SPECIFICATIONS

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

NOTE: *All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.*
Application
Air Conditioning System Sealing Washer

Reusable Threaded Fastener Tightening Specifications

NOTE: *All fasteners listed in this table can be reused after removal.*	
Application	**Specification**
	Metric (English)
Air Conditioning Compressor and Condenser Hose Nut	22 N.m (16 lb ft)
Air Conditioning Compressor Bolt (L5P)	58 N.m (43 lb ft)
Air Conditioning Compressor Bolt (L83, L86, L8B, LV3)	22 N.m (16 lb ft)
Air Conditioning Compressor Bolt (L96, LC8)	50 N.m (37 lb ft)
Air Conditioning Compressor Bracket Bolt (L5P, L96, LC8)	50 N.m (37 lb ft)
Air Conditioning Compressor Bracket Nut (L5P)	50 N.m (37 lb ft)
Air Conditioning Compressor Bracket Stud (L5P)	9 N.m (80 lb in)
Air Conditioning Compressor Hose Bolt @ Air Conditioning Compressor (L8B)	22 N.m (16 lb ft)
Air Conditioning Compressor Hose Bracket Bolt (L8B)	22 N.m (16 lb ft)
Air Conditioning Compressor Hose Nut	22 N.m (16 lb ft)
Air Conditioning Compressor Nut (L83, L86, L8B, LV3)	22 N.m (16 lb ft)
Air Conditioning Compressor Pulley Bolt	18 N.m (13 lb ft)
Air Conditioning Compressor Stud (L83, L86, L8B)	8 N.m (71 lb in)
Air Conditioning Condenser Bracket Nut @ Radiator **(L83, L86, LV3)**	6 N.m (53 lb in)
Air Conditioning Condenser Hose Nut	22 N.m (16 lb ft)

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NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Air Conditioning Condenser Nut	22 N.m (16 lb ft)
Air Conditioning Condenser Nut @ Front End Upper Tie Bar Support **(L5P, L96, LC8)**	9 N.m (80 lb in)
Air Conditioning Receiver and Dehydrator	9 N.m (80 lb in)
Air Conditioning Refrigerant Pressure Sensor	7.5 N.m (66 lb in)
Air Conditioning Refrigerant Service Valve	2 N.m (18 lb in)
Air Conditioning Thermal Expansion Valve Bolt	7.5 N.m (66 lb in)
Air Conditioning Tube Bracket Bolt @**Generator and Drive Belt Tensioner Bracket (L83, L86, LV3)**	22 N.m (16 lb ft)
Engine Wiring Harness Bracket Bolt (L5P)	10 N.m (89 lb in)
Heater and Air Conditioning Evaporator and Blower Module Bolt (R-1234yf)	2 N.m (18 lb in)
Heater and Air Conditioning Evaporator and Blower Module Bolt @ Cowl Panel (L5P)	5 N.m (44 lb in)
Heater and Air Conditioning Evaporator and Blower Module Nut (L83, L86, L8B, LV3)	9.5 N.m (84 lb in)
Heater and Blower Module Nut (L96, L83, LV3 with C42, MCX)	9.5 N.m (84 lb in)
Heater Outlet Pipe Retainer Bolt (L5P)	9 N.m (80 lb in)
Instrument Panel Air Outlet Duct Bolt	2.5 N.m (22 lb in)

APPROXIMATE FLUID CAPACITIES

Application	Specification	
	Metric	English
Compressor Replacement	40 ml[1]	1.4 oz[1]
Condenser Replacement	35 ml[1]	1 oz[1]
Evaporator Replacement	35 ml[1]	1 oz[1]
• Total System Refrigerant Oil Capacity	130 ml	4 oz
R-134a		
• Refrigerant Charge	0.6 kg	1.4 lb
R-1234yf		
• Refrigerant Charge	0.55 kg	1 lb

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Application	Specification	
	Metric	English
[1] If more than the specified amount of refrigerant oil was drained from a component, add the equal amount of refrigerant 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

DIAGNOSTIC INFORMATION AND PROCEDURES

HANDLING OF REFRIGERANT LINES AND FITTINGS

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.

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- 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.

SYMPTOMS - HEATING, VENTILATION, AND AIR CONDITIONING

NOTE: **The following steps must be completed before using the symptom tables.**

1. Perform the **Diagnostic Starting Point - Vehicle** before using the symptom tables in order to verify that all of the following are true:
   - There are no DTCs set
   - The control modules can communicate via the serial data link
2. Review the system operation in order to familiarize yourself with the system functions. **Symptoms - HVAC Systems - Automatic** , or **Symptoms - HVAC Systems - Manual** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the HVAC System. **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Verify the A/C compressor clutch turns freely and is not seized.
- The A/C compressor will not operate in cold outside air temperatures .
- The following could cause window fogging:
  - Wet carpet or mats
  - High humidity
  - Interior water leak
  - Blocked A/C evaporator drain tube
  - Maximum passenger capacity
  - Blocked body pressure relief valves
- Inspect the air distribution system for causes of reduced air flow:
  - Obstructed or dirty passenger compartment air filter, if equipped
  - Blocked or damaged air inlet or outlet vents

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

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

- **Leak Testing (R-1234yf)Leak Testing (R-134a)**
- **Noise Diagnosis - HVAC Module**
- **Noise Diagnosis - Air Conditioning (A/C) System**
- **Noise Diagnosis - Blower Motor**

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- **Odor Diagnosis**

LEAK TESTING (R-1234YF)

Special Tools

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

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

- 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 to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

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)

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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 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

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- 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.**

- 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 (R-134a)Refrigerant Recovery and Recharging (R-1234yf)** 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.

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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.
- 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)

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

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

Test Description

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**				

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Step	Action	Values	Yes	No
	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 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?	• Above 16Â°C (60Â°F) 345 kPa (50 psi) • Above 24Â°C (75Â°F) 483 kPa (70 psi) • Above 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**	-	Go to **Step 5**	Go to **Step 3**

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Step	Action	Values	Yes	No
	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: • 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?			

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Step	Action	Values	Yes	No
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** Acr2000 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	Go to **Symptoms - HVAC Systems - Manual** or Go to **Symptoms - HVAC Systems - Automatic**

A/C Performance Table - RPO L86, L96, LC8

Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Discharge Air Temperature
		Low Side	High Side	
13-18Â°C (55-65Â°F)	0-100%	186-234 kPa (27-34 psi)	1378-1591 kPa (200-231 psi)	8Â°C (46Â°F)
19-24Â°C (66-75Â°F)	Below 40%	199-254 kPa (29-37 psi)	1398-1619 kPa (203-235 psi)	10Â°C (50Â°F)
	Above 40%	199-261 kPa (29-38 psi)	1446-1639 kPa (210-238 psi)	10Â°C (50Â°F)
25-29Â°C (76-85Â°F)	Below 35%	213-268 kPa (31-39 psi)	1522-1688 kPa (221-245 psi)	12Â°C (52Â°F)
	35-50%	213-268 kPa (31-39 psi)	1529-1688 kPa (222-245 psi)	13Â°C (54Â°F)
	Above 50%	220-282 kPa (32-41 psi)	1543-1681 kPa (224-244 psi)	13Â°C (54Â°F)
30-35Â°C (86-95Â°F)	Below 30%	220-282 kPa (32-41 psi)	1619-1791 kPa (235-260 psi)	13Â°C (55Â°F)
	30-50%	227-289 kPa (33-42 psi)	1612-1756 kPa (234-255 psi)	14Â°C (57Â°F)
	Above 50%	234-303 kPa (34-44 psi)	1612-1729 kPa (234-251 psi)	15Â°C (59Â°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%	234-296 kPa (34-43 psi)	1729-1908 kPa (251-277 psi)	14Â°C (57Â°F)
	20-40%	241-303 kPa (35-44 psi)	1722-1860 kPa (250-270 psi)	15Â°C (59Â°F)
	Above 40%	248-310 kPa (36-45 psi)	1701-1818 kPa (247-264 psi)	17Â°C (61Â°F)
42-46Â°C (106-115Â°F)	Below 20%	248-303 kPa (36-44 psi)	1853-1998 kPa (269-290 psi)	15Â°C (59Â°F)
	Above 20%	254-316 kPa (37-46 psi)	1832-1942 kPa (266-282 psi)	18Â°C (63Â°F)
47-49Â°C (116-120Â°F)	Below 30%	261-323 kPa (38-47 psi)	1922-2053 kPa (279-298 psi)	18Â°C (63Â°F)

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

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

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

Test Description

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**				

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Step	Action	Values	Yes	No
	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 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?	• Above 16Â°C (60Â°F) 345 kPa (50 psi) • Above 24Â°C (75Â°F) 483 kPa (70 psi) • Above 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**	-	Go to **Step 5**	Go to **Step 3**

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Step	Action	Values	Yes	No
	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: • 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:	-	Go to **Step 5**	Go to **Step 4**

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Step	Action	Values	Yes	No
	1. Continue to operate the A/C system for an additional 5 minutes. 2. (RESET the **J-43600** Acr2000 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?			
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	Go to **Symptoms - HVAC Systems - Manual** or Go to **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	Left Center	Left Rear
13-18Â°C (55-65Â°F)	0-100%	234-303 kPa (34-44 psi)	1233-1522 kPa (179-221 psi)	14Â°C (57Â°F)	15Â°C (59Â°F)
19-24Â°C (66-75Â°F)	Below 40%	254-344 kPa (37-50 psi)	1302-1612 kPa (189-234 psi)	18Â°C (63Â°F)	18Â°C (64Â°F)
	Above 40%	261-358 kPa (38-52 psi)	1357-1667 kPa (197-242 psi)	18Â°C (64Â°F)	19Â°C (66Â°F)
25-29Â°C (76-85Â°F)	Below 35%	289-372 kPa (42-54 psi)	1488-1743 kPa (216-253 psi)	19Â°C (66Â°F)	20Â°C (68Â°F)
	35-50%	303-378 kPa (44-55 psi)	1522-1756 kPa (221-255 psi)	20Â°C 68Â°F)	22Â°C (70Â°F)
	Above 50%	303-399 kPa (44-58 psi)	1543-1791 kPa (224-260 psi)	23Â°C (72Â°F)	23Â°C (72Â°F)
30-35Â°C (86-95Â°F)	Below 30%	316-399 kPa (46-58 psi)	1639-1901 kPa (238-276 psi)	23Â°C (72Â°F)	23Â°C (73Â°F)
	30-50%	323-420 kPa (47-61 psi)	1646-1922 kPa (239-279 psi)	24Â°C (75Â°F)	24Â°C (75Â°F)
	Above 50%	337-440 kPa (49-64 psi)	1681-1942 kPa (244-282 psi)	27Â°C (79Â°F)	27Â°C (79Â°F)
36-41Â°C (96-105Â°F)	Below 20%	344-427 kPa (50-62 psi)	1812-2067 kPa (263-300 psi)	24Â°C (75Â°F)	27Â°C (79Â°F)

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Ambient Air Temperature	Relative Humidity	Service Port Pressure		Maximum Discharge Air Temperature	
		Low Side	High Side	Left Center	Left Rear
42-46Â°C (106-115Â°F)	20-40%	358-447 kPa (52-65 psi)	1812-2067 kPa (263-300 psi)	27Â°C (79Â°F)	28Â°C (81Â°F)
	Above 40%	372-468 kPa (54-68 psi)	1832-2080 kPa (266-302 psi)	28Â°C (82Â°F)	28Â°C (82Â°F)
	Below 20%	378-454 kPa (55-66 psi)	1977-2211 kPa (287-321 psi)	28Â°C (81Â°F)	28Â°C (82Â°F)
	Above 20%	385-482 kPa (56-70 psi)	1991-2211 kPa (289-321 psi)	29Â°C (84Â°F)	30Â°C (86Â°F)
47-49Â°C (116-120Â°F)	Below 30%	420-496 kPa (61-72 psi)	2129-2349 kPa (309-341 psi)	30Â°C (86Â°F)	30Â°C (86Â°F)

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

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A/C System Concern	Potential Causes
	Refrigerant Overcharge
	Restricted Condenser Air Flow
	Air in A/C System

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 - Manual** or Go to **Symptoms - HVAC Systems - Automatic**
2	1. Start the engine. 2. Allow the engine to idle. Does the engine reach a normal operating temperature?	Go to **Step 3**	Go to **Step 9**

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Step	Action	Yes	No
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**
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**	-

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Step	Action	Yes	No
7	1. Turn OFF the engine. 2. Backflush the heater core. 3. Start the engine. 4. Select the FLOOR mode. 5. Select the minimum blower speed. 6. Select the warmest temperature setting. 7. Feel the temperature of the inlet and outlet heater hoses at the heater core. 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**

DEFROSTING INSUFFICIENT

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Manual** or 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**	Go to **Step 11**	Go to **Step 5**

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Step	Action	Yes	No
	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?		
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 or to **Air Conditioning Compressor Malfunction** for the manual 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)Air Conditioning (A/C) System Performance Test (R-1234yf)**. Is the A/C system operating within the specifications?	Go to **Step 9**	Go to **Step 12**
8	Repair the low engine temperature concern. Refer to **Engine Fails To Reach Normal Operating Temperature** . 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)Air Conditioning (A/C) System Performance Test (R-1234yf)**. 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	Go to **Step 2**	Go to **Symptoms -**

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Step	Action	Yes	No
	diagnostic table?		**HVAC Systems - Manual** or 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. 4. Cycle the blower motor through all of the speeds and modes in order to determine where and when the noise occurs. Is a noise evident during the blower operation?	Go to **Step 4**	Go to **Step 11**
4	Inspect for excessive vibration at each blower motor speed by feeling the blower case. Is excess vibration present?	Go to **Step 6**	Go to **Step 5**
5	Listen to the blower motor at each speed. Is the blower motor making a squeaking or chirping noise?	Go to **Step 9**	Go to **Step 11**
6	1. Remove the blower motor. Refer to **Blower Assembly Replacement**. 2. Inspect the blower motor impeller for deposits of foreign material. 3. Inspect the blower motor for deposits of foreign material. Did you find any foreign material on the blower motor or blower motor impeller?	Go to **Step 8**	Go to **Step 7**
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 Replacement**. Is the repair complete?	Go to **Step 11**	-
10	Install the blower motor. Refer to **Blower Assembly Replacement**.	Go to **Step 11**	-

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Step	Action	Yes	No
	Is the action complete?		
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, always inspect the condition of the refrigerant oil and take the appropriate corrective action before installing the replacement**	

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Condition	Corrective Action
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. • 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**	Go to **Symptoms - HVAC Systems - Manual** or

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Step	Action	Yes	No
			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**
4	Inspect the drive belt tension. **Drive Belt Tensioner Diagnosis (L83, L86)** **Drive Belt Tensioner Diagnosis (L8B)** . 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.	Go to **Step 21**	Go to **Step 13**

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Step	Action	Yes	No
	Are any of the A/C components grounding out and causing a noise?		
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**
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 (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 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 (L8B) Air Conditioning Compressor Belt Replacement (L83, L86)** . 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 (LV3)Air Conditioning Clutch Assembly Replacement (L83, L86)Air Conditioning Clutch Assembly Replacement (L96, LC8)**. Is the replacement complete?	Go to **Step 25**	-
23	Replace the A/C compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement**	Go to **Step 25**	-

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Step	Action	Yes	No
	(L8B)Air Conditioning Compressor Replacement (L5P). Is the replacement complete?		
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**

NOISE DIAGNOSIS - HVAC MODULE

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

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Step	Action	Yes	No
8	Inspect the mode and temperature doors and seals for warping or cracking. Are the doors in normal condition?	Go to **Step 11**	Go to **Step 9**
9	Replace the appropriate door and/or seals. Is the repair complete?	Go to **Step 11**	-
10	Remove any obstructions or foreign material found. Is the action complete?	Go to **Step 11**	-
11	Install the I/P carrier. Refer to **Instrument Carrier Replacement** . 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 - Manual** or 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**
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**

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Step	Action	Yes	No
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 (L8B, L83, L86)** **Loss of Coolant (LV3)** **Loss of Coolant (LC8, L96)** **Loss of Coolant (L5P)** . 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 4.3L engine or **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**	-
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:

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- 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:
    - 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 (R-134A)

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**

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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 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

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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 Polyolester (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.

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 (R-1234YF)

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 .

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

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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 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.**

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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 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**.

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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 air conditioning oil
- Desiccant, following a desiccant bag failure
- Overcharge of air conditioning oil
- Refrigerant contamination

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

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)**
2. Remove the front air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
3. Install the J 45268-115 in place of the thermal expansion valve.
4. Remove the air conditioning compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**
5. Install J 45268-10 to the discharge hose.
6. Install J 45268-10 to the suction hose.

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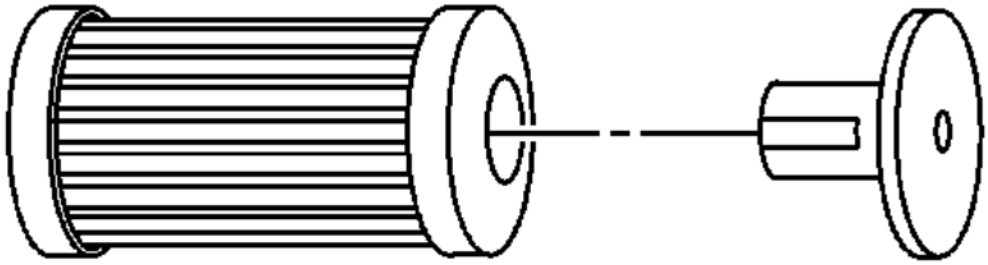


Fig. 1: View Of A/C Filter & Check Valve
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Forward flow refrigerant flushing is recommended for contaminated refrigerant or air conditioning 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 45268-10.
    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 the discharge port of J 45268-10 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**

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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 45268-10.
    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 45268-10 flush adapter.

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

9. Flush the front air conditioning 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.**

10. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Remove J 45268-115 from the front evaporator.
    2. Inspect the front air conditioning evaporator thermal expansion valve for debris. Clean or replace as needed
    3. Install the front air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
    4. Install J 45268-115 in place of the auxiliary air conditioning evaporator thermal expansion valve.
11. Flush the auxiliary air conditioning system by following the instructions supplied with the GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine.
12. Remove J 45268-10 from the discharge hose.
13. Remove J 45268-10 from the suction hose.

NOTE: **Flushing will remove all the air conditioning oil from the air conditioning system. The air conditioning system must be replenished with the correct amount of air conditioning oil.**

14. If the removed air conditioning compressor is being reinstalled, perform the following procedure:

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

    1. Drain the air conditioning oil from the air conditioning compressor.

CAUTION: **Refer to Correct Refrigerant Lubricant Caution .**

    2. Add the total system capacity of air conditioning oil to the air conditioning compressor. **Approximate Fluid Capacities**
15. Refill the air conditioning system with the proper amount of air conditioning oil. **Approximate Fluid Capacities**

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16. If the removed air conditioning compressor is being reinstalled, perform the following procedure:
    1. Drain the air conditioning oil from the air conditioning compressor.

       CAUTION: Refer to Correct Refrigerant Lubricant Caution .

    2. Add the total system capacity of air conditioning oil to the air conditioning compressor. **Approximate Fluid Capacities**
17. If you will replace the air conditioning compressor after flushing the system, perform the following procedure:
    1. DO NOT drain the new air conditioning oil from the compressor.
    2. Deduct the amount of air conditioning oil shipped with the service compressor from the amount of air conditioning oil listed in the approximate fluid capacities table. **Approximate Fluid Capacities**

CAUTION: Refer to Correct Refrigerant Lubricant Caution .

18. Add the calculated amount to the compressor, as needed.

NOTE: GE-41447-a leak detection dye is for PAG oil only.

19. Add one bottle of J 41447-a leak detection dye directly to the air conditioning compressor.
20. Install the air conditioning compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**
21. Replace the air conditioning receiver and dehydrator. **Receiver and Dehydrator Replacement (L83, L86, LV3)Receiver and Dehydrator Replacement (L5P)**
22. Remove J 45268-115.
23. Install the auxiliary air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
24. Evacuate and recharge the air conditioning system. **Refrigerant Recovery and Recharging (R-134a)**.
25. 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 air conditioning oil
- Desiccant, following a desiccant bag failure

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- Overcharge of air conditioning oil
- Refrigerant contamination

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

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-1234yf)**
2. Remove the front air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
3. Install the J 45268-151 in place of the thermal expansion valve.
4. Remove the air conditioning compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**
5. Install J 45268-10 to the discharge hose.
6. Install J 45268-10 to the suction hose.

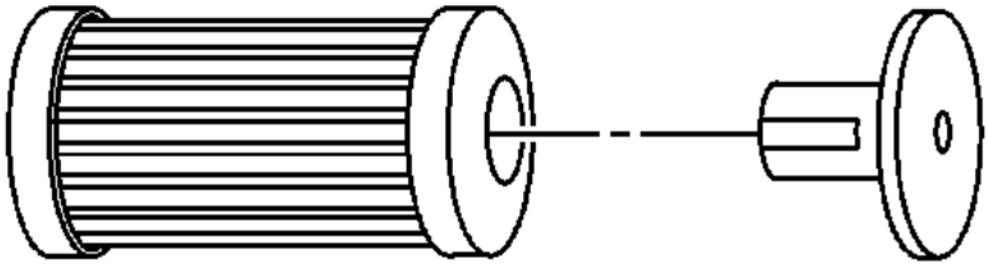


Fig. 2: View Of A/C Filter & Check Valve
Courtesy of GENERAL MOTORS COMPANY

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NOTE: **Forward flow refrigerant flushing is recommended for contaminated refrigerant or air conditioning 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 45268-10.
    2. Connect the blue hose from GE-50300 Air Conditioning Service Center for HFO1234-yf to the J 45268-1 flush filter adapter.
    3. Connect the red hose from GE-50300 Air Conditioning Service Center for HFO1234-yf to the J 45268-10 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 45268-10.
    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 45268-10 flush adapter.

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

9. Flush the front air conditioning 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.**

10. Service the filter with ACDelco P/N GF 470 before each flush.
    1. Remove J 45268-115 from the front evaporator.
    2. Inspect the front air conditioning evaporator thermal expansion valve for debris. Clean or replace as needed
    3. Install the front air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
    4. Install J 45268-115 in place of the auxiliary air conditioning evaporator thermal expansion valve.
11. Flush the auxiliary air conditioning system by following the instructions supplied with the GE-50300 Air Conditioning Service Center for HFO1234-yf.
12. Remove J 45268-10 from the discharge hose.
13. Remove J 45268-10 from the suction hose.

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NOTE: **Flushing will remove all the air conditioning oil from the air conditioning system. The air conditioning system must be replenished with the correct amount of air conditioning oil.**

14. If the removed air conditioning compressor is being reinstalled, perform the following procedure:

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

    1. Drain the air conditioning oil from the air conditioning compressor.

       CAUTION: **Refer to Correct Refrigerant Lubricant Caution .**

    2. Add the total system capacity of air conditioning oil to the air conditioning compressor. **Approximate Fluid Capacities**

15. Refill the air conditioning system with the proper amount of air conditioning oil. **Approximate Fluid Capacities**
16. If the removed air conditioning compressor is being reinstalled, perform the following procedure:
    1. Drain the air conditioning oil from the air conditioning compressor.

       CAUTION: **Refer to Correct Refrigerant Lubricant Caution .**

    2. Add the total system capacity of air conditioning oil to the air conditioning compressor. **Approximate Fluid Capacities**
17. If you will replace the air conditioning compressor after flushing the system, perform the following procedure:
    1. DO NOT drain the new air conditioning oil from the compressor.
    2. Deduct the amount of air conditioning oil shipped with the service compressor from the amount of air conditioning oil listed in the approximate fluid capacities table. **Approximate Fluid Capacities**

CAUTION: **Refer to Correct Refrigerant Lubricant Caution .**

18. Add the calculated amount to the compressor, as needed.

    NOTE: **GE-41447-a leak detection dye is for PAG oil only.**

19. Add one bottle of GE-41447-a leak detection dye directly to the air conditioning compressor.
20. Install the air conditioning compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**
21. Replace the air conditioning receiver and dehydrator. **Receiver and Dehydrator Replacement (L83, L86, LV3)Receiver and Dehydrator Replacement (L5P)**
22. Remove J 45268-115.
23. Install the auxiliary air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
24. Evacuate and recharge the air conditioning system. **Refrigerant Recovery and Recharging (R-1234yf)**.

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25. Leak test the fittings using **GE-50078** Electronic Leak Detector..

FLUSHING (HYBRID)

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

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

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
2. Remove the front air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
3. Install the J 45268-115 in place of the thermal expansion valve.
4. Remove the air conditioning compressor. **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**
5. Install J45268-10 to the suction and discharge hose.

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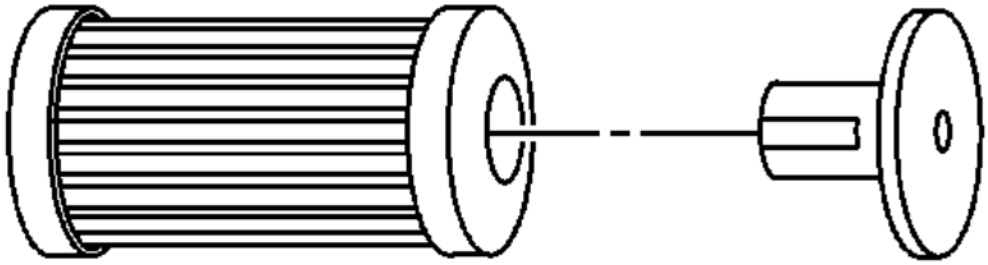


Fig. 3: View Of A/C Filter & Check Valve
Courtesy of GENERAL MOTORS COMPANY

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.**

6. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the suction port of J 45268-10.
    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 the discharge port of J 45268-10 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**

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valve from the filter.

7. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Connect J 45268-1 to the discharge port of J 45268-10.
    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 45268-10 flush adapter.

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

8. 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.**

9. Service the filter with ACDelco P/N GF 470, before each flush.
    1. Remove J 45268-115 from the front evaporator.
    2. Inspect the front TXV for debris. Clean or replace as needed
    3. Install the front TXV. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
    4. Install J 45268-115 in place of the auxiliary TXV.
10. Flush the auxiliary air conditioning system by following the instructions supplied with the GE 48800 Cool Tech Refrigerant Recovery/Recharge Machine.
11. Remove J 45268-10 from the discharge hose.

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

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

12. If the removed A/C compressor is being reinstalled, perform the following procedure:
    1. Drain the POE oil from the A/C compressor.
    2. Add the total system capacity of POE oil to the A/C compressor. **Approximate Fluid Capacities**

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

13. Refill the air conditioning system with the proper amount of air conditioning oil. **Approximate Fluid Capacities**
14. 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. **Approximate Fluid Capacities**

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15. 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. **Approximate Fluid Capacities**
16. Add the calculated amount to the compressor, as needed.
17. Install the air conditioning compressor. **Air Conditioning Compressor Replacement (L8B)**
18. Replace the air conditioning receiver and dehydrator. **Receiver and Dehydrator Replacement (L83, L86, LV3)**
19. Remove J-45268-115 or 121.
20. Install the auxiliary air conditioning evaporator thermal expansion valve. **Air Conditioning Evaporator Thermal Expansion Valve Replacement**
21. Evacuate and recharge the A/C system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
22. 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 (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**.
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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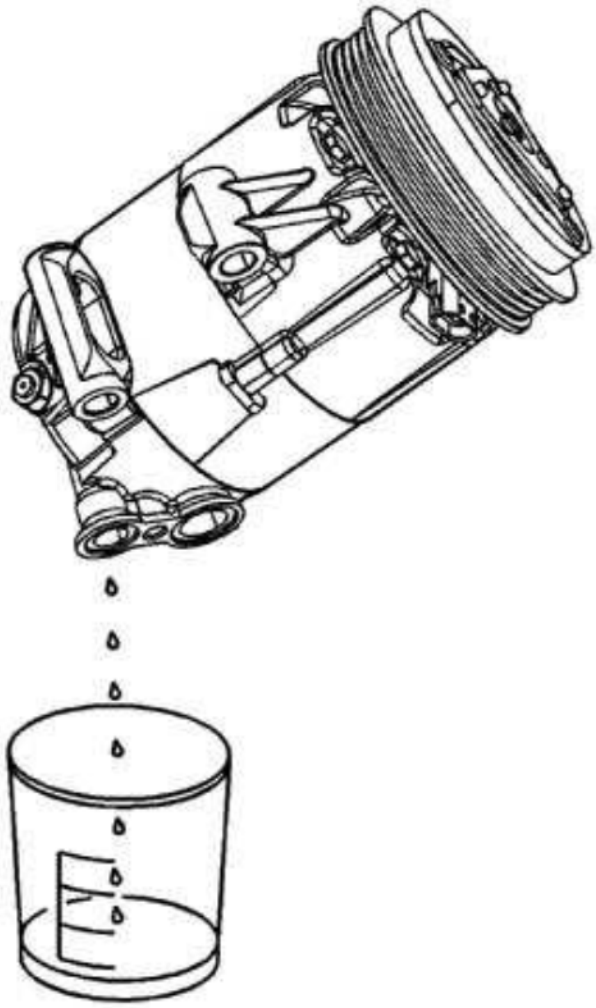


Fig. 4: Measuring Oil Drained From Removed Compressor
Courtesy of GENERAL MOTORS COMPANY

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.

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.

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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.

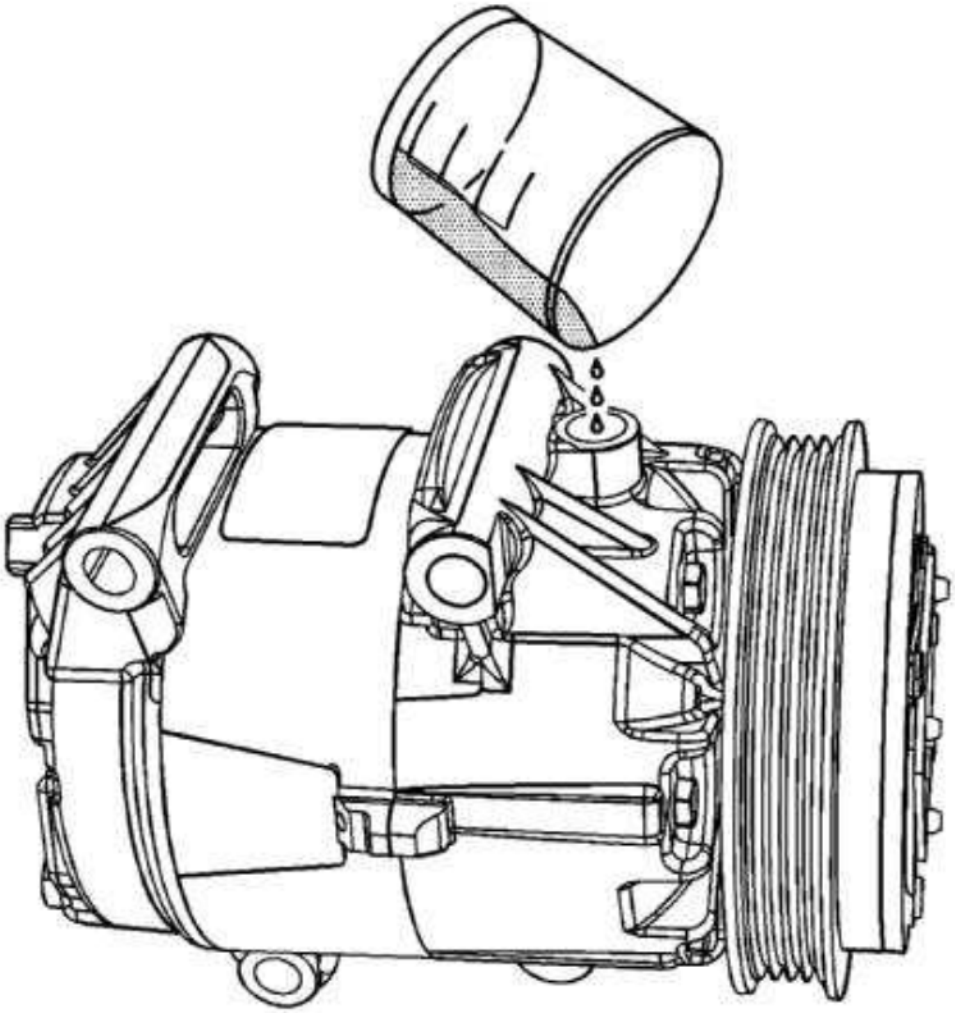


Fig. 5: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

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.
   - 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.

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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)Flushing (Hybrid)**.
2. Remove the A/C compressor from the vehicle. Refer to **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**.

   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.

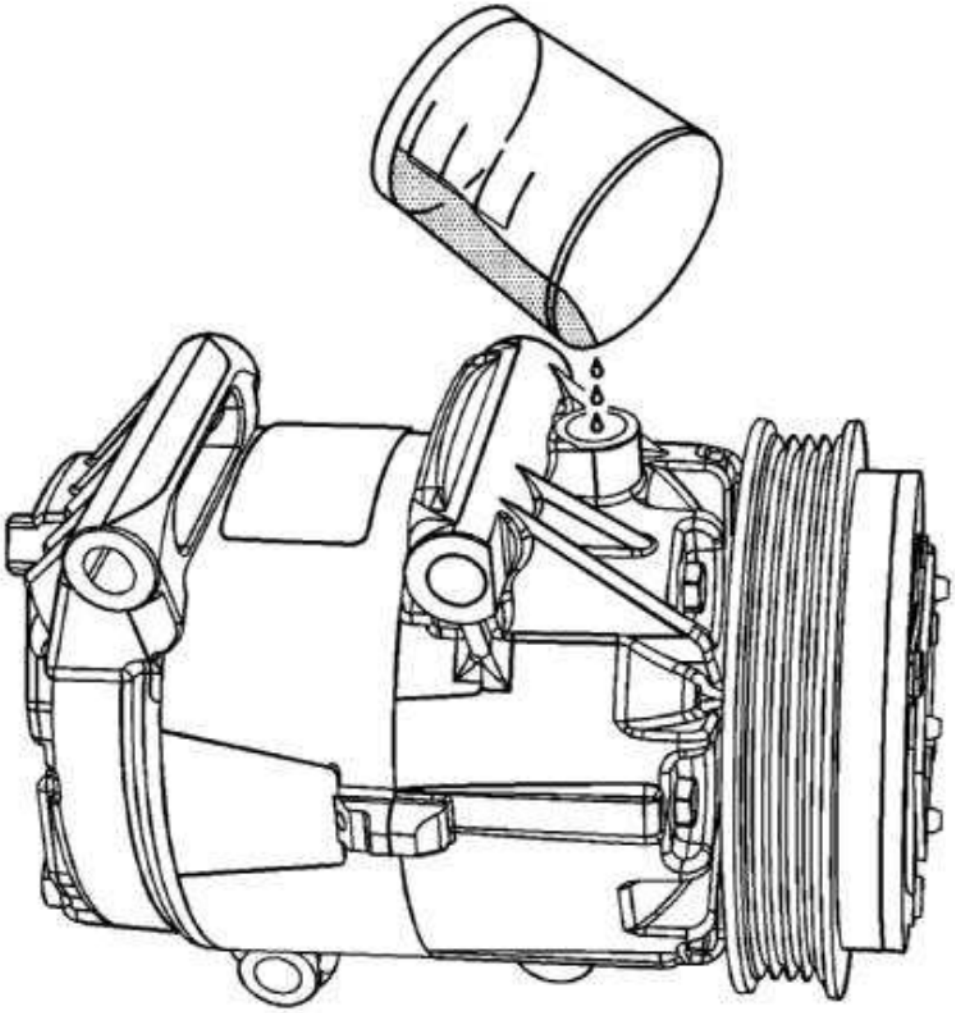


Fig. 6: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

3. Before installing the compressor, deduct the amount of oil shipped with the compressor 40 ml (1.4 oz)

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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)

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)Flushing (Hybrid)**.
2. Remove the A/C compressor from the vehicle. Refer to **Air Conditioning Compressor Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**.

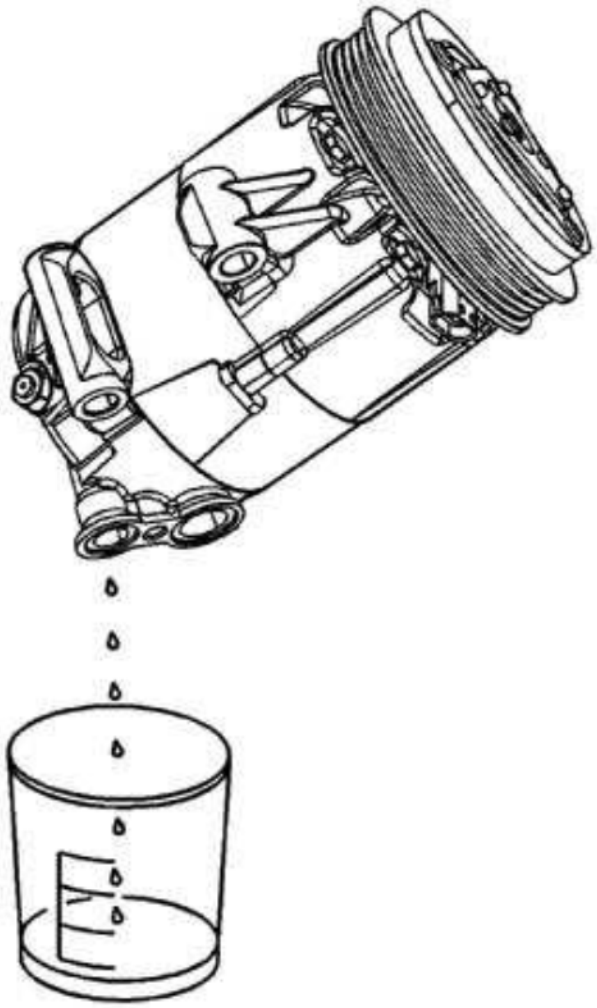


Fig. 7: Measuring Oil Drained From Removed Compressor
Courtesy of GENERAL MOTORS COMPANY

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

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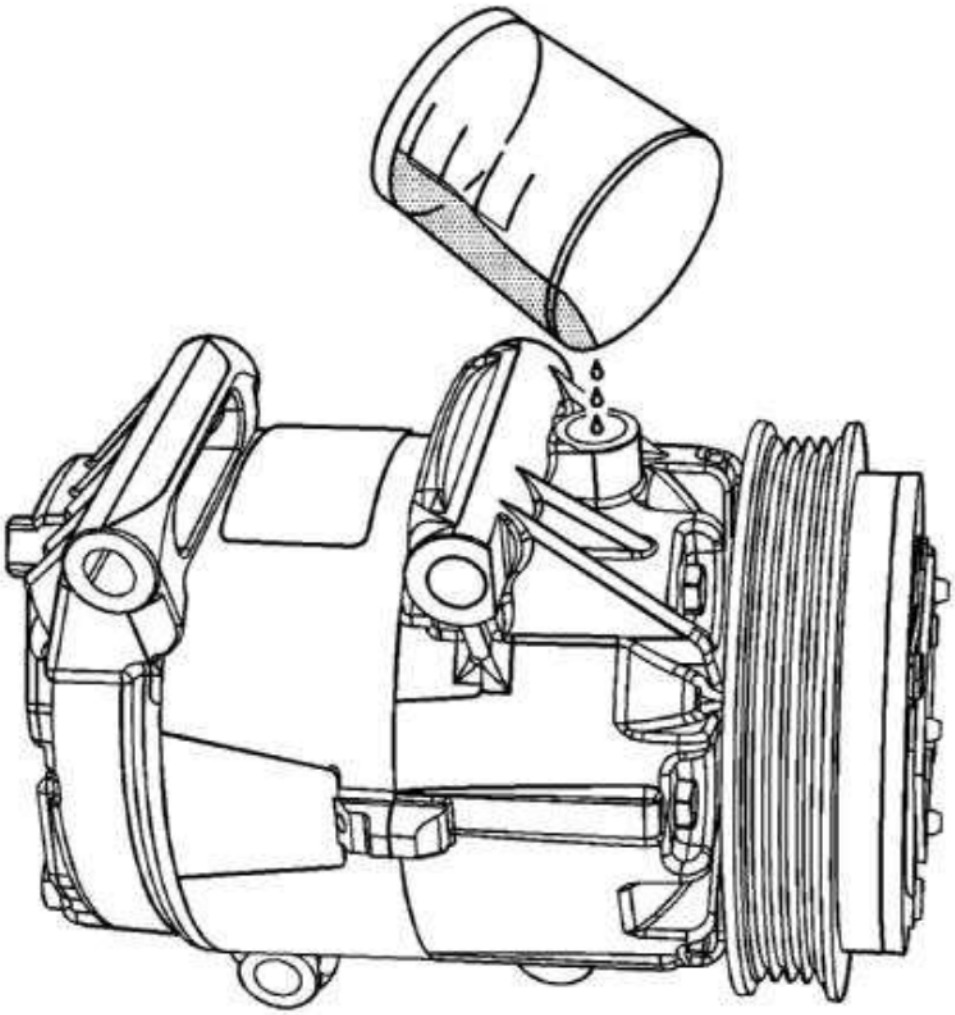


Fig. 8: Adding Measured Oil To Compressor
Courtesy of GENERAL MOTORS COMPANY

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

AIR CONDITIONING COMPRESSOR REPLACEMENT (LV3)

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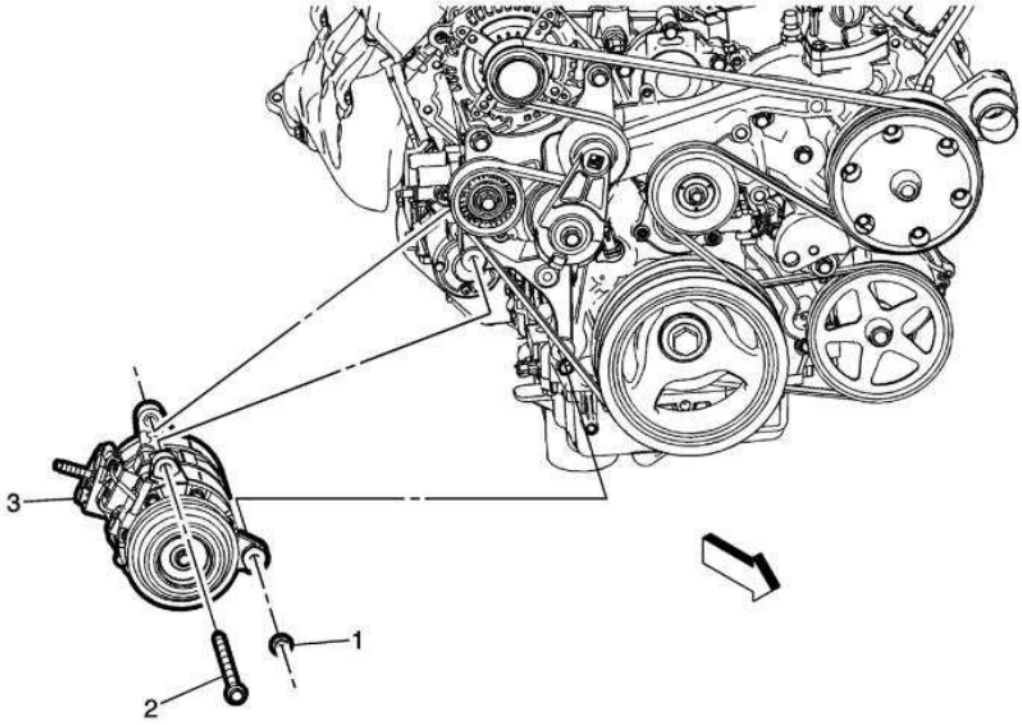


Fig. 9: Air Conditioning Compressor (LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Remove the steering gear skid shield if equipped. 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 from the air conditioning compressor. Refer to **Air Conditioning Compressor Hose Replacement (LV3)Air Conditioning Compressor Hose Replacement (L96, LC8)Air Conditioning Compressor Hose Replacement (L8B)Air Conditioning Compressor Hose Replacement (L5P)Air Conditioning Compressor Hose Replacement (L83, L86)** .	
1	Air Conditioning Compressor Nut **CAUTION:** **Refer to** **Fastener Caution** . **Tighten**

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Callout	Component Name
	22 N.m (16 lb ft)
2	Air Conditioning Compressor Bolt **CAUTION:** **Refer to** Fastener Caution . **Tighten** 22 N.m (16 lb ft)
3	Air Conditioning Compressor **Procedure** 1. Disconnect electrical connector from the air conditioning (A/C) clutch coil. 2. Remove and discard old sealing washers and replace with NEW sealing washers. Refer to **Air Conditioning System Seal Replacement**. 3. When replacing the air conditioning compressor, balance compressor oil. Refer to **Air Conditioning Compressor Oil Balancing**.

AIR CONDITIONING COMPRESSOR REPLACEMENT (L83, L86)

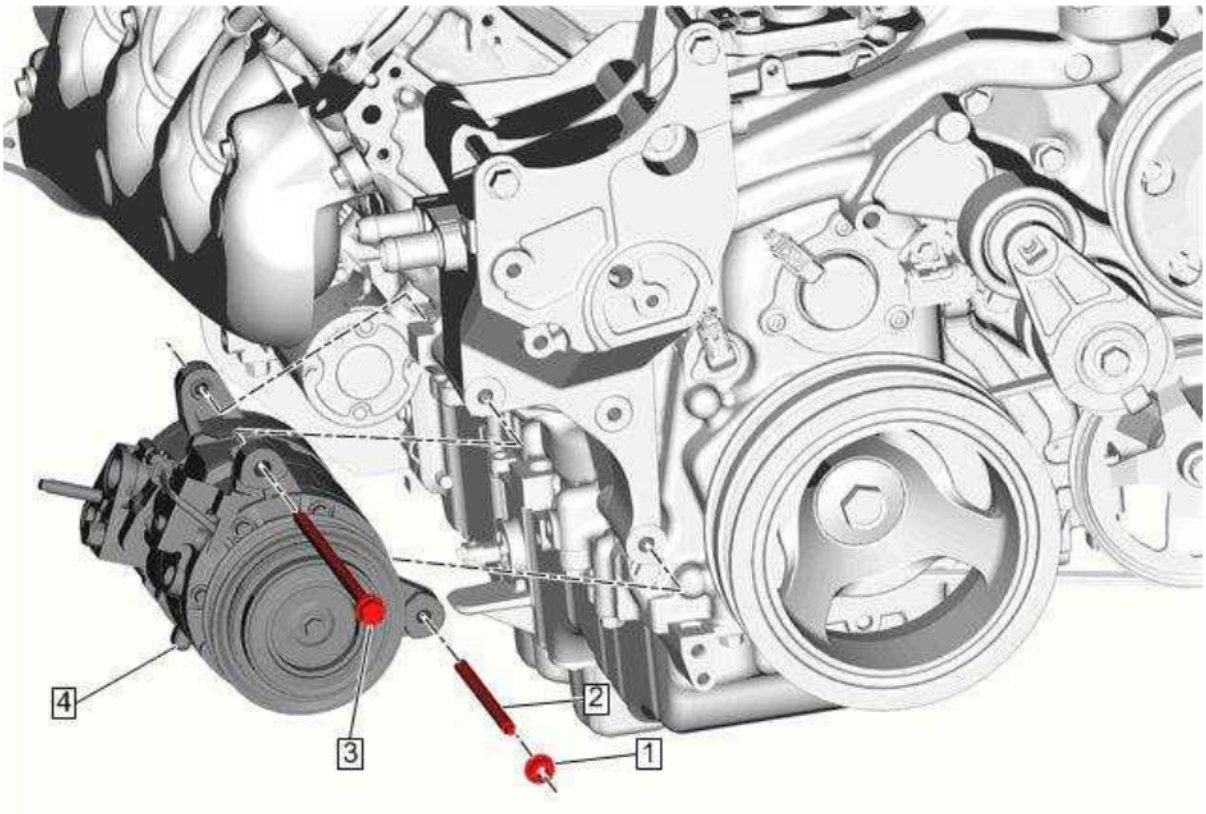


Fig. 10: Air Conditioning Compressor (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedures 1. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)** 2. **Steering Gear Skid Shield Replacement** 3. **Air Conditioning Compressor Belt Replacement (L8B) Air Conditioning Compressor Belt Replacement (L83, L86)** 4. Air Conditioning Compressor Hose@Air Conditioning Compressor - Remove **Air Conditioning Compressor Hose Replacement (LV3)Air Conditioning Compressor Hose Replacement (L96, LC8)Air Conditioning Compressor Hose Replacement (L8B)Air Conditioning Compressor Hose Replacement (L5P)Air Conditioning Compressor Hose Replacement (L83, L86)**	
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. **Air Conditioning Compressor Oil Balancing**

AIR CONDITIONING COMPRESSOR REPLACEMENT (L96, LC8)

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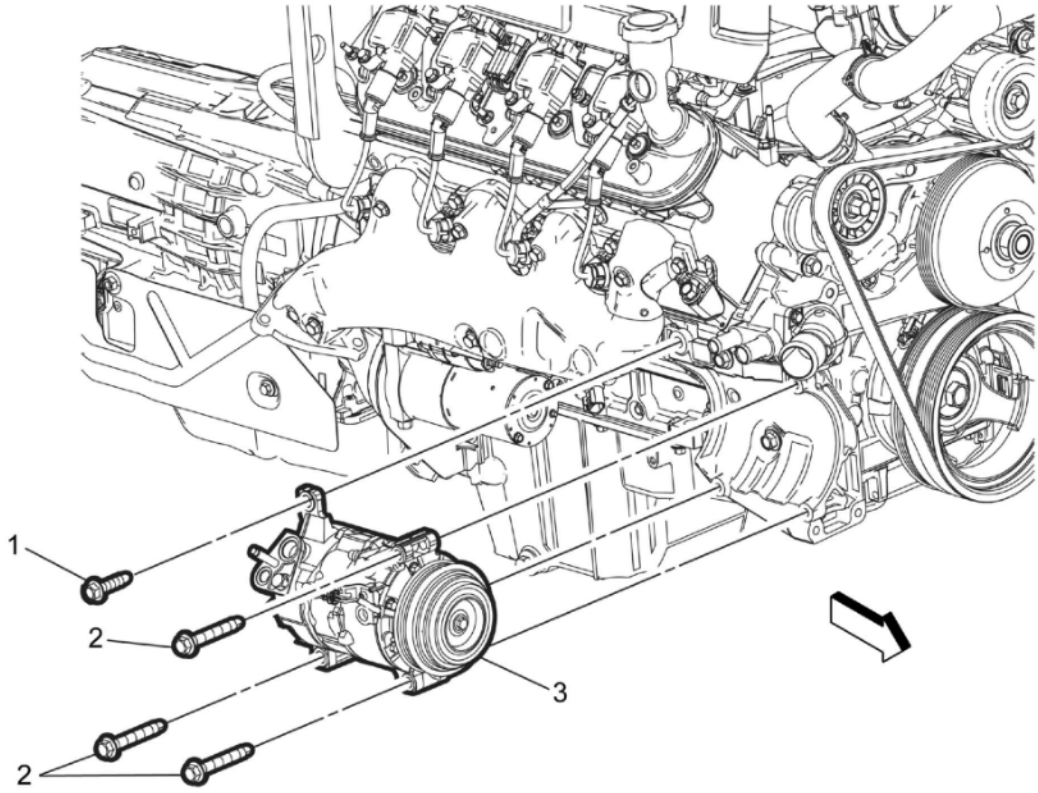


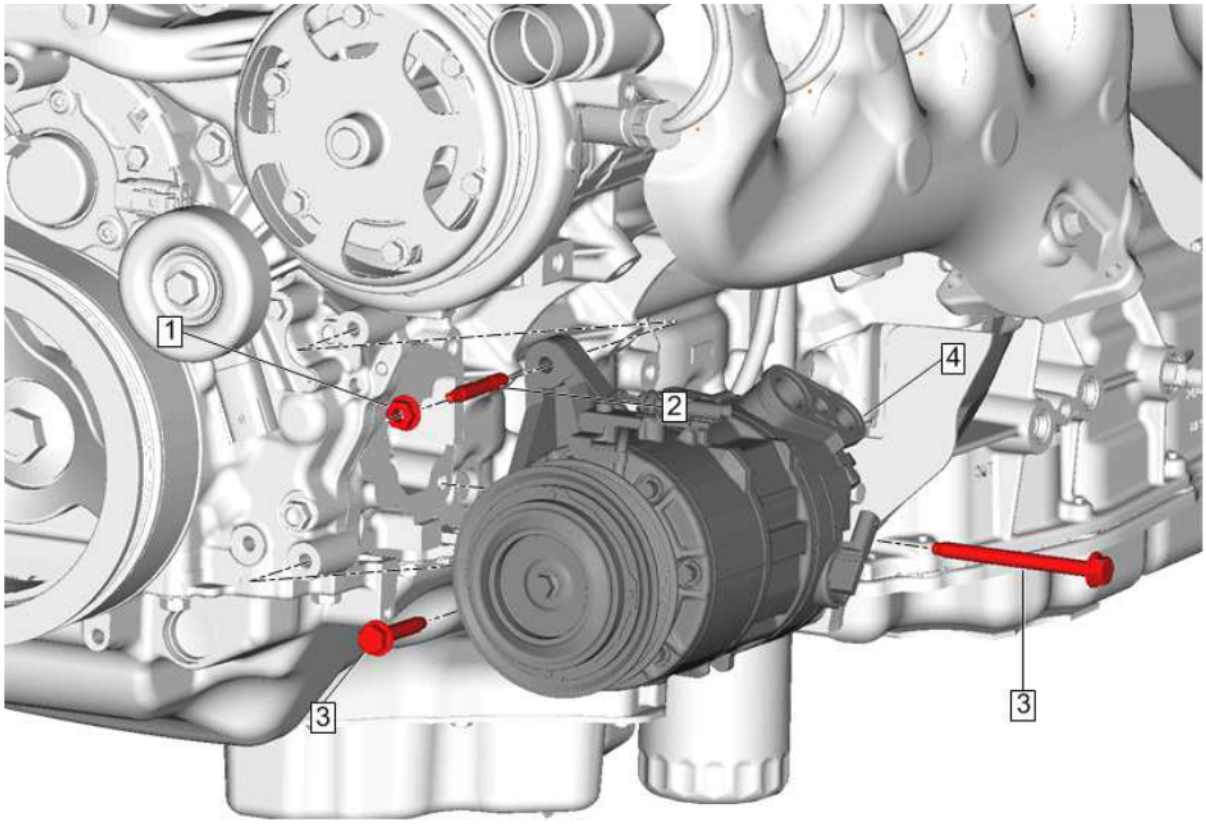
Fig. 11: Air Conditioning Compressor (L96, LC8)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement (L8B) Air Conditioning Compressor Belt Replacement (L83, L86)** . 3. Remove air conditioning compressor hose from the air conditioning compressor and position out of the way. Refer to **Air Conditioning Compressor Hose Replacement (LV3)Air Conditioning Compressor Hose Replacement (L96, LC8)Air Conditioning Compressor Hose Replacement (L8B)Air Conditioning Compressor Hose Replacement (L5P)Air Conditioning Compressor Hose Replacement (L83, L86)** .	
1	Air Conditioning Compressor Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 50 N.m (37 lb ft)

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Callout	Component Name
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 COMPRESSOR REPLACEMENT (L8B)



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Fig. 12: Air Conditioning Compressor (L8B)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)** 2. **Steering Gear Skid Shield Replacement** 3. **Air Conditioning Compressor Belt Replacement (L8B) Air Conditioning Compressor Belt Replacement (L83, L86)** 4. Air Conditioning Compressor Hose@Air Conditioning Compressor - Remove **Air Conditioning Compressor Hose Replacement (LV3)Air Conditioning Compressor Hose Replacement (L96, LC8)Air Conditioning Compressor Hose Replacement (L8B)Air Conditioning Compressor Hose Replacement (L5P)Air Conditioning Compressor Hose Replacement (L83, L86)**	
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. **Air Conditioning Compressor Oil Balancing** 3. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING COMPRESSOR REPLACEMENT (L5P)

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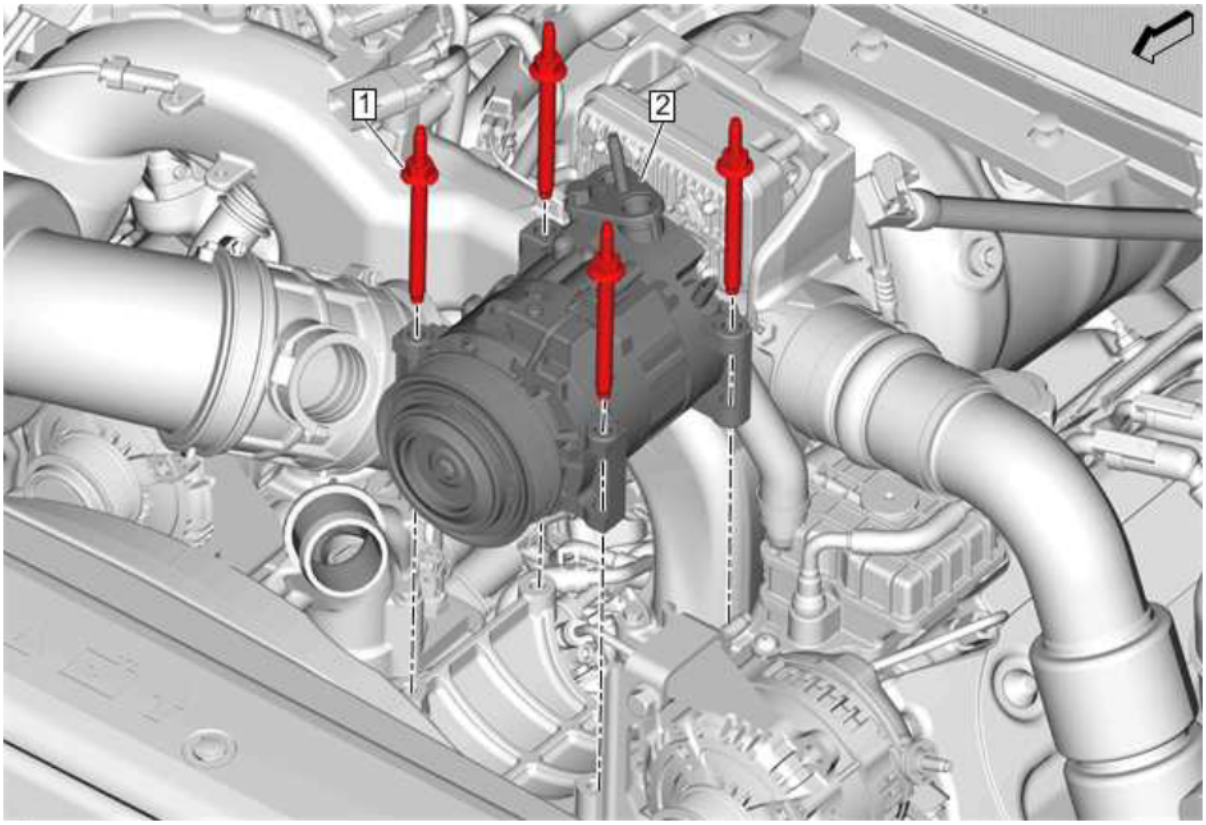


Fig. 13: Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Air Conditioning Compressor Hose@Air Conditioning Compressor - Remove - **Air Conditioning Compressor Hose Replacement (LV3)Air Conditioning Compressor Hose Replacement (L96, LC8)Air Conditioning Compressor Hose Replacement (L8B)Air Conditioning Compressor Hose Replacement (L5P)Air Conditioning Compressor Hose Replacement (L83, L86)** 2. **Intake Manifold Bracket Replacement** 3. Drive Belt@Air Conditioning Compressor - Remove - **Drive Belt Replacement (Dual Generators)** **Drive Belt Replacement (Single Generator)** 4. Disconnect all electrical connectors.	
1	Air Conditioning Compressor Bolt **CAUTION:** **Fastener Caution** . **Tighten** 58 N.m (43 lb ft)
2	Air Conditioning Compressor **Procedure**

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Callout	Component Name
	1. When replacing the air conditioning compressor, balance compressor oil. **Air Conditioning Compressor Oil Balancing**.

AIR CONDITIONING CLUTCH ASSEMBLY REPLACEMENT (LV3)

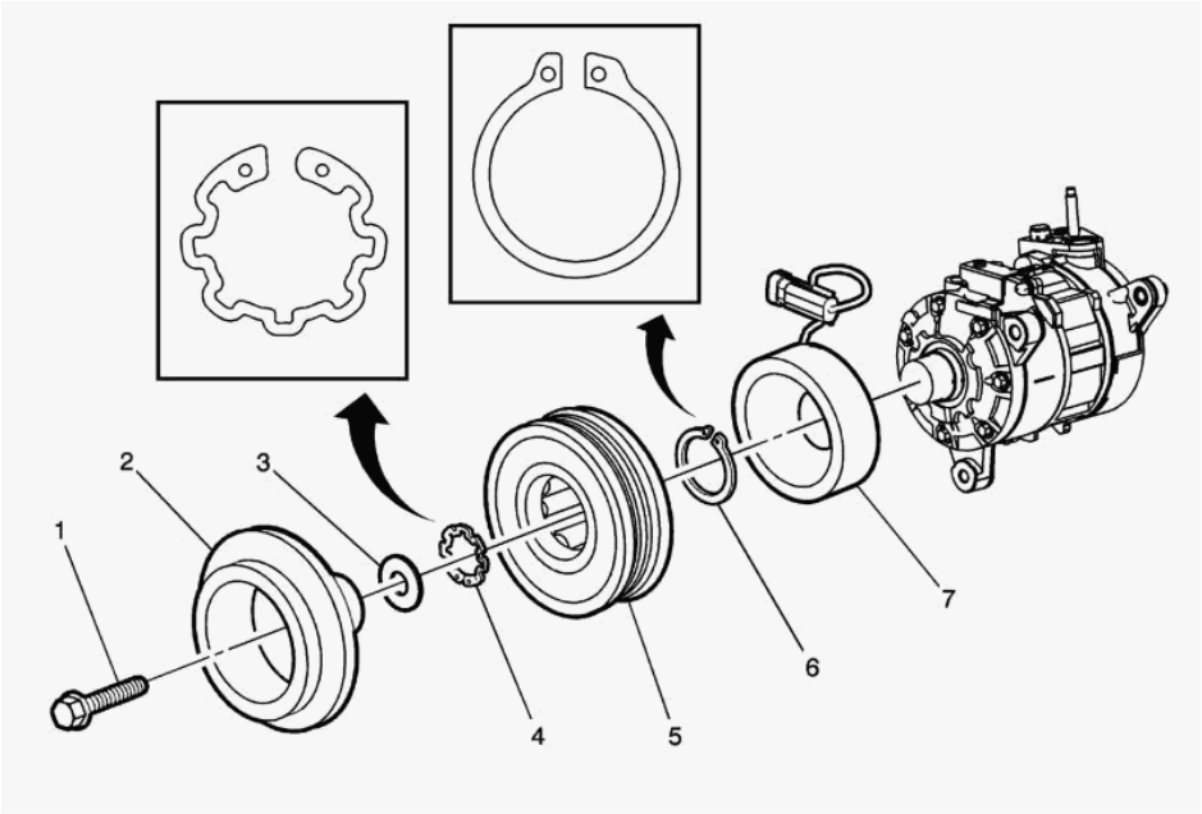


Fig. 14: Air Conditioning Clutch Assembly Replacement (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

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 (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P)**. 3. Disconnect the electrical connector from the air conditioning compressor.

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Callout	Component Name
1	Air Conditioning Compressor Pulley Bolt **CAUTION:** **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 (L83, L86)

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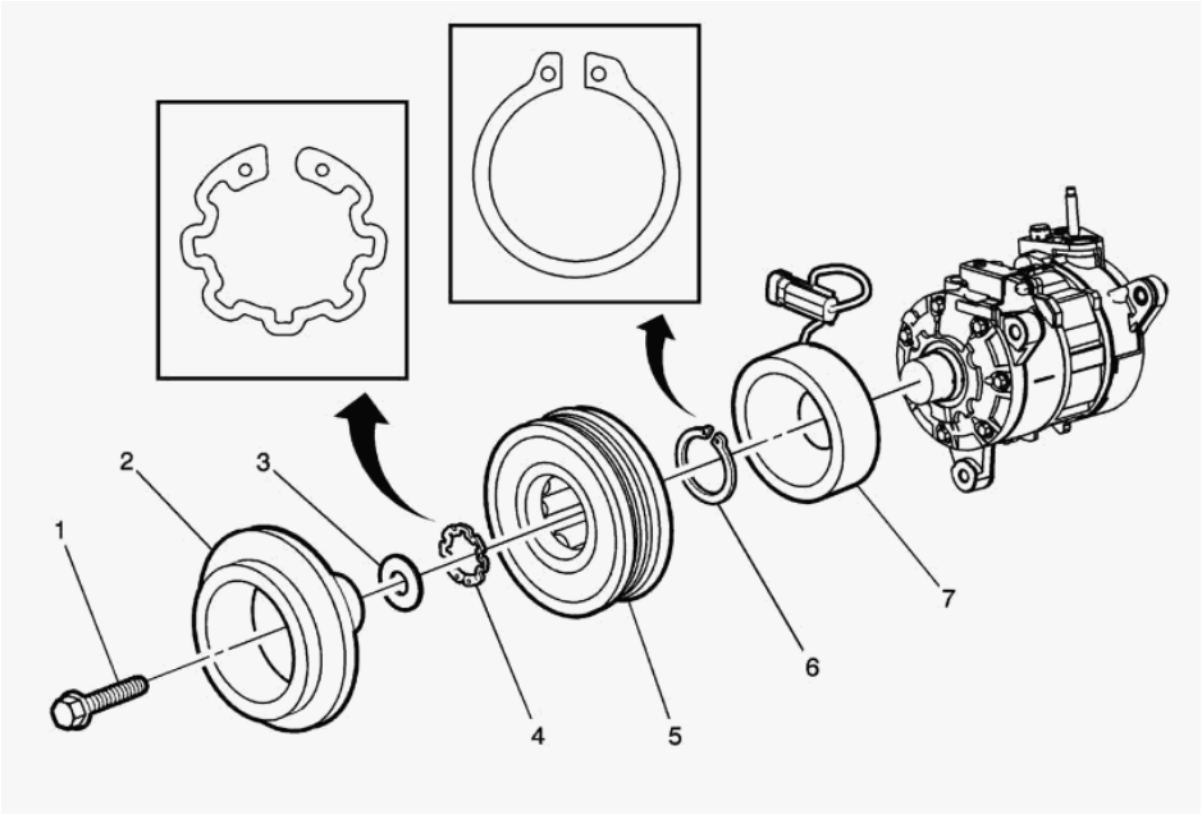


Fig. 15: Air Conditioning Clutch Assembly Replacement (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement (L8B)** **Air Conditioning Compressor Belt Replacement (L83, L86)** . 2. Remove the air conditioning compressor if necessary. Refer to **Air Conditioning Compressor Replacement (LV3)** **Air Conditioning Compressor Replacement (L83, L86)** **Air Conditioning Compressor Replacement (L96, LC8)** **Air Conditioning Compressor Replacement (L8B)** **Air Conditioning Compressor Replacement (L5P)**. 3. Disconnect the electrical connector from the air conditioning compressor.	
1	Air Conditioning Compressor Pulley Bolt **CAUTION:** **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.

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Callout	Component Name
	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, LC8)

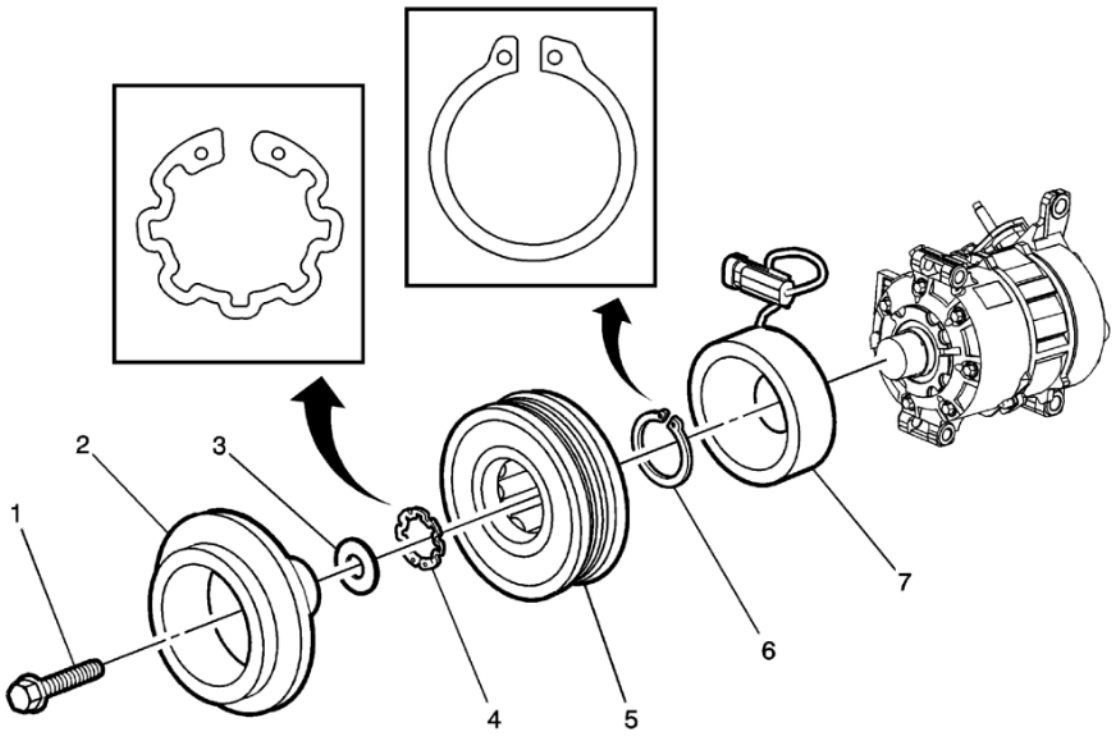


Fig. 16: Air Conditioning Clutch Assembly Replacement (L96, LC8)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the air conditioning compressor belt. Refer to **Air Conditioning Compressor Belt Replacement (L8B)** **Air Conditioning Compressor Belt Replacement (L83, L86)** . 2. Remove the air conditioning compressor if necessary. Refer to **Air Conditioning Compressor**	

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Callout	Component Name
	Replacement (LV3)Air Conditioning Compressor Replacement (L83, L86)Air Conditioning Compressor Replacement (L96, LC8)Air Conditioning Compressor Replacement (L8B)Air Conditioning Compressor Replacement (L5P). 3. Disconnect the electrical connector from the air conditioning compressor.
1	Air Conditioning Compressor Pulley Bolt **CAUTION:** **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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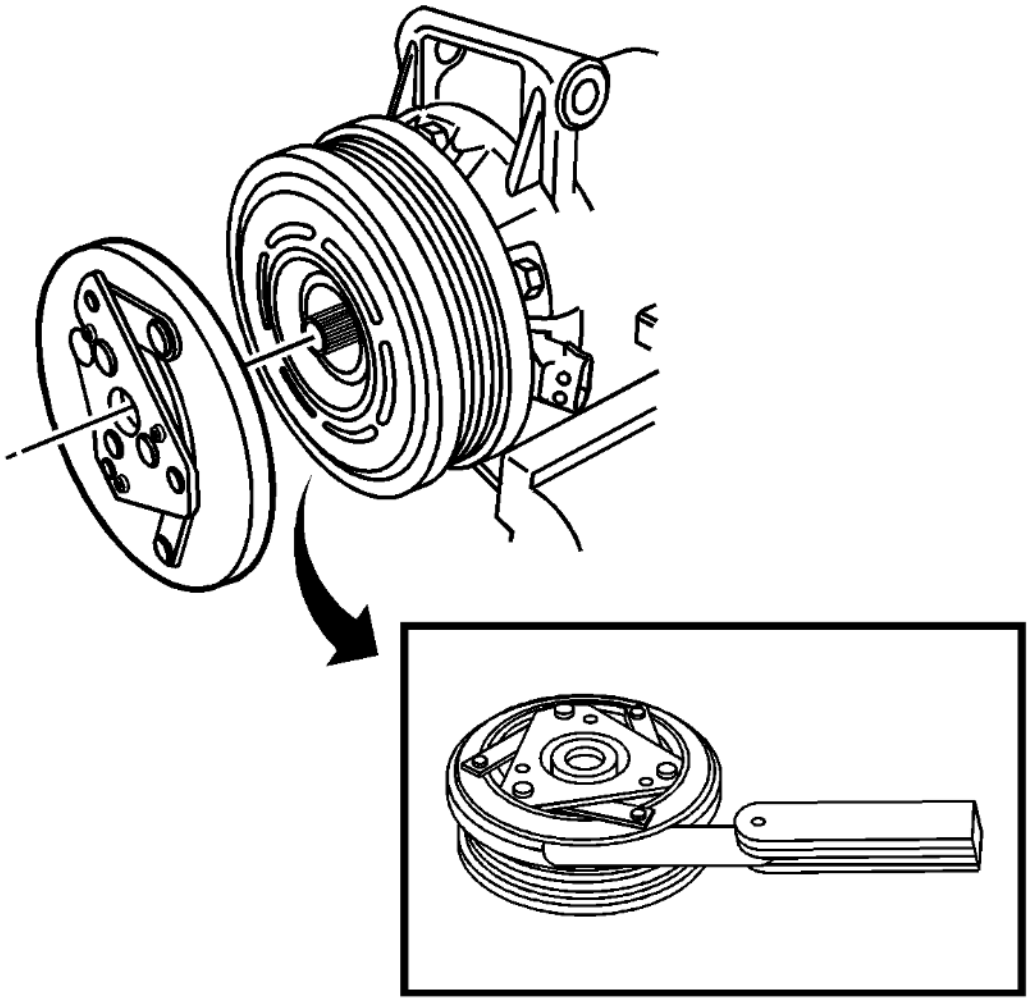


Fig. 17: Air Conditioning Clutch Drive Plate Adjustment
Courtesy of GENERAL MOTORS COMPANY

1. Install the clutch plate assembly. Refer to Air Conditioning Clutch Assembly Replacement (LV3)Air Conditioning Clutch Assembly Replacement (L83, L86)Air Conditioning Clutch Assembly Replacement (L96, LC8).

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

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, LC8)

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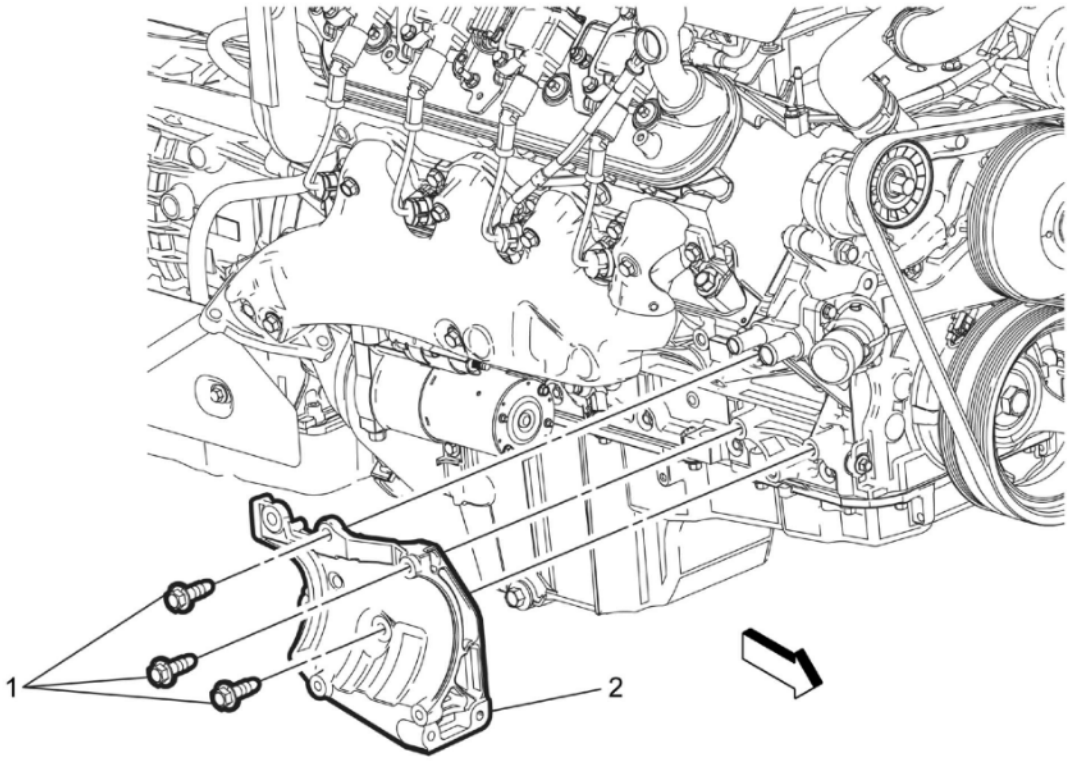


Fig. 18: Air Conditioning Compressor Bracket (L96, LC8)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Remove air conditioning compressor. Refer to **Air Conditioning Compressor Replacement (L96, LC8)**.	
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 COMPRESSOR BRACKET REPLACEMENT (L5P)

Removal Procedure

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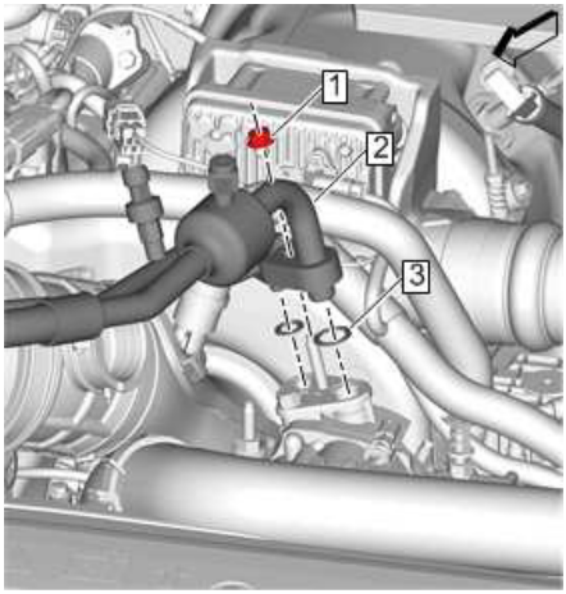


Fig. 19: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**

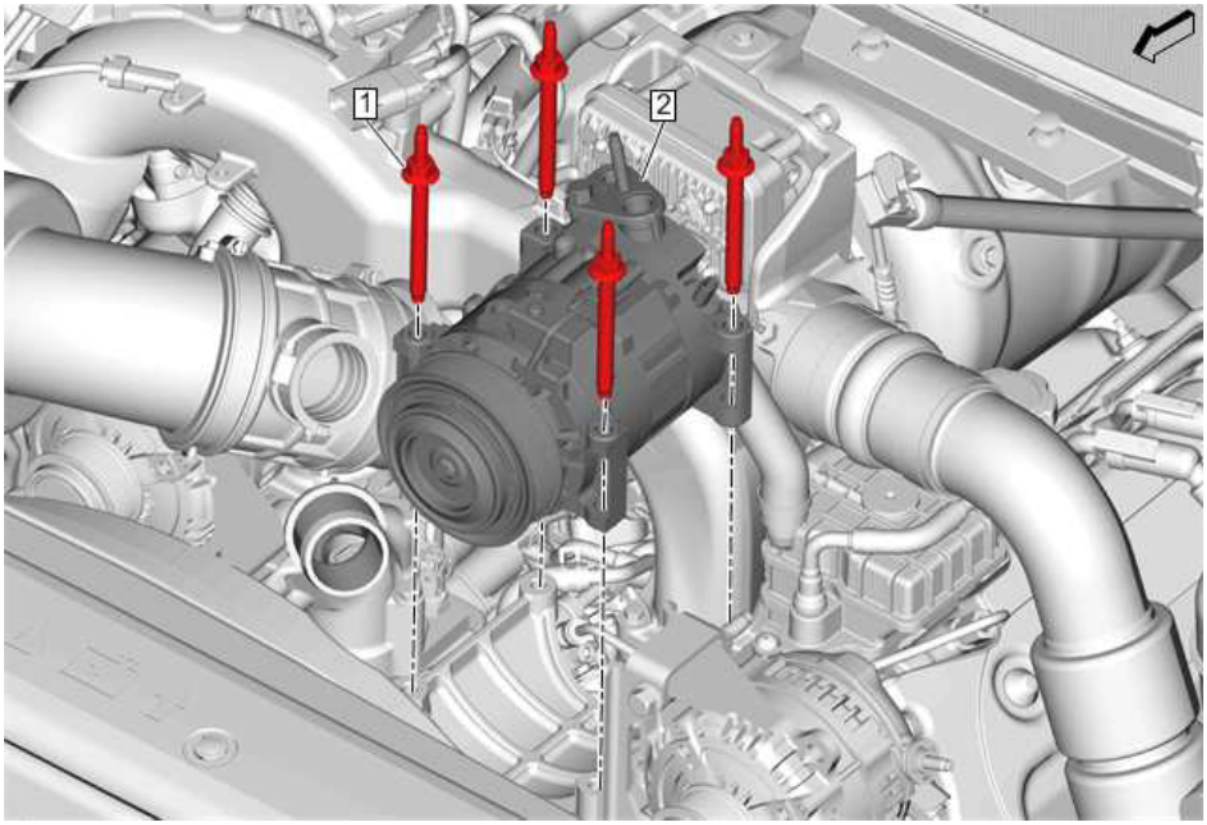


Fig. 20: Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor 2 - Remove - **Air Conditioning Compressor Replacement (L5P)**

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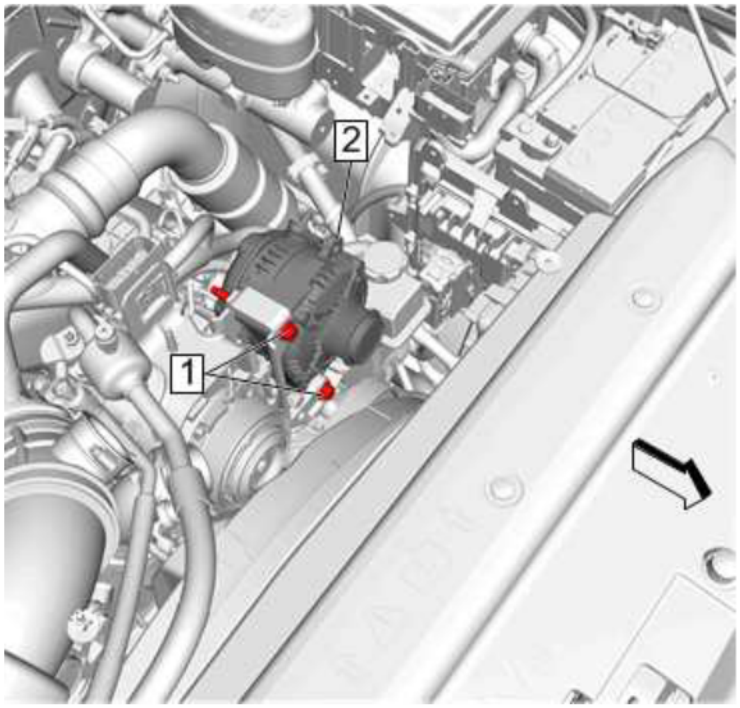


Fig. 21: Generator
Courtesy of GENERAL MOTORS COMPANY

3. { If equipped }Auxiliary Generator 2 - Remove - **Auxiliary Generator Replacement (Diesel - KHB)**
4. { If equipped }Auxiliary Generator Bracket - Remove - **Auxiliary Generator Bracket Replacement (KHB)**

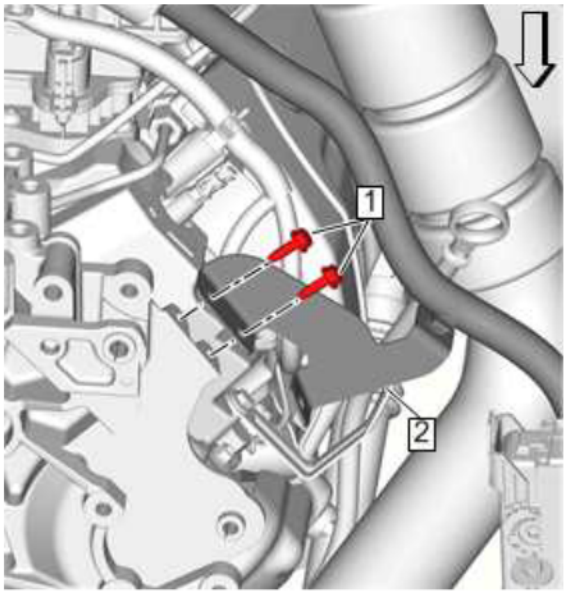


Fig. 22: Engine Wiring Harness Bracket And Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Engine Wiring Harness Bracket Bolt 1 @Air Conditioning Compressor Bracket - Remove
6. Engine Wiring Harness Bracket 2 @Air Conditioning Compressor Bracket - Position aside

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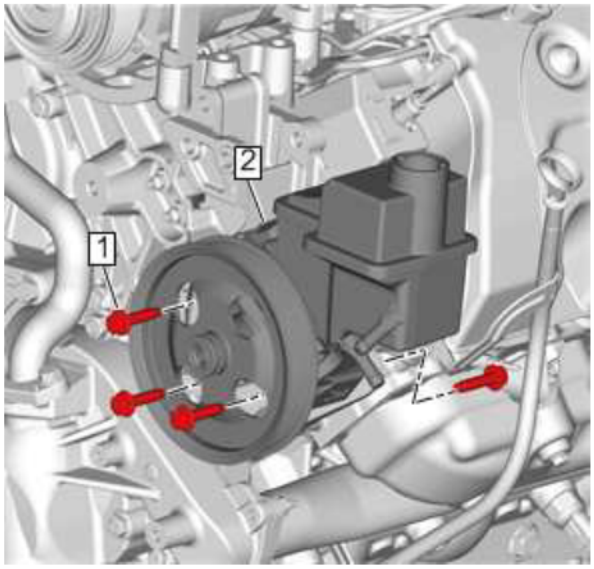


Fig. 23: Power Steering Pump
Courtesy of GENERAL MOTORS COMPANY

7. Power Steering Pump 2 - Remove - **Power Steering Pump Replacement (Heavy Duty, L5P, Without Auxiliary Generator)** **Power Steering Pump Replacement (Heavy Duty, L5P, With Auxiliary Generator)**
8. { If equipped }Drive Belt Idler Pulley - Remove - **Drive Belt Idler Pulley Replacement**

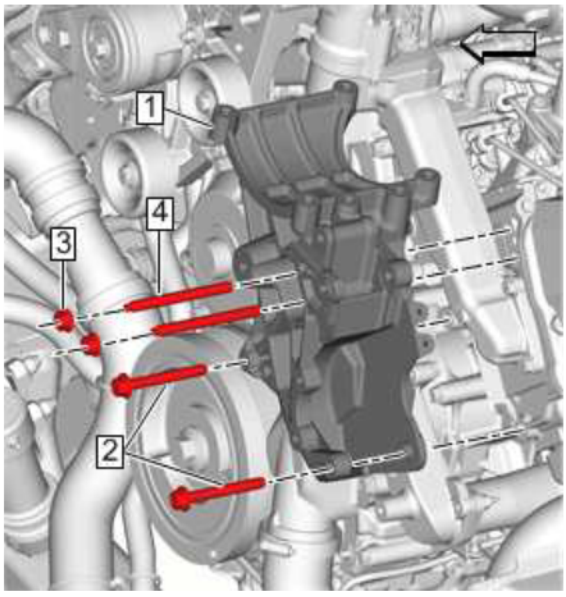


Fig. 24: Air Conditioning Compressor Bracket
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Bracket Nut 3 - Remove
10. Air Conditioning Compressor Bracket Bolt 2 - Remove
11. Air Conditioning Compressor Bracket Stud 4 - Remove
12. Remove the air conditioning compressor bracket (1) from the vehicle.

Installation Procedure

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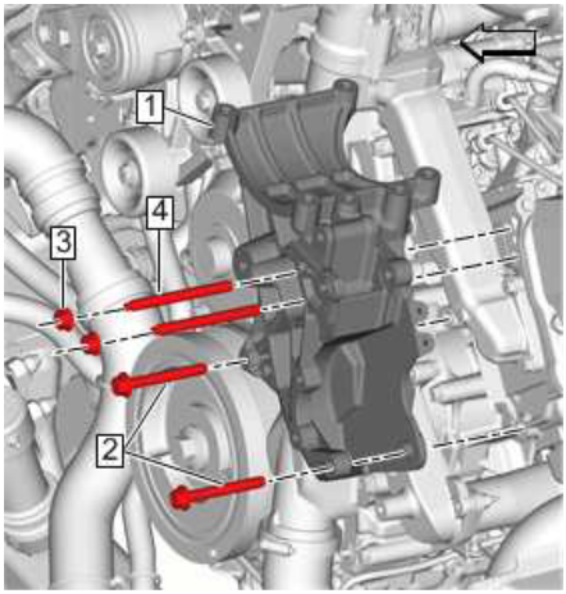


Fig. 25: Air Conditioning Compressor Bracket
Courtesy of GENERAL MOTORS COMPANY

1. Install the air conditioning compressor bracket (1) to the vehicle.

CAUTION: Refer to Fastener Caution .

2. Air Conditioning Compressor Bracket Stud 4 - Install and tighten 9 N.m (80 lb in)
3. Air Conditioning Compressor Bracket Bolt 2 - Install and tighten 50 N.m (37 lb ft)
4. Air Conditioning Compressor Bracket Nut 3 - Install and tighten 50 N.m (37 lb ft)

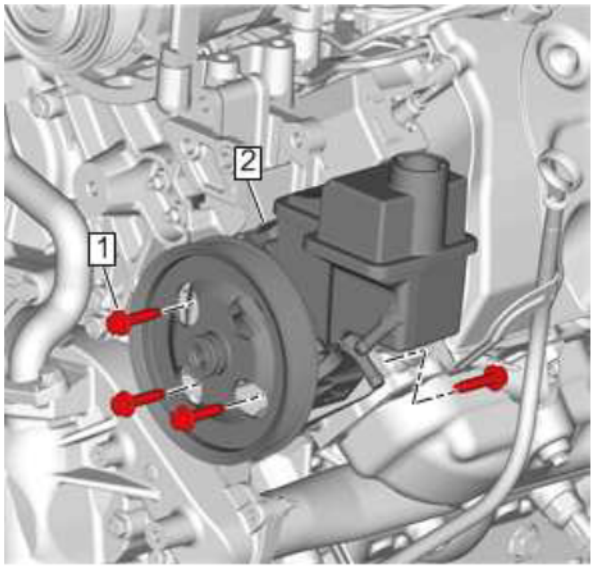


Fig. 26: Power Steering Pump
Courtesy of GENERAL MOTORS COMPANY

5. Power Steering Pump 2 - Install - **Power Steering Pump Replacement (Heavy Duty, L5P, Without Auxiliary Generator)** **Power Steering Pump Replacement (Heavy Duty, L5P, With Auxiliary Generator)**
6. { If equipped }Drive Belt Idler Pulley - Install - **Drive Belt Idler Pulley Replacement**

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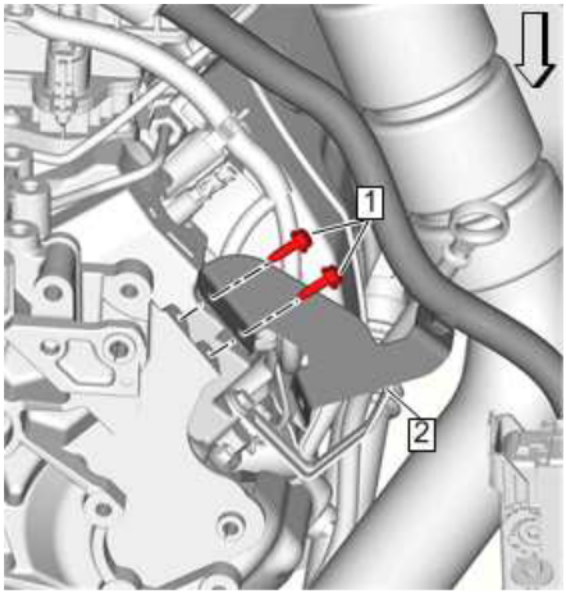


Fig. 27: Engine Wiring Harness Bracket
Courtesy of GENERAL MOTORS COMPANY

7. Engine Wiring Harness Bracket 2 @Air Conditioning Compressor Bracket - Move into position
8. Engine Wiring Harness Bracket Bolt 1 @Air Conditioning Compressor Bracket - Install and tighten 10 N.m (89 lb in)
9. { If equipped }Auxiliary Generator Bracket - Install - **Auxiliary Generator Bracket Replacement (KHB)**

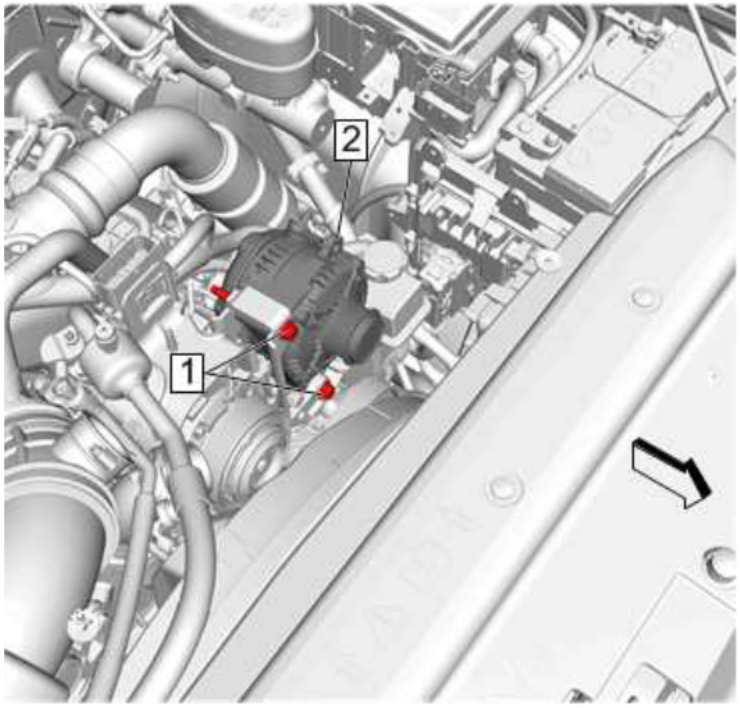


Fig. 28: Generator
Courtesy of GENERAL MOTORS COMPANY

10. { If equipped }Auxiliary Generator 2 - Install - **Auxiliary Generator Replacement (Diesel - KHB)**

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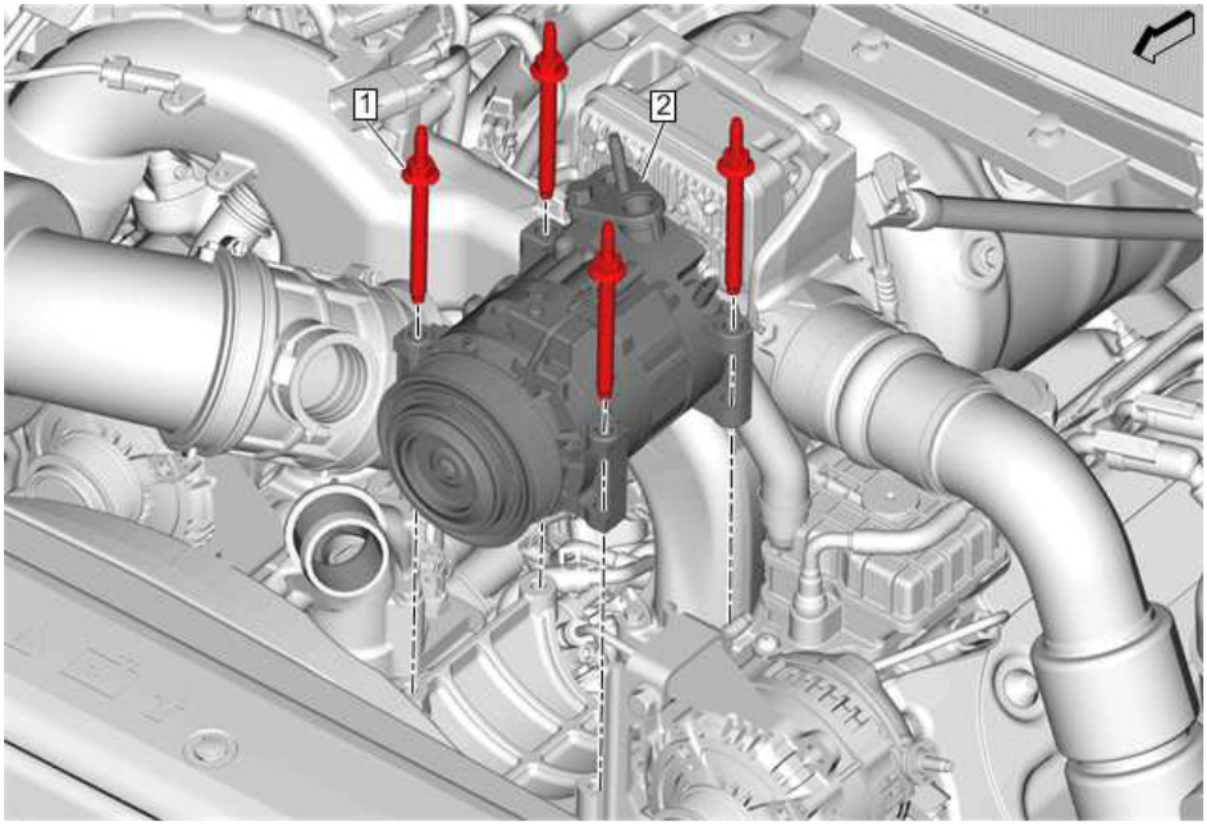


Fig. 29: Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

11. Air Conditioning Compressor 2 - Install - **Air Conditioning Compressor Replacement (L5P)**

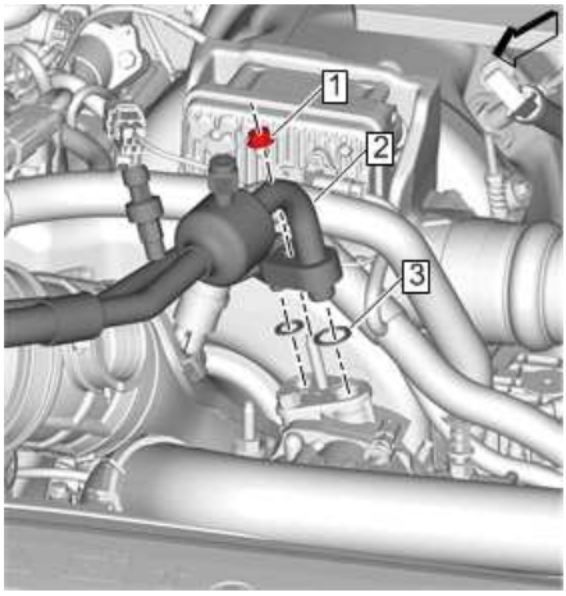


Fig. 30: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

12. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Install - **Air Conditioning Compressor Hose Replacement (L5P)**

AIR CONDITIONING SYSTEM SEAL REPLACEMENT

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Removal Procedure

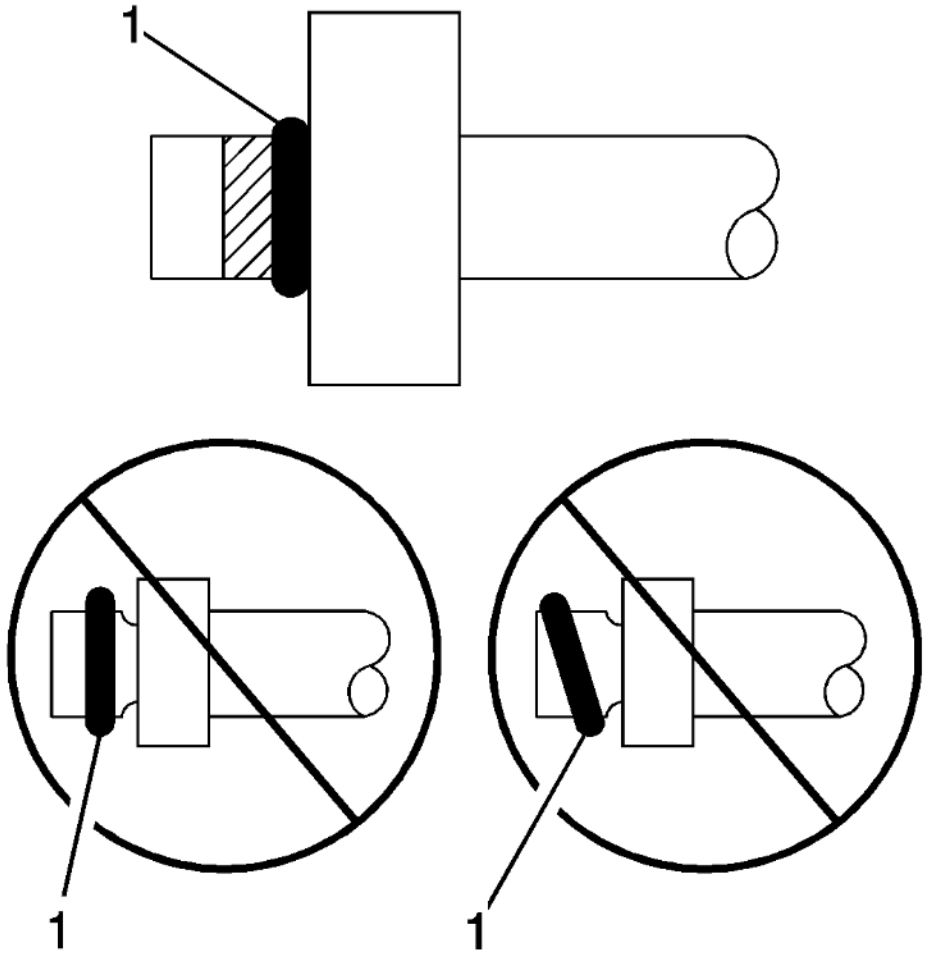


Fig. 31: Identifying Good & Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS COMPANY

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.
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.

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

   Do not use a damaged seal washer.

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

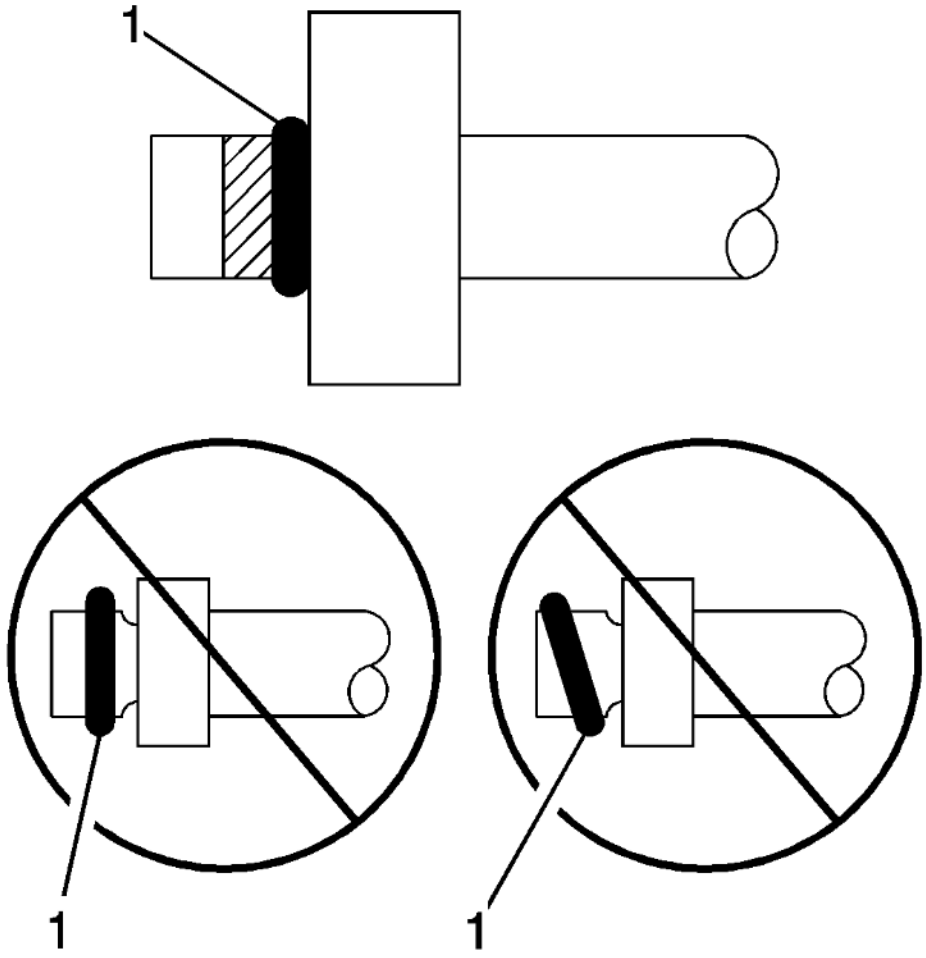


Fig. 32: Identifying Good & Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS COMPANY

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.

   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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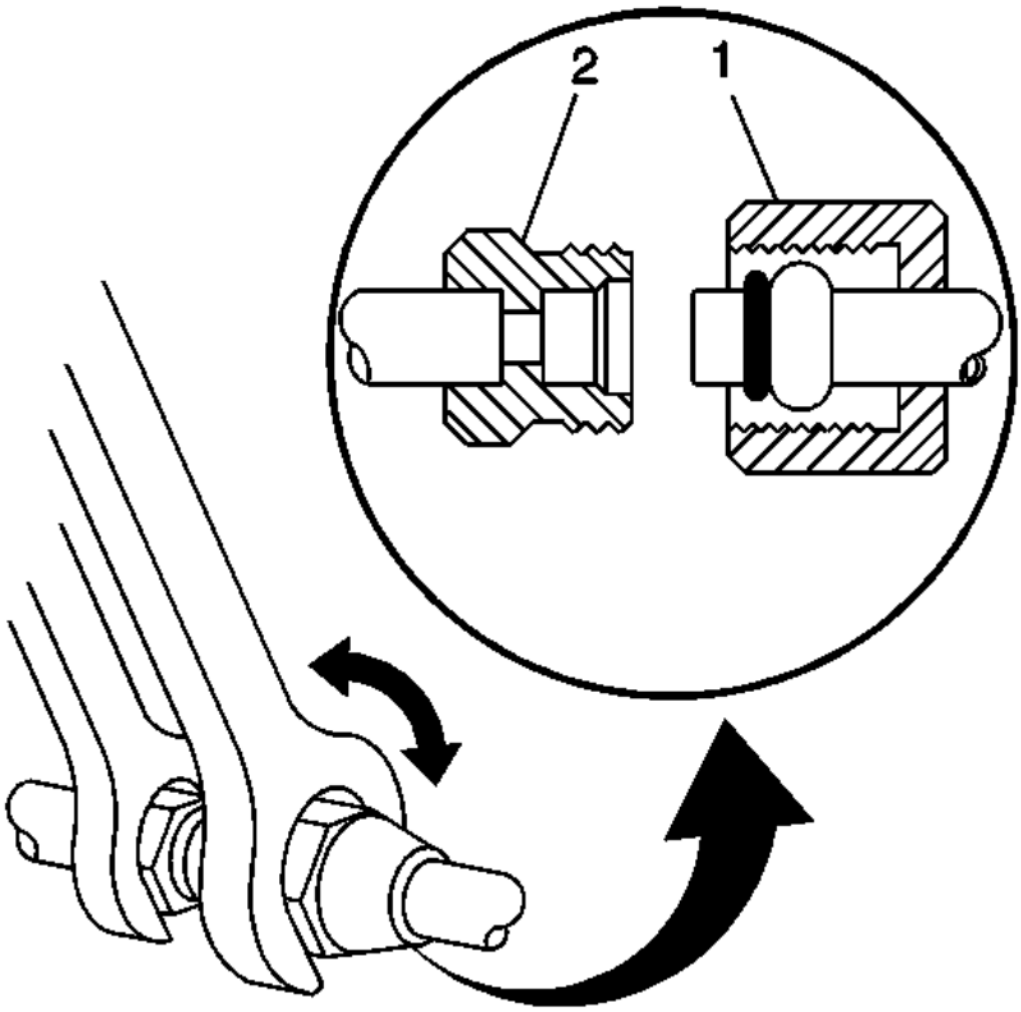


Fig. 33: Identifying A/C Compression Style Line Fittings
Courtesy of GENERAL MOTORS COMPANY

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.
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.

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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.

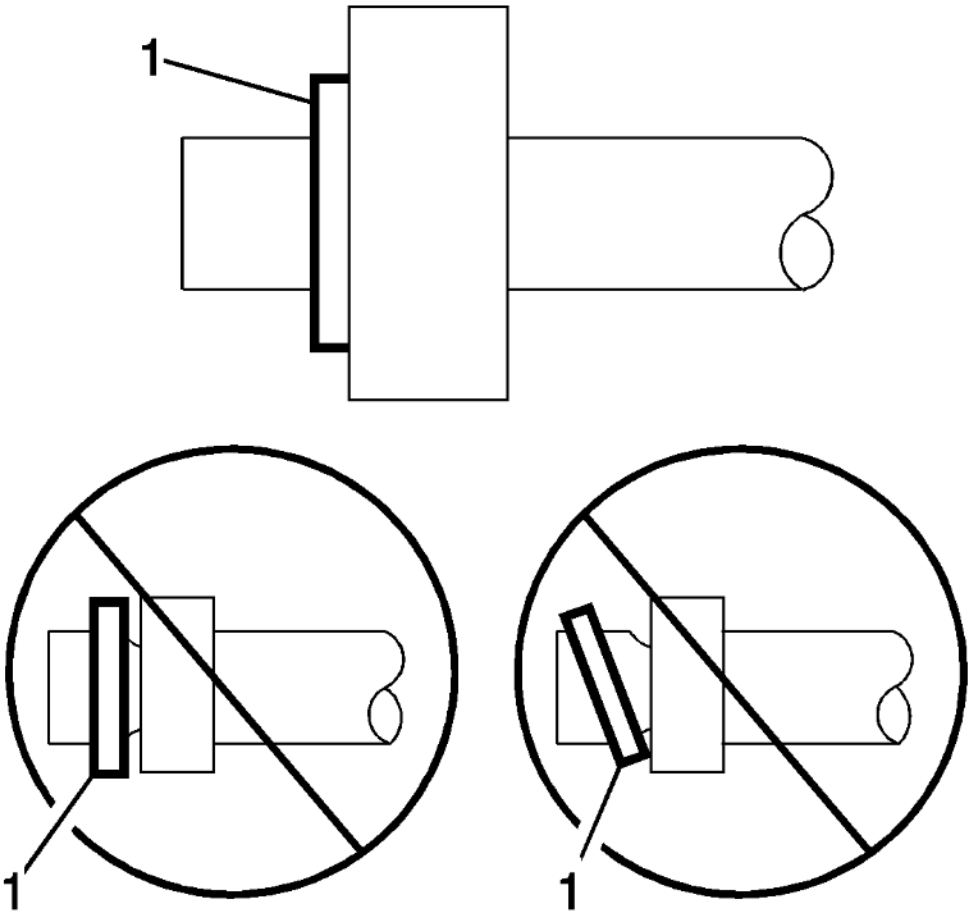


Fig. 34: Identifying Proper Seating Of A/C Refrigerant O-Ring
Courtesy of GENERAL MOTORS COMPANY

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

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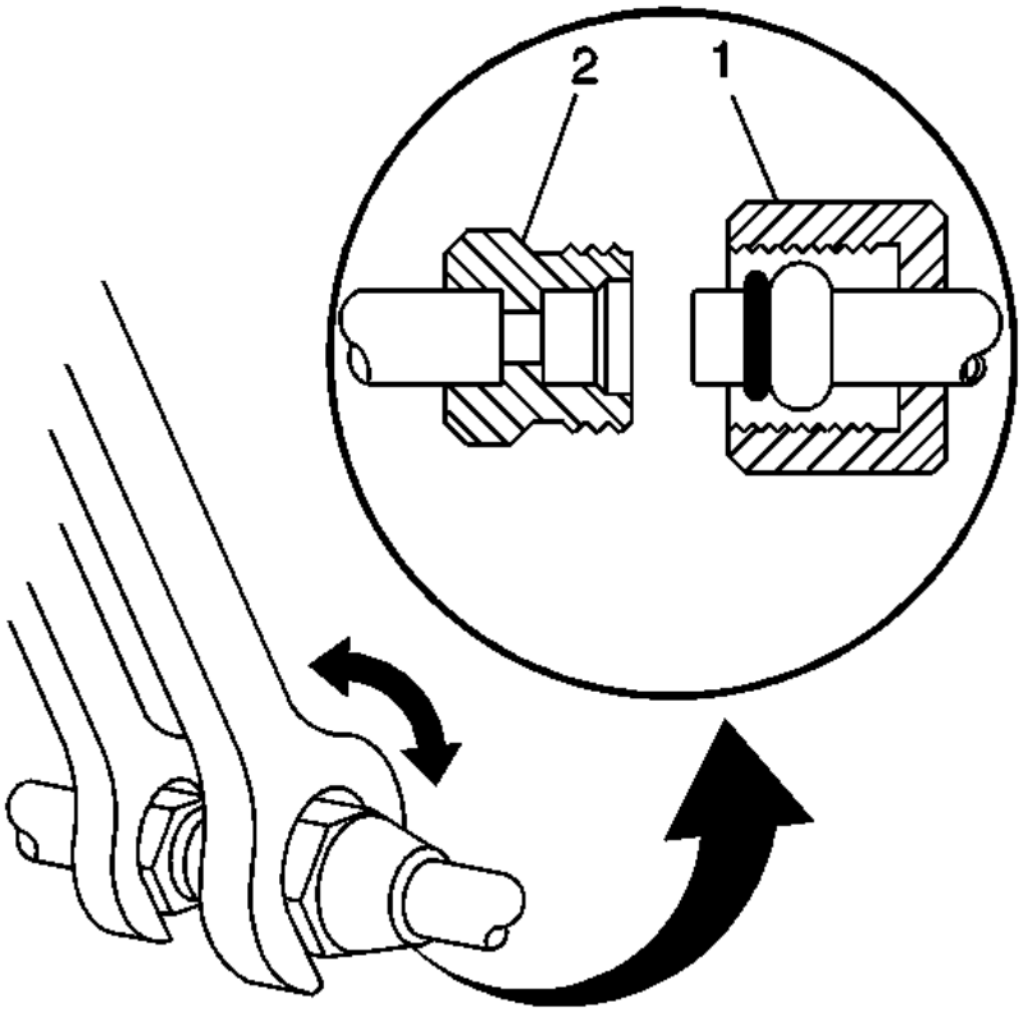


Fig. 35: Identifying A/C Compression Style Line Fittings
Courtesy of GENERAL MOTORS COMPANY

7. Assemble the A/C components.

   Refer to the appropriate repair procedure.

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

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (LV3)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner 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 (LV3)**.

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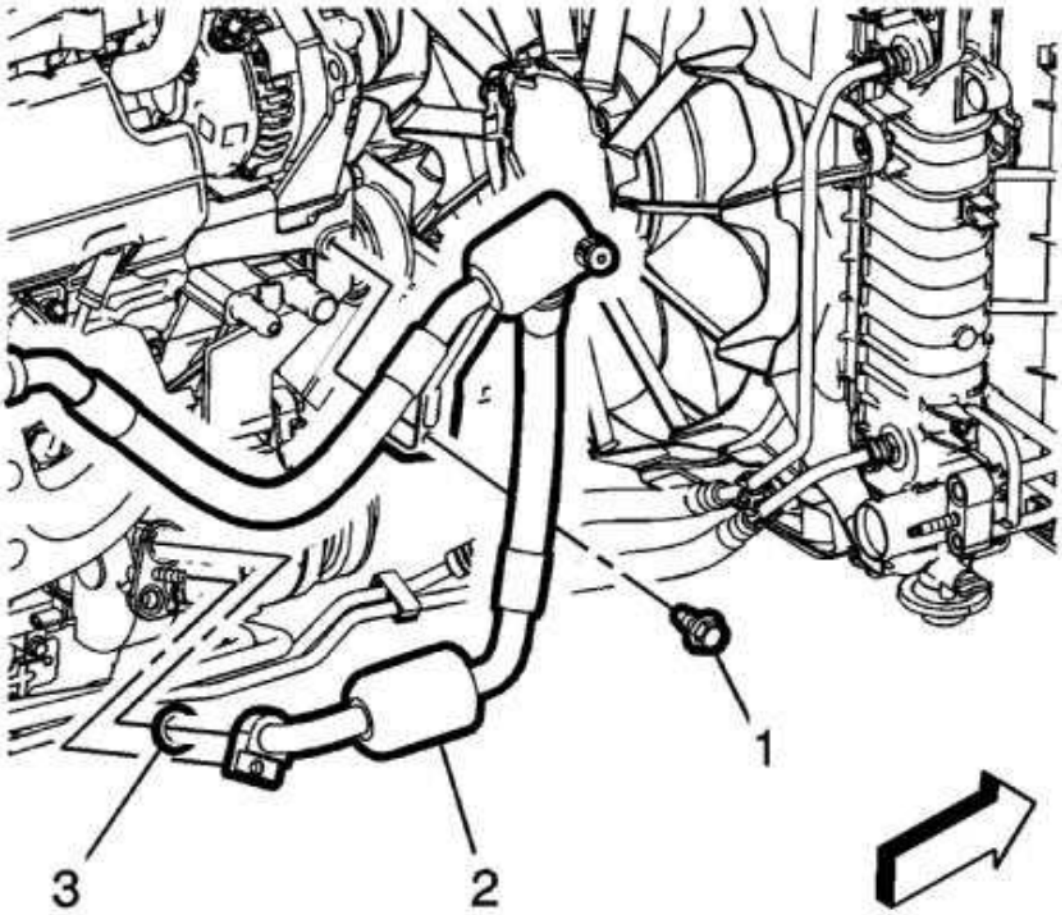


Fig. 36: Air Conditioning Tube Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

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

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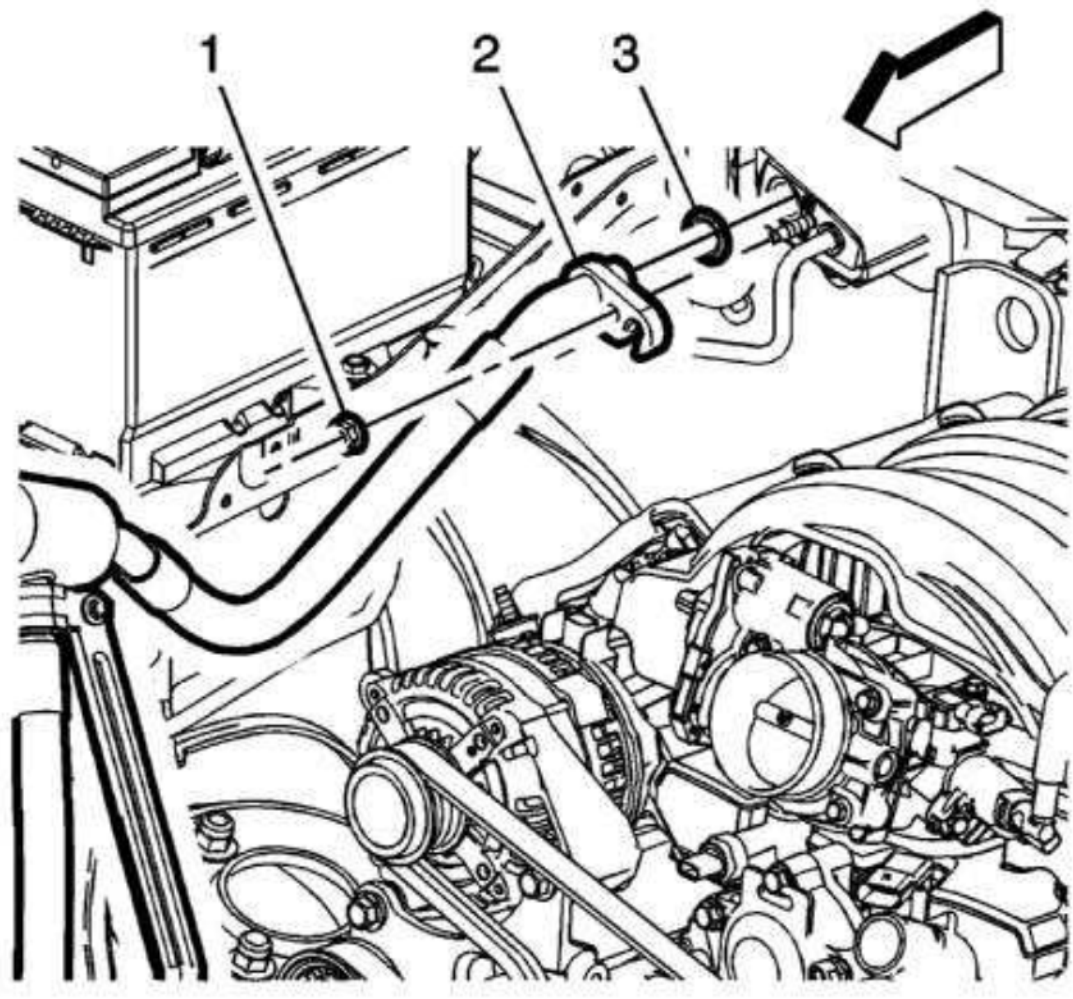


Fig. 37: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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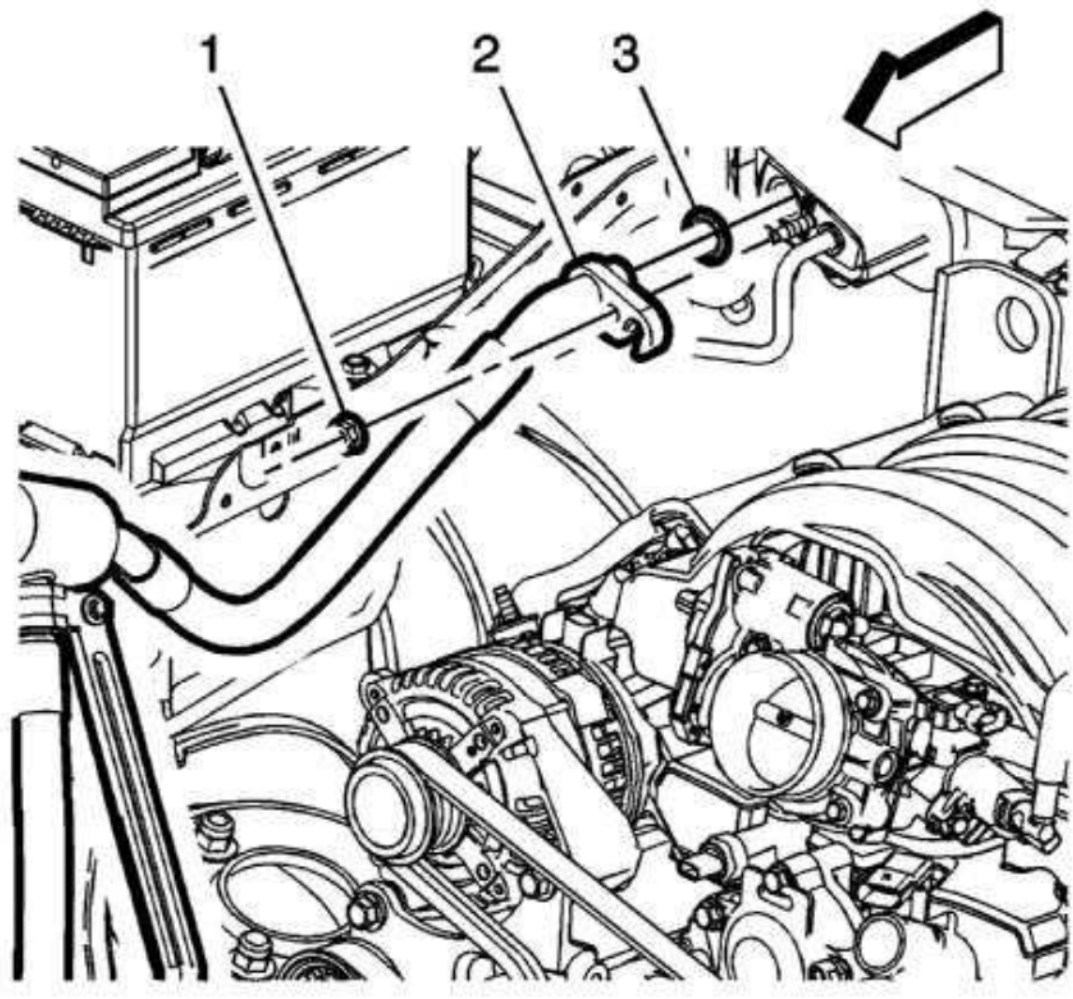


Fig. 38: Air Conditioning Compressor Hose Nut
Courtesy of GENERAL MOTORS COMPANY

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.

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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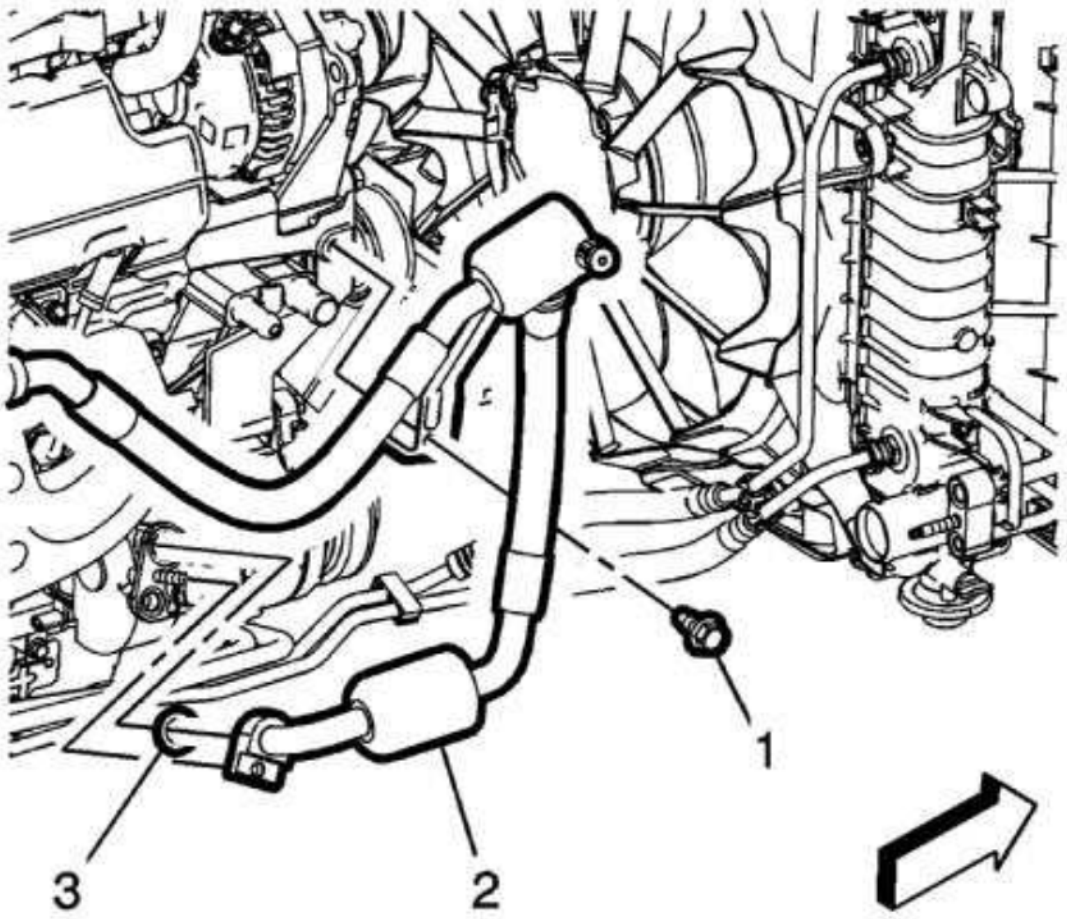


Fig. 39: Air Conditioning Tube Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

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 (LV3)**.
8. 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).
9. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
10. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L96, LC8)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

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3. Remove the air conditioning condenser hose from the compressor and position out of the way. Refer to **Air Conditioning Condenser Hose Replacement (L96, LC8)**.

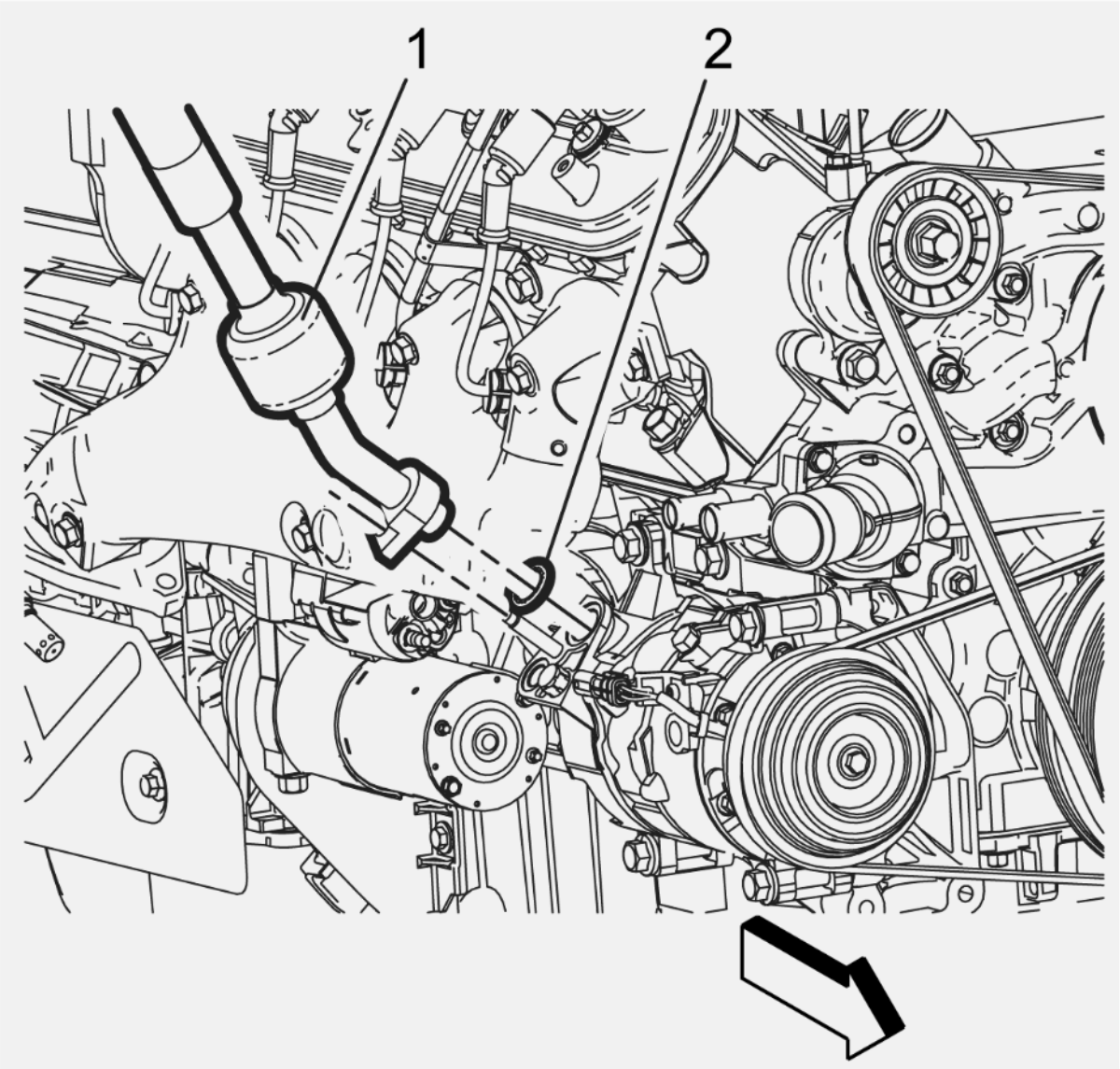


Fig. 40: Air Conditioning Compressor Hose From The Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

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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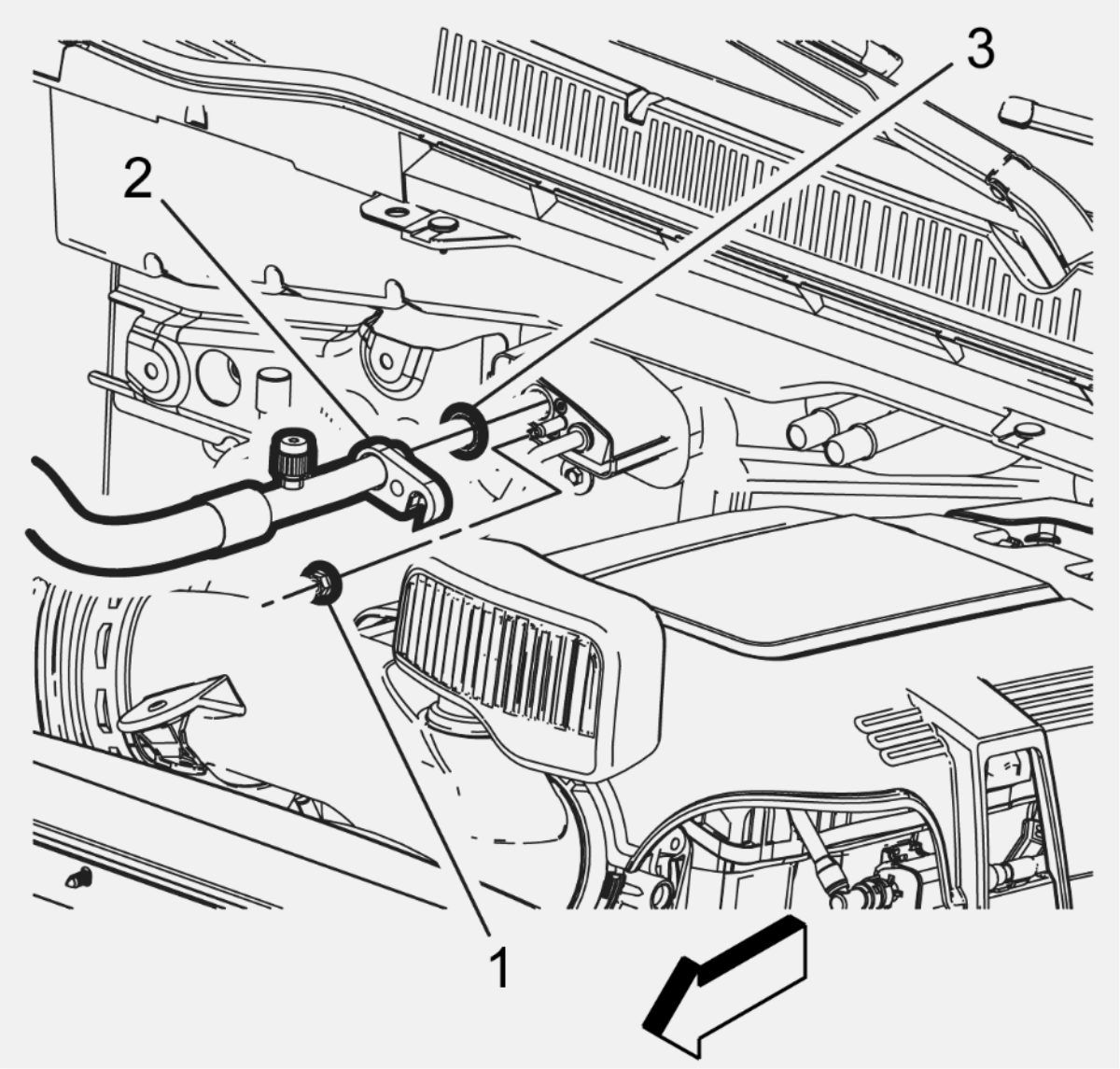


Fig. 41: Air Conditioning Compressor Hose From The Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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).

Installation Procedure

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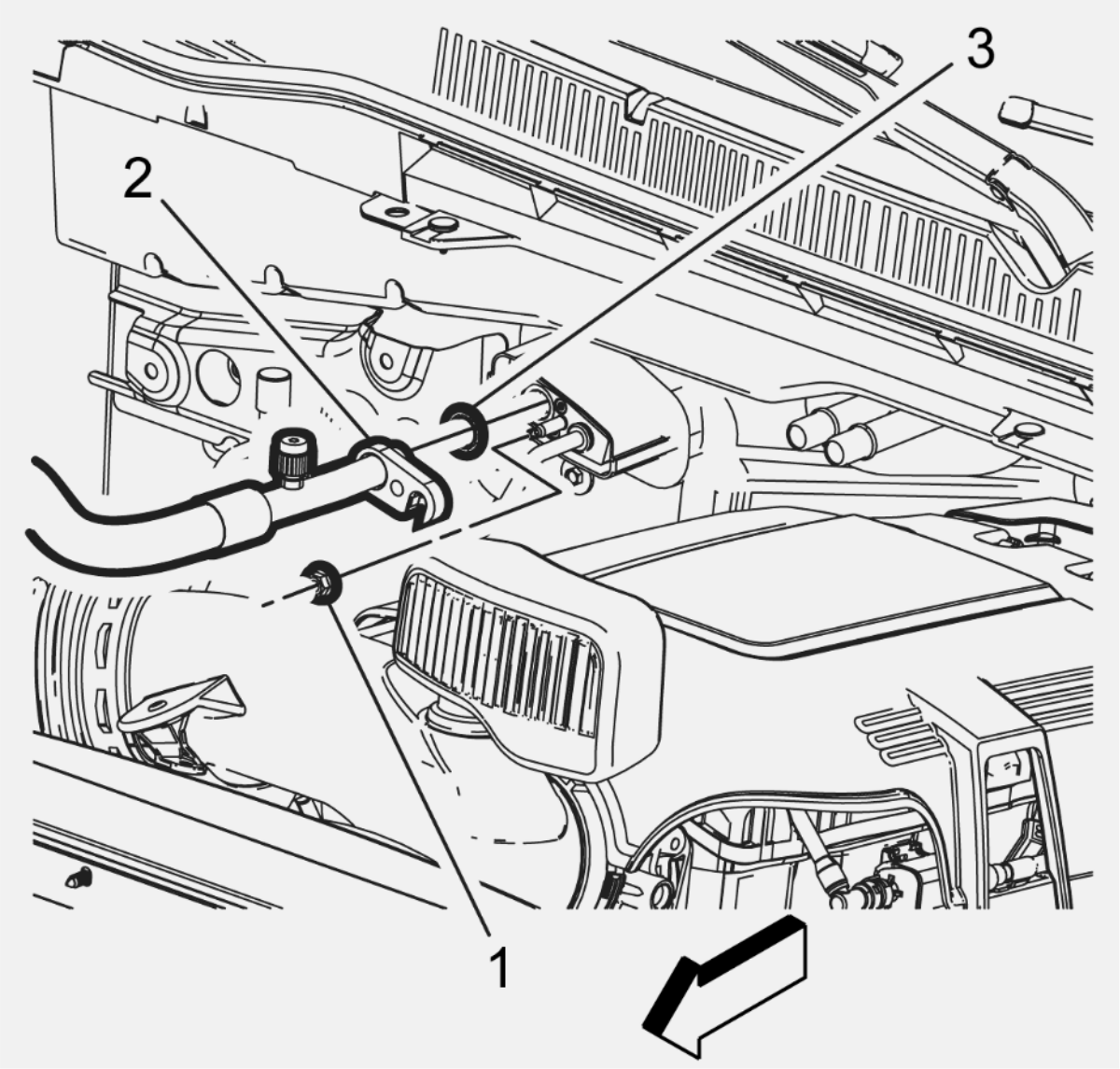


Fig. 42: Air Conditioning Compressor Hose From The Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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.

