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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	22 N.m (16 lb ft)
Air Conditioning Compressor Hose Nut	22 N.m (16 lb ft)
Air Conditioning Compressor Nut	22 N.m (16 lb ft)
Air Conditioning Compressor Stud	9 N.m (80 lb in)
Air Conditioning Condenser and Evaporator Hose Nut	22 N.m (16 lb ft)
Air Conditioning Evaporator Hose Nut	22 N.m (16 lb ft)
Air Conditioning Evaporator Rear Hose Bolt	5 N.m (44 lb in)
Air Conditioning Evaporator Thermal Expansion Valve Bolt	8 N.m (71 lb in)
Air Conditioning Receiver and Dehydrator	7 N.m (62 lb in)
Air Conditioning Refrigerant Heat Exchanger Nut	9 N.m (80 lb in)
Air Conditioning Refrigerant Heat Exchanger Nut @ Air Conditioning Evaporator Hose	22 N.m (16 lb ft)
Air Conditioning Refrigerant High Pressure Service Valve	2 N.m (18 lb in)
Air Conditioning Refrigerant Pressure Sensor	7 N.m (62 lb in)
Air Conditioning Refrigerant Service Valve	2 N.m (18 lb in)
Air Distributor Nut	9 N.m (80 lb in)
Air Inlet Deflector Water Deflector Retainer Nut	9 N.m (80 lb in)
Air Inlet Housing Fastener	2.5 N.m (22 lb in)
Auxiliary Air Conditioning Air Outlet Duct Fastener	2.5 N.m (22 lb in)
Auxiliary Air Conditioning Air Outlet Upper Duct Bolt	2.5 N.m (22 lb in)
Auxiliary Air Conditioning Evaporator and Blower Module Screw	1.3 N.m (12 lb in)
Auxiliary Air Conditioning Evaporator and Blower Module Screw	1.3 N.m (12 lb in)
Auxiliary Air Conditioning Evaporator Intermediate Tube 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)
Auxiliary Air Conditioning Evaporator Intermediate Tube Nut @ Rear Wheelhouse Inner Assembly	2.5 N.m (22 lb in)
Auxiliary Air Conditioning Evaporator Intermediate Tube Nut @ Underbody Rail Assembly	5 N.m (44 lb in)
Auxiliary Blower Motor Control Module Bolt	1.5 N.m (13 lb in)
Auxiliary Blower Motor Fastener	1.5 N.m (13 lb in)
Auxiliary Heater Core Cover Screw	1.3 N.m (12 lb in)
Auxiliary Heater Core Tube Bracket Screw	1.3 N.m (12 lb in)
Blower Motor Bolt	2.5 N.m (22 lb in)
Floor Front Air Outlet Duct Adapter Bolt	2.5 N.m (22 lb in)
Heater and Air Conditioning Evaporator and Blower Lower Case Fastener	2.5 N.m (22 lb in)
Heater and Air Conditioning Evaporator and Blower Upper Case Screw	2.5 N.m (22 lb in)
Heater Coolant Pump Bolt	22 N.m (16 lb ft)
Heater Coolant Pump Bracket Bolt	22 N.m (16 lb ft)
Heater Coolant Pump Nut	22 N.m (16 lb ft)
Heater Core Bracket Fastener	1.5 N.m (13 lb in)
Heater Core Tube Bracket Fastener	2.5 N.m (22 lb in)
Heater Core Tube Clamp Screw	2 N.m (18 lb in)
Heater Inlet and Outlet Pipe Nut	9 N.m (80 lb in)
Heater Water Auxiliary Pump Inlet Hose Clip Bolt	9 N.m (80 lb in)
HVAC Module Assembly Bolt	9 N.m (80 lb in)
Instrument Panel Outer Air Outlet Duct Bolt	2.5 N.m (22 lb in)
Passenger Compartment Air Filter Module Fastener	2.5 N.m (22 lb in)
Side Window Defogger Outlet Duct Bolt	2.5 N.m (22 lb in)
Transmission Stud	58 N.m (43 lb ft)

APPROXIMATE FLUID CAPACITIES

Refrigerant System Capacities

Application	Specification	
	Metric	US English
Abrupt Refrigerant Loss	60 ml[1]	2.0 oz[1]
Compressor Replacement		
NOTE: **Compressor failure can occur if the oil removed during refrigerant recovery is not replaced.** The service compressor is precharged with one of the following specified amounts of refrigerant oil. Refer to the instruction sheet included with the service compressor.	41 ml[2]	1.4 oz[2]
Condenser Replacement	30 ml[2]	1.0 oz[2]
Evaporator Replacement	30 ml[2]	1.0 oz[2]
Any Line Set (Hose/Tube or Tube Assembly) Replacement	30 ml[2]	1.0 oz[2]

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Application	Specification	
	Metric	US English
• Total System Refrigerant Oil Capacity (C24)	230.0 ml	7.8 oz
• Total System Refrigerant Oil Capacity (CJ2 with HP9)	200.0 ml	6.8 oz
• Total System Refrigerant Oil Capacity (CJ2 without HP9)	140.0 ml	4.7 oz
R-134a		
• Refrigerant Charge (C24)	1.13 kg	2.5 lb
• Refrigerant Charge (CJ2 with HP9)	1.1 kg	2.4 lb
• Refrigerant Charge (CJ2 without HP9)	0.66 kg	1.5 lb
R-1234yf		
• Refrigerant Charge (C24)	1.1 kg	2.4 lb
• Refrigerant Charge (CJ2)	0.61 kg	1.3 lb
[1] Abrupt refrigerant loss due to large leak, hose rupture, collision or pressure relief valve opening. Conditions that allow the refrigerant to seep or bleed off over time do not cause this oil loss. Upon replacement of a component that caused a large refrigerant loss, also add the required amount of oil for the particular component. [2] If more than the specified amount of refrigerant oil was drained from a component, add the amount drained.		

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
PAG Oil (R-134a)	Lubricant	88901445	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-1234yf and 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.

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- Proceed very cautiously regardless of the gauge readings.
- Open the fittings very slowly.

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.**

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

NOTE: **Use two proper wrenches to connect the fittings.**

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

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. Refer to **Symptoms - HVAC Systems - Automatic** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the HVAC System. Refer to **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

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Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **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**
- **Noise Diagnosis - HVAC Module**
- **Noise Diagnosis - Air Conditioning (A/C) System**
- **Noise Diagnosis - Blower Motor**
- **Odor Diagnosis**

LEAK TESTING

Refrigerant Leak Testing

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 polyalkylene glycol (PAG) oil throughout the refrigerant system.

Verifying some passive leaks may require using a halogen leak detector, even though the A/C system contains fluorescent dye.

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

Fluorescent Leak Detector

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

- Condensation on the evaporator core or the refrigerant lines may wash the PAG oil and fluorescent dye away from the actual leak. Condensation may also carry dye through the HVAC module drain.

  NOTE: **PAG oil is water soluble.**

- Leaks in the A/C system will be indicated in a light green or yellow color when using the leak detection lamp.

  Use the leak detection lamp in the following areas:

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

- Follow the instructions supplied with the 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 an approved fluorescent dye cleaner.

Fluorescent Dye Injection

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

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

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

- To prevent false diagnosis, thoroughly clean any residual dye from the service port with a rag and an approved fluorescent dye cleaner.

Halogen 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. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**

NOTE: **Halogen leak detectors are sensitive to the following items:**

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

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

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 instructions supplied with the halogen leak tester.

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST

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

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

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Step	Action	Values	Yes	No
2	1. Close the vehicle doors and windows. **NOTE:** **Record the relative humidity and the ambient air temperature at the time of the test.** 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?	-	Go to **Step 5**	Go to **Step 3**

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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	**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%	179-261 kPa (26-38 psi)	937-1150 kPa (136-167 psi)	10Â°C (50Â°F)	15Â°C (59Â°F)
19-24Â°C (66-75Â°F)	Below 40%	199-259 kPa (29-42 psi)	1061-1288 kPa (154-187 psi)	13Â°C (54Â°F)	18Â°C (63Â°F)
	Above 40%	213-310 kPa (31-45 psi)	1061-1302 kPa (154-189 psi)	14Â°C (57Â°F)	19Â°C (66Â°F)
25-29Â°C (76-85Â°F)	Below 35%	241-323 kPa (35-47 psi)	1212-1412 kPa (176-205 psi)	15Â°C (59Â°F)	20Â°C (68Â°F)
	35-50%	248-330 kPa (36-48 psi)	1212-1419 kPa (176-206 psi)	18Â°C 63Â°F)	23Â°C (72Â°F)
	Above 50%	254-344 kPa (37-50 psi)	1212-1419 kPa (176-206 psi)	19Â°C (66Â°F)	23Â°C (73Â°F)
30-35Â°C (86-95Â°F)	Below 30%	268-358 kPa (39-52 psi)	1329-1557 kPa (193-226 psi)	18Â°C (63Â°F)	23Â°C (73Â°F)
	30-50%	275-365 kPa (40-53 psi)	1329-1570 kPa (193-228 psi)	19Â°C (66Â°F)	24Â°C (75Â°F)
	Above 50%	289-385 kPa (42-56 psi)	1336-1570 kPa (194-228 psi)	20Â°C (68Â°F)	27Â°C (79Â°F)
36-41Â°C (96-105Â°F)	Below 20%	303-385 kPa (44-56 psi)	1481-1708 kPa (215-248 psi)	20Â°C (68Â°F)	25Â°C (77Â°F)
	20-40%	310-399 kPa (45-58 psi)	1481-1708 kPa (215-248 psi)	22Â°C (70Â°F)	28Â°C (81Â°F)
	Above 40%	323-413 kPa (47-60 psi)	1481-1722 kPa (215-250 psi)	23Â°C (73Â°F)	29Â°C (84Â°F)
42-46Â°C (106-115Â°F)	Below 20%	337-413 kPa (49-60 psi)	1632-1839 kPa (237-267 psi)	23Â°C (72Â°F)	28Â°C (82Â°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
	Above 20%	344-427 kPa (50-62 psi)	1632-1839 kPa (237-267 psi)	24Â°C (75Â°F)	30Â°C (86Â°F)
47-49Â°C (116-120Â°F)	Below 30%	378-454 kPa (55-66 psi)	1756-1956 kPa (255-284 psi)	25Â°C (77Â°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
		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
DEFINITION: Heating system performance.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**
2	1. Start the engine. 2. Allow the engine to idle. Does the engine reach a normal operating temperature?	Go to **Step 3**	Go to **Step 9**
3	1. Select the FLOOR mode. **WARNING:** **Refer to Moving Parts and Hot Surfaces Warning .** 2. Select the minimum blower speed. 3. Select the warmest temperature setting. 4. 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 instrument panel (I/P) air outlet. 2. Secure a thermometer to the heater core outlet hose. 3. Select the PANEL mode. 4. Select the maximum blower speed. 5. Select the warmest temperature setting. 6. Record the temperature at the following locations: • The center I/P 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**	-

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Step	Action	Yes	No
6	1. Inspect the temperature door operation. Refer to **Automatic HVAC Description and Operation** . 2. Inspect the temperature valve actuator for proper operation. Refer to **Temperature Valve Actuator Replacement - Right Side (CJ2 C24)** , **Temperature Valve Actuator Replacement - Right Side (Floor Front Console C24)** , **Temperature Valve Actuator Replacement - Left Side (CJ2 C24)** and/or **Temperature Valve Actuator Replacement - Left Side (Floor Console CJ2 C24)** . 3. Perform any necessary repairs. Are the repairs complete?	Go to **Step 10**	-
7	1. Turn OFF the engine. 2. Back flush the heater core. 3. Start the engine. 4. Select the FLOOR mode. 5. Select the minimum blower speed. 6. Select the warmest temperature setting. 7. Feel the temperature of the inlet and outlet heater hoses at the heater core. Does the inlet heater hose feel warmer than the outlet heater hose?	Go to **Step 8**	Go to **Step 10**
8	Replace the heater core. Refer to **Heater Core Replacement**. 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
DEFINITION: Time required to defrost the windshield is longer than normal.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**
2	1. Start the engine. 2. Select the DEFROST mode. 3. Select the maximum blower speed. Does sufficient air flow from the defroster outlets?	Go to **Step 3**	Go to **Step 6**

Step	Action	Yes	No
3	1. Select the minimum blower speed. 2. Select the maximum temperature setting. 3. Feel the temperature of the inlet and outlet hoses at the heater core. **WARNING:** **Refer to Moving Parts and Hot Surfaces Warning .** Does the inlet hose feel warmer than the outlet hose?	Go to **Step 7**	Go to **Step 4**
4	Perform the A/C system performance test. Refer to **Air Conditioning (A/C) System Performance Test**. Is the A/C system operating within the specifications?	Go to **Step 5**	Go to **Step 8**
5	Inspect for correct operation of the air inlet door. Is the air inlet door operating correctly?	Go to **Step 10**	Go to **Step 9**
6	Repair the air delivery concern. Refer to **Diagnostic Starting Point - Vehicle** . Is the repair complete?	Go to **Step 10**	-
7	Repair the heating concern. Refer to **Heating Performance Diagnostic**. Is the repair complete?	Go to **Step 10**	-
8	Repair the A/C performance concern. Refer to **Air Conditioning (A/C) System Performance Test**. Is the repair complete?	Go to **Step 10**	-
9	Repair the air inlet door concern. Refer to **Air Inlet Housing Replacement**. Is the repair complete?	Go to **Step 10**	-
10	Operate the system in order to verify the repair. Did you find and correct the problem?	System OK	Go to **Step 2**

NOISE DIAGNOSIS - BLOWER MOTOR

Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**
2	Inspect the air inlet grille for debris. Is debris present?	Go to **Step 8**	Go to **Step 3**

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Step	Action	Yes	No
3	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine OFF. 4. Cycle the blower motor through all of the speeds and modes in order to determine where and when the noise occurs. Is a noise evident during the blower operation?	Go to **Step 4**	Go to **Step 11**
4	Inspect for excessive vibration at each blower motor speed by feeling the blower case. Is excess vibration present?	Go to **Step 6**	Go to **Step 5**
5	Listen to the blower motor at each speed. Is the blower motor making a squeaking or chirping noise?	Go to **Step 9**	Go to **Step 11**
6	1. Remove the blower motor. Refer to **Blower Motor Replacement**. 2. Inspect the blower motor impeller for deposits of foreign material. 3. Inspect the blower motor for deposits of foreign material. Did you find any foreign material on the blower motor or blower motor impeller?	Go to **Step 8**	Go to **Step 7**
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 Motor Replacement**. Is the repair complete?	Go to **Step 11**	-
10	Install the blower motor. Refer to **Blower Motor Replacement**. Is the action complete?	Go to **Step 11**	-
11	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Step 2**

AIR CONDITIONING COMPRESSOR OIL DIAGNOSIS

Condition	Corrective Action

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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 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

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Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - 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. Refer to **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** Is the drive belt tension correct?	Go to **Step 5**	Go to **Step 19**
5	Inspect the drive belt for excessive oil coverage. Is the drive belt covered with oil?	Go to **Step 17**	Go to **Step 6**
6	1. Start the engine. 2. Ensure that the A/C is ON. 3. Inspect the compressor and the clutch. Is the compressor locked up?	Go to **Step 23**	Go to **Step 7**
7	Is the A/C compressor clutch slipping?	Go to **Step 23**	Go to **Step 8**
8	Using a stethoscope, listen to the A/C compressor for any abnormal noises. Is the compressor causing an abnormal noise?	Go to **Step 15**	Go to **Step 10**
9	Does a moaning noise exist when the A/C clutch is engaged?	Go to **Step 10**	Go to **Step 12**
10	Listen to the A/C compressor components and mounting for noise concerns using a stethoscope. Are any of these components loose, damaged or excessively worn?	Go to **Step 20**	Go to **Step 11**
11	1. Idle the engine. 2. Engage the A/C compressor clutch. 3. Using a stethoscope, move around the entire refrigerant plumbing system, inspecting for any abnormal noises caused by component ground-out. Are any of the A/C components grounding out and causing a noise?	Go to **Step 22**	Go to **Step 13**
12	Does a vibration or rattle noise exist when the A/C clutch is engaged?	Go to **Step 13**	Go to **Step 14**

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Step	Action	Yes	No
13	Does the noise stop when the A/C clutch is disengaged?	Go to **Step 15**	Go to **Step 14**
14	1. Idle the engine in PARK with the A/C compressor clutch engaged. 2. Using a stethoscope, move around the entire A/C system testing for any abnormal noises caused by a component. Do any of the A/C components cause an abnormal noise?	Go to **Step 21**	Go to **Step 24**
15	Verify that the A/C system is properly charged. Refer to **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. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **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. Refer to **Drive Belt Replacement (LGX)** and/or **Drive Belt Replacement (LGW)** Is the replacement complete?	Go to **Step 25**	-
19	Replace the A/C drive belt tensioner. Refer to **Drive Belt Tensioner Replacement (LGX)** and/or **Drive Belt Tensioner Replacement (LGW)** Is the replacement complete?	Go to **Step 25**	-
20	Repair or replace the A/C compressor mounting component. Is the repair complete?	Go to **Step 25**	-
21	Repair or replace the component which is causing the moaning concern as needed. Is the repair complete?	Go to **Step 25**	-
22	Correctly route or insulate the A/C component. Is the repair complete?	Go to **Step 25**	-
23	Replace the A/C compressor. Refer to **Air Conditioning Compressor Replacement (LTG)** and/or **Air Conditioning Compressor Replacement (LGW, LGX)** Is the replacement complete?	Go to **Step 25**	-
24	The concern may be caused by an engine related component. Refer to **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
DEFINITION: Noise originating from the HVAC module.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**
2	1. Start the engine. 2. Cycle through all of the following: • Blower motor speeds • HVAC modes • Temperature control settings 3. Determine the type of noise: • Scrape, pop • Tick/click, chirp or groaning • Air rush/whistle Is a scrape or pop noise evident when selecting modes or temperature settings?	Go to **Step 6**	Go to **Step 3**
3	Is a tick/click, chirping, groaning or scraping noise present, but decreases as blower motor speed is decreased?	Go to **Step 6**	Go to **Step 4**
4	Is an air rush/whistle noise evident in all modes but not all temperature settings?	Go to **Step 6**	Go to **Step 5**
5	Is an air rush/whistle noise evident only in defrost or floor mode?	Go to **Step 6**	Go to **Step 6**
6	Remove the IP carrier. Refer to **Instrument Panel Carrier Replacement (UQH)** and/or **Instrument Panel Carrier Replacement (UQA)** . Is the action complete?	Go to **Step 7**	-
7	1. Inspect the air flow doors for proper operation. 2. Inspect the ducts for obstructions or foreign materials. Were any of these conditions found?	Go to **Step 10**	Go to **Step 8**
8	Inspect the mode and temperature doors and seals for warping or cracking. Are the doors in normal condition?	Go to **Step 11**	Go to **Step 9**
9	Replace the appropriate door and/or seals. Is the repair complete?	Go to **Step 11**	-
10	Remove any obstructions or foreign material found. Is the action complete?	Go to **Step 11**	-
11	Install the IP carrier. Refer to **Instrument Panel Carrier Replacement (UQH)** and/or **Instrument Panel Carrier Replacement (UQA)** . 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
DEFINITION: Odor originating or noticed through the HVAC system.			

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Step	Action	Yes	No
1	Were you sent here from Symptoms or another diagnostic table?	Go to **Step 2**	Go to **Symptoms - HVAC Systems - Automatic**
2	1. Sit inside the vehicle. 2. Close all of the doors and windows. 3. Start the engine. 4. Allow the engine to 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 filter and the air inlet grille for debris. Refer to **Passenger Compartment Air Filter Replacement**. Is the debris present?	Go to **Step 4**	Go to **Step 5**
4	Remove any debris. Is the action complete?	Go to **Step 15**	-
5	Inspect for wet carpeting. Is the carpet wet?	Go to **Step 6**	Go to **Step 14**
6	Inspect for the following conditions: • Water leaks around the windshield • Blockage of the HVAC module drain • Leaks around the door seals Is the 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** . Is the 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**. Is the repair complete?	Go to **Step 15**	-
12	Does the odor have an oily smell?	Go to **Step 13**	Go to **Step 15**

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Step	Action	Yes	No
13	1. Inspect the engine compartment for any leaks. Refer to the following procedures: • **Oil Leak Diagnosis** for engine oil leaks • **Fluid Leak Diagnosis** for the automatic transmission leaks 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 or the heater core inside of the HVAC module. Refer to **Odor Correction**. Is the action complete?	Go to **Step 15**	-
15	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to **Step 2**

REPAIR INSTRUCTIONS

ODOR CORRECTION

Eliminating Air Conditioning Odor

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

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

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

Deodorize the evaporator core using Deodorizing Aerosol Kit.

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

1. Ensure that the plenum that 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 maximum 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.

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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.
13. Using the scan tool enable the afterblow. Refer to **Afterblow Enabling** .

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**

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 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.**

Both the **J-43600** ACR 2000 Air Conditioning Service Center and **GE-48800** CoolTech A/C Recharge Machine are complete air conditioning service center for R-134a. Both units recovers, recycles, evacuates and recharges A/C refrigerant quickly, accurately and automatically. Both units have a display screen that contains the function controls and displays prompts that will lead the technician through the recover, recycle, evacuate and recharge operations. R-134a is recovered into and charged out of an internal storage vessel. Both units automatically replenishes this vessel from an external source tank in order to maintain a constant 5.45-6.82 kg (12-15 lbs) of A/C refrigerant.

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

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

GE-48800 CoolTech A/C Recharge Machine is released as a required replacement for the previously essential **J-43600** ACR 2000 Air Conditioning Service Center. The **GE-48800** CoolTech A/C Recharge Machine is SAE J2788 compliant and meets GM requirements for A/C Refrigerant System Repairs on all General Motors vehicles, including Hybrid systems with 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/POE oil must be replenished. If no oil was removed from the A/C system during recovery, do not charge any PAG/POE 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

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

General Information

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

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

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

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

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

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

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

Refrigerant Recovery and Recharging

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

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

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

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

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

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

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

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

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

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

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

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

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**.

FLUSHING (WITHOUT HP9)

Special Tools

- **GE-45268** A/C Flushing Adapter Kit
- **GE-45268-130** 1234yf Refrigerant Adapters
- **GE-50078** Enhanced Leak Detector
- **GE-50300** Air Conditioning Service Center for HFO1234yf

For equivalent regional tools, refer to **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.

Technicians repairing or servicing motor vehicle air conditioning (MVAC) 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: **Refer to R-1234yf Proper Service Procedures Warning .**

NOTE: **Flushing is not intended to remove metal from the A/C system.**

Flushing is intended to remove the following:

- Contaminated A/C Compressor oil
- Desiccant, following a desiccant bag failure
- Overcharge of A/C Compressor oil
- Refrigerant contamination

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

Forward Flushing Setup

1. Install both GE-45268-9 (2) onto the GE-45268-10 (3).

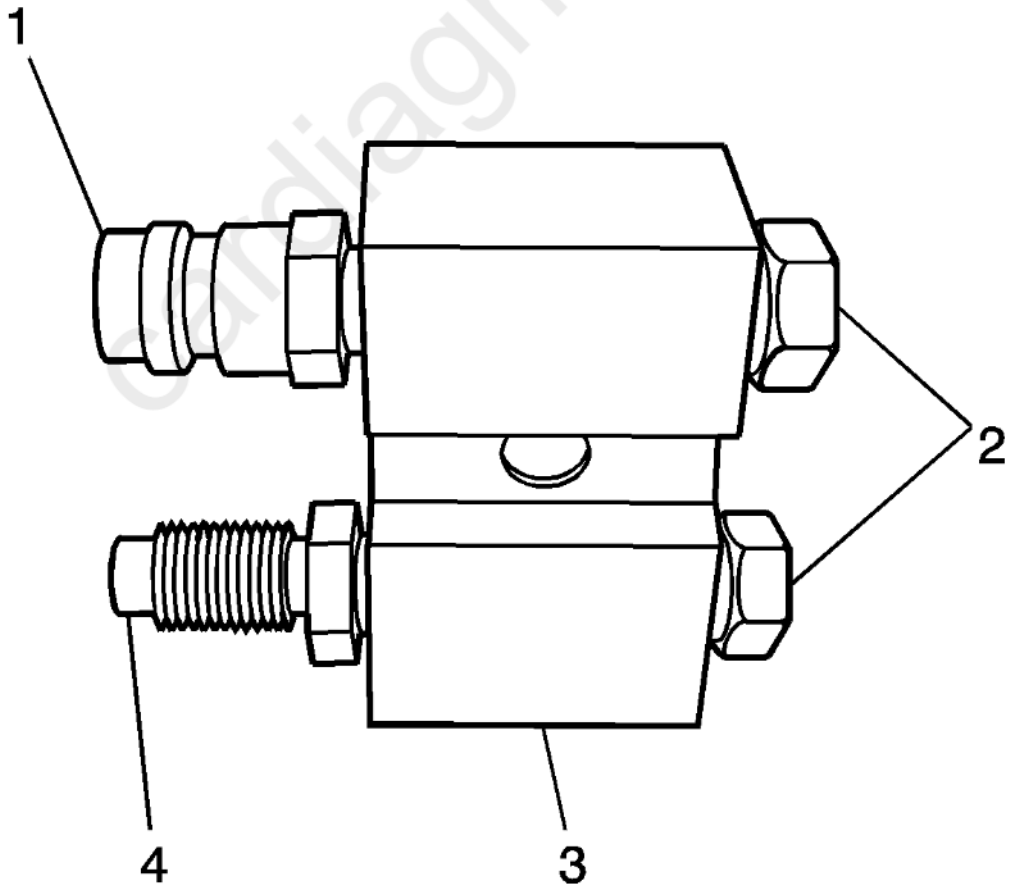


Fig. 1: Identifying J 45268-2, J 45268-7, J 45268-8 & J 45268-9
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: **Inspect and lubricate the GE-45268 A/C Flushing Adapter Kit fitting O-rings. Refer to Air Conditioning O-Ring Seal Replacement.**

2. Install the GE-45268-7 (4) onto the suction side of the GE-45268-10 (3).
3. Install the GE-45268-129 (1) onto the discharge side of the GE-45268-10 (3).

Reverse Flushing Setup

1. Install both GE-45268-9 (2) onto the GE-45268-10 (3).

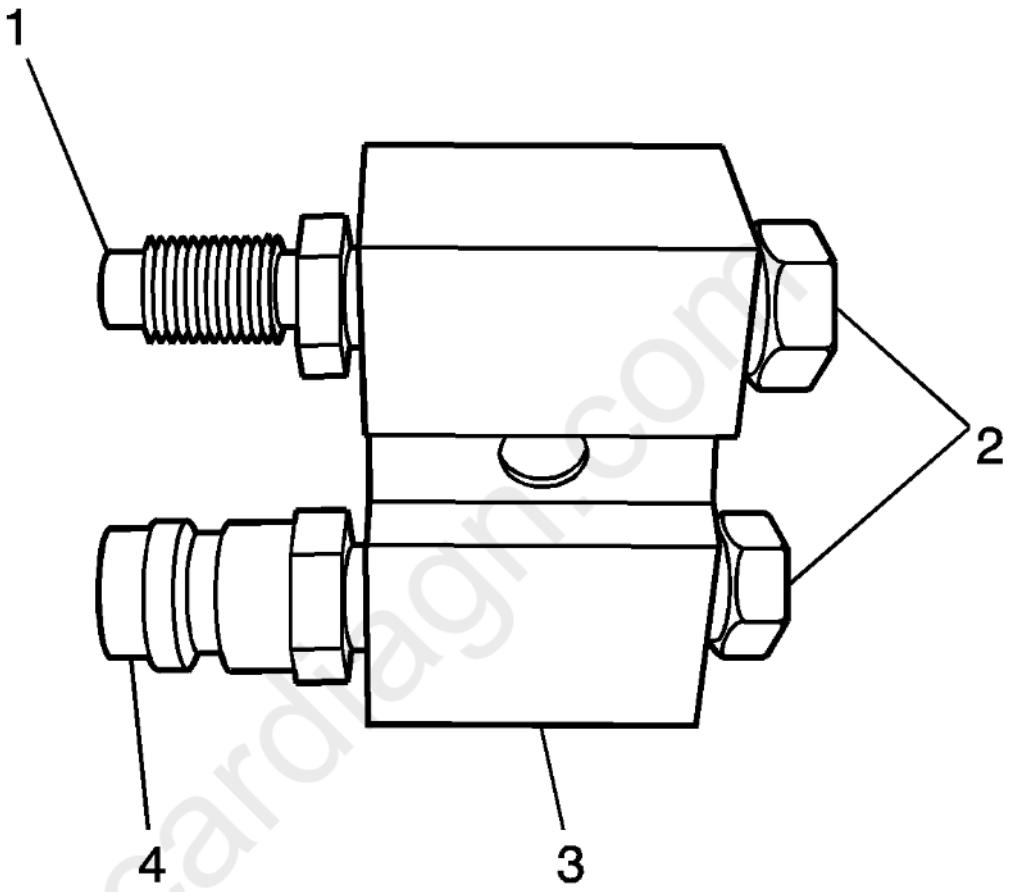


Fig. 2: Using J45268-9, J45268-8, J 45268-7, & J 45268-2
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Reverse flow refrigerant flush is recommended for desiccant bag failure. Replace the condenser/receiver dehydrator assembly when the A/C flush is complete and perform the following procedure:**

NOTE: **Inspect and lubricate the GE-45268 A/C Flushing Adapter Kit fitting O-rings. Refer to Air Conditioning O-Ring Seal Replacement.**

2. Install the GE-45268-129 (4) onto the suction side of the GE-45268-10 (3).
3. Install the GE-45268-7 (1) onto the discharge side of the GE-45268-10 (3).

Flush Procedure

1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf).

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

2. Remove the thermal expansion valve (TXV). Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement** and/or **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)**.
3. Install the TXV stud onto the GE-45268-115 adapter.
4. Install new sealing washers onto the evaporator core. Refer to **Air Conditioning System Seal Replacement**.
5. Install GE-45268-115 in place of the TXV.
6. Install TXV mounting bolts and tighten to 5 N.m (44 lb in).

CAUTION: **Refer to Fastener Caution .**

7. Install new washers onto the liquid line and suction hose. Refer to **Air Conditioning System Seal Replacement**.
8. Connect the liquid line and suction hose to the GE-45268-115.
9. Install the TXV block fitting nut and tighten to 22 N.m (16 lb ft).
10. Remove the A/C compressor. Refer to **Air Conditioning Compressor Replacement (LTG)** and/or **Air Conditioning Compressor Replacement (LGW, LGX)**.
11. Service the filter before each flush.

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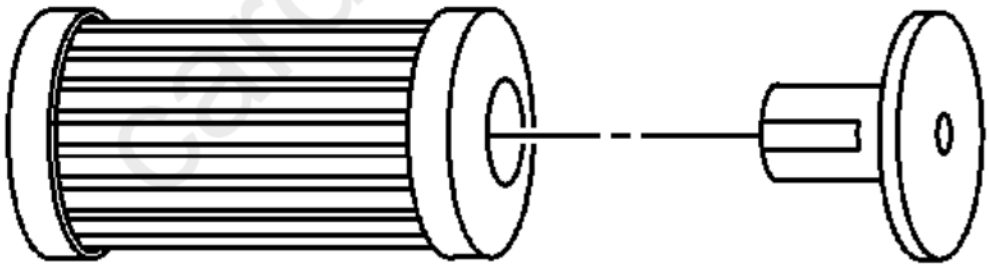


Fig. 3: View Of A/C Filter & Check Valve
Courtesy of GENERAL MOTORS COMPANY

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

12. Install the GE-45268-10 to the A/C compressor to condenser hose assembly.

NOTE: **Install new sealing washers onto the compressor hose assembly. Refer to Air Conditioning System Seal Replacement.**

Assure that the suction and discharge ports on the GE-45268-10 correspond to the suction and discharge ports on the compressor hose assembly.

13. Install fitting GE-45268-128 to the filter cylinder end of GE-45268-1.
14. Connect GE-45268-1 filter to GE-45268-7 adapter.
15. Connect the blue hose from the **GE-50300** Air Conditioning Service Center to GE-45268-1 flush filter adapter.

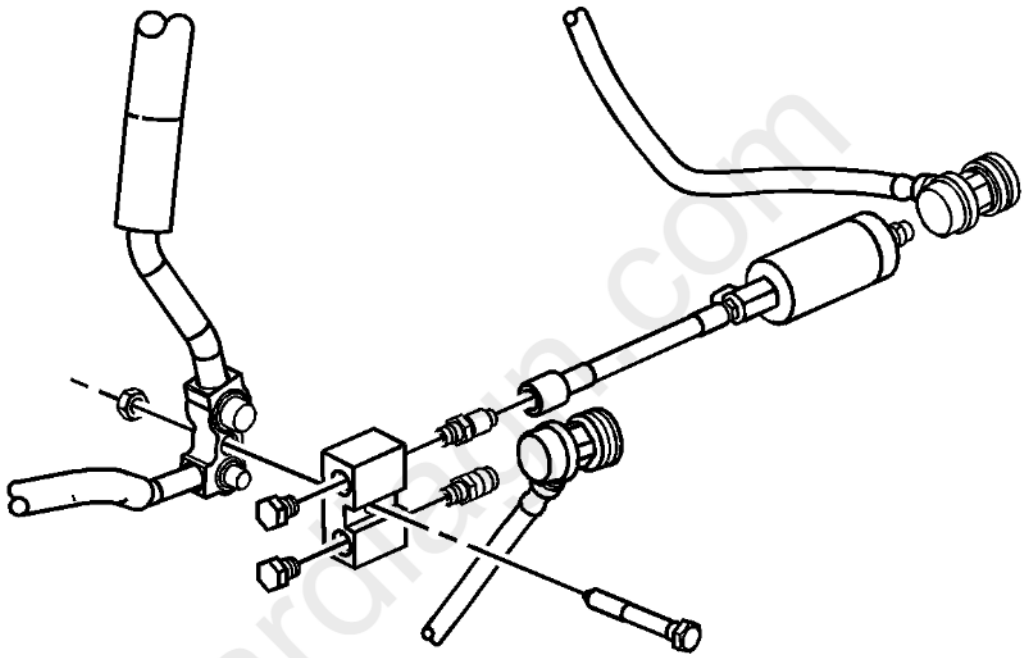


Fig. 4: Flush Adapters
Courtesy of GENERAL MOTORS COMPANY

16. Connect the red hose from the **GE-50300** Air Conditioning Service Center to fitting GE-45268-129.
17. Flush the A/C system. Follow the instructions supplied with the **GE-50300** Air Conditioning Service Center.

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

18. Disconnect the red hose from the **GE-50300** Air Conditioning Service Center from fitting GE-45268-129.
19. Disconnect the blue hose from the **GE-50300** Air Conditioning Service Center to GE-45268-1 flush filter adapter.
20. Disconnect the GE-45268-1 flush filter from the GE-45268-10 flush adapter.
21. Remove the GE-45268-10 from the A/C compressor hose assembly.

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

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

    The A/C system must be replenished with the correct amount of PAG oil.

    1. Remove the A/C compressor drain plug.
    2. Drain the PAG oil from the A/C compressor. Rotate the compressor input shaft to assist in draining the PAG oil from the compressor.
    3. Install the A/C compressor drain plug and tighten to 30 N.m (22 lb ft).
    4. Add the total system capacity of PAG oil to the A/C compressor. Refer to **Approximate Fluid Capacities**.
23. If you will replace the A/C compressor after flushing the system, perform the following procedure:
    1. Deduct 41 ml (1.4 oz), which is the amount of PAG oil shipped with the service compressor, from the amount of PAG oil listed in the capacities table. Refer to **Approximate Fluid Capacities**.
    2. Add the calculated amount to the compressor, as needed.
24. Add one bottle of A/C Tracer Dye directly to the A/C Compressor.

    NOTE: **Flushing will remove fluorescent leak detection dye from A/C system.**

25. Install the A/C compressor. Refer to **Air Conditioning Compressor Replacement (LTG)** and/or **Air Conditioning Compressor Replacement (LGW, LGX)**.
26. Remove the TXV block fitting nut.
27. Disconnect the liquid line and suction hose from the GE-45268-115.
28. Remove the TXV bolts retaining the GE-45268-115.
29. Remove the GE-45268-115.
30. Inspect the TXV for debris. Clean or replace as needed.
31. Install the TXV. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement** and/or **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)**.
32. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**.
33. Leak test the fittings using **GE-50078** Enhanced Leak Detector.

FLUSHING (HP9)

Special Tools

- **GE-41447** R-1234yf A/C Tracer Dye Box of 24
- **GE-42220** Universal 12V Leak Detection Lamp
- **GE-45268** Flush Adapter Kit
- **GE-45268-130** Fittings, R-1234yf Refrigerant Flushing Kit
- **GE-50300-A** Air Conditioning Refrigerant Recovery Machine

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

NOTE:

- **Hybrid compliant A/C refrigerant recharging equipment GE-50300-A meets SAE refrigerant recovery standard J-2843 and is specially designed for GM hybrid vehicle A/C service**
- **The high voltage (HV) electric air conditioning (A/C) compressor uses a polyolester (POE) refrigerant oil instead of a polyalkylene glycol (PAG) synthetic refrigerant oil. This is due to the better**

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electrical resistance of the POE oil and its ability to provide HV isolation.

- **When servicing vehicles with an electric compressor, first perform the hose flush procedure to clear the unit of residual PAG oil. Failure to perform this procedure will cause contamination of the hybrid system as well as failure of the compressor.**

GE-50300-A A/C System Procedure

NOTE: **Flushing with the GE-50300-A is not intended to remove metal from the A/C system.**

Flushing is intended to remove the following contaminants:

- Contaminated polyolester (POE) oil
- Desiccant, following a desiccant bag failure
- Overcharge of POE oil
- Refrigerant contamination

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

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

2. Remove the air conditioning refrigerant heat exchanger at the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**
3. Remove the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
4. Install new sealing washers. Refer to **Air Conditioning System Seal Replacement**
5. Install a GE-45268-115 to the air conditioning evaporator using the air conditioning evaporator thermal expansion valve bolts. Install and tighten 8 N.m (71 lb in)

   CAUTION: **Fastener Caution** .

6. Install the air conditioning refrigerant heat exchanger to the GE-45268-115. Refer to **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**
7. Remove the auxiliary air conditioning evaporator intermediate tube at the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
8. Remove the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
9. Install a GE-45268-115 to the drive motor battery coolant cooler using the auxiliary air conditioning evaporator thermal expansion valve bolts. Install and tighten 8 N.m (71 lb in)
10. Install the auxiliary air conditioning evaporator intermediate tube to the GE-45268-115. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
11. Remove the air conditioning receiver and dehydrator. Refer to **Receiver and Dehydrator Replacement**
12. Install the air conditioning receiver and dehydrator plug without the air conditioning refrigerant desiccant. Install and tighten 7 N.m (62 lb in)
13. Remove the air conditioning and drive motor battery cooling compressor. Refer to **Air Conditioning and Drive Motor Battery Cooling Compressor Replacement**
14. If installed, remove the screen from the air conditioning evaporator connector hose/tube and compressor Hose at the air conditioning and drive motor battery cooling compressor.
15. Install the fitting GE-45268-7 onto the GE-45268-4.

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

16. Install GE-45268-4 to the air conditioning evaporator connector hose/tube and compressor hose. Install and tighten 22 N.m (16 lb ft)
17. Install the R-1234yf high side fitting GE-45268-131 onto the GE-45268-5.
18. Install GE-45268-5 to the air conditioning compressor and condenser hose. Install and tighten 22 N.m (16 lb ft)
19. Install the R-1234yf low side fitting GE-45268-132 onto the GE-45268-1.
20. Service the filter with ACDelco P/N GF 470, before each flush, either forward or reverse.

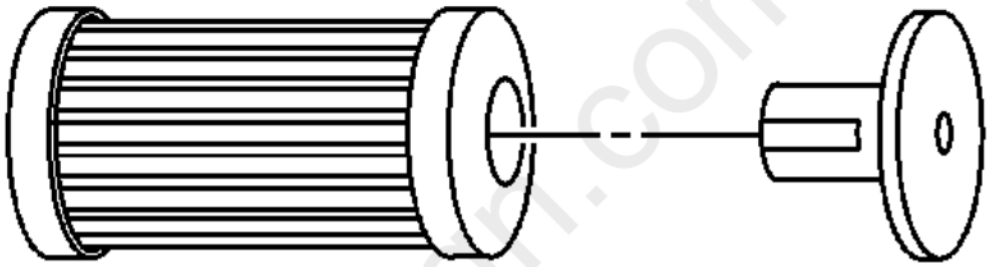


Fig. 5: View Of A/C Filter & Check Valve
Courtesy of GENERAL MOTORS COMPANY

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

21. Connect the GE-45268-1 flush filter to the suction port fitting of the GE-45268-4 flush adapter.
22. Connect the blue hose from the GE-50300-A to the J 45268-1 flush filter adapter.
23. Connect the red hose from the GE-50300-A to the GE-45268-5 flush adapter.
24. To reverse flush the system, install the block fittings GE-45268-4 air conditioning compressor and condenser hose. Install and tighten 22 N.m (16 lb ft)

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

25. Install the block fittings GE-45268-5 to the air conditioning evaporator connector hose/tube and compressor hose Install and tighten 22 N.m (16 lb ft)
26. Flush the front A/C system. Follow the instructions supplied with the GE-50300-A.

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

27. Flush the A/C system. Follow the instructions supplied with the GE-50300-A
28. Remove the GE-45268-4 from the air conditioning evaporator connector hose/tube and compressor hose.
29. Remove the GE-45268-5 from the air conditioning compressor and condenser hose.
30. Refill the air conditioning system with the proper amount of air conditioning oil. Refer to **Approximate Fluid Capacities**

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

31. If the removed air conditioning compressor is being reinstalled, perform the following procedure:
    1. Drain the POE oil from the air conditioning compressor.
    2. Add the total system capacity of POE oil to the air conditioning compressor. Refer to **Approximate Fluid Capacities**
32. If you will replace the A/C compressor after flushing the system, perform the following procedure:
    1. DO NOT drain the new POE oil from the compressor.
    2. Deduct the amount of POE oil shipped with the service compressor from the amount of POE oil listed in the approximate fluid capacities table. Refer to **Approximate Fluid Capacities**
33. Add the calculated amount to the compressor, as needed.
34. Install the air conditioning and drive motor battery cooling compressor. Refer to **Air Conditioning and Drive Motor Battery Cooling Compressor Replacement**
35. Replace the air conditioning receiver and dehydrator. Refer to **Receiver and Dehydrator Replacement**

NOTE: **Flushing will remove fluorescent leak detection dye from A/C system. The air conditioning refrigerant desiccant is manufactured with POE fluorescent leak detection dye wafer inside.**

36. Remove the GE-45268-115 from the drive motor battery cooler.
37. Install the auxiliary air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
38. Remove the air conditioning refrigerant heat exchanger from the GE-45268-115. Refer to **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**
39. Install the air conditioning refrigerant heat exchanger at the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**
40. Install the air conditioning evaporator thermal expansion valve. Refer to **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**
41. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**.
42. Leak test the fittings using **GE-42220** Universal 12V Leak Detection Lamp.

AIR CONDITIONING COMPRESSOR OIL BALANCING

Draining Procedure

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

NOTE: **Drain and measure as much of the refrigerant oil as possible from the rear head ports of the REMOVED compressor.**

2. Drain the oil from both the suction and discharge ports into the same container. Rotate the compressor shaft to assist in draining the compressor.



Fig. 6: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS COMPANY

3. Measure and record the amount of oil drained from the removed compressor. In addition, measure and record the amount of oil recovered during refrigerant recovery.

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

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

Balancing Procedure

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

NOTE: **Check the oil volume in the replacement compressor.**

The replacement compressor is shipped partially filled with refrigerant oil. The amount of oil has to be balanced according to below:

1. Refer to the amounts of refrigerant oil recorded during the compressor removal and refrigerant recovery.
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 the oil volume in the replacement compressor, no balancing is required. Refill the replacement compressor with the amount removed. It contains the proper amount of oil.
   - More than the oil volume in the replacement compressor, additional oil is required. Subtract the oil volume in the replacement compressor from the sum of removed oil (oil drained + oil

recovered). This calculated difference is the amount of service oil that needs to be added to the replacement compressor. Add the additional oil needed and install the replacement compressor.

AIR CONDITIONING COMPRESSOR REPLACEMENT (LTG)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Drive Belt @ Air Conditioning CompressorÂ» Remove - **Drive Belt Replacement (Except Hybrid)** and/or **Drive Belt Replacement (Hybrid)**
3. Underbody Front Air Deflector (3)Â» Remove - **Underbody Front Air Deflector Replacement**

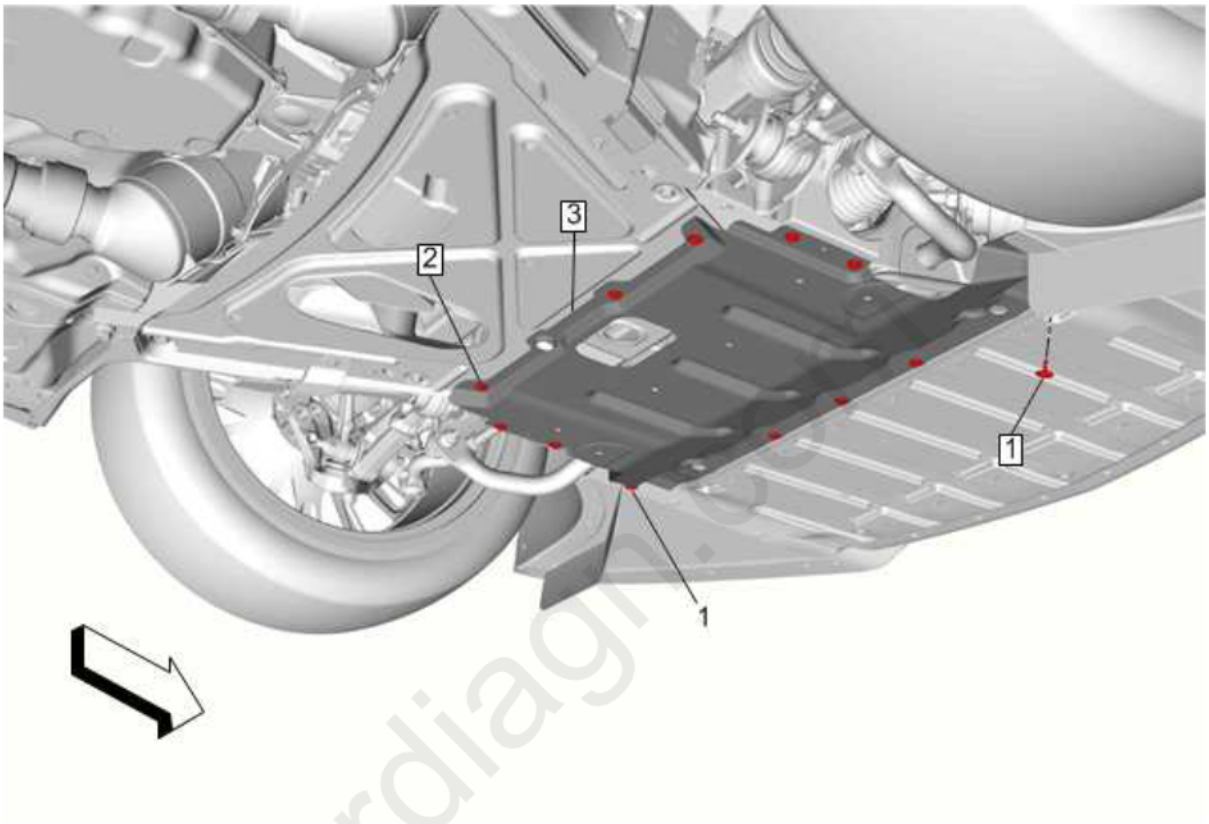


Fig. 7: Underbody Front Air Deflector
Courtesy of GENERAL MOTORS COMPANY

4. Engine Front Splash Shield (3) - Left SideÂ» Remove - **Engine Front Splash Shield Replacement - Left Side (Rear)** **Engine Front Splash Shield Replacement - Left Side (Front)**

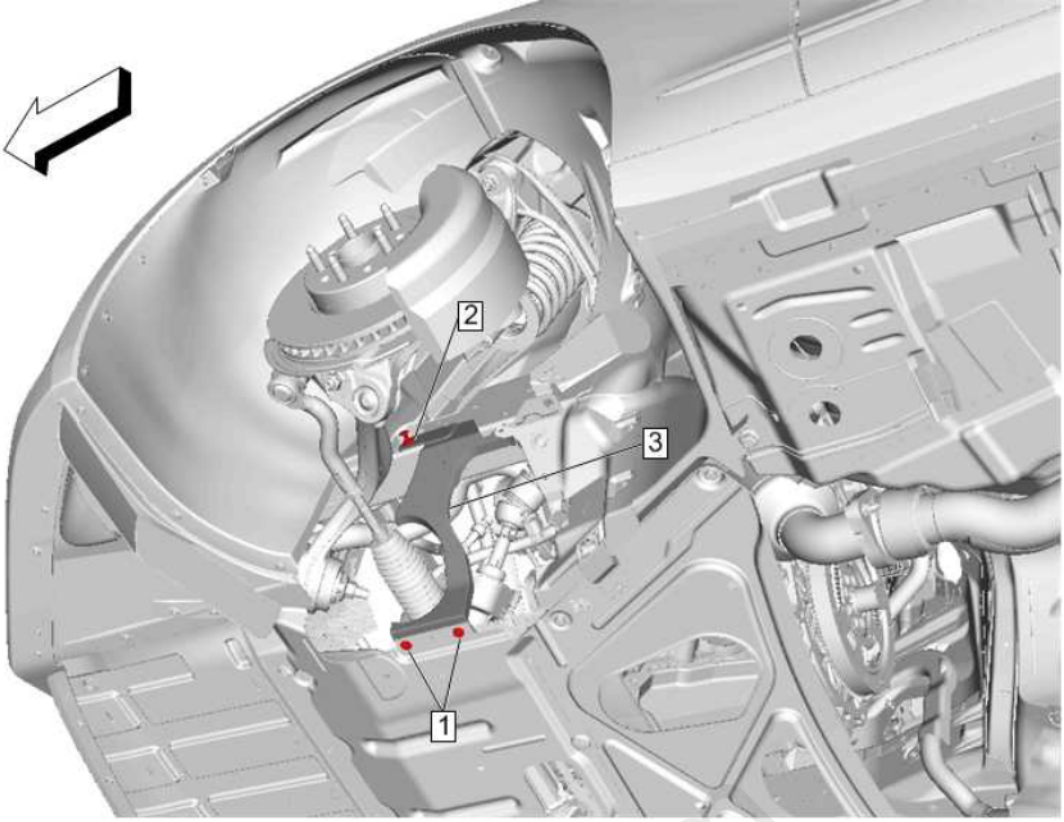


Fig. 8: Engine Front Splash Shield - Left Side (Front)
Courtesy of GENERAL MOTORS COMPANY

5. Charge Air Cooler Inlet Air TubeÂ» Remove - **Charge Air Cooler Inlet Air Tube Replacement**
6. Air Conditioning Compressor and Condenser Hose (1) @ Air Conditioning CompressorÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

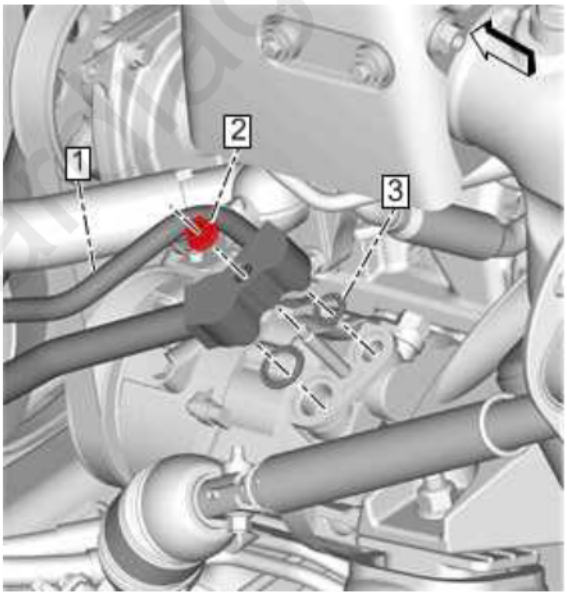


Fig. 9: Air Conditioning Compressor And Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Disconnect all electrical connectors.
8. Air Conditioning Compressor Bolt (2)Â» Remove [2x]

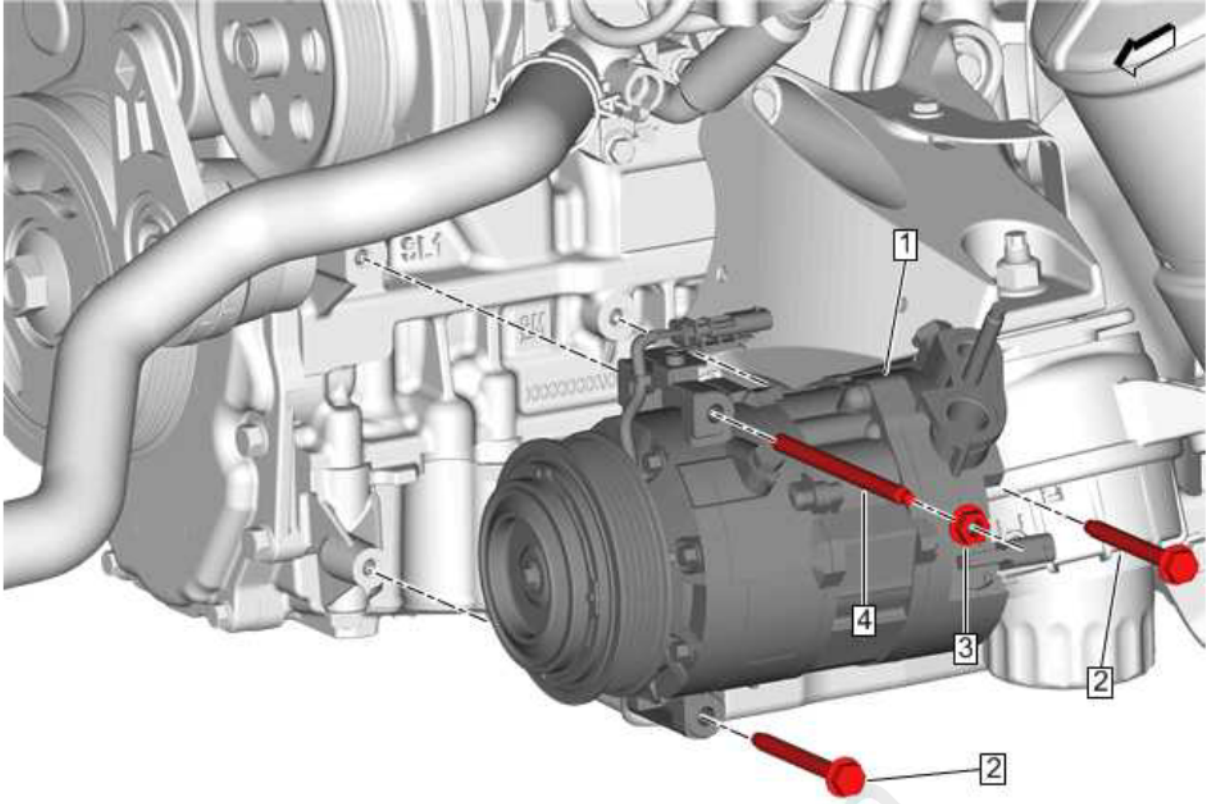


Fig. 10: Air Conditioning Compressor And Retainers
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Nut (3)Â» Remove
10. Air Conditioning Compressor Stud (4)Â» Remove
11. Remove the air conditioning compressor (1) from the vehicle.
12. When replacing the air conditioning compressor, balance the air conditioning compressor oil. Refer to **Air Conditioning Compressor Oil Balancing**

