2005 HVAC

Heating, Ventilation and Air Conditioning - Yukon, Suburban, Tahoe, Escalade, Yukon XL, Avalanche, Escalade EXT & Escalade ESV

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
A/C High Pressure Recirculation Switch	6 N.m	53 lb in
A/C Low Pressure Switch	6 N.m	53 lb in
A/C Refrigerant Filter Retaining Nuts	15 N.m	11 lb ft
Accumulator Bracket Nut	9 N.m	80 lb in
Accumulator Clamp Bolt	10 N.m	8 lb ft
Air Distribution Duct Screws	1.6 N.m	14 lb in
Air Outlet Mounting Screw	1.6 N.m	14 lb in
Auxiliary A/C Tubes at the Auxiliary HVAC Module	16 N.m	12 lb ft
Auxiliary Evaporator Tube to TXV Nut	28 N.m	21 lb ft
Auxiliary HVAC Module A/C Line Nut	16 N.m	12 lb ft
Auxiliary HVAC Module Mounting Nuts to Vehicle	9 N.m	80 lb in
Blower Motor Insulating Cover Screw	1.6 N.m	14 lb in
Blower Motor Relay/Resistor Screw	1.6 N.m	14 lb in
Compressor Bracket Mounting Bolts	50 N.m	37 lb ft
Compressor Clutch Coil Connector Retaining Bracket Screw	9 N.m	80 lb in
Compressor Clutch Plate Retaining Bolt	18 N.m	13 lb ft
Compressor Discharge Hose Nut at Compressor	16 N.m	12 lb ft
Compressor Hose Bolt to Compressor (L18 Harrison)	34 N.m	25 lb ft
Compressor Mounting Bolts (L18 Harrison)	50 N.m	37 lb ft
Compressor Mounting Bolts (LR4, LM7, LQ4 Denso)	50 N.m	37 lb ft
Compressor Suction/Discharge Hose Bolt	34 N.m	25 lb ft

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Compressor Suction Hose Nut to Accumulator	16 N.m	12 lb ft
Compressor Suction Hose to Accumulator	41 N.m	30 lb ft
Condenser Upper Insulator Retainer Bolts	2.4 N.m	21 lb in
Discharge Hose Mounting Bolt (LR4, LM7, LQ4 Denso)	16 N.m	12 lb ft
Evaporator Tube Fitting at Orifice	25 N.m	18 lb ft
Evaporator Tube Nut at Condenser	16 N.m	12 lb ft
Evaporator Tube Nut at Evaporator	16 N.m	12 lb ft
Evaporator Tube to the Auxiliary A/C Tube	16 N.m	12 lb ft
Filter Access Door Screw	1.6 N.m	14 lb in
Floor Air Outlet Duct Screw	1.6 N.m	14 lb in
Heater A/C Auxiliary Tubes Retaining Nuts	7 N.m	62 lb in
Heater Core Cover Screws	1.6 N.m	14 lb in
Heater Hose Outlet Mounting Nut and Bolt	25 N.m	18 lb ft
Heater/Ventilation Module Mounting Nuts	9 N.m	80 lb in
Heater/Ventilation Module Mounting Screws	4 N.m	35 lb in
Heater Ventilation Module Screws	1.6 N.m	14 lb in
Insulator Retainers and Bolts	2.4 N.m	21 lb in
Pressure Relief Valve	9 N.m	80 lb in
Suction Hose Mounting Bolt (LR4, LM7, LQ4 Denso)	16 N.m	12 lb ft

REFRIGERANT SYSTEM CAPACITIES

Refrigerant System Capacities

Application	Specification	
	Metric	English
PAG Oil GM P/N 12378526 for United States PAG Oil GM P/N 88900060 for Canada		
Accumulator Replacement	60 ml*	2 oz.*
• * Add PAG oil equal to the amount of oil drained from the accumulator plus the specified additional amount.		
Compressor Replacement	60 ml[1]	2 oz.[1]
• The Denso service compressor is precharged with 237 ml (8.0 oz.) of PAG oil.		
Condenser Replacement	30 ml[1]	1 oz.[1]

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Evaporator Replacement	90 ml[1]	3 oz.[1]
Evaporator, Rear Replacement	90 ml[1]	3 oz.[1]
• Total System PAG Oil Capacity	210 ml	7.1 oz.
• Total System PAG Oil Capacity with Rear A/C	330 ml	11 oz.
R-134a		
• Refrigerant Charge	0.7 kg	1.6 lb
• Refrigerant Charge Utility with Front and Rear A/C	1.2 kg	2.7 lb
• Refrigerant Charge Suburban with Front and Rear A/C	1.4 kg	3.0 lb
[1] 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

LEAK TESTING

Tools Required

- **J 39400-A** Halogen Leak Detector. See **Special Tools**.
- **J 41447** R-134a A/C Tracer Dye-Box of 24. See **Special Tools**.
- **J 41459** R-134a A/C Tracer Dye Injector
- **J 42220** Universal 12V Leak Detection Lamp. See **Special Tools**.
- **J 43872** Fluorescent Dye Cleaner. See **Special Tools**.

Refrigerant Leak Testing

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

The preferred method of leak testing is with the use of fluorescent dye. **J 41447** is the only fluorescent dye approved by General Motors. See **Special Tools**.

The fluorescent dye mixes and flows with the 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. See **Special Tools**.

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 fluorescent dye cleaner **J 43872** . See **Special Tools**.

Fluorescent Dye Injection

IMPORTANT: J 41447 is the only A/C leak detection dye approved by General Motors. See Special Tools.

- Not all of the fluorescent dyes are compatible with PAG oil.

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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. This may cause reliability problems. Use only one 7.39 ml (0.25 oz.) charge bottle of J 41447 .

- With the A/C system charged, add **J 41447** to the A/C system using **J 41459** R-134a A/C Tracer Dye Injector. Follow the instructions provided with **J 41459** .
- 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

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** . See **Special Tools**.

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (WITH AUX A/C AND ELECT ELECTRIC COOLING FAN)

Test Description

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

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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 air temperatures.

Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)

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 Refrigerant Station. See **Special Tools**. 6. Record the ambient air temperature displayed on the **J 43600** . 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16° C (60° F), 345 kPa (50 psi) • Greater than 24° C (75° F), 483 kPa (70 psi) • Greater than 33° C (90° F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing**
	IMPORTANT: **Record the relative humidity and the ambient air temperature**			

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	at the time of the test.				
2	1. Close the vehicle doors and windows. 2. Open the drivers door window 127-152 mm (5-6 inches). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The IP panel outlet mode • All IP panel outlets are OPEN • Recirculation mode 4. Install the temperature probes to the **J 43600** in the left and right center A/C air outlets. 5. Apply the parking brake. 6. Place the transaxle/transmission in one of the following positions: • PARK for Automatic • NEUTRAL for Manual 7. Start the engine. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions: • Abnormal frost areas • Unusual noises	-			

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	IMPORTANT: **Press the RESET button, before using the print function of the J 43600 .** 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 table below. Does all the data recorded fall within the specified ranges of the table below?		Go to **Step 8**	Go to **Step 3**
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 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 4**

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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 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** in HVAC Systems - Manual or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

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A/C System Pressure Zone Classification with Aux A/C and with Electric Cooling Fan

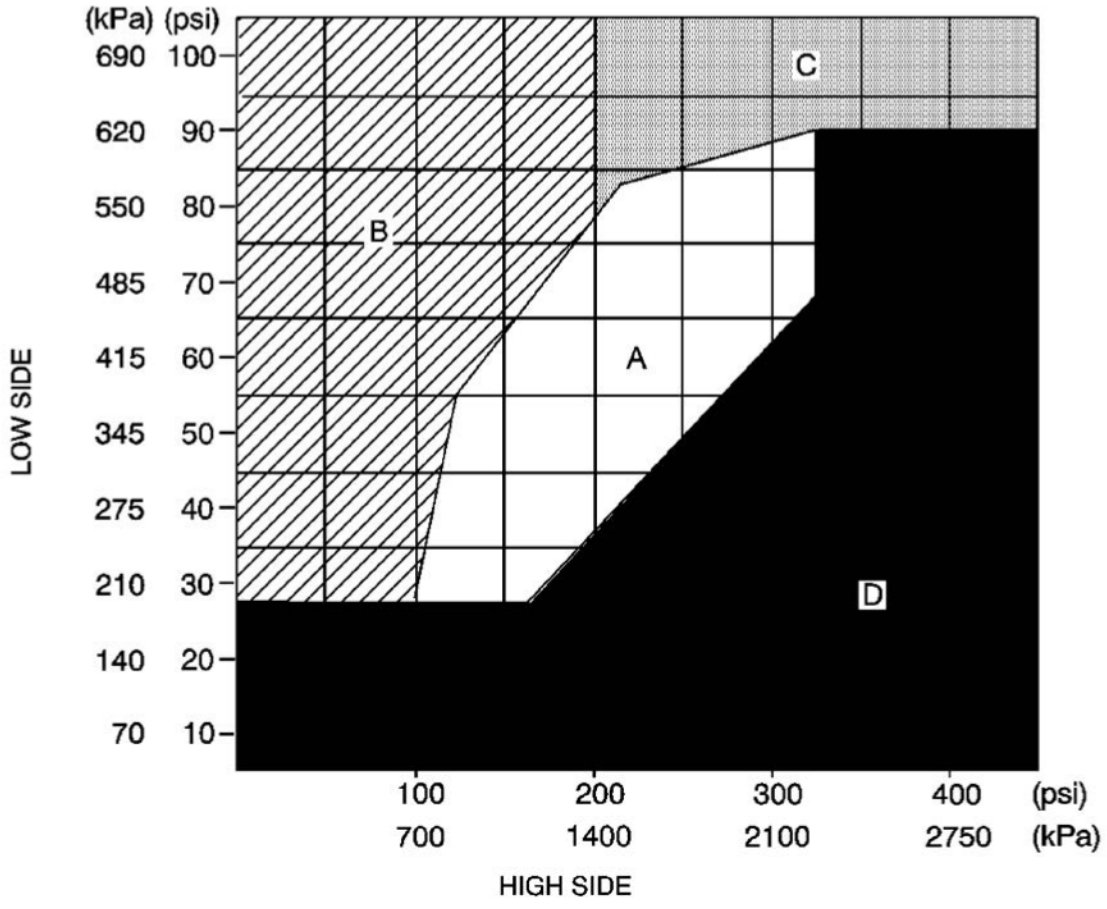


Fig. 1: A/C System Pressure Zone Classification Chart With Aux A/C & With Electric Cooling Fan
Courtesy of GENERAL MOTORS CORP.

A/C Performance Table with Aux A/C and with Electric Cooling Fan

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Left Center Discharge Air Temperature	Maximum Left Rear Discharge Air Temperature
		Low Side	High Side		
13-18°C (55-65°F)	0-100%	192-282 kPa (28-41 psi)	778-1026 kPa (113-149 psi)	10°C (50°F)	13°C (55°F)
19-24°C (66-75°F)	Below 40%	303-372 kPa (44-54 psi)	950-1247 kPa (138-181 psi)	17°C (61°F)	18°C (63°F0
		282-365 kPa	950-1281 kPa		

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	Above 40%	(41-53 psi)	(138-186 psi)	15°C (59°F)	18°C (63°F0
25-29°C (76-85°F)	Below 35%	337-413 kPa (49-60 psi)	1150-1419 kPa (167-206 psi)	19°C (66°F)	20°C (68°F)
	35-50%	330-420 kPa (48-61 psi)	1157-1440 kPa (168-209 psi)	21°C (69°F)	22°C (70°F)
	Above 50%	330-420 kPa (48-61 psi)	1171-1481 kPa (170-215 psi)	21°C (69°F)	22°C (70°F)
30-35°C (86-95°F)	Below 30%	372-461 kPa (54-67 psi)	1309-1619 kPa (190-235 psi)	23°C (72°F)	23°C (72°F)
	30-50%	372-475 kPa (54-69 psi)	1329-1756 kPa (193-255 psi)	23°C (72°F)	24°C (75°F)
	Above 50%	378-489 kPa (55-71 psi)	1357-1729 kPa (197-251 psi)	24°C (75°F)	25°C (77°F)
36-41°C (96-105°F)	Below 20%	413-496 kPa (60-72 psi)	1488-1791 kPa (216-260 psi)	24°C (75°F)	25°C (77°F)
	20-40%	413-516 kPa (60-75 psi)	1508-1853 kPa (219-269 psi)	27°C (79°F)	28°C (81°F)
	Above 40%	427-537 kPa (62-78 psi)	1557-1908 kPa (226-277 psi)	28°C (81°F)	28°C (82°F)
42-46°C (106-115°F)	Below 20%	447-537 kPa (65-78 psi)	1681-1956 kPa (244-284 psi)	27°C (79°F)	28°C (82°F)
	Above 20%	461-564 kPa (67-82 psi)	1708-2032 kPa (248-295 psi)	29°C (84°F)	29°C (84°F)
47-49°C (116-120°F)	Below 30%	496-585 kPa (72-85 psi)	1880-2156 kPa (273-313 psi)	30°C (86°F)	30°C (86°F)

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (W/O AUX A/C AND WITH ELECTRIC COOLING)

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 air temperatures.

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Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)

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 Refrigerant Station. See **Special Tools**. 6. Record the ambient air temperature displayed on the **J 43600** . 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16° C (60° F), 345 kPa (50 psi) • Greater than 24° C (75° F), 483 kPa (70 psi) • Greater than 33° C (90° F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing**
	IMPORTANT: **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			

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2	window 127-152 mm (5-6 inches). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The IP panel outlet mode • All IP panel outlets are OPEN • Recirculation mode 4. Install the temperature probes to the **J 43600** in the left and right center A/C air outlets. 5. Apply the parking brake. 6. Place the transaxle/transmission in one of the following positions: • PARK for Automatic • NEUTRAL for Manual 7. Start the engine. 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 .**	-			

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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 table below. Does all the data recorded fall within the specified ranges of the table below?		Go to **Step 8**	Go to **Step 3**
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 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 4**
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** -	

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			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 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** in HVAC Systems - Manual or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

A/C System Pressure Zone Classification w/o Aux A/C and with Electric Cooling Fan

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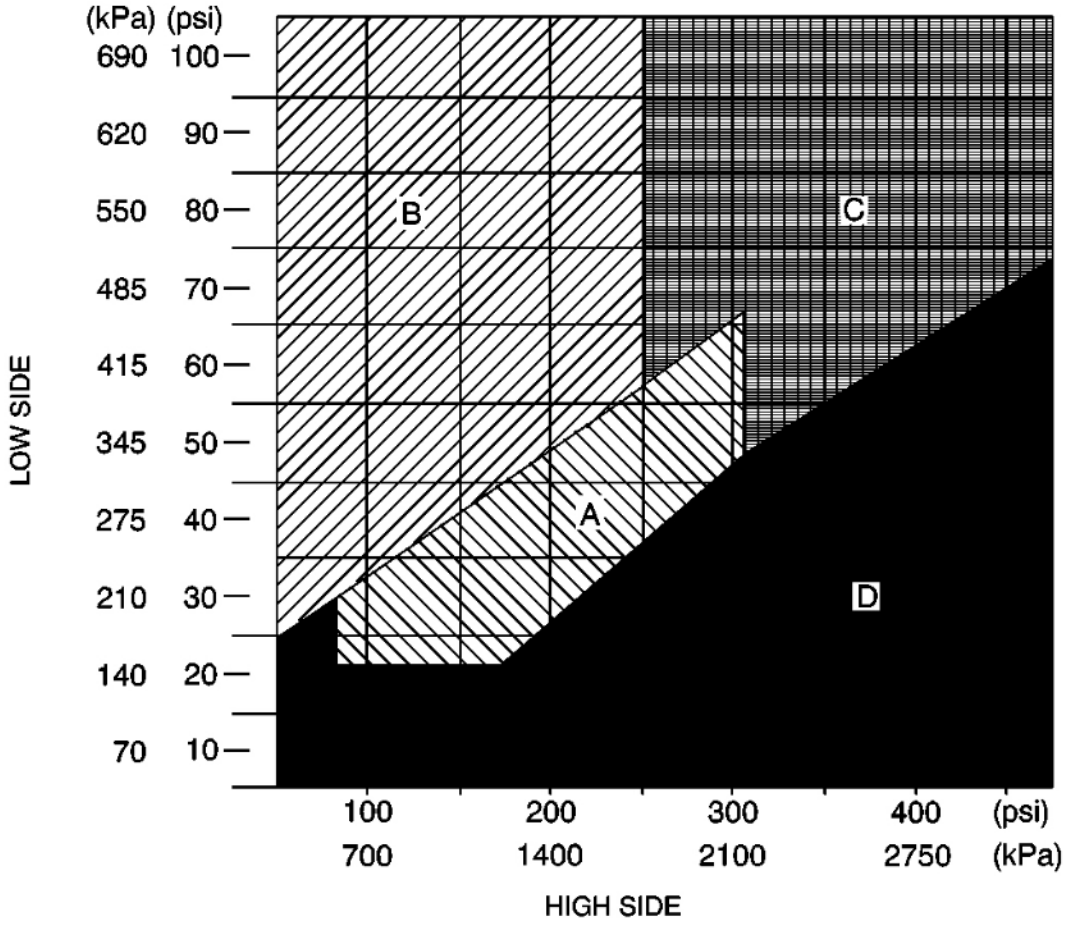


Fig. 2: A/C System Pressure Zone Classification Chart w/o Aux A/C & With Electric Cooling Fan
Courtesy of GENERAL MOTORS CORP.

A/C Performance Table w/o Aux A/C and with Electric Cooling Fan

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Left Center Discharge Air Temperature
		Low Side	High Side	
13-18°C (55-65°F)	0-100%	165-257 kPa (24-37 psi)	830-1180 kPa (120-171 psi)	10°C (50°F)
19-24°C (66-	Below 40%	185-290 kPa (27-42 psi)	1010-1340 kPa (147-194 psi)	11°C (52°F)

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75°F)	Above 40%	202-313 kPa (29-45 psi)	990-1370 kPa (144-199 psi)	13°C (55°F)
25-29°C (76-85°F)	Below 35%	225-319 kPa (33-46 psi)	1180-1470 kPa (171-213 psi)	14°C (57°F)
	35-50%	238-330 kPa (35-48 psi)	1180-1490 kPa (171-216 psi)	14°C (57°F)
	Above 50%	248-352 kPa (36-51 psi)	1190-1520 kPa (173-221 psi)	16°C (61°F)
30-35°C (86-95°F)	Below 30%	257-359 kPa (37-52 psi)	1320-1610 kPa (192-234 psi)	17°C (63°F)
	30-50%	267-375 kPa (39-54 psi)	1340-1650 kPa (194-239 psi)	18°C (64°F)
	Above 50%	281-399 kPa (41-58 psi)	1360-1710 kPa (197-248 psi)	20°C (68°F)
36-41°C (96-105°F)	Below 20%	290-393 kPa (42-57 psi)	1480-1760 kPa (215-255 psi)	19°C (66°F)
	20-40%	298-411 kPa (43-60 psi)	1500-1820 kPa (218-264 psi)	21°C (70°F)
	Above 40%	313-429 kPa (45-62 psi)	1540-1880 kPa (224-273 psi)	22°C (72°F)
42-46°C (106-115°F)	Below 20%	327-428 kPa (47-62 psi)	1650-1910 kPa (239-277 psi)	21°C (70°F)
	Above 20%	336-448 kPa (49-65 psi)	1680-1980 kPa (244-287 psi)	23°C (73°F)
47-49°C (116-120°F)	Below 30%	367-474 kPa (53-69 psi)	1830-2100 kPa (266-305 psi)	25°C (77°F)

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (W/AUX A/C AND ENGINE DRIVE DRIVEN COOLING)

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 air temperatures.

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Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)

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 Refrigerant Station. 6. Record the ambient air temperature displayed on the **J 43600** . 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16° C (60° F), 345 kPa (50 psi) • Greater than 24° C (75° F), 483 kPa (70 psi) • Greater than 33° C (90° F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing**
	IMPORTANT: **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 127-152 mm (5-6			

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2	inches). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The IP panel outlet mode • All IP panel outlets are OPEN • Recirculation mode 4. Install the temperature probes to the **J 43600** in the left and right center A/C air outlets. See **Special Tools**. 5. Apply the parking brake. 6. Place the transaxle/transmission in one of the following positions: • PARK for Automatic • NEUTRAL for Manual 7. Start the engine. 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 .**	-			

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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 table below. Does all the data recorded fall within the specified ranges of the table below?		Go to **Step 8**	Go to **Step 3**
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 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 4**
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** -	

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			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 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** in HVAC Systems - Manual or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

A/C System Pressure Zone Classification with Aux A/C and Engine Driven Cooling Fan

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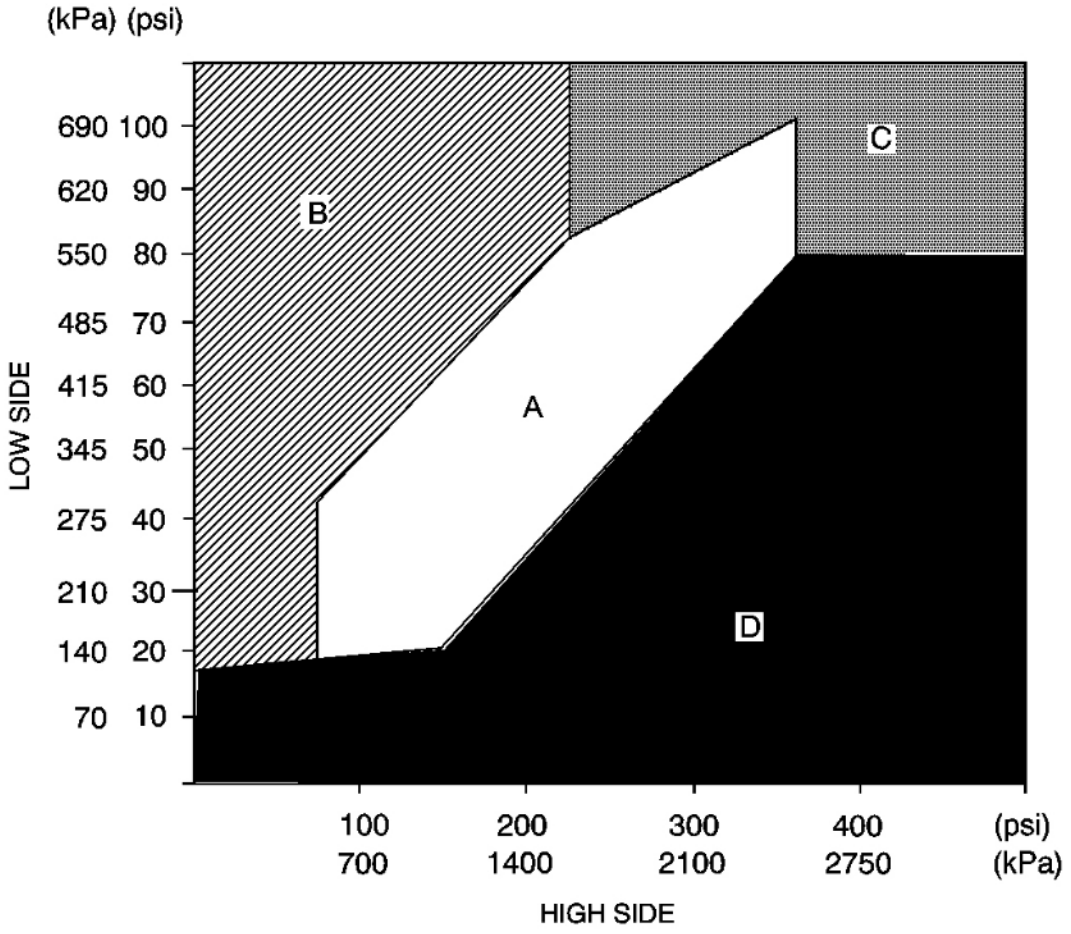


Fig. 3: A/C System Pressure - Zone Classification Chart (With Rear A/C)
Courtesy of GENERAL MOTORS CORP.

A/C Performance Table with Aux A/C and Engine Driven Cooling Fan

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Discharge Air Temperature	
		Low Side	High Side	Left Front Center	Left Rear
13-18°C (55-65°F)	0-100%	150-280 kPa (22-41 psi)	540-990 kPa (78-144 psi)	11°C (52°F)	14°C (57° F)
19-24°C (66-75°F)	Below 40%	187-328 kPa (27-48 psi)	680-1140 kPa (99-165 psi)	15°C (59°F)	18°C (64° F)
	Above 40%	214-370 kPa (31-54 psi)	780-1240 kPa (113-180 psi)	16°C (61°F)	20°C (68° F)

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25-29°C (76-85°F)	Below 35%	266-386 kPa (39-56 psi)	1000-1370 kPa (145-199 psi)	19°C (66°F)	22°C (72° F)
	35-60%	280-405 kPa (41-59 psi)	1050-1390 kPa (152-202 psi)	20°C (68°F)	23°C (73° F)
	Above 60%	300-431 kPa (44-63 psi)	1080-1440 kPa (157-209 psi)	21°C (70°F)	25°C (77° F)
30-35°C (86-95°F)	Below 30%	328-459 kPa (48-67 psi)	1260-1650 kPa (183-239 psi)	23°C (73°F)	26°C (79° F)
	30-50%	344-482 kPa (50-70 psi)	1280-1670 kPa (186-242 psi)	25°C (77°F)	28°C (82° F)
	Above 50%	365-516 kPa (53-75 psi)	1310-1700 kPa (190-247 psi)	27°C (81°F)	30°C (86° F)
36-41°C (96-105°F)	Below 20%	397-523 kPa (58-76 psi)	1560-1950 kPa (226-283 psi)	27°C (81°F)	30°C (86° F)
	20-40%	405-545 kPa (59-79 psi)	1570-1950 kPa (228-283 psi)	29°C (84°F)	32°C (90° F)
	Above 40%	431-572 kPa (63-83 psi)	1580-1950 kPa (229-283 psi)	31°C (88°F)	34°C (93° F)
42-46°C (106-115°F)	Below 20%	471-585 kPa (68-85 psi)	1870-2200 kPa (271-319 psi)	30°C (86°F)	33°C (92° F)
	Above 20%	482-611 kPa (70-89 psi)	1870-2180 kPa (271-316 psi)	33°C (92°F)	36°C (97° F)
47-49°C (116-120°F)	Below 30%	545-661 kPa (79-96 psi)	2120-2430 kPa (308-353 psi)	35°C (95°F)	37°C (99° F)

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (W/O AUX A/C AND ENGINE DRIVEN COOLING)

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

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

Test Description

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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 air temperatures.

Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)

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 Refrigerant Station. See **Special Tools**. 6. Record the ambient air temperature displayed on the **J 43600** . 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Above 16°C (60°F) 345 kPa (50 psi) • Above 24°C (75°F) 483 kPa (70 psi) • Above 33°C (90°F) 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing**
	IMPORTANT: **Record the relative humidity and**			

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	the ambient air temperature at the time of the test. 1. Close the vehicle doors and windows. 2. Open the drivers door window 127-152 mm (5-6 inches). 3. Select the following HVAC control settings: • The A/C ON • The coldest temperature setting • The maximum blower speed • The IP panel outlet mode • All IP panel outlets are OPEN • Recirculation mode				
2	4. Install the temperature probes to the **J 43600** in the left and right center air outlets. 5. Apply the parking brake. 6. Place the transaxle/transmission in one of the following positions: • PARK for Automatic • NEUTRAL for Manual 7. Start the engine. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions: • Abnormal frost areas • Unusual noises **IMPORTANT:**	-			

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	Press the RESET button, before using the print function of the J 43600 . 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 table below. Does all the data recorded fall within the specified ranges of the table below?		Go to **Step 8**	Go to **Step 3**
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 4**
	Do the high and low side pressures		Go to **Air**	

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4	fall within the specified ranges but the panel outlet temperatures do not?	-	**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 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** in HVAC Systems - Manual or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

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A/C System Pressure Zone Classification w/o Aux A/C and Engine Driven Cooling Fan

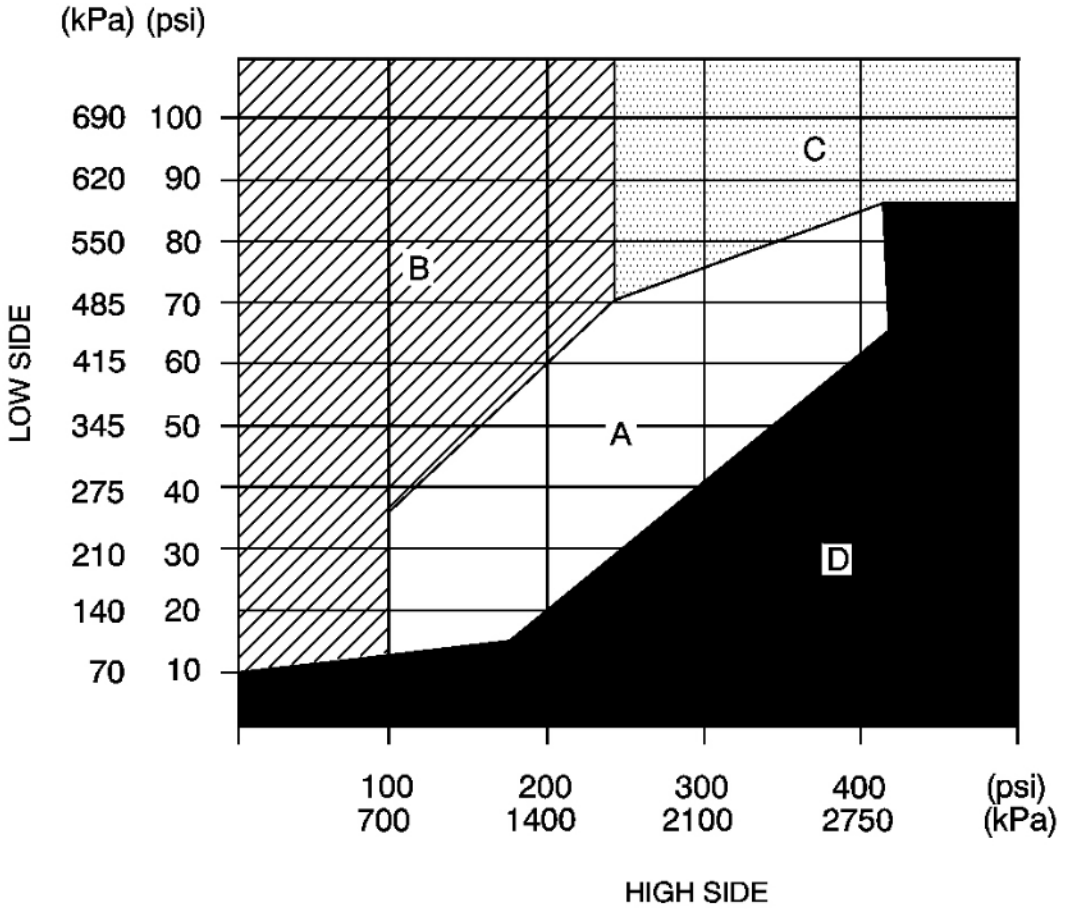


Fig. 4: A/C System Pressure (4.3L, 4.8L, 5.3L, 6.0 & 8.1L Engines)
Courtesy of GENERAL MOTORS CORP.

A/C Performance Table w/o Aux A/C and Engine Driven Cooling Fan

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Left Center Discharge Air Temperature
		Low Side	High Side	
13-16°C (55-65°F)	0-100%	150-246 kPa (22-36 psi)	730-1190 kPa (106-173 psi)	12°C (54°F)
	Below 40%	150-280 kPa (22-41 psi)	900-1390 kPa (131-202 psi)	14°C (57°F)

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19-24°C (66-75°F)	Above 40%	179-137 kPa (26-46 psi)	990-1500 kPa (144-218 psi)	16°C (61°F)
25-29°C (76-85°F)	Below 35%	218-328 kPa (32-48 psi)	1240-1640 kPa (180-238 psi)	17°C (63°F)
	35-60%	236-342 kPa (34-50 psi)	1290-1680 kPa (187-244 psi)	18°C (64°F)
	Above 60%	250-365 kPa (36-53 psi)	1340-1760 kPa (194-255 psi)	20°C (68°F)
30-35°C (86-95°F)	Below 30%	266-386 kPa (39-56 psi)	1500-1940 kPa (218-282 psi)	21°C (70°F)
	30-50%	280-397 kPa (41-58 psi)	1540-1990 kPa (224-289 psi)	22°C (72°F)
	Above 50%	300-430 kPa (44-62 psi)	1600-2070 kPa (232-300 psi)	24°C (75°F)
36-41°C (96-105°F)	Below 20%	328-439 kPa (48-64 psi)	1810-2240 kPa (263-325 psi)	25°C (77°F)
	20-40%	337-457 kPa (49-66 psi)	1840-2290 kPa (267-332 psi)	26°C (79°F)
	Above 40%	355-474 kPa (52-69 psi)	1890-2340 kPa (274-340 psi)	27°C (81°F)
42-46°C (106-115°F)	Below 20%	391-491 kPa (57-71 psi)	2130-2500 kPa (309-363 psi)	29°C (84°F)
	Above 20%	397-508 kPa (58-74 psi)	2160-2550 kPa (313-370 psi)	30°C (86°F)
47-49°C (116-120°F)	Below 30%	451-552 kPa (65-80 psi)	2420-2790 kPa (351-405 psi)	33°C (92°F)

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

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

Step	Action	Value	Yes	No
DEFINITION: The high and low side pressures may be normal or slightly less than normal. • Air Delivery Concern • Slight Refrigerant Under Charge • Refrigerant Contamination				
	Were you sent here from the A/C			Go to **Air**

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1	System Performance Test?	-	Go to **Step 2**	**Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
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 1-2°C (2-3°F)?	-	Go to **Step 7**	Go to **Step 3**
	Did the customer mention that the			

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3	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 2000 RPM. During extended operation of the A/C system, does the low side pressure decrease, possibly accompanied by heavy frost on the liquid line between the expansion device and the evaporator?	-	Go to **Air Conditioning (A/C) Diagnostics - Pressure Zone D**	Go to **Step 5**
5	1. Refer to the pressures recorded during the A/C system performance test. 2. 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 Pressure-Zone Classification Chart in the A/C System Performance Test. Refer to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)Air Conditioning (A/C) System Performance Test**	-		

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	(w/o Aux A/C and with Electric Cooling) Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling). • The discharge line is hot. • The suction line is cool. Do the listed conditions exist?		Go to **Step 7**	Go to **Step 6**
6	1. Refer to the pressures recorded during the A/C system performance test. 2. 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 **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)Air Conditioning**	-		

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	(A/C) System Performance Test (w/o Aux A/C and with Electric Cooling) Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling). • The discharge line is warm-to-hot. • The suction line is cool-to-warm. Do the listed conditions exist?		Go to **Step 8**	Go to **Too Hot in Vehicle** in HVAC Systems - Manual or **Too Hot in Vehicle** in HVAC Systems - Automatic
7	The A/C system may be undercharged. 1. Leak test A/C system. Refer to **Leak Testing**. 2. Recharge the A/C system to specifications. Refer to **Refrigerant Recovery and Recharging**. Is the action complete?	-	Go to **Step 14**	-
8	The A/C system may be contaminated. View the information screen on **J 43600** ACS 2000 Air Conditioning Service Center for detection of foreign gases in the	-		

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	A/C system. 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 action complete?	-	Go to **Step 14**	-
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 (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Are the panel outlet temperatures	-		

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	within the specified ranges of the A/C Performance Test Table?		Go to **Step 15**	Go to **Step 11**
11	The A/C system may contain too much refrigerant oil. 1. Recover the refrigerant from the A/C system. Refer to **Refrigerant Recovery and Recharging**. 2. Remove the accumulator. Refer to **Accumulator Replacement**. 3. Drain and measure the refrigerant oil from the accumulator. Was more than the specified amount of refrigerant oil drained from the accumulator?	148 ml (5 oz.)	Go to **Step 12**	Go to **Step 13**
12	1. Reinstall the accumulator. Refer to **Accumulator Replacement**. 2. Flush the A/C system. Refer to **Flushing**. 3. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Are the actions complete?	-	Go to **Step 14**	-
13	1. Add the specified amount of refrigerant oil to the accumulator. Refer to **Refrigerant System Capacities**. 2. Install the accumulator. Refer to **Accumulator Replacement**.	-		

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	3. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Are the actions complete?		Go to **Step 14**	-
14	1. Record the low and high side pressures and the I/P outlet air temperature. 2. Compare the outlet temperatures to those listed in the A/C System Performance Chart. Refer to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Are the high and low side pressures and I/P panel outlet temperatures within specifications?	-	Go to **Step 15**	Go to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
	Operate the system in order to verify the repair.			Go to **Symptoms** -

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15	Did you find and correct the condition?	-	System OK	**HVAC Systems - Manual** or **Symptoms - HVAC Systems - Automatic**

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			
1	Were you sent here from the A/C System Performance Test?		Go to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air**

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		Go to **Step 2**	**Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
2	After continued operation of the air conditioning (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 (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. • 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 (with Aux A/C and Electric Cooling Fan)** or **Air**		

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	Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling) or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. • 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**
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 Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**.		Go to **Air Conditioning (A/C) System Performance Test (with Aux A/C and**

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	• 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 (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. • 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**	**Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
5	The A/C system has a low refrigerant charge. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Is the procedure complete?	Go to **Step 6**	-
	1. Record the low and the high side pressures as well as the instrument panel (I/P) air outlet 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 **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air**		

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6	**Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. 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 **Expansion (Orifice) Tube Replacement**. 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**
9	1. Remove the suction and the discharge lines from the compressor. Refer to **Suction Hose Replacement** and to **Discharge Hose Replacement**. 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 **Compressor Replacement (LR4, LM7, and LQ4)**. 2. Install an A/C refrigerant filter. Refer to **Air Conditioning (A/C) Refrigerant Filter Installation**. 3. Replace the orifice tube. Refer to		

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	Expansion (Orifice) Tube Replacement. 4. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Is the repair complete?	Go to **Step 13**	-
11	1. Flush the A/C system. Refer to **Flushing**. 2. Replace the orifice tube. Refer to **Expansion (Orifice) Tube Replacement**. 3. Replace the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**. 4. Replace the accumulator. Refer to **Accumulator Replacement**. 5. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Is the repair complete?	Go to **Step 13**	-
12	1. Replace the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**. 2. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. 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 **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

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

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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 **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
	1. With the engine idling, turn ON the A/C. 2. Inspect for proper cooling fan		

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2	operation. Refer to **Cooling System Description and Operation** 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: • Restricted air flow. • Damaged condenser cooling fins. • Inspect for missing or misaligned air baffles. Do the following conditions exist?	Go to **Step 4**	Go to **Step 6**
4	Repair the air flow restriction. Is the repair complete?	Go to **Step 9**	-
5	Repair the cooling fan operation fault. Refer to **Fan Clutch Diagnosis** 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.Is the temperature the same before and after the expansion device?	Go to **Step 7**	Go to **Step 8**
7	Replace the damaged/faulty orifice tube. Refer to **Expansion (Orifice) Tube 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 Refrigerant Station for foreign gas content in the refrigerant. Recover and recharge the A/C system. Refer to **Refrigerant Recovery and**		

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	Recharging. Is the repair complete?	Go to **Step 9**	-
9	1. Record the low and high side pressures and the I/P outlet air temperature after repairs are performed. 2. Compare the pressures and outlet temperature to those listed in the A/C Performance Chart. Refer to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Are the readings within the specified ranges?	Go to **Step 10**	Go to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
10	Operate the system in order to verify the repair. Did you find and correct the condition?		Go to **Symptoms - HVAC Systems - Manual** in HVAC - Manual OR **Symptoms - HVAC Systems - Automatic** in

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		System OK	HVAC - Automatic

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

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.			
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 (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
	CAUTION:		

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2	**Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices.** 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**
5	Feel along the surfaces of the following low side components: • The evaporator inlet tube between the expansion device and the evaporator core • The evaporator outlet tube between the evaporator core and the compressor • The accumulator		

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	• 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 inlet tube between the expansion device and the evaporator core • The evaporator outlet tube between the evaporator core and the accumulator • The accumulator • The compressor suction hose • The compressor discharge hose • The condenser • The evaporator inlet tube between the condenser and the 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 **Refrigerant Recovery and Recharging**. 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**	-
	1. Recover the refrigerant and evacuate the system. Refer to **Refrigerant Recovery and Recharging**.		

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8	2. Record the weight of the recovered refrigerant. 3. Compare the weight of the recovered refrigerant with the system capacity. Refer to **Refrigerant System Capacities**. 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 **Refrigerant Recovery and Recharging**. Is the cooling performance improved?	Go to **Step 21**	Go to **Step 10**
10	1. Leak test the system. Refer to **Leak Testing**. 2. Repair any leaks. Is the repair complete?	Go to **Step 21**	-
11	The expansion device is restricted. Replace the expansion device. Refer to **Expansion (Orifice) Tube Replacement**. Are metal flakes present?	Go to **Step 12**	Go to **Step 13**
12	1. Remove the suction line from the vehicle. Refer to **Suction Hose Replacement**. 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. Flush the A/C system. Refer to **Flushing**. 2. Replace the accumulator. Refer to **Accumulator Replacement**. Are the repairs complete?	Go to **Step 21**	-
14	1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**. 2. Disconnect the suction and the discharge lines from the compressor. Refer to **Suction Hose Replacement** and **Discharge Hose Replacement**. 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 expansion device for damage or debris. Refer to **Expansion (Orifice) Tube Replacement**. Did you find evidence of damage or debris?	Go to **Step 17**	Go to **Step 16**
16	If the expansion device does not show any signs of damage or debris, perform the following procedure: 1. Remove the suction line from the vehicle. Refer to **Suction Hose Replacement**. 2. Inspect the hose for debris by blowing shop air through one end of the hose while covering the other end		

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	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 19**
17	1. Replace the expansion device. Refer to **Expansion (Orifice) Tube Replacement**. 2. If the 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 compressor hose assembly, perform the following procedure: Replace the accumulator. Refer to **Accumulator Replacement**. Is the repair complete?	Go to **Step 19**	-
19	Install the suction and the discharge lines. Refer to **Suction Hose Replacement** and **Discharge Hose Replacement**. Are the repairs complete?	Go to **Step 21**	-
20	1. Install the suction and the discharge lines. Refer to **Suction Hose Replacement** and **Discharge Hose Replacement**. 2. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**. Are the repairs complete?	Go to **Step 21**	-
	1. Record the low and the high side pressures and the panel outlet air temperature after you perform the		Go to **Air Conditioning (A/C) System**

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21	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 (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Are the readings within the specified ranges as shown on the A/C Performance Chart?	Go to **Step 22**	**Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**
22	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Symptoms - HVAC Systems - Manual** in HVAC Systems - Manual or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic

HEATING PERFORMANCE DIAGNOSTIC

Heating Performance Diagnostic

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Step	Action	Yes	No
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 or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic
2	1. Start the engine. 2. Allow the engine to idle. Does the engine reach a normal operating temperature?	Go to **Step 3**	Go to **Step 9**
3	**CAUTION:** **Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices.** 1. Allow the engine to idle. 2. Select the FLOOR mode. 3. Select the minimum blower speed. 4. Select the warmest temperature setting. 5. 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 7**	Go to **Step 4**
	1. Install a thermometer into the center IP PANEL air outlet. 2. Secure a thermometer to the heater core outlet hose. 3. Select the PANEL mode. 4. Select the maximum blower speed.		

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4	5. Select the warmest temperature setting. 6. Record the temperature at the following locations: • The center IP 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. 7. 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 8**	Go to **Step 10**
8	Replace the heater core. Refer to **Heater Core Replacement (Visteon)** or **Heater Core Replacement (Delphi)**. 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
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Manual** or **Symptoms - HVAC Systems - Automatic**
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 10**
3	Measure the engine operating temperature. Does engine reach a normal operating temperature?	Go to **Step 10**	Go to **Step 8**
	1. Select the minimum blower speed. 2. Select the warmest temperature		

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4	setting. **CAUTION:** **Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices.** 3. Feel the temperature of the inlet and outlet hoses at the heater core. Does the inlet heater hose feel warmer than the outlet heater hose?	Go to **Step 11**	Go to **Step 5**
5	Test the operation of the A/C compressor clutch. Does the A/C compressor clutch engage?	Go to **Step 7**	Go to **Step 6**
6	Repair the A/C compressor clutch. Refer to **HVAC Compressor Clutch Does Not Engage** in HVAC Systems-Automatic or to **HVAC Compressor Clutch Does Not Engage** in HVAC Systems - Manual. Is the repair complete?	Go to **Step 14**	-
7	Perform the A/C system performance test. Refer to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Is the A/C system operating within the specifications?	Go to **Step 9**	Go to **Step 12**
8	Repair the low engine temperature concern. Refer to **Engine Fails To Reach Normal Operating Temperature** in Engine Cooling.		

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	Is the repair complete?	Go to **Step 14**	-
9	Inspect for correct operation of the recirculation door. Is the recirculation door operating correctly?	Go to **Step 14**	Go to **Step 13**
10	Repair the air delivery concern. Refer to **Air Delivery Improper** in HVAC Systems - Automatic or to **Air Delivery Improper** in HVAC Systems - Manual. Is the repair complete?	Go to **Step 14**	-
11	Repair the heating concern. Refer to **Heating Performance Diagnostic**. Is the repair complete?	Go to **Step 14**	-
12	Repair the A/C performance concern. Refer to **Air Conditioning (A/C) System Performance Test (with Aux A/C and Electric Cooling Fan)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and with Electric Cooling)** or **Air Conditioning (A/C) System Performance Test (w/Aux A/C and Engine Driven Cooling)** or **Air Conditioning (A/C) System Performance Test (w/o Aux A/C and Engine Driven Cooling)**. Is the repair complete?	Go to **Step 14**	-
13	Repair the recirculation door concern. Refer to **Air Recirculation Malfunction** in HVAC Systems - Automatic or to **Air Recirculation Malfunction** in HVAC Systems - Manual. Is the repair complete?	Go to **Step 14**	-
14	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Step 2**

NOISE DIAGNOSIS - AUXILIARY BLOWER MOTOR

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Noise Diagnosis - Auxiliary Blower Motor

Step	Action	Yes	No
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 or to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine OFF. 4. Cycle the auxiliary blower motor through all of the speeds and modes in order to determine where and when the noise occurs. Is a noise evident during auxiliary blower operation?	Go to **Step 3**	Go to **Step 10**
3	Does the noise vary with the auxiliary blower speed?	Go to **Step 4**	Go to **Step 5**
4	Inspect for excessive vibration at each auxiliary blower motor speed by feeling the auxiliary blower case. Is excess vibration present?	Go to **Step 5**	Go to **Step 10**
5	1. Remove the auxiliary blower motor. Refer to **Blower Motor Replacement - Auxiliary**. 2. Inspect the auxiliary blower motor for deposits of foreign material. Did you find foreign material on the auxiliary blower motor?	Go to **Step 7**	Go to **Step 6**

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6	Inspect the auxiliary blower motor for the following conditions: • Cracked blades • A loose impeller retainer • Improper impeller alignment Did you find any of these conditions?	Go to **Step 8**	Go to **Step 9**
7	Remove the foreign material. Is the action complete?	Go to **Step 10**	-
8	Replace the auxiliary blower motor. Refer to **Blower Motor Replacement - Auxiliary**. Is the action complete?	Go to **Step 10**	-
9	Install the auxiliary blower motor. Refer to **Blower Motor Replacement - Auxiliary**. Is the action 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**

NOISE DIAGNOSIS - BLOWER MOTOR

Noise Diagnosis - Blower Motor

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Manual** or **Symptoms - HVAC Systems - Automatic**
2	Inspect the air inlet grille for debris. Is debris present?	Go to **Step 8**	Go to **Step 3**
	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine		

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3	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 (Delphi)** or **Blower Motor Replacement (Visteon)**. 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**
7	Inspect the blower motor for the following conditions: 1. Cracked blades 2. A loose impeller retainer 3. 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**	-
	Replace the blower motor. Refer to		

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9	**Blower Motor Replacement (Delphi)** or **Blower Motor Replacement (Visteon)**. Is the repair complete?	Go to **Step 11**	-
10	Install the blower motor. Refer to **Blower Motor Replacement (Delphi)** or **Blower Motor Replacement (Visteon)**. 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
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 or **Symptoms - HVAC Systems - Automatic** in HVAC Systems Automatic
2	1. A/C system noises can be generally categorized into three areas: • Screeching, Squealing, Chirping noises • Moaning noises • Vibration/Rattle noises 2. Start the engine. 3. Ensure that the A/C is ON. Is a screeching, squealing noise heard when the A/C is engaged?	Go to **Step 3**	Go to **Step 9**
	With the engine OFF, inspect the drive belt		

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3	for excessive wear. Refer to **Drive Belt Excessive Wear Diagnosis** in Engine Mechanical. 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** in Engine Mechanical. Is the drive belt tension correct?	Go to **Step 19**	Go to **Step 5**
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 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	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, inspecting for any abnormal noises caused by component ground-out. Are any of the A/C components grounding out and causing a noise?	Go to **Step 22**	Go to **Step 13**

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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 14**
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 25**	Go to **Step 26**
17	Repair the oil leak. Refer to the appropriate repair procedure in Engine Mechanical. Is the repair complete?	Go to **Step 26**	-
18	Replace the A/C drive belt. Refer to **Drive Belt Replacement - Air Conditioning** in Engine Mechanical - 4.8L, 5.3L and 6.0L. Is the replacement complete?	Go to **Step 26**	-
19	Replace the A/C drive belt tensioner. Refer to **Drive Belt Tensioner Replacement - Air Conditioning** in Engine Mechanical - 4.8L, 5.3L and 6.0L. Is the replacement complete?	Go to **Step 26**	-
20	Repair or replace the A/C compressor mounting component. Is the repair complete?	Go to **Step 26**	-
	Repair or replace the component which is		

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21	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 **Compressor Clutch Plate/Hub Assembly Replacement**. Is the replacement complete?	Go to **Step 26**	-
24	Replace the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**. Is the replacement complete?	Go to **Step 26**	-
25	The concern may be caused by an engine related component. Refer to **Vibration Analysis - Engine** 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
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 or **Symptoms - HVAC Systems - Automatic** in HVAC Systems - Automatic
	1. Start the engine.		

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2	2. Cycle through all of the following: • Blower motor speeds • HVAC modes • Temperature control settings 3. Determine the type of noise: • Scrape, pop • Tick/click, chirp or groaning • Air rush/whistle 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 **Step 6**	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 instrument panel I/P carrier. Refer to **Instrument Panel (I/P) Carrier Replacement** in Instrument Panel, Gages, and Console. 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 11**	Go to **Step 9**
9	Replace the appropriate door and/or seals. Is the repair complete?	Go to **Step 11**	-
10	Remove any obstructions or foreign material found.		

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	Is the action complete?	Go to **Step 11**	-
11	Install the I/P carrier. Refer to **Instrument Panel (I/P) Carrier Replacement** in Instrument Panel, Gages, and Console. 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**

ODOR DIAGNOSIS

Odor Diagnosis

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Manual** or **Symptoms - HVAC Systems - Automatic**
2	1. Sit inside the vehicle. 2. Close all of the doors and windows. 3. Start the engine. 4. Allow the engine idle at normal operating temperature. 5. Select the maximum blower speed. 6. Select the PANEL air outlet mode. 7. Select the coldest temperature setting. 8. Cycle through all of the blower speeds, modes and temperatures to define what type of odor is present. • Musty smell • Coolant smell • Oil smell Does the odor have a musty smell?	Go to **Step 3**	Go to **Step 8**
3	Inspect the HVAC air inlet grille for debris.		

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	Is debris present?	Go to **Step 4**	Go to **Step 5**
4	Remove any debris. Is the action complete?	Go to **Step 15**	-
5	Inspect for wet carpeting. Is the carpet wet?	Go to **Step 6**	Go to **Step 14**
6	Inspect for the following conditions: • Water leaks around the windshield • Blockage of the HVAC module drain • Leaks around the door seals Is a leak present?	Go to **Step 7**	Go to **Step 14**
7	Repair the leak as necessary. Is the repair complete?	Go to **Step 15**	-
8	Does the odor have a coolant smell?	Go to **Step 9**	Go to **Step 12**
9	Inspect the cooling system for leaks. Refer to **Loss of Coolant** in Engine Cooling. Is a leak present?	Go to **Step 10**	Go to **Step 12**
10	Inspect for coolant leaking inside the vehicle or for a film build-up on the windshield. Is the condition present?	Go to **Step 11**	Go to **Step 15**
11	Replace the heater core. Refer to **Heater Core Replacement (Visteon)** or **Heater Core Replacement (Delphi)**. Is the repair complete?	Go to **Step 15**	-
12	Does the odor have an oily smell?	Go to **Step 13**	Go to **Step 15**
	1. Inspect the engine compartment for any leaks. Refer to the following procedures: • **Oil Leak Diagnosis** in Engine Mechanical - 4.8L, 5.3L and 6.0L • **Oil Leak Diagnosis** in Engine Mechanical - 8.1L • **Fluid Leak Diagnosis** in		

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13	Automatic Transmission - 4L60-E/4L65-E • **Fluid Leak Diagnosis** in Automatic Transmission - 4L80-E/4L65-E • **Power Steering Fluid Leaks** in Power Steering System 2. Repair any oil leaks. Is the repair complete?	Go to **Step 15**	-
14	A musty odor can be caused by mold or mildew build-up on the evaporator, the heater core, or inside of the HVAC module. Refer to **Odor Correction**. Is the action 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**

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.

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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 air conditioning duct 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 the of 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

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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

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

IMPORTANT: Flushing with the ACR 2000 is not intended to remove metal from the A/C system.

Flushing is intended to remove the following contaminants:

- Contaminated PAG oil
- Desiccant, following a desiccant bag failure
- Overcharge of PAG oil
- Refrigerant contamination

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Flushing Procedure

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

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the orifice tube. Refer to **Expansion (Orifice) Tube Replacement**.
3. Connect the A/C lines with the orifice tube removed.
4. Remove the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**.
5. Inspect the end of the suction hose for a suction screen.
6. Remove the suction screen, if installed.
7. Install J 45268-4 to the A/C compressor suction hose.
8. Install J 45268-5 to the A/C compressor discharge hose.

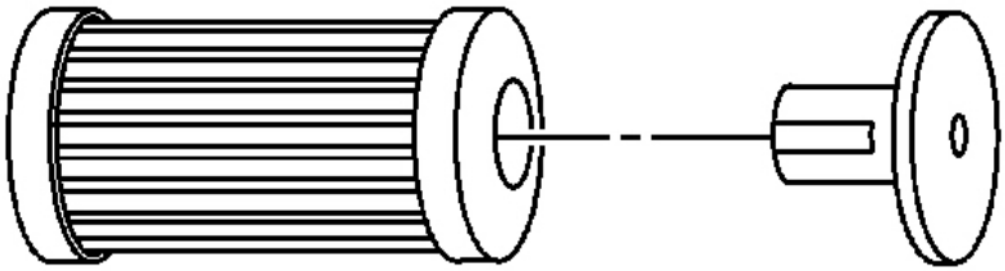


Fig. 5: View Of A/C Filter And Check Valve
Courtesy of GENERAL MOTORS CORP.

9. Forward flow refrigerant flushing is recommended for contaminated refrigerant or PAG oil.

   Perform the following procedure:

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

1. Service the filter with ACDelco P/N GF 470, before each flush.

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Connect the J 45268-1 flush filter to the suction port of the J 45268-4 flush adapter.

2. Connect the blue hose from the **J 43600** to the J 45268-1 flush filter adapter.
3. Connect the red hose from the **J 43600** to the J 45268-5 flush adapter.

10. Reverse flow refrigerant flushing is recommended for desiccant bag failure. Perform the following procedure and replace the accumulator when the flush procedure is complete.

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

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

   Connect the J 45268-1 flush filter to the discharge port of the J 45268-5 flush adapter.

2. Connect the blue hose from the **J 43600** to the J 45268-1 flush filter adapter.
3. Connect the red hose from the **J 43600** to the suction port of the J 45268-4 flush adapter.

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

11. Flush the front A/C system. Follow the instructions supplied with the **J 43600** .

IMPORTANT: Flush the front A/C system before flushing the auxiliary A/C system.

12. If the vehicle is equipped with rear A/C, flush the auxiliary A/C system separately.

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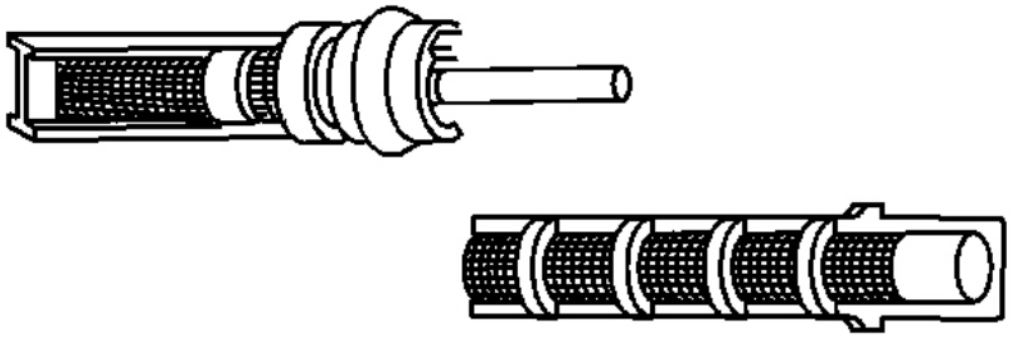


Fig. 6: Cutting Orifice Tube Frame & Screen
Courtesy of GENERAL MOTORS CORP.

13. Cut the orifice tube frame and screen, enough to access the end of the orifice tube. Pinch off the orifice tube.

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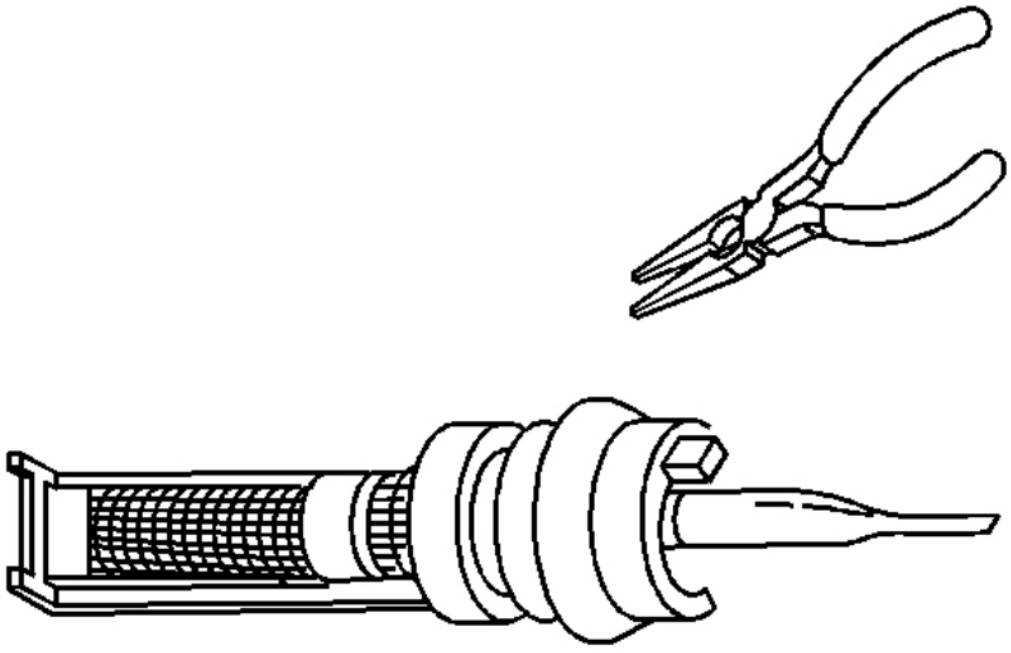


Fig. 7: Pinching Off Orifice Tube
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Pinch off the orifice tube in order to prevent refrigerant flow to the front system during the auxiliary system flush.

14. Install the pinched orifice tube. Refer to **Expansion (Orifice) Tube Replacement**.
15. Remove the auxiliary TXV. Refer to **Thermal Expansion Valve Replacement - Auxiliary**.
16. Install the J 45268-104.

IMPORTANT: The auxiliary evaporator core can be flushed without totally reassembling into the auxiliary HVAC module.

17. Install the auxiliary evaporator core to the A/C lines.
18. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
19. Connect the auxiliary A/C lines to the auxiliary evaporator core.

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20. Lower the vehicle.
21. Flush the auxiliary A/C system. Follow the instructions supplied with the **J 43600** .
22. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
23. Remove the auxiliary A/C lines from the auxiliary evaporator core.
24. Lower the vehicle.
25. Remove the J 45268-104.
26. Inspect the TXV for debris.

    Clean or replace as needed.

27. Install the auxiliary TXV. Refer to **Thermal Expansion Valve Replacement - Auxiliary**.
28. Remove the J 45268-4 from the A/C compressor suction hose.
29. Remove the J 45268-5 from the A/C compressor discharge hose.

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.

30. If the removed A/C compressor is being reinstalled, perform the following procedure:
    - Drain the PAG oil from the A/C compressor.
    - Rotate the compressor input shaft to assist in draining the PAG oil from the A/C compressor.
    - Add the total system capacity of PAG oil to the A/C compressor. Refer to **Refrigerant System Capacities**.
31. If you will replace the A/C compressor after flushing the system, perform the following procedure:
    1. Determine if the new service compressor is shipped with PAG oil. Refer to the **Refrigerant System Capacities**.
    2. If the service compressor is shipped with PAG oil, DO NOT drain the new PAG oil from the compressor.
    3. Deduct the amount of PAG oil shipped with the service compressor from the amount of PAG oil listed in the capacities table. Refer to **Refrigerant System Capacities**.
    4. Add the calculated amount to the compressor, as needed.

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

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32. Add one bottle of **J 41447** directly to the A/C compressor. See **Special Tools**.
33. Install the A/C compressor. Refer to **Compressor Replacement (LR4, LM7 and LQ4)**.
34. Install a new orifice tube. Refer to **Expansion (Orifice) Tube Replacement**.
35. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
36. 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. Drain the oil from both the suction and discharge ports of the removed compressor into a clean, graduated container. Rotate the compressor shaft to assist in draining the compressor.

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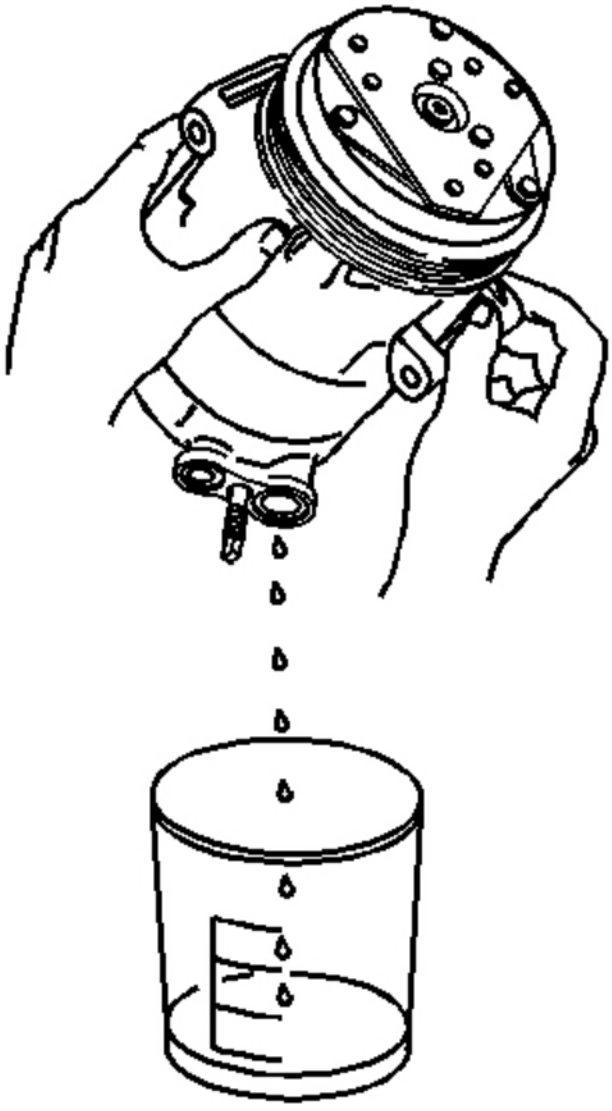


Fig. 8: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS CORP.

2. Measure and record the amount of oil drained from the removed compressor. This measurement will be used during installation of the replacement compressor.
3. Properly discard the used refrigerant oil.

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Balancing Procedure

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

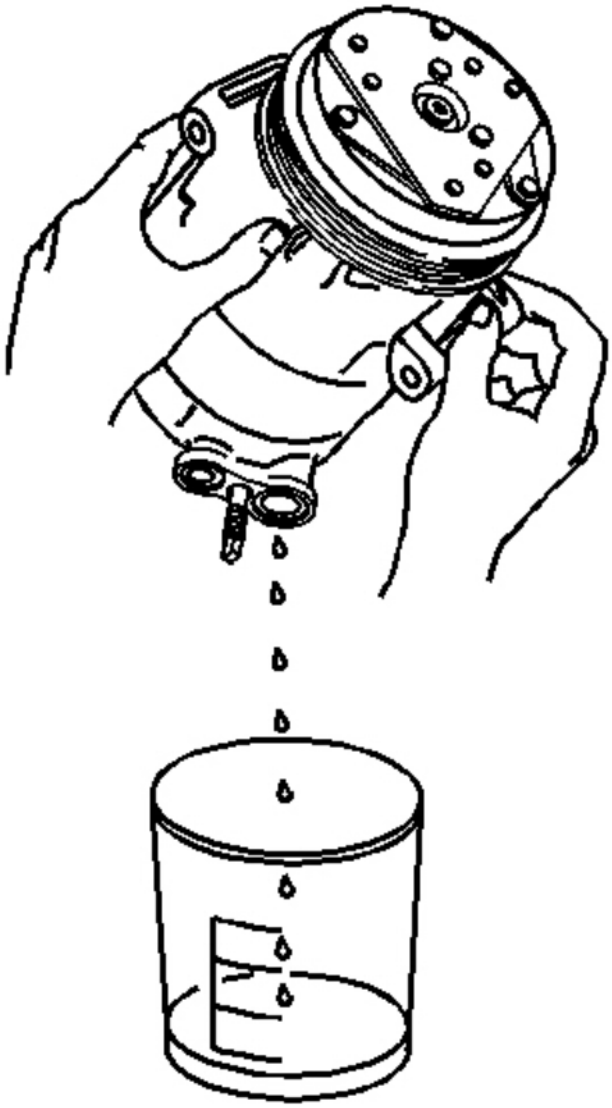


Fig. 9: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS CORP.

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1. The Denso replacement compressor is shipped with 74 ml (2.5 oz.) of refrigerant.
2. Before installing the compressor, the refrigerant oil will have to be fully drained.
3. Add back the same quantity of PAG oil as drained from the removed compressor.

   Refer to the amount of refrigerant oil recorded during the compressor removal.

COMPRESSOR REPLACEMENT (LR4, LM7 AND LQ4)

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

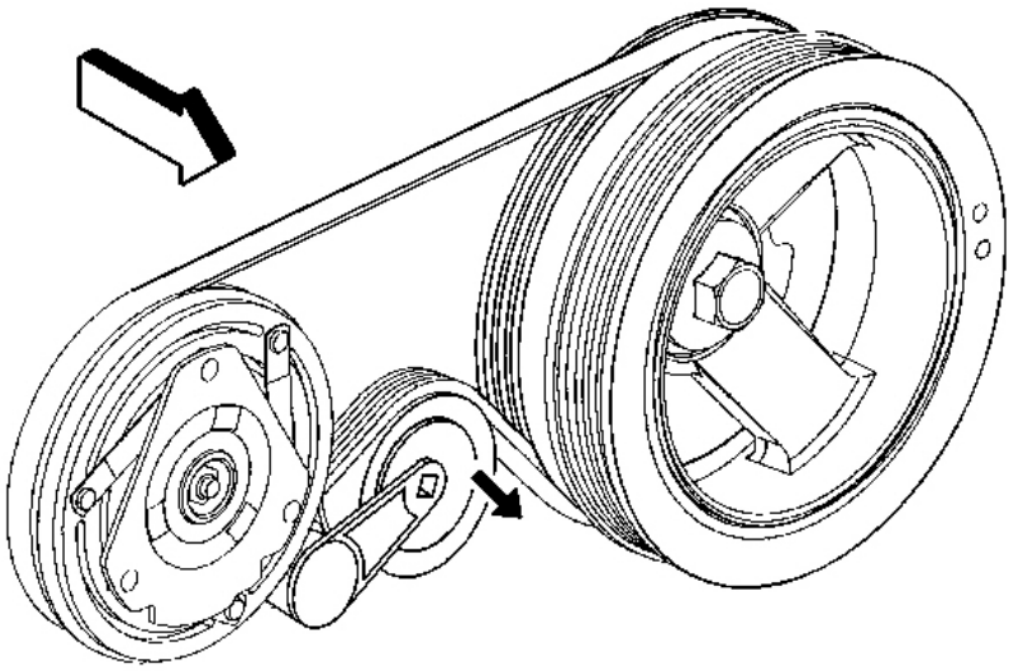


Fig. 10: A/C Belt Tensioner
Courtesy of GENERAL MOTORS CORP.

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

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2. Install a ratchet into the air conditioning (A/C) belt tensioner adapter opening.
3. Rotate the A/C belt tensioner clockwise in order to relieve the tension on the belt.
4. Remove the A/C belt from the A/C compressor.
5. Slowly release the tension on the A/C belt tensioner.
6. Remove the right front tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
7. Remove the wheel house panel from the vehicle. Refer to **Wheelhouse Panel Replacement** in Body Front End.
8. Remove the discharge hose bolt from the A/C compressor.
9. Remove the discharge hose from the A/C compressor.
10. Remove the suction hose bolt from the A/C compressor.
11. Remove the suction hose from the A/C compressor.
12. Discard the sealing washers. Cap all of the openings.
13. Disconnect the electrical connections.

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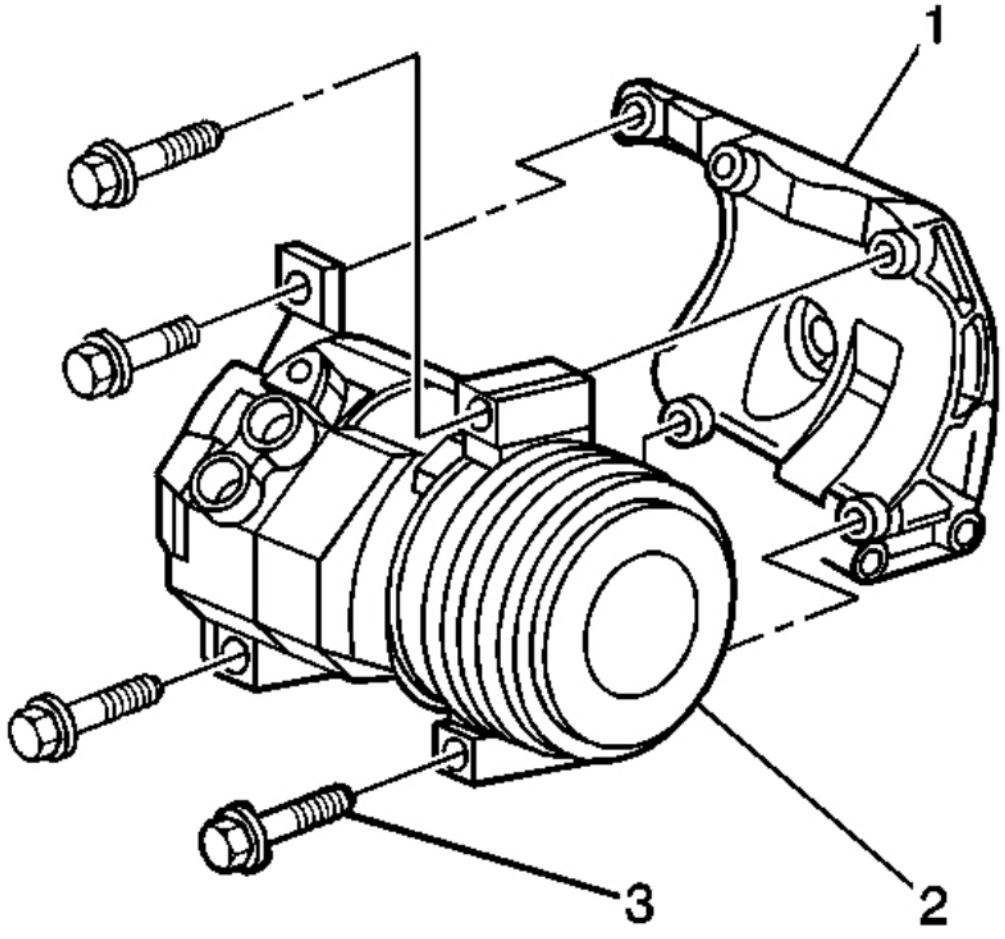


Fig. 11: View of A/C Compressor & Bolts
Courtesy of GENERAL MOTORS CORP.

14. Remove the A/C compressor mounting bolts. The lower right bolt (3) will stay with the compressor due to a lack of clearance.
15. Remove the A/C compressor (2) from the bracket (1).
16. If replacing the A/C compressor. Refer to **Compressor Oil Balancing**.

Installation Procedure

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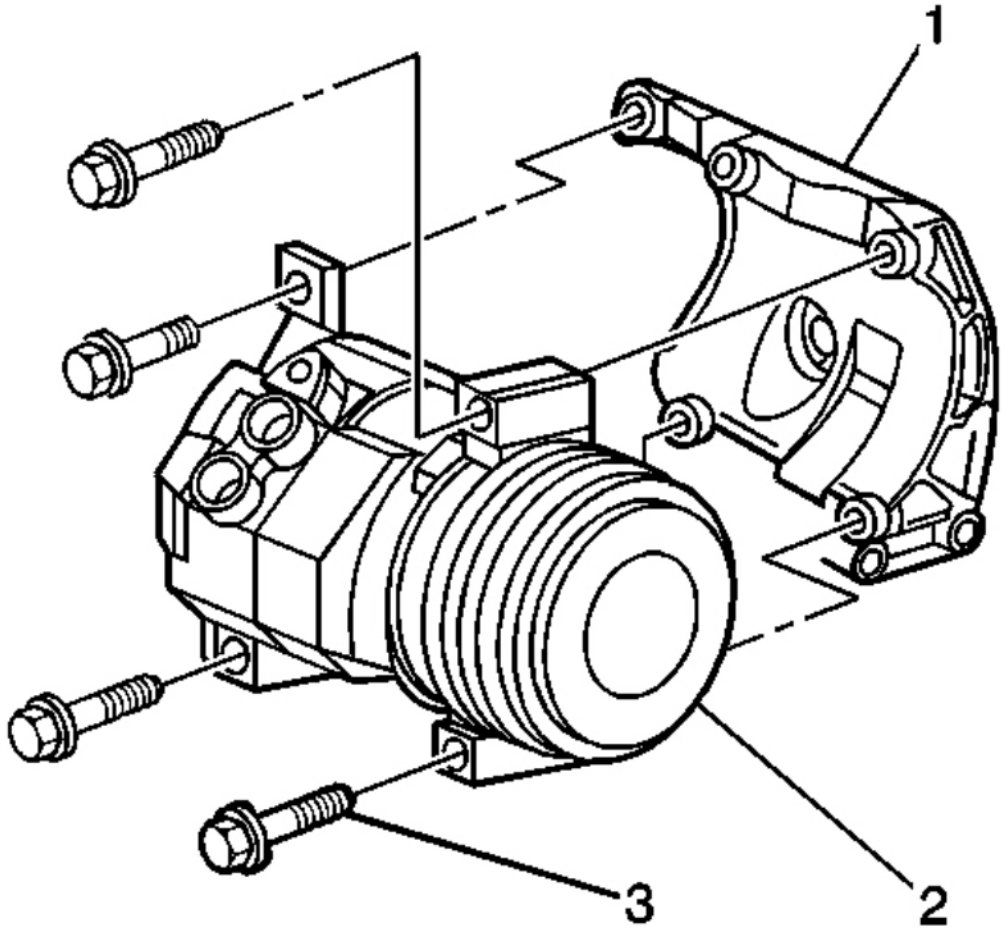


Fig. 12: View of A/C Compressor & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the A/C compressor (2) to the bracket (1) through the fender well. Insert the mounting bolt (3) into the lower right mounting boss before installing the A/C compressor.
2. Install the A/C compressor to the bracket. Insert the mounting bolt into the lower right mount before installing the A/C compressor.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the A/C compressor mounting bolts.

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Tighten: Tighten the bolts to 50 N.m (37 lb ft).

4. Connect the electrical connector to the A/C compressor.
5. Install the A/C discharge hose to the compressor using new sealing washers. Refer to **Sealing Washer Replacement**.
6. Install the A/C discharge hose bolt to the A/C compressor.

   Tighten: Tighten the bolt to 16 N.m (12 lb ft).

7. Install the A/C suction hose to the compressor using new sealing washers. Refer to **Sealing Washer Replacement**.
8. Install the A/C suction hose bolt to the A/C compressor.

   Tighten: Tighten the bolt to 16 N.m (12 lb ft).

9. Install the wheel house panel to the vehicle. Refer to **Wheelhouse Panel Replacement** in Body Front End.
10. Install the right front tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
11. Install the A/C drive belt. Refer to **Drive Belt Replacement - Air Conditioning** in Engine Mechanical - 4.8L, 5.3L and 6.0L.
12. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
13. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

COMPRESSOR CLUTCH PLATE/HUB ASSEMBLY REPLACEMENT

Removal Procedure

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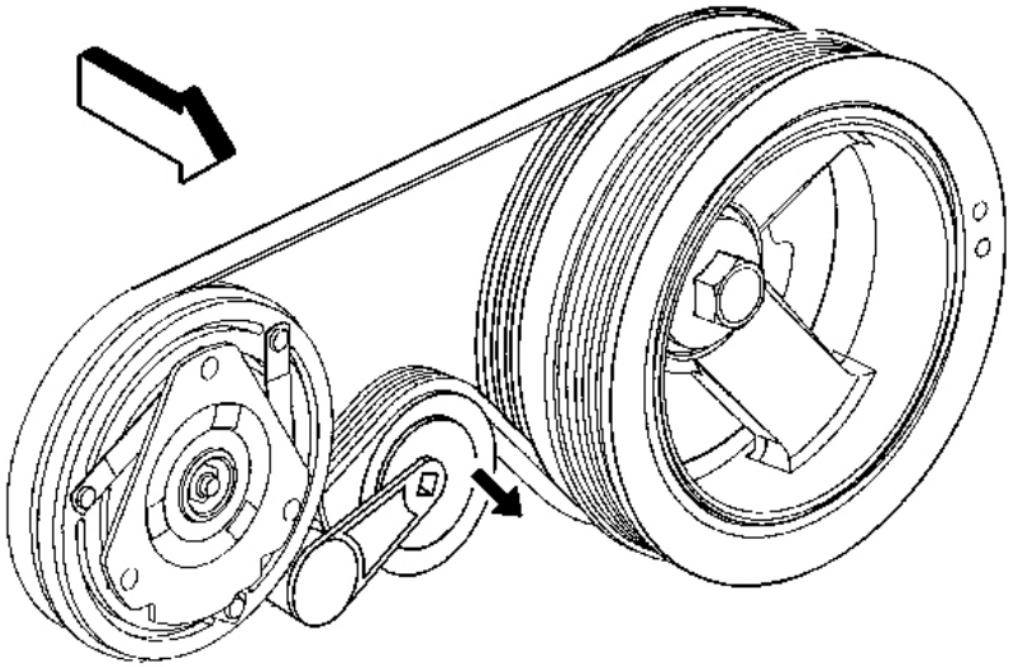


Fig. 13: A/C Belt Tensioner
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to in General Information.
2. Remove the engine protection shield. Refer to **Engine Protection Shield Replacement** in Frame and Underbody.
3. Install a ratchet into the air conditioning (A/C) belt tensioner adapter opening.
4. Rotate the A/C belt tensioner clockwise in order to relieve the tension on the belt.
5. Remove the A/C belt from the A/C compressor.
6. Slowly release the tension on the A/C belt tensioner.

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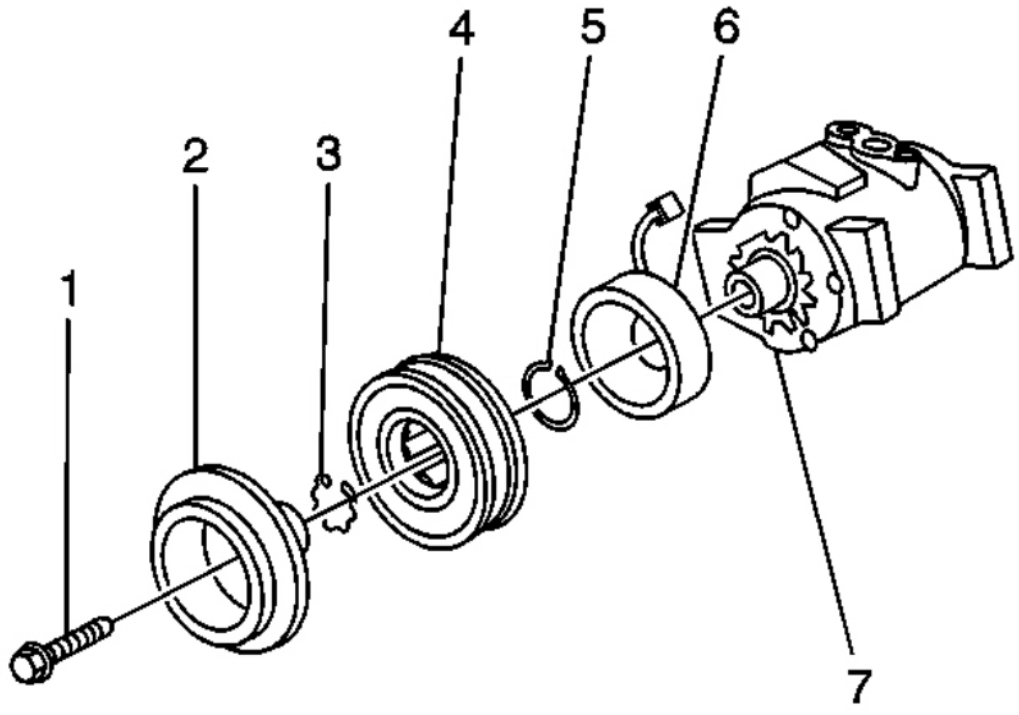


Fig. 14: Exploded View Of Compressor Clutch Plate Assembly
Courtesy of GENERAL MOTORS CORP.

7. Remove the clutch plate retaining bolt (1).
8. Remove the clutch plate assembly (2).
9. Remove the clutch hub/bearing snap ring (3).
10. Remove the clutch hub/bearing assembly (4).
11. Remove the snap ring (5) from the clutch coil (6).
12. Remove the clutch coil (6) from the A/C compressor (7).

Installation Procedure

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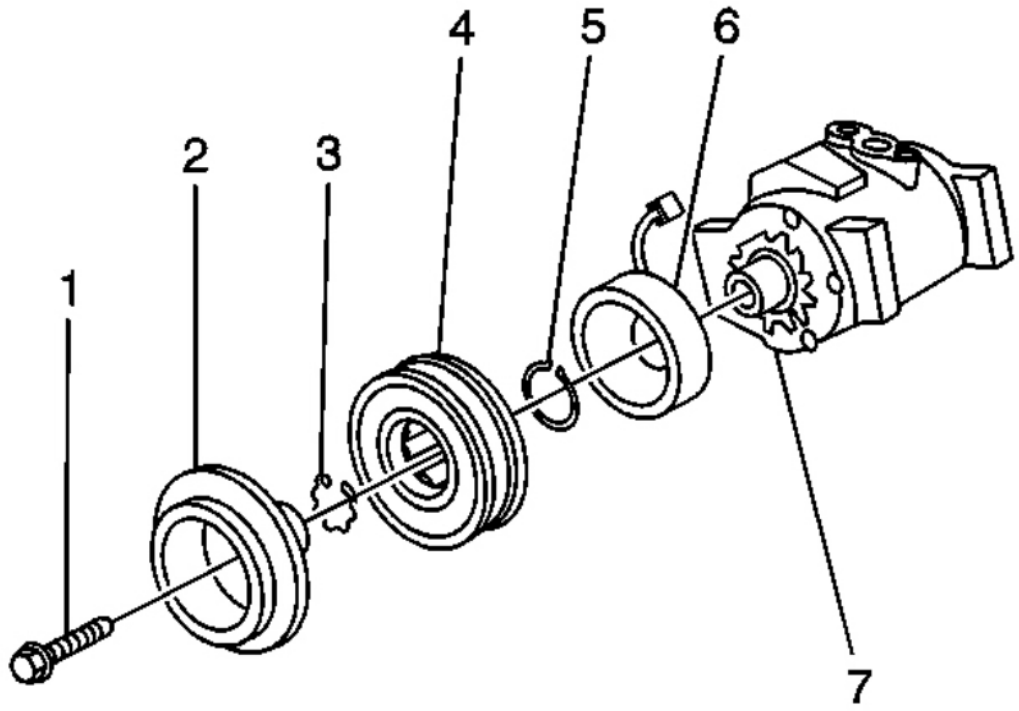


Fig. 15: Exploded View Of Compressor Clutch Plate Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the clutch coil (6) to the A/C compressor (7).
2. Install the snap ring (5) to the clutch coil (6).
3. Install the clutch hub/bearing assembly (4).
4. Install the clutch hub/bearing snap ring (3).
5. Install the clutch plate assembly (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

6. Install the clutch plate retaining bolt (1).

Tighten: Tighten the bolt to 18 N.m (13 lb ft).

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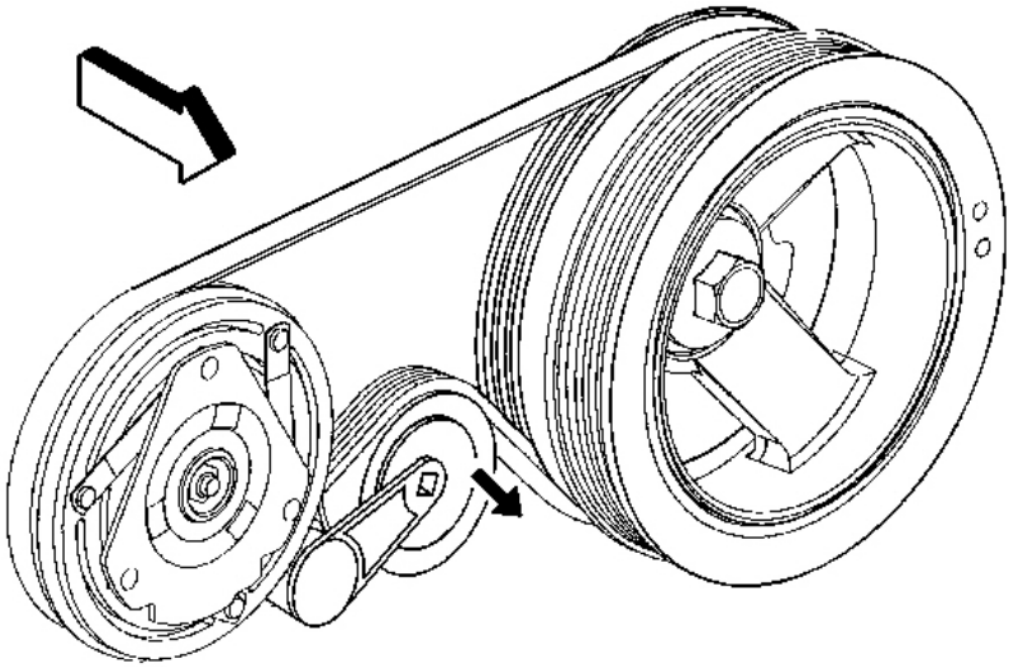


Fig. 16: A/C Belt Tensioner
Courtesy of GENERAL MOTORS CORP.

7. Install a ratchet into the A/C belt tensioner adapter opening.
8. Rotate the A/C belt tensioner clockwise in order to relieve the tension on the belt.
9. Install the A/C belt to the A/C compressor.
10. Slowly release the tension on the A/C belt tensioner.
11. Remove the ratchet from the A/C belt tensioner.
12. Install the engine protection shield. Refer to **Engine Protection Shield Replacement** in Frame and Underbody.
13. Lower the vehicle.

COMPRESSOR MOUNTING BRACKET REPLACEMENT

Removal Procedure

1. Remove the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**.

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2. Remove the A/C belt tensioner bolts.
3. Remove the A/C belt tensioner.

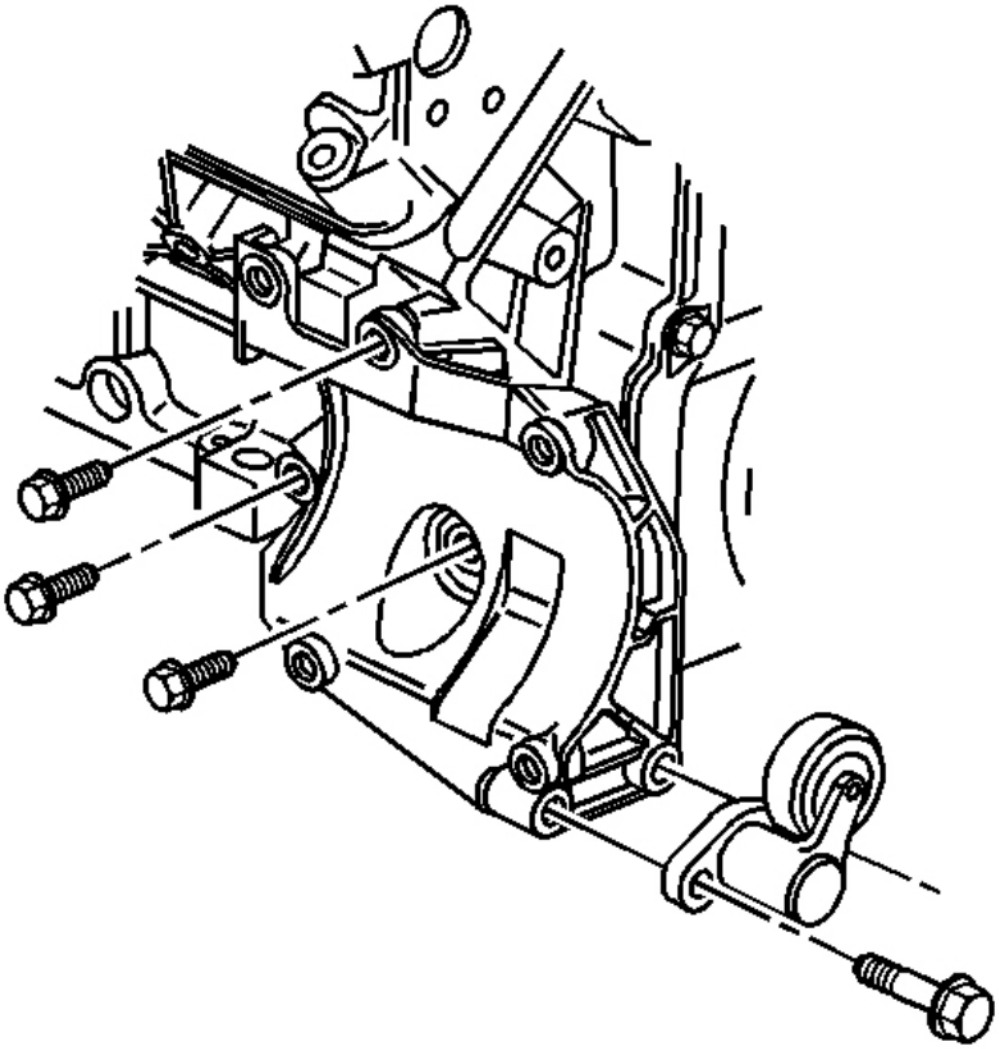


Fig. 17: A/C Compressor Bracket Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

4. Remove the A/C compressor bracket mounting bolts.
5. Remove the A/C compressor bracket.

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Installation Procedure

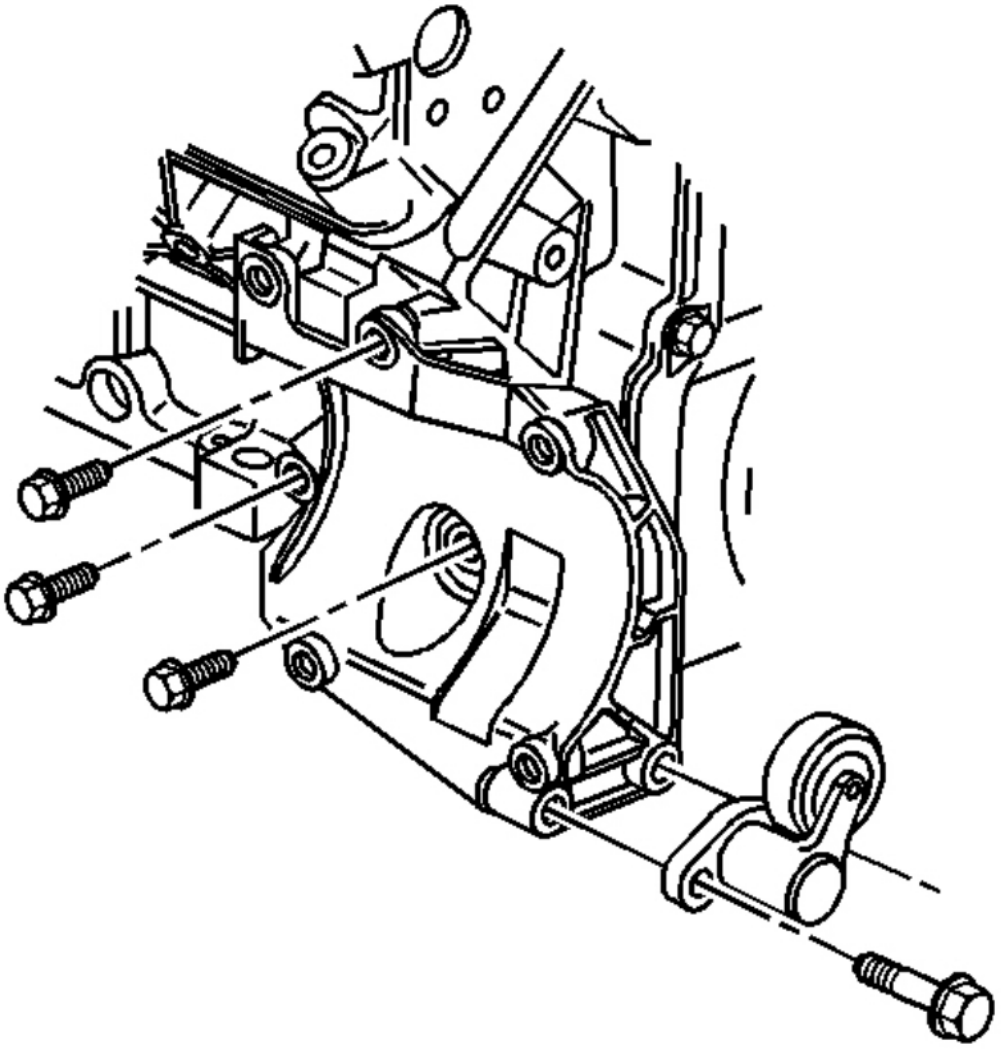


Fig. 18: A/C Compressor Bracket Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the A/C compressor bracket.

NOTE: Refer to Fastener Notice in Cautions and Notices.

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2. Install the A/C compressor bracket mounting bolts.

   Tighten: Tighten the bolts to 50 N.m (37 lb ft).

3. Install the A/C belt tensioner.
4. Install the A/C belt tensioner bolts.

   Tighten: Tighten the bolts to 50 N.m (37 lb ft).

5. Install the A/C compressor. Refer to **Compressor Replacement (LR4, LM7, and LQ4)**.

SEALING WASHER REPLACEMENT

Removal Procedure

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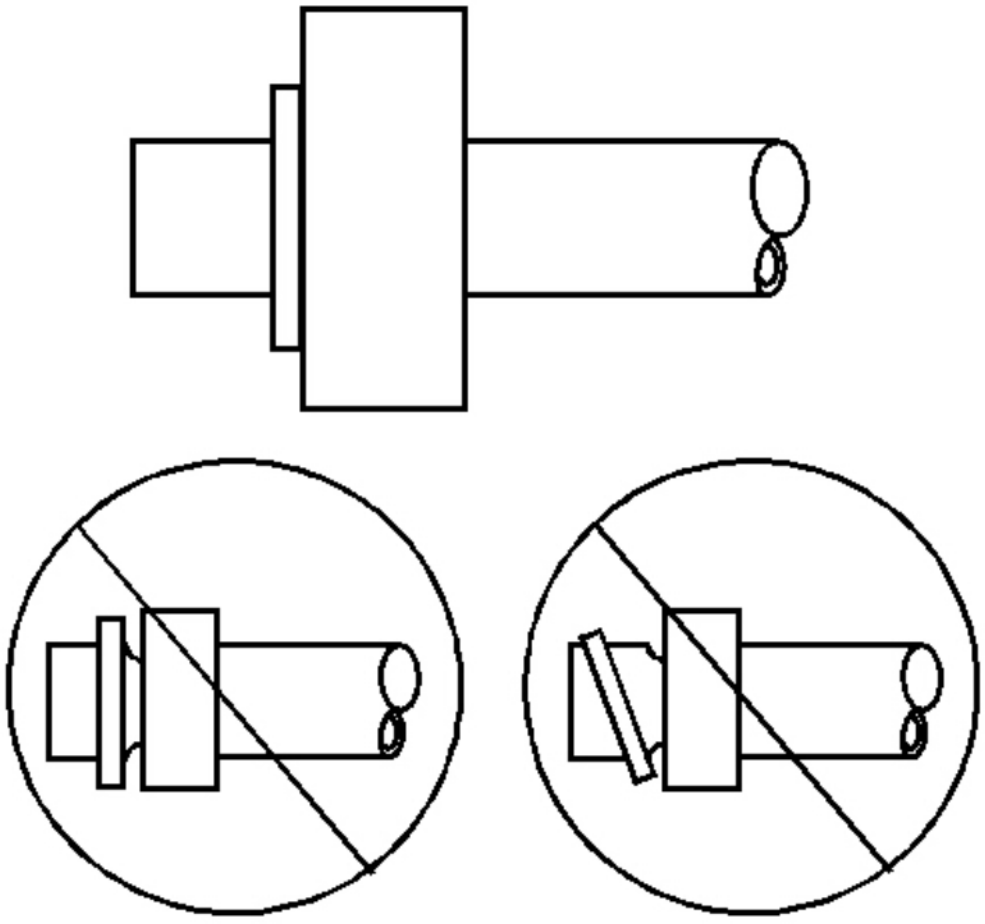


Fig. 19: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

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.

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IMPORTANT: DO NOT reuse 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.

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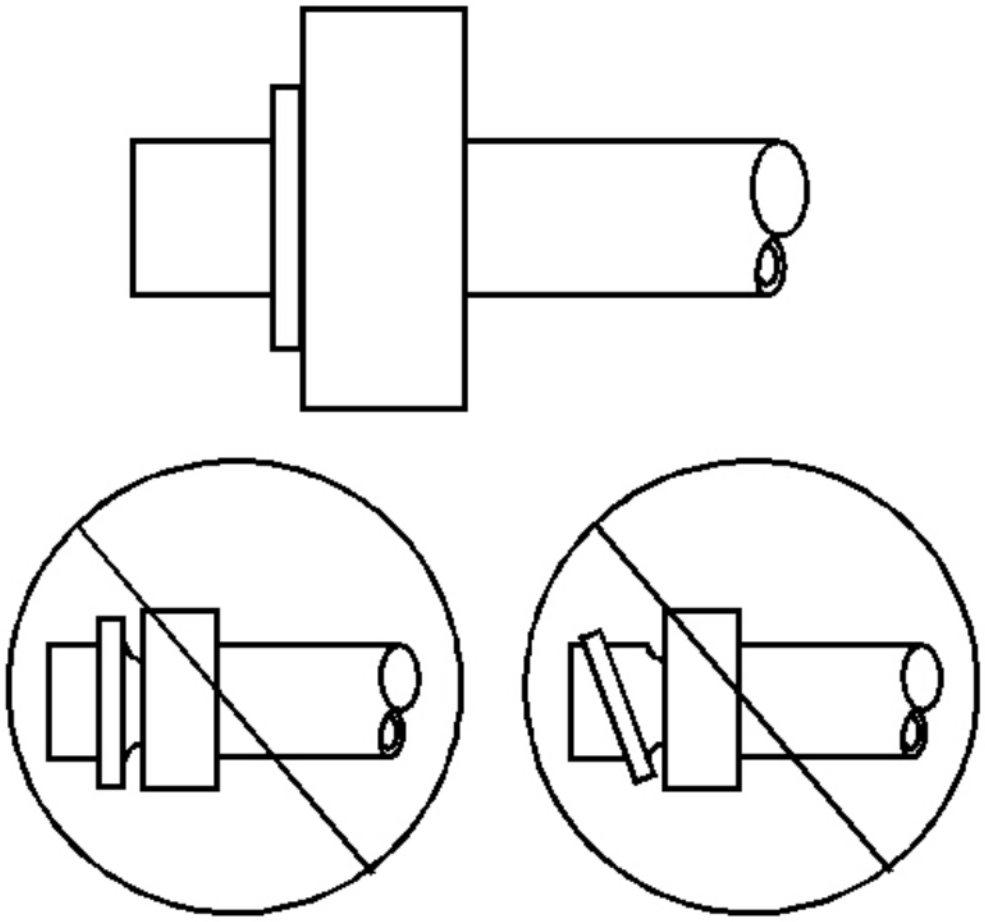


Fig. 20: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

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)

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between the A/C line and the A/C component.

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

O-RING REPLACEMENT

Removal Procedure

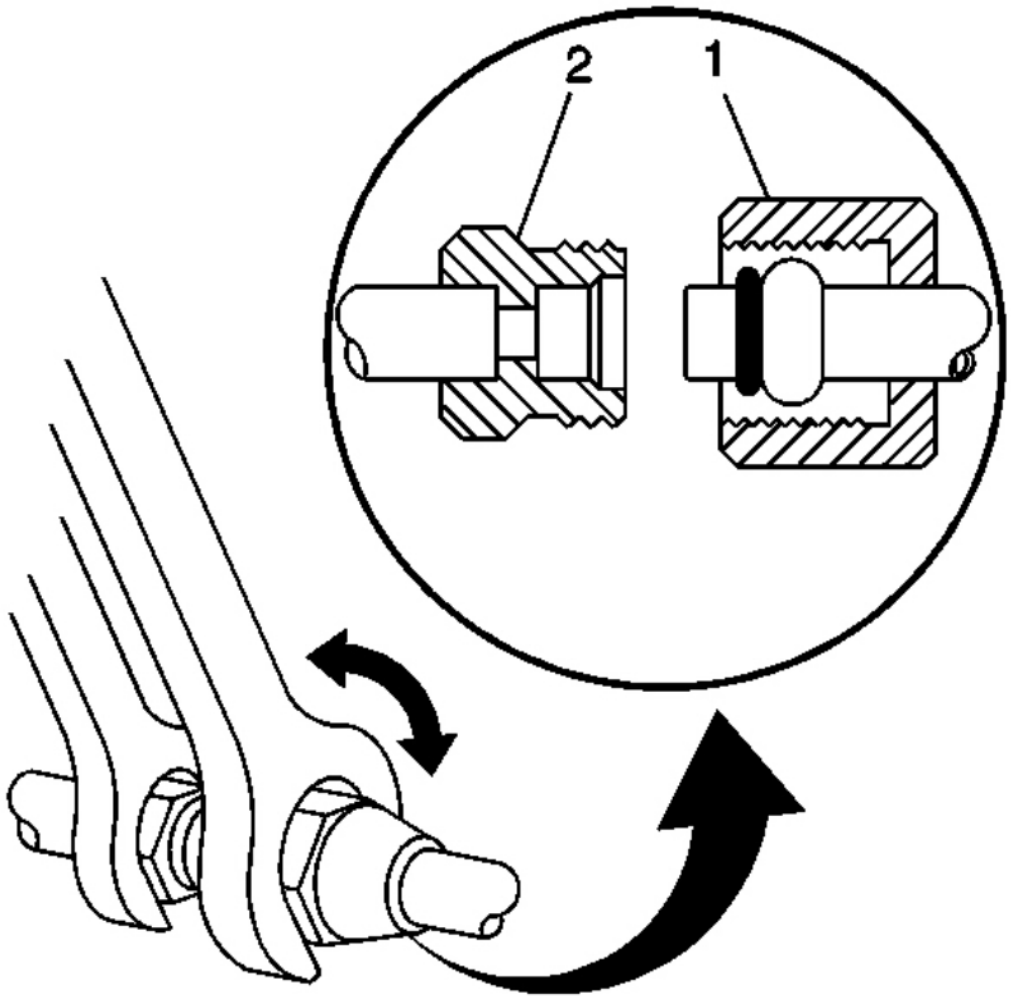


Fig. 21: Disassembling/Reassembling A/C Line Fittings
Courtesy of GENERAL MOTORS CORP.

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1. Disassemble the A/C refrigerant components. Refer to the appropriate repair procedure
   - For compression style fittings use a back up wrench on the fitting (2) and loosen the fitting nut (1).
   - For banjo style fittings remove the bolt retaining the banjo type fitting.
2. Remove the O-ring seal from the A/C refrigerant component.
3. Inspect the O-ring seal for signs of damage to help determine the root cause of the failure.
4. Inspect the A/C refrigerant components for damage or burrs. Repair if necessary.

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

5. Cap or tape the A/C refrigerant components.
6. Discard the O-ring seal.

Installation Procedure

1. Inspect the new O-ring seal for any sign or cracks, cuts, or damage. Replace if necessary.
2. Remove the cap or tape from the A/C refrigerant components.
3. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the A/C refrigerant components.

IMPORTANT: DO NOT allow any of the mineral base 525 viscosity refrigerant oil on the new O-ring seal to enter the refrigerant system.

4. Lightly coat the new O-ring seal with mineral base 525 viscosity refrigerant oil.

IMPORTANT: DO NOT reuse O-ring seals.

5. Carefully slide the new O-ring seal onto the A/C refrigerant component.

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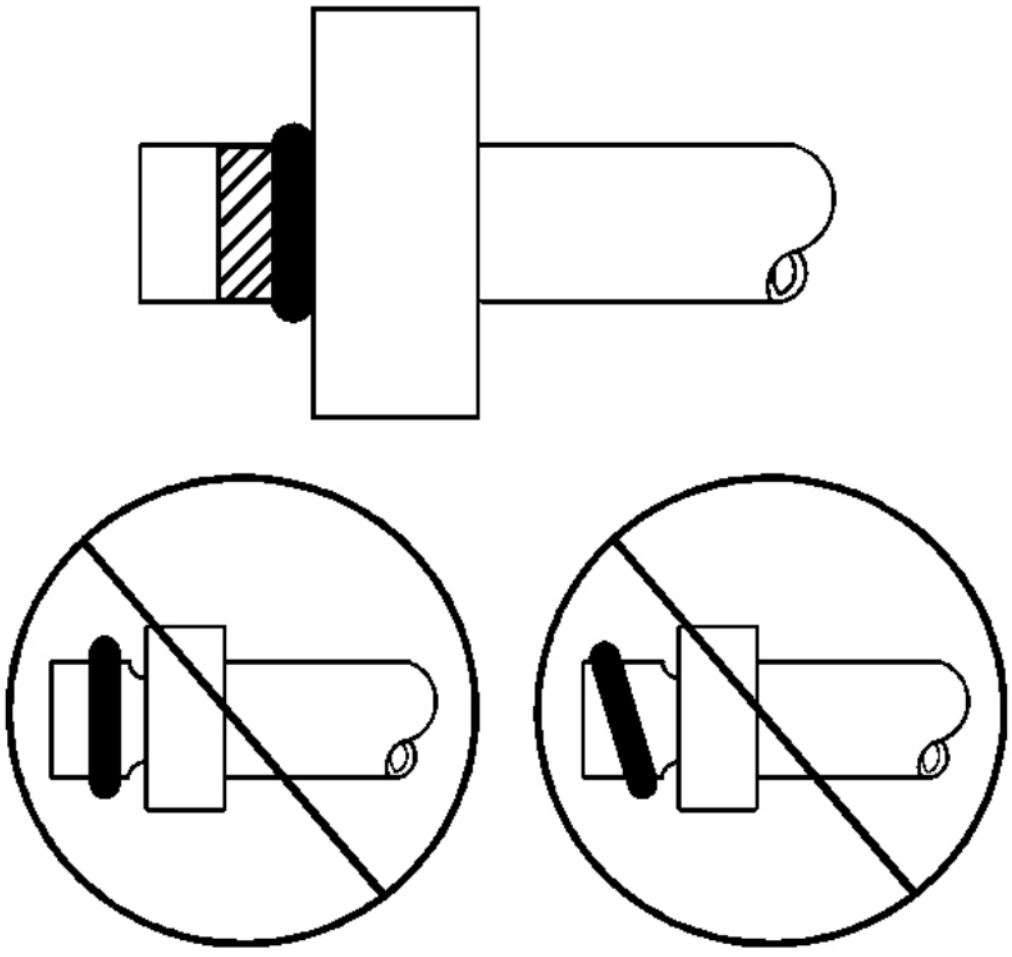


Fig. 22: Identifying Proper Seating Of A/C Refrigerant O-Ring
Courtesy of GENERAL MOTORS CORP.

6. The O-ring seal must be fully seated.

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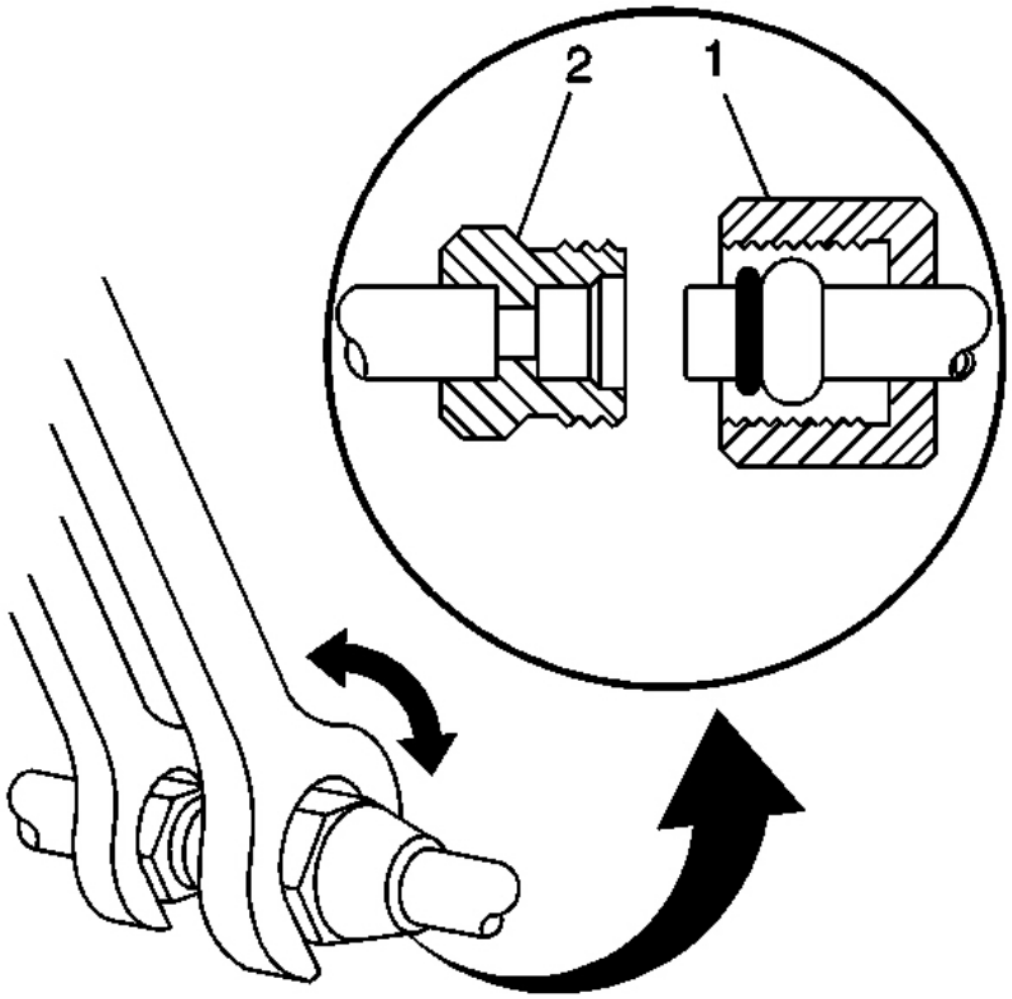


Fig. 23: Disassembling/Reassembling A/C Line Fittings
Courtesy of GENERAL MOTORS CORP.

7. Assemble the A/C components.

   Refer to the appropriate repair procedure.

   - For compression style fittings use a back up wrench on the fitting (2) and tighten the fitting nut (1) to specification.
   - For banjo style fittings install the bolt retaining the banjo type fitting and tighten to

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specification.

DISCHARGE HOSE REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

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

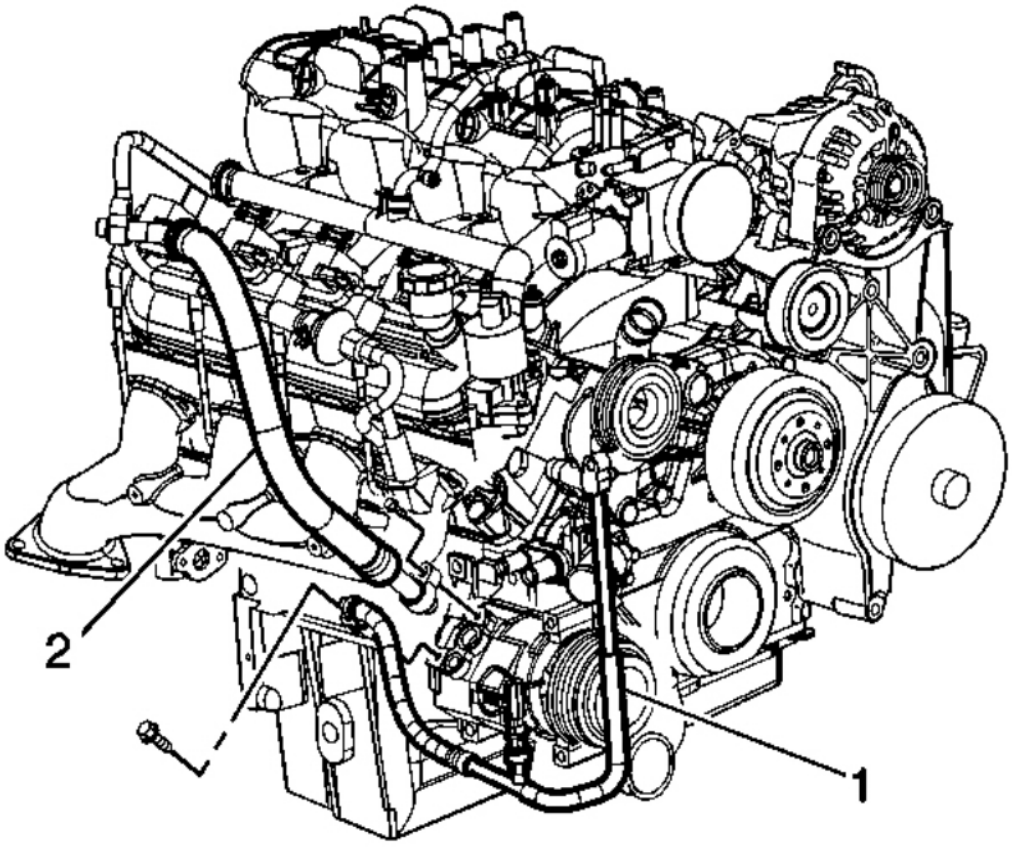


Fig. 24: Identifying Suction/Discharge Hoses To A/C Compressor
Courtesy of GENERAL MOTORS CORP.

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2. Remove the discharge hose mounting bolt (2) from the A/C compressor.
3. Remove the discharge hose (1) from the A/C compressor.
4. Remove the upper radiator baffle. Refer to **Radiator Air Baffle and Deflector Replacement - Upper** in Engine Cooling.

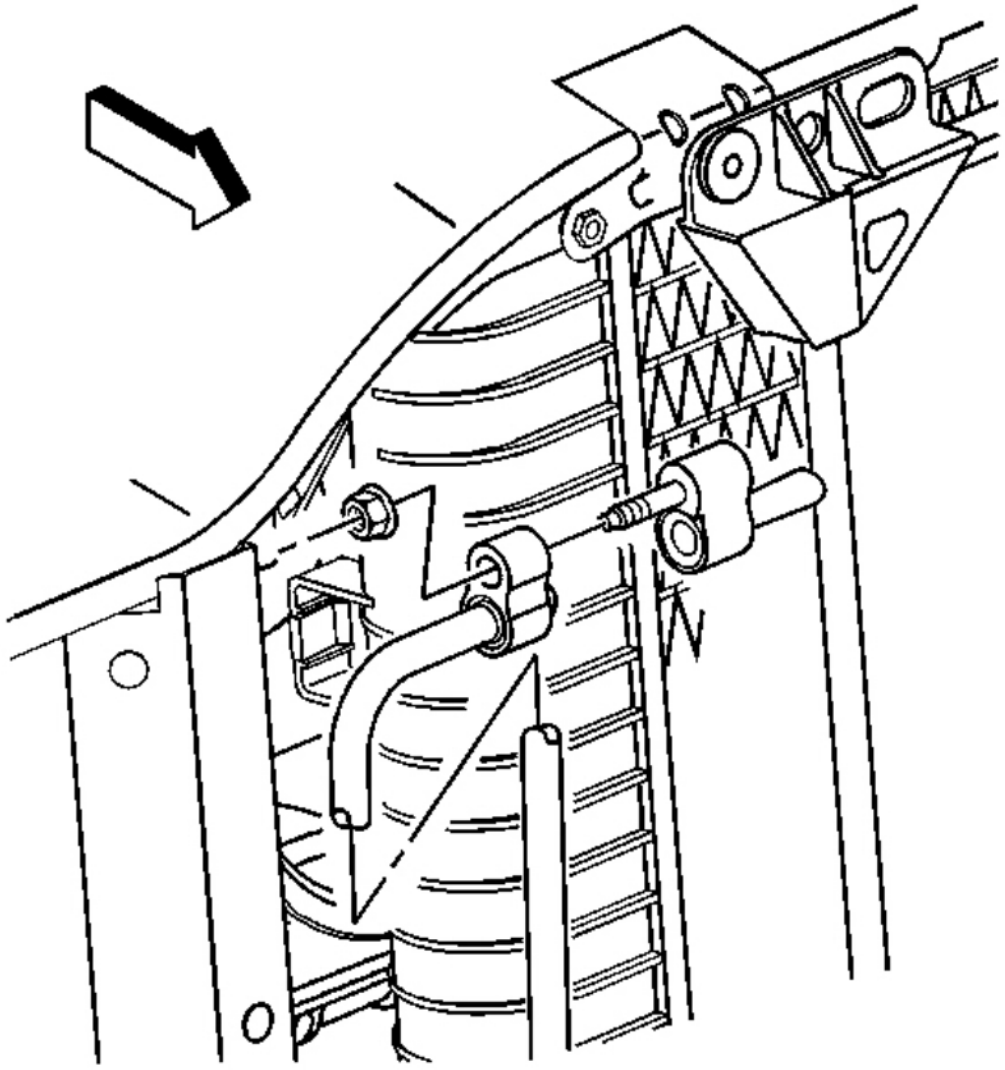


Fig. 25: View Of Discharge Hose At Condenser
Courtesy of GENERAL MOTORS CORP.

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5. Remove the discharge hose nut from the condenser.
6. Remove the discharge hose from the condenser.
7. Disconnect the electrical connector from the A/C recirculation switch.
8. Remove the discharge hose from the vehicle.
9. Discard all of the used sealing washers. Cap the system openings.

Installation Procedure

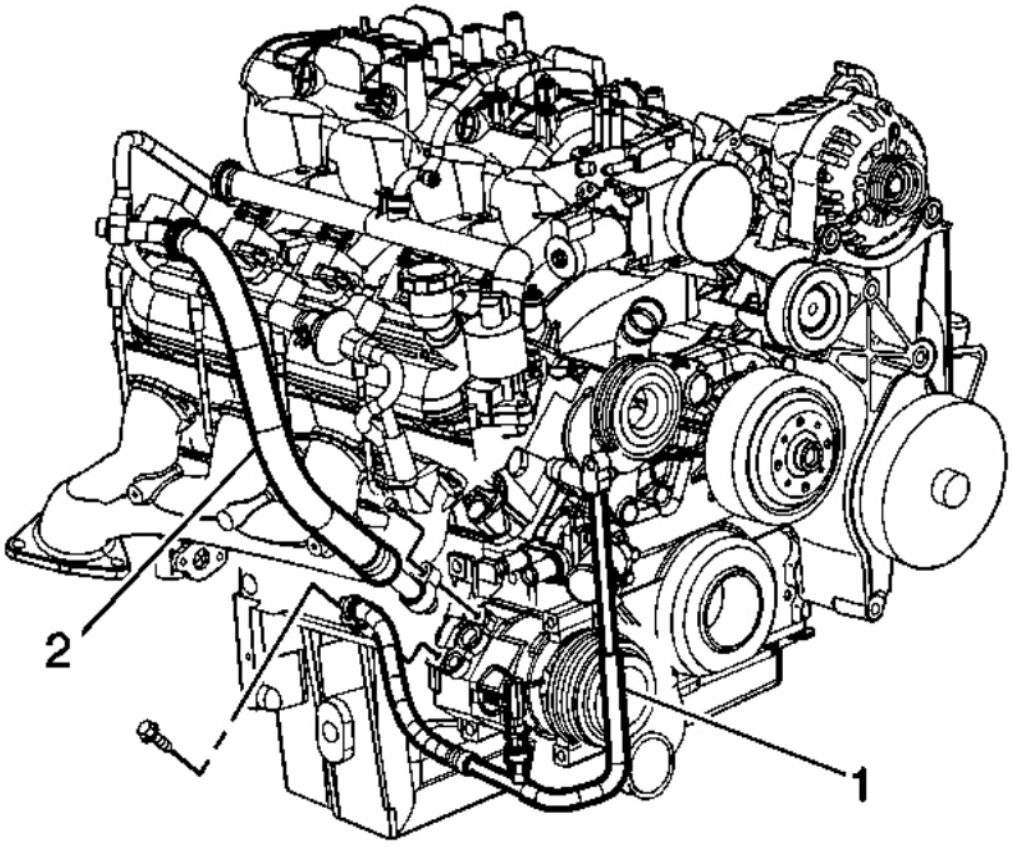


Fig. 26: Identifying Suction/Discharge Hoses To A/C Compressor
Courtesy of GENERAL MOTORS CORP.

1. Install the discharge hose (1) to the vehicle.
2. Connect the electrical connector to the A/C recirculation switch.

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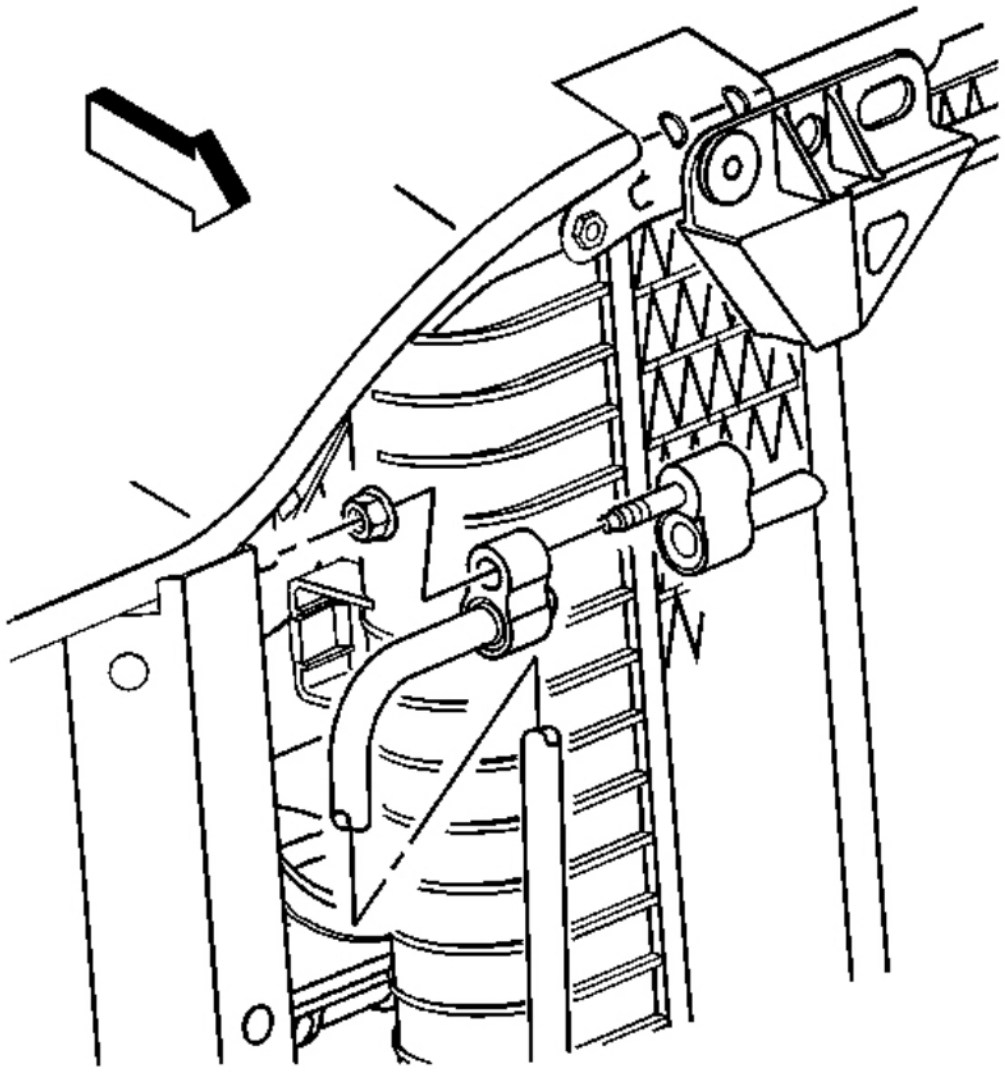


Fig. 27: View Of Discharge Hose At Condenser
Courtesy of GENERAL MOTORS CORP.

3. Install the discharge hose to the condenser using new sealing washers. Refer to **Sealing Washer Replacement**.

NOTE: Refer to Fastener Notice in Cautions and Notices.

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4. Install the discharge hose nut to the condenser.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

5. Install the upper air baffle. Refer to **Radiator Air Baffle and Deflector Replacement - Upper** in Engine Cooling.

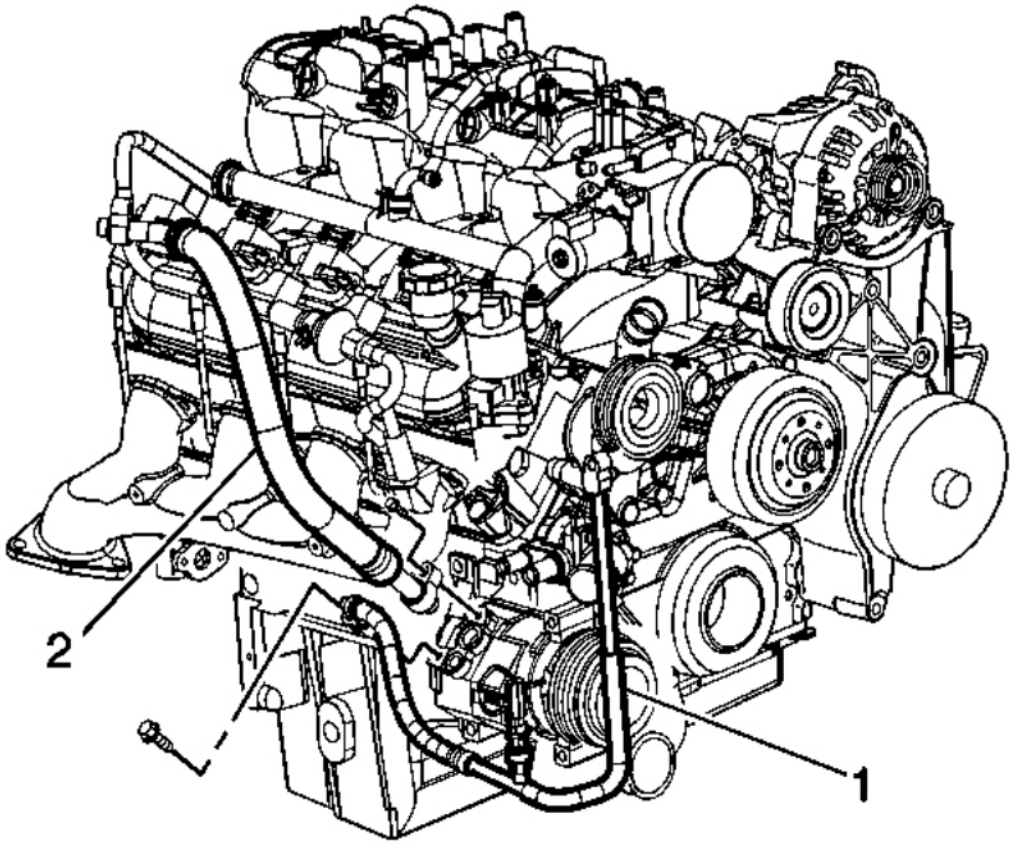


Fig. 28: Identifying Suction/Discharge Hoses To A/C Compressor
Courtesy of GENERAL MOTORS CORP.

6. Install the discharge hose (1) to the A/C compressor using new sealing washers. Refer to **Sealing Washer Replacement**.
7. Install the discharge hose mounting bolt.

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Tighten: Tighten the bolt to 16 N.m (12 lb ft).

8. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
9. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

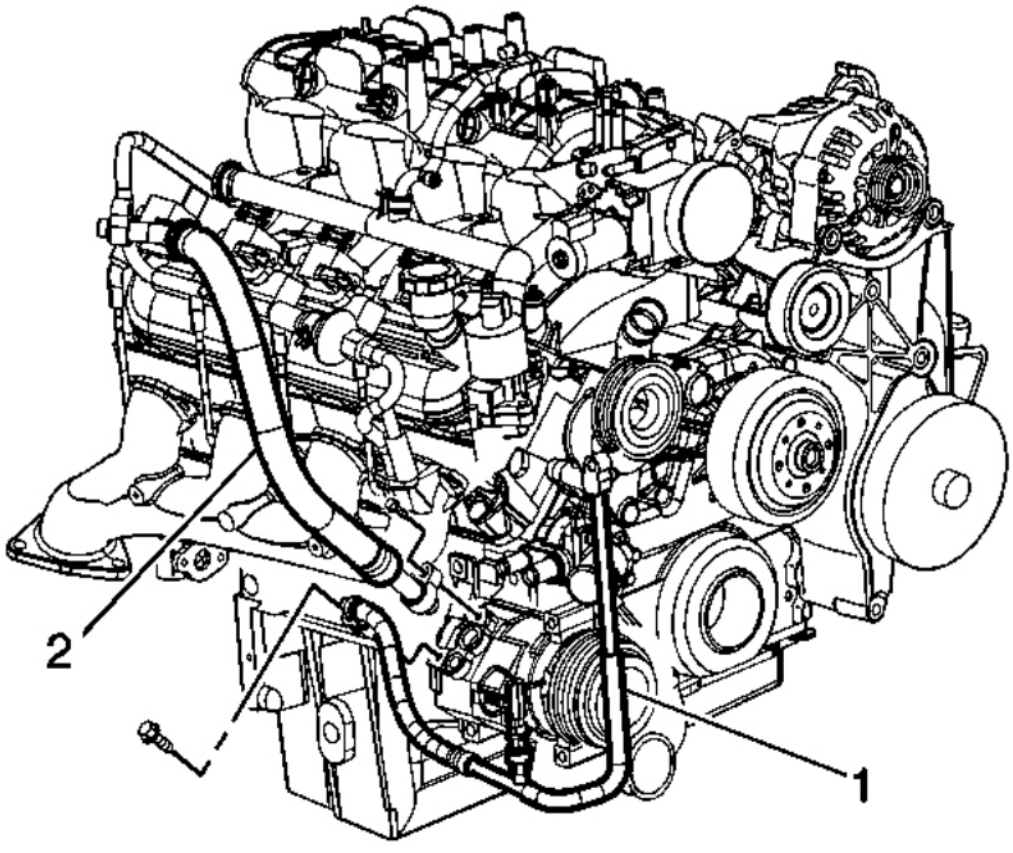
SUCTION HOSE REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

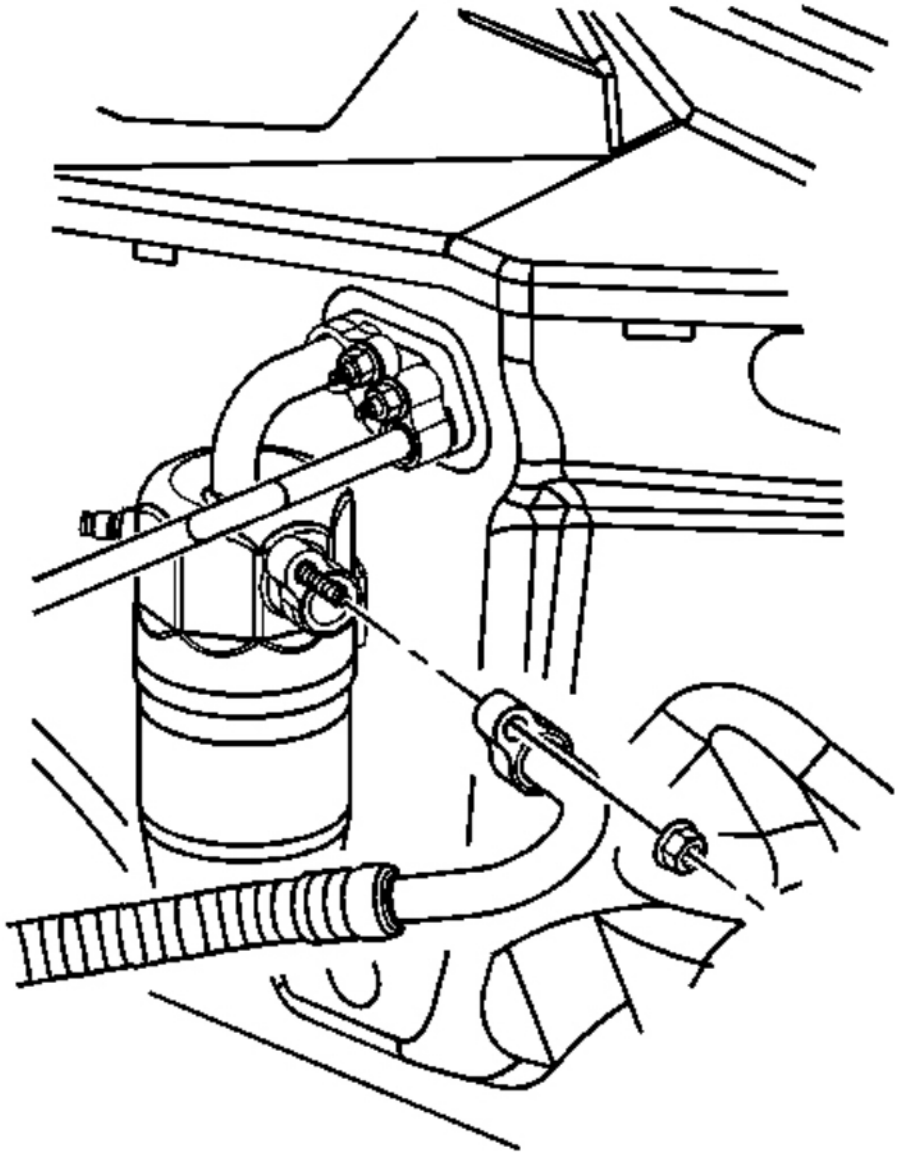
1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.



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Fig. 29: Identifying Suction/Discharge Hoses To A/C Compressor
Courtesy of GENERAL MOTORS CORP.

2. Remove the suction hose mounting bolt from the A/C compressor.
3. Remove the suction hose (2) from the A/C compressor.



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Fig. 30: Removing/Installing Suction Hose From Accumulator
Courtesy of GENERAL MOTORS CORP.

4. Remove the suction hose nut from the accumulator.
5. Remove the suction hose from the accumulator.
6. Remove the suction hose assembly from the vehicle.
7. Discard all of the used sealing washers. Cap the system openings.

Installation Procedure

1. Install the suction hose to the vehicle.

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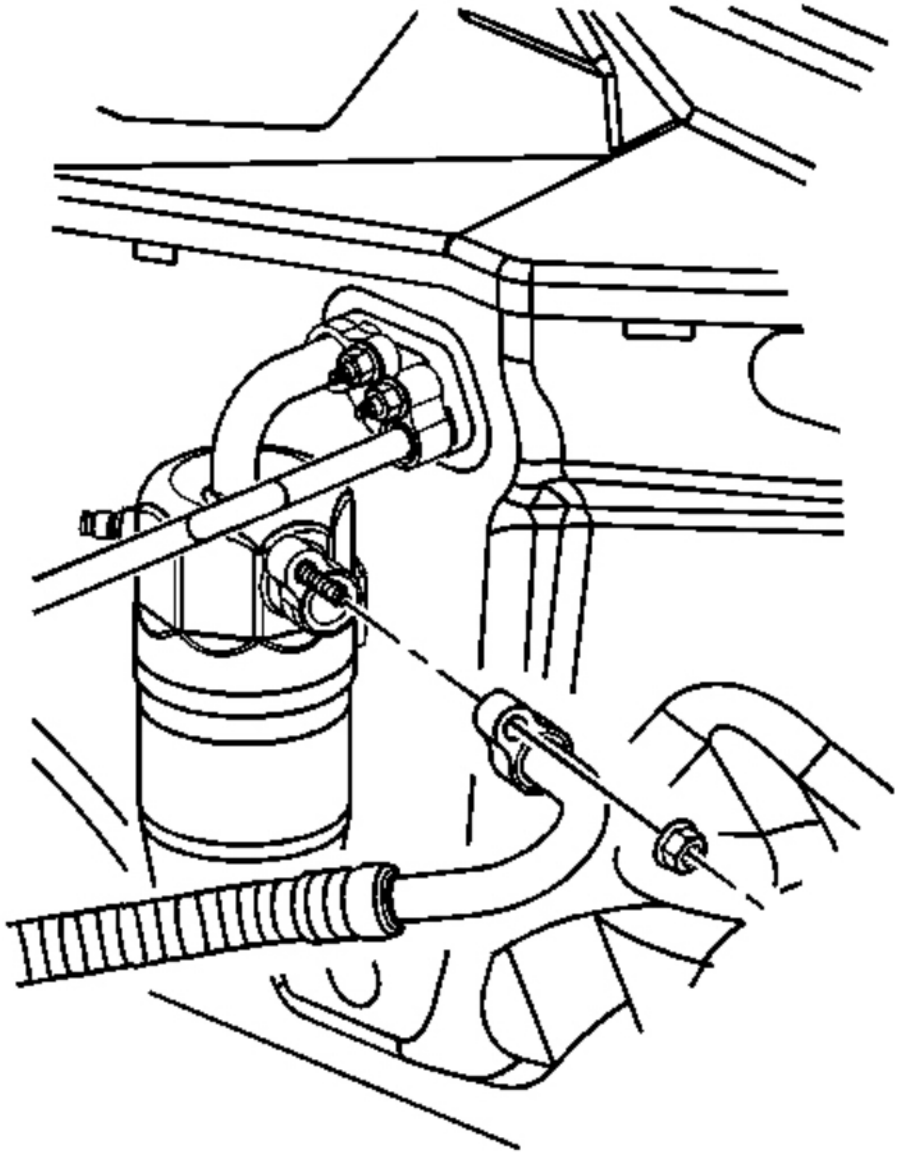


Fig. 31: Removing/Installing Suction Hose From Accumulator
Courtesy of GENERAL MOTORS CORP.

2. Install the suction hose to the accumulator.

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NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the suction hose nut to the accumulator.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

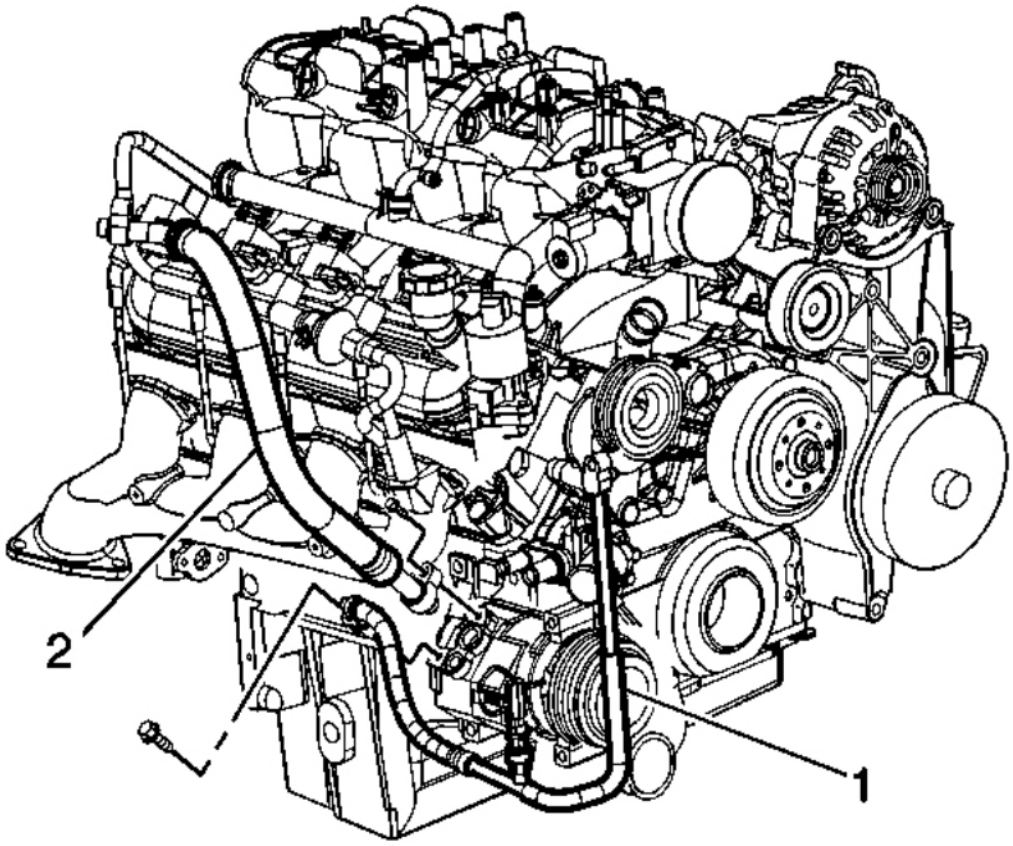


Fig. 32: Identifying Suction/Discharge Hoses To A/C Compressor
Courtesy of GENERAL MOTORS CORP.

4. Install the suction hose (2) to the compressor using new sealing washers. Refer to **Sealing Washer Replacement**.
5. Install the suction hose mounting bolt to the A/C compressor.

   Tighten: Tighten the bolt to 16 N.m (12 lb ft).

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6. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
7. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

EVAPORATOR TUBE REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

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

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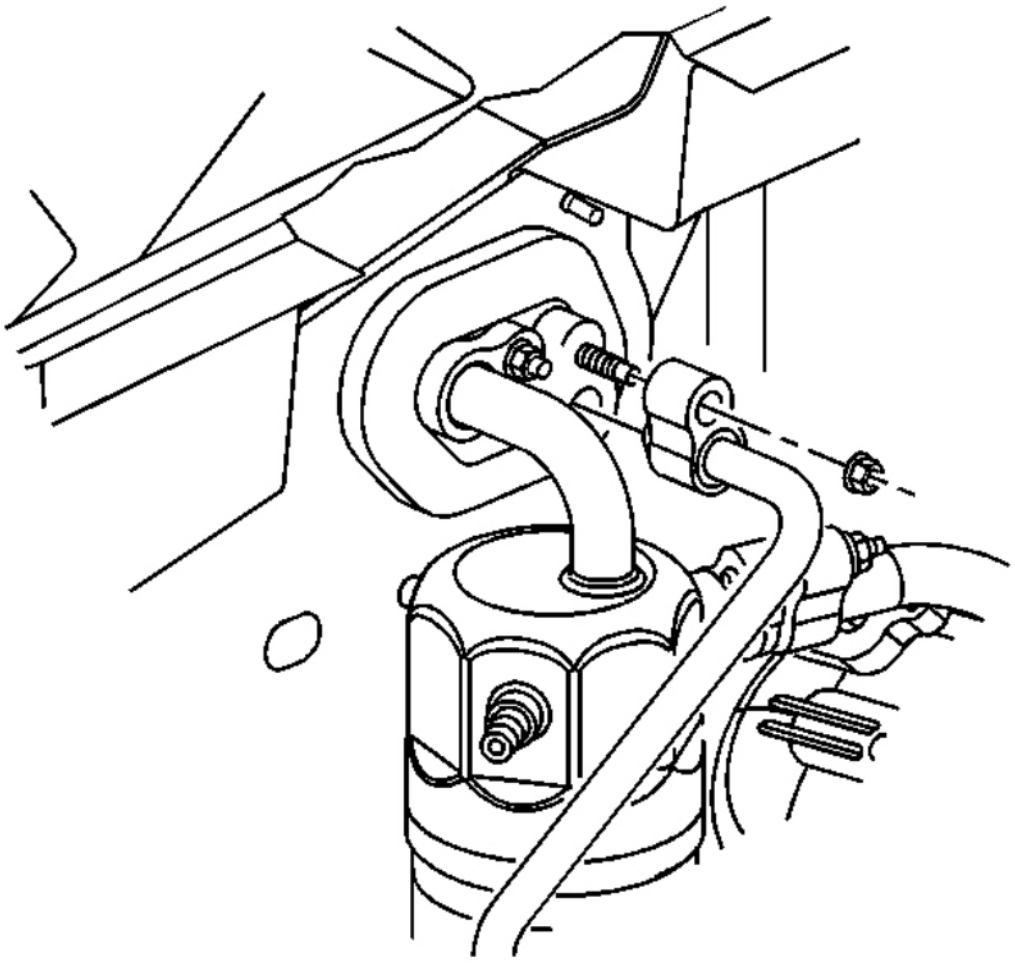


Fig. 33: Removing/Installling Evaporator Tube At Evaporator
Courtesy of GENERAL MOTORS CORP.

2. Remove the evaporator tube nut from the evaporator.
3. Disconnect the evaporator tube from the evaporator.
4. Remove the evaporator tube nut from the auxiliary A/C tube, if equipped.
5. Disconnect the evaporator tube from the auxiliary A/C tube, if equipped.

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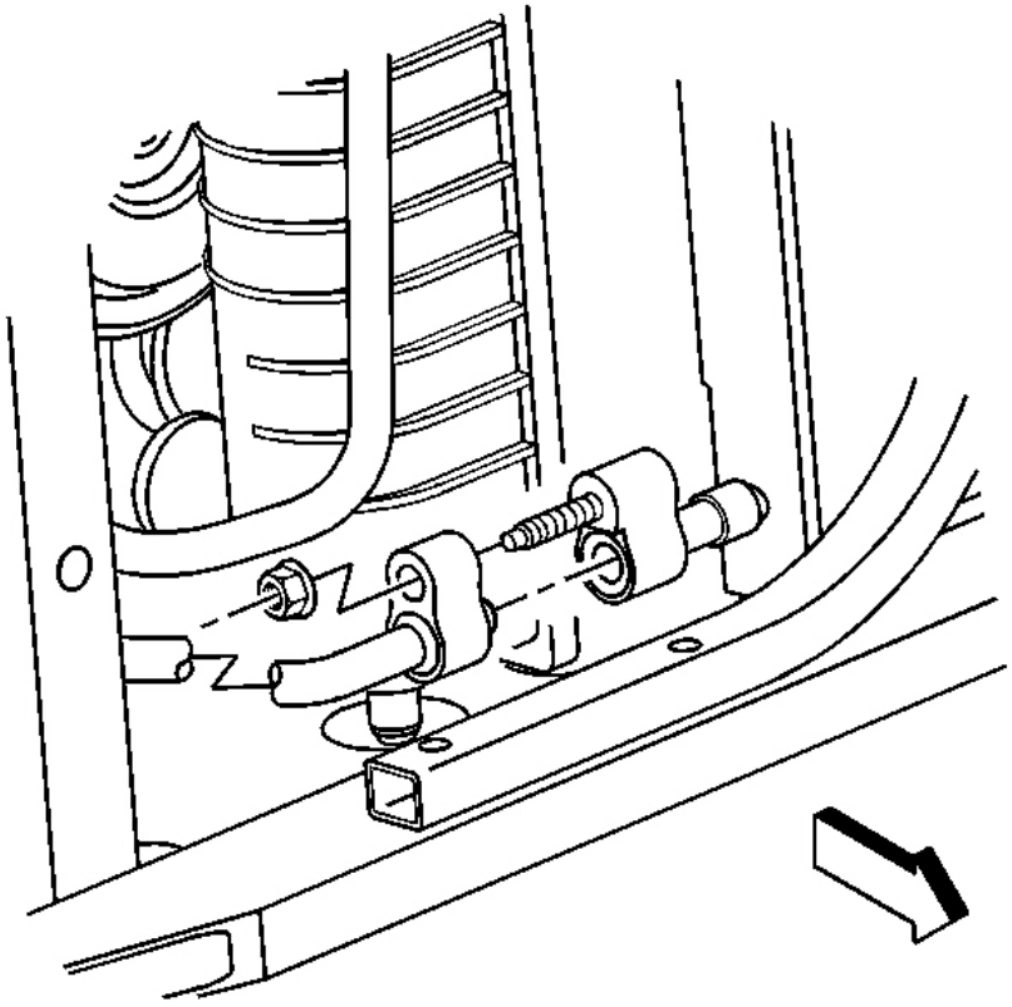


Fig. 34: Removing Evaporator Tube From Condenser (W/O HP2)
Courtesy of GENERAL MOTORS CORP.

6. Remove the right park/turn signal lamp. Refer to **Park/Turn Signal Lamp Replacement (Except Avalanche)** or **Park/Turn Signal Lamp Replacement (Avalanche)** in Lighting Systems.
7. Remove the grille from the vehicle. Refer to **Grille Replacement (Cadillac)** or **Grille Replacement (Avalanche)** or **Grille Replacement (Chevrolet)** or **Grille Replacement (GMC)** in Exterior Trim.
8. Remove the evaporator tube nut from the condenser.

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9. Disconnect the evaporator tube from the condenser.
10. Remove the evaporator tube from the vehicle.
11. Discard all of the used sealing washers. Cap all of the open connections.

Installation Procedure

1. Connect the evaporator tube to the condenser using new sealing washers. Refer to **Sealing Washer Replacement**.

NOTE: Refer to Fastener Notice in Cautions and Notices.

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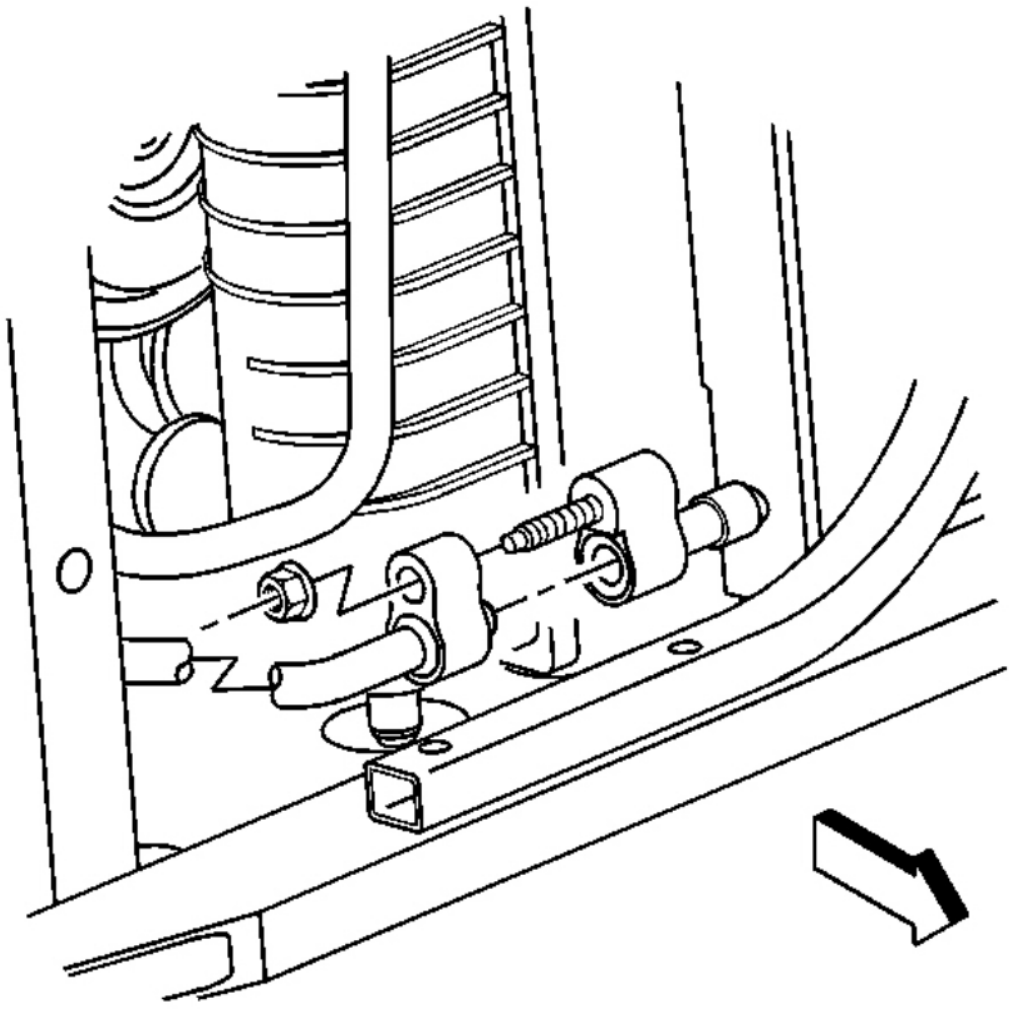


Fig. 35: Removing Evaporator Tube From Condenser (W/O HP2)
Courtesy of GENERAL MOTORS CORP.

2. Install the evaporator tube nut to the condenser.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

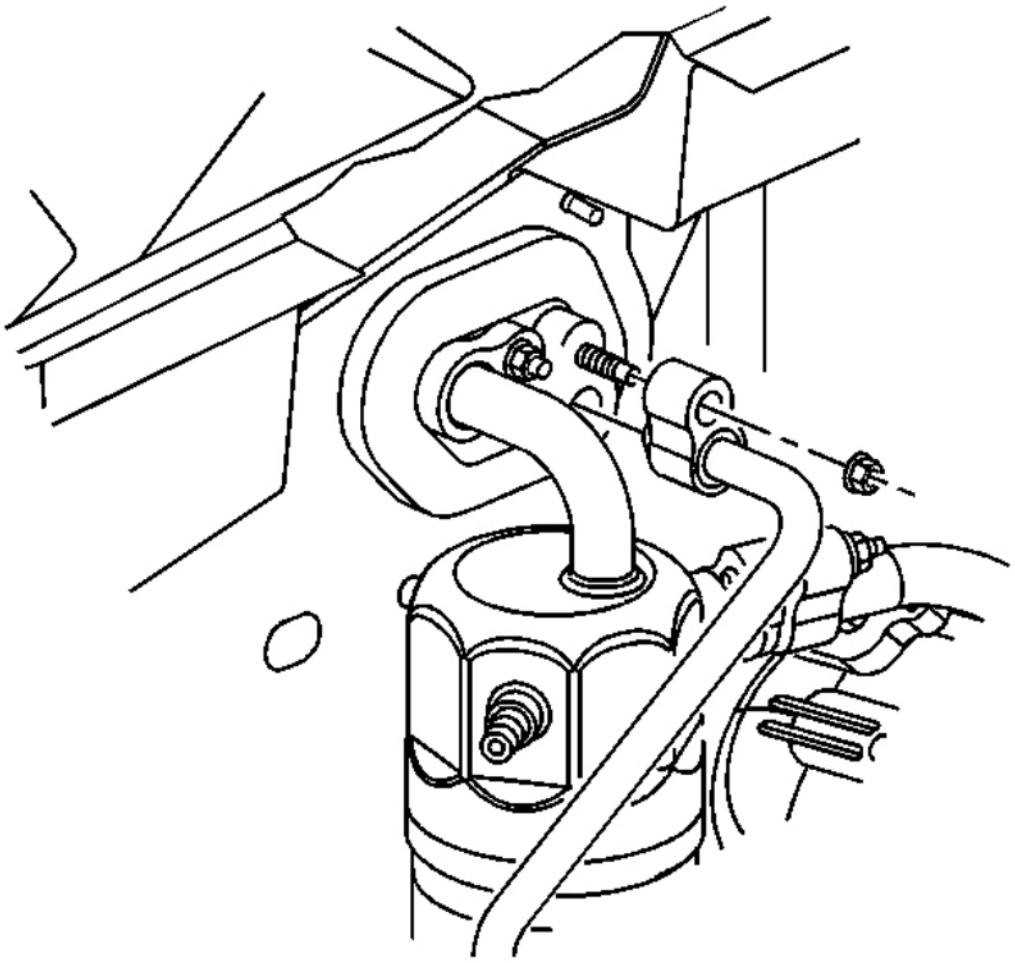
3. Install the grille to the vehicle. Refer to **Grille Replacement (Cadillac)** or **Grille Replacement (Avalanche)** or **Grille Replacement (Chevrolet)** or **Grille Replacement (GMC)** in Exterior Trim.

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4. Install the right park/turn signal lamp. Refer to **Park/Turn Signal Lamp Replacement (Except Avalanche)** or **Park/Turn Signal Lamp Replacement (Avalanche)** in Lighting Systems.
5. Connect the evaporator tube to the auxiliary A/C tube using new sealing washers, if equipped. Refer to **Sealing Washer Replacement**.
6. Install the evaporator tube nut to the auxiliary A/C tube, if equipped.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

7. Install the evaporator tube to the evaporator.



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Fig. 36: Removing/Installling Evaporator Tube At Evaporator
Courtesy of GENERAL MOTORS CORP.

8. Install the evaporator tube nut to the evaporator.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

9. Evacuate and recharge the system. Refer to **Refrigerant Recovery and Recharging**.
10. Leak test the fittings of the components using the **J 39400-A** . See **Special Tools**.

AIR CONDITIONING (A/C) REFRIGERANT FILTER INSTALLATION

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

IMPORTANT: The A/C refrigerant filter installation procedure applies to vehicles with an auxiliary system only.
The A/C refrigerant filter must be installed to the A/C evaporator tube (liquid line) between the condenser and evaporator. The installation of this A/C refrigerant filter eliminates the need for flushing.

Installation Procedure

1. Remove the air cleaner. Refer to **Air Cleaner Assembly Replacement** in Engine Controls.

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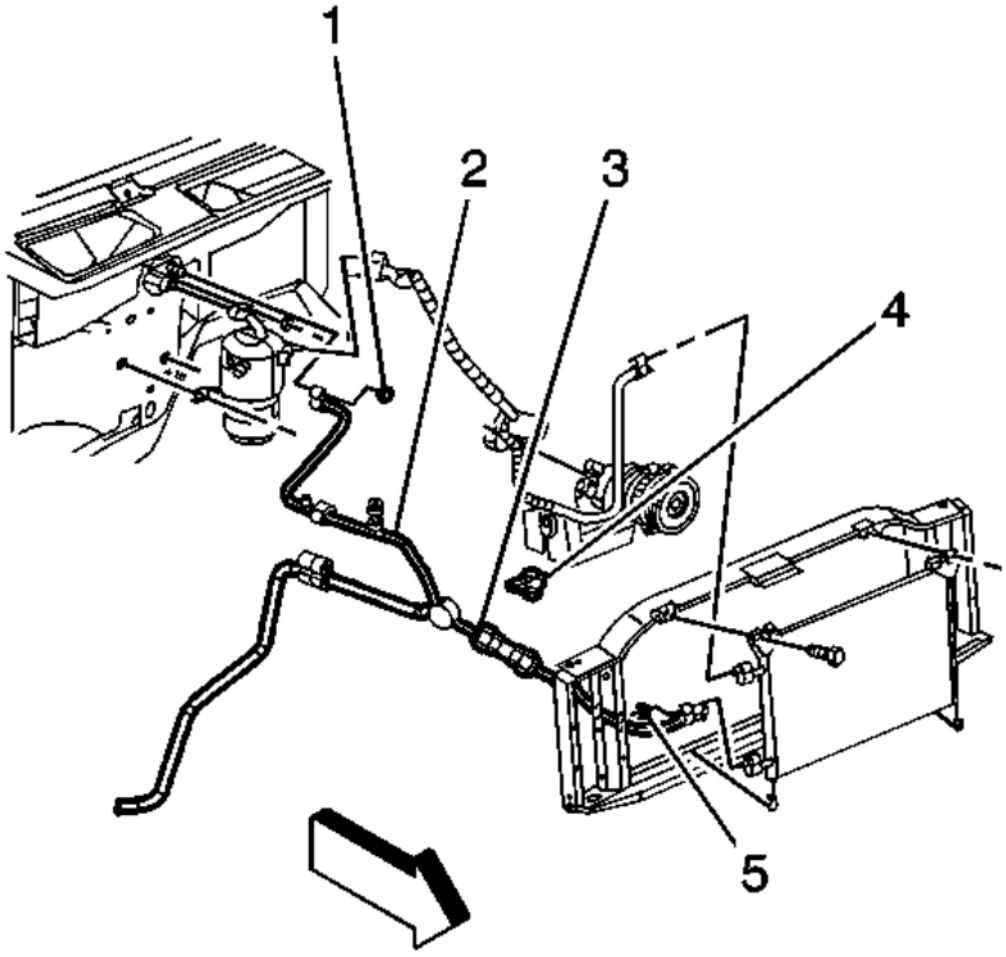


Fig. 37: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

2. Remove the evaporator tube (2) from the vehicle. Refer to **Evaporator Tube Replacement**.
3. Measure 45 mm (1.75 in) from the bend on the condenser end of the evaporator tube (2) and mark the location.
4. Measure 45 mm (1.75 in) from the mark on the evaporator tube (2) towards the evaporator from the previous step.

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IMPORTANT: Do not allow metal burrs to enter the evaporator tube (2) during cutting or when removing the burrs.

5. Using a tubing cutter, cut the marked section of the evaporator tube (2).
6. Remove the burrs from the evaporator tube (2).

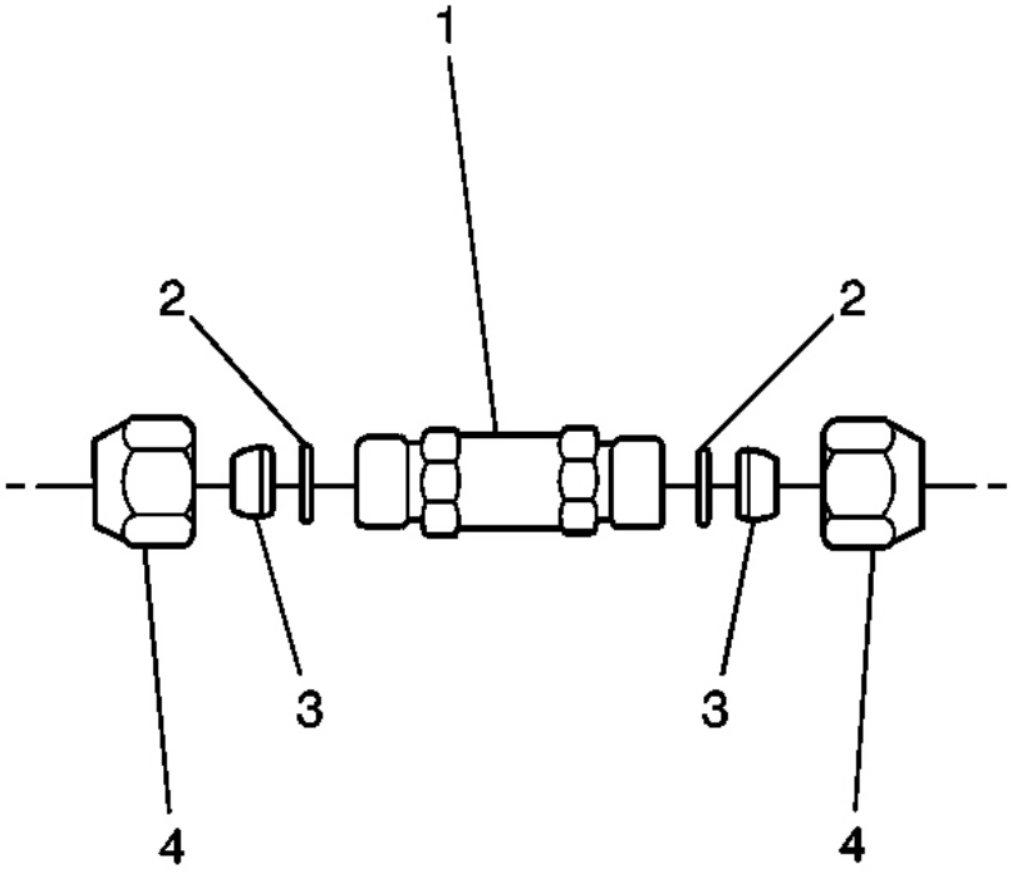


Fig. 38: Identifying A/C Refrigerant Filter Components
Courtesy of GENERAL MOTORS CORP.

7. Remove the nuts (4), the ferrules (3), and the O-rings (2) from the A/C refrigerant filter (1).

IMPORTANT: Do Not install the O-rings (2) in this step.

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8. Push the proper size nuts (4) and ferrules (3) over each of the evaporator tube halves.
9. Install the ferrules (3) with the small end toward the nut (4).

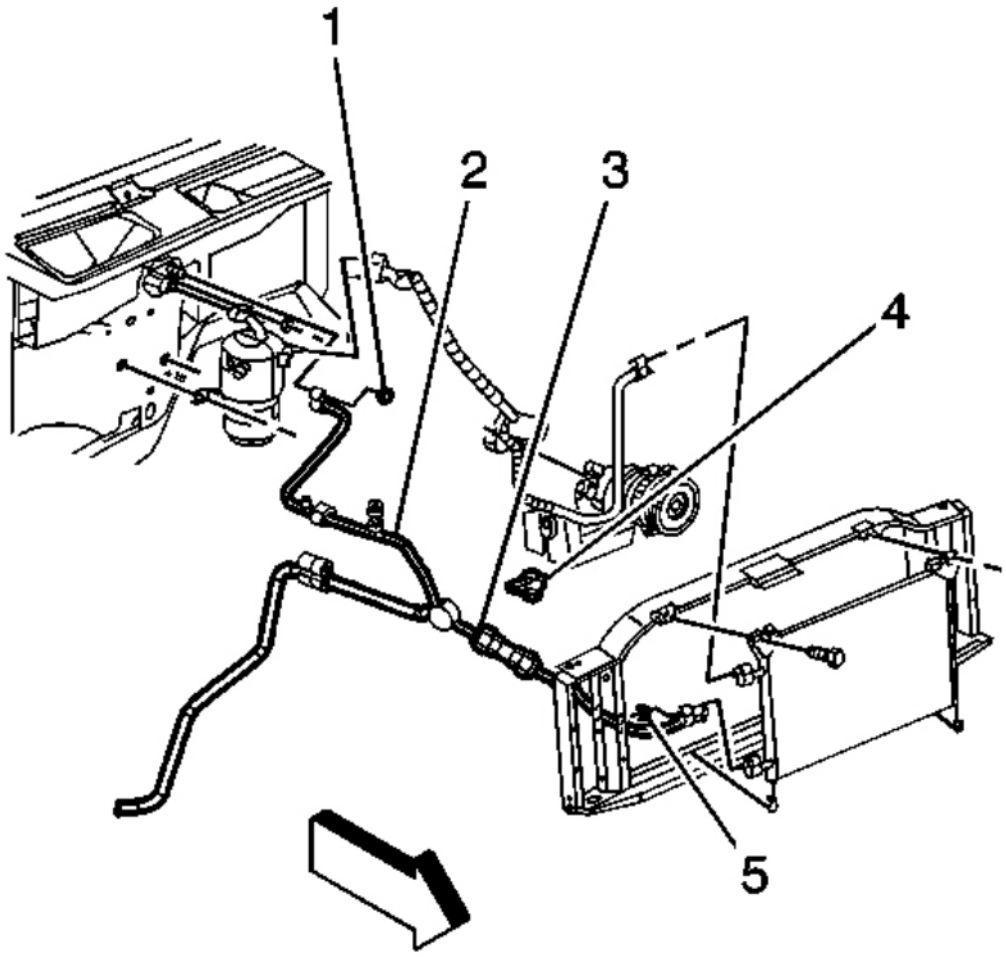


Fig. 39: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

10. Install the A/C refrigerant filter (3) to the evaporator tube (2) with the flow arrow pointing towards the evaporator.

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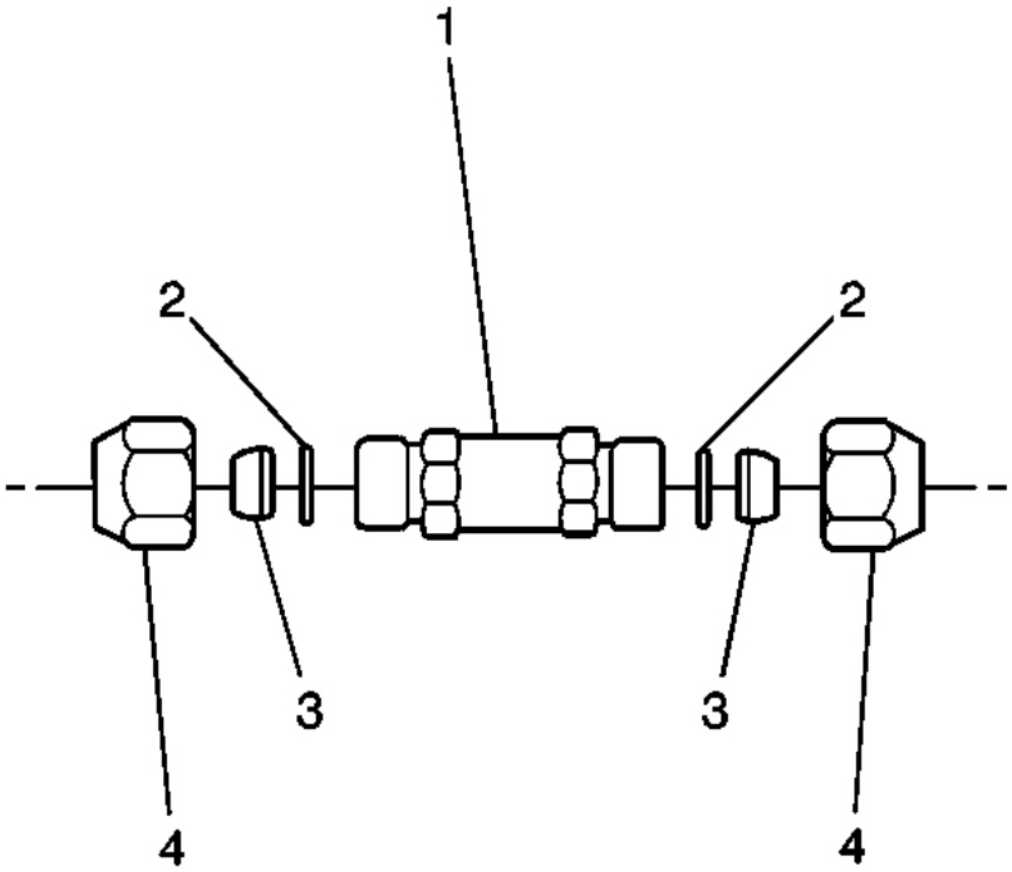


Fig. 40: Identifying A/C Refrigerant Filter Components
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

11. While holding the evaporator tube in the A/C refrigerant filter (1), tighten the nuts (4) to the A/C refrigerant filter (1).

    Tighten: Tighten the nuts to 34 N.m (25 lb ft).

12. Remove the nuts (4) from the A/C refrigerant filter (1).
13. Install the O-rings (2) to the evaporator tube halves. Refer to **O-Ring Replacement**.
14. Install the nuts (4) to the A/C refrigerant filter (1).

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Tighten: Tighten the nuts to 34 N.m (25 lb ft).

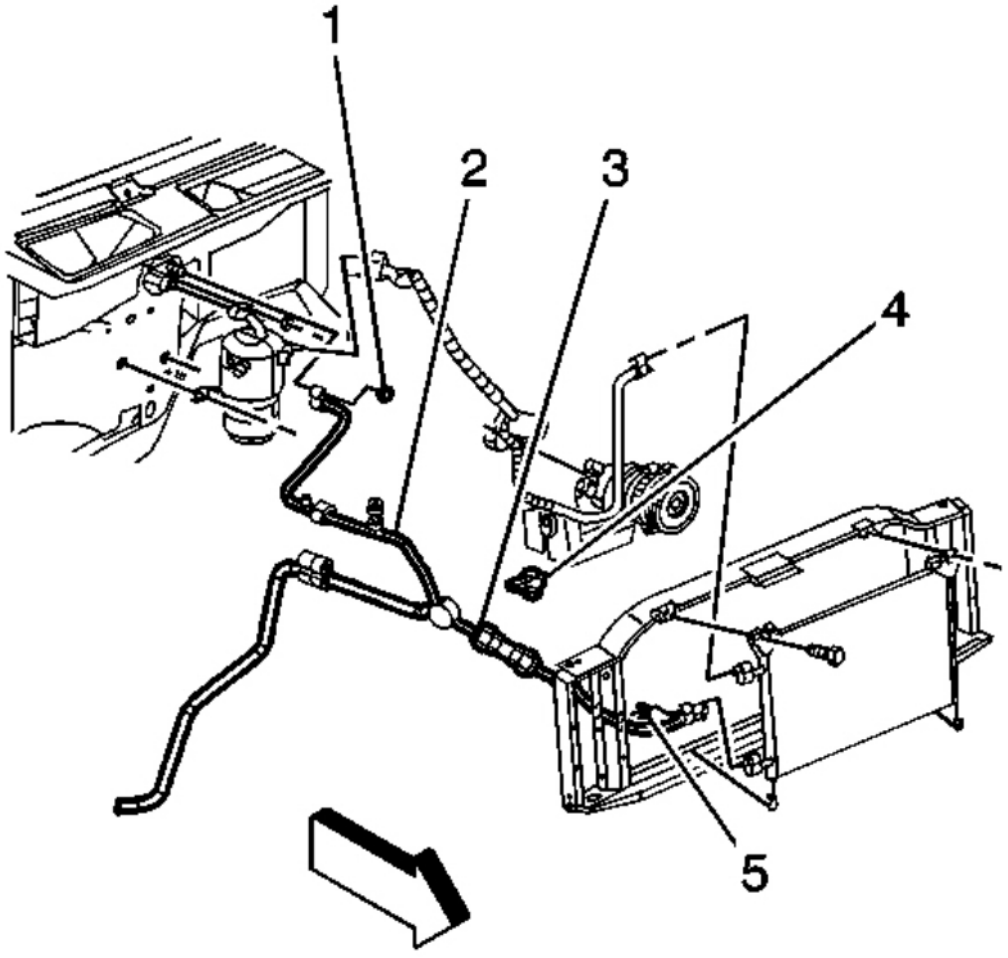


Fig. 41: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

15. Install the evaporator tube (2) to the vehicle. Refer to **Evaporator Tube Replacement**.
16. Evacuate and recharge the system. Refer to **Refrigerant Recovery and Recharging**.
17. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.
18. Install the air cleaner. Refer to **Air Cleaner Assembly Replacement** in Engine Controls.

AIR CONDITIONING (A/C) REFRIGERANT FILTER REPLACEMENT (C69)

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Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

1. Recover the refrigerant from the system. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the air cleaner. Refer to **Air Cleaner Assembly Replacement** in Engine Controls.

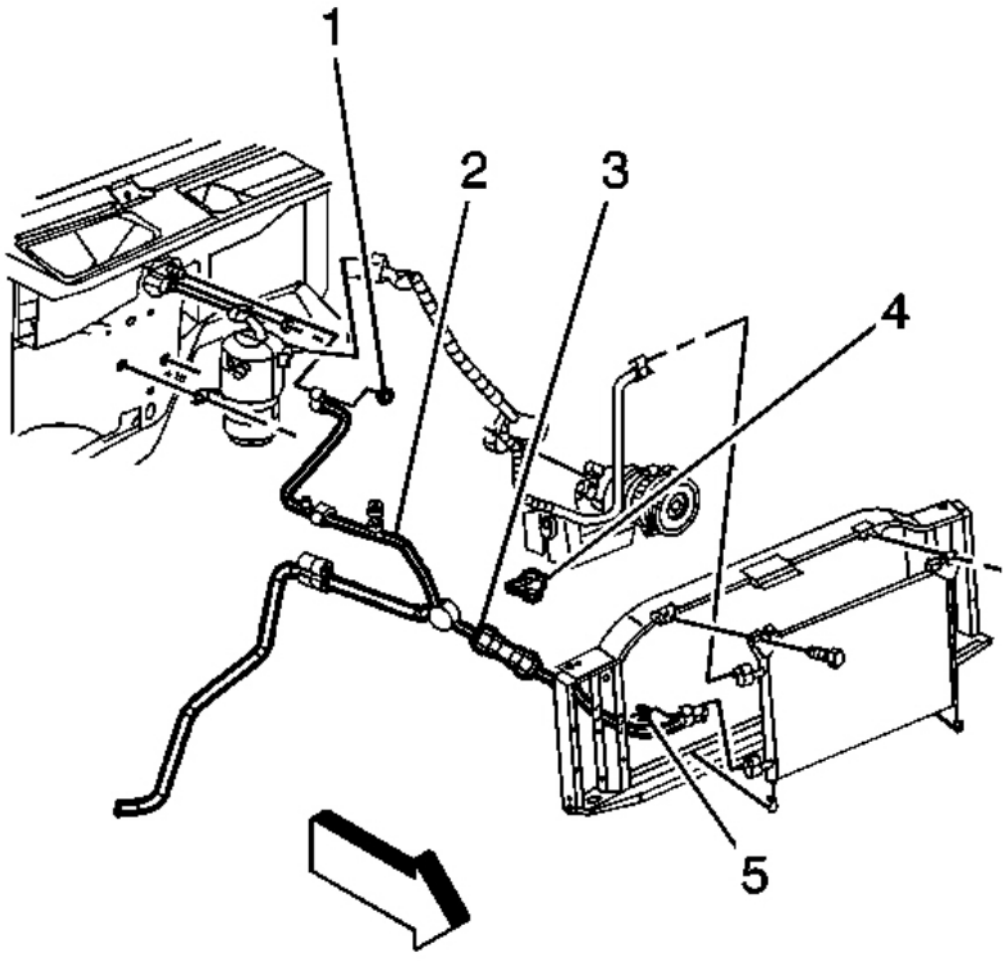


Fig. 42: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

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3. Remove the evaporator tube (2) from the vehicle. Refer to **Evaporator Tube Replacement**.

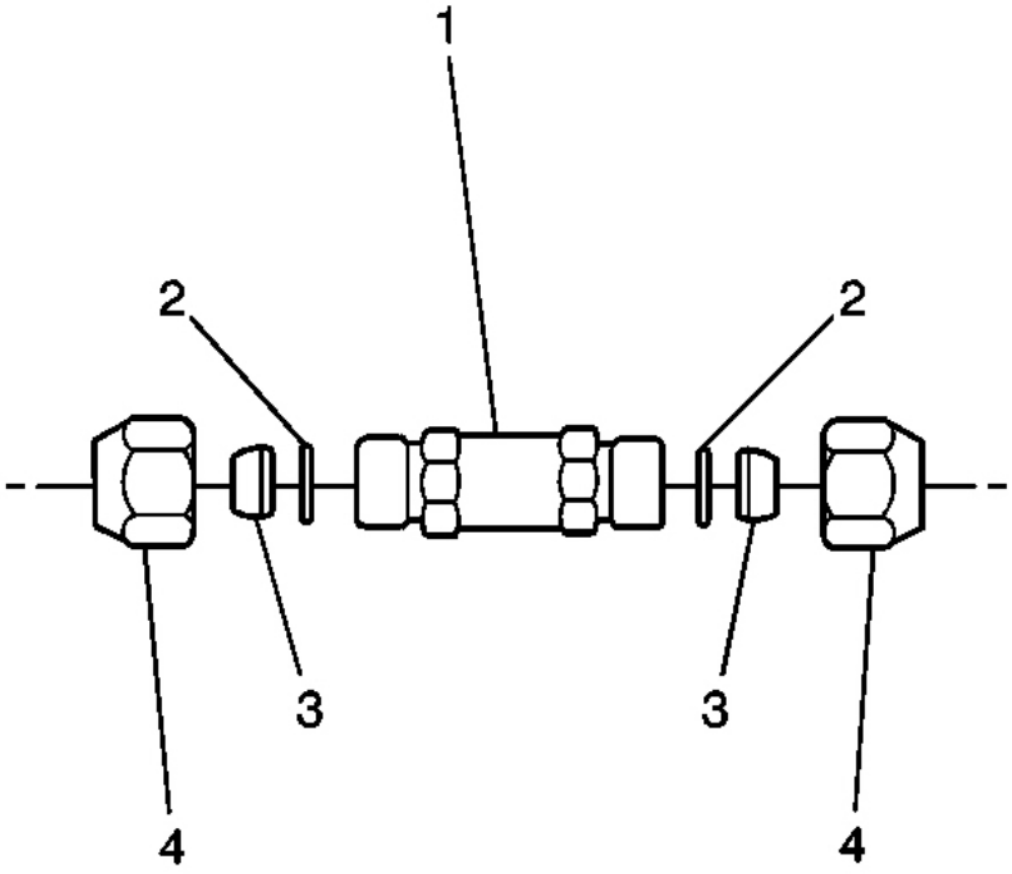


Fig. 43: Identifying A/C Refrigerant Filter Components
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The nuts (4) and ferrules (3) will remain on the evaporator tube. Do not try to remove.

4. Remove the nuts (4) from the A/C refrigerant filter (1).

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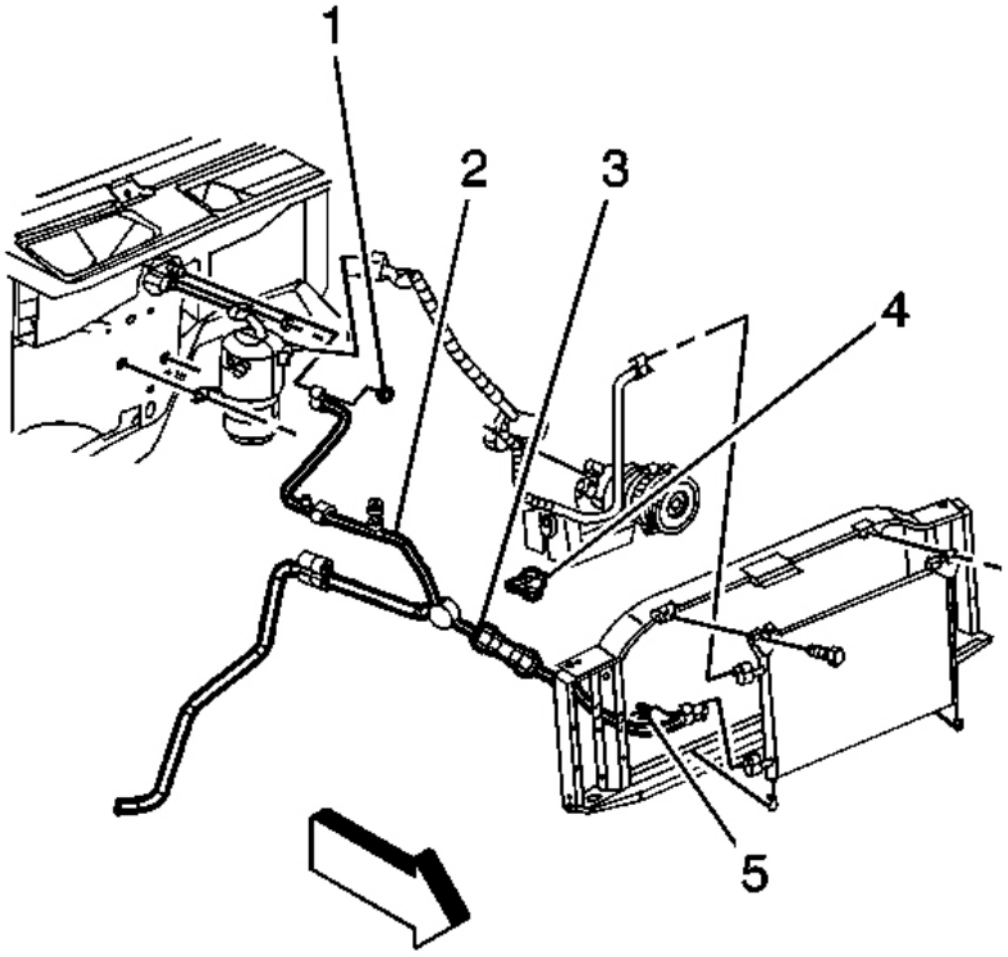


Fig. 44: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

5. Remove the A/C refrigerant filter (3) from the evaporator tube (2).

Installation Procedure

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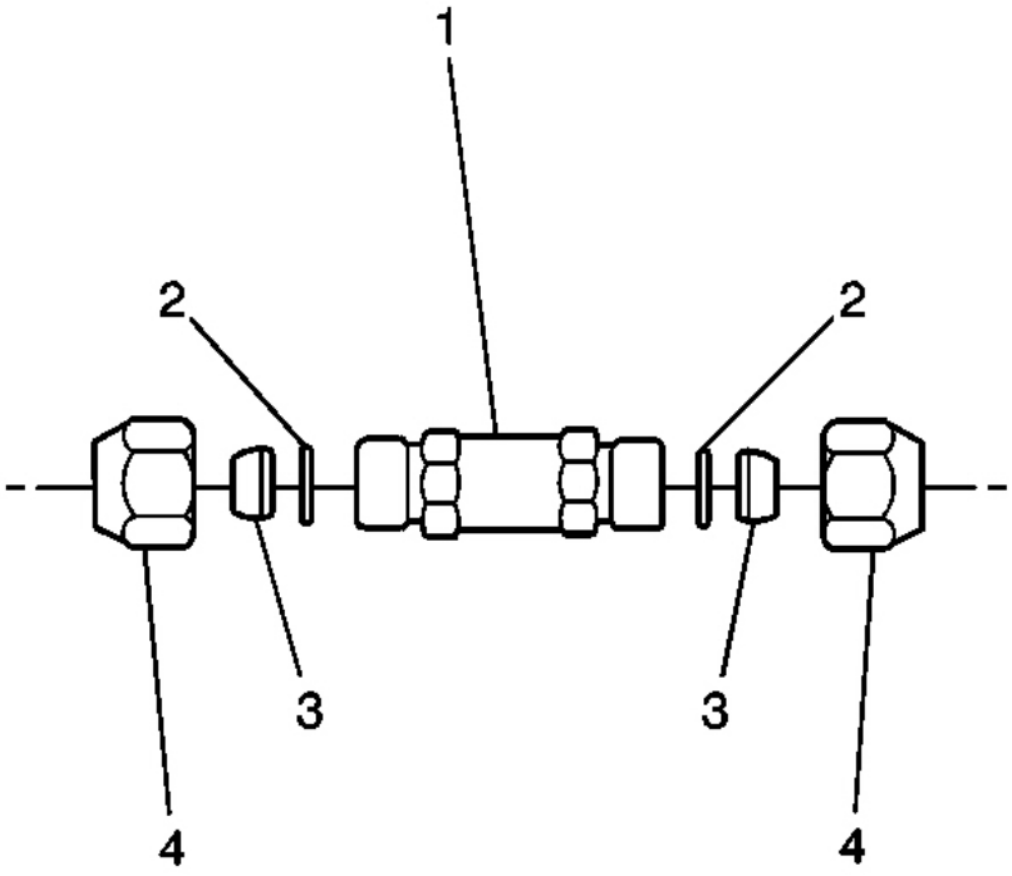


Fig. 45: Identifying A/C Refrigerant Filter Components
Courtesy of GENERAL MOTORS CORP.

1. Install the O-rings (2) to the evaporator tube. Refer to **O-Ring Replacement**.

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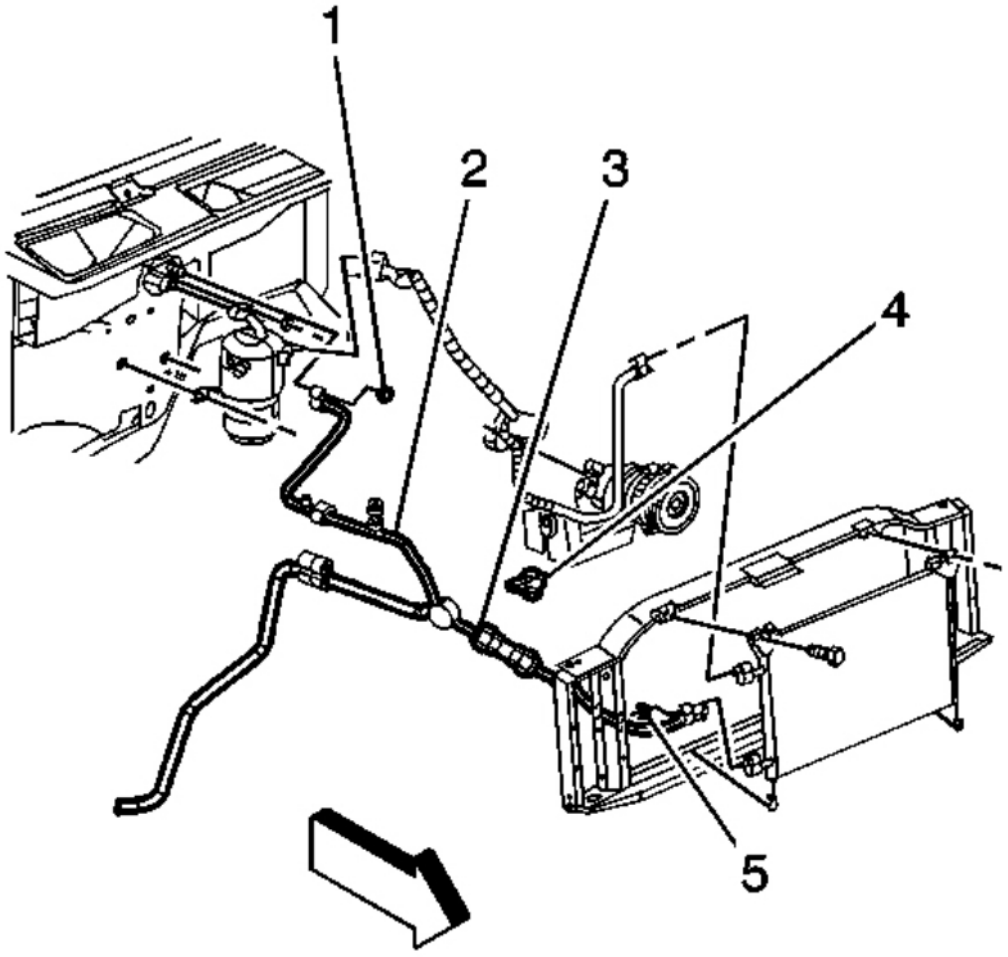


Fig. 46: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

2. Install the A/C refrigerant filter (3) to the evaporator tube (2) with the flow arrow pointing towards the evaporator.

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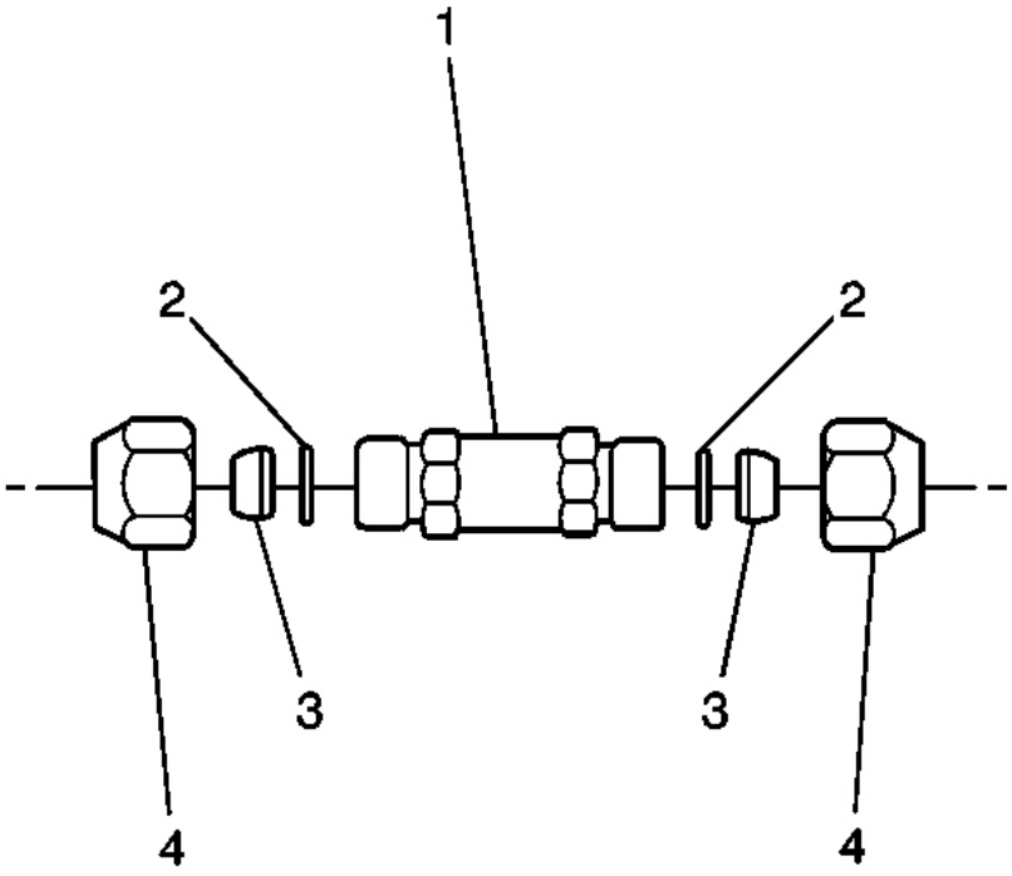


Fig. 47: Identifying A/C Refrigerant Filter Components
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

3. Install the nuts (4) to the A/C refrigerant filter (1).

   Tighten: Tighten the nuts to 34 N.m (25 lb ft).

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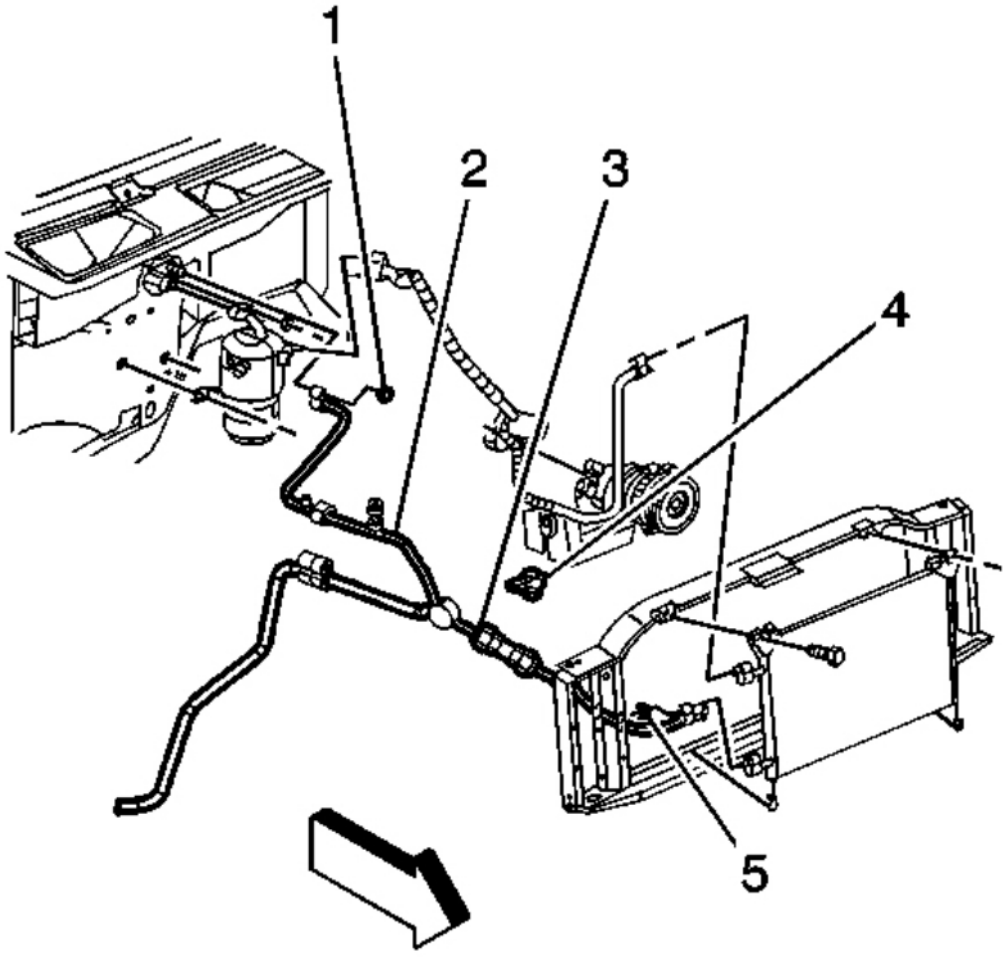


Fig. 48: View Of Evaporator Tube, A/C Refrigerant Filter & Components (C69)
Courtesy of GENERAL MOTORS CORP.

4. Install the evaporator tube (2) to the vehicle. Refer to **Evaporator Tube Replacement**.
5. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
6. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.
7. Install the air cleaner. Refer to **Air Cleaner Assembly Replacement** in Engine Controls.

EXPANSION (ORIFICE) TUBE REPLACEMENT

Tools Required

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- **J 26549-E** Orifice Tube Remover. See **Special Tools**.
- **J 39400-A** Halogen Leak Detector. See **Special Tools**.

Removal Procedure

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

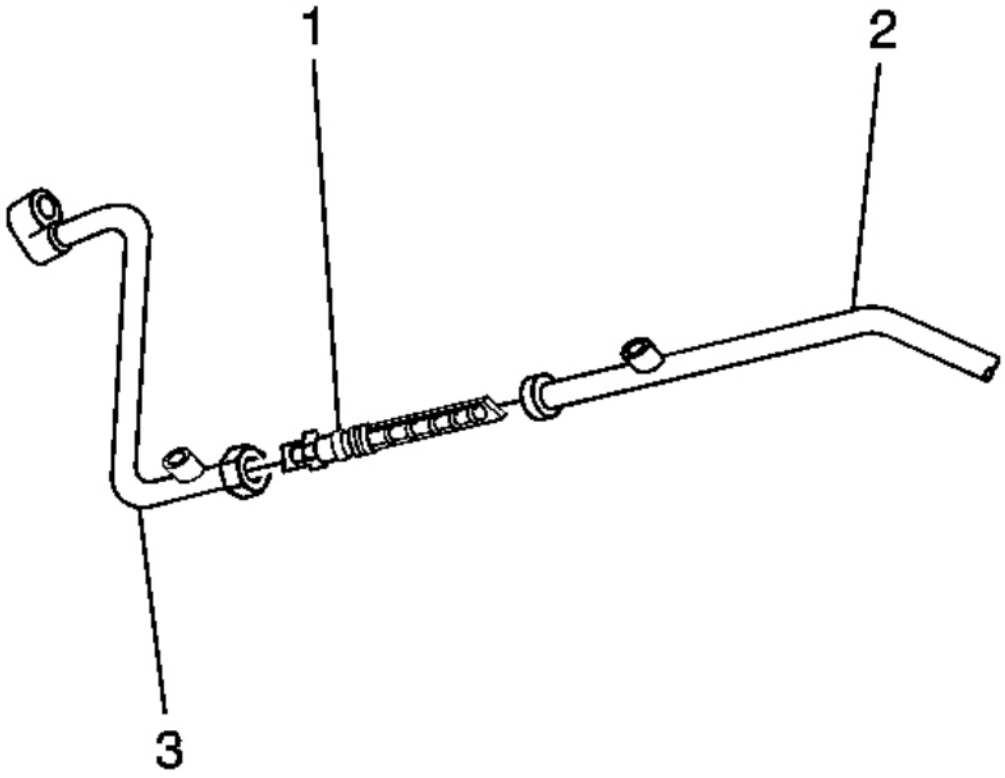


Fig. 49: Locating Evaporator Tube
Courtesy of GENERAL MOTORS CORP.

2. Loosen the nut from the evaporator tube fitting.
3. Use the **J 26549-E** in order to remove the orifice tube (1) from the evaporator tube (2). See **Special Tools**.
4. Cap or plug the open line.

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Installation Procedure

1. Uncap or unplug the evaporator tube.

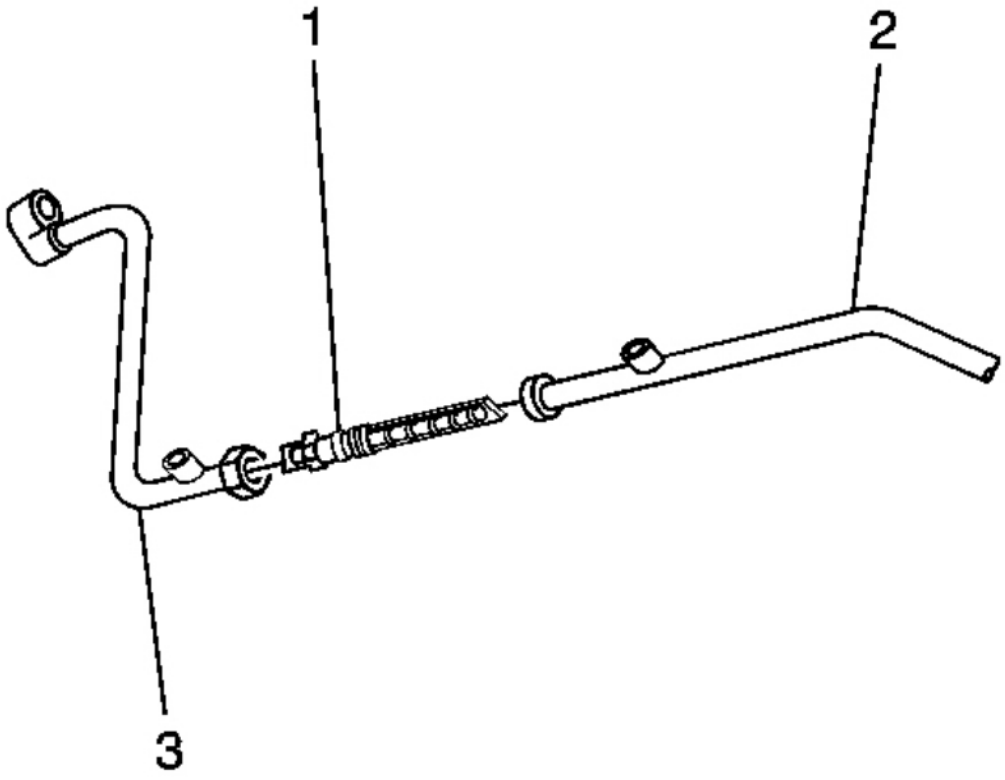


Fig. 50: Locating Evaporator Tube
Courtesy of GENERAL MOTORS CORP.

2. Install the new O-ring seal. Refer to **O-Ring Replacement**.
3. Install the short screen end of the new orifice (1) into the evaporator tube.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Connect the evaporator tube at the fitting.

Tighten: Tighten the fitting to 25 N.m (18 lb ft).

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5. Evacuate and recharge the system. Refer to **Refrigerant Recovery and Recharging**.
6. Leak test the fittings of the repaired component using **J 39400-A** . See **Special Tools**.

COMPRESSOR RELAY REPLACEMENT

Removal Procedure

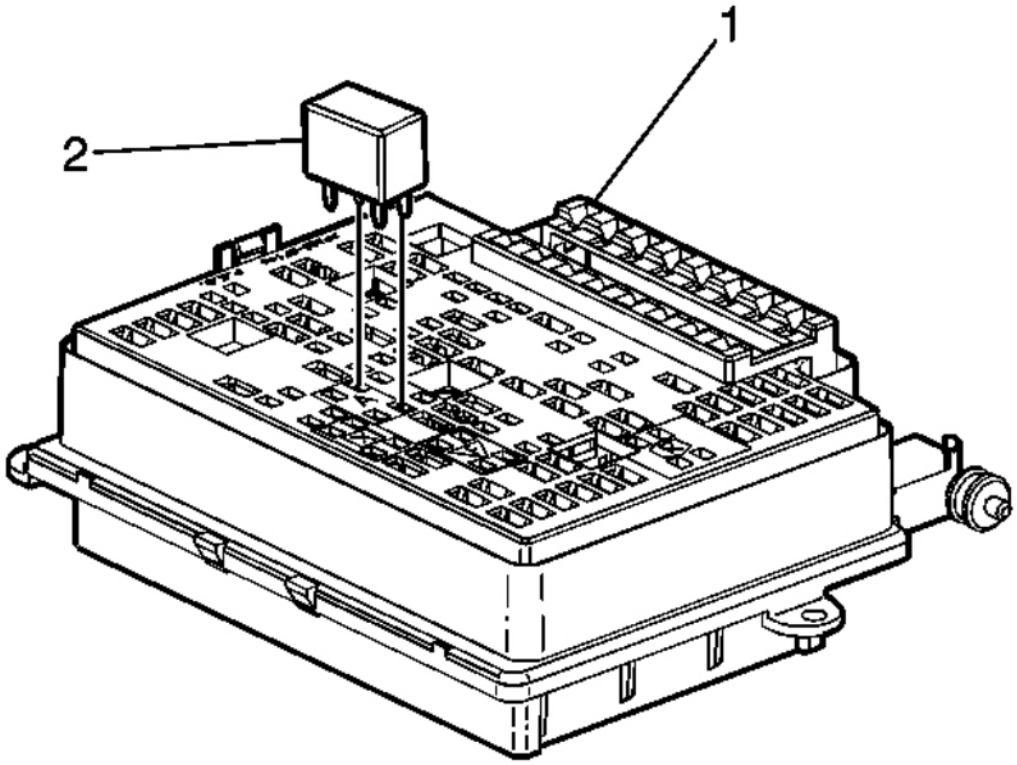


Fig. 51: Compressor Relay Location
Courtesy of GENERAL MOTORS CORP.

1. Remove the cover from the underhood convenience center (1).
2. Remove the compressor relay (2).

Installation Procedure

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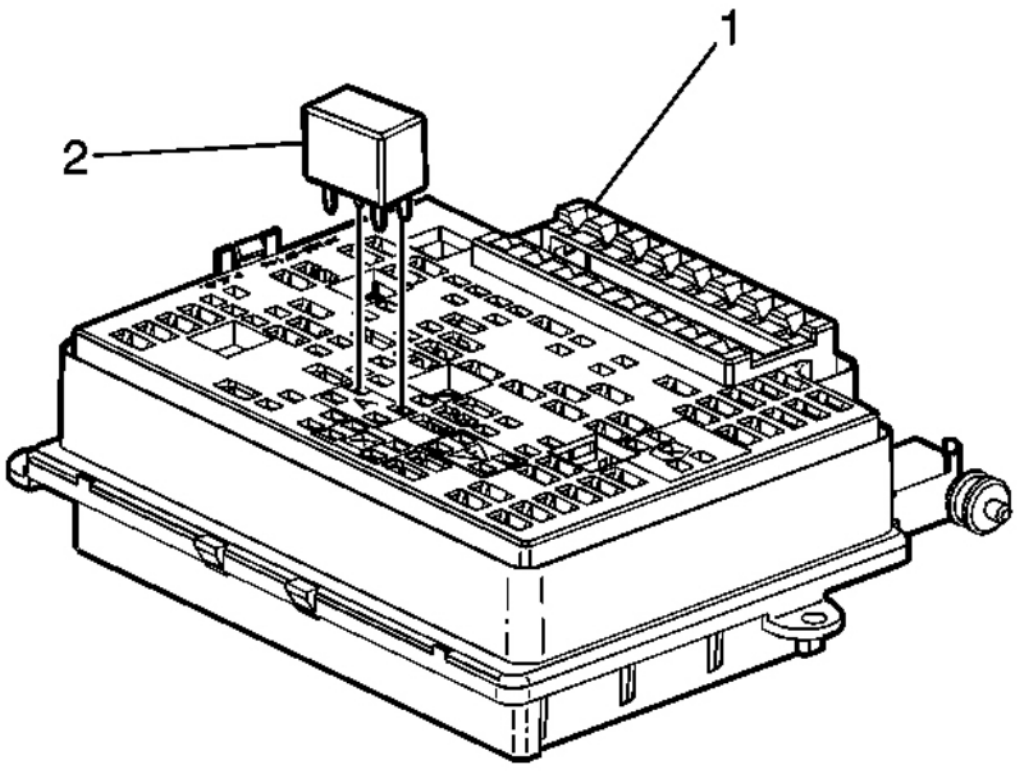


Fig. 52: Compressor Relay Location
Courtesy of GENERAL MOTORS CORP.

1. Install the compressor relay (2).
2. Install the cover to the underhood convenience center (1).

AIR CONDITIONING (A/C) LOW PRESSURE SWITCH REPLACEMENT

Removal Procedure

1. Disconnect the electrical connector from the A/C low pressure switch.

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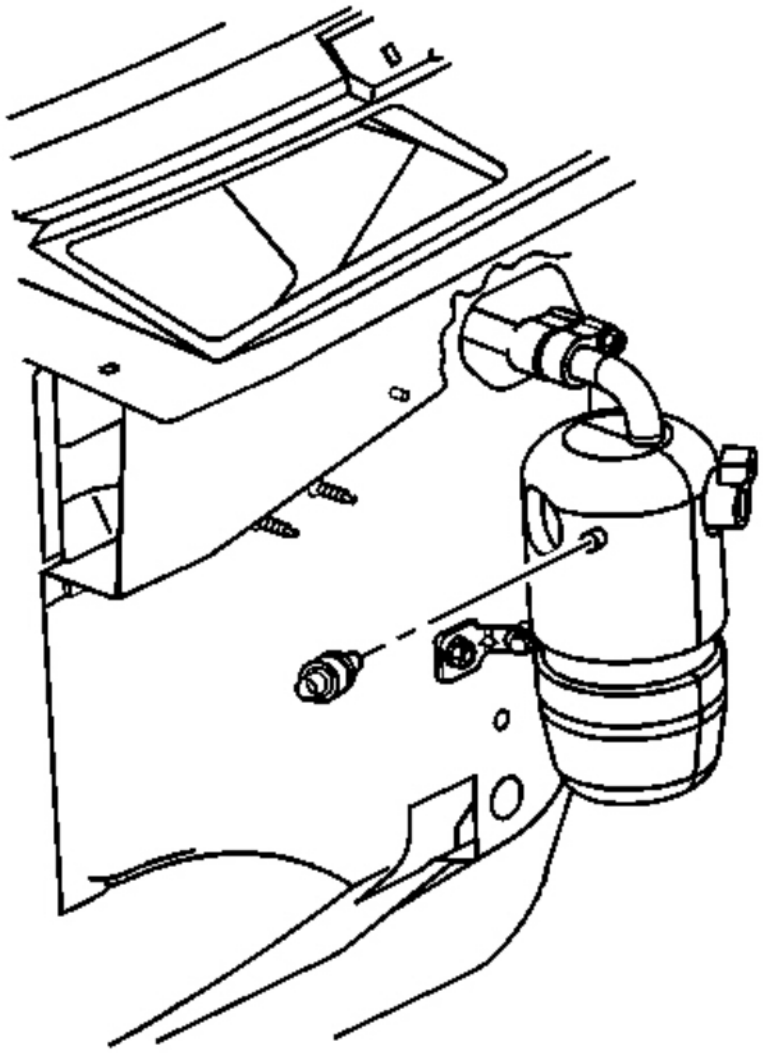


Fig. 53: A/C Low Pressure Switch
Courtesy of GENERAL MOTORS CORP.

2. Remove the A/C low pressure switch from the accumulator.
3. Remove the O-ring and discard.

Installation Procedure

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1. Install the new O-ring seal to the switch. Refer to **O-Ring Replacement**

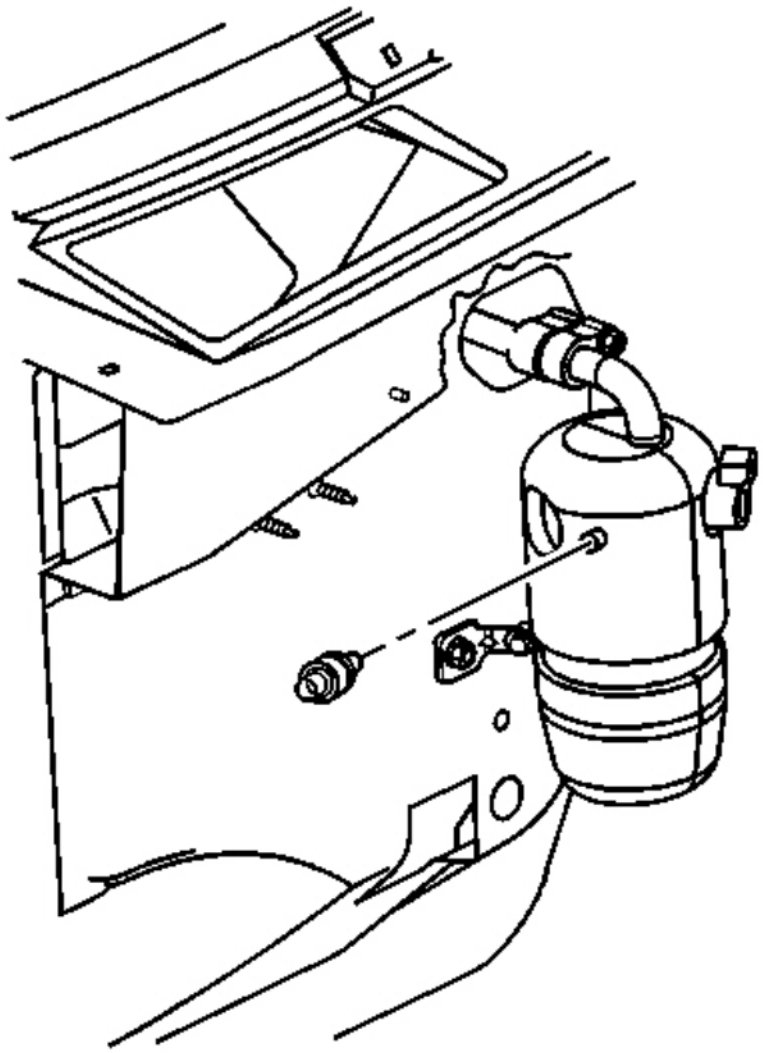


Fig. 54: A/C Low Pressure Switch
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the A/C low pressure switch to the accumulator.

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Tighten: Tighten the switch to 6 N.m (53 lb in).

3. Connect the electrical connector to the A/C low pressure switch.
4. Leak test the fittings of the components using the **J 39400-A** . See **Special Tools**.

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

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

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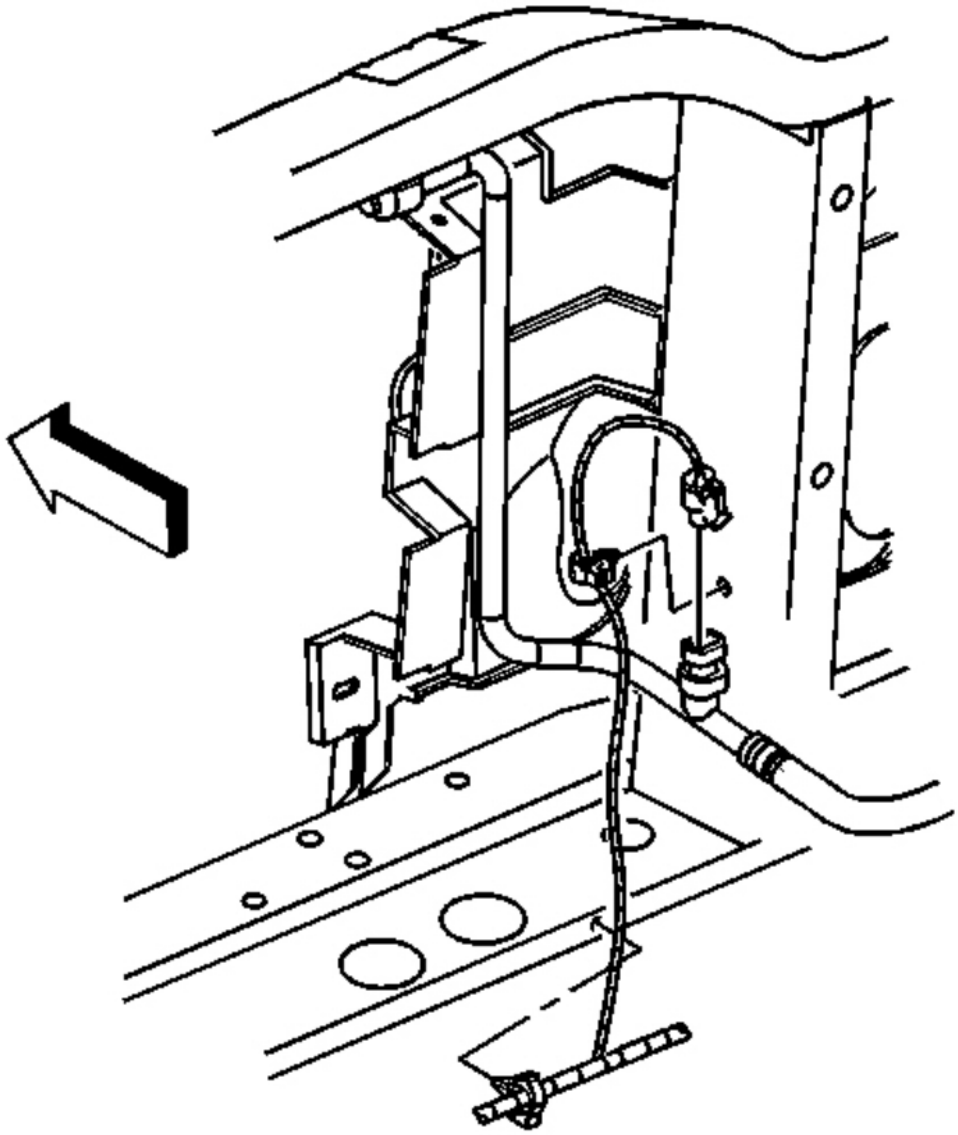


Fig. 55: Automatic Recirculation Switch Electrical Connector
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector from the A/C high pressure recirculation switch.
3. Remove the A/C high pressure recirculation switch from the evaporator tube.

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Installation Procedure

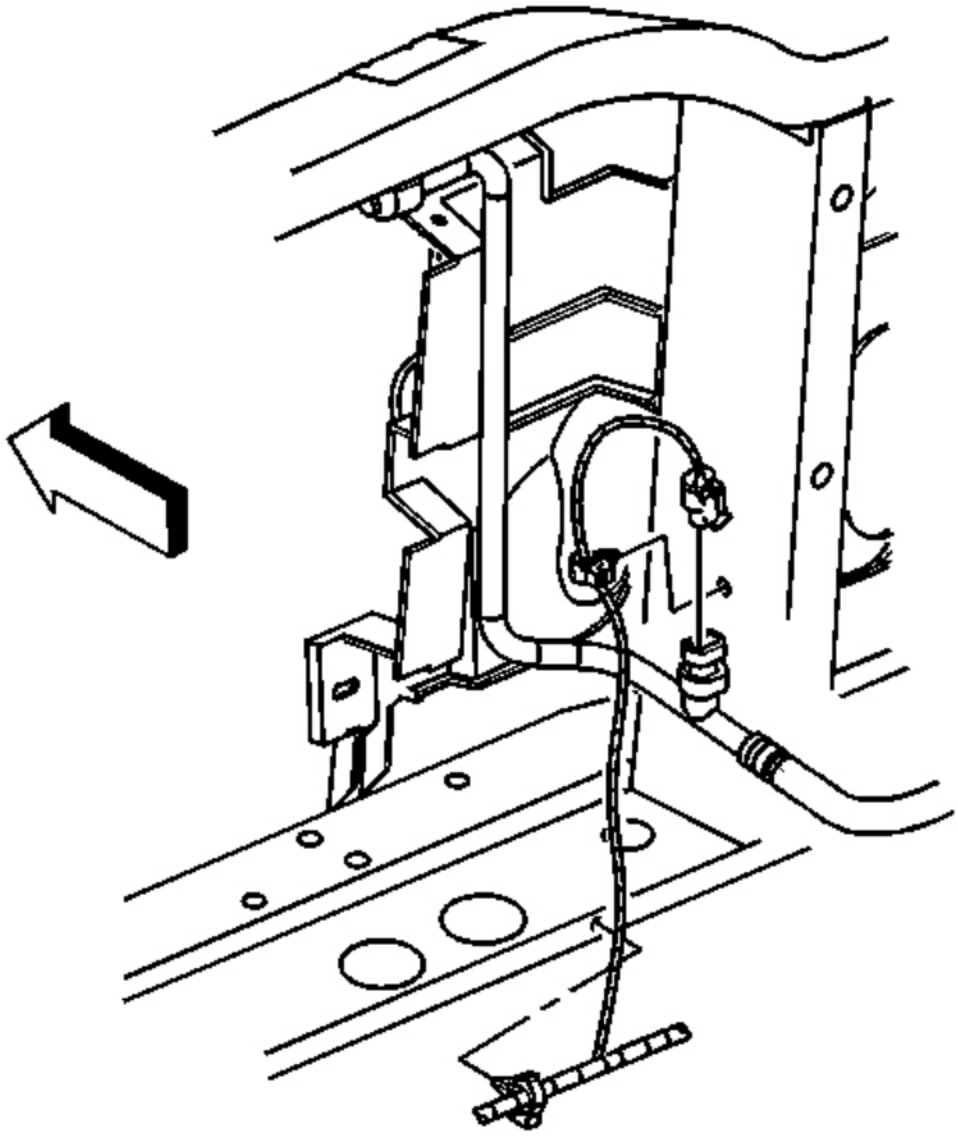


Fig. 56: Automatic Recirculation Switch Electrical Connector
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

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1. Install the A/C high pressure recirculation switch.

   Tighten: Tighten the switch to 6 N.m (53 lb in).

2. Connect the electrical connector to the A/C high pressure recirculation switch.
3. Leak test the fittings of the components using the **J 39400-A** . See **Special Tools**.
4. Lower the vehicle.

CONDENSER REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

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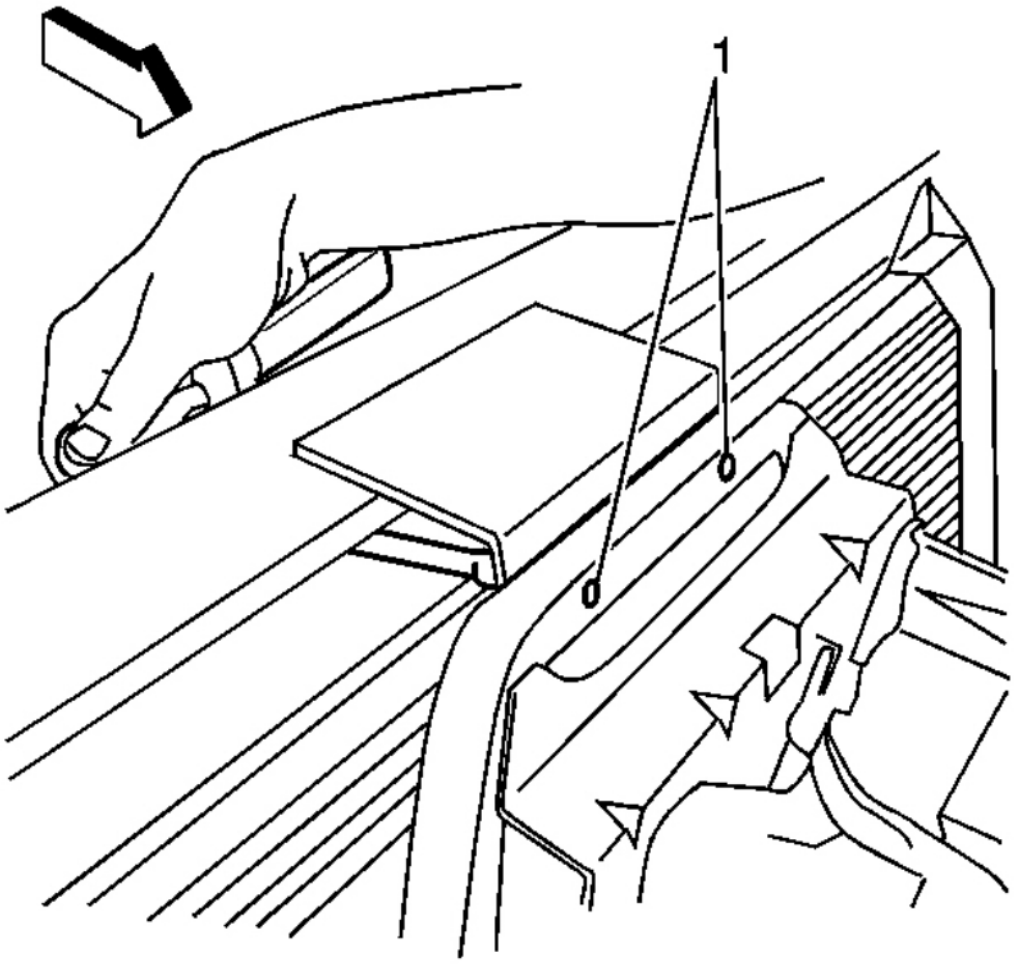


Fig. 57: Tie Bar To Radiator Brace & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the grille. Refer to **Grille Replacement (Cadillac)** or **Grille Replacement (Avalanche)** or **Grille Replacement (Chevrolet)** or **Grille Replacement (GMC)** in Exterior Trim.
3. Remove the tie bar to radiator brace bolts (1). Access the bolts from the rear of the upper radiator support.

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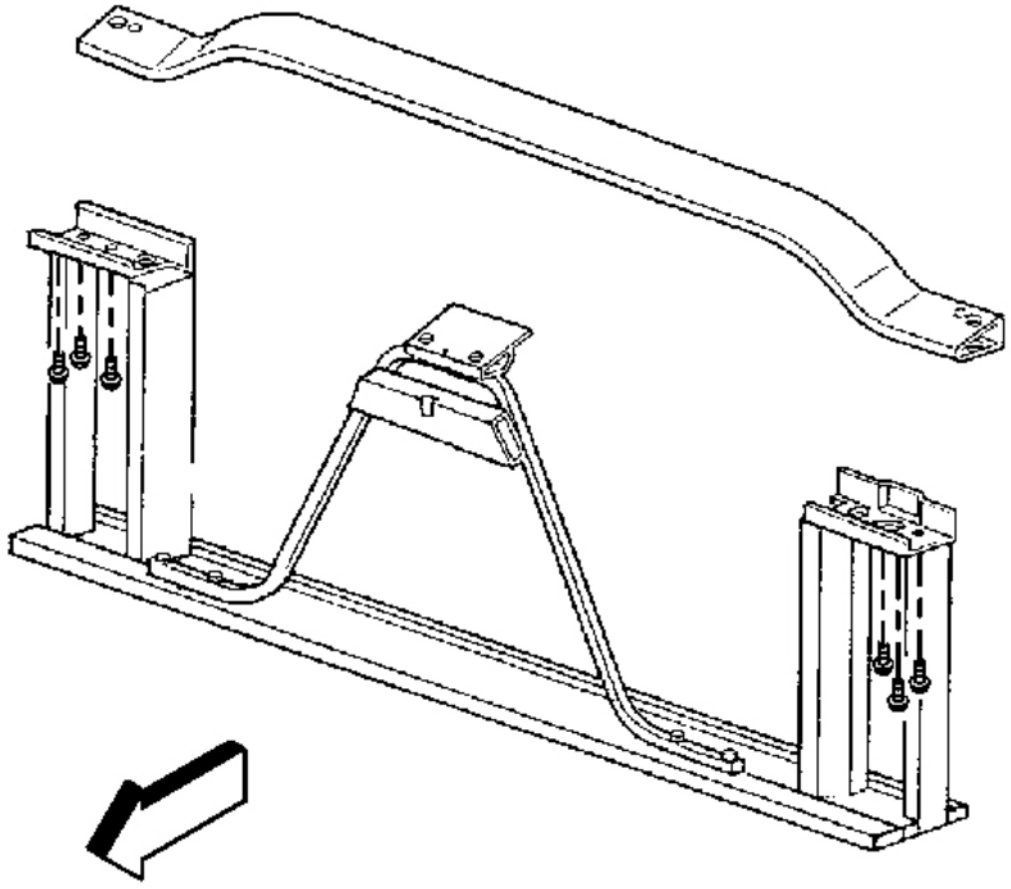


Fig. 58: Tie Bar & Bolts
Courtesy of GENERAL MOTORS CORP.

4. Remove the lower bolts from the hood latch support bracket.

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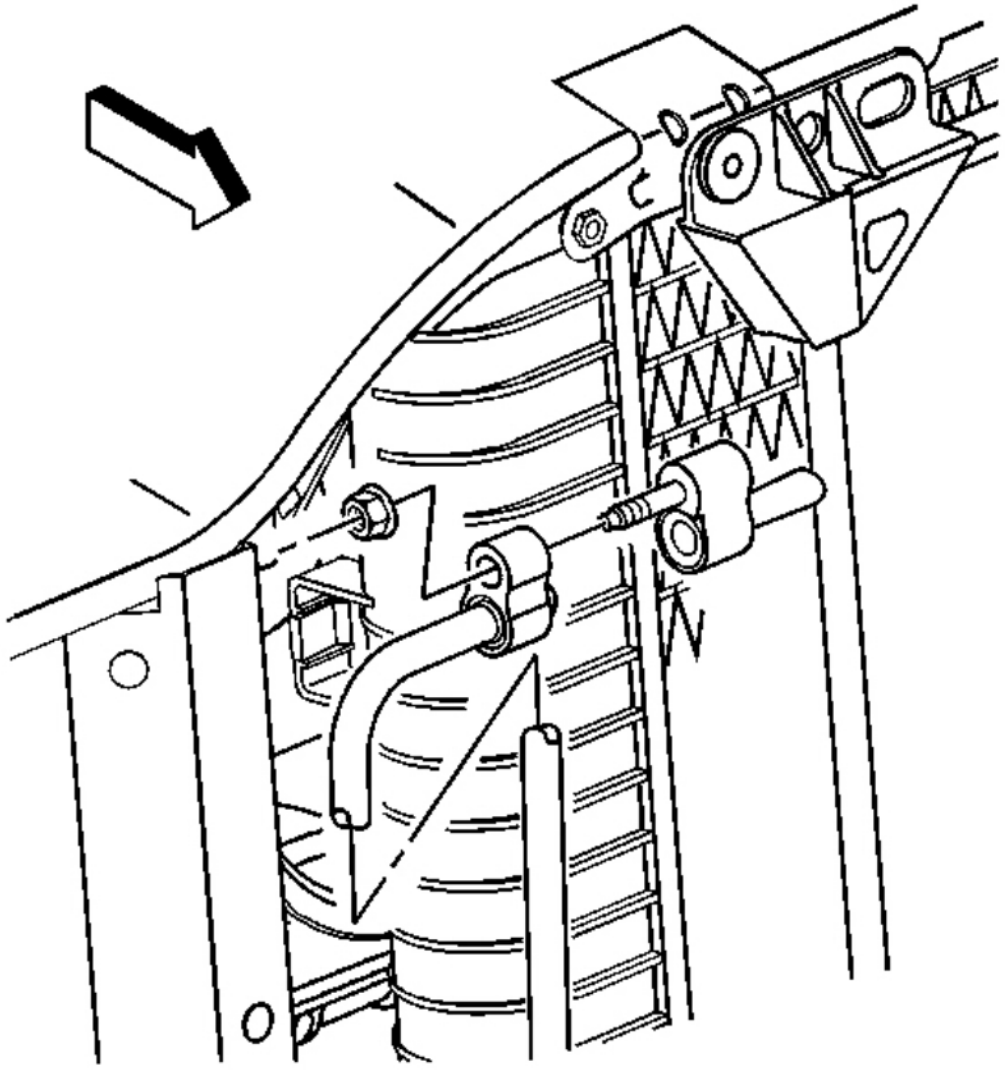


Fig. 59: View Of Discharge Hose At Condenser
Courtesy of GENERAL MOTORS CORP.

5. Remove the compressor discharge hose assembly bolt from the condenser.
6. Disconnect the compressor discharge hose assembly from the condenser.

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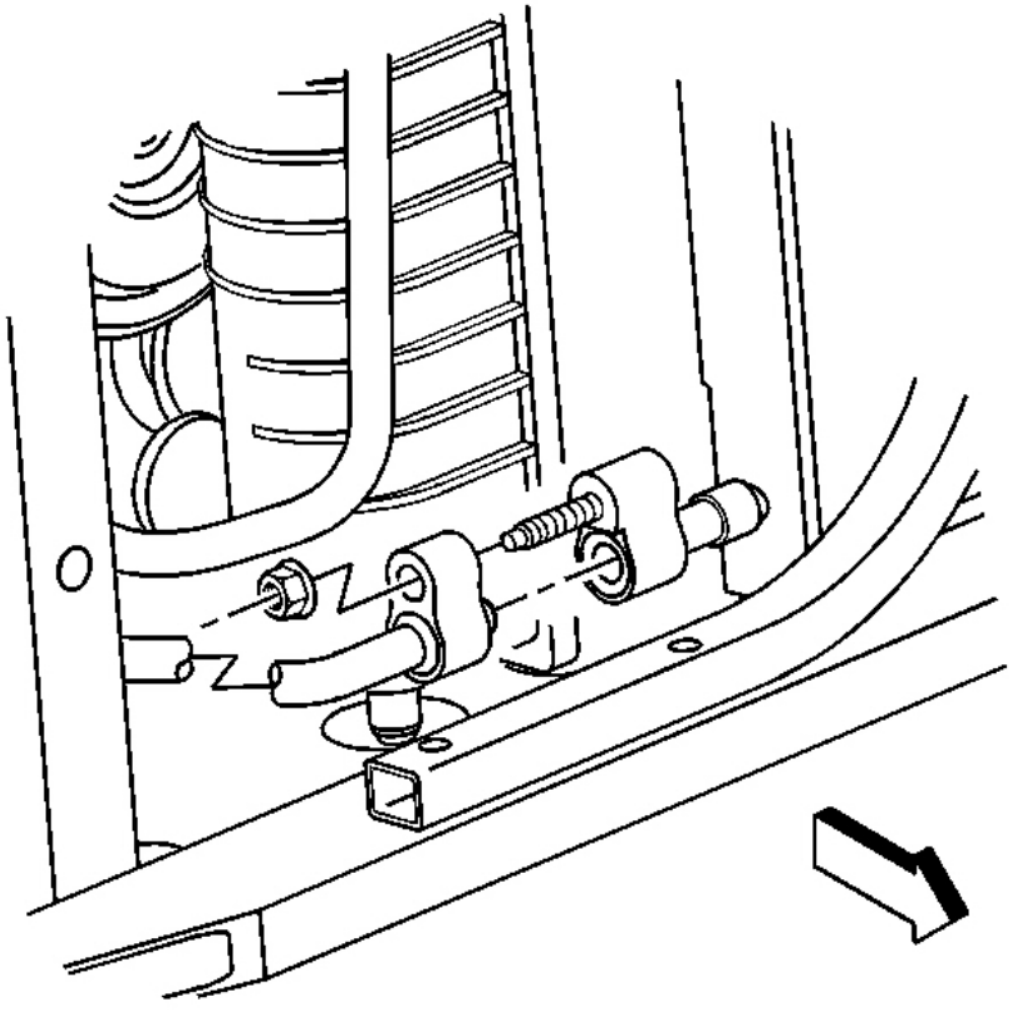


Fig. 60: Removing Evaporator Tube From Condenser (W/O HP2)
Courtesy of GENERAL MOTORS CORP.

7. Remove the evaporator tube nut from the condenser.
8. Disconnect the evaporator tube from the condenser.

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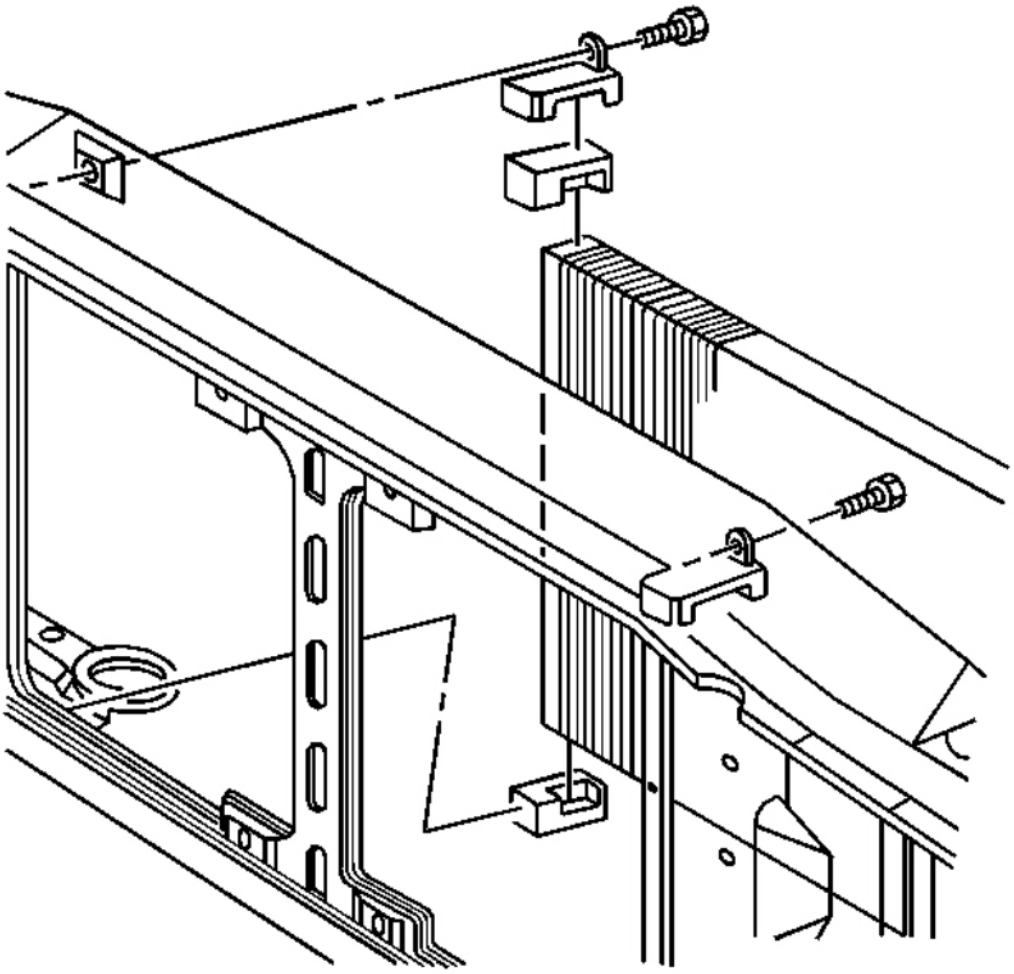


Fig. 61: Removing Condenser From Vehicle
Courtesy of GENERAL MOTORS CORP.

9. Remove the insulator retainer bolts and the upper insulator retainers.
10. Remove the condenser from the vehicle.

Installation Procedure

IMPORTANT: If replacing the condenser, add the refrigerant oil to the condenser. Refer to Refrigerant System Capacities for system capacity information.

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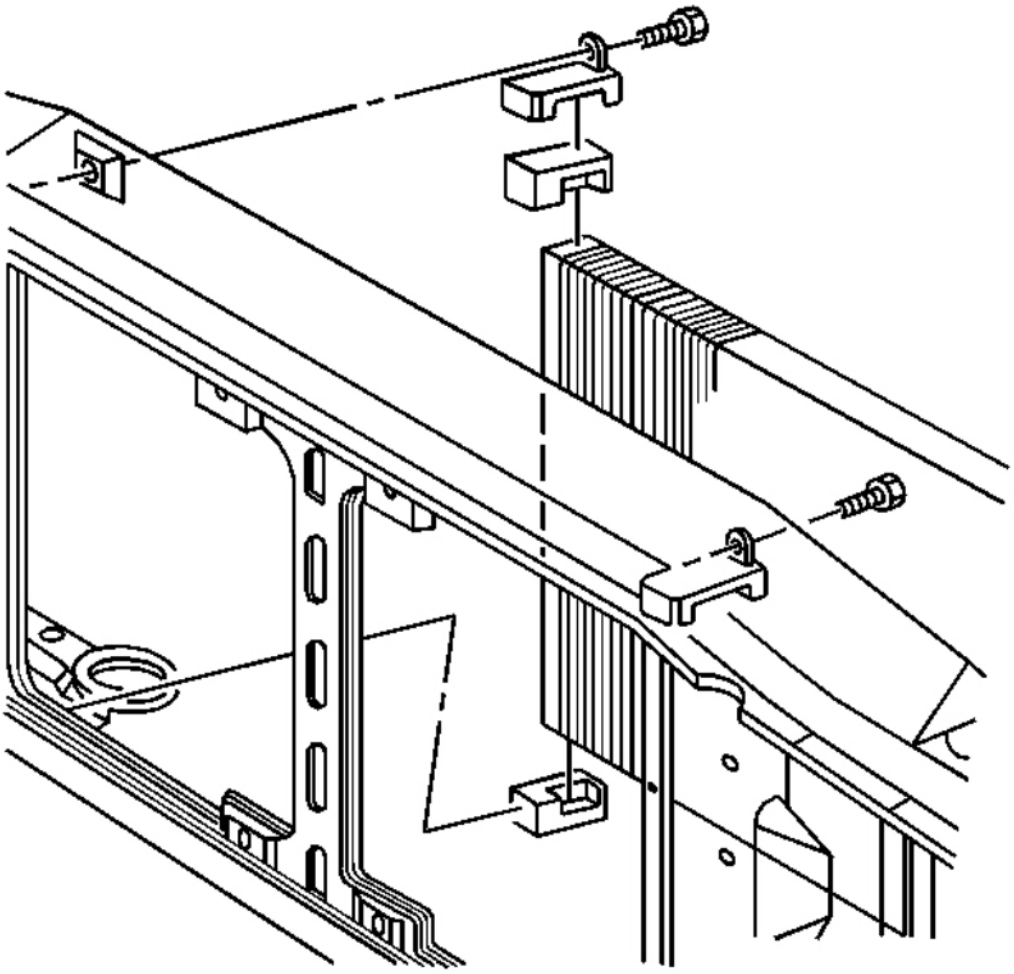


Fig. 62: Removing Condenser From Vehicle
Courtesy of GENERAL MOTORS CORP.

1. Install the condenser to the vehicle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the upper insulator retainers and the insulator retainer bolts.

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

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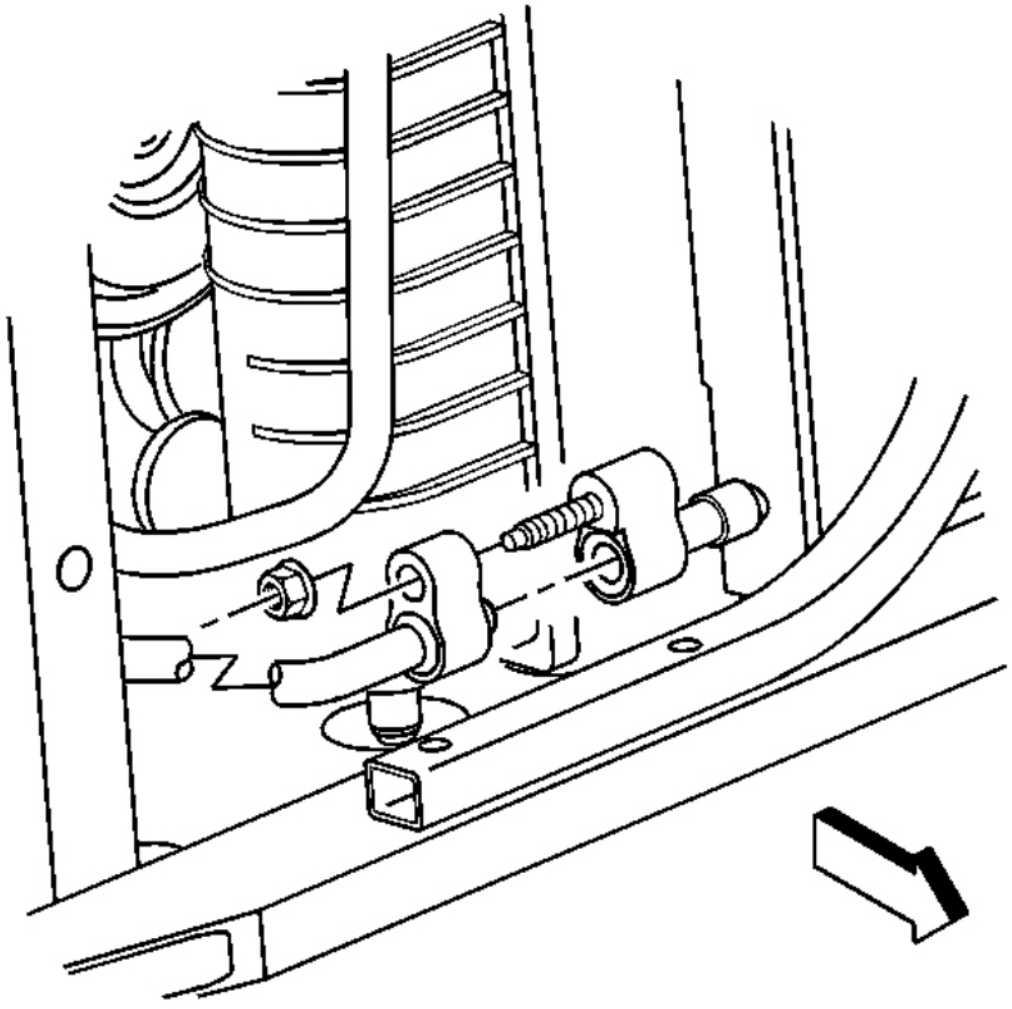


Fig. 63: Removing Evaporator Tube From Condenser (W/O HP2)
Courtesy of GENERAL MOTORS CORP.

3. Connect the evaporator tube to the condenser using new sealing washers. Refer to **Sealing Washer Replacement**.
4. Install the evaporator tube nut to the condenser.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

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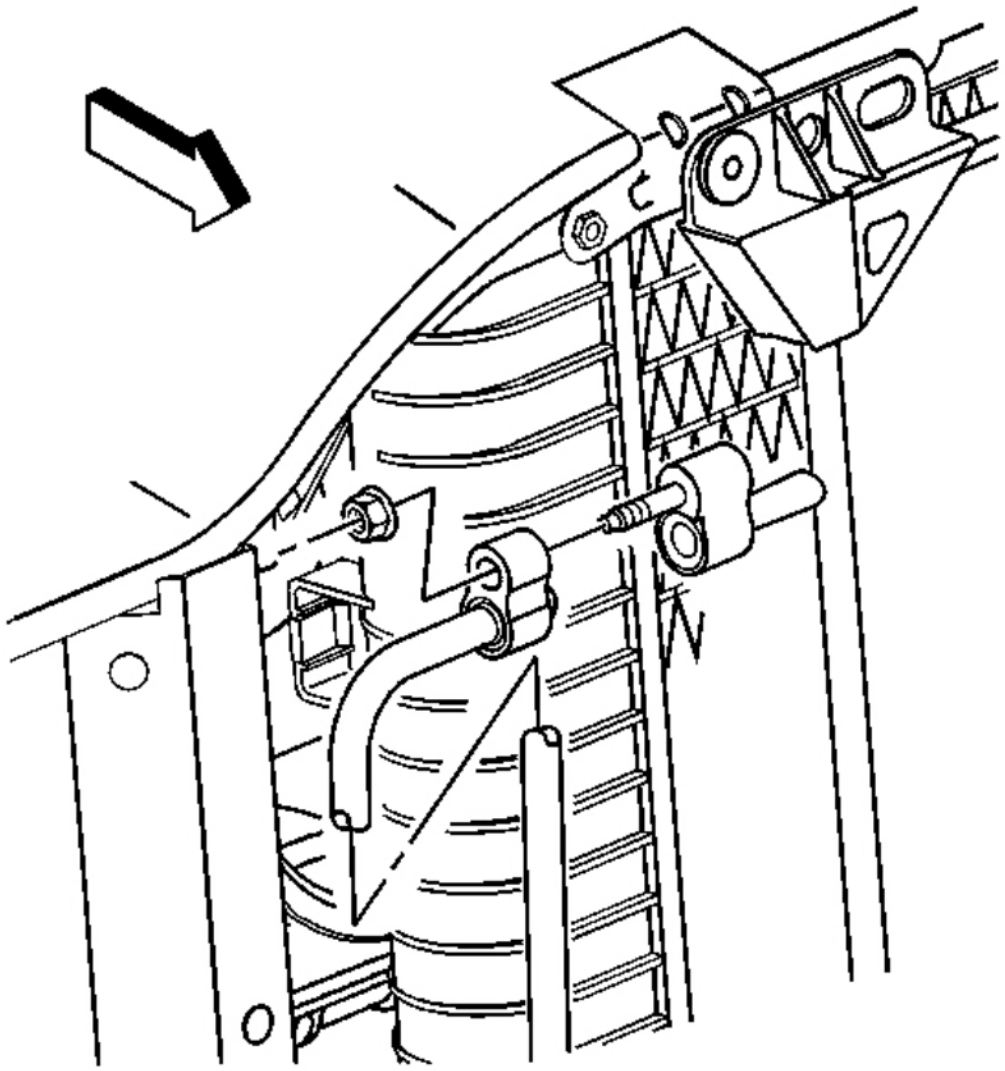


Fig. 64: View Of Discharge Hose At Condenser
Courtesy of GENERAL MOTORS CORP.

5. Connect the compressor discharge hose to the condenser using new sealing washers. Refer to **Sealing Washer Replacement**
6. Install the compressor discharge hose nut to the condenser.

Tighten: Tighten the nut to 16 N.m (12 lb ft).

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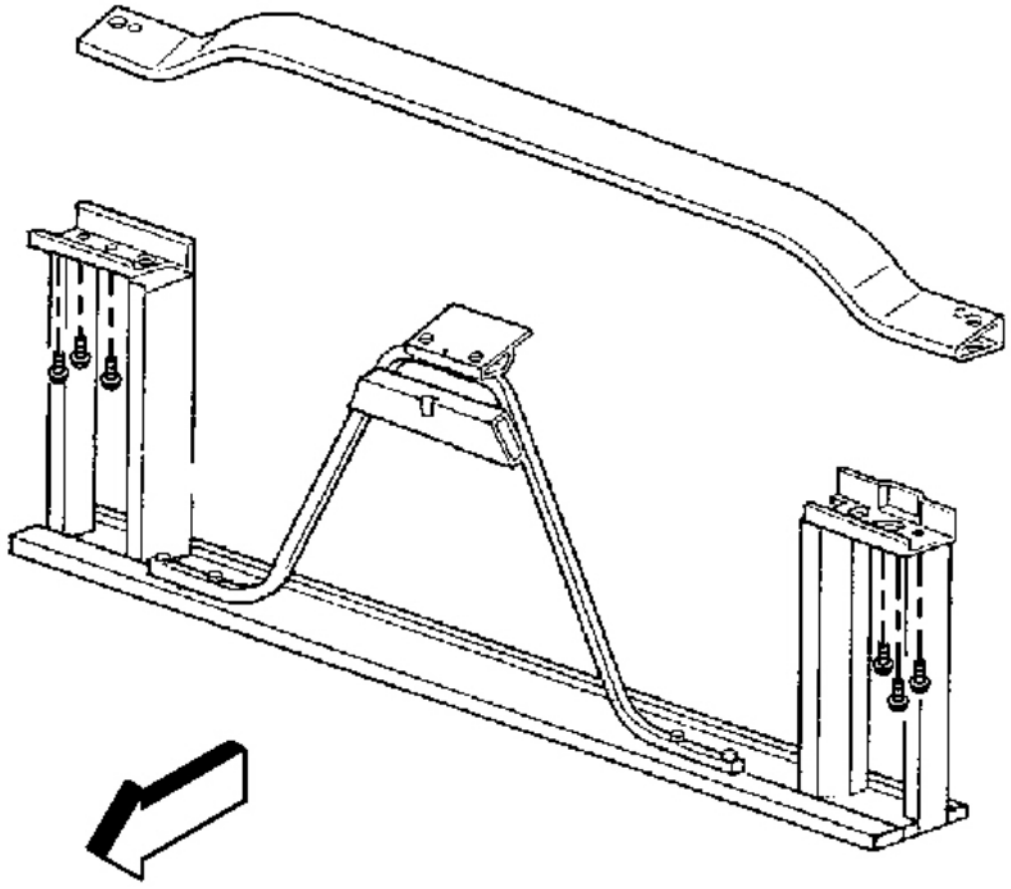


Fig. 65: Tie Bar & Bolts
Courtesy of GENERAL MOTORS CORP.

7. Install the lower bolts to the hood latch support bracket.

   Tighten: Tighten the bolts to 9 N.m (80 lb in).

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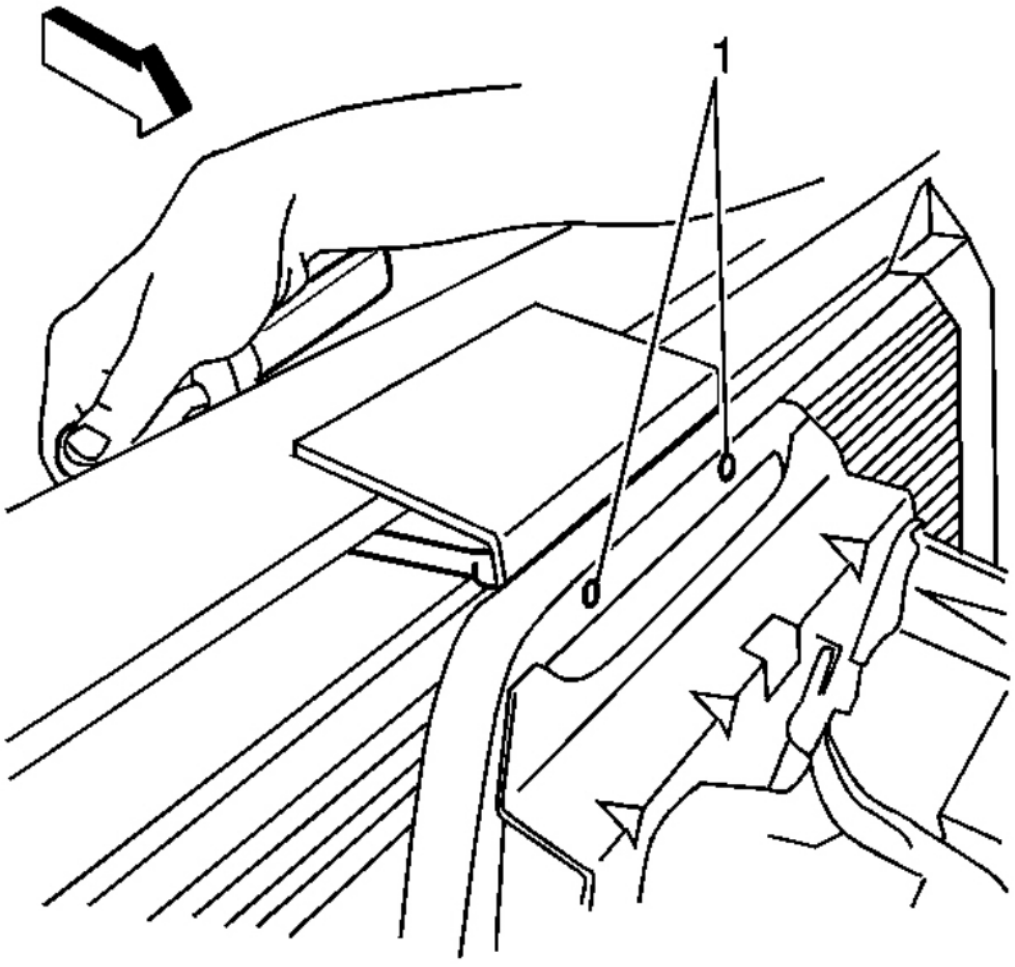


Fig. 66: Tie Bar To Radiator Brace & Bolts
Courtesy of GENERAL MOTORS CORP.

8. Install the tie bar to radiator brace bolts (1). Access the bolts from the rear of the upper radiator support.

   Tighten: Tighten the bolts to 9 N.m (80 lb in).

9. Install the grille. Refer to **Grille Replacement (Cadillac)** or **Grille Replacement (Avalanche)** or **Grille Replacement (Chevrolet)** or **Grille Replacement (GMC)** in Exterior Trim.

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10. Evacuate and recharge the system. Refer to **Refrigerant Recovery and Recharging**.
11. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

ACCUMULATOR REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

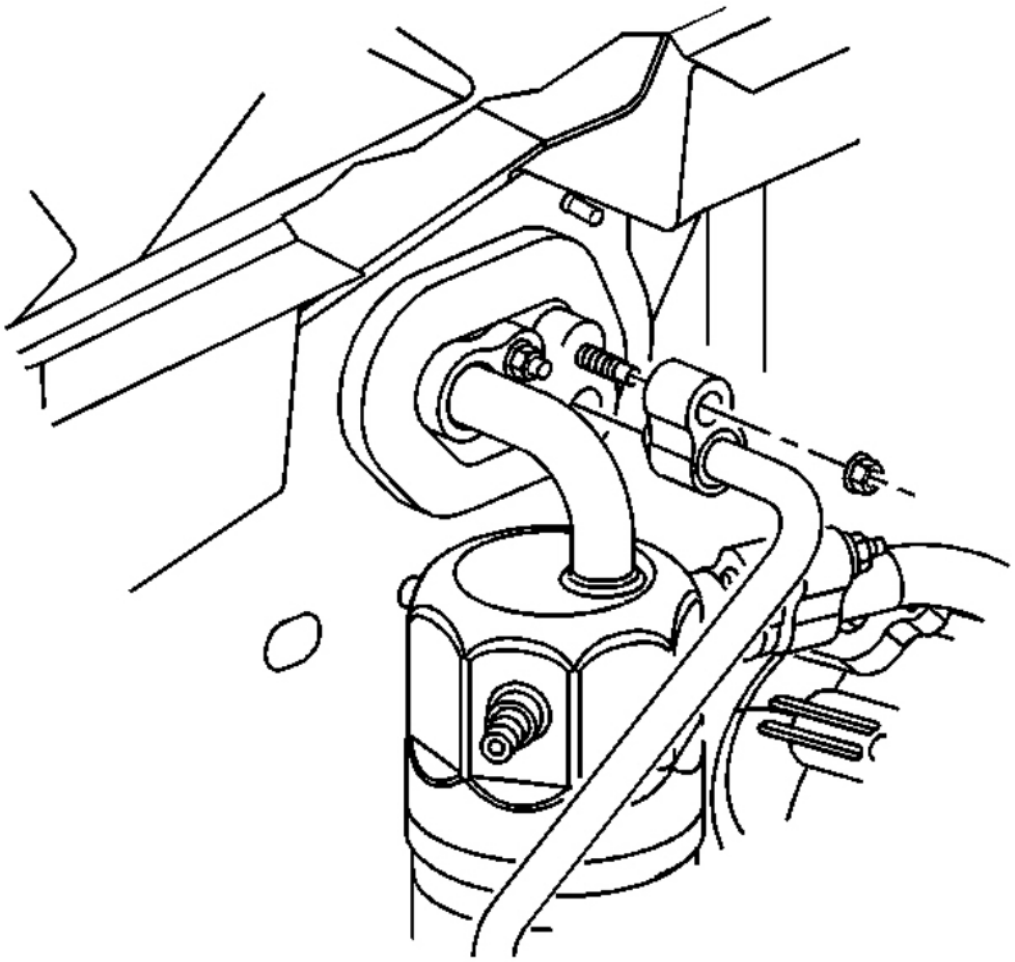


Fig. 67: Removing/Installling Evaporator Tube At Evaporator

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Courtesy of GENERAL MOTORS CORP.