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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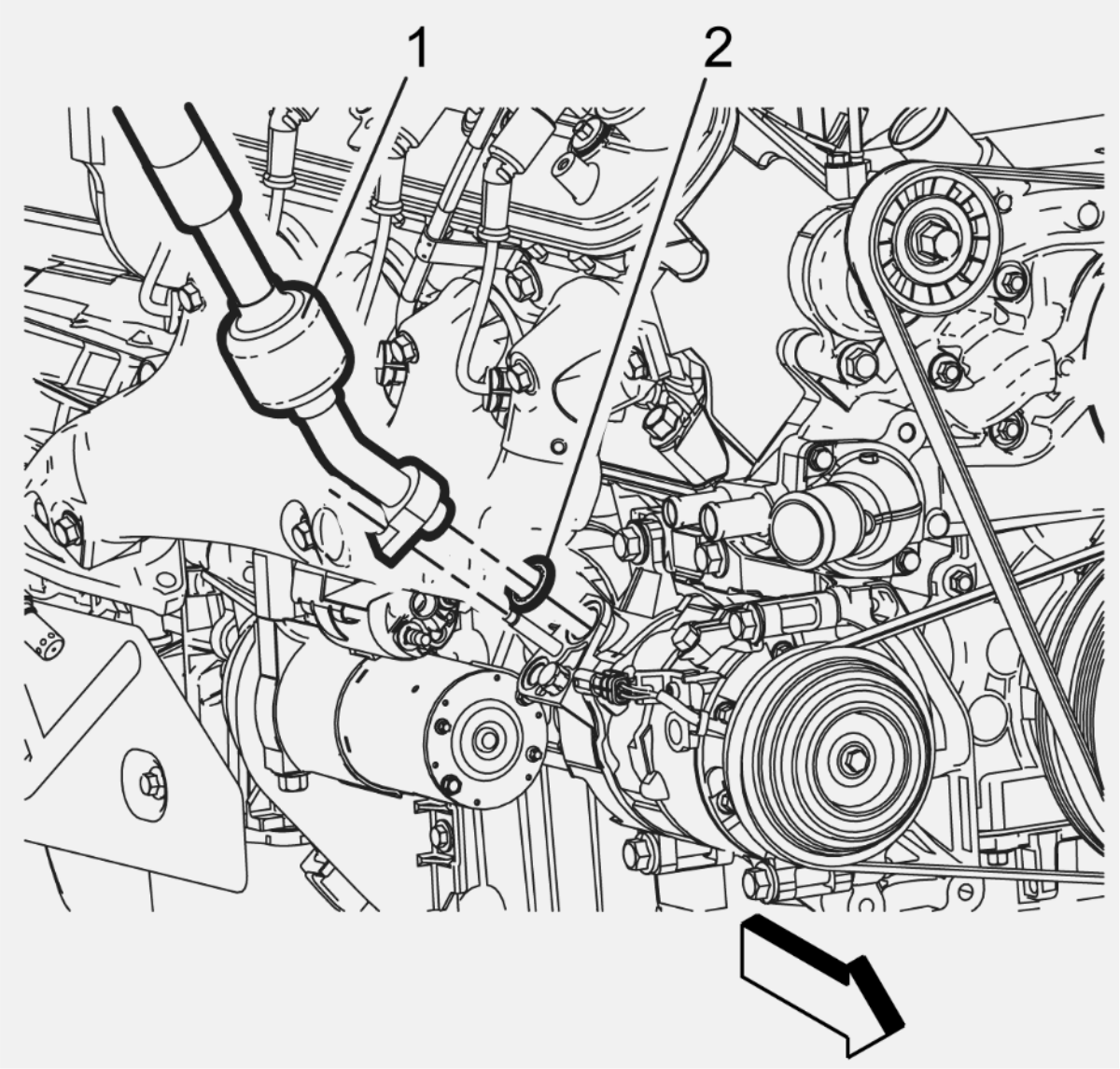


Fig. 43: Air Conditioning Compressor Hose From Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

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, LC8)**.
8. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L8B)

Removal Procedure

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
2. Intake Air Duct - Remove - **Air Cleaner Outlet Duct Replacement**

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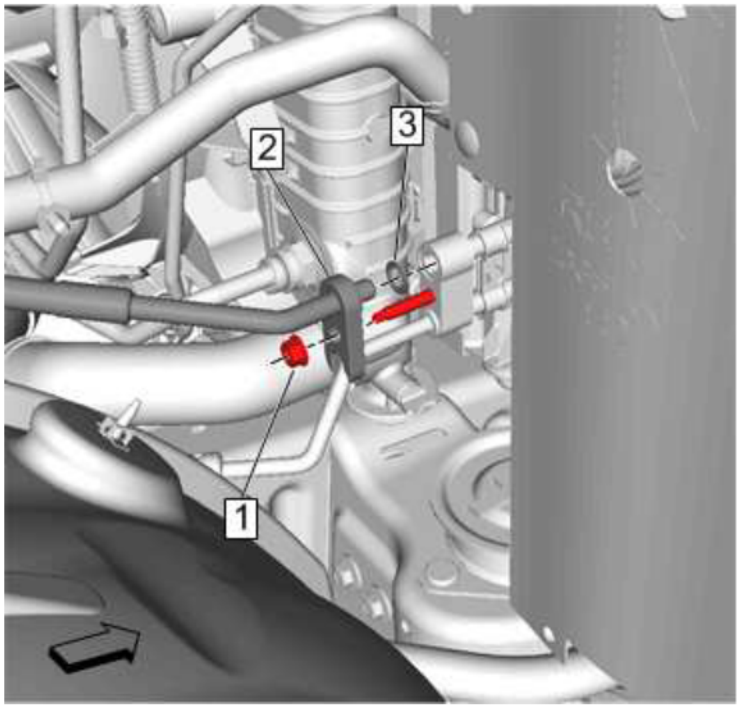


Fig. 44: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor Hose Nut 1 @Air Conditioning Condenser - Remove
4. Air Conditioning Compressor Hose 2 @Air Conditioning Condenser - Remove
5. Remove and DISCARD the sealing washer. 3

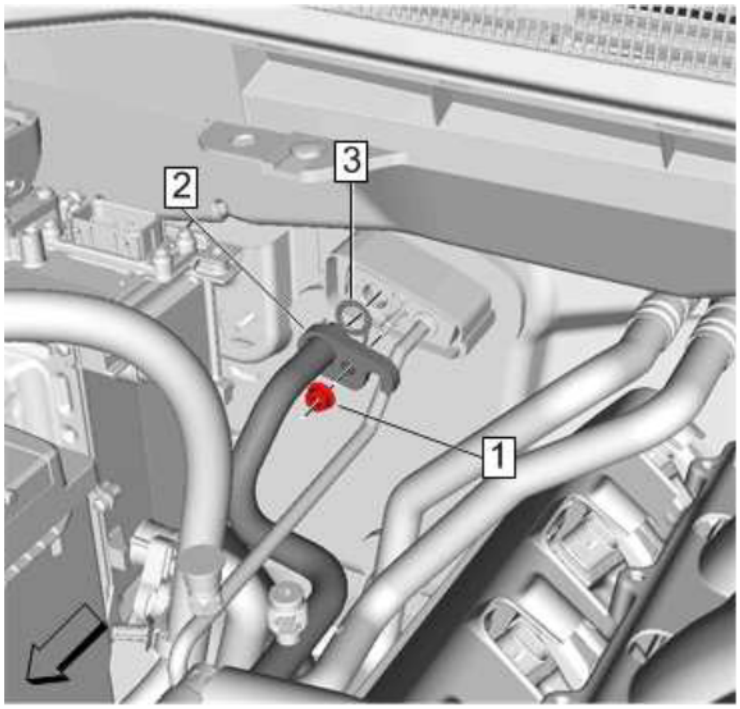


Fig. 45: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose Nut 1 @Air Conditioning Evaporator Thermal Expansion Valve -

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Remove

7. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove
8. Remove and DISCARD the sealing washer. 3

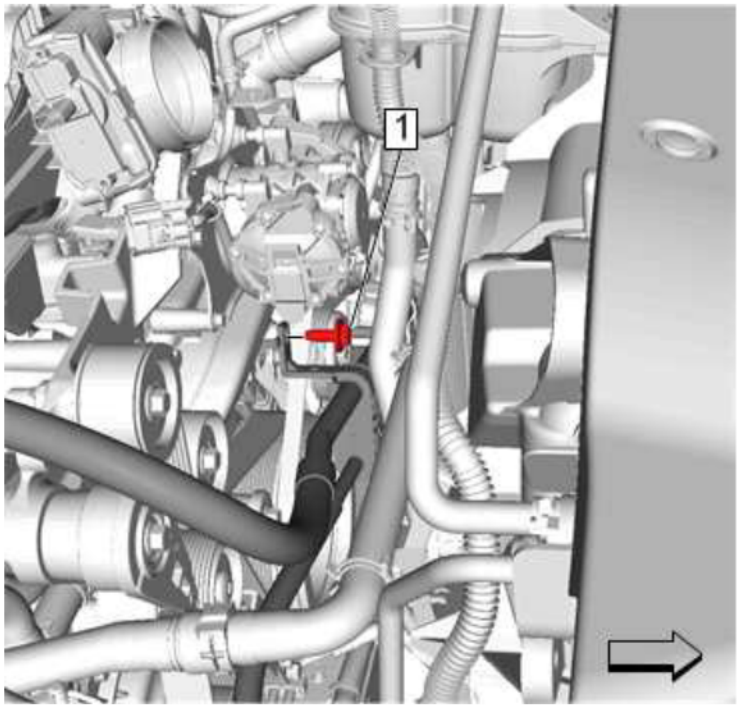


Fig. 46: Air Conditioning Compressor Hose Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Hose Bracket Bolt 1 - Remove

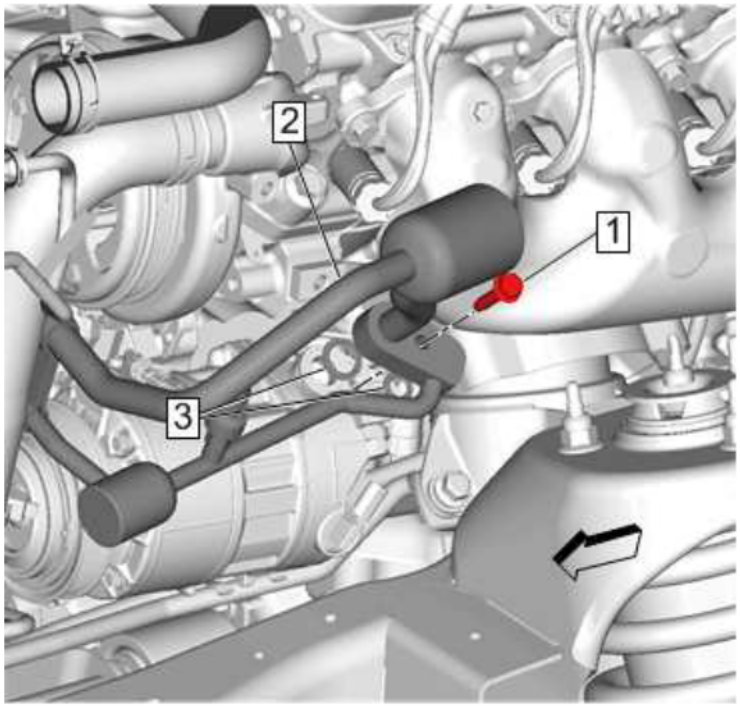


Fig. 47: Air Conditioning Compressor Hose, Bolt And Seal
Courtesy of GENERAL MOTORS COMPANY

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10. Air Conditioning Compressor Hose Bolt 1 @Air Conditioning Compressor - Remove
11. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Remove
12. Remove and DISCARD the sealing washer. 3
13. Remove the air conditioning compressor hose from the vehicle.

Installation Procedure

1. Install the air conditioning compressor hose to the vehicle.

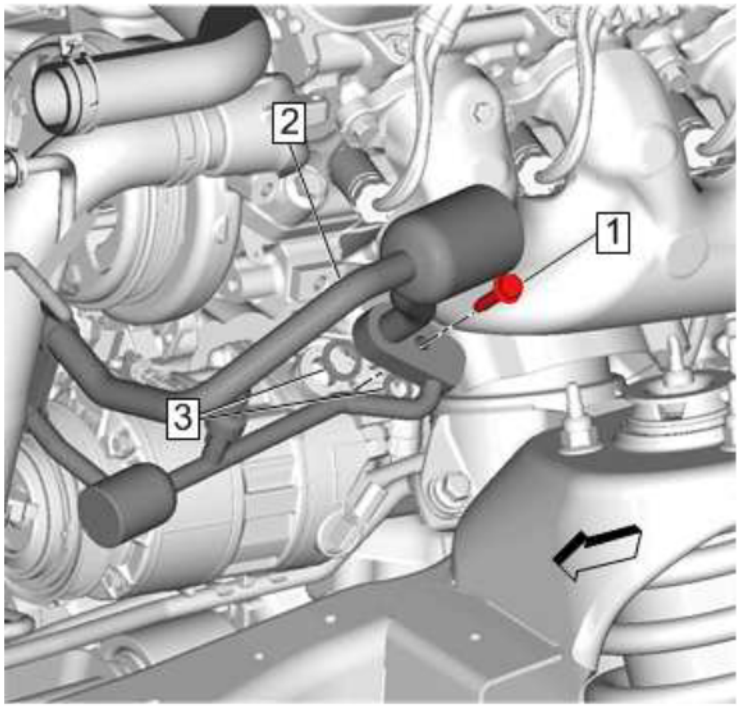


Fig. 48: Air Conditioning Compressor Hose, Bolt And Seal
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Install a NEW sealing washer. 3
3. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Install
4. Air Conditioning Compressor Hose Bolt 1 @Air Conditioning Compressor - Install and tighten 22 N.m (16 lb ft)

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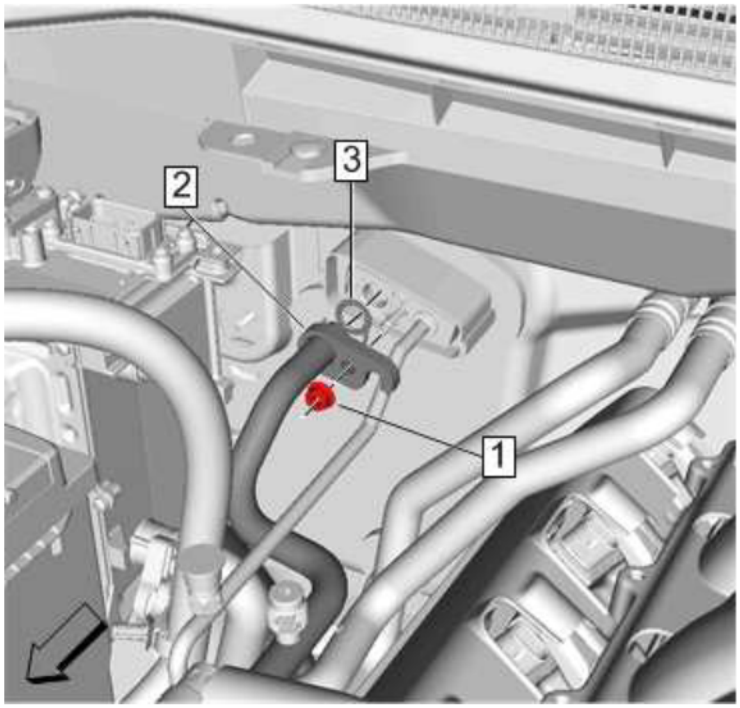


Fig. 49: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

5. Install a NEW sealing washer. 3
6. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install
7. Air Conditioning Compressor Hose Nut 1 @Air Conditioning Evaporator Thermal Expansion Valve - Install and tighten 22 N.m (16 lb ft)

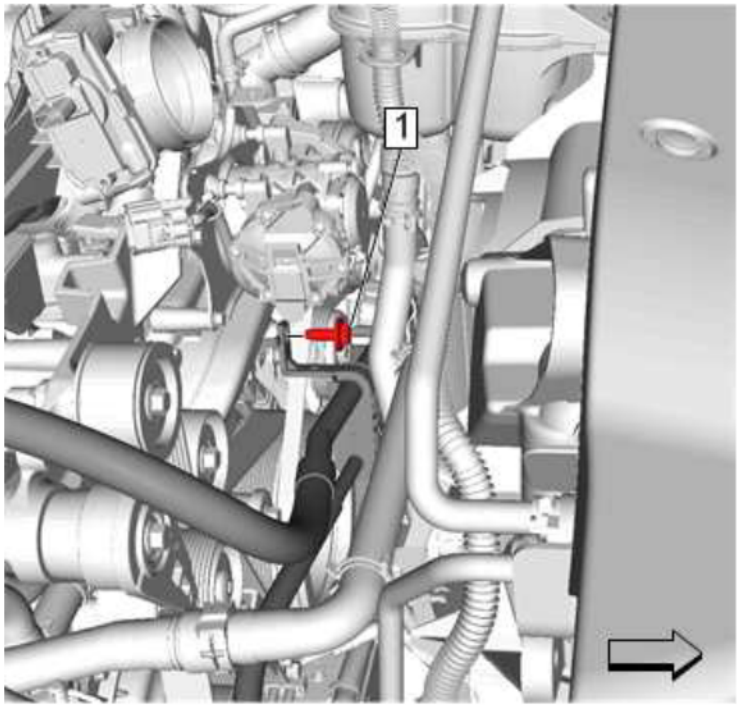


Fig. 50: Air Conditioning Compressor Hose Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

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8. Air Conditioning Compressor Hose Bracket Bolt 1 - Install and tighten 22 N.m (16 lb ft)

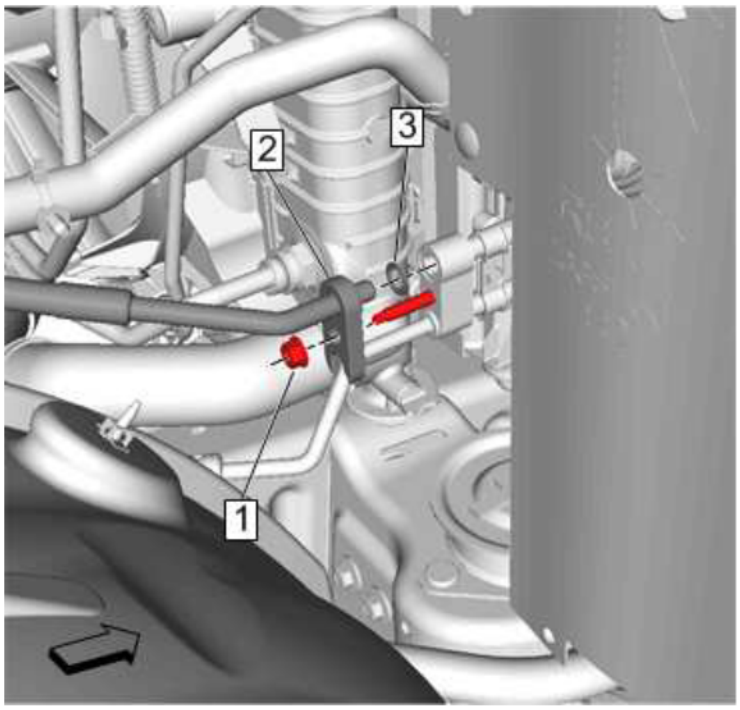


Fig. 51: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

9. Install a NEW sealing washer. 3
10. Air Conditioning Compressor Hose 2 @Air Conditioning Condenser - Install
11. Air Conditioning Compressor Hose Nut 1 @Air Conditioning Condenser - Install and tighten 22 N.m (16 lb ft)
12. Intake Air Duct - Install - **Air Cleaner Outlet Duct Replacement**
13. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L5P)

Removal Procedure

1. Recover refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Air Cleaner Outlet Resonator - Remove - **Air Cleaner Outlet Resonator Replacement**
3. Air Cleaner Outlet Front Duct - Remove - **Air Cleaner Outlet Front Duct Replacement**
4. Air Cleaner Assembly - Remove - **Air Cleaner Assembly Replacement**

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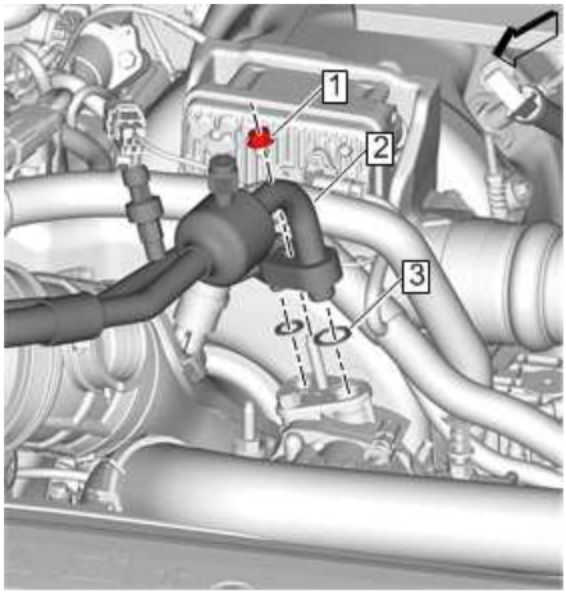


Fig. 52: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor Hose Nut 1 - Remove
6. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Remove
7. Remove and DISCARD the sealing washer. 3
8. Disconnect the electrical connector.

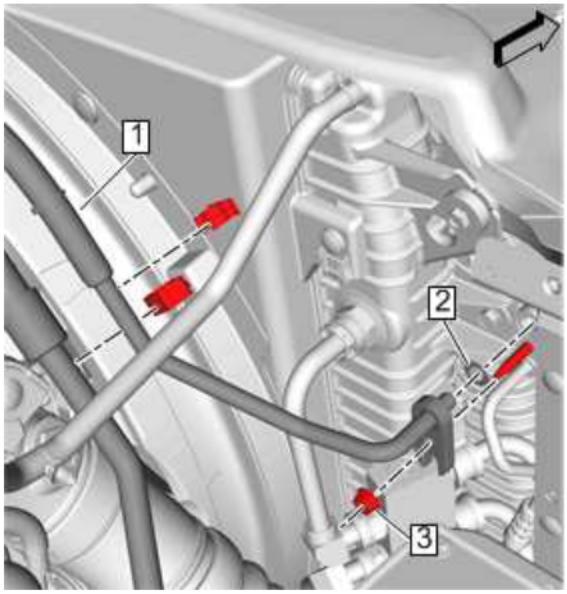


Fig. 53: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Hose Nut 3 - Remove
10. Air Conditioning Compressor Hose 1 @Air Conditioning Condenser - Remove
11. Air Conditioning Compressor Hose 1 @Engine Coolant Fan Shroud - Remove
12. Remove and DISCARD the sealing washer. 2

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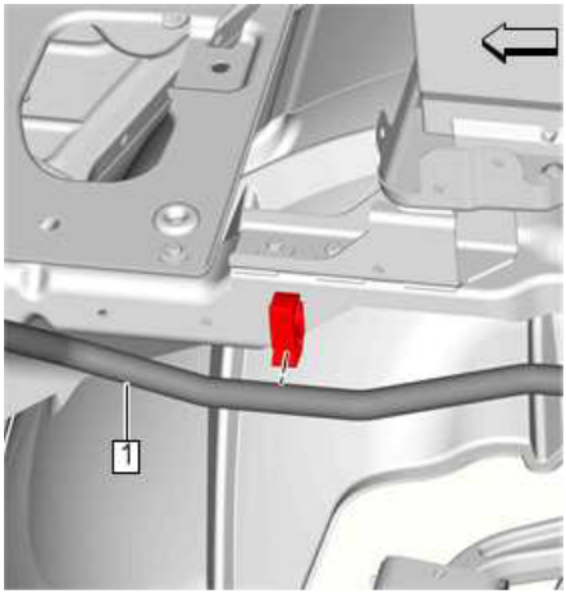


Fig. 54: Air Conditioning Compressor Hose At Air Cleaner Bracket
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Compressor Hose 1 @Air Cleaner Bracket - Remove

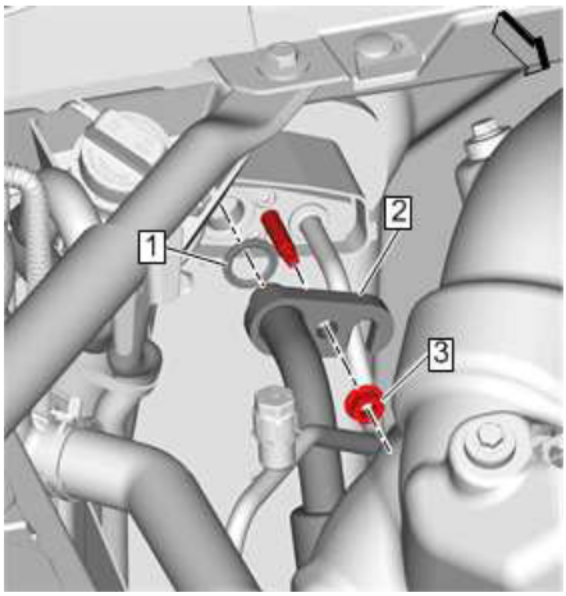


Fig. 55: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

14. Air Conditioning Compressor Hose Nut 3 - Remove
15. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove
16. Remove and DISCARD the sealing washer. 1
17. Remove the air conditioning compressor hose (2) from the vehicle.

Installation Procedure

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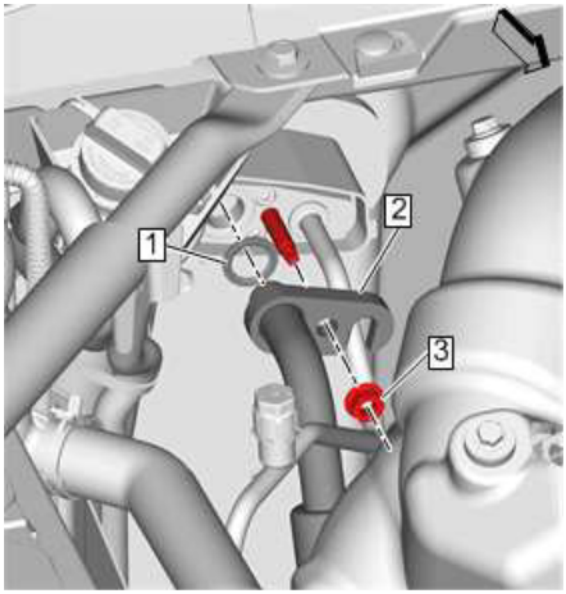


Fig. 56: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

1. Install the air conditioning compressor hose (2) to the vehicle.
2. Install a NEW sealing washer. 1 **Air Conditioning System Seal Replacement**
3. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install

CAUTION: **Refer to Fastener Caution .**

4. Air Conditioning Compressor Hose Nut 3 - Install and tighten 22 N.m (16 lb ft)

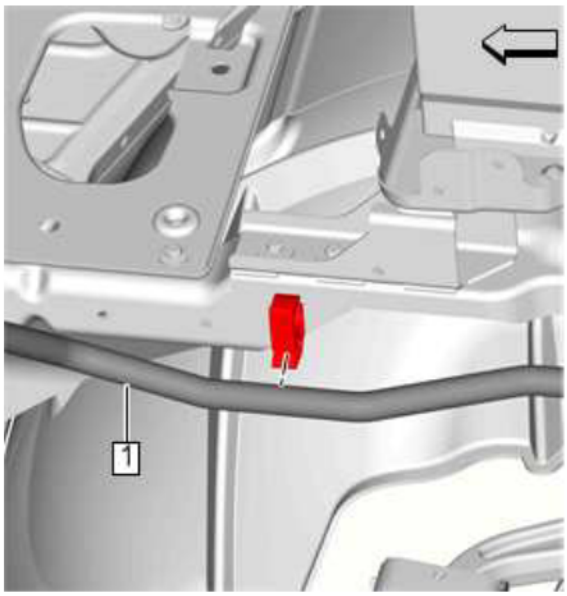


Fig. 57: Air Conditioning Compressor Hose At Air Cleaner Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor Hose 1 @Air Cleaner Bracket - Install

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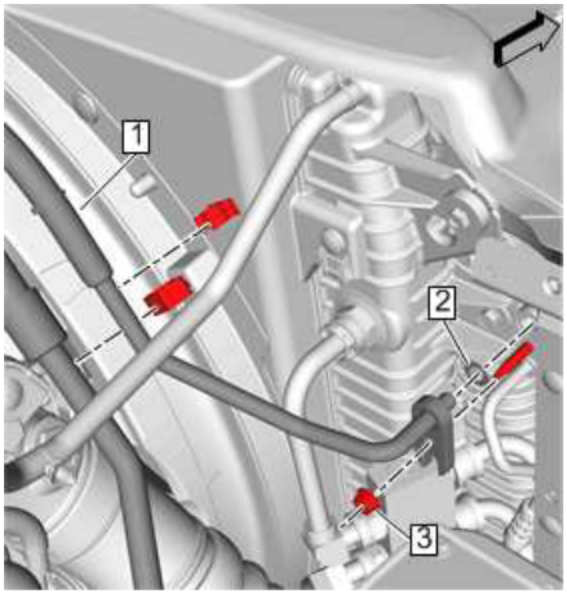


Fig. 58: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

6. Install a NEW sealing washer. 2
7. Air Conditioning Compressor Hose 1 @Engine Coolant Fan Shroud - Install
8. Air Conditioning Compressor Hose 2 @Air Conditioning Condenser - Install
9. Air Conditioning Compressor Hose Nut 3 - Install and tighten 22 N.m (16 lb ft)

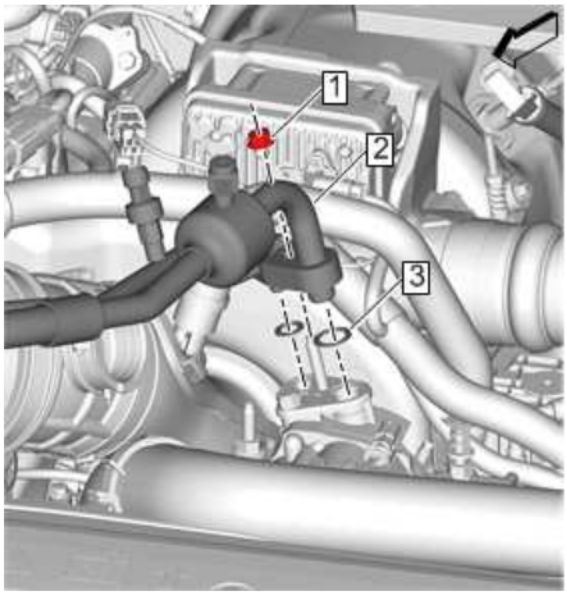


Fig. 59: Air Conditioning Compressor Hose, Air Conditioning Compressor And Sealing Washers
Courtesy of GENERAL MOTORS COMPANY

10. Install NEW sealing washers. 3
11. Air Conditioning Compressor Hose 2 @Air Conditioning Compressor - Install
12. Air Conditioning Compressor Hose Nut 1 - Install and tighten 22 N.m (16 lb ft)
13. Connect the electrical connector.
14. Air Cleaner Assembly - Install - **Air Cleaner Assembly Replacement**

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15. Air Cleaner Outlet Front Duct - Install - **Air Cleaner Outlet Front Duct Replacement**
16. Air Cleaner Outlet Resonator - Install - **Air Cleaner Outlet Resonator Replacement**
17. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
18. Inspect for refrigerant leaks.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (L83, L86)

Removal Procedure

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner assembly. **Air Cleaner Assembly Replacement**
3. Air Conditioning Condenser Hose - Remove - **Air Conditioning Condenser Hose Replacement (L83, L86)**

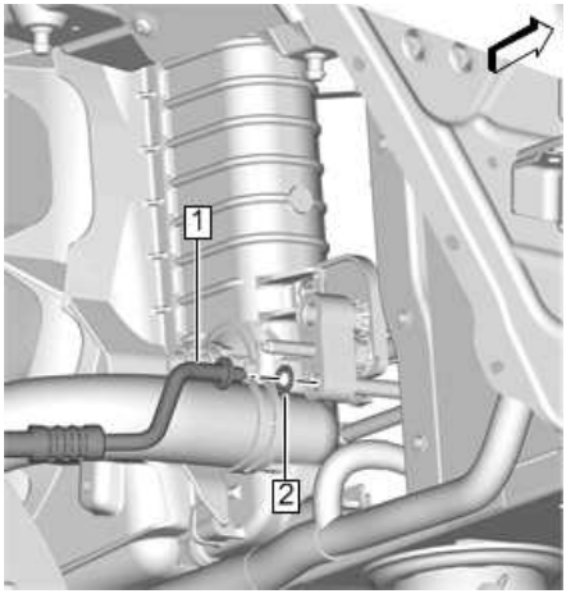


Fig. 60: Air Conditioning Compressor Hose At Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Remove
5. Remove and DISCARD the sealing washer. 2

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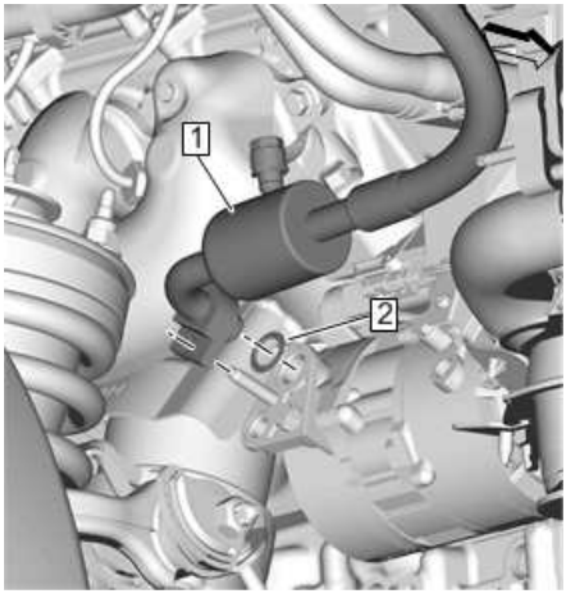


Fig. 61: Air Conditioning Compressor Hose At Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose 1 @Air Conditioning Compressor - Remove
7. Remove and DISCARD the sealing washer. 2

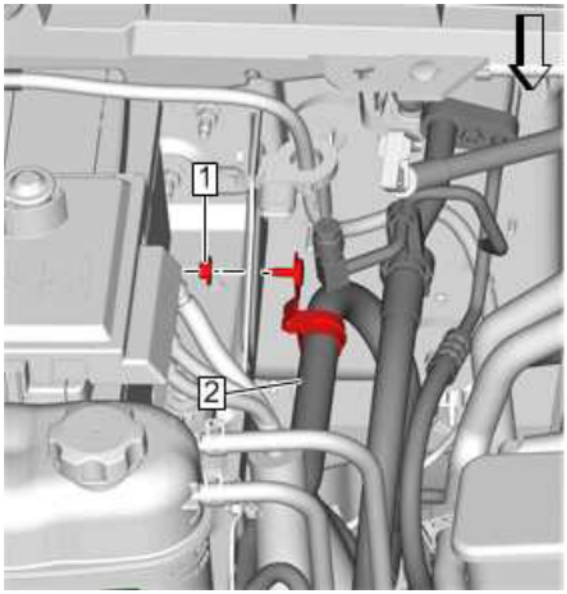


Fig. 62: Air Conditioning Compressor Hose At Battery Tray
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Compressor Hose Nut 1 @Battery Tray - Remove
9. Air Conditioning Compressor Hose 2 @Battery Tray - Remove

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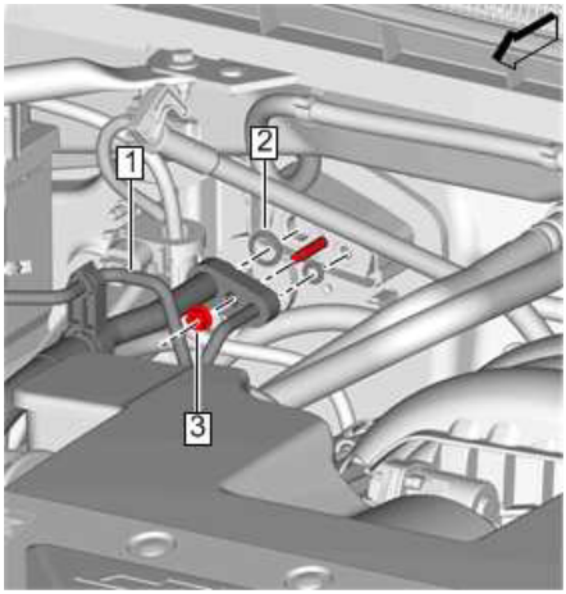


Fig. 63: Air Conditioning Compressor Hose At Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Compressor Hose Nut 3 @Air Conditioning Evaporator Thermal Expansion Valve - Remove
11. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporator Thermal Expansion Valve - Remove
12. Remove and DISCARD the sealing washer. 2

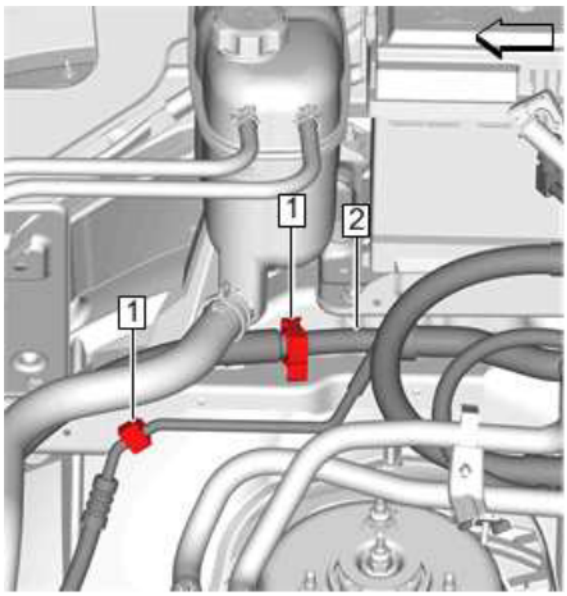


Fig. 64: Air Conditioning Condenser Hose and Clip
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Condenser Hose Clip 1 - Disengage
14. Remove the air conditioning compressor hose (2) from the vehicle.

Installation Procedure

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1. Install the air conditioning compressor hose to the vehicle.

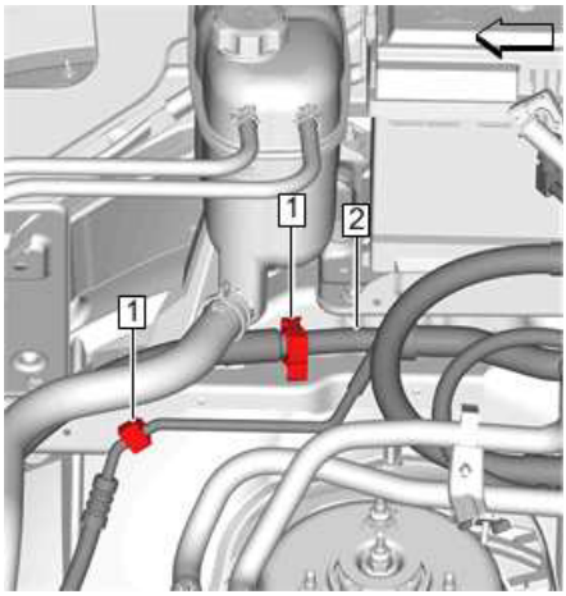


Fig. 65: Air Conditioning Condenser Hose and Clip
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Condenser Hose Clip 1 - Engage

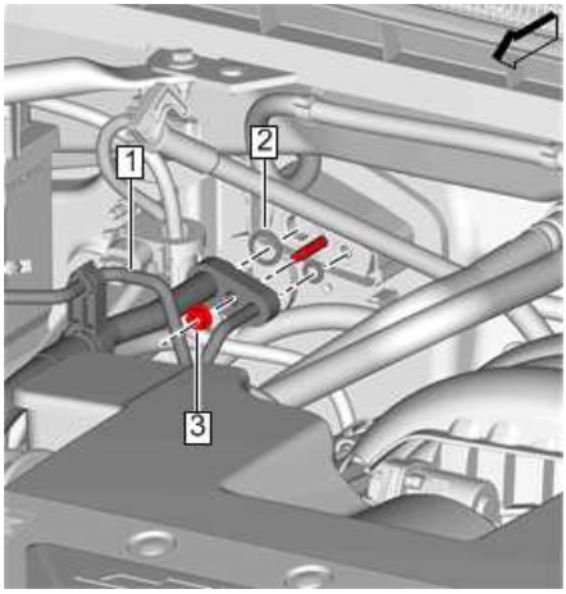


Fig. 66: Air Conditioning Compressor Hose At Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

3. Install a NEW sealing washer. 2 **Air Conditioning System Seal Replacement**
4. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporator Thermal Expansion Valve - Install

CAUTION: Refer to Fastener Caution .

5. Air Conditioning Compressor Hose Nut 3 @Air Conditioning Evaporator Thermal Expansion Valve - Install and tighten 22 N.m (16 lb ft)

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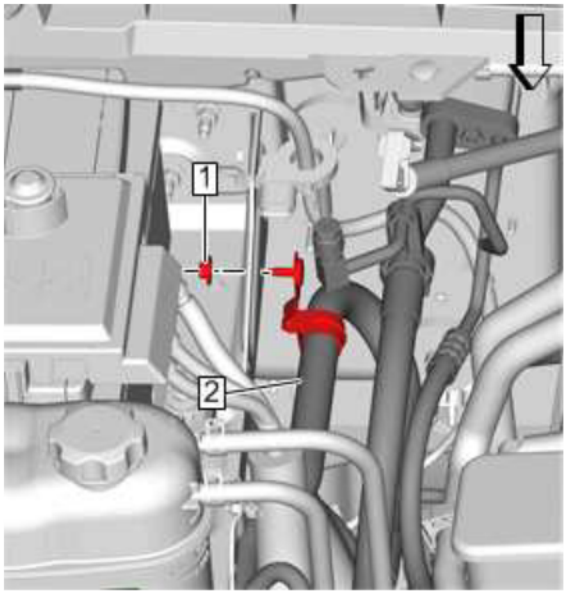


Fig. 67: Air Conditioning Compressor Hose At Battery Tray
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose 2 @Battery Tray - Install
7. Air Conditioning Compressor Hose Nut 1 @Battery Tray - Install and tighten 9 N.m (80 lb in)

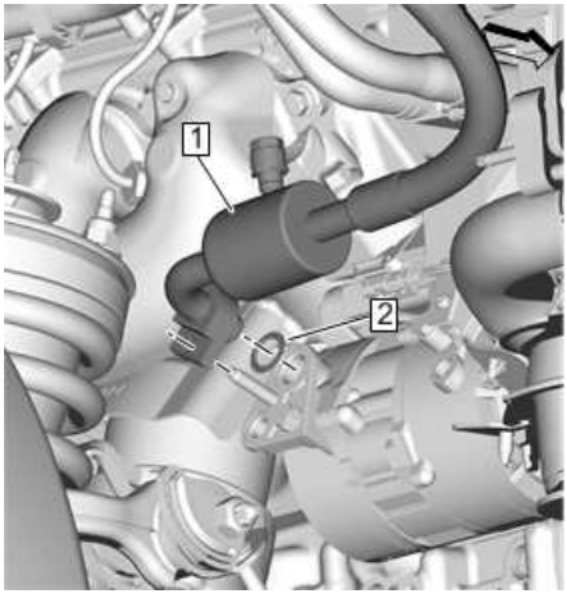


Fig. 68: Air Conditioning Compressor Hose At Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

8. Install a NEW sealing washer. 1 **Air Conditioning System Seal Replacement**
9. Air Conditioning Compressor Hose 1 @Air Conditioning Compressor - Install

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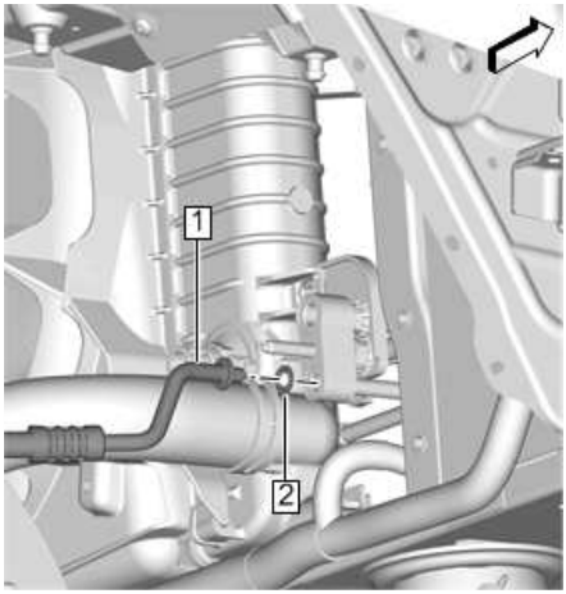


Fig. 69: Sealing Washer
Courtesy of GENERAL MOTORS COMPANY

10. Install a NEW sealing washer. 2 **Air Conditioning System Seal Replacement**
11. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Install
12. Air Conditioning Condenser Hose - Install - **Air Conditioning Condenser Hose Replacement (L83, L86)**
13. Air Cleaner Assembly - Install - **Air Cleaner Assembly Replacement**
14. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
15. Inspect for refrigerant leaks.

AIR CONDITIONING CONDENSER HOSE REPLACEMENT (LV3)

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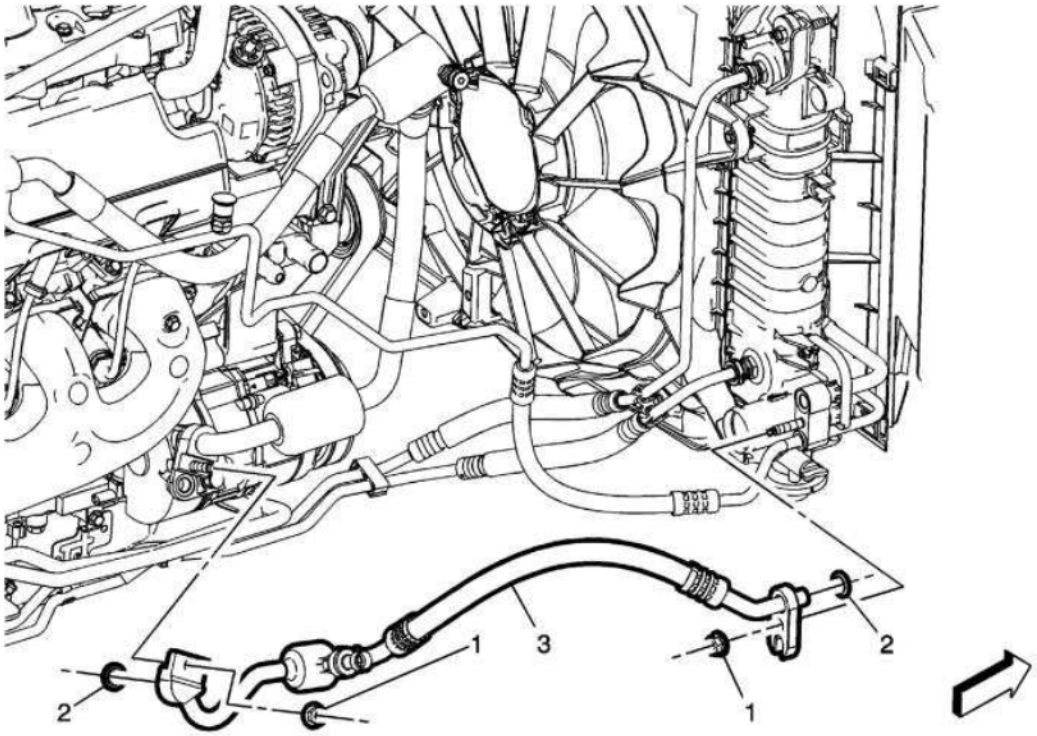


Fig. 70: Air Conditioning Condenser Hose (LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Remove air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** . 3. Disconnect electrical connector from the air conditioning (A/C) refrigerant pressure sensor.	
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**.

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Callout	Component Name
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, L96, LV3)**.

AIR CONDITIONING CONDENSER HOSE REPLACEMENT (L83, L86)

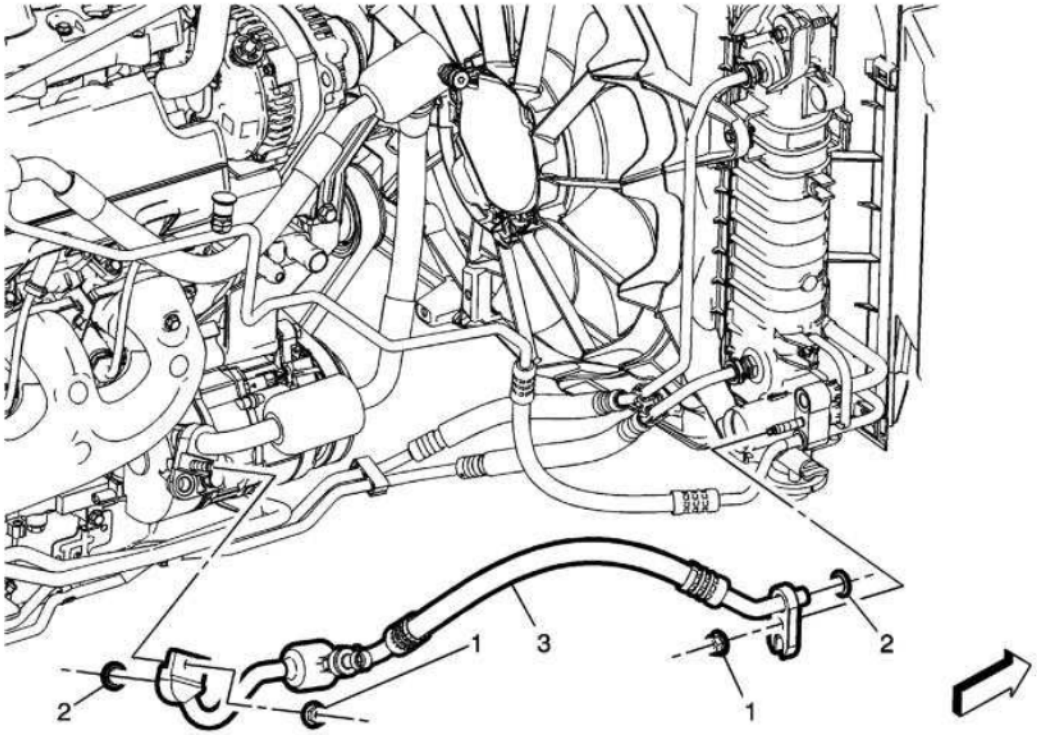


Fig. 71: Air Conditioning Condenser Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)** 2. **Air Cleaner Assembly Replacement** 3. Disconnect the electrical connector.	
1	Air Conditioning Condenser Hose Nut **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 22 N.m (16 lb ft)
2	Sealing Washer **Procedure** Remove and discard old sealing washers and replace with NEW sealing washers. **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. **Air Conditioning (A/C) Refrigerant Pressure Sensor Replacement (L83, L96, LV3)**

AIR CONDITIONING CONDENSER HOSE REPLACEMENT (L96, LC8)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

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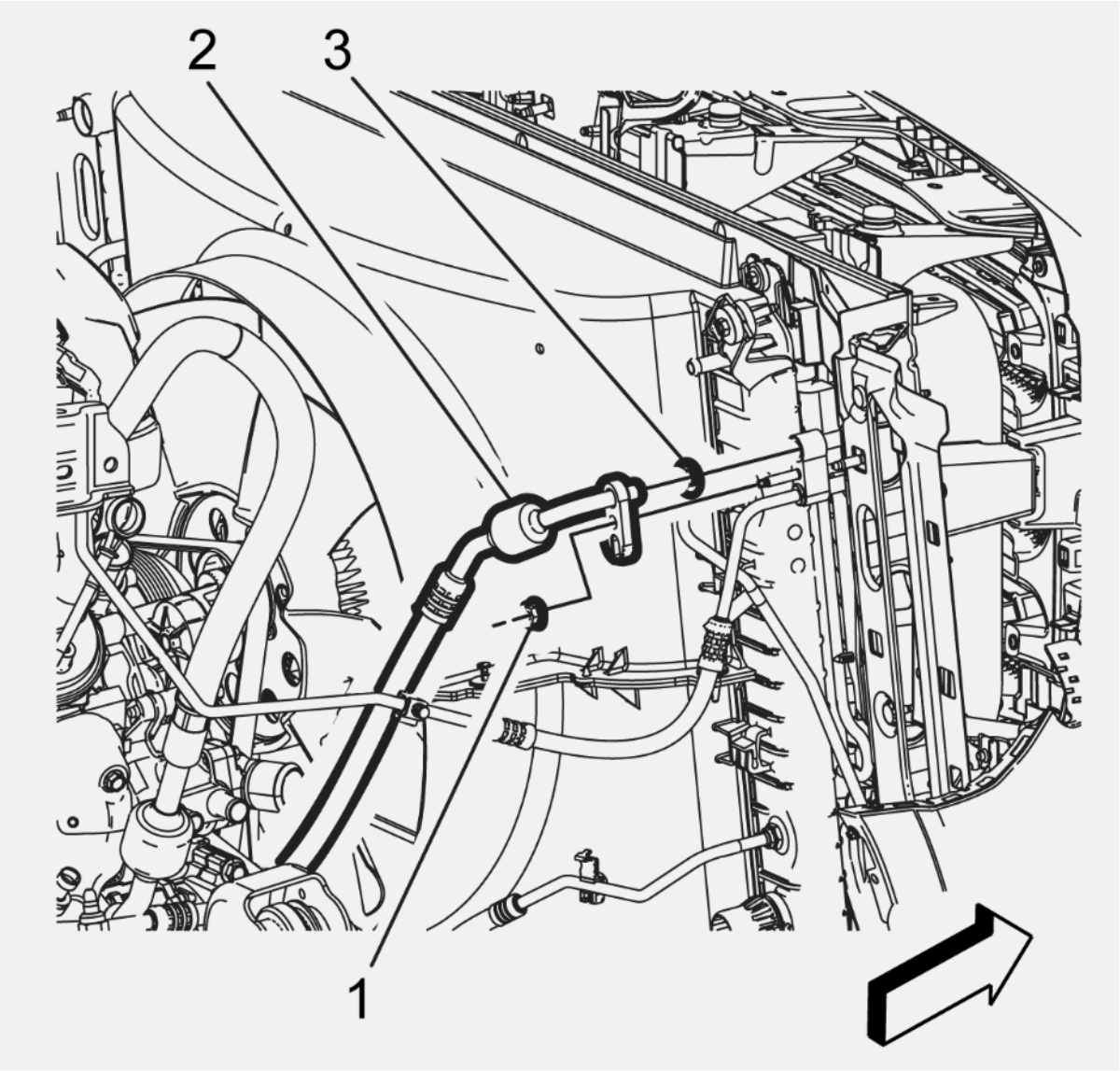


Fig. 72: Air Conditioning Compressor Hose To Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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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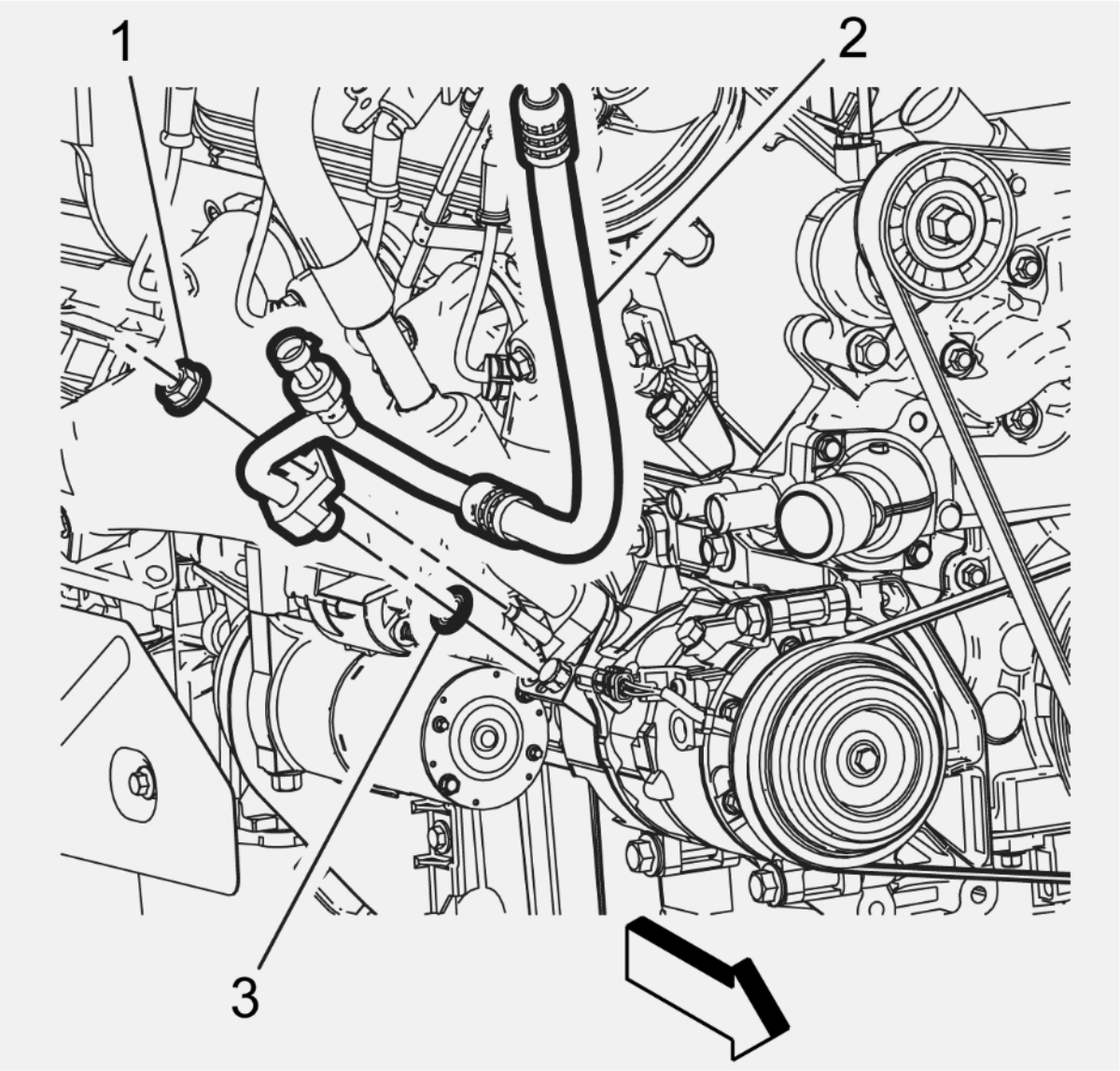


Fig. 73: Air Conditioning Compressor Hose To Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

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).

Installation Procedure

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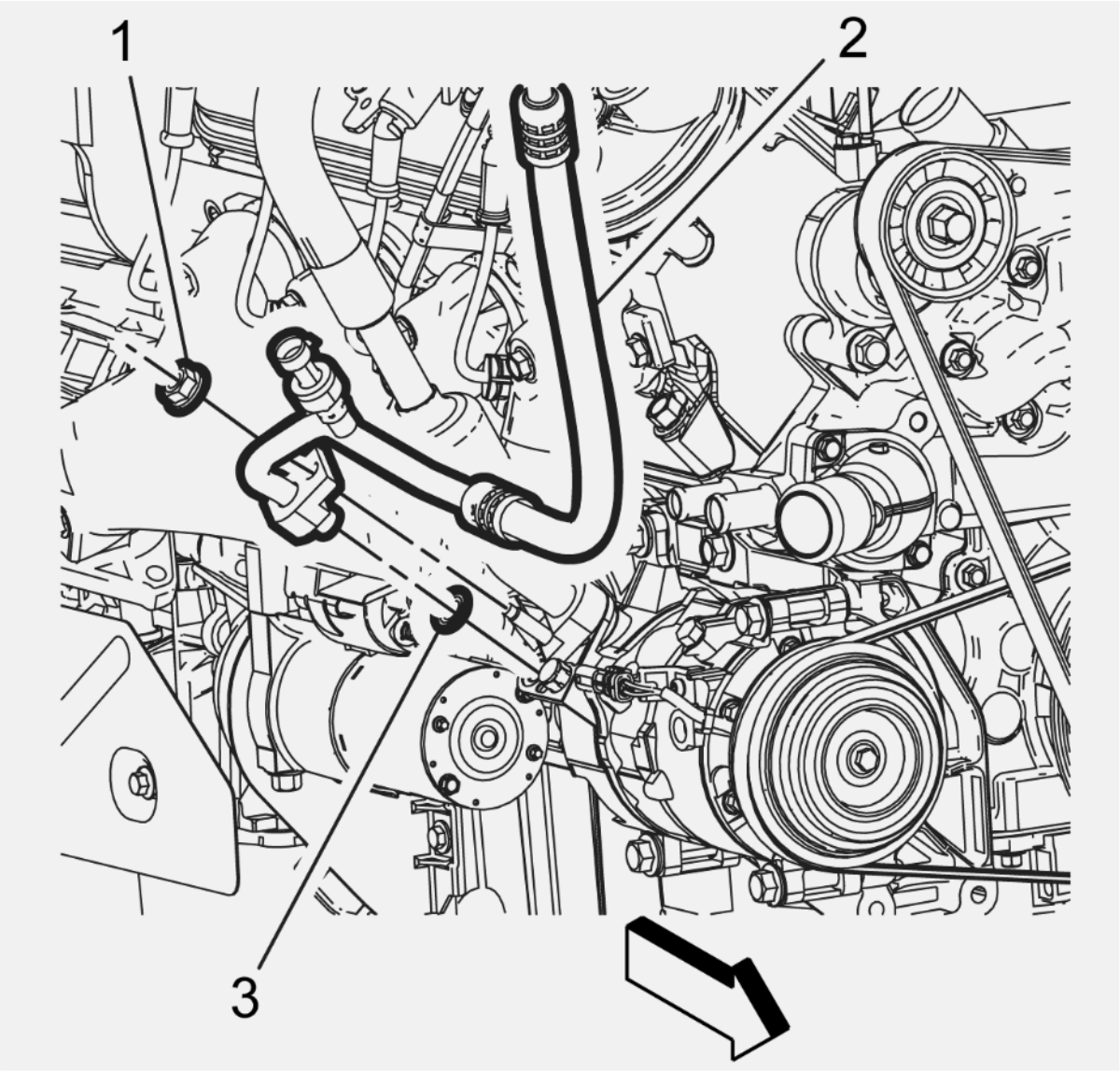


Fig. 74: Air Conditioning Compressor Hose To Air Conditioning Compressor
Courtesy of GENERAL MOTORS COMPANY

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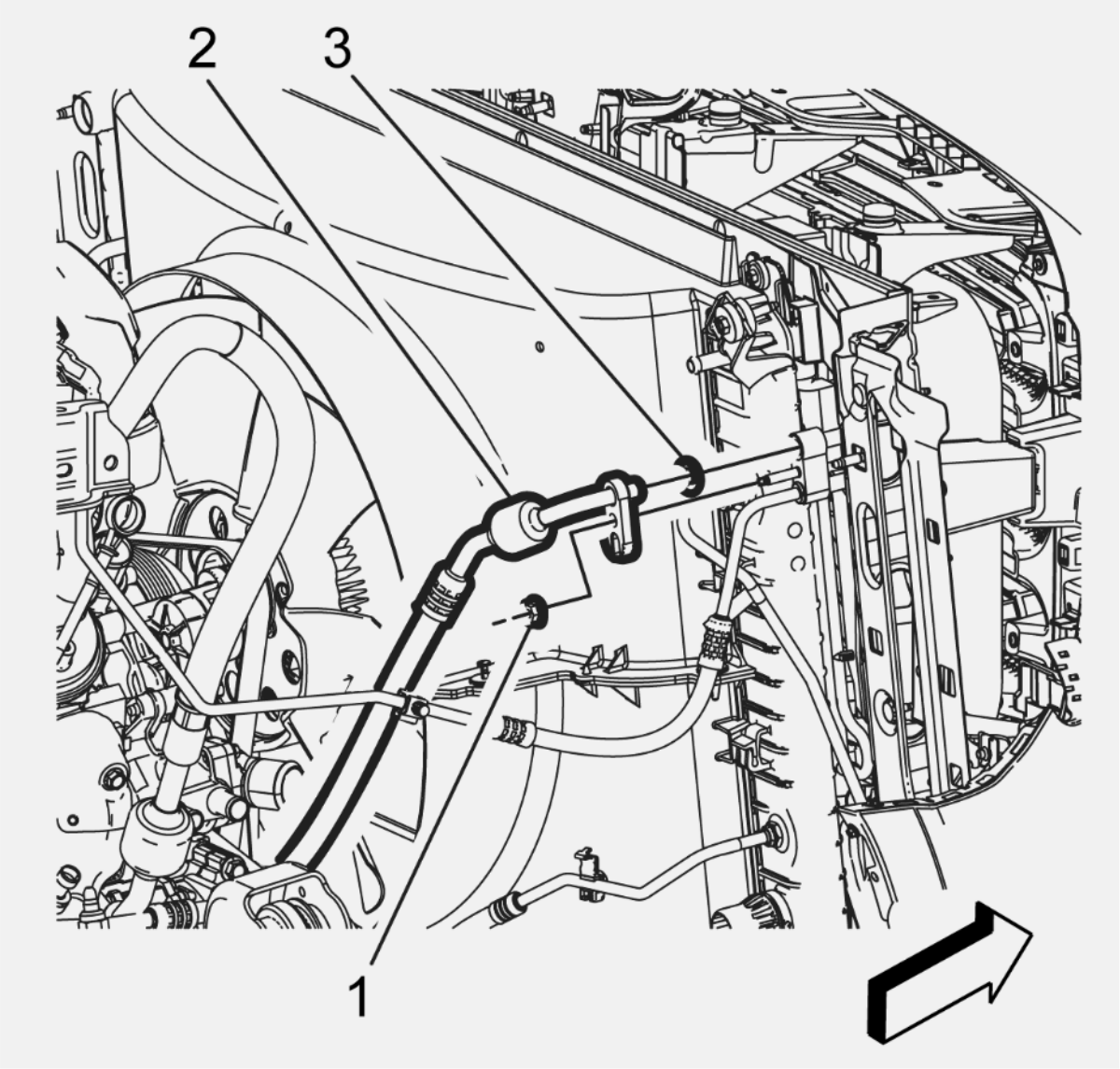


Fig. 75: Air Conditioning Compressor Hose To Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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 outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (LV3)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
3. Remove the air conditioning compressor hose from the air conditioning evaporator thermal expansion

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valve and position out of the way. Refer to **Air Conditioning Compressor Hose Replacement (LV3)**.

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 (LV3)**.

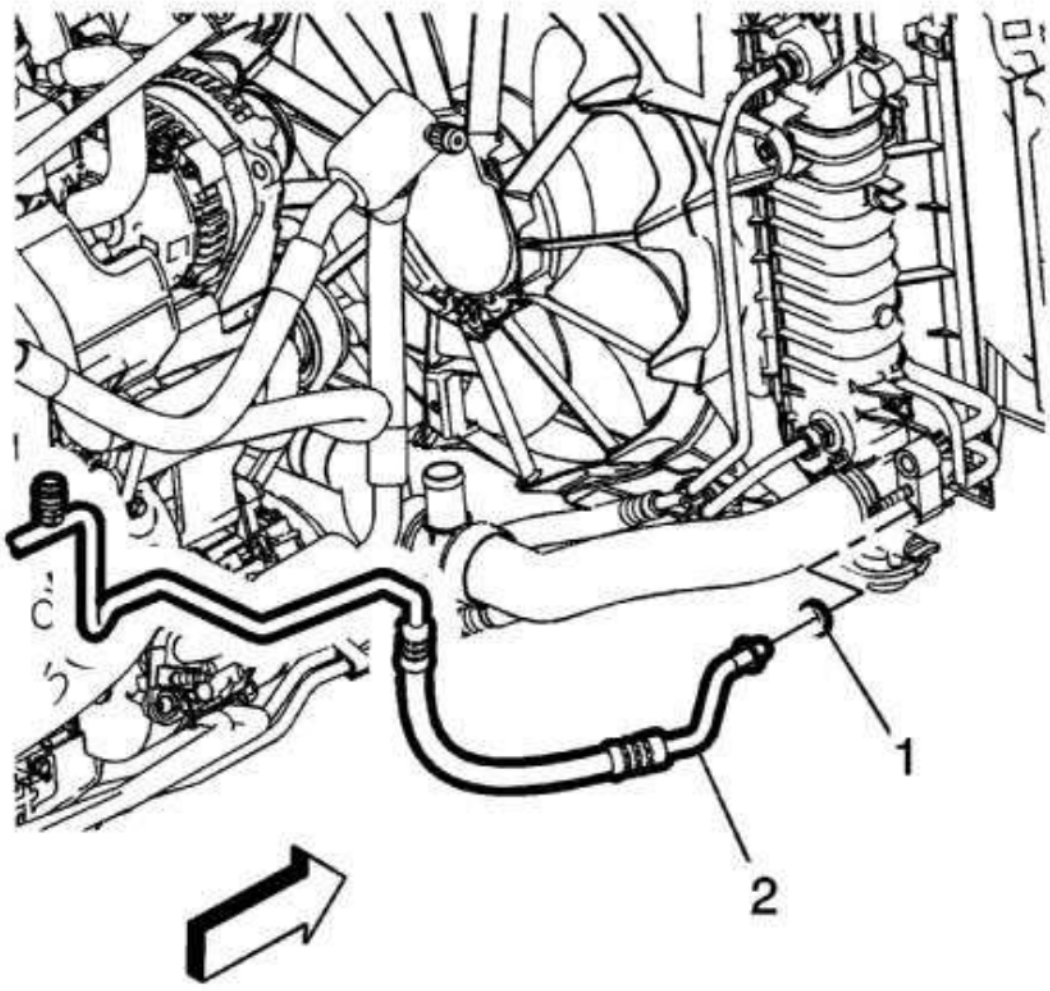


Fig. 76: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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

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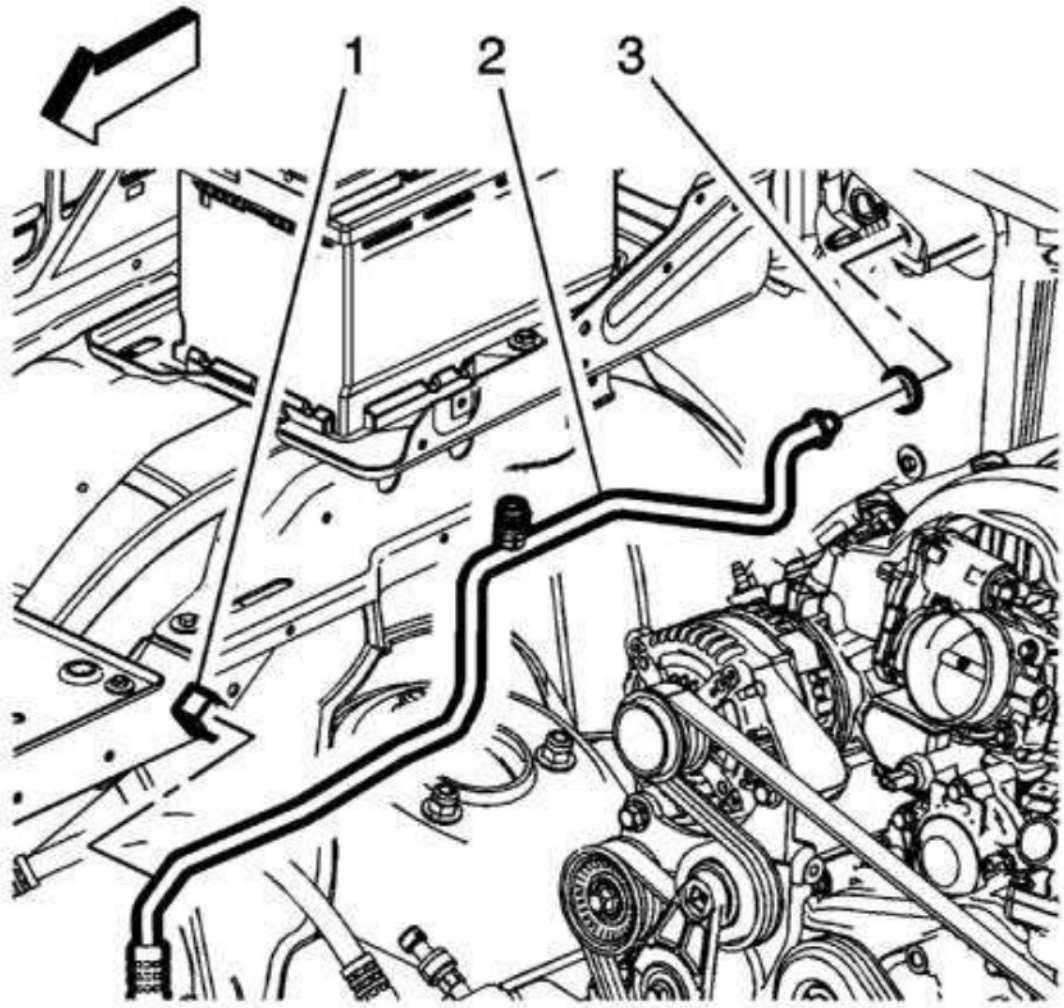


Fig. 77: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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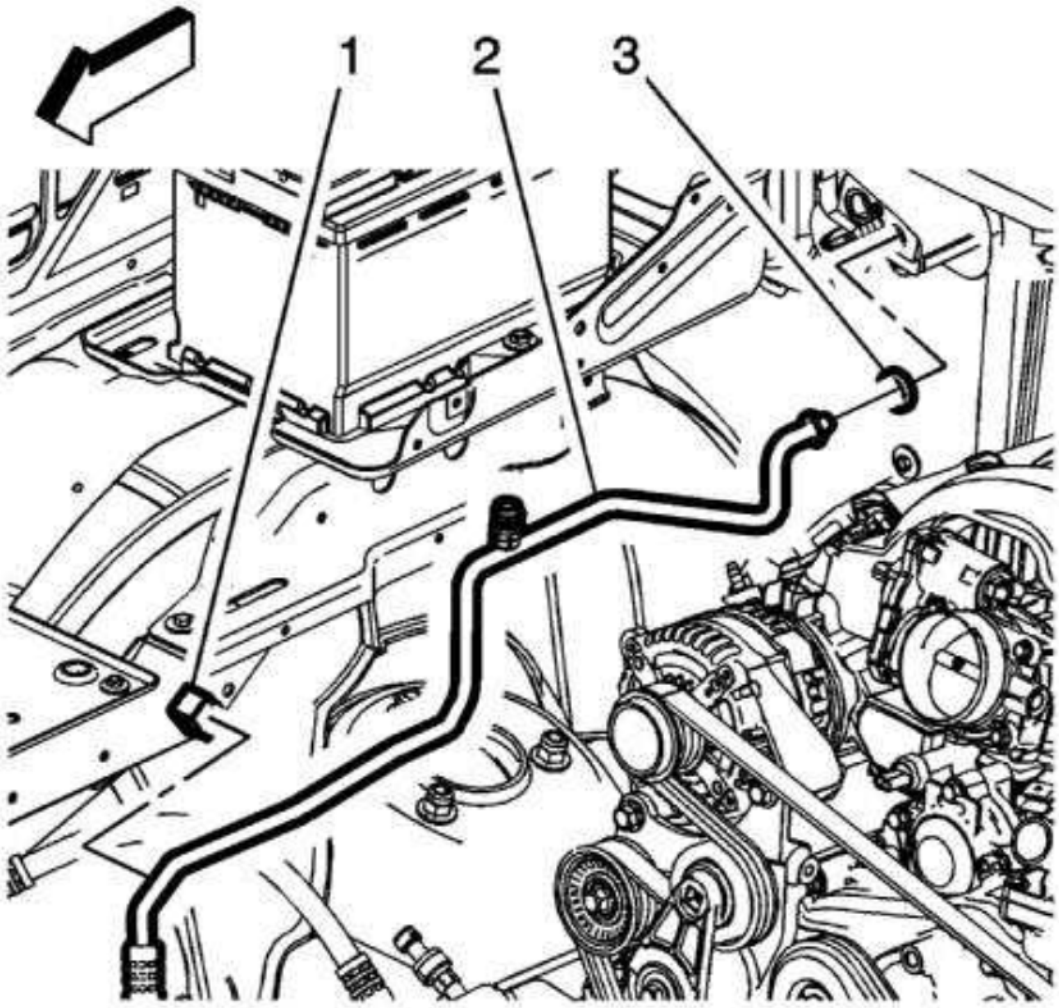


Fig. 78: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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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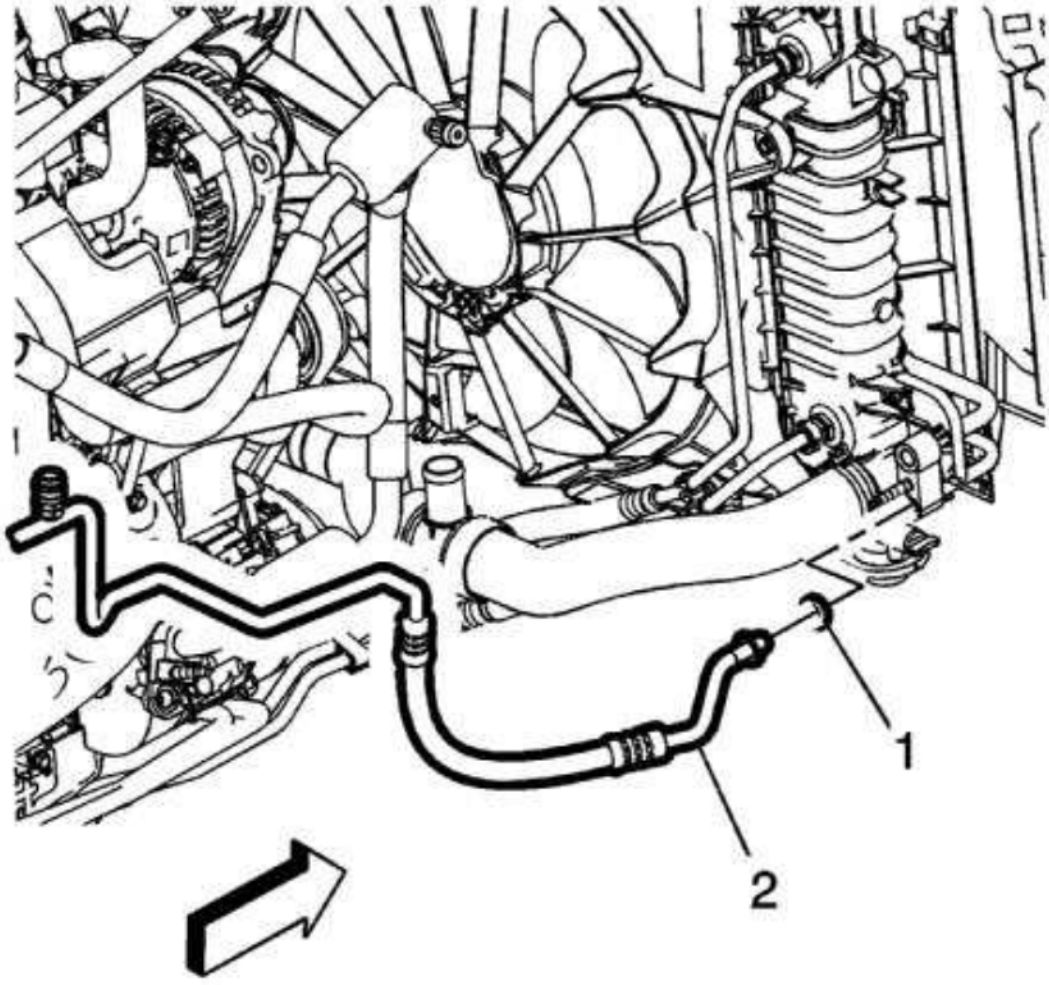


Fig. 79: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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 (LV3)**.
8. Install the air conditioning compressor hose to the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Compressor Hose Replacement (LV3)**.
9. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
10. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L83, L86)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

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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)**.

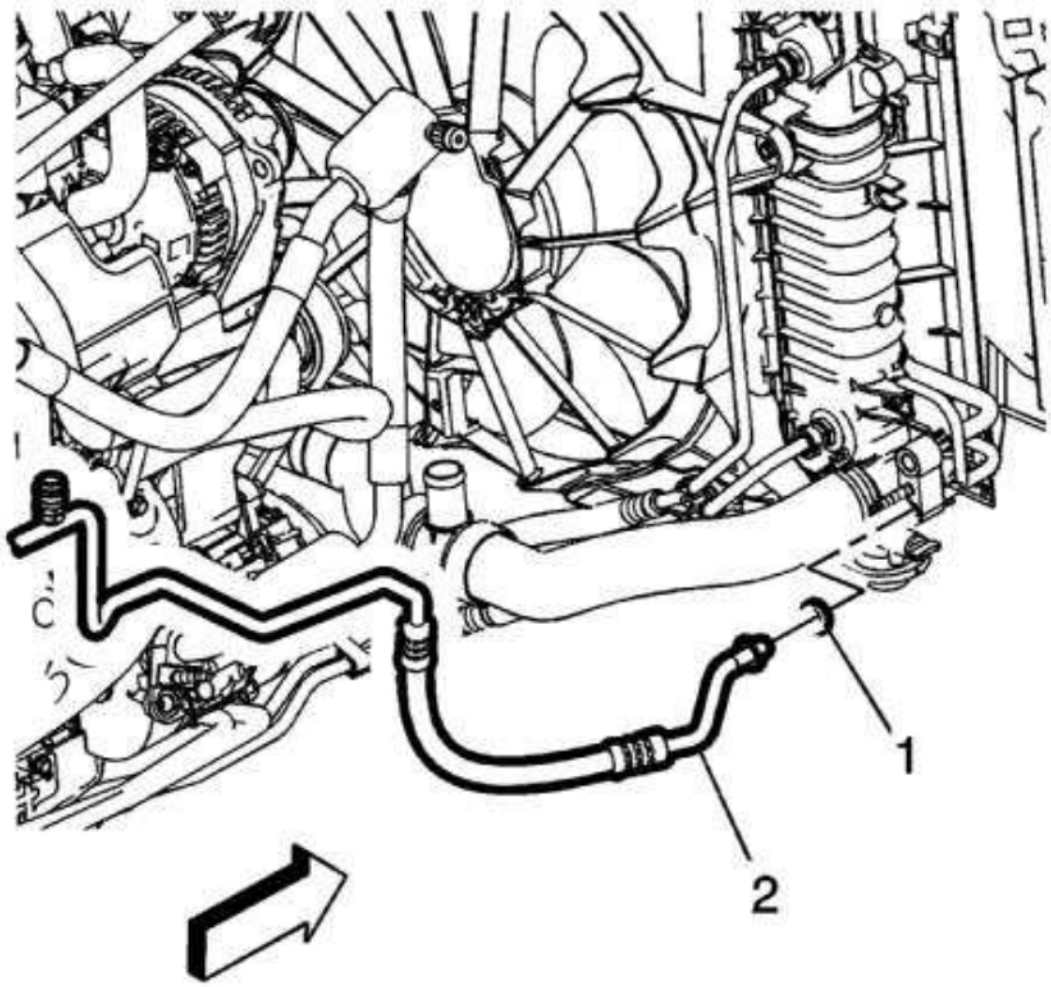


Fig. 80: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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

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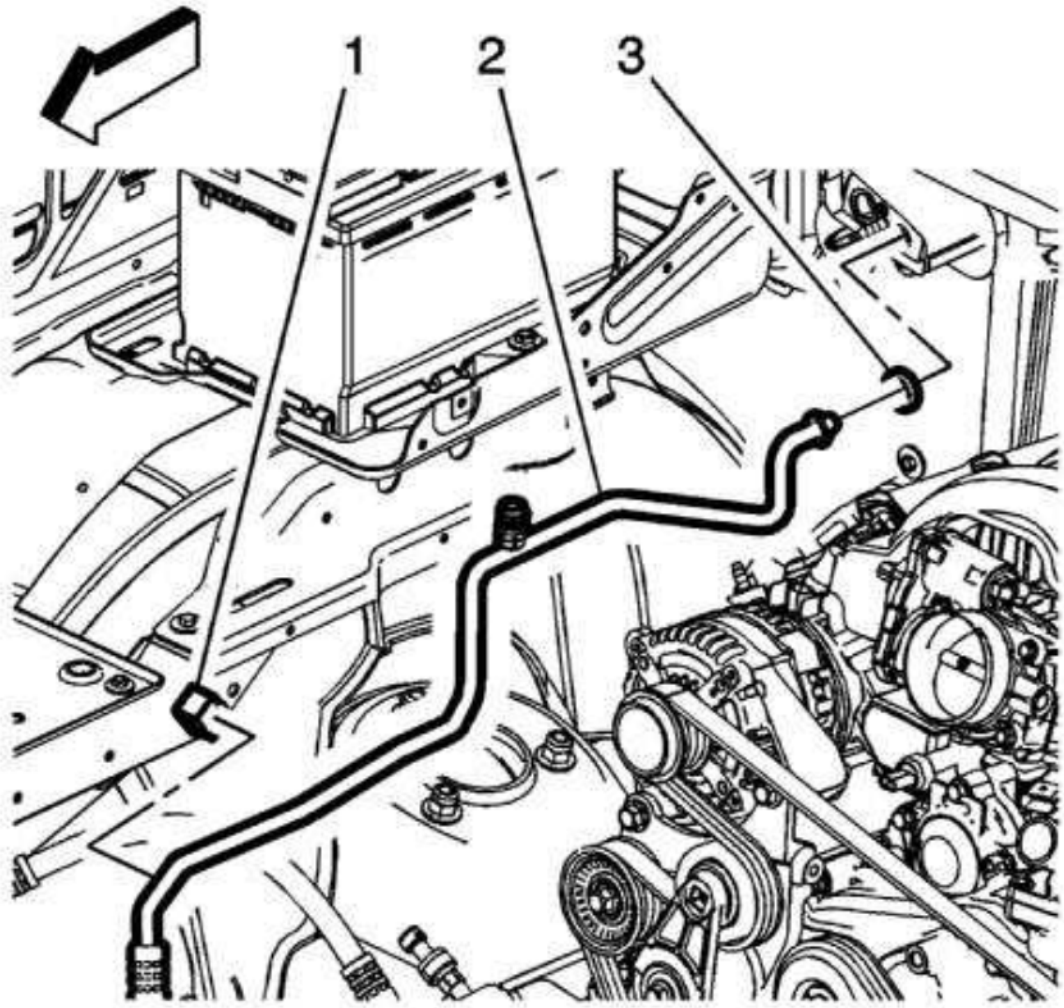


Fig. 81: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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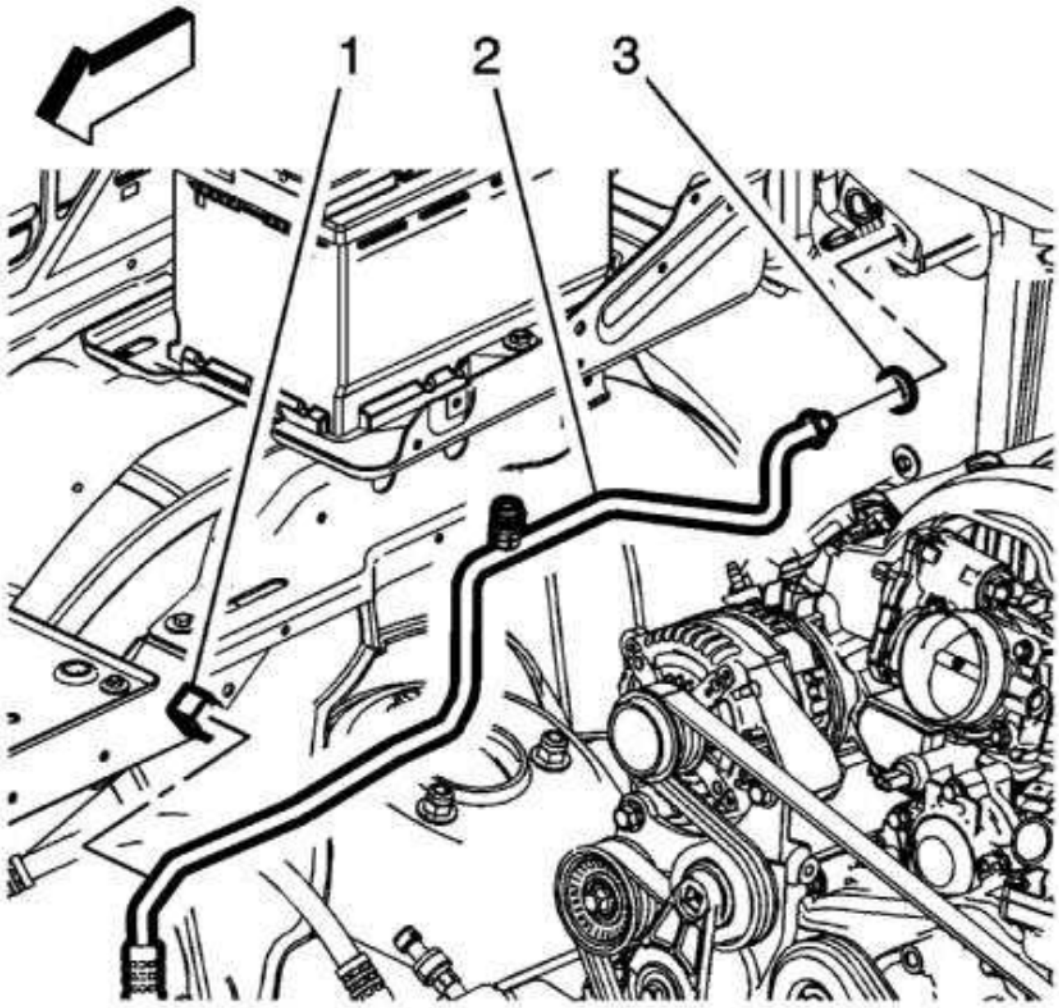


Fig. 82: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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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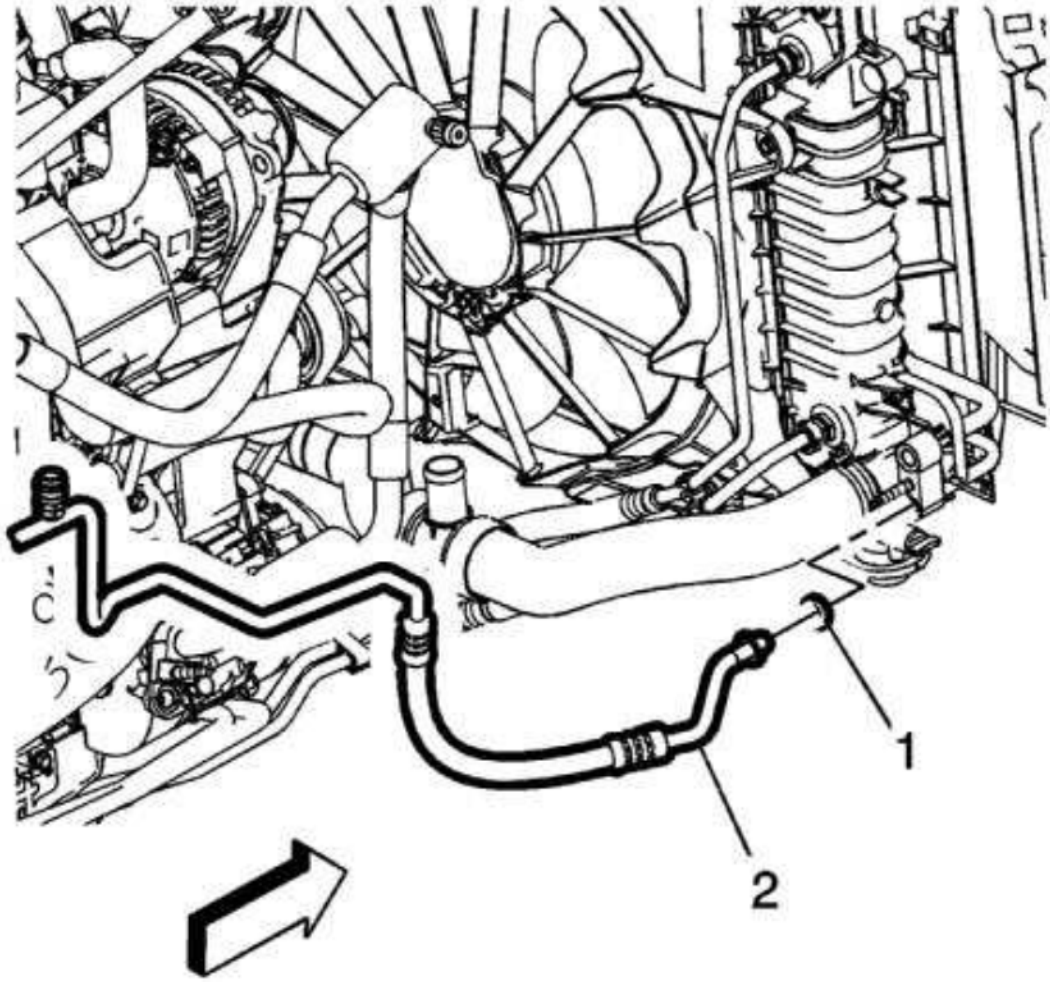


Fig. 83: Air Conditioning Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

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, 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 air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
10. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L96, LC8)

Removal Procedure

1. Recover refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.
2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

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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, LC8)**.
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, LC8)**.

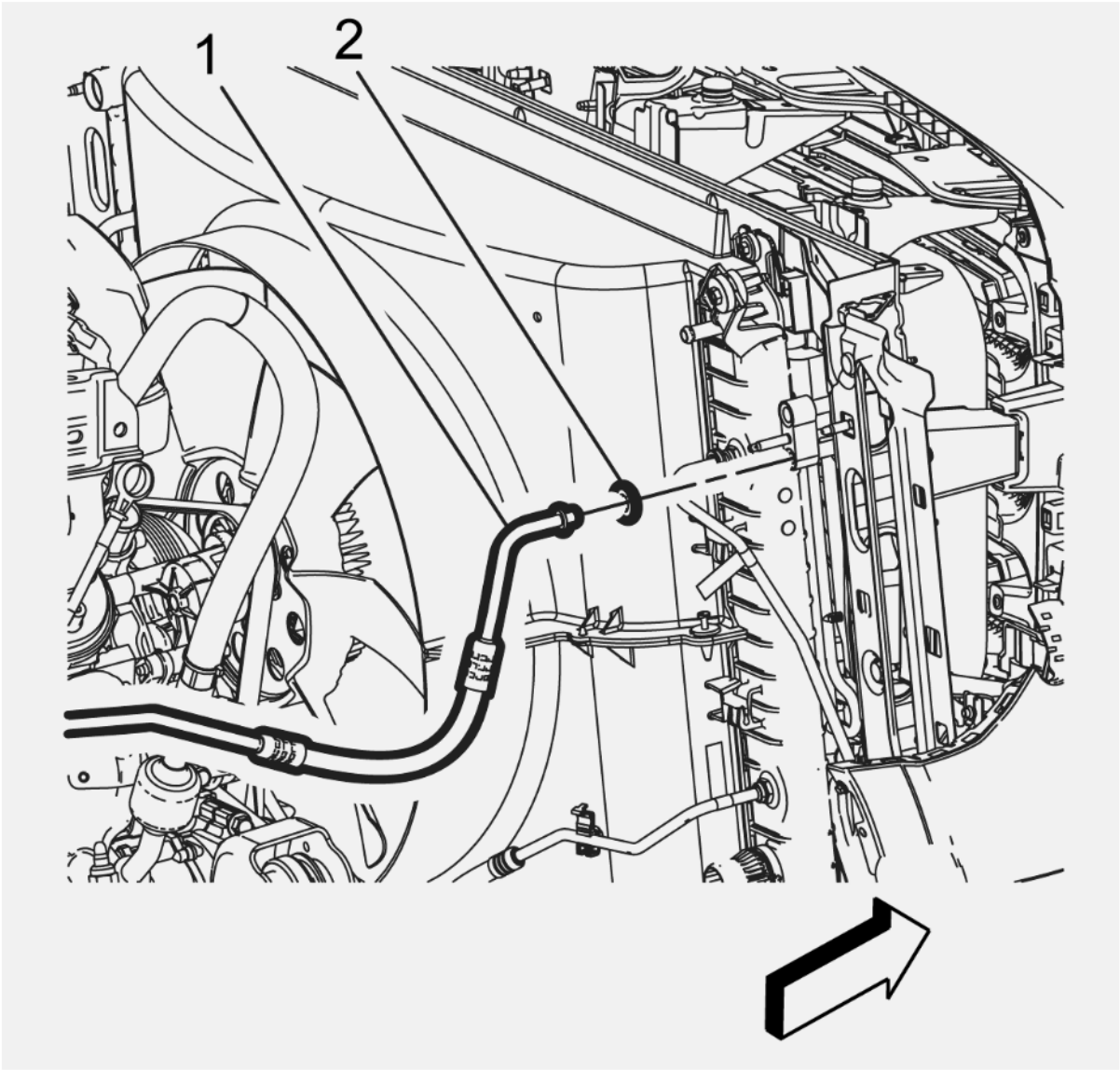


Fig. 84: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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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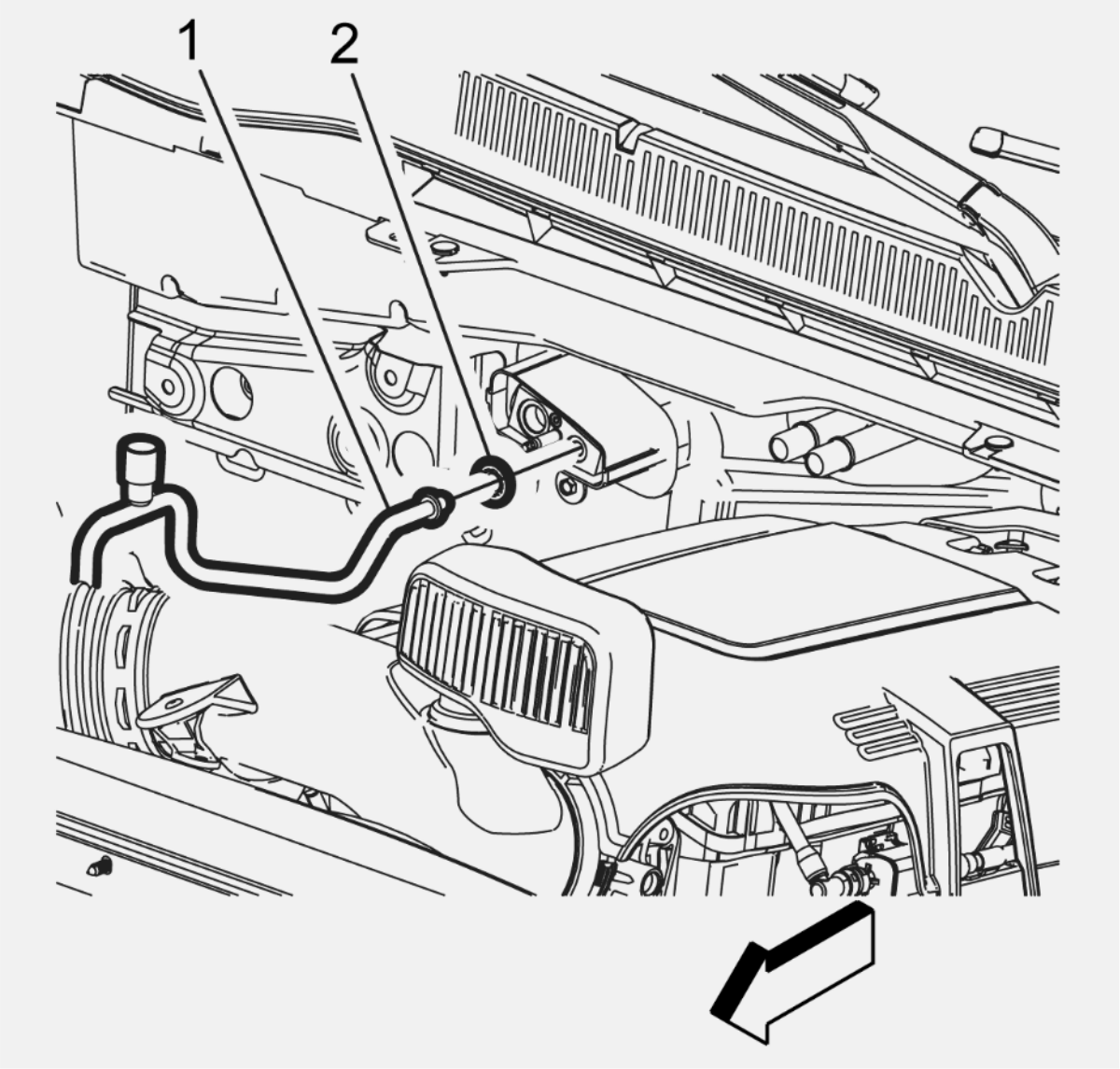


Fig. 85: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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).

Installation Procedure

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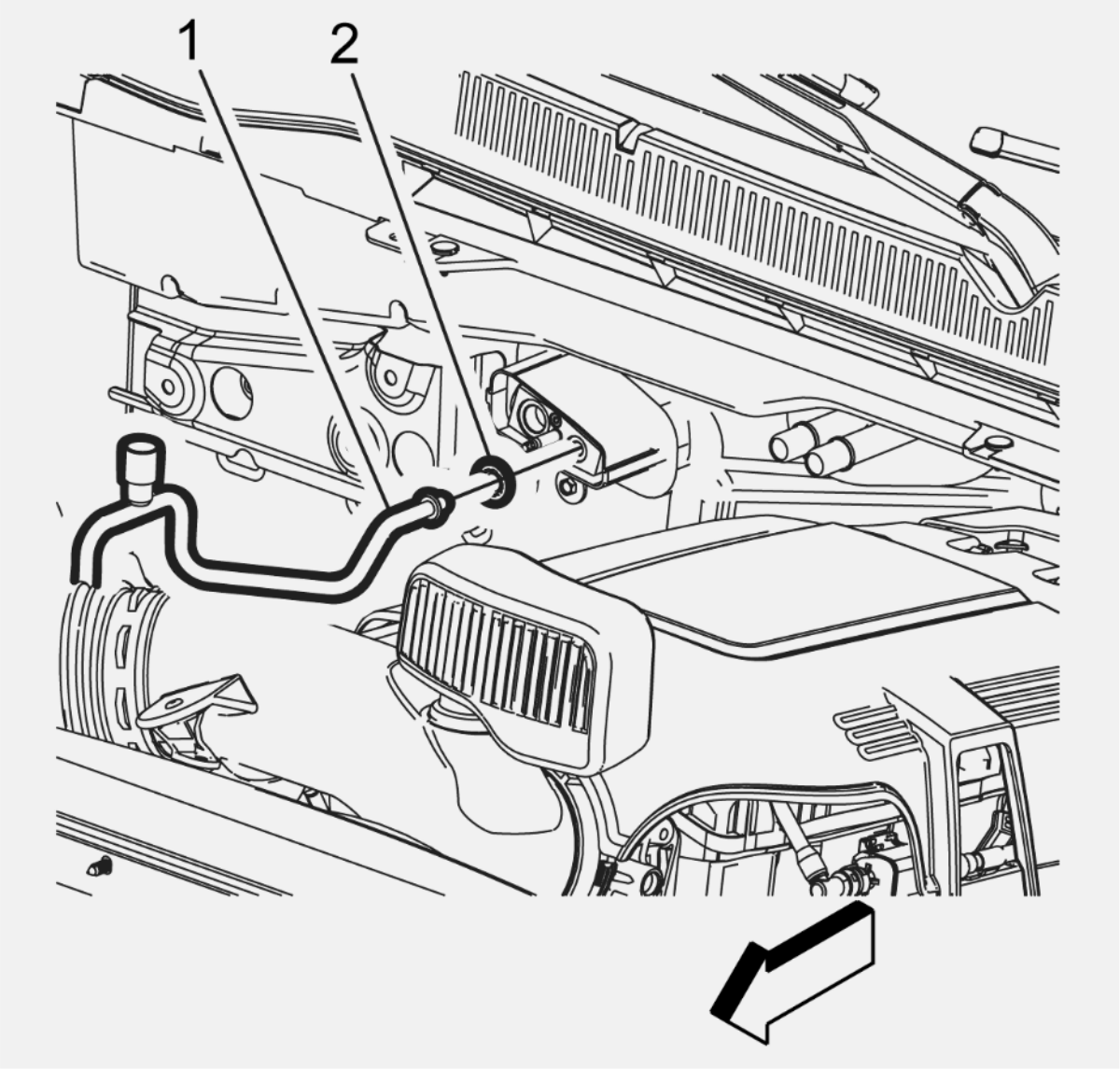


Fig. 86: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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

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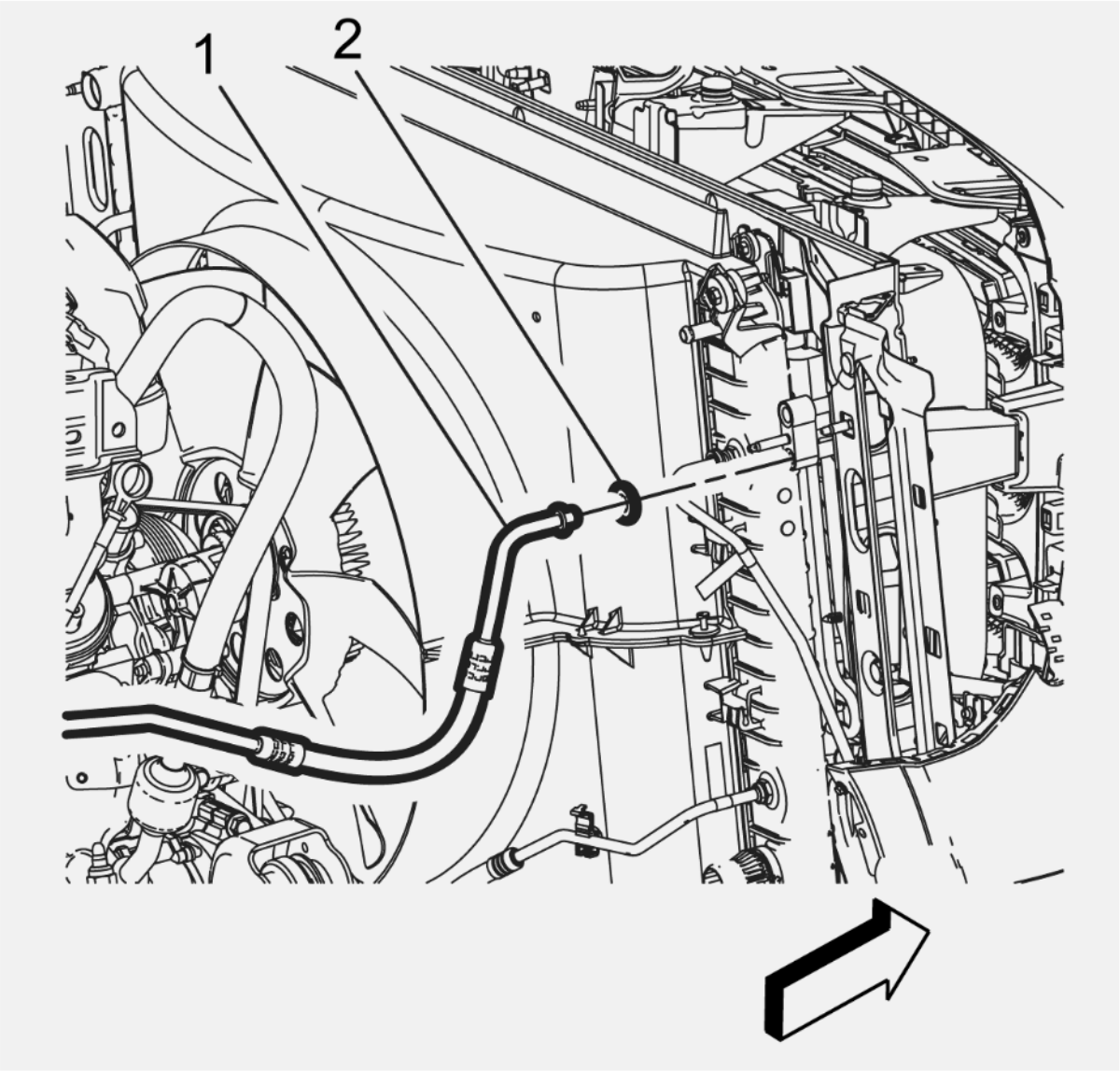


Fig. 87: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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, LC8)**.
7. Install the air conditioning compressor hose to the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Compressor Hose Replacement (L96, LC8)**.
8. Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
9. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L8B)

Removal Procedure

1. Recover refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

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2. Front Wheelhouse Front Liner- Right - Remove - **Front Wheelhouse Liner Replacement - Right Side**
3. Air Conditioning Compressor Hose - Remove - **Air Conditioning Compressor Hose Replacement (L8B)**

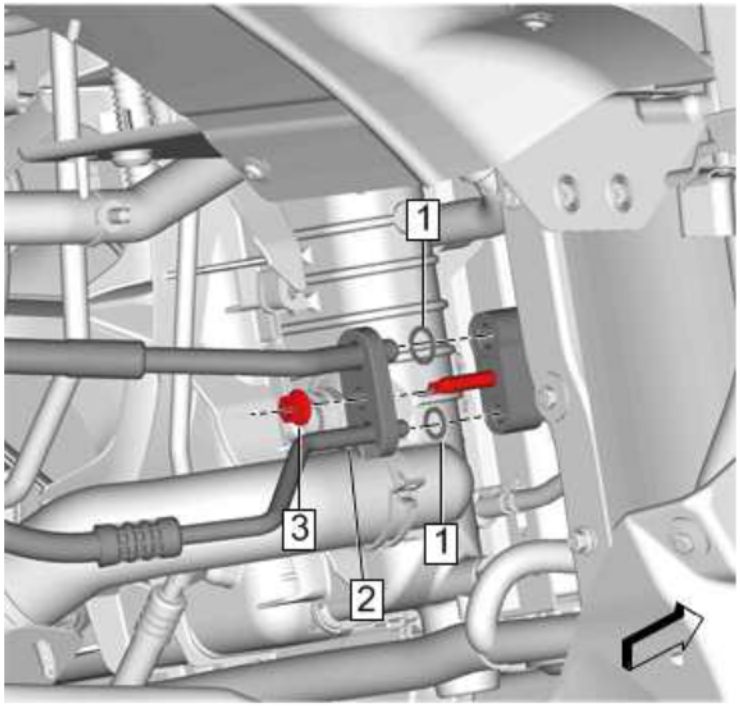
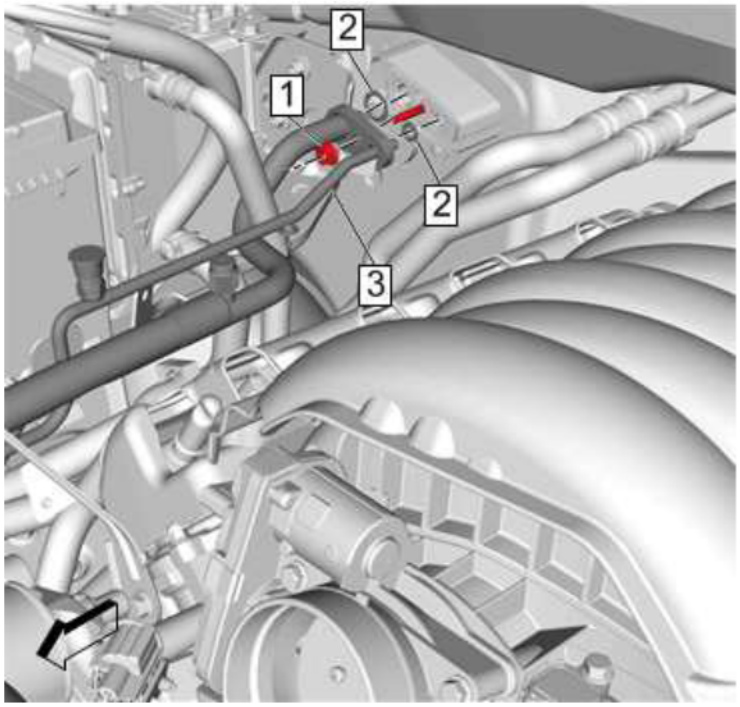


Fig. 88: Air Conditioning Compressor Hoses And Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Compressor and Condenser Hose Nut 3 - Remove
5. Air Conditioning Evaporator Tube 2 - Remove
6. O-Ring 1 - Remove and DISCARD



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Fig. 89: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Compressor and Condenser Hose Nut 1 - Remove
8. Air Conditioning Evaporator Tube 3 - Remove
9. O-Ring 2 Remove and DISCARD

Installation Procedure

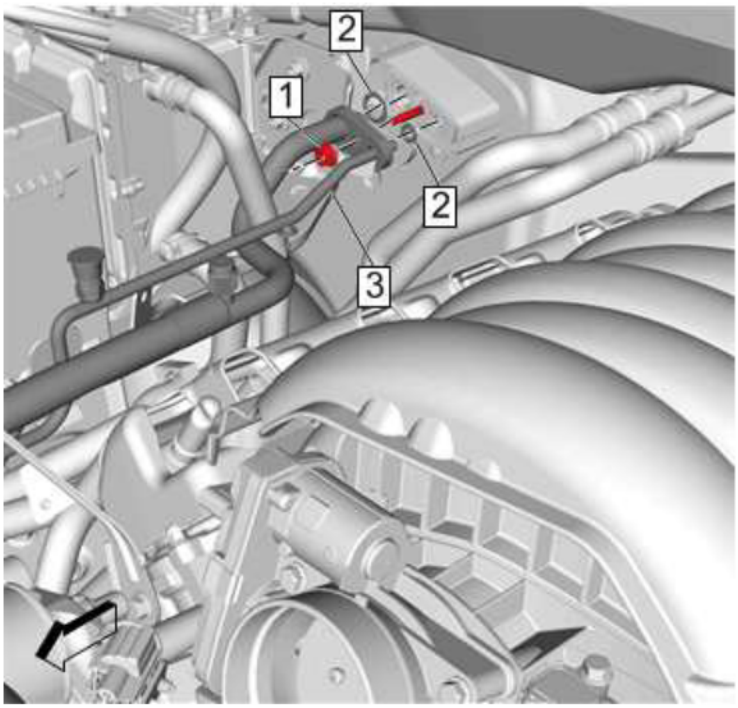


Fig. 90: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

1. O-Ring 2 - Install NEW **Air Conditioning O-Ring Seal Replacement**
2. Air Conditioning Evaporator Tube 3 - Install

CAUTION: Refer to Fastener Caution

3. Air Conditioning Compressor and Condenser Hose Nut 1 - Install and tighten 22 N.m (16 lb ft)

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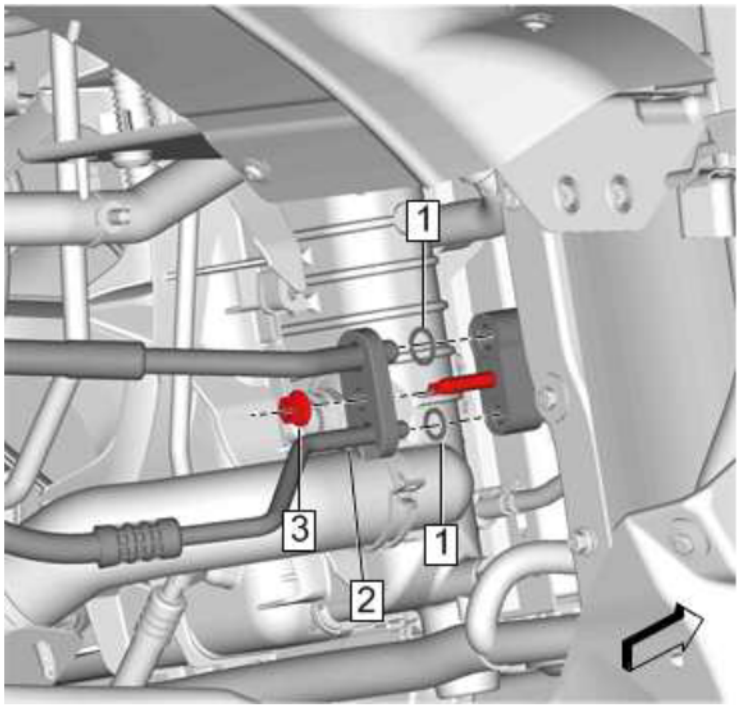
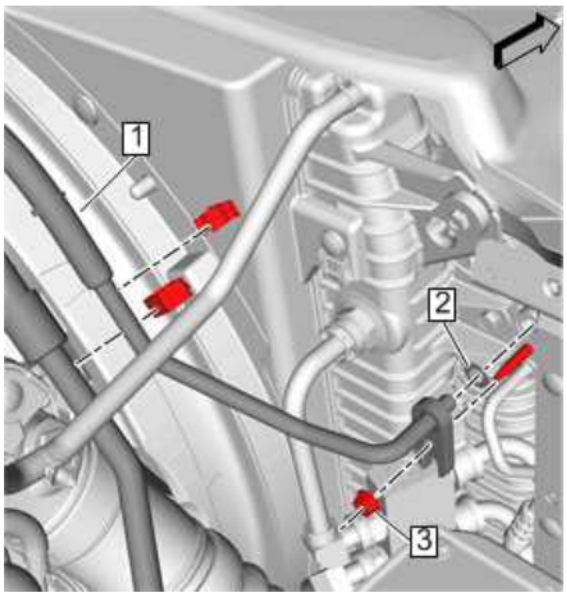


Fig. 91: Air Conditioning Compressor Hoses And Evaporator Tube
Courtesy of GENERAL MOTORS COMPANY

4. O-Ring (2) - Install NEW - **Air Conditioning O-Ring Seal Replacement**
5. Air Conditioning Compressor Hose - Install - **Air Conditioning Compressor Hose Replacement (L8B)**
6. Air Conditioning Evaporator Tube 2 - Install
7. Air Conditioning Compressor and Condenser Hose Nut 3 - Install and tighten 22 N.m (16 lb ft)
8. Front Wheelhouse Front Liner- Right - Install - **Front Wheelhouse Liner Replacement - Right Side**
9. Recharge the refrigerant.

AIR CONDITIONING EVAPORATOR TUBE REPLACEMENT (L5P)

Removal Procedure



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Fig. 92: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Compressor Hose 1 @Air Conditioning Condenser - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**

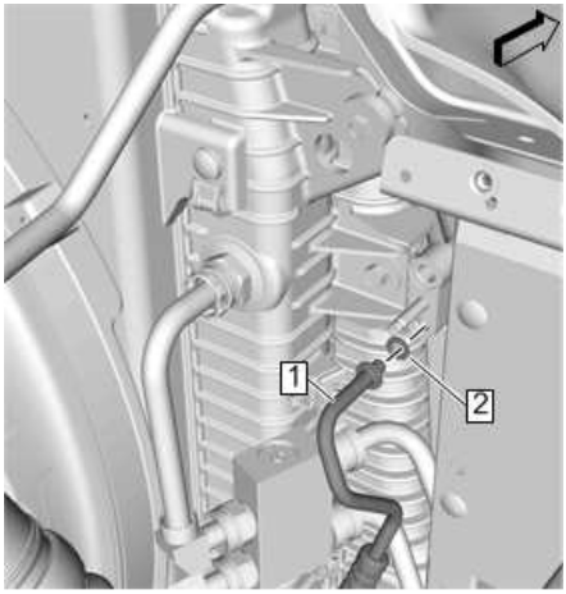


Fig. 93: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Evaporator Tube 1 @Air Conditioning Condenser - Remove
3. Remove and DISCARD the sealing washer. 2

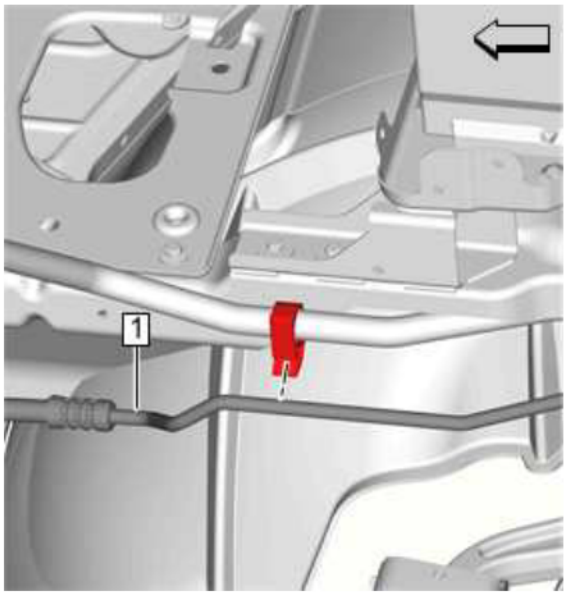


Fig. 94: Air Conditioning Evaporator Tube And Air Cleaner Bracket
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Evaporator Tube 1 @Air Cleaner Bracket - Remove

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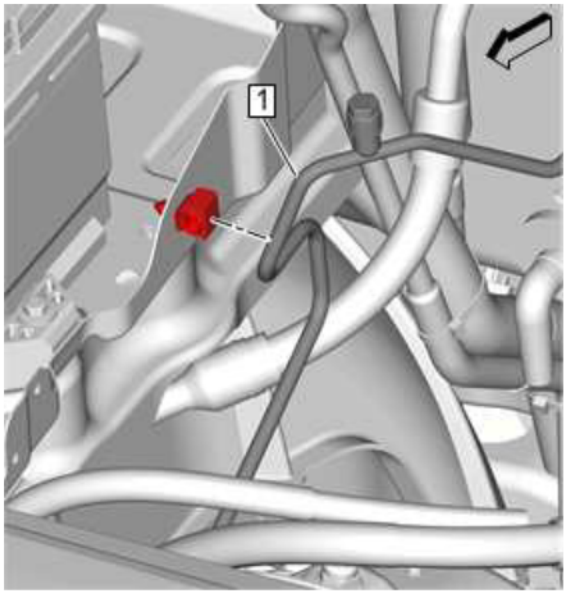


Fig. 95: Air Conditioning Evaporator Tube And Battery Tray
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Evaporator Tube 1 @Battery Tray - Remove

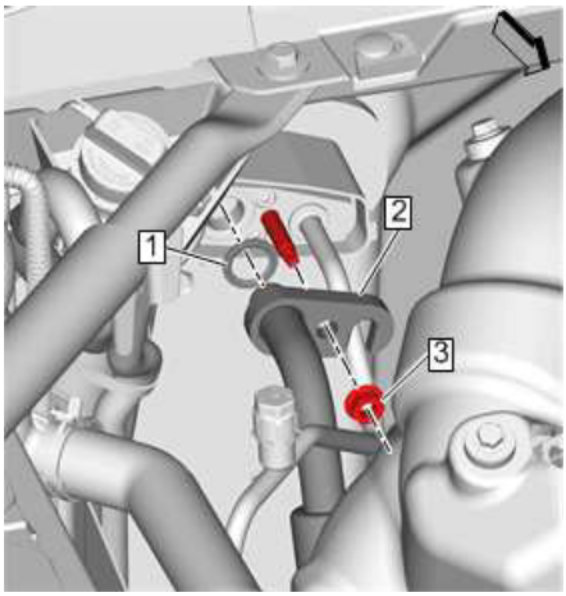


Fig. 96: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**

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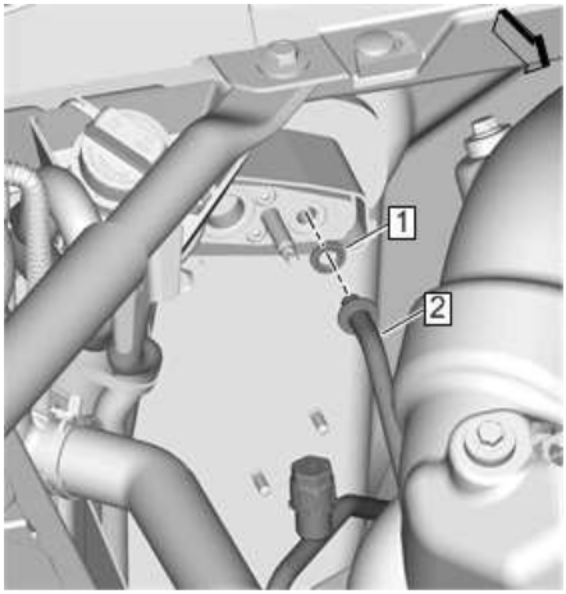


Fig. 97: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Evaporator Tube 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove
8. Remove and DISCARD the sealing washer. 1
9. Remove the air conditioning evaporator tube (2) from the vehicle.

Installation Procedure

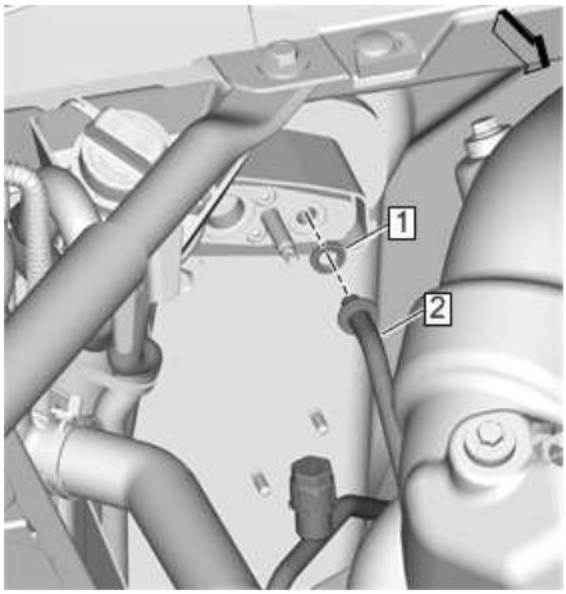


Fig. 98: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

1. Install the air conditioning evaporator tube (2) to the vehicle.
2. Install a NEW sealing washer. 1 **Air Conditioning System Seal Replacement**
3. Air Conditioning Evaporator Tube 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install

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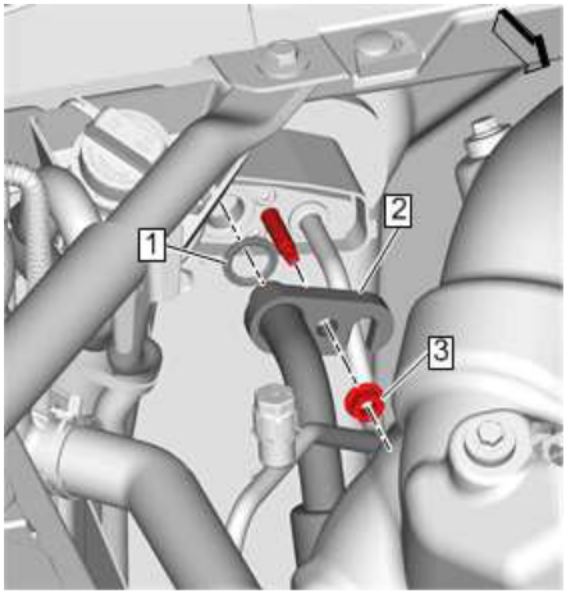


Fig. 99: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install - **Air Conditioning Compressor Hose Replacement (L5P)**

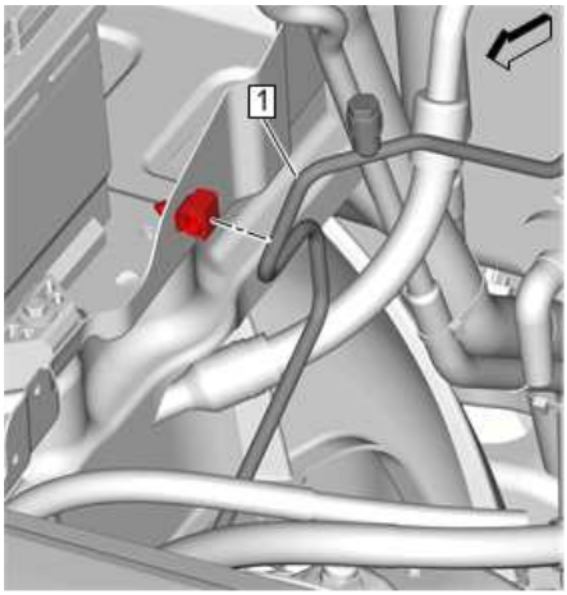


Fig. 100: Air Conditioning Evaporator Tube And Battery Tray
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Evaporator Tube 1 @Battery Tray - Install

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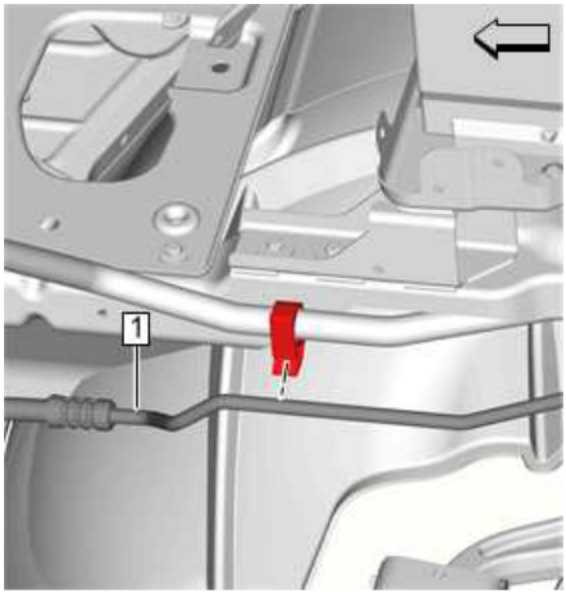


Fig. 101: Air Conditioning Evaporator Tube And Air Cleaner Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Tube 1 @Air Cleaner Bracket - Install

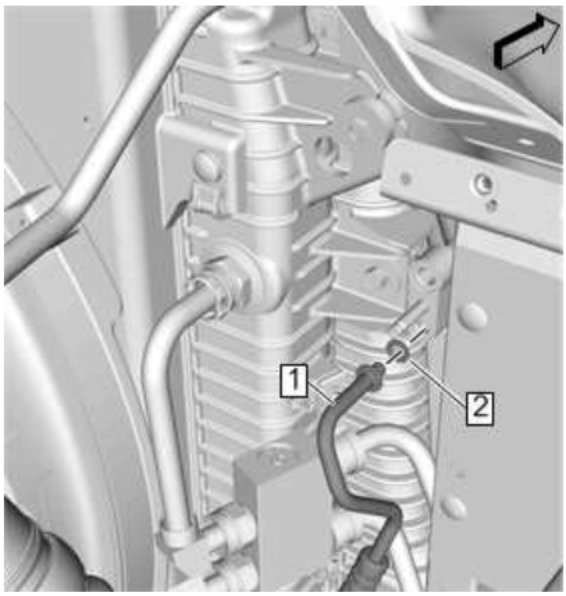


Fig. 102: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

7. Install a NEW sealing washer. 2
8. Air Conditioning Evaporator Tube 1 @Air Conditioning Condenser - Install

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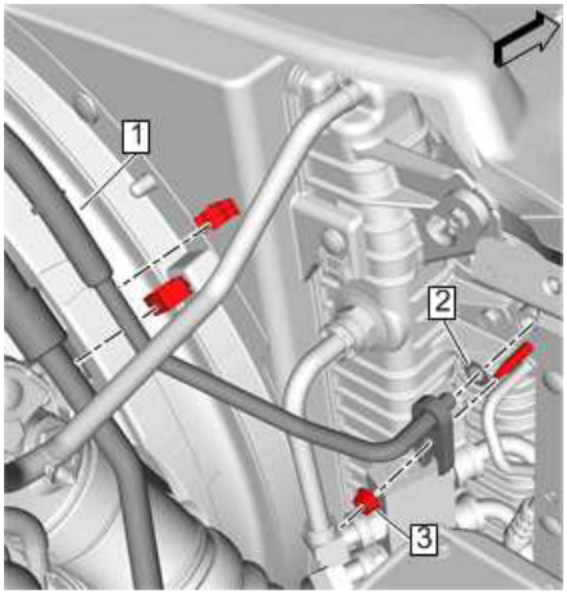


Fig. 103: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Hose 1 @Air Conditioning Condenser - Install - **Air Conditioning Compressor Hose Replacement (L5P)**

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 (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

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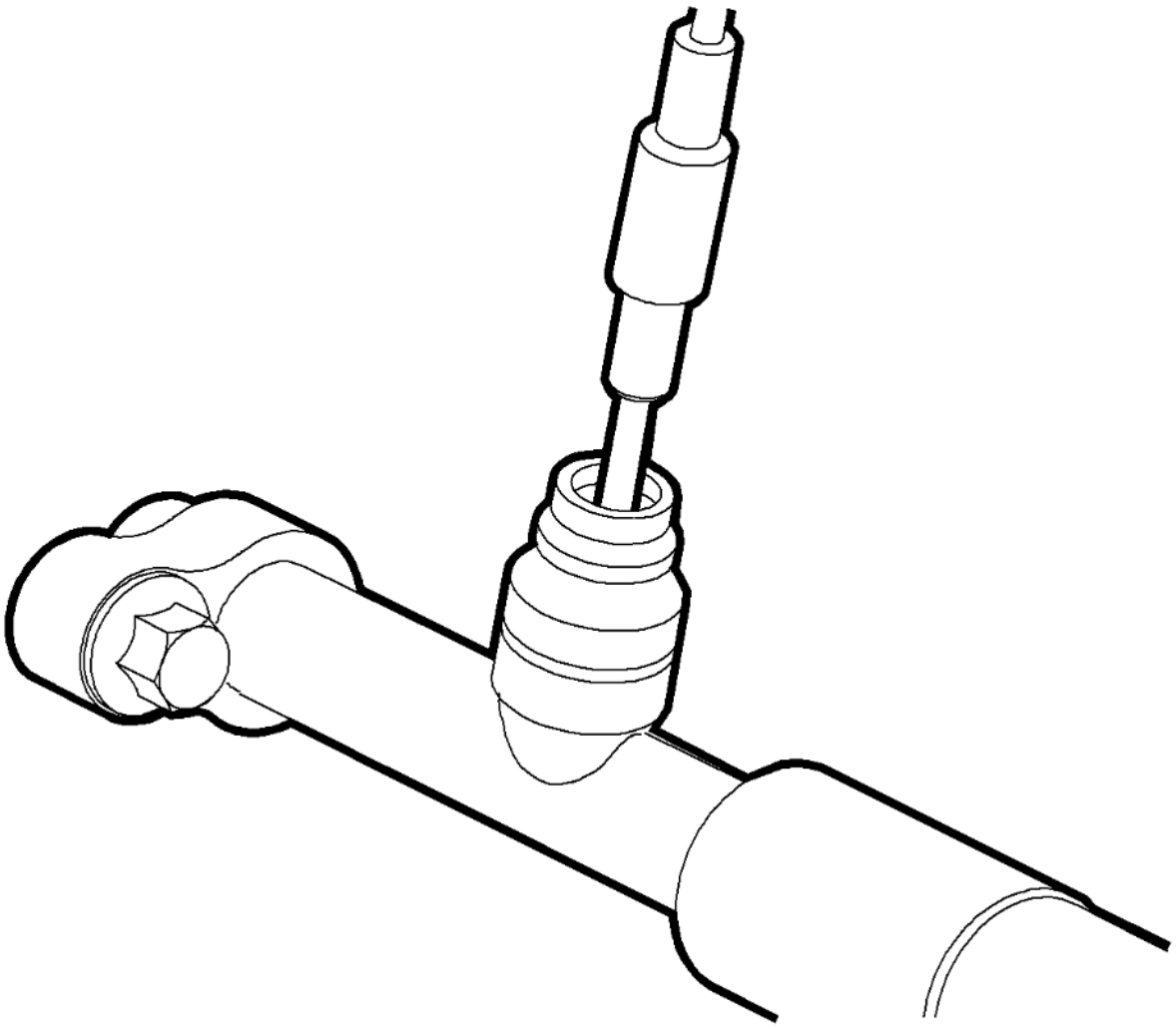


Fig. 104: Valve Core Removal/Installation Tool
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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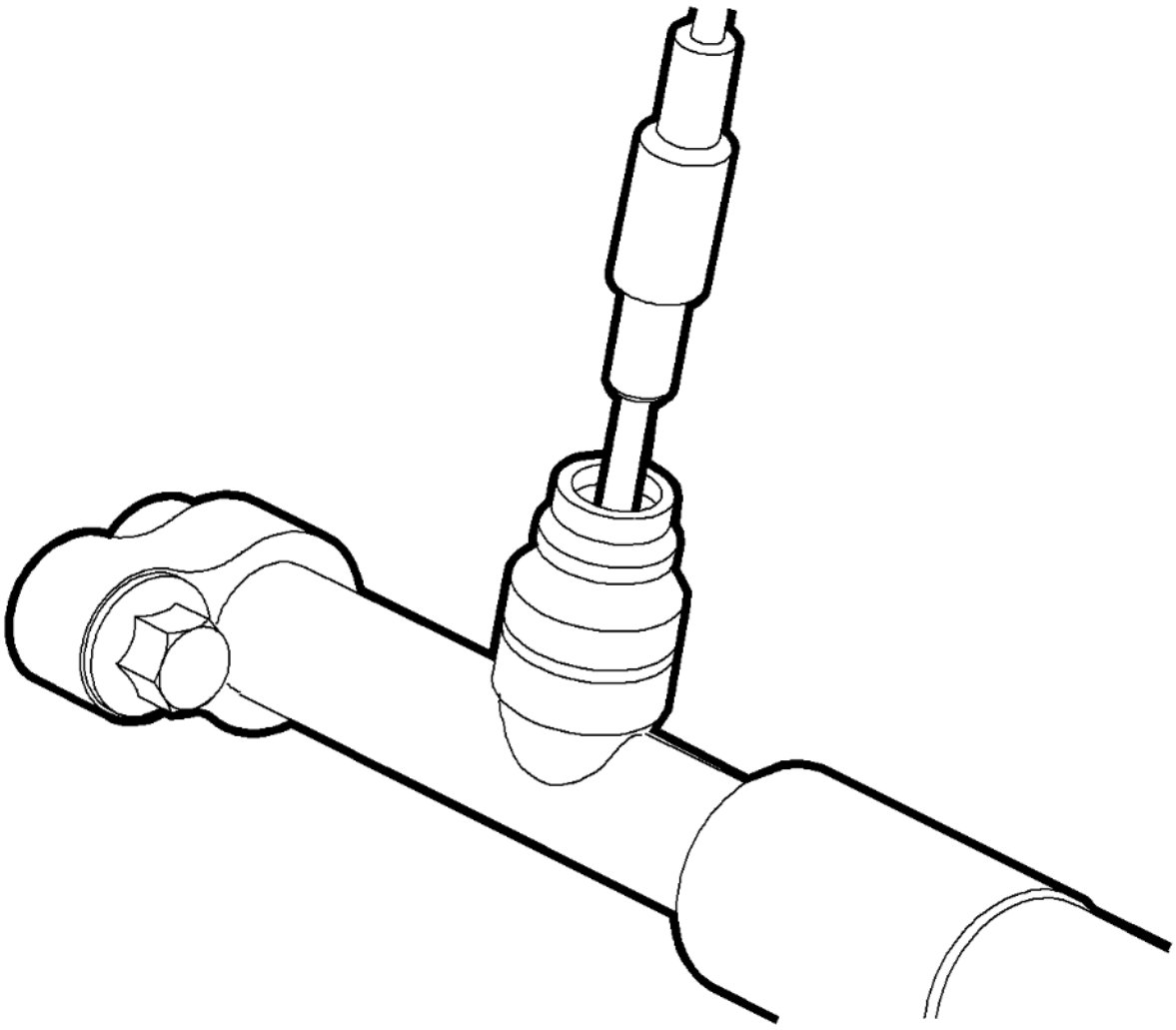


Fig. 105: Valve Core Removal/Installation Tool
Courtesy of GENERAL MOTORS COMPANY

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 (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

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.

