HVAC

Heating, Ventilation, and Air Conditioning - Escalade, Suburban, Tahoe, Yukon

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Air Cleaner Bracket Assembly Bolt	9 N.m	80 lb in
Air Conditioning Compressor and Condenser Hose Nut	22 N.m	16 lb ft
Air Conditioning Compressor Bolt	22 N.m	16 lb ft
Air Conditioning Compressor Nut	22 N.m	16 lb ft
Air Conditioning Compressor Stud	8 N.m	71 lb in
Air Conditioning Condenser Tube Nut	22 N.m	16 lb ft
Air Conditioning Evaporator Thermal Expansion Valve Hose Nut	22 N.m	16 lb ft
Air Conditioning Evaporator Thermal Expansion Valve Mounting Bolt	7.5 N.m	66 lb in
Air Conditioning Tube Bracket Bolt	22 N.m	16 lb ft
Clutch Plate Retaining Bolt	18 N.m	13 lb ft
Compressor Clutch Coil Connector Retaining Bracket Screw	3.4 N.m	30 lb in
HVAC Module Assembly Nut	9.5 N.m	84 lb in

APPROXIMATE FLUID CAPACITIES

Application	Specification	
	Metric	English
Compressor Replacement	41 ml[1]	1.4 oz[1]
Condenser Replacement	30 ml[1]	1 oz[1]
Evaporator Replacement	60 ml[1]	2 oz[1]
Evaporator, Rear Replacement	60 ml[1]	2 oz[1]

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Application	Specification	
	Metric	English
• Total System PAG Oil Capacity with Rear A/C	195 ml	6.59 oz
R-134a		
• Refrigerant Charge Utility with Front and Rear A/C	0.92 kg	2 lb
R-1234yf		
• Refrigerant Charge Utility with Front and Rear A/C	0.85 kg	1.87 lb
[1] If more than the specified amount of PAG oil was drained from a component, add the equal amount of oil drained.		

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
PAG Oil (R-134a)	Lubricant	12378526	88900060
PAG Oil (R-1234yf)	Lubricant	19299051	19299052

VISUAL IDENTIFICATION

REFRIGERANT LABEL SYMBOLS

Air Conditioning Service Fittings

Service fittings meeting SAE J639 are used on this vehicle for R-1234yf refrigerant. GM has chosen gray caps to designate systems with R-1234yf.

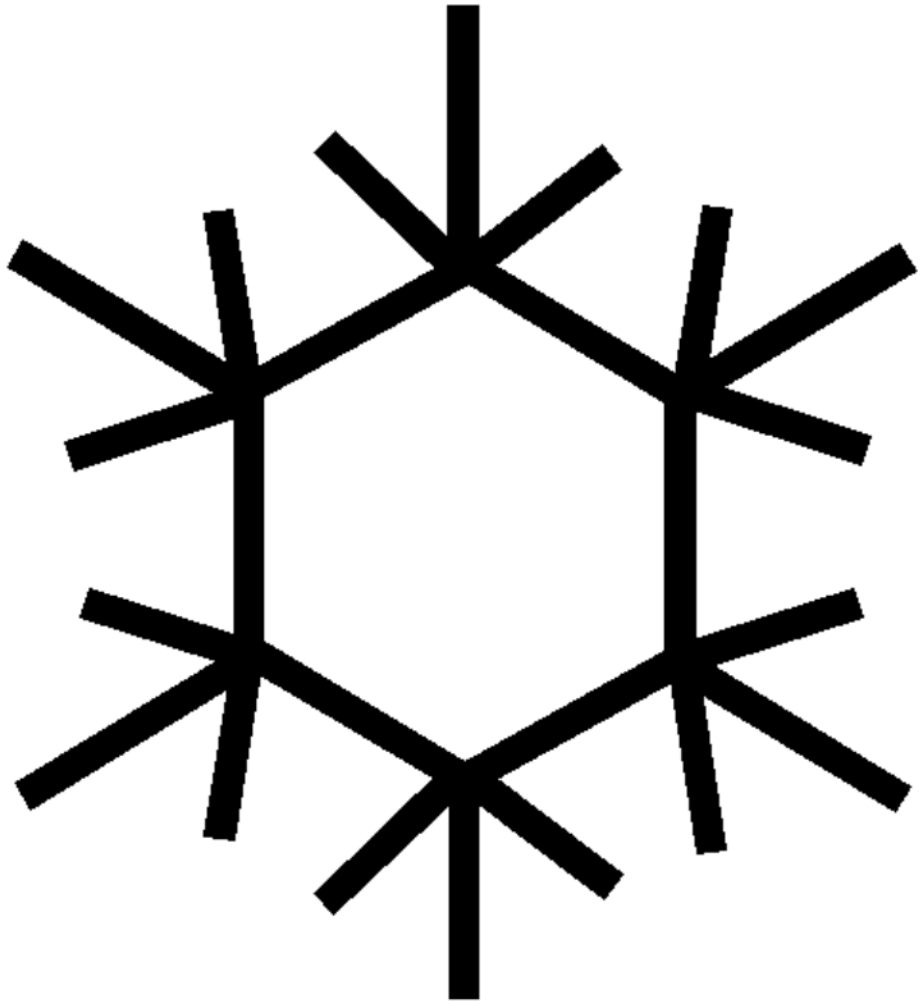
Refrigerant Charge Label Symbols

Symbols	Description

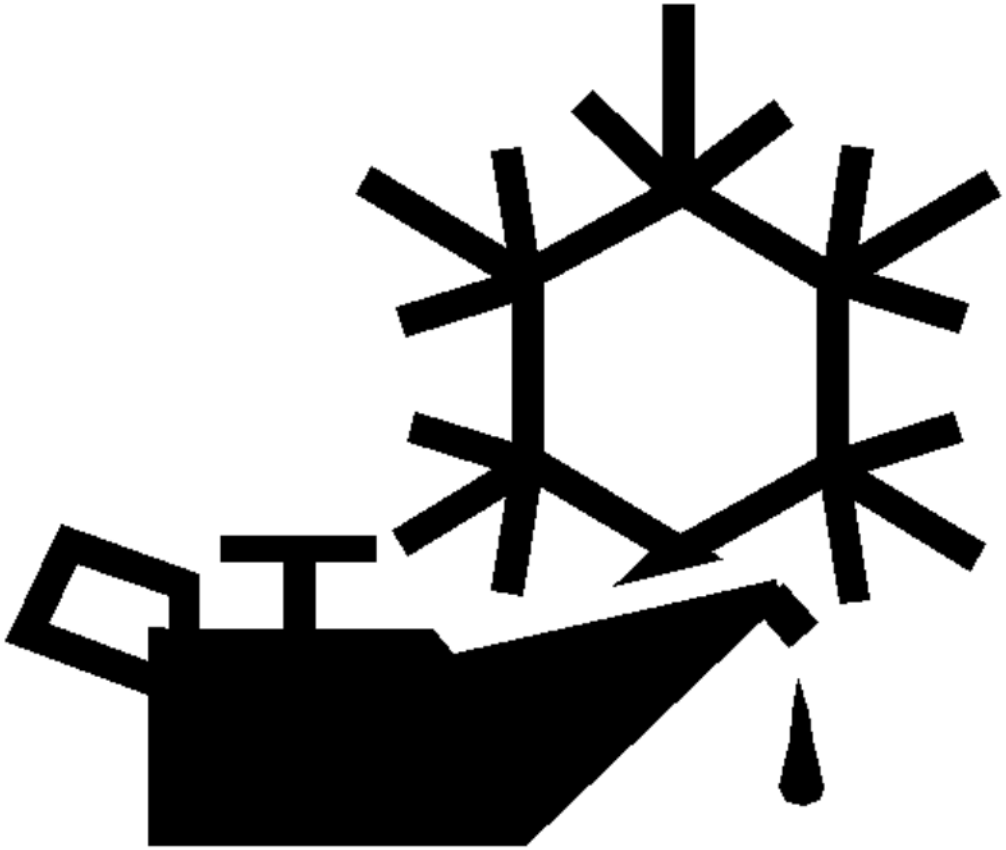
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Symbols	Description
	Caution

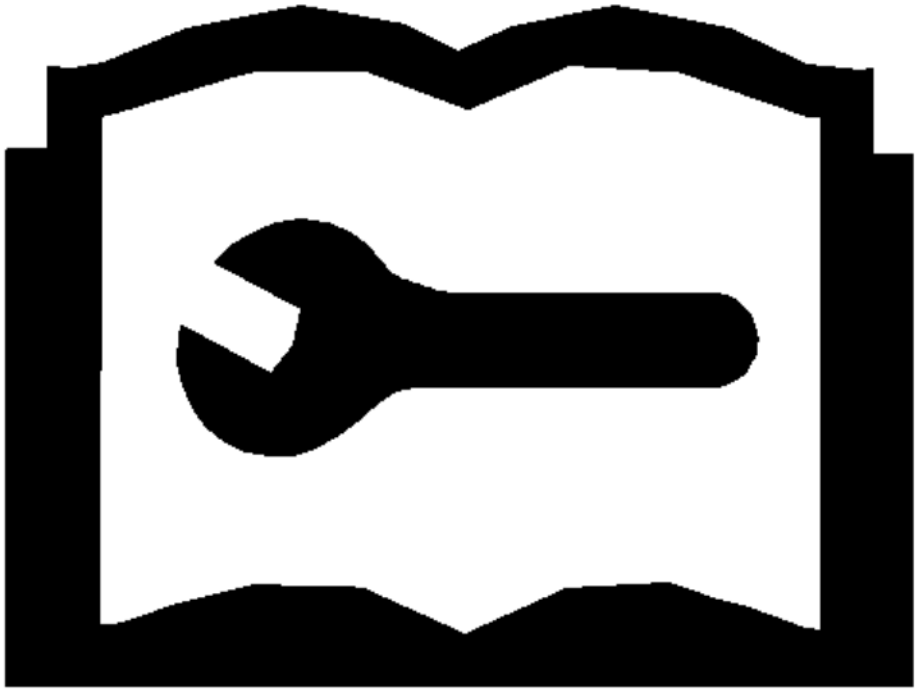
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Symbols	Description
	Air Conditioning System-Mobile Air Conditioning

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Symbols	Description
	MAC System Lubricant Type

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Symbols	Description
	See Vehicle Service Manual for MAC Service Information

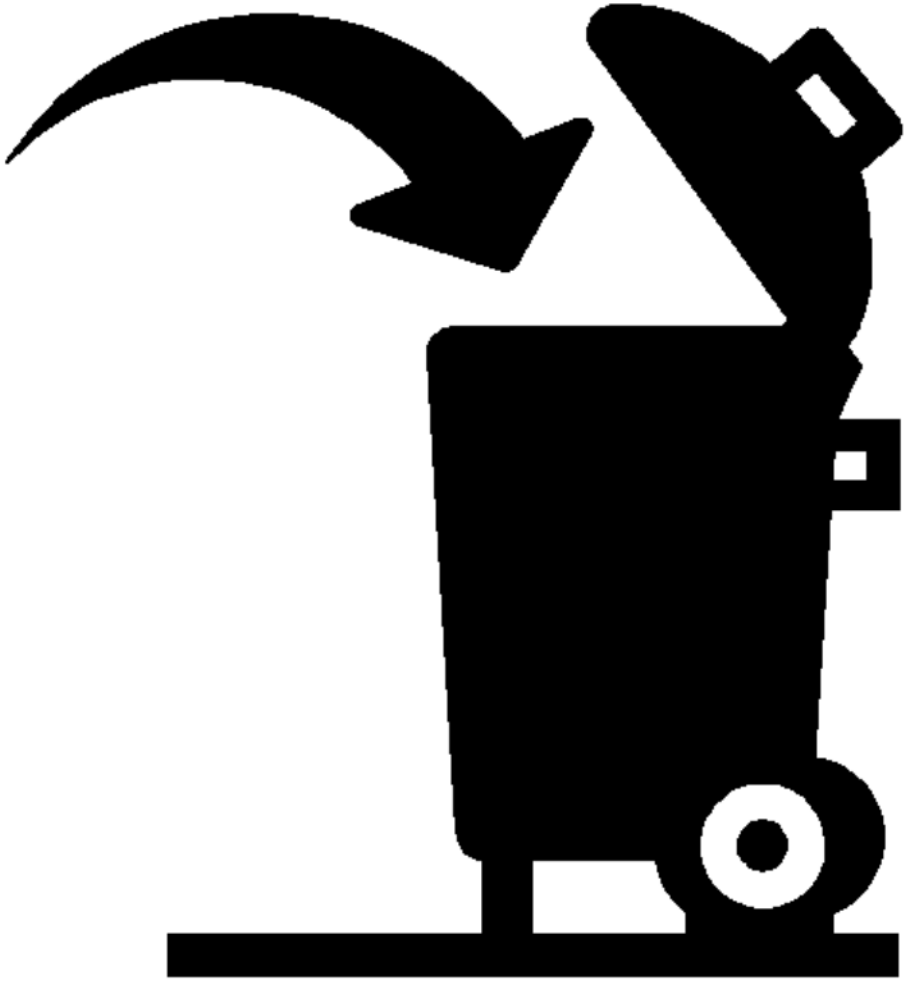
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Symbols	Description
	Requires Registered Technician to Service MAC System

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Symbols	Description
	Flammable Refrigerant

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Symbols	Description
	For Safety System Components Shall Be Replaced-Shall Not Be Repaired or Salvaged for Reuse

DIAGNOSTIC INFORMATION AND PROCEDURES

HANDLING OF REFRIGERANT LINES AND FITTINGS

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

- Keep all metal tubing lines free of dents or kinks. Any line restrictions will cause the loss of system capacity.
- Never bend a flexible hose line to a radius of less than four times the diameter of the hose.
- Never allow a flexible hose line to come within 65 mm (2-1/2 in) of the exhaust manifold.
- Inspect flexible hose lines regularly for leaks or brittleness.
- Replace flexible hose lines with new lines if you find signs of deterioration or leaking.
- Discharge the refrigeration system of all refrigerant before disconnecting any fitting in the refrigeration system.
- Proceed very cautiously regardless of the gauge readings.

WARNING: For personal protection, goggles and lint-free gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If refrigerant 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.

- Open the fittings very slowly.
- If you notice pressure when you loosen a fitting, allow the pressure to bleed off as described Discharging, Adding Oil, Evacuating, and Charging Procedures for A/C System.
- Cap or tape any refrigerant line immediately after it is opened. This will prevent the entrance of moisture and dirt, which can cause internal compressor wear or plugged lines in the condenser, the evaporator core, the expansion valve, or the compressor inlet screens.

NOTE: Use two proper wrenches to connect the fittings.

- Back up the opposing fitting to prevent distortion of the connecting lines or the components.
- Keep the sealing surfaces in perfect condition. A burr or a piece of dirt may cause a refrigerant leak.
- When seal washers are used, always install the seal washer without lubrication.
- When O-rings are used, always lightly coat the new O-ring seal with mineral base 525 viscosity refrigerant oil prior to installation.

LEAK TESTING (R-1234YF)

Special Tools

- **GE-41447** A/C Tracer Dye - Box of 24
- **GE-42220** Universal 12V Leak Detection Lamp

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- **GE-43872** Fluorescent Dye Cleaner
- **GE-50078** Electronic Leak Detector

Equivalent regional tools. **Special Tools**

Refrigerant Leak Testing

Technicians repairing or servicing motor vehicle air conditioning (MVAC) systems must be trained and certified by an EPA approved organization. Certification is obtained by passing an EPA approved examination. (http://www.epa.gov/ozone/title6/609/technicians/609certs.html)

WARNING: ***Technicians must only use a SAE J2913 certified electronic leak detector when checking for leaks in an R-1234yf A/C refrigerant system. Other, non-certified, leak detection devices could serve as ignition sources in the presence of hydrocarbons or other flammable refrigerants. Failure to follow these precautions may cause personal injury and/or damage to the vehicle or its components.***

WARNING: **Refer to R-1234yf Proper Service Procedures Warning**

WARNING: ***R1234-yf is considered a mildly flammable refrigerant and proper refrigerant leak testing should be completed to ensure safe and proper operation. Failure to follow these precautions may cause personal injury and/or damage to the vehicle or its components.***

CAUTION: **Leak detection shall only be done with the refrigerant that is specified for the system. Do not attempt to increase pressure of the A/C refrigerant system with shop air or another type of refrigerant. Failure to follow the above guidelines could result in damage to the vehicle or its components.**

NOTE: **General Motors vehicles are manufactured with fluorescent dye installed in the A/C refrigerant system.**

The fluorescent dye mixes and flows with the A/C compressor oil throughout the refrigerant system.

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

Verifying some passive leaks may require using **GE-50078** Electronic Leak Detector or a SAE J2913 certified electronic leak detector, even though the refrigerant system contains fluorescent dye.

Fluorescent Leak Detection

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

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- Condensation on the evaporator core or the refrigerant lines may wash the compressor 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 **GE-42220** Universal 12V Leak Detection Lamp.
- 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 **GE-43872** Fluorescent Dye Cleaner.

Fluorescent Dye Injection

NOTE: **Use only fluorescent dye approved by General Motors.**

- Not all of the fluorescent dyes are compatible with all air conditioning oils. Some types of dye decrease the oil viscosity or may chemically react with the oil.
- **GE-41447** A/C Tracer Dye-Box of 24 can be poured directly into a removed A/C component.

NOTE: **Do NOT overcharge the A/C system with dye.**

- 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.
- To prevent false diagnosis, thoroughly clean any residual dye from the service port with a rag and the approved **GE-43872** Fluorescent Dye Cleaner.

Electronic Leak Detector - SAE J2913 Certified

Ensure that the vehicle has at least 15 percent of the specified refrigerant charge in the A/C refrigeration system in order to perform a leak test. Refer

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to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.

NOTE: **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 manufacturer instructions supplied with **GE-50078** Electronic Leak Detector or a SAE J2913 certified electronic leak detector.

LEAK TESTING (R-134A)

Special Tools

- **GE-41447** R-134A A/C Tracer Dye - Box of 24
- **GE-42220** Universal 12V Leak Detection Lamp
- **GE-43872** Fluorescent Dye Cleaner
- **GE-46297** A/C Dye Injector Kit
- **GE-46297-12** Replacement Dye Cartridges
- **GE-50078** Electric Leak Detector

Equivalent regional tools:**Special Tools**

Refrigerant Leak Testing

NOTE: **All A/C system repairs must be verified using electronic leak detection. Dye detection may take up 2 or 3 days to be reliable.**

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

The fluorescent dye mixes and flows with the air conditioning oil throughout the refrigerant system.

Verifying some passive leaks may require using the **GE-50078** Electric Leak Detector, even though the A/C system contains fluorescent dye.

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

Visual Inspection

Visually trace the entire refrigerant system and look for signs of lubricant leakage, damage, and corrosion on all lines hoses and components (Oil can

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be an indication of a leak). Each questionable area should be checked for leaks using an electric leak detector.

Fluorescent Leak Detector

NOTE: Always use UV protective eyewear when working with UV light.

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

NOTE: Air conditioning oil is water soluble.

- Condensation on the evaporator core or the refrigerant lines may wash the air conditioning 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 **GE-42220** Universal 12V Leak Detection Lamp.
- 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 **GE-43872** Fluorescent Dye Cleaner.

Fluorescent Dye Injection

NOTE: Use only fluorescent dye approved by General Motors.

- **GE-41447 R-134A A/C Tracer Dye-Box of 24 can be poured directly into a removed A/C component.**
- **GE-46297-12 Replacement Dye Cartridges is injected into the low side port using GE-46297 A/C Dye Injector Kit.**

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- Not all of the fluorescent dyes are compatible with all air conditioning oils. 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.

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

- To prevent false diagnosis, thoroughly clean any residual dye from the service port with a rag and the approved fluorescent dye cleaner **GE-43872** Fluorescent Dye Cleaner.

Electric Leak Detector

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

Ensure that the vehicle has at least 15 percent of the specified refrigerant charge in the A/C refrigeration system in order to perform a leak test. **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)** for recharging the A/C system.

NOTE: **Electronic 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.

Do not use:

- Soap solutions (not effective for leak detection)
- Shop air (will introduce contamination to the refrigerant system)

Air movement from the engine cooling fan can affect the detectors ability to detect leaks. Always leak test with engine off and if possible after engine has reached normal operating temperature.

- All fittings and components should be checked.

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- Take care not to contaminate the probe tip if the part being tested is contaminated.
- No cleaners containing solvents should be used prior to using electronic leak detector.
- Always follow the refrigerant system around in a continuous path so that no areas of potential leaks are missed. Move the tip along the refrigerant system at a rate of no more than 3 inches per second and a distance of 3/8 inch from the surface being tested. If a leak is found, always continue to test the remainder of the system.

Follow the instructions supplied with the **GE-50078** Electric Leak Detector.

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (R-134A - SWB)

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.

Step	Action	Values	Yes	No
NOTE: • **The ambient air temperature must be at least 16Â°C (60Â°F).** • **Do not induce**				

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Step	Action	Values	Yes	No
	additional air flow across the front of the vehicle during the test. • **If you were sent here from a DTC diagnostic table, clear the DTC upon completion of this test.**			
1	1. Park the vehicle inside or in the shade. 2. Open the windows in order to ventilate the interior of the vehicle. 3. If the A/C system was operating, allow the A/C system to equalize for about 2 minutes. 4. Turn OFF the ignition. 5. Install the **J-43600** ACR 2000 Air Conditioning Service Center or the GE-48800 CoolTech A/C Recharge Machine. 6. Record the ambient air temperature and humidity. 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16Â°C (60Â°F), 345 kPa (50 psi) • Greater than 24Â°C (75Â°F), 483 kPa (70 psi) • Greater than 33Â°C (90Â°F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing (R-1234yf)Leak Testing (R-134a)**

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Step	Action	Values	Yes	No
2	**NOTE:** **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 in). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The I/P panel outlet mode • All I/P panel outlets are OPEN • Recirculation mode 4. Install the temperature probes or thermometers 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 and warm to operating temperature. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions:	-	Go to **Step 5**	Go to **Step 3**

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Step	Action	Values	Yes	No
	• Abnormal frost areas • Unusual noises 10. Record 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?			
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** ACR 2000 if using). Record the pressures and temperatures again. 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 5**	Go to **Step 4**
4	Perform the necessary repairs. Refer to **A/C Diagnostics Chart**. Is the action complete?	-	Go to **Step 5**	-
5	Operate the system in order to verify the test results. Did you find the same results?	-	System OK	**Symptoms - HVAC Systems - Automatic**

A/C Performance Table with Aux A/C

Ambient Air	Relative Humidity	Service Port Pressure	Maximum Discharge Air

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Temperature				Temperature	
		Low Side	High Side	Left Center	Left Rear
13-18Â°C (55-65Â°F)	0-100%	179-275 kPa (26-40 psi)	1150-1378 kPa (167-200 psi)	13Â°C (55Â°F)	14Â°C (57Â°F)
19-24Â°C (66-75Â°F)	Below 40%	192-296 kPa (28-43 psi)	1329-1591 kPa (193-231 psi)	14Â°C (57Â°F)	15Â°C (59Â°F)
	Above 40%	213-323 kPa (31-47 psi)	1322-1612 kPa (192-234 psi)	18Â°C (63Â°F)	18Â°C (64Â°F)
25-29Â°C (76-85Â°F)	Below 35%	234-323 kPa (34-47 psi)	1502-1750 kPa (218-254 psi)	18Â°C (63Â°F)	18Â°C (64Â°F)
	35-50%	248-337 kPa (36-49 psi)	1508-1756 kPa (219-255 psi)	18Â°C 64Â°F)	20Â°C (68Â°F)
	Above 50%	261-365 kPa (38-53 psi)	1508-1798 kPa (219-261 psi)	20Â°C (68Â°F)	23Â°C (72Â°F)
30-35Â°C (86-95Â°F)	Below 30%	268-358 kPa (39-52 psi)	1639-1922 kPa (238-279 psi)	20Â°C (68Â°F)	23Â°C (72Â°F)
	30-50%	282-378 kPa (41-55 psi)	1660-1970 kPa (241-286 psi)	23Â°C (72Â°F)	24Â°C (75Â°F)
	Above 50%	296-406 kPa (43-59 psi)	1681-2032 kPa (244-295 psi)	24Â°C (75Â°F)	27Â°C (79Â°F)
36-41Â°C (96-105Â°F)	Below 20%	303-392 kPa (44-57 psi)	1798-2080 kPa (261-302 psi)	23Â°C (72Â°F)	25Â°C (77Â°F)
	20-40%	310-413 kPa (45-60 psi)	1818-2142 kPa (264-311 psi)	24Â°C (75Â°F)	28Â°C (81Â°F)
	Above 40%	330-427 kPa (48-62 psi)	1867-2197 kPa (271-319 psi)	27Â°C (79Â°F)	28Â°C (82Â°F)
42-46Â°C (106-115Â°F)	Below 20%	344-427 kPa (50-62 psi)	1970-2232 kPa (286-324 psi)	25Â°C (77Â°F)	28Â°C (82Â°F)
	Above 20%	351-440 kPa (51-64 psi)	1998-2301 kPa (290-334 psi)	28Â°C (81Â°F)	30Â°C (86Â°F)
47-49Â°C (116-120Â°F)	Below 30%	385-468 kPa (56-68 psi)	2149-2418 kPa (312-351 psi)	29Â°C (84Â°F)	32Â°C (88Â°F)

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AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (R-1234YF)

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.

Step	Action	Values	Yes	No
NOTE: • **The ambient air temperature must be at least 16Â°C (60Â°F).** • **Do not induce additional air flow across the front of the vehicle during the test.** • **If you were sent here**				

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Step	Action	Values	Yes	No
	from a DTC diagnostic table, clear the DTC upon completion of this test.			
1	1. Park the vehicle inside or in the shade. 2. Open the windows in order to ventilate the interior of the vehicle. 3. If the A/C system was operating, allow the A/C system to equalize for about 2 minutes. 4. Turn OFF the ignition. 5. Install the **J-43600** ACR 2000 Air Conditioning Service Center or the GE-48800 CoolTech A/C Recharge Machine. 6. Record the ambient air temperature and humidity. 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16Â°C (60Â°F), 345 kPa (50 psi) • Greater than 24Â°C (75Â°F), 483 kPa (70 psi) • Greater than 33Â°C (90Â°F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing (R-1234yf)Leak Testing (R-134a)**
2	**NOTE:** **Record the relative humidity and the ambient air temperature at the time of the test.**	-	Go to **Step 5**	Go to **Step 3**

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Step	Action	Values	Yes	No
	1. Close the vehicle doors and windows. 2. Open the drivers door window 127-152 mm (5-6 in). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The I/P panel outlet mode • All I/P panel outlets are OPEN • Recirculation mode 4. Install the temperature probes or thermometers 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 and warm to operating temperature. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions: • Abnormal frost areas • Unusual noises 10. Record 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			

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Step	Action	Values	Yes	No
	the table below?			
3	If the pressures and temperatures recorded do not fall within the specified ranges: 1. Continue to operate the A/C system for an additional 5 minutes. 2. (RESET the **J-43600** ACR 2000 if using). Record the pressures and temperatures again. 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 5**	Go to **Step 4**
4	Perform the necessary repairs. Refer to **A/C Diagnostics Chart**. Is the action complete?	-	Go to **Step 5**	-
5	Operate the system in order to verify the test results. Did you find the same results?	-	System OK	**Symptoms - HVAC Systems - Automatic**

A/C Performance Table with Aux A/C

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Discharge Air Temperature
		Low Side	High Side	
13-18Â°C (55-65Â°F)	0-100%	186-296 kPa (27-43 psi)	1040-1440 kPa (151-209 psi)	12Â°C (52Â°F)
19-24Â°C (66-75Â°F)	Below 40%	165-275 kPa (24-40 psi)	1123-1522 kPa (163-221 psi)	13Â°C (54Â°F)
	Above 40%	206-323 kPa (30-47 psi)	1219-1591 kPa (177-231 psi)	14Â°C (57Â°F)
25-29Â°C (76-85Â°F)	Below 35%	206-296 kPa (30-43 psi)	1398-1701 kPa (203-247 psi)	14Â°C (57Â°F)
	35-50%	234-310 kPa (34-45 psi)	1433-1701 kPa (208-247 psi)	15Â°C (59Â°F)
	Above 50%	248-337 kPa (36-49 psi)	1460-1708 kPa (212-248 psi)	17Â°C (61Â°F)
30-35Â°C (86-95Â°F)	Below 30%	234-316 kPa (34-46 psi)	1612-1929 kPa (234-280 psi)	18Â°C (63Â°F)
	30-50%	248-337 kPa (36-49 psi)	1619-1901 kPa (235-276 psi)	18Â°C (64Â°F)
	Above 50%	268-358 kPa (39-52 psi)	1619-1860 kPa (235-270 psi)	19Â°C (66Â°F)

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Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Discharge Air Temperature
		Low Side	High Side	
36-41Â°C (96-105Â°F)	Below 20%	261-344 kPa (38-50 psi)	1880-2191 kPa (273-318 psi)	19Â°C (66Â°F)
	20-40%	268-358 kPa (39-52 psi)	1860-2129 kPa (270-309 psi)	20Â°C (68Â°F)
	Above 40%	289-365 kPa (42-53 psi)	1839-2067 kPa (267-300 psi)	22Â°C (70Â°F)
42-46Â°C (106-115Â°F)	Below 20%	296-372 kPa (43-54 psi)	2149-2397 kPa (312-348 psi)	22Â°C (70Â°F)
	Above 20%	303-378 kPa (44-55 psi)	2108-2308 kPa (306-335 psi)	23Â°C (72Â°F)
47-49Â°C (116-120Â°F)	Below 30%	330-399 kPa (48-58 psi)	2321-2549 kPa (337-370 psi)	24Â°C (75Â°F)

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST (R-134A - LWB)

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.

Step	Action	Values	Yes	No
NOTE: • **The ambient air temperature must be at least 16Â°C (60Â°F).**				

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Step	Action	Values	Yes	No
• **Do not induce additional air flow across the front of the vehicle during the test.** • **If you were sent here from a DTC diagnostic table, clear the DTC upon completion of this test.**				
1	1. Park the vehicle inside or in the shade. 2. Open the windows in order to ventilate the interior of the vehicle. 3. If the A/C system was operating, allow the A/C system to equalize for about 2 minutes. 4. Turn OFF the ignition. 5. Install the **J-43600** ACR 2000 Air Conditioning Service Center or the GE-48800 CoolTech A/C Recharge Machine. 6. Record the ambient air temperature and humidity. 7. Record the low and high side STATIC pressure readings. Are both the low and high side pressures within the specified value?	• Greater than 16Â°C (60Â°F), 345 kPa (50 psi) • Greater than 24Â°C (75Â°F), 483 kPa (70 psi) • Greater than 33Â°C (90Â°F), 690 kPa (100 psi)	Go to **Step 2**	Go to **Leak Testing (R-1234yf)Leak Testing (R-134a)**

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Step	Action	Values	Yes	No
2	**NOTE:** **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 in). 3. Select the following HVAC control settings: • The A/C ON. • The coldest temperature setting • The maximum blower speed • The I/P panel outlet mode • All I/P panel outlets are OPEN • Recirculation mode 4. Install the temperature probes or thermometers 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 and warm to operating temperature. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions:	-	Go to **Step 5**	Go to **Step 3**

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Step	Action	Values	Yes	No
	• Abnormal frost areas • Unusual noises 10. Record 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?			
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** ACR 2000 if using). Record the pressures and temperatures again. 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 5**	Go to **Step 4**
4	Perform the necessary repairs. Refer to **A/C Diagnostics Chart**. Is the action complete?	-	Go to **Step 5**	-
5	Operate the system in order to verify the test results. Did you find the same results?	-	System OK	**Symptoms - HVAC Systems - Automatic**

A/C Performance Table with Aux A/C

Ambient Air	Relative Humidity	Service Port Pressure	Maximum Discharge Air

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Temperature				Temperature	
		Low Side	High Side	Left Center	Left Rear
13-18Â°C (55-65Â°F)	0-100%	151-268 kPa (22-39 psi)	1109-1281 kPa (161-186 psi)	13Â°C (54Â°F)	13Â°C (55Â°F)
19-24Â°C (66-75Â°F)	Below 40%	151-275 kPa (22-40 psi)	1302-1508 kPa (189-219 psi)	14Â°C (57Â°F)	15Â°C (59Â°F)
	Above 40%	186-316 kPa (27-46 psi)	1247-1467 kPa (181-213 psi)	17Â°C (61Â°F)	18Â°C (63Â°F)
25-29Â°C (76-85Â°F)	Below 35%	206-303 kPa (30-44 psi)	1446-1660 kPa (210-241 psi)	17Â°C (61Â°F)	18Â°C (64Â°F)
	35-50%	227-316 kPa (33-46 psi)	1433-1646 kPa (208-239 psi)	18Â°C (63Â°F)	18Â°C (64Â°F)
	Above 50%	241-351 kPa (35-51 psi)	1419-1632 kPa (206-237 psi)	19Â°C (66Â°F)	20Â°C (68Â°F)
30-35Â°C (86-95Â°F)	Below 30%	248-344 kPa (36-50 psi)	1591-1832 kPa (231-266 psi)	20Â°C (68Â°F)	22Â°C (70Â°F)
	30-50%	261-365 kPa (38-53 psi)	1577-1818 kPa (229-264 psi)	22Â°C (70Â°F)	22Â°C (72Â°F)
	Above 50%	275-385 kPa (40-56 psi)	1570-1818 kPa (228-264 psi)	23Â°C (73Â°F)	24Â°C (75Â°F)
36-41Â°C (96-105Â°F)	Below 20%	286-385 kPa (42-56 psi)	1750-1991 kPa (254-289 psi)	23Â°C (73Â°F)	24Â°C (75Â°F)
	20-40%	303-399 kPa (44-58 psi)	1750-1998 kPa (254-290 psi)	24Â°C (75Â°F)	25Â°C (77Â°F)
	Above 40%	316-413 kPa (46-60 psi)	1750-1998 kPa (254-290 psi)	25Â°C (77Â°F)	28Â°C (81Â°F)
42-46Â°C (106-115Â°F)	Below 20%	344-427 kPa (50-62 psi)	1908-2129 kPa (277-309 psi)	27Â°C (79Â°F)	28Â°C (81Â°F)
	Above 20%	351-434 kPa (51-63 psi)	1908-2301 kPa (277-311 psi)	28Â°C (81Â°F)	28Â°C (82Â°F)
47-49Â°C (116-120Â°F)	Below 30%	385-475 kPa (56-68 psi)	2053-2280 kPa (298-331 psi)	29Â°C (84Â°F)	30Â°C (86Â°F)

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A/C DIAGNOSTICS CHART

A/C System Concern		Potential Causes
Compressor Inoperative		Electrical Wiring Issue
		No or Low Refrigerant Charge
		Compressor Internal Malfunction
		Compressor Clutch Malfunction
		A/C Pressure Sensor Malfunction
		Evaporator Air Temperature (EAT) Malfunction
		HVAC Controls Malfunction
Low Side Gauge Reading	**High Side Gauge Reading**	**Potential Causes**
Same as High Side	Same as Low Side	No or Low Refrigerant Charge
		Compressor Malfunction
		A/C Pressure Sensor Malfunction
		EAT Malfunction
		HVAC Controls Malfunction
Normal	Normal	Temperature Actuator Malfunction
		Temperature Door Malfunction
Low	Low	Low Refrigerant Charge
		Restriction between the Compressor Outlet and Low Side Port
	Low/Normal	Evaporator Freezing/EAT Malfunction
	High	Compressor Stuck at Maximum Displacement/EAT Malfunction
Normal/High	Normal/High	PAG or POE Oil Overcharge
High	Low	Restriction between the Low Side Port and Compressor Inlet
		Expansion Device Stuck Open
		Compressor has Low Displacement or Internal Malfunction
	High	Malfunctioning Cooling Fans
		Refrigerant Overcharge
		Restricted Condenser Air Flow
		Air in A/C System

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A/C System Concern	Potential Causes
NOTE: **Restrictions can occur in any part of an A/C system and may result in various gauge pressure values, depending on the system design and service port locations. The use of a non-contact, infrared thermometer can help diagnose a restricted A/C system with the ability to quickly observe significant, unexpected temperature changes in components and plumbing due to debris, contamination, pinched/damaged hoses, etc.**	

HEATING PERFORMANCE DIAGNOSTIC

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**

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Step	Action	Yes	No
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	**WARNING:** **Refer to Moving Parts and Hot Surfaces Warning .** 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**
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. 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**

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Step	Action	Yes	No
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** . 2. Perform any necessary repairs. Are the repairs complete?	Go to **Step 10**	-
7	1. Turn OFF the engine. 2. Back flush 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. 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 (Non Heat Stake)Heater Core Replacement (Heat Stake)**. Is the repair complete?	Go to **Step 10**	-
9	Repair the low engine temperature concern. Refer to **Engine Fails To Reach Normal Operating Temperature** . 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**

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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 - 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**
4	1. Select the minimum blower speed. 2. Select the warmest temperature setting. **WARNING:** **Refer to Moving Parts and Hot Surfaces Warning .** 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 **Air Conditioning Compressor Malfunction** for the automatic system. 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 (R-134a - SWB)Air Conditioning (A/C) System Performance Test (R-1234yf)Air Conditioning (A/C) System Performance Test (R-134a - LWB)**.	Go to **Step 9**	Go to **Step 12**

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Step	Action	Yes	No
	Is the A/C system operating within the specifications?		
8	Repair the low engine temperature concern. Refer to **Engine Fails To Reach Normal Operating Temperature** . 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 **Diagnostic Starting Point - Vehicle** . 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 (R-134a - SWB)Air Conditioning (A/C) System Performance Test (R-1234yf)Air Conditioning (A/C) System Performance Test (R-134a - LWB)**. Is the repair complete?	Go to **Step 14**	-
13	Repair the recirculation door concern. Refer to **Diagnostic Starting Point - Vehicle** . 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 - 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 - Automatic**
2	Inspect the air inlet grille for debris. Is debris present?	Go to **Step 8**	Go to **Step 3**
3	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine OFF.	Go to **Step 4**	Go to **Step 11**

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Step	Action	Yes	No
	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?		
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 Assembly ReplacementBlower Assembly Replacement (Z75)**. 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: • Cracked blades • A loose impeller retainer • Improper impeller alignment Did you find any of these conditions?	Go to **Step 9**	Go to **Step 10**
8	Remove the foreign material. Is the action complete?	Go to **Step 10**	-
9	Replace the blower motor. Refer to **Blower Assembly ReplacementBlower Assembly Replacement (Z75)**. Is the repair complete?	Go to **Step 11**	-
10	Install the blower motor. Refer to **Blower Assembly ReplacementBlower Assembly Replacement (Z75)**. Is the action complete?	Go to **Step 11**	-

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Step	Action	Yes	No
11	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Step 2**

AIR CONDITIONING COMPRESSOR OIL DIAGNOSIS

Condition	Corrective Action
CAUTION: **Always ensure the correct PAG or POE oil is used during A/C servicing of R-134a or R-1234YF systems. Failure to use the correct PAG or POE oil could cause A/C performance issues and/or A/C system failure.** **NOTE:** **To avoid repeat compressor failure,**	

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Condition	Corrective Action
always inspect the condition of the refrigerant oil and take the appropriate corrective action before installing the replacement compressor.	
Clean Oil no debris present	No corrective action necessary.
Clean Oil with debris present	• Inspect the suction port of the replacement compressor for presence of a suction screen. If the replacement compressor does NOT contain a suction screen, install suction screen in the line. • Replace desiccant or component containing the desiccant. • Replace desiccant filter if applicable. • Remove and inspect high pressure side filter (if applicable). • Remove, inspect, clean, or replace orifice tube. • If the system has a front orifice tube and is equipped with a filter in the rear auxiliary line, remove, inspect, clean, or replace the filter.
Dark brown/black and/or pungent/unusual odor with no debris present	• Replace desiccant or component containing the desiccant. • Replace desiccant filter if applicable. • Flush refrigerant system.
Dark brown/black and/or pungent/unusual odor with debris present	• Replace desiccant or component containing the desiccant. • Replace desiccant filter if applicable.

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Condition	Corrective Action
	• Flush refrigerant system. • Inspect the suction port of the replacement compressor for presence of a suction screen. If the replacement compressor does NOT contain a suction screen, install suction screen. • Remove and inspect high pressure side filter (if applicable). • Remove, inspect, clean, or replace orifice tube. • If the system has a front orifice tube and is equipped with a filter in the rear auxiliary line, remove, inspect, clean, or replace the filter.
Oil Overcharge	Flush refrigerant system.
Refrigerant Contamination	Flush refrigerant system.
Hybrid Polyester Refrigerant Oil (POE) Contamination	• Flush refrigerant system. • Replace desiccant or component containing the desiccant. • Replace desiccant filter if applicable.

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**	**Symptoms - HVAC Systems - Automatic**
2	1. A/C system noises can be generally categorized into 3 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**
3	With the engine OFF, inspect the drive belt for excessive wear. **Drive Belt Falls Off and Excessive Wear Diagnosis** . Is the drive belt excessively worn?	Go to **Step 18**	Go to **Step 4**

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Step	Action	Yes	No
4	Inspect the drive belt tension. **Drive Belt Tensioner Diagnosis** . Is the drive belt tension correct?	Go to **Step 18**	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 23**	Go to **Step 7**
7	Is the A/C compressor clutch slipping?	Go to **Step 22**	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 19**	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 21**	Go to **Step 13**
12	Does a vibration or rattle noise exist when the A/C clutch is engaged?	Go to **Step 13**	Go to **Step 14**
13	Does the noise stop when the A/C clutch is disengaged?	Go to **Step 15**	Go to **Step 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 20**	Go to **Step 24**

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Step	Action	Yes	No
15	Verify that the A/C system is properly charged. **Approximate Fluid Capacities**. Is the A/C system properly charged?	Go to **Step 25**	Go to **Step 16**
16	Recharge the A/C system to specification. **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**. Is the abnormal compressor noise still present?	Go to **Step 24**	Go to **Step 25**
17	Repair the oil leak. Refer to the appropriate repair procedure in Engine Mechanical. Is the repair complete?	Go to **Step 25**	-
18	Replace the A/C drive belt. **Air Conditioning Compressor Belt Replacement** . Is the replacement complete?	Go to **Step 25**	-
19	Repair or replace the A/C compressor mounting component. Is the repair complete?	Go to **Step 25**	-
20	Repair or replace the component which is causing the moaning concern as needed. Is the repair complete?	Go to **Step 25**	-
21	Correctly route or insulate the A/C component. Is the repair complete?	Go to **Step 25**	-
22	Replace the A/C compressor clutch. **Air Conditioning Clutch Assembly Replacement (L83 L86)Air Conditioning Clutch Assembly Replacement (L96)**. Is the replacement complete?	Go to **Step 25**	-
23	Replace the A/C compressor. **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**. Is the replacement complete?	Go to **Step 25**	-
24	The concern may be caused by an engine related component. **Vibration Analysis - Engine** . Did you find and correct the condition?	Go to **Step 25**	-
25	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Step 2**

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NOISE DIAGNOSIS - 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 - Automatic**
2	1. Start the engine. 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 Carrier Replacement (Chevrolet / GMC)** **Instrument Carrier Replacement (Cadillac)** . 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**

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Step	Action	Yes	No
9	Replace the appropriate door and/or seals. Is the repair complete?	Go to **Step 11**	-
10	Remove any obstructions or foreign material found. Is the action complete?	Go to **Step 11**	-
11	Install the I/P carrier. Refer to **Instrument Carrier Replacement (Chevrolet / GMC)** **Instrument Carrier Replacement (Cadillac)** . 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

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **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. Is debris present?	Go to **Step 4**	Go to **Step 5**

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Step	Action	Yes	No
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 (L86 L83) Loss of Coolant (L96)** . 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 (Non Heat Stake)Heater Core Replacement (Heat Stake)**. Is the repair complete?	Go to **Step 15**	-
12	Does the odor have an oily smell?	Go to **Step 13**	Go to **Step 15**
13	1. Inspect the engine compartment for any leaks. Refer to the following procedures: • **Oil Leak Diagnosis** for a 5.3L or 6.2L engine. • **Fluid Leak Diagnosis** 2. Repair any oil leaks. Is the repair complete?	Go to **Step 15**	-

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Step	Action	Yes	No
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.
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:

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- 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 (R134A)

Special Tools

- **GE-48800** CoolTech A/C Recharge Machine
- **J-43600** ACR 2000 Air Conditioning Service Center
- **J-45037** A/C Oil Injector

For equivalent regional tools, refer to **Special Tools**

WARNING: To prevent personal injury, avoid breathing A/C Refrigerant and lubricant vapor or mist. Work in a well ventilated area. To remove refrigerant from the A/C System, use service equipment designed for recovery that is certified to meet the requirements of the appropriate SAE Standards. If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant, refrigerant recovery, and lubricant manufacturers.

WARNING: For personal protection, goggles with side protection and lint-free gloves (insulated against heat loss and impermeable to refrigerant) must be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If refrigerant comes in contact with any part of

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the body severe frostbite and personal injury may result. The exposed area should be flushed immediately with cold water and prompt medical attention should be obtained.

CAUTION: You must replace the desiccant if the A/C refrigerant system has been open to atmosphere for more than four hours, or if the A/C refrigerant oil has been contaminated. Failure to replace the desiccant will result in damage to the A/C refrigerant system.

CAUTION: 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 and potentially void the vehicle warranty for the refrigerant system.

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

CAUTION: Do not lubricate A/C line seal washers as mineral oil will damage the seal and cause leaks. Use only 525 viscosity mineral oil to lubricate o-rings as well as fitting threads for the prevention of fitting seizure.

CAUTION: Use only GM approved Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system.

Both the **J-43600** ACR 2000 Air Conditioning Service Center and **GE-48800** CoolTech A/C Recharge Machine are complete air conditioning service center for R-134a. Both units recovers, recycles, evacuates and recharges A/C refrigerant quickly, accurately and automatically. Both units have a display screen that contains the function controls and displays prompts that will lead the technician through the recover, recycle, evacuate and recharge operations. R-134a is recovered into and charged out of an internal storage vessel. Both units 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.

GE-48800 CoolTech A/C Recharge Machine is released as a required replacement for the previously essential **J-43600** ACR 2000 Air Conditioning Service Center. The **GE-48800** CoolTech A/C Recharge Machine is SAE J2788 compliant and meets GM requirements for A/C Refrigerant System Repairs on all General Motors vehicles, including Hybrid systems with Polyester (POE) refrigerant oil.

Refer to the **J-43600** ACR 2000 Air Conditioning Service Center or **GE-48800** CoolTech A/C Recharge Machine manual for operation and setup instruction. Always recharge the A/C System with the proper amount of R-134a. Refer to **Approximate Fluid Capacities** for the correct amount.

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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 same quantity of PAG oil must be replenished. If no oil was removed from the A/C system during recovery, do not charge any PAG oil into the A/C system. Oil can be injected into a charged system using **J-45037** A/C Oil Injector. For the proper quantities of oil to add to the A/C refrigerant system, refer to **Approximate Fluid Capacities**.

REFRIGERANT RECOVERY AND RECHARGING (R1234YF)

Special Tools

- **GE-45037** A/C Oil Injector
- **GE-50078** Electronic Leak Detector
- **GE-50300** R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart
- **GE-50957** Machine R-1234yf Contaminated Refrigerant
- **GE-50744** A/C R1234yf PAG Oil Injector Hose

Equivalent regional tools: **Special Tools**.

General Information

R-1234yf (HFO-1234yf) - 2, 3, 3, 3 - Tetrafluoroprop-1-ene (CF3CFCH2), is an olefin containing hydrogen, fluorine and carbon with thermodynamic properties similar to R-134a. This refrigerant is a mildly flammable gas. It has a boiling point of -29.2Â°C, a vapor pressure of 583 kPa absolute at 20Â°C, no ozone depletion potential, and a global warming potential (GWP) of 4.

R-1234yf supply tank is white with red band to denote flammability.

Technicians repairing or servicing MVAC (motor vehicle air conditioning) must be trained and certified by an EPA approved organization. Certification is obtained by passing an EPA approved examination. (http://www.epa.gov/ozone/title6/609/technicians/609certs.html)

MVAC service shops must certify to the EPA that they have acquired and are properly using approved refrigerant recovery equipment. Service shops must also verify (with on site documentation) that each person using the equipment has been properly trained and certified. MVAC service shops must maintain records of the names and addresses of facilities to which the refrigerant they recover is sent. (http://www.epa.gov/ozone/title6/609/technicians/appequip.html)

WARNING: Refer to R-1234yf Proper Service Procedures Warning .

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Vehicles equipped with R-1234yf refrigerant systems have unique low and high side service fittings.

The proper handling procedures should be followed for all refrigerants as designated by the refrigerant manufacturer's Material Safety Data Sheet (MSDS).

Refrigerant Recovery and Recharging

To remove, recycle and install R-1234yf from/to a vehicles refrigerant system only use **GE-50300** R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart or refrigerant recovery recharge equipment certified to meet the requirements of SAE J2843 and approved by the EPA. (http://www.epa.gov/ozone/title6/609/technicians/appequip.html)

To remove contaminated refrigerant from a vehicles refrigerant system use **GE-50957** Machine R-1234yf Contaminated Refrigerant or only service equipment designed for contaminated refrigerant removal and certified to meet the requirements of SAE J2851. Refrigerant recovered by this equipment cannot be reused or recycled on site and must be sent to an EPA approved reclamation facility for reprocessing or disposal. (http://www.epa.gov/ozone/title6/608/reclamation/reclist.html)

To prevent accidental release of refrigerant and minimize safety concerns, the installation of any refrigerant service equipment to the vehicle shall only be done with the engine off and after the refrigerant high side pressure has been reduced (approximately 2-3 minutes).

Open the windows and/or doors before charging the vehicle to prevent an accumulation of refrigerant in case of a major refrigerant leak.

WARNING: ***R-1234yf is heavier than air and may accumulate in low or pit areas - make sure these areas are properly ventilated. Failure to follow this precaution may cause personal injury.***

Refrigerant service equipment is required to ensure adequate refrigerant recovery to reduce emissions and provide for accurate recharging of mobile air conditioning systems. Venting refrigerant to the atmosphere is illegal per US Environmental Protection Agency (EPA) Clean Air Act Section 608.

WARNING: ***To prevent personal injury, avoid breathing any refrigerant vapor and lubricant mist. Servicing of R-1234yf systems shall only be done in well ventilated work areas. To remove R-1234yf refrigerant from the A/C refrigerant system, recover using SAE J2843 certified equipment. Un-controlled release of R-1234yf refrigerant in the work area may result in high concentrations of R-1234yf that can be flammable. If an accidental system discharge occurs, ventilate the work area before continuing service. Failure to follow these precautions may cause personal injury and/or damage to the vehicle or its components.***

WARNING: **For personal protection, goggles and lint-free gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If refrigerant comes in contact with any part of the body severe frostbite and personal injury can result. The exposed area should be**

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flushed immediately with cold water and prompt medical help should be obtained.

CAUTION: Air Conditioning (A/C) desiccant must be replaced if the A/C refrigerant system has been open to atmosphere for more than four hours, or if the A/C refrigerant oil has been contaminated. Failure to replace the A/C desiccant will result in damage to the A/C refrigerant system.

CAUTION: Use only the refrigerant and the charge amount specified in "Refrigerant System Specifications" found in HVAC Service Manual or the vehicles under hood refrigerant label. Use of incorrect refrigerant or charge amounts may result in poor system performance and premature system failure.

CAUTION: Use only the lubricant specified for this vehicles refrigerant system. Do not mix refrigerant oils which may result in system contamination and unknown reaction by-products which may cause HVAC System failure.

To protect the refrigerant supply **GE-50300** R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart or SAE J2843 equipment requires the refrigerant to be analyzed for purity prior to its recovery or transfer. The equipment is required to receive an acceptable reading from the integrated refrigerant identifier prior to recovery or transfer. An acceptable reading is ≥ 98% -1/+2 R-1234yf.

If an unacceptable reading is received (and the presence of foreign gases detected) the refrigerant is considered contaminated and the equipment will not allow its recovery or transfer to an onboard storage vessel. If refrigerant is contaminated use **GE-50957** Machine R-1234yf Contaminated Refrigerant or SAE J2851 compliant equipment to recover for reclamation and/or disposal at an EPA approved facility (http://www.epa.gov/ozone /title6/608/reclamation/reclist.html).

As a safety precaution **GE-50300** R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart or SAE J2843 compliant equipment requires the MAC system to pass a pre-charge leak test (to detect the possibility of a gross system leak prior to charging, >0.3 g/s) prior to allowing the MAC system to be charged. The pressurized portion of this test will require the technician set the vehicles HVAC blower motor on high, A/C switch off and air distribution mode set to floor. The technician shall insert a **GE-50078** Electronic Leak Detector or J2913-compliant electronic leak detector, set to low sensitivity (14 grams/year leak rate) into the center of a floor duct outlet, as far as possible. When the technician confirms that the vehicle is set up for the pressurized leak check the **GE-50300** R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart will install 15% of the programmed charge into the vehicles refrigerant system. The technician monitors the electronic leak detector for 5 minutes or until the detector alarms.

The equipments display will then ask the following:

1. Was this test performed? If the technician replies Yes, the display next shall ask,
2. Was a leak found? If technician replies Yes, the machine shall only allow recovery and evacuation to allow repair. If the technician replies No, the display shall continue with,
3. Is there an auxiliary evaporator? If the technician replies No the machine shall permit completion of the recharge process. If the technician

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replies Yes, the display shall instruct the technician to perform a leak check with **GE-50078** Electronic Leak Detector or a J2913-compliant detector at a rear evaporator outlet, then ask,

4. Was an auxiliary evaporator leak check performed? If the technician replies Yes, the display will continue with Was a leak found? and if the answer is Yes, the machine shall only allow recovery and evacuation to allow repair. If the technician replies No, the machine shall permit completion of the recharge process.

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 **GE-45037** injector with **GE-50744** A/C R1234yf PAG Oil Injector Hose. For the proper quantities of oil to add to the A/C refrigerant system, refer to **Approximate Fluid Capacities**, and **Air Conditioning Compressor Oil Balancing**.

FLUSHING (R-134A)

Tools Required

- **GE 48800** Cool Tech Refrigerant Recovery/Recharge Machine
- **J 45268** Air Conditioning Flushing Adapter Kit
- **J 41447-A** Leak Detection Dye
- **GE 50078** Electronic Leak Detector

NOTE: **Flushing with the GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine is not intended to remove metal from the air conditioning system.**

Flushing is intended to remove the following contaminants:

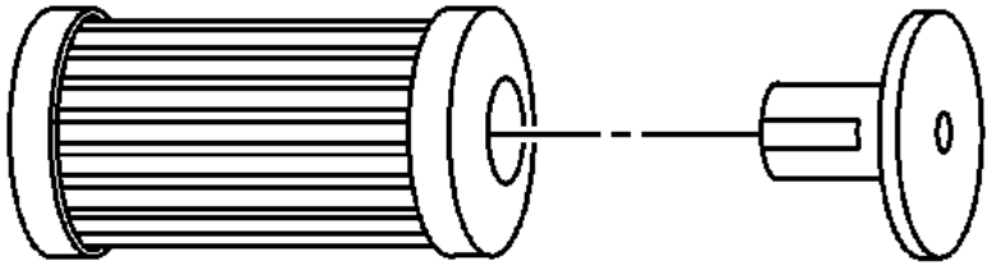
- Contaminated polyalkylene glycol (PAG) oil
- Desiccant, following a desiccant bag failure
- Overcharge of PAG oil
- Refrigerant contamination

NOTE: **Warmer engine or ambient temperature decreases the refrigerant recovery time during the air conditioning flush procedure.**

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)**

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2. Remove the front air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
3. Install the J 45268-121 in place of the thermal expansion valve.
4. Remove the air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**
5. Install J 45268-5 to the discharge hose.
6. Install J 45268-4 to the suction hose.



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Fig. 1: A/C Filter And Check Valve
Courtesy of GENERAL MOTORS COMPANY

NOTE: Forward flow refrigerant flushing is recommended for contaminated refrigerant or POE oil.

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

7. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the suction port of J 45268-4.
    2. Connect the blue hose from GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine to J 45268-1 flush filter adapter.
    3. Connect the red hose from GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine to J 45268-5 flush adapter.

NOTE: Reverse flow refrigerant flushing is recommended for desiccant cartridge failure.

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

8. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the discharge port of J 45268-4.
    2. Connect the red hose from J 43600 GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine to the suction port of J 45268-4 flush adapter.
    3. Connect the red hose from J 43600 GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine to the suction port of J 45268-4 flush adapter.

NOTE: The valve on the external refrigerant tank must be closed before starting the flush process.

9.

10. Flush the front A/C system by following the instructions supplied with the GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine.

NOTE: If the vehicle is equipped with an auxiliary air conditioning system, it will be necessary to flush the front air conditioning system before flushing the auxiliary air conditioning system.

11.

12. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Remove J 45268-121 from the front evaporator.

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2. Inspect the front TXV for debris. Clean or replace as needed
3. Install the front TXV. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
4. Install J 45268-121 in place of the auxiliary TXV.

13. Flush the auxiliary air conditioning system by following the instructions supplied with the GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine.
14. Remove J 45268-5 from the discharge hose.
15. Remove J 45268-4 from the suction hose.

NOTE: **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.**

16.
17. If the removed A/C compressor is being reinstalled, perform the following procedure:

NOTE: **Rotate the compressor input shaft to assist in draining the PAG oil from the compressor.**

1. Drain the PAG oil from the A/C compressor.
2. Add the total system capacity of PAG oil to the A/C compressor. Refer to **Approximate Fluid Capacities**

NOTE: **Flushing will remove all the POE oil from the A/C system.**

18. Refill the air conditioning system with the proper amount of air conditioning oil. Refer to **Approximate Fluid Capacities**
19. If the removed air conditioning compressor is being reinstalled, perform the following procedure:
    1. Drain the POE oil from the air conditioning compressor.
    2. Add the total system capacity of POE oil to the air conditioning compressor. Refer to **Approximate Fluid Capacities**
20. If you will replace the A/C compressor after flushing the system, perform the following procedure:
    1. DO NOT drain the new POE oil from the compressor.
    2. Deduct the amount of POE oil shipped with the service compressor from the amount of POE oil listed in the approximate fluid capacities table. Refer to **Approximate Fluid Capacities**
21. Add the calculated amount to the compressor, as needed.
22. Add one bottle of J 41447-a leak detection dye directly to the A/C compressor.
23. Install the air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor**

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Replacement (L96)

24. Replace the air conditioning receiver and dehydrator. Refer to **Receiver and Dehydrator Replacement (L83 L86)Receiver and Dehydrator Replacement (L96)**
25. Remove J 45268-121.
26. Install the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
27. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging (R134A)**.
28. Leak test the fittings using **GE 50078** Electronic Leak Detector.

FLUSHING (R-1234YF)

Tools Required

- **GE-45268** Air Conditioning Flushing Adapter Kit
- **GE-41447-a** Leak Detection Dye
- **GE-50078** Electronic Leak Detector
- **GE-50300** Air Conditioning Service Center for HFO1234-yf

NOTE: **Flushing with the GE-50300 Cool Tech Refrigerant Recovery/Recharge Machine is not intended to remove metal from the air conditioning system.**

Flushing is intended to remove the following contaminants:

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

NOTE: **Warmer engine or ambient temperature decreases the refrigerant recovery time during the air conditioning flush procedure.**

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R1234yf)**
2. Remove the front air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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3. Install the J 45268-121 in place of the thermal expansion valve.
4. Remove the air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**
5. Install J 45268-5 to the discharge hose.
6. Install J 45268-4 to the suction hose.

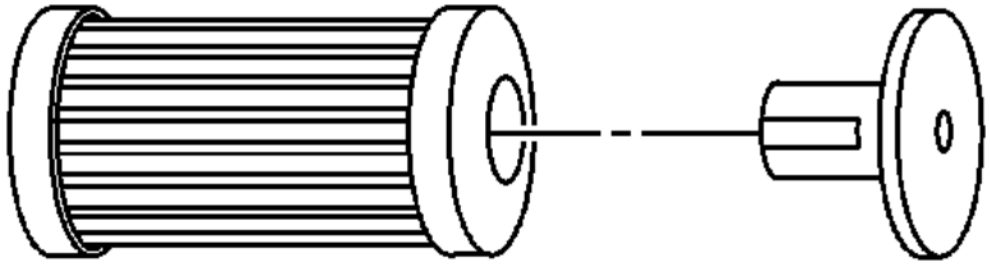


Fig. 2: A/C Filter And Check Valve

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Courtesy of GENERAL MOTORS COMPANY

NOTE: **Forward flow refrigerant flushing is recommended for contaminated refrigerant or POE oil.**

NOTE: **The filter inside GE-45268-1 is serviceable. Remove and discard the check valve from the filter.**

7. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the suction port of J 45268-4.
    2. Connect the blue hose from GE-50300 Air Conditioning Service Center for HFO1234-yf flush filter adapter.
    3. Connect the red hose from GE-50300 Air Conditioning Service Center for HFO1234-yf to J 45268-5 flush adapter.

NOTE: **Reverse flow refrigerant flushing is recommended for desiccant cartridge failure.**

NOTE: **The filter inside GE-45268-1 is serviceable. Remove and discard the check valve from the filter.**

8. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the discharge port of J 45268-5.
    2. Connect the blue hose from GE-50300 Air Conditioning Service Center for HFO1234-yf to the suction port of J 45268-1 flush adapter.
    3. Connect the red hose from GE-50300 Air Conditioning Service Center for HFO1234-yf to the suction port of J 45268-4 flush adapter.

NOTE: **The valve on the external refrigerant tank must be closed before starting the flush process.**

9.

10. Flush the front A/C system by following the instructions supplied with the GE-50300 Air Conditioning Service Center for HFO1234-yf.

NOTE: **If the vehicle is equipped with an auxiliary air conditioning system, it will be necessary to flush the front air conditioning system before flushing the auxiliary air conditioning system.**

11.

12. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Remove J 45268-121 from the front evaporator.
    2. Inspect the front TXV for debris. Clean or replace as needed
    3. Install the front TXV. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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4. Install J 45268-121 in place of the auxiliary TXV.

13. Flush the auxiliary air conditioning system by following the instructions supplied with the GE-50300 Air Conditioning Service Center for HFO1234-yf.
14. Remove J 45268-5 from the discharge hose.
15. Remove J 45268-4 from the suction hose.

NOTE: **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.**

16.
17. If the removed A/C compressor is being reinstalled, perform the following procedure:

NOTE: **Rotate the compressor input shaft to assist in draining the PAG oil from the compressor.**

1. Drain the PAG oil from the A/C compressor.
2. Add the total system capacity of PAG oil to the A/C compressor. Refer to **Approximate Fluid Capacities**

NOTE: **Flushing will remove all the POE oil from the A/C system.**

18. Refill the air conditioning system with the proper amount of air conditioning oil. Refer to **Approximate Fluid Capacities**
19. If the removed air conditioning compressor is being reinstalled, perform the following procedure:
    1. Drain the POE oil from the air conditioning compressor.
    2. Add the total system capacity of POE oil to the air conditioning compressor. Refer to **Approximate Fluid Capacities**
20. If you will replace the A/C compressor after flushing the system, perform the following procedure:
    1. DO NOT drain the new POE oil from the compressor.
    2. Deduct the amount of POE oil shipped with the service compressor from the amount of POE oil listed in the approximate fluid capacities table. Refer to **Approximate Fluid Capacities**
21. Add the calculated amount to the compressor, as needed.
22. Add one bottle of GE-41447-a leak detection dye directly to the A/C compressor.
23. Install the air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**
24. Replace the air conditioning receiver and dehydrator. Refer to **Receiver and Dehydrator Replacement (L83 L86)Receiver and Dehydrator**

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Replacement (L96)

25. Remove J 45268-121.
26. Install the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
27. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging (R1234yf)**.
28. Leak test the fittings using **GE-50078** Electronic Leak Detector.

AIR CONDITIONING COMPRESSOR OIL BALANCING

Special Tools

- **GE-50078** Infrared Refrigerant Leak Detector
- **J 45037** A/C Oil Injector

Draining Procedure

1. Remove the A/C compressor from the vehicle. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**.
2. Record the amount of oil removed from the refrigerant system during refrigerant recovery. This measurement will be used during installation of the replacement compressor.

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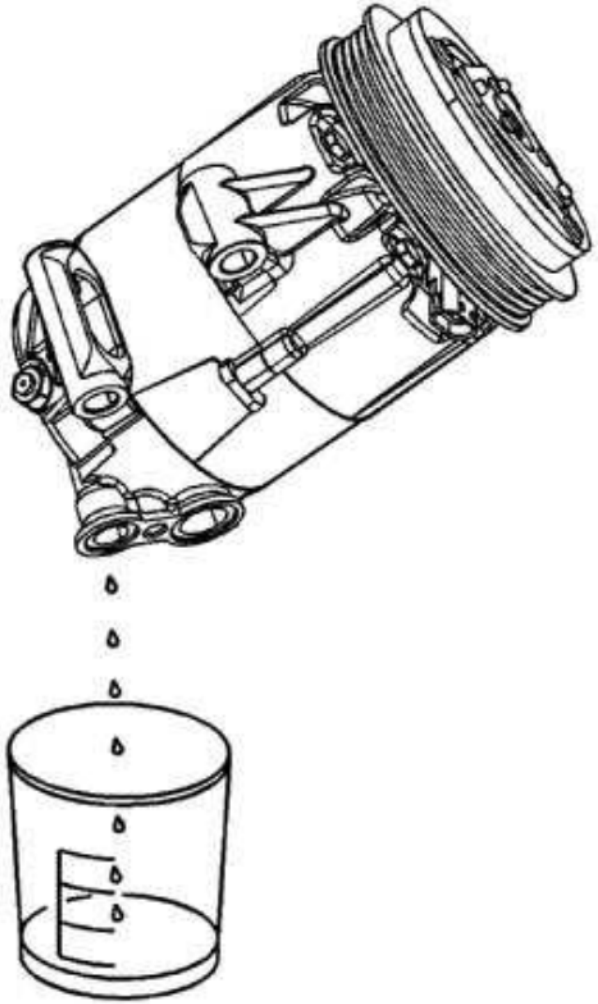


Fig. 3: Measuring Oil Drained From Removed Compressor
Courtesy of GENERAL MOTORS COMPANY

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

3. Drain the oil from both the suction and discharge ports of the removed compressor into a clean, graduated container.
4. Measure and record the amount of oil drained from the removed compressor. This measurement will be used during installation of the replacement compressor.

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NOTE: **During the oil removal procedure, the condition of the oil should be evaluated. Compressor oil never breaks down unless something is wrong with the compressor or air conditioning (A/C) system. If one or more of the following conditions exist, replace the compressor and receiver dehydrator.**

5. Inspect oil drained from the removed compressor. Refer to **Air Conditioning Compressor Oil Diagnosis**.
6. Properly discard the used PAG refrigerant oil.

Balancing Procedure with Service Compressor Replacement (Flushing Not Required)

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

The replacement compressor is shipped with 40 ml (1.4 oz) of refrigerant oil.

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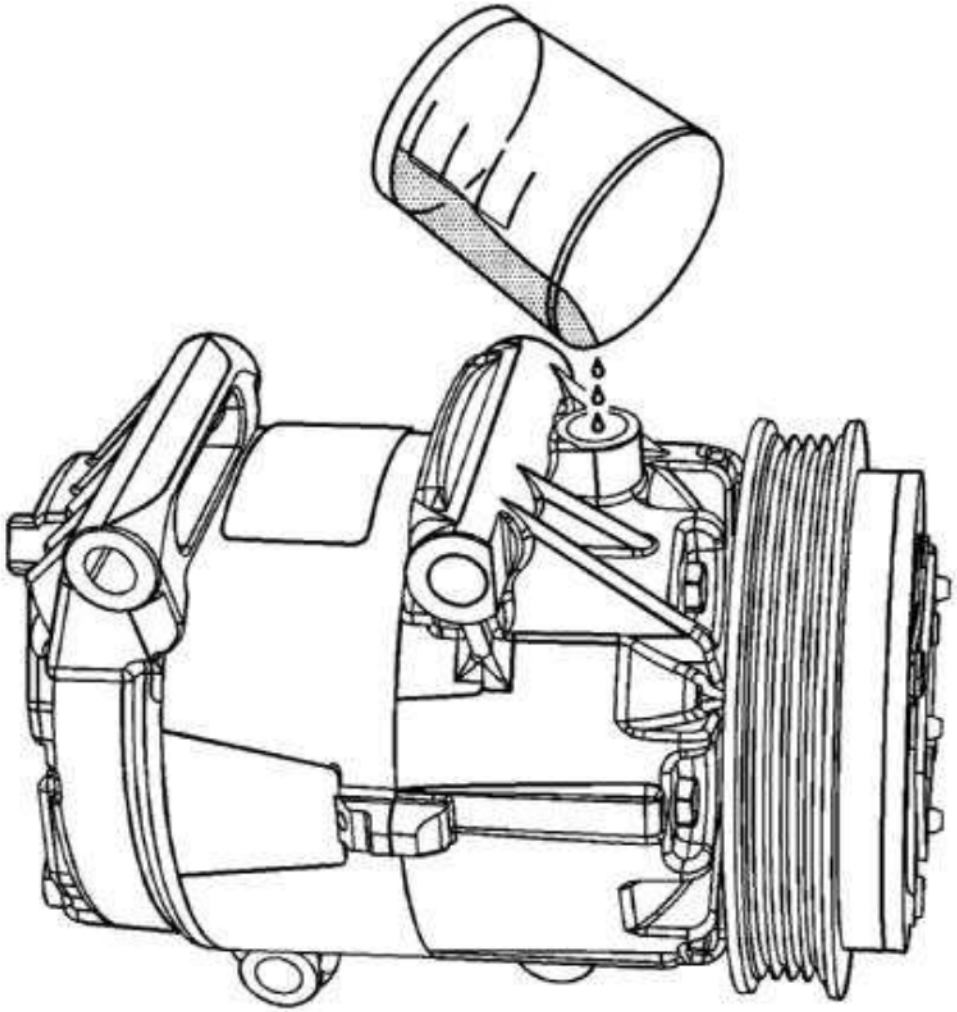


Fig. 4: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

1. Before installing the compressor, calculate the total amount of oil drained from the compressor and collected by the recovery equipment.
2. If the sum of the amount of oil drained from the removed compressor and the amount of oil removed during refrigerant recovery is:
    - LESS THAN 40 ml (1.4 ounces), no balancing is required. Install the replacement compressor as is. It contains 40 ml (1.4 ounces) of PAG oil.

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- MORE THAN 40 ml (1.4 ounces), additional oil is required. Subtract 40 ml (1.4 oz) from the sum of removed oil (oil drained + oil recovered). ADD the calculated difference to the A/C compressor or by filling the A/C system using **J 45037** injector.

Balancing Procedure with Service Compressor Replacement (Flushing Required)

1. Flush the A/C system. Flushing will remove all the oil from the A/C system. Refer to **Flushing (R-134a)Flushing (R-1234yf)**.
2. Remove the A/C compressor from the vehicle. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**.

The A/C system must be replenished with 100 ml (3.4 oz) of PAG oil.

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

The new service compressor is shipped with 40 ml (1.4 oz) of refrigerant oil. Do not drain the oil from the compressor.

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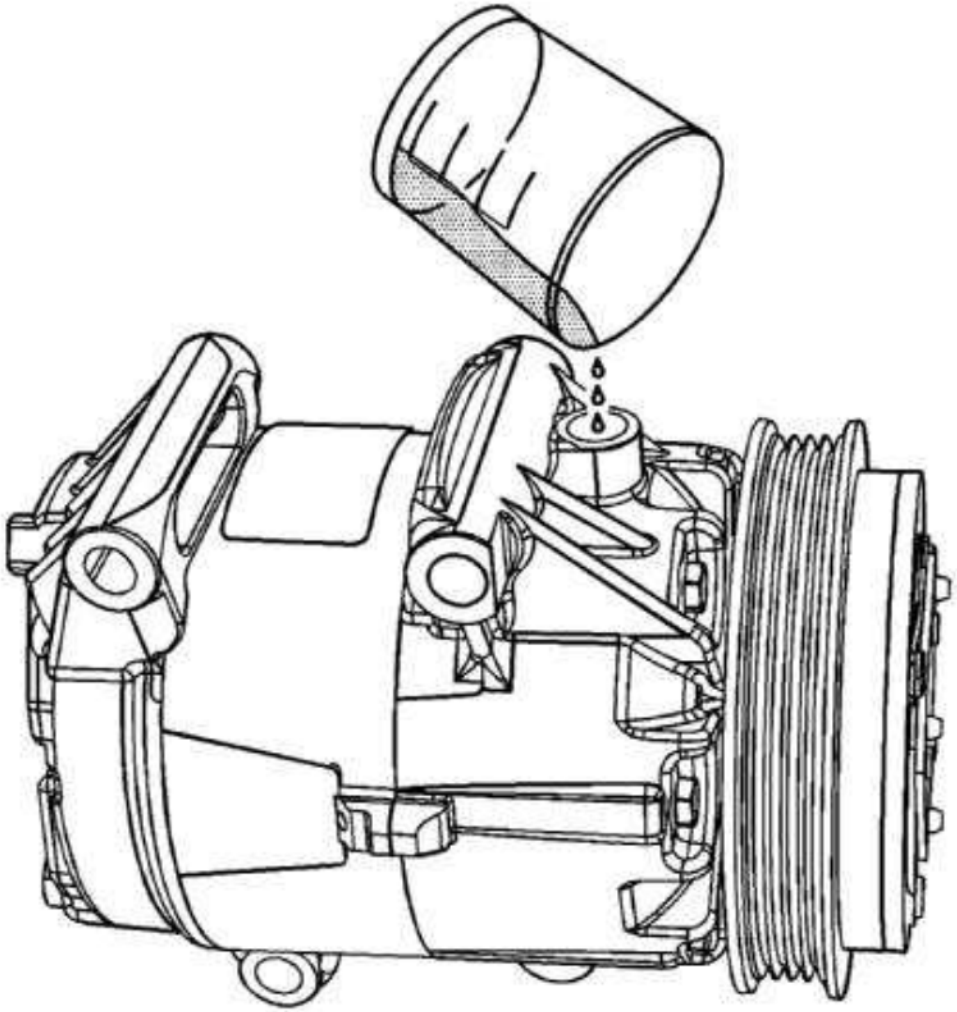


Fig. 5: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

3. Before installing the compressor, deduct the amount of oil shipped with the compressor 40 ml (1.4 oz) from the total amount of the system oil 100 ml (3.4 oz).
4. Add the calculated amount 60 ml (2.0 oz) of oil to the A/C compressor or by filling the A/C system using **J 45037** injector.

Balancing Procedure (Flushing Required Only)

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1. Flush the A/C system. Flushing will remove all the oil from the A/C system. Refer to **Flushing (R-134a)Flushing (R-1234yf)**.
2. Remove the A/C compressor from the vehicle. Refer to **Air Conditioning Compressor Replacement (L83 L86)Air Conditioning Compressor Replacement (L96)**.

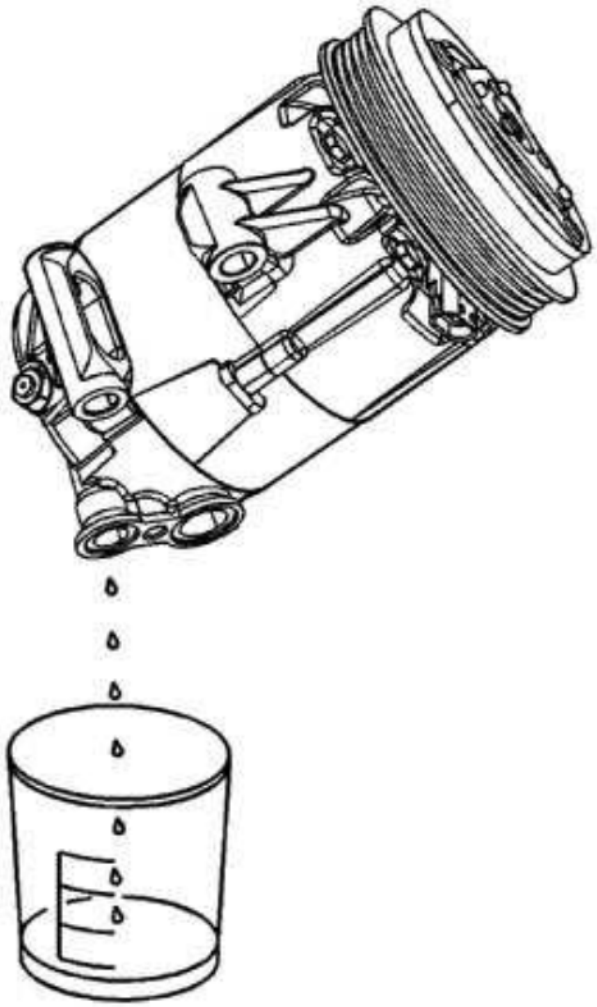


Fig. 6: Measuring Oil Drained From Removed Compressor
Courtesy of GENERAL MOTORS COMPANY

3. Drain the oil from both the suction and discharge ports of the removed compressor into a clean, graduated container.

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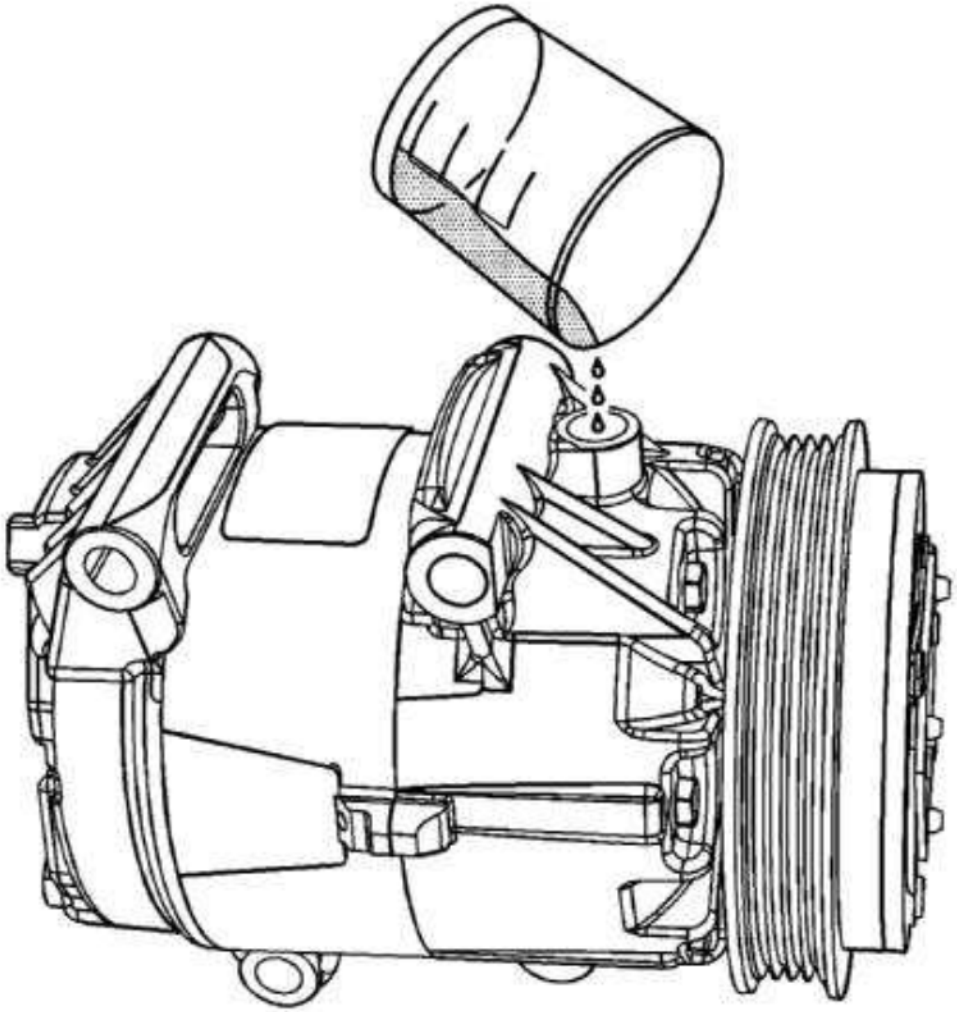


Fig. 7: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The A/C system must be replenished with PAG oil.**

4. Add the total system capacity of PAG oil 100 ml (3.4 oz) to the A/C system by filling the A/C compressor or by filling the A/C system using **J 45037** injector

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AIR CONDITIONING COMPRESSOR REPLACEMENT (L83 L86)

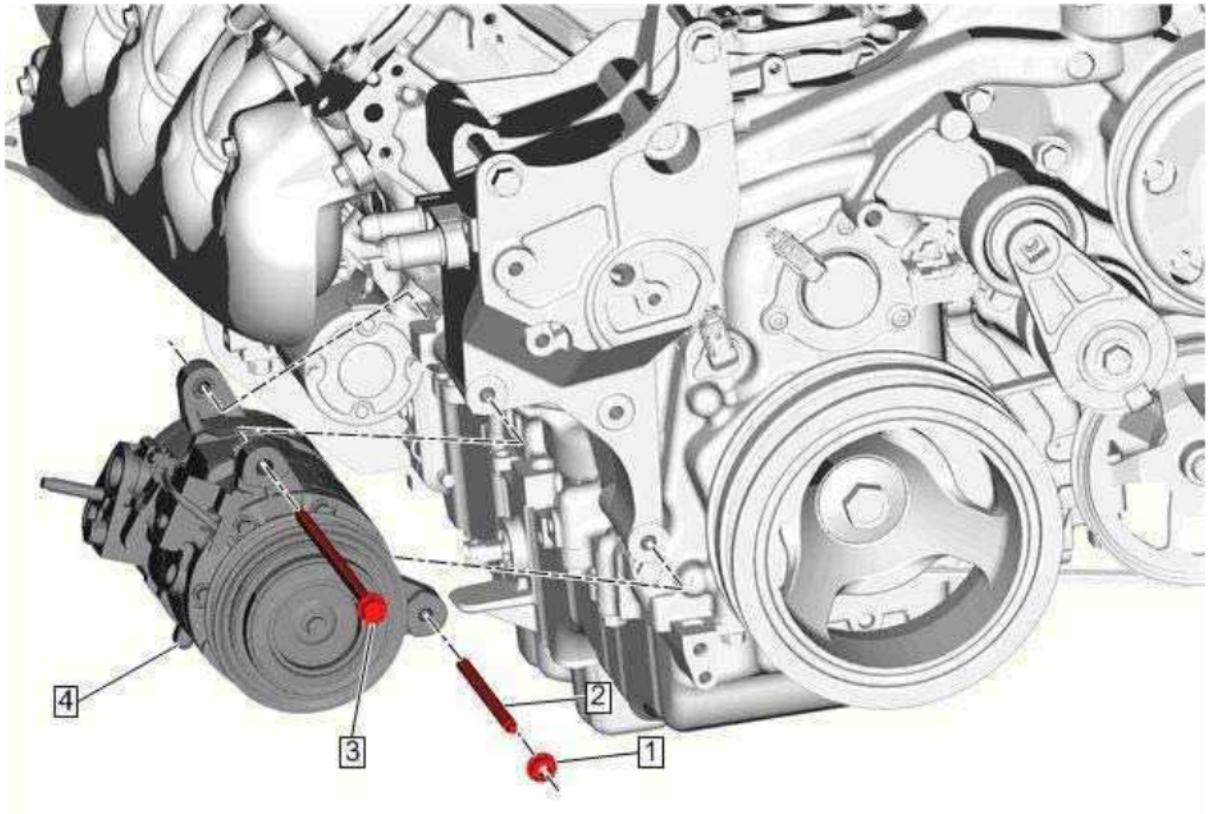


Fig. 8: Air Conditioning Compressor (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**	
2. Remove Steering Gear Skid Shield. Refer to **Steering Gear Skid Shield Replacement**	
3. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement**	
4. Remove Air Conditioning Compressor Hose @ Air Conditioning Compressor - **Air Conditioning Compressor Hose Replacement (L83 L86)**	

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Callout	Component Name
1	Air Conditioning Compressor Nut **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 22 N.m (16 lb ft)
2	Air Conditioning Compressor Stud **Tighten** 8 N.m (71 lb in)
3	Air Conditioning Compressor Bolt **Tighten** 22 N.m (16 lb ft)
4	Air Conditioning Compressor **Procedure** 1. Disconnect all electrical connectors from the air conditioning compressor. 2. When replacing the air conditioning compressor, balance compressor oil. Refer to **Air Conditioning Compressor Oil Balancing**

AIR CONDITIONING COMPRESSOR REPLACEMENT (L96)

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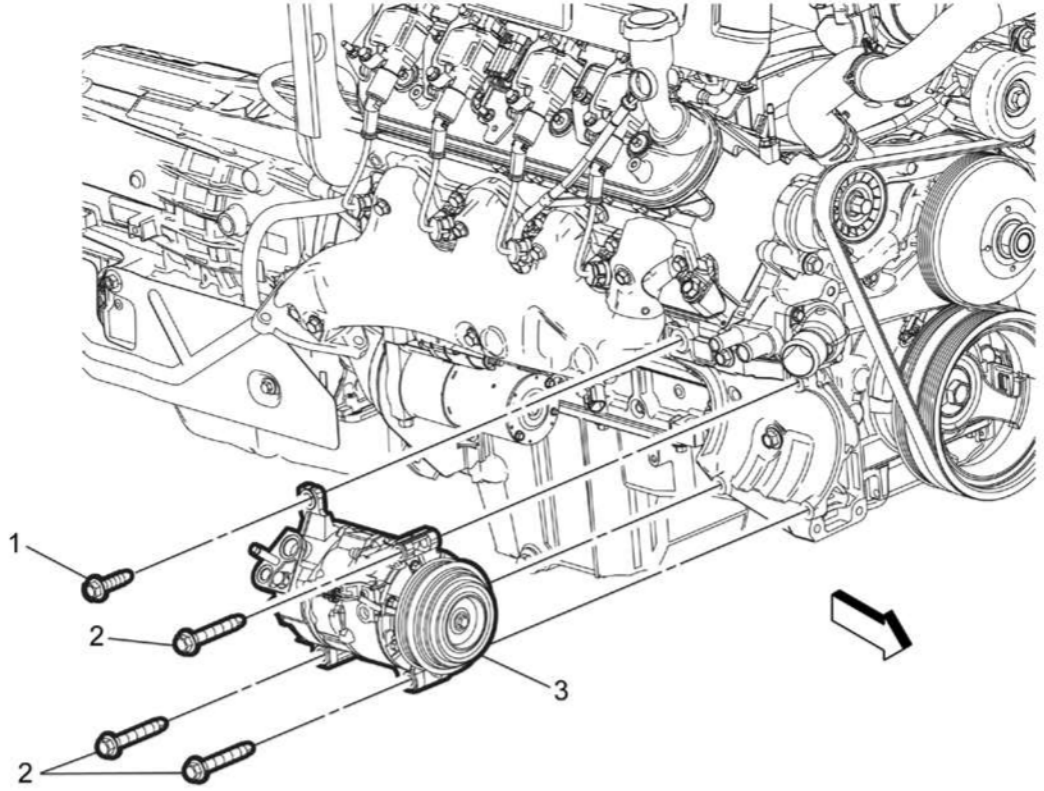


Fig. 9: Air Conditioning Compressor (L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**. 2. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement** . 3. Remove air conditioning compressor hose from the air conditioning compressor and position out of the way. Refer to **Air Conditioning Compressor Hose Replacement (L96)**.	
1	Air Conditioning Compressor Bolt **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 50 N.m (37 lb ft)
2	Air Conditioning Compressor Bolt (Qty: 3) **Tighten** 50 N.m (37 lb ft) **NOTE:** **To remove the lower rear bolt the compressor must be rotated up slightly to clear the front axle bracket nut and bolt.**
3	Air Conditioning Compressor **Procedure** 1. Disconnect electrical connector from the air conditioning (A/C) clutch coil. 2. When replacing the air conditioning compressor, balance compressor oil. Refer to **Air Conditioning Compressor Oil Balancing**.

AIR CONDITIONING CLUTCH ASSEMBLY REPLACEMENT (L83 L86)

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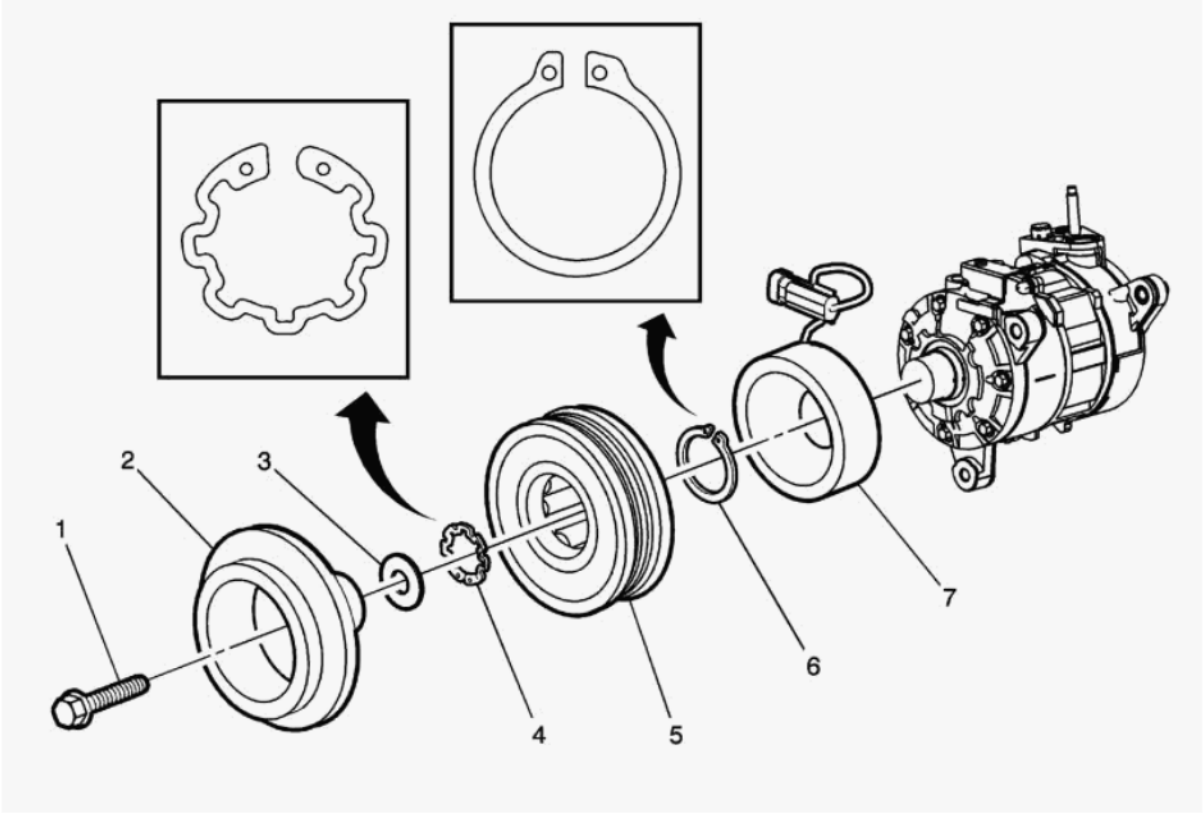


Fig. 10: Air Conditioning Clutch Assembly Replacement (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement** . 2. Remove the air conditioning compressor if necessary. Refer to **Air Conditioning Compressor Replacement (L83 L86)**. 3. Disconnect the electrical connector from the air conditioning compressor.	
1	Air Conditioning Compressor Pulley Bolt **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 18 N.m (13 lb ft)
2	Air Conditioning Clutch Drive Plate **Procedure** Measure and adjust the air conditioning compressor clutch drive plate per specification. Refer to **Air Conditioning Clutch Drive Plate Adjustment**.
3	Air Conditioning Compressor Clutch Drive Plate Adjustment Shim
4	Air Conditioning Compressor Clutch Pulley Snap Ring **Procedure** Ensure the clutch pulley snap ring is installed with the flat side toward the air compressor. Note the rounded off portion of the snap ring per illustration, will be on the right side upon proper installation.
5	Air Conditioning Compressor Clutch Pulley
6	Air Conditioning Compressor Clutch Coil Snap Ring **Procedure** Ensure the clutch coil snap ring is installed with the flat side toward the air compressor. Note the larger portion of the snap ring per illustration, will be on the right side upon proper installation.
7	Air Conditioning Compressor Clutch Coil

AIR CONDITIONING CLUTCH ASSEMBLY REPLACEMENT (L96)

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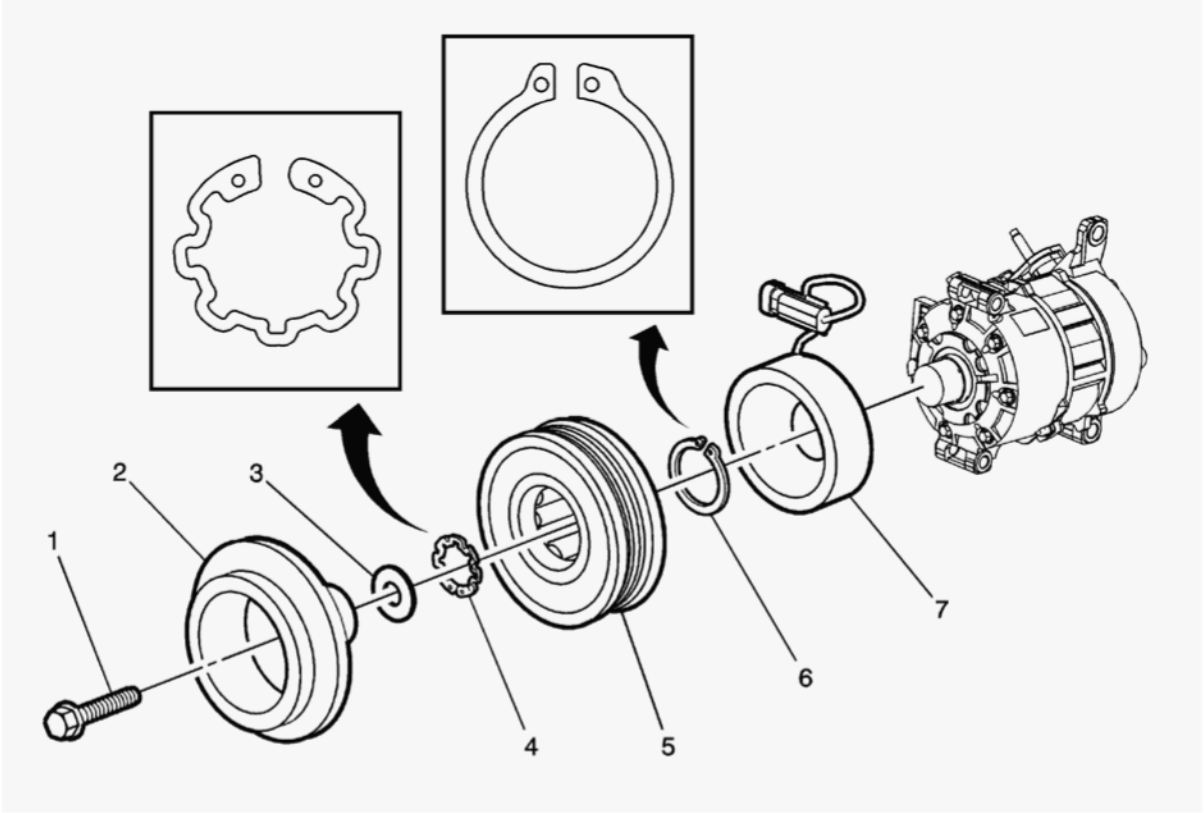


Fig. 11: Air Conditioning Clutch Assembly Replacement (L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement** . 2. Remove the air conditioning compressor if necessary. Refer to **Air Conditioning Compressor Replacement (L96)**. 3. Disconnect the electrical connector from the air conditioning compressor.	
1	Air Conditioning Compressor Pulley Bolt **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 18 N.m (13 lb ft)
2	Air Conditioning Clutch Drive Plate **Procedure** Measure and adjust the air conditioning compressor clutch drive plate per specification. Refer to **Air Conditioning Clutch Drive Plate Adjustment**.
3	Air Conditioning Compressor Clutch Drive Plate Adjustment Shim
4	Air Conditioning Compressor Clutch Pulley Snap Ring **Procedure** Ensure the clutch pulley snap ring is installed with the flat side toward the air compressor. Note the rounded off portion of the snap ring per illustration, will be on the right side upon proper installation.
5	Air Conditioning Compressor Clutch Pulley
6	Air Conditioning Compressor Clutch Coil Snap Ring **Procedure** Ensure the clutch coil snap ring is installed with the flat side toward the air compressor. Note the larger portion of the snap ring per illustration, will be on the right side upon proper installation.
7	Air Conditioning Compressor Clutch Coil

AIR CONDITIONING CLUTCH DRIVE PLATE ADJUSTMENT

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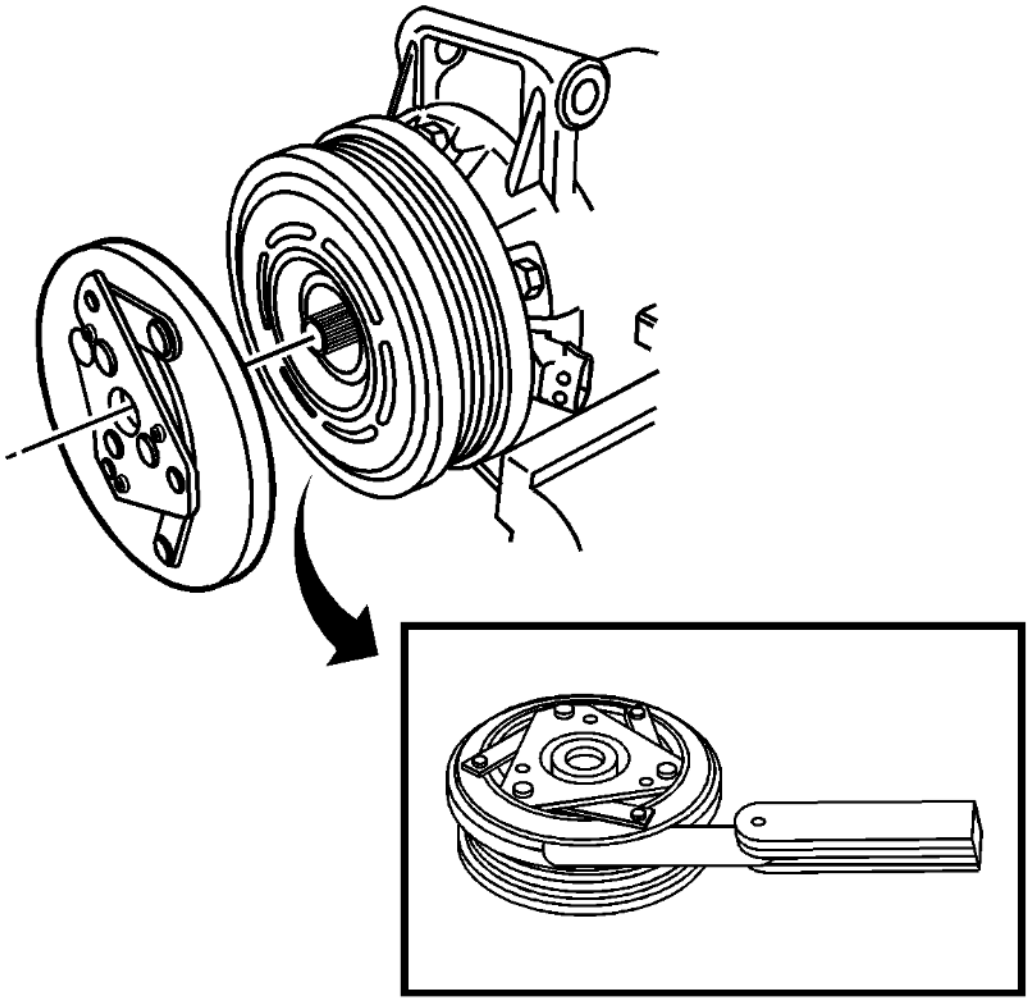


Fig. 12: Air Conditioning Clutch Drive Plate Adjustment
Courtesy of GENERAL MOTORS COMPANY

1. Install the clutch plate assembly. Refer to **Air Conditioning Clutch Assembly Replacement (L83 L86)Air Conditioning Clutch Assembly Replacement (L96)**.