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the evaporator tube nut from the evaporator.
3. Remove the evaporator tube from the evaporator.

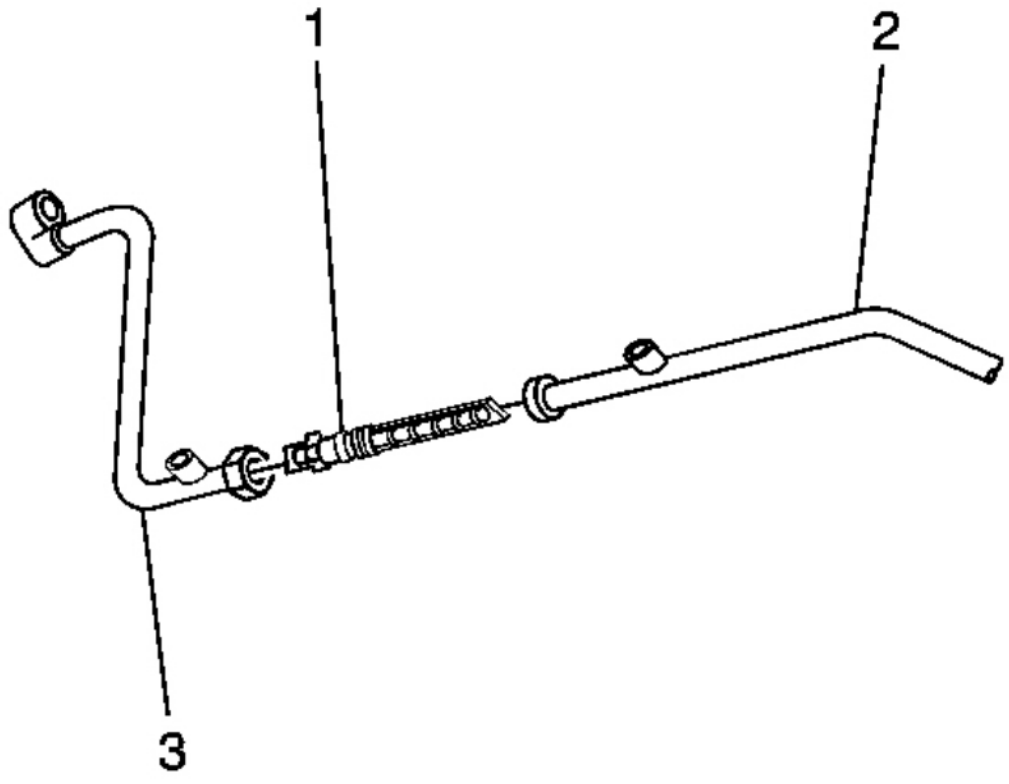


Fig. 68: Locating Evaporator Tube
Courtesy of GENERAL MOTORS CORP.

4. Remove the nut from the evaporator tube (3).

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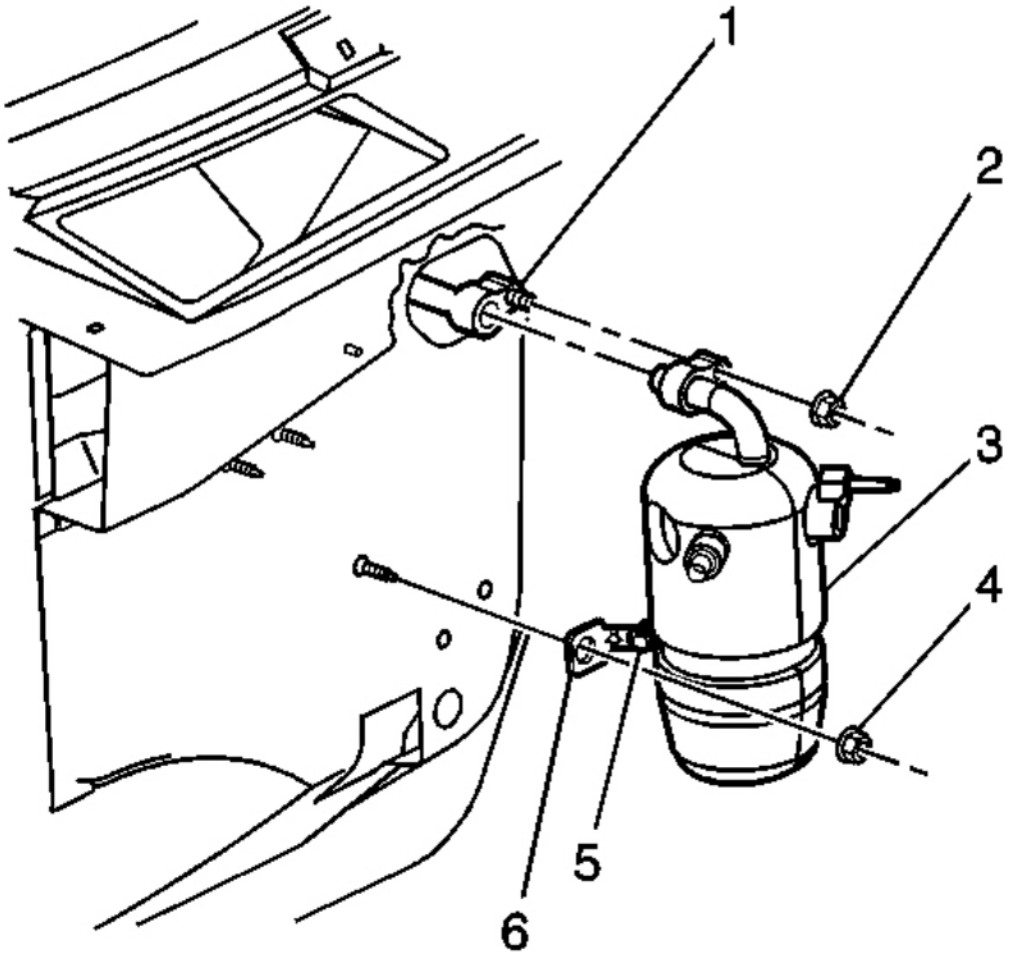


Fig. 69: Exploded View Of Accumulator Mounting
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the electrical connector from the A/C low pressure switch.
6. Remove the compressor hose nut from the accumulator.
7. Remove the compressor hose from the accumulator.
8. Remove the nut (2) from the evaporator fitting.
9. Remove the accumulator bracket nut (4) from the retaining stud.
10. Remove the accumulator (3).
11. Remove the retaining bracket bolt (5).

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12. Remove the retaining bracket (6) from the accumulator.
13. Remove and discard the O-ring seals.

Installation Procedure

IMPORTANT: If replacing the accumulator, add the refrigerant oil to the condenser. Refer to Refrigerant System Capacities for system capacity information.

1. Install the O-ring seals. Refer to **O-Ring Replacement**.
2. Install the retaining bracket (6) to the accumulator.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the retaining bracket bolt (5).

Tighten: Tighten the bolt to 10 N.m (89 lb in).

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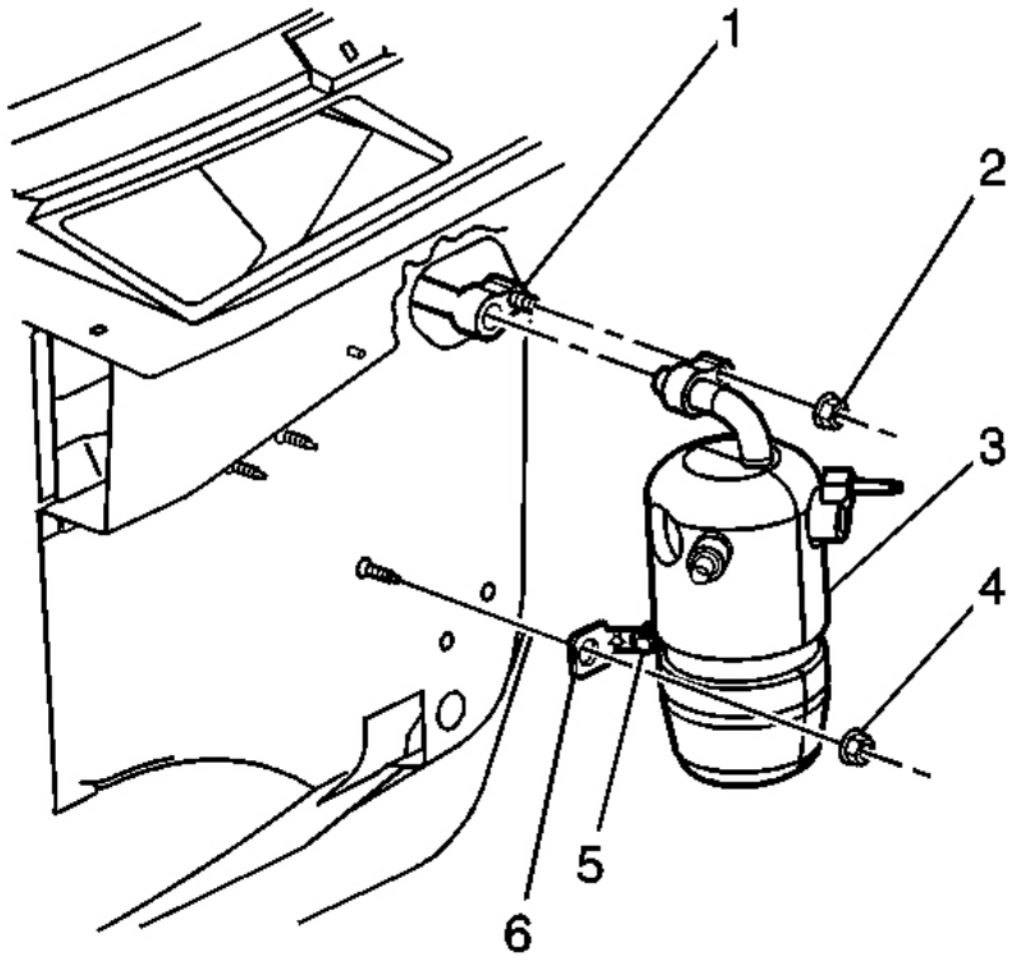


Fig. 70: Exploded View Of Accumulator Mounting
Courtesy of GENERAL MOTORS CORP.

4. Install the accumulator (3).
5. Install the accumulator bracket nut (4).

   Tighten: Tighten the nut to 9 N.m (80 lb in).

6. Install the nut (2) to the evaporator fitting.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

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7. Install the compressor hose to the accumulator.
8. Install the compressor hose nut to the accumulator.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

9. Connect the electrical connector to the A/C low pressure switch.

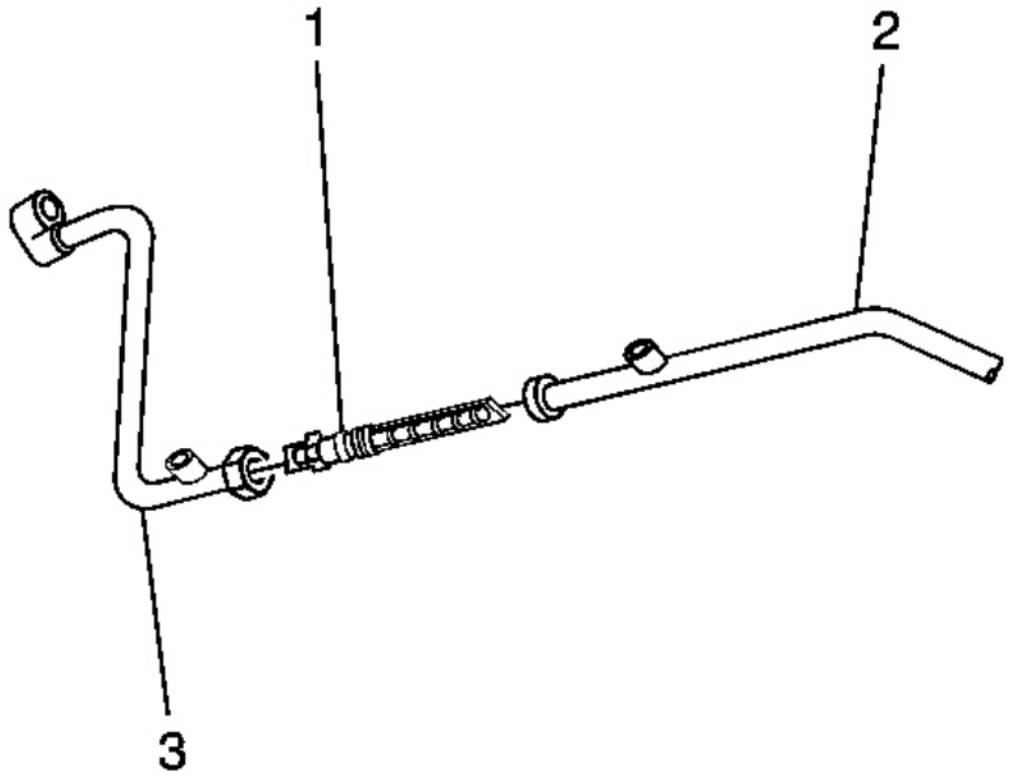


Fig. 71: Locating Evaporator Tube
Courtesy of GENERAL MOTORS CORP.

10. Install the nut to the evaporator tube (3).

    Tighten: Tighten the nut to 25 N.m (18 lb ft).

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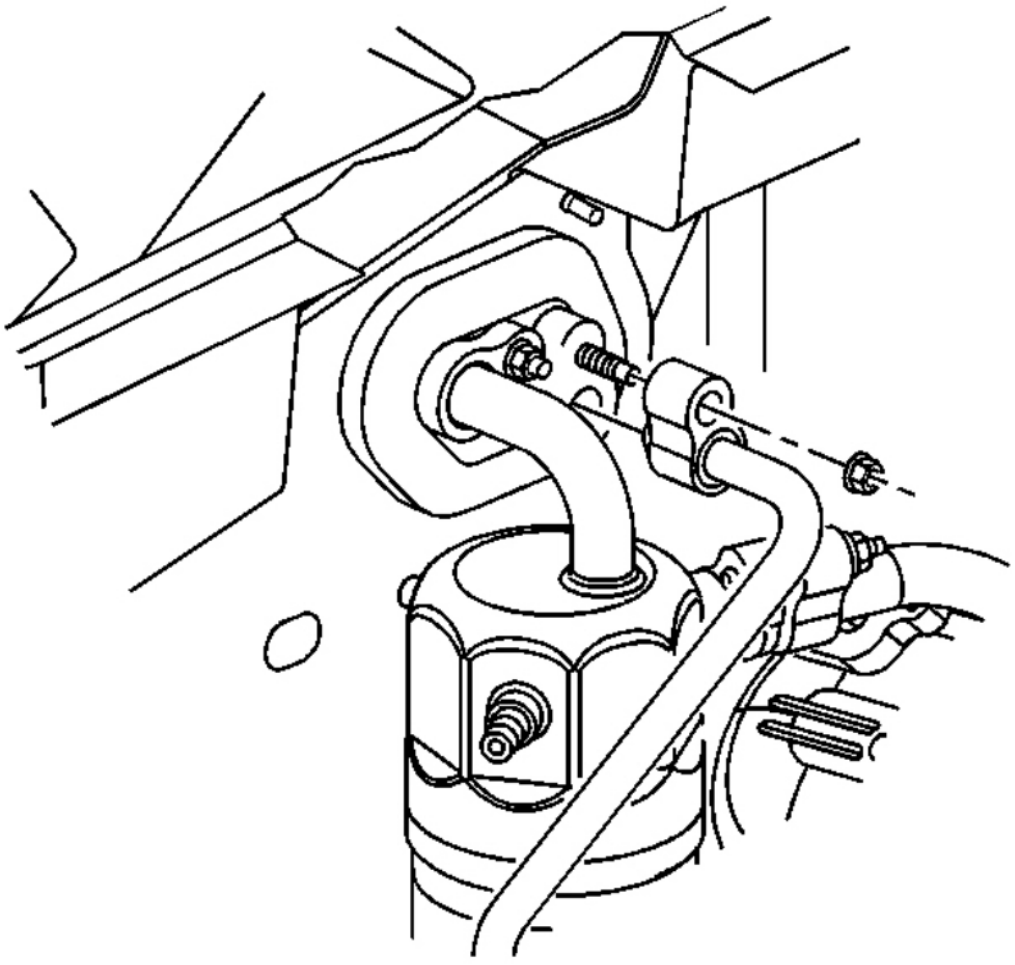


Fig. 72: Removing/Installling Evaporator Tube At Evaporator
Courtesy of GENERAL MOTORS CORP.

11. Install the evaporator tube to the evaporator.
12. Install the evaporator tube nut to the evaporator.

    Tighten: Tighten the nut to 16 N.m (12 lb ft).

13. Evacuate and recharge the system. Refer to **Refrigerant Recovery and Recharging**.
14. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

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HVAC MODULE ASSEMBLY REPLACEMENT

Tools Required

J 43181 Quick Connect Connector Removal Tool

Removal Procedure

1. Drain the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.

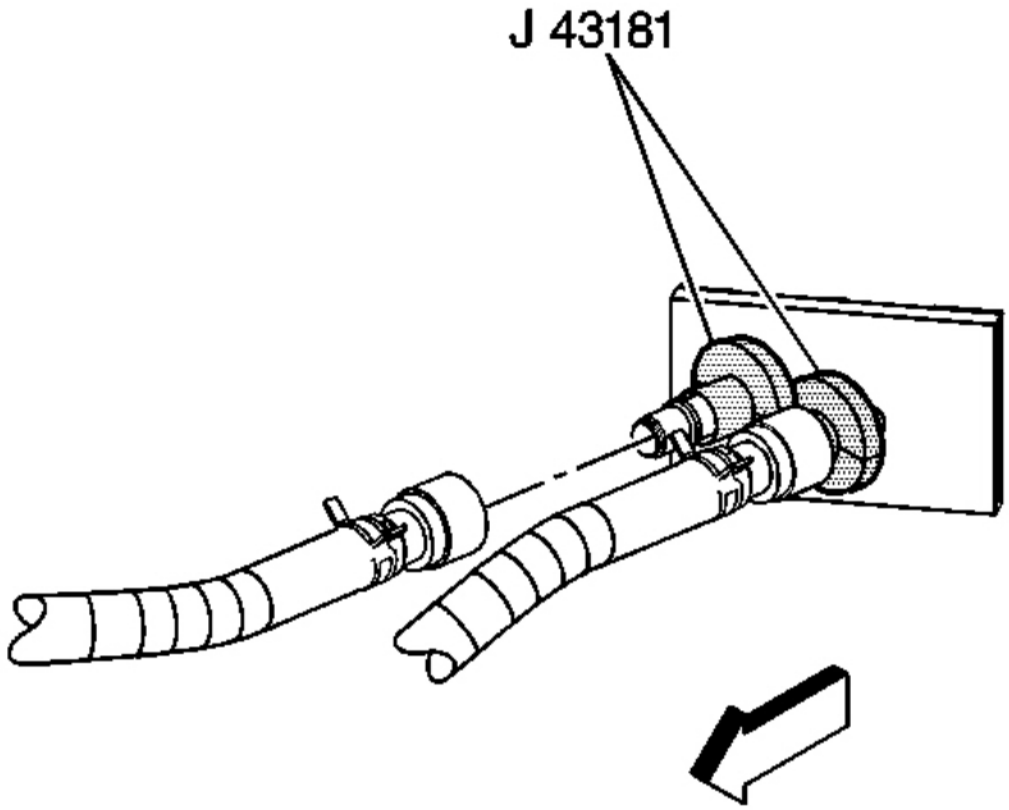


Fig. 73: Identifying Heater Hose To Heater Core Fittings
Courtesy of GENERAL MOTORS CORP.

2. Using the **J 43181** disconnect the inlet heater hose from the heater core.
    1. Install the **J 43181** to the heater core pipe.

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2. Close the tool around the heater core pipe.
3. Firmly pull the tool into the quick connect end of the heater hose.
4. Firmly grasp the heater hose. Pull the heater hose forward in order to disengage the inlet hose from the heater core.

3. Using the **J 43181** disconnect the surge tank outlet hose from the heater core.
    1. Install the **J 43181** to the heater core pipe.
    2. Close the tool around the heater core pipe.
    3. Firmly pull the tool into the quick connect end of the heater hose.
    4. Firmly grasp the heater hose. Pull the heater hose forward in order to disengage the surge tank outlet hose from the heater core.
4. Remove the accumulator. Refer to **Accumulator Replacement**.
5. Remove the instrument panel carrier. Refer to **Instrument Panel (I/P) Carrier Replacement** in Instrument Panel, Gages and Console.
6. Remove the HVAC module drain hose.
7. Disconnect the electrical harnesses and the ground connections from the HVAC module.

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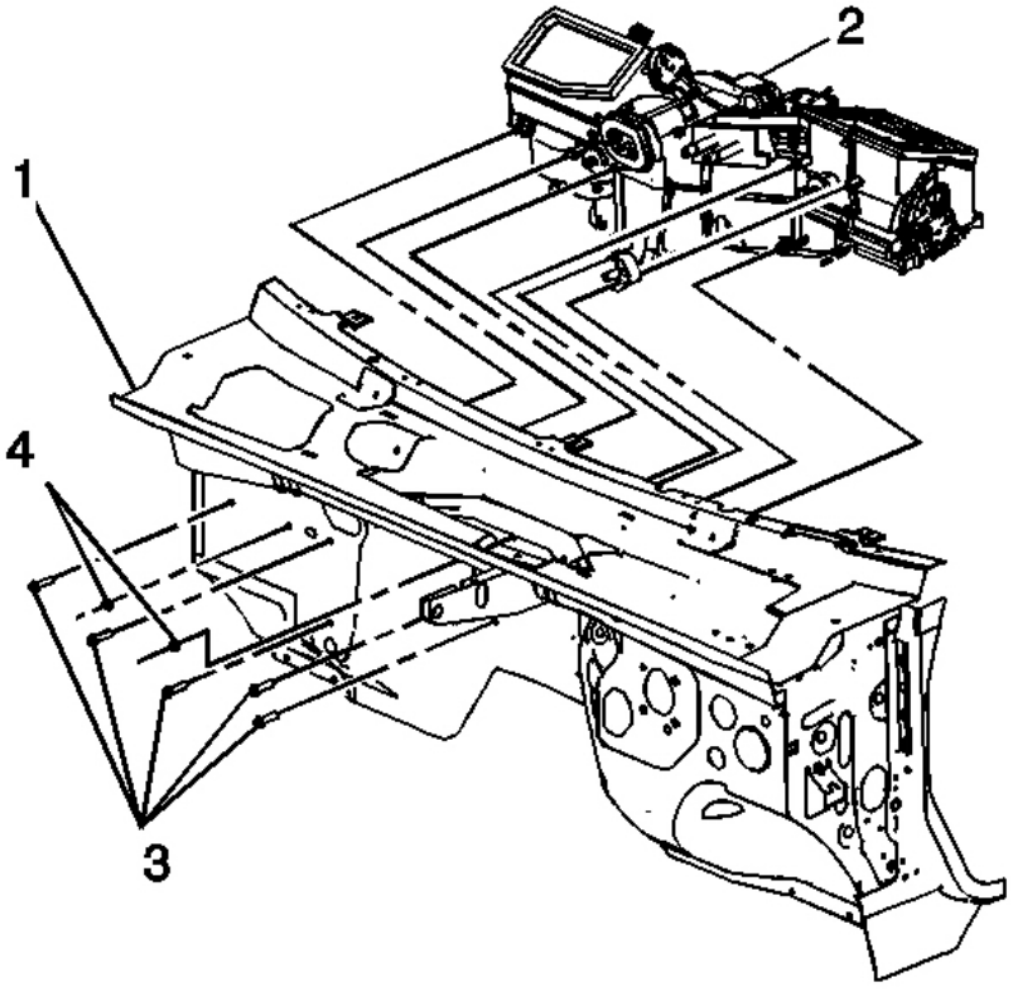


Fig. 74: HVAC Module
Courtesy of GENERAL MOTORS CORP.

8. Remove the nuts (4) from the HVAC module (2).
9. Remove the bolts (3) from the HVAC module (2).
10. Remove the HVAC module (2) from the vehicle (1).

Installation Procedure

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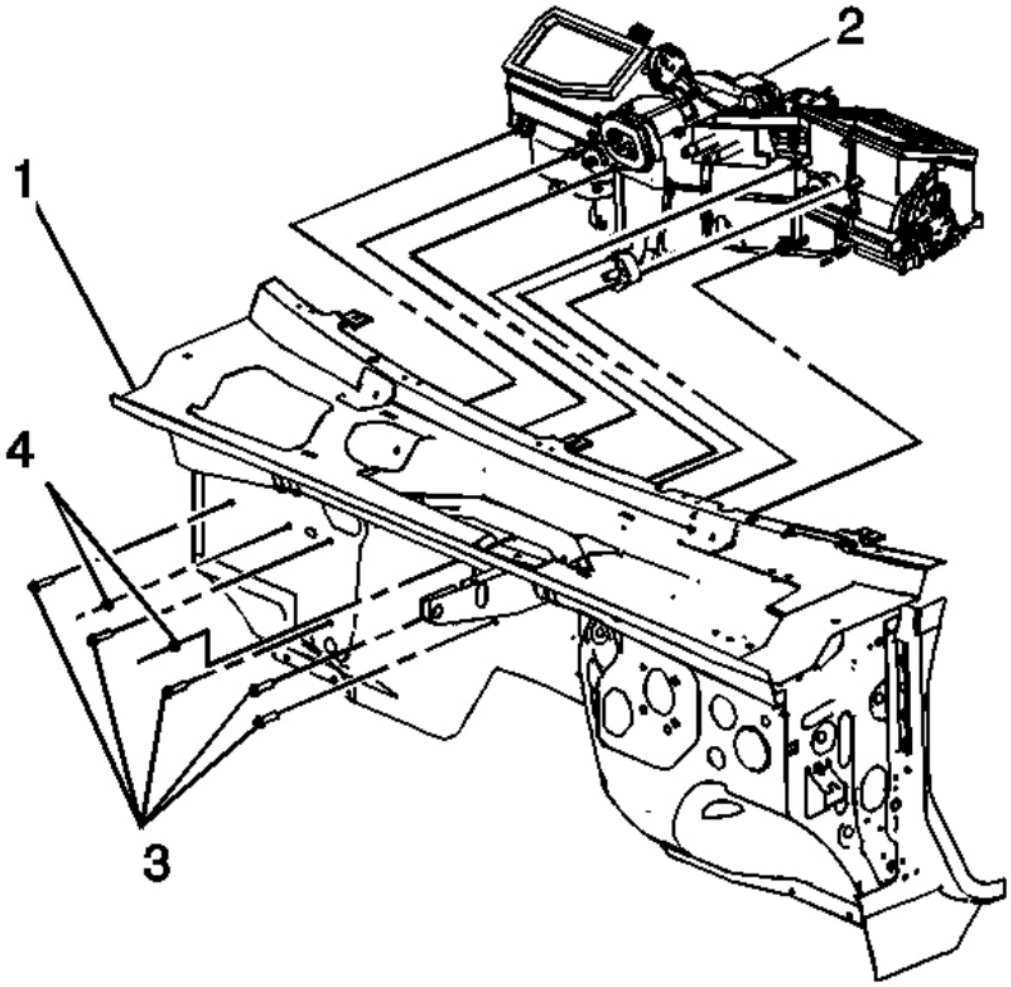


Fig. 75: HVAC Module
Courtesy of GENERAL MOTORS CORP.

1. If replacing the HVAC module, transfer the components from the old HVAC module as necessary.
2. Install the HVAC module (2) to the vehicle (1).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the nuts (4) to the HVAC module (2).

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Tighten: Tighten the nuts to 9 N.m (80 lb in).

4. Install the bolts (4) to the HVAC module (2).

   Tighten: Tighten the bolts to 4 N.m (35 lb in).

5. Connect the electrical harnesses and the ground connections.
6. Install the HVAC module drain hose.
7. Install the instrument panel carrier. Refer to **Instrument Panel (I/P) Carrier Replacement** in Instrument Panel, Gages and Console.
8. Install the accumulator. Refer to **Accumulator Replacement**.

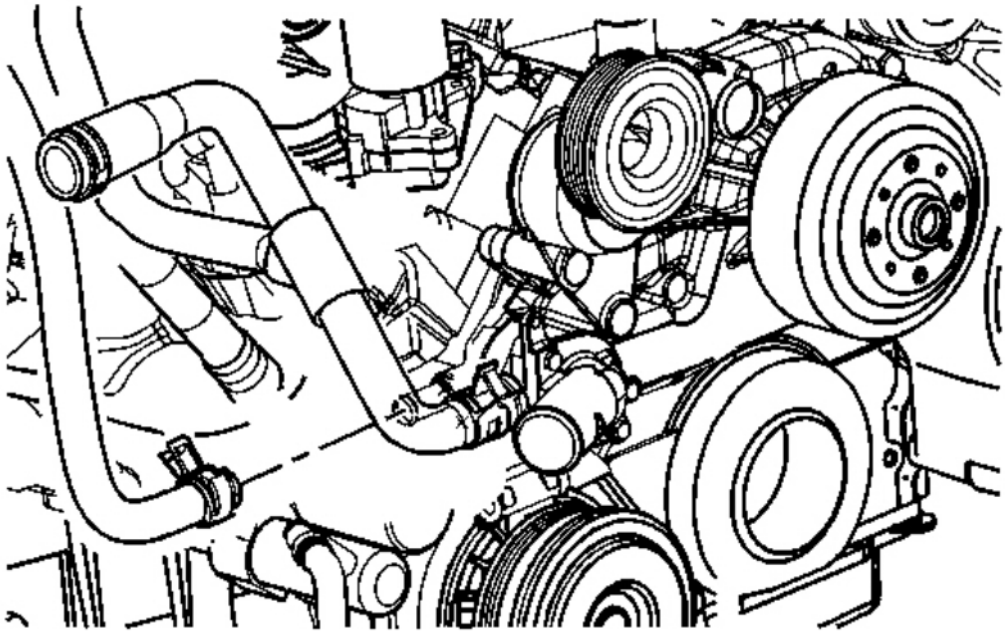


Fig. 76: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

9. Install the surge tank outlet hose to the heater core.

   Firmly push the quick connect onto the heater core pipe until you hear an audible click.

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10. Install the inlet heater hose to the heater core.

    Firmly push the quick connect onto the heater core pipe until you hear an audible click.

11. Fill the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.

EVAPORATOR CORE REPLACEMENT (VISTEON)

Removal Procedure

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. Disconnect the electrical connector from the recirculation actuator.
3. Remove the screws from the evaporator cover (1).

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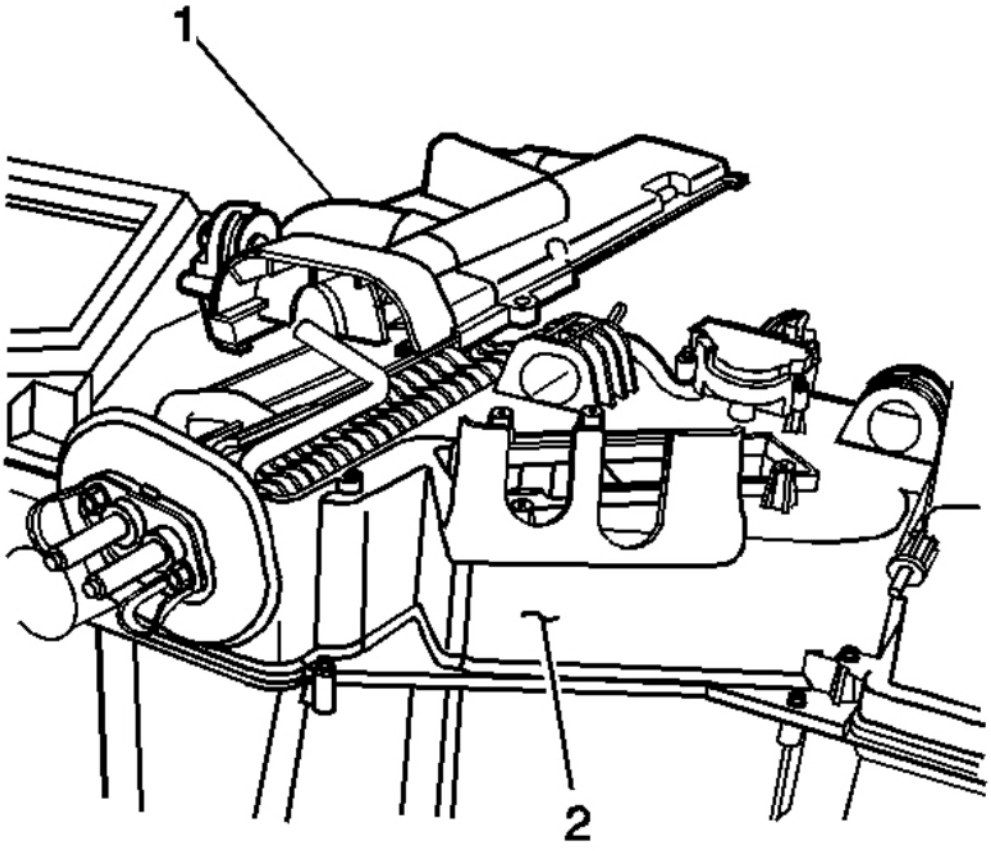


Fig. 77: Evaporator Core Cover And HVAC Module Assembly (Visteon)
Courtesy of GENERAL MOTORS CORP.

4. Remove the evaporator cover (1) from the HVAC module assembly (2).

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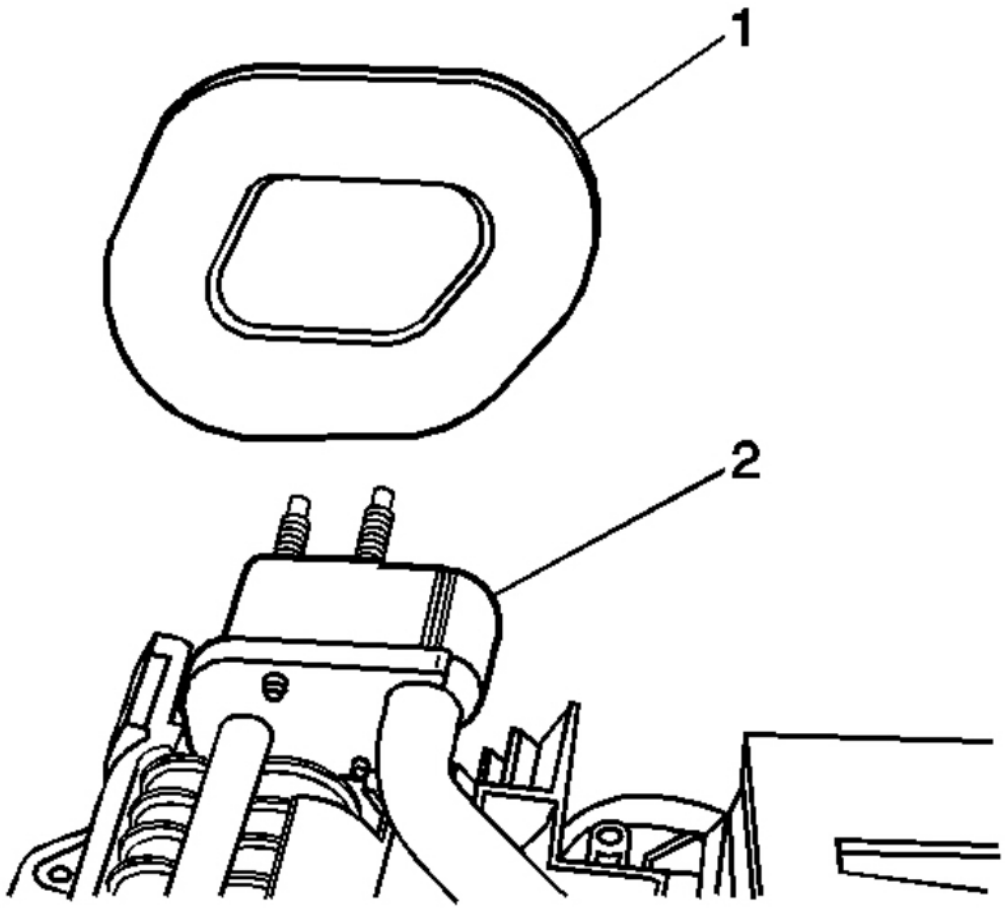


Fig. 78: View Of Evaporator Cowl Gasket (Visteon)
Courtesy of GENERAL MOTORS CORP.

5. Remove the evaporator cowl gasket (1) from the evaporator (2).

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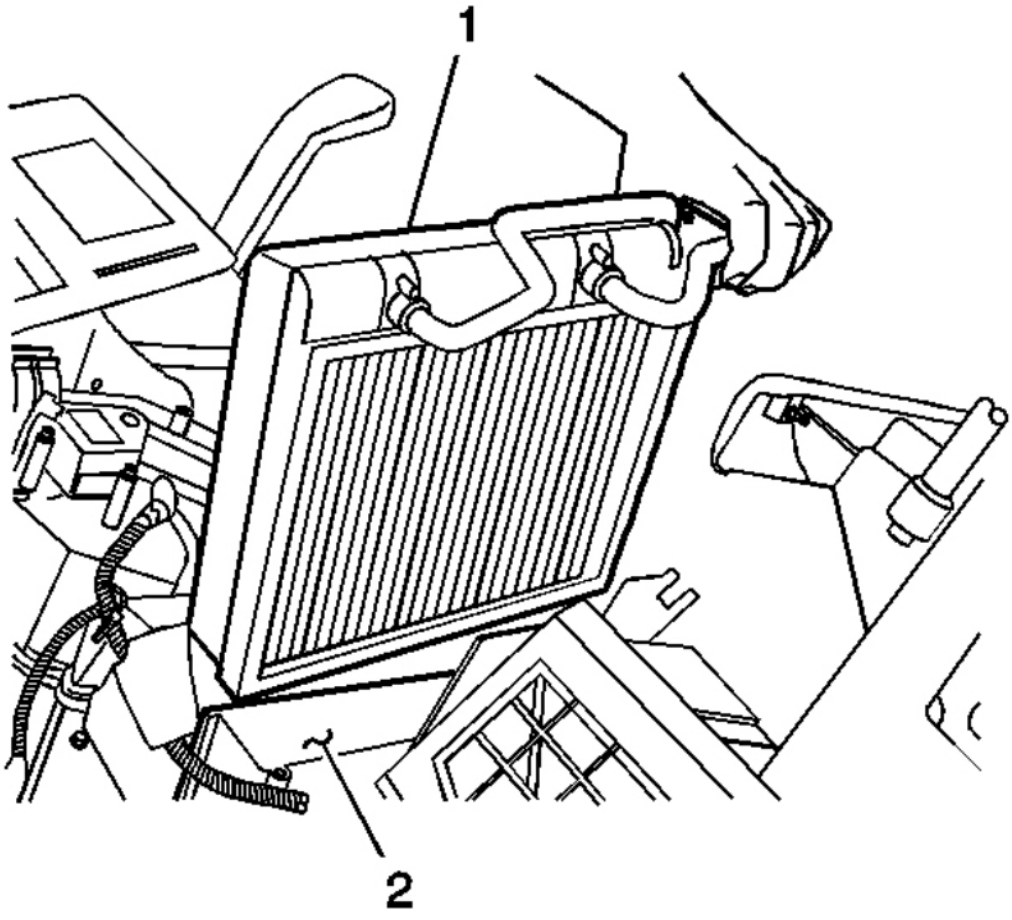


Fig. 79: View Of Evaporator Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the evaporator core (1) from the HVAC module assembly (2).

Installation Procedure

IMPORTANT: If replacing the condenser, add the refrigerant oil to the evaporator core. Refer to Refrigerant System Capacities.

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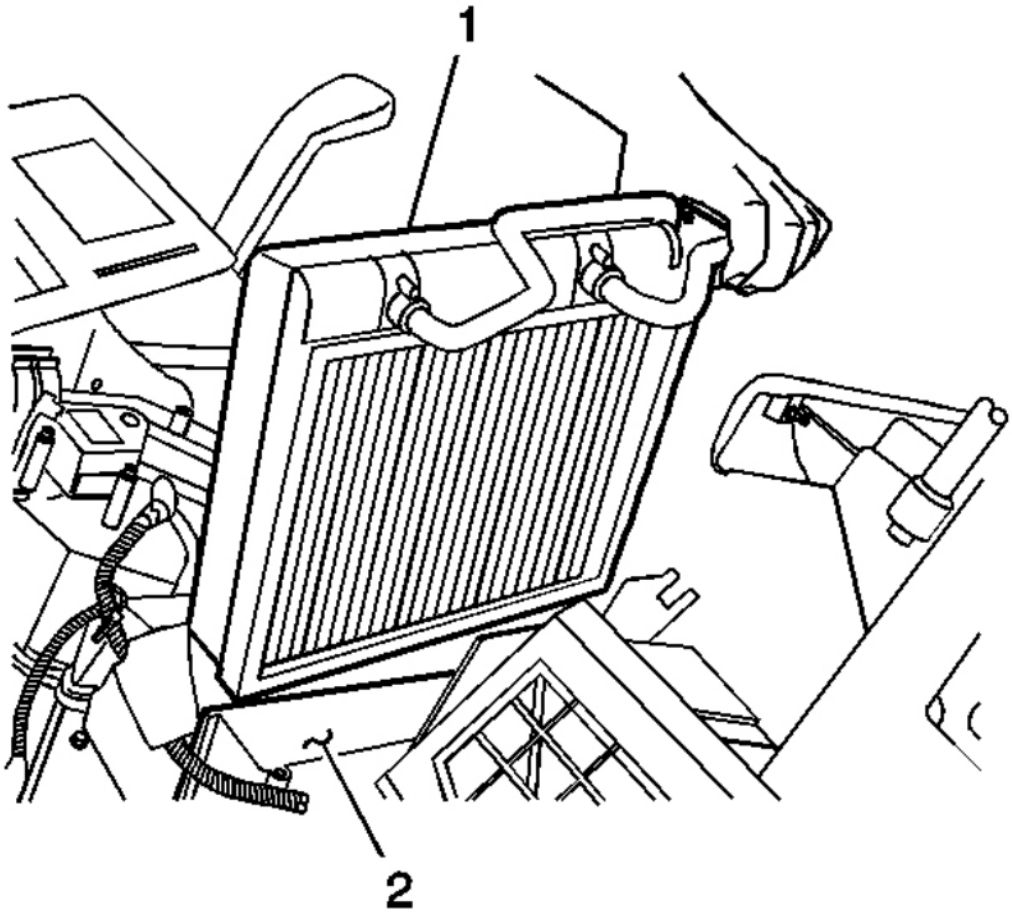


Fig. 80: View Of Evaporator Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the evaporator core (1) to the HVAC module assembly (2).

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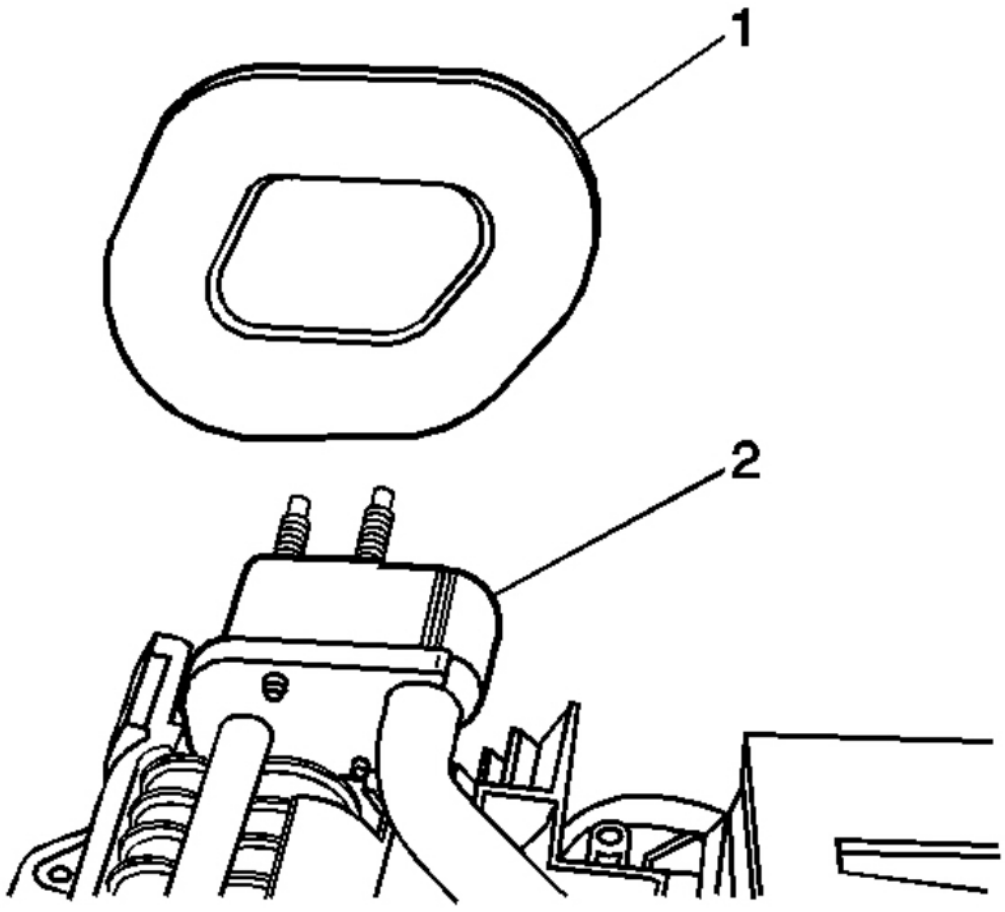


Fig. 81: View Of Evaporator Cowl Gasket (Visteon)
Courtesy of GENERAL MOTORS CORP.

2. Install the evaporator cowl gasket (1) to the evaporator (2).

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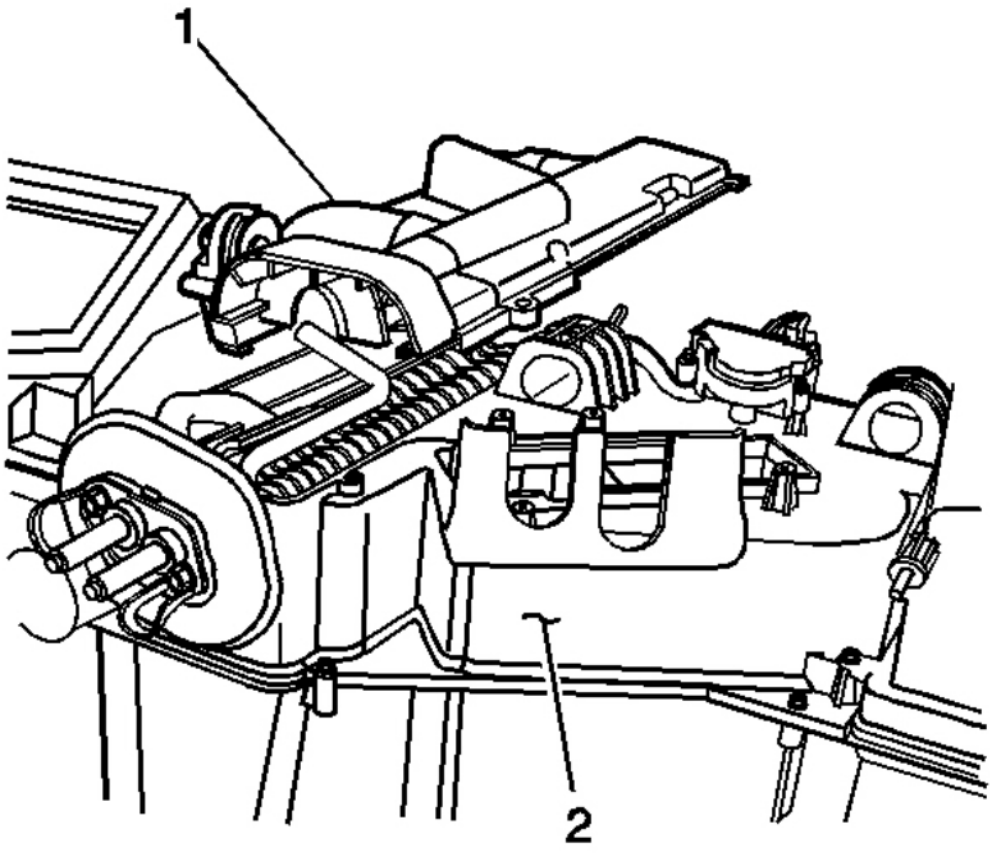


Fig. 82: Evaporator Core Cover And HVAC Module Assembly (Visteon)
Courtesy of GENERAL MOTORS CORP.

3. Install the evaporator cover (1) to the HVAC module assembly (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the evaporator cover (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

5. Connect the electrical connector to the recirculation actuator (1).

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6. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

EVAPORATOR CORE REPLACEMENT (DELPHI)

Removal Procedure

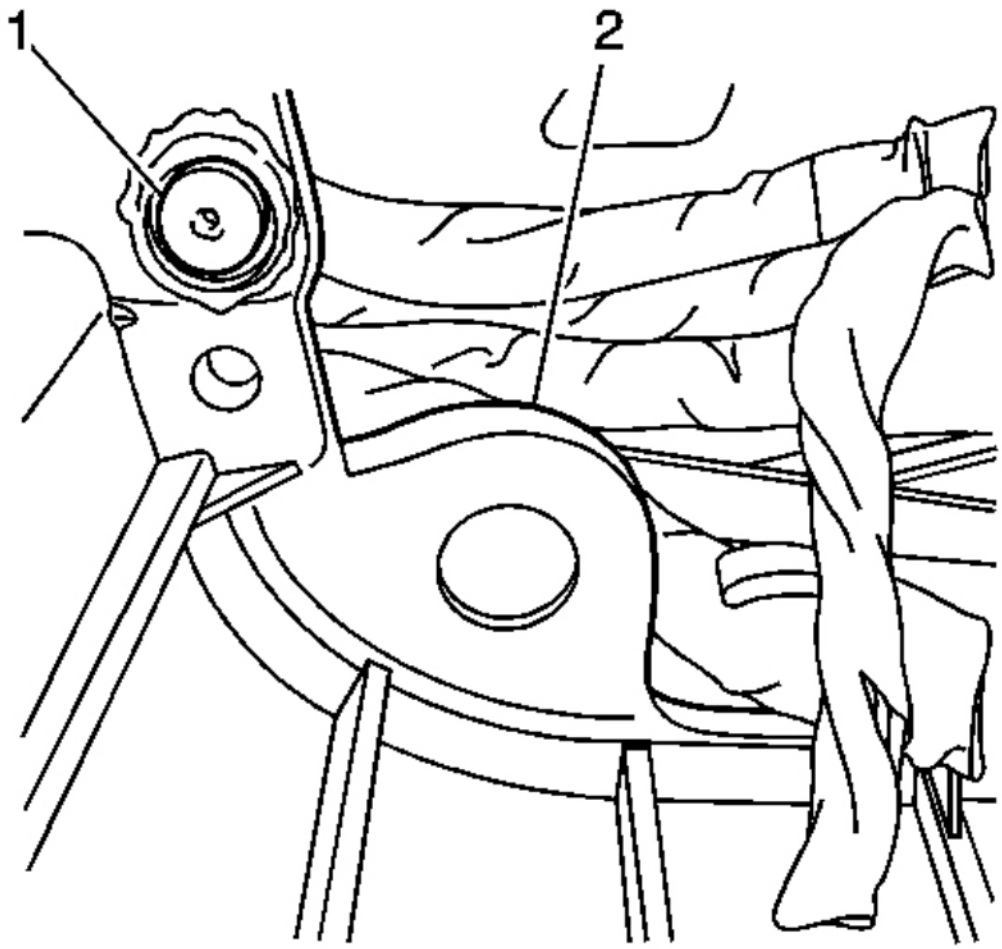


Fig. 83: Removing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and

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a hammer.

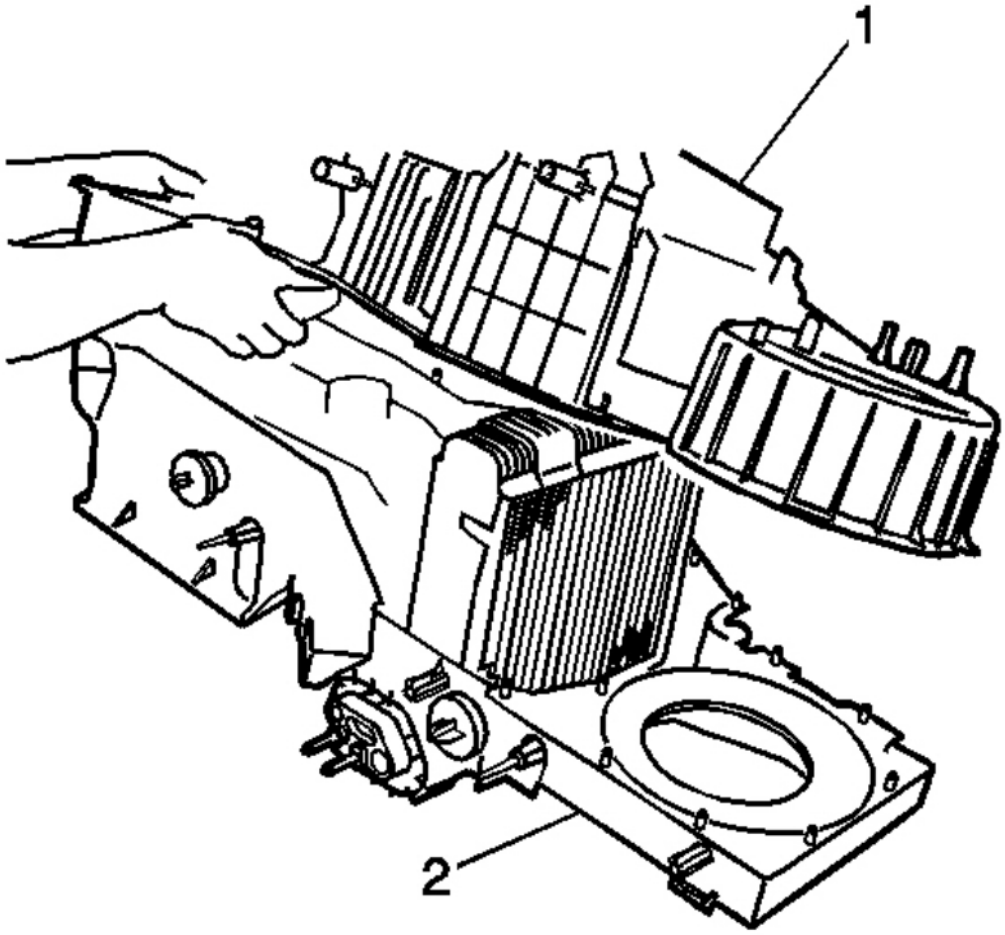


Fig. 84: View Of Upper & Lower HVAC Module Assemblies (Delphi)
Courtesy of GENERAL MOTORS CORP.

3. If equipped remove the screws from the HVAC module assembly.
4. Remove the evaporator cowl gasket from the evaporator.
5. Separate the upper HVAC module assembly (2) from the lower HVAC module assembly (1)

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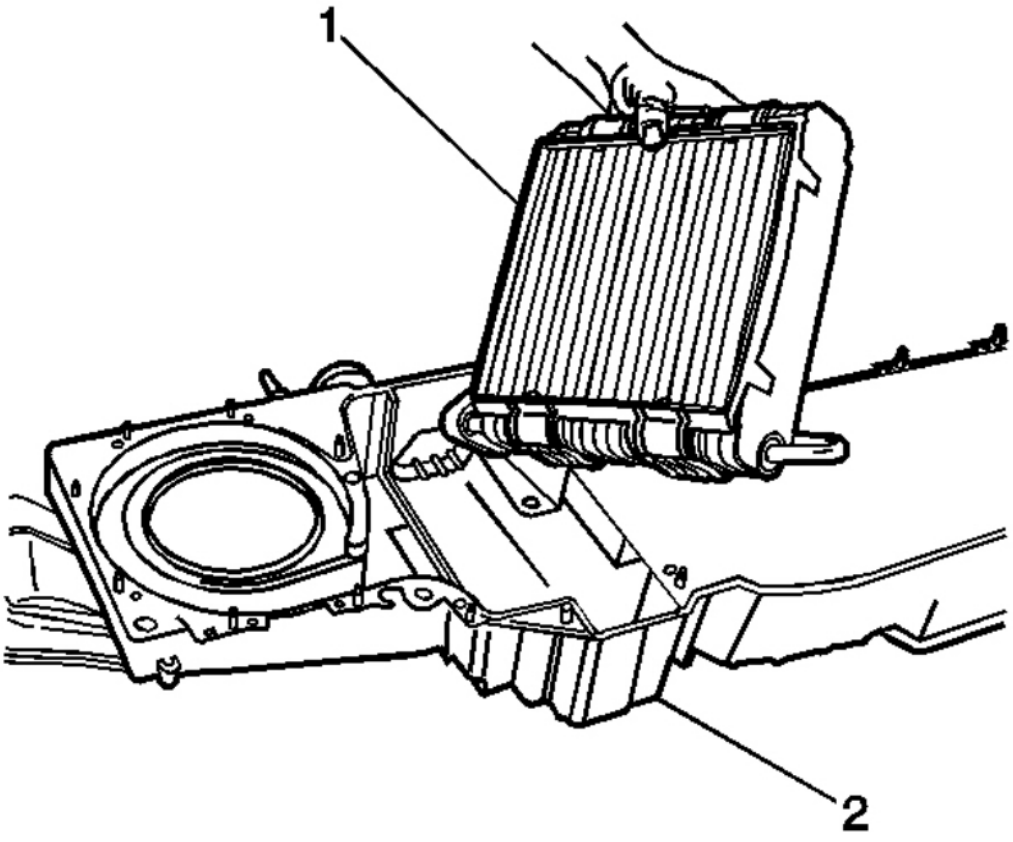


Fig. 85: View Of Evaporator Core (Delphi)
Courtesy of GENERAL MOTORS CORP.

6. Remove the evaporator core (1) from the upper HVAC module assembly (2).

Installation Procedure

IMPORTANT: If replacing the evaporator core, add the refrigerant oil to the evaporator core. Refer to Refrigerant System Capacities.

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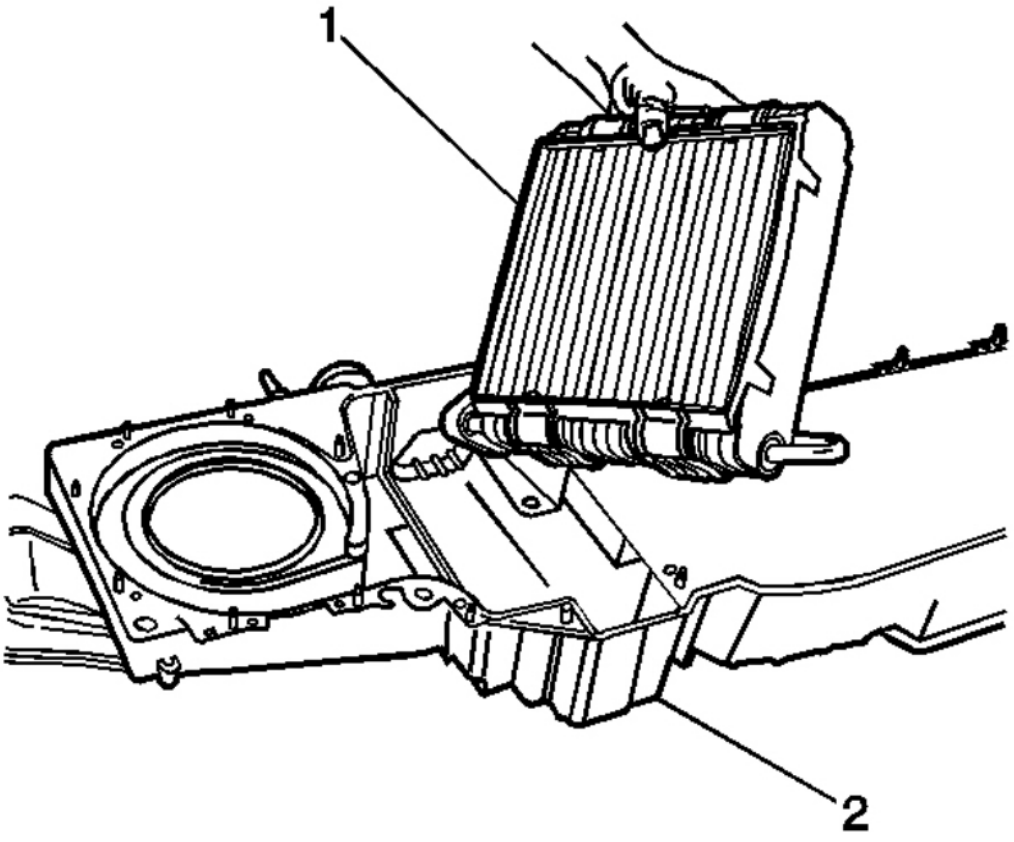


Fig. 86: View Of Evaporator Core (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Install the evaporator core (1) to the HVAC module assembly (2).

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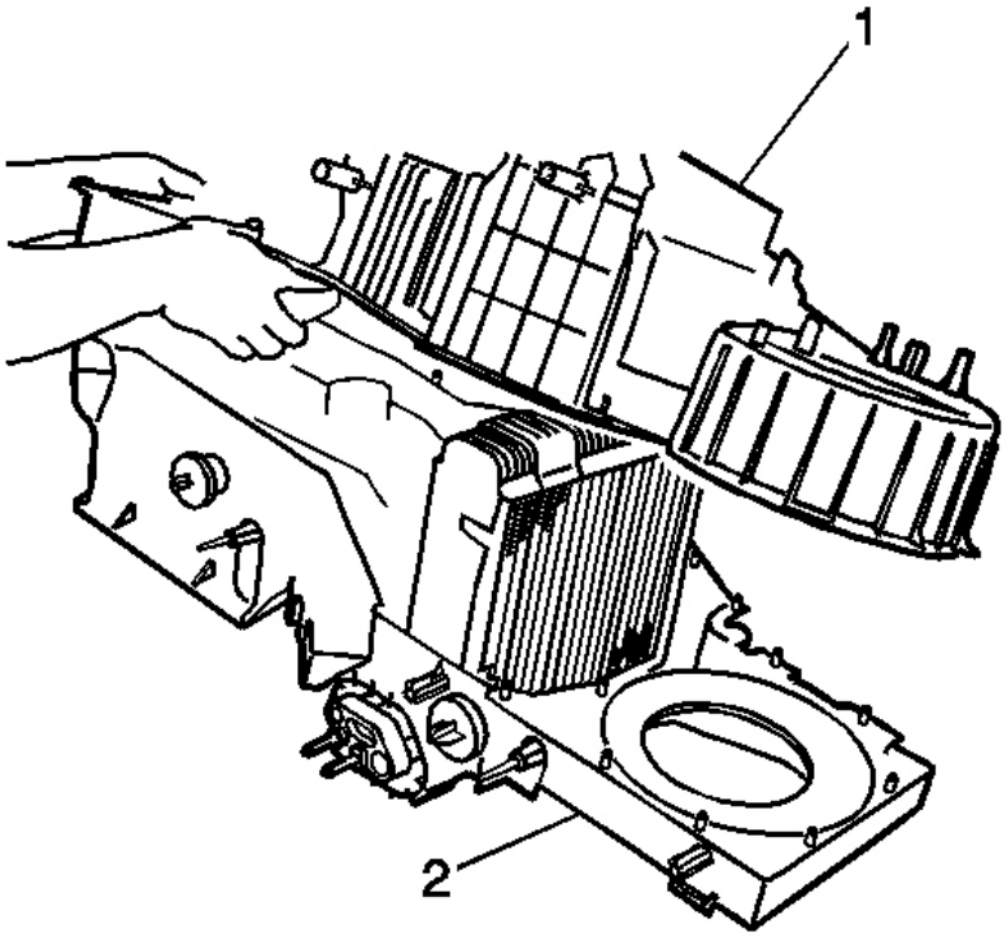


Fig. 87: View Of Upper & Lower HVAC Module Assemblies (Delphi)
Courtesy of GENERAL MOTORS CORP.

2. Install the upper HVAC module assembly (2) from the lower HVAC module assembly (1)
3. Install the evaporator cowl gasket to the evaporator.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the HVAC module assembly.

Tighten: Tighten the screws to 2 N.m (18 lb in).

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5. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

HEATER HOSE REPLACEMENT - INLET (UTILITY L18)

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.
3. Remove the heater and surge tank hoses from the mounting clip.

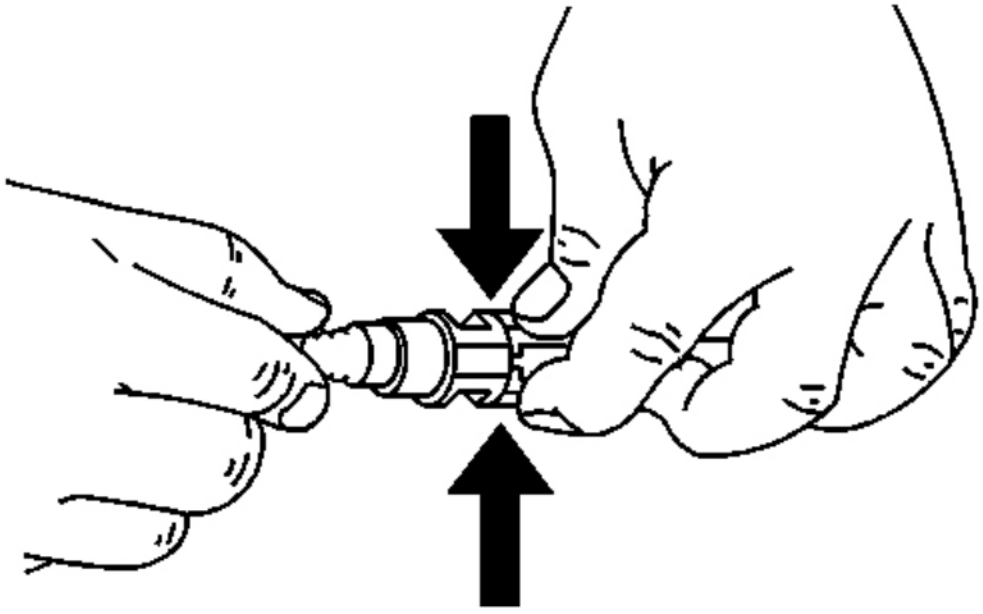


Fig. 88: Squeezing Quick Connect Fitting Release Tabs (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

4. Squeeze the plastic retainer release tabs.

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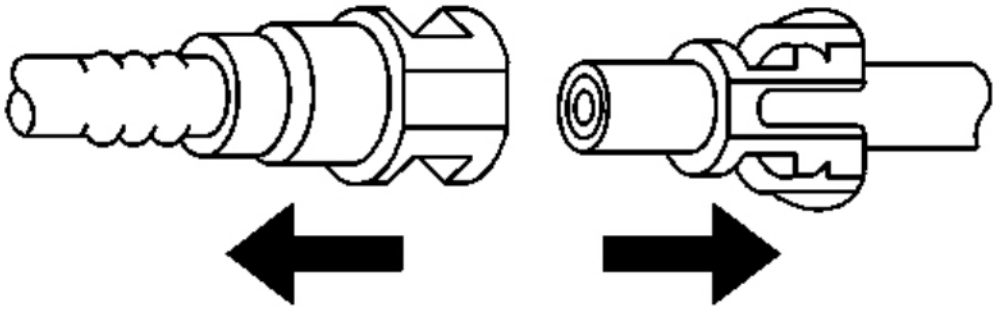


Fig. 89: Pulling Connection Apart (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

5. Pull the connection apart.

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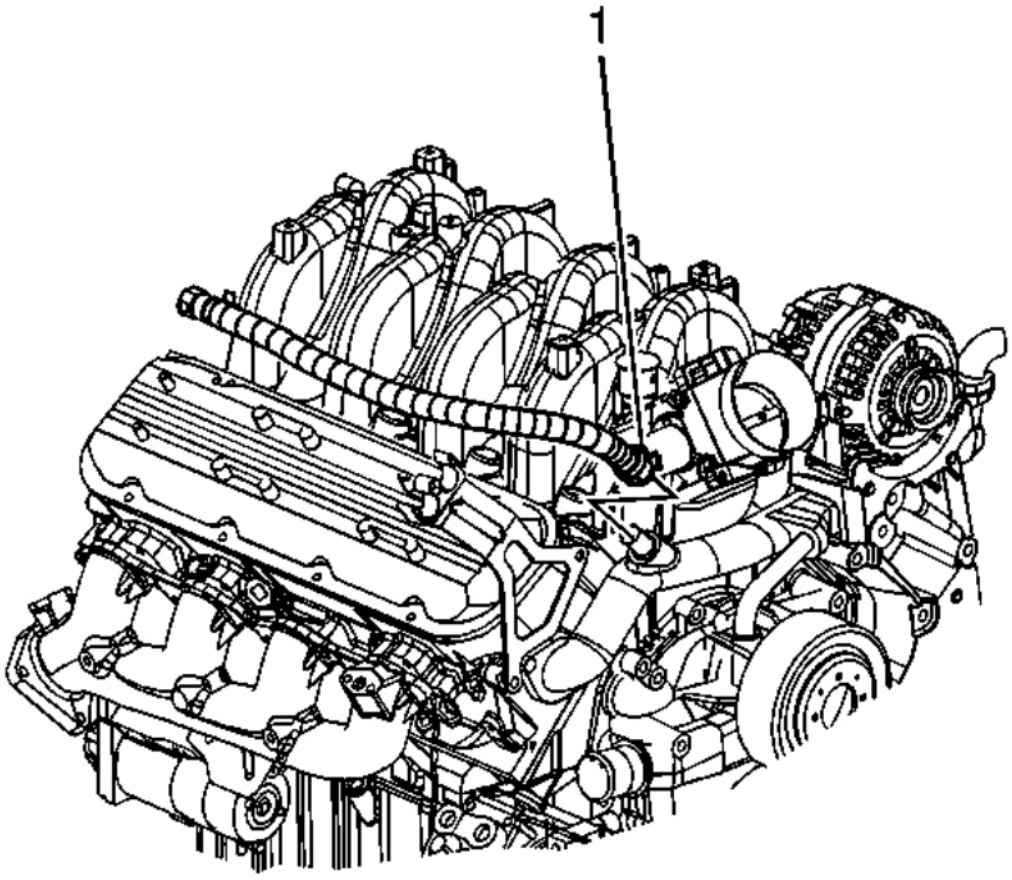


Fig. 90: Removing Inlet Heater Hose From The Engine Coolant Inlet Fitting (L18)
Courtesy of GENERAL MOTORS CORP.

6. Remove the inlet heater hose (1) from the coolant outlet fitting.
7. Remove the inlet heater hose.

Installation Procedure

1. Install the inlet heater hose.

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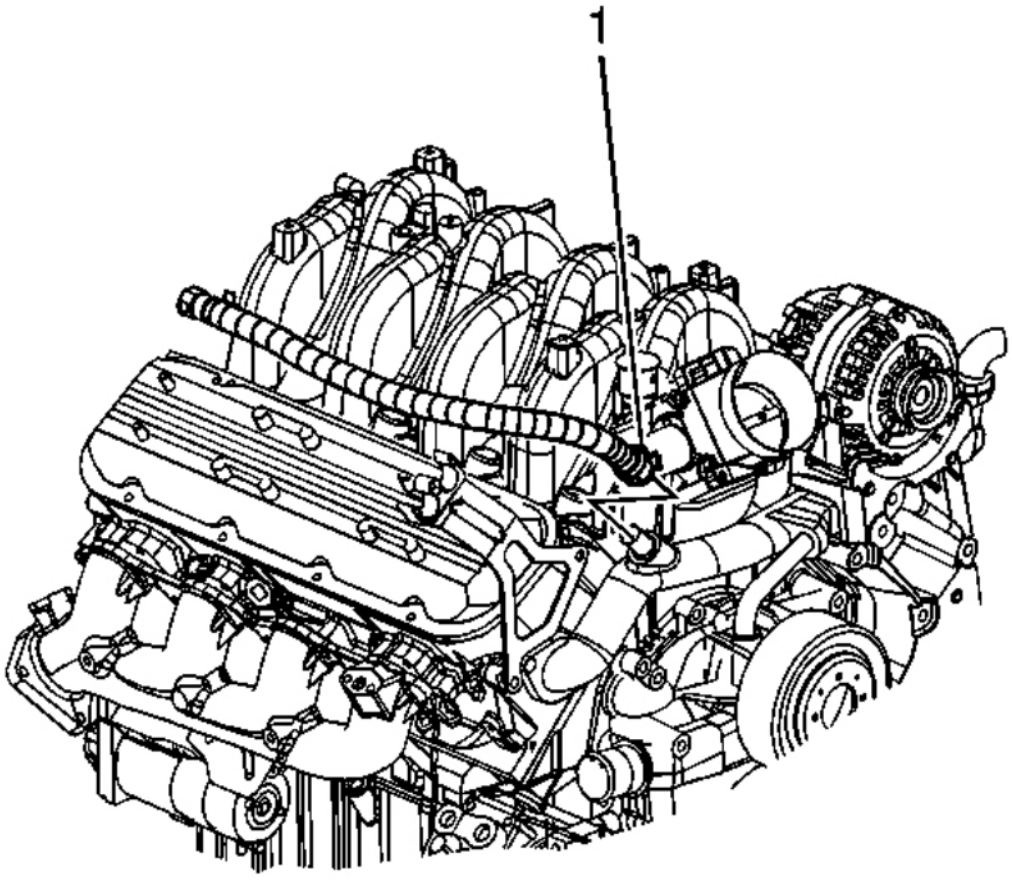


Fig. 91: Removing Inlet Heater Hose From The Engine Coolant Inlet Fitting (L18)
Courtesy of GENERAL MOTORS CORP.

2. Install the inlet heater hose (1) to the coolant outlet fitting.

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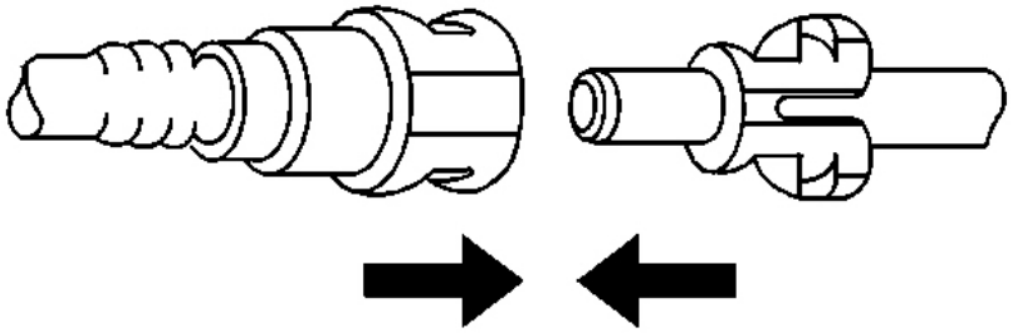


Fig. 92: Connecting Quick-Connect Fittings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Firmly push the quick connect onto the heater core pipe until you hear an audible click.

3. Connect the heater and surge tank hoses to the heater core.
4. Install the heater and surge tank hoses to the mounting clip.
5. Install the air intake tube.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

HEATER HOSE REPLACEMENT - INLET (UTILITY LR4, LM7, LQ4)

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.
3. Remove the heater and surge tank hoses from the mounting clip.

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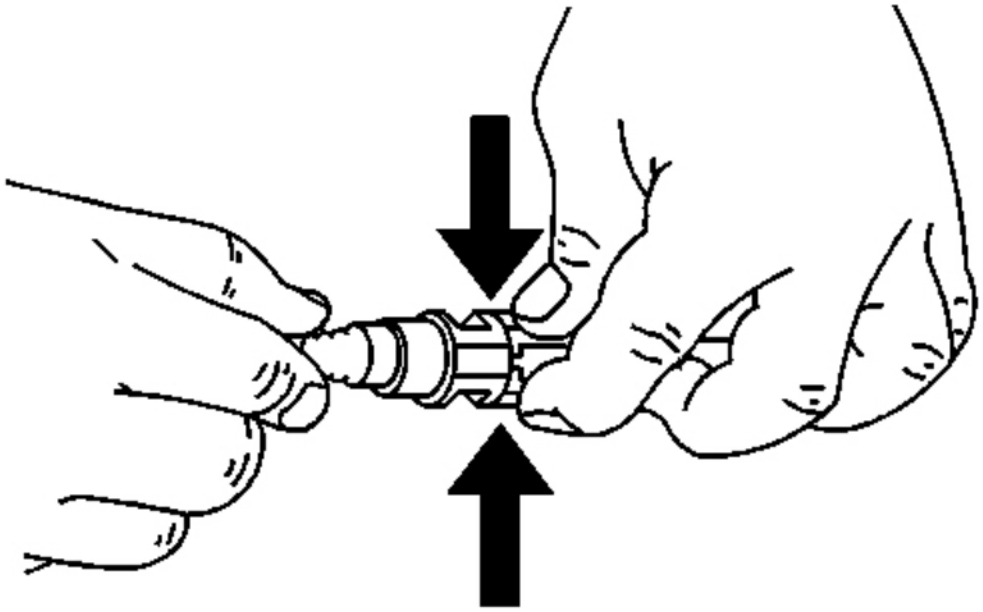
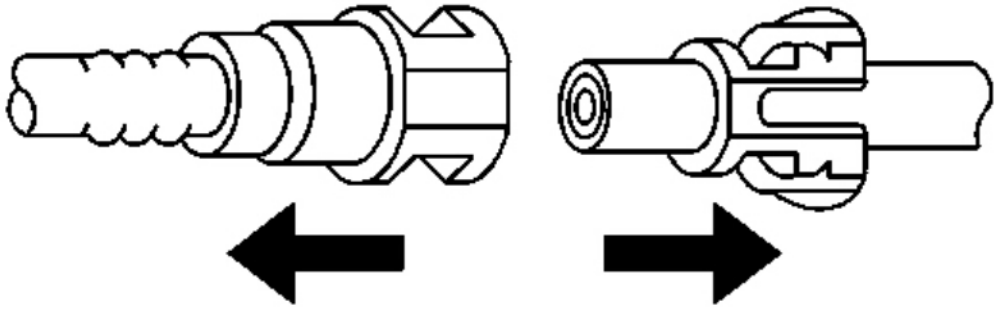


Fig. 93: Squeezing Quick Connect Fitting Release Tabs (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

4. Squeeze the plastic retainer release tabs.



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Fig. 94: Pulling Connection Apart (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

5. Pull the connection apart.

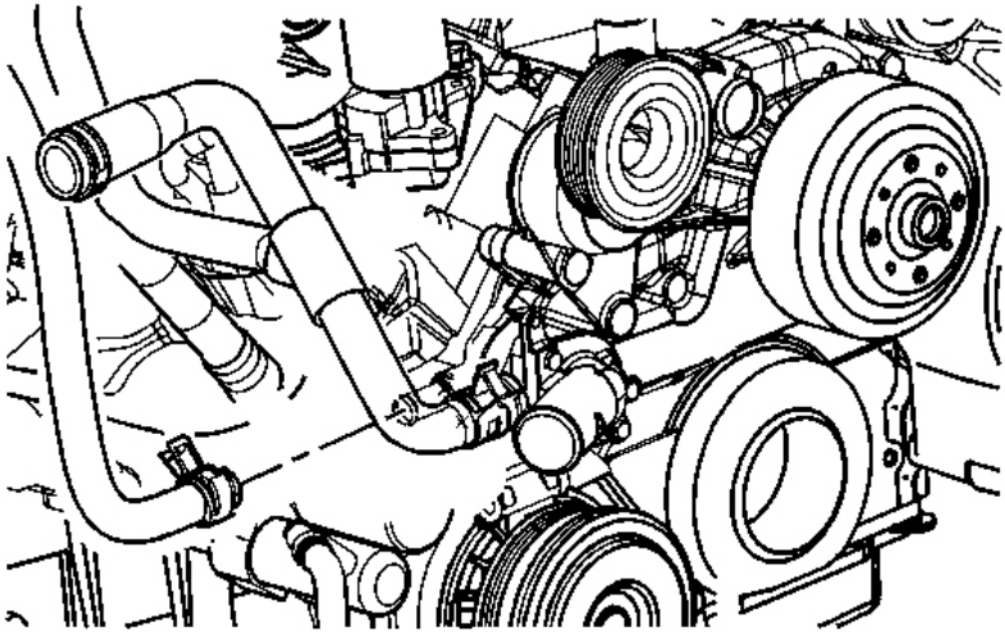


Fig. 95: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

6. Remove the inlet heater hose from the water pump.

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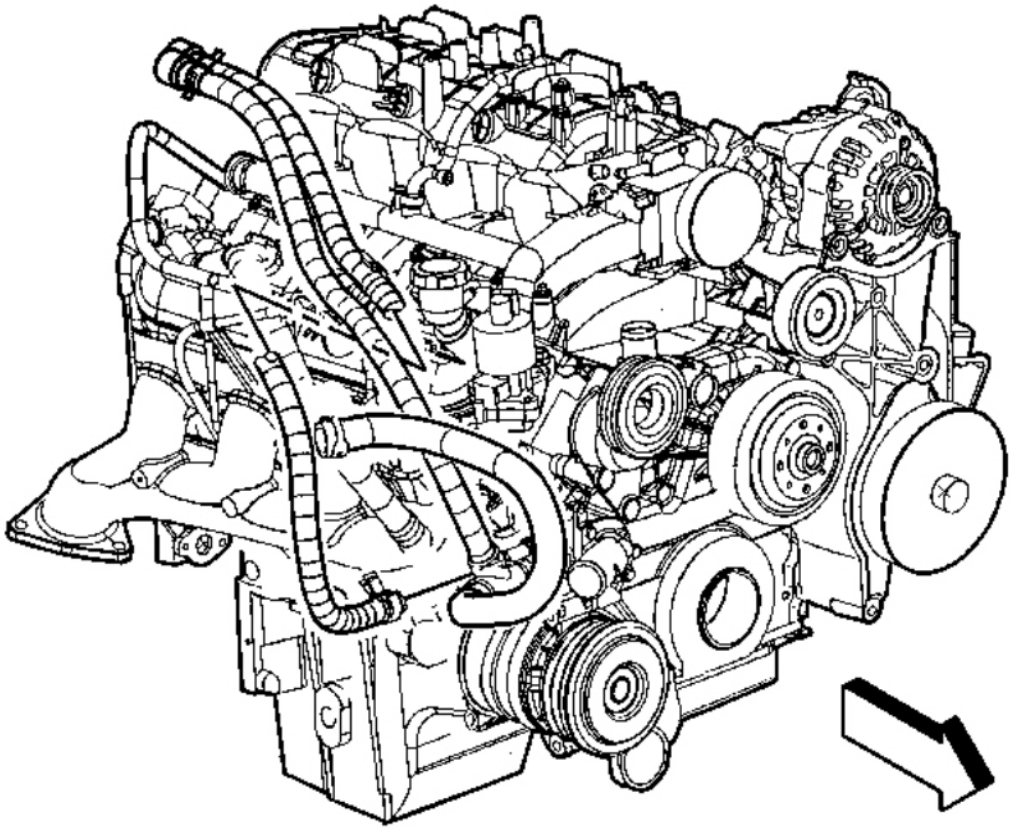


Fig. 96: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

7. Remove the inlet heater hose.

Installation Procedure

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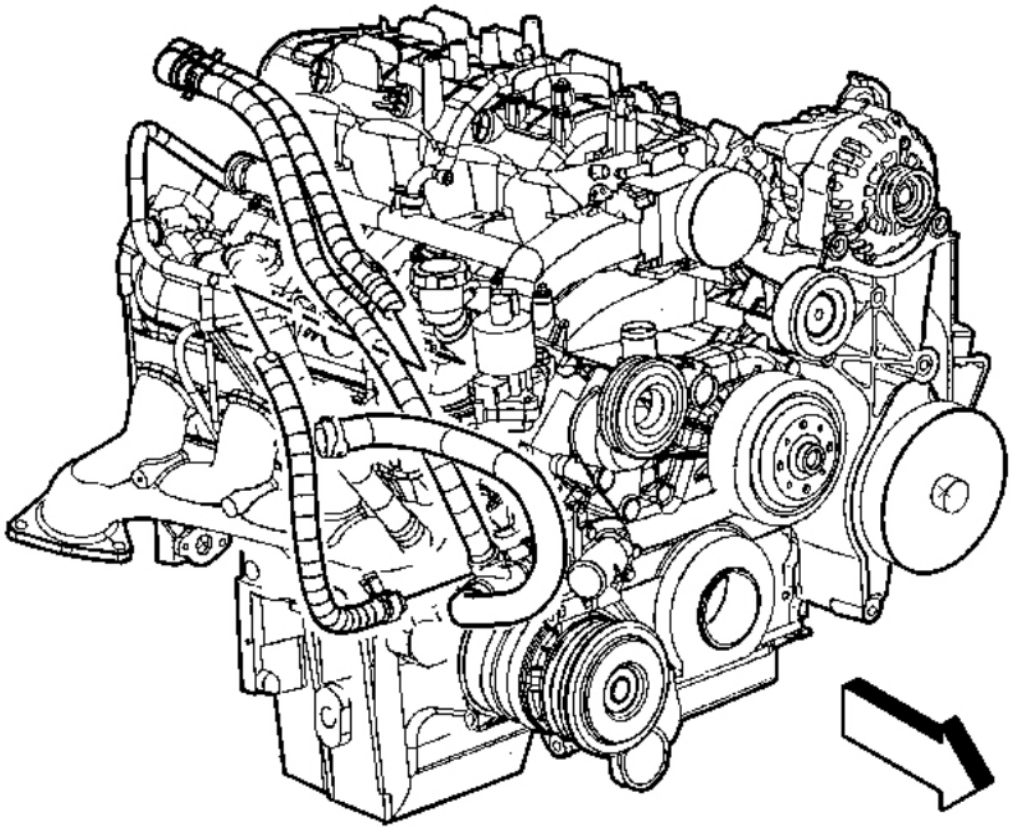


Fig. 97: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

1. Install the inlet heater hose.

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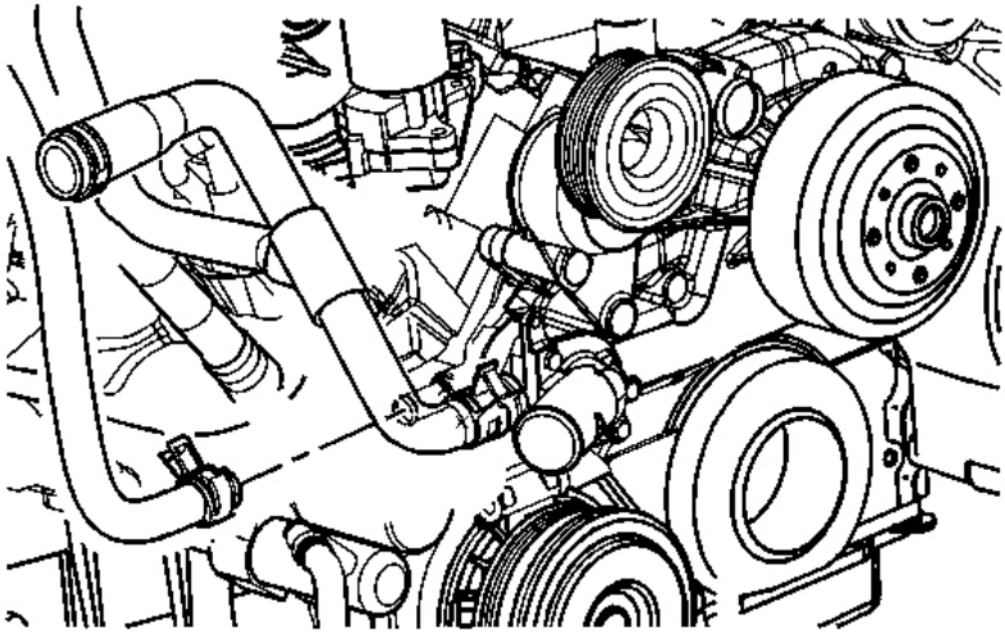
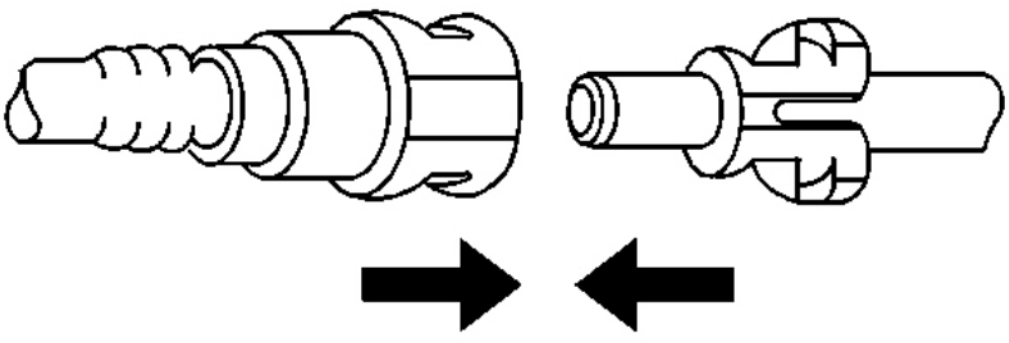


Fig. 98: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

2. Install the inlet heater hose to the water pump.



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Fig. 99: Connecting Quick-Connect Fittings
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Firmly push the quick connect onto the heater core pipe until you hear an audible click.

3. Connect the heater hose to the heater core.
4. Install the heater and surge tank hoses to the mounting clip.
5. Install the air intake tube.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

HEATER HOSE REPLACEMENT - INLET (AVALANCHE/XLT L18)

Tools Required

J 43181 Quick Connect Connector Removal Tool

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.
3. Remove the heater and surge tank hose from the mounting clip.

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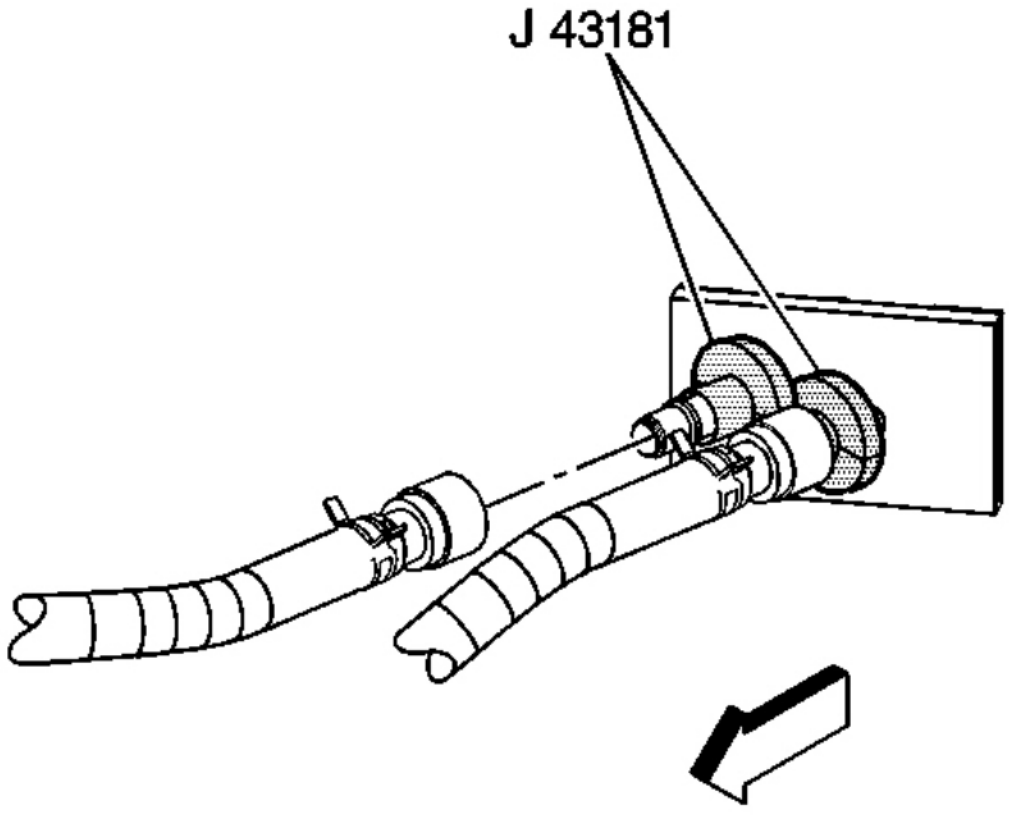


Fig. 100: Identifying Heater Hose To Heater Core Fittings
Courtesy of GENERAL MOTORS CORP.

4. Using the **J 43181** disconnect the heater hose from the heater core inlet.
    1. Install the **J 43181** to the heater core pipe.
    2. Close the tool around the heater core pipe.
    3. Firmly pull the tool into the quick connect end of the heater hose.
    4. Firmly grasp the heater hose. Pull the heater hose forward in order to disengage the hose from the heater core.

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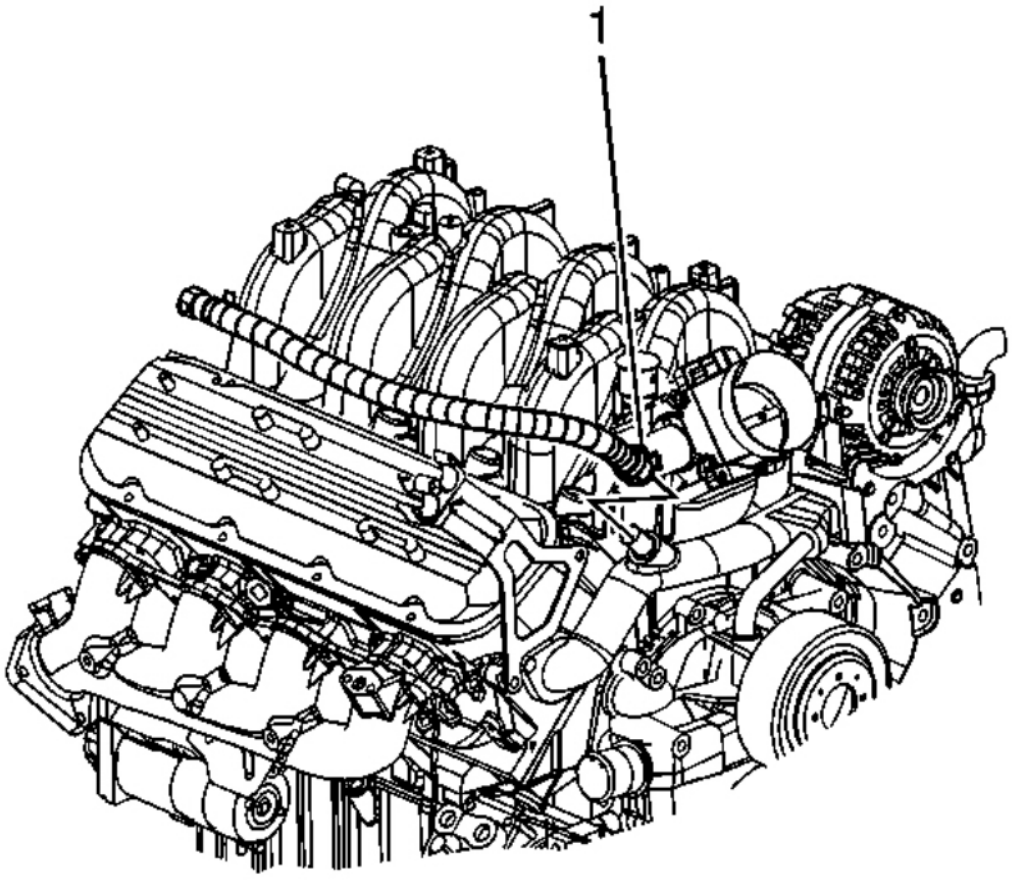


Fig. 101: Removing Inlet Heater Hose From The Engine Coolant Inlet Fitting (L18)
Courtesy of GENERAL MOTORS CORP.

5. Remove the inlet heater hose (1) from the engine coolant inlet fitting.
6. Remove the inlet heater hose.

Installation Procedure

1. Install the inlet heater hose.

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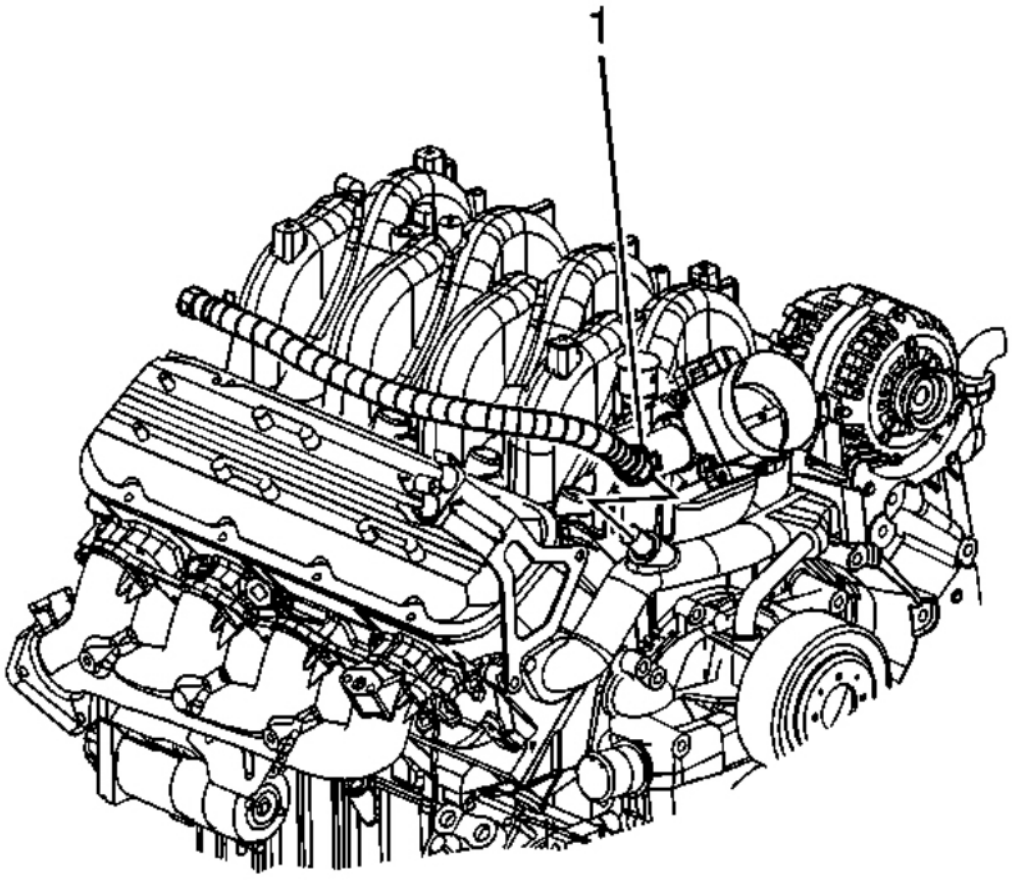


Fig. 102: Removing Inlet Heater Hose From The Engine Coolant Inlet Fitting (L18)
Courtesy of GENERAL MOTORS CORP.

2. Install the inlet heater hose (1) to the engine coolant inlet fitting.

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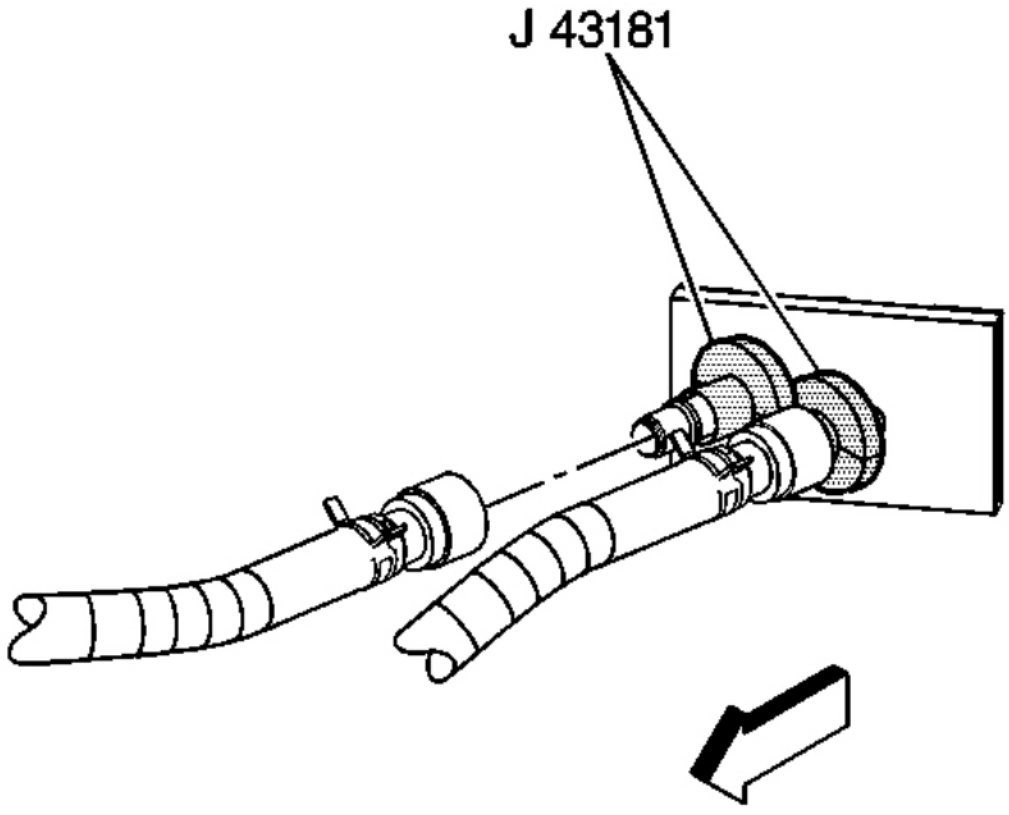


Fig. 103: Identifying Heater Hose To Heater Core Fittings
Courtesy of GENERAL MOTORS CORP.

3. Connect the heater and surge tank hose to the heater core.

   Firmly push the quick connect onto the heater core pipe until you hear an audible click.

4. Install the heater and surge tank hose to the mounting clip.
5. Install the air intake tube.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

HEATER HOSE REPLACEMENT - INLET (AVALANCHE/XLT LR4, LM7, LQ4)

Tools Required

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J 43181 Quick Connect Connector Removal Tool

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.
3. Remove the heater and surge tank hose from the mounting clip.

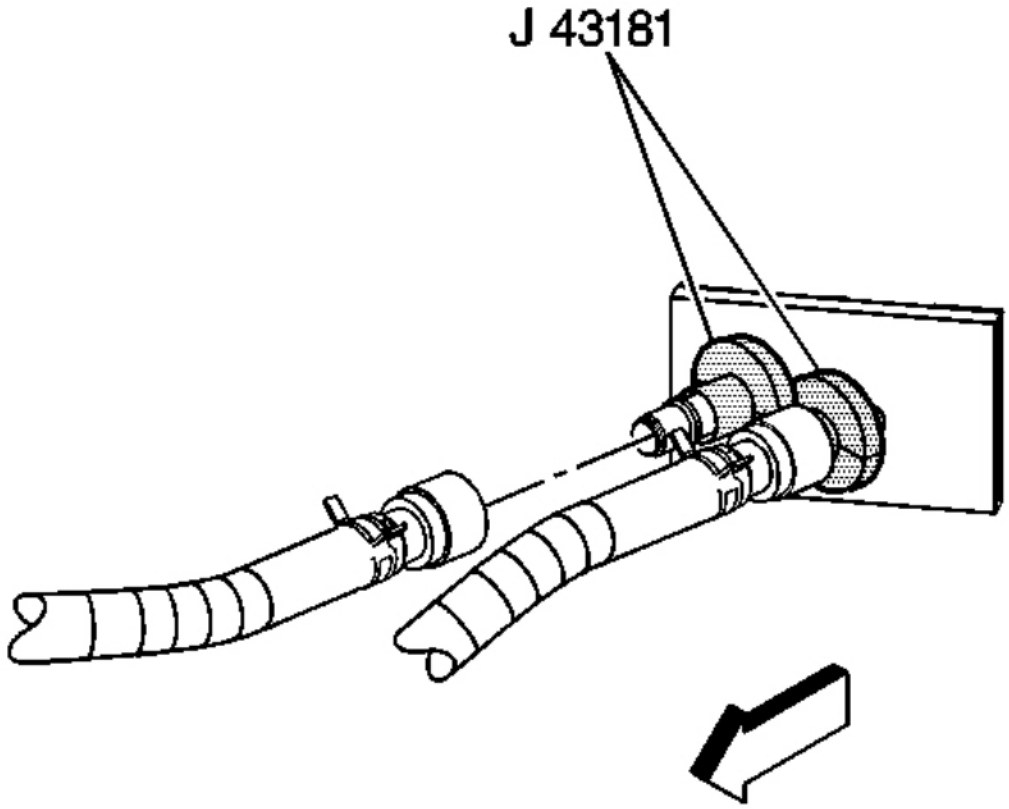


Fig. 104: Identifying Heater Hose To Heater Core Fittings
Courtesy of GENERAL MOTORS CORP.

4. Using the **J 43181** disconnect the heater hose from the heater core inlet.
    1. Install the **J 43181** to the heater core pipe.

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2. Close the tool around the heater core pipe.
3. Firmly pull the tool into the quick connect end of the heater hose.
4. Firmly grasp the heater hose. Pull the heater hose forward in order to disengage the hose from the heater core.

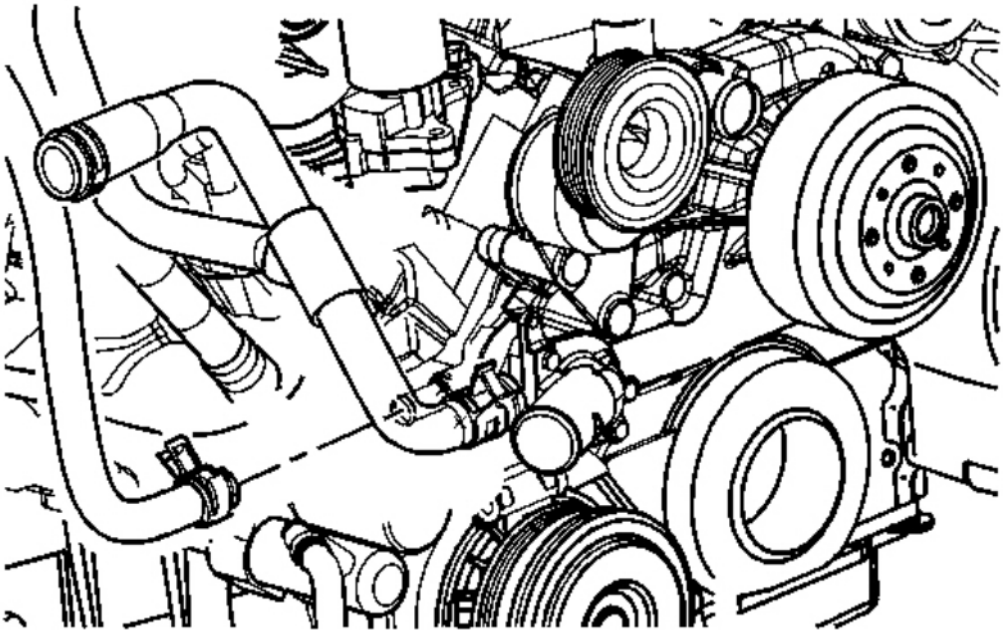


Fig. 105: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

5. Remove the inlet heater hose from the engine.

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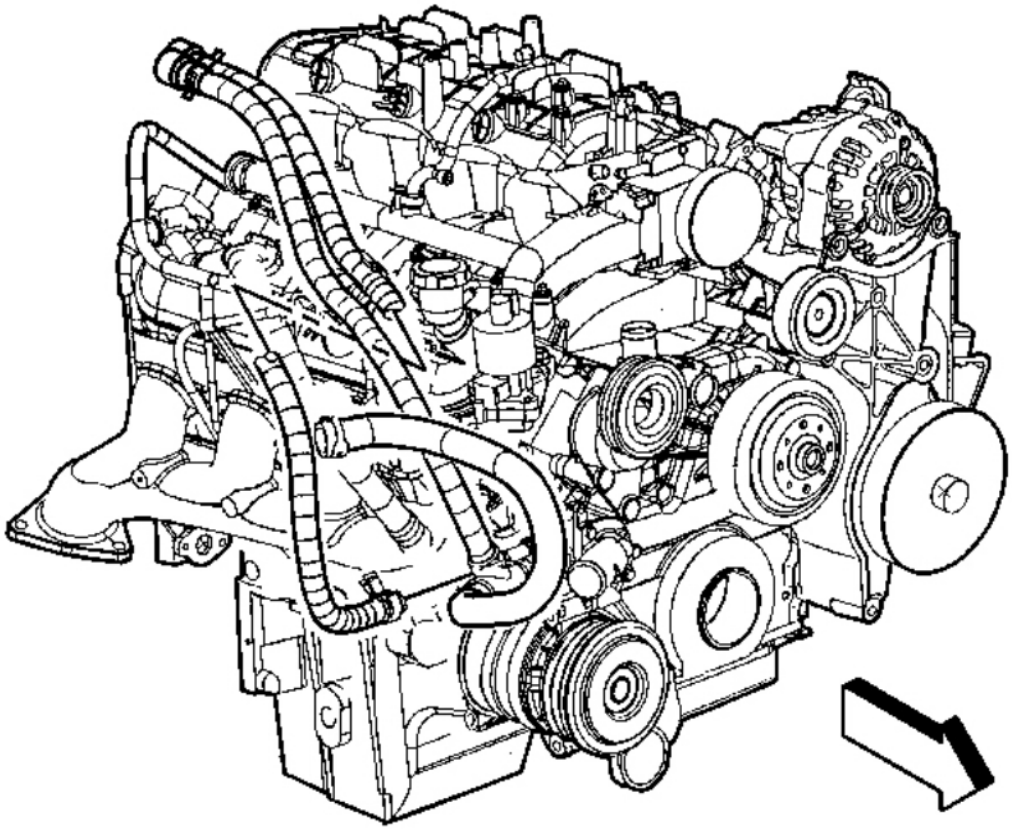


Fig. 106: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

6. Remove the inlet heater hose.

Installation Procedure

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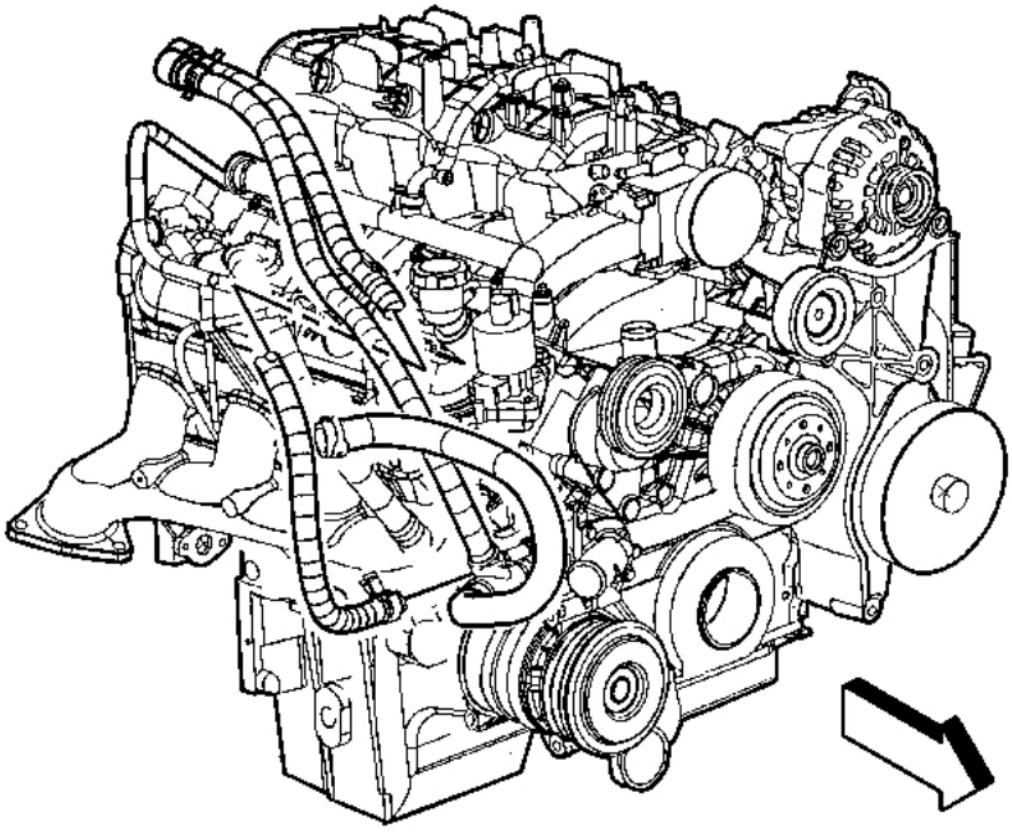


Fig. 107: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

1. Install the inlet heater hose.

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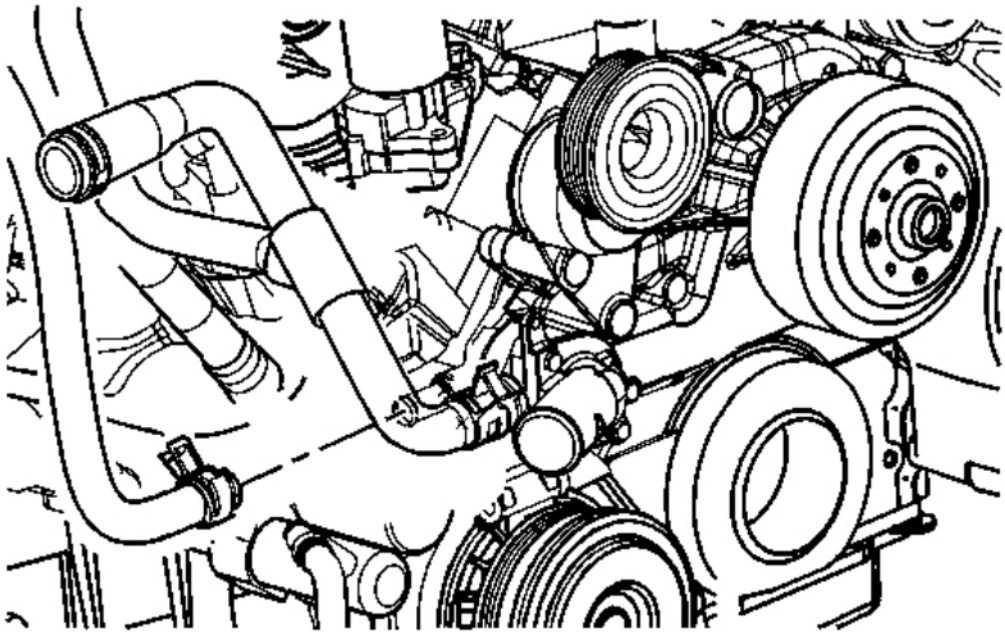


Fig. 108: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

2. Install the inlet heater hose to the engine.
3. Connect the heater and surge tank hose to the heater core.

   Firmly push the quick connect onto the heater core pipe until you hear an audible click.

4. Install the heater and surge tank hose to the mounting clip.
5. Install the air intake tube.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

HEATER HOSE REPLACEMENT - OUTLET (UTILITY LR4, LM7, LQ4)

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.

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3. Remove the heater and surge tank hoses from the mounting clip.

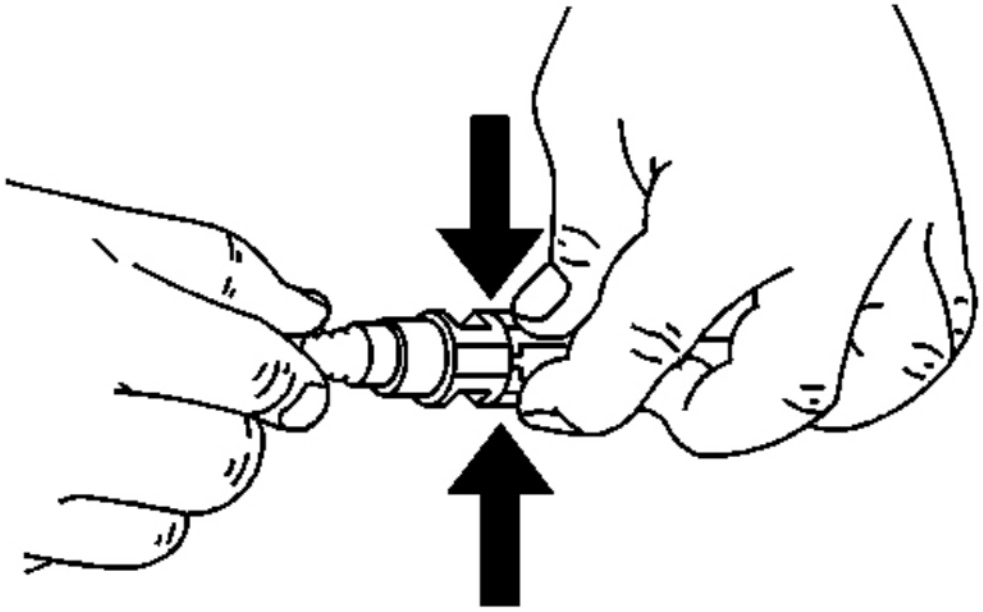


Fig. 109: Squeezing Quick Connect Fitting Release Tabs (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

4. Squeeze the plastic retainer release tabs.

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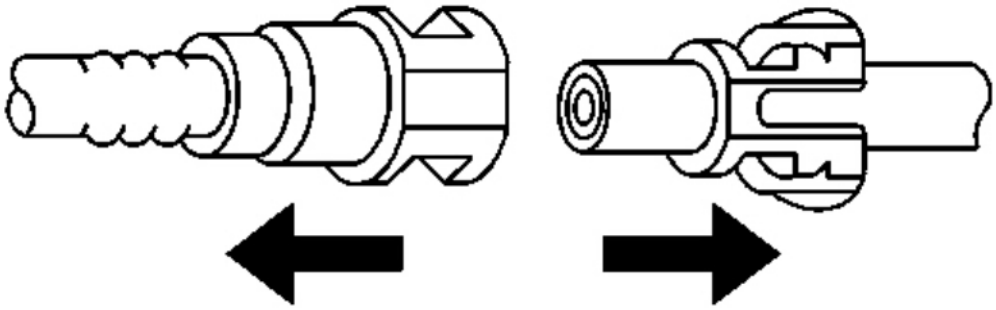
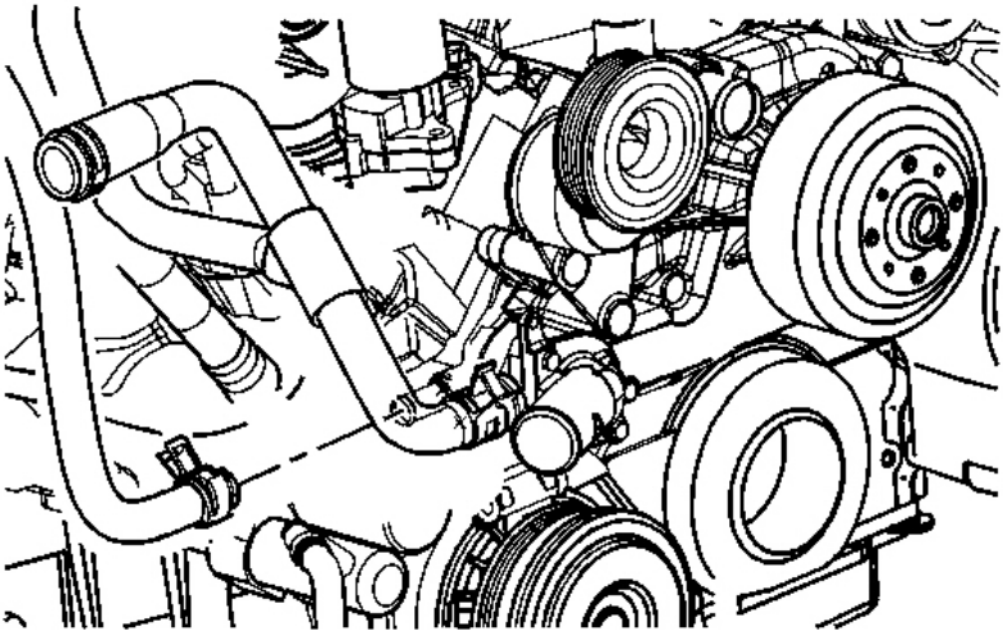


Fig. 110: Pulling Connection Apart (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

5. Pull the connection apart.



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Fig. 111: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

6. Remove the outlet heater hose from the water pump.
7. Reposition the outlet heater hose clamp at the surge tank.
8. Remove the outlet heater hose from the surge tank.

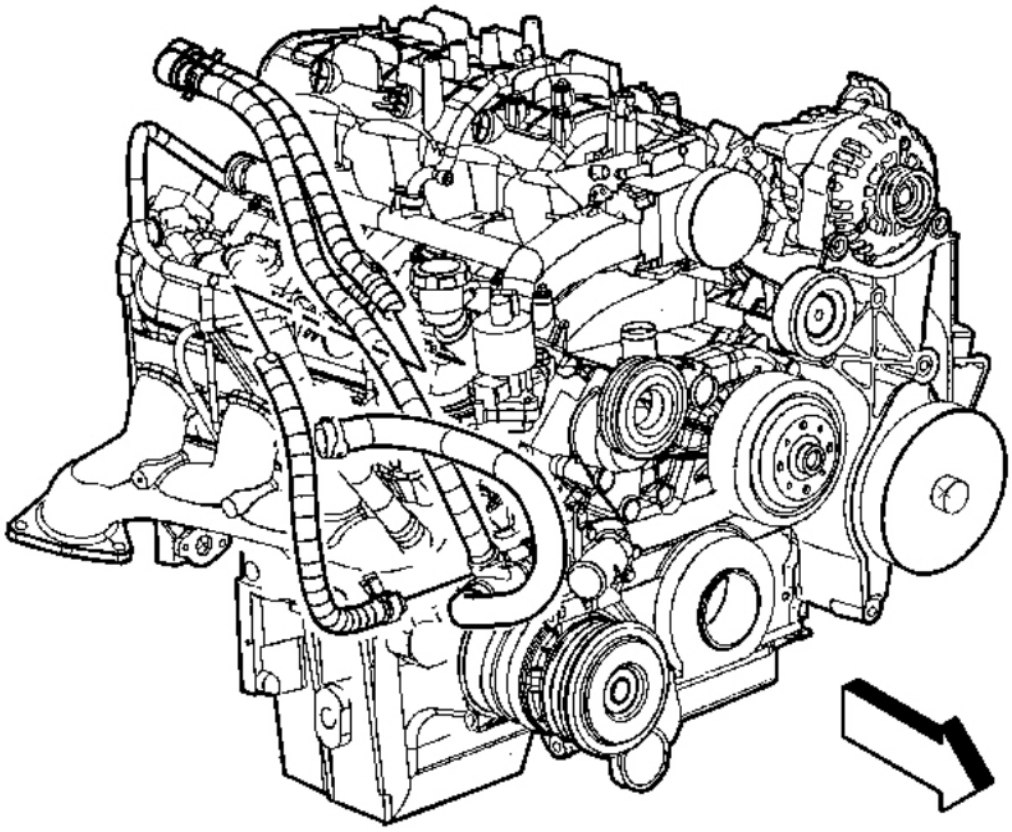


Fig. 112: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

9. Remove the outlet heater hose.

Installation Procedure

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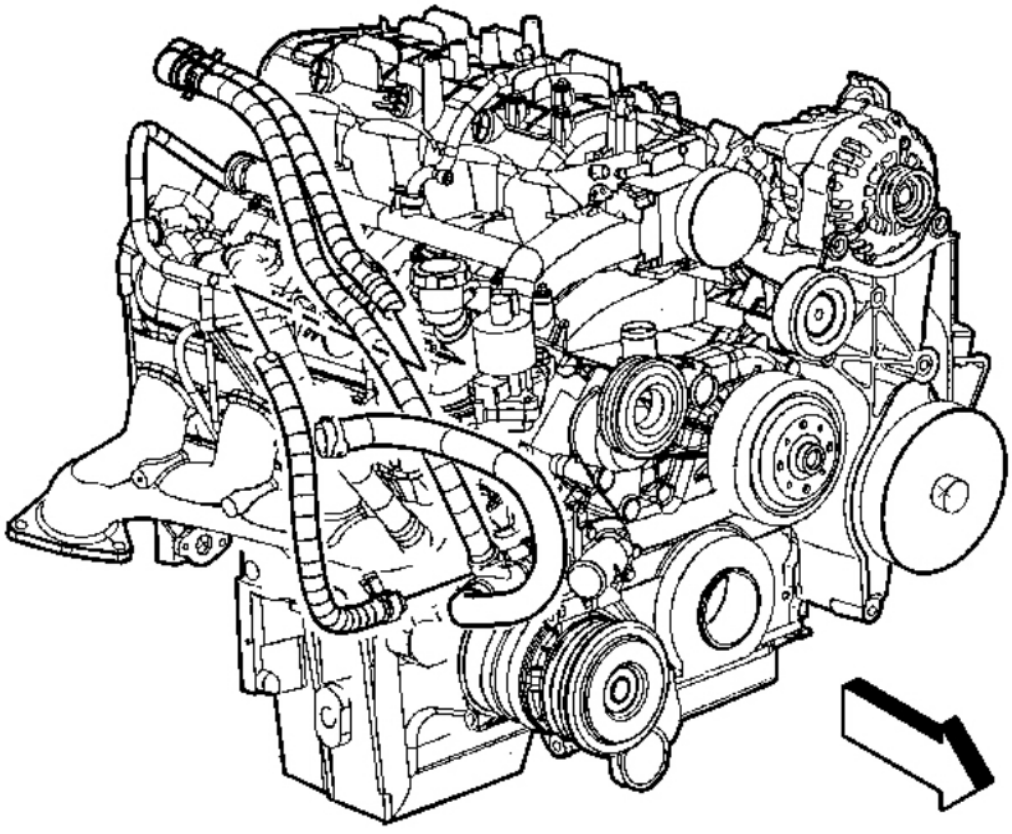


Fig. 113: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

1. Install the outlet heater hose.

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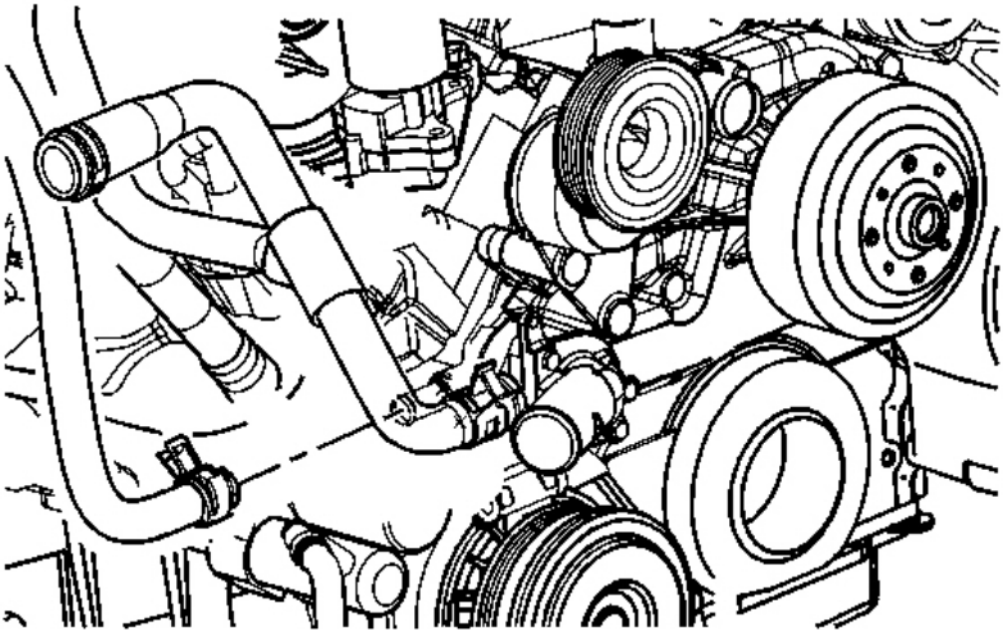


Fig. 114: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

2. Install the outlet heater hose to the water pump.
3. Install the outlet heater hose to the surge tank.
4. Install the outlet heater hose clamp to the surge tank.

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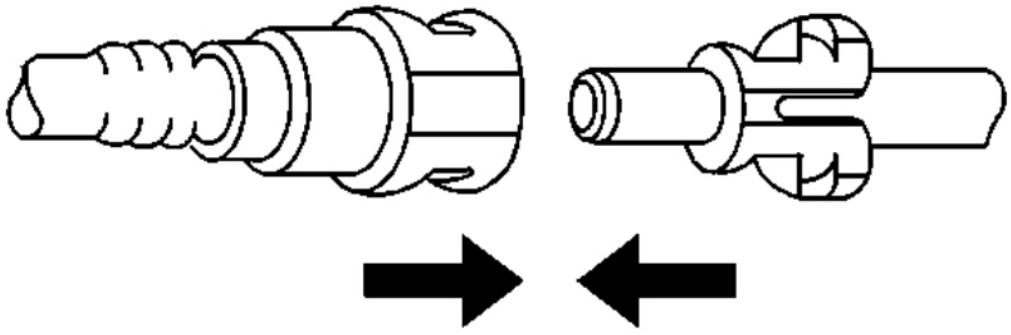


Fig. 115: Connecting Quick-Connect Fittings
Courtesy of GENERAL MOTORS CORP.