Installation Procedure

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

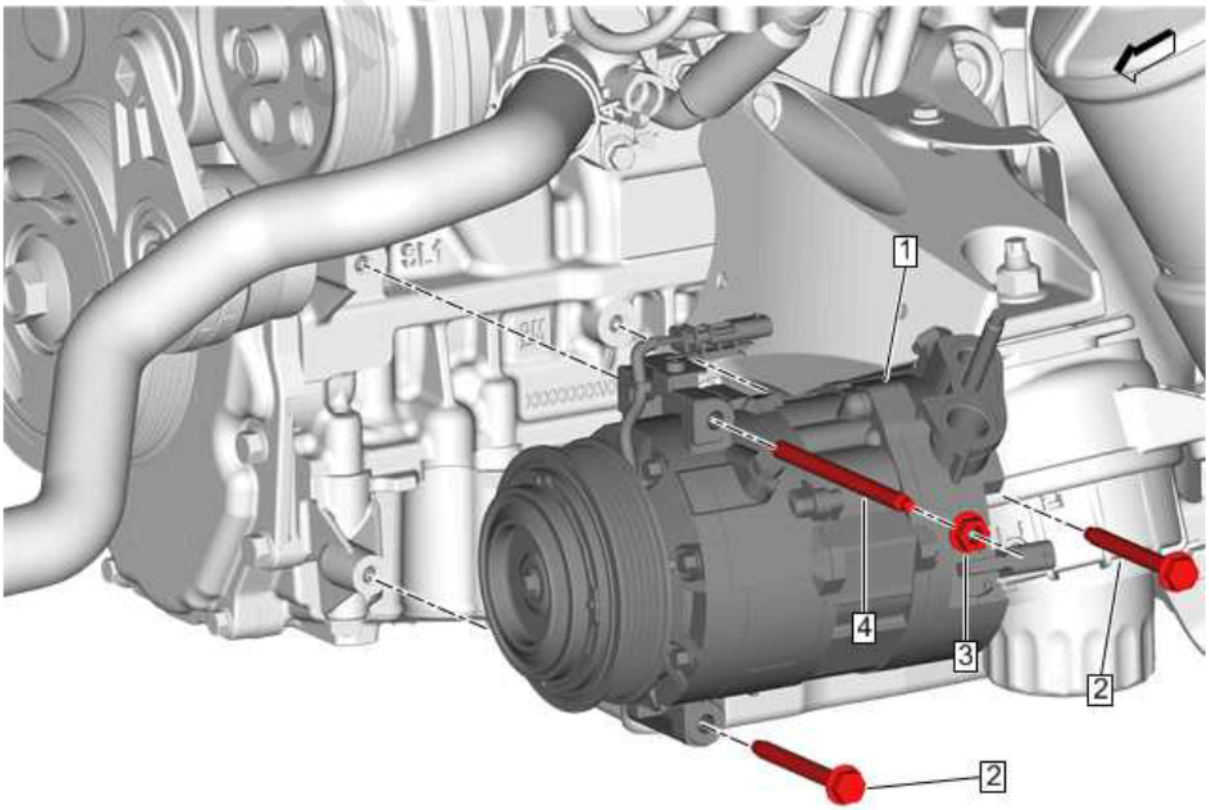


Fig. 11: Air Conditioning Compressor And Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor Stud (4)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

3. Air Conditioning Compressor Bolt (2) Install and tighten 22 N.m (16 lb ft) [2x]
4. Air Conditioning Compressor NutÂ» Install and tighten 22 N.m (16 lb ft)
5. Connect the electrical connectors.
6. Air Conditioning Compressor and Condenser Hose (1) @ Air Conditioning CompressorÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)**

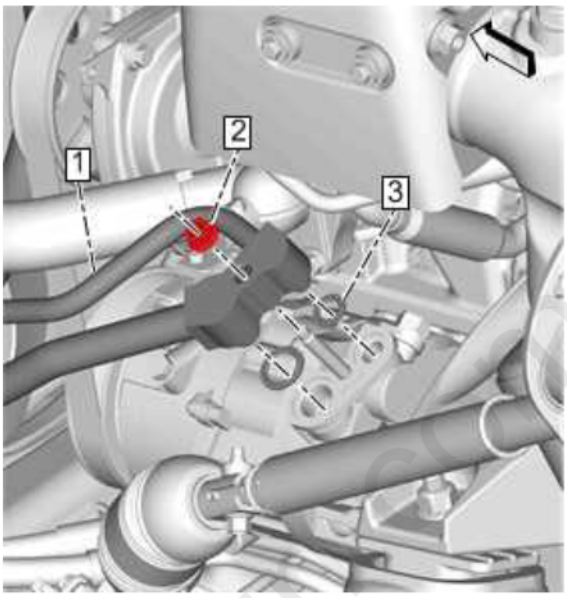


Fig. 12: Air Conditioning Compressor And Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Charge Air Cooler Inlet Air TubeÂ» Install - **Charge Air Cooler Inlet Air Tube Replacement**
8. Engine Front Splash Shield - Left SideÂ» Remove - **Engine Front Splash Shield Replacement - Left Side (Rear)** **Engine Front Splash Shield Replacement - Left Side (Front)**

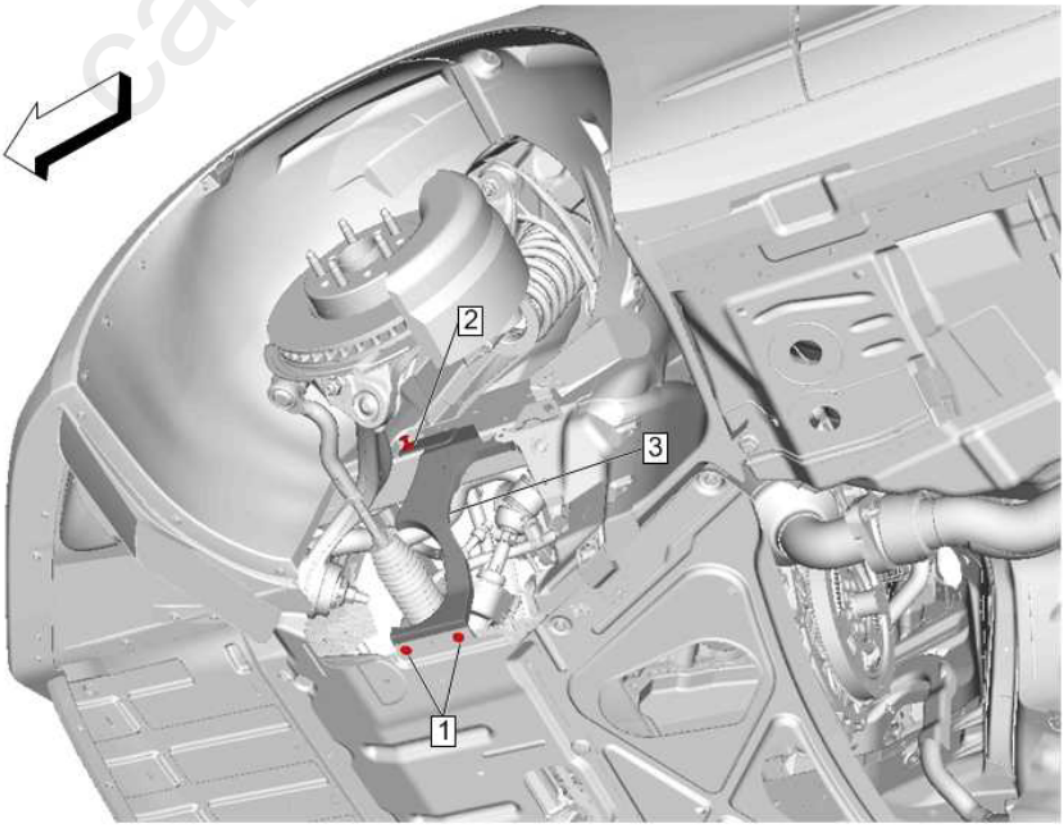


Fig. 13: Engine Front Splash Shield - Left Side (Front)
Courtesy of GENERAL MOTORS COMPANY

9. Underbody Front Air Deflector (3)Â» Remove - **Underbody Front Air Deflector Replacement**

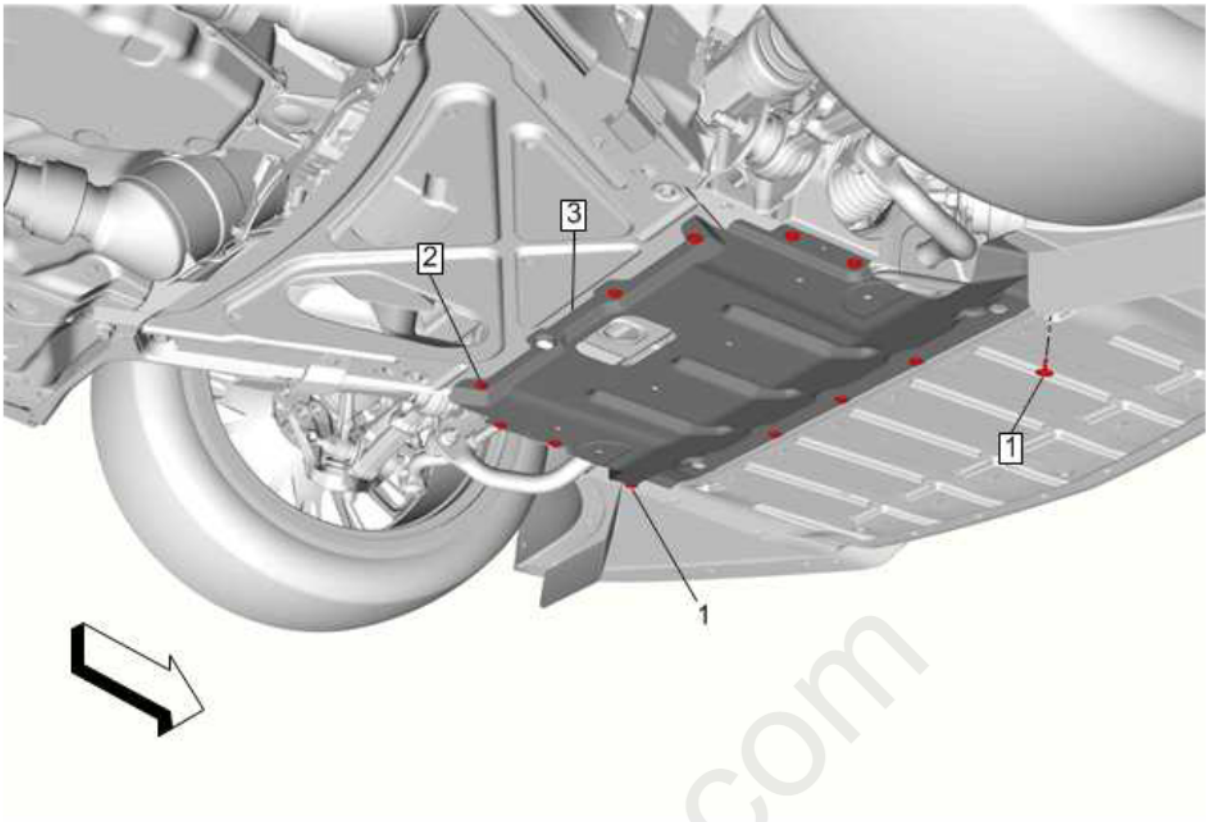


Fig. 14: Underbody Front Air Deflector
Courtesy of GENERAL MOTORS COMPANY

10. Drive Belt @ Air Conditioning CompressorÂ» Install - **Drive Belt Replacement (Except Hybrid)** **Drive Belt Replacement (Hybrid)**
11. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING COMPRESSOR REPLACEMENT (LGW, LGX)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Drive Belt @ Air Conditioning CompressorÂ» Remove - **Drive Belt Replacement (LGX)** **Drive Belt Replacement (LGW)**
3. Engine Front Splash Shield (4) - Left SideÂ» Remove - **Engine Front Splash Shield Replacement - Left Side (Rear)** **Engine Front Splash Shield Replacement - Left Side (Front)**

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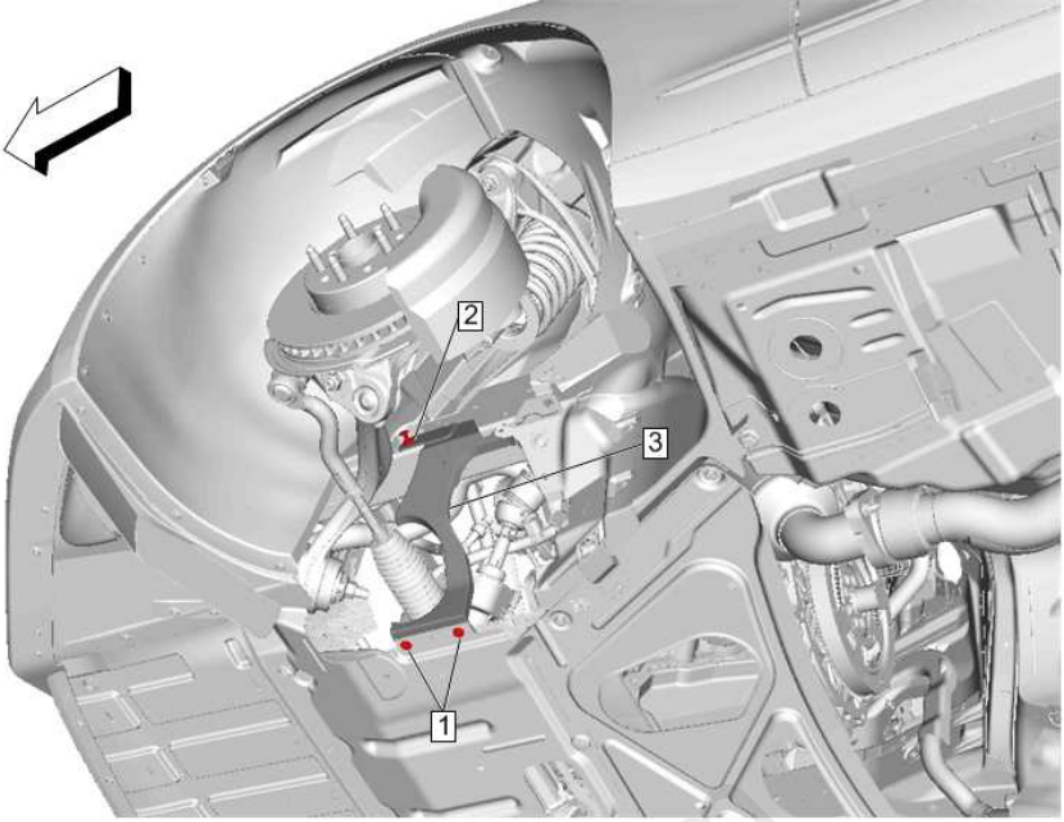


Fig. 15: Engine Front Splash Shield - Left Side (Front)
Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the electrical connectors.

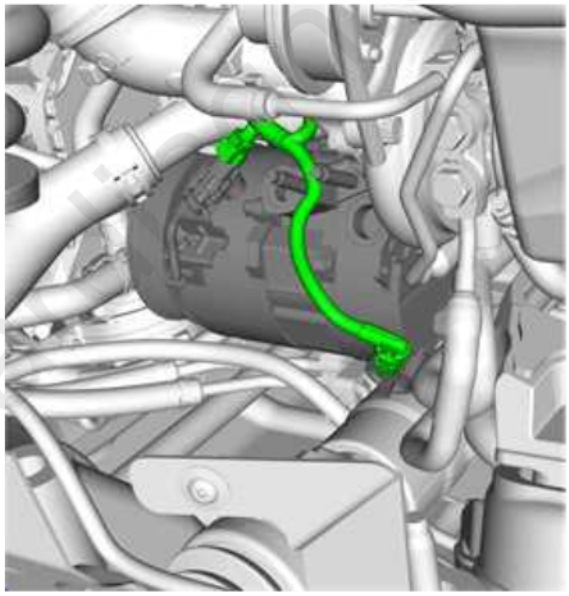


Fig. 16: Air Conditioning Compressor Electrical Connectors
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor and Condenser Hose (3) @ Air Conditioning CompressorÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)**

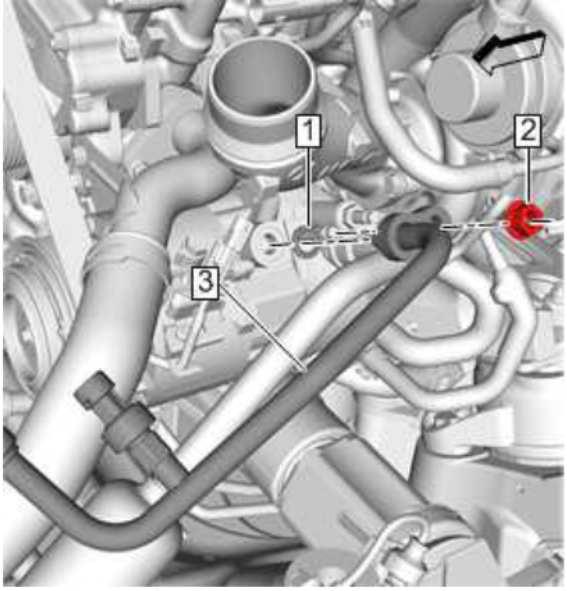


Fig. 17: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

6. Disconnect the electrical connector.
7. Air Conditioning Compressor Hose (3) @ Air Conditioning CompressorÂ» Remove - **Air Conditioning Compressor Hose Replacement (LGW, LGX)**

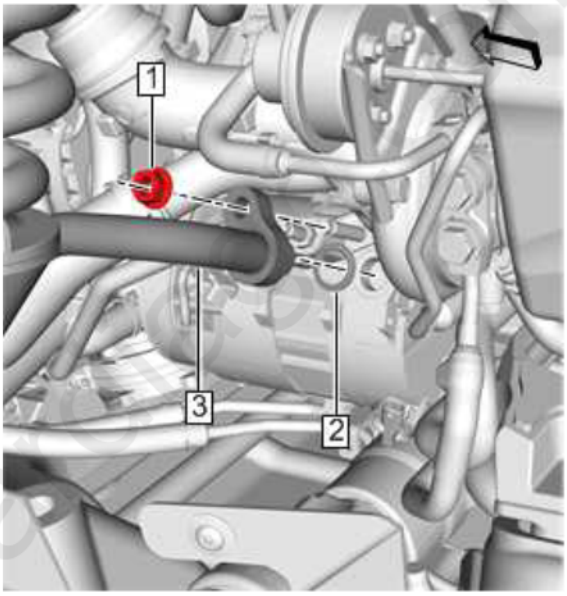


Fig. 18: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Compressor Bolt (1) [2x]Â» Remove

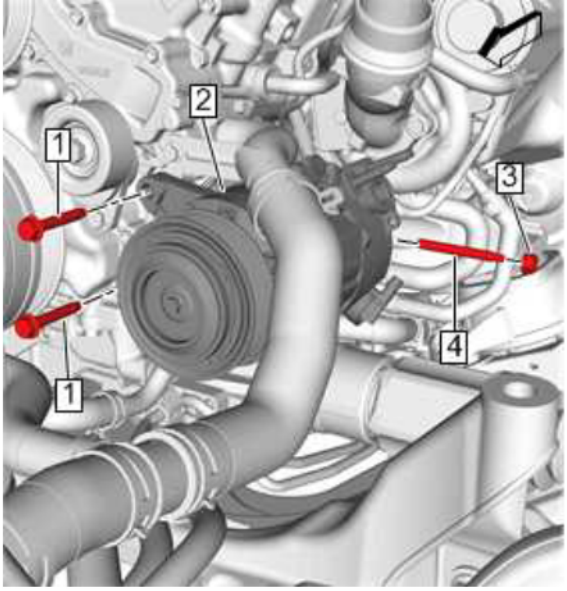


Fig. 19: Air Conditioning Compressor And Retainers
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor Nut (3)Â» Remove
10. Air Conditioning Compressor Stud (4)Â» Remove
11. Remove the air conditioning compressor (2) from the vehicle.

Installation Procedure

1. Install the air conditioning compressor (2) to the vehicle.

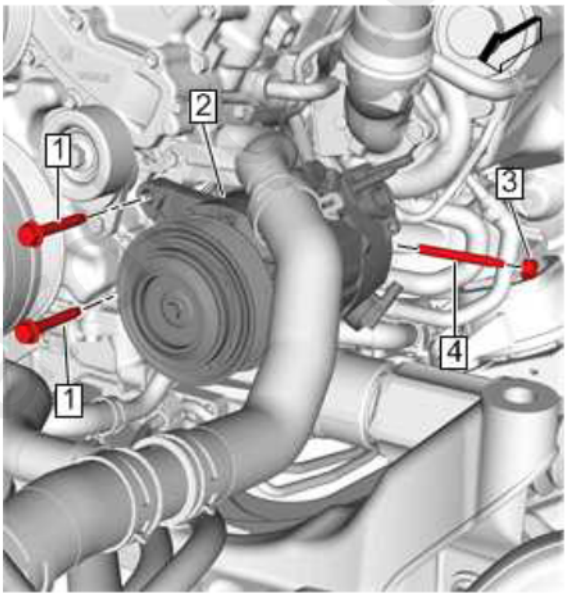


Fig. 20: Air Conditioning Compressor And Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor Stud (4)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

3. Air Conditioning Compressor Bolt (1) [2x] Install and tighten 22 N.m (16 lb ft)
4. Air Conditioning Compressor Nut (3)Â» Install and tighten 22 N.m (16 lb ft)
5. Air Conditioning Compressor Hose (3) @ Air Conditioning CompressorÂ» Install - **Air Conditioning Compressor Hose Replacement (LGW, LGX)**

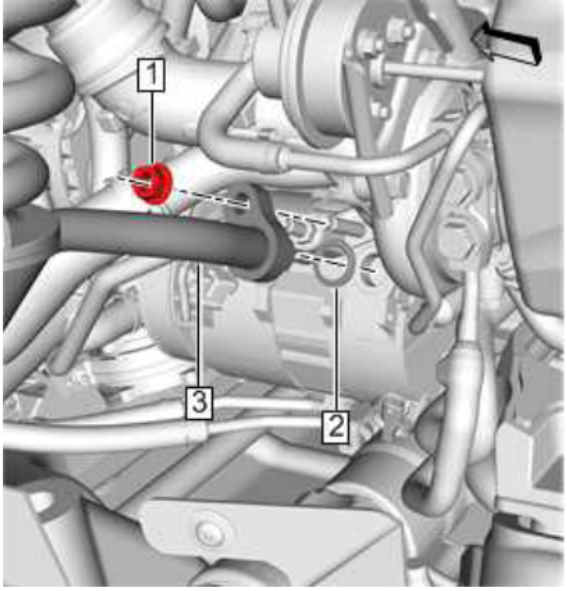


Fig. 21: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor and Condenser Hose (3) @ Air Conditioning CompressorÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)**

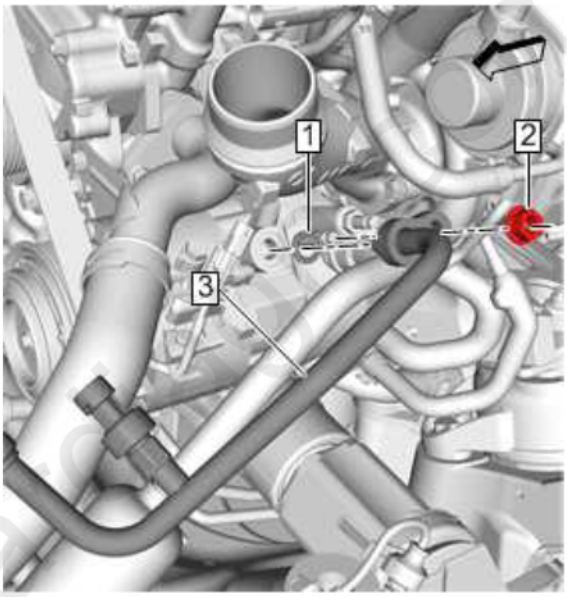


Fig. 22: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Connect the electrical connector.
8. Connect the electrical connectors.

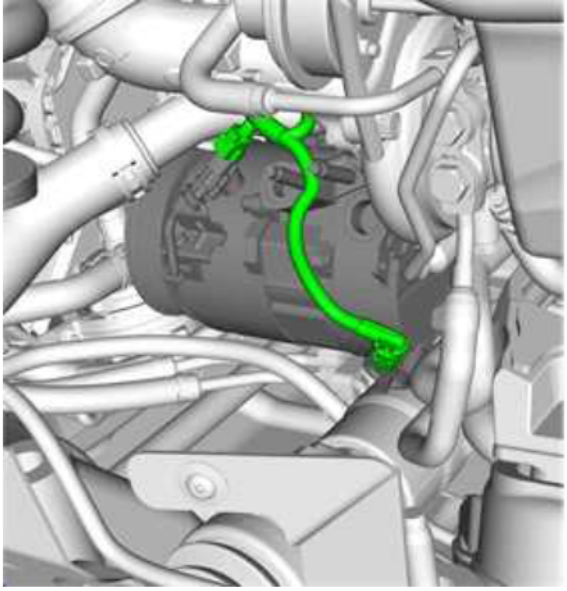


Fig. 23: Air Conditioning Compressor Electrical Connectors
Courtesy of GENERAL MOTORS COMPANY

9. Engine Front Splash Shield (4) - Left SideÂ» Remove - Engine Front Splash Shield Replacement - Left Side (Rear) Engine Front Splash Shield Replacement - Left Side (Front)

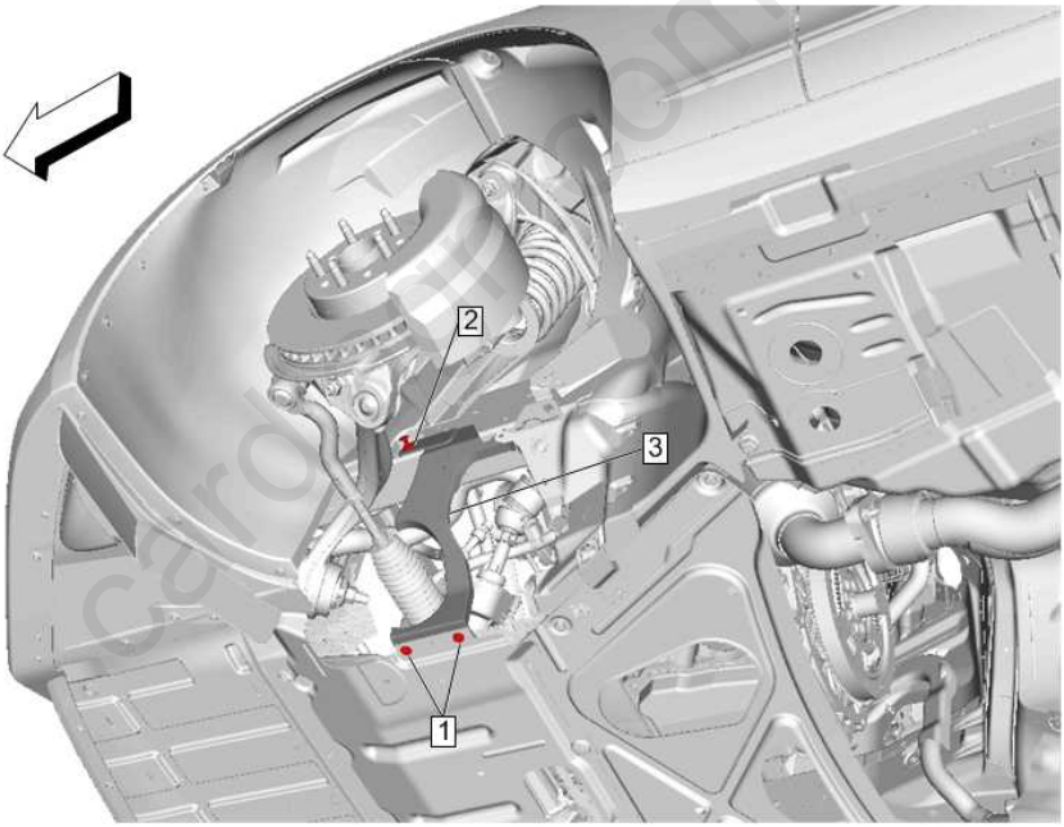


Fig. 24: Engine Front Splash Shield - Left Side (Front)
Courtesy of GENERAL MOTORS COMPANY

10. Drive Belt @ Air Conditioning CompressorÂ» Install - Drive Belt Replacement (LGX) Drive Belt Replacement (LGW)
11. Recharge the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf)

AIR CONDITIONING AND DRIVE MOTOR BATTERY COOLING COMPRESSOR REPLACEMENT

Removal Procedure

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure will perform the following tasks:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

CAUTION: **This A/C system's high voltage A/C Compressor uses Polyolester (POE) refrigerant oil instead of Polyalkylene Glycol (PAG) refrigerant oil. Use only approved GM POE oil no more than two hours after removal from its sealed moisture proof packaging (reference GM POE label for proper usage) in refrigerant systems equipped with a High Voltage A/C compressor. GM POE oil is intended to be used with the GE-45037-A A/C oil injector and the GE-48997 A/C POE oil injector hose. Use of any refrigerant oil other than the approved GM POE, handled and installed per GM requirements may result in compressor failure and/or loss of HV isolation with associated DTCs set.**

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Disconnect the electrical connectors.
4. Remove the air cleaner assembly (2). Refer to **Air Cleaner Assembly Replacement**

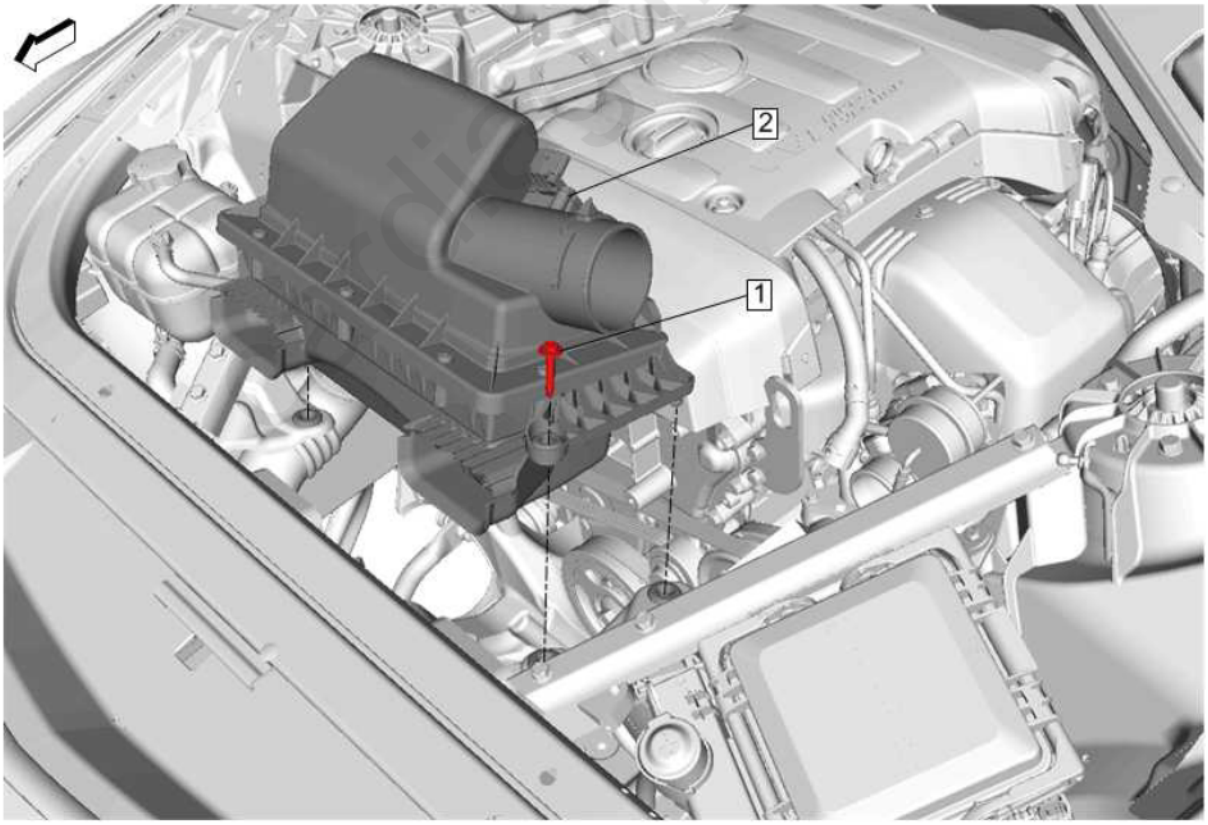


Fig. 25: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Remove - **Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Replacement**.

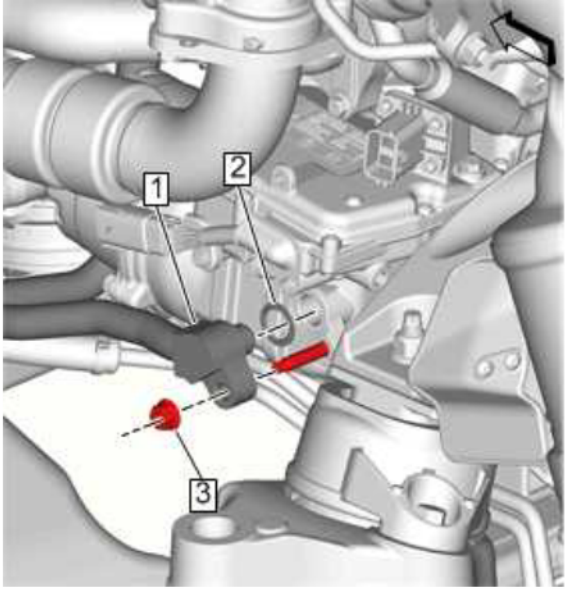


Fig. 26: Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor and Condenser Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**.

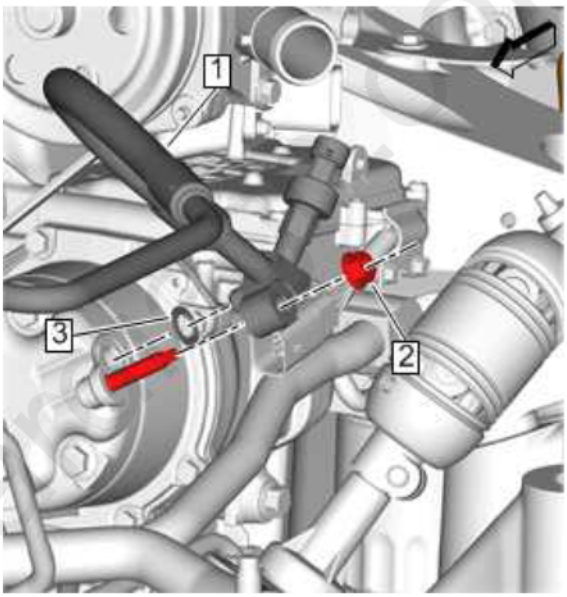


Fig. 27: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Compressor Nut (3)Â» Remove

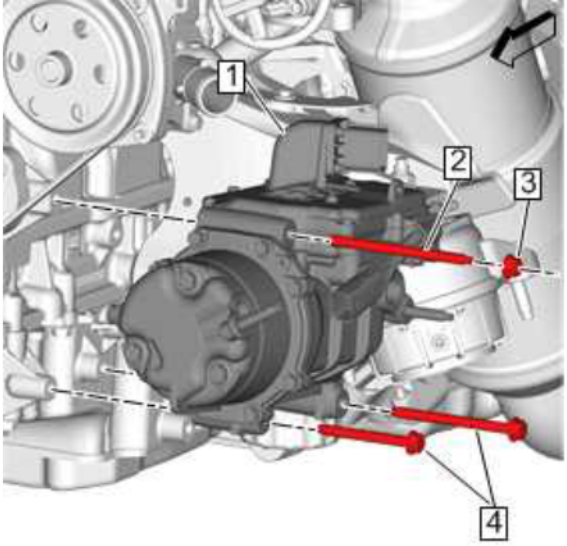


Fig. 28: Air Conditioning Compressor Nut, Bolts And Stud
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Compressor Bolt (4)Â» Remove [2x]
9. Air Conditioning Compressor Stud (2)Â» Remove
10. Air Conditioning and Drive Motor Battery Cooling Compressor (1)Â» Remove

Installation Procedure

1. Install the air conditioning and drive motor cooling compressor (1) to the vehicle.

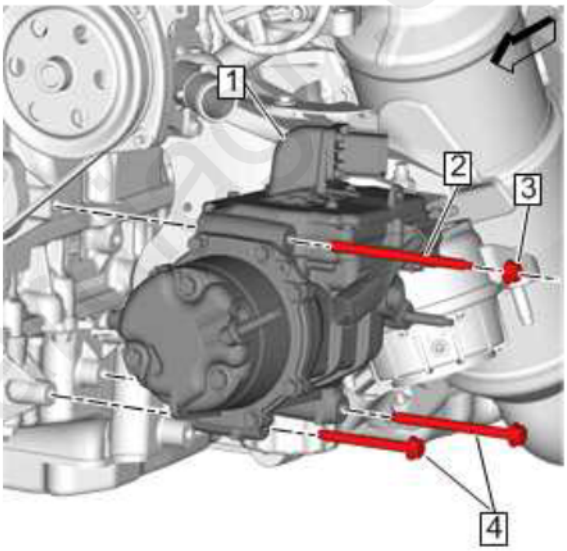


Fig. 29: Air Conditioning Compressor Nut, Bolts And Stud
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor Stud (2)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

3. Air Conditioning Compressor Bolt (4)Â» Install and tighten [2x] 22 N.m (16 lb ft)
4. Air Conditioning Compressor Nut (3)Â» Install and tighten 22 N.m (16 lb ft)
5. Air Conditioning Compressor and Condenser Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**.

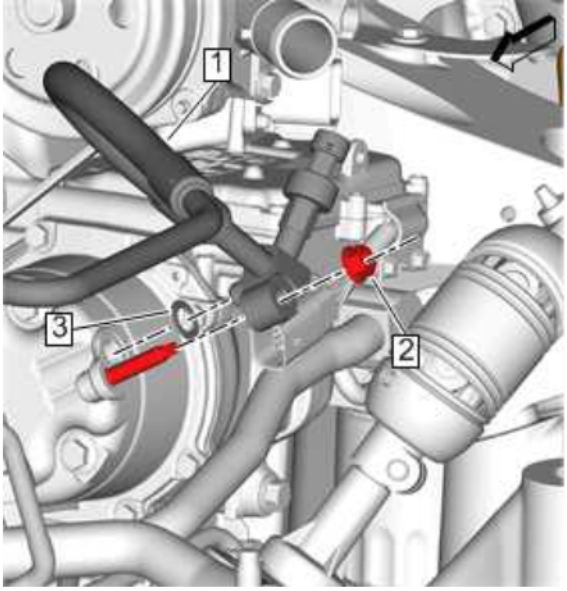


Fig. 30: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Install - **Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Replacement**.

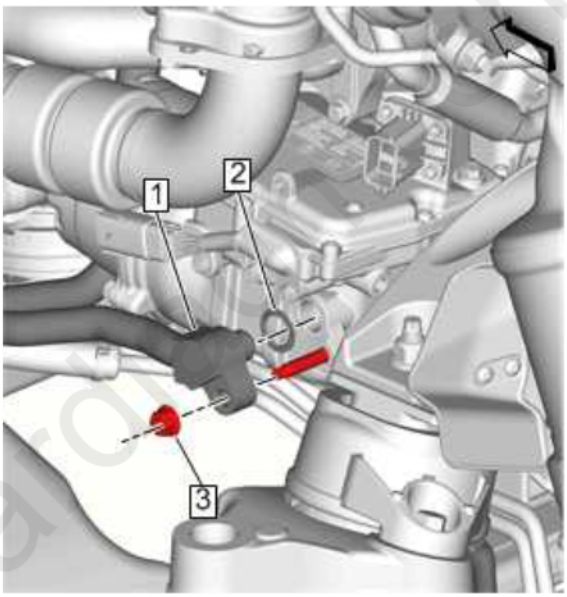


Fig. 31: Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

7. Install the air cleaner assembly (2). Refer to **Air Cleaner Assembly Replacement**

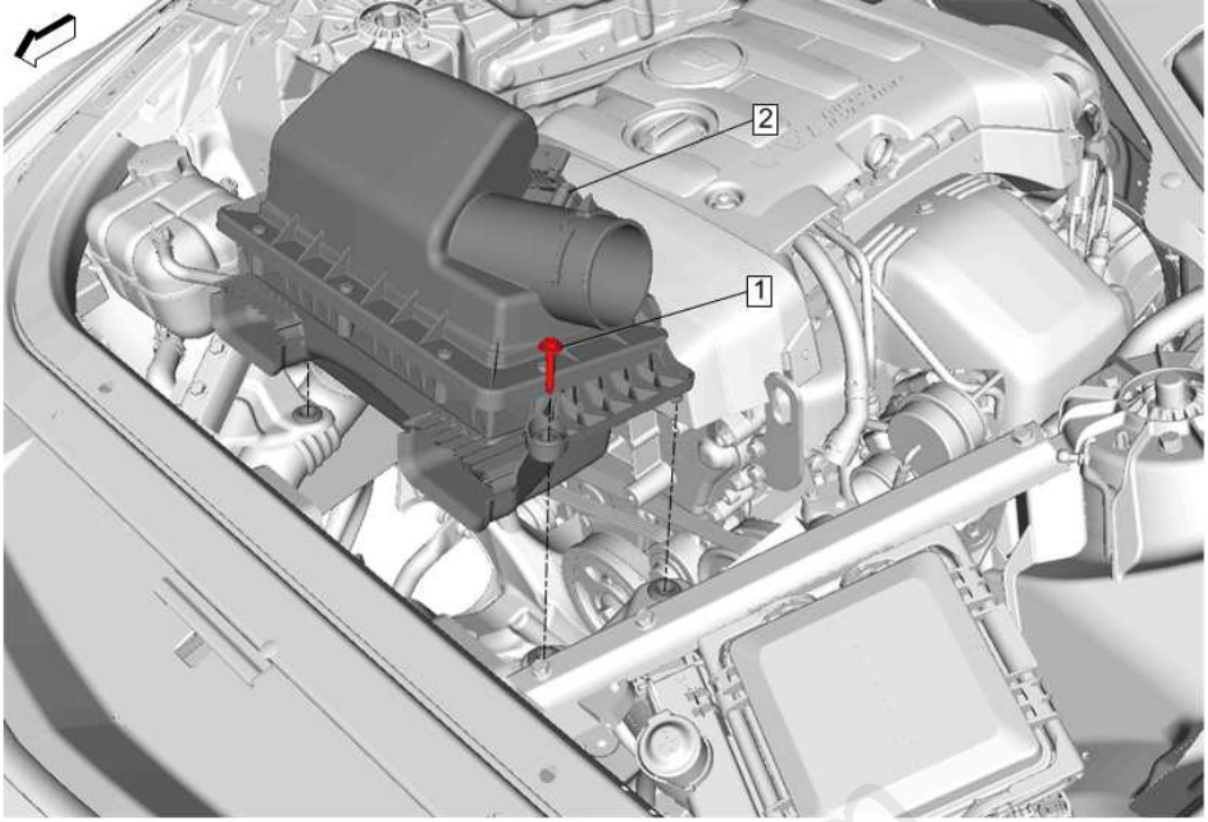


Fig. 32: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

8. Connect the electrical connectors.
9. Enable the high voltage system. Refer to **High Voltage Enabling**
10. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
11. Inspect for refrigerant leaks.

COMPRESSOR PRESSURE RELIEF VALVE REMOVAL (HP9)

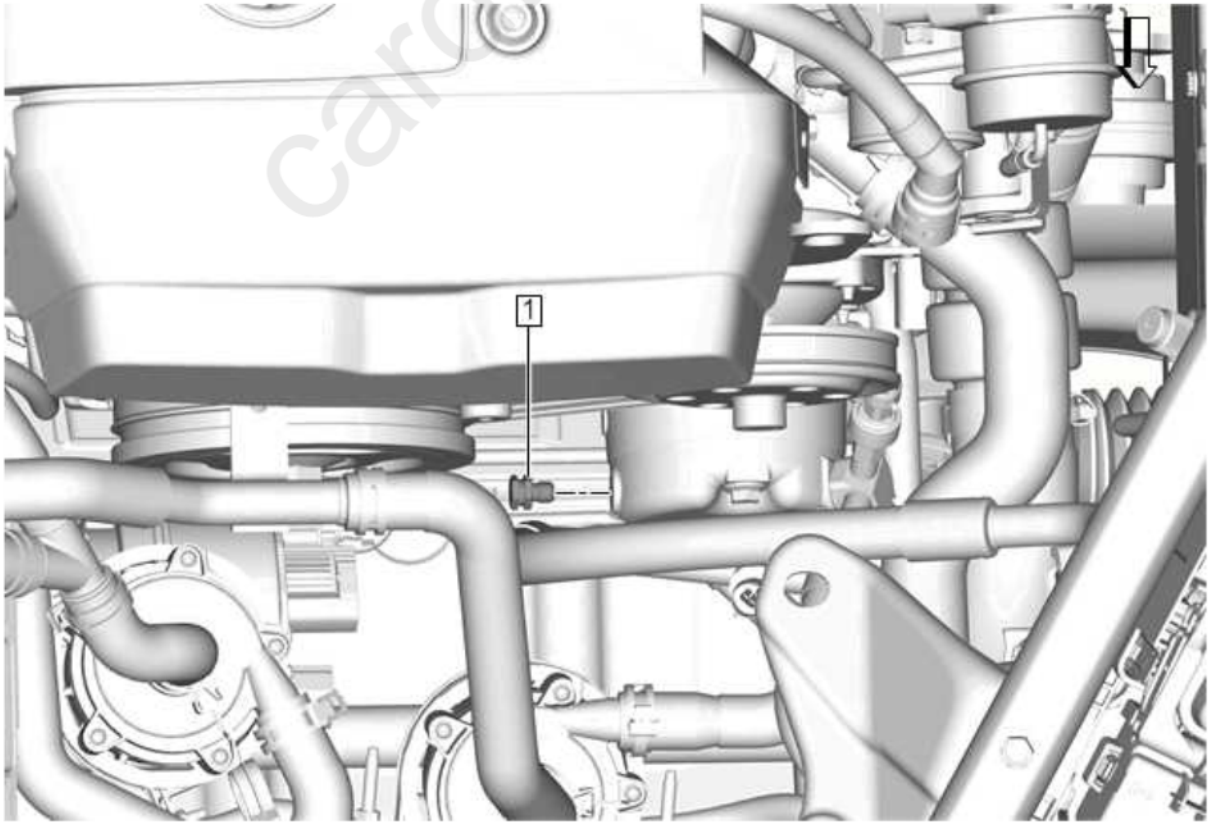


Fig. 33: Compressor Pressure Relief Valve (HP9)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedure 1. Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf) 2. Air Cleaner Assembly Replacement	
1	Air Conditioning Compressor Pressure Relief Valve **CAUTION:** **Refer to Component Fastener Tightening Caution .** **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING SYSTEM SEAL REPLACEMENT

Removal Procedure

1. Disassemble the A/C refrigerant components. Refer to the appropriate repair procedure.
2. Cap or tape the A/C refrigerant components.

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

3. Remove the sealing washer (1) from the A/C refrigerant component.

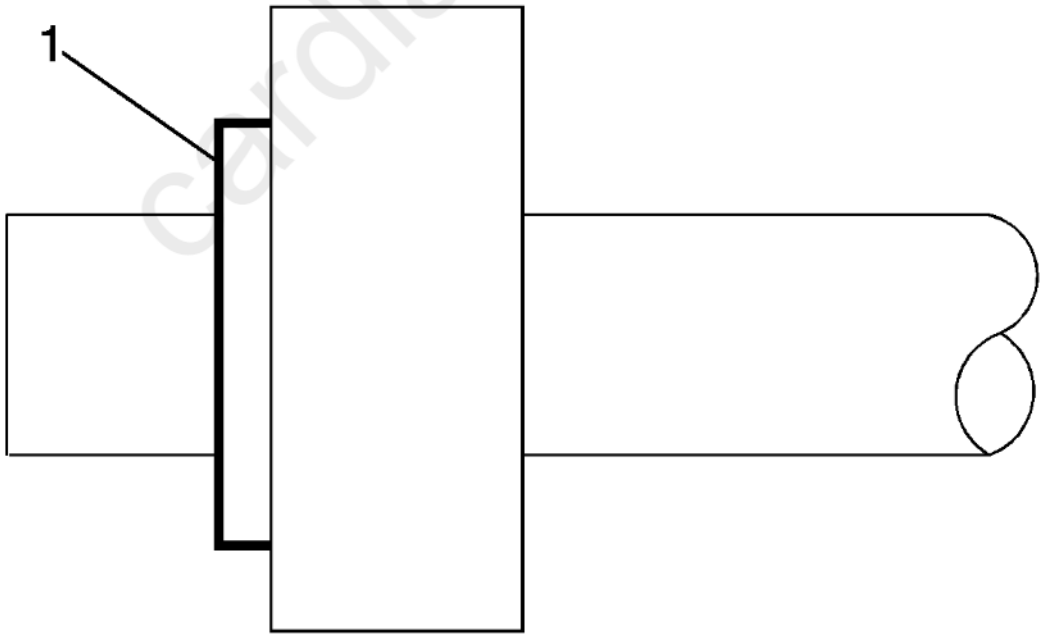


Fig. 34: A/C Refrigerant Sealing Washer
Courtesy of GENERAL MOTORS COMPANY

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4. Inspect the seal washer for signs of damage to help determine the root cause of the failure.
5. Inspect the A/C refrigerant components for damage or burrs. Repair if necessary.
6. DISCARD the sealing washer.

NOTE: **DO NOT reuse sealing washer.**

Installation Procedure

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

NOTE: **Flat washer type seals do not require lubrication.**

Do not use a damaged sealing washer.

2. Remove the cap or tape from the A/C refrigerant components.
3. Using a lint-free clean, dry cloth, clean the sealing surfaces of the A/C refrigerant components.

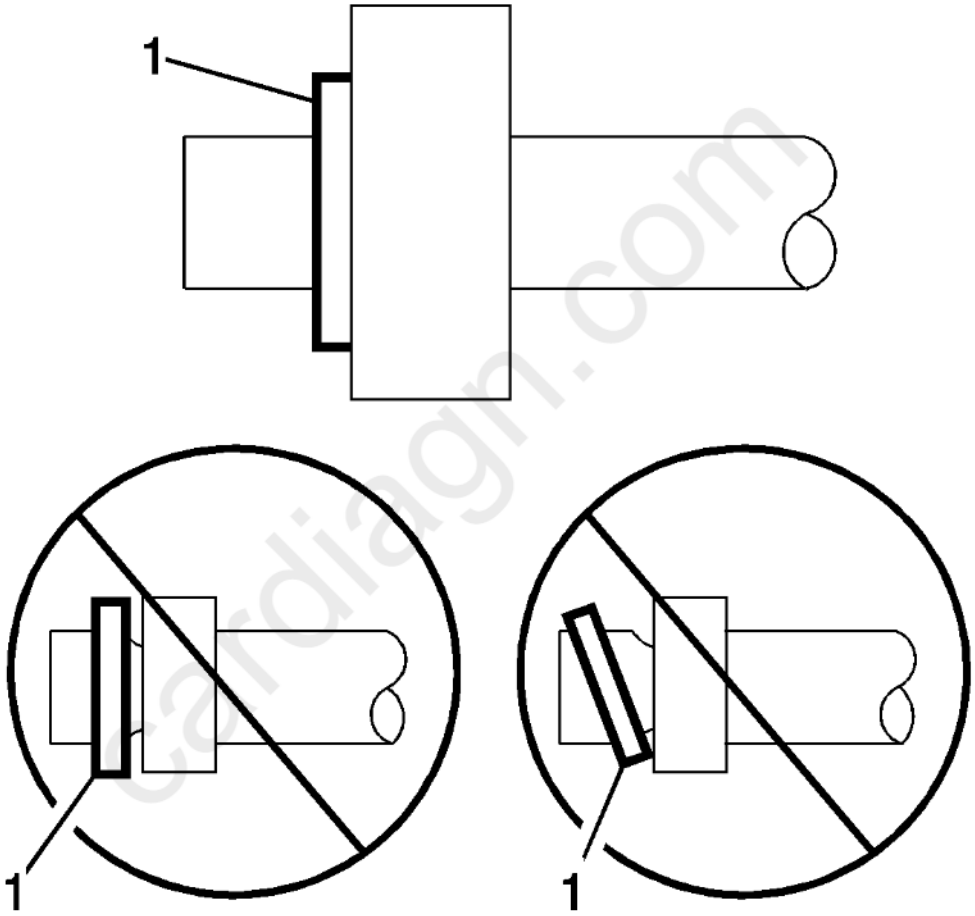


Fig. 35: Identifying Proper Seating Of A/C Refrigerant O-Ring
Courtesy of GENERAL MOTORS COMPANY

4. Carefully install the NEW sealing washer (1) onto the A/C refrigerant component.

The sealing washer (1) must completely bottom against the surface of the fitting.

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

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

AIR CONDITIONING O-RING SEAL REPLACEMENT

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Removal Procedure

1. Disassemble the A/C refrigerant components. Refer to the appropriate repair procedure
2. Cap or tape the A/C refrigerant components.

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

3. Remove the O-ring seal (1) from the A/C refrigerant component.

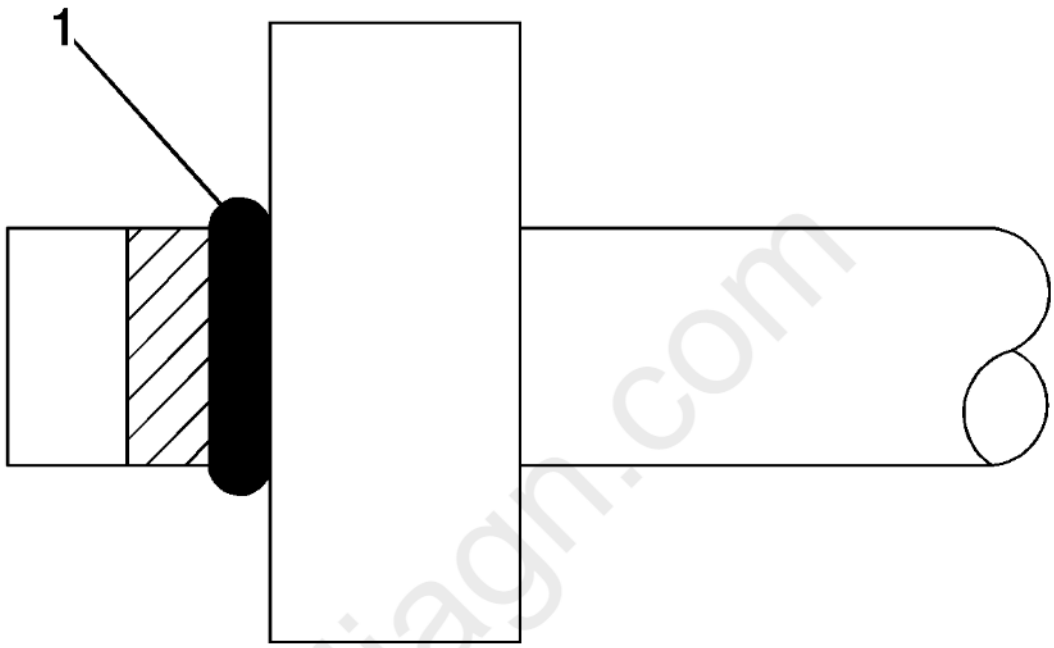


Fig. 36: O-Ring Seal
Courtesy of GENERAL MOTORS COMPANY

4. Inspect the O-ring seal for signs of damage to help determine the root cause of the failure.
5. Inspect the A/C refrigerant components for damage or burrs. Repair if necessary.
6. DISCARD the O-ring seal.