AIR CONDITIONING COMPRESSOR AND CONDENSER HOSE FITTING REPLACEMENT

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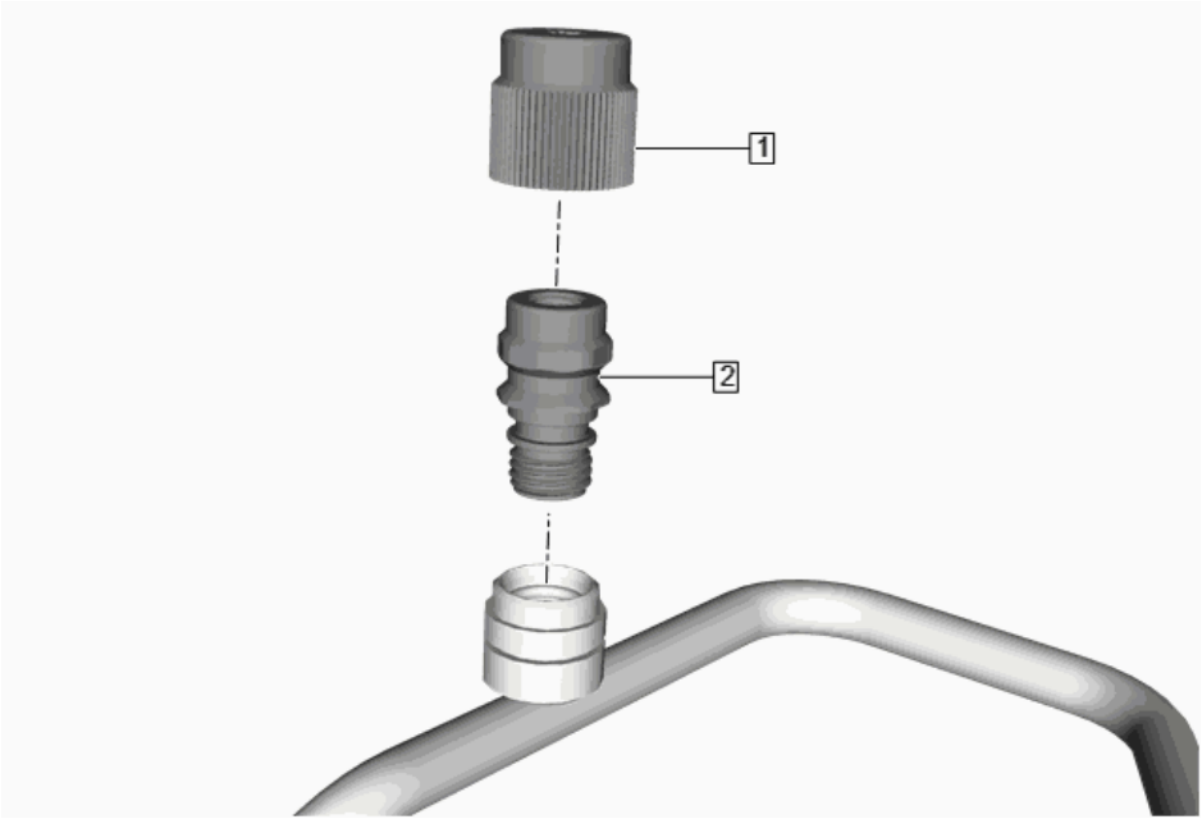


Fig. 106: Air Conditioning Refrigerant High Pressure Service Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the service port cap. 2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.	
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. Replace the O-ring. Refer to **Air Conditioning O-Ring Seal Replacement**. 3. Test the system for refrigerant leaks. Refer to **Leak Testing (R-1234yf)Leak Testing (R-134a)**. **Tighten** 2 N.m (18 lb in)

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Callout	Component Name
	Special Tools **GE-39037** Charge Valve Octagon Socket For equivalent region tools, refer to **Special Tools**.

AIR CONDITIONING EVAPORATIVE CONNECTOR HOSE/TUBE AND COMPRESSOR AND CONDENSER HOSE REPLACEMENT (L5P)

Removal Procedure

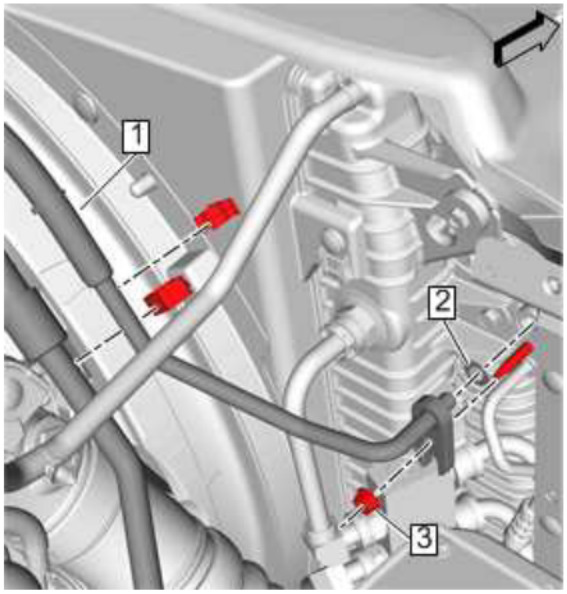


Fig. 107: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**

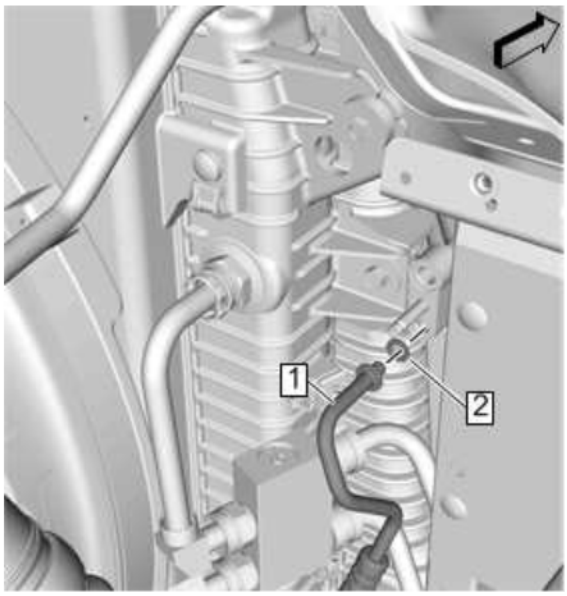


Fig. 108: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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2. Air Conditioning Evaporator Tube 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Remove - **Air Conditioning Evaporator Tube Replacement (L5P)**
3. Remove and DISCARD the sealing washer. 2

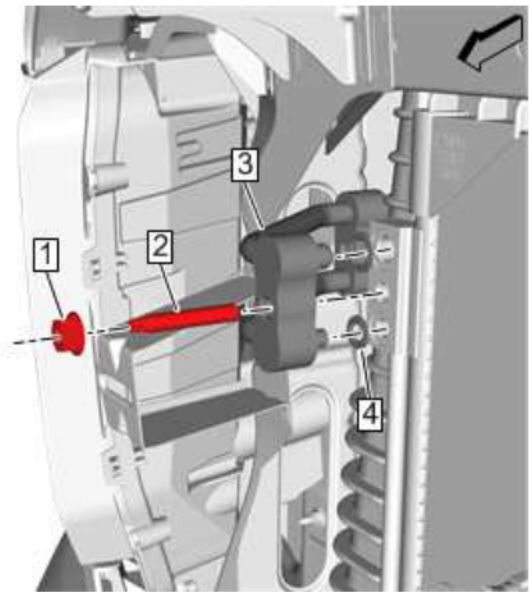


Fig. 109: Air Conditioning Evaporative Connector Hose/Tube And Compressor And Condenser Hose Nut
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Radiator Air Seal has been removed from graphic for clarity.**

4. Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose Nut 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 - Remove

NOTE: **The air conditioning condenser stud will have to be removed with the air conditioning evaporative connector hose/tube and compressor and condenser hose.**

5. Air Conditioning Condenser Stud 2 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 - Remove
6. Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 @Air Conditioning Condenser - Remove
7. Remove and DISCARD the sealing washer. 4

Installation Procedure

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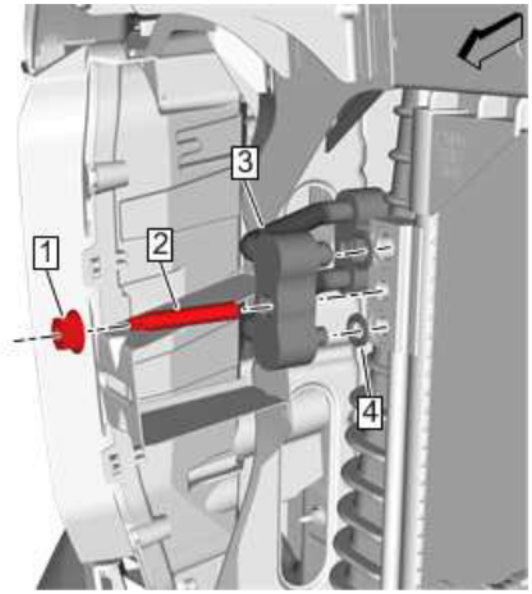


Fig. 110: Air Conditioning Evaporative Connector Hose/Tube And Compressor And Condenser Hose Nut
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Radiator Air Seal has been removed from graphic for clarity.**

1. Install NEW sealing washers 4 **Air Conditioning System Seal Replacement**

NOTE: **The air conditioning condenser stud will have to be installed with the air conditioning evaporative connector hose/tube and compressor and condenser hose.**

2. Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 @Air Conditioning Condenser - Install
3. Air Conditioning Condenser Stud 2 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 - Install and tighten 9 N.m (80 lb in)
4. Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose Nut 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose 3 - Install and tighten 22 N.m (16 lb ft)

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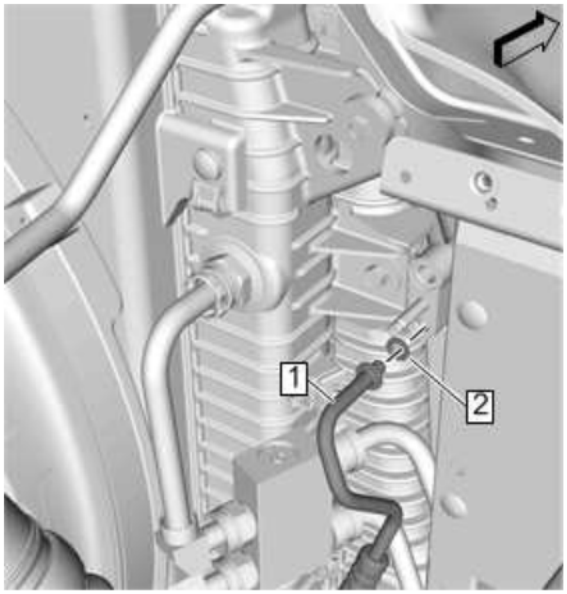


Fig. 111: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Evaporator Tube 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Install - **Air Conditioning Evaporator Tube Replacement (L5P)**

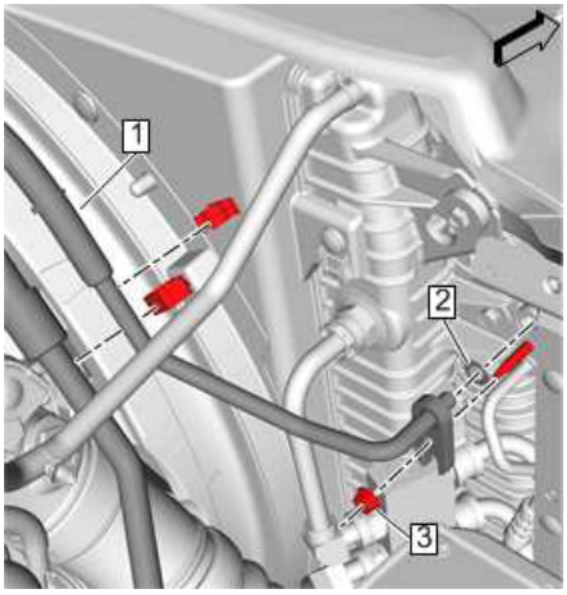


Fig. 112: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose 1 @Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose - Install - **Air Conditioning Compressor Hose Replacement (L5P)**

RECEIVER AND DEHYDRATOR REPLACEMENT (L83, L86, LV3)

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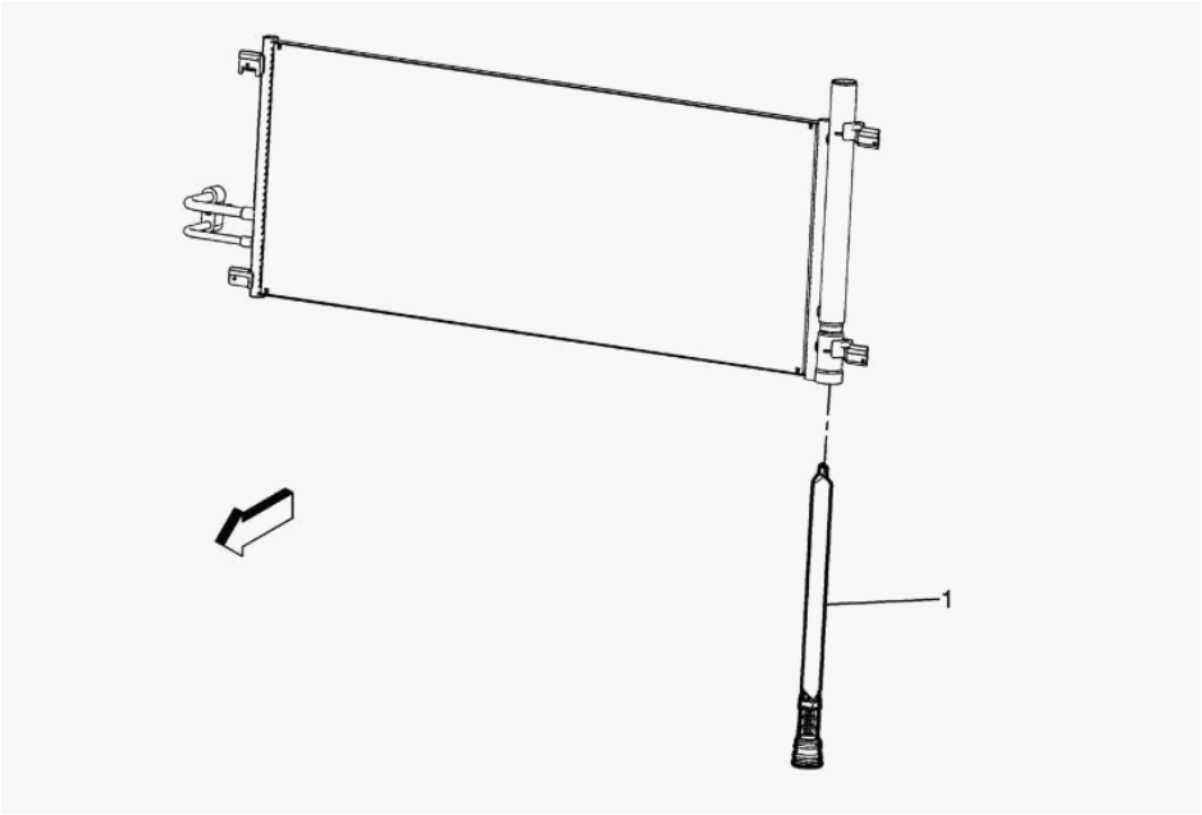


Fig. 113: Receiver and Dehydrator (L83, L86, LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the air conditioning condenser. Refer to **Air Conditioning Condenser Replacement (LV3)Air Conditioning Condenser Replacement (L83, L86)**.	
1	Air Conditioning Refrigerant Desiccant **CAUTION:** **Refer to Fastener Caution .** **NOTE:** **Cap all A/C components immediately to prevent system contamination.**

RECEIVER AND DEHYDRATOR REPLACEMENT (L5P)

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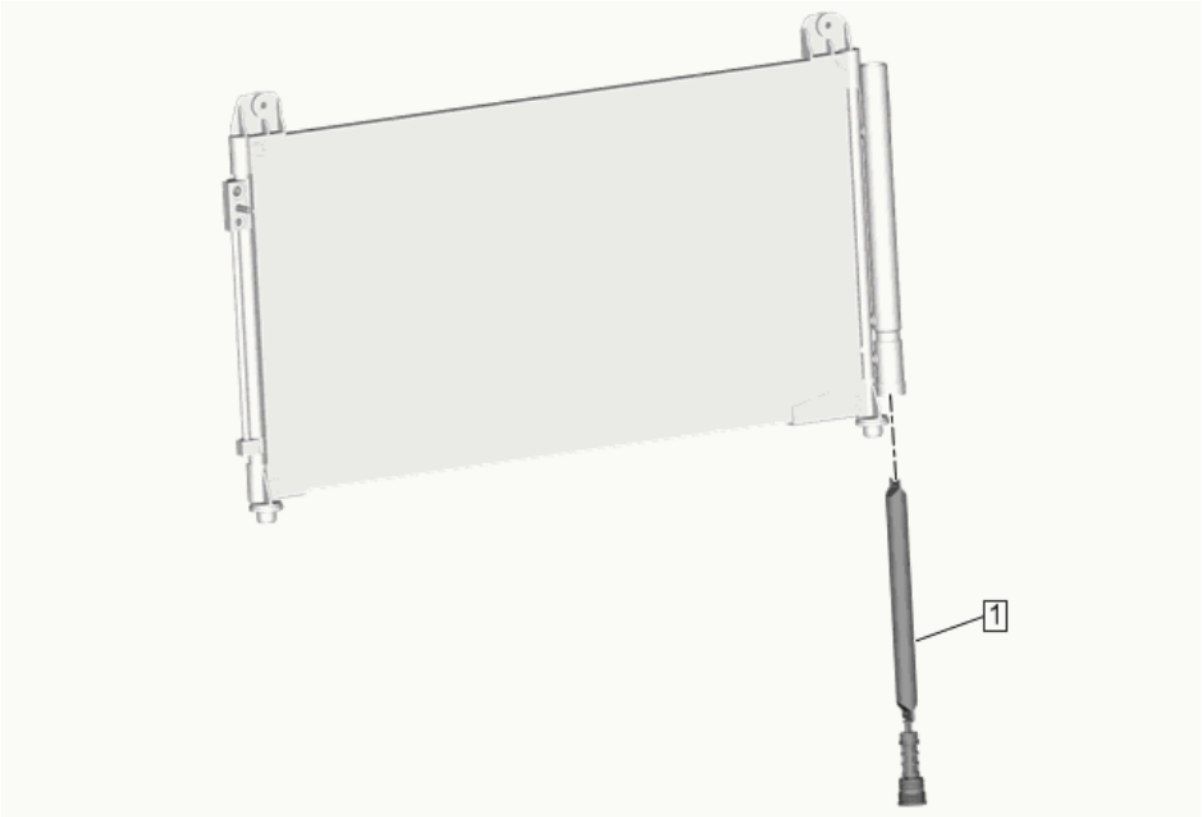


Fig. 114: Receiver and Dehydrator (L5P)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Air Conditioning Condenser Replacement (L5P)**	
1	Air Conditioning Receiver and Dehydrator **CAUTION:** **Refer to** **Component Fastener Tightening Caution** . **Tighten** 9 N.m (80 lb in)

AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT

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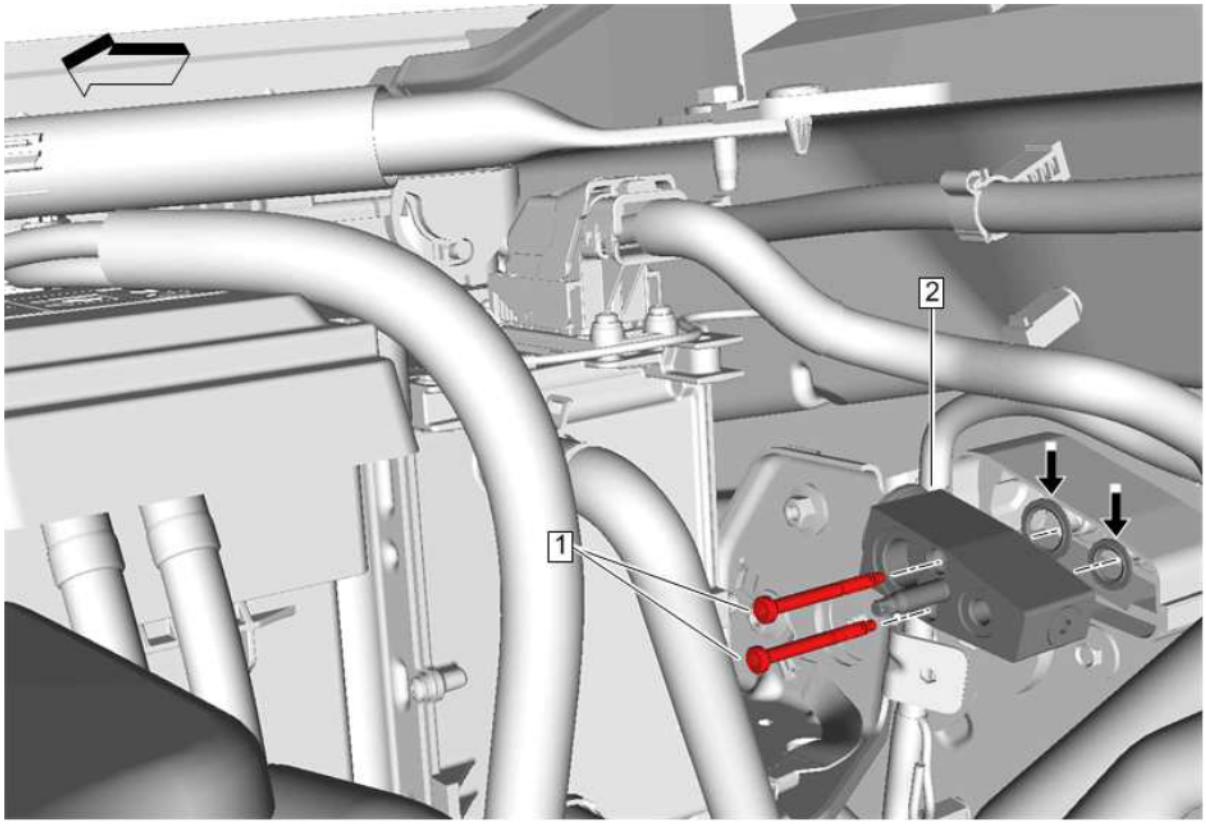


Fig. 115: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Air Conditioning Evaporator Tube@Air Conditioning Evaporator Thermal Expansion Valve - Remove **Air Conditioning Evaporator Tube Replacement (LV3)Air Conditioning Evaporator Tube Replacement (L83, L86)Air Conditioning Evaporator Tube Replacement (L96, LC8)Air Conditioning Evaporator Tube Replacement (L8B)Air Conditioning Evaporator Tube Replacement (L5P)**.	
1	Air Conditioning Evaporator Thermal Expansion Valve Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 7.5 N.m (66 lb in)
2	Air Conditioning Evaporator Thermal Expansion Valve **Procedure**

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Callout	Component Name
	1. Install NEW seals. Do NOT reuse old seals. **Air Conditioning System Seal Replacement**. 2. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING REFRIGERANT HIGH PRESSURE SERVICE VALVE REPLACEMENT

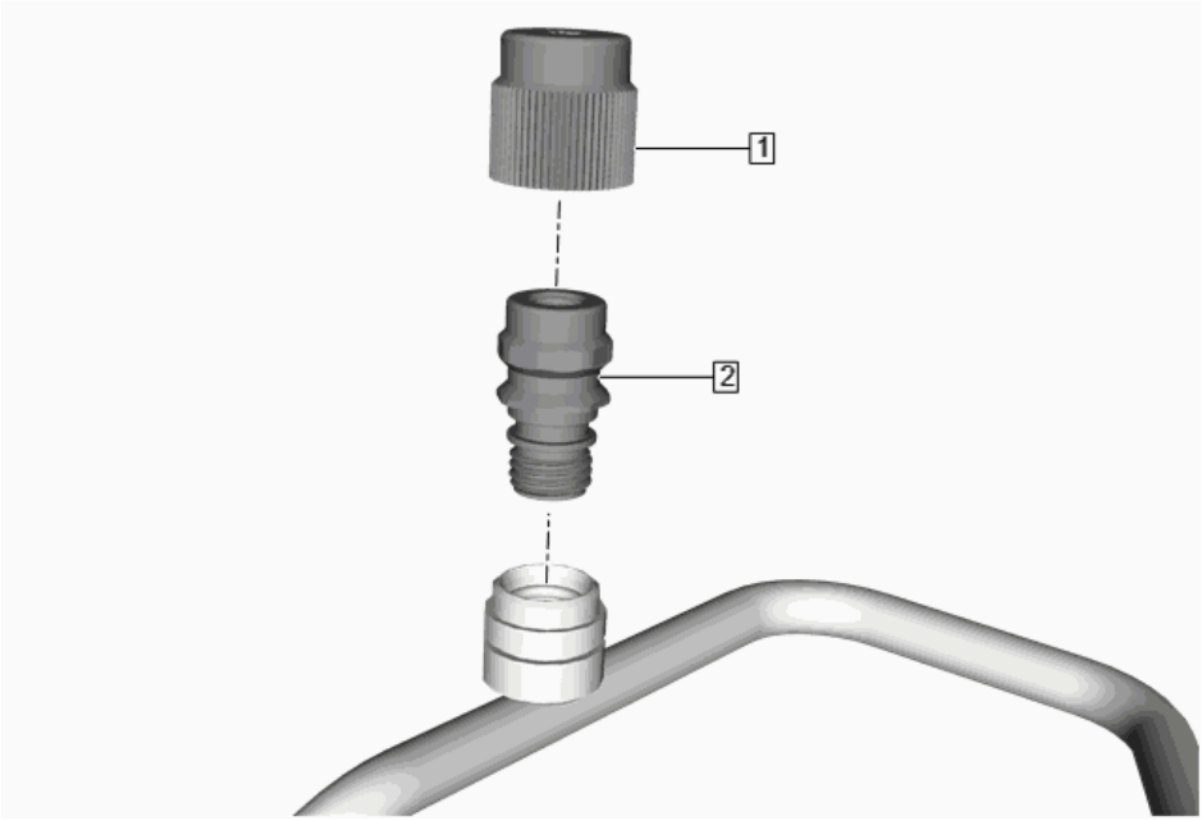


Fig. 116: Air Conditioning Refrigerant High Pressure Service Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the service port cap. 2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.	
1	Air Conditioning Refrigerant Service Valve **CAUTION:** **Refer to Fastener Caution .** **Procedure**

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Callout	Component Name
	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 (L83, L96, LV3)

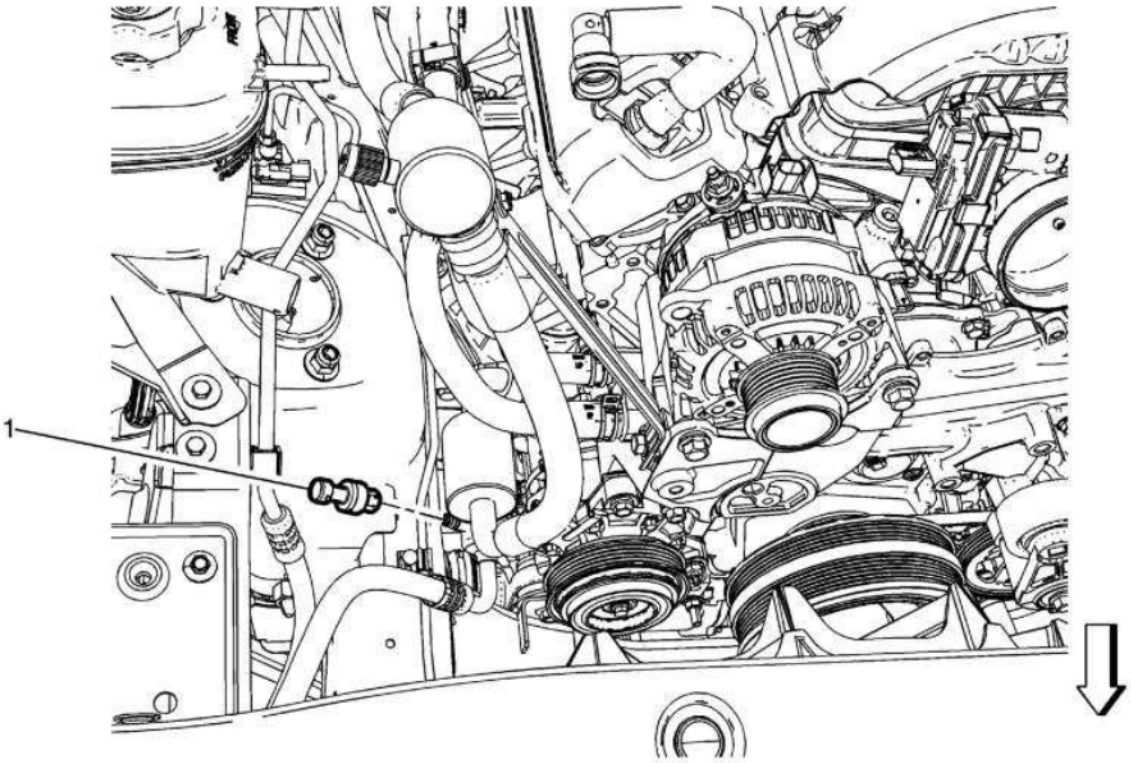


Fig. 117: Air Conditioning (A/C) Refrigerant Pressure Sensor (L83, L96, LV3)
Courtesy of GENERAL MOTORS COMPANY

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:**

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Callout	Component Name
	Refer to Fastener 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 (L8B)

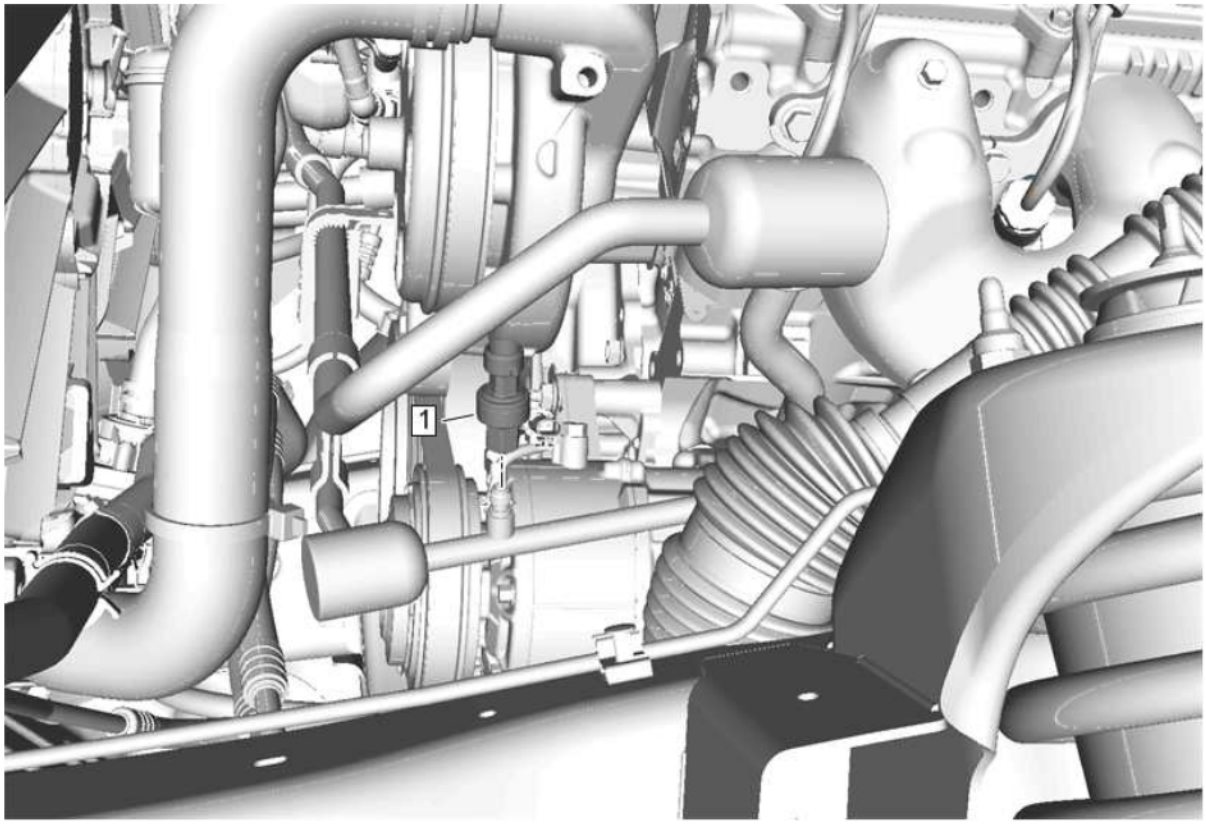


Fig. 118: Air Conditioning (A/C) Refrigerant Pressure Sensor (L8B)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Electrical Connector@Air Conditioning Refrigerant Pressure Sensor - Disconnect	
1	Air Conditioning Refrigerant Pressure Sensor **CAUTION:**

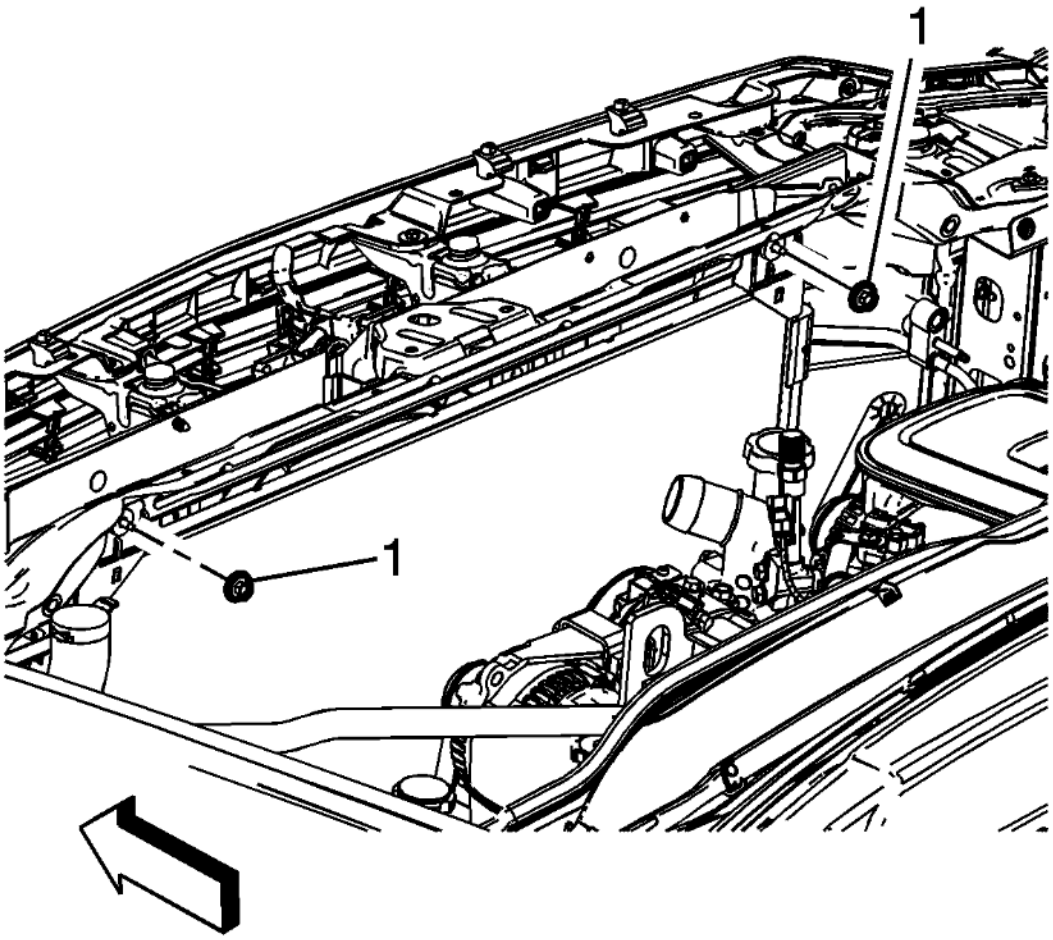
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Callout	Component Name
	Refer to Component Fastener Tightening Caution . **Procedure** Install NEW O-rings. Do NOT reuse old O-rings. Air Conditioning O-Ring Seal Replacement **Tighten** 7.5 N.m (66 lb in)

AIR CONDITIONING CONDENSER REPLACEMENT (L96, LC8)

Removal Procedure

1. Recover refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf).
2. Remove the radiator. Refer to Radiator Replacement (LC8, L96) .



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Fig. 119: Air Conditioning Condenser Nut
Courtesy of GENERAL MOTORS COMPANY

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

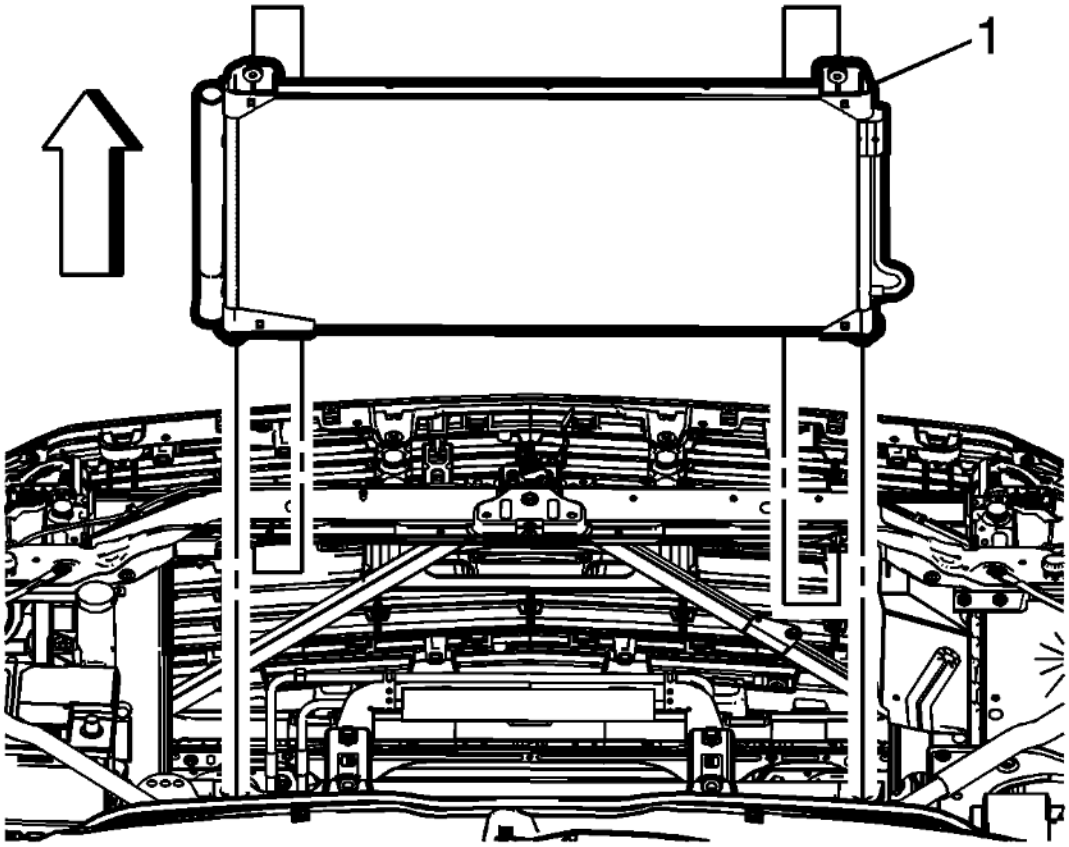


Fig. 120: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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

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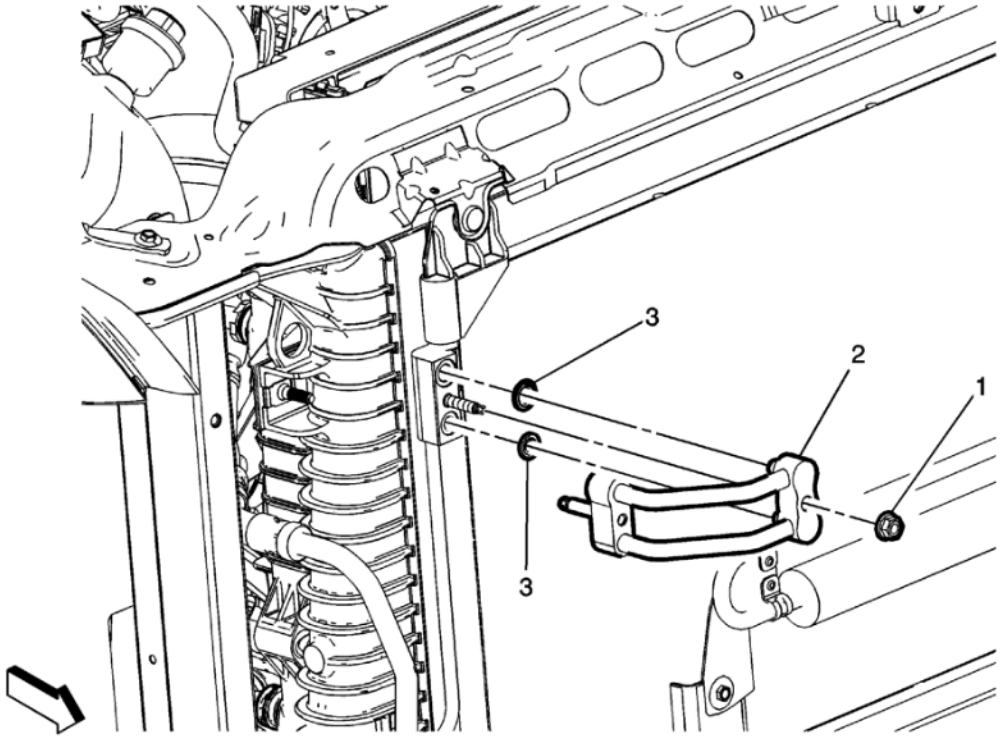


Fig. 121: Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

5. Remove the air conditioning condenser nut (1).
6. Remove the air conditioning evaporative connector hose/tube and compressor and condenser hose (2) from the air conditioning condenser.
7. 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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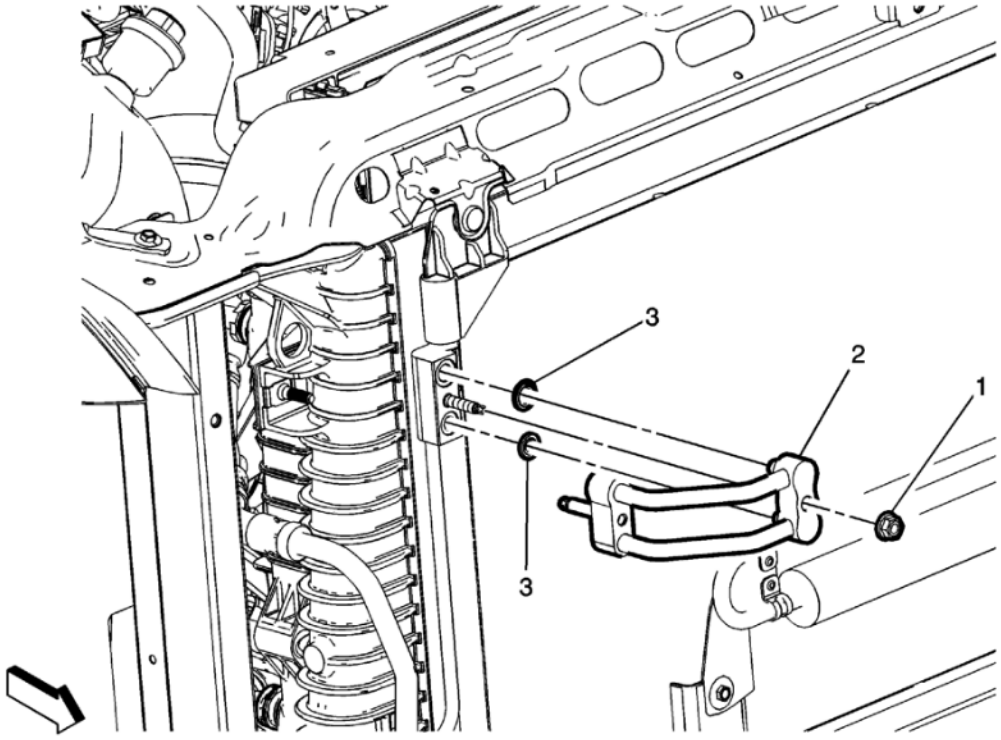


Fig. 122: Air Conditioning Evaporative Connector Hose/Tube and Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

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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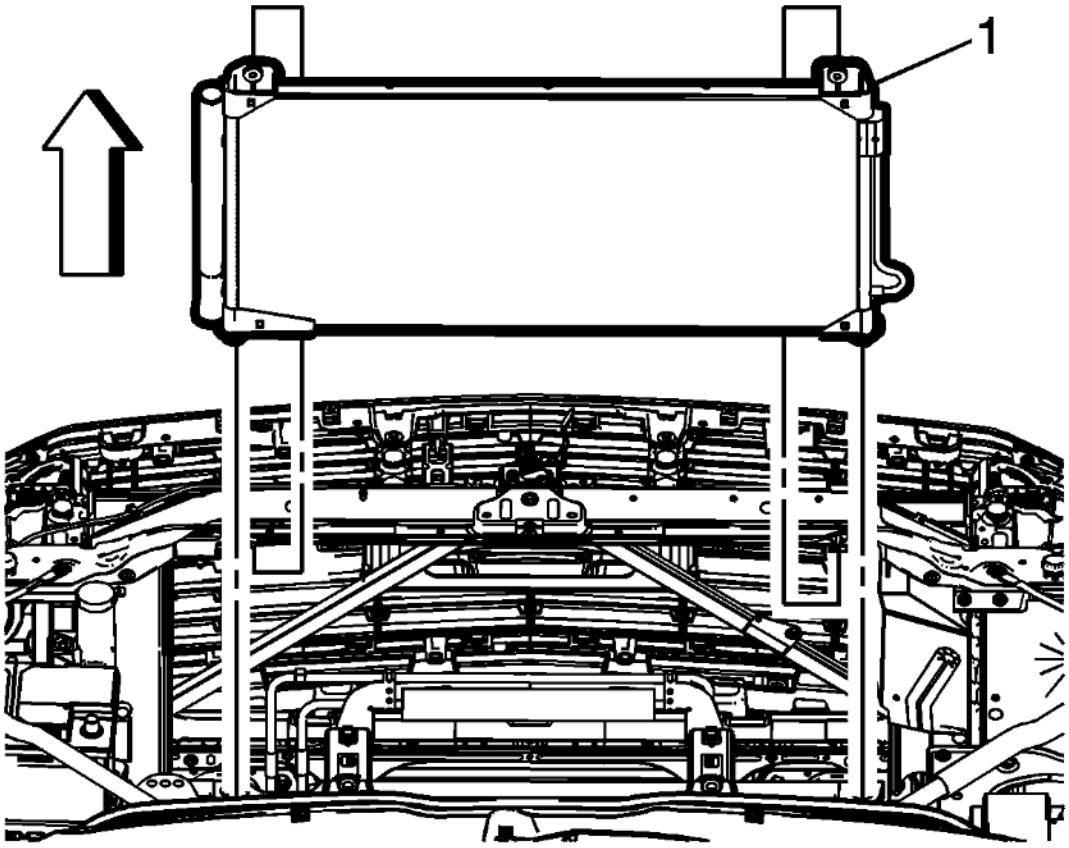


Fig. 123: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

4. Install the air conditioning condenser (1) to the vehicle.

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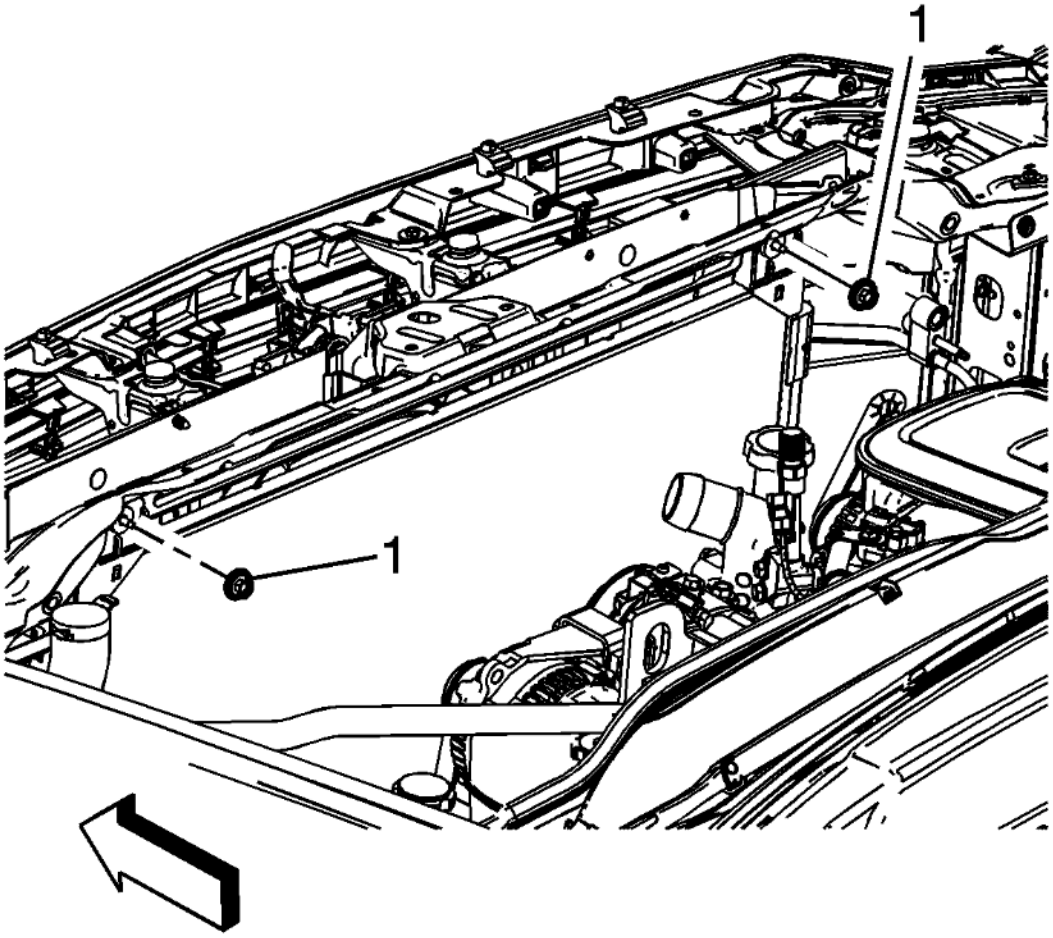


Fig. 124: Air Conditioning Condenser Nut
Courtesy of GENERAL MOTORS COMPANY

5. Install the air conditioning condenser nut (1) to the air conditioning condenser and tighten to 9 N.m (80 lb in).
6. Install the radiator. Refer to **Radiator Replacement (LC8, L96)** .
7. Evacuate and recharge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

AIR CONDITIONING CONDENSER REPLACEMENT (LV3)

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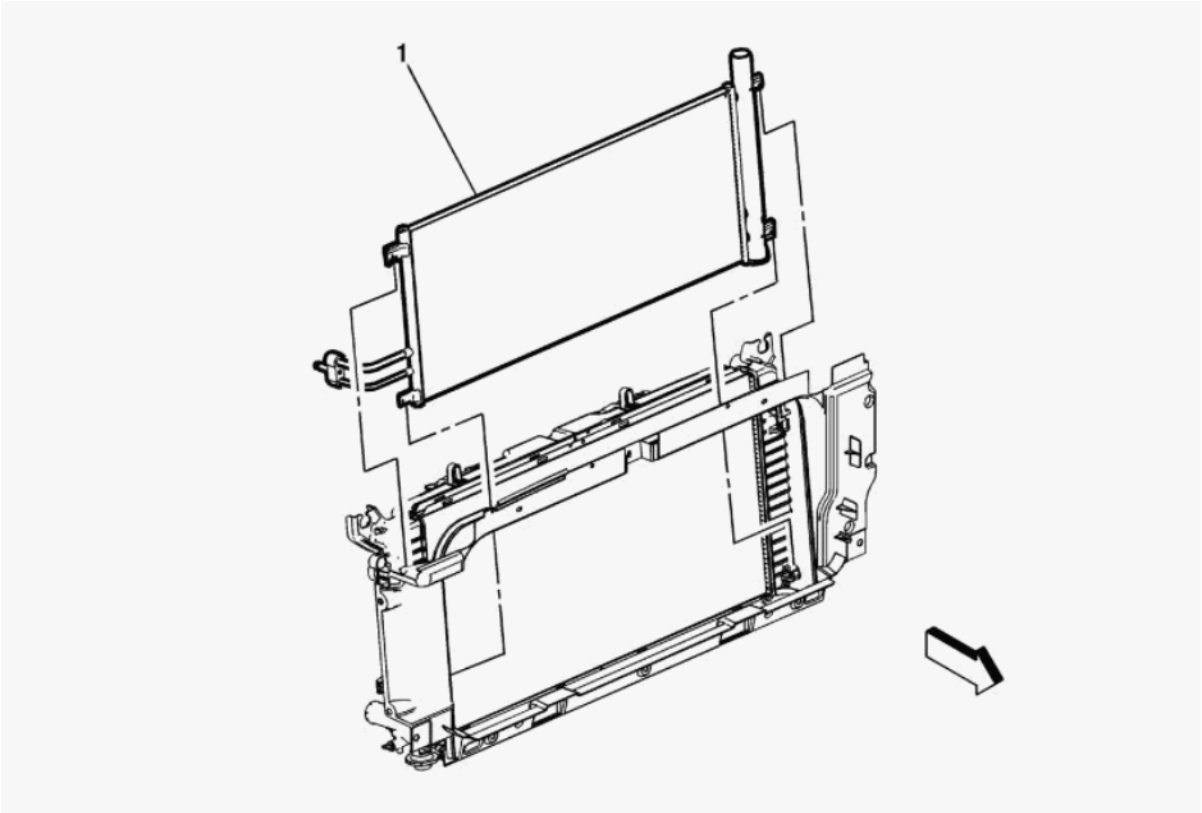


Fig. 125: Air Conditioning Condenser (LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Recover refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**. 2. Remove the radiator air upper baffle and deflector. **Radiator Air Upper Baffle and Deflector Replacement (L83, L86, LV3)** . 3. Remove the air conditioning condenser bracket. **Air Conditioning Condenser Bracket Replacement (L83, L86, LV3)**. 4. Remove the air conditioning evaporator tube from the condenser and position out of the way. **Air Conditioning Evaporator Tube Replacement (LV3)**.	
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. **Radiator Air Baffle Replacement - Left (LV3)** . 3. Remove the right radiator air baffle. **Radiator Air Baffle Replacement - Right (LV3)** . **NOTE:**

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Callout	Component Name
	If replacing the condenser, add refrigerant oil to the condenser. Approximate Fluid Capacities for system capacity information.

AIR CONDITIONING CONDENSER REPLACEMENT (L83, L86)

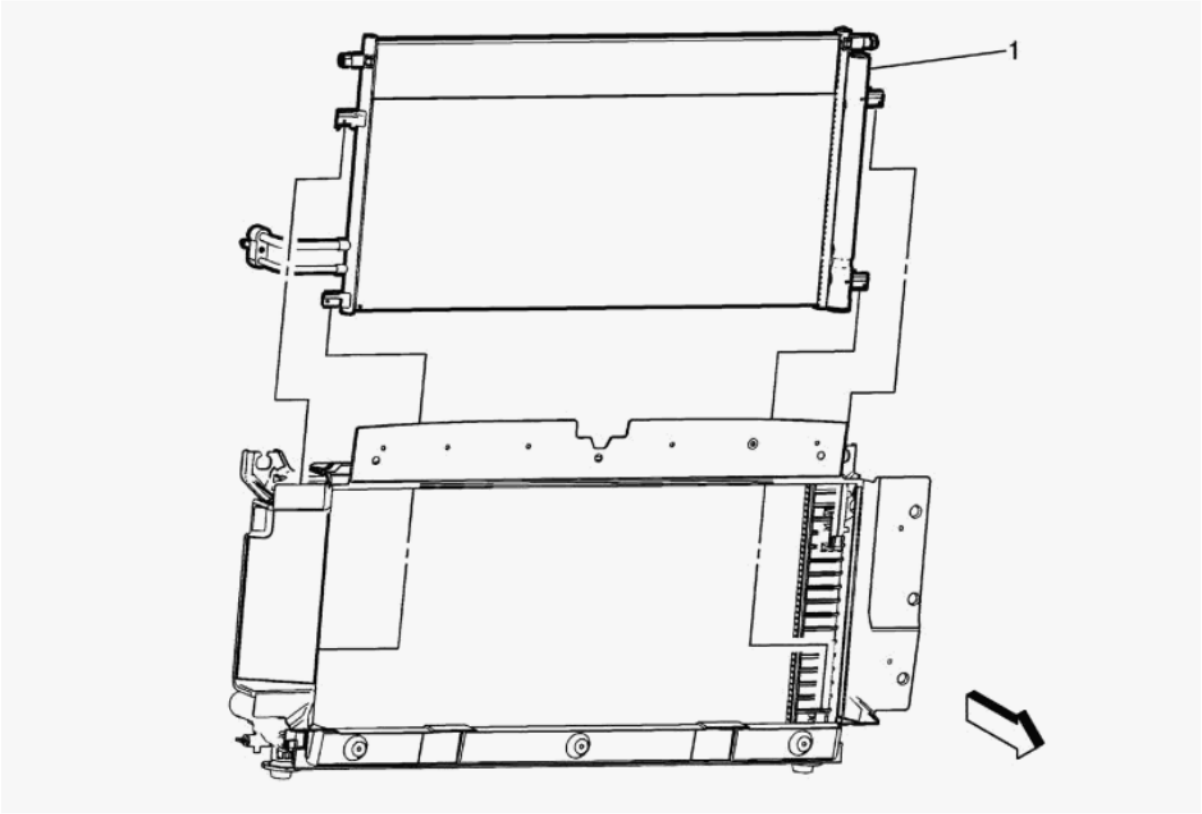


Fig. 126: Air Conditioning Condenser (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Recover refrigerant. Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf). 2. Remove the radiator air upper baffle and deflector. Radiator Air Upper Baffle and Deflector Replacement (L83, L86, LV3) .	

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Callout	Component Name
	3. Remove the transmission fluid auxiliary cooler inlet pipe. **Transmission Fluid Auxiliary Cooler Inlet Pipe Replacement (L83, L86)** . 4. Remove the transmission fluid auxiliary cooler outlet pipe. **Transmission Fluid Auxiliary Cooler Outlet Pipe Replacement (L83, L86)** . 5. Remove the air conditioning condenser bracket. **Air Conditioning Condenser Bracket Replacement (L83, L86, LV3)**\. 6. Remove the air conditioning evaporator tube from the condenser and position out of the way. **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. **Radiator Air Baffle Replacement - Left (L83, L86)** . 3. Remove the right radiator air baffle. **Radiator Air Baffle Replacement - Right (L83, L86)** . **NOTE:** **If replacing the condenser, add refrigerant oil to the condenser. Approximate Fluid Capacities for system capacity information.**

AIR CONDITIONING CONDENSER REPLACEMENT (L8B)

Removal Procedure

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**

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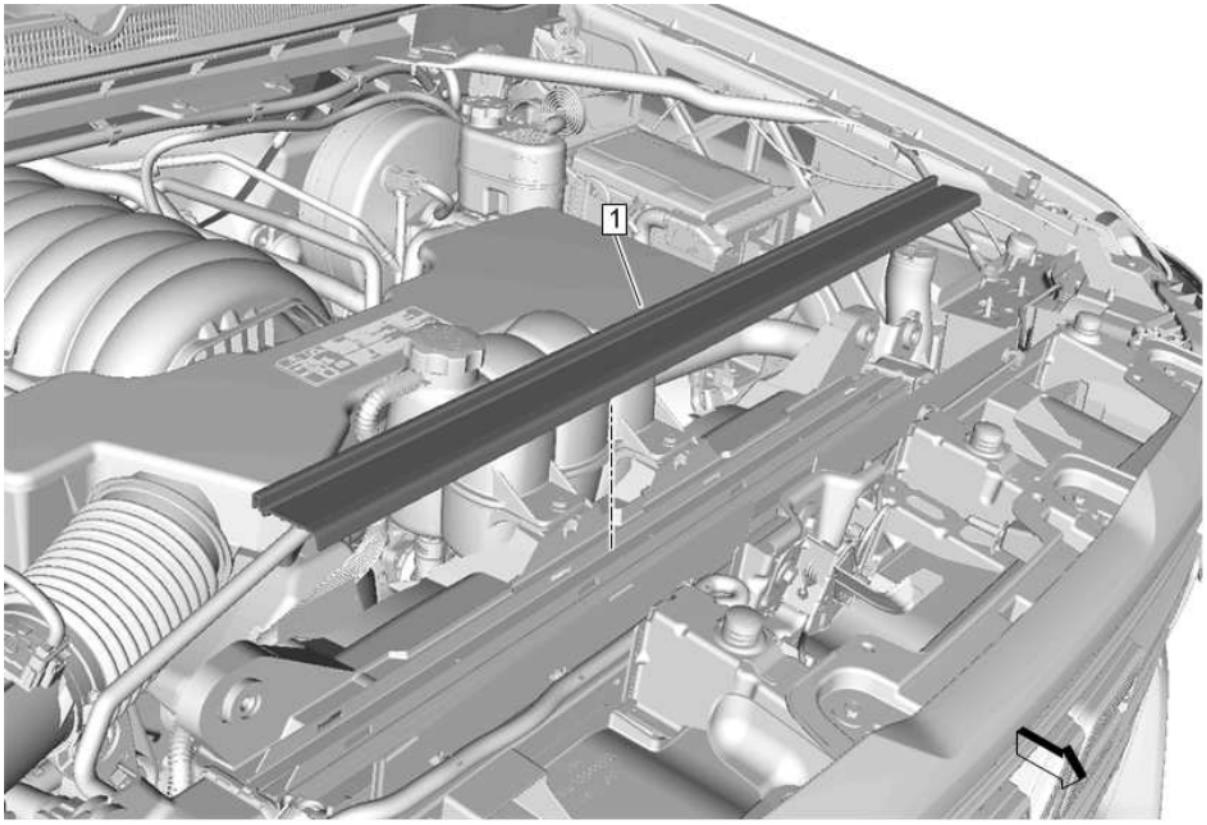


Fig. 127: Radiator Air Upper Baffle and Deflector (L8B)
Courtesy of GENERAL MOTORS COMPANY

2. Radiator Air Upper Baffle 1 - Remove - **Radiator Air Upper Baffle and Deflector Replacement (L8B)**

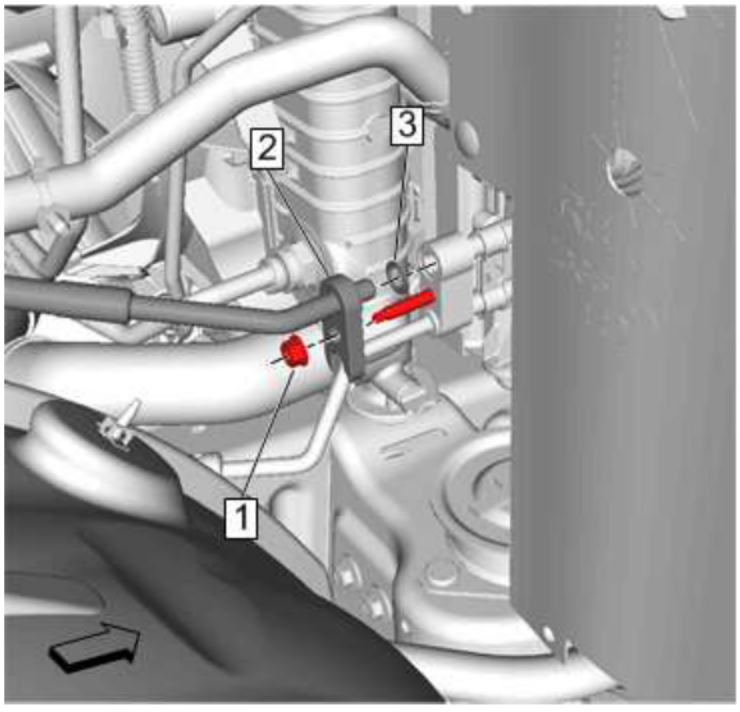


Fig. 128: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor Hose 2 @Air Conditioning CondenserRemove - **Air Conditioning**

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Compressor Hose Replacement (L8B)

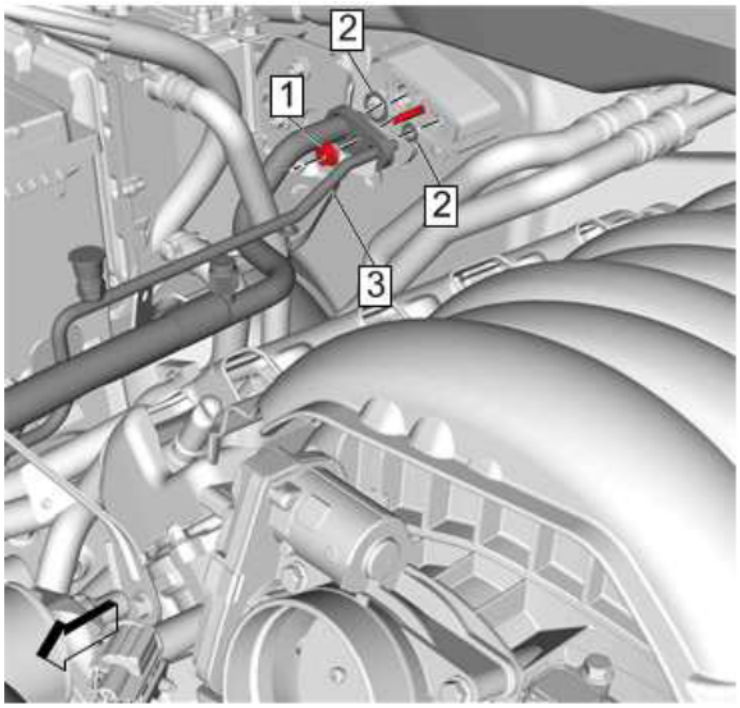


Fig. 129: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Evaporator Tube 3 @Air Conditioning Condenser - Remove - Air Conditioning Evaporator Tube Replacement (L8B)

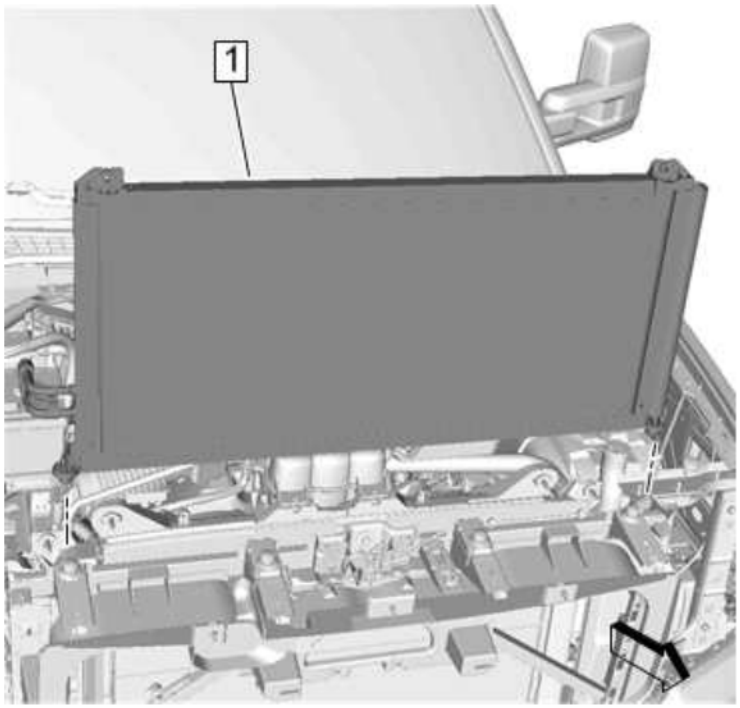


Fig. 130: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

5. Tilt the air conditioning condenser (1) forward and lift to remove.

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6. Transfer components as necessary.

Installation Procedure

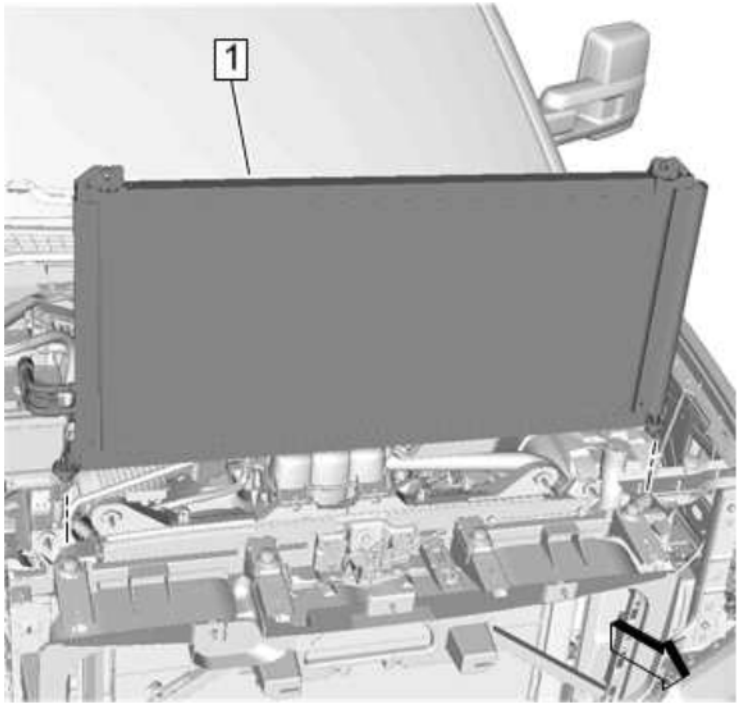


Fig. 131: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Condenser 1 - Install **Air Conditioning Condenser Replacement (L8B)**

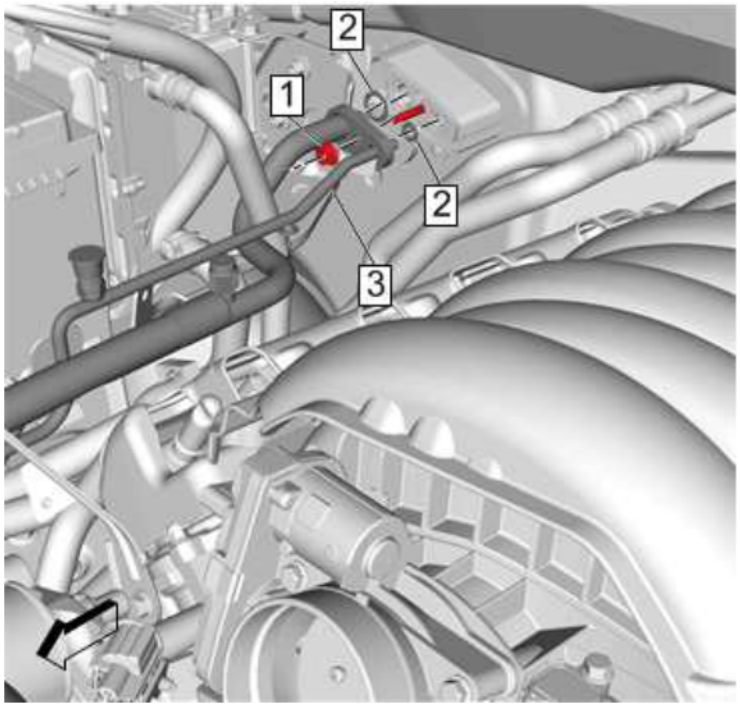


Fig. 132: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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2. Air Conditioning Evaporator Tube 3 @Air Conditioning Condenser - Install - **Air Conditioning Evaporator Tube Replacement (L8B)**

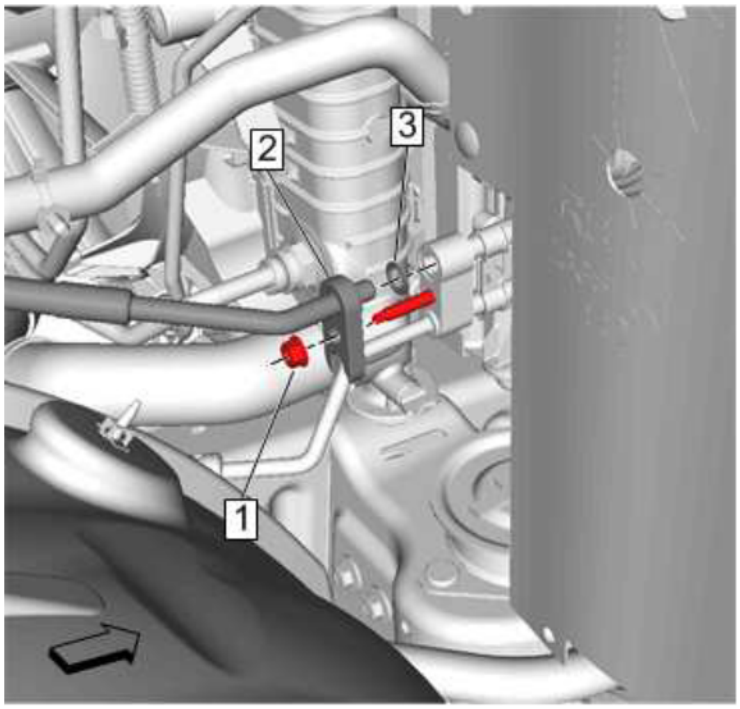
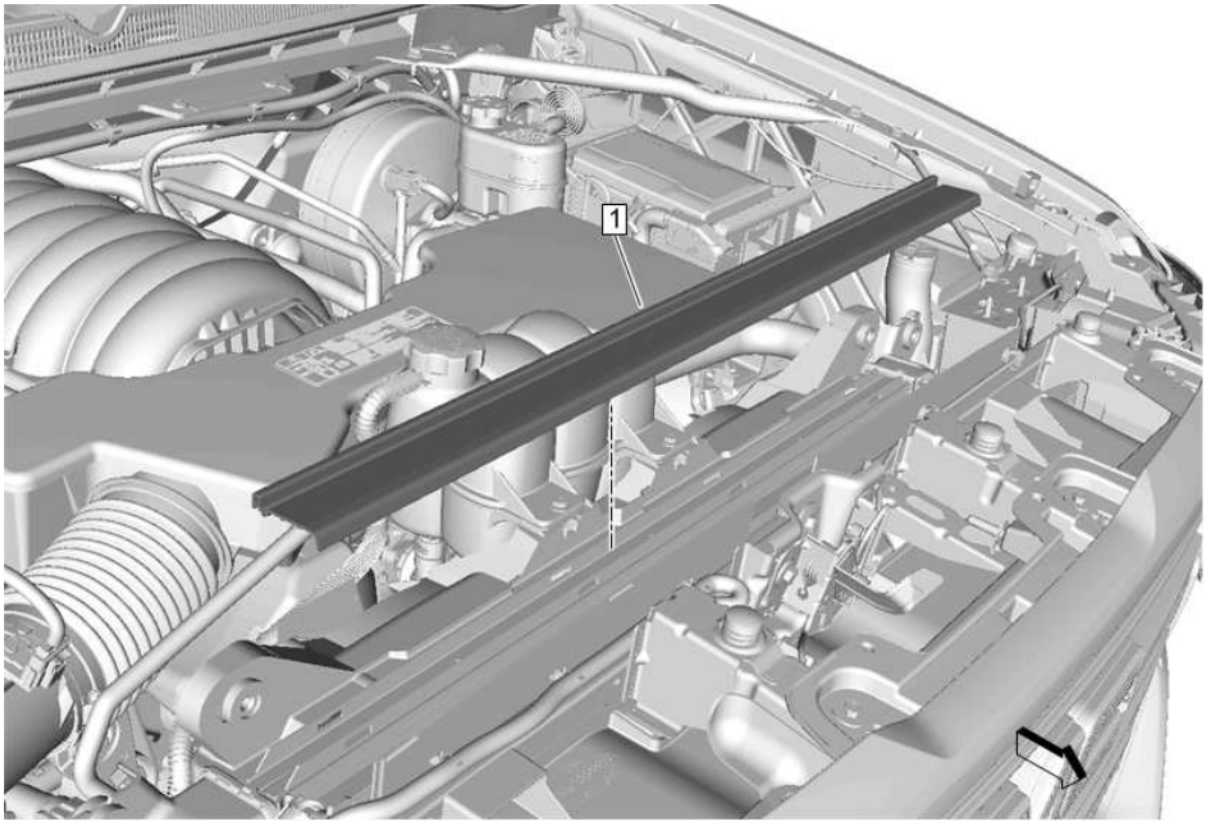


Fig. 133: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor Hose 2 @Air Conditioning CondenserInstall - **Air Conditioning Compressor Hose Replacement (L8B)**



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Fig. 134: Radiator Air Upper Baffle and Deflector (L8B)
Courtesy of GENERAL MOTORS COMPANY

4. Radiator Air Upper Baffle 1 - Install - **Radiator Air Upper Baffle and Deflector Replacement (L8B)**
5. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING CONDENSER REPLACEMENT (L5P)

Removal Procedure

1. Recover refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**.

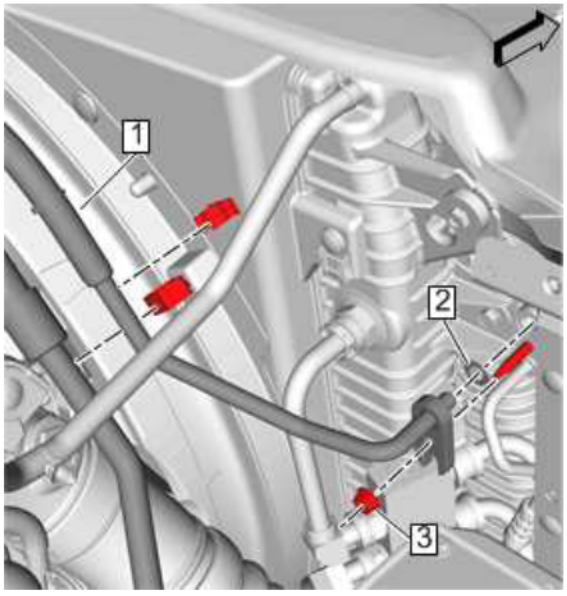
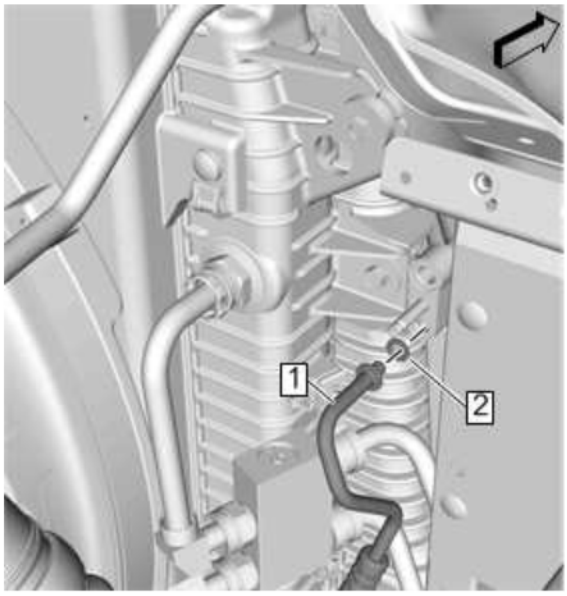


Fig. 135: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor Hose 1 @ Air Conditioning Condenser - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**



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Fig. 136: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Evaporator Tube 1 @Air Conditioning Condenser - Remove - **Air Conditioning Evaporator Tube Replacement (L5P)**

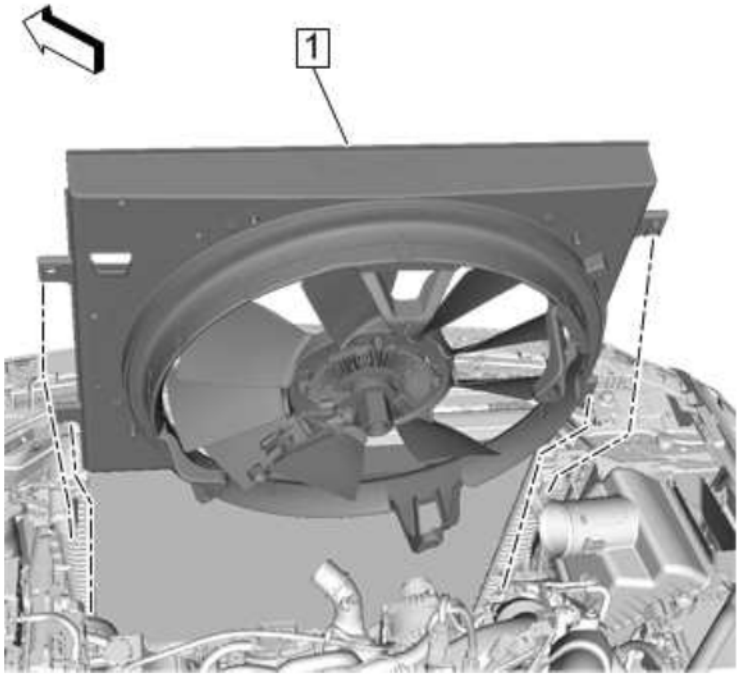
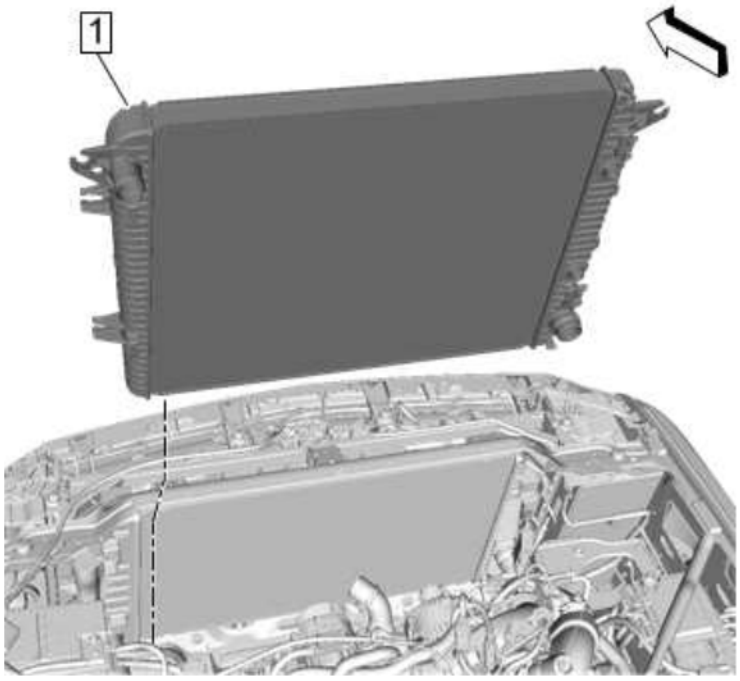


Fig. 137: Fan Blade, Fan Blade Clutch And Engine Coolant Fan Shrouds Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Remove the fan blade, fan blade clutch and the engine coolant fan shrouds as an assembly (1) from the vehicle. **Fan Blade Clutch Replacement (L5P)**



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Fig. 138: Radiator
Courtesy of GENERAL MOTORS COMPANY

5. Radiator 1 - Remove - **Radiator Replacement (L5P)**
6. Charge Air Cooler - Remove - **Charge Air Cooler Replacement**

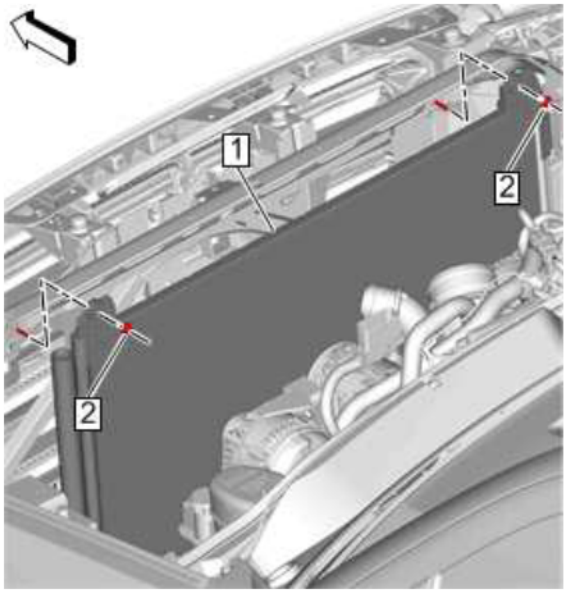


Fig. 139: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Condenser Nut 2 - Remove
8. Remove the air conditioning condenser (1) from the vehicle.
9. Transfer components as necessary.

Installation Procedure

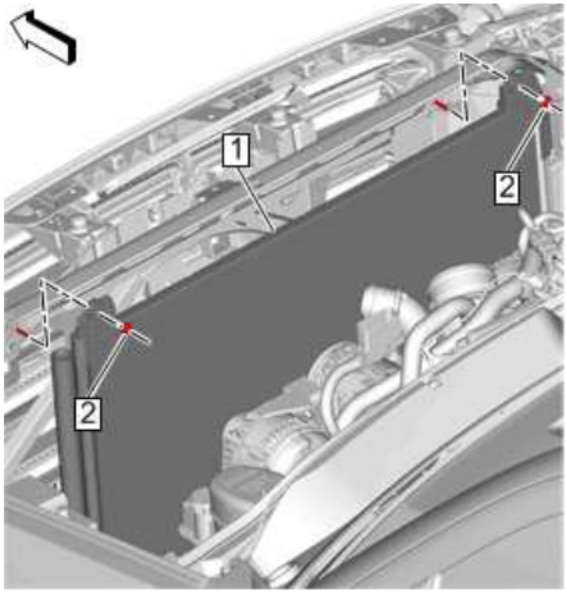


Fig. 140: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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1. Install the air conditioning condenser (1) to the vehicle.

CAUTION: Refer to Fastener Caution .

2. Air Conditioning Condenser Nut 2 - Install and tighten 9 N.m (80 lb in)
3. Charge Air Cooler - Install - **Charge Air Cooler Replacement**

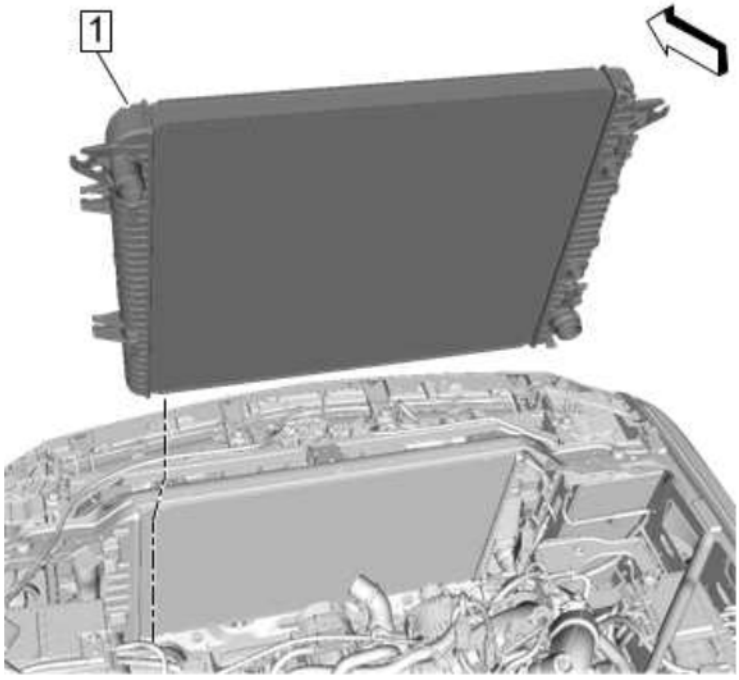
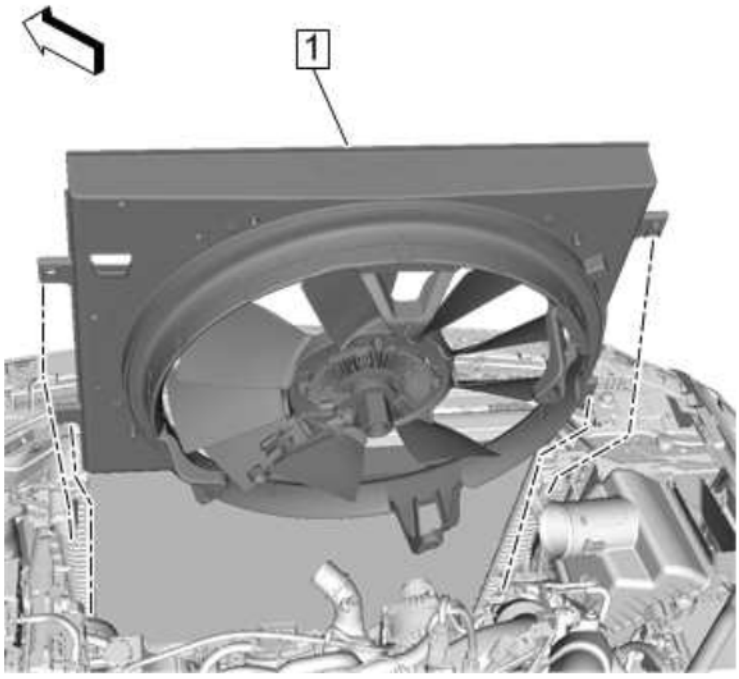


Fig. 141: Radiator
Courtesy of GENERAL MOTORS COMPANY

4. Radiator 1 - Install - **Radiator Replacement (L5P)**



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Fig. 142: Fan Blade, Fan Blade Clutch And Engine Coolant Fan Shrouds Assembly
Courtesy of GENERAL MOTORS COMPANY

5. Install the fan blade, fan blade clutch and the engine coolant fan shrouds as an assembly (1) to the vehicle. **Fan Blade Clutch Replacement (L5P)**

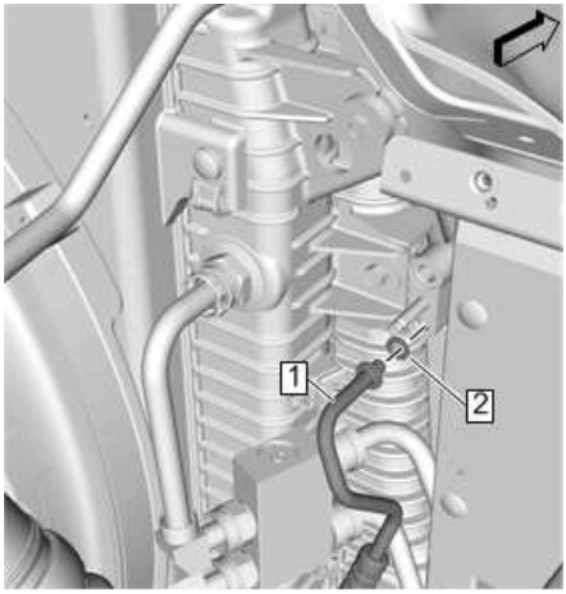


Fig. 143: Air Conditioning Evaporator Tube And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Tube 1 @Air Conditioning Condenser - Install - **Air Conditioning Evaporator Tube Replacement (L5P)**

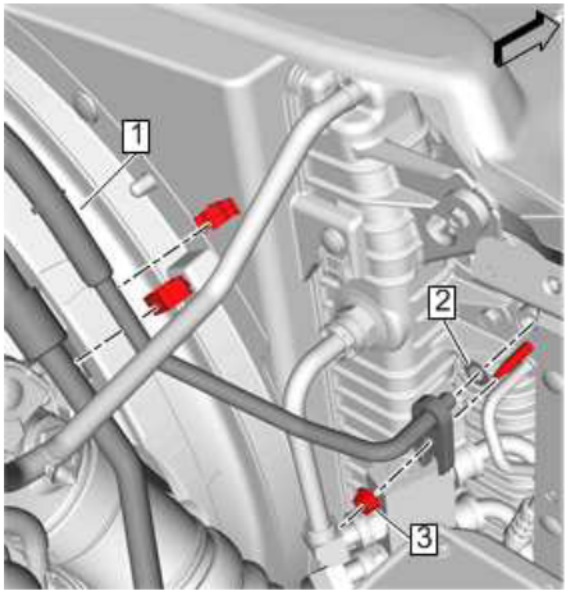


Fig. 144: Air Conditioning Compressor Hose And Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Compressor Hose 1 @Air Conditioning Condenser - Install - **Air Conditioning Compressor Hose Replacement (L5P)**
8. Recharge the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and**

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Recharging (R-1234yf)

9. Inspect for refrigerant leaks.

AIR CONDITIONING CONDENSER BRACKET REPLACEMENT (L83, L86, LV3)

Removal Procedure

1. Remove the radiator air upper baffle and deflector. Refer to **Radiator Air Upper Baffle and Deflector Replacement (L83, L86, LV3)** .

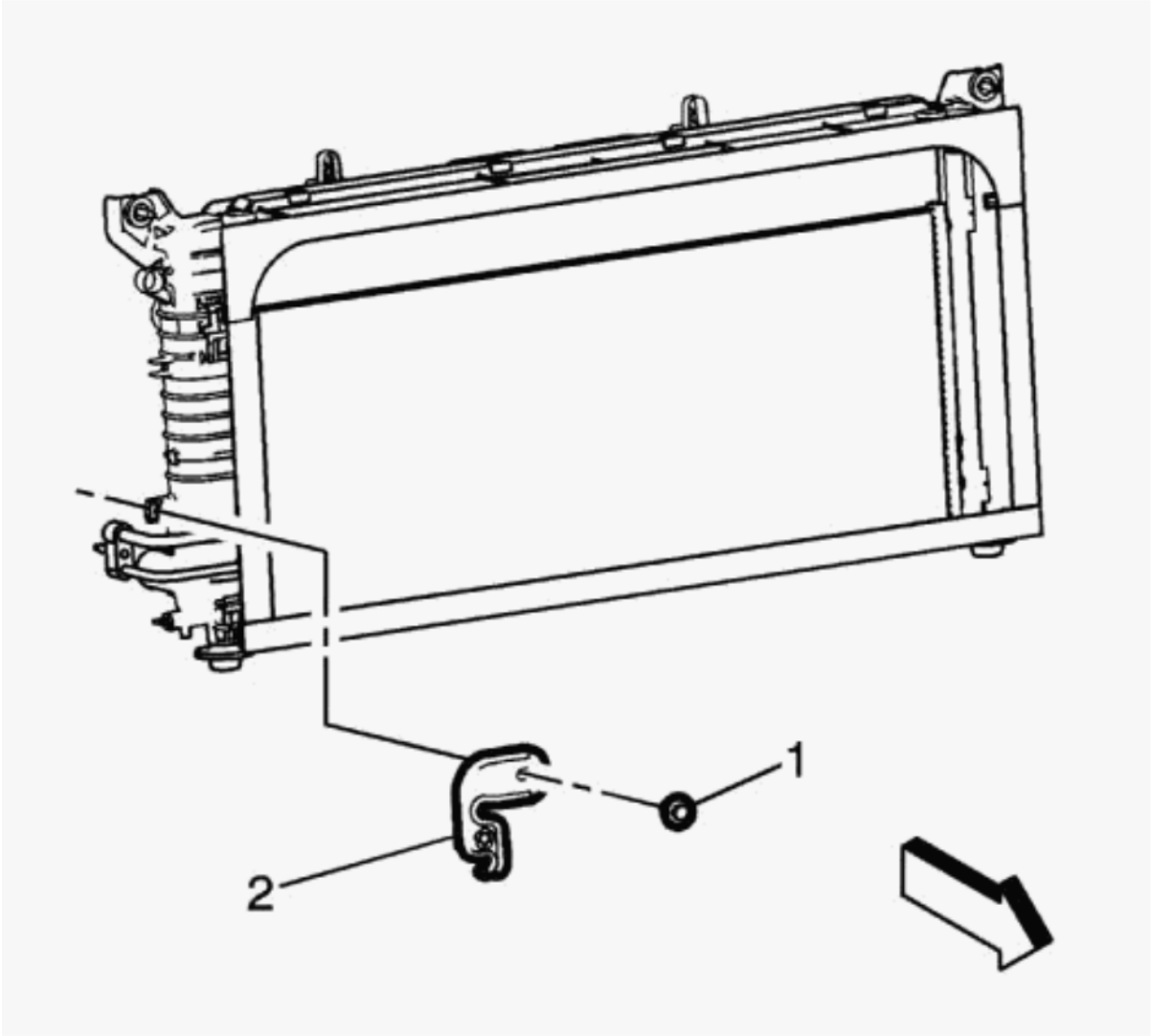


Fig. 145: Air Conditioning Condenser Bracket
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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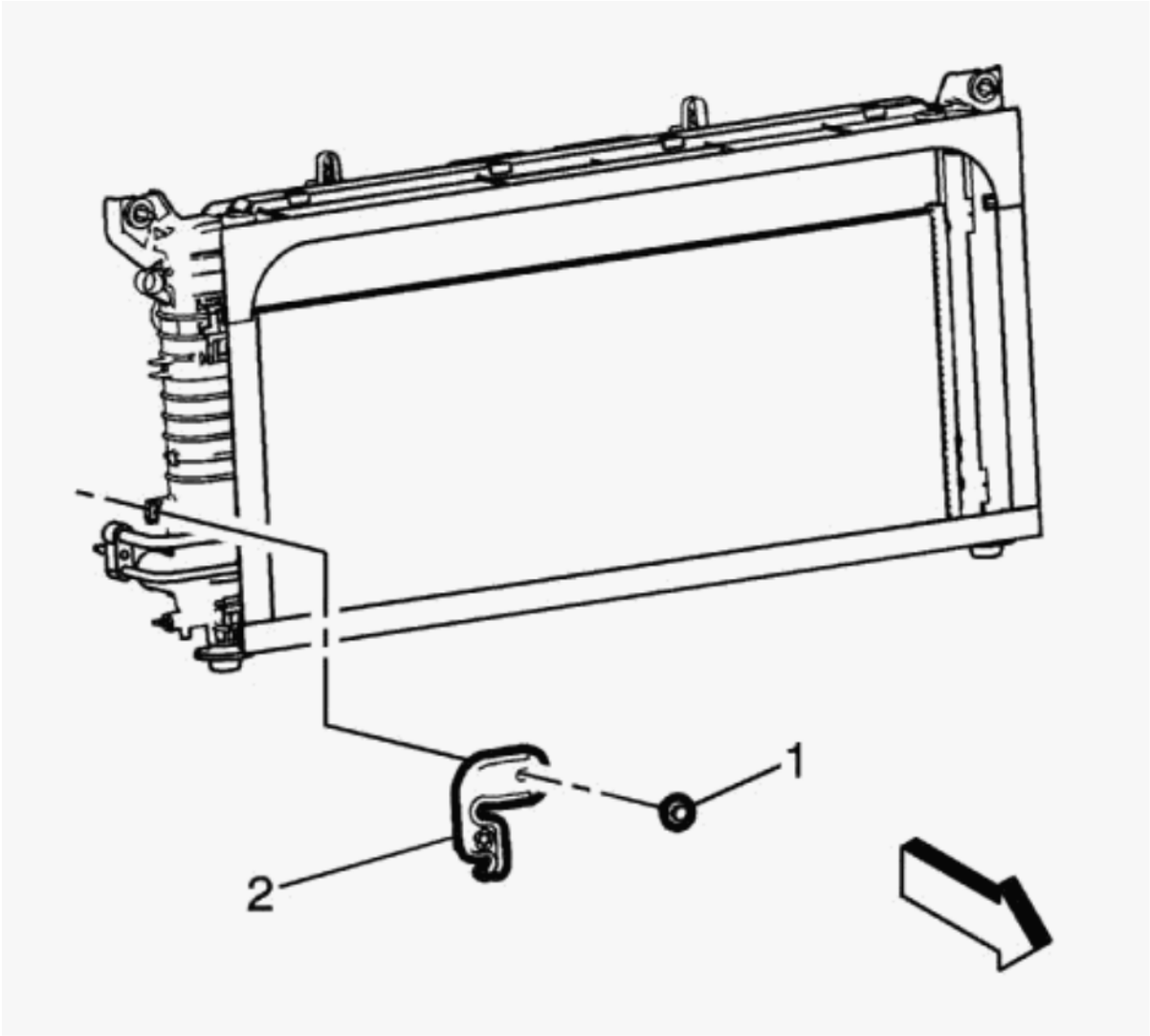


Fig. 146: Air Conditioning Condenser Bracket
Courtesy of GENERAL MOTORS COMPANY

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 (L83, L86, LV3)** .

AIR CONDITIONING CONDENSER BRACKET REPLACEMENT (L5P)

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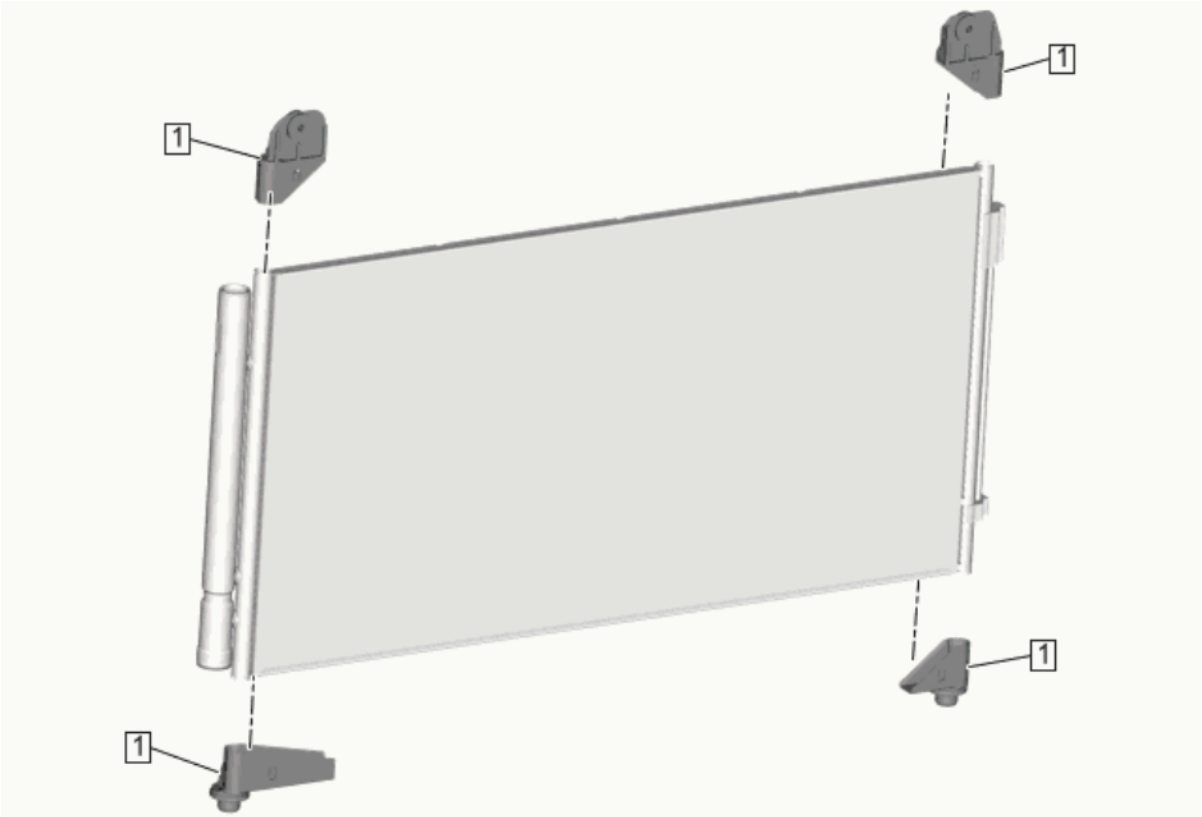


Fig. 147: Air Conditioning Condenser Bracket (L5P)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Conditioning Condenser Replacement (L5P)	
1	Air Conditioning Condenser Bracket

HEATER AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH C42 L96)

Removal Procedure

1. Disconnect the negative battery cable. Battery Negative Cable Disconnection and Connection (L96 LC8)
2. Drain the engine coolant system. Cooling System Draining and Filling (Static Fill LC8 L96) Cooling System Draining and Filling (Vac N Fill LC8 L96)
3. Remove the battery. Battery Replacement (Gas)

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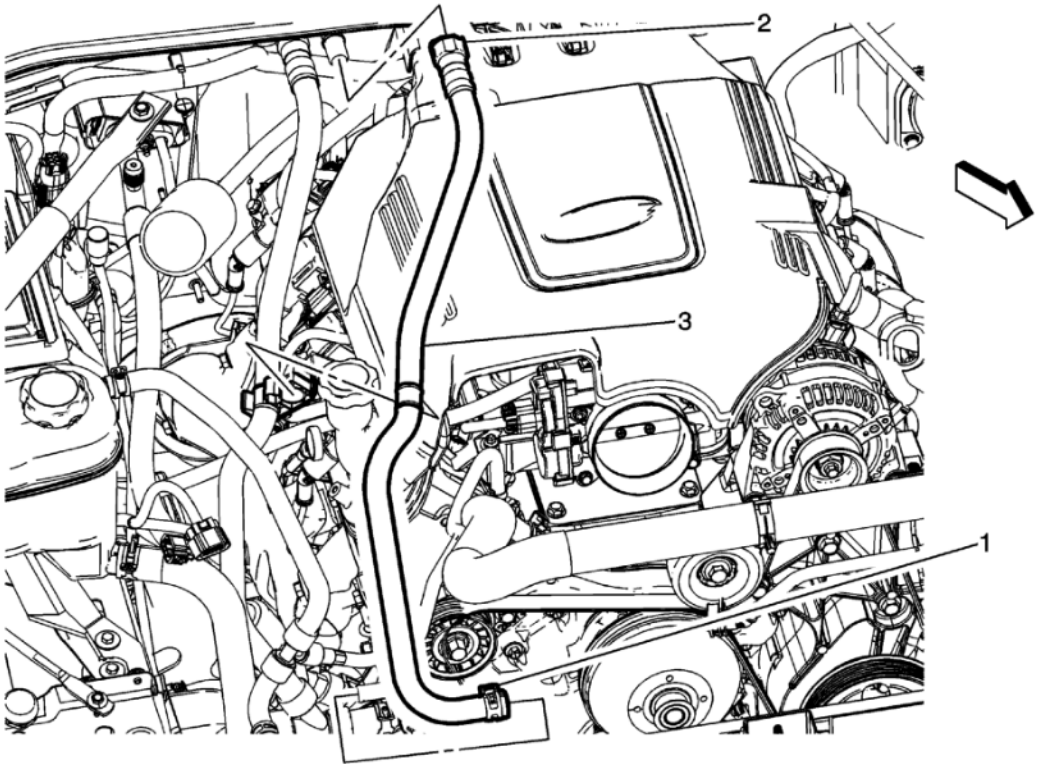


Fig. 148: Heater Inlet Hose (LC8, L96)
Courtesy of GENERAL MOTORS COMPANY

4. Remove the heater inlet hose (3) from the heater core tube. **Heater Inlet Hose Replacement (LC8, L96)**

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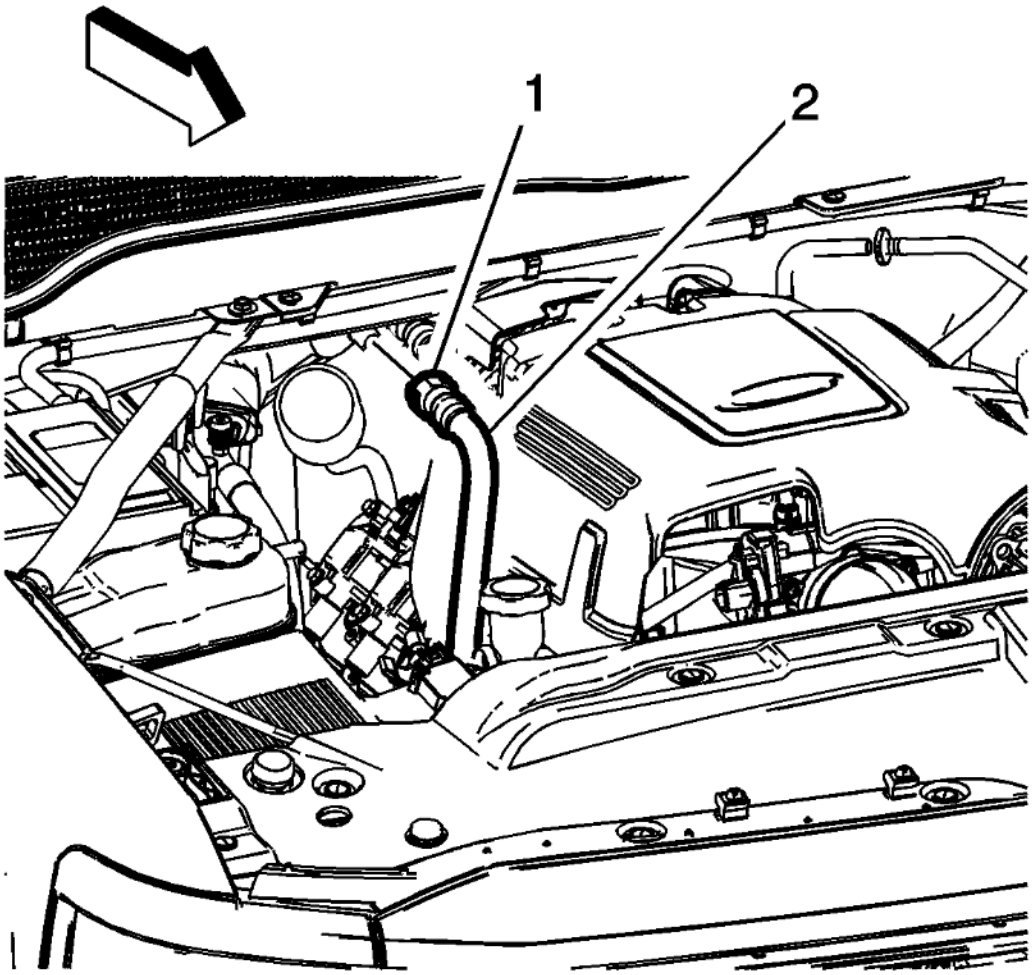


Fig. 149: Radiator Surge Tank Outlet Hose Clamp At Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

5. Remove the radiator surge tank outlet hose (2) from the heater core tube. **Radiator Surge Tank Outlet Hose Replacement (LC8, L96)**

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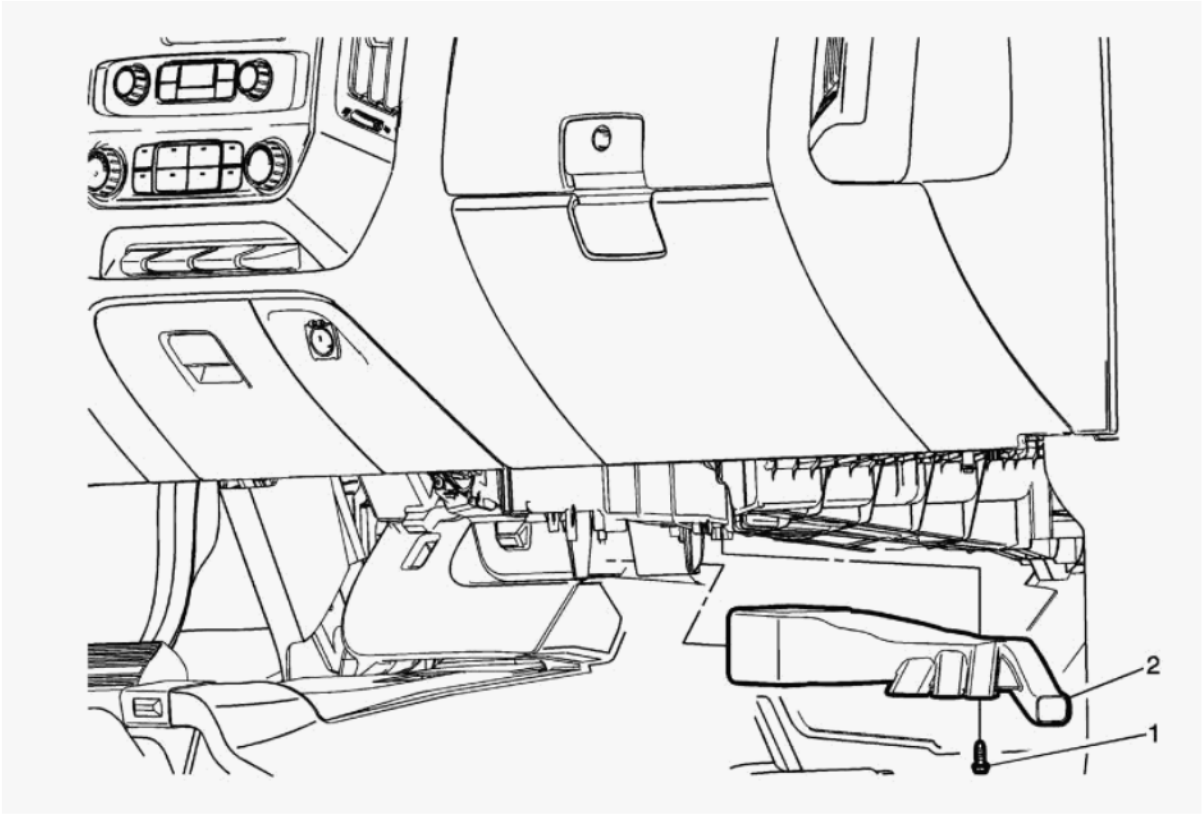
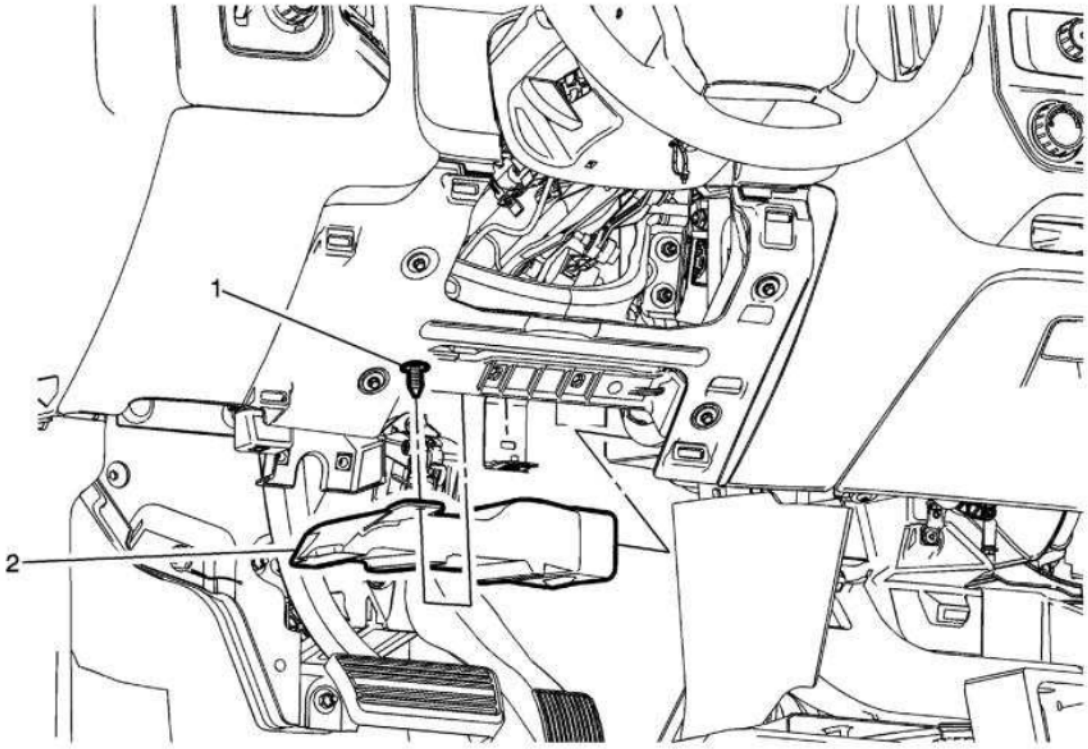


Fig. 150: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

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



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Fig. 151: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

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

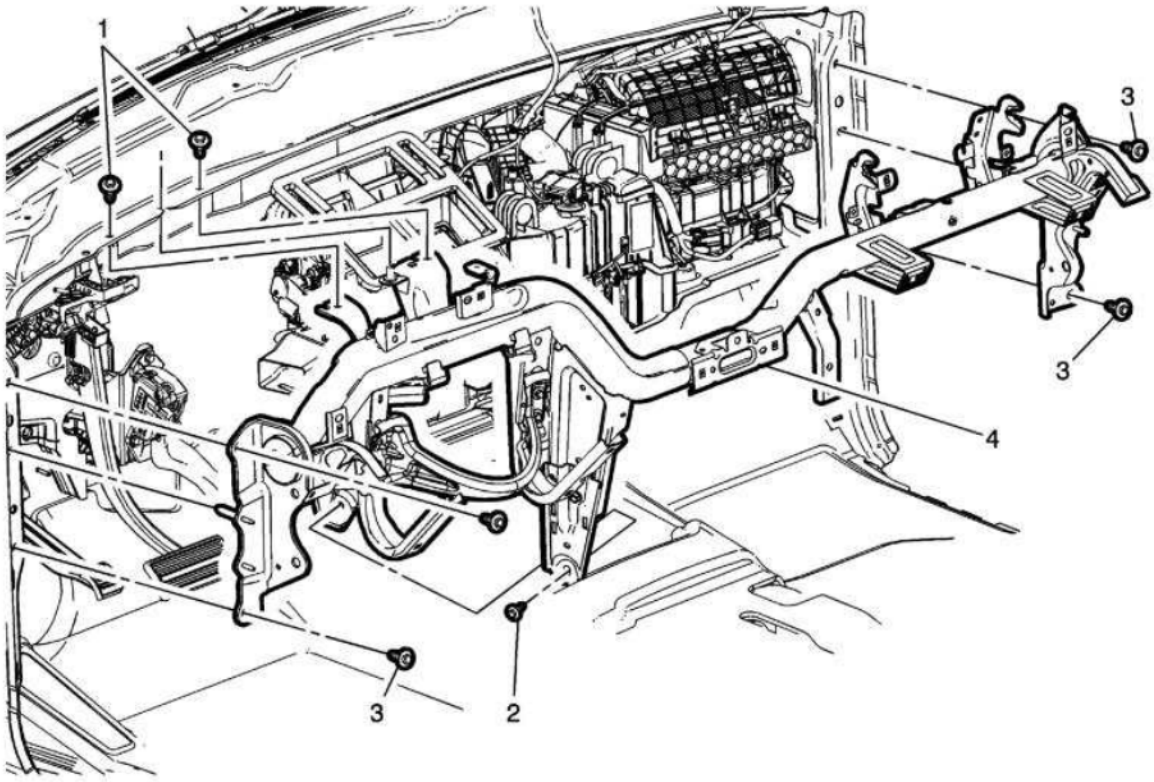


Fig. 152: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

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

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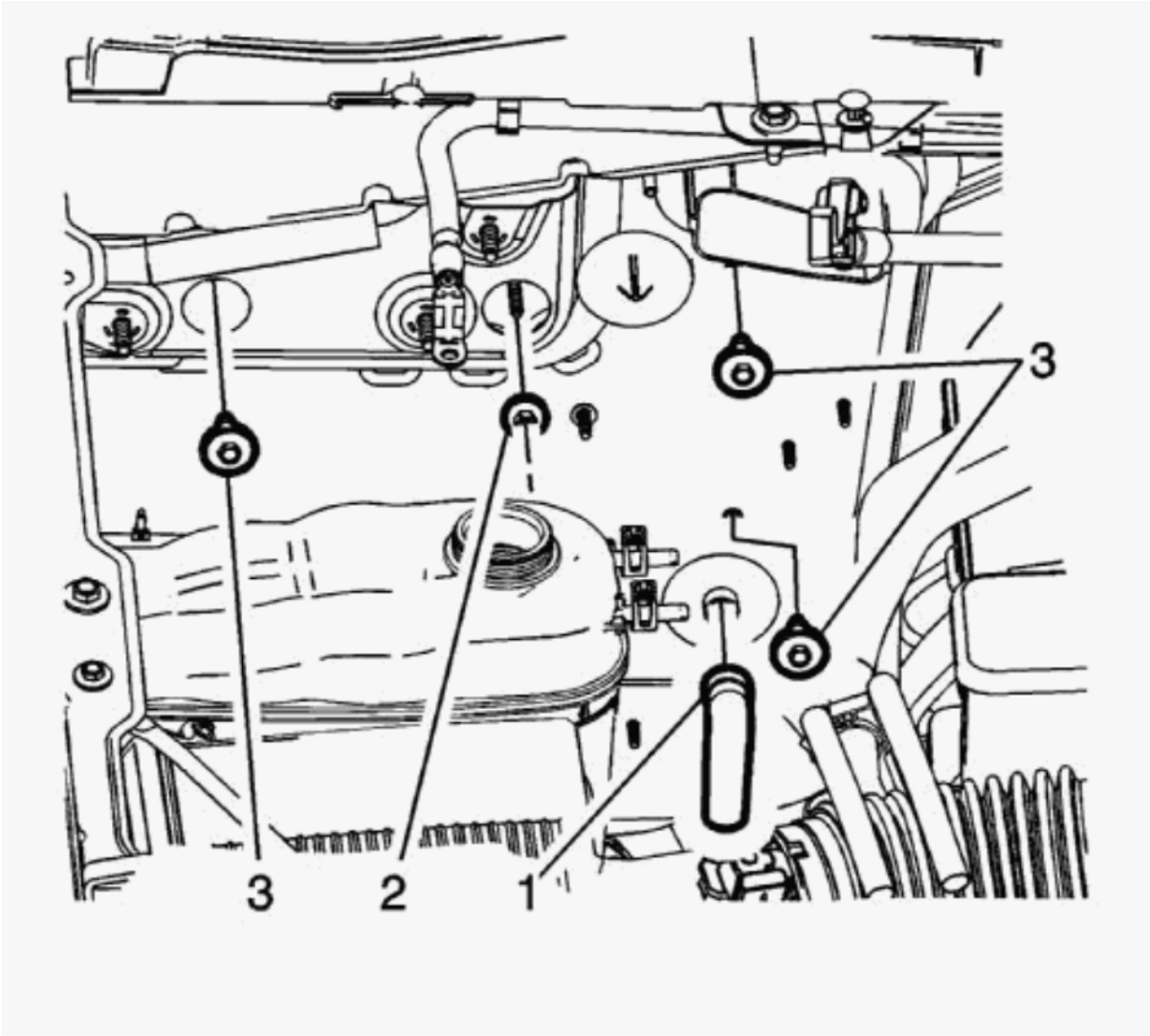


Fig. 153: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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.
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.

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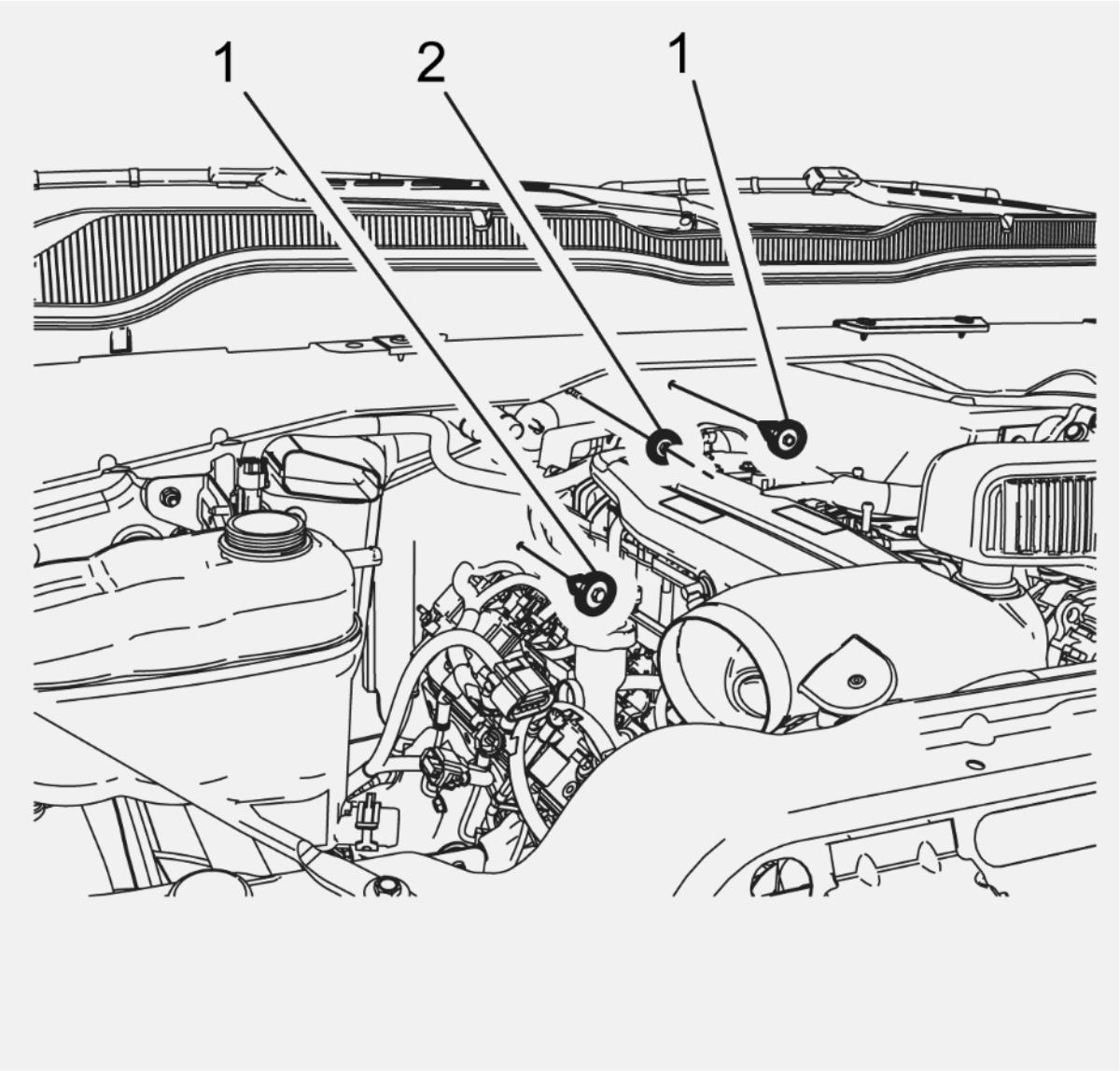


Fig. 154: HVAC Module Assembly And Cowl Panel
Courtesy of GENERAL MOTORS COMPANY

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.

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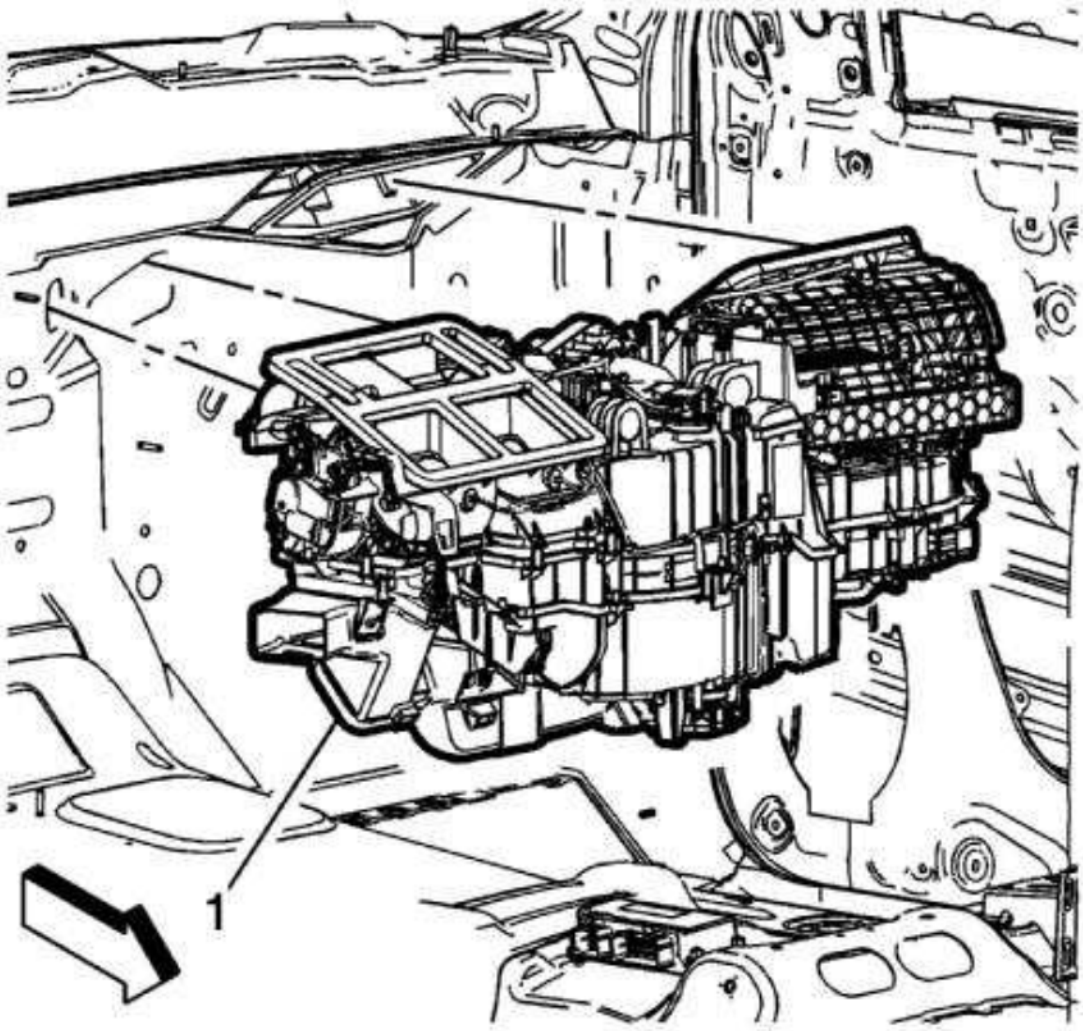


Fig. 155: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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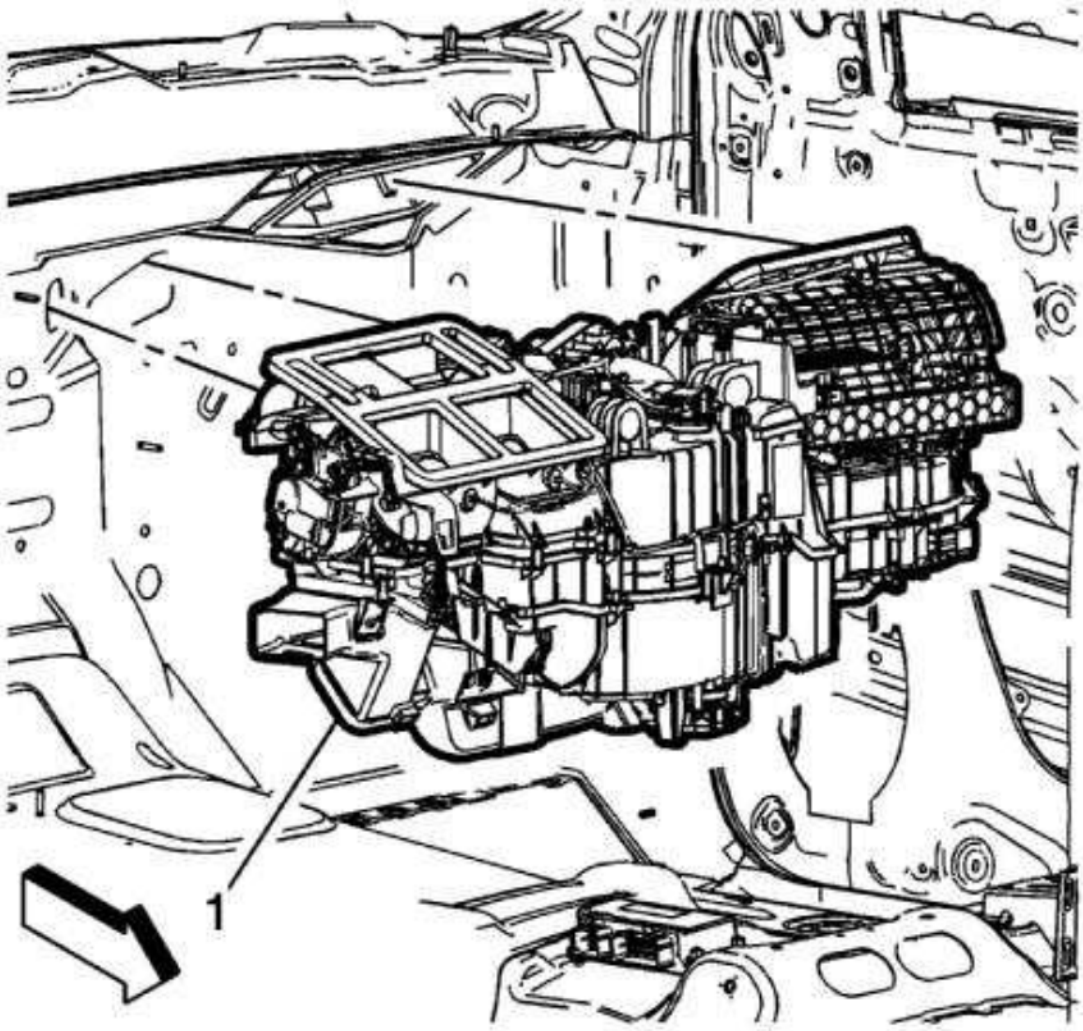


Fig. 156: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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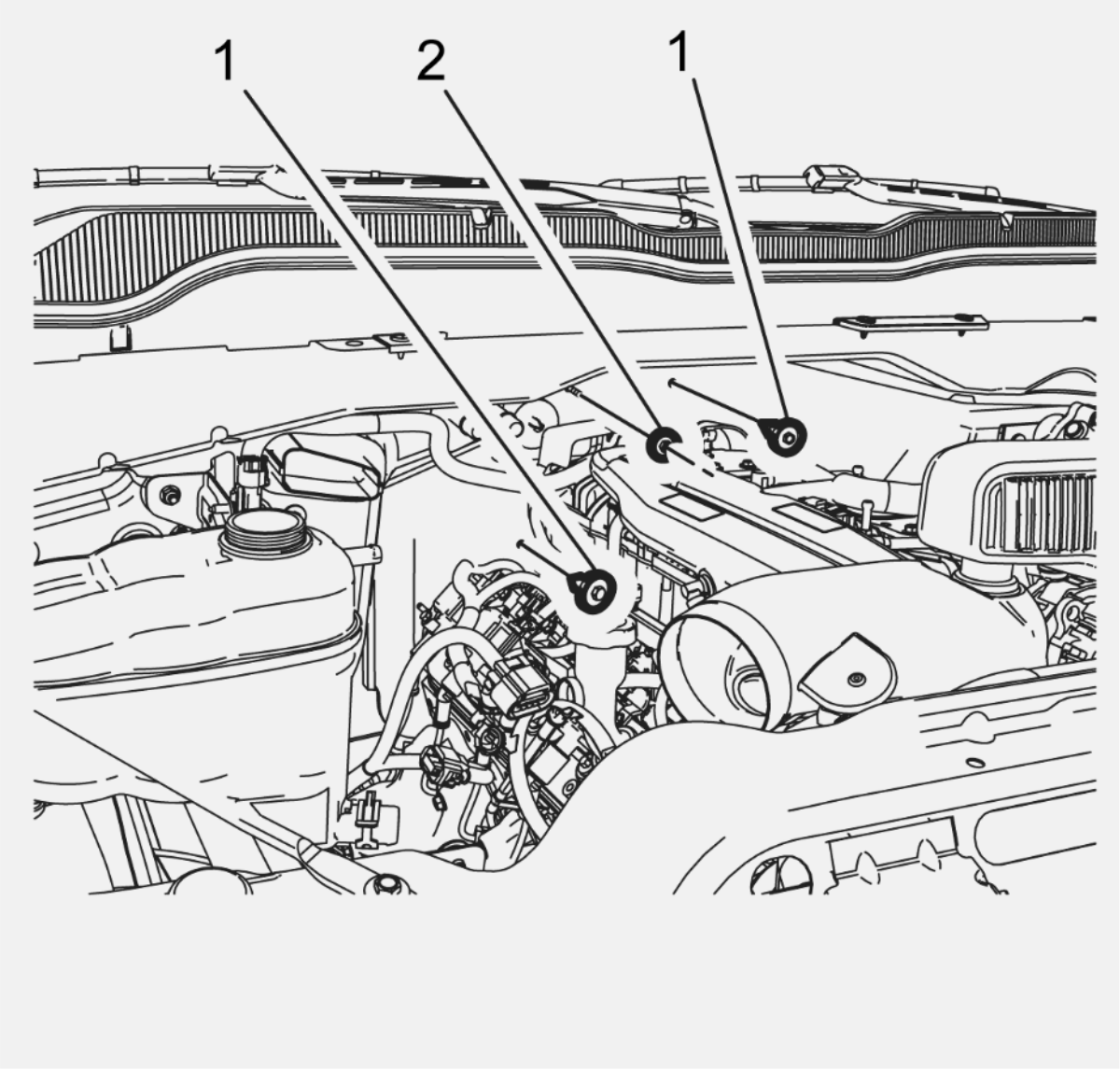


Fig. 157: HVAC Module Assembly And Cowl Panel
Courtesy of GENERAL MOTORS COMPANY

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.

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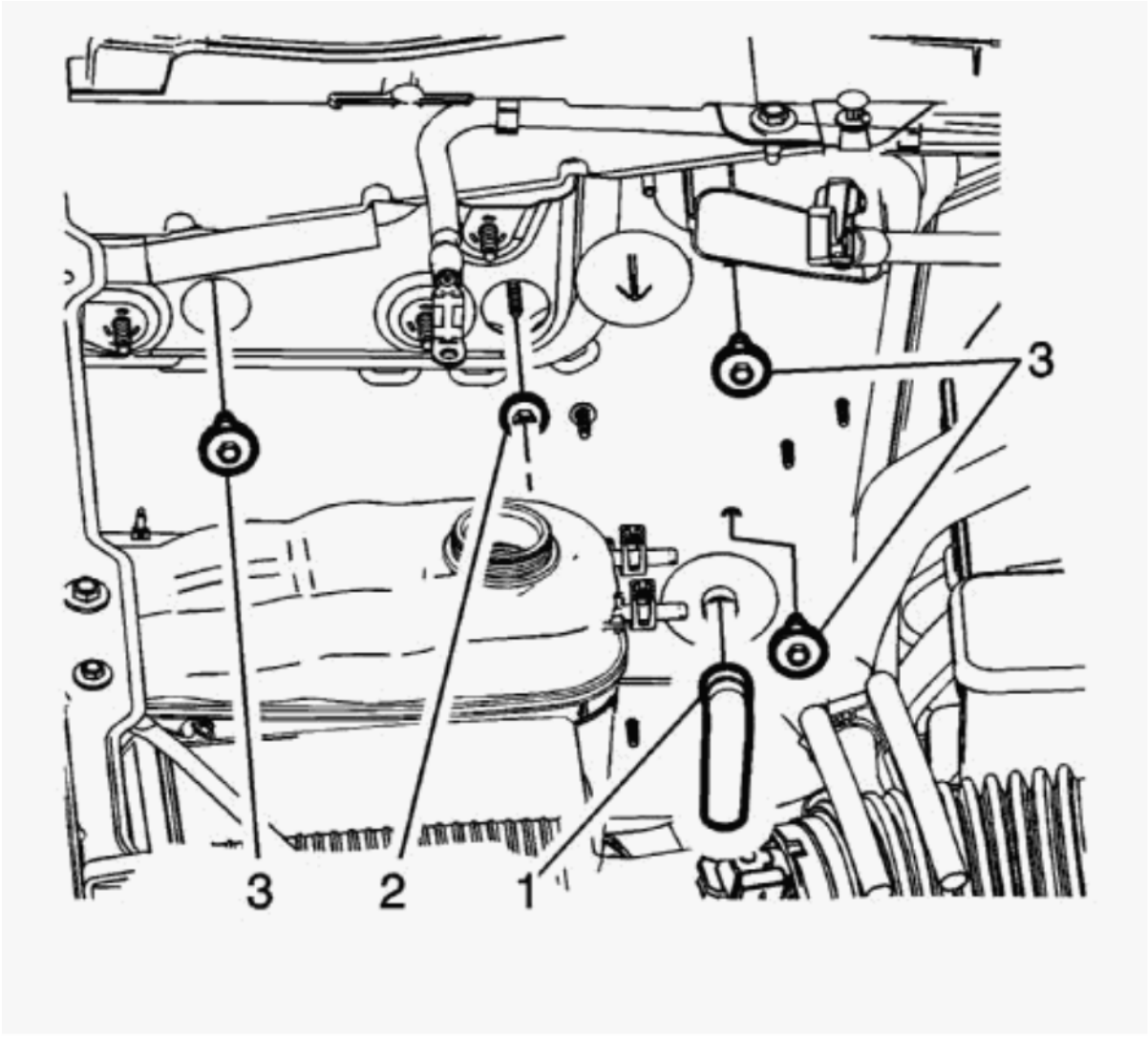


Fig. 158: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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.