5. Connect the heater and surge tank hoses to the heater core.

IMPORTANT: Firmly push the quick connect onto the heater core hose until you hear an audible click.

6. Pull the heater outlet hose to ensure the connection.
7. Install the heater and surge tank hoses to the mounting clip.
8. Install the air intake tube.
9. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

HEATER HOSE REPLACEMENT - OUTLET (AVALANCHE/XLT LR4, LM7, LQ4)

Tools Required

J 43181 Quick Connect Connector Removal Tool

Removal Procedure

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Remove the air intake tube.
3. Remove the heater and surge tank hose from the mounting clip.

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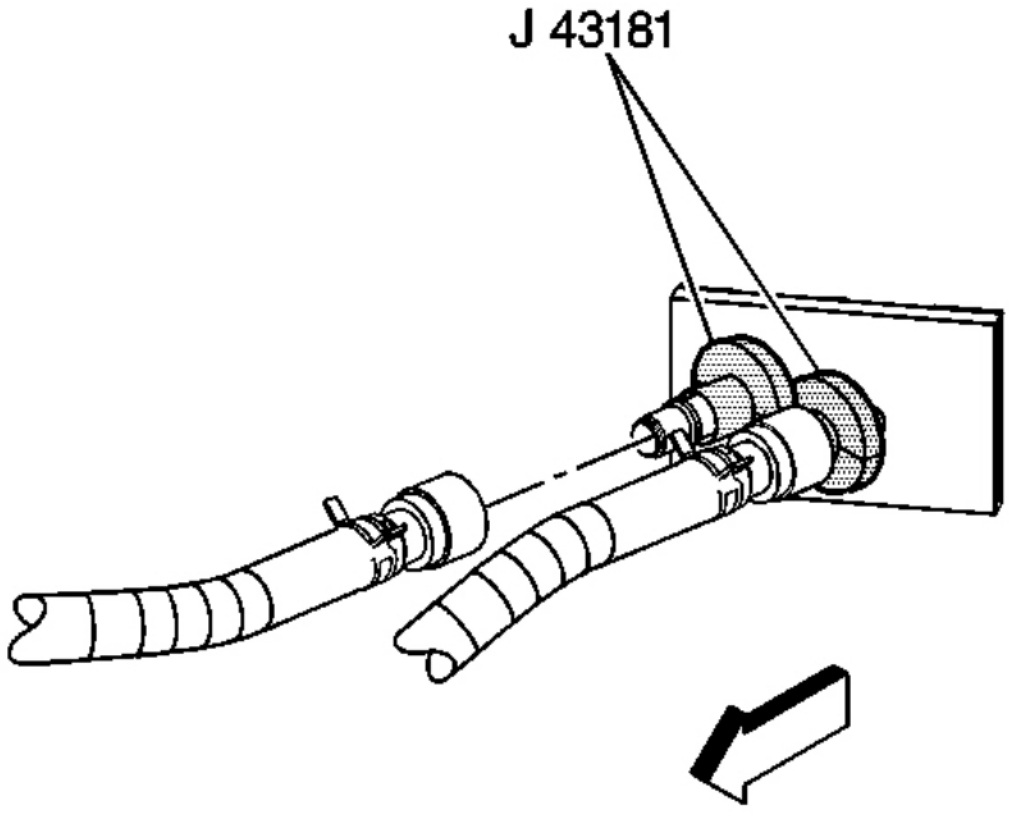


Fig. 116: Identifying Heater Hose To Heater Core Fittings
Courtesy of GENERAL MOTORS CORP.

4. Using the **J 43181** disconnect the heater hose from the heater core outlet.
    1. Install the **J 43181** to the heater core pipe.
    2. Close the tool around the heater core pipe.
    3. Firmly pull the tool into the quick connect end of the heater hose.
    4. Firmly grasp the heater hose. Pull the heater hose forward in order to disengage the hose from the heater core.

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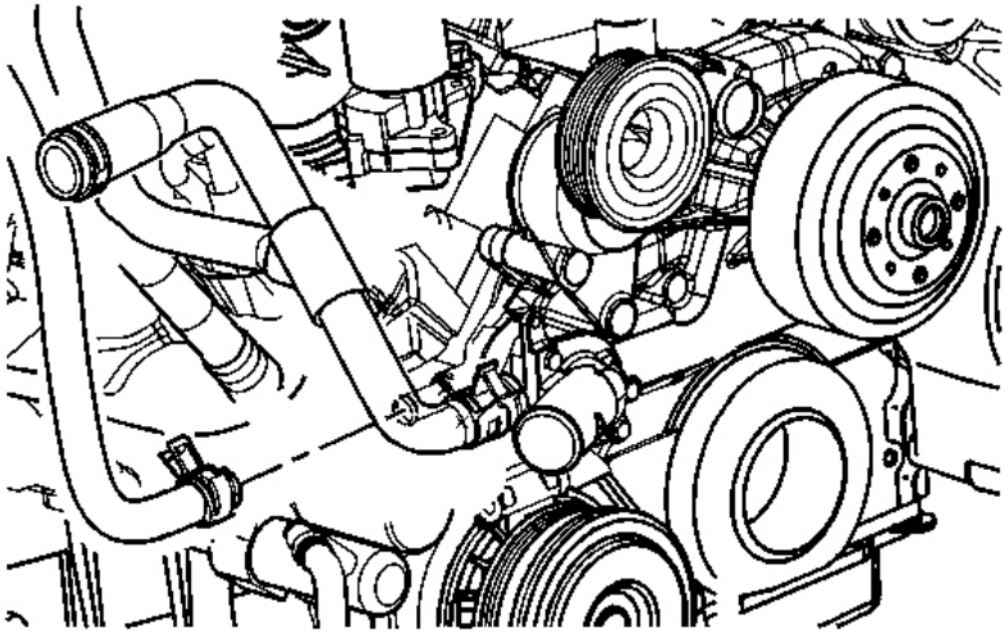


Fig. 117: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

5. Remove the outlet heater hose from the engine.

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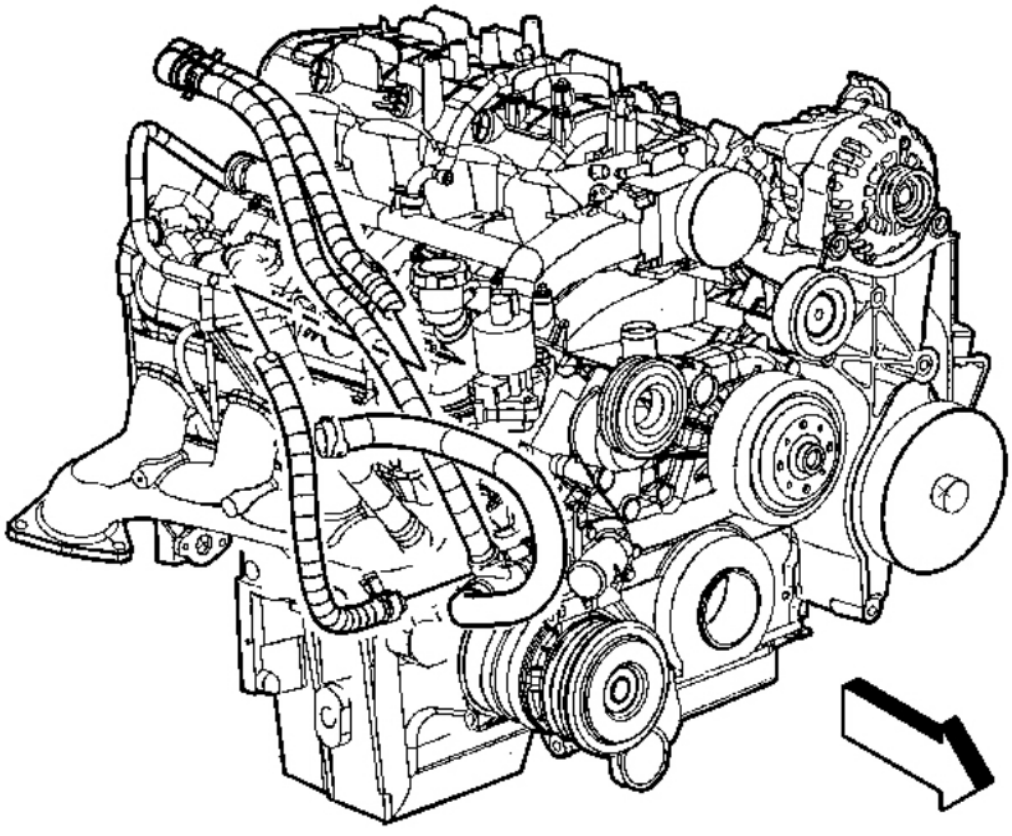


Fig. 118: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

6. Remove the outlet heater hose.

Installation Procedure

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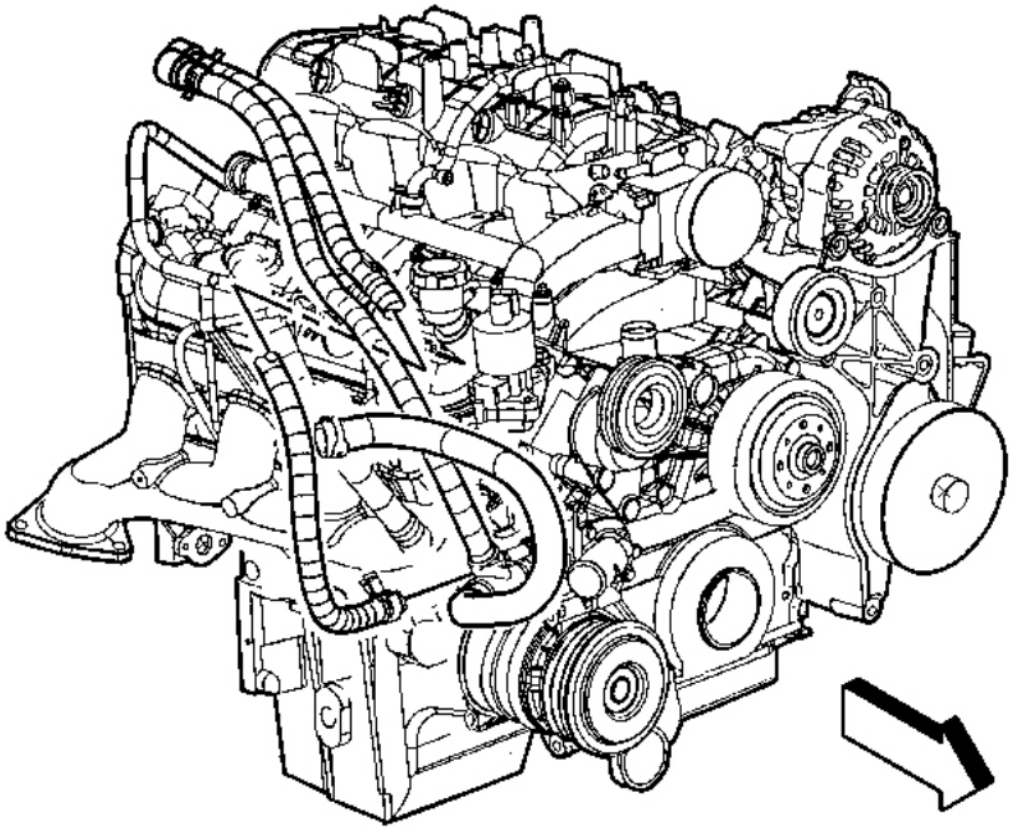


Fig. 119: View Of Inlet & Outlet Heater Hoses (LR4, LM7, LQ4)
Courtesy of GENERAL MOTORS CORP.

1. Install the outlet heater hose.

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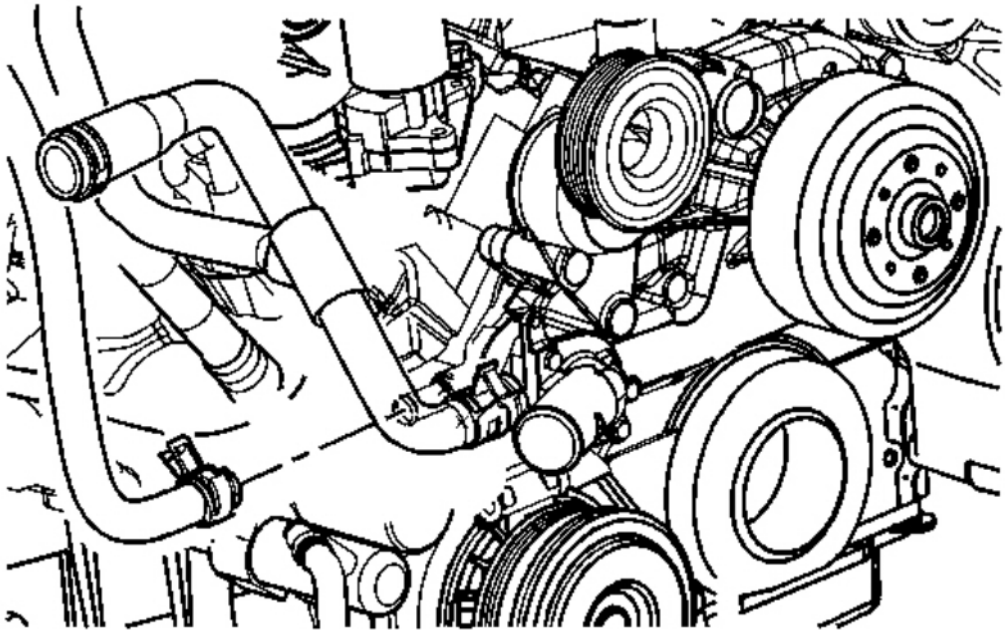


Fig. 120: Removing/Installing Heater Hose To Engine
Courtesy of GENERAL MOTORS CORP.

2. Install the outlet heater hose to the engine.
3. Connect the outlet heater hose to the heater core.

   Firmly push the quick connect onto the heater core pipe until you hear an audible click.

4. Install the heater and surge tank hose to the mounting clip.
5. Install the air intake tube.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

BLOWER MOTOR RESISTOR REPLACEMENT

Removal Procedure

1. If equipped, remove the IP sound insulator. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

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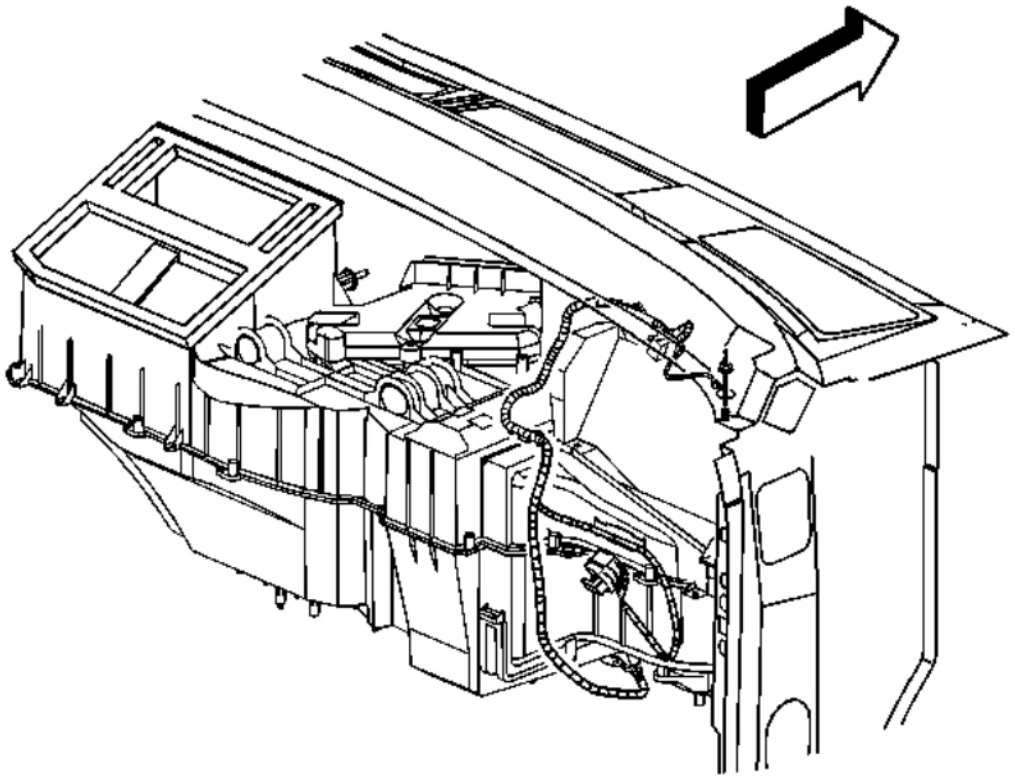


Fig. 121: View Of Electrical Connector At The Blower Motor
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connection from the blower motor.
3. Disconnect the electrical connection from the blower motor resistor.

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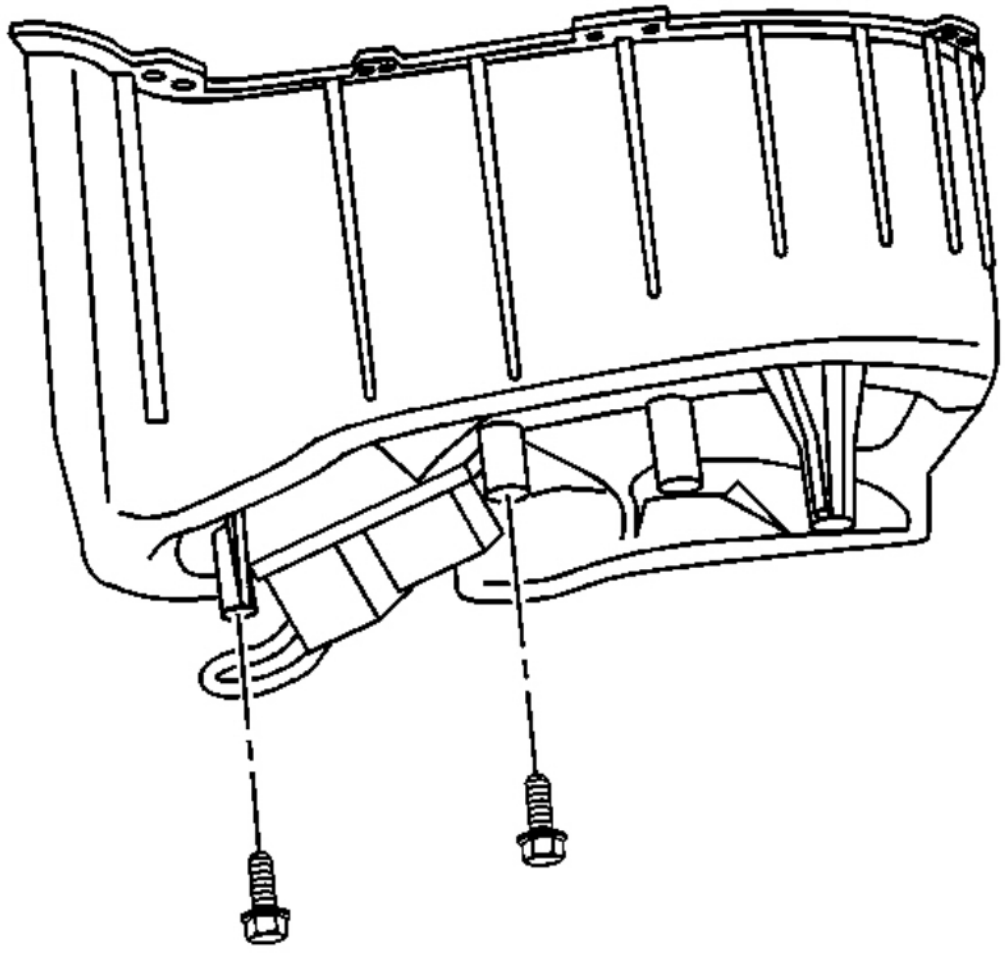


Fig. 122: Removing/Installing Blower Motor Resistor Retaining Screws
Courtesy of GENERAL MOTORS CORP.

4. Remove the blower motor resistor retaining screws.

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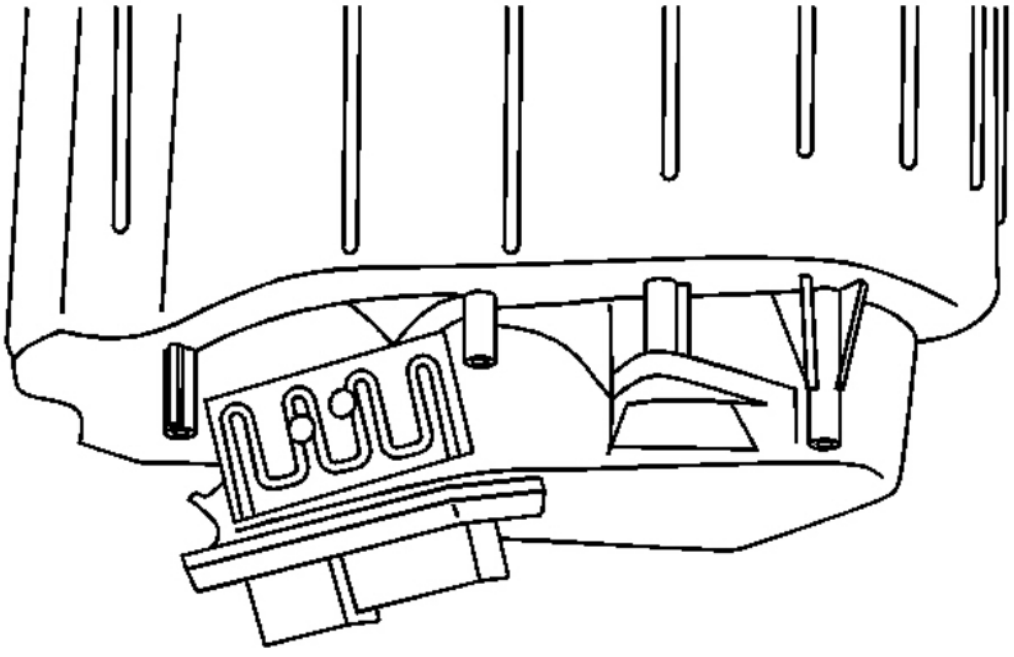


Fig. 123: Removing/Installing Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

5. Remove the blower motor resistor.

Installation Procedure

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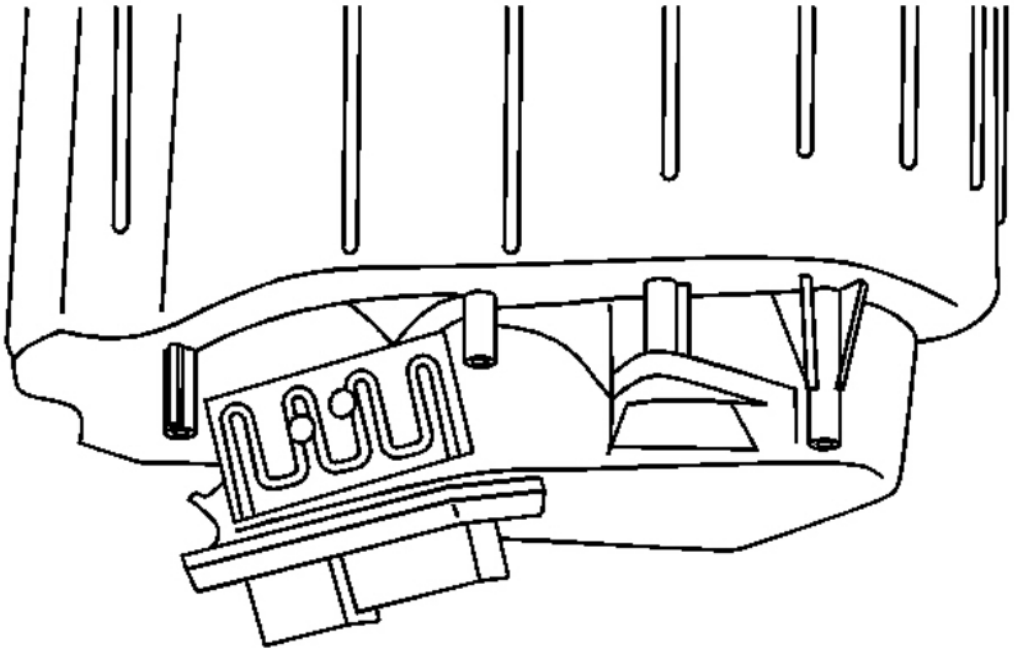


Fig. 124: Removing/Installing Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor resistor.

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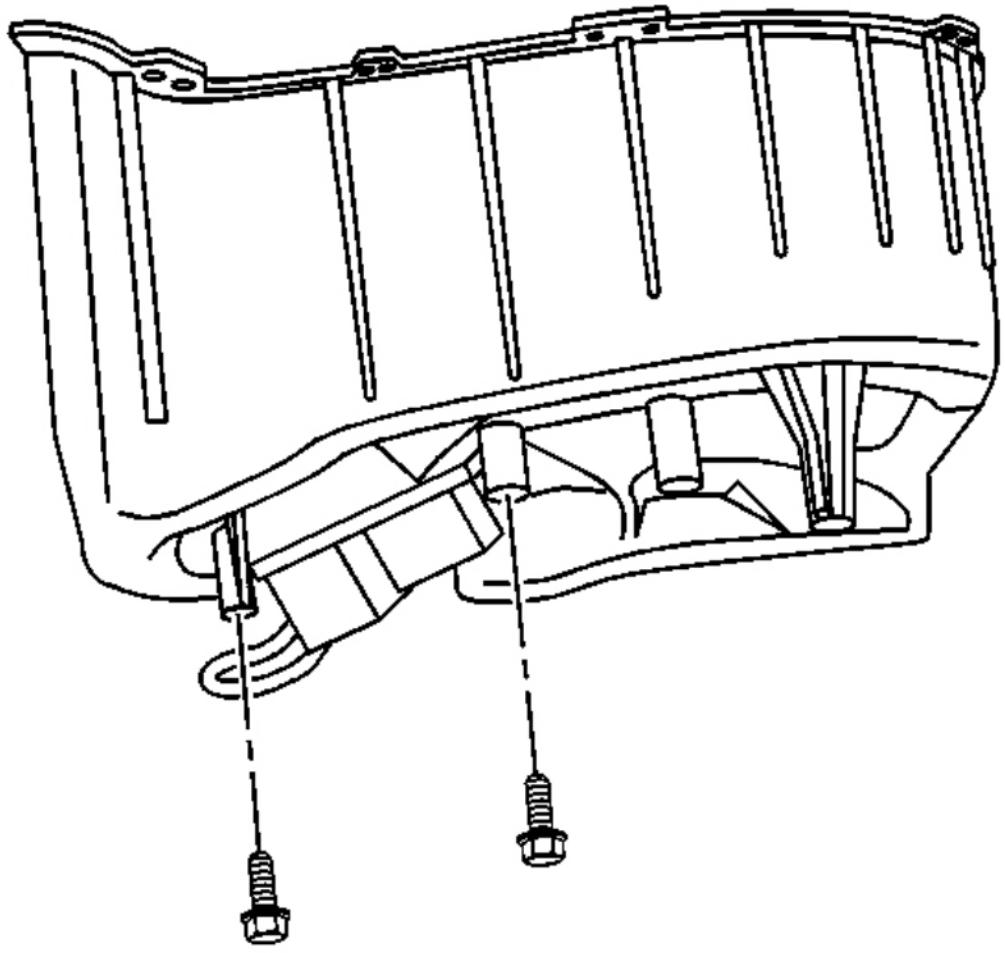


Fig. 125: Removing/Installing Blower Motor Resistor Retaining Screws
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the blower motor resistor retaining screws.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

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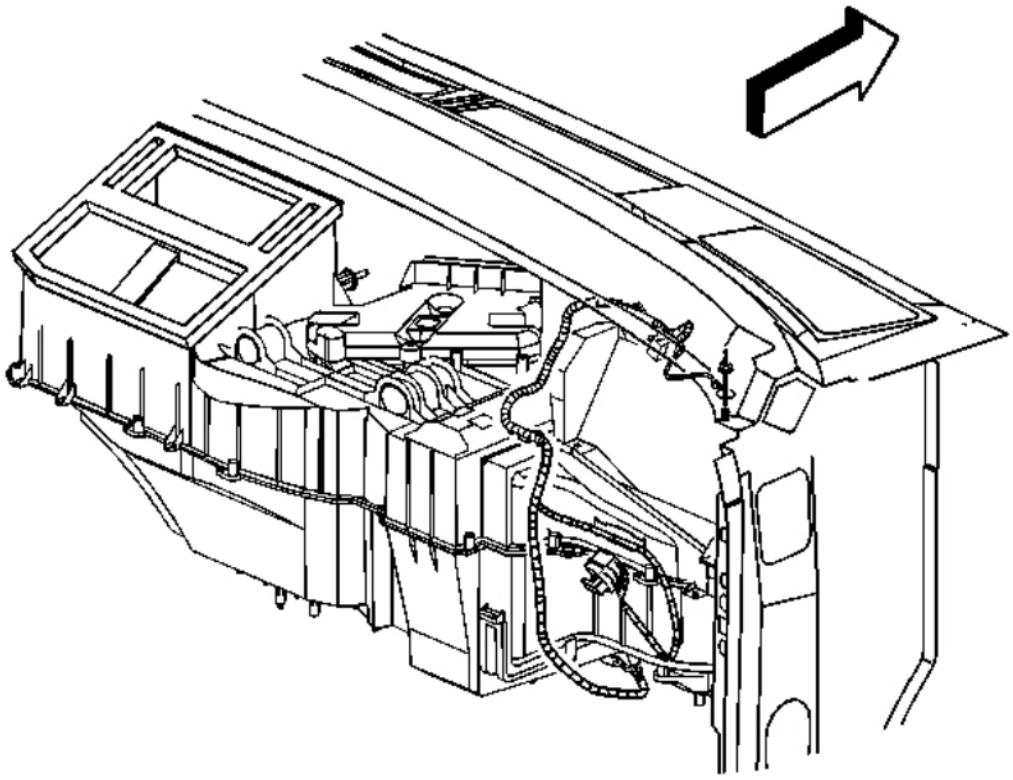


Fig. 126: View Of Electrical Connector At The Blower Motor
Courtesy of GENERAL MOTORS CORP.

3. Connect the electrical connection to the blower motor resistor.
4. Connect the electrical connection to the blower motor.
5. If equipped, install the IP sound insulator. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

BLOWER MOTOR REPLACEMENT (DELPHI)

Removal Procedure

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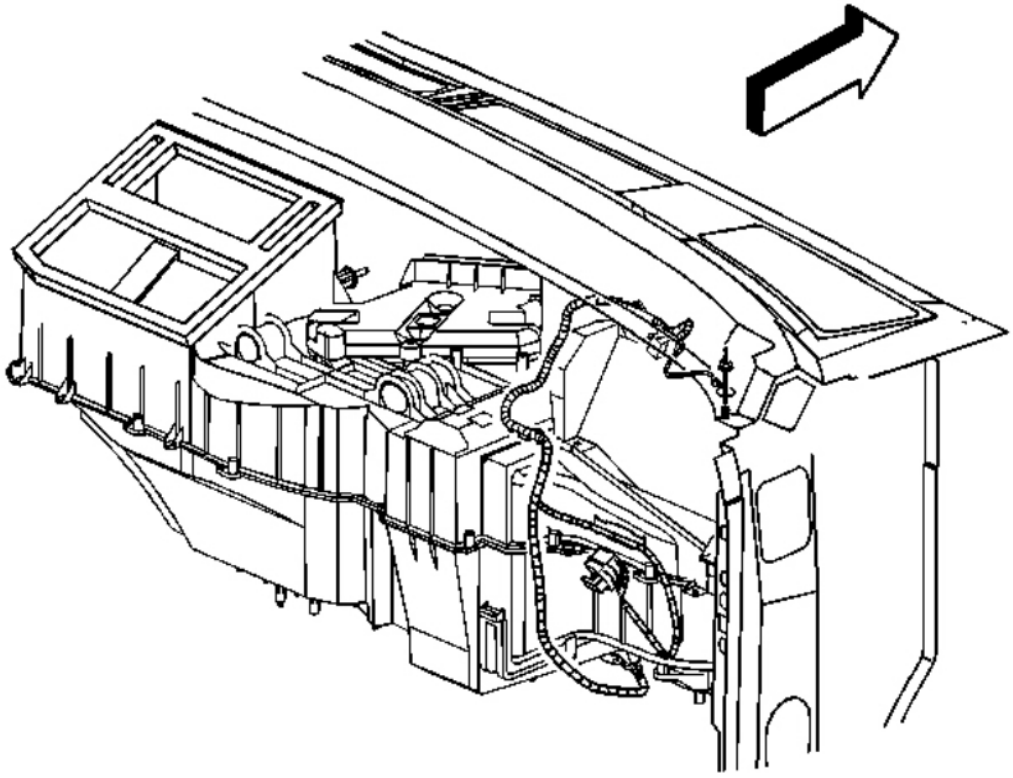


Fig. 127: View Of Electrical Connector At The Blower Motor
Courtesy of GENERAL MOTORS CORP.

1. If equipped, remove the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.
2. Remove the blower motor insulating cover screws.
3. Disconnect the electrical connector from the blower motor.
4. Remove the blower motor insulating cover.

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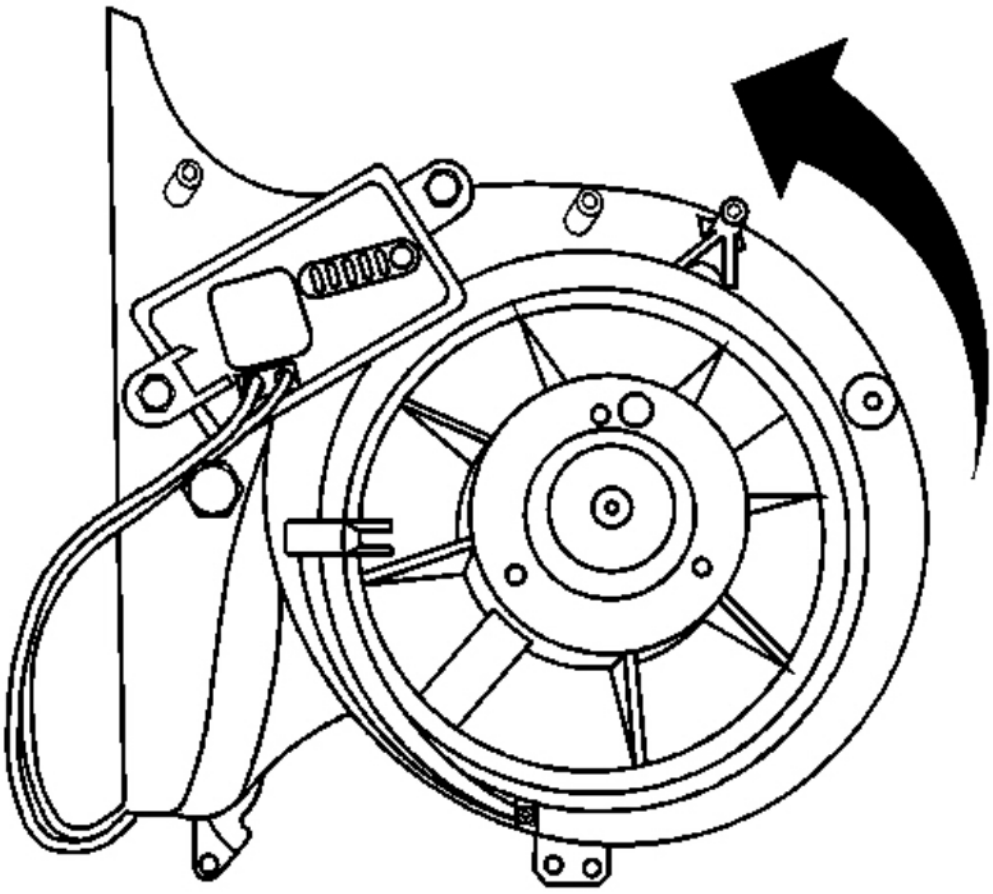


Fig. 128: Disengaging Blower Motor (Delphi)
Courtesy of GENERAL MOTORS CORP.

5. Pull the retaining tab down while turning the blower motor counterclockwise in order to disengage the blower motor from the heater/ventilation module.

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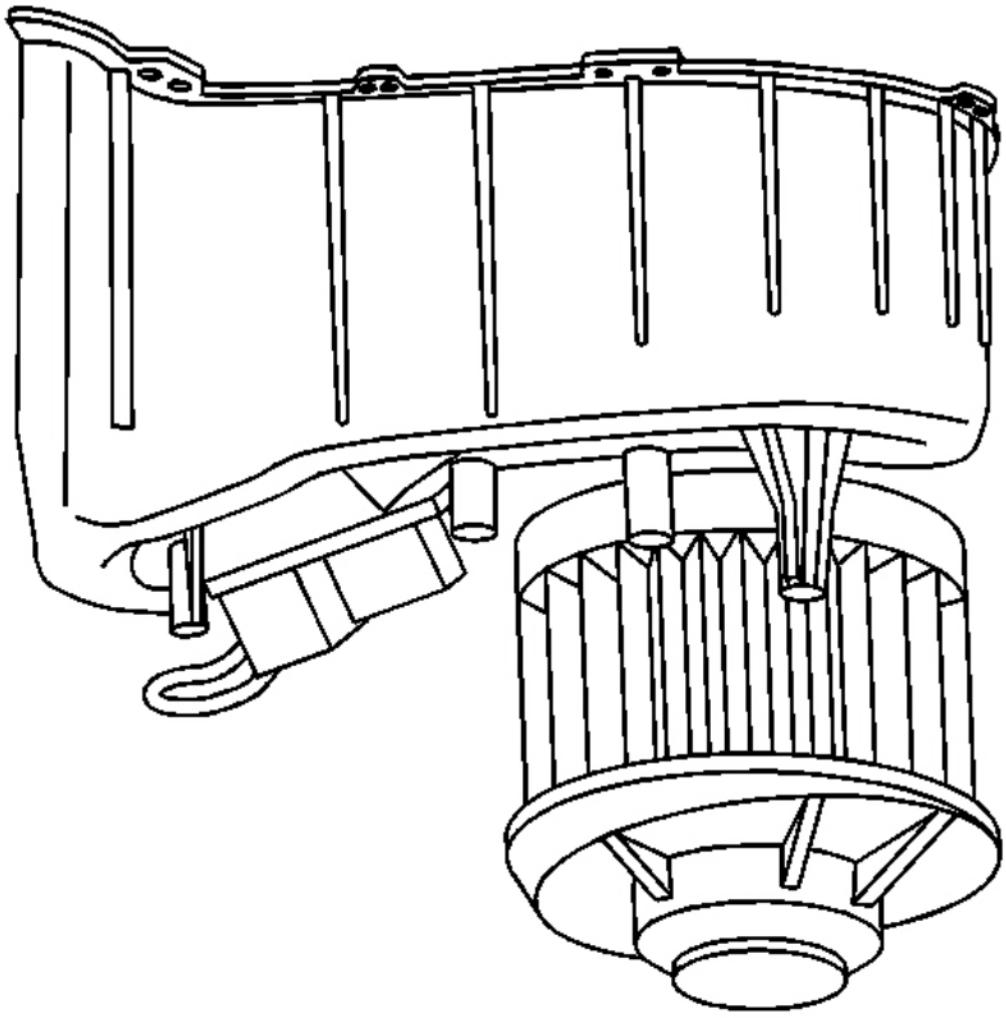


Fig. 129: Removing/Installing Blower Motor (Delphi)
Courtesy of GENERAL MOTORS CORP.

6. Remove the blower motor.

Installation Procedure

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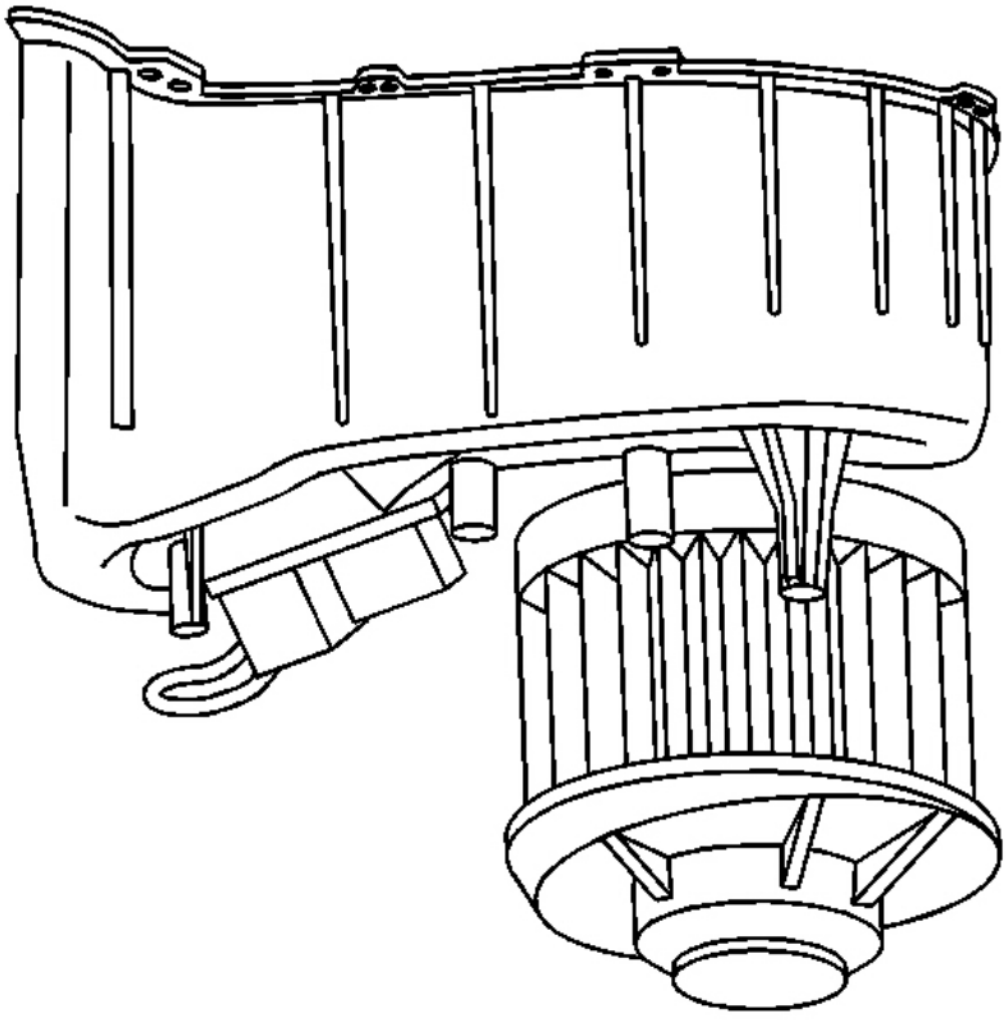


Fig. 130: Removing/Installing Blower Motor (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor.

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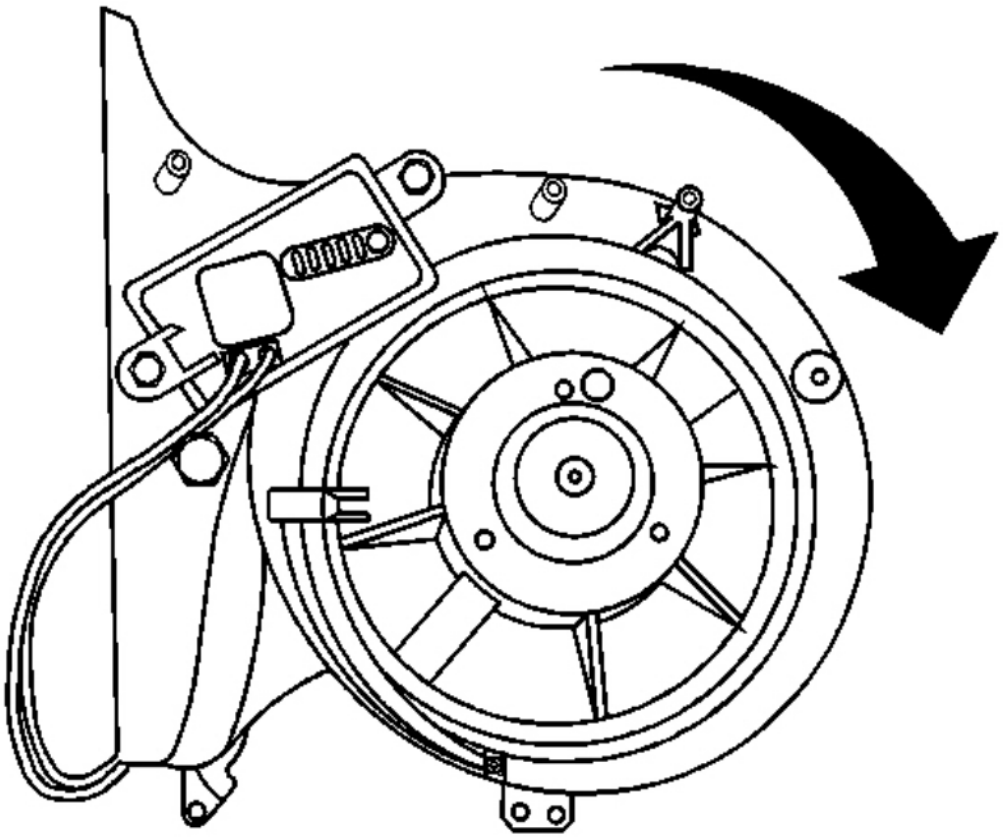


Fig. 131: Turning Blower Assembly Clockwise (Delphi)
Courtesy of GENERAL MOTORS CORP.

2. Install the blower motor to the heater/ventilation module. Turn the blower assembly clockwise until the retaining tab locks into place.
3. Install the blower motor insulating cover.

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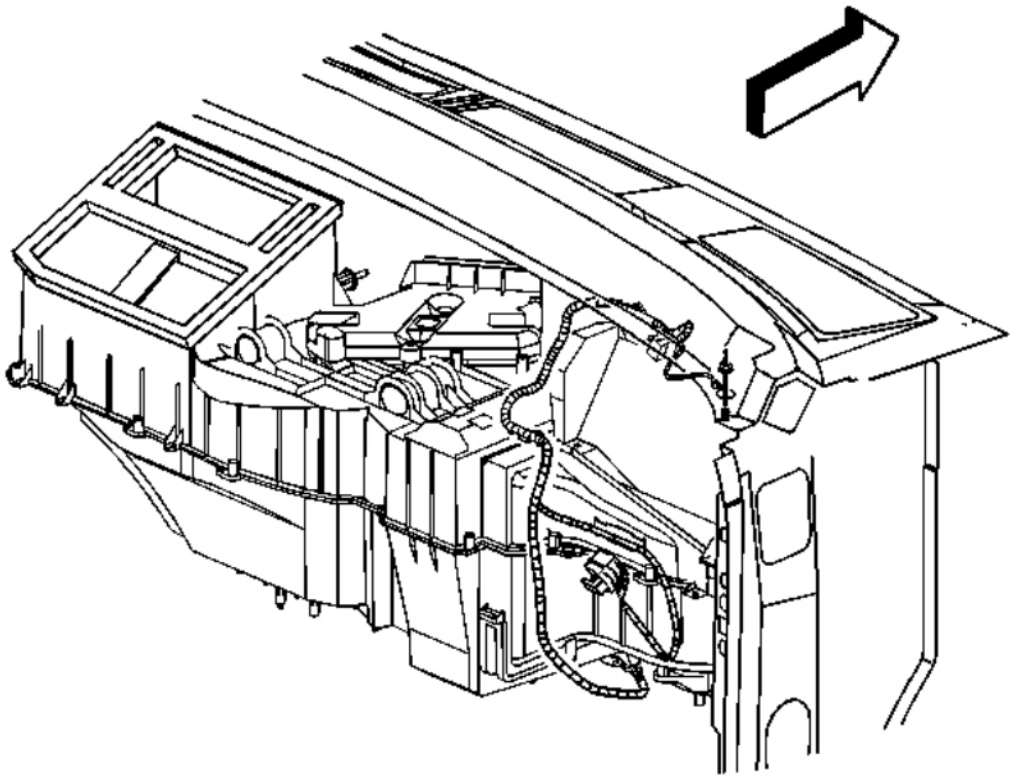


Fig. 132: View Of Electrical Connector At The Blower Motor
Courtesy of GENERAL MOTORS CORP.

4. Connect the electrical connector to the blower motor.

NOTE: Refer to Fastener Notice in Cautions and Notices.

5. Install the blower motor insulating cover screws.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

6. If equipped, install the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

BLOWER MOTOR REPLACEMENT (VISTEON)

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Removal Procedure

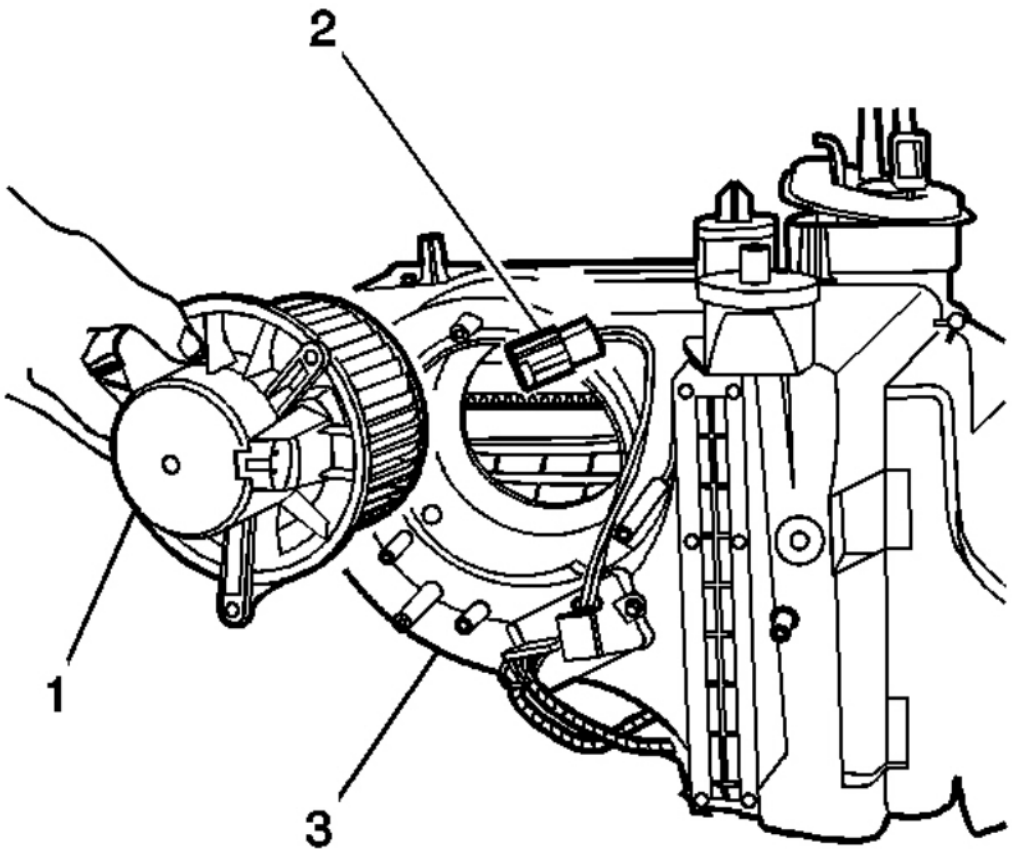


Fig. 133: Removing/Installing Blower Motor Assembly
Courtesy of GENERAL MOTORS CORP.

1. Remove the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.
2. Disconnect the electrical connector (2) from the blower motor (1).
3. Remove the screws from the blower motor (1).
4. Remove the blower motor (1) from the HVAC module (3).
5. Remove the retainer from the blower motor wheel.

   Discard the retainer.

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6. Remove the blower motor wheel from the blower motor (1).

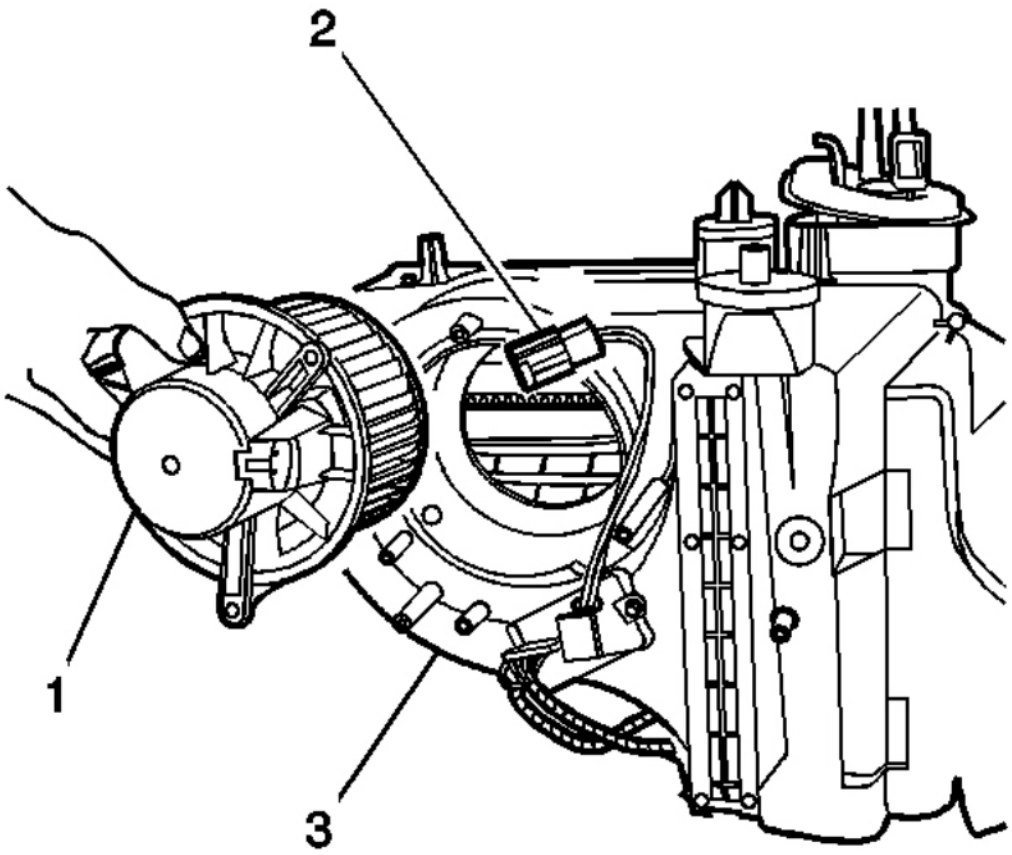
Installation Procedure

1. Install the blower motor wheel to the blower motor (1).
2. Install the New retainer to the blower motor wheel.
3. Install the blower motor (1) to the HVAC module (3).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the blower motor (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).



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Fig. 134: Removing/Installing Blower Motor Assembly
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connector (2) to the blower motor (1).
6. Install the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

BLOWER MOTOR IMPELLER REPLACEMENT (VISTEON)

Removal Procedure

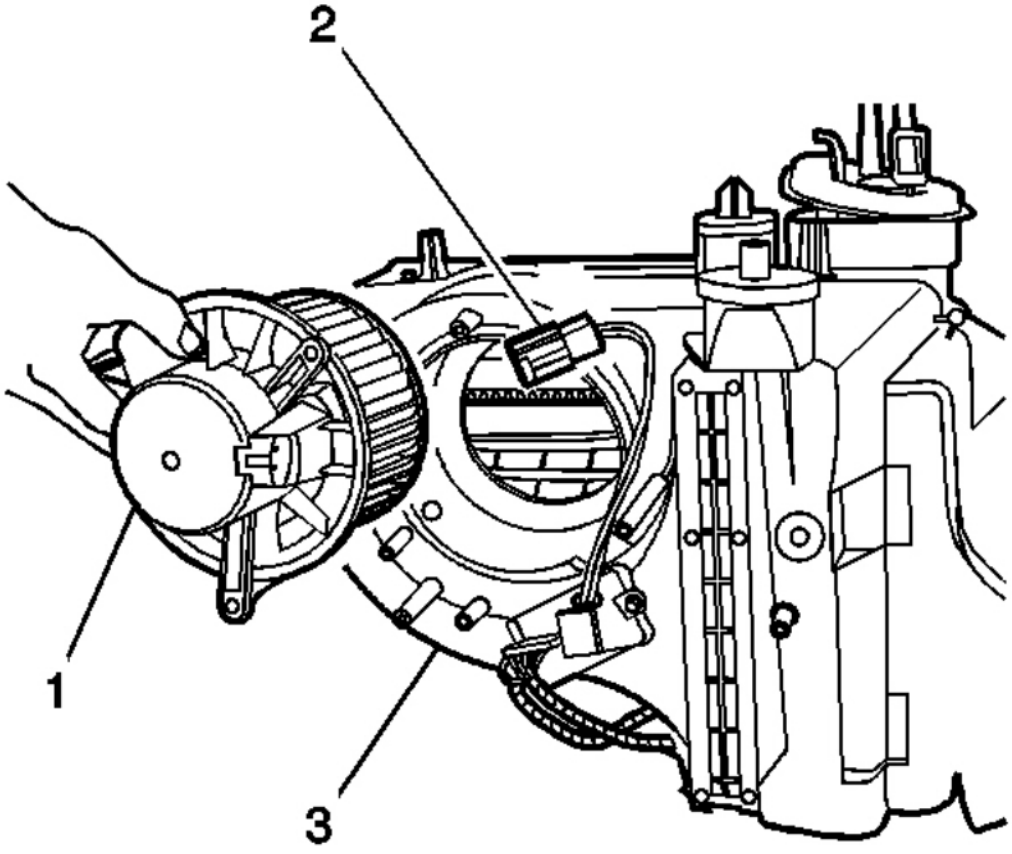


Fig. 135: Removing/Installing Blower Motor Assembly
Courtesy of GENERAL MOTORS CORP.

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1. Remove the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.
2. Disconnect the electrical connector (2) from the blower motor (1).
3. Remove the screws from the blower motor (1).
4. Remove the blower motor (1) from the HVAC module (3).
5. Remove the retainer from the blower motor impeller.

   Discard the retainer.

6. Remove the blower motor impeller from the blower motor (1).

Installation Procedure

1. Install the blower motor impeller to the blower motor (1).
2. Install the new retainer to the blower motor impeller.
3. Install the blower motor (1) to the HVAC module (3).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the blower motor (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

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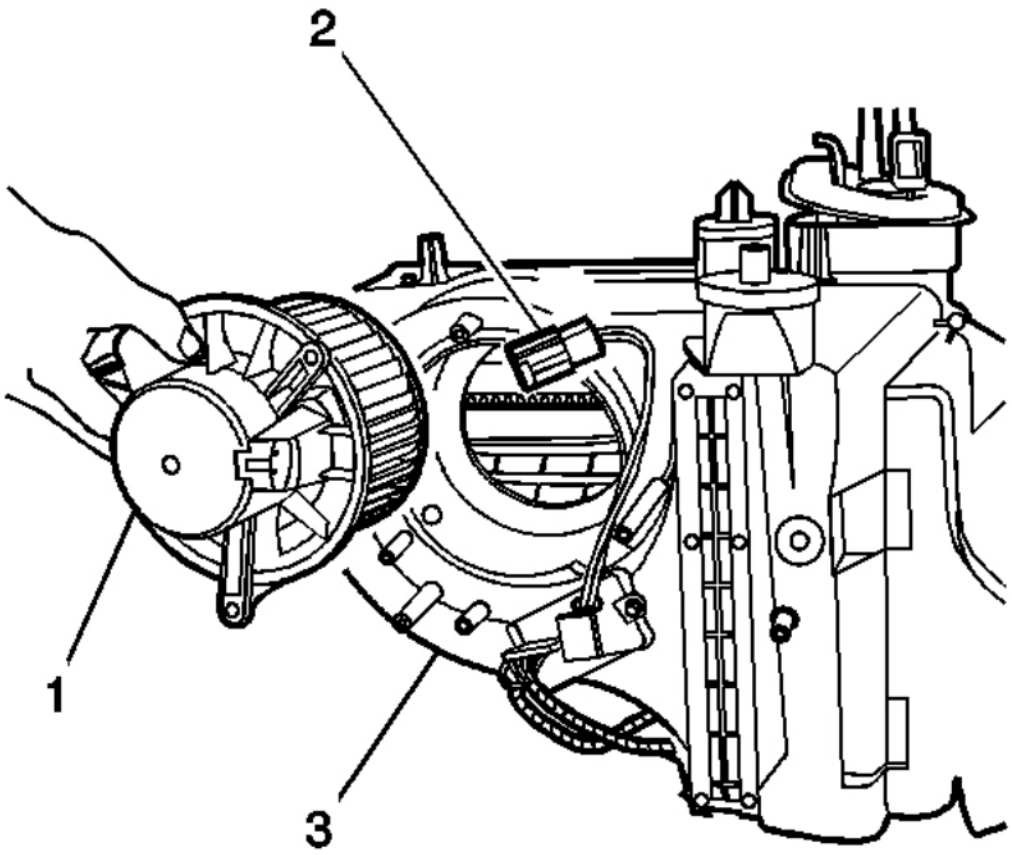


Fig. 136: Removing/Installing Blower Motor Assembly
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connector (2) to the blower motor (1).
6. Install the sound insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

AIR DISTRIBUTOR DUCT REPLACEMENT

Removal Procedure

1. Remove the instrument panel (I/P) trim panel. Refer to **Instrument Panel (I/P) Assembly Replacement** in Instrument Panel, Gages, and Console.

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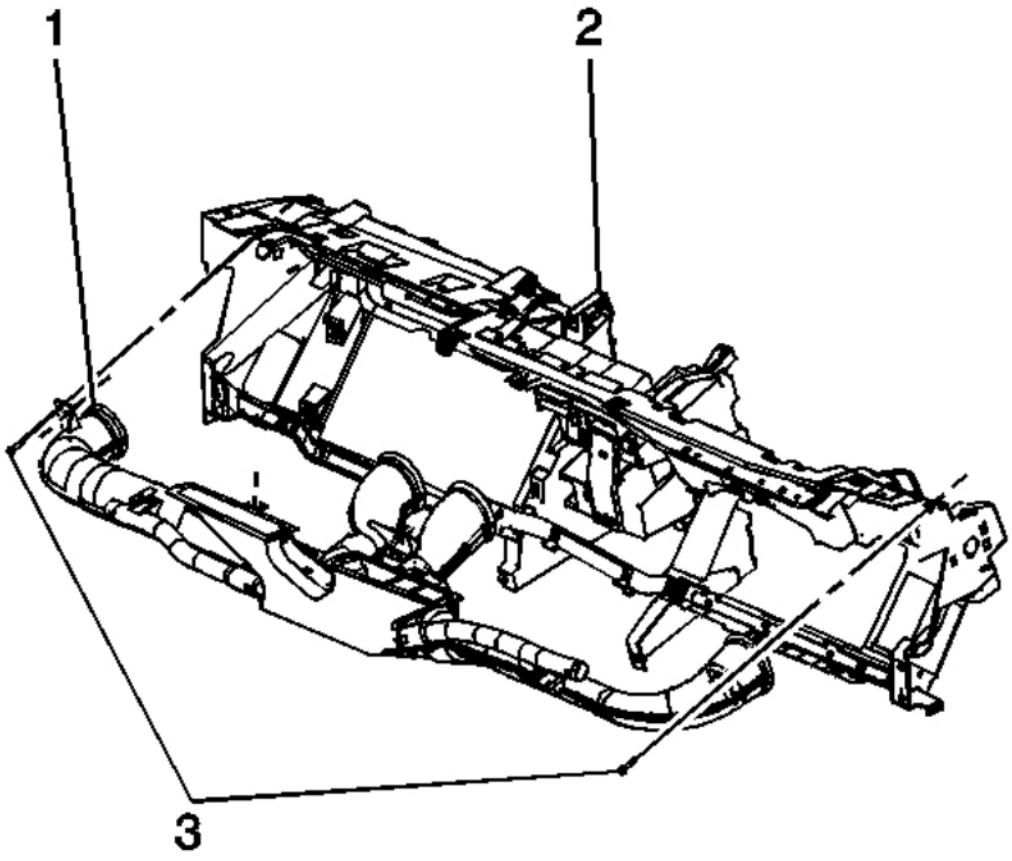


Fig. 137: View Of Air Distribution Duct & Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the screws (3) from the air distribution duct (1).
3. Remove the air distribution duct (1) from the I/P trim panel (2).

Installation Procedure

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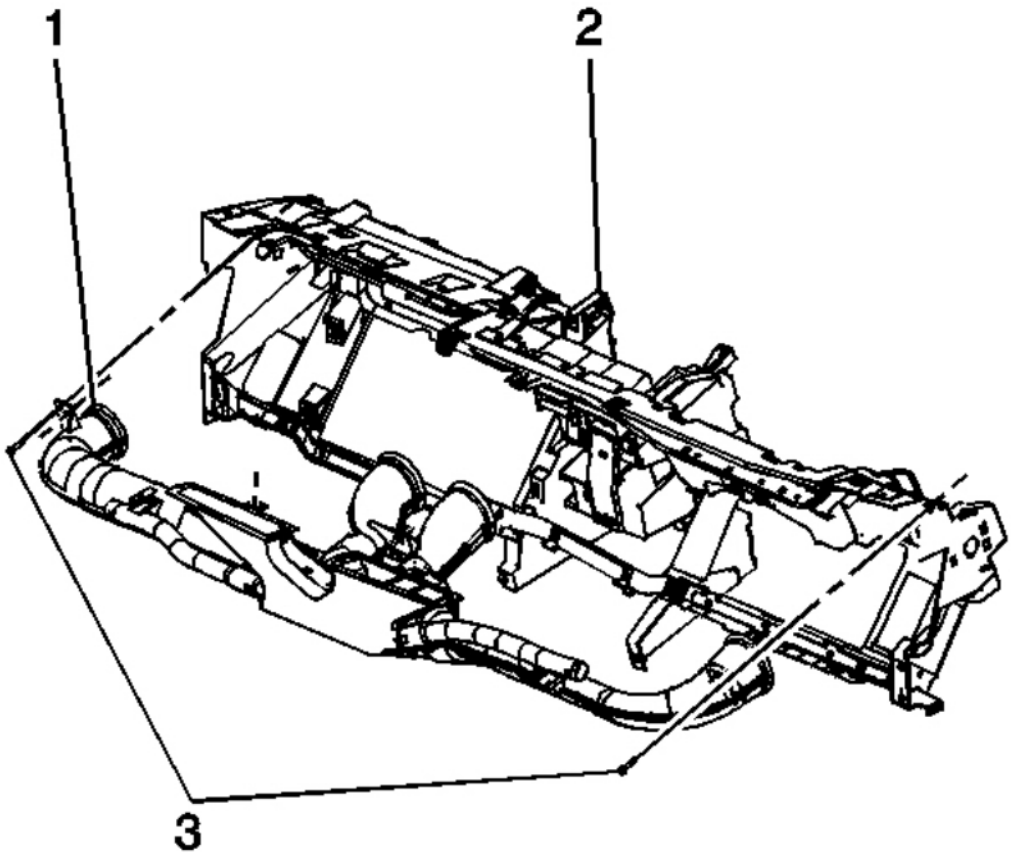


Fig. 138: View Of Air Distribution Duct & Screws
Courtesy of GENERAL MOTORS CORP.

1. Install the air distribution duct (1) to the I/P trim panel (2).

NOTE: **Refer to Fastener Notice .**

2. Install the screws (3) to the air distribution duct (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

3. Install the I/P trim panel. Refer to **Instrument Panel (I/P) Assembly Replacement** in Instrument Panel, Gages, and Console.

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DEFLECTOR REPLACEMENT - INSTRUMENT PANEL AIR - LEFT

Removal Procedure

1. Remove the instrument panel (I/P) bezel. Refer to **Bezel Replacement - Instrument Panel (I/P) Cluster** in Instrument Panel, Gages, and Console.
2. Remove the knee bolster. Refer to **Knee Bolster Replacement**

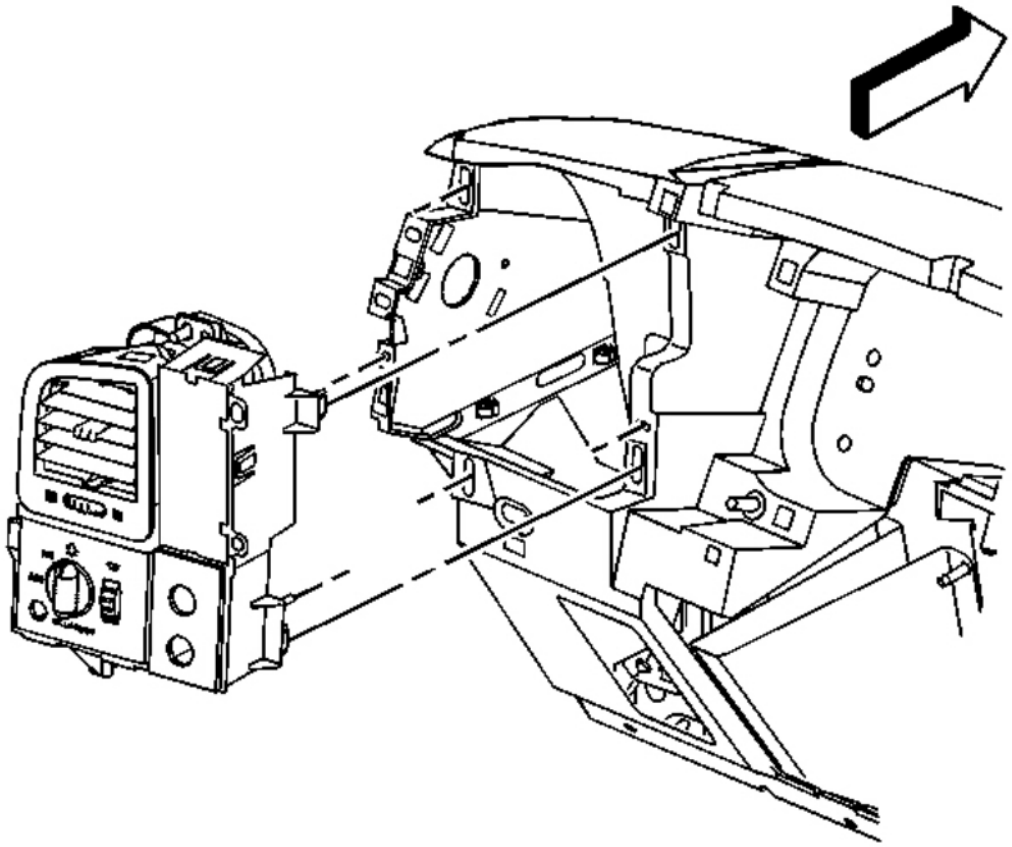


Fig. 139: Removing/Installing Air Deflector Housing (Left)
Courtesy of GENERAL MOTORS CORP.

3. Remove the air deflector housing from the I/P by prying it out.
4. Disconnect the electrical connectors.
5. Remove the air deflector screws.

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6. Remove the air deflector from the housing.

Installation Procedure

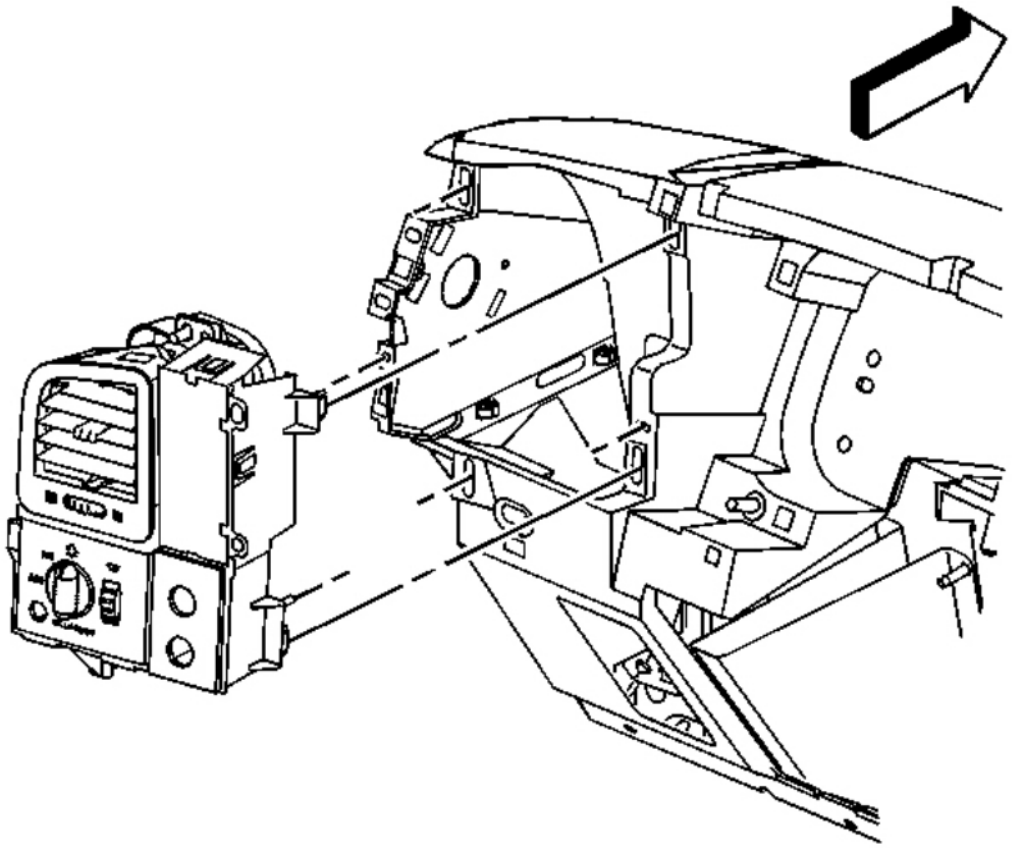


Fig. 140: Removing/Installing Air Deflector Housing (Left)
Courtesy of GENERAL MOTORS CORP.

1. Install the air deflector to the housing.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the retaining screws.

Tighten: Tighten the screws to 1.6 N.m (14 lb in).

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3. Connect the electrical connectors.
4. Install the air deflector assembly to the I/P.
5. Remove the knee bolster. Refer to **Knee Bolster Replacement**
6. Install the I/P bezel. Refer to **Bezel Replacement - Instrument Panel (I/P) Cluster** in Instrument Panel, Gages, and Console.

DEFLECTOR REPLACEMENT - INSTRUMENT PANEL AIR - CENTER

Removal Procedure

1. Remove the instrument panel (I/P) bezel. Refer to **Bezel Replacement - Instrument Panel (I/P) Cluster** in Instrument Panel, Gages, and Console.
2. Remove the I/P trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** in Instrument Panel, Gages, and Console.

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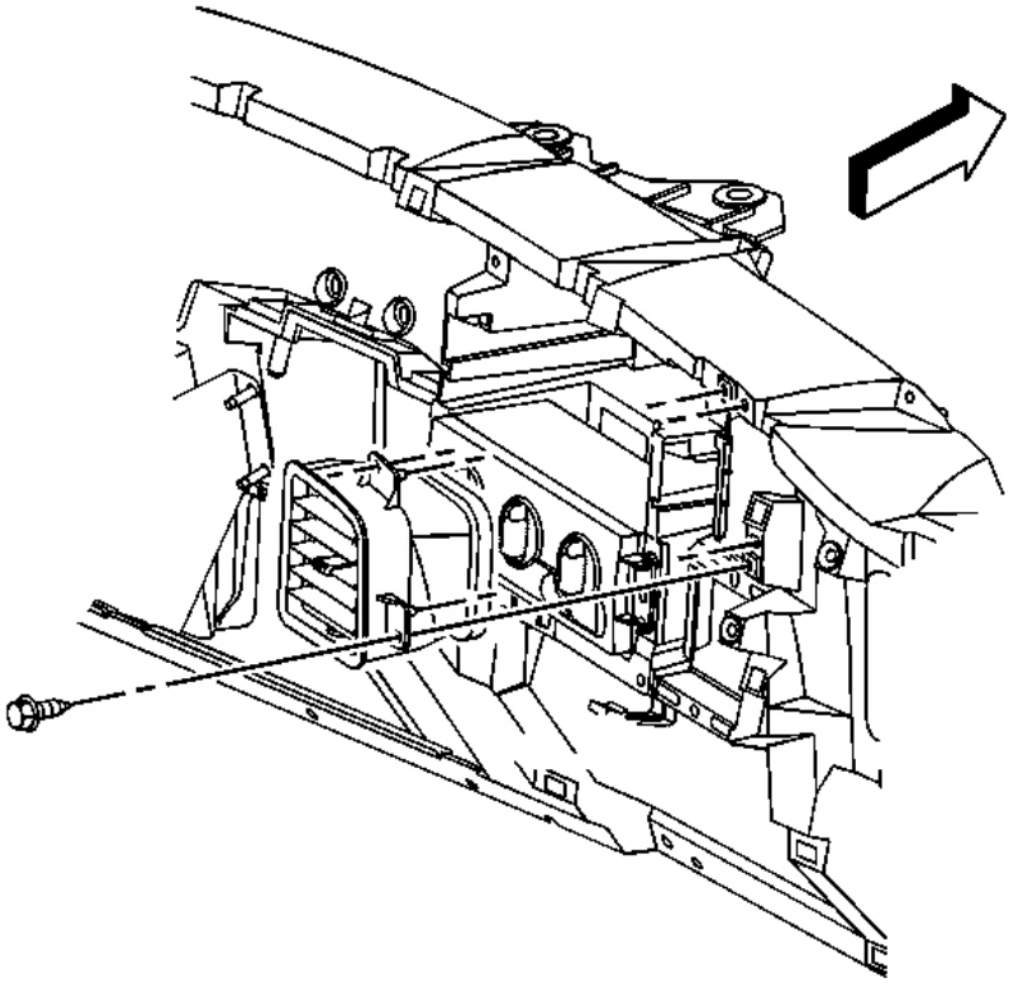


Fig. 141: Removing/Installing Deflector Mounting Screws (Center)
Courtesy of GENERAL MOTORS CORP.

3. Remove the deflector mounting screws.
4. Remove the deflector from the I/P.

Installation Procedure

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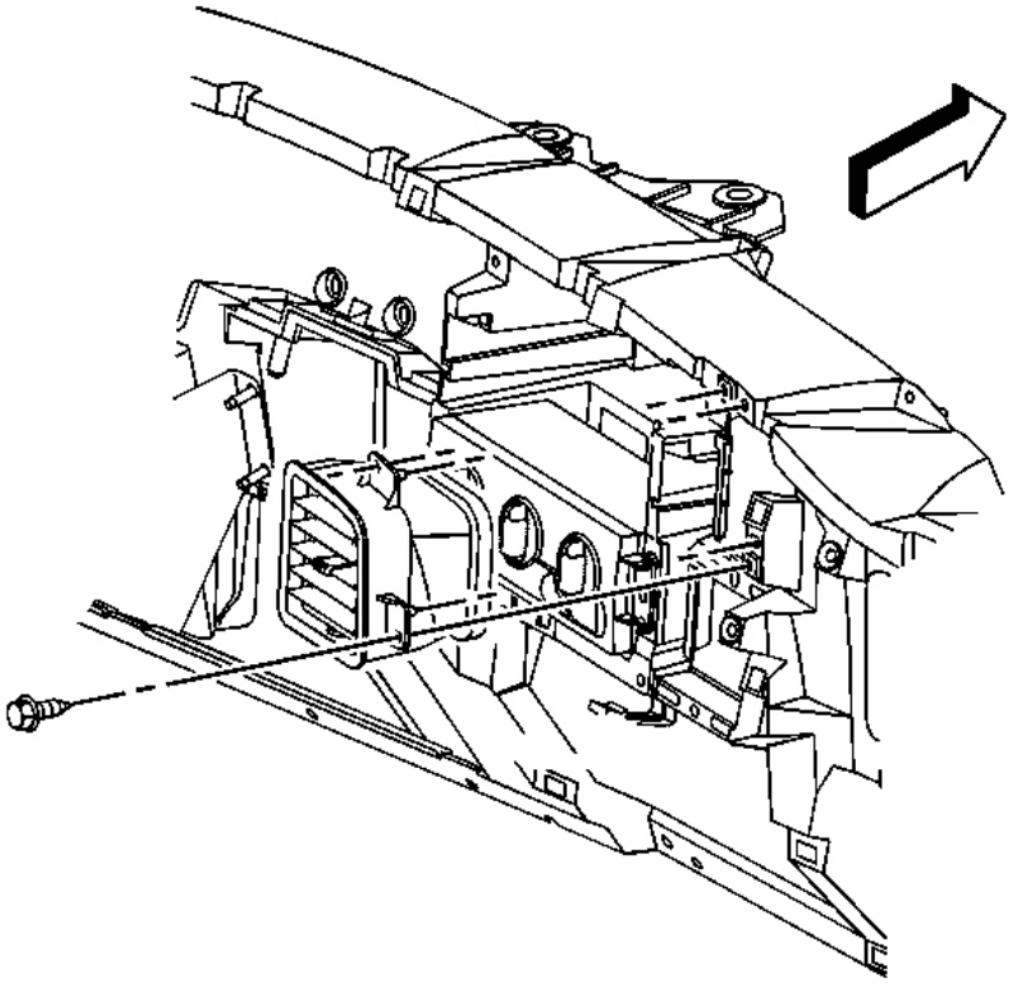


Fig. 142: Removing/Installing Deflector Mounting Screws (Center)
Courtesy of GENERAL MOTORS CORP.

1. Install the deflector to the I/P.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the deflector mounting screws.

Tighten: Tighten the screw to 1.6 N.m (14 lb in).

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3. Install the I/P trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** in Instrument Panel, Gages, and Console.
4. Install the I/P bezel. Refer to **Bezel Replacement - Instrument Panel (I/P) Cluster** in Instrument Panel, Gages, and Console.

DEFLECTOR REPLACEMENT - INSTRUMENT PANEL AIR - RIGHT

Removal Procedure

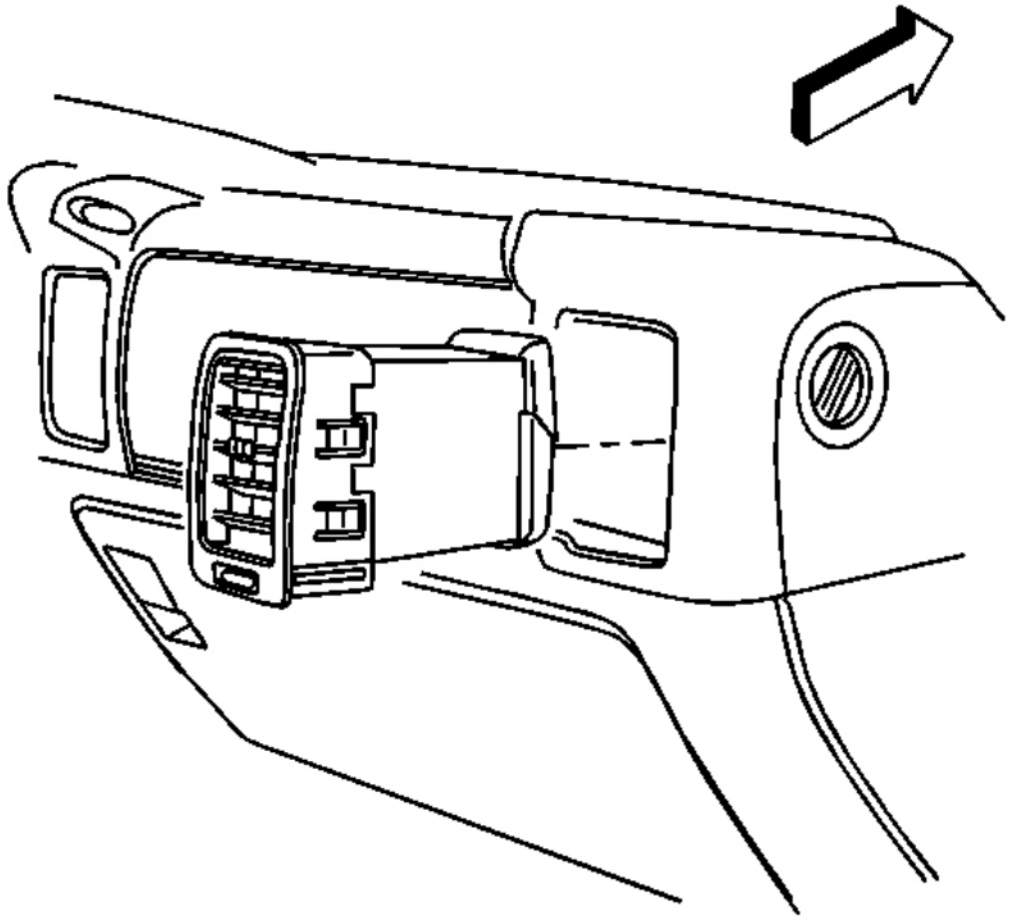


Fig. 143: Removing/Installing Air Deflector (Right)
Courtesy of GENERAL MOTORS CORP.

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1. Use a flat blade tool in order to remove the deflector from the instrument panel.
2. Remove the deflector.

Installation Procedure

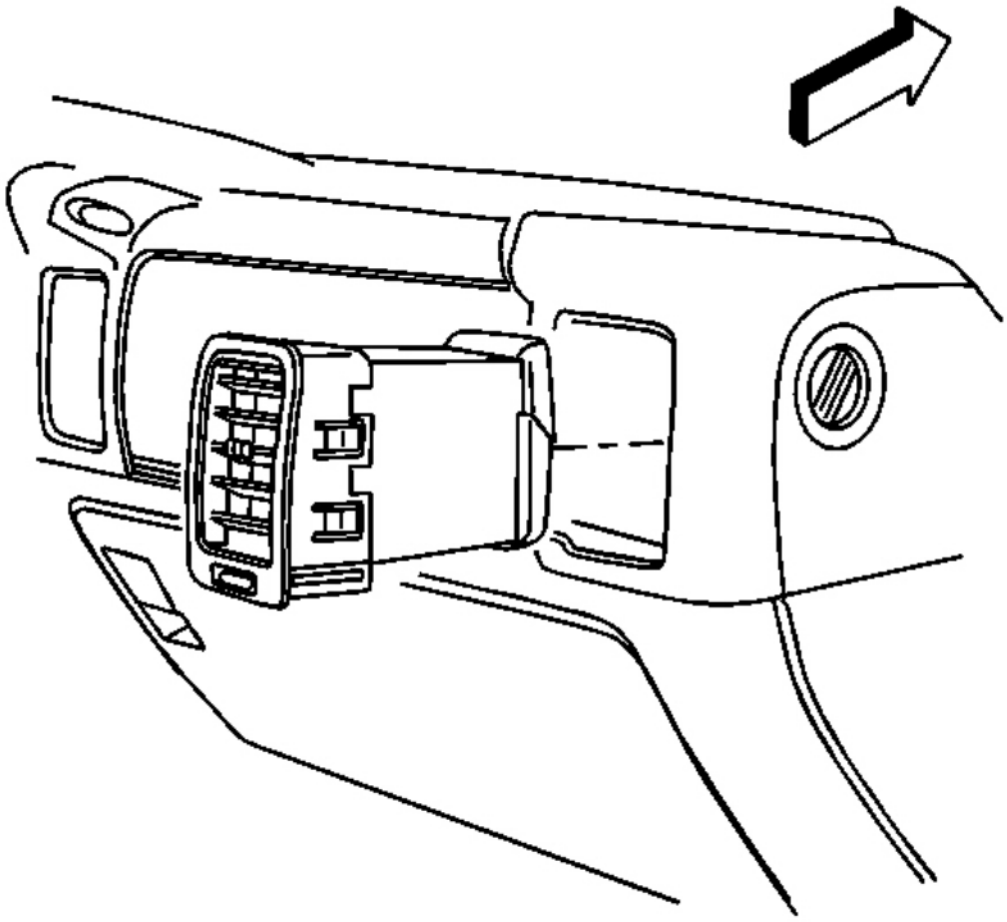


Fig. 144: Removing/Installing Air Deflector (Right)
Courtesy of GENERAL MOTORS CORP.

1. Align the deflector into the opening in the instrument panel.
2. Push the deflector into the instrument panel until the deflector snaps into place.

AIR OUTLET REPLACEMENT - REAR FLOOR

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Removal Procedure

1. Remove the floor console. Refer to **Console Replacement (w/Console Mounting Bracket)** or **Console Replacement (w/o Console Mounting Bracket)** in Instrument Panel, Gages, and Console.
2. Remove the seats. Refer to **Seat Replacement - Center** in Seats.
3. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
4. Roll the carpeting back to expose the rear floor air ducts.

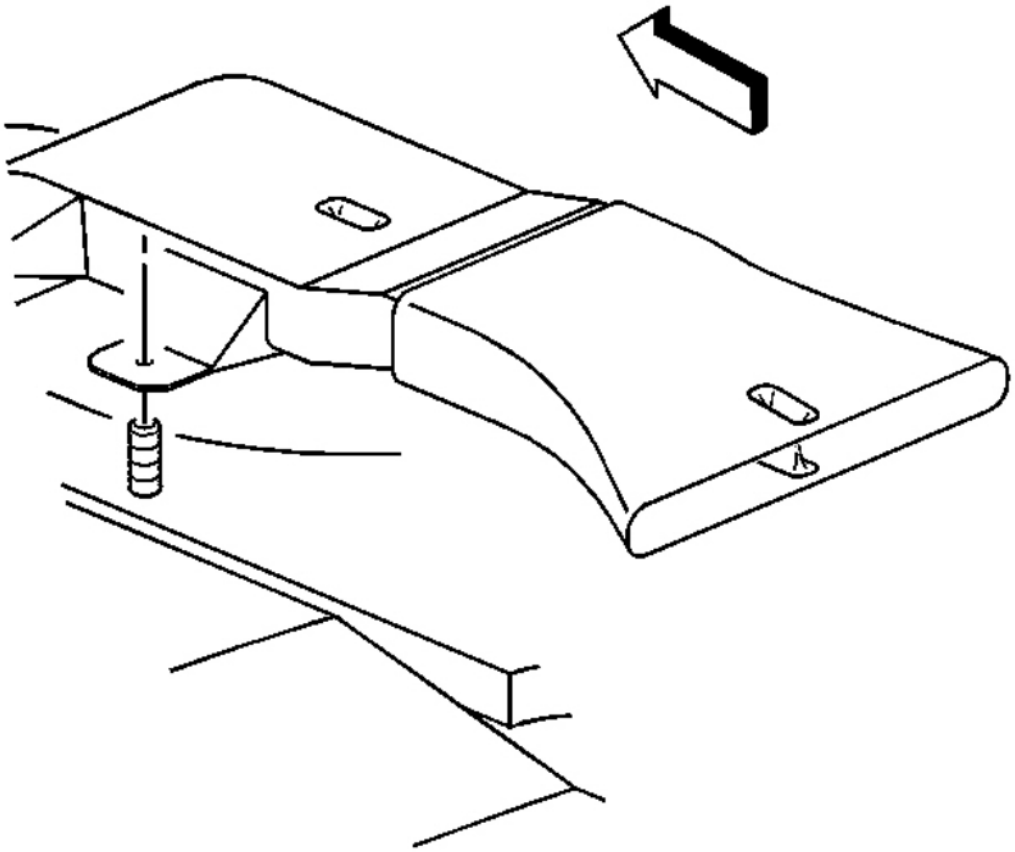


Fig. 145: View Of Rear Floor Ducts At Floor Studs
Courtesy of GENERAL MOTORS CORP.

5. Remove the rear floor ducts from the floor studs.

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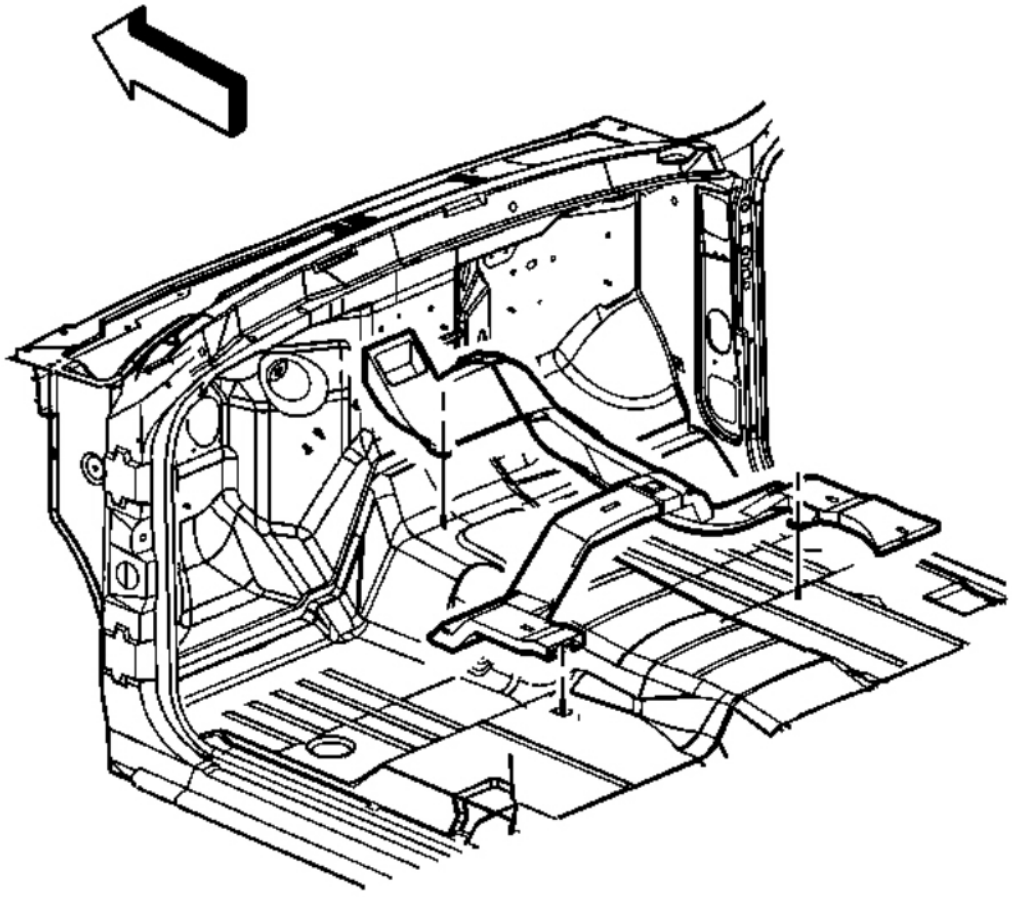


Fig. 146: View Of Rear Floor Duct
Courtesy of GENERAL MOTORS CORP.

6. Remove the rear floor duct.

Installation Procedure

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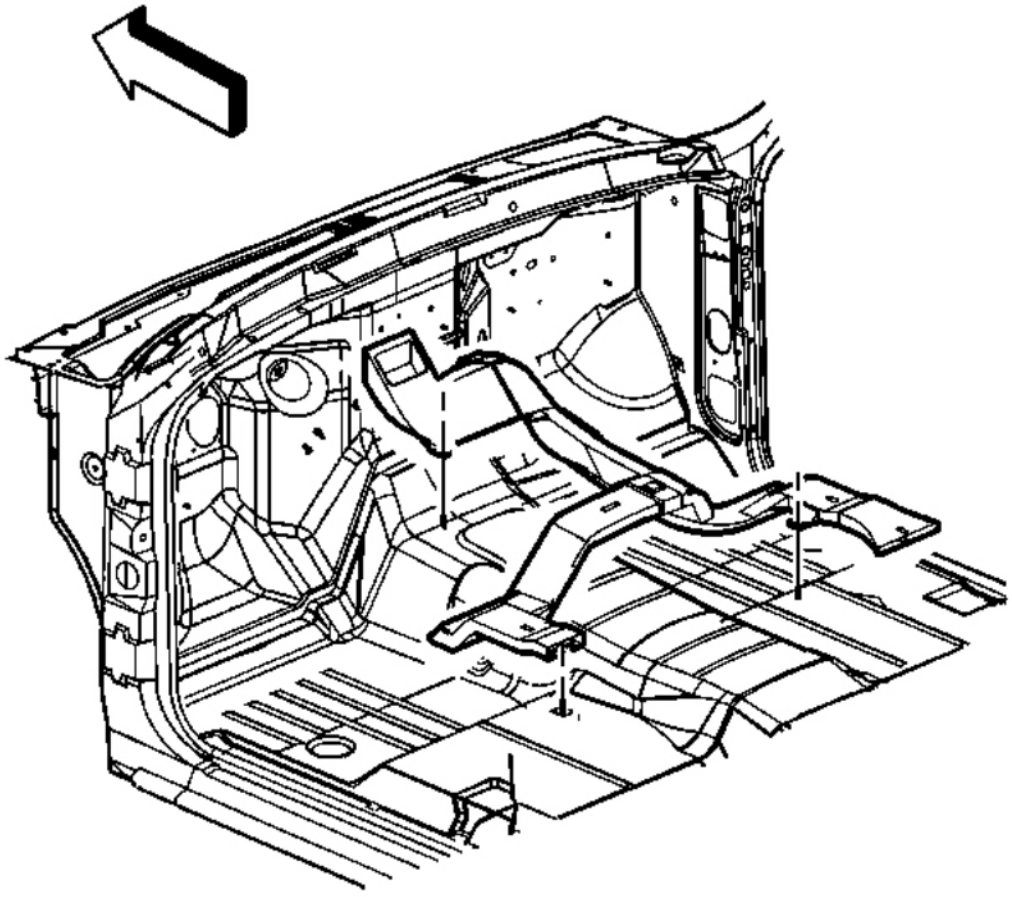


Fig. 147: View Of Rear Floor Duct
Courtesy of GENERAL MOTORS CORP.

1. Install the rear floor air duct.

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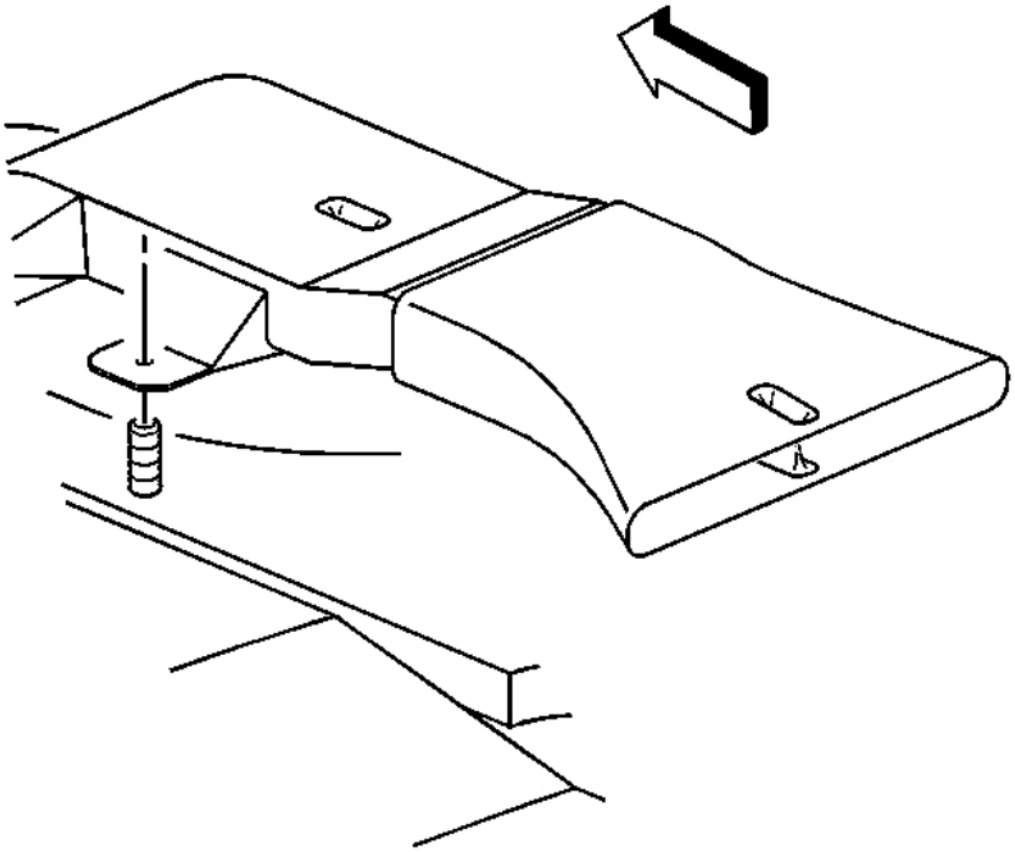


Fig. 148: View Of Rear Floor Ducts At Floor Studs
Courtesy of GENERAL MOTORS CORP.

2. Install the rear floor ducts from the floor studs.
3. Position the carpeting back into place.
4. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
5. Install the seats. Refer to **Seat Replacement - Center** in Seats.
6. Install the floor console. Refer to **Console Replacement (w/Console Mounting Bracket)** or **Console Replacement (w/o Console Mounting Bracket)** in Instrument Panel, Gages, and Console.

AIR OUTLET DUCT REPLACEMENT - FLOOR, LH

Removal Procedure

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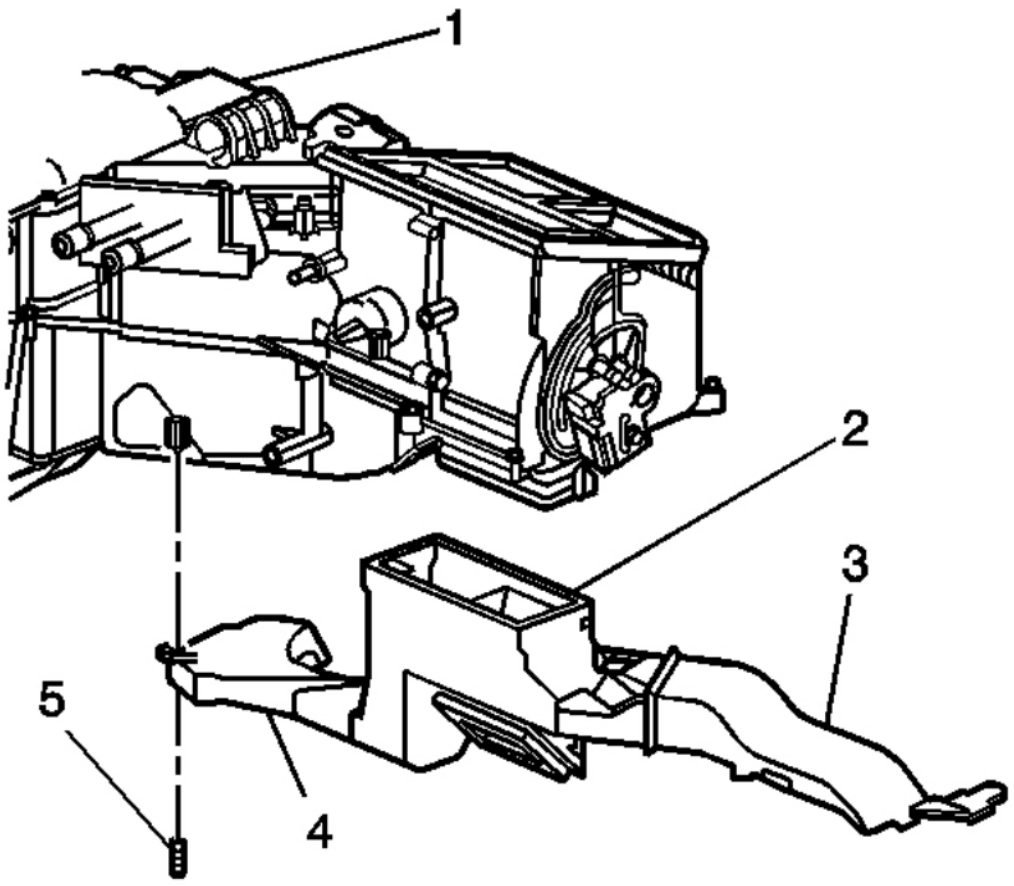


Fig. 149: View Of Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the push pin (5) from the left floor air outlet duct (4).
2. Remove the left floor duct (1) from the HVAC module (2).

Installation Procedure

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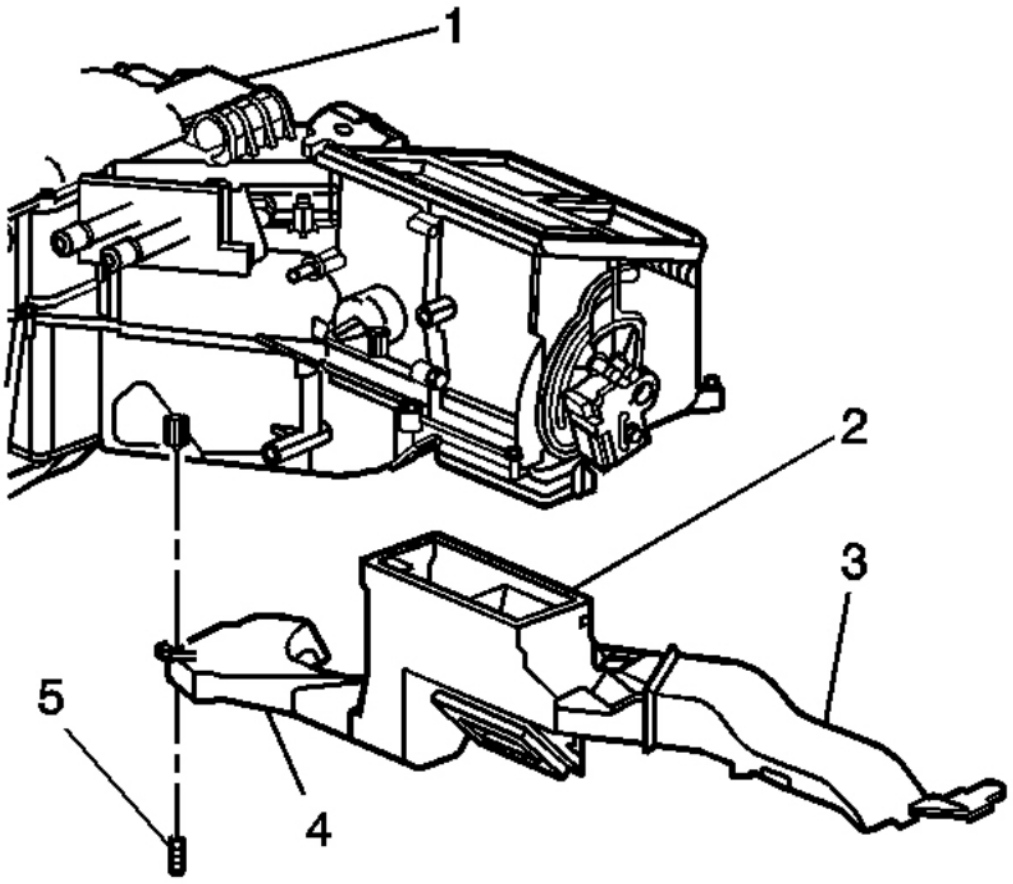


Fig. 150: View Of Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Install the left floor air outlet duct (1) to the HVAC module (2).
2. Install the push pin (2) to the left floor air outlet duct.

AIR OUTLET DUCT REPLACEMENT - FLOOR, RH

Removal Procedure

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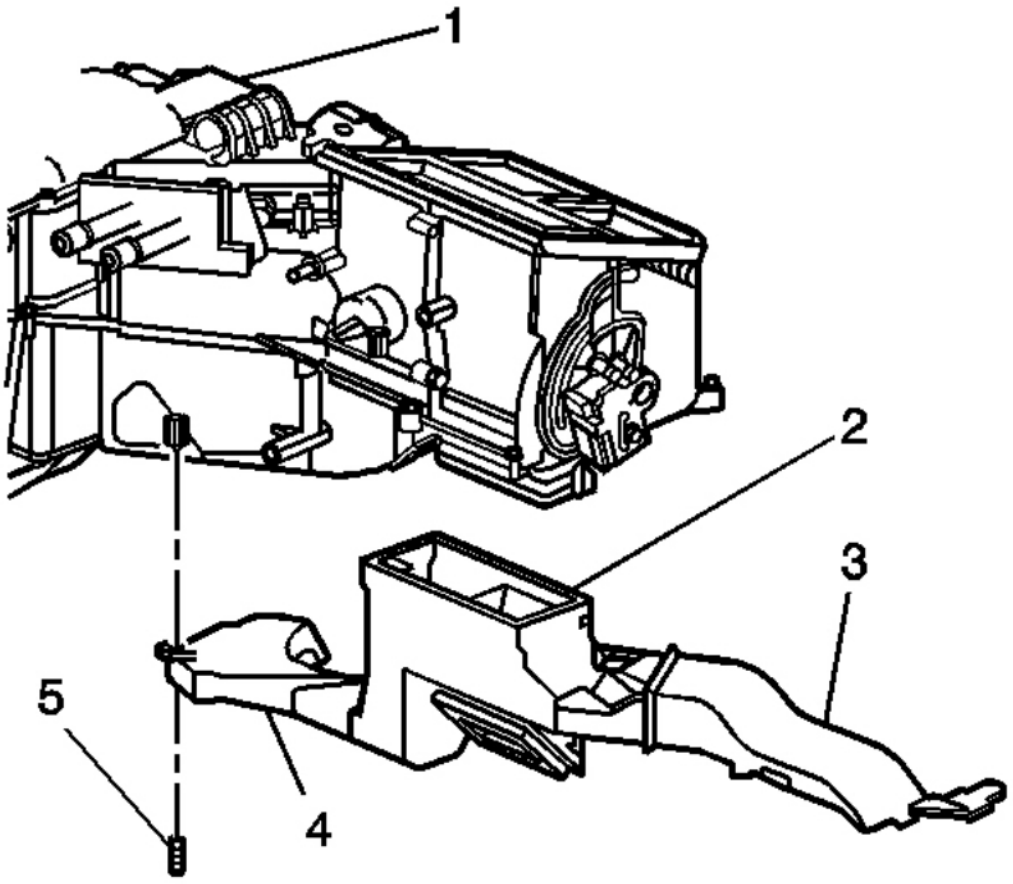


Fig. 151: View Of Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the right closeout/insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.
2. Remove the screw from the right floor air outlet duct (3).
3. Remove the right floor air outlet duct (3) from the HVAC module (2).

Installation Procedure

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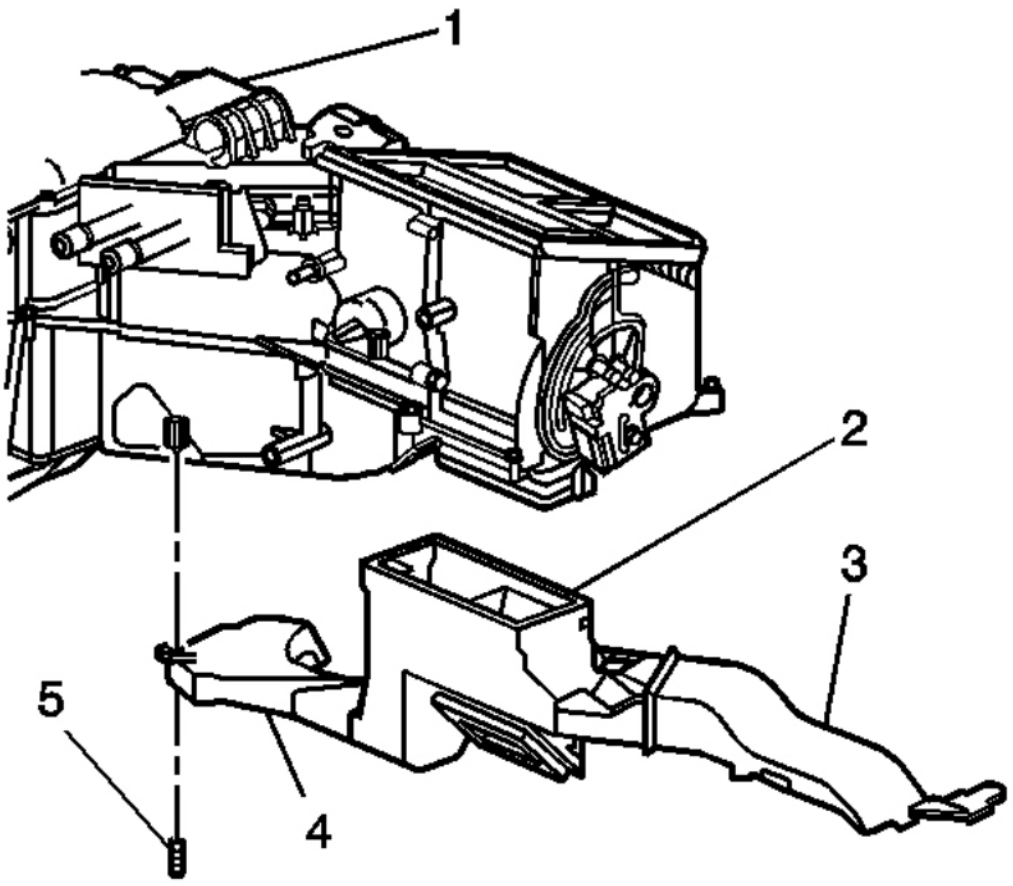


Fig. 152: View Of Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Install the right floor air outlet duct (3) to the HVAC module (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the screw to the right floor air outlet duct (3).

   Tighten: Tighten the screw to 1.6 N.m (14 lb in).

3. Install the right closeout/insulator panel. Refer to **Insulator Replacement - Instrument Panel (I/P)** in Instrument Panel, Gages, and Console.

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AIR TEMPERATURE DOOR REPLACEMENT - RIGHT (VISTEON)

Removal Procedure

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.

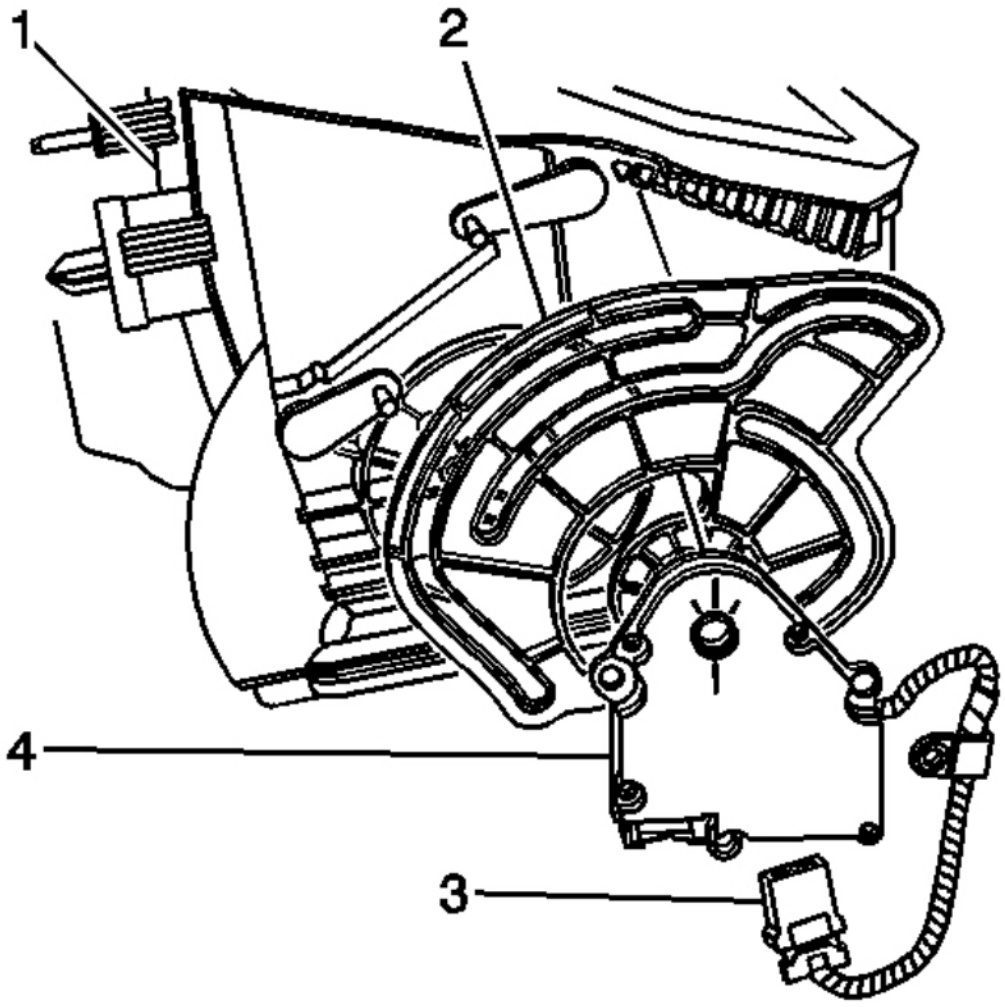


Fig. 153: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector (3) from the mode actuator (4).

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3. Remove the screws from the mode actuator (4).
4. Remove the mode actuator (4) from the HVAC module (1).
5. Remove the wiring harness from the air distribution housing (1).

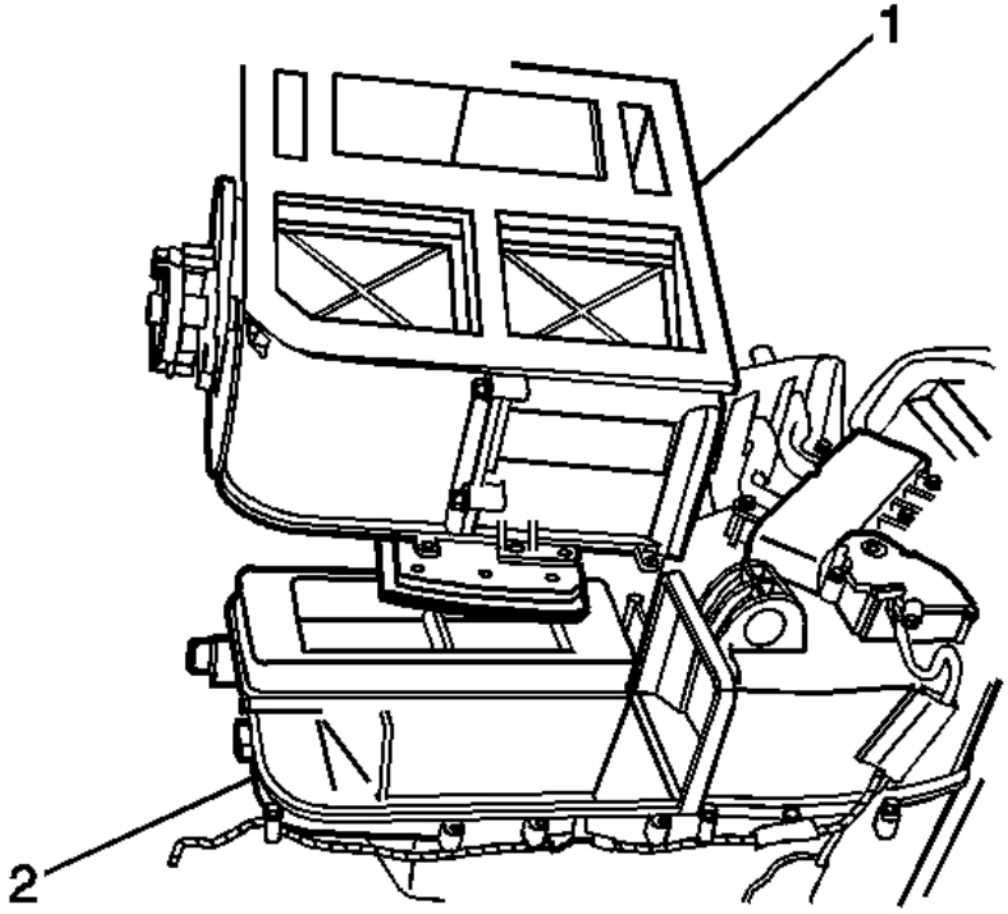


Fig. 154: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the screws from the air distribution housing (1).
7. Remove the air distribution housing (1) from the HVAC module (2).

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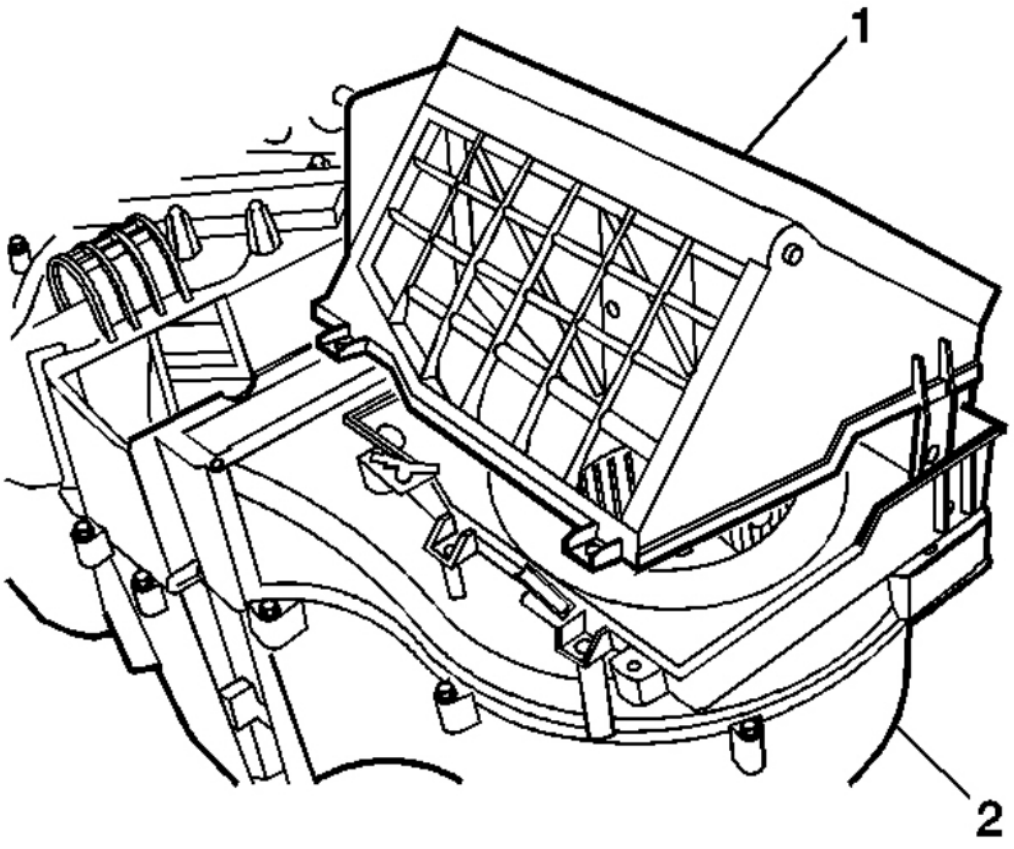


Fig. 155: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws from the upper recirculation housing (1).
9. Remove the upper recirculation housing (1) from the HVAC module (2).

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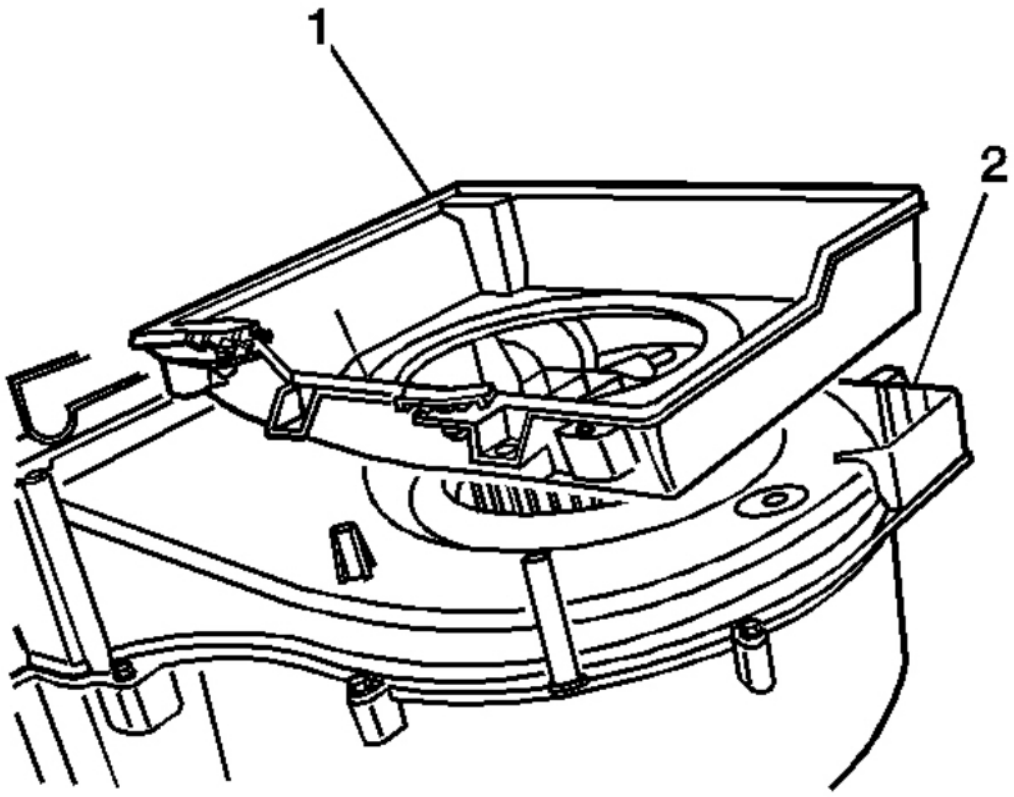


Fig. 156: View Of Upper And Lower Recirulation Housing
Courtesy of GENERAL MOTORS CORP.

10. Remove the screws from the lower recirculation housing (1).
11. Remove the lower recirculation housing (1) from the HVAC module (2).

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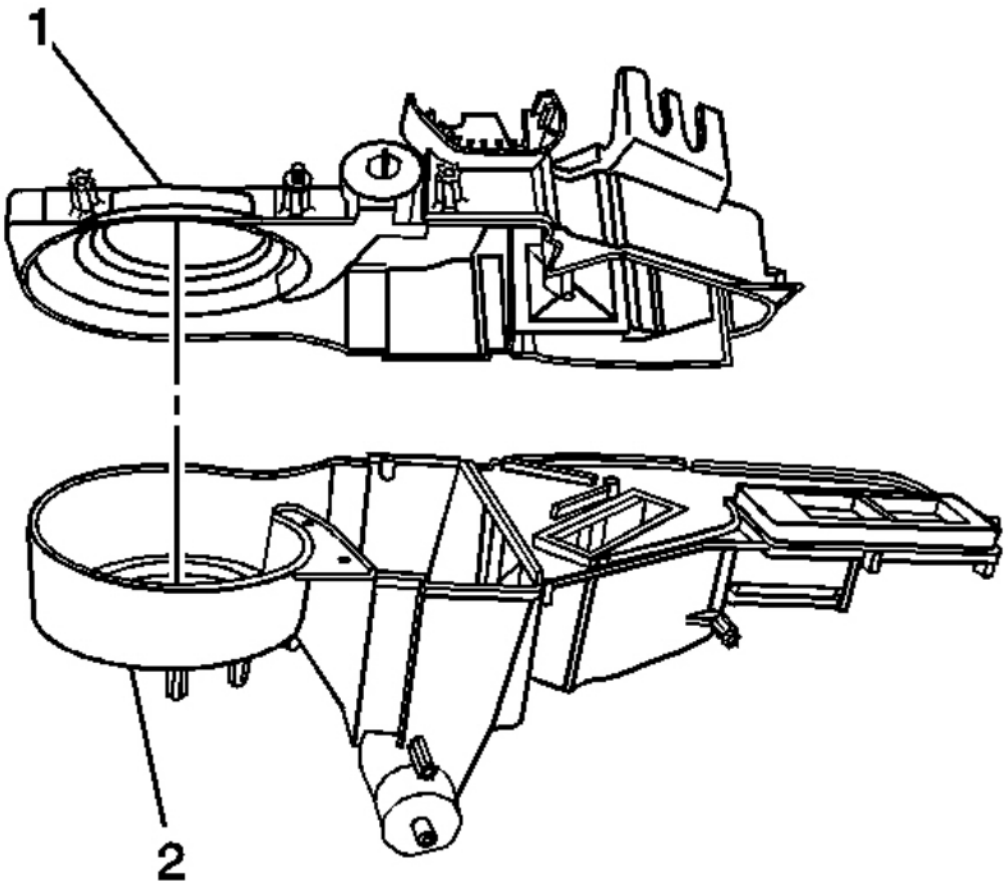


Fig. 157: Upper HVAC Module Case And Lower HVAC Module Case
Courtesy of GENERAL MOTORS CORP.

12. Remove the wiring harness from the HVAC module.
13. Remove the screws from the HVAC module.
14. Remove the upper HVAC module case (1) from the lower HVAC module case (2).