Installation Procedure

1. Inspect the new O-ring seal for any sign of cracks, cuts or damage.
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.
4. Lightly coat the new O-ring seal with the recommended refrigerant oil. Refer to **Adhesives, Fluids, Lubricants and Sealers**

NOTE: **Use only the recommended refrigerant oil or damage to the A/C system could occur.**

5. Carefully slide the NEW O-ring seal (1) onto the A/C refrigerant component.

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NOTE: **DO NOT reuse O-ring seals.**

6. The O-ring seal (1) must be fully seated.

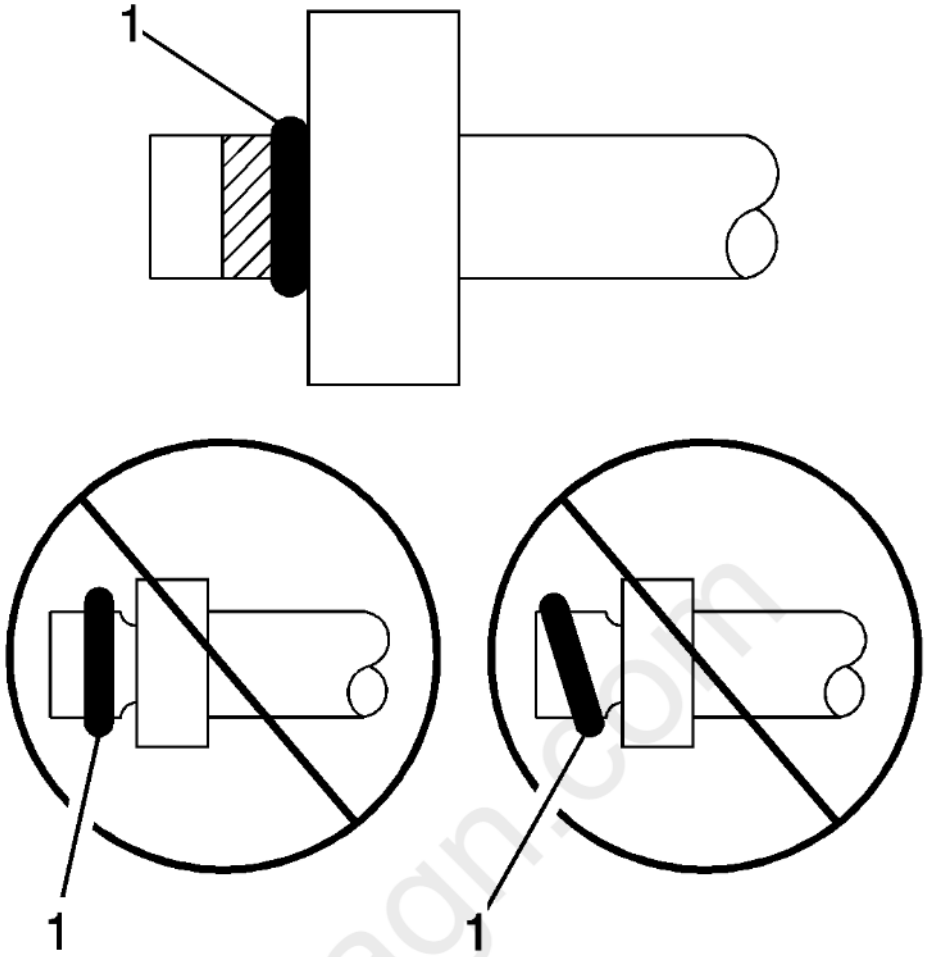


Fig. 37: Identifying Good & Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS COMPANY

7. Assemble the A/C components.

   Refer to the appropriate repair procedure.

AIR CONDITIONING COMPRESSOR HOSE REPLACEMENT (LGW, LGX)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
3. **Air Cleaner Outlet Front Duct Replacement (LGW)** Â» Remove
4. Air Conditioning Compressor Hose Nut (3)Â» Remove

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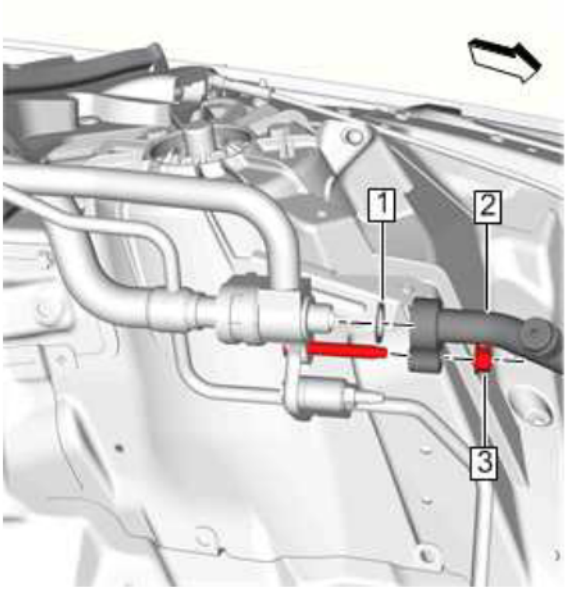


Fig. 38: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor Hose (2)Â» Remove
6. Remove and DISCARD the sealing washer. (1) - **Air Conditioning System Seal Replacement**
7. Air Conditioning Compressor Hose Nut (1)Â» Remove

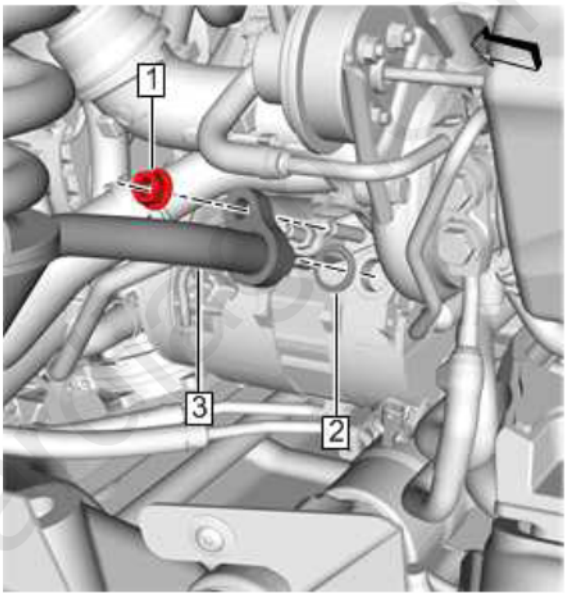


Fig. 39: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Compressor Hose (3)Â» Remove
9. Remove and DISCARD the sealing washer. (2)
10. Remove the air conditioning compressor hose (3) from the vehicle.

Installation Procedure

1. Install the air conditioning compressor hose to the vehicle.
2. Install NEW sealing washers. (2) - **Air Conditioning System Seal Replacement**

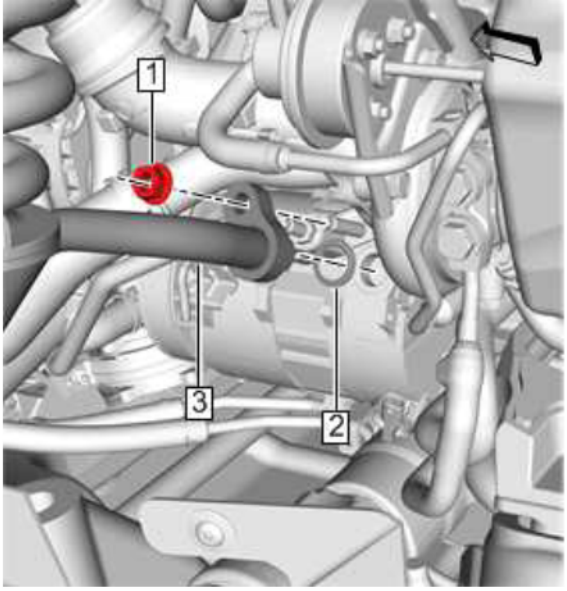


Fig. 40: Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor Hose (3)Â» Install
4. Air Conditioning Compressor Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Install NEW sealing washers. (1)Â» Install

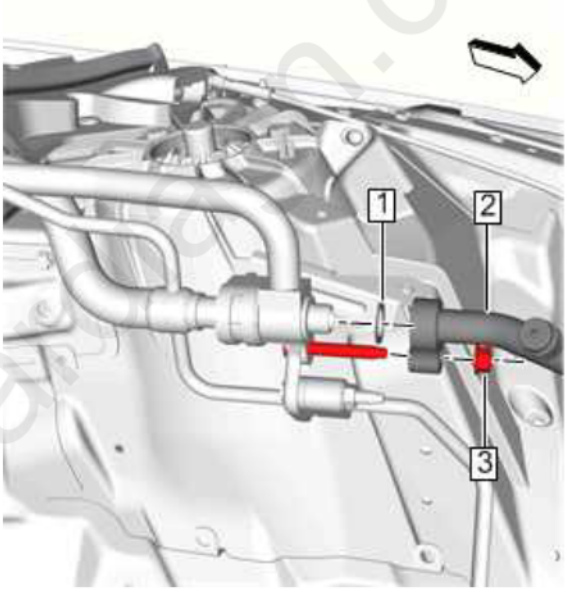


Fig. 41: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor Hose (2)Â» Install
7. Air Conditioning Compressor Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)
8. **Air Cleaner Outlet Front Duct Replacement (LGW)** Â» Remove
9. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
10. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
11. Inspect for refrigerant leaks.

AIR CONDITIONING COMPRESSOR AND CONDENSER HOSE REPLACEMENT (LTG)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
3. **Air Cleaner Outlet Duct Replacement** Â» Remove
4. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Remove

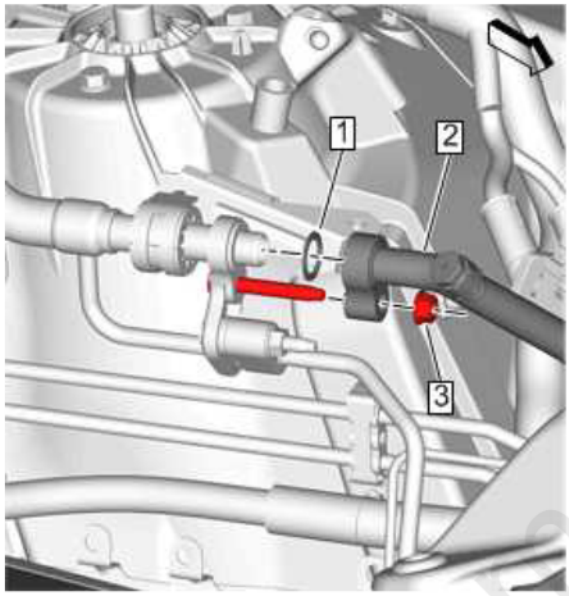


Fig. 42: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor and Condenser Hose (2)Â» Remove
6. Remove and DISCARD the sealing washer. (1) **Air Conditioning System Seal Replacement**
7. **Front Bumper Fascia Replacement (With out UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Remove
8. **Engine Front Splash Shield Replacement - Left Side (Rear)** **Engine Front Splash Shield Replacement - Left Side (Front)** Â» Remove
9. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Remove

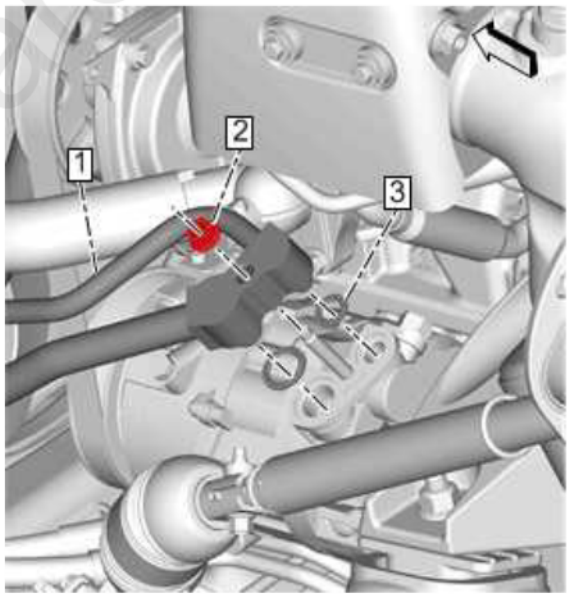


Fig. 43: Air Conditioning Compressor And Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Compressor and Condenser Hose (1)Â» Remove
11. Remove and DISCARD the sealing washer. (3) [2x]
12. Disconnect the electrical connector.
13. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Unclip

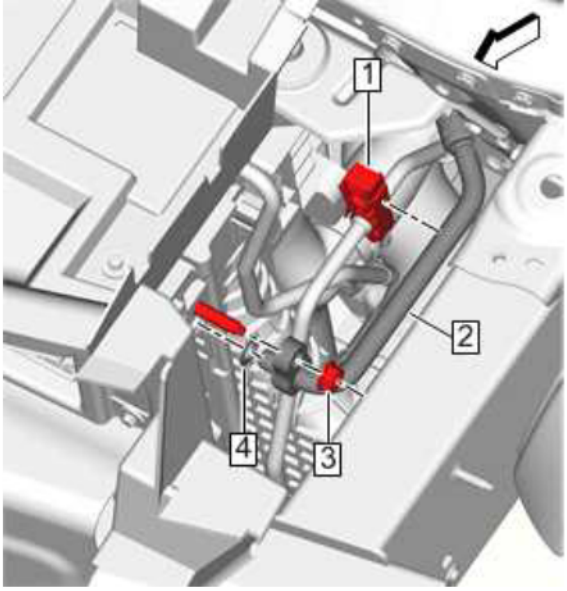


Fig. 44: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

14. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Remove
15. Air Conditioning Compressor and Condenser Hose (2)Â» Remove
16. Remove and DISCARD the sealing washer. (4)
17. Remove the air conditioning compressor and condenser hose (2) from the vehicle.

Installation Procedure

1. Install the air conditioning compressor hose to the vehicle.
2. Install NEW sealing washers. (4) - **Air Conditioning System Seal Replacement**

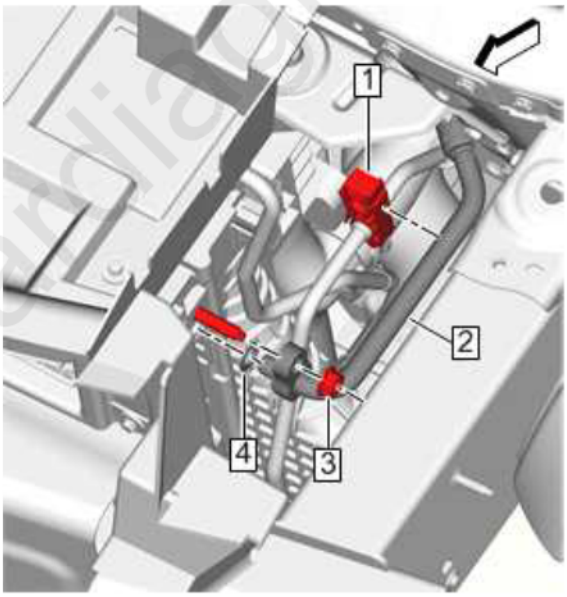


Fig. 45: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor and Condenser Hose (2)Â» Install
4. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Clip
6. Install NEW sealing washers. (3) [2x]

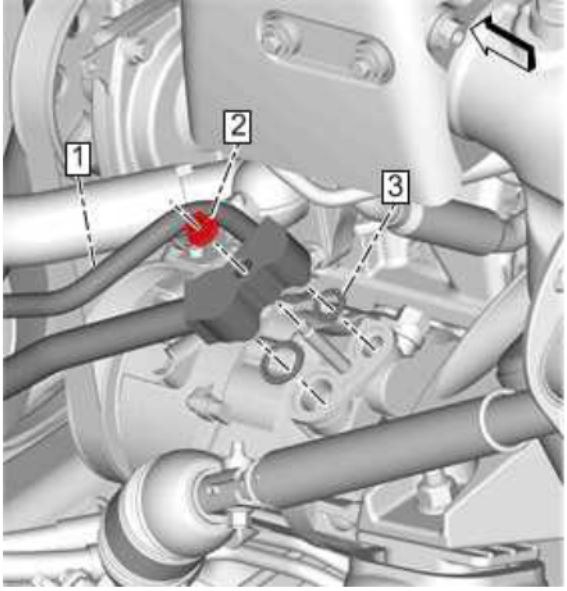


Fig. 46: Air Conditioning Compressor And Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Compressor and Condenser Hose (1)Â» Install
8. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Install and tighten 22 N.m (16 lb ft)
9. Connect the electrical connector.
10. **Engine Front Splash Shield Replacement - Left Side (Rear)** **Engine Front Splash Shield Replacement - Left Side (Front)** Â» Install
11. **Front Bumper Fascia Replacement (With out UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Install
12. Install NEW sealing washers. (1)Â» Install

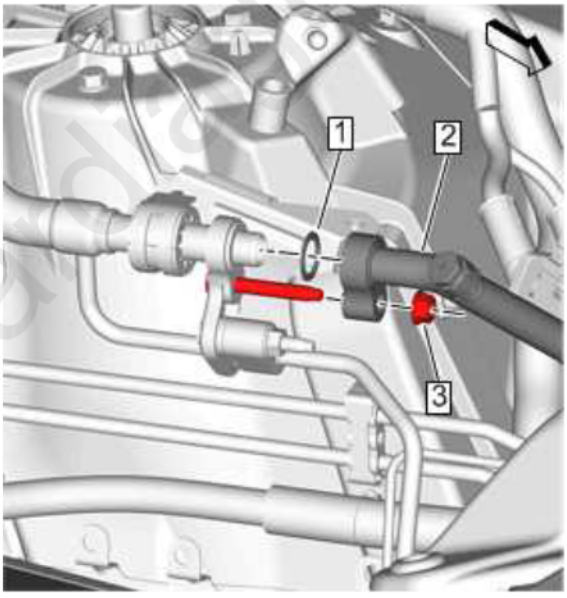


Fig. 47: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Compressor and Condenser Hose (2)Â» Install
14. Air Conditioning Compressor Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)
15. **Air Cleaner Outlet Duct Replacement** Â» Remove
16. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
17. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
18. Inspect for refrigerant leaks.

AIR CONDITIONING COMPRESSOR AND CONDENSER HOSE REPLACEMENT (LGW, LGX)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Air Cleaner Outlet Front Duct Replacement (LGW)** Â» Remove
3. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
4. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Remove

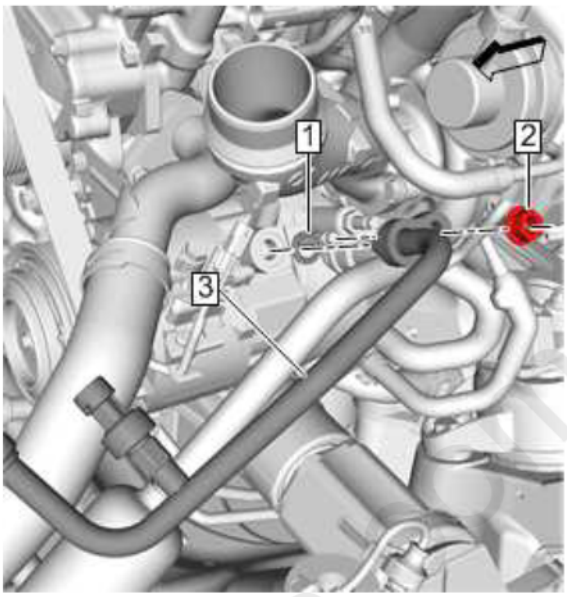


Fig. 48: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Compressor and Condenser Hose (3)Â» Remove
6. Remove and DISCARD the sealing washer. (1)Â» Remove
7. Disconnect the electrical connector.
8. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Unclip

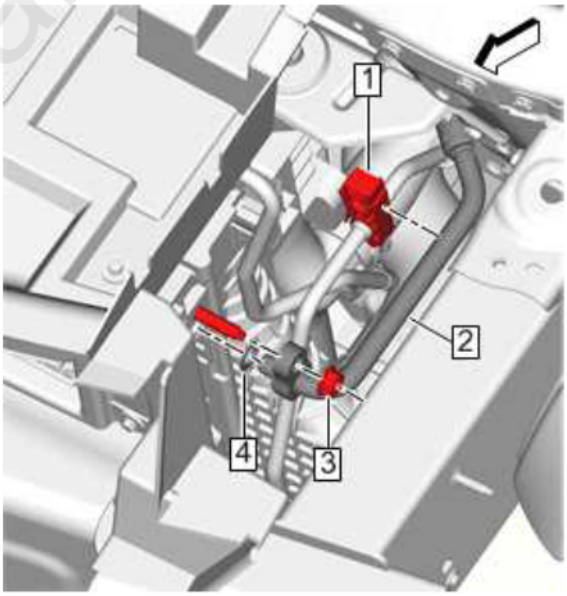


Fig. 49: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Remove
10. Air Conditioning Compressor and Condenser Hose (2)Â» Remove
11. Remove and DISCARD the sealing washer. (4)

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12. Remove the air conditioning compressor and condenser hose (2) from the vehicle.

Installation Procedure

1. Install the air conditioning compressor hose to the vehicle.
2. Install NEW sealing washers. (4) - **Air Conditioning System Seal Replacement**

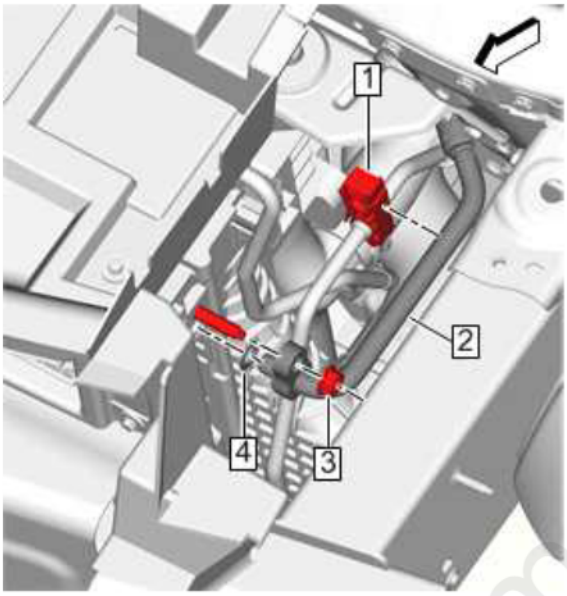


Fig. 50: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Compressor and Condenser Hose (2)Â» Install
4. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Clip
6. Install NEW sealing washers. (1)

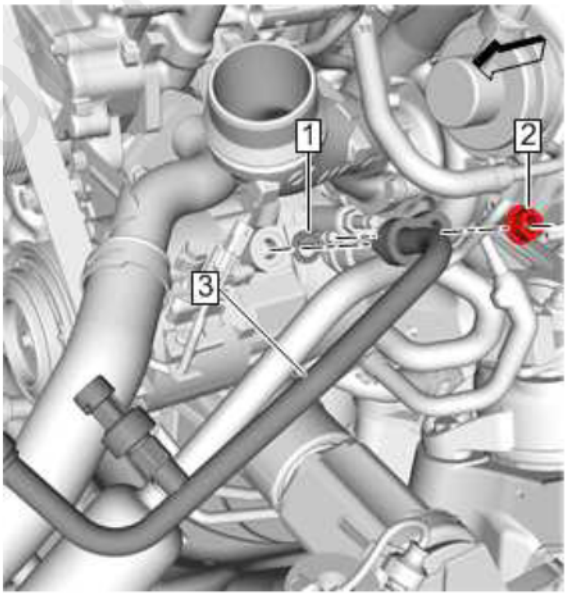


Fig. 51: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Compressor and Condenser Hose (3)Â» Install
8. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Install and tighten 22 N.m (16 lb ft)
9. Connect the electrical connector.
10. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Install

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11. **Air Cleaner Outlet Front Duct Replacement (LGW)** Â» Install
12. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
13. Inspect for refrigerant leaks.

AIR CONDITIONING COMPRESSOR AND CONDENSER HOSE REPLACEMENT (LTG WITH HP9)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement**
3. Remove the front bumper fascia. Refer to **Front Bumper Fascia Replacement (Without UV3)** and/or **Front Bumper Fascia Replacement (With UV3)**
4. Disconnect the electrical connector.
5. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Remove

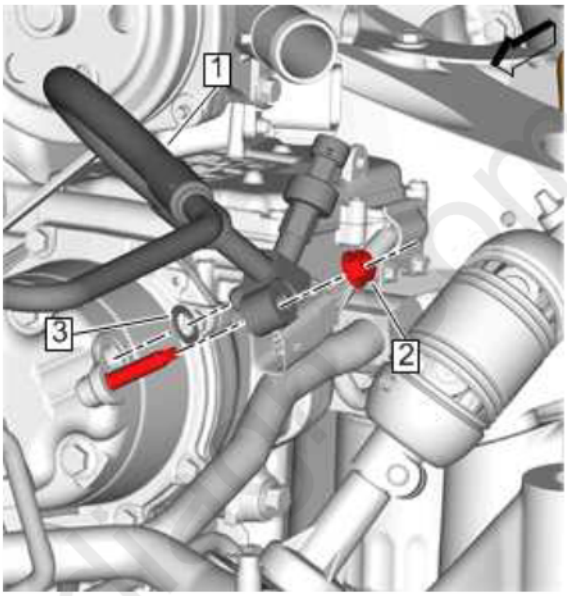


Fig. 52: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor and Condenser Hose (1)Â» Remove
7. Remove and DISCARD the sealing washer. (3) **Air Conditioning System Seal Replacement**
8. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Disengage

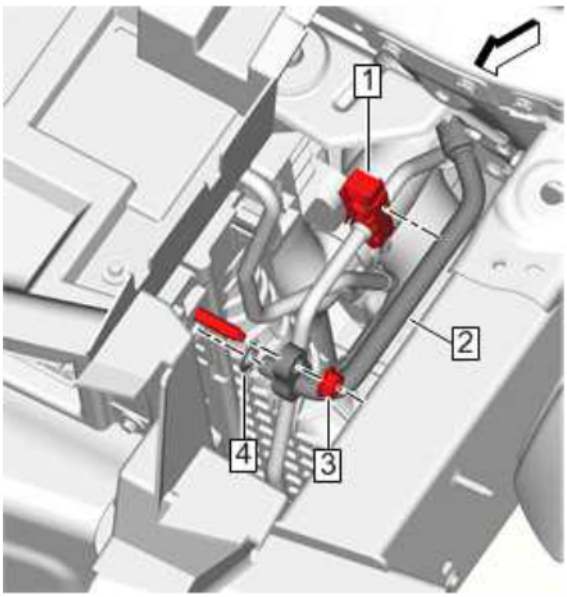


Fig. 53: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Remove
10. Air Conditioning Compressor and Condenser Hose (2)Â» Remove
11. Remove and DISCARD the sealing washer. (4)
12. Transfer components as necessary.

Installation Procedure

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

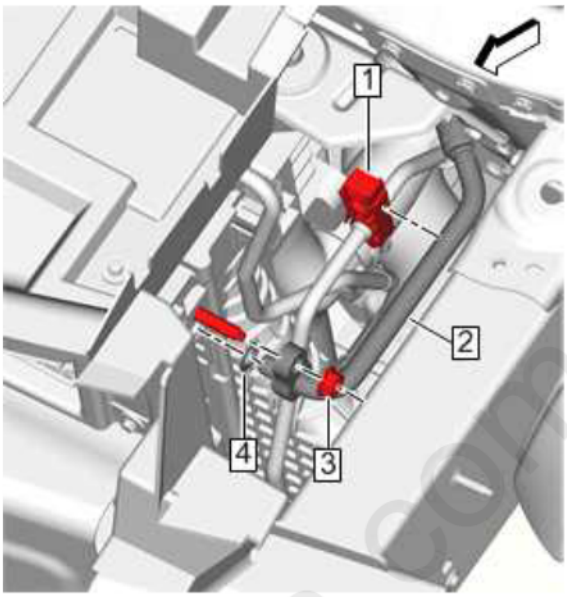


Fig. 54: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Compressor and Condenser Hose (2)Â» Install
3. Air Conditioning Compressor and Condenser Hose Clip (1)Â» Engage
4. Air Conditioning Compressor and Condenser Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Install NEW sealing washers. (3)

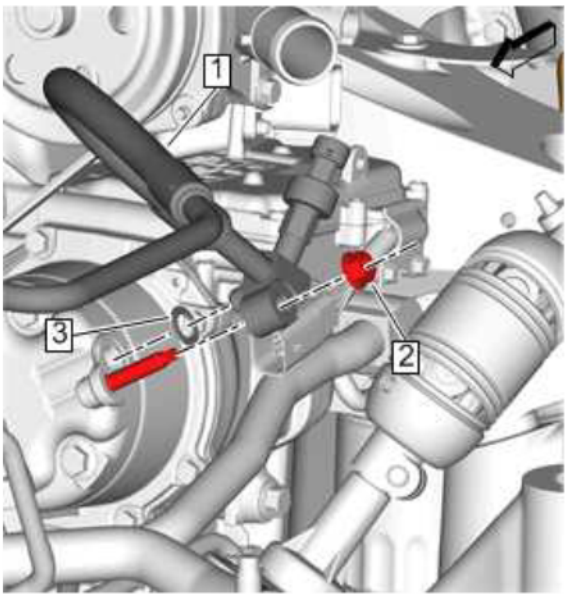


Fig. 55: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor and Condenser Hose (1)Â» Install

7. Air Conditioning Compressor and Condenser Hose Nut (2)Â» Install and tighten 22 N.m (16 lb ft)
8. Install the front bumper fascia. Refer to **Front Bumper Fascia Replacement (Without UV3)** and/or **Front Bumper Fascia Replacement (With UV3)**
9. Install the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement (LGW)** and/or **Air Cleaner Assembly Replacement (LGX)**
10. Connect the electrical connector.
11. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
12. Inspect for refrigerant leaks.

AIR CONDITIONING REFRIGERANT HEAT EXCHANGER REPLACEMENT (LTG)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Front End Sheet Metal Cross Brace Replacement** Â» Remove
3. **Front Fender Front Brace Replacement** Â» Remove
4. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

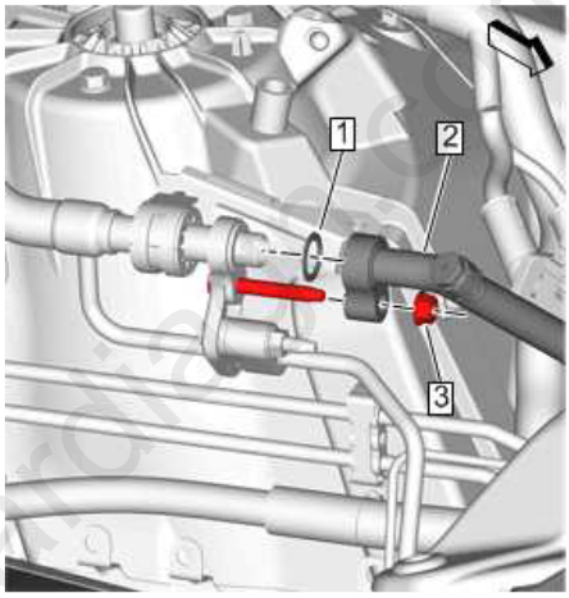


Fig. 56: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)**

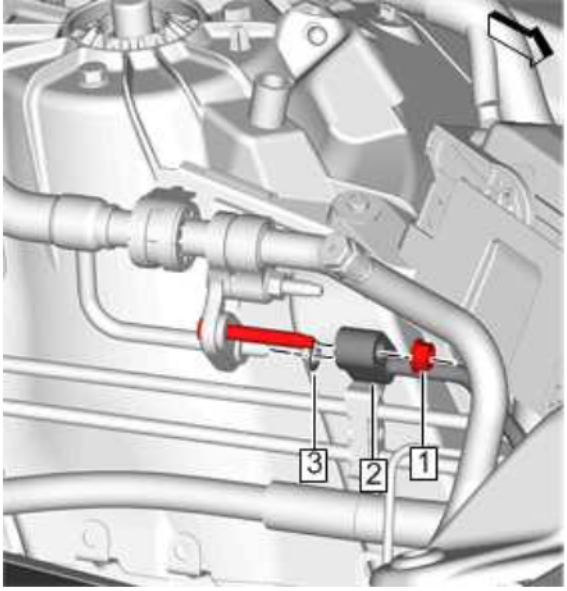


Fig. 57: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

6. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Remove - **Engine Wiring Harness Fuse Block Bracket Replacement**

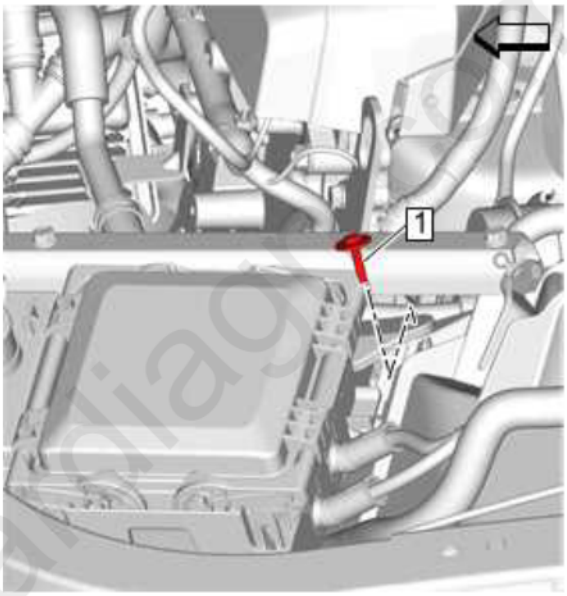


Fig. 58: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Loosen

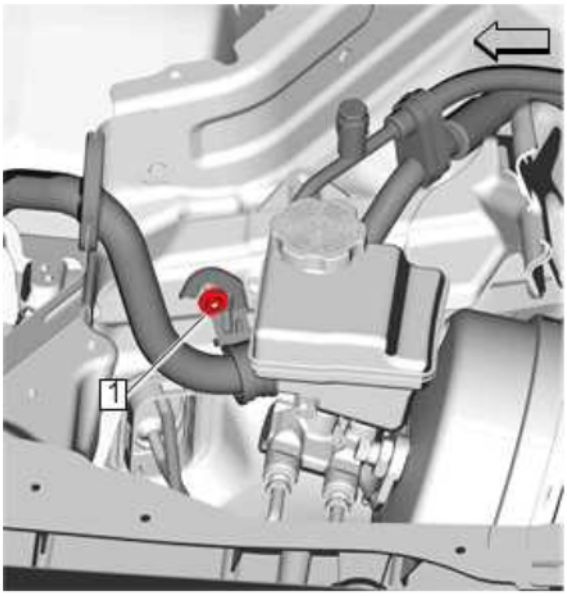


Fig. 59: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Evaporator Hose Nut (1)Â» Remove

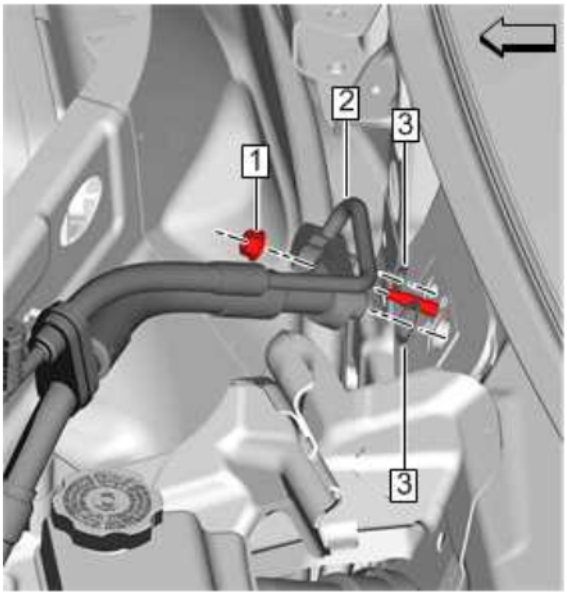


Fig. 60: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Refrigerant Heat Exchanger (2)Â» Remove
10. Remove and DISCARD the sealing washer. (3) [2x] **Air Conditioning System Seal Replacement**
11. Air Conditioning Refrigerant Heat Exchanger (1) @ Front Wheelhouse PanelÂ» Remove

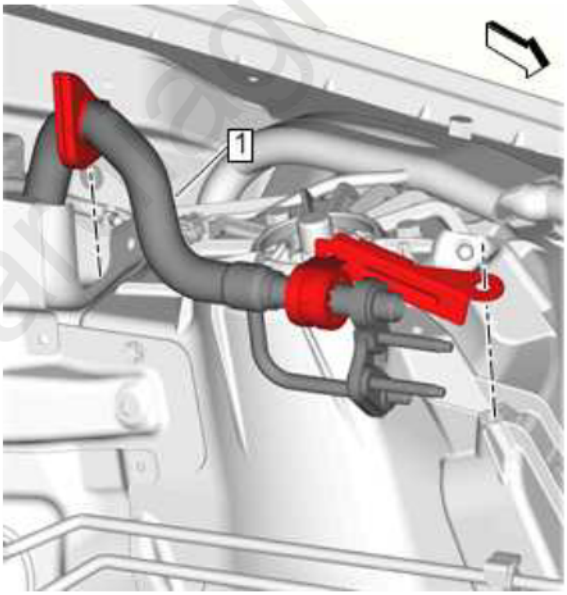


Fig. 61: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

12. Remove the air conditioning refrigerant heat exchanger (1) from the vehicle.

Installation Procedure

1. Install the air conditioning refrigerant heat exchanger to the vehicle.
2. Air Conditioning Refrigerant Heat Exchanger (1) @ Front Wheelhouse PanelÂ» Install

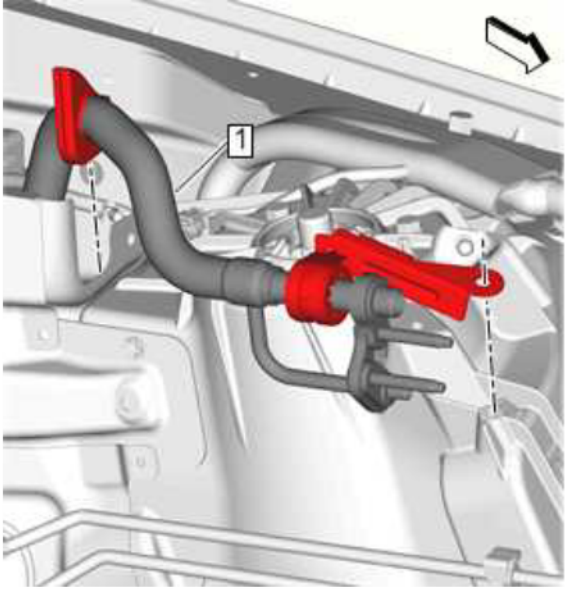


Fig. 62: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

3. Install NEW sealing washers. (3) [2x] **Air Conditioning System Seal Replacement**

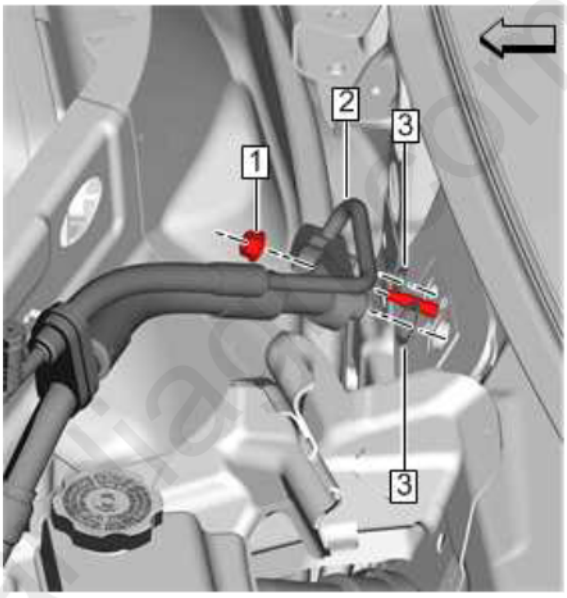


Fig. 63: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Refrigerant Heat Exchanger (2)Â» Install
5. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

6. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Install and tighten 9 N.m (80 lb in)

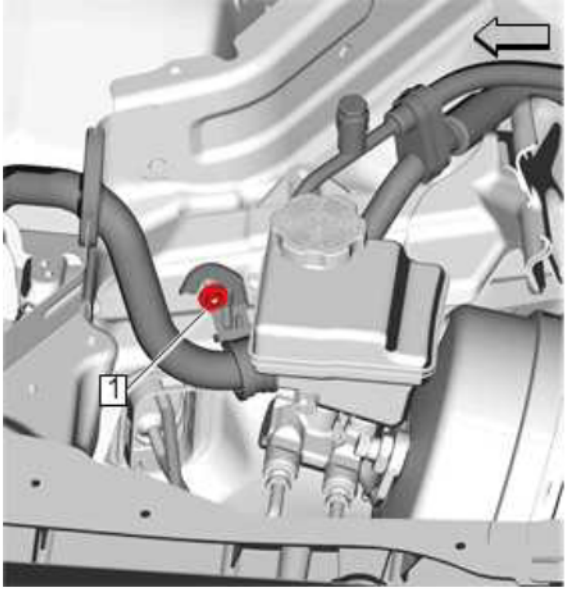


Fig. 64: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

7. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Install - **Engine Wiring Harness Fuse Block Bracket Replacement**

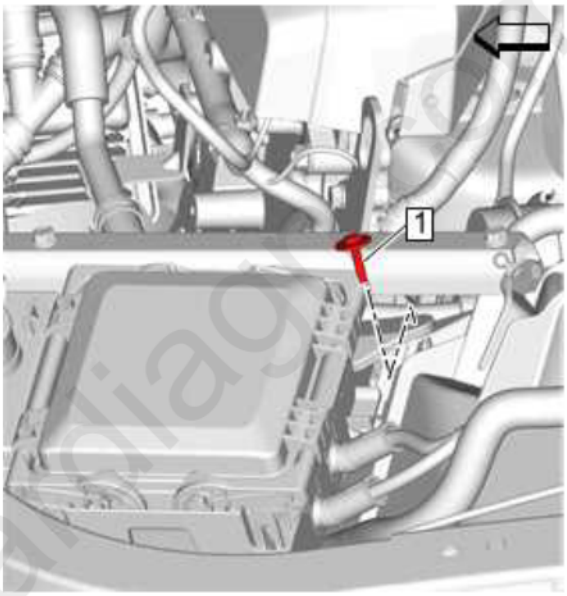


Fig. 65: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)**

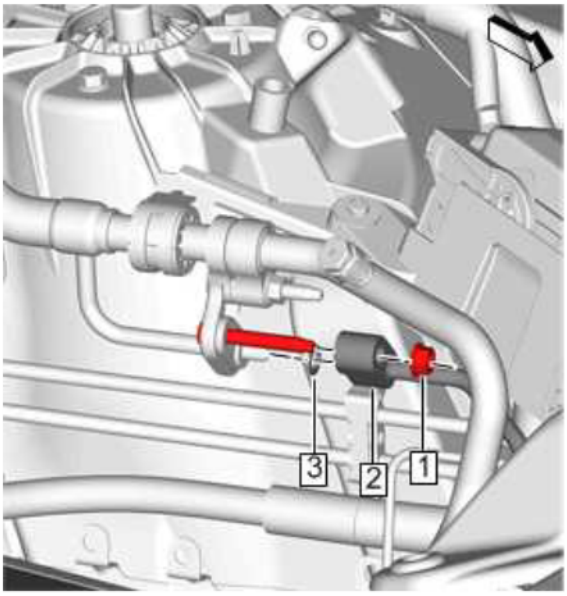


Fig. 66: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

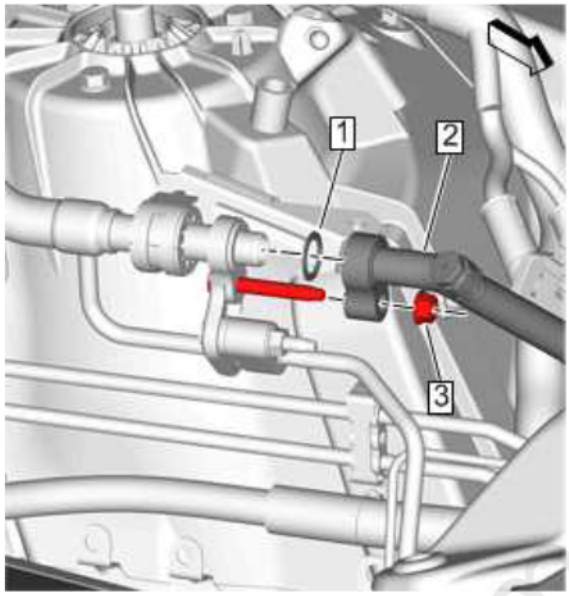


Fig. 67: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

10. **Front Fender Front Brace Replacement** Â» Install
11. **Front End Sheet Metal Cross Brace Replacement** Â» Install
12. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
13. Inspect for refrigerant leaks.

AIR CONDITIONING REFRIGERANT HEAT EXCHANGER REPLACEMENT (LGW, LGX)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Front End Sheet Metal Cross BraceÂ» Remove - **Front End Sheet Metal Cross Brace Replacement**
3. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)**

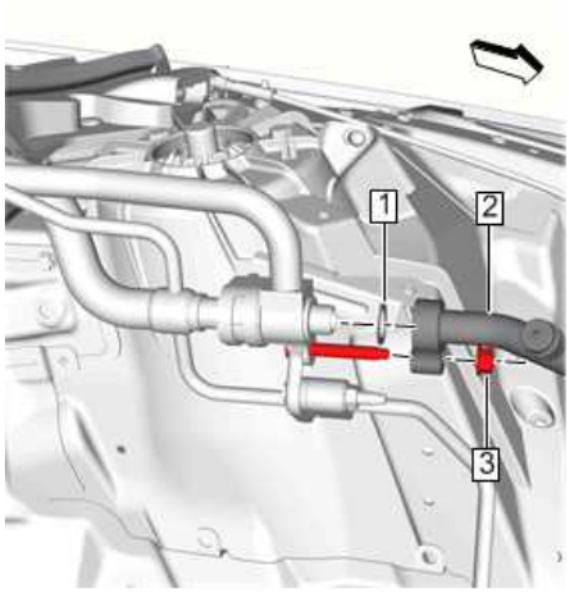


Fig. 68: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)**

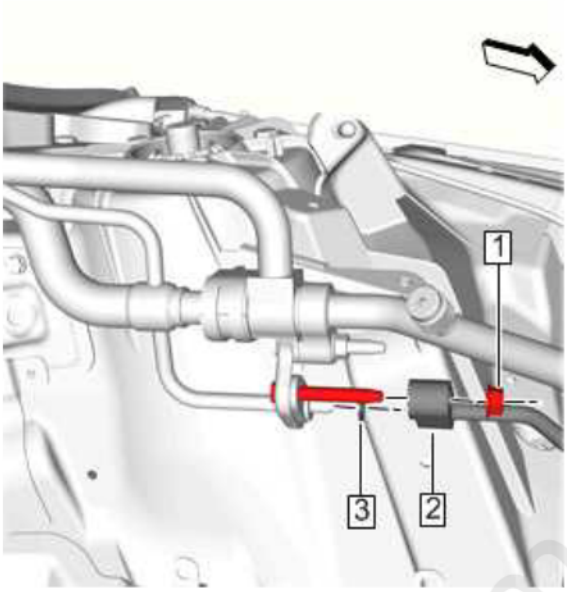


Fig. 69: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

5. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Remove - **Engine Wiring Harness Fuse Block Bracket Replacement**

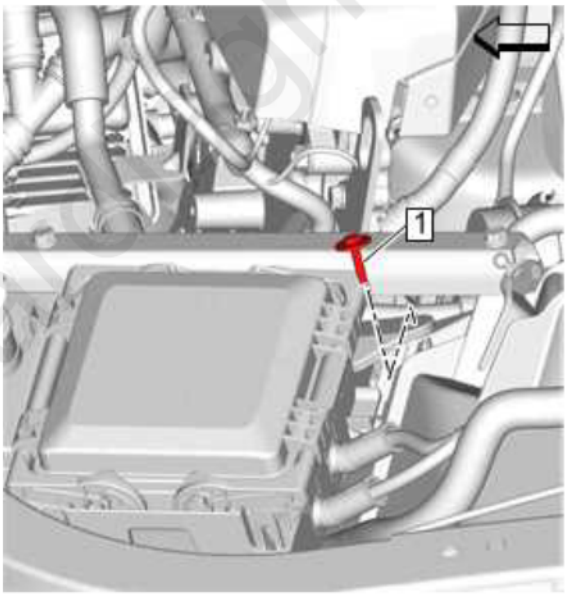


Fig. 70: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Loosen

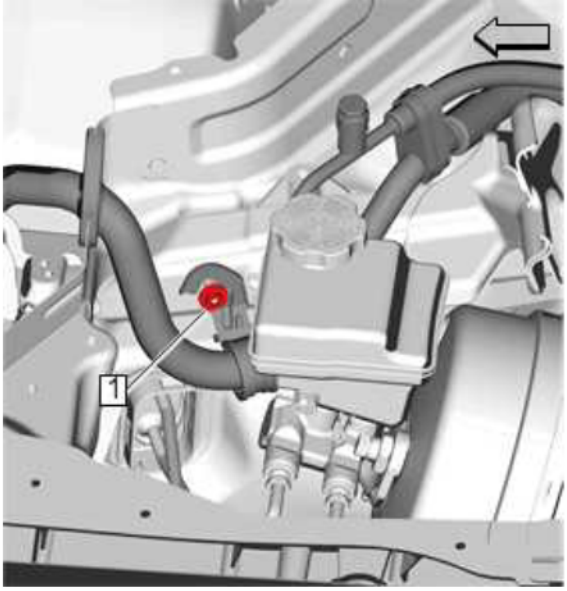


Fig. 71: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Refrigerant Heat Exchanger Nut (3) @ Front Wheelhouse Panel BraceÂ» Loosen

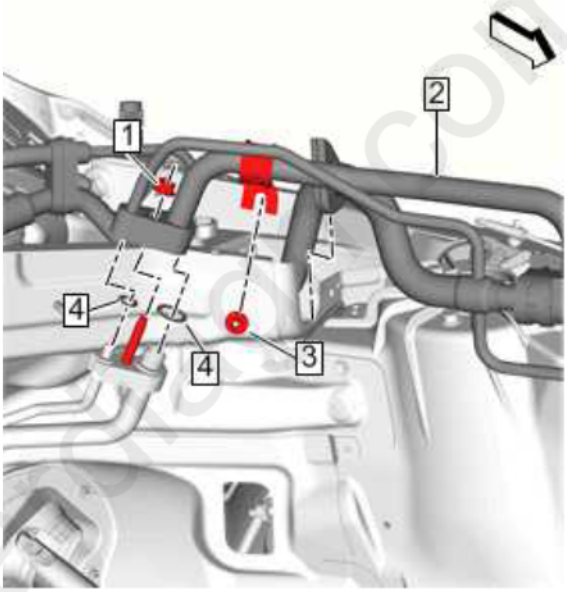


Fig. 72: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Remove
9. Air Conditioning Refrigerant Heat Exchanger (2)Â» Remove
10. Remove and DISCARD the sealing washer. (4) [2x] - **Air Conditioning System Seal Replacement**
11. Air Conditioning Evaporator Hose Nut (1)Â» Remove

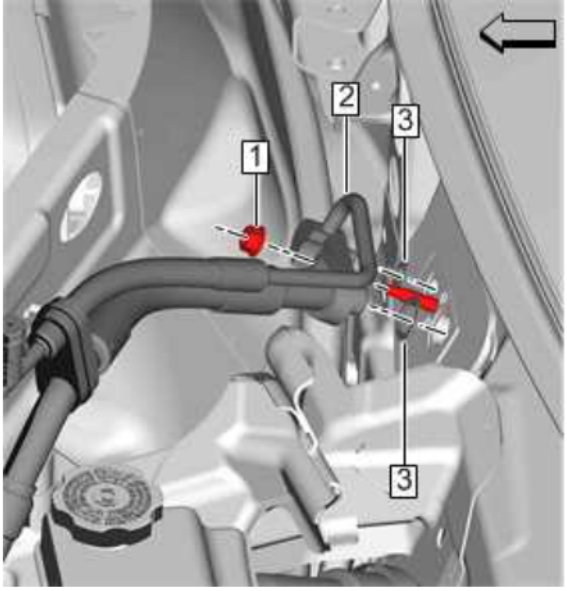


Fig. 73: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

12. Air Conditioning Refrigerant Heat Exchanger (2)Â» Remove
13. Remove and DISCARD the sealing washer. (3) [2x]
14. Remove the air conditioning refrigerant heat exchanger (2) from the vehicle.