NOTE: **Ensure the drive plate does not drag against the pulley when the pulley is rotated.**

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2. Measure the air gap between the pulley and the drive plate. Adjust the shims to achieve a 0.4-0.70 mm (0.015-0.028 in) air gap.

CAUTION: **Refer to Fastener Caution .**

3. Install the clutch plate retaining bolt and tighten to 18 N.m (13 lb ft).

AIR CONDITIONING COMPRESSOR BRACKET REPLACEMENT (L96)

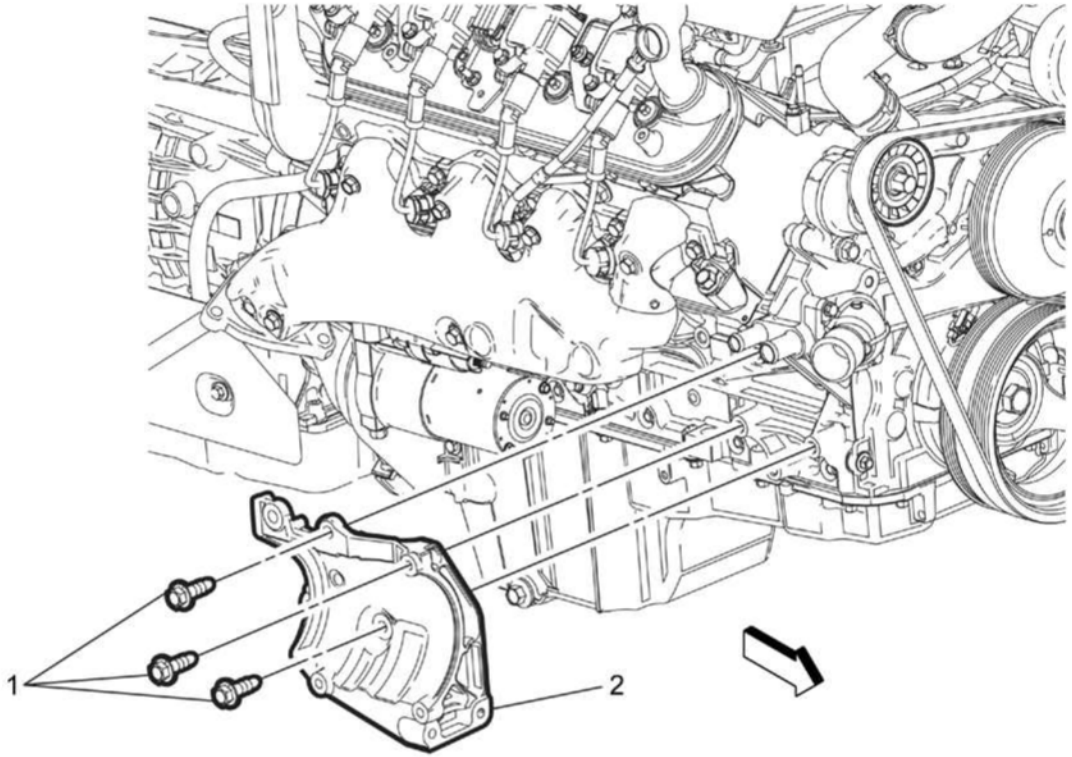


Fig. 13: Air Conditioning Compressor Bracket (L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.	

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Callout	Component Name
2. Remove air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L96)**.	
1	Air Conditioning Compressor Bracket Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 50 N.m (37 lb ft)
2	Air Conditioning Compressor Bracket

AIR CONDITIONING SYSTEM SEAL REPLACEMENT

Removal Procedure

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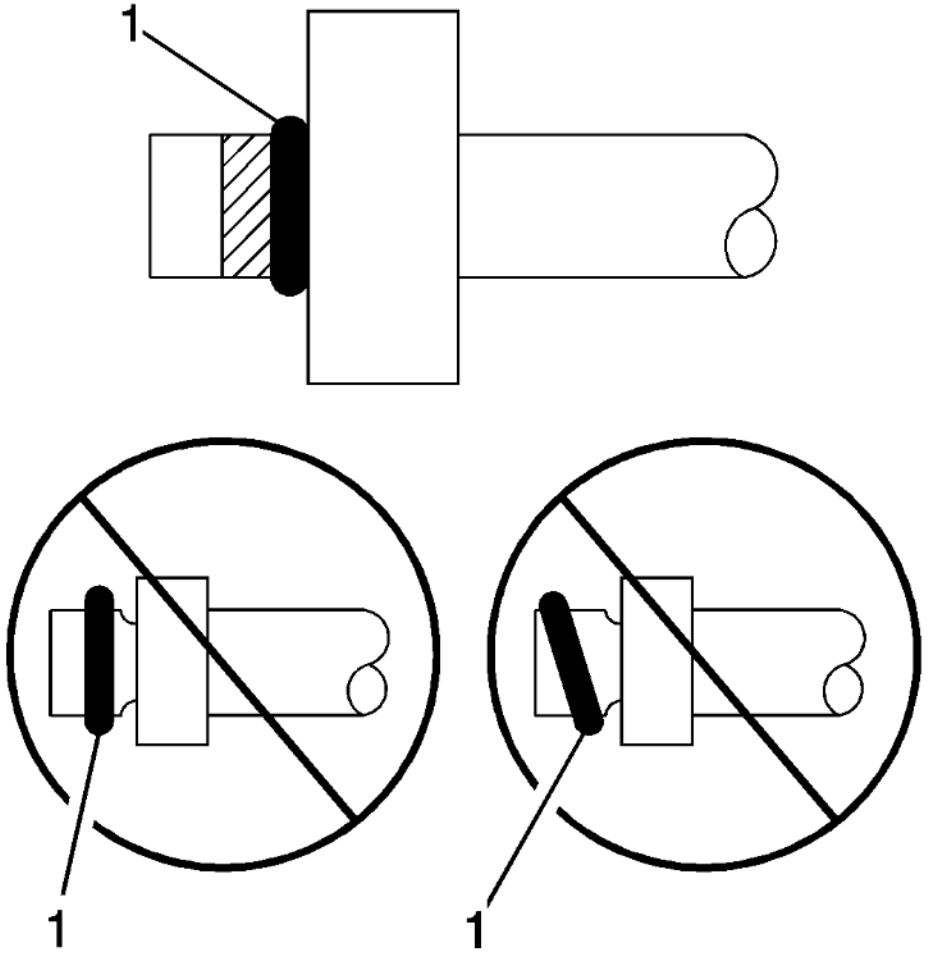


Fig. 14: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS COMPANY

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.

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3. Inspect the A/C refrigerant components for damage or burrs. Repair if necessary.

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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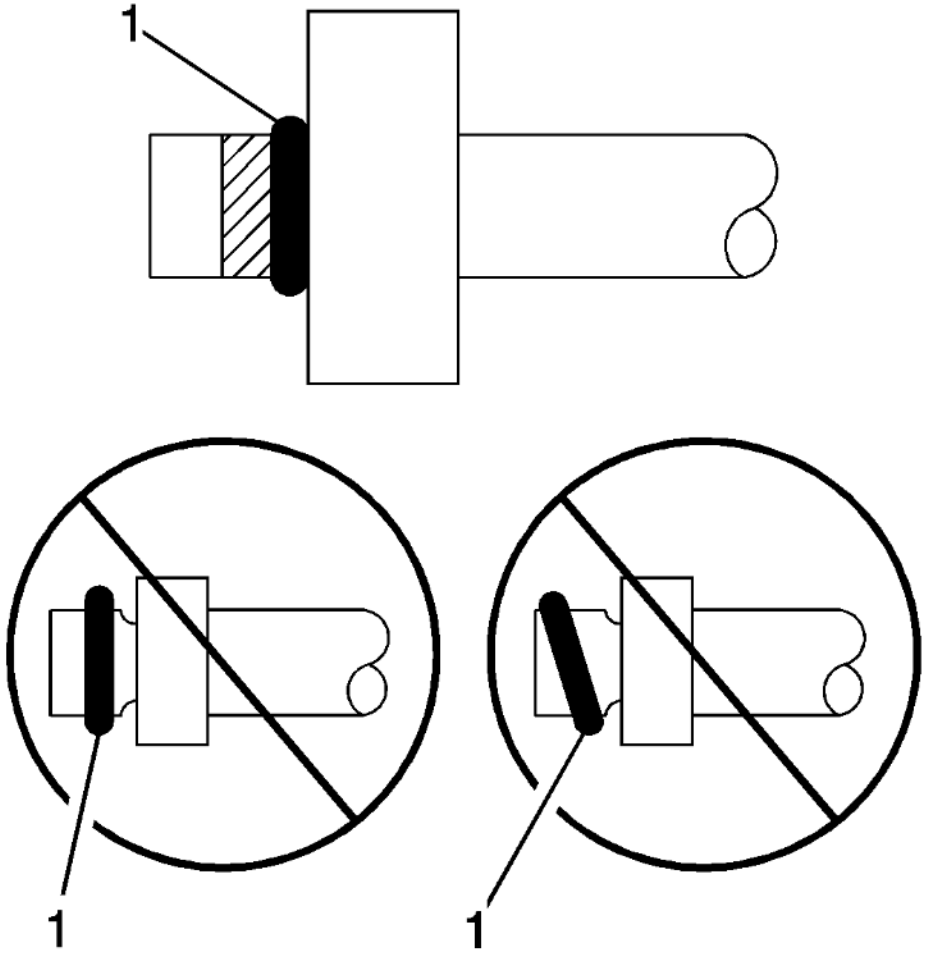


Fig. 15: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS COMPANY

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.

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

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

AIR CONDITIONING O-RING SEAL REPLACEMENT

Removal Procedure

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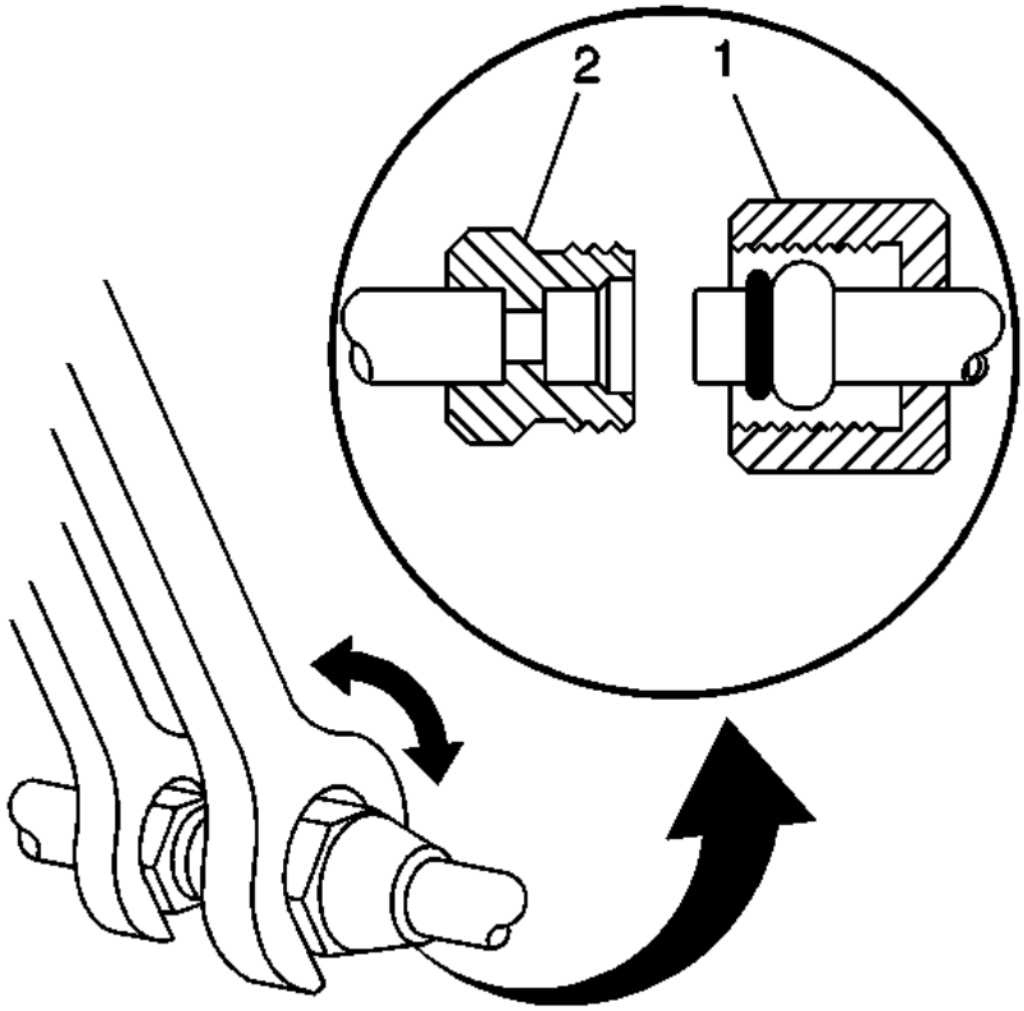


Fig. 16: A/C Compression Style Line Fittings
Courtesy of GENERAL MOTORS COMPANY

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.

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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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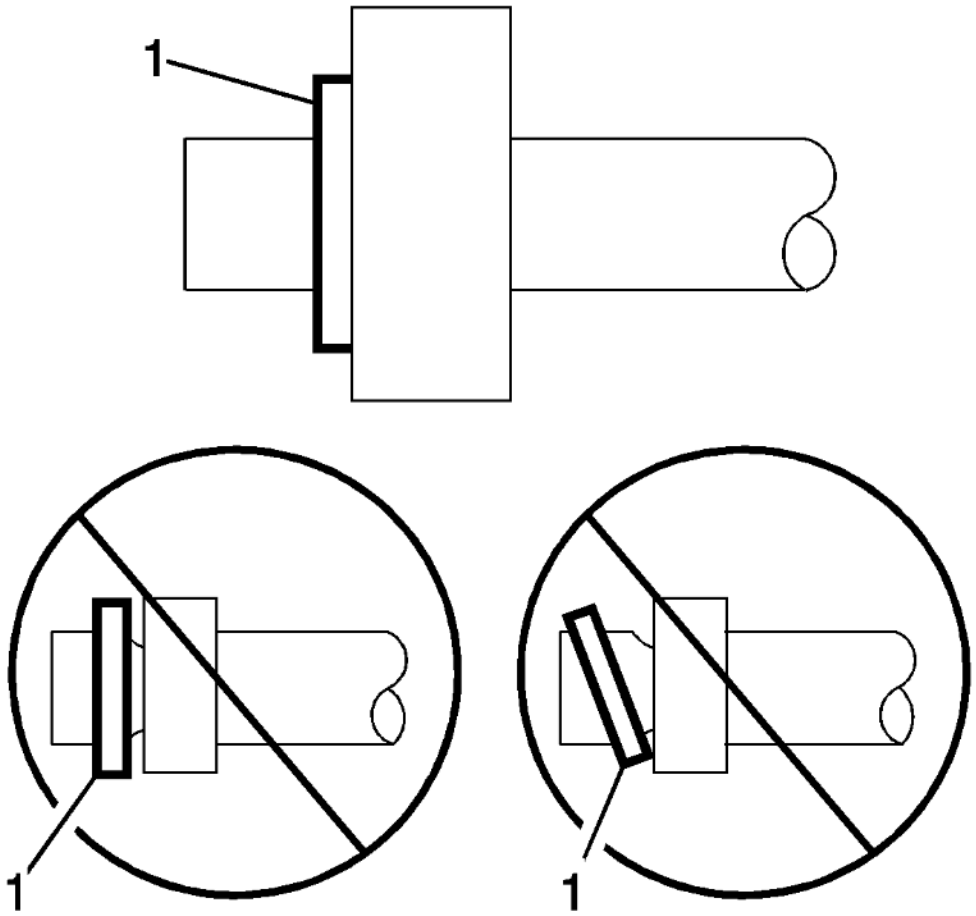


Fig. 17: Proper Seating Of A/C Refrigerant O-Ring
Courtesy of GENERAL MOTORS COMPANY

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

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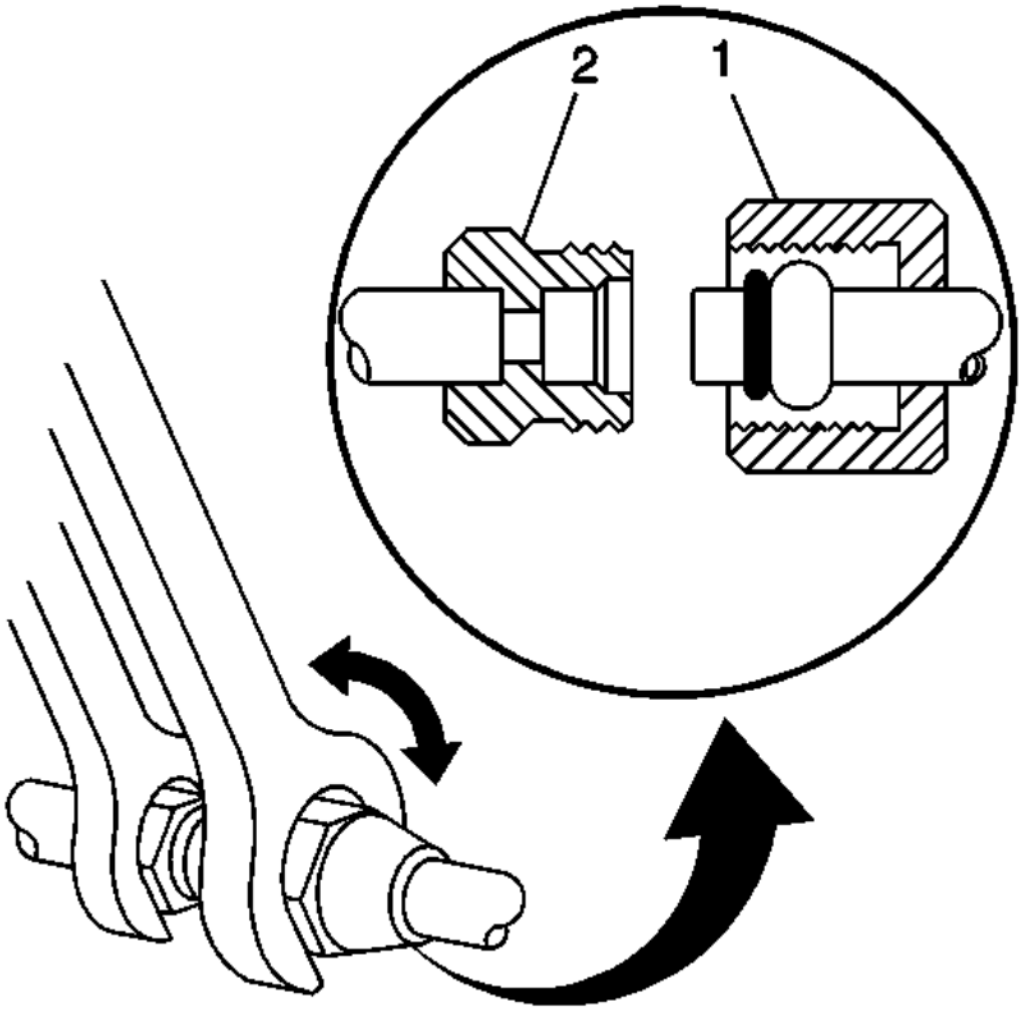


Fig. 18: A/C Compression Style Line Fittings
Courtesy of GENERAL MOTORS COMPANY

7. Assemble the A/C components.

   Refer to the appropriate repair procedure.

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- 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 specification.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L83 L86)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC)** **Air Cleaner Outlet Duct Replacement (Cadillac)** .
3. Remove the air conditioning condenser hose from the compressor and position out of the way. Refer to **Air Conditioning Condenser Hose Replacement (L83 L86)**.
4. Remove the auxiliary air conditioning evaporator hose from the air conditioning compressor hose and position out of the way. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.

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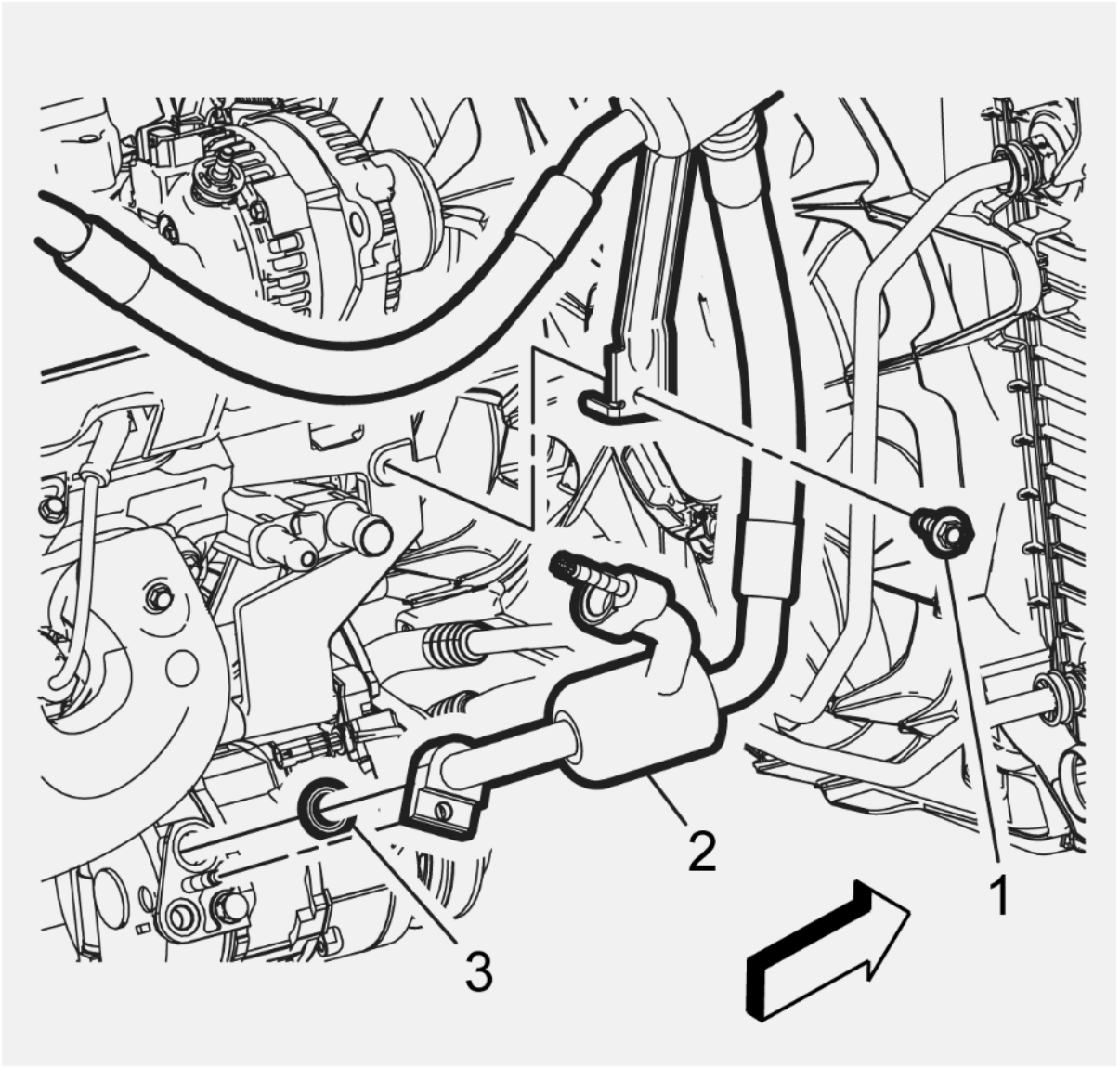


Fig. 19: Air Conditioning Tube Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Remove the air conditioning tube bracket bolt (1) from the generator and drive belt tensioner bracket.
6. Remove the air conditioning compressor hose (2) from the air conditioning compressor.
7. Remove and discard the old sealing washer (3) from the air conditioning compressor hose (2).

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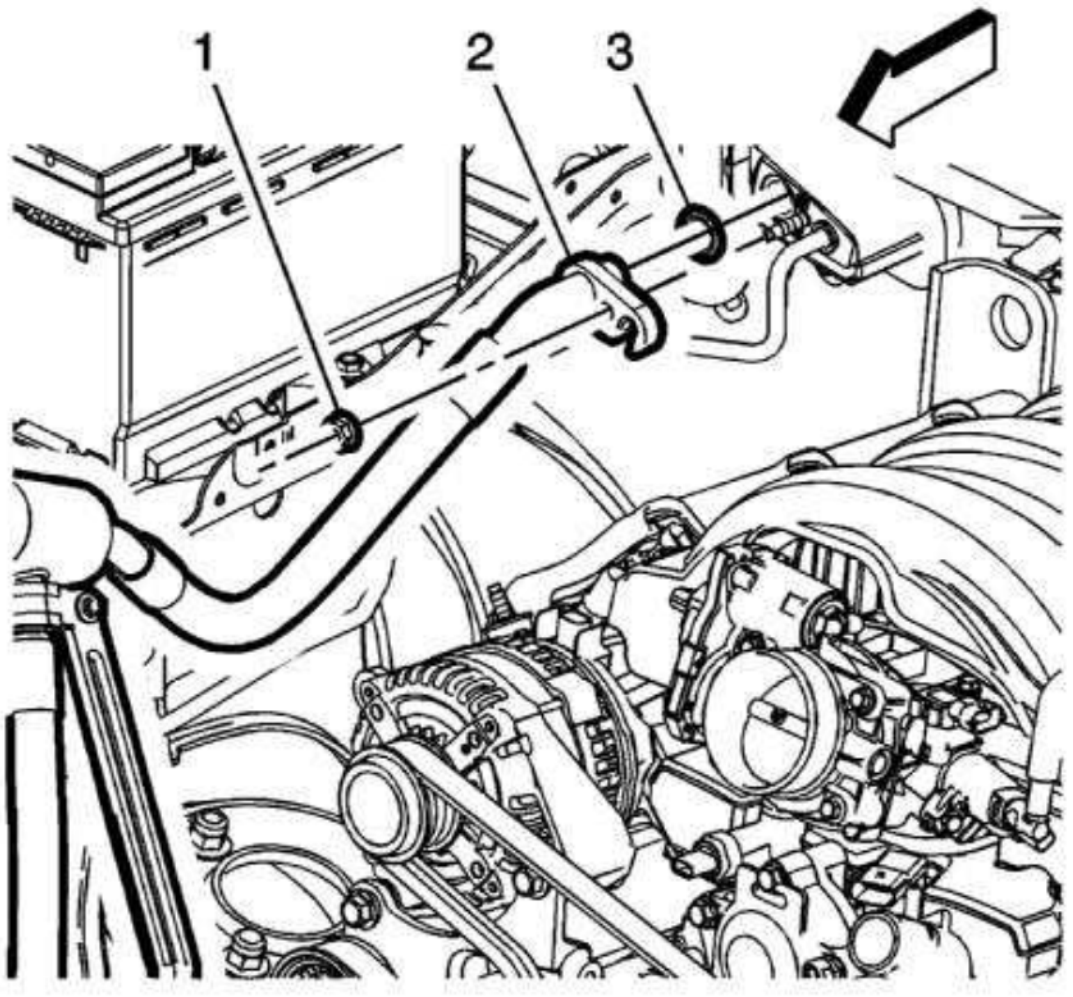


Fig. 20: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

8. Remove the air conditioning compressor hose nut (1) from the air conditioning evaporator thermal expansion valve.
9. Remove the air conditioning compressor hose (2) from the air conditioning evaporator thermal expansion valve.
10. Remove and discard the old sealing washer (3) from the air conditioning compressor hose (2).

Installation Procedure

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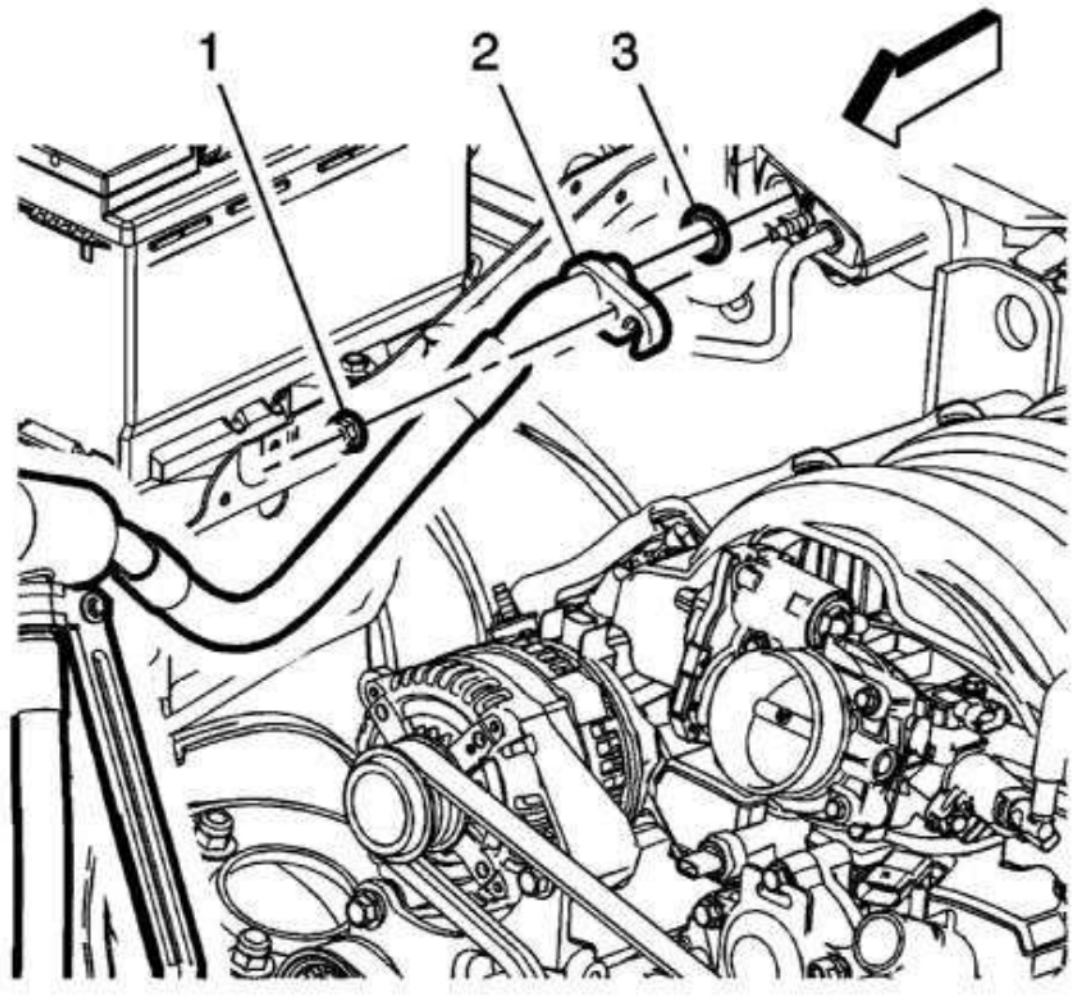


Fig. 21: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

1. Install NEW sealing washer (3) to the air conditioning compressor hose (2). Refer to **Air Conditioning System Seal Replacement**.
2. Install the air conditioning compressor hose (2) to the vehicle.
3. Install the air conditioning compressor hose (2) to the air conditioning evaporator thermal expansion valve.

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CAUTION: **Refer to Fastener Caution .**

4. Install the air conditioning compressor hose nut (1) to the air conditioning evaporator thermal expansion valve and tighten to 22 N.m (16 lb ft).

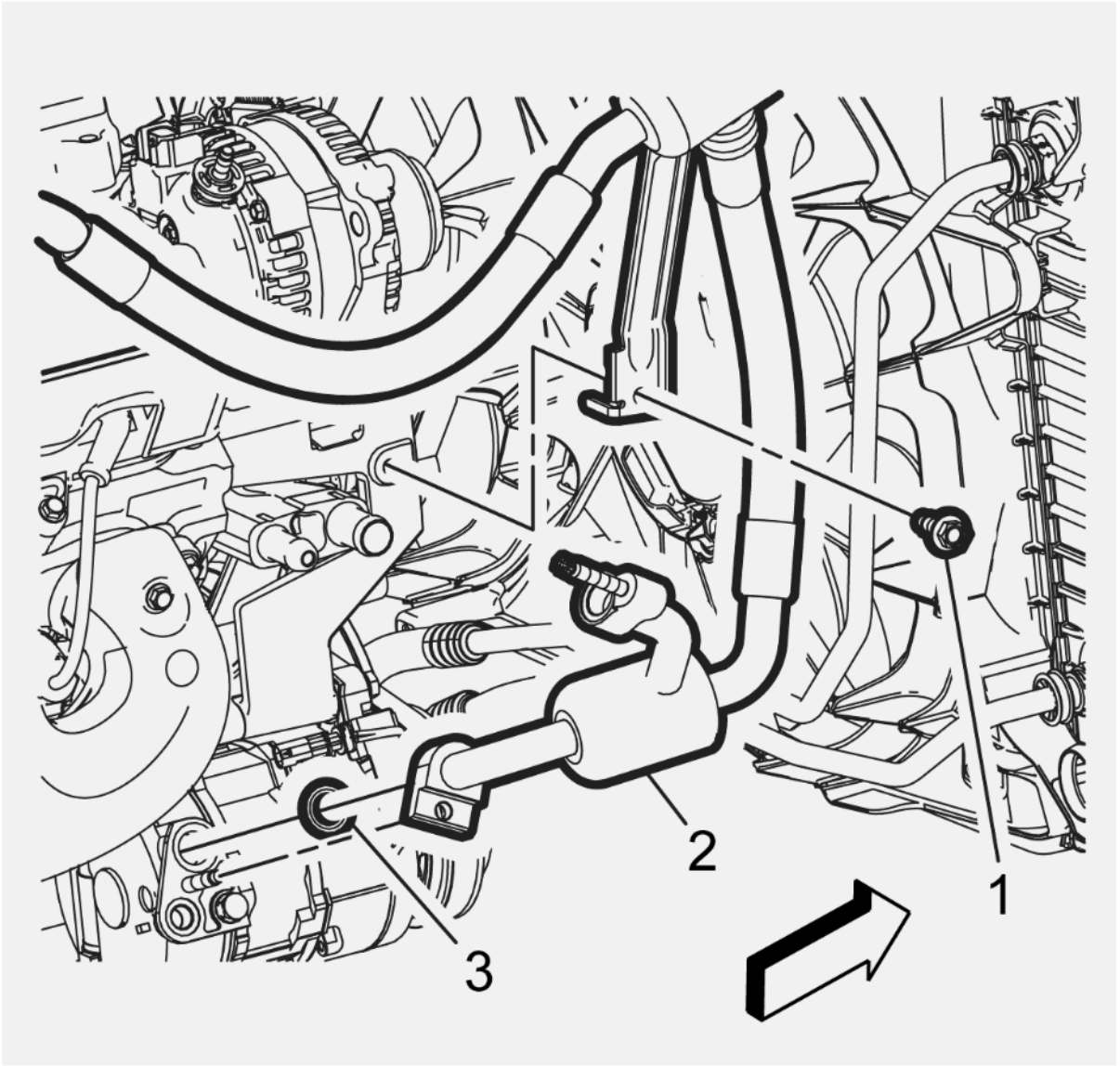


Fig. 22: Air Conditioning Tube Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

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5. Install NEW sealing washer (3) to the air conditioning compressor hose (2).
6. Install the air conditioning compressor hose (2) to the air conditioning compressor.
7. Install the air conditioning condenser hose. Refer to **Air Conditioning Condenser Hose Replacement (L83 L86)**.
8. Install the auxiliary air conditioning evaporator hose to the air conditioning compressor. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
9. Install the air conditioning tube bracket bolt (1) to the generator and drive belt tensioner bracket and tighten to 22 N.m (16 lb ft).
10. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC)** **Air Cleaner Outlet Duct Replacement (Cadillac)** .
11. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L96)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
2. Remove the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**
3. Remove the air conditioning condenser hose from the compressor and position out of the way. Refer to **Air Conditioning Condenser Hose Replacement (L96)**

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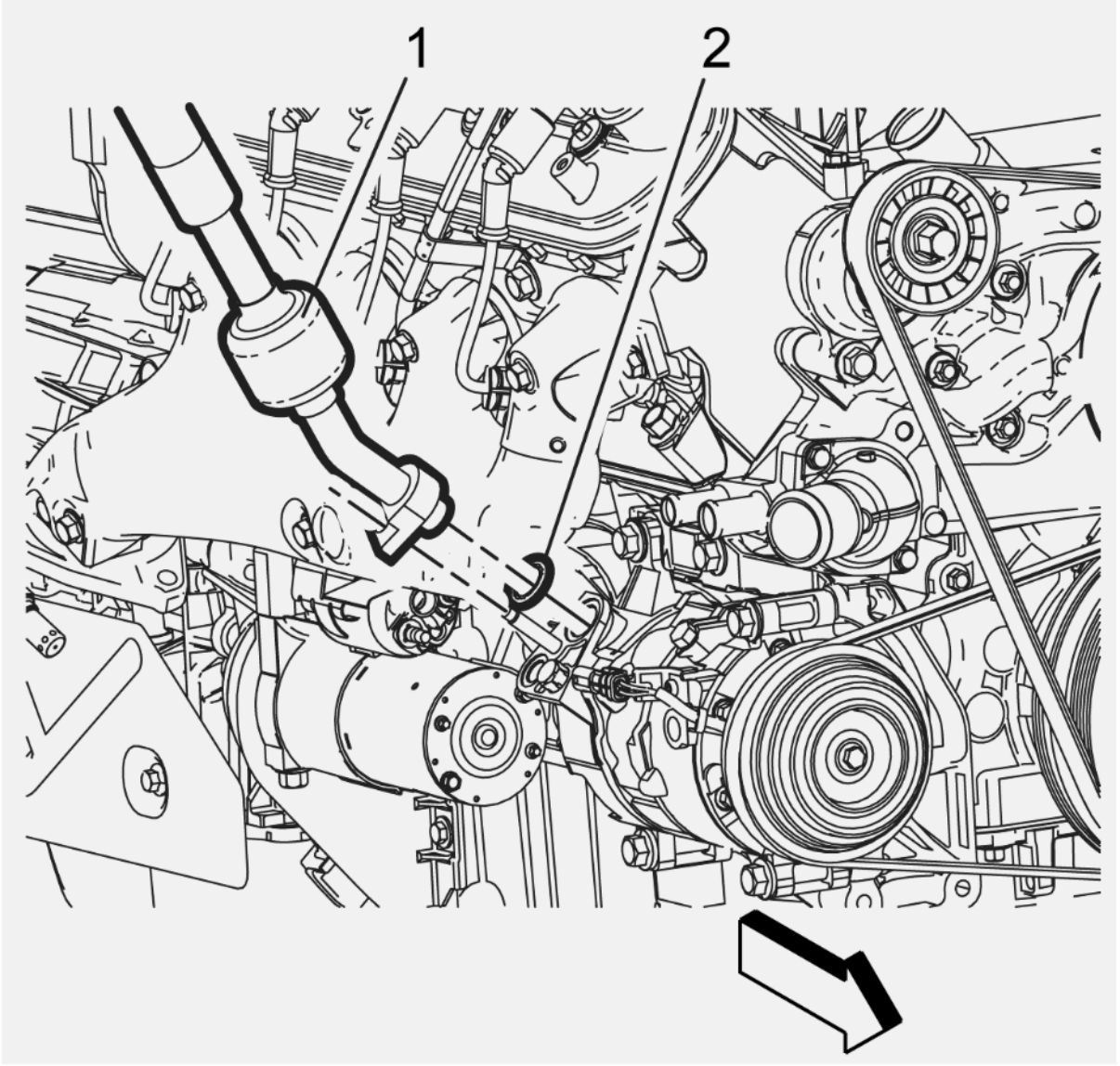


Fig. 23: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

4. Remove the air conditioning compressor hose (1) from the air conditioning compressor.
5. Remove and discard the old sealing washer (2) from the air conditioning compressor hose (2).

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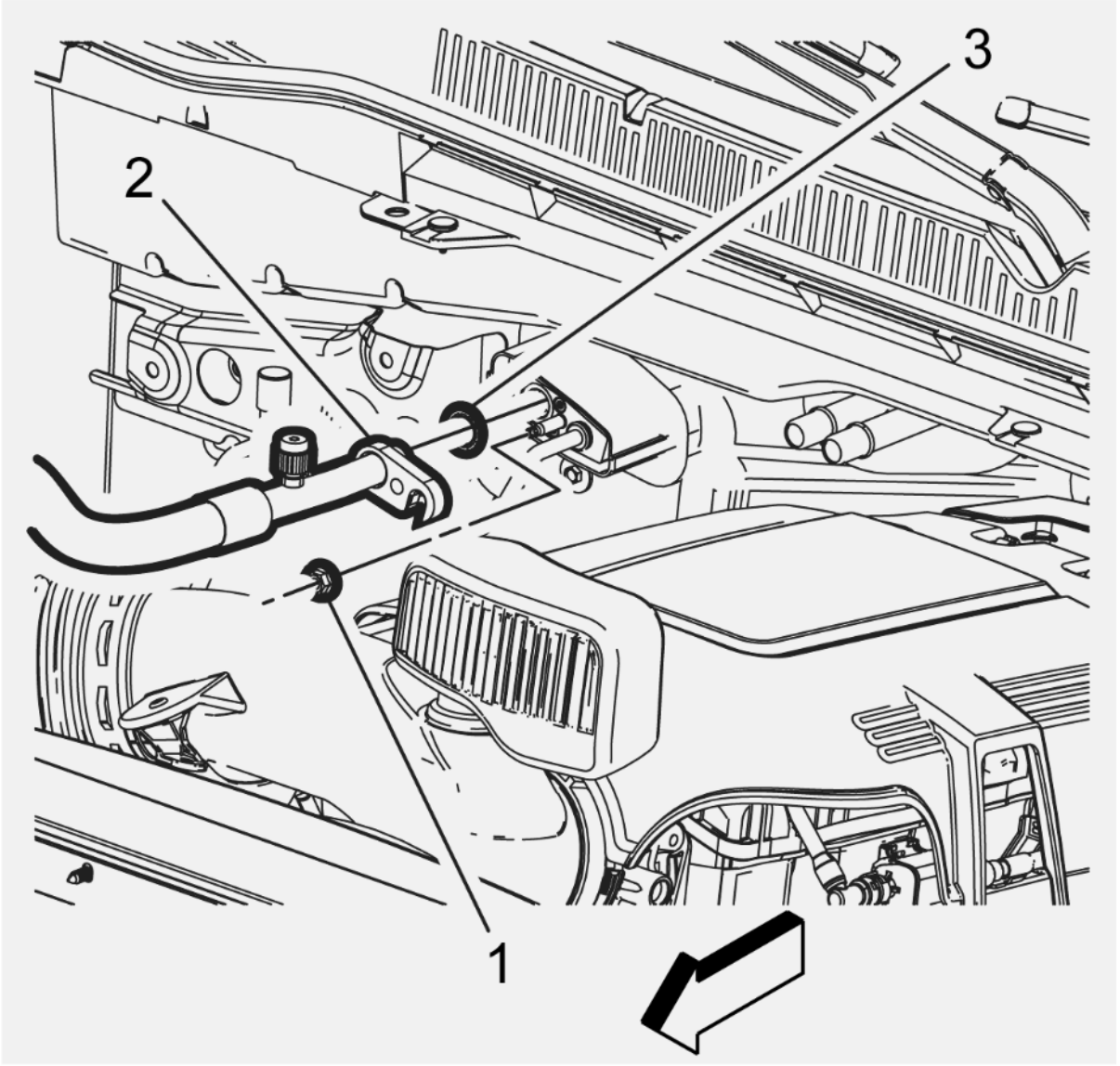


Fig. 24: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

6. Remove the air conditioning compressor hose nut (1) from the air conditioning evaporator thermal expansion valve.
7. Remove the air conditioning compressor hose (2) from the air conditioning evaporator thermal expansion valve.
8. Remove and discard the old sealing washer (3) from the air conditioning compressor hose (2).

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Installation Procedure

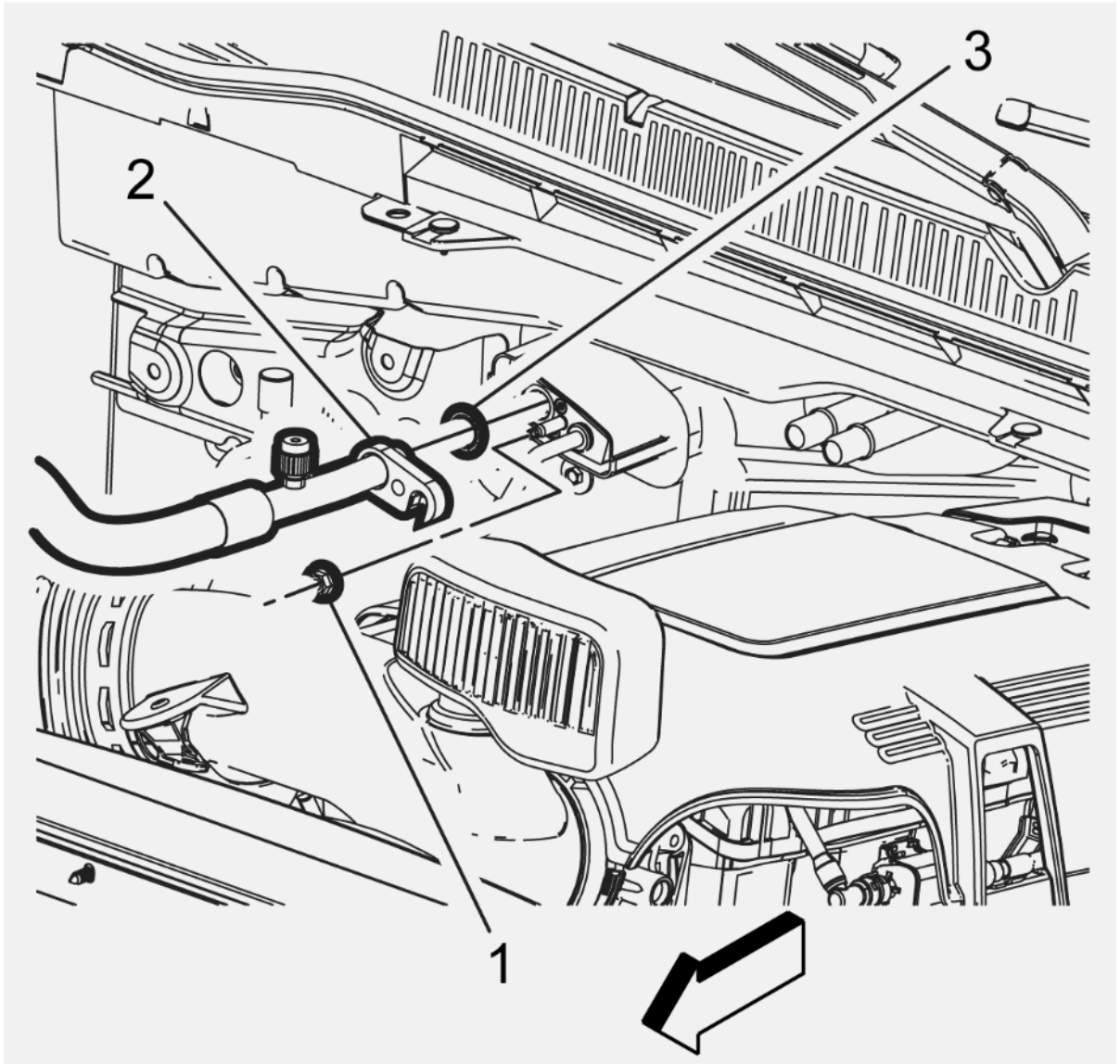


Fig. 25: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

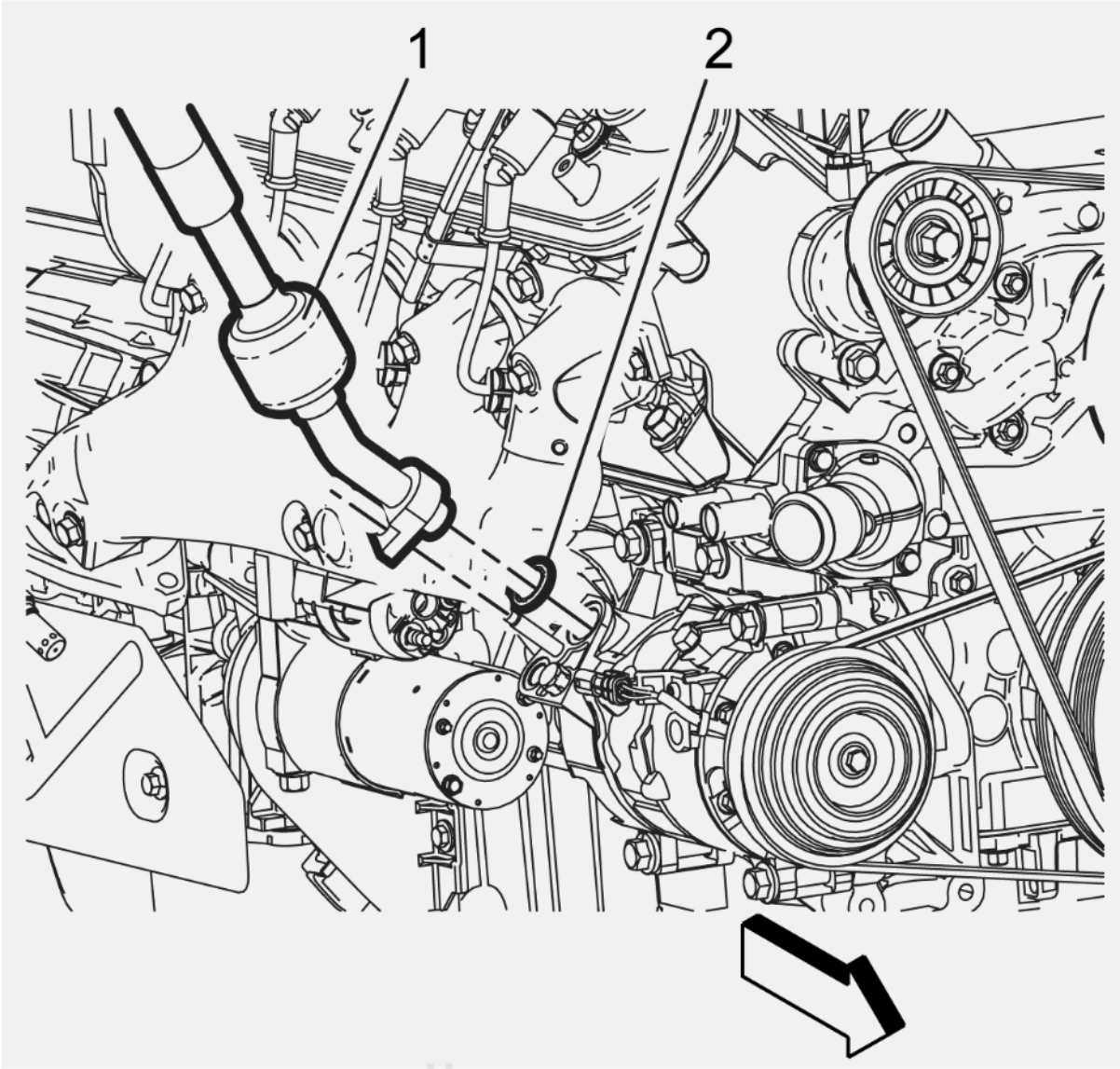
1. Install NEW sealing washer (3) to the air conditioning compressor hose (2). Refer to **Air Conditioning System Seal Replacement**

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2. Install the air conditioning compressor hose (2) to the vehicle.
3. Install the air conditioning compressor hose (2) to the air conditioning evaporator thermal expansion valve.

CAUTION: Refer to Fastener Caution .

4. Install the air conditioning compressor hose nut (1) to the air conditioning evaporator thermal expansion valve and tighten to 22 N.m (16 lb ft).



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Fig. 26: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

5. Install NEW sealing washer (3) to the air conditioning compressor hose (1).
6. Install the air conditioning compressor hose (2) to the air conditioning compressor.
7. Install the air conditioning condenser hose. Refer to **Air Conditioning Condenser Hose Replacement (L96)**
8. Install the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**

AIR CONDITIONING CONDENSER HOSE REPLACEMENT (L83 L86)

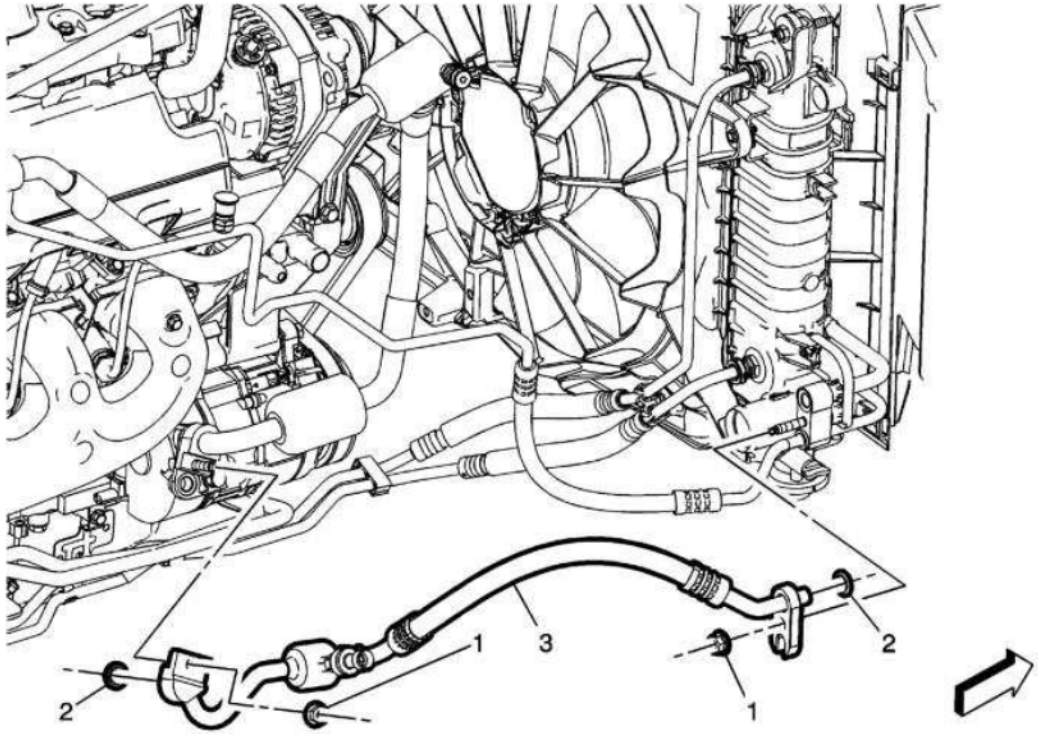


Fig. 27: Air Conditioning Condenser Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)** 2. Remove Air Cleaner Assembly. Refer to **Air Cleaner Assembly Replacement** 3. Disconnect the electrical connector.	
1	Air Conditioning Condenser Hose Nut (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 22 N.m (16 lb ft)
2	Sealing Washer (Qty: 2) **Procedure** Remove and discard old sealing washers and replace with NEW sealing washers. Refer to **Air Conditioning System Seal Replacement**
3	Air Conditioning Condenser Hose **Procedure** If replacing the air conditioning compressor hose, transfer the air conditioning refrigerant pressure sensor. Refer to **Air Conditioning (A/C) Refrigerant Pressure Sensor Replacement (L83 L86)**

AIR CONDITIONING CONDENSER HOSE REPLACEMENT (L96)

Removal Procedure

1. Recover refrigerant. **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
2. Remove the air cleaner resonator outlet duct. **Air Cleaner Resonator Outlet Duct Replacement**

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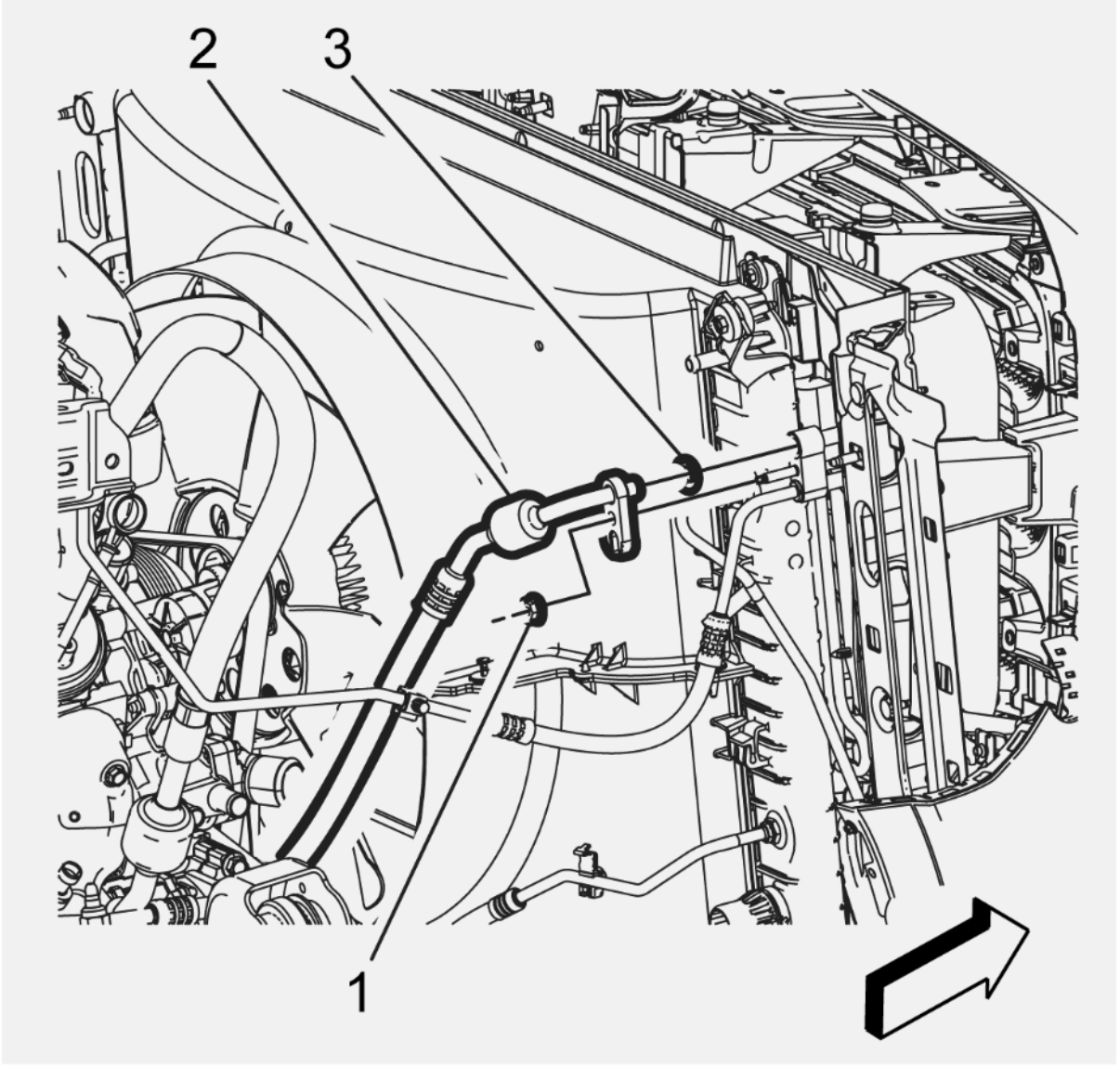


Fig. 28: Air Conditioning Compressor Hose From Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

3. Remove the air conditioning condenser hose nut (1) from the air conditioning condenser.
4. Remove the air conditioning condenser hose (2) from the air conditioning condenser.
5. Remove and discard the old sealing washer (3) from the air conditioning compressor hose (2).

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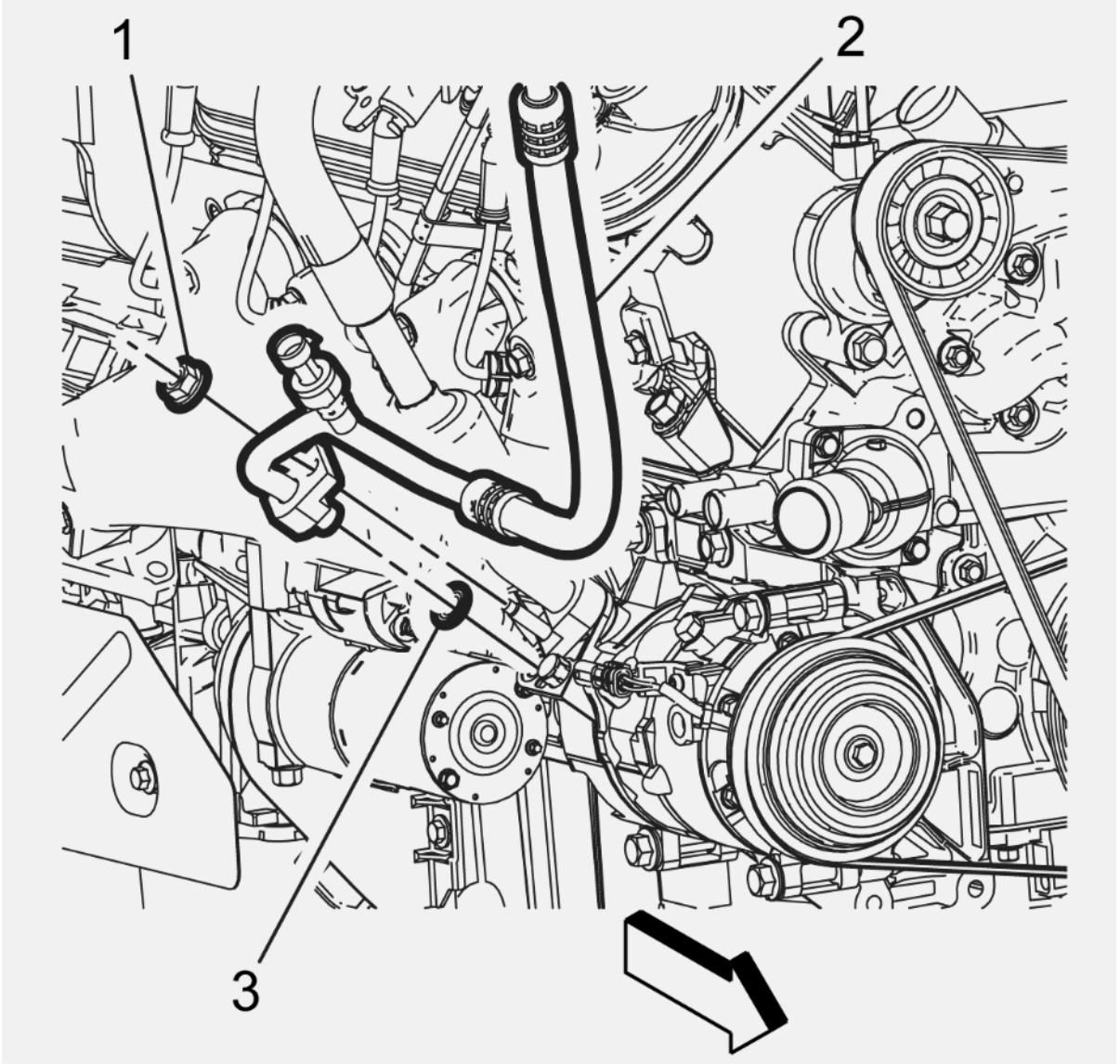


Fig. 29: Air Conditioning Compressor Hose From Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

6. Remove the air conditioning condenser hose nut (1) from the air conditioning compressor.
7. Remove the air conditioning condenser hose (2) from the air conditioning compressor.
8. Remove and discard the old sealing washer (3) from the air conditioning compressor hose (2).

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Installation Procedure

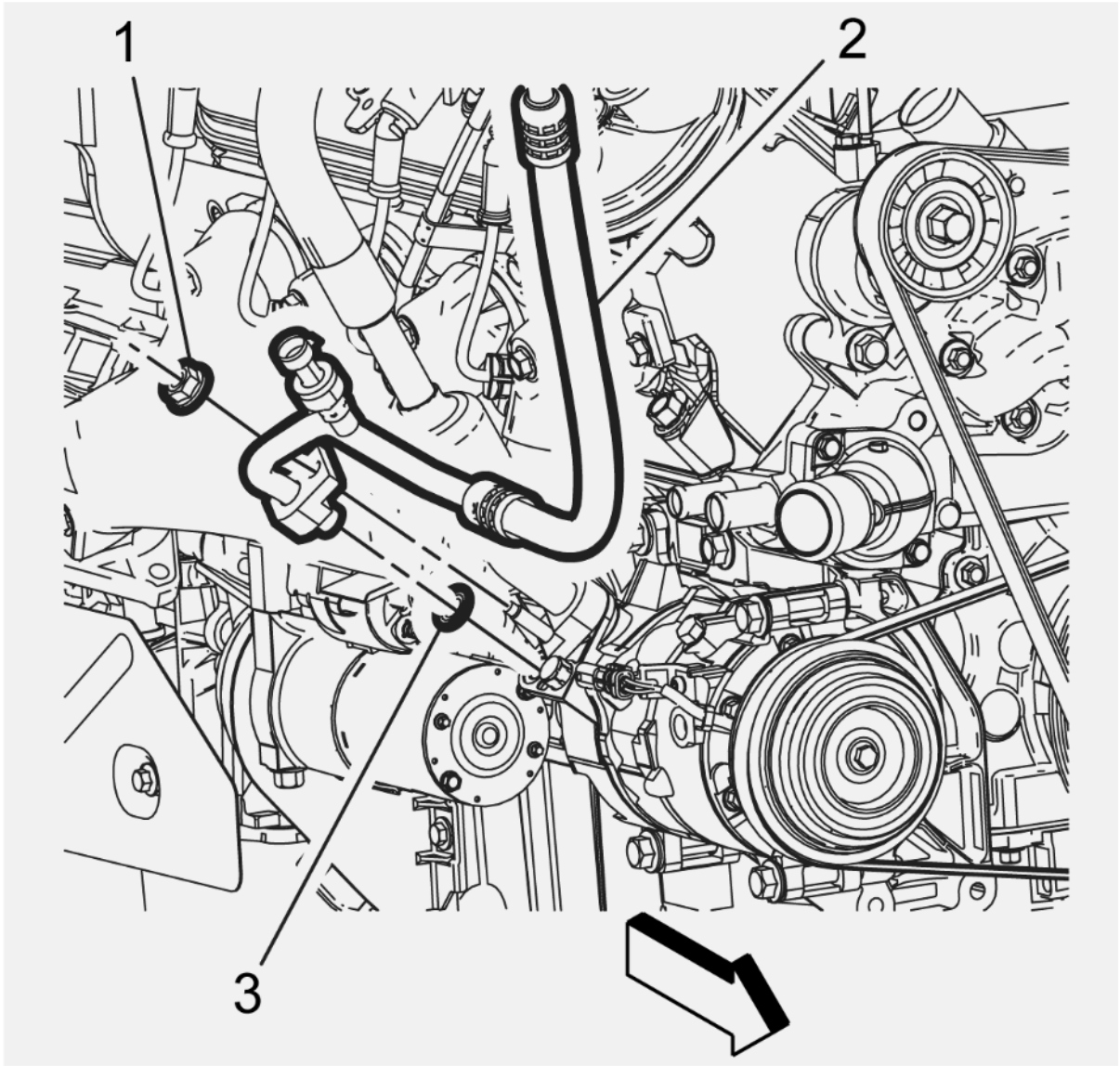


Fig. 30: Air Conditioning Compressor Hose To Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

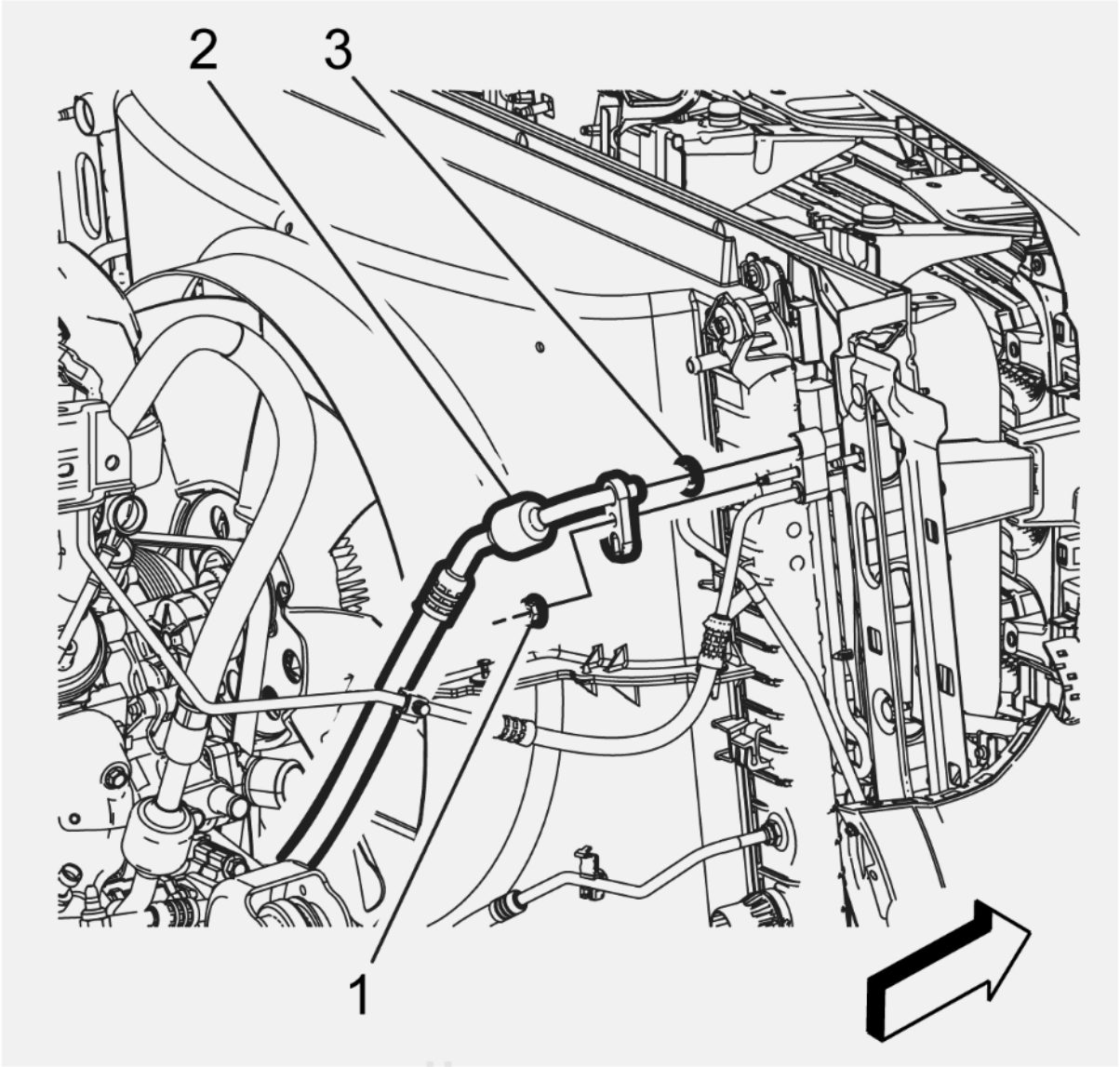
1. Install NEW sealing washer (3) to the air conditioning condenser hose (2). Refer to **Air Conditioning System Seal Replacement**

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2. Install the air conditioning condenser hose (2) to the vehicle.
3. Install the air conditioning condenser hose (2) to the air conditioning compressor.

CAUTION: **Fastener Caution** .

4. Install the air conditioning condenser hose nut (1) to the air conditioning compressor and tighten to 22 N.m (16 lb ft).



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Fig. 31: Air Conditioning Compressor Hose To Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

5. Install NEW sealing washer (3) to the air conditioning condenser hose (2).
6. Install the air conditioning condenser hose (2) to the air conditioning condenser.
7. Install the air conditioning condenser hose nut (1) to the air conditioning condenser and tighten to 22 N.m (16 lb ft).
8. Install the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L83 L86)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC)** **Air Cleaner Outlet Duct Replacement (Cadillac)** .
3. Remove the air conditioning compressor hose from the air conditioning evaporator thermal expansion valve and position out of the way. Refer to **Air Conditioning Compressor Hose Replacement (L83 L86)**.
4. Remove the air conditioning condenser hose from the air conditioning condenser and position out of the way. Refer to **Air Conditioning Condenser Hose Replacement (L83 L86)**.
5. Remove the auxiliary air conditioning evaporator hose from the air conditioning evaporator tube and position out of the way. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.

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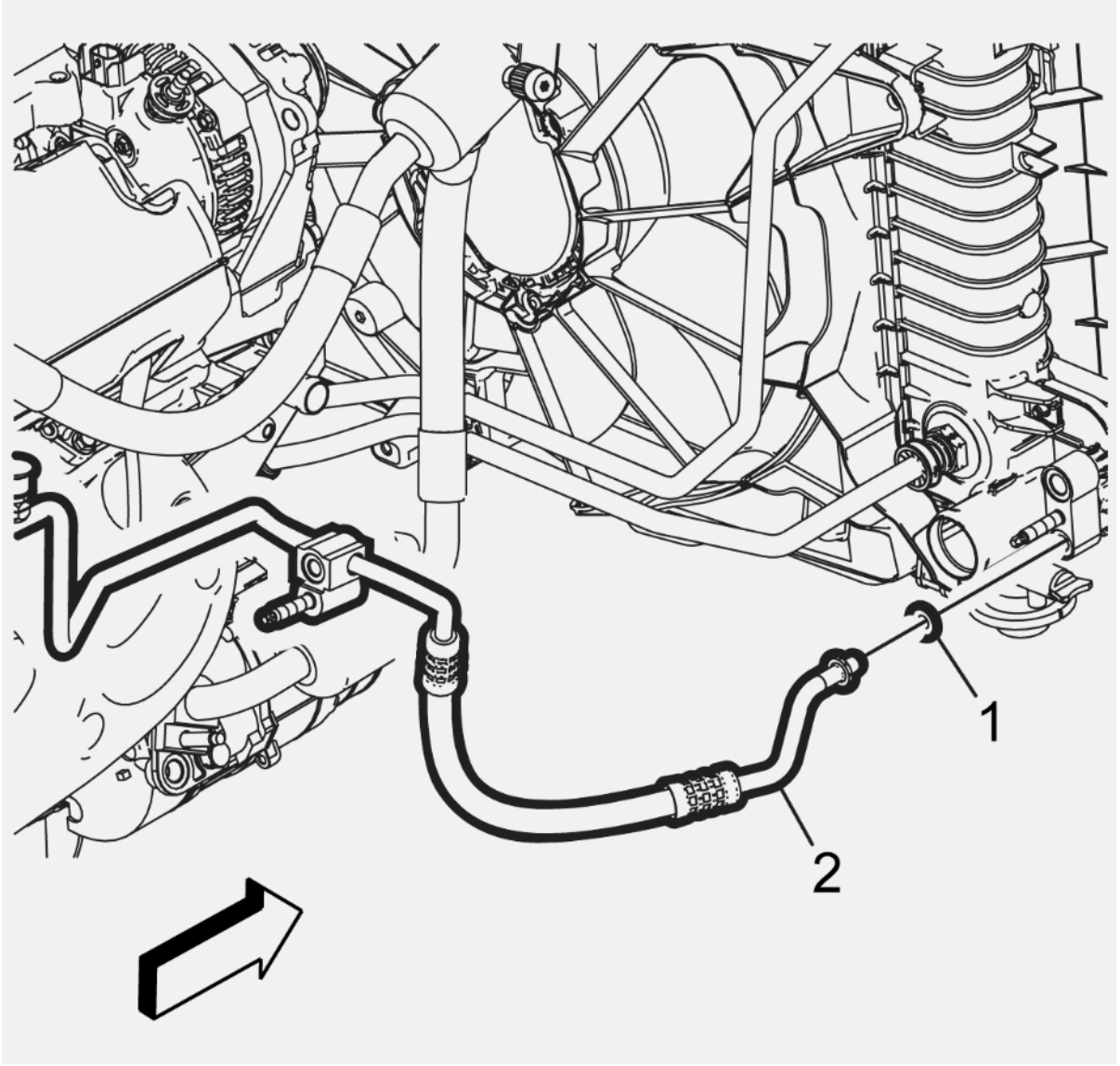


Fig. 32: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

6. Remove the air conditioning evaporator tube (2) from the air conditioning condenser.
7. Remove and discard the old sealing washer (1) from the air conditioning evaporator tube (2).

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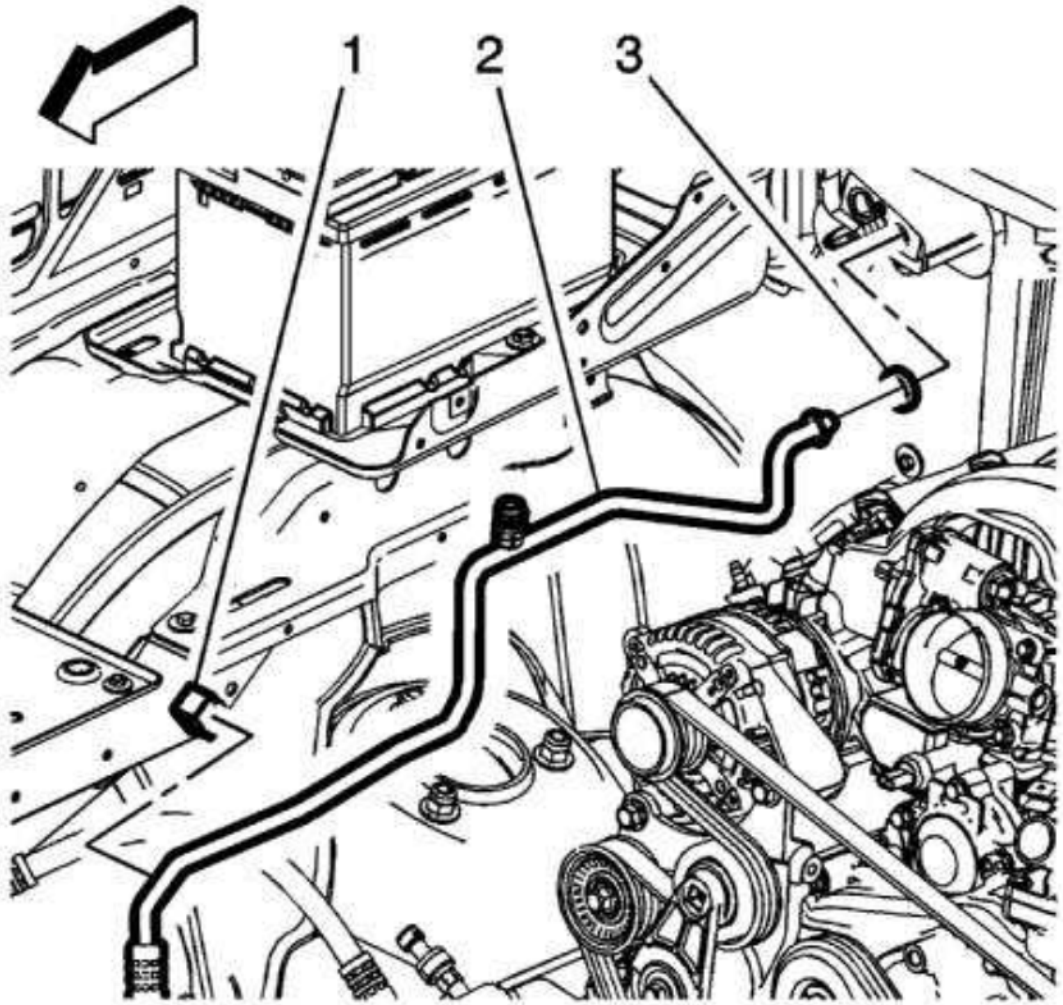


Fig. 33: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

8. Remove the air conditioning evaporator tube (2) from the air conditioning compressor and evaporator hose clip (1).
9. Remove the air conditioning evaporator tube (2) from the air conditioning evaporator thermal expansion valve.
10. Remove and discard the old sealing washer (3) from the air conditioning evaporator tube (2).

Installation Procedure

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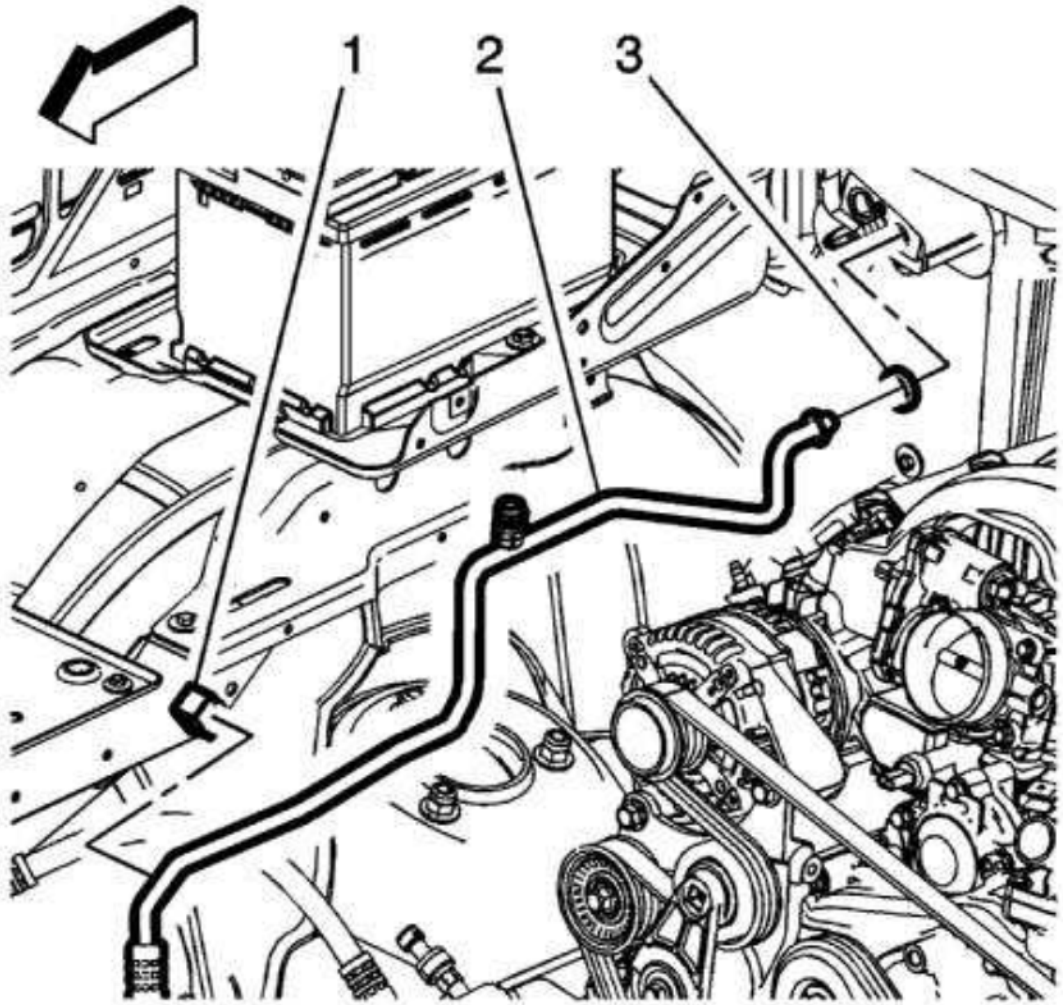


Fig. 34: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

1. Install NEW sealing washer (3) to the air conditioning evaporator tube (2). Refer to **Air Conditioning System Seal Replacement**.
2. Install the air conditioning evaporator tube (2) to the vehicle.
3. Install the air conditioning evaporator tube (2) to the air conditioning evaporator thermal expansion valve.
4. install the air conditioning evaporator tube (2) to the air conditioning compressor and evaporator hose clip (1).

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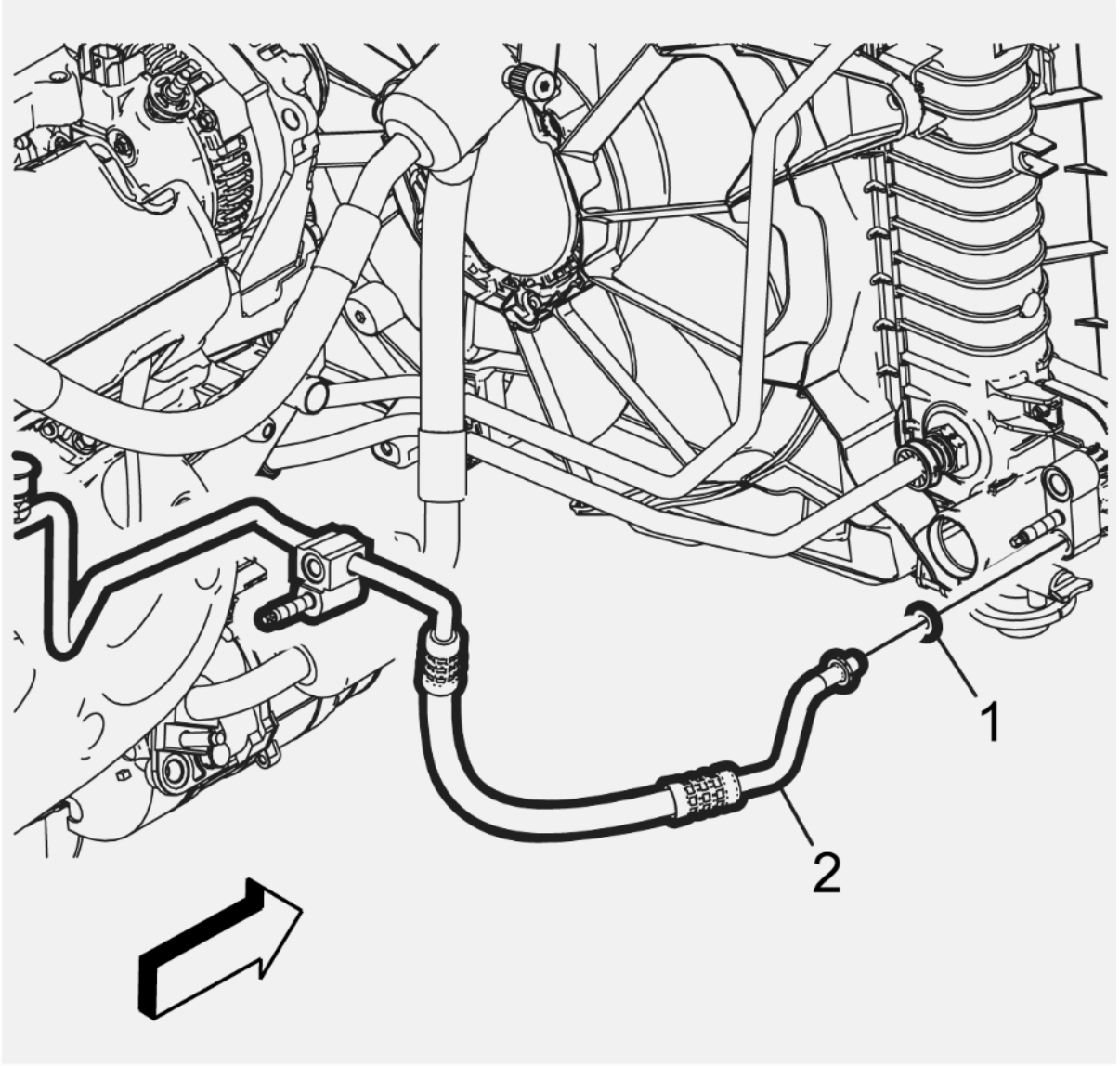


Fig. 35: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

5. Install NEW sealing washer (1) to the air conditioning evaporator tube (2).
6. Install the air conditioning evaporator tube (2) to the air conditioning condenser.
7. Install the air conditioning condenser hose to the air conditioning condenser. Refer to **Air Conditioning Condenser Hose Replacement (L83**

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L86).