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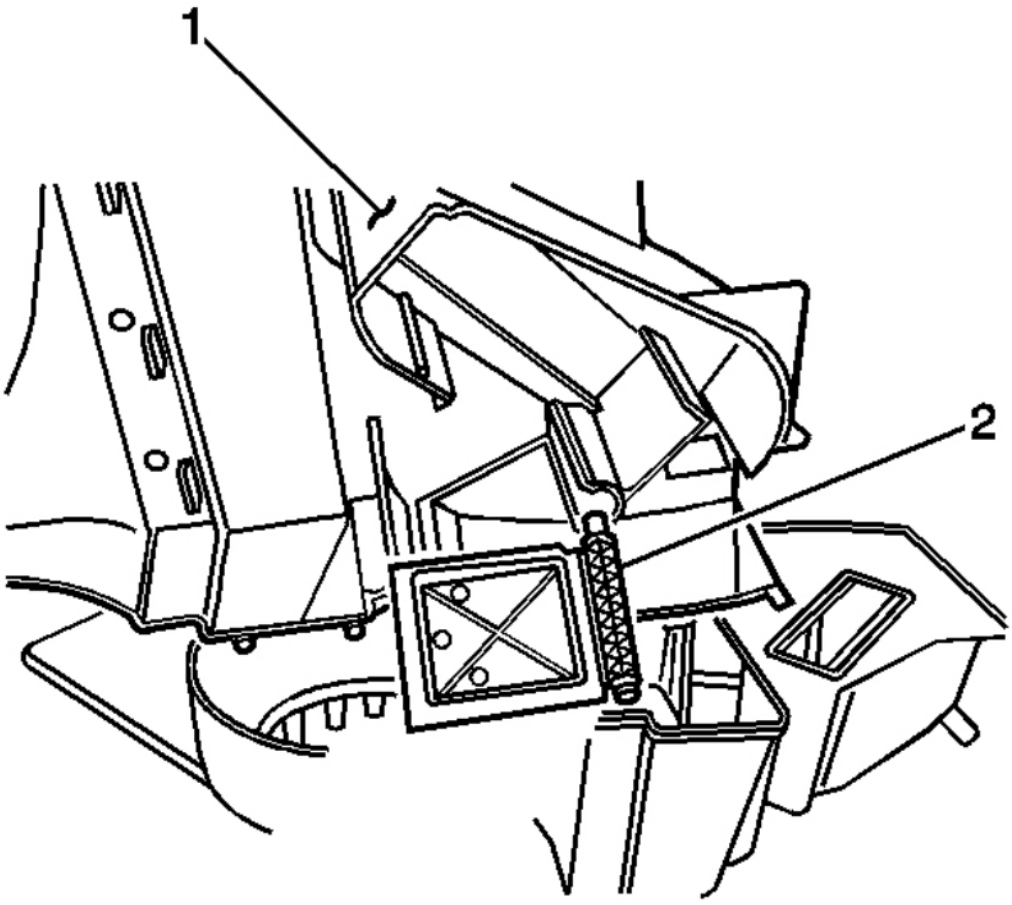


Fig. 158: Removing/Installing Right Temperature Door From The Upper HVAC Module Case (Visteon)
Courtesy of GENERAL MOTORS CORP.

15. Remove the right temperature door (2) from the upper HVAC module case (1).

Installation Procedure

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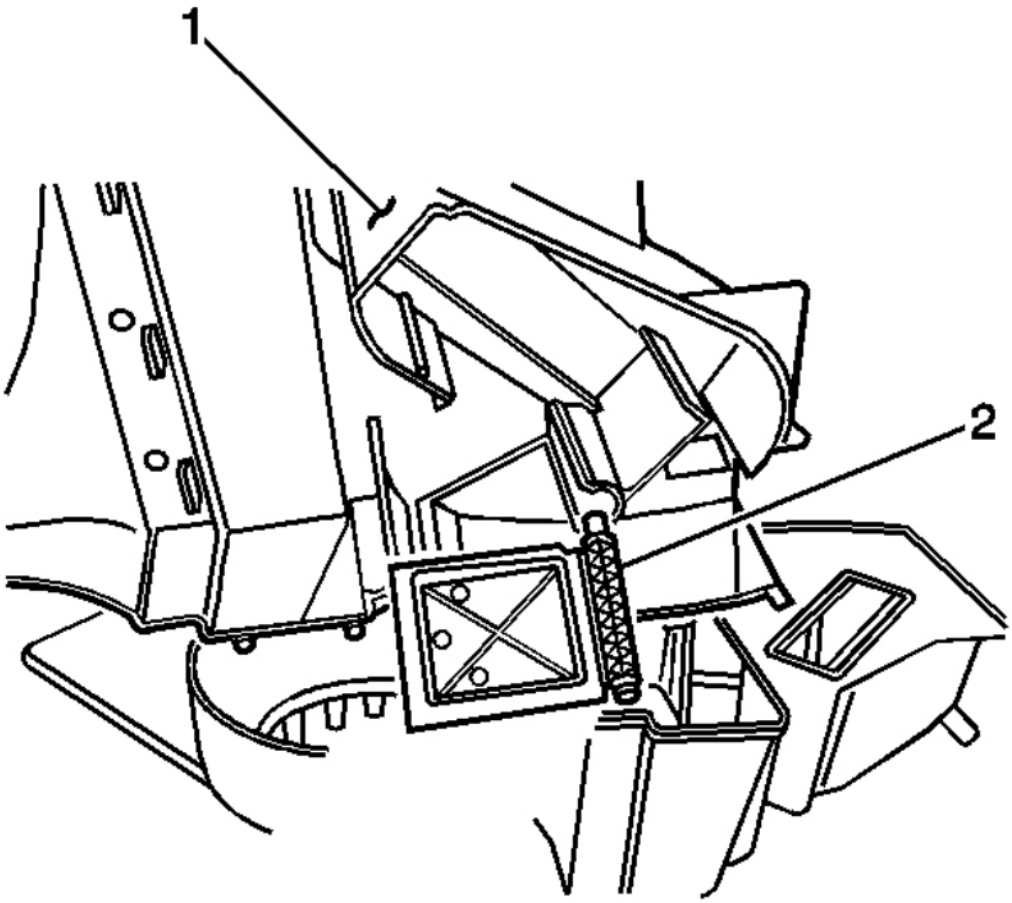


Fig. 159: Removing/Installing Right Temperature Door From The Upper HVAC Module Case (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the right temperature door (2) to the upper HVAC module case (1).
2. Install the upper HVAC module case (1) to the lower HVAC module case (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the HVAC module.

Tighten: Tighten the screws to 2 N.m (18 lb in).

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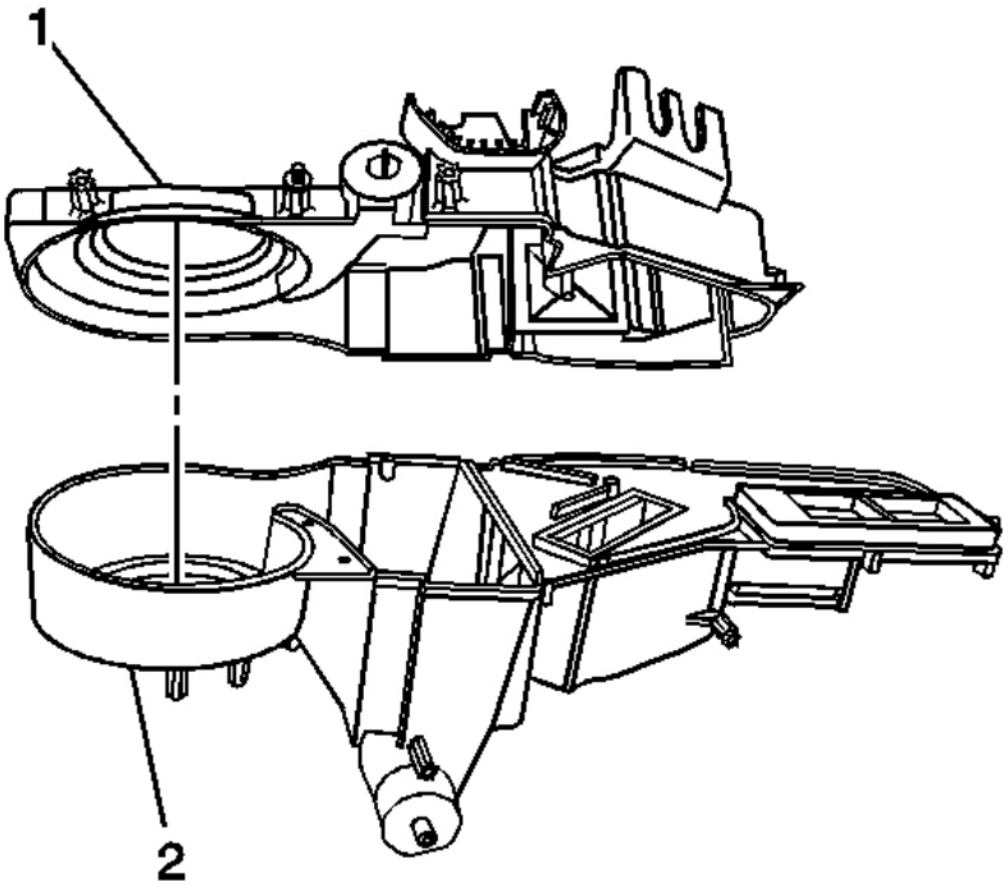


Fig. 160: Upper HVAC Module Case And Lower HVAC Module Case
Courtesy of GENERAL MOTORS CORP.

4. Install the wiring harness to the HVAC module.
5. Install the lower recirculation housing (1) to the HVAC module (2).

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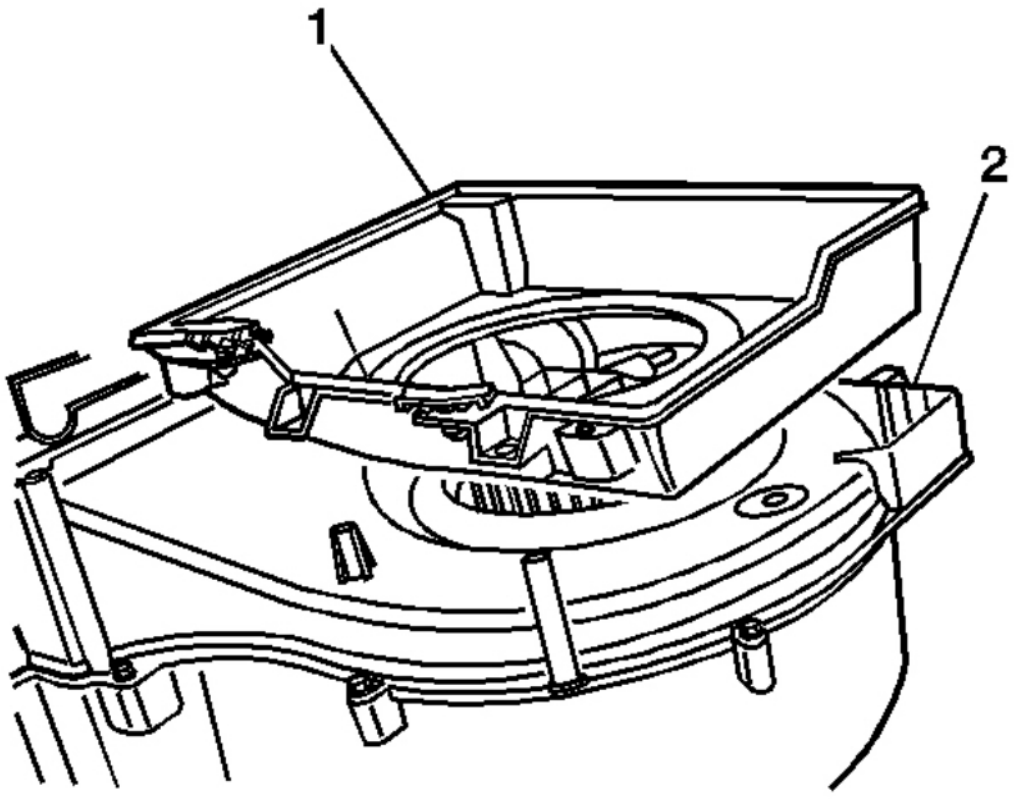


Fig. 161: View Of Upper And Lower Recirulation Housing
Courtesy of GENERAL MOTORS CORP.

6. Install the screws to the lower recirculation housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

7. Install the upper recirculation housing (1) to the HVAC module (2).

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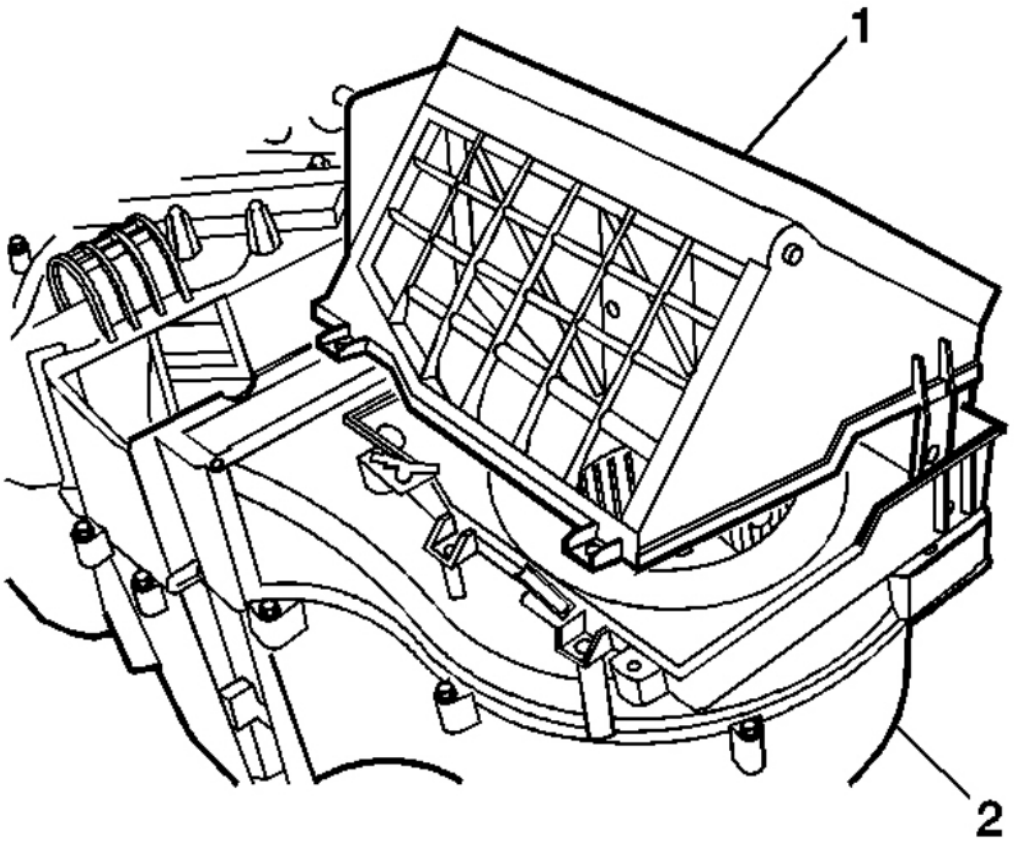


Fig. 162: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

8. Install the screws to the upper recirculation housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

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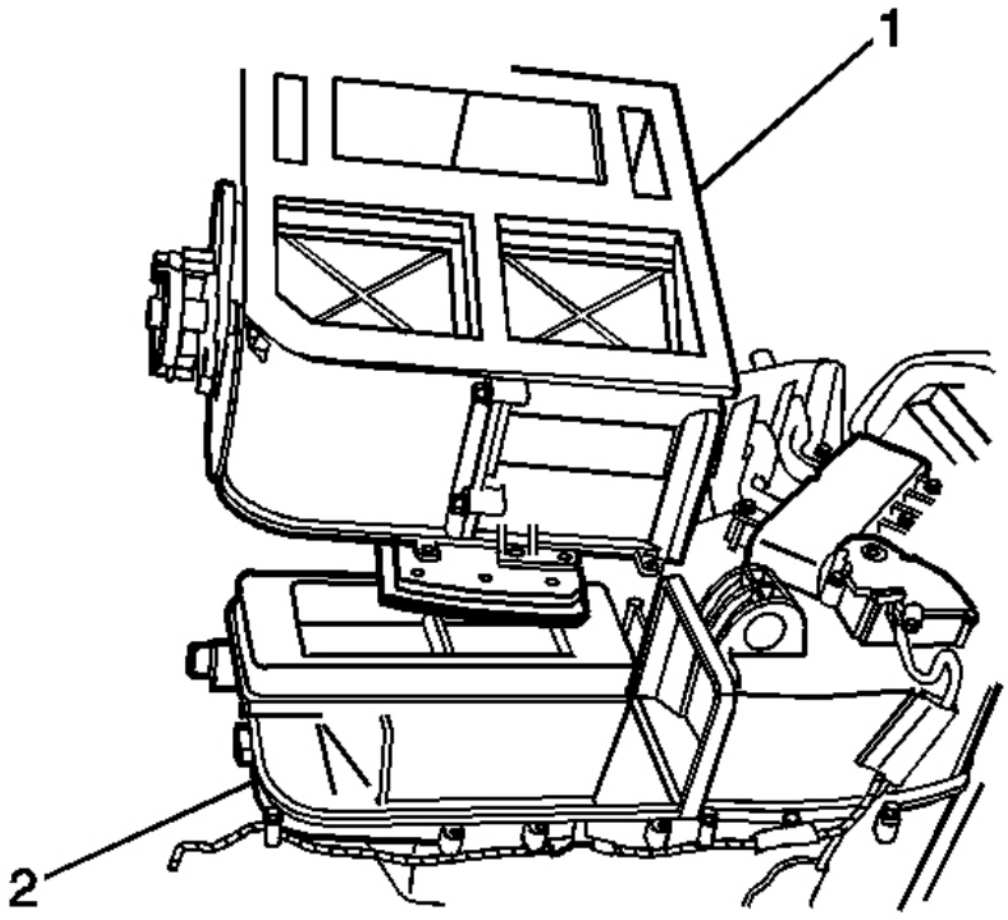


Fig. 163: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

9. Install the air distribution housing (1) to the HVAC module (2).
10. Install the screws to the air distribution housing (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

11. Install the wiring harness to the air distribution housing (1).
12. Install the mode actuator (4) to the HVAC module (1).
13. Install the screws to the mode actuator (4).

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Tighten: Tighten the screws to 2 N.m (18 lb in).

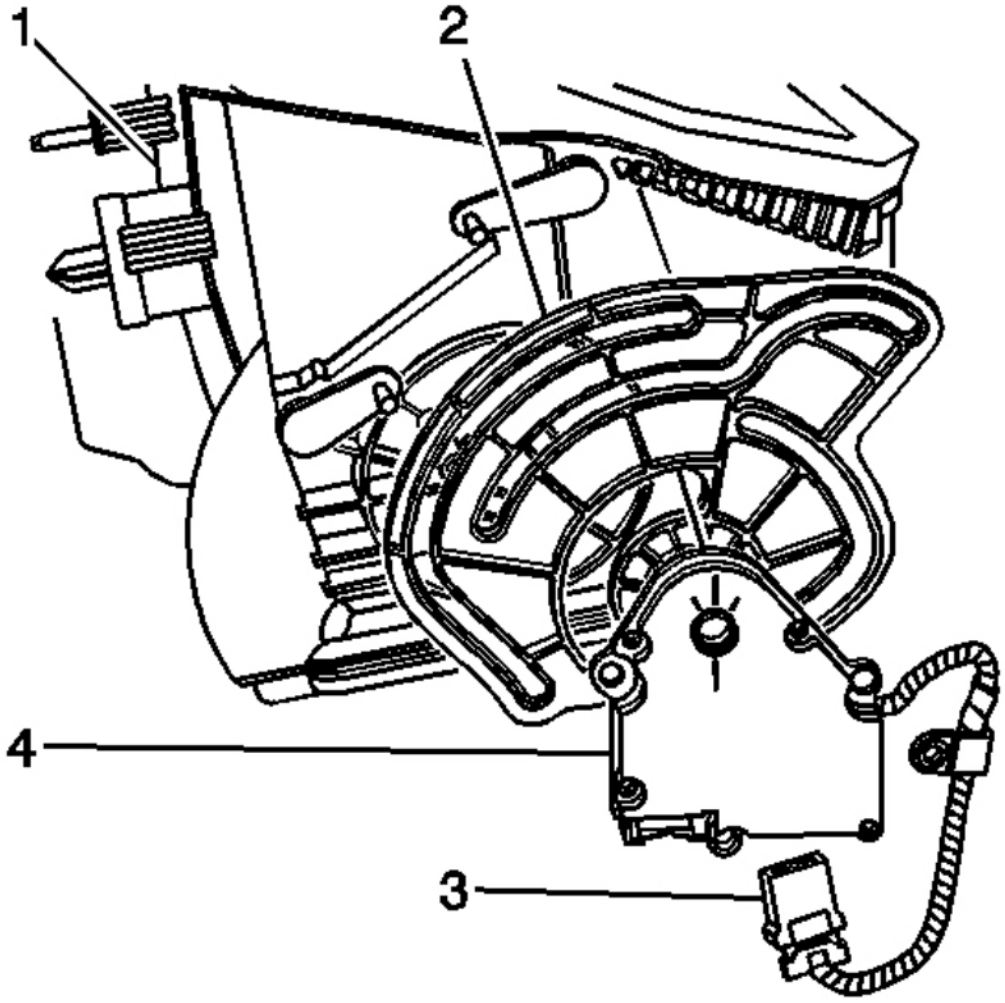


Fig. 164: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

14. Connect the electrical connector (3) to the mode actuator (4).
15. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

AIR TEMPERATURE DOOR REPLACEMENT - RIGHT (DELPHI)

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Removal Procedure

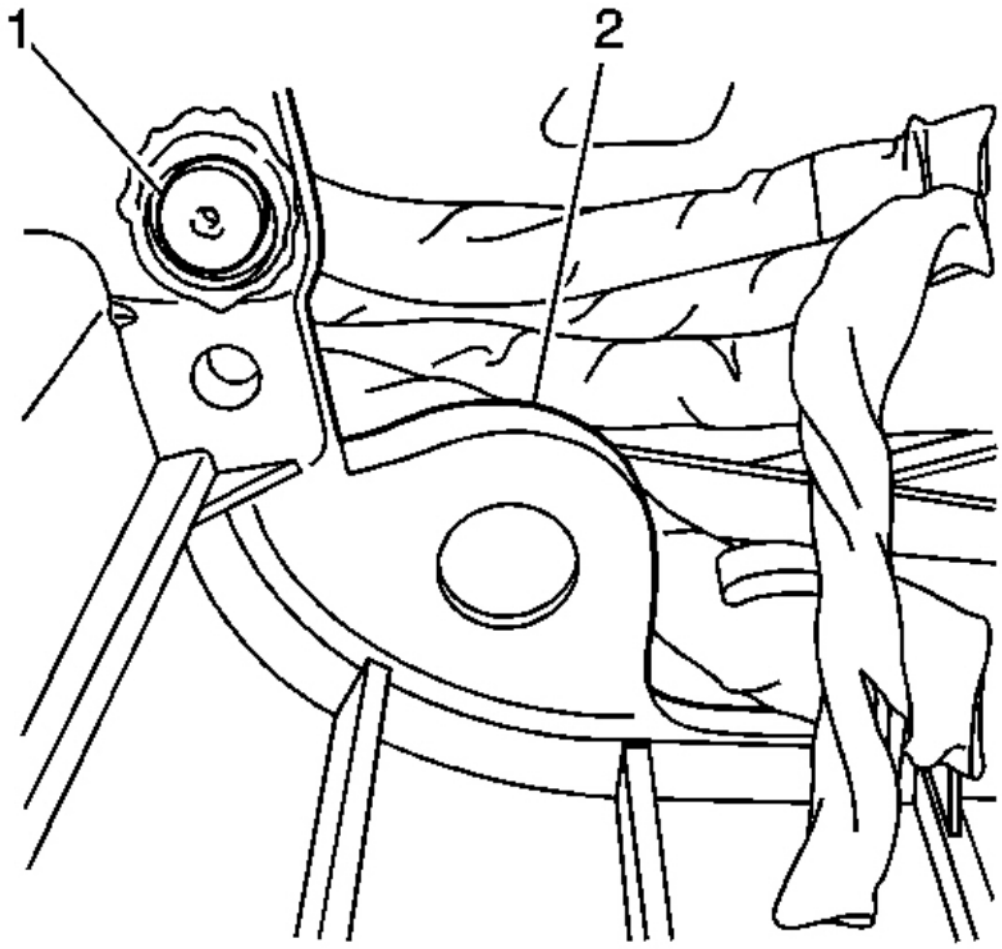


Fig. 165: Removing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and a hammer.

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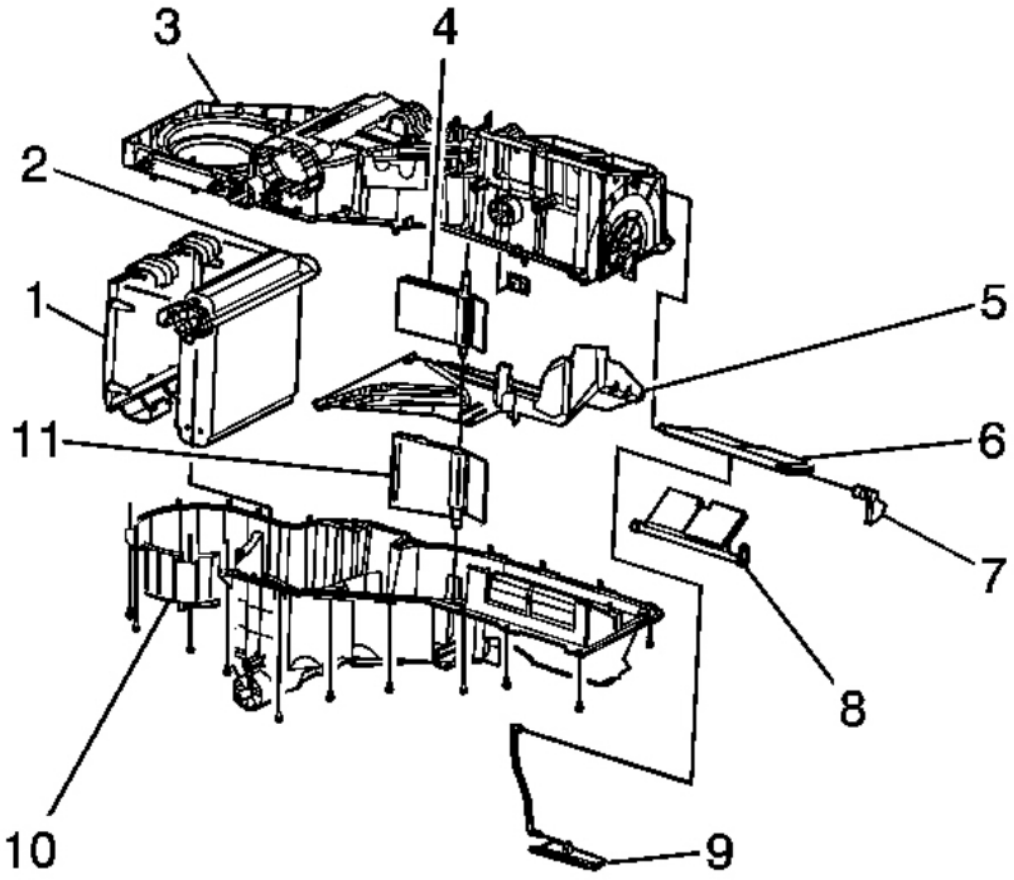


Fig. 166: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. If equipped remove the HVAC module assembly screws.
4. Remove the upper HVAC module case (1) from the lower HVAC module case (2).
5. Remove the right temperature door (4) from the upper HVAC module case (3).

Installation Procedure

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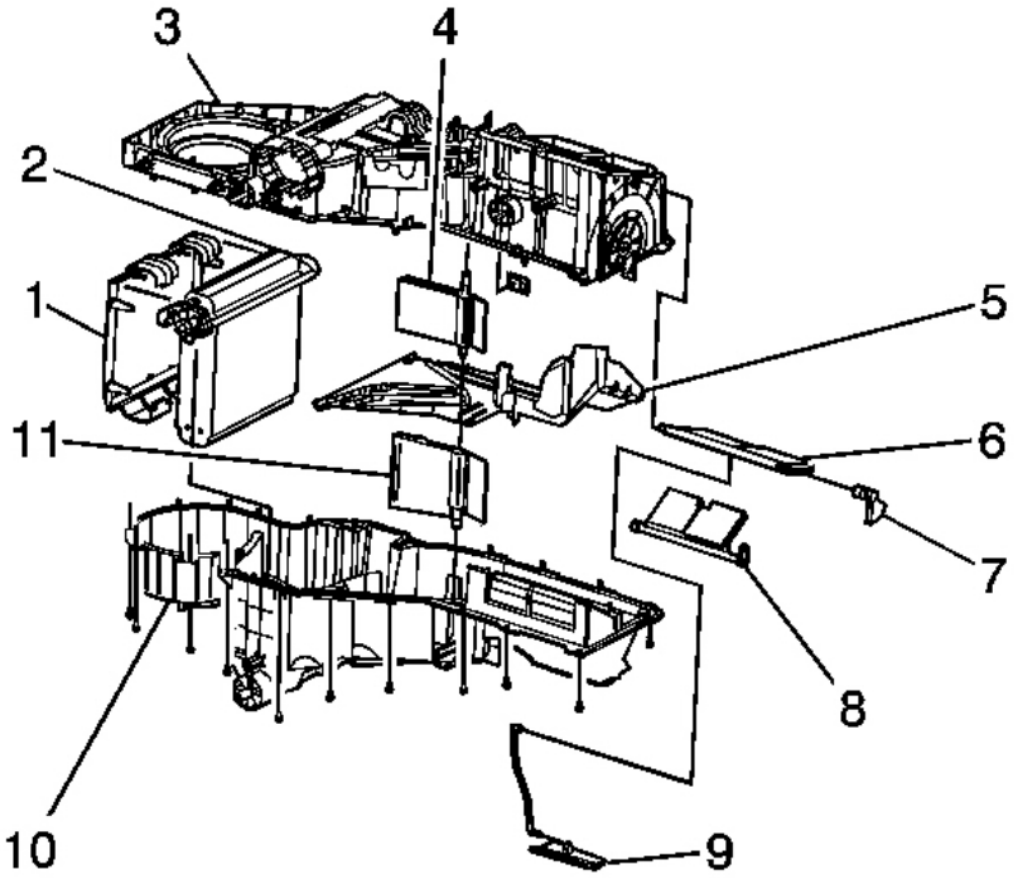


Fig. 167: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the right temperature door (4) to the upper HVAC module case (3).
2. Install the upper HVAC module case (1) to the lower HVAC module case (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: For every heat stake removed ensure that you install a screw.

3. Install the screws to the HVAC module assembly.

Tighten: Tighten the screws to 1.6 N.m (14 lb in).

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4. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

AIR TEMPERATURE DOOR REPLACEMENT - LEFT (VISTEON)

Removal Procedure

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.

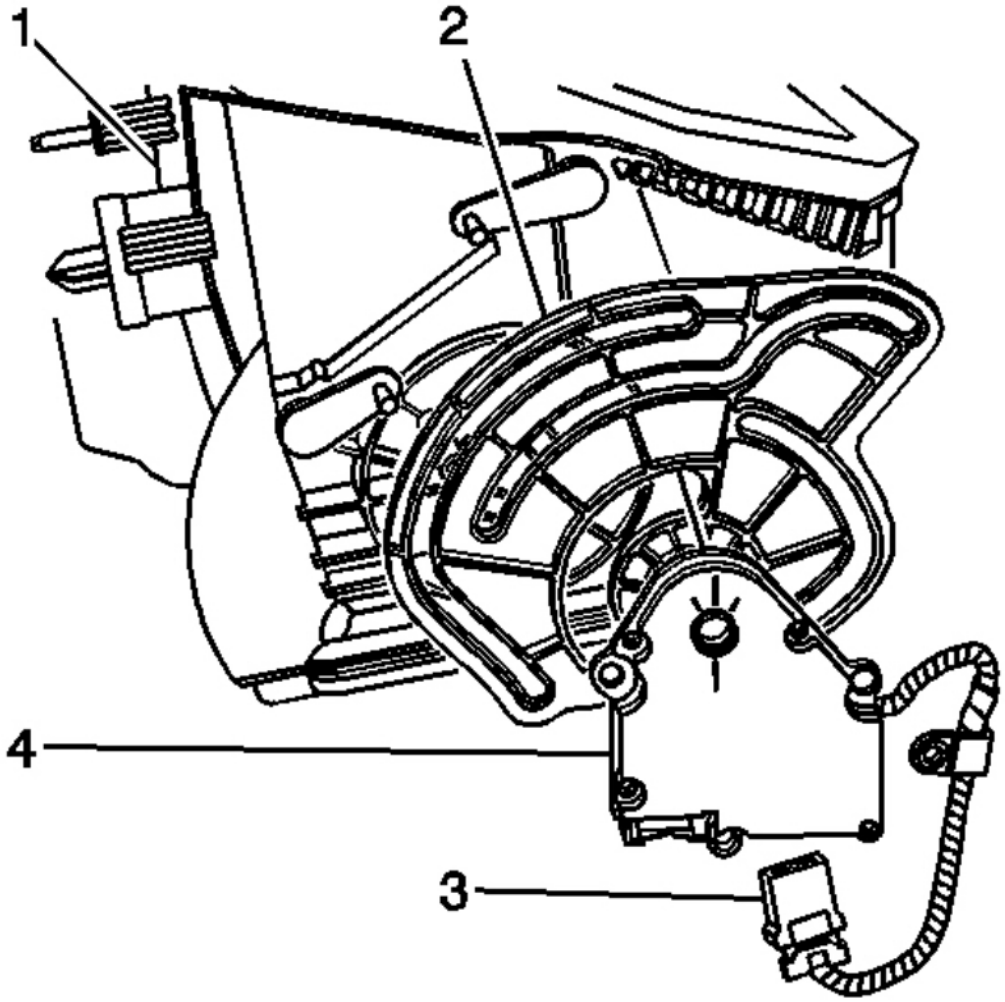


Fig. 168: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

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2. Disconnect the electrical connector (3) from the mode actuator (4).
3. Remove the screws from the mode actuator (4).
4. Remove the mode actuator (4) from the HVAC module (1).
5. Remove the wiring harness from the air distribution housing (1).

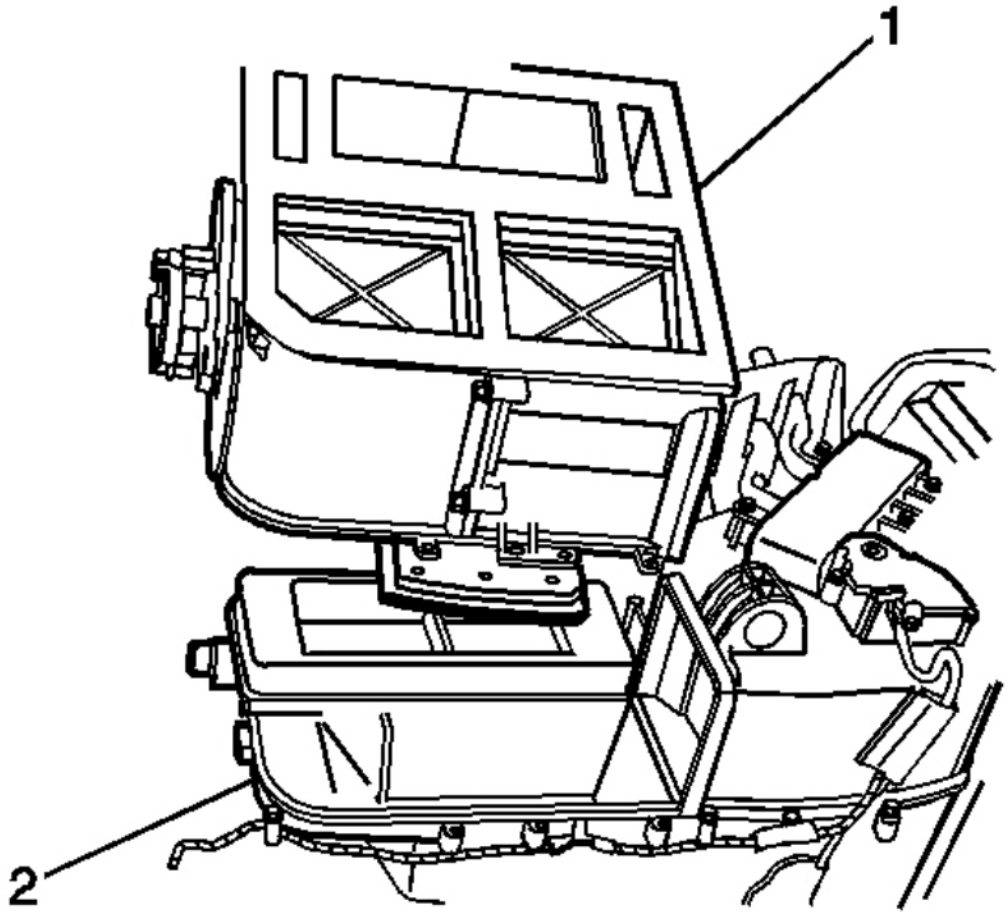


Fig. 169: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the screws from the air distribution housing (1).
7. Remove the air distribution housing (1) from the HVAC module (2).

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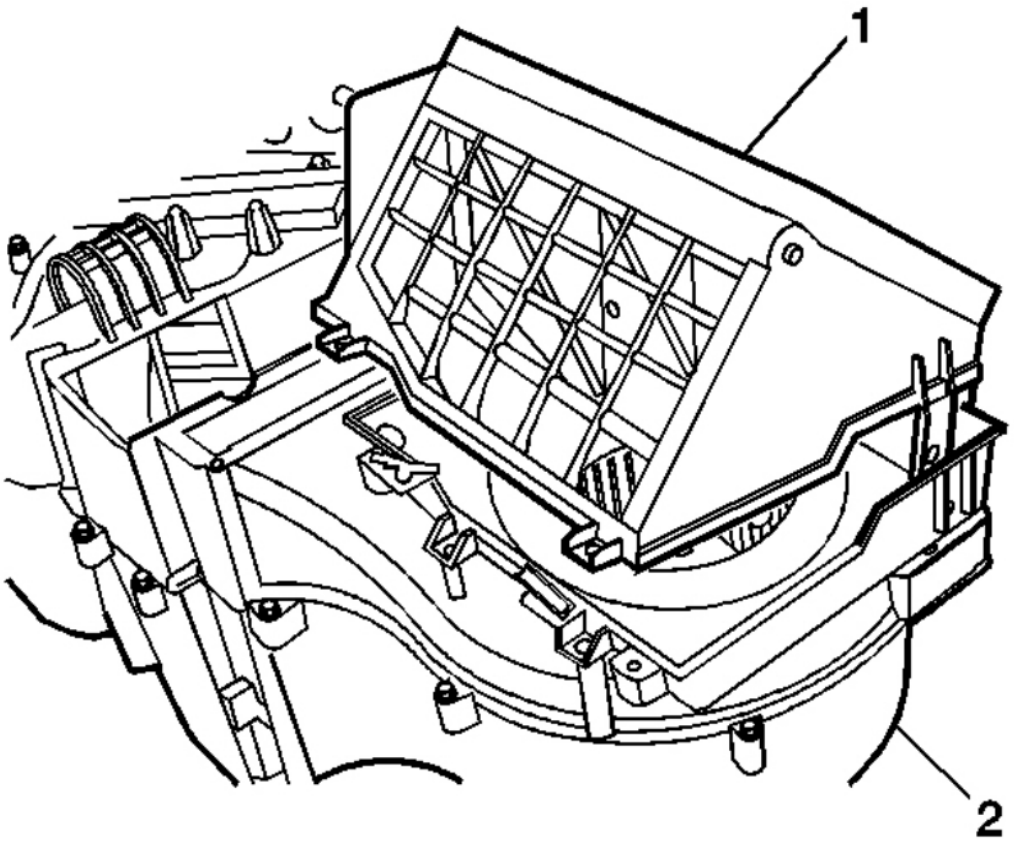


Fig. 170: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws from the upper recirulation housing (1).
9. Remove the upper recirulation housing (1) from the HVAC module (2).

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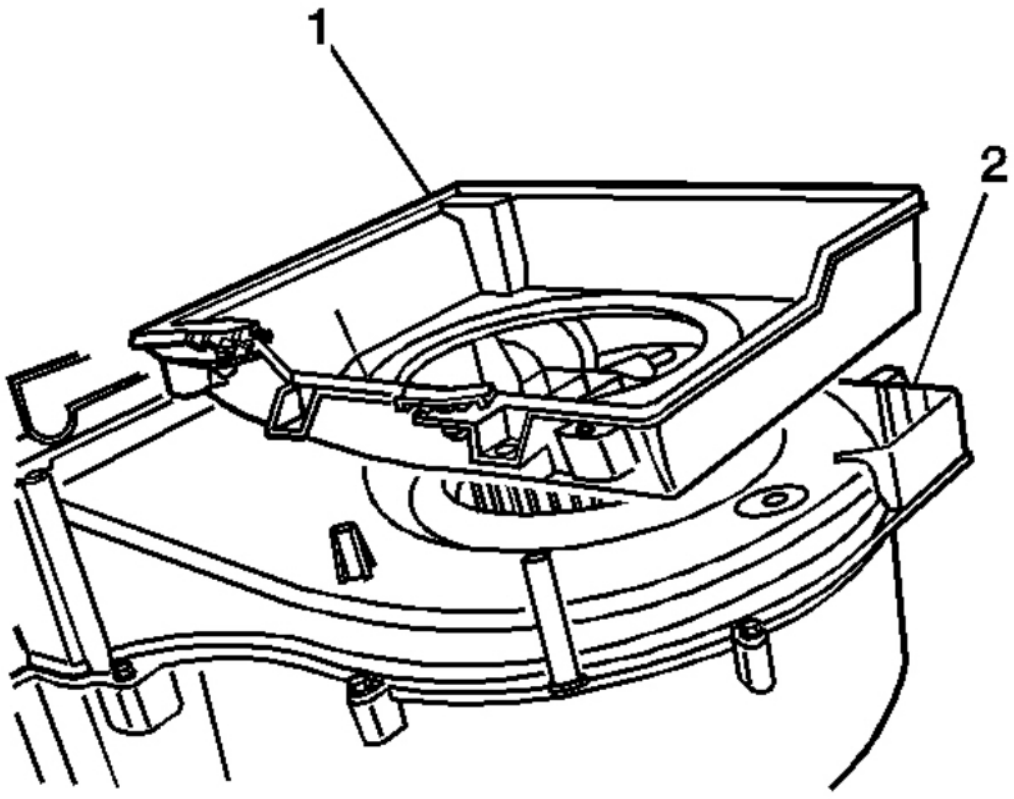


Fig. 171: View Of Upper And Lower Recirulation Housing
Courtesy of GENERAL MOTORS CORP.

10. Remove the screws from the lower recirulation housing (1).
11. Remove the lower recirulation housing (1) from the HVAC module (2).

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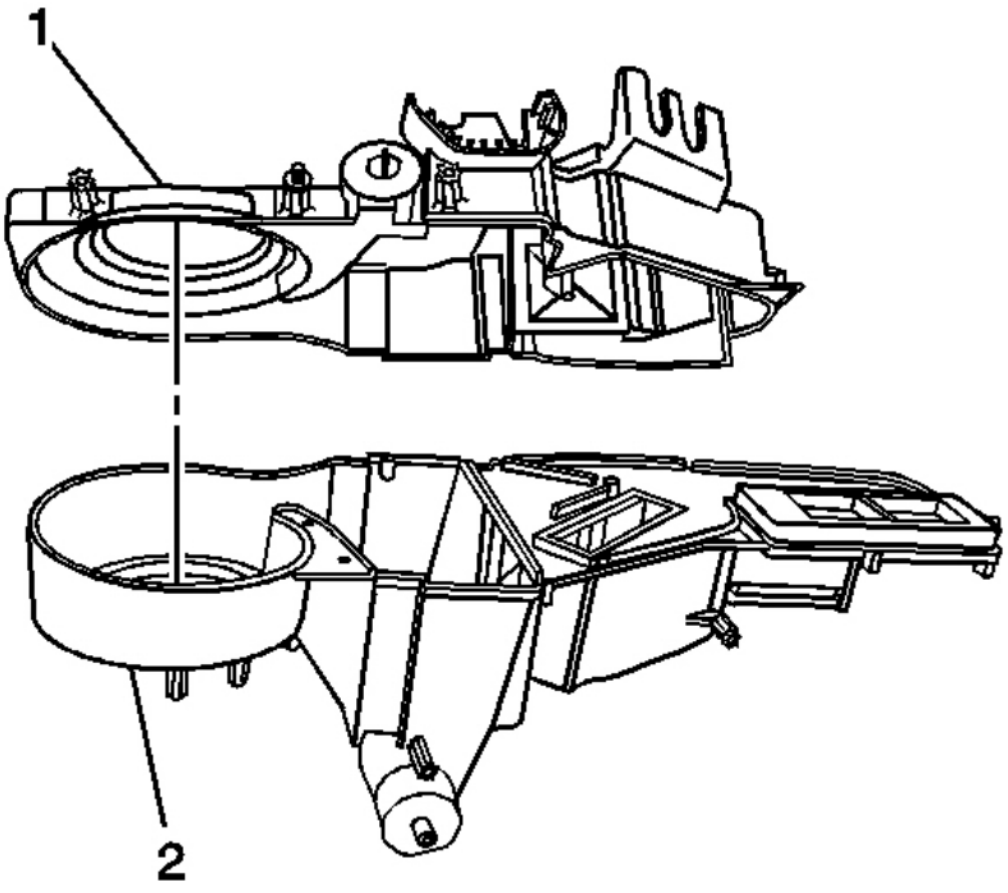


Fig. 172: Upper HVAC Module Case And Lower HVAC Module Case
Courtesy of GENERAL MOTORS CORP.

12. Remove the wiring harness from the HVAC module.
13. Remove the screws from the HVAC module.
14. Remove the upper HVAC module case (1) from the lower HVAC module case (2).

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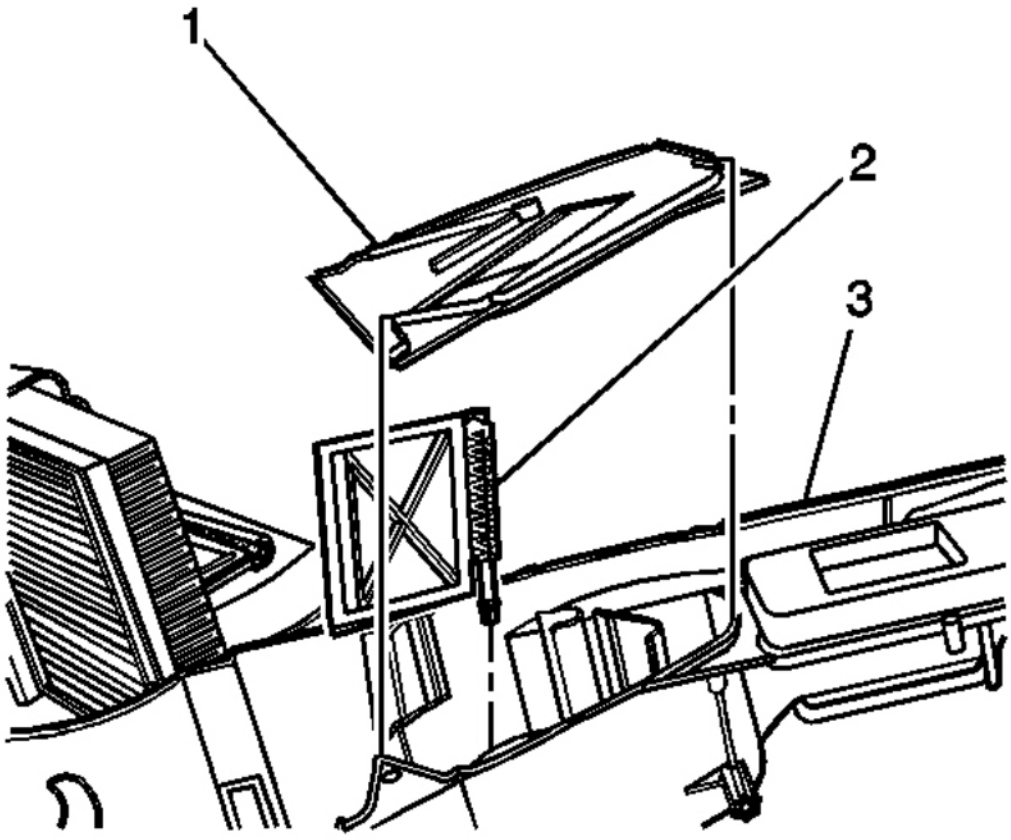


Fig. 173: Removing/Installing HVAC Module Chamber Plate From Lower HVAC Module Case (Visteon)
Courtesy of GENERAL MOTORS CORP.

15. Remove the HVAC module chamber plate (1) from the lower HVAC module case (3).
16. Remove the left temperature door (2) from the lower HVAC module case (3).

Installation Procedure

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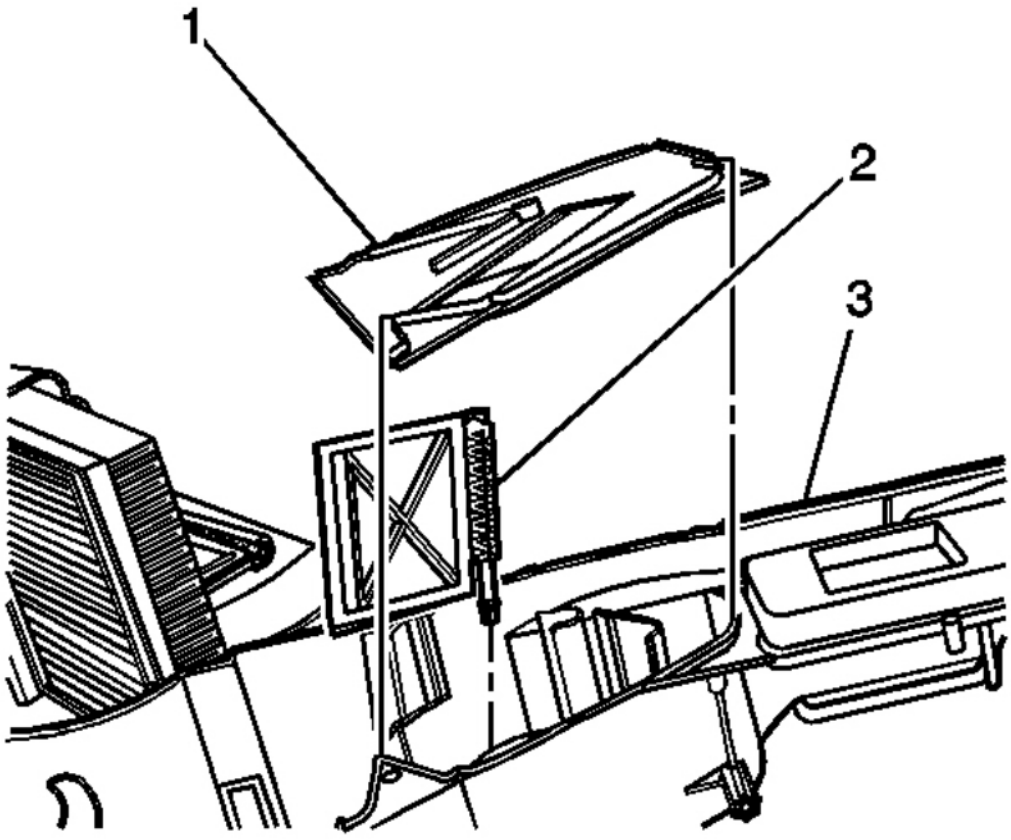


Fig. 174: Removing/Installing HVAC Module Chamber Plate From Lower HVAC Module Case (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the left temperature door (2) to the lower HVAC module case (3).
2. Install the HVAC module chamber plate (1) to the lower HVAC module case (3).
3. Install the upper HVAC module case (1) to the lower HVAC module case (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the HVAC module.

Tighten: Tighten the screws to 2 N.m (18 lb in).

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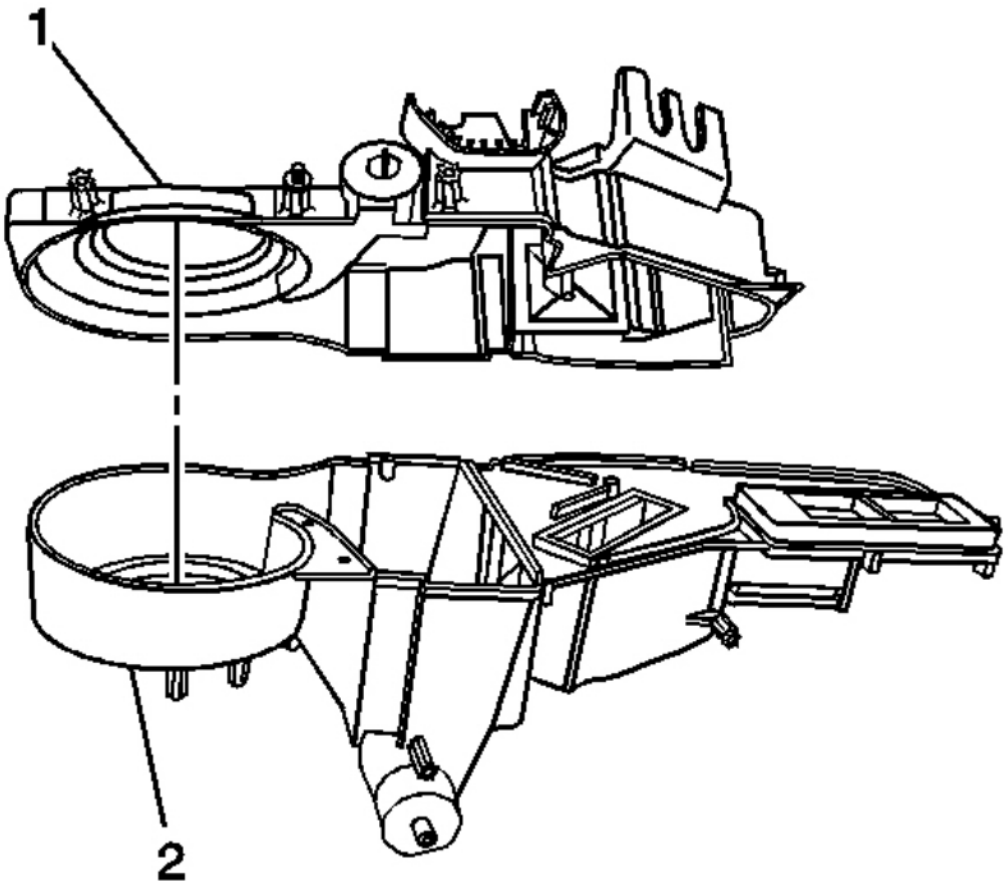


Fig. 175: Upper HVAC Module Case And Lower HVAC Module Case
Courtesy of GENERAL MOTORS CORP.

5. Install the wiring harness to the HVAC module.
6. Install the lower recirulation housing (1) to the HVAC module (2).

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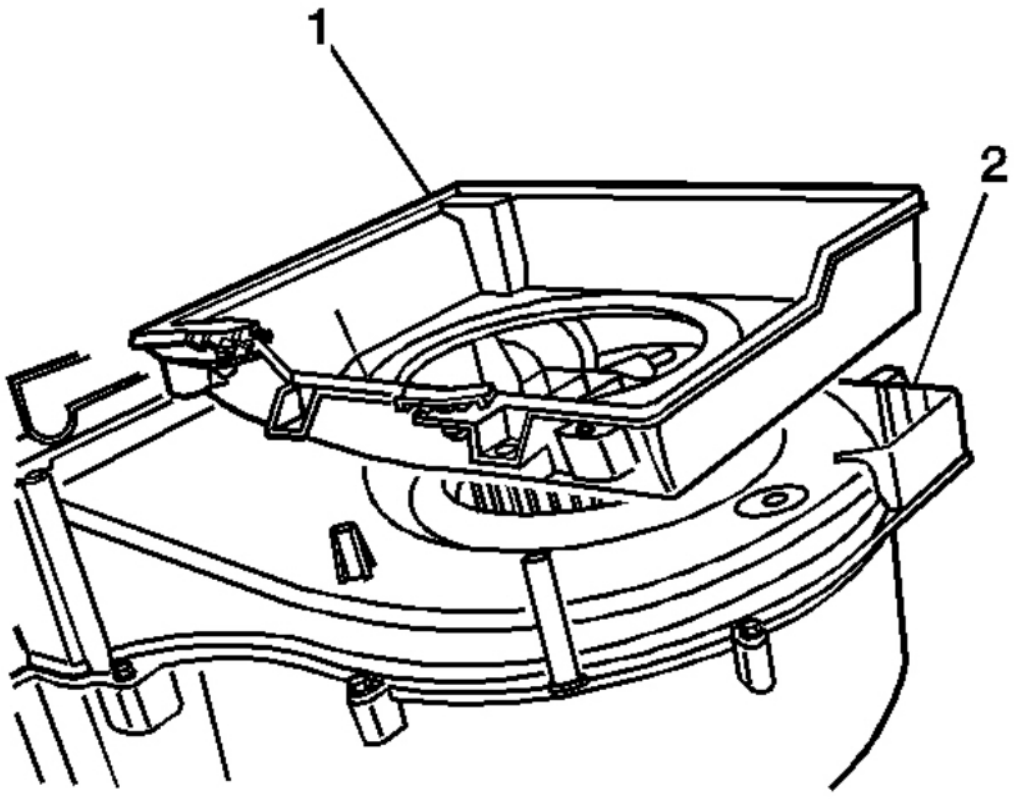


Fig. 176: View Of Upper And Lower Recirulation Housing
Courtesy of GENERAL MOTORS CORP.

7. Install the screws to the lower recirulation housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

8. Install the upper recirulation housing (1) to the HVAC module (2).

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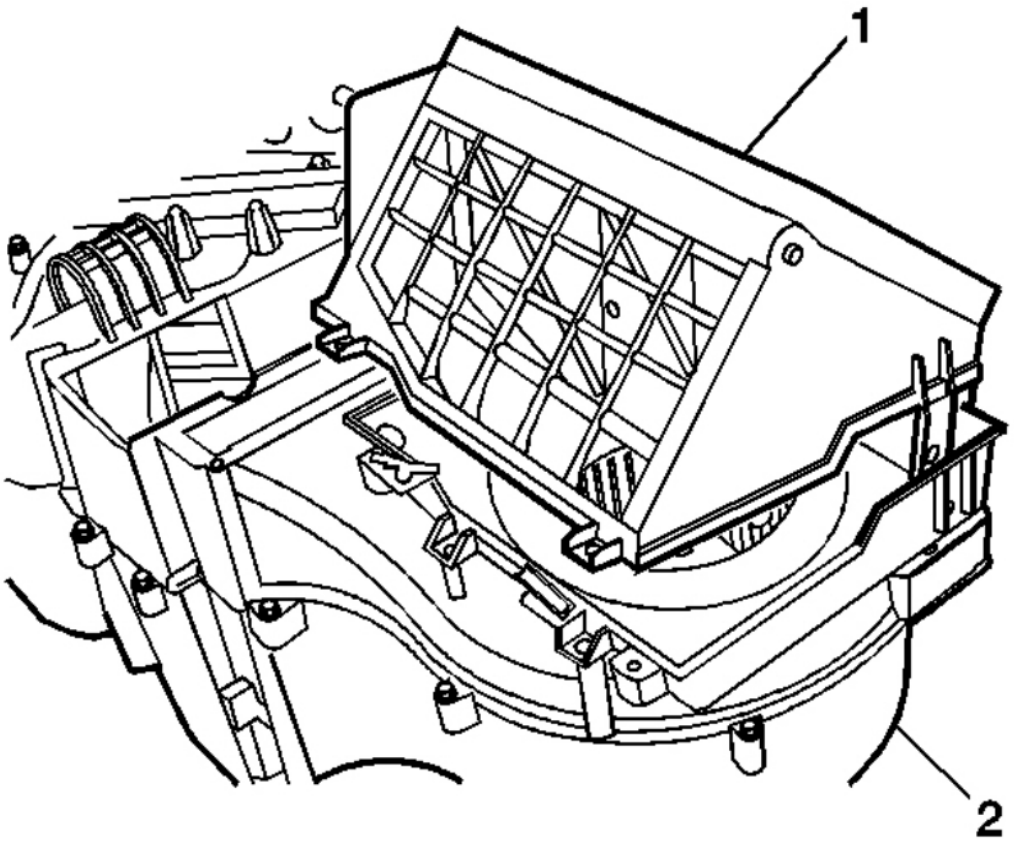


Fig. 177: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

9. Install the screws to the upper recirulation housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

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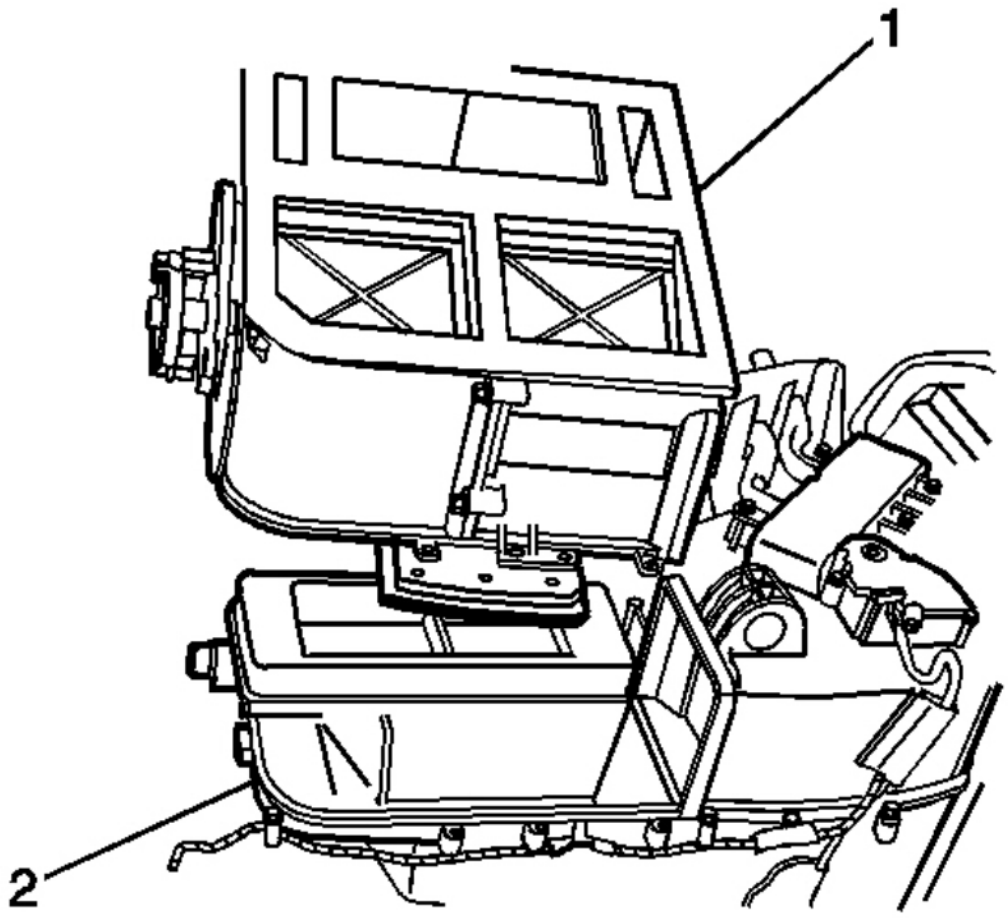


Fig. 178: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

10. Install the air distribution housing (1) to the HVAC module (2).
11. Install the screws to the air distribution housing (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

12. Install the wiring harness to the air distribution housing (1).
13. Install the mode actuator (4) to the HVAC module (1).
14. Install the screws to the mode actuator (4).

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Tighten: Tighten the screws to 2 N.m (18 lb in).

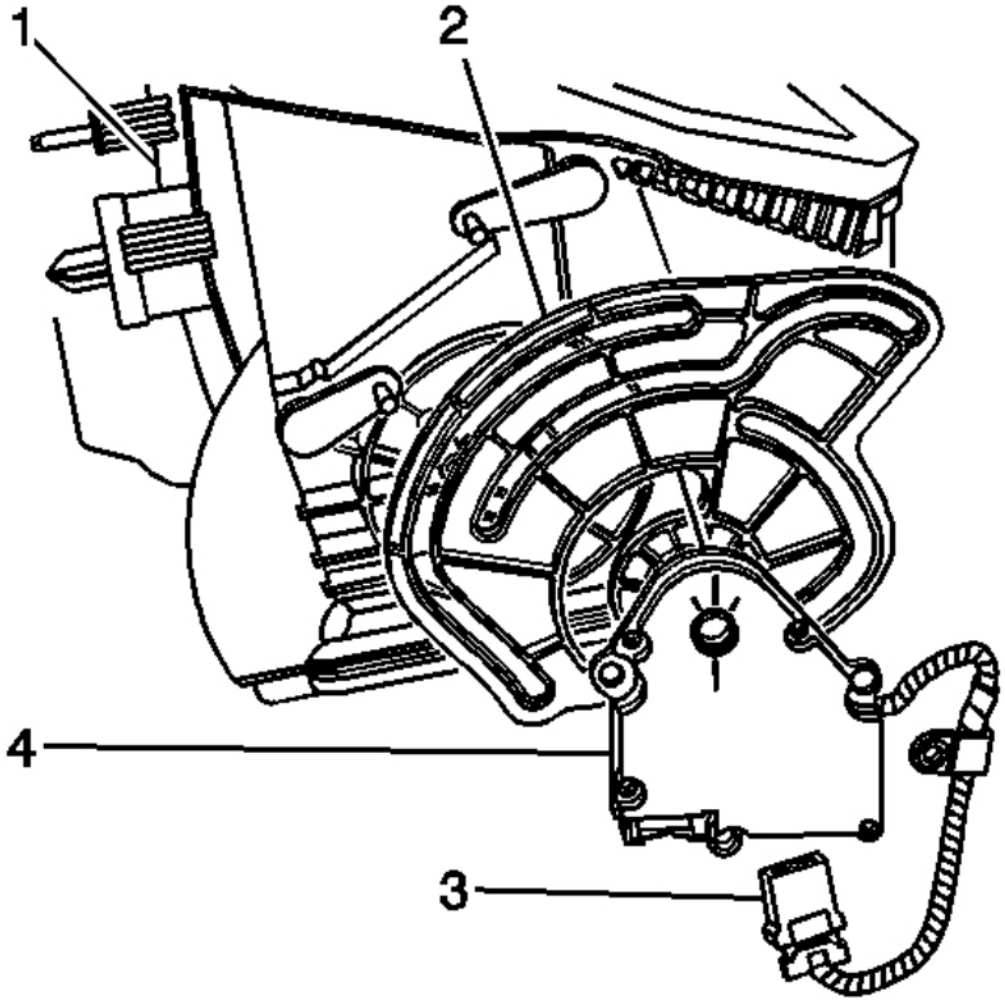


Fig. 179: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

15. Connect the electrical connector (3) to the mode actuator (4).
16. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

AIR TEMPERATURE DOOR REPLACEMENT - LEFT (DELPHI)

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Removal Procedure

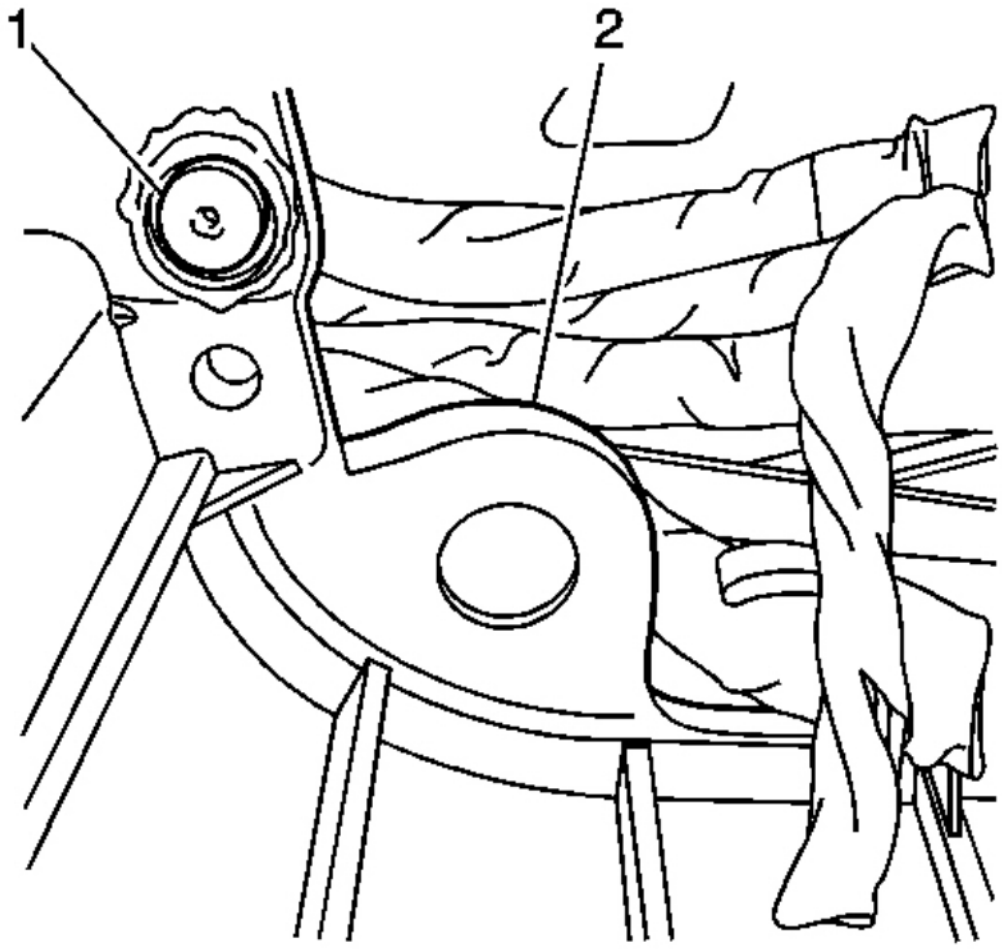


Fig. 180: Removing/Installing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and a hammer.

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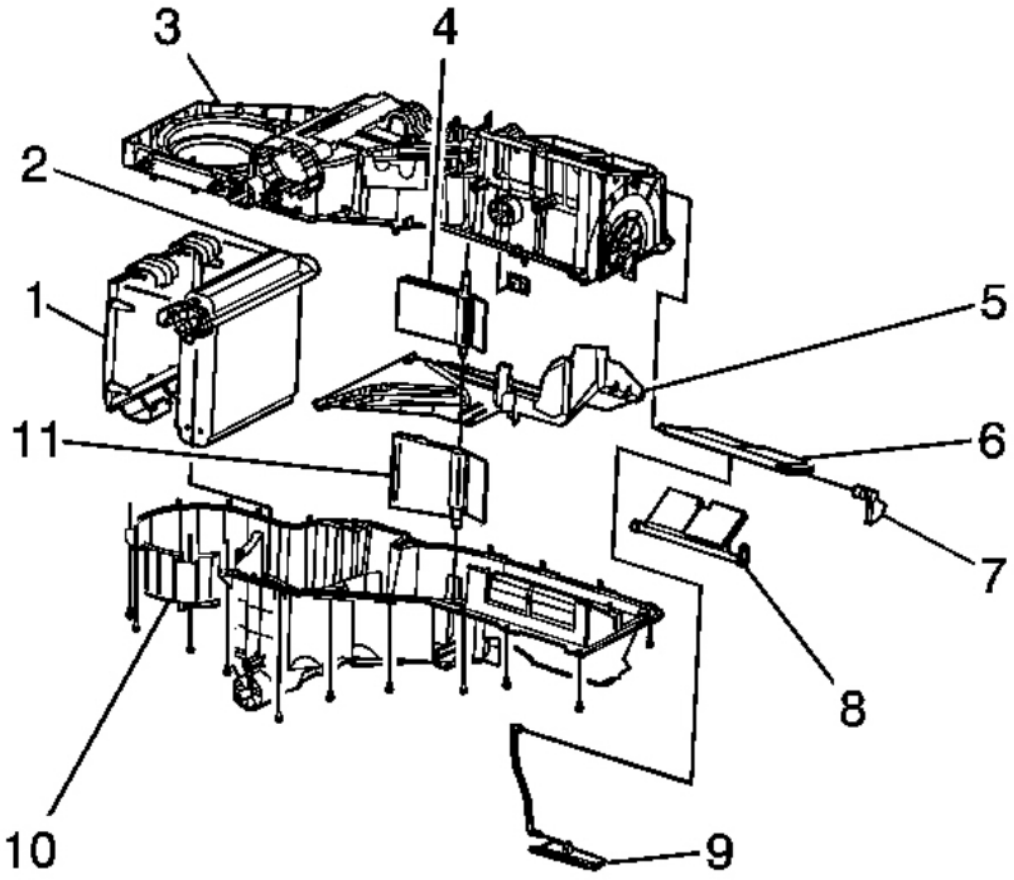


Fig. 181: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. If equipped remove the HVAC module assembly screws.
4. Remove the upper HVAC module case (3) from the lower HVAC module case (10).
5. Remove the air temperature separator plate (5) from the lower HVAC module case (10).
6. Remove the left temperature door (11) from the lower HVAC module case (10).

Installation Procedure

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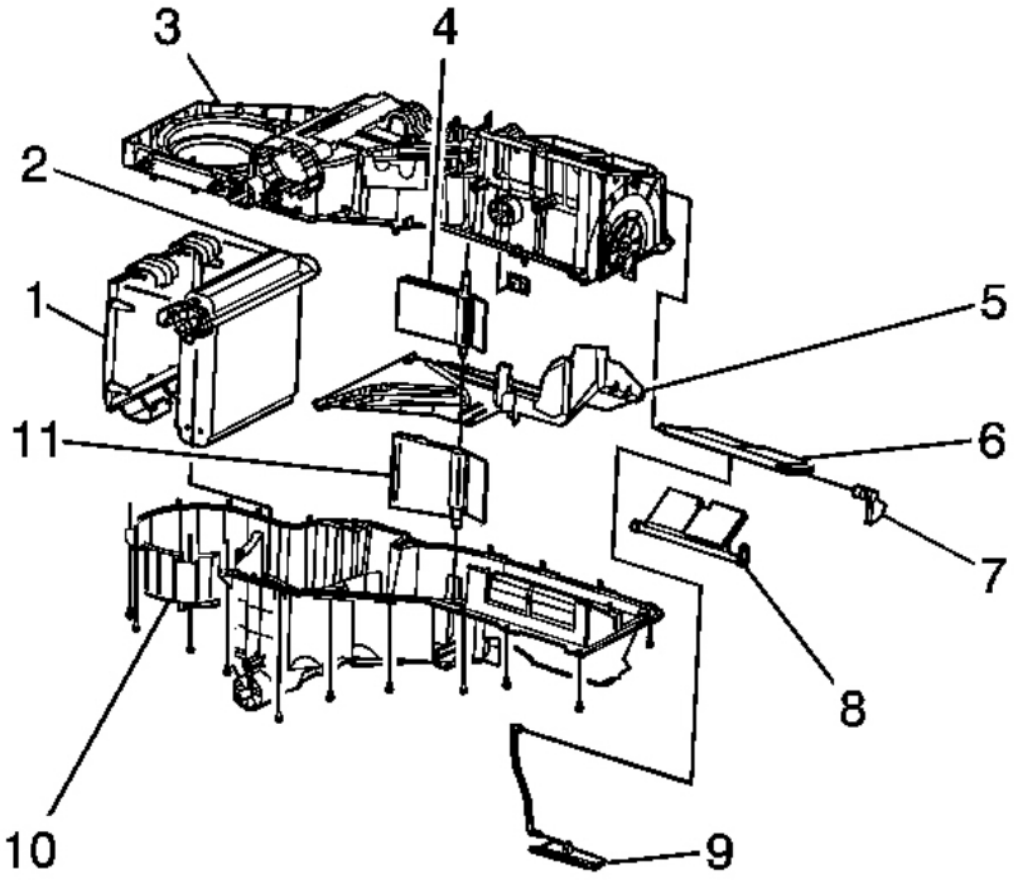


Fig. 182: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the left temperature door (11) to the lower HVAC module case (10).
2. Install the air temperature separator plate (5) to the lower HVAC module case (10).
3. Install the upper HVAC module case (3) to the lower HVAC module case (10).

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: For every heat stake removed ensure that you install a screw.

4. Install the screws to the HVAC module assembly.

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Tighten: Tighten the screws to 1.6 N.m (14 lb in).

5. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

DEFROSTER DOOR REPLACEMENT (VISTEON)

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

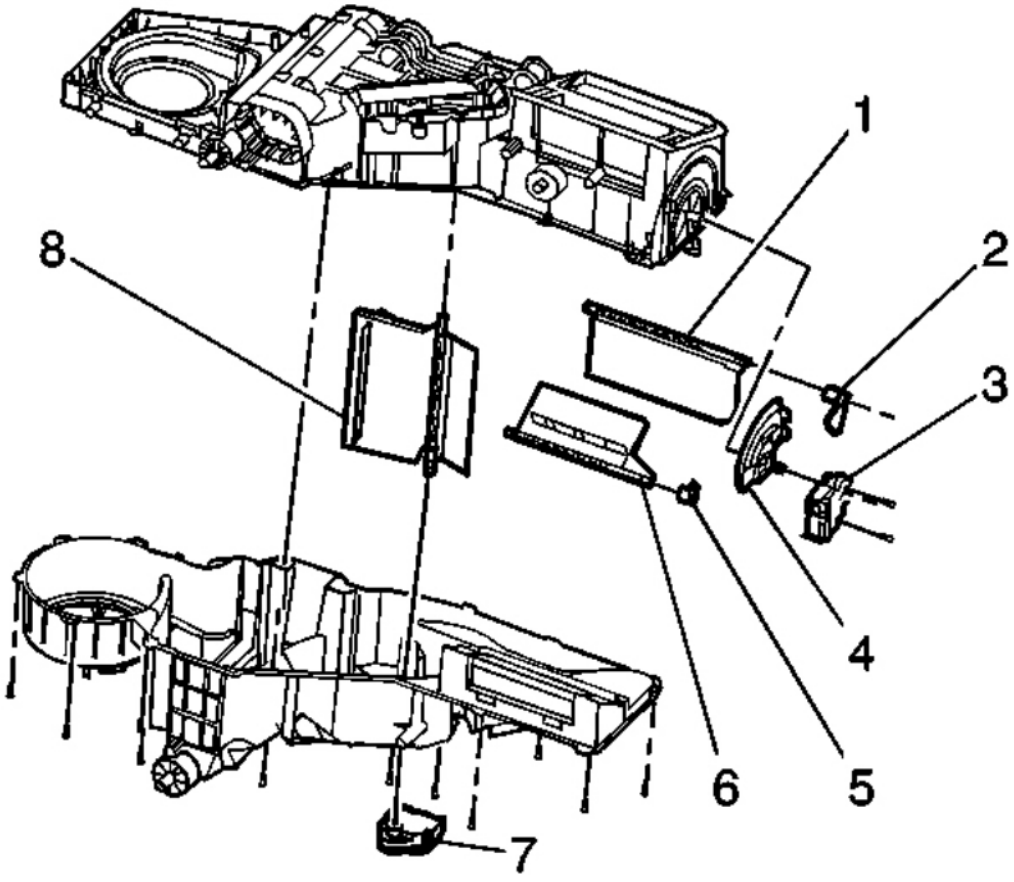


Fig. 183: Exploded View Of Heater/Vent Module
Courtesy of GENERAL MOTORS CORP.

2. Remove the HVAC module assembly screws.

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3. Separate the HVAC module assembly.
4. Remove the mode actuator screws.
5. Remove the mode actuator (3).
6. Remove the mode actuator cam assembly (4).
7. Remove the defroster door lever (2).
8. Remove the defroster door (1).

Installation Procedure

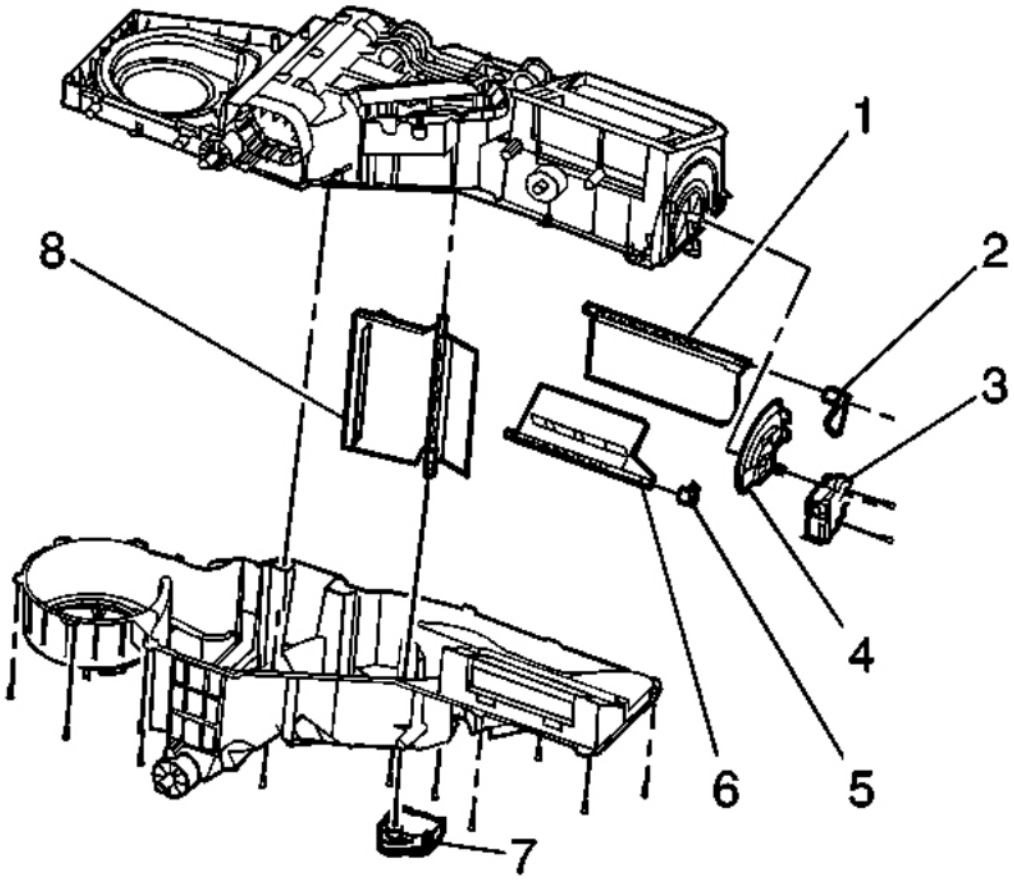


Fig. 184: Exploded View Of Heater/Vent Module
Courtesy of GENERAL MOTORS CORP.

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1. Install the defroster door (1).
2. Install the defroster door lever (2).
3. Install the mode actuator cam assembly (4).
4. Install the mode actuator (3).
5. Install the mode actuator screws.

NOTE: Refer to Fastener Notice in Cautions and Notices.

6. Install the mode actuator screws.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

7. Install the HVAC module assembly halves.
8. Install the screws to the HVAC module assembly.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

9. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

DEFROSTER DOOR REPLACEMENT (DELPHI)

Removal Procedure

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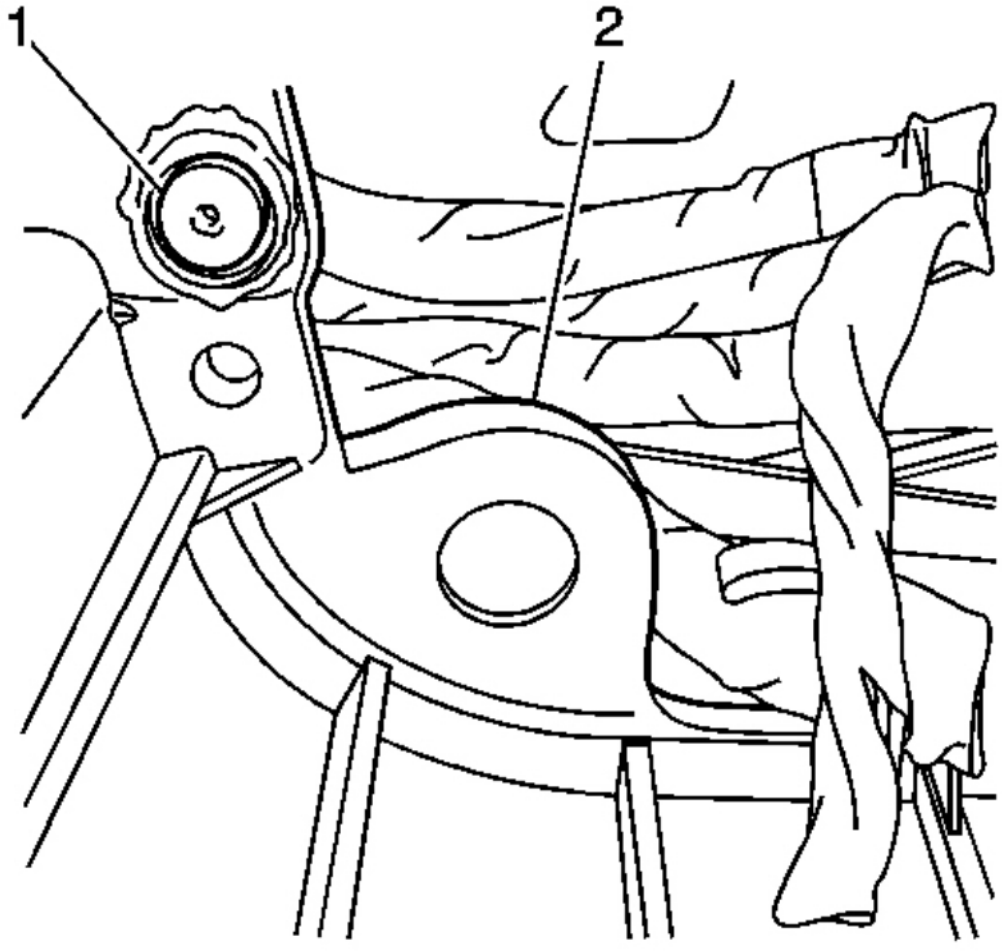


Fig. 185: Removing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and a hammer.

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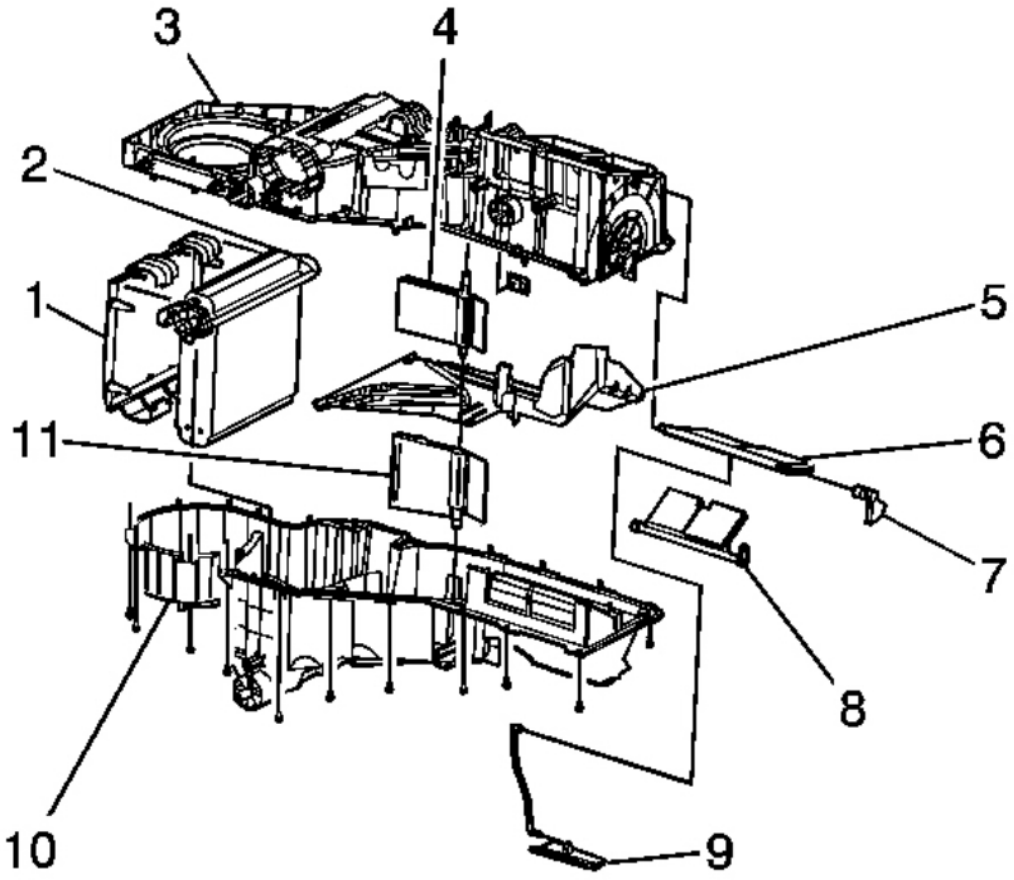


Fig. 186: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. If equipped remove the HVAC module assembly screws.
4. Separate the HVAC module assembly.
5. Remove the mode actuator screws.
6. Remove the mode actuator.
7. Remove the mode actuator cam assembly.
8. Remove the defroster door (8).

Installation Procedure

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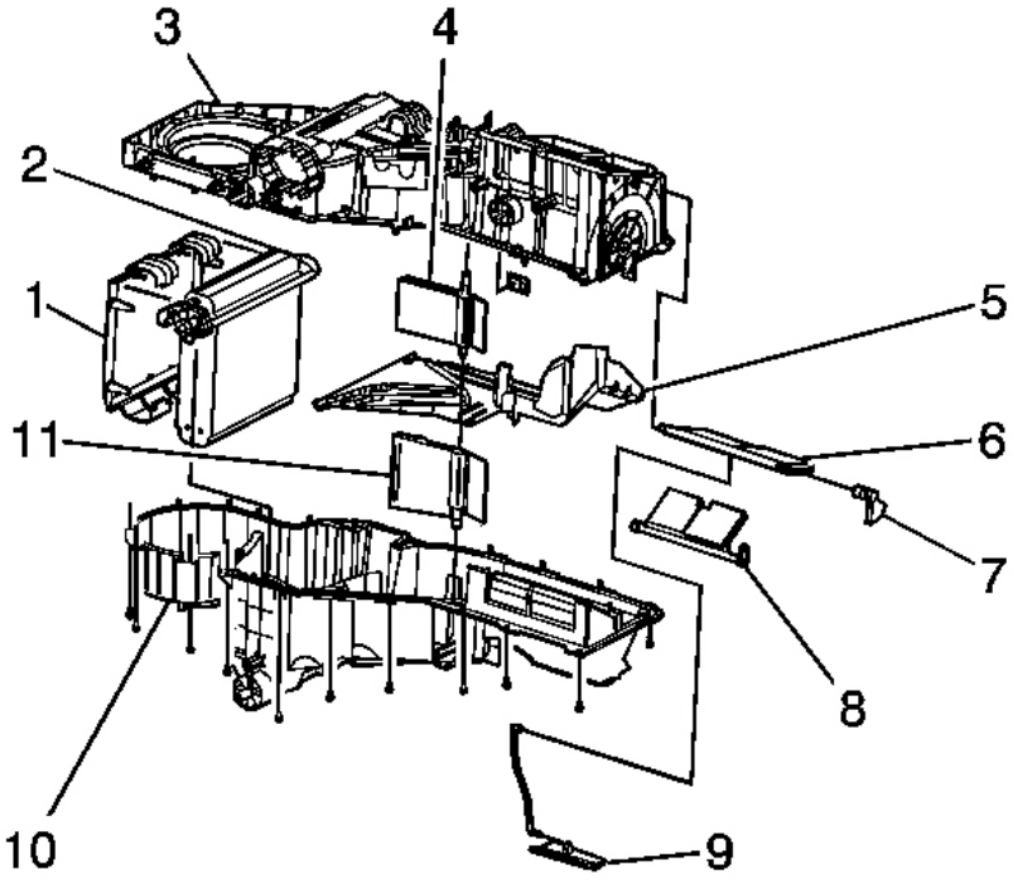


Fig. 187: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the defroster door (8).
2. Install the mode actuator cam assembly.
3. Install the mode actuator.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the mode actuator screws.

Tighten: Tighten the screws to 1.6 N.m (14 lb in).

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5. Install the HVAC module assembly halves.

IMPORTANT: For every heat stake removed ensure that you install a screw.

6. Install the screws to the HVAC module assembly.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

7. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

MODE DOOR REPLACEMENT - LOWER (VISTEON)

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

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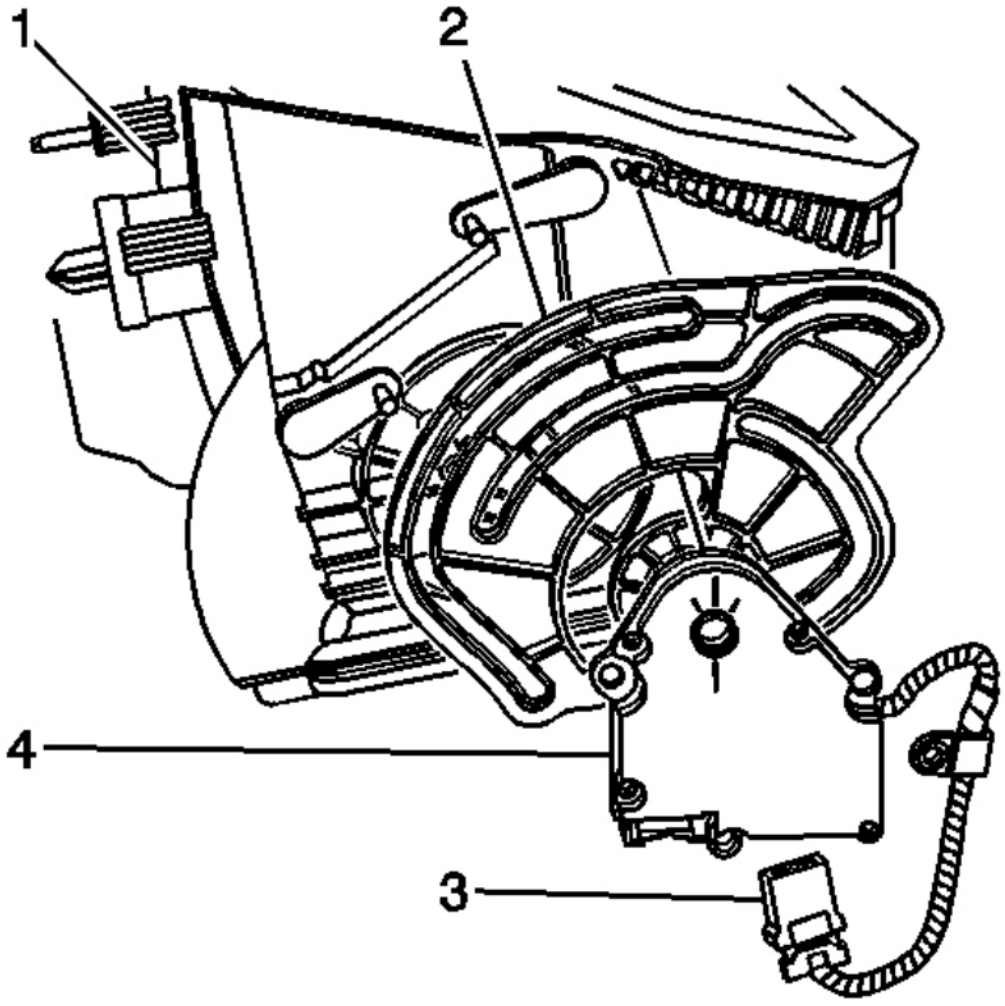


Fig. 188: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector (3) from the mode actuator (4).
3. Remove the screws from the mode actuator (4).
4. Remove the mode actuator (4) from the HVAC module assembly (1).
5. Remove the wiring harness from the air distribution housing (1).

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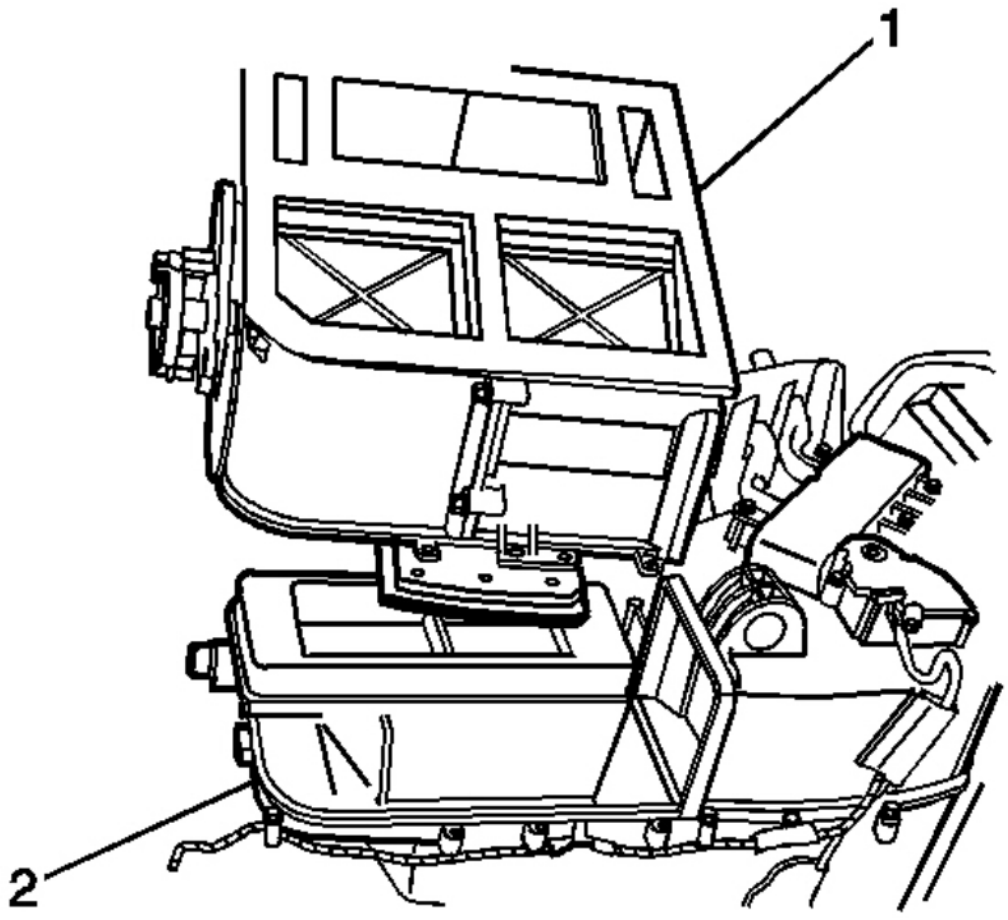


Fig. 189: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the screws from the air distribution housing (1).
7. Remove the air distribution housing (1) from the HVAC module assembly (2).

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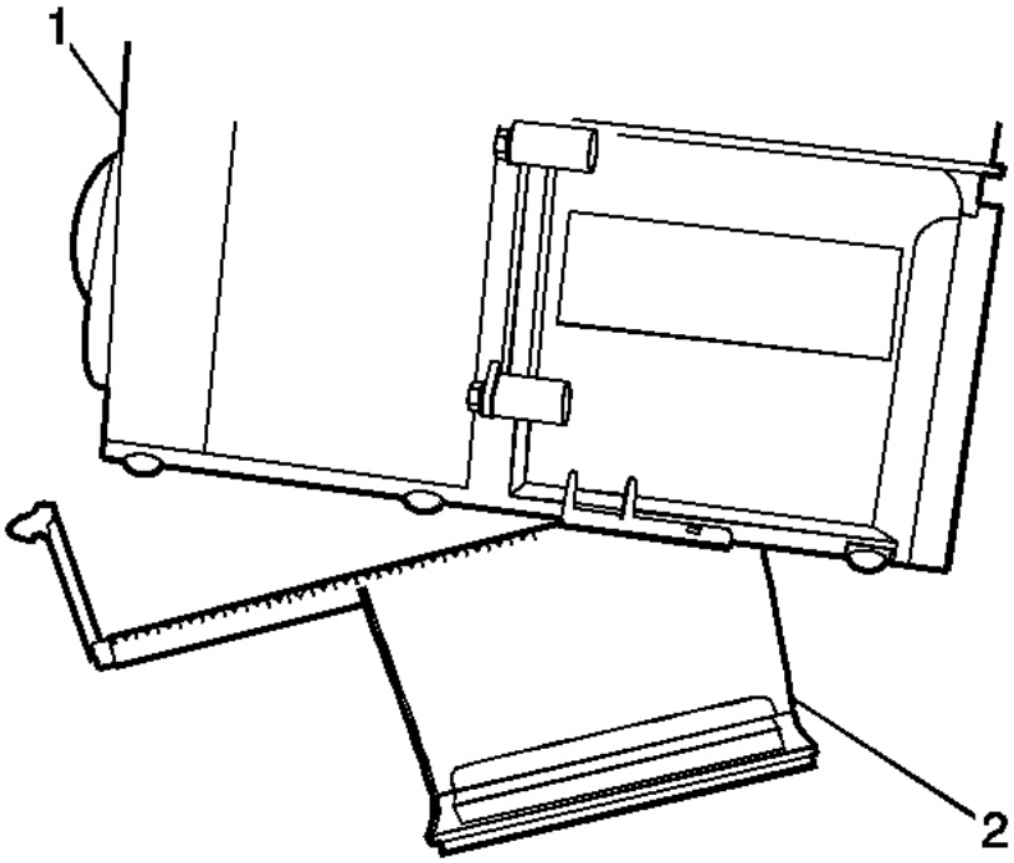


Fig. 190: Removing/Installing Mode Door (Visteon)
Courtesy of GENERAL MOTORS CORP.

8. Remove the mode door (2) from the air distribution housing (1).

Installation Procedure

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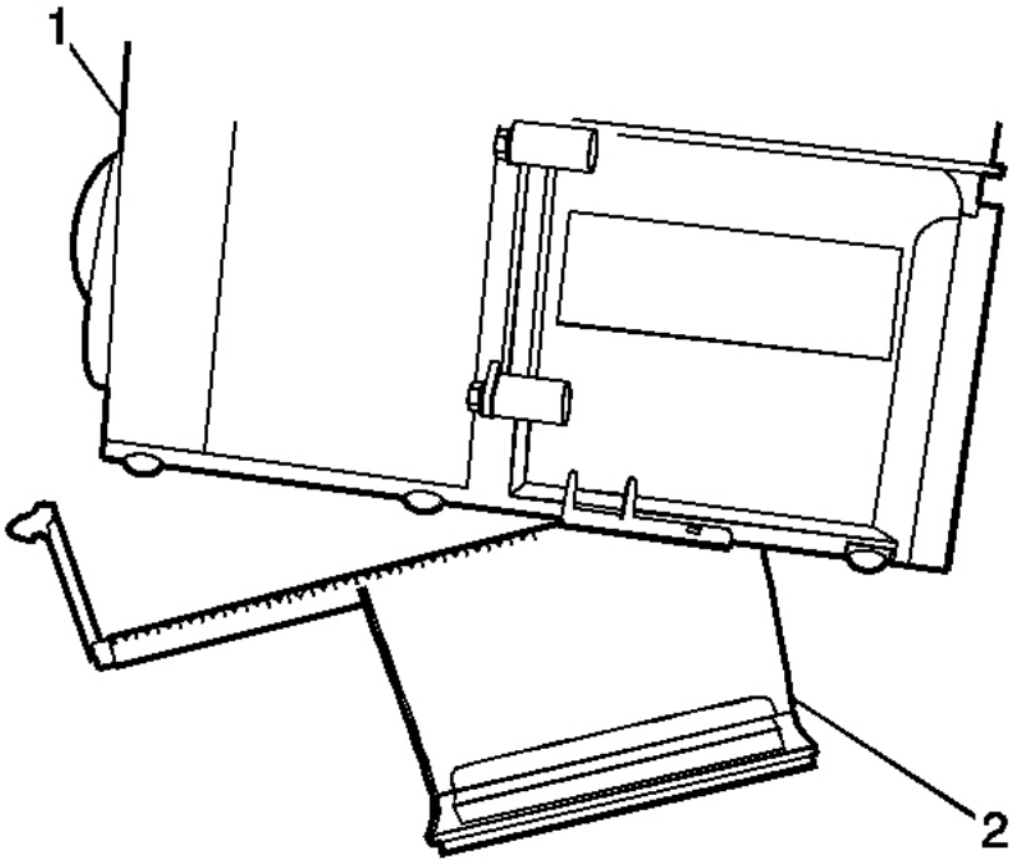


Fig. 191: Removing/Installing Mode Door (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the mode door (1) to the air distribution housing (1).

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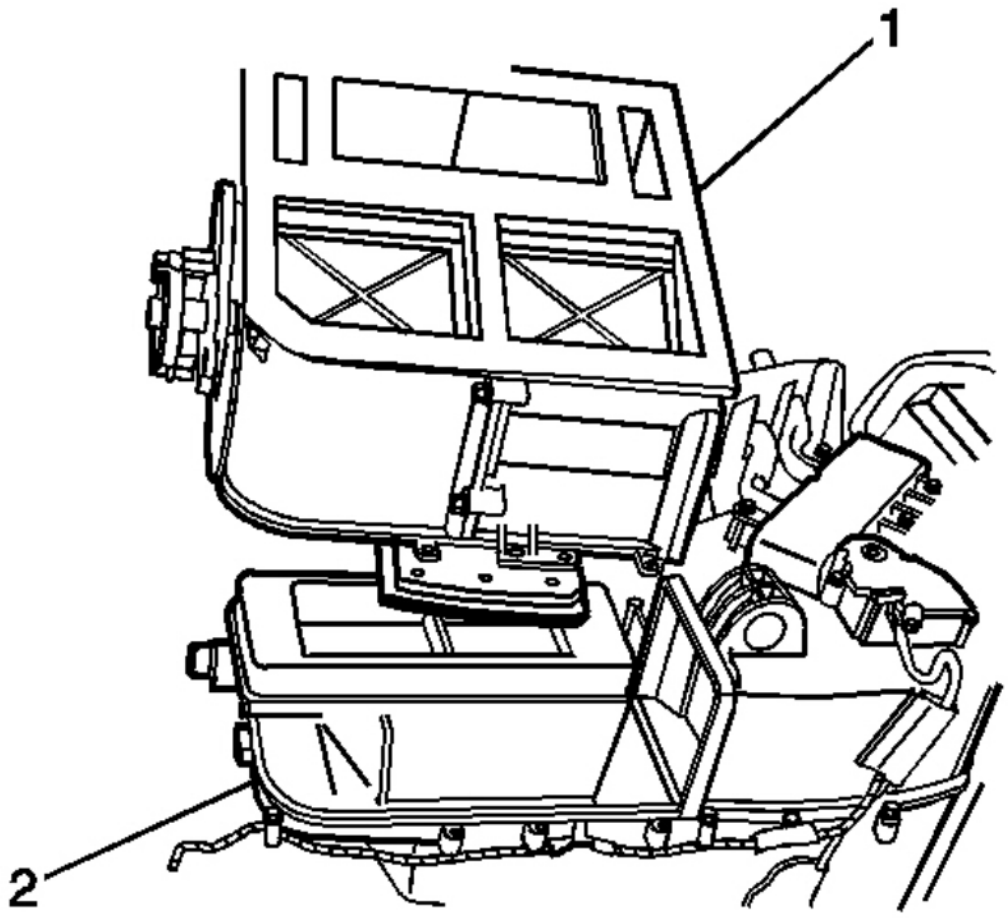


Fig. 192: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

2. Install the air distribution housing (1) to the HVAC module assembly (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the air distribution housing (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

4. Install the wiring harness to the air distribution housing (1).

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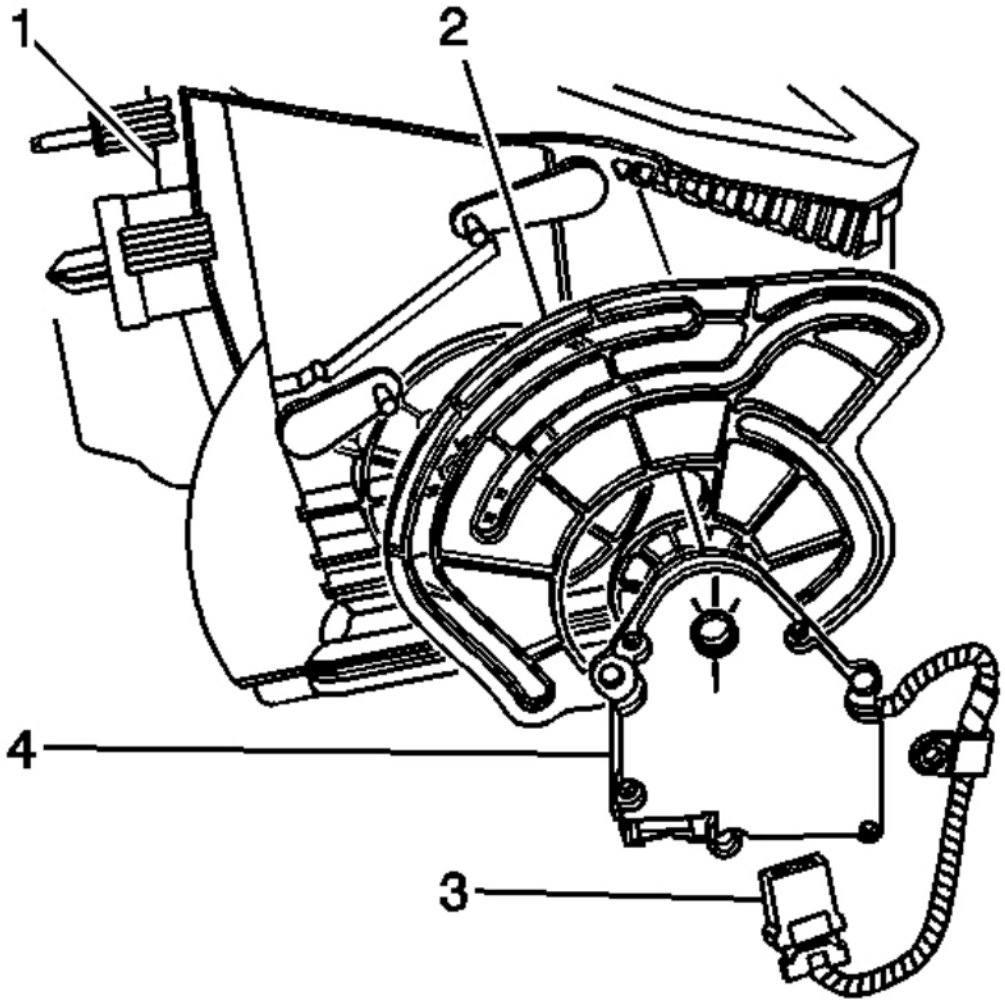


Fig. 193: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connector (3) to the mode actuator (4).
6. Install the screws to the mode actuator (4).
7. Install the mode actuator (4) to the HVAC module assembly (1).
8. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

MODE DOOR REPLACEMENT - LOWER (DELPHI)

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Removal Procedure

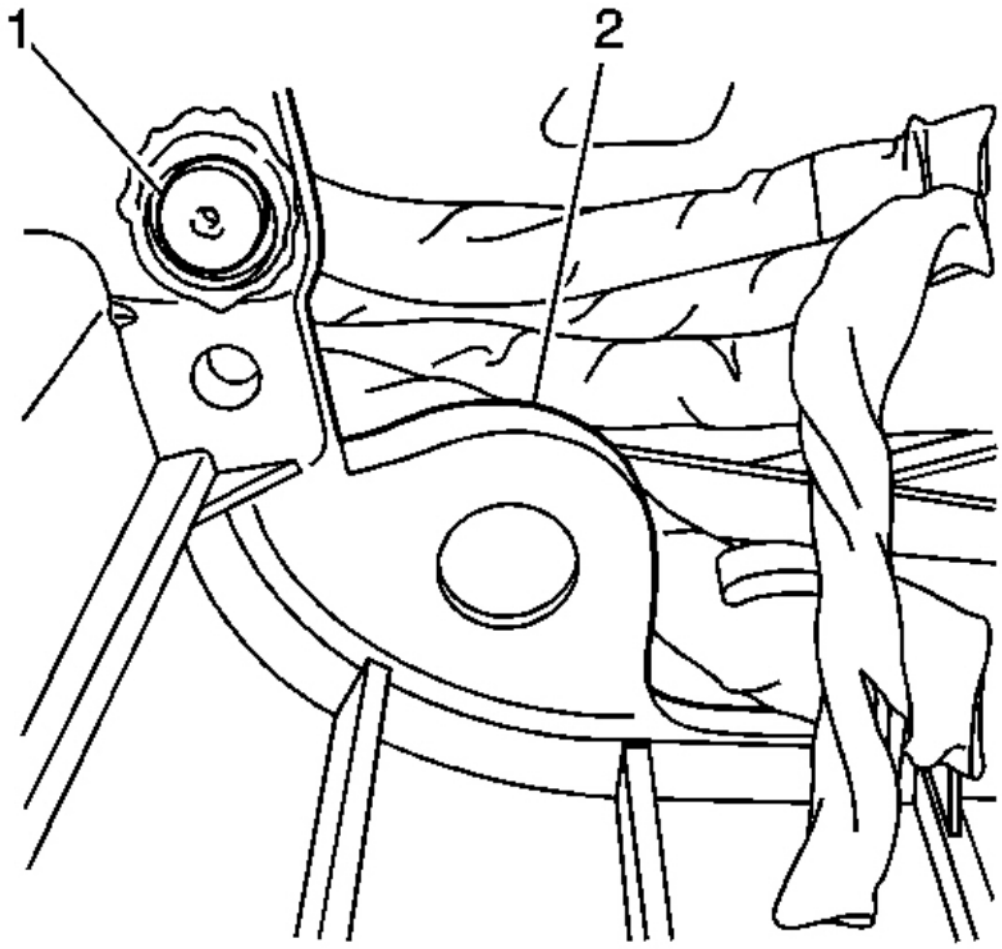


Fig. 194: Removing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and a hammer.

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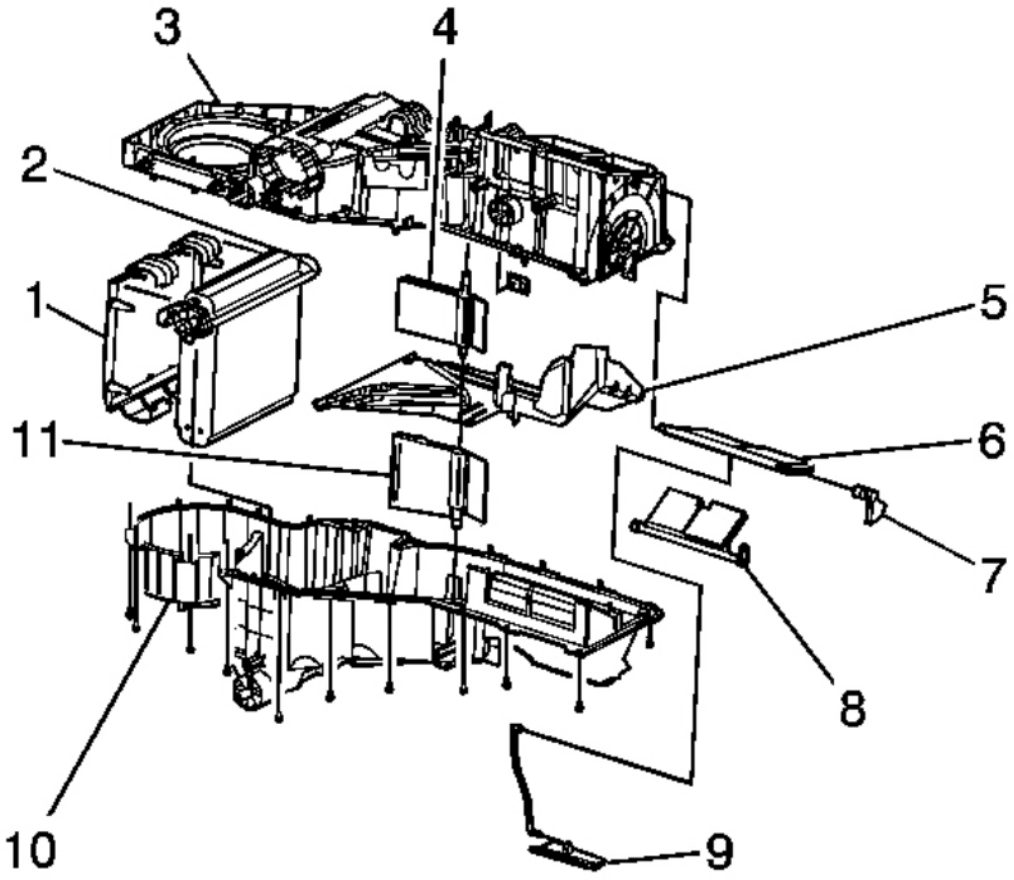


Fig. 195: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. If equipped remove the HVAC module assembly screws.
4. Separate the HVAC module assembly.
5. Remove the air temperature separator plate (5) from the HVAC module assembly (10).
6. Remove the lower mode door (9) from the HVAC module assembly (10).

Installation Procedure

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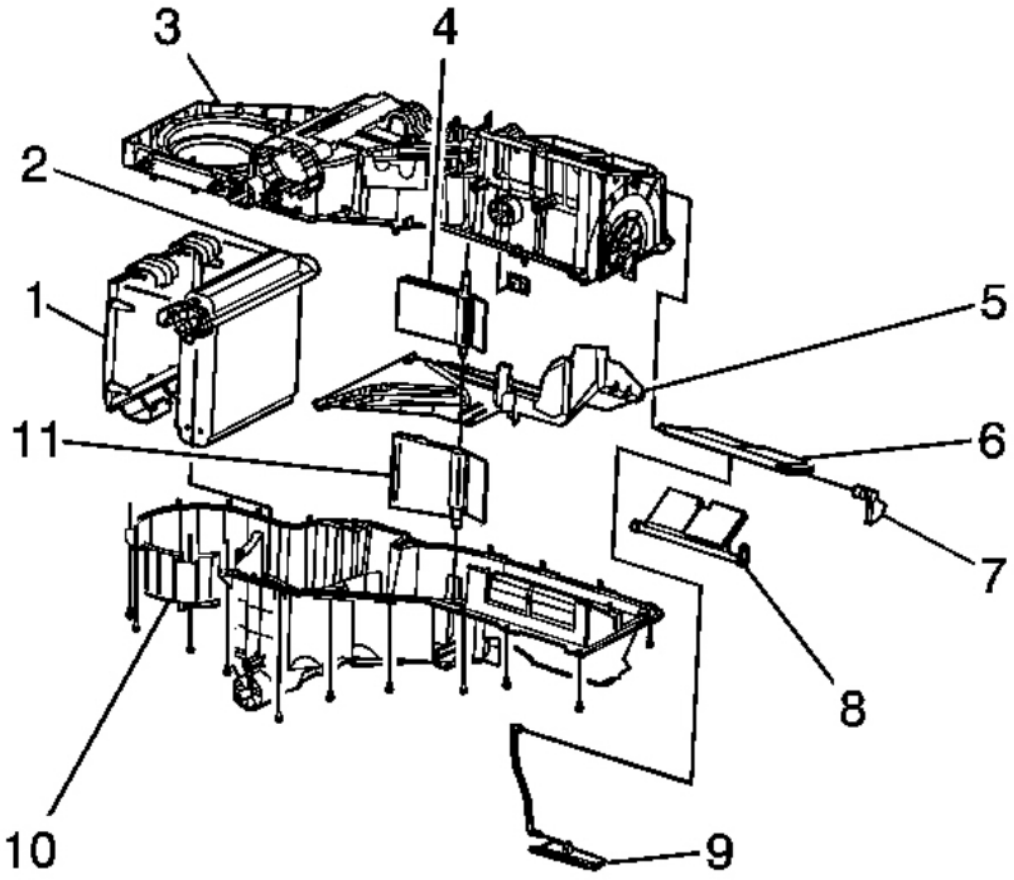


Fig. 196: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the lower mode door (9) to the HVAC module assembly (10).
2. Install the air temperature separator plate (5) to the HVAC module assembly (10).
3. Install the HVAC module assembly halves.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: For every heat stake removed ensure that you install a screw.

4. Install the screws to the HVAC module assembly.

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Tighten: Tighten the screws to 1.6 N.m (14 lb in).

5. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

MODE DOOR REPLACEMENT - UPPER (VISTEON)

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

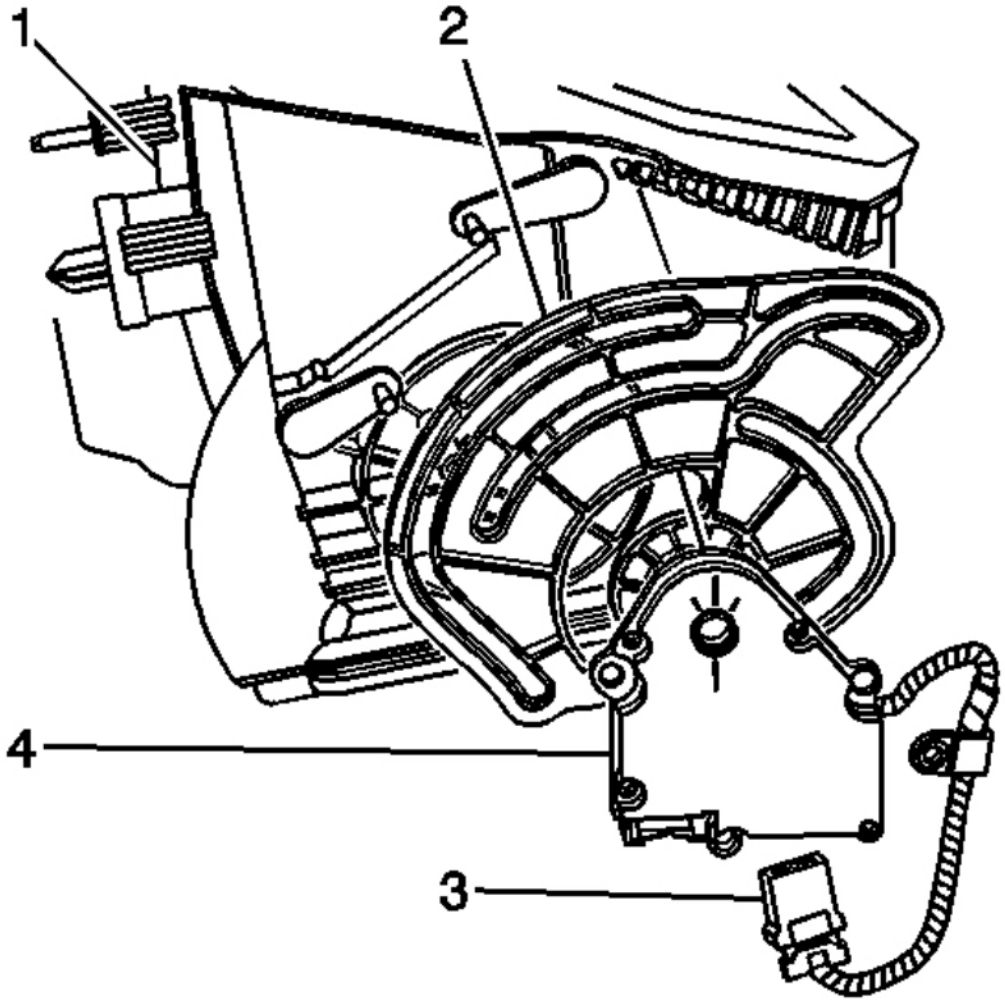


Fig. 197: View Of Mode Actuator

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Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector (3) from the mode actuator (4).
3. Remove the screws from the mode actuator (4).
4. Remove the mode actuator (4) from the HVAC module assembly (1).
5. Remove the wiring harness from the air distribution housing (1).

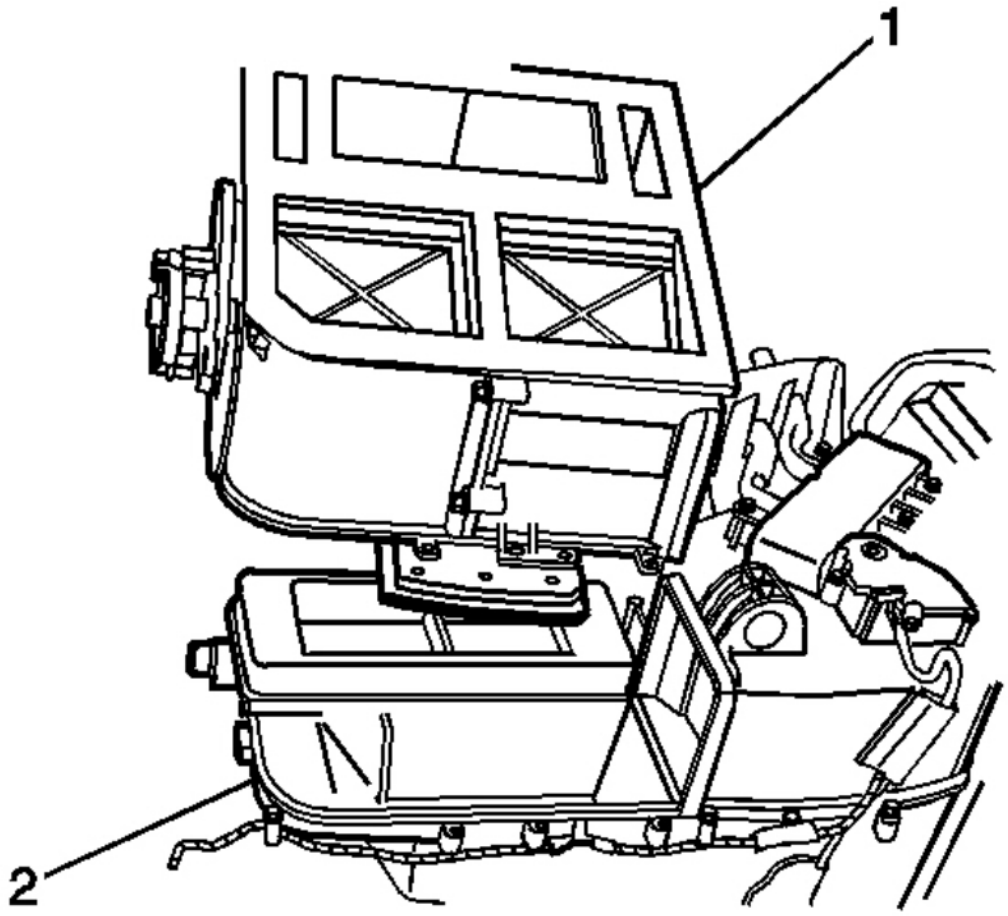


Fig. 198: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the screws from the air distribution housing (1).

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7. Remove the air distribution housing (1) from the HVAC module assembly (2).

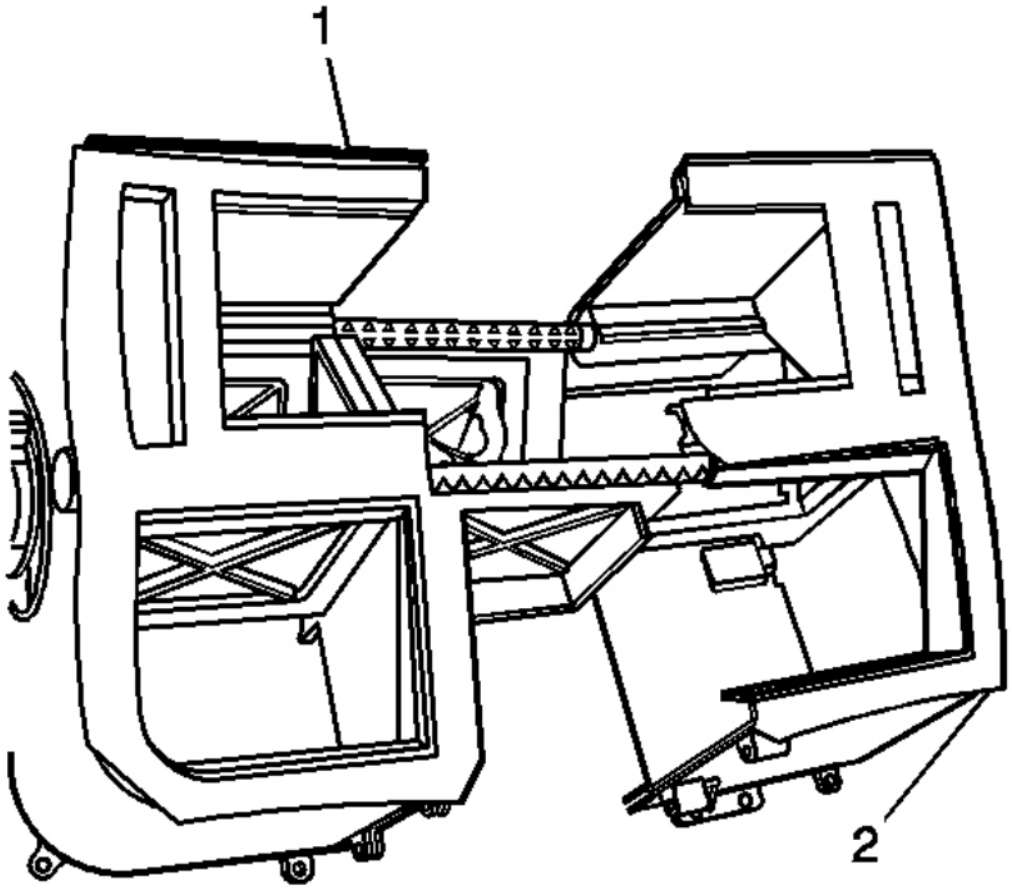


Fig. 199: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws from the air distribution housing (1).
9. Separate the air distribution housing halves.

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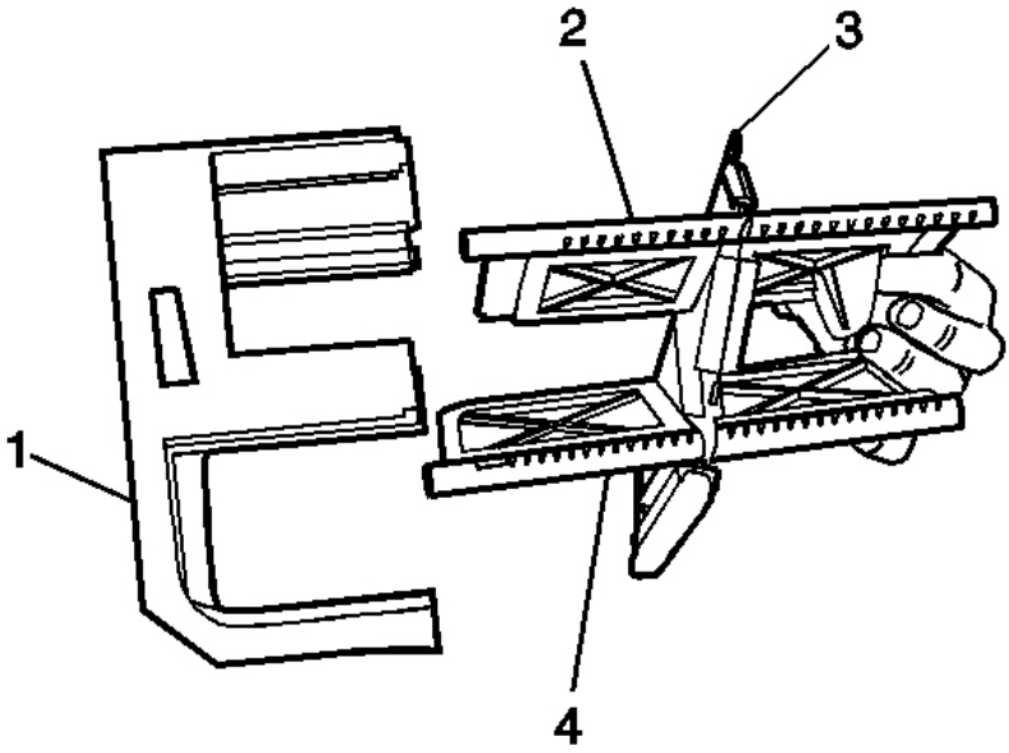


Fig. 200: Removing/Installing Upper Mode Door & Defroster Door (Visteon)
Courtesy of GENERAL MOTORS CORP.