Installation Procedure

1. Install the air conditioning refrigerant heat exchanger to the vehicle.
2. Install NEW sealing washers. (3) [2x] - **Air Conditioning System Seal Replacement**

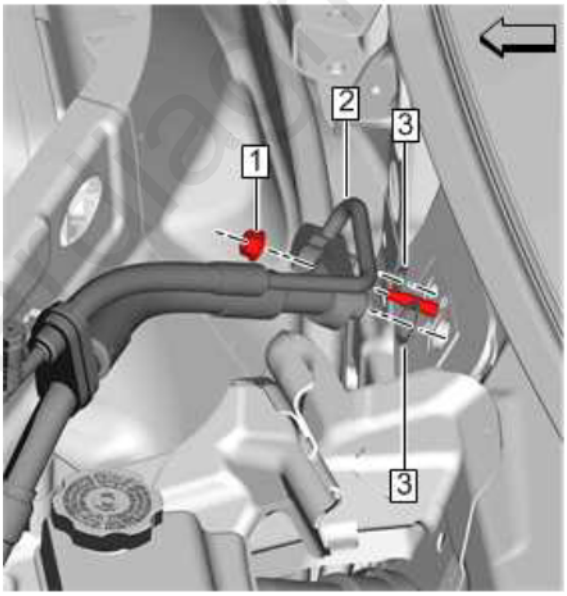


Fig. 74: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Refrigerant Heat Exchanger (2)Â» Install
4. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Install NEW sealing washers. (4) [2x]

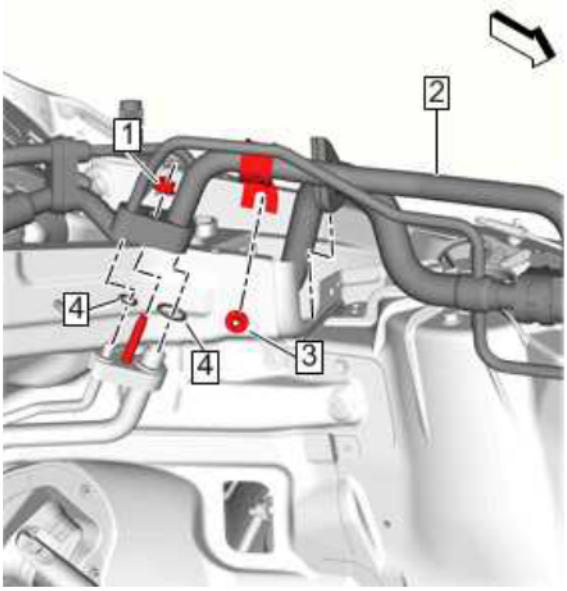


Fig. 75: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Refrigerant Heat Exchanger (2)Â»
7. Air Conditioning Refrigerant Heat Exchanger Front Wheelhouse PanelÂ» Install
8. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
9. Air Conditioning Refrigerant Heat Exchanger Nut (3) @ Front Wheelhouse Panel BraceÂ» Install and tighten 9 N.m (80 lb in)
10. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Install and tighten 9 N.m (80 lb in)

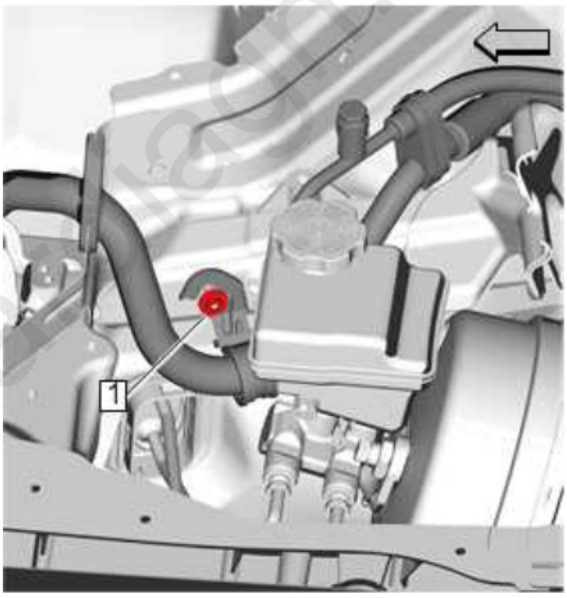


Fig. 76: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

11. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Install - **Engine Wiring Harness Fuse Block Bracket Replacement**

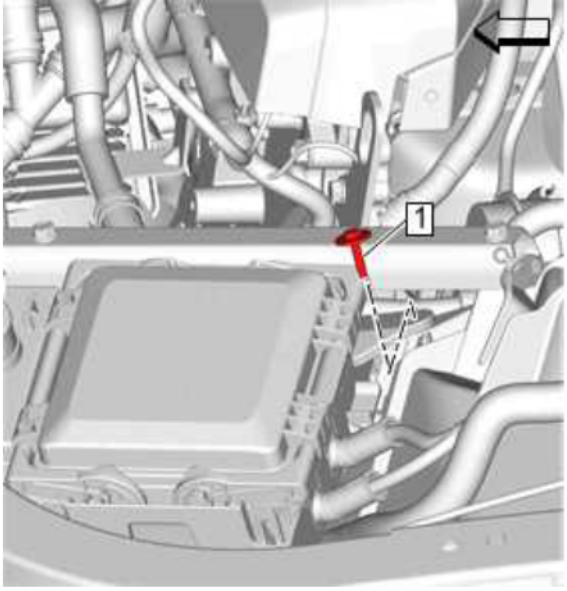


Fig. 77: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

12. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)**

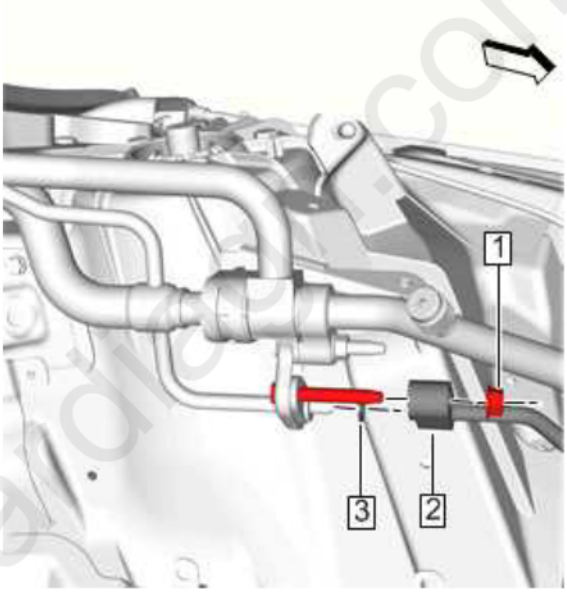


Fig. 78: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)**

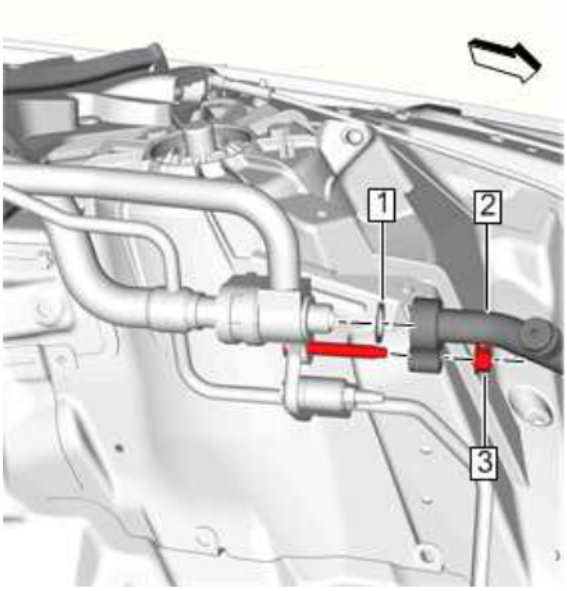


Fig. 79: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

14. Front End Sheet Metal Cross BraceÂ» Install - **Front End Sheet Metal Cross Brace Replacement**
15. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
16. Inspect for refrigerant leaks.

AIR CONDITIONING REFRIGERANT HEAT EXCHANGER REPLACEMENT (HP9)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement**
3. Front End Sheet Metal Cross BraceÂ» Remove - **Front End Sheet Metal Cross Brace Replacement**
4. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Replacement**

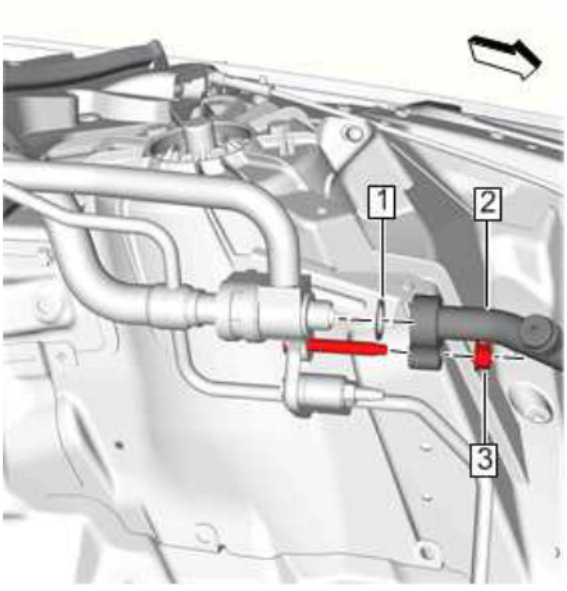


Fig. 80: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement**

(LTG)Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)

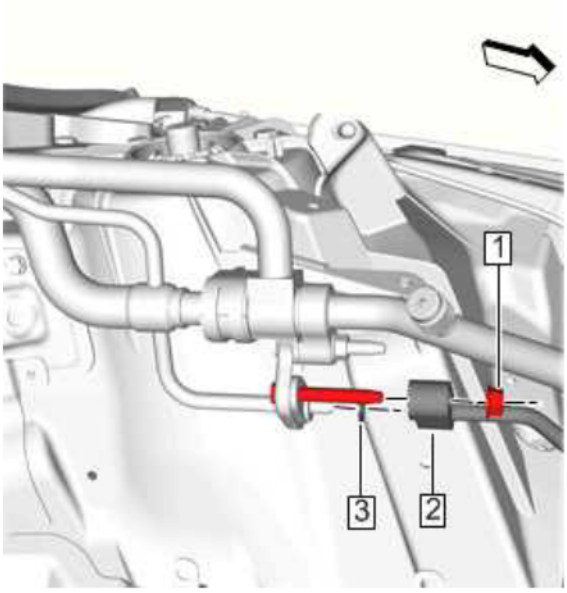


Fig. 81: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

6. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Remove - Engine Wiring Harness Fuse Block Bracket Replacement

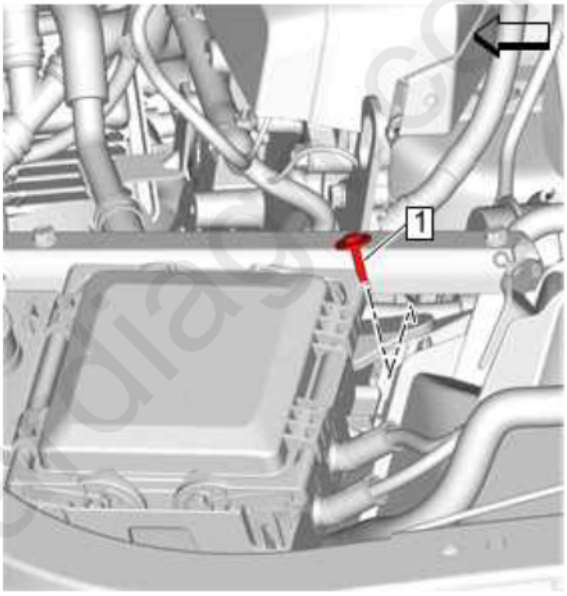


Fig. 82: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Loosen

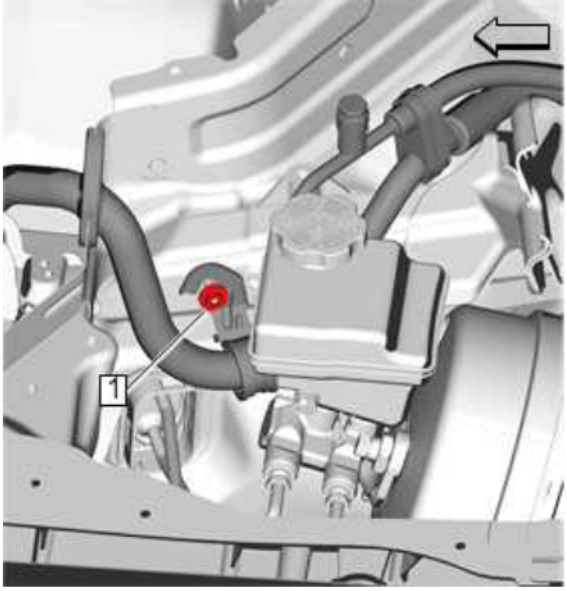


Fig. 83: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Refrigerant Heat Exchanger Nut (3) @ Front Wheelhouse Panel BraceÂ» Loosen

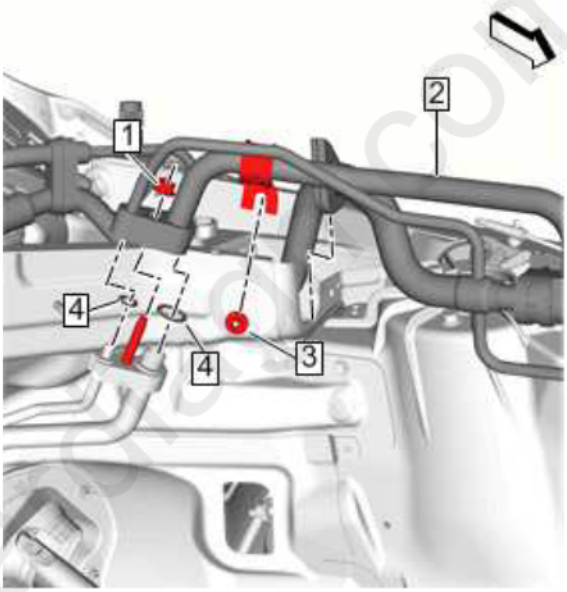


Fig. 84: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Remove
10. Air Conditioning Refrigerant Heat Exchanger (2)Â» Remove
11. Remove and DISCARD the sealing washer. (4) [2x] **Air Conditioning System Seal Replacement**
12. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Remove

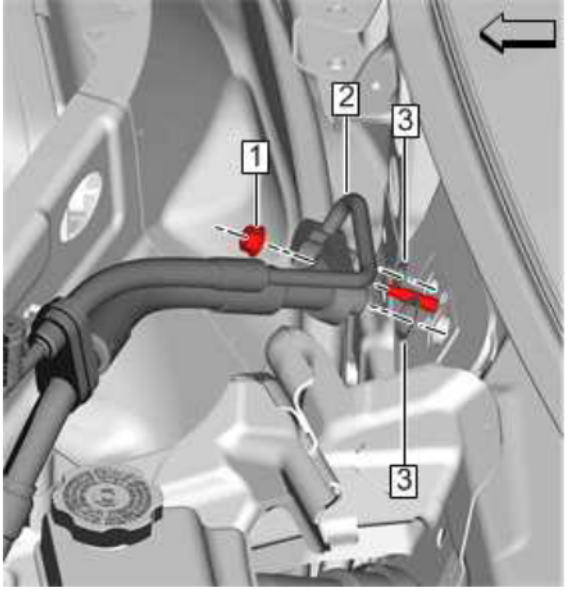


Fig. 85: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Refrigerant Heat Exchanger (2)Â» Remove
14. Remove and DISCARD the sealing washer. (3) [2x]
15. Remove the air conditioning refrigerant heat exchanger (2) from the vehicle.

Installation Procedure

1. Install the air conditioning refrigerant heat exchanger to the vehicle.
2. Install NEW sealing washers. (3) [2x] **Air Conditioning System Seal Replacement**

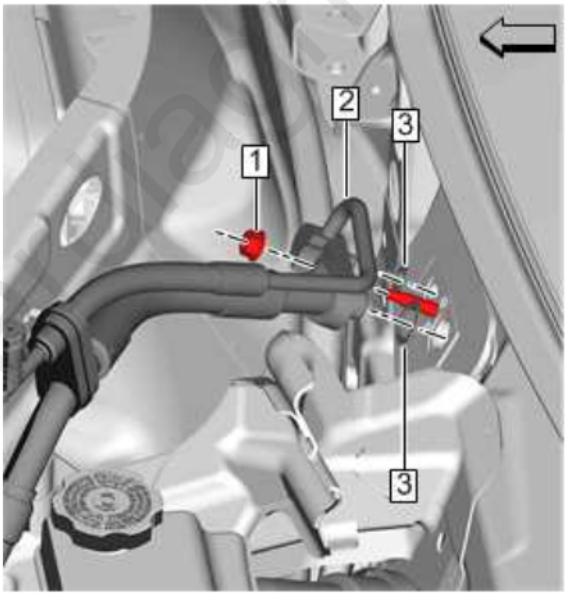


Fig. 86: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Refrigerant Heat Exchanger (2)Â» Install
4. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Install NEW sealing washers. (4) [2x]

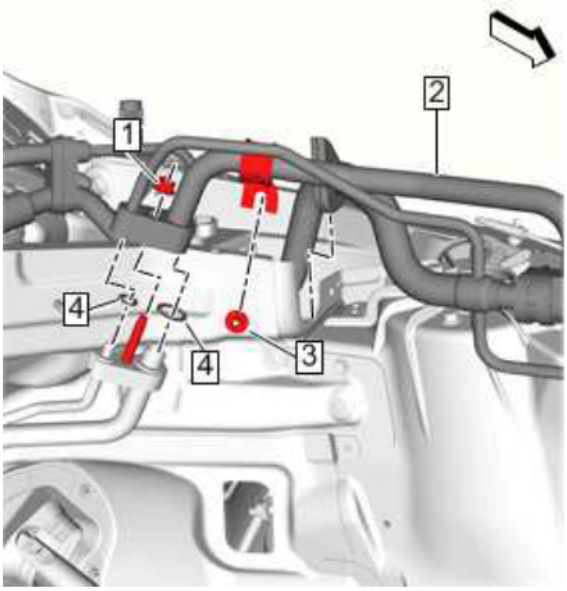


Fig. 87: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Refrigerant Heat Exchanger (2)Â» Install
7. Air Conditioning Refrigerant Heat Exchanger Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
8. Air Conditioning Refrigerant Heat Exchanger Nut (3) @ Front Wheelhouse Panel BraceÂ» Install and tighten 9 N.m (80 lb in)
9. Air Conditioning Refrigerant Heat Exchanger Nut (1) @ Front Wheelhouse Panel BraceÂ» Install and tighten 9 N.m (80 lb in)

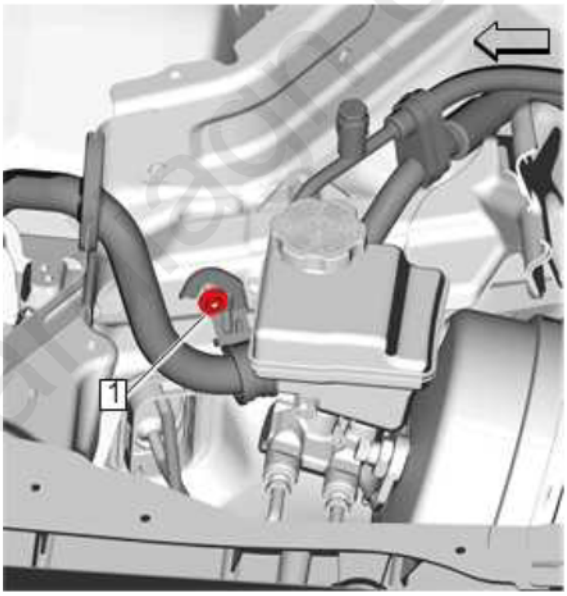


Fig. 88: Air Conditioning Refrigerant Heat Exchanger Nut
Courtesy of GENERAL MOTORS COMPANY

10. Engine Wiring Harness Fuse Block Bracket Bolt (1)Â» Install - **Engine Wiring Harness Fuse Block Bracket Replacement**

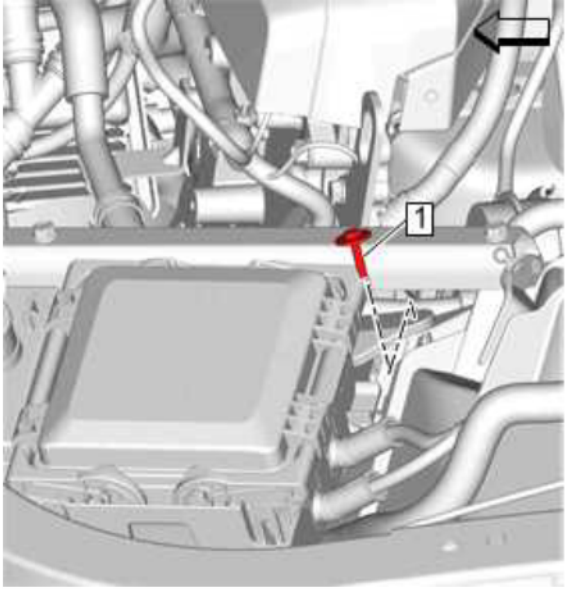


Fig. 89: Engine Wiring Harness Fuse Block Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

11. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)**

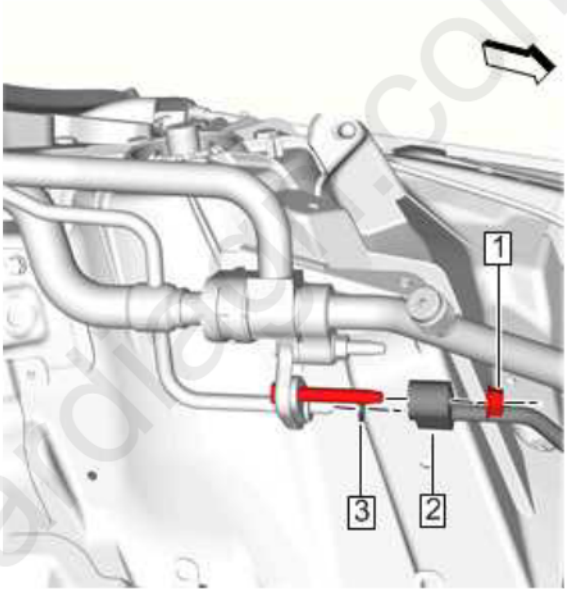


Fig. 90: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

12. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install - **Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Replacement**

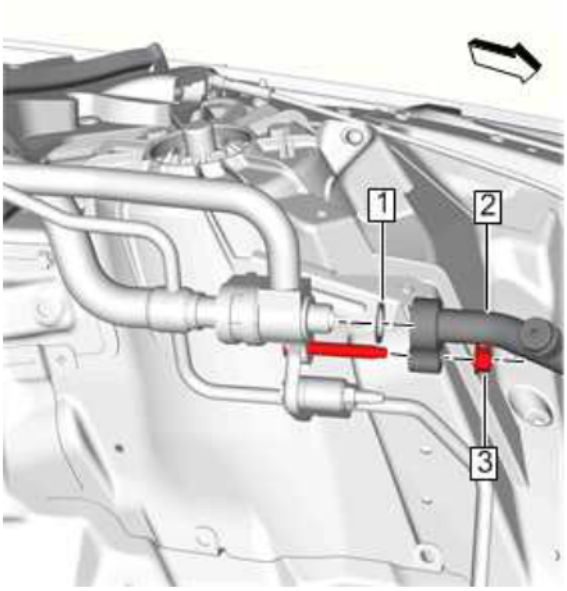


Fig. 91: Air Conditioning Compressor Hose And Retainer
Courtesy of GENERAL MOTORS COMPANY

13. Front End Sheet Metal Cross BraceÂ» Install - **Front End Sheet Metal Cross Brace Replacement**
14. Install the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement (LGW)** and/or **Air Cleaner Assembly Replacement (LGX)**
15. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
16. Inspect for refrigerant leaks.

AIR CONDITIONING CONDENSER AND EVAPORATOR HOSE REPLACEMENT (LTG)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
3. **Air Cleaner Outlet Duct Replacement** Â» Remove
4. Air Conditioning Condenser and Evaporator Hose Nut (1)Â» Remove

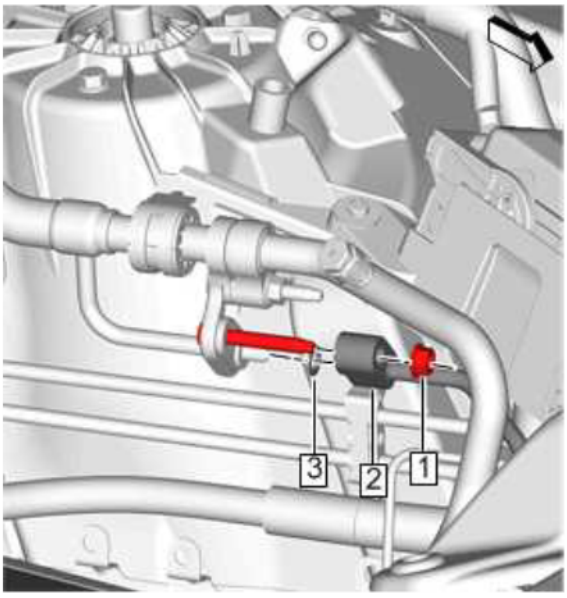


Fig. 92: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove

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6. Remove and DISCARD the sealing washer. (3) **Air Conditioning System Seal Replacement**
7. Air Conditioning Condenser and Evaporator Hose Clip (1) @ Front Compartment Front Side RailÂ» Remove

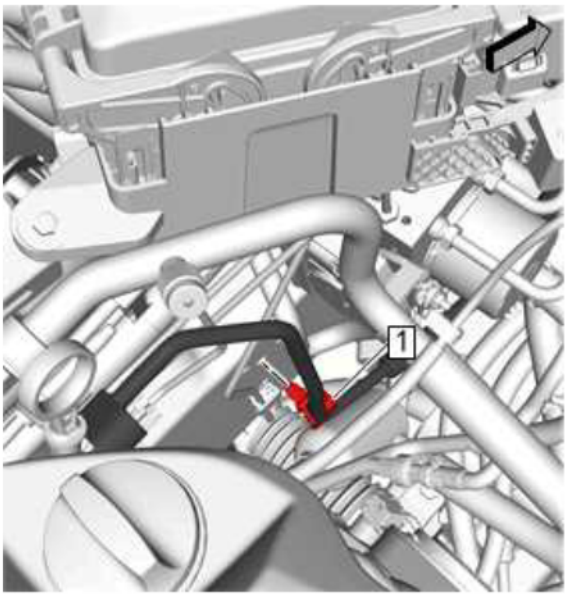


Fig. 93: Air Conditioning Condenser and Evaporator Hose Clip
Courtesy of GENERAL MOTORS COMPANY

8. **Front Bumper Fascia Replacement (Without UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Remove
9. Air Conditioning Condenser and Evaporator Hose Nut (3)Â» Remove

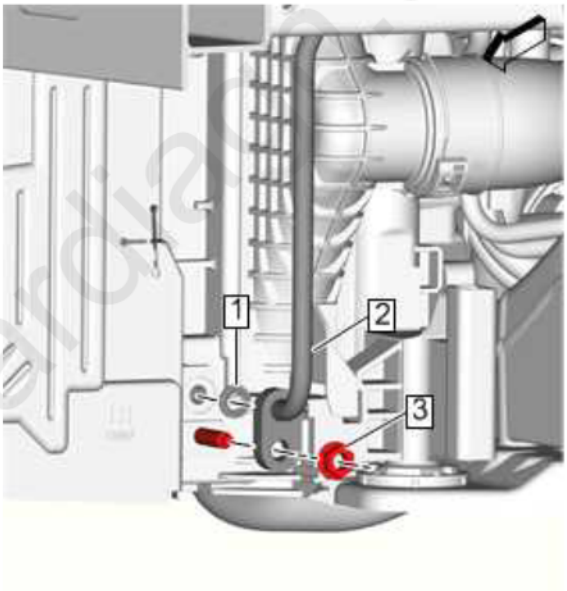


Fig. 94: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove
11. Remove and DISCARD the sealing washer. (1)
12. Air Conditioning Condenser and Evaporator Hose Clip (1)Â» Unclip

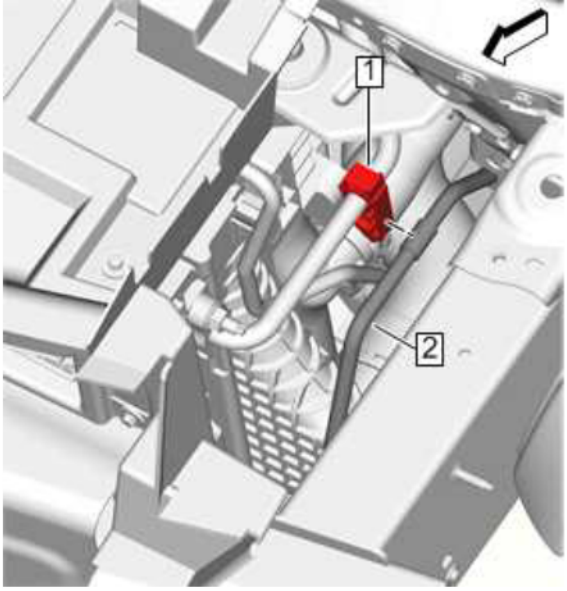


Fig. 95: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove
14. Remove the air conditioning condenser and evaporator hose (1) from the vehicle.

Installation Procedure

1. Install the air conditioning condenser and evaporator hose to the vehicle.
2. Air Conditioning Condenser and Evaporator Hose (2)Â» Install

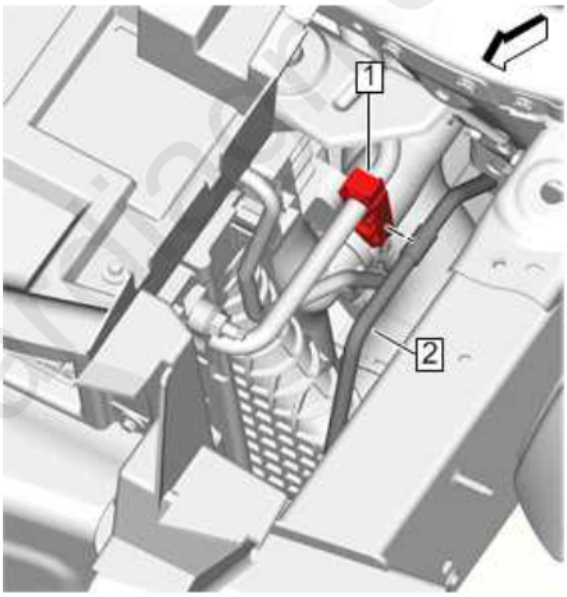


Fig. 96: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Condenser and Evaporator Hose Clip (1)Â» Clip
4. Install NEW sealing washers. (1) **Air Conditioning System Seal Replacement**

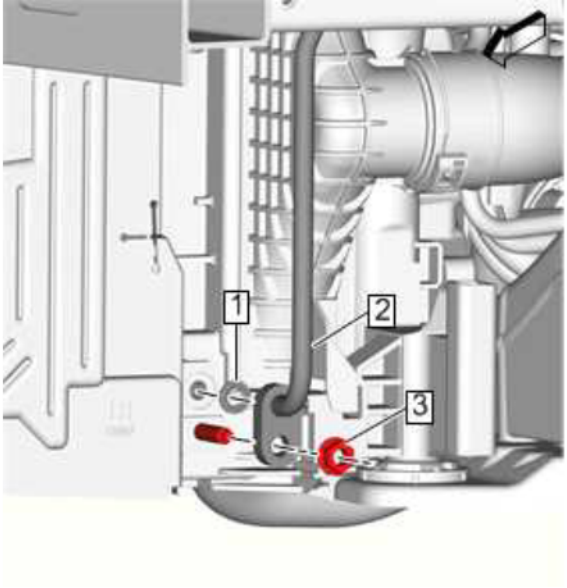


Fig. 97: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Condenser and Evaporator Hose (2)Â» Install
6. Air Conditioning Condenser and Evaporator Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

7. **Front Bumper Fascia Replacement (Without UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Install
8. Air Conditioning Condenser and Evaporator Hose Clip (1) @ Front Compartment Front Side RailÂ» Install

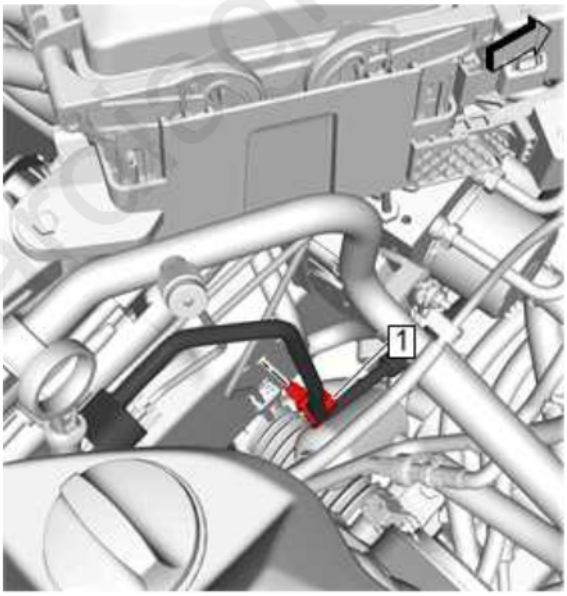


Fig. 98: Air Conditioning Condenser and Evaporator Hose Clip
Courtesy of GENERAL MOTORS COMPANY

9. Install NEW sealing washers. (3)Â» Install

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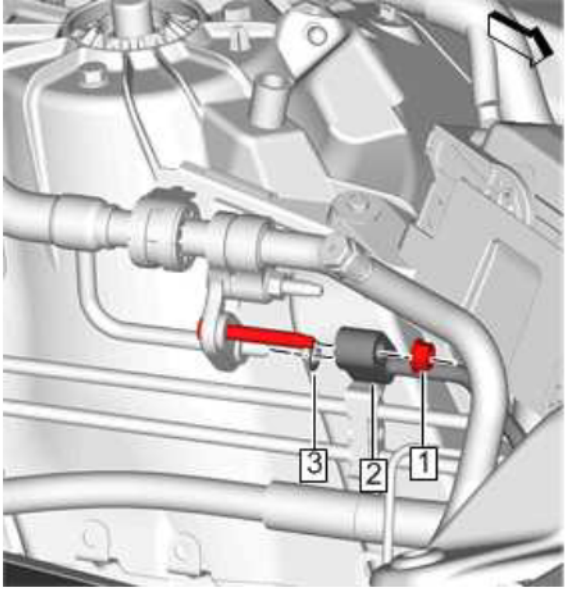


Fig. 99: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Condenser and Evaporator Hose (2)Â» Install
11. Air Conditioning Condenser and Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
12. **Air Cleaner Outlet Duct Replacement** Â» Install
13. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Install
14. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**

AIR CONDITIONING CONDENSER AND EVAPORATOR HOSE REPLACEMENT (LGW, LGX)

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Remove
3. **Air Cleaner Outlet Duct Replacement** Â» Remove
4. Air Conditioning Condenser and Evaporator Hose Nut (1)Â» Remove

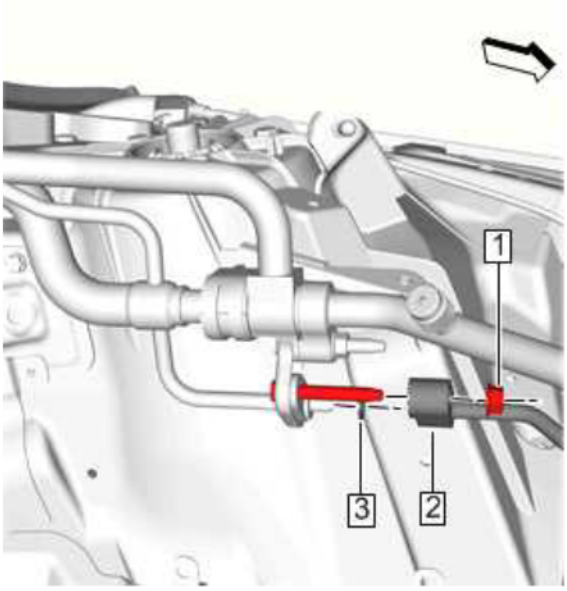


Fig. 100: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

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5. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove
6. Remove and DISCARD the sealing washer. (3) **Air Conditioning System Seal Replacement**
7. Air Conditioning Condenser and Evaporator Hose Clip (1) @ Front Compartment Front Side RailÂ» Remove

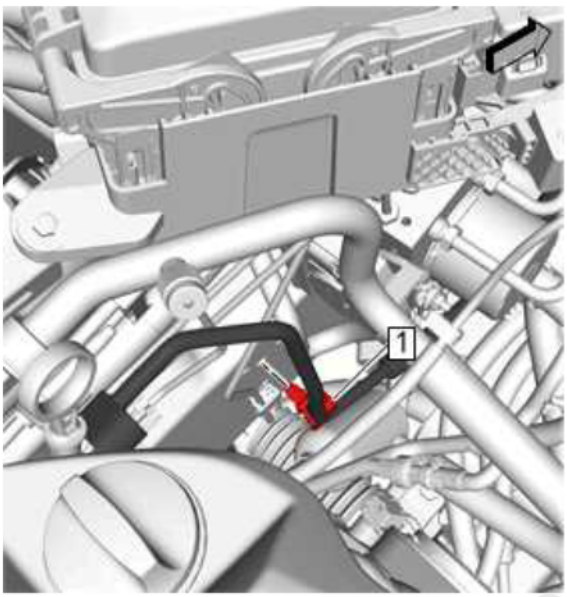


Fig. 101: Air Conditioning Condenser and Evaporator Hose Clip
Courtesy of GENERAL MOTORS COMPANY

8. **Front Bumper Fascia Replacement (Without UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Remove
9. Air Conditioning Condenser and Evaporator Hose Nut (3)Â» Remove

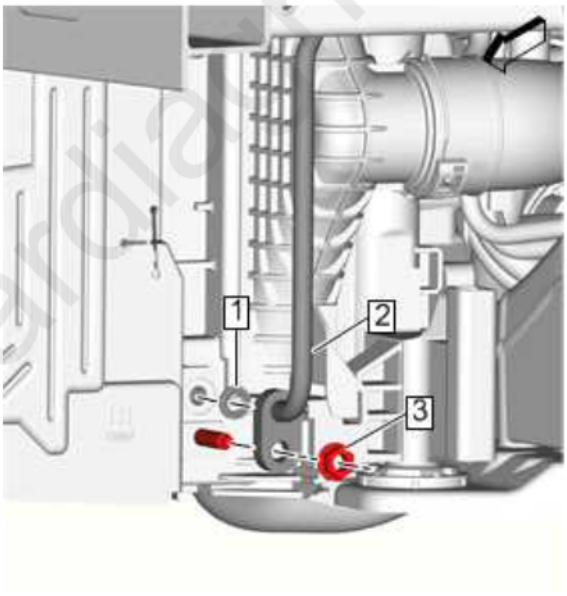


Fig. 102: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove
11. Remove and DISCARD the sealing washer. (1)
12. Air Conditioning Condenser and Evaporator Hose Clip (1)Â» Unclip

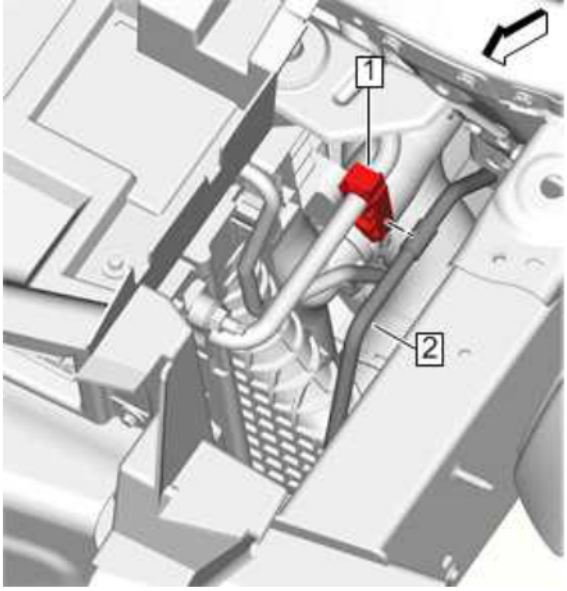


Fig. 103: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

13. Air Conditioning Condenser and Evaporator Hose (2)Â» Remove
14. Remove the air conditioning condenser and evaporator hose (1) from the vehicle.

Installation Procedure

1. Install the air conditioning condenser and evaporator hose to the vehicle.
2. Air Conditioning Condenser and Evaporator Hose (2)Â» Install

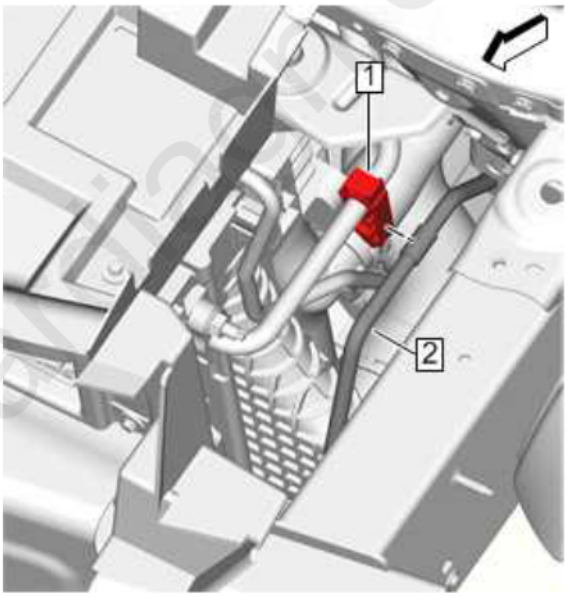


Fig. 104: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Condenser and Evaporator Hose Clip (1)Â» Clip
4. Install NEW sealing washers. (1) **Air Conditioning System Seal Replacement**

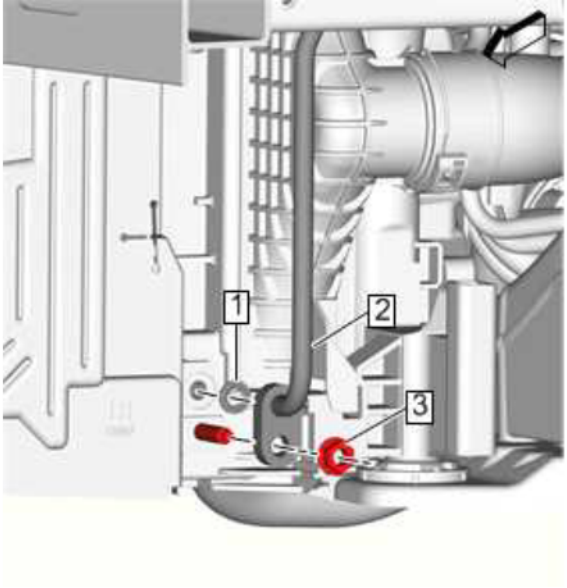


Fig. 105: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

5. Air Conditioning Condenser and Evaporator Hose (2)Â» Install
6. Air Conditioning Condenser and Evaporator Hose Nut (3)Â» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

7. **Front Bumper Fascia Replacement (Without UV3)** **Front Bumper Fascia Replacement (With UV3)** Â» Install
8. Air Conditioning Condenser and Evaporator Hose Clip (1) @ Front Compartment Front Side RailÂ» Install

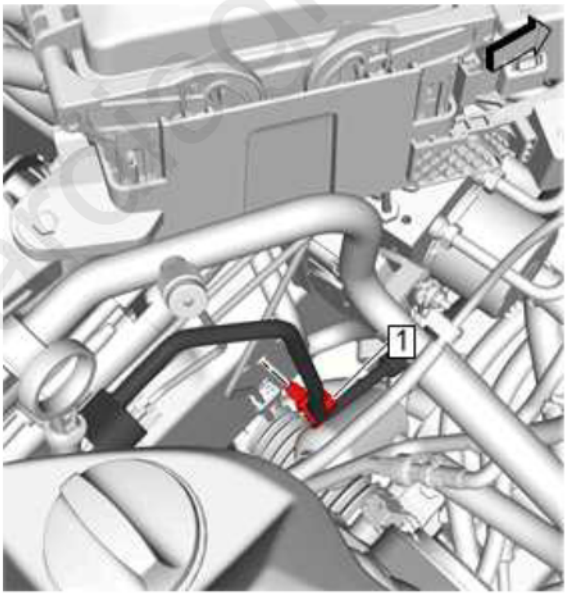


Fig. 106: Air Conditioning Condenser and Evaporator Hose Clip
Courtesy of GENERAL MOTORS COMPANY

9. Install NEW sealing washers. (3)Â» Install

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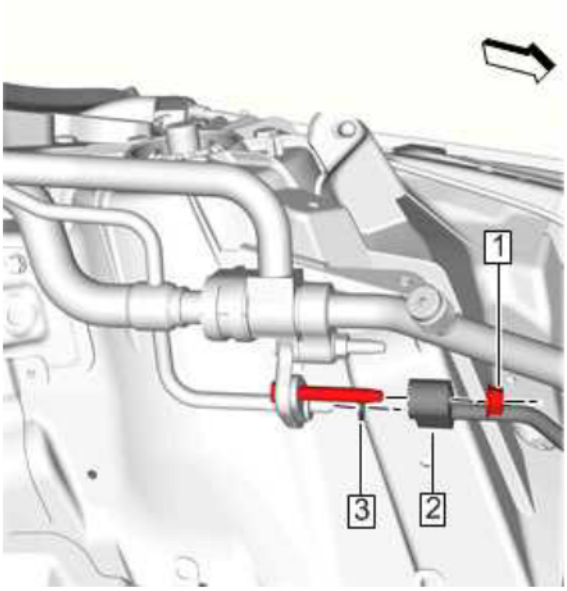


Fig. 107: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Condenser and Evaporator Hose (2)Â» Install
11. Air Conditioning Condenser and Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
12. **Air Cleaner Outlet Duct Replacement** Â» Install
13. **Air Cleaner Assembly Replacement (LGW)** **Air Cleaner Assembly Replacement (LGX)** Â» Install
14. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**

AUXILIARY AIR CONDITIONING EVAPORATOR INTERMEDIATE TUBE REPLACEMENT

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Air Conditioning Refrigerant Heat Exchanger (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Air Conditioning Refrigerant Heat Exchanger Replacement (LTG)** **Air Conditioning Refrigerant Heat Exchanger Replacement (LGW, LGX)** **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

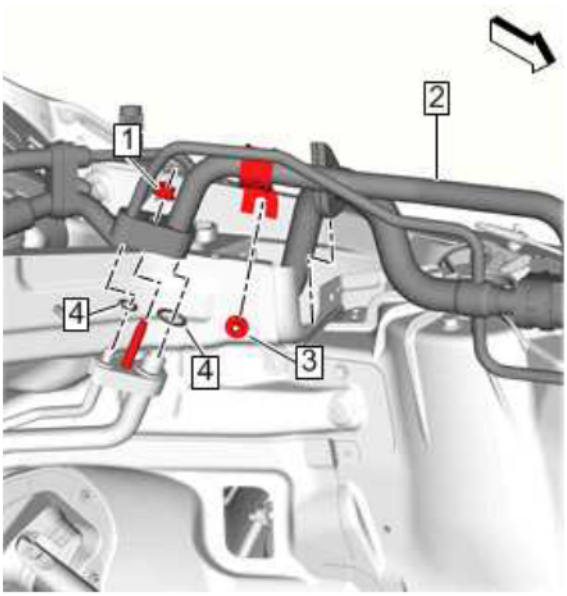


Fig. 108: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

4. Heater Outlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)Heater Outlet Hose Replacement (LTG with HP9)**

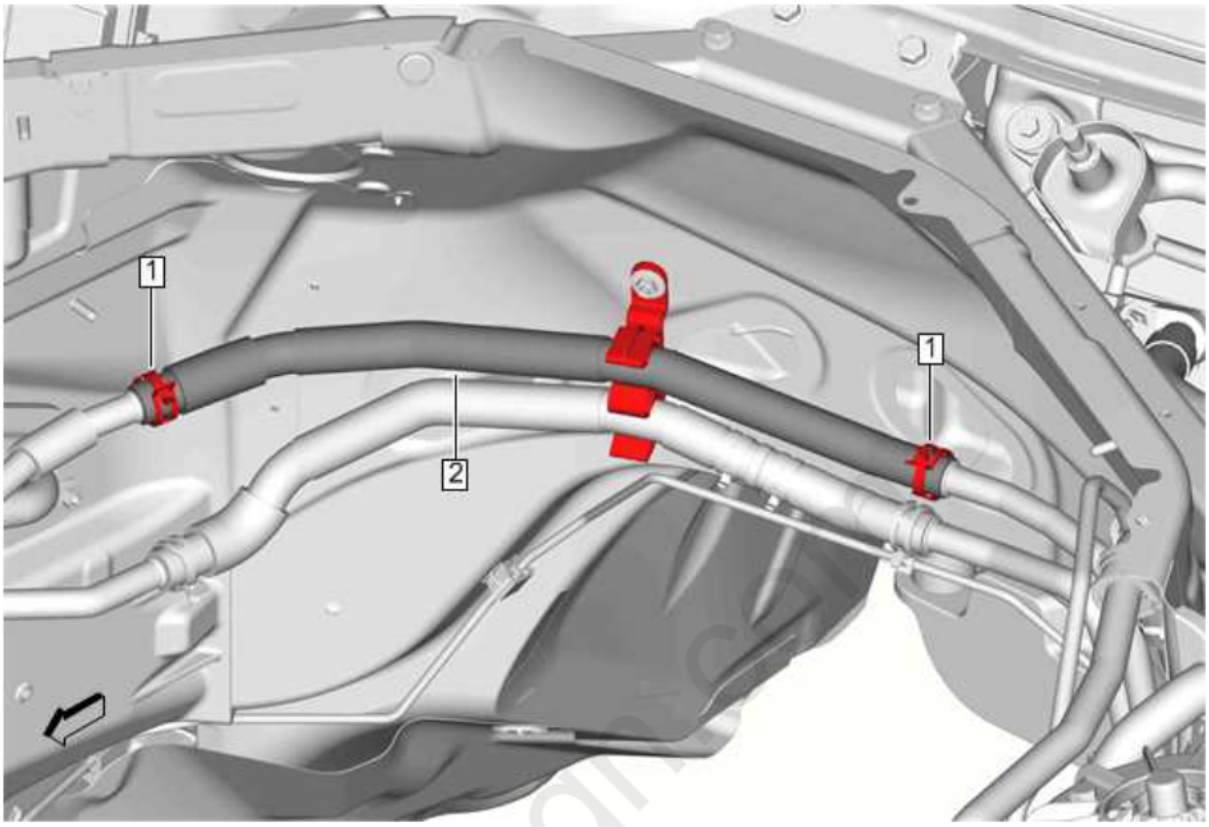


Fig. 109: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)Heater Inlet Hose Replacement (LTG with HP9)**

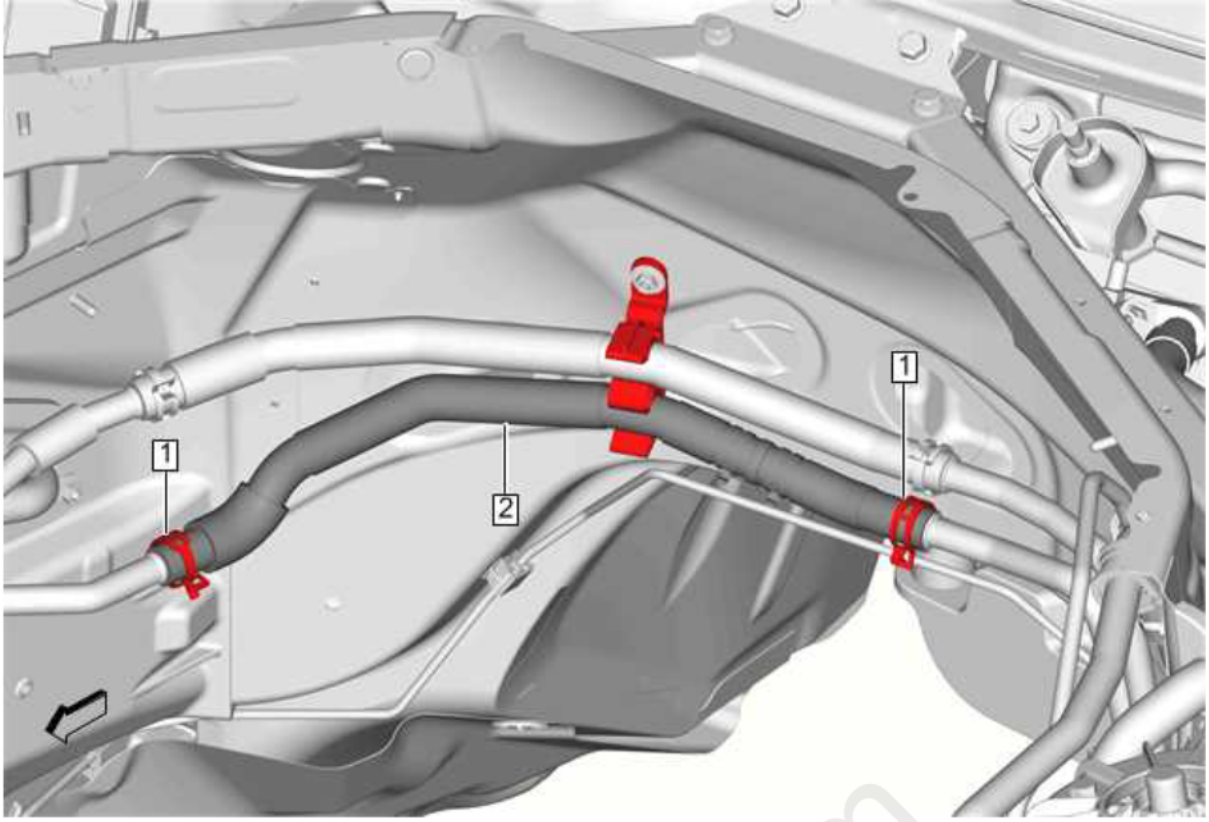


Fig. 110: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Front Body Exhaust Heat Shield - Left (3)Â» Remove - **Front Body Exhaust Heat Shield Replacement (Right Side, LTG)** **Front Body Exhaust Heat Shield Replacement (Left Side, LTG)** **Front Body Exhaust Heat Shield Replacement (Right Side, LGW, LGX)** **Front Body Exhaust Heat Shield Replacement (Left Side, LGW, LGX)**