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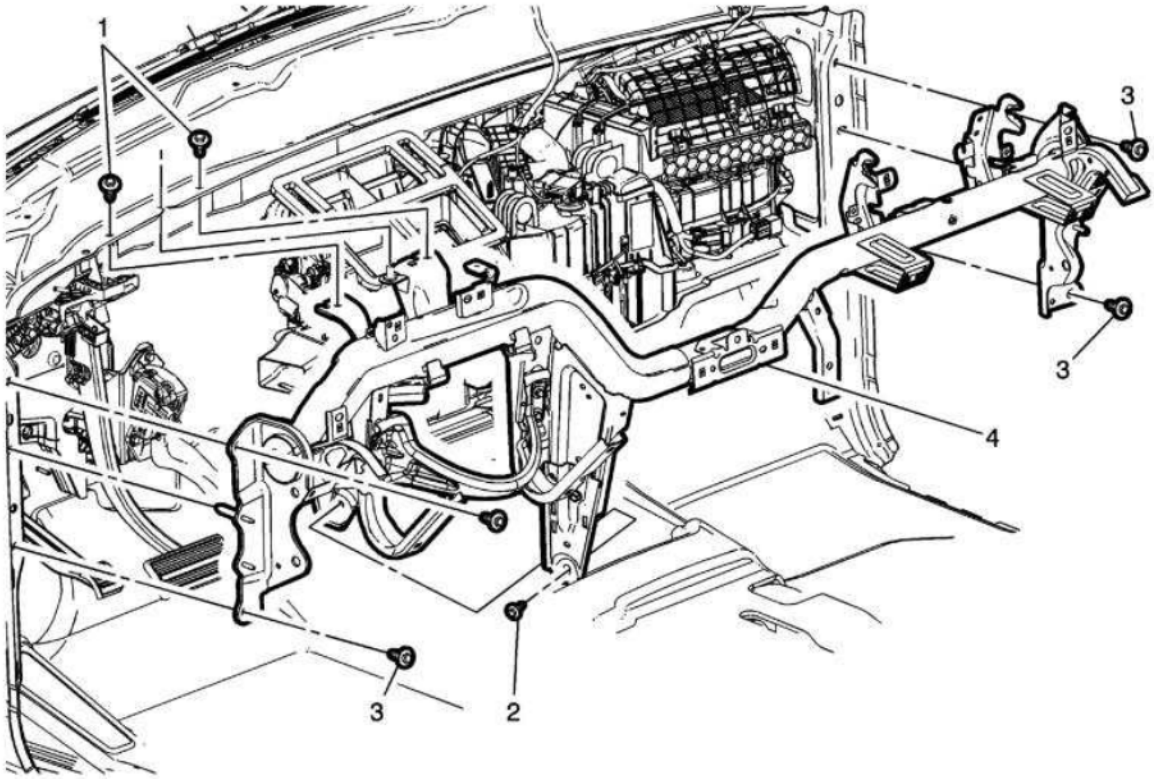


Fig. 159: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

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

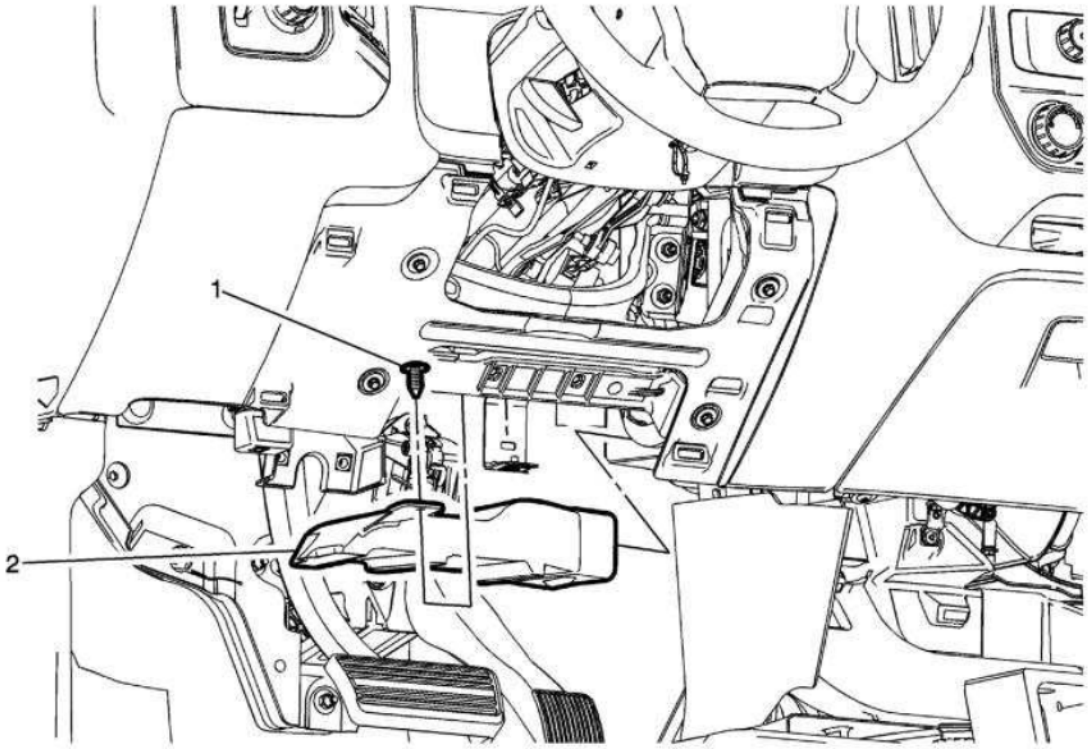


Fig. 160: Floor Front Air Outlet Duct - Left Side

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Courtesy of GENERAL MOTORS COMPANY

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

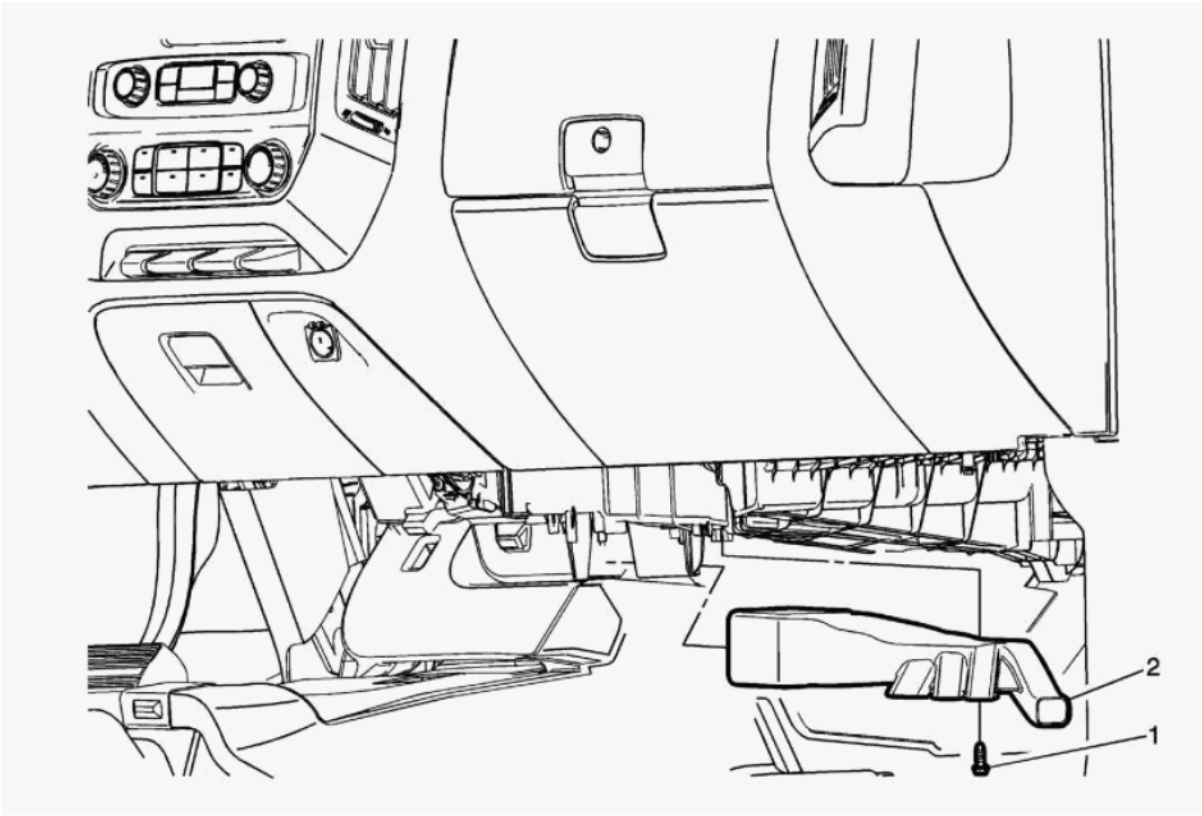


Fig. 161: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

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

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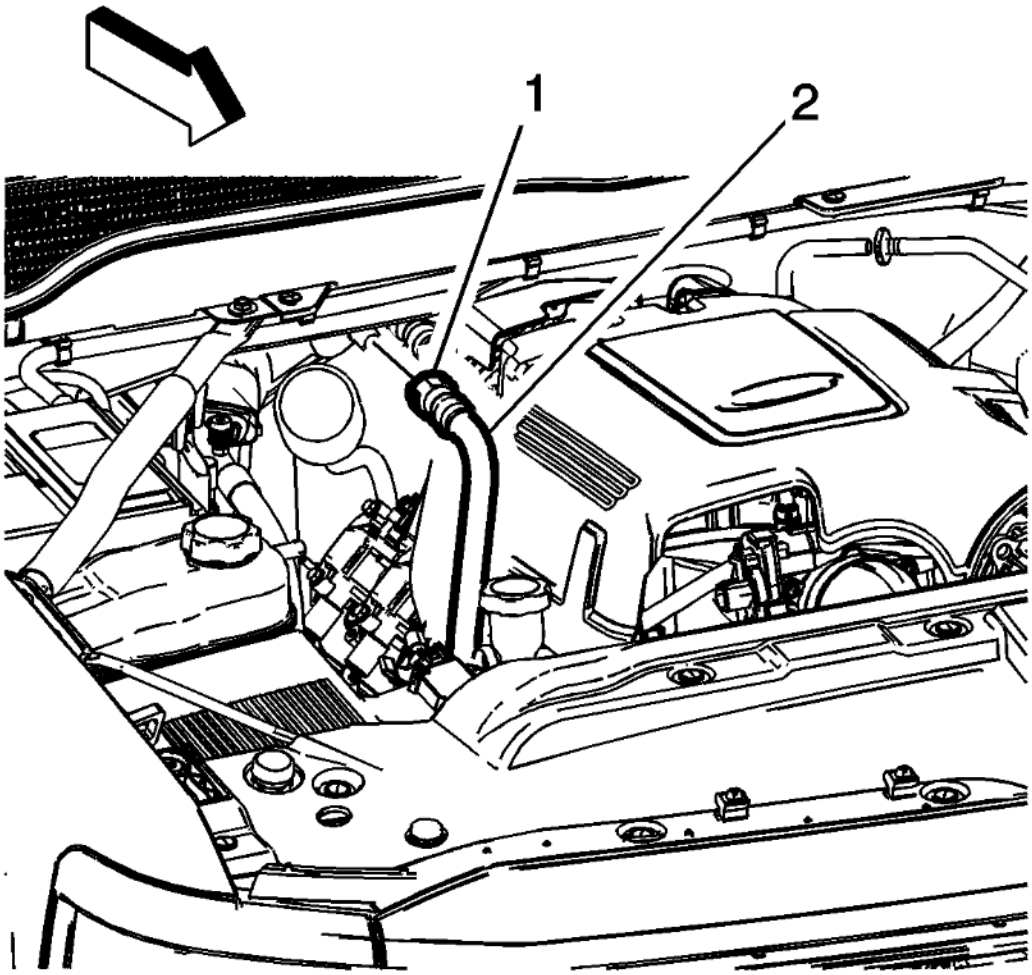


Fig. 162: Radiator Surge Tank Outlet Hose Clamp At Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

10. Install the radiator surge tank outlet hose (2) to the heater core tube. **Radiator Surge Tank Outlet Hose Replacement (LC8, L96)**

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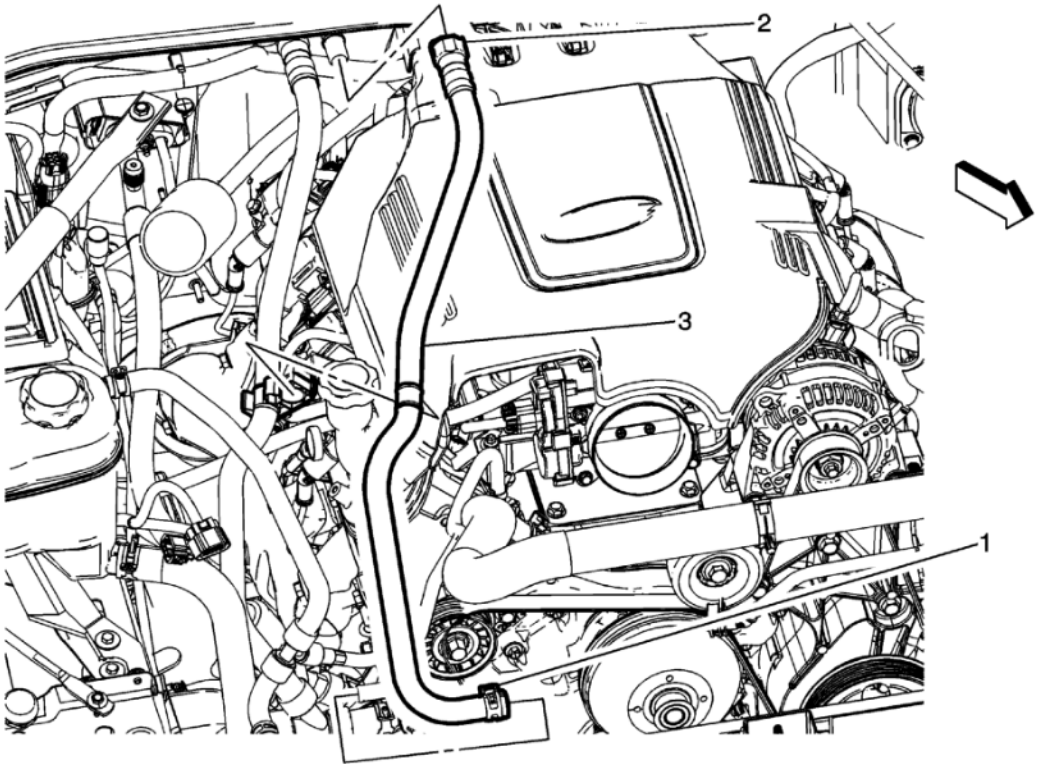


Fig. 163: Heater Inlet Hose (LC8, L96)
Courtesy of GENERAL MOTORS COMPANY

11. Install the heater inlet hose (3) to the heater core tube. **Heater Inlet Hose Replacement (LC8, L96)**
12. Install the battery. **Battery Replacement (Gas)**
13. Fill the engine coolant system. **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)**
14. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L96 LC8)**
15. Visually inspect for coolant leaks.
16. Visually inspect for refrigerant leaks.

HEATER AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH C42, L83, MCX)

Removal Procedure

1. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)Battery Negative Cable Disconnection and Connection (Dual Battery)**
2. Drain the engine coolant system. **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)**
3. Remove the battery tray. **Battery Tray Replacement (Gas)**
4. Remove the heater inlet hose from the heater core tube. **Heater Inlet Hose Replacement (L83, L86)**
5. Remove the heater outlet hose from the heater core tube. **Heater Outlet Hose Replacement (L83, L86)**
6. Remove the fuel pump Insulator. **Fuel Pump Insulator Replacement**
7. Remove the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
8. Remove the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Remove the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**

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10. Temporary support the heater and blower module assembly.

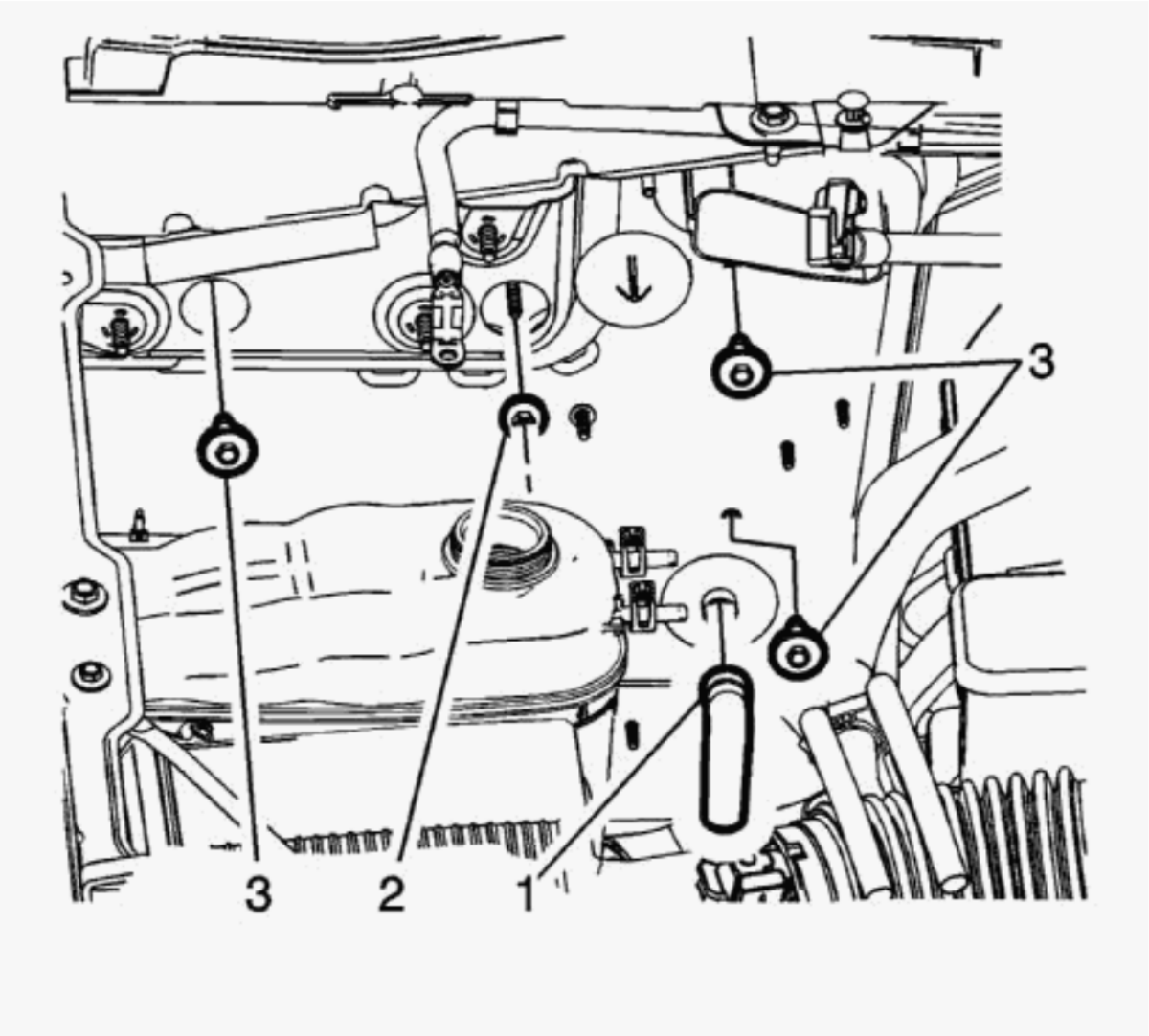


Fig. 164: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

11. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the heater and blower module.
12. Remove the heater and blower module nut, (2) securing the heater and blower module to the cowl panel.
13. Remove the heater and blower module bolts, (3) securing the heater and blower module to the cowl panel.

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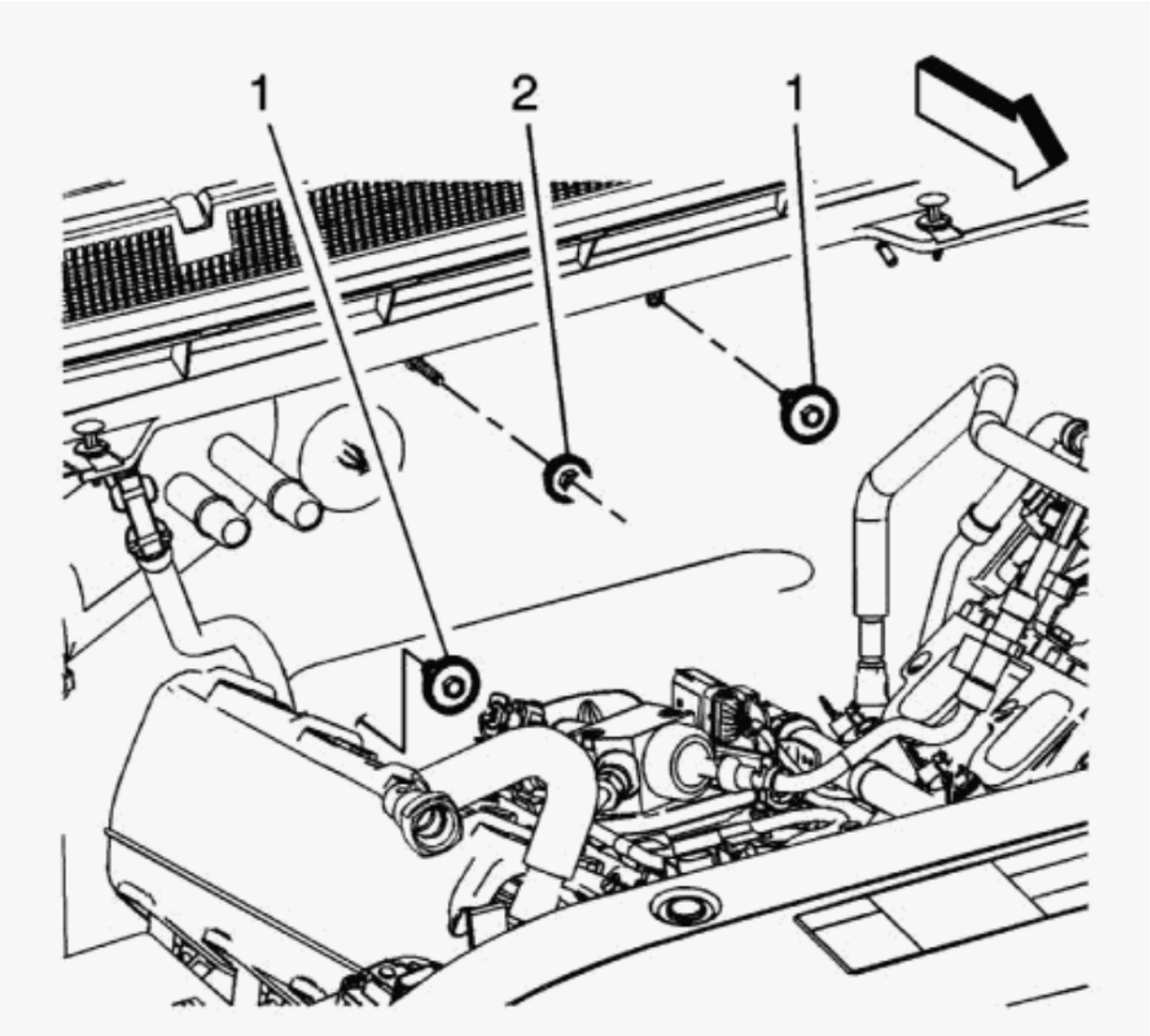


Fig. 165: HVAC Module Assembly Bolts And HVAC Module Assembly Nut
Courtesy of GENERAL MOTORS COMPANY

14. Remove the heater and blower module bolts, (1) securing the heater and blower module to the cowl panel.
15. Remove the heater and blower module nut, (2) securing the heater and blower module to the cowl panel.

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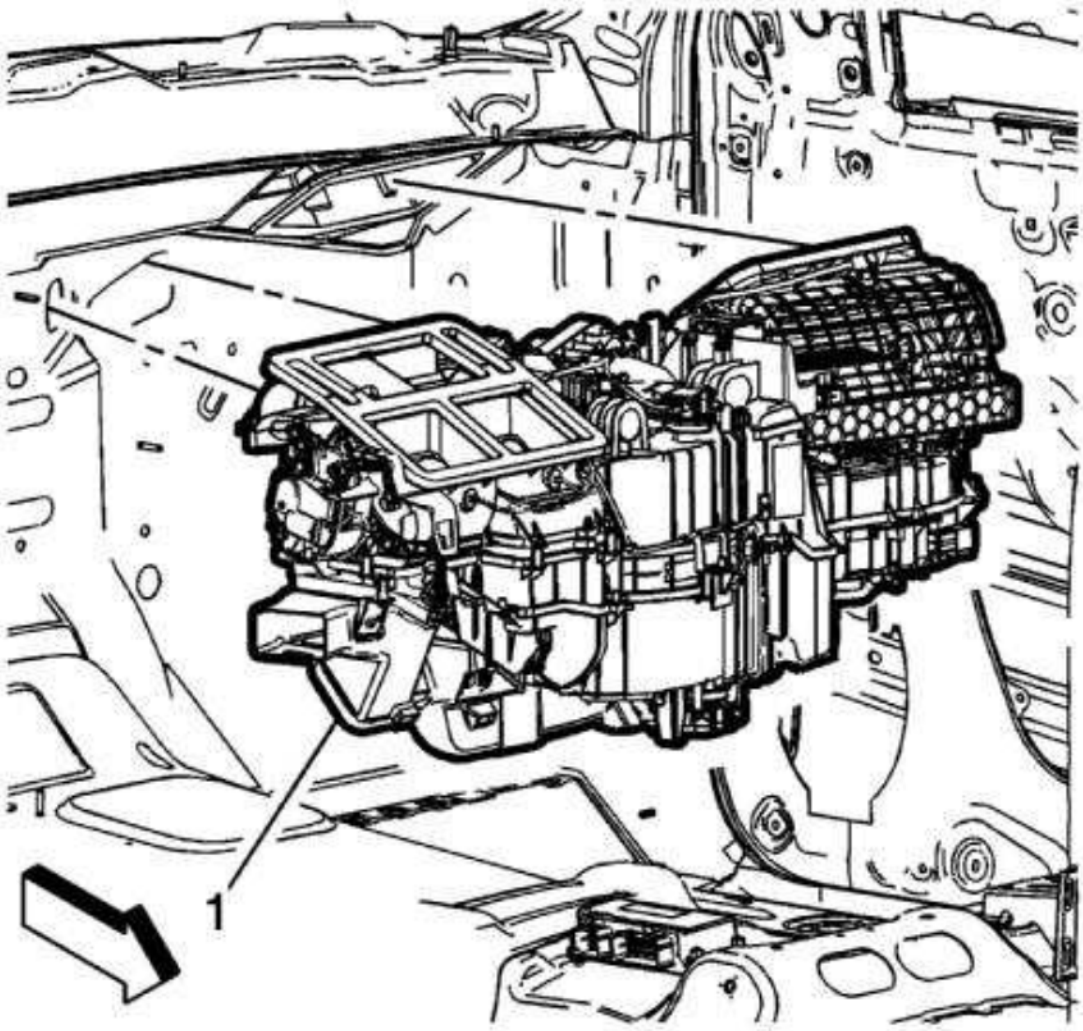


Fig. 166: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

16. Remove the heater and blower module assembly (1) from the vehicle.
17. Transfer all the necessary components.

Installation Procedure

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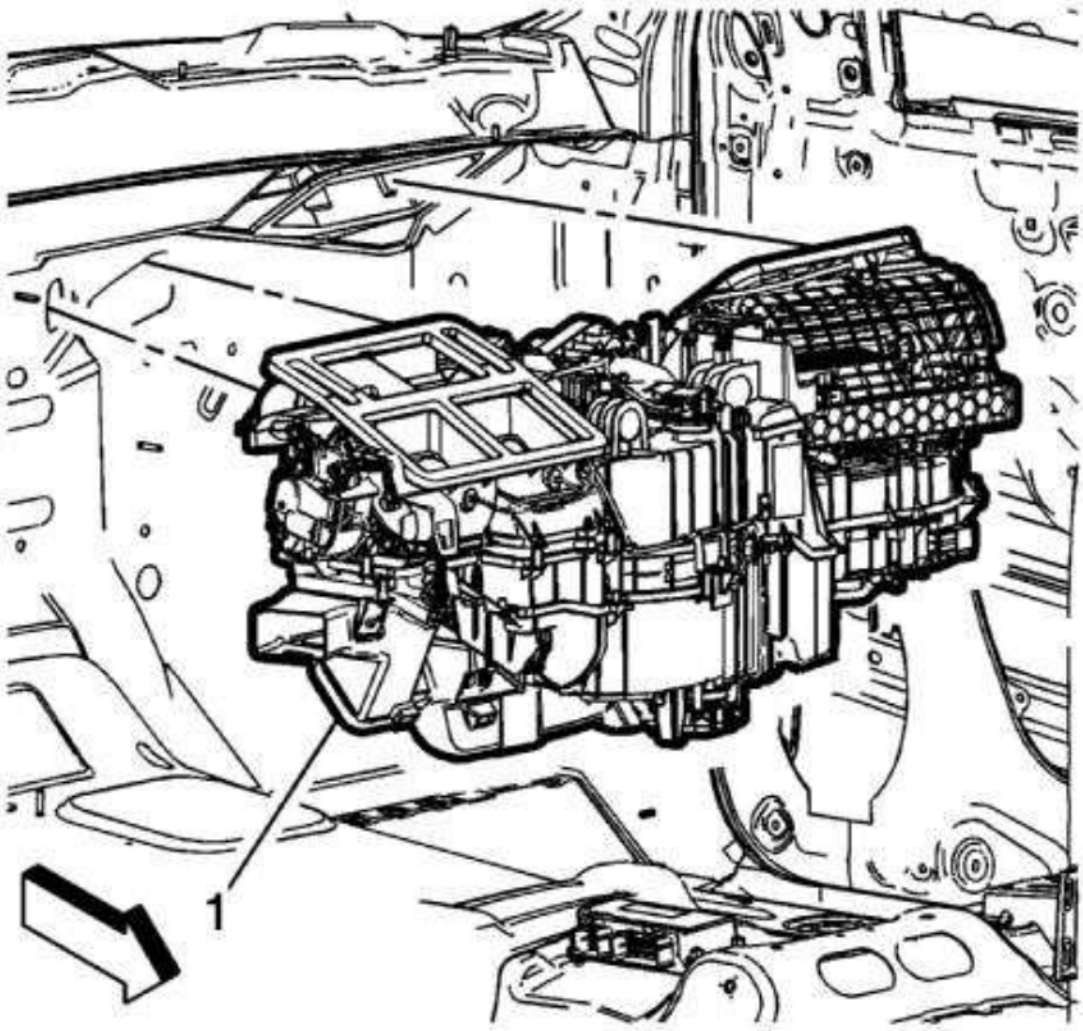


Fig. 167: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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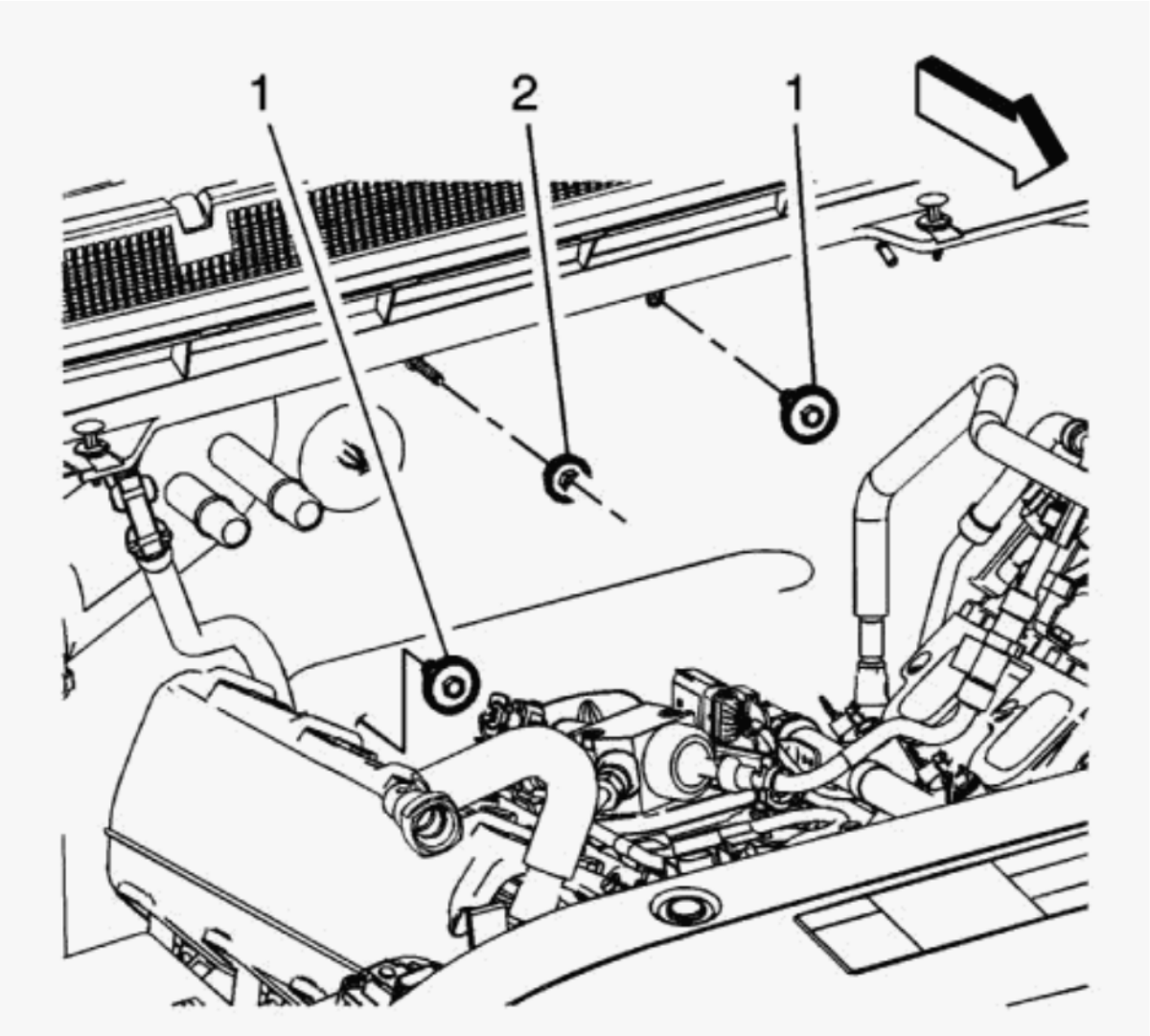


Fig. 168: HVAC Module Assembly Bolts And HVAC Module Assembly Nut
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

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

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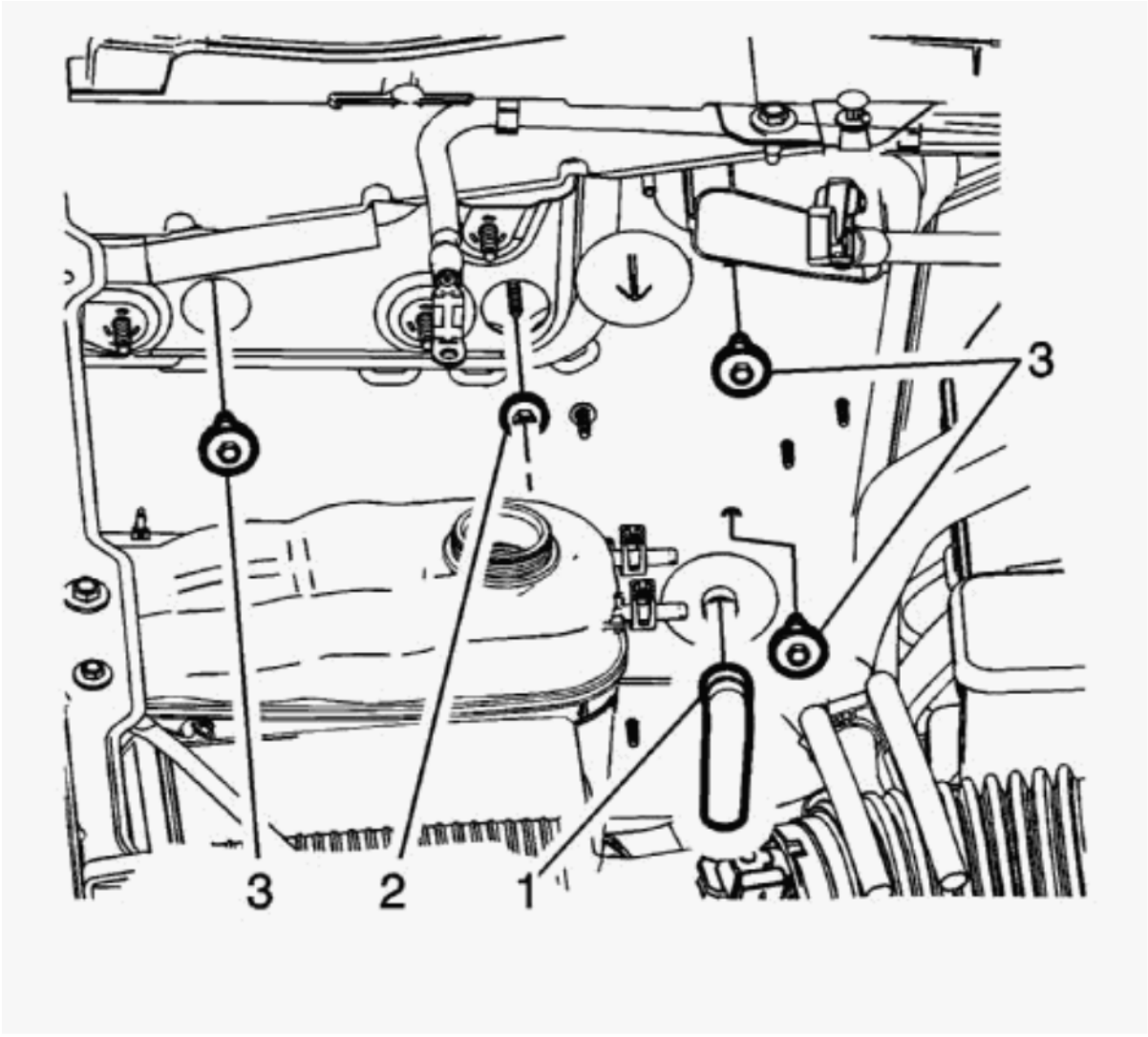


Fig. 169: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

4. Install the heater and blower module bolts, (3) securing the heater and blower module to the cowl panel.
5. Install the heater and blower module nut, (2) securing the heater and blower module to the cowl panel.
6. Install the air conditioning evaporator case drain tube (1) onto the heater and blower module.
7. Install the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
8. Install the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Install the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
10. Install the fuel pump Insulator. **Fuel Pump Insulator Replacement**
11. Install the heater outlet hose to the heater core tube. **Heater Outlet Hose Replacement (L83, L86)**
12. Install the heater inlet hose to the heater core tube. **Heater Inlet Hose Replacement (L83, L86)**
13. Install the battery tray. **Battery Tray Replacement (Gas)**
14. Fill the engine coolant system.**Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)**
15. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
16. Visually inspect for coolant leaks.

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HEATER AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH C42, LV3, MCX)

Removal Procedure

1. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
2. Drain the engine coolant system. **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)**
3. Remove the battery tray. **Battery Tray Replacement (Gas)**
4. Remove the heater inlet hose from the heater core tube. **Heater Inlet Hose Replacement (LV3)**
5. Remove the heater outlet hose from the heater core tube. **Heater Outlet Hose Replacement (LV3)**
6. Remove the fuel pump Insulator. **Fuel Pump Insulator Replacement**
7. Remove the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
8. Remove the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Remove the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
10. Temporary support the heater and blower module assembly (HVAC).

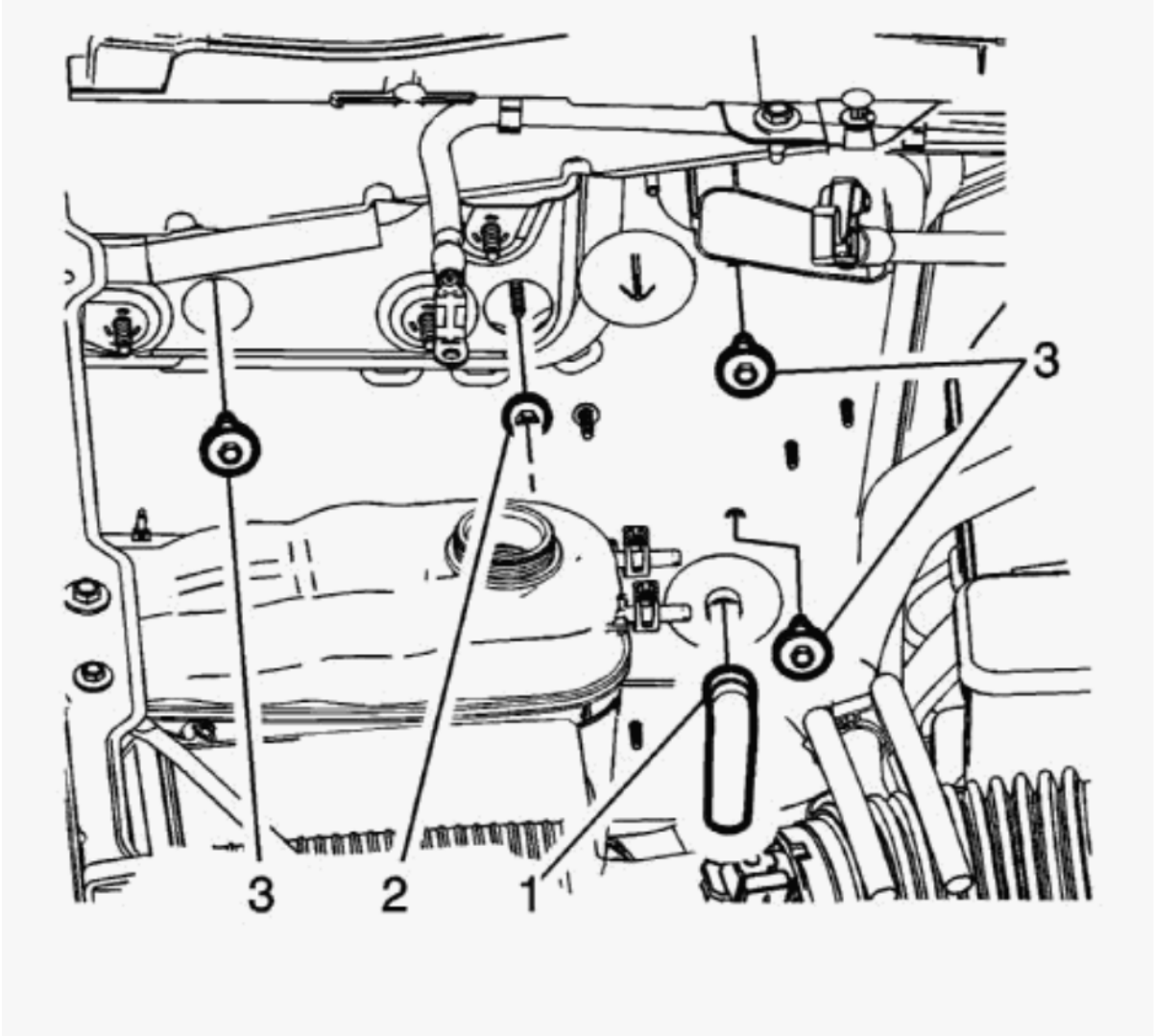


Fig. 170: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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

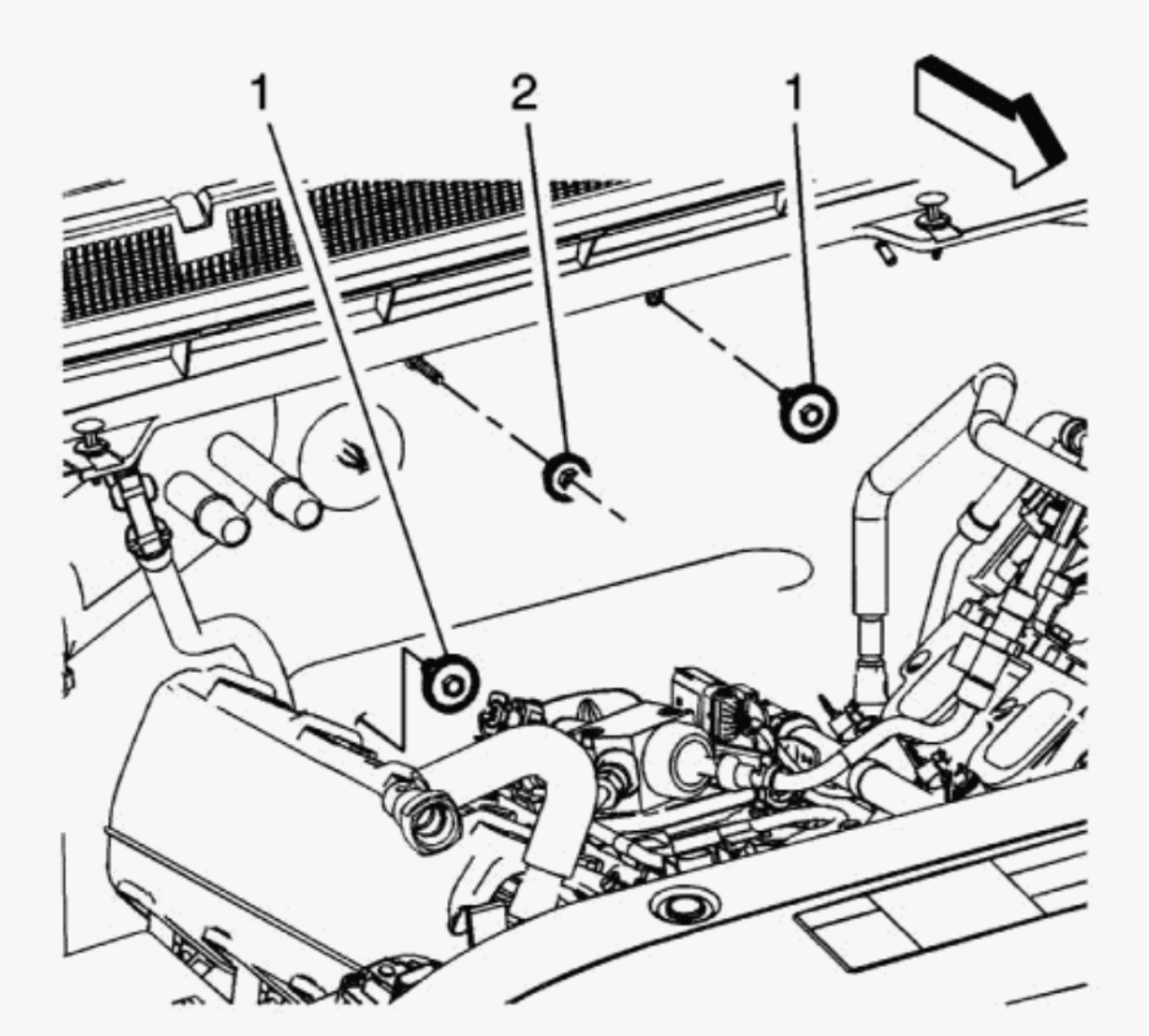


Fig. 171: HVAC Module Assembly Bolts And HVAC Module Assembly Nut
Courtesy of GENERAL MOTORS COMPANY

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

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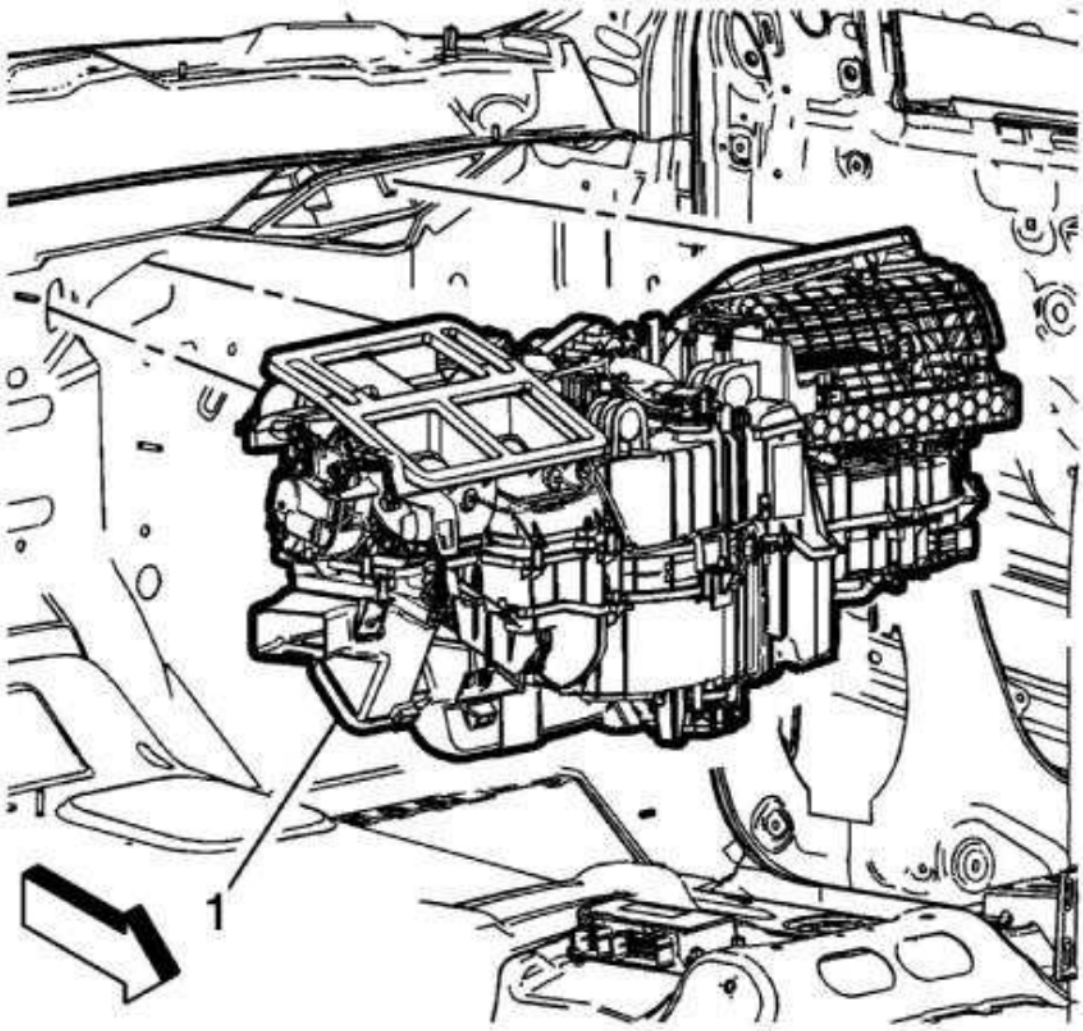


Fig. 172: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to HVAC Module Drain Tube Caution .

16. Remove the HVAC module assembly (1) from the vehicle.
17. Transfer all the necessary components.

Installation Procedure

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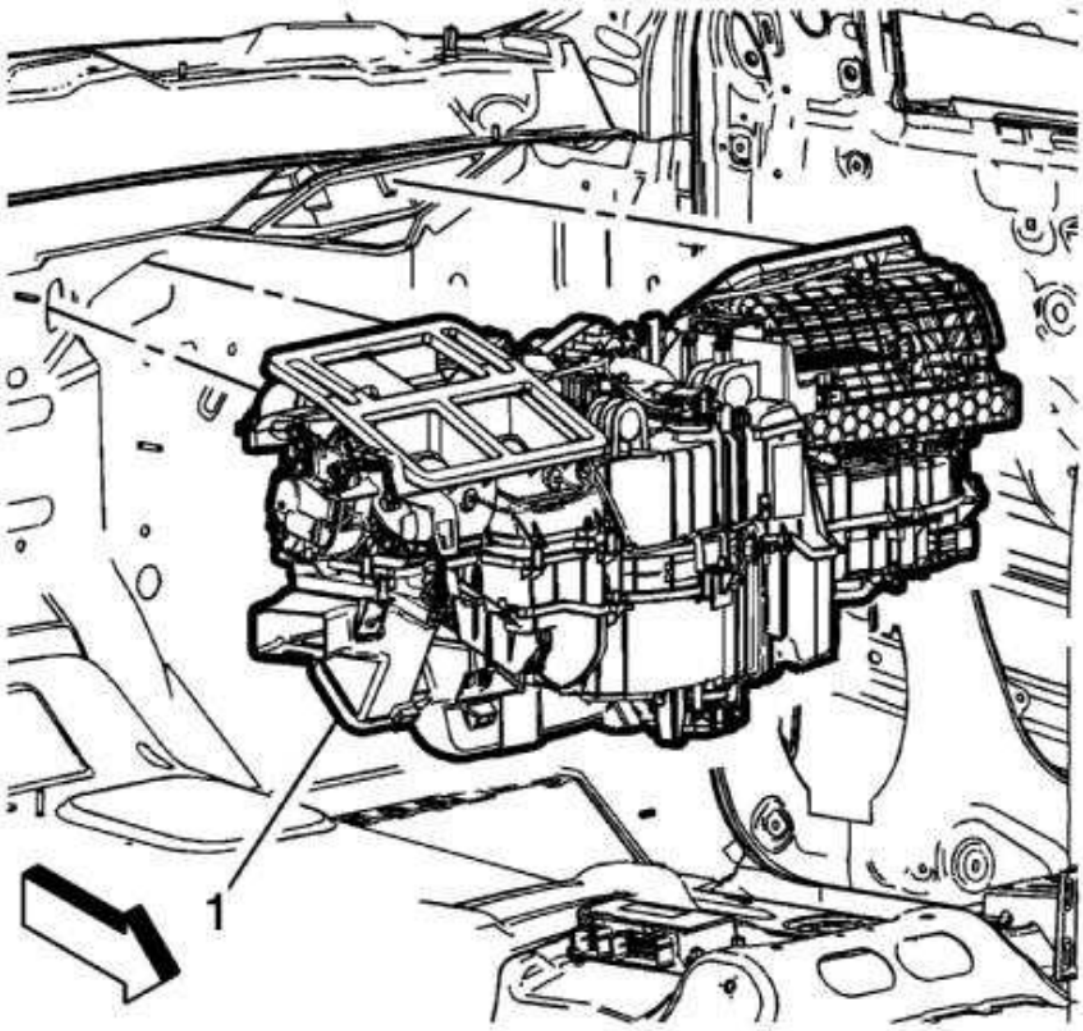


Fig. 173: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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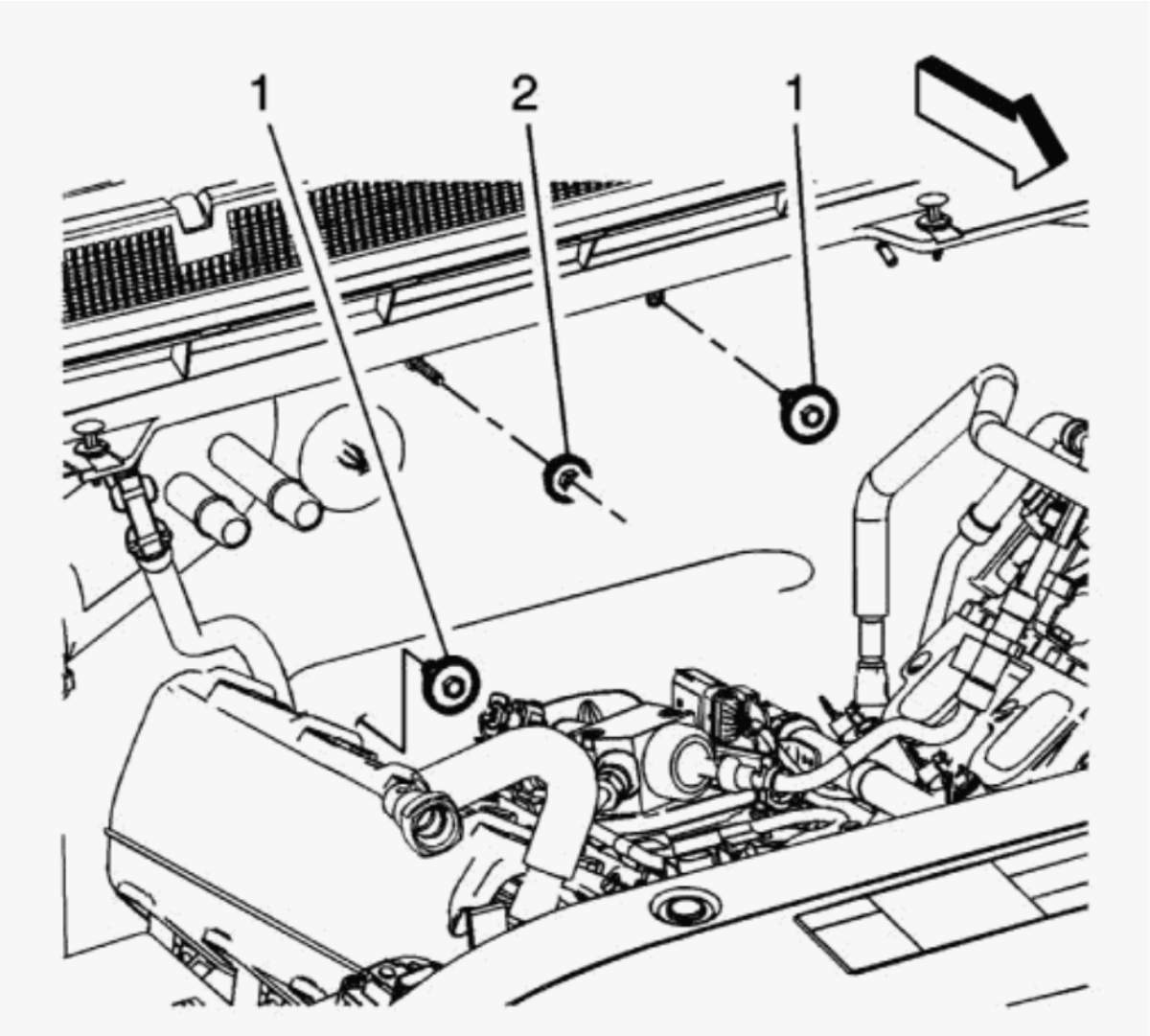


Fig. 174: HVAC Module Assembly Bolts And HVAC Module Assembly Nut
Courtesy of GENERAL MOTORS COMPANY

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 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.

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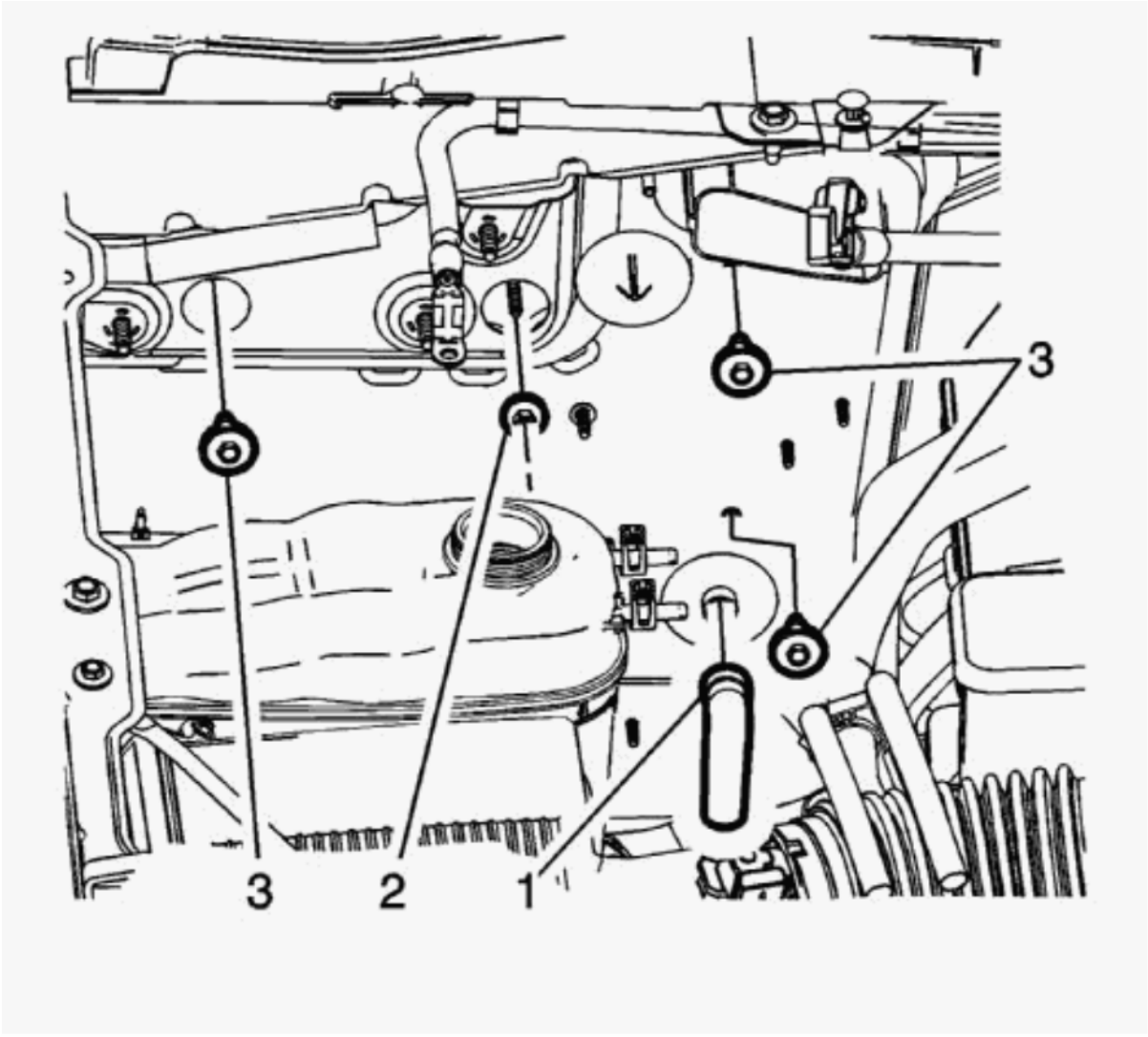


Fig. 175: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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.
6. Install the air conditioning evaporator case drain tube (1) onto the HVAC module assembly.
7. Install the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
8. Install the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Install the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
10. Install the fuel pump Insulator. **Fuel Pump Insulator Replacement**
11. Install the heater outlet hose to the heater core tube. **Heater Outlet Hose Replacement (LV3)**
12. Install the heater inlet hose to the heater core tube. **Heater Inlet Hose Replacement (LV3)**
13. Install the battery tray. **Battery Tray Replacement (Gas)**
14. Fill the engine coolant system. **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)**
15. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
16. Visually inspect for coolant leaks.

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HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH L83, L86)

Removal Procedure

1. Remove the drivers and passengers seats. **Driver or Passenger Seat Removal and Installation**
2. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
3. Recover the refrigerant system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
4. Drain the engine coolant system. **Cooling System Draining and Filling (Vac N Fill L83 L86) Cooling System Draining and Filling (Static Fill L83 L86)**
5. Remove the battery tray. **Battery Tray Replacement (Gas)**
6. Remove the heater inlet hose from the heater core tube. **Heater Inlet Hose Replacement (L83, L86)**
7. Remove the heater outlet hose from the heater core tube. **Heater Outlet Hose Replacement (L83, L86)**
8. Remove the air conditioning evaporator tube from the thermal expansion valve. **Air Conditioning Evaporator Tube Replacement (L83, L86)**
9. Remove the air conditioning condenser hose from the thermal expansion valve. **Air Conditioning Condenser Hose Replacement (L83, L86)**
10. Remove the intake manifold. **Intake Manifold Replacement**
11. Remove the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
12. Remove the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
13. Remove the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
14. Temporary support the heater and air conditioning evaporator and blower module assembly.

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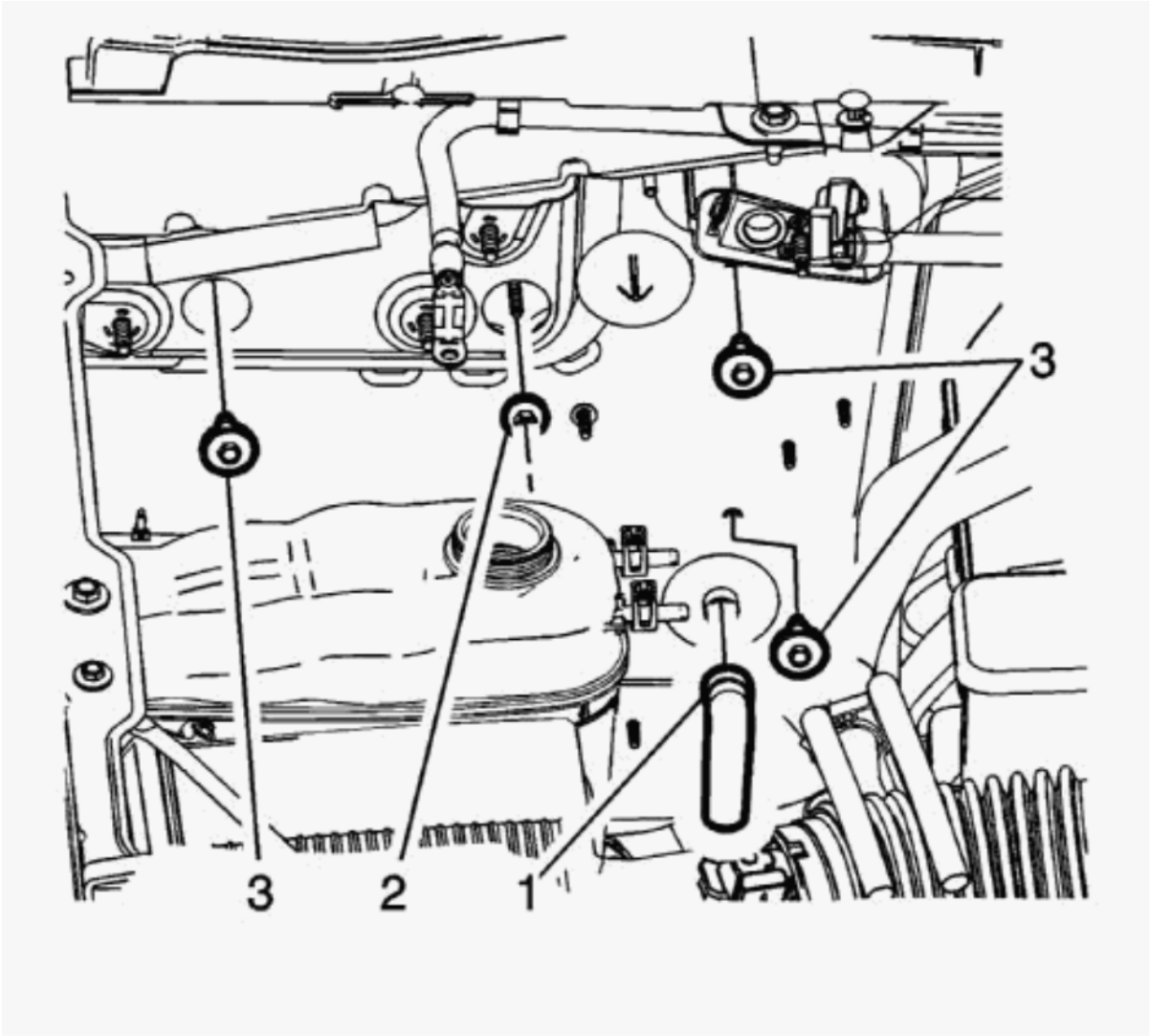


Fig. 176: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

15. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the heater and air conditioning evaporator and blower module.
16. 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.
17. 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.

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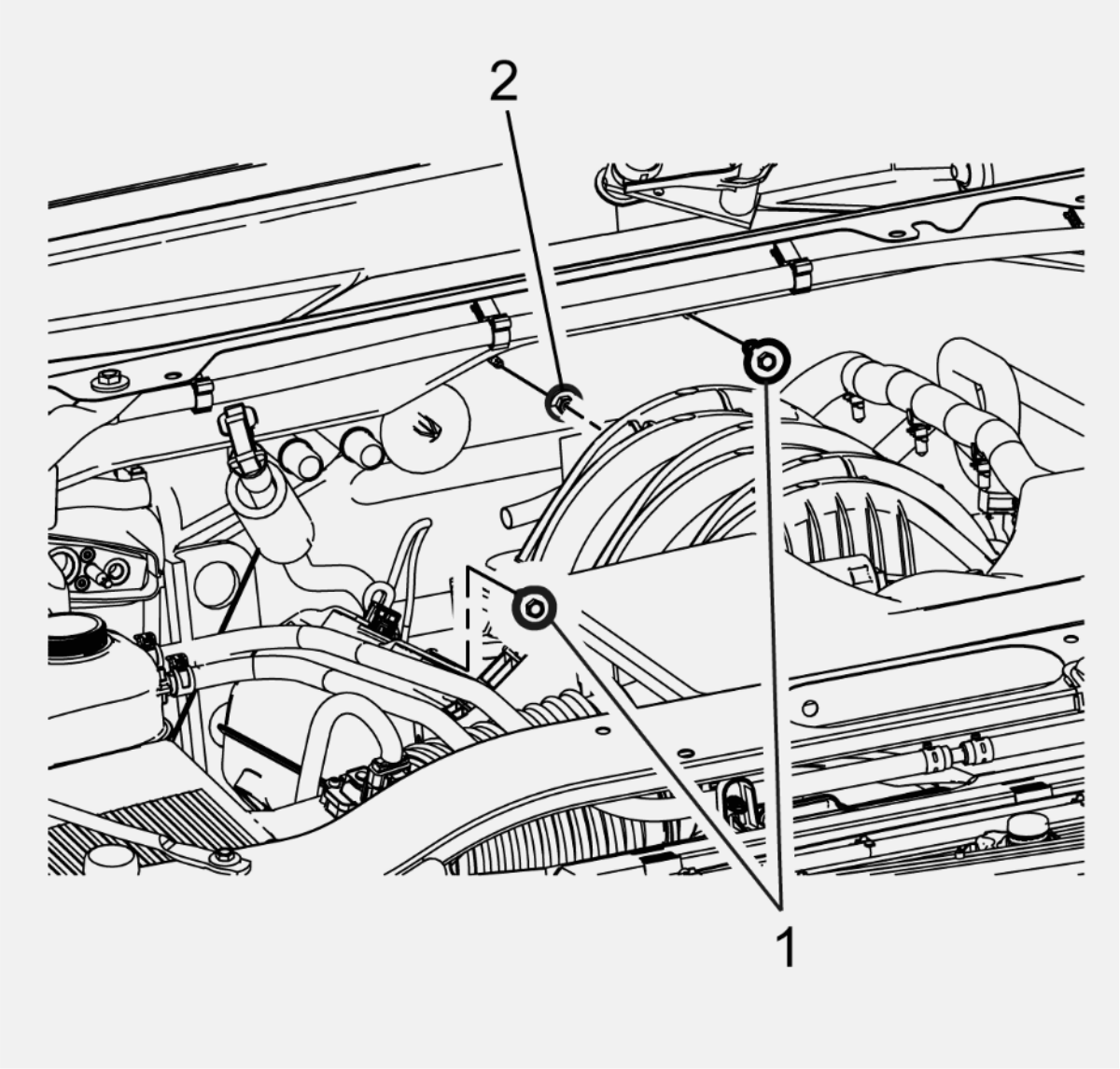


Fig. 177: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

18. 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.
19. 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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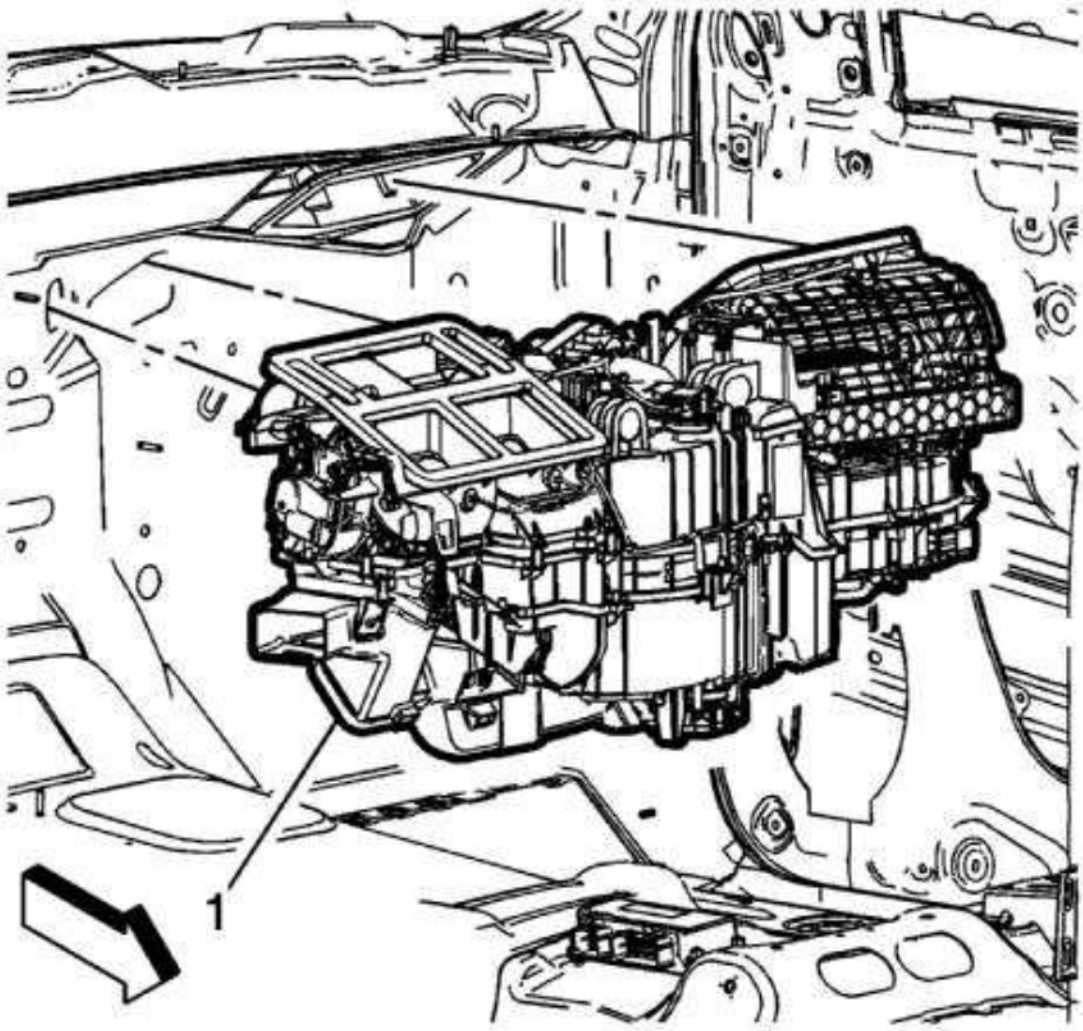


Fig. 178: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to HVAC Module Drain Tube Caution .

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

Installation Procedure

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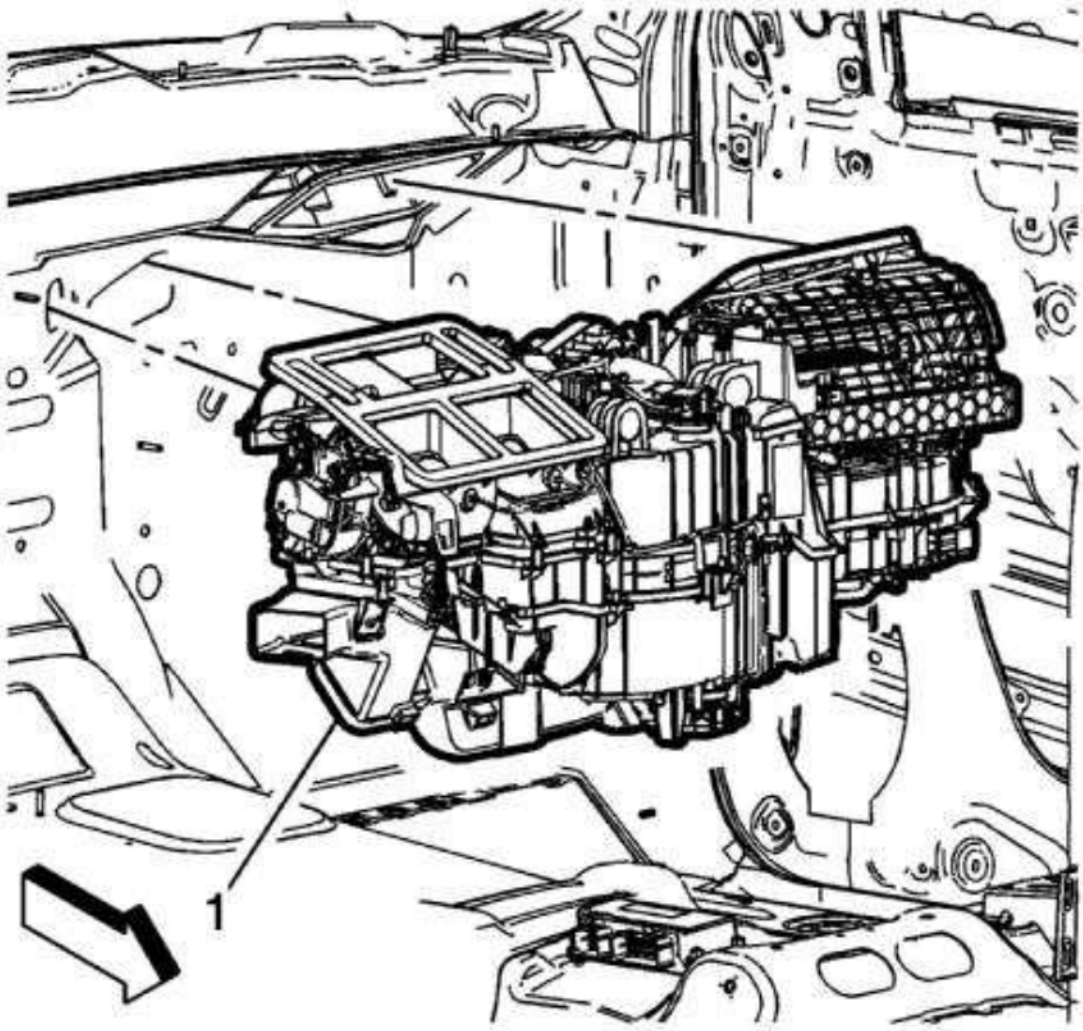


Fig. 179: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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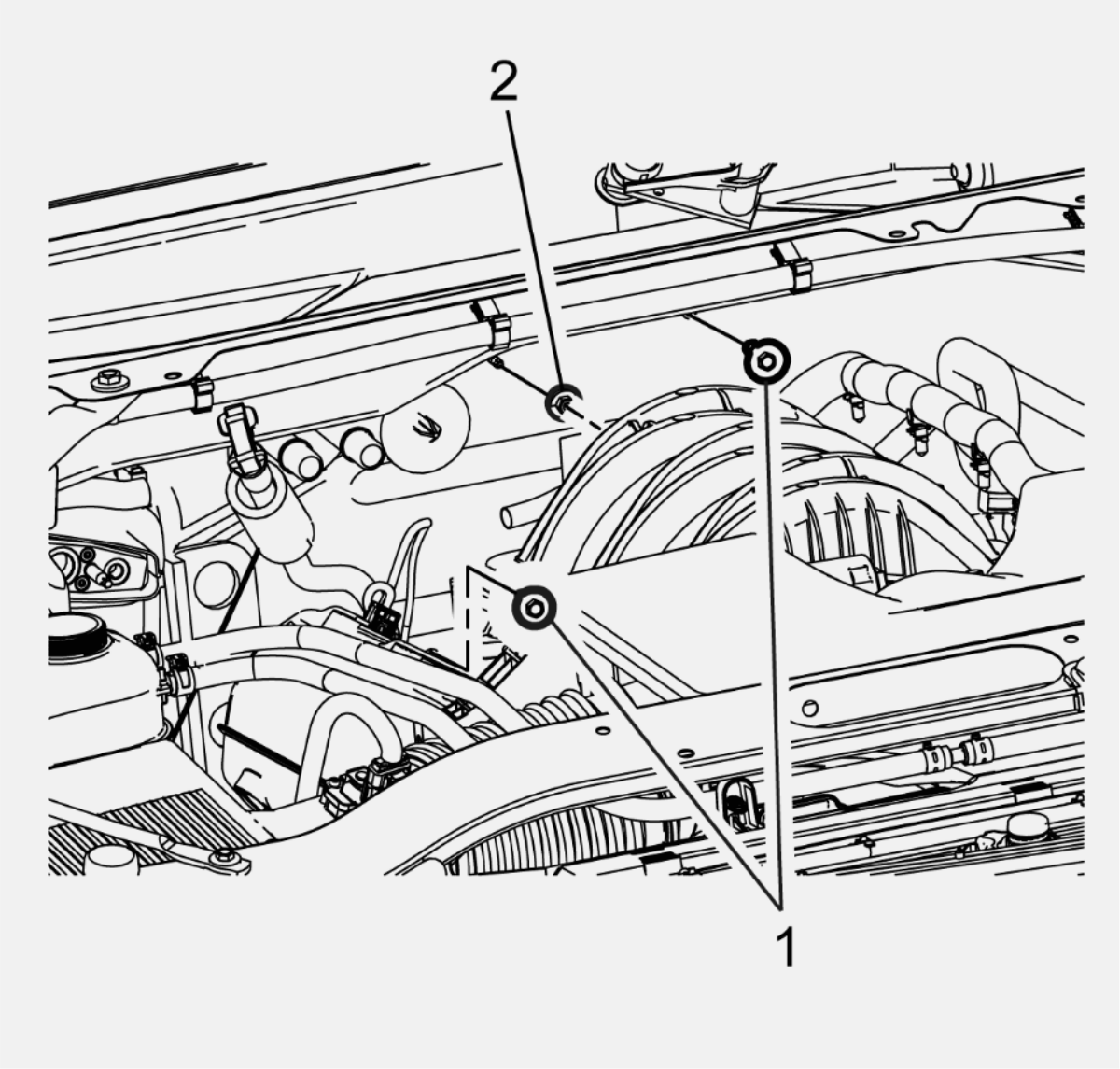


Fig. 180: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

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 HVAC module assembly to the cowl panel.

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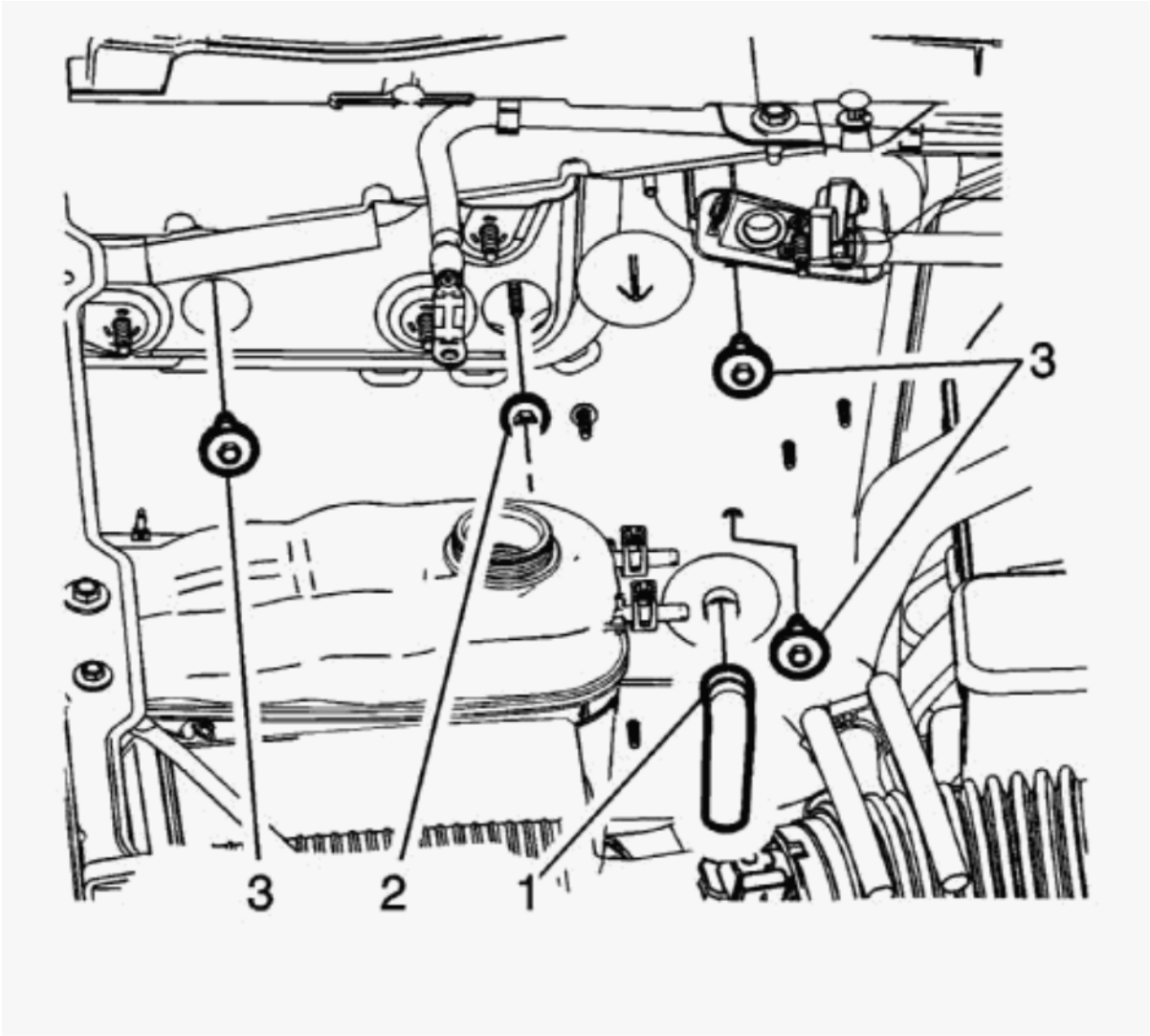


Fig. 181: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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.
7. Install the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
8. Install the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Install the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
10. Install the intake manifold. **Intake Manifold Replacement**
11. Install the air conditioning condenser hose to the thermal expansion valve. **Air Conditioning Condenser Hose Replacement (L83, L86)**
12. Install the air conditioning evaporator tube to the thermal expansion valve. **Air Conditioning Evaporator Tube Replacement (L83, L86)**
13. Install the heater outlet hose to the heater core tube. **Heater Outlet Hose Replacement (L83, L86)**
14. Install the heater inlet hose to the heater core tube. **Heater Inlet Hose Replacement (L83, L86)**

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15. Install the battery tray. **Battery Tray Replacement (Gas)**
16. Fill the engine coolant system. **Cooling System Draining and Filling (Vac N Fill L83 L86)** **Cooling System Draining and Filling (Static Fill L83 L86)**
17. Recharge the refrigerant system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
18. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
19. Install the drivers and passengers seats. **Driver or Passenger Seat Removal and Installation**
20. Visually inspect for coolant leaks.
21. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH LV3)

Removal Procedure

1. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
2. Recover the refrigerant system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the engine coolant system. **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)**
4. Remove the battery tray. **Battery Tray Replacement (Gas)**
5. Remove the heater inlet hose from the heater core tube. **Heater Inlet Hose Replacement (LV3)**
6. Remove the heater outlet hose from the heater core tube. **Heater Outlet Hose Replacement (LV3)**
7. Remove the air conditioning evaporator tube from the thermal expansion valve. **Air Conditioning Evaporator Tube Replacement (LV3)**
8. Remove the air conditioning condenser hose from the thermal expansion valve. **Air Conditioning Condenser Hose Replacement (LV3)**
9. Remove the Intake cover. **Intake Manifold Replacement**
10. Remove the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
11. Remove the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
12. Remove the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
13. Temporary support the heater and air conditioning evaporator and blower module assembly.

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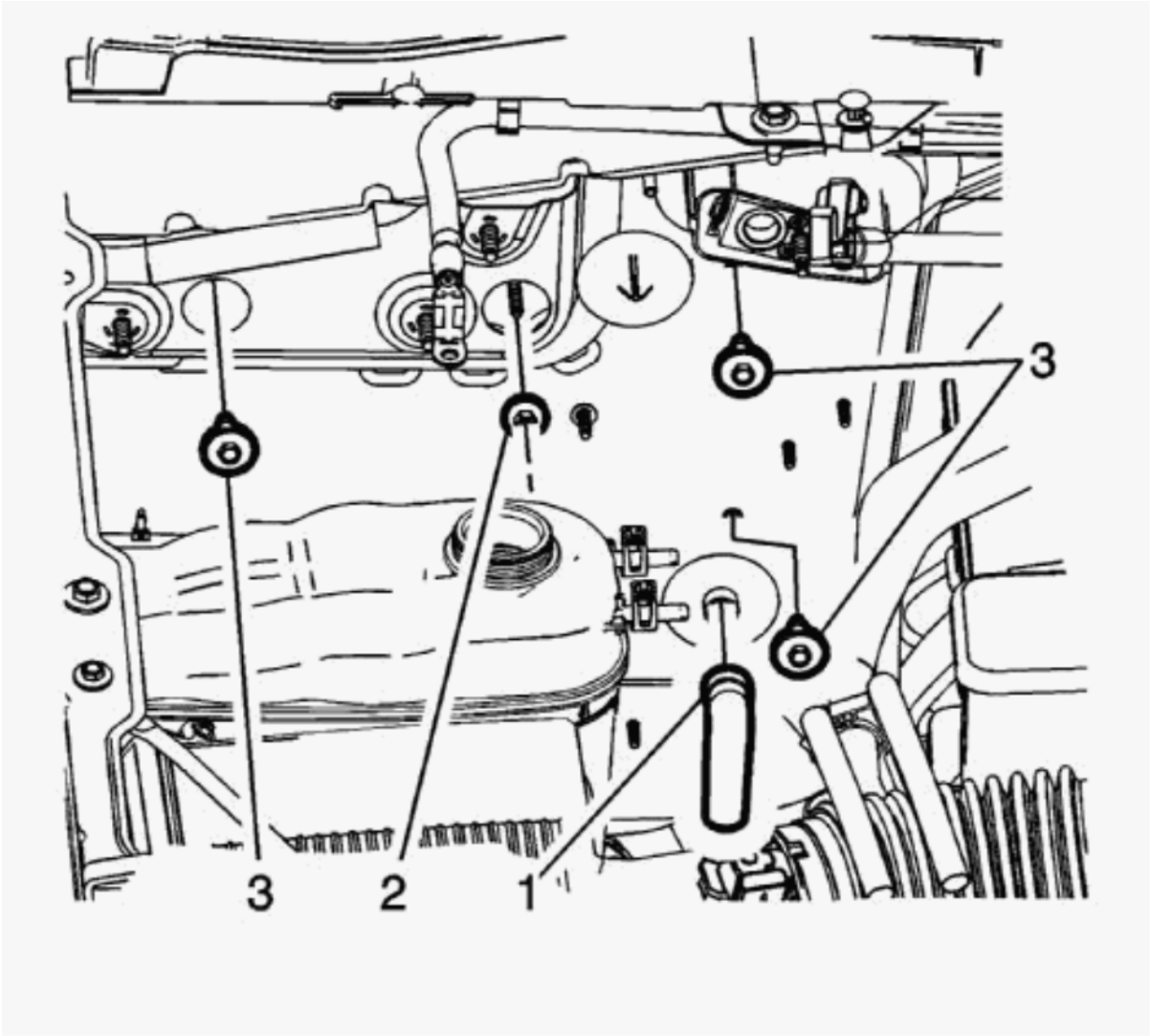


Fig. 182: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

14. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the heater and air conditioning evaporator and blower module assembly.
15. 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.
16. 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.

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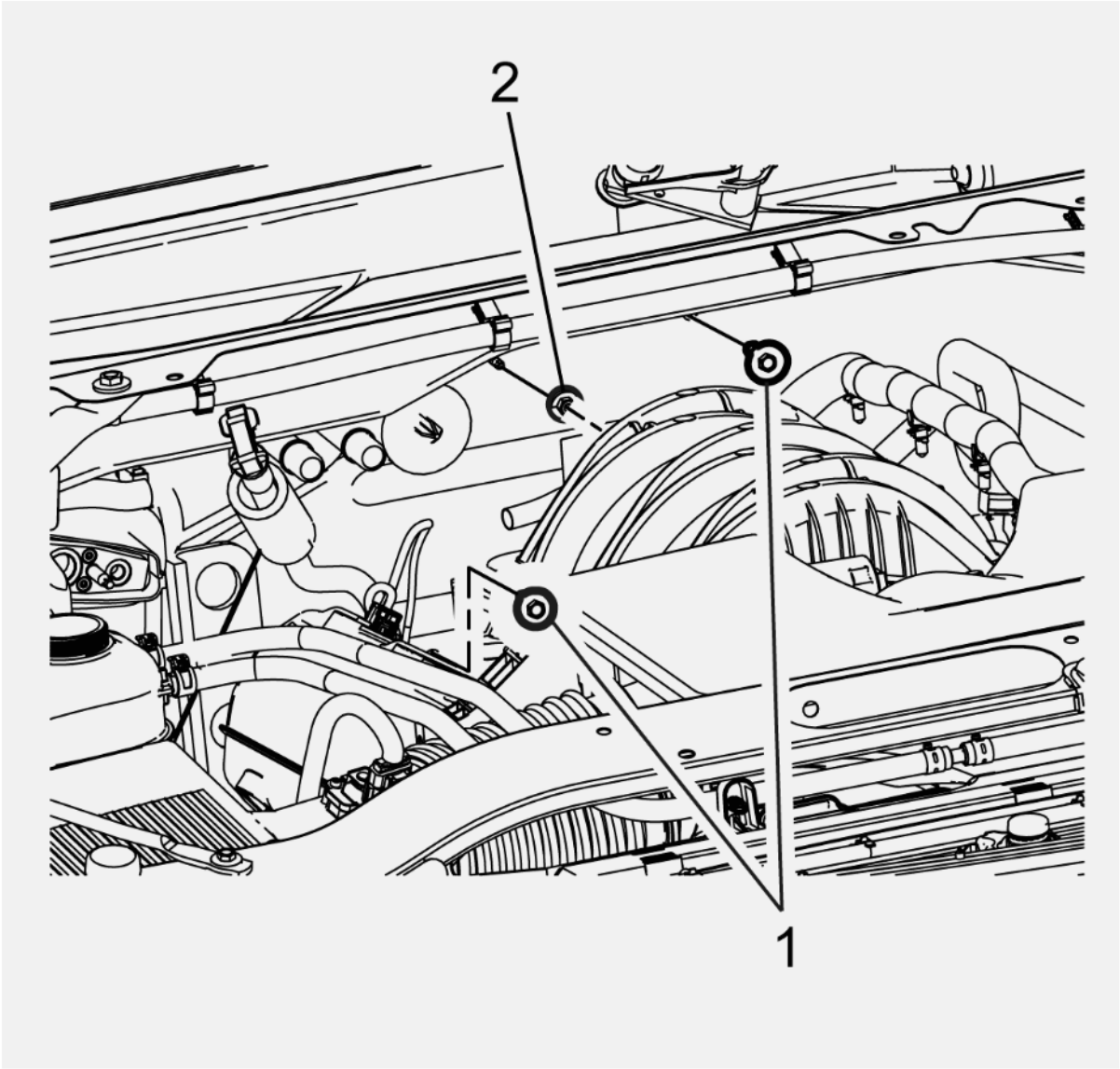


Fig. 183: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

17. 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.
18. 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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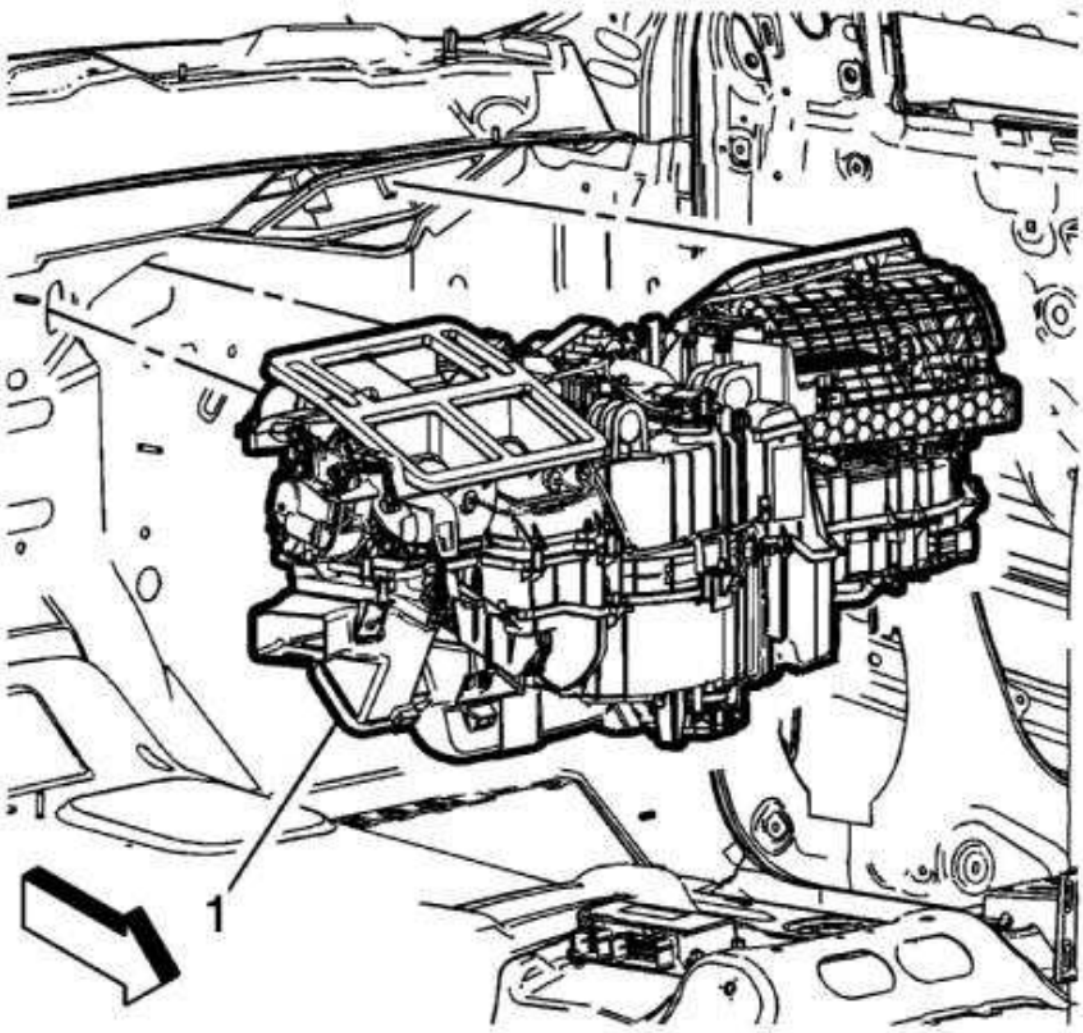


Fig. 184: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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

Installation Procedure

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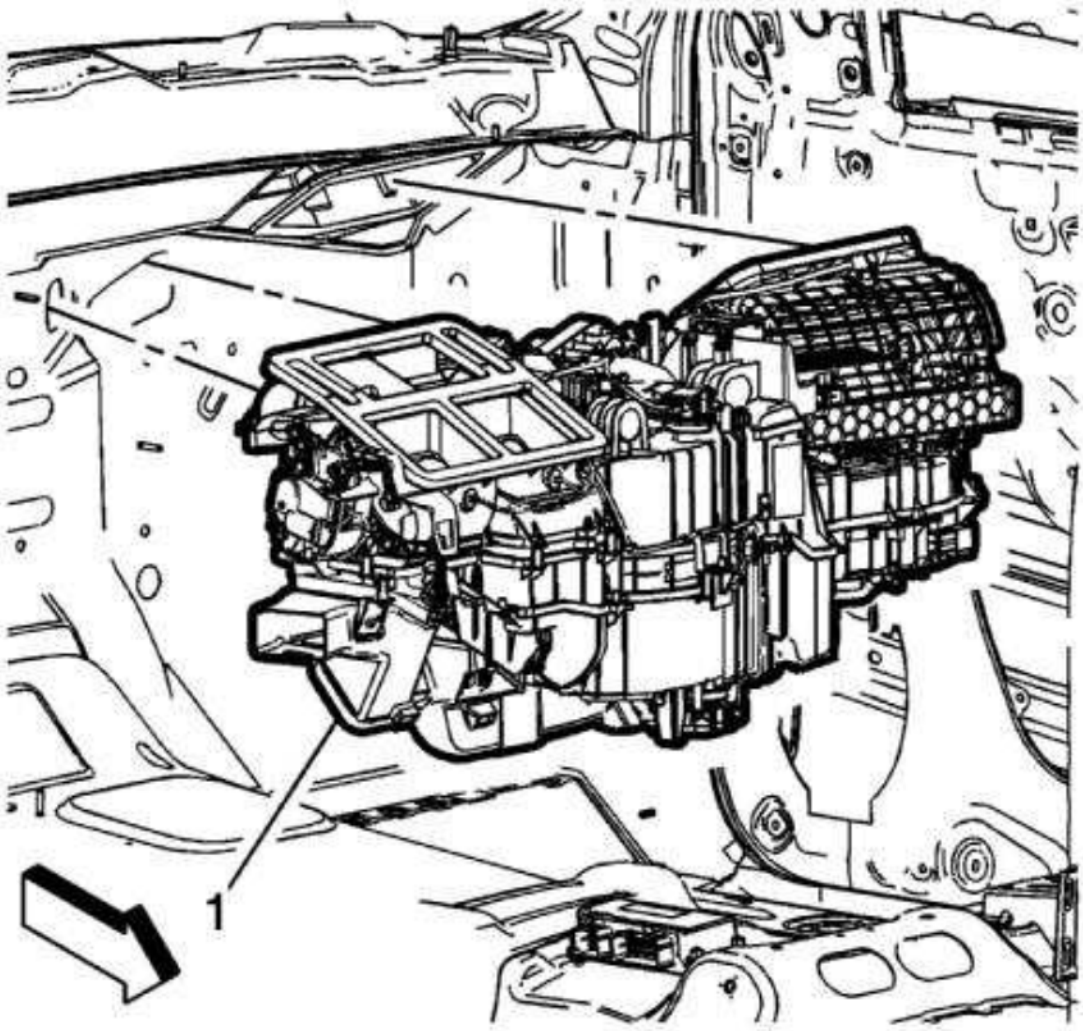


Fig. 185: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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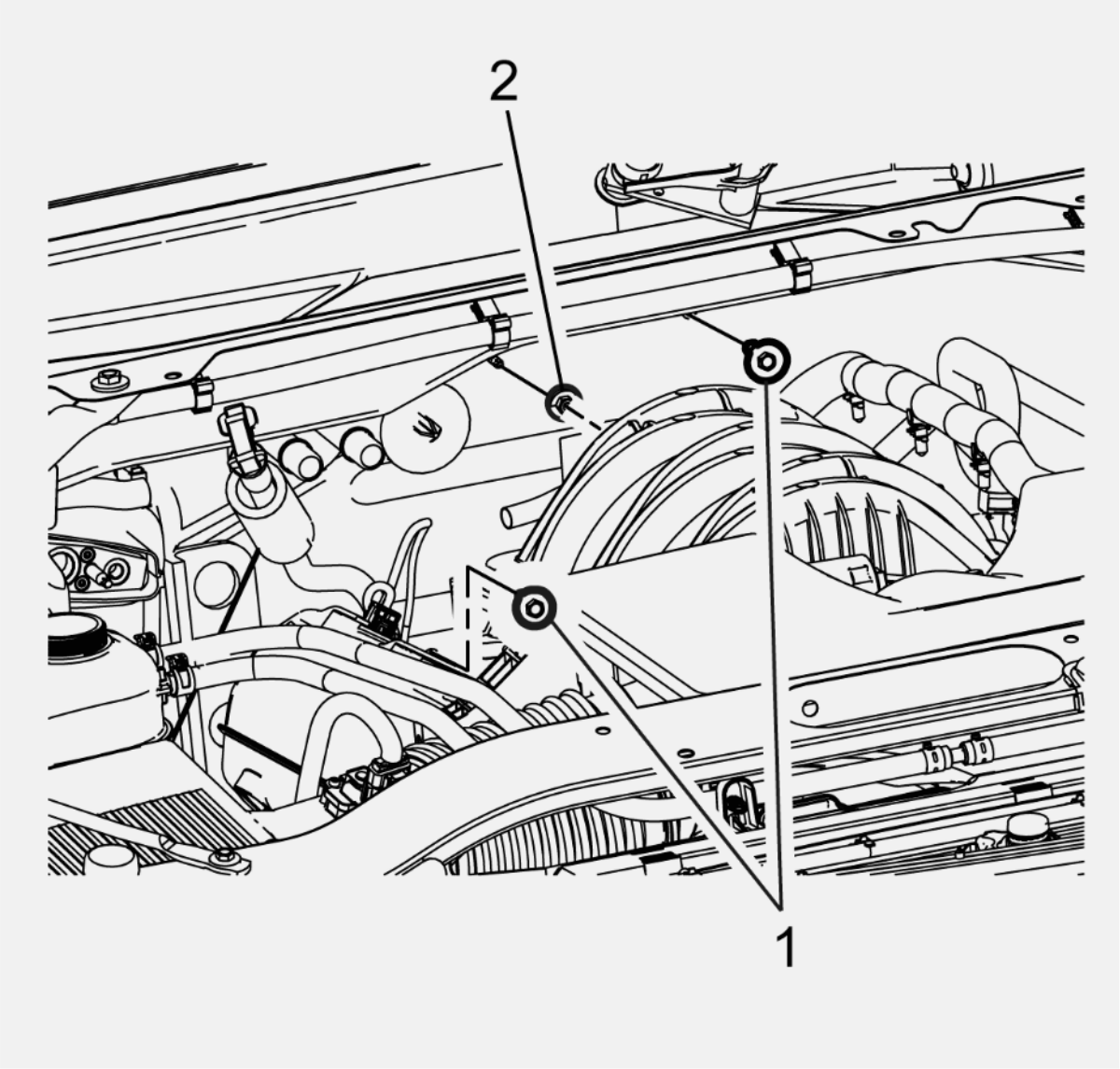


Fig. 186: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

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.

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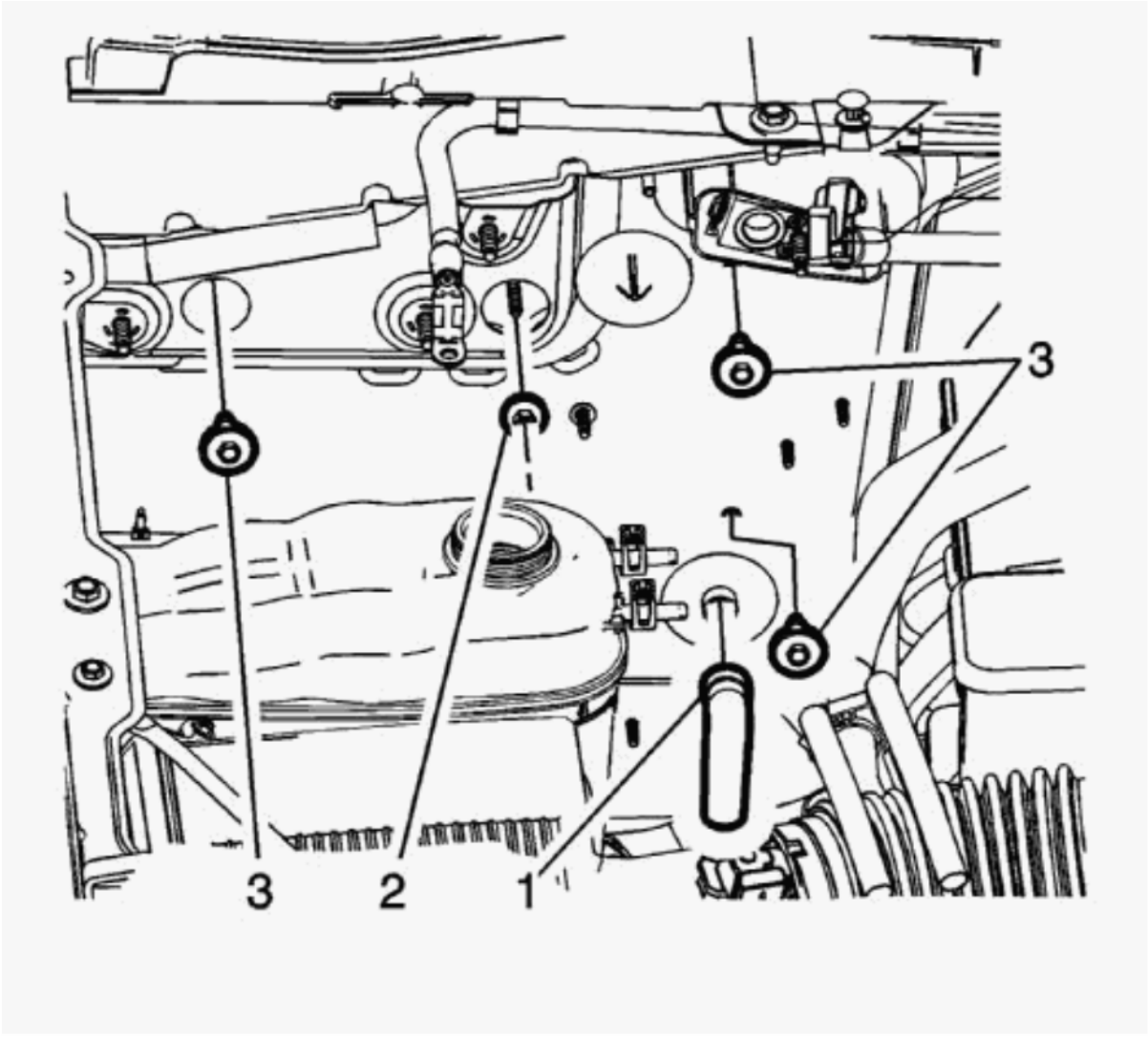


Fig. 187: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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.
7. Install the instrument panel tie bar assembly. **Instrument Panel Tie Bar Replacement**
8. Install the left side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Left Side**
9. Install the right side floor rear air outlet duct. **Floor Front Air Outlet Duct Replacement - Right Side**
10. Install the intake manifold. **Intake Manifold Replacement**
11. Install the air conditioning condenser hose to the thermal expansion valve. **Air Conditioning Condenser Hose Replacement (LV3)**
12. Install the air conditioning evaporator tube to the thermal expansion valve. **Air Conditioning Evaporator Tube Replacement (LV3)**
13. Install the heater outlet hose to the heater core tube. **Heater Outlet Hose Replacement (LV3)**
14. Install the heater inlet hose to the heater core tube. **Heater Inlet Hose Replacement (LV3)**

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15. Install the battery tray. **Battery Tray Replacement (Gas)**
16. Fill the engine coolant system. **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)**
17. Recharge the refrigerant system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
18. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
19. Visually inspect for coolant leaks.
20. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (L5P)

Removal Procedure

1. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
2. Drain the coolant. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**
3. Remove the battery. **Battery Replacement (Diesel)** .

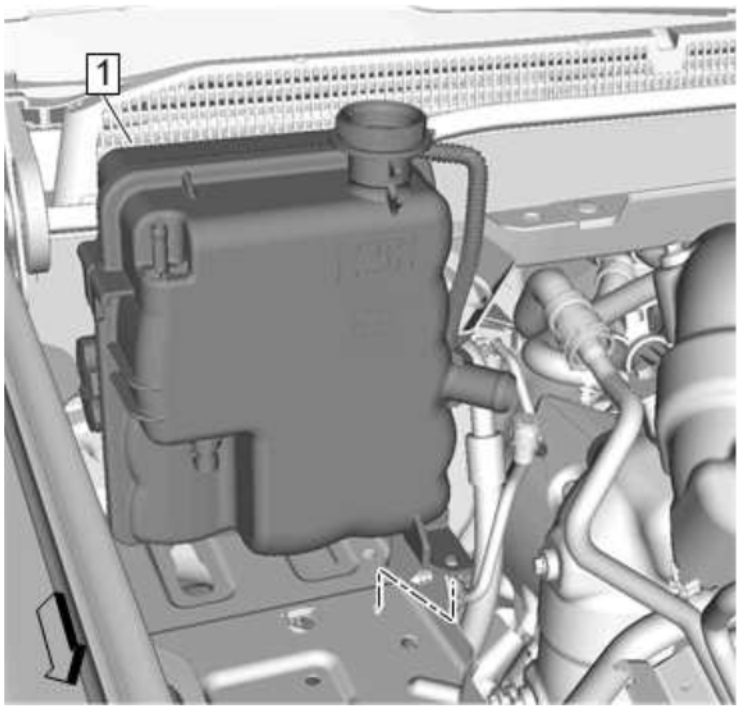


Fig. 188: Radiator Surge Tank
Courtesy of GENERAL MOTORS COMPANY

4. Remove the radiator surge tank.1 **Radiator Surge Tank Replacement (L5P)**

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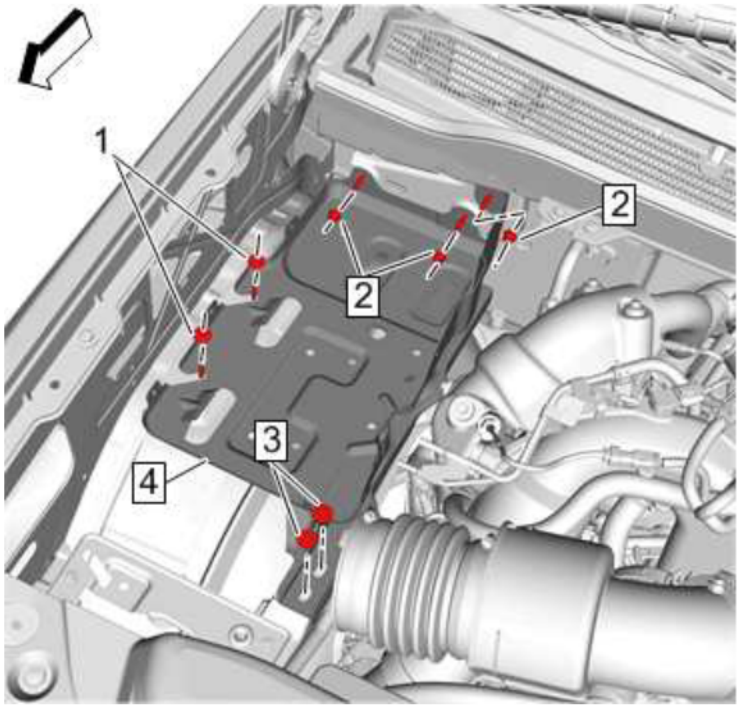


Fig. 189: Battery Tray
Courtesy of GENERAL MOTORS COMPANY

5. Remove the battery tray. 4 **Battery Tray Replacement (Diesel)**

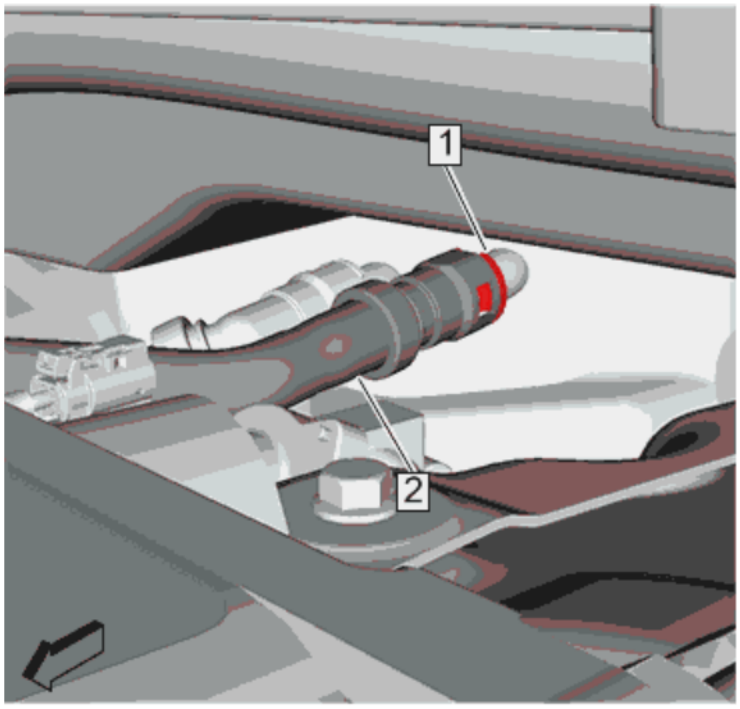


Fig. 190: Heater Inlet Hose/Tube
Courtesy of GENERAL MOTORS COMPANY

6. Heater Inlet Hose 2 @Heater Core Inlet Tube - Remove - **Heater Inlet Hose Replacement (L5P)**

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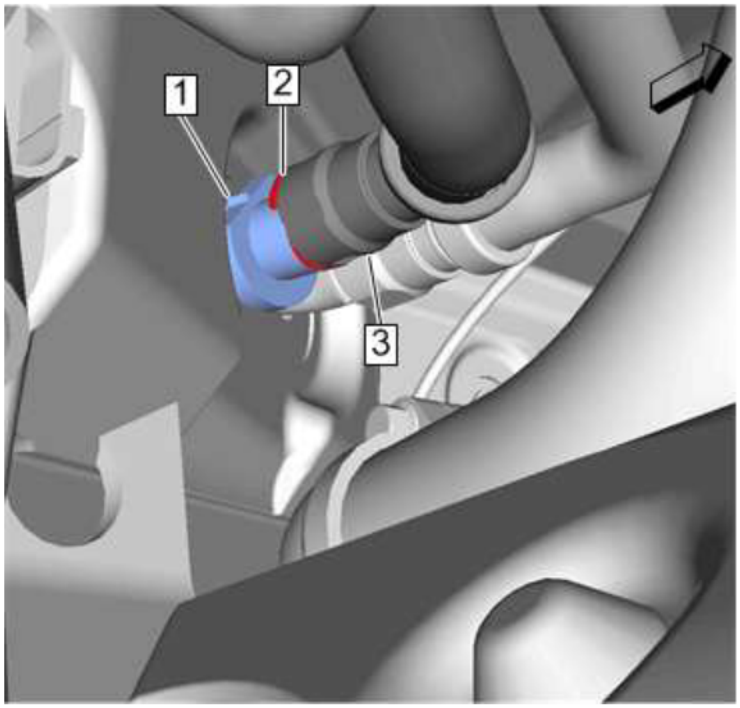


Fig. 191: Heater Outlet Hose And Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

7. Heater Outlet Hose 2 @Heater Core Outlet Tube - Remove - **Heater Outlet Hose Replacement (L5P)**

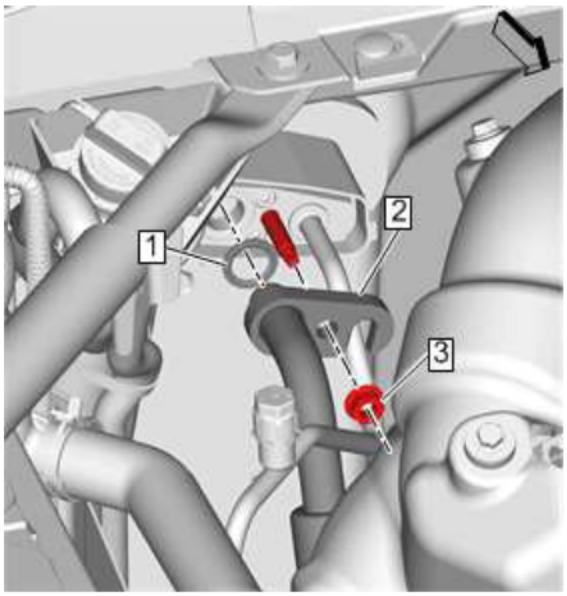


Fig. 192: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove - **Air Conditioning Compressor Hose Replacement (L5P)**

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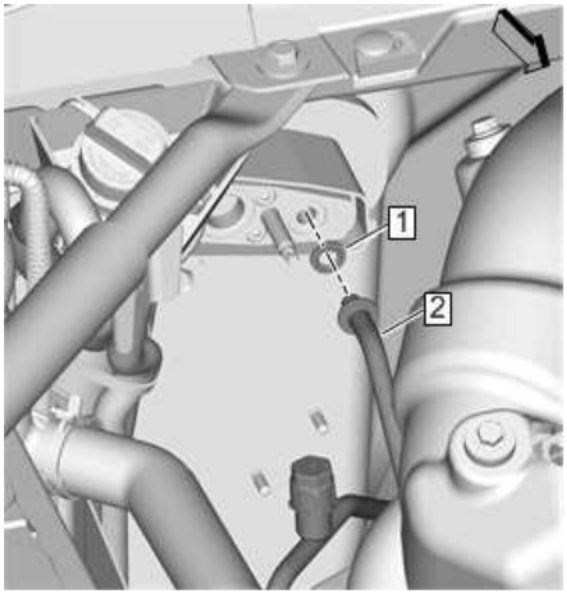


Fig. 193: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Evaporator Tube 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove - **Air Conditioning Evaporator Tube Replacement (L5P)**

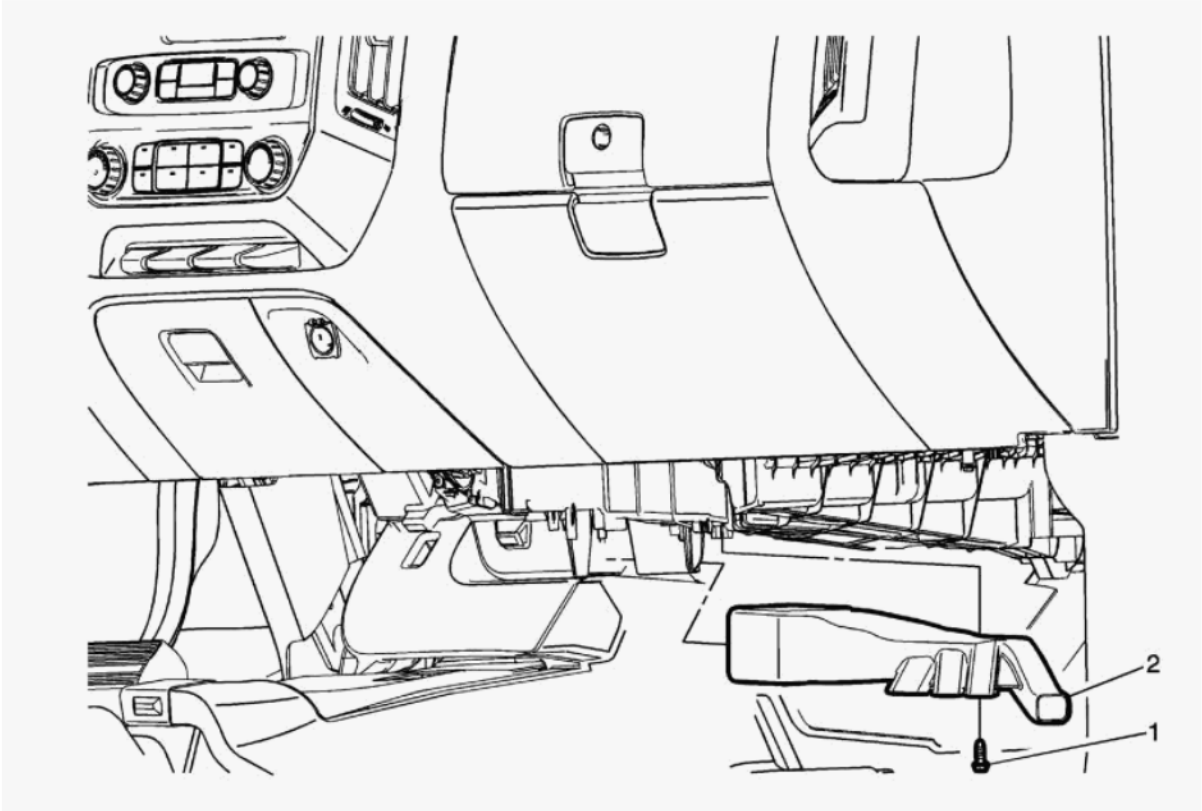


Fig. 194: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

10. Floor Front Air Outlet Duct - Right Side 2 - Remove - **Floor Front Air Outlet Duct Replacement - Right Side**

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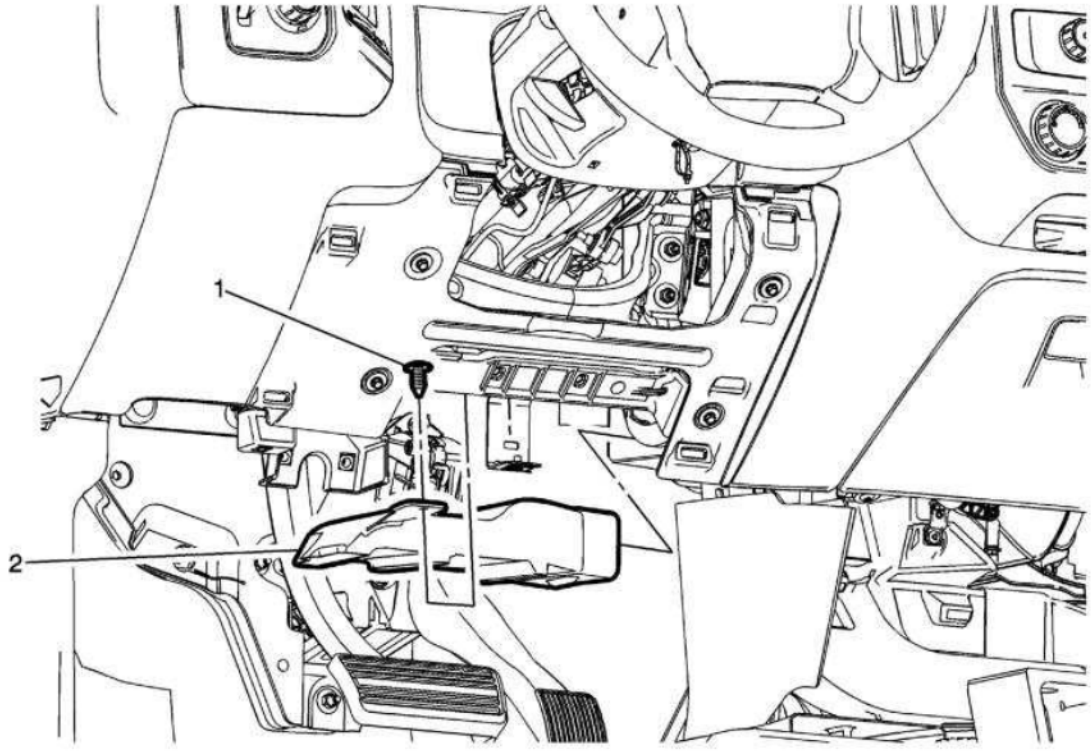
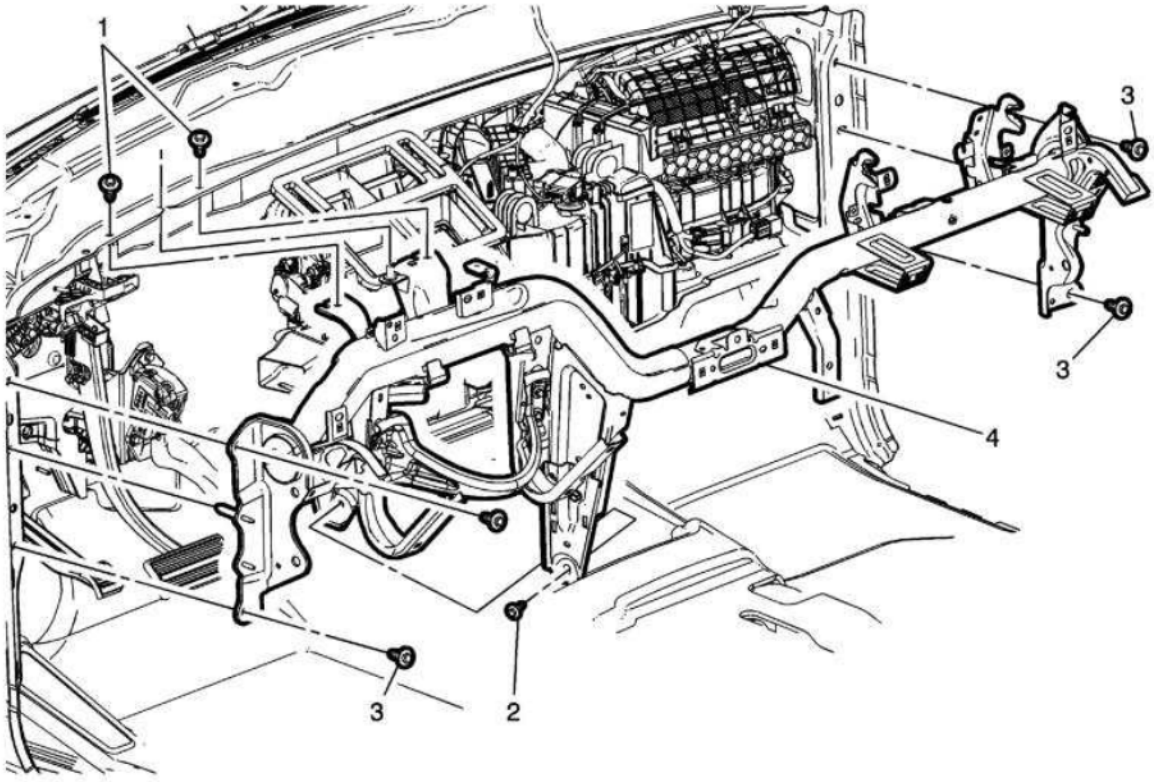


Fig. 195: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

11. Floor Front Air Outlet Duct - Left Side 2 - Remove - **Floor Front Air Outlet Duct Replacement - Left Side**



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Fig. 196: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

12. Instrument Panel Tie Bar 4 - Remove - **Instrument Panel Tie Bar Replacement**
13. Temporary support the heater and air conditioning evaporator and blower module assembly.

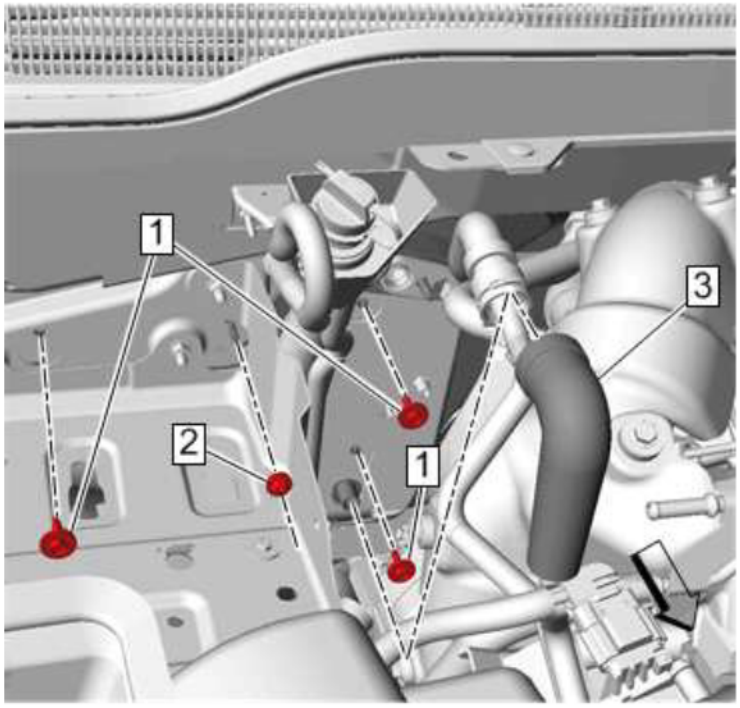


Fig. 197: Heater and Air Conditioning Evaporator, Blower Module Bolt And Cowl Panel
Courtesy of GENERAL MOTORS COMPANY

14. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Remove
15. Heater and Air Conditioning Evaporator and Blower Module Nut 2 @Cowl Panel - Remove
16. Air Conditioning Evaporator and Blower Module Drain Lower Hose 3 - Remove

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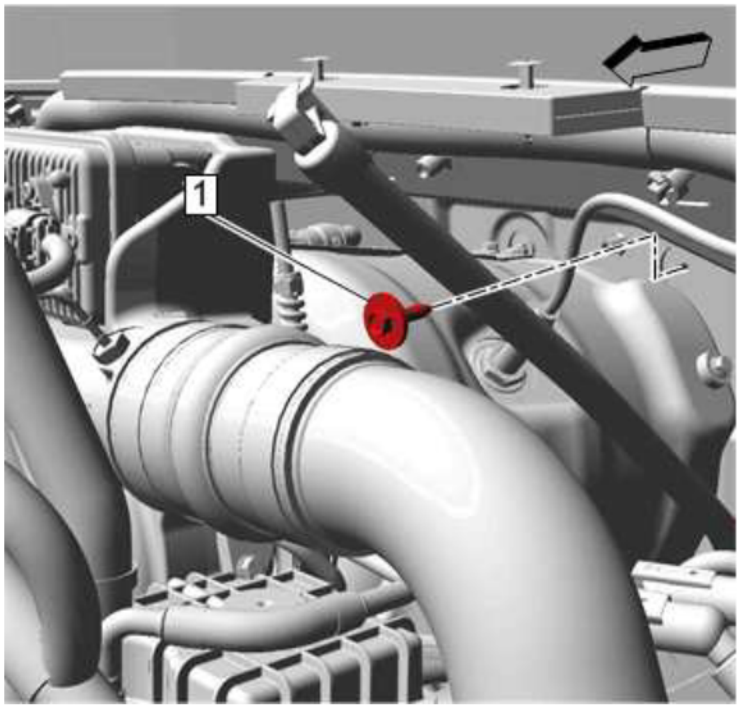


Fig. 198: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

17. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Remove

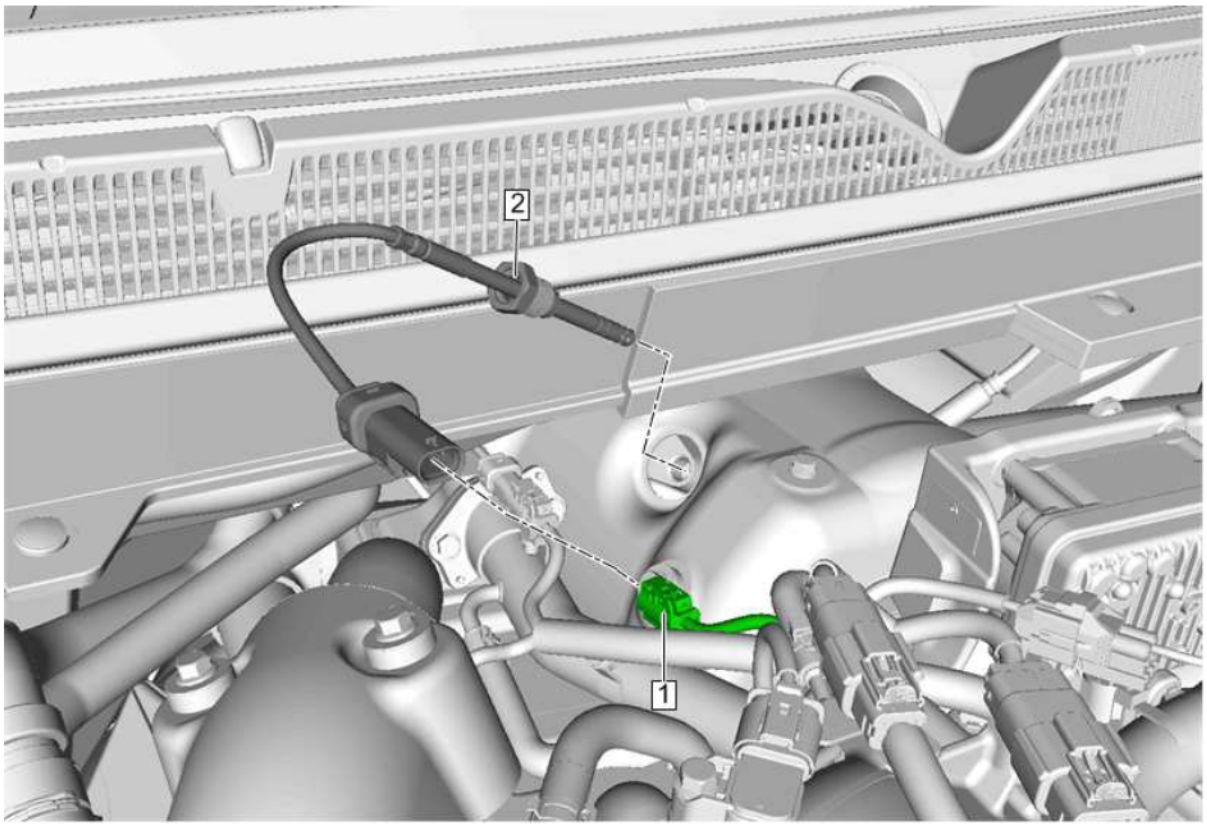


Fig. 199: Exhaust Temperature Sensor - Position 1
Courtesy of GENERAL MOTORS COMPANY

18. Exhaust Temperature Sensor - Position 1 (2) - Remove - **Exhaust Temperature Sensor Replacement -**

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Position 1

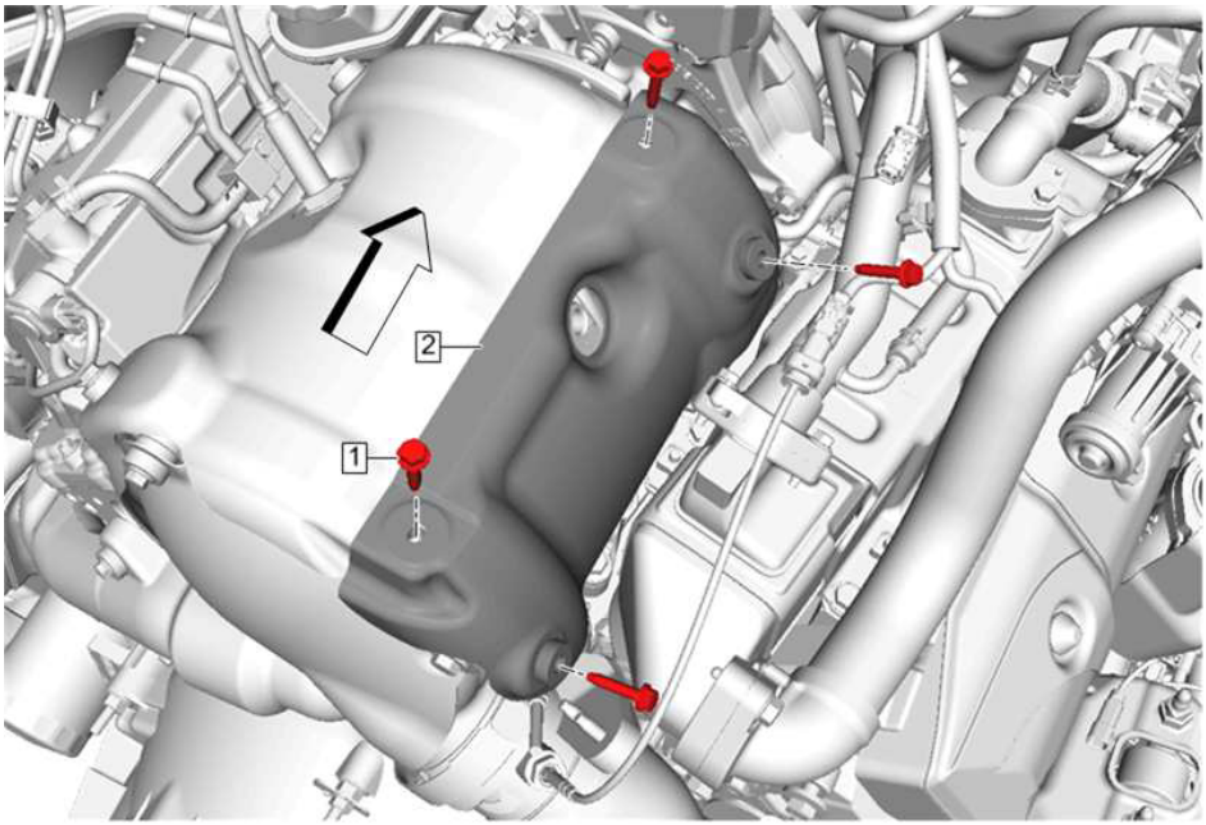


Fig. 200: Turbocharger Heat Shield - Right Side
Courtesy of GENERAL MOTORS COMPANY

19. Turbocharger Heat Shield - Right Side 3 - Remove - **Turbocharger Heat Shield Replacement - Right Side (L5P)**

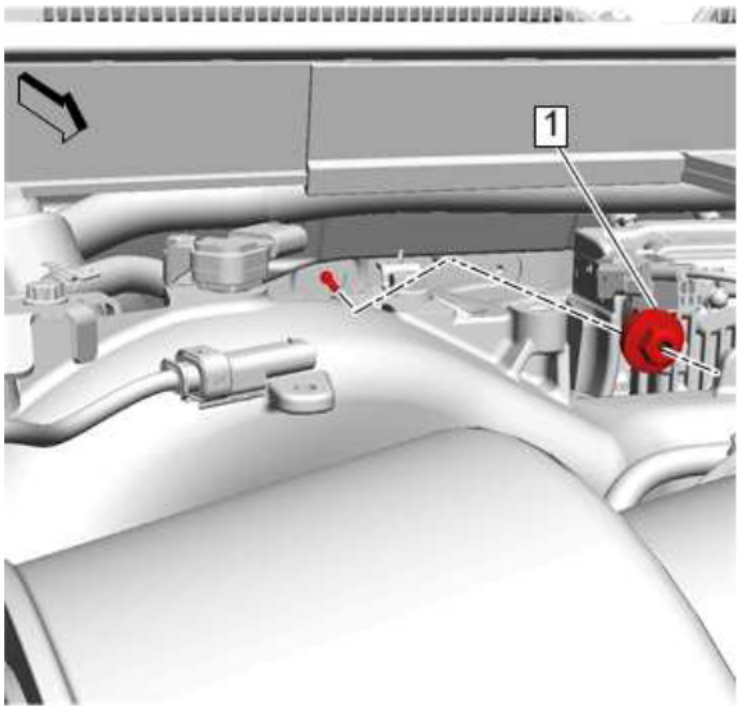


Fig. 201: Blower Module Nut

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Courtesy of GENERAL MOTORS COMPANY

20. Heater and Air Conditioning Evaporator and Blower Module Nut 1 @Cowl Panel - Remove

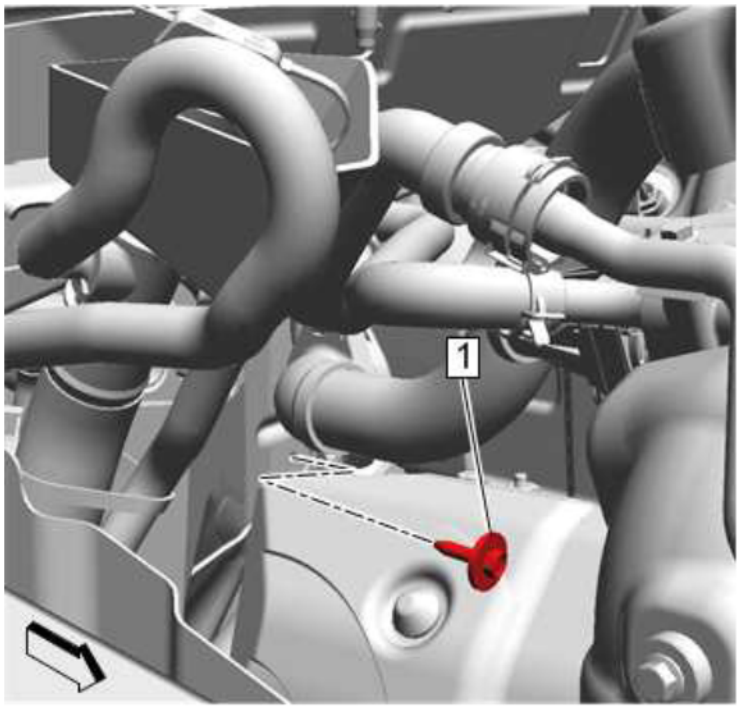


Fig. 202: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

21. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Remove

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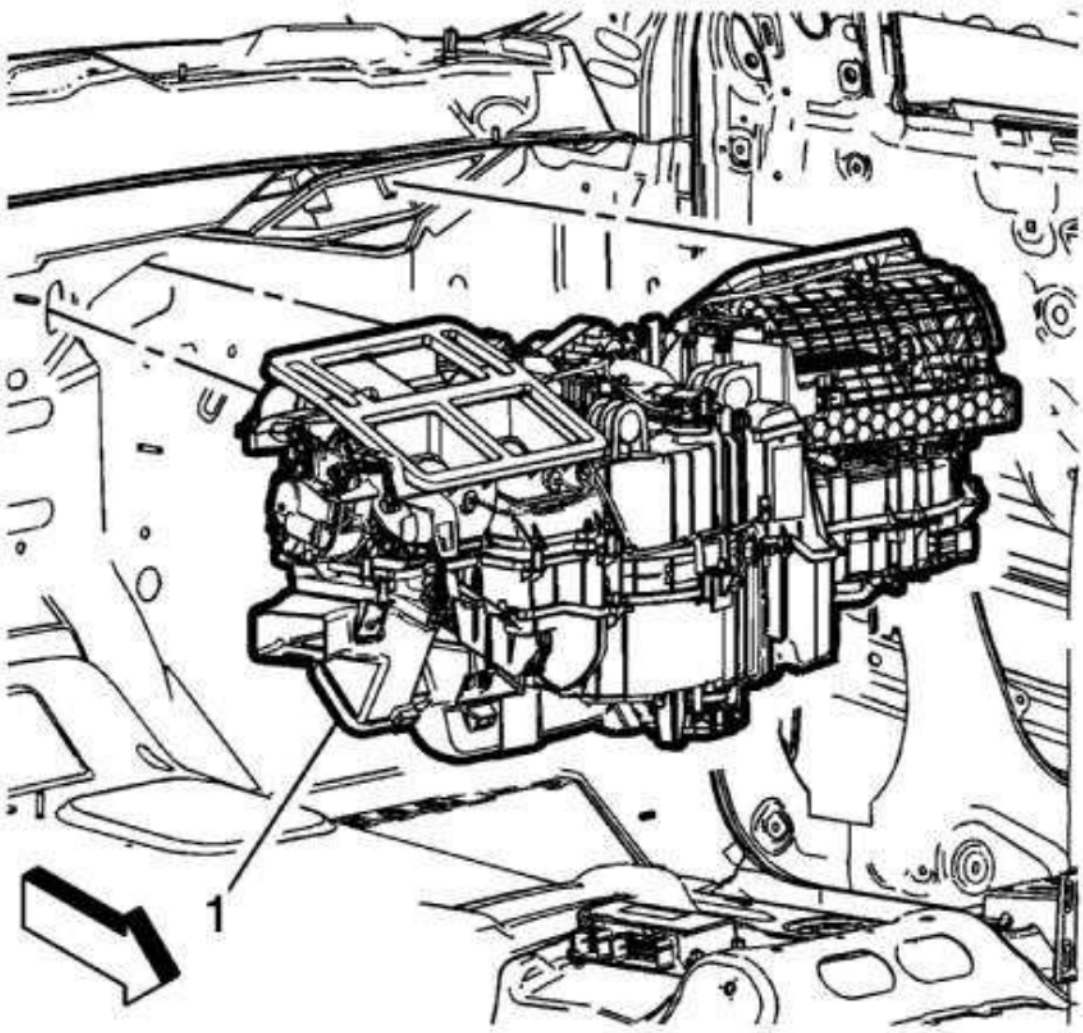


Fig. 203: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

22. Prior to removing the heater and air conditioning evaporator and blower module or heater and air conditioning evaporator and blower module drain tube/hose, use clean and absorbent shop clothes/towels to cover the electrical components protecting the electrical components from water damage.
23. Heater and Air Conditioning Evaporator and Blower Module 1 - Remove
24. Transfer components as necessary.