10. Remove the lever from the upper mode door (4).
11. Remove the lever from the defrost door (2).
12. Remove the door assembly (3) from the left air distribution housing (1).
13. Remove the mode door (4) from the door assembly (3).

Installation Procedure

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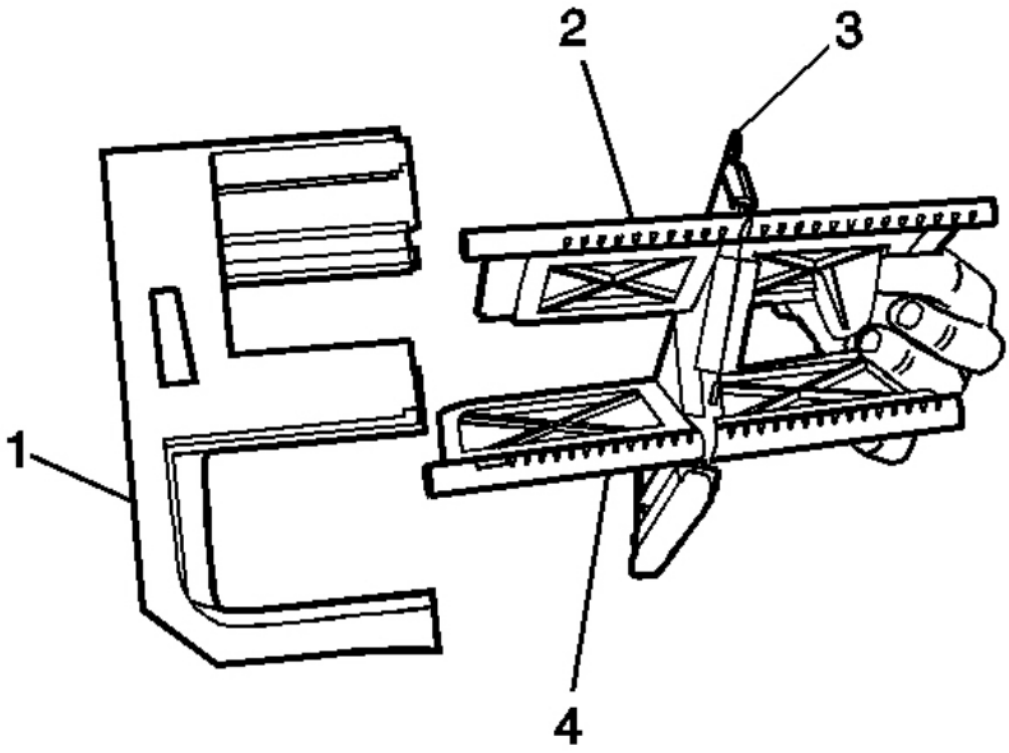


Fig. 201: Removing/Installing Upper Mode Door & Defroster Door (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the mode door (4) to the door assembly (3).
2. Install the door assembly (3) to the left air distribution housing (1).
3. Install the lever to the defrost door (2).
4. Install the lever to the upper mode door (4).

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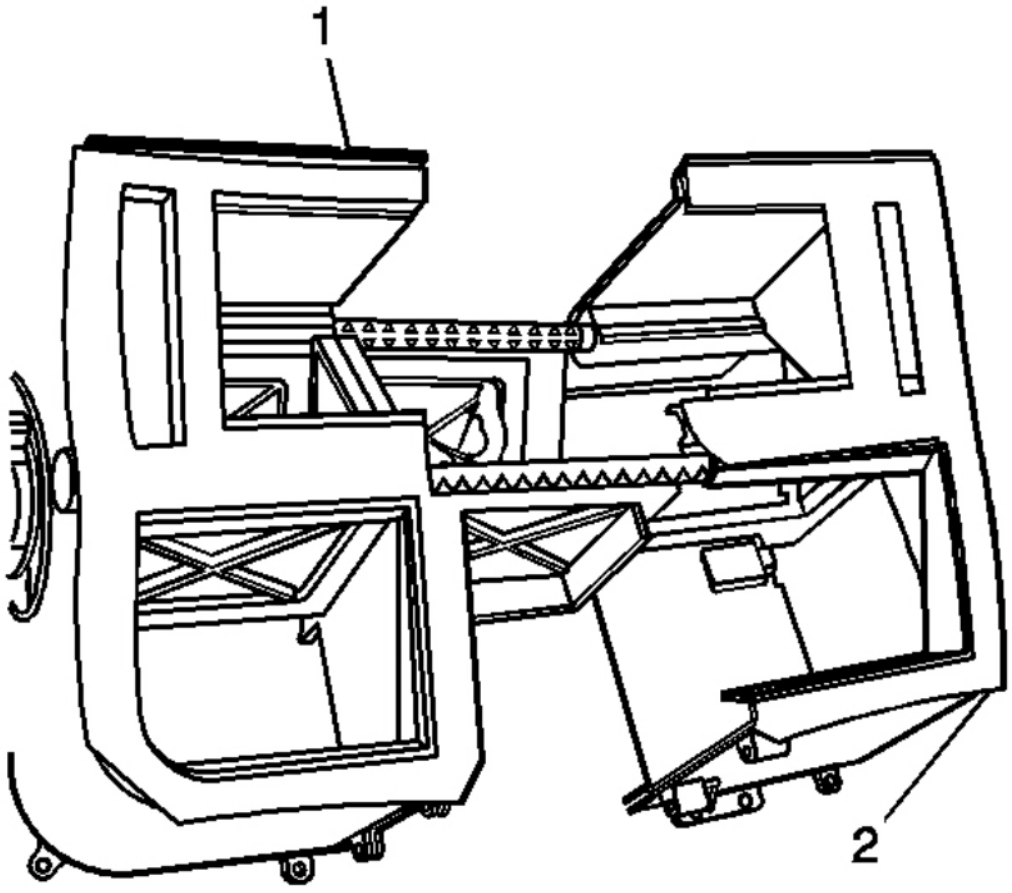


Fig. 202: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

5. Install the air distribution housing halves.

NOTE: Refer to Fastener Notice in Cautions and Notices.

6. Install the screws to the air distribution housing (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

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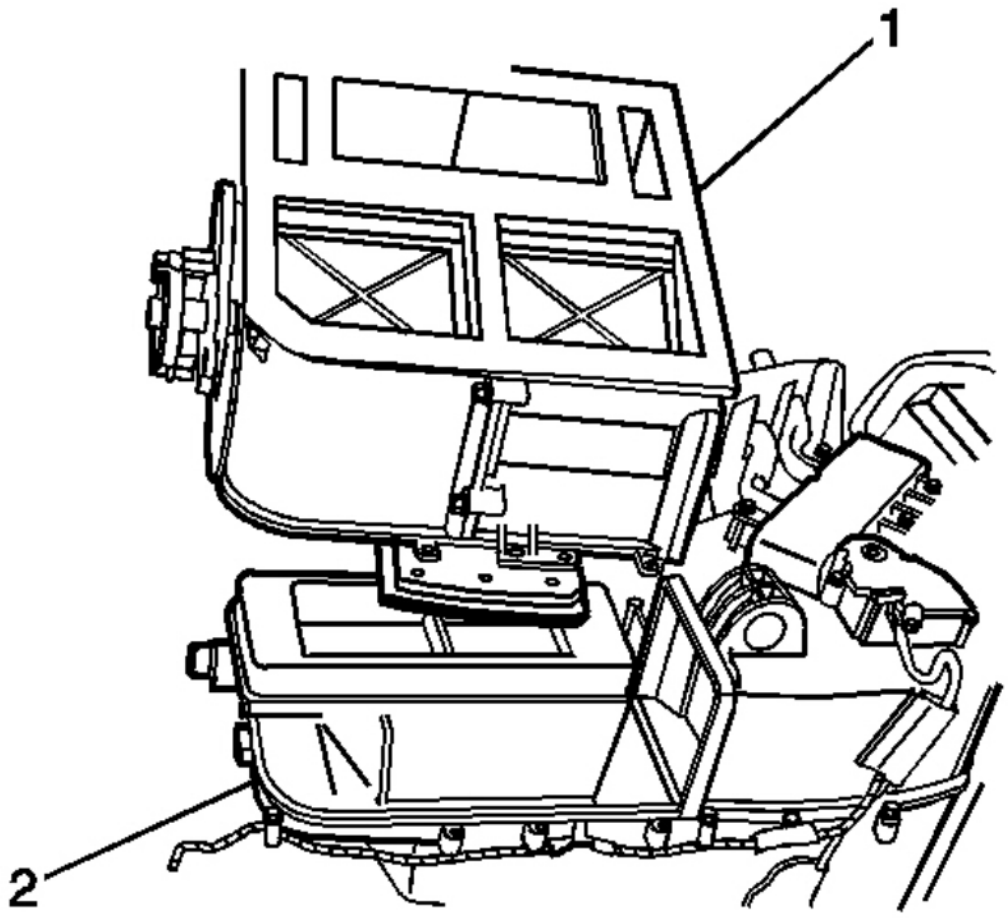


Fig. 203: Removing/Installing Air Distribution Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

7. Install the air distribution housing (1) to the HVAC module assembly (2).
8. Install the screws to the air distribution housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

9. Install the wiring harness to the air distribution housing (1).

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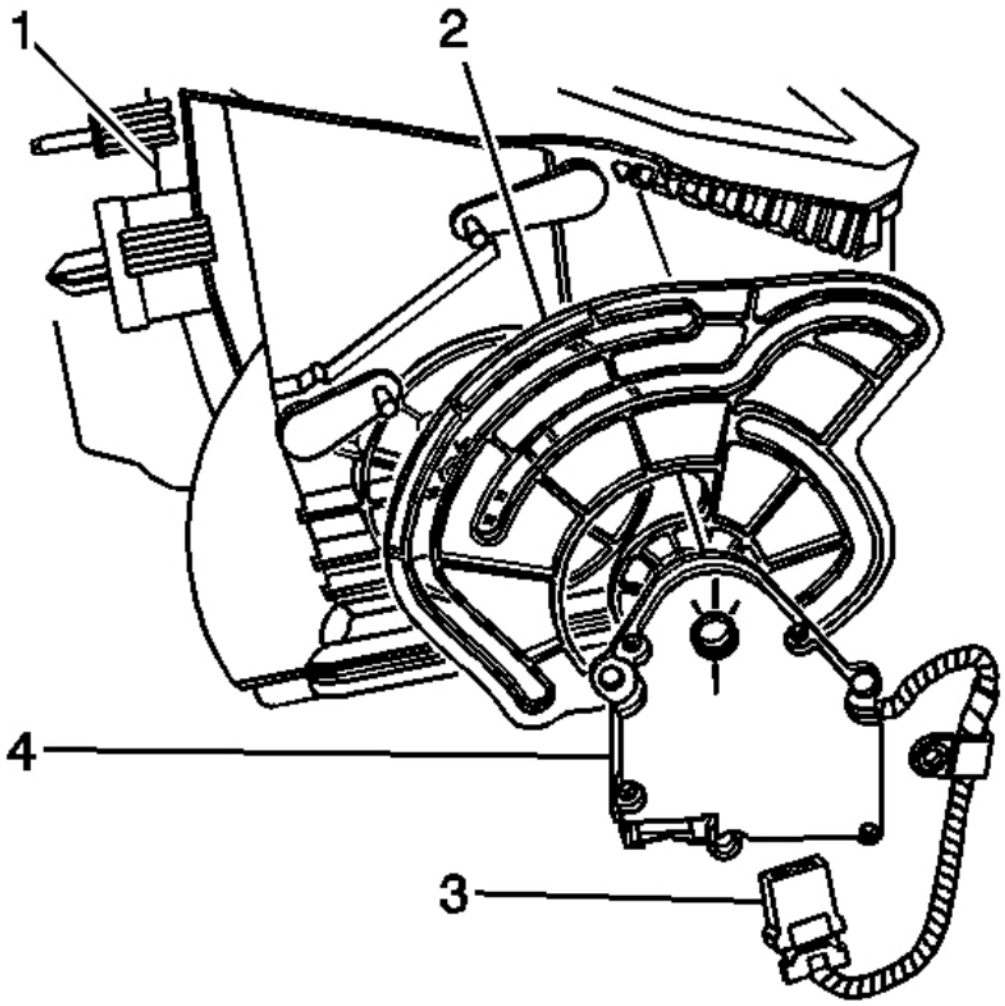


Fig. 204: View Of Mode Actuator
Courtesy of GENERAL MOTORS CORP.

10. Connect the electrical connector (3) to the mode actuator (4).
11. Install the mode actuator (4) to the HVAC module assembly (1).
12. Install the screws to the mode actuator (4).

Tighten: Tighten the screws to 2 N.m (18 lb in).

13. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

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MODE DOOR REPLACEMENT - UPPER (DELPHI)

Removal Procedure

IMPORTANT: The upper mode door (6) is serviced with the upper HVAC module case (3).

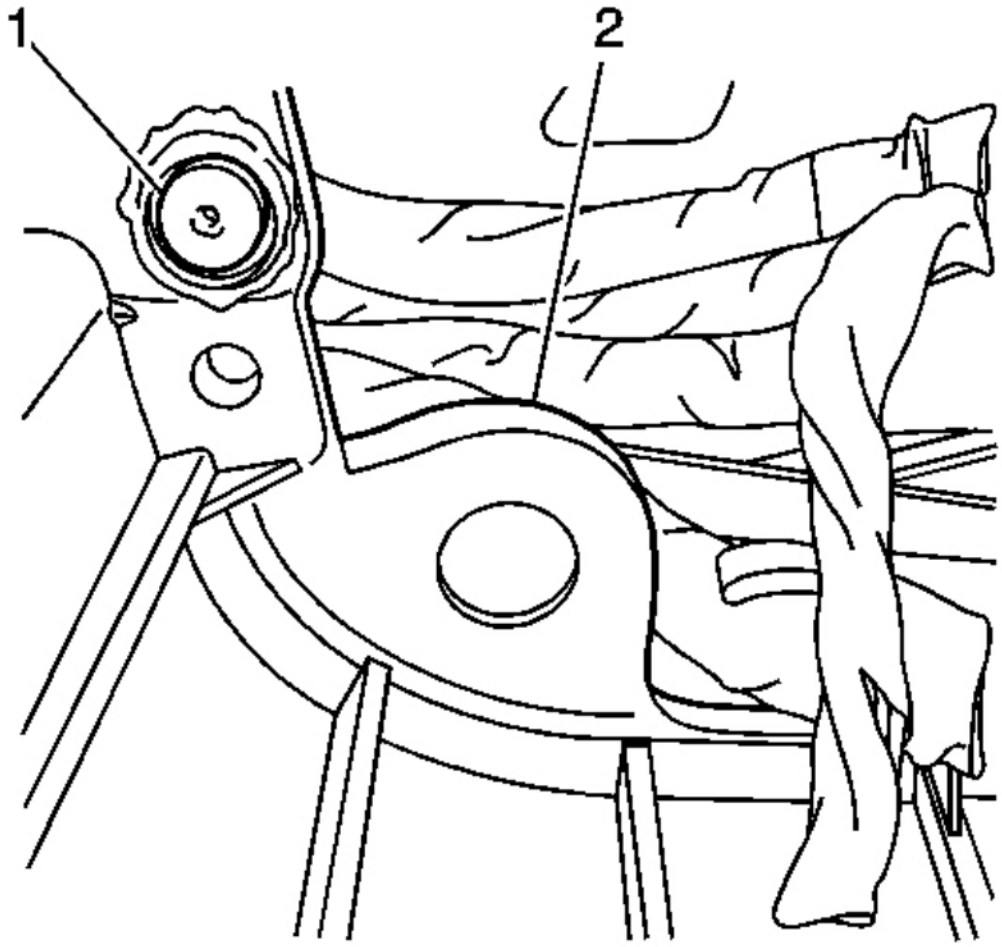


Fig. 205: Removing Heat Stakes From The HVAC Module (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.

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2. Disconnect the electrical connector (3) from the mode actuator (4).
3. Remove the screws from the mode actuator (4).
4. Remove the mode actuator (4) from the HVAC module assembly (1).
5. If equipped remove the heat stakes (1) from the HVAC module (2) with a screw driver and a hammer.

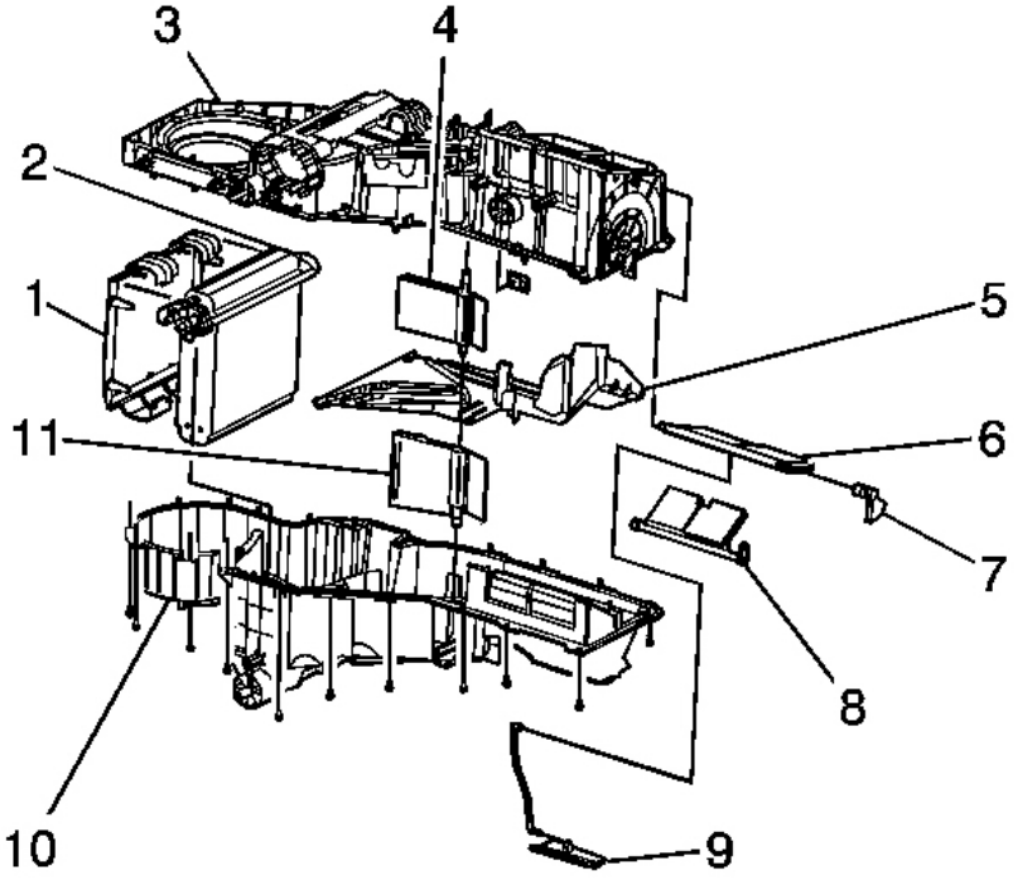


Fig. 206: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

6. If equipped remove the HVAC module assembly screws.
7. Separate the HVAC module assembly.
8. Remove the lever (7) from the upper mode door/upper HVAC module case (6).

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Installation Procedure

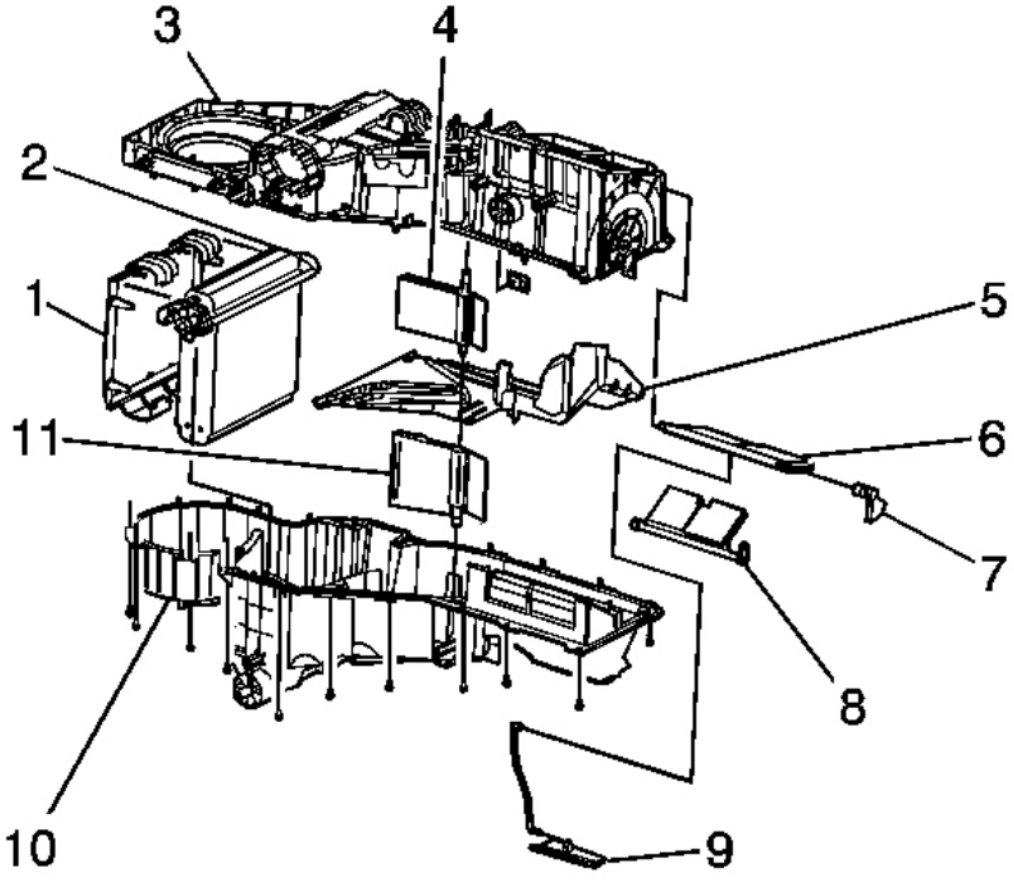


Fig. 207: Exploded View Of HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the lever (7) to the upper mode door/upper HVAC module case (6).
2. Install the HVAC module assembly halves.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: For every heat stake removed ensure that you install a screw.

3. Install the screws to the HVAC module assembly.

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Tighten: Tighten the screws to 1.6 N.m (14 lb in).

4. Install the mode actuator to the HVAC module assembly.
5. Install the screws to the mode actuator.

   Tighten: Tighten the screws to 1.6 N.m (14 lb in).

6. Connect the electrical connector to the mode actuator.
7. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

RECIRCULATION DOOR REPLACEMENT (VISTEON)

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
2. Remove the wiring harness from the recirculation housing (1).
3. Remove the screws from the upper recirculation housing (1).

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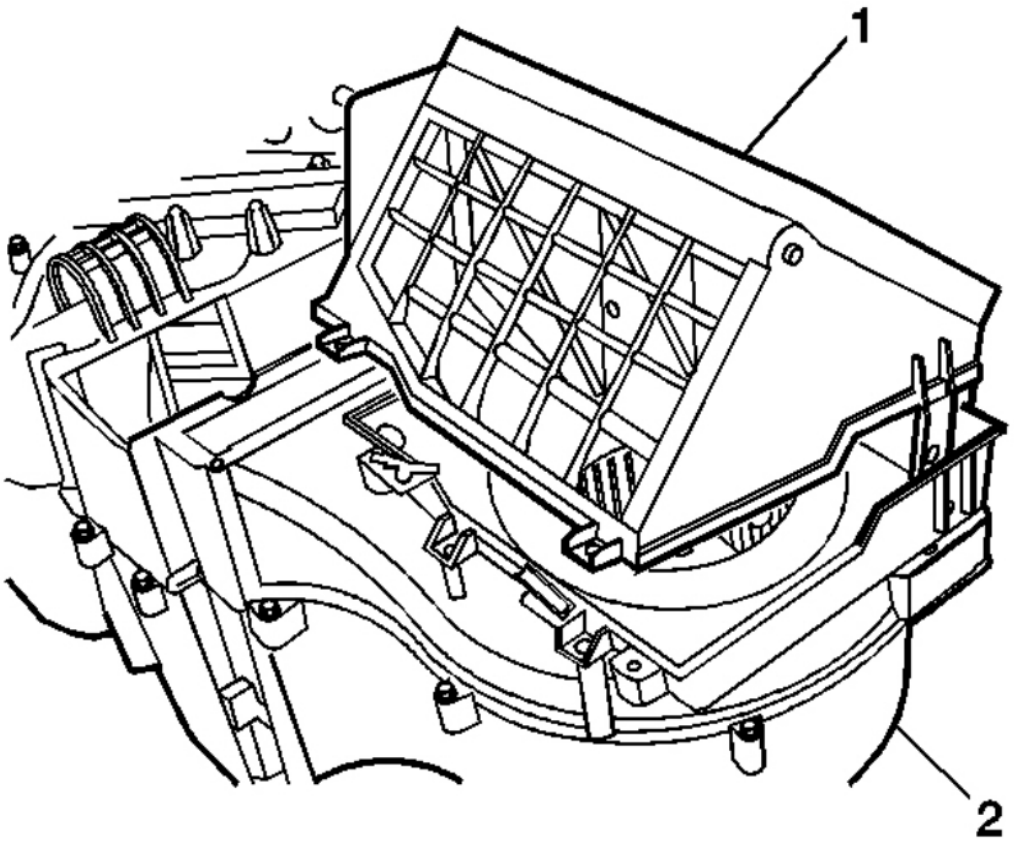


Fig. 208: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

4. Remove the upper recirculation housing (1) from the HVAC module assembly (2).
5. Disconnect the electrical connector from the recirculation actuator (1).
6. Remove the screws from the recirculation actuator (1).

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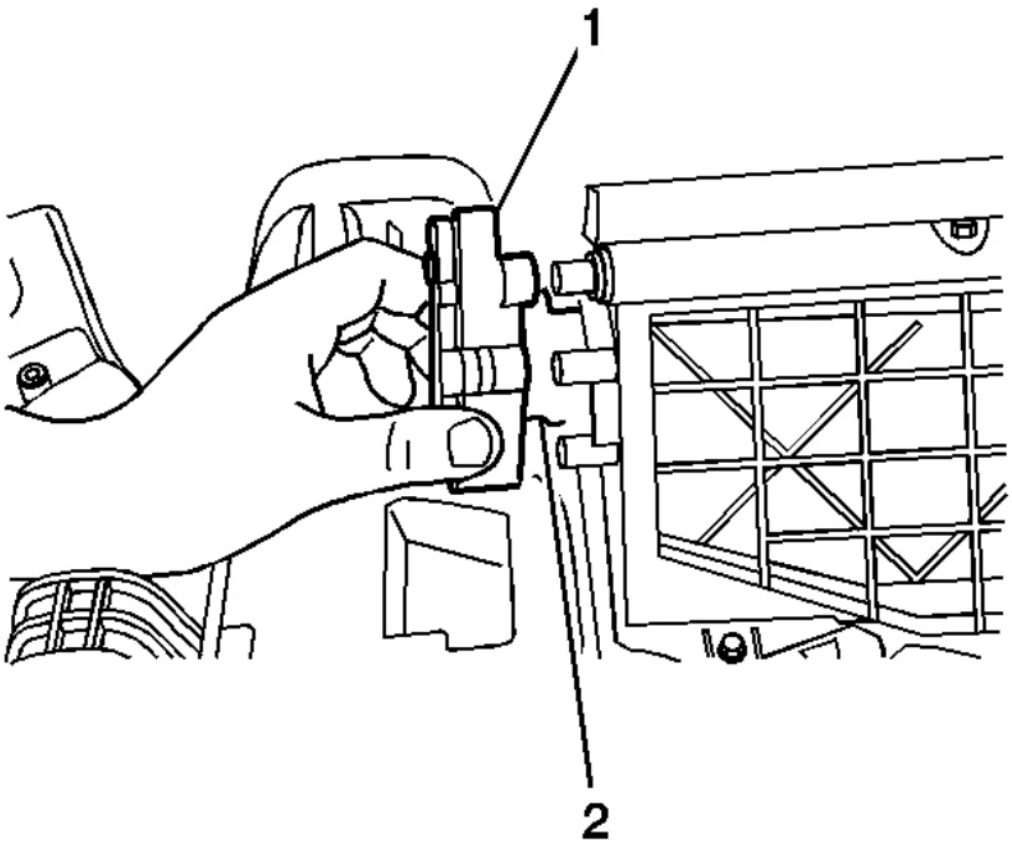


Fig. 209: View Of Recirculation Actuator & Recirculation Housing
Courtesy of GENERAL MOTORS CORP.

7. Remove the recirculation actuator (1) from the recirculation housing (2).

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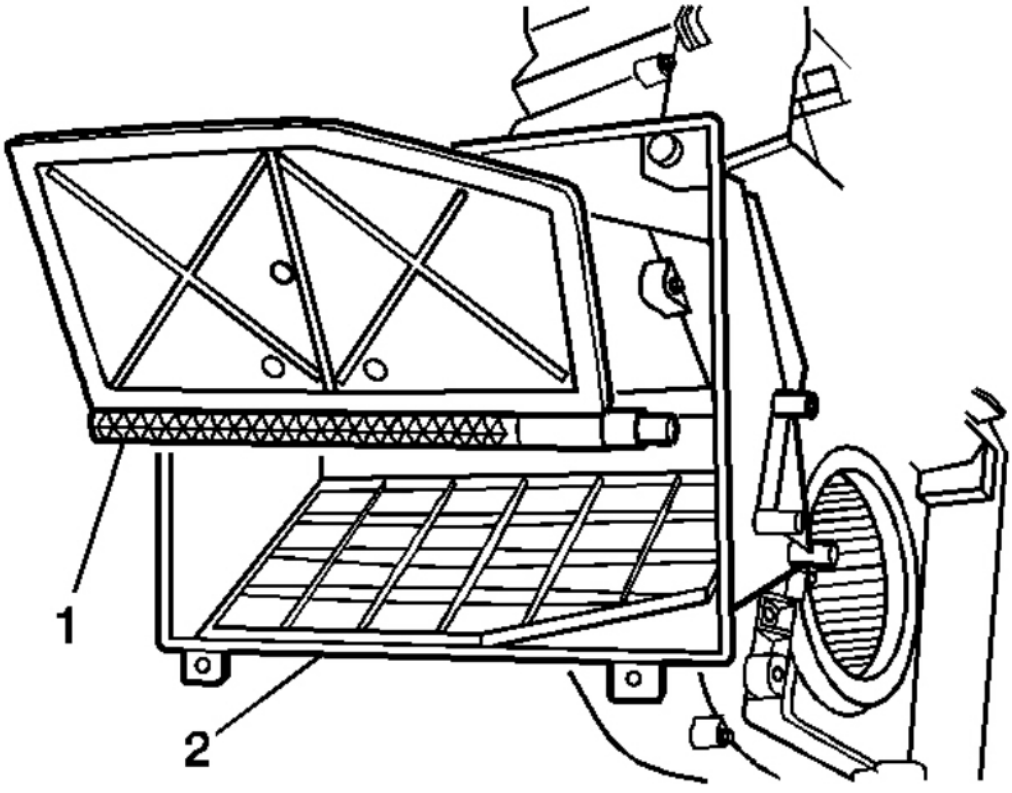


Fig. 210: Removing/Installing Recirculation Door & Recirculation Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

8. Remove the recirculation door (1) from the recirculation housing (2).

Installation Procedure

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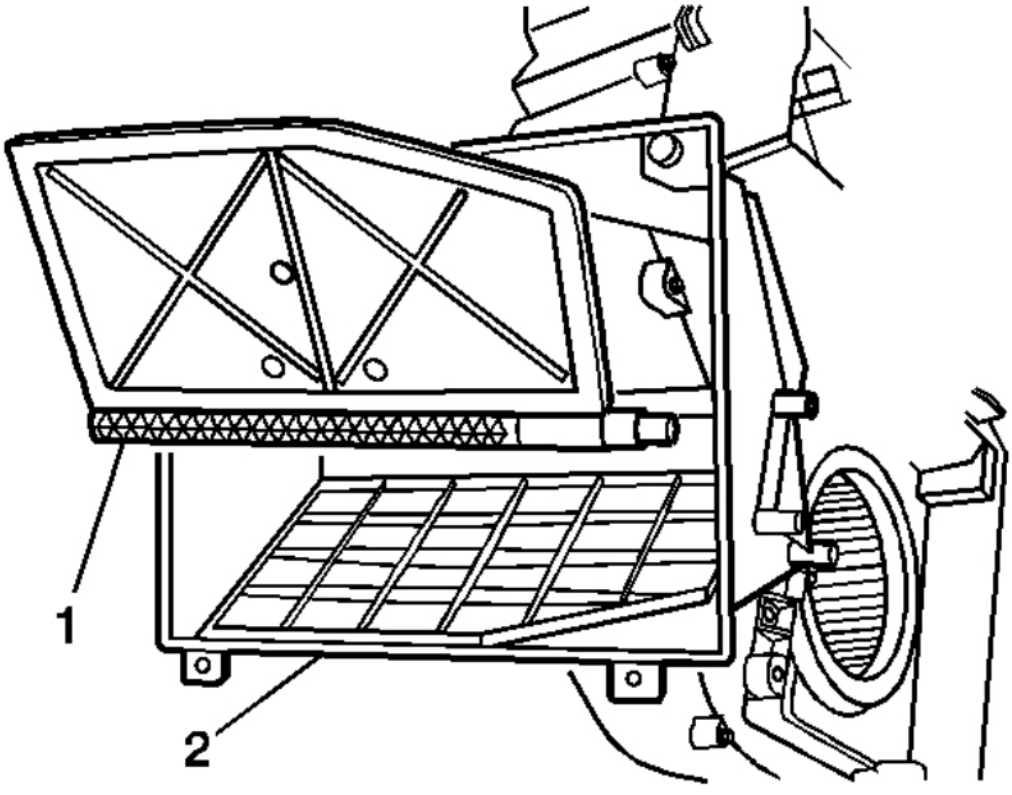


Fig. 211: Removing/Installing Recirculation Door & Recirculation Housing (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the recirculation door (1) to the recirculation housing (2).

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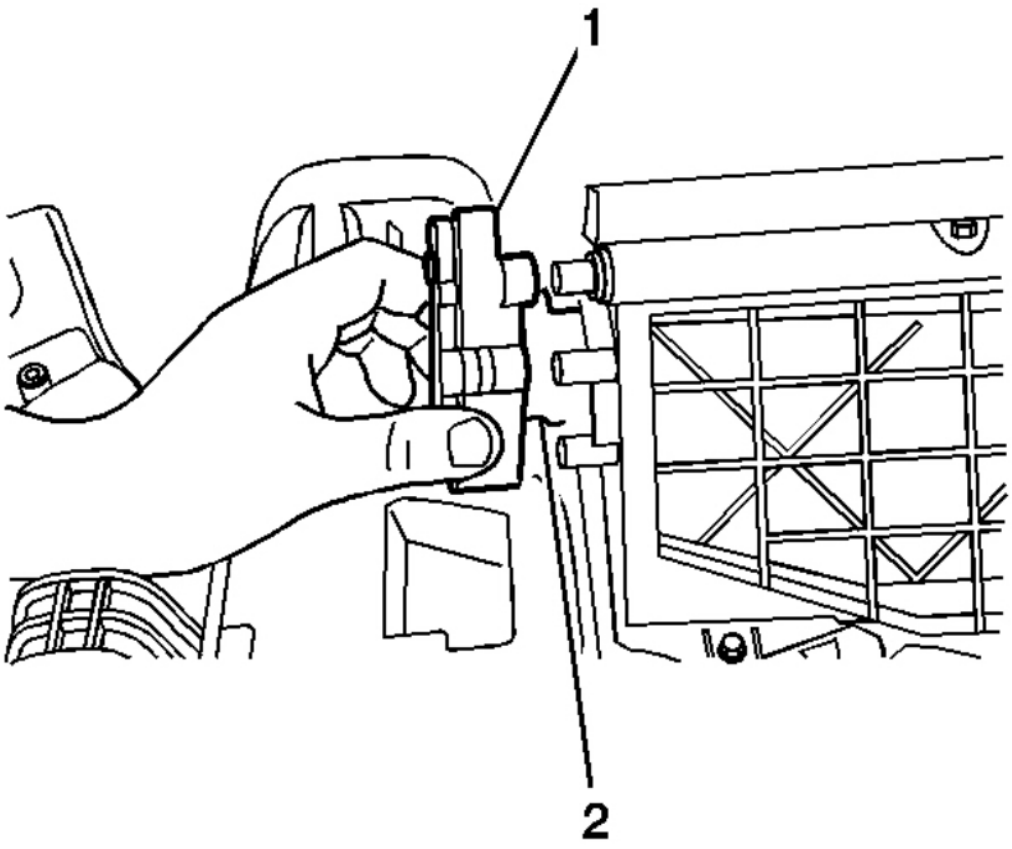


Fig. 212: View Of Recirculation Actuator & Recirculation Housing
Courtesy of GENERAL MOTORS CORP.

2. Install the recirculation actuator (1) to the recirculation housing (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the recirculation actuator (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

4. Connect the electrical connection to the recirculation actuator (1).

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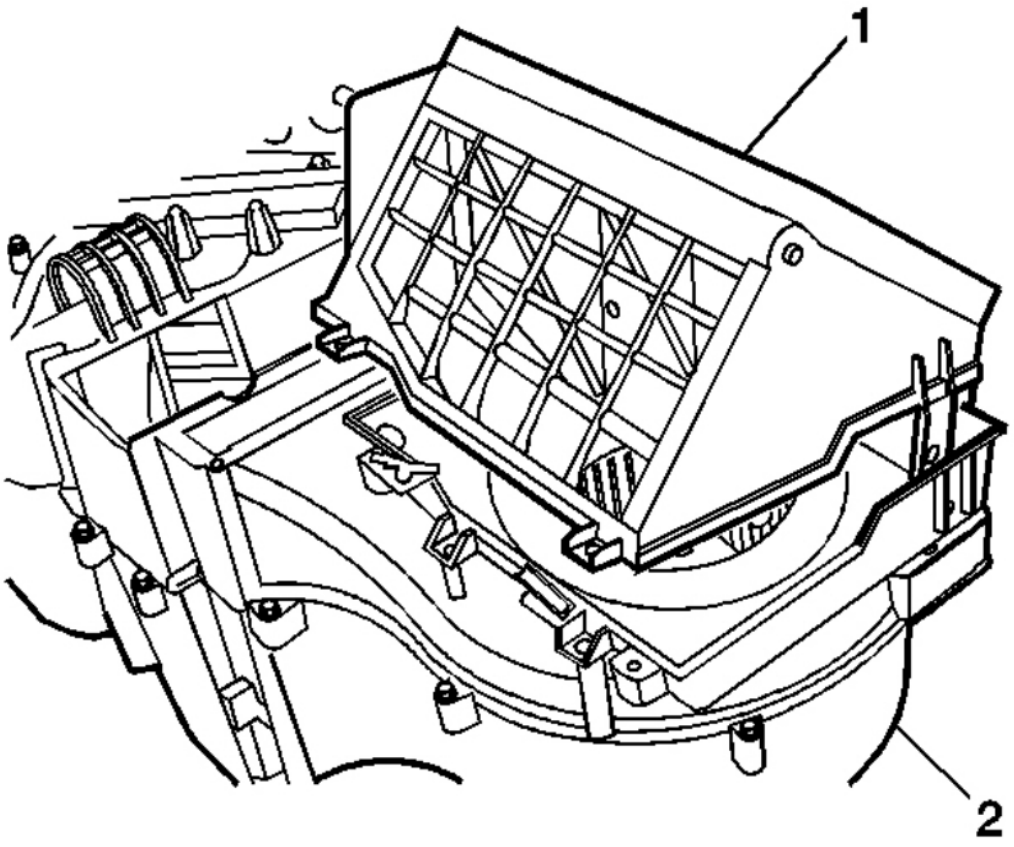


Fig. 213: View Of Upper Recirculation Housing And HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

5. Install the upper recirculation housing (1) to the HVAC module assembly (2).
6. Install the screws to the upper recirculation housing (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

7. Install the wiring harness to the recirculation housing (1).
8. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

RECIRCULATION DOOR REPLACEMENT (DELPHI)

Removal Procedure

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1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

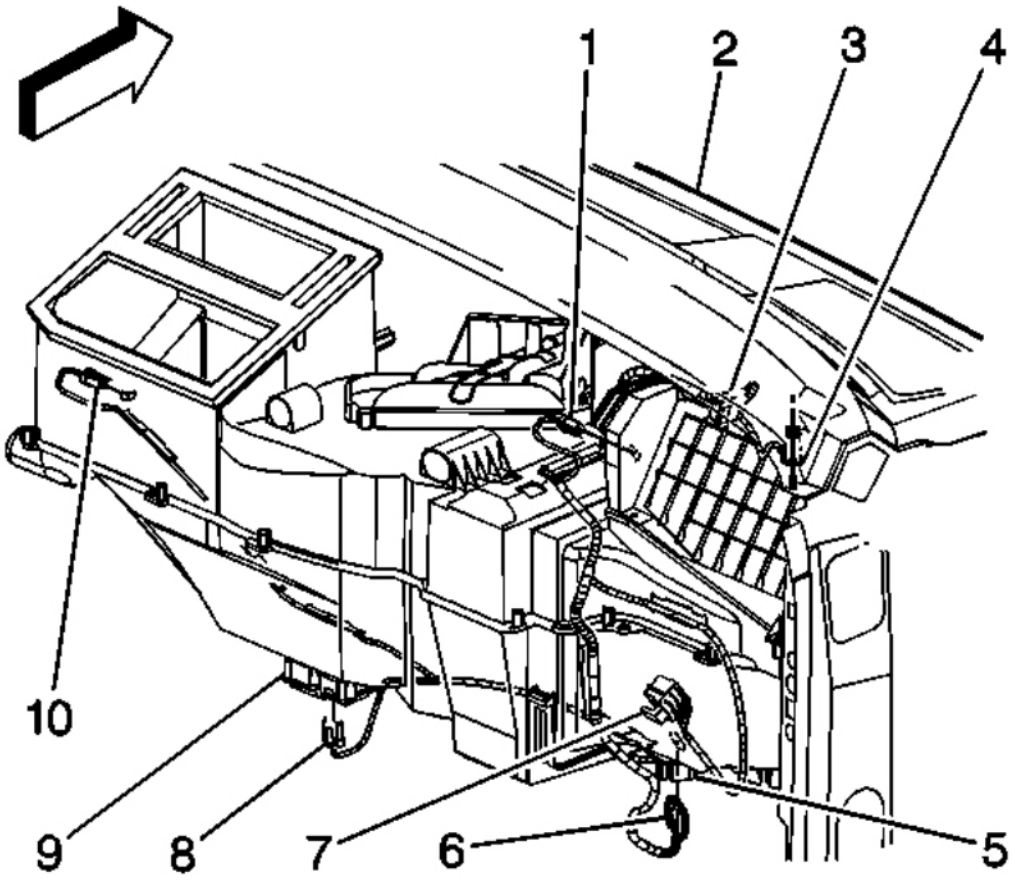


Fig. 214: Identifying Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the recirculation actuator electrical connection (1).

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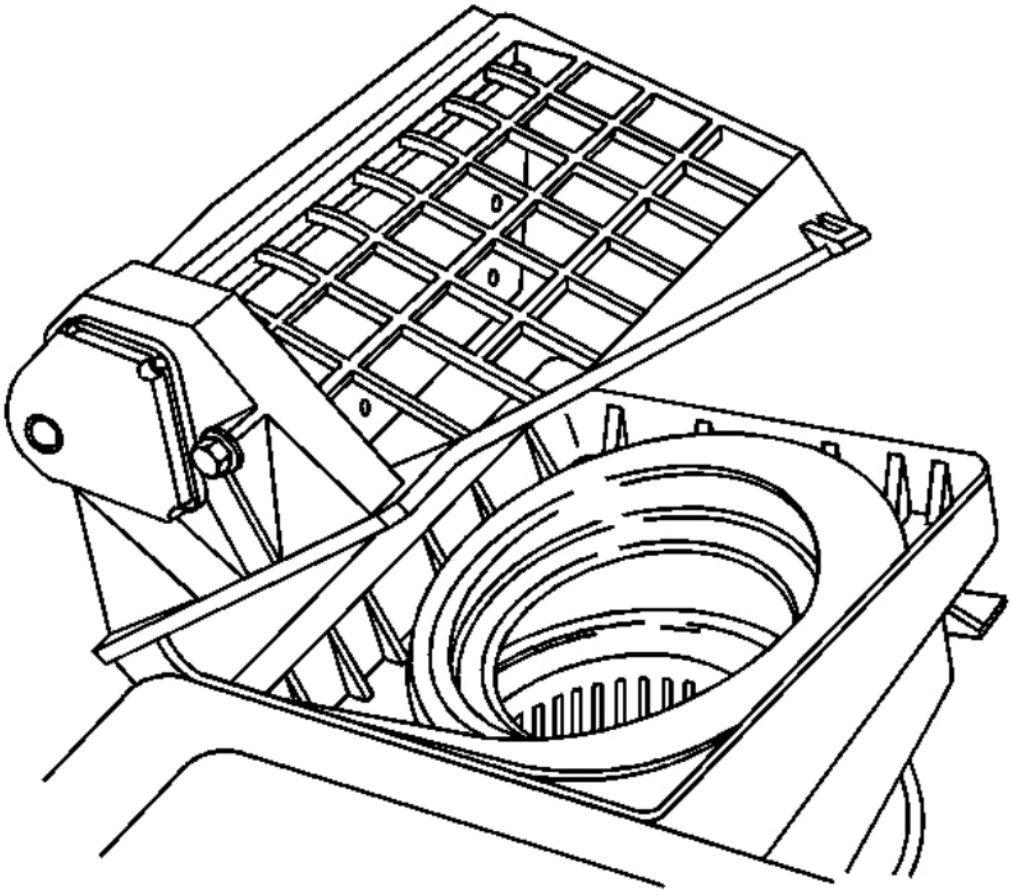


Fig. 215: Removing/Installing Recirculation Actuator Mounting Screws (Delphi)
Courtesy of GENERAL MOTORS CORP.

3. Remove the recirculation actuator mounting screws.

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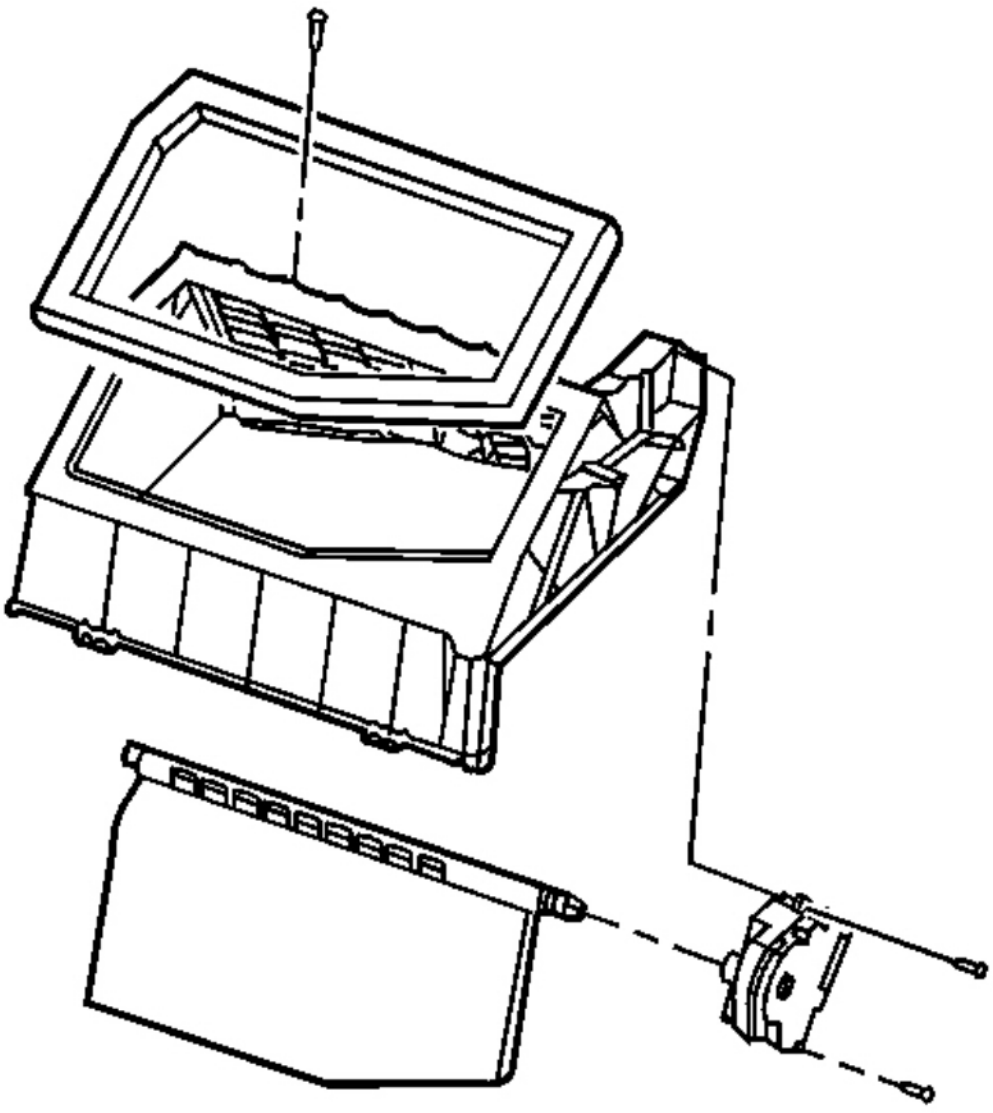


Fig. 216: Removing/Installing Recirculation Actuator And Door (Delphi)
Courtesy of GENERAL MOTORS CORP.

4. Remove the recirculation actuator.
5. Remove the recirculation door.

Installation Procedure

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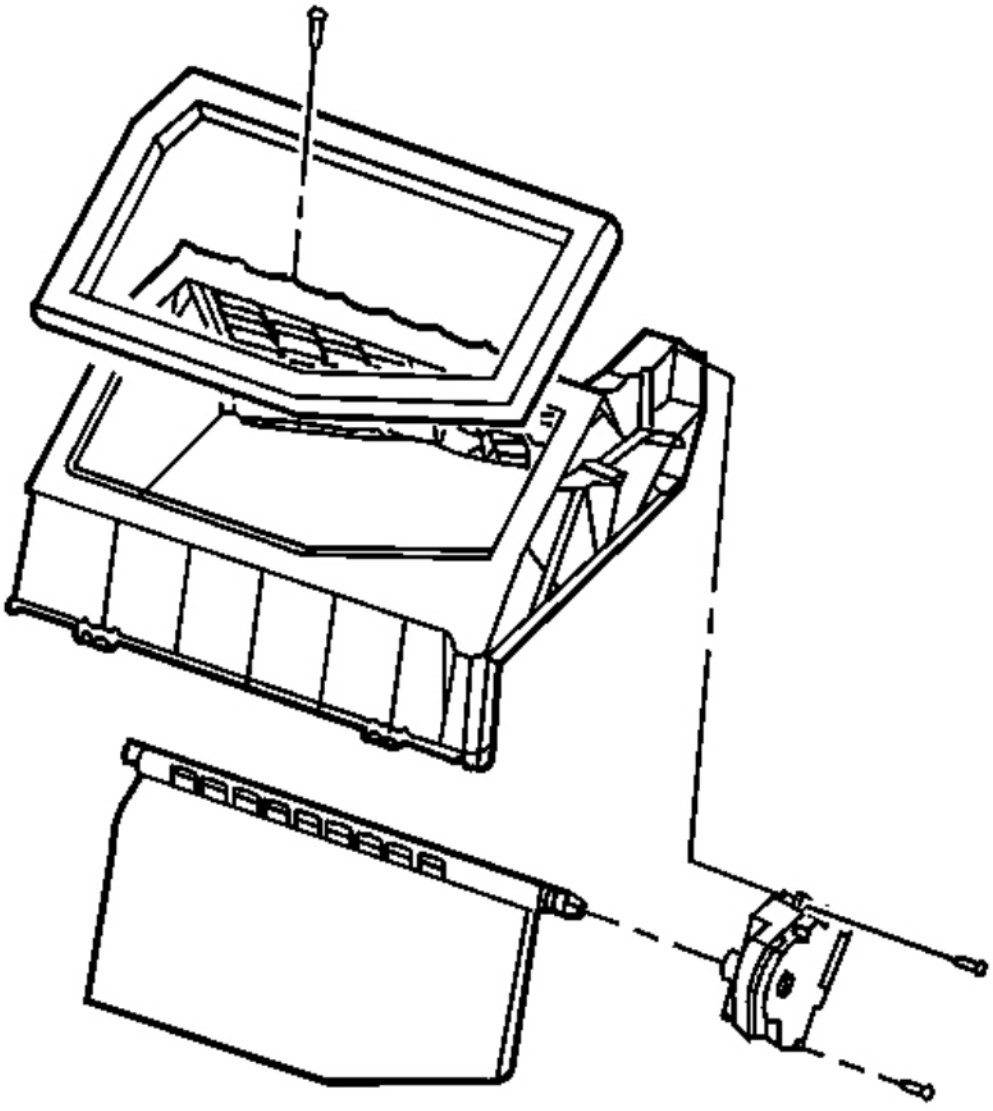


Fig. 217: Removing/Installing Recirculation Actuator And Door (Delphi)
Courtesy of GENERAL MOTORS CORP.

1. Install the recirculation door.
2. Install the recirculation actuator.

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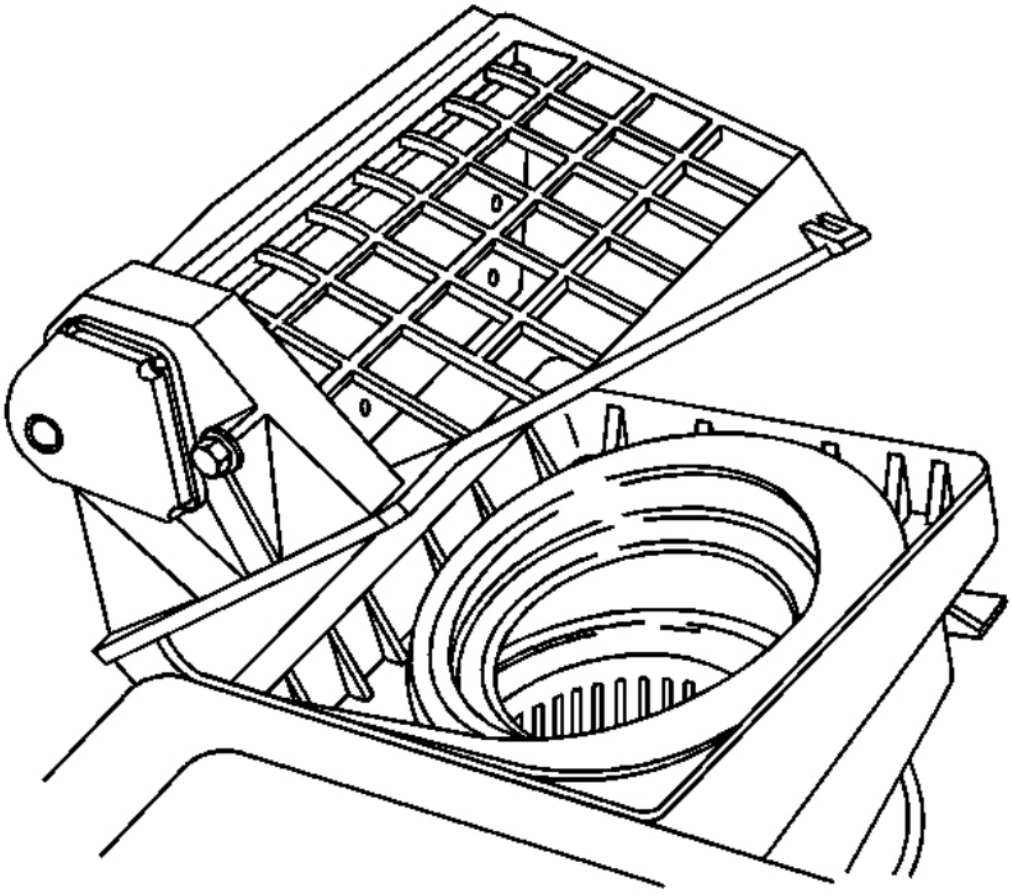


Fig. 218: Removing/Installing Recirculation Actuator Mounting Screws (Delphi)
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the recirculation actuator mounting screws.

   Tighten: Tighten the screws to 1.9 N.m (17 lb in).

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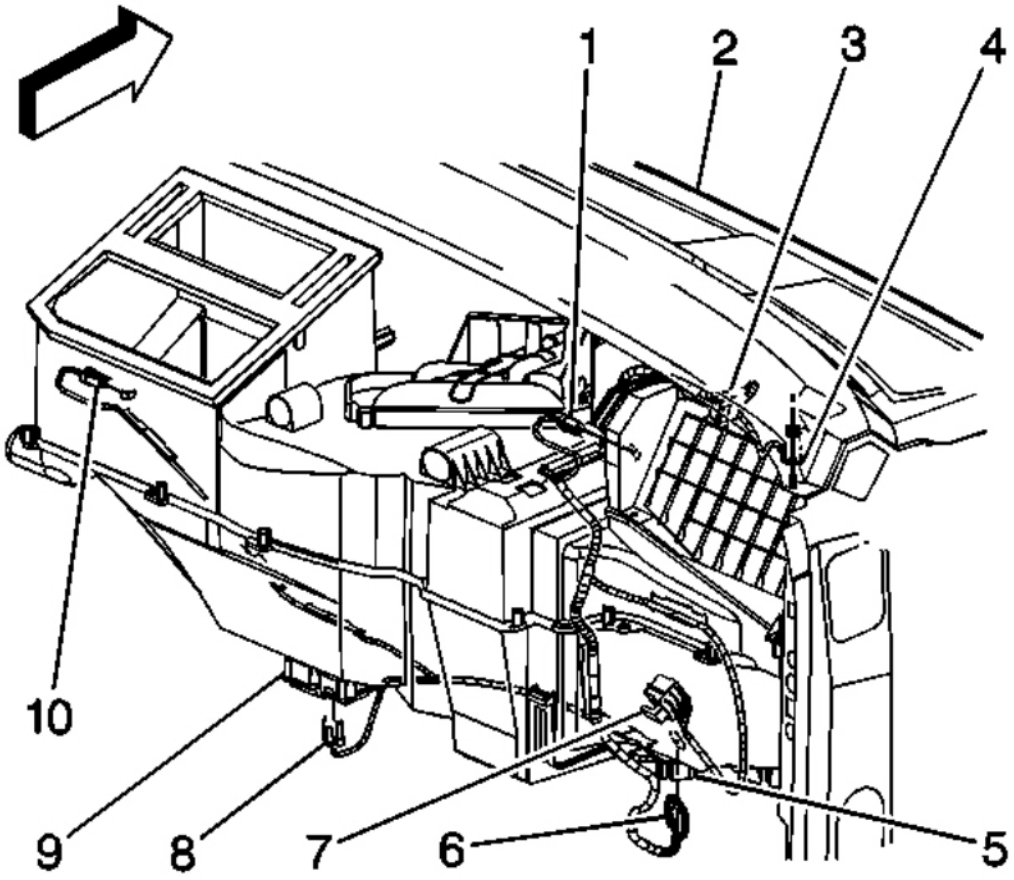


Fig. 219: Identifying Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

4. Connect the recirculation actuator electrical connection (1).
5. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

HEATER CORE REPLACEMENT (VISTEON)

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
2. Remove the screws from the heater core cover.

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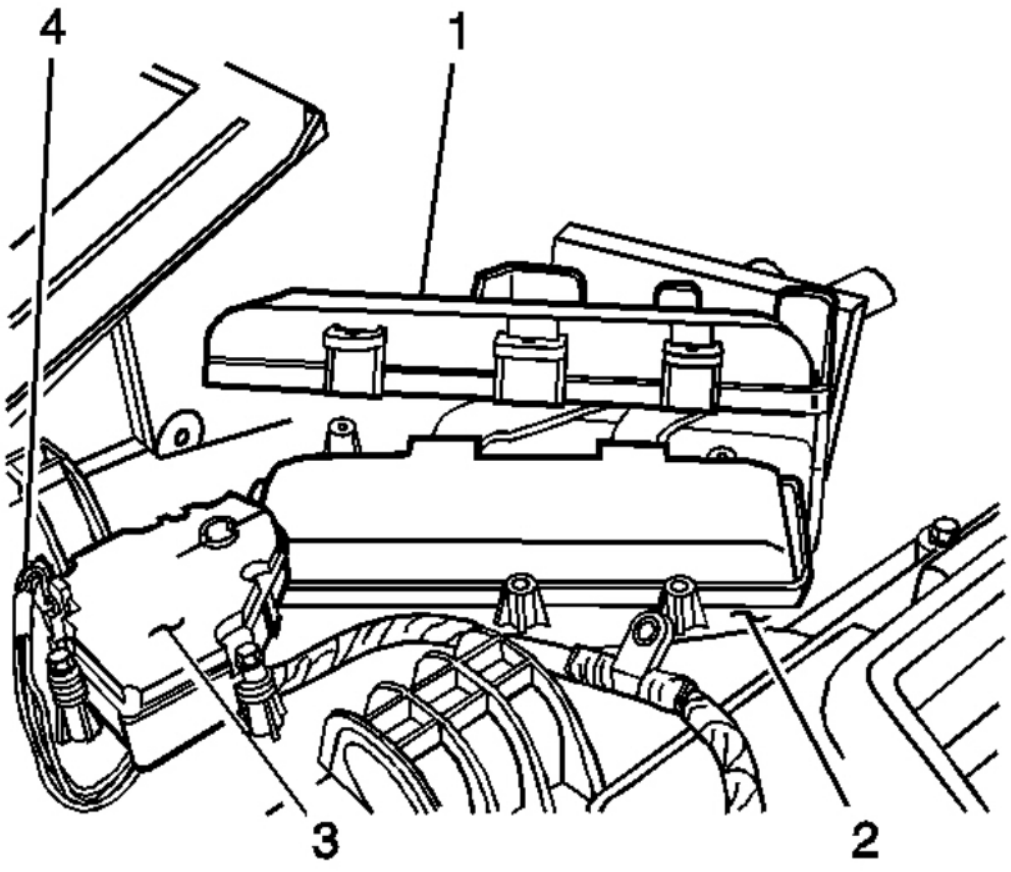


Fig. 220: View Of Heater Core Cover & HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. Remove the heater core cover (1) from the HVAC module assembly (2).

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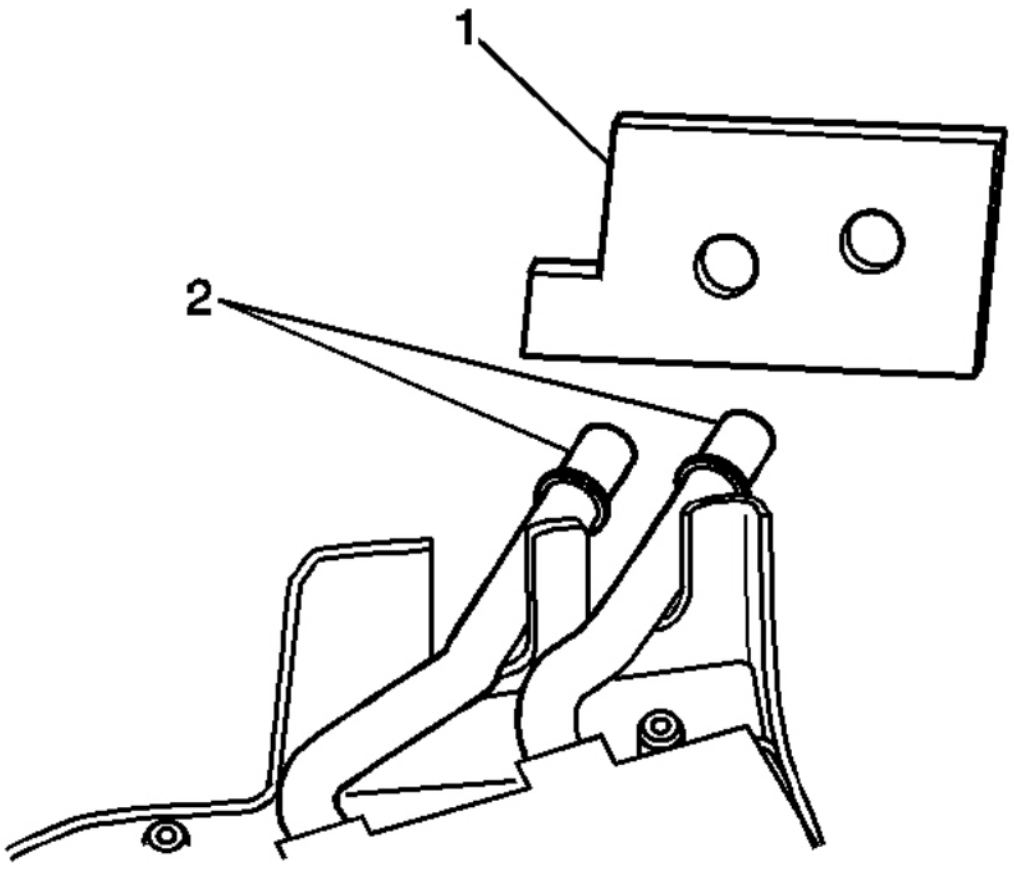


Fig. 221: Removing/Installing Heater Core Cowl Gasket (Visteon)
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core cowl gasket (1) from the heater core (2).

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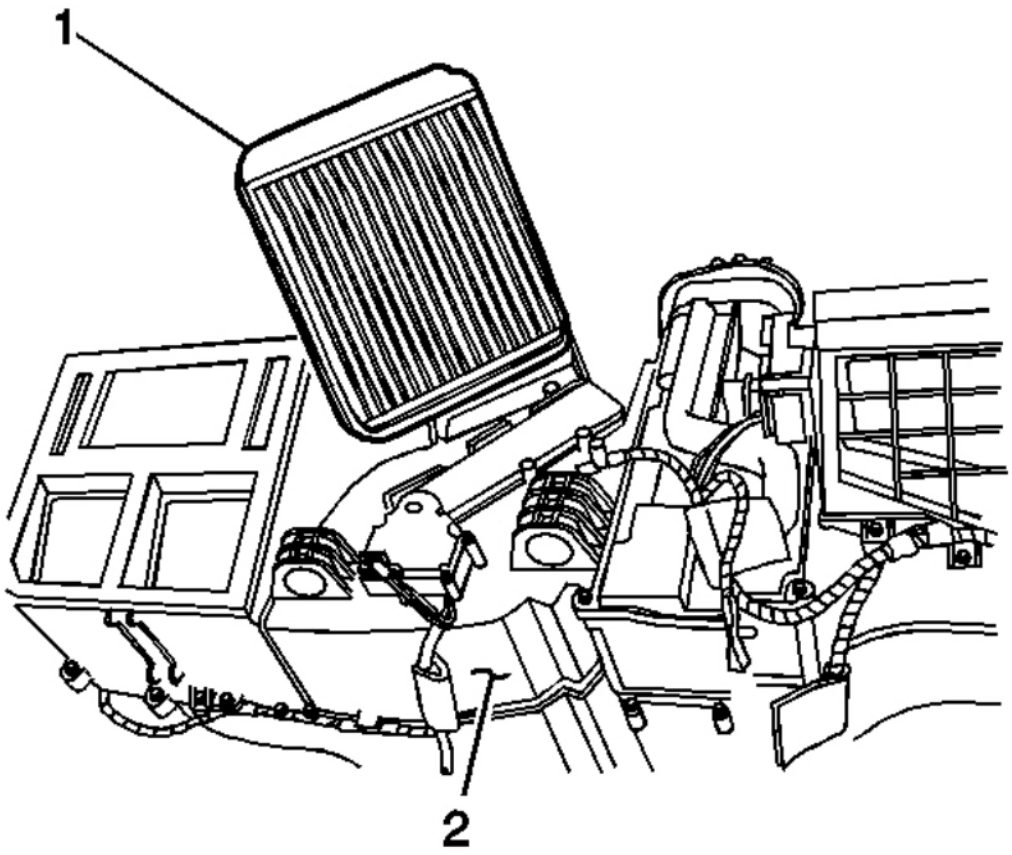


Fig. 222: Removing/Installing Heater Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

5. Remove the heater core (1) from the HVAC module assembly (2).

Installation Procedure

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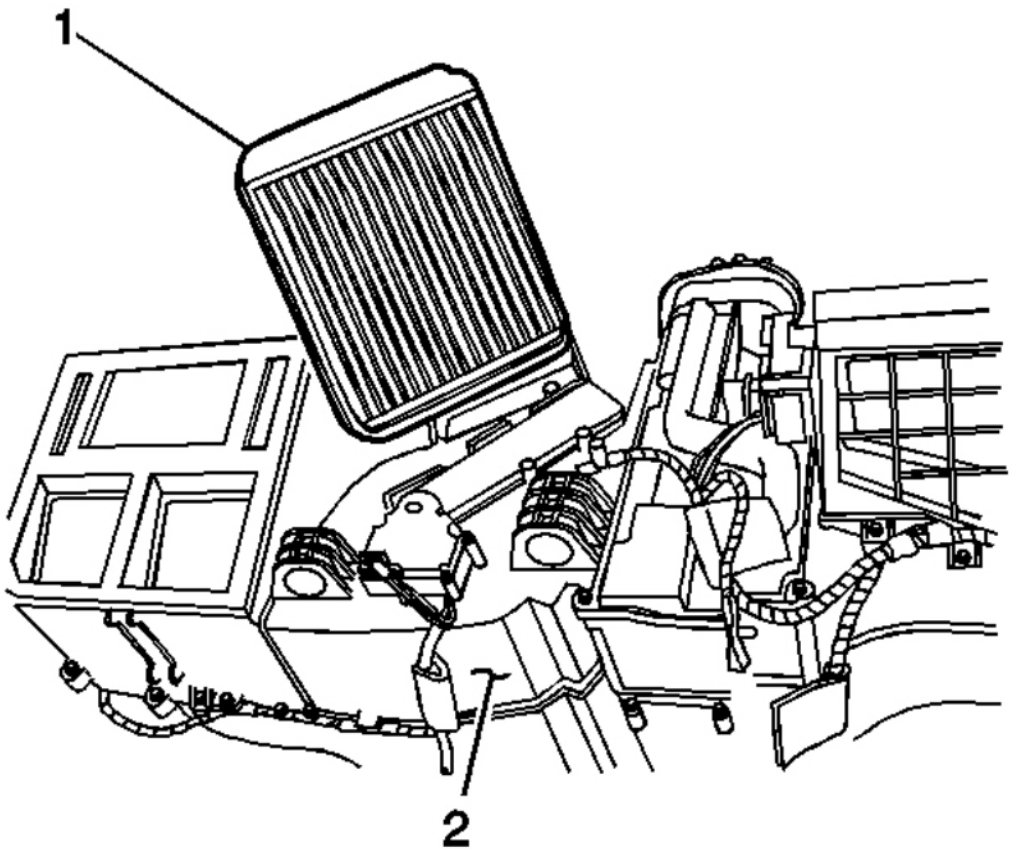


Fig. 223: Removing/Installing Heater Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the heater core (1) to the HVAC module assembly (2).

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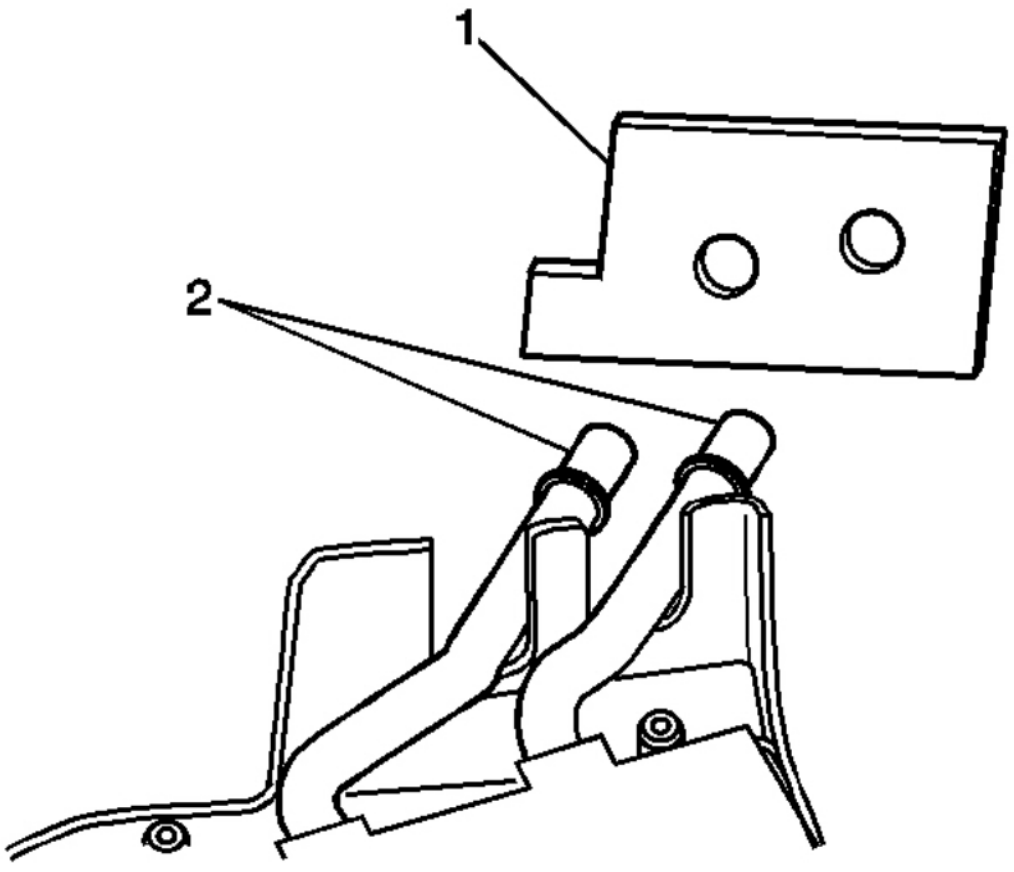


Fig. 224: Removing/Installing Heater Core Cowl Gasket (Visteon)
Courtesy of GENERAL MOTORS CORP.

2. Install the heater core cowl gasket (1) to the HVAC module assembly (2).

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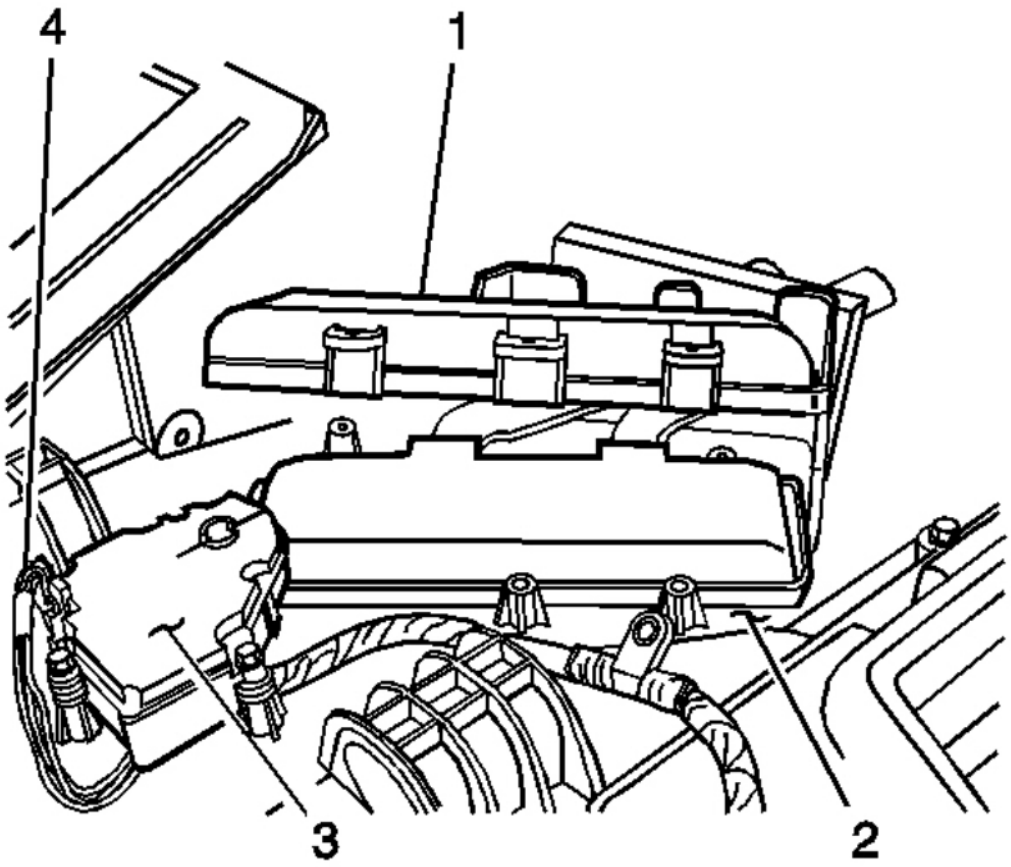


Fig. 225: View Of Heater Core Cover & HVAC Module Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the heater core cover (1) to the HVAC module assembly (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the heater core cover (1).

   Tighten: Tighten the screws to 2 N.m (18 lb in).

5. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

HEATER CORE REPLACEMENT (DELPHI)

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Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
2. Remove the screws from the heater core cover.

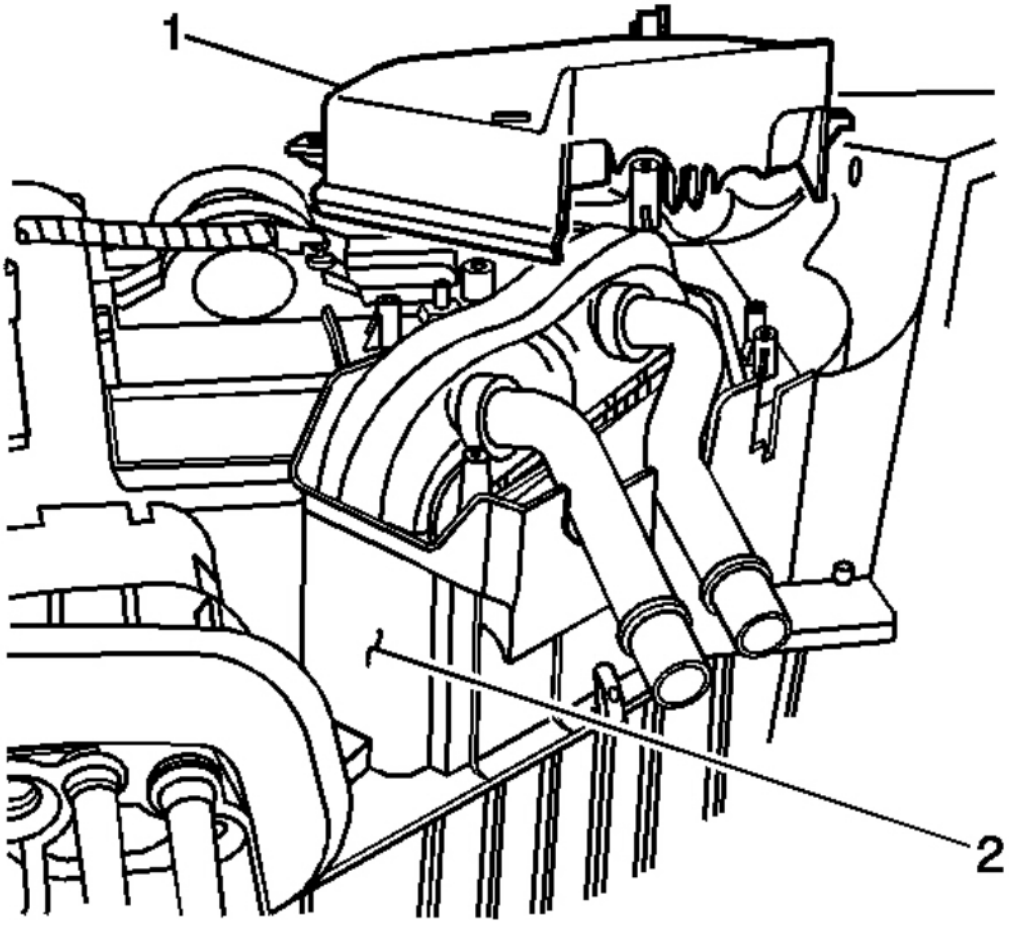


Fig. 226: Removing/Installing Heater Core Cover And HVAC Module Assembly (Delphi)
Courtesy of GENERAL MOTORS CORP.

3. Remove the heater core cover (1) from the HVAC module assembly (2).

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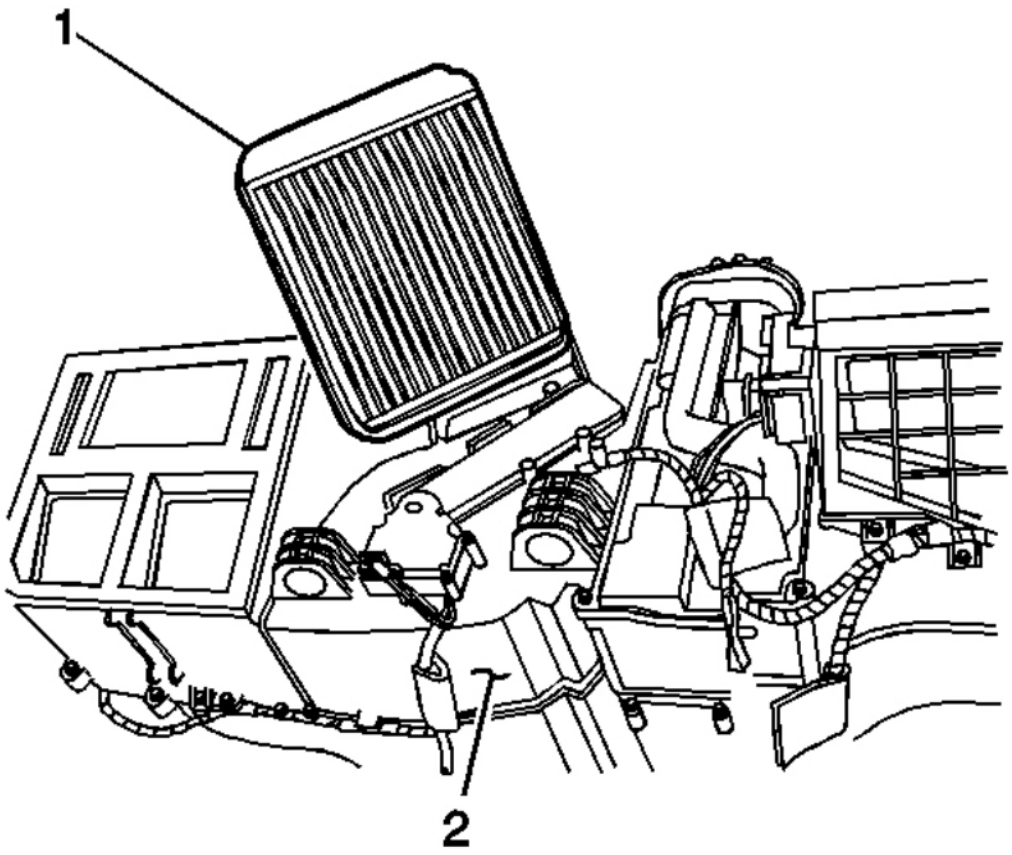


Fig. 227: Removing/Installing Heater Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core cowl gasket (1) from the heater core (2).
5. Remove the heater core (2) from the HVAC module assembly (3).

Installation Procedure

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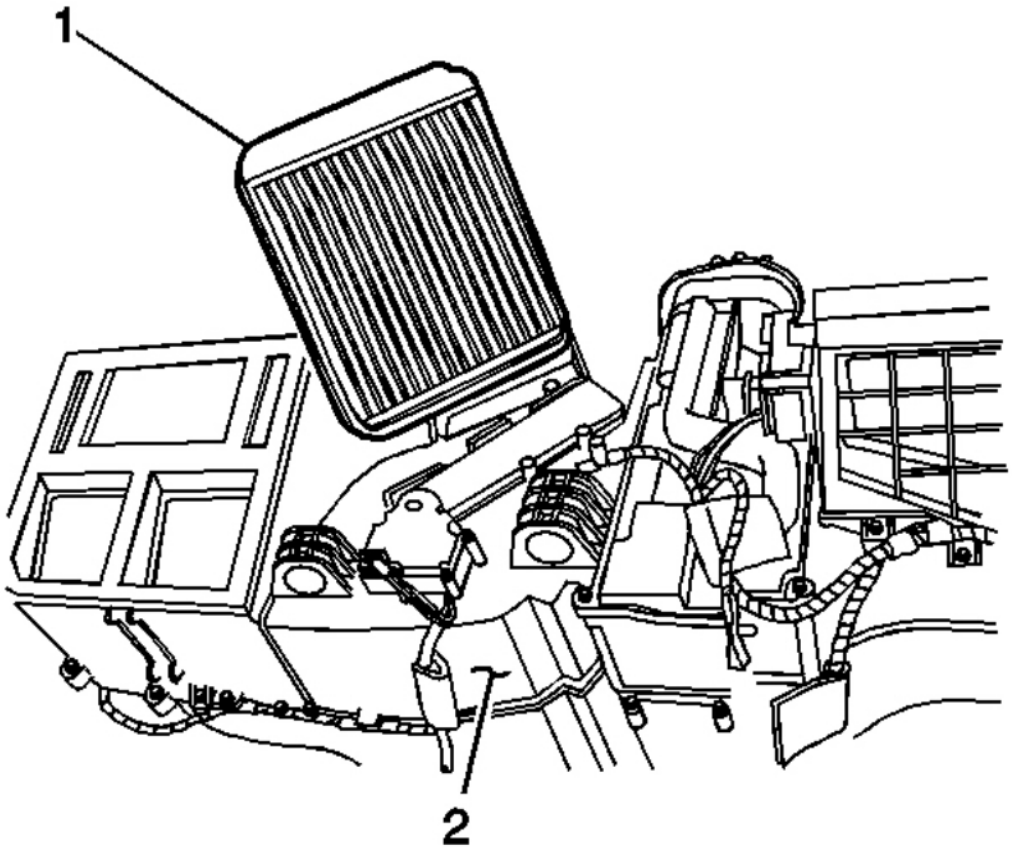


Fig. 228: Removing/Installing Heater Core (Visteon)
Courtesy of GENERAL MOTORS CORP.

1. Install the heater core (2) to the HVAC module assembly (3).
2. Install the heater core cowl gasket (1) to the heater core (2).

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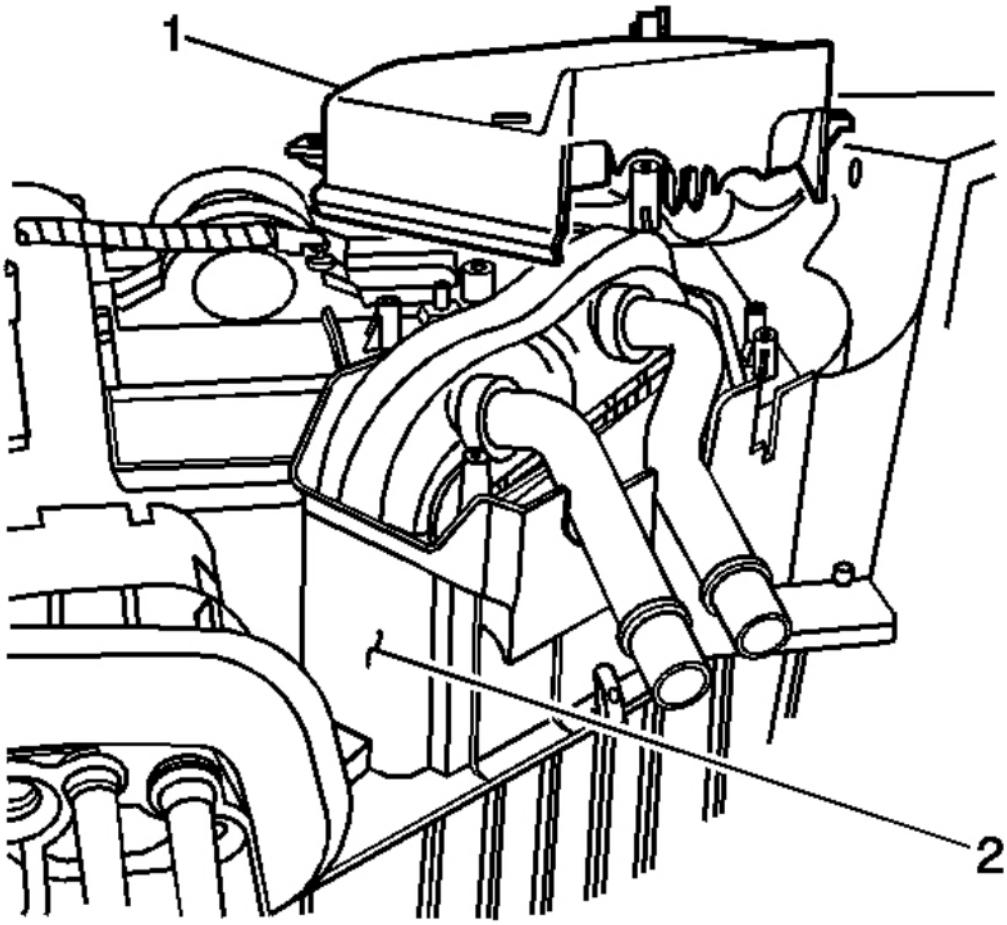


Fig. 229: Removing/Installing Heater Core Cover And HVAC Module Assembly (Delphi)
Courtesy of GENERAL MOTORS CORP.

3. Install the heater core cover (1) to the HVAC module assembly (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the screws to the heater core cover (1).

Tighten: Tighten the screws to 2 N.m (18 lb in).

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5. Install the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.

HEATER PIPE REPLACEMENT - AUXILIARY

Removal Procedure

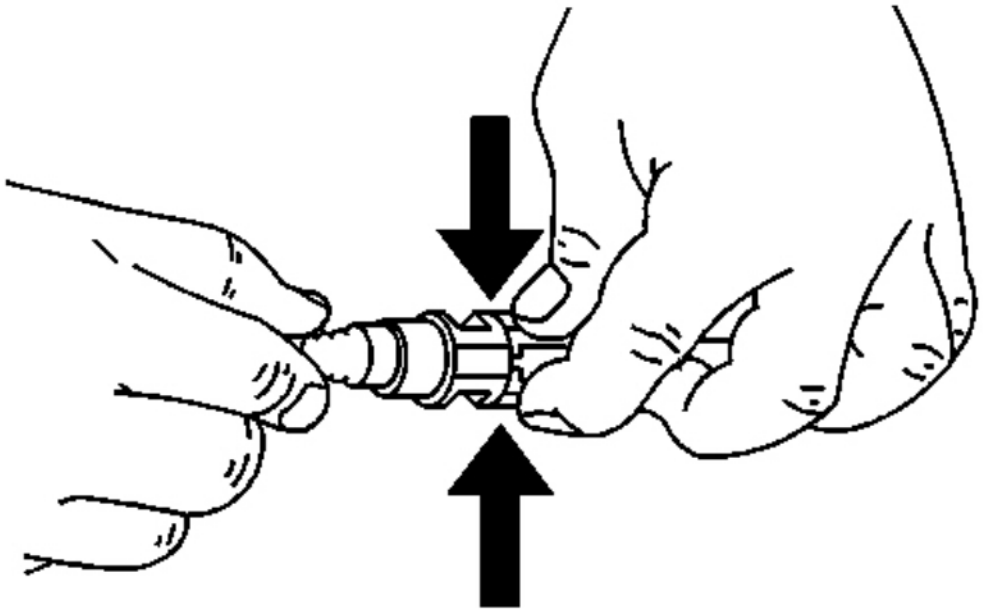


Fig. 230: Squeezing Quick Connect Fitting Release Tabs (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

1. Drain the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.
2. Squeeze the plastic retainer tabs on the inlet hose.

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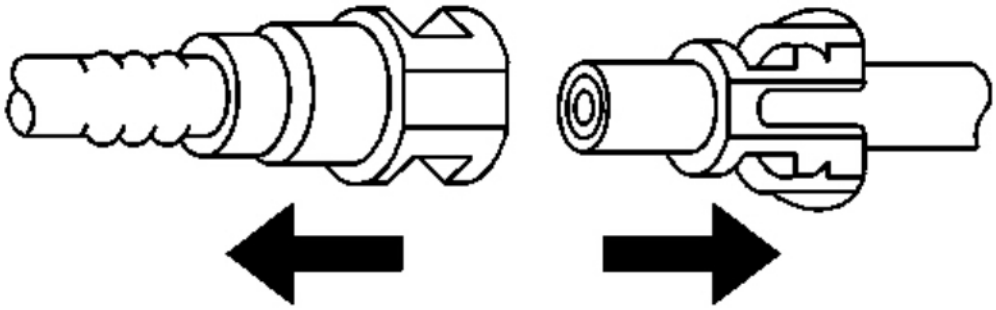
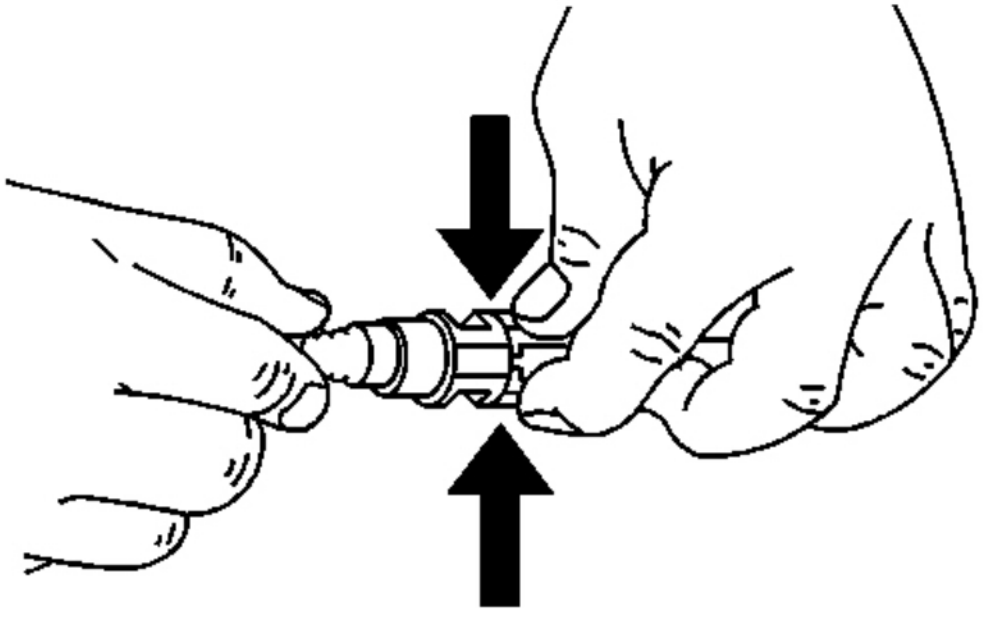


Fig. 231: Pulling Connection Apart (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

3. Pull the connection apart.



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Fig. 232: Squeezing Quick Connect Fitting Release Tabs (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

4. Squeeze the plastic retainer tabs on the outlet hose.

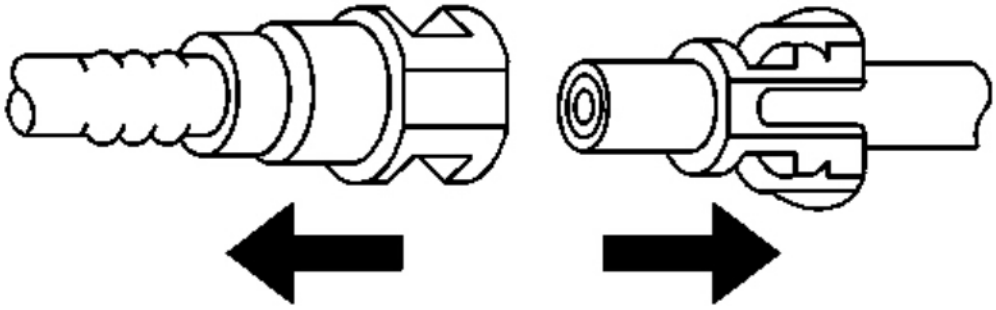


Fig. 233: Pulling Connection Apart (Plastic Collar)
Courtesy of GENERAL MOTORS CORP.

5. Pull the connection apart.

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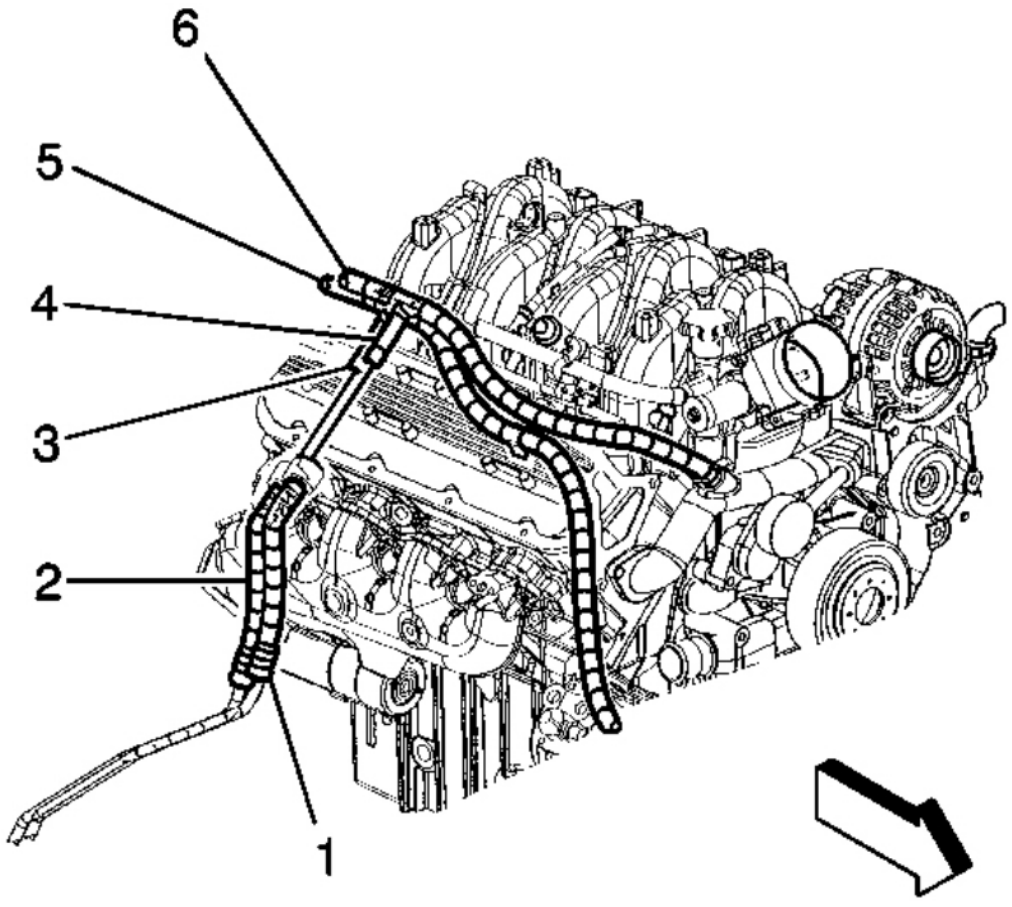


Fig. 234: View Of Auxiliary Heater Pipes At Heater Inlet & Outlet Tees
Courtesy of GENERAL MOTORS CORP.

6. Remove the auxiliary heater pipes (1, 2) from the heater inlet and outlet tees (3, 4).
7. Remove both of the right tires. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
8. Remove the right rear wheelhouse panel. Refer to **Wheelhouse Inner Panel Extension Replacement - Rear** in Body Rear End.
9. Remove the right front wheelhouse panel. Refer to **Wheelhouse Panel Replacement** in Body Front End.

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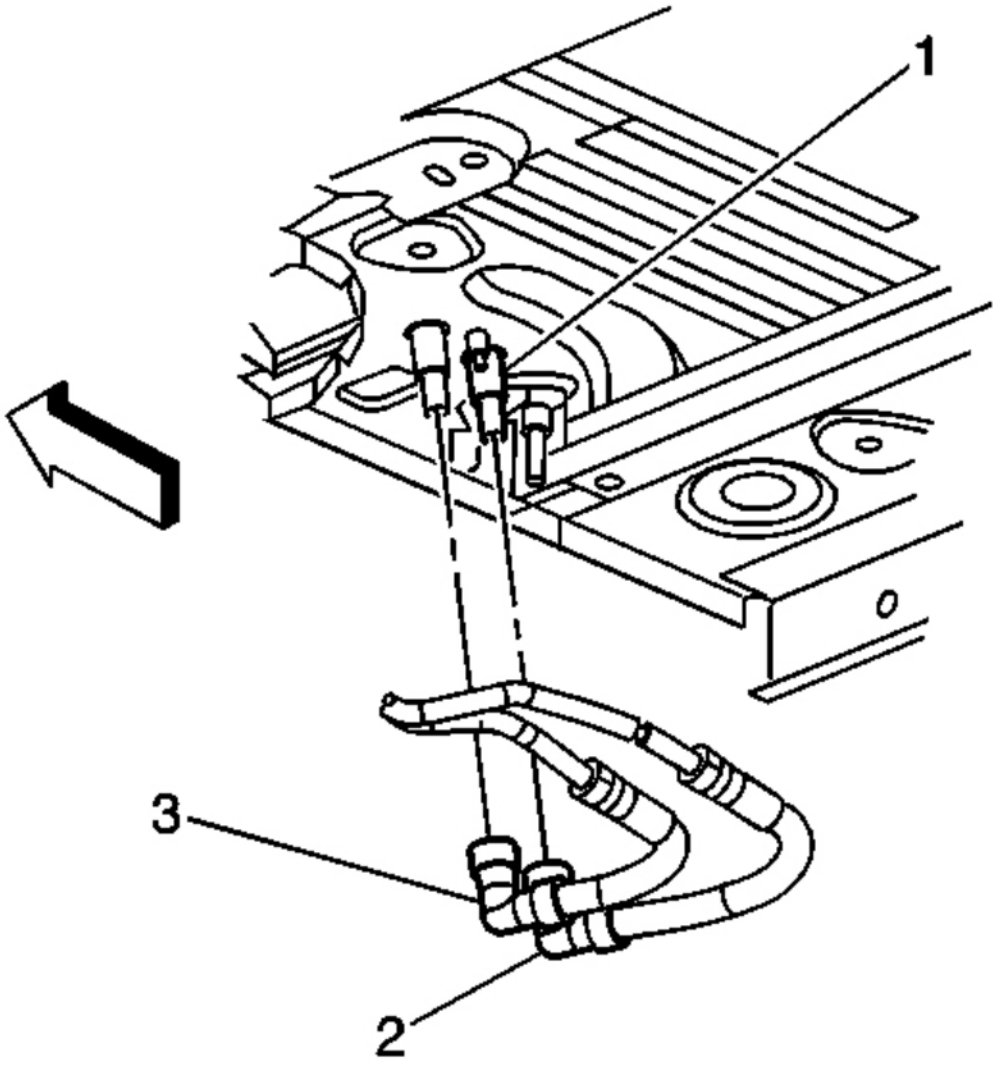


Fig. 235: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

10. Remove the auxiliary heater pipes (2, 3) from the auxiliary heater core.

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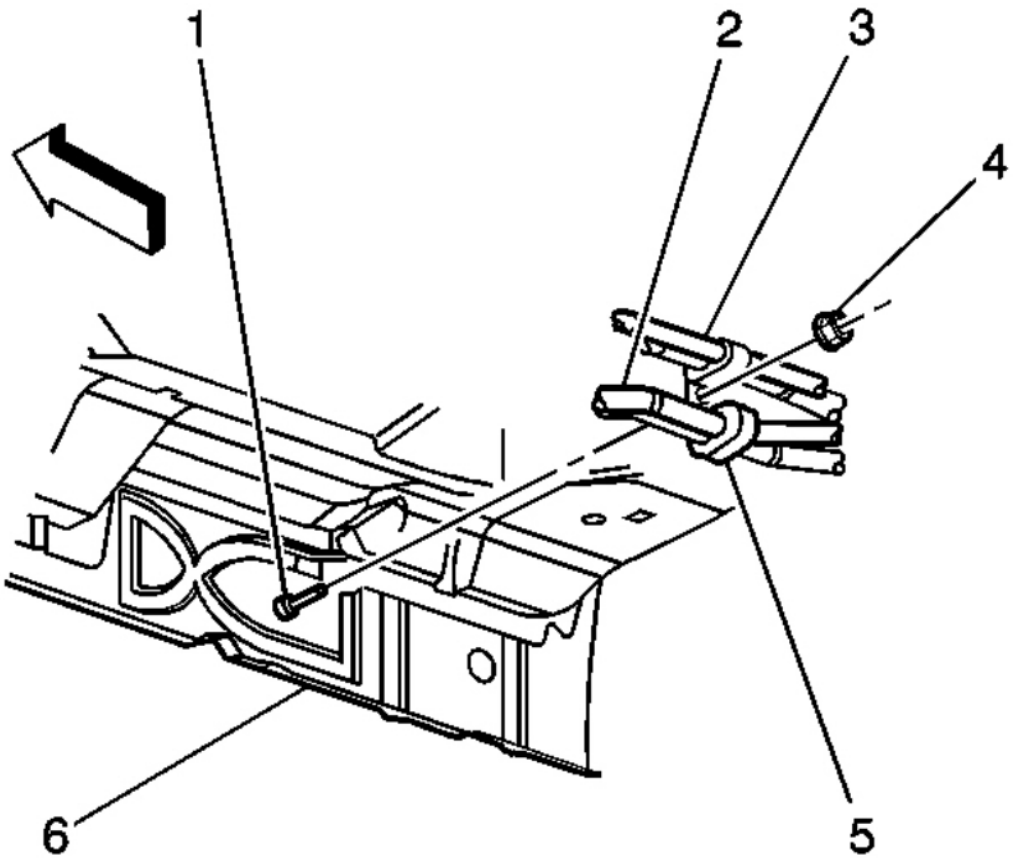


Fig. 236: View Of Auxiliary Heater Pipes, Clamps & Heater/A/C Tubes Retaining Nut & Stud
Courtesy of GENERAL MOTORS CORP.

11. Remove the heater/A/C tubes retaining nut (4) from the stud (1) at the frame (6).
12. Remove the auxiliary heater pipes (2) from the clamps (5).
13. Remove the auxiliary heater pipes from the vehicle.

Installation Procedure

1. Install the auxiliary heater pipes to the vehicle.

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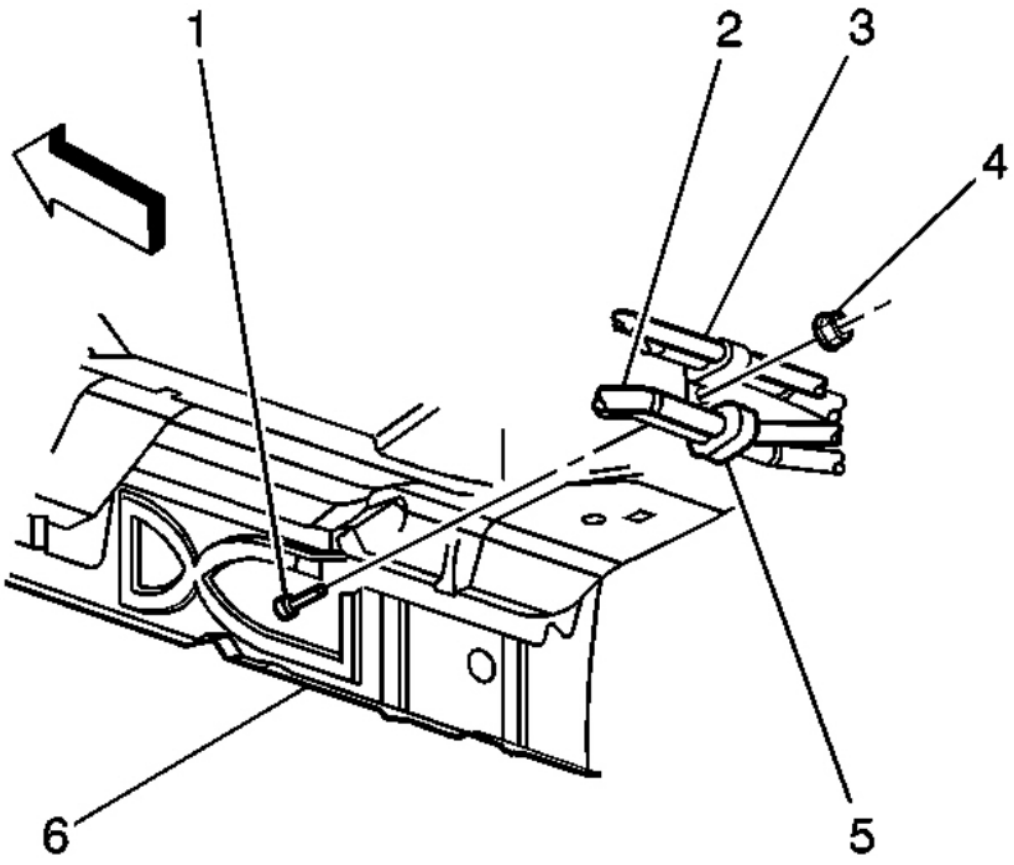


Fig. 237: View Of Auxiliary Heater Pipes, Clamps & Heater/A/C Tubes Retaining Nut & Stud
Courtesy of GENERAL MOTORS CORP.

2. Install the auxiliary heater pipes (2) to the clamps (5).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the heater/A/C tubes retaining nut (4) to the stud (1) at the frame (6).

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

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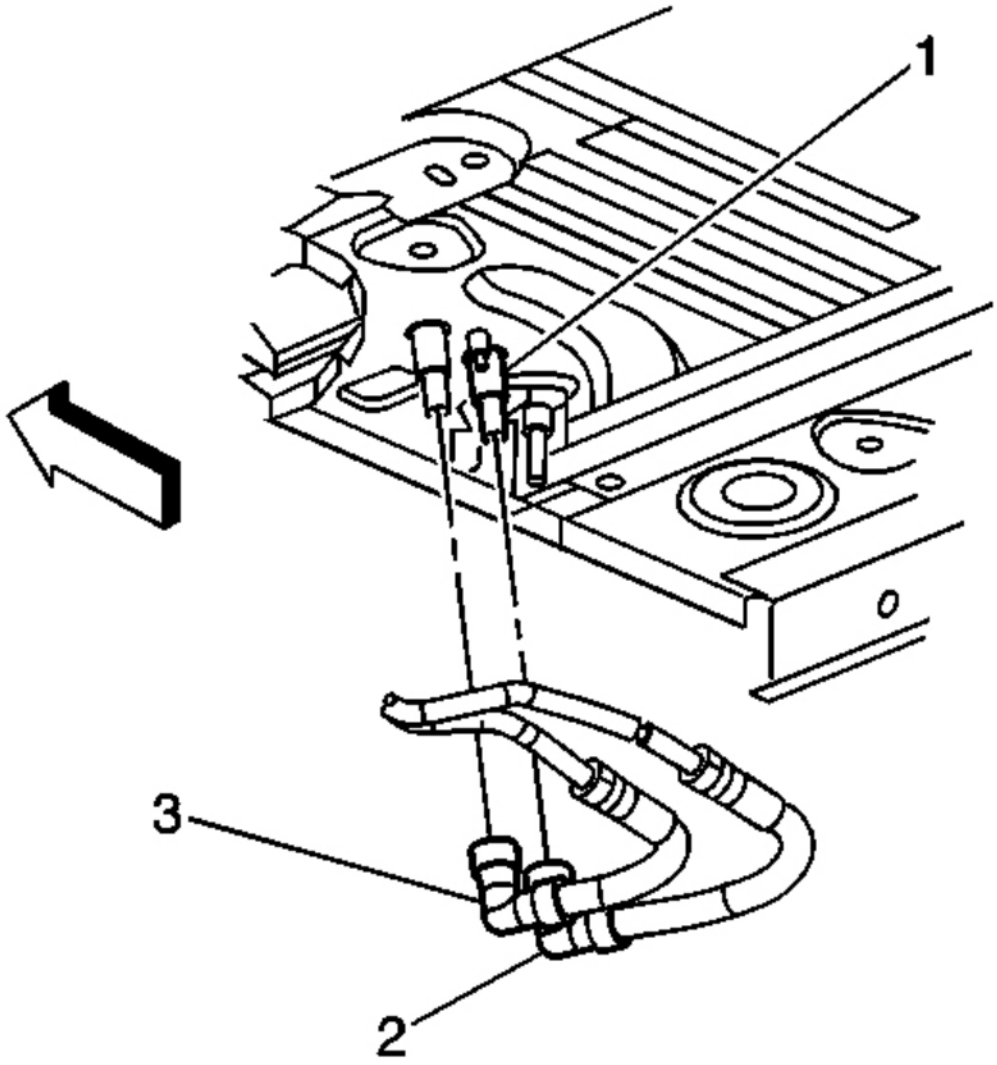


Fig. 238: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

4. Install the auxiliary heater pipes (2, 3) to the auxiliary heater core.
5. Install the right front wheelhouse panel. Refer to **Wheelhouse Panel Replacement** in Body Front End.
6. Install the right rear wheelhouse panel. Refer to **Wheelhouse Inner Panel Extension Replacement - Rear** in Body Rear End.

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7. Install both of the right tires. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.

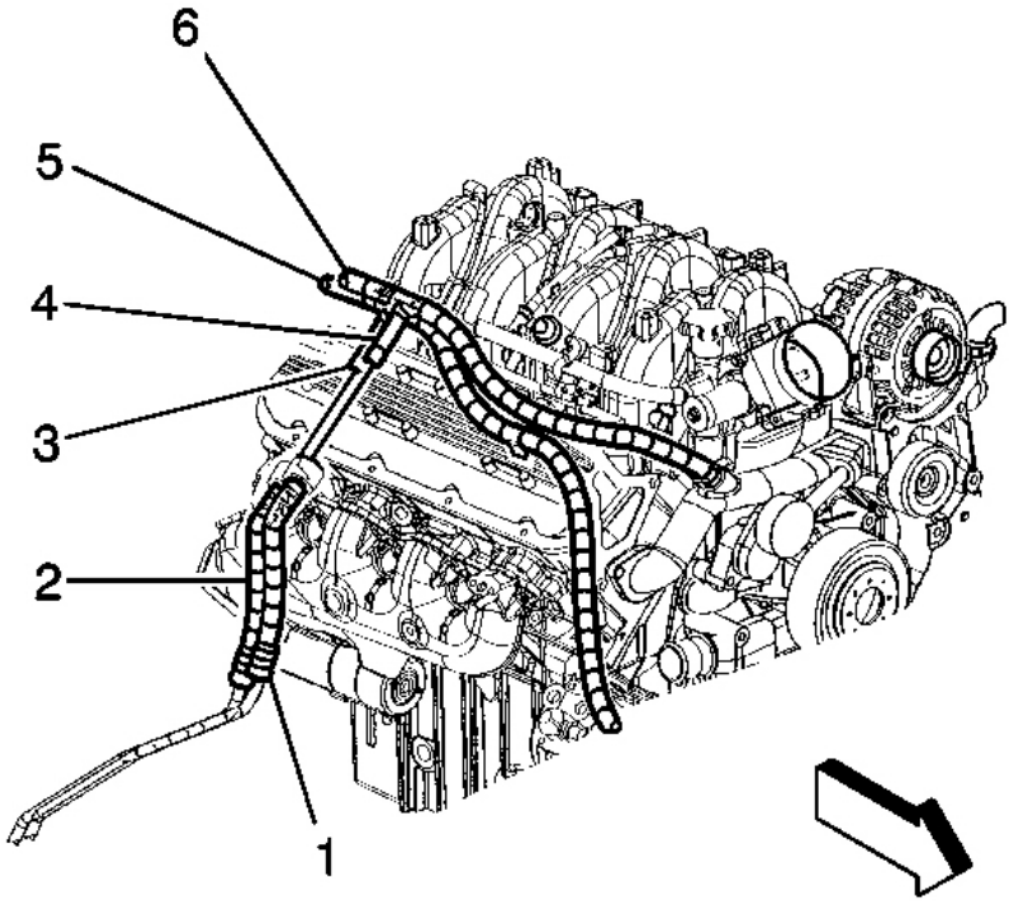


Fig. 239: View Of Auxiliary Heater Pipes At Heater Inlet & Outlet Tees
Courtesy of GENERAL MOTORS CORP.

8. Install the auxiliary heater pipes (1, 2) to the heater inlet and outlet tees (3, 4).

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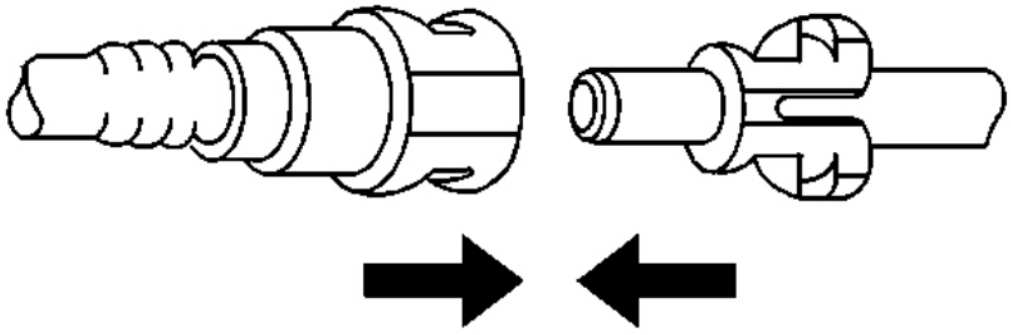


Fig. 240: Connecting Quick-Connect Fittings
Courtesy of GENERAL MOTORS CORP.

9. Connect the outlet heater hose to the heater core.
10. Connect the inlet heater hose to the heater core.
11. Fill the cooling system. Refer to **Draining and Filling Cooling System** in Engine Cooling.

BLOWER MOTOR RESISTOR REPLACEMENT - AUXILIARY

Removal Procedure

1. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
2. Disconnect the electrical connector from the blower motor resistor.
3. Remove the retaining screws from the blower motor resistor.

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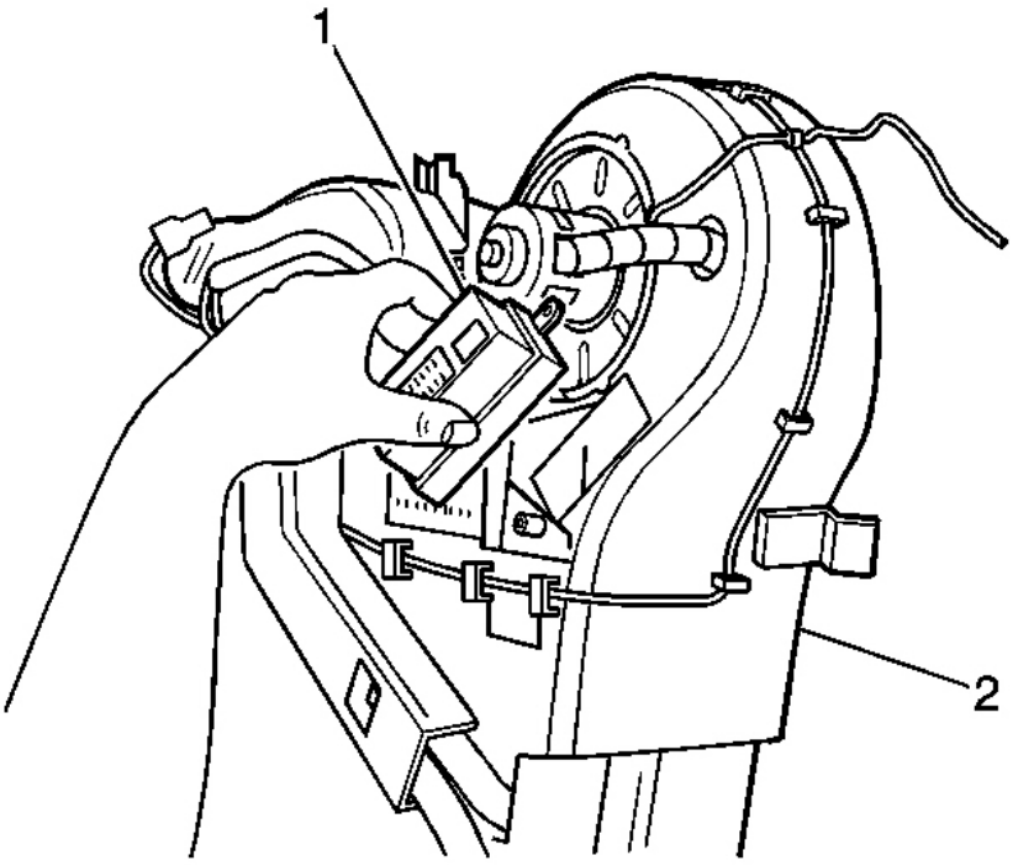


Fig. 241: View Of Auxiliary Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

4. Remove the blower motor resistor (1) from the vehicle.

Installation Procedure

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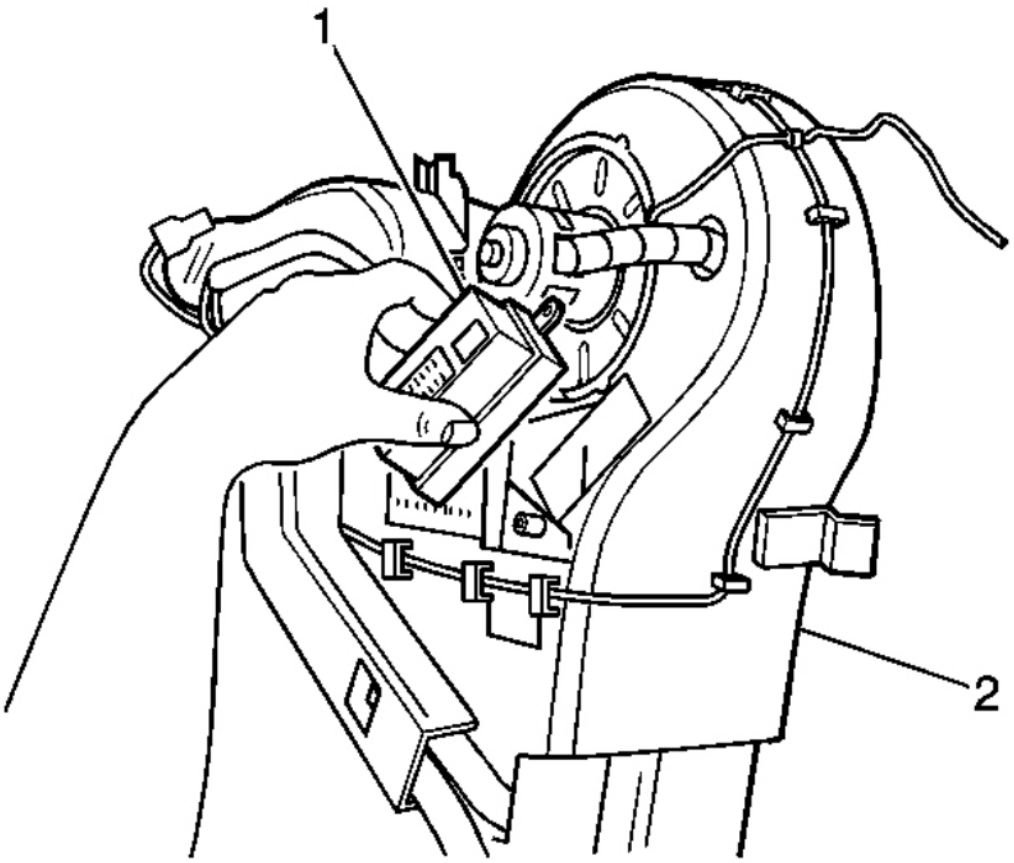


Fig. 242: View Of Auxiliary Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor resistor (1) to the vehicle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the retaining screws to the blower motor resistor.

   Tighten: Tighten the screws to 1.9 N.m (17 lb in).

3. Connect the electrical connector to the blower motor resistor.
4. Install the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right**

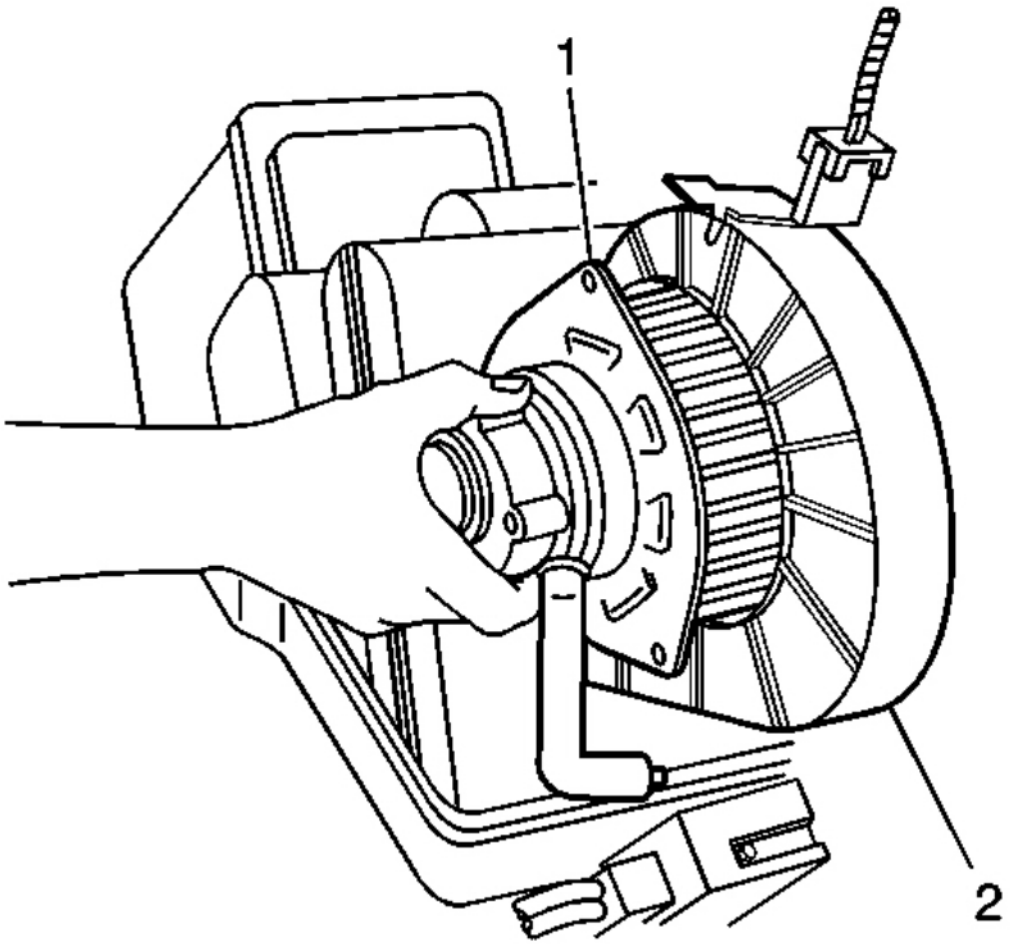
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(Suburban) in Interior Trim.

BLOWER MOTOR REPLACEMENT - AUXILIARY

Removal Procedure

1. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
2. Disconnect the electrical connectors.
3. Remove the blower motor screws.



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Fig. 243: View Of Auxiliary Blower Motor
Courtesy of GENERAL MOTORS CORP.

4. Remove the blower motor (1) from the auxiliary HVAC module (2).
5. Remove the retaining clip from the fan cage.
6. Remove the fan cage from the blower motor.