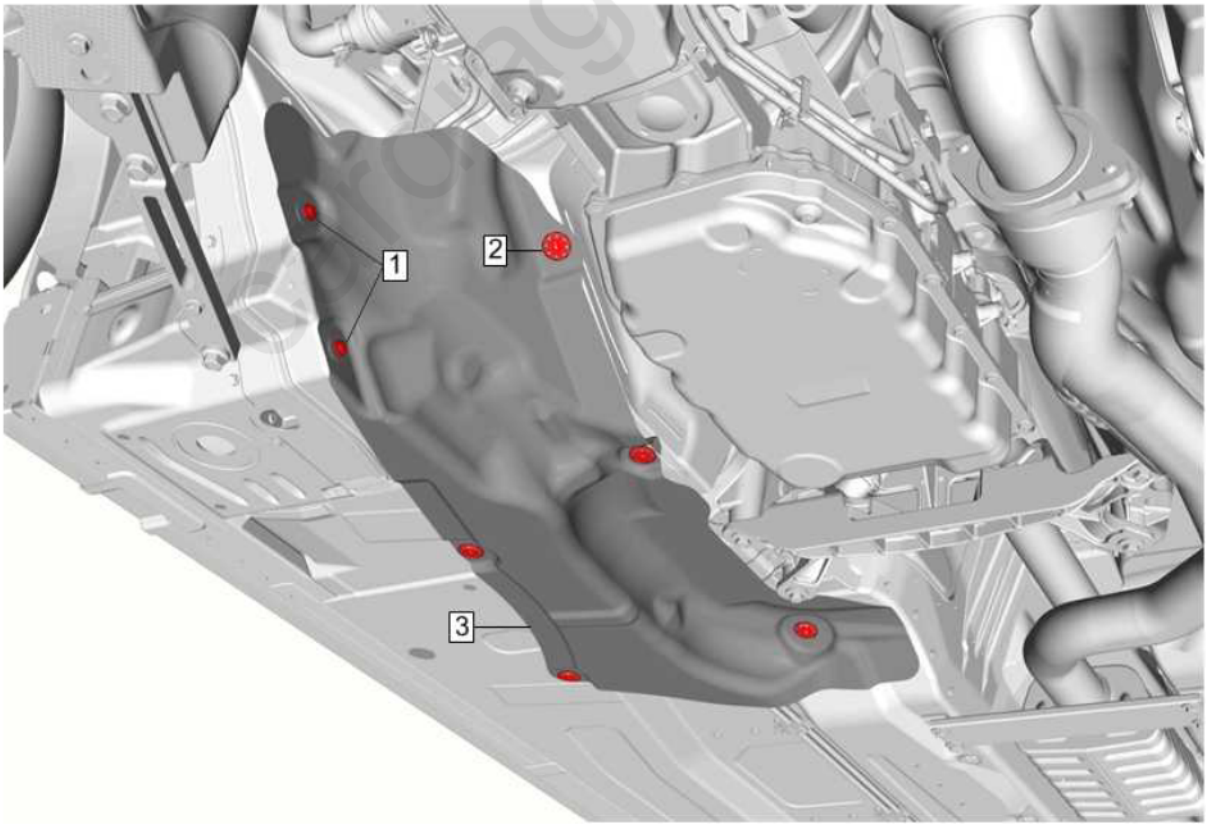


Fig. 111: Front Body Exhaust Heat Shield
Courtesy of GENERAL MOTORS COMPANY

7. Underbody Rear Air Deflector - Left Side (2)Â» Remove - **Underbody Rear Air Deflector Replacement - Left Side**

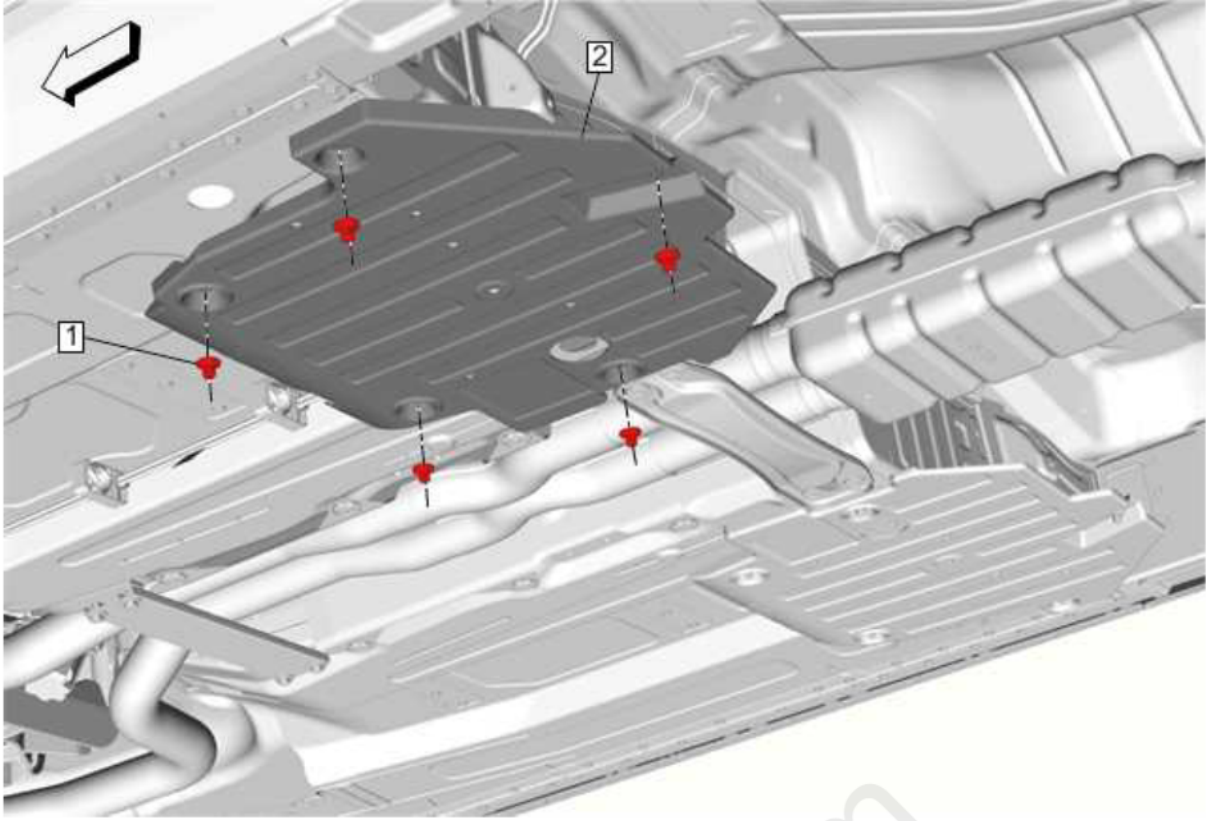


Fig. 112: Underbody Rear Air Deflector - Left Side
Courtesy of GENERAL MOTORS COMPANY

8. Place a suitable adjustable jack under the fuel tank.

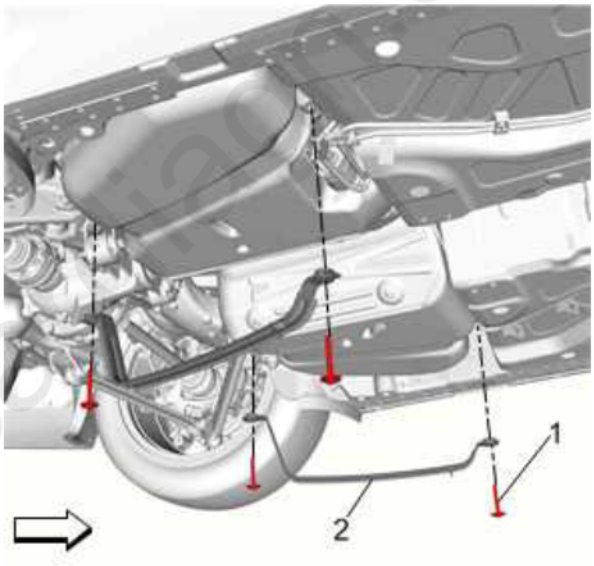


Fig. 113: Fuel Tank Strap
Courtesy of GENERAL MOTORS COMPANY

9. Fuel Tank Strap (2) - Left SideÂ» Remove
10. Rear Suspension Cradle (1)Â» Remove - **Rear Suspension Cradle Replacement**

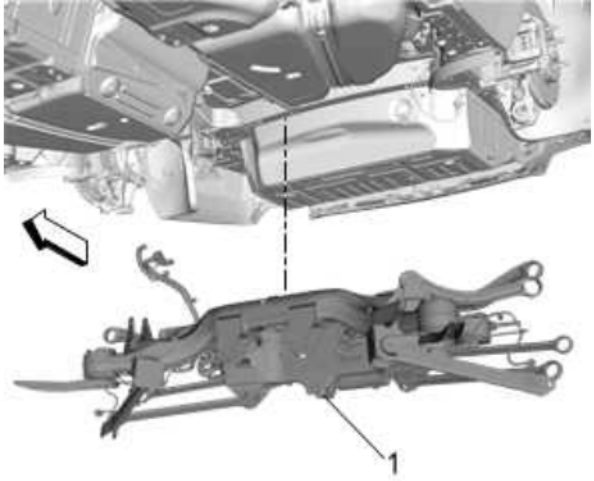


Fig. 114: Rear Suspension Cradle
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Remove

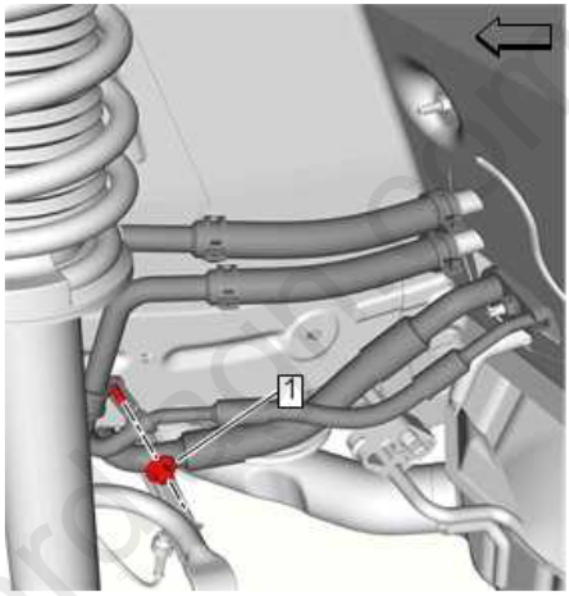


Fig. 115: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

12. Auxiliary Air Conditioning Evaporator Intermediate Tube Clamp (2) [2x] Disengage

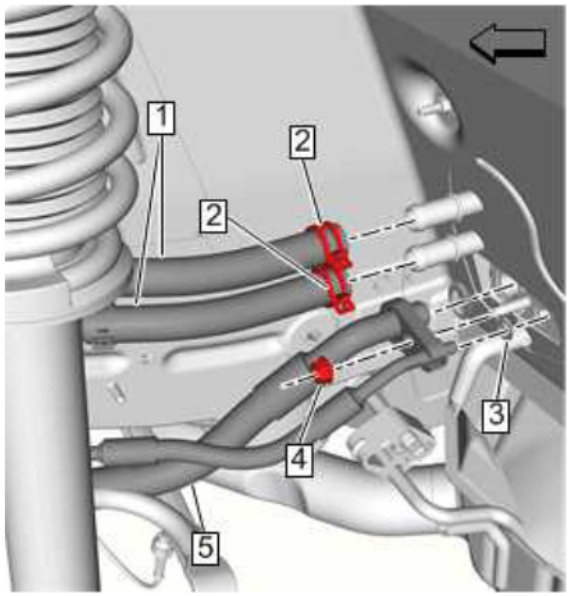


Fig. 116: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Air Conditioning Evaporator Intermediate Tube (1) @ Auxiliary Heater CoreÂ» Remove
14. Air Conditioning Evaporator Thermal Expansion Valve Nut (4)Â» Remove
15. Auxiliary Air Conditioning Evaporator Intermediate Tube (5) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove
16. Remove and DISCARD the sealing washer. (3) [2x] **Air Conditioning System Seal Replacement**
17. Auxiliary Air Conditioning Evaporator Intermediate Tube (2)Â» Support using a suitable fixture

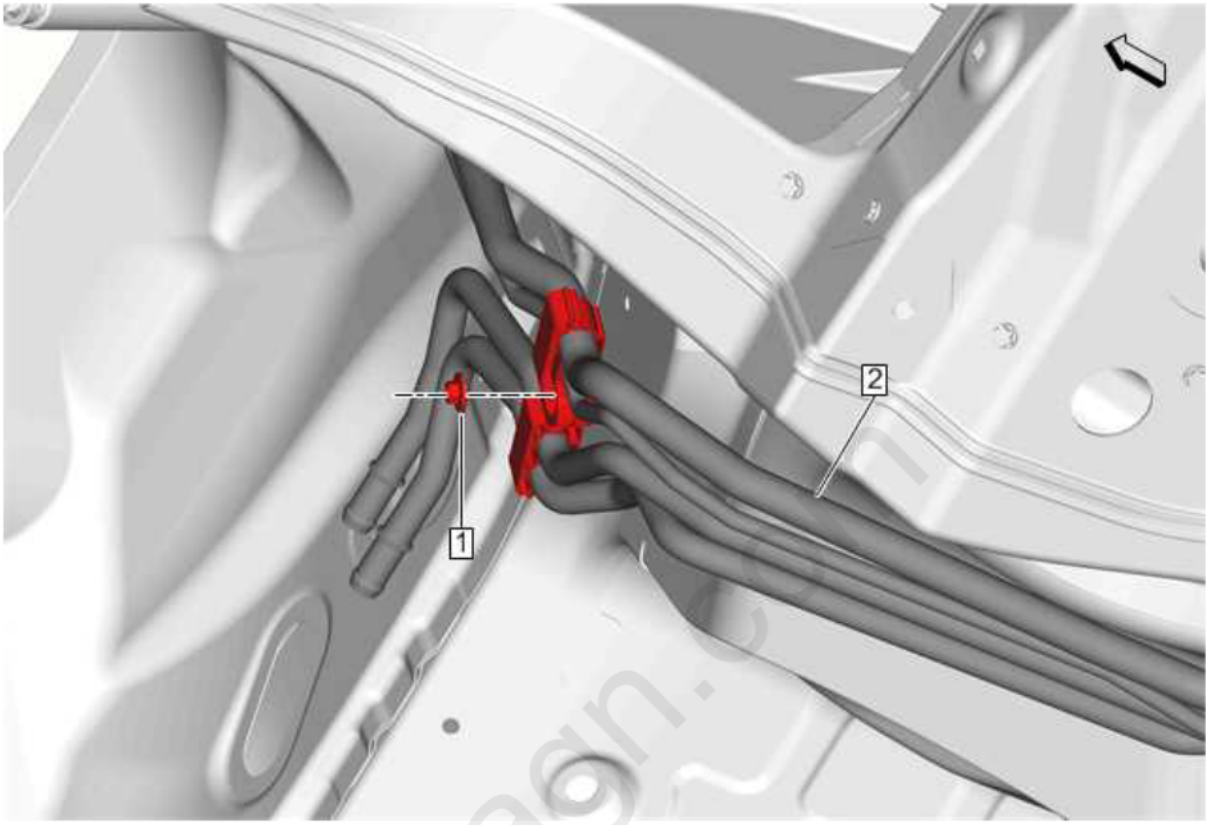


Fig. 117: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

18. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Remove
19. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1) [2x]Â» Remove

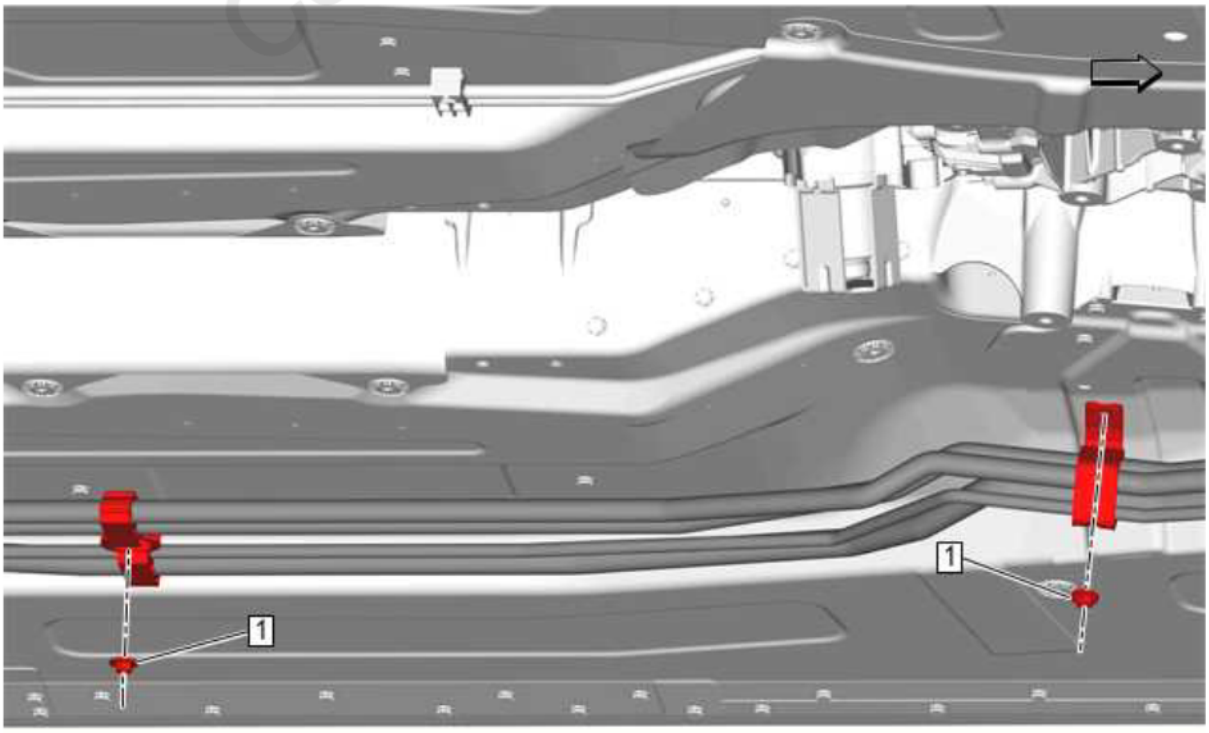


Fig. 118: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

20. Air Conditioning Evaporator Rear Hose Bolt (2)Â» Remove

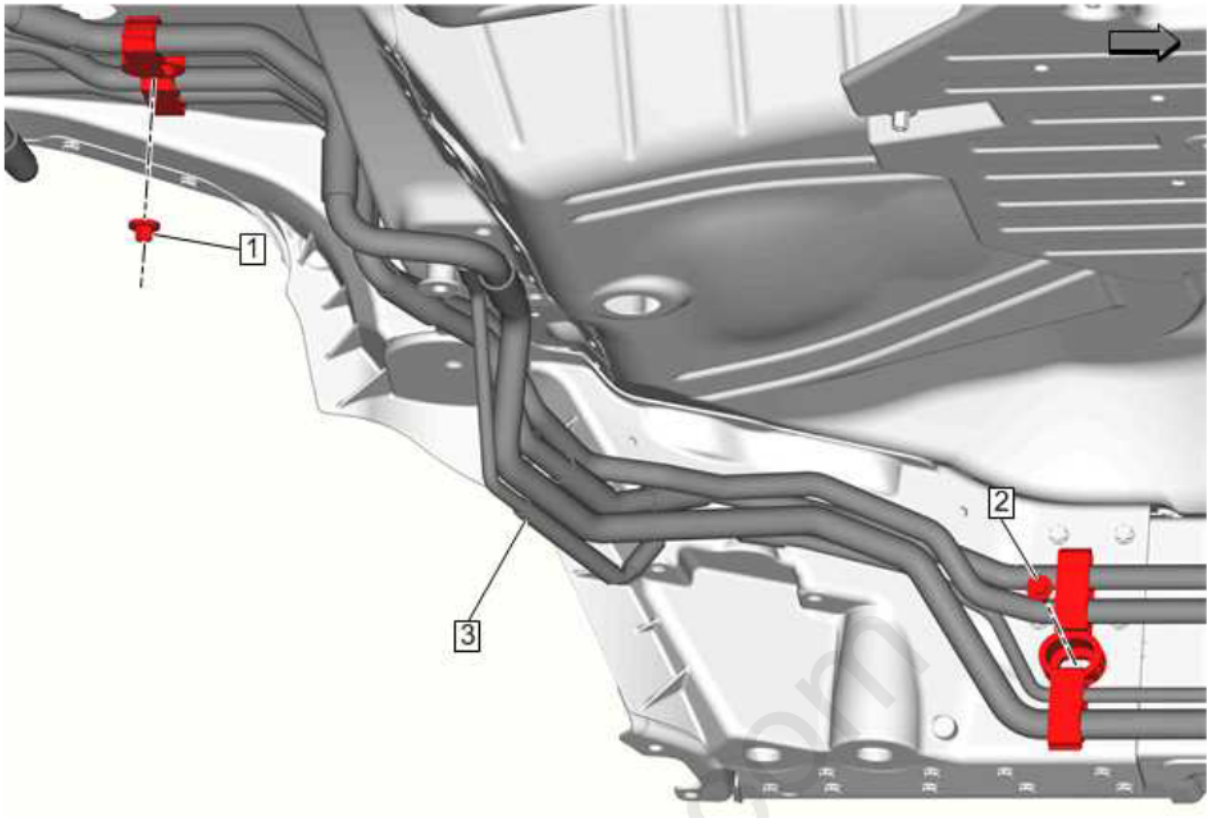


Fig. 119: Auxiliary Air Conditioning Evaporator Intermediate Tube And Retainers
Courtesy of GENERAL MOTORS COMPANY

21. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Remove
22. Remove the auxiliary air conditioning evaporator intermediate tube (3) from the vehicle.

Installation Procedure

1. Install the auxiliary air conditioning evaporator intermediate tube (3) in the proper position using a suitable support.

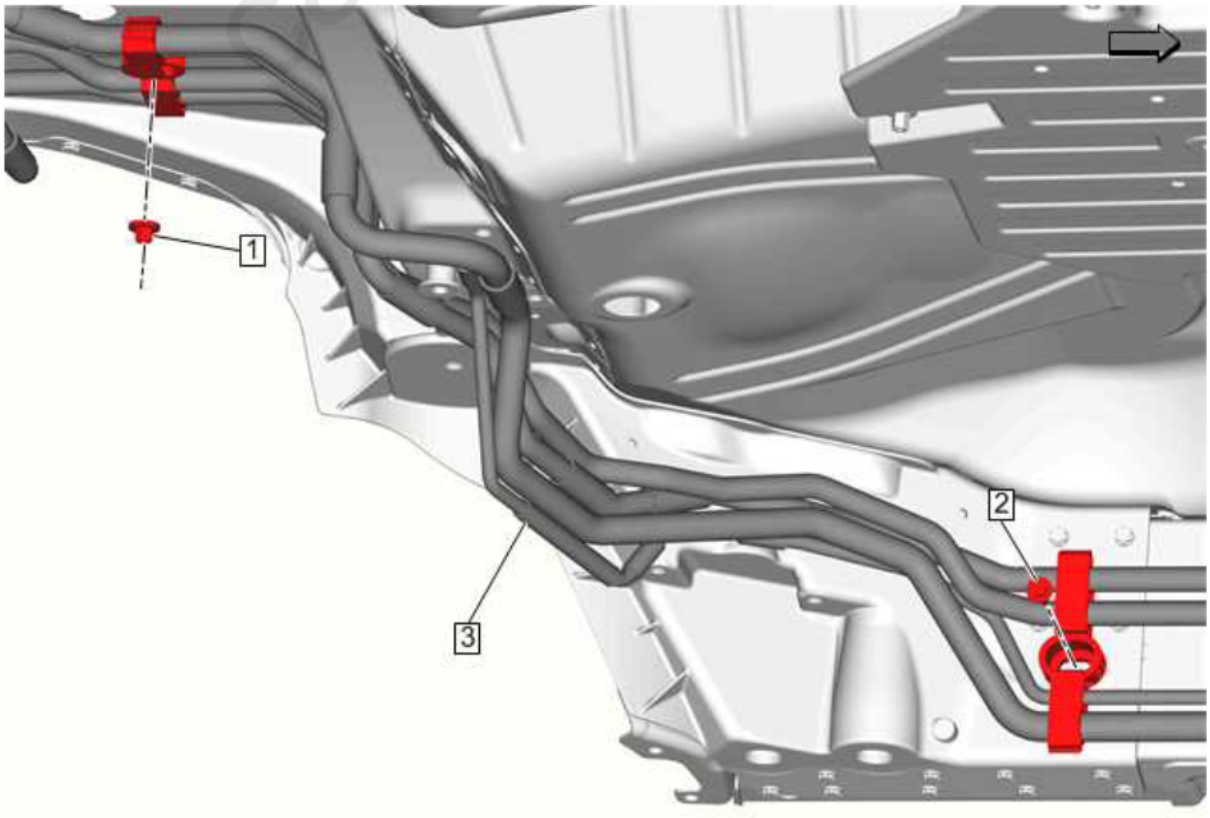


Fig. 120: Auxiliary Air Conditioning Evaporator Intermediate Tube And Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Air Conditioning Evaporator Rear Hose Bolt (2)Â» Install and tighten 5 N.m (44 lb in)

CAUTION: **Refer to Fastener Caution .**

3. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Install and tighten 5 N.m (44 lb in)
4. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1) [2x]Â» Install and tighten 5 N.m (44 lb in)

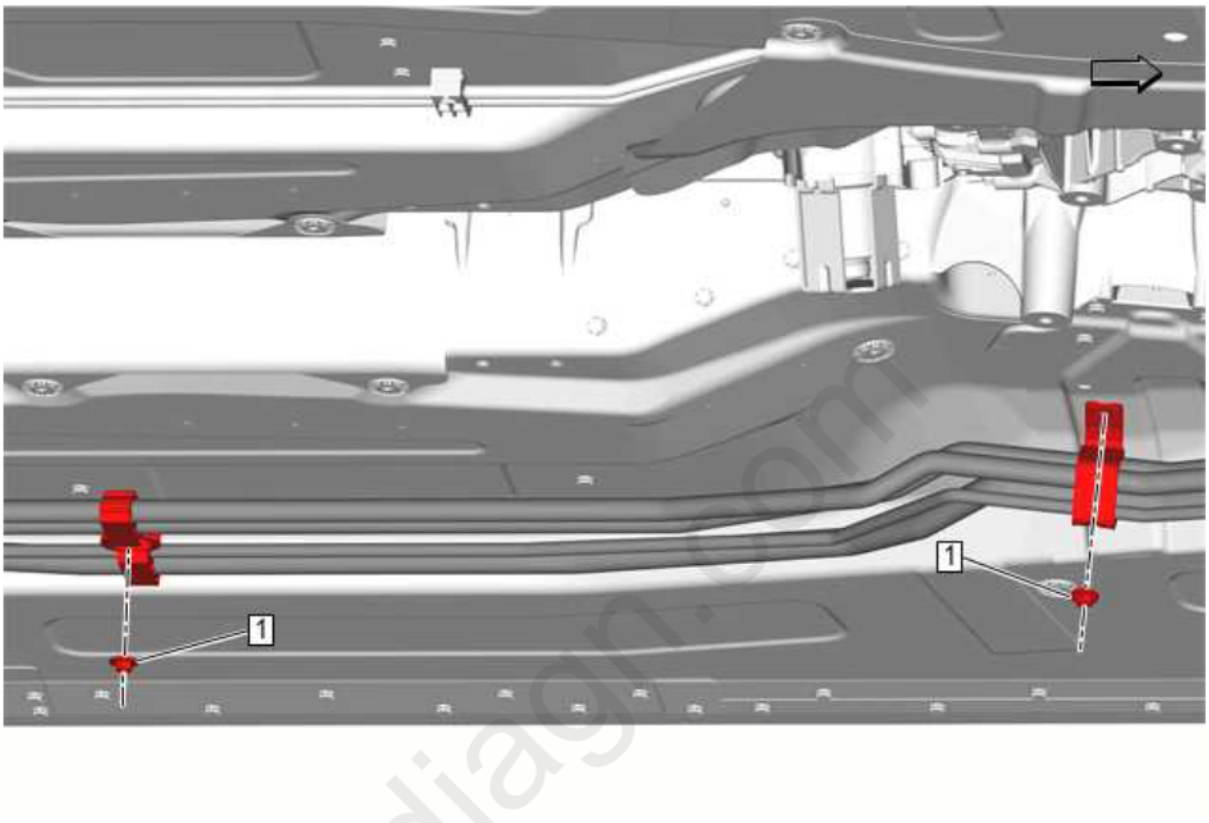


Fig. 121: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Install and tighten 5 N.m (44 lb in)

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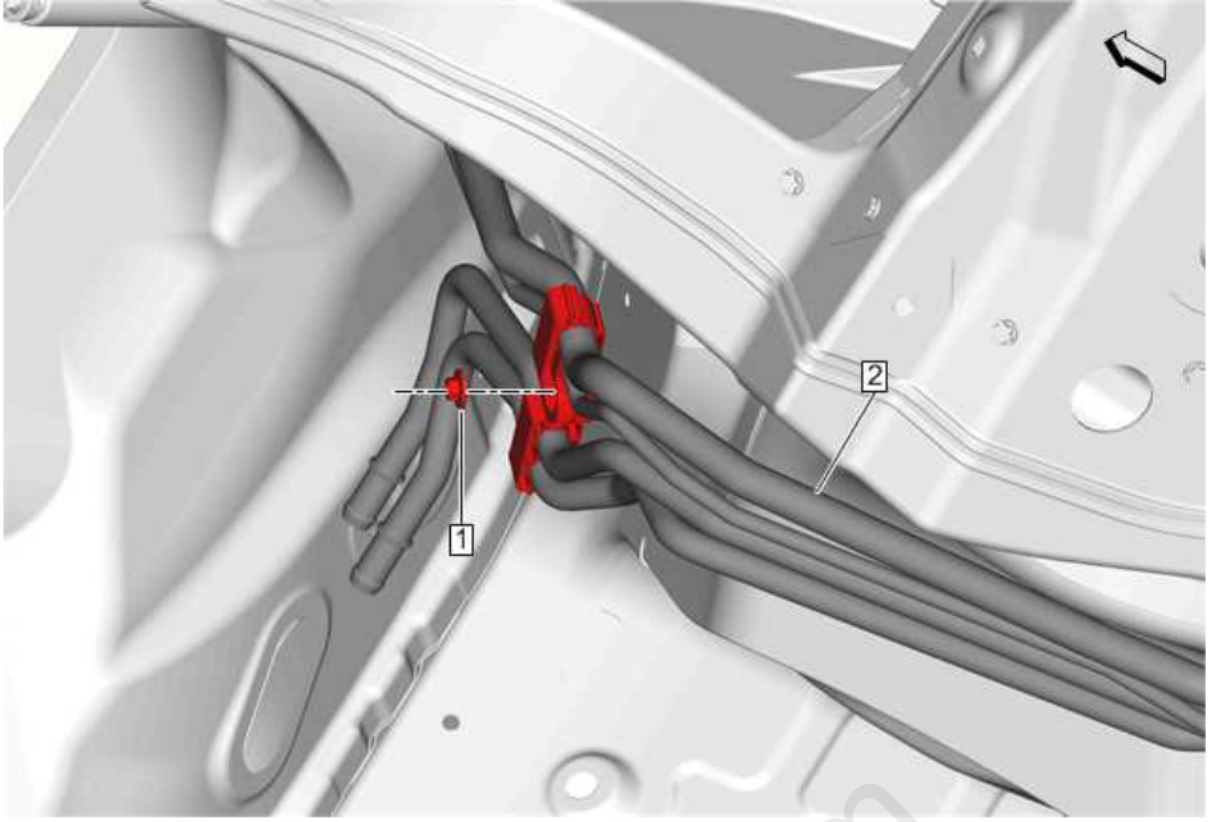


Fig. 122: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

6. Remove support.
7. Install NEW sealing washers. (3) [2x] - **Air Conditioning System Seal Replacement**

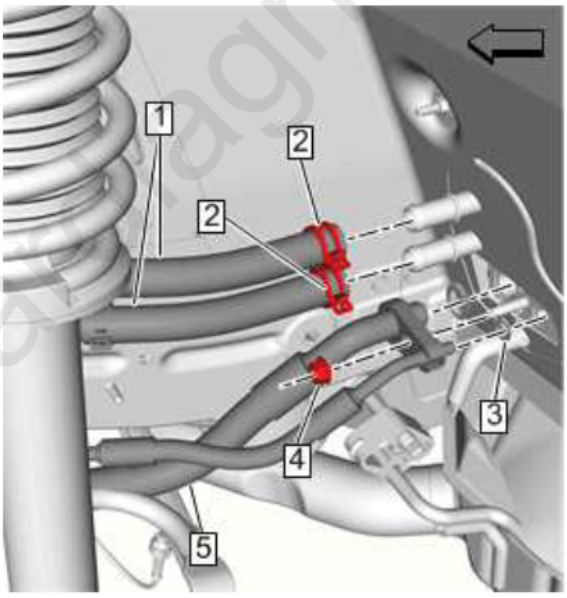


Fig. 123: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Air Conditioning Evaporator Intermediate Tube (5) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install
9. Air Conditioning Evaporator Thermal Expansion Valve Nut (4)Â» Install and tighten 22 N.m (16 lb ft)
10. Auxiliary Air Conditioning Evaporator Intermediate Tube (1) @ Auxiliary Heater CoreÂ» Install
11. Auxiliary Air Conditioning Evaporator Intermediate Tube Clamp (2) [2x] Engage
12. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Install and tighten 5 N.m (44 lb in)

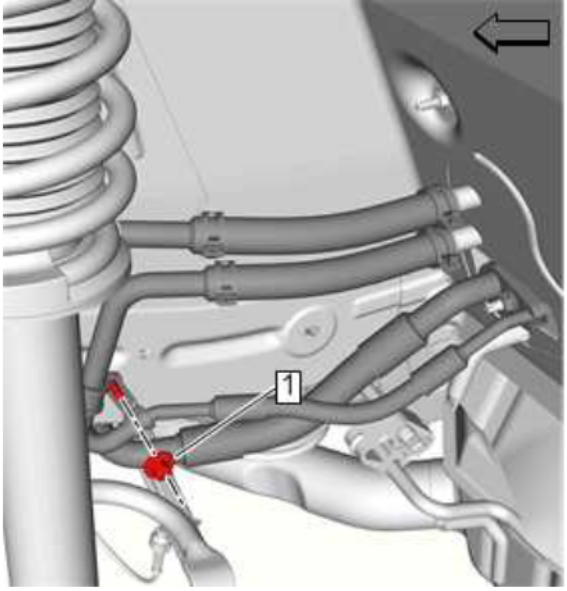


Fig. 124: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

13. Rear Suspension Cradle (1)Â» Install - **Rear Suspension Cradle Replacement**

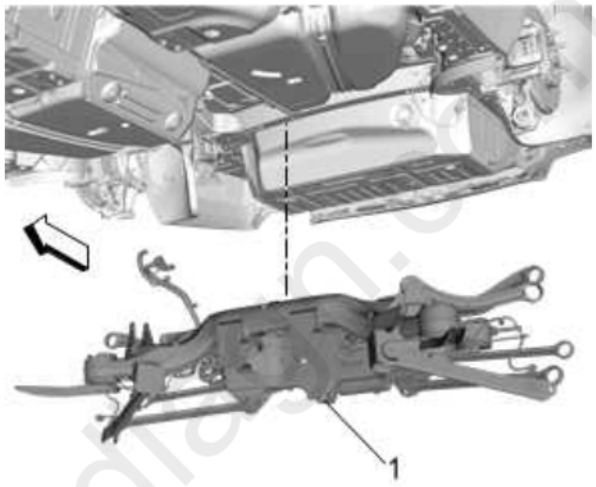


Fig. 125: Rear Suspension Cradle
Courtesy of GENERAL MOTORS COMPANY

14. Fuel Tank Strap (2) - Left SideÂ» Install

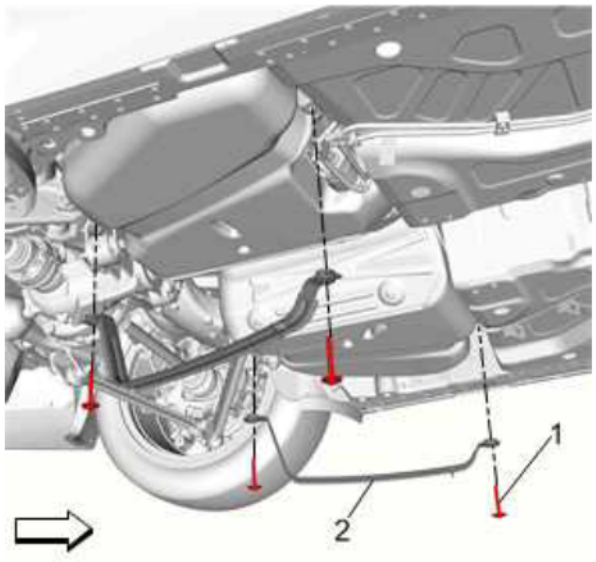


Fig. 126: Fuel Tank Strap
Courtesy of GENERAL MOTORS COMPANY

15. Remove the adjustable jack from under the fuel tank.
16. Underbody Rear Air Deflector - Left Side (2)Â» Install - **Underbody Rear Air Deflector Replacement - Left Side**

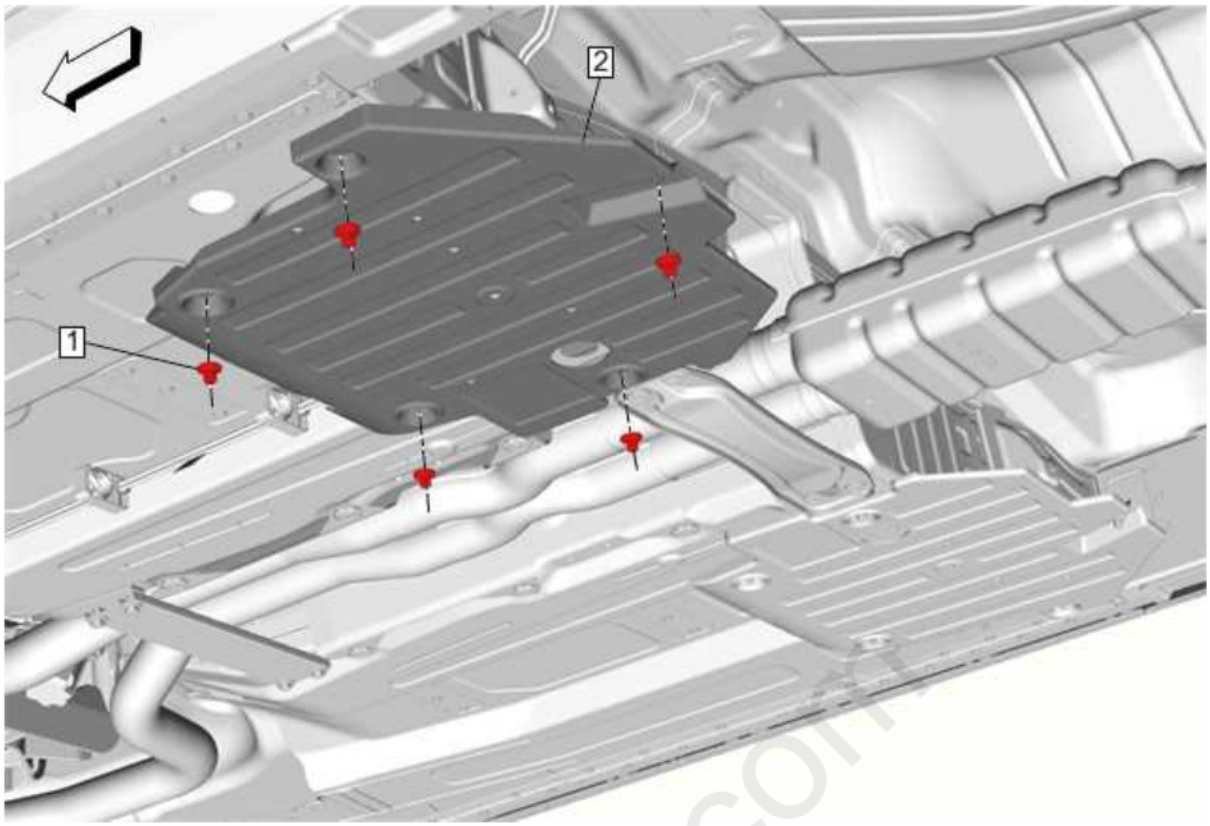


Fig. 127: Underbody Rear Air Deflector - Left Side
Courtesy of GENERAL MOTORS COMPANY

17. Front Body Exhaust Heat Shield - Left (3)Â» Install - **Front Body Exhaust Heat Shield Replacement (Right Side, LTG) Front Body Exhaust Heat Shield Replacement (Left Side, LTG) Front Body Exhaust Heat Shield Replacement (Right Side, LGW, LGX) Front Body Exhaust Heat Shield Replacement (Left Side, LGW, LGX)**

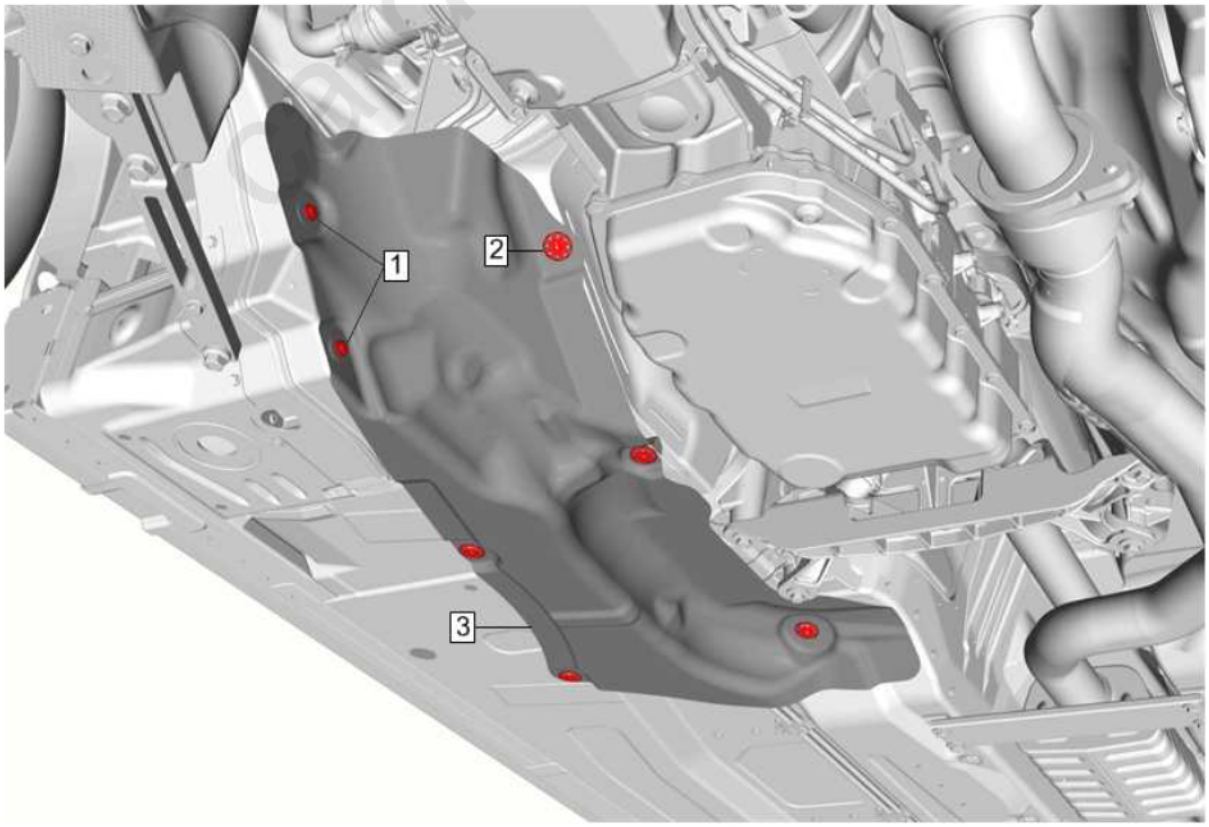


Fig. 128: Front Body Exhaust Heat Shield
Courtesy of GENERAL MOTORS COMPANY

18. Heater Inlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)Heater Inlet Hose Replacement (LTG with HP9)**

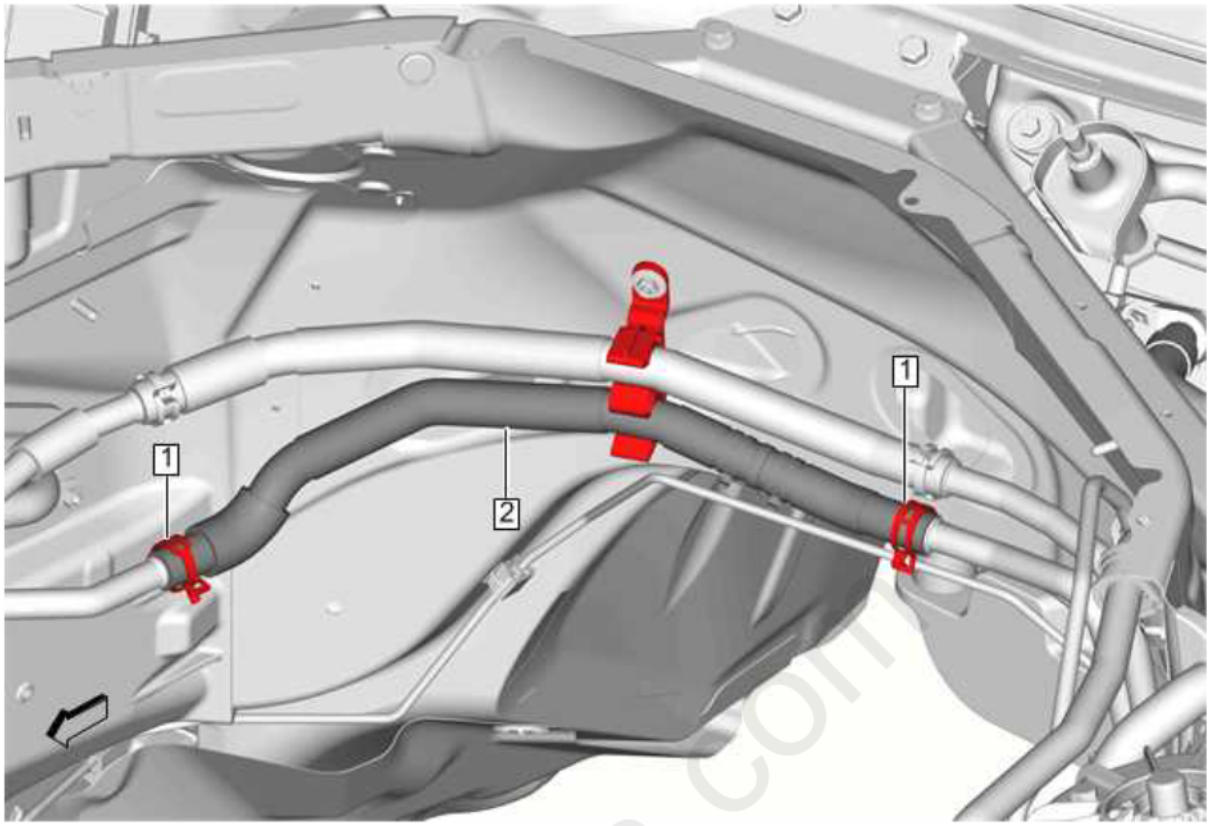


Fig. 129: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

19. Heater Outlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)Heater Outlet Hose Replacement (LTG with HP9)**

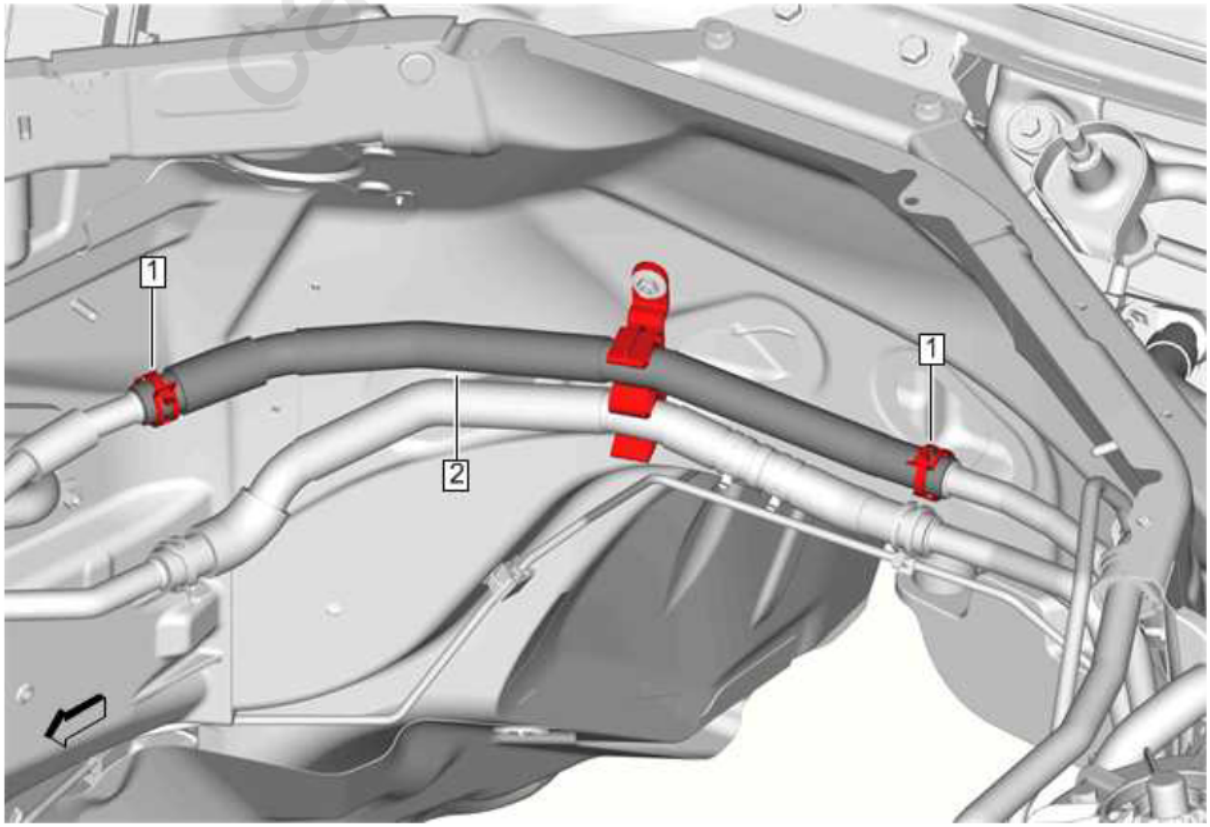


Fig. 130: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

20. Air Conditioning Refrigerant Heat Exchanger (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Air Conditioning Refrigerant Heat Exchanger Replacement (LTG)Air Conditioning Refrigerant Heat Exchanger Replacement (LGW, LGX)Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

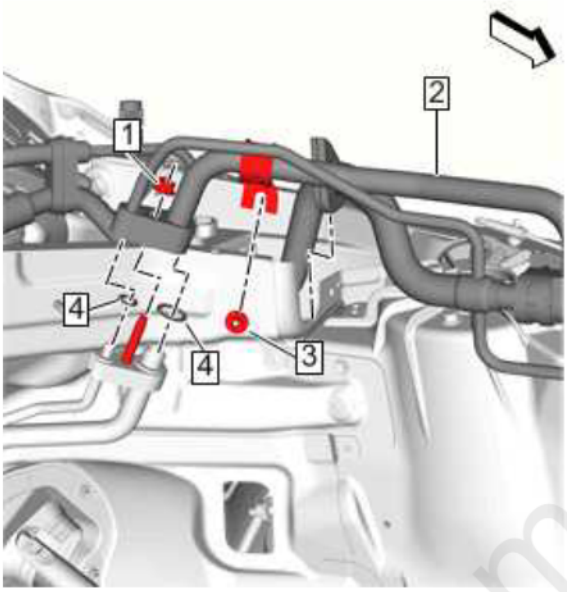


Fig. 131: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

21. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
22. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9) Cooling System Draining and Filling (GE 47716 without HP9) Cooling System Draining and Filling (Static LTG with HP9) Cooling System Draining and Filling (GE 47716 LTG with HP9)**
23. Inspect for refrigerant leaks.
24. Start the engine and check for coolant leaks.