8. Install the air conditioning compressor hose to the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Compressor Hose Replacement (L83 L86)**.
9. Install the auxiliary air conditioning evaporator hose to the air conditioning evaporator tube. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
10. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC) Air Cleaner Outlet Duct Replacement (Cadillac)** .
11. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L96)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
2. Remove the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**
3. Remove the air conditioning compressor hose from the air conditioning evaporator thermal expansion valve and position out of the way. Refer to **Air Conditioning Compressor Hose Replacement (L96)**.
4. Remove the air conditioning condenser hose from the air conditioning condenser and position out of the way. Refer to **Air Conditioning Condenser Hose Replacement (L96)**

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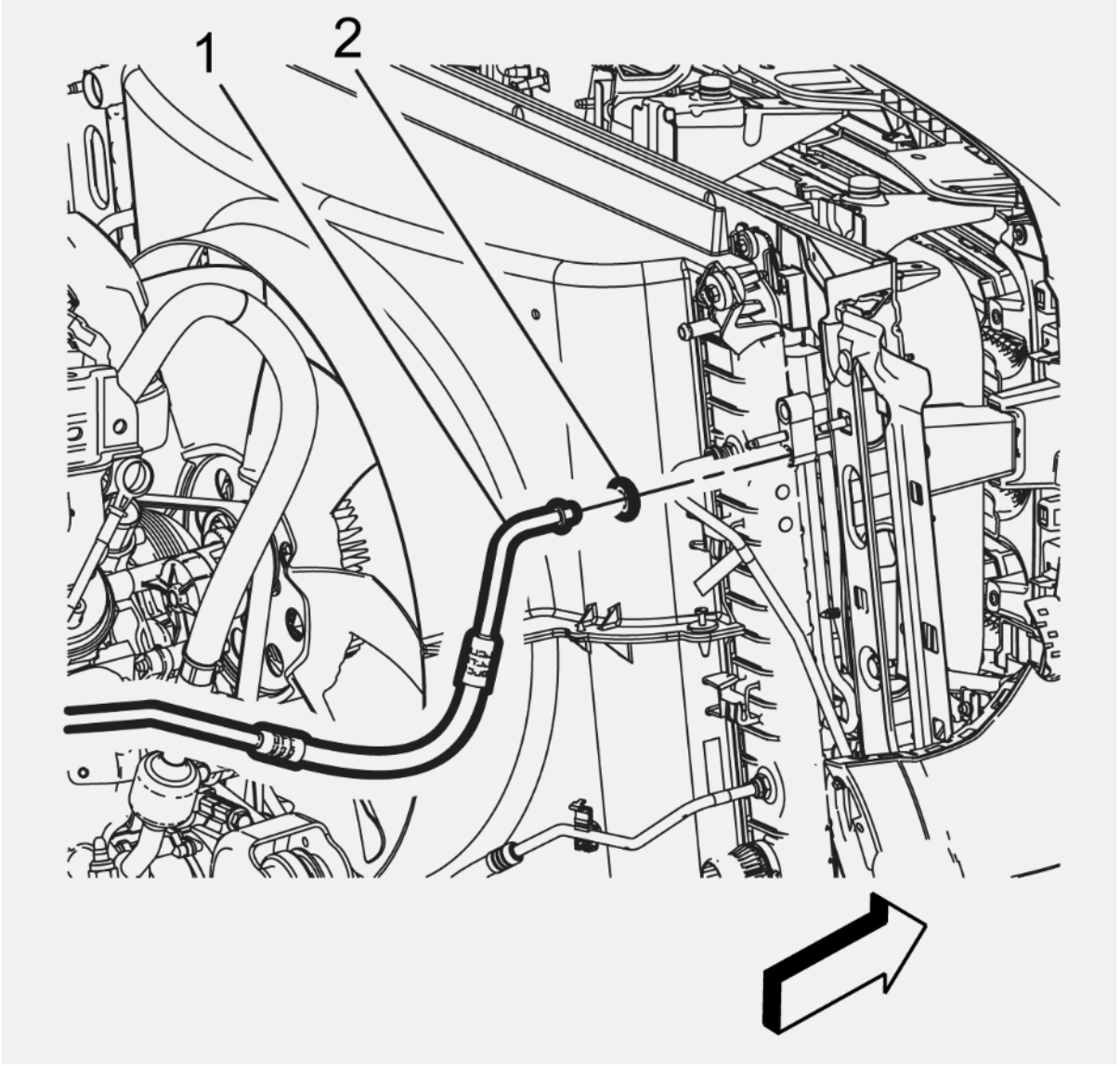


Fig. 36: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

5. Remove the air conditioning evaporator tube (1) from the air conditioning condenser.
6. Remove and discard the old sealing washer (2) from the air conditioning evaporator tube (1).

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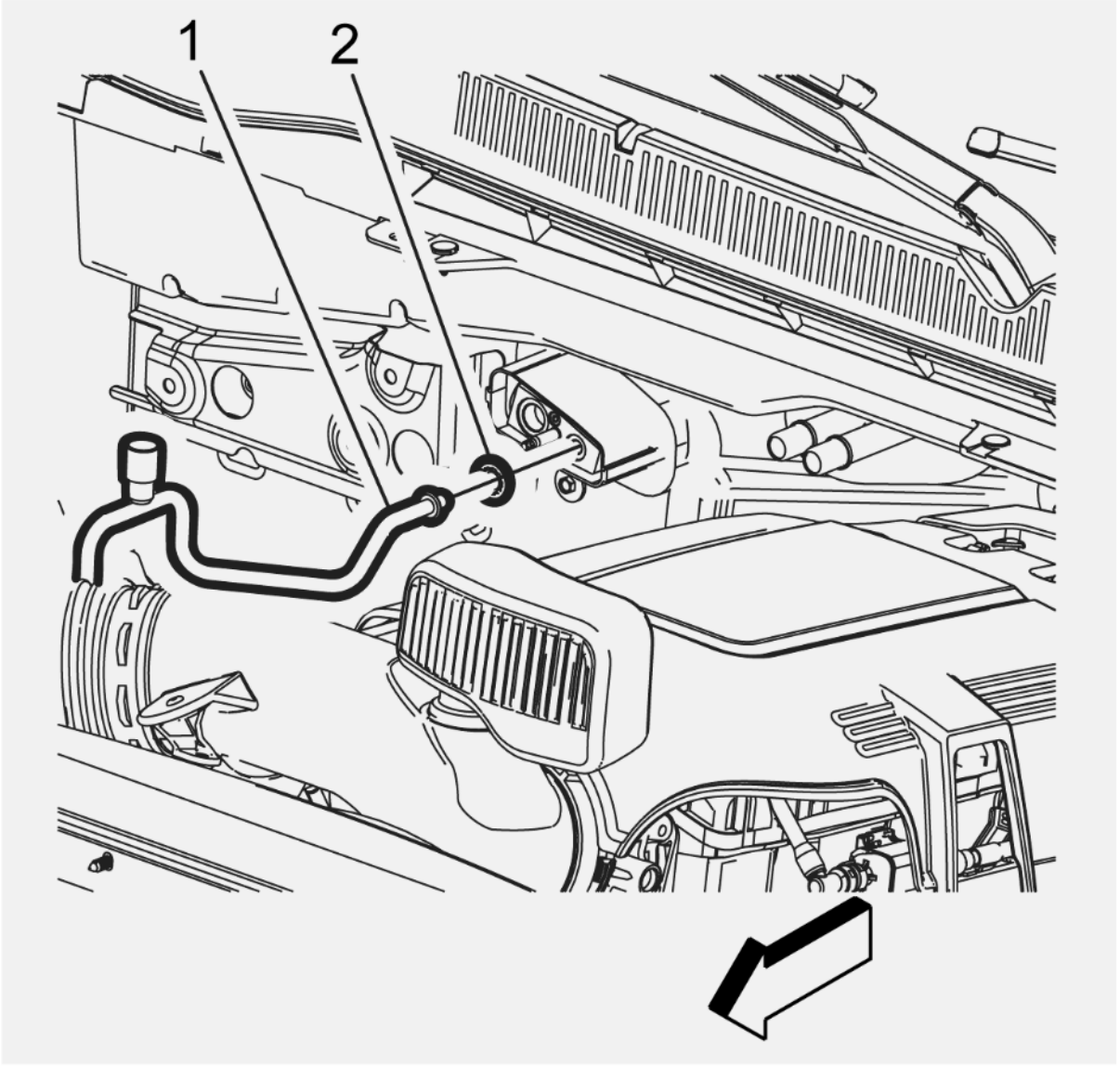


Fig. 37: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

7. Remove the air conditioning evaporator tube (1) from the air conditioning evaporator thermal expansion valve.
8. Remove and discard the old sealing washer (2) from the air conditioning evaporator tube (1).

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Installation Procedure

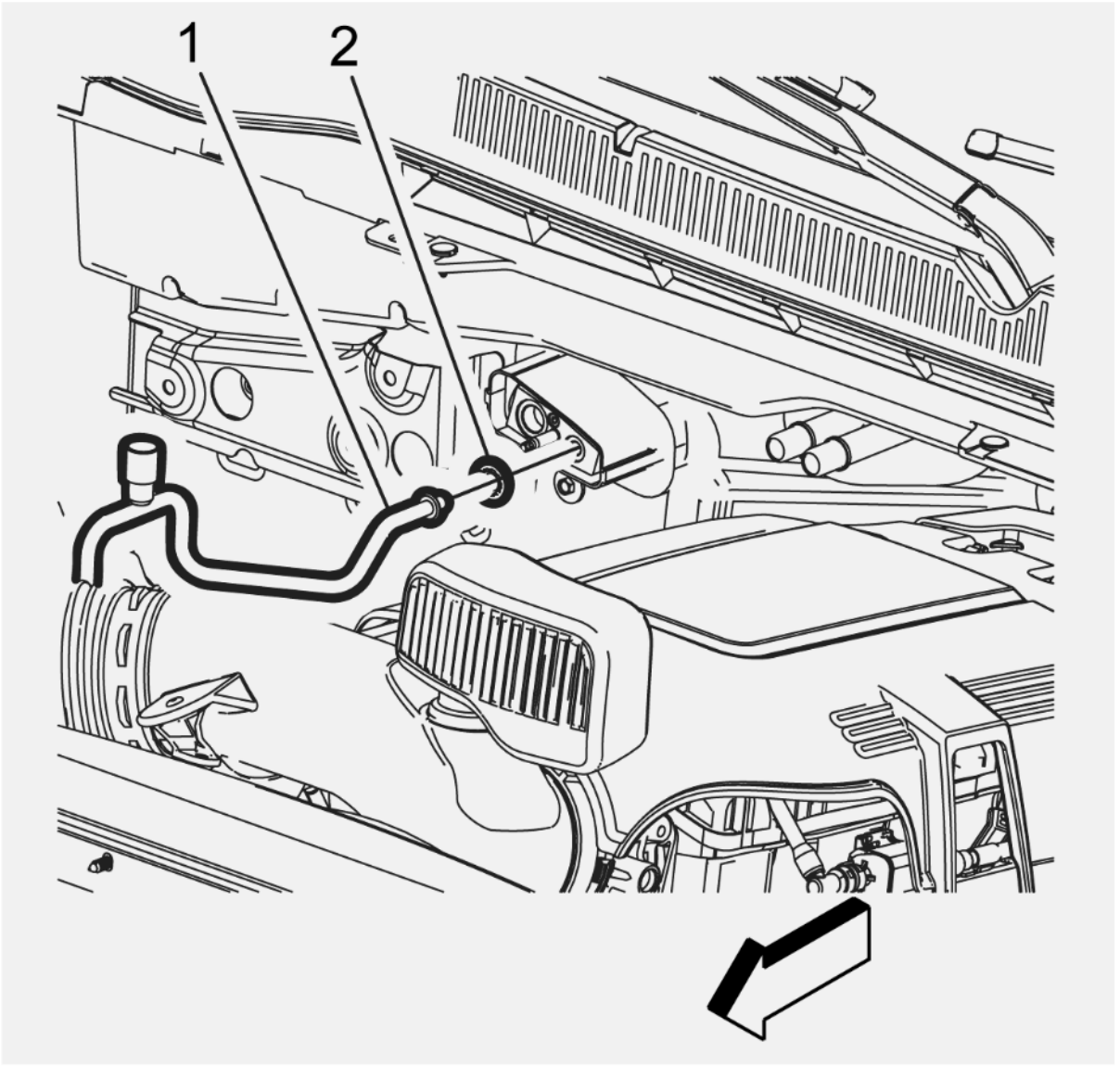


Fig. 38: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

1. Install NEW sealing washer (2) to the air conditioning evaporator tube (1). Refer to **Air Conditioning System Seal Replacement**

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2. Install the air conditioning evaporator tube (2) to the vehicle.
3. Install the air conditioning evaporator tube (2) to the air conditioning evaporator thermal expansion valve.

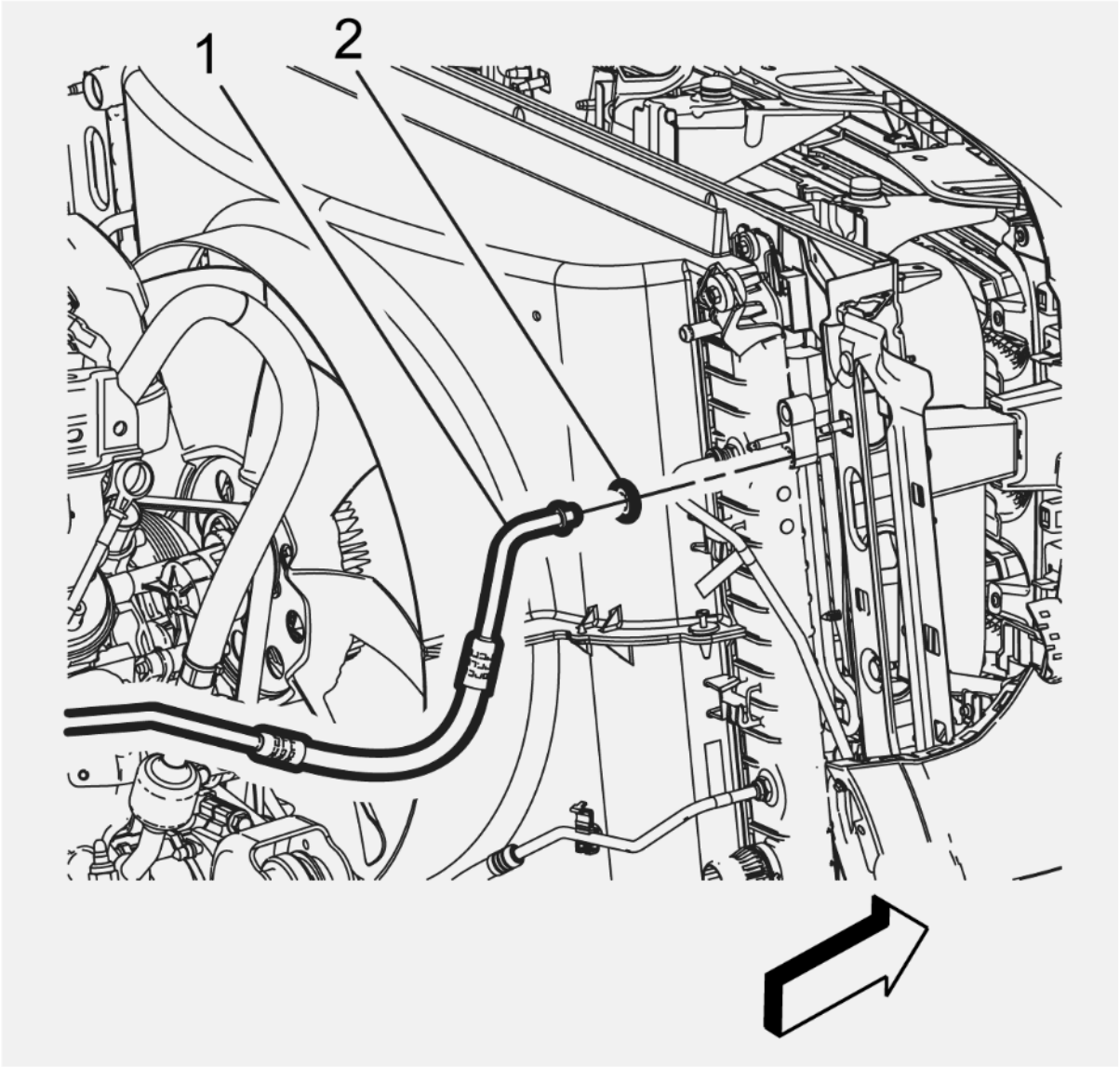


Fig. 39: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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4. Install NEW sealing washer (2) to the air conditioning evaporator tube (1).
5. Install the air conditioning evaporator tube (2) to the air conditioning condenser.
6. Install the air conditioning condenser hose to the air conditioning condenser. Refer to **Air Conditioning Condenser Hose Replacement (L96)**
7. Install the air conditioning compressor hose to the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Compressor Hose Replacement (L96)**
8. Install the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement**
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**

AIR CONDITIONING (AC) REFRIGERANT FILTER REPLACEMENT (AUXILIARY)

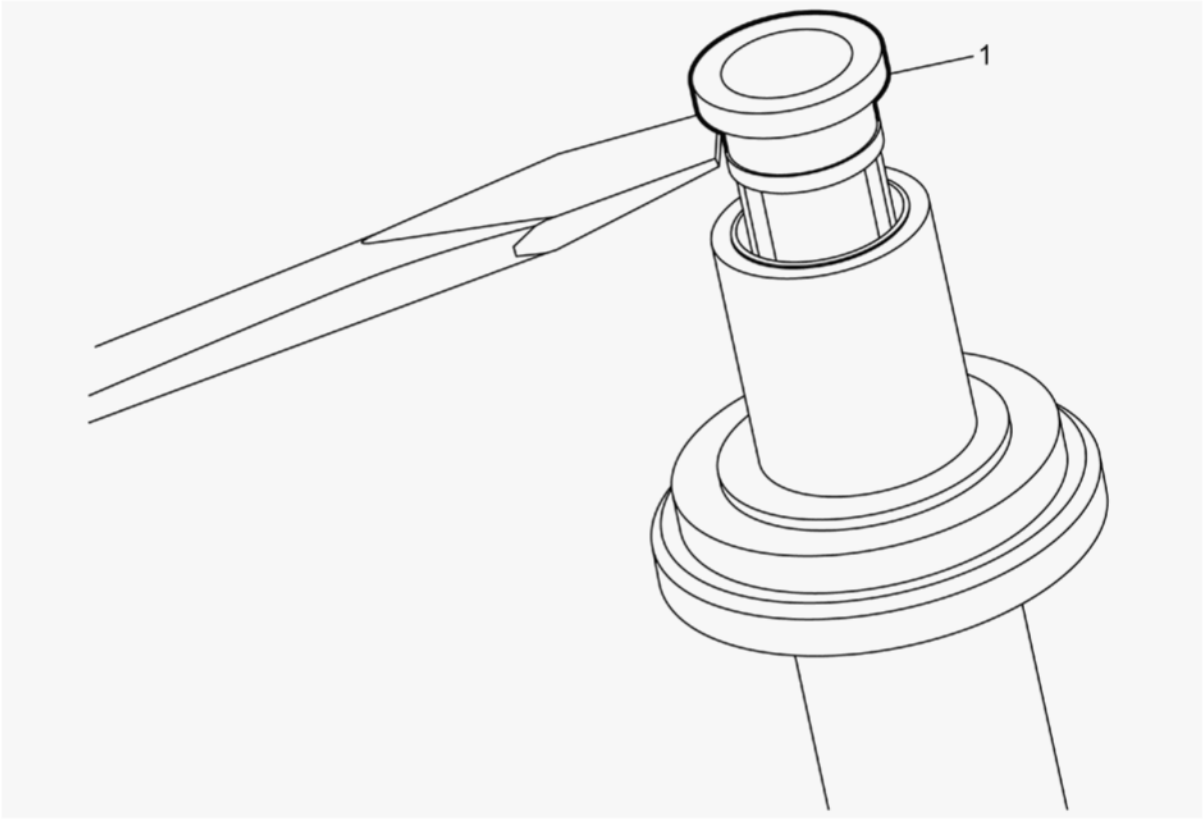


Fig. 40: Air Conditioning (AC) Refrigerant Filter (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**. 2. Remove the Auxiliary Air Conditioning Evaporator Hose from the Auxiliary Air Conditioning Evaporator. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**	
1	Auxiliary Air Conditioning Refrigerant Filter. **Procedure** Using a suitable flat bladed tool remove the air conditioning refrigerant filter from the auxiliary air conditioning evaporator tube. **NOTE:** • **The air conditioning refrigerant filter must be inspected and replaced in conjunction with A/C compressor failure, desiccant failure, or any refrigerant system failure that results in debris circulating in the system.** • **If debris is found at the filter location, it will be necessary to**

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Callout	Component Name
	flush the refrigerant system. Do not attempt to clean and reuse the air conditioning refrigerant filter. Refer to Flushing (R-134a)Flushing (R-1234yf). • If no debris is found at the filter location reinstall the air conditioning refrigerant filter.

AIR CONDITIONING REFRIGERANT SERVICE VALVE CORE REPLACEMENT

Tools Required

- **J 39400-A** Halogen Leak Detector
- **J 46246** Valve Core Removal Tool

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.

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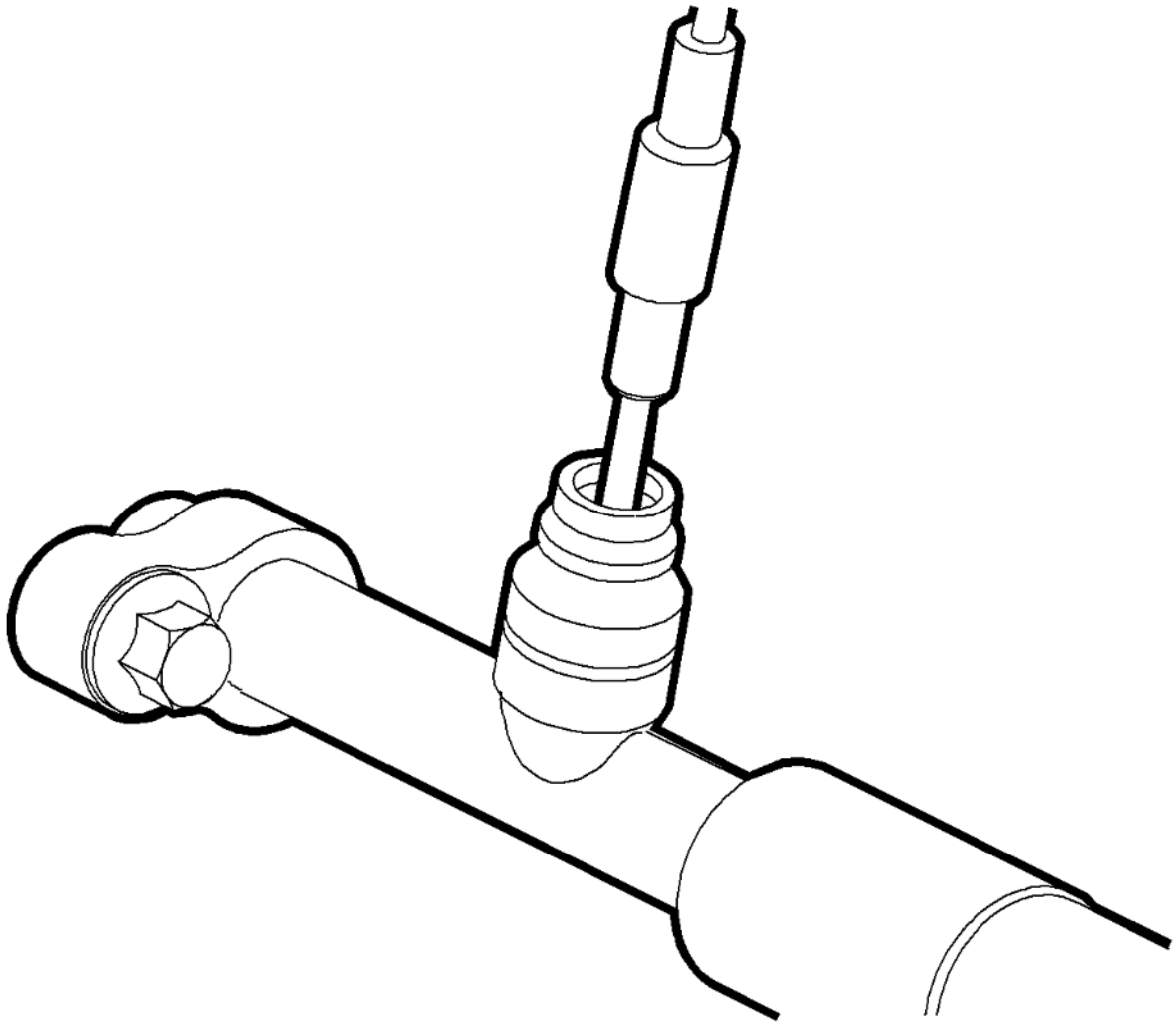


Fig. 41: Removing/Installing Valve Core
Courtesy of GENERAL MOTORS COMPANY

2. Use **J 46246** valve core removal tool or equivalent to remove the valve core.

Installation Procedure

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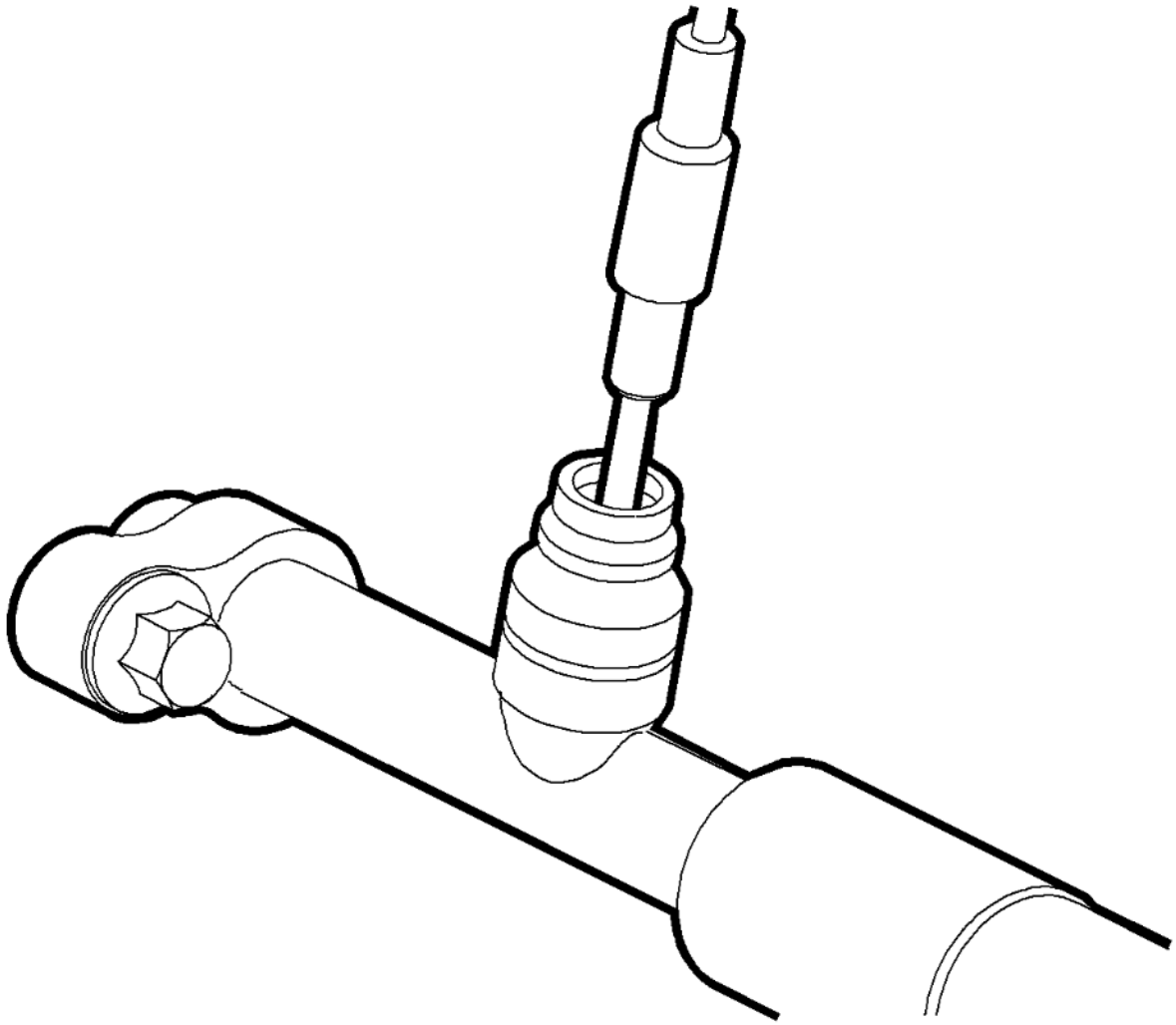


Fig. 42: Removing/Installing Valve Core
Courtesy of GENERAL MOTORS COMPANY

1. Use **J 46246** valve core removal tool or equivalent to install and tighten the valve core.
2. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.

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IMPORTANT: To prevent loss of refrigerant charge, tighten the cap. Replace the cap if the seal is missing or damaged.

3. Test the affected A/C fittings for leaks using **J 39400-A** halogen leak detector.

RECEIVER AND DEHYDRATOR REPLACEMENT (L83 L86)

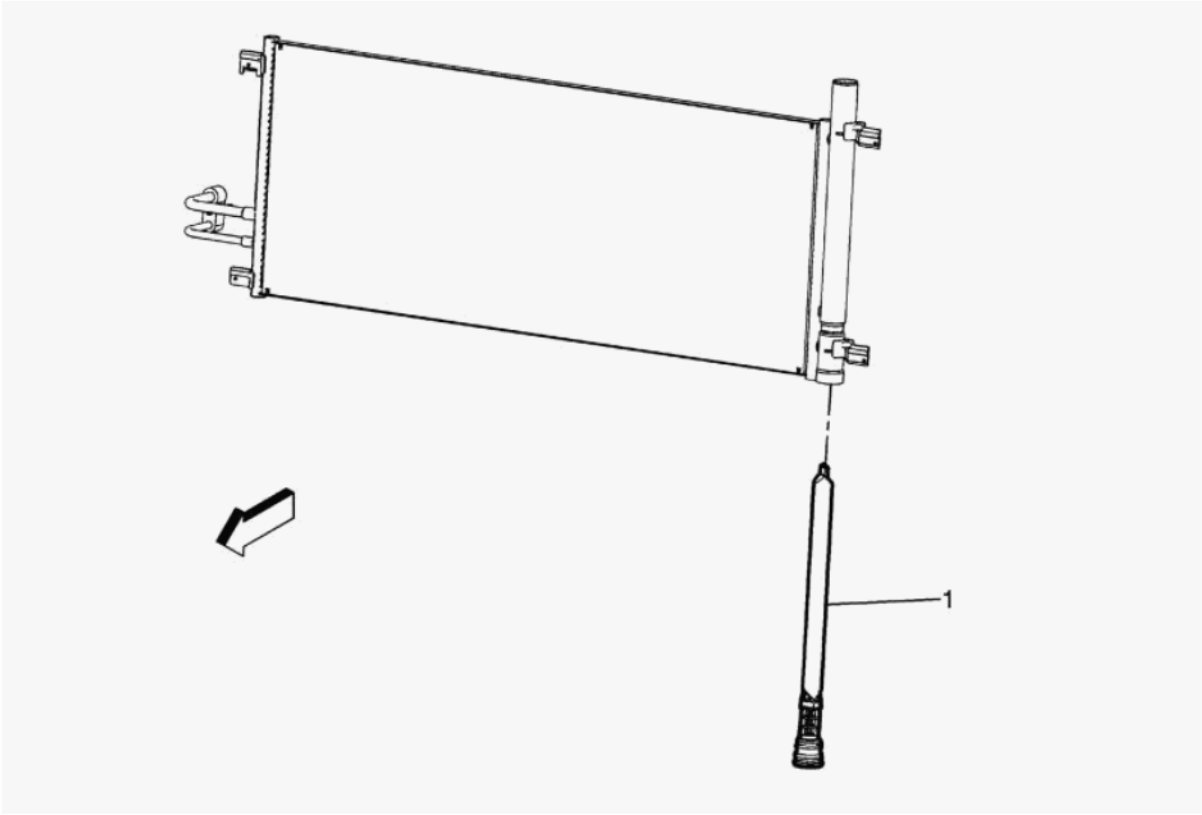


Fig. 43: Receiver And Dehydrator (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the air conditioning condenser. Refer to **Air Conditioning Condenser Replacement (L83 L86)**.	
1	Air Conditioning Refrigerant Desiccant

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Callout	Component Name
	CAUTION: Refer to NOTE: er Caution Cap all A/C components immediately to prevent system contamination.

RECEIVER AND DEHYDRATOR REPLACEMENT (L96)

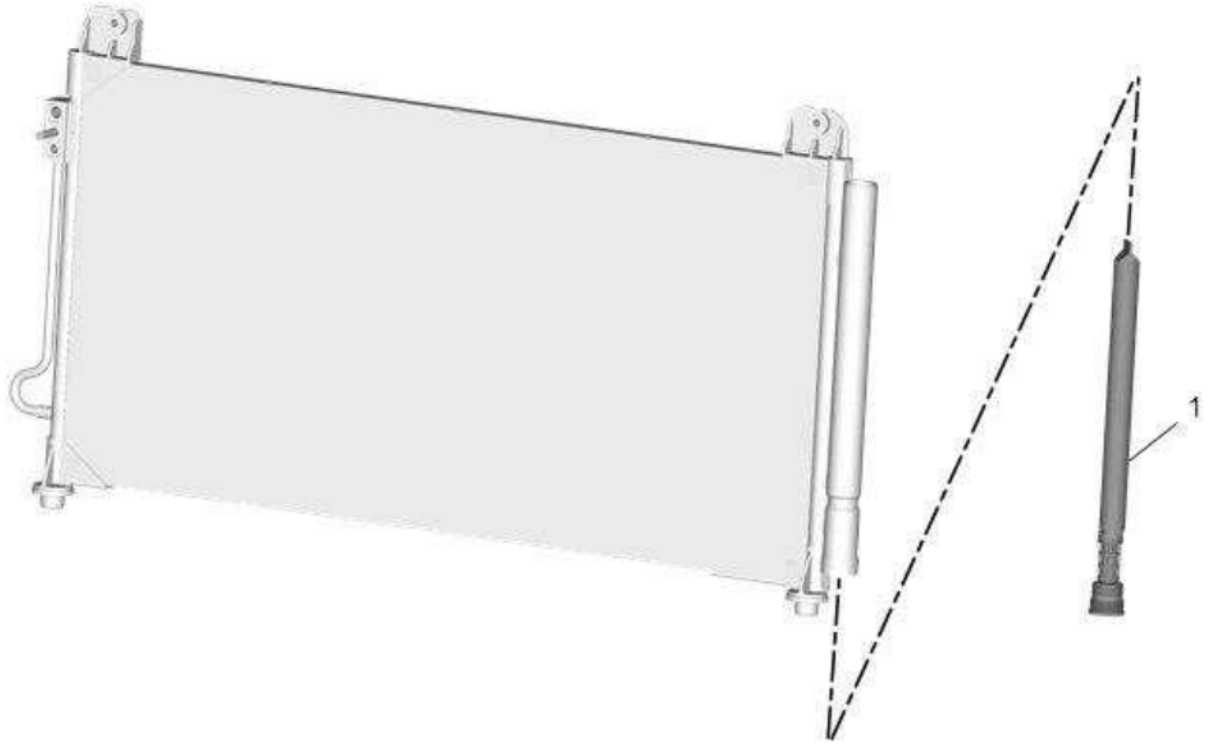


Fig. 44: Receiver And Dehydrator (L96)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure Remove the air conditioning condenser. Refer to **Air Conditioning Condenser Replacement (L96)**.	
1	Air Conditioning Receiver and Dehydrator **CAUTION:** **Refer to Fastener Caution .** **NOTE:** **Cap all A/C components immediately to prevent system contamination.**

AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT

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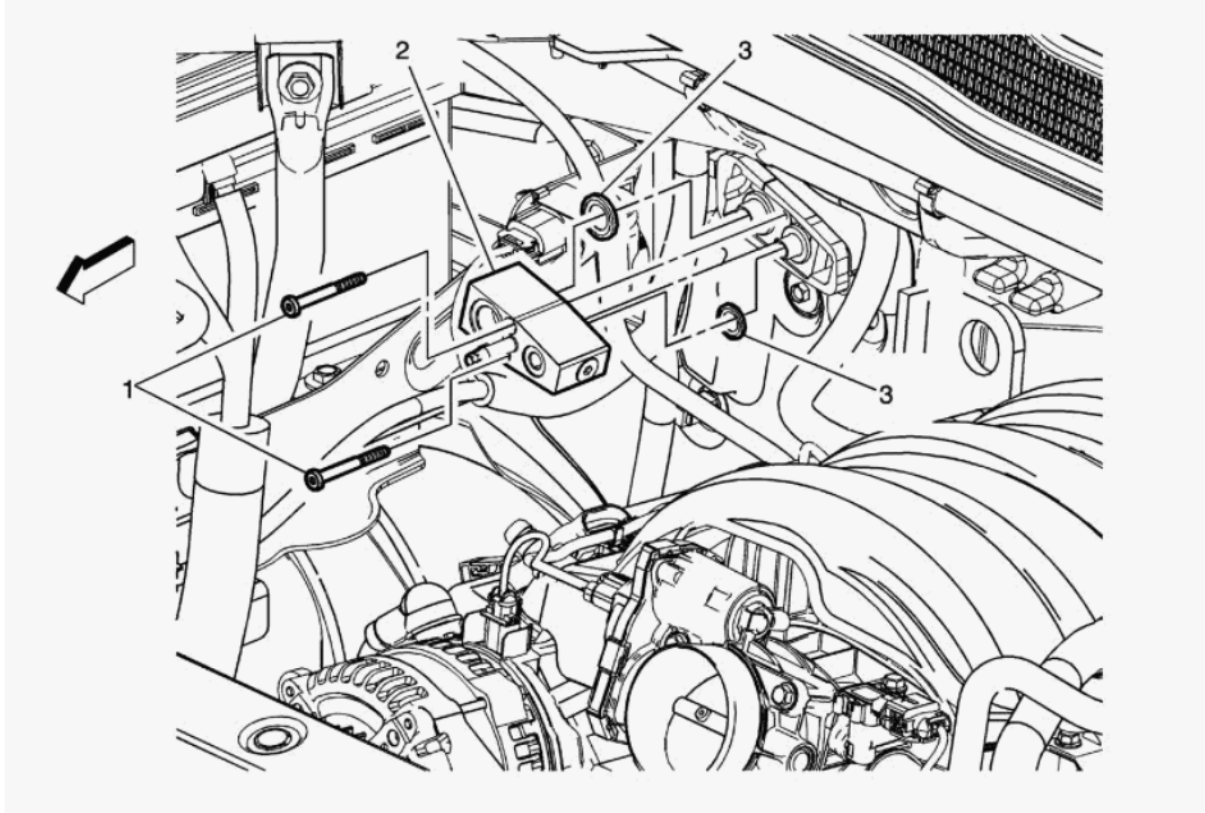


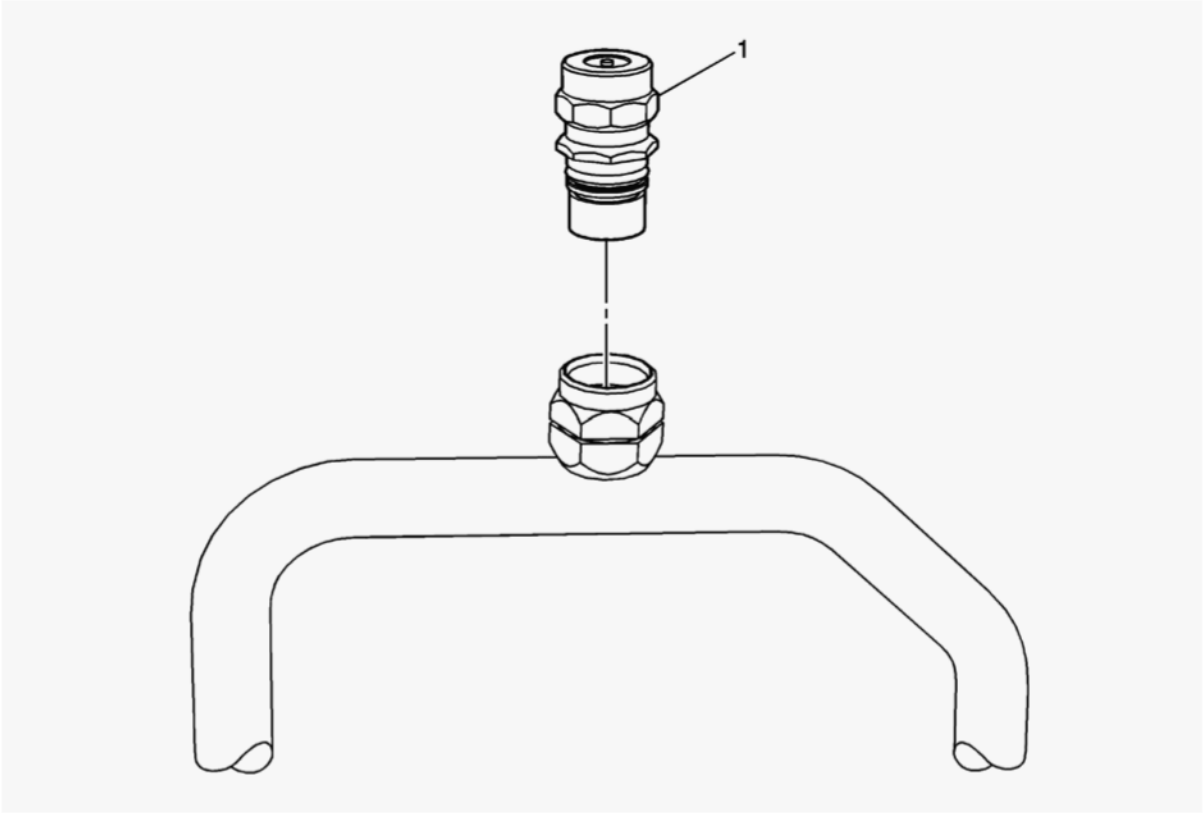
Fig. 45: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**. 2. Disconnect the air conditioning evaporator tube from the air conditioning evaporator thermal expansion valve and position out of the way. Refer to **Air Conditioning Evaporator Tube Replacement (L83 L86)Air Conditioning Evaporator Tube Replacement (L96)**.	
1	Air Conditioning Thermal Expansion Valve Bolt (Qty: 2)

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Callout	Component Name
	CAUTION: **Refer to Fastener Caution .** Tighten 7.5 N.m (66 lb in)
2	Air Conditioning Thermal Expansion Valve
3	Air Conditioning Sealing Washer (Qty: 2) **Procedure** Remove and discard old sealing washers and replace with NEW sealing washers. Refer to **Air Conditioning System Seal Replacement**.

AIR CONDITIONING REFRIGERANT HIGH PRESSURE SERVICE VALVE REPLACEMENT



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Fig. 46: Air Conditioning Refrigerant High Pressure Service Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the service port cap. 2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.	
1	Air Conditioning Refrigerant Service Valve **CAUTION:** **Refer to Fastener Caution .** **Procedure** 1. Use **GE-39037** socket to remove the air conditioning refrigerant valve. 2. Test the system for refrigerant leaks. Refer to **Leak Testing (R-1234yf)Leak Testing (R-134a)**. **Tighten** 2 N.m (18 lb in) **Special Tools** **GE-39037** Charge Valve Octagon Socket For equivalent region tools, refer to **Special Tools**.

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT (L96)

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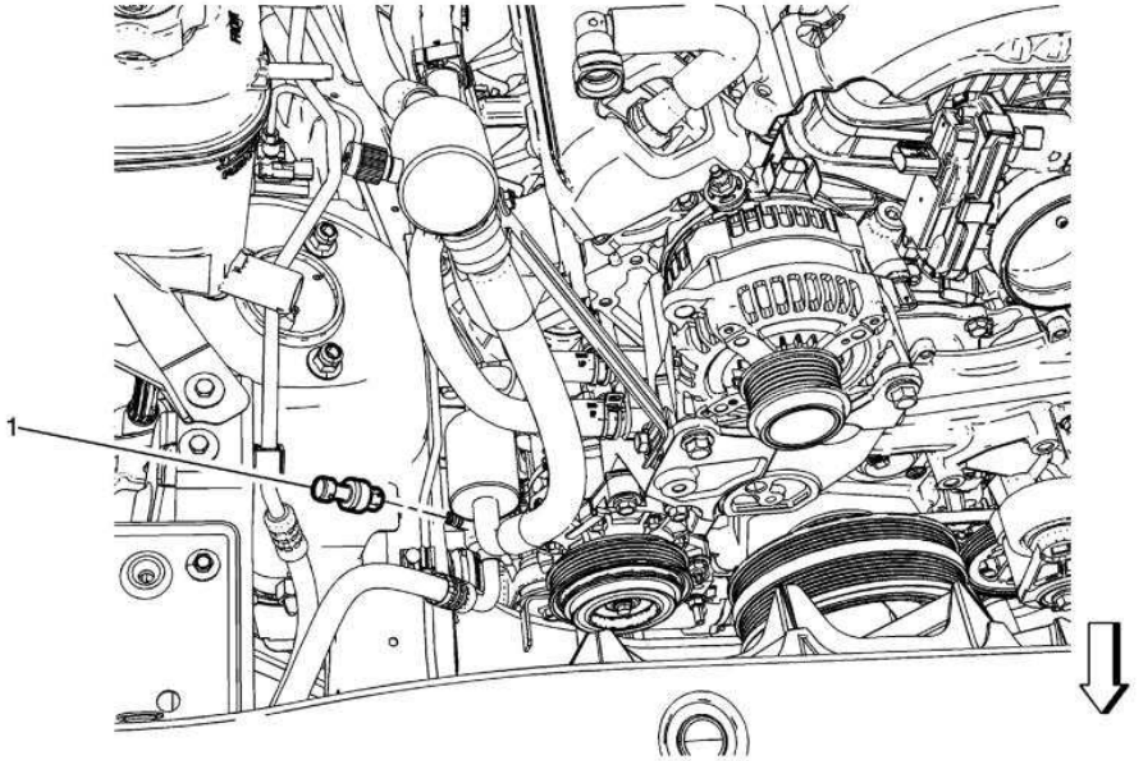


Fig. 47: Air Conditioning (A/C) Refrigerant Pressure Sensor (L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the steering gear skid shield, if equipped. Refer to **Steering Gear Skid Shield Replacement** . 2. Disconnect the electrical connector from the air conditioning (A/C) refrigerant pressure sensor.	
1	A/C Refrigerant Pressure Sensor **CAUTION:** **Refer to** **Fastener**

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Callout	Component Name
	Caution . NOTE: Remove and discard the O-ring and replace with NEW only. Refer to Air Conditioning O-Ring Seal Replacement.

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT (L83 L86)

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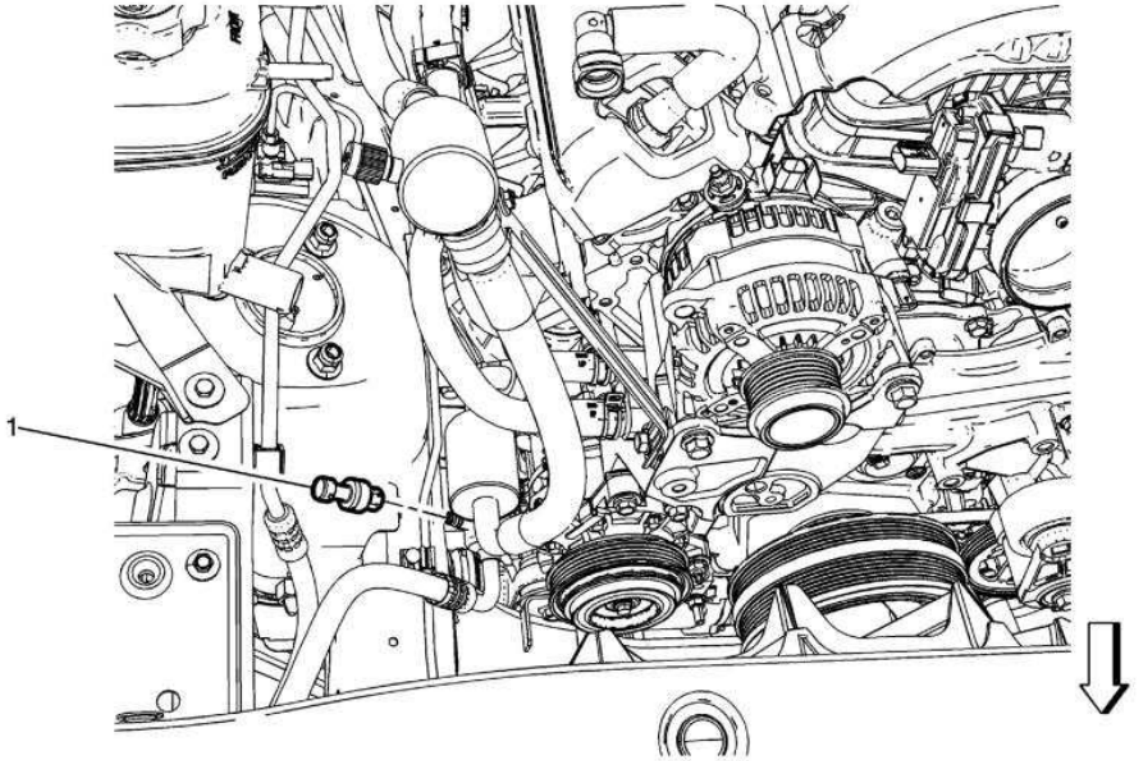


Fig. 48: Air Conditioning (A/C) Refrigerant Pressure Sensor (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the steering gear skid shield, if equipped. Refer to **Steering Gear Skid Shield Replacement** . 2. Disconnect the electrical connector from the air conditioning (A/C) refrigerant pressure sensor.	
1	A/C Refrigerant Pressure Sensor **CAUTION:** **Refer to** **Fastener**

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Callout	Component Name
	Caution . NOTE: Remove and discard the O-ring and replace with NEW only. Refer to Air Conditioning O-Ring Seal Replacement.

AIR CONDITIONING CONDENSER REPLACEMENT (L83 L86)

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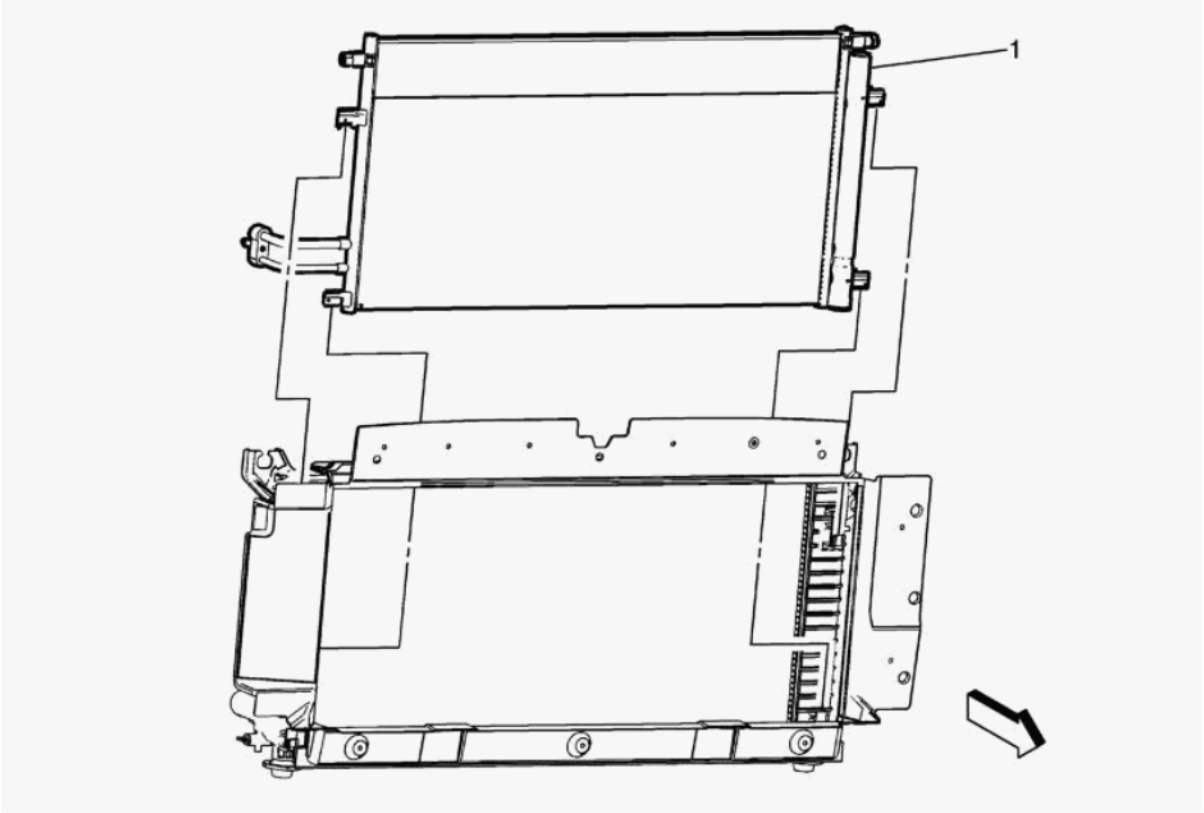


Fig. 49: Air Conditioning Condenser (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
1. Recover refrigerant. **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)** 2. Remove the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86) Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)** 3. Remove the transmission fluid auxiliary cooler inlet pipe. Refer to **Transmission Fluid Auxiliary Cooler Inlet Pipe Replacement (L83 L86)** 4. Remove the transmission fluid auxiliary cooler outlet pipe. Refer to **Transmission Fluid Auxiliary Cooler Outlet Pipe Replacement (L83 L86)**	

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Callout	Component Name
5. Remove the air conditioning condenser bracket. Refer to **Air Conditioning Condenser Bracket Replacement** 6. Remove the air conditioning evaporator tube from the condenser and position out of the way. Refer to **Air Conditioning Evaporator Tube Replacement (L83 L86)**	
1	Air Conditioning Condenser **Procedure** 1. Press in retaining tabs on the radiator and remove condenser from the vehicle. 2. Remove the left radiator air baffle. Refer to **Radiator Air Baffle Replacement - Left (L83 L86)** 3. Remove the right radiator air baffle. Refer to **Radiator Air Baffle Replacement - Right (L83 L86)** **NOTE:** **If replacing the condenser, add refrigerant oil to the condenser. Refer to Approximate Fluid Capacities**

AIR CONDITIONING CONDENSER REPLACEMENT (L96)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
2. Remove the radiator. Refer to **Radiator Replacement (L96)**

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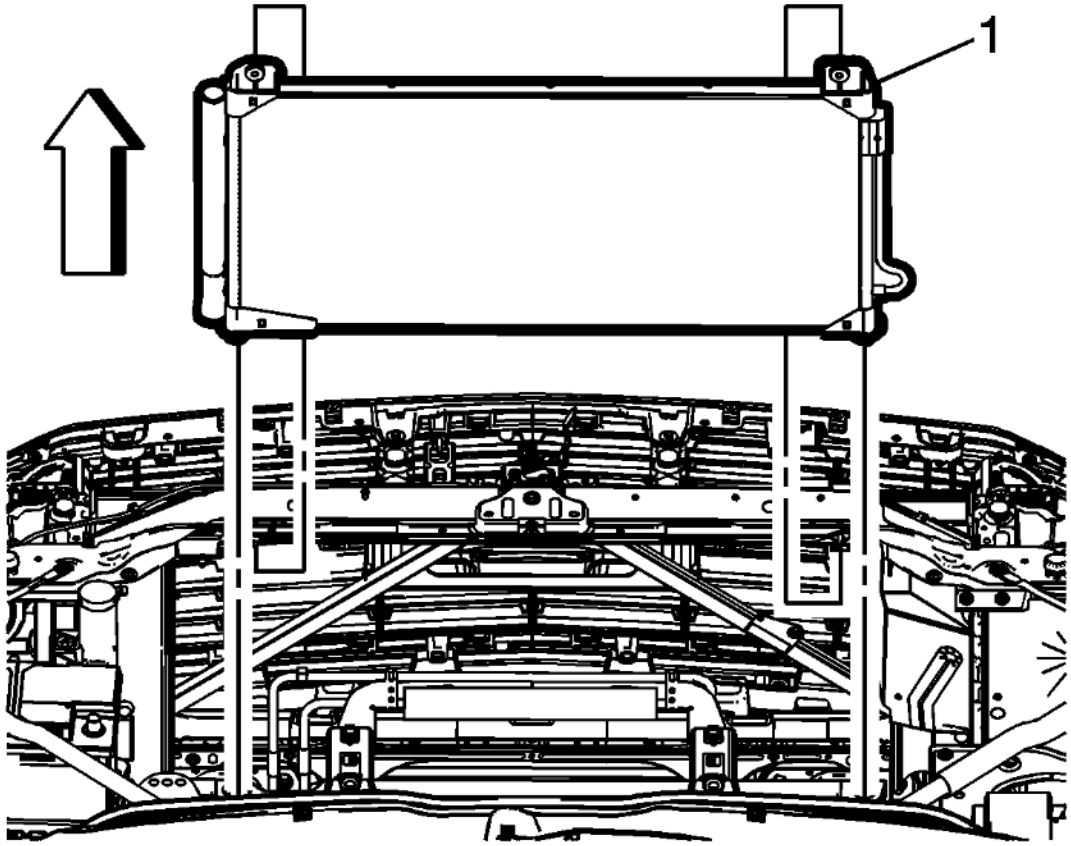


Fig. 50: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

3. Remove the air conditioning condenser (1) from the vehicle.

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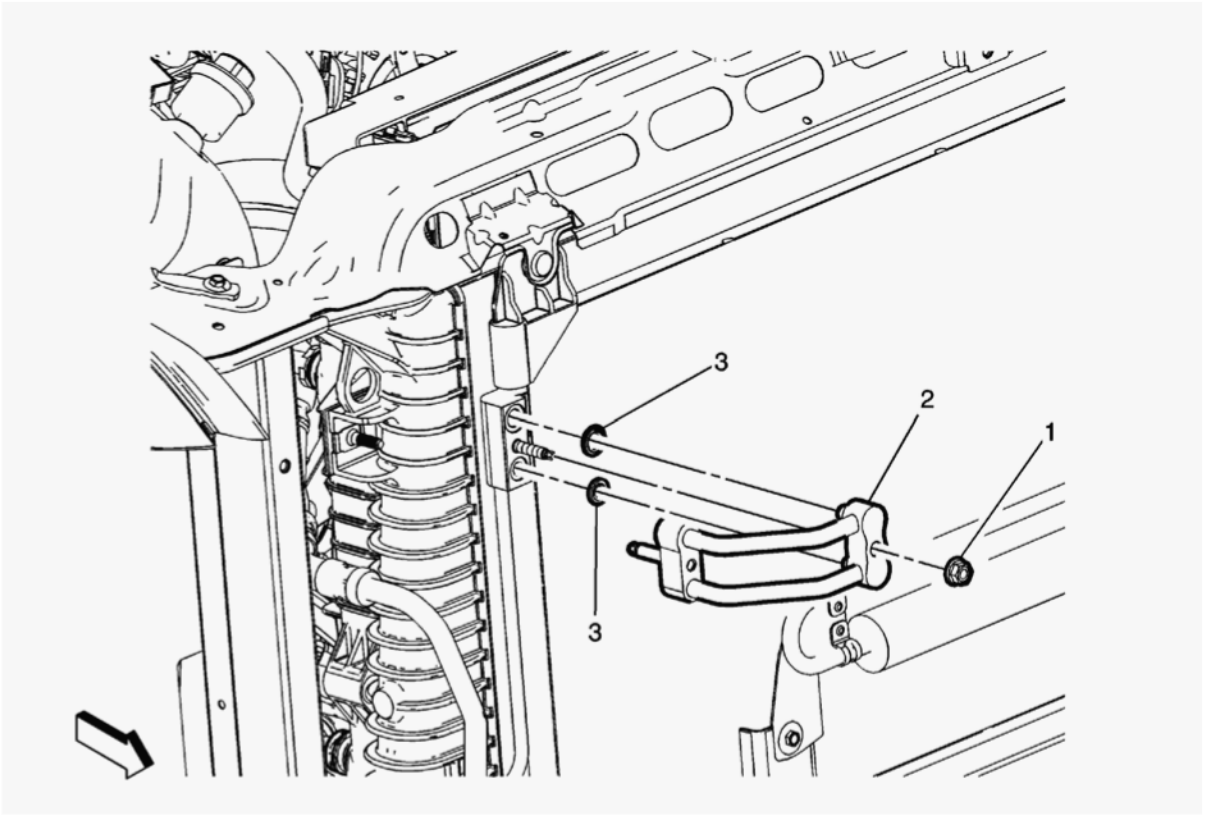


Fig. 51: Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

4. Remove the air conditioning condenser nut (1).
5. Remove the air conditioning evaporative connector hose/tube and compressor and condenser hose (2) from the air conditioning condenser.
6. Remove and discard the old sealing washer (3) from the air conditioning evaporative connector hose/tube and compressor and condenser hose (2).

Installation Procedure

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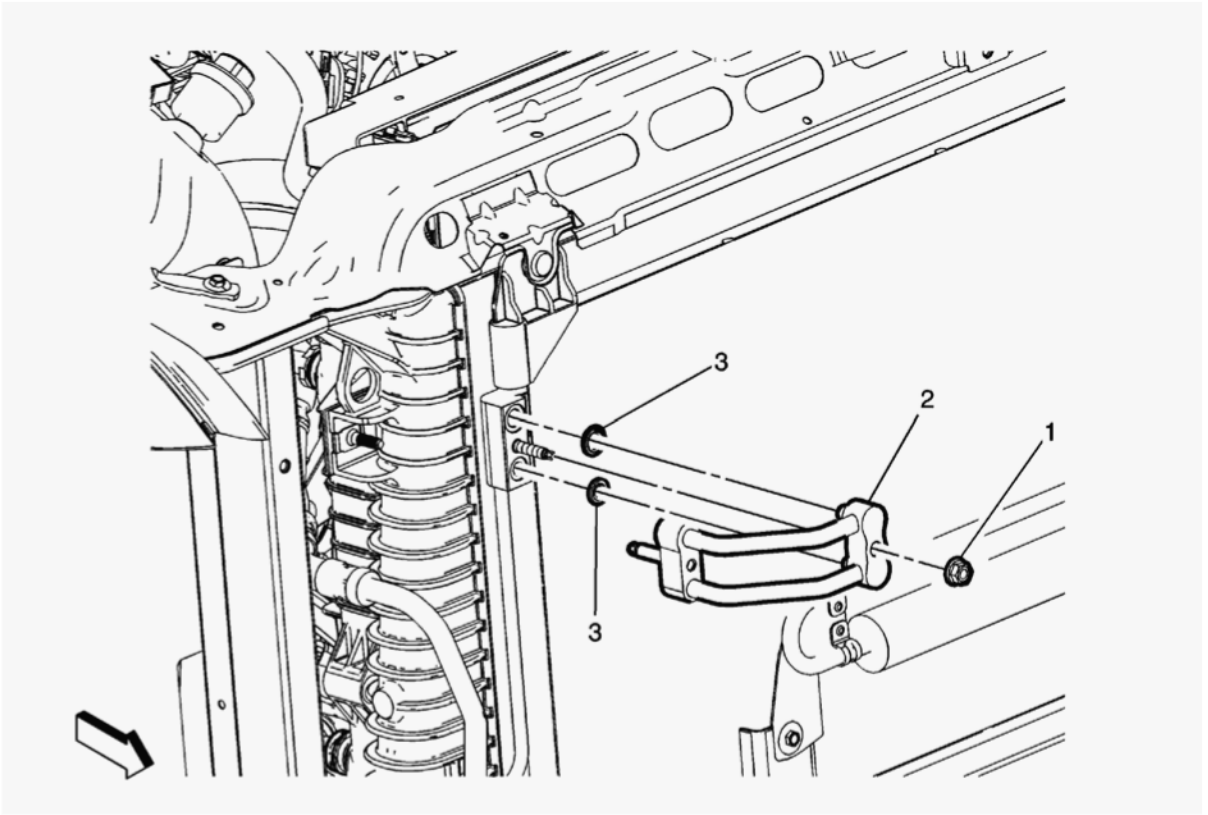


Fig. 52: Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

1. Install NEW sealing washer (3) to the air conditioning evaporative connector hose/tube and compressor and condenser hose (2). Refer to **Air Conditioning System Seal Replacement**
2. Install the air conditioning evaporative connector hose/tube and compressor and condenser hose (2) to the air conditioning condenser.

CAUTION: **Refer to Fastener Caution .**

3. Install the air conditioning condenser nut (1) to the air conditioning condenser and tighten to 22 N.m (16 lb ft).

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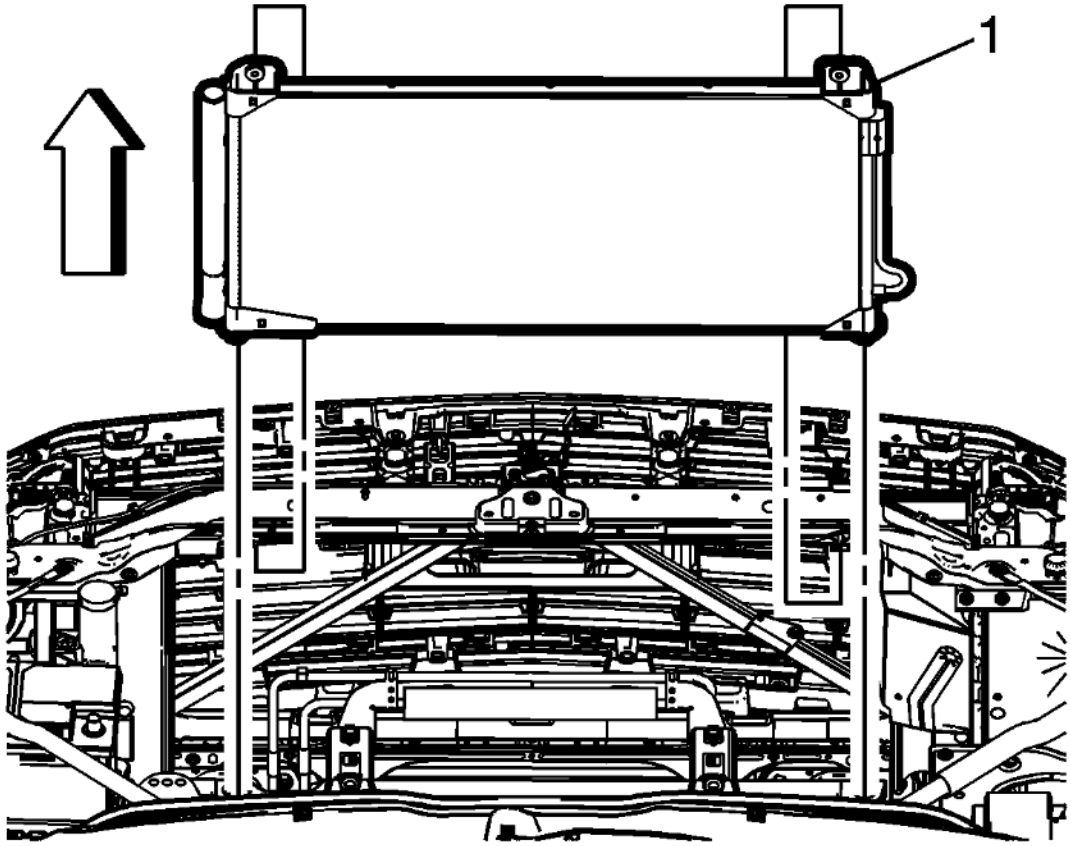


Fig. 53: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

4. Install the air conditioning condenser (1) to the vehicle.
5. Install the radiator. Refer to **Radiator Replacement (L96)**
6. Evacuate and recharge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**

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AIR CONDITIONING CONDENSER BRACKET REPLACEMENT

Removal Procedure

1. Remove the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86)** **Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)** .

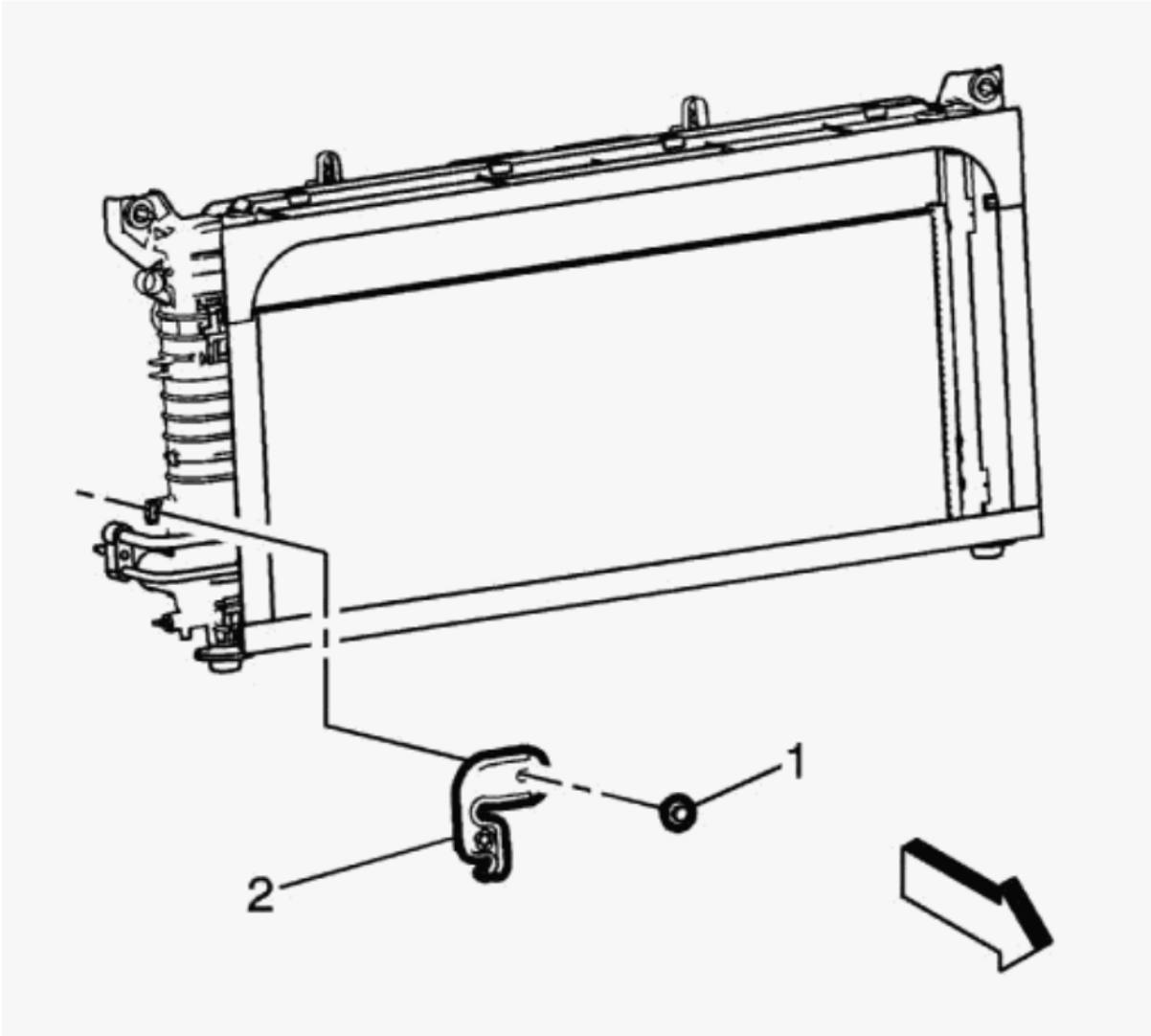


Fig. 54: Air Conditioning Condenser Bracket
Courtesy of GENERAL MOTORS COMPANY

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2. Remove the air conditioning condenser bolt (1) from the radiator.
3. Remove the air conditioning condenser bracket (2) from the vehicle.

Installation Procedure

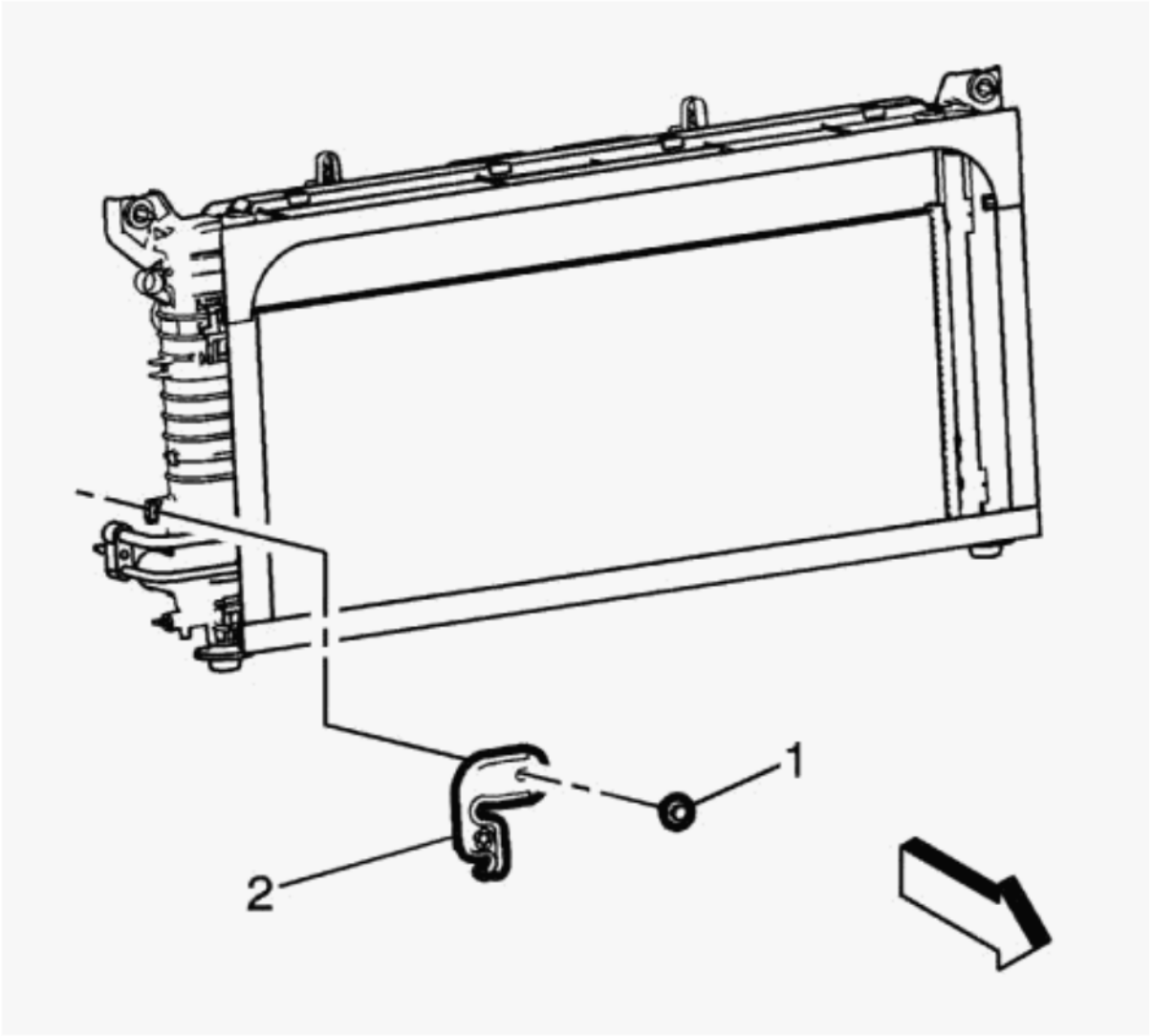


Fig. 55: Air Conditioning Condenser Bracket
Courtesy of GENERAL MOTORS COMPANY

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1. Install the air conditioning condenser bracket (2) to the air conditioning condenser.

CAUTION: **Refer to Fastener Caution .**

2. Install the air conditioning condenser bracket nut (1) to the radiator and tighten to tighten to 6 N.m (53 lb in).
3. Install the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (Top of Radiator L83 L86)** **Radiator Air Upper Baffle and Deflector Replacement (Right of Radiator L83 L86)** .

HEATER AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH L96)

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (Single Battery)**
2. Drain the engine coolant system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)**
3. Remove the battery. Refer to **Battery Replacement**

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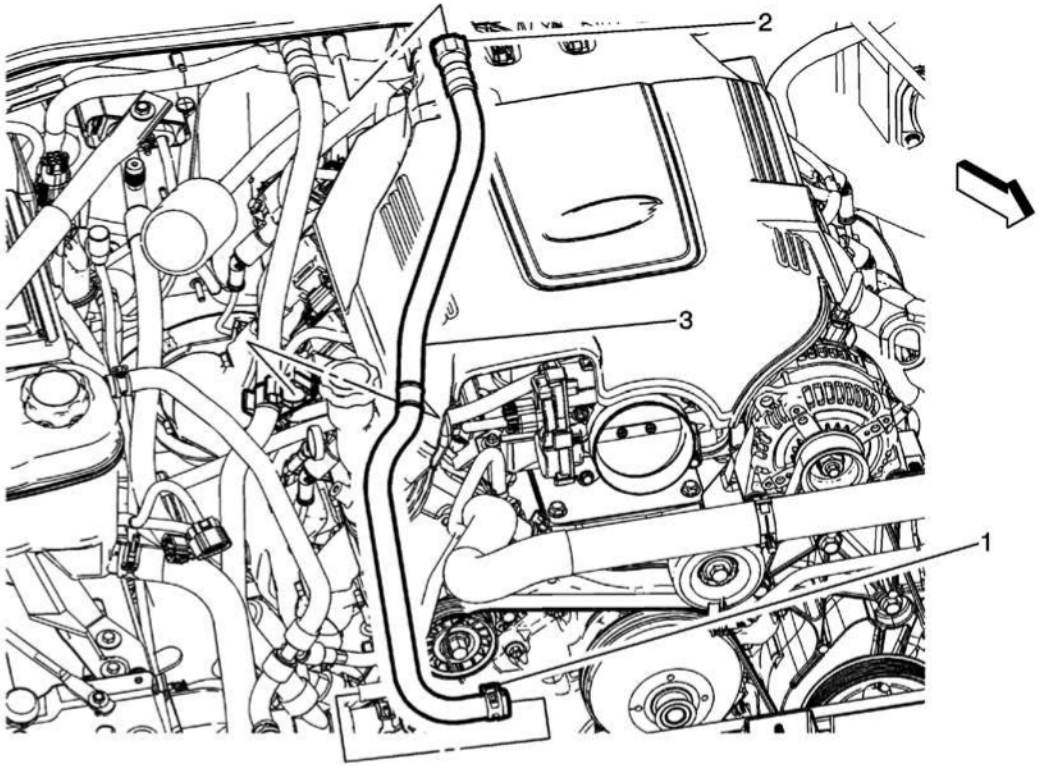


Fig. 56: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Remove the heater inlet hose (3) from the heater core tube. Refer to **Heater Inlet Hose Replacement (L96)**

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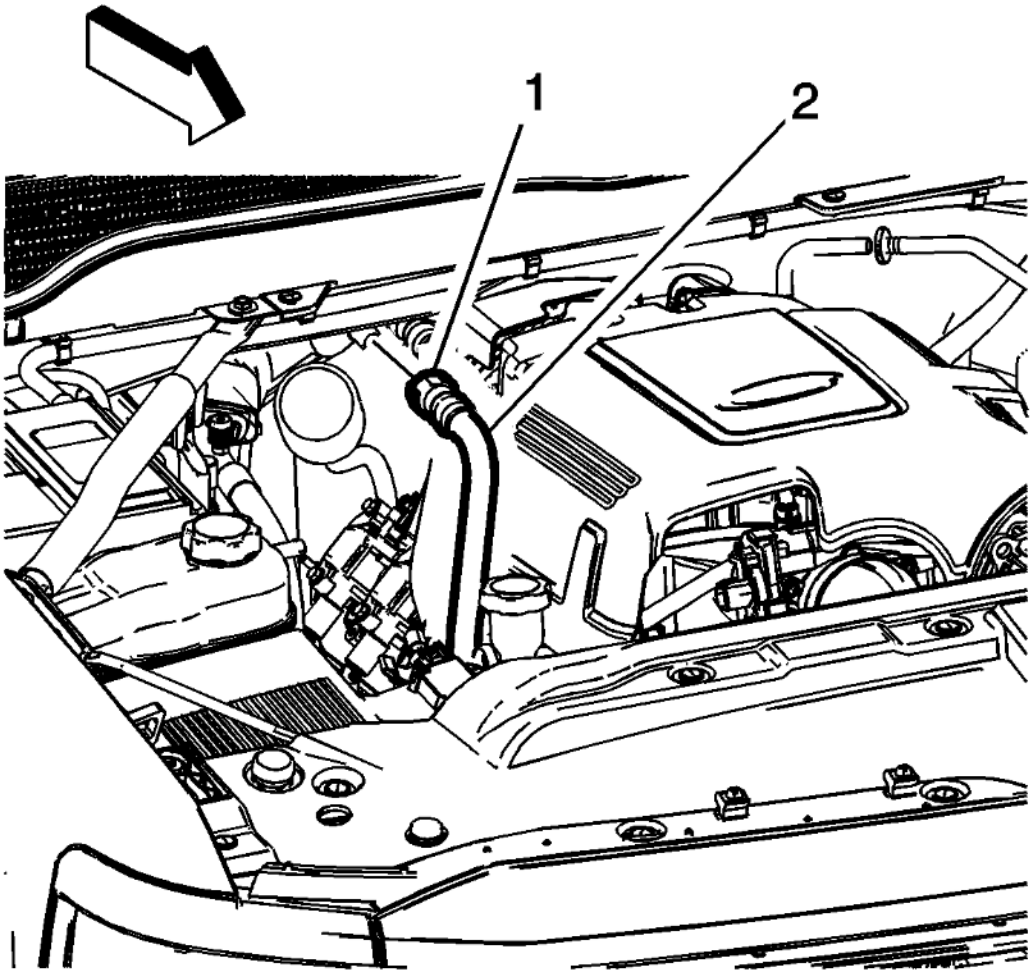


Fig. 57: Radiator Surge Tank Outlet Hose Clamp At Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

5. Remove the radiator surge tank outlet hose (2) from the heater core tube. Refer to **Radiator Surge Tank Outlet Hose Replacement (L96)**

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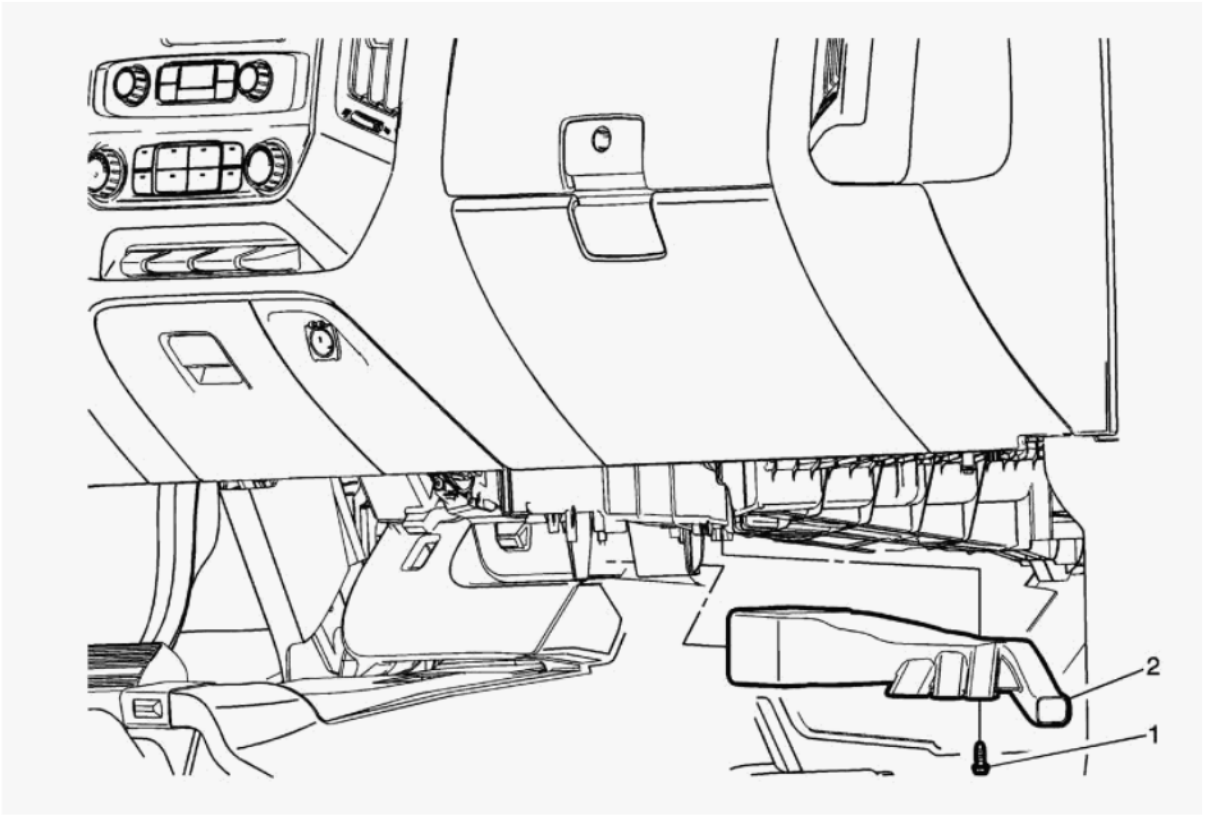


Fig. 58: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Remove the right side floor rear air outlet duct (2). Refer to **Floor Front Air Outlet Duct Replacement - Right SideFloor Front Air Outlet Duct Replacement - Right Side (Z75)**

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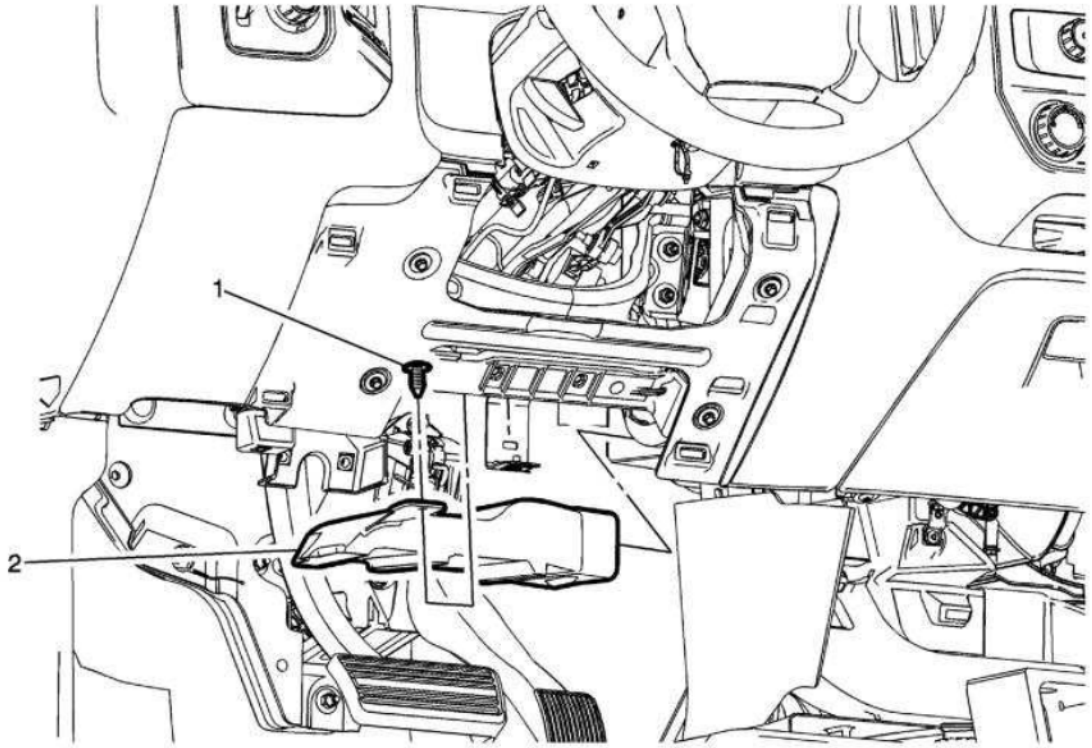


Fig. 59: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

7. Remove the left side floor rear air outlet duct (2). Refer to **Floor Front Air Outlet Duct Replacement - Left Side (Utilities)Floor Front Air Outlet Duct Replacement - Left Side (Z75)**

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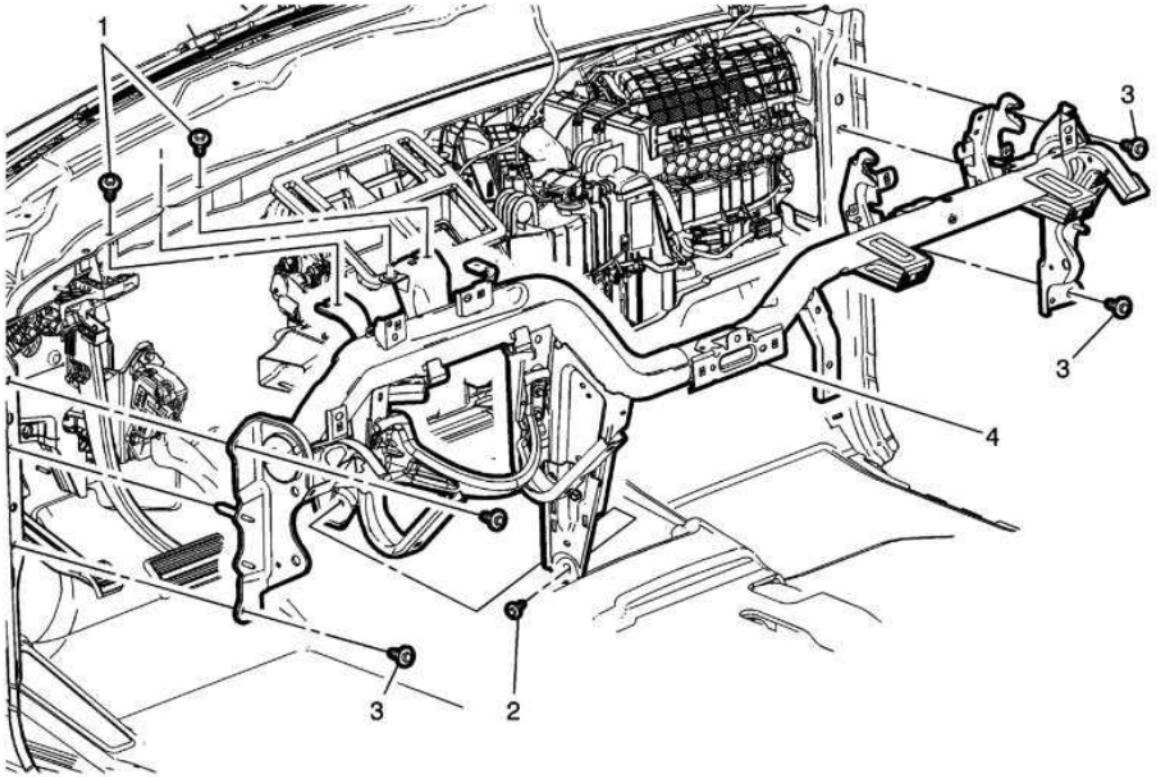


Fig. 60: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

8. Remove the instrument panel tie bar (4) assembly. Refer to **Instrument Panel Tie Bar Replacement**
9. Temporary support the heater and air conditioning evaporator and blower module assembly.

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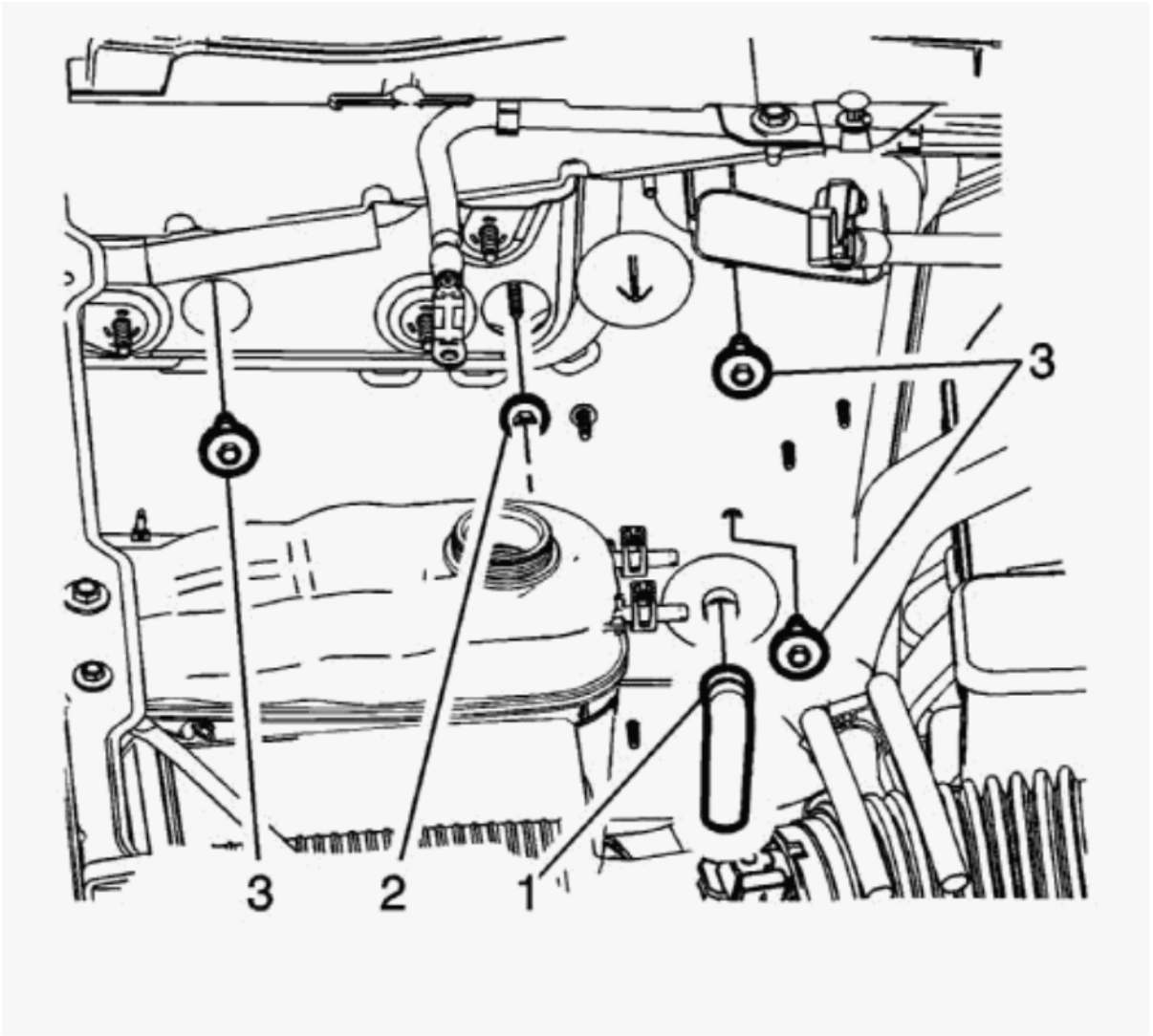


Fig. 61: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

10. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the heater and air conditioning evaporator and blower module.
11. Remove the heater and air conditioning evaporator and blower module nut, (2) securing the heater and air conditioning evaporator and blower module to the cowl panel.