Installation Procedure

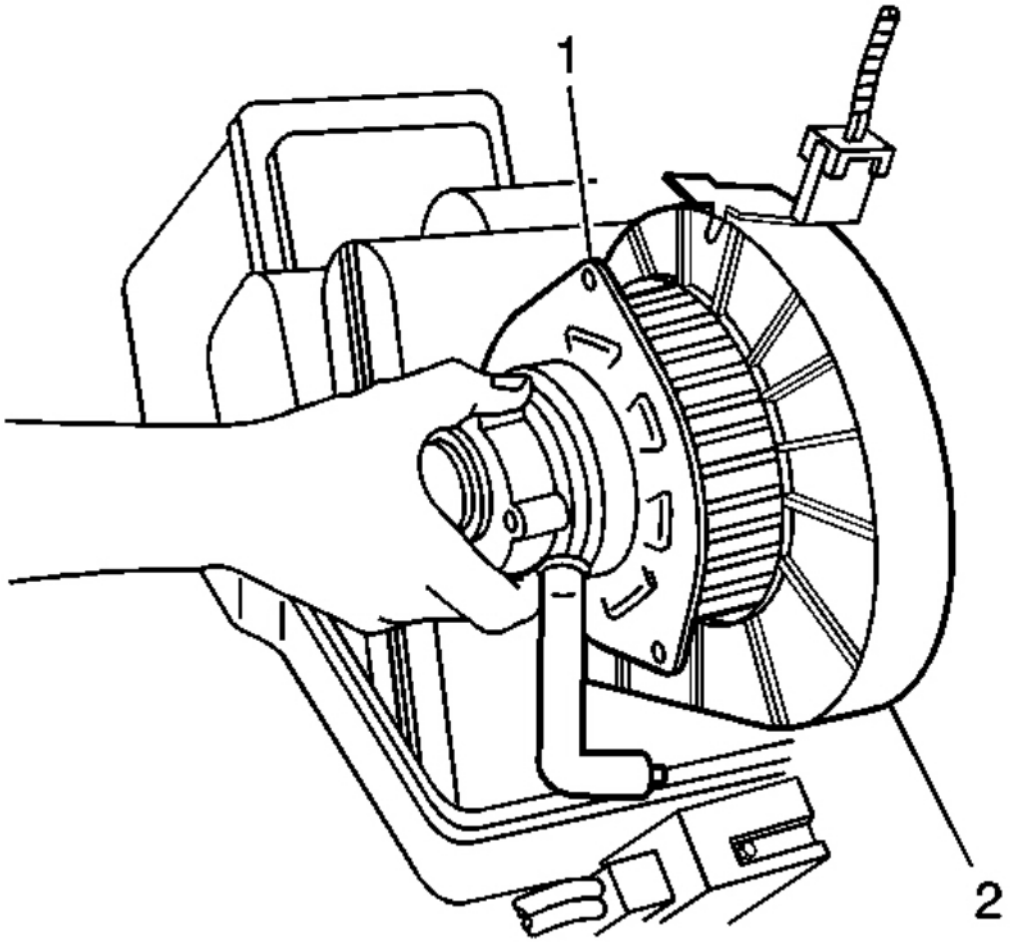


Fig. 244: View Of Auxiliary Blower Motor
Courtesy of GENERAL MOTORS CORP.

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1. Install the fan cage to the blower motor (1).
2. Install the retaining clip to the fan cage.
3. Install the blower motor (1) to the auxiliary HVAC module (2).

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the blower motor screws.

   Tighten: Tighten the screws to 1.9 N.m (17 lb in).

5. Connect the electrical connectors.
6. Install the right rear quarter trim. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.

AIR DISTRIBUTION DUCTS REPLACEMENT - AUXILIARY (UPPER)

Removal Procedure

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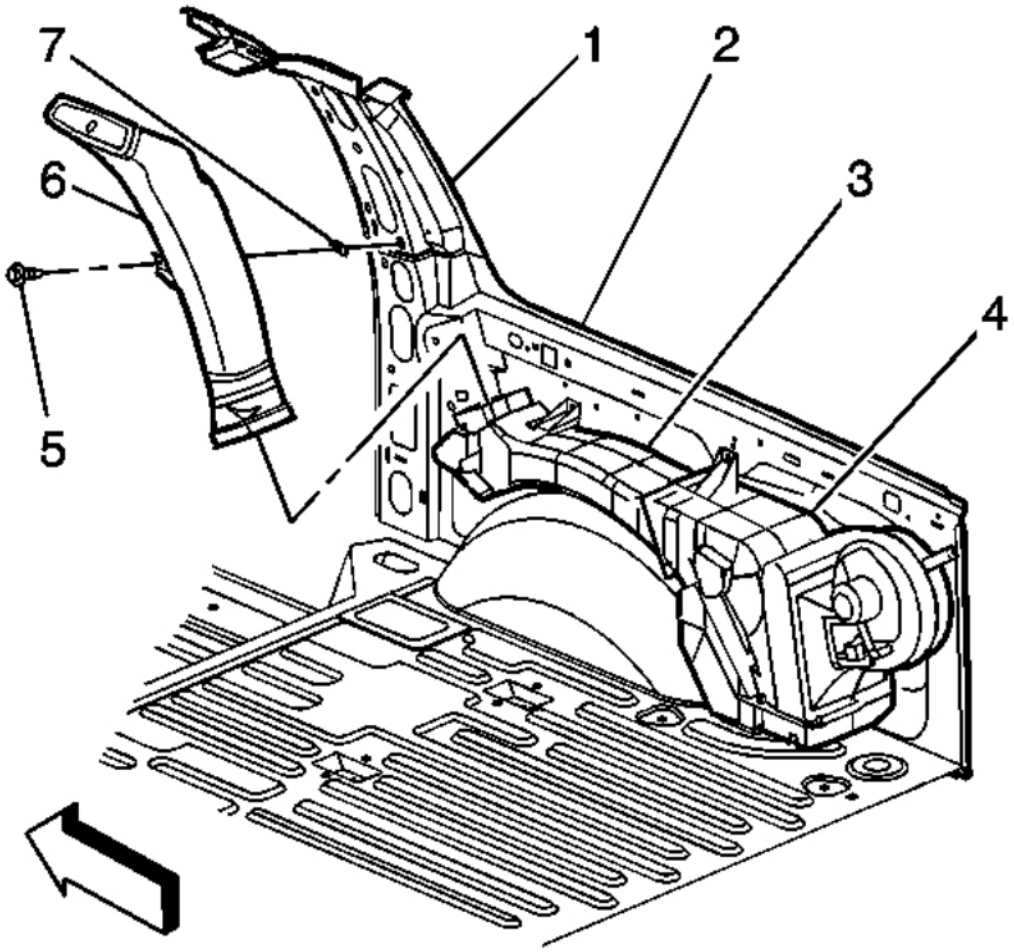


Fig. 245: View Of Upper Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
2. Remove the upper air temperature sensor, if equipped.
3. Remove the upper air duct fastener (5).
4. Remove the duct (6) from the vehicle.

Installation Procedure

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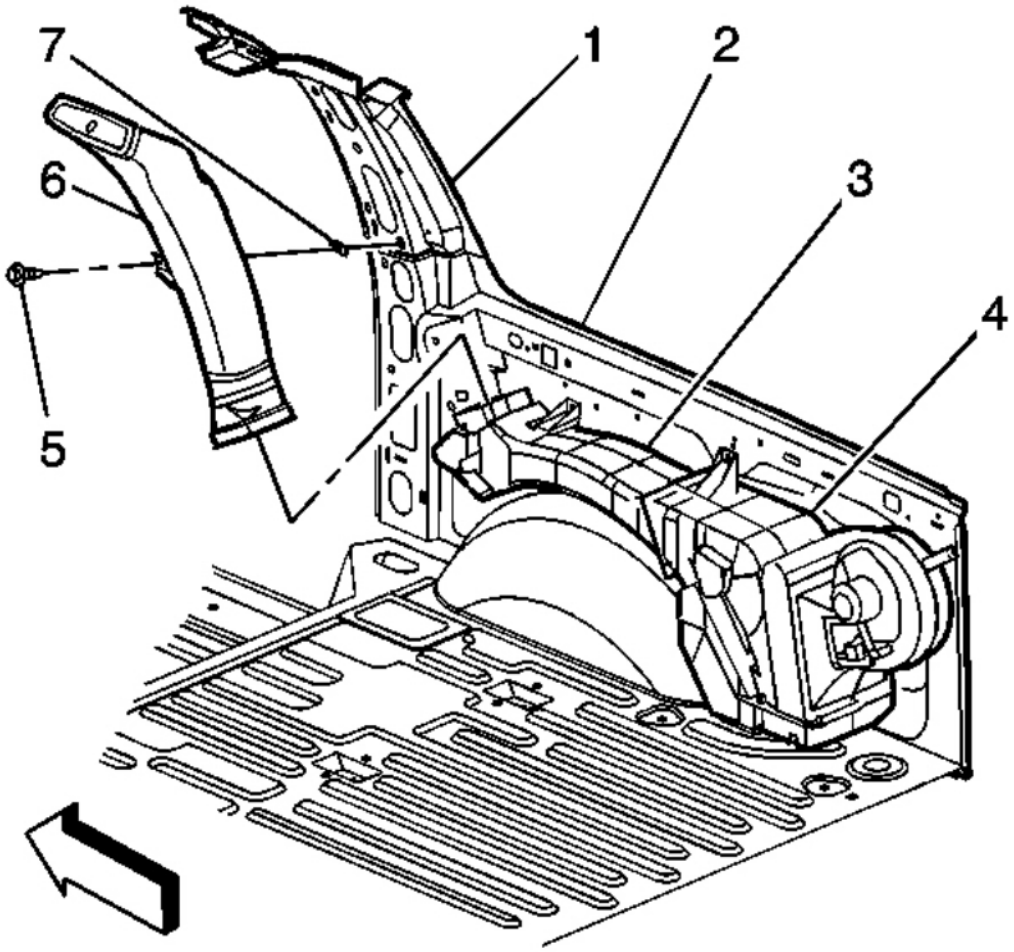


Fig. 246: View Of Upper Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

1. Install the duct (6) to the vehicle.
2. Install the upper air duct fastener (5).
3. Install the upper air temperature sensor, if equipped.
4. Install the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.

AIR DISTRIBUTION DUCTS REPLACEMENT - AUXILIARY (LOWER)

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Removal Procedure

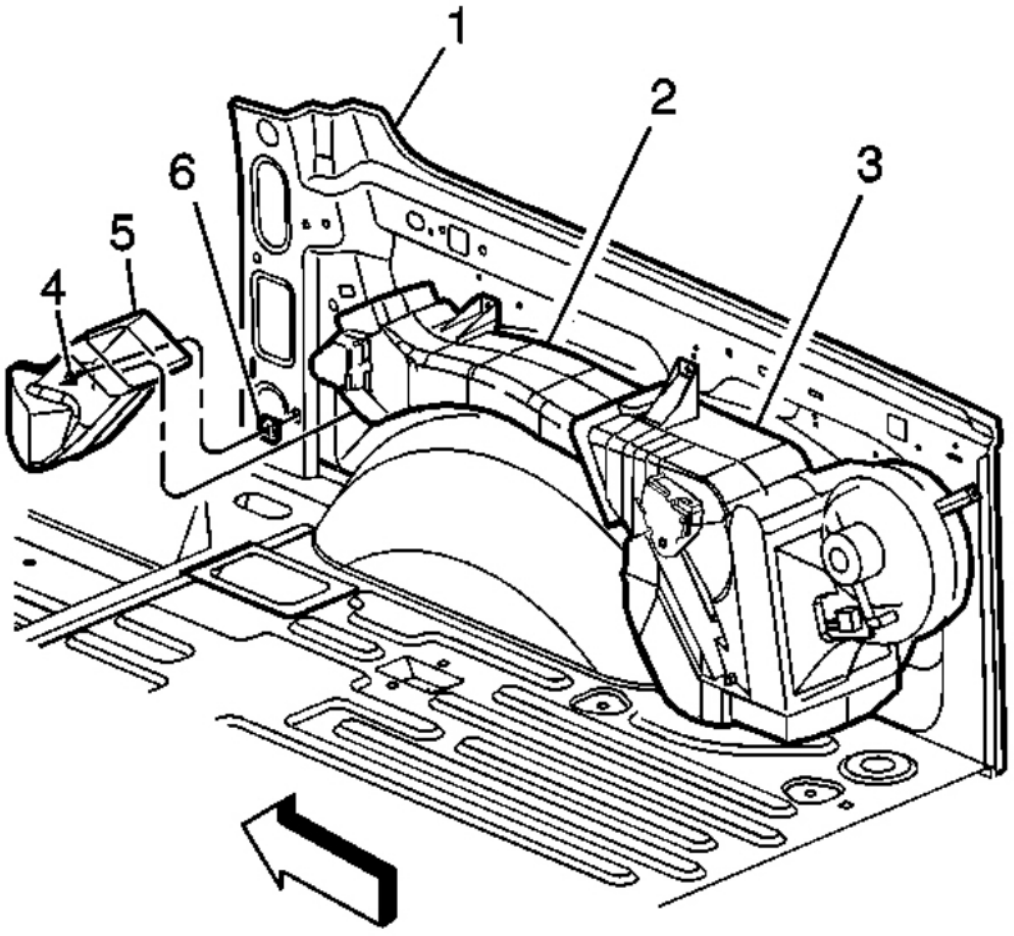


Fig. 247: View Of Lower Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
2. Remove the air temperature sensor, if equipped.
3. Remove the lower air duct fastener.
4. Remove the lower air duct (5) from the vehicle.

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Installation Procedure

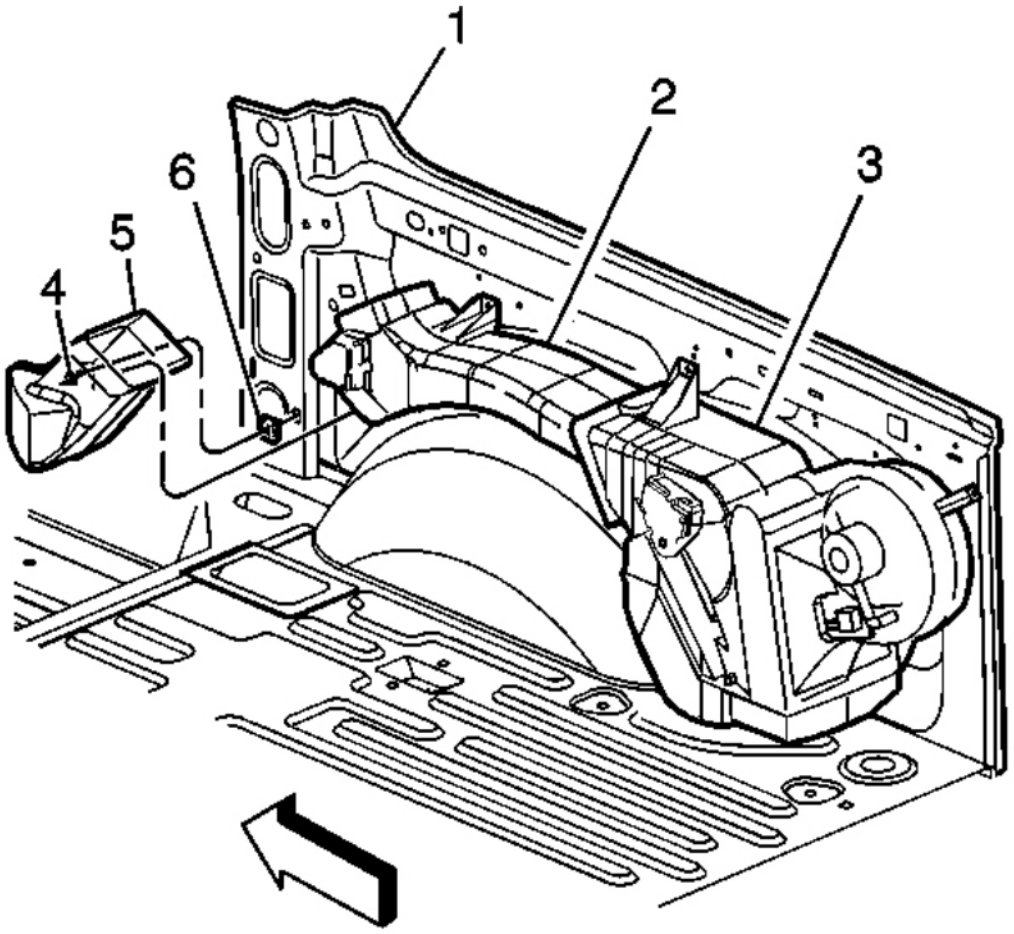


Fig. 248: View Of Lower Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

1. Install the air duct (5) to the vehicle.
2. Install the lower air duct fastener.
3. Install the air temperature sensor, if equipped.
4. Install the left rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.

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HEATER CORE REPLACEMENT - AUXILIARY (TAHOE/YUKON)

Removal Procedure

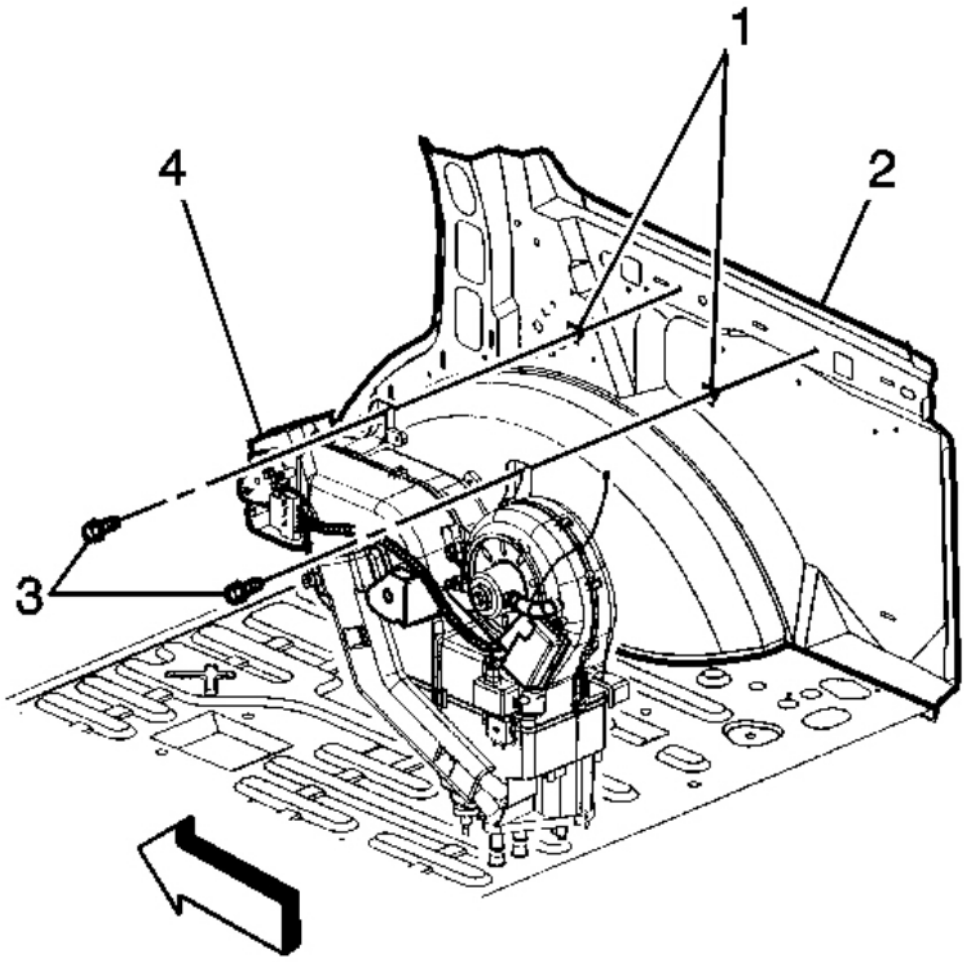


Fig. 249: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

1. Remove the auxiliary HVAC module (4) from the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**

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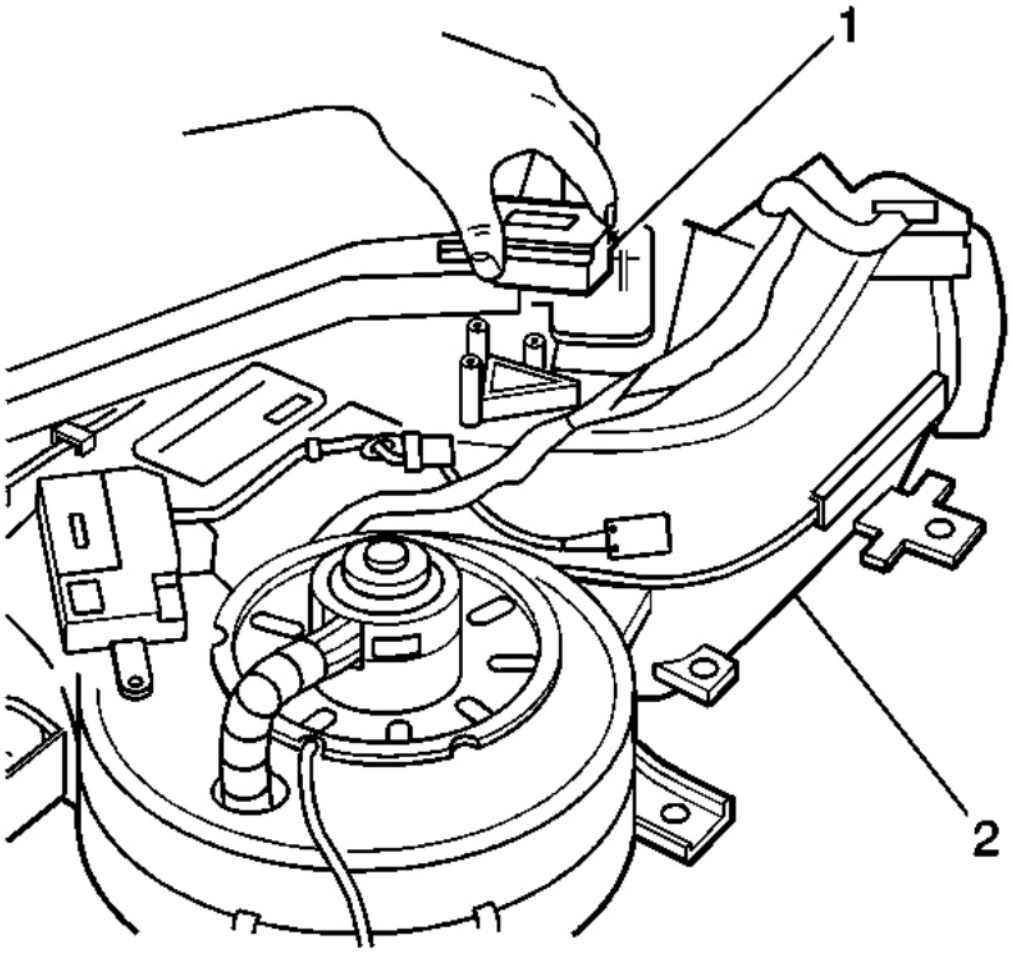


Fig. 250: View Of Air Temperature Actuator (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

2. Remove the air temperature actuator (1) from the auxiliary HVAC module.

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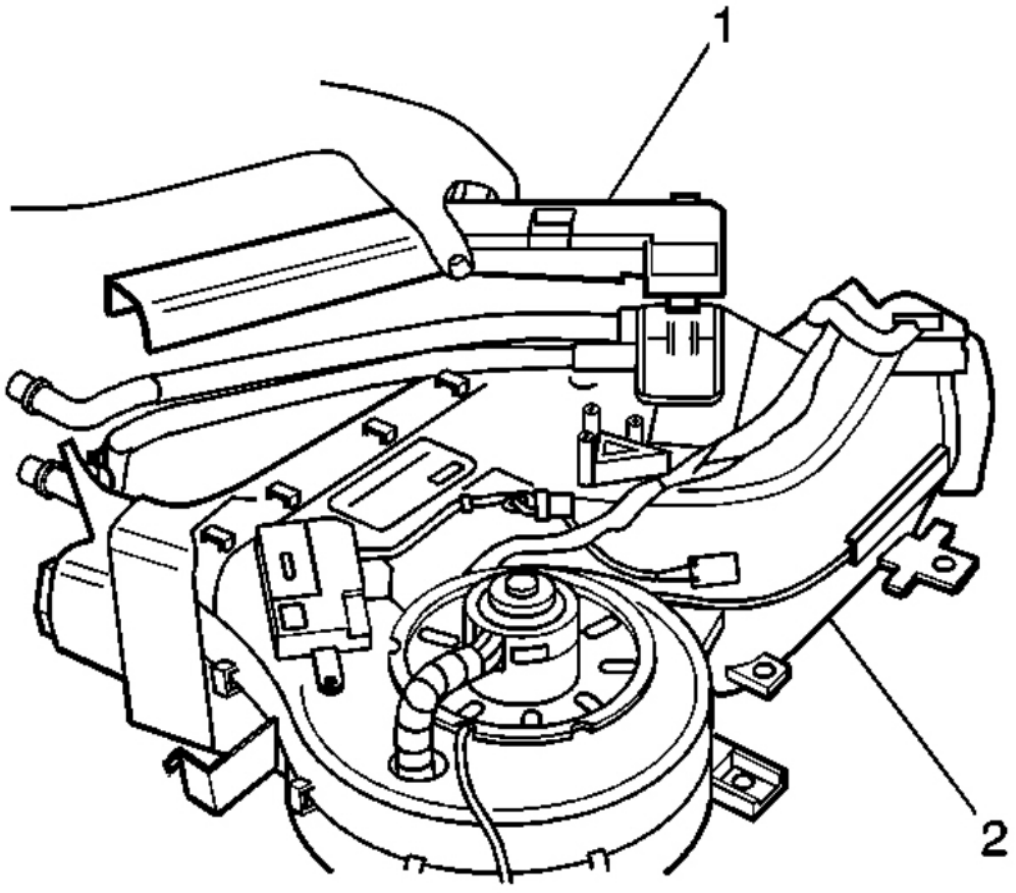


Fig. 251: View Of Heater Core Cover - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

3. Remove the heater core cover (1) from the auxiliary HVAC module.

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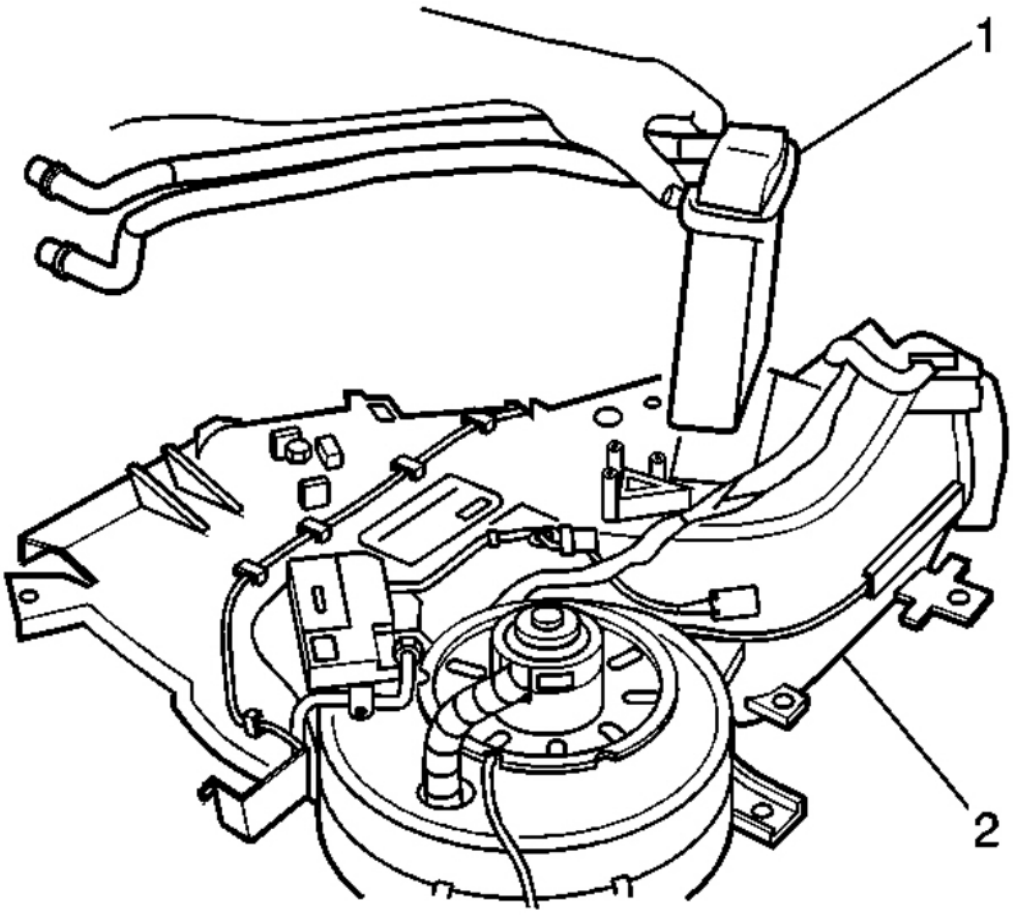


Fig. 252: View Of Heater Core - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core (1) from the auxiliary HVAC module.

Installation Procedure

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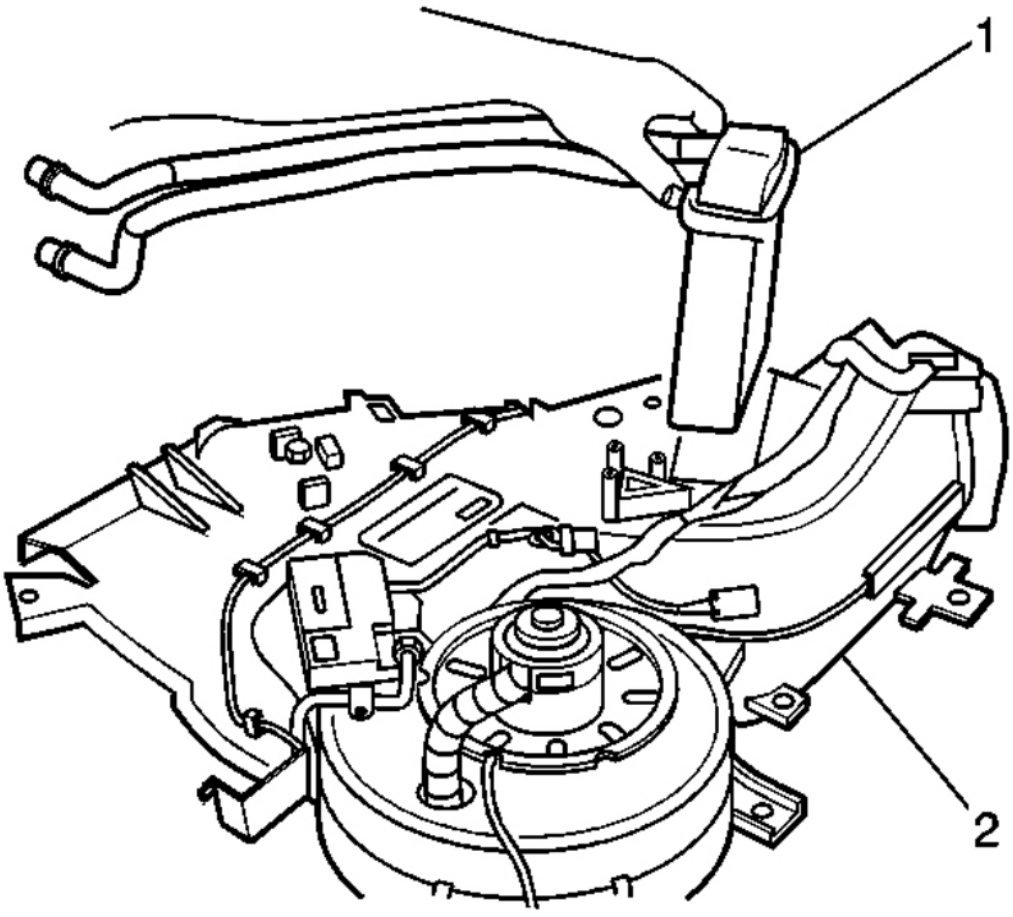


Fig. 253: View Of Heater Core - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

1. Install the heater core (1) to the auxiliary HVAC module.

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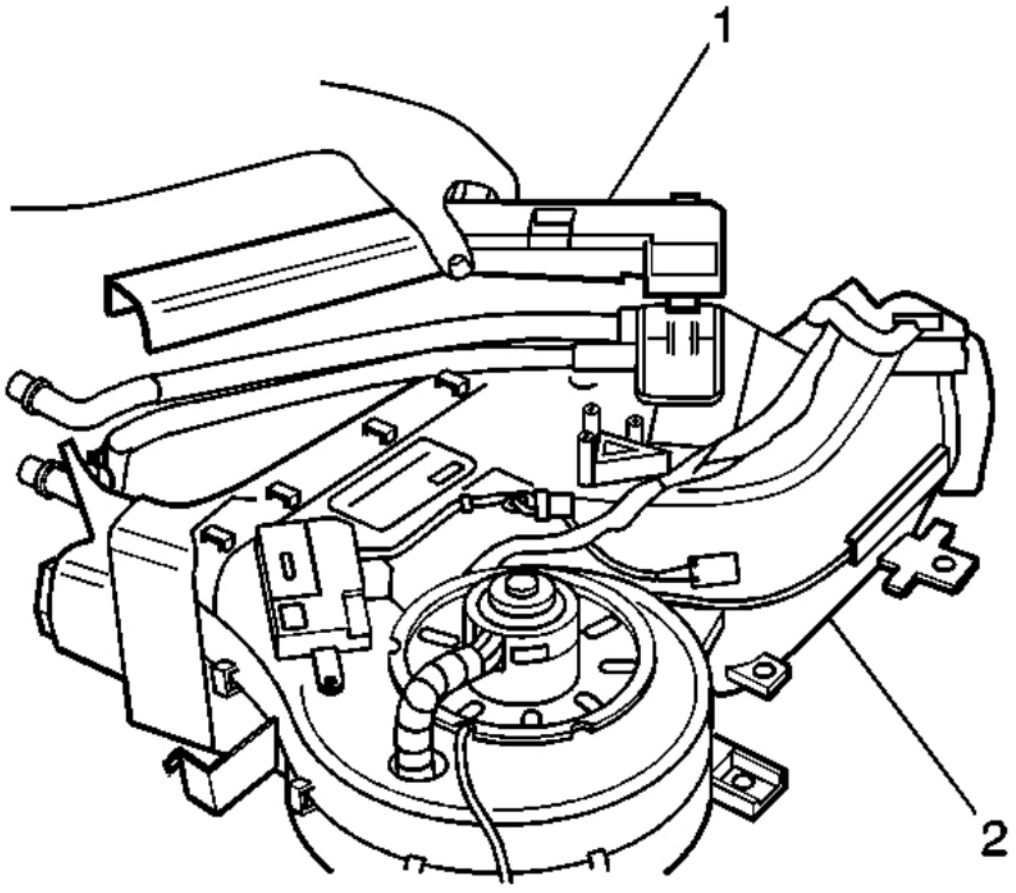


Fig. 254: View Of Heater Core Cover - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

2. Install the heater core cover (1) to the auxiliary HVAC module.

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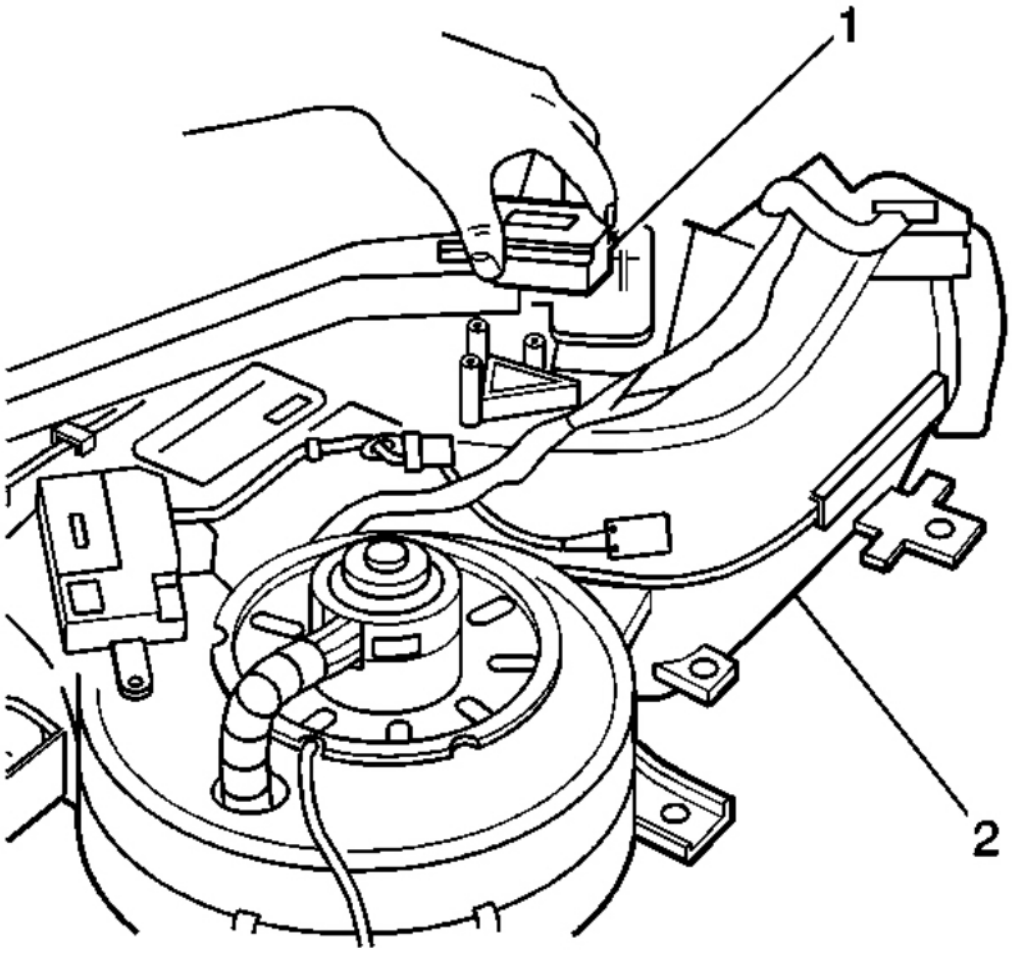


Fig. 255: View Of Air Temperature Actuator (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

3. Install the air temperature actuator (1) to the auxiliary HVAC module.

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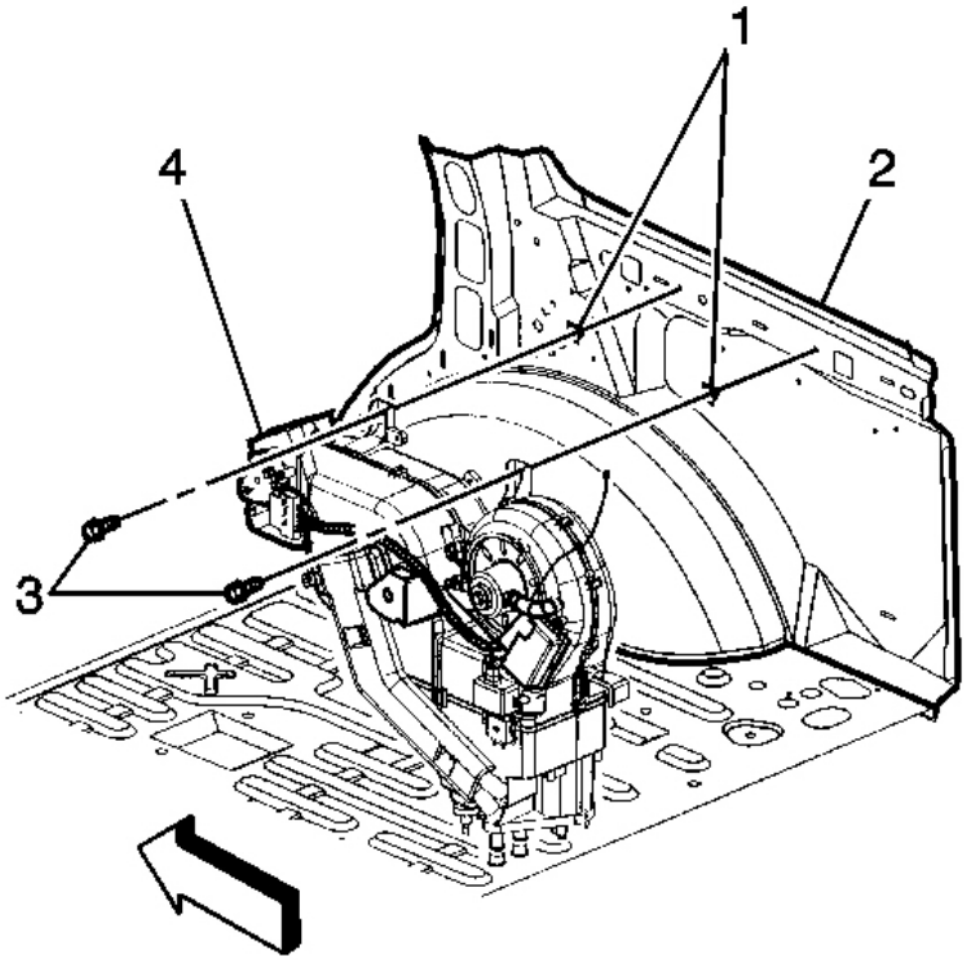


Fig. 256: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

4. Install the auxiliary HVAC module assembly (4) to the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**

HEATER CORE REPLACEMENT - AUXILIARY (SUBURBAN/YUKON XL)

Removal Procedure

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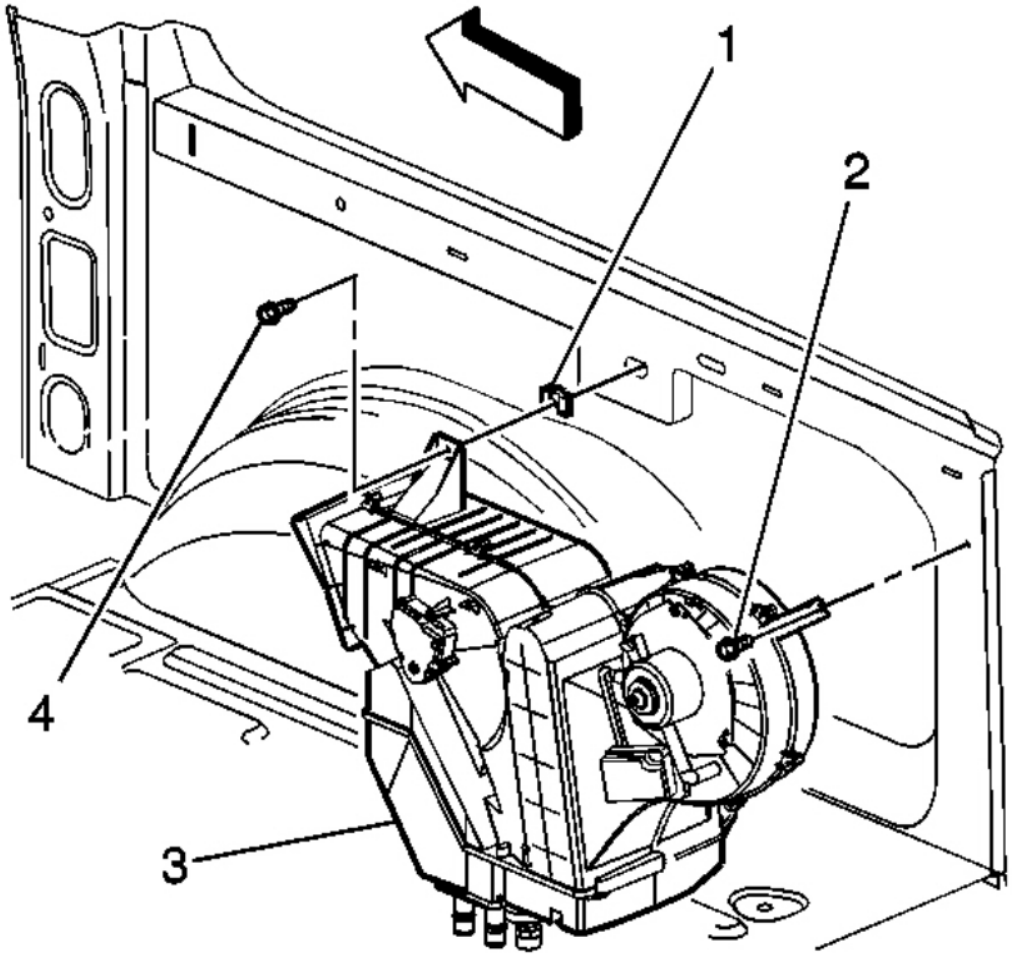


Fig. 257: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

1. Remove the auxiliary HVAC module (3) from the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**.

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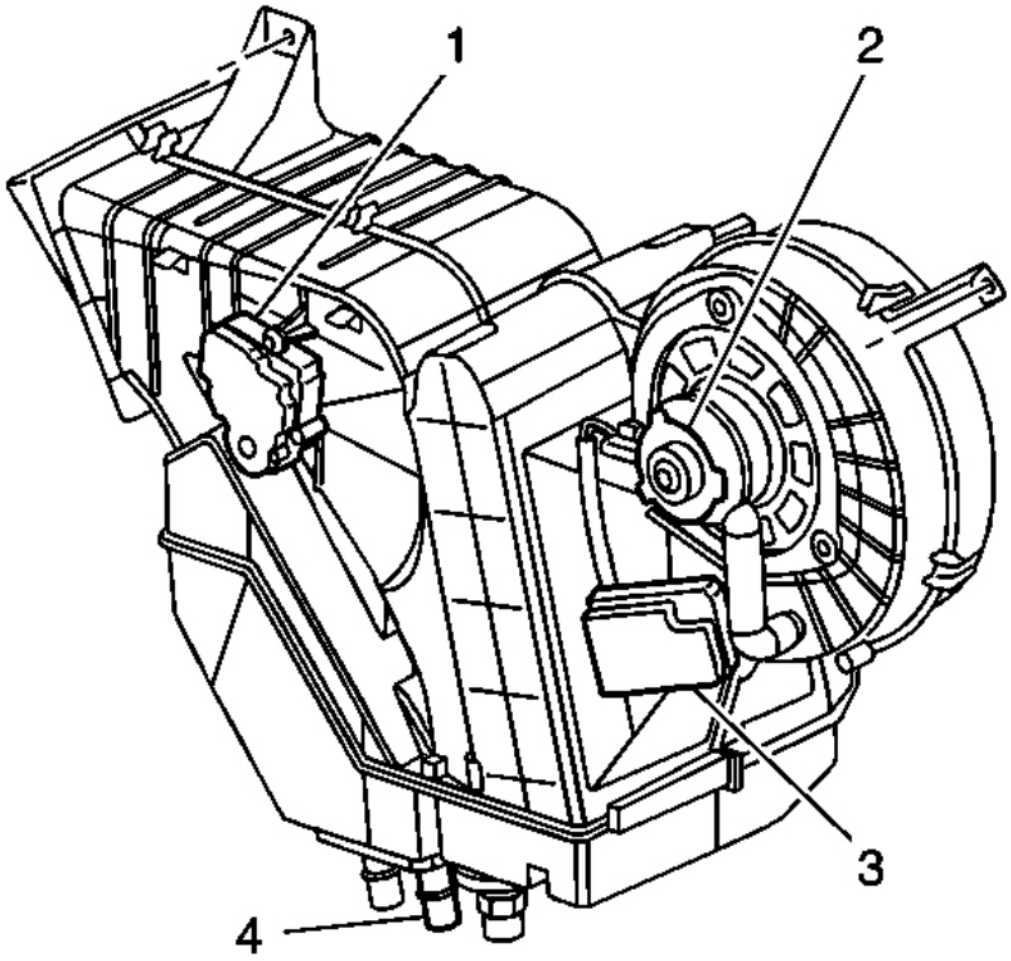


Fig. 258: View Of Auxiliary Air Temperature Actuator
Courtesy of GENERAL MOTORS CORP.

2. Remove the air temperature actuator (1) from the auxiliary HVAC module.

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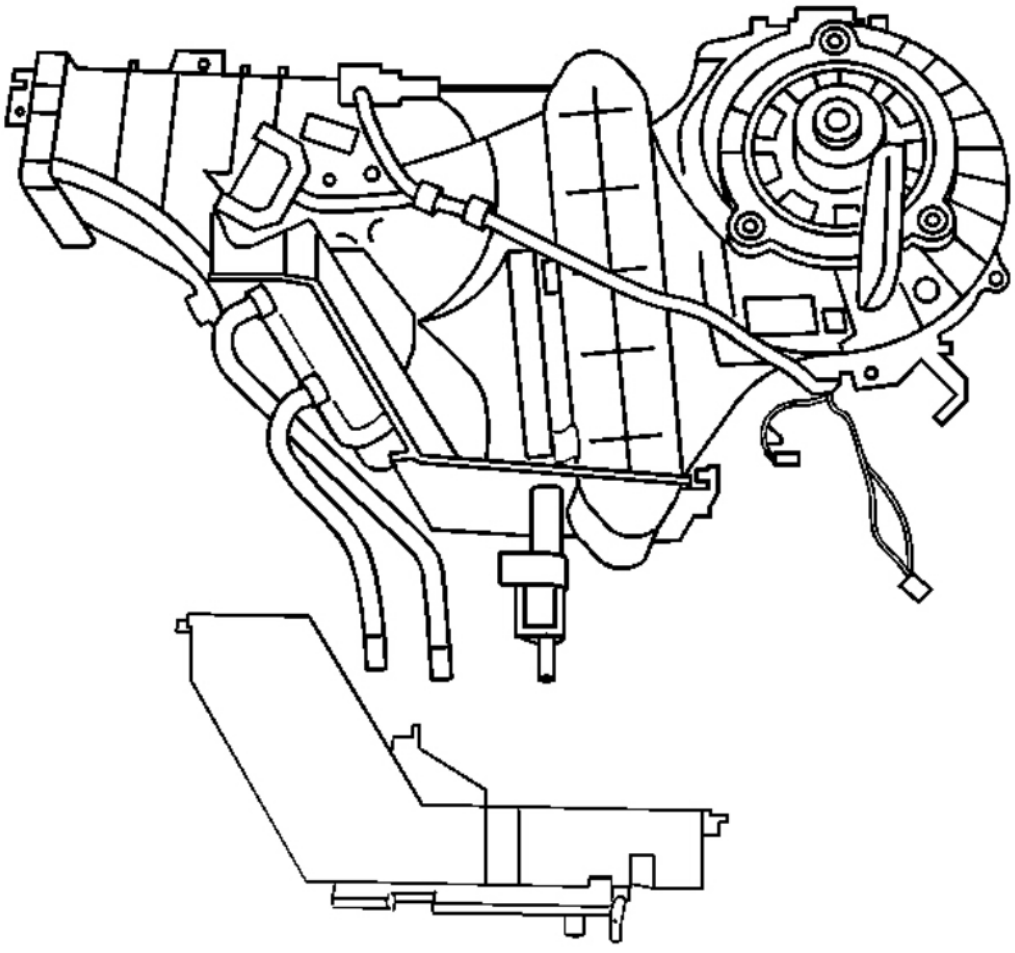


Fig. 259: View Of Auxiliary HVAC Module Lower Cover (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

3. Remove the stud on the underside of the auxiliary HVAC module between the heater core inlet and outlet pipes.
4. Carefully separate the heater core pipe gasket from the module case and remove the heater core pipe retainer.
5. Remove the auxiliary HVAC module lower cover.

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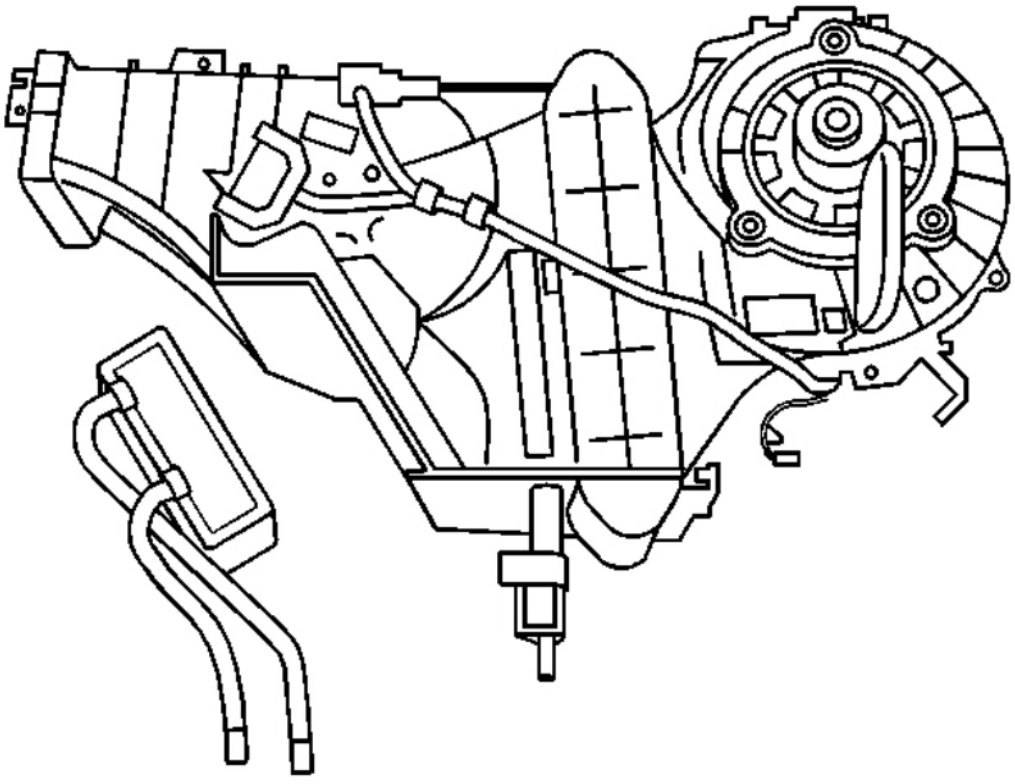


Fig. 260: View Of Heater Core - Auxiliary (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

6. Remove the heater core clamp.
7. Remove the heater core from the auxiliary HVAC module.

Installation Procedure

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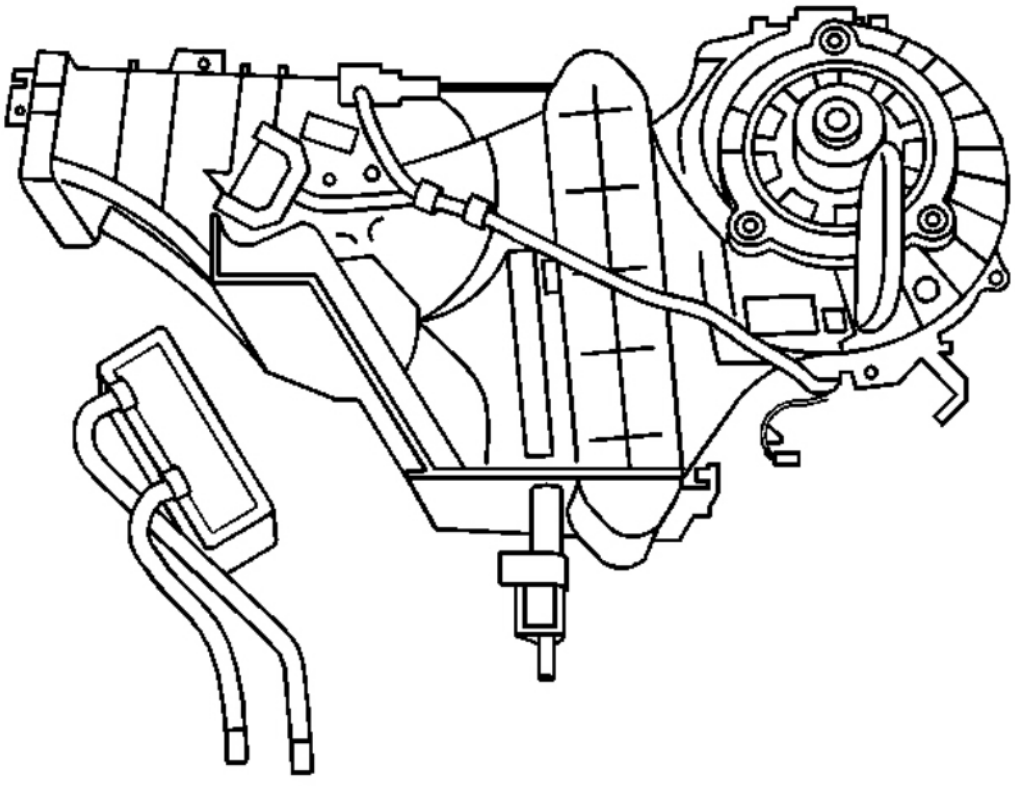


Fig. 261: View Of Heater Core - Auxiliary (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

1. Install the heater core to the auxiliary HVAC module.
2. Install the heater core clamp.

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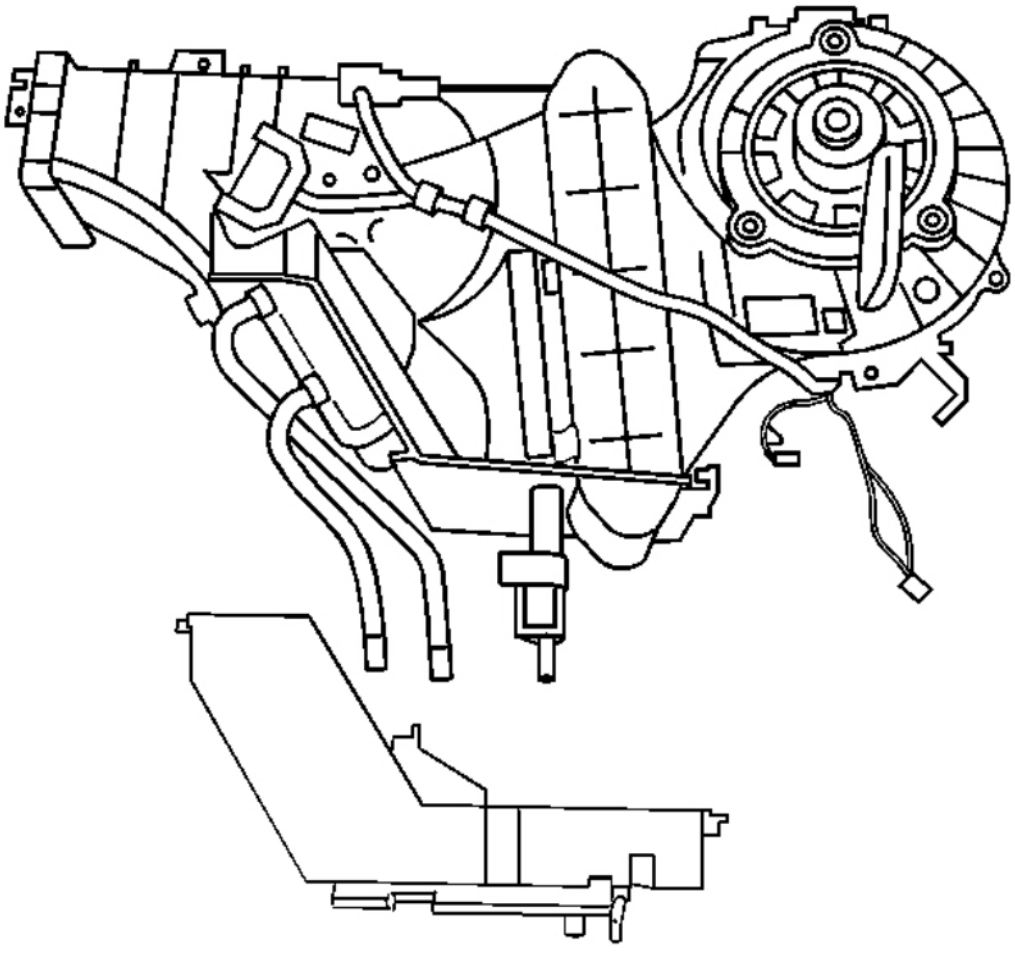


Fig. 262: View Of Auxiliary HVAC Module Lower Cover (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

3. Install the auxiliary HVAC module lower cover.
4. Install the heater core pipe retainer and gasket.
5. Install the stud between the heater core inlet and outlet on the underside of the rear HVAC module.

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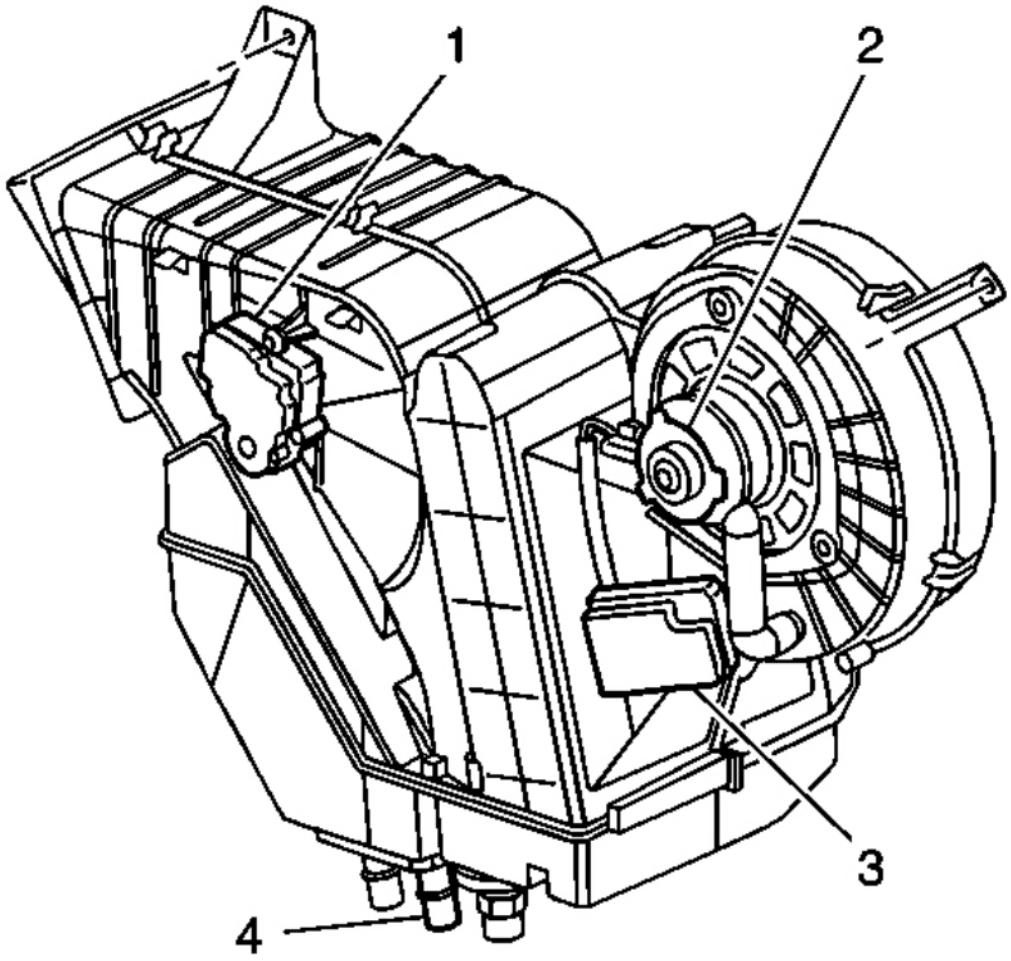


Fig. 263: View Of Auxiliary Air Temperature Actuator
Courtesy of GENERAL MOTORS CORP.

6. Install the air temperature actuator (1) to the auxiliary HVAC module.

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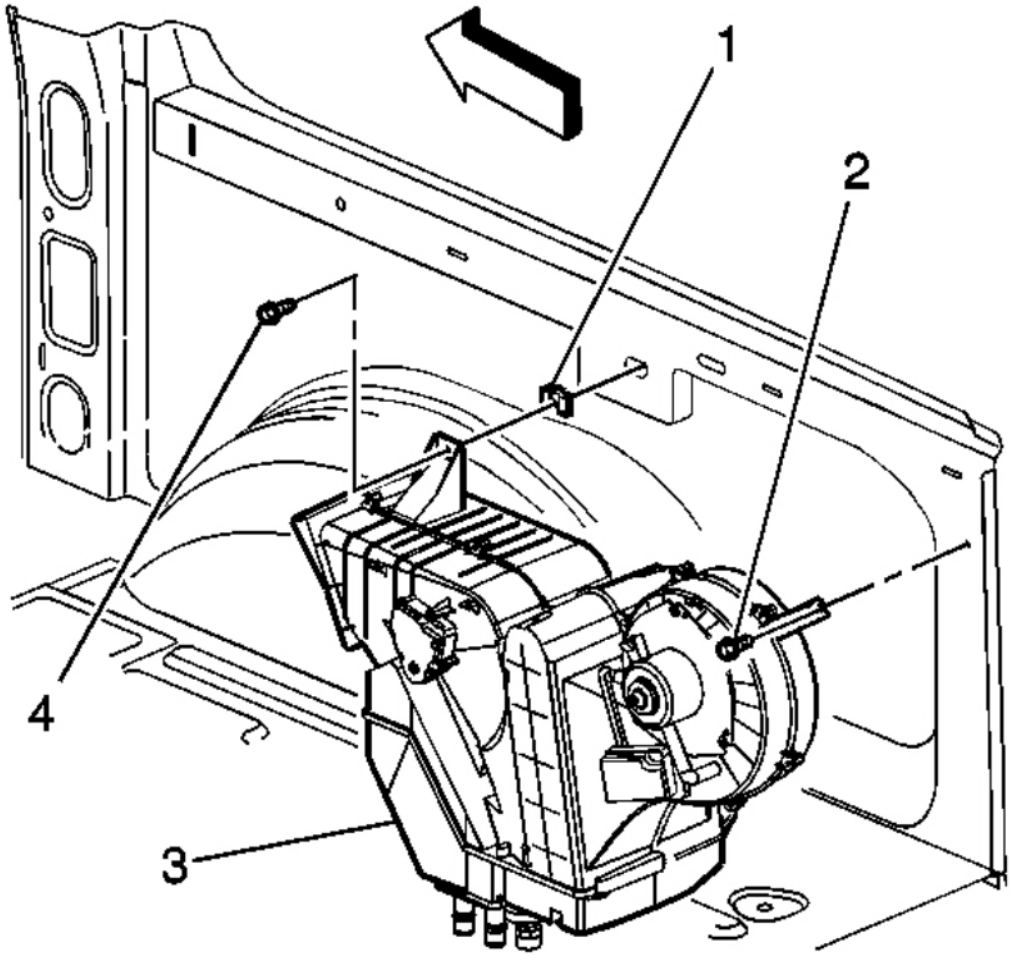


Fig. 264: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

7. Install the auxiliary HVAC module assembly (3) to the vehicle.

THERMAL EXPANSION VALVE REPLACEMENT - AUXILIARY

Removal Procedure

1. Remove the evaporator core. Refer to **Evaporator Core Replacement - Auxiliary (Tahoe/Yukon)** or **Evaporator Core Replacement - Auxiliary (Suburban/Yukon XL)**.

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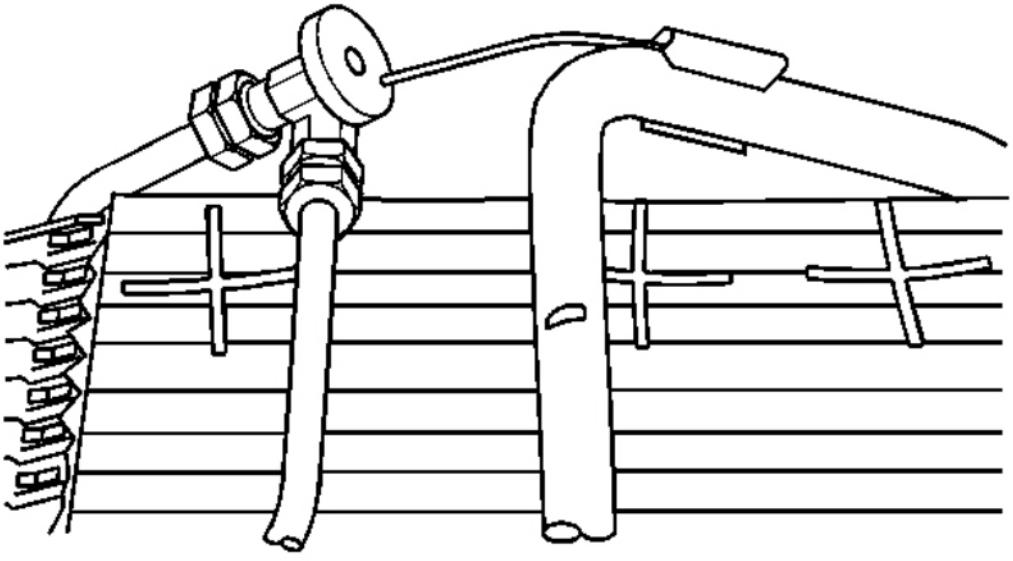


Fig. 265: View Of Thermal Expansion Valve & Evaporator Tube Connectors - Auxiliary
Courtesy of GENERAL MOTORS CORP.

2. Carefully remove the sealer packed around the Thermal Expansion Valve (TXV). Reuse the sealer on the replacement TXV.

IMPORTANT: Note the mounting location and the orientation of the tube on the core.

3. Remove the clip retaining the capillary tube to the evaporator core.
4. Disconnect the evaporator tube connections from the TXV.
5. Remove the TXV from the tubes.

Installation Procedure

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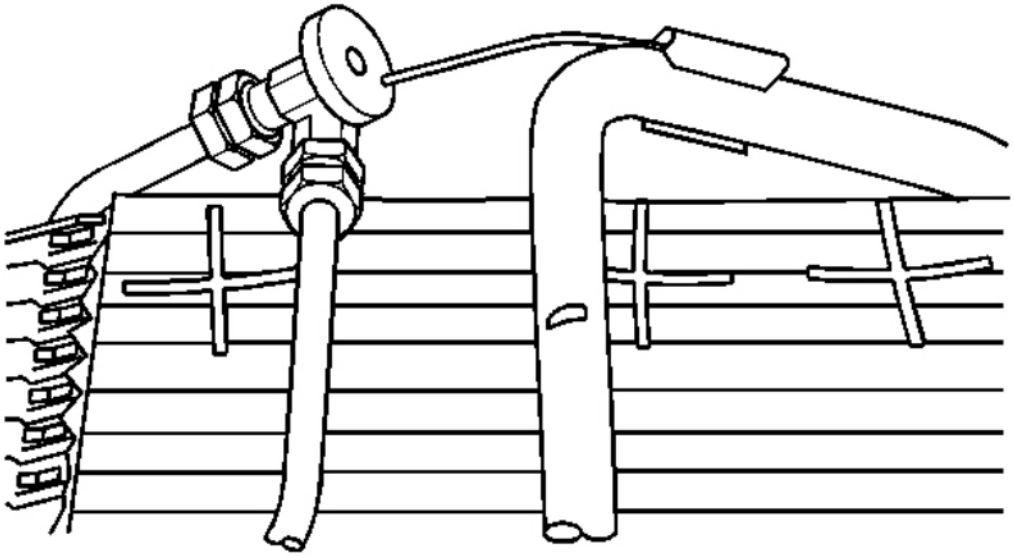


Fig. 266: View Of Thermal Expansion Valve & Evaporator Tube Connectors - Auxiliary
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

1. Install the TXV to the tubes.
2. Connect the evaporator tube connections from the TXV.

   Tighten: Tighten the tube connections to 28 N.m (21 lb ft).

IMPORTANT: Install the clip and the tube in the location and the orientation as noted during the disassembly.

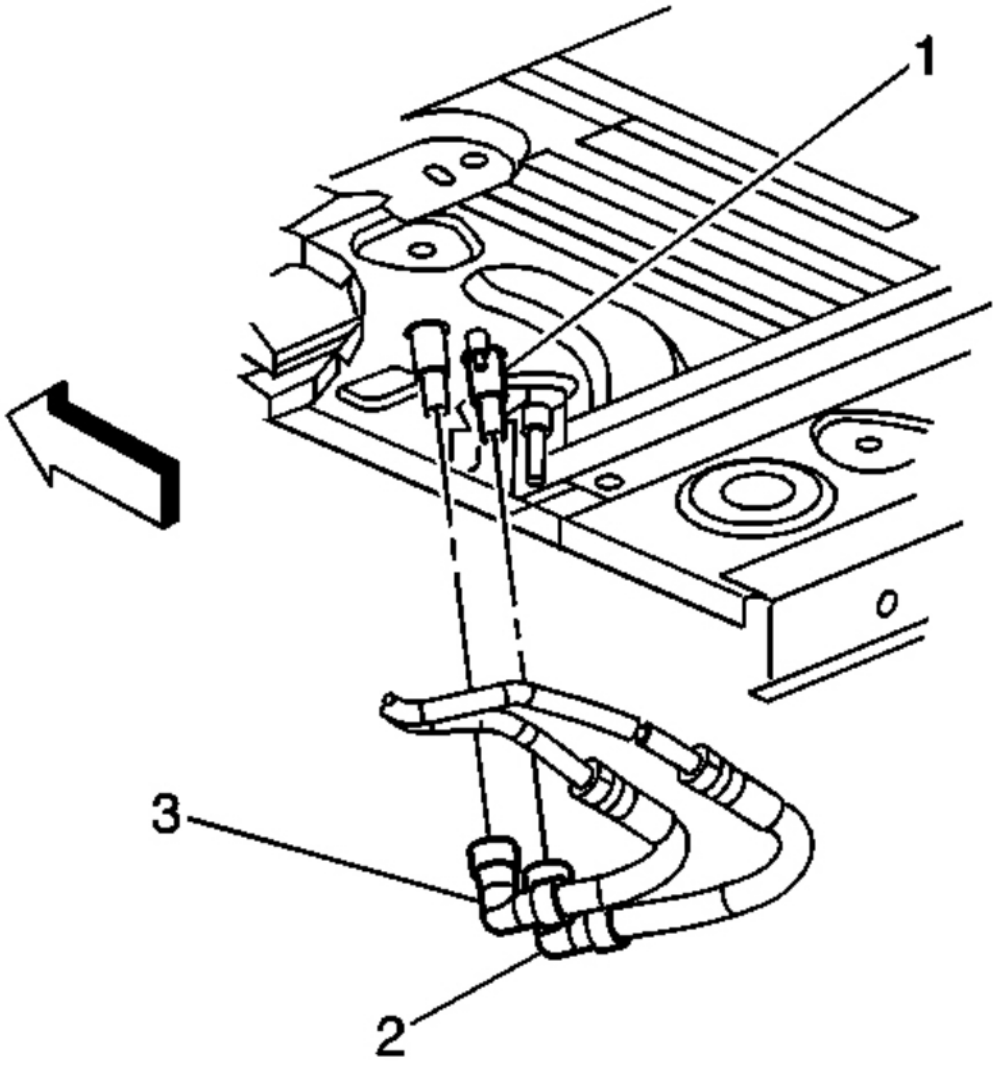
3. Install the clip in order to retain the capillary tube to the evaporator core.
4. Pack sealer around the TXV in the manner found during the disassembly.
5. Install the evaporator core. Refer to **Evaporator Core Replacement - Auxiliary (Tahoe/Yukon)** or **Evaporator Core Replacement - Auxiliary (Suburban/Yukon XL)**.

HVAC MODULE REPLACEMENT - AUXILIARY (SUBURBAN/YUKON XL)

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Removal Procedure

1. Recover the refrigerant from the A/C system. Refer to **Refrigerant Recovery and Recharging**.
2. Drain the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.
3. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.



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Fig. 267: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the heater lines (2,3) from the auxiliary HVAC module at the underside of the vehicle.

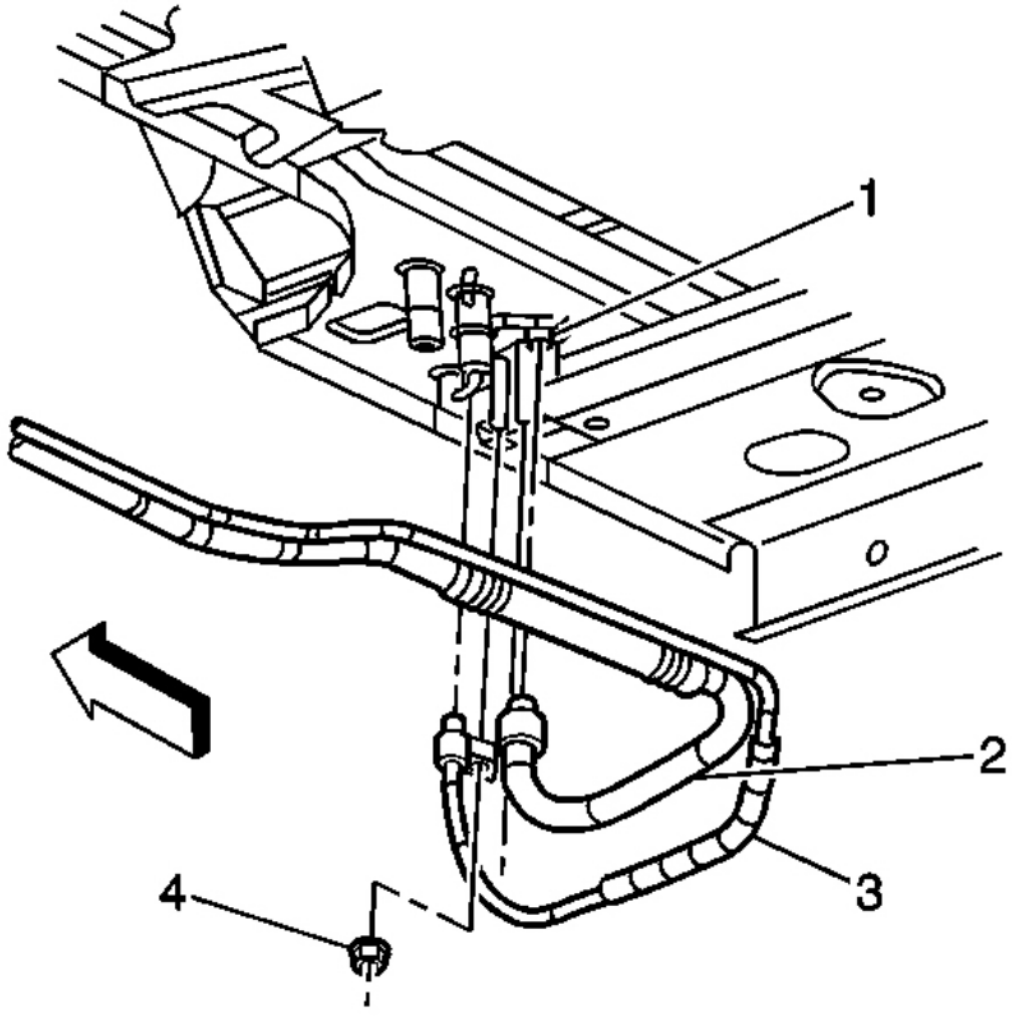


Fig. 268: View Of Air Conditioning Lines At Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the air conditioning lines (2,3) from the auxiliary HVAC module at the

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underside of the vehicle.

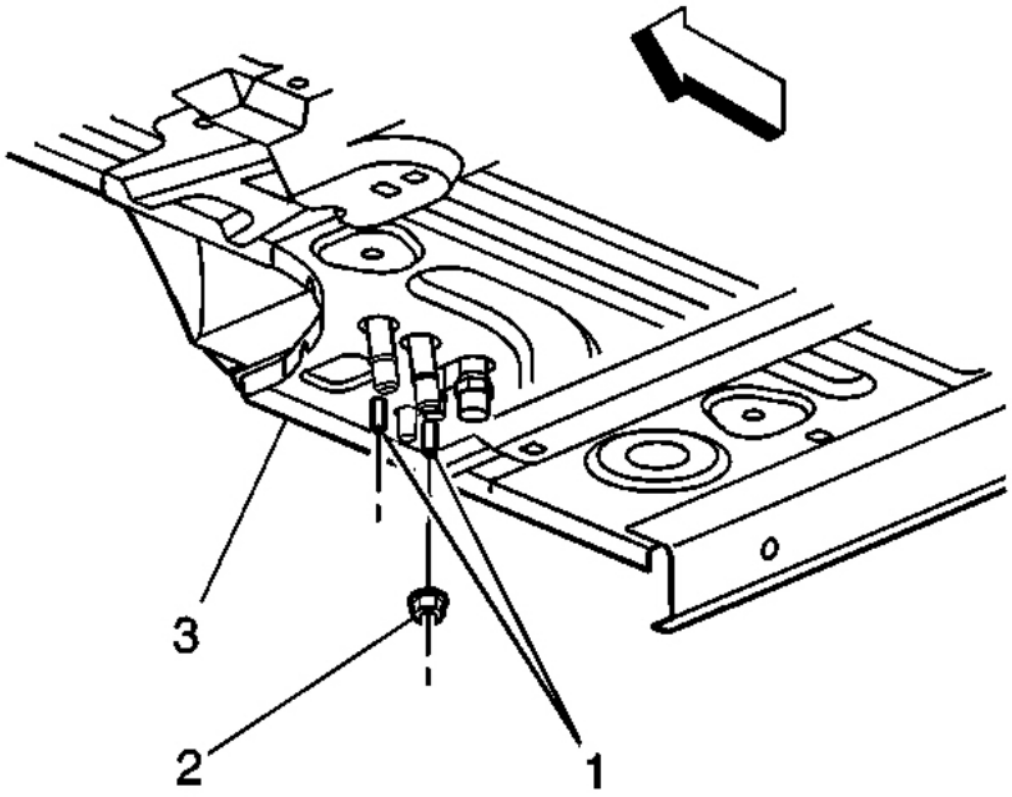


Fig. 269: View Of Auxiliary HVAC Module Nuts To Studs
Courtesy of GENERAL MOTORS CORP.

6. Remove the nuts (2) from the studs (1) that secure the auxiliary HVAC module to the underside of the vehicle.
7. Remove the safety stands.
8. Lower the vehicle.
9. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
10. Remove the electronic suspension control module. Refer to **Electronic Suspension Control Module Replacement (Tahoe/Yukon/Escalade)** or **Electronic Suspension**

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Control Module Replacement (Escalade EXT) in Electronic Suspension Control.

11. Disconnect the electrical connectors from the auxiliary HVAC module.

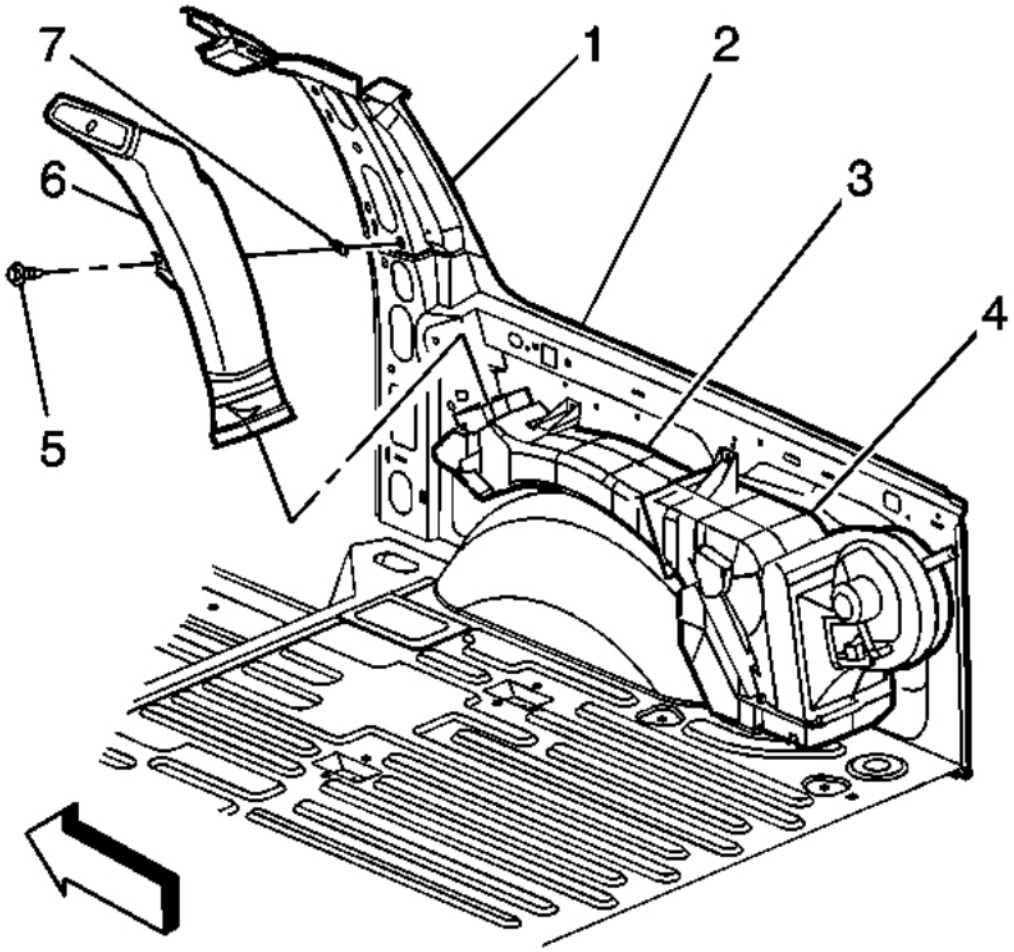


Fig. 270: View Of Upper Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

12. Remove the fastener (5) for the upper auxiliary air duct (6). Carefully slide the duct up, into the headliner, until the bottom edge of the duct is above the air distributor duct.

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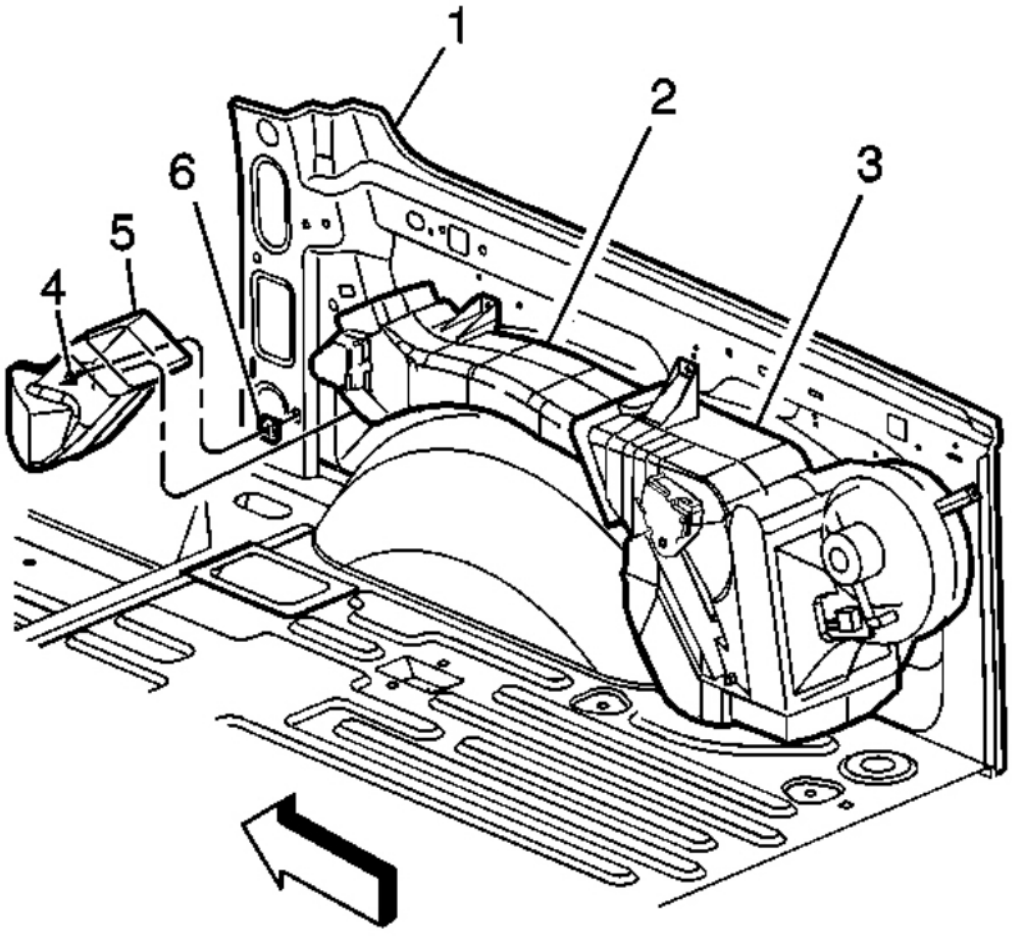


Fig. 271: View Of Lower Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

13. Remove the fastener (4) for the lower auxiliary air outlet (5).

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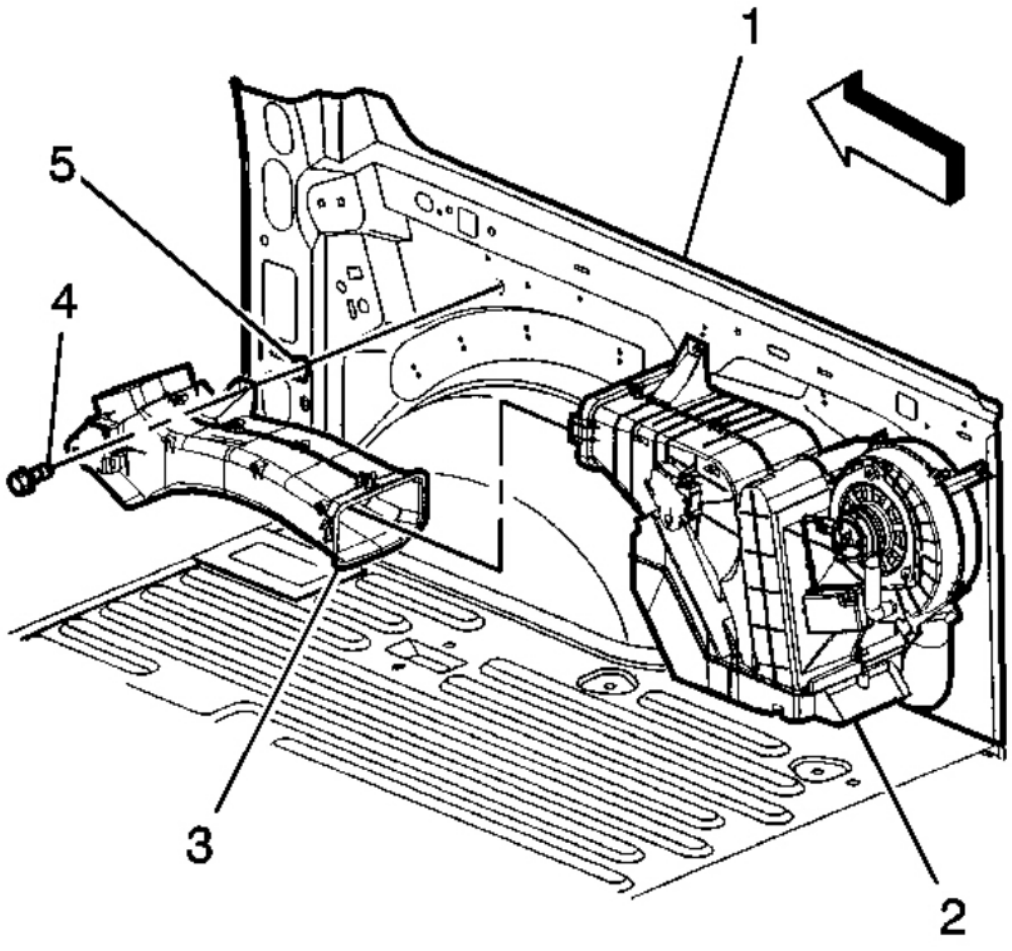


Fig. 272: View Of Air Distributor Duct & Fastener (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

14. Remove the fastener (4) for the air distributor duct (3).
15. Remove the air distributor duct (3).

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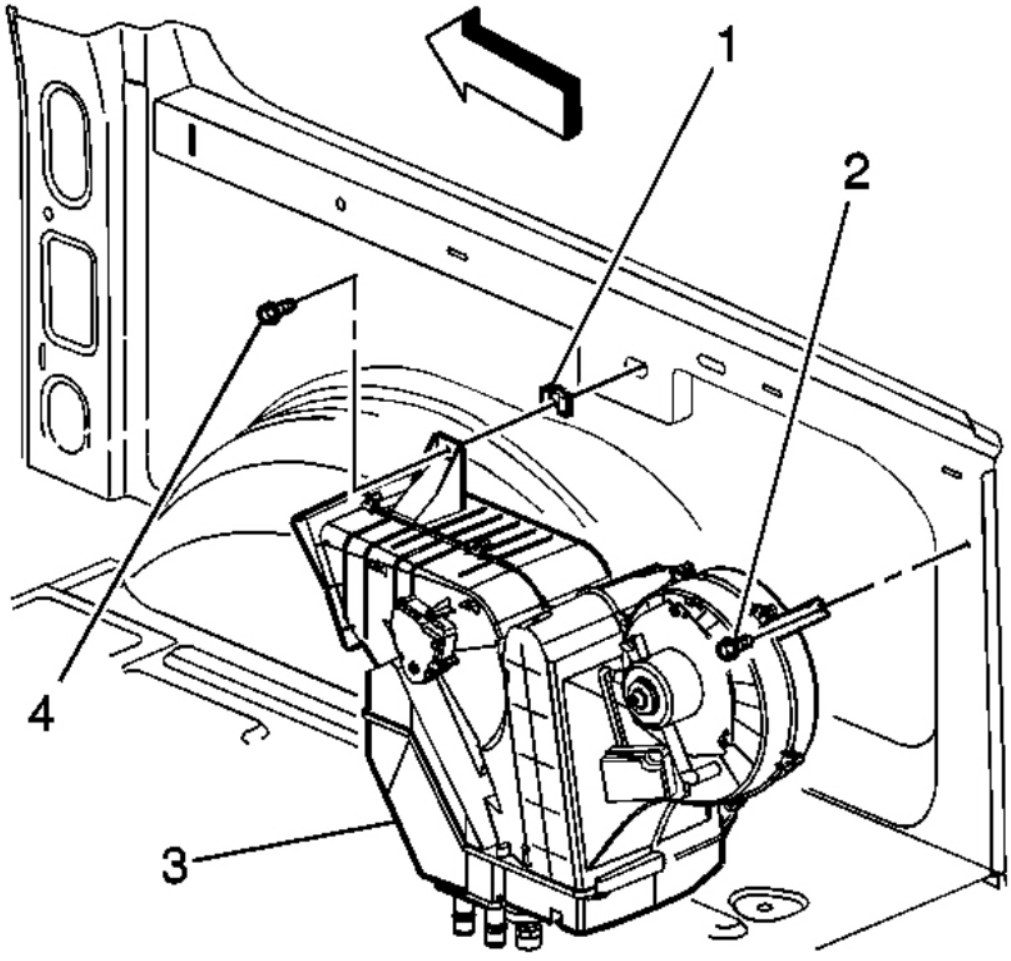


Fig. 273: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

16. Remove the fasteners (2,4) retaining the auxiliary HVAC module to the vehicle.
17. Remove the auxiliary HVAC module (3) from the vehicle.

Installation Procedure

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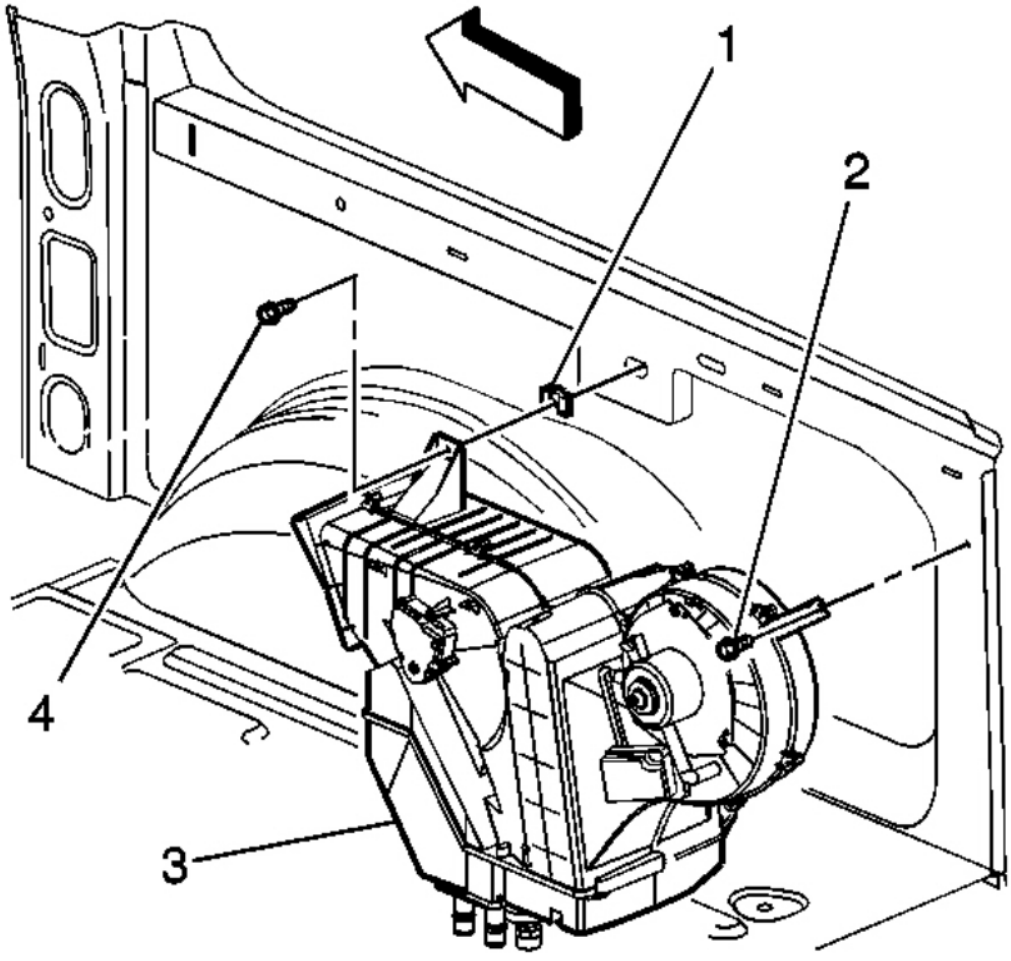


Fig. 274: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

1. Install the auxiliary HVAC module assembly (3) to the vehicle.
2. Install the two bolts (2,4) inside the vehicle in order to retain the auxiliary HVAC module to the vehicle.

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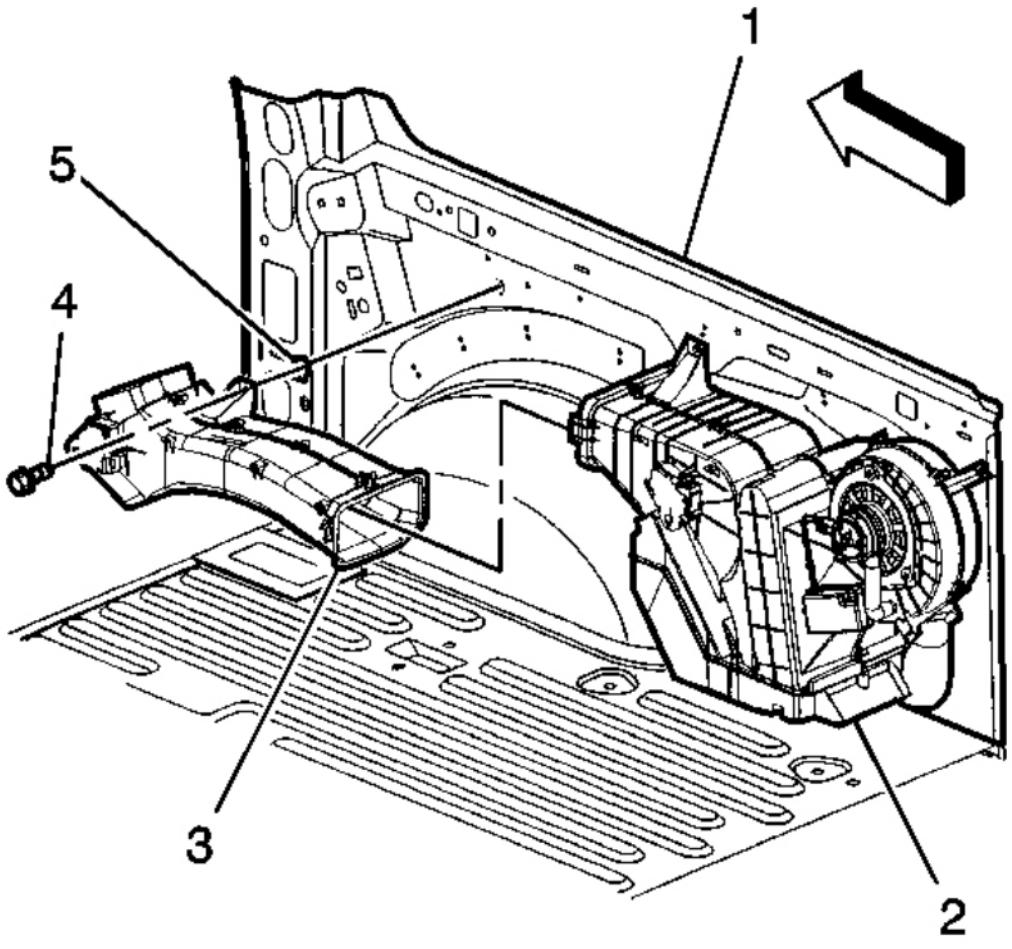


Fig. 275: View Of Air Distributor Duct & Fastener (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

3. Install the air distributor duct (3).
4. Install the fastener (4)

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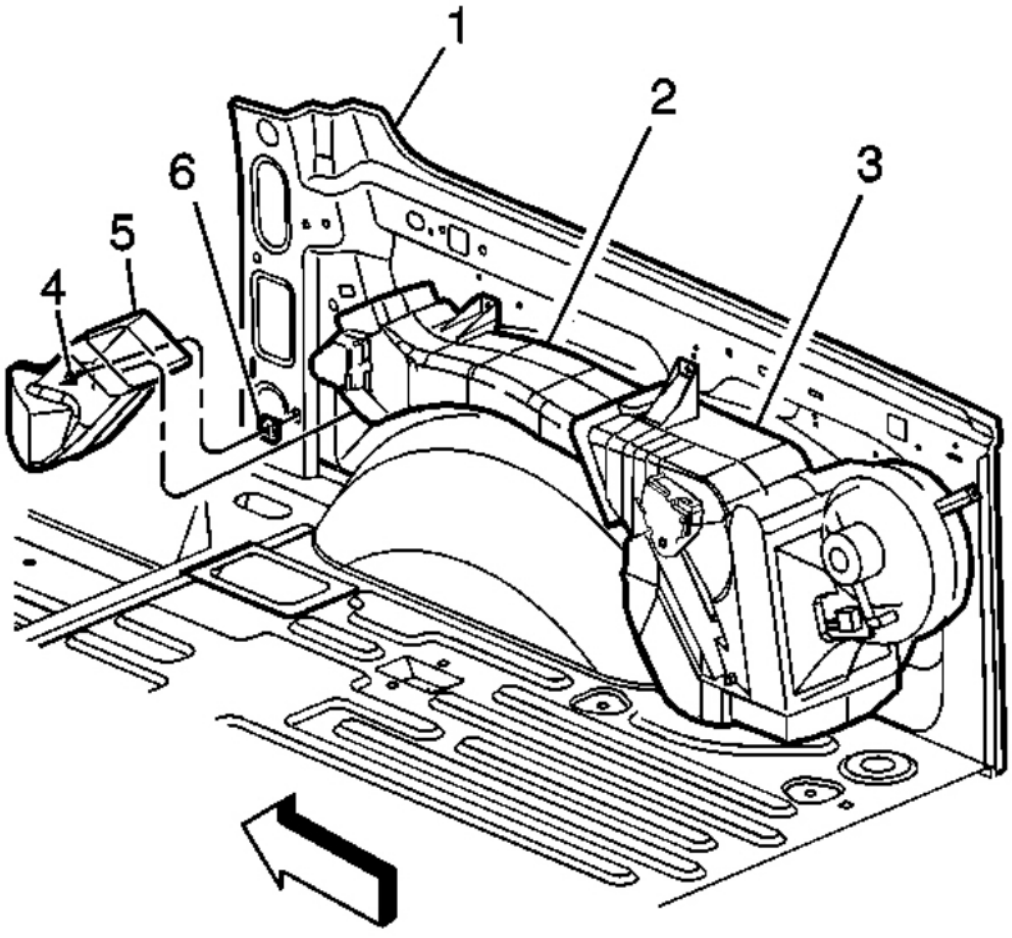


Fig. 276: View Of Lower Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

5. Install the lower auxiliary air outlet (5).
6. Install the fastener (4)

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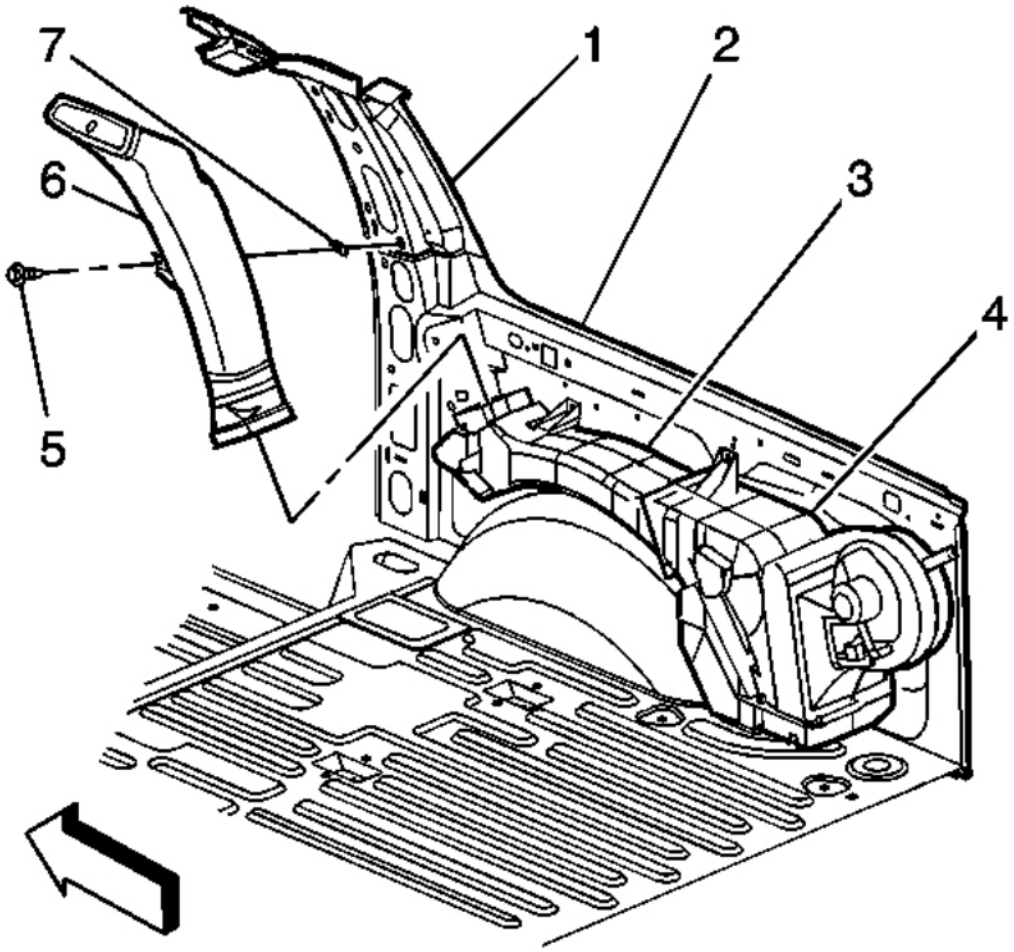


Fig. 277: View Of Upper Auxiliary Air Distribution Duct
Courtesy of GENERAL MOTORS CORP.

7. Install the upper auxiliary air duct (6) to the air distributor duct (3).
8. Install the fastener (5)
9. Connect the electrical connectors to the auxiliary HVAC module.
10. Install the electronic suspension control module. Refer to **Electronic Suspension Control Module Replacement (Tahoe/Yukon/Escalade)** or **Electronic Suspension Control Module Replacement (Escalade EXT)** in Electronic Suspension Control.
11. Install the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear**

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Quarter - Right (Utility) or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.

12. Raise the vehicle.

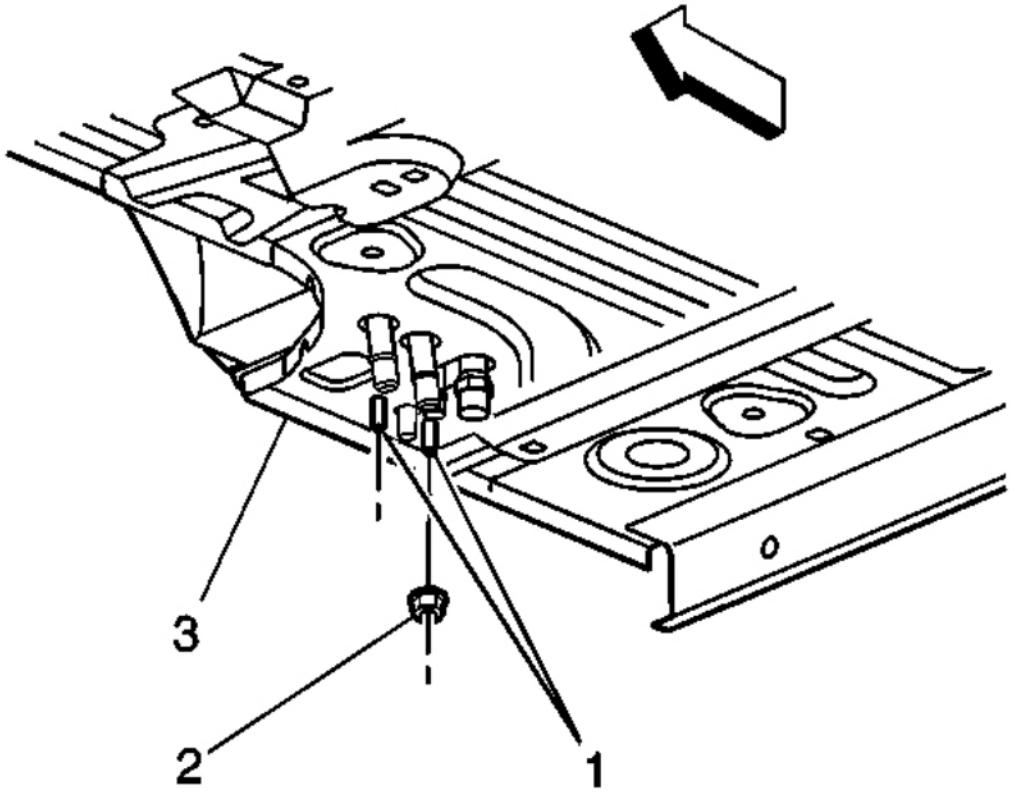


Fig. 278: View Of Auxiliary HVAC Module Nuts To Studs
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

13. Install the nuts (2) that secure the auxiliary HVAC module to the vehicle.

Tighten: Tighten the nuts to 9 N.m (80 lb in).

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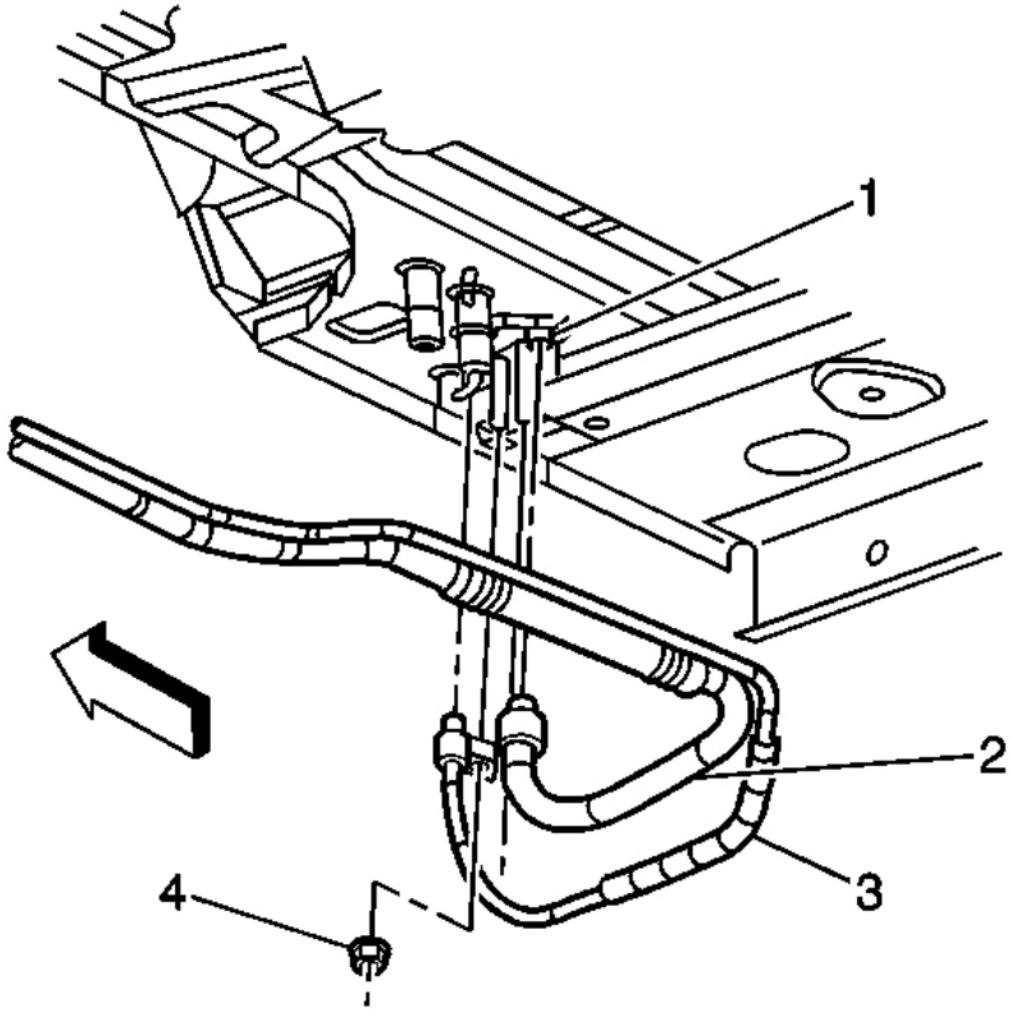


Fig. 279: View Of Air Conditioning Lines At Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

14. Install the air conditioning lines (2,3) and the nut (4) to the auxiliary HVAC module.

    Tighten: Tighten the nut to 16 N.m (12 lb ft).

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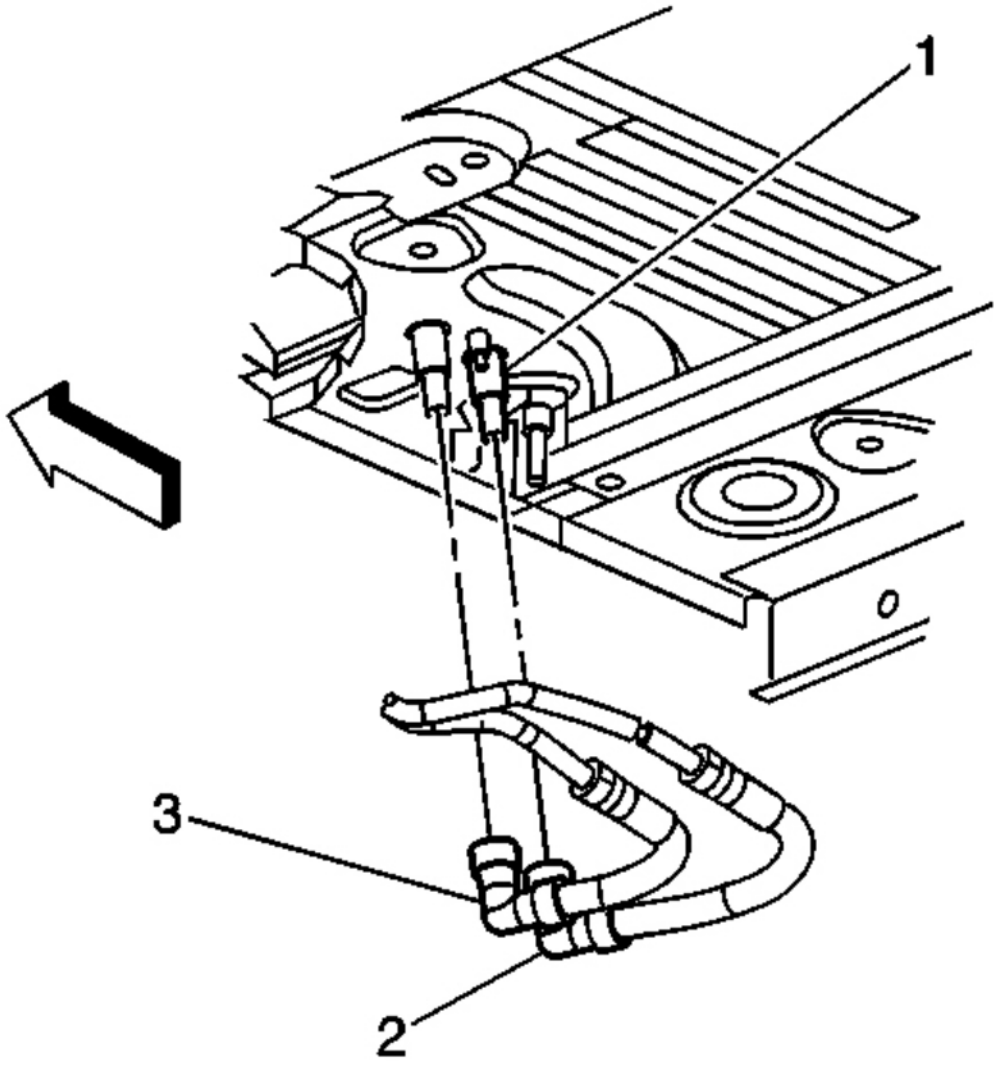


Fig. 280: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

15. Install the heater lines (2,3) to the auxiliary HVAC module at the underside of vehicle.
16. Remove the safety stands.
17. Lower the vehicle.
18. Fill the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.

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19. Recharge the refrigerant to the system. Refer to **Refrigerant Recovery and Recharging**.

HVAC MODULE REPLACEMENT - AUXILIARY (TAHOE/YUKON)

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

1. Recover the refrigerant from the A/C system. Refer to **Refrigerant Recovery and Recharging**.
2. Drain the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.
3. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.

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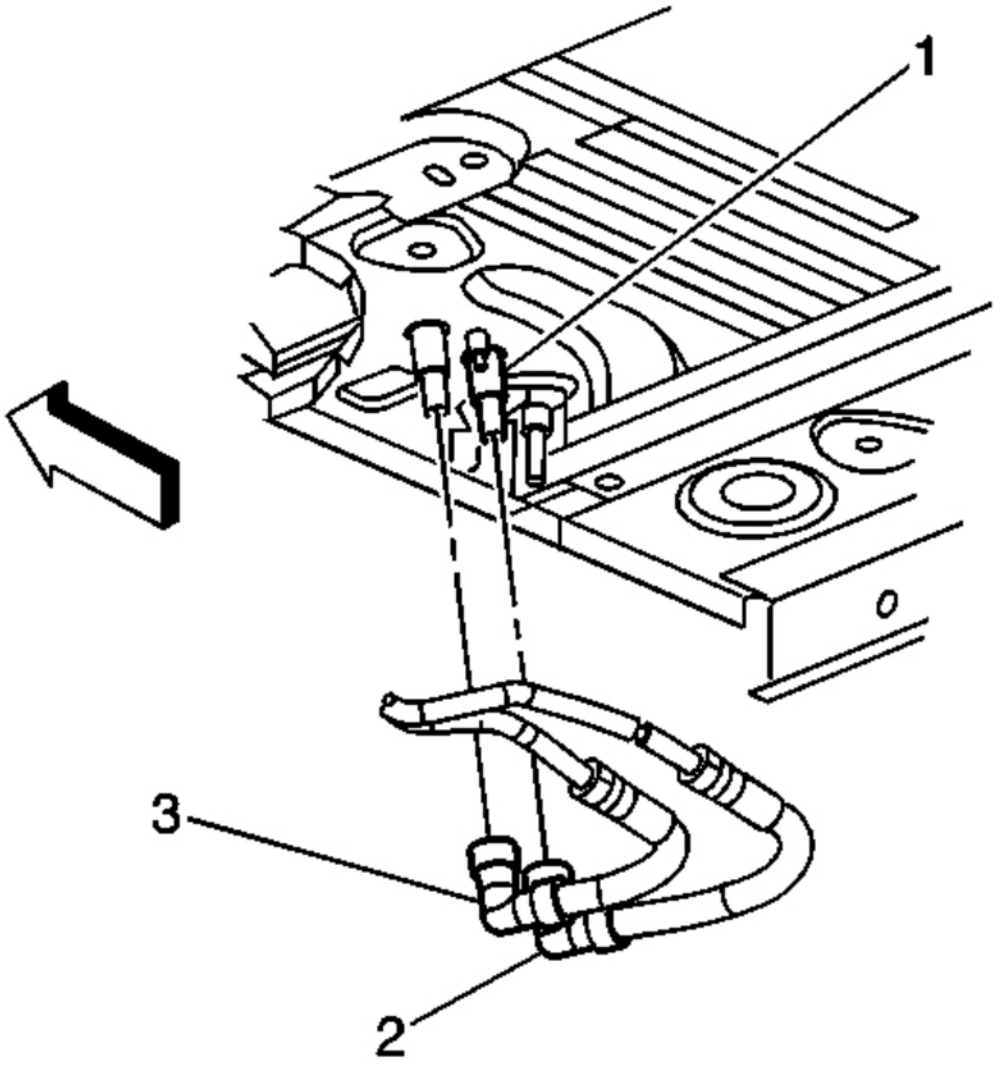


Fig. 281: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the heater lines (2,3) from the auxiliary HVAC module at the underside of the vehicle.

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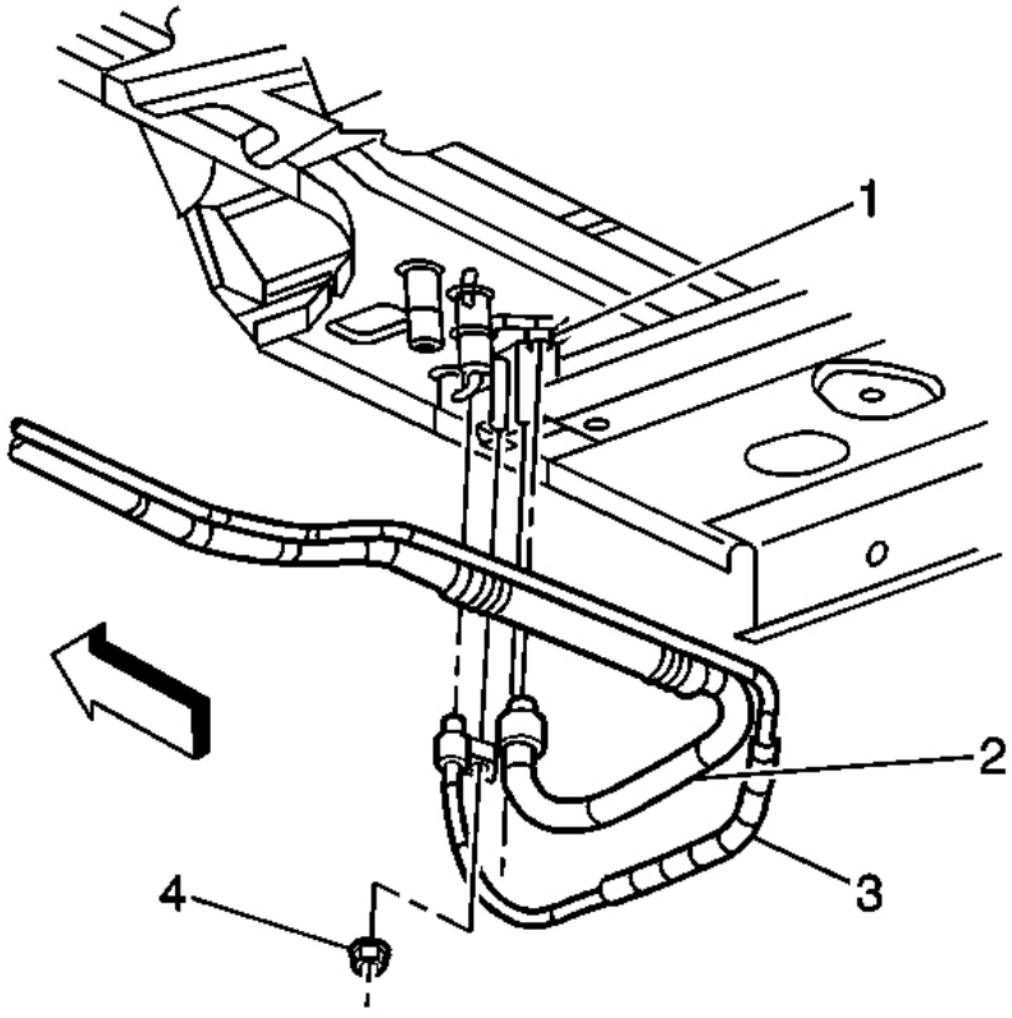


Fig. 282: View Of Air Conditioning Lines At Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the air conditioning lines (2,3) from the auxiliary HVAC module at the underside of the vehicle.

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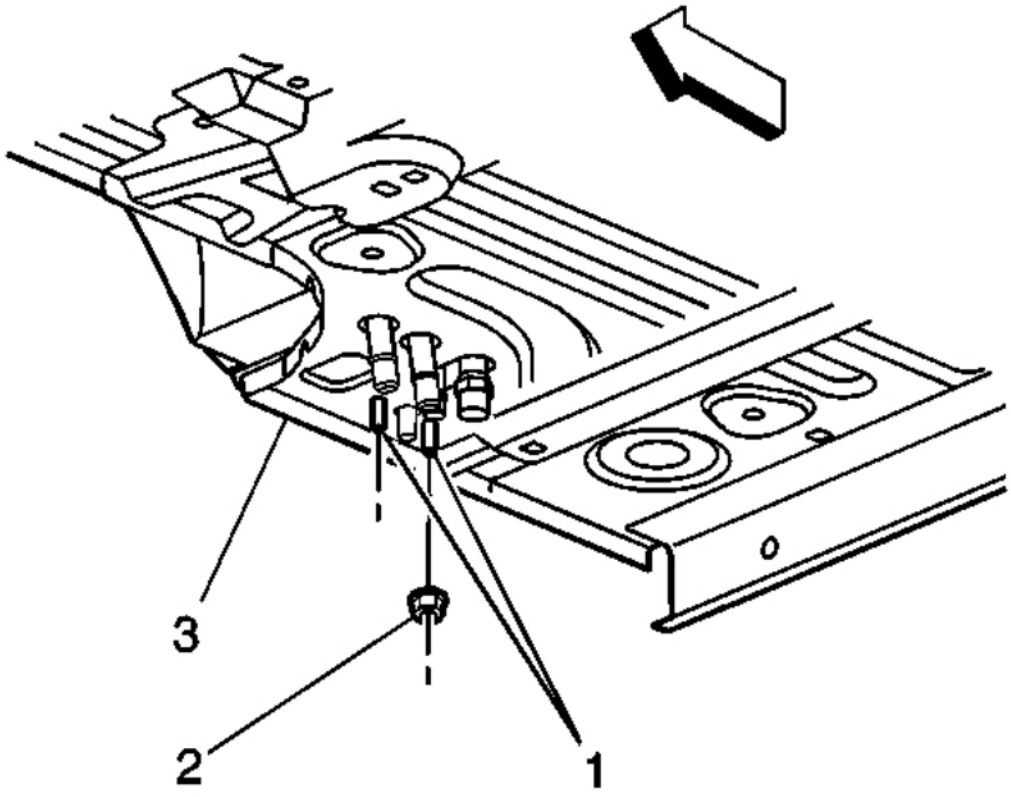


Fig. 283: View Of Auxiliary HVAC Module Nuts To Studs
Courtesy of GENERAL MOTORS CORP.

6. Remove the nuts (2) from the studs (1) that secure the auxiliary HVAC module to the underside of the vehicle.
7. Lower the vehicle.
8. Remove the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right (Suburban)** in Interior Trim.
9. Remove the electronic suspension control module. Refer to **Electronic Suspension Control Module Replacement (Tahoe/Yukon/Escalade)** or **Electronic Suspension Control Module Replacement (Escalade EXT)** in Electronic Suspension Control.
10. Disconnect the electrical connectors from the Auxiliary HVAC module.

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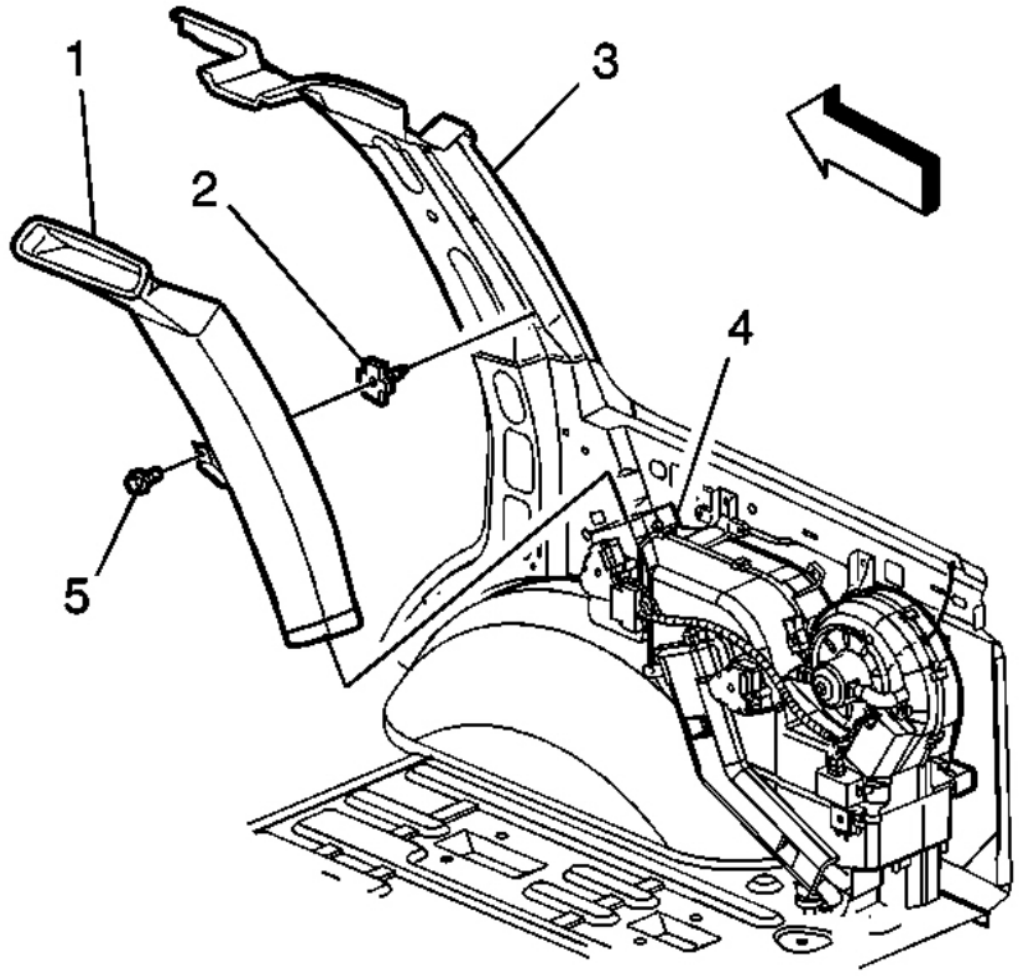


Fig. 284: View Of Upper Auxiliary Air Duct & Fastener (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

11. Remove the fastener (5) for the upper auxiliary air duct (1). Carefully slide the duct up, into the headliner, until the bottom edge of the duct is above the air distributor duct.