Installation Procedure

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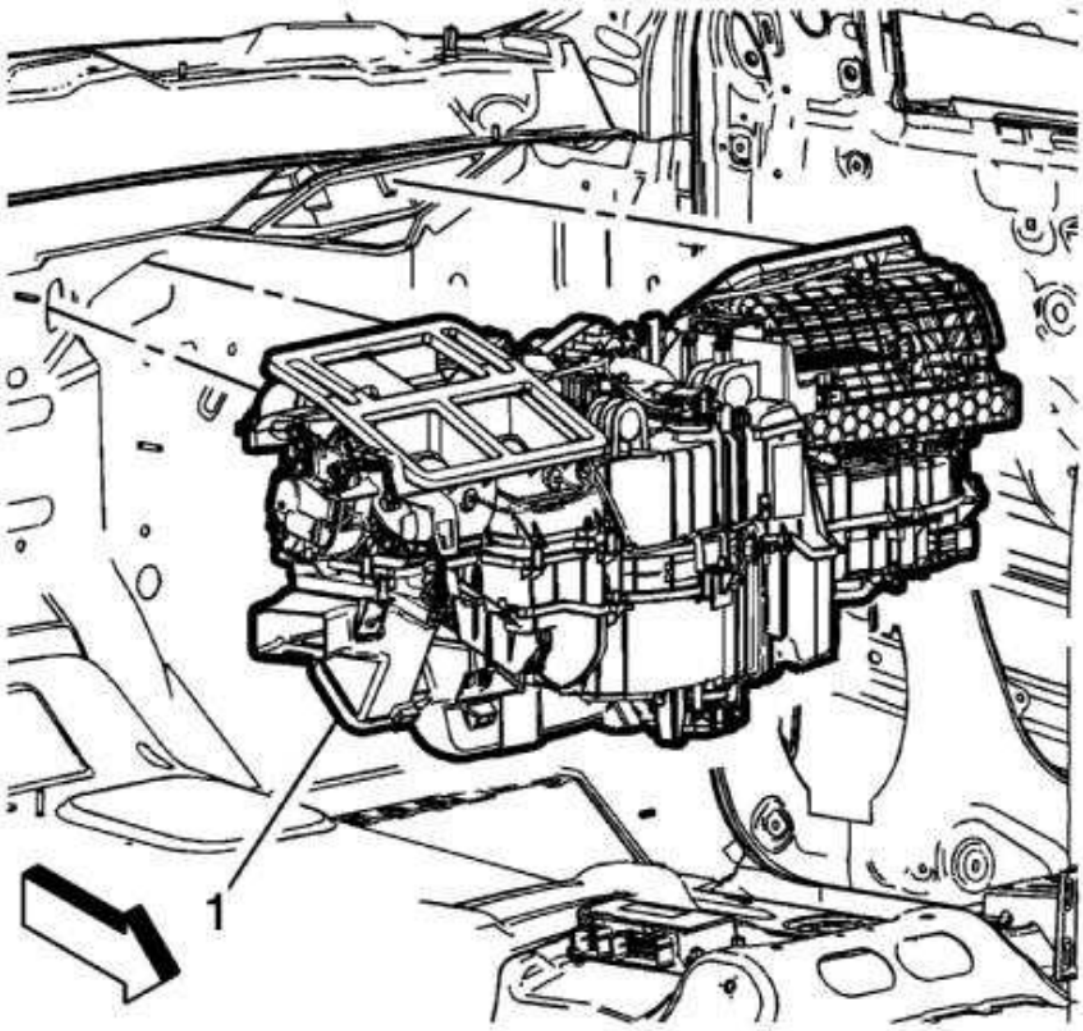


Fig. 204: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

1. Position the HVAC module assembly (1) into the vehicle and temporarily support it.
2. Remove the absorbent shop clothes or towels from the vehicle.

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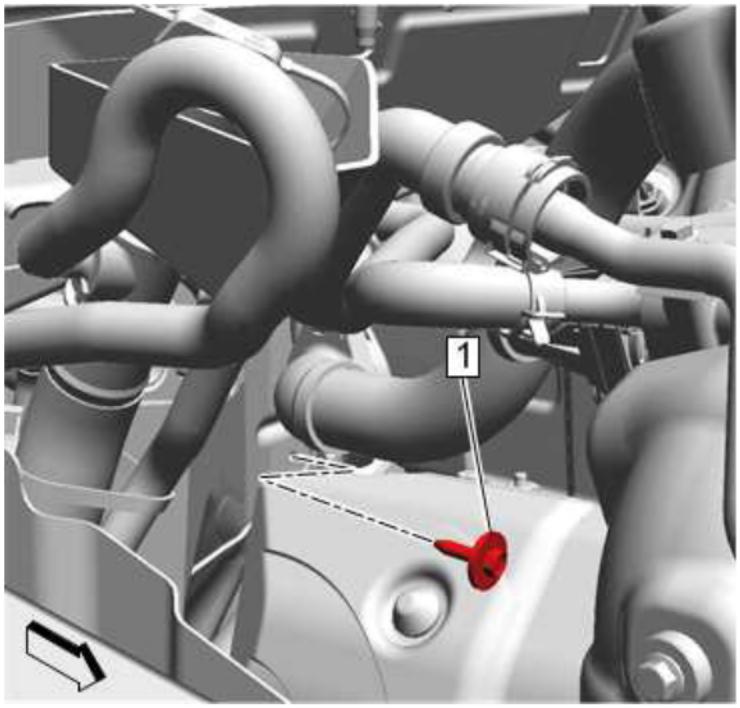


Fig. 205: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Install and tighten 5 N.m (44 lb in)

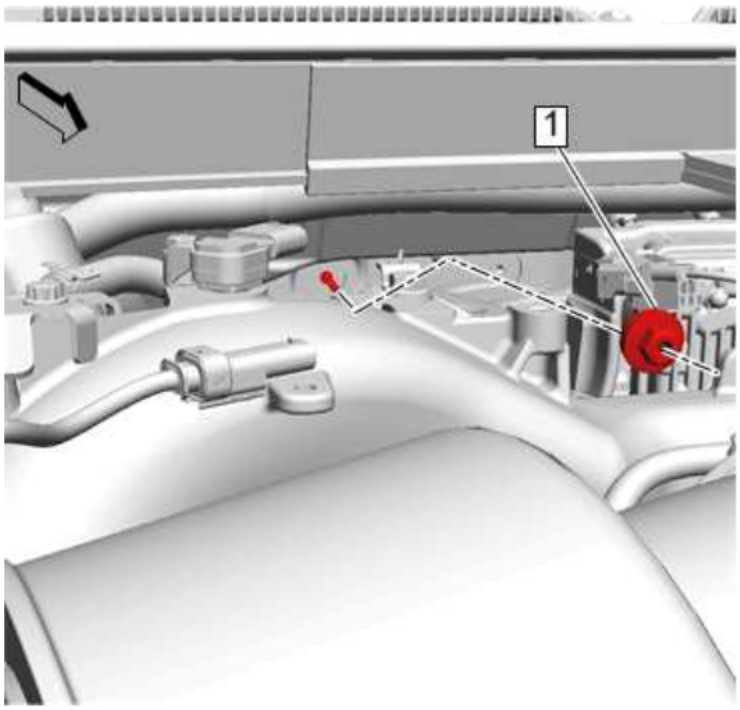


Fig. 206: Blower Module Nut
Courtesy of GENERAL MOTORS COMPANY

4. Heater and Air Conditioning Evaporator and Blower Module Nut 1 @Cowl Panel - Install and tighten 9

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N.m (80 lb in)

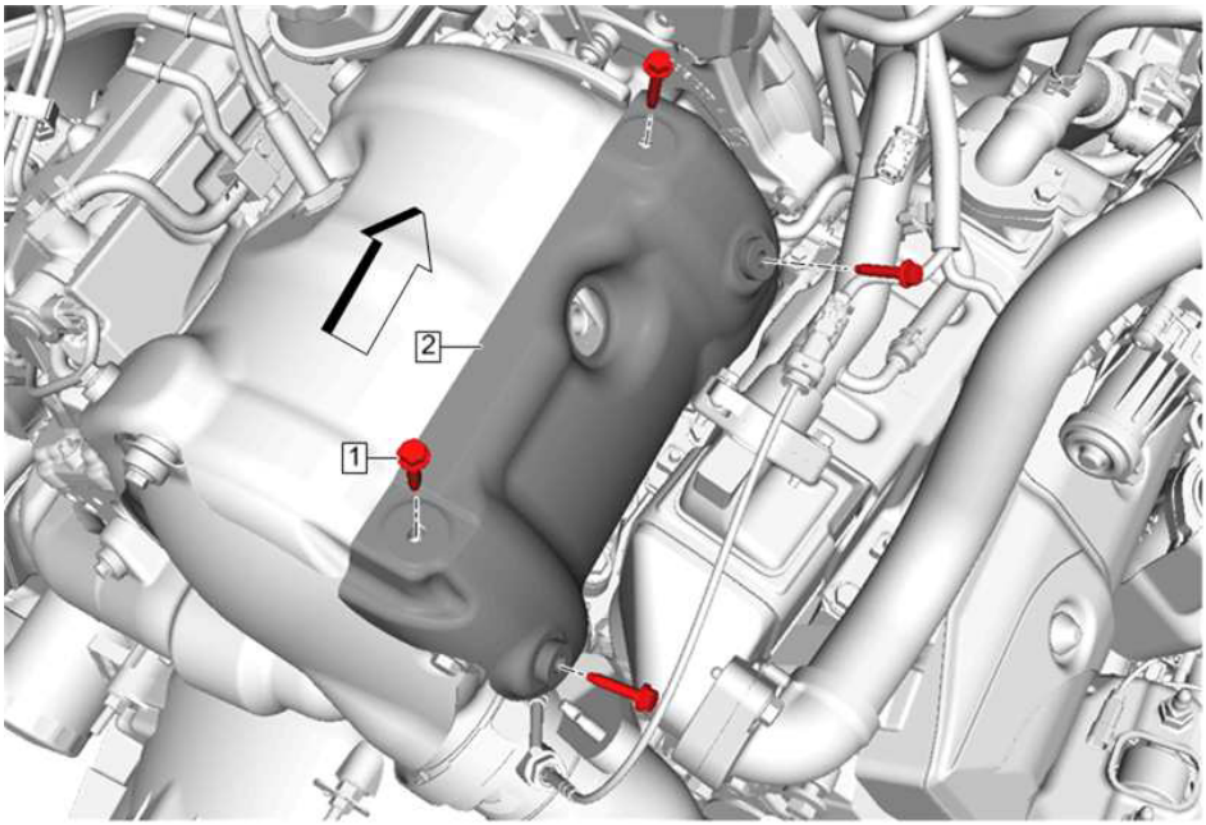


Fig. 207: Turbocharger Heat Shield - Right Side
Courtesy of GENERAL MOTORS COMPANY

5. Turbocharger Heat Shield - Right Side 3 - Install - **Turbocharger Heat Shield Replacement - Right Side (L5P)**

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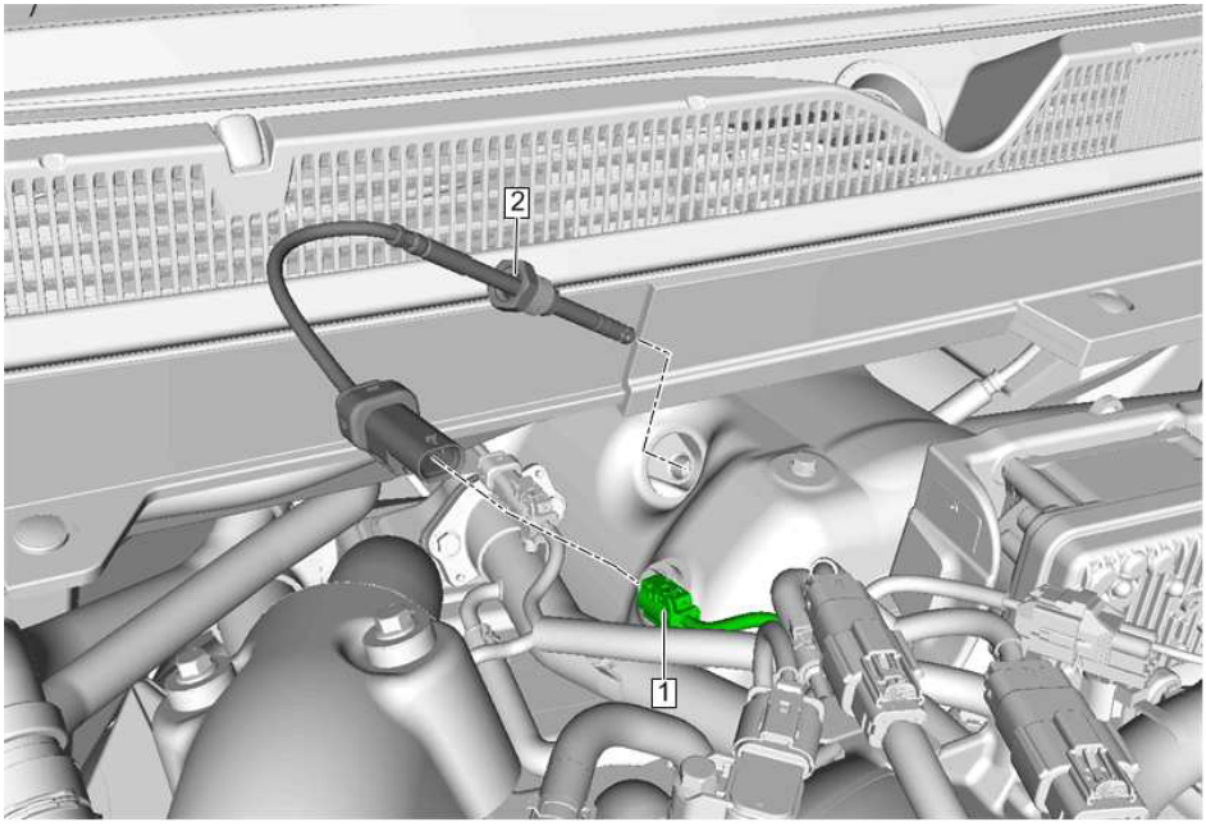


Fig. 208: Exhaust Temperature Sensor - Position 1
Courtesy of GENERAL MOTORS COMPANY

6. Exhaust Temperature Sensor - Position 1 (2) - Install - **Exhaust Temperature Sensor Replacement - Position 1**

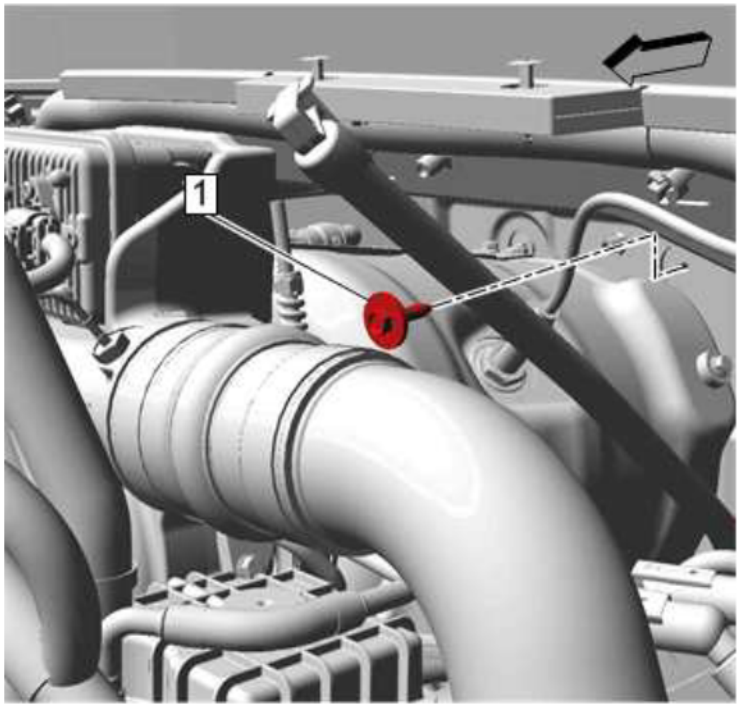


Fig. 209: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

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7. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Install and tighten 5 N.m (44 lb in)

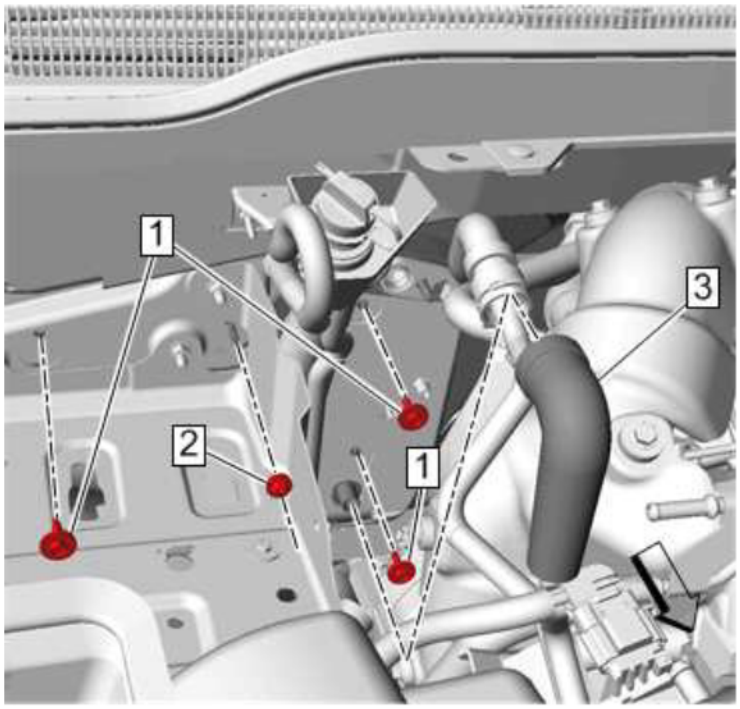


Fig. 210: Blower Module Nut
Courtesy of GENERAL MOTORS COMPANY

8. Heater and Air Conditioning Evaporator and Blower Module Nut 2 @Cowl Panel - Install and tighten 9 N.m (80 lb in)
9. Heater and Air Conditioning Evaporator and Blower Module Bolt 1 @Cowl Panel - Install and tighten 5 N.m (44 lb in)
10. Air Conditioning Evaporator and Blower Module Drain Lower Hose 3 - Install

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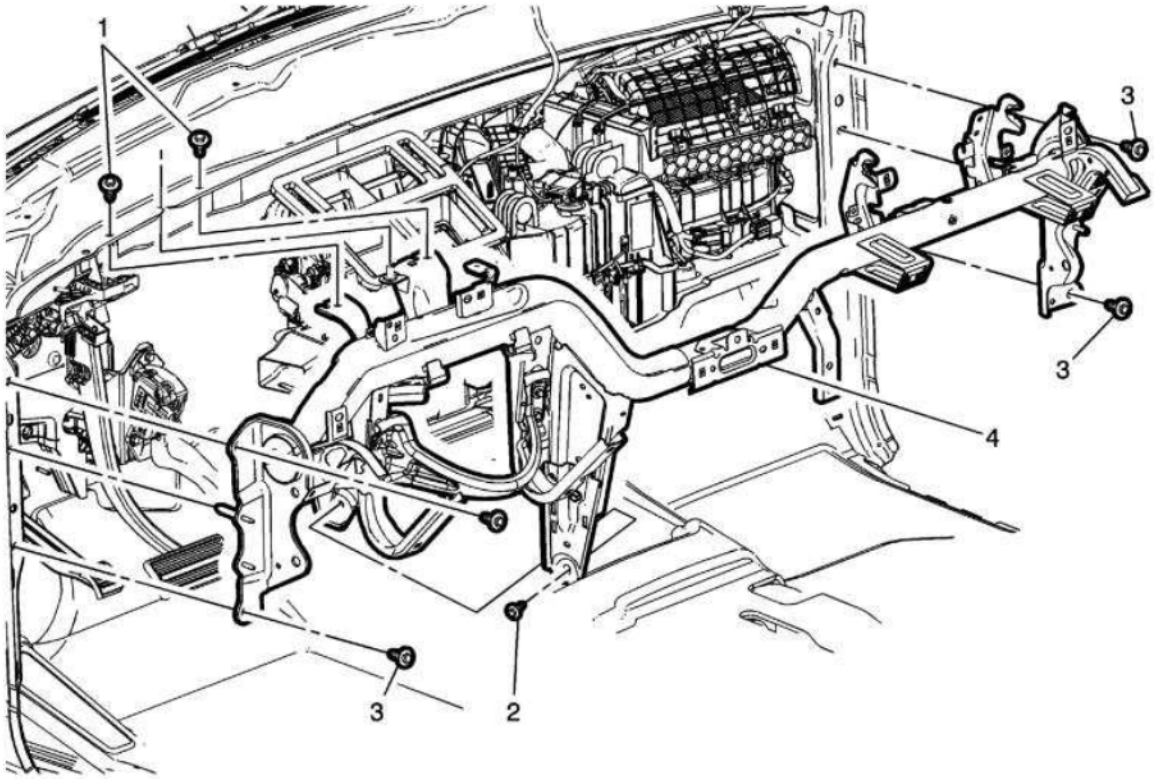


Fig. 211: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

11. Instrument Panel Tie Bar 4 - Install - **Instrument Panel Tie Bar Replacement**

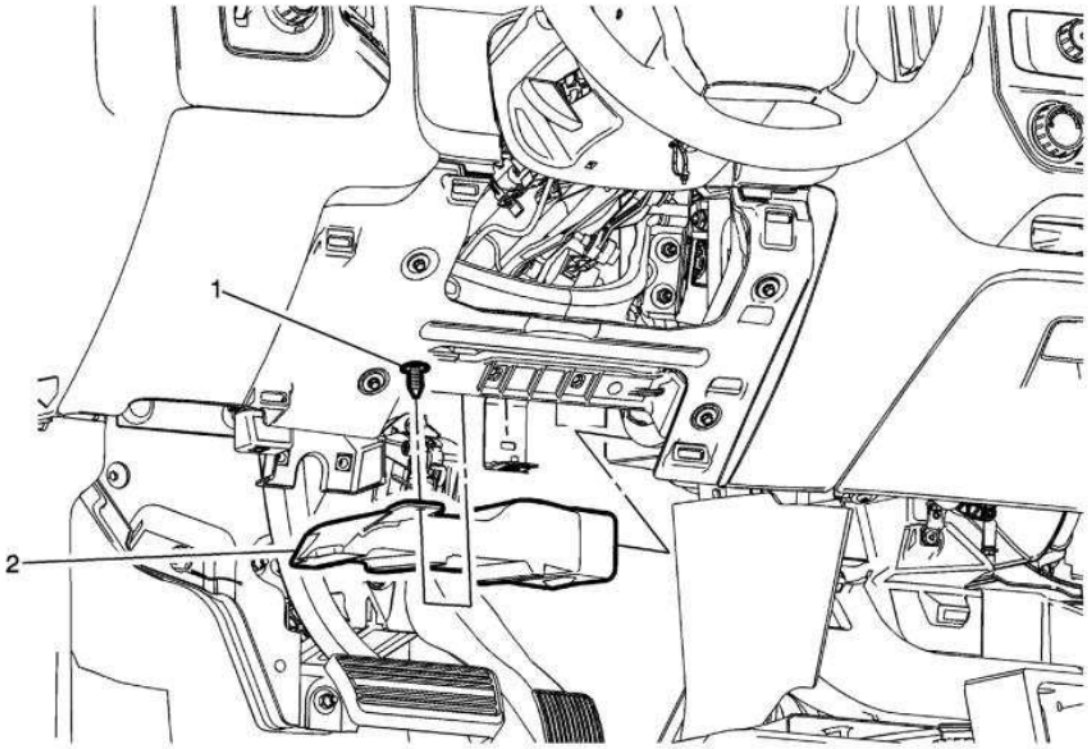


Fig. 212: Floor Front Air Outlet Duct - Left Side

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Courtesy of GENERAL MOTORS COMPANY

12. Floor Front Air Outlet Duct - Left Side 2 - Install - **Floor Front Air Outlet Duct Replacement - Left Side**

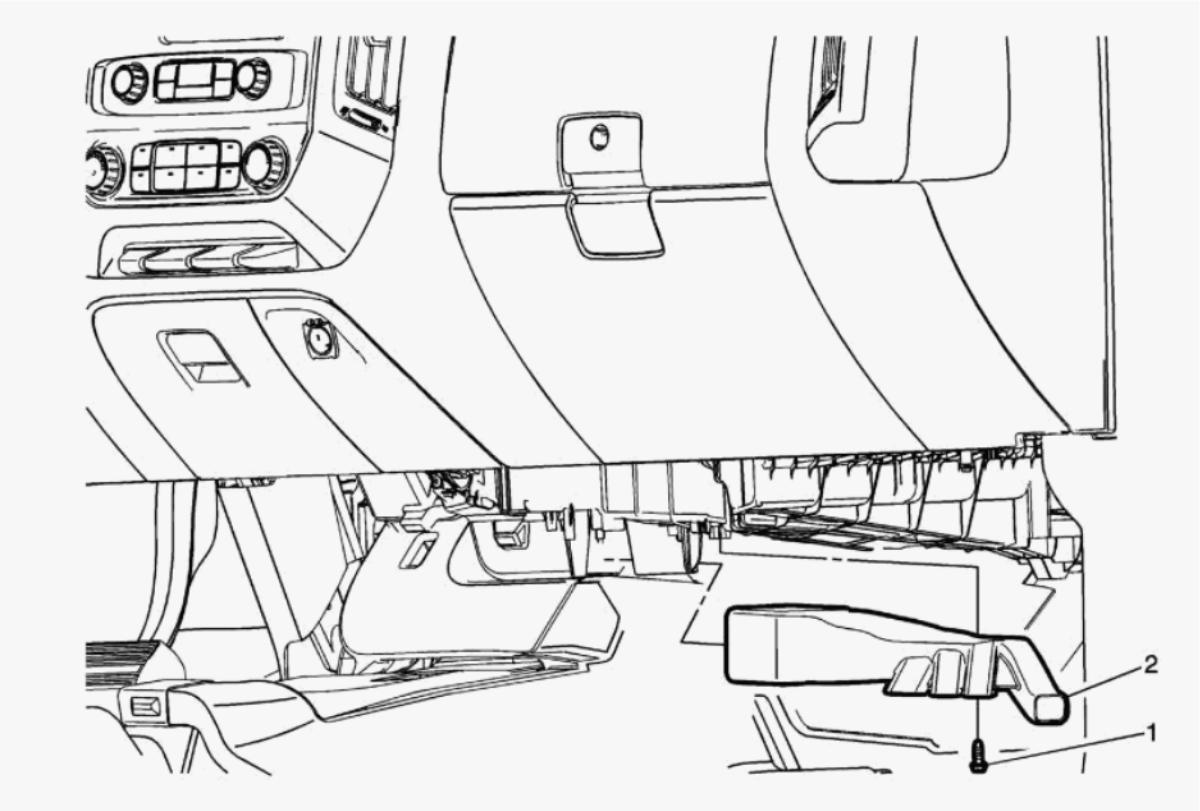


Fig. 213: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

13. Floor Front Air Outlet Duct - Right Side 2 - Install - **Floor Front Air Outlet Duct Replacement - Right Side**

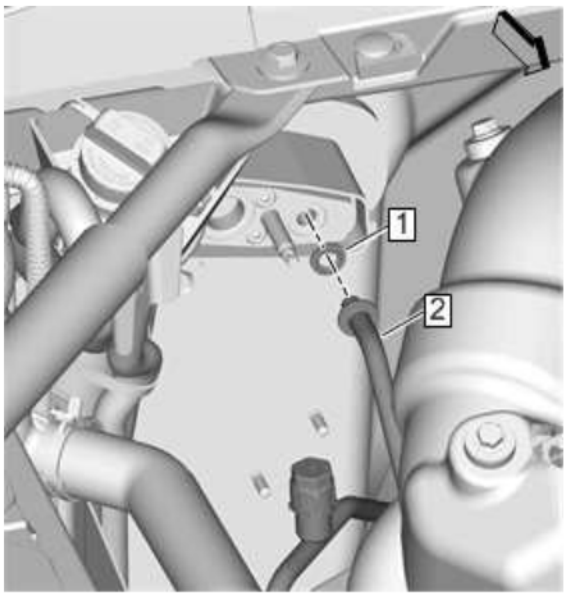


Fig. 214: Air Conditioning Evaporator Tube And Air Conditioning Evaporator Thermal Expansion

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Valve
Courtesy of GENERAL MOTORS COMPANY

14. Air Conditioning Evaporator Tube 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install - **Air Conditioning Evaporator Tube Replacement (L5P)**

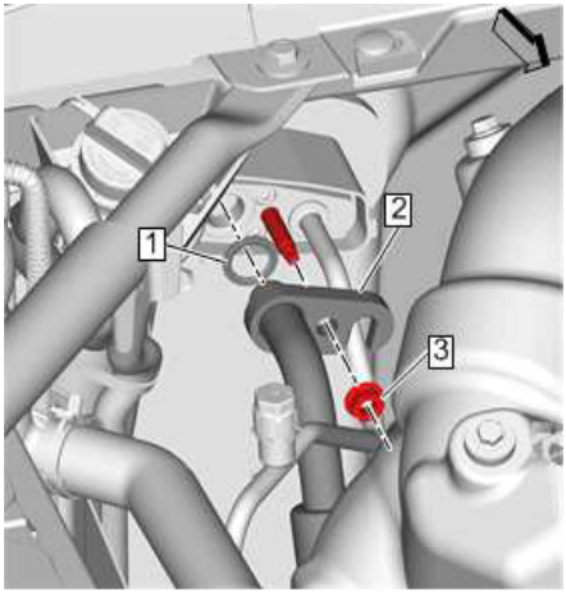


Fig. 215: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

15. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install - **Air Conditioning Compressor Hose Replacement (L5P)**

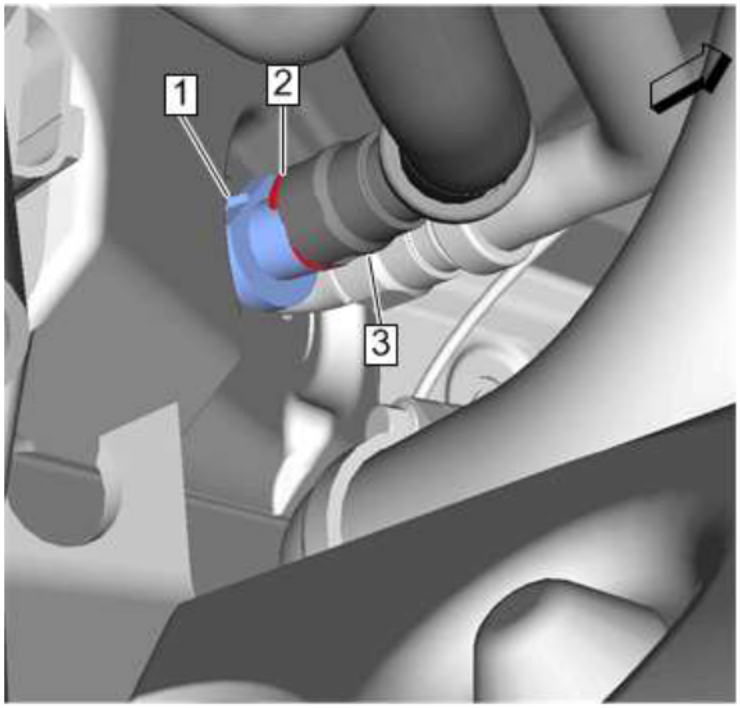


Fig. 216: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

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16. Heater Outlet Hose 2 @Heater Core Outlet Tube - Install - **Heater Outlet Hose Replacement (L5P)**

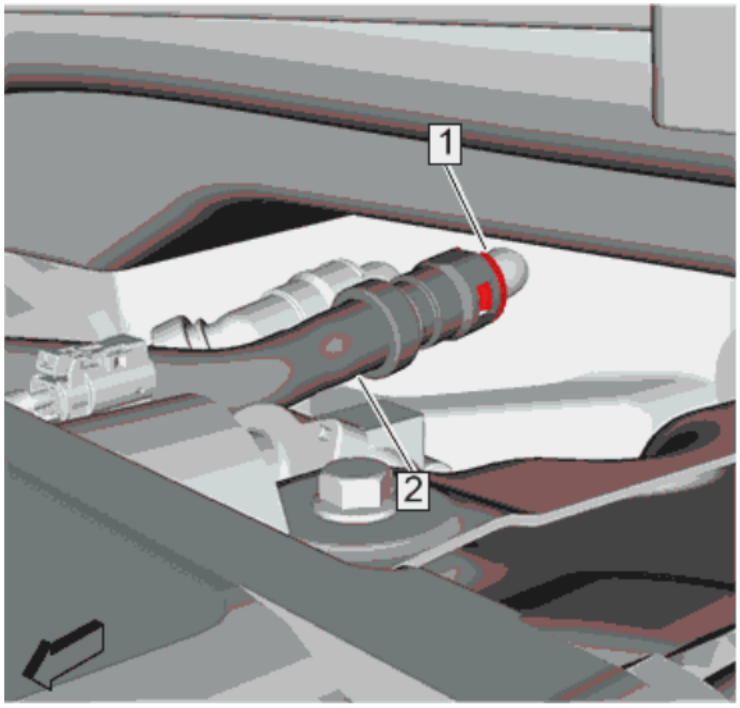


Fig. 217: Heater Inlet Hose/Tube
Courtesy of GENERAL MOTORS COMPANY

17. Heater Inlet Hose 2 @Heater Core Inlet Tube - Install - **Heater Inlet Hose Replacement (L5P)**

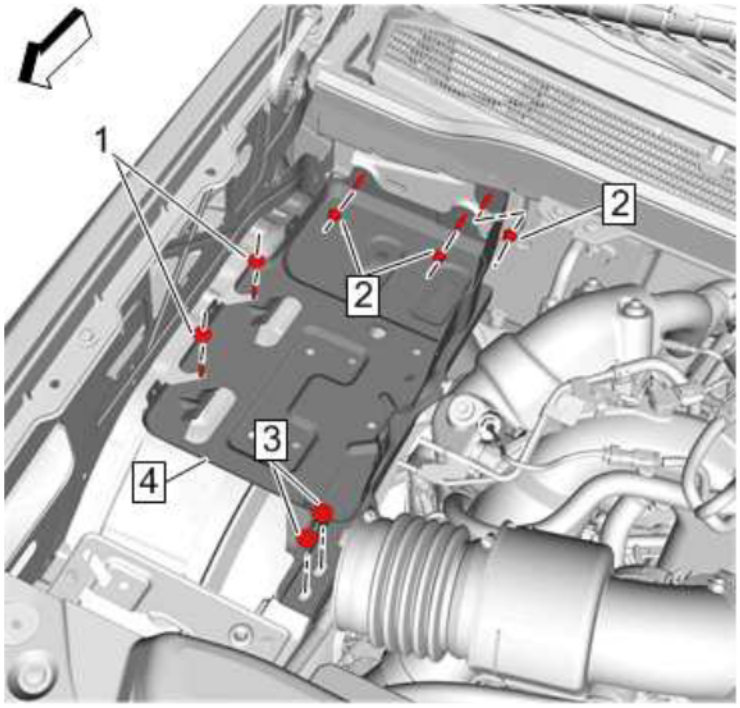


Fig. 218: Battery Tray
Courtesy of GENERAL MOTORS COMPANY

18. Install the battery tray. 4 **Battery Tray Replacement (Diesel)**

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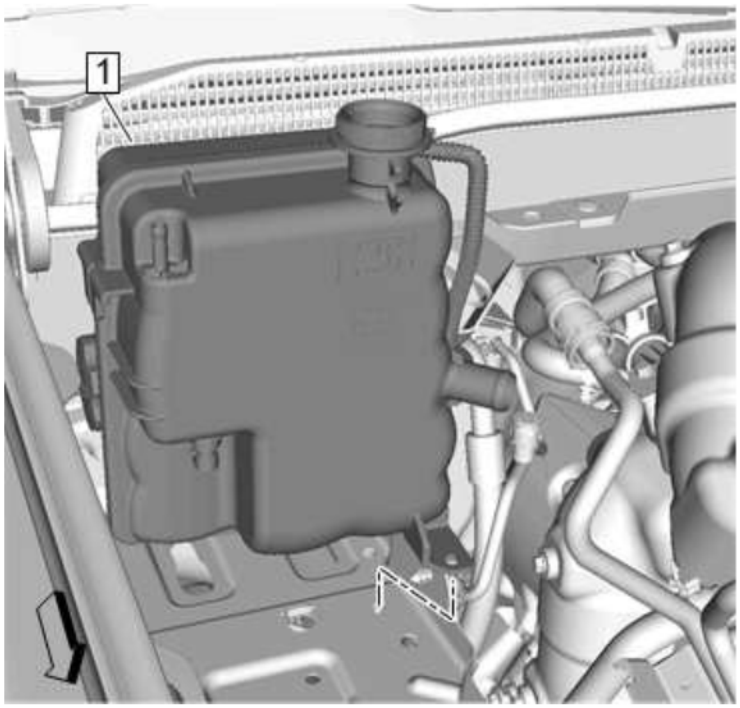


Fig. 219: Radiator Surge Tank
Courtesy of GENERAL MOTORS COMPANY

19. Install the radiator surge tank. 1 Radiator Surge Tank Replacement (L5P)
20. Install the battery into the vehicle. Battery Replacement (Diesel)
21. Fill the engine coolant system. Cooling System Draining and Filling (GE 47716 L5P) Cooling System Draining and Filling (Static L5P)
22. Recharge the refrigerant system. Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)
23. Visually inspect for coolant leaks.
24. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (L8B HP5)

WARNING: **Ensure all High Voltage safety procedures are followed. Failure to follow the procedure exactly as written may result in serious injury or death.**

WARNING: **Before working on any high voltage system, be sure to wear the following Personal Protection Equipment:**

- **Safety glasses with appropriate side shields when within 50 feet of the vehicle, either indoors or outdoors**
- **Certified and up-to-date Class "0" Insulation gloves rated at 1000V with leather protectors**
  - **Visually and functionally inspect the gloves before use.**
  - **Wear the Insulation gloves at all times when working with the high voltage battery assembly, whether the system is energized or not.**

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Failure to follow the procedure exactly as written may result in serious injury or death.

Removal Procedure

1. Disable the SIR system. **SIR Disabling and Enabling**
2. Disable the high voltage system. **High Voltage Disabling**
3. Disconnect the battery negative cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
4. Recover the refrigerant. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
5. Drain the cooling system. **Cooling System Draining and Filling (Vac N Fill L8B)**

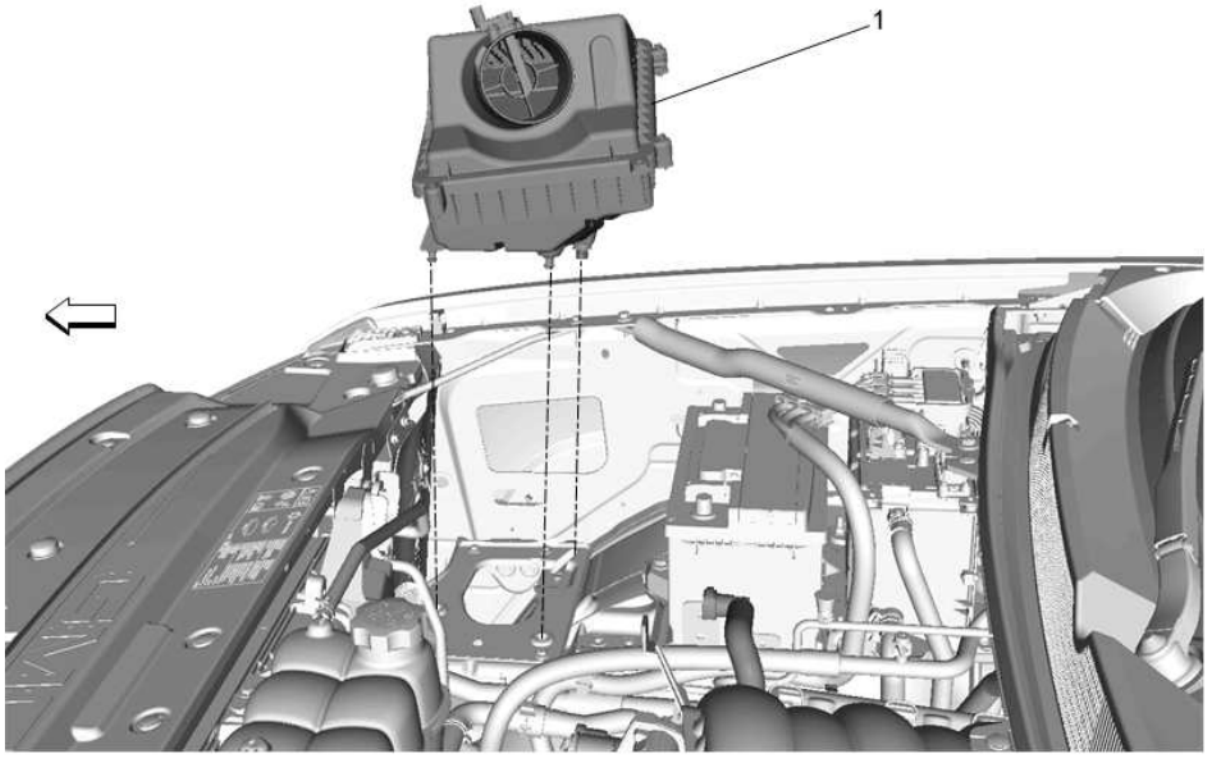


Fig. 220: Air Cleaner Assembly (L8B)
Courtesy of GENERAL MOTORS COMPANY

6. Remove the air cleaner assembly. 1 **Air Cleaner Assembly Replacement**

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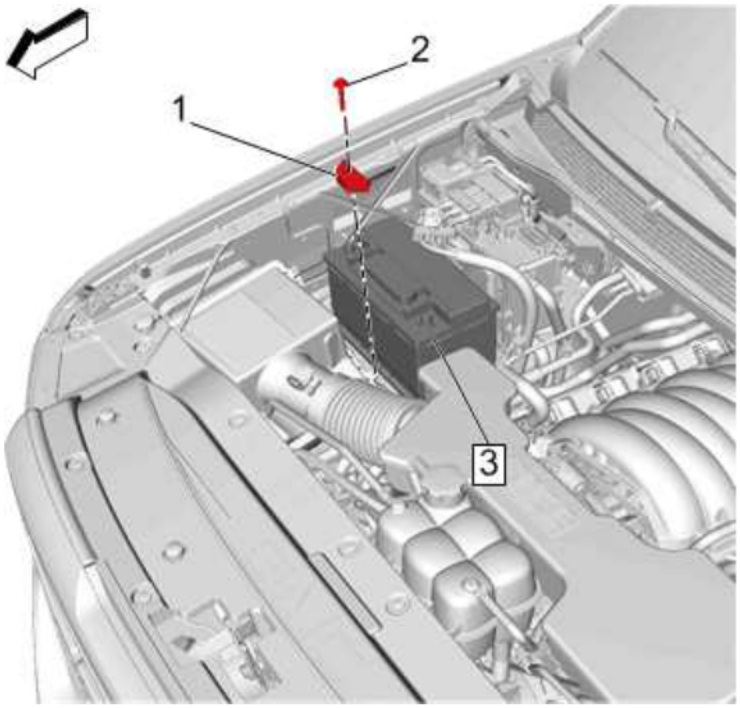


Fig. 221: Battery Hold Down Retainer
Courtesy of GENERAL MOTORS COMPANY

7. Remove the battery. 3 **Battery Replacement**

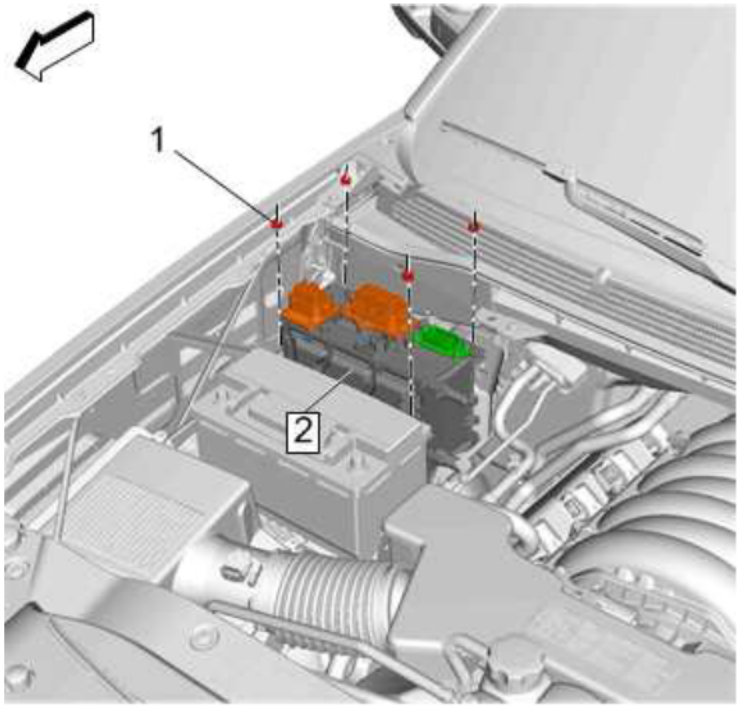


Fig. 222: Generator Control Module
Courtesy of GENERAL MOTORS COMPANY

8. Generator Control Module 2 - Remove - **Generator Control Module Replacement**

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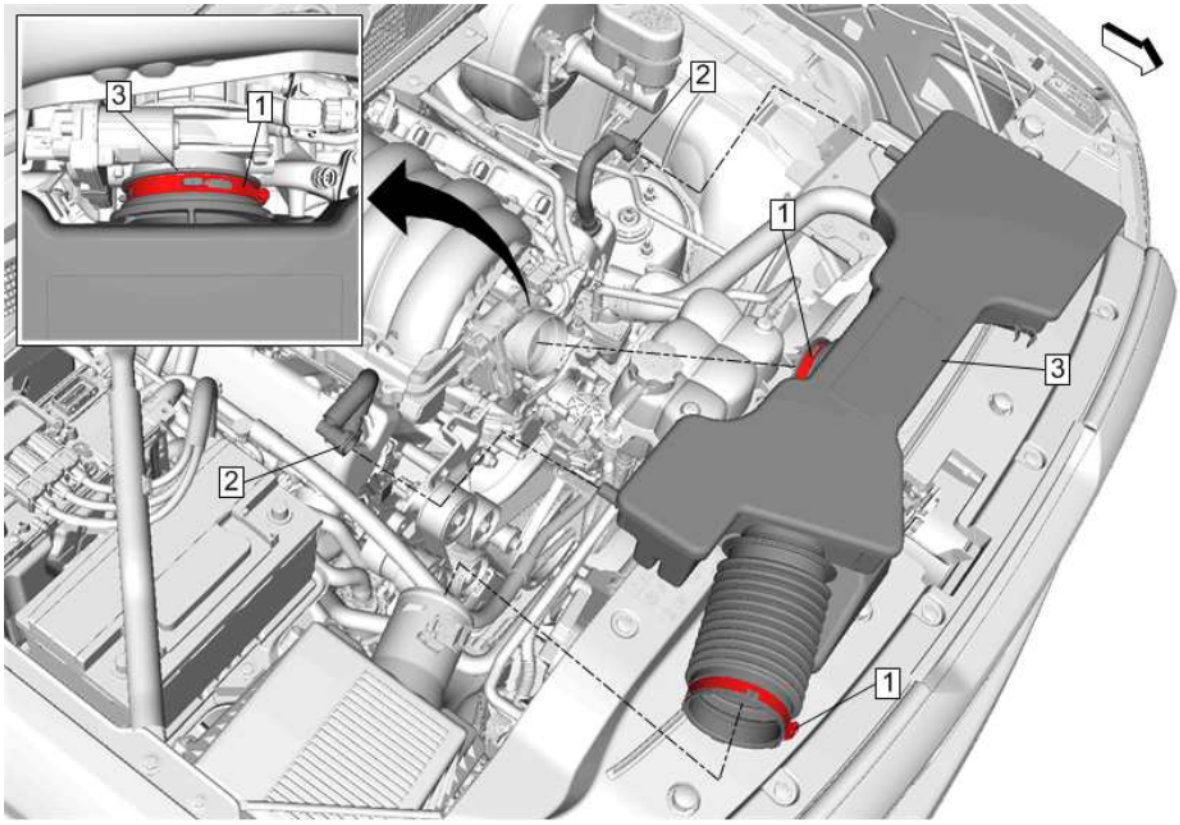


Fig. 223: Air Cleaner Outlet Duct (L8B)
Courtesy of GENERAL MOTORS COMPANY

9. Air Cleaner Outlet Duct 3 - Remove - **Air Cleaner Outlet Duct Replacement**

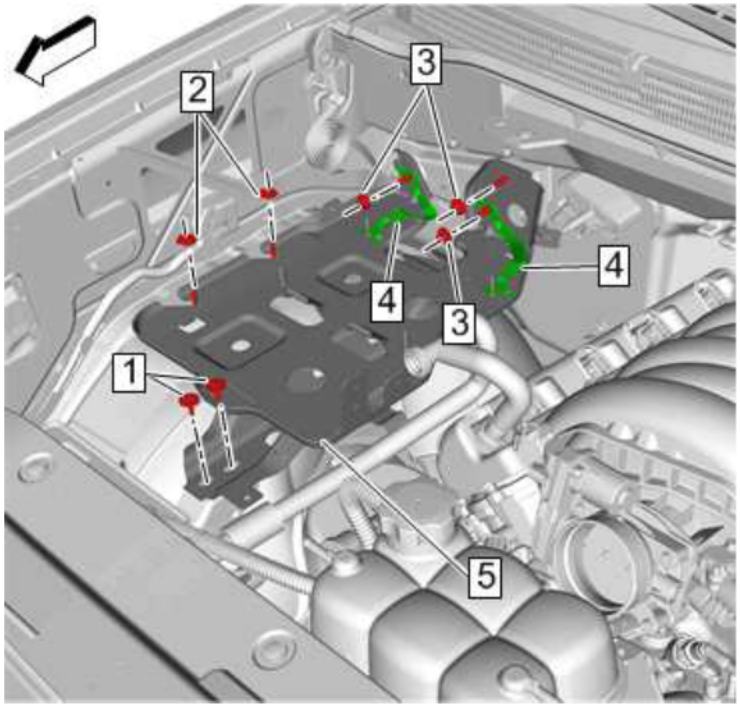


Fig. 224: Accessory DC Power Control Module Tray
Courtesy of GENERAL MOTORS COMPANY

10. Accessory DC Power Control Module Tray 5 - Remove - **Accessory DC Power Control Module Tray**

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Replacement

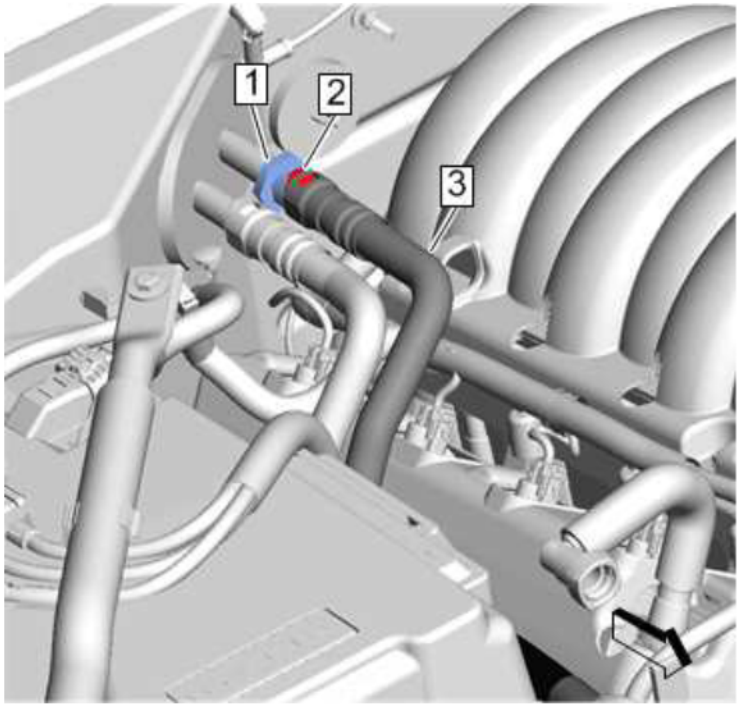


Fig. 225: Heater Inlet Hose And Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

11. Heater Inlet Hose 3 @Heater Core Inlet Tube - Remove - **Heater Inlet Hose Replacement (L8B)**

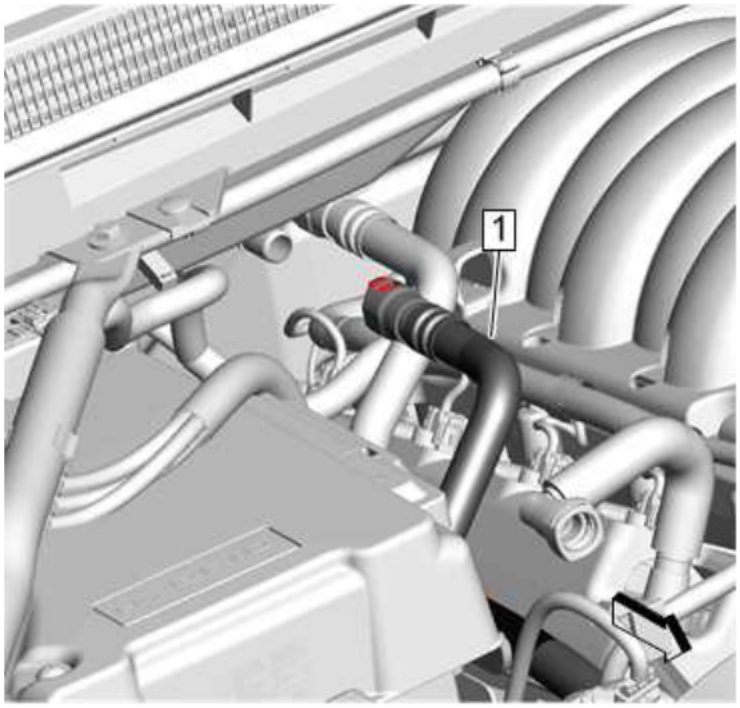


Fig. 226: Heater Outlet Hose And Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

12. Heater Outlet Hose 1 @Heater Core Outlet Tube - Remove - **Heater Outlet Hose Replacement (L8B)**

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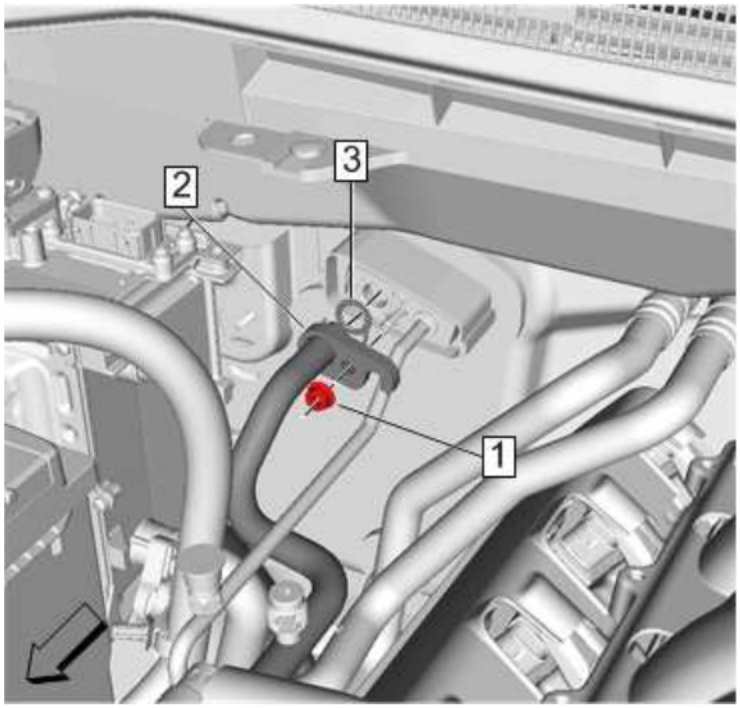


Fig. 227: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Remove - **Air Conditioning Compressor Hose Replacement (L8B)**

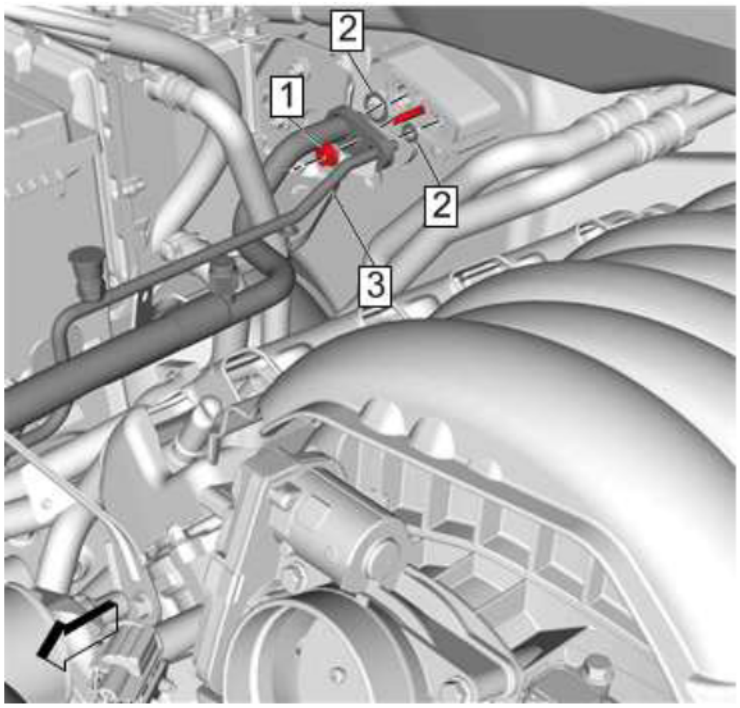


Fig. 228: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

14. Air Conditioning Evaporator Tube 3 @Air Conditioning Evaporator Thermal Expansion Valve - Remove - **Air Conditioning Evaporator Tube Replacement (L8B)**

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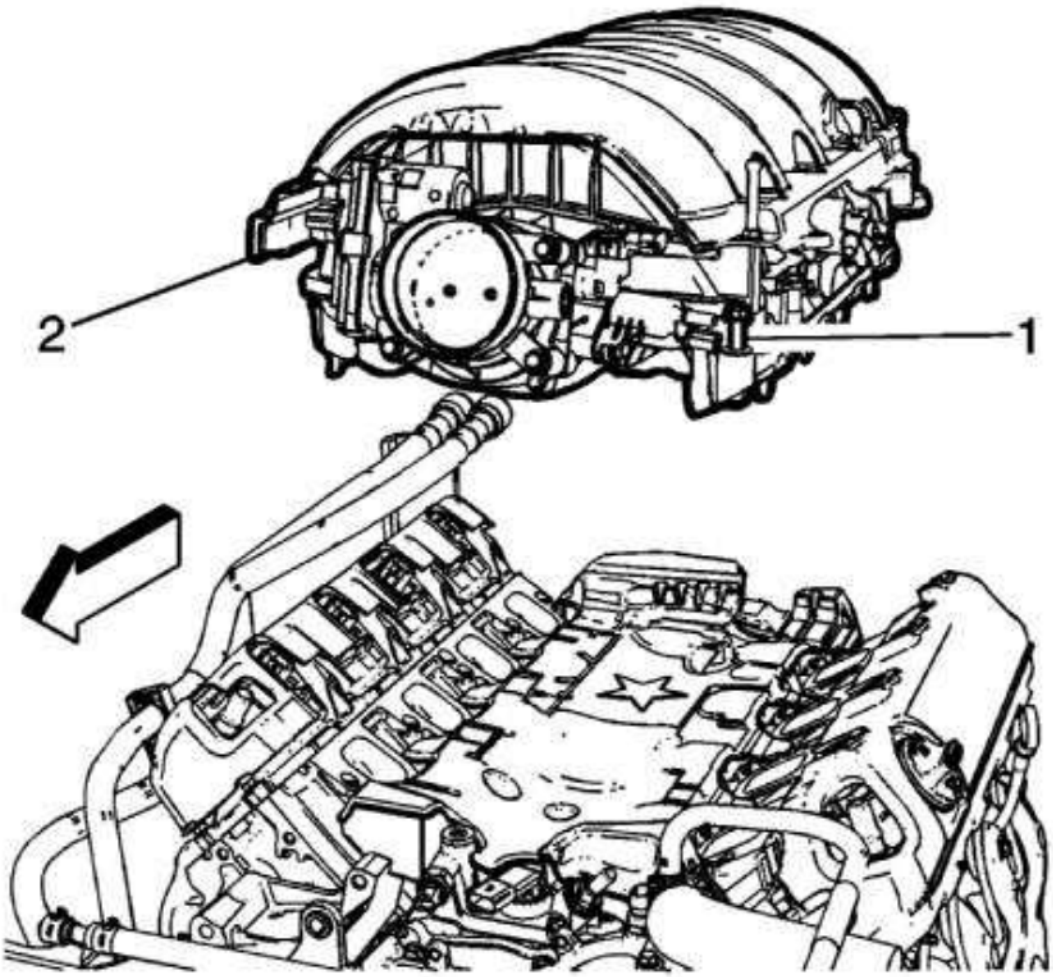


Fig. 229: Intake Manifold Bolts
Courtesy of GENERAL MOTORS COMPANY

15. Intake Manifold 2 - Remove - **Intake Manifold Replacement**

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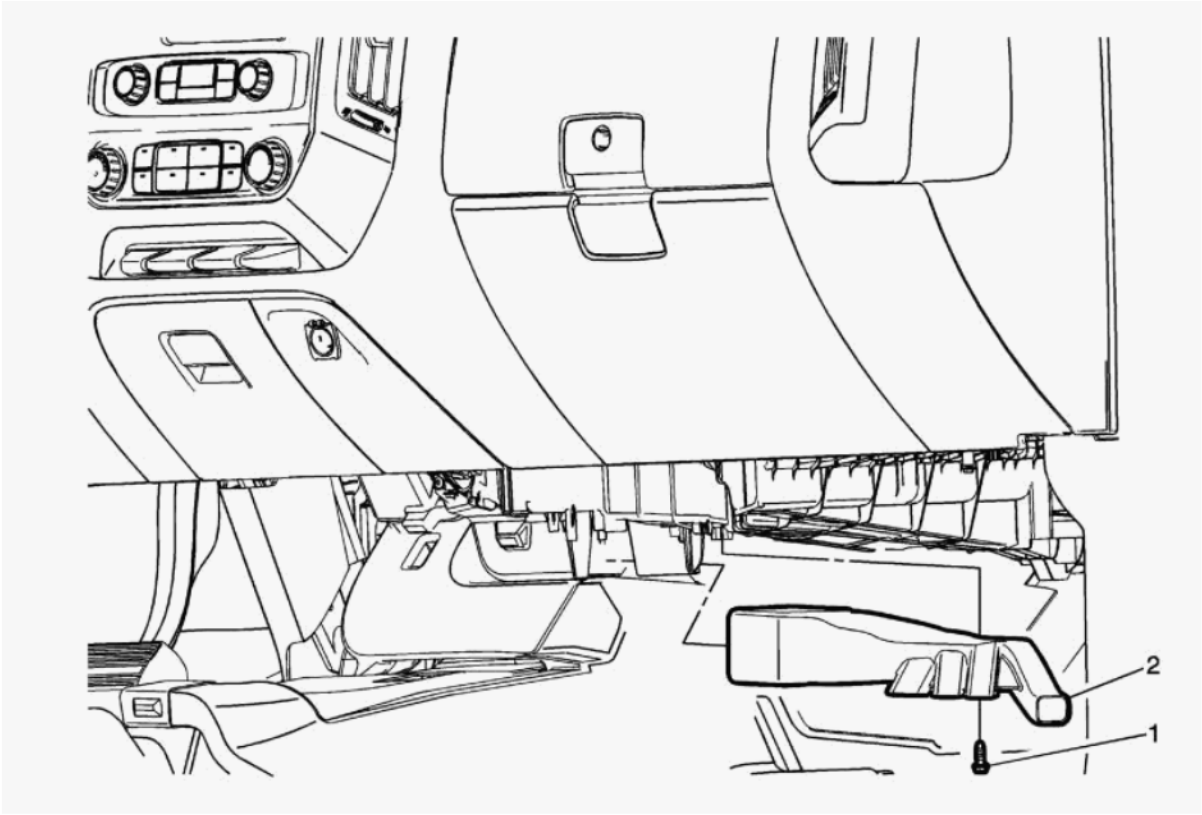
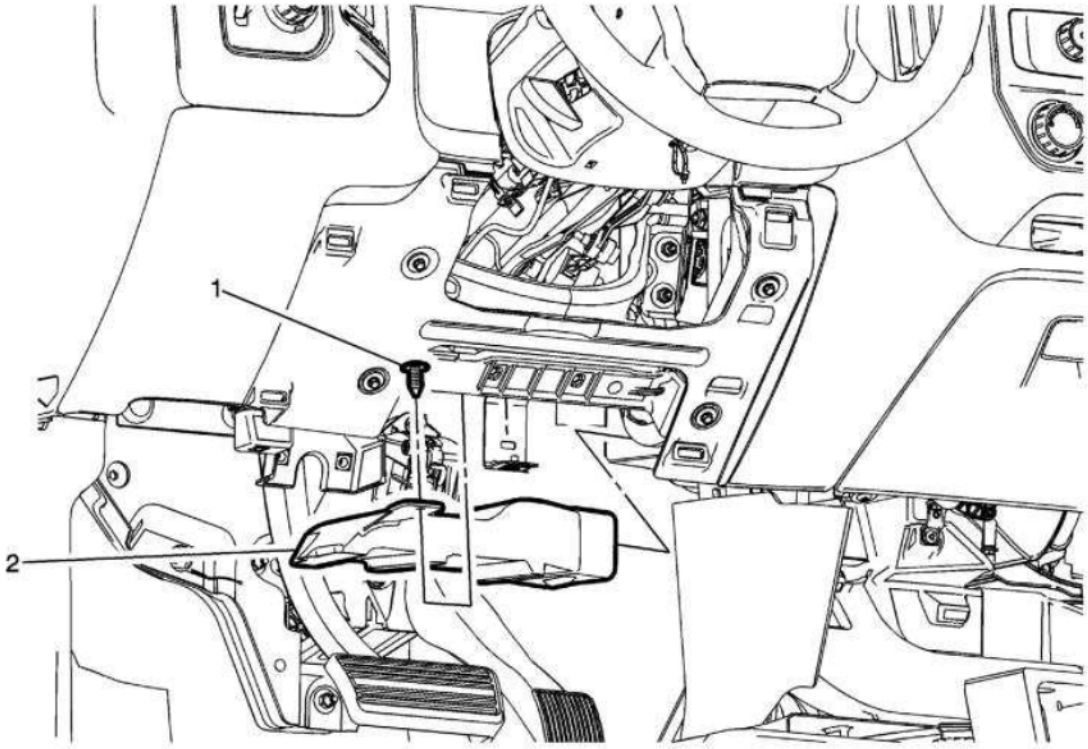


Fig. 230: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

16. Floor Front Air Outlet Duct - Right Side 2 - Remove - **Floor Front Air Outlet Duct Replacement - Right Side**



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Fig. 231: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

17. Floor Front Air Outlet Duct - Left Side 2 - Remove - **Floor Front Air Outlet Duct Replacement - Left Side**

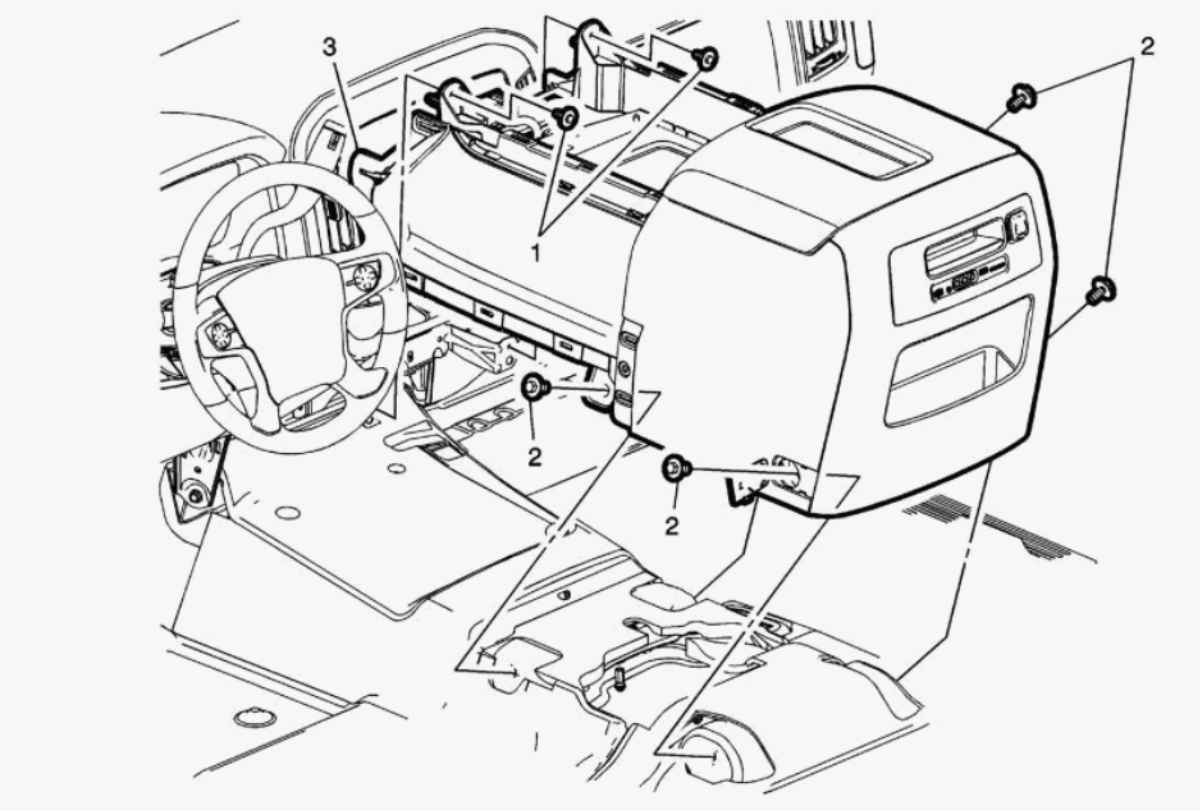


Fig. 232: Front Floor Console
Courtesy of GENERAL MOTORS COMPANY

18. { If equipped }Front Floor Console 3 - Remove - **Front Floor Console Assembly Replacement (without HP5)**

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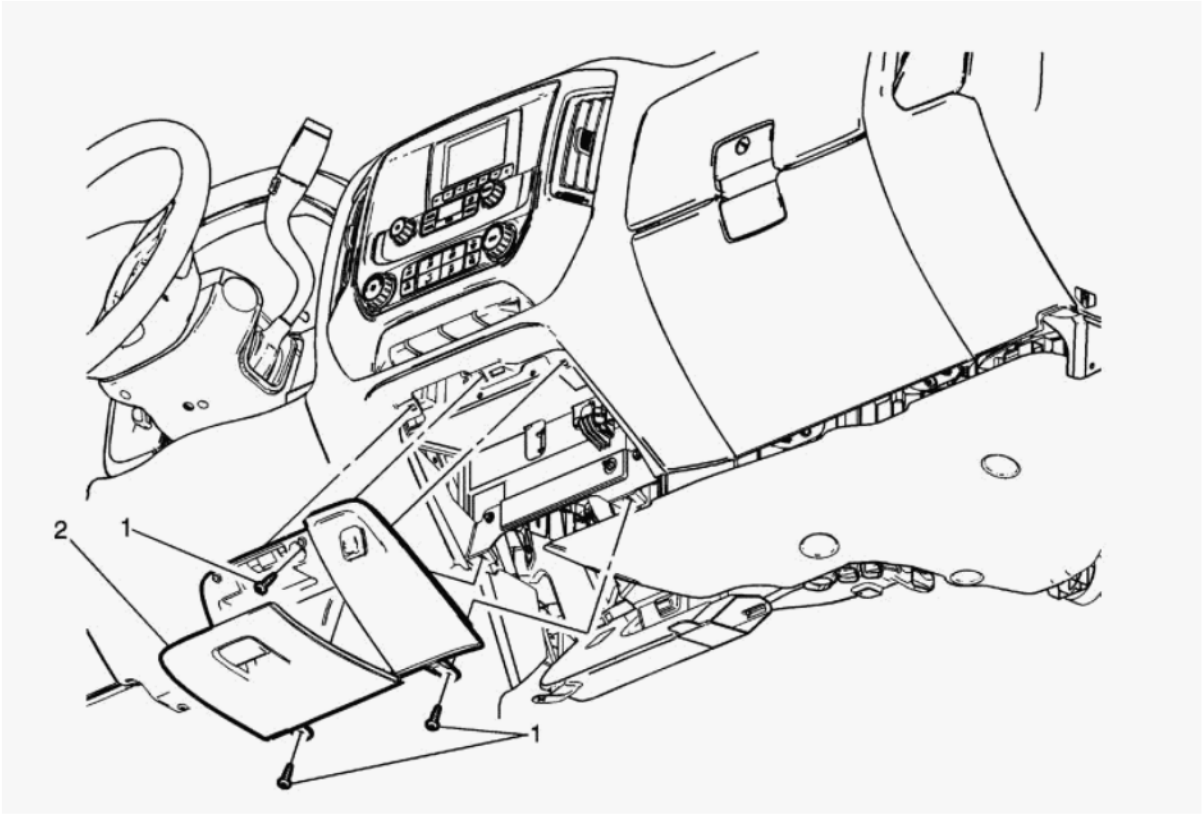
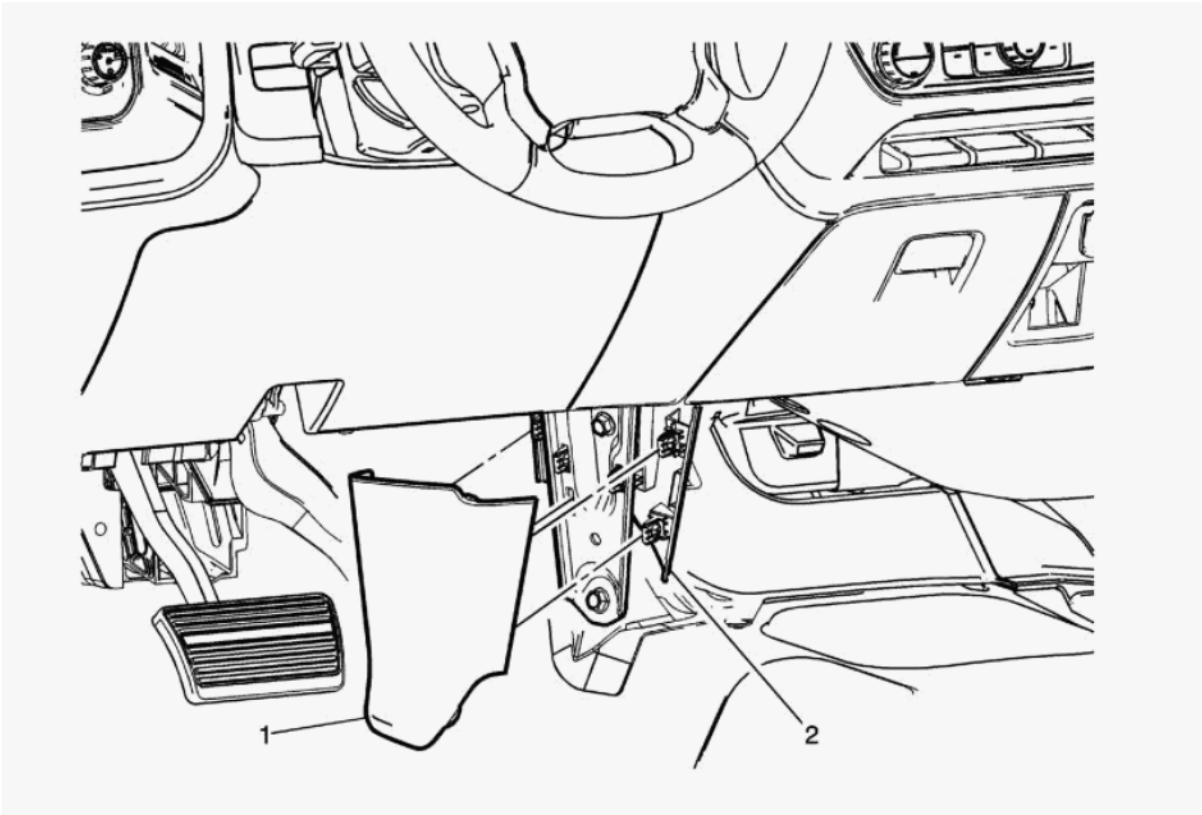


Fig. 233: Instrument Panel Center Compartment
Courtesy of GENERAL MOTORS COMPANY

19. { If equipped }Instrument Panel Center Compartment 2 - Remove - **Instrument Panel Center Compartment Replacement**



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Fig. 234: Instrument Panel Lower Center Trim Panel
Courtesy of GENERAL MOTORS COMPANY

20. { If equipped }Instrument Panel Lower Center Trim Panel 1 & 2 - Remove - **Instrument Panel Lower Center Trim Panel Replacement**

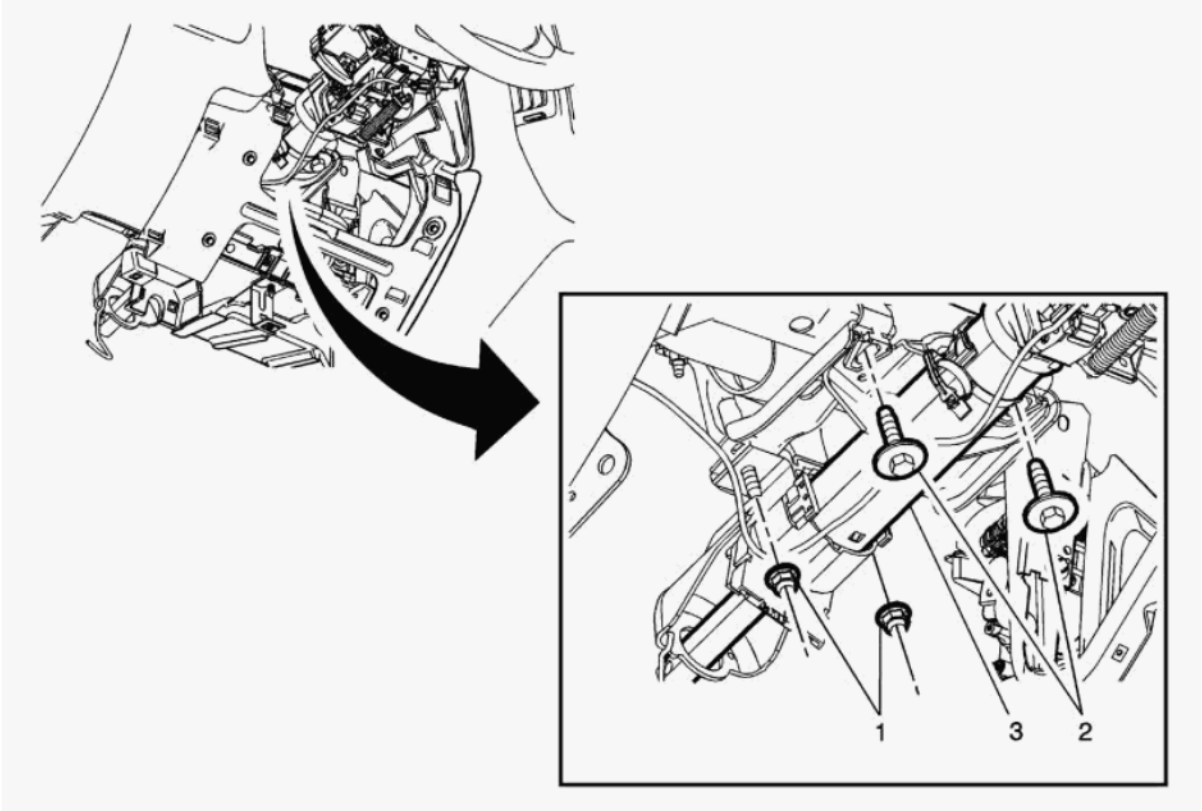


Fig. 235: Steering Column
Courtesy of GENERAL MOTORS COMPANY

21. Steering Column 2 - Remove - **Steering Column Replacement**

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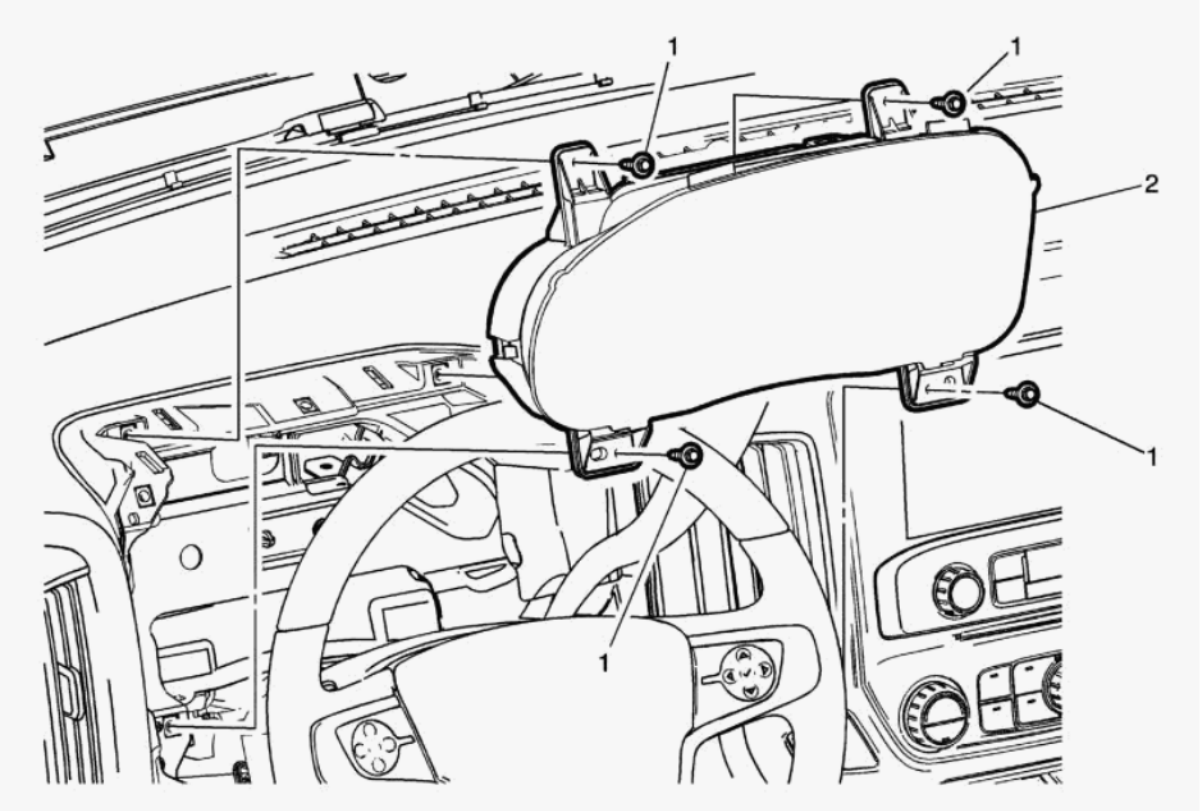


Fig. 236: Instrument Cluster
Courtesy of GENERAL MOTORS COMPANY

22. Instrument Cluster 2 - Remove - **Instrument Cluster Replacement**

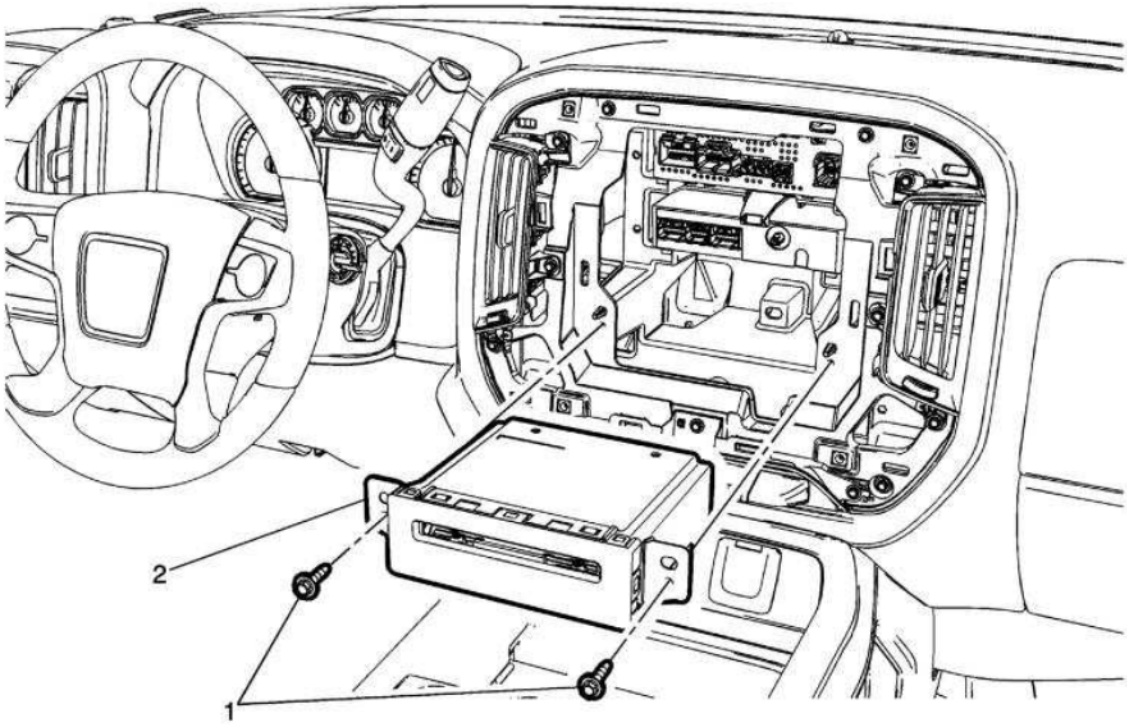


Fig. 237: Audio Disc Player

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Courtesy of GENERAL MOTORS COMPANY

23. Audio Disc Player 2 - Remove - **Disc Player Replacement (With IO3, IO5, IO6)** **Disc Player Replacement (With IOB)**

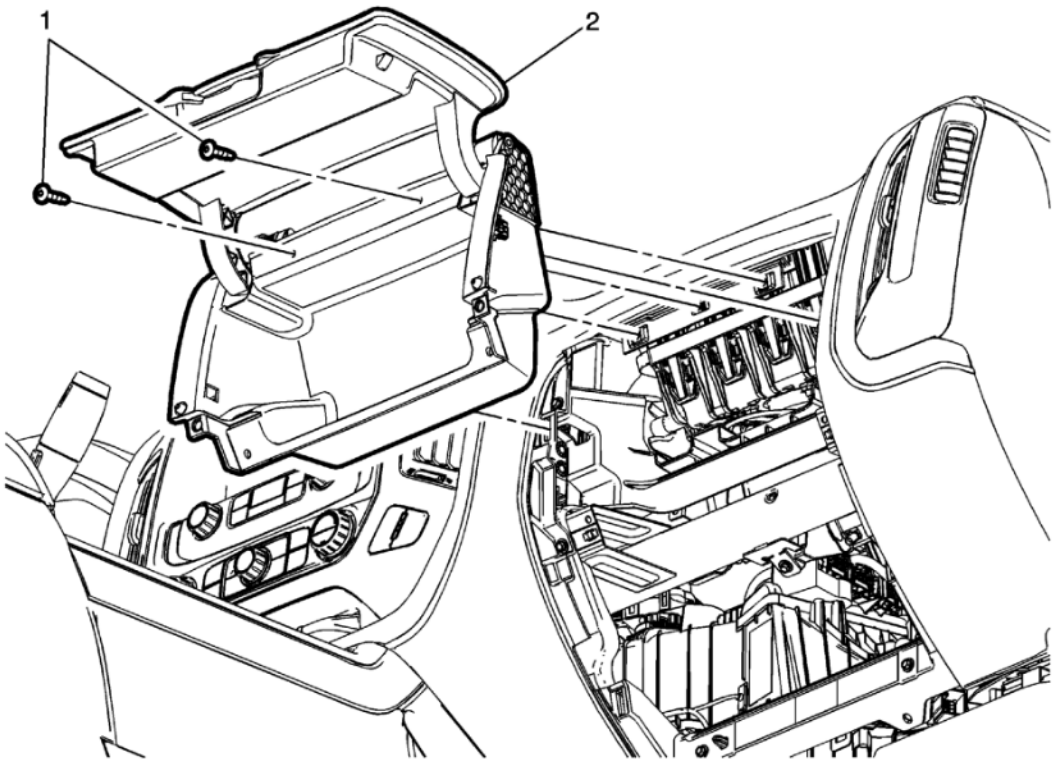


Fig. 238: Instrument Panel Upper Compartment
Courtesy of GENERAL MOTORS COMPANY

24. Instrument Panel Upper Compartment 2 - Remove - **Instrument Panel Upper Compartment Replacement**

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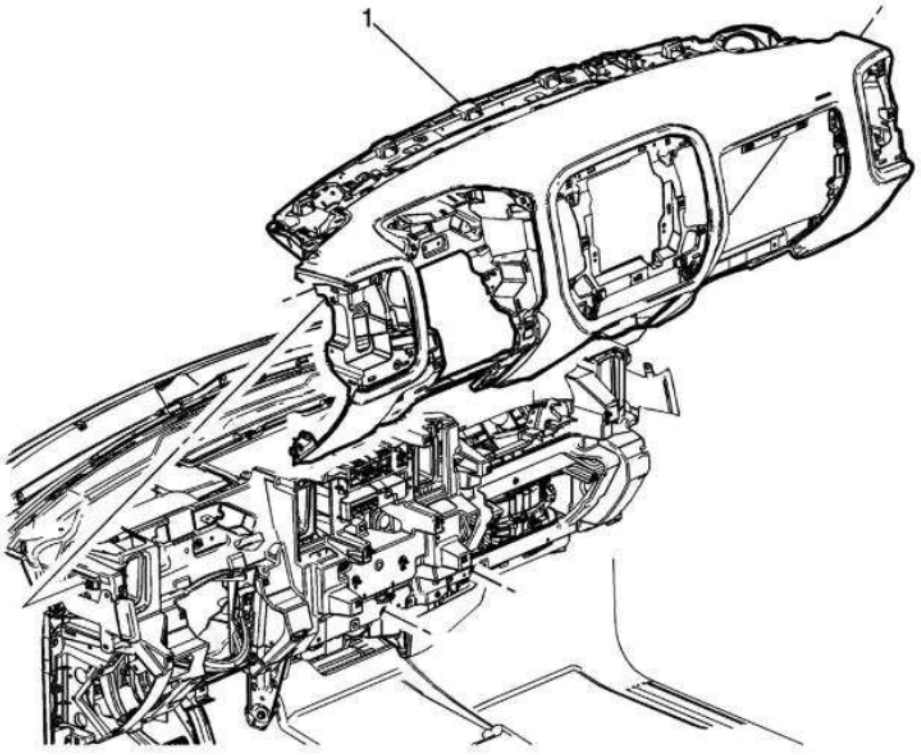
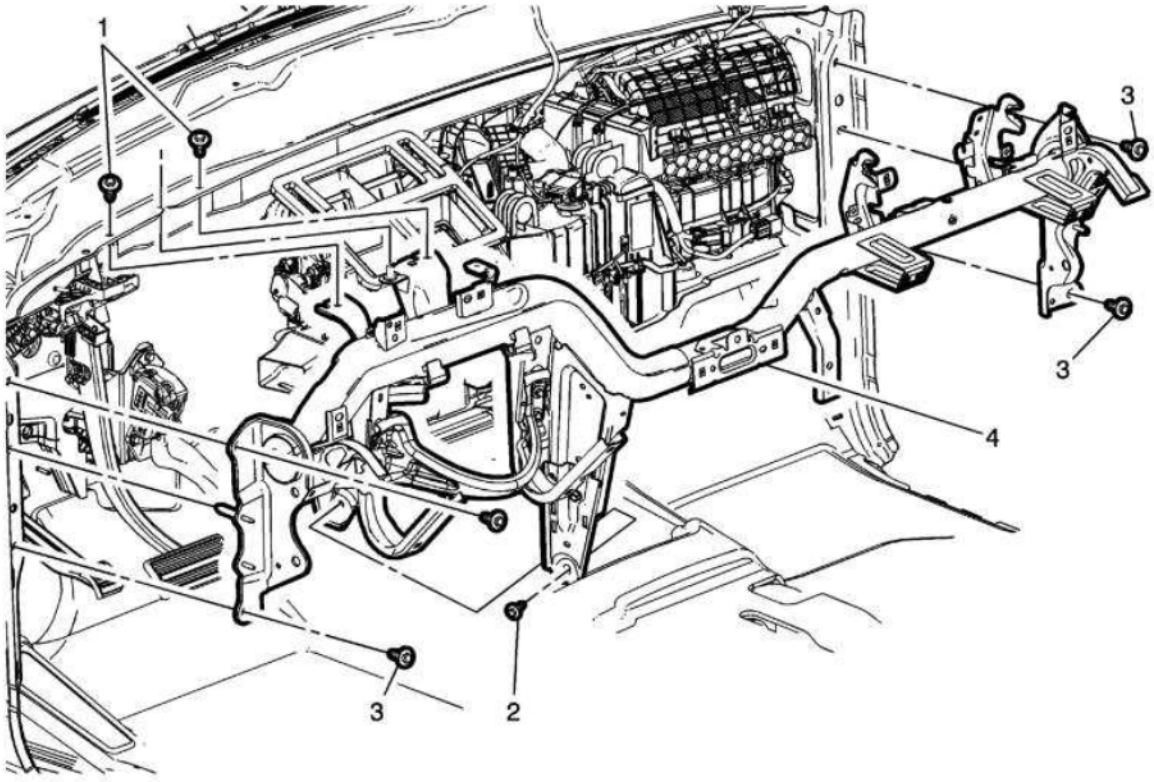


Fig. 239: Instrument Panel Assembly
Courtesy of GENERAL MOTORS COMPANY

25. Disconnect the wiring harness from the instrument panel assembly.
26. Instrument Panel Assembly 1 - Remove - **Instrument Panel Assembly Replacement**



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Fig. 240: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

27. Instrument Panel Tie Bar 4 - Remove - **Instrument Panel Tie Bar Replacement**
28. Temporary support the heater and air conditioning evaporator and blower module assembly.

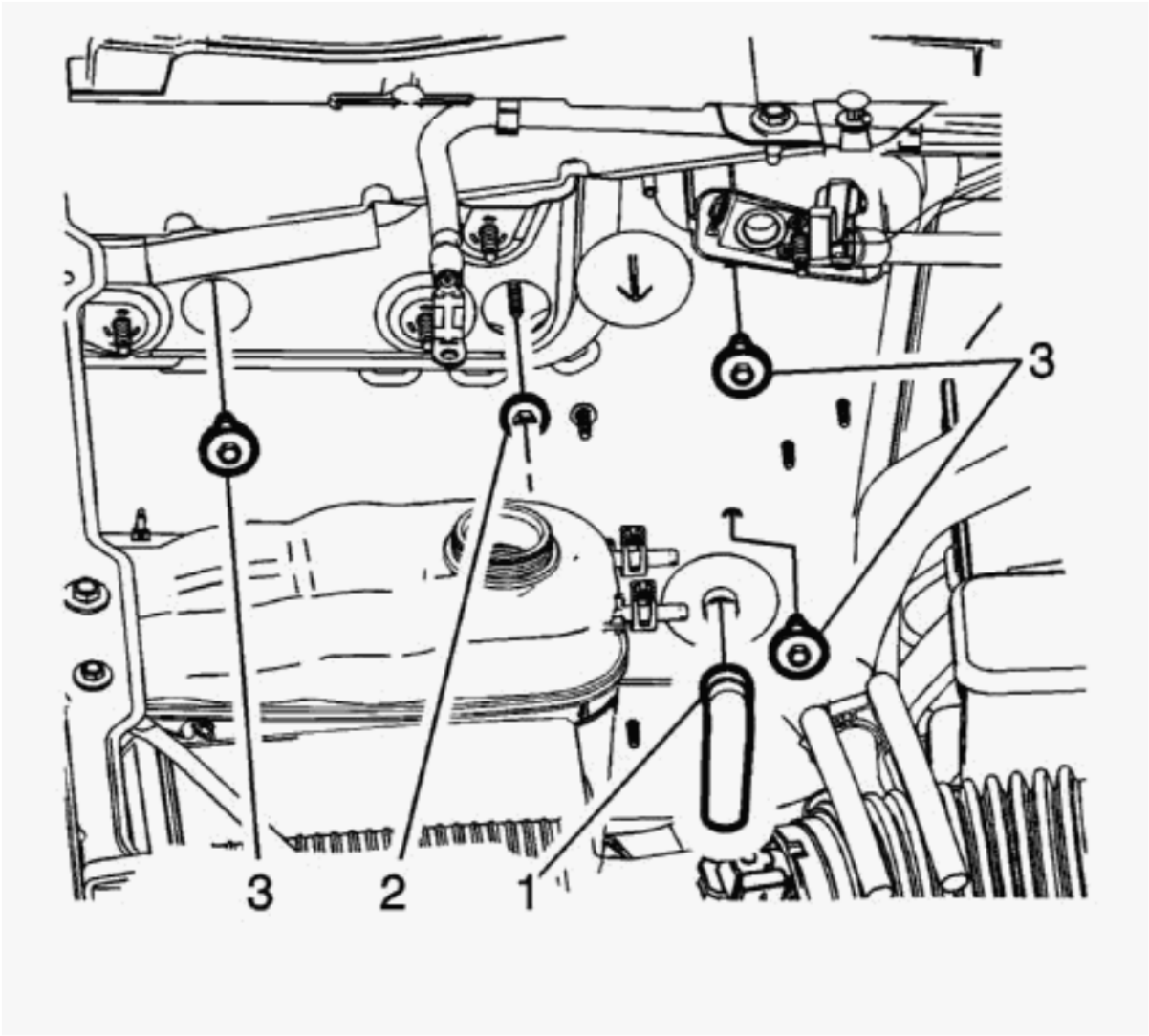


Fig. 241: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

29. From within the engine compartment, remove the air conditioning evaporator case drain tube (1) from the heater and air conditioning evaporator and blower module.
30. 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.
31. 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.

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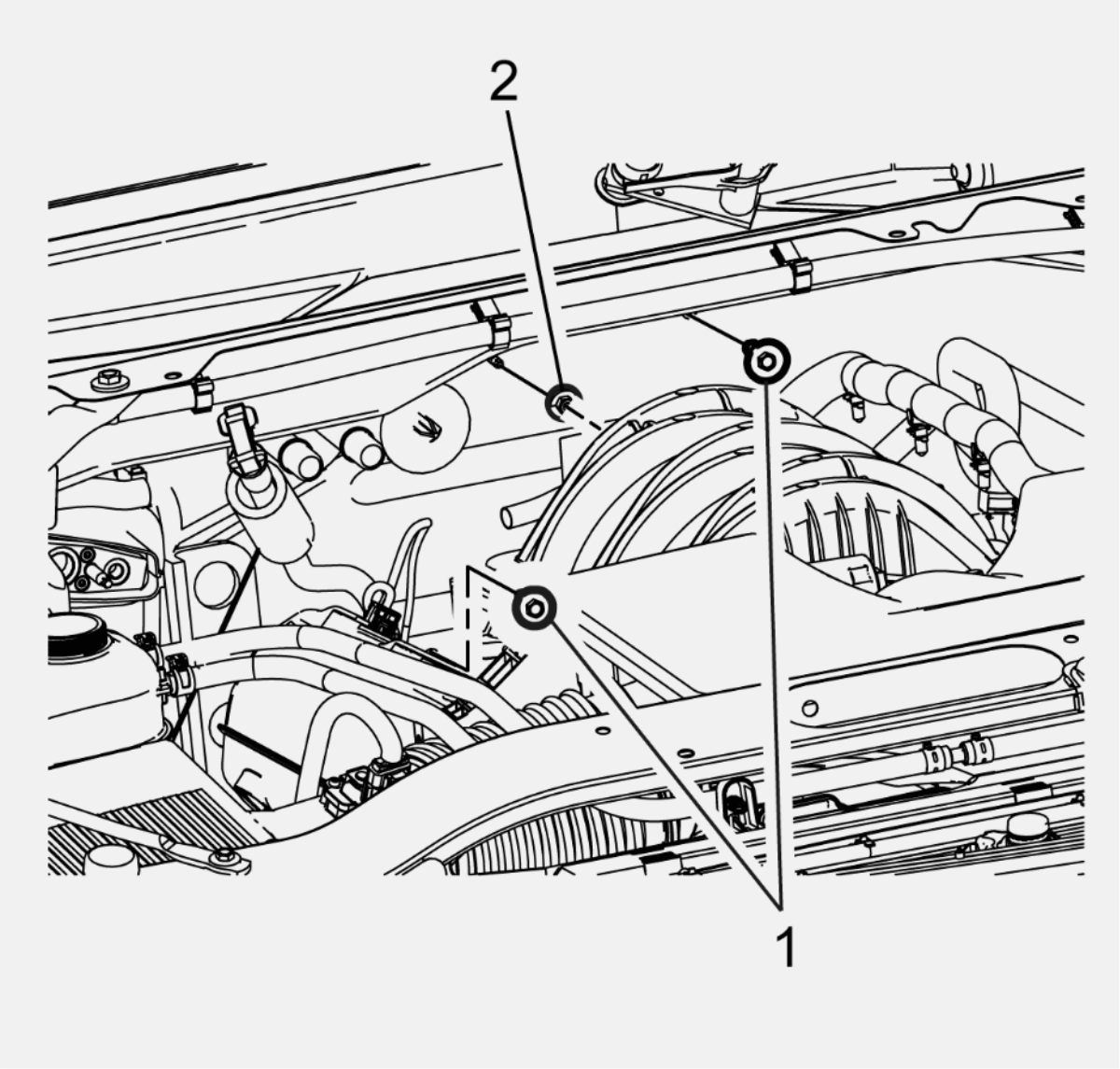


Fig. 242: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

32. 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.
33. 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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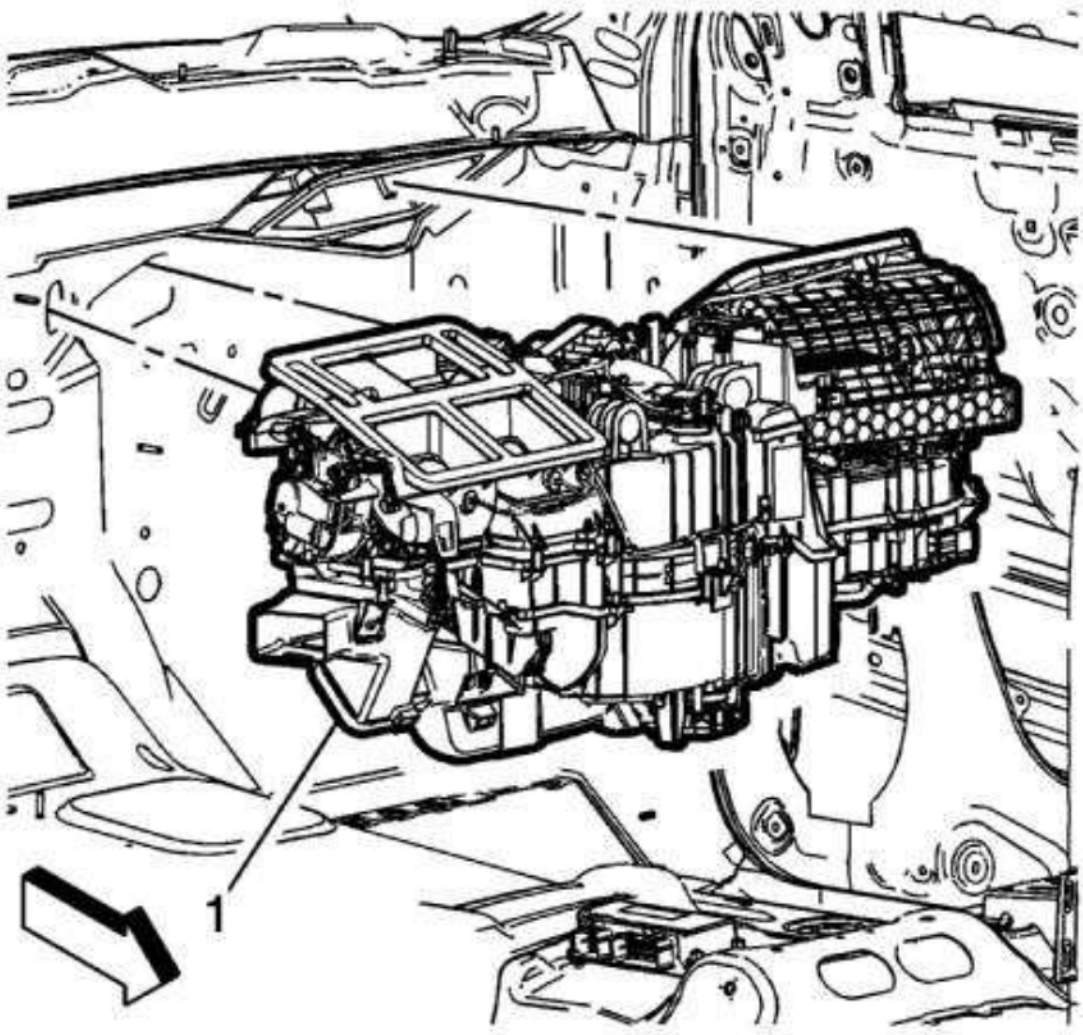


Fig. 243: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

34. Prior to removing the heater and air conditioning evaporator and blower module or heater and air conditioning evaporator and blower module drain tube/hose, use clean and absorbent shop clothes/towels to cover the electrical components protecting the electrical components from water damage.
35. Remove the heater and air conditioning evaporator and blower module assembly (1) from the vehicle.
36. Transfer all the necessary components.

Installation Procedure

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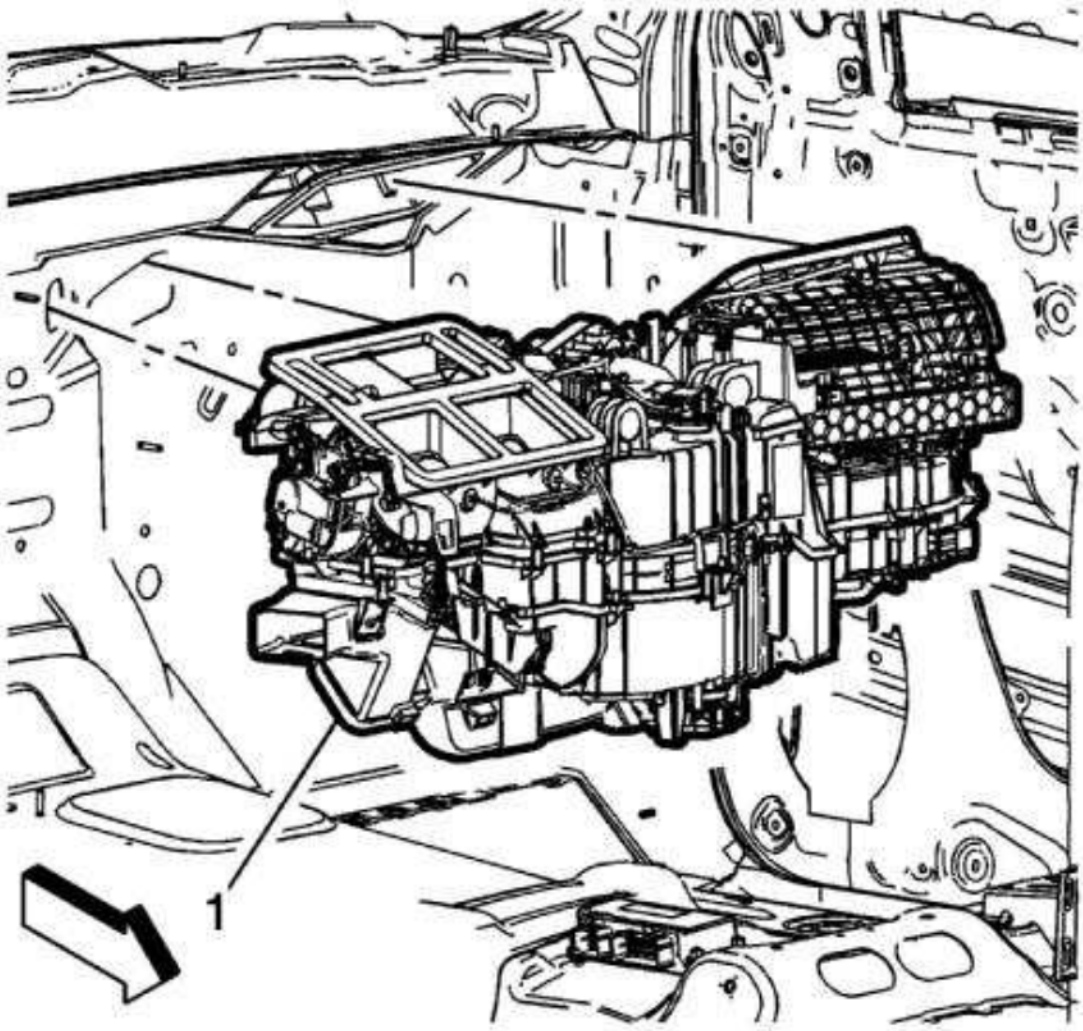


Fig. 244: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

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

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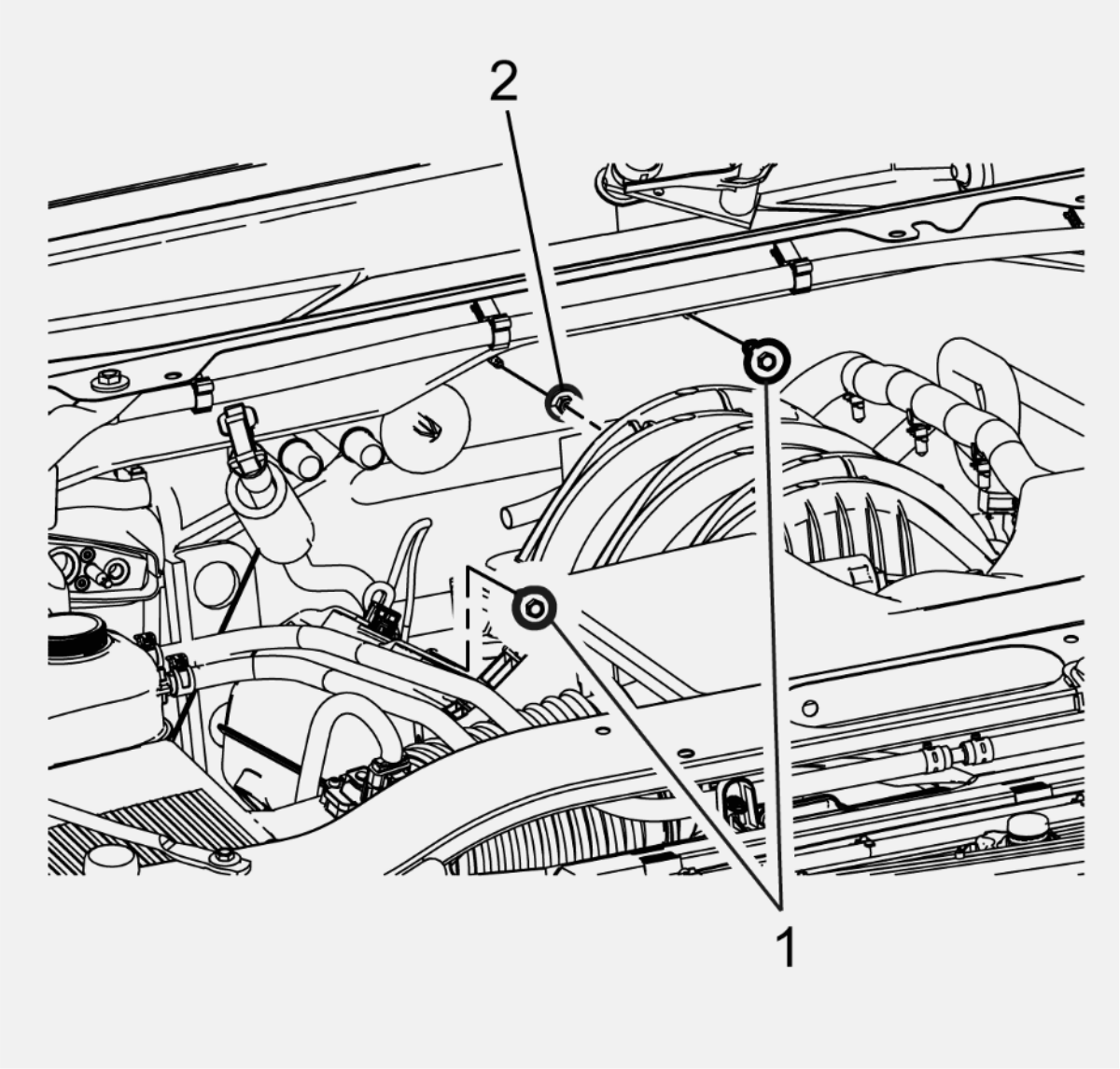


Fig. 245: HVAC Module
Courtesy of GENERAL MOTORS COMPANY

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 HVAC module assembly to the cowl panel and tighten to 9.5 N.m (84 lb in).

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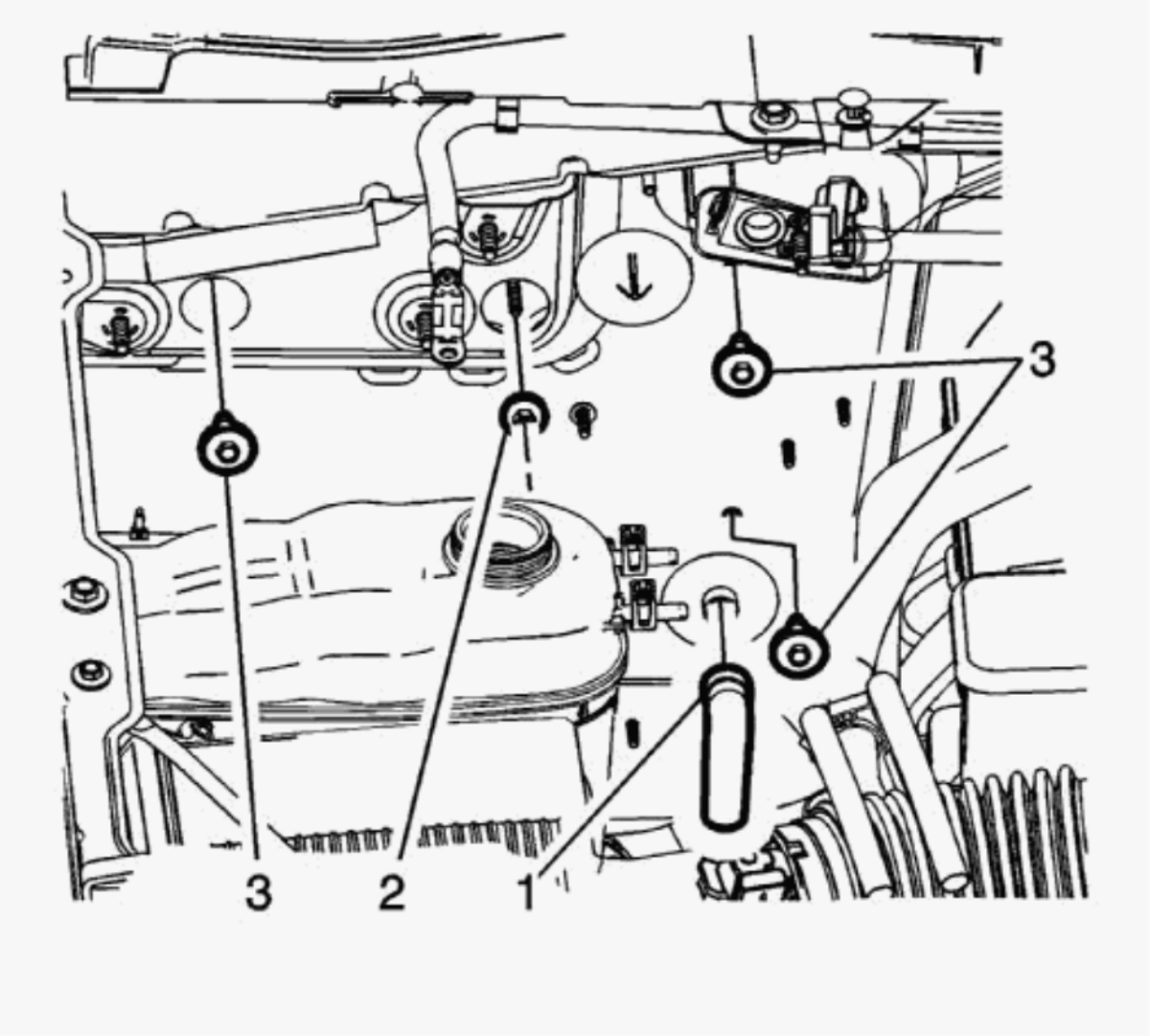


Fig. 246: Air Conditioning Evaporator Case Drain Tube
Courtesy of GENERAL MOTORS COMPANY

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

CAUTION: Refer to HVAC Module Drain Tube Caution .

6. Install the air conditioning evaporator case drain tube (1) onto the heater and air conditioning evaporator and blower module.
7. Remove the absorbent shop clothes/towels.

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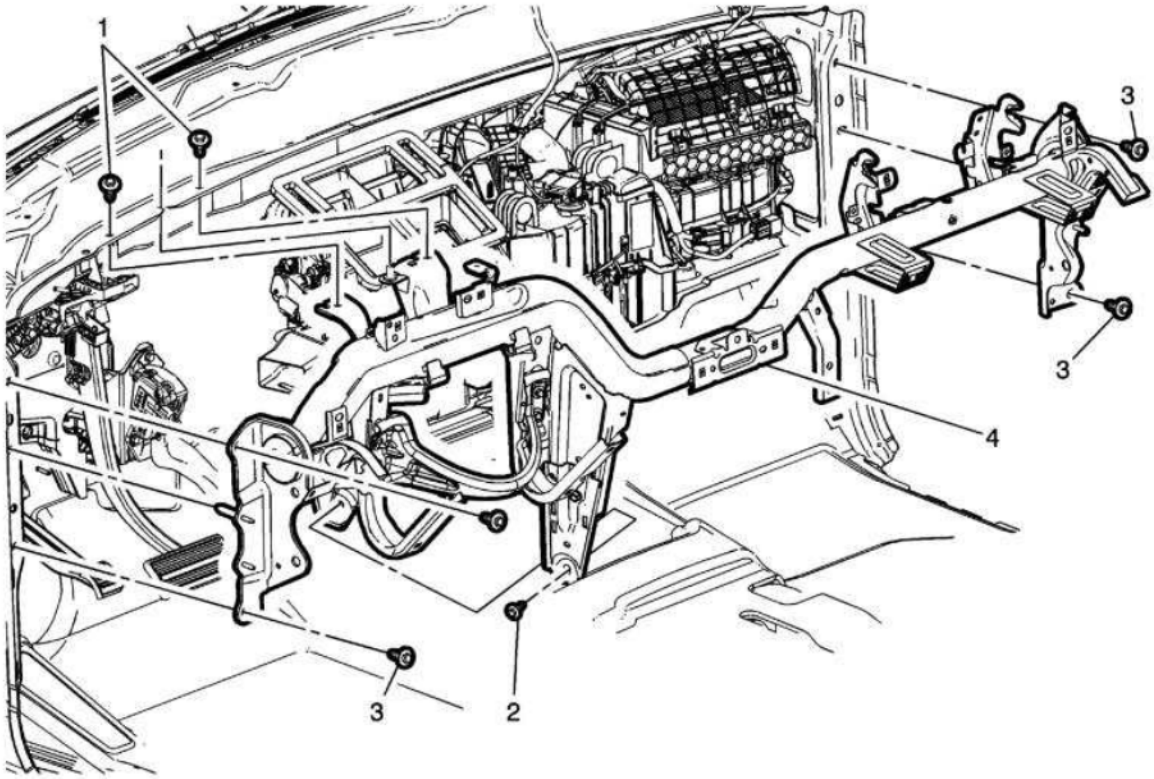


Fig. 247: Instrument Panel Tie Bar
Courtesy of GENERAL MOTORS COMPANY

8. Instrument Panel Tie Bar 4 - Install - **Instrument Panel Tie Bar Replacement**

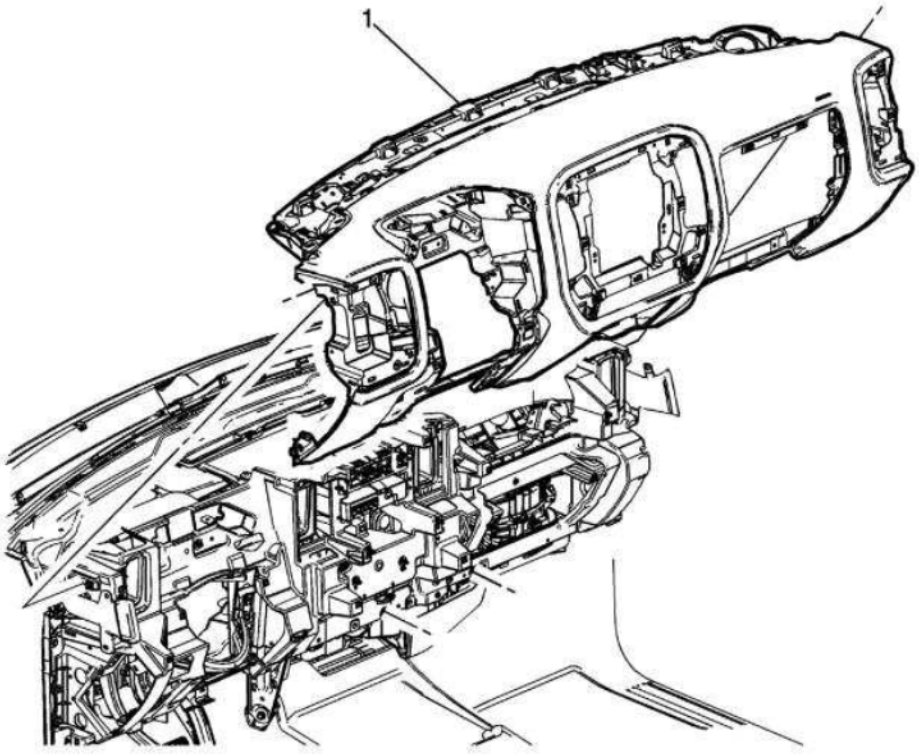


Fig. 248: Instrument Panel Assembly

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Courtesy of GENERAL MOTORS COMPANY

9. Instrument Panel Assembly 1 - Install - **Instrument Panel Assembly Replacement**
10. Connect the electrical connectors.