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12. Remove the heater and air conditioning evaporator and blower module bolts, (3) securing the heater and air conditioning evaporator and blower module to the cowl panel.

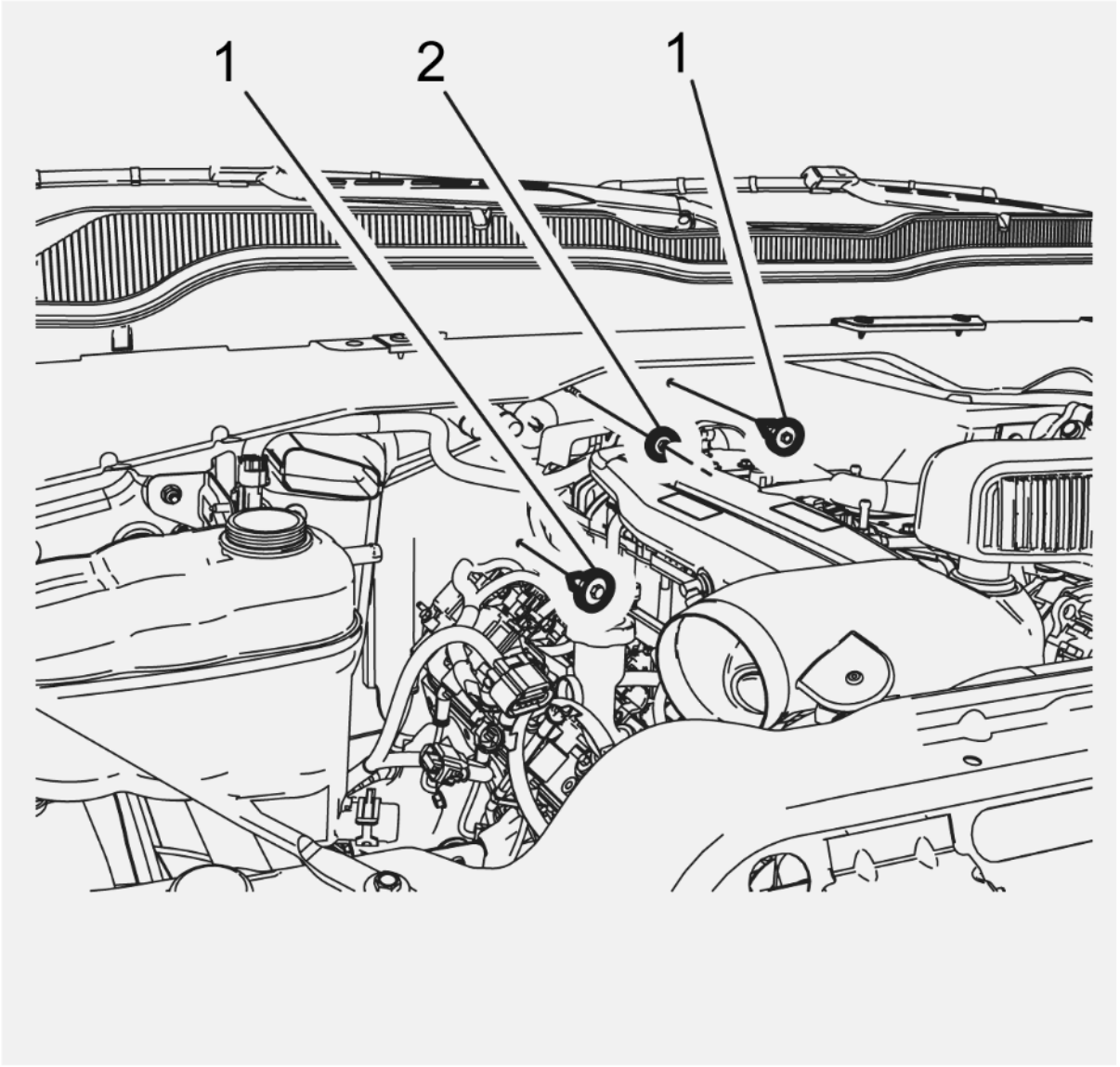


Fig. 62: HVAC Module Assembly And Cowl Panel
Courtesy of GENERAL MOTORS COMPANY

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13. Remove the heater and air conditioning evaporator and blower module bolts, (1) securing the heater and air conditioning evaporator and blower module to the cowl panel.
14. Remove the heater and air conditioning evaporator and blower module nut, (2) securing the heater and air conditioning evaporator and blower module to the cowl panel.

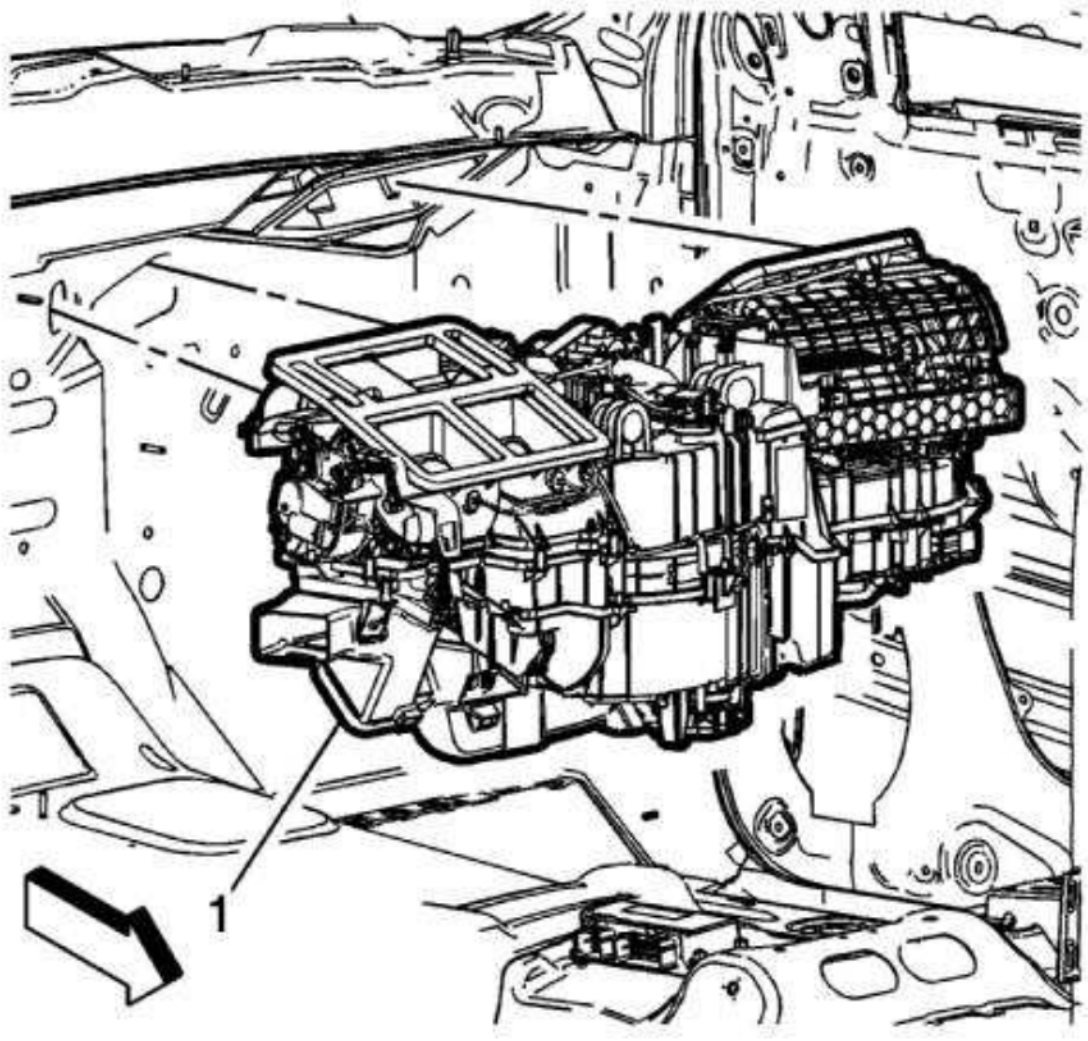


Fig. 63: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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CAUTION: **Refer to HVAC Module Drain Tube Caution .**

15. Remove the heater and air conditioning evaporator and blower module assembly (1) from the vehicle.
16. Transfer all the necessary components.

Installation Procedure

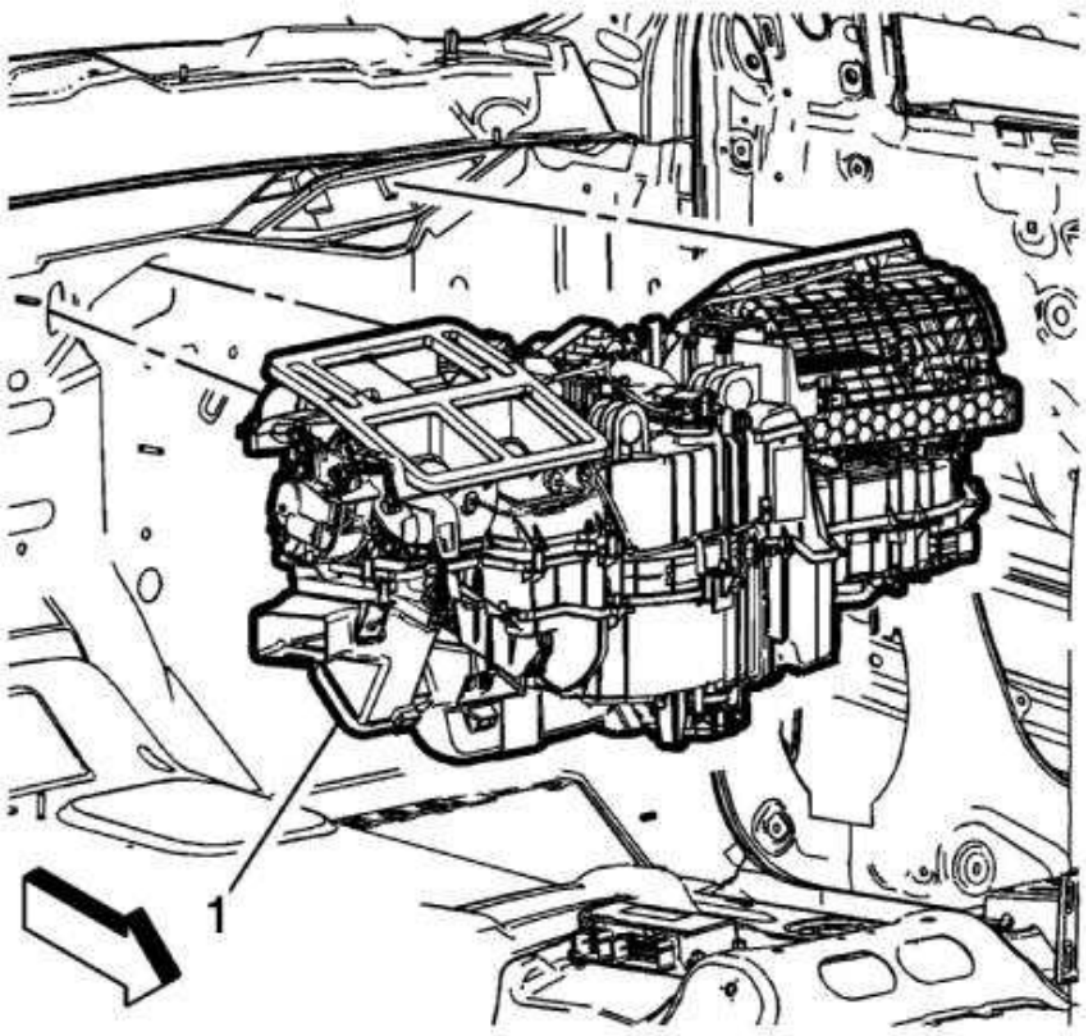


Fig. 64: HVAC Module Assembly

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Courtesy of GENERAL MOTORS COMPANY

1. Position the heater and air conditioning evaporator and blower module assembly (1) into the vehicle and temporarily support it.

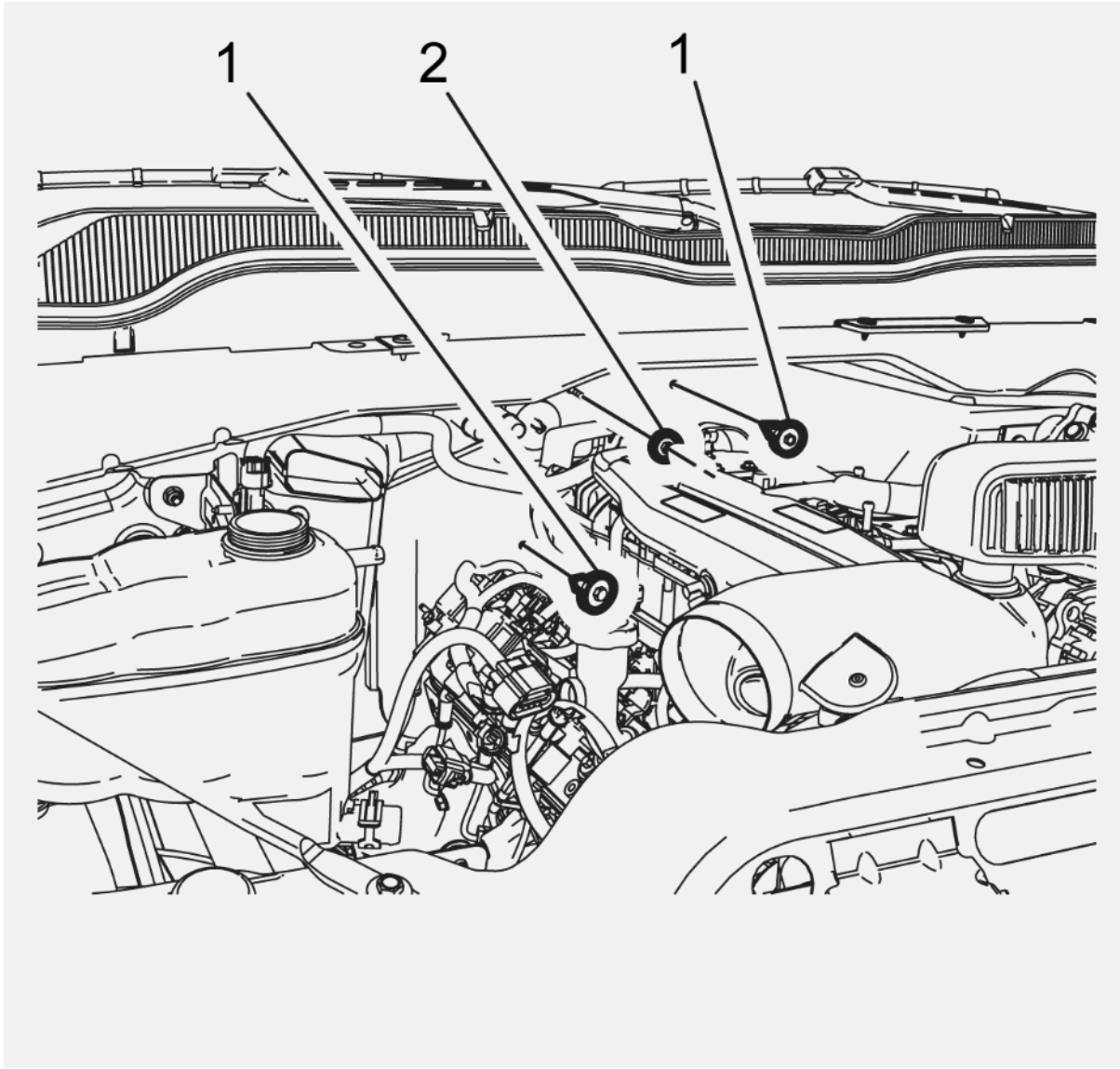


Fig. 65: HVAC Module Assembly And Cowl Panel
Courtesy of GENERAL MOTORS COMPANY

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CAUTION: **Refer to Fastener Caution .**

2. From within the engine compartment, install the heater and air conditioning evaporator and blower module nut, (2) securing the heater and air conditioning evaporator and blower module to the cowl panel, and tighten to 9.5 N.m (84 lb in).
3. Install the heater and air conditioning evaporator and blower module bolts, (1) securing the heater and air conditioning evaporator and blower module to the cowl panel.

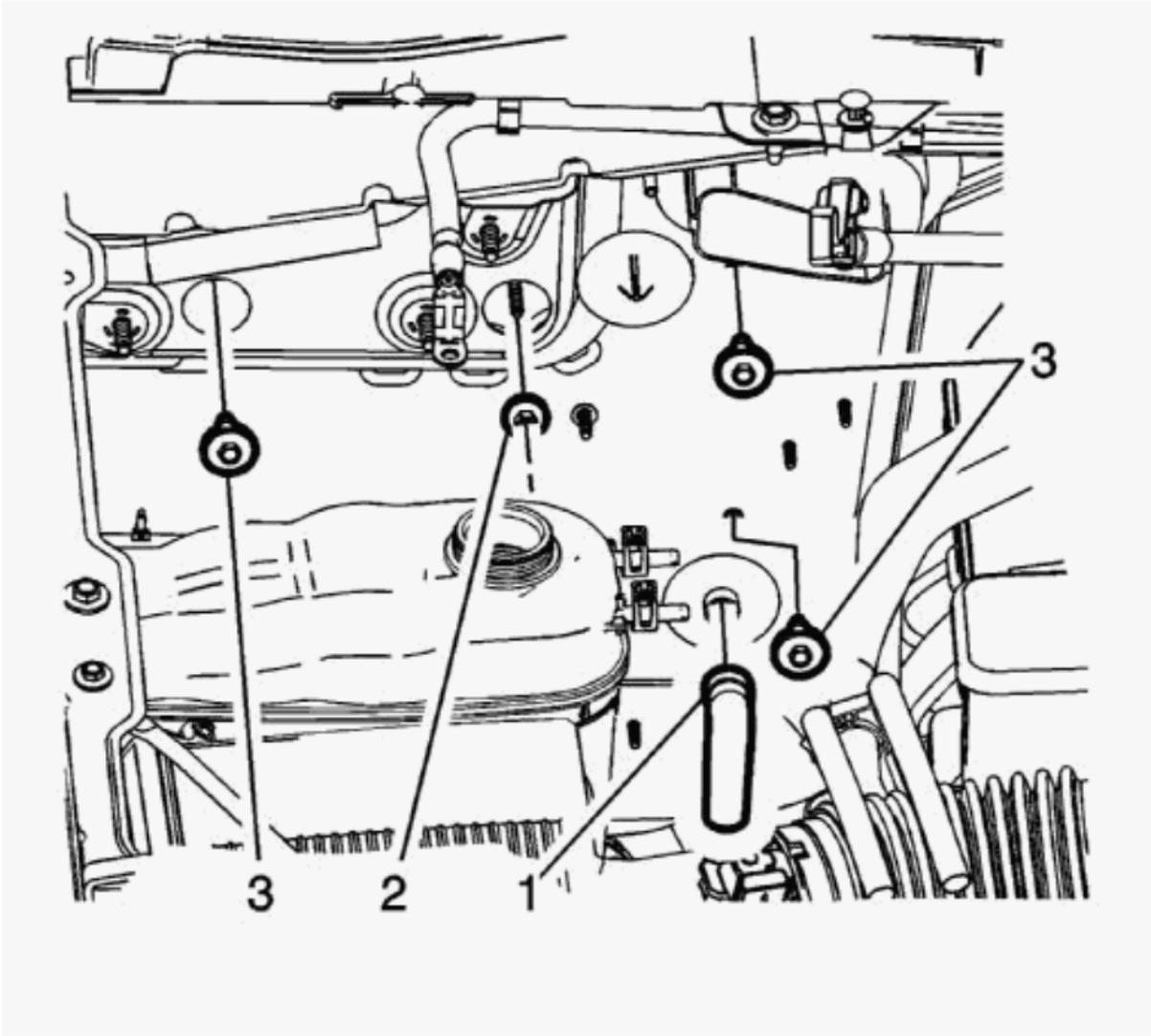


Fig. 66: Air Conditioning Evaporator Case Drain Tube

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Courtesy of GENERAL MOTORS COMPANY

4. Install the heater and air conditioning evaporator and blower module bolts, (3) securing the heater and air conditioning evaporator and blower module to the cowl panel.
5. Install the heater and air conditioning evaporator and blower module nut, (2) securing the heater and air conditioning evaporator and blower module to the cowl panel.
6. Install the air conditioning evaporator case drain tube (1) onto the heater and air conditioning evaporator and blower module.

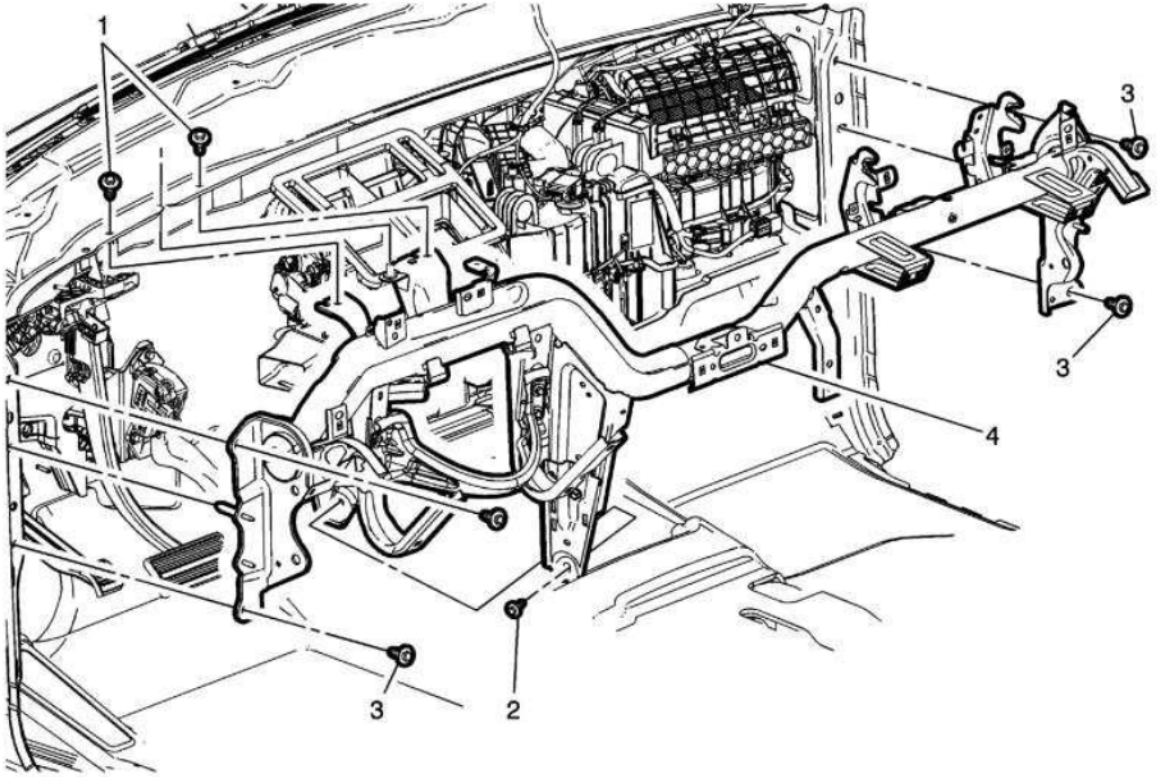


Fig. 67: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

7. Install the instrument panel tie bar (4) assembly. Refer to **Instrument Panel Tie Bar Replacement**

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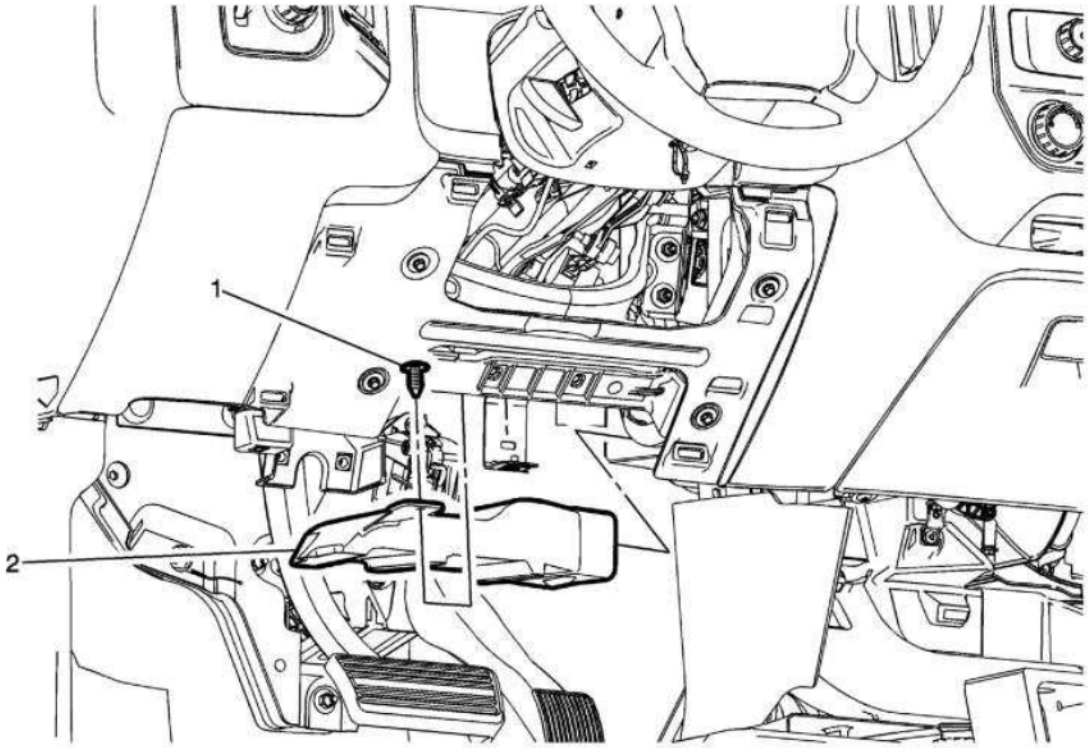


Fig. 68: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

8. Install the left side floor rear air outlet duct (2). Refer to **Floor Front Air Outlet Duct Replacement - Left Side (Utilities)Floor Front Air Outlet Duct Replacement - Left Side (Z75)**

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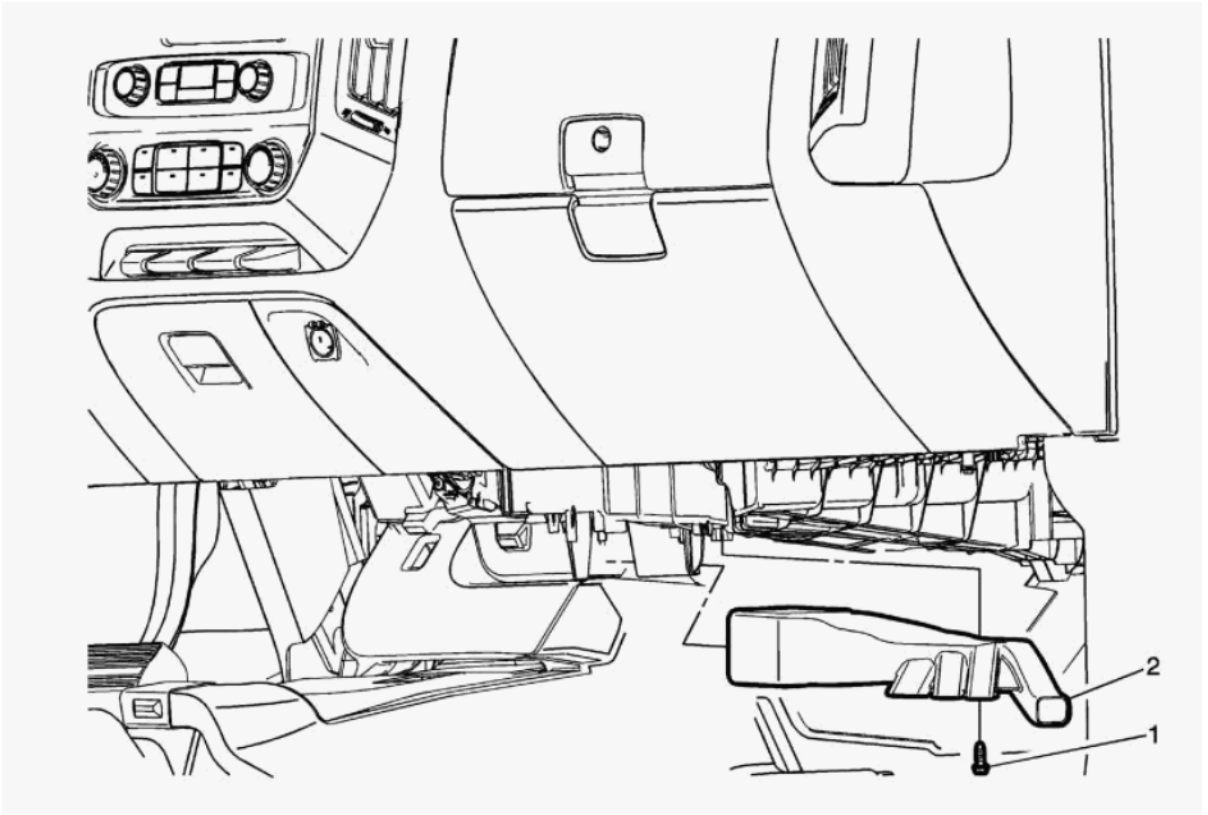


Fig. 69: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

9. Install the right side floor rear air outlet duct (2). Refer to **Floor Front Air Outlet Duct Replacement - Right SideFloor Front Air Outlet Duct Replacement - Right Side (Z75)**

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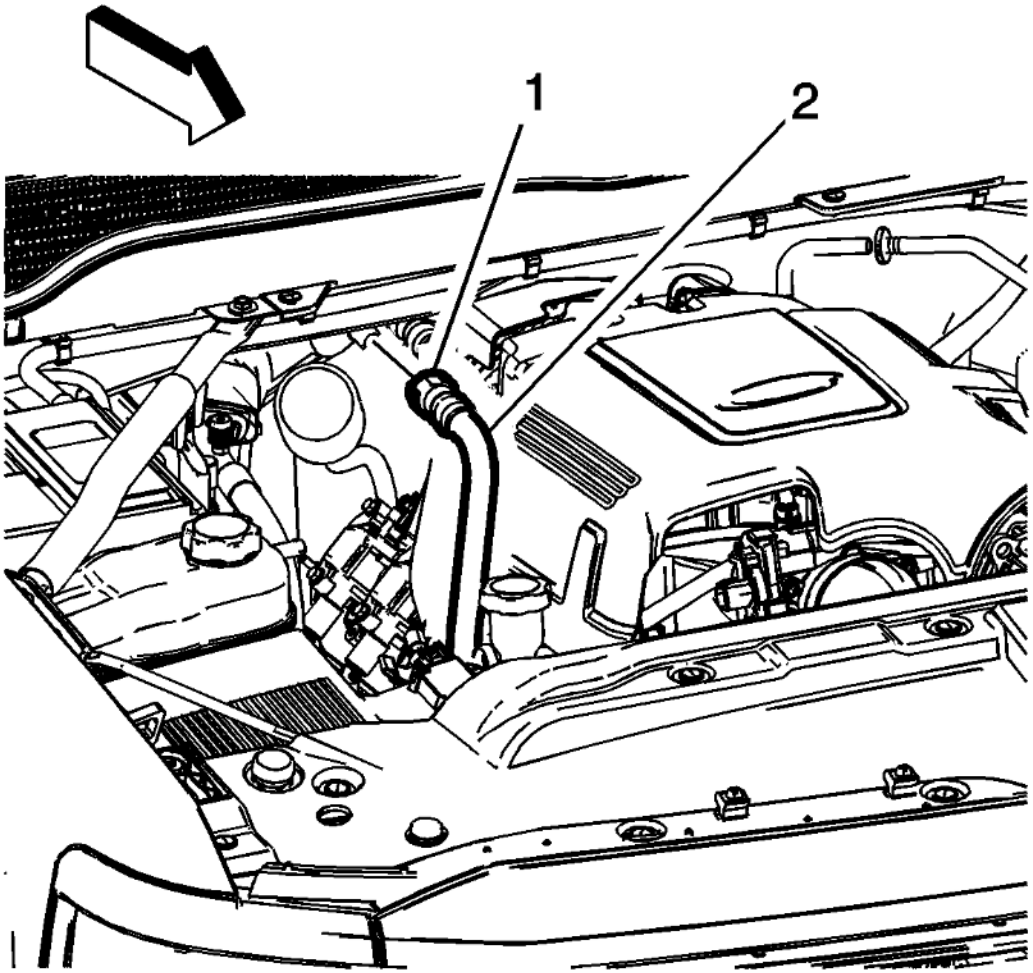


Fig. 70: Radiator Surge Tank Outlet Hose Clamp At Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

10. Install the radiator surge tank outlet hose (2) to the heater core tube. Refer to **Radiator Surge Tank Outlet Hose Replacement (L96)**

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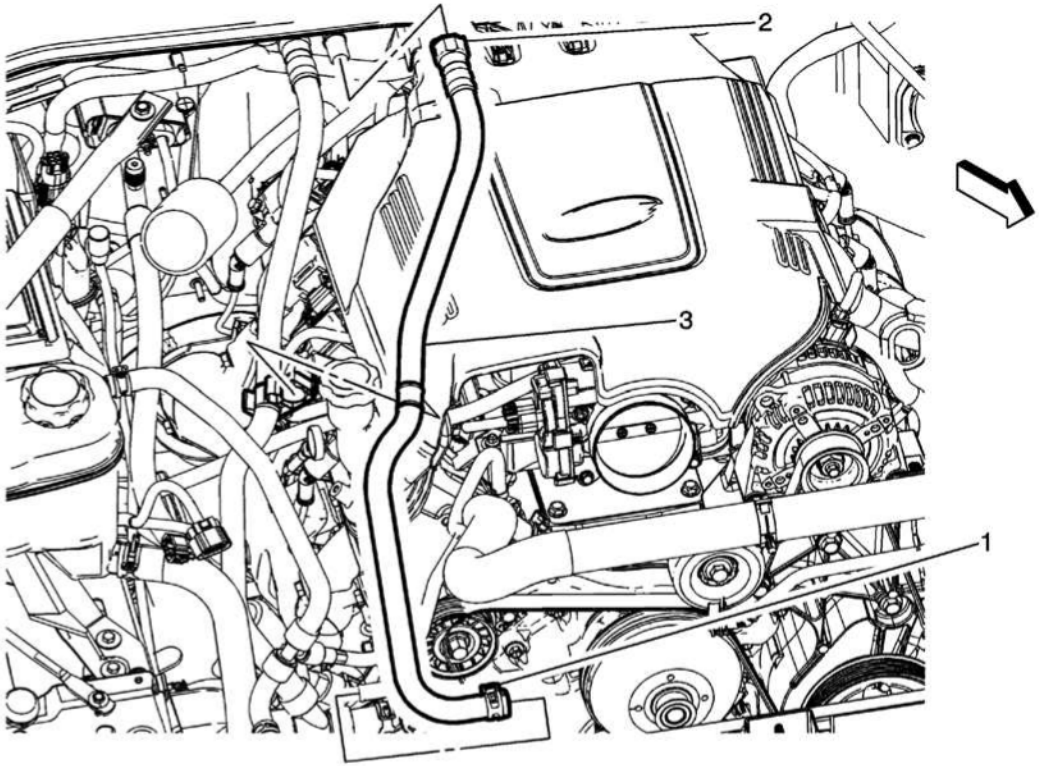


Fig. 71: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

11. Install the heater inlet hose (3) to the heater core tube. Refer to **Heater Inlet Hose Replacement (L96)**
12. Install the battery. Refer to **Battery Replacement**
13. Fill the engine coolant system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)**
14. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (Single Battery)**
15. Visually inspect for coolant leaks.
16. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION

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Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (Single Battery)**
2. Recover the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
3. Drain the engine coolant system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)**
4. Remove the battery tray. Refer to **Battery Tray Replacement**
5. Remove the heater inlet hose from the heater core tube. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**
6. Remove the heater outlet hose from the heater core tube. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**
7. Remove the air conditioning evaporator tube from the thermal expansion valve. Refer to **Air Conditioning Evaporator Tube Replacement (L83 L86)Air Conditioning Evaporator Tube Replacement (L96)**
8. Remove the air conditioning condenser hose from the thermal expansion valve. Refer to **Air Conditioning Condenser Hose Replacement (L83 L86)Air Conditioning Condenser Hose Replacement (L96)**
9. Remove the intake manifold. Refer to **Intake Manifold Replacement**
10. Remove the right side floor front air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Right SideFloor Front Air Outlet Duct Replacement - Right Side (Z75)**
11. Remove the instrument panel tie bar assembly. Refer to **Instrument Panel Tie Bar Replacement**
12. Temporary support the heater and air conditioning evaporator and blower module assembly.

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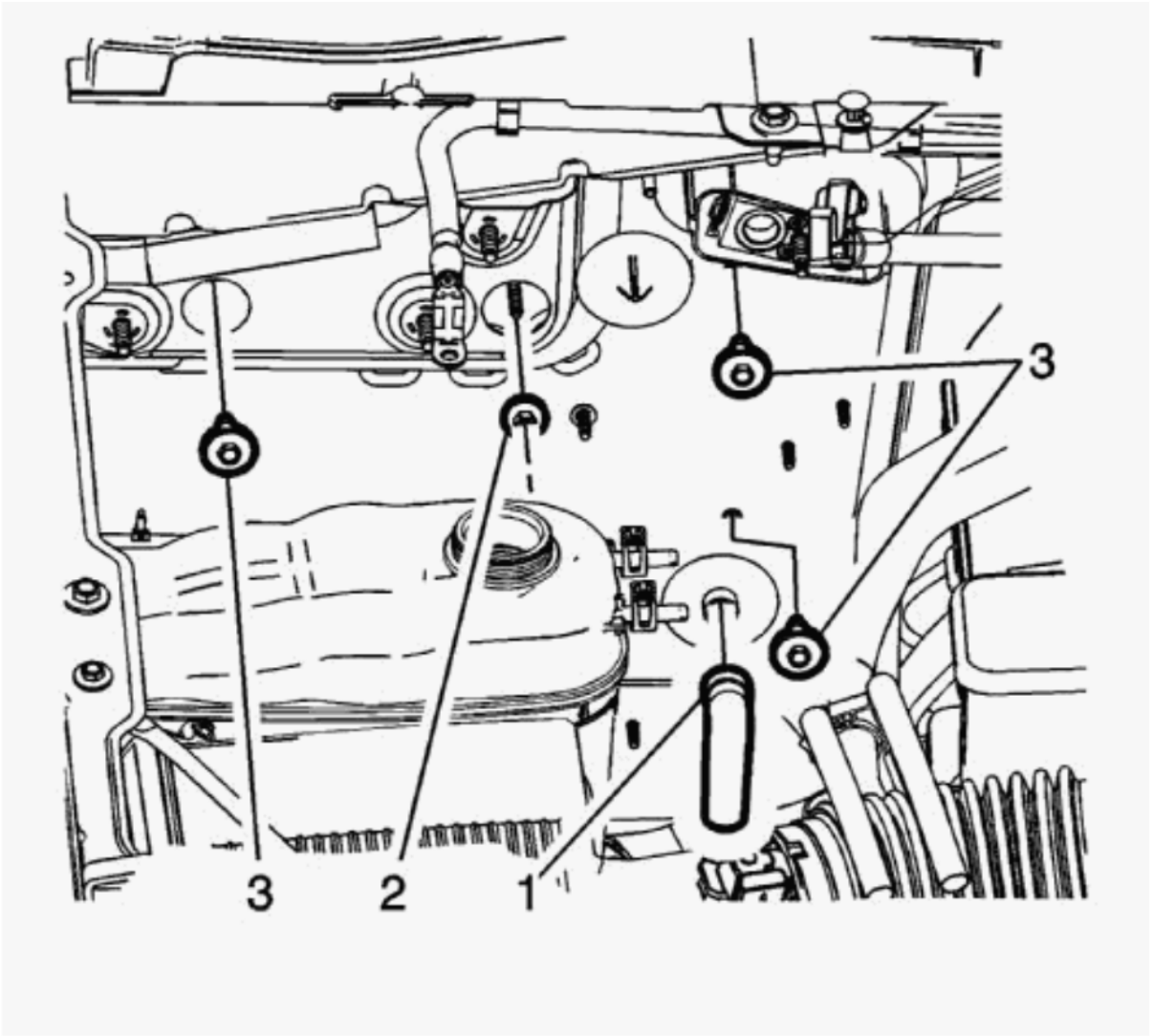


Fig. 72: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

13. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the HVAC module assembly.
14. Remove the HVAC module assembly nut, (2) securing the HVAC module assembly to the cowl panel.
15. Remove the HVAC module assembly bolts, (3) securing the HVAC module assembly to the cowl panel.

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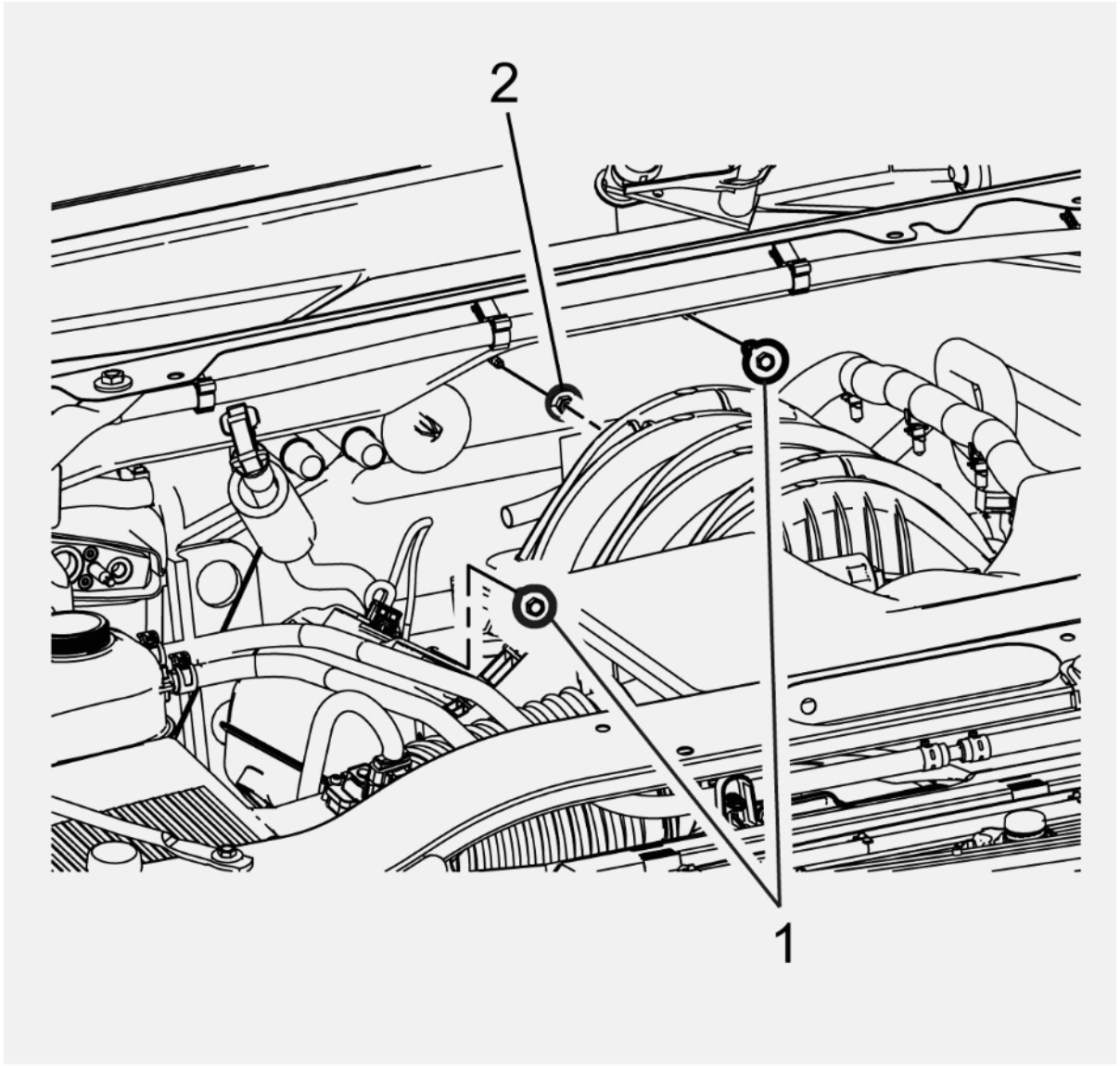


Fig. 73: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

16. Remove the HVAC module assembly bolts, (1) securing the HVAC module assembly to the cowl panel.
17. Remove the HVAC module assembly nut, (2) securing the HVAC module assembly to the cowl panel.

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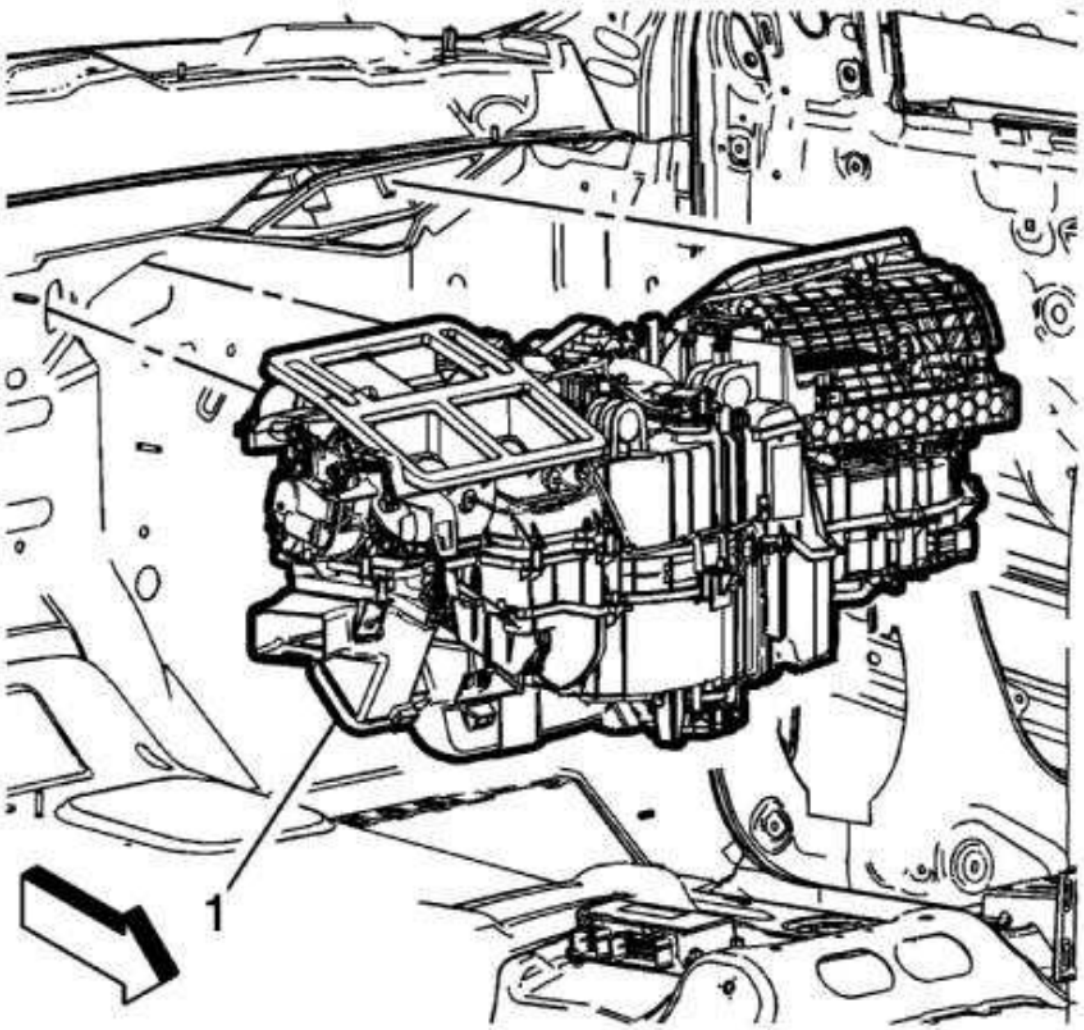


Fig. 74: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to HVAC Module Drain Tube Caution .

18. Remove the HVAC module assembly (1) from the vehicle.
19. Transfer all the necessary components.

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Installation Procedure

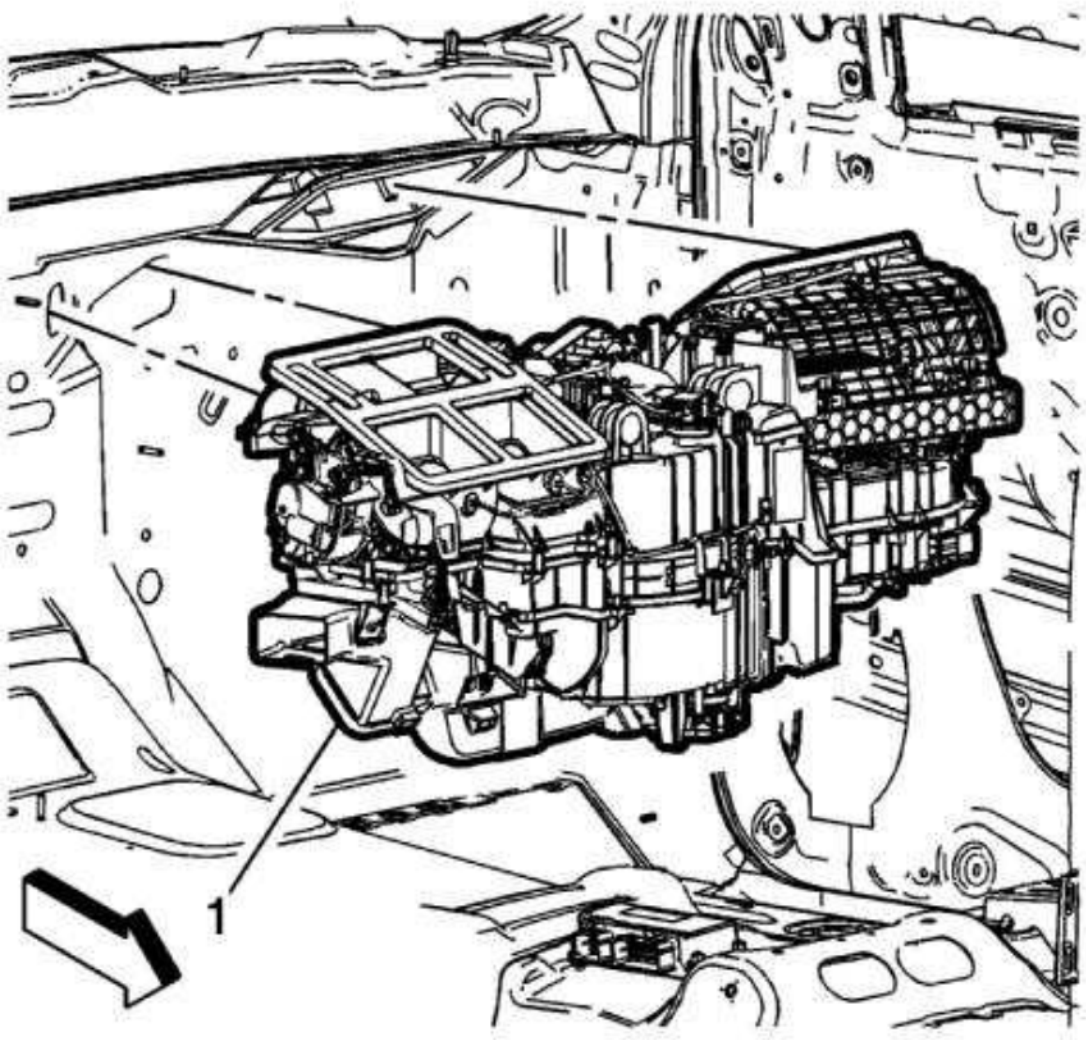


Fig. 75: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

1. Position the HVAC module assembly (1) into the vehicle and temporarily support it.

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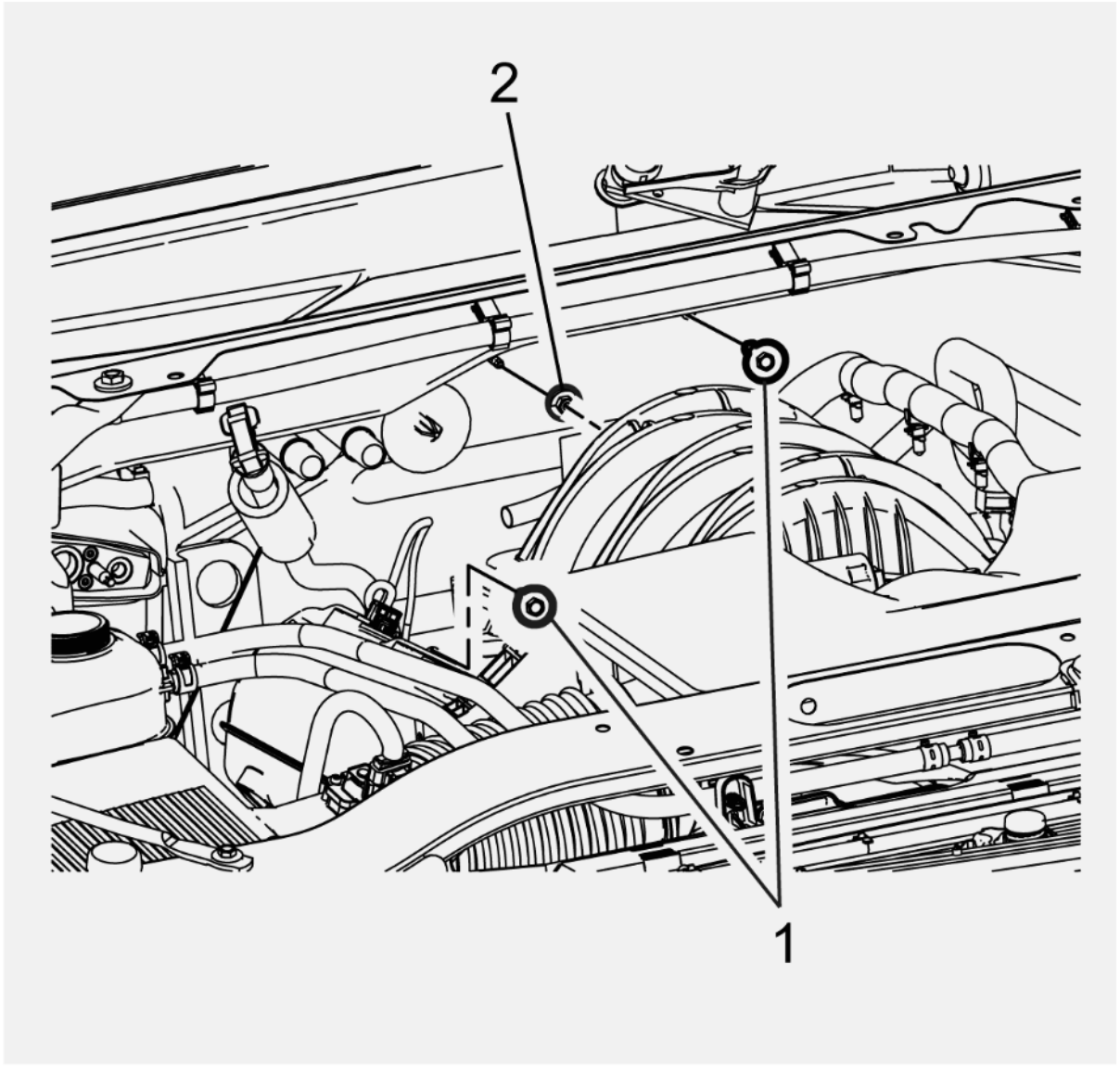


Fig. 76: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. From within the engine compartment, install the HVAC module assembly nut, (2) securing the HVAC module assembly to the cowl panel, and

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tighten to 9.5 N.m (84 lb in).

3. Install the HVAC module assembly bolts, (1) securing the HVAC module assembly to the cowl panel.

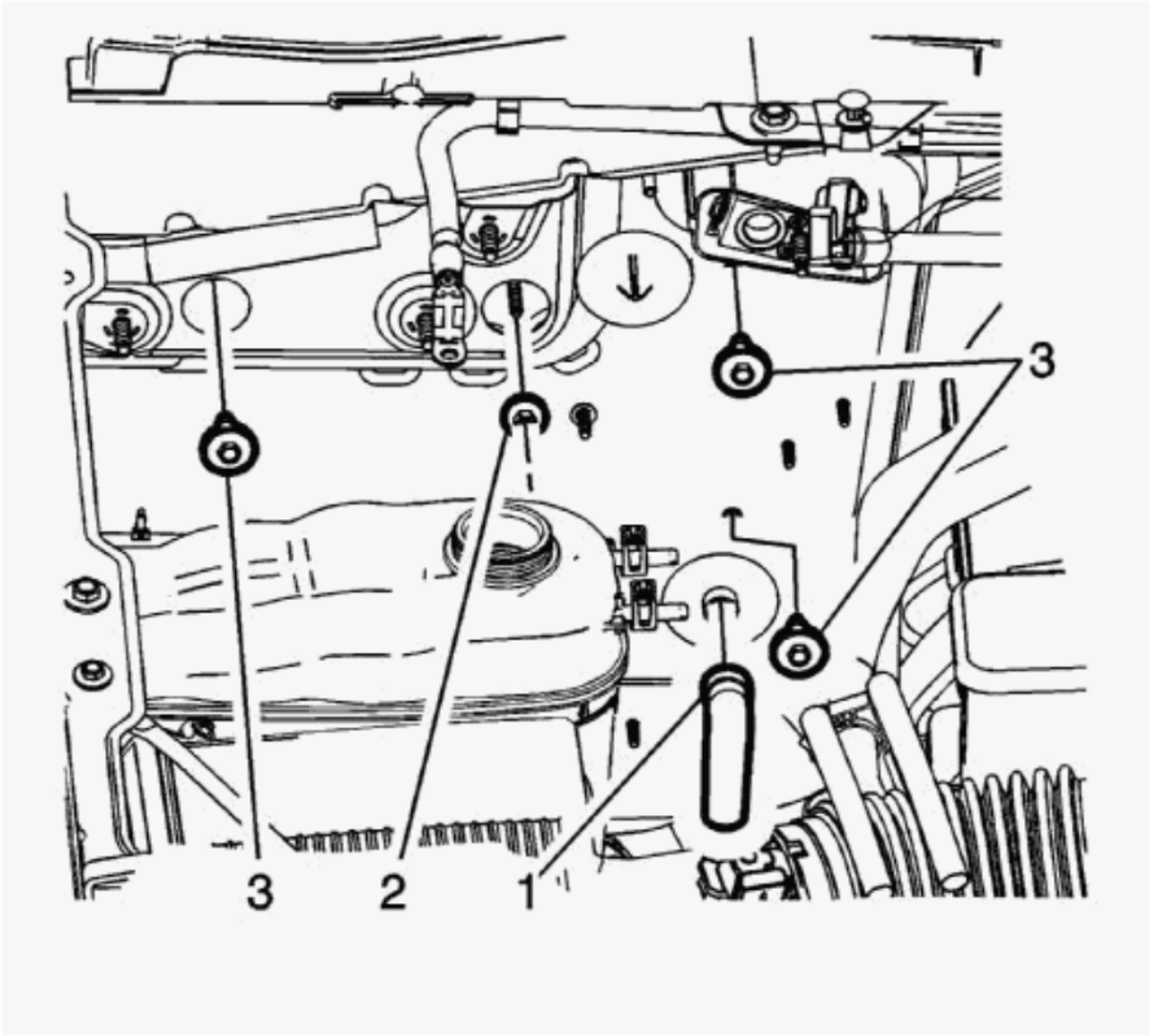


Fig. 77: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

4. Install the HVAC module assembly bolts, (3) securing the HVAC module assembly to the cowl panel.
5. Install the HVAC module assembly nut, (2) securing the HVAC module assembly to the cowl panel.

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6. Install the air conditioning evaporator case drain tube (1) onto the HVAC module assembly.
7. Install the instrument panel tie bar assembly. Refer to **Instrument Panel Tie Bar Replacement**
8. Install the right side floor front air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Right SideFloor Front Air Outlet Duct Replacement - Right Side (Z75)**
9. Install the intake manifold cover. Refer to **Intake Manifold Replacement**
10. Install the air conditioning condenser hose to the thermal expansion valve. Refer to **Air Conditioning Condenser Hose Replacement (L83 L86)Air Conditioning Condenser Hose Replacement (L96)**
11. Install the air conditioning evaporator tube to the thermal expansion valve. Refer to **Air Conditioning Evaporator Tube Replacement (L83 L86)Air Conditioning Evaporator Tube Replacement (L96)**
12. Install the heater outlet hose to the heater core tube. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**
13. Install the heater inlet hose to the heater core tube. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**
14. Install the battery tray. Refer to **Battery Tray Replacement**
15. Fill the engine coolant system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)**
16. Recharge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**
17. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (Single Battery)**
18. Visually inspect for coolant leaks.
19. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR CASE REPLACEMENT

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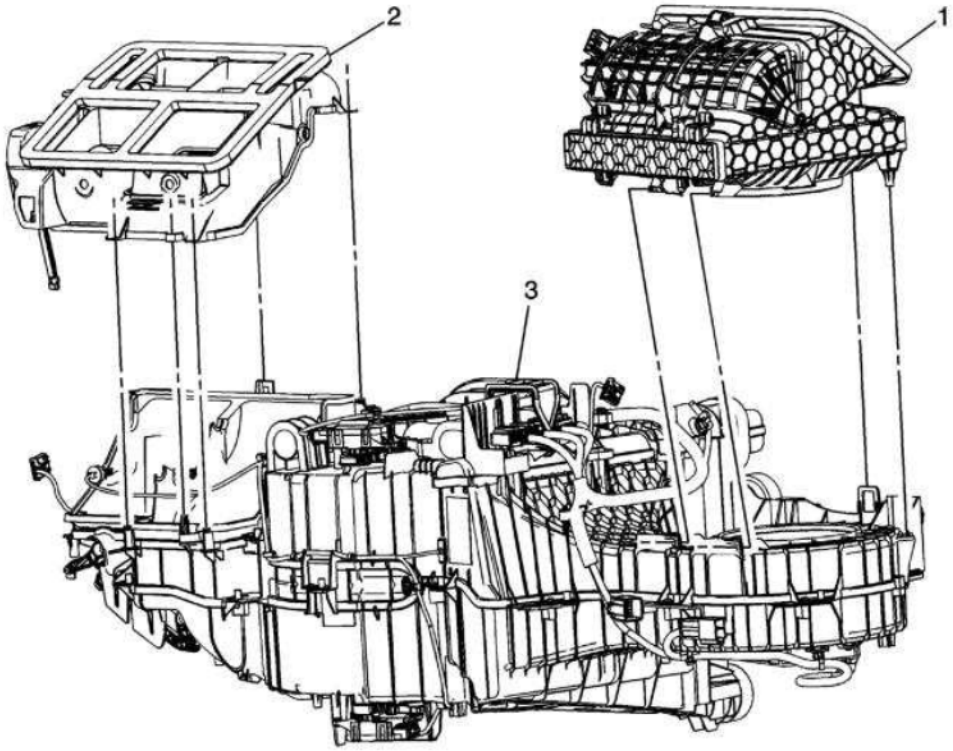


Fig. 78: Heater and Air Conditioning Evaporator Case
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**. 2. Disconnect the electrical connectors as necessary.	
1	Air Inlet Housing Assembly Refer to **Air Inlet Housing Replacement**.
2	Air Distributor Case Assembly Refer to **Air Distributor Case Replacement**.

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Call out	Component Name
3	Heater and Air Conditioning Evaporator Case Assembly **Procedures** 1. Remove the heater core assembly. Refer to **Heater Core Replacement (Non Heat Stake)Heater Core Replacement (Heat Stake)**. 2. Remove the air conditioning evaporator core assembly. Refer to **Air Conditioning Evaporator Core Replacement (R-134A Non Heat Stake)Air Conditioning Evaporator Core Replacement (R-1234yf Non Heat Stake)Air Conditioning Evaporator Core Replacement (R-1234yf Heat Stake)Air Conditioning Evaporator Core Replacement (R-134A Heat Stake)**. 3. Remove the blower motor assembly. Refer to **Blower Assembly ReplacementBlower Assembly Replacement (Z75)**. 4. Remove the left side temperature valve actuator if equipped. Refer to **Temperature Valve Actuator Replacement - Left Side** . 5. Remove the right side temperature valve actuator. Refer to **Temperature Valve Actuator Replacement - Right Side** . 6. Transfer the components as necessary.

BLOWER ASSEMBLY REPLACEMENT (W/O Z75)

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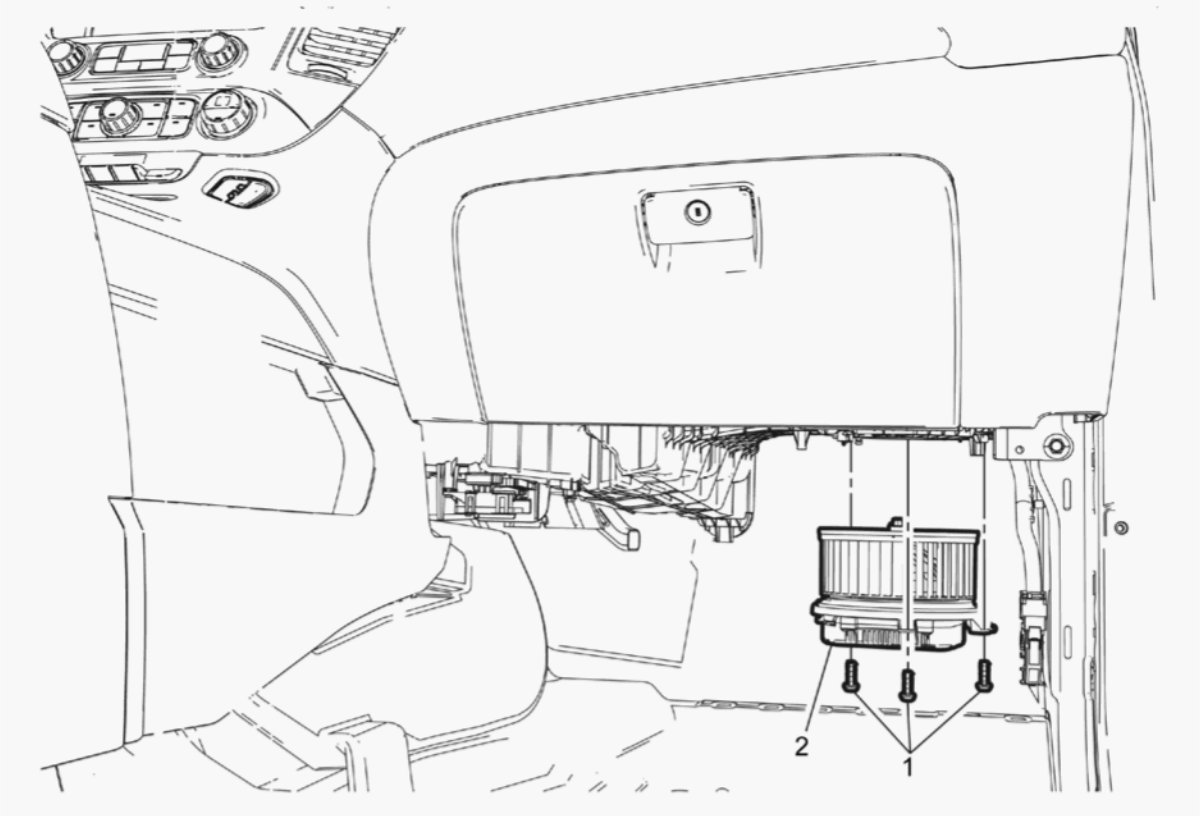


Fig. 79: Blower Assembly (W/O Z75)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (Chevrolet / GMC)** **Instrument Panel Insulator Replacement (Cadillac)** .	
1	Blower Motor Fastener (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** .

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Call out	Component Name
	Tighten 1.7 N.m (15 lb in)
2	Blower Motor Assembly **Procedure** Disconnect the blower motor assembly electrical connector.

BLOWER ASSEMBLY REPLACEMENT (Z75)

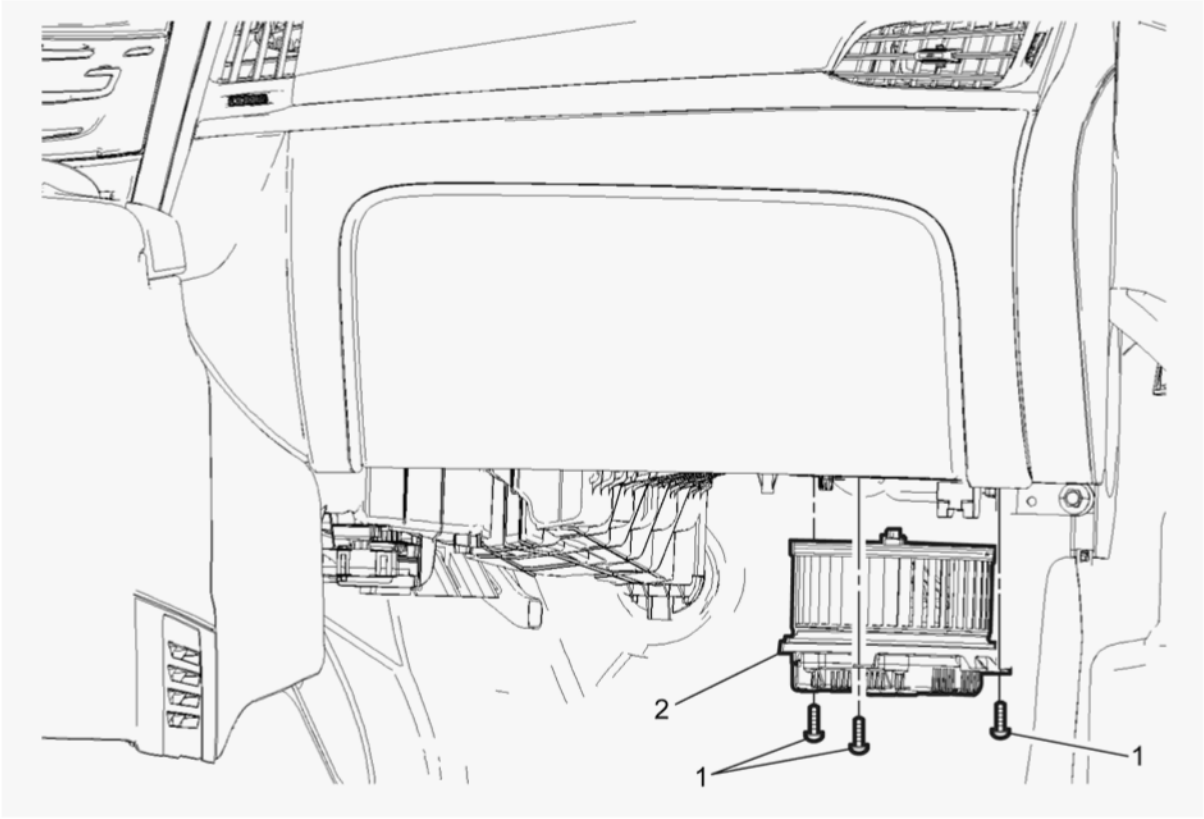


Fig. 80: Blower Assembly (Z75)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedure Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (Chevrolet / GMC)** **Instrument Panel Insulator Replacement (Cadillac)** .	
1	Blower Motor Fastener (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1.7 N.m (15 lb in)
2	Blower Motor Assembly **Procedure** Disconnect the blower motor assembly electrical connector.

AIR CONDITIONING EVAPORATOR CORE REPLACEMENT (R-134A NON HEAT STAKE)

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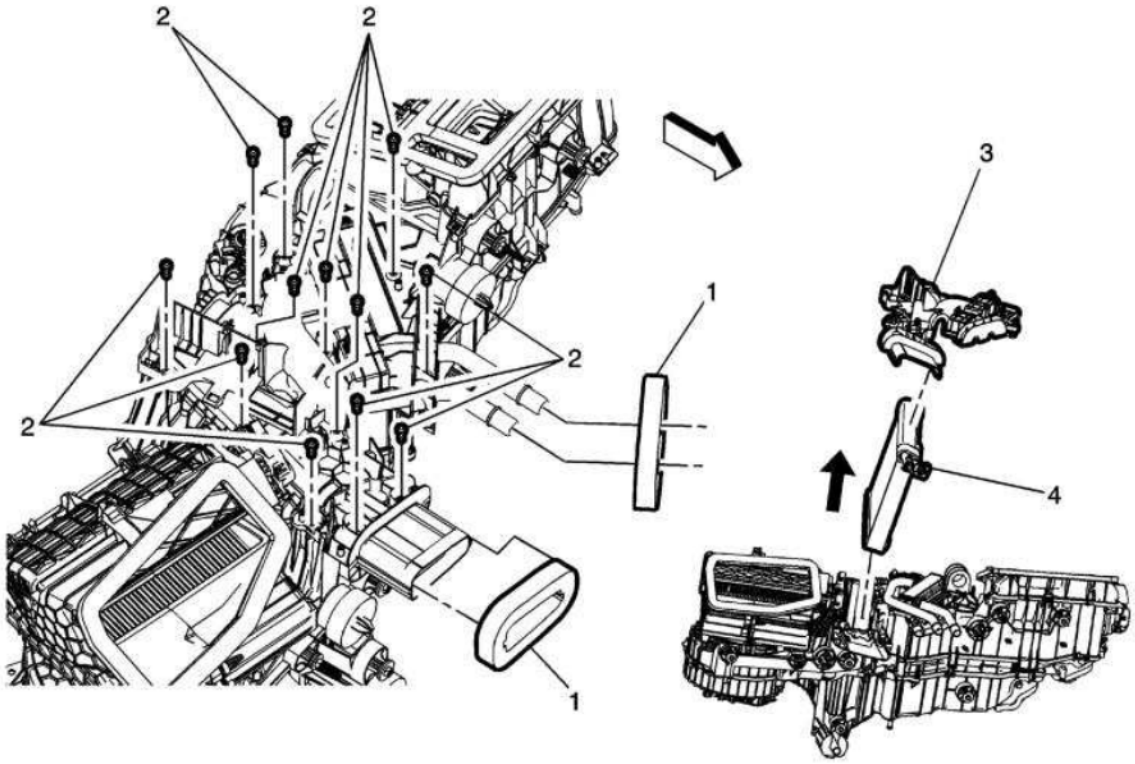


Fig. 81: Air Conditioning Evaporator Core (R-134A Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**. 2. Remove the temperature valve actuator. Refer to **Temperature Valve Actuator Replacement - Left Side** . 3. Disconnect the electrical connectors as necessary.	
1	Seal (Qty: 2)
2	Heater Cover Fastener (Qty: 12)

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Call out	Component Name
	CAUTION:
3	Heater Cover **Refer to Fastener Caution .**
4	Air Conditioning Evaporator Core **Procedures** 1. Lift the air conditioning evaporator core up and out of the heater and air conditioning evaporator and blower module assembly. 2. Transfer the components as necessary.

AIR CONDITIONING EVAPORATOR CORE REPLACEMENT (R-1234YF NON HEAT STAKE)

WARNING: **Refer to R-1234yf Proper Service Procedures Warning .**

CAUTION: **Evaporators in vehicles equipped with R-1234yf refrigerant systems, shall never be repaired or replaced with one removed from another or salvage. Only new, SAE J2842 certified and labeled evaporator(s) shall be used as replacement parts. Failure to follow the above guidelines could result in EPA Penalties and/or fines.**

NOTE: **Technicians repairing or servicing motor vehicle air conditioning (MVAC) systems must be trained and certified by an EPA approved organization. Certification is obtained by passing an EPA approved examination. (http://www.epa.gov/ozone/title6/609/technicians/609certs.html)**

Removal Procedure

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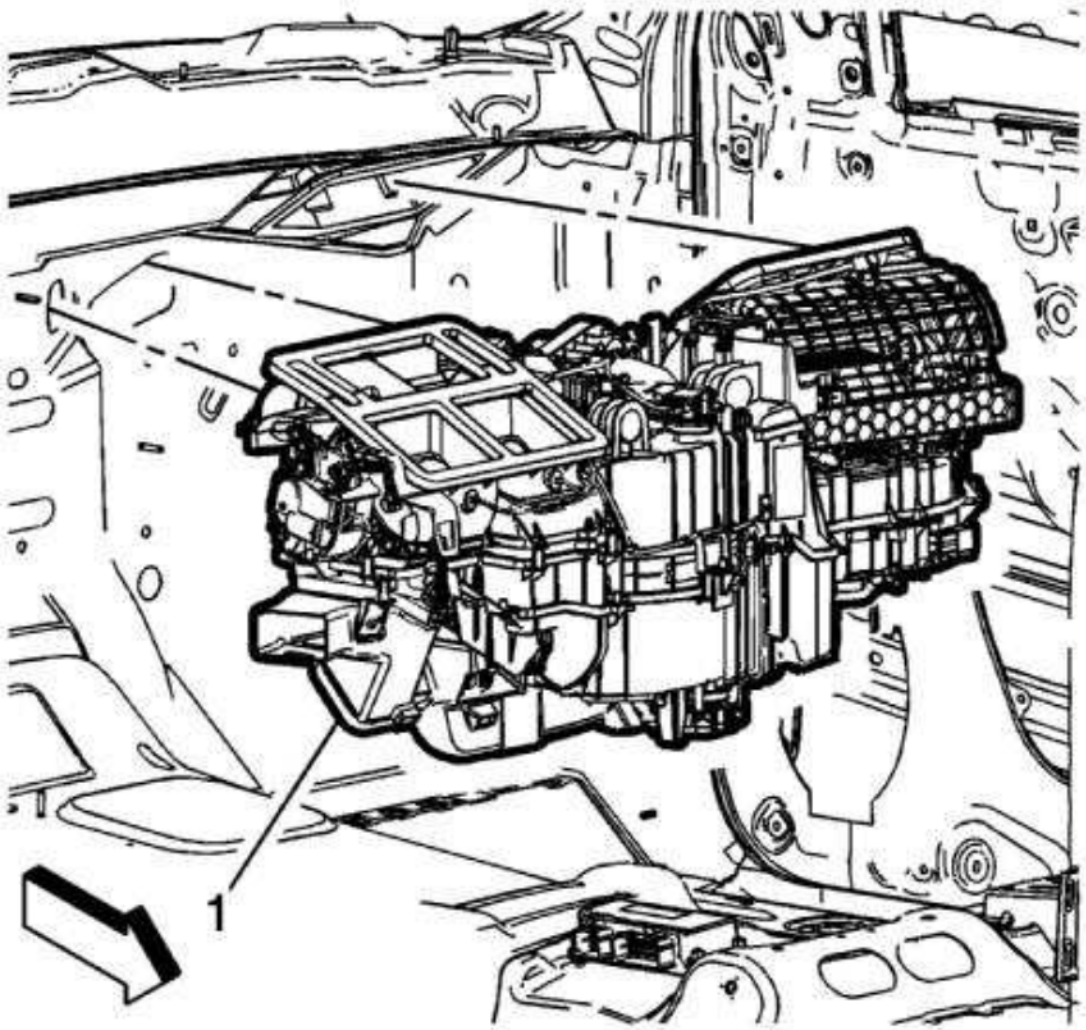


Fig. 82: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

1. Remove the heater and air conditioning evaporator and blower module assembly (1). Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

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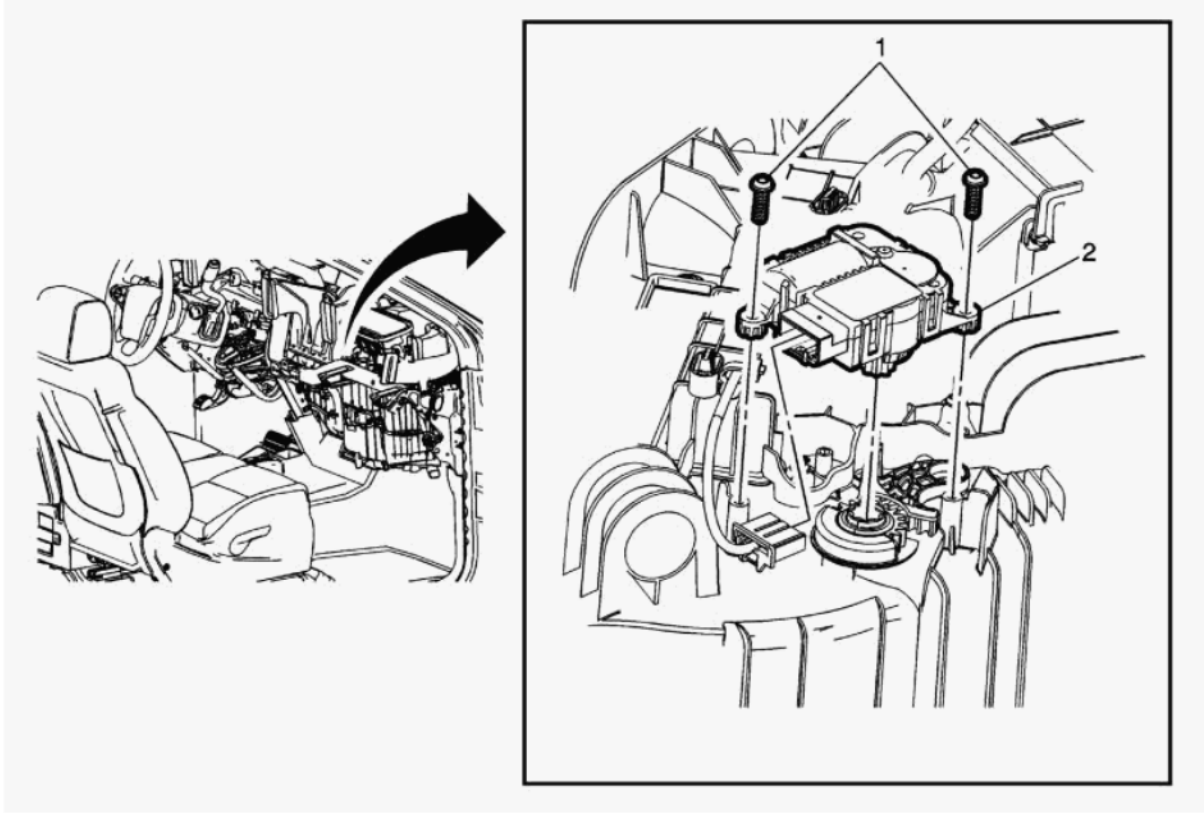


Fig. 83: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

2. Remove the temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .

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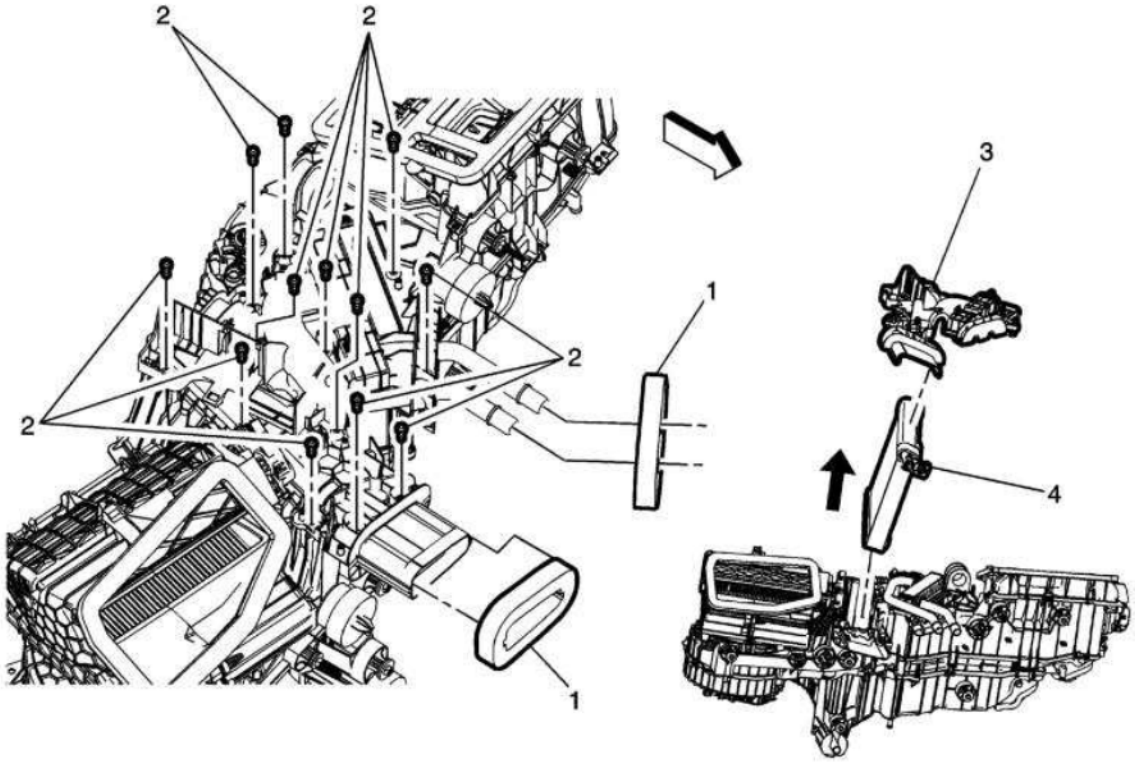


Fig. 84: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

3. Remove the heater and air conditioning evaporator and blower case seals (1).
4. Remove the heater cover fasteners (2).
5. Remove the heater cover (3).
6. Remove the air conditioning evaporator core (4) from the heater and air conditioning evaporator and blower module assembly.

Installation Procedure

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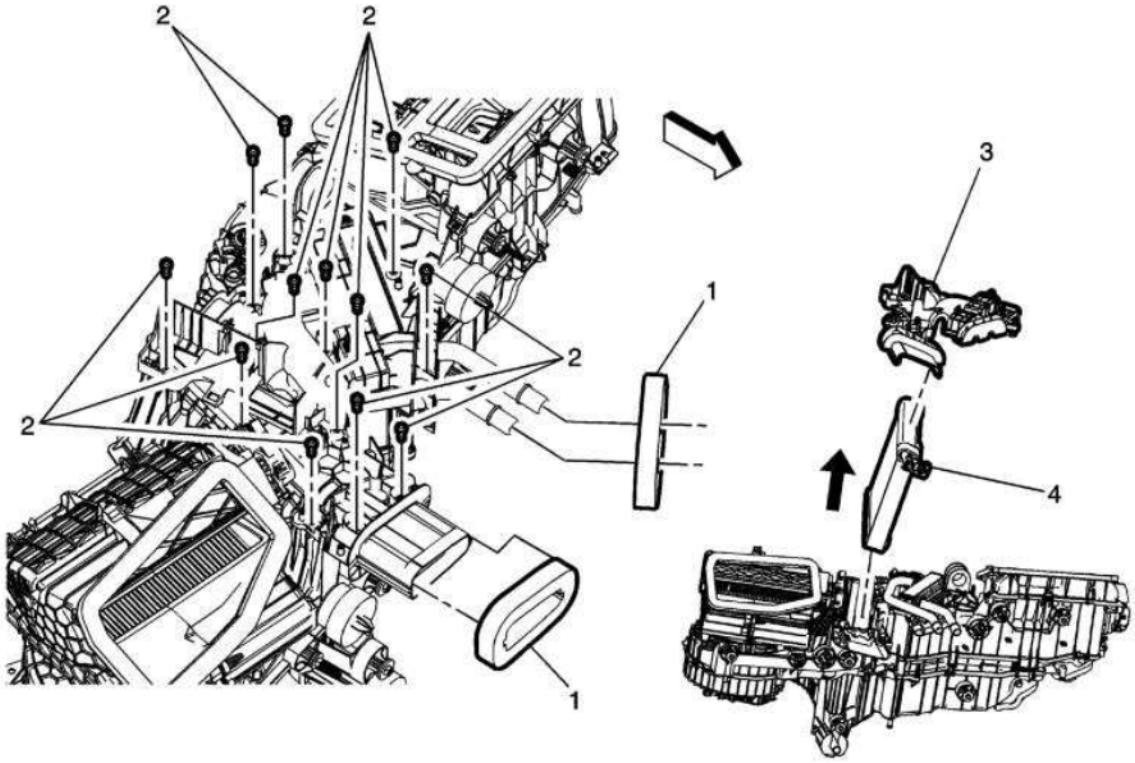


Fig. 85: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

1. Position the air conditioning evaporator core (4) into the heater and air conditioning evaporator and blower module assembly.
2. Install the heater cover (3)

CAUTION: Refer to Fastener Caution .

3. Install the heater cover fasteners (2) and tighten to 1.7 N.m (15 lb in).
4. Install the heater and air conditioning evaporator and blower case seals (1).

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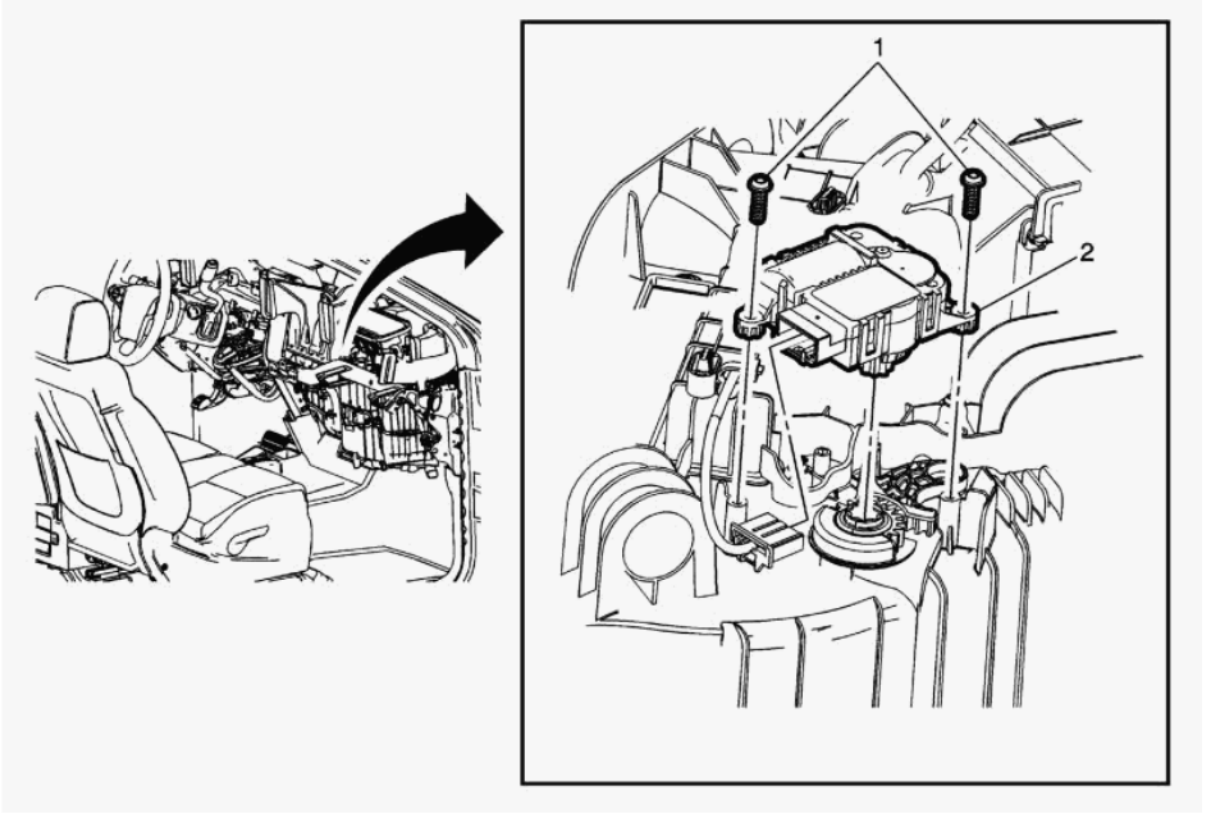


Fig. 86: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

5. Install the temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .

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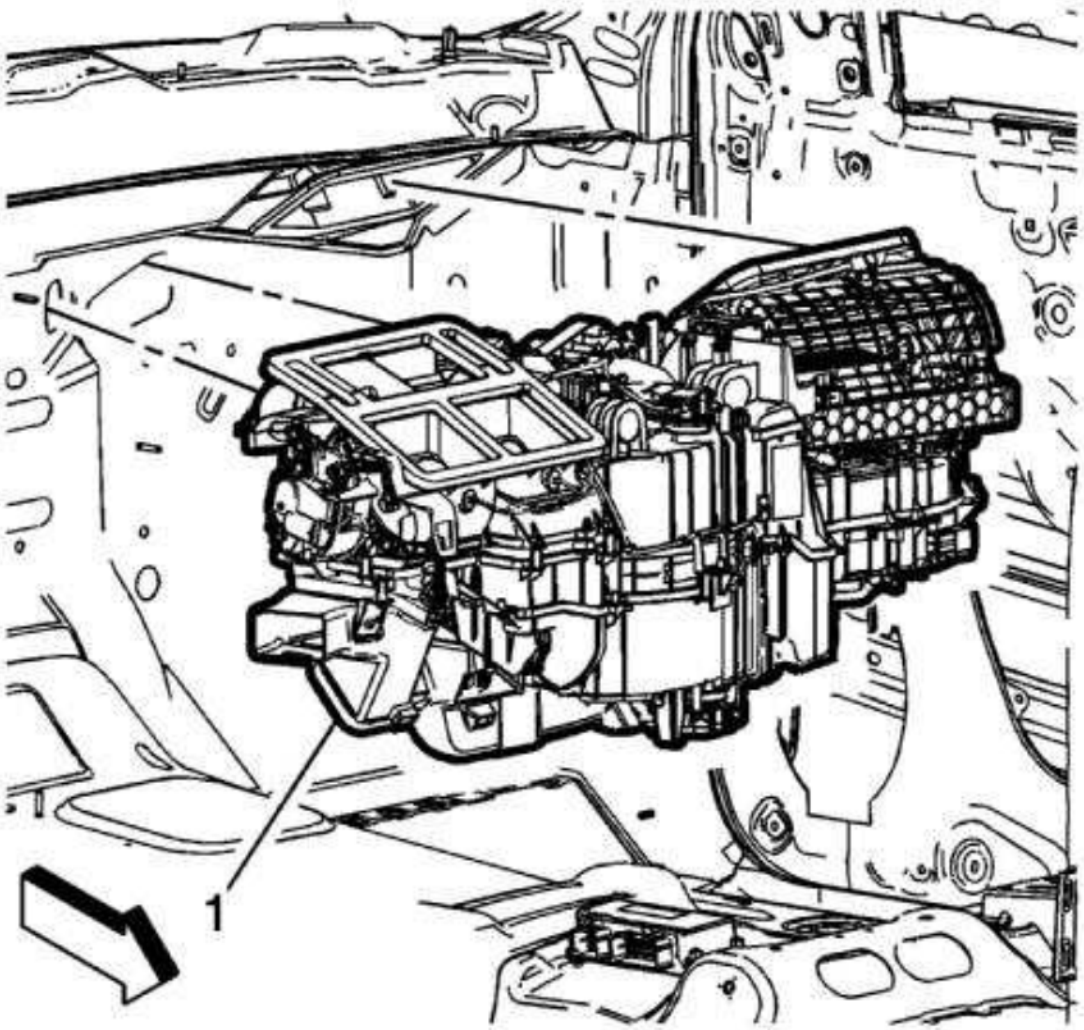


Fig. 87: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

6. Install the heater and air conditioning evaporator and blower module assembly (1). Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

Replacement Evaporator Label Requirements

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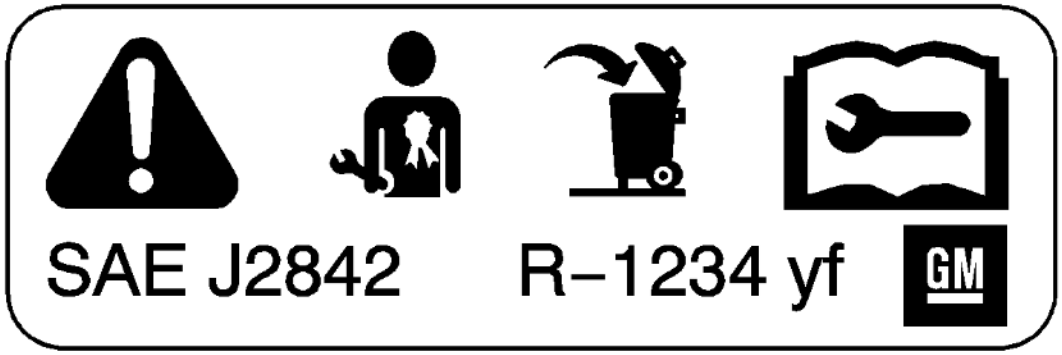


Fig. 88: Replacement Evaporator Label
Courtesy of GENERAL MOTORS COMPANY

Replacement evaporators shall have a permanent marking (label, stamp, or etching) that indicates that this evaporator design meets SAE J2842 and shall include the wording below or optionally the symbols as shown:

Text Only- Label Wording - "Conforms to SAE J2842 (Evaporator Manufacturer's Name or Trademark) Replace only with new evaporator certified to meet SAE J2842.