AUXILIARY AIR CONDITIONING EVAPORATOR INTERMEDIATE TUBE REPLACEMENT (WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the High Voltage Battery System. Refer to **High Voltage Battery Drain and Filling (Without Heater Vent Hose Quick Connect)** and/or **High Voltage Battery Drain and Filling (With Heater Vent Hose Quick Connect)**
4. Air Conditioning Refrigerant Heat Exchanger (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

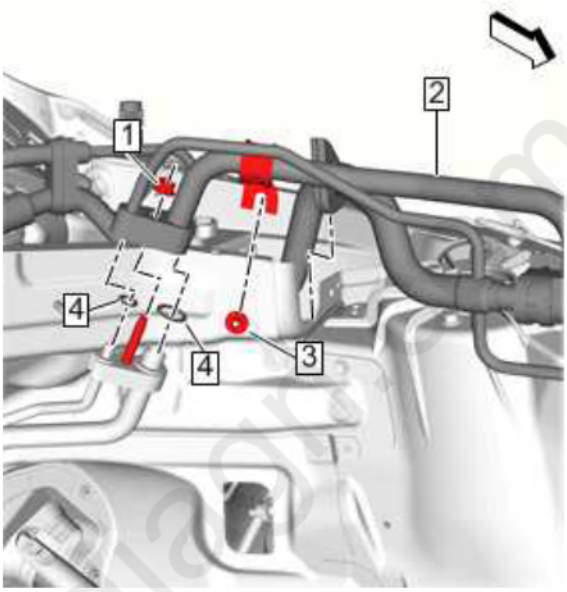


Fig. 132: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

5. Heater Outlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Heater Outlet Hose Replacement (LTG with HP9)**

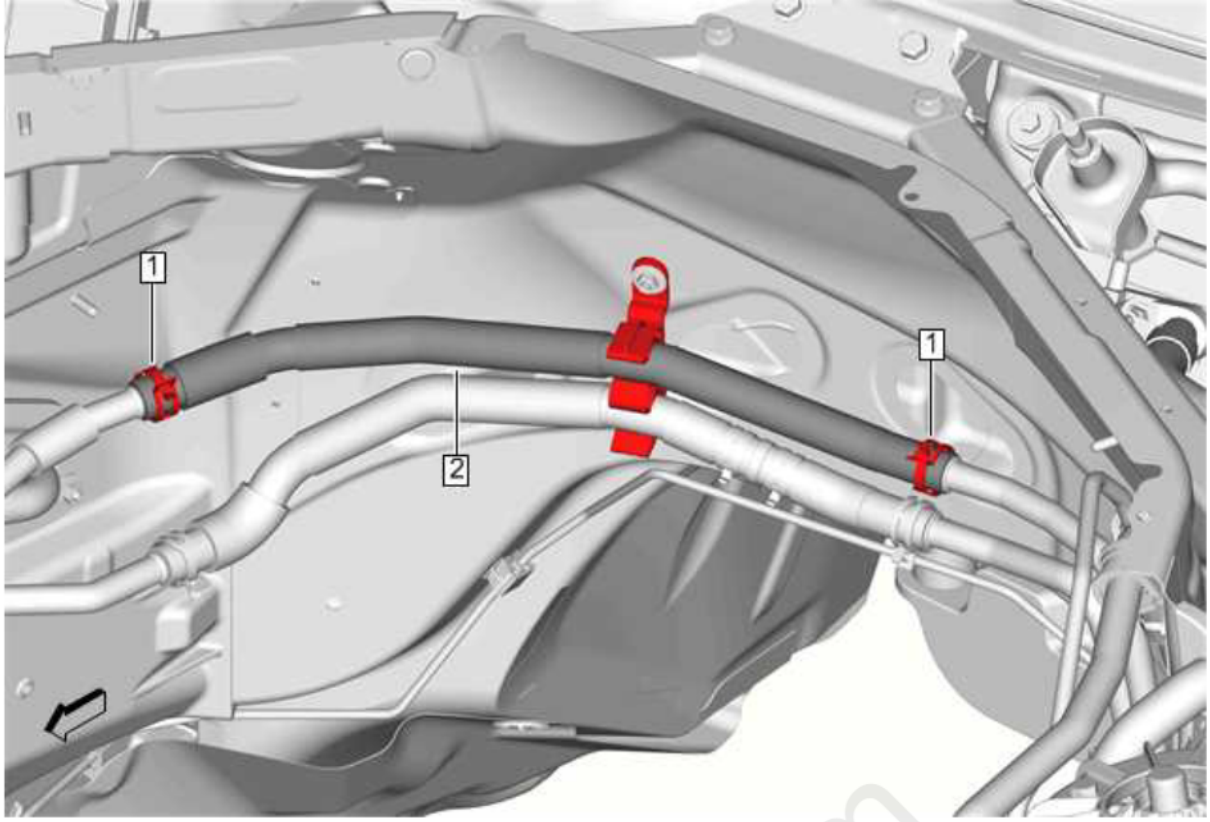


Fig. 133: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Inlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Heater Inlet Hose Replacement (LTG with HP9)**

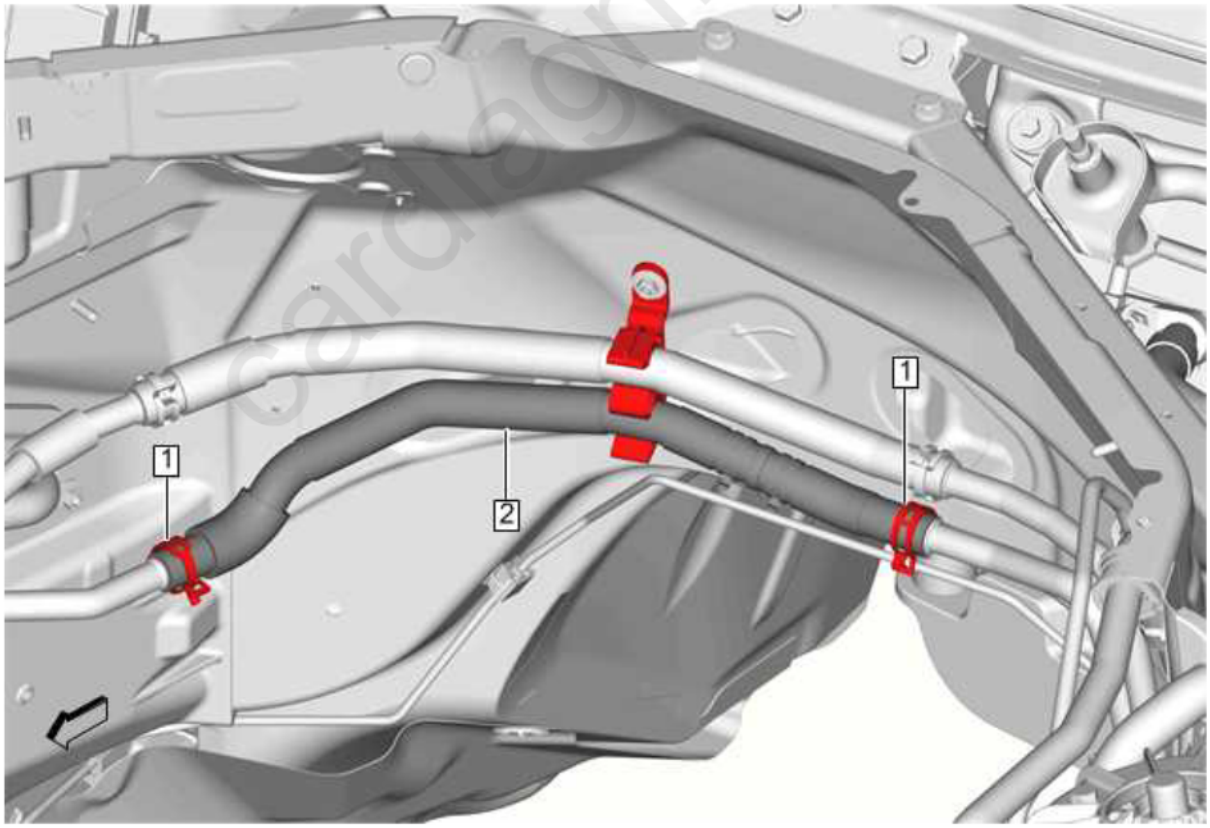


Fig. 134: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Front Body Exhaust Heat Shield - Left (3)Â» Remove - **Front Body Exhaust Heat Shield Replacement (Right Side, LTG) Front Body Exhaust Heat Shield Replacement (Left Side, LTG) Front Body Exhaust Heat Shield Replacement (Right Side, LGW, LGX) Front Body Exhaust Heat Shield Replacement (Left Side, LGW, LGX)**

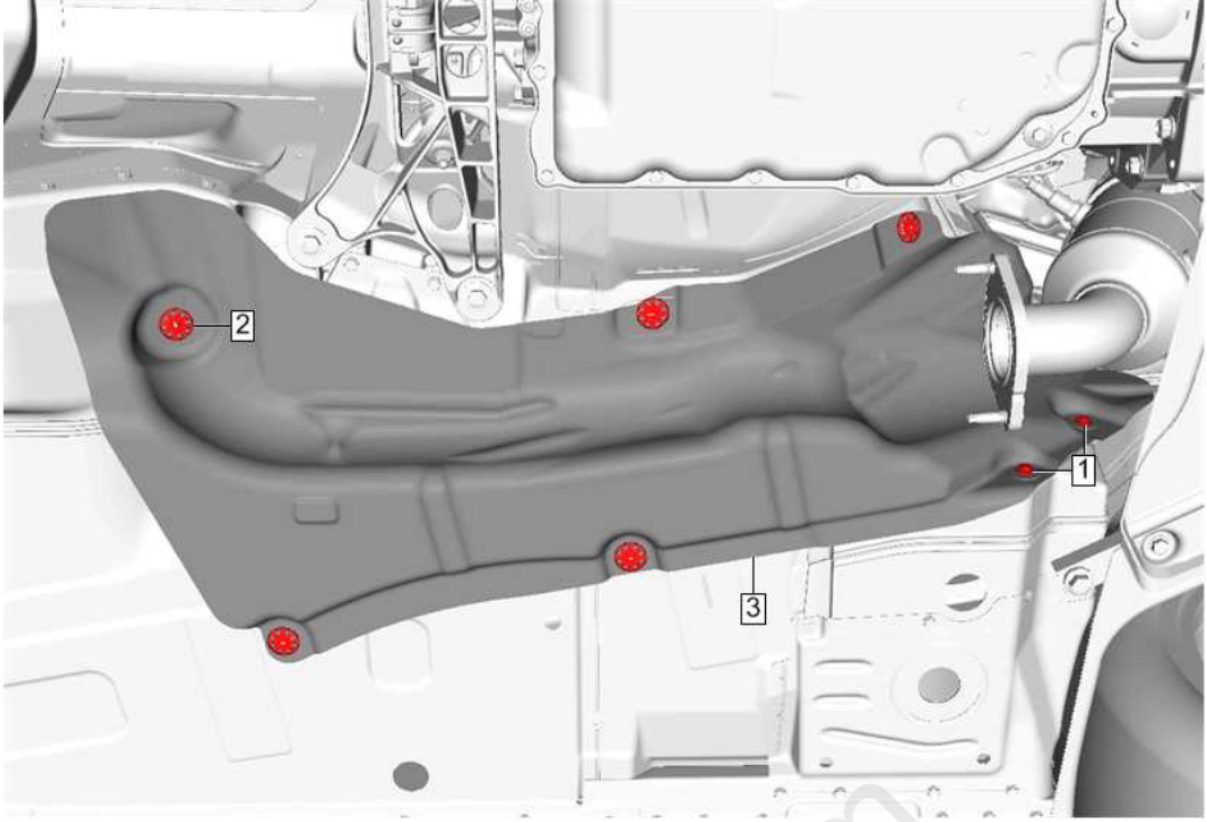


Fig. 135: Front Body Exhaust Heat Shield
Courtesy of GENERAL MOTORS COMPANY

8. Underbody Rear Air Deflector - Left Side (2)Â» Remove - **Underbody Rear Air Deflector Replacement - Left Side**

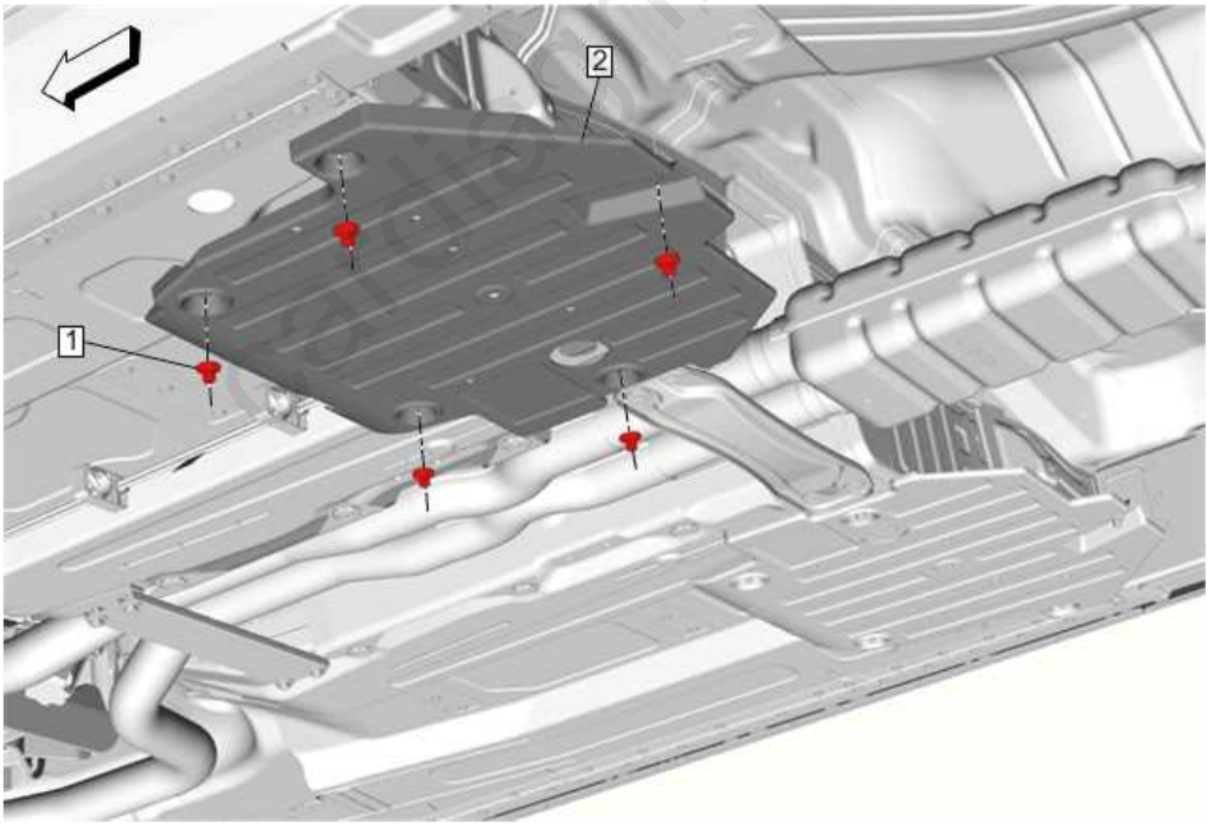


Fig. 136: Underbody Rear Air Deflector - Left Side
Courtesy of GENERAL MOTORS COMPANY

9. Place a suitable adjustable jack under the fuel tank.

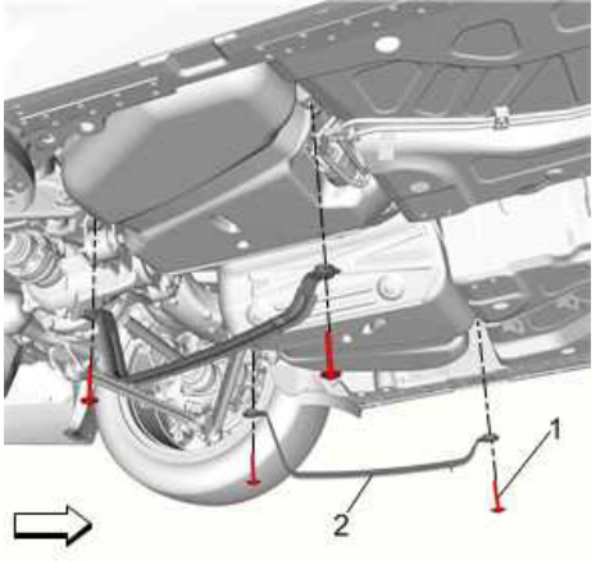


Fig. 137: Fuel Tank Strap
Courtesy of GENERAL MOTORS COMPANY

10. Fuel Tank Strap (2) - Left SideÂ» Remove - **Fuel Tank Replacement**
11. Rear Suspension Cradle (1)Â» Remove - **Rear Suspension Cradle Replacement**

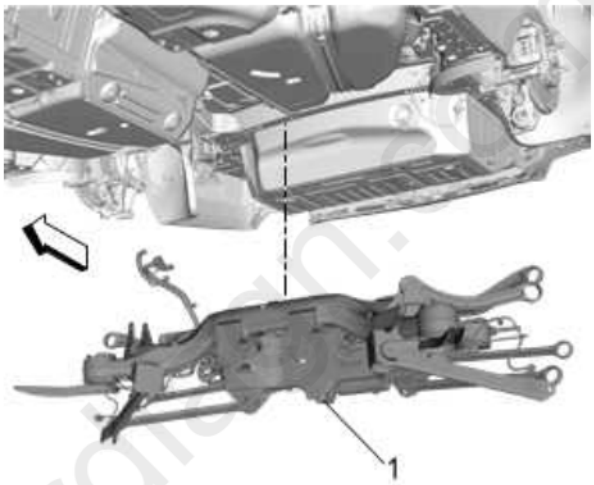


Fig. 138: Rear Suspension Cradle
Courtesy of GENERAL MOTORS COMPANY

12. Generator Control Module Coolant Outlet Hose - Outlet (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Generator Control Module Coolant Outlet Hose Replacement (Outlet)**

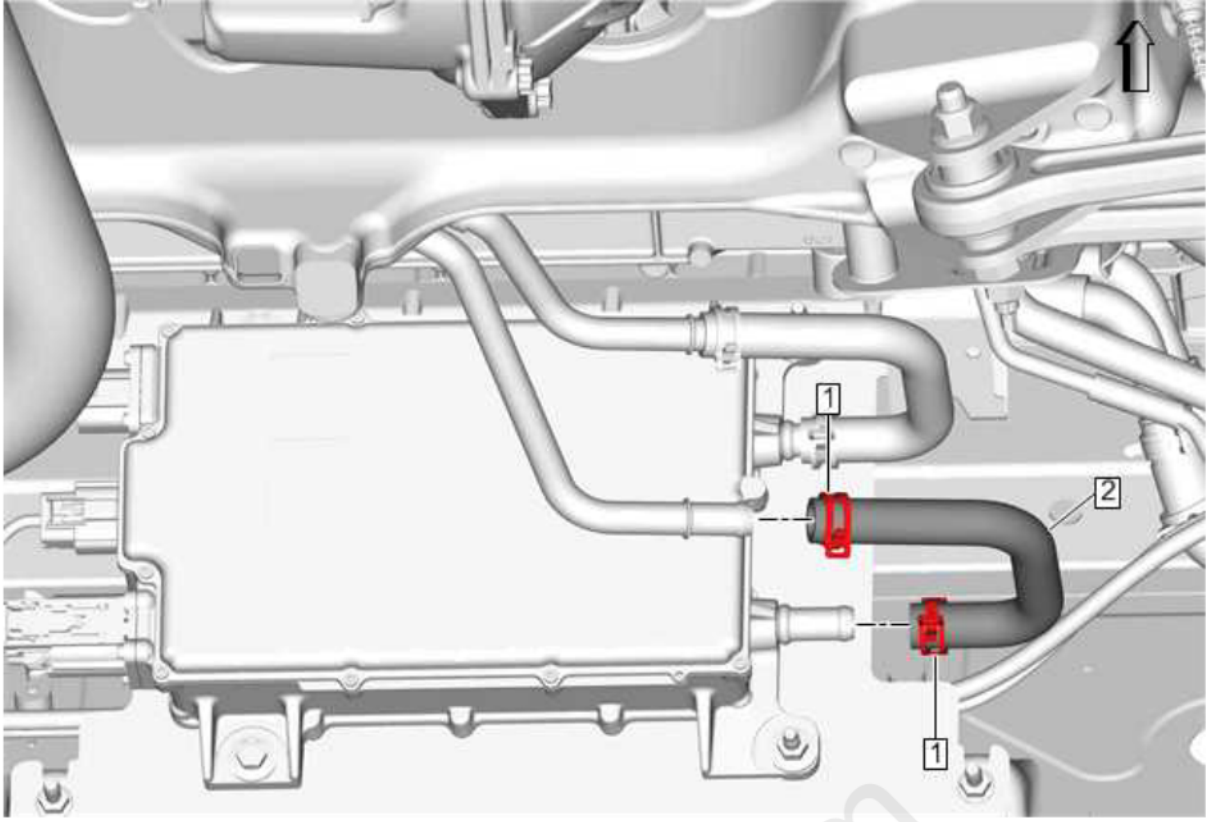


Fig. 139: Generator Control Module Coolant Outlet Hose - Outlet
Courtesy of GENERAL MOTORS COMPANY

13. Generator Control Module Coolant Inlet Hose - Inlet (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Remove - **Generator Control Module Coolant Outlet Hose Replacement (Inlet)**

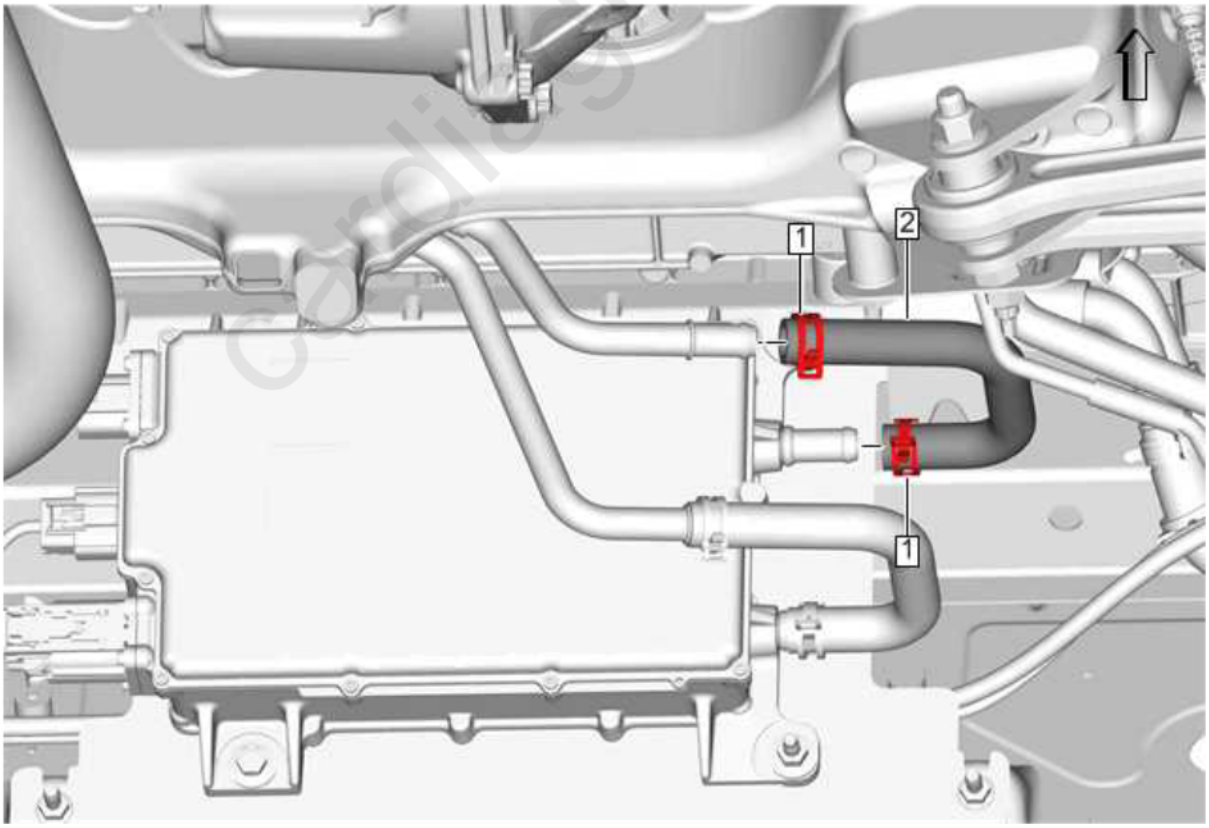


Fig. 140: Generator Control Module Coolant Inlet Hose - Inlet
Courtesy of GENERAL MOTORS COMPANY

14. Air Conditioning Evaporator Thermal Expansion Valve Nut (1) @ Auxiliary Air Conditioning Evaporator Intermediate Tube (2)Â» Remove

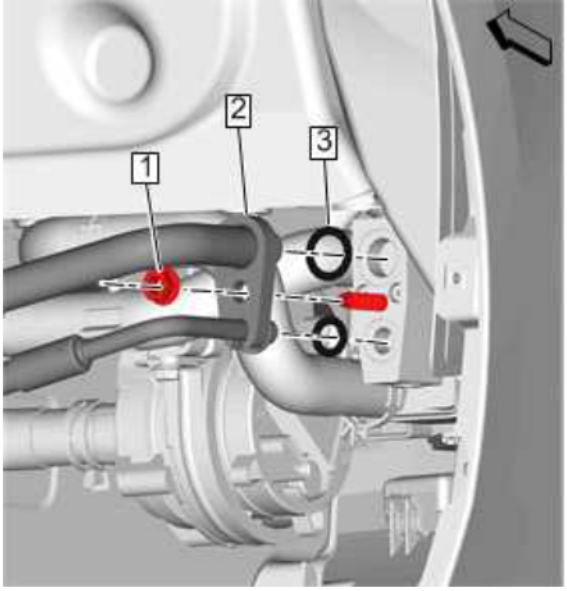


Fig. 141: Air Conditioning Evaporator Thermal Expansion Valve Nut
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove
16. Remove and DISCARD the sealing washer. (3) [2x] **Air Conditioning System Seal Replacement**
17. Auxiliary Air Conditioning Evaporator Intermediate Tube (2)Â» Support using a suitable fixture

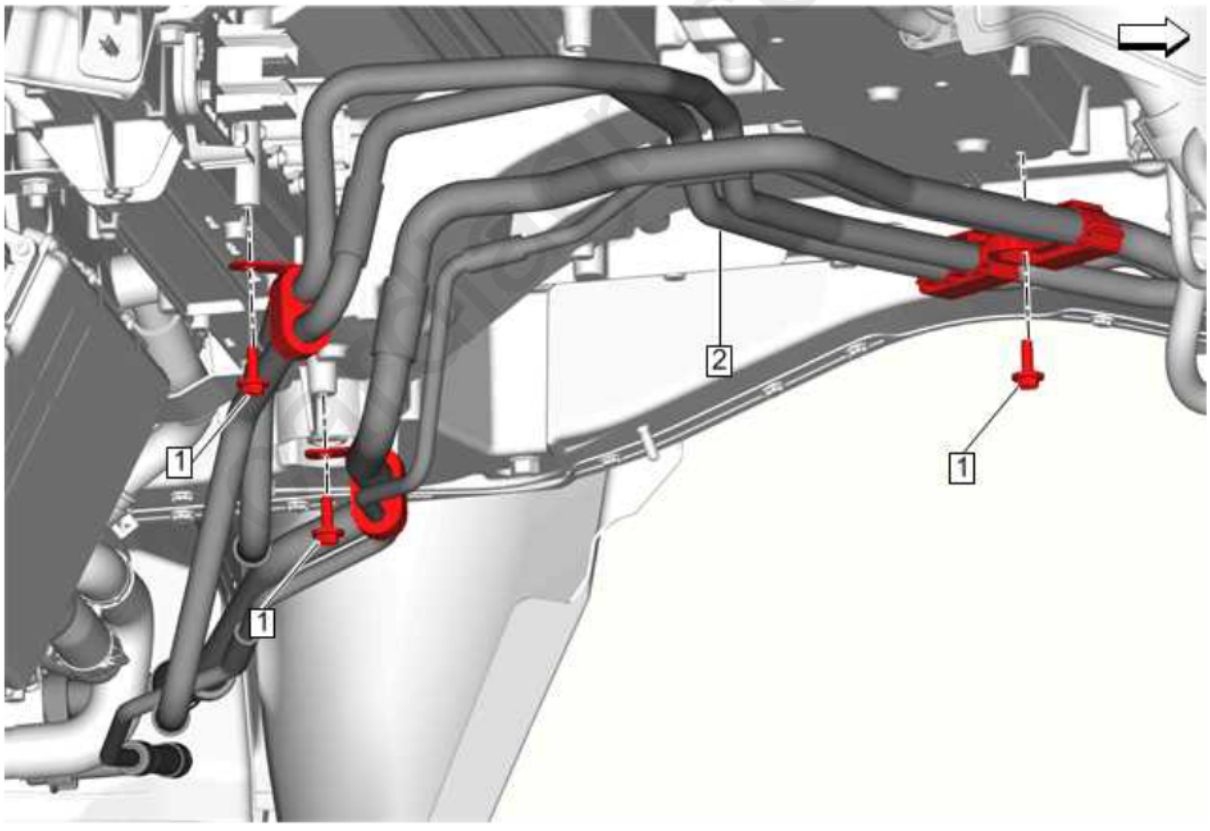


Fig. 142: Auxiliary Air Conditioning Evaporator Intermediate Tube Bolts
Courtesy of GENERAL MOTORS COMPANY

18. Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt (1)Â» Remove [3x]
19. Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt (1)Â» Remove

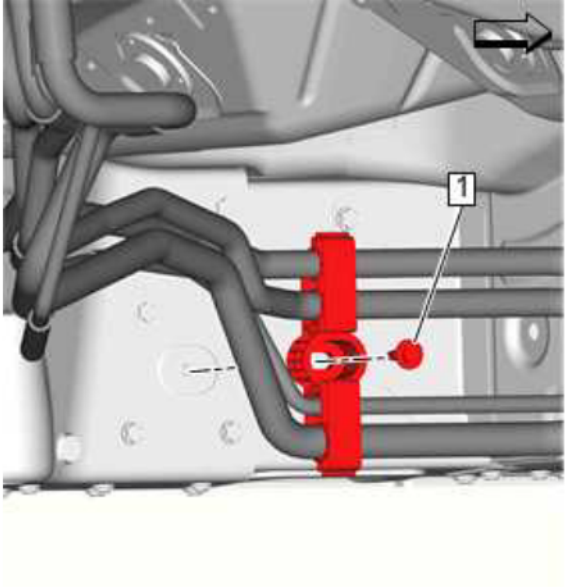


Fig. 143: Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt
Courtesy of GENERAL MOTORS COMPANY

20. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1) [2x]Â» Remove

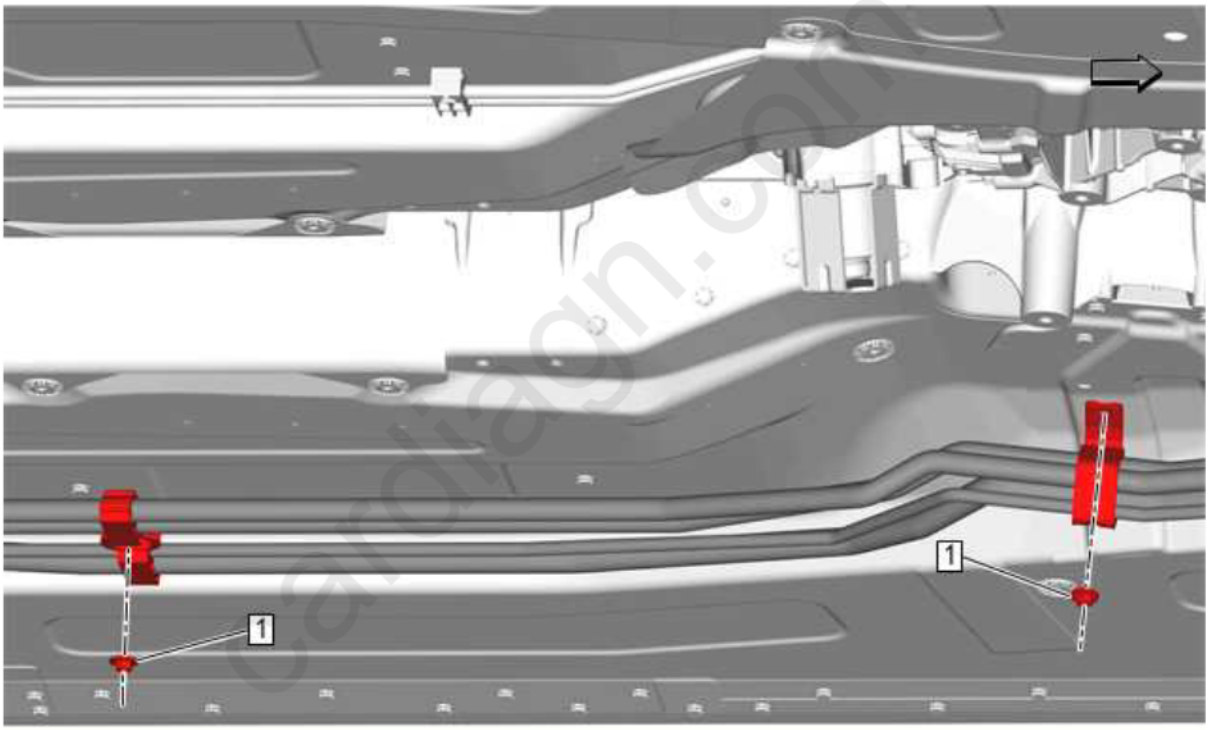


Fig. 144: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

21. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Remove

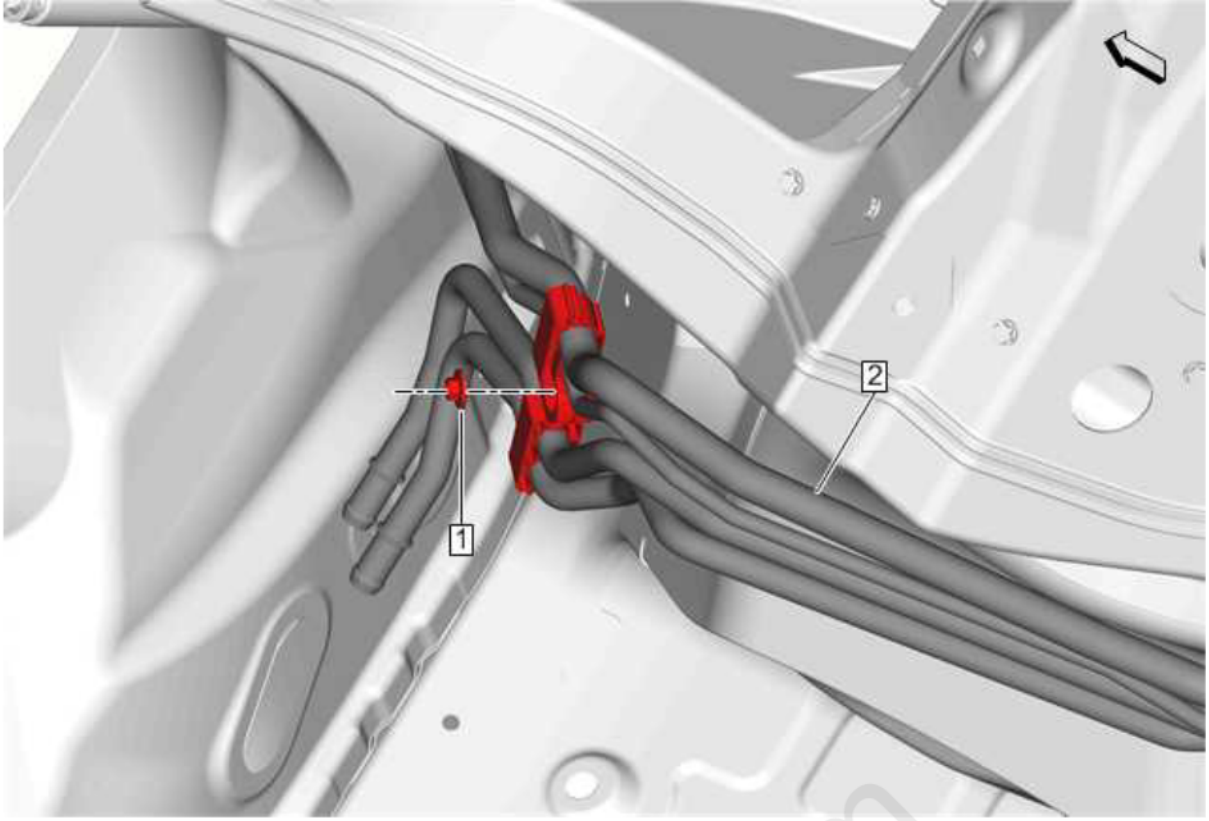


Fig. 145: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

22. Remove the auxiliary air conditioning evaporator intermediate tube (3) from the vehicle.

Installation Procedure

1. Install the auxiliary air conditioning evaporator intermediate tube (2) in the proper position using a suitable support.

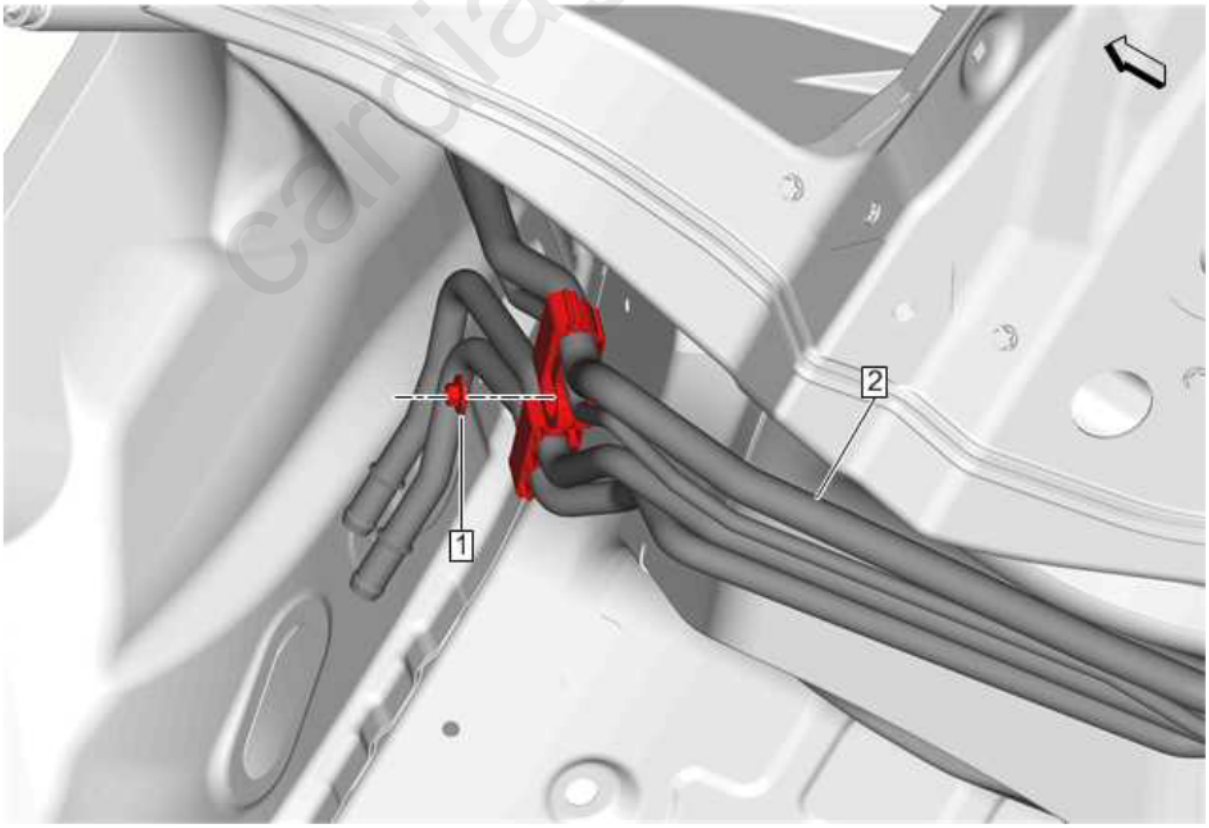


Fig. 146: Auxiliary Air Conditioning Evaporator Intermediate Tube
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Install and tighten 5 N.m (44 lb in)

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CAUTION: Refer to Fastener Caution .

3. Auxiliary Air Conditioning Evaporator Intermediate Tube Nut (1)Â» Install and tighten [2x] 5 N.m (44 lb in)

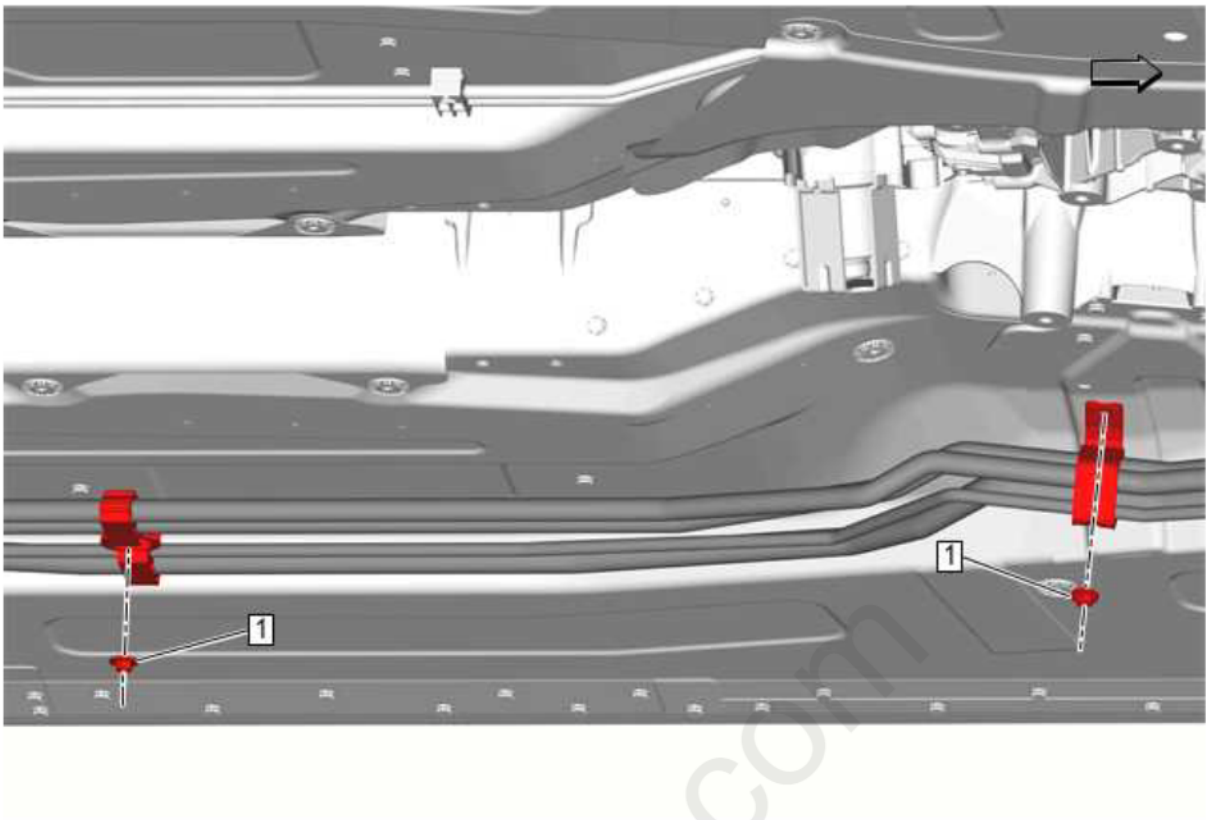


Fig. 147: Auxiliary Air Conditioning Evaporator Intermediate Tube Nut
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt (1)Â» Install and tighten 5 N.m (44 lb in)

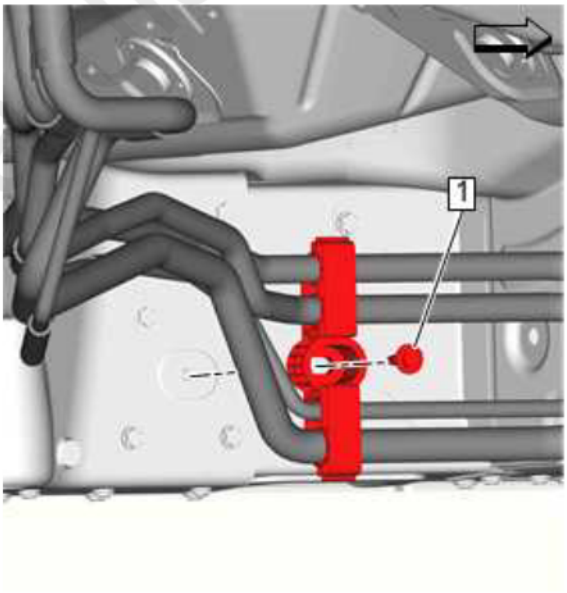


Fig. 148: Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator Intermediate Tube Bolt (2)Â» Install and tighten [3x] 5 N.m (44 lb in)

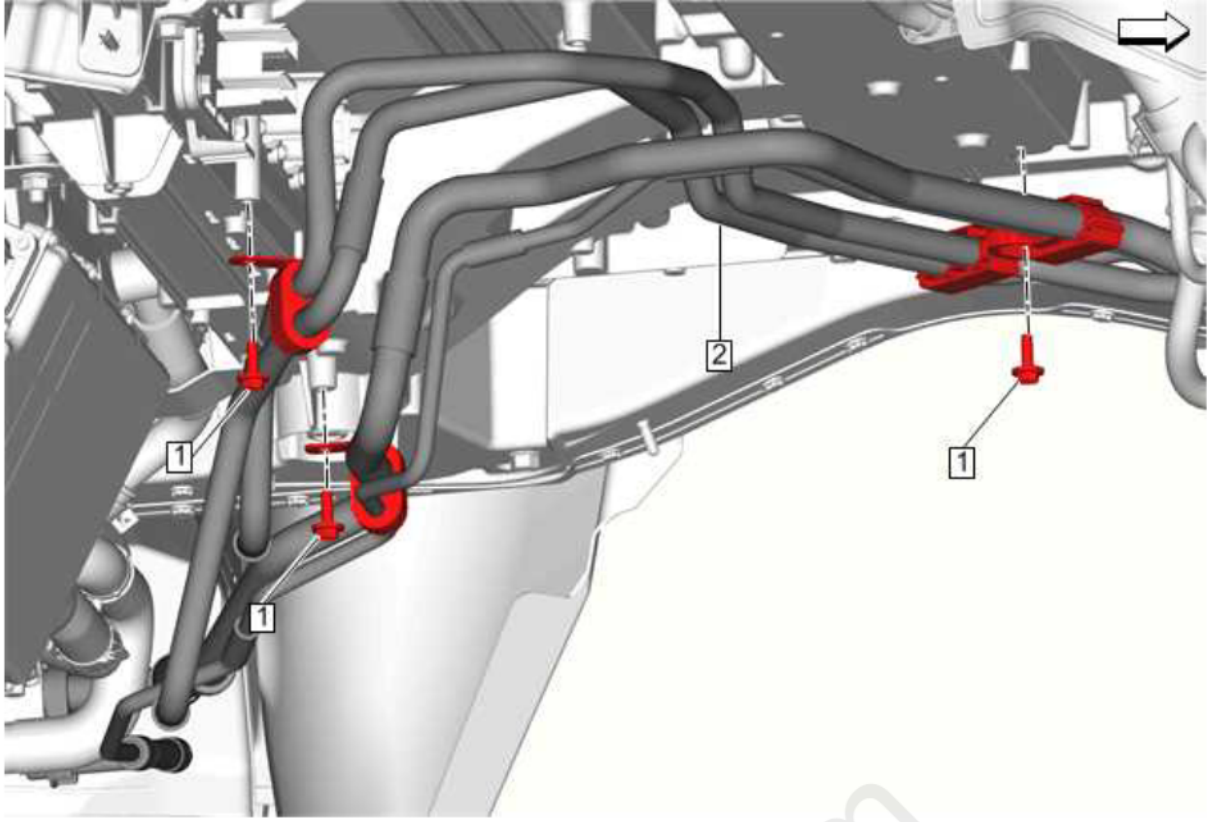


Fig. 149: Auxiliary Air Conditioning Evaporator Intermediate Tube Bolts
Courtesy of GENERAL MOTORS COMPANY

6. Remove support.
7. Install NEW sealing washers. (3) [2x] - **Air Conditioning System Seal Replacement**

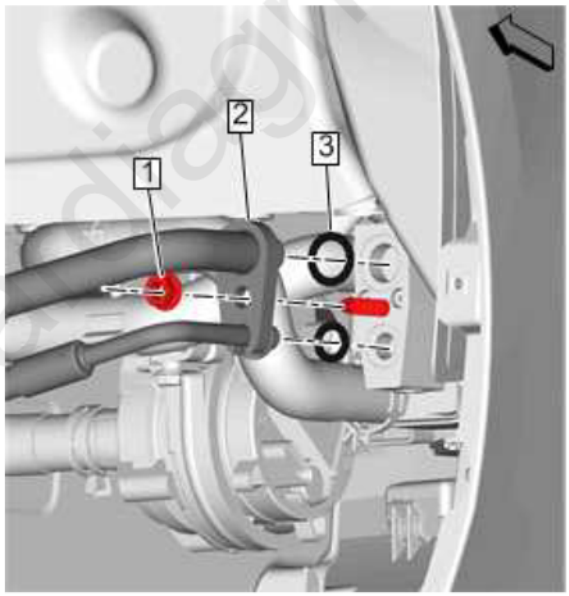


Fig. 150: Sealing Washers
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install
9. Air Conditioning Evaporator Thermal Expansion Valve Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
10. Generator Control Module Coolant Inlet Hose - Inlet (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Generator Control Module Coolant Outlet Hose Replacement (Inlet)**

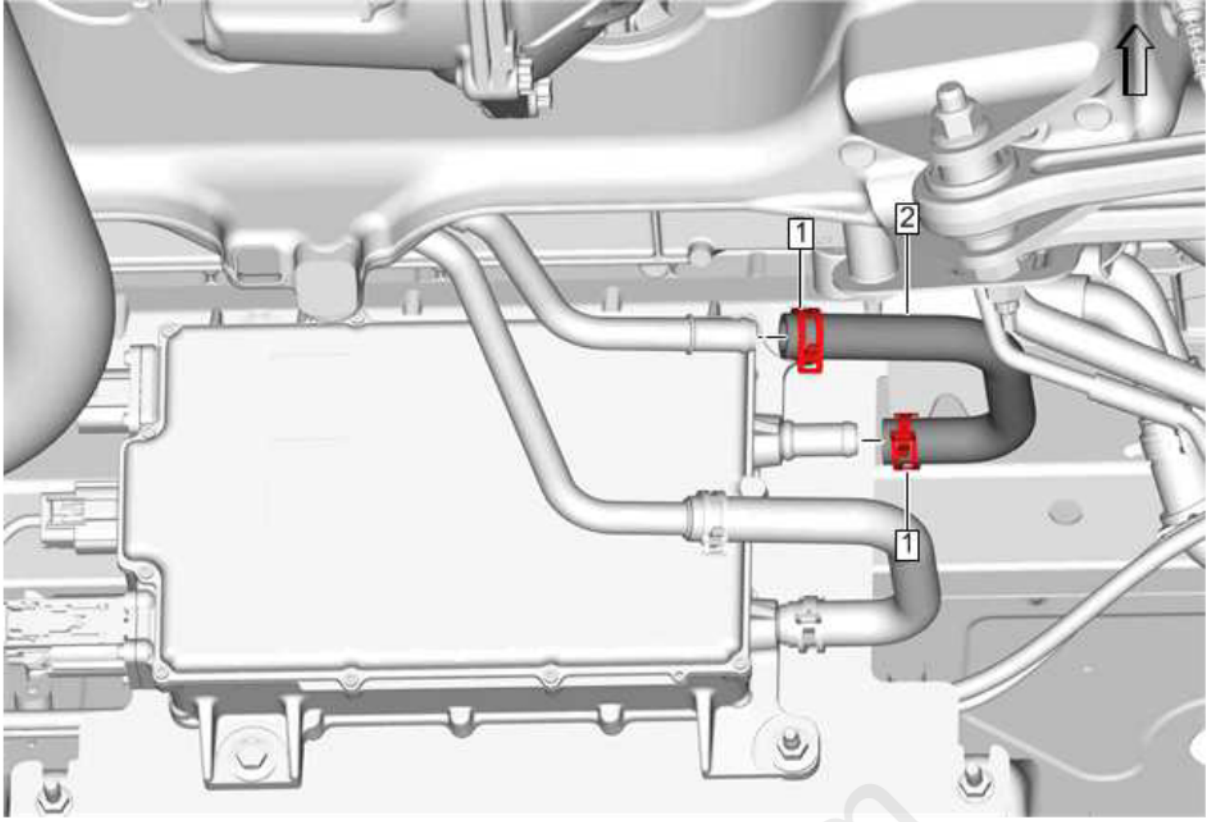


Fig. 151: Generator Control Module Coolant Inlet Hose - Inlet
Courtesy of GENERAL MOTORS COMPANY

11. Generator Control Module Coolant Outlet Hose - Outlet (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Generator Control Module Coolant Outlet Hose Replacement (Outlet)**

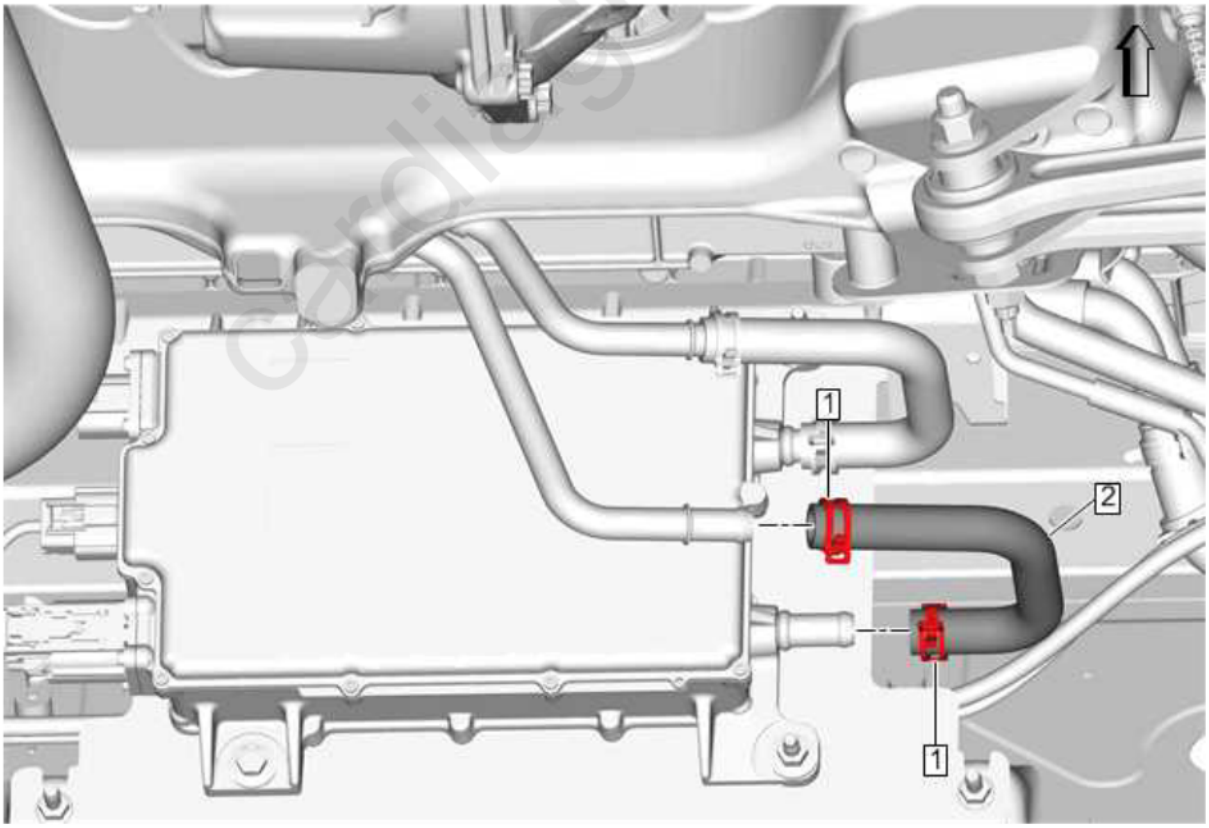


Fig. 152: Generator Control Module Coolant Outlet Hose - Outlet
Courtesy of GENERAL MOTORS COMPANY

12. Rear Suspension Cradle (1)Â» Install - **Rear Suspension Cradle Replacement**

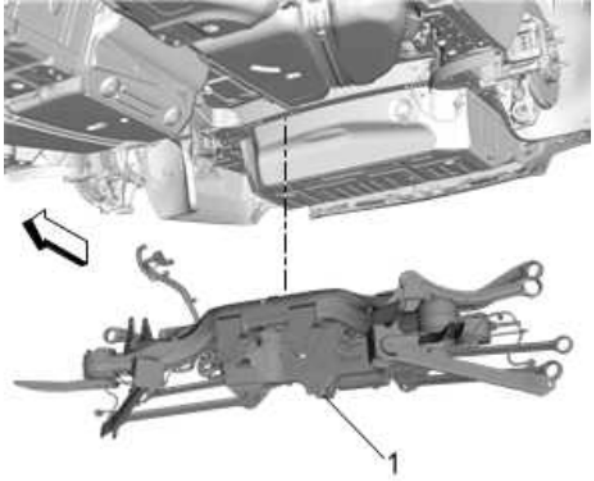


Fig. 153: Rear Suspension Cradle
Courtesy of GENERAL MOTORS COMPANY

13. Fuel Tank Strap (2) - Left SideÂ» Install - **Fuel Tank Replacement**

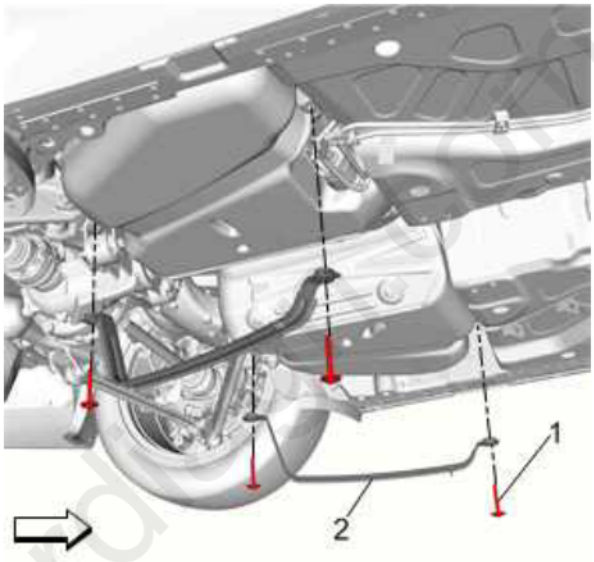


Fig. 154: Fuel Tank Strap
Courtesy of GENERAL MOTORS COMPANY

14. Remove the adjustable jack from under the fuel tank.
15. Underbody Rear Air Deflector - Left Side (2)Â» Install - **Underbody Rear Air Deflector Replacement - Left Side**