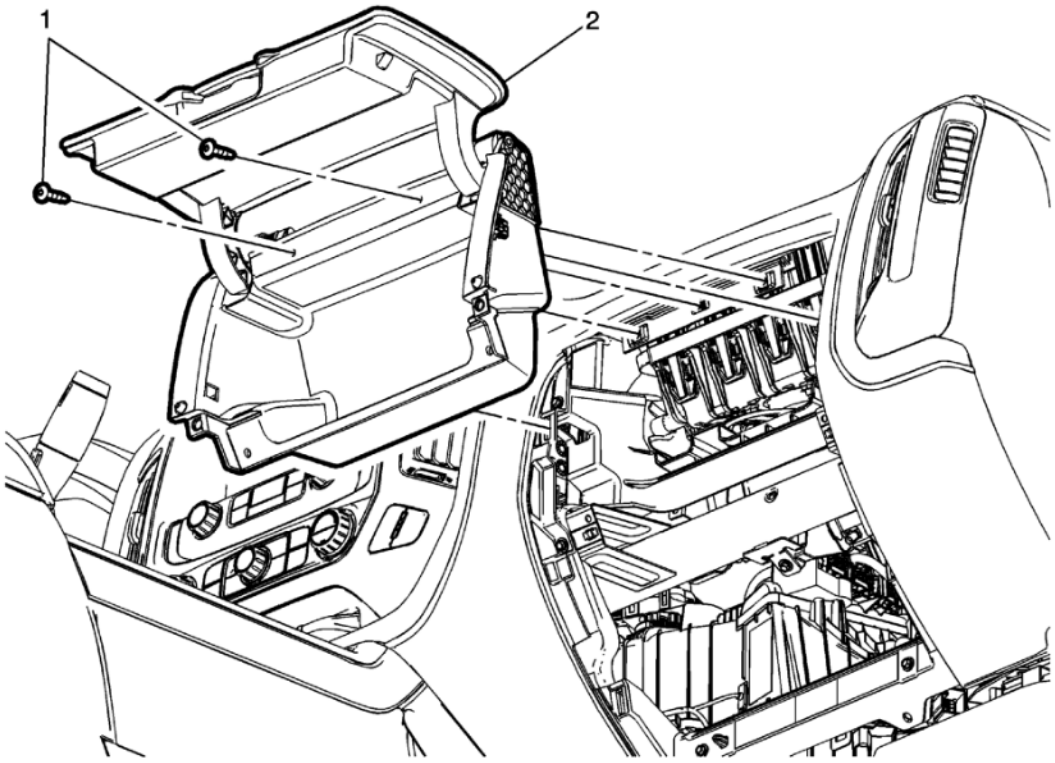


Fig. 249: Instrument Panel Upper Compartment
Courtesy of GENERAL MOTORS COMPANY

11. Instrument Panel Upper Compartment 2 - Install - **Instrument Panel Upper Compartment Replacement**

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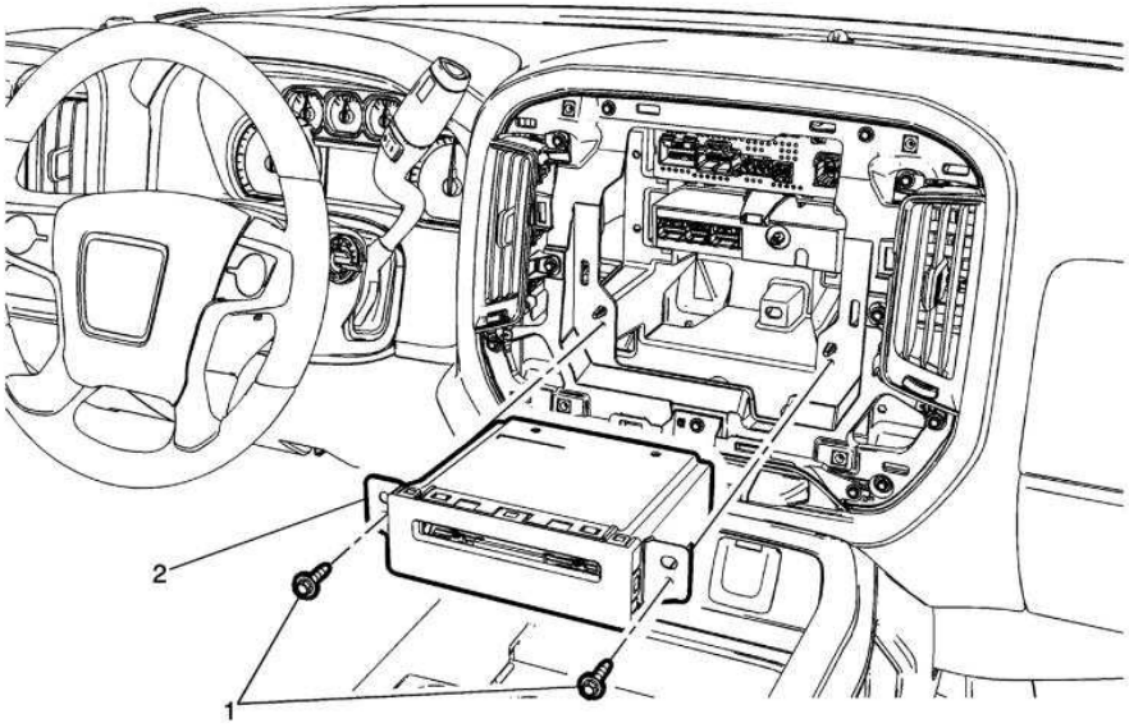
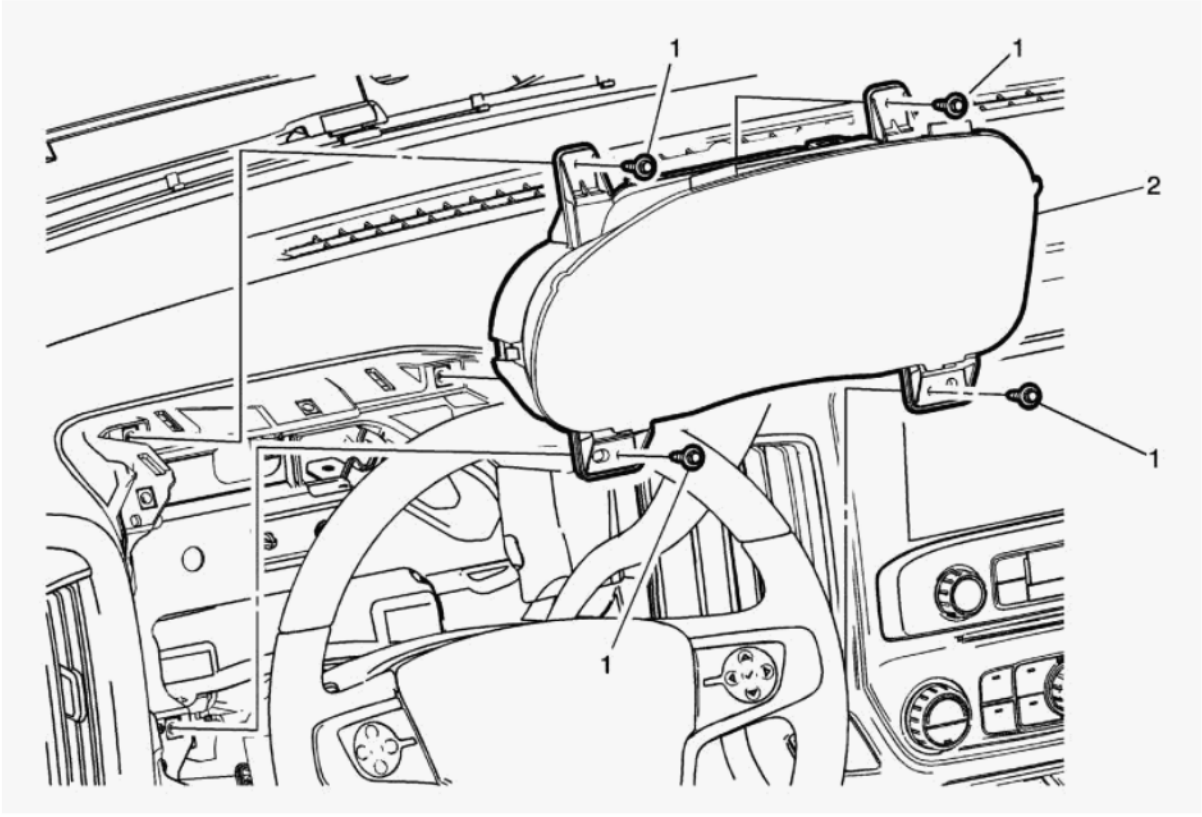


Fig. 250: Audio Disc Player
Courtesy of GENERAL MOTORS COMPANY

12. Audio Disc Player 2 - Install - **Disc Player Replacement (With IO3, IO5, IO6)** **Disc Player Replacement (With IOB)**



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Fig. 251: Instrument Cluster
Courtesy of GENERAL MOTORS COMPANY

13. Instrument Cluster 2 - Install - **Instrument Cluster Replacement**

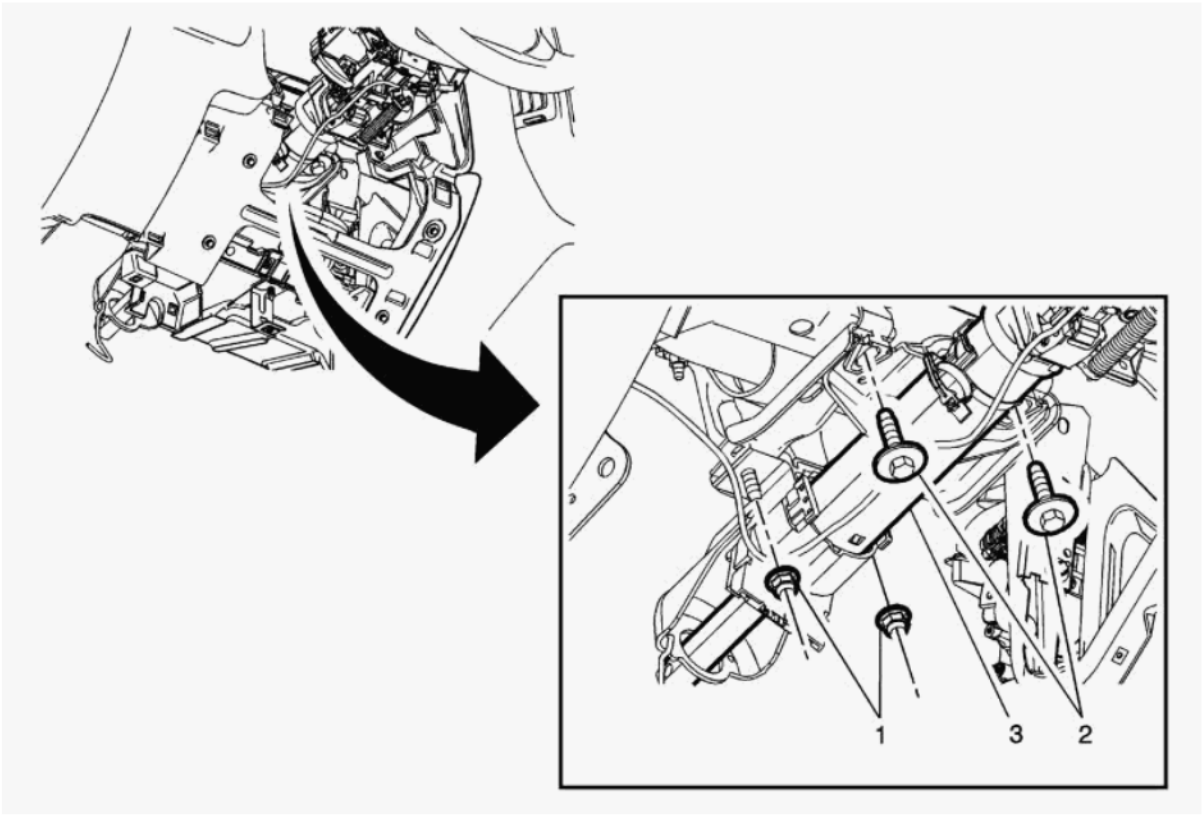


Fig. 252: Steering Column
Courtesy of GENERAL MOTORS COMPANY

14. Steering Column 2 - Install - **Steering Column Replacement**

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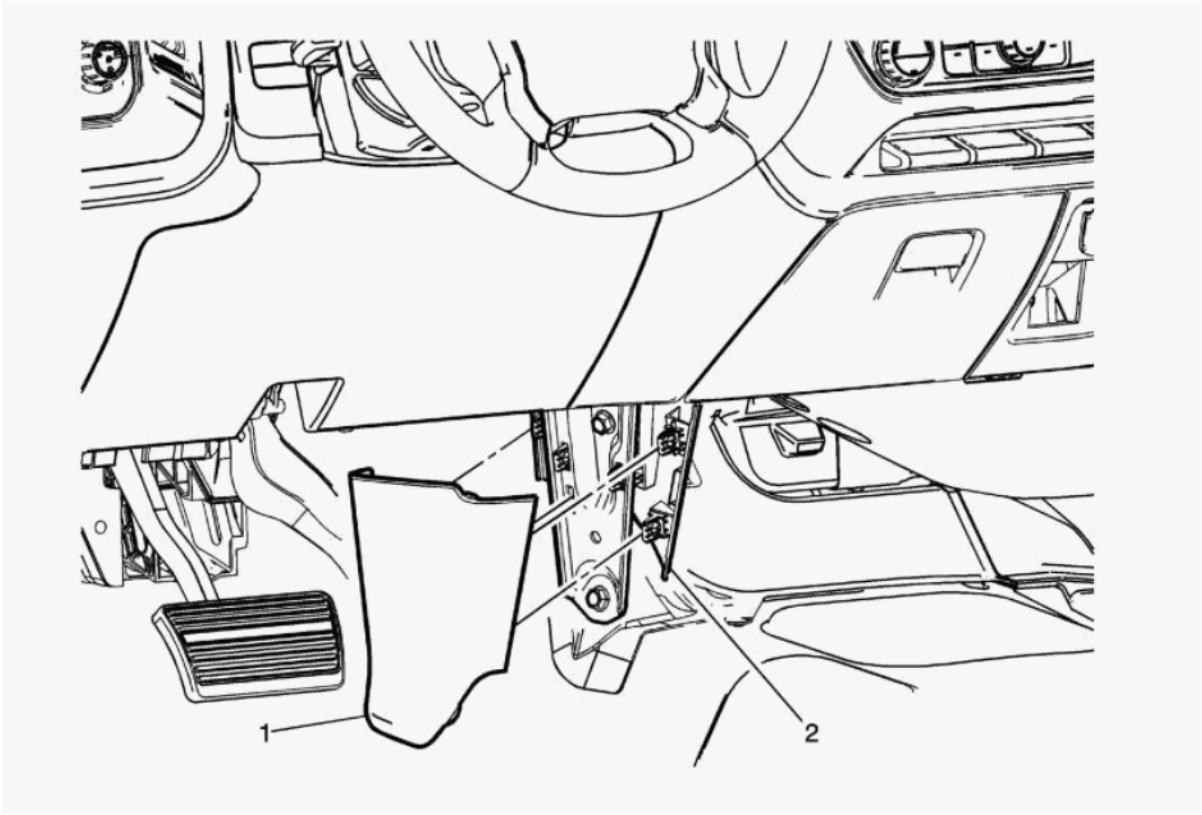
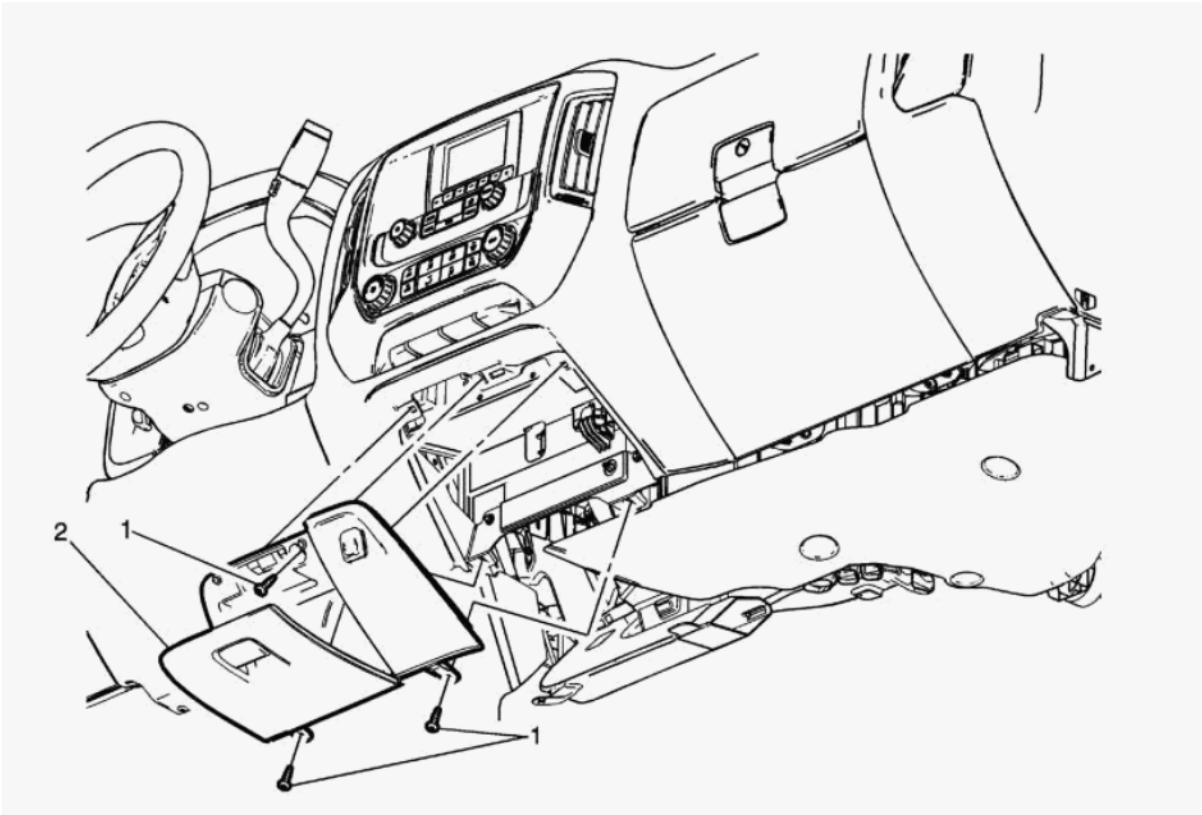


Fig. 253: Instrument Panel Lower Center Trim Panel
Courtesy of GENERAL MOTORS COMPANY

15. { If equipped }Instrument Panel Lower Center Trim Panel 1 & 2 - Install - **Instrument Panel Lower Center Trim Panel Replacement**



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Fig. 254: Instrument Panel Center Compartment
Courtesy of GENERAL MOTORS COMPANY

16. { If equipped }Instrument Panel Center Compartment 2 - Install - **Instrument Panel Center Compartment Replacement**

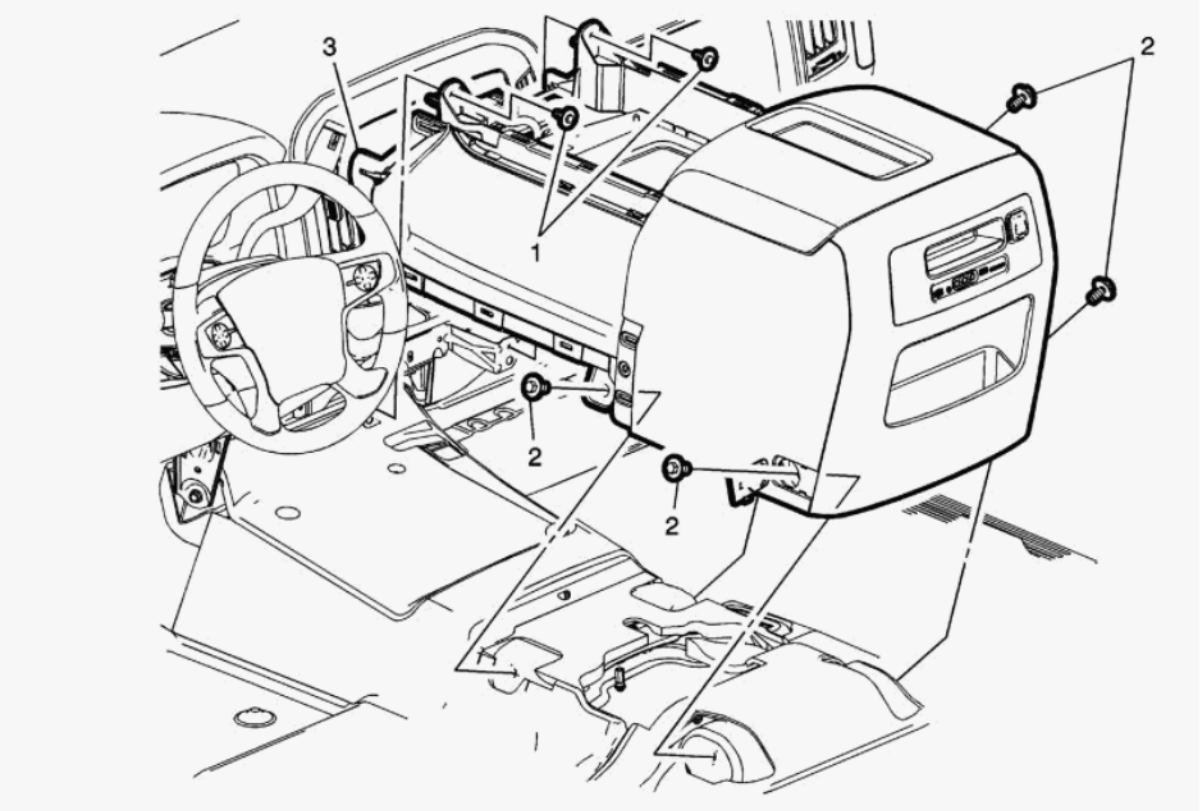


Fig. 255: Front Floor Console
Courtesy of GENERAL MOTORS COMPANY

17. { If equipped }Front Floor Console 3 - Install - **Front Floor Console Assembly Replacement (without HP5)**

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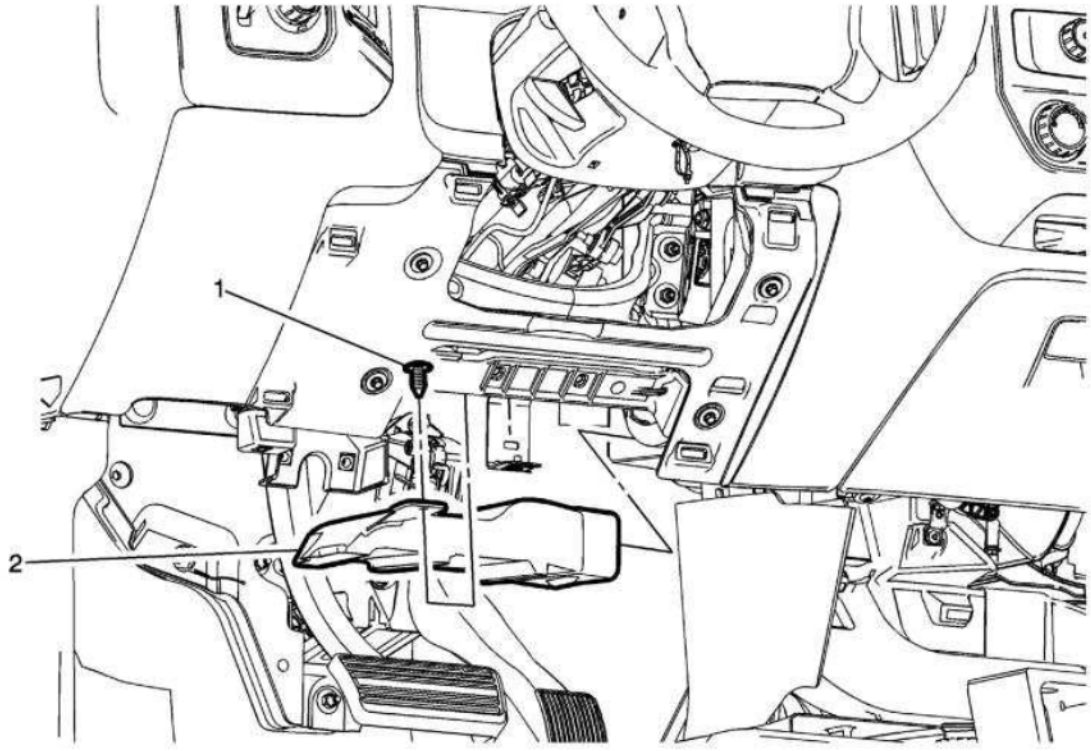
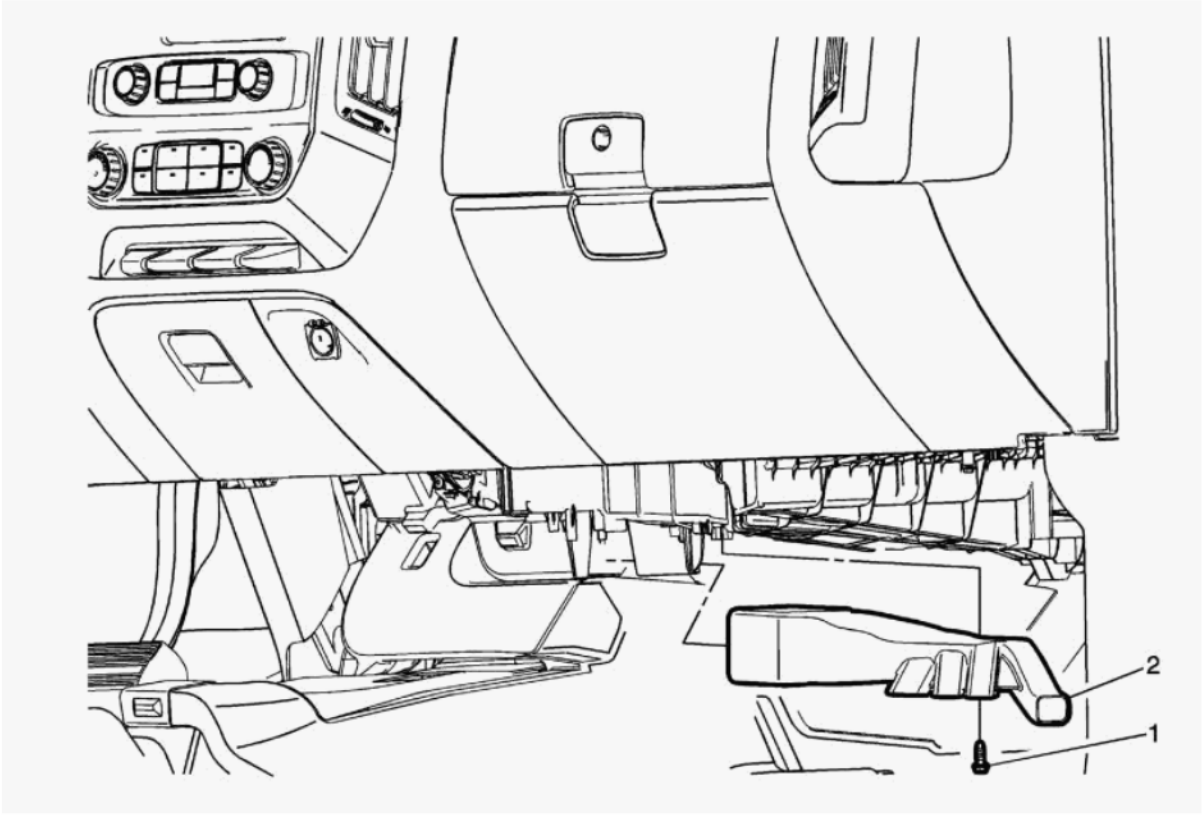


Fig. 256: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

18. Floor Front Air Outlet Duct - Left Side 2 - Install - **Floor Front Air Outlet Duct Replacement - Left Side**



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Fig. 257: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

19. Floor Front Air Outlet Duct - Right Side 2 - Install - **Floor Front Air Outlet Duct Replacement - Right Side**

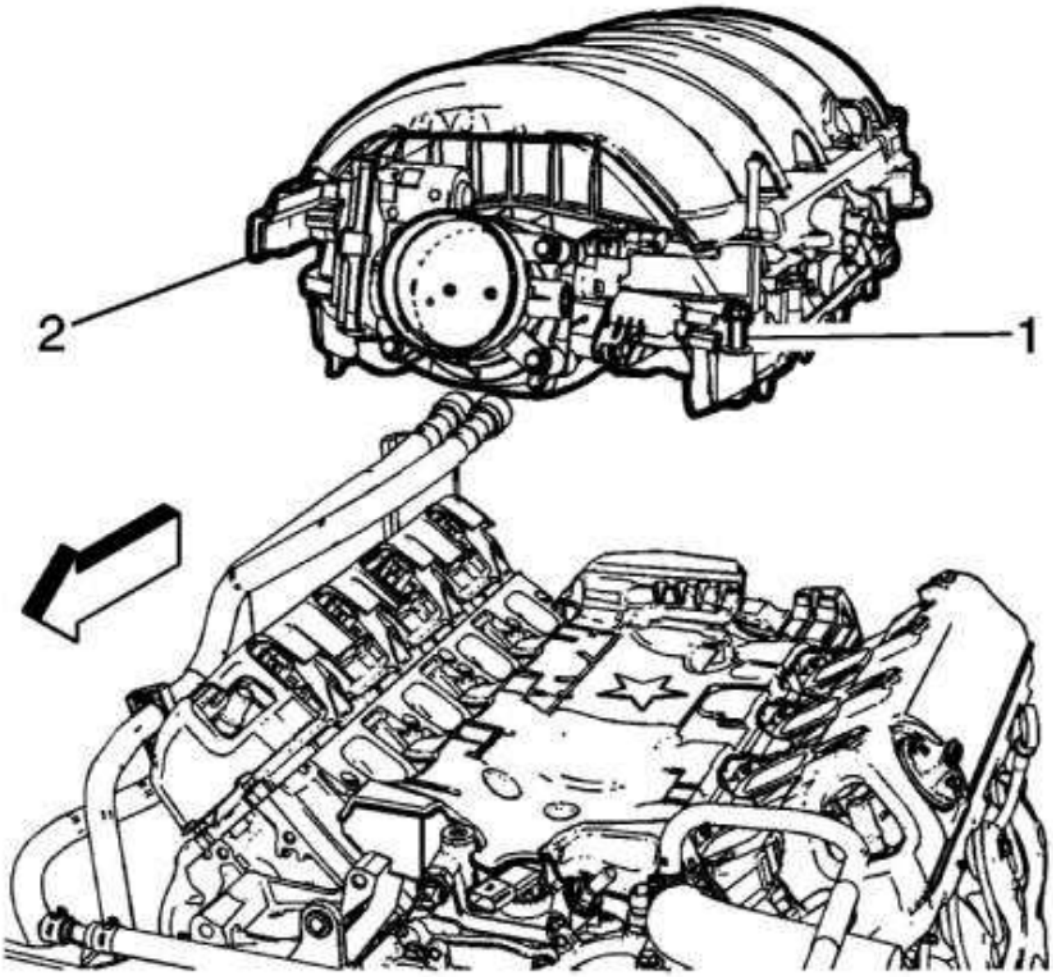


Fig. 258: Intake Manifold Bolts
Courtesy of GENERAL MOTORS COMPANY

20. Intake Manifold 2 - Install - **Intake Manifold Replacement**

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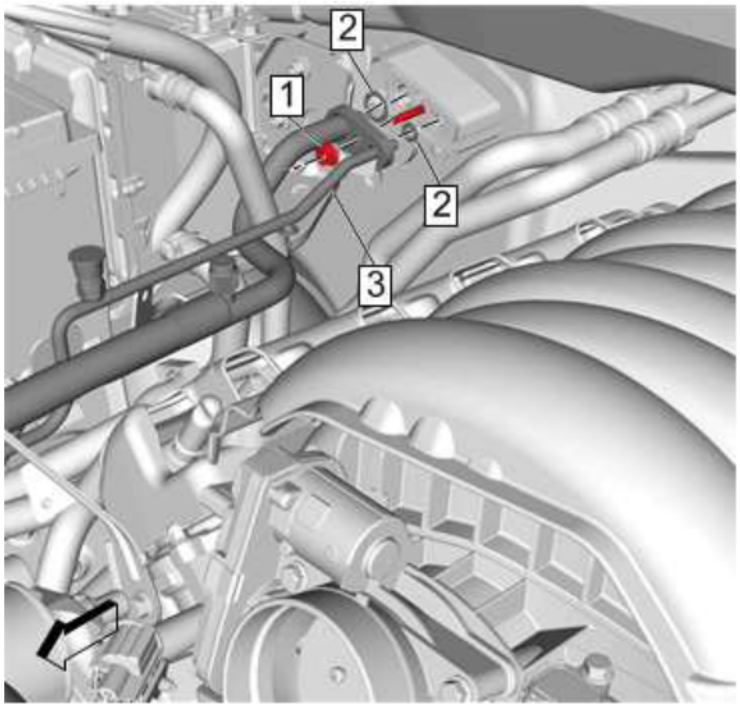


Fig. 259: Air Conditioning Evaporator TubeAnd Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

21. Air Conditioning Evaporator Tube 3 @Air Conditioning Evaporator Thermal Expansion Valve - Install - **Air Conditioning Evaporator Tube Replacement (L8B)**

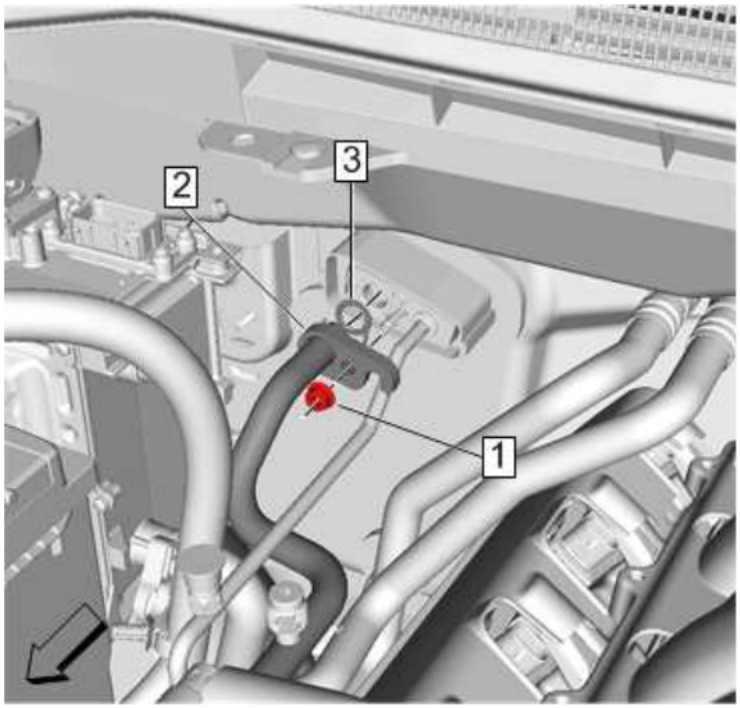


Fig. 260: Air Conditioning Compressor Hose And Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

22. Air Conditioning Compressor Hose 2 @Air Conditioning Evaporator Thermal Expansion Valve - Install - **Air Conditioning Compressor Hose Replacement (L8B)**

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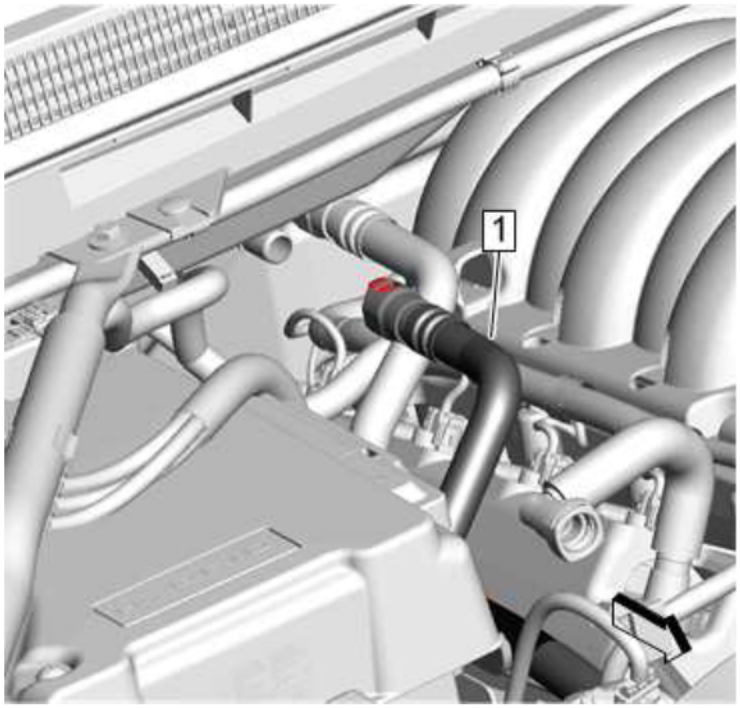


Fig. 261: Heater Outlet Hose And Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

23. Heater Outlet Hose 1 @Heater Core Outlet Tube - Install - **Heater Outlet Hose Replacement (L8B)**

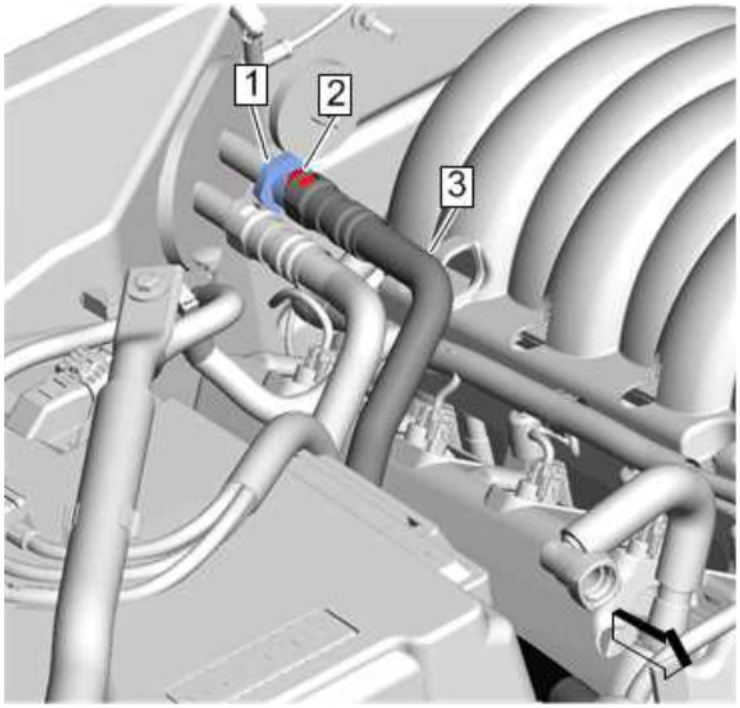


Fig. 262: Heater Inlet Hose And Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

24. Heater Inlet Hose 3 @Heater Core Inlet Tube - Install - **Heater Inlet Hose Replacement (L8B)**

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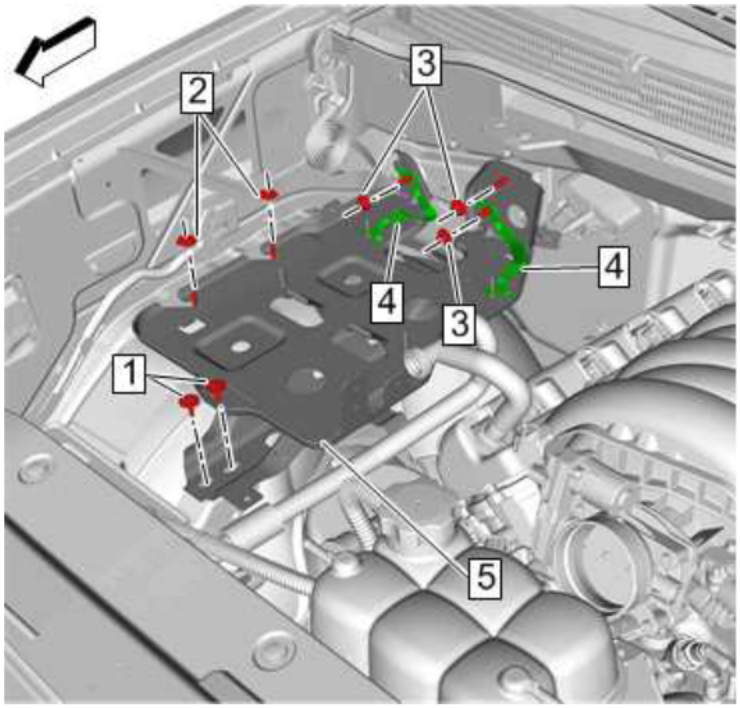


Fig. 263: Accessory DC Power Control Module Tray
Courtesy of GENERAL MOTORS COMPANY

25. Accessory DC Power Control Module Tray 5 - Install - **Accessory DC Power Control Module Tray Replacement**

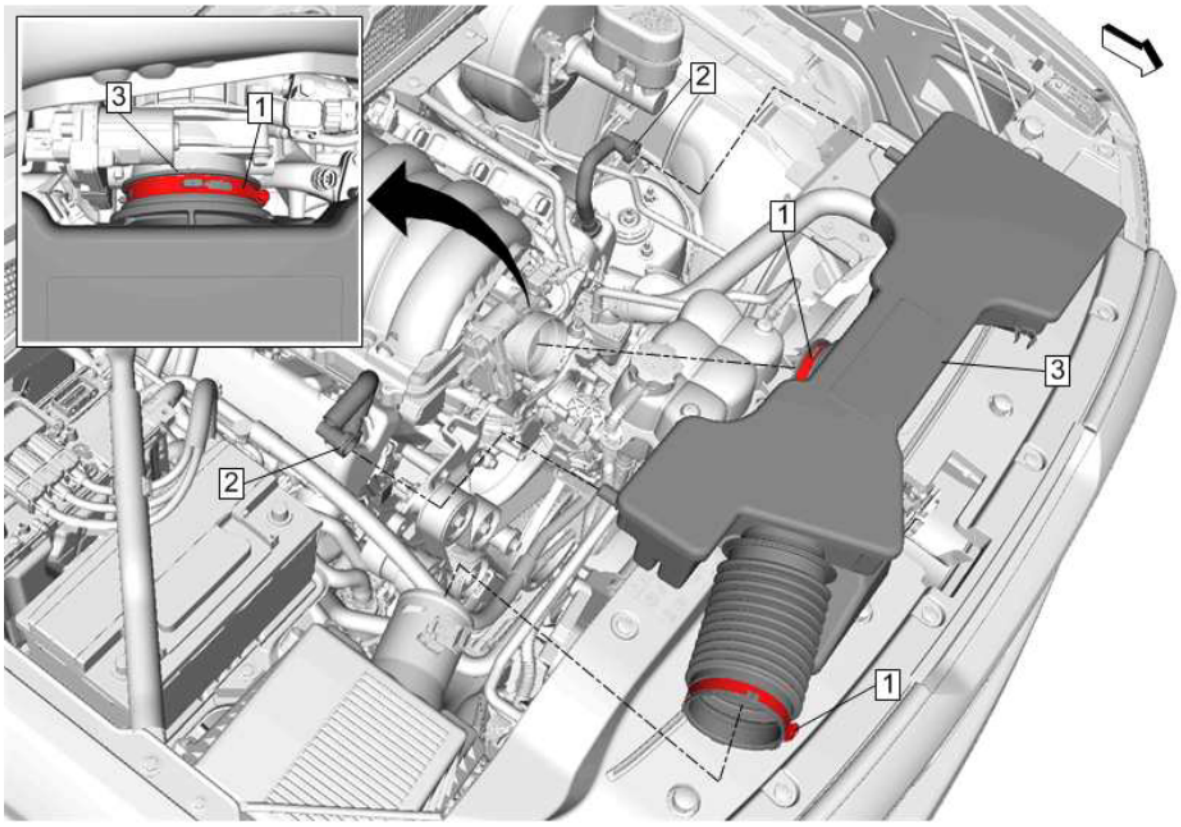


Fig. 264: Air Cleaner Outlet Duct (L8B)
Courtesy of GENERAL MOTORS COMPANY

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26. Air Cleaner Outlet Duct 3 - Install - **Air Cleaner Outlet Duct Replacement**

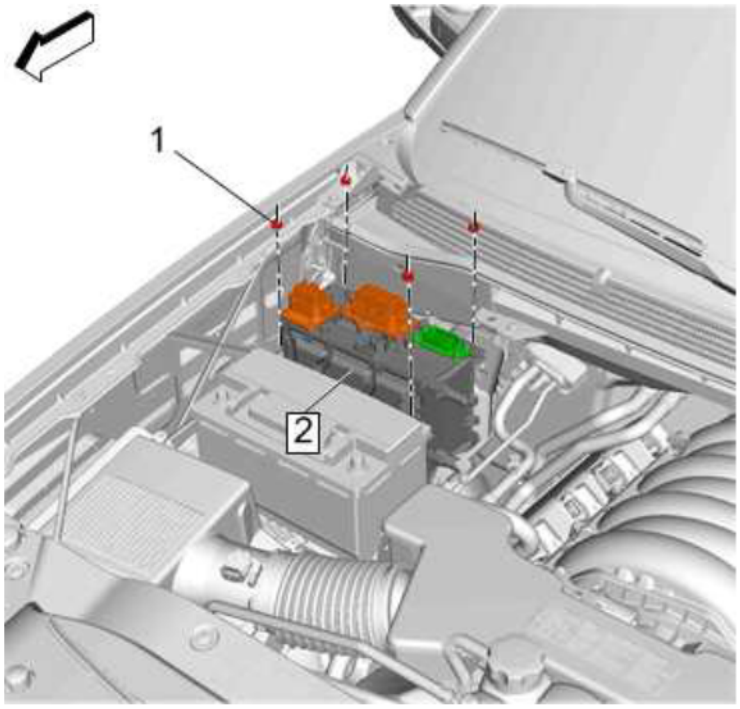


Fig. 265: Generator Control Module
Courtesy of GENERAL MOTORS COMPANY

27. Generator Control Module 2 - Install - **Generator Control Module Replacement**

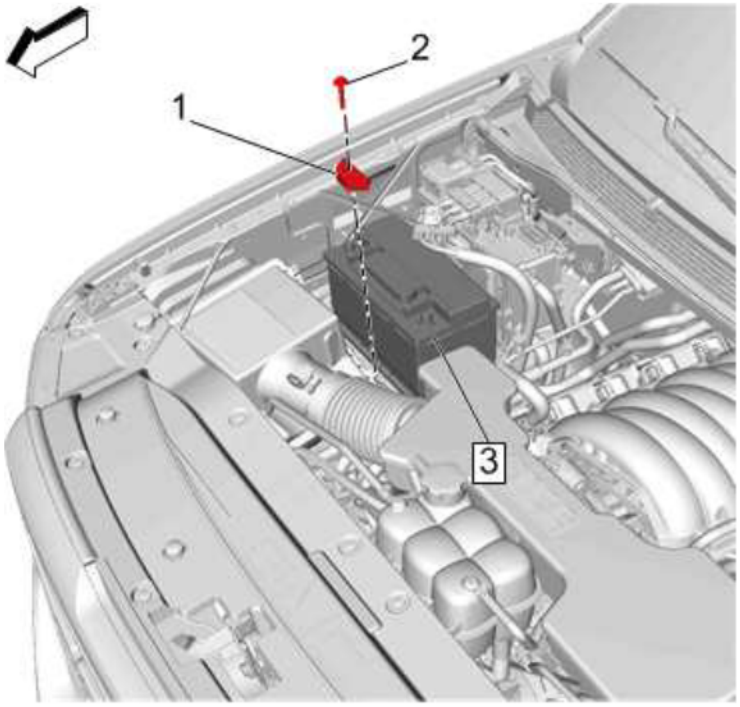


Fig. 266: Battery Hold Down Retainer
Courtesy of GENERAL MOTORS COMPANY

28. Install the battery. 3 **Battery Replacement**

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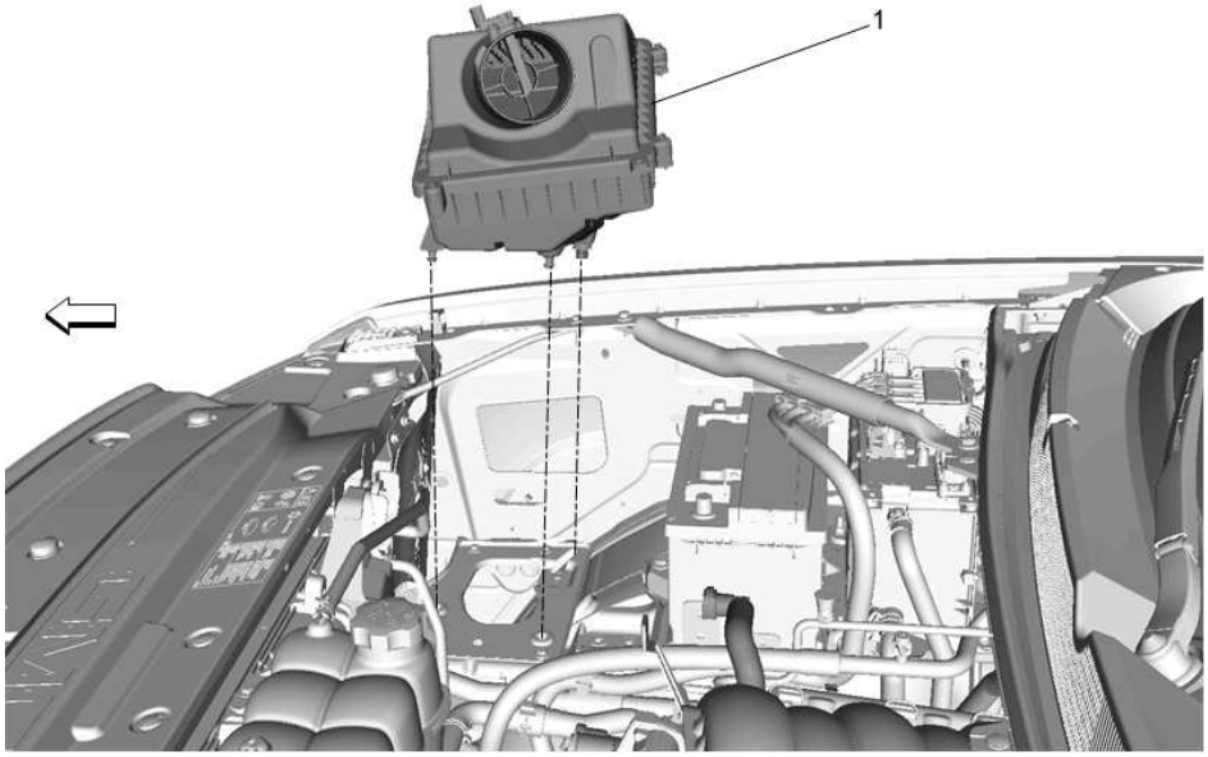


Fig. 267: Air Cleaner Assembly (L8B)
Courtesy of GENERAL MOTORS COMPANY

29. Install the air cleaner assembly. 1 **Air Cleaner Assembly Replacement**
30. Fill the engine coolant system. **Cooling System Draining and Filling (Vac N Fill L8B)**
31. Recharge the refrigerant system. **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
32. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)**
33. Enable the high voltage system. **High Voltage Disabling**
34. Visually inspect for coolant leaks.
35. Visually inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR CASE REPLACEMENT (C67, CJ2)

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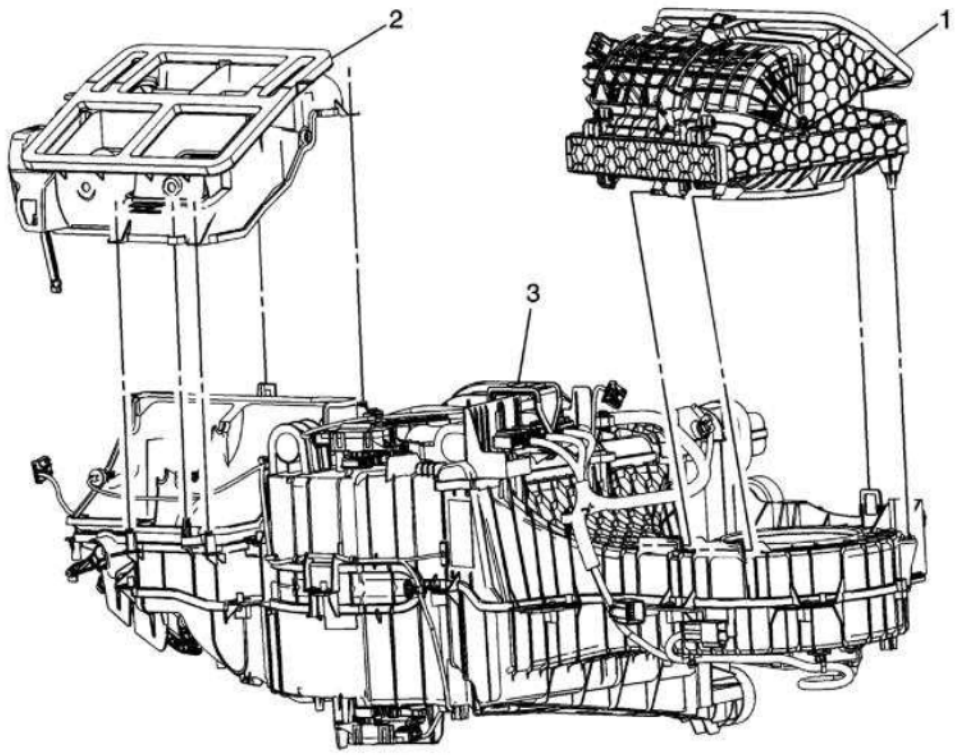


Fig. 268: Heater and Air Conditioning Evaporator Case (C67, CJ2)
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**. 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**.
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**

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Callout	Component Name
	Evaporator Core Replacement (R-134A Heat Stake). 3. Remove the blower motor assembly. Refer to Blower Assembly Replacement. 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 . 6. Transfer the components as necessary.

HEATER AND AIR CONDITIONING EVAPORATOR CASE REPLACEMENT (C42)

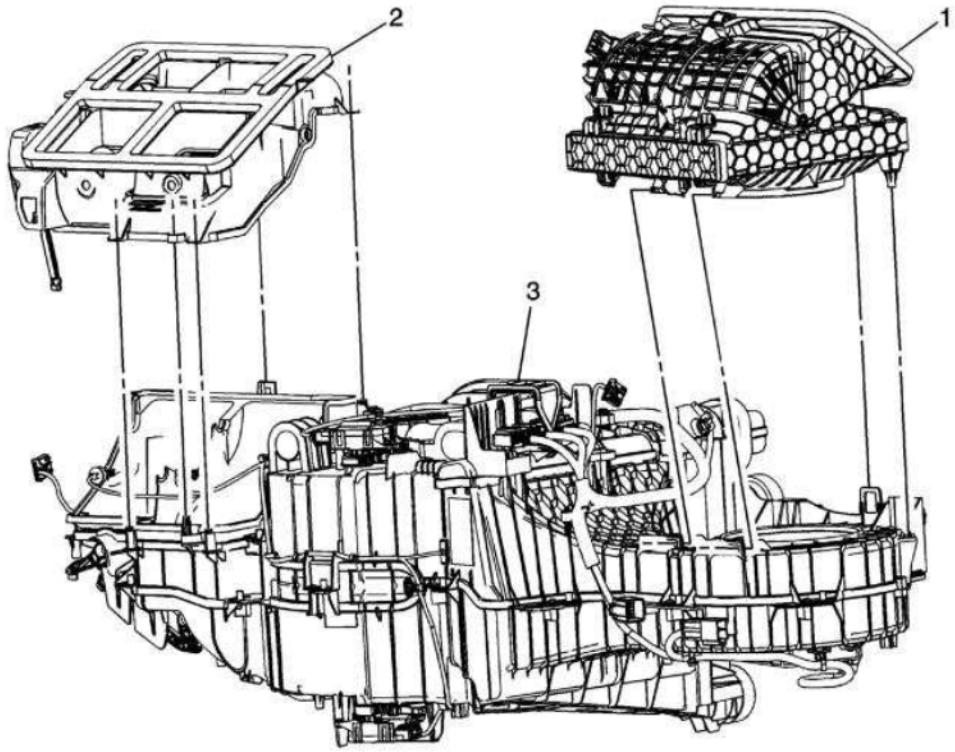


Fig. 269: Heater and Air Conditioning Evaporator Case (C42)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the heater and blower module assembly. Refer to Heater and Blower Module Removal and Installation (With C42 L96)Heater and Blower Module Removal and Installation (With C42, L83, MCX)Heater and Blower Module Removal and Installation (WITH C42, LV3, MCX). 2. Disconnect the electrical connectors as necessary.	
1	Air Inlet Housing Assembly Refer to Air Inlet Housing Replacement.

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Callout	Component Name
2	Air Distributor Case Assembly Refer to **Air Distributor Case Replacement**.
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 blower motor assembly. Refer to **Blower Assembly Replacement**. 3. Remove the temperature valve actuator. Refer to **Temperature Valve Actuator Replacement** . 4. Transfer the components as necessary.

BLOWER ASSEMBLY REPLACEMENT

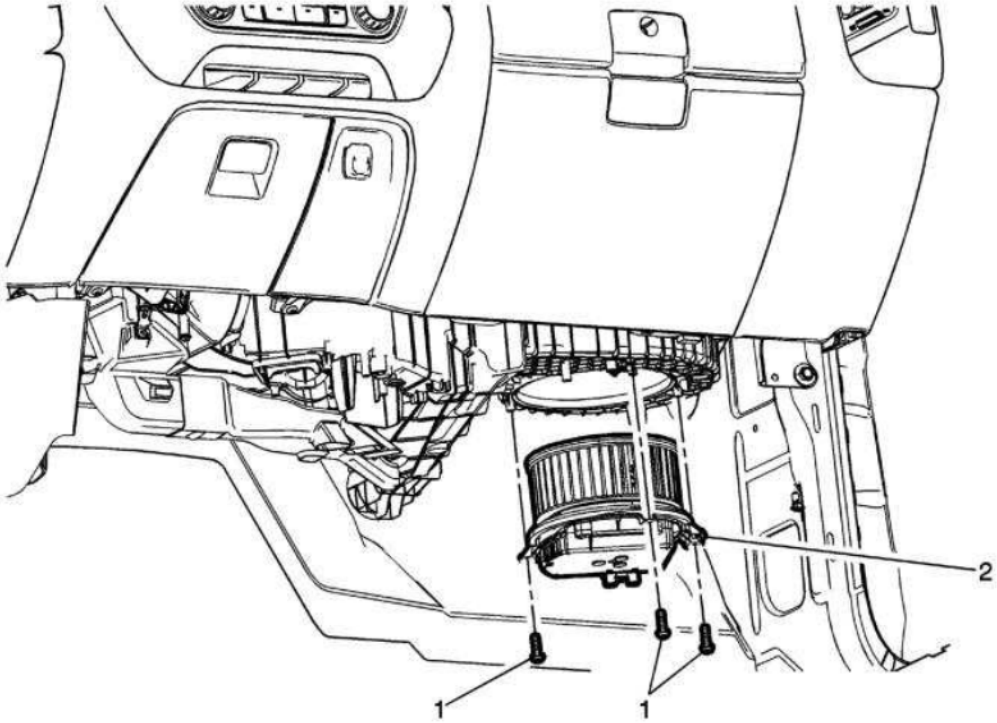


Fig. 270: Blower Assembly
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (RPO D07) Instrument Panel Insulator Replacement (Without RPO D07)** .	
1	Blower Motor Fastener (Qty: 3) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution .
2	Blower Motor Assembly **Procedure** Disconnect the blower motor assembly electrical connector.

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

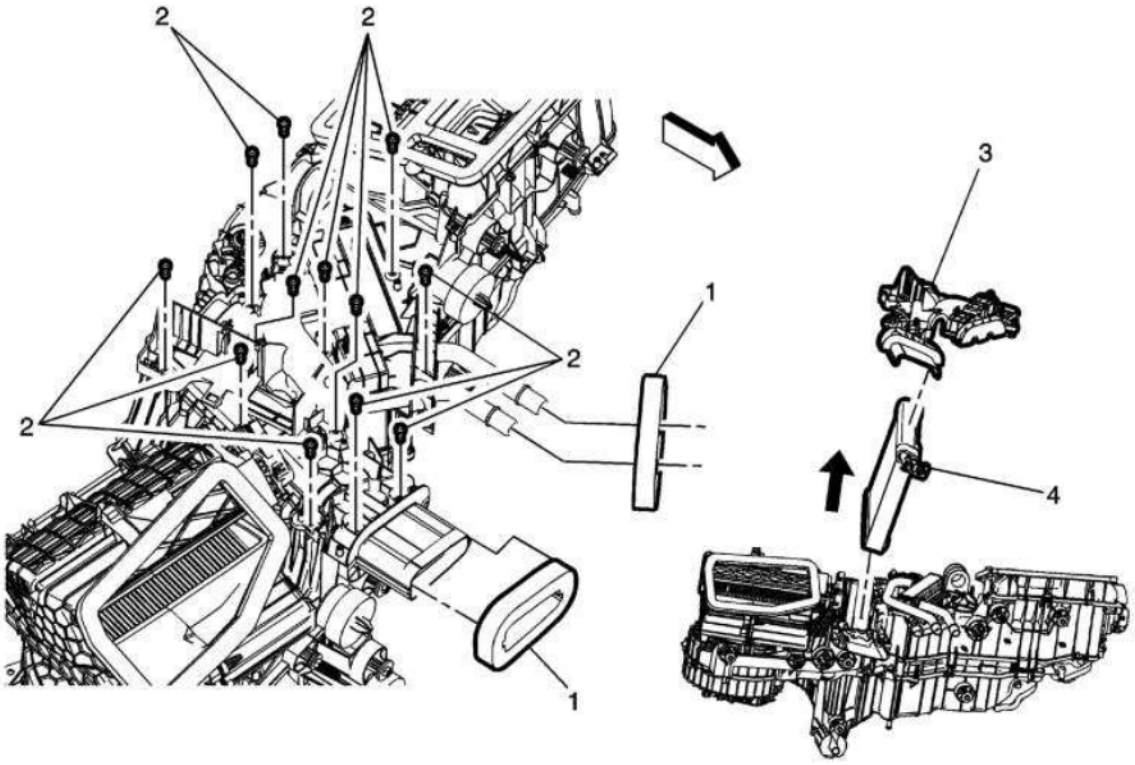


Fig. 271: Air Conditioning Evaporator Core (R-134A Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5) 2. Temperature Valve Actuator Replacement 3. Heater and Air Conditioning Remote Control Replacement 4. Disconnect the electrical connectors.	
1	Seal (Qty: 2)

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Callout	Component Name
2	Heater Cover Fastener (Qty: 12) **CAUTION:** **Refer to Fastener Caution .**
3	Heater Cover
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 .**

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 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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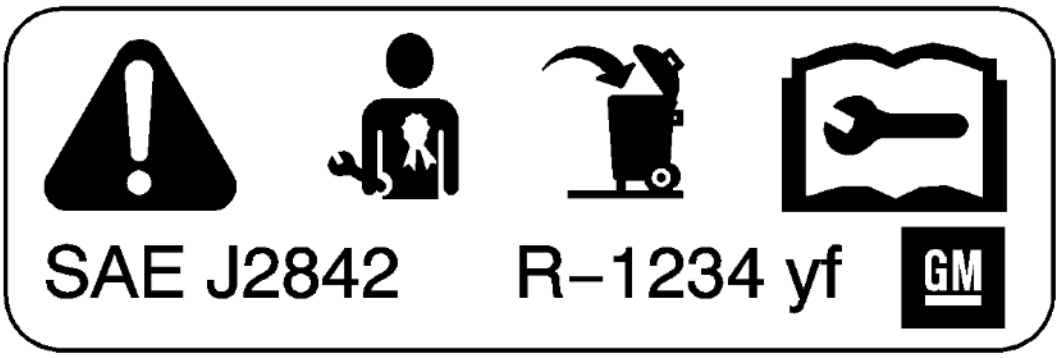


Fig. 272: Replacement Evaporator Label
Courtesy of GENERAL MOTORS COMPANY

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.

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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.

Removal Procedure

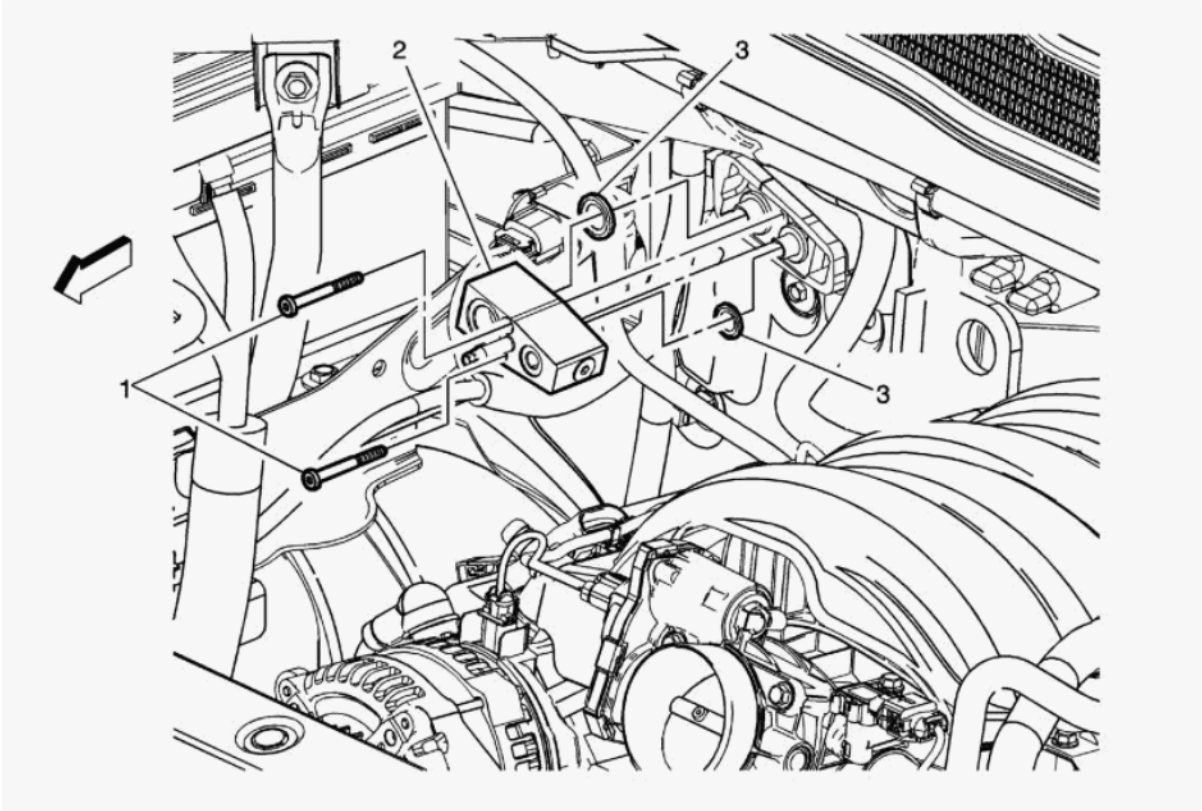


Fig. 273: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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

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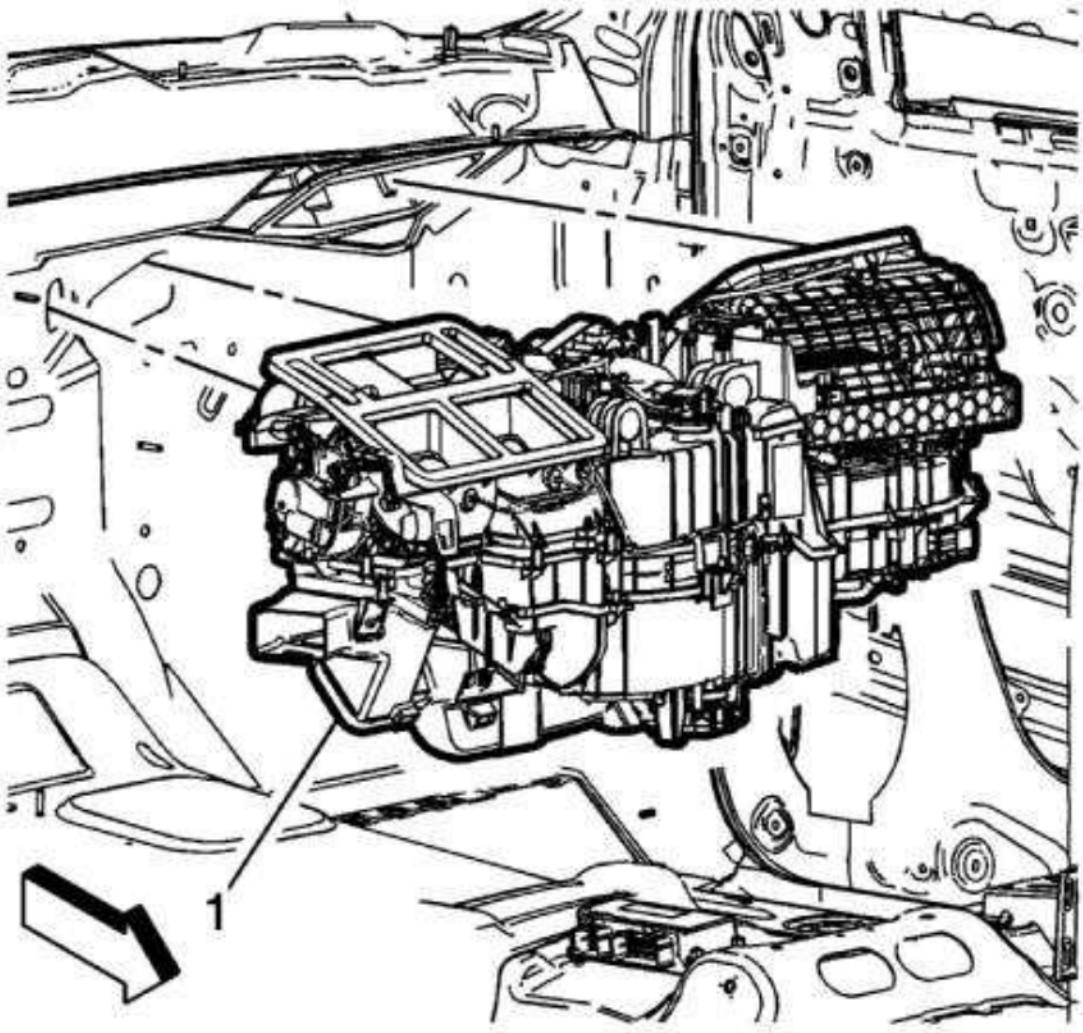


Fig. 274: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Module 1 - Remove - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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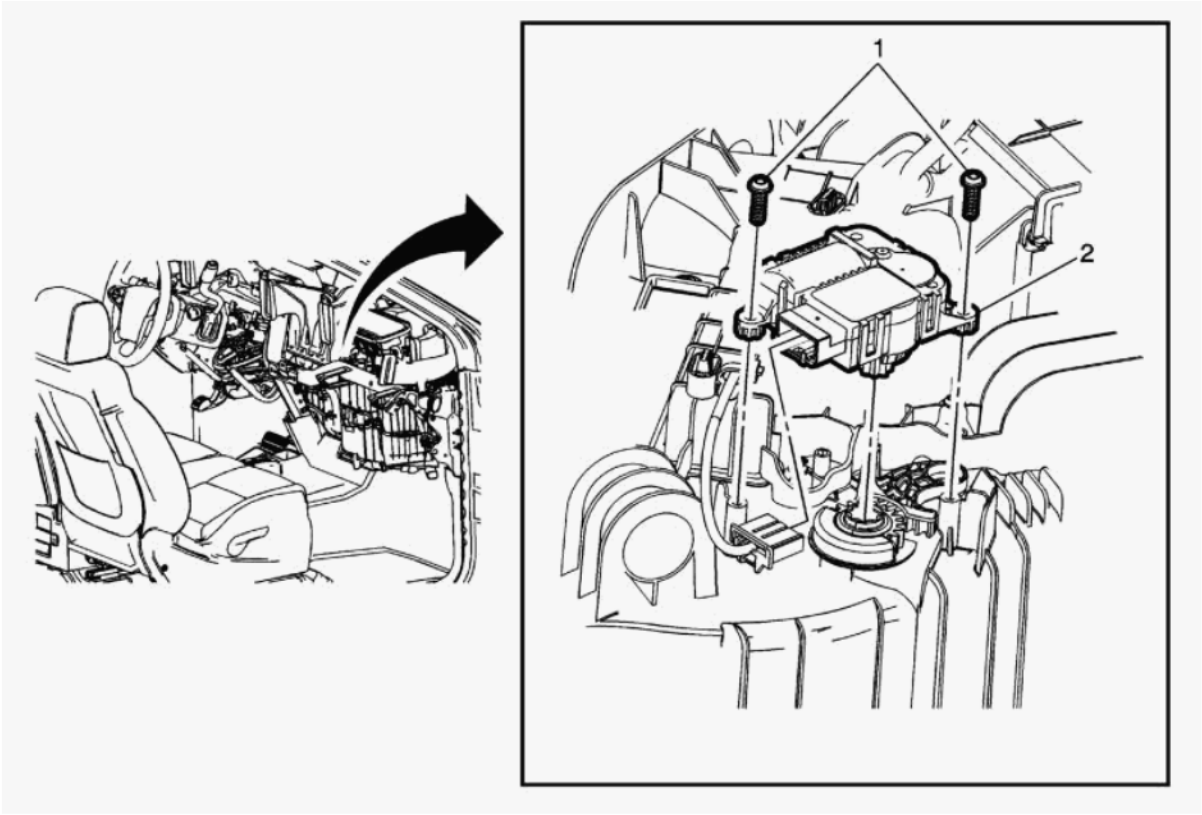
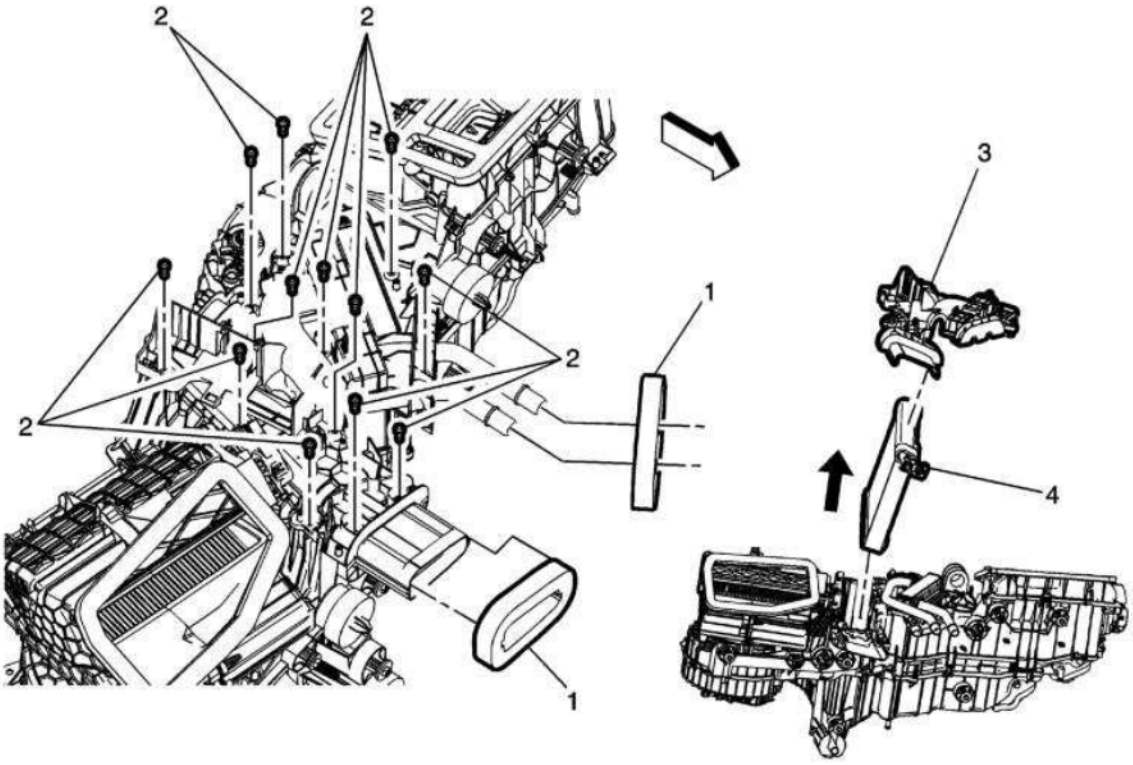


Fig. 275: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

3. Temperature Valve Actuator 2 - Remove - **Temperature Valve Actuator Replacement**
4. Disconnect the electrical connectors.



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Fig. 276: Air Conditioning Evaporator Core (R-134A Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

5. Heater and Air Conditioning Evaporator and Blower Module Seal 1 - Remove
6. Heater and Air Conditioning Evaporator and Blower Module Bolt (2) - Remove
7. Heater Cover 3 - Remove
8. Air Conditioning Evaporator Core 4 - Remove
9. Transfer components as necessary.

Installation Procedure

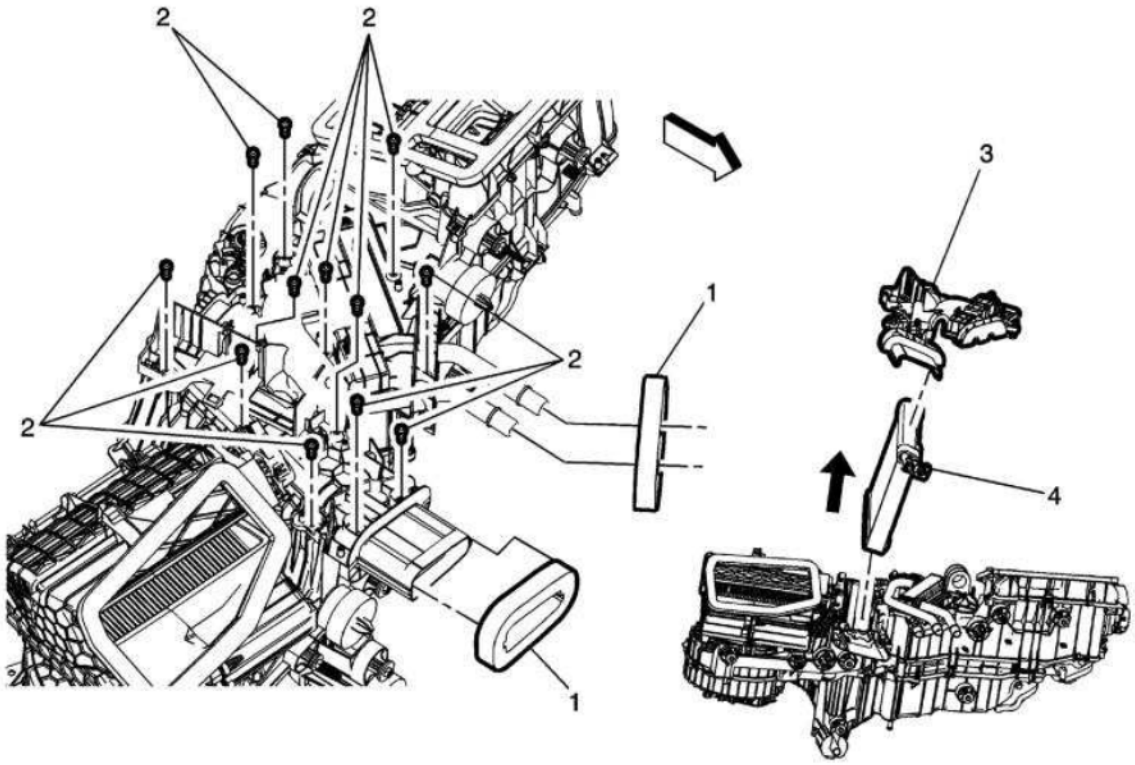


Fig. 277: Air Conditioning Evaporator Core (R-134A Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Evaporator Core 4 - Install
2. Heater Cover 3 - Install

CAUTION: Refer to Fastener Caution .

3. Heater and Air Conditioning Evaporator and Blower Module Bolt(2)Â»Install and tighten [12x] 2. N.m (18 lb in)
4. Heater and Air Conditioning Evaporator and Blower Module Seal 1 - Install
5. Connect the electrical connectors.

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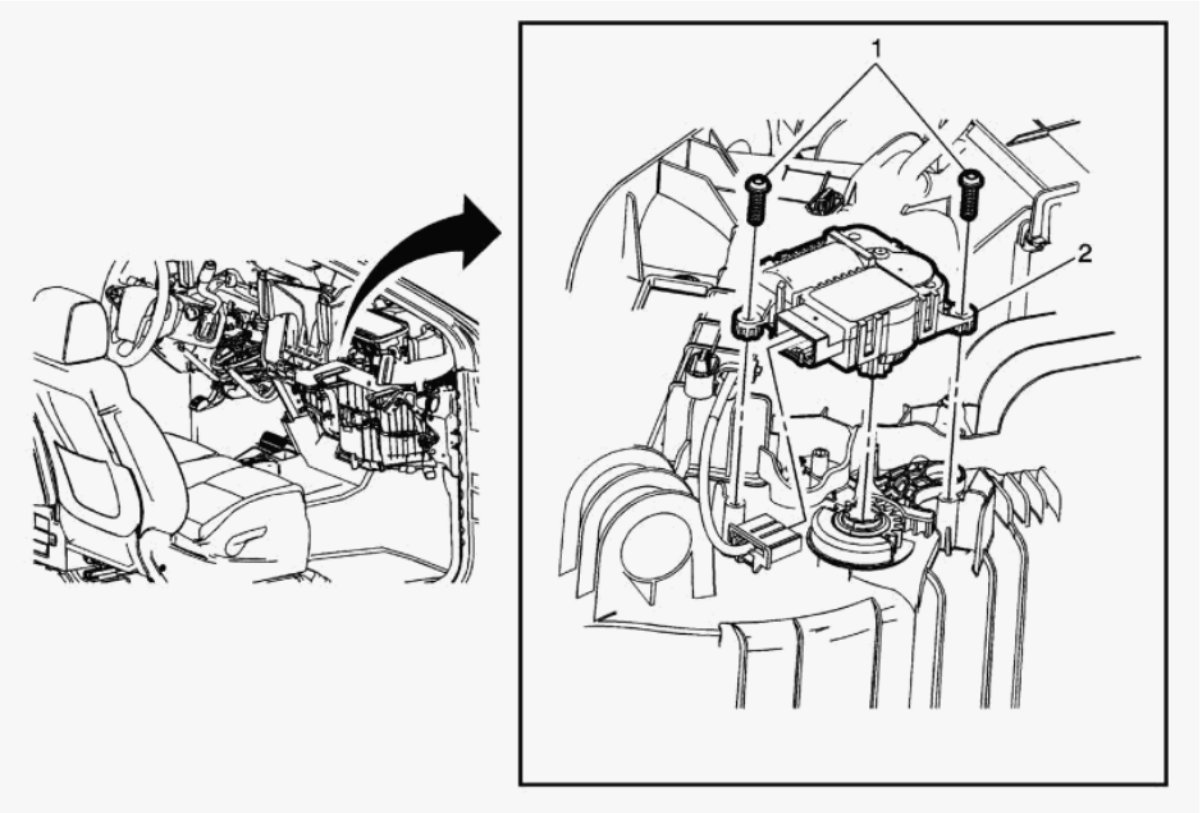


Fig. 278: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Temperature Valve Actuator 2 - Install - **Temperature Valve Actuator Replacement**

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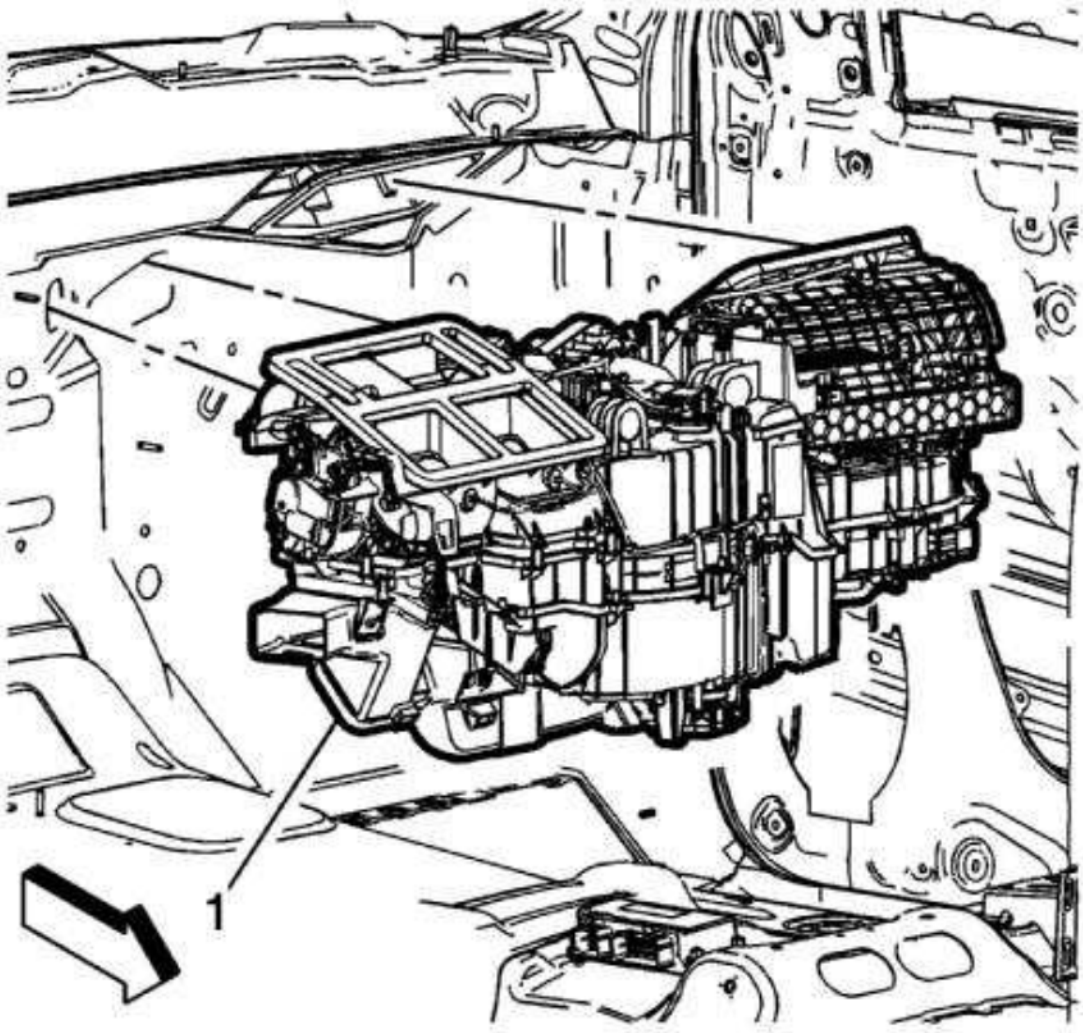


Fig. 279: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

7. Heater and Air Conditioning Evaporator and Blower Module 1 - Install - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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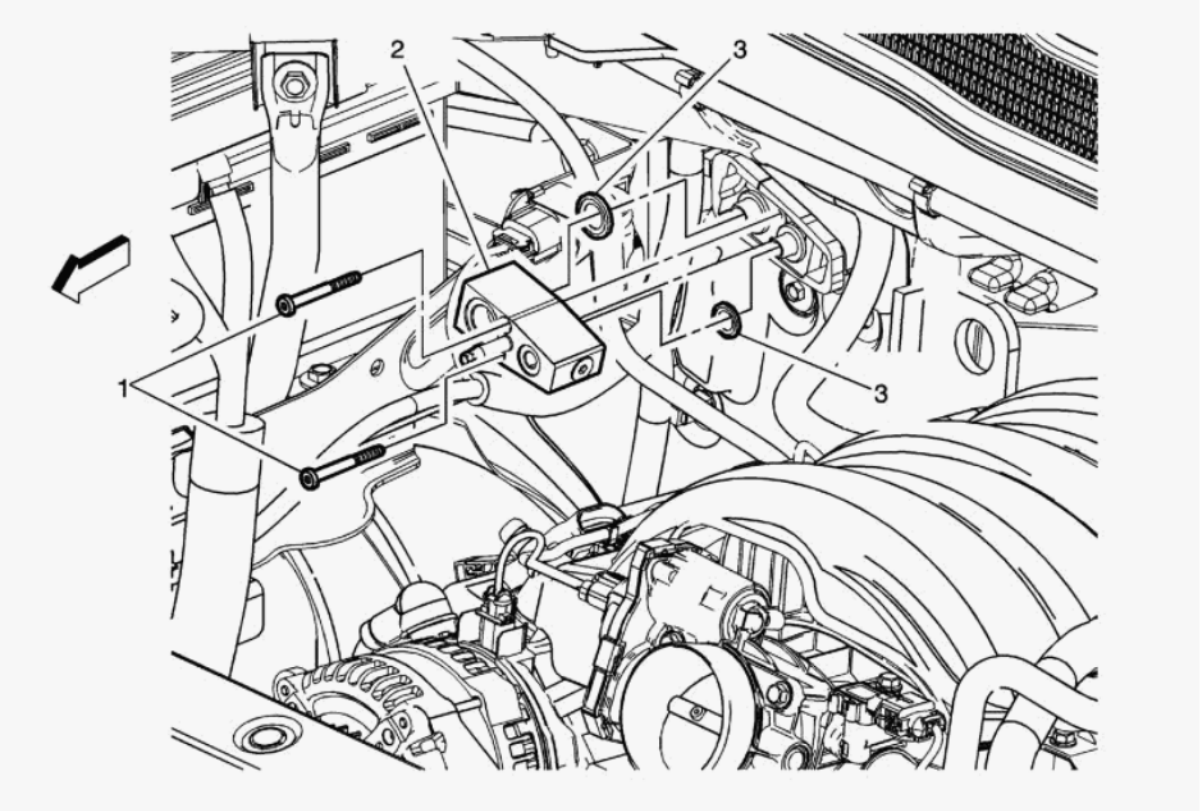


Fig. 280: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Evaporator Thermal Expansion Valve 2 - Install - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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 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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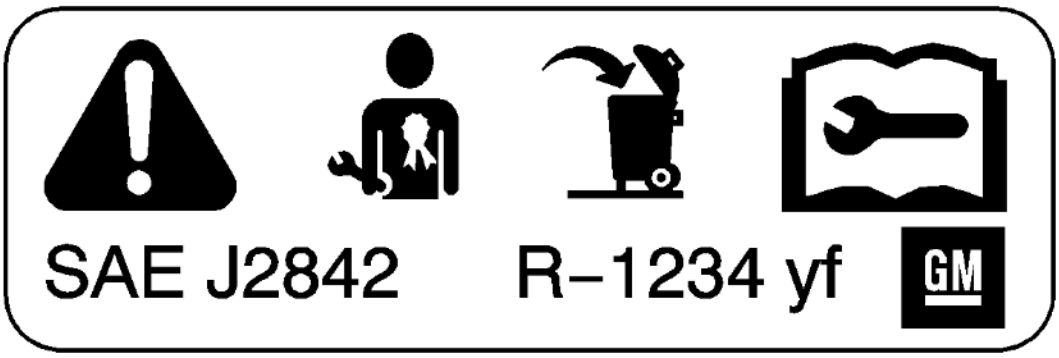


Fig. 281: Replacement Evaporator Label
Courtesy of GENERAL MOTORS COMPANY

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.

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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.

Removal Procedure

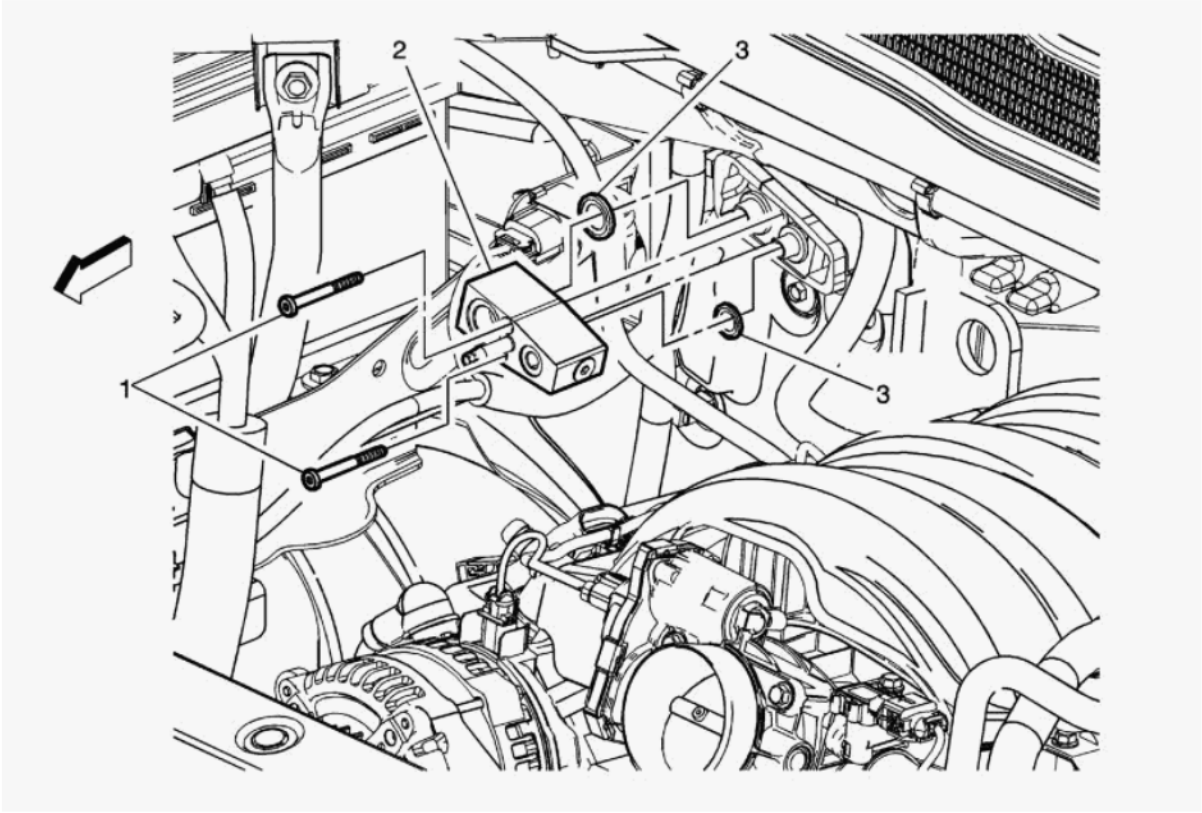


Fig. 282: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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

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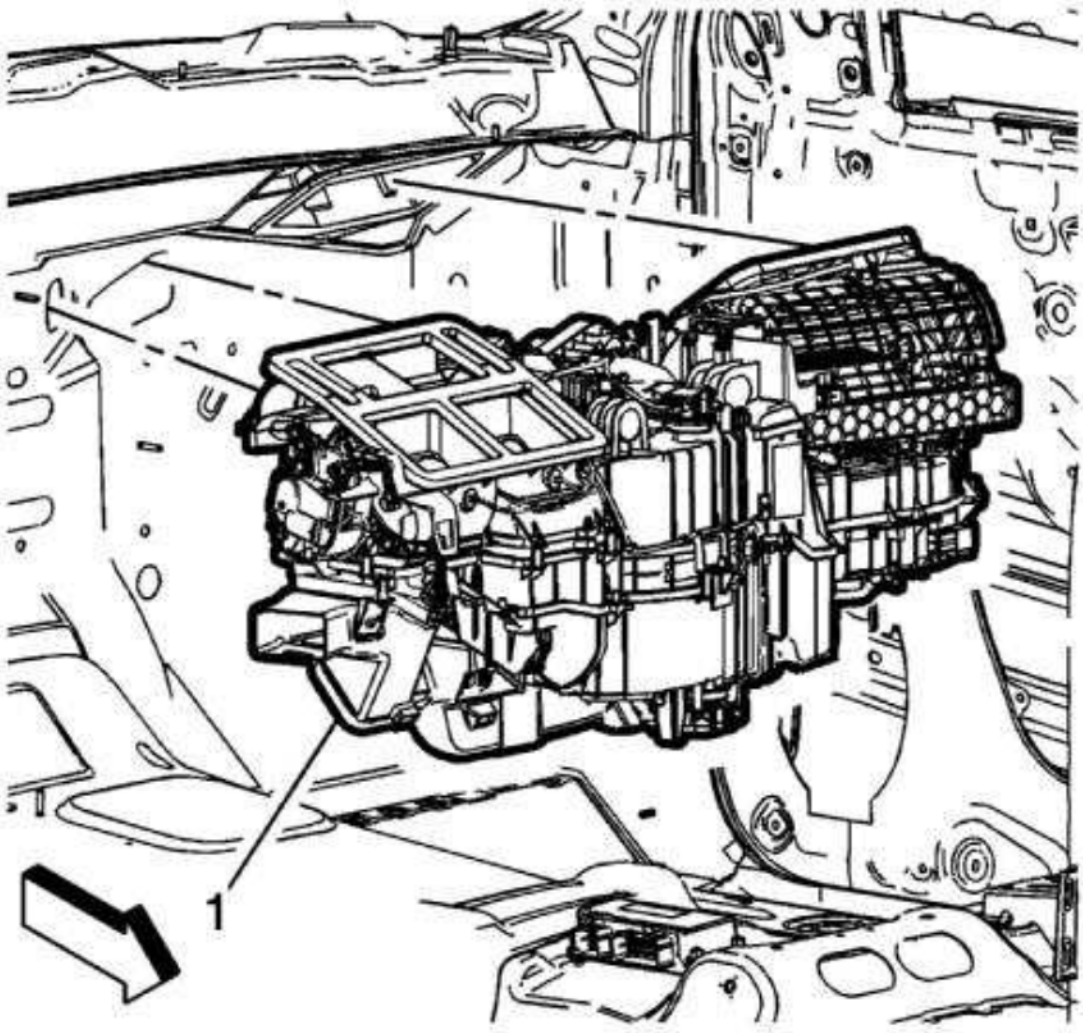


Fig. 283: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Module 1 - Remove - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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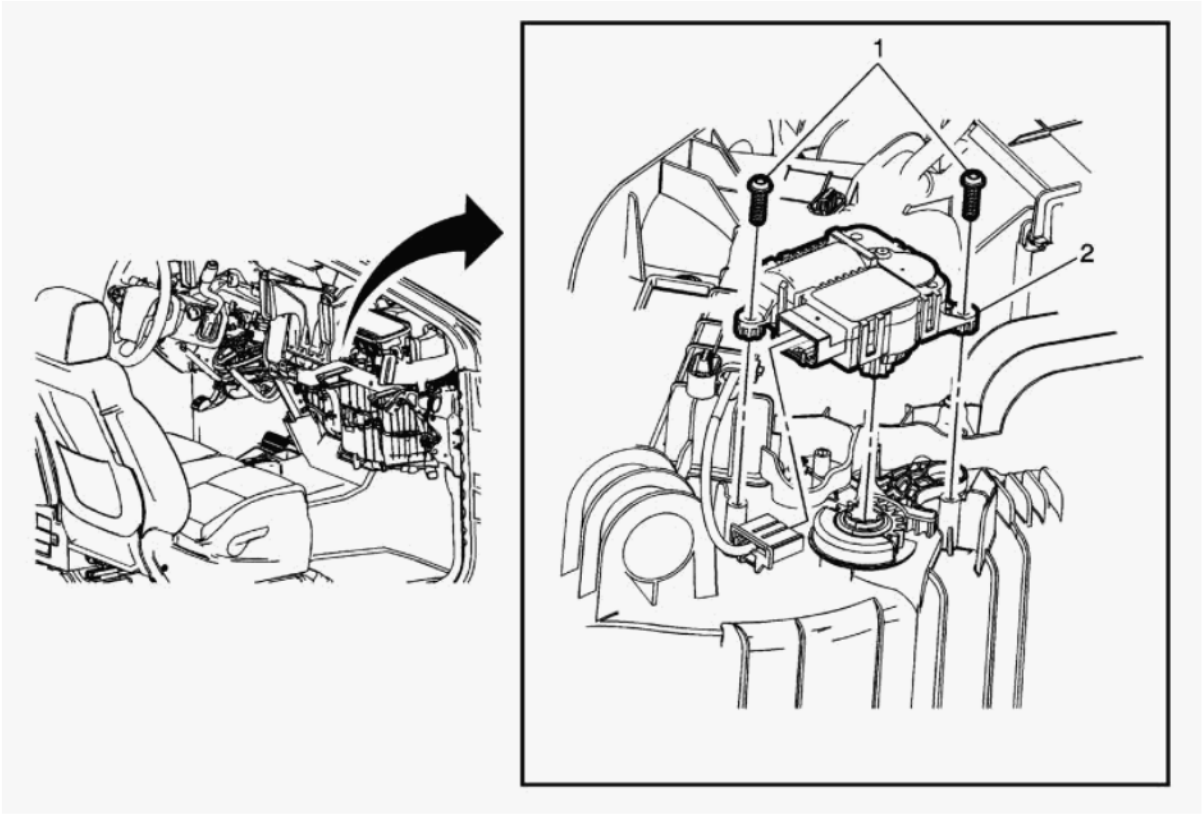
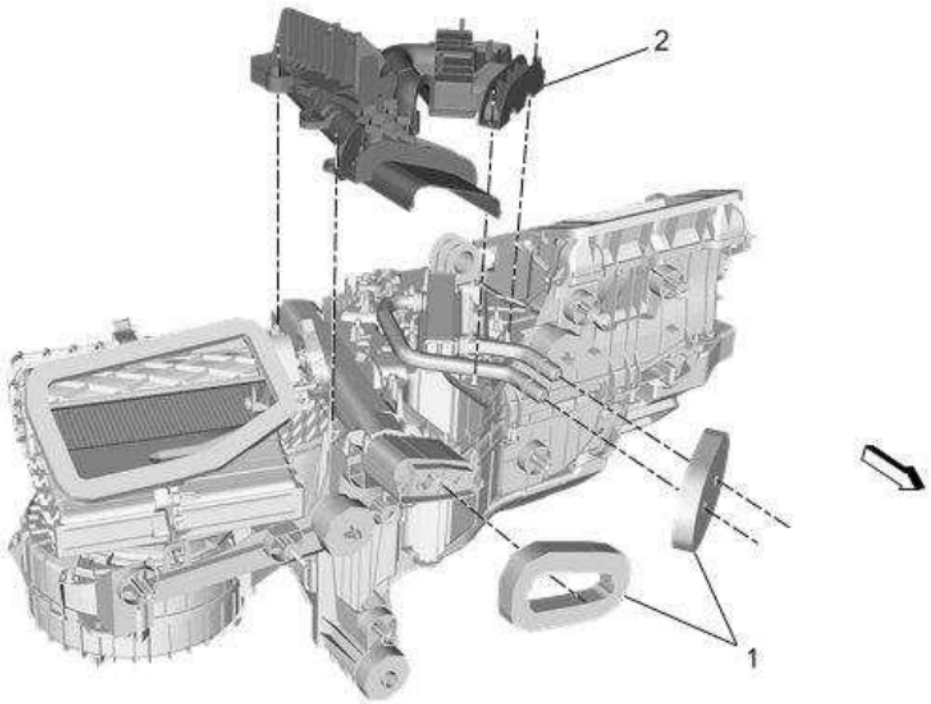


Fig. 284: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

3. Temperature Valve Actuator 2 - Remove - **Temperature Valve Actuator Replacement**
4. Disconnect the electrical connectors.



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Fig. 285: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

5. Heater and Air Conditioning Evaporator and Blower Module Seal 1 - Remove
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. Heater Cover 2 - Remove

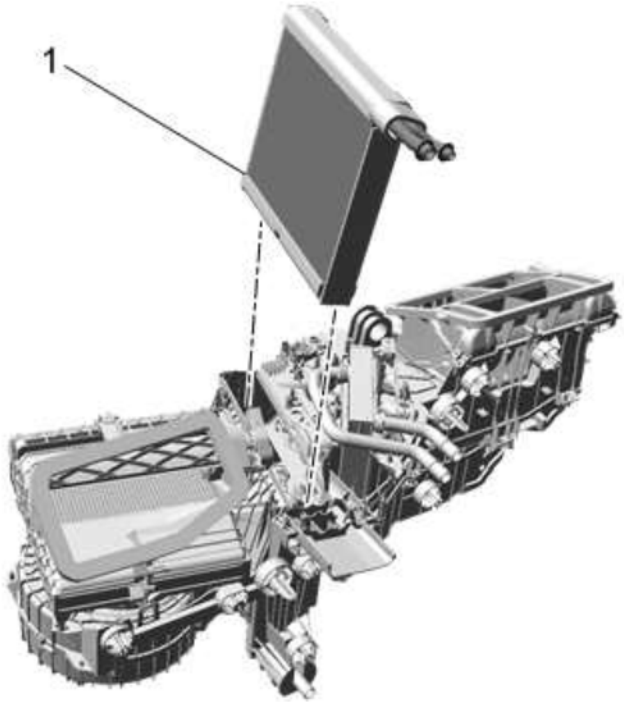


Fig. 286: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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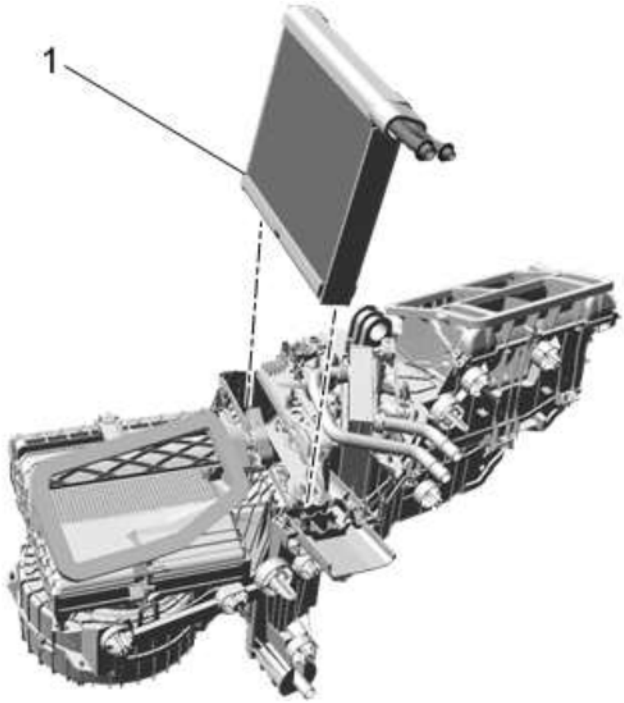


Fig. 287: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Evaporator Core 1 - Install

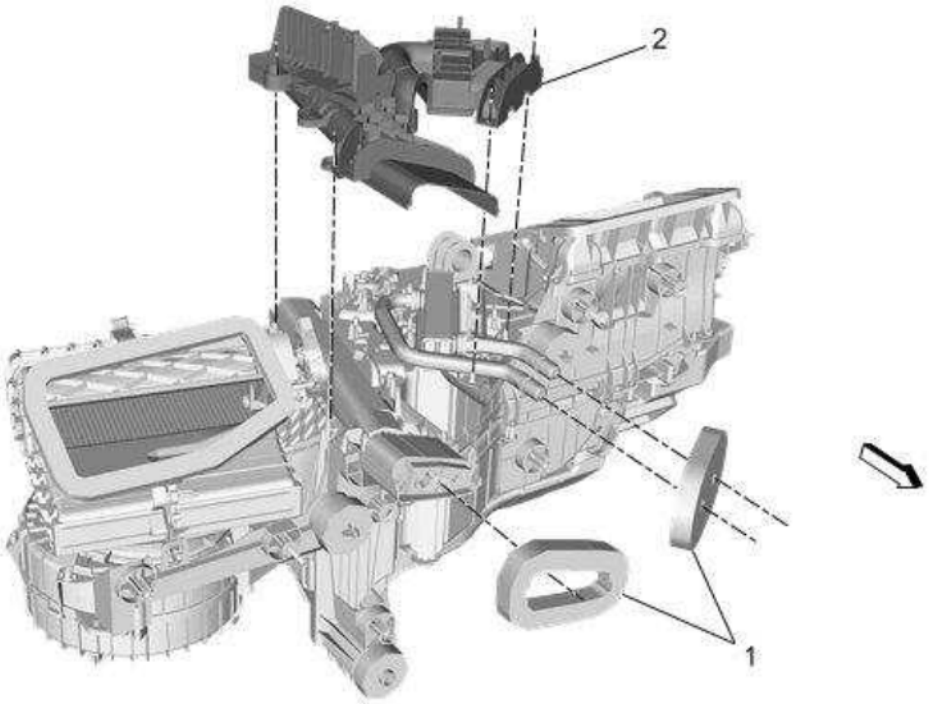


Fig. 288: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

2. Heater Cover 2 - Install

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CAUTION: **Refer to Fastener Caution .**

3. Use 12 M4X 1.79X16 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.
4. Heater and Air Conditioning Evaporator and Blower Module Seal 1 - Install (x2)
5. Connect the electrical connectors.

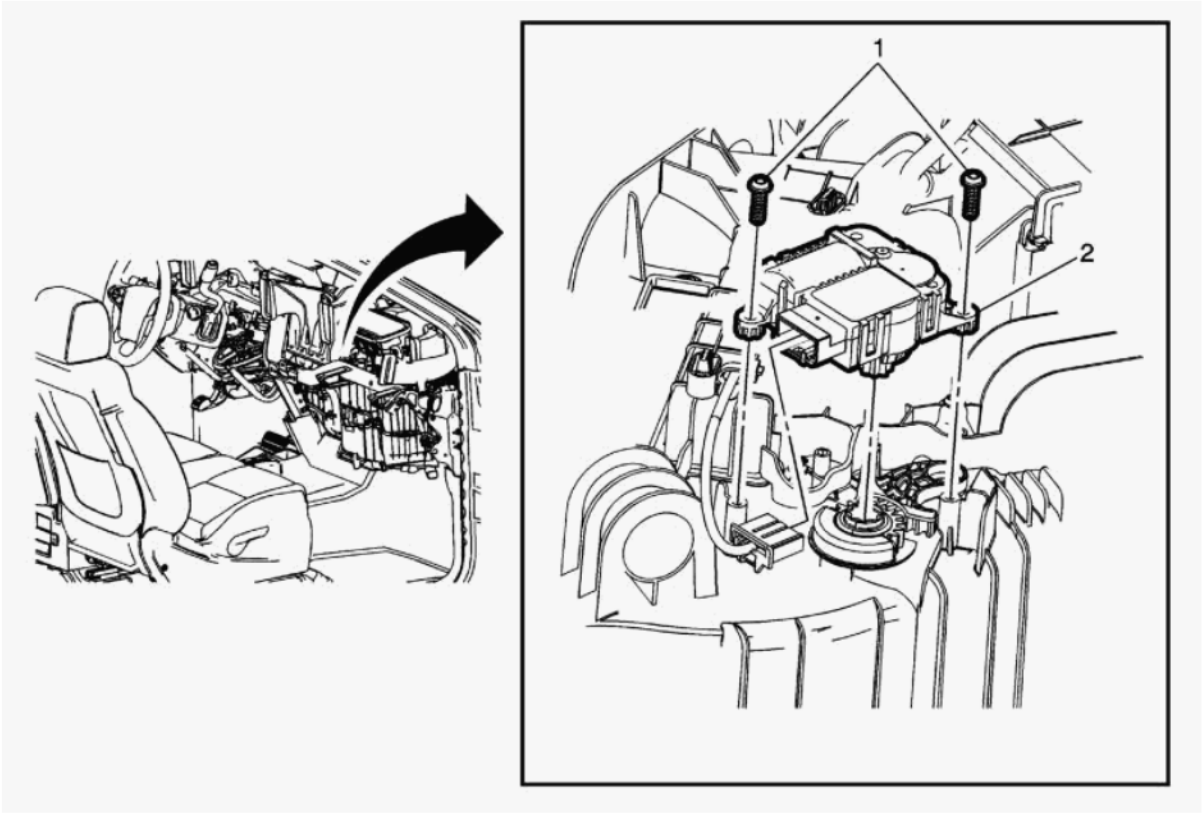


Fig. 289: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Temperature Valve Actuator 2 - Install - **Temperature Valve Actuator Replacement**

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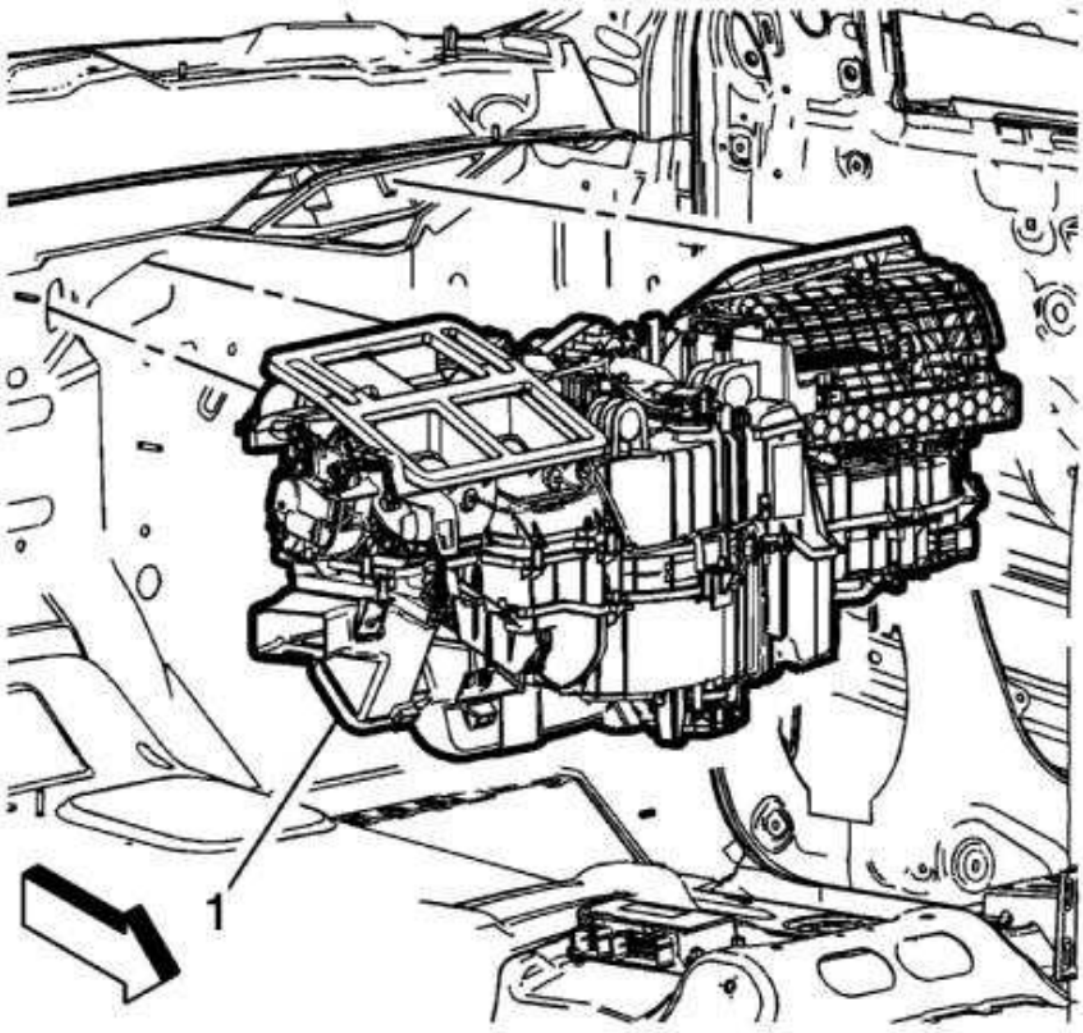


Fig. 290: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

7. Heater and Air Conditioning Evaporator and Blower Module 1 - Install - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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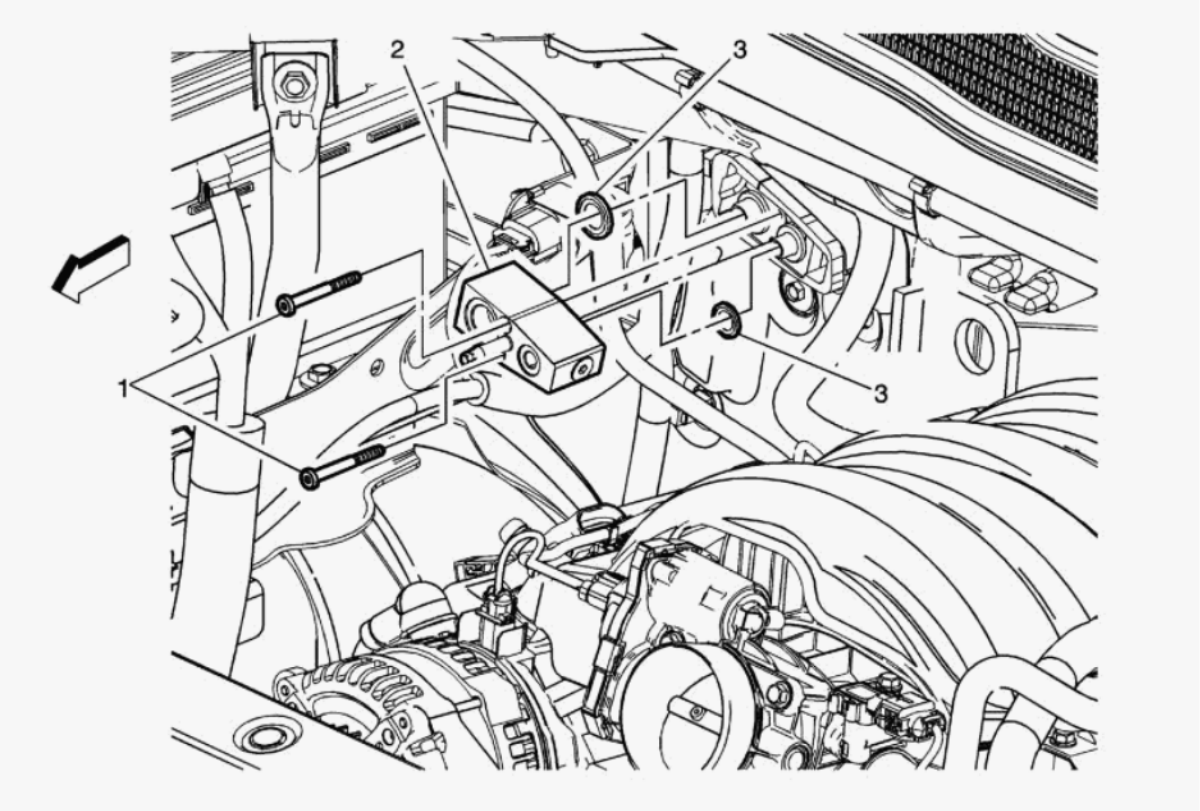


Fig. 291: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Evaporator Thermal Expansion Valve 2 - Install - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

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

Removal Procedure

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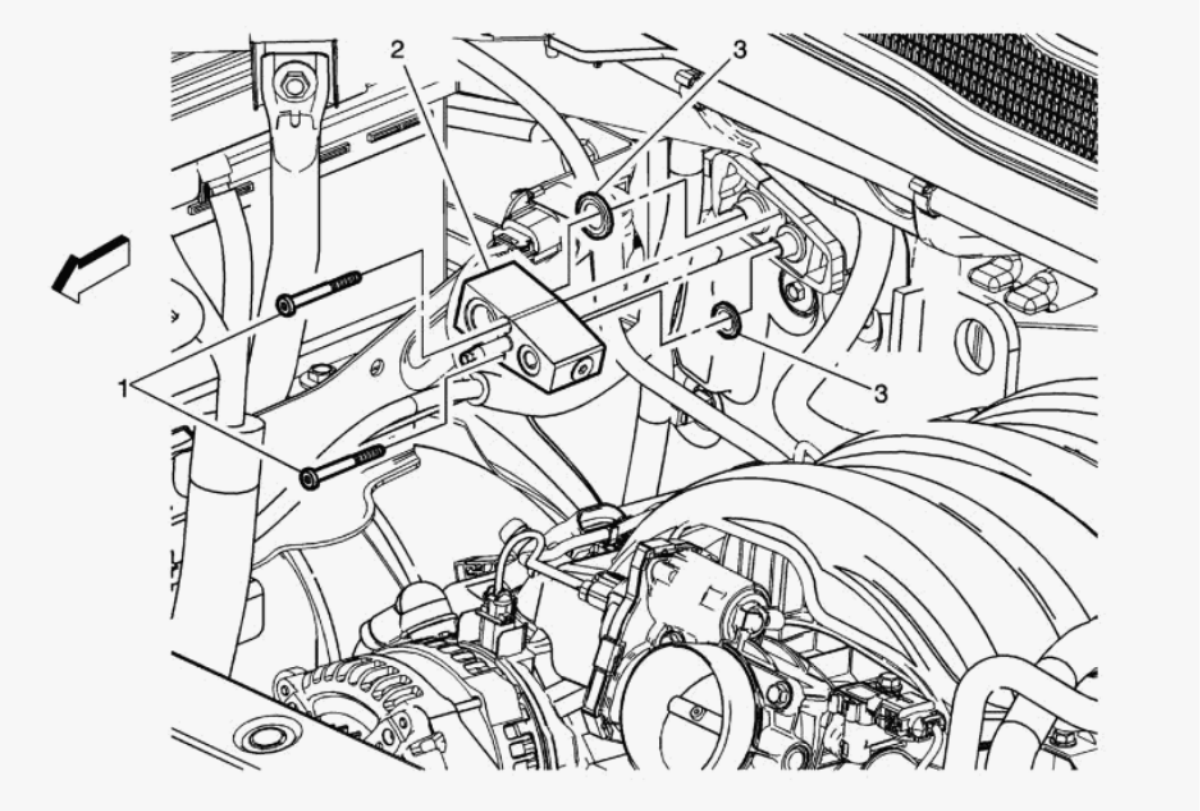


Fig. 292: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

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

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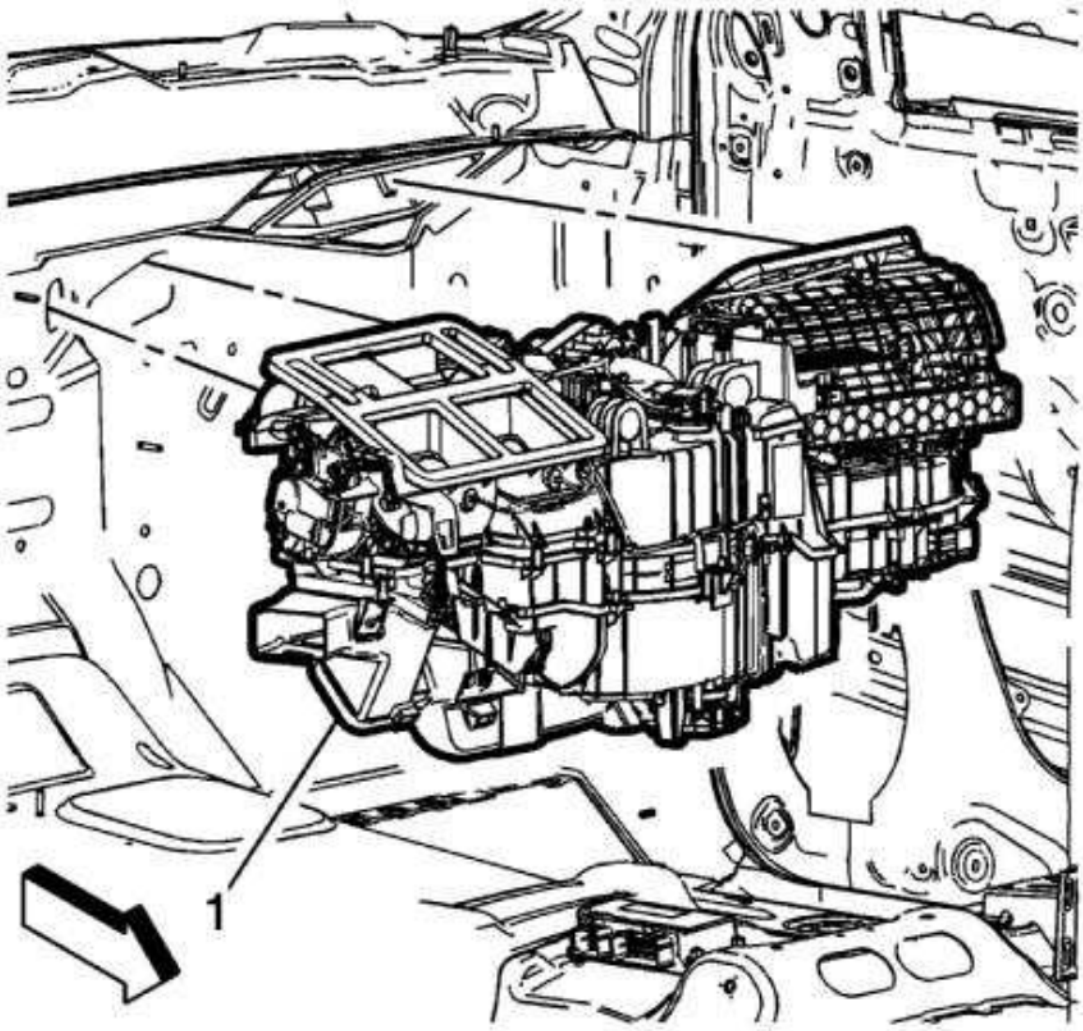


Fig. 293: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Module 1 - Remove - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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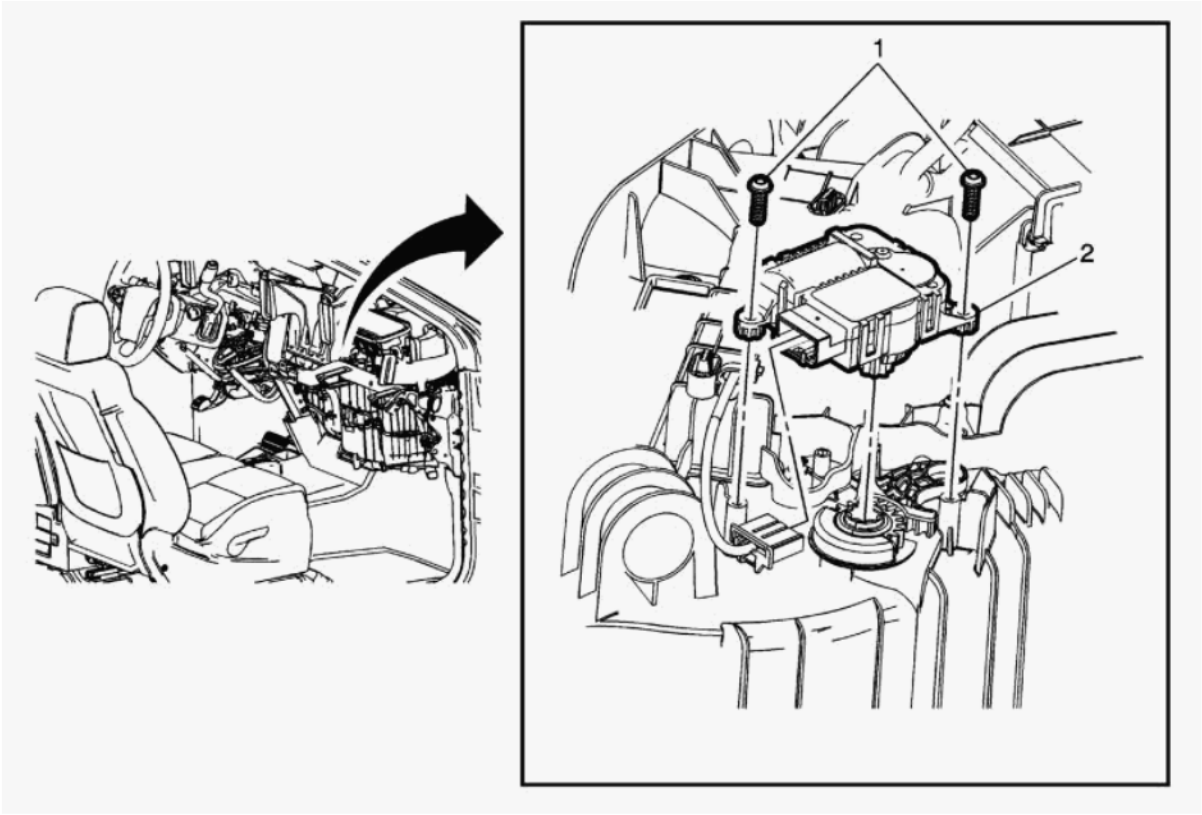
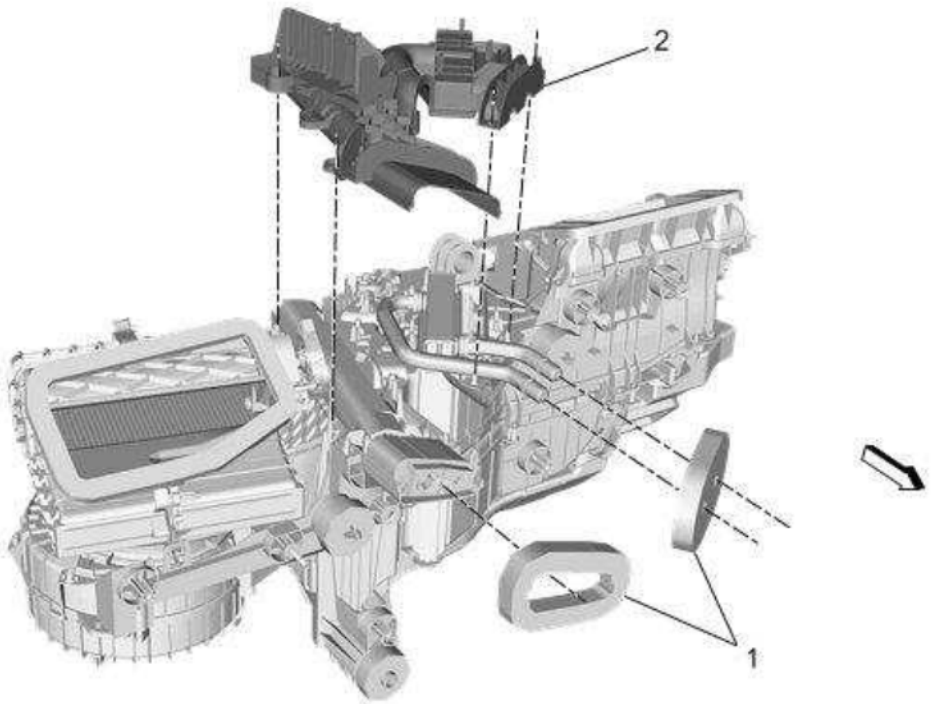


Fig. 294: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

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



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Fig. 295: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

5. Heater and Air Conditioning Evaporator and Blower Module Seal 1 1- Remove (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. Heater Cover 2 - Remove

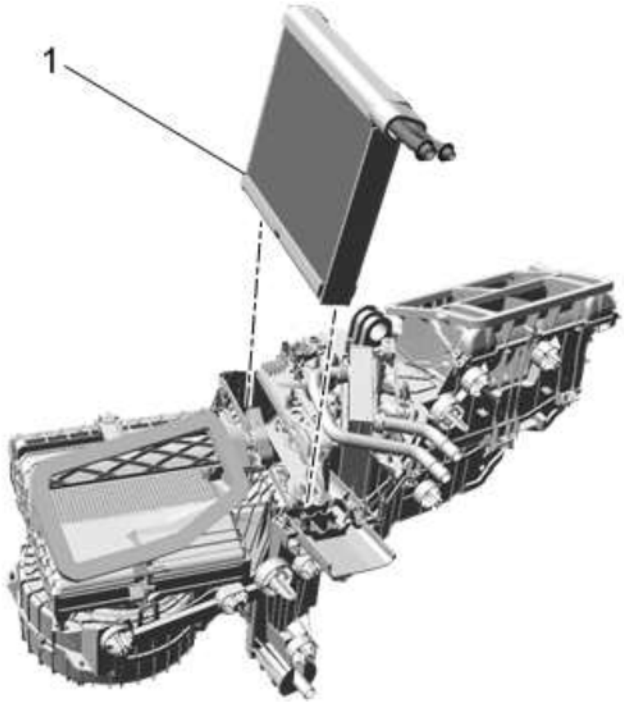


Fig. 296: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

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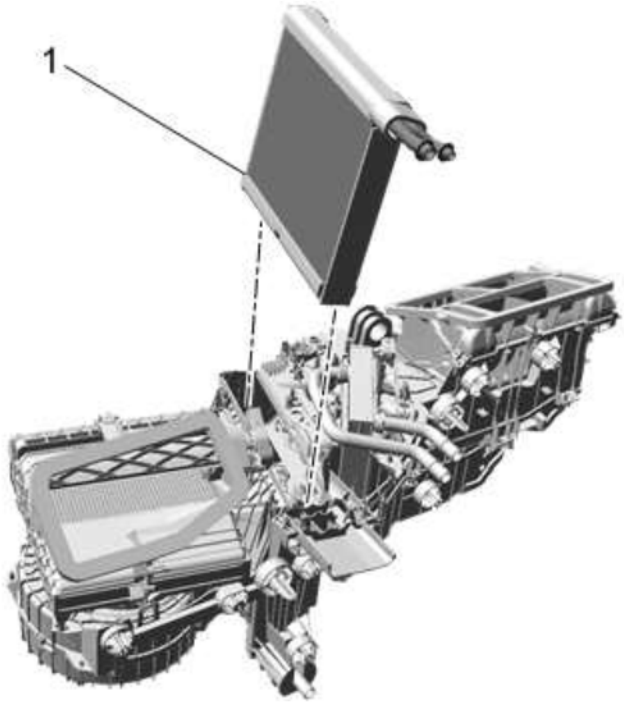


Fig. 297: Air Conditioning Evaporator Core
Courtesy of GENERAL MOTORS COMPANY

1. Air Conditioning Evaporator Core 1 - Install

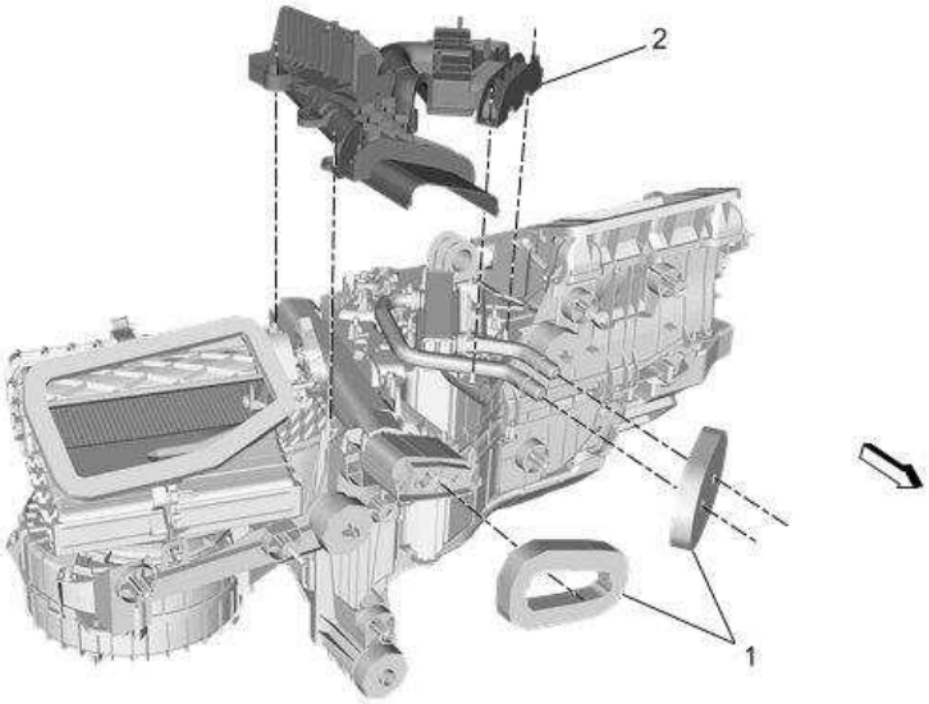


Fig. 298: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

2. Heater Cover 2 - Install

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CAUTION: **Refer to Fastener Caution .**

3. Use 12 M4X 1.79X16 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.
4. Heater and Air Conditioning Evaporator and Blower Module Seal 1 - Install
5. Connect the electrical connectors.

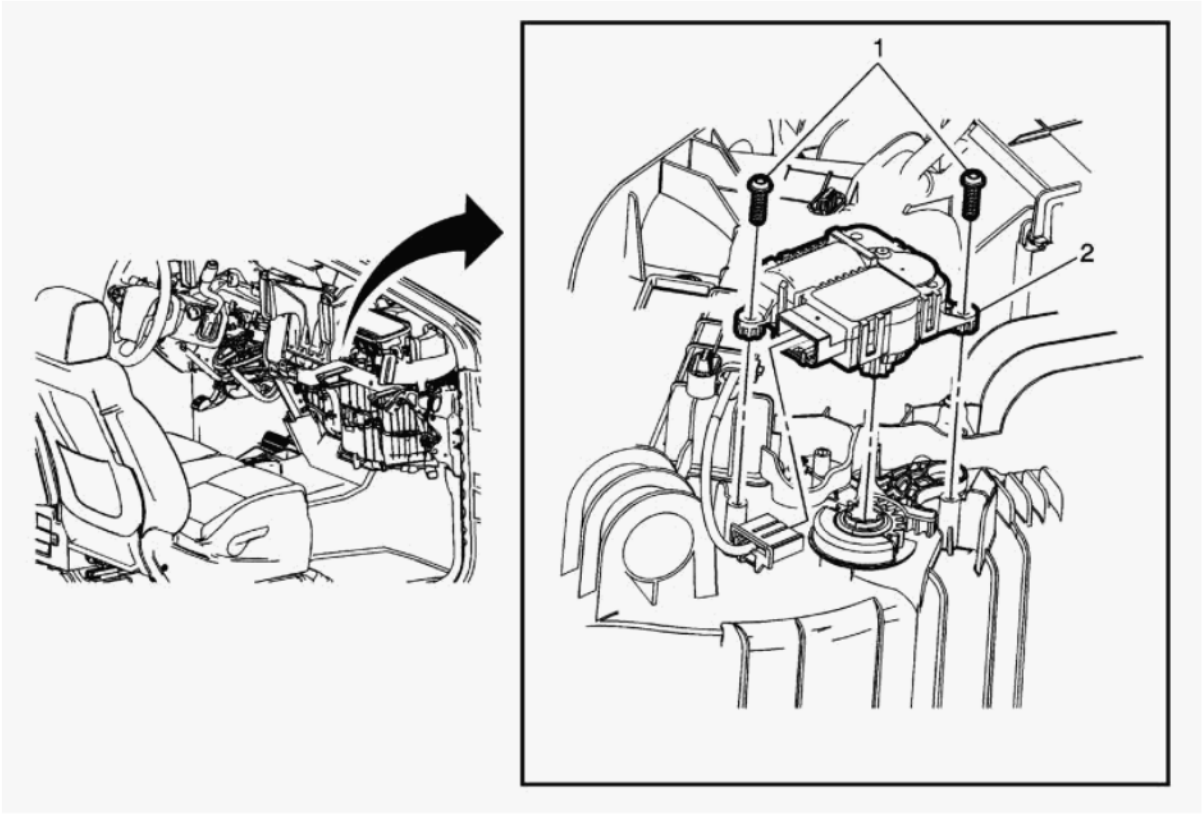


Fig. 299: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Temperature Valve Actuator 2 - Install - **Temperature Valve Actuator Replacement - Left Side**

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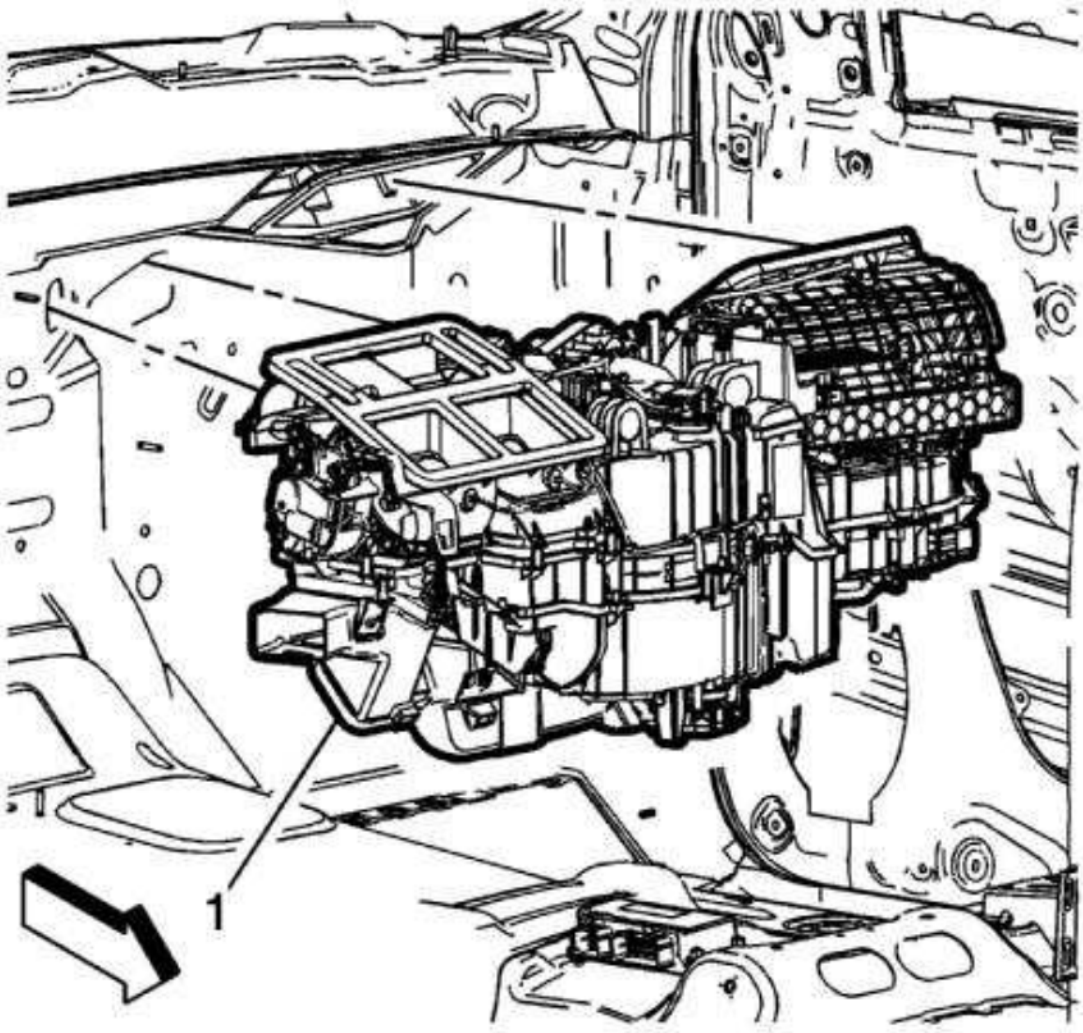


Fig. 300: HVAC Module Assembly
Courtesy of GENERAL MOTORS COMPANY

7. Heater and Air Conditioning Evaporator and Blower Module 1 - Install - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**

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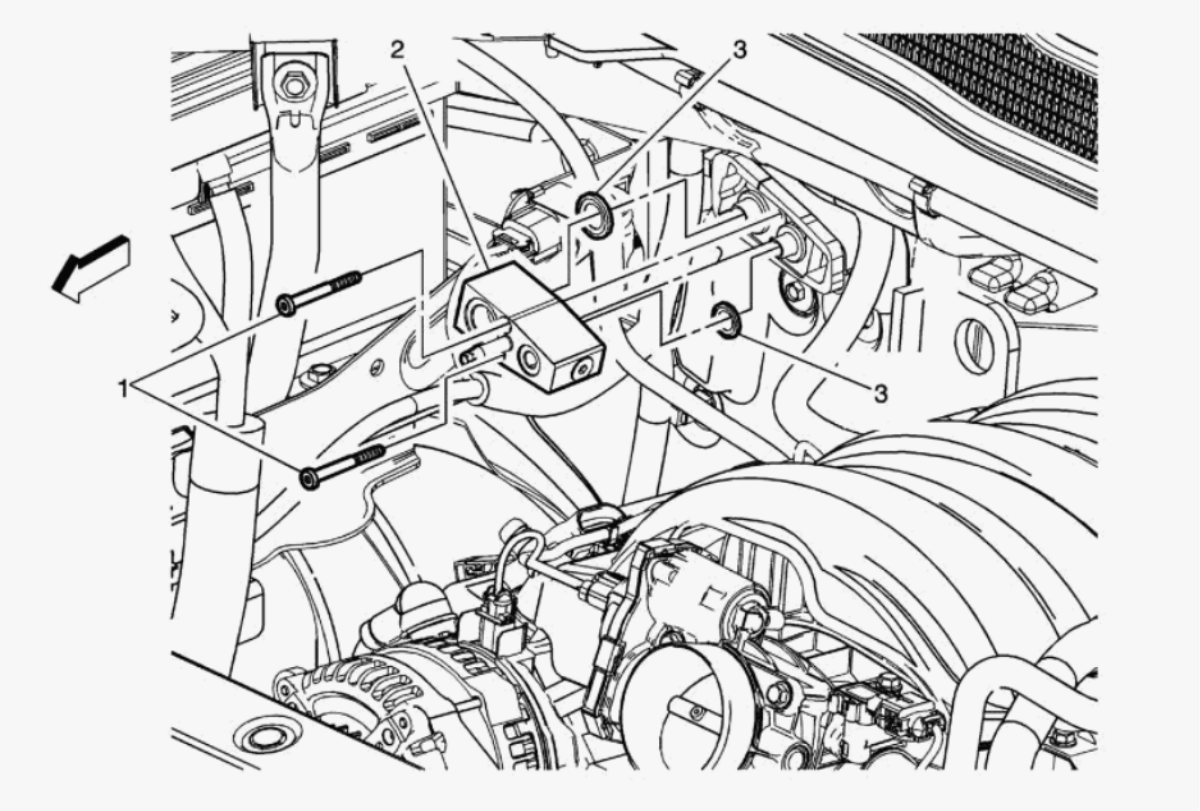


Fig. 301: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Evaporator Thermal Expansion Valve 2 - Install - **Air Conditioning Evaporator Thermal Expansion Valve Replacement**

AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN LOWER HOSE REPLACEMENT (GAS ENGINES)

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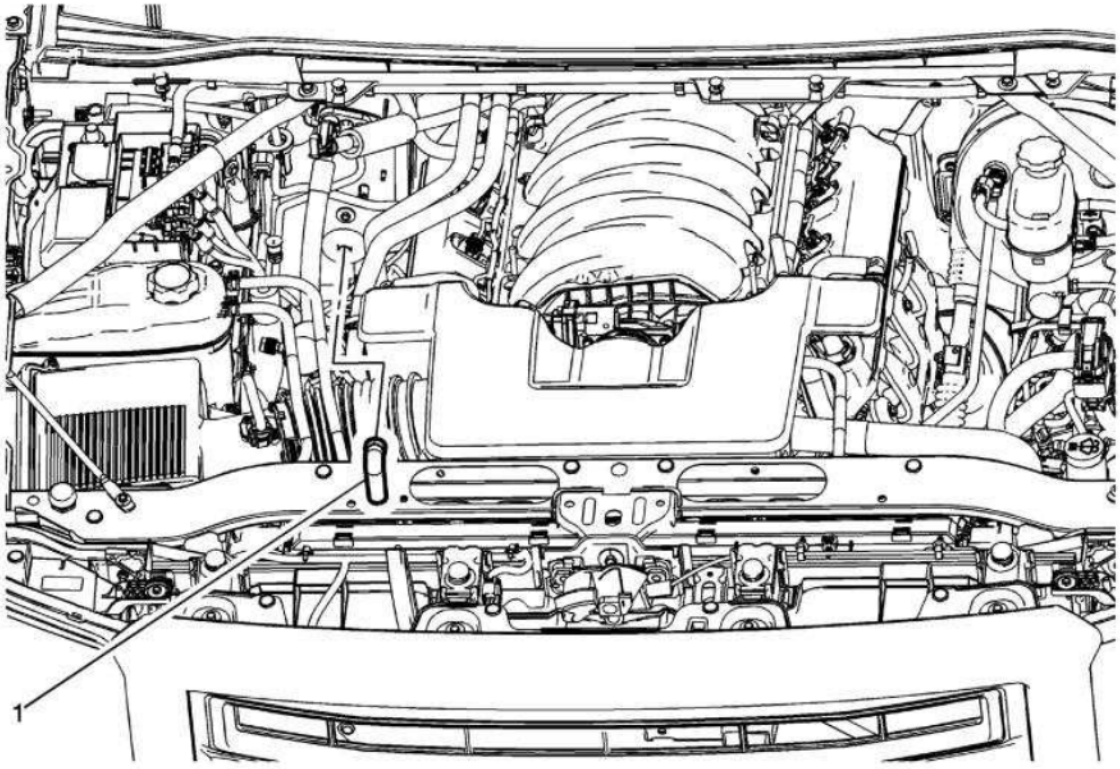


Fig. 302: Air Conditioning Evaporator and Blower Module Drain Lower Hose (Gas Engines)
Courtesy of GENERAL MOTORS COMPANY

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

AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN LOWER HOSE REPLACEMENT (L5P)

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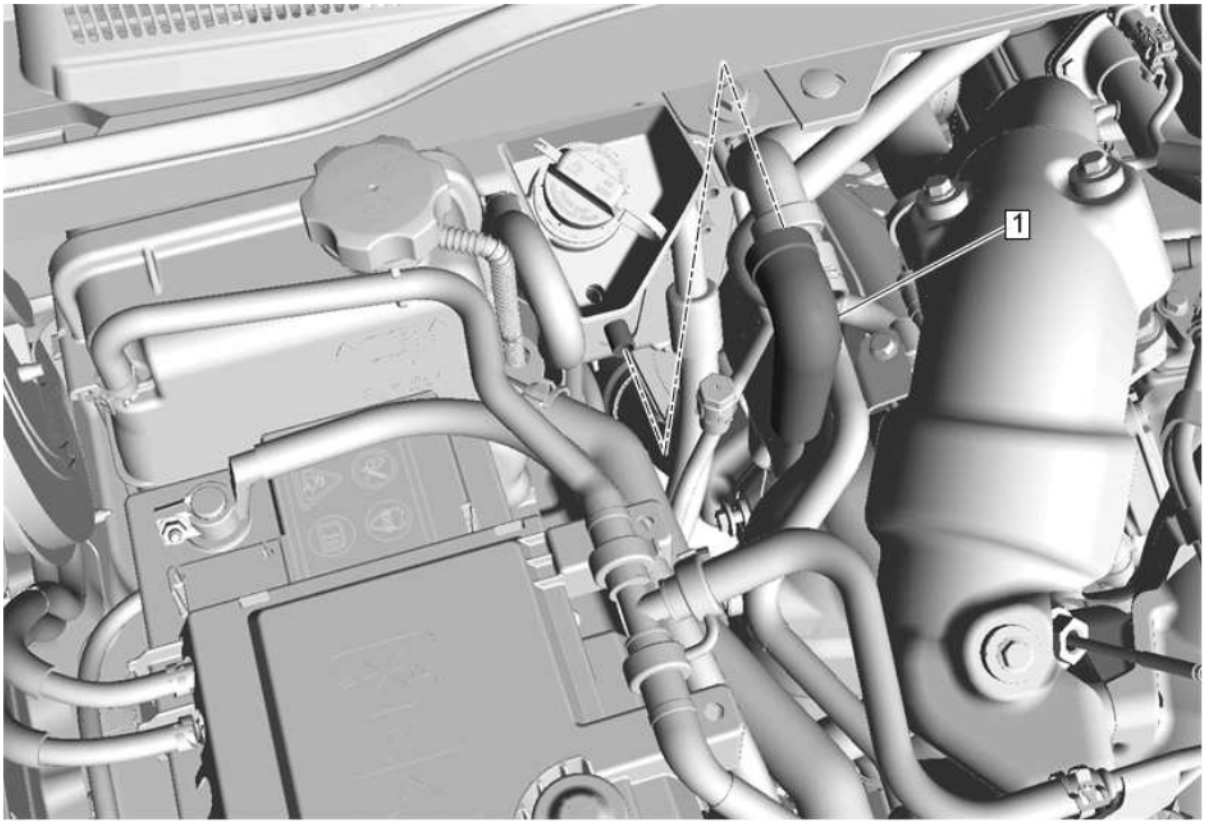


Fig. 303: Air Conditioning Evaporator and Blower Module Drain Lower Hose (L5P)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Fender Rear Upper Brace - Left Side - Remove - **Front Fender Rear Upper Brace Replacement (L5P)**	
1	Air Conditioning Evaporator and Blower Module Drain Lower Hose

HEATER INLET HOSE REPLACEMENT (L83, L86)

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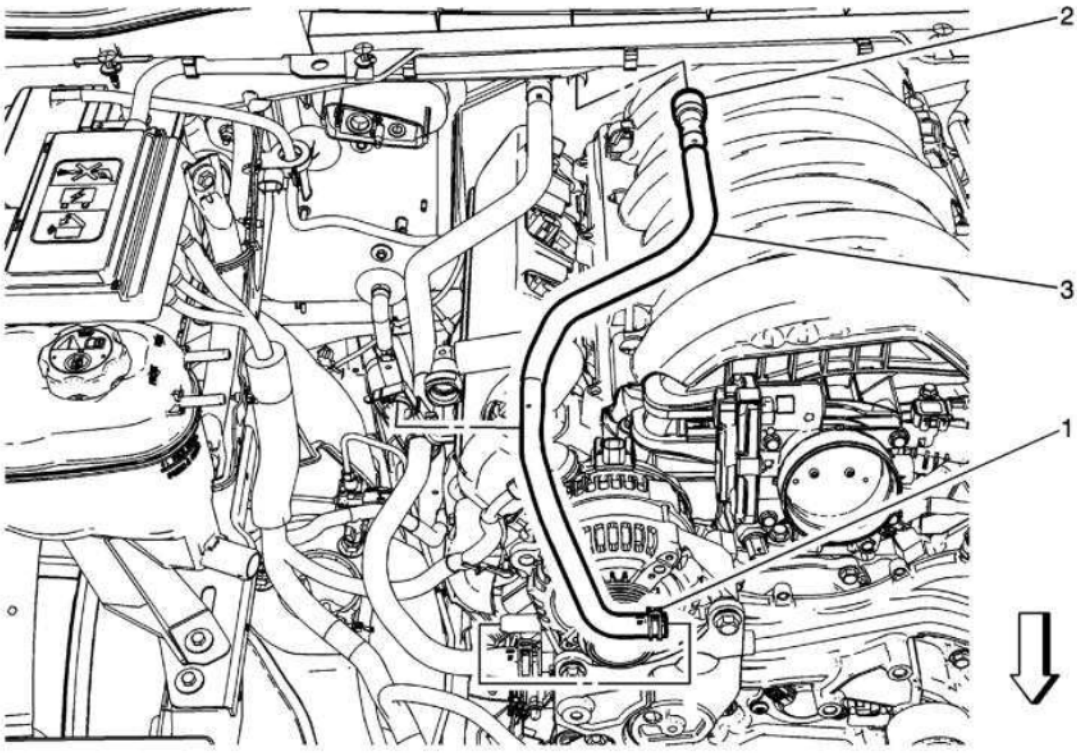


Fig. 304: Heater Inlet Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

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** .	
1	Heater Inlet Hose Clamp **Procedure** Reposition the heater inlet hose clamp using **BO-38185** Hose Clamp Pliers. **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.