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Leak Free Joints Inside the Passenger Compartment

If a refrigerant joint/connection is made or disturbed inside the passenger cabin the following steps shall be followed by the technician to ensure the joint/connection is leak free.

1. Shall clean all dirt, grease and debris from and around connection joints before disassembly/assembly of refrigerant connections.
2. Shall be advised to carefully inspect the joint/connection seal surfaces for signs of deformation, contamination or damage after disassembly.
3. Shall be advised that Seals/O-rings shall never be reused, but replaced with all new parts.
4. Shall be advised to ensure proper alignment of male/female portions and seal so there is no misalignment and stress on the fitting connection.
5. Shall tighten the joint using the proper torque.
6. With full refrigerant charge installed and the vehicles HVAC blower motor set on its lowest speed, A/C switch off and air distribution set to floor. The technician shall insert a SAE J2913 compliant electronic leak detector set to high sensitivity (4 grams/year leak rate) into the center of a floor duct outlet, as far as possible. The technician shall monitor the electronic leak detector for 5 minutes or until the detector alarms.
    - If electronic leak detector alarms, recover the refrigerant and repair the leak.
    - If after 5 minutes there is no alarm, there is no indication of a leak in the passenger compartment and the repair can be completed.
7. If vehicle is equipped with an auxiliary evaporator, monitor the air downstream from the evaporator at the outlet duct closest to the auxiliary unit under the same conditions and set up as step 6.

Proper Disposal of the Replaced Evaporator

The replaced evaporator shall be disabled to ensure that it never be repaired or reused.

Disable the replaced evaporator by completing one of the following steps:

- Using tin snips sever a minimum of 3 of the evaporators tubes.
- Drill or Punch a minimum of two 25 mm (.25 inch) holes in each end tank.

AIR CONDITIONING EVAPORATOR CORE REPLACEMENT (R-1234YF HEAT STAKE)

WARNING: **Refer to R-1234yf Proper Service Procedures Warning .**

WARNING: **Refer to R-1234yf Refrigerant Evaporator Caution .**

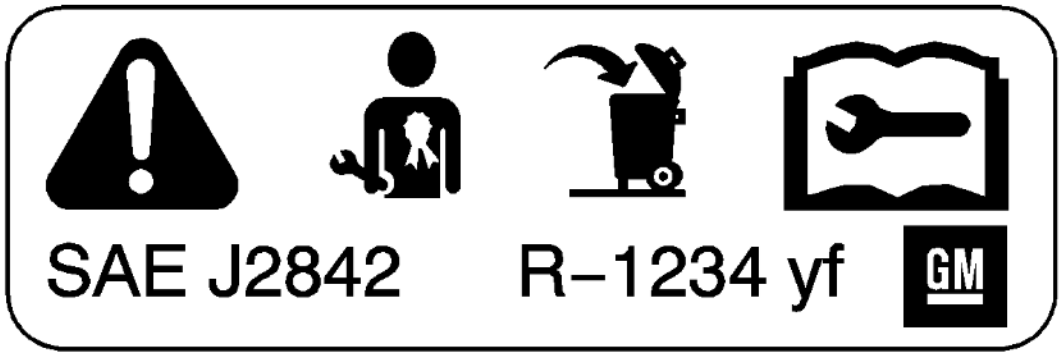
WARNING: **Evaporators in vehicles equipped with R-1234yf refrigerant systems must never be repaired or replaced with an evaporator removed from another or salvage vehicle. Use only new SAE J2842 certified and labeled**

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evaporator(s) as replacement parts. Failure to follow this guideline could pose a health and/or safety risk to the vehicle occupant(s).

NOTE: Technicians repairing or servicing motor vehicle air conditioning (MVAC) systems must be trained and certified by an EPA approved organization. Certification is obtained by passing an EPA approved examination. (http://www.epa.gov/ozone/title6/609/technicians/609certs.html)

Replacement Evaporator Label Requirements



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Fig. 89: Replacement Evaporator Label
Courtesy of GENERAL MOTORS COMPANY

Replacement evaporators shall have a permanent marking (label, stamp, or etching) that indicates that this evaporator design meets SAE J2842 and shall include the wording below or optionally the symbols as shown:

Text Only - Label Wording- "Conforms to SAE J2842 (Evaporator Manufacturer's Name or Trademark) Replace only with new evaporator certified to meet SAE J2842.

Leak Free Joints Inside the Passenger Compartment

If a refrigerant joint/connection is made or disturbed inside the passenger cabin the following steps shall be followed by the technician to ensure the joint/connection is leak free.

1. Shall clean all dirt, grease and debris from and around connection joints before disassembly/assembly of refrigerant connections.
2. Shall be advised to carefully inspect the joint/connection seal surfaces for signs of deformation, contamination or damage after disassembly.
3. Shall be advised that Seals/O-rings shall never be reused, but replaced with all new parts.
4. Shall be advised to ensure proper alignment of male/female portions and seal so there is no misalignment and stress on the fitting connection.
5. Shall tighten the joint using the proper torque.
6. With full refrigerant charge installed and the vehicles HVAC blower motor set on its lowest speed, A/C switch off and air distribution set to floor. The technician shall insert a SAE J2913 compliant electronic leak detector set to high sensitivity (4 grams/year leak rate) into the center of a floor duct outlet, as far as possible. The technician shall monitor the electronic leak detector for 5 minutes or until the detector alarms.
    - If electronic leak detector alarms, recover the refrigerant and repair the leak.
    - If after 5 minutes there is no alarm, there is no indication of a leak in the passenger compartment and the repair can be completed.
7. If vehicle is equipped with an auxiliary evaporator, monitor the air downstream from the evaporator at the outlet duct closest to the auxiliary unit under the same conditions and set up as step 6.

Proper Disposal of the Replaced Evaporator

The replaced evaporator shall be disabled to ensure that it never be repaired or reused.

Disable the replaced evaporator by completing one of the following steps:

- Using tin snips sever a minimum of 3 of the evaporators tubes.
- Drill or Punch a minimum of two 25 mm (.25 inch) holes in each end tank.

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Removal Procedure

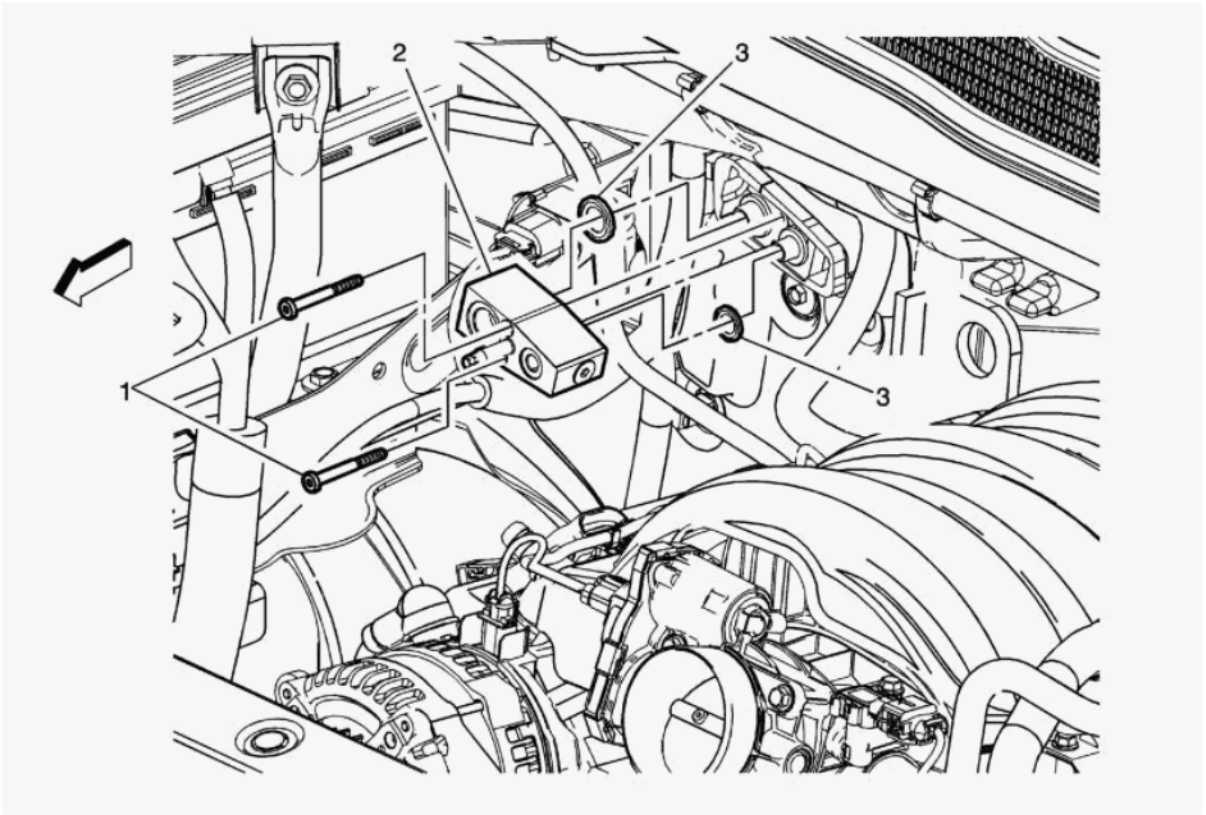


Fig. 90: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

1. Remove Air Conditioning Evaporator Thermal Expansion Valve (2) - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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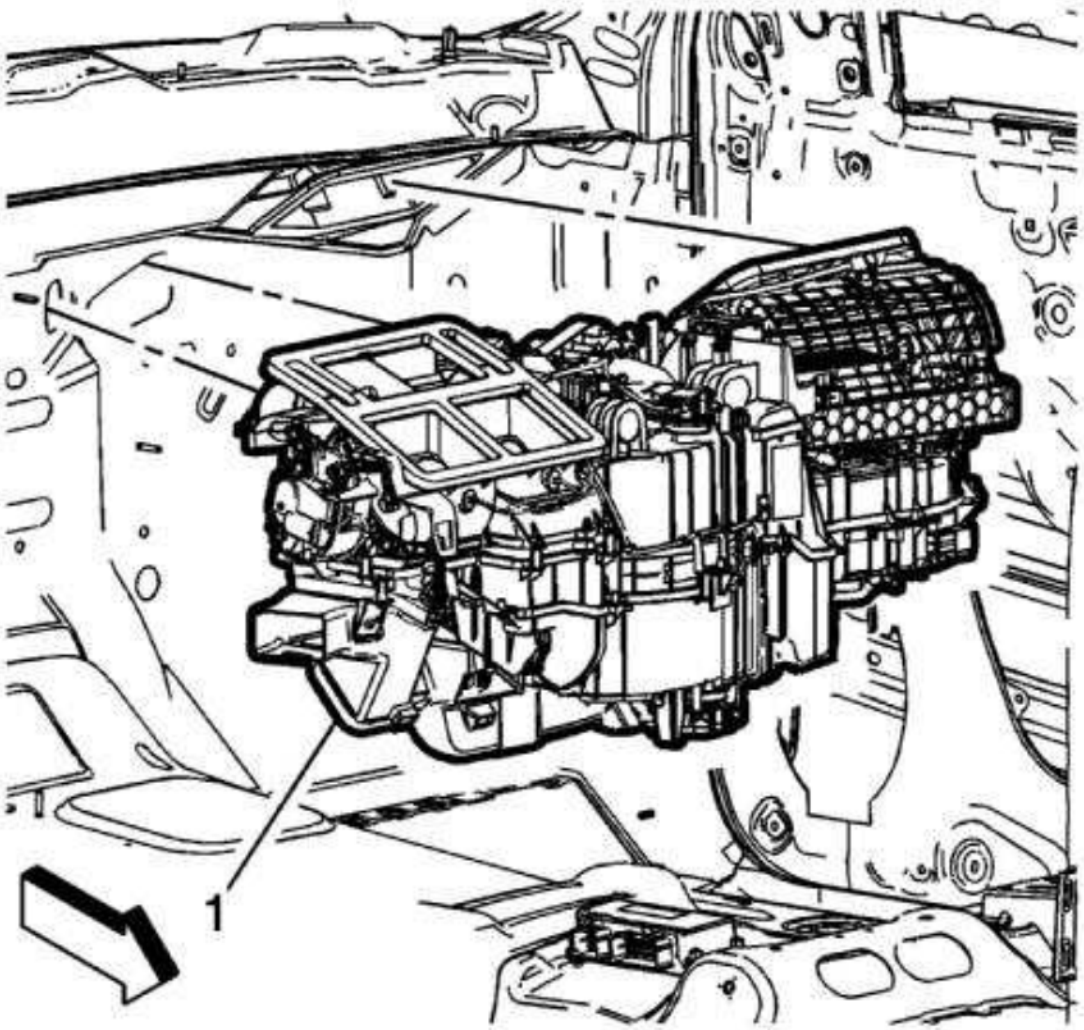


Fig. 91: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Remove Heater and Air Conditioning Evaporator and Blower Module (1) - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**

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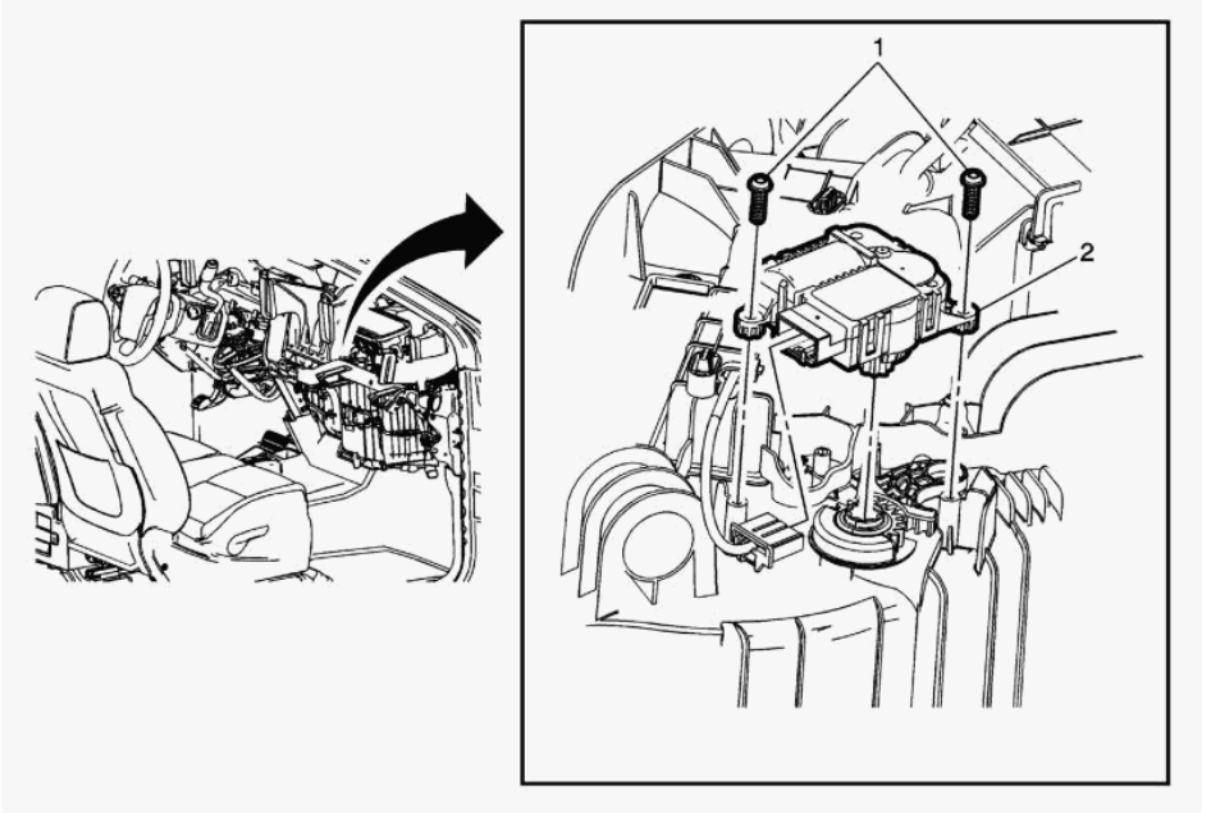


Fig. 92: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

3. Remove Temperature Valve Actuator (2) - **Temperature Valve Actuator Replacement - Left Side**
4. Disconnect the electrical connectors.

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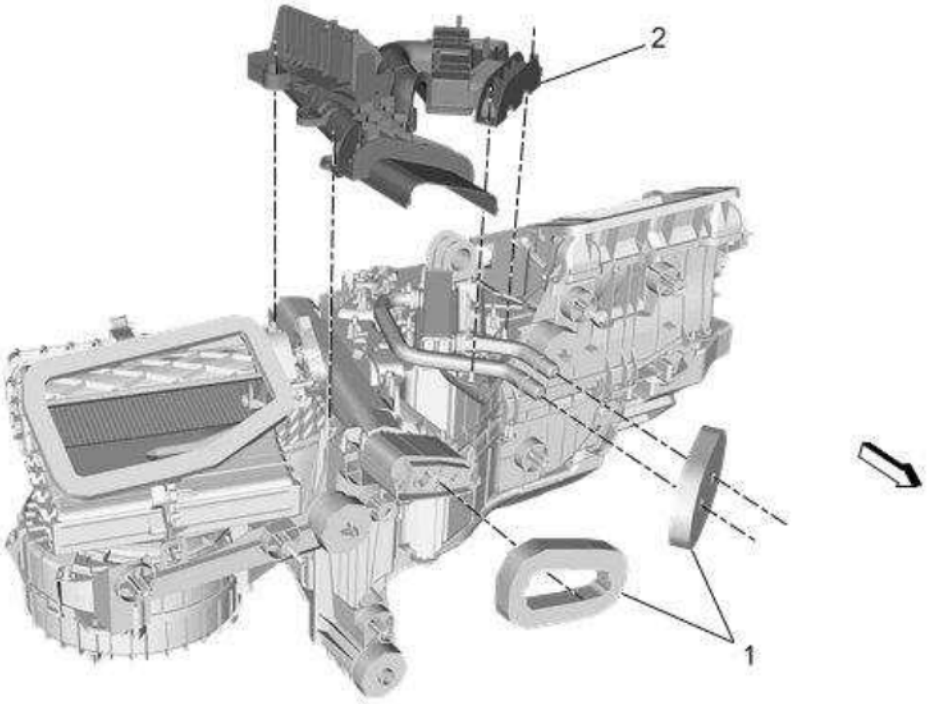


Fig. 93: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

5. Remove Heater and Air Conditioning Evaporator and Blower Module Seal (1) (Qty: 2)
6. The heater cover is heat staked to the heater and air conditioning evaporator and blower module, use a step drill bit to drill out the 12 heat stakes.
7. Remove Heater Cover (2)

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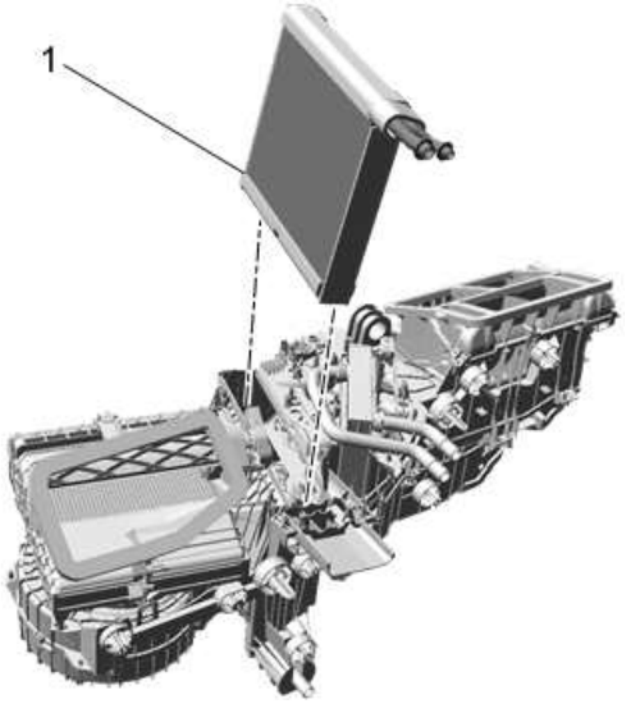


Fig. 94: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

8. Remove Air Conditioning Evaporator Core (1)
9. Transfer components as necessary.

Installation Procedure

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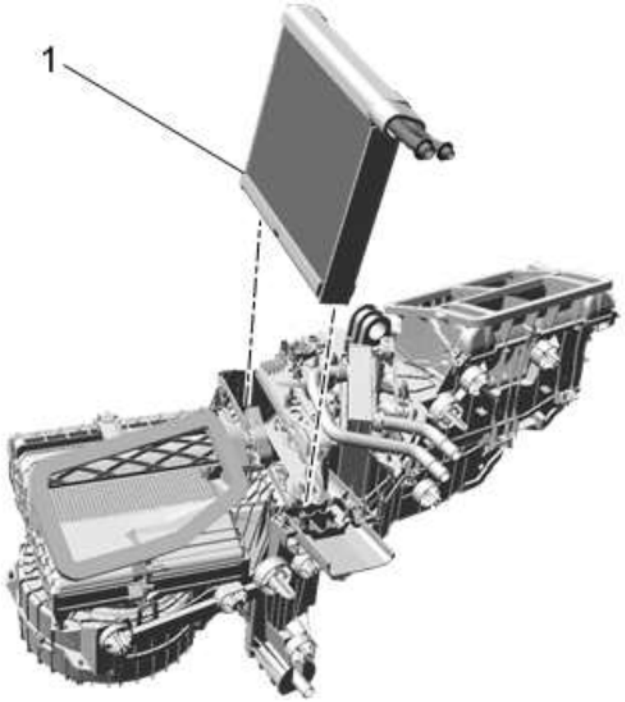


Fig. 95: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

1. Install Air Conditioning Evaporator Core (1)

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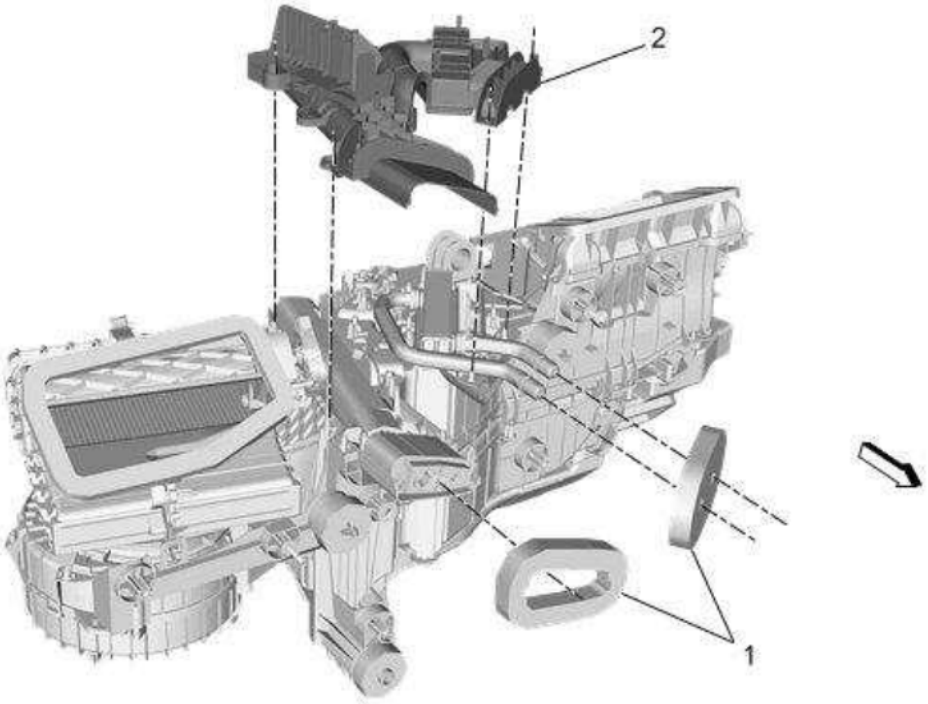


Fig. 96: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install Heater Cover (2)

CAUTION: **Refer to Fastener Caution .**

3.

4. Use 12 M4 X 1.79 X 16 self tapping screws, and tighten the screws until fully seated but not striped, to secure the heater cover to the heater and air conditioning evaporator and blower module.
5. Install Heater and Air Conditioning Evaporator and Blower Module Seal (1) (Qty: 2)
6. Connect the electrical connectors.

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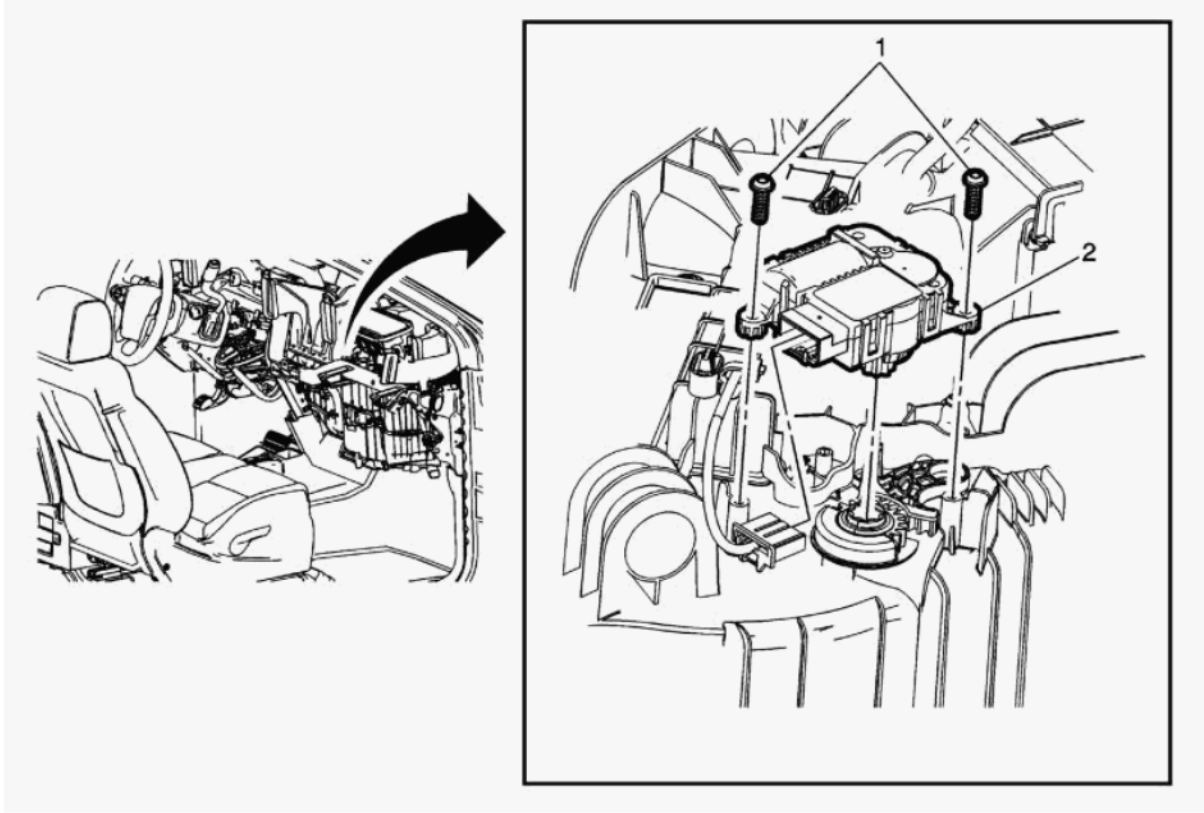


Fig. 97: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

7. Install Temperature Valve Actuator (2) - **Temperature Valve Actuator Replacement - Left Side**

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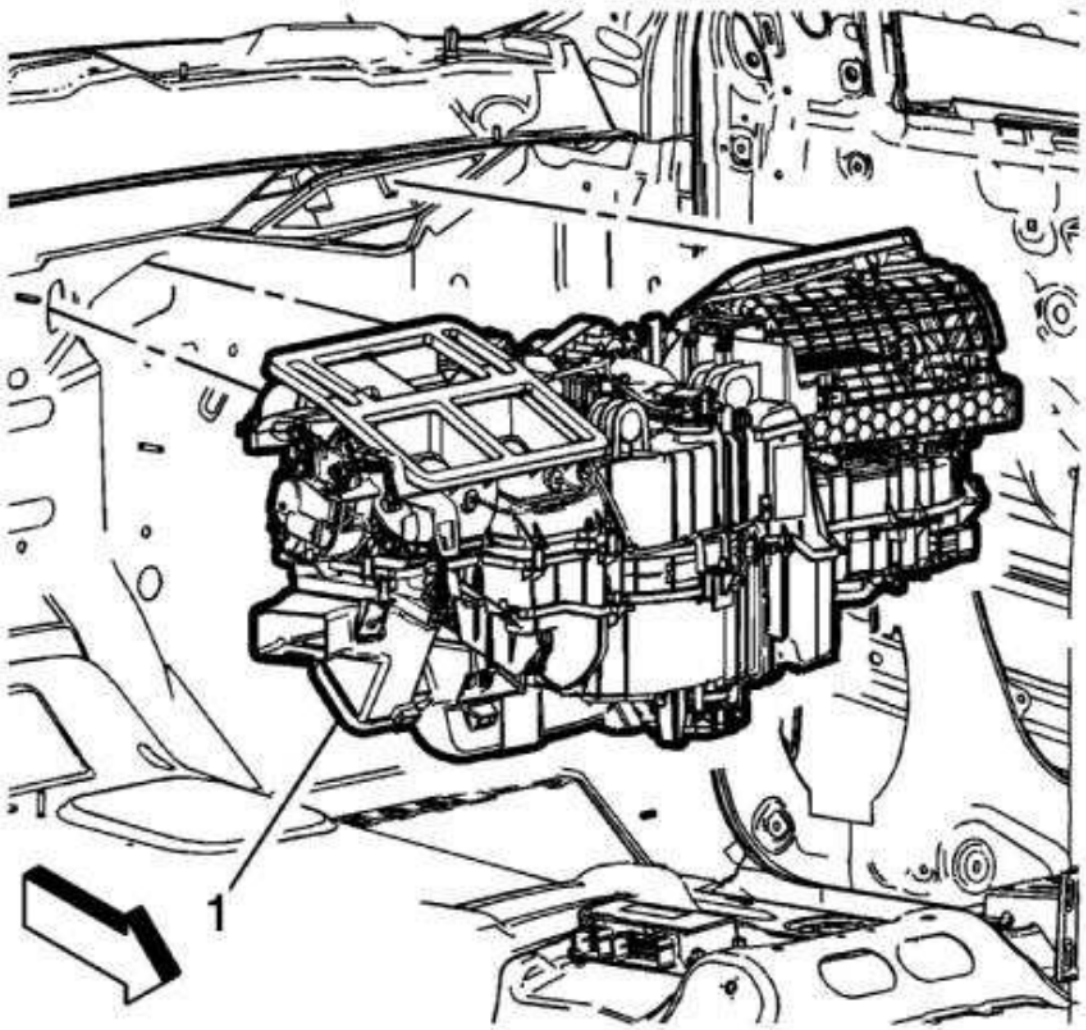


Fig. 98: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

8. Install Heater and Air Conditioning Evaporator and Blower Module (1) - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**

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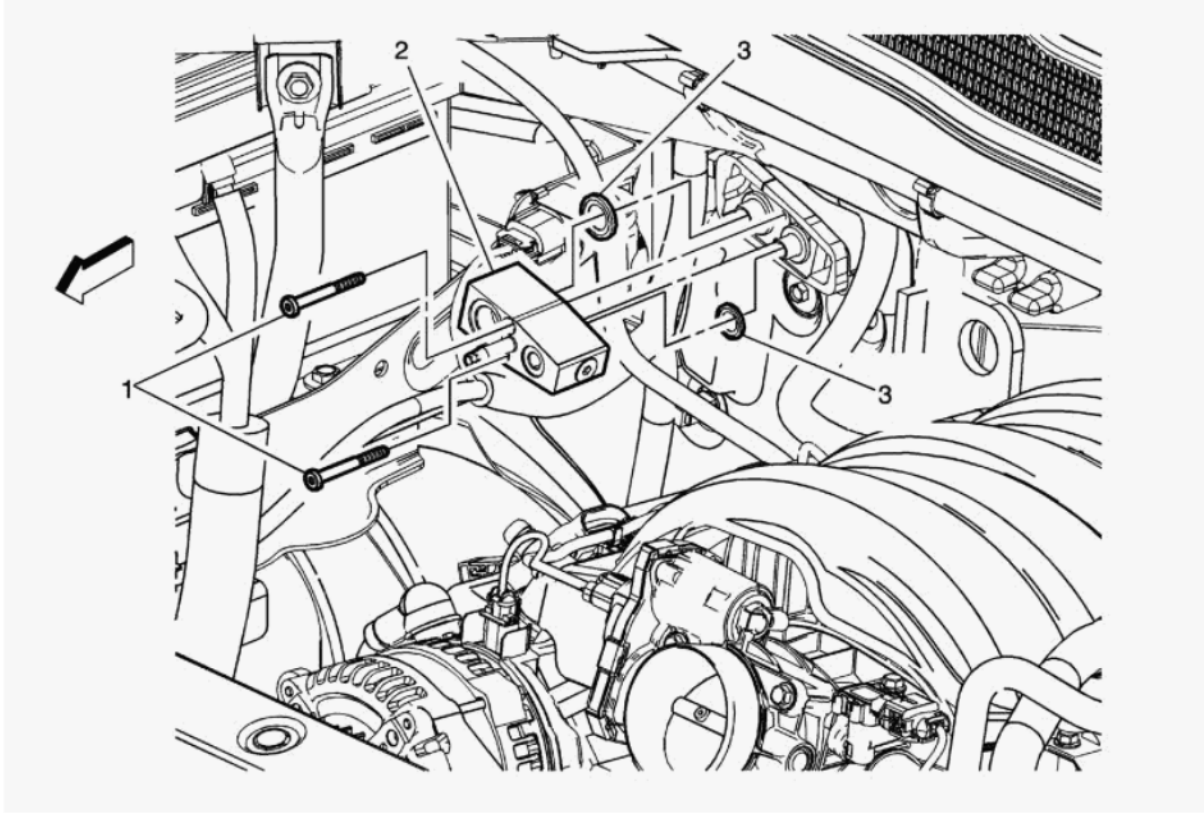


Fig. 99: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

9. Install Air Conditioning Evaporator Thermal Expansion Valve (2) - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

AIR CONDITIONING EVAPORATOR CORE REPLACEMENT (R-134A HEAT STAKE)

Removal Procedure

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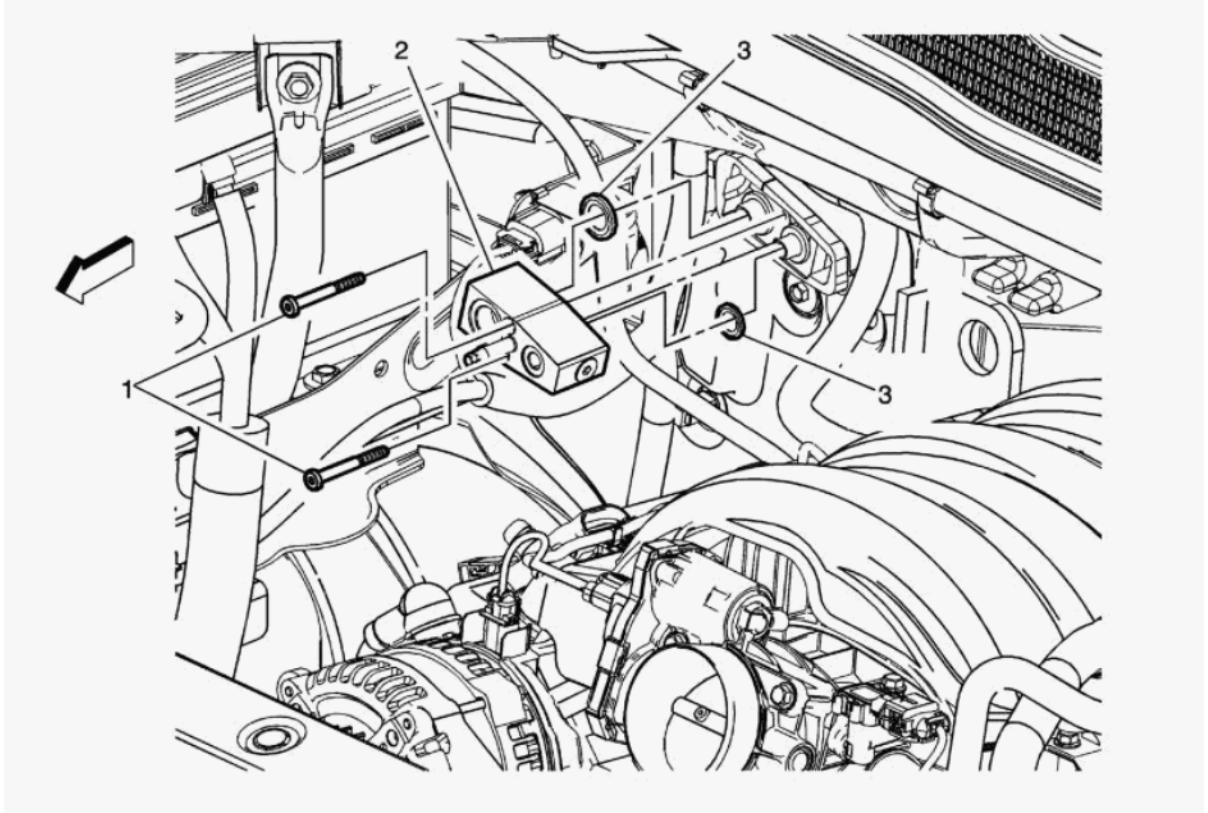


Fig. 100: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

1. Remove Air Conditioning Evaporator Thermal Expansion Valve (2) - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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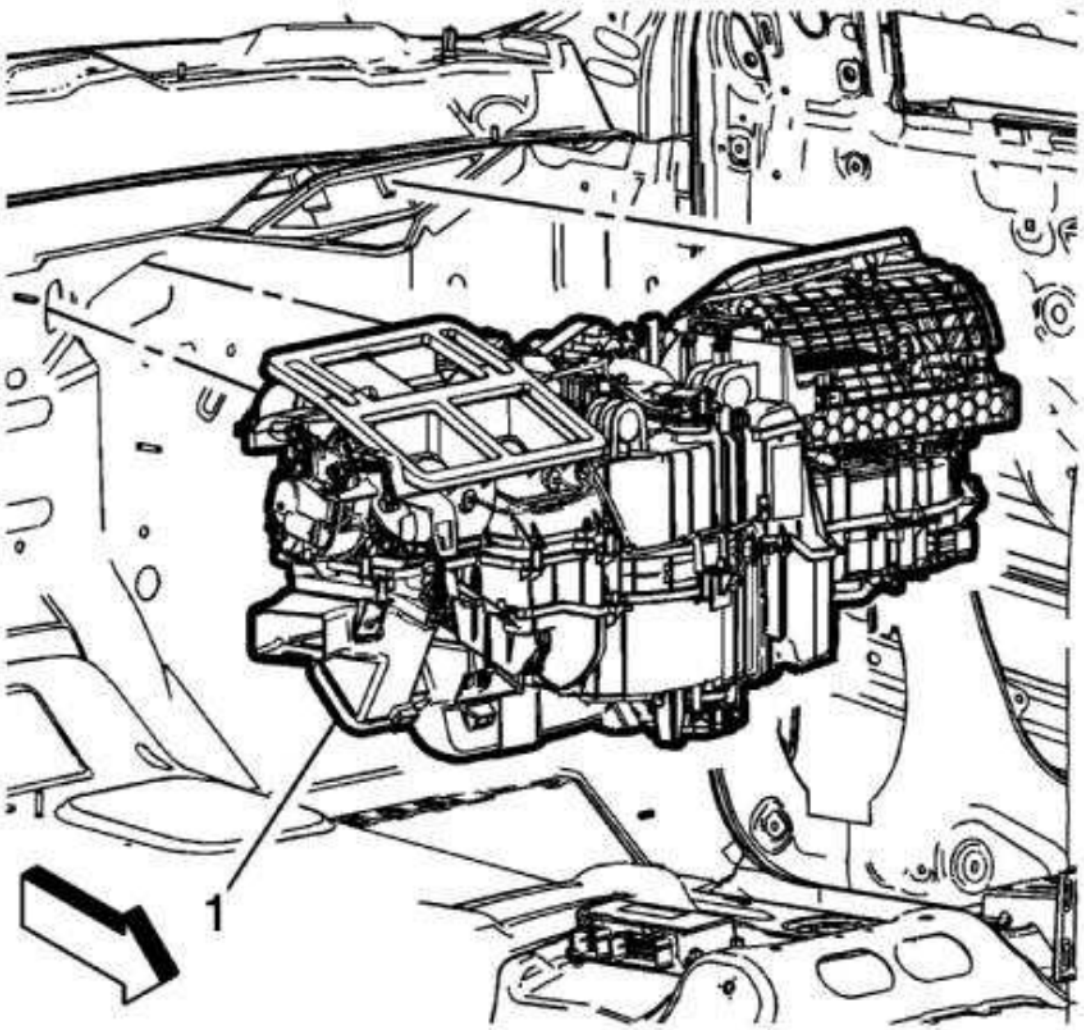


Fig. 101: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Remove Heater and Air Conditioning Evaporator and Blower Module (1) - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**

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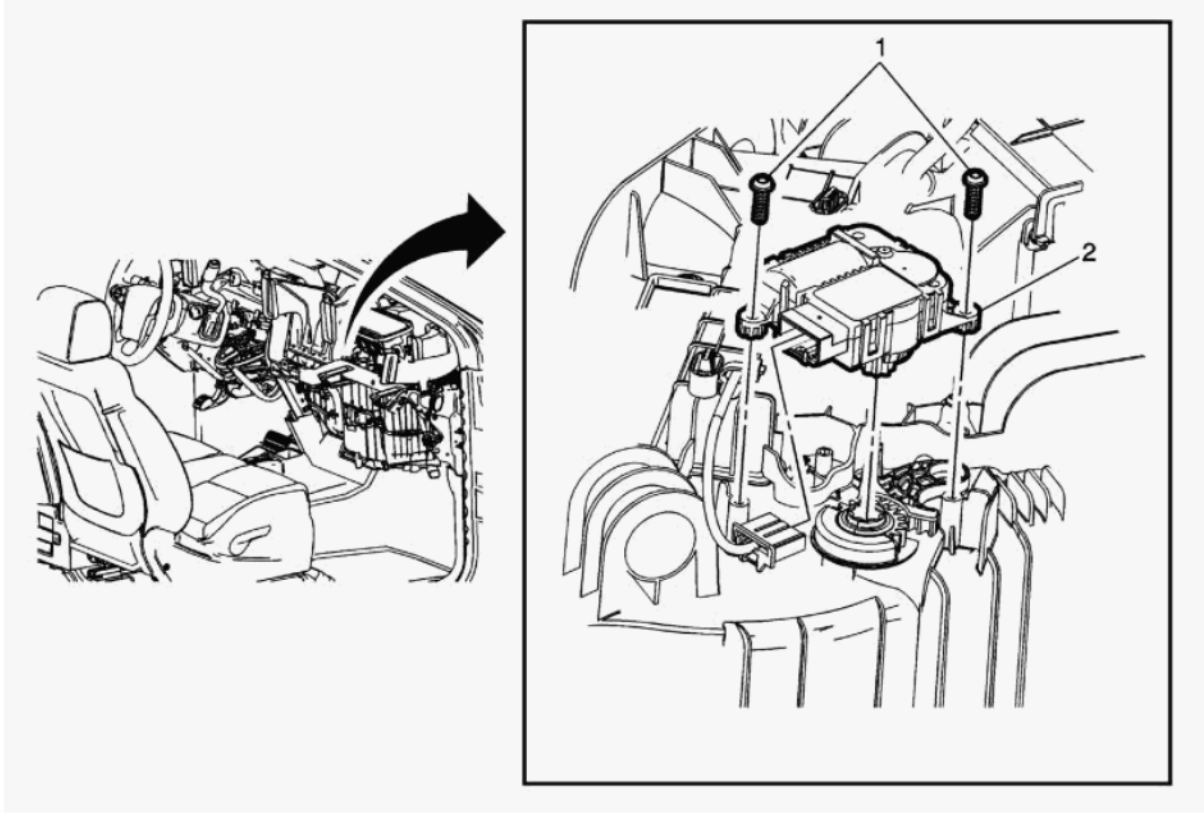


Fig. 102: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

3. Remove Temperature Valve Actuator (2) - **Temperature Valve Actuator Replacement - Left Side**
4. Disconnect the electrical connectors.

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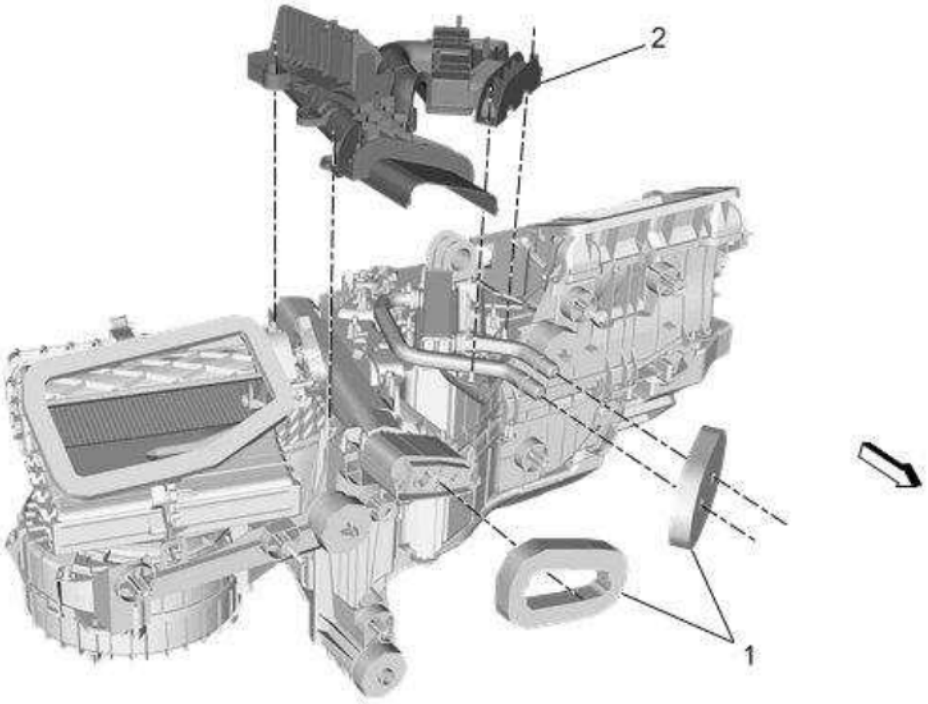


Fig. 103: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

5. Remove Heater and Air Conditioning Evaporator and Blower Module Seal (1) (Qty: 2)
6. The heater cover is heat staked to the heater and air conditioning evaporator and blower module, use a step drill bit to drill out the 12 heat stakes.
7. Remove Heater Cover (2)

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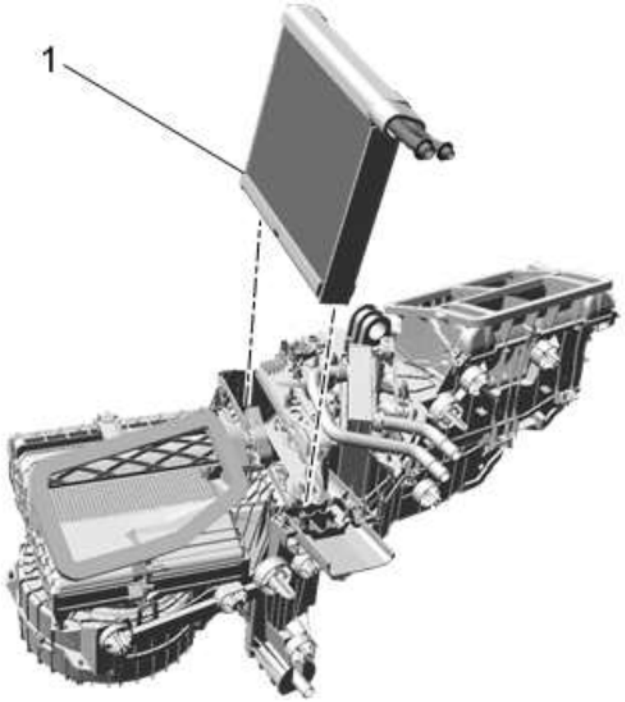


Fig. 104: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

8. Remove Air Conditioning Evaporator Core (1)
9. Transfer components as necessary.

Installation Procedure

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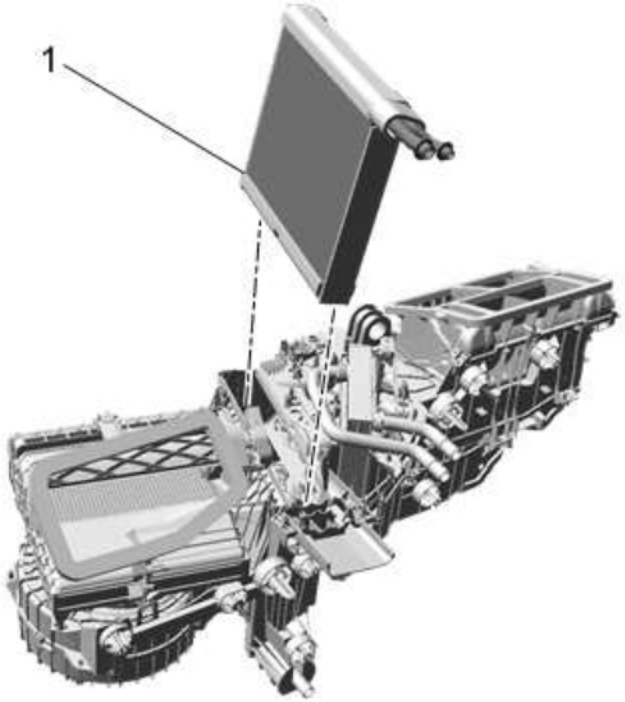


Fig. 105: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

1. Install Air Conditioning Evaporator Core (1)

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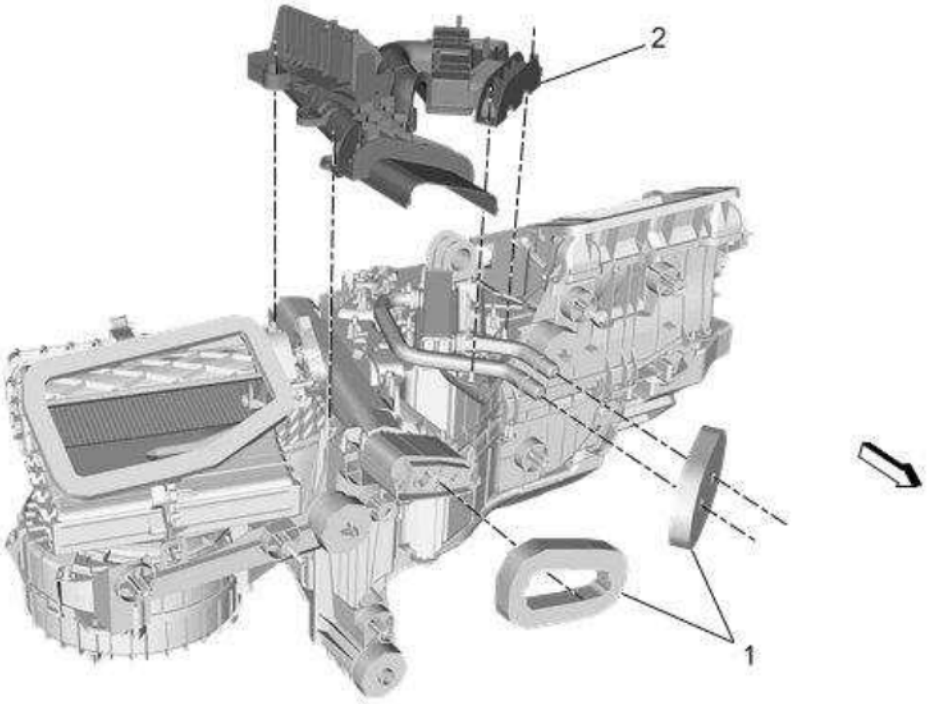


Fig. 106: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install Heater Cover (2)

CAUTION: **Refer to Fastener Caution .**

3.

4. Use 12 M4 X 1.79 X 16 self tapping screws, and tighten the screws until fully seated but not striped, to secure the heater cover to the heater and air conditioning evaporator and blower module.
5. Install Heater and Air Conditioning Evaporator and Blower Module Seal (1) (Qty: 2)
6. Connect the electrical connectors.

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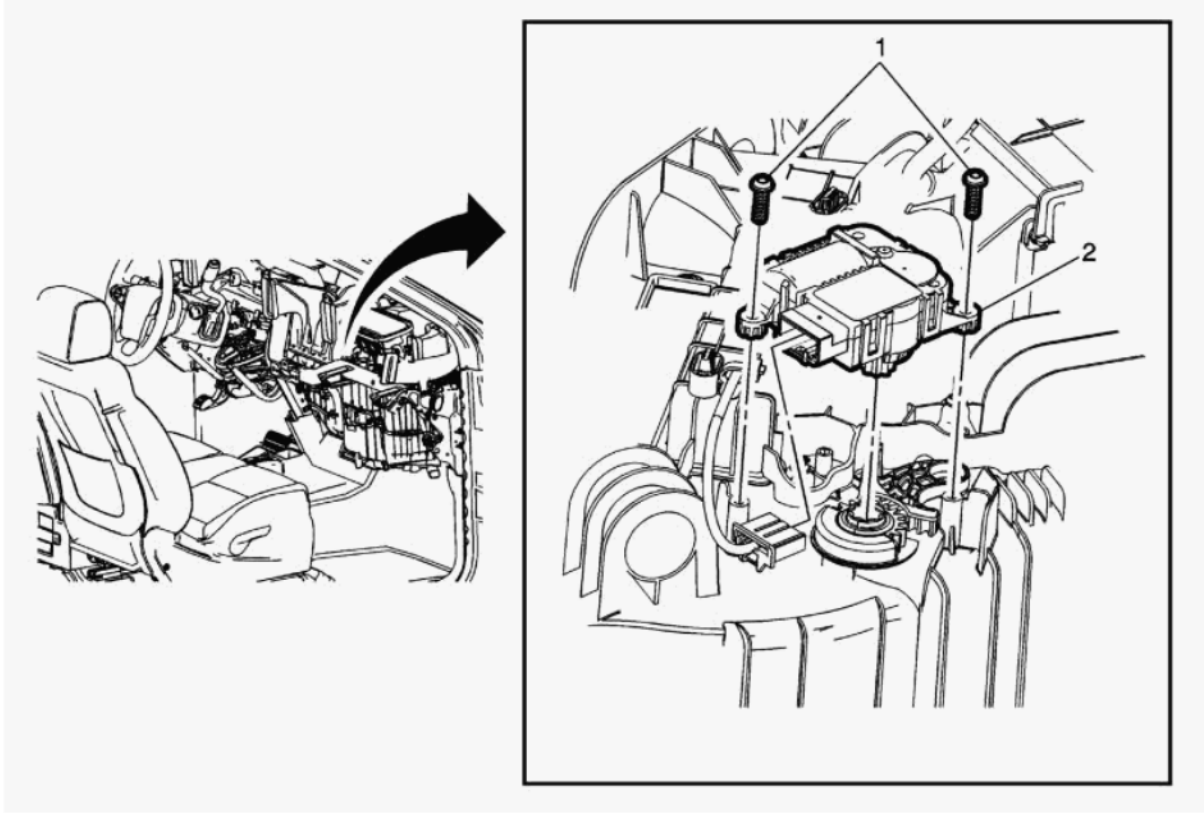


Fig. 107: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

7. Install Temperature Valve Actuator (2) - **Temperature Valve Actuator Replacement - Left Side**

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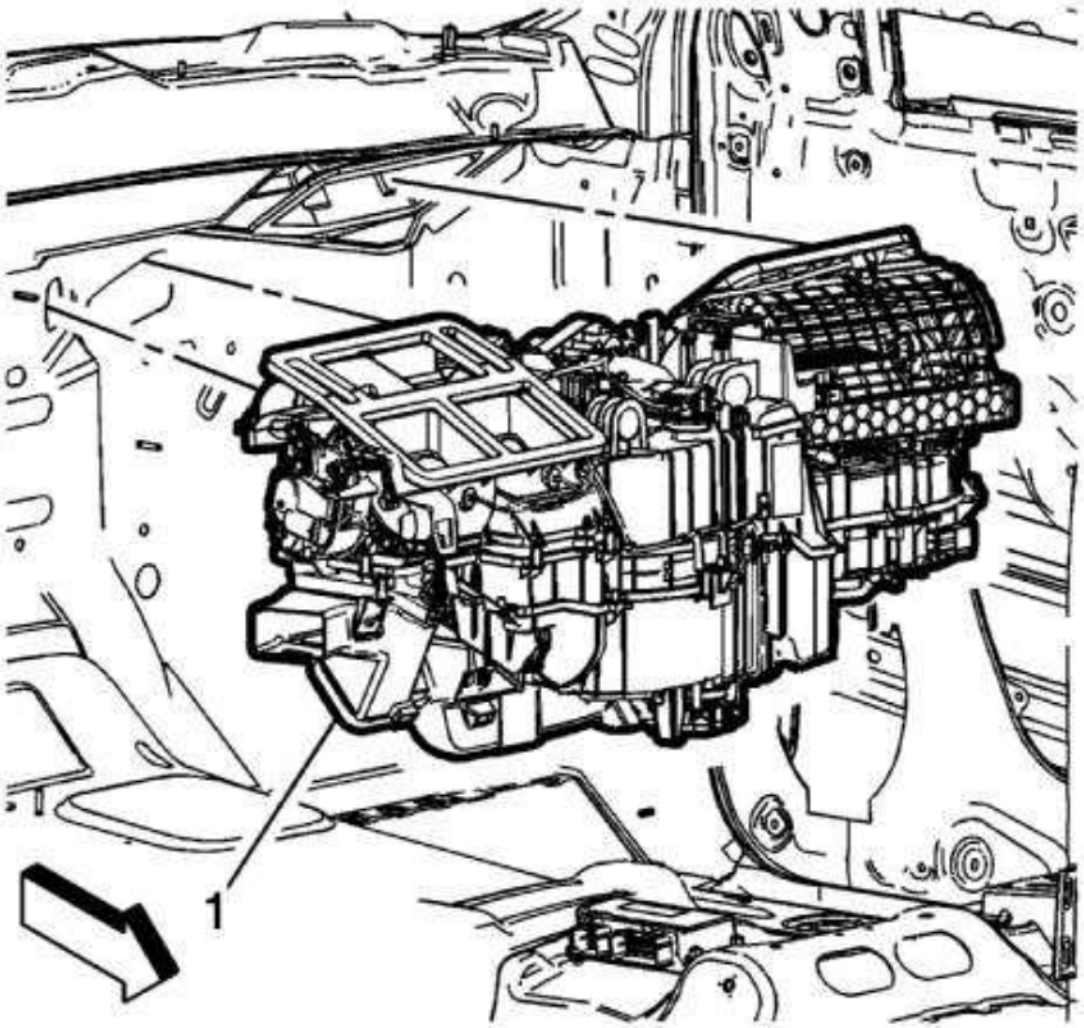


Fig. 108: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

8. Install Heater and Air Conditioning Evaporator and Blower Module (1) - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**

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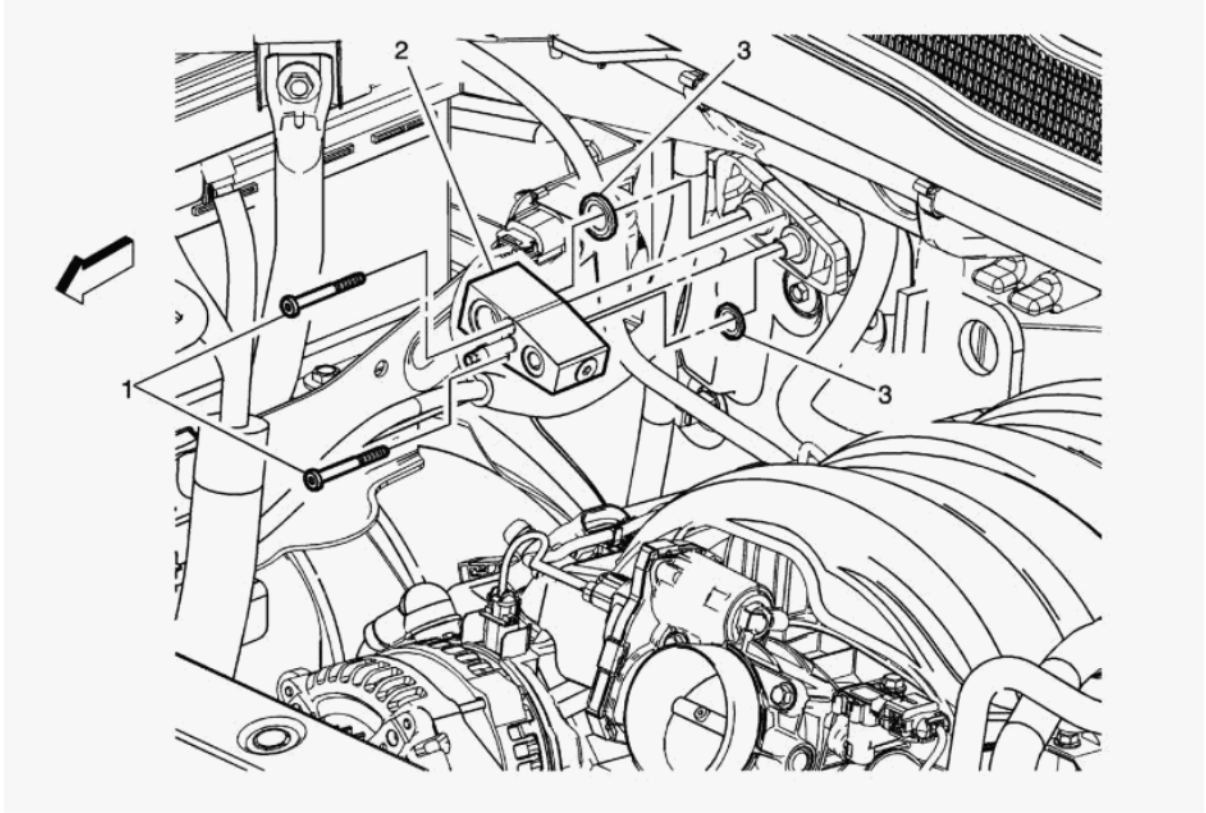


Fig. 109: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

9. Install Air Conditioning Evaporator Thermal Expansion Valve (2) - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN LOWER HOSE REPLACEMENT

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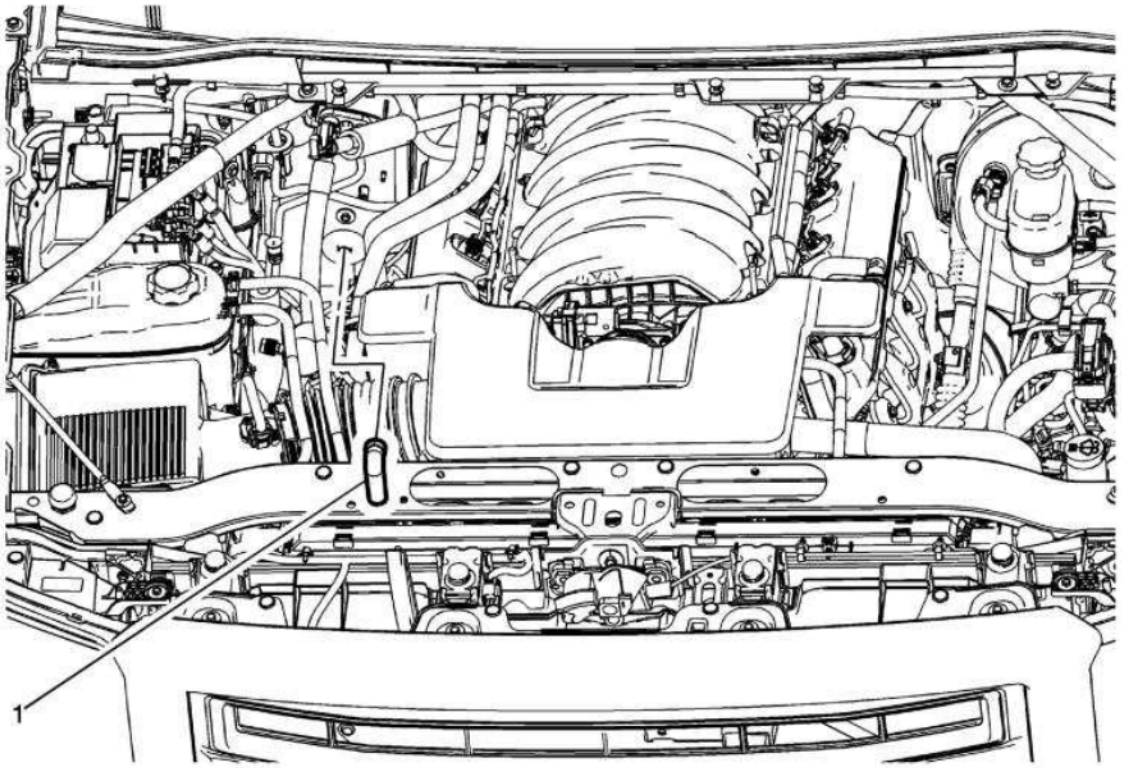


Fig. 110: Air Conditioning Evaporator and Blower Module Drain Lower Hose
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Air Conditioning Evaporator and Blower Module Drain Lower Hose

HEATER INLET HOSE REPLACEMENT (L83 L86)

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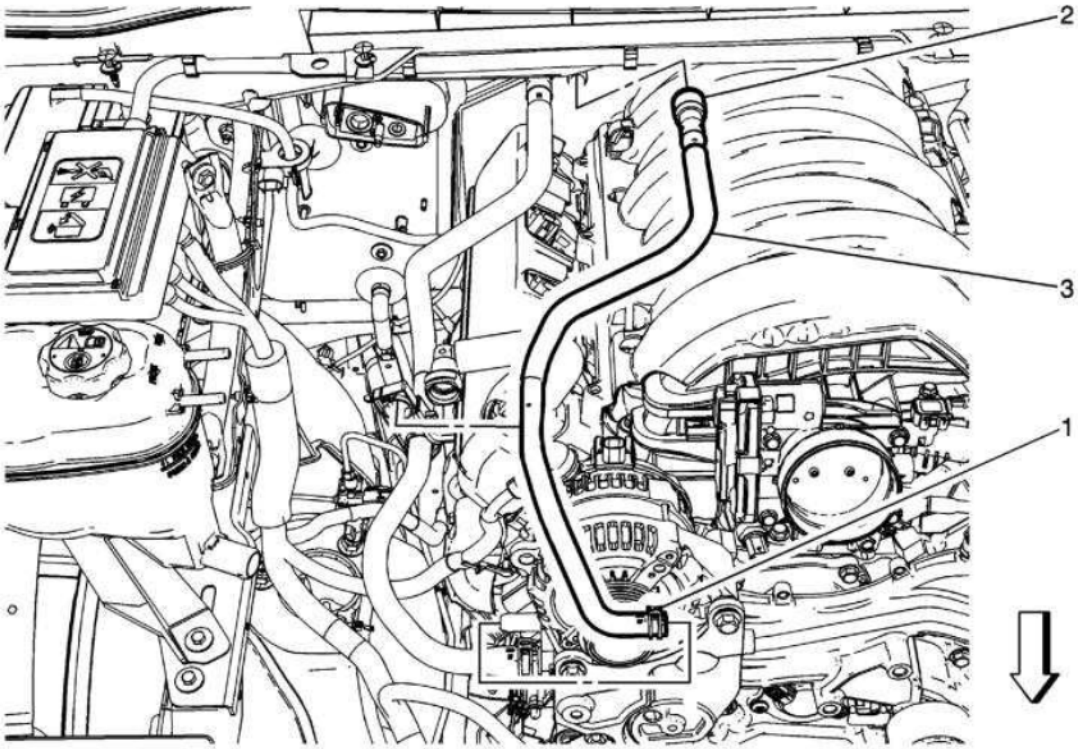


Fig. 111: Heater Inlet Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** . 2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC)** **Air Cleaner Outlet Duct Replacement (Cadillac)** .	
1	Heater Inlet Hose Clamp **Procedure** Reposition the heater inlet hose clamp using **BO-38185** Hose Clamp Pliers.

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Callout	Component Name
	Special Tools **BO-38185** Hose Clamp Pliers For equivalent regional tools, Refer to **Special Tools**.
2	Heater Inlet Hose Quick Disconnect **Special Tools** **J-43181** Heater Line Q.C. Release Tool For equivalent regional tools, Refer to **Special Tools**.
3	Heater Inlet Hose **Procedures** 1. Remove heater inlet hose from retainer. 2. Fill the cooling system to the proper level. 3. Inspect the cooing system for leaks.

HEATER INLET HOSE REPLACEMENT (L96)

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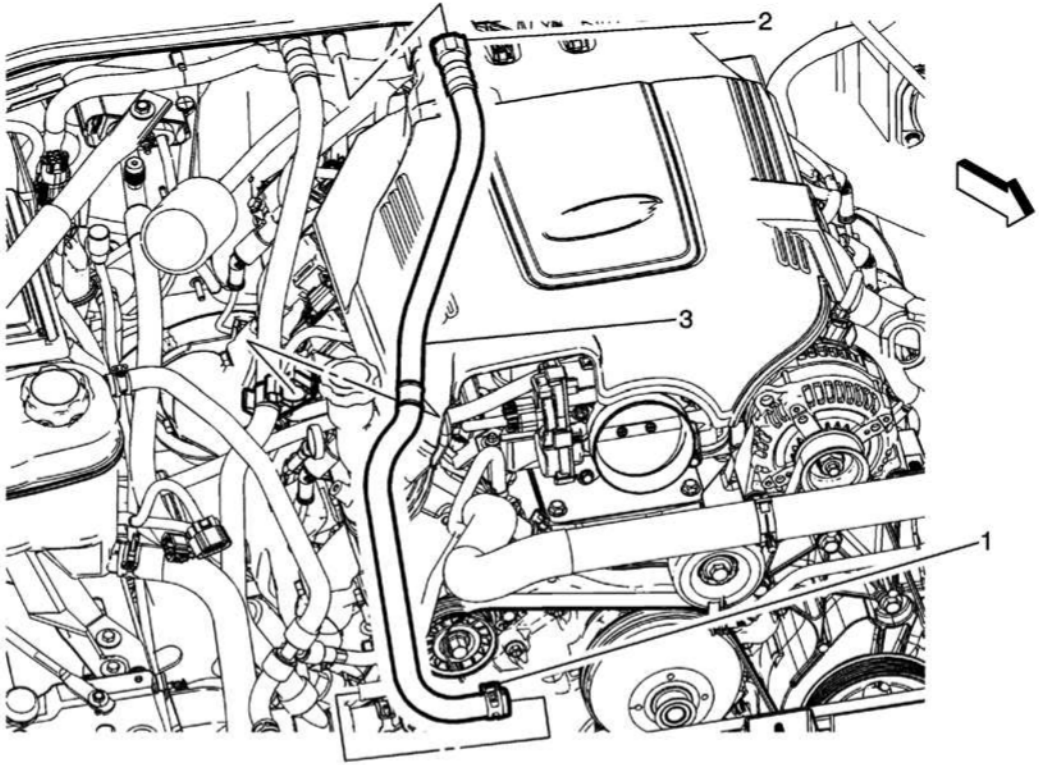


Fig. 112: Heater Inlet Hose (L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** . 2. Remove the air cleaner resonator outlet duct. Refer to **Air Cleaner Resonator Outlet Duct Replacement** .	
1	Heater Inlet Hose Clamp **Procedure** Disengage tension on the heater inlet hose clamp using **BO-38185** hose clamp pliers and remove the heater inlet hose and clamp from the water pump.

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Callout	Component Name
	Special Tools **BO-38185** Hose Clamp Pliers For equivalent regional tools, refer to **Special Tools**.
2	Heater Inlet Hose Quick Disconnect **Special Tools** **J-43181** Heater Line Q.C. Release Tool For equivalent regional tools, refer to **Special Tools**.
3	Heater Inlet Hose **Procedures** 1. Remove heater inlet hose from the heater hose retainer. 2. Fill the engine cooling system to the proper level. **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** . 3. Inspect the cooling system for leaks. **Cooling System Leak Testing (L96)** .

HEATER OUTLET HOSE REPLACEMENT (L83 L86)

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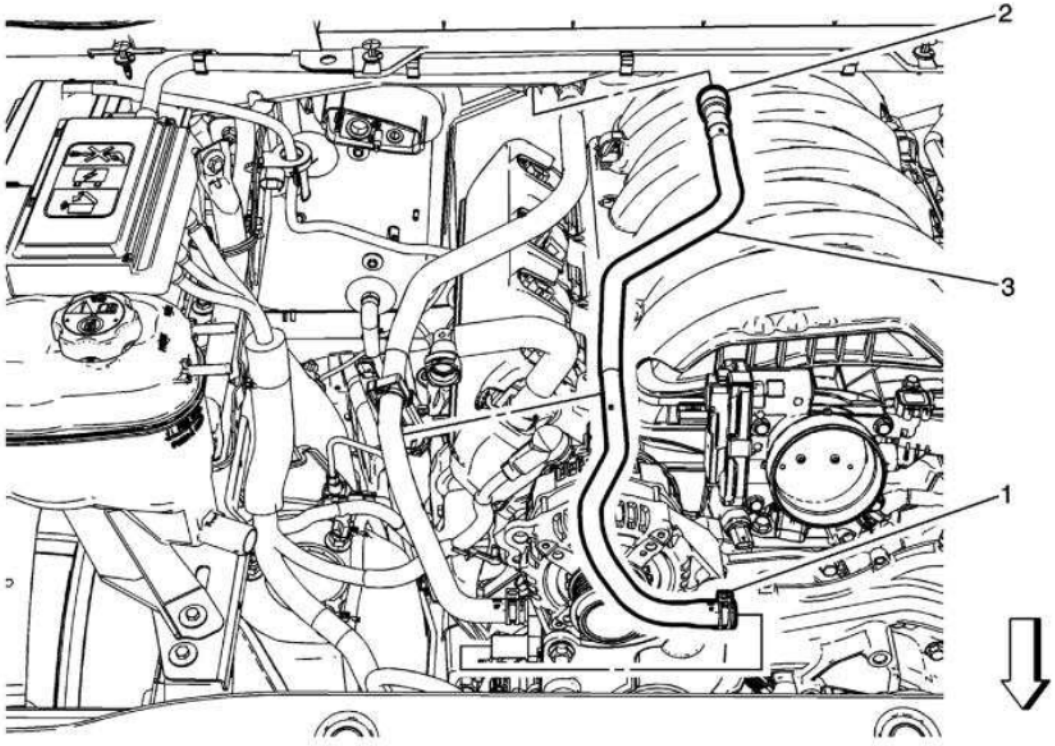


Fig. 113: Heater Outlet Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** . 2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement (Chevrolet and GMC)** **Air Cleaner Outlet Duct Replacement (Cadillac)** .	
1	Heater Outlet Hose Clamp **Procedure** Reposition the heater outlet hose clamp using **BO-38185** Hose Clamp Pliers.

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Callout	Component Name
	Special Tools **BO-38185** Hose Clamp Pliers For equivalent regional tools, Refer to **Special Tools**.
2	Heater Outlet Hose Quick Disconnect **Special Tools** **J-43181** Heater Line Q.C. Release Tool For equivalent regional tools, Refer to **Special Tools**.
3	Heater Outlet Hose **Procedures** 1. Remove heater outlet hose from retainer. 2. Fill the cooling system to the proper level. 3. Inspect the cooing system for leaks.

HEATER OUTLET HOSE REPLACEMENT (L96)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** .
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .

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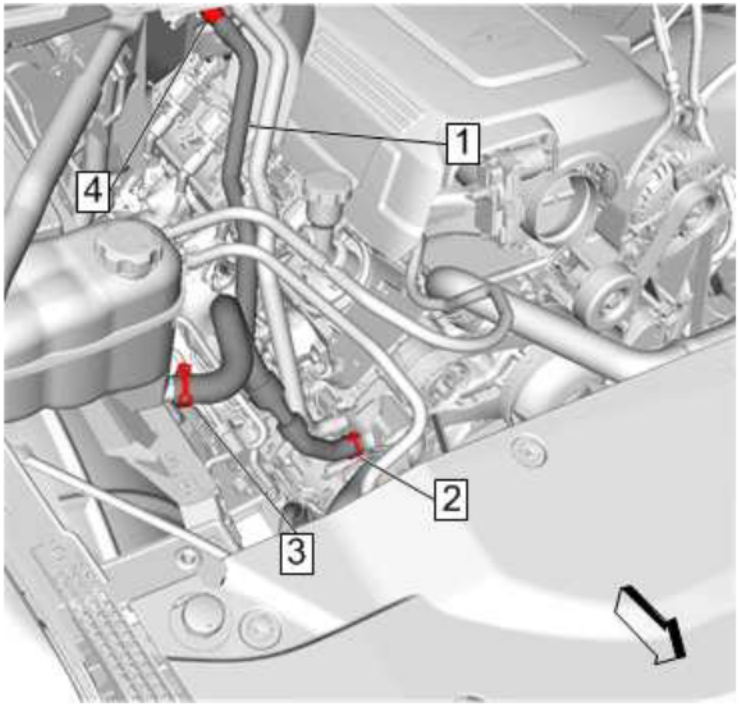


Fig. 114: Radiator Surge Tank Outlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

3. Disengage Heater Outlet Hose Clamp @ Radiator Surge Tank - **Hose Clamp Replacement Guidelines - Spring Type**
4. Remove Heater Outlet Hose Clamp @ Radiator Surge Tank
5. Disengage Heater Outlet Hose Clamp @ Engine Coolant Thermostat Housing - **Hose Clamp Replacement Guidelines - Spring Type**
6. Remove Heater Outlet Hose @ Engine Coolant Thermostat Housing
7. Disconnect Heater Outlet Hose @ Quick Connect Fitting (4)
8. Remove Heater Outlet Hose (1)

Installation Procedure

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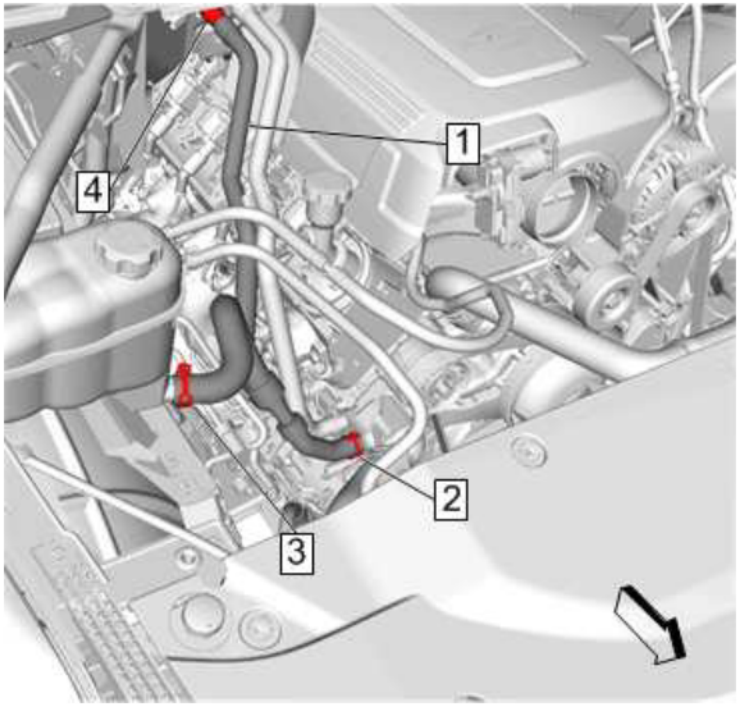


Fig. 115: Radiator Surge Tank Outlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

1. Install Heater Outlet Hose (1)
2. Connect Heater Outlet Hose @ Quick Connect Fitting (4)
3. Install Heater Outlet Hose @ Radiator Surge Tank (3)
4. Engage Heater Outlet Hose Clamp @ Radiator Surge Tank - **Hose Clamp Replacement Guidelines - Spring Type**
5. Install Heater Outlet Hose @ Engine Coolant Thermostat Housing (2)
6. Engage Heater Outlet Hose Clamp @ Engine Coolant Thermostat Housing - **Hose Clamp Replacement Guidelines - Spring Type**
7. Install the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .
8. Fill the engine cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** .
9. Inspect the cooling system for leaks. Refer to **Cooling System Leak Testing (L96)** .

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT (UTILITIES)

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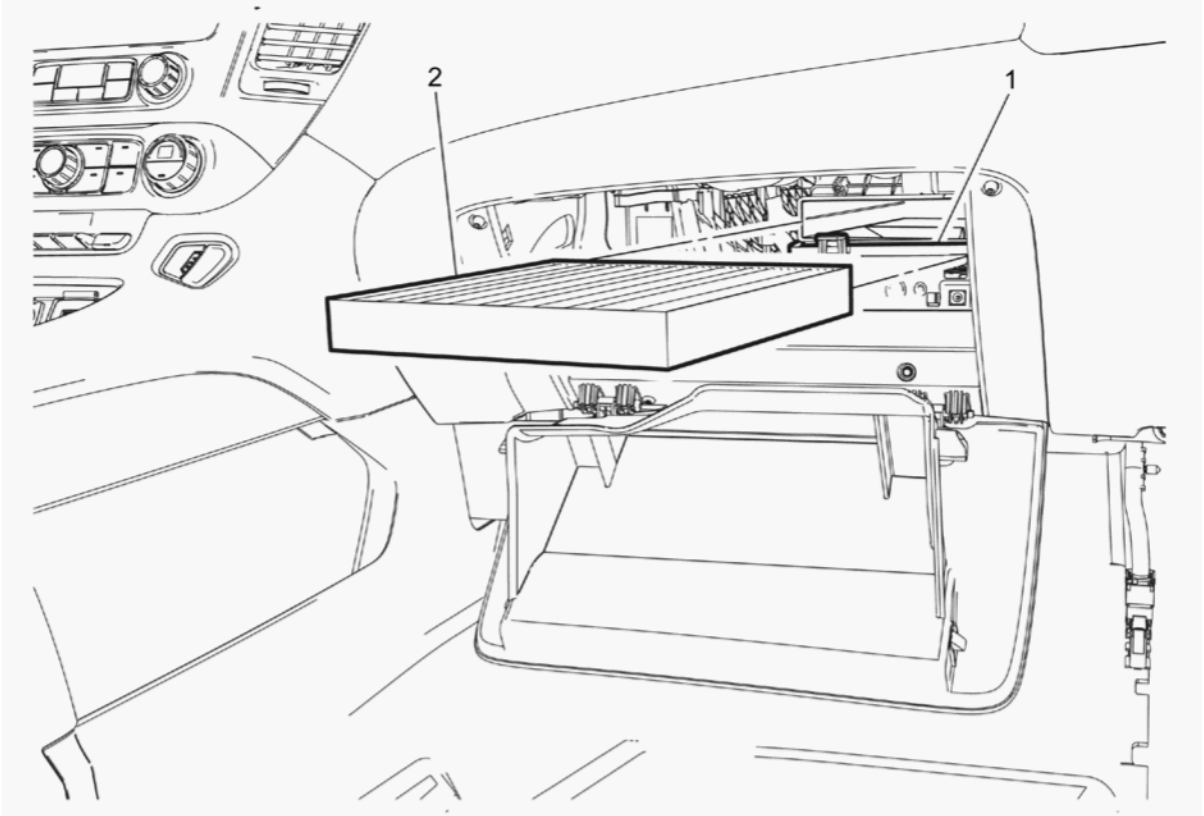


Fig. 116: Passenger Compartment Air Filter (Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the instrument panel compartment access hole cover. Refer to **Instrument Panel Compartment Access Hole Cover Replacement (Chevrolet / GMC)** .	
1	Passenger Compartment Air Inlet Filter Cover
2	Passenger Compartment Air Filter

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT (Z75)

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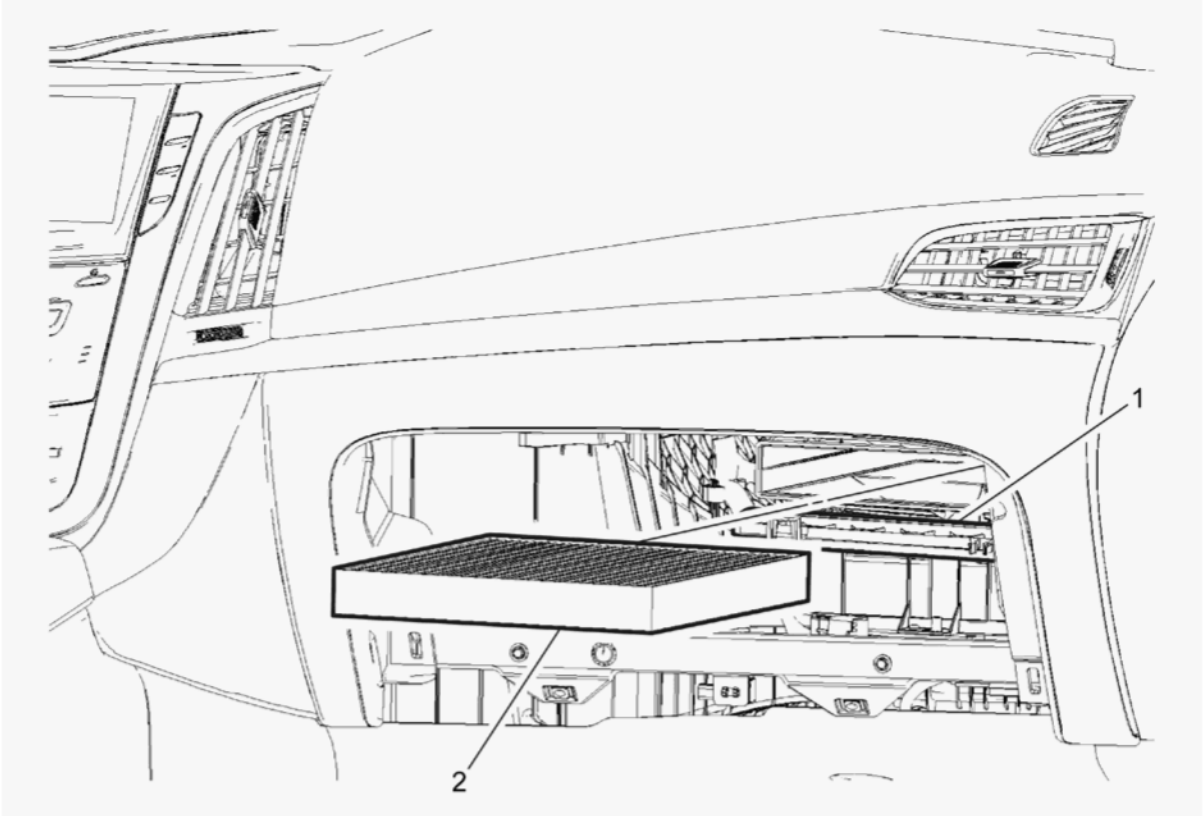


Fig. 117: Passenger Compartment Air Filter (Z75)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the instrument panel compartment assembly. Refer to **Instrument Panel Compartment Replacement (Chevrolet / GMC)** **Instrument Panel Compartment Replacement (Cadillac)** .	
1	Passenger Compartment Air Inlet Filter Cover
2	Passenger Compartment Air Filter

AIR INLET HOUSING REPLACEMENT

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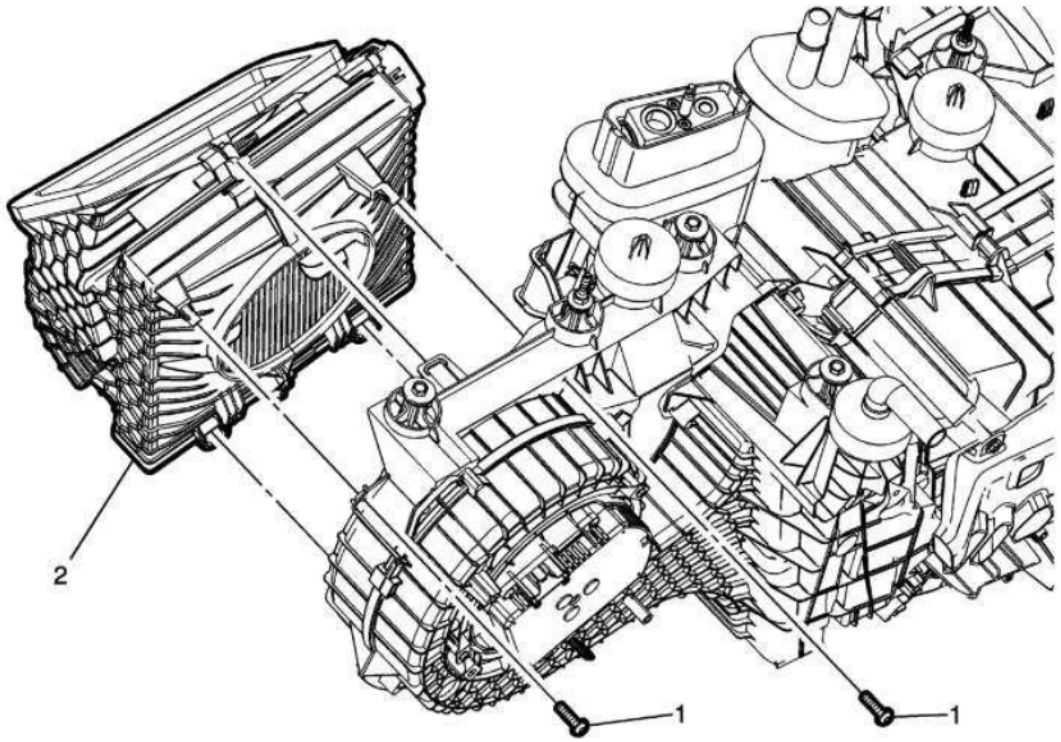


Fig. 118: Air Inlet Housing
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**. 2. Disconnect the electrical connectors as necessary.	
1	Air Inlet Housing Fastener (Qty: 2) **CAUTION:**

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Callout	Component Name
	Refer to **Fastener** **Caution** .
2	Air Inlet Housing Assembly **Procedure** Transfer the components as necessary.