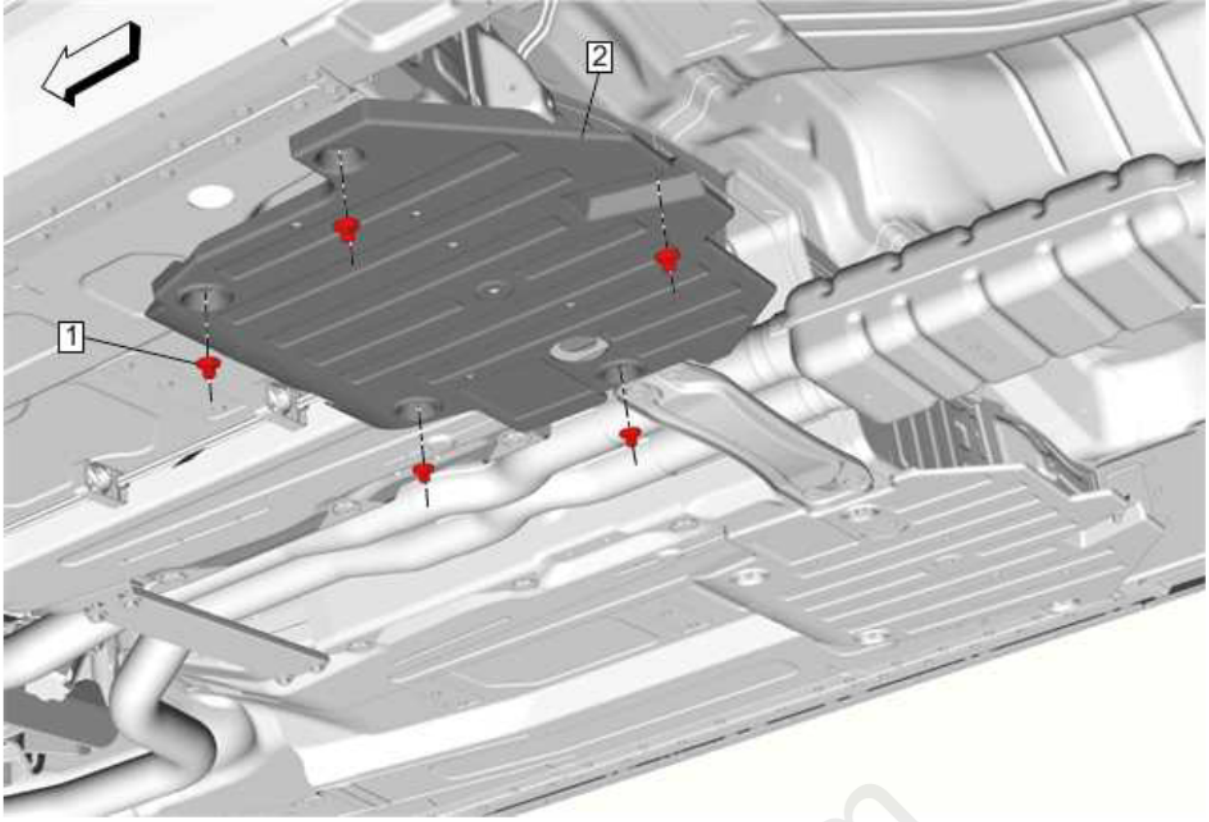


Fig. 155: Underbody Rear Air Deflector - Left Side
Courtesy of GENERAL MOTORS COMPANY

16. Front Body Exhaust Heat Shield - Left (3)Â» Install - **Front Body Exhaust Heat Shield Replacement (Right Side, LTG)** **Front Body Exhaust Heat Shield Replacement (Left Side, LTG)** **Front Body Exhaust Heat Shield Replacement (Right Side, LGW, LGX)** **Front Body Exhaust Heat Shield Replacement (Left Side, LGW, LGX)**

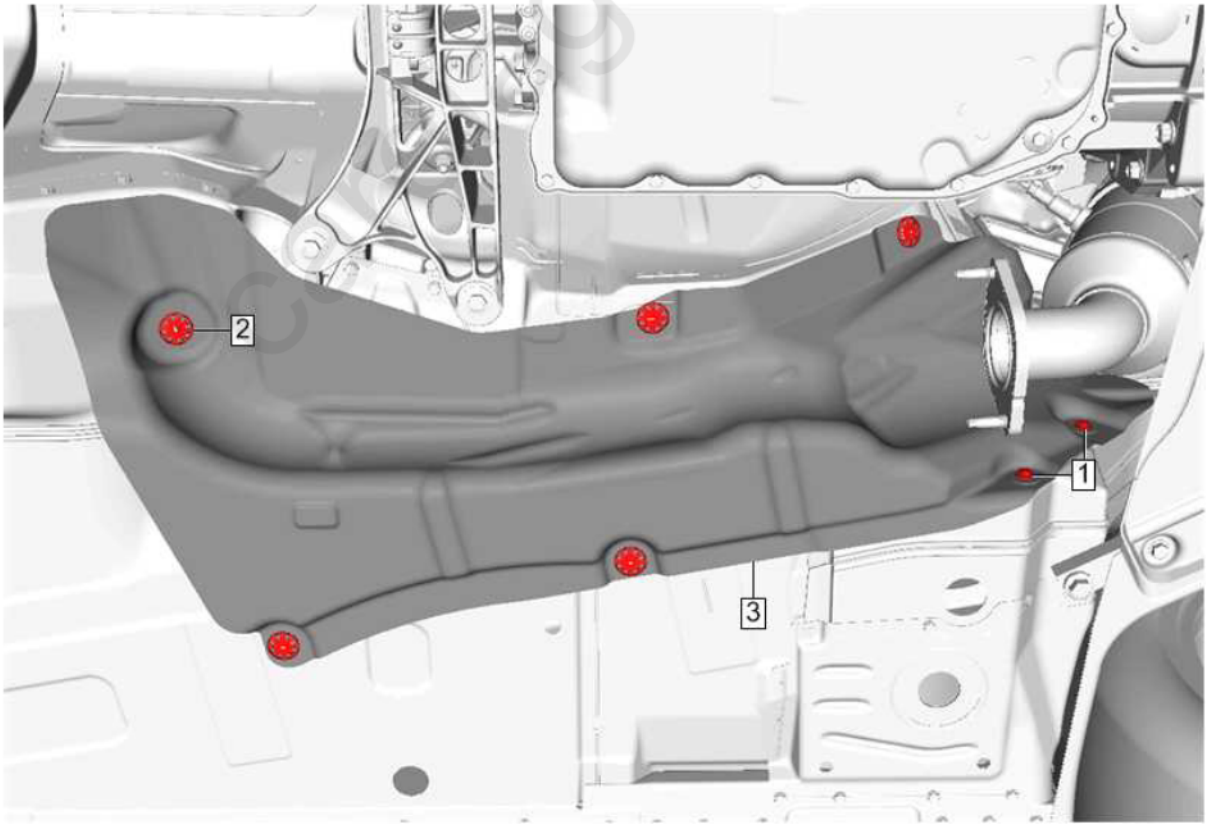


Fig. 156: Front Body Exhaust Heat Shield
Courtesy of GENERAL MOTORS COMPANY

17. Heater Inlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Heater Inlet Hose Replacement (LTG with HP9)**

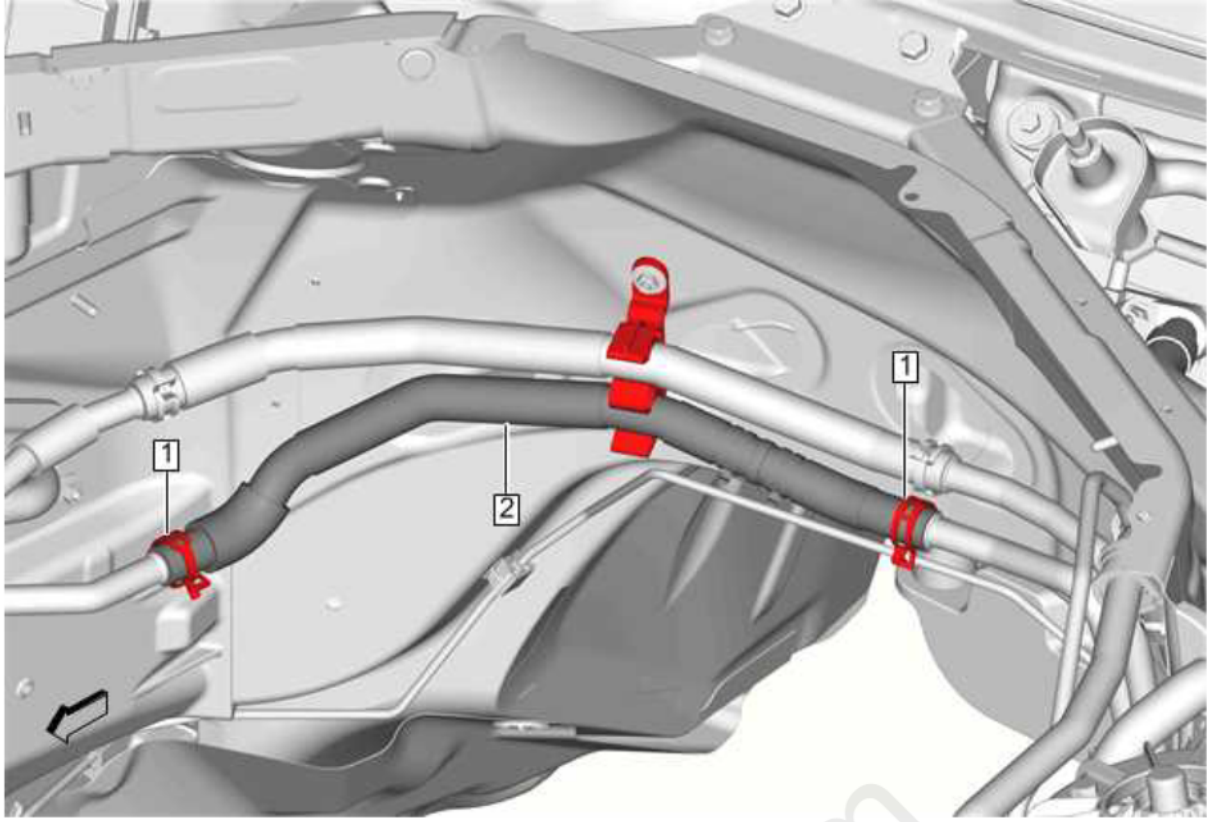


Fig. 157: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

18. Heater Outlet Hose (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Heater Outlet Hose Replacement (LTG with HP9)**

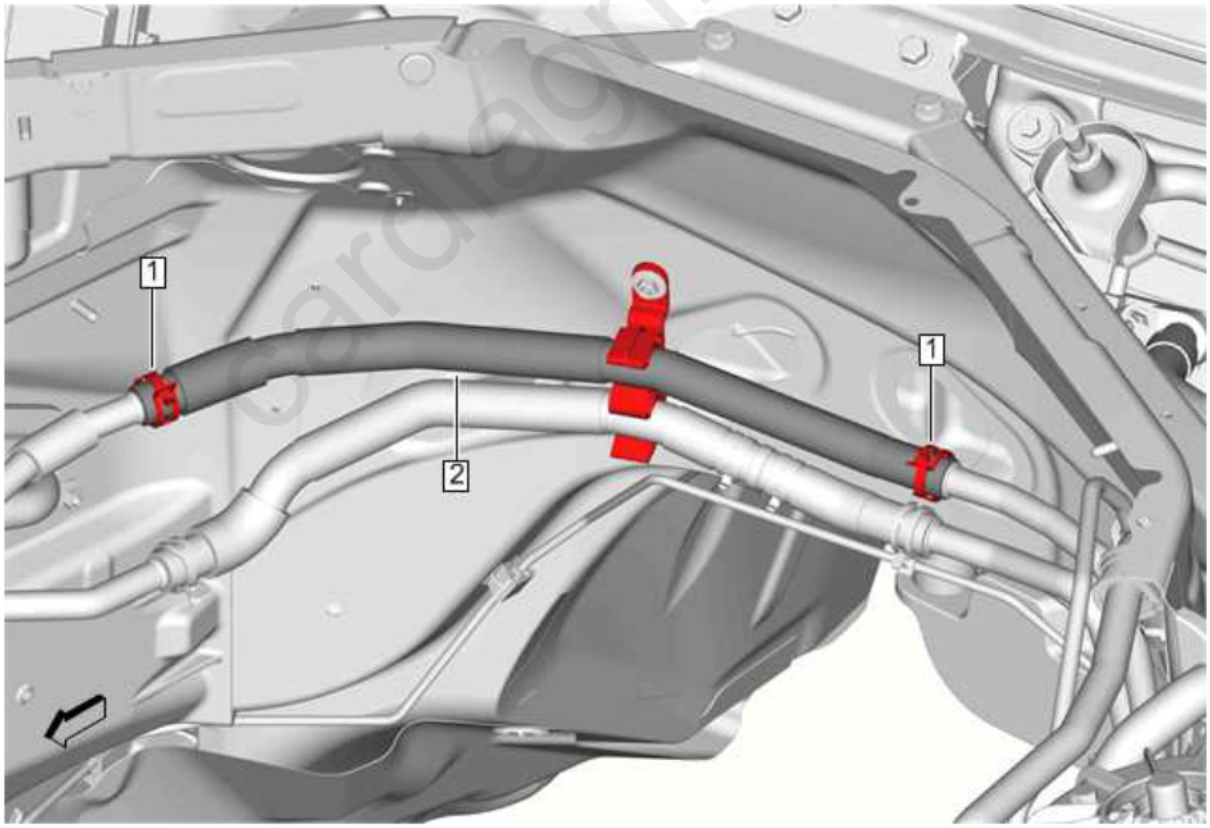


Fig. 158: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

19. Air Conditioning Refrigerant Heat Exchanger (2) @ Auxiliary Air Conditioning Evaporator Intermediate TubeÂ» Install - **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

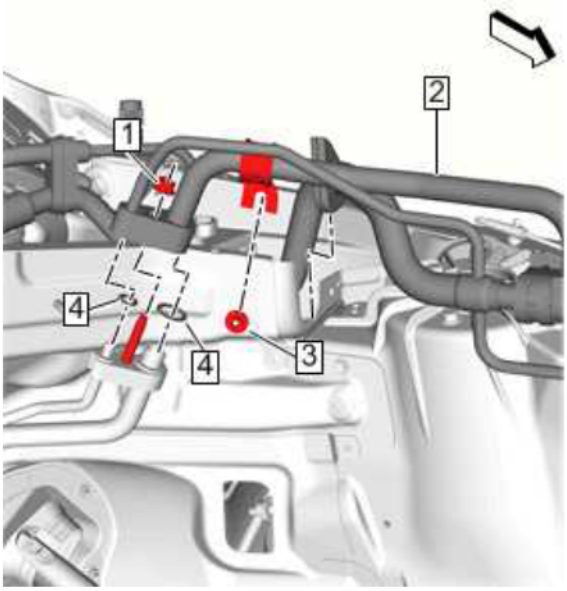


Fig. 159: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

20. Enable the high voltage system. Refer to **High Voltage Enabling**
21. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
22. Fill the cooling system to the proper level. Refer to **High Voltage Battery Drain and Filling (Without Heater Vent Hose Quick Connect)** and/or **High Voltage Battery Drain and Filling (With Heater Vent Hose Quick Connect)**
23. Inspect for refrigerant leaks.
24. Start the engine and check for coolant leaks.

AIR CONDITIONING REFRIGERANT SERVICE VALVE CORE REPLACEMENT

Special Tools

- **GE 50078** Electronic Leak Detector
- **GE 46246** Valve Core Tool

For equivalent regional tools. Refer to **Special Tools**.

Removal Procedure

1. Recover the refrigerant from the A/C system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**.

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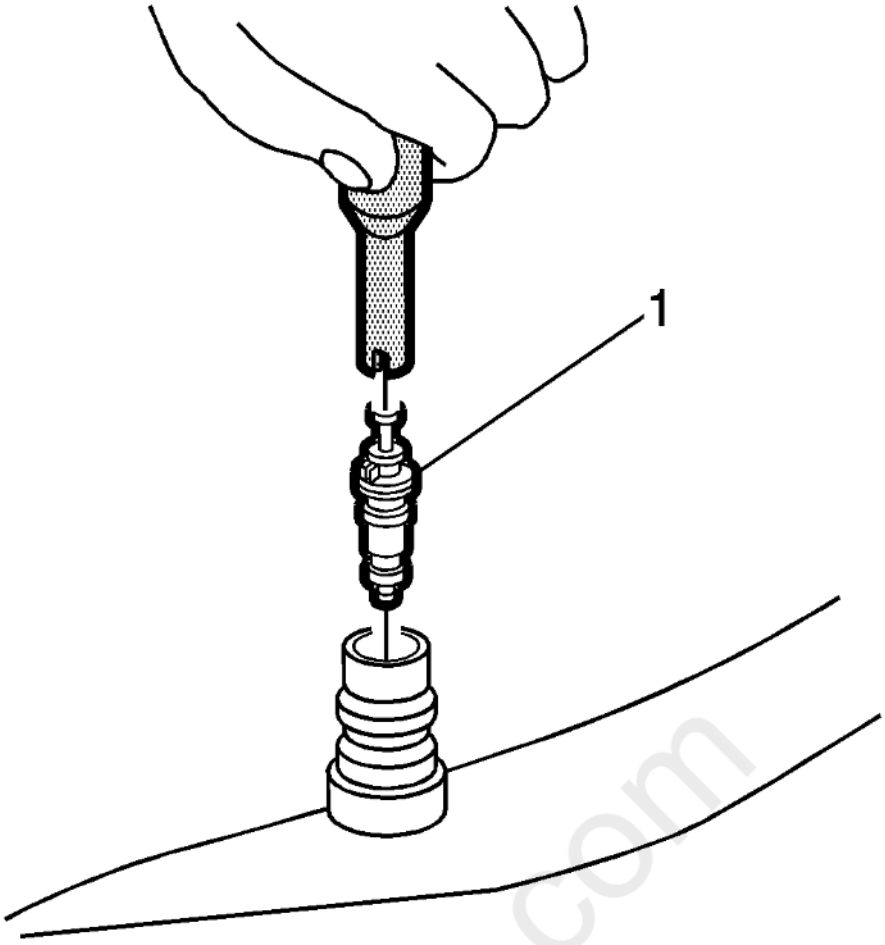


Fig. 160: Valve Core
Courtesy of GENERAL MOTORS COMPANY

2. Using the **GE 46246** Valve Core Tool, remove the valve core (1) from the service port.

Installation Procedure

1. Install the valve core (1) to the service port.

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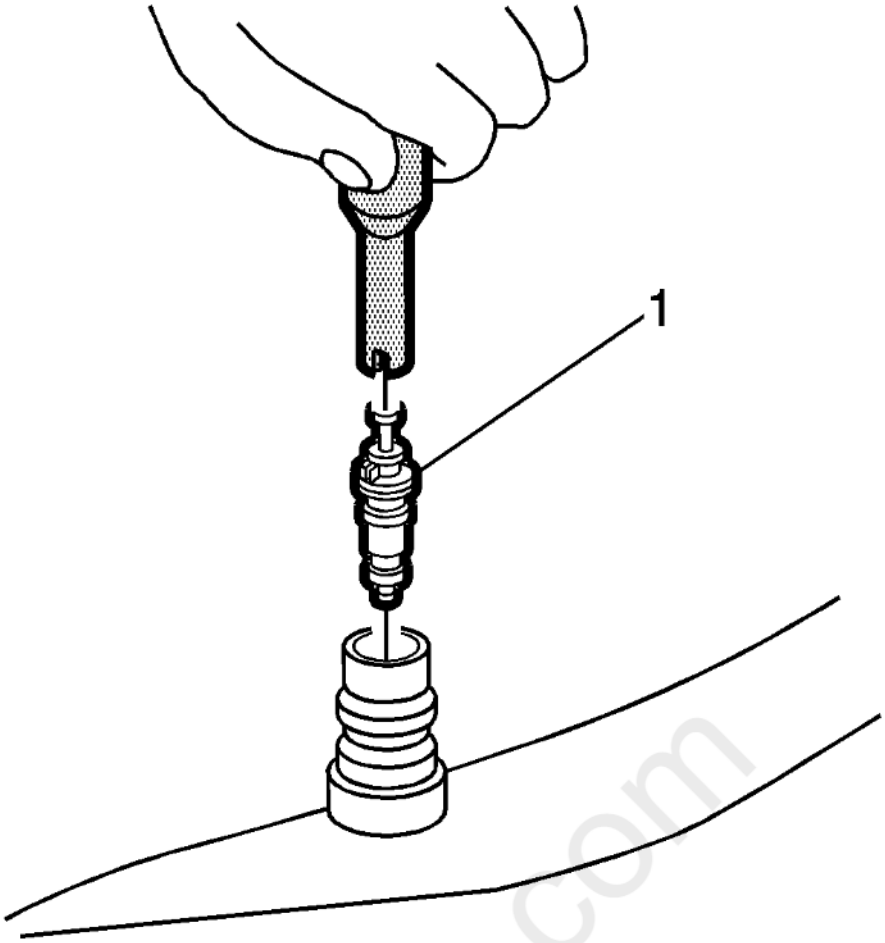


Fig. 161: Valve Core
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Using the **GE 46246** Valve Core Tool, tighten the valve core.
3. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**.
4. Leak test the fittings of the component using **GE 50078** Electronic Leak Detector.

RECEIVER AND DEHYDRATOR REPLACEMENT

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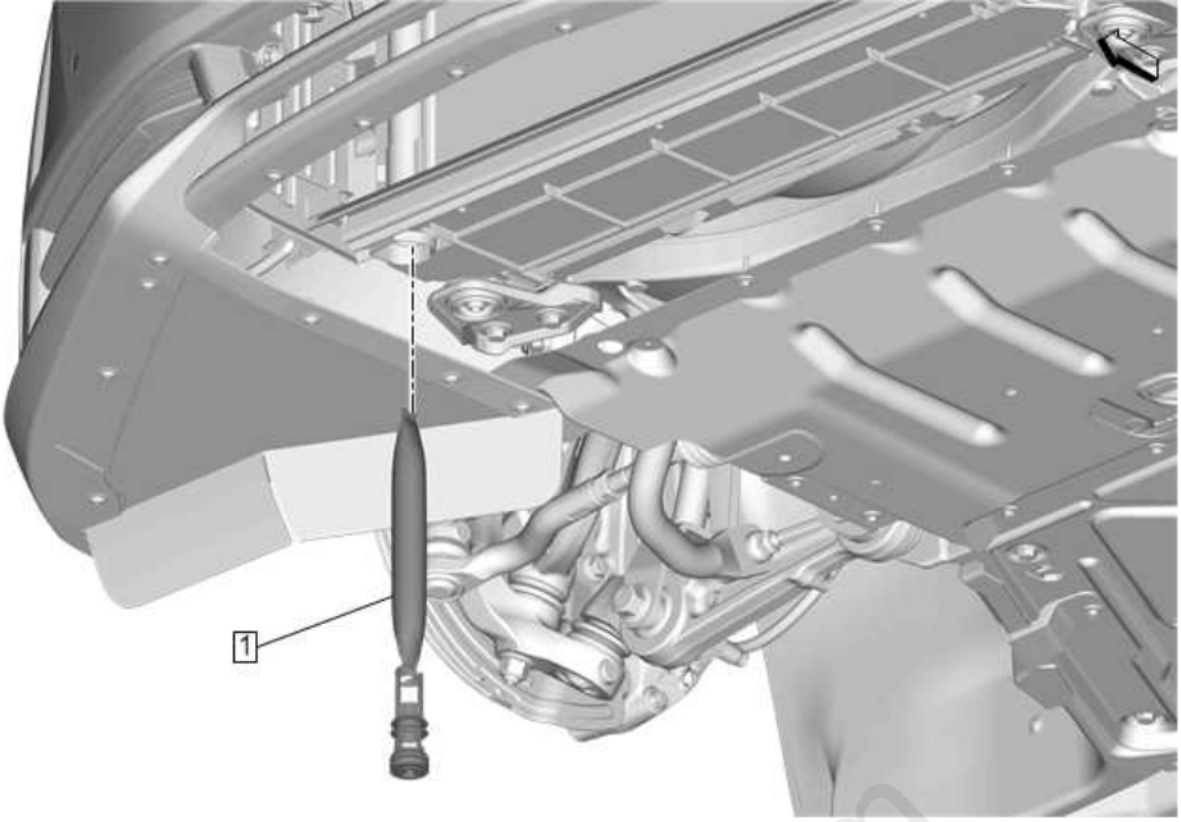


Fig. 162: Receiver and Dehydrator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf). 2. Front Bumper Fascia Lower Stiffener Replacement	
1	Air Conditioning Receiver and Dehydrator **CAUTION:** **Refer to Component Fastener Tightening Caution .** **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT

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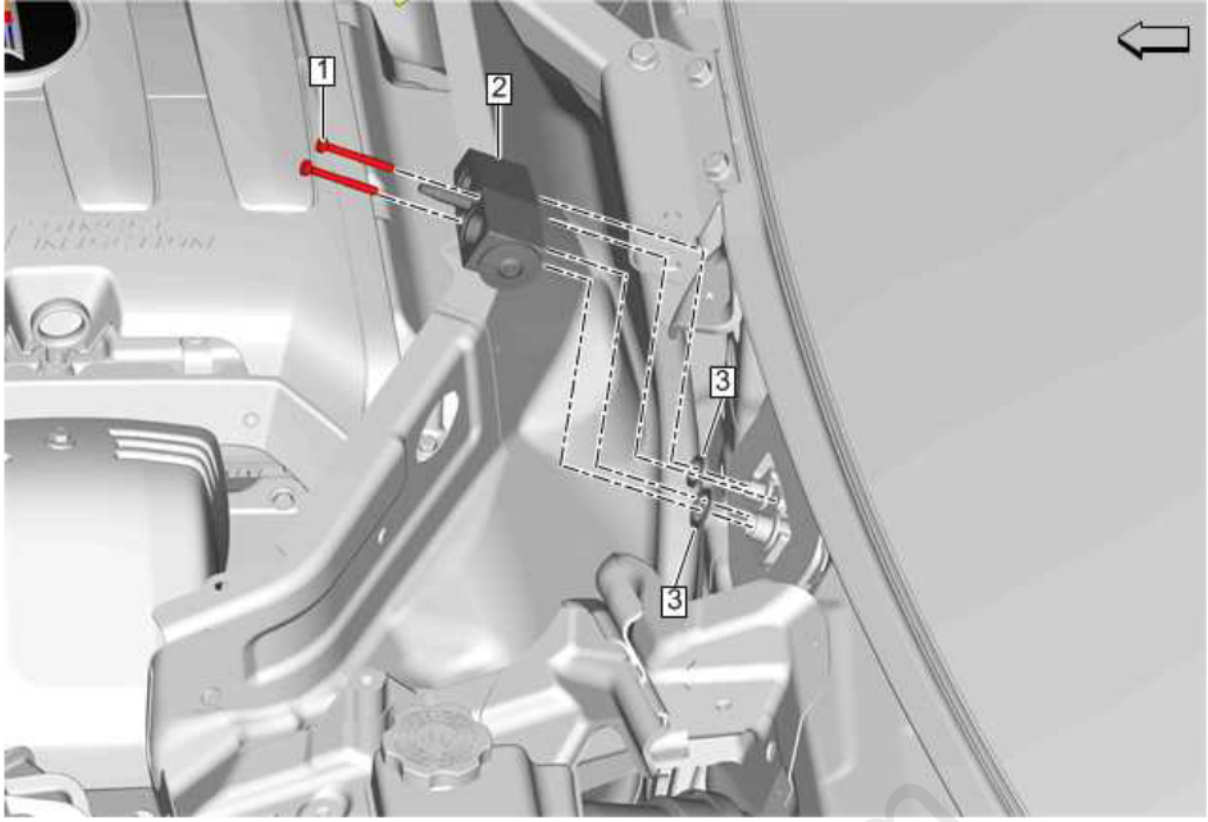


Fig. 163: Air Conditioning Evaporator Thermal Expansion Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Conditioning Refrigerant Heat Exchanger @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Air Conditioning Refrigerant Heat Exchanger Replacement (LTG)Air Conditioning Refrigerant Heat Exchanger Replacement (LGW, LGX)Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**	
1	Air Conditioning Evaporator Thermal Expansion Valve Bolt [2x] **CAUTION:** **Refer to Component Fastener Tightening Caution .** **Tighten** 8 N.m (71 lb in)
2	Air Conditioning Evaporator Thermal Expansion Valve **NOTE:** **To prevent leakage caused by the air conditioning thermal expansion valve seal being pinched between the air conditioning thermal expansion valve and the evaporator hoses, ensure the air conditioning evaporator thermal expansion valve seal is behind the air conditioning evaporator thermal expansion valve backing plate.**
3	Sealing Washer [2x] **Procedure** Remove and DISCARD the sealing washer. Refer to **Air Conditioning System Seal Replacement**

AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT (AUXILIARY)

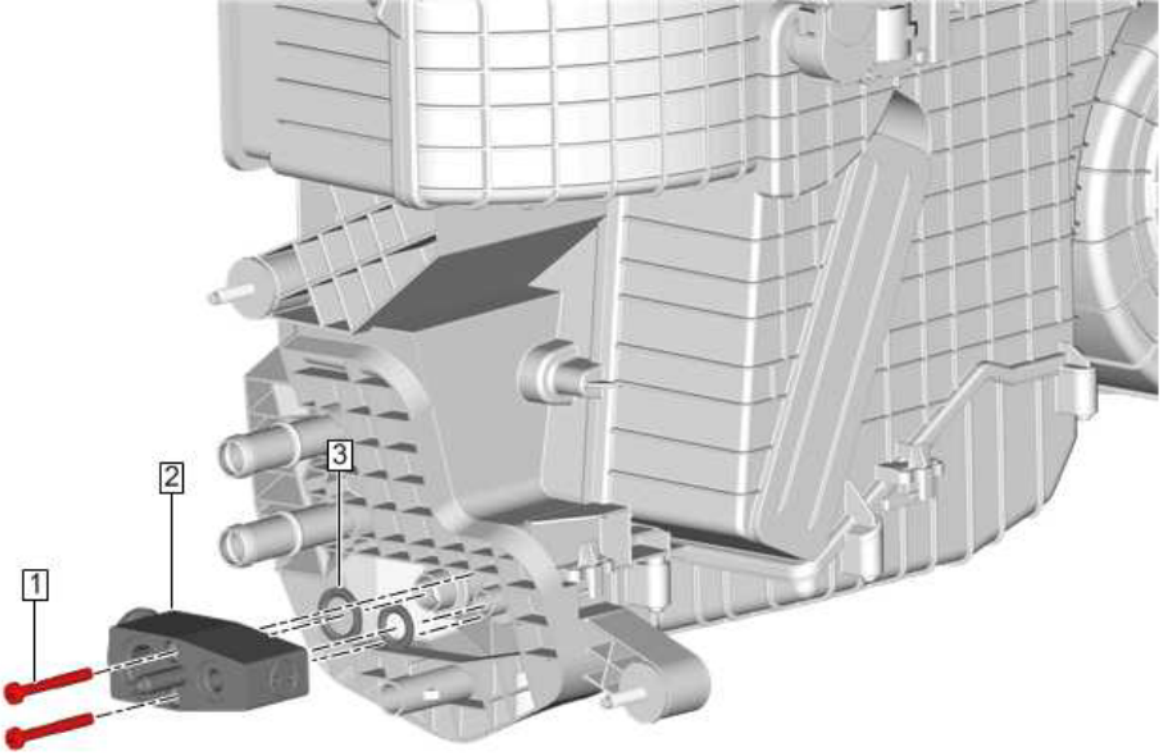


Fig. 164: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Auxiliary Air Conditioning Evaporator Intermediate Tube @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Auxiliary Air Conditioning Evaporator Intermediate Tube ReplacementAuxiliary Air Conditioning Evaporator Intermediate Tube Replacement (With HP9)**	
1	Air Conditioning Evaporator Thermal Expansion Valve Bolt [2x] **CAUTION:** **Refer to Component Fastener Tightening Caution .** **Tighten** 8 N.m (71 lb in)
2	Air Conditioning Evaporator Thermal Expansion Valve **NOTE:** **To prevent leakage caused by the air conditioning thermal expansion valve seal being pinched between the air conditioning thermal expansion valve and the evaporator hoses, ensure the air conditioning evaporator thermal expansion valve seal is behind the air conditioning evaporator thermal expansion valve backing plate.**
3	Sealing Washer [2x] **Procedure** Remove and DISCARD the sealing washer. Refer to **Air Conditioning System Seal Replacement**

AIR CONDITIONING EVAPORATOR THERMAL EXPANSION VALVE REPLACEMENT (AUXILIARY WITH HP9)

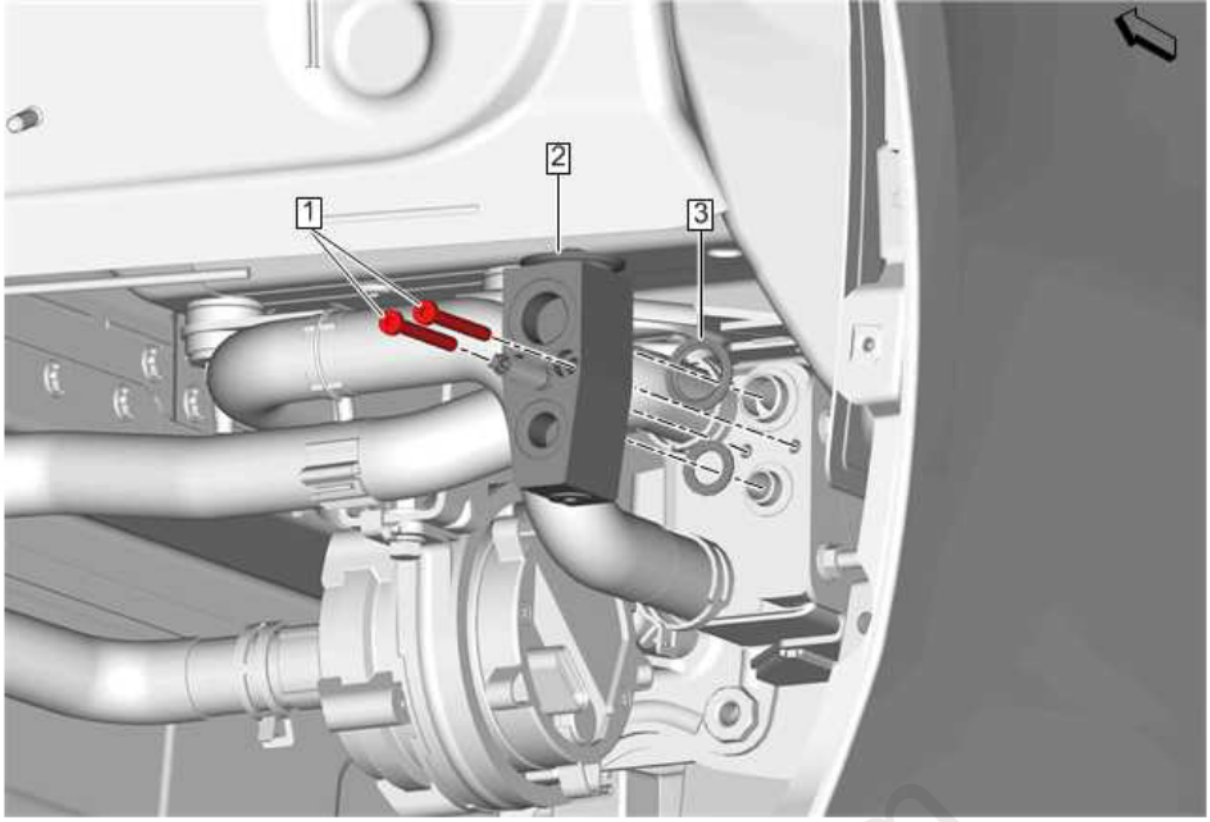


Fig. 165: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary with HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Auxiliary Air Conditioning Evaporator Intermediate Tube @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Auxiliary Air Conditioning Evaporator Intermediate Tube Replacement (With HP9)**	
1	Air Conditioning Evaporator Thermal Expansion Valve Bolt [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 8 N.m (71 lb in)
2	Air Conditioning Evaporator Thermal Expansion Valve
3	Sealing Washer [2x] **Procedure** Remove and DISCARD the sealing washer. Refer to **Air Conditioning System Seal Replacement**

AIR CONDITIONING REFRIGERANT HIGH PRESSURE SERVICE VALVE REPLACEMENT

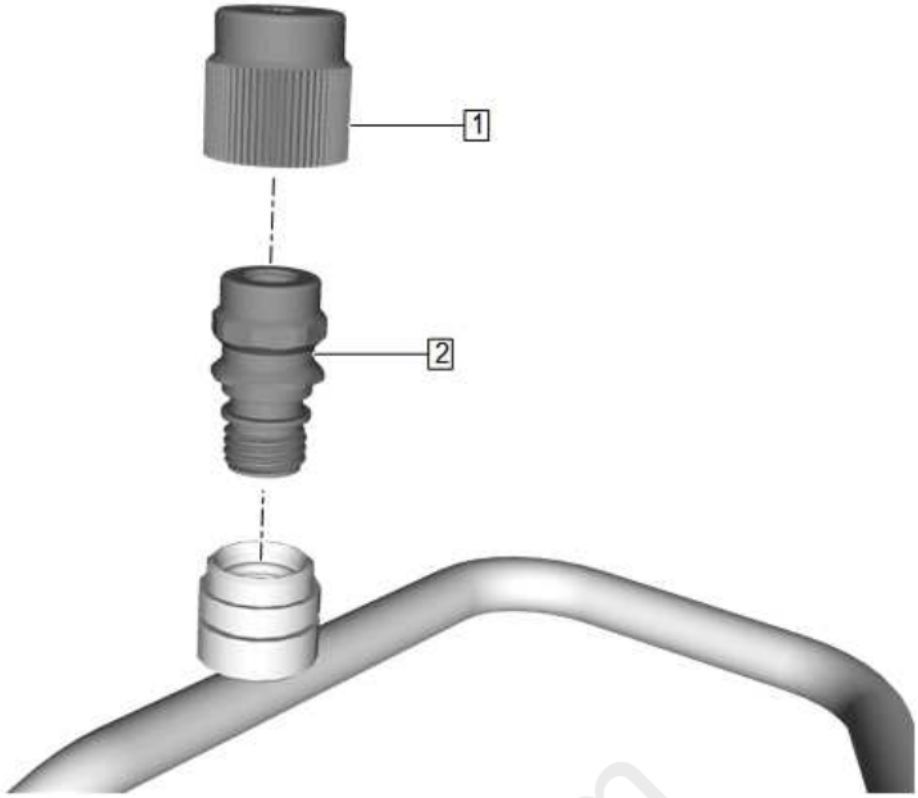


Fig. 166: Air Conditioning Refrigerant High Pressure Service Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the service port cap. 2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**	
1	Air Conditioning Refrigerant High Pressure Service Valve **CAUTION:** **Refer to Fastener Caution .** **Procedure** 1. Use the **J 39037** Charge Valve Octagon Socket to remove the air conditioning refrigerant high pressure service valve. 2. Replace the O-ring. **Tighten** 2 N.m (18 lb in) **Special Tools** **J 39037** Charge Valve Octagon Socket

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

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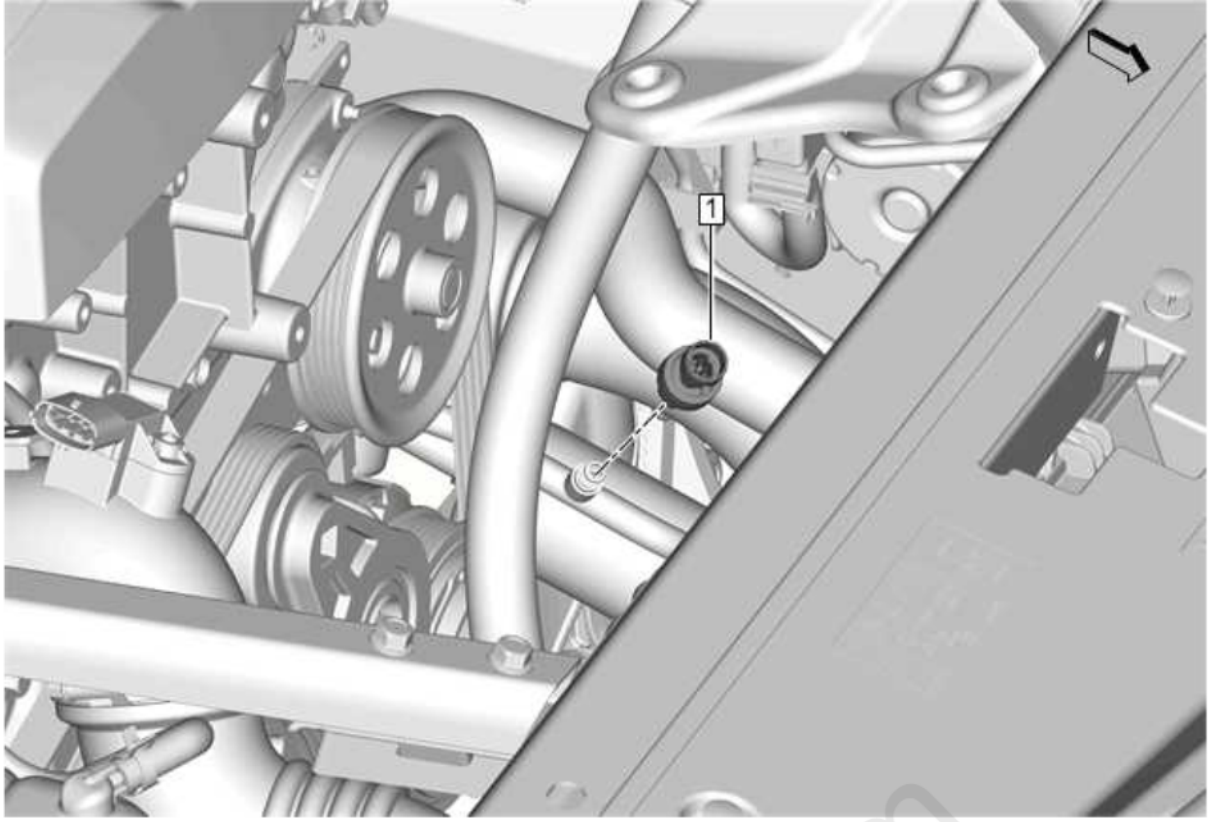


Fig. 167: Air Conditioning (A/C) Refrigerant Pressure Sensor (LTG)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Outlet Duct Replacement	
1	Air Conditioning Refrigerant Pressure Sensor **CAUTION:** Refer to Component Fastener Tightening Caution . **Procedure** Disconnect the electrical connector. **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT (LGW, LGX)

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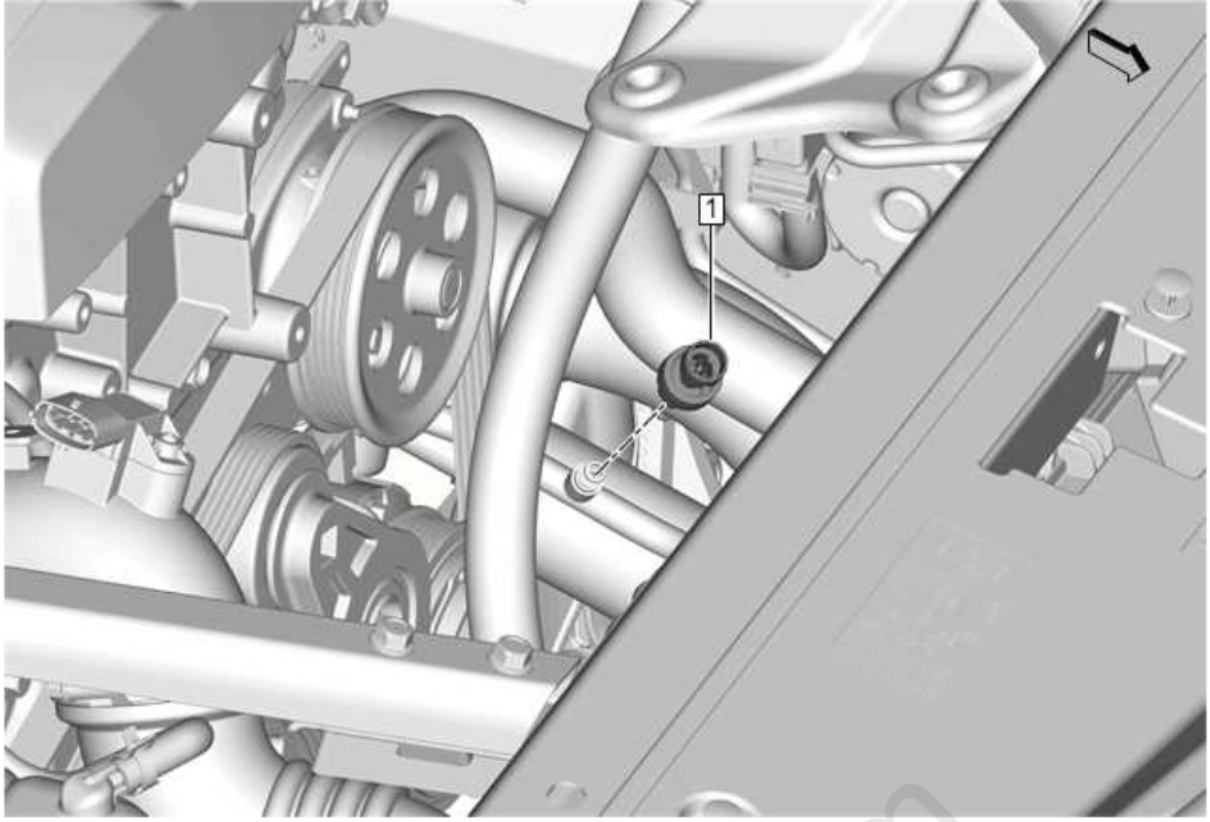


Fig. 168: Air Conditioning (A/C) Refrigerant Pressure Sensor (LGW, LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Outlet Duct Replacement	
1	Air Conditioning Refrigerant Pressure Sensor **CAUTION:** Refer to Component Fastener Tightening Caution . **Procedure** Disconnect the electrical connector. **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT (LTG WITH HP9 HIGH PRESSURE)

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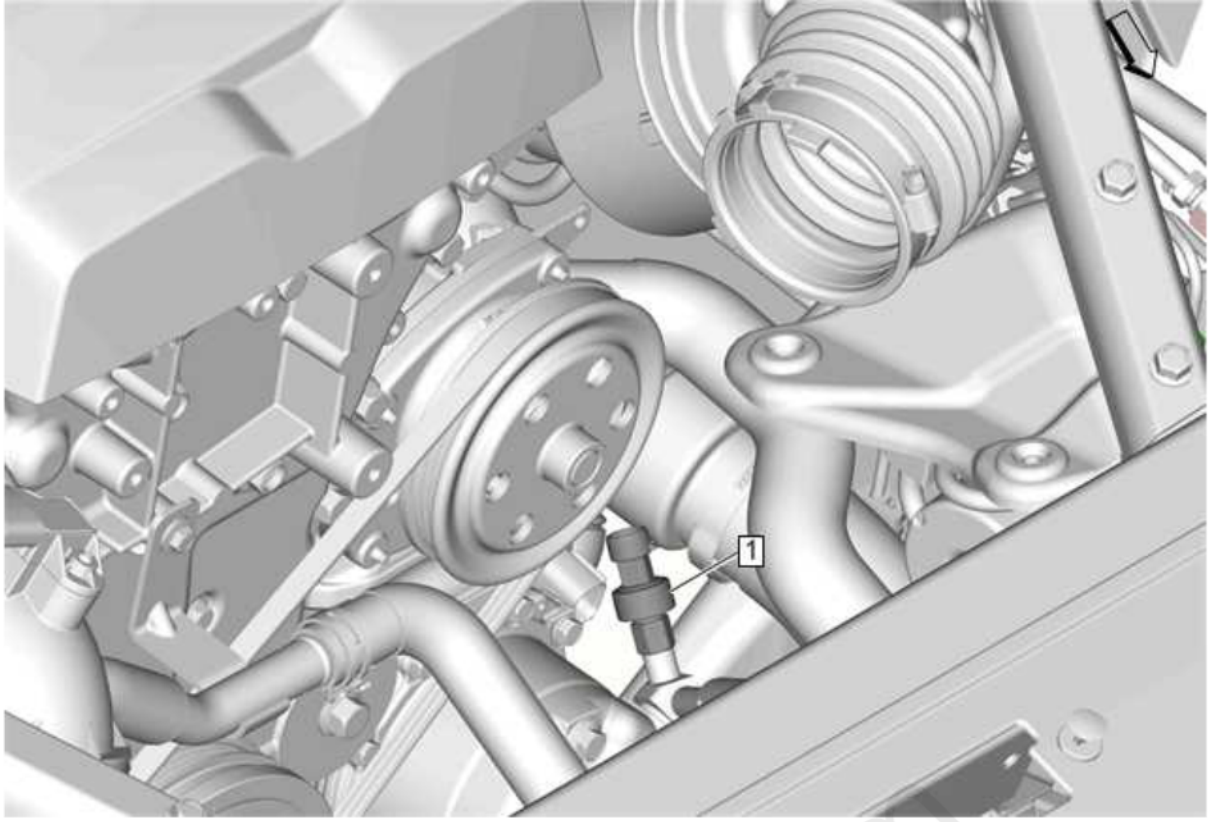


Fig. 169: Air Conditioning (A/C) Refrigerant Pressure Sensor (LTG with HP9 High Pressure)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Outlet Duct Replacement	
1	Air Conditioning Refrigerant Pressure Sensor **Procedure** Disconnect the electrical connector. **CAUTION:** Refer to Component Fastener Tightening Caution . **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT (LTG WITH HP9 LOW PRESSURE)

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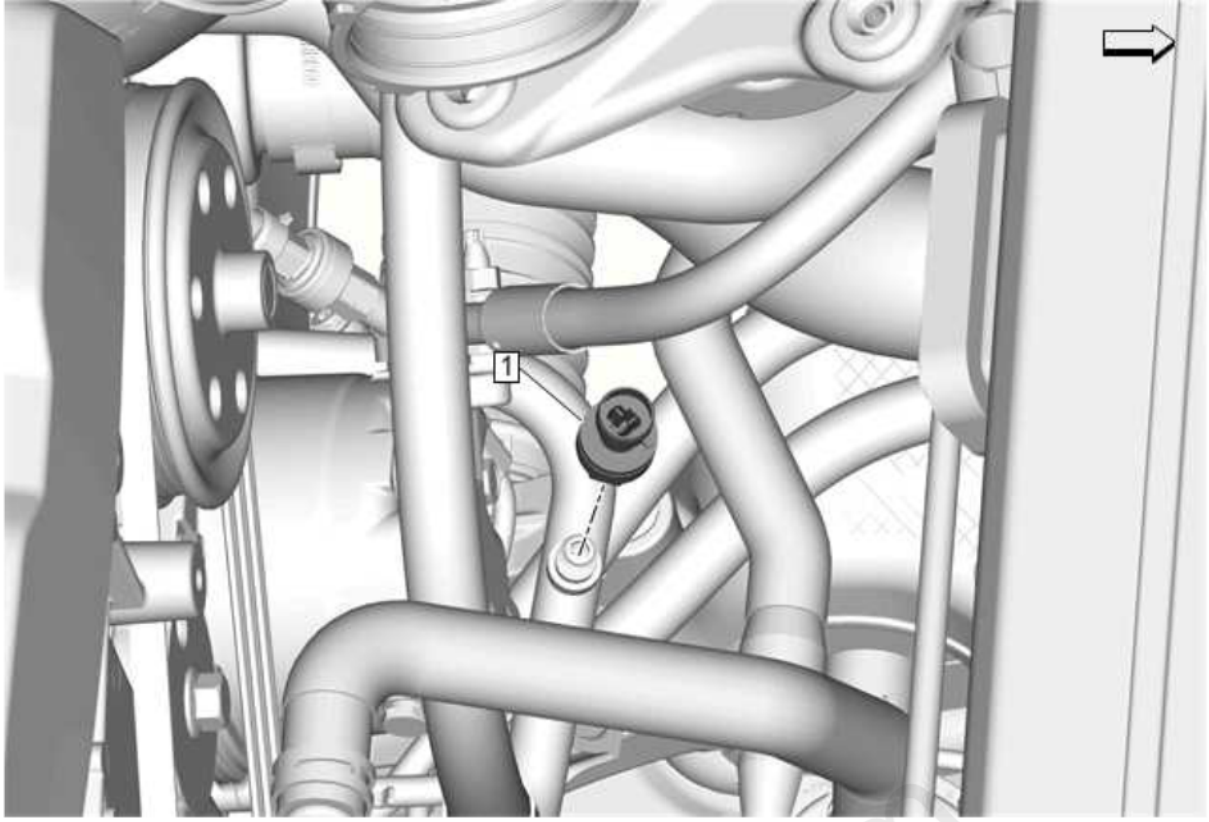


Fig. 170: Air Conditioning (A/C) Refrigerant Pressure Sensor (LTG with HP9 Low Pressure)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Outlet Duct Replacement	
1	Air Conditioning Refrigerant Pressure Sensor **Procedure** Disconnect the electrical connector. **CAUTION:** **Refer to Component Fastener Tightening Caution .** **Tighten** 7 N.m (62 lb in)

AIR CONDITIONING CONDENSER REPLACEMENT

Removal Procedure

1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf)
2. Radiator Air Upper Baffle and Deflector Replacement (LGW LTG) Radiator Air Upper Baffle and Deflector Replacement (LGX) (2)Â» Remove

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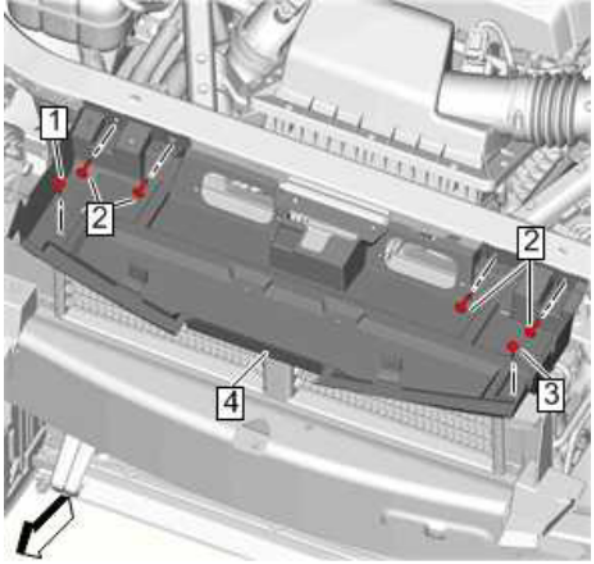


Fig. 171: Radiator Air Upper Baffle and Deflector
Courtesy of GENERAL MOTORS COMPANY

3. **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side)** - Left Side and Right SideÂ» Remove
4. **Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side)** **Radiator Air Side Upper Baffle Replacement (LGX - Right Side)** - Left Side and Right SideÂ» Remove
5. **Radiator Air Lower Baffle Replacement (LGW LXG LTG)** (1)Â» Remove

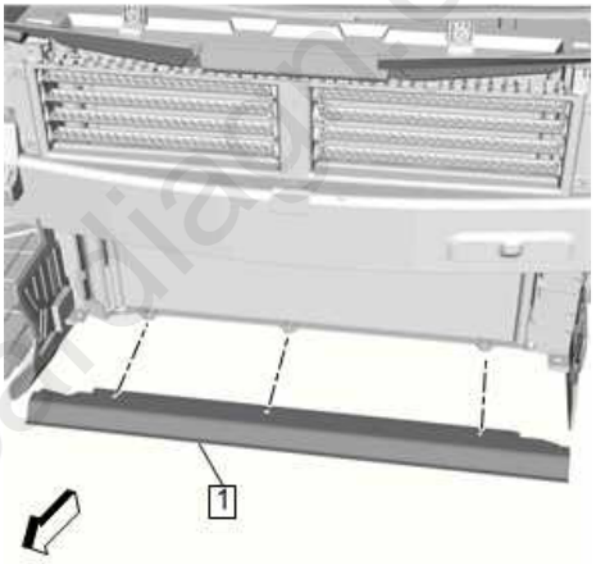


Fig. 172: Radiator Air Lower Baffle
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning CondenserÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)** **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)** **Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

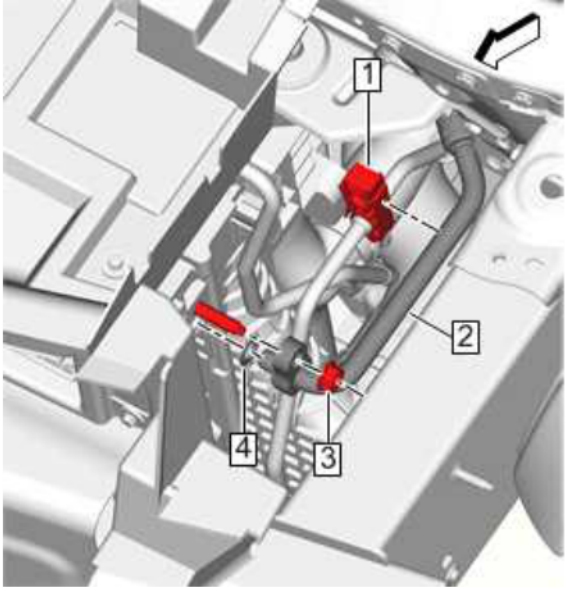


Fig. 173: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

7. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning CondenserÂ» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)**