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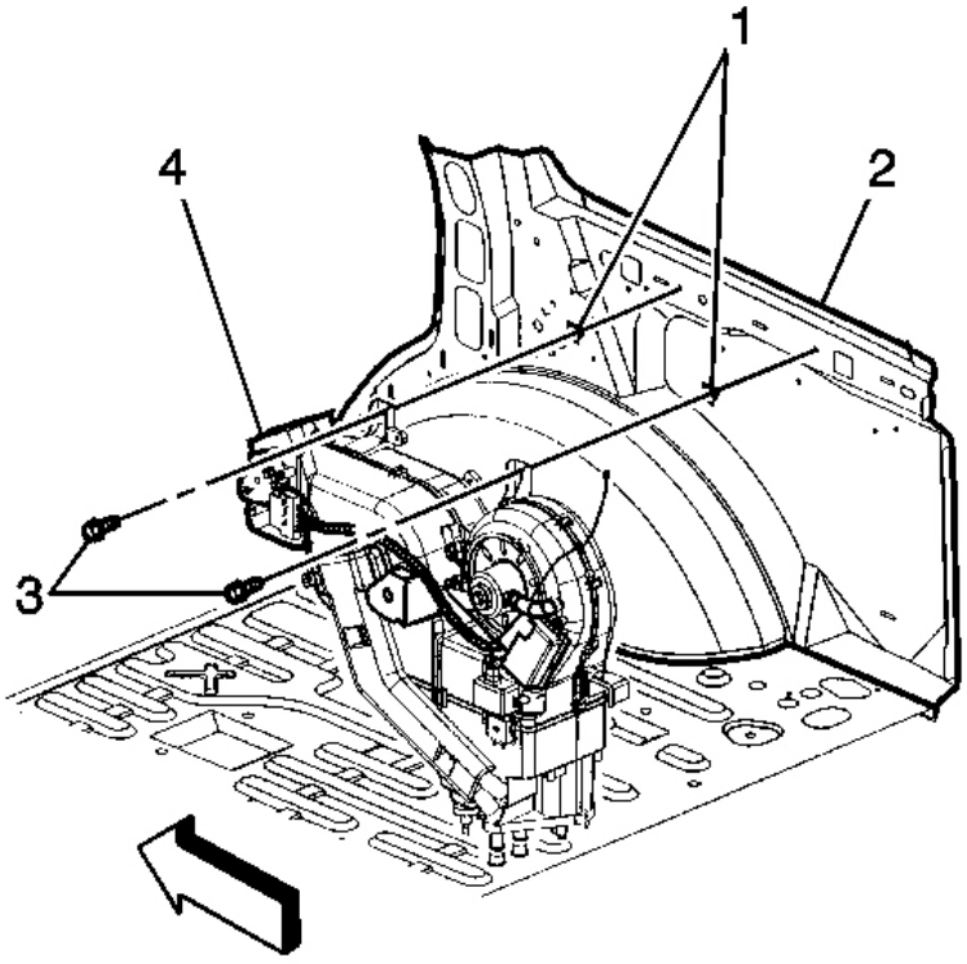


Fig. 285: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

12. Remove the fasteners (3) retaining the auxiliary HVAC module to the vehicle.
13. Remove the auxiliary HVAC module (4) from the vehicle.

Installation Procedure

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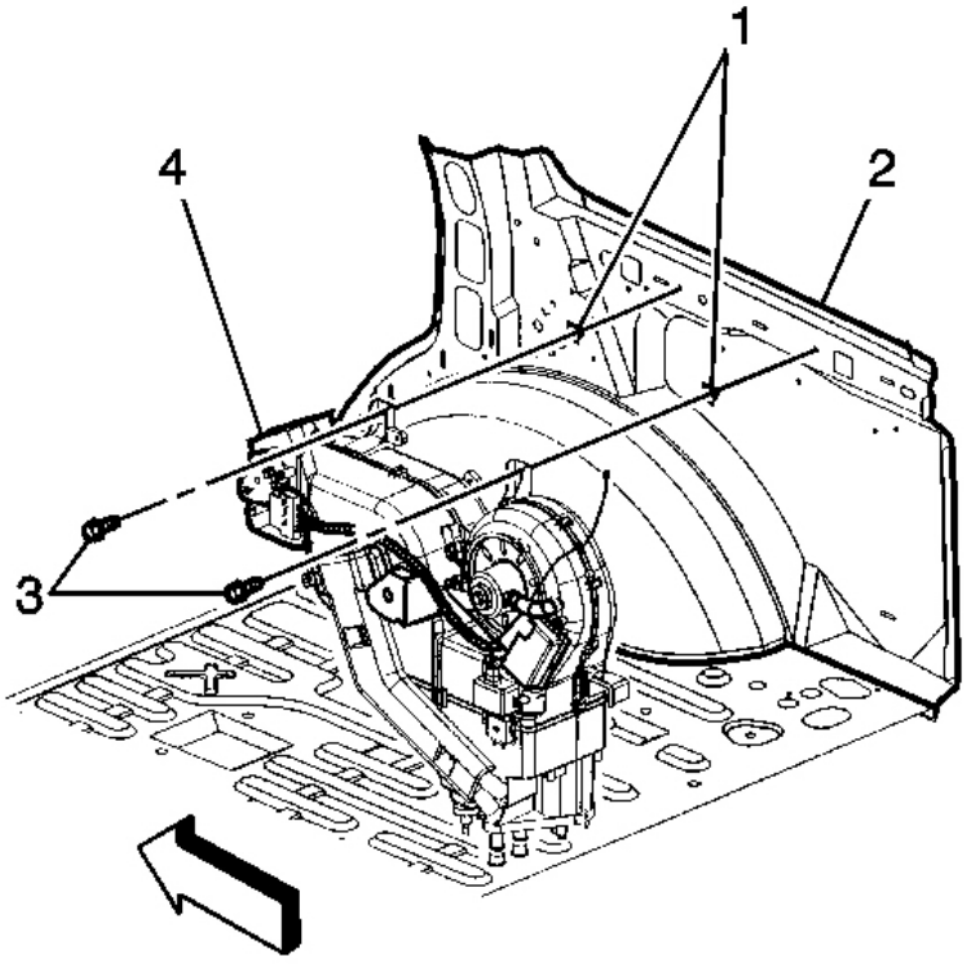


Fig. 286: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

1. Install the auxiliary HVAC module assembly (4) to the vehicle.
2. Install the two bolts (3) inside the vehicle in order to retain the auxiliary HVAC module to the vehicle.

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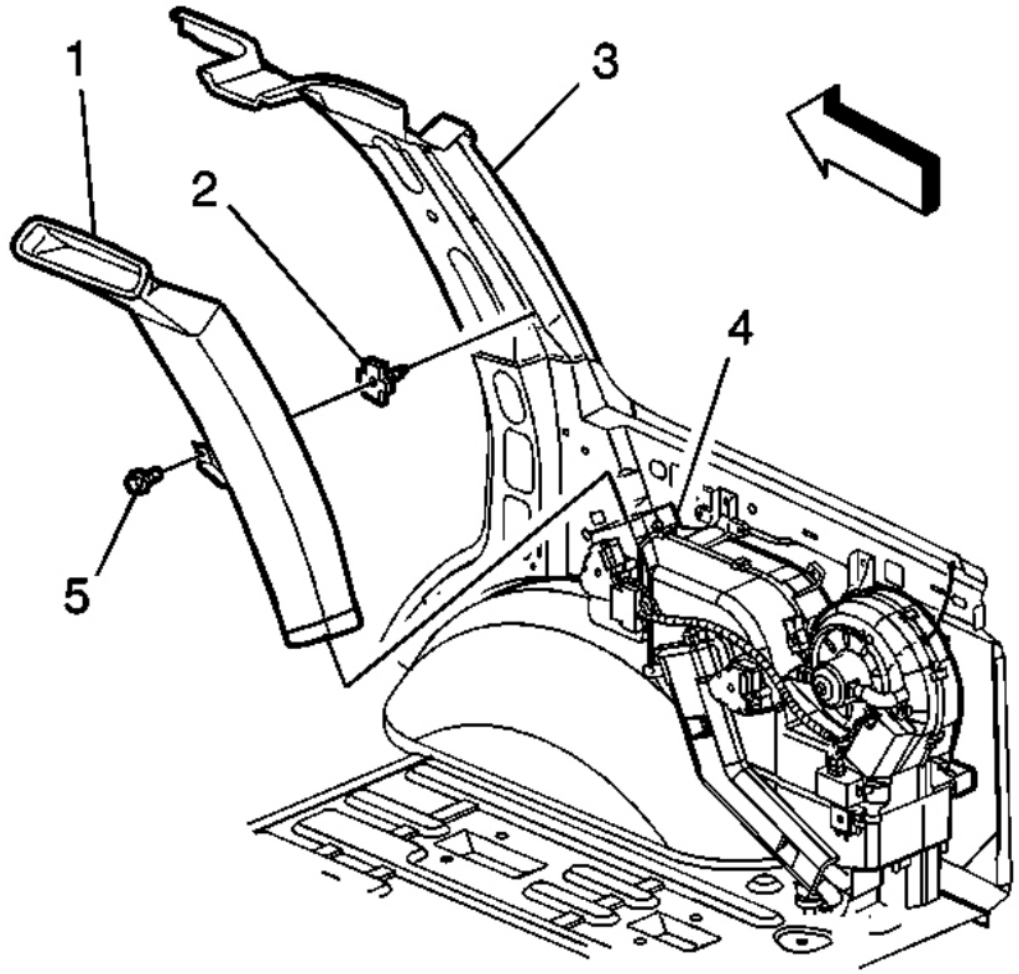


Fig. 287: View Of Upper Auxiliary Air Duct & Fastener (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

3. Install the upper auxiliary air duct (1) to the air distributor duct. Install the fastener (5).
4. Connect the electrical connectors to the auxiliary HVAC module.
5. Install the electronic suspension control module. Refer to **Electronic Suspension Control Module Replacement (Tahoe/Yukon/Escalade)** or **Electronic Suspension Control Module Replacement (Escalade EXT)** in Electronic Suspension Control.
6. Install the right rear quarter trim panel. Refer to **Trim Panel Replacement - Rear Quarter - Right (Utility)** or **Trim Panel Replacement - Rear Quarter - Right**

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(Suburban) in Interior Trim.

7. Raise the vehicle.

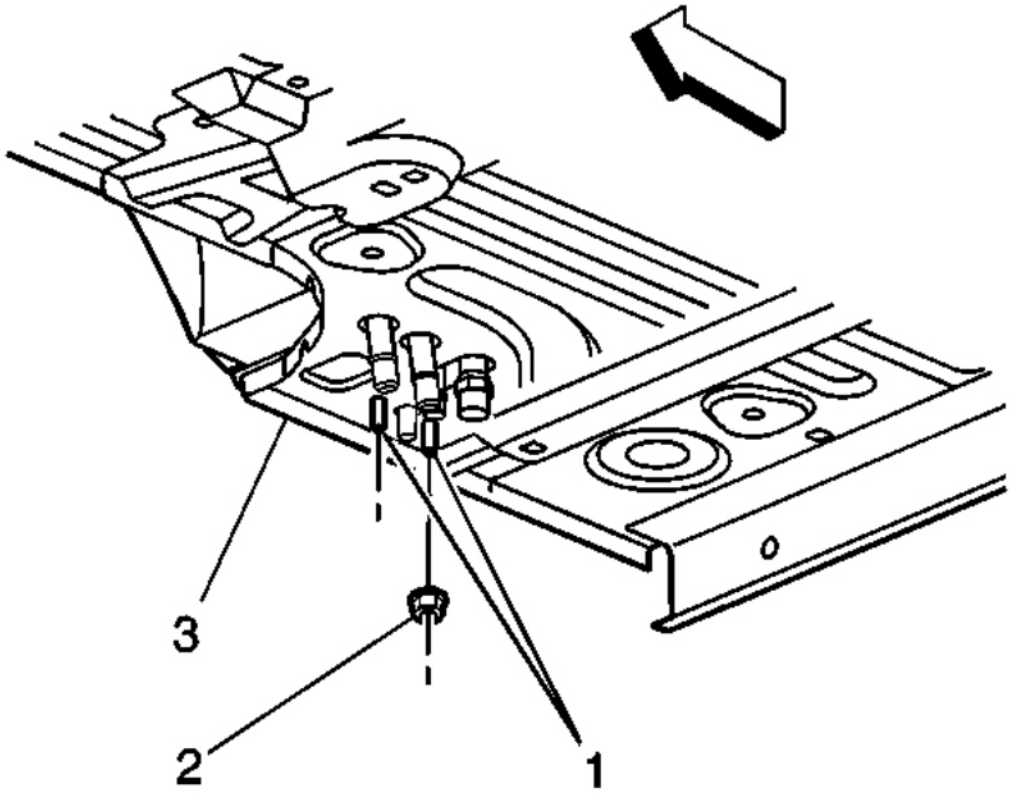


Fig. 288: View Of Auxiliary HVAC Module Nuts To Studs
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

8. Install the nuts (2) that secure the auxiliary HVAC module to the vehicle.

Tighten: Tighten the nuts to 9 N.m (80 lb in).

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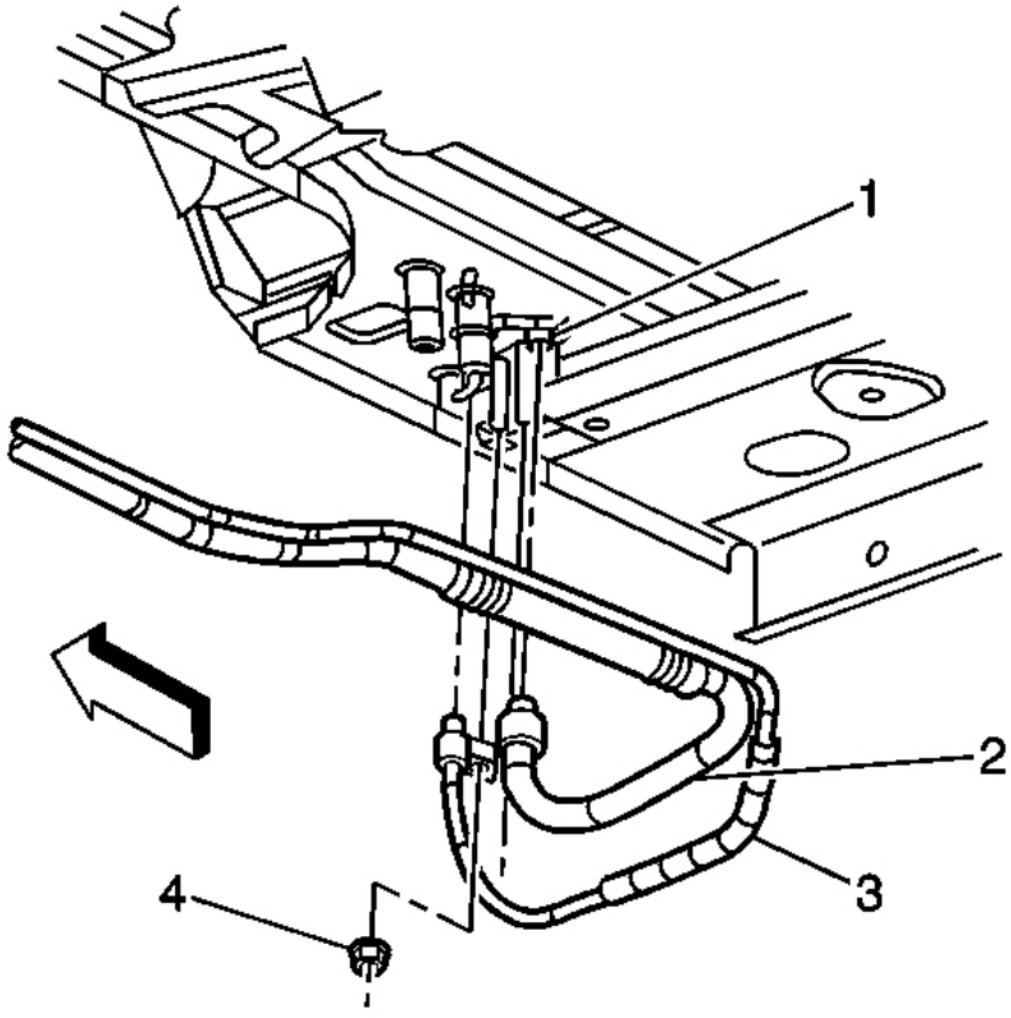


Fig. 289: View Of Air Conditioning Lines At Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

9. Install the air conditioning lines (2,3) and the nut (4) to the auxiliary HVAC module.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

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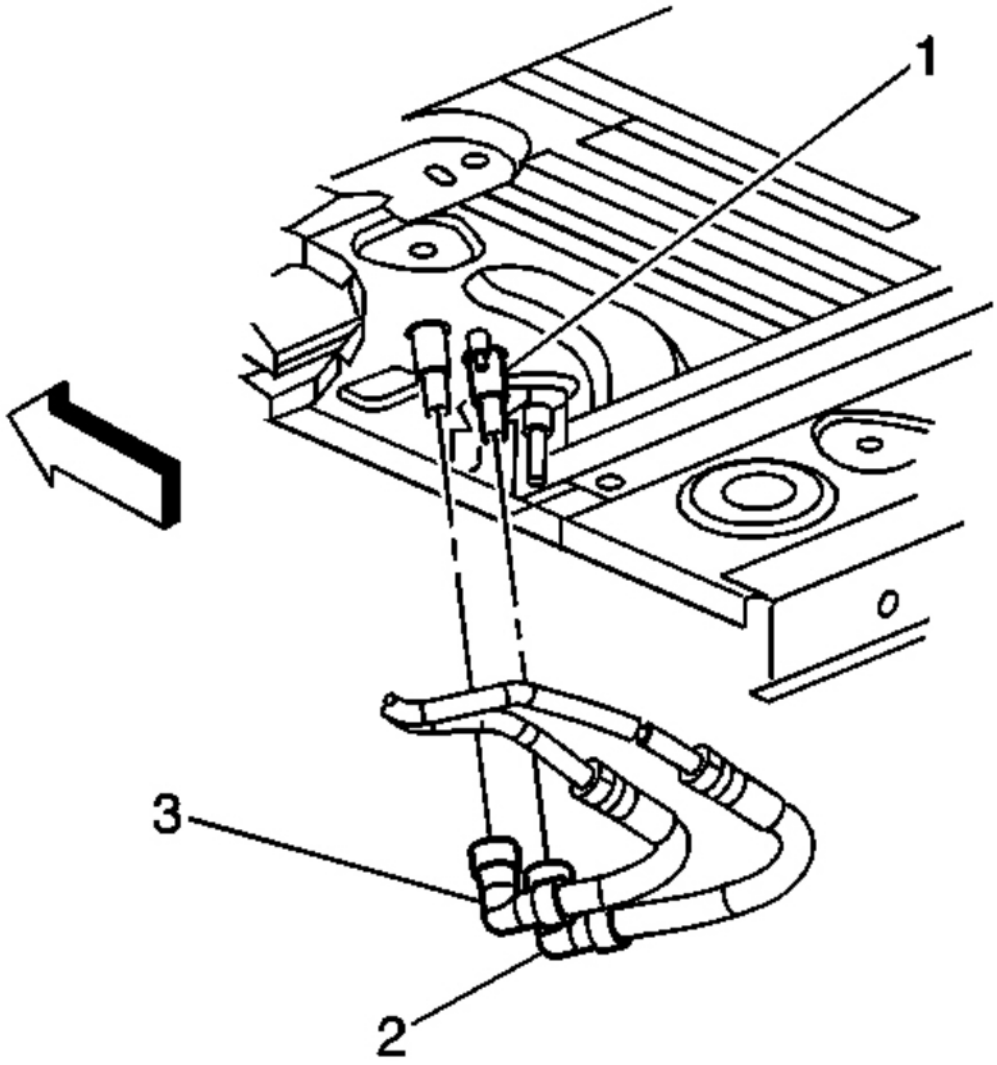


Fig. 290: View Of Auxiliary Heater Pipes
Courtesy of GENERAL MOTORS CORP.

10. Install the heater lines (2,3) to the auxiliary HVAC module at the underside of vehicle.
11. Lower the vehicle.
12. Fill the engine coolant. Refer to **Draining and Filling Cooling System** in Engine Cooling.
13. Recharge the refrigerant to the system. Refer to **Refrigerant Recovery and Recharging**.

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14. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

EVAPORATOR CORE REPLACEMENT - AUXILIARY (TAHOE/YUKON)

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

Removal Procedure

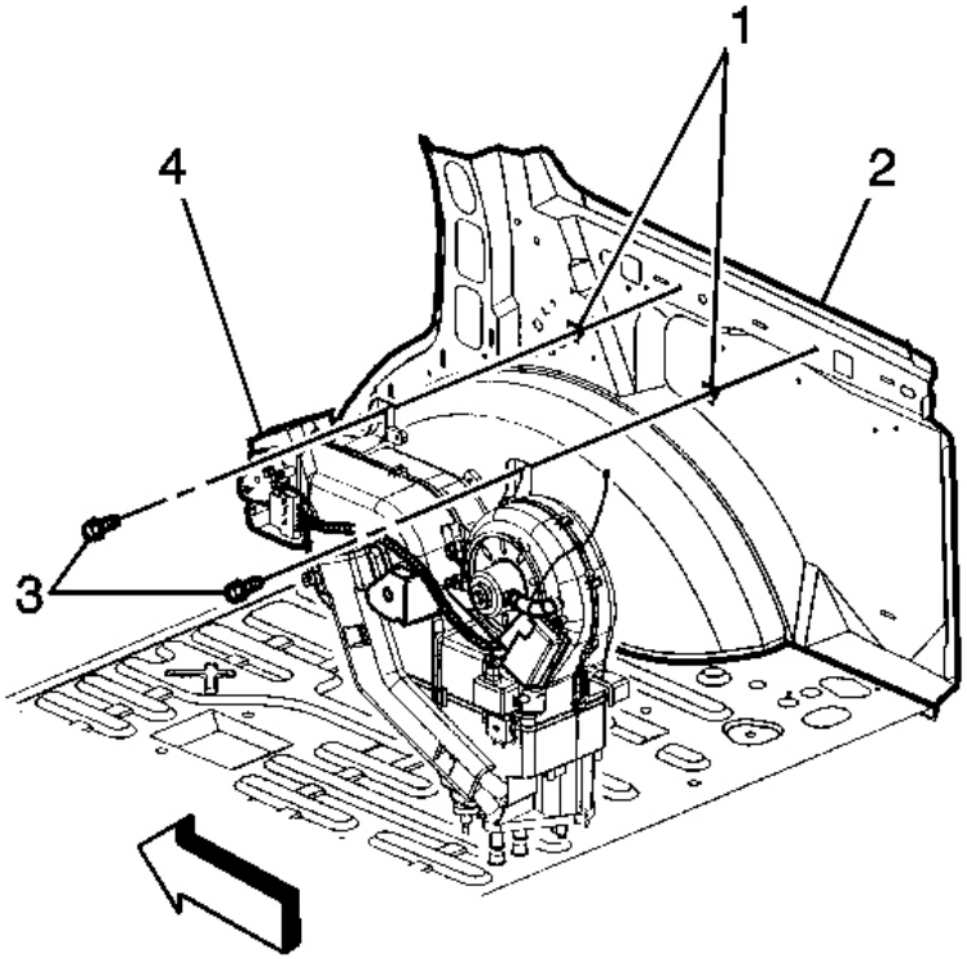


Fig. 291: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

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1. Remove the auxiliary HVAC module (4) from the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**.

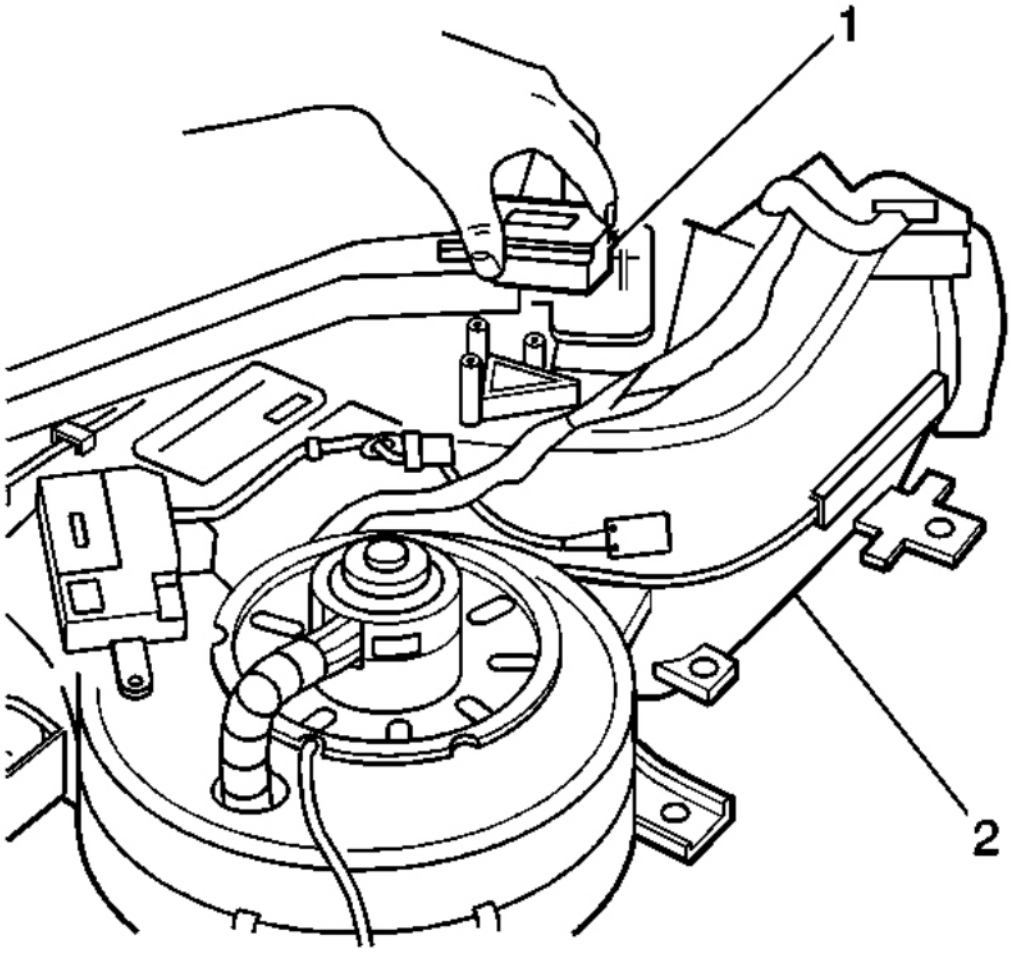


Fig. 292: View Of Air Temperature Actuator (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

2. Remove the air temperature actuator (1) from the auxiliary HVAC module.

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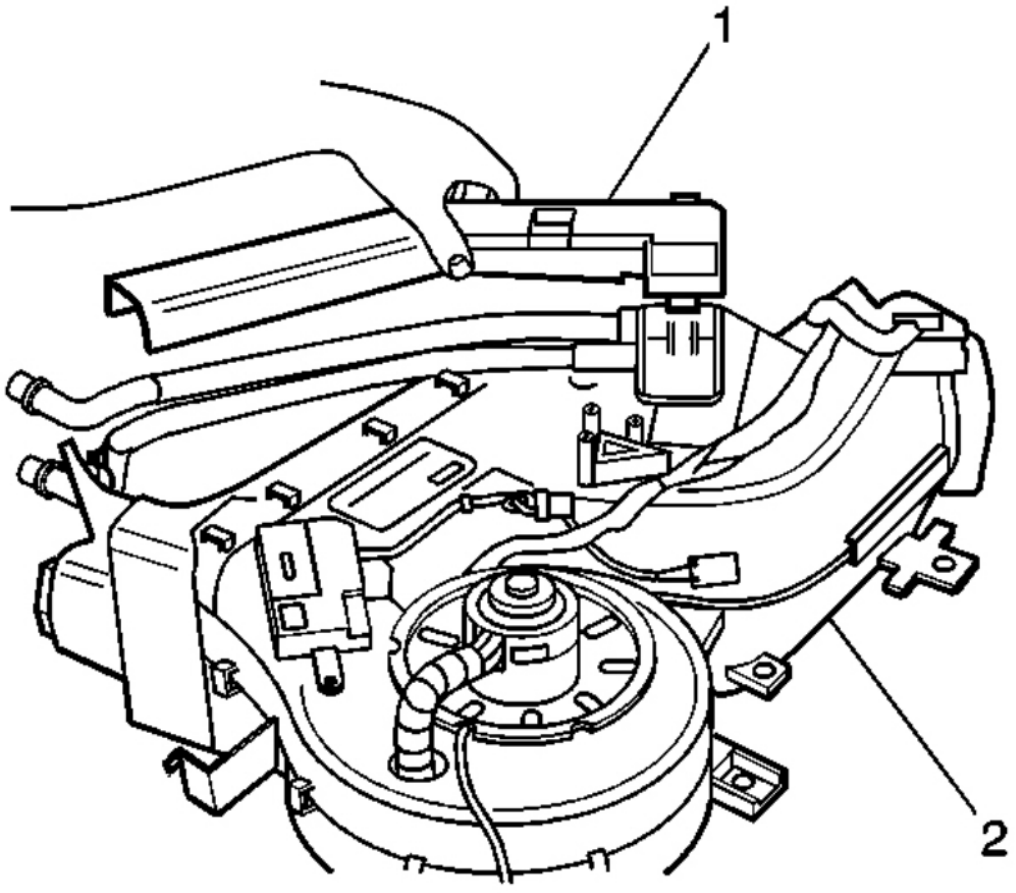


Fig. 293: View Of Heater Core Cover - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

3. Remove the heater core cover (1) from the auxiliary HVAC module.

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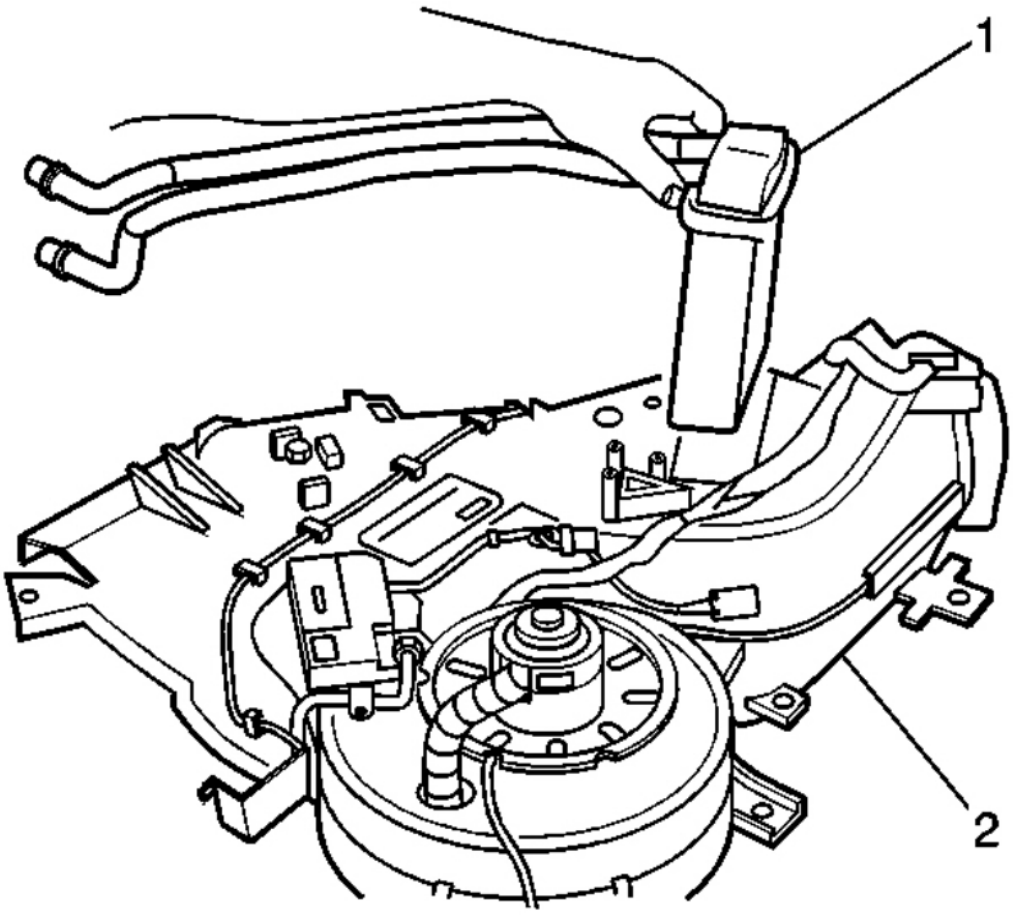


Fig. 294: View Of Heater Core - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core (1) from the auxiliary HVAC module.

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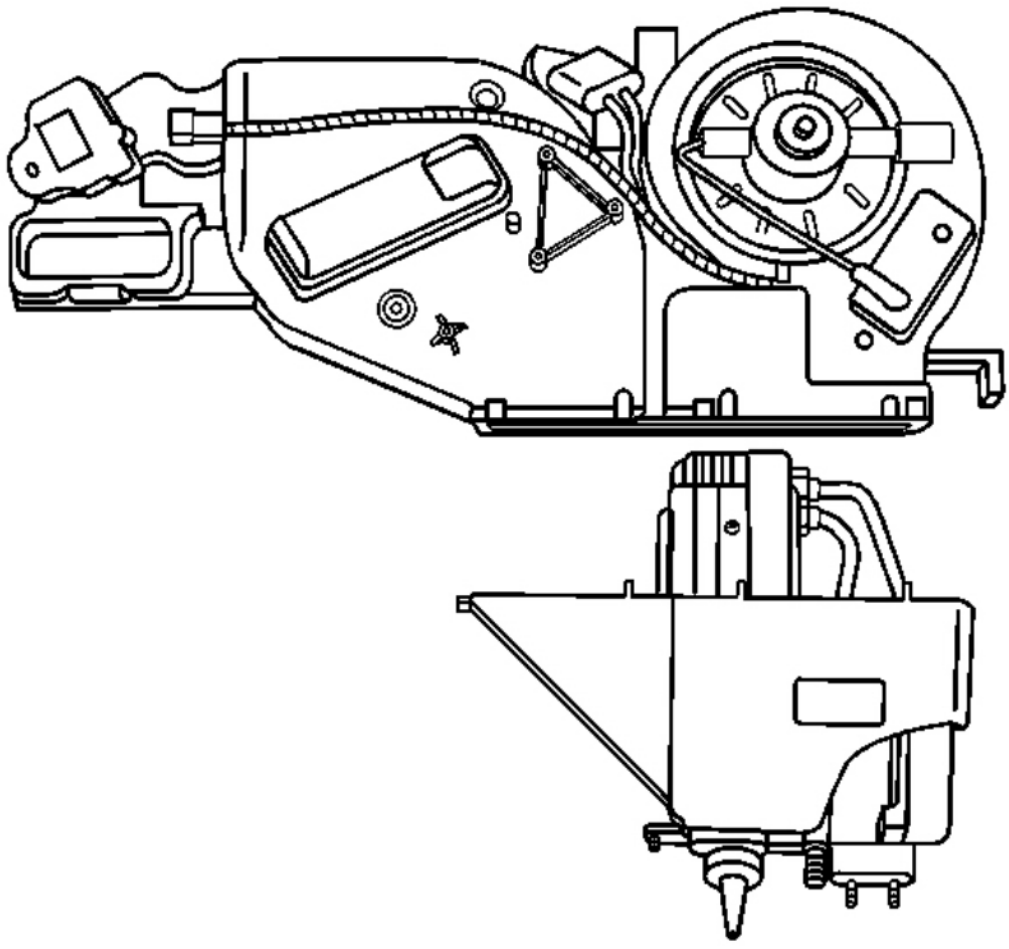


Fig. 295: View Of Lower Module Cover & Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

5. Remove the lower module cover from the auxiliary HVAC module.

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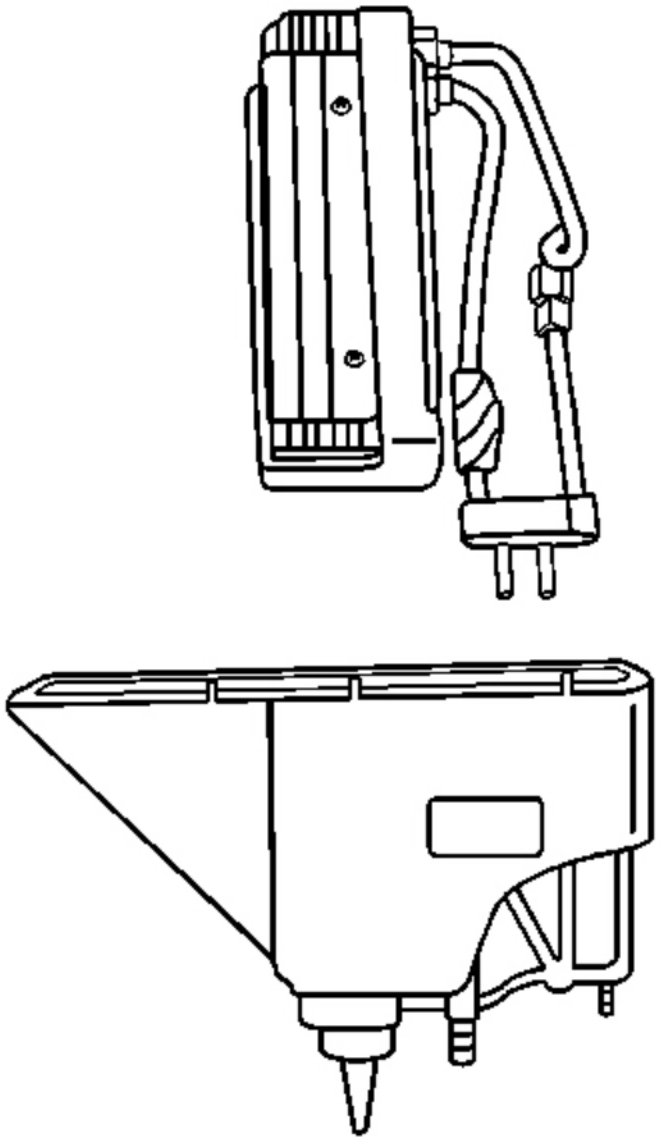


Fig. 296: View Of Evaporator Core & Lower Module Cover (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

6. Remove the evaporator core from the lower module cover.

Installation Procedure

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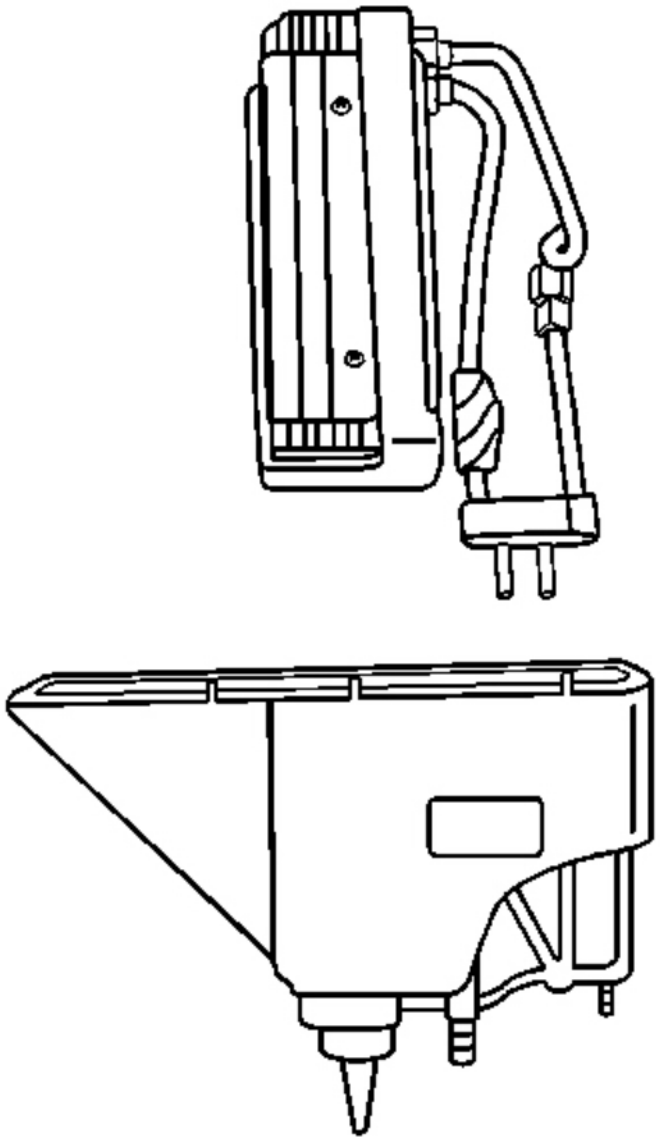


Fig. 297: View Of Evaporator Core & Lower Module Cover (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

1. Install the evaporator core to the lower module cover.

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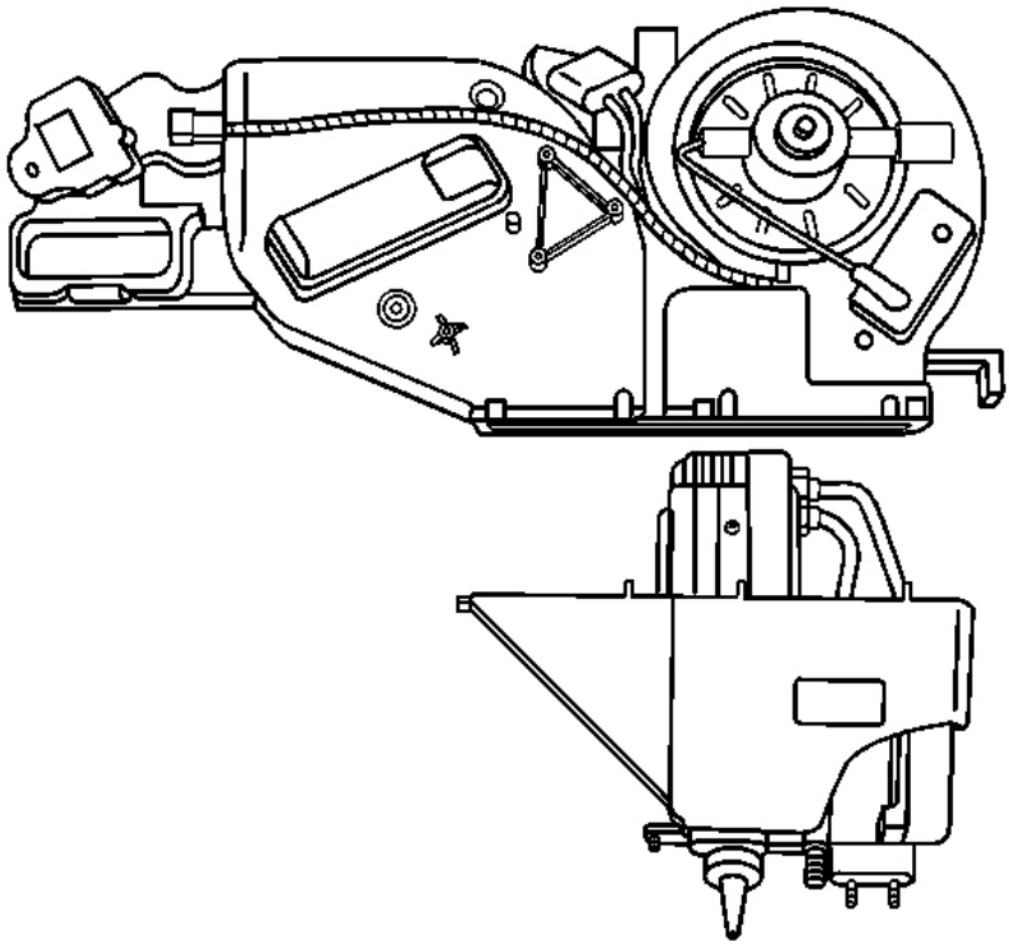


Fig. 298: View Of Lower Module Cover & Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

2. Install the lower module cover to the auxiliary HVAC module.

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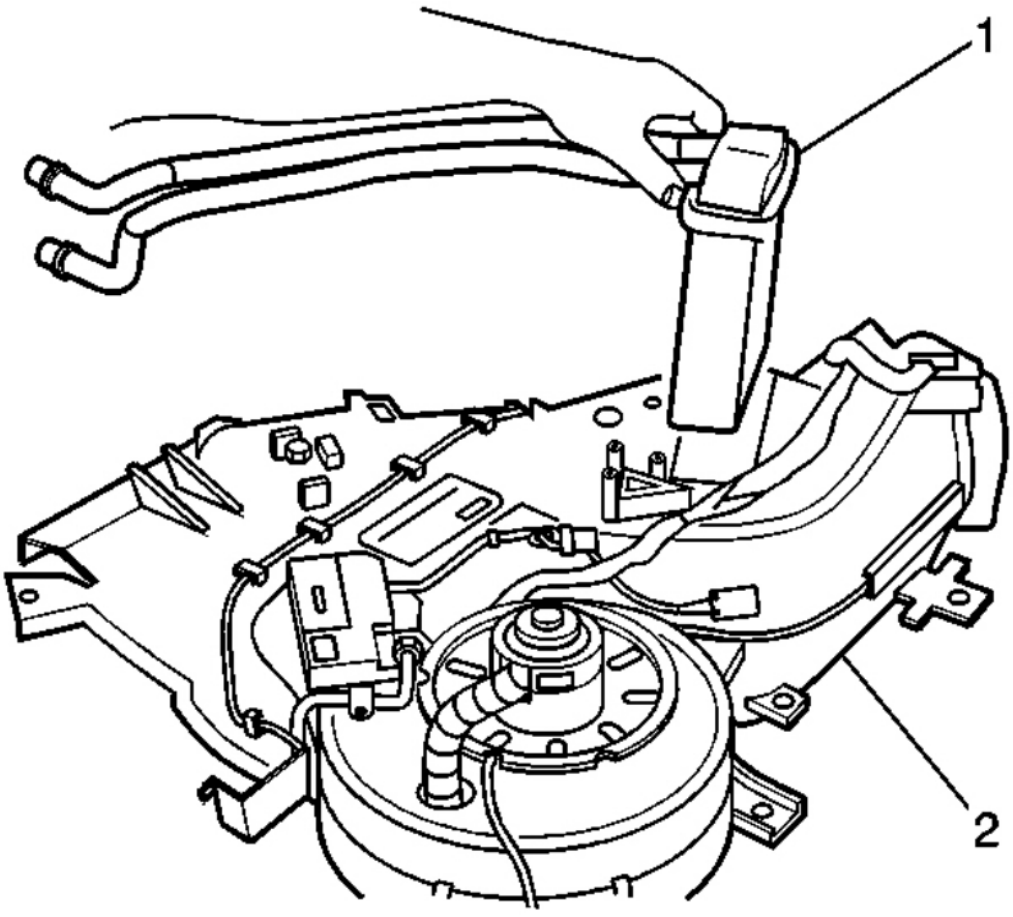


Fig. 299: View Of Heater Core - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

3. Install the heater core (1) to the auxiliary HVAC module.

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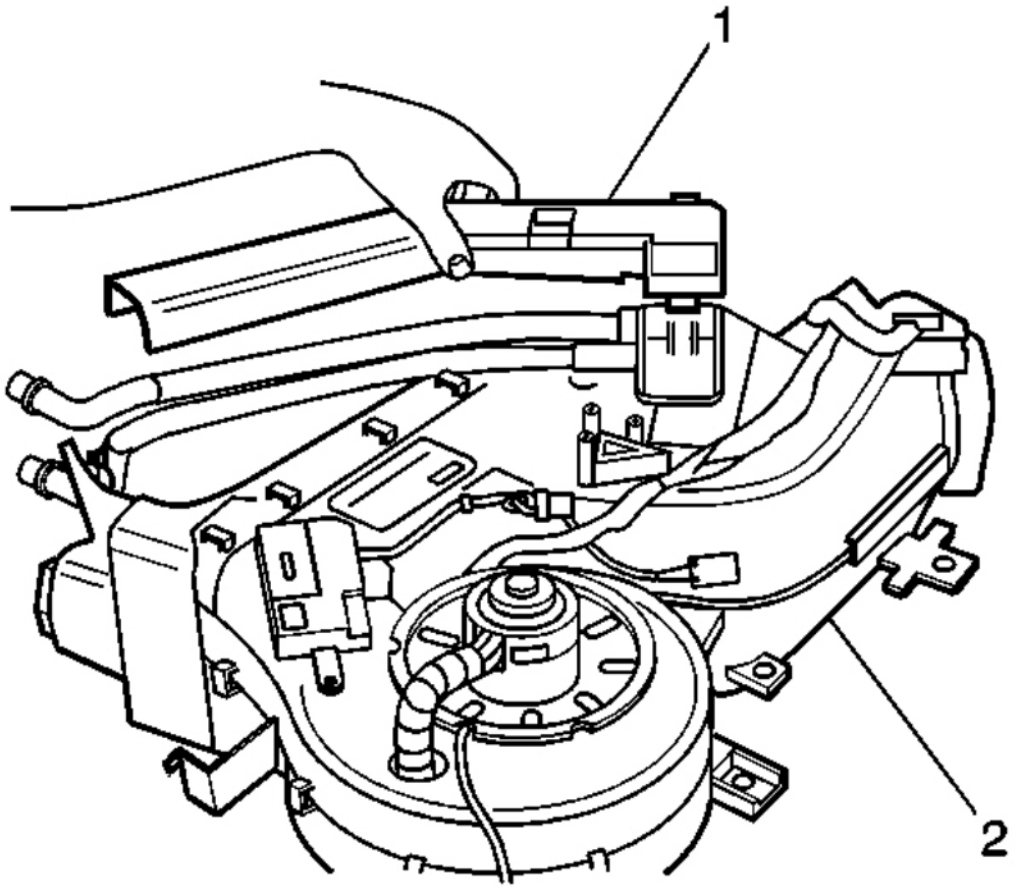


Fig. 300: View Of Heater Core Cover - Auxiliary (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

4. Install the heater core cover (1) to the auxiliary HVAC module.

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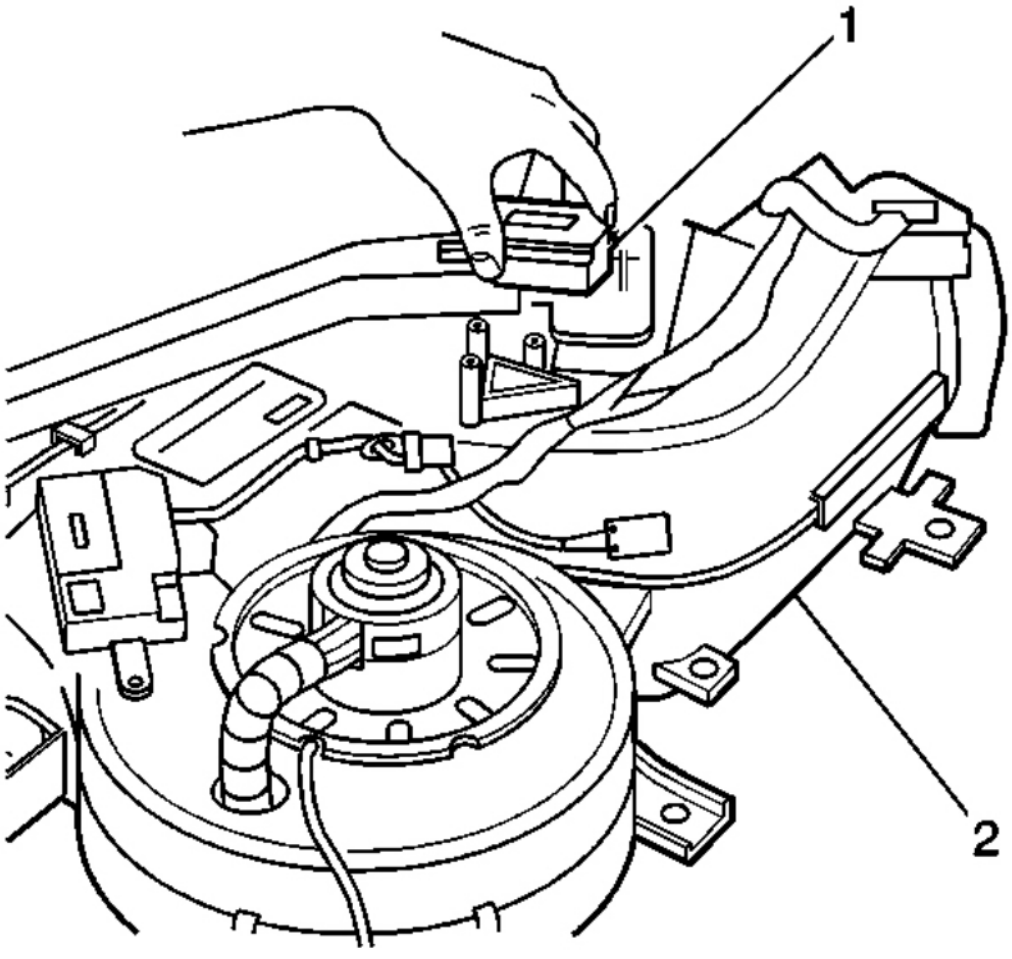


Fig. 301: View Of Air Temperature Actuator (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

5. Install the air temperature actuator (1) to the auxiliary HVAC module.

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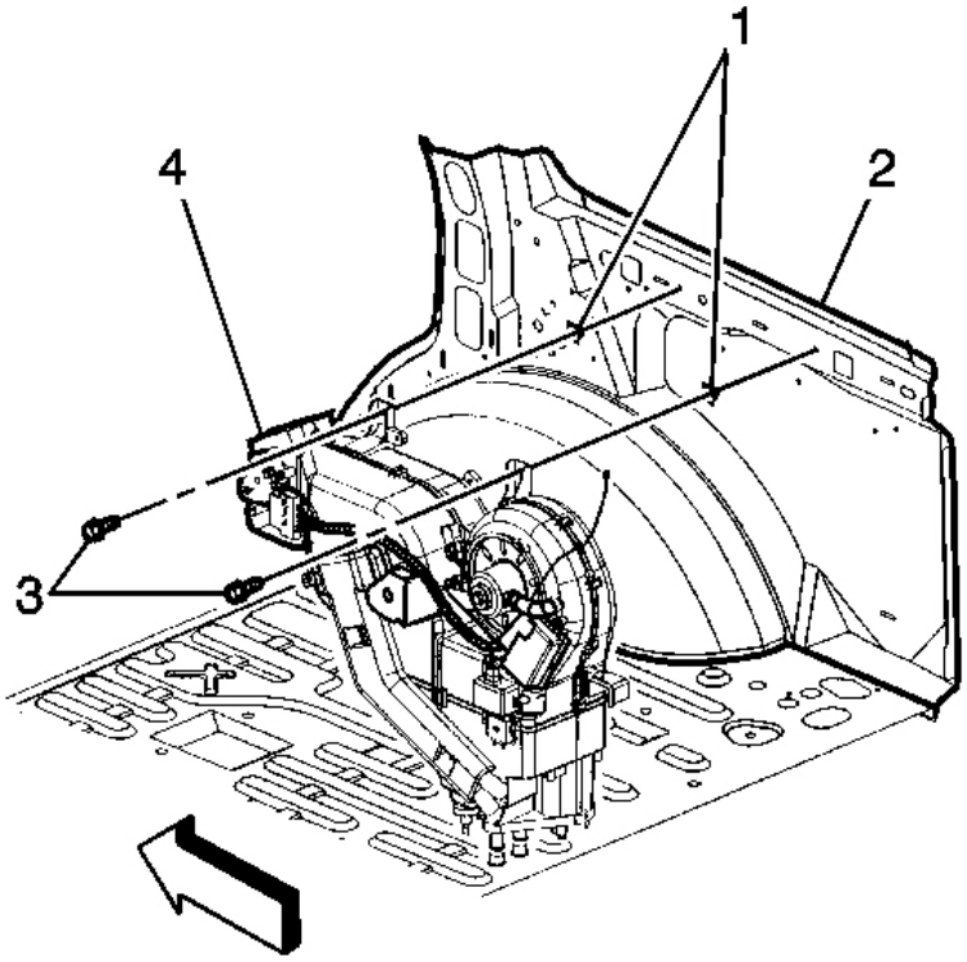


Fig. 302: View Of Auxiliary HVAC Module (Tahoe/Yukon)
Courtesy of GENERAL MOTORS CORP.

6. Install the auxiliary HVAC module assembly (4) to the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**.

EVAPORATOR CORE REPLACEMENT - AUXILIARY (SUBURBAN/YUKON XL)

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

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Removal Procedure

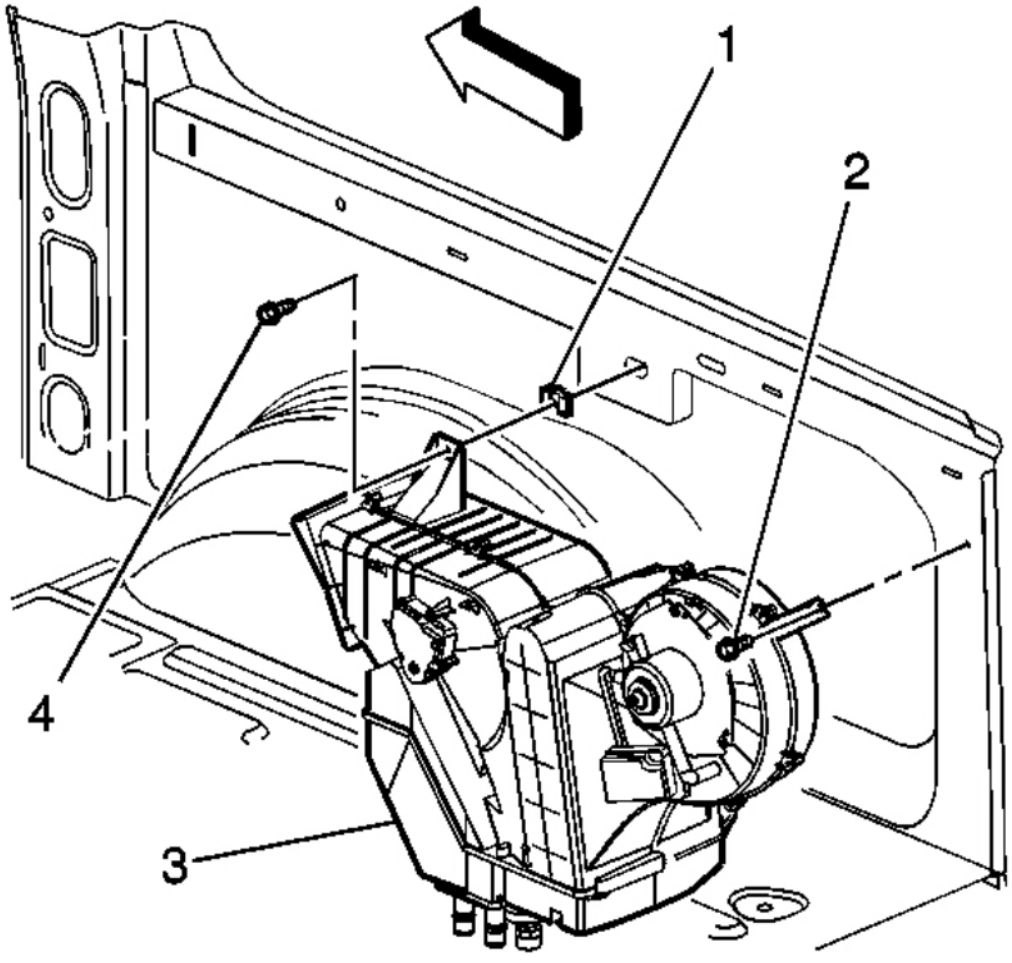


Fig. 303: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

1. Remove the auxiliary HVAC module (3) from the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**.

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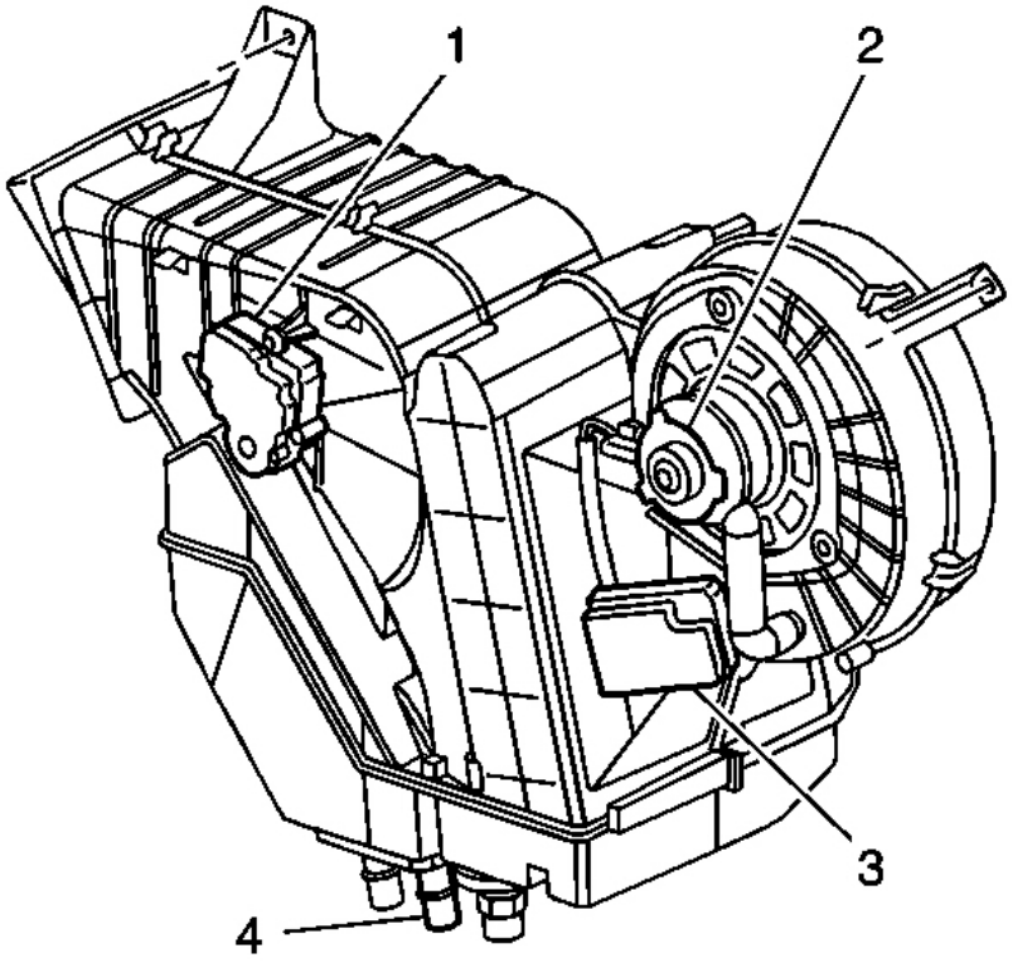


Fig. 304: View Of Auxiliary Air Temperature Actuator
Courtesy of GENERAL MOTORS CORP.

2. Remove the air temperature actuator (1).
3. Remove the stud on the underside of the rear HVAC module between the heater core inlet and outlet pipes (4).
4. Carefully separate the heater core pipe gasket from the module case and remove the heater core pipe retainer.

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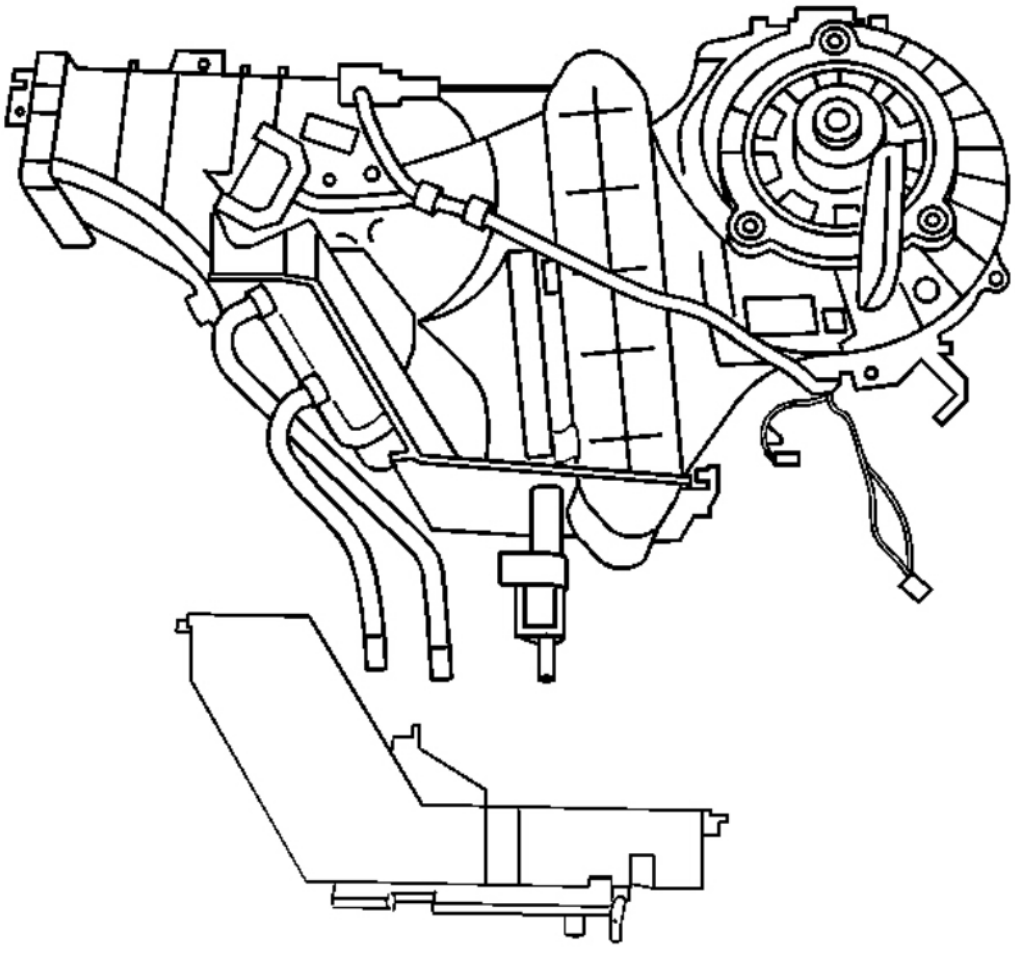


Fig. 305: View Of Auxiliary HVAC Module Lower Cover (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

5. Remove the screws from the HVAC module lower cover.
6. Remove the auxiliary HVAC module lower cover.

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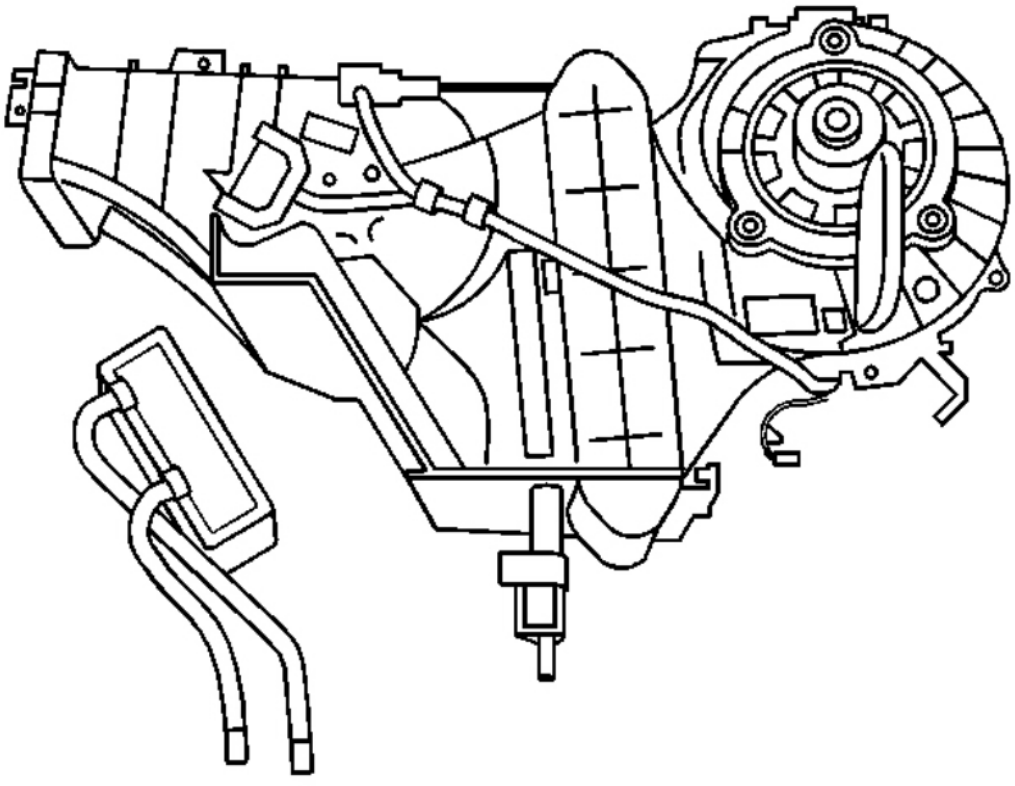


Fig. 306: View Of Heater Core - Auxiliary (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

7. Remove the heater core clamp.
8. Remove the heater core from the auxiliary HVAC module.
9. Carefully remove the gasket between the auxiliary HVAC module and the air distributor duct. This gasket will be re-used if possible.

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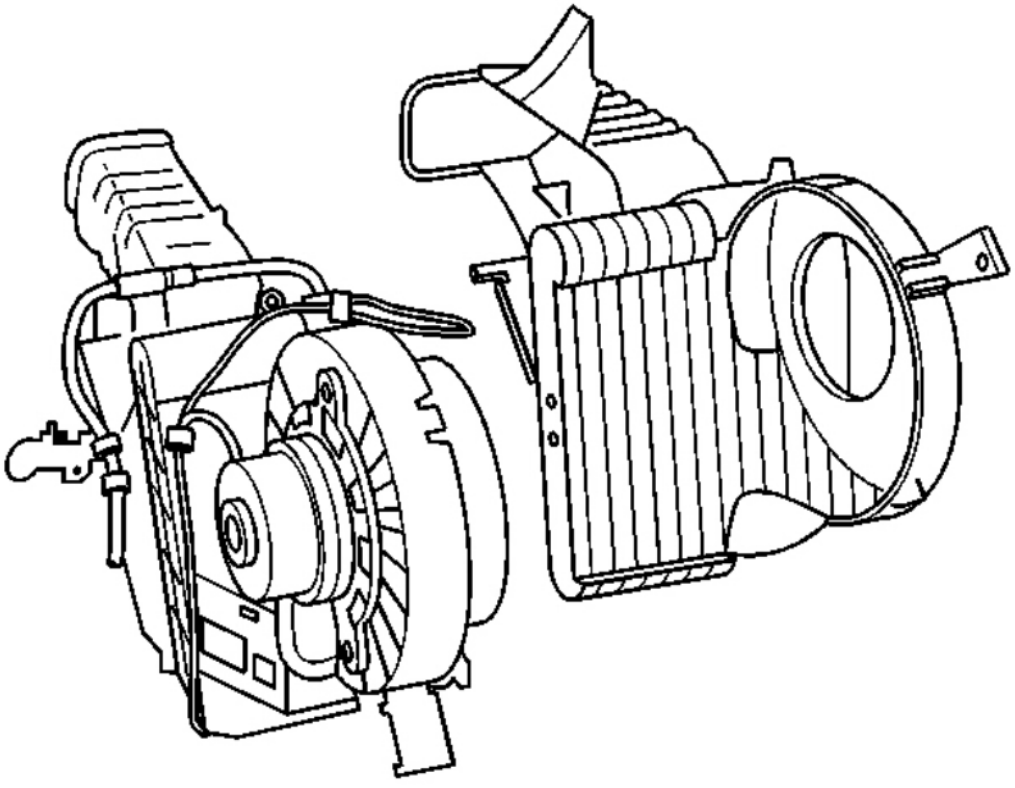


Fig. 307: View Of Evaporator Core Case Halves (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

10. Remove the fasteners and separate the front case half from the back half.
11. Remove the evaporator core from the back case half.
12. Inspect the gaskets and the seals for damage.
13. Replace the gaskets and the seals, as needed.

Installation Procedure

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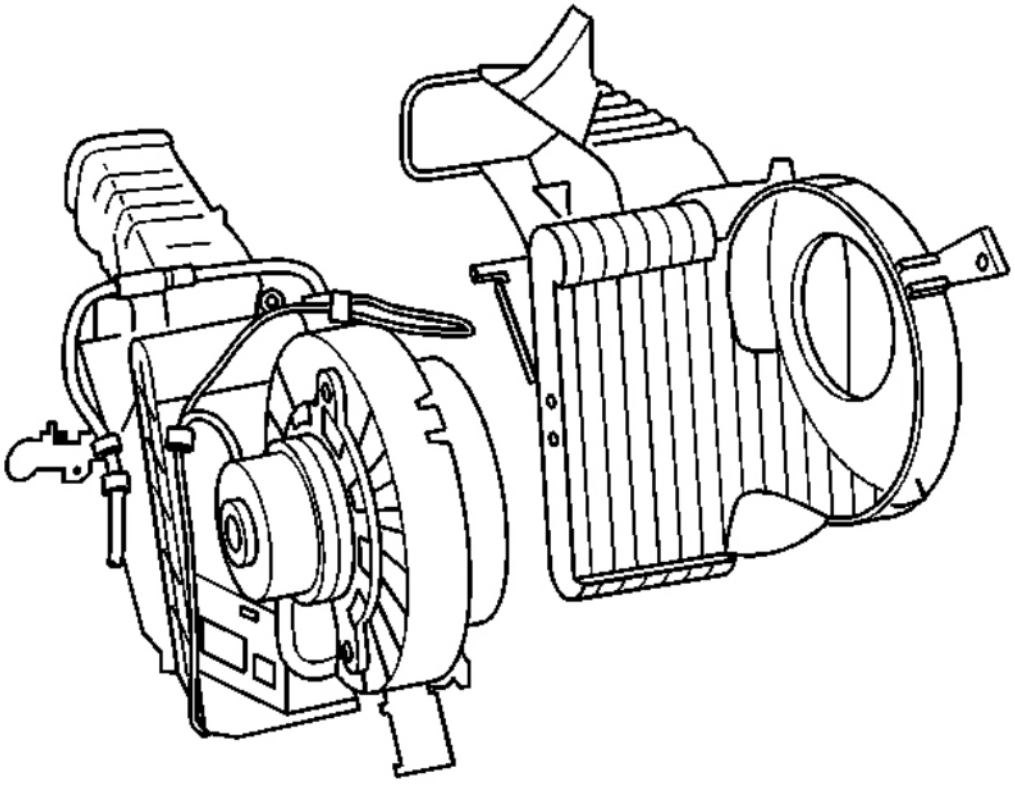


Fig. 308: View Of Evaporator Core Case Halves (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

1. Install the evaporator core into the case.
2. Install the evaporator core seal.

IMPORTANT: Ensure the proper positioning of the air distributor duct gasket and the temperature door during assembly.

3. Reassemble the case halves.

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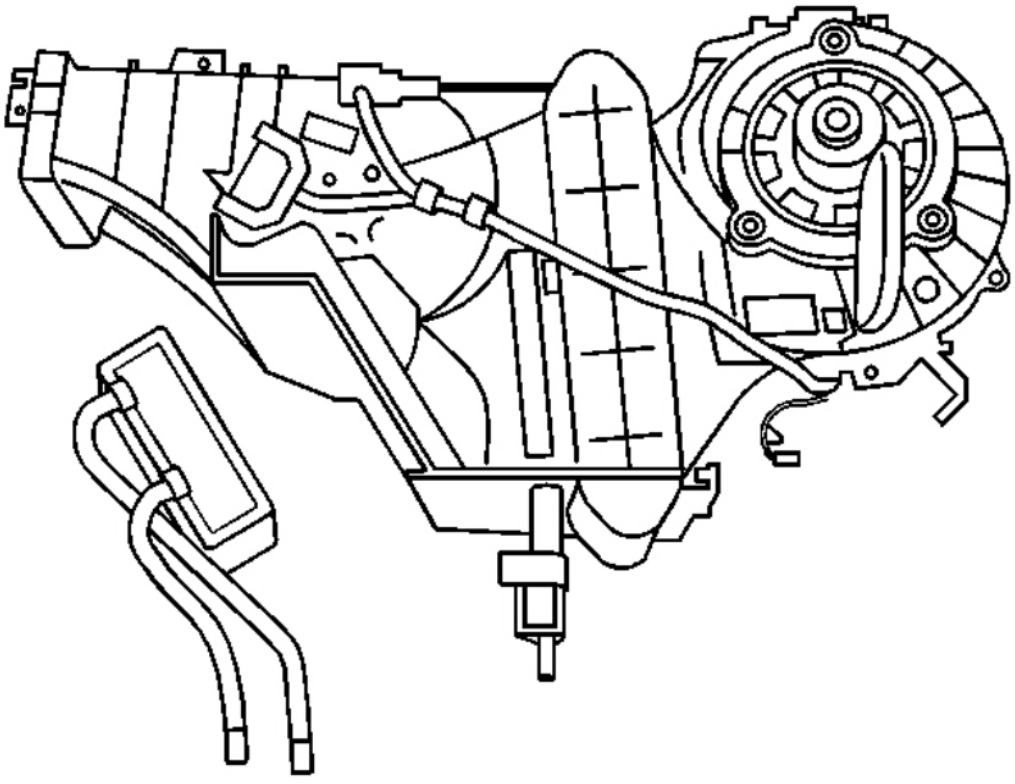


Fig. 309: View Of Heater Core - Auxiliary (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

4. Install the heater core to the auxiliary HVAC module.
5. Install the heater core clamp.

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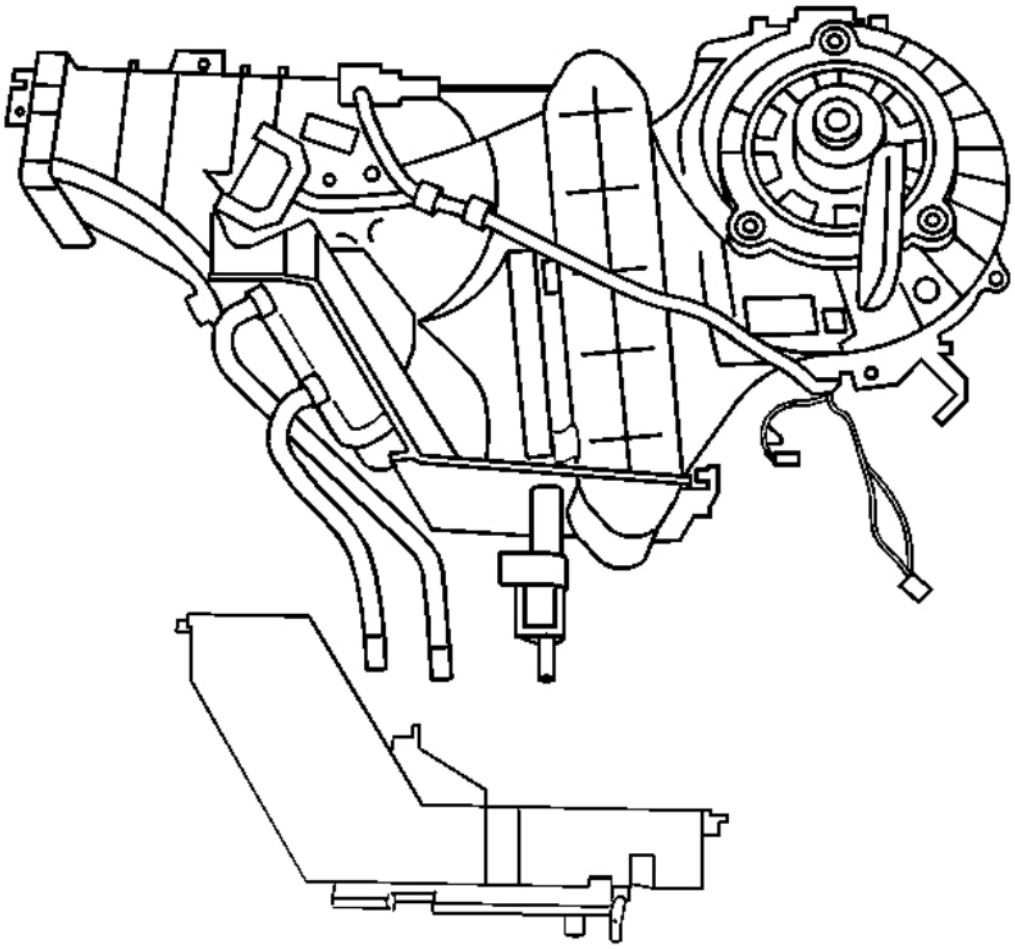


Fig. 310: View Of Auxiliary HVAC Module Lower Cover (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

6. Install the auxiliary HVAC module lower cover.

NOTE: Refer to Fastener Notice in Cautions and Notices.

7. Install the screws to the HVAC module lower cover.

Tighten: Tighten the screws to 1.6 N.m (14 lb in).

8. Install the heater core pipe retainer and gasket.

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9. Install the stud between the heater core inlet and outlet on the underside of the auxiliary HVAC module.

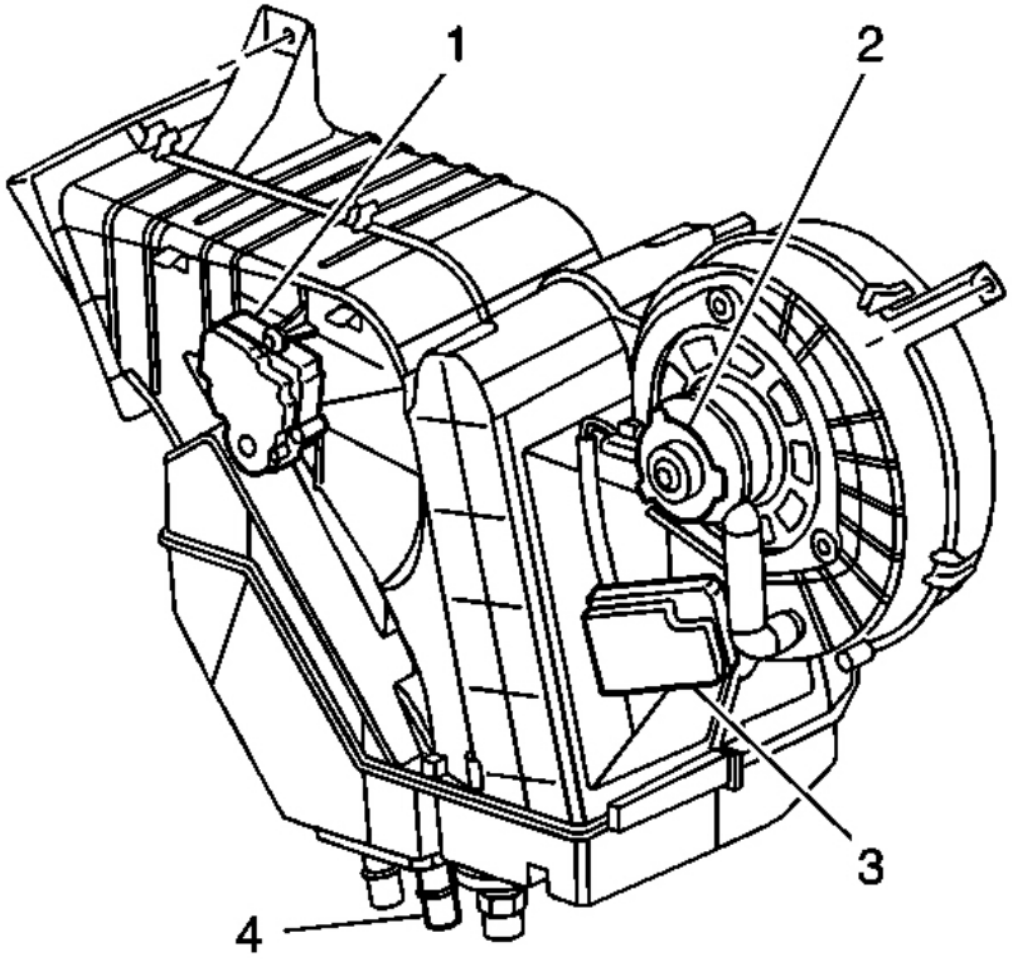


Fig. 311: View Of Auxiliary Air Temperature Actuator
Courtesy of GENERAL MOTORS CORP.

10. Install the air temperature actuator (1).

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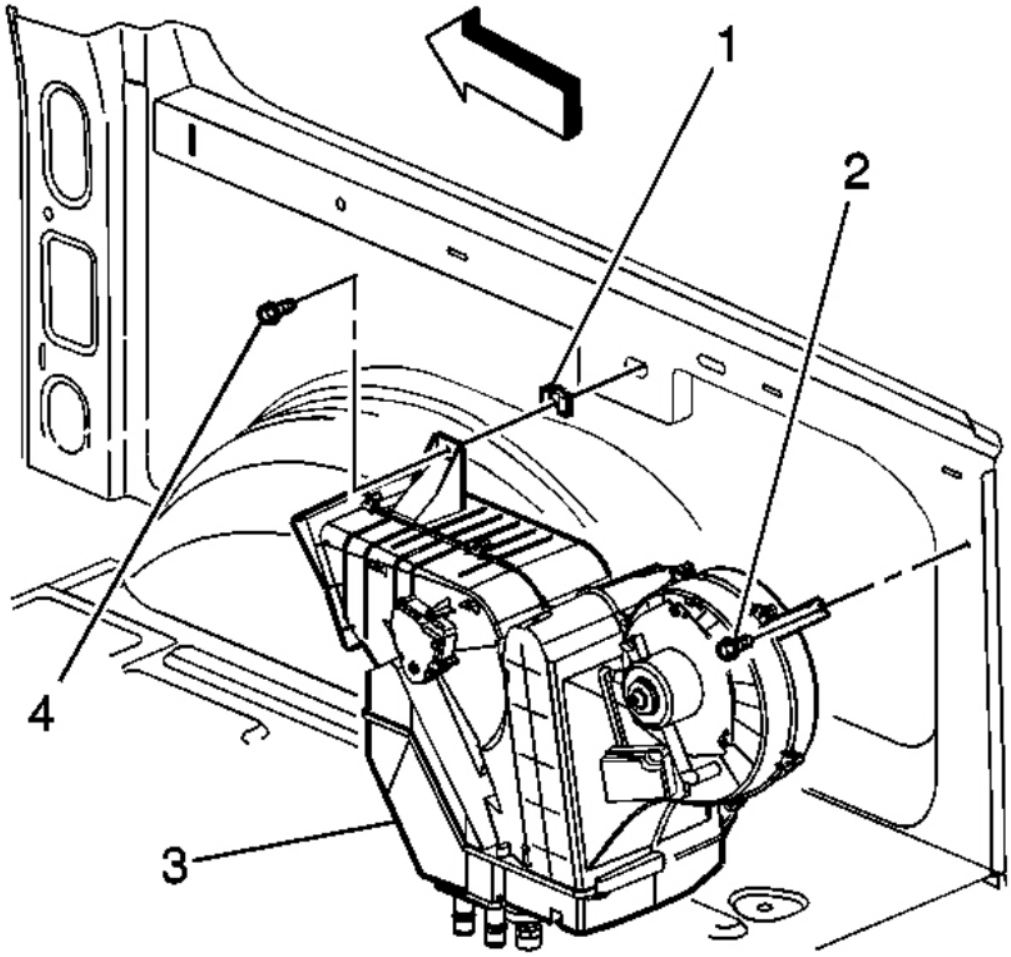


Fig. 312: View Of Auxiliary HVAC Module (Suburban/Yukon XL)
Courtesy of GENERAL MOTORS CORP.

11. Install the auxiliary HVAC module (3) to the vehicle. Refer to **HVAC Module Replacement - Auxiliary (Suburban/Yukon XL)** or **HVAC Module Replacement - Auxiliary (Tahoe/Yukon)**.

EVAPORATOR TUBE REPLACEMENT - AUXILIARY

Tools Required

J 39400-A Halogen Leak Detector. See **Special Tools**.

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Removal Procedure

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

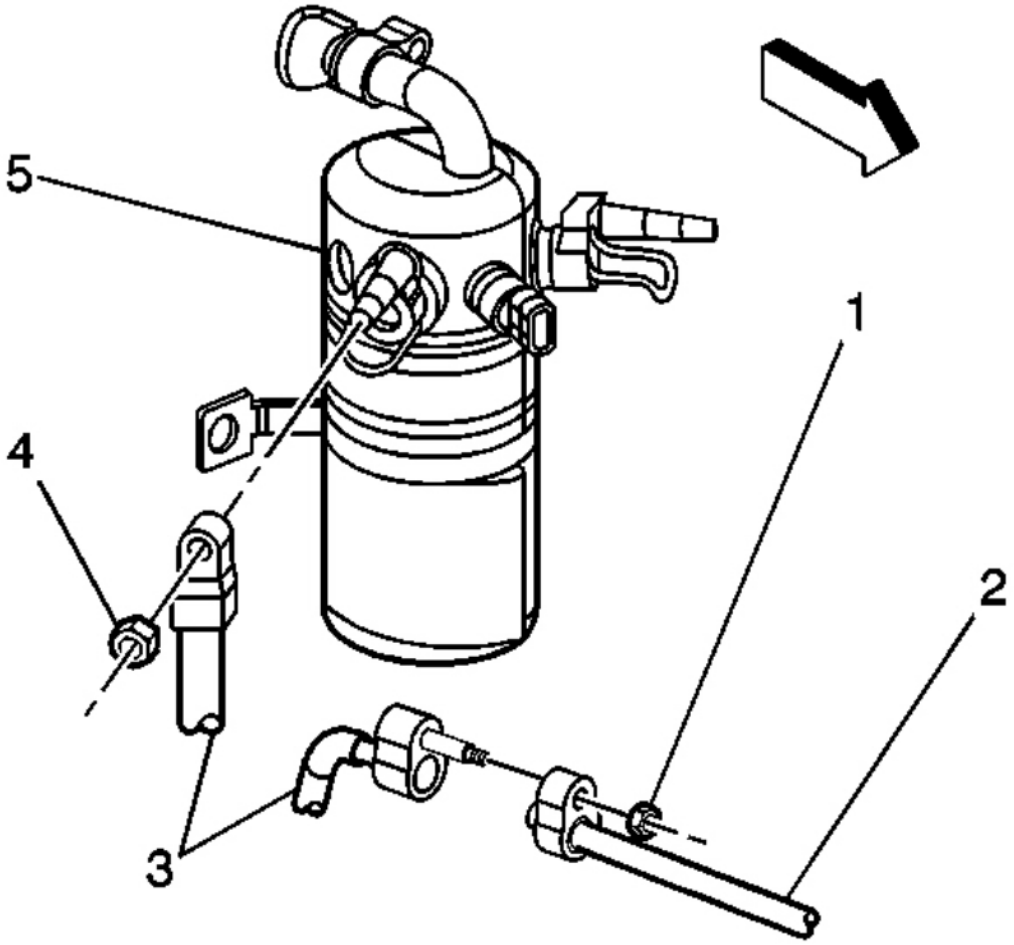


Fig. 313: View Of Auxiliary A/C Evaporator Tubes At Condenser Tube & Accumulator
Courtesy of GENERAL MOTORS CORP.

2. Remove the auxiliary A/C evaporator tubes (3) from the condenser tube (2) and the accumulator (5).
3. Loosen the right front wheelhouse to gain access to the clamp behind the wheelhouse.

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

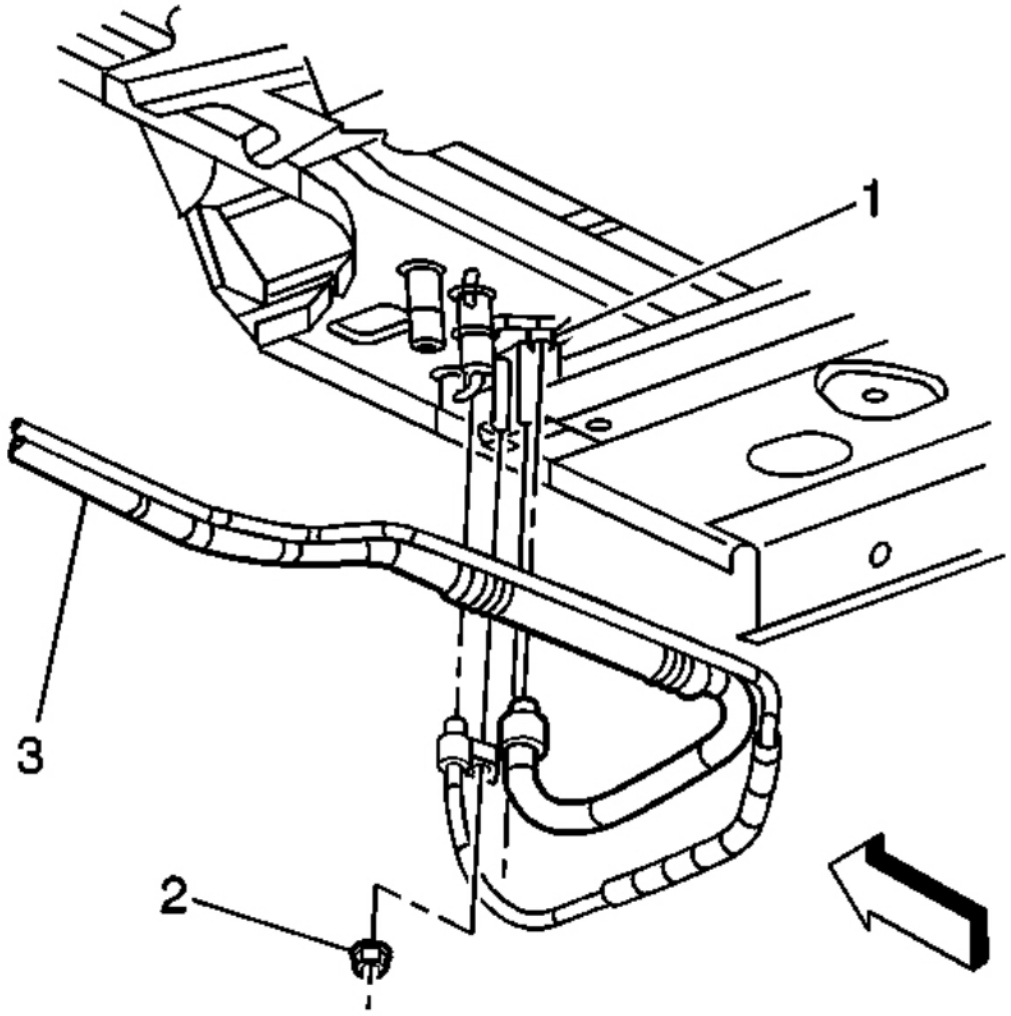


Fig. 314: View Of Auxiliary A/C Evaporator Tubes & Nut & Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

5. Remove the retaining nut (2) and the auxiliary A/C evaporator tubes (3) from the auxiliary HVAC module.

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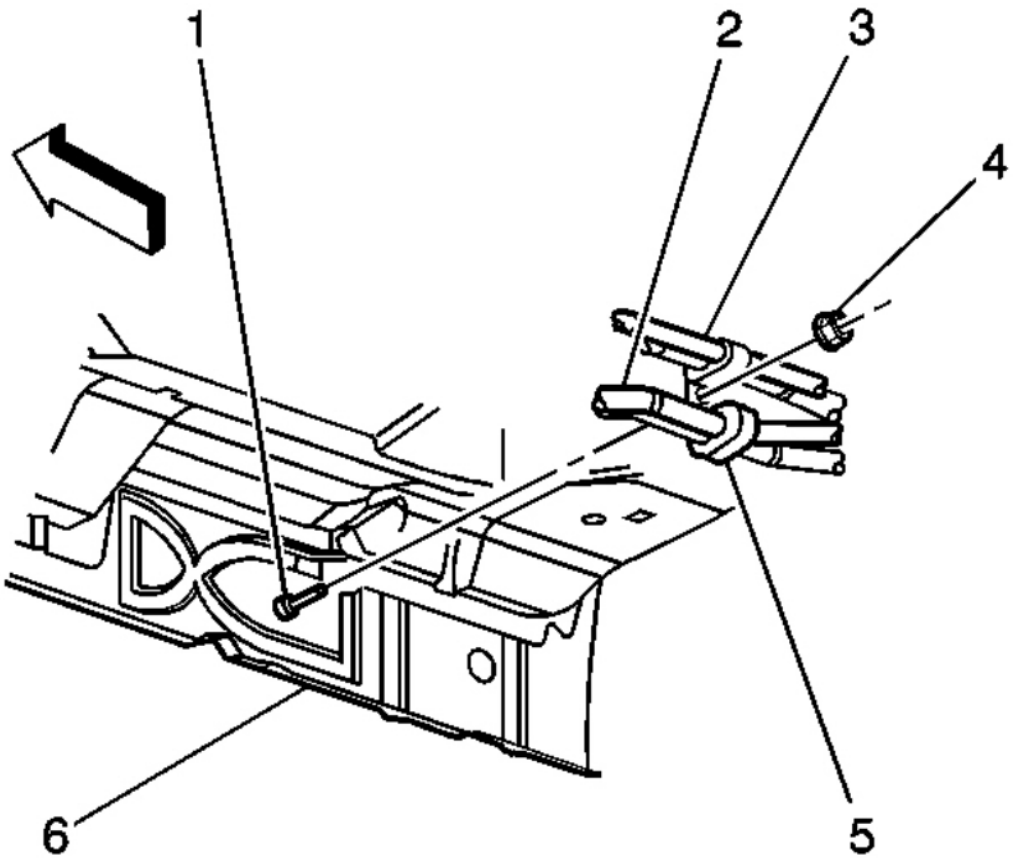


Fig. 315: View Of Auxiliary Heater Pipes, Clamps & Heater/A/C Tubes Retaining Nut & Stud
Courtesy of GENERAL MOTORS CORP.

6. Remove the heater/A/C tubes retaining nut (4) from the stud (1) at the frame (6).
7. Remove the auxiliary A/C evaporator tubes (3) from the clamps (5).
8. Remove the auxiliary A/C evaporator tubes from the vehicle.

Installation Procedure

1. Install the auxiliary A/C evaporator tubes to the vehicle.

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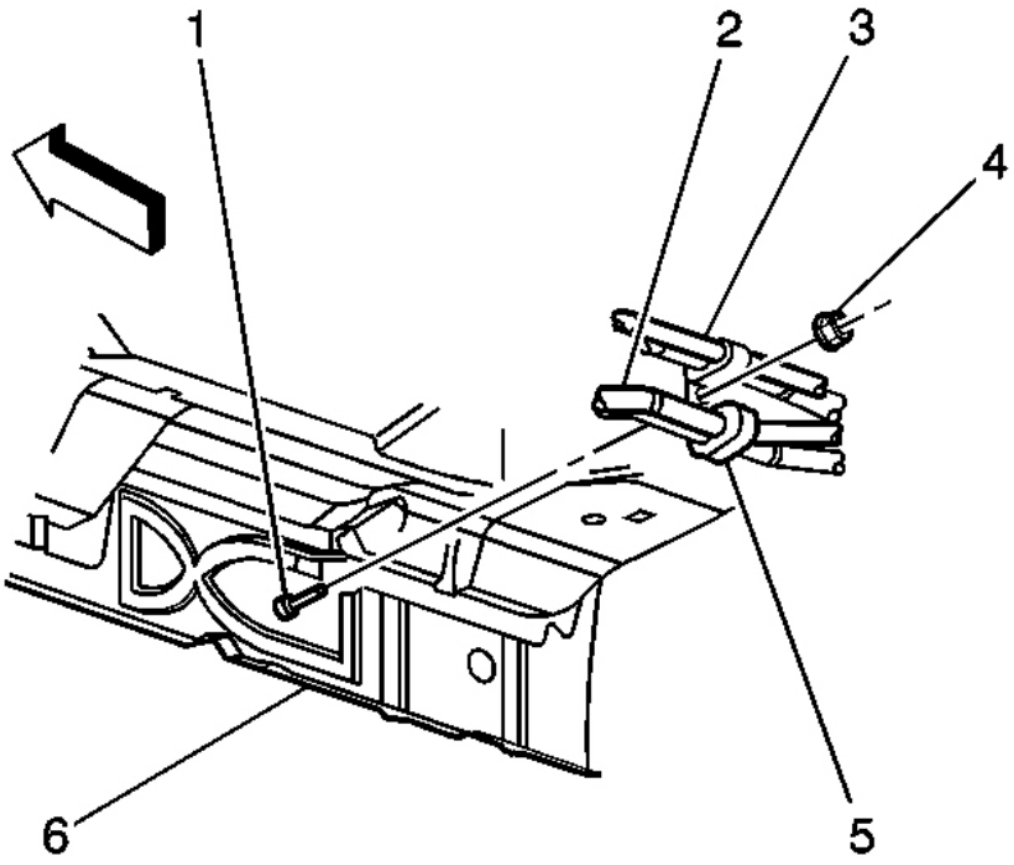


Fig. 316: View Of Auxiliary Heater Pipes, Clamps & Heater/A/C Tubes Retaining Nut & Stud
Courtesy of GENERAL MOTORS CORP.

2. Install the auxiliary A/C evaporator tubes (3) to the clamps (5).

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the heater/A/C tubes retaining nut (4) to the stud (1) at the frame (6).

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

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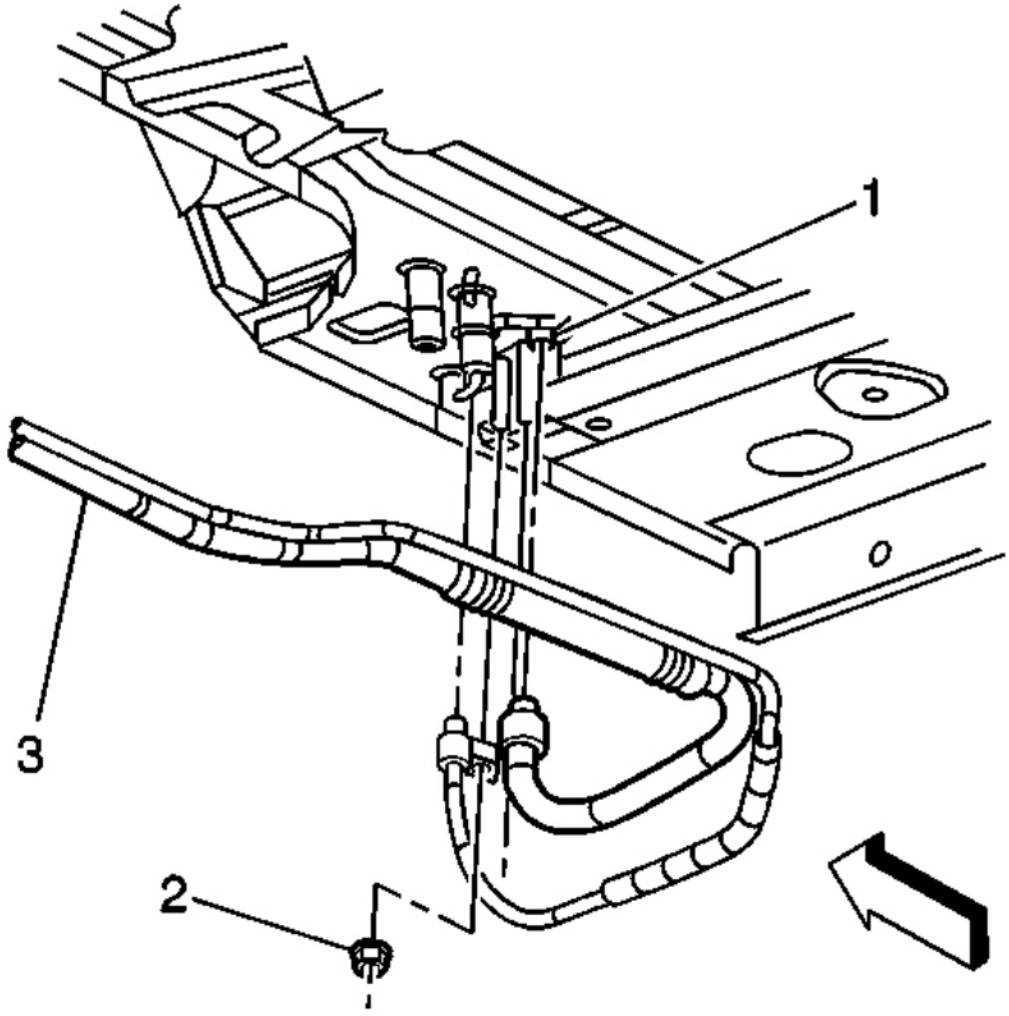


Fig. 317: View Of Auxiliary A/C Evaporator Tubes & Nut & Auxiliary HVAC Module
Courtesy of GENERAL MOTORS CORP.

4. Install the auxiliary A/C evaporator tubes (2, 3) and the retaining nut to the auxiliary HVAC module.

   Tighten: Tighten the nut to 16 N.m (12 lb ft).

5. Lower the vehicle.

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6. Install the right front wheelhouse. Refer to **Wheelhouse Panel Replacement** in Body Front End.

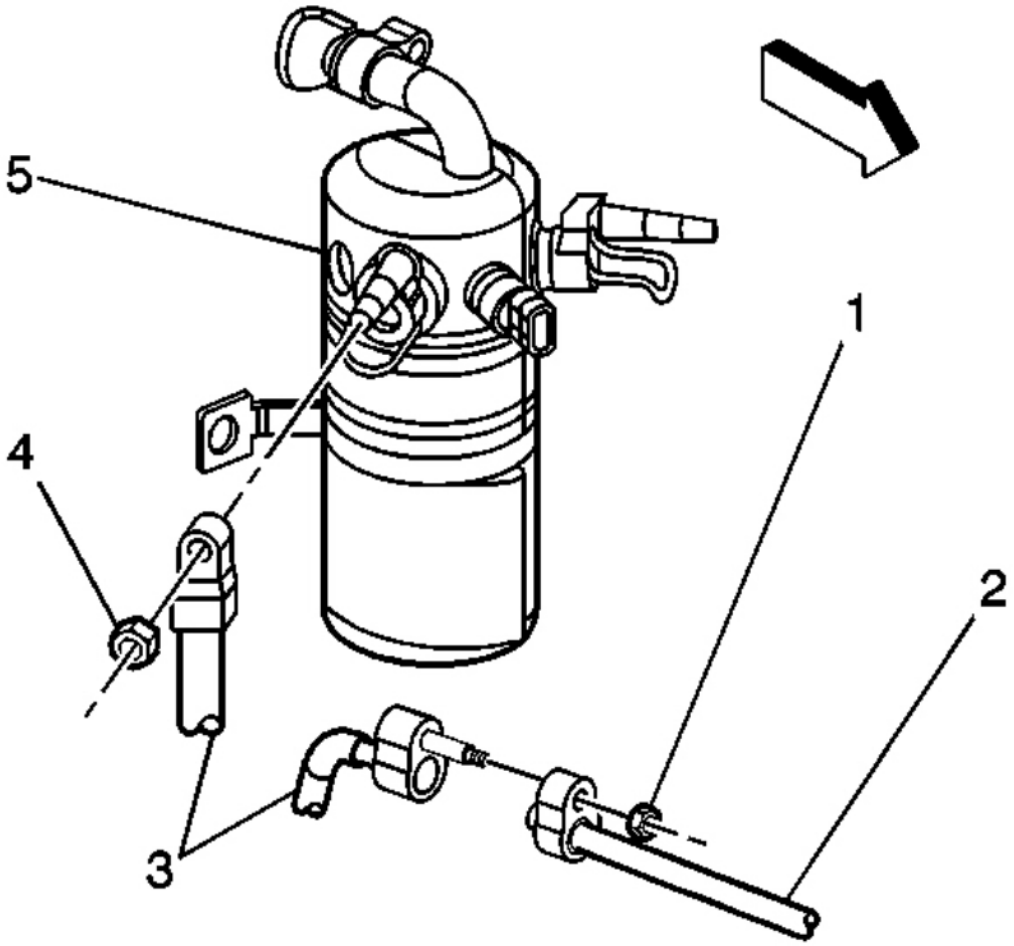


Fig. 318: View Of Auxiliary A/C Evaporator Tubes At Condenser Tube & Accumulator
Courtesy of GENERAL MOTORS CORP.

7. Install the auxiliary A/C evaporator tubes (3) to the condenser tube (2) and the accumulator (5).

Tighten: Tighten the nuts to 16 N.m (12 lb ft).

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8. Recharge the refrigerant to the system. Refer to **Refrigerant Recovery and Recharging**.
9. Leak test the fittings of the component using the **J 39400-A** . See **Special Tools**.

HEATER AND AIR CONDITIONING (A/C) PIPE REPAIR - AUXILIARY

Tools Required

J 41425 A/C Line Repair Kit. See **Special Tools**.

Do not service the rear A/C or heater lines as a complete unit. Service the rear A/C or heater lines as a sectional repair.

You can obtain the various sections of line through GMSPO.

Use the **J 41425** when any of the following actions damage the rear A/C or heater lines. See **Special Tools**.

- Rub-through
- Collision damage
- Leakage in the system

Minimum Tube Length Required Table

IMPORTANT: When you section the rear A/C or heater lines, ensure that the correct minimum length remains in the straight part of the line on both sides of the splice.

Follow the Straight Line Repair procedure in order to repair line damage in a straight section of line.

Follow the Line Sectioning Repair procedure in order to repair any damage in a bend area. Do not repair the rear A/C or heater lines in a bend area, replace the lines. Maintaining the original line shape will prevent vibrations and rub-through.

Heater and Air Conditioning (A/C) Pipe Repair - Auxiliary

Tube Size	Dim A Standard Installation	Dim A Jaw Reversed Installation
8 mm (5/16 in)	29 mm (1 1/8 in) MIN	19-29 mm (3/4-1 1/8 in)
10 mm (3/8 in)	29 mm (1 1/8 in) MIN	19-29 mm (3/4-1 1/8 in)
13 mm (1/2 in)	29 mm (1 1/8 in) MIN	19-29 mm (3/4-1 1/8 in)

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16 mm (5/8 in)	32 mm (1 1/4 in) MIN	23-32 mm (7/8-1 1/4 in)
19 mm (3/4 in)	34 mm (1 5/16 in) MIN	23-34 mm (7/8-1 5/16 in)

Straight Line Repair

1. Recover the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging**.
2. Drain the coolant, if repairing the heater lines. Refer to **Draining and Filling Cooling System** in Engine Cooling.
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
4. Locate the area that requires repair.
5. Obtain a length of replacement line to make the repair.
6. Use a tubing cutter in order to cut and remove the section of damaged line.

IMPORTANT: The length of the replacement line must be the same as the section being replaced.

7. Use a tubing cutter in order to cut the replacement line to length.
8. Use the cleaning pad from the **J 41425** in order to clean any burrs or grease from the line ends. See **Special Tools**. Be sure to clean at least 19 mm (0.75 in) from the line ends.
9. Use the LOK prep sealant in order to prep the line ends.
10. Apply one drop of the J 41425-3 sealing compound to the outside of each end of the line.
11. Insert the line ends into the LOK fitting.
12. Rotate the LOK fitting one complete turn in order to evenly distribute the sealing compound around the lines.
13. Install the correct LOK fitting jaws into the J 41425-1 tool.
14. Install the J 41425-1 tool over the LOK connectors.

    Verify that the LOK connector ends are positioned in the counter bores of the jaws.

IMPORTANT: Hold the J 41425-1 tool body with a 3/8" breaker bar.

15. Tighten the forcing screw of the J 41425-1 tool.

    When fully seated, the LOK connector collars will bottom out on the center shoulder of the LOK fitting.

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16. Loosen the forcing screw and remove the J 41425-1 tool from the repaired line.
17. Repeat Step 8 through Step 16 to repair the other end of the line.
18. Verify that the LOK fittings are correctly installed.
19. Lower the vehicle.
20. Refill the coolant, if drained. Refer to **Draining and Filling Cooling System** in Engine Cooling.
21. Evacuate and recharge the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging**.

Line Sectioning Repair

1. Recover the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging**.
2. Drain the coolant, if repairing the heater lines. Refer to **Draining and Filling Cooling System** in Engine Cooling.
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
4. Obtain a new A/C or heater line for sectioning.

IMPORTANT: Stagger the splices if repairing more than one line.

5. Scribe a mark on the line that will be sectioned.
6. Use a tubing cutter in order to cut the line or lines being replaced.
7. Remove the section of line being replaced from the vehicle.

IMPORTANT: The length of the replacement line must be the same as the line being replaced.

8. Install the replacement line to the vehicle.
9. Use a tubing cutter in order to cut the replacement line to length.
10. Use the cleaning pad from the **J 41425** in order to clean any burrs or grease. Be sure to clean at least 19 mm (0.75 in) from the A/C line.
11. Use the LOK prep sealant in order to prep the A/C or heater line.
12. Apply one drop of the J 41425-3 sealing compound to the outside of each line end.
13. Insert the line ends into the LOK fitting.
14. Rotate the LOK fitting one complete turn in order to evenly distribute the sealing compound

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around the lines.

15. Install the correct LOK fitting jaws into the J 41425-1 tool.
16. Install the J 41425-1 tool over the LOK connectors.

    Verify that the LOK connector ends are positioned in the counter bores of the jaws.

17. Hold the tool body with a 3/8" breaker bar. Turn the forcing screw until both of the connector collars bottom on the center shoulder of the LOK fitting.
18. Loosen the forcing screw. Remove the tool from the repaired line.
19. Verify that the LOK fitting is correctly installed.
20. Lower the vehicle.
21. Refill the coolant, if drained. Refer to **Draining and Filling Cooling System** in Engine Cooling.
22. Evacuate and recharge the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging**.

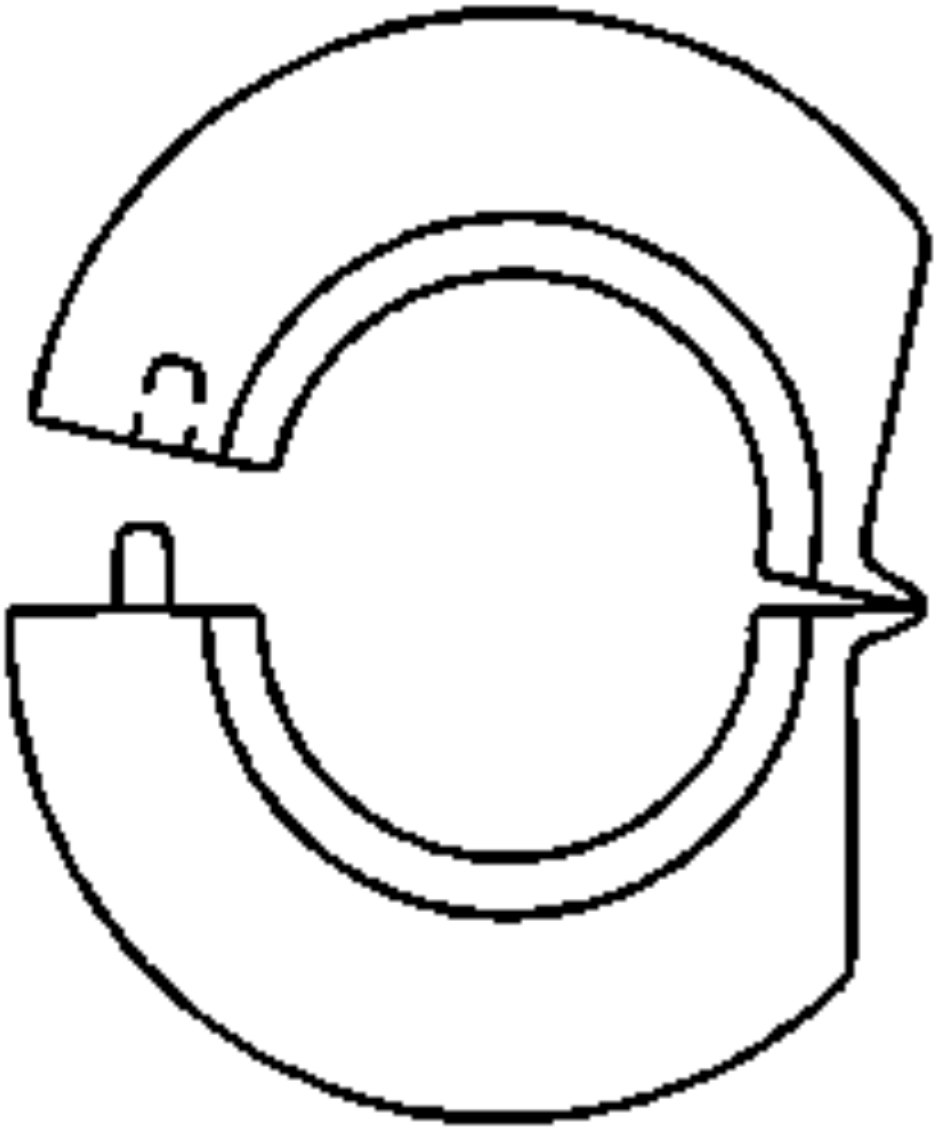
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

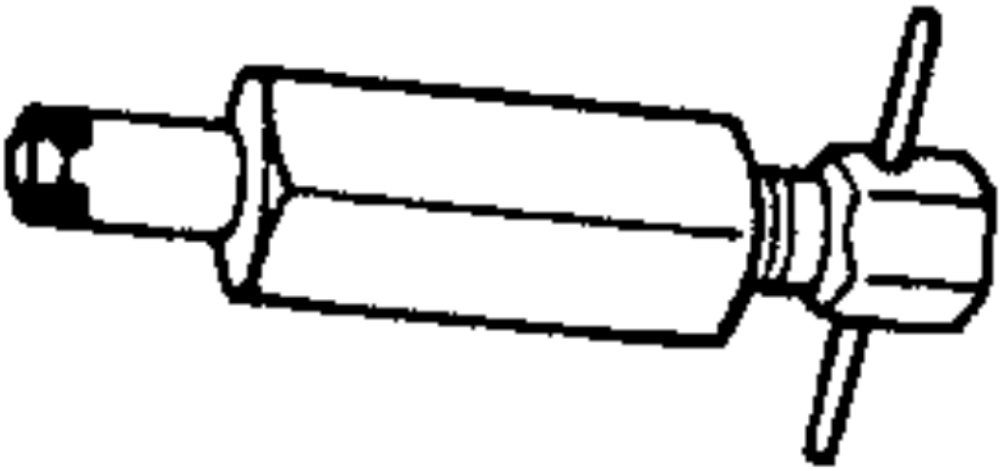
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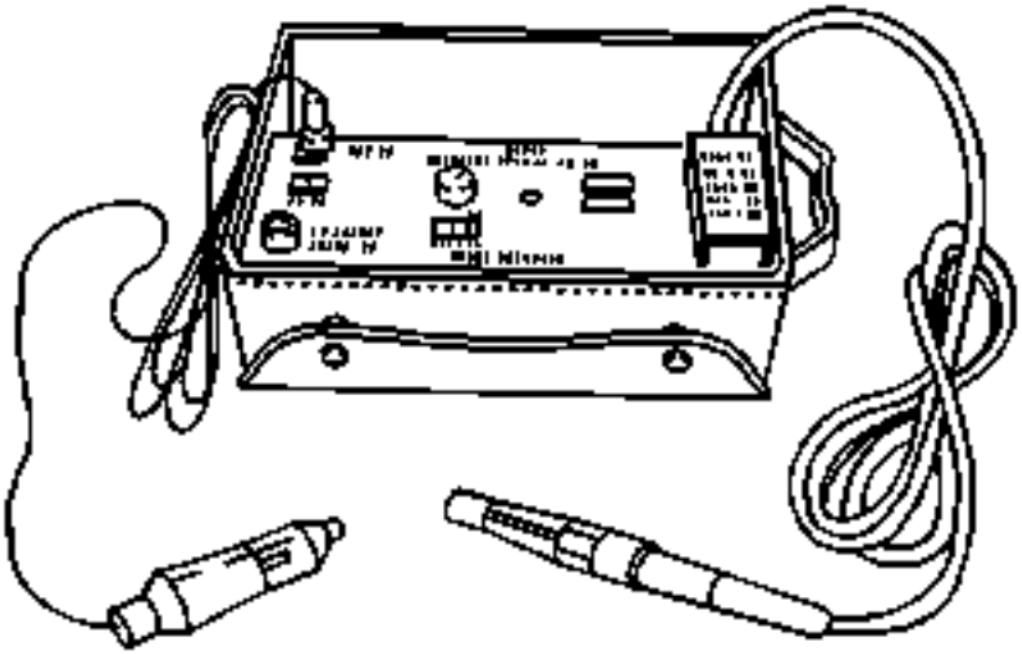
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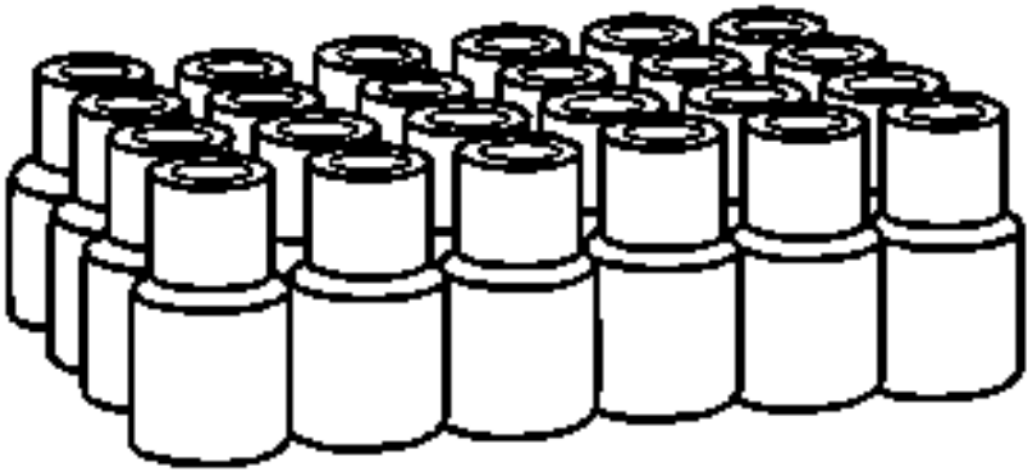
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J 41
A/C Line

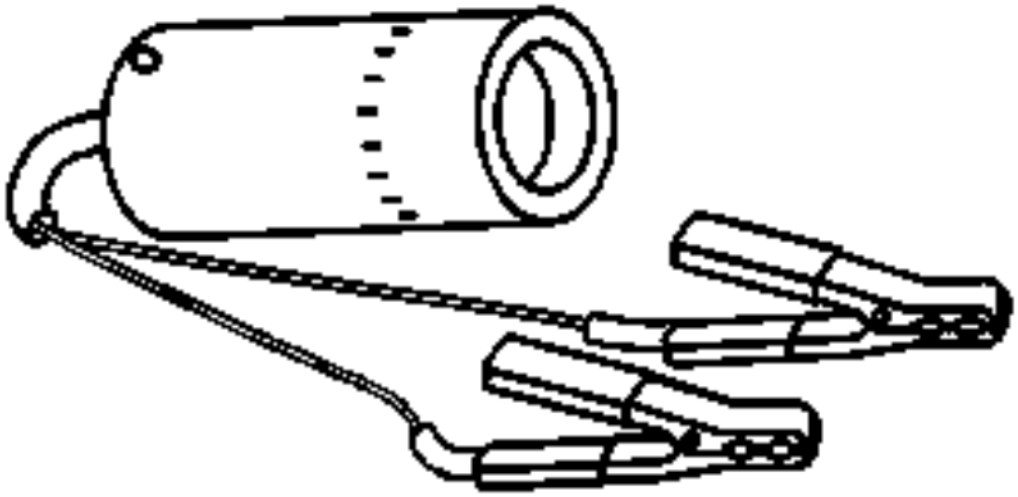
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J 41
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J 42
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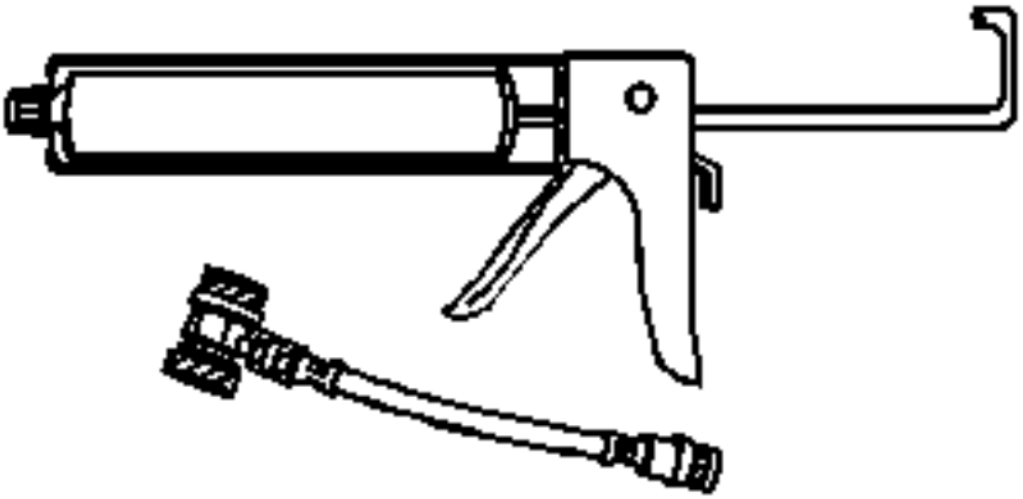
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J 43
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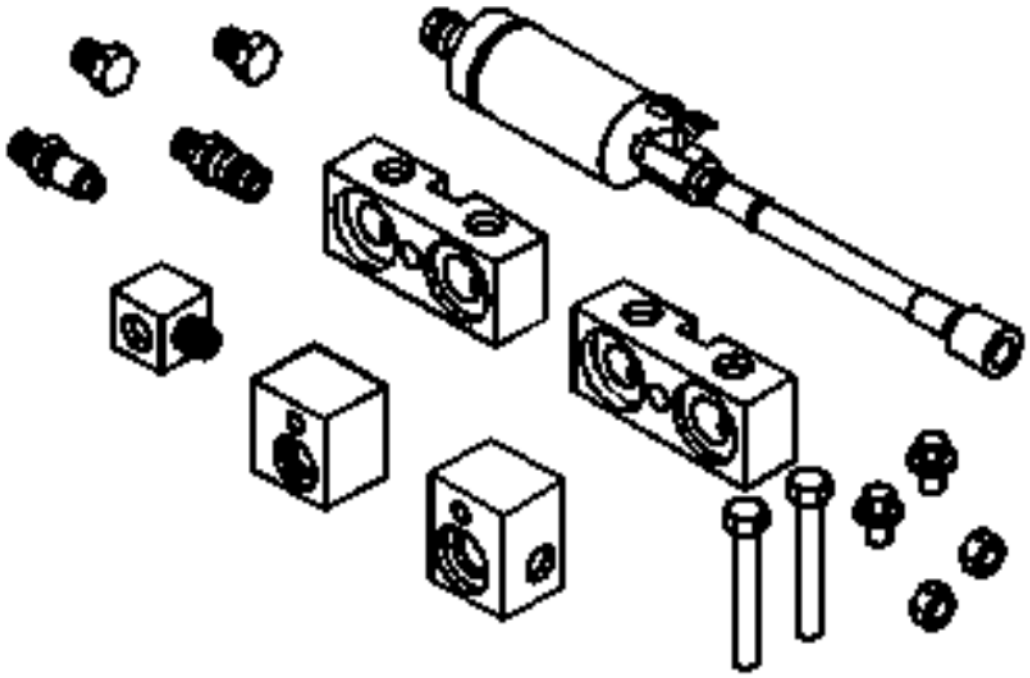
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J 45
A/C Oil

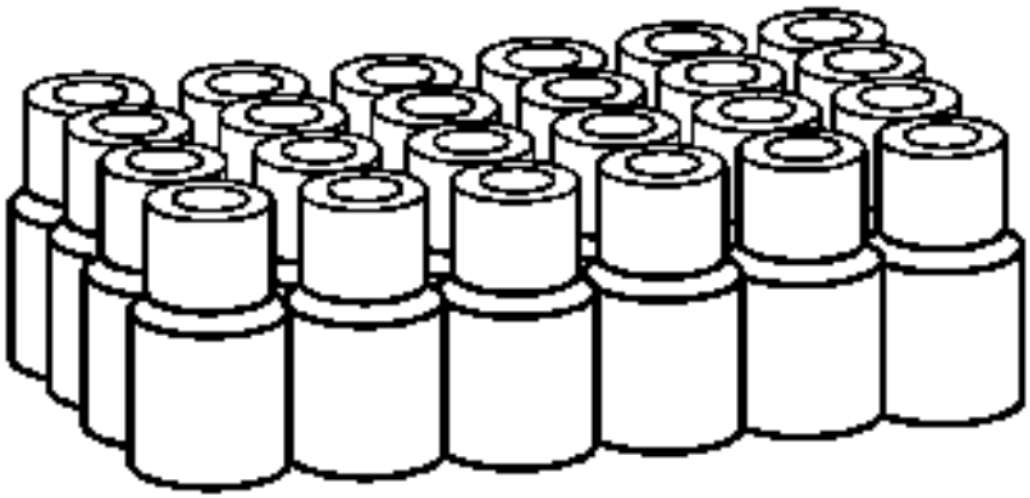
J 45
Flush Ad

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A/C Dye I



J 462
Replacer
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