BLOWER MOTOR CONTROL MODULE REPLACEMENT (LWB AUXILIARY)

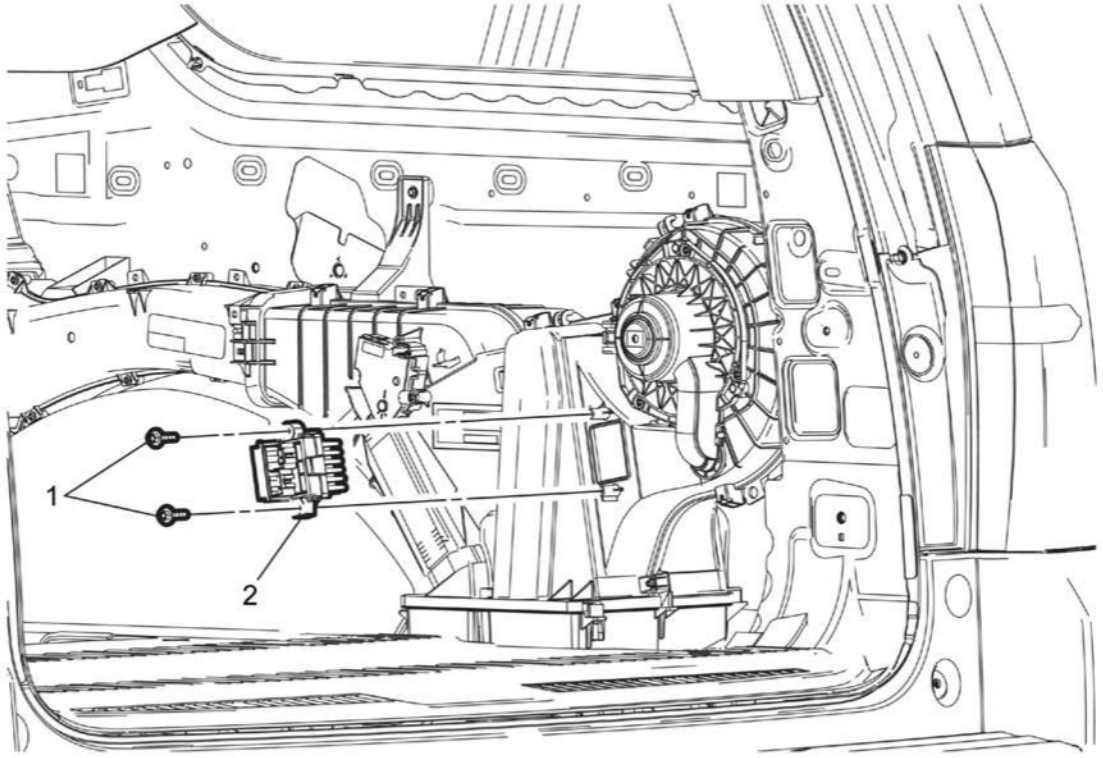


Fig. 119: Blower Motor Control Module (LWB Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .	
1	Blower Motor Control Module Fastener (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1.7 N.m (15 lb in)
2	Blower Motor Control Module **Procedure** Disconnect the blower motor control module electrical connector.

BLOWER MOTOR CONTROL MODULE REPLACEMENT (SWB)

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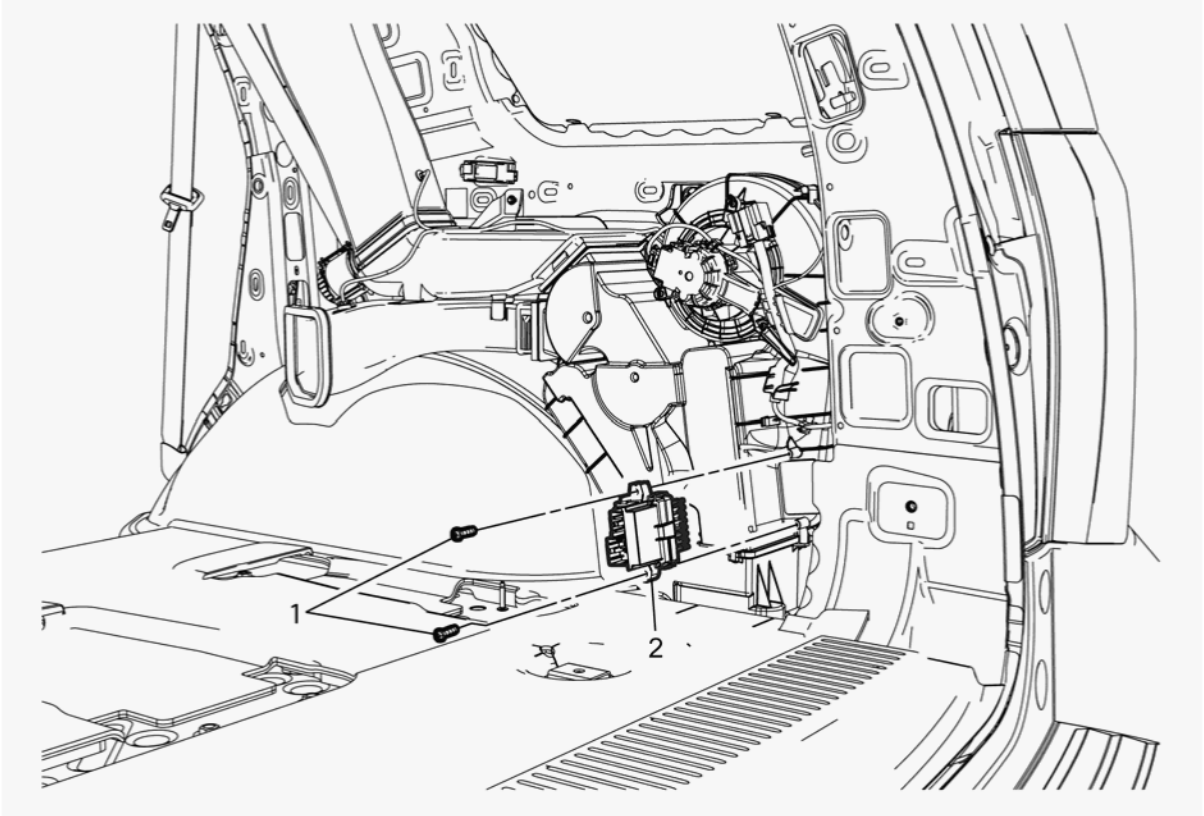


Fig. 120: Blower Motor Control Module (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)** .	
1	Blower Motor Control Module Fastener (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** .

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Call out	Component Name
	Tighten 1.7 N.m (15 lb in)
2	Blower Motor Control Module - Auxiliary **Procedure** Disconnect the auxiliary blower motor control module electrical connectors.

AIR DISTRIBUTOR CASE REPLACEMENT

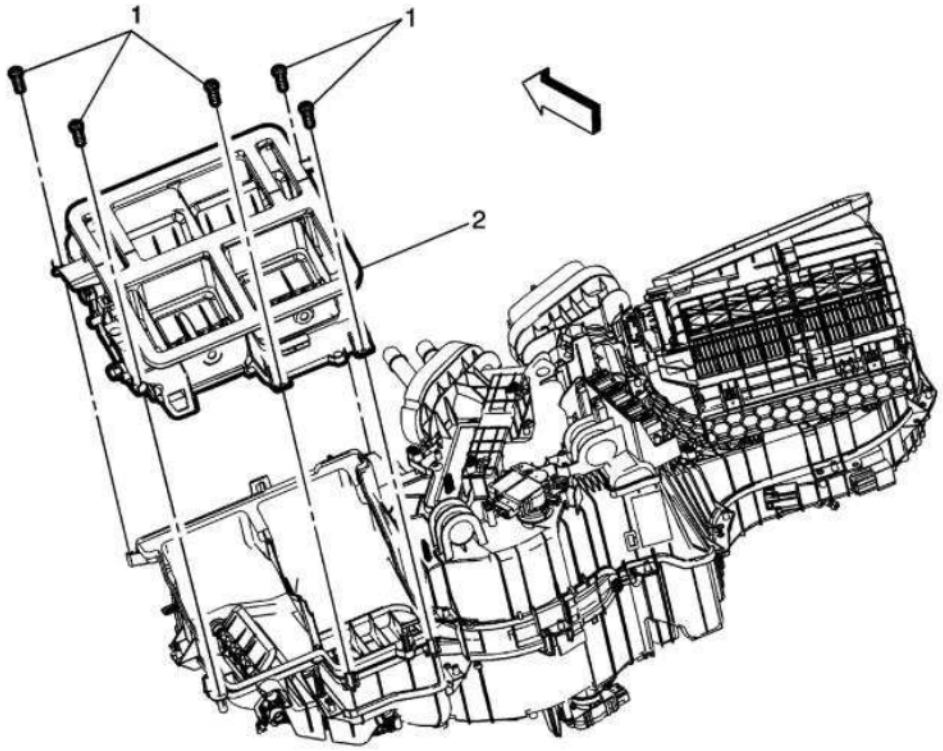


Fig. 121: Air Distributor Case
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedures 1. Remove the instrument panel tie bar assembly. Refer to **Instrument Panel Tie Bar Replacement** . 2. Remove the mode control cam assembly. Refer to **Mode Control Cam Replacement**	
1	Air Distributor Case Fastener (Qty: 5) **CAUTION:** **Refer to Fastener Caution .**
2	Air Distributor Case **Procedures** 1. Disconnect the electrical connectors. 2. Unclip and reposition the HVAC module electrical harnesses out of the way. 3. Using the appropriate flat bladed tool, release the retaining tabs to remove the air distributor case. 4. Transfer the components as necessary.

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - LEFT SIDE (CHEVROLET / GMC)

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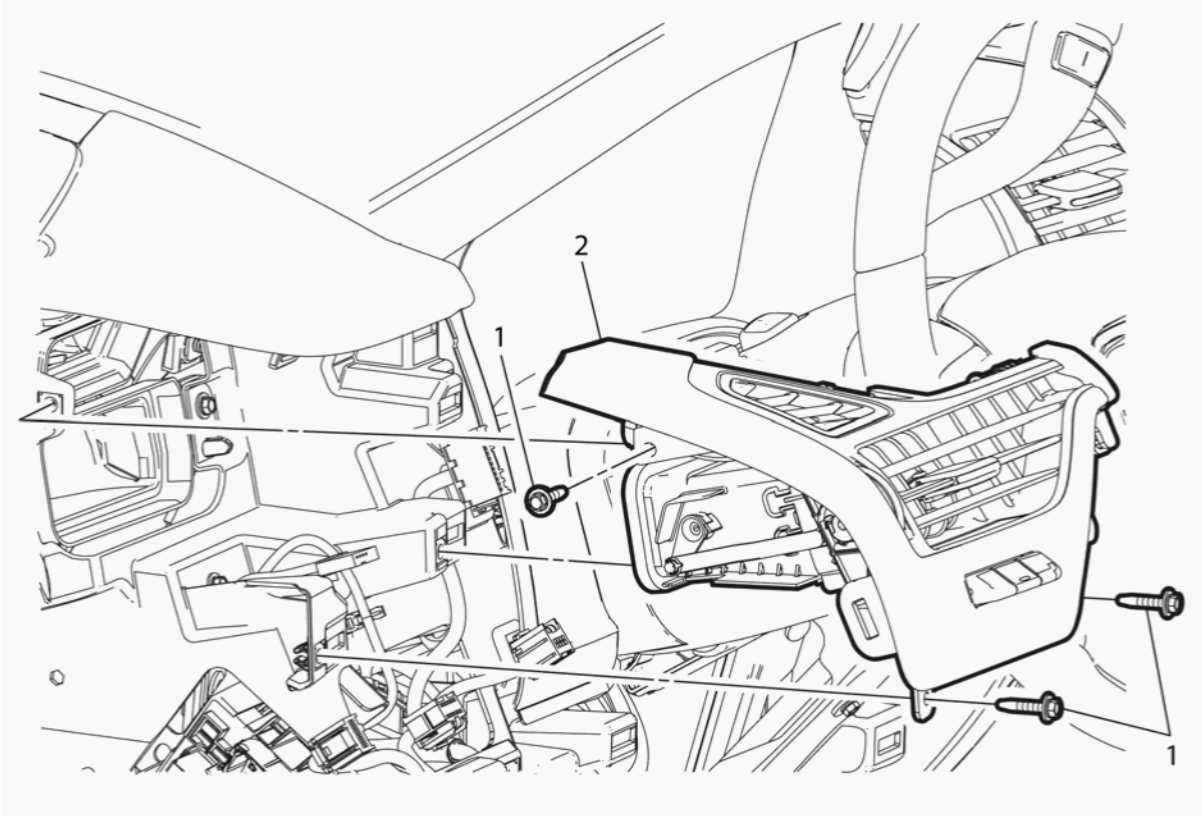


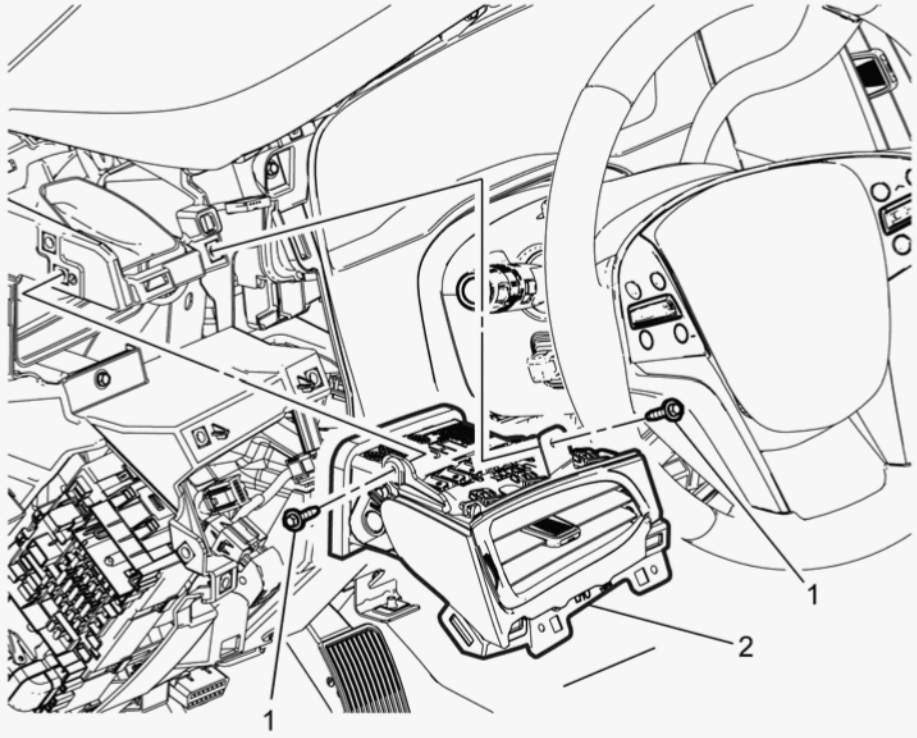
Fig. 122: Instrument Panel Outer Air Outlet - Left Side (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel accessory bezel. Refer to **Instrument Panel Accessory Bezel Replacement (Chevrolet / GMC)** .	
1	Instrument Panel Outer Air Outlet Bolt (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet **Procedures** 1. Use a flat bladed plastic trim tool in order to release the retainer clips securing the air outlet to the instrument panel carrier. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - LEFT SIDE (CADILLAC)



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Fig. 123: Instrument Panel Outer Air Outlet - Left Side (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the left instrument panel upper trim panel. Refer to **Instrument Panel Upper Trim Panel Replacement - Left Side (Cadillac)** . 2. Remove the instrument panel accessory bezel. Refer to **Instrument Panel Accessory Bezel Replacement (Cadillac)** .	
1	Instrument Panel Outer Air Outlet Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT - LEFT SIDE (CADILLAC)

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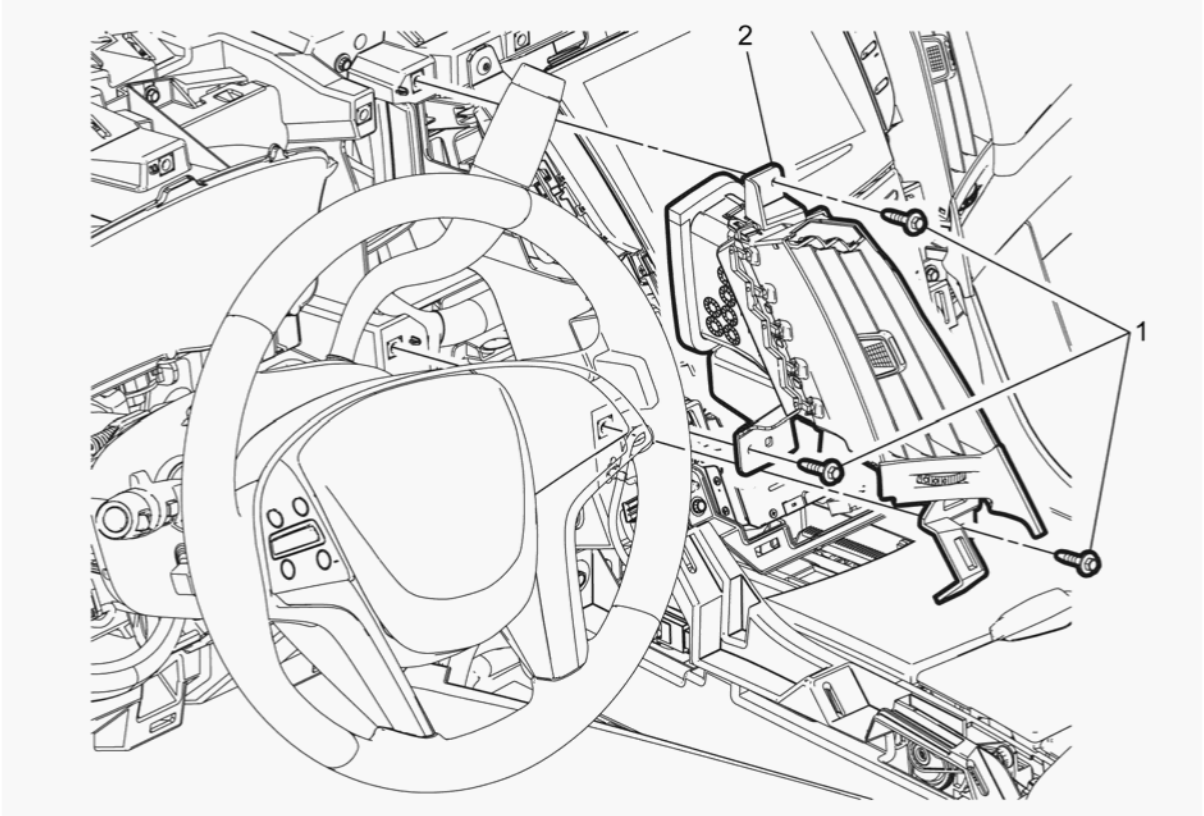


Fig. 124: Instrument Panel Center Air Outlet - Left Side (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel instrument cluster hood. Refer to **Instrument Panel Instrument Cluster Hood Replacement (Cadillac)** .	
1	Instrument Panel Center Air Outlet Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Instrument Panel Center Air Outlet

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT - LEFT SIDE (CHEVROLET / GMC)

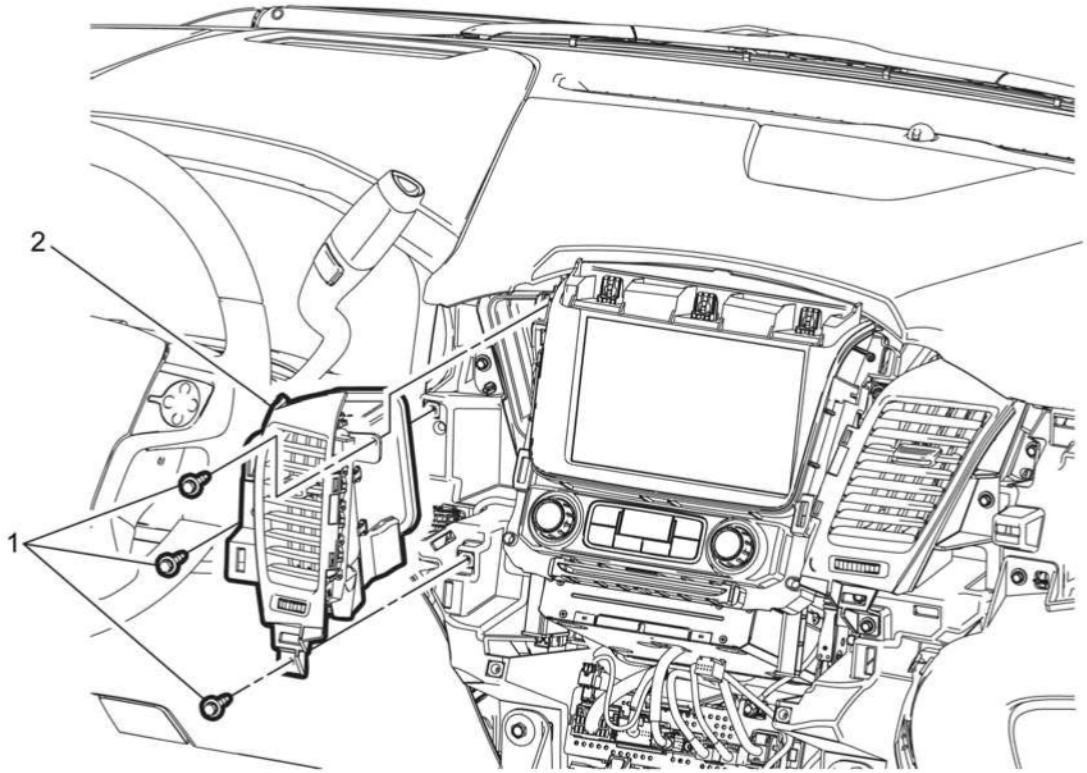


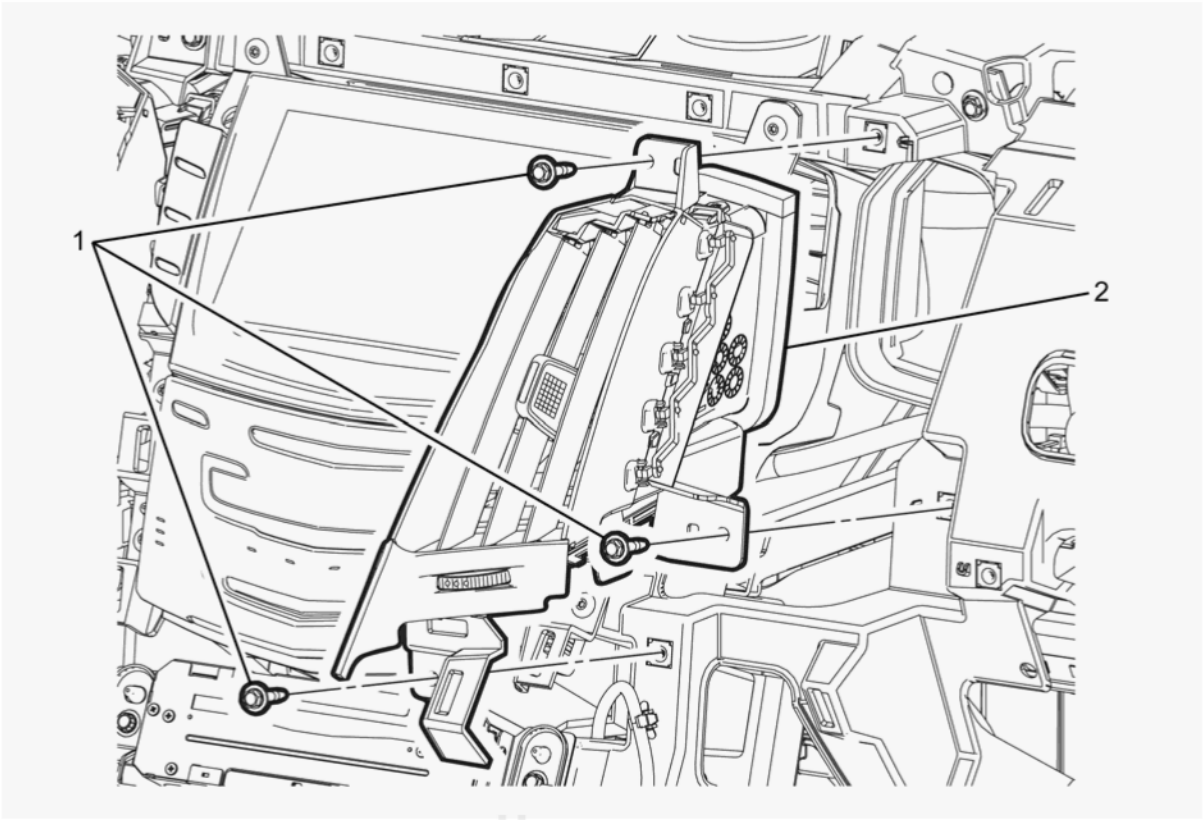
Fig. 125: Instrument Panel Center Air Outlet - Left Side (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
	Preliminary Procedure Remove the instrument panel accessory center trim plate. Refer to **Instrument Panel Accessory Center Trim Plate Replacement (Chevrolet / GMC)** .

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Callout	Component Name
1	Instrument Panel Center Air Outlet Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Center Air Outlet

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT - RIGHT SIDE (CADILLAC)



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Fig. 126: Instrument Panel Center Air Outlet - Right Side (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the right instrument panel upper trim panel. Refer to **Instrument Panel Upper Trim Panel Replacement - Right Side (Cadillac)** .	
1	Instrument Panel Center Air Outlet Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Center Air Outlet

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT - RIGHT SIDE (CHEVROLET / GMC)

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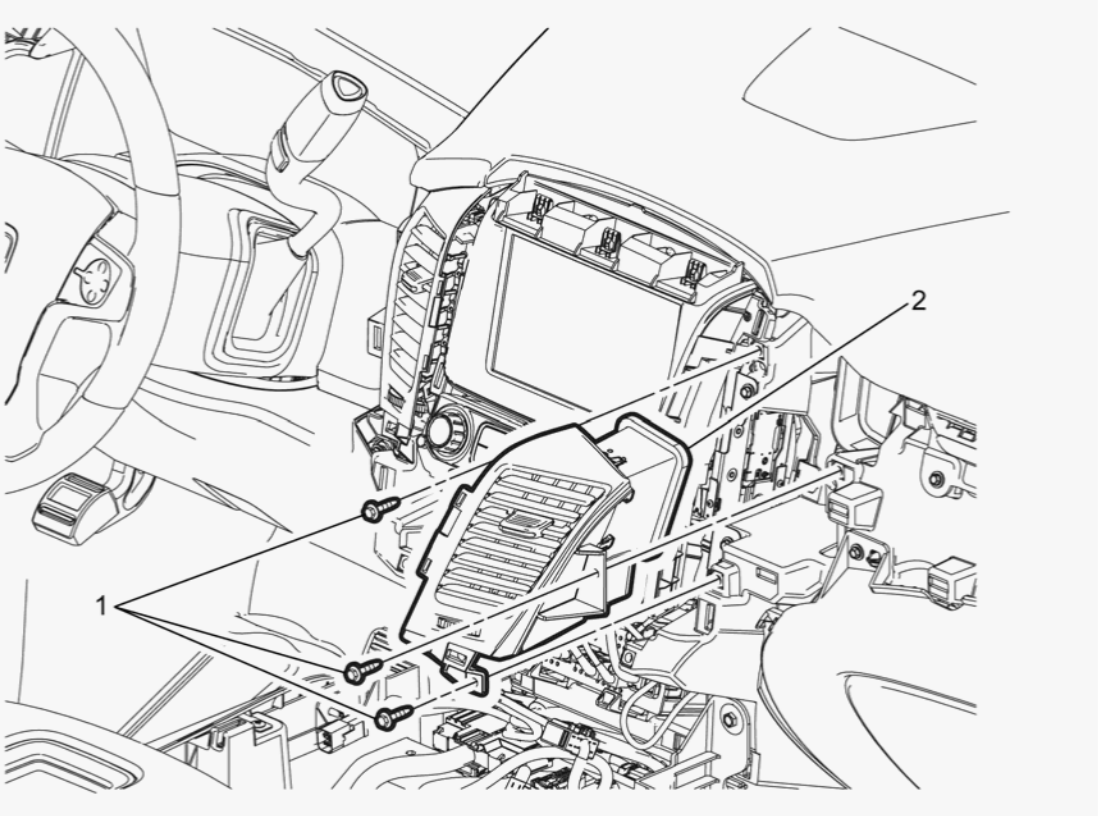


Fig. 127: Instrument Panel Center Air Outlet - Right Side (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel accessory center trim plate. Refer to **Instrument Panel Accessory Center Trim Plate Replacement (Chevrolet / GMC)** .	
1	Instrument Panel Center Air Outlet Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Instrument Panel Center Air Outlet

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - RIGHT SIDE (CHEVROLET / GMC)

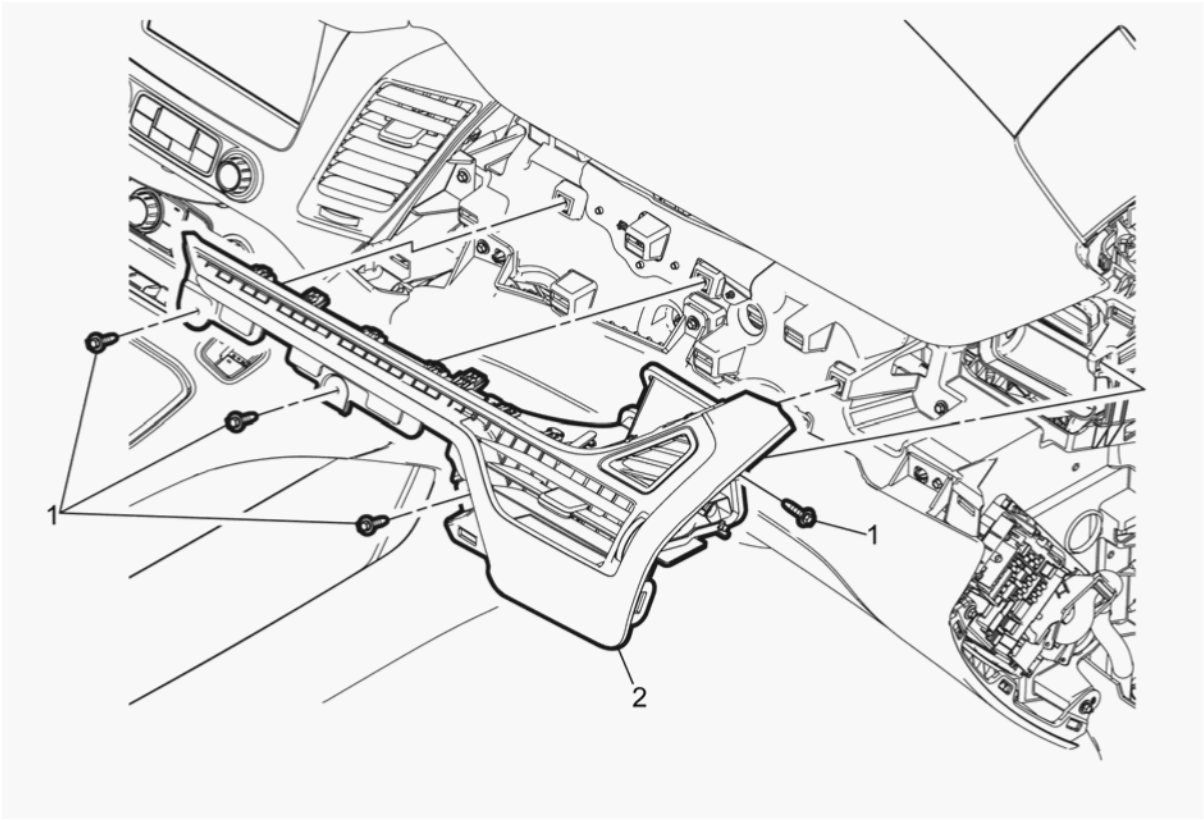


Fig. 128: Instrument Panel Outer Air Outlet - Right Side (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Remove the instrument panel lower trim panel. Refer to **Instrument Panel Lower Trim Panel Replacement (Chevrolet / GMC)** . 2. Remove the right instrument panel fuse block access hole cover. Refer to **Instrument Panel Fuse Block Access Hole Cover Replacement (Chevrolet / GMC)** .	
1	Instrument Panel Outer Air Outlet Bolt (Qty: 4) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet **Procedure** Use a flat bladed plastic trim tool in order to release the retainer clips securing the outlet to the instrument panel carrier.

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - RIGHT SIDE (CADILLAC)

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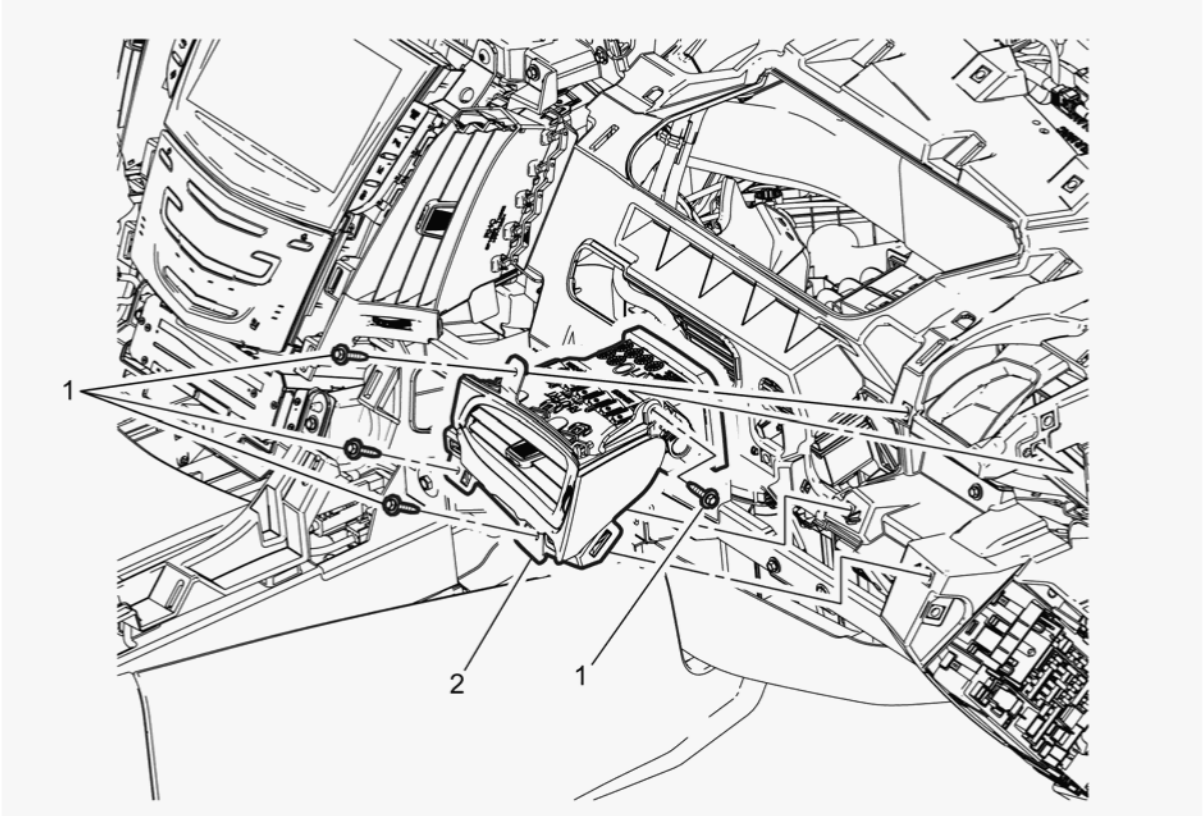


Fig. 129: Instrument Panel Outer Air Outlet - Right Side (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the right instrument panel upper trim panel. Refer to **Instrument Panel Upper Trim Panel Replacement - Right Side (Cadillac)** .	
1	Instrument Panel Outer Air Outlet Bolt (Qty: 4) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE

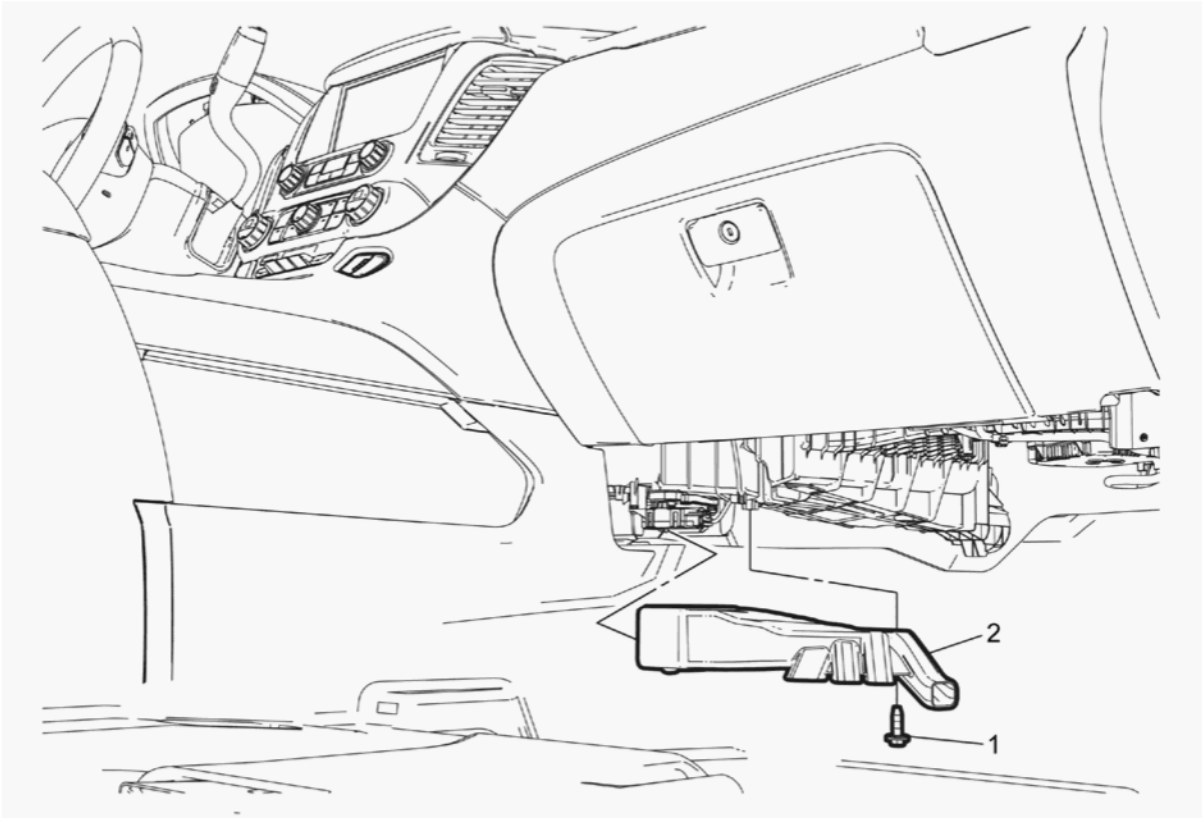


Fig. 130: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (Chevrolet / GMC)**	

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Call out	Component Name
	Instrument Panel Insulator Replacement (Cadillac) . 2. Loosen the center floor air outlet duct fasteners only. Refer to **Floor Air Outlet Duct Replacement - Center**.
1	Floor Front Air Outlet Duct Fastener **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Floor Front Air Outlet Duct - Right Side

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE (Z75)

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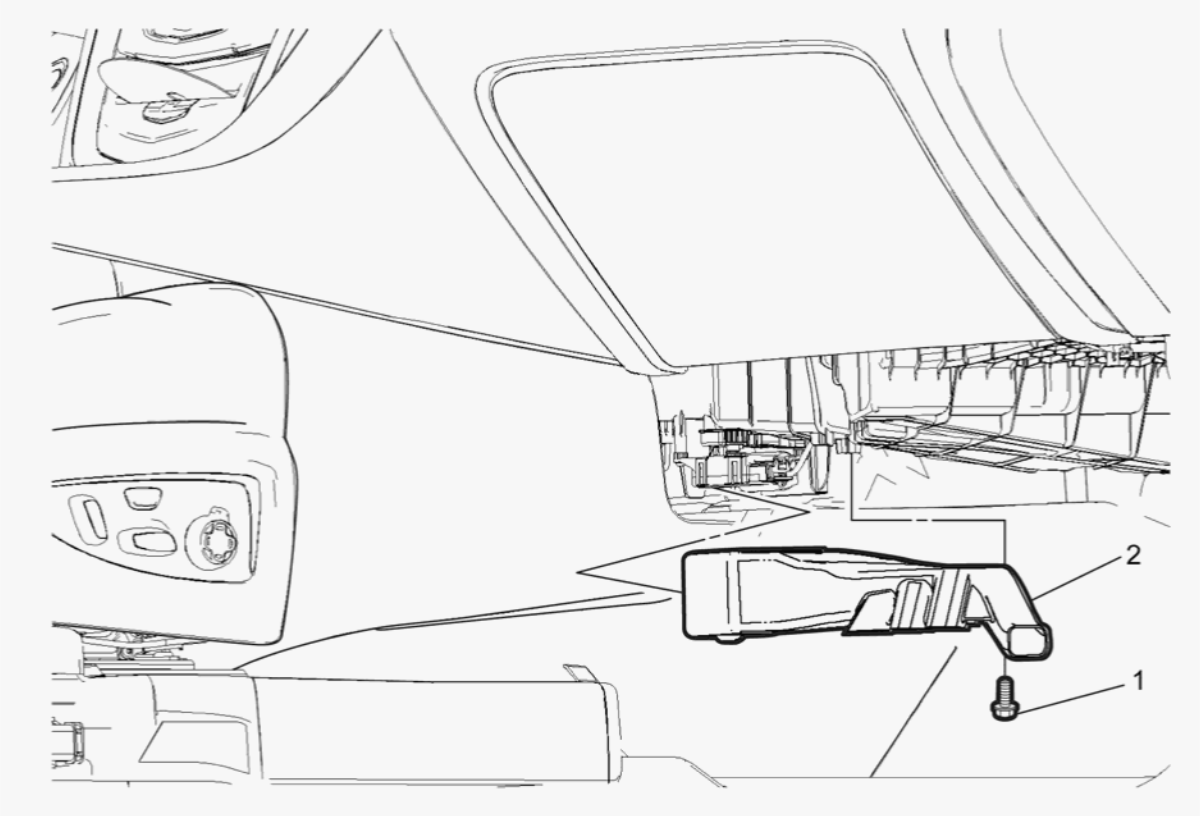


Fig. 131: Floor Front Air Outlet Duct - Right Side (Z75)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (Chevrolet / GMC)** **Instrument Panel Insulator Replacement (Cadillac)** .	
1	Floor Front Air Outlet Duct Fastener **CAUTION:** **Refer to** **Fastener Caution** .

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Call out	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Floor Front Air Outlet Duct - Right Side

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - LEFT SIDE (UTILITIES)

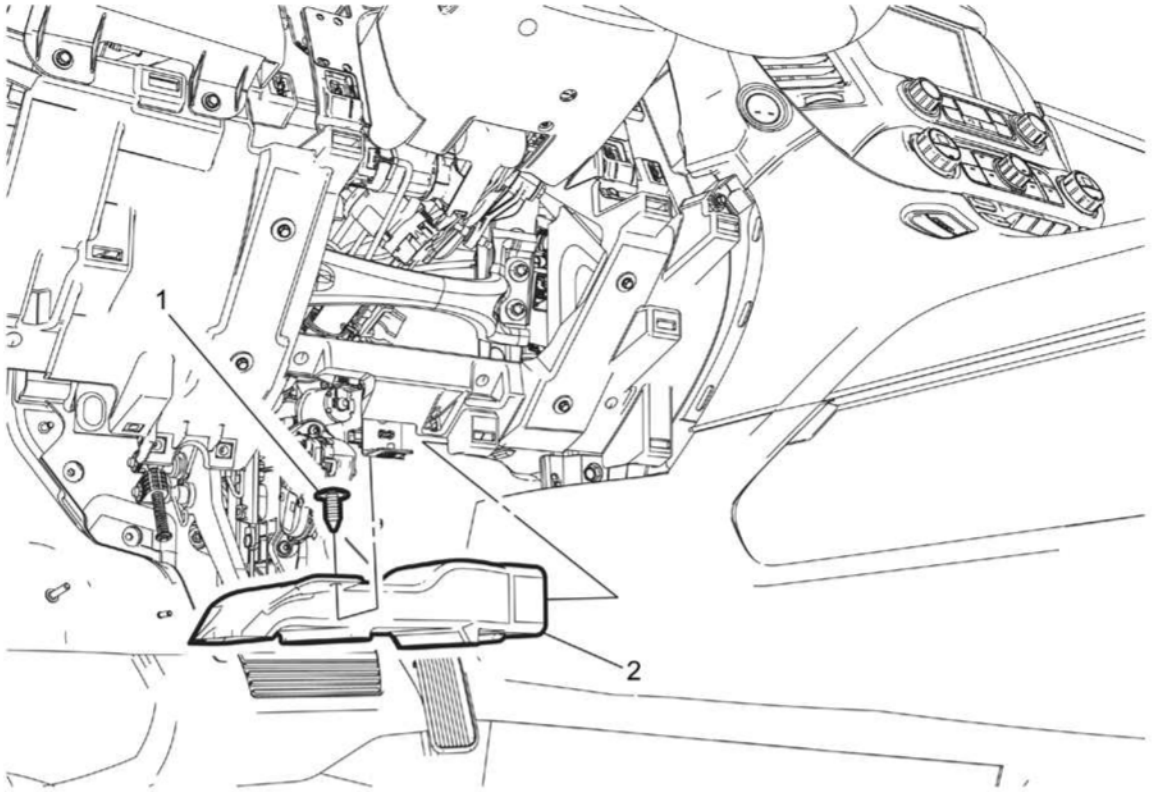


Fig. 132: Floor Front Air Outlet Duct - Left Side (Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure	
Remove the instrument panel knee bolster. Refer to **Instrument Panel Knee Bolster Replacement (Chevrolet / GMC) Instrument Panel**	

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Call out	Component Name
Knee Bolster Replacement (Cadillac) .	
1	Floor Front Air Outlet Duct Fastener
2	Floor Front Air Outlet Duct - Left Side

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - LEFT SIDE (Z75)

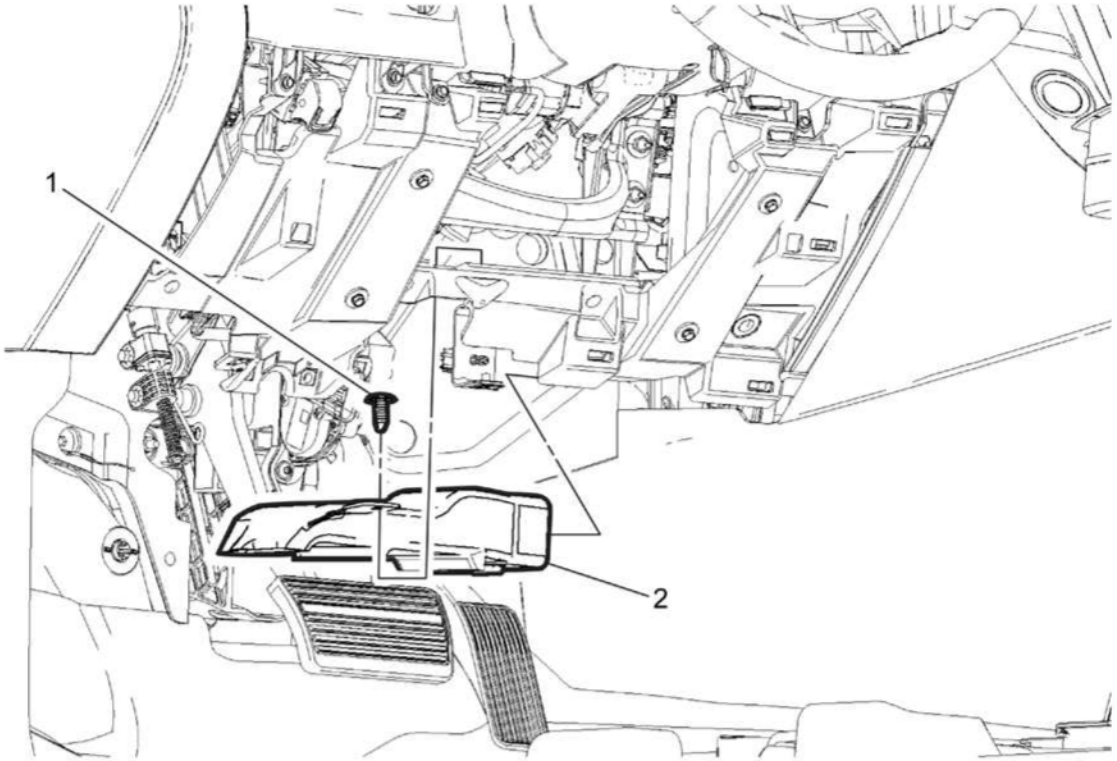


Fig. 133: Floor Front Air Outlet Duct - Left Side (Z75)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the instrument panel knee bolster. Refer to Instrument Panel Knee Bolster Replacement (Chevrolet / GMC) Instrument Panel Knee Bolster Replacement (Cadillac) .	

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Call out	Component Name
1	Floor Front Air Outlet Duct Fastener
2	Floor Front Air Outlet Duct - Left Side

FLOOR AIR OUTLET DUCT REPLACEMENT - CENTER

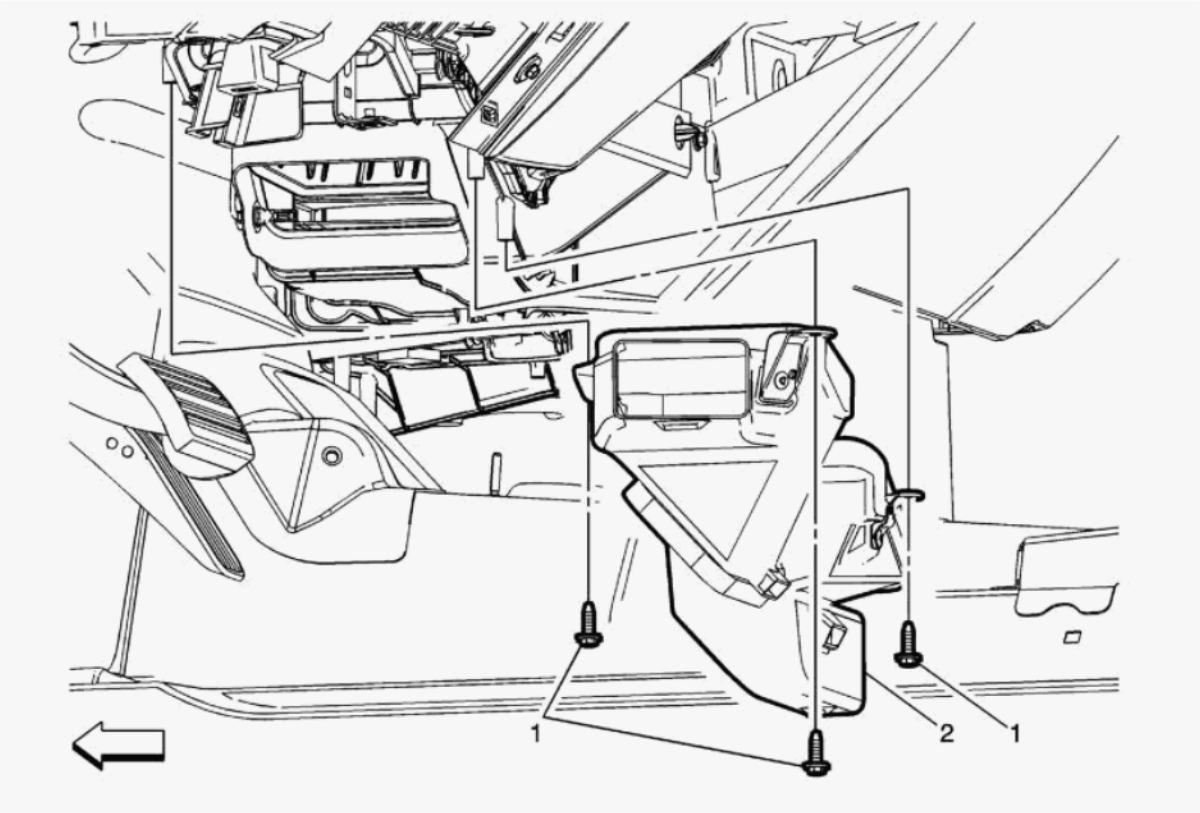


Fig. 134: Floor Air Outlet Duct - Center
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Remove the left front floor air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Left Side (Utilities)Floor Front Air Outlet Duct Replacement - Left Side (Z75)**.	

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Callout	Component Name
2. Remove the right front floor air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Right SideFloor Front Air Outlet Duct Replacement - Right Side (Z75)**. 3. Remove the floor rear air outlet duct. Refer to **Floor Rear Air Outlet Duct ReplacementFloor Rear Air Outlet Duct Replacement (Z75)**.	
1	Center Floor Duct Fastener (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**
2	Center Floor Duct **Procedure** Maneuver the center floor duct out from under the dash from the left side.

AIR DISTRIBUTOR FRONT DUCT REPLACEMENT

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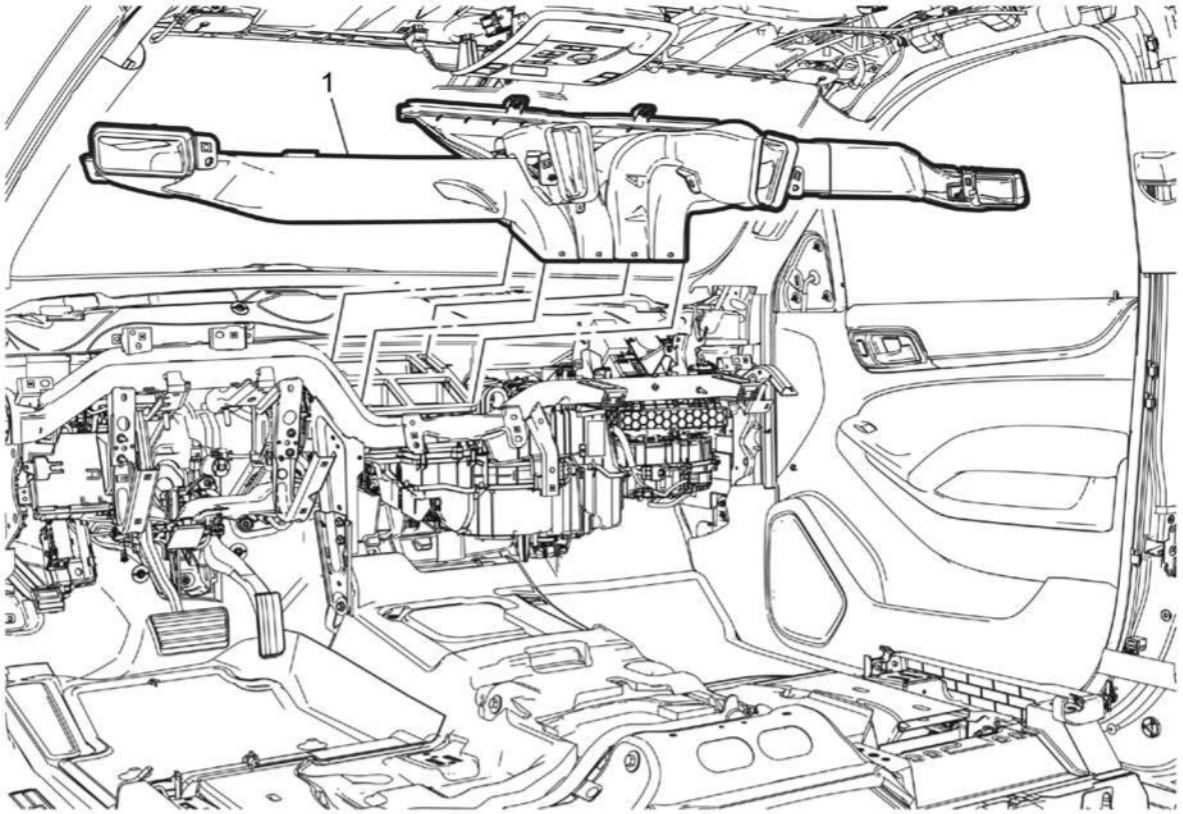


Fig. 135: Air Distributor Front Duct
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the left side window defogger outlet duct. Refer to **Side Window Defogger Outlet Outer Duct Replacement - Left Side (W/O HUD UV6)Side Window Defogger Outlet Outer Duct Replacement - Left Side (UV6 HUD)**. 2. Remove the right side window defogger outlet duct. Refer to **Side Window Defogger Outlet Outer Duct Replacement - Right Side**.	
1	Air Distributor Front Duct **Procedures**

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Call out	Component Name
	1. Note the location and routing of the instrument panel wiring harness in order to ensure proper re-installation of the harness. 2. To remove air distributor front duct, disconnect and reposition the instrument panel wiring harness out of the way.

SIDE WINDOW DEFOGGER OUTLET OUTER DUCT REPLACEMENT - LEFT SIDE (W/O HUD UV6)

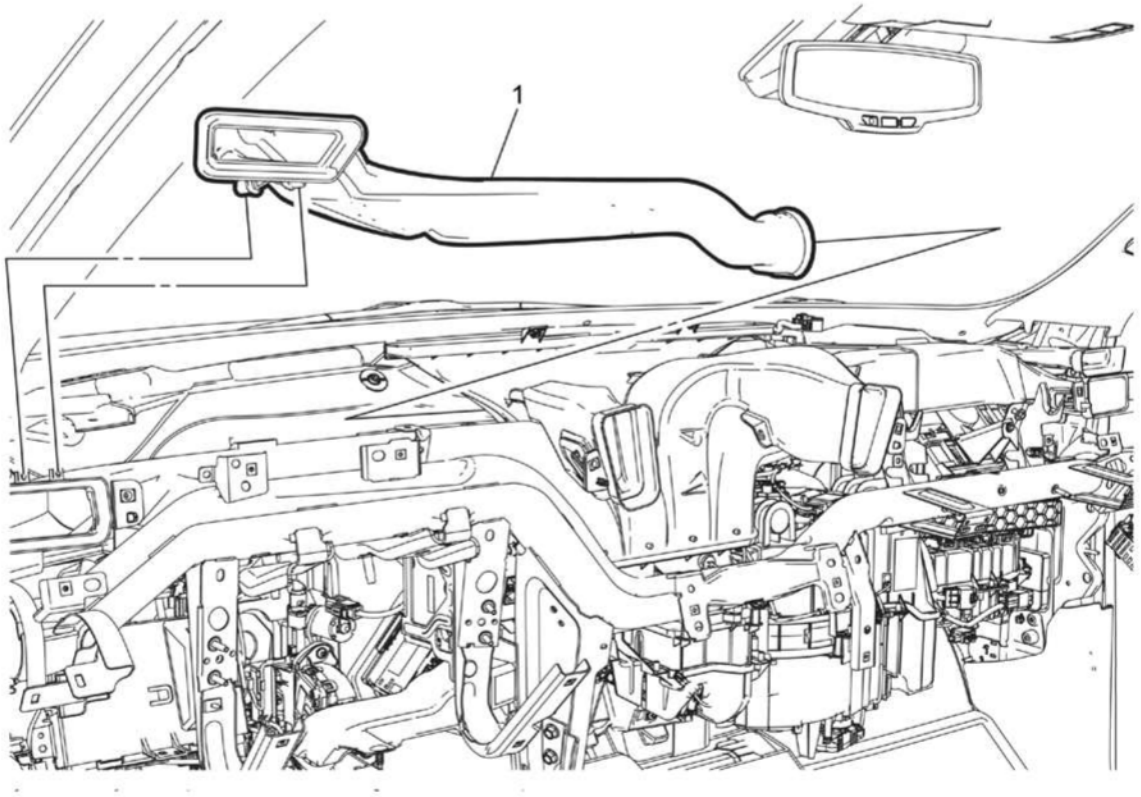


Fig. 136: Side Window Defogger Outlet Outer Duct - Left Side (W/O HUD UV6)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure	
Remove the instrument panel carrier. Refer to **Instrument Carrier Replacement (Chevrolet / GMC) Instrument Carrier Replacement**	

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Call out	Component Name
(Cadillac) .	
1	Side Window Defogger Outlet Duct - Left Side **Procedure** Un-clip the electrical harness retainers from the left side window defogger outlet duct.

SIDE WINDOW DEFOGGER OUTLET OUTER DUCT REPLACEMENT - LEFT SIDE (UV6 HUD)

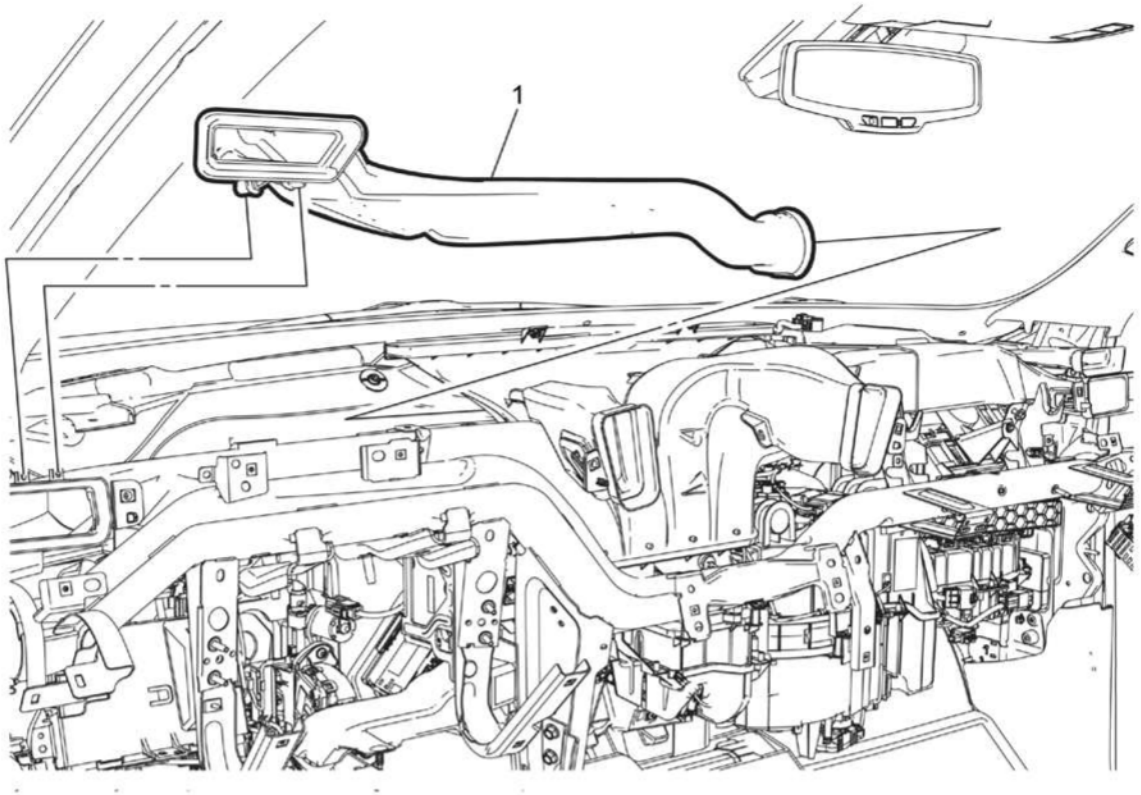


Fig. 137: Side Window Defogger Outlet Outer Duct - Left Side (UV6 HUD)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures	

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Call out	Component Name
1. Remove the instrument panel carrier. Refer to **Instrument Carrier Replacement (Chevrolet / GMC)** **Instrument Carrier Replacement (Cadillac)** 2. Remove the Head-Up Display. Refer to **Head-Up Display Replacement (Chevrolet / GMC)** **Head-Up Display Replacement (Cadillac)**	
1	Side Window Defogger Outlet Duct - Left Side **Procedure** Un-clip the electrical harness retainers from the left side window defogger outlet duct.

SIDE WINDOW DEFOGGER OUTLET OUTER DUCT REPLACEMENT - RIGHT SIDE

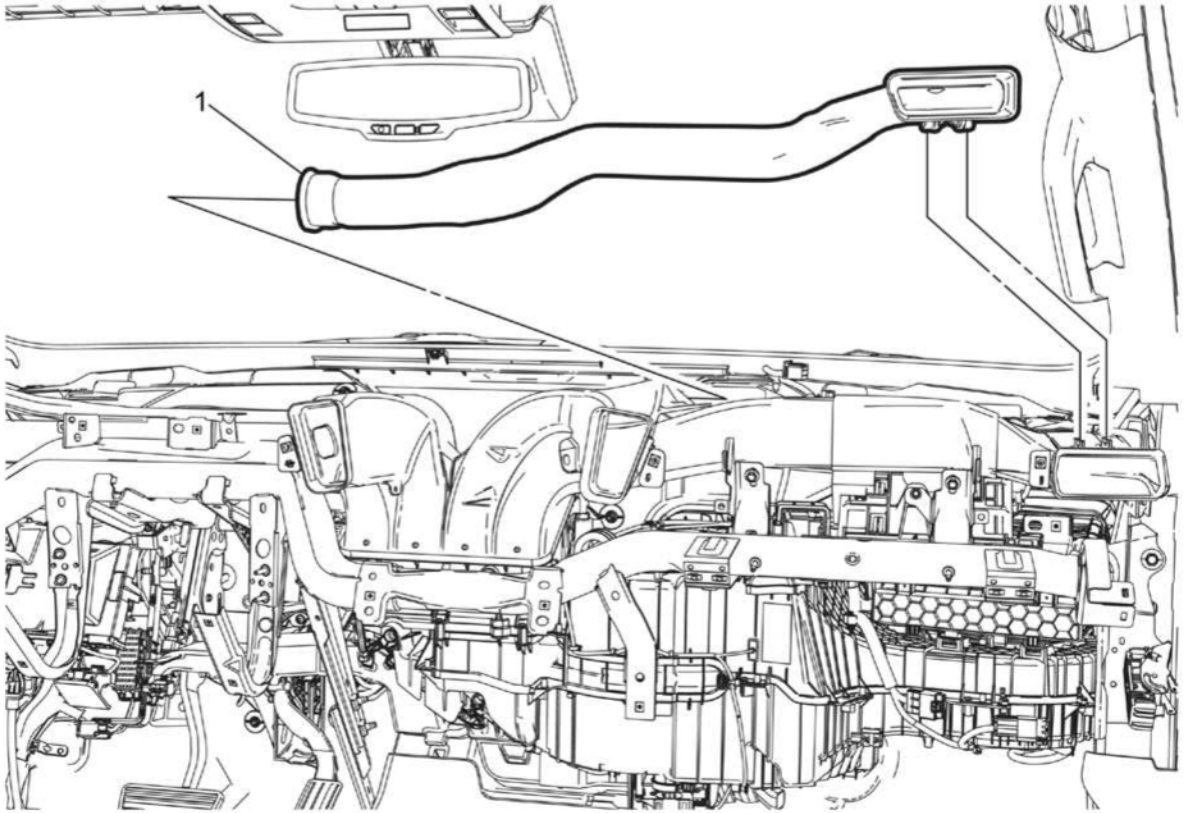


Fig. 138: Side Window Defogger Outlet Outer Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

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Call out	Component Name
Preliminary Procedure Remove the instrument panel carrier. Refer to **Instrument Carrier Replacement (Chevrolet / GMC)** **Instrument Carrier Replacement (Cadillac)** .	
1	Side Window Defogger Outlet Duct - Right Side **Procedure** Un-clip the electrical harness retainers from the right side window defogger outlet duct.

FLOOR REAR AIR OUTLET DUCT REPLACEMENT

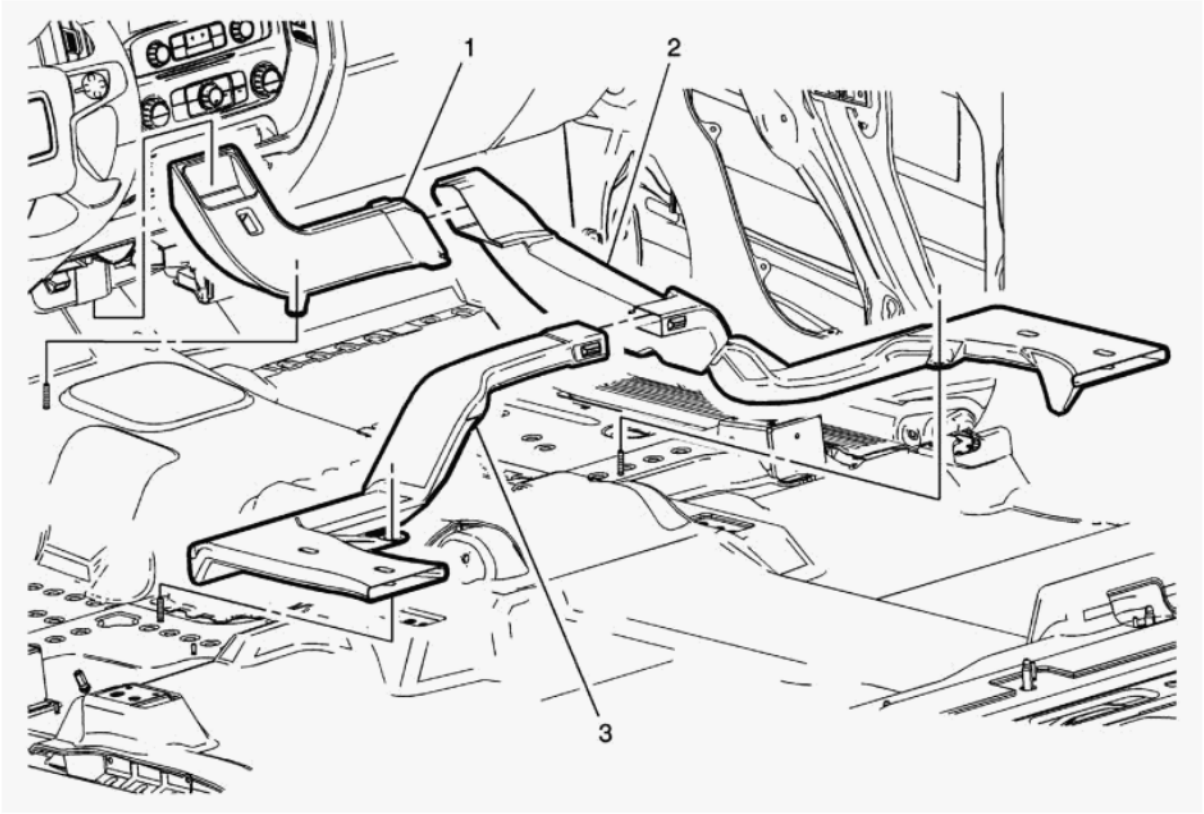


Fig. 139: Floor Rear Air Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedure Remove the floor panel carpet. Refer to **Front Floor Panel Carpet Replacement** .	
1	Floor Rear Air Outlet Duct - Front **Procedure** Removing the floor rear air outlet duct as an assembly, separate the ducts.
2	Floor Rear Air Outlet Duct - intermediate **Procedure** Removing the floor rear air outlet duct as an assembly, separate the ducts.
3	Floor Rear Air Outlet Duct - Rear

FLOOR REAR AIR OUTLET DUCT REPLACEMENT (Z75)

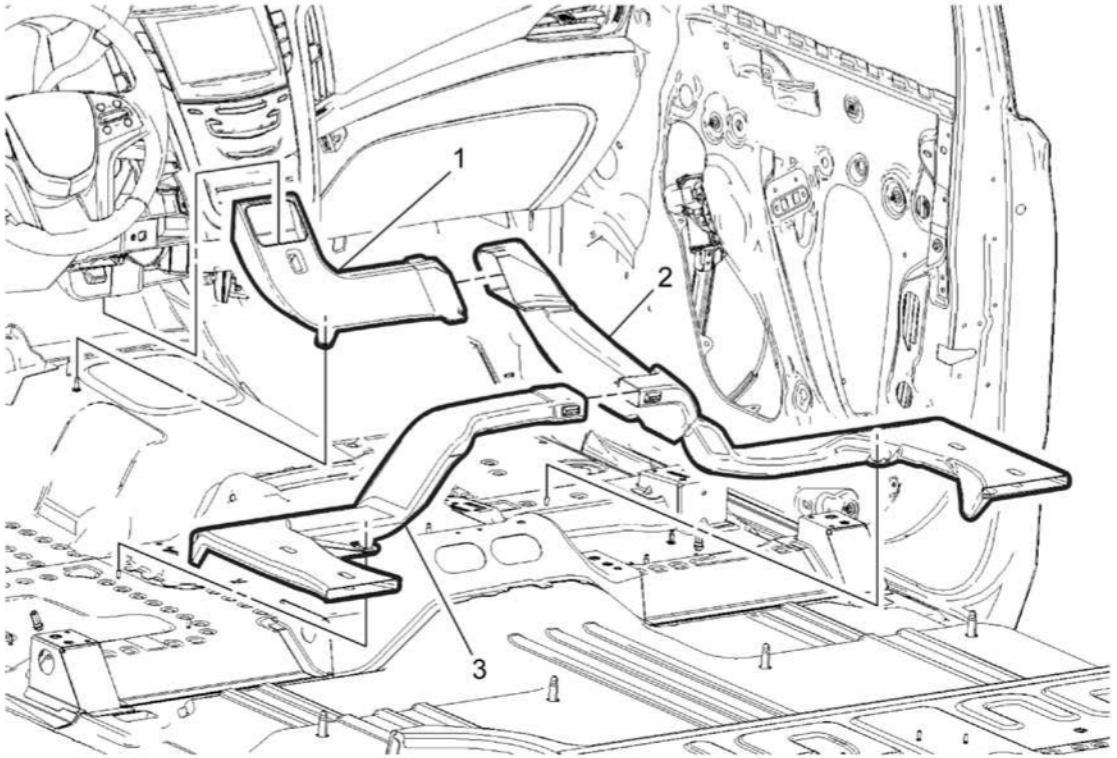


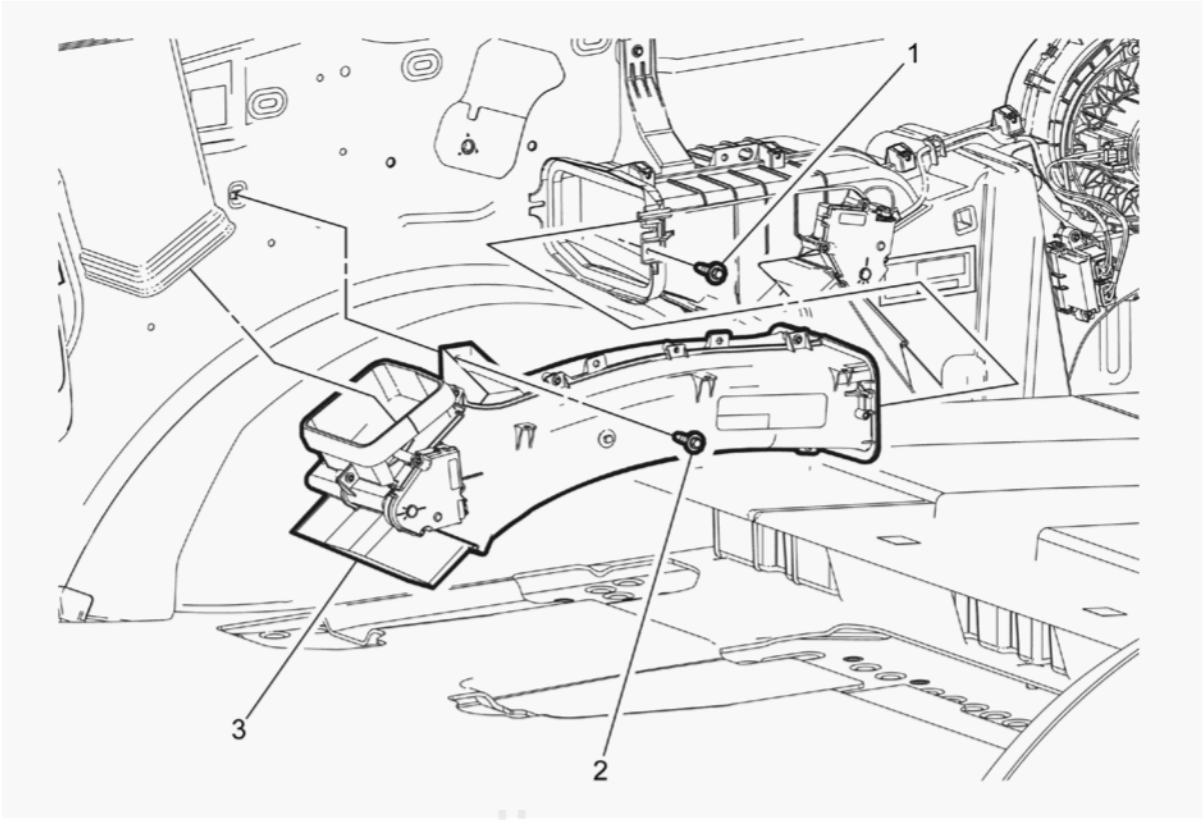
Fig. 140: Floor Rear Air Outlet Duct (Z75)

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Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the floor panel carpet. Refer to **Front Floor Panel Carpet Replacement** .	
1	Floor Rear Air Outlet Duct - Front **Procedure** Removing the floor rear air outlet duct as an assembly, separate the ducts.
2	Floor Rear Air Outlet Duct - intermediate **Procedure** Removing the floor rear air outlet duct as an assembly, separate the ducts.
3	Floor Rear Air Outlet Duct - Rear

FLOOR REAR AIR DISTRIBUTOR REPLACEMENT (LWB)



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Fig. 141: Floor Rear Air Distributor (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary heater air outlet duct. Refer to **Auxiliary Heater Air Outlet Duct Replacement (LWB)**.	
1	Auxiliary Air Conditioning Evaporator and Blower Module to Floor Rear Air Distributor Fastener **CAUTION:** **Refer to** **Fastener** **Caution** .
2	Floor Rear Air Distributor Fastener **Tighten** 1.6 N.m (14 lb in)
3	Floor Rear Air Distributor **Procedures** 1. Disconnect the electrical connectors and position the harness out of the way. 2. Transfer the components as necessary.

FLOOR REAR AIR DISTRIBUTOR REPLACEMENT (SWB)

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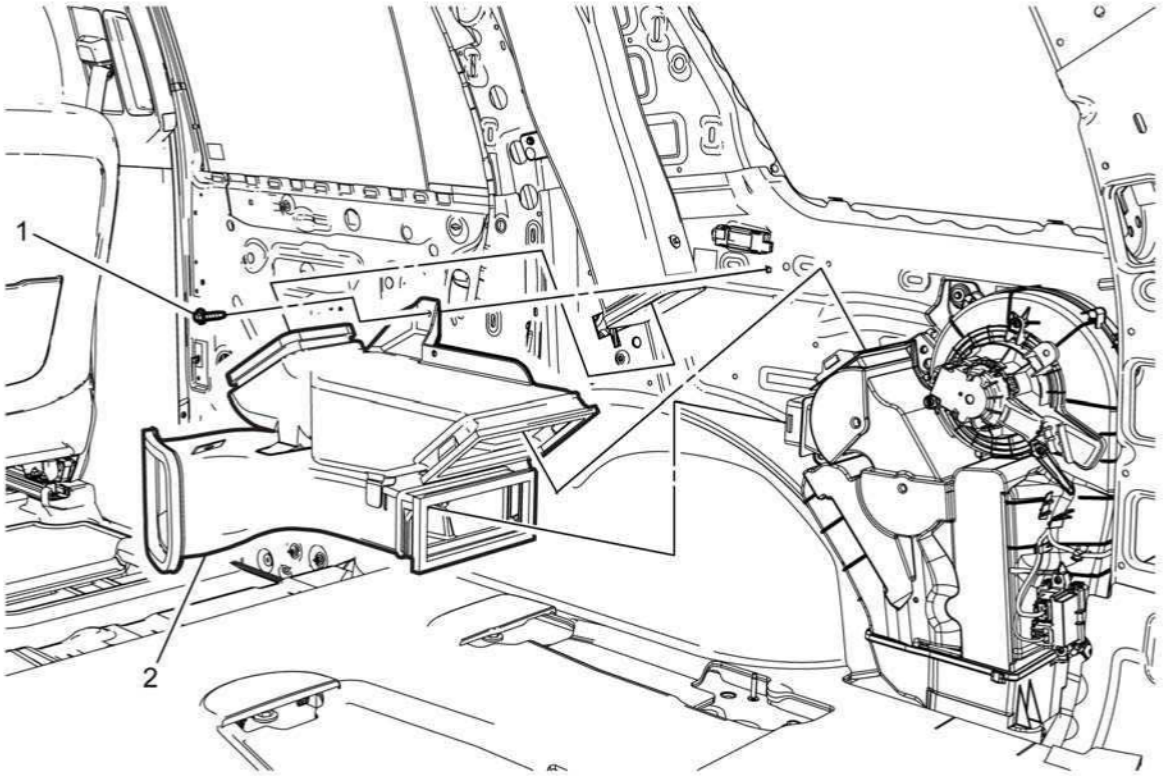


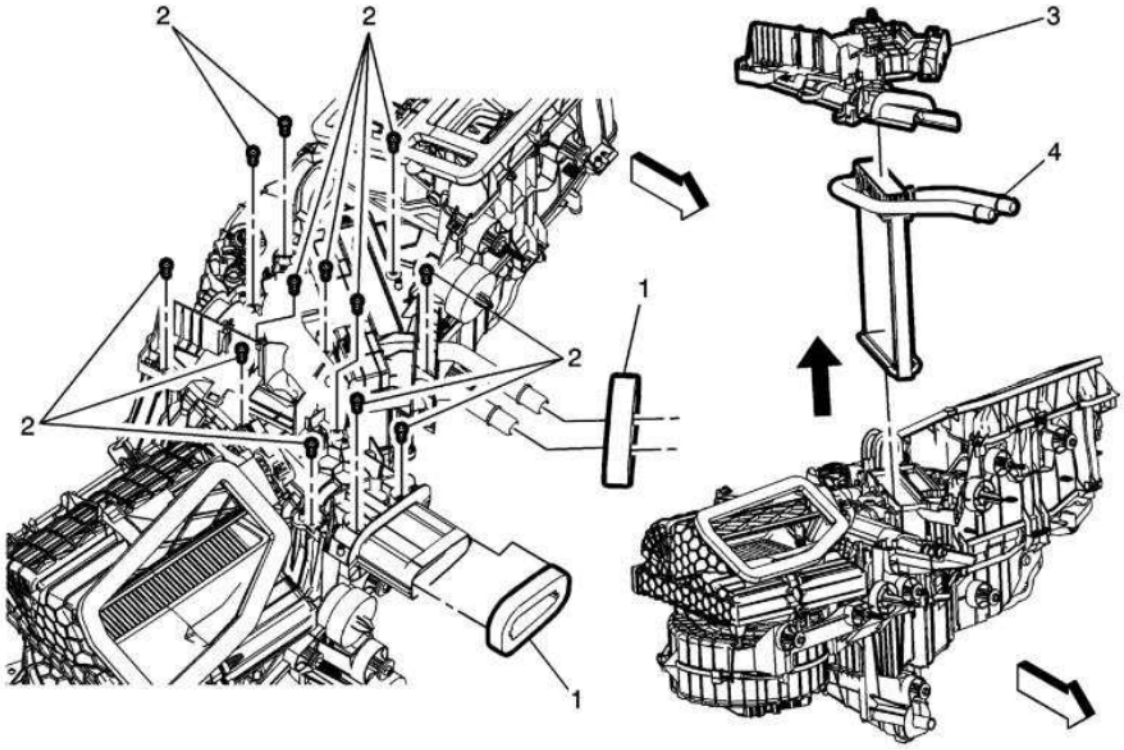
Fig. 142: Floor Rear Air Distributor (SWB)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)**	
1	Floor Rear Air Distributor Fastener **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 1.6 N.m (14 lb in)
2	Floor Rear Air Distributor **Procedure** 1. Un-clip the harness retainers, and position the harness out of the way. 2. Transfer the air temperature sensor. 3. Transfer components as necessary.

HEATER CORE REPLACEMENT (NON HEAT STAKE)



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Fig. 143: Heater Core (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**. 2. Remove the temperature valve actuator. Refer to **Temperature Valve Actuator Replacement - Left Side** . 3. Disconnect the electrical connectors as necessary.	
1	Seal (Qty: 2)
2	Heater Cover Fastener (Qty: 12) **CAUTION:** **Refer to Fastener Caution .**
3	Heater Cover
4	Heater Core Assembly **Procedures** 1. Lift the heater core up and out of the heater and air conditioning evaporator and blower module assembly. 2. Transfer the components as necessary.

HEATER CORE REPLACEMENT (HEAT STAKE)

Removal Procedure

1. Remove the heater and air conditioning evaporator and blower module assembly (HVAC). Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

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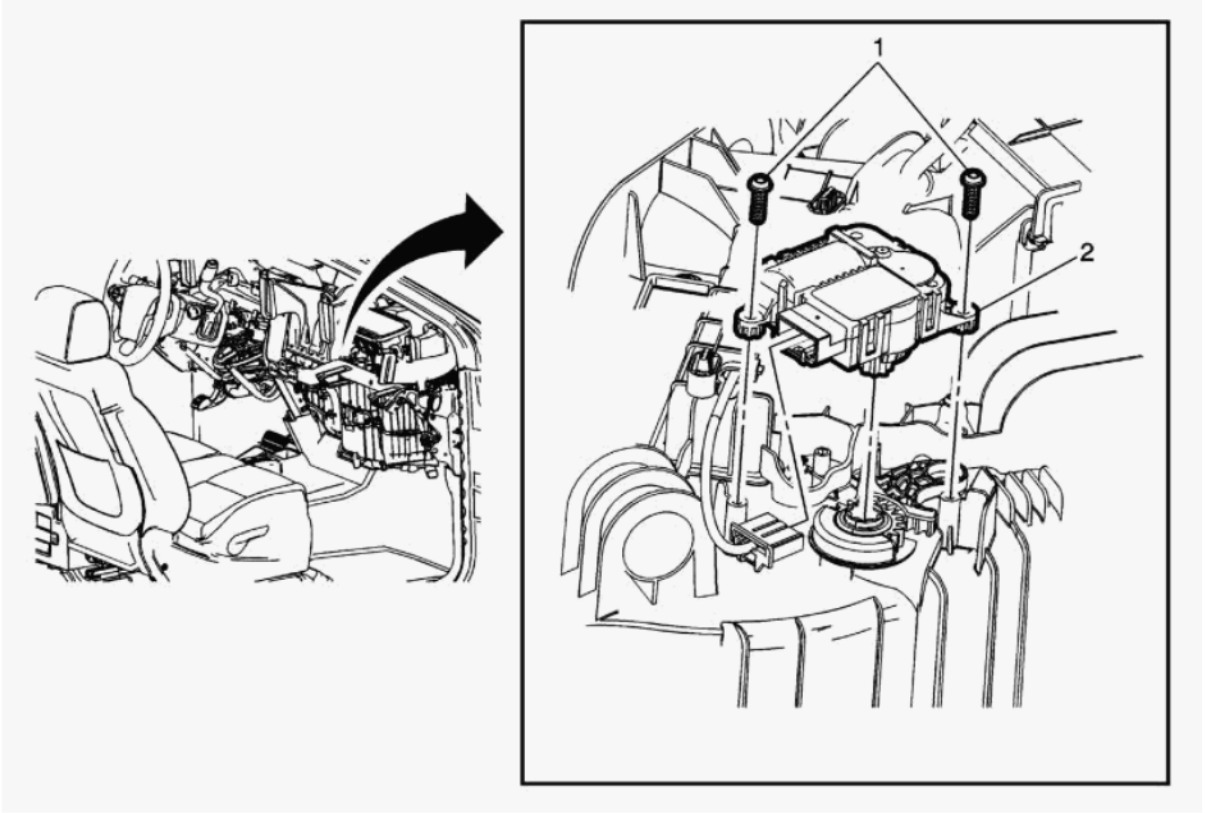


Fig. 144: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

2. Remove the left side temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .

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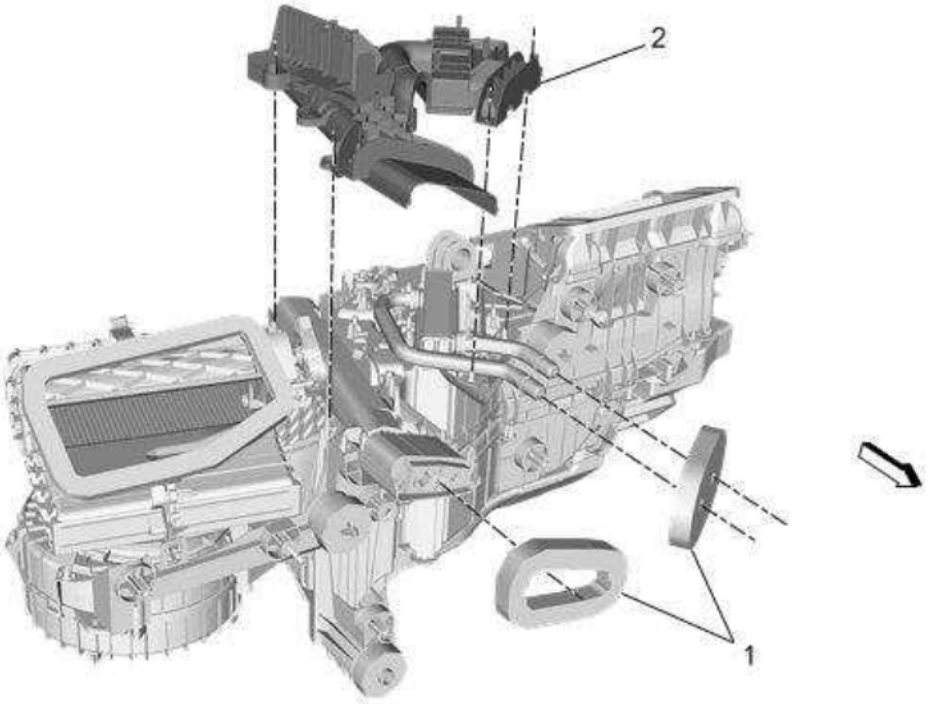


Fig. 145: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

3. Remove the HVAC seals (1).
4. The heater cover is heat staked to the HVAC module assembly, use a step drill bit to drill out the 13 heat stakes.
5. Remove the heater cover (2) from the HVAC module assembly.

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Fig. 146: Heater Core
Courtesy of GENERAL MOTORS COMPANY

6. Lift the heater core assembly (1) up and out of the heater and air conditioning evaporator and blower module assembly.
7. Transfer the components as necessary.

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Installation Procedure

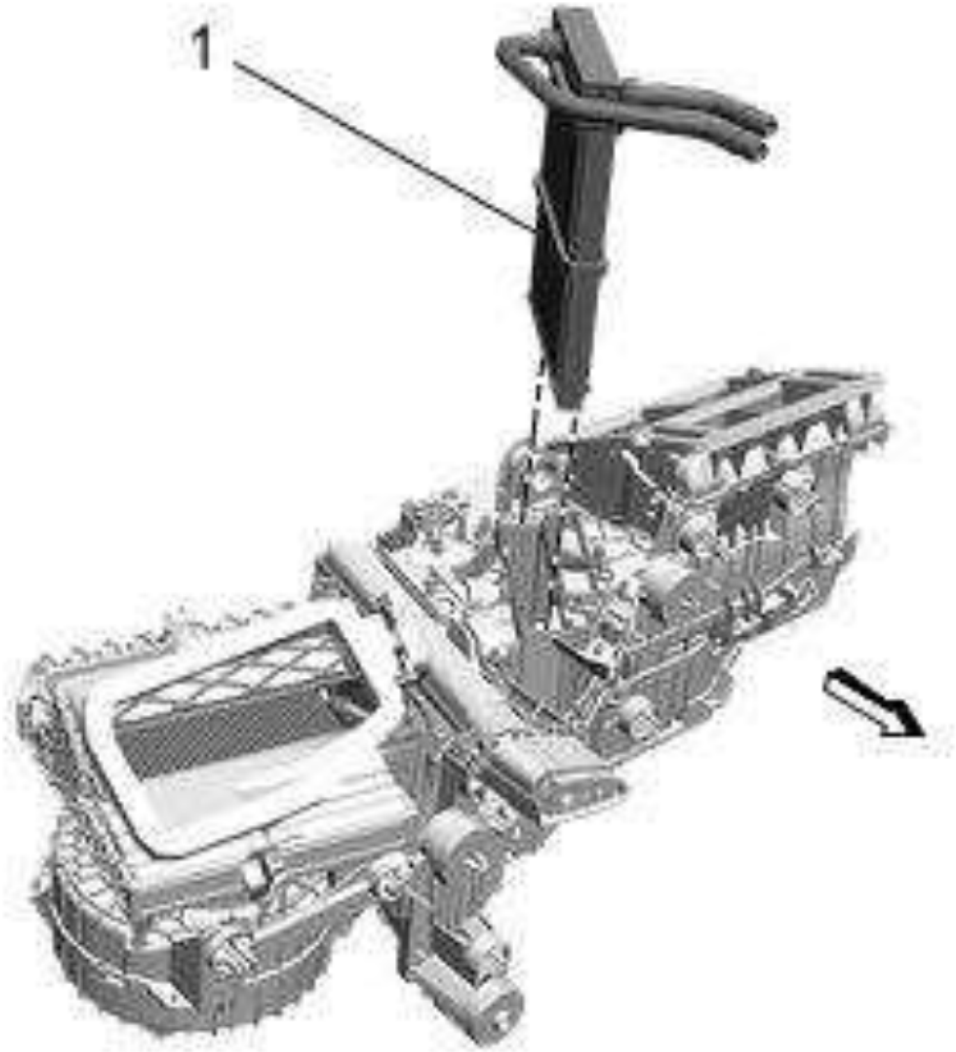


Fig. 147: Heater Core
Courtesy of GENERAL MOTORS COMPANY

1. Install the heater core assembly (1) into the heater and air conditioning evaporator and blower module assembly.

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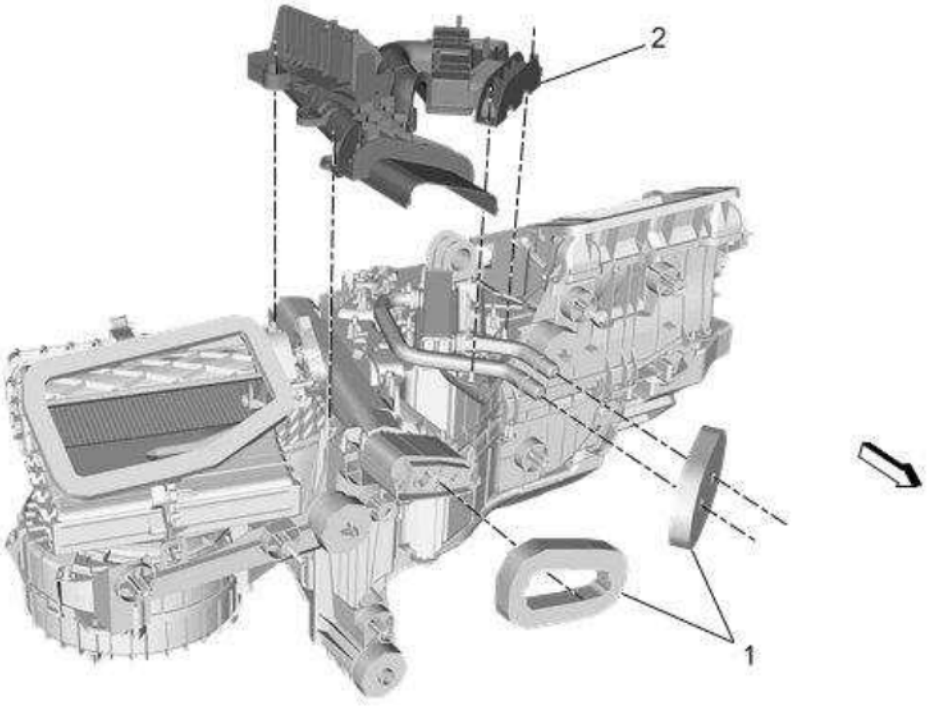


Fig. 148: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install the heater cover (2) onto the HVAC module assembly.