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HEATER INLET HOSE REPLACEMENT (LV3)

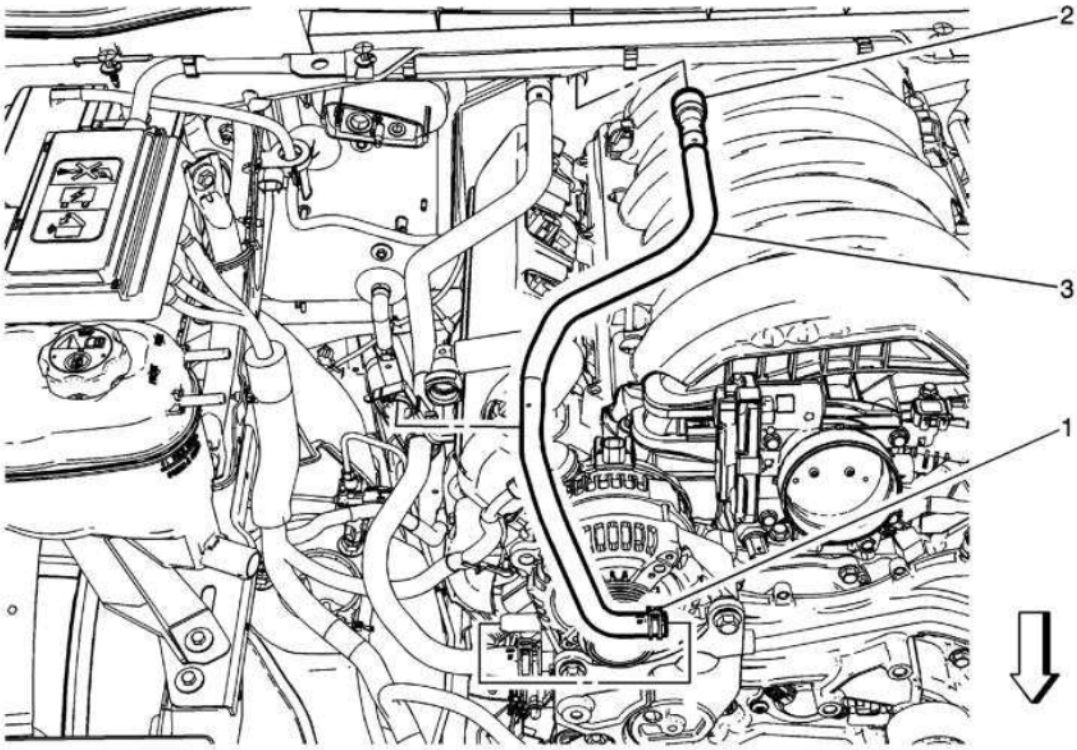


Fig. 305: Heater Inlet Hose (LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)** . 2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .	
1	Heater Inlet Hose Clamp **Procedure** Reposition the heater inlet hose clamp using **BO-38185** Hose Clamp Pliers. **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 **Procedure** Remove heater inlet hose from retainer.

HEATER INLET HOSE REPLACEMENT (LC8, L96)

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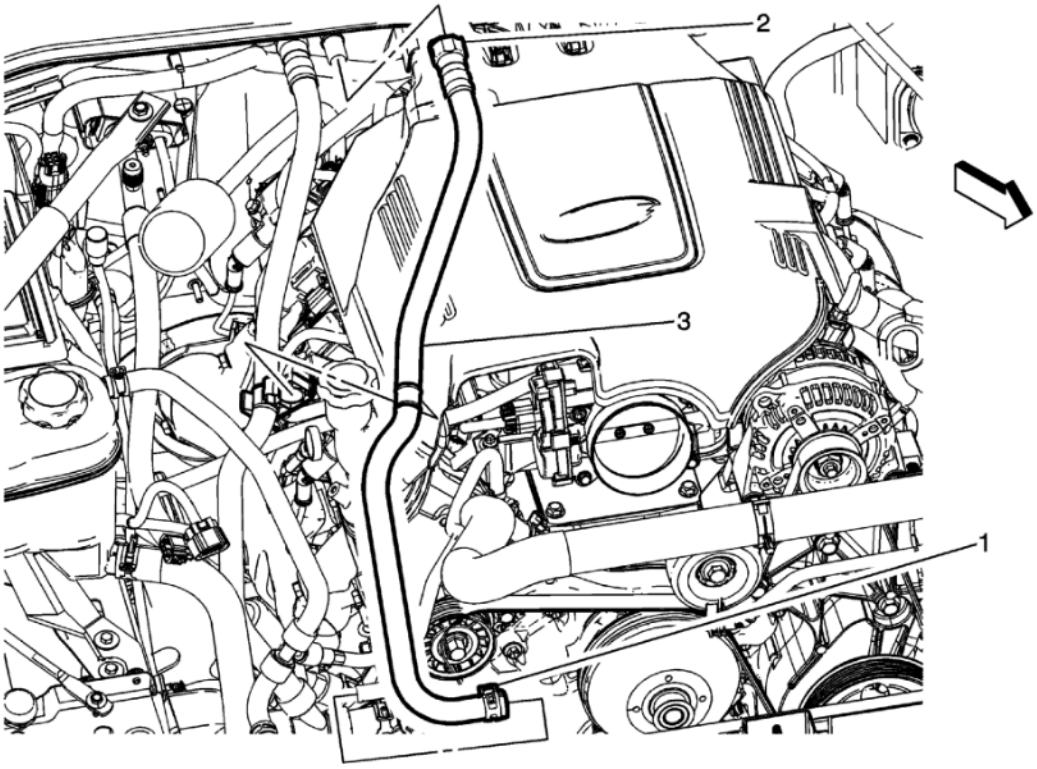


Fig. 306: Heater Inlet Hose (LC8, L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)** . 2. Remove the air cleaner outlet duct. Refer to **Air Cleaner 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. **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. Refer to **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill**

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Callout	Component Name
	LC8 L96) . 3. Inspect the cooling system for leaks. Refer to Cooling System Leak Testing (LC8, L96) .

HEATER INLET HOSE REPLACEMENT (CNG)

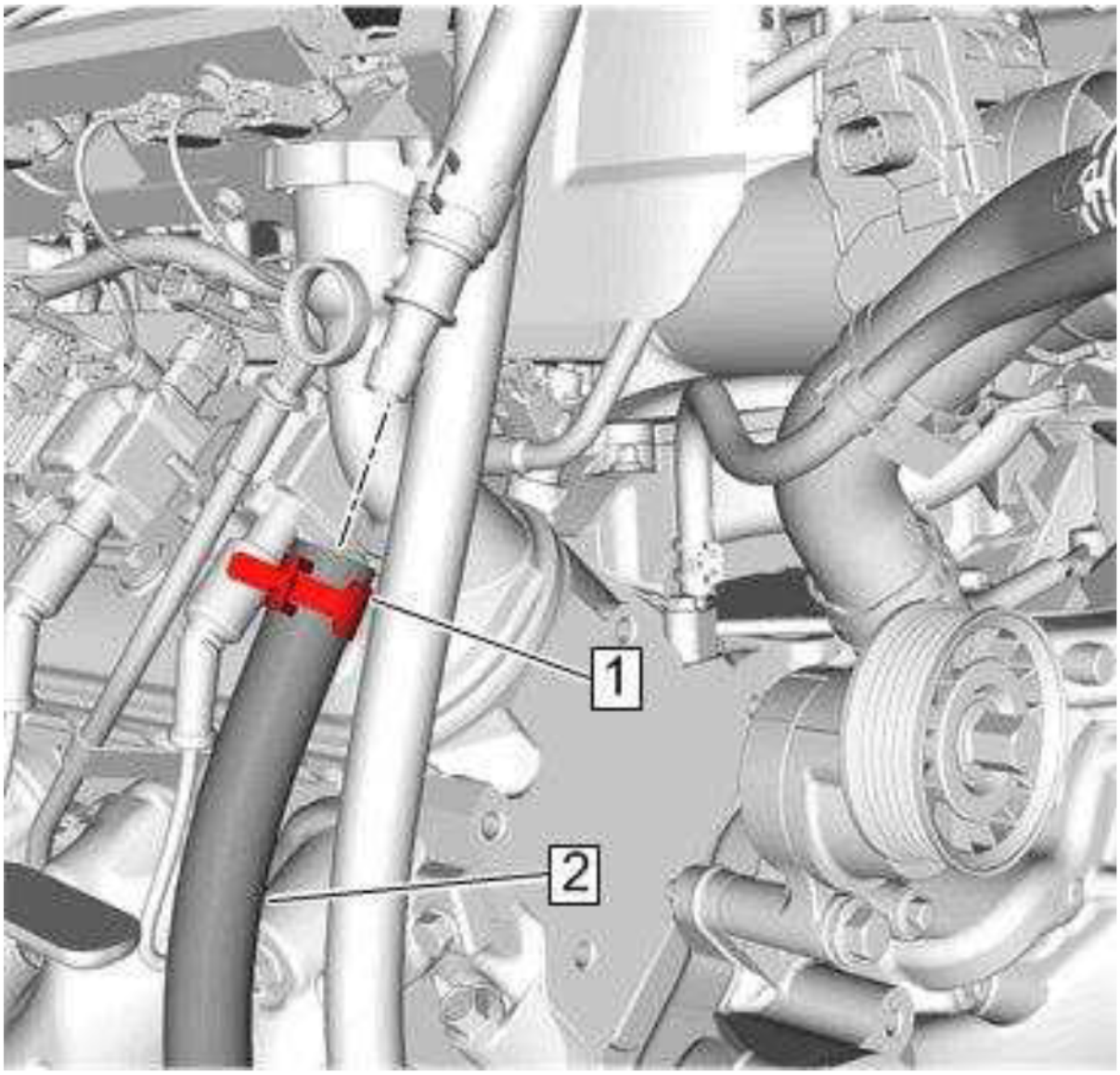
Special Tools

BO-38185 Hose Clamp Pliers

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

Removal Procedure

1. Drain the coolant. **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)**
2. **Air Cleaner Outlet Duct Replacement** - Remove



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Fig. 307: Radiator Surge Tank Outlet Hose Clamp at the Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Radiator Surge Tank Outlet Hose Clamp 1 @Heater Inlet Hose Assembly - Disengage - Using **BO-38185** Hose Clamp Pliers
4. Radiator Surge Tank Outlet Hose 2 @Heater Inlet Hose Assembly - Remove

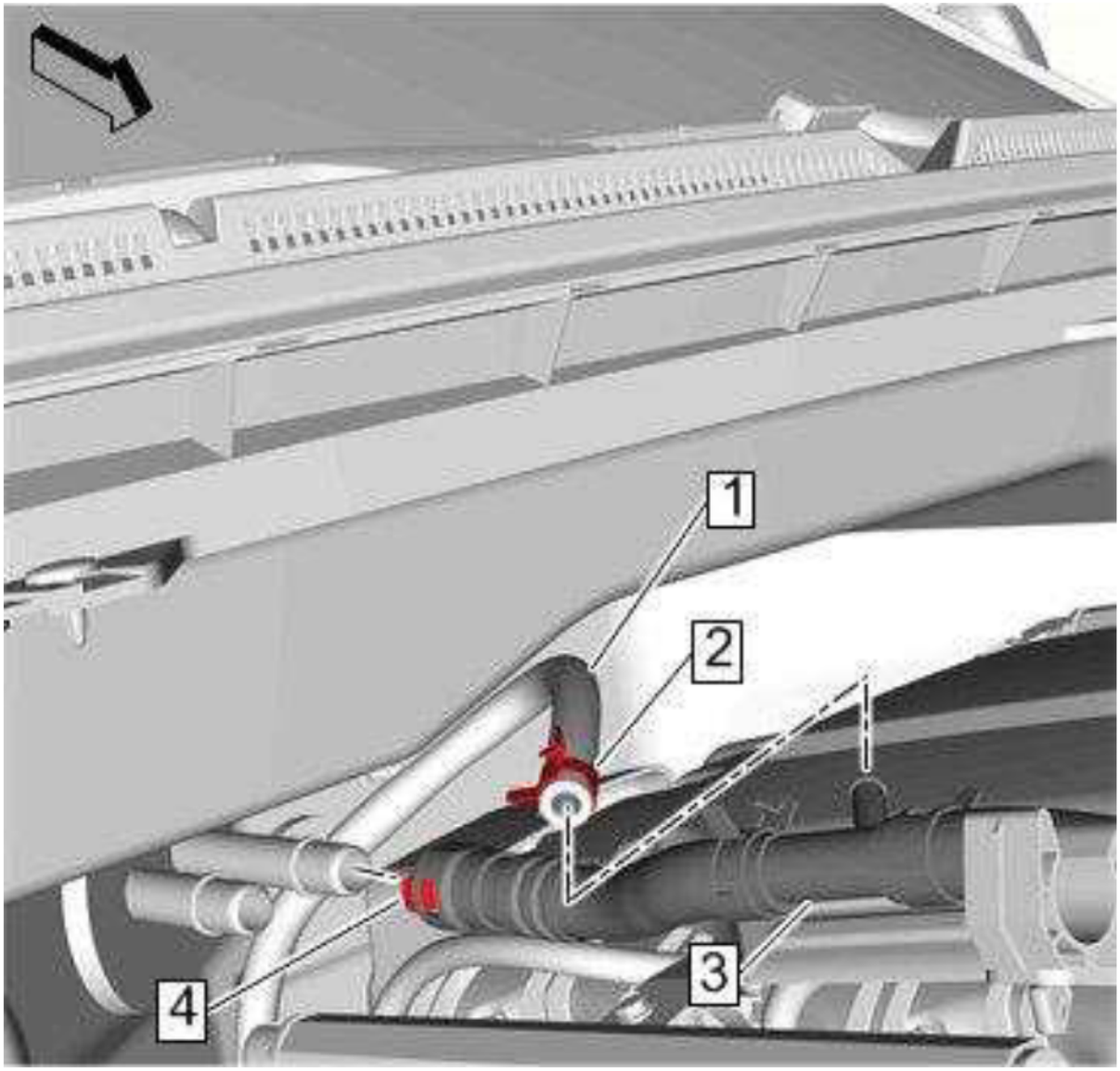


Fig. 308: Heater Inlet Hose And Heater Core Tube
Courtesy of GENERAL MOTORS COMPANY

5. Release the clip and remove the heater inlet hose from the heater core tube. 4
6. Disengage the clamp (2) securing the compressed natural gas (CNG) high pressure regulator heater inlet hose (1) using **BO-38185** Hose Clamp Pliers.
7. Remove the CNG high pressure regulator heater inlet hose (1) from the heater inlet hose (3).
8. Remove the heater inlet hose from the vehicle.

Installation Procedure

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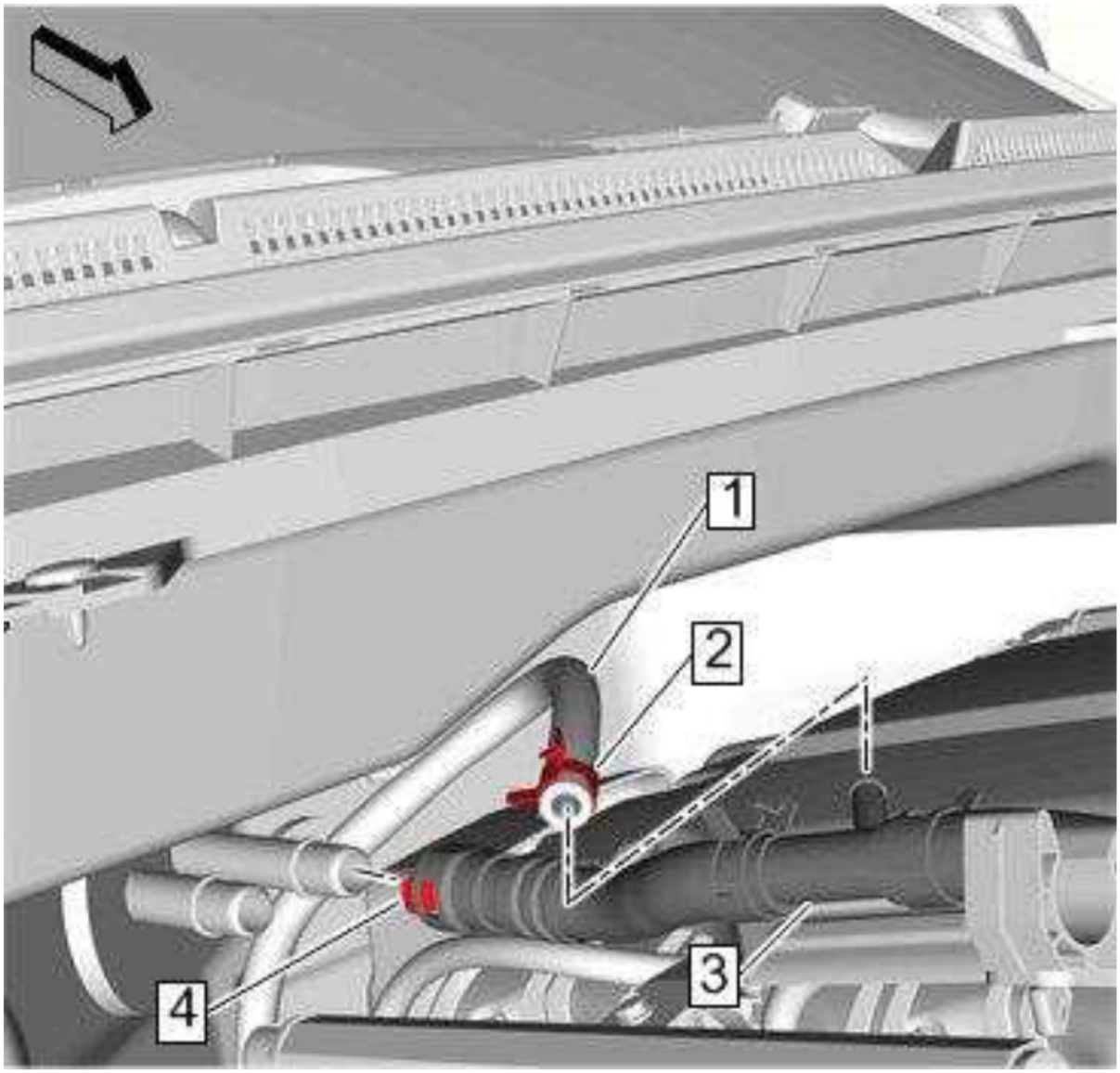


Fig. 309: Heater Inlet Hose And Heater Core Tube
Courtesy of GENERAL MOTORS COMPANY

1. Heater Inlet Hose Assembly 3 - Position in vehicle.
2. Install the CNG high pressure regulator heater inlet hose (1) to the heater inlet hose (3).
3. Engage the clamp (2) securing the compressed natural gas (CNG) high pressure regulator heater inlet hose (1) using **BO-38185** Hose Clamp Pliers.
4. Heater Inlet Hose Assembly@Heater Core Inlet Tube - Install

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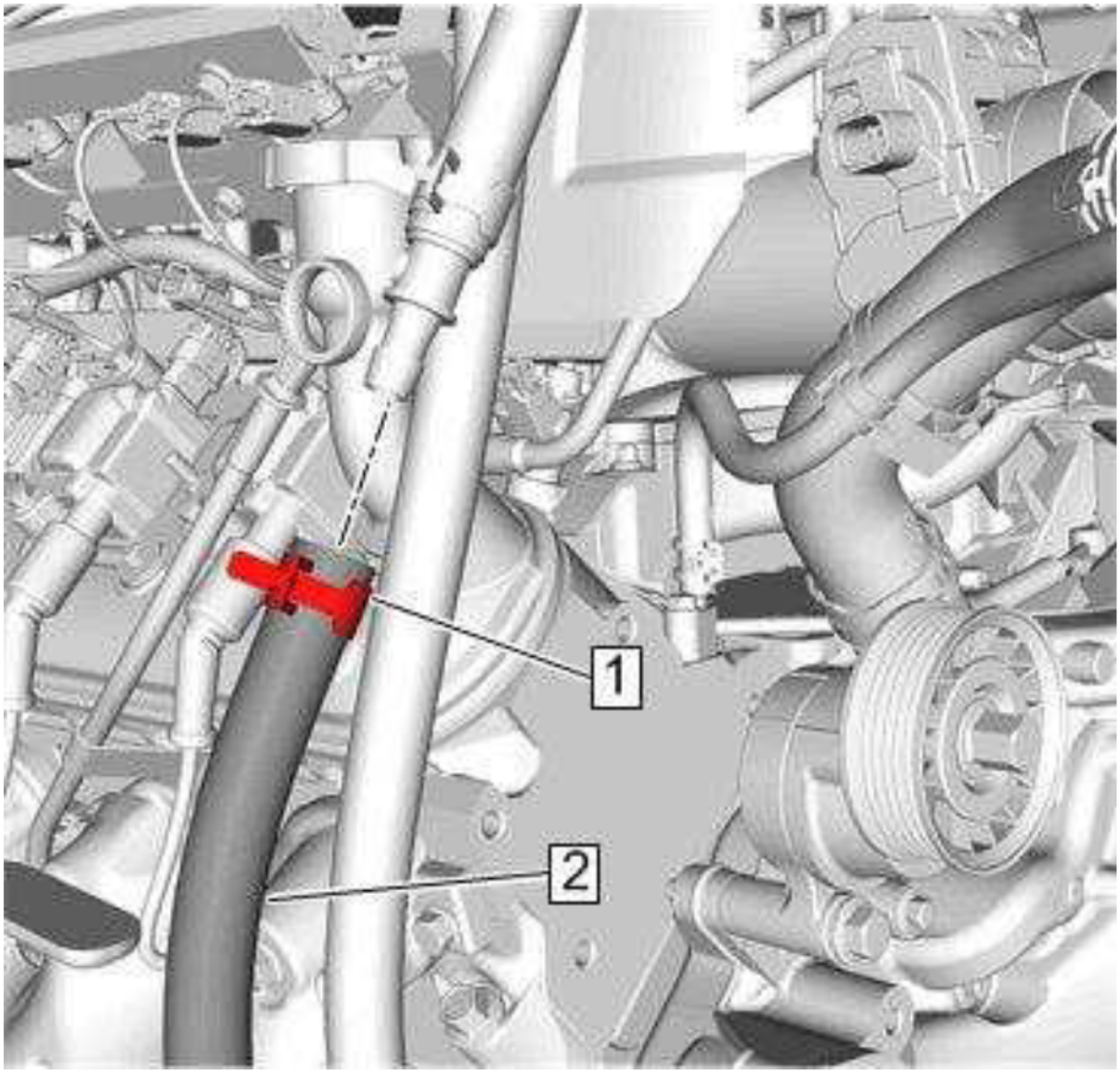


Fig. 310: Radiator Surge Tank Outlet Hose Clamp at the Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Radiator Surge Tank Outlet Hose 2 @Heater Inlet Hose - Install
6. Radiator Surge Tank Outlet Hose Clamp 1 @Heater Inlet Hose - Engage - Using **BO-38185** Hose Clamp Pliers
7. **Air Cleaner Outlet Duct Replacement** - Install
8. Fill the cooling system to the proper level. **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)**
9. Start the engine and inspect for leaks.

HEATER INLET HOSE REPLACEMENT (L8B)

Special Tool

J-43181 Heater Line Q.C.Release Tool

Equivalent regional tools:**Special Tools**

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Removal Procedure

1. Drain the cooling system. **Cooling System Draining and Filling (Vac N Fill L8B)**

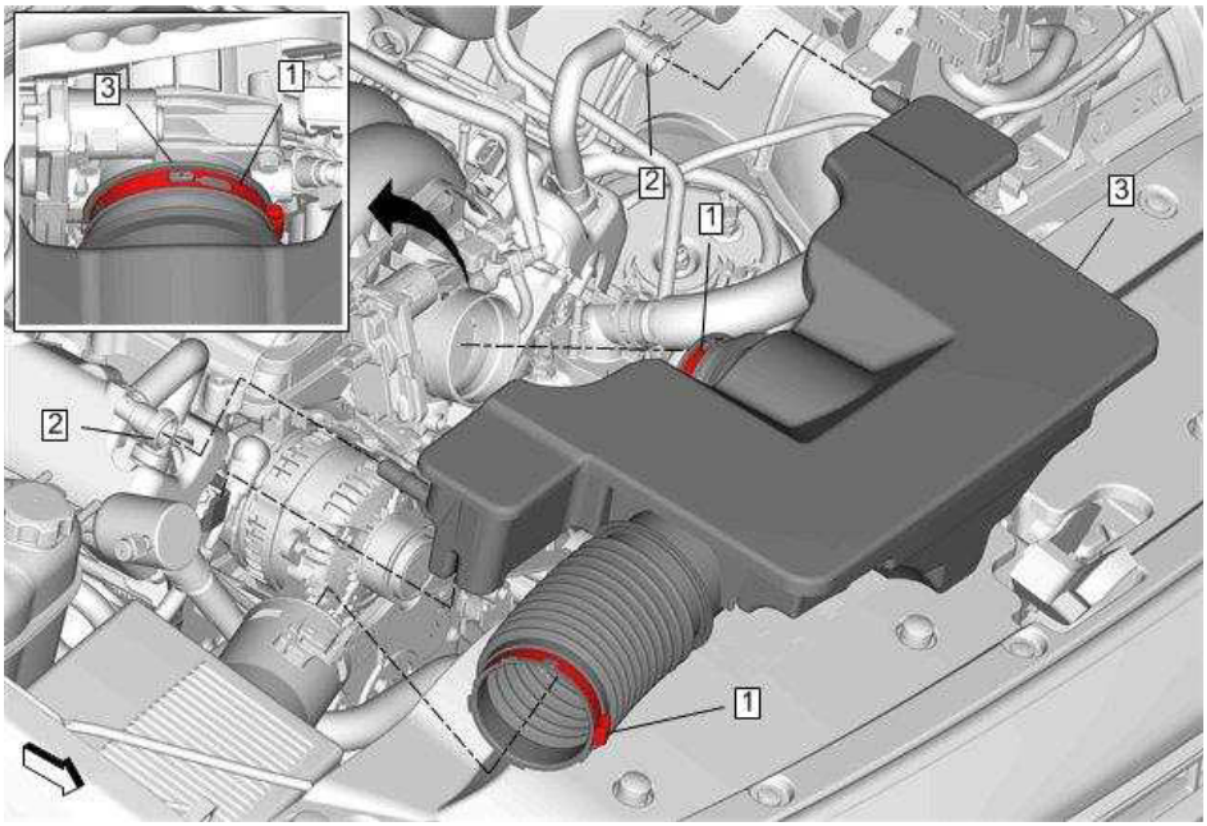
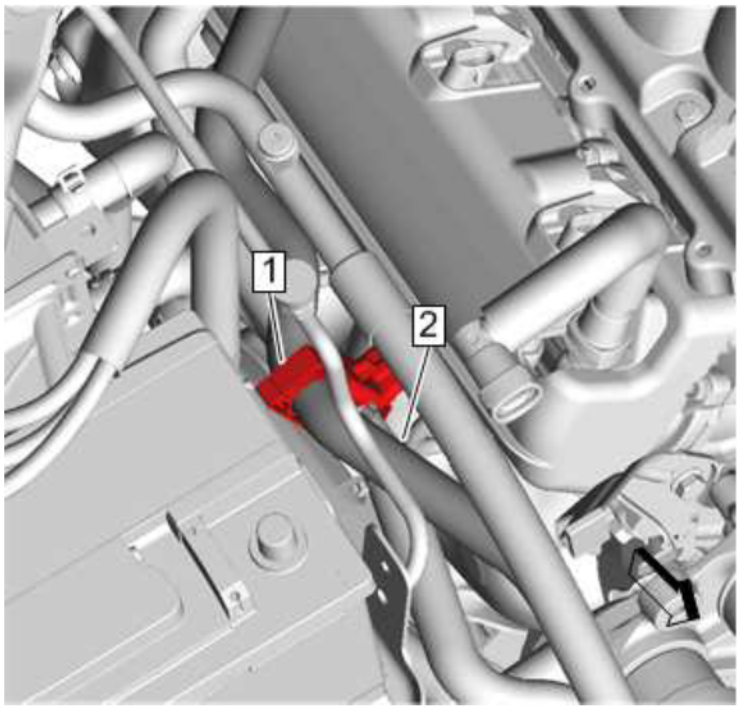


Fig. 311: Air Cleaner Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

2. Air Cleaner Outlet Duct 3 - Remove - **Air Cleaner Outlet Duct Replacement**
3. Reposition the wiring harness.



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Fig. 312: Heater Inlet HoseAt Heater Inlet and Outlet Hose Bracket
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Hose 2 @Heater Inlet and Outlet Hose Bracket 1 - Remove

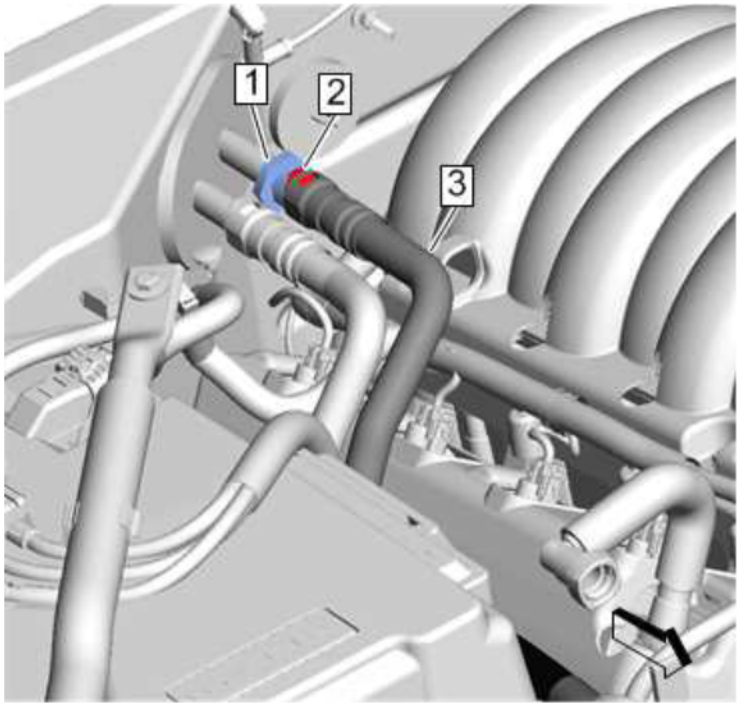


Fig. 313: Heater Inlet Hose And Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet Hose Quick Connect 2 - Disengage - **J-43181** Heater Line Q.C.Release Tool 1
6. Heater Inlet Hose 3 @Heater Core - Remove

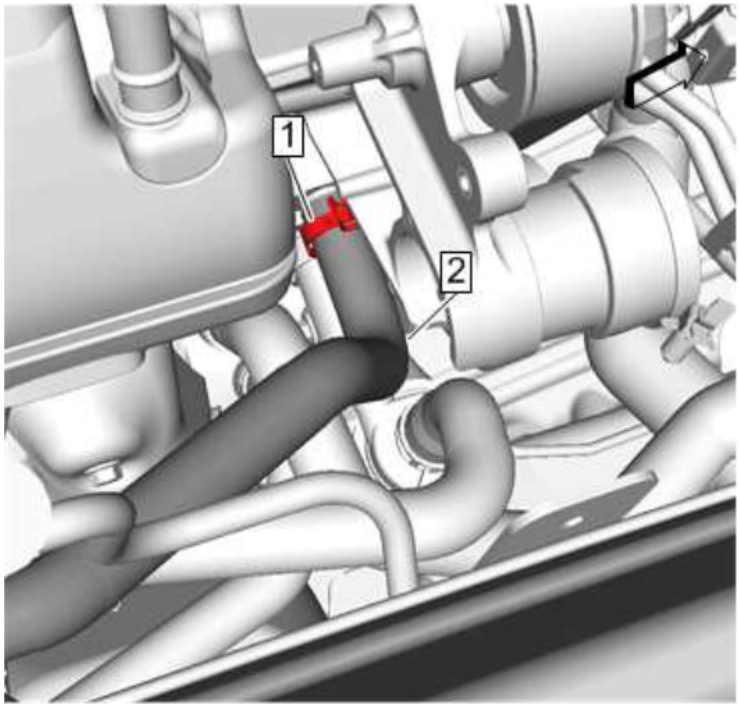


Fig. 314: Heater Inlet Hose Clamp

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Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose Clamp 1 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
8. Heater Inlet Hose 2 @Engine Coolant Manifold - Remove
9. Heater Inlet Hose 2 - Remove

Installation Procedure

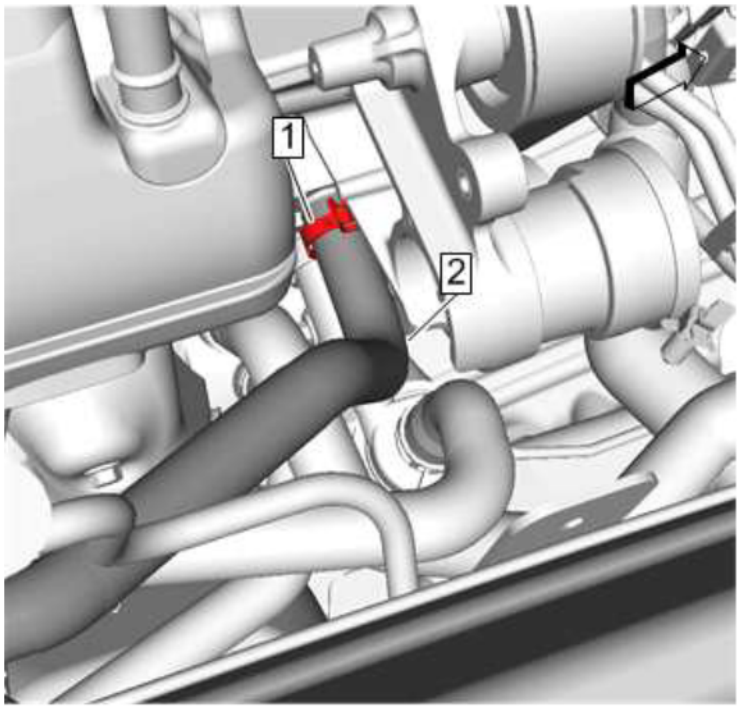


Fig. 315: Heater Inlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

1. Heater Inlet Hose 2 @Engine Coolant Manifold - Install
2. Heater Inlet Hose Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

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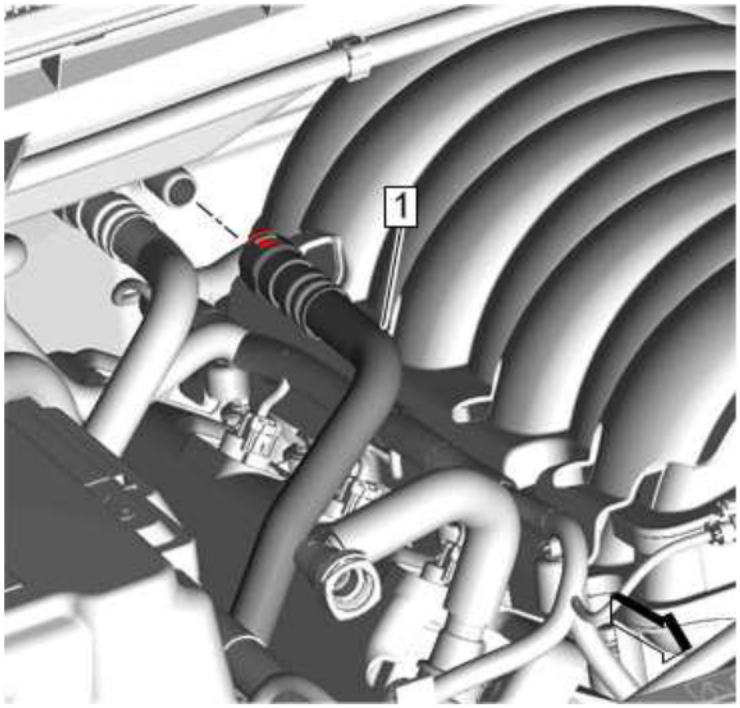


Fig. 316: Heater Inlet Hose And Heater Core
Courtesy of GENERAL MOTORS COMPANY

3. Heater Inlet Hose 1 @Heater Core - Install

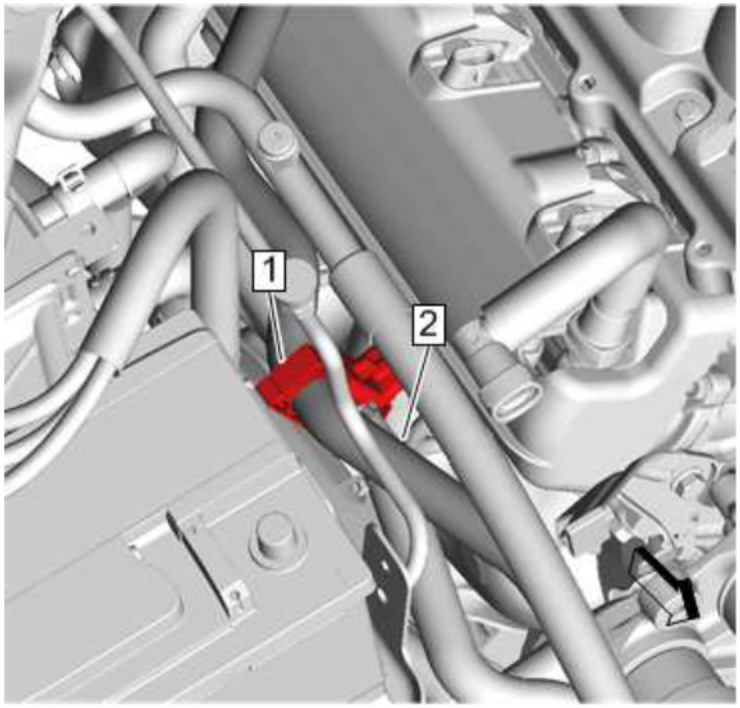


Fig. 317: Heater Inlet HoseAt Heater Inlet and Outlet Hose Bracket
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Hose 2 @Heater Inlet and Outlet Hose Bracket 1 - Install
5. Reposition the wiring harness.

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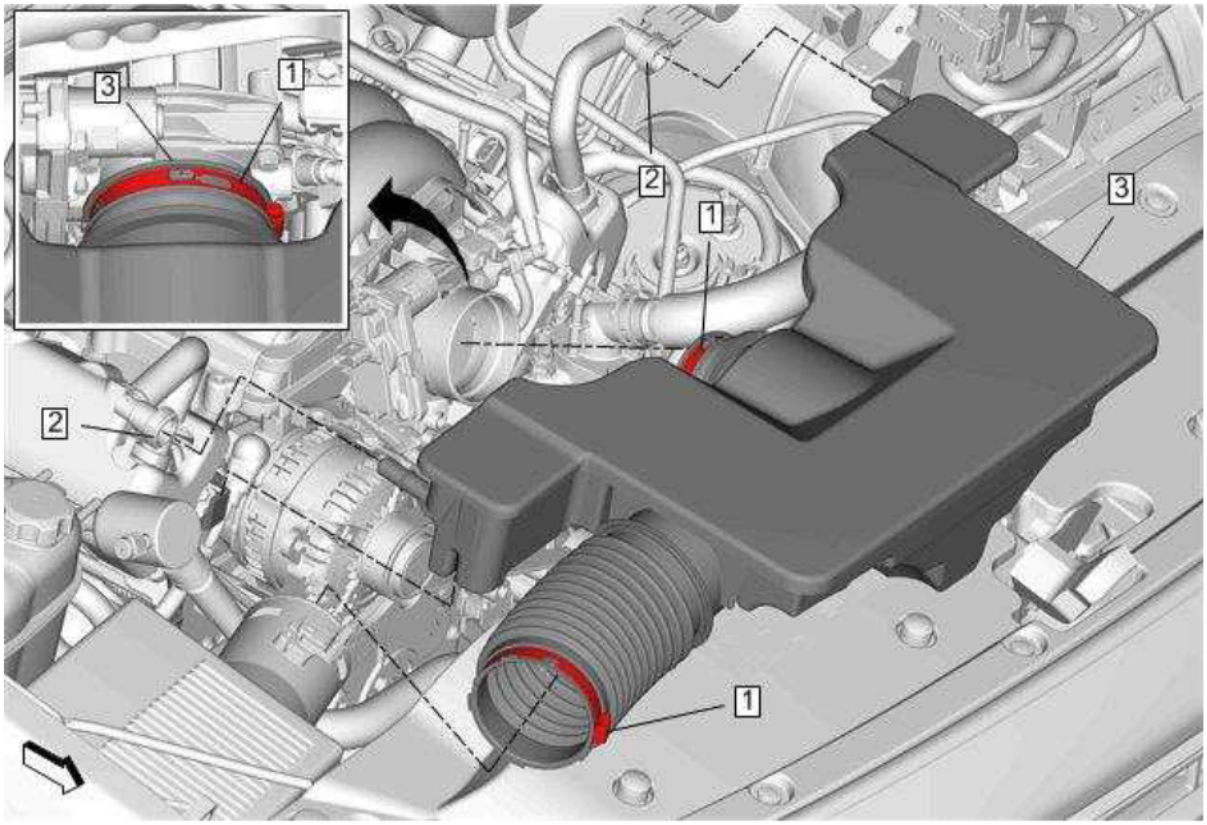


Fig. 318: Air Cleaner Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

6. Air Cleaner Outlet Duct 3 - Install - **Air Cleaner Outlet Duct Replacement**
7. Fill the cooling system. **Cooling System Draining and Filling (Vac N Fill L8B)**
8. Start the engine and check for coolant leaks.

HEATER INLET HOSE REPLACEMENT (L5P)

Removal Procedure

1. Drain the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**

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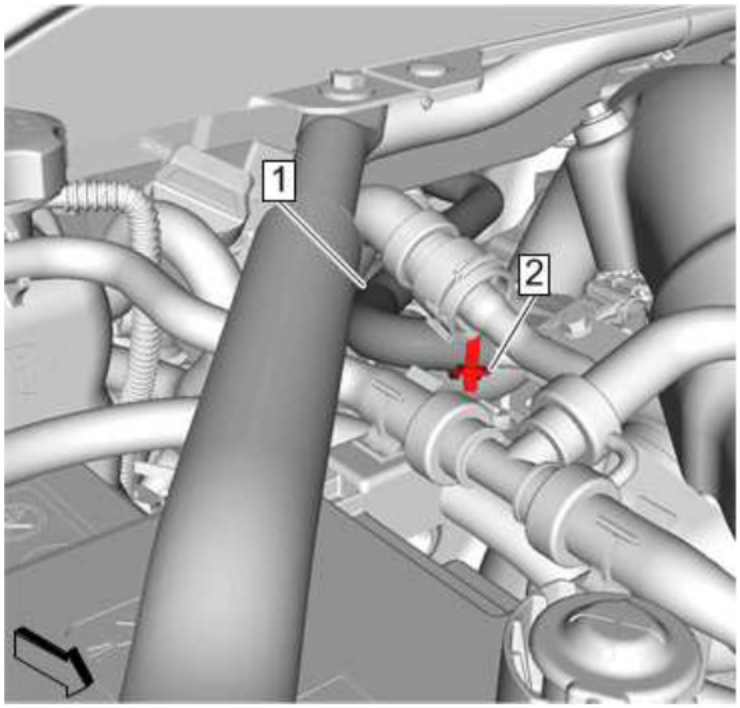


Fig. 319: Heater Inlet Hose And xhaust Gas Recirculation Cooler Bypass Valve
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Hose Clamp 2 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
3. Heater Inlet Hose 1 @Exhaust Gas Recirculation Valve Cooler Bypass Valve - Remove

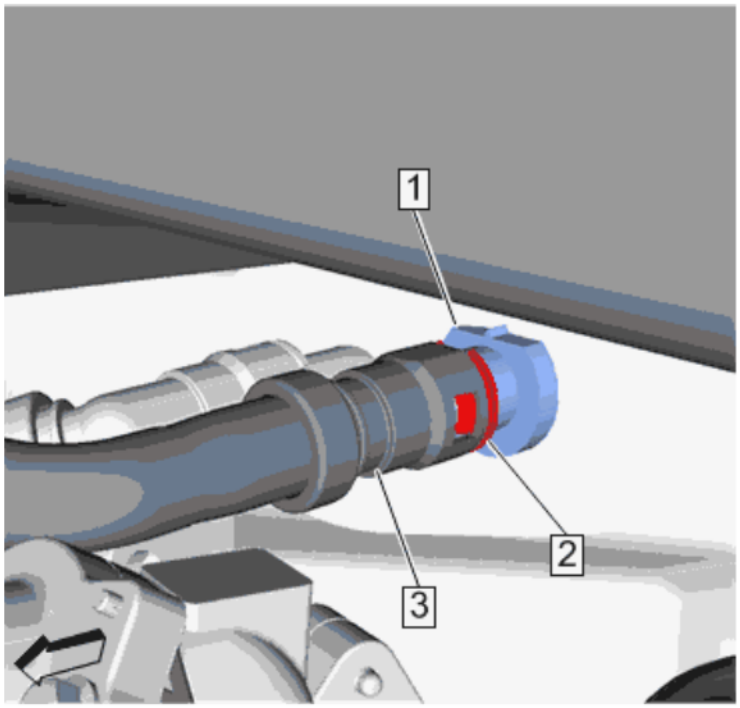


Fig. 320: Heater Inlet Hose And Tube
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Hose Retainer 2 - Disengage - **J-43181** Heater Line Q.C.Release Tool 1
5. Heater Inlet Hose 3 @Heater Core Inlet Tube - Remove

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6. Heater Inlet Hose 3 - Remove

Installation Procedure

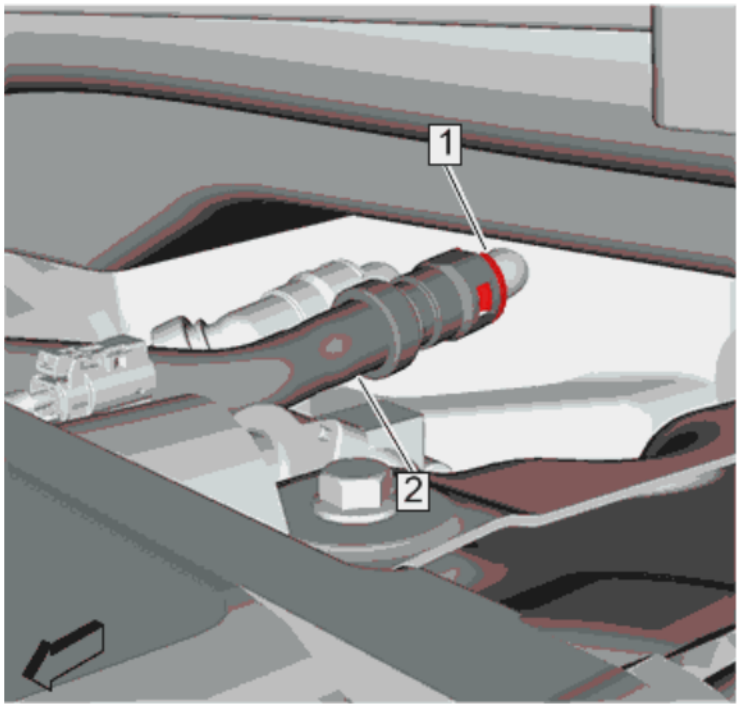


Fig. 321: Heater Inlet Hose/Tube
Courtesy of GENERAL MOTORS COMPANY

1. Heater Inlet Hose 2 @Heater Core Inlet Tube - Install
2. Heater Inlet Hose Retainer 1 - Engage

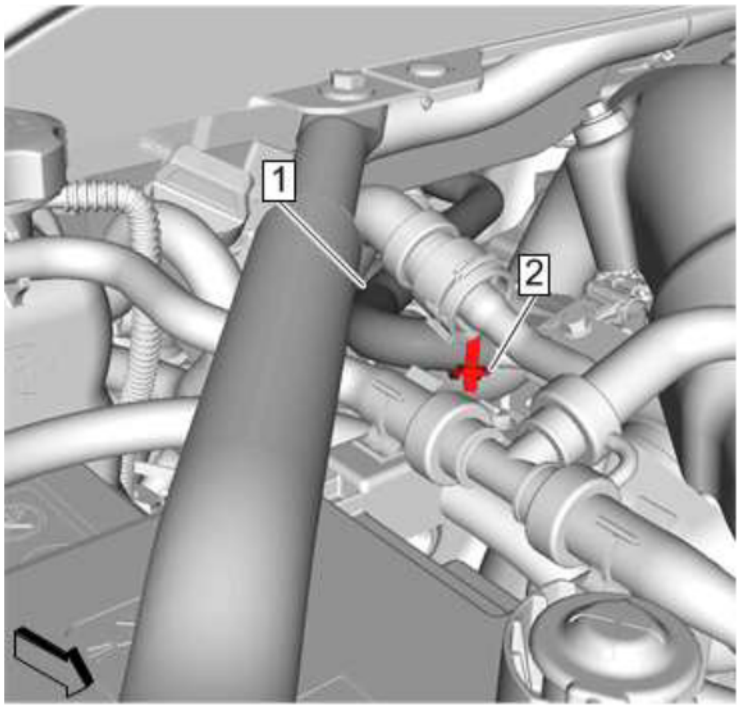


Fig. 322: Heater Inlet Hose And xhaust Gas Recirculation Cooler Bypass Valve
Courtesy of GENERAL MOTORS COMPANY

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3. Heater Inlet Hose 1 @Exhaust Gas Recirculation Valve Cooler Bypass Valve - Install
4. Heater Inlet Hose Clamp 2 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
5. Fill the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**
6. Start the engine and check for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (L83, L86)

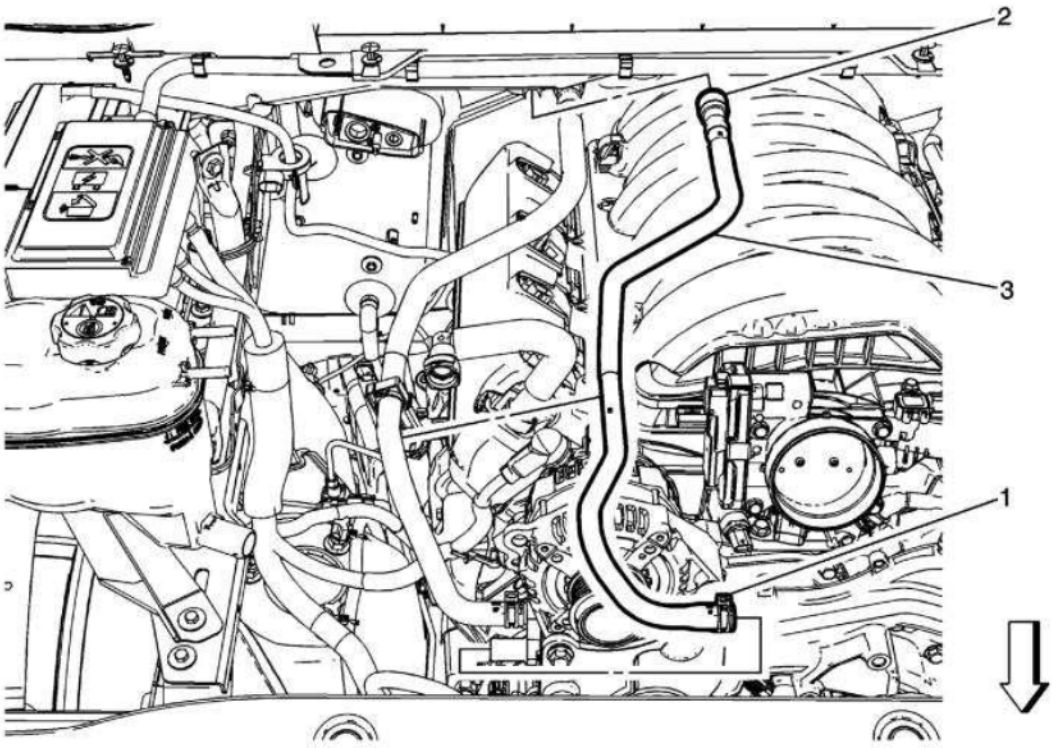


Fig. 323: Heater Outlet Hose (L83, L86)
Courtesy of GENERAL MOTORS COMPANY

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** .	
1	Heater Outlet Hose Clamp **Procedure** Reposition the heater outlet hose clamp using **BO-38185** Hose Clamp Pliers. **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

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Callout	Component Name
	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 (LV3)

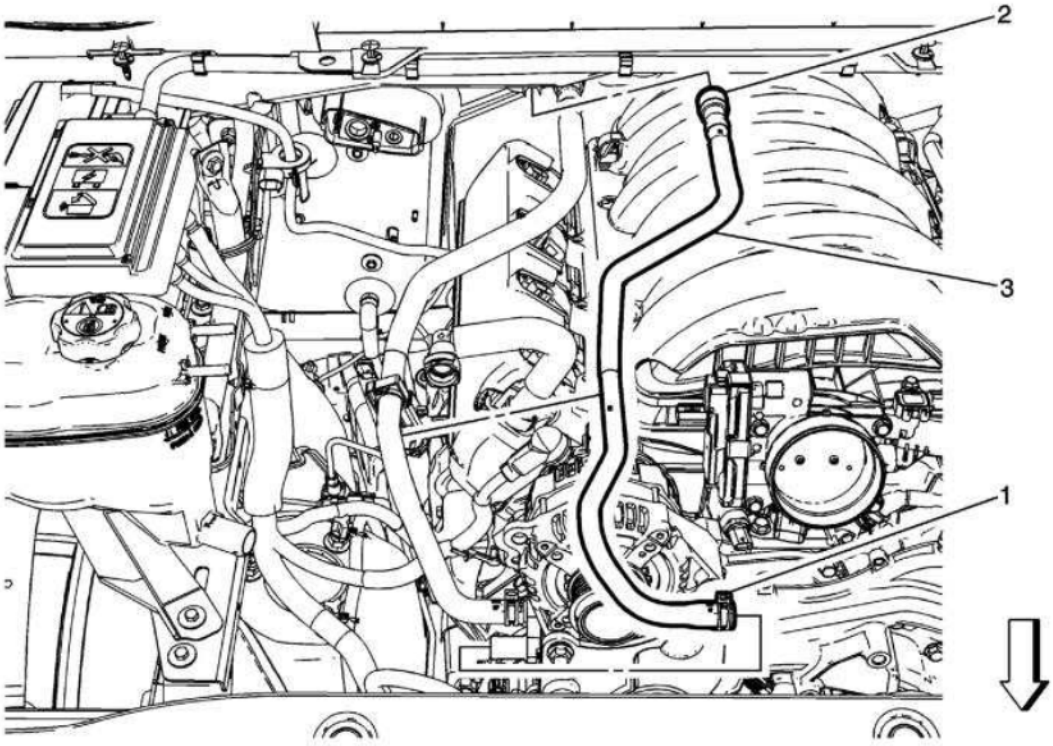


Fig. 324: Heater Outlet Hose (LV3)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the coolant. Refer to **Cooling System Draining and Filling (Static Fill LV3)** **Cooling System Draining and Filling (Vac N Fill LV3)** . 2. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .	
1	Heater Outlet Hose Clamp **Procedure** Reposition the heater outlet hose clamp using **BO-38185** Hose Clamp Pliers. **Special Tools** **BO-38185** Hose Clamp Pliers

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Callout	Component Name
	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 (CNG)

Special Tools

BO-38185 Hose Clamp Pliers

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

Removal Procedure

1. Drain the coolant. **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)**
2. **Air Cleaner Outlet Duct Replacement** - Remove

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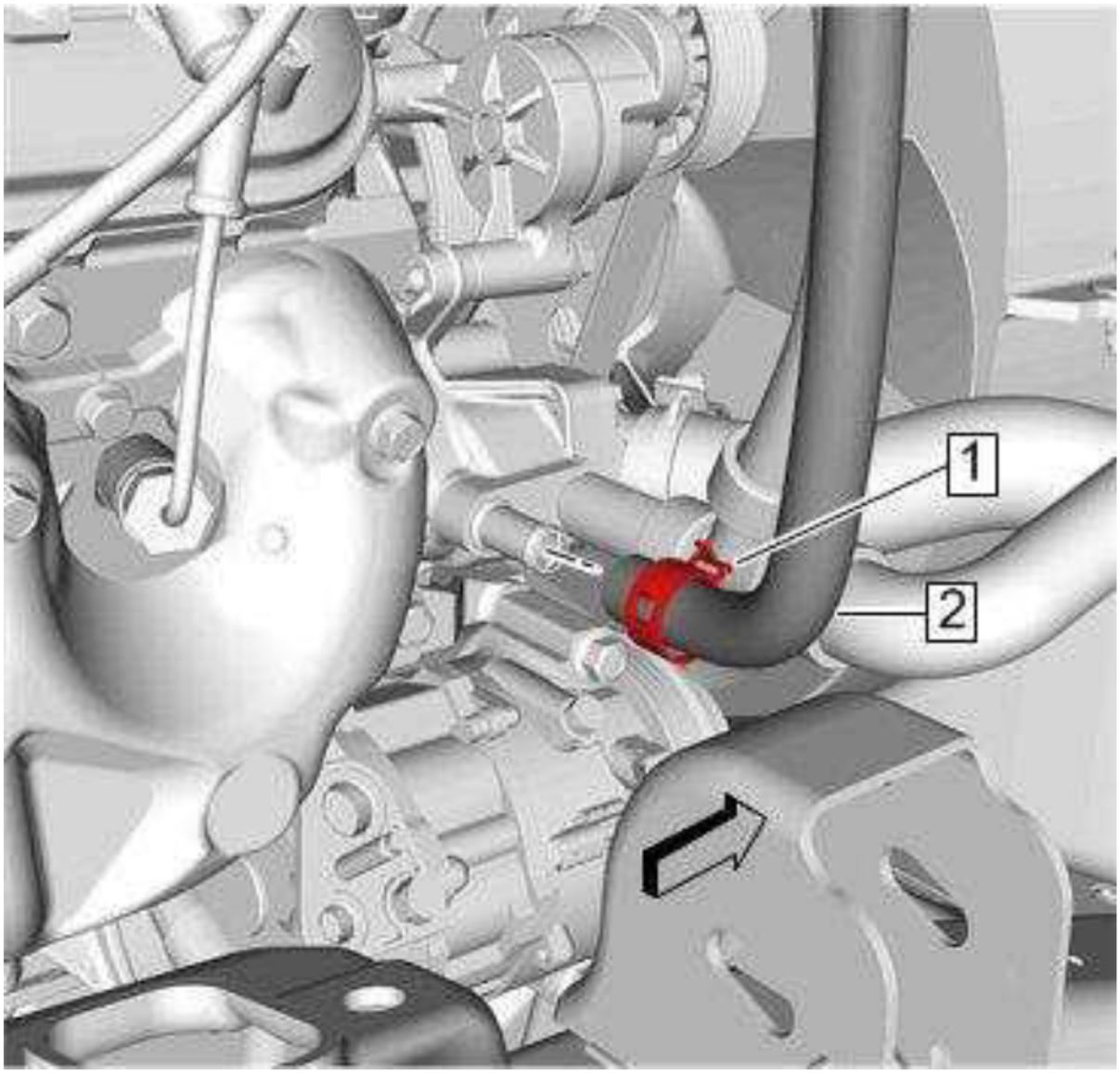


Fig. 325: Heater Outlet Hose Clamp To Water Pump
Courtesy of GENERAL MOTORS COMPANY

3. Heater Outlet Hose Clamp 1 @Water Pump - Disengage - Using **BO-38185** Hose Clamp Pliers
4. Heater Outlet Hose Assembly 2 @Water Pump - Remove

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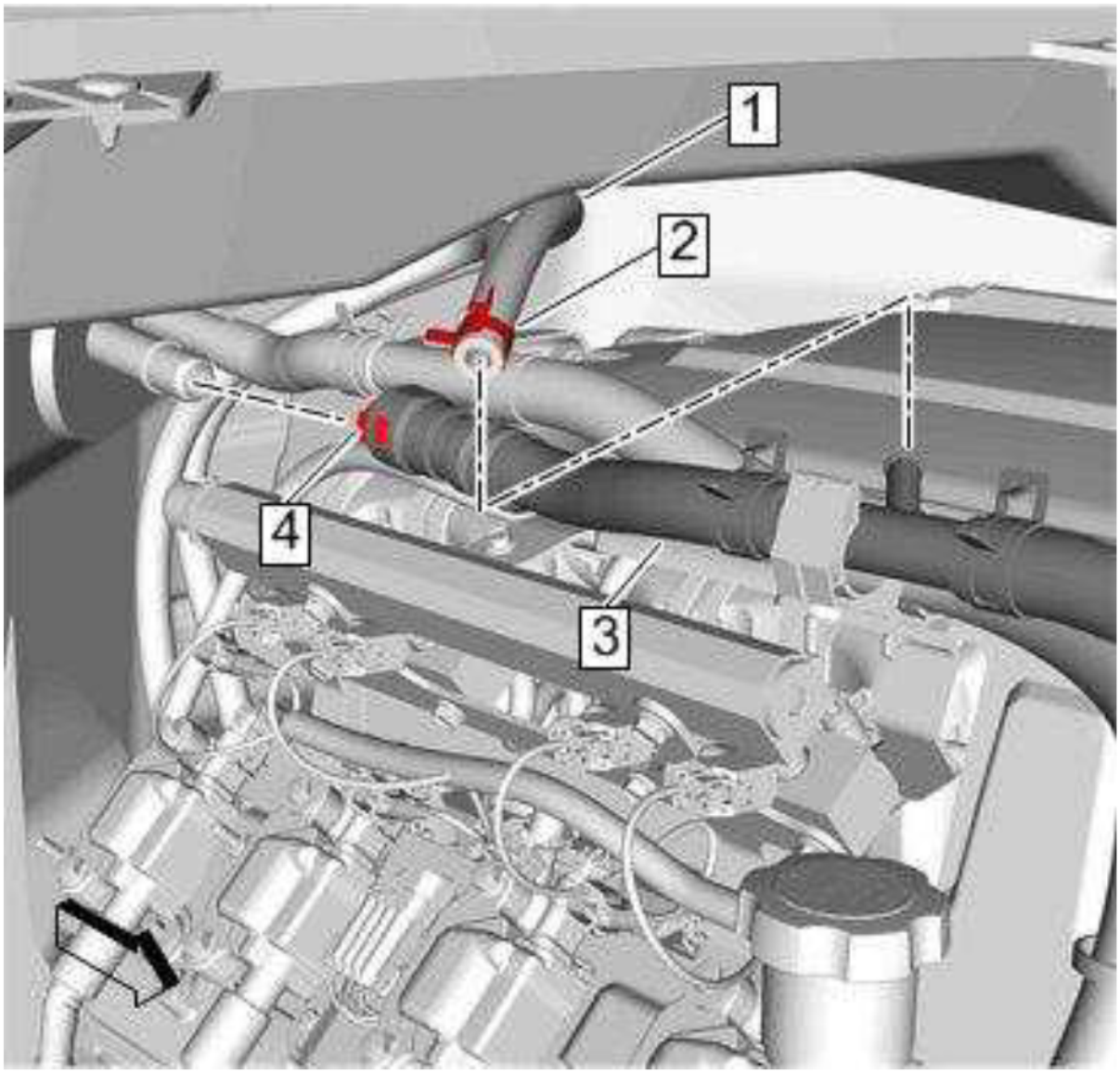


Fig. 326: Heater Outlet Hose From The Heater Core Tube
Courtesy of GENERAL MOTORS COMPANY

5. Release the clip and remove the heater outlet hose from the heater core tube. 4
6. Disengage the clamp (2) securing the compressed natural gas (CNG) high pressure regulator heater outlet hose using **BO-38185** Hose Clamp Pliers.
7. Remove the CNG high pressure regulator heater outlet hose (1) from the heater outlet hose (3).
8. Remove the heater outlet hose from the vehicle. 3

Installation Procedure

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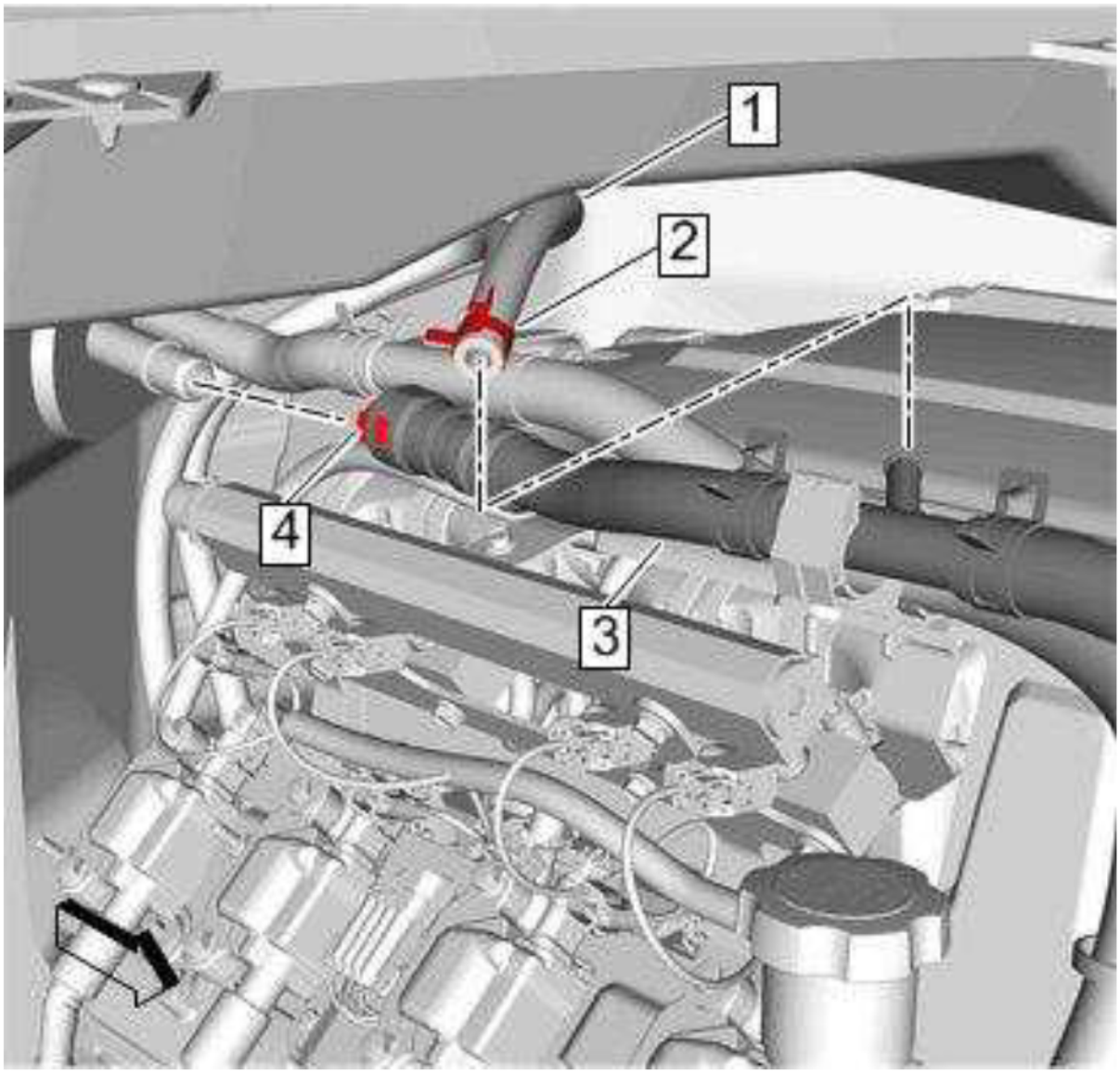


Fig. 327: Heater Outlet Hose From The Heater Core Tube
Courtesy of GENERAL MOTORS COMPANY

1. Heater Inlet Hose Assembly - Position in vehicle.
2. Install the CNG high pressure regulator heater outlet hose (1) to the heater outlet hose (3).
3. Engage the clamp (2) securing the compressed natural gas (CNG) high pressure regulator heater outlet hose (1) using **BO-38185** Hose Clamp Pliers.
4. Heater Outlet Hose Assembly@Heater Core Outlet Tube - Install

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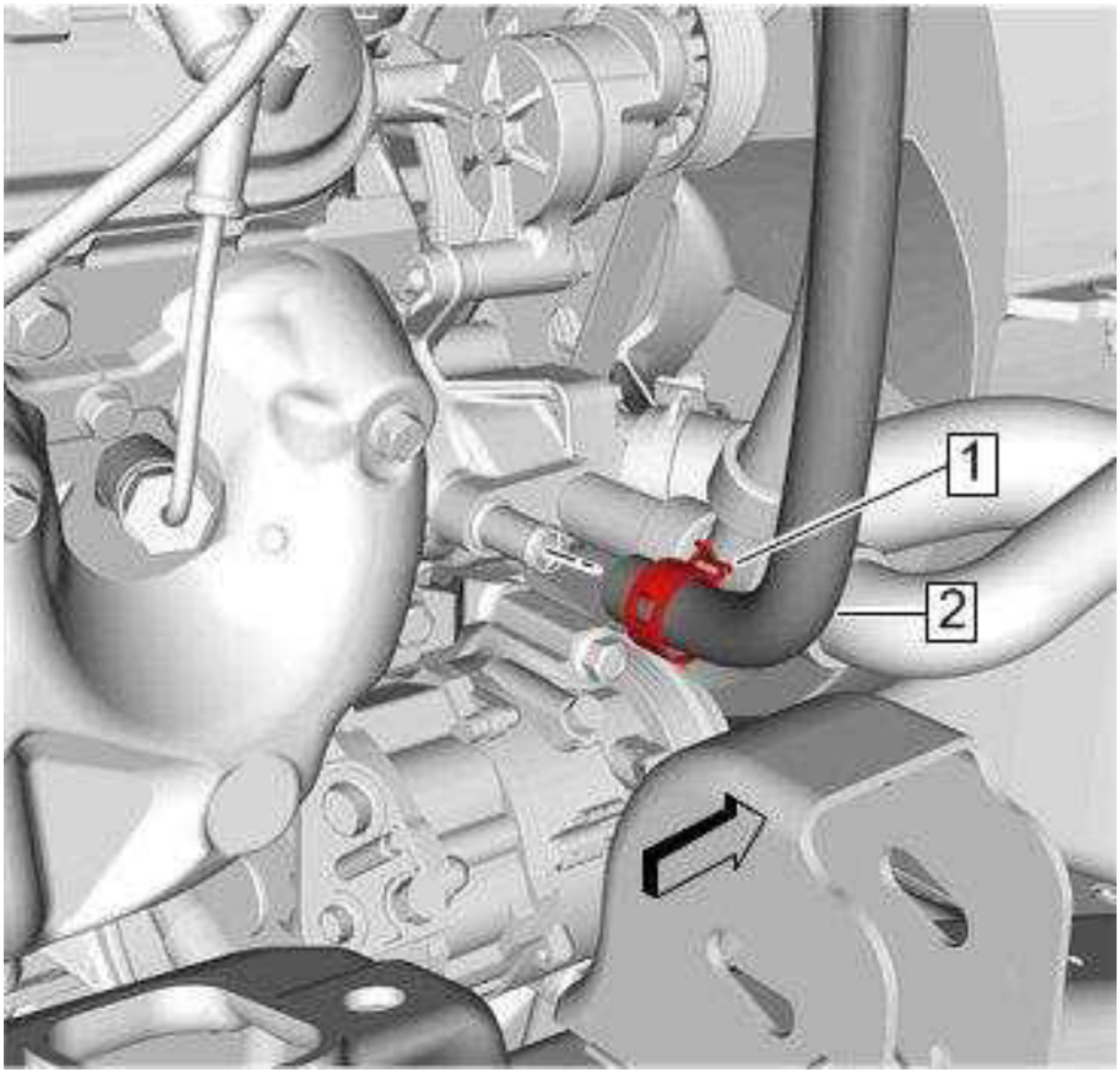


Fig. 328: Heater Outlet Hose Clamp To Water Pump
Courtesy of GENERAL MOTORS COMPANY

5. Heater Outlet Hose Assembly 2 @Water Pump - Install
6. Heater Outlet Hose Clamp 1 @Water Pump - Engage - Using **BO-38185** Hose Clamp Pliers
7. **Air Cleaner Outlet Duct Replacement** - Install
8. Fill the cooling system to the proper level. **Cooling System Draining and Filling (Static Fill LC8 L96)** **Cooling System Draining and Filling (Vac N Fill LC8 L96)**
9. Start the engine and inspect for leaks.

HEATER OUTLET HOSE REPLACEMENT (L8B)

Special Tool

J-43181 Heater Line Q.C.Release Tool

Equivalent regional tools:**Special Tools**

Removal Procedure

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1. Drain the cooling system. **Cooling System Draining and Filling (Vac N Fill L8B)**

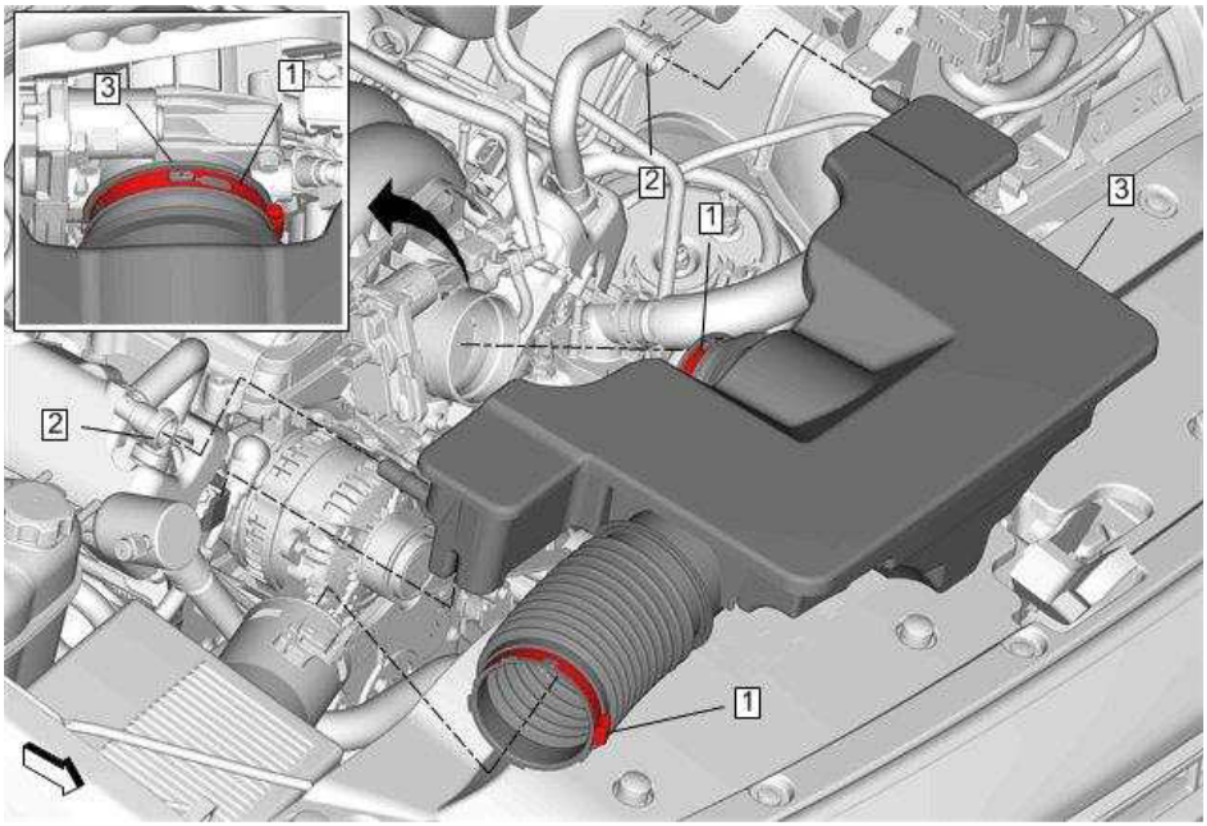


Fig. 329: Air Cleaner Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

2. Air Cleaner Outlet Duct 3 - Remove - **Air Cleaner Outlet Duct Replacement**

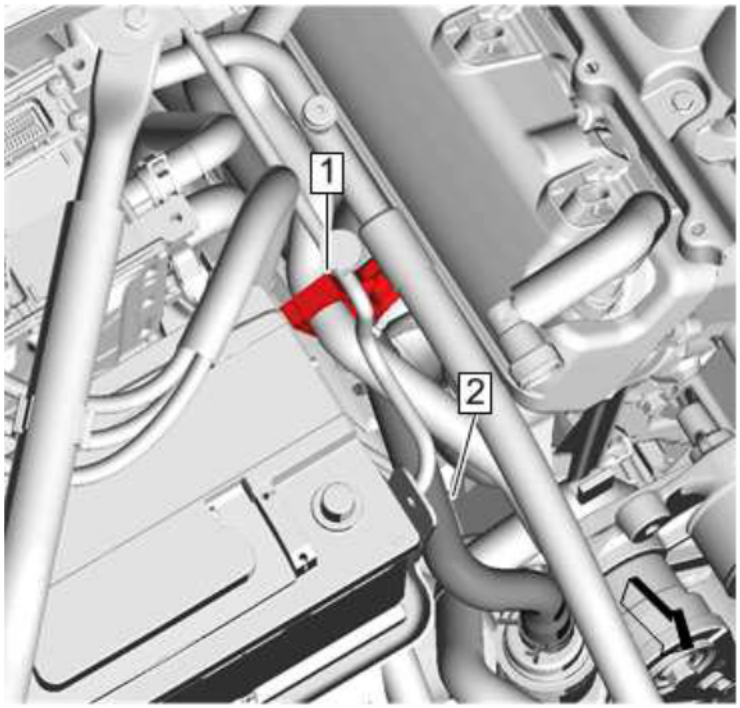


Fig. 330: Heater Outlet Hose At Heater Inlet and Outlet Hose Bracket
Courtesy of GENERAL MOTORS COMPANY

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3. Heater Outlet Hose 2 @Heater Inlet and Outlet Hose Bracket 1 - Remove

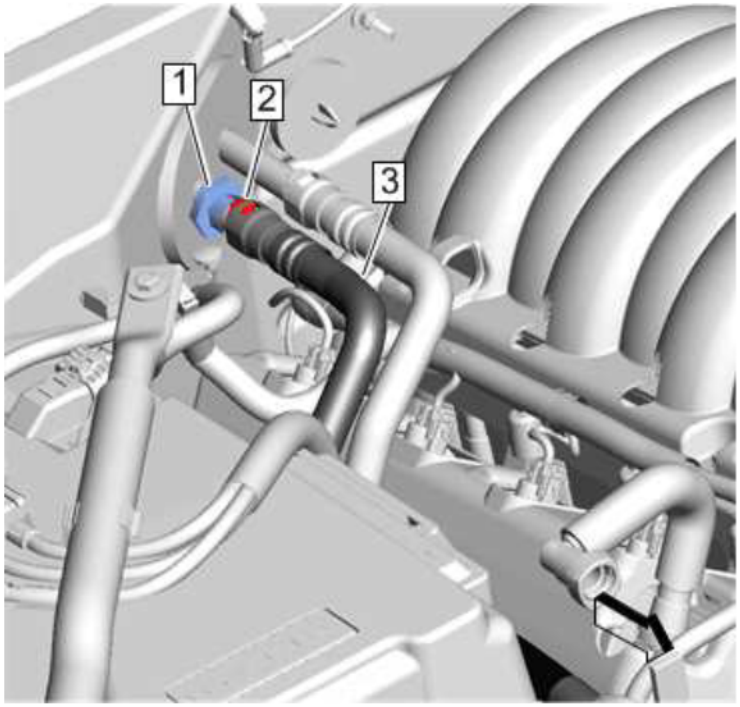


Fig. 331: Heater Outlet Hose At Heater Core
Courtesy of GENERAL MOTORS COMPANY

4. Heater Outlet Hose Quick Connect 2 - Disengage - **J-43181** Heater Line Q.C.Release Tool 1
5. Heater Outlet Hose 3 @Heater Core - Remove

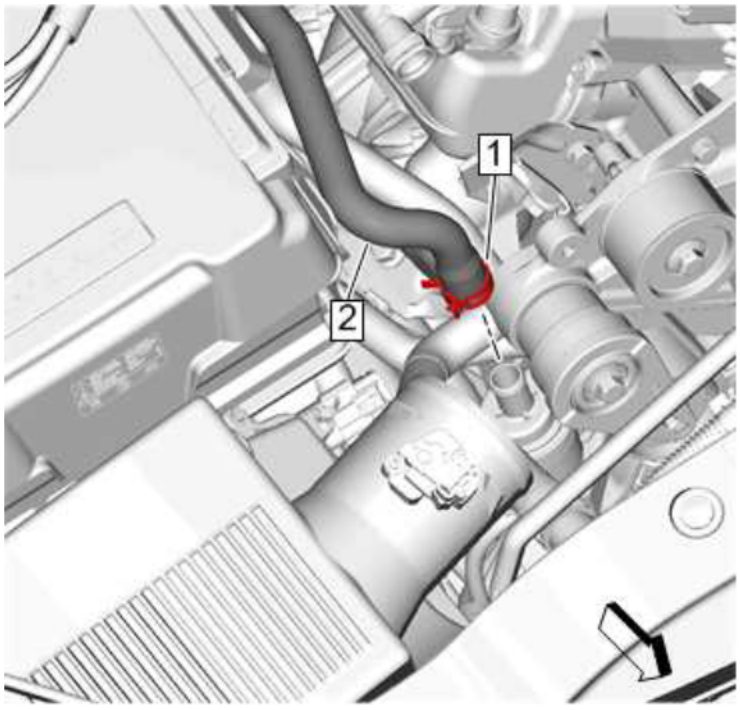


Fig. 332: Heater Outlet Hose And Clamp
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose Clamp 1 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

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7. Heater Outlet Hose 2 @Auxiliary Water Pump - Remove
8. Heater Outlet Hose 2 - Remove

Installation Procedure

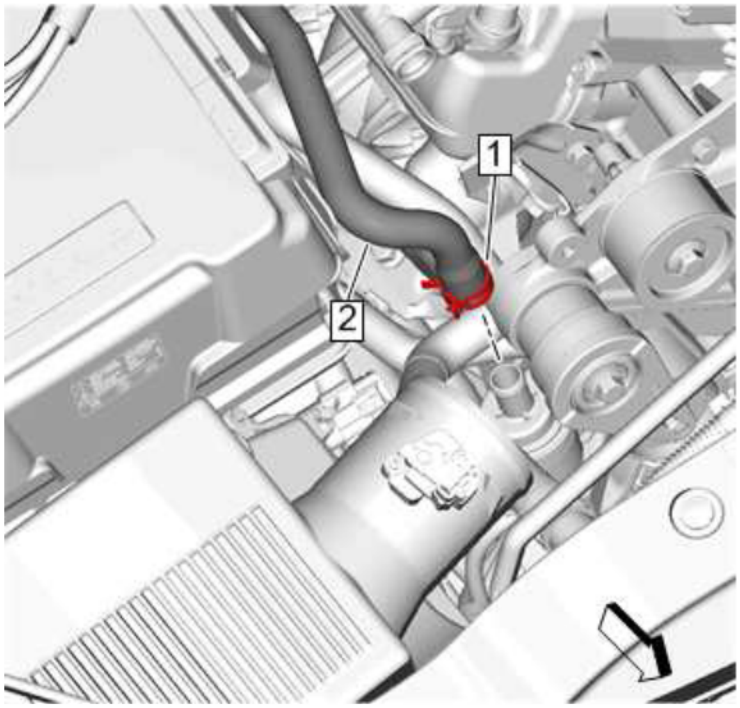


Fig. 333: Heater Outlet Hose And Clamp
Courtesy of GENERAL MOTORS COMPANY

1. Heater Outlet Hose 2 @Auxiliary Water Pump - Install
2. Heater Outlet Hose Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

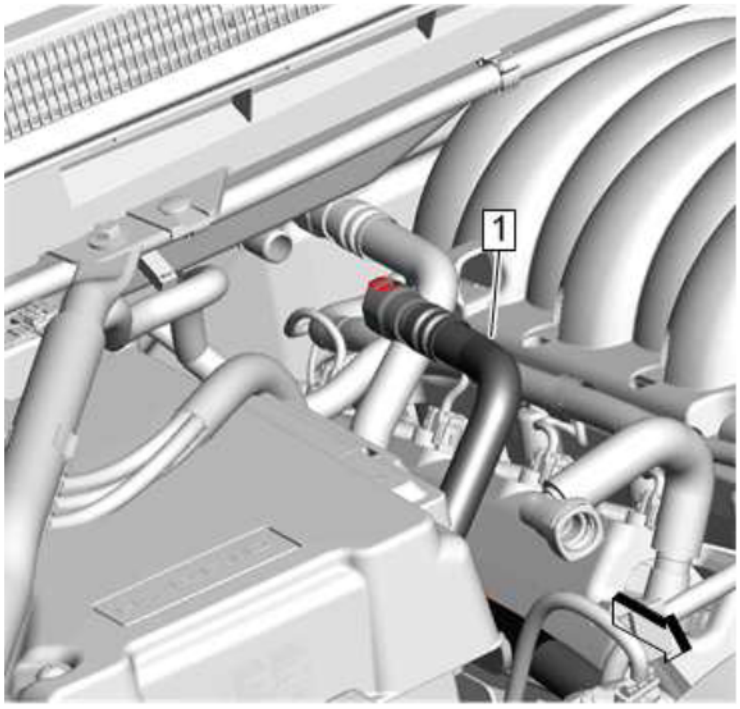


Fig. 334: Heater Outlet Hose And Heater Core Outlet Tube

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Courtesy of GENERAL MOTORS COMPANY

3. Heater Outlet Hose 1 @Heater Core - Install

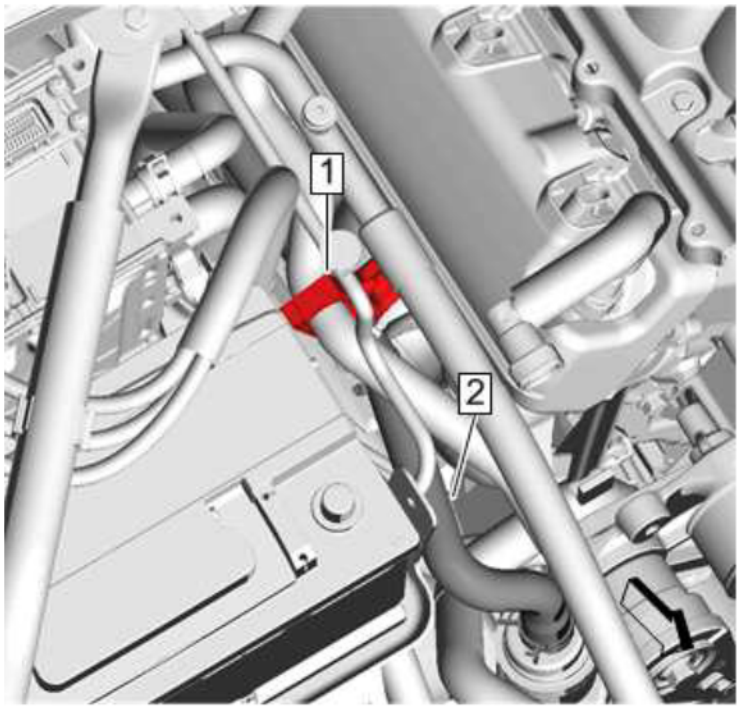
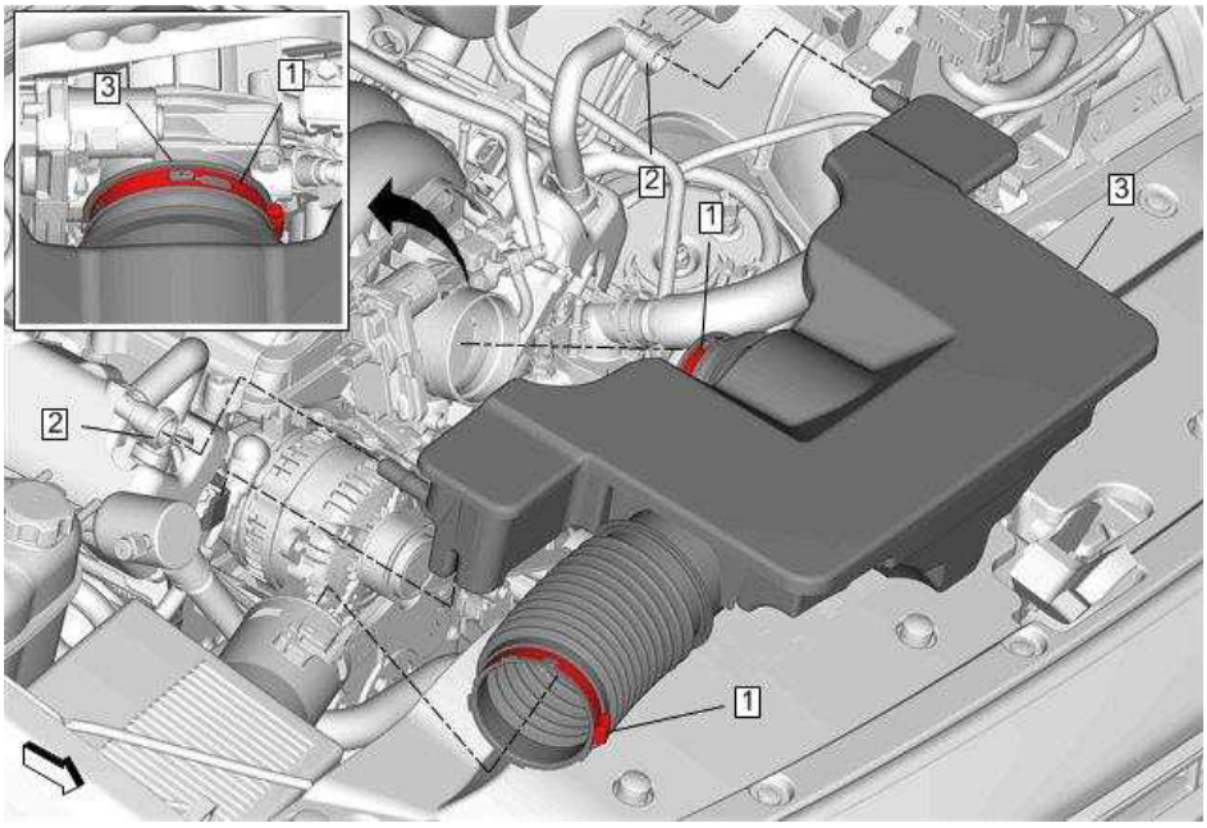


Fig. 335: Heater Outlet Hose At Heater Inlet and Outlet Hose Bracket
Courtesy of GENERAL MOTORS COMPANY

4. Heater Outlet Hose 2 @Heater Inlet and Outlet Hose Bracket 1 - Install



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Fig. 336: Air Cleaner Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

5. Air Cleaner Outlet Duct 3 - Install - **Air Cleaner Outlet Duct Replacement**
6. Fill the cooling system. **Cooling System Draining and Filling (Vac N Fill L8B)**
7. Start the engine and check for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (L5P)

Removal Procedure

1. Drain the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**

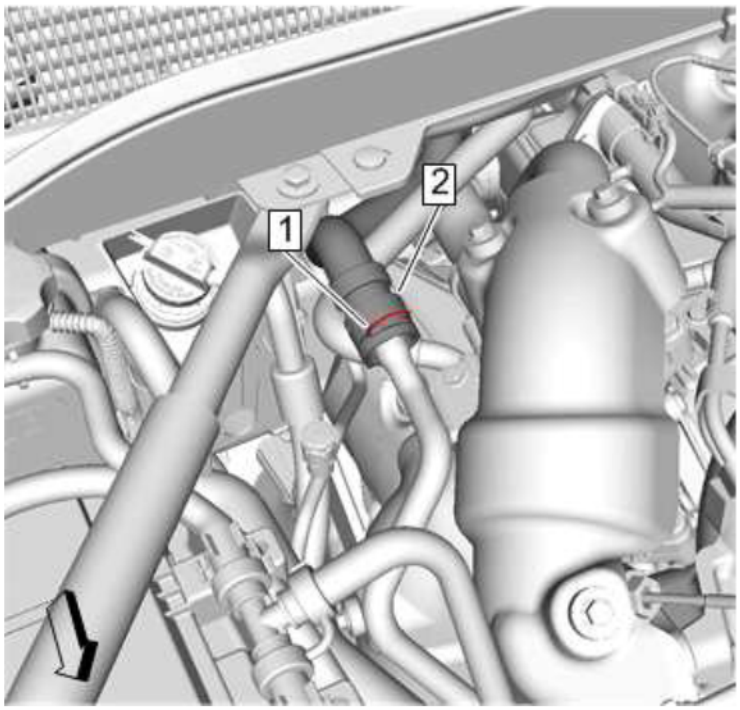


Fig. 337: Heater Outlet Hose And Pipe
Courtesy of GENERAL MOTORS COMPANY

2. Heater Outlet Hose Retainer 1 - Disengage
3. Heater Outlet Hose 2 @Heater Outlet Pipe - Remove

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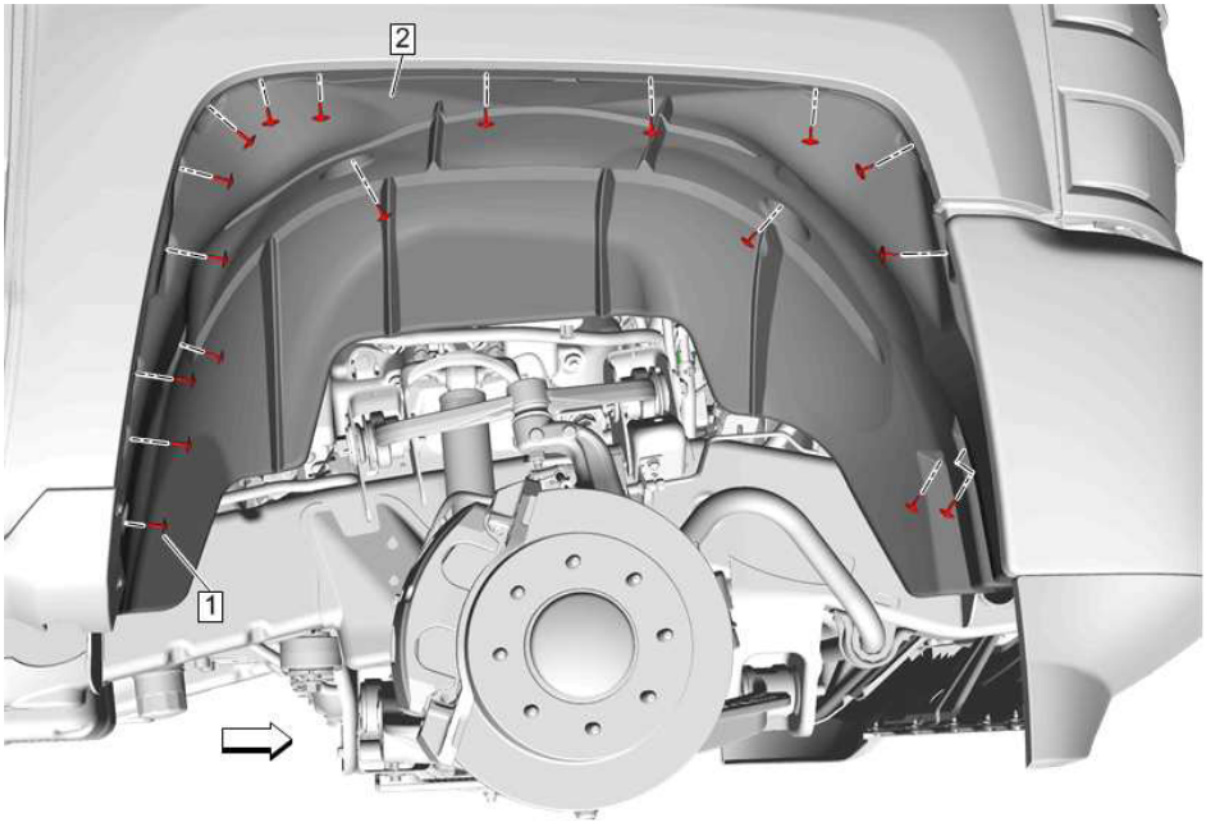


Fig. 338: Front Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

4. Front Wheelhouse Liner-Right Side 2 - Remove - **Front Wheelhouse Liner Replacement - Right Side**

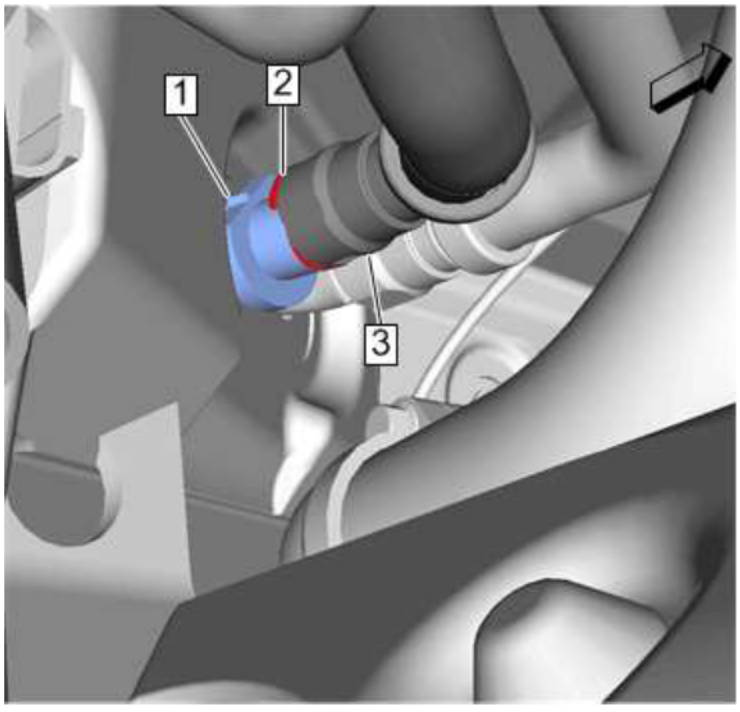


Fig. 339: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Outlet Hose Retainer 2 - Disengage - **J-43181** Heater Line Q.C.Release Tool 1

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6. Heater Outlet Hose 3 @Heater Outlet Pipe - Remove
7. Heater Outlet Hose 3 - Remove

Installation Procedure

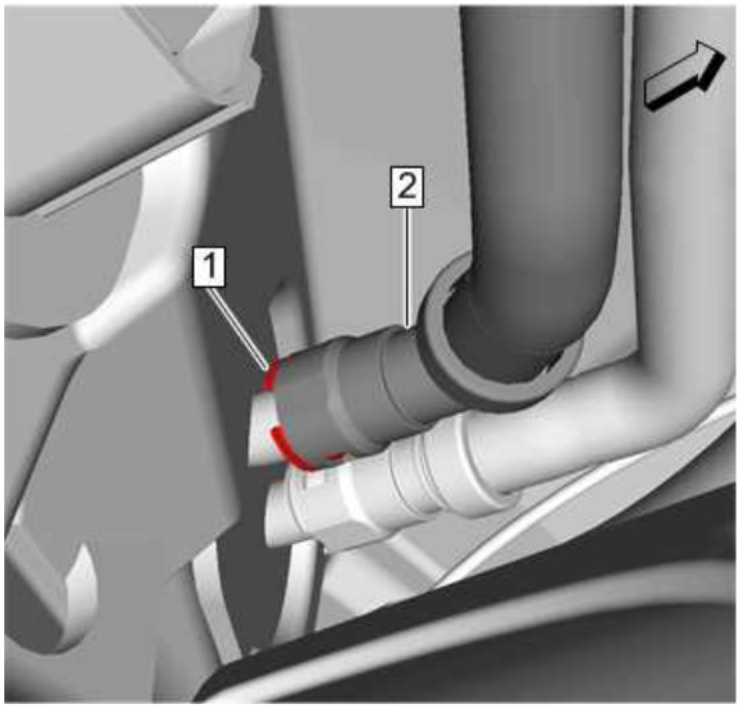


Fig. 340: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

1. Heater Outlet Hose 2 @Heater Outlet Pipe - Install
2. Heater Outlet Hose Retainer 1 - Engage

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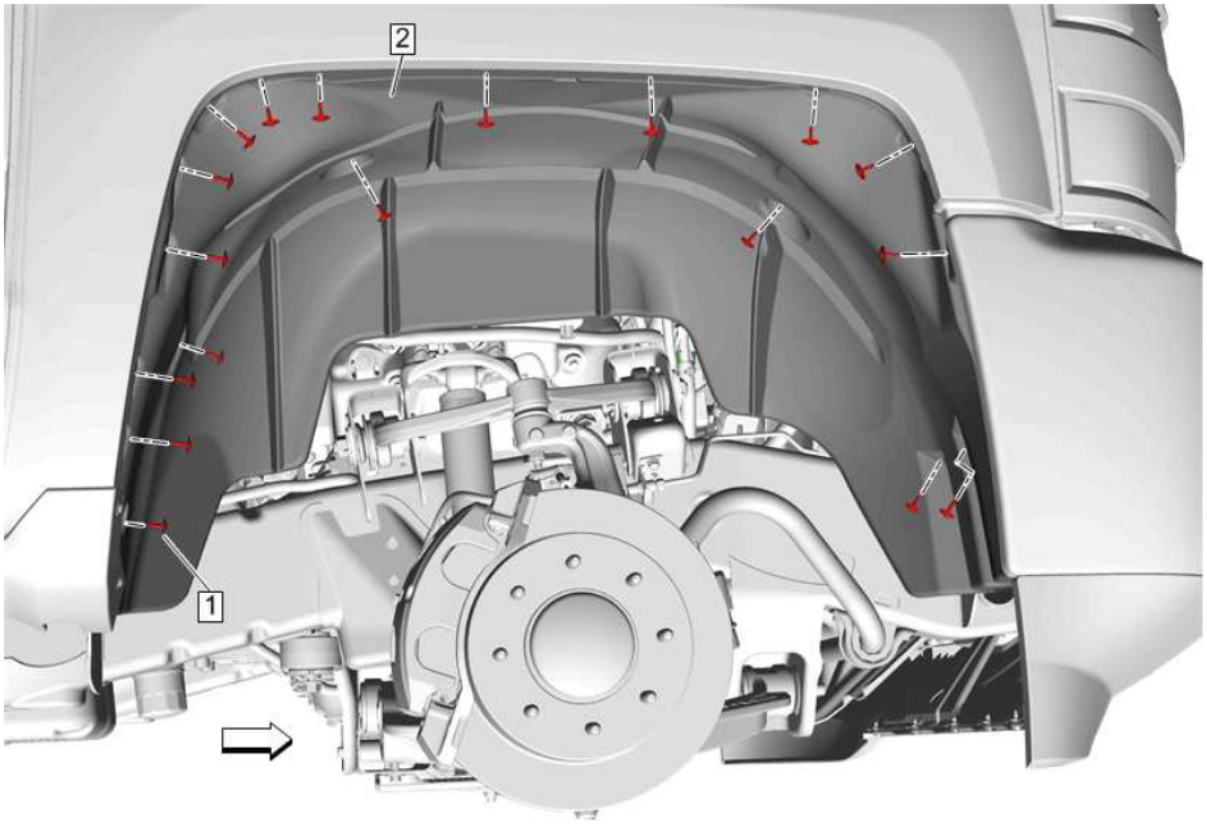


Fig. 341: Front Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

3. Front Wheelhouse Liner-Right Side 2 - Install - **Front Wheelhouse Liner Replacement - Right Side**

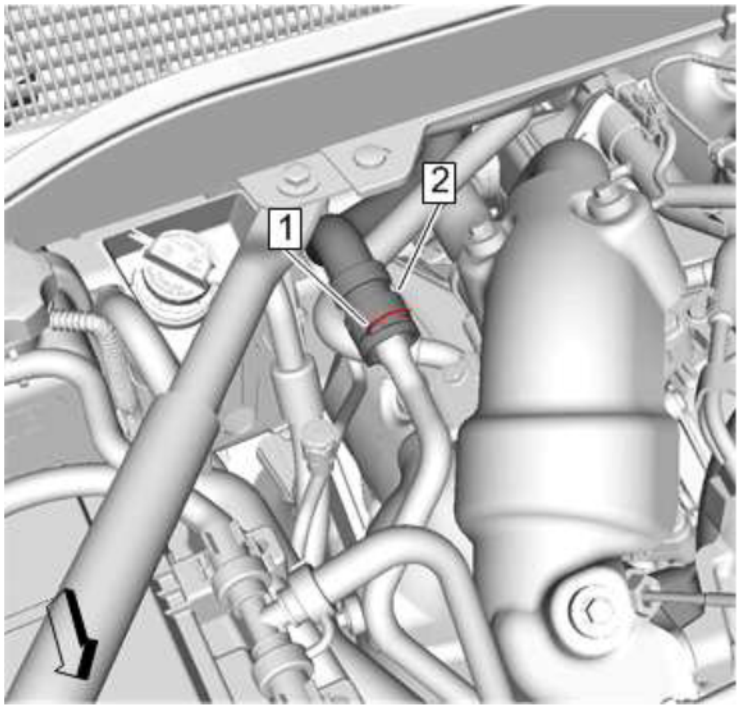


Fig. 342: Heater Outlet Hose And Pipe
Courtesy of GENERAL MOTORS COMPANY

4. Heater Outlet Hose 2 @Heater Outlet Pipe - Install

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5. Heater Outlet Hose Retainer 1 - Engage
6. Fill the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**
7. Start the engine and check for coolant leaks.

HEATER OUTLET PIPE REPLACEMENT (L5P)

Removal Procedure

1. Drain the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**

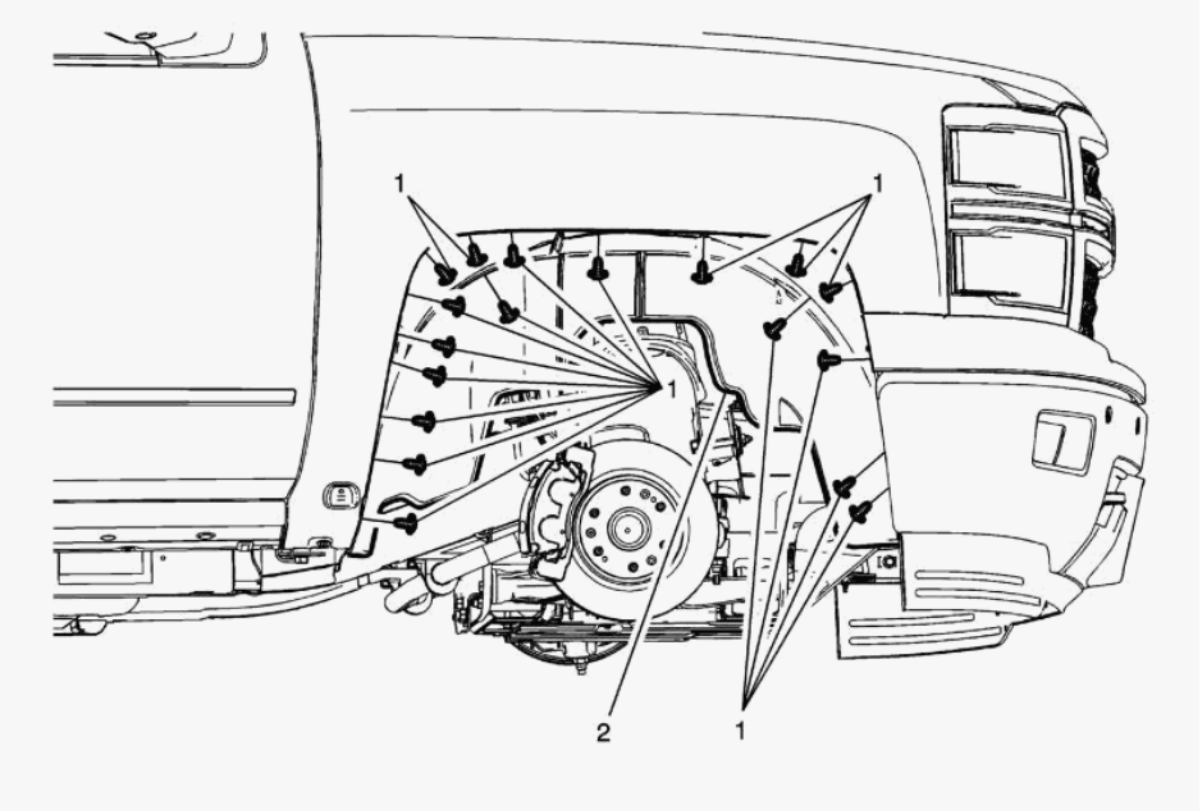


Fig. 343: Front Wheelhouse Liner - Right Side
Courtesy of GENERAL MOTORS COMPANY

2. Front Wheelhouse Liner-Right Side 2 - Remove - **Front Wheelhouse Liner Replacement - Right Side**

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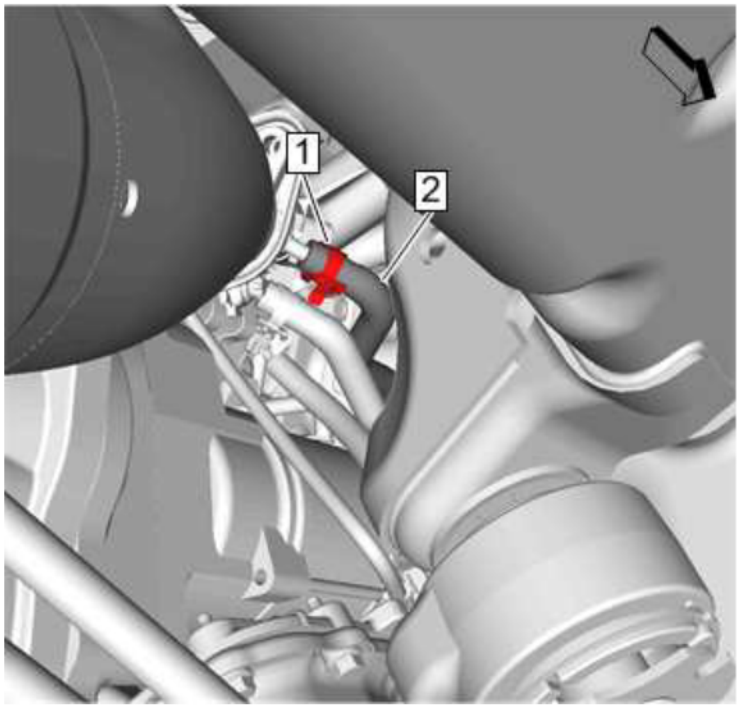


Fig. 344: Heater Outlet Pipe And Clamp
Courtesy of GENERAL MOTORS COMPANY

3. Heater Outlet Pipe Clamp 1 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
4. Heater Outlet Pipe 2 @Emission Reduction Fluid Injector - Remove

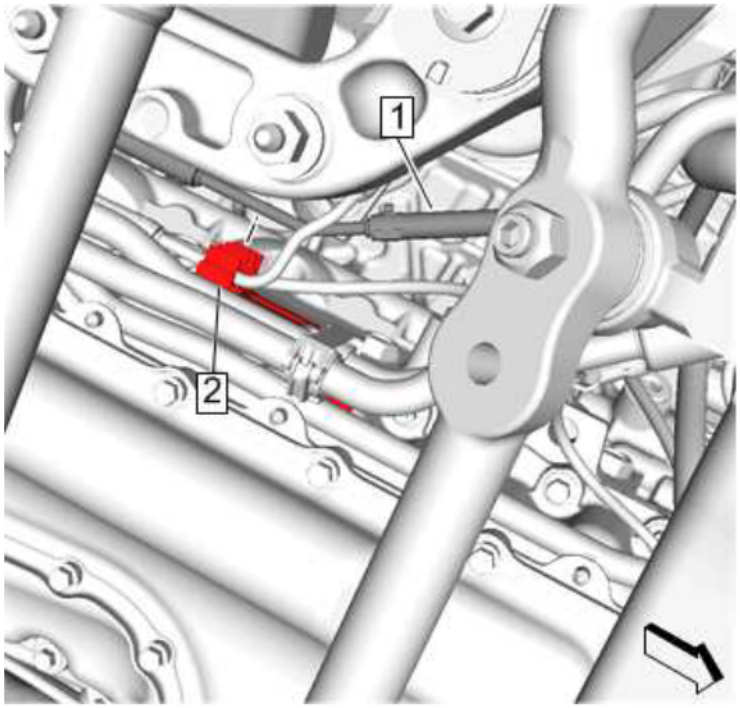


Fig. 345: Heater Outlet Pipe And Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

5. Heater Outlet Pipe 1 @Transmission Fluid Cooler Pipe Clip Bracket 2 - Remove
6. Wiring Harness@Heater Outlet Pipe - Remove

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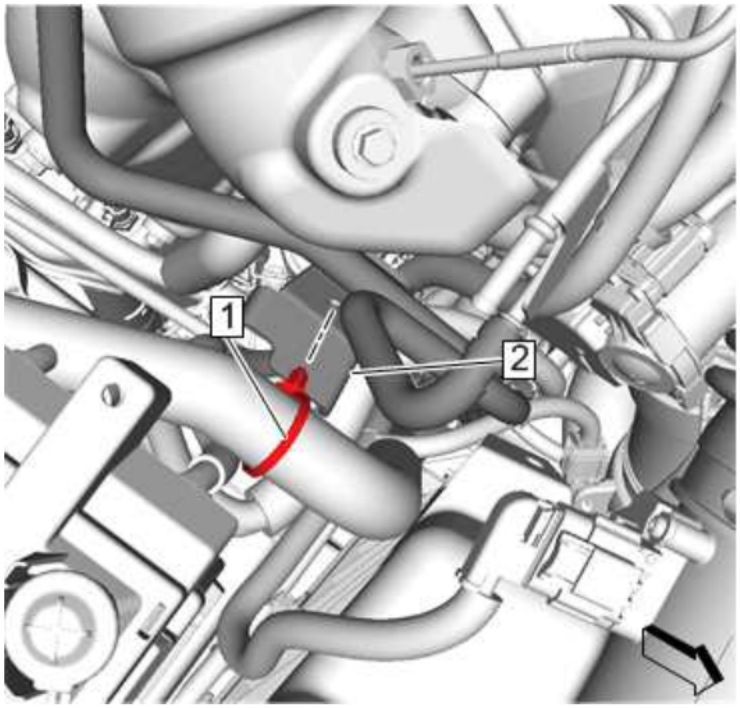


Fig. 346: Radiator Outlet Hose Clip And Heater Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

7. Radiator Outlet Hose Clip 1 @Heater Outlet Pipe 2 - Remove

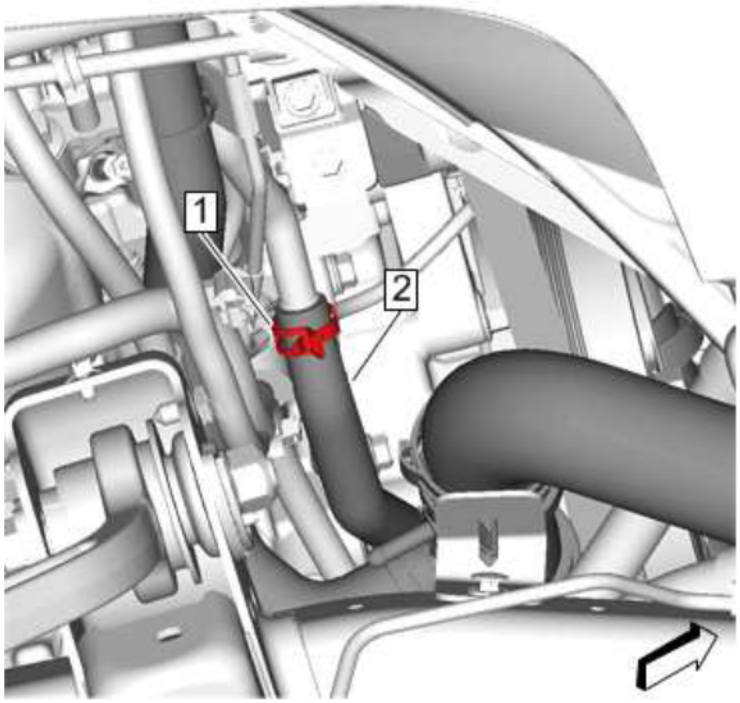


Fig. 347: Radiator Outlet Hose And Heater Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Outlet Hose 2 @Heater Outlet Pipe - Remove - **Radiator Outlet Hose Replacement (L5P)**

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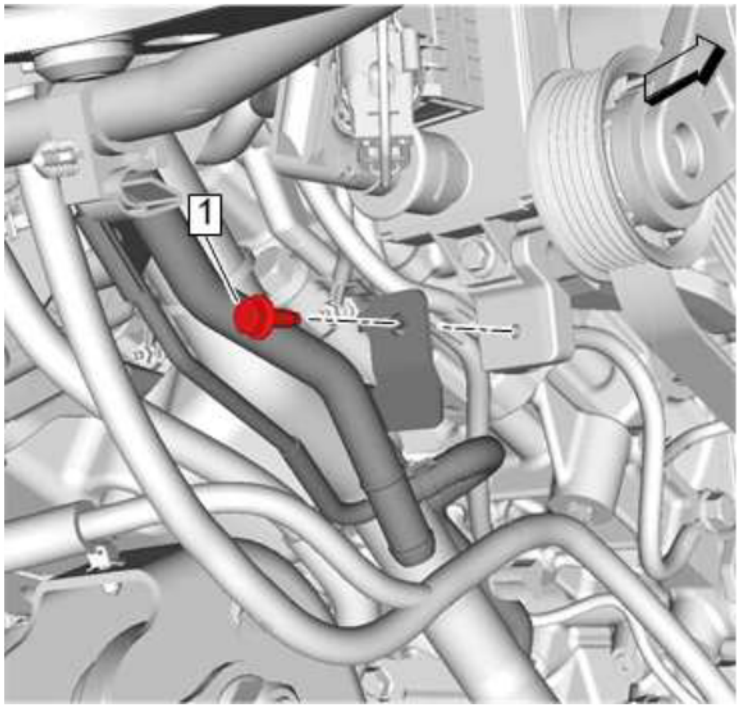


Fig. 348: Heater Outlet Pipe Retainer Bolt And Generator Bracket
Courtesy of GENERAL MOTORS COMPANY

9. Heater Outlet Pipe Retainer Bolt 1 @Generator Bracket - Remove

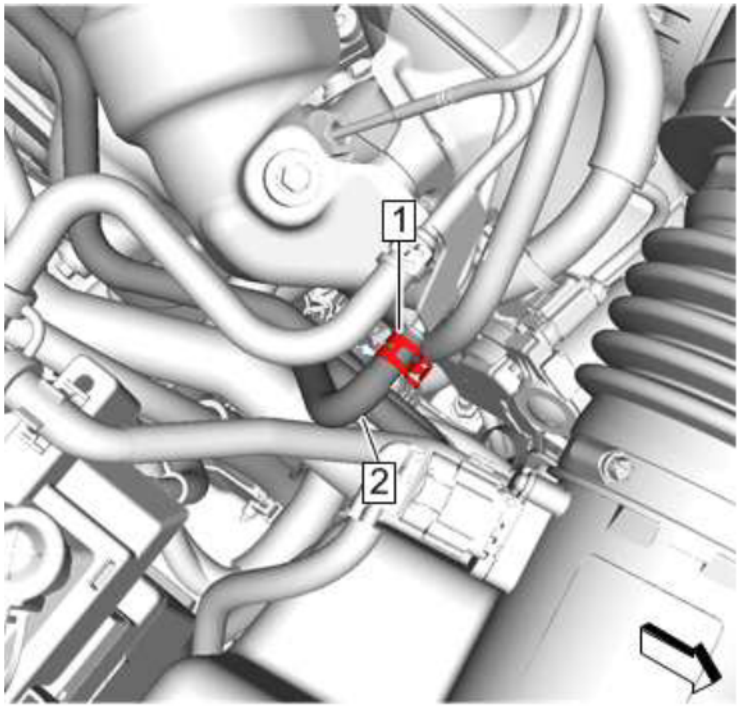


Fig. 349: Heater Outlet Pipe, Clamp And Radiator Surge Tank Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Heater Outlet Pipe Clamp 1 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
11. Heater Outlet Pipe 2 @Radiator Surge Tank Inlet Hose - Remove

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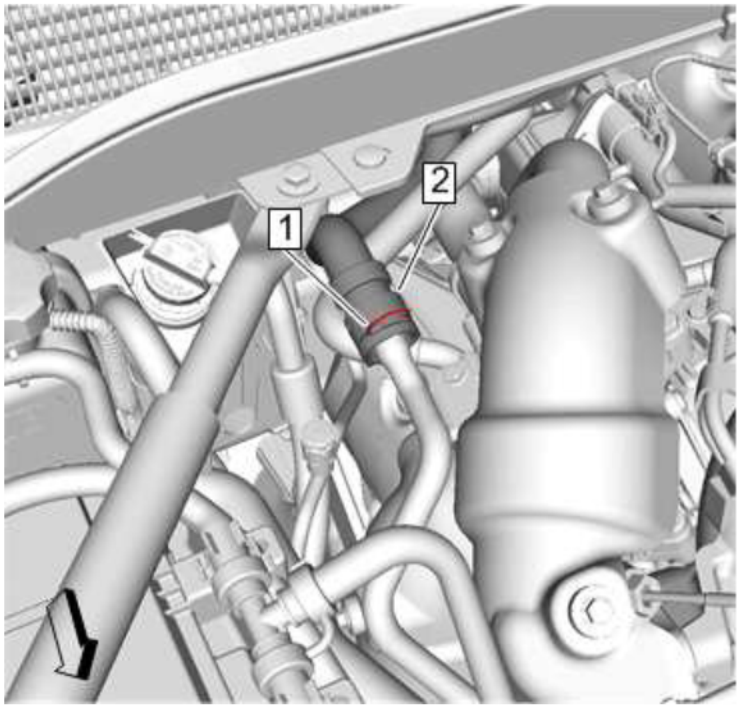


Fig. 350: Heater Outlet Hose And Pipe
Courtesy of GENERAL MOTORS COMPANY

12. Heater Outlet Hose 2 @Heater Outlet Pipe - Remove - **Heater Outlet Hose Replacement (L5P)**

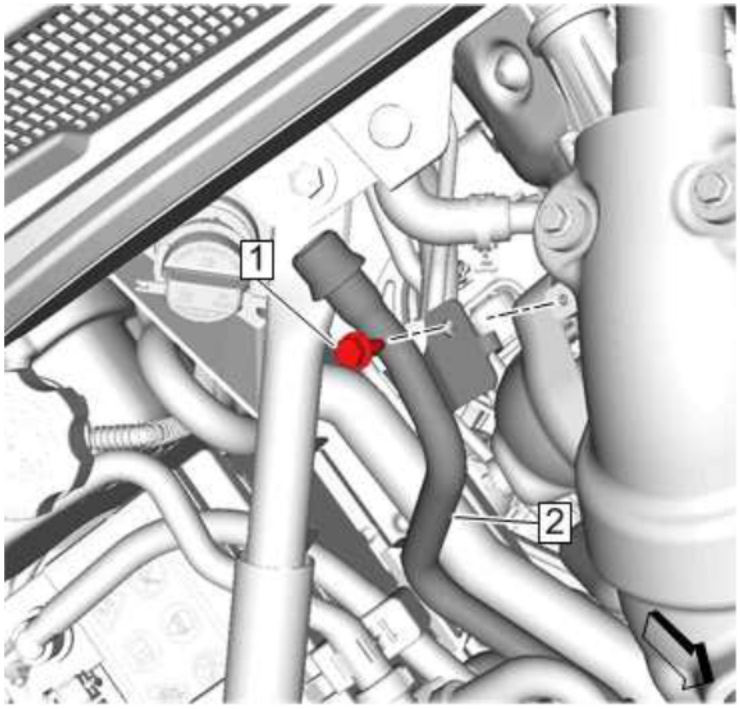


Fig. 351: Heater Outlet Pipe And Retainer Bolt
Courtesy of GENERAL MOTORS COMPANY

13. Heater Outlet Pipe Retainer Bolt 1 @Heater Outlet Pipe 2 - Remove
14. Heater Outlet Pipe 2 - Remove

Installation Procedure

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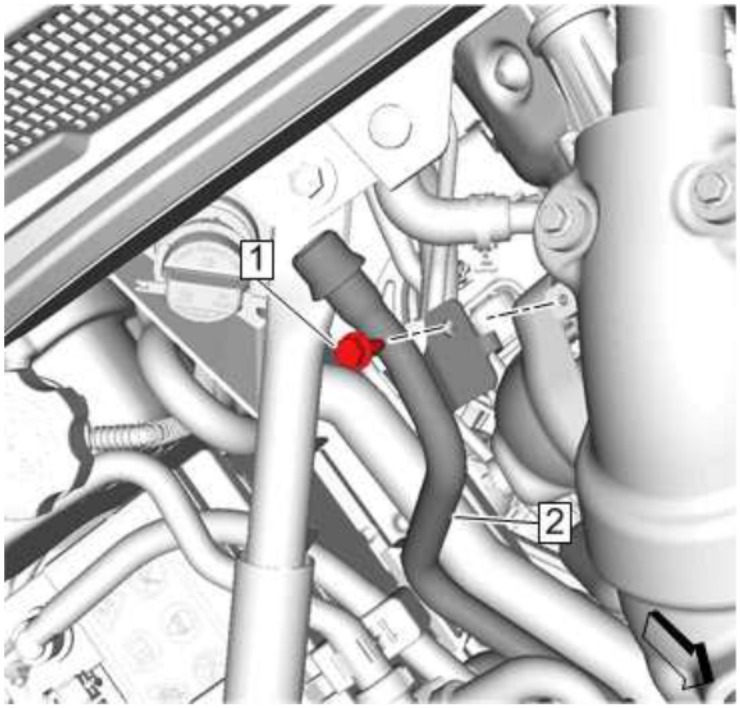


Fig. 352: Heater Outlet Pipe And Retainer Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Heater Outlet Pipe 2 - Install

CAUTION: **Refer to Fastener Caution .**

2. Heater Outlet Pipe Retainer Bolt 1 @Heater Outlet Pipe 2 - Install and tighten 9 N.m (80 lb in)

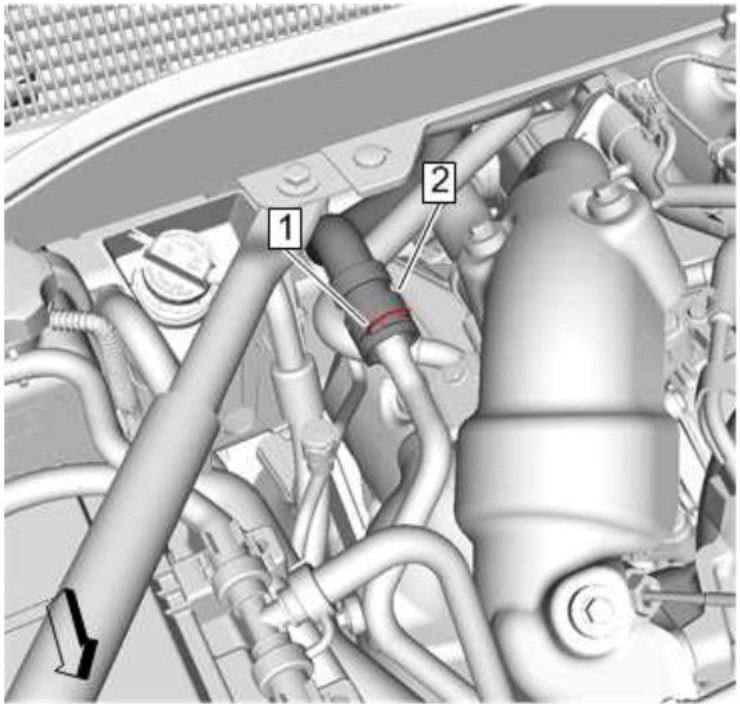


Fig. 353: Heater Outlet Hose And Pipe
Courtesy of GENERAL MOTORS COMPANY

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3. Heater Outlet Hose 2 @Heater Outlet Pipe - Install - **Heater Outlet Hose Replacement (L5P)**

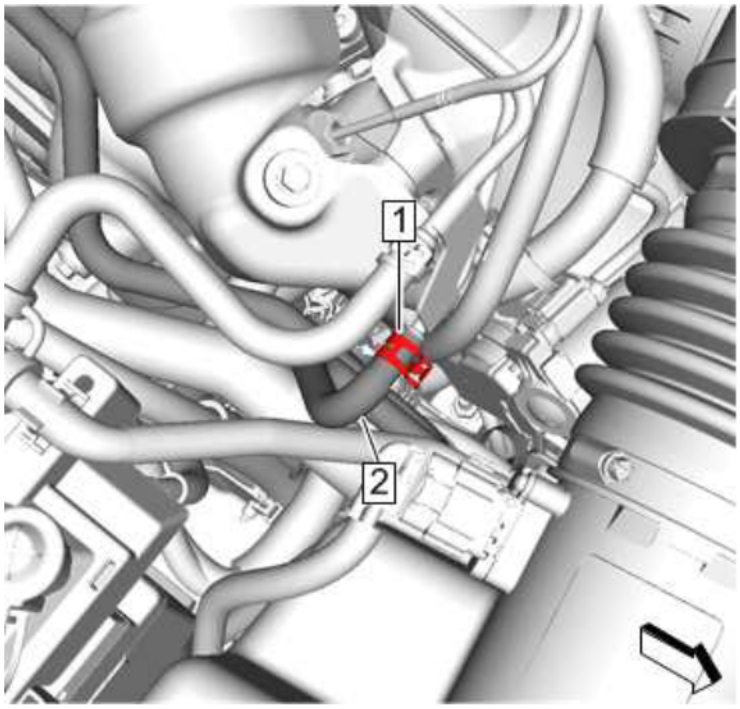


Fig. 354: Heater Outlet Pipe, Clamp And Radiator Surge Tank Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Outlet Pipe 2 @Radiator Surge Tank Inlet Hose - Install
5. Heater Outlet Pipe Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

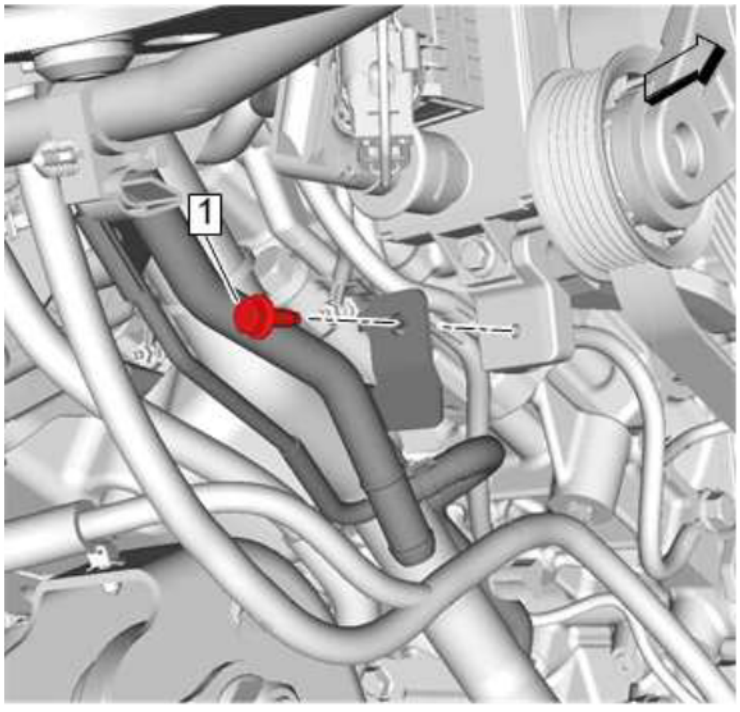


Fig. 355: Heater Outlet Pipe Retainer Bolt And Generator Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Pipe Retainer Bolt 1 @Generator Bracket - Install and tighten 9 N.m (80 lb in)

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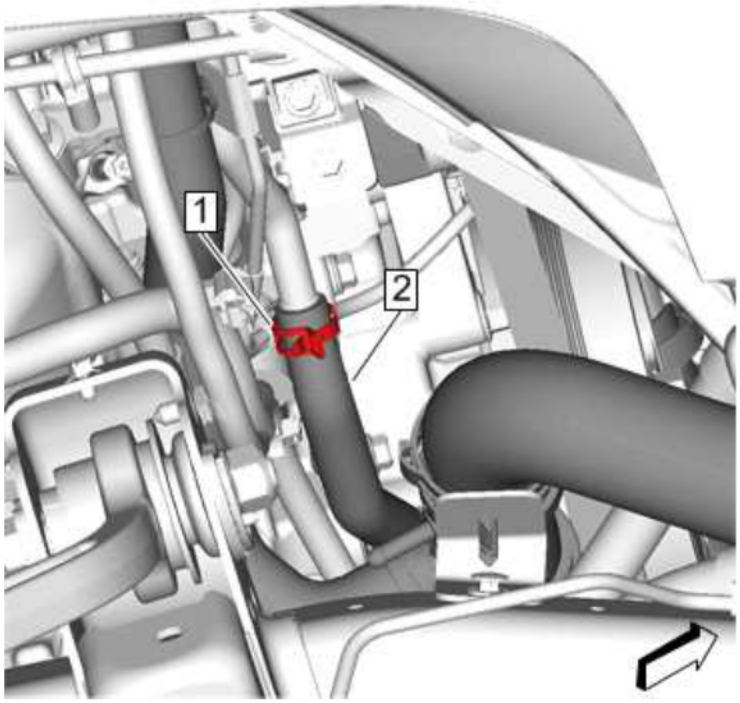


Fig. 356: Radiator Outlet Hose And Heater Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

7. Radiator Outlet Hose 2 @Heater Outlet Pipe - Install - **Radiator Outlet Hose Replacement (L5P)**

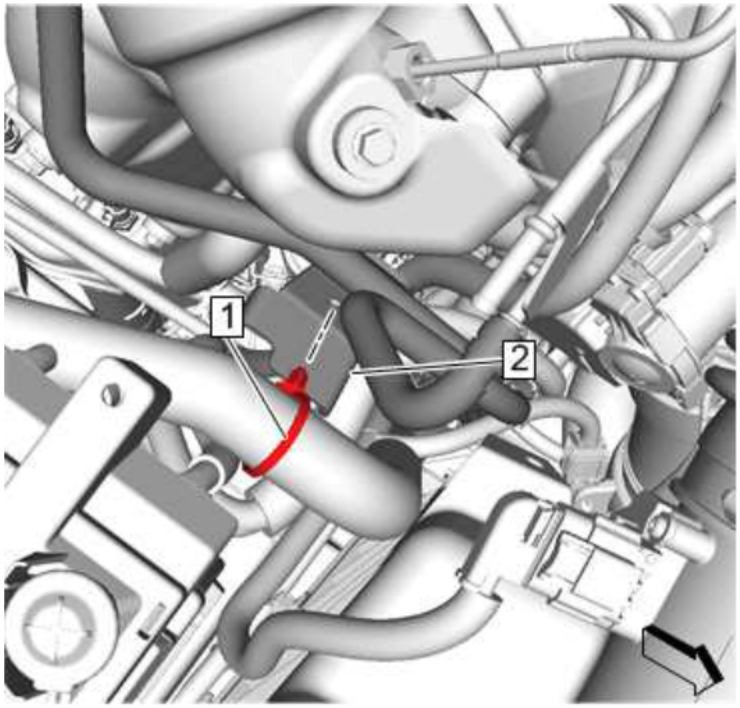


Fig. 357: Radiator Outlet Hose Clip And Heater Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Outlet Hose Clip 1 @Heater Outlet Pipe 2 - Install
9. Wiring Harness@Heater Outlet Pipe - Install

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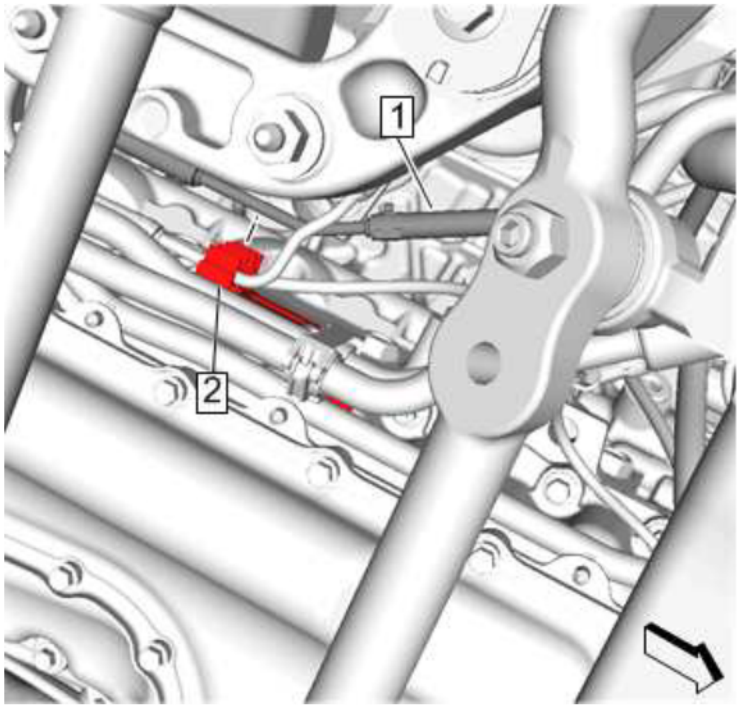


Fig. 358: Heater Outlet Pipe And Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

10. Heater Outlet Pipe 1 @Transmission Fluid Cooler Pipe Clip Bracket 2 - Install

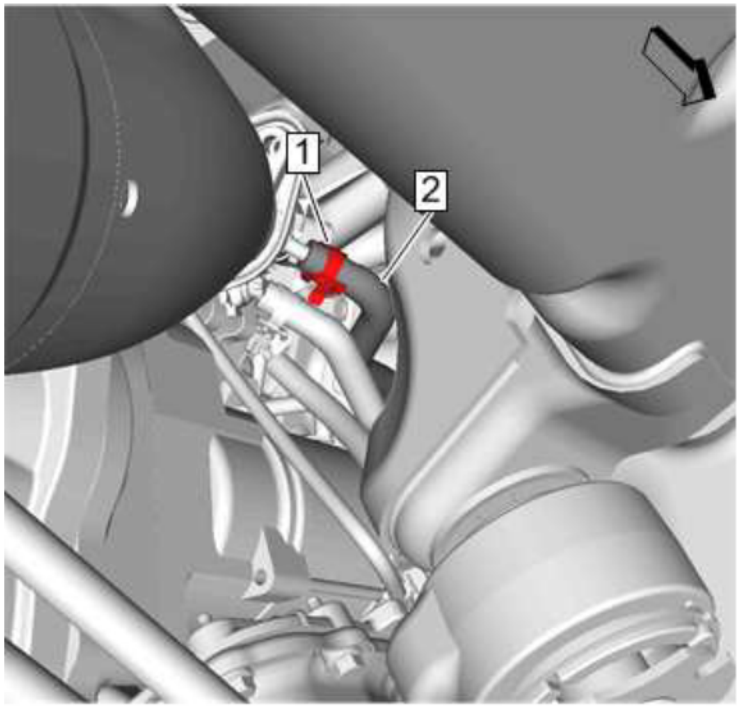


Fig. 359: Heater Outlet Pipe And Clamp
Courtesy of GENERAL MOTORS COMPANY

11. Heater Outlet Pipe 2 @Emission Reduction Fluid Injector - Install
12. Heater Outlet Pipe Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

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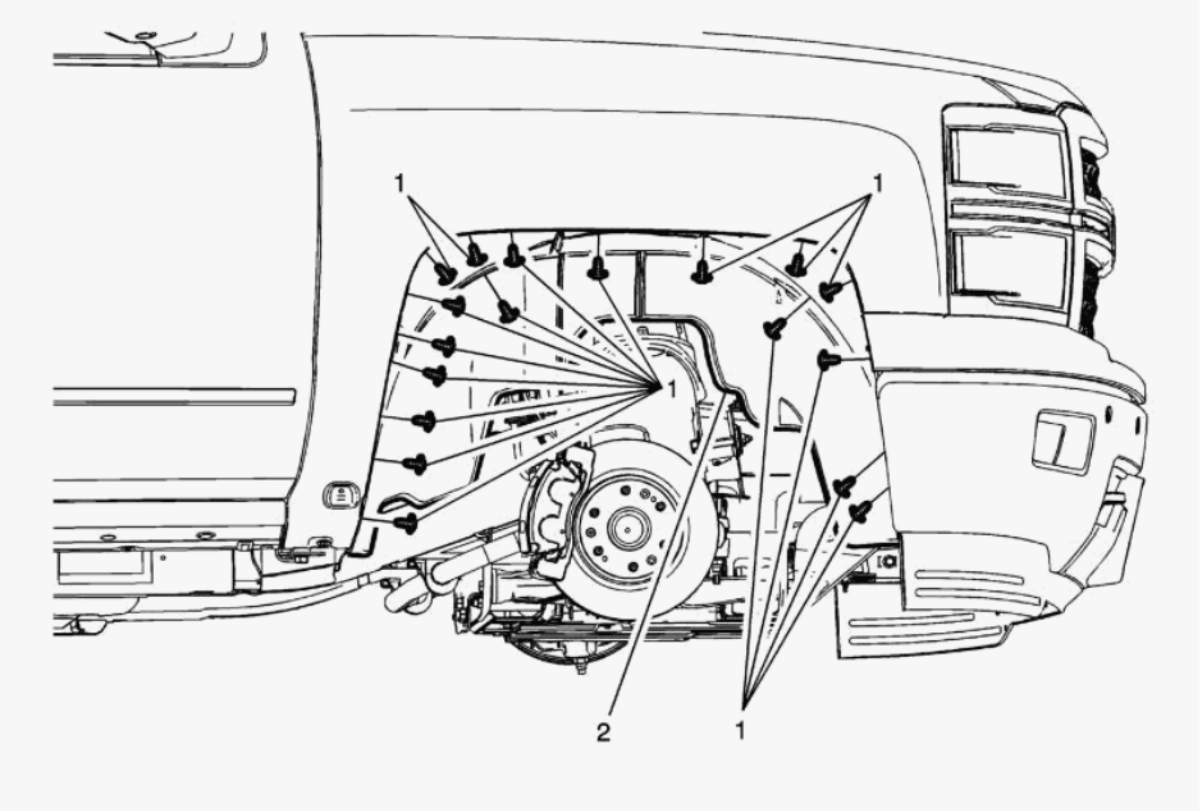


Fig. 360: Front Wheelhouse Liner - Right Side
Courtesy of GENERAL MOTORS COMPANY

13. Front Wheelhouse Liner-Right Side 2 - Install - **Front Wheelhouse Liner Replacement - Right Side**
14. Fill the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**
15. Start the engine and check for coolant leaks.