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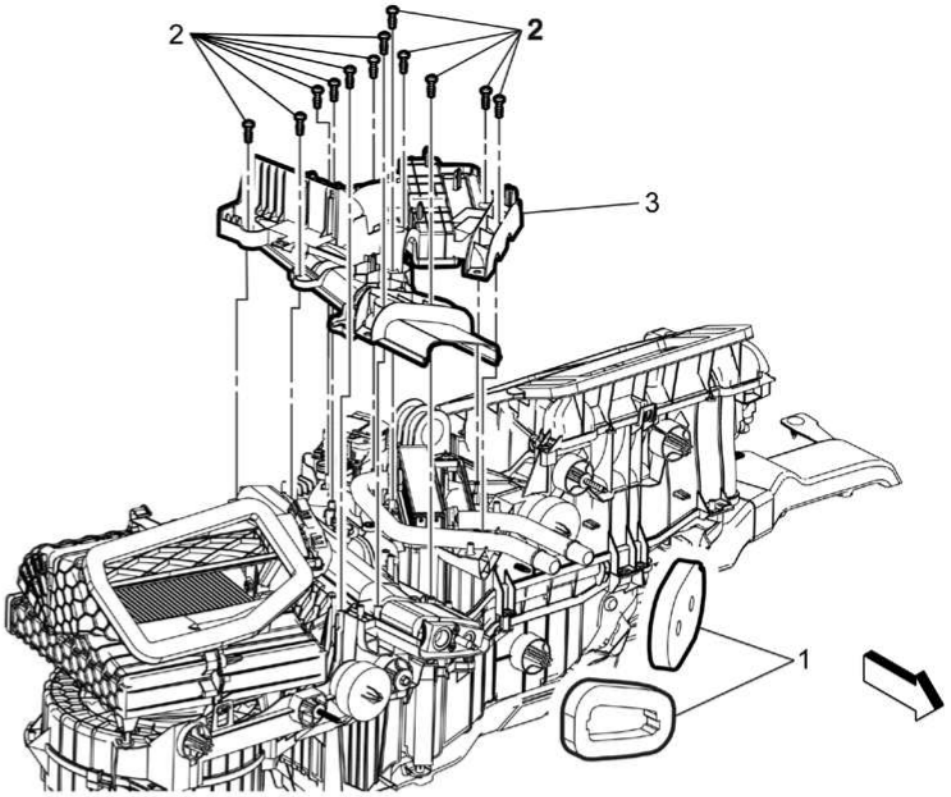


Fig. 149: Heater Cover (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Use 12 M4 X 1.79 X 16 self tapping screws (2), and tighten the screws until fully seated but not stripped, to secure the heater cover (3) to the HVAC module assembly.
4. Install the HVAC seals (1).

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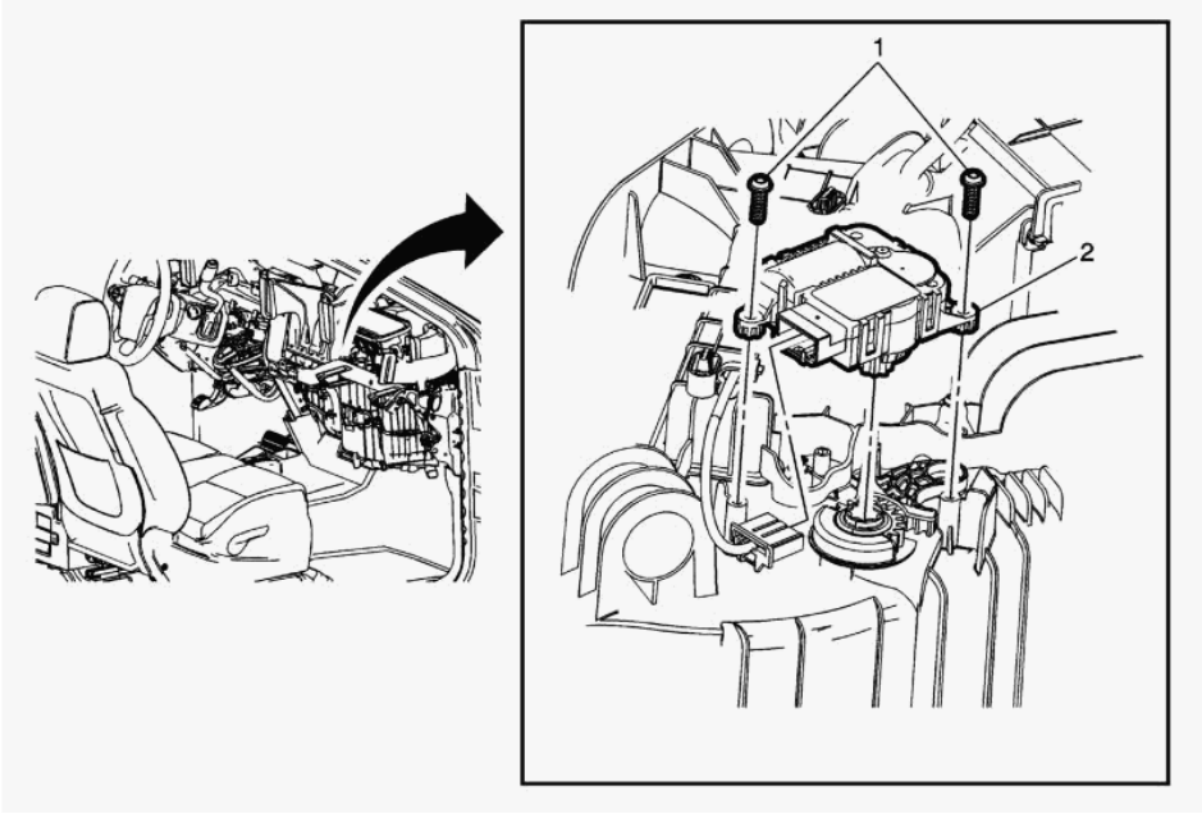


Fig. 150: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

5. Install the left side temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .
6. Install the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

AUXILIARY AIR CONDITIONING (A/C) EVAPORATOR AND BLOWER MODULE ASSEMBLY REMOVAL AND INSTALLATION (LWB)

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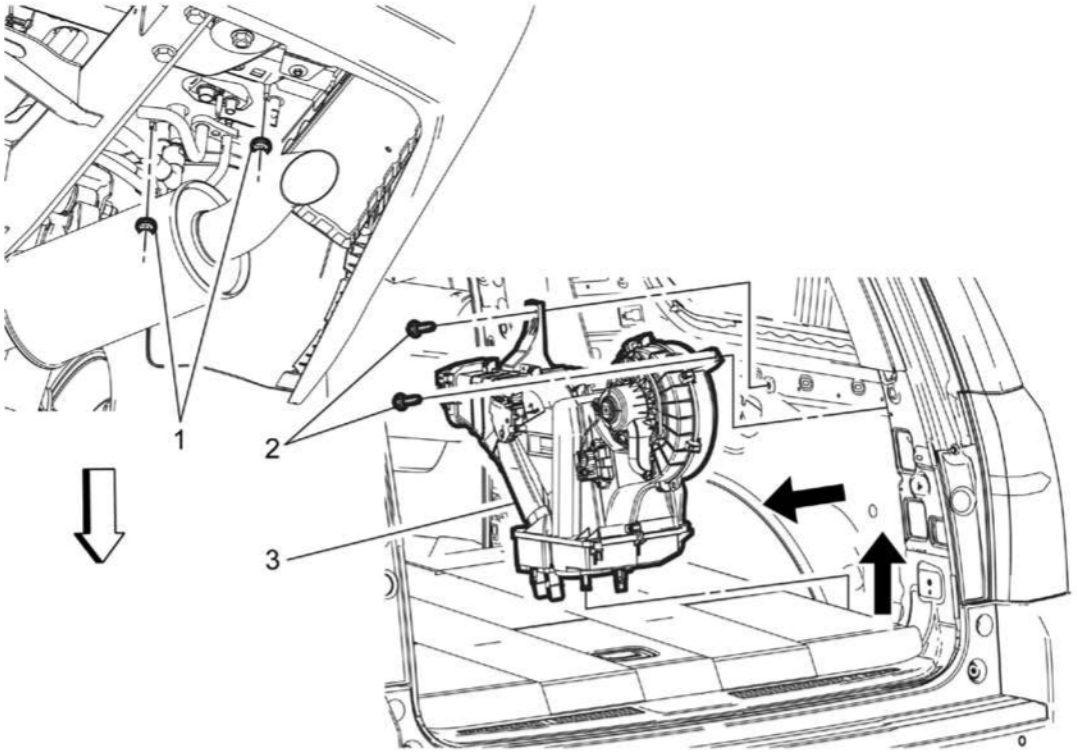


Fig. 151: Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures	

1. Disconnect the auxiliary air conditioning evaporator hose form the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
2. Disconnect the auxiliary heater inlet and outlet hose from the auxiliary heater core tubes. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
3. Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .
4. Disconnect the floor rear air distributor from the auxiliary air conditioning evaporator and blower module assembly. Refer to **Floor**

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Call out	Component Name
Rear Air Distributor Replacement (LWB).	
1	Auxiliary Air Conditioning Evaporator and Blower Module Nut (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution .** **Tighten** 9 N.m (7 lb ft)
2	Auxiliary Air Conditioning Evaporator and Blower Module Bolt (Qty: 2) **Tighten** 1.6 N.m (14 lb in)
3	Auxiliary Air Conditioning Evaporator and Blower Module Assembly **Procedures** 1. Disconnect the electrical connectors. 2. Transfer the components as necessary.

AUXILIARY AIR CONDITIONING (A/C) EVAPORATOR AND BLOWER MODULE ASSEMBLY REMOVAL AND INSTALLATION (SWB)

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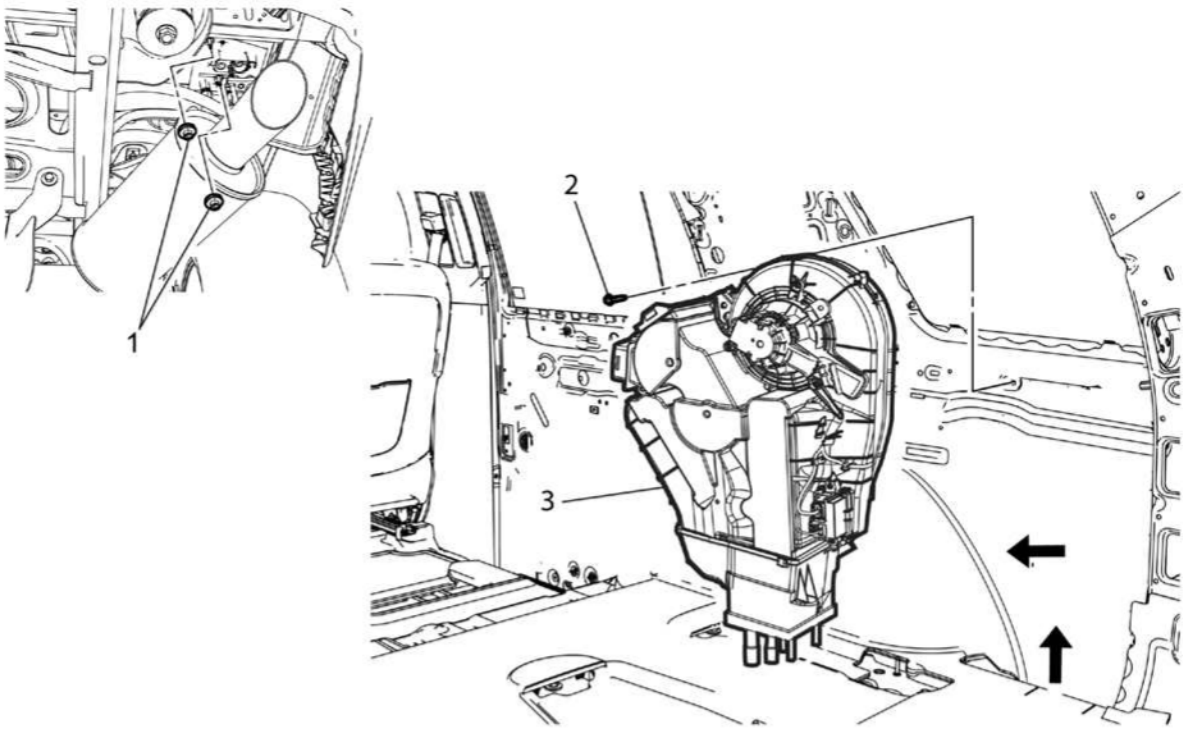


Fig. 152: Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures	

1. Disconnect the auxiliary air conditioning evaporator hose form the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
2. Disconnect the auxiliary heater inlet and outlet hose from the auxiliary heater core tubes. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.
3. Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)** .
4. Disconnect the floor rear air distributor from the auxiliary air conditioning evaporator and blower module assembly. Refer to **Floor**

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Call out	Component Name
Rear Air Distributor Replacement (SWB).	
1	Auxiliary Air Conditioning Evaporator and Blower Module Nut (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 9 N.m (7 lb ft)
2	Auxiliary Air Conditioning Evaporator and Blower Module Bolt **Tighten** 2.5 N.m (2 lb ft)
3	Auxiliary Air Conditioning Evaporator and Blower Module Assembly **Procedures** 1. Disconnect the electrical connectors. 2. Transfer the components as necessary.

AUXILIARY BLOWER MOTOR REPLACEMENT (LWB)

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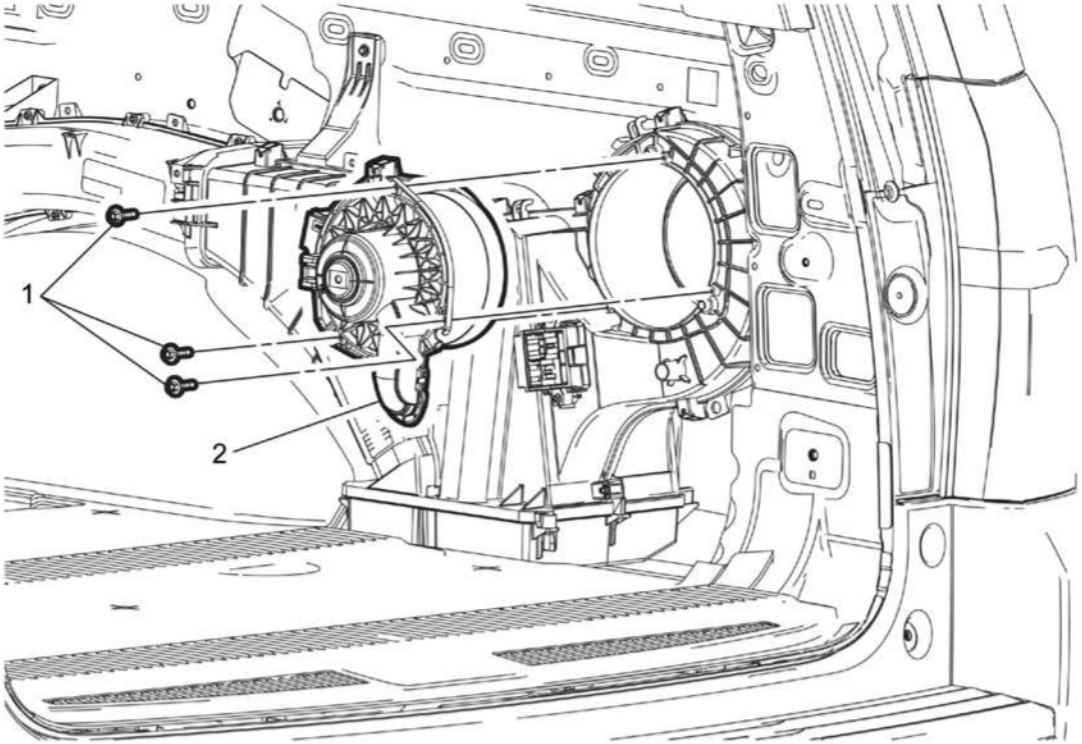


Fig. 153: Auxiliary Blower Motor (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .	
1	Auxiliary Blower Motor Fastener (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** .

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Call out	Component Name
	Tighten 1.7 N.m (15 lb in)
2	Auxiliary Blower Motor **Procedure** Disconnect the auxiliary blower motor electrical connector.

AUXILIARY BLOWER MOTOR REPLACEMENT (SWB)

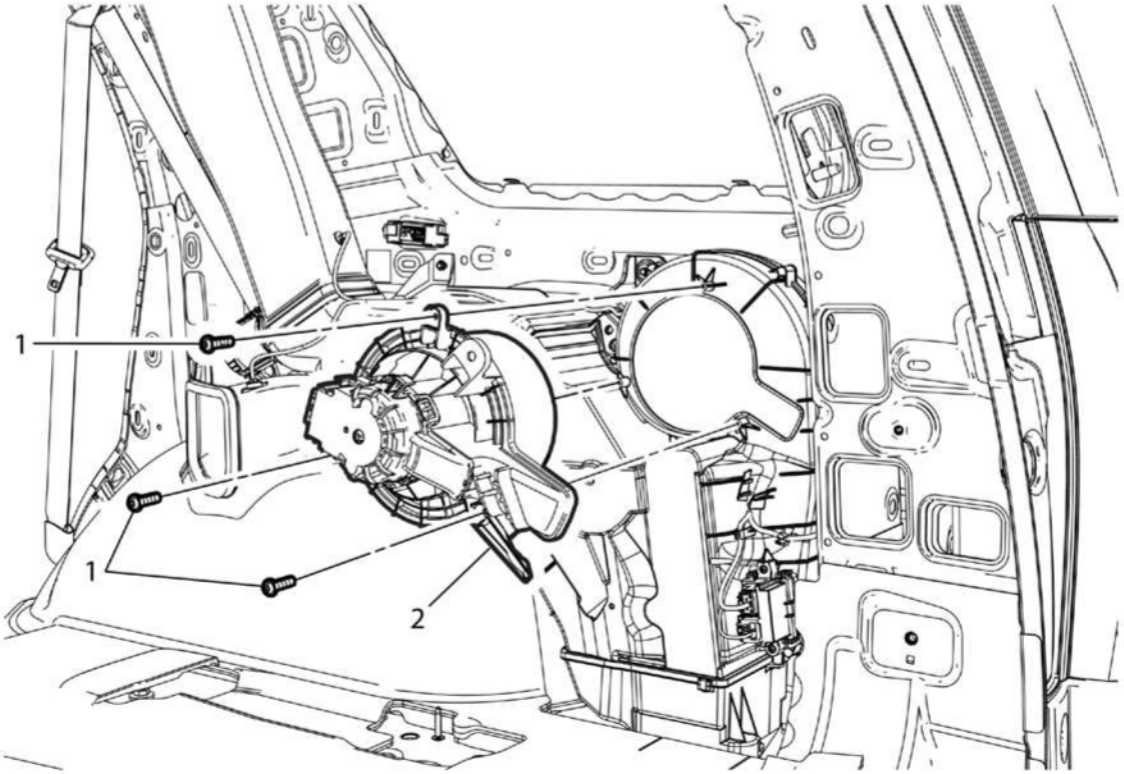


Fig. 154: Auxiliary Blower Motor (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)** .	
1	Auxiliary Blower Motor Fastener (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1.7 N.m (15 lb in)
2	Auxiliary Blower Motor **Procedure** Disconnect the auxiliary blower motor electrical connector.

AUXILIARY HEATER AIR OUTLET DUCT REPLACEMENT (LWB)

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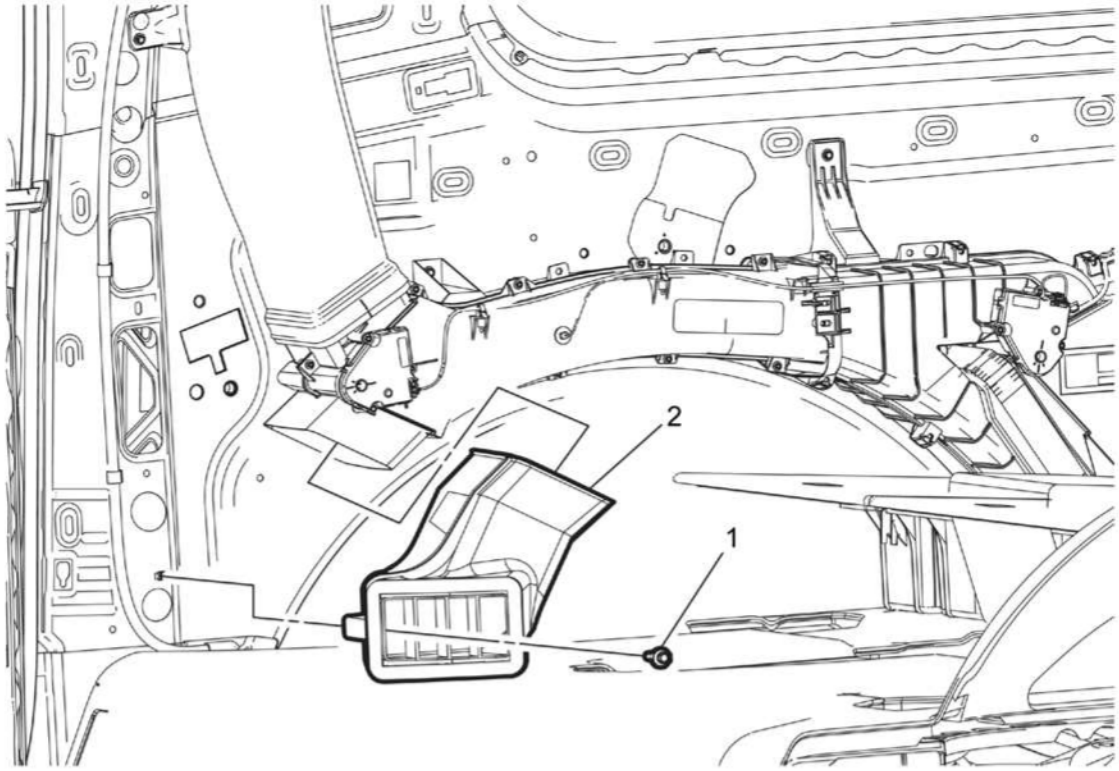


Fig. 155: Auxiliary Heater Air Outlet Duct (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the right rear quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .	
1	Auxiliary Heater Air Outlet Duct Fastener **CAUTION:** **Refer to** **Fastener Caution** .

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Call out	Component Name
	Tighten 1.6 N.m (14 lb in)
2	Auxiliary Heater Air Outlet Duct

AUXILIARY AIR CONDITIONING AIR LOWER DUCT REPLACEMENT (LWB)

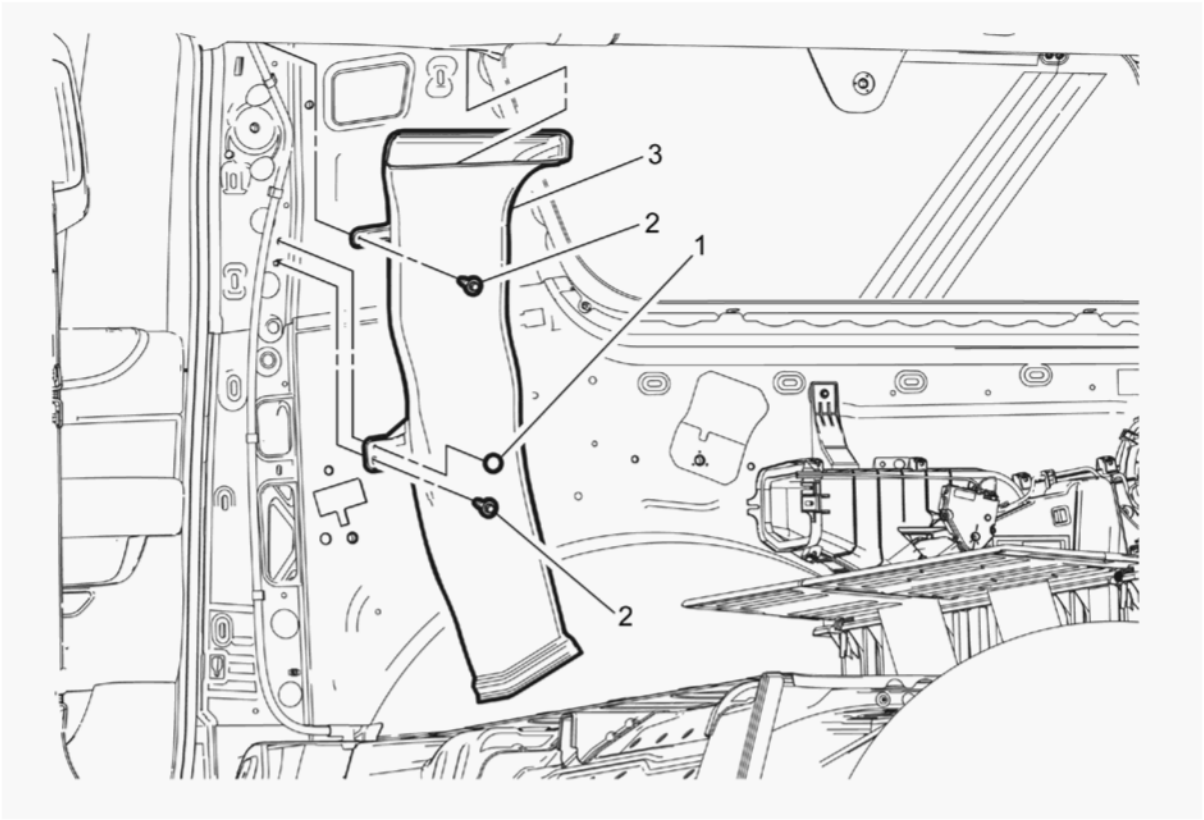


Fig. 156: Auxiliary Air Conditioning Air Lower Duct (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the floor rear air distributor. Refer to **Floor Rear Air Distributor Replacement (LWB)**.	

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Call out	Component Name
1	Auxiliary Air Conditioning Air Lower Duct Retainer
2	Auxiliary Air Conditioning Air Lower Duct Fastener (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 1.6 N.m (14 lb in)
3	Auxiliary Air Conditioning Air Lower Duct **Procedure** Maneuver the auxiliary air conditioning air lower duct down and out from the headliner.

AUXILIARY AIR CONDITIONING AIR LOWER DUCT REPLACEMENT (SWB)

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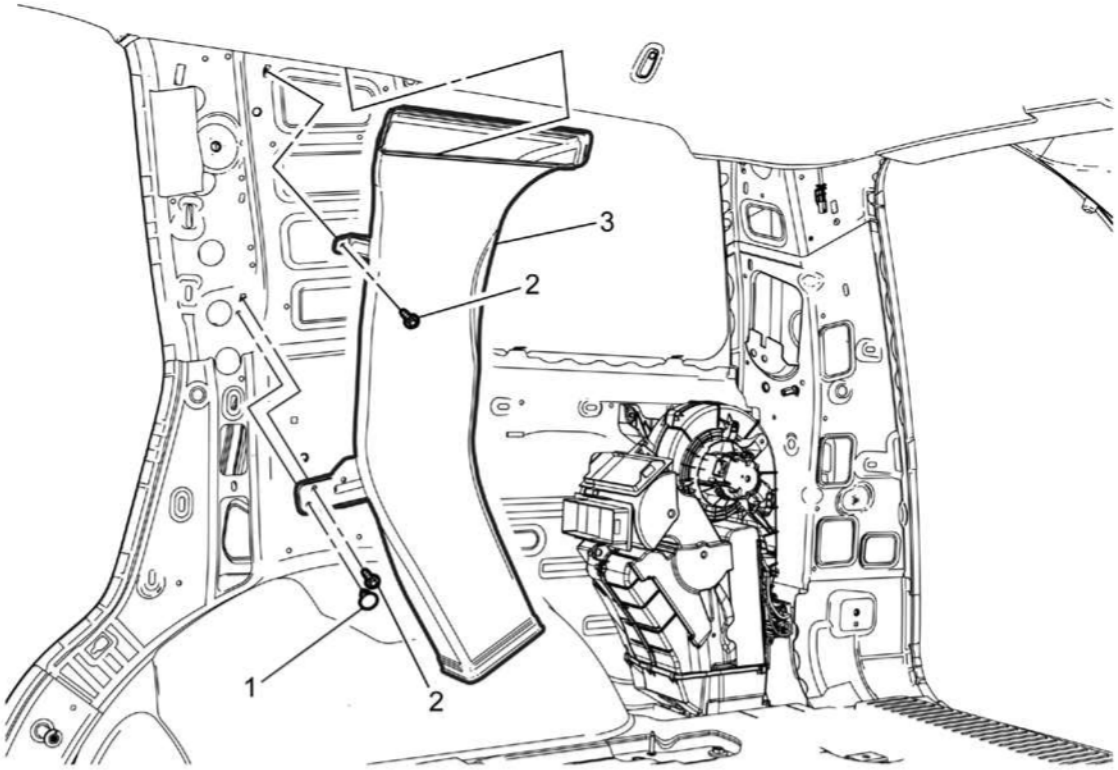


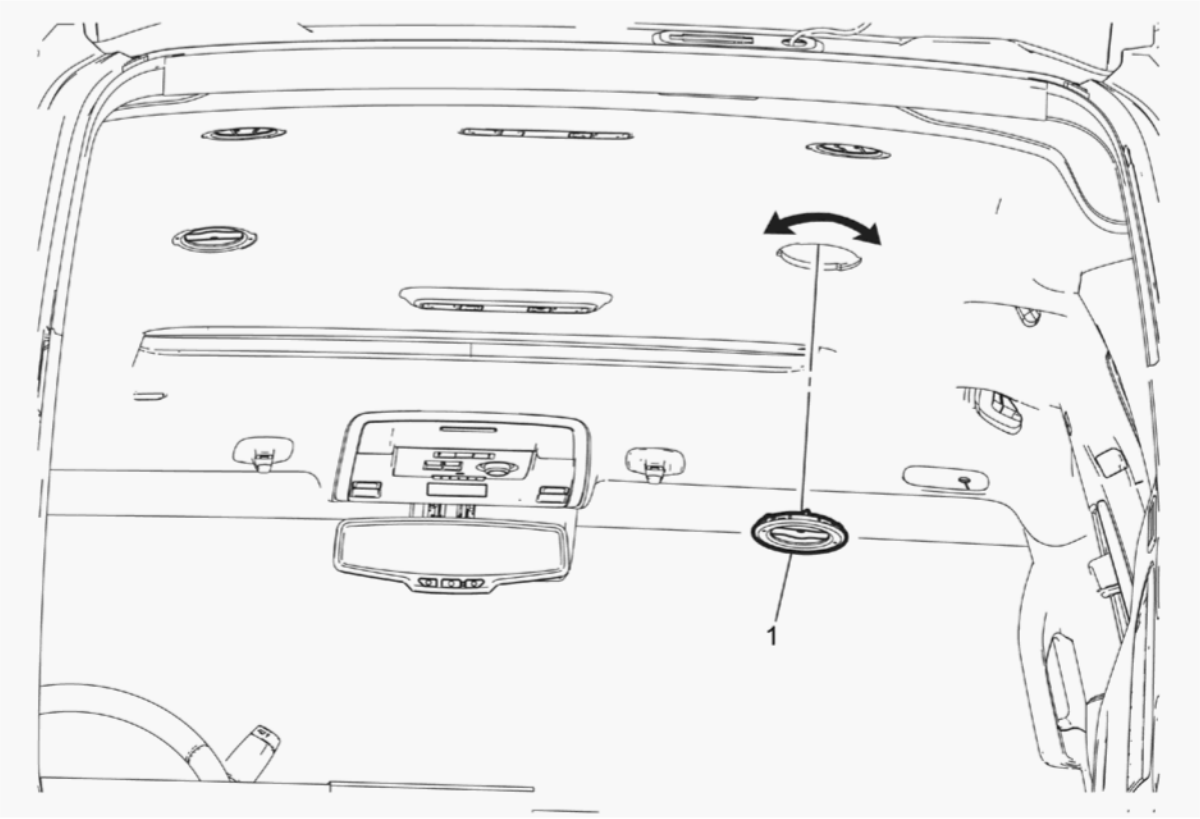
Fig. 157: Auxiliary Air Conditioning Air Lower Duct (SWB)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the floor rear air distributor. Refer to **Floor Rear Air Distributor Replacement (SWB)**	
1	Auxiliary Air Conditioning Air Lower Duct Retainer
2	Auxiliary Air Conditioning Air Lower Duct Fastener (Qty: 2) **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 1.6 N.m (14 lb in)
3	Auxiliary Air Conditioning Air Lower Duct **Procedures** 1. Maneuver the auxiliary air conditioning air lower duct down and out from the headliner. 2. Transfer the air temperature sensor.

AUXILIARY AIR CONDITIONING AIR OUTLET DEFLECTOR REPLACEMENT (UTILITIES)

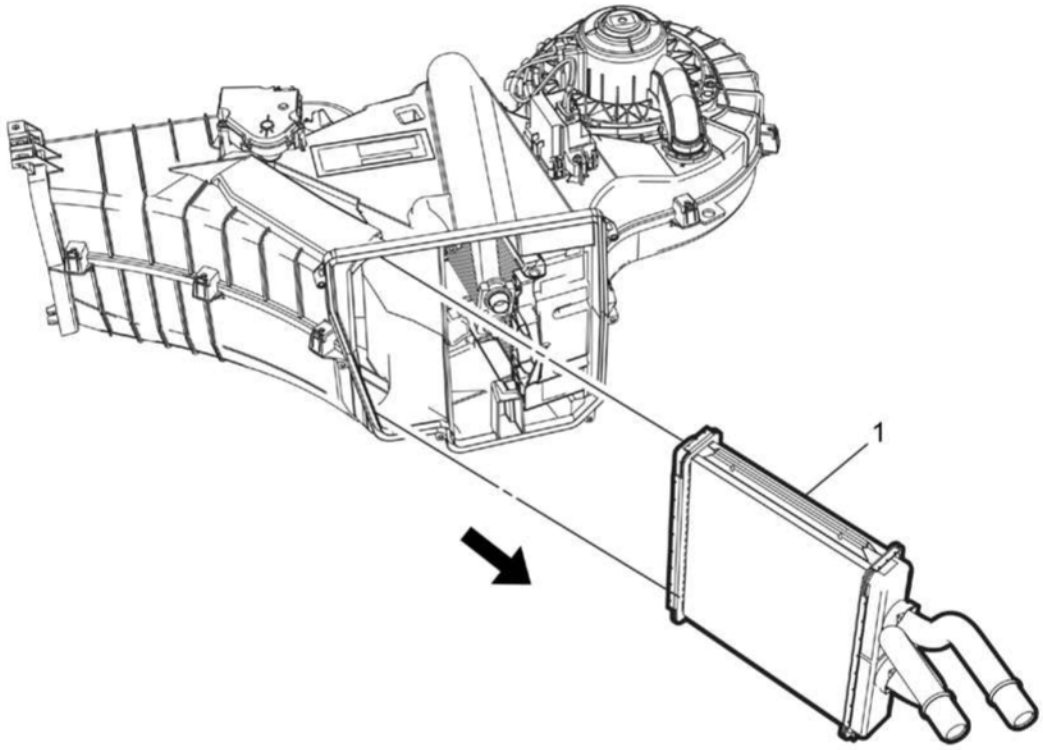


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Fig. 158: Auxiliary Air Conditioning Air Outlet Deflector (Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
1	Auxiliary Air Conditioning Air Outlet Deflector (Qty: 4) **Procedure** 1. Turn the auxiliary air conditioning air outlet deflector counter clockwise in order to release it from the headliner. 2. Pull down on the auxiliary air conditioning air outlet deflector to remove from the headliner. 3. Insert and turn auxiliary air conditioning air outlet deflector clock wise to secure to the headliner.

AUXILIARY HEATER CORE REPLACEMENT (LWB UTILITIES)



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Fig. 159: Auxiliary Heater Core (LWB Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary heater cover. Refer to **Auxiliary Heater Cover Replacement (LWB Utilities)**.	
1	Auxiliary Heater Core

AUXILIARY HEATER CORE REPLACEMENT (SWB)

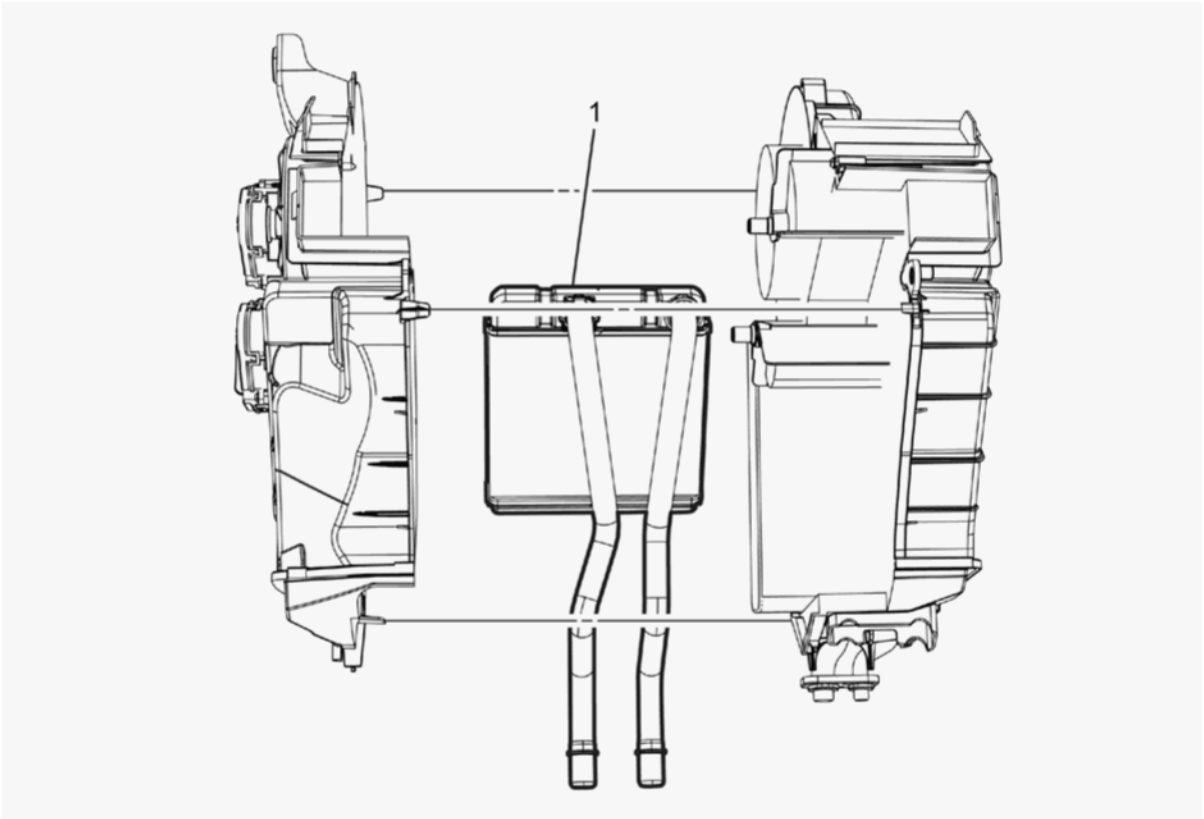


Fig. 160: Auxiliary Heater Core (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name

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Call out	Component Name
Preliminary Procedure Remove the inboard auxiliary air conditioning evaporator and blower case. Refer to **Auxiliary Air Conditioning Evaporator and Blower Case Replacement - Inboard (SWB)**.	
1	Auxiliary Heater Core

AUXILIARY AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT

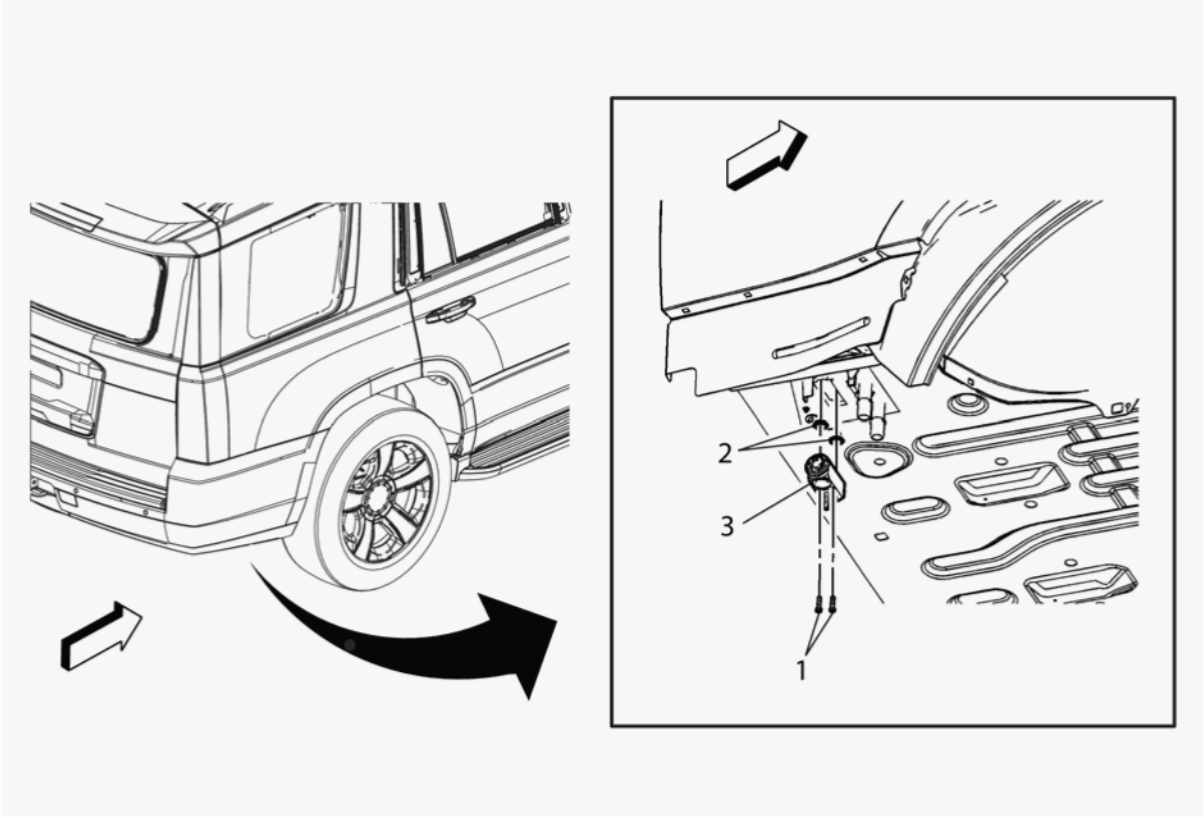


Fig. 161: Auxiliary Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**. 2. Remove the auxiliary air conditioning evaporator hose from the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Auxiliary Air Conditioning Evaporator Hose Replacement (BVE)Auxiliary Air Conditioning Evaporator Hose Replacement (BRS)**.	
1	Auxiliary Air Conditioning Evaporator Thermal Expansion Valve Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Procedure** 1. Insert a small phillips screwdriver through one of the thermal expansion valve (TXV) bolt holes and into the threaded hole of the mounting plate. 2. Install the TXV bolt into the other hole without the screwdriver. 3. Remove the screwdriver and install the other TXV bolt. **Tighten** 5 N.m (44 lb in)
2	Auxiliary Air Conditioning Evaporator Thermal Expansion Valve Sealing Washer **Procedure** Remove and discard the sealing washer. Refer to **Air Conditioning System Seal Replacement**.
3	Auxiliary Air Conditioning Evaporator Thermal Expansion Valve **Procedure** Transfer all parts as necessary.

AUXILIARY AIR CONDITIONING EVAPORATOR REPLACEMENT (LWB UTILITIES)

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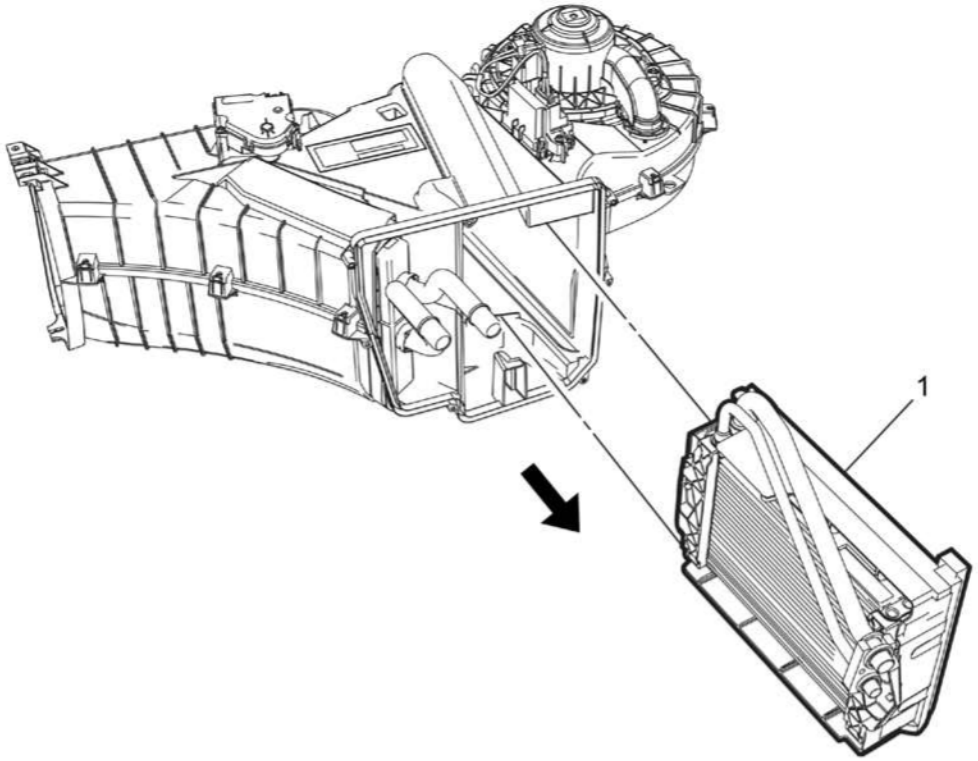


Fig. 162: Auxiliary Air Conditioning Evaporator (LWB Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary heater cover. Refer to **Auxiliary Heater Cover Replacement (LWB Utilities)**.	
1	Auxiliary Air Conditioning Evaporator Assembly

AUXILIARY AIR CONDITIONING EVAPORATOR REPLACEMENT (SWB)

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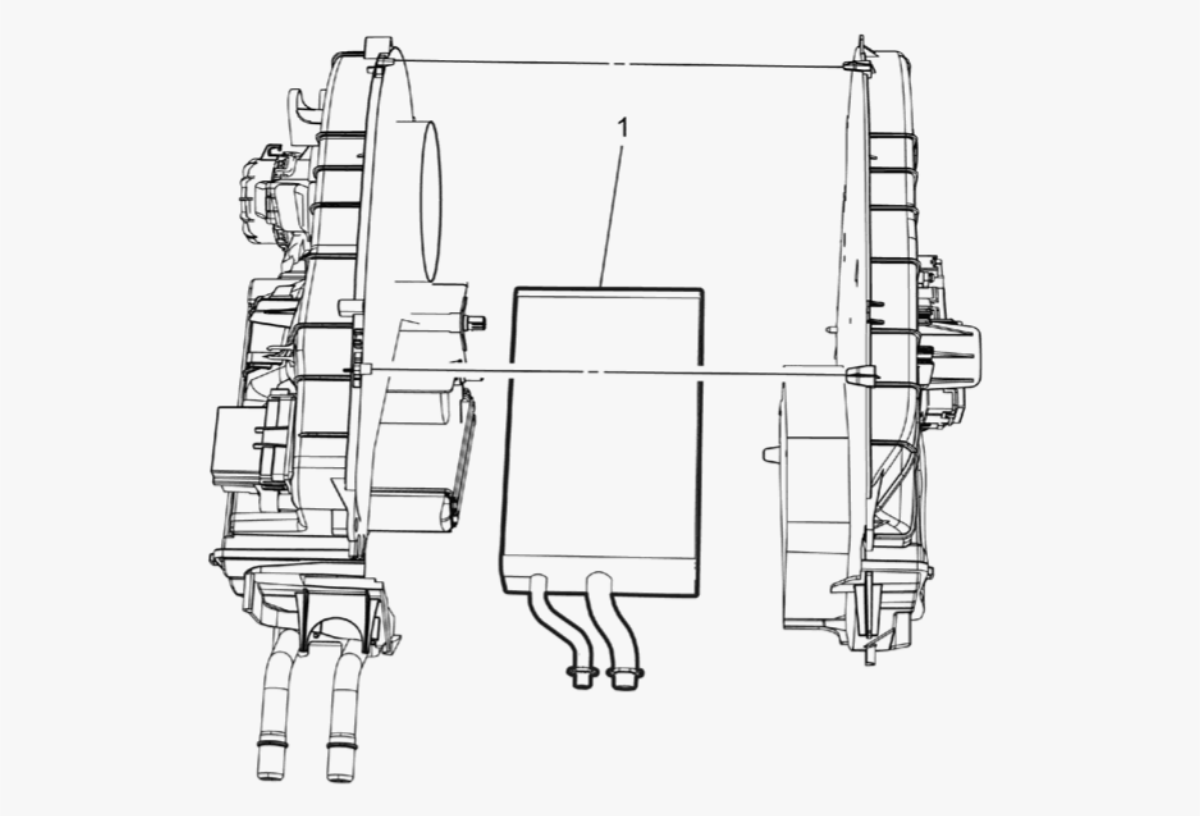


Fig. 163: Auxiliary Air Conditioning Evaporator (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the inboard auxiliary air conditioning evaporator and blower case. Refer to **Auxiliary Air Conditioning Evaporator and Blower Case Replacement - Inboard (SWB)**.	
1	Auxiliary Air Conditioning Evaporator

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - INBOARD (LWB UTILITIES)

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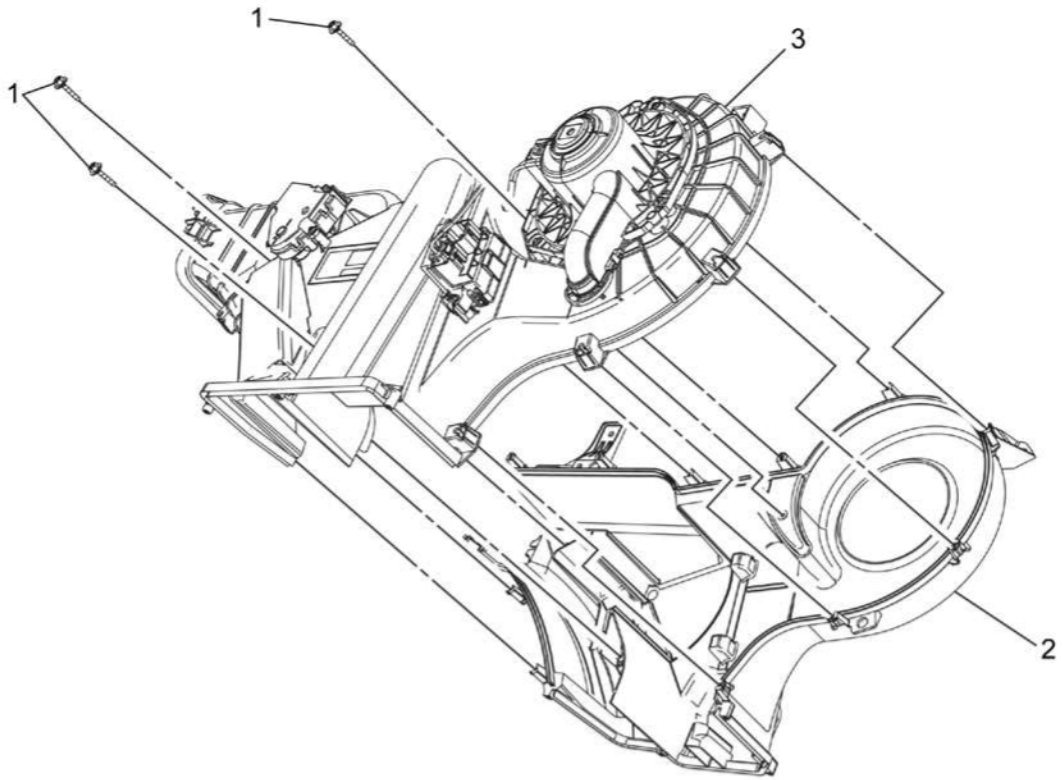


Fig. 164: Auxiliary Air Conditioning Evaporator and Blower Case - Inboard (LWB Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the auxiliary air conditioning evaporator assembly. Refer to **Auxiliary Air Conditioning Evaporator Replacement (LWB Utilities)**. 2. Remove the auxiliary heater core. Refer to **Auxiliary Heater Core Replacement (LWB Utilities)**. 3. Remove the auxiliary temperature actuator. Refer to **Auxiliary Temperature Valve Actuator Replacement (LWB)** .	
1	Auxiliary Heater and Air Conditioning Evaporator and Blower Module Bolt (Qty: 3) **CAUTION:**

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Call out	Component Name
	Refer to Fastener Caution .
2	Auxiliary Air Conditioning Evaporator and Blower Case - Outboard **Procedures** 1. Remove the auxiliary air conditioning evaporator and blower case seals as needed. 2. Separate the inboard auxiliary air conditioning evaporator and blower case from the outboard.
3	Auxiliary Air Conditioning Evaporator and Blower Case - Inboard **Procedures** 1. Transfer the components as necessary. 2. Replace the components as necessary.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - INBOARD (SWB)

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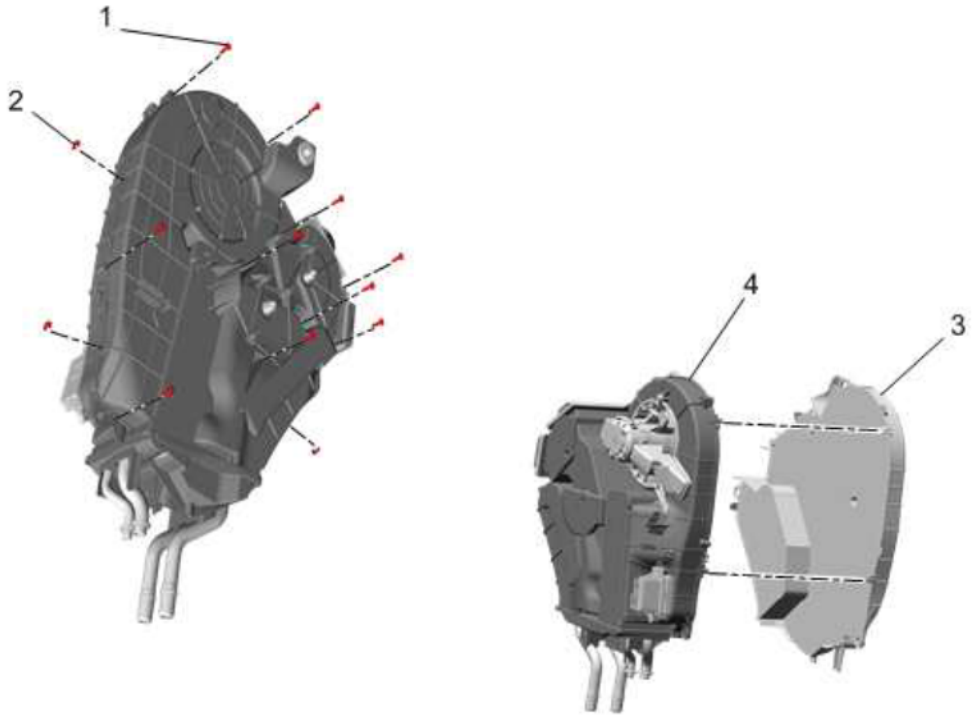


Fig. 165: Auxiliary Air Conditioning Evaporator and Blower Case - Inboard (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the auxiliary air conditioning evaporator assembly. Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement (SWB)** 2. Remove the auxiliary mode valve actuator. Refer to **Auxiliary Mode Valve Actuator Replacement (SWB)** 3. Remove the auxiliary temperature actuator. Refer to **Auxiliary Temperature Valve Actuator Replacement (SWB)**	
1	Auxiliary Air Conditioning Evaporator and Blower Case Fastener (Qty: 10) **CAUTION:**

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Call out	Component Name
	Refer to **Fastener Caution** . Tighten 1.7 N.m (15 lb in)
2	Air Conditioning Evaporator Case Clip (Qty: 3)
3	Auxiliary Air Conditioning Evaporator and Blower Case - Outboard **Procedures** 1. Separate the inboard auxiliary air conditioning evaporator and blower case form the outboard auxiliary air conditioning evaporator and blower case. 2. Remove the auxiliary air conditioning evaporator and blower case seals.
4	Auxiliary Air Conditioning Evaporator and Blower Case - Inboard **Procedures** 1. Remove Auxiliary Blower Motor. Refer to **Auxiliary Blower Motor Replacement (SWB)** 2. Remove Blower Motor Control Module. Refer to **Blower Motor Control Module Replacement (SWB)** 3. Transfer components as necessary. 4. Install new auxiliary air conditioning evaporator and blower case seals. 5. Recalibrate Actuator. Refer to **Actuator Recalibration**

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - OUTBOARD (LWB UTILITIES)

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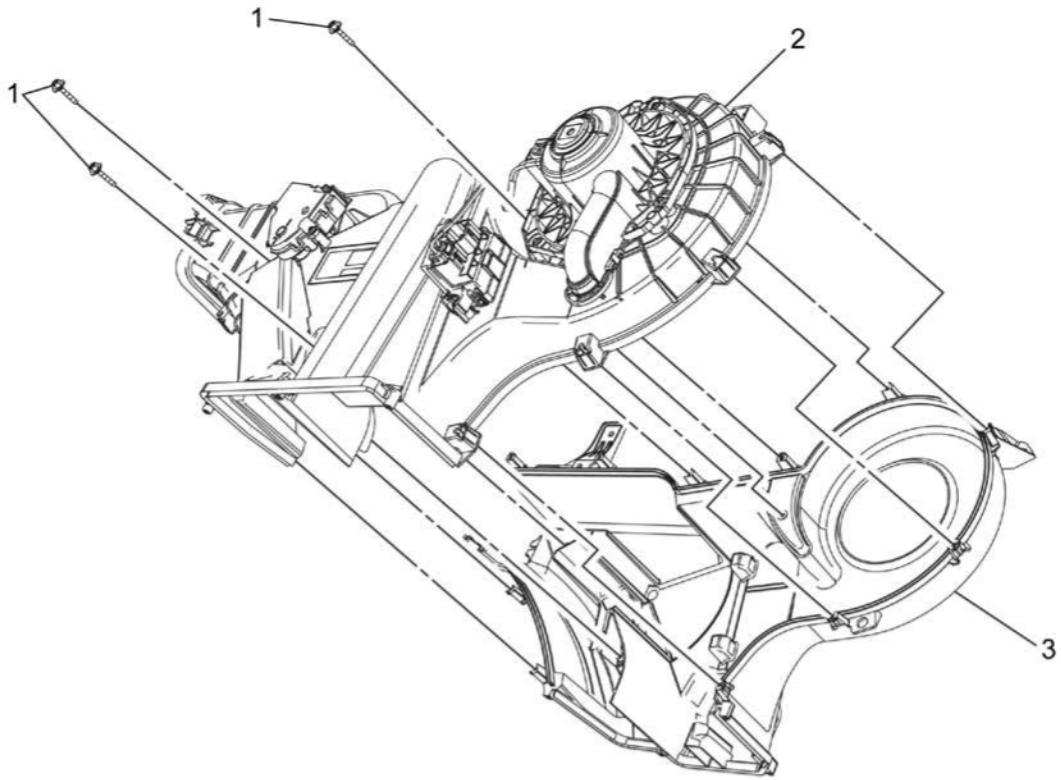


Fig. 166: Auxiliary Air Conditioning Evaporator and Blower Case - Outboard (LWB Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. Remove the auxiliary air conditioning evaporator assembly. Refer to **Auxiliary Air Conditioning Evaporator Replacement (LWB Utilities)**. 2. Remove the auxiliary heater core. Refer to **Auxiliary Heater Core Replacement (LWB Utilities)**. 3. Remove the auxiliary temperature actuator. Refer to **Auxiliary Temperature Valve Actuator Replacement (LWB)** .	
1	Auxiliary Heater and Air Conditioning Evaporator and Blower Module Bolt (Qty: 3) **CAUTION:**

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Call out	Component Name
	Refer to Fastener Caution .
2	Auxiliary Air Conditioning Evaporator and Blower Case - Inboard **Procedures** 1. Remove the auxiliary air conditioning evaporator and blower case seals as needed. 2. Separate the outboard auxiliary air conditioning evaporator and blower case from the inboard.
3	Auxiliary Air Conditioning Evaporator and Blower Case - Outboard **Procedures** 1. Transfer the components as necessary. 2. Replace the components as necessary.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - OUTBOARD (SWB)

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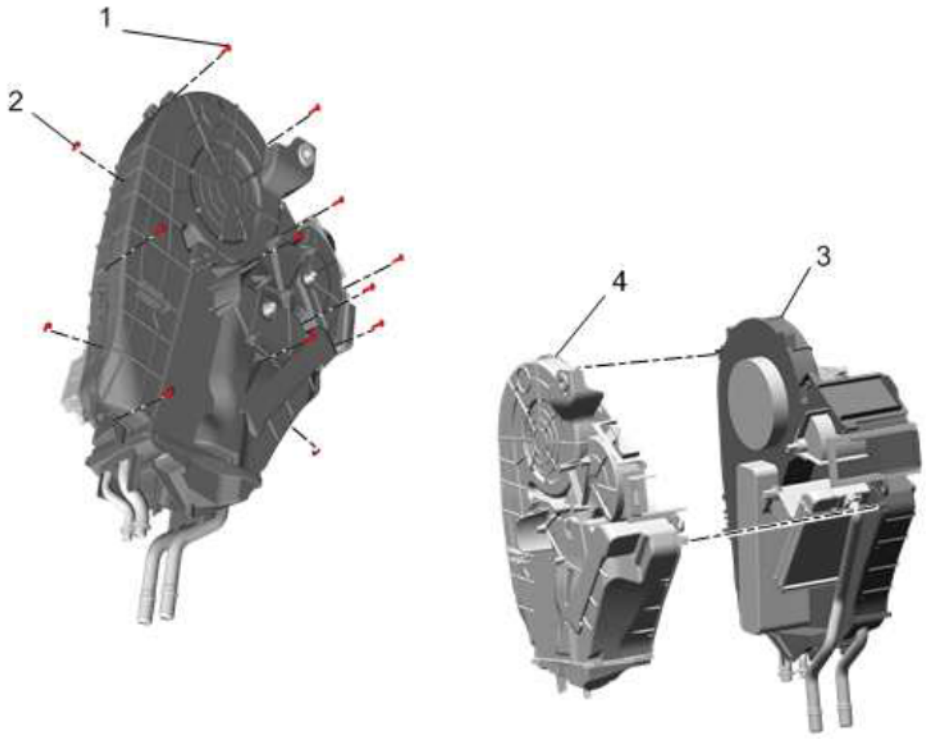


Fig. 167: Auxiliary Air Conditioning Evaporator and Blower Case - Outboard (SWB)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the auxiliary air conditioning evaporator assembly. Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement (SWB)** 2. Remove the auxiliary mode valve actuator. Refer to **Auxiliary Mode Valve Actuator Replacement (SWB)** 3. Remove the auxiliary temperature actuator. Refer to **Auxiliary Temperature Valve Actuator Replacement (SWB)**	
1	Auxiliary Air Conditioning Evaporator and Blower Case Fastener (Qty: 10) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 1.7 N.m (15 lb in)
2	Air Conditioning Evaporator Case Clip (Qty: 3)
3	Auxiliary Air Conditioning Evaporator and Blower Case - Inboard **Procedure** 1. Disconnect the electrical connectors and remove the auxiliary heater and air conditioning wiring harness. 2. Separate the inboard auxiliary air conditioning evaporator and blower case form the outboard auxiliary air conditioning evaporator and blower case. 3. Remove the auxiliary air conditioning evaporator and blower case seals.
4	Auxiliary Air Conditioning Evaporator and Blower Case - Outboard **Procedure** 1. Install new auxiliary air conditioning evaporator and blower case seals. 2. Transfer the components as necessary. 3. Recalibrate Actuator. Refer to **Actuator Recalibration** .

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER LOWER CASE REPLACEMENT (SWB)

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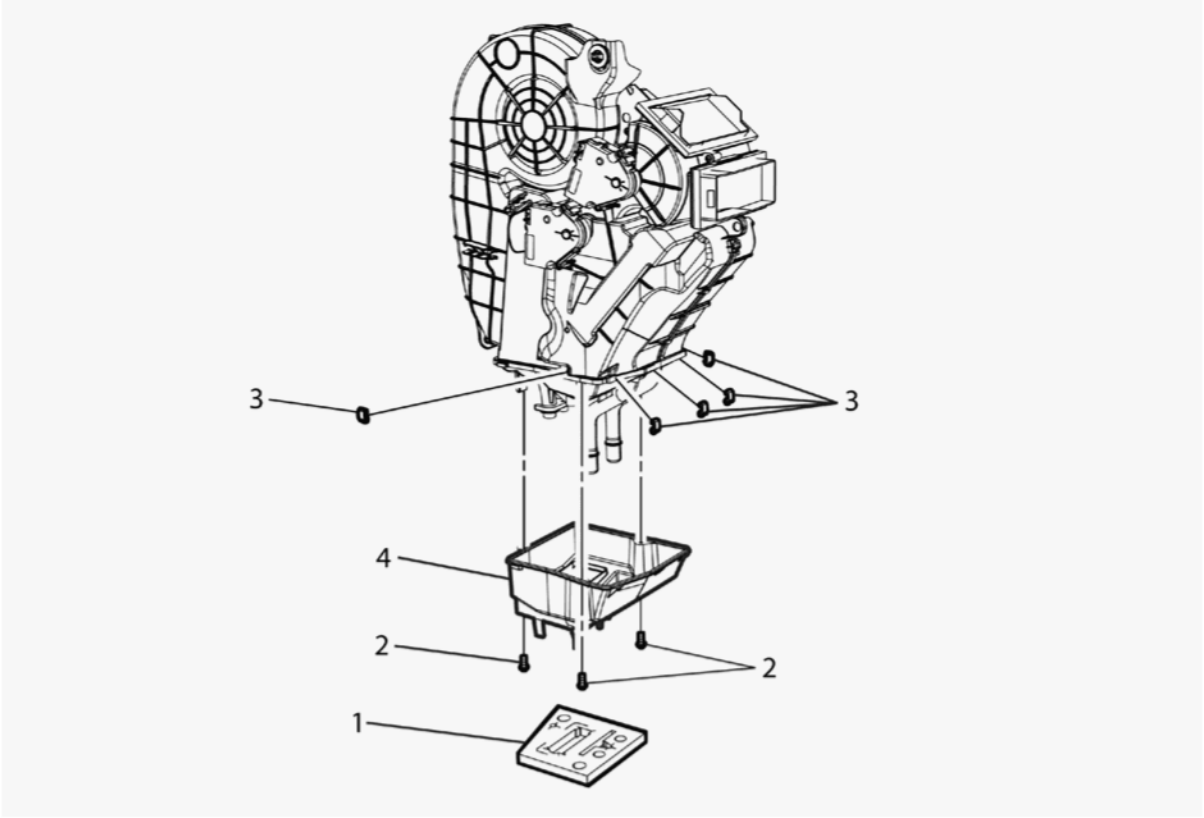


Fig. 168: Auxiliary Air Conditioning Evaporator and Blower Lower Case (SWB)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the auxiliary air conditioning evaporator and blower module assembly. Refer to **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation (SWB)**.	
1	Auxiliary Heater Case Seal

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Callout	Component Name
2	Auxiliary Air Conditioning Evaporator and Blower Case Fastener (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 1.7 N.m (15 lb in)
3	Air Conditioning Evaporator Case Clip (Qty: 5)
4	Auxiliary Air Conditioning Evaporator and Blower Lower Case **Procedure** Transfer the components as necessary.

AUXILIARY AIR CONDITIONING EVAPORATOR HOSE REPLACEMENT (BVE)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** .
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
3. Remove the heater inlet hose from the auxiliary heater inlet and outlet hose and position out of the way. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**.
4. Remove the heater outlet hose from the auxiliary heater inlet and outlet hose position out of the way. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**.
5. Remove the right front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac)** **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** **Front Wheelhouse Liner Replacement - Right Side (GMC)** .
6. Remove the right rear wheelhouse panel. Refer to **Rear Wheelhouse Liner Replacement (LWB)** **Rear Wheelhouse Liner Replacement (LWB Z75)** **Rear Wheelhouse Liner Replacement (SWB Z75)** **Rear Wheelhouse Liner Replacement (SWB)** .
7. Remove the vehicle right assist step. Refer to **Assist Step Replacement (Step Pad - BRS)** **Assist Step Replacement (Assembly - BRS)** **Assist Step Replacement (BVE-Short Wheel Base)** **Assist Step Replacement (BVE-Long Wheel Base)** .

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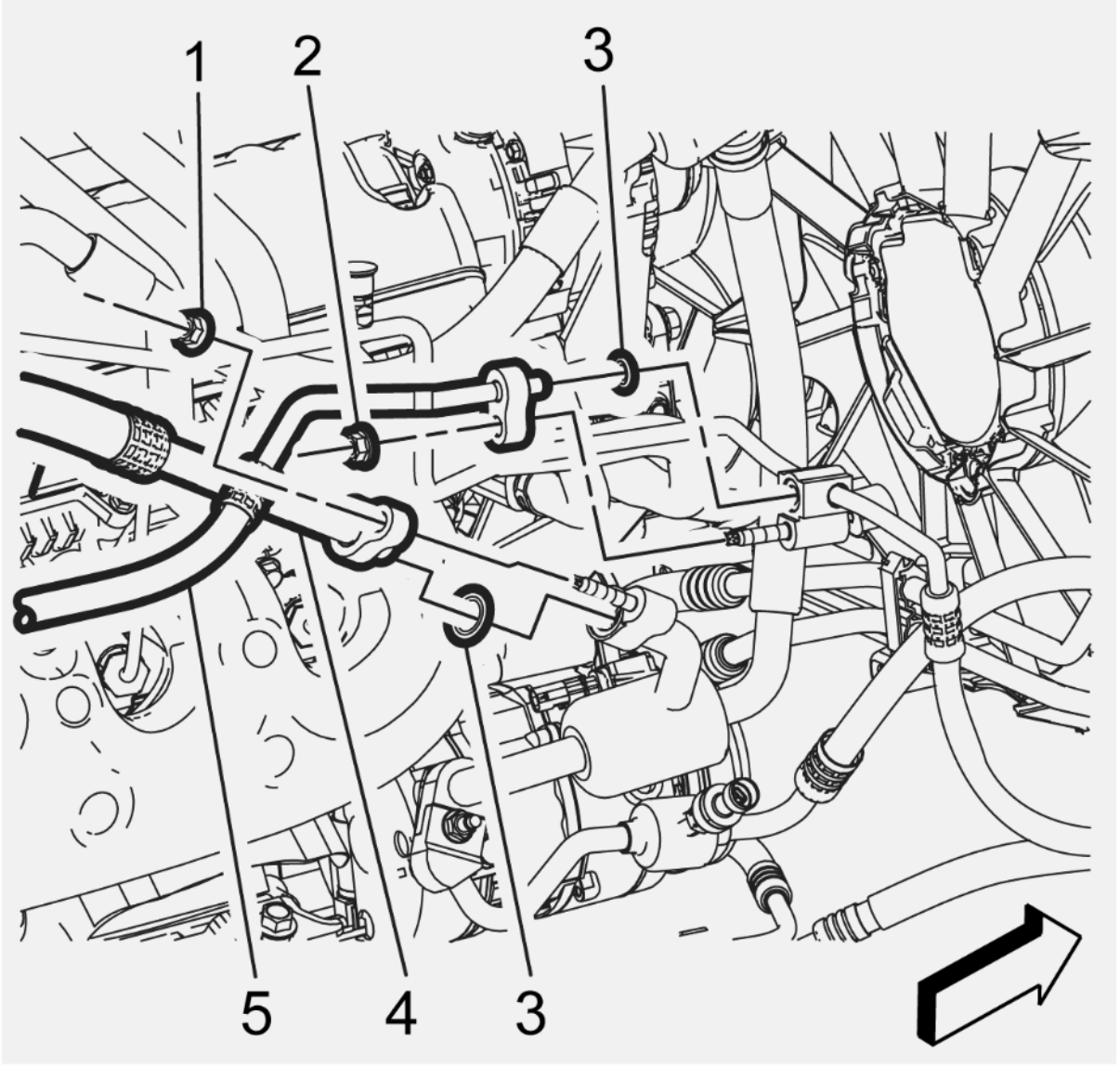


Fig. 169: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

8. Remove the air conditioning compressor hose nut (1).
9. Remove the auxiliary air conditioning evaporator low side hose (4) from the air conditioning compressor hose.
10. Remove the air conditioning evaporator tube nut (2).

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11. Remove the auxiliary air conditioning evaporator high side hose (5) from the air conditioning evaporator tube.
12. Remove and discard the old sealing washers (3) from the auxiliary air conditioning evaporator hose (4).

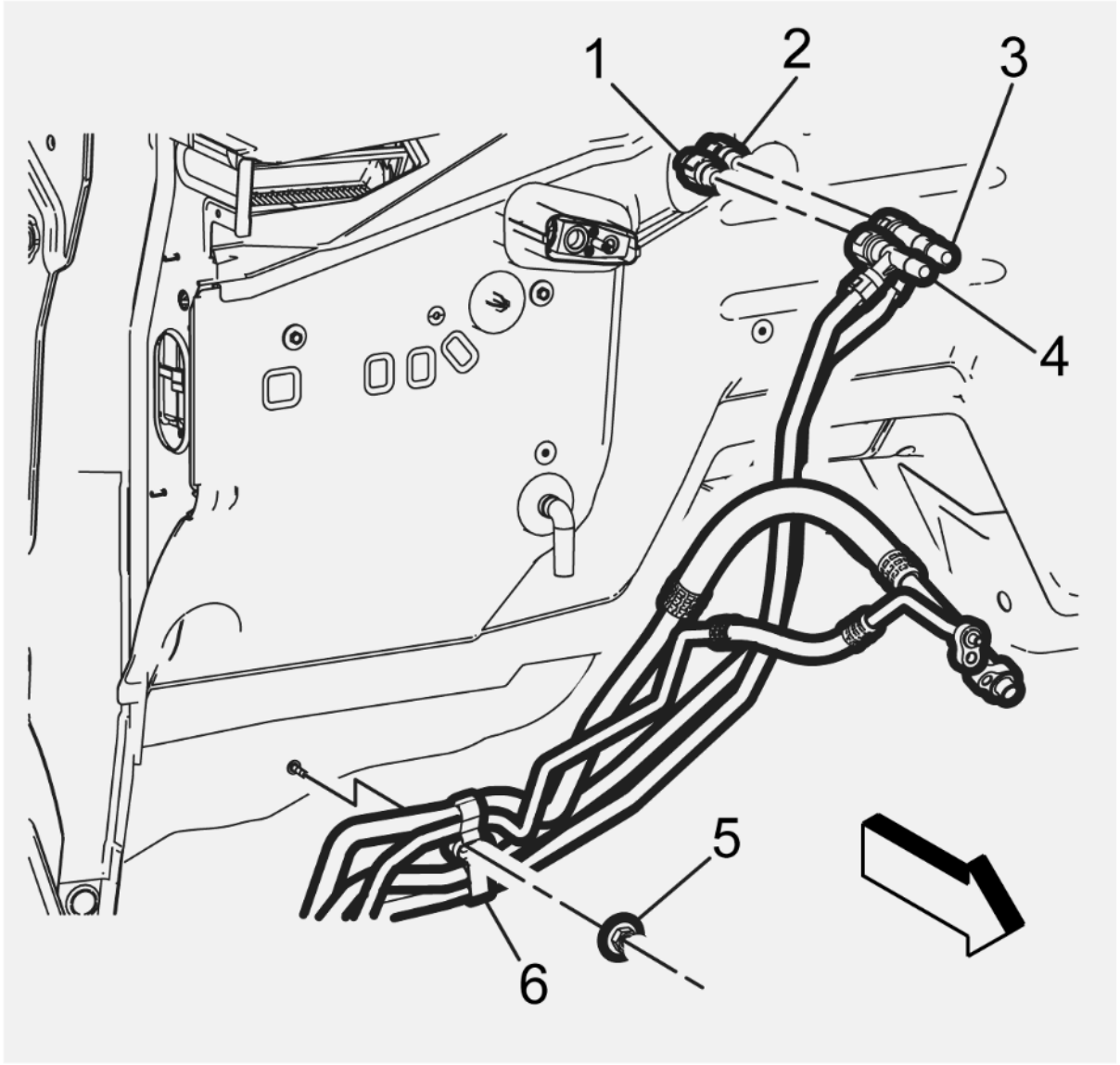


Fig. 170: Auxiliary Heater Inlet And Outlet Hose Outlet
Courtesy of GENERAL MOTORS COMPANY

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13. Disconnect the auxiliary heater inlet and outlet hose outlet (4) from the auxiliary heater inlet and outlet hose clip (1).
14. Disconnect the auxiliary heater inlet and outlet hose inlet (3) from the auxiliary heater inlet and outlet hose clip (2).
15. Remove the auxiliary air conditioning evaporator hose clip nut (5) from the auxiliary air conditioning evaporator hose clip (6).

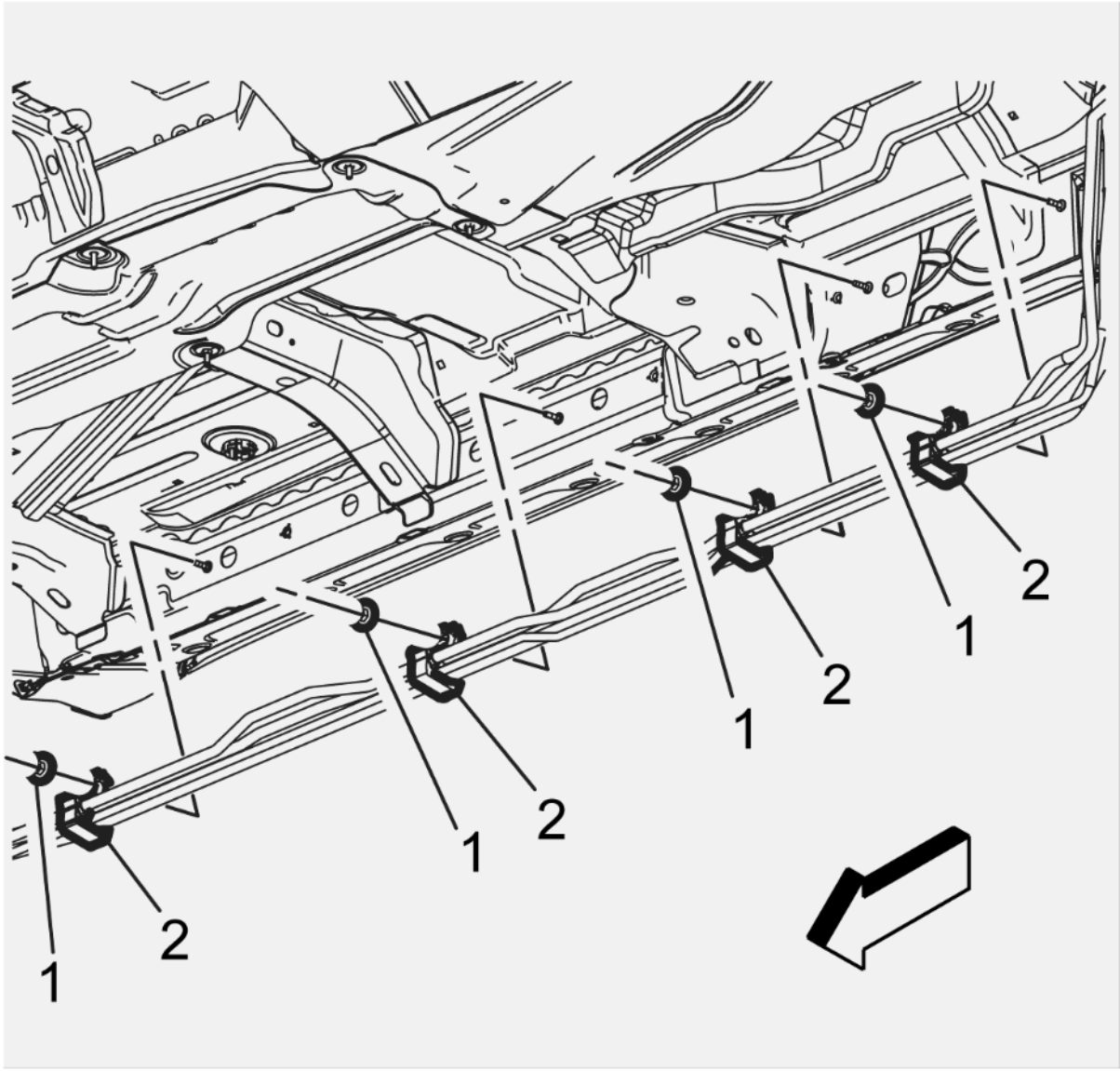


Fig. 171: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

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16. Remove the air conditioning evaporator hose clip nut (1) from the auxiliary air conditioning evaporator hose clip (2).

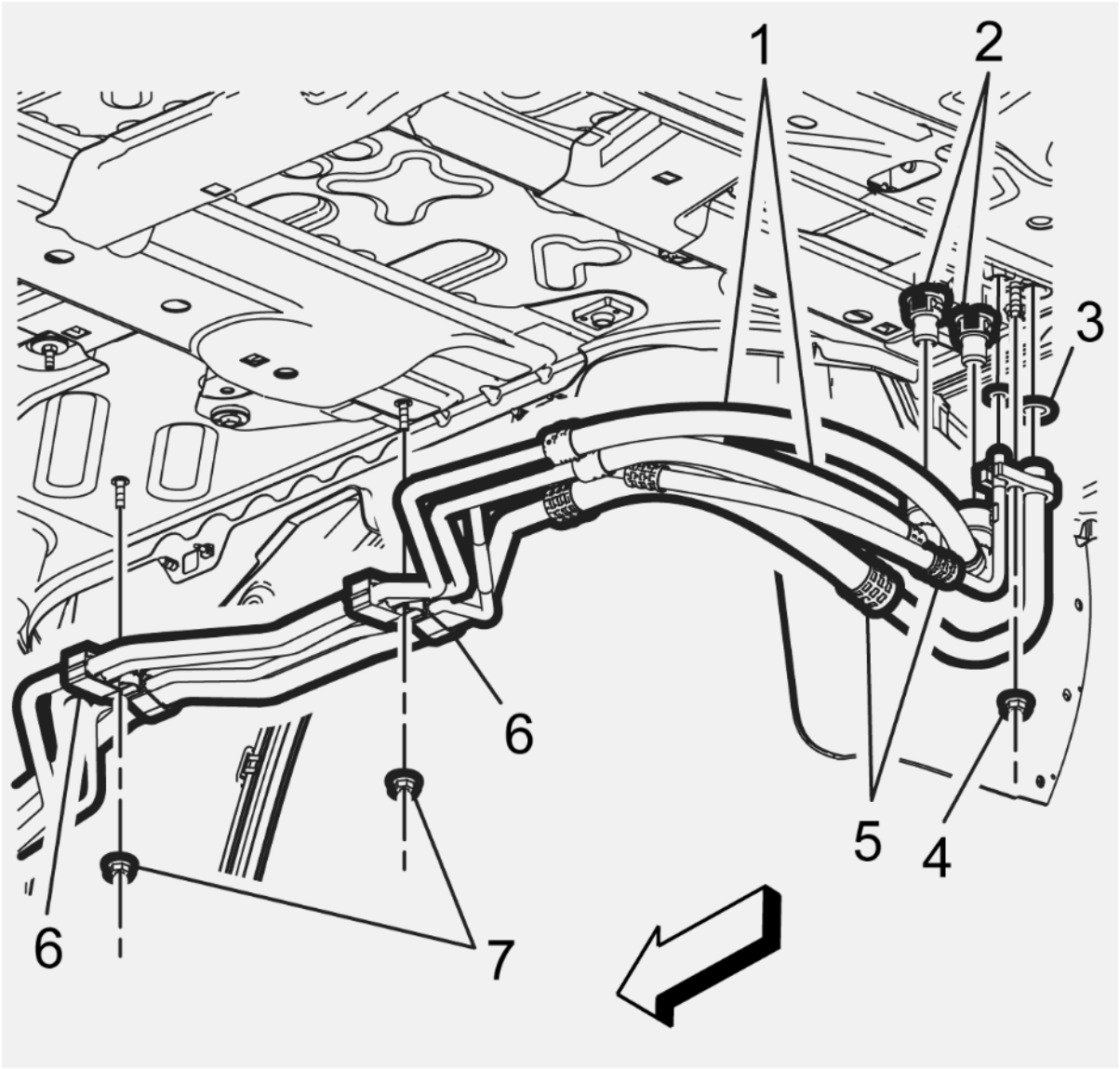


Fig. 172: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

17. Remove the air conditioning evaporator hose clip nut (7) from the auxiliary air conditioning evaporator hose clip (6).

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18. Remove the auxiliary air conditioning evaporator thermal expansion valve nut (4) from the air conditioning evaporator thermal expansion valve.
19. Remove the auxiliary air conditioning evaporator low side and high side hoses (5) from the auxiliary air conditioning evaporator thermal expansion valve.
20. Remove and discard the old sealing washers (3) from the auxiliary air conditioning evaporator hose (4).
21. Disconnect the auxiliary heater inlet and outlet hose (1) from the auxiliary heater inlet and outlet hose clips (2).
22. Remove the auxiliary air conditioning evaporator hose from the vehicle.

Installation Procedure

1. Install the auxiliary air conditioning evaporator hose to the vehicle.

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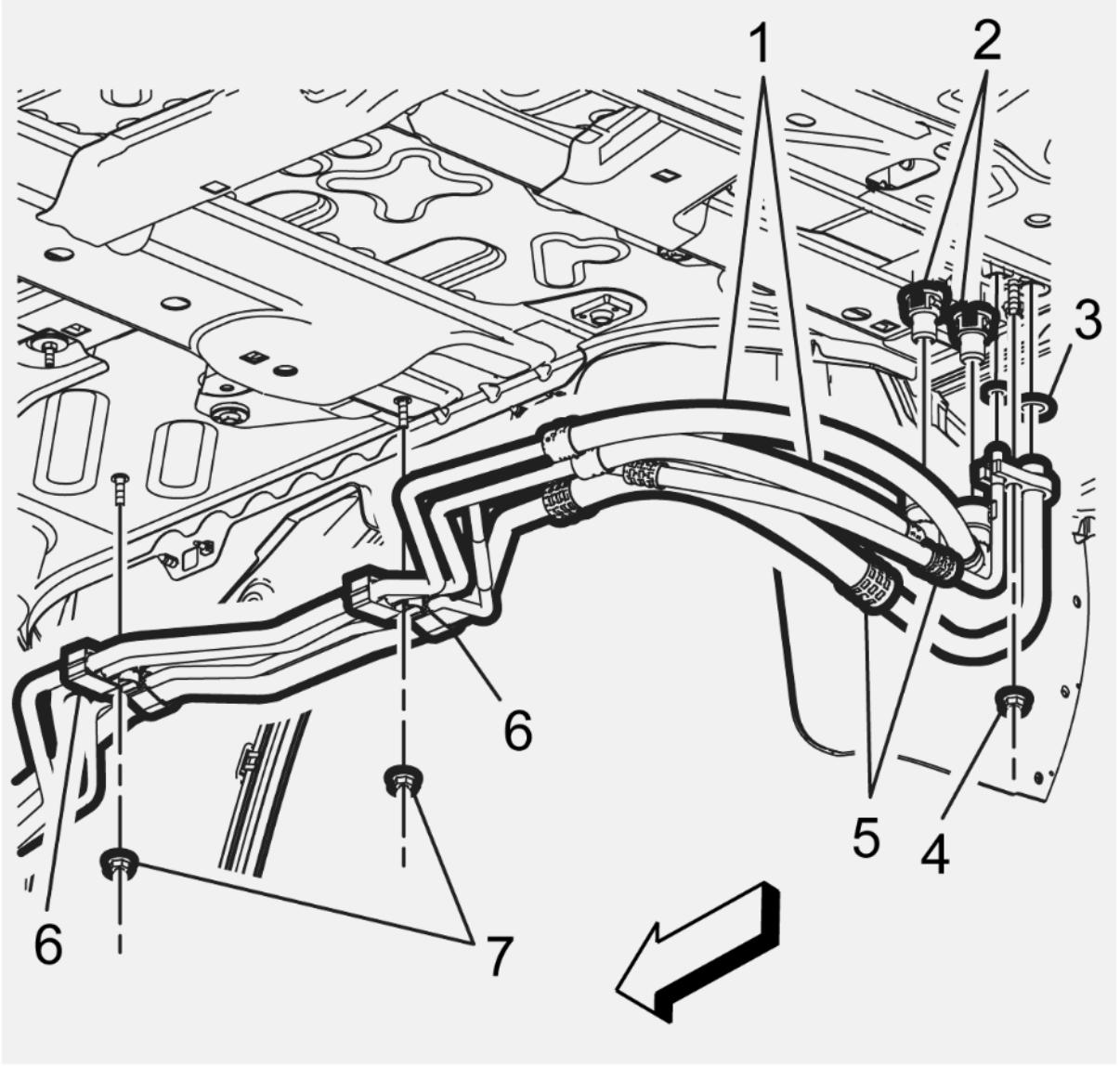


Fig. 173: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

2. Install the auxiliary heater inlet and outlet hose (1) to the auxiliary heater inlet and outlet hose clips (2).
3. Install NEW sealing washers (3) to the auxiliary air conditioning evaporator low side and high side hoses (4). Refer to **Air Conditioning System Seal Replacement**.

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4. Install the auxiliary air conditioning evaporator low side and high side hoses (5) to the auxiliary air conditioning evaporator thermal expansion valve.

CAUTION: **Refer to Fastener Caution .**

5. Install the auxiliary air conditioning evaporator thermal expansion valve nut (4) to the air conditioning evaporator thermal expansion valve and tighten to 22 N.m (16 lb ft).
6. Install the air conditioning evaporator hose clip nut (7) from the auxiliary air conditioning evaporator hose clip (6) and tighten.

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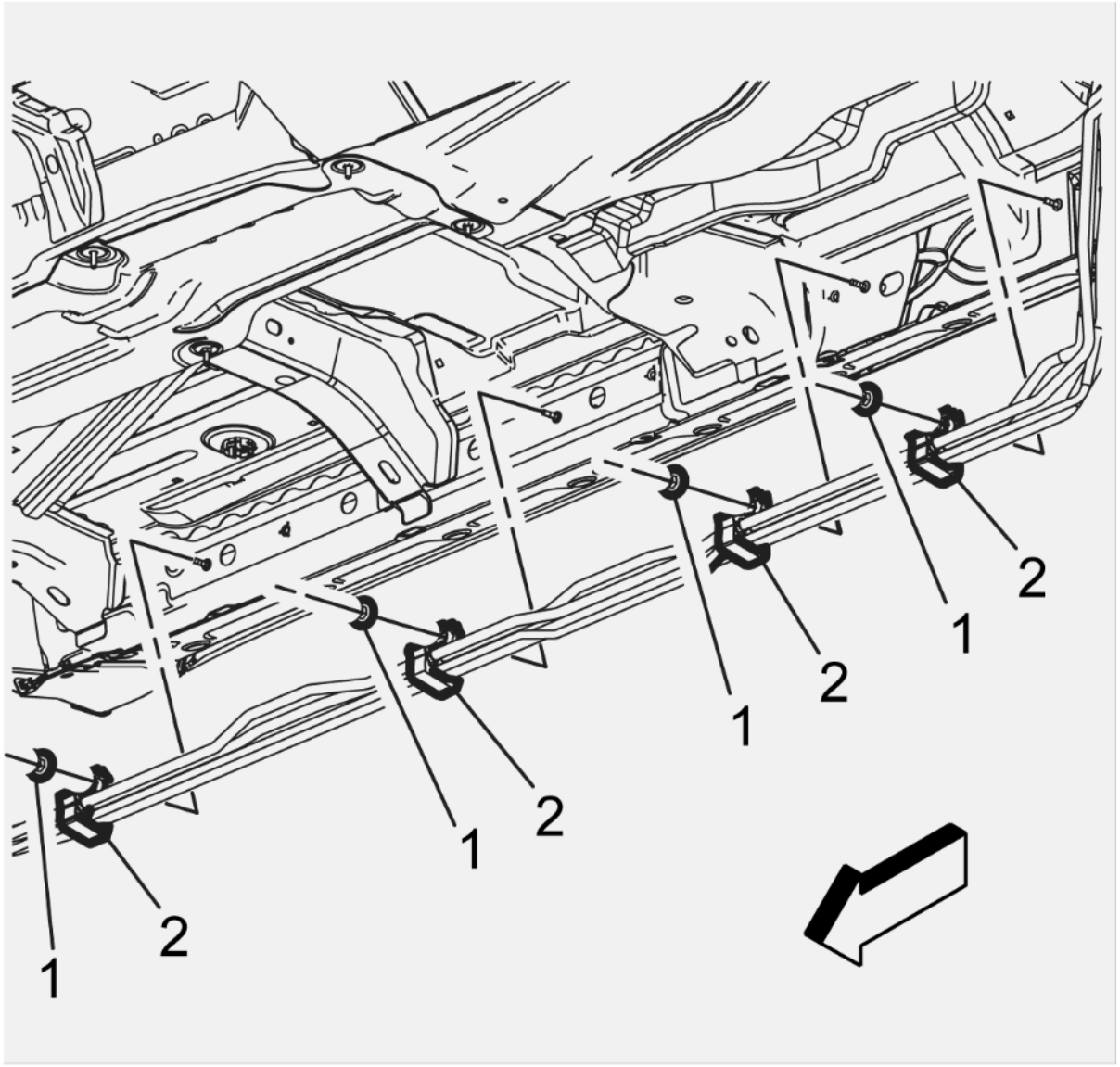


Fig. 174: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

7. Install the air conditioning evaporator hose clip nut (1) from the auxiliary air conditioning evaporator hose clip (2) and tighten.

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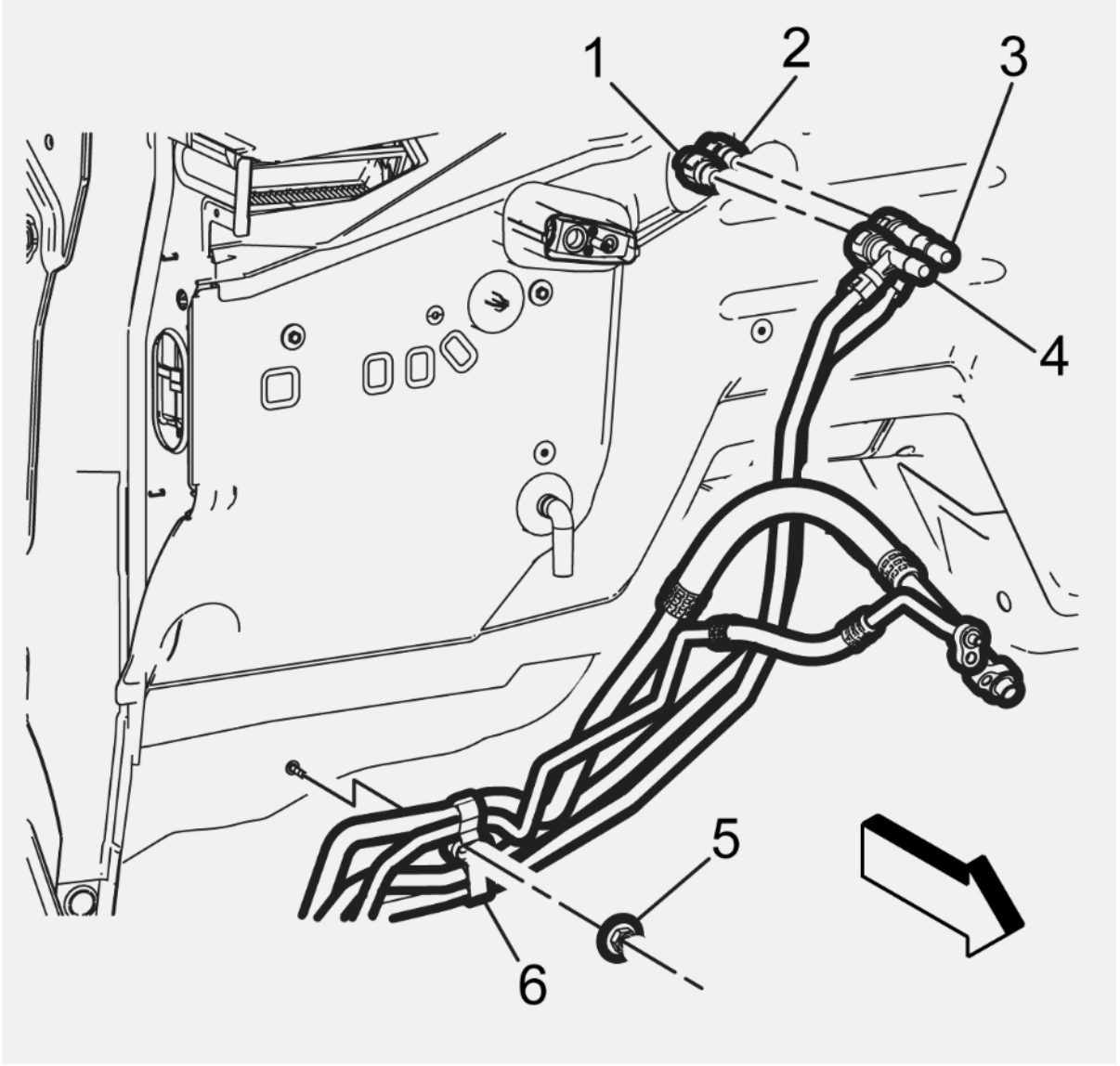


Fig. 175: Auxiliary Heater Inlet And Outlet Hose Outlet
Courtesy of GENERAL MOTORS COMPANY

8. Install the auxiliary heater inlet and outlet hose outlet (4) to the auxiliary heater inlet and outlet hose clip (1).
9. Install the auxiliary heater inlet and outlet hose inlet (3) to the auxiliary heater inlet and outlet hose clip (2).
10. Install the auxiliary air conditioning evaporator hose clip nut (5) to the auxiliary air conditioning evaporator hose clip (6).

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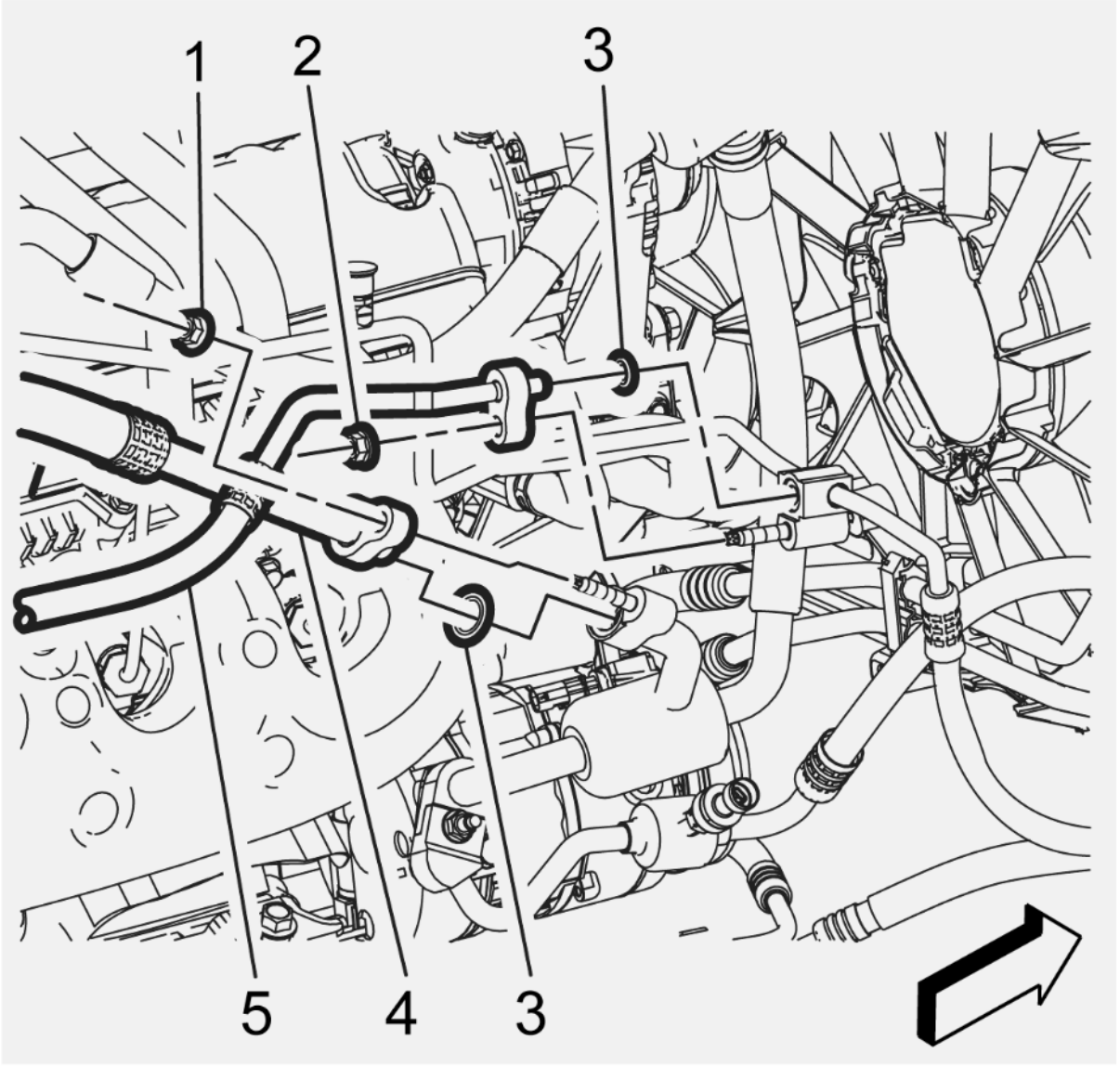


Fig. 176: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

11. Install NEW sealing washers (3) to the auxiliary air conditioning evaporator low side and high side hoses (4).
12. Install the auxiliary air conditioning evaporator low side hose (4) to the air conditioning compressor hose.
13. Install the air conditioning compressor hose nut (1) and tighten to 22 N.m (16 lb ft).

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14. Install the auxiliary air conditioning evaporator high side hose (5) to the air conditioning evaporator tube.
15. Install the air conditioning evaporator tube nut (2) and tighten to 22 N.m (16 lb ft).
16. Install the heater outlet hose to the auxiliary heater inlet and outlet hose. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**.
17. Install the heater inlet hose to the auxiliary heater inlet and outlet hose. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**.
18. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
19. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static Fill L96) Cooling System Draining and Filling (Vac N Fill L96) Cooling System Draining and Filling (Vac N Fill L83 L86) Cooling System Draining and Filling (Static Fill L83 L86)** .
20. Install the vehicle right assist step. Refer to **Assist Step Replacement (Step Pad - BRS) Assist Step Replacement (Assembly - BRS) Assist Step Replacement (BVE-Short Wheel Base) Assist Step Replacement (BVE-Long Wheel Base)** .
21. Install the right rear wheelhouse panel. Refer to **Rear Wheelhouse Liner Replacement (LWB) Rear Wheelhouse Liner Replacement (LWB Z75) Rear Wheelhouse Liner Replacement (SWB Z75) Rear Wheelhouse Liner Replacement (SWB)** .
22. Install the right front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac) Front Wheelhouse Liner Replacement - Right Side (Chevrolet) Front Wheelhouse Liner Replacement - Right Side (GMC)** .

AUXILIARY AIR CONDITIONING EVAPORATOR HOSE REPLACEMENT (BRS)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static Fill L96) Cooling System Draining and Filling (Vac N Fill L96) Cooling System Draining and Filling (Vac N Fill L83 L86) Cooling System Draining and Filling (Static Fill L83 L86)** .
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
3. Remove the heater inlet hose from the auxiliary heater inlet and outlet hose and position out of the way. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**.
4. Remove the heater outlet hose from the auxiliary heater inlet and outlet hose position out of the way. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**.
5. Remove the right front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac) Front Wheelhouse Liner Replacement - Right Side (Chevrolet) Front Wheelhouse Liner Replacement - Right Side (GMC)** .
6. Remove the right rear wheelhouse panel. Refer to **Rear Wheelhouse Liner Replacement (LWB) Rear Wheelhouse Liner Replacement (LWB Z75) Rear Wheelhouse Liner Replacement (SWB Z75) Rear Wheelhouse Liner Replacement (SWB)** .
7. Remove the right side assist step. Refer to **Assist Step Replacement (Step Pad - BRS) Assist Step Replacement (Assembly - BRS) Assist**

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Step Replacement (BVE-Short Wheel Base) Assist Step Replacement (BVE-Long Wheel Base) .

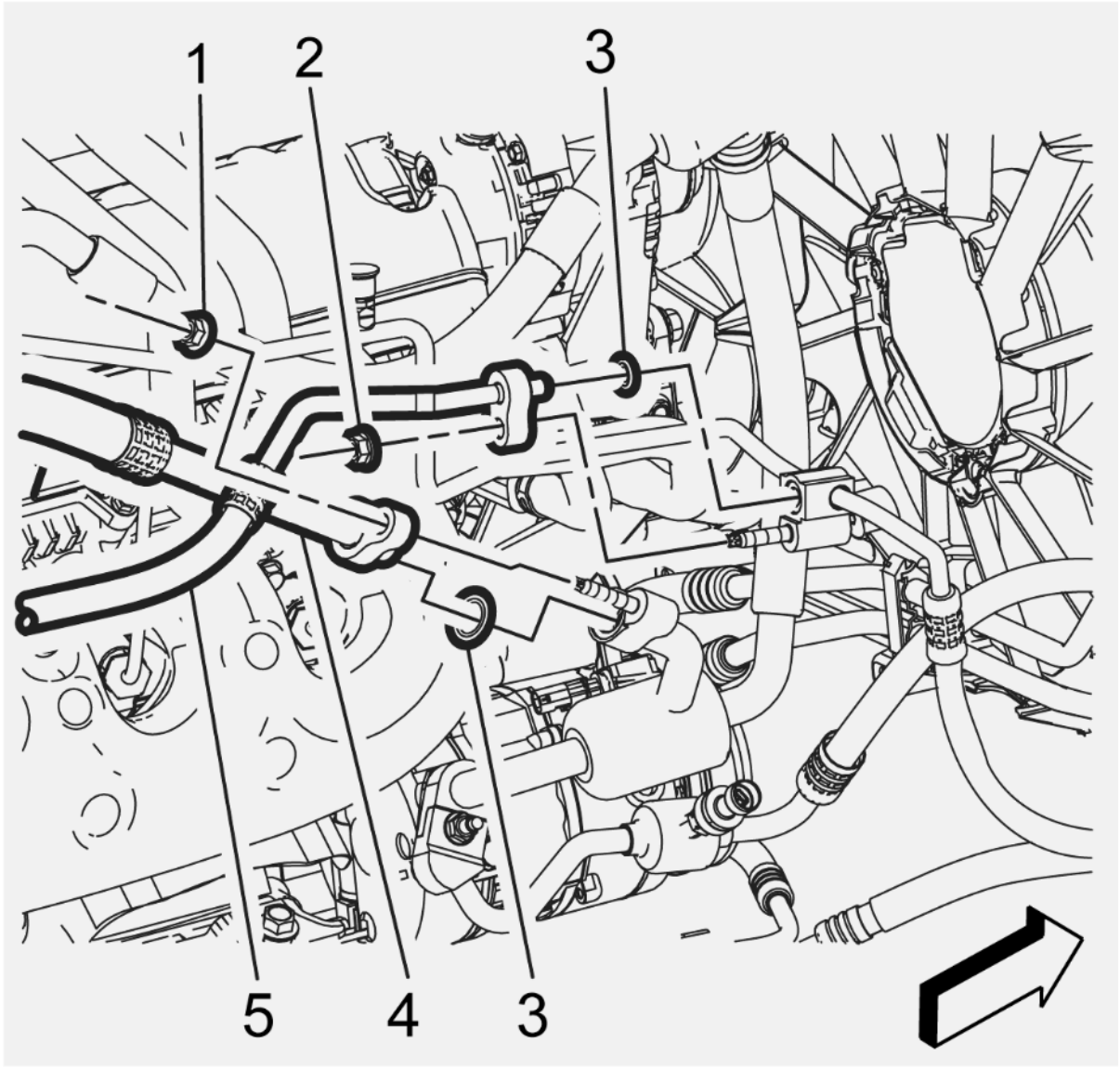


Fig. 177: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

8. Remove the air conditioning compressor hose nut (1).

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9. Remove the auxiliary air conditioning evaporator low side hose (4) from the air conditioning compressor hose.
10. Remove the air conditioning evaporator tube nut (2).
11. Remove the auxiliary air conditioning evaporator high side hose (5) from the air conditioning evaporator tube.
12. Remove and discard the old sealing washers (3) from the auxiliary air conditioning evaporator hose (4).

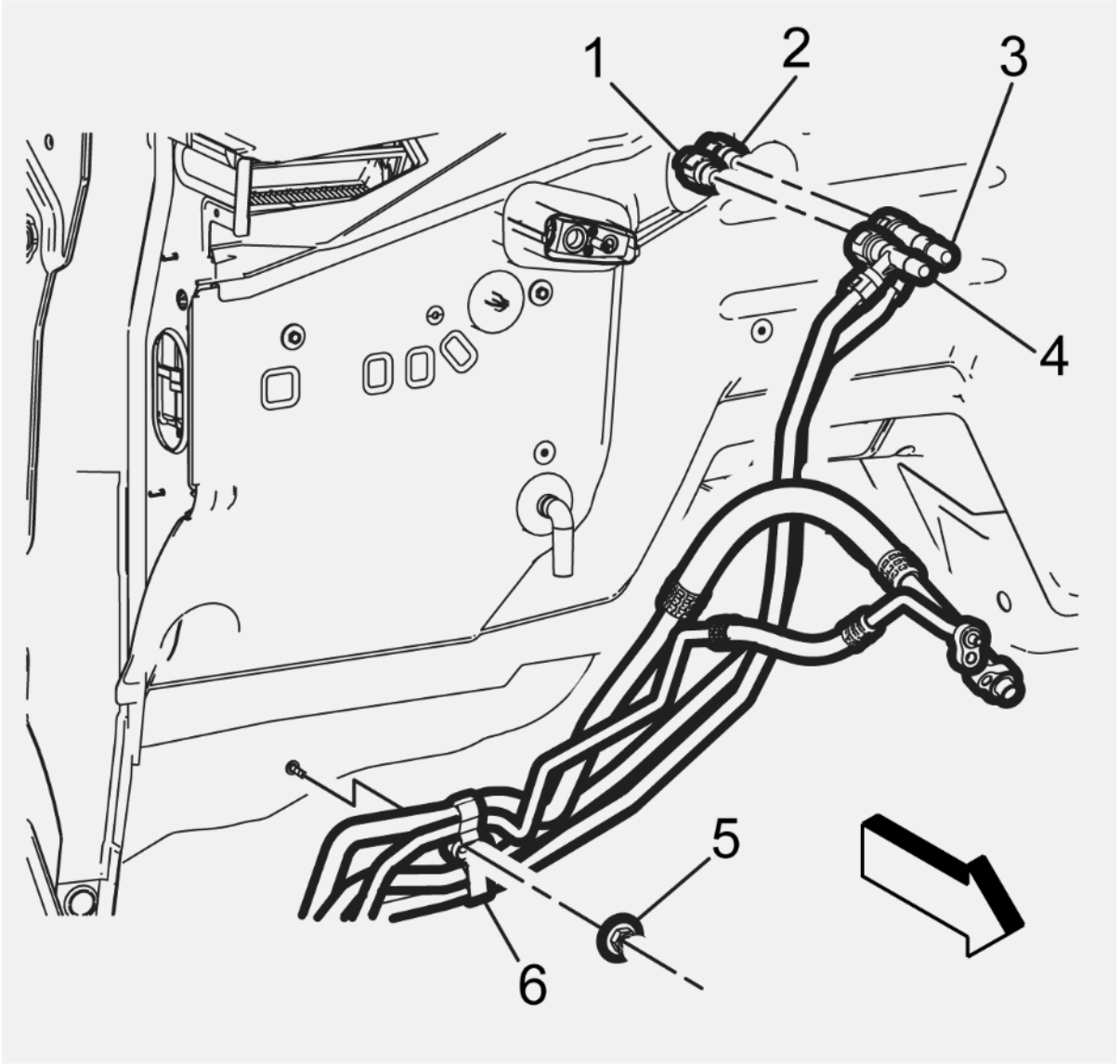
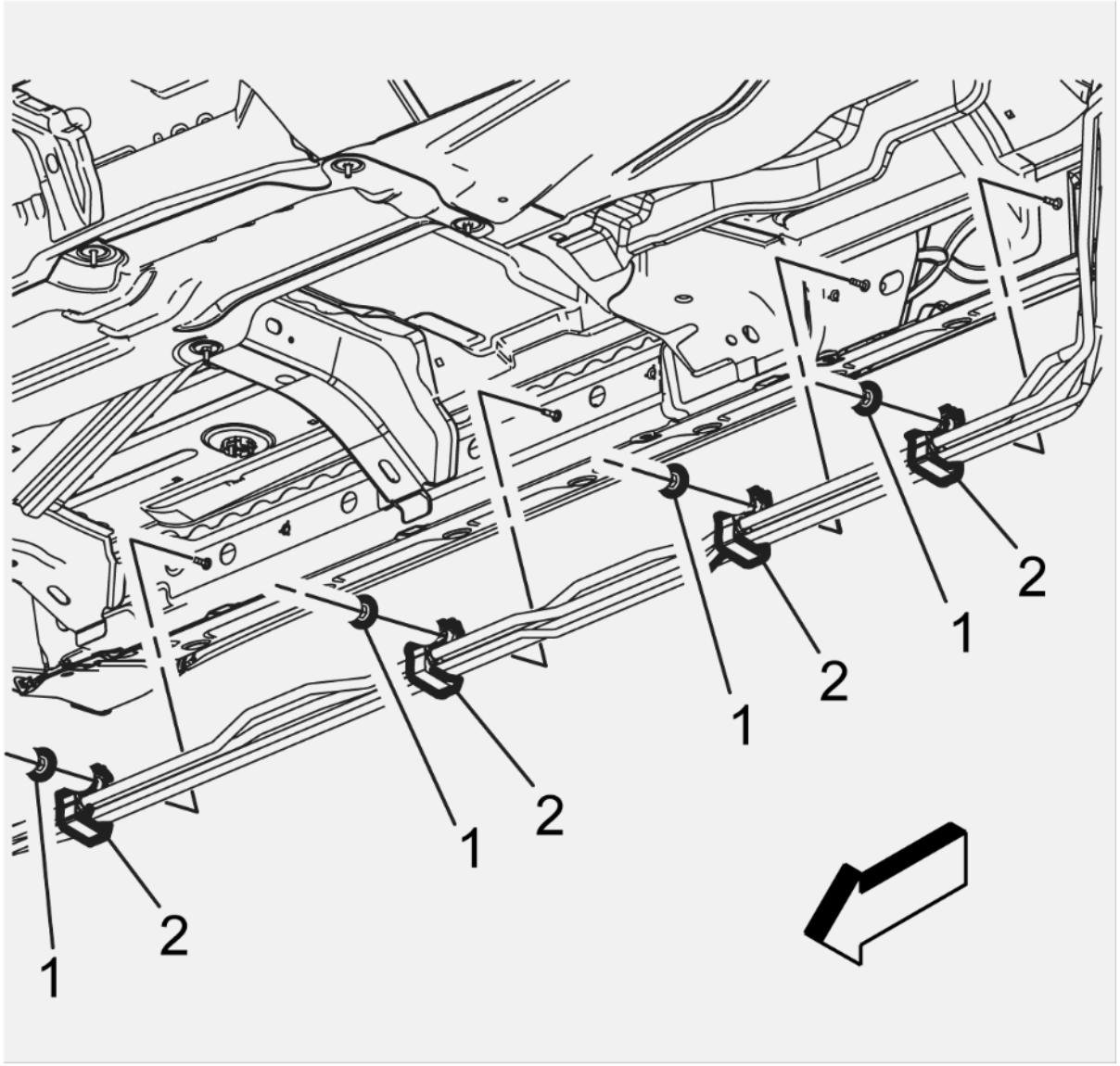


Fig. 178: Auxiliary Heater Inlet And Outlet Hose Outlet

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Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the auxiliary heater inlet and outlet hose outlet (4) from the auxiliary heater inlet and outlet hose clip (1).
14. Disconnect the auxiliary heater inlet and outlet hose inlet (3) from the auxiliary heater inlet and outlet hose clip (2).
15. Remove the auxiliary air conditioning evaporator hose clip nut (5) from the auxiliary air conditioning evaporator hose clip (6).



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Fig. 179: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

16. Remove the air conditioning evaporator hose clip nut (1) from the auxiliary air conditioning evaporator hose clip (2).

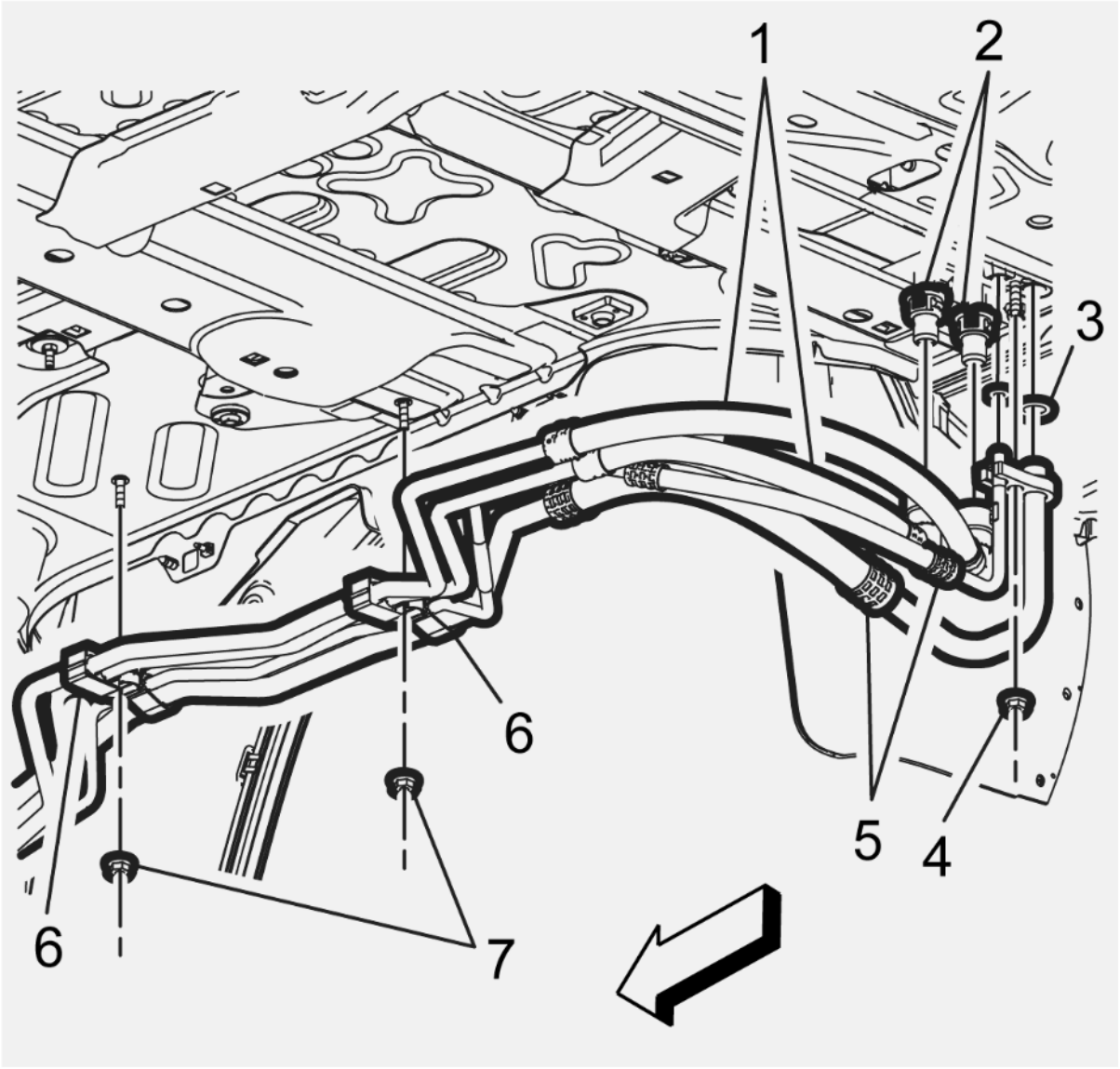


Fig. 180: Air Conditioning Evaporator Hose Clip Nut

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Courtesy of GENERAL MOTORS COMPANY

17. Remove the air conditioning evaporator hose clip nut (7) from the auxiliary air conditioning evaporator hose clip (6).
18. Remove the auxiliary air conditioning evaporator thermal expansion valve nut (4) from the air conditioning evaporator thermal expansion valve.
19. Remove the auxiliary air conditioning evaporator low side and high side hoses (5) from the auxiliary air conditioning evaporator thermal expansion valve.
20. Remove and discard the old sealing washers (3) from the auxiliary air conditioning evaporator hose (4).
21. Disconnect the auxiliary heater inlet and outlet hose (1) from the auxiliary heater inlet and outlet hose clips (2).
22. Remove the auxiliary air conditioning evaporator hose from the vehicle.

Installation Procedure

1. Install the auxiliary air conditioning evaporator hose to the vehicle.

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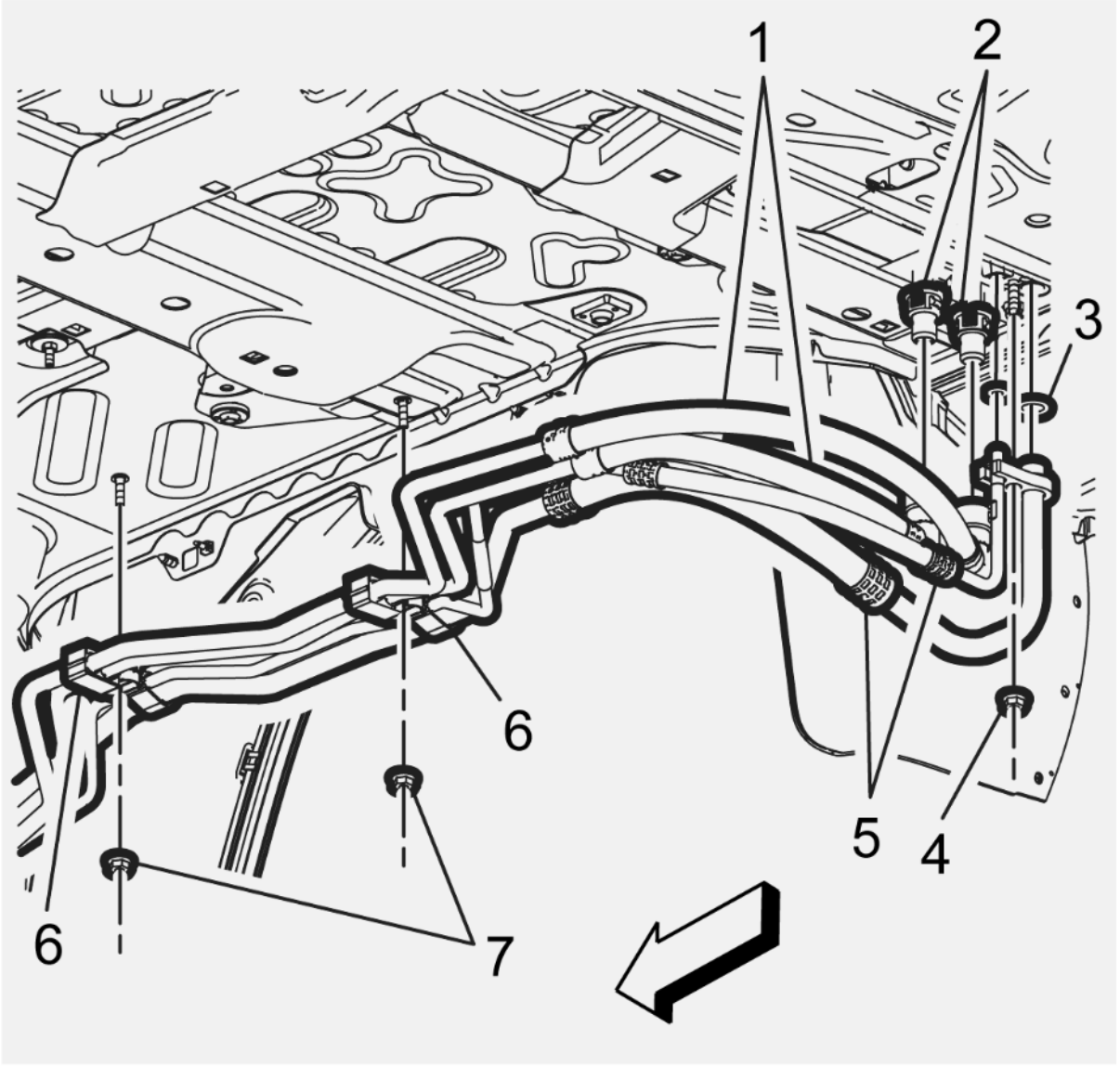


Fig. 181: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

2. Install the auxiliary heater inlet and outlet hose (1) to the auxiliary heater inlet and outlet hose clips (2).
3. Install NEW sealing washers (3) to the auxiliary air conditioning evaporator low side and high side hoses (4). Refer to **Air Conditioning System Seal Replacement**.

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4. Install the auxiliary air conditioning evaporator low side and high side hoses (5) to the auxiliary air conditioning evaporator thermal expansion valve.

CAUTION: **Refer to Fastener Caution .**

5. Install the auxiliary air conditioning evaporator thermal expansion valve nut (4) to the air conditioning evaporator thermal expansion valve and tighten to 22 N.m (16 lb ft).
6. Install the air conditioning evaporator hose clip nut (7) from the auxiliary air conditioning evaporator hose clip (6) and tighten.

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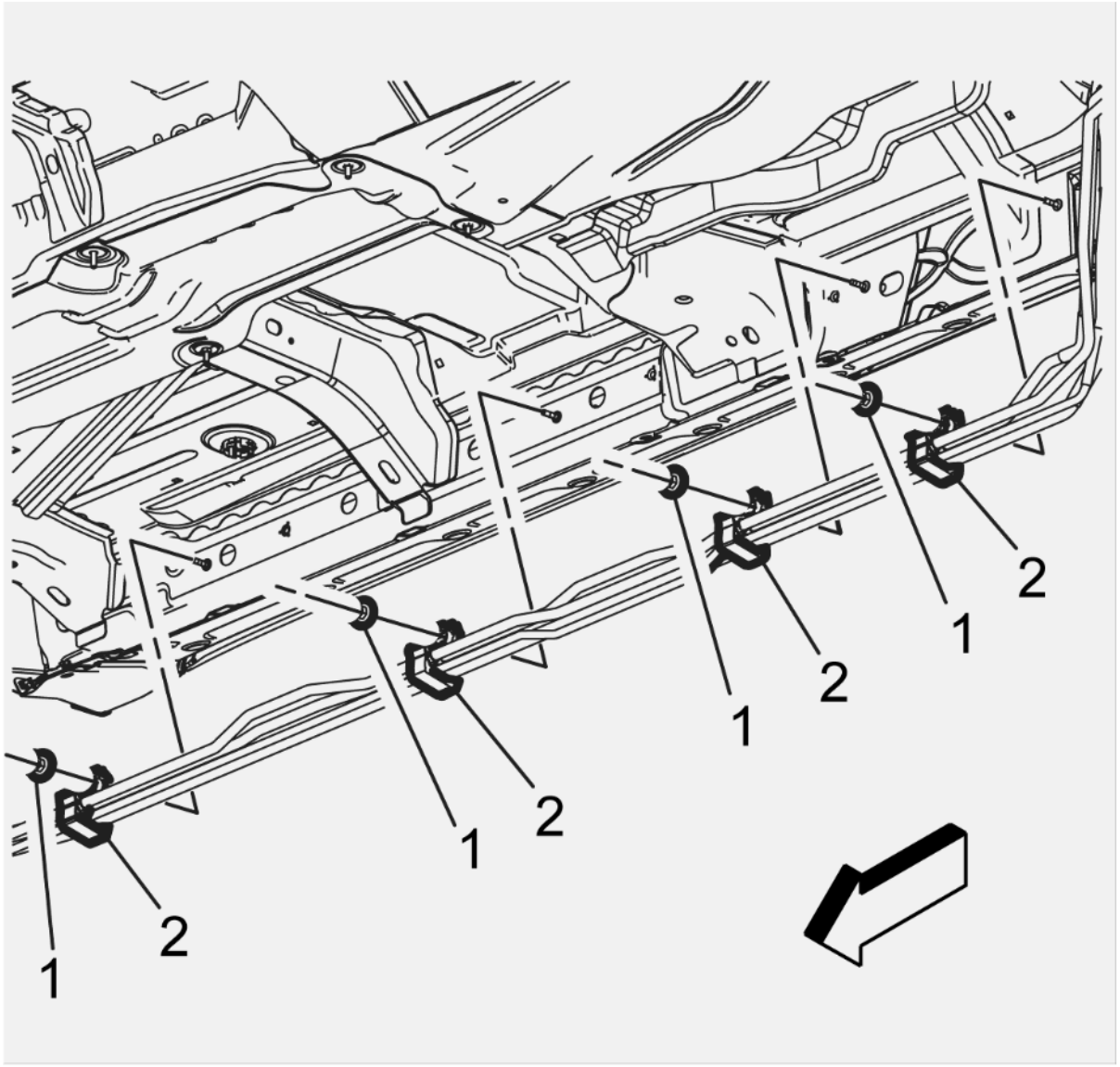


Fig. 182: Air Conditioning Evaporator Hose Clip Nut
Courtesy of GENERAL MOTORS COMPANY

7. Install the air conditioning evaporator hose clip nut (1) from the auxiliary air conditioning evaporator hose clip (2) and tighten.

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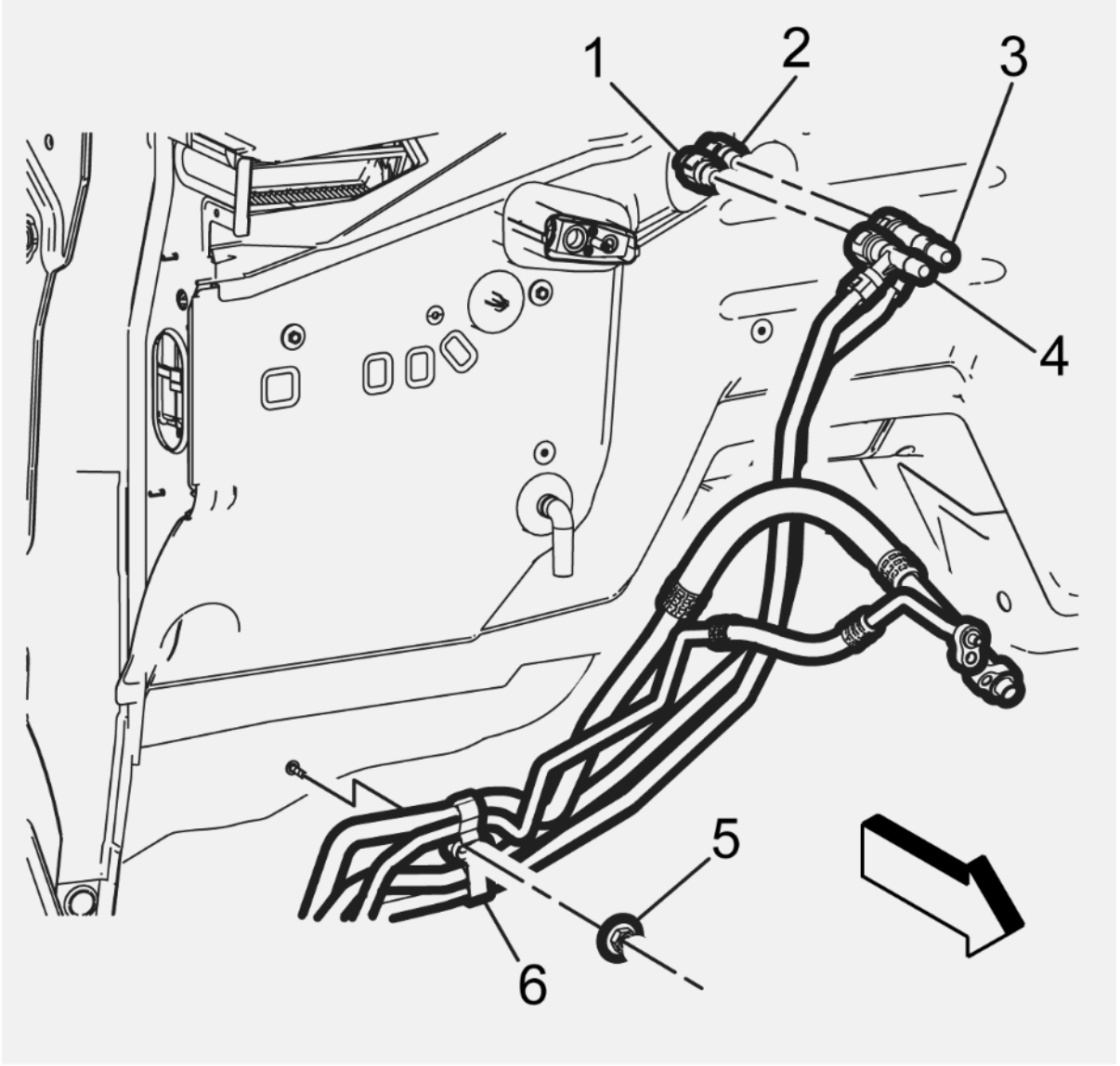


Fig. 183: Auxiliary Heater Inlet And Outlet Hose Outlet
Courtesy of GENERAL MOTORS COMPANY

8. Install the auxiliary heater inlet and outlet hose outlet (4) to the auxiliary heater inlet and outlet hose clip (1).
9. Install the auxiliary heater inlet and outlet hose inlet (3) to the auxiliary heater inlet and outlet hose clip (2).
10. Install the auxiliary air conditioning evaporator hose clip nut (5) to the auxiliary air conditioning evaporator hose clip (6).

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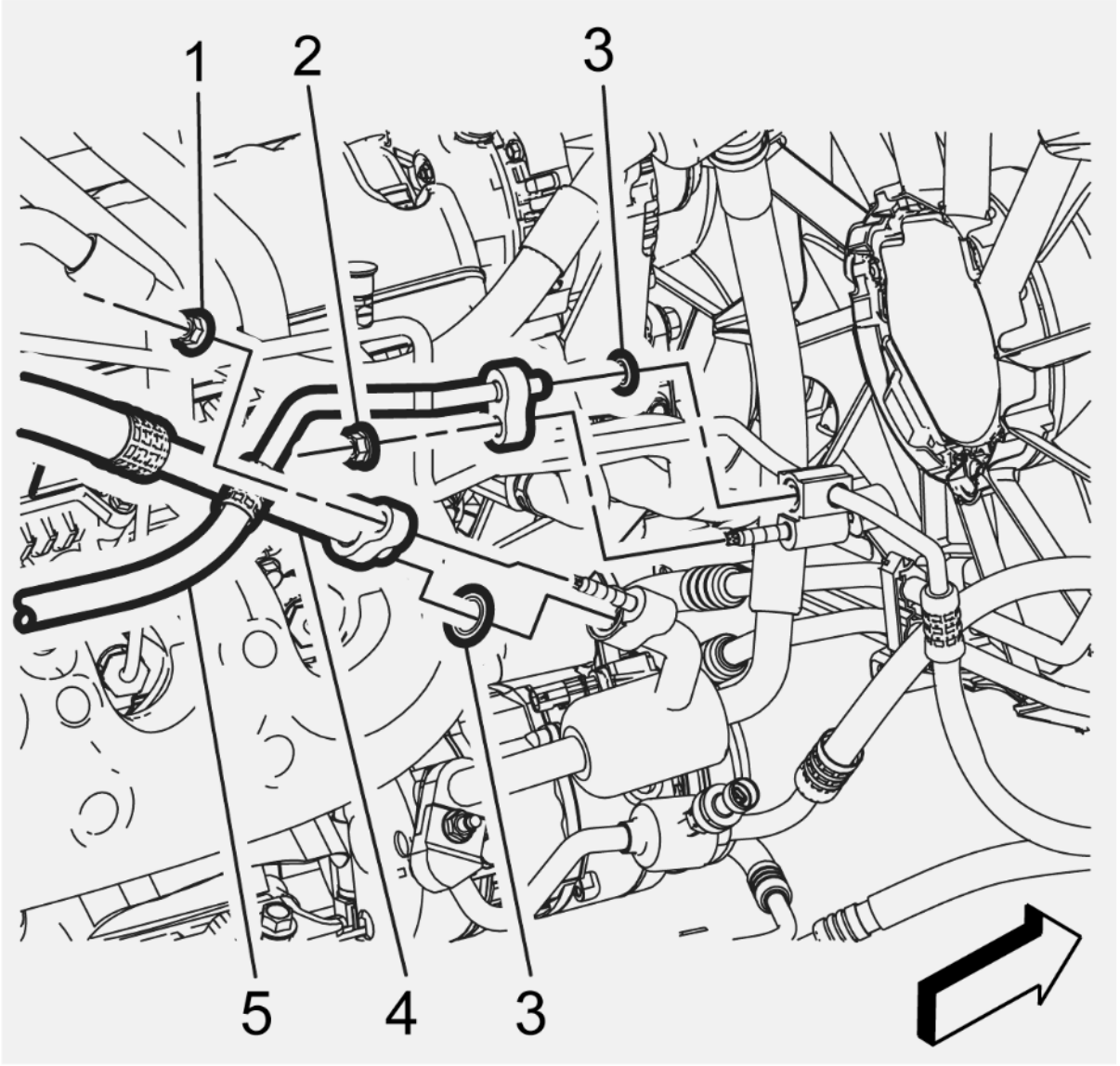


Fig. 184: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

11. Install NEW sealing washers (3) to the auxiliary air conditioning evaporator low side and high side hoses (4).
12. Install the auxiliary air conditioning evaporator low side hose (4) to the air conditioning compressor hose.
13. Install the air conditioning compressor hose nut (1) and tighten to 22 N.m (16 lb ft).

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14. Install the auxiliary air conditioning evaporator high side hose (5) to the air conditioning evaporator tube.
15. Install the air conditioning evaporator tube nut (2) and tighten to 22 N.m (16 lb ft).
16. Install the heater outlet hose to the auxiliary heater inlet and outlet hose. Refer to **Heater Outlet Hose Replacement (L83 L86)Heater Outlet Hose Replacement (L96)**.
17. Install the heater inlet hose to the auxiliary heater inlet and outlet hose. Refer to **Heater Inlet Hose Replacement (L83 L86)Heater Inlet Hose Replacement (L96)**.
18. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
19. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** .
20. Install the right side assist step. Refer to **Assist Step Replacement (Step Pad - BRS)** **Assist Step Replacement (Assembly - BRS)** **Assist Step Replacement (BVE-Short Wheel Base)** **Assist Step Replacement (BVE-Long Wheel Base)** .
21. Install the right rear wheelhouse panel. Refer to **Rear Wheelhouse Liner Replacement (LWB)** **Rear Wheelhouse Liner Replacement (LWB Z75)** **Rear Wheelhouse Liner Replacement (SWB Z75)** **Rear Wheelhouse Liner Replacement (SWB)** .
22. Install the right front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Right Side (Cadillac)** **Front Wheelhouse Liner Replacement - Right Side (Chevrolet)** **Front Wheelhouse Liner Replacement - Right Side (GMC)** .

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN VALVE REPLACEMENT (LWB)

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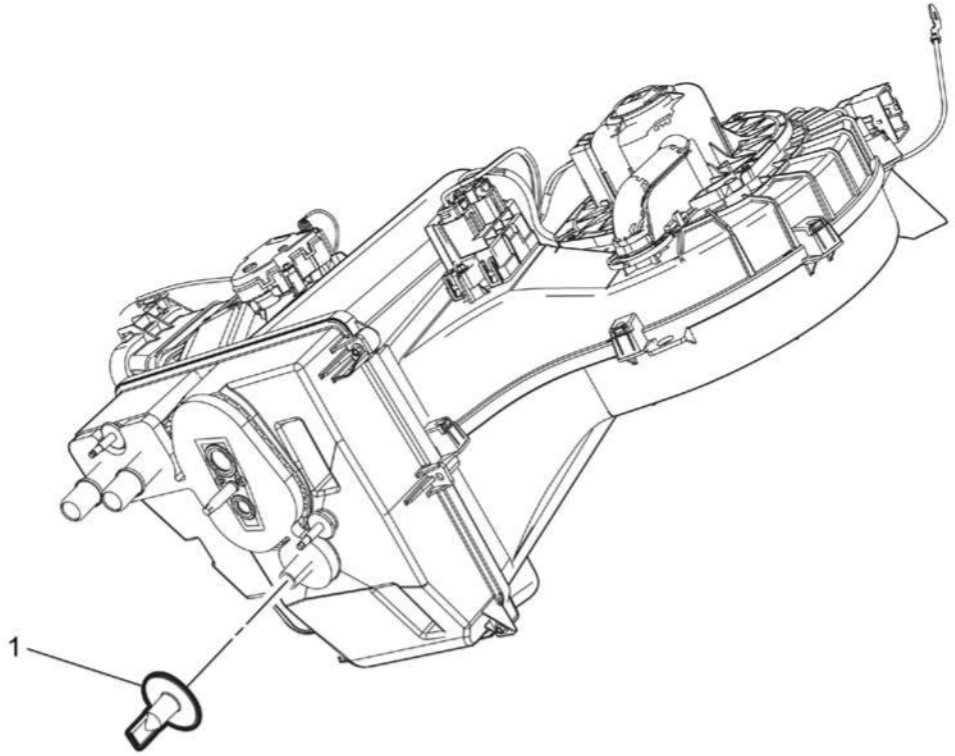


Fig. 185: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (LWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary air conditioning evaporator and blower module assembly. Refer to **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation (LWB)**.	
1	Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve **Procedure** Remove the air conditioning evaporator tube seal.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN VALVE REPLACEMENT (SWB)

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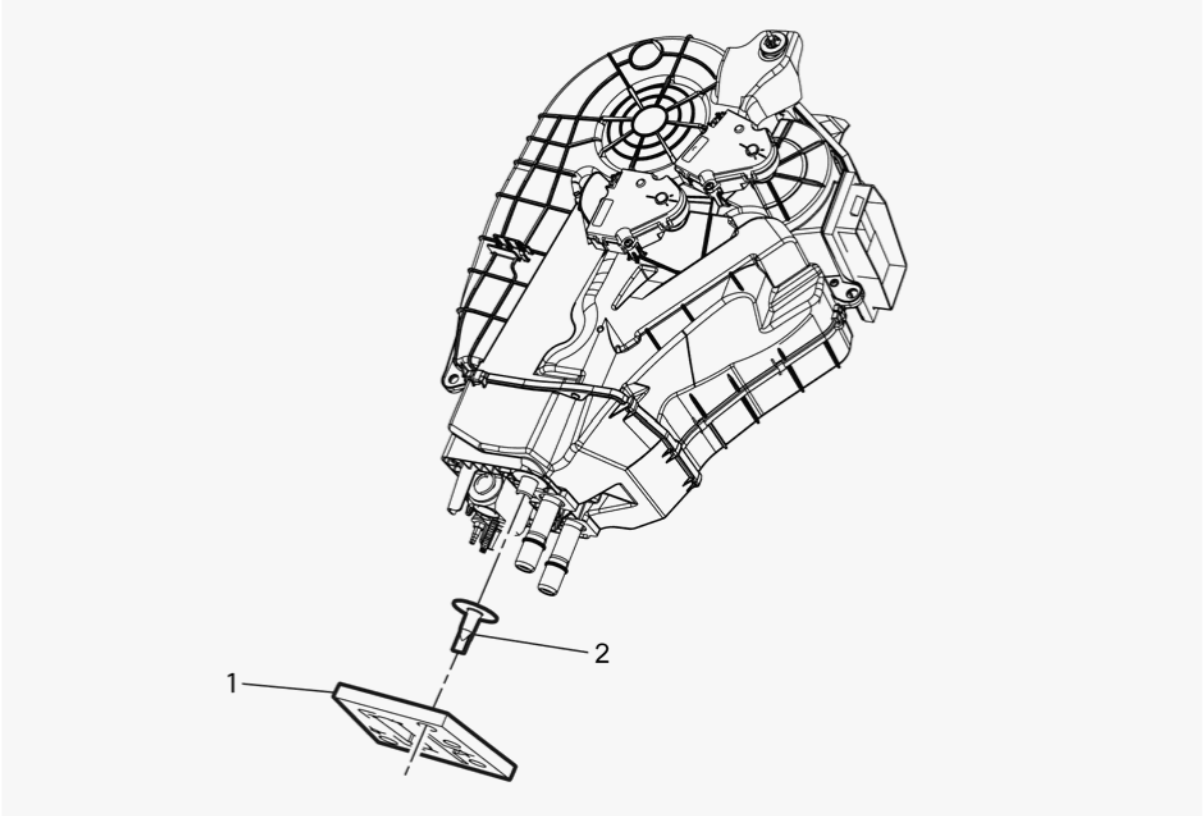


Fig. 186: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (SWB)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary air conditioning evaporator and blower module assembly. Refer to **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation (SWB)**.	
1	Auxiliary Heater Case Seal
2	Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve

AUXILIARY HEATER AND AIR CONDITIONING PIPE REPAIR

Auxiliary Heater and Air Conditioning Pipe Replacement/Repair

The rear AC or Heater lines can be repaired in sections.

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Auxiliary Heater and A/C service replacement lines contain all 4 lines in two sections.

A/C Tube Repair Kits are available in the GM Parts Catalog, and can be used when any of the following actions damage the rear A/C or heater lines:

- Rub-through
- Collision damage
- Leakage in the system

NOTE: **Only use A/C Tube Repair Kits on straight sections, long enough to accommodate coupler length. Stagger the splices if repairing more than one line.**

A/C Tube Repair Kit Specification

A/C Tube Repair Kits require a specific length of tube/pipe removed to accommodate the length added by the coupler body. The length removed at the service cut location varies for each kit size. See the char below for specifications

Kit Size/Pipe "Outside Diameter"	Pipe Length Removed to Install Kit Coupler	Required Torque for Kit Coupler Nuts
5/16 in	4 mm	20-24 N.m (15-18 lb ft)
3/8 in	7 mm	20-24 N.m (15-18 lb ft)
1/2 in	10 mm	20-24 N.m (15-18 lb ft)
5/8 in	11 mm	24-27 N.m (18-20 lb ft)
3/4 in	31 mm	24-27 N.m (18-20 lb ft)
8 mm	4 mm	20-24 N.m (15-18 lb ft)
10 mm	4 mm	20-24 N.m (15-18 lb ft)
12 mm	10 mm	20-24 N.m (15-18 lb ft)
16 mm	11 mm	24-27 N.m (18-20 lb ft)

Straight Line Repair

1. Recover the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
2. Drain the coolant, if repairing the heater lines. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** .

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3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
4. Locate the area that requires repair.
5. Determine if a length of replacement line is needed to make the repair, and/or if the repair can be made using an A/C Tube Repair Kit.
6. Use a tubing cutter in order to cut and remove the section of damaged line, and to obtain appropriate length of replacement line (if needed).

NOTE: **A/C Tube Repair Kits add to overall line length. Refer to kit specifications above to accommodate the appropriate coupler body length.**

7. Clean away and burrs and remove oxidation, scale or other surface contamination.

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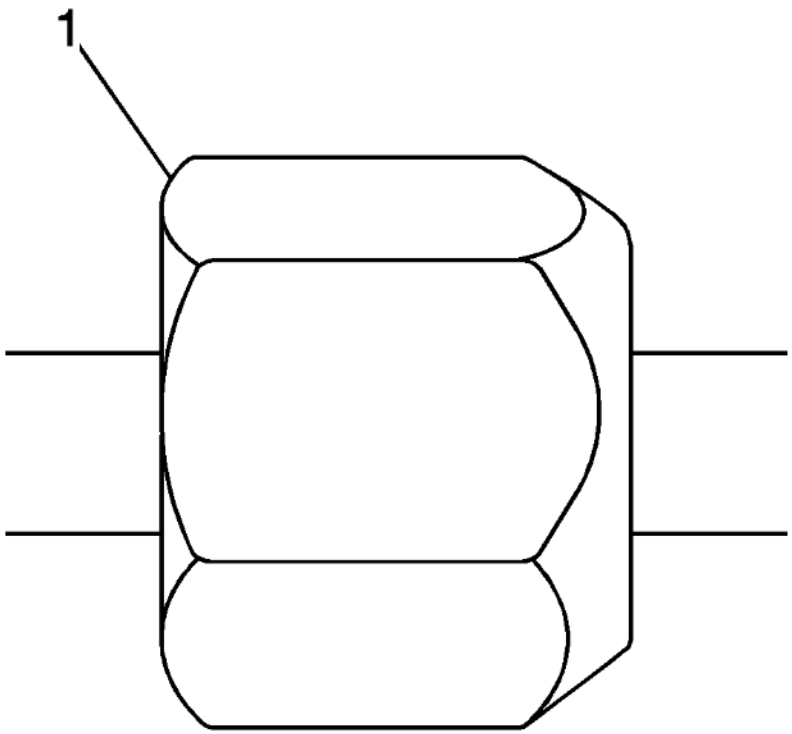


Fig. 187: Coupler Nuts
Courtesy of GENERAL MOTORS COMPANY

8. Assemble coupler nuts (1) on each tube end.

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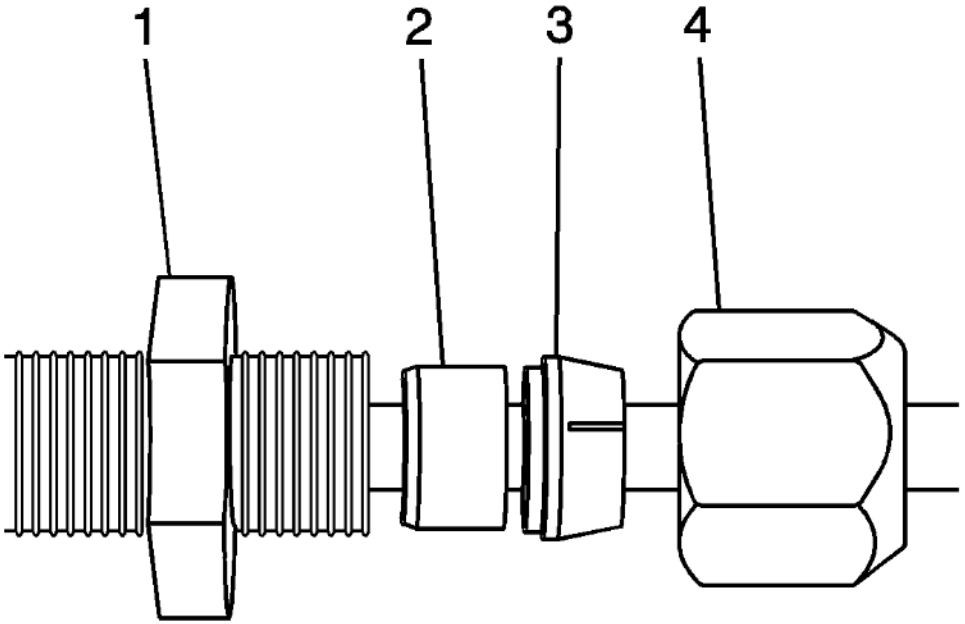


Fig. 188: Brass Tension Ring And Coupler Nut
Courtesy of GENERAL MOTORS COMPANY

9. Lubricate both tube ends and green sealing sleeves (2) with mineral oil.
10. Install the brass tension ring (3) with the tapered end facing the coupler nut (4) on each tube end.

NOTE: **Tension ring inside diameter must match tubing outside diameter.**

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11. Install the sealing sleeve (2) on the tube end with tapered side facing the coupler body (1).

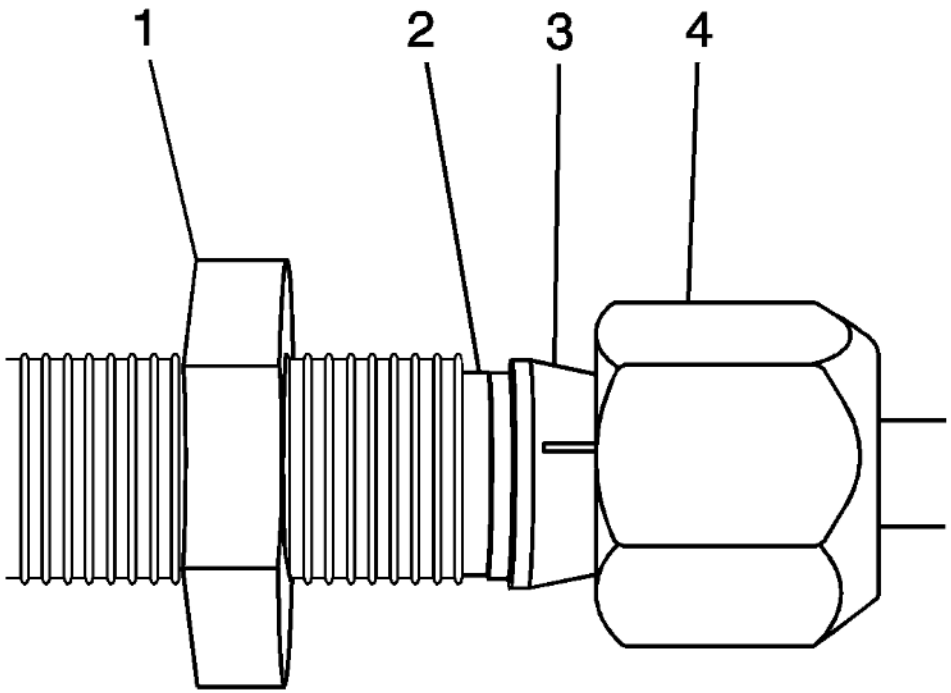


Fig. 189: Brass Tension Ring And Coupler Nut
Courtesy of GENERAL MOTORS COMPANY

12. Press each tube end into the coupler body (1), ensuring both the sealing sleeve (2) and the tube end are fully seated within the coupler body (1).
13. Slide the brass tension ring (3) and coupler nut (4) against the sealing sleeve (3) and hand tighten.

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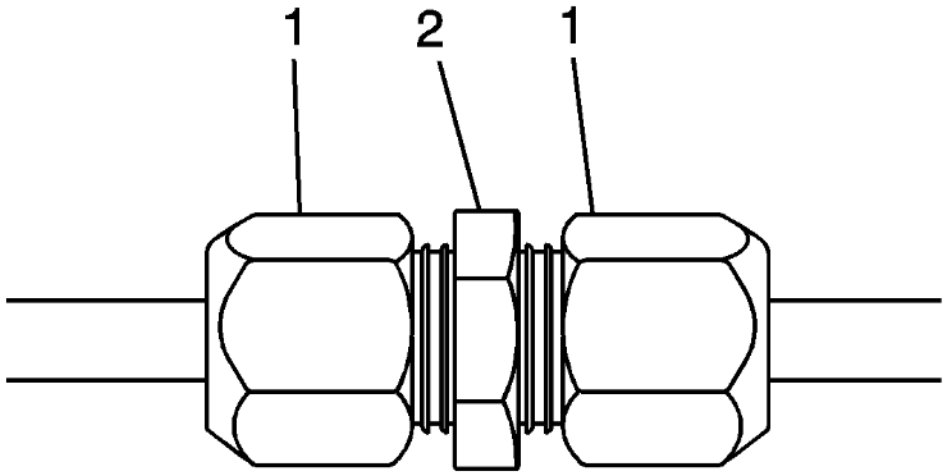


Fig. 190: Coupler Nut And Coupler Body
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

14. Tighten each coupler nut (1) separately, against the coupler body (2) using the proper torque from the chart above.
15. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

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16. Refill the coolant, if drained. Refer to **Cooling System Draining and Filling (Static Fill L96)** **Cooling System Draining and Filling (Vac N Fill L96)** **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)** .
17. Evacuate and recharge the refrigerant, if repairing the A/C lines. Refer to **Refrigerant Recovery and Recharging (R134A)Refrigerant Recovery and Recharging (R1234yf)**.
18. Verify that all coupler kits are installed properly and not leaking.

HEATER COVER REPLACEMENT (NON HEAT STAKE)

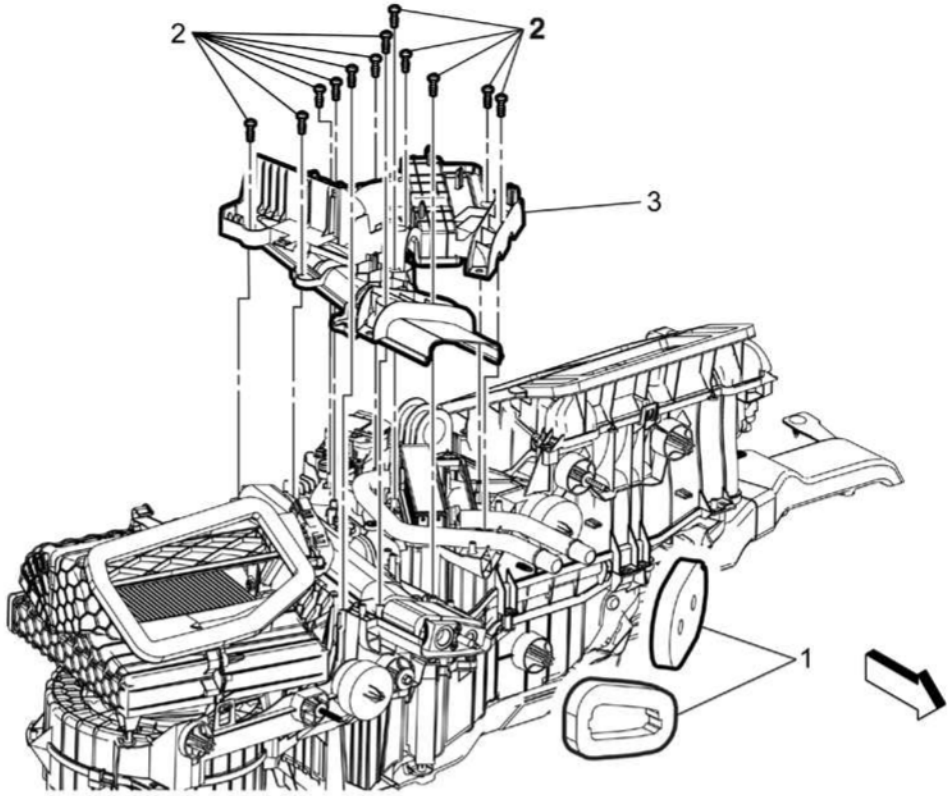


Fig. 191: Heater Cover (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures	

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Call out	Component Name
1. Remove the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**. 2. Remove the left side temperature valve actuator. Refer to **Temperature Valve Actuator Replacement - Left Side** . 3. Disconnect the electrical connectors as necessary.	
1	Seal (Qty: 2)
2	Heater Cover Fastener (Qty: 12) **CAUTION:** **Refer to Fastener Caution .**
3	Heater Cover **Procedure** Transfer the components as necessary.

HEATER COVER REPLACEMENT (HEAT STAKE)

Removal Procedure

1. Remove the heater and air conditioning evaporator and blower module assembly (HVAC). Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

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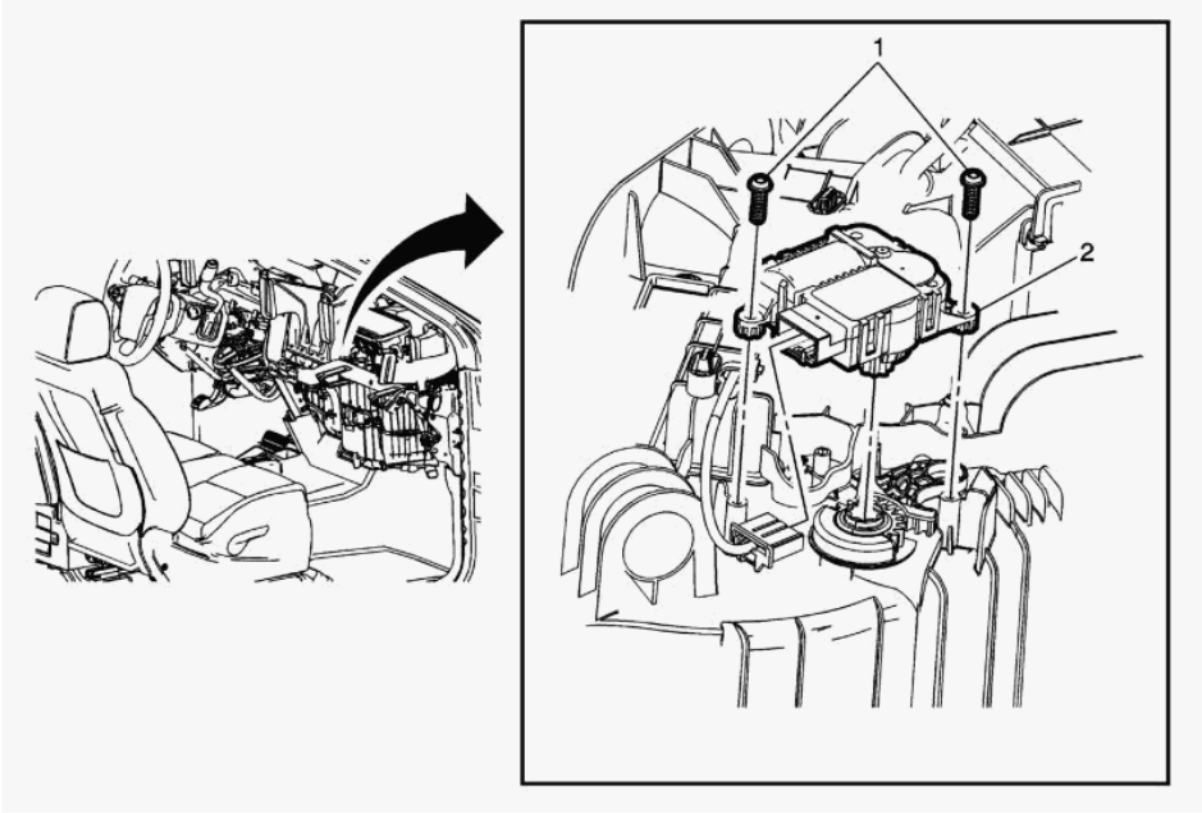


Fig. 192: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

2. Remove the left side temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .

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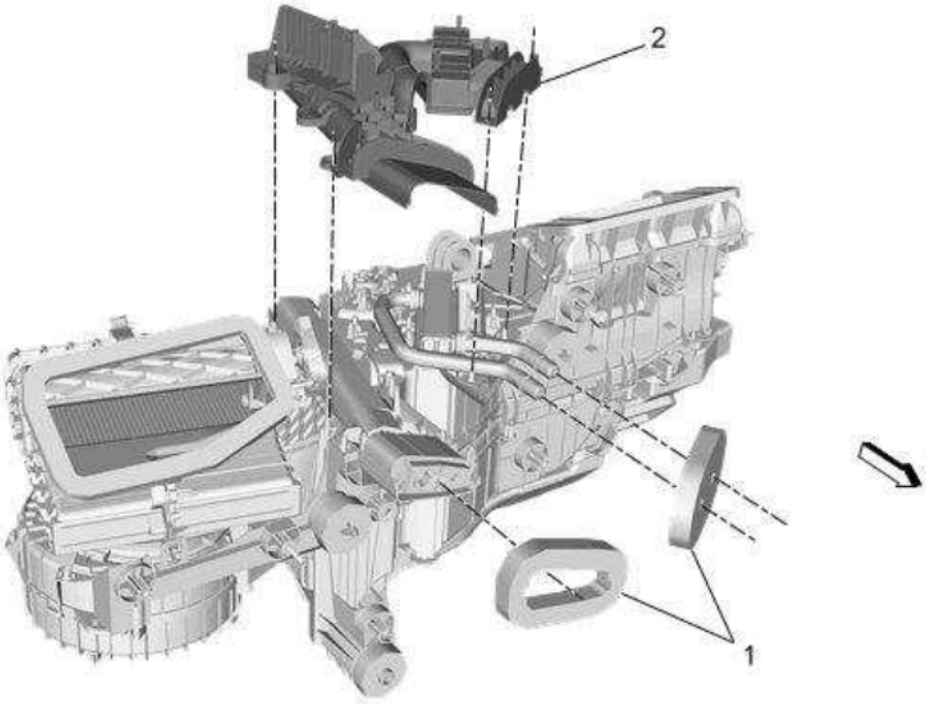


Fig. 193: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

3. Remove the HVAC seals (1).
4. The heater cover is heat staked to the HVAC module assembly, use a step drill bit to drill out the 13 heat stakes.
5. Remove the heater cover (2) from the HVAC module assembly.

Installation Procedure

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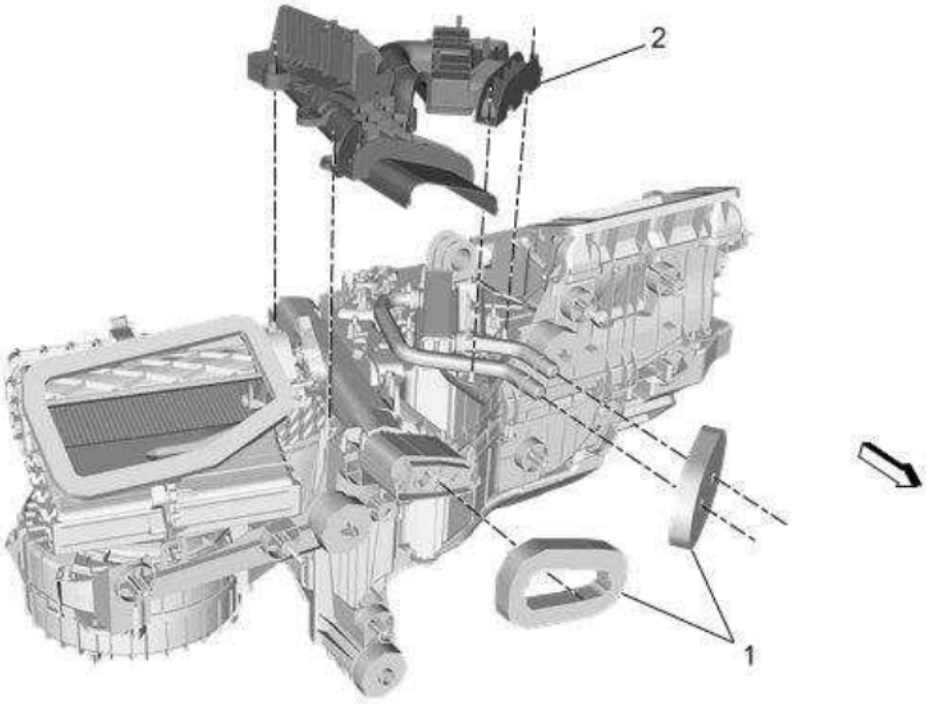


Fig. 194: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

1. Install the heater cover (2) onto the HVAC module assembly.

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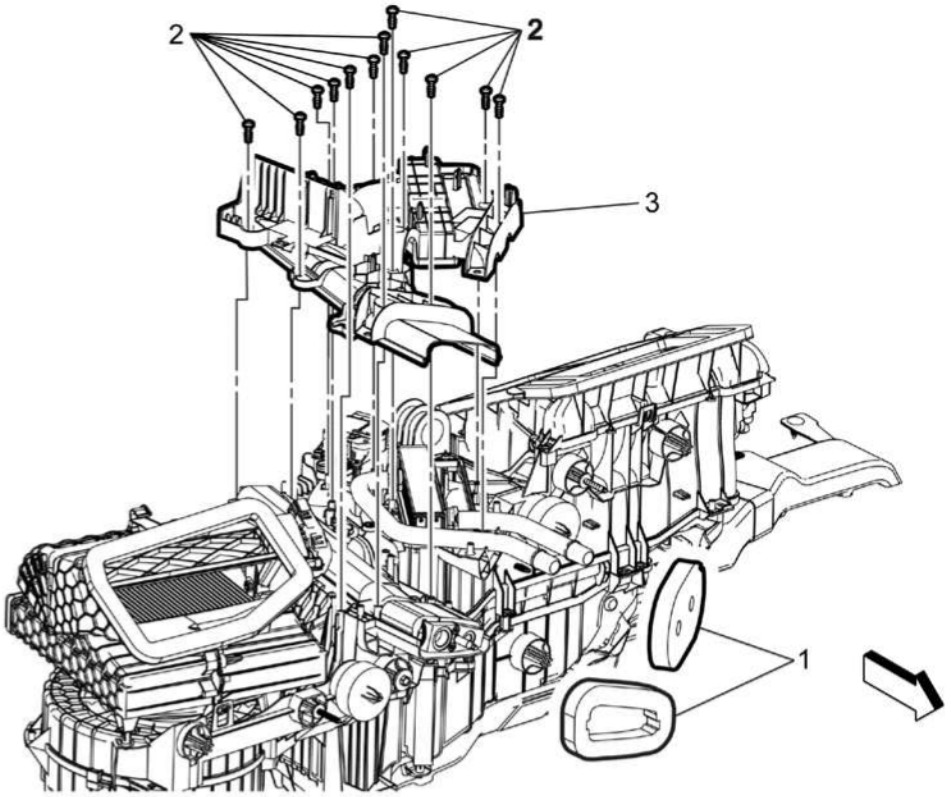


Fig. 195: Heater Cover (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Use 12 M4 X 1.79 X 16 self tapping screws (2), and tighten the screws until fully seated but not striped, to secure the heater cover (3) to the HVAC module assembly.
3. Install the HVAC seals (1).

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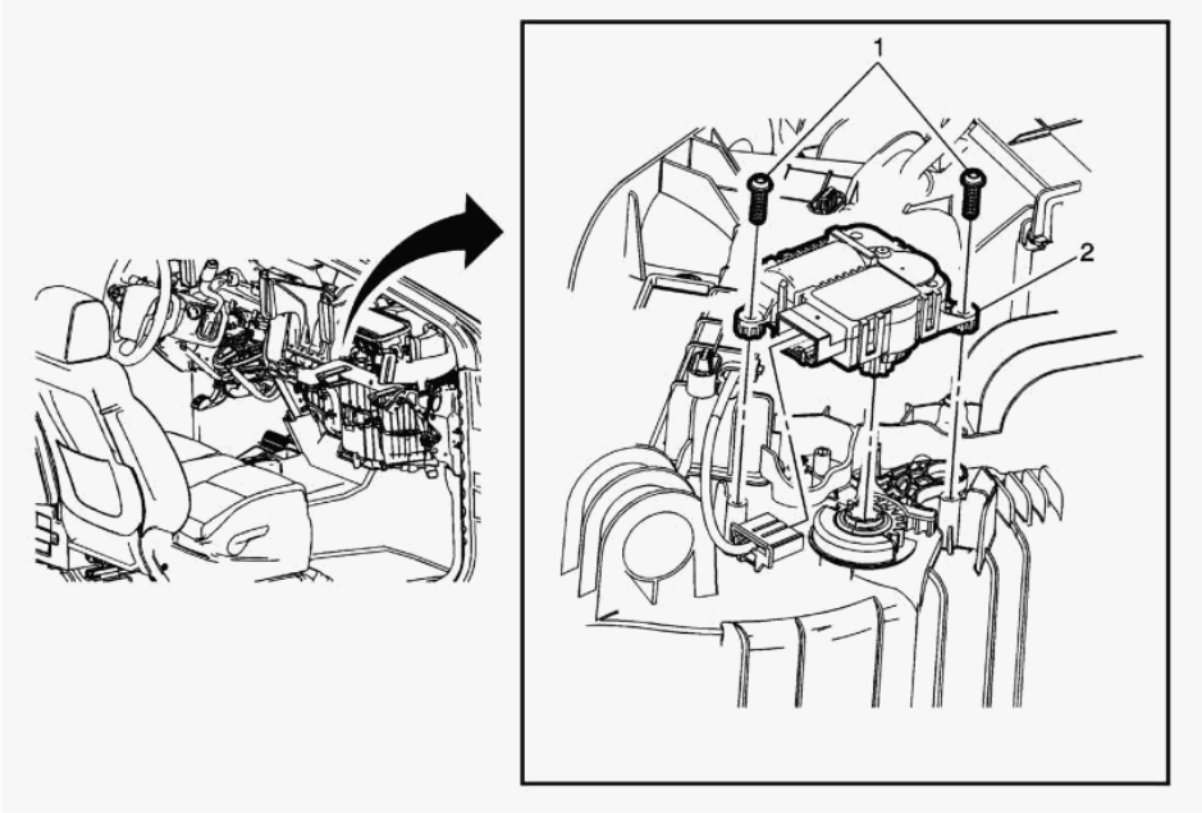


Fig. 196: Temperature Valve Actuator
Courtesy of GENERAL MOTORS COMPANY

4. Install the left side temperature valve actuator (2). Refer to **Temperature Valve Actuator Replacement - Left Side** .
5. Install the heater and air conditioning evaporator and blower module assembly. Refer to **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**.

AUXILIARY HEATER COVER REPLACEMENT (LWB UTILITIES)

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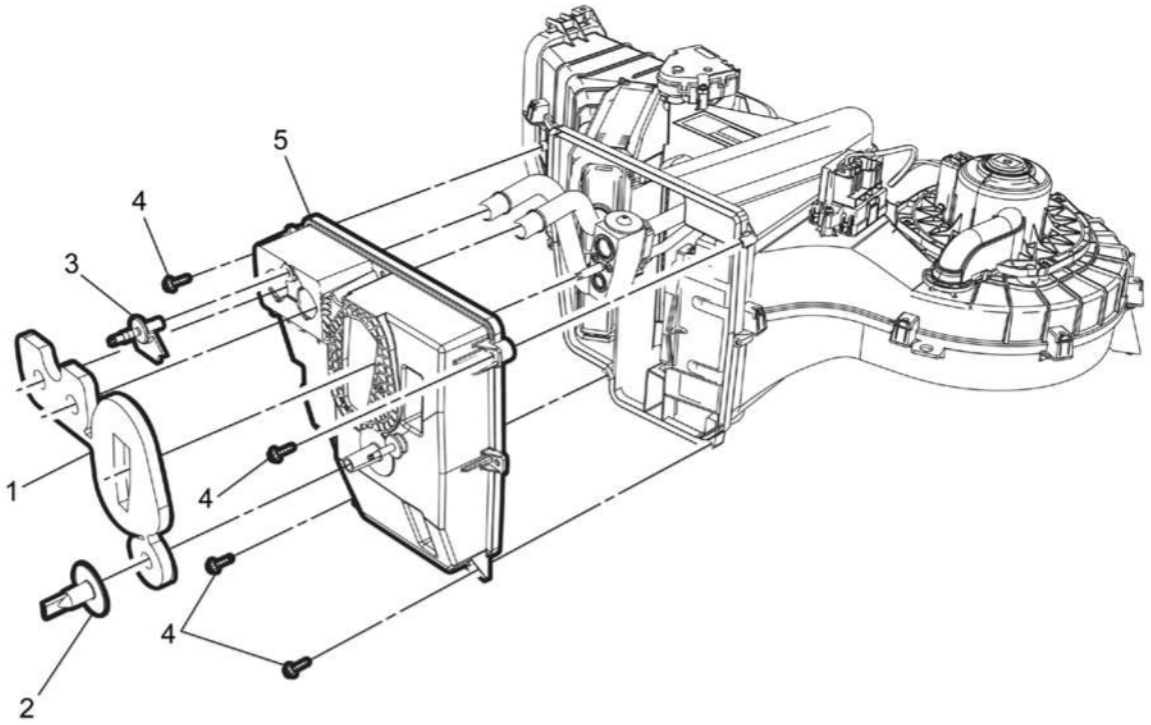


Fig. 197: Auxiliary Heater Cover (LWB Utilities)
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedure Remove the auxiliary air conditioning evaporator and blower module assembly. Refer to **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation (LWB)**.	
1	Air Conditioning Evaporator Tube Seal
2	Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
3	Heater and Air Conditioning Evaporator and Blower Module Stud with Heater Core Tube Clamp **CAUTION:** **Refer to**

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Call out	Component Name
	Fastener Caution .
4	Auxiliary Heater and Air Conditioning Evaporator and Blower Module Bolt (Qty: 4)
5	Auxiliary Heater Cover

DESCRIPTION AND OPERATION

HEATING AND AIR CONDITIONING SYSTEM DESCRIPTION AND OPERATION

Engine Coolant

Engine coolant is the key element of the heating system. The engine thermostat controls the normal engine operating coolant temperature. Coolant pumped out of the engine enters the heater core through the inlet heater hose. The air flowing through the HVAC module absorbs the heat of the coolant flowing through the heater core. The coolant then exits the heater core through the heater outlet hose and returns back to the engine block.

A/C Cycle

Refrigerant is the key element in an air conditioning system. R-134a and R-1234yf are very low temperature gases that can transfer the undesirable heat from the passenger compartment to the outside air.

The A/C compressor is belt driven and operates when the magnetic clutch is engaged. The compressor builds pressure in the A/C system. Compressing the refrigerant also adds heat to the refrigerant. The refrigerant is discharged from the compressor through the discharge hose, and forced to flow to the condenser and then through the balance of the A/C system. The A/C system is mechanically protected with the use of a high pressure relief valve. If the high pressure A/C switch were to fail or if the refrigerant system becomes restricted and refrigerant pressure continued to rise, the high pressure relief will pop open and release refrigerant from the system.

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

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

The TXV is located at the evaporator inlet. The TXV is the dividing point for the high and the low pressure sides of the A/C system. As the refrigerant passes through the TXV, the refrigerant is lowered. Due to the pressure differential on the liquid refrigerant, the refrigerant will begin to

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boil at the TXV. The TXV also meters the amount of liquid refrigerant that can flow into the evaporator.

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

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

The conditioned air is distributed through the HVAC module for passenger comfort. The moisture removed from the passenger compartment will also change form, or condense, and is discharged from the HVAC module as water.

A/C Cycle with Auxiliary

The auxiliary A/C system operates from the vehicles primary A/C system. The front or primary A/C system must be ON to allow the rear A/C system to function.

The liquid refrigerant, flows from the front system to the rear A/C system into the rear thermal expansion valve (TXV). The rear TXV is located at the rear evaporator inlet. The TXV is the dividing point for the high and the low pressure sides of the rear A/C system. As the refrigerant passes through the TXV, the pressure on the refrigerant is lowered. Due to the pressure differential on the liquid refrigerant, the refrigerant will begin to boil at the expansion device. The TXV also meters the amount of liquid refrigerant that can flow into the evaporator.

Refrigerant exiting the TXV flows into the evaporator core in a low pressure, liquid state. Ambient air is drawn through the rear A/C module and passes through the evaporator core. Warm and moist air will cause the liquid refrigerant boil inside of the evaporator core. The boiling refrigerant absorbs heat from the ambient air and draws moisture onto the evaporator. The refrigerant exits the evaporator through the suction line and back to the primary A/C systems suction line. Refrigerant in the primary A/C system suction line flows back to the compressor, in a vapor state, and completes the A/C cycle of heat removal. At the compressor, the refrigerant is compressed again and the cycle of heat removal is repeated.

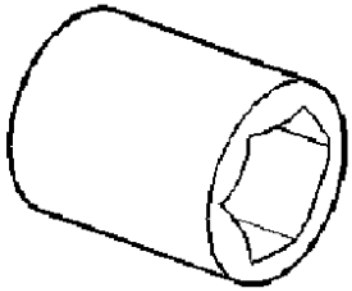
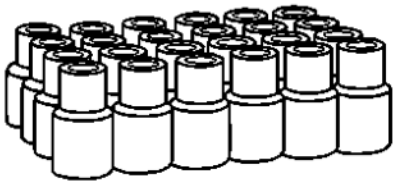
The conditioned air is distributed through the rear A/C module for passenger comfort. The heat and moisture removed from the rear passenger compartment will also change form, or condense, and is discharged from the rear A/C module as water.

SPECIAL TOOLS AND EQUIPMENT

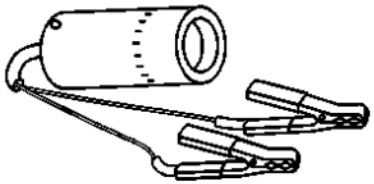
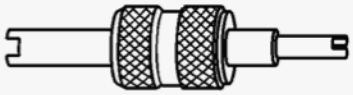
SPECIAL TOOLS

Illustration	Tool Number/Description

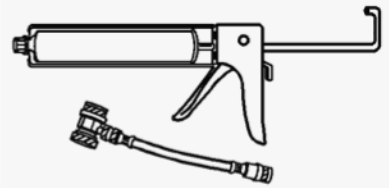
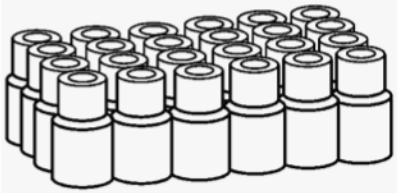
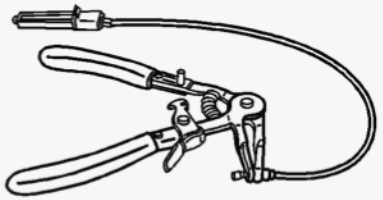
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Illustration	Tool Number/Description
	BO-38185 J-38185 Hose Clamp Pliers
	GE-39037 J-39037 Charge Valve Octagon Socket
	GE-41447 J-41447 R-134A A/C Tracer Dye - Box of 24

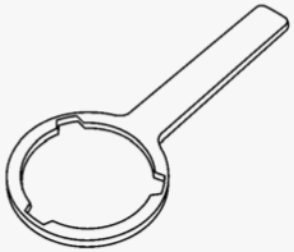
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Illustration	Tool Number/Description
	GE-42220 J-42220 Universal 12V Leak Detection Lamp
	GE-43872 J-43872 Fluorescent Dye Cleaner
	GE-46246 Valve Core Tool

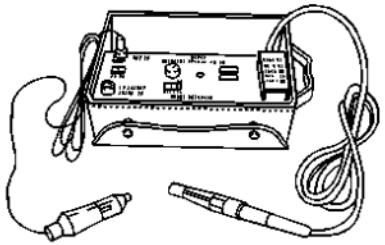
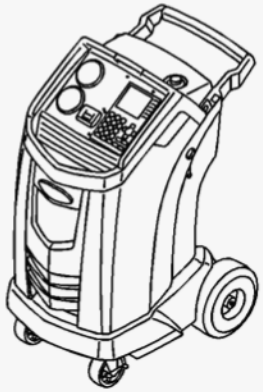
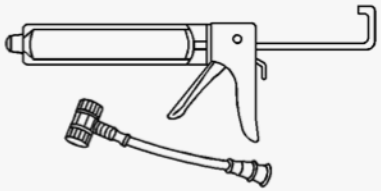
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Illustration	Tool Number/Description
	GE-46297 A/C Dye Injector Kit
	GE-46297-12 Replacement Dye Cartridges
	GE 47622 Hose Clamp Pliers

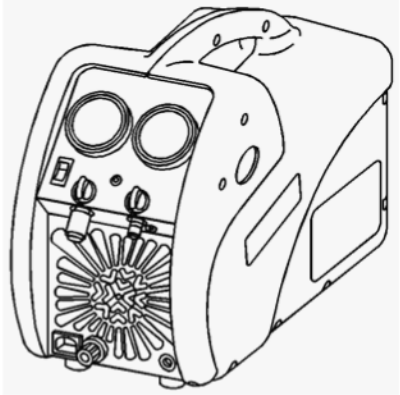
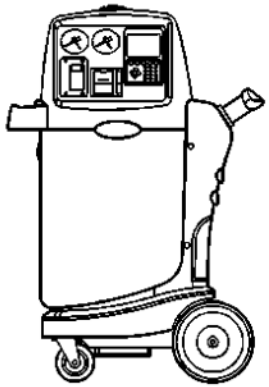
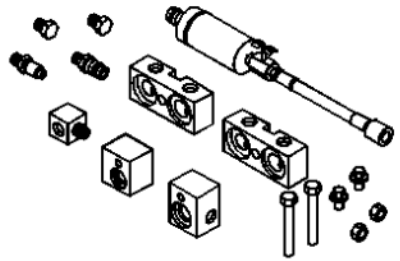
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Illustration	Tool Number/Description
	GE-48800 CoolTech A/C Recharge Machine
	GE 48965 Holding Wrench
	GE-50078 Infrared Refrigerant Leak Detector

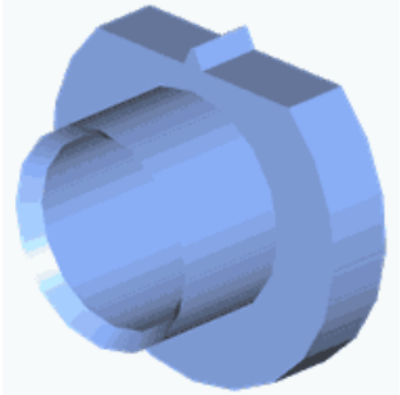
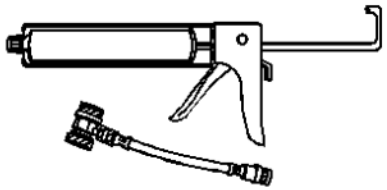
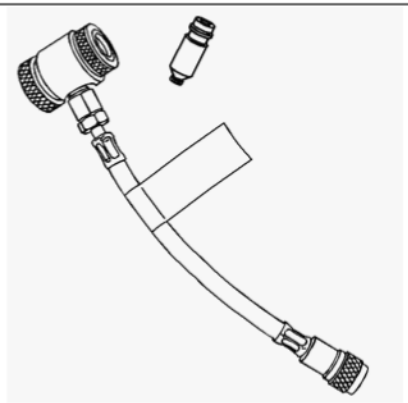
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Illustration	Tool Number/Description
	GE 39400-A J 39400-A Halogen Leak Detector
	GE-50300 R-1234yf Air Conditioning Refrigerant Recovery/Recharge Cart
	GE-50744 R-1234yf PAG Oil Injector Hose

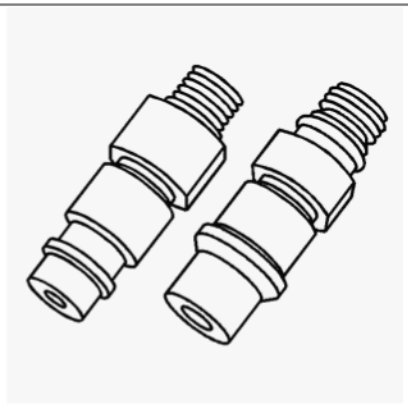
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Illustration	Tool Number/Description
	GE-50957 R-1234yf Contaminated Refrigerant Recovery
	J-43600 ACR 2000 Air Conditioning Service Center
	J-45268 A/C Flushing Adapter Kit

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Illustration	Tool Number/Description
	J-43181 Heater Line Q.C. Release Tool
	J-45037 A/C Oil Injector
	GE-50745 R-1234yf POG Oil Injector Hose

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Illustration	Tool Number/Description
	GE-45268-130 R-1234yf Flushing Adapter Kit

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