EMISSION REDUCTION FLUID INJECTOR OUTLET HOSE REPLACEMENT (L5P)

Removal Procedure

1. Drain the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**

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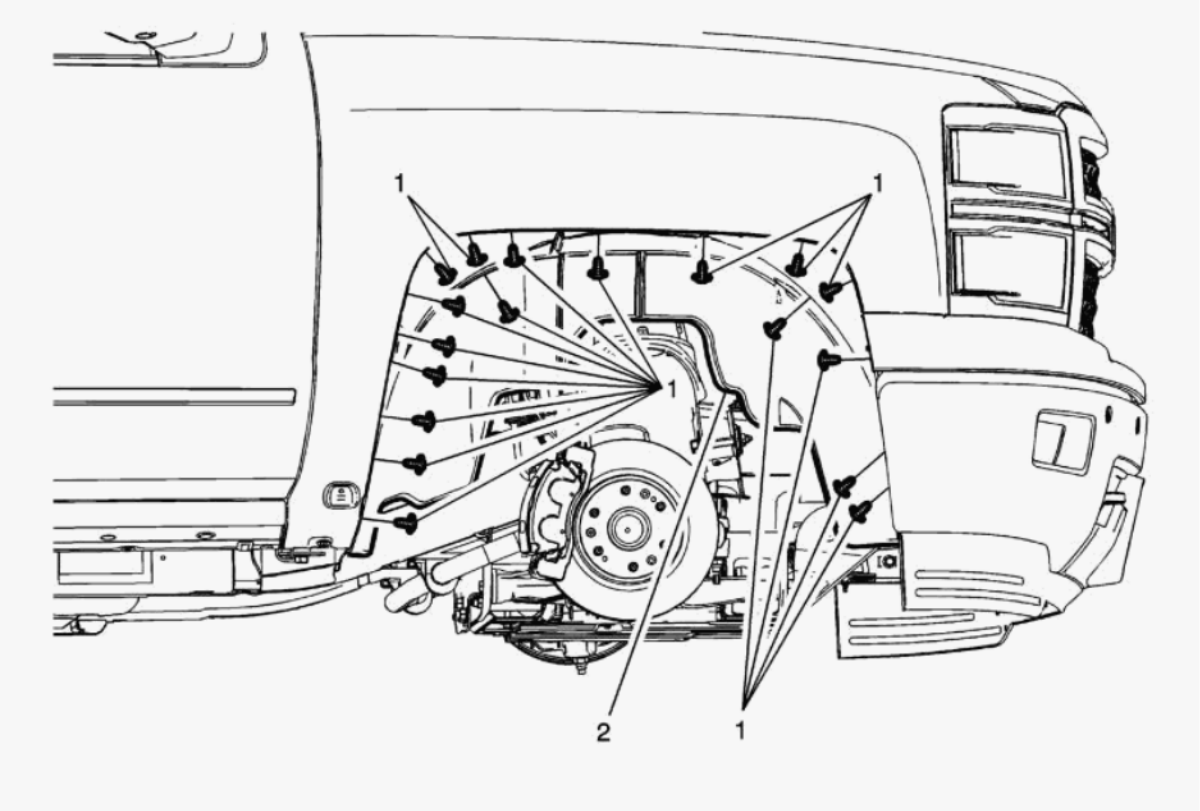


Fig. 361: Front Wheelhouse Liner - Right Side
Courtesy of GENERAL MOTORS COMPANY

2. Front Wheelhouse Liner-Right Side 2 - Remove - **Front Wheelhouse Liner Replacement - Right Side**

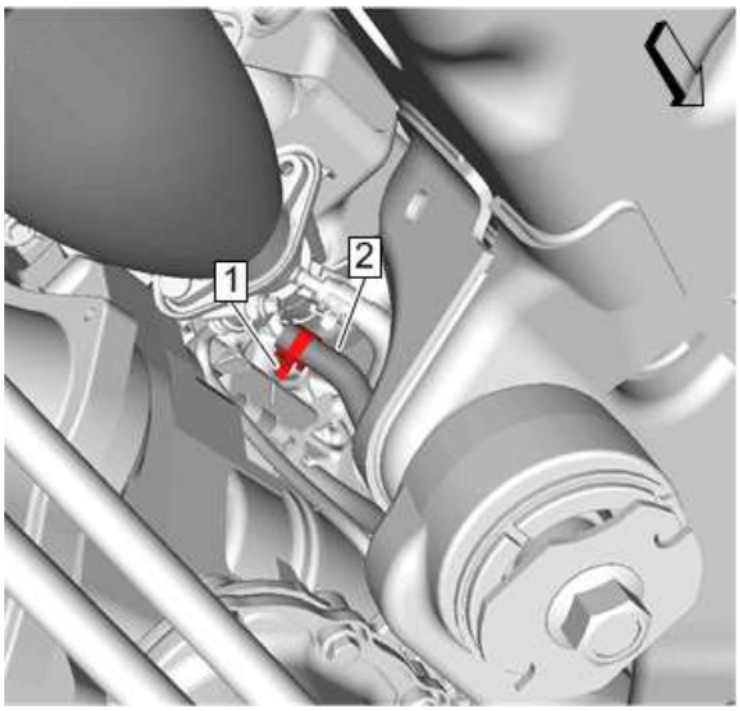


Fig. 362: Emission Reduction Fluid Injector Outlet Hose And Injector
Courtesy of GENERAL MOTORS COMPANY

3. Emission Reduction Fluid Injector Outlet Hose Clamp 1 - Disengage - **Hose Clamp Replacement**

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Guidelines - Spring Type

4. Emission Reduction Fluid Injector Outlet Hose 2 @Emission Reduction Fluid Injector - Remove

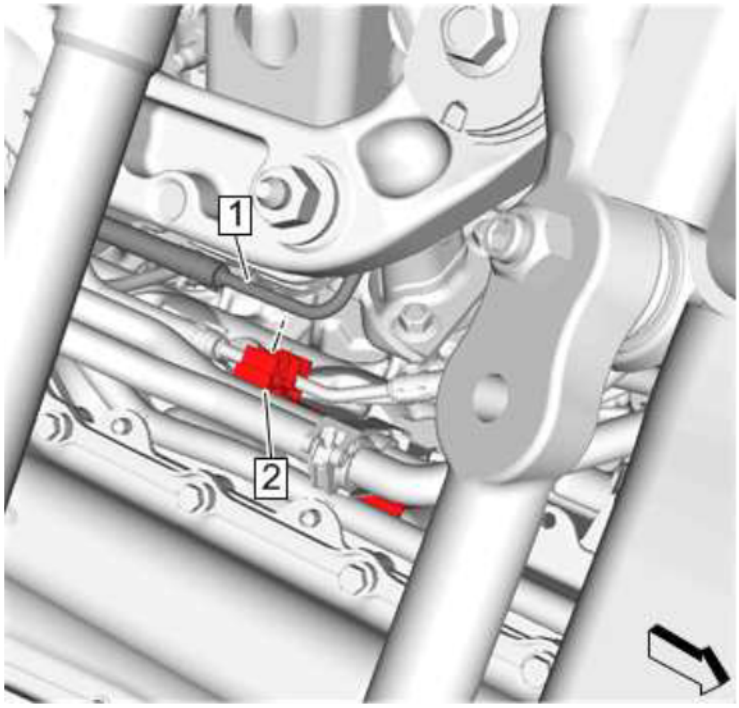


Fig. 363: Emission Reduction Fluid Injector Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Emission Reduction Fluid Injector Outlet Hose 1 @Transmission Fluid Cooler Pipe Clip Bracket 2 - Remove

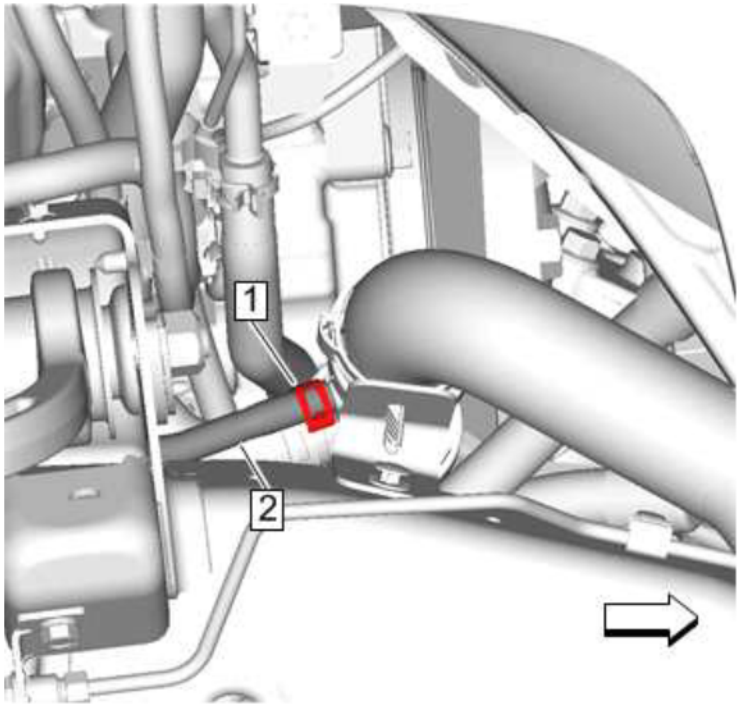


Fig. 364: Emission Reduction Fluid Injector Outlet Hose And Radiator Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

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6. Emission Reduction Fluid Injector Outlet Hose Clamp 1 - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**
7. Emission Reduction Fluid Injector Outlet Hose 2 @Radiator Outlet Hose - Remove
8. Emission Reduction Fluid Injector Outlet Hose 2 - Remove

Installation Procedure

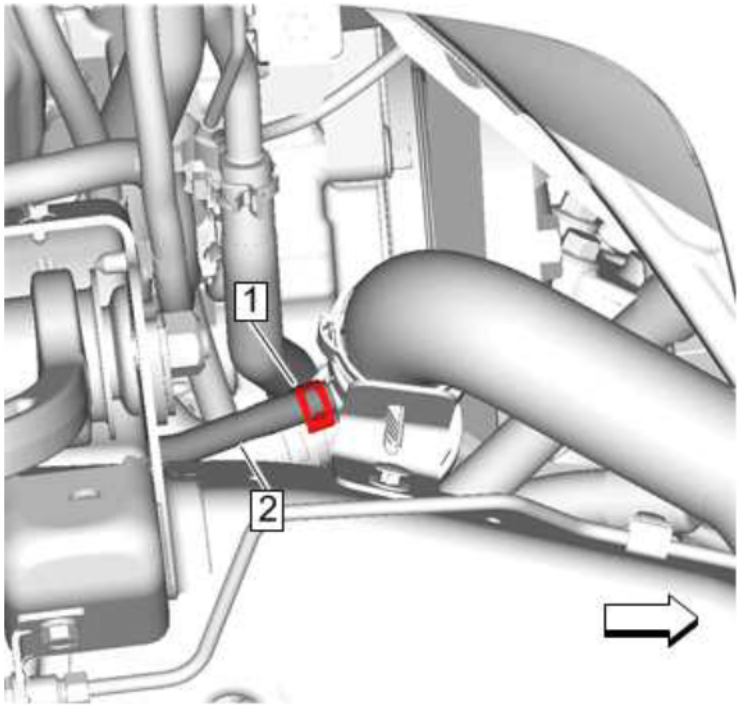


Fig. 365: Emission Reduction Fluid Injector Outlet Hose And Radiator Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

1. Emission Reduction Fluid Injector Outlet Hose 2 @Radiator Outlet Hose - Install
2. Emission Reduction Fluid Injector Outlet Hose Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

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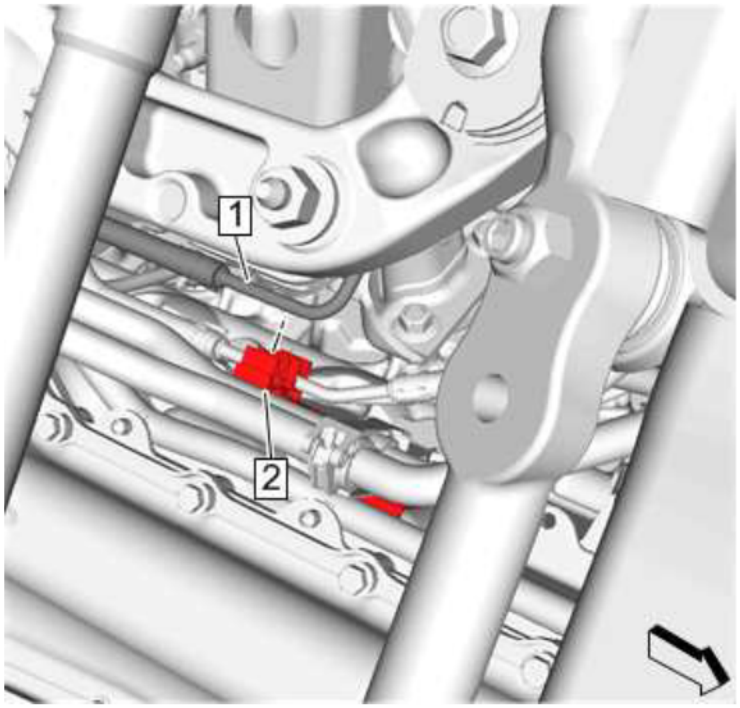


Fig. 366: Emission Reduction Fluid Injector Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Emission Reduction Fluid Injector Outlet Hose 1 @Transmission Fluid Cooler Pipe Clip Bracket 2 - Install

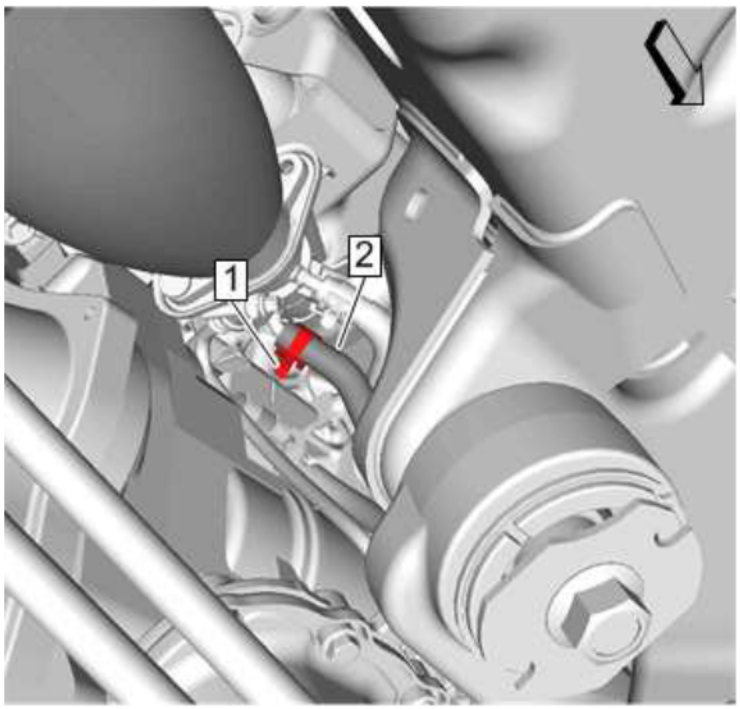


Fig. 367: Emission Reduction Fluid Injector Outlet Hose And Injector
Courtesy of GENERAL MOTORS COMPANY

4. Emission Reduction Fluid Injector Outlet Hose 2 @Emission Reduction Fluid Injector - Install
5. Emission Reduction Fluid Injector Outlet Hose Clamp 1 - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

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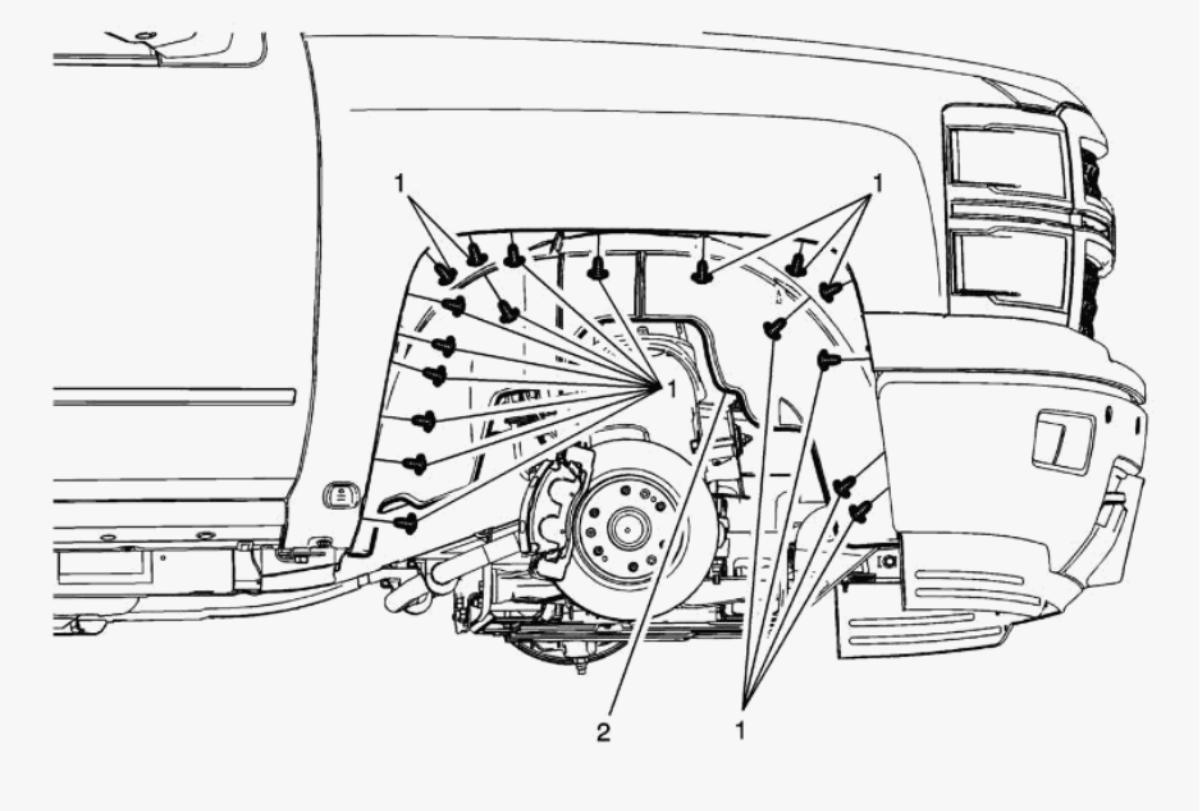


Fig. 368: Front Wheelhouse Liner - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Front Wheelhouse Liner-Right Side 2 - Install - **Front Wheelhouse Liner Replacement - Right Side**
7. Fill the cooling system. **Cooling System Draining and Filling (GE 47716 L5P)** **Cooling System Draining and Filling (Static L5P)**
8. Start the engine and check for coolant leaks.

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT

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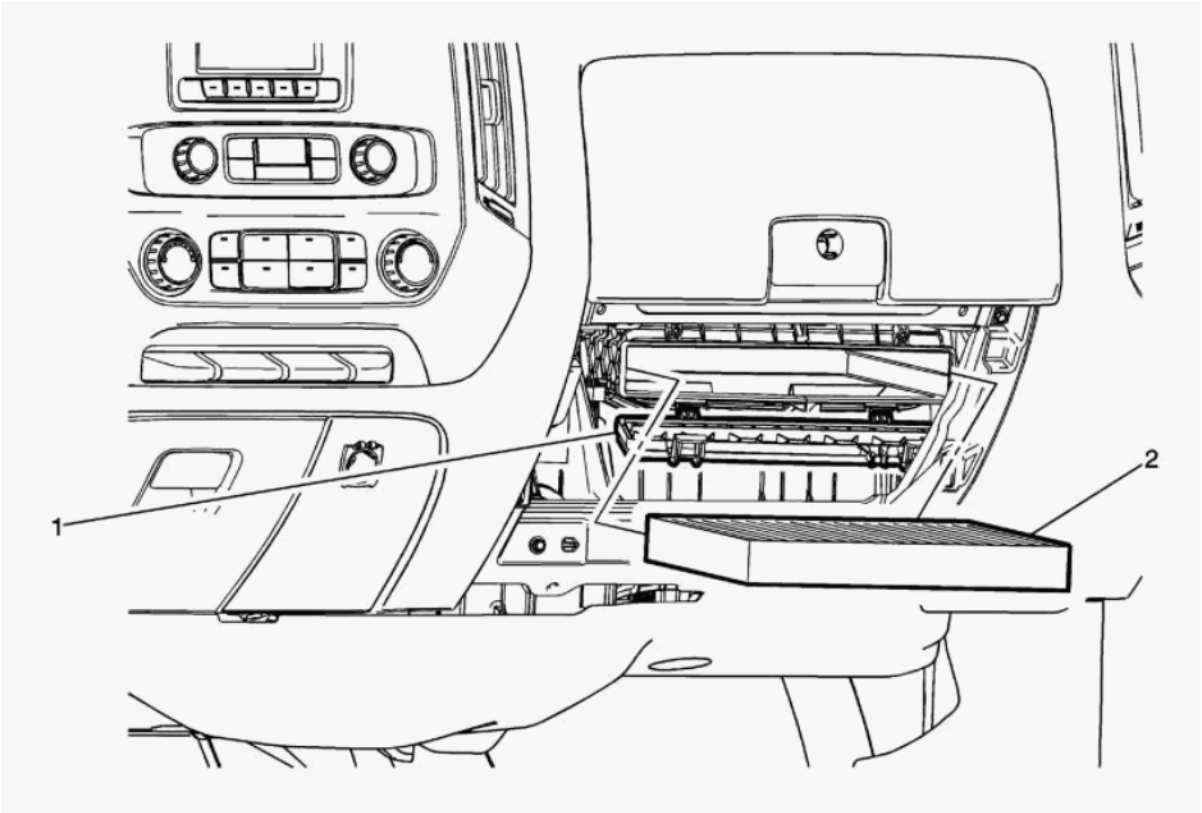


Fig. 369: Passenger Compartment Air Filter
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the Instrument Panel Compartment assembly. Refer to **Instrument Panel Compartment Replacement** .	
1	Passenger Compartment Air Inlet Filter Cover
2	Passenger Compartment Air Filter

AIR INLET HOUSING REPLACEMENT

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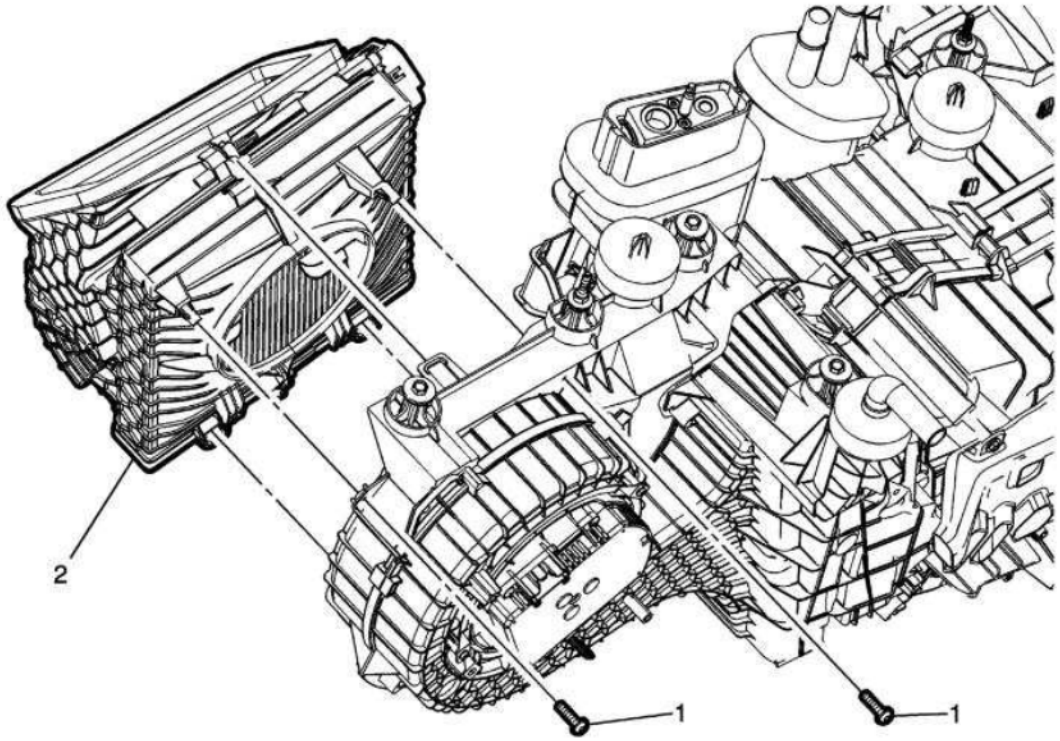


Fig. 370: Air Inlet Housing
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**. 2. Disconnect the electrical connectors as necessary.	
1	Air Inlet Housing Fastener (Qty: 2) **CAUTION:** **Refer to Fastener Caution .**
2	Air Inlet Housing Assembly **Procedure** Transfer the components as necessary.

AIR DISTRIBUTOR CASE REPLACEMENT

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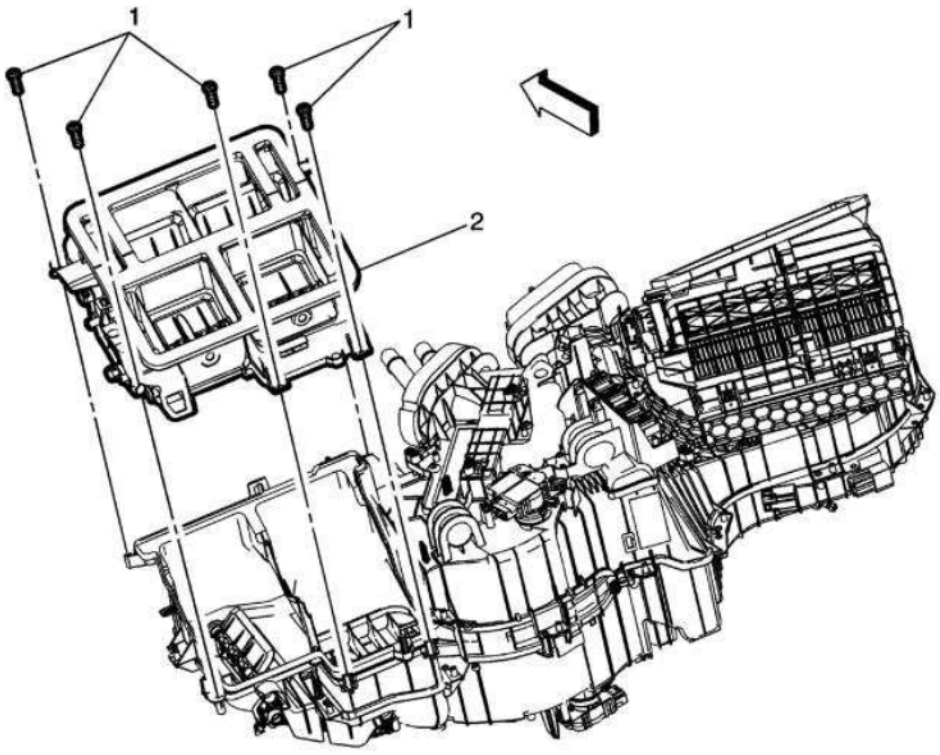


Fig. 371: Air Distributor Case
Courtesy of GENERAL MOTORS COMPANY

Callout	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 (CJ2)**	
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

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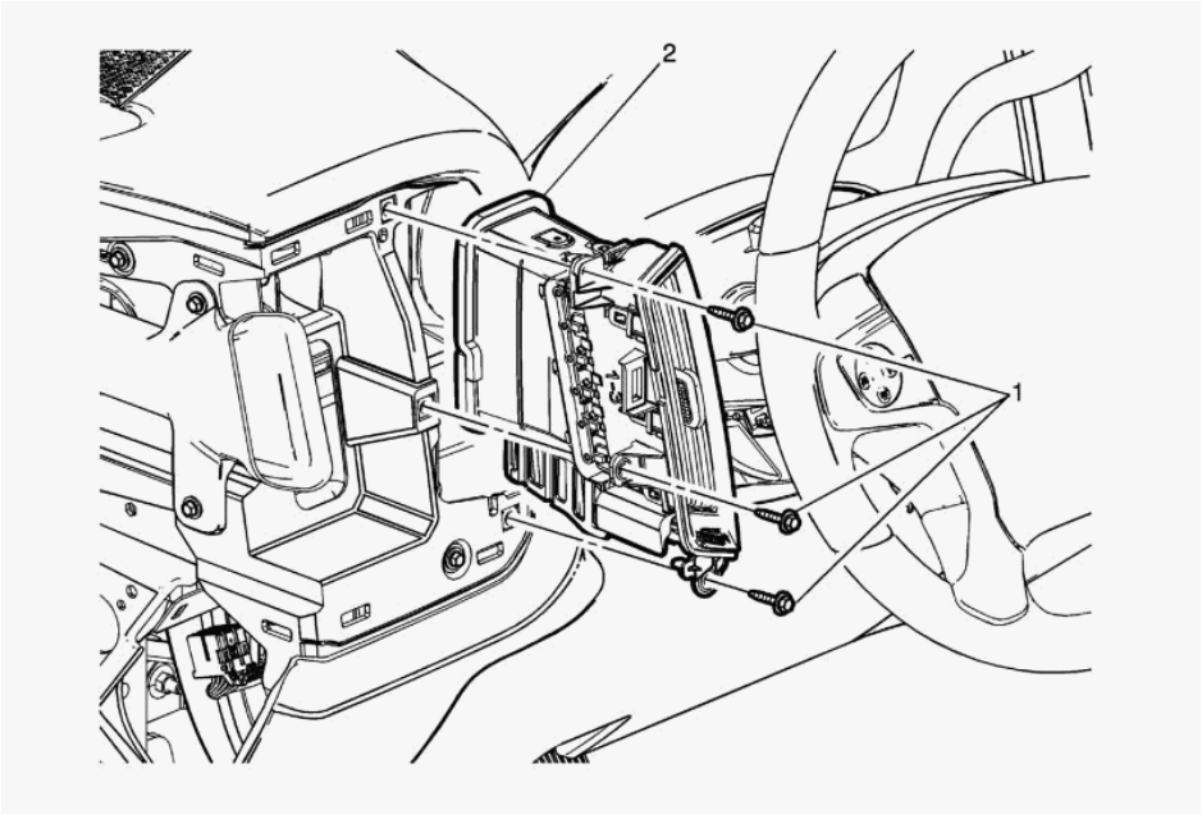


Fig. 372: Left Instrument Panel Outer Air Outlet - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the left instrument panel trim plate. Refer to **Instrument Panel Trim Plate Replacement - Left Side** .	
1	Instrument Panel Air Outlet Duct Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet - Left Side

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT

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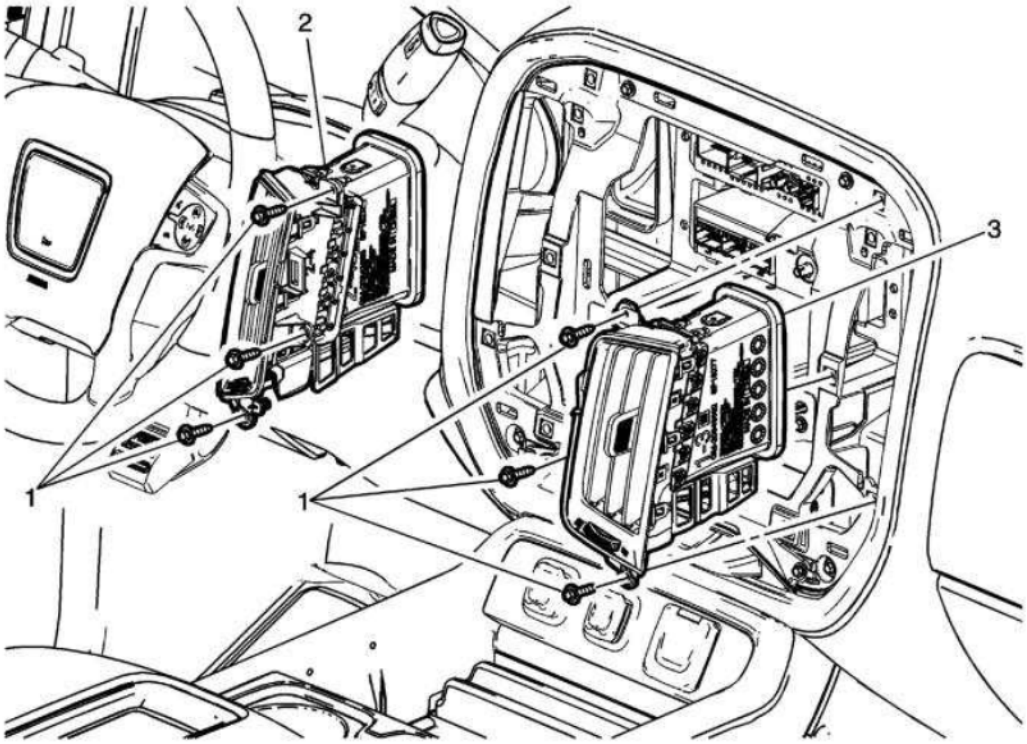


Fig. 373: Instrument Panel Center Air Outlet
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the radio control assembly. Refer to **Radio Control Assembly Replacement** .	
1	Instrument Panel Air Outlet Duct Bolt (Qty: 6) **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Center Air Outlet - Left Side
3	Instrument Panel Center Air Outlet - Right Side

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - RIGHT SIDE

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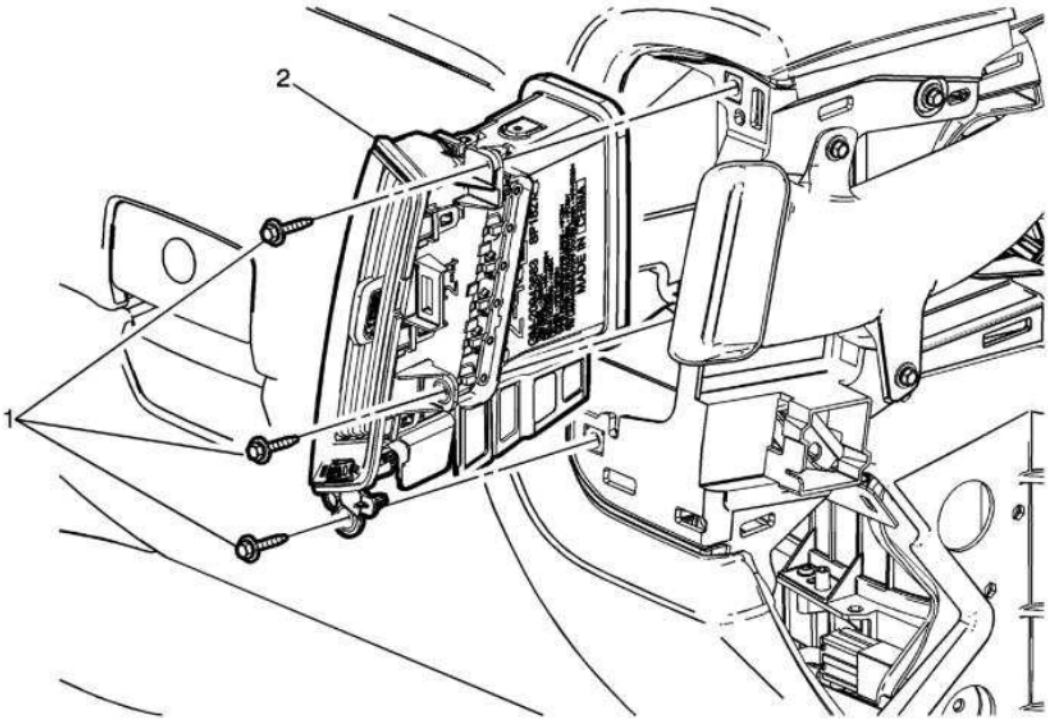


Fig. 374: Right Instrument Panel Outer Air Outlet - Right Side
Courtesy of GENERAL MOTORS COMPANY

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

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE

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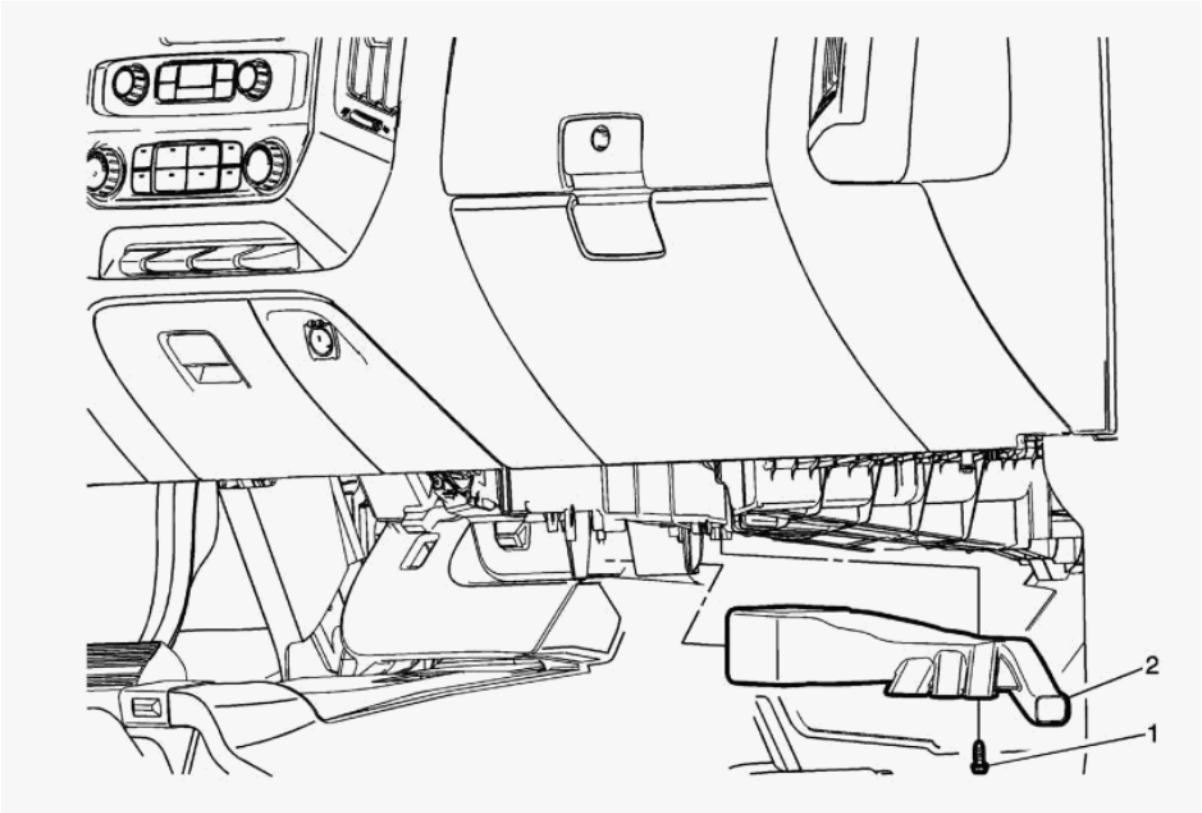


Fig. 375: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the right side instrument panel insulator. Refer to **Instrument Panel Insulator Replacement (RPO D07)** **Instrument Panel Insulator Replacement (Without RPO D07)** .	
1	Floor Front Air Outlet Duct Fastener **CAUTION:** **Refer to** **Fastener Caution** .
2	Floor Front Air Outlet Duct - Right Side

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - LEFT SIDE

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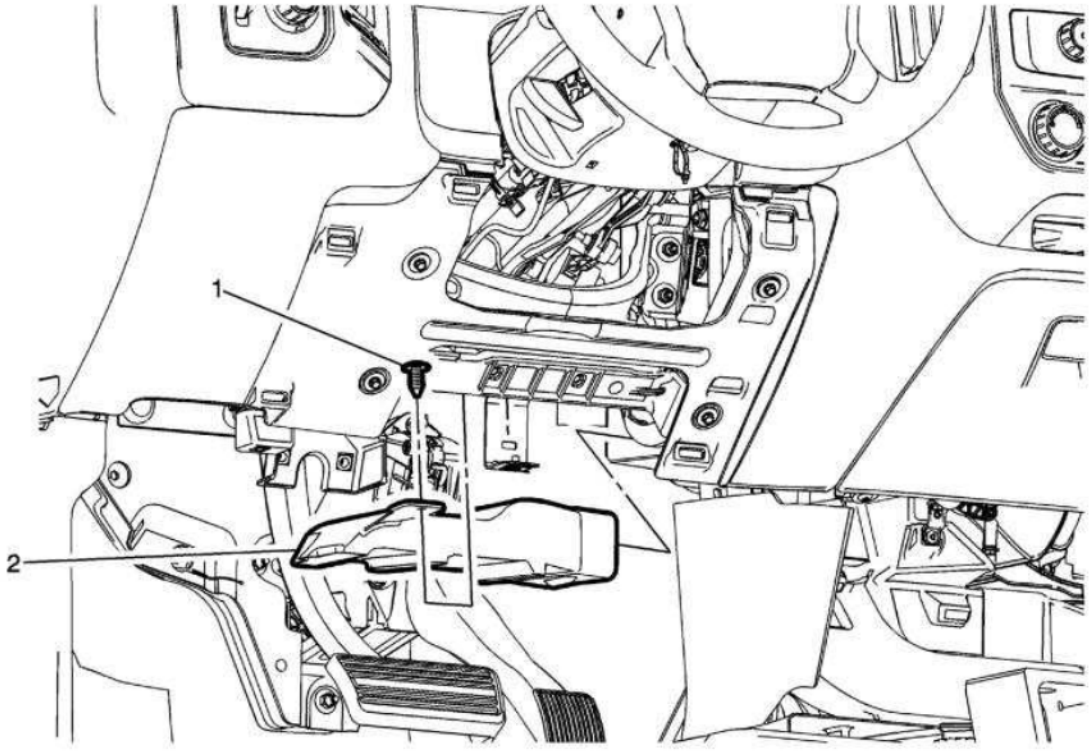


Fig. 376: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel knee bolster. Refer to **Instrument Panel Knee Bolster Replacement** .	
1	Floor Front Air Outlet Duct Fastener
2	Floor Front Air Outlet Duct - Left Side

FLOOR AIR OUTLET DUCT REPLACEMENT - CENTER

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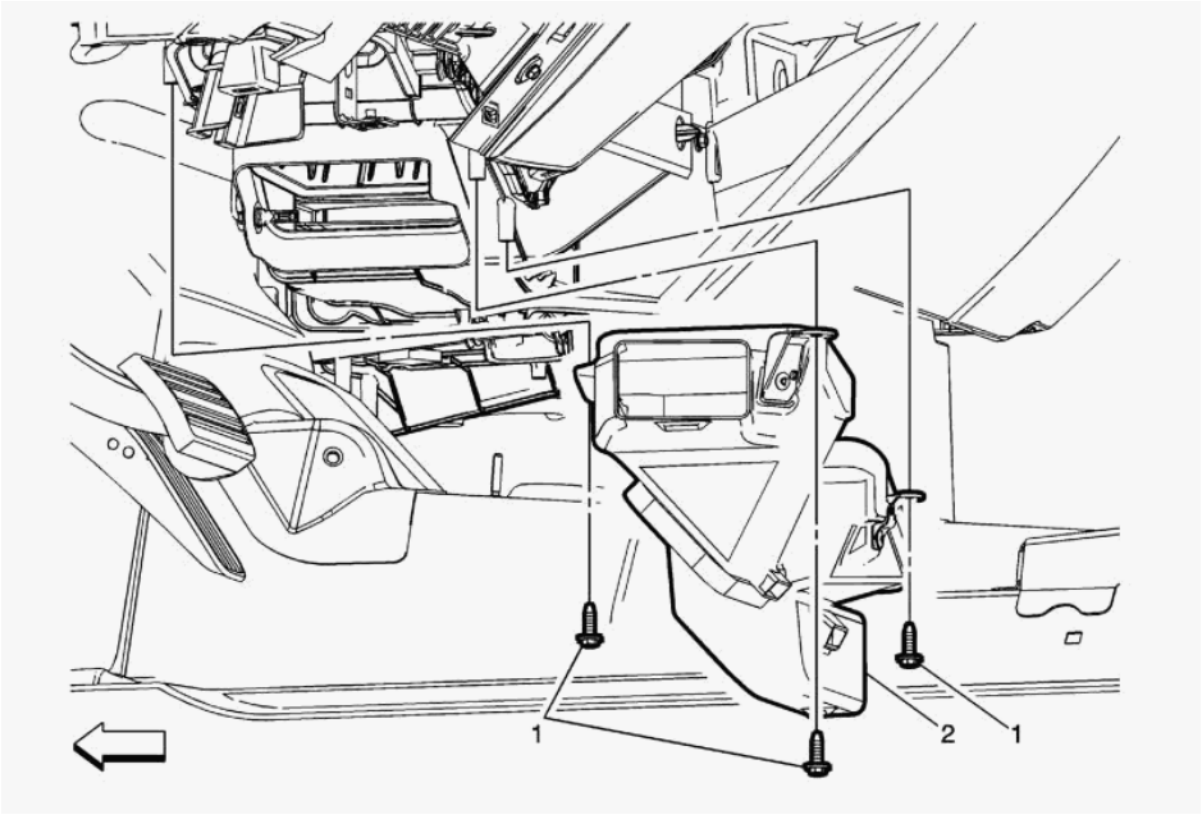


Fig. 377: Floor Air Outlet Duct - Center
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the left front floor air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Left Side**. 2. Remove the right front floor air outlet duct. Refer to **Floor Front Air Outlet Duct Replacement - Right Side**. 3. Remove the floor rear air outlet duct. Refer to **Floor Rear Air Outlet Duct Replacement**.	
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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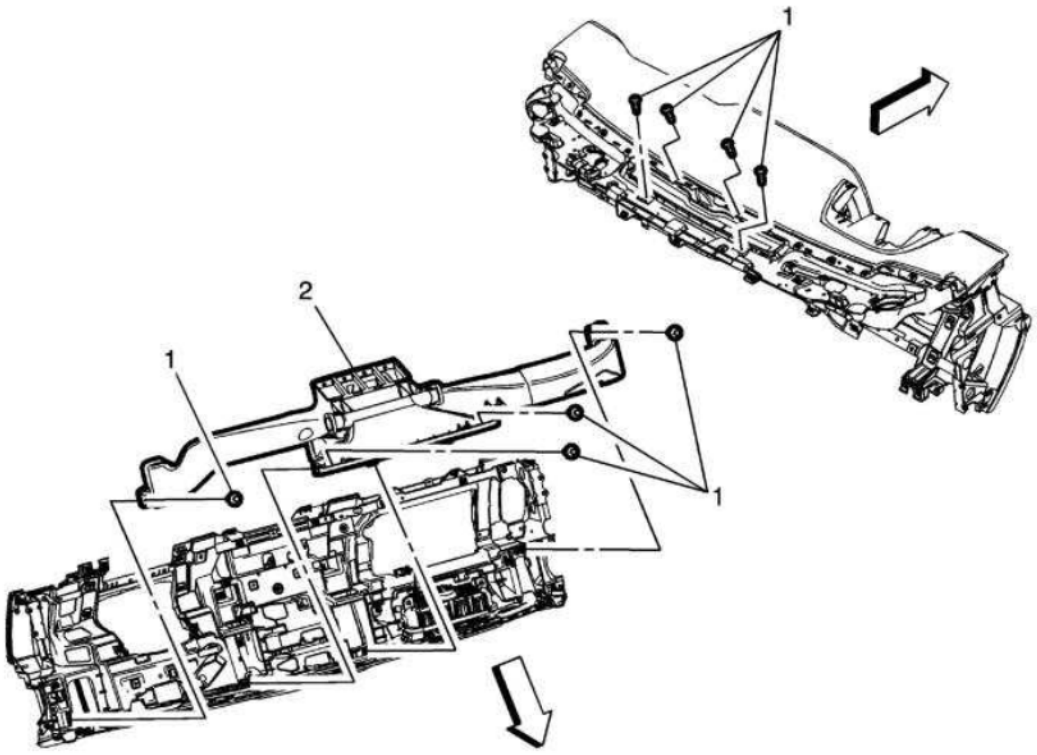


Fig. 378: Air Distributor Front Duct
Courtesy of GENERAL MOTORS COMPANY

Call out	Component Name
Preliminary Procedures 1. **Instrument Carrier Replacement** 2. **Side Window Defogger Outlet Duct Replacement - Left Side** 3. **Side Window Defogger Outlet Duct Replacement - Right Side**	
1	Air Distributor Front Duct Fastener (Qty: 8) **CAUTION:** **Refer to Fastener Caution .**
2	Air Distributor Front Duct

SIDE WINDOW DEFOGGER OUTLET DUCT REPLACEMENT - LEFT SIDE

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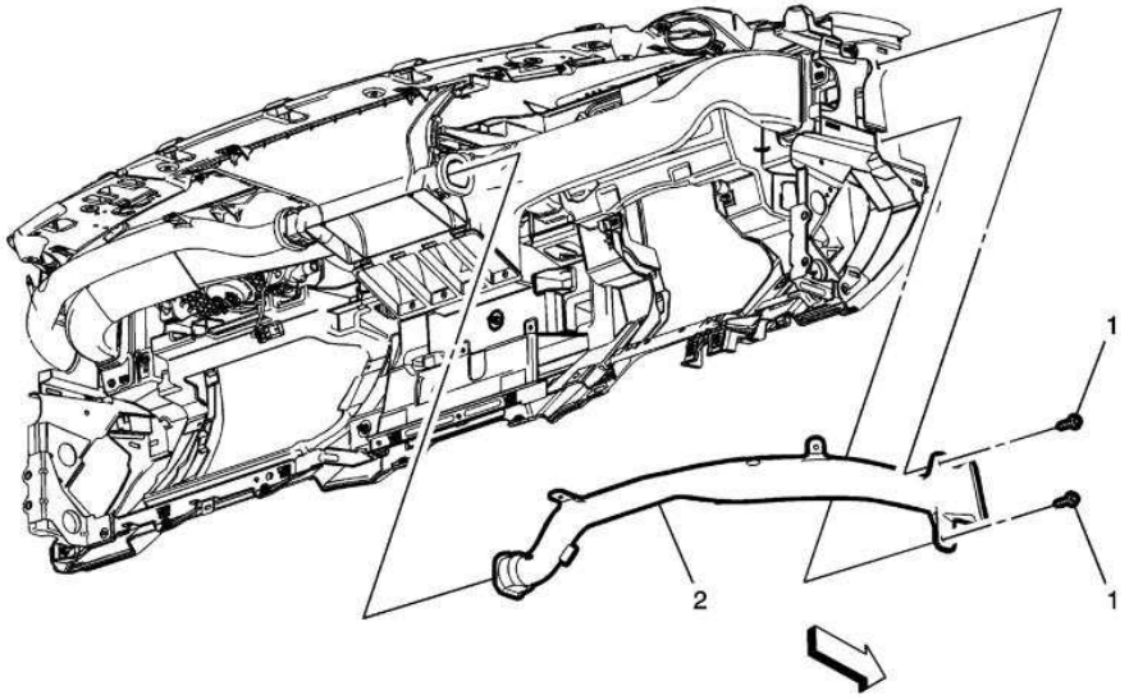


Fig. 379: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel assembly. Refer to **Instrument Panel Assembly Removal** .	
1	Side Window Defogger Outlet Duct Fastener (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** .
2	Side Window Defogger Outlet Duct - Left Side **Procedure** Remove the wiring harness from the right side window defogger outlet duct.

SIDE WINDOW DEFOGGER OUTLET DUCT REPLACEMENT - RIGHT SIDE

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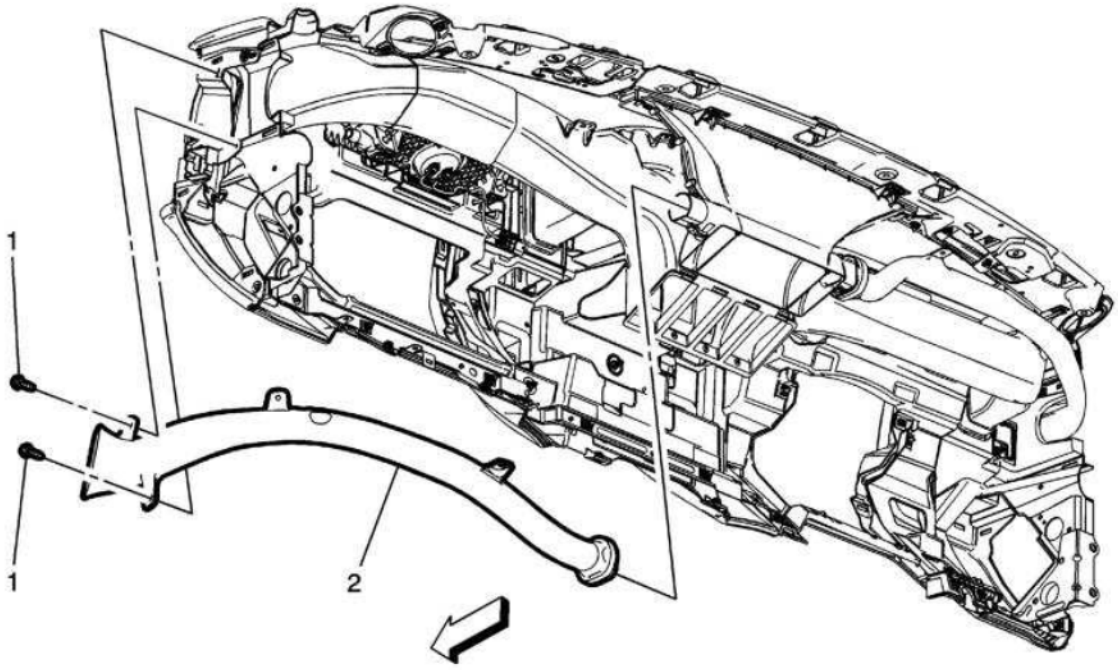


Fig. 380: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the instrument panel assembly. Refer to **Instrument Panel Assembly Removal** .	
1	Side Window Defogger Outlet Duct Fastener (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** .
2	Side Window Defogger Outlet Duct - Right Side **Procedure** Remove the wiring harness from the right side window defogger outlet duct.

FLOOR REAR AIR OUTLET DUCT REPLACEMENT

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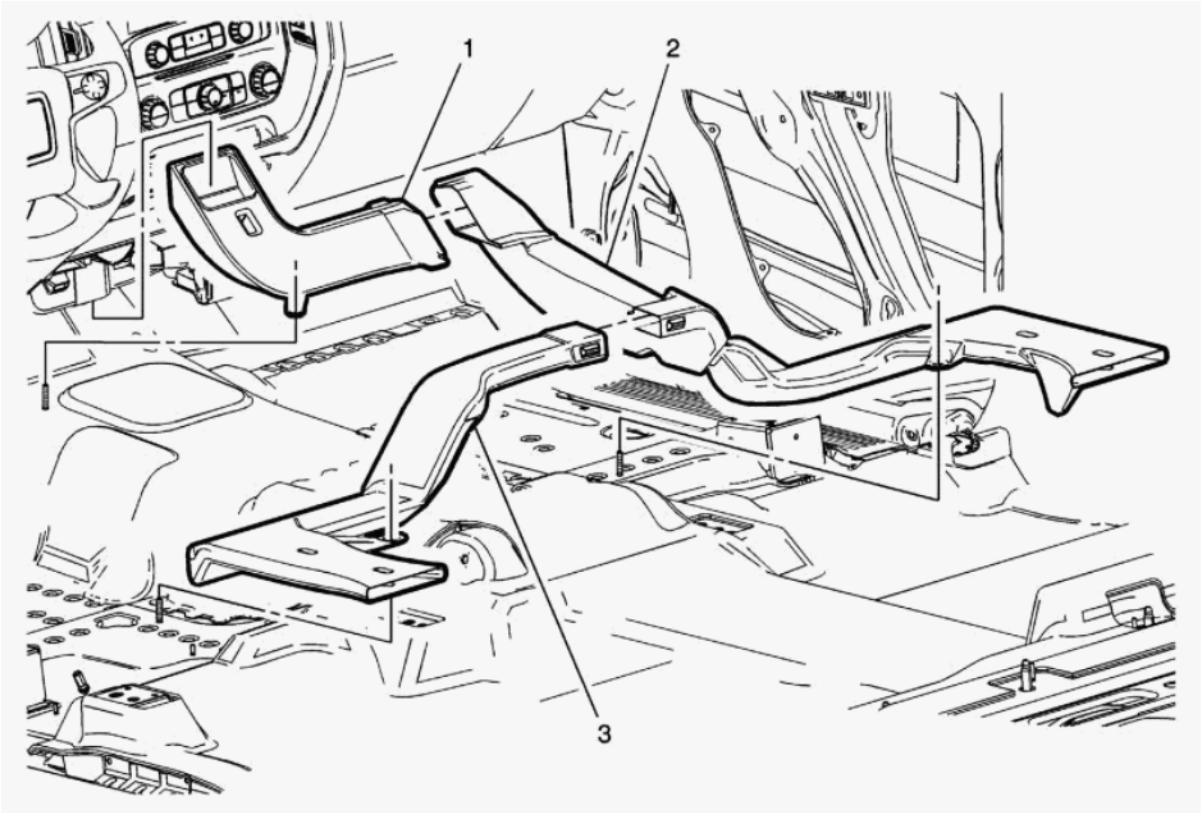


Fig. 381: Floor Rear Air Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the floor panel carpet. Refer to **Floor Panel Carpet Replacement (Crew Cab)** **Floor Panel Carpet Replacement (Extended Cab)** **Floor Panel Carpet Replacement (Regular Cab)** .	
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

HEATER AND AIR CONDITIONING CONTROL CAM REPLACEMENT (AIR INLET)

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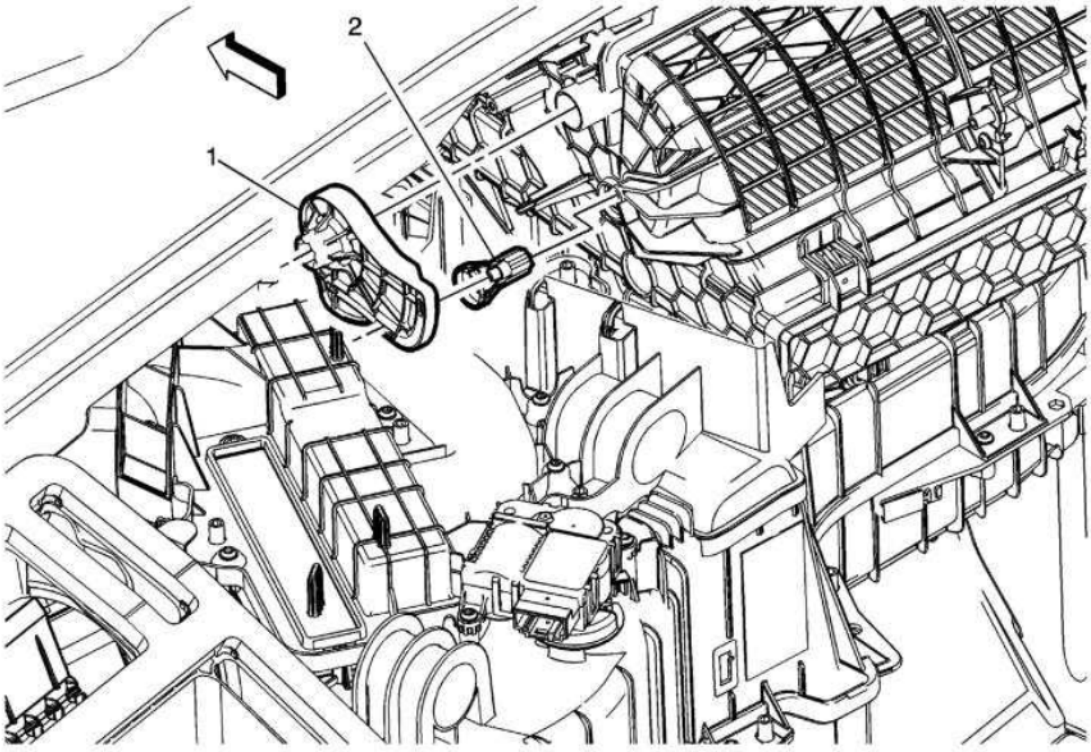


Fig. 382: Heater and Air Conditioning Control Cam (Air Inlet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the air inlet valve actuator. Refer to **Air Inlet Valve Actuator Replacement** .	
1	Air Inlet Valve Link
2	Air Inlet Valve Lever

HEATER CORE REPLACEMENT (NON HEAT STAKE)

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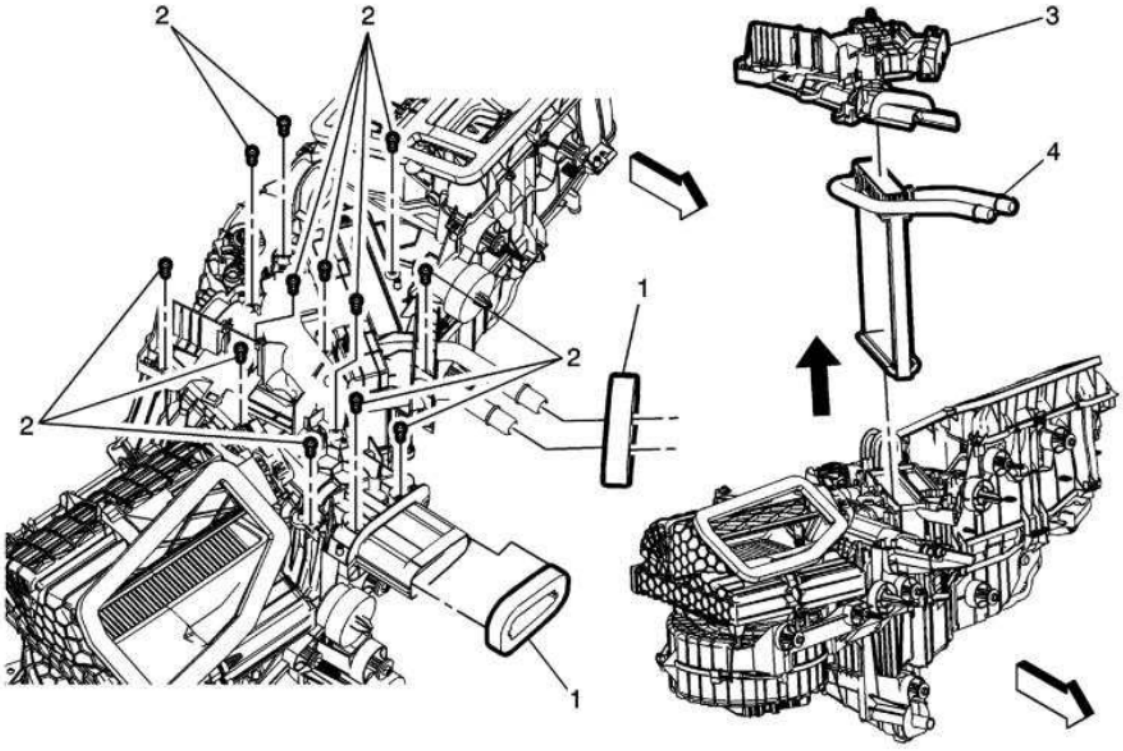


Fig. 383: Heater Core (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**. 2. Remove the temperature valve actuator. Refer to **Temperature Valve Actuator Replacement** . 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**

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Callout	Component Name
	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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**.

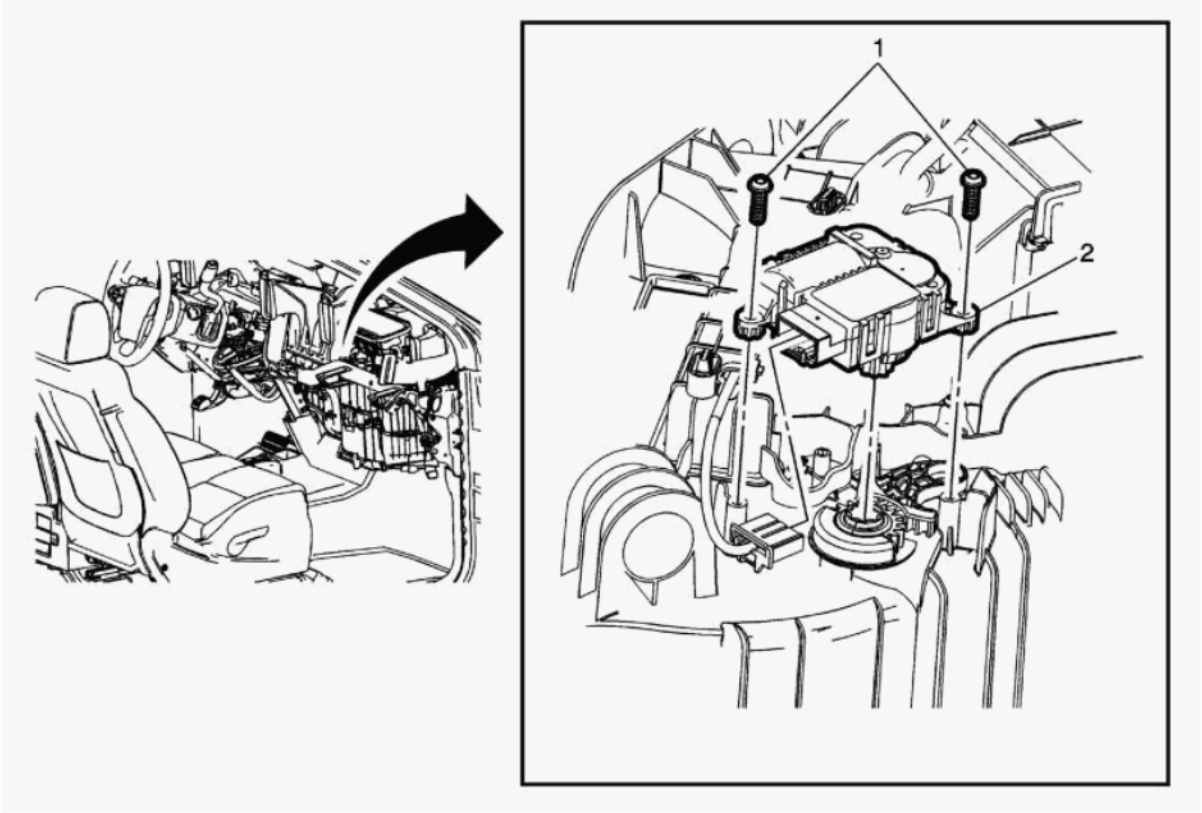


Fig. 384: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

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

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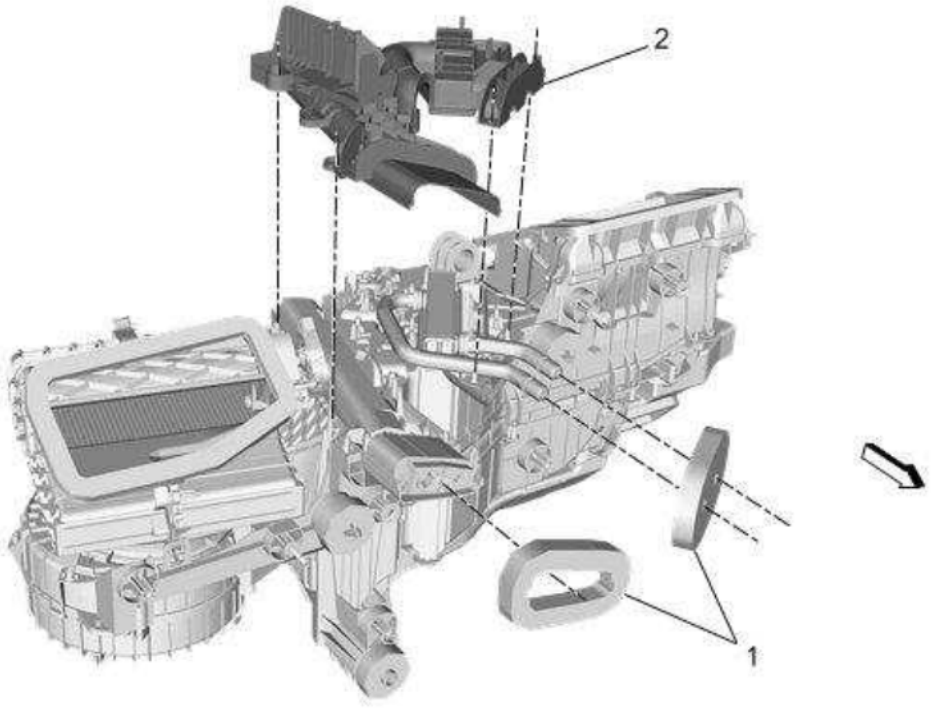


Fig. 385: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

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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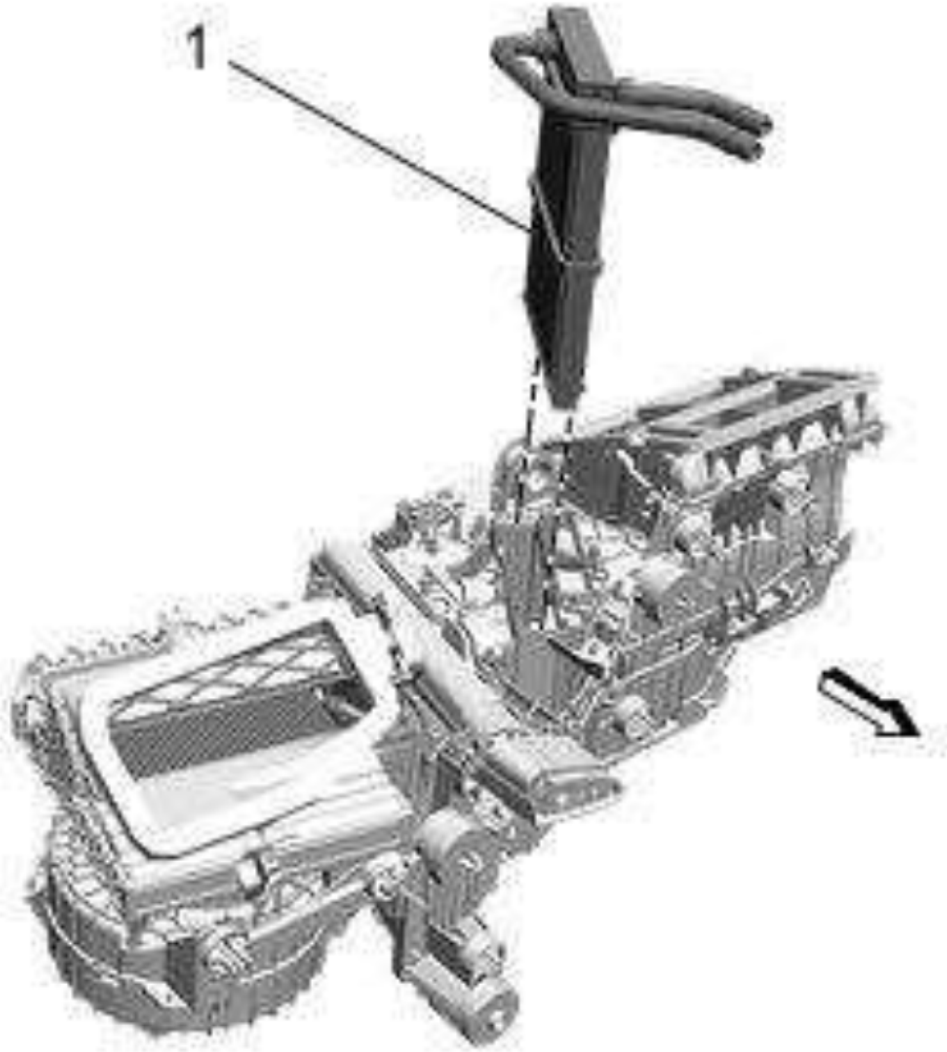


Fig. 386: Heater Core
Courtesy of GENERAL MOTORS COMPANY

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.

Installation Procedure

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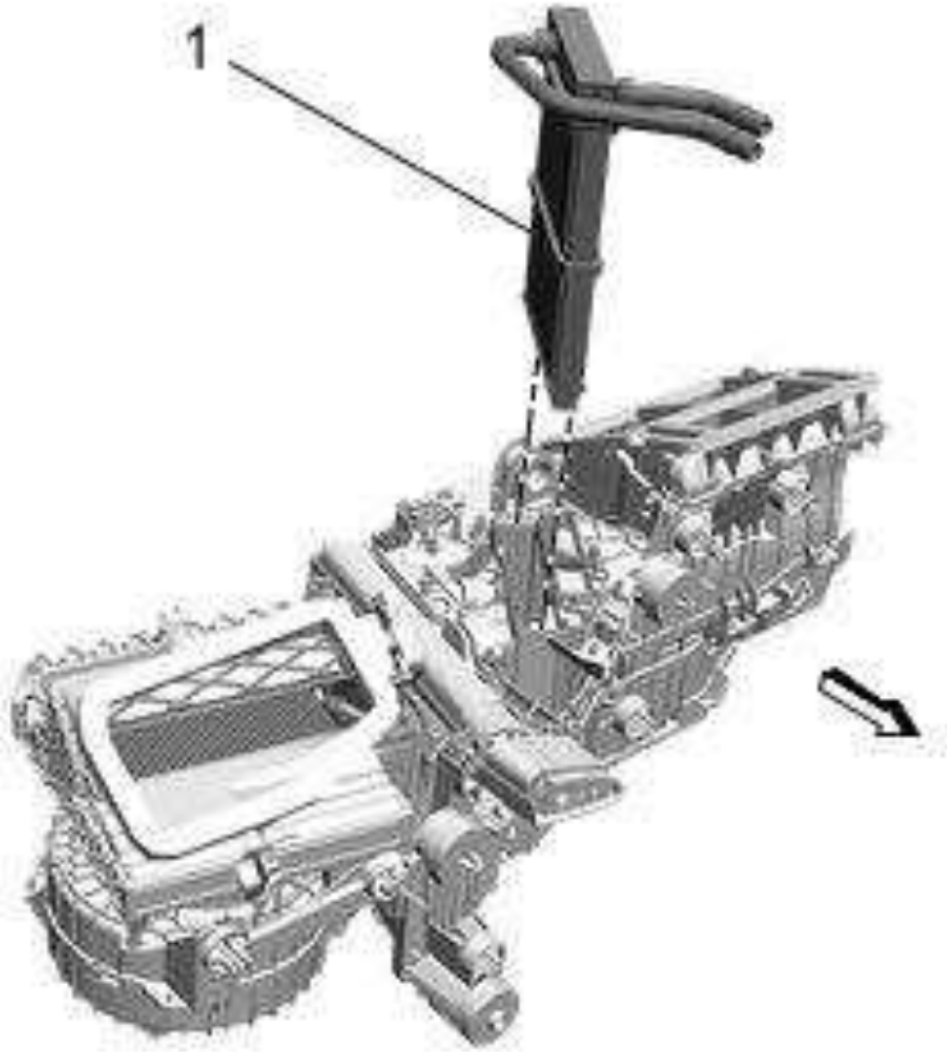


Fig. 387: Heater Core
Courtesy of GENERAL MOTORS COMPANY

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

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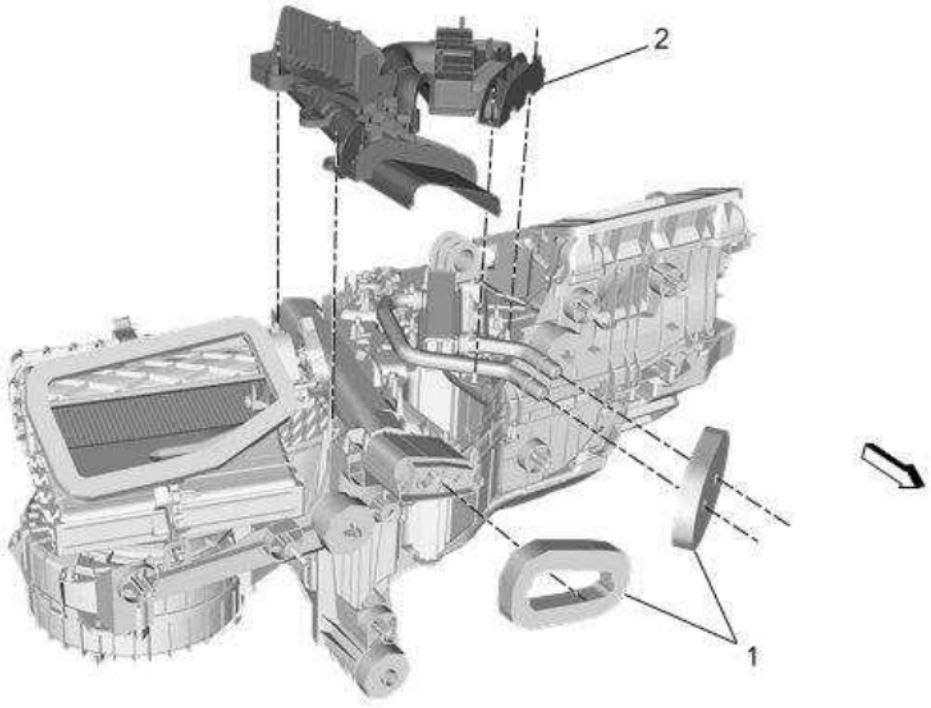


Fig. 388: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

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

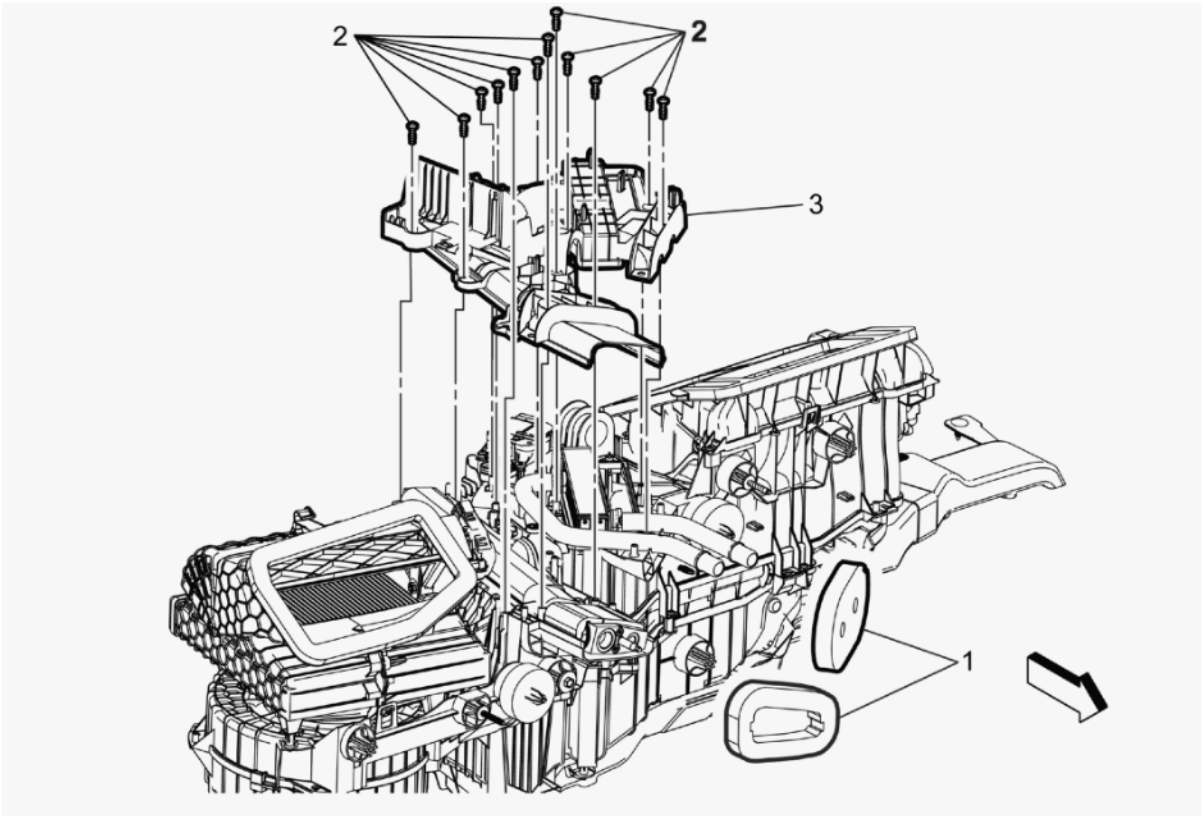


Fig. 389: Heater Cover (Non Heat Stake)

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Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

3. Use 12 M4X 1.79X16 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.
4. Install the HVAC seals (1).

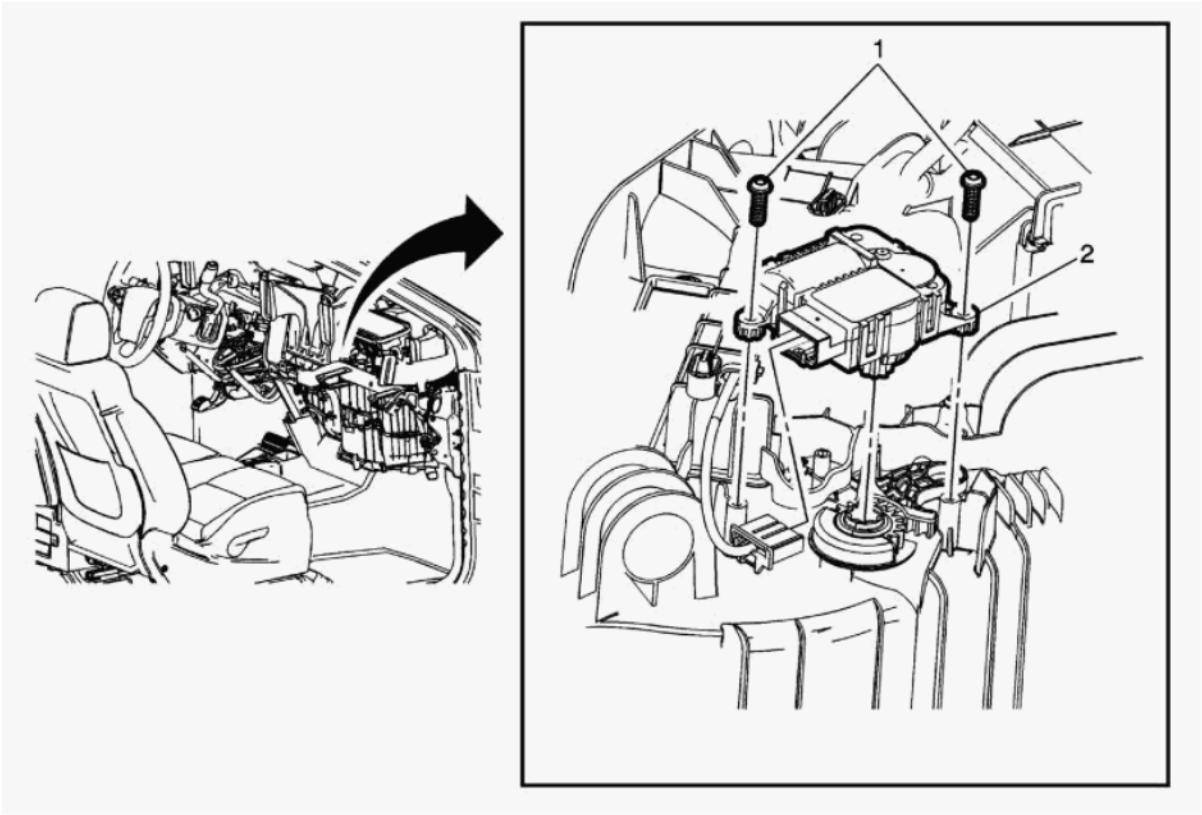


Fig. 390: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**.

HEATER COVER REPLACEMENT (NON HEAT STAKE)

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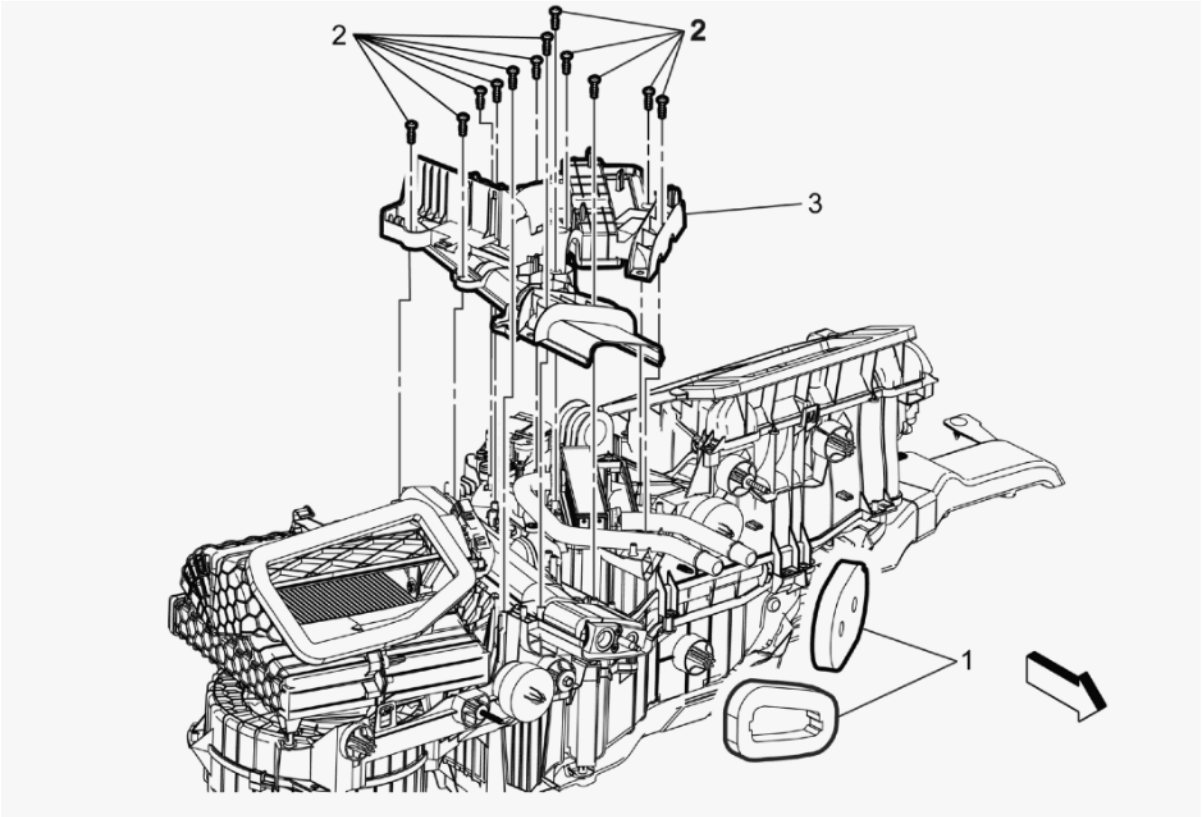


Fig. 391: Heater Cover (Non Heat Stake)
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**. 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.

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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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**.

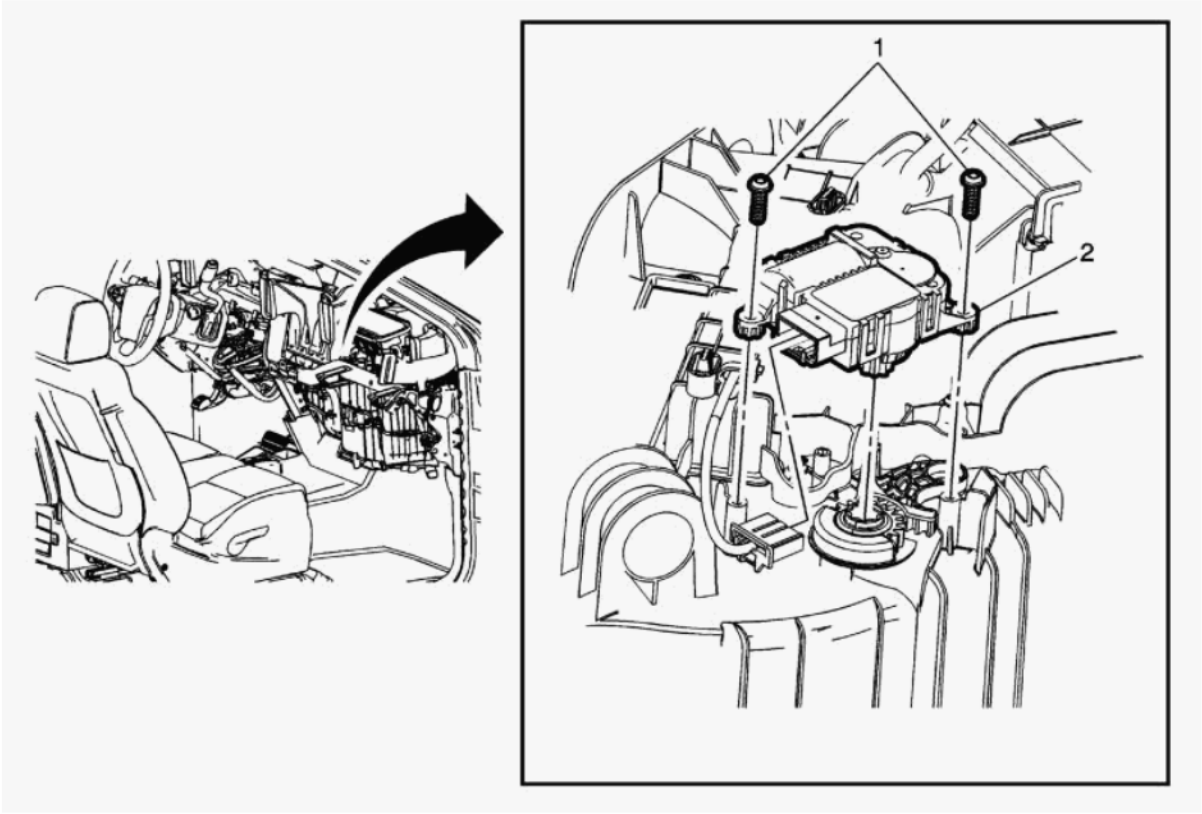


Fig. 392: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

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

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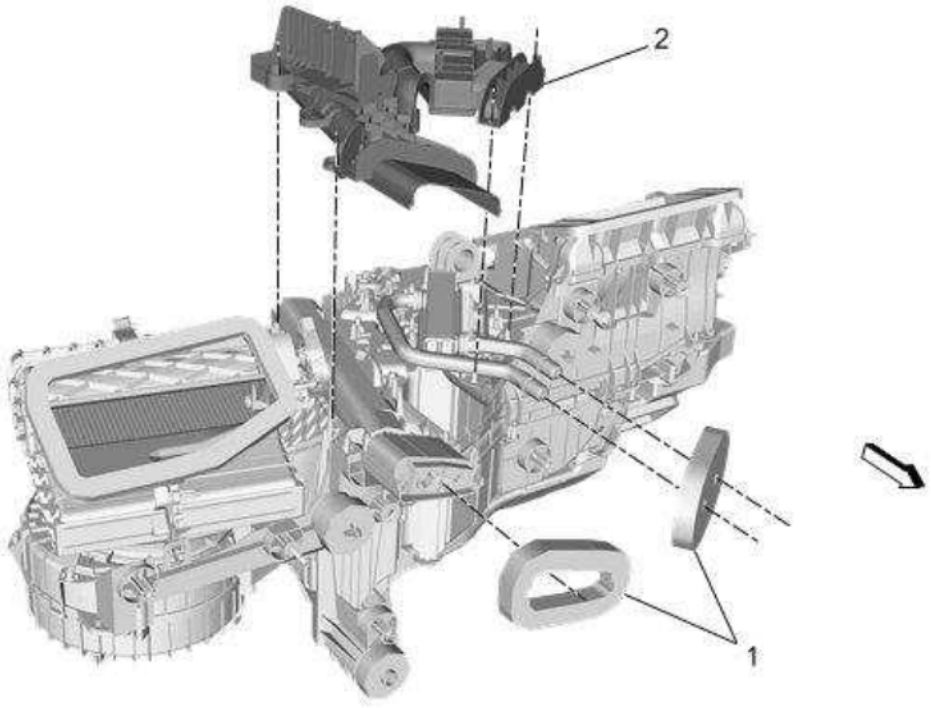


Fig. 393: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

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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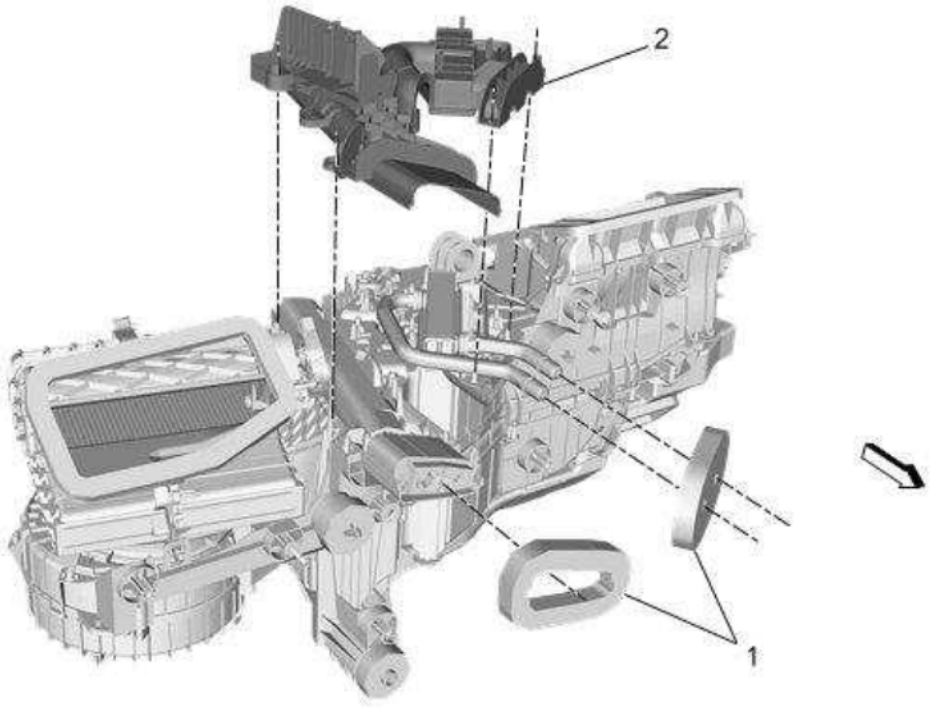


Fig. 394: Heater Cover And Seals
Courtesy of GENERAL MOTORS COMPANY

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

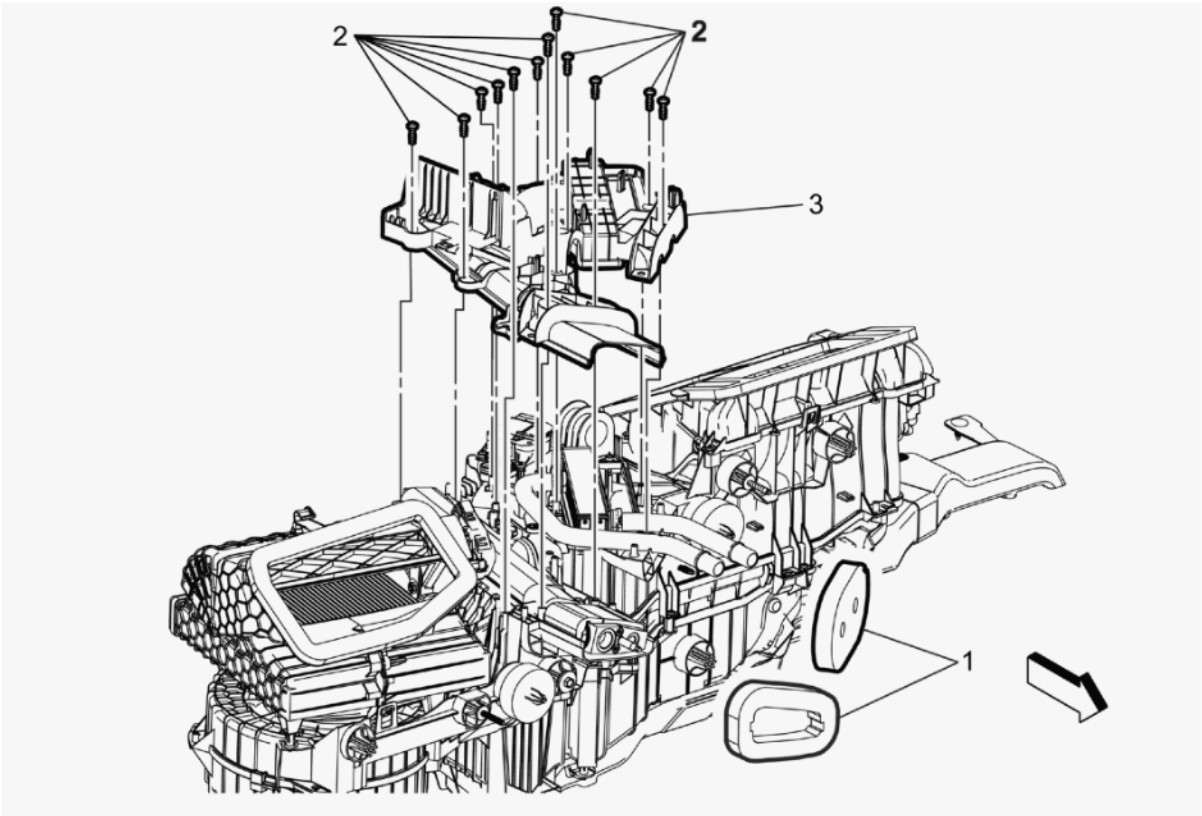


Fig. 395: Heater Cover (Non Heat Stake)

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Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Use 12 M4X 1.79X16 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).

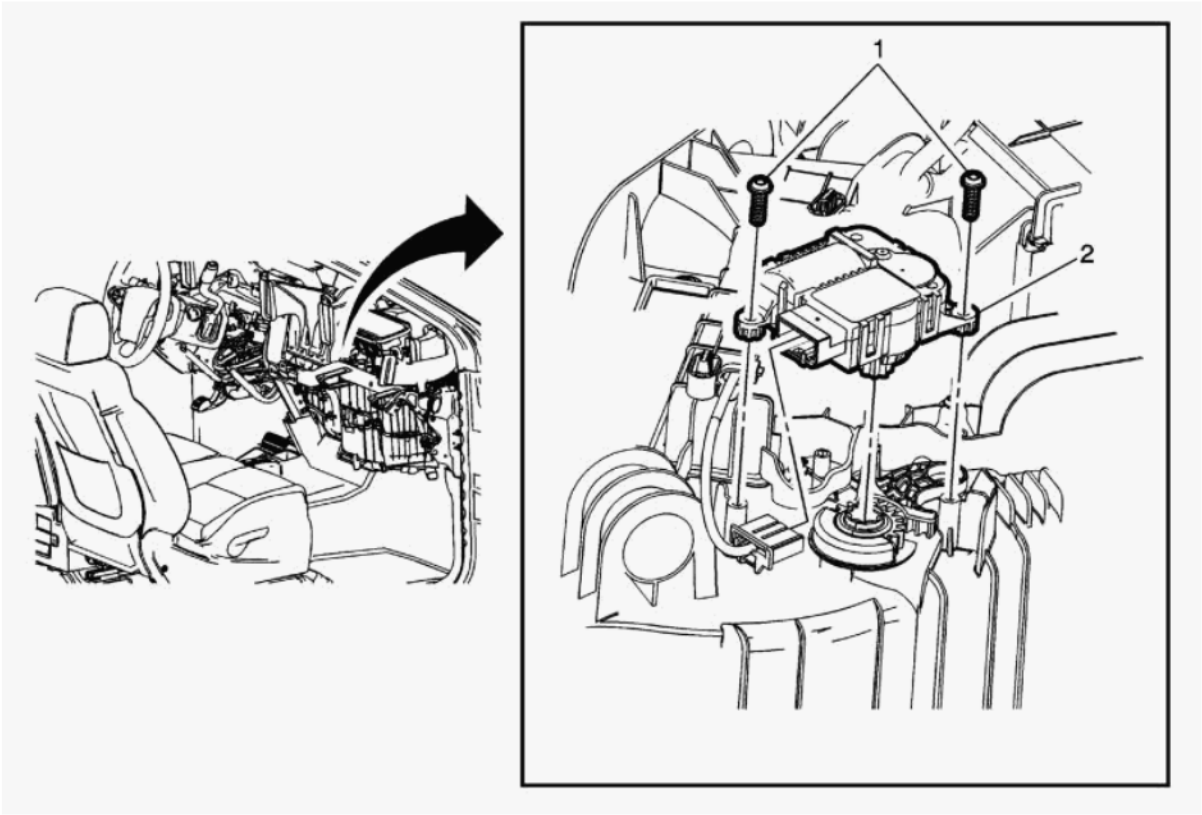


Fig. 396: Temperature Valve Actuator - Right Side
Courtesy of GENERAL MOTORS COMPANY

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 (With L83, L86)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With LV3)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L5P)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (L8B HP5)**.

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.

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Auxiliary Electric Heater

Vehicles equipped with a diesel engine come with an auxiliary electric heater. This 12V electrically powered heating element is positioned directly behind the regular coolant flow based heater core in the HVAC case. All airflow goes through the regular heater core first, and then through the auxiliary electric heater. The auxiliary electric heater is active when the outside ambient temperature is below 8Â°C (46Â°F) , the coolant temperature is below 75Â°C (167Â°F) , and the temperature air mix door is near the full hot position.

A/C Cycle

Refrigerant is the key element in an air conditioning system. R-134a and 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 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.

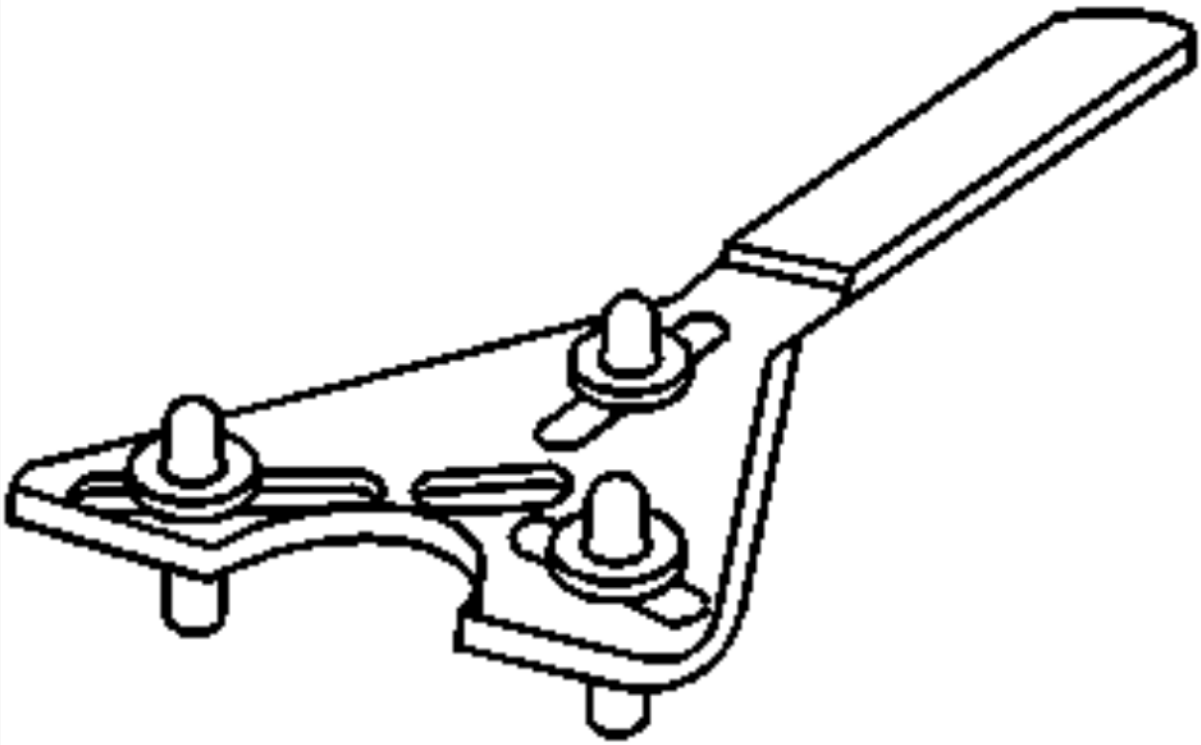
Vehicles equipped with R-1234yf may utilize an IXH (Integral heat exchanger) in the A/C line set. An IHX transfers heat between liquid line and the suction line. It uses the cold vapor from the evaporator to cool the warm liquid refrigerant before it enters the TXV, resulting in increased cooling and higher efficiency.

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.

SPECIAL TOOLS AND EQUIPMENT

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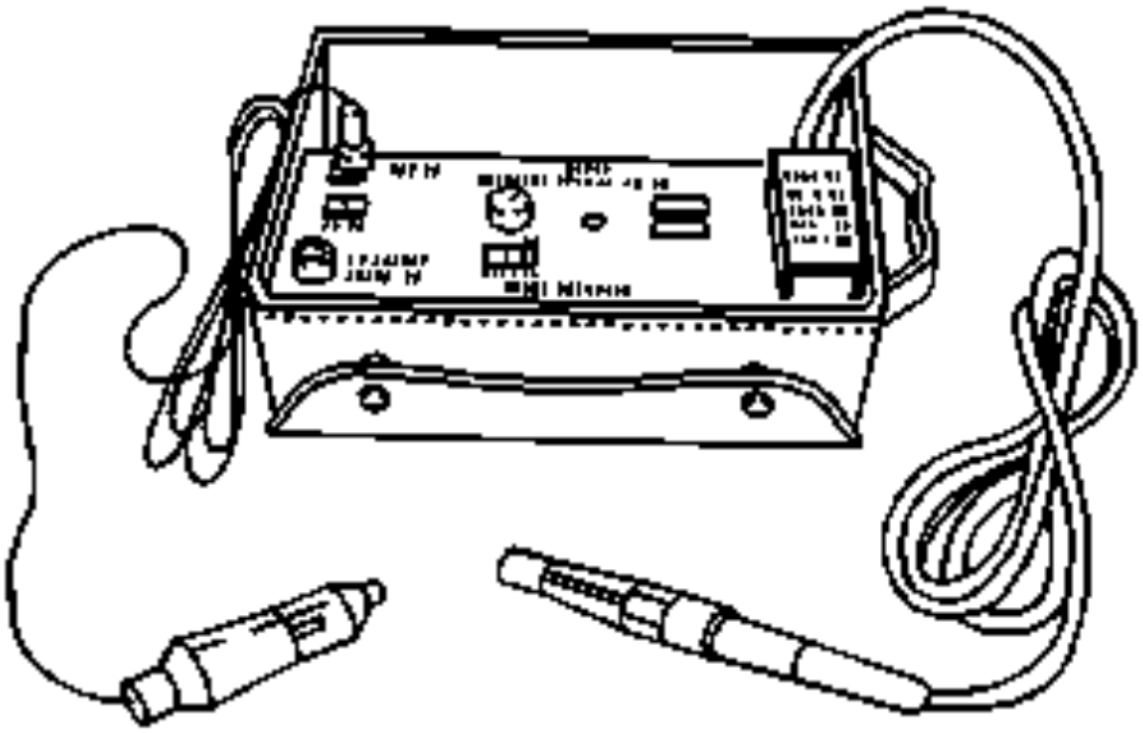
SPECIAL TOOLS

Illustration	Tool Number / Description
	CH 37872 J 37872 Universal Spanner Wrench

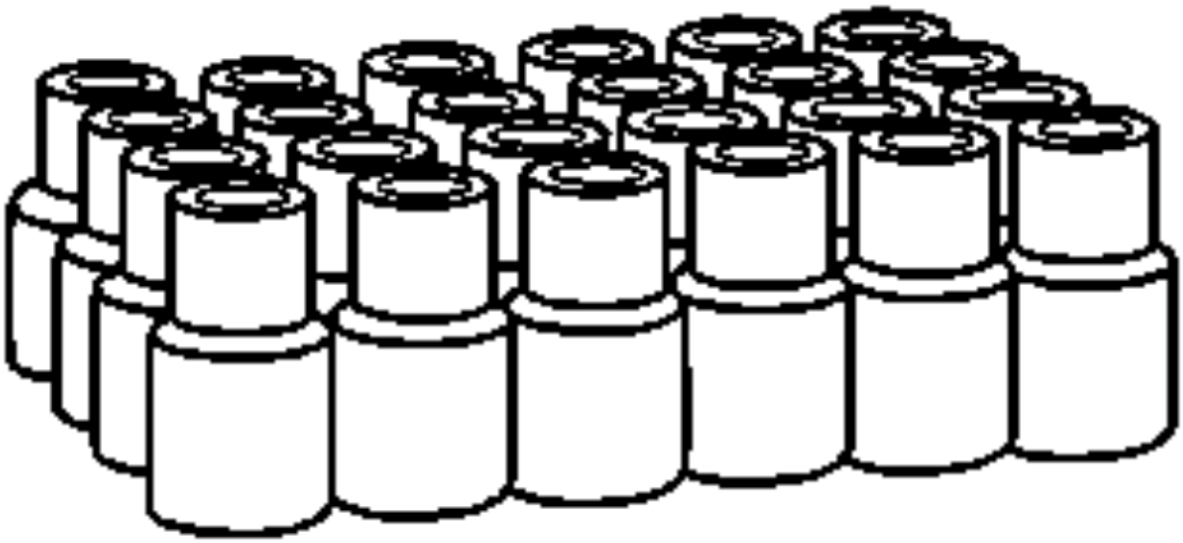
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Illustration	Tool Number / Description
	BO 38185 J 38185 Hose Clamp Pliers

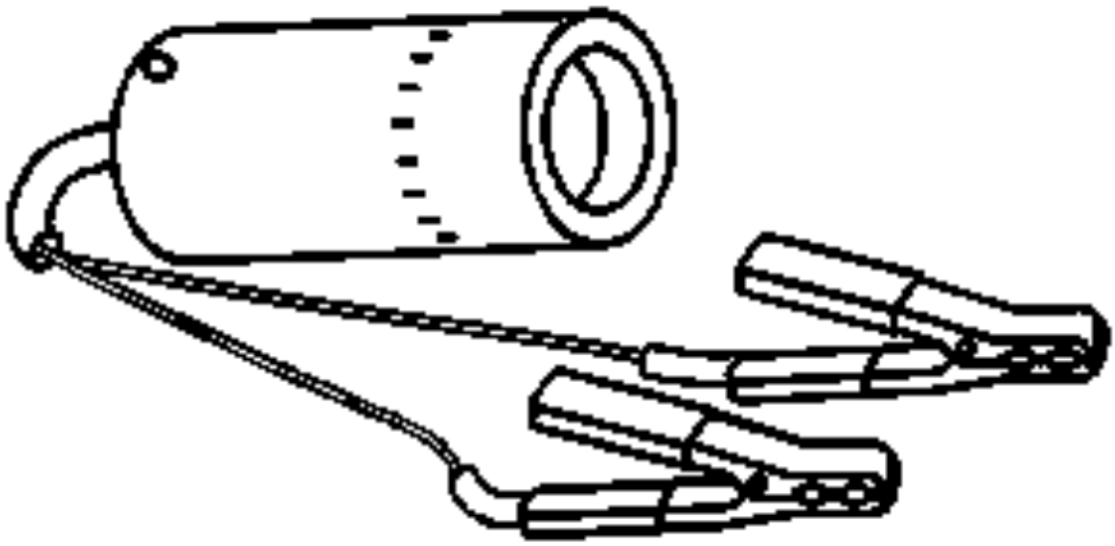
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Illustration	Tool Number / Description
	GE 39400-A J 39400-A Halogen Leak Detector

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Illustration	Tool Number / Description
	GE-41447-A J-41447 R-123a and R1234yf A/C Tracer Dye-Box of 24

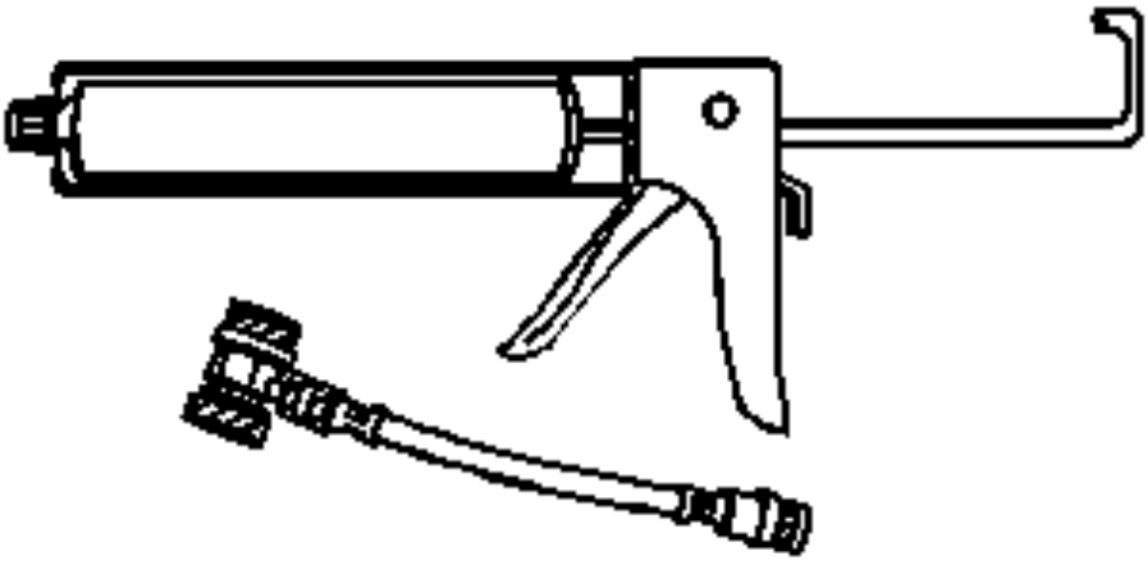
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Illustration	Tool Number / Description
	GE 42220 J 42220 Universal 12V Leak Detection Lamp

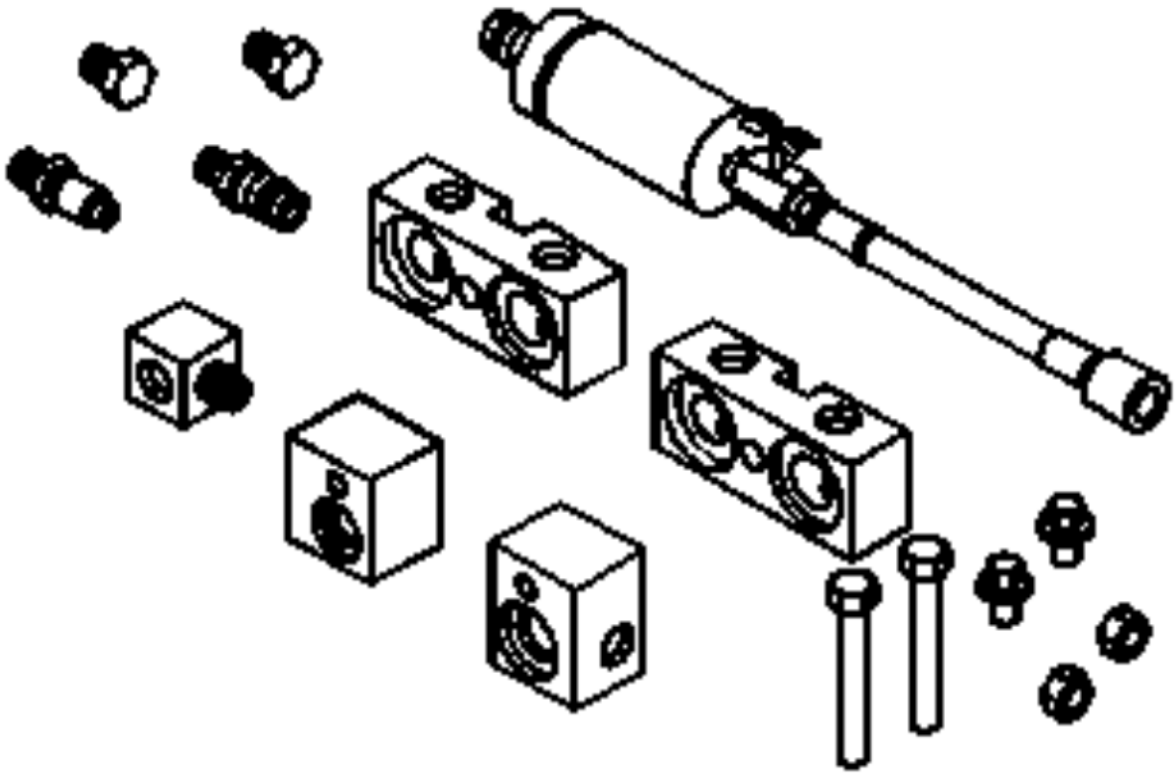
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Illustration	Tool Number / Description
	GE 43872 J 43872 Fluorescent Dye Cleaner

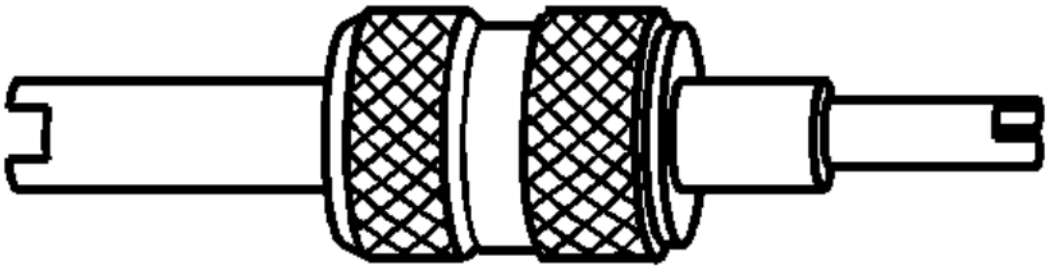
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Illustration	Tool Number / Description
	GE 45037 J 45037 A/C Oil Injector

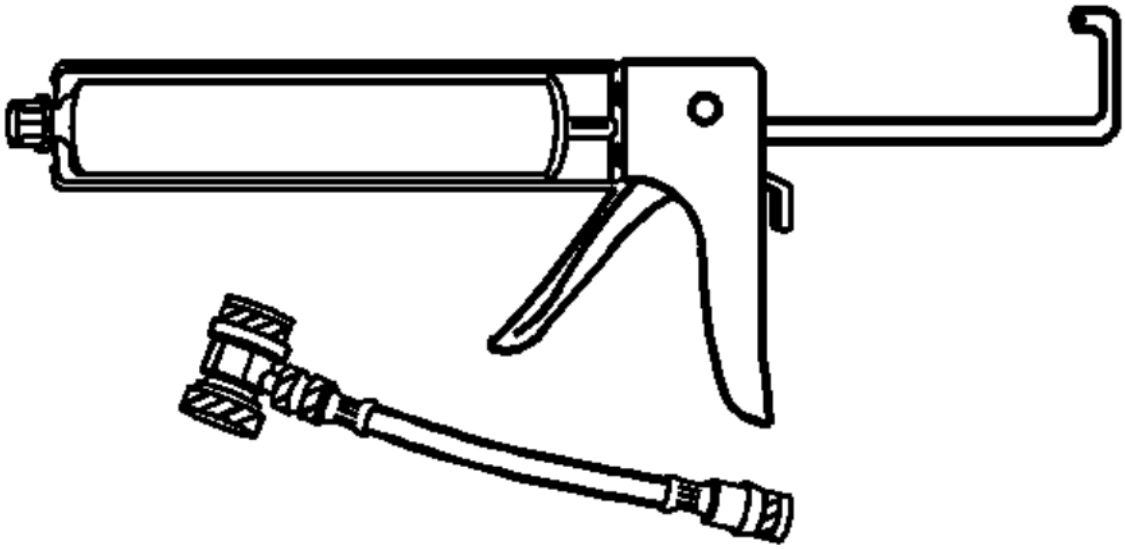
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Illustration	Tool Number / Description
	GE 45268 J 45268 A/C Flushing Adapter Kit

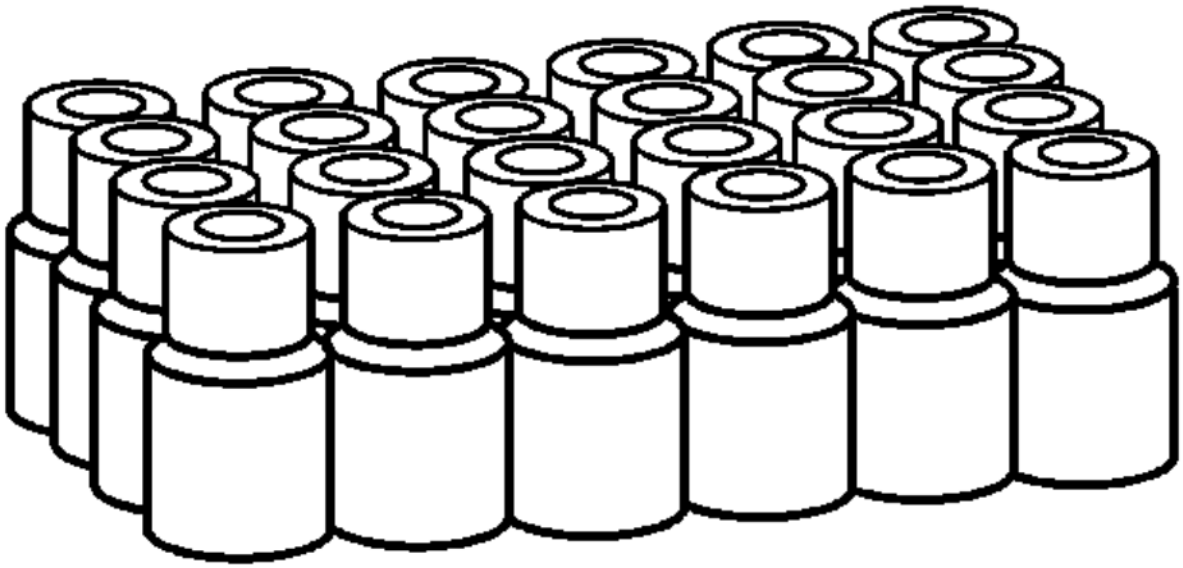
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Illustration	Tool Number / Description
	GE 46246 J 46246 Valve Core Tool

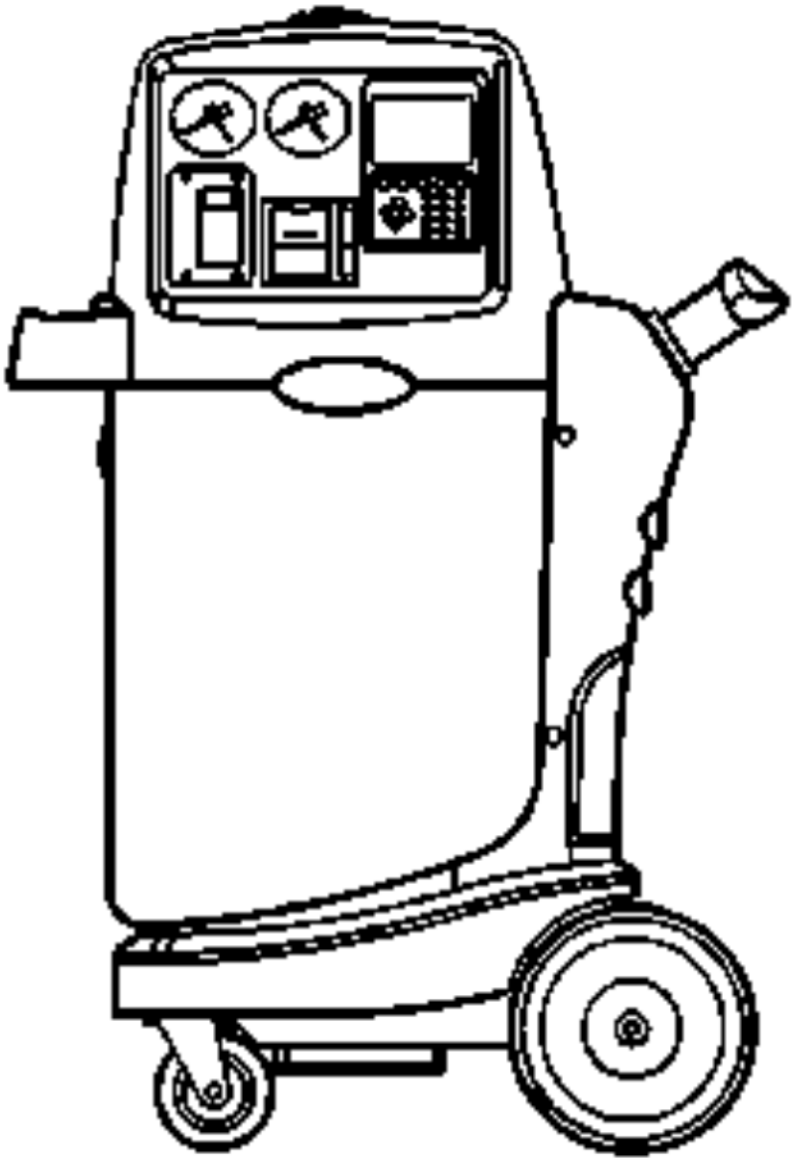
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Illustration	Tool Number / Description
	GE 46297 J 46297 A/C Dye Injector Kit

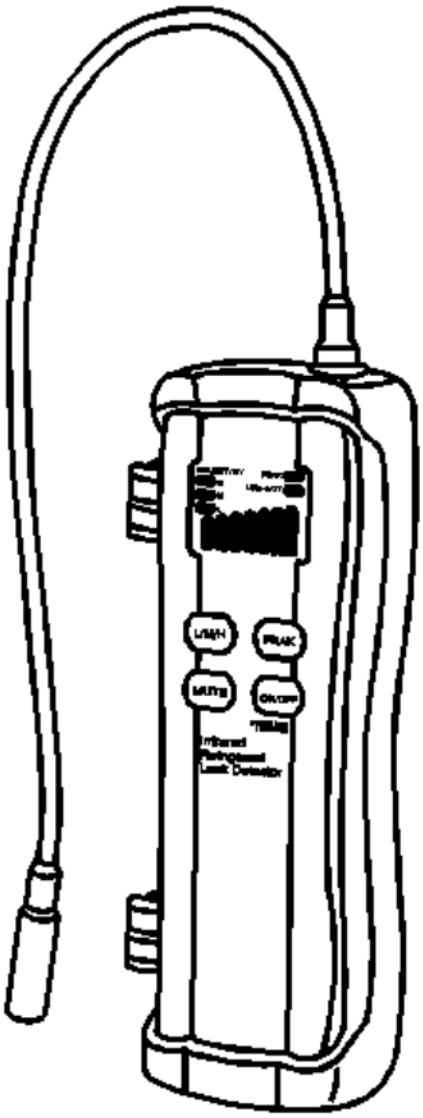
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Illustration	Tool Number / Description
	GE 46297-12 J 46297-12 Replacement Dye Cartridges

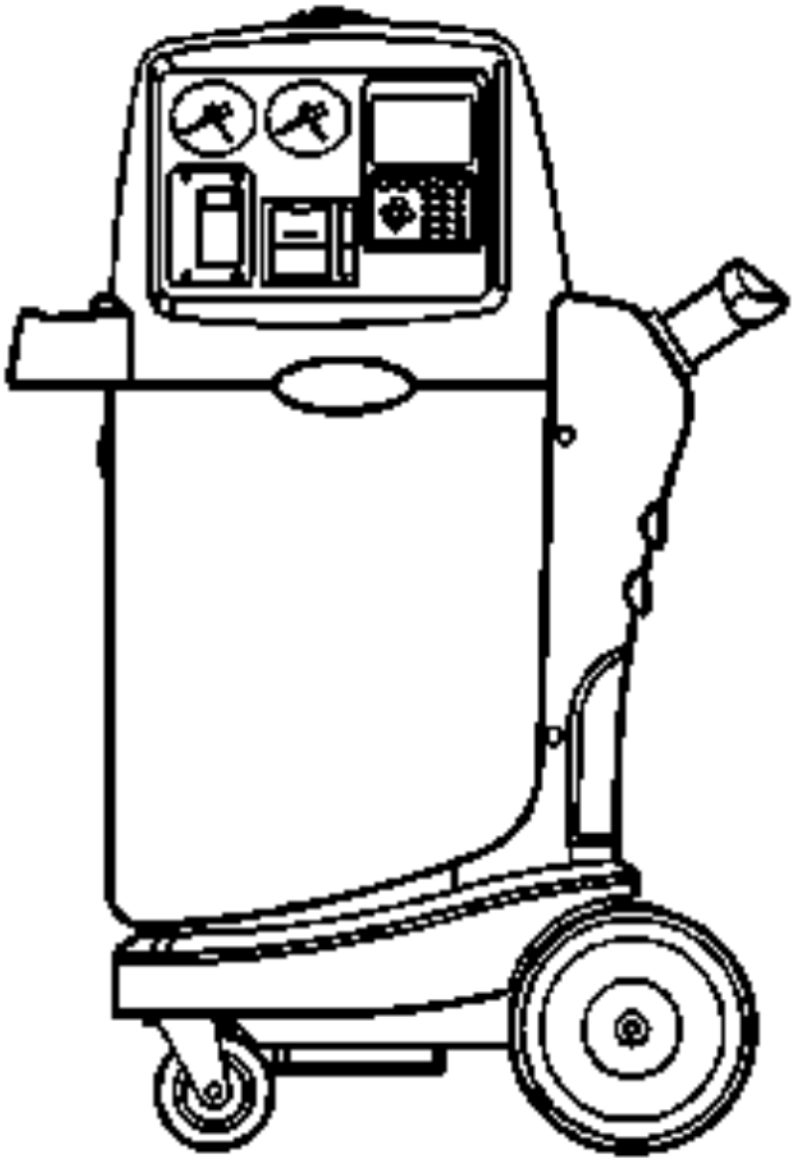
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Illustration	Tool Number / Description
	GE 48800 J 43600 CoolTech A/C Recharge Machine

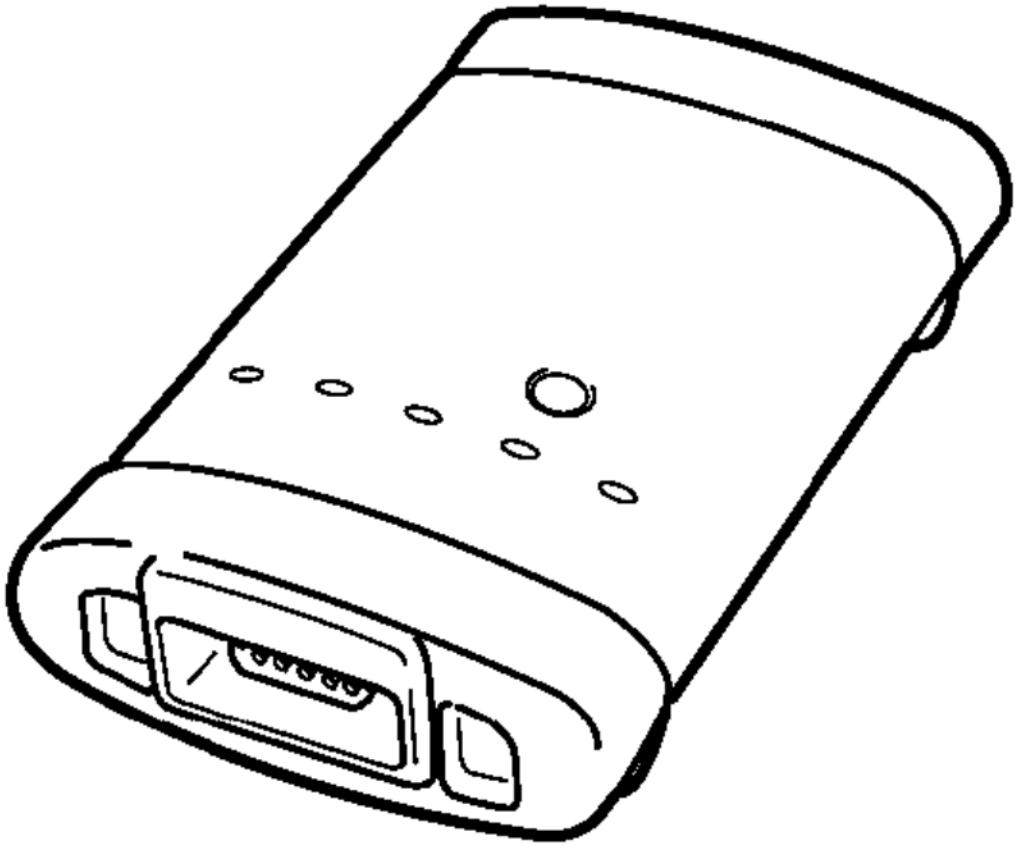
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Illustration	Tool Number / Description
	GE 50078 Electronic Leak Detector

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Illustration	Tool Number / Description
	GE 8800 J 43600 ACR 2000 Air Conditioning Service Center

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Illustration	Tool Number / Description
	EL-47955 J-2534 Multi Diagnostic Interface MDI

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