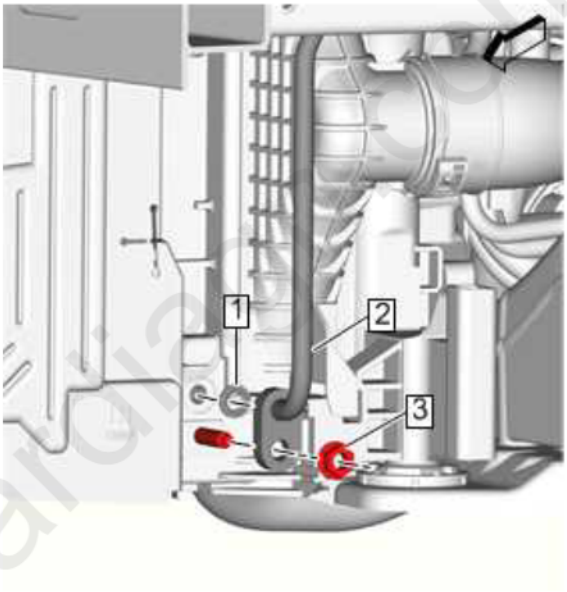


Fig. 174: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Condenser @ Air Conditioning Condenser BracketÂ» Remove

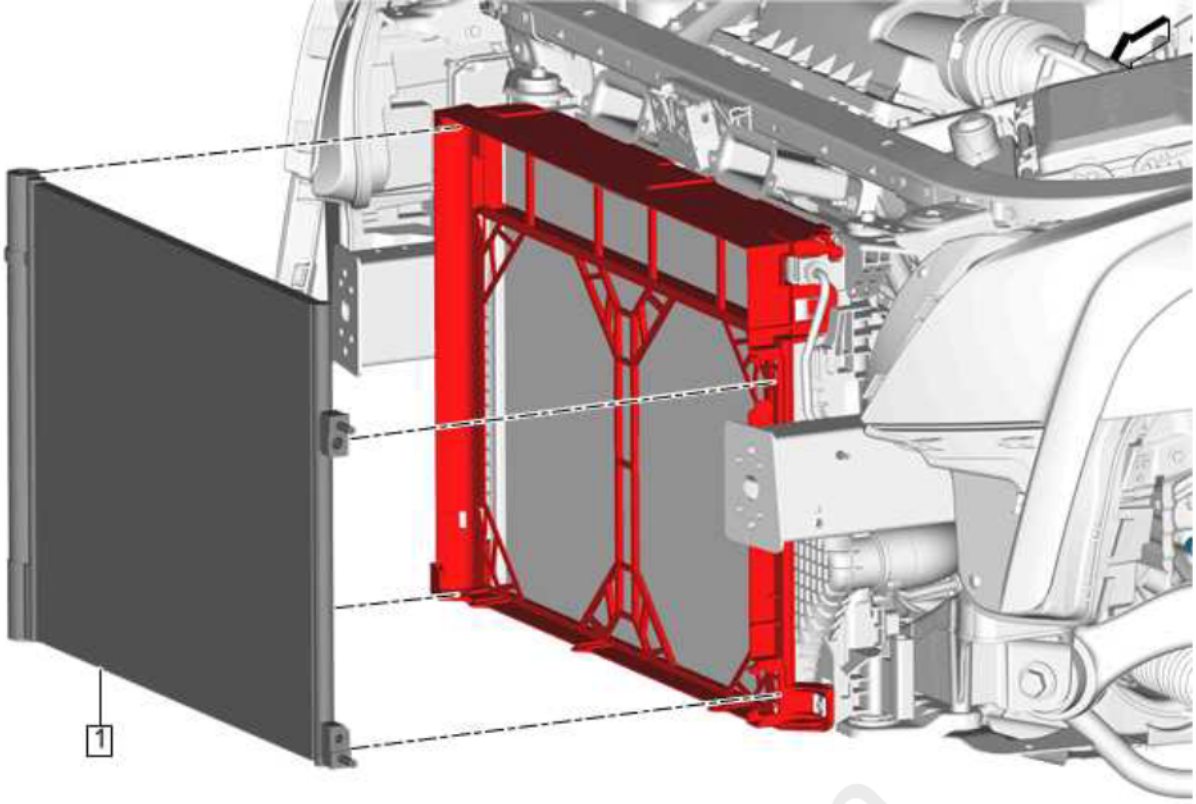


Fig. 175: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

1. Install the air conditioning condenser to the vehicle.
2. Air Conditioning Condenser (1) @ Air Conditioning Condenser BracketÂ» Install

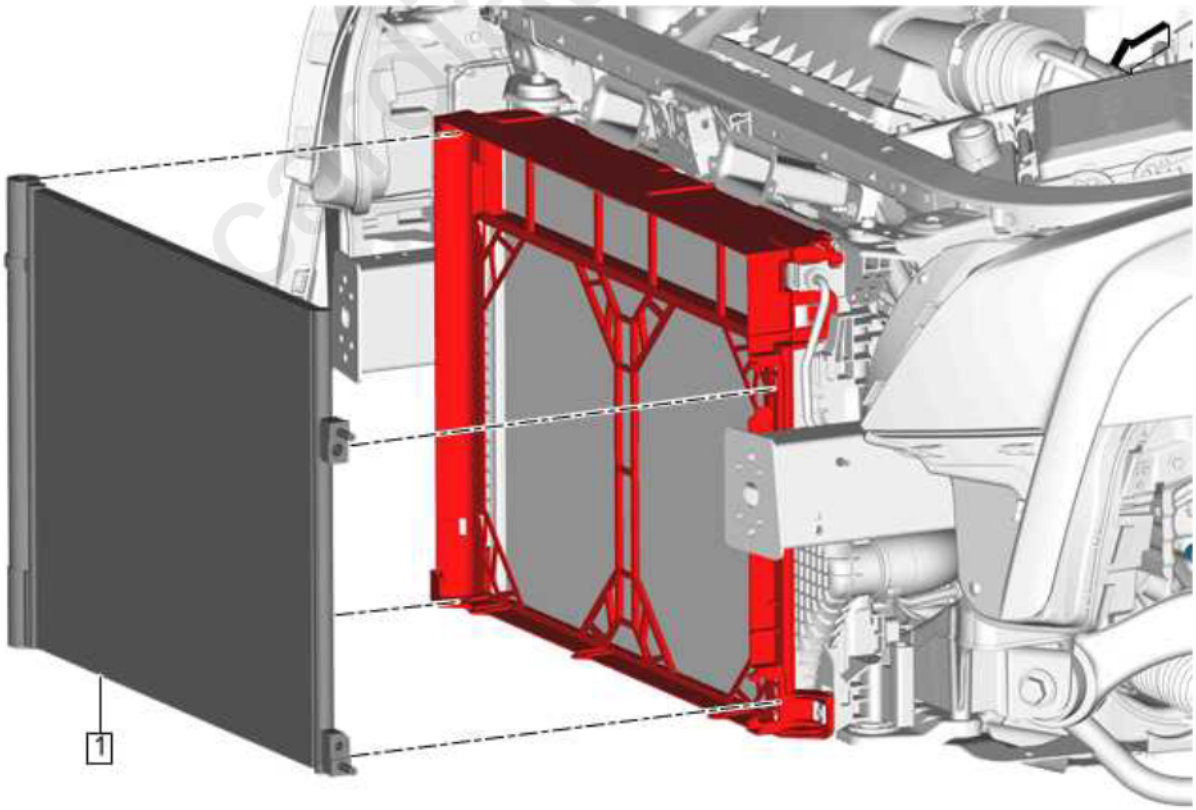


Fig. 176: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning CondenserÂ» Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)Air Conditioning**

Condenser and Evaporator Hose Replacement (LGW, LGX)

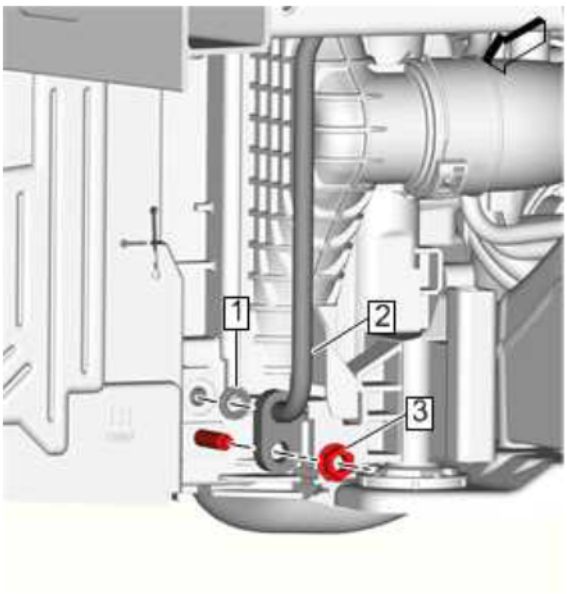


Fig. 177: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning CondenserÂ» Install - Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)

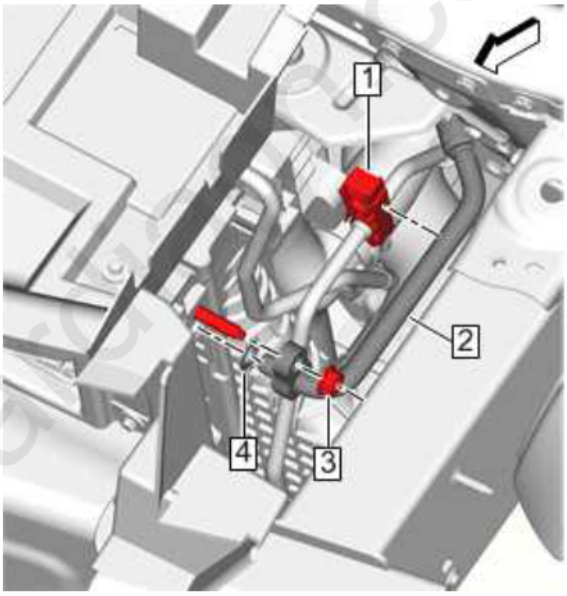


Fig. 178: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

5. Radiator Air Lower Baffle Replacement (LGW LXG LTG) (1)Â» Install

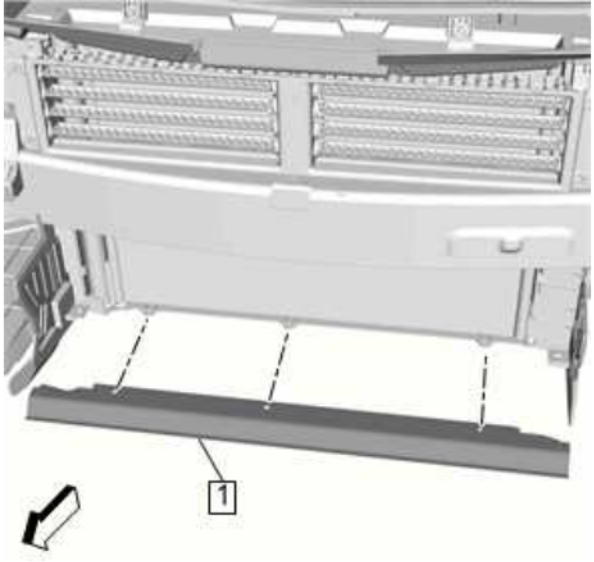


Fig. 179: Radiator Air Lower Baffle
Courtesy of GENERAL MOTORS COMPANY

6. Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side) Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side) Radiator Air Side Upper Baffle Replacement (LGX - Right Side) - Left Side and Right SideÂ» Install
7. Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side) Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side) - Left Side and Right SideÂ» Install
8. Radiator Air Upper Baffle and Deflector Replacement (LGW LTG) Radiator Air Upper Baffle and Deflector Replacement (LGX) (2)Â» Install

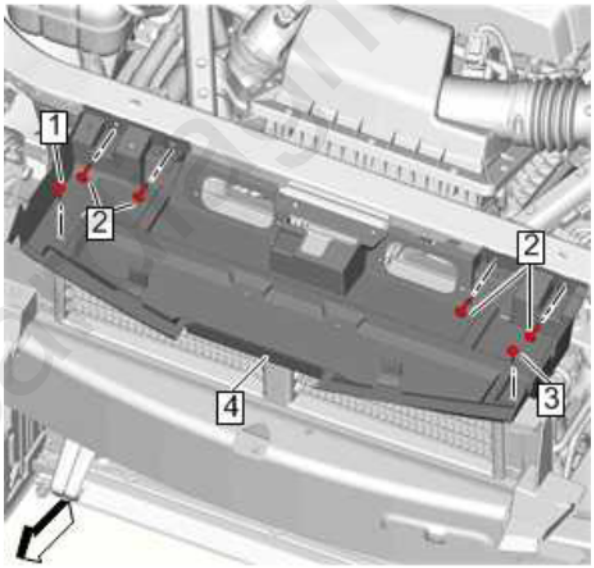


Fig. 180: Radiator Air Upper Baffle and Deflector
Courtesy of GENERAL MOTORS COMPANY

9. Recharge the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf)

AIR CONDITIONING CONDENSER REPLACEMENT (LTG WITH HP9)

Removal Procedure

1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf)
2. Remove the front bumper fascia (4). Refer to Front Bumper Fascia Replacement (Without UV3) Front Bumper Fascia Replacement (With UV3)

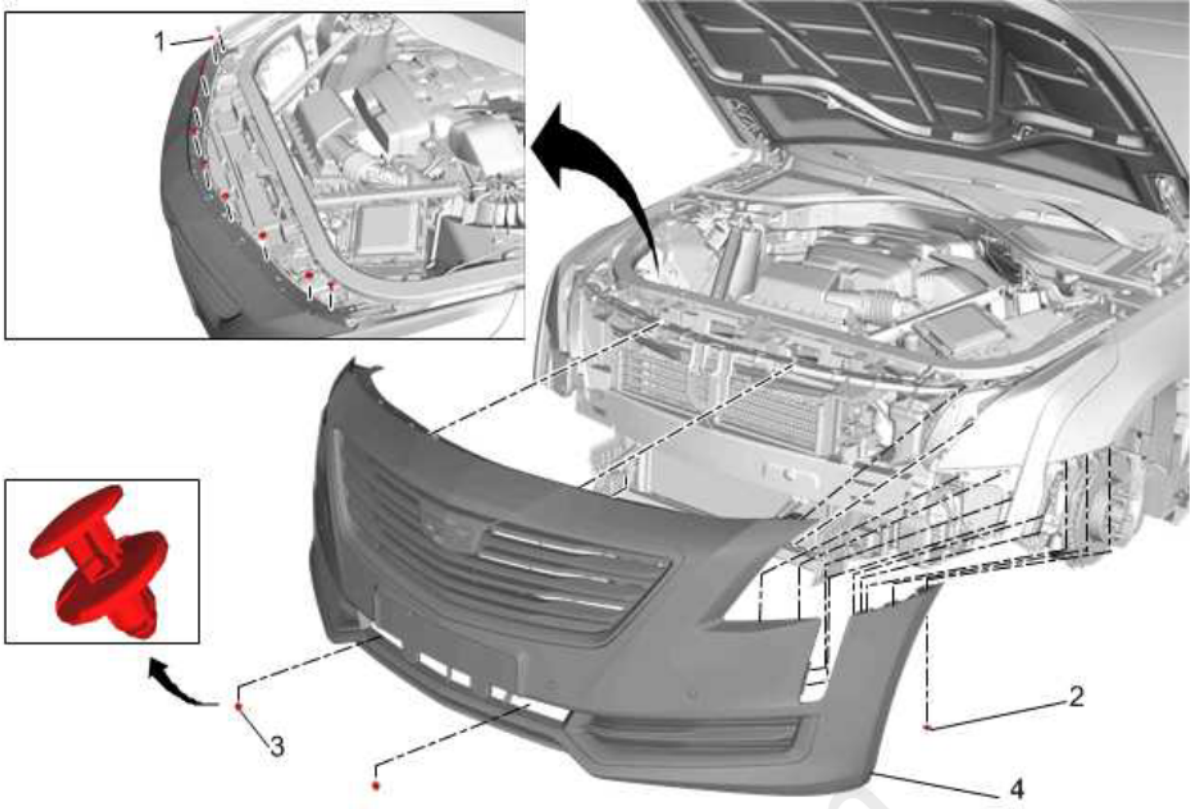


Fig. 181: Front Bumper Fascia
Courtesy of GENERAL MOTORS COMPANY

3. Radiator Air Upper Baffle and Deflector (4)Â» Remove - **Radiator Air Upper Baffle and Deflector Replacement (LGW LTG)**

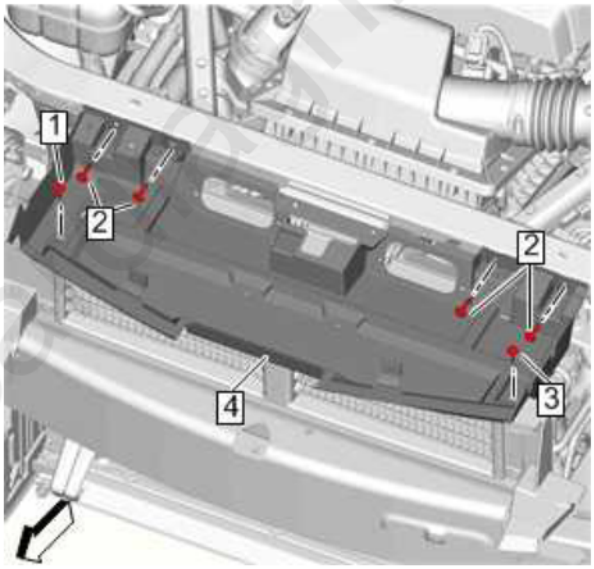


Fig. 182: Radiator Air Upper Baffle and Deflector
Courtesy of GENERAL MOTORS COMPANY

4. Radiator Air Side Lower Baffle - Left Side (2)Â» Remove - **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side)**

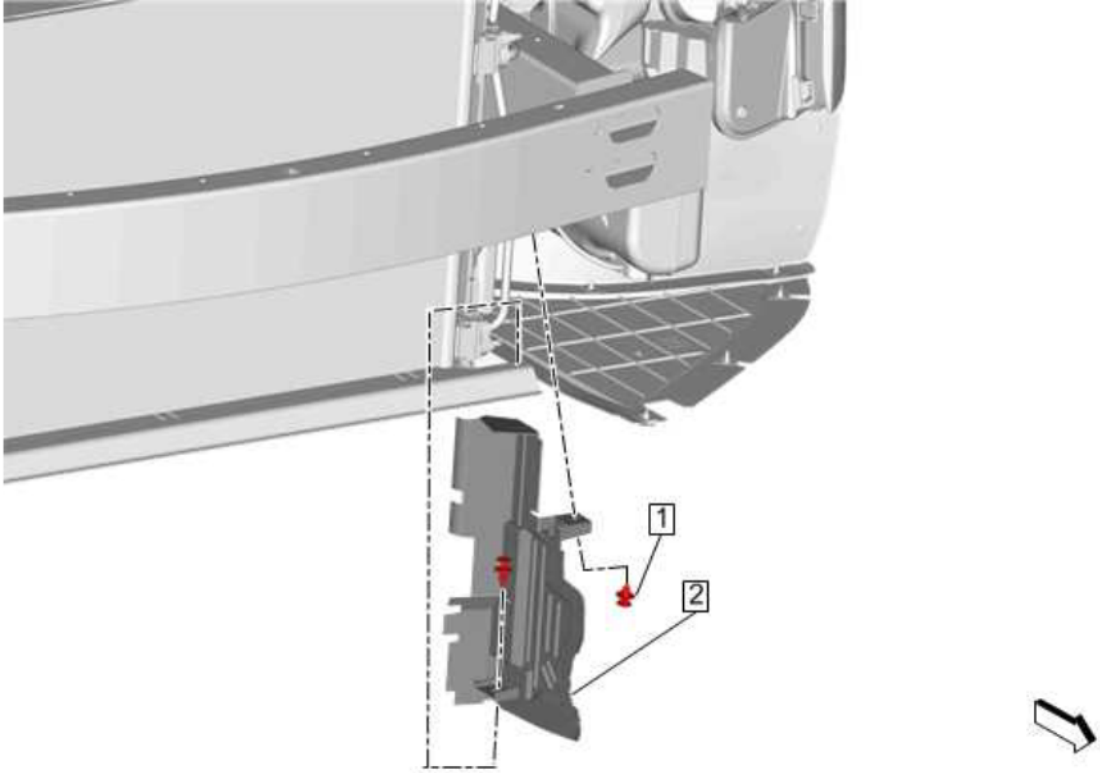


Fig. 183: Radiator Air Side Lower Baffle (LGW LGX LTG - Left Side)
Courtesy of GENERAL MOTORS COMPANY

5. Radiator Air Side Lower Baffle - Right Side (2)Â» Remove - **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side)**

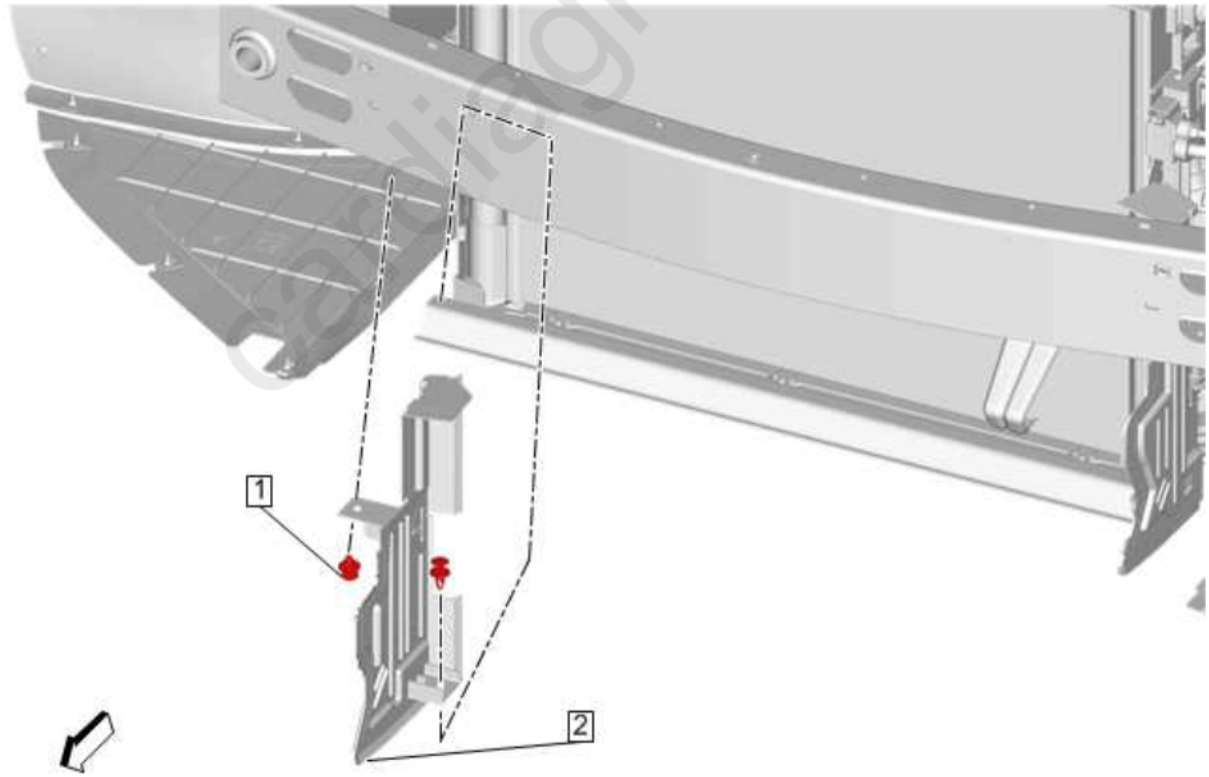


Fig. 184: Radiator Air Side Lower Baffle (LGW LGX LTG - Right Side)
Courtesy of GENERAL MOTORS COMPANY

6. Radiator Air Side Upper Baffle - Left Side (2)Â» Remove - **Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side)**

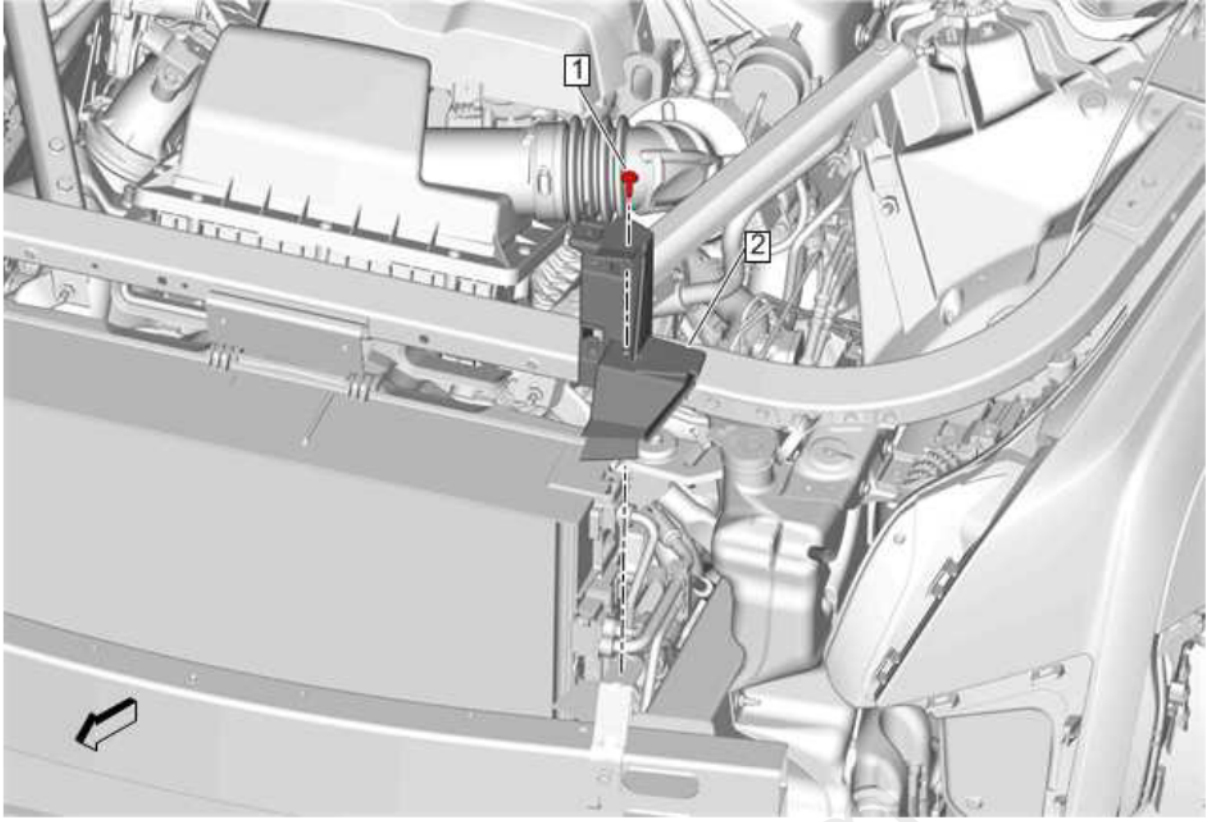


Fig. 185: Radiator Air Side Upper Baffle (LGW LGX LTG - Left Side)
Courtesy of GENERAL MOTORS COMPANY

7. Radiator Air Side Upper Baffle - Right Side (2)Â» Remove - **Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side)**

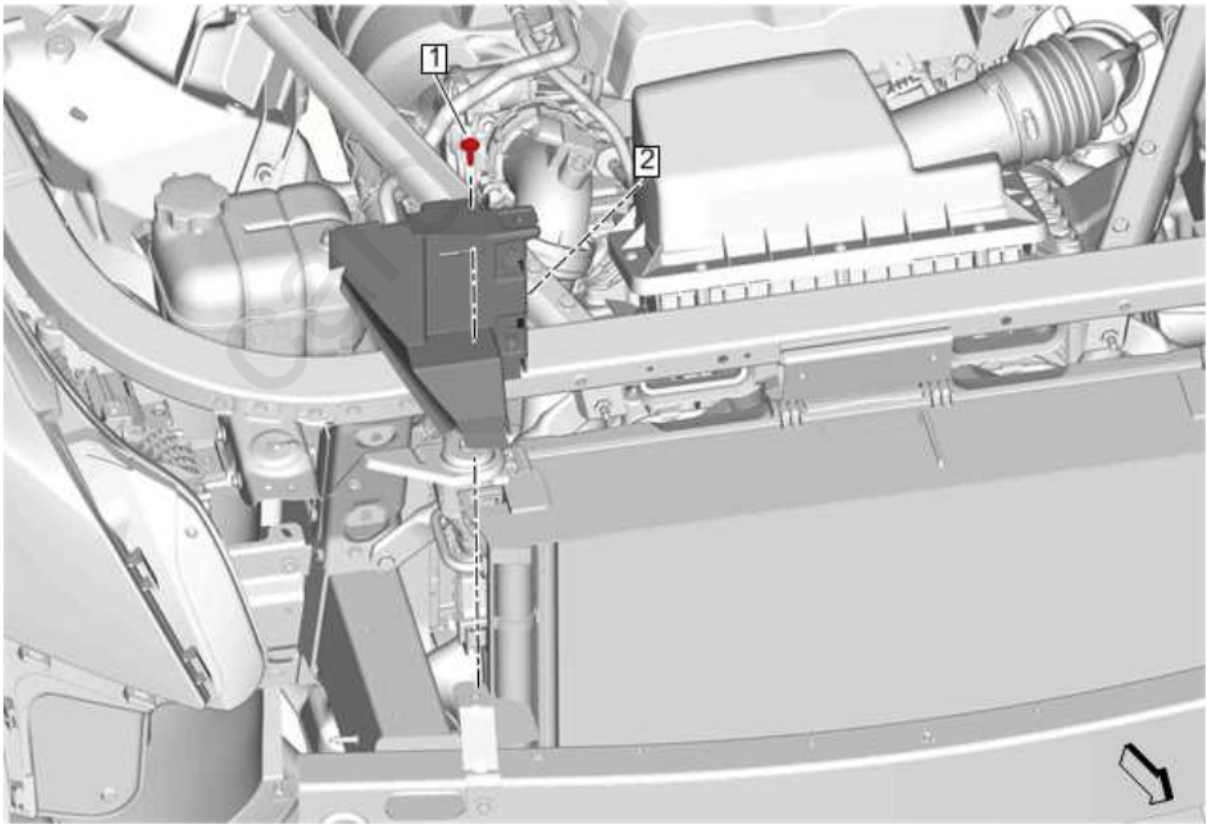


Fig. 186: Radiator Air Side Upper Baffle (LGX - Right Side)
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Air Lower Baffle (1)Â» Remove - **Radiator Air Lower Baffle Replacement (LGW LXG LTG)**

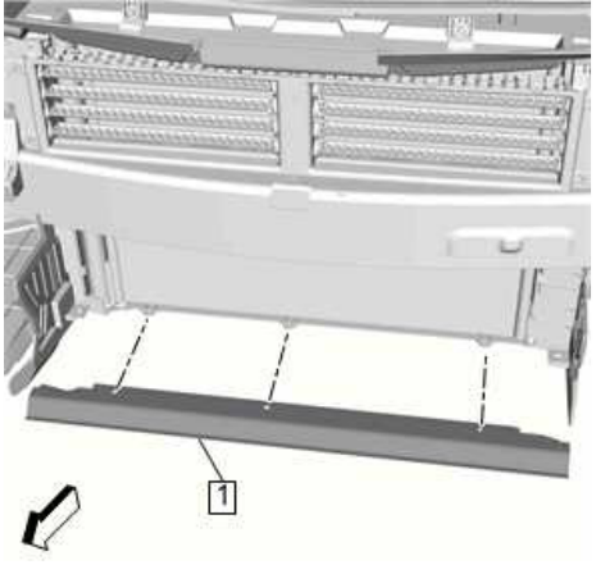


Fig. 187: Radiator Air Lower Baffle
Courtesy of GENERAL MOTORS COMPANY

9. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning CondenserÂ» Remove - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

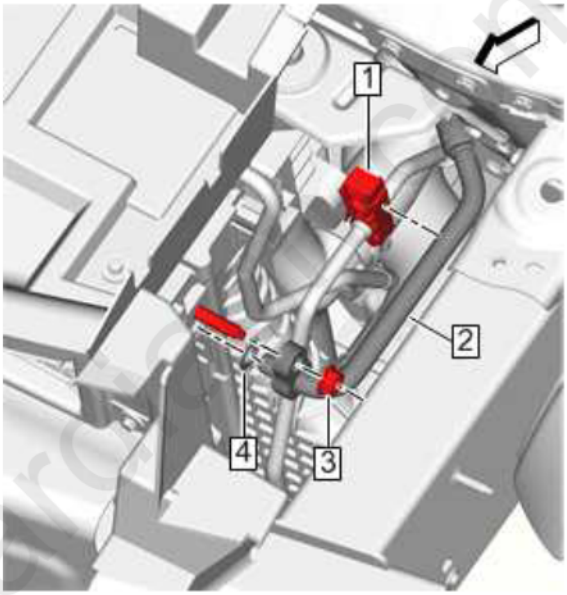


Fig. 188: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning CondenserÂ» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)**

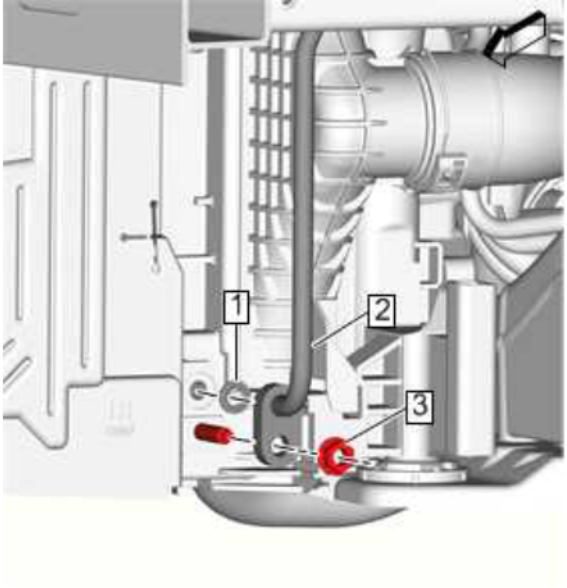


Fig. 189: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Radiator (1)Â» Remove - **Auxiliary Radiator Replacement**

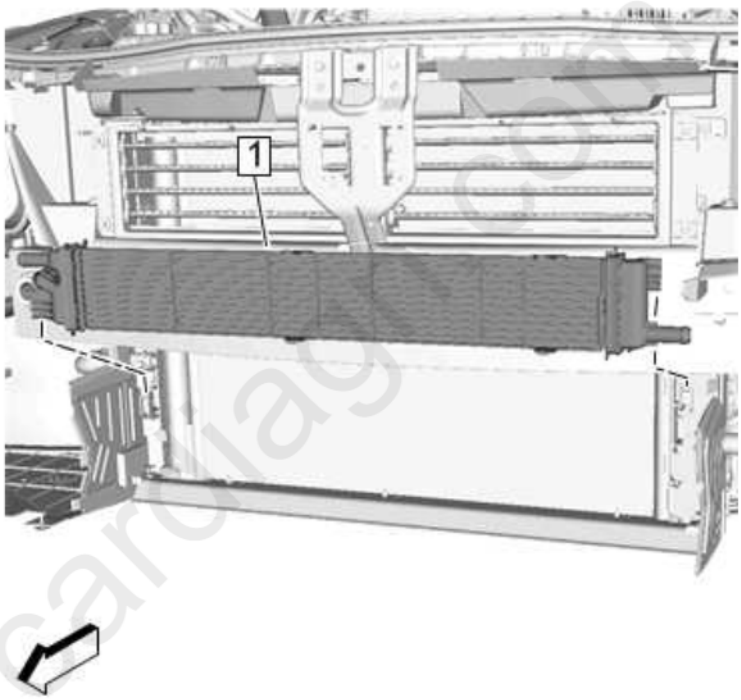


Fig. 190: Auxiliary Radiator
Courtesy of GENERAL MOTORS COMPANY

12. Air Conditioning Condenser (1) @ Air Conditioning Condenser BracketÂ» Remove

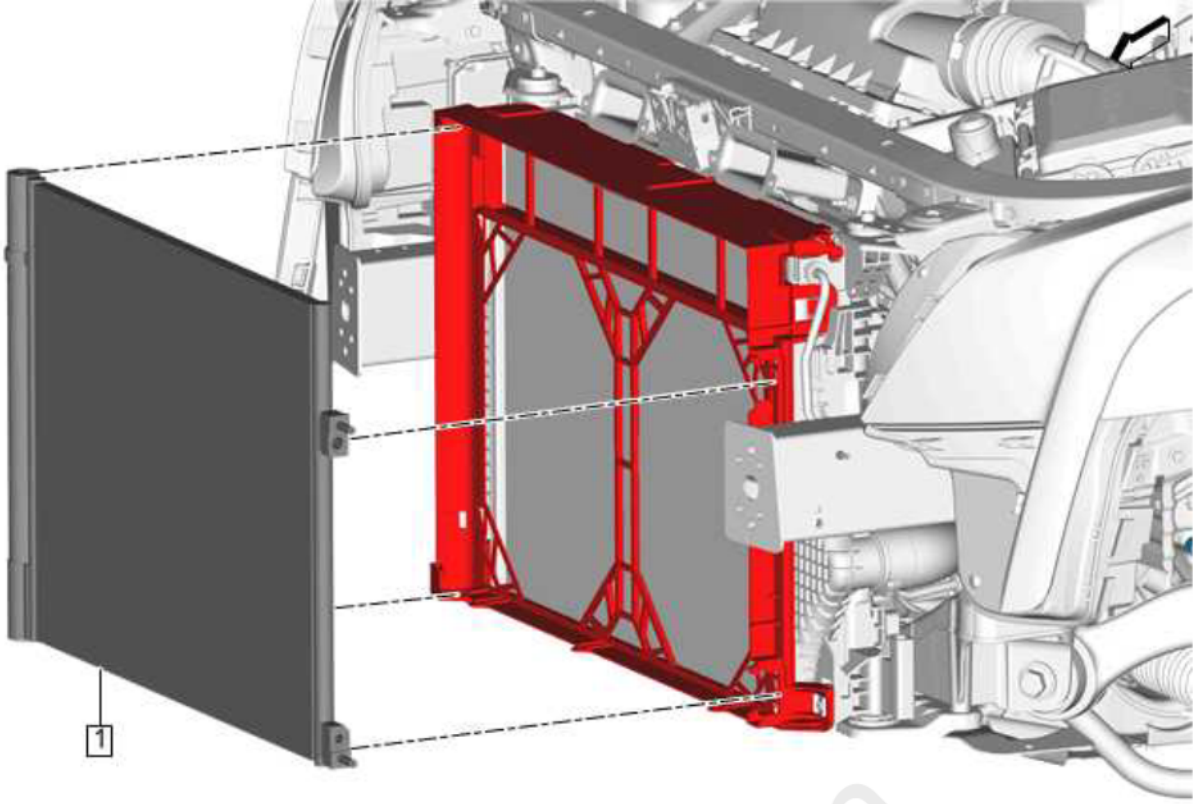


Fig. 191: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Air Conditioning Condenser (1) @ Air Conditioning Condenser BracketÂ» Install

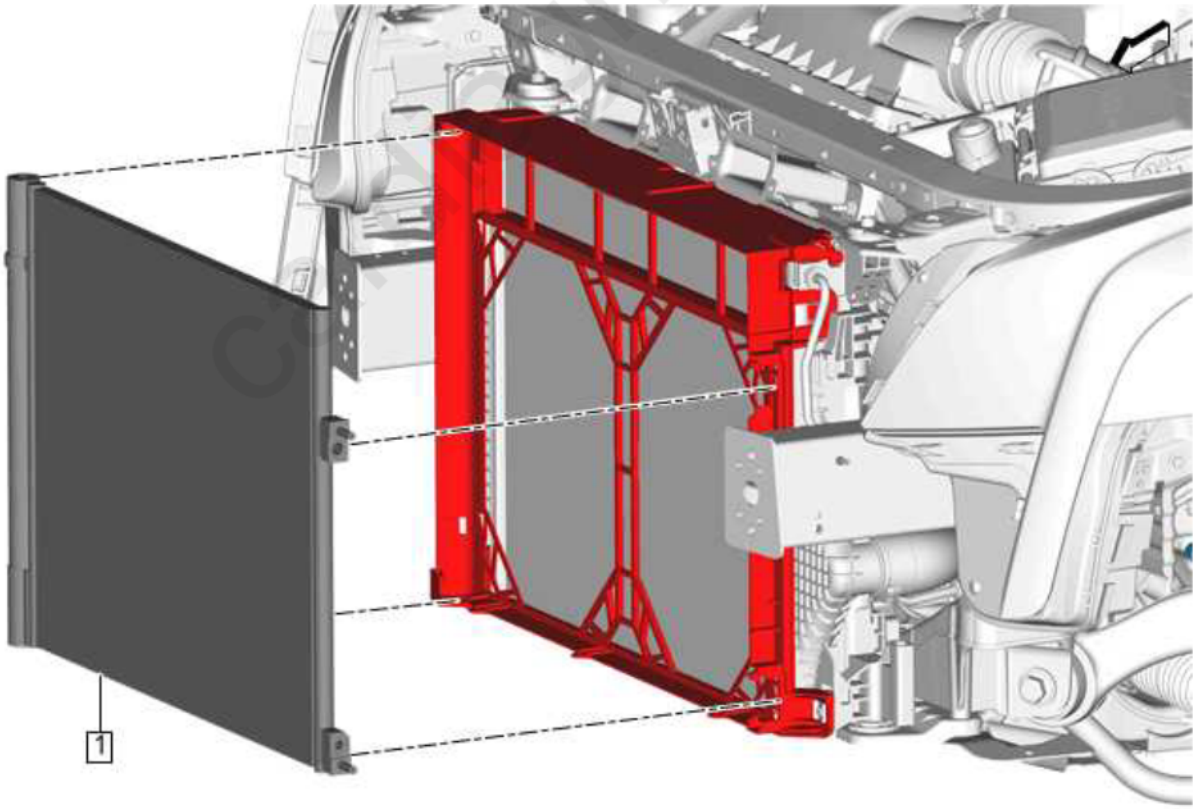


Fig. 192: Air Conditioning Condenser
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Radiator (1)Â» Install - **Auxiliary Radiator Replacement**

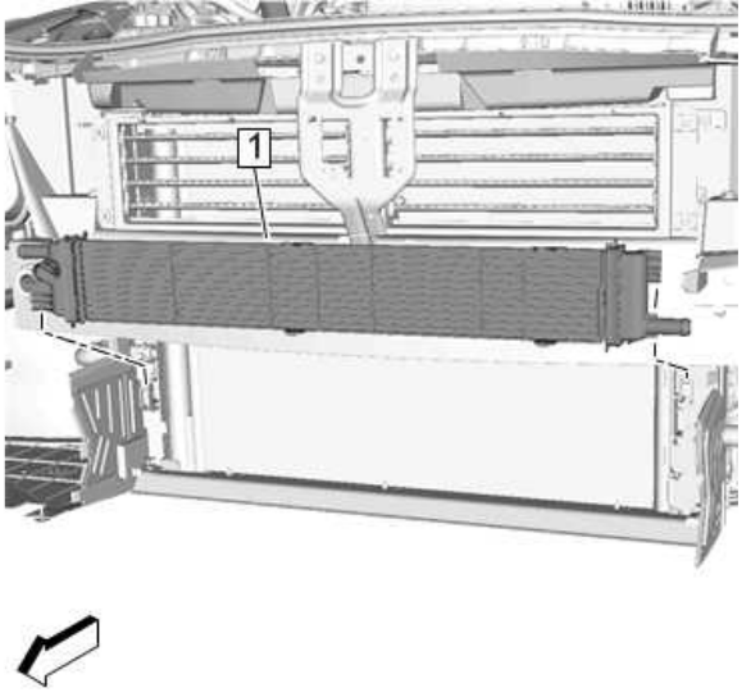


Fig. 193: Auxiliary Radiator
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning CondenserÂ» Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)**

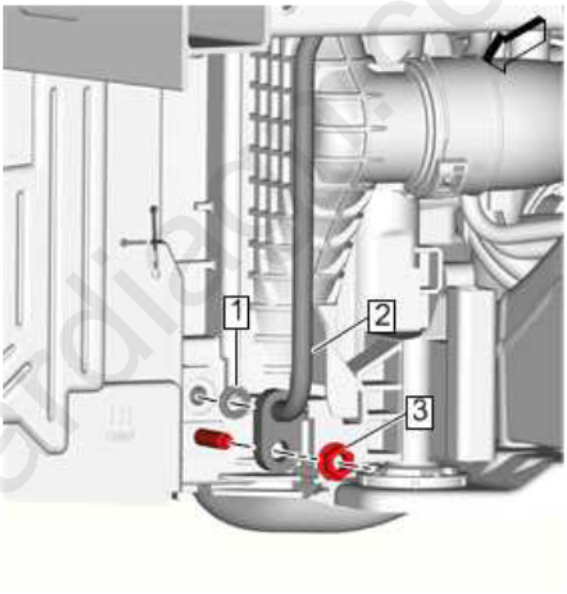


Fig. 194: Air Conditioning Condenser and Evaporator Hose
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning CondenserÂ» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LTG)Air Conditioning Compressor and Condenser Hose Replacement (LTG with HP9)**

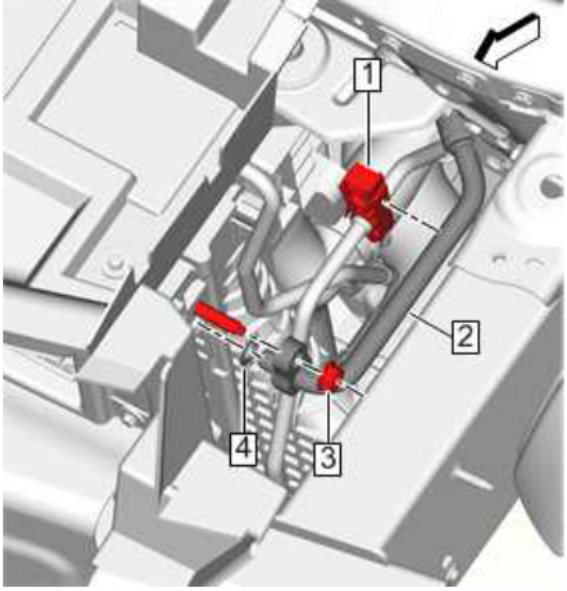


Fig. 195: Air Conditioning Compressor and Condenser Hose
Courtesy of GENERAL MOTORS COMPANY

5. Radiator Air Lower Baffle (1)Â» Install - Radiator Air Lower Baffle Replacement (LGW LXG LTG)

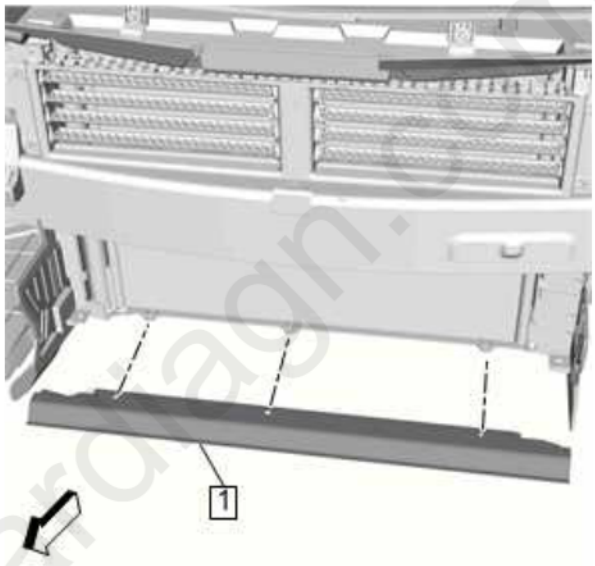


Fig. 196: Radiator Air Lower Baffle
Courtesy of GENERAL MOTORS COMPANY

6. Radiator Air Side Upper Baffle - Right Side (2)Â» Install - Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side) Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side)

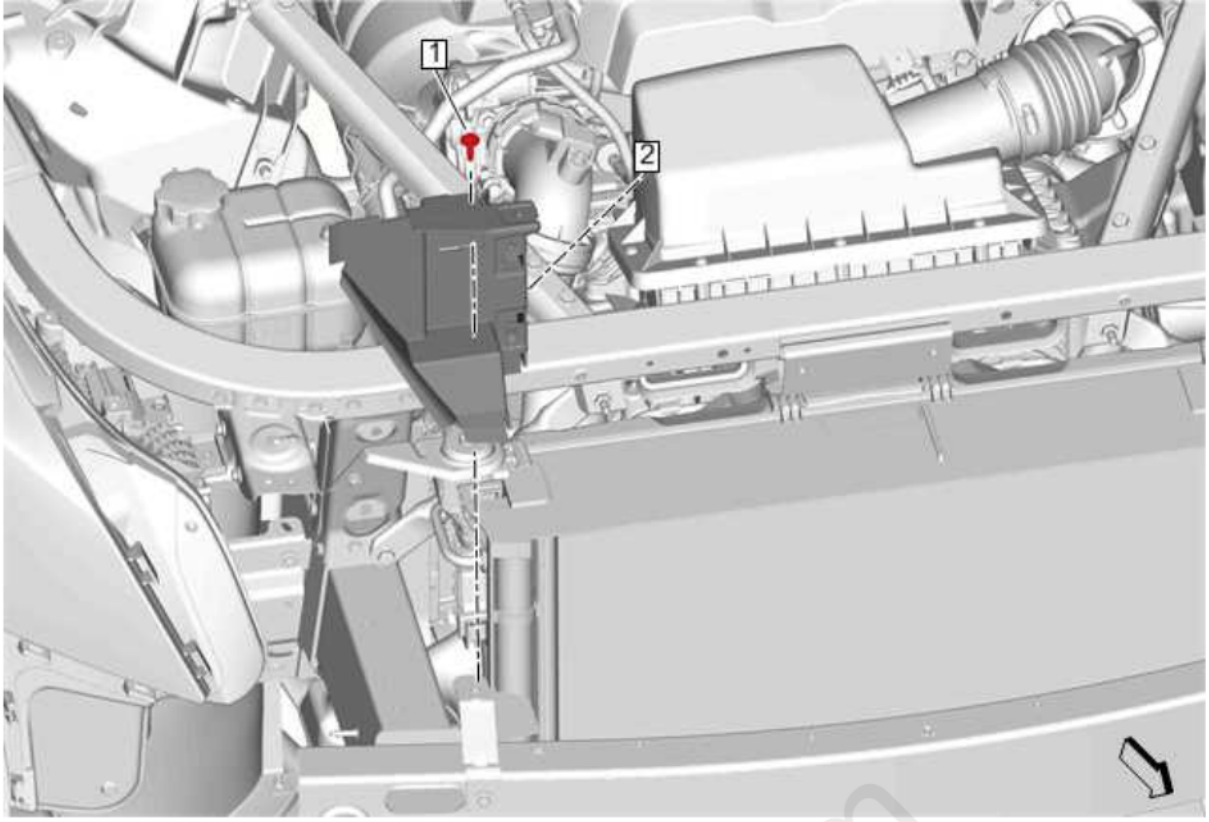


Fig. 197: Radiator Air Side Upper Baffle (LGX - Right Side)
Courtesy of GENERAL MOTORS COMPANY

7. Radiator Air Side Upper Baffle - Left Side (2)Â» Install - **Radiator Air Side Upper Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Upper Baffle Replacement (LGW LTG - Right Side)**

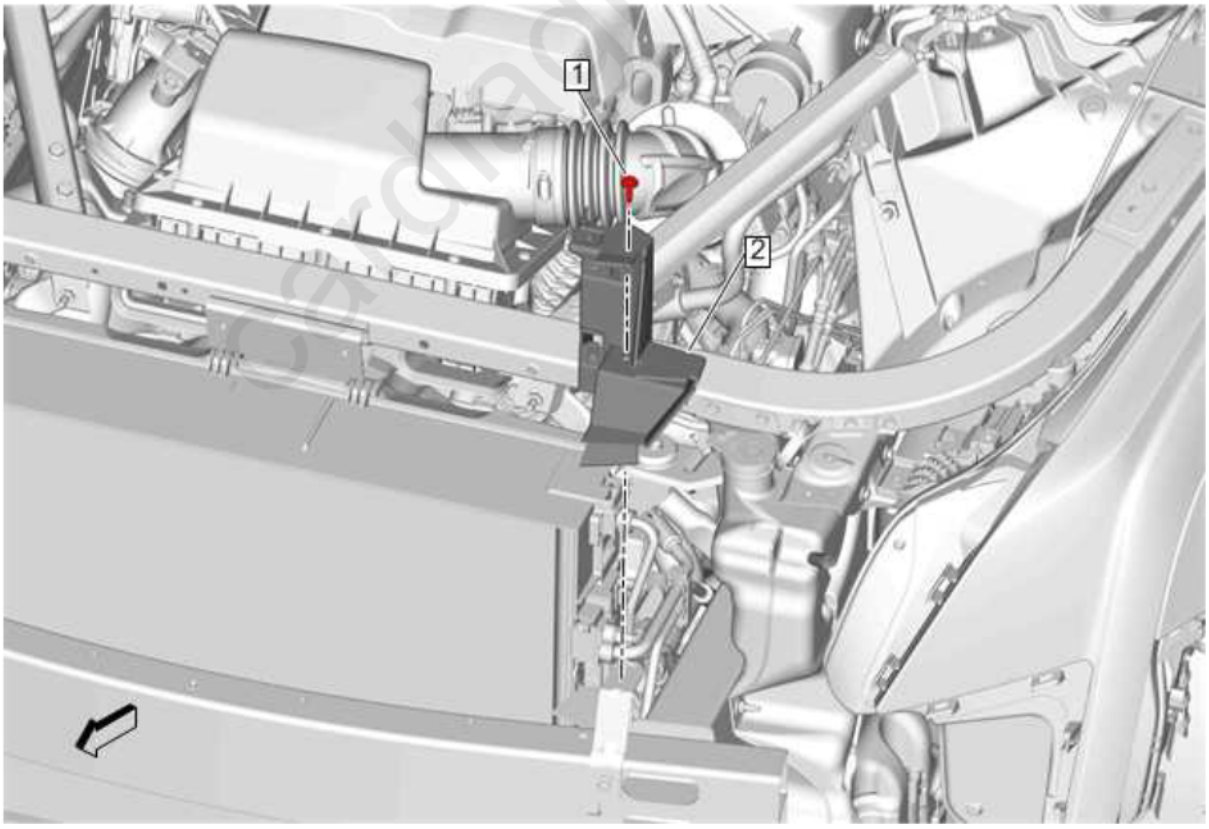


Fig. 198: Radiator Air Side Upper Baffle (LGW LGX LTG - Left Side)
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Air Side Lower Baffle - Right Side (2)Â» Install - **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side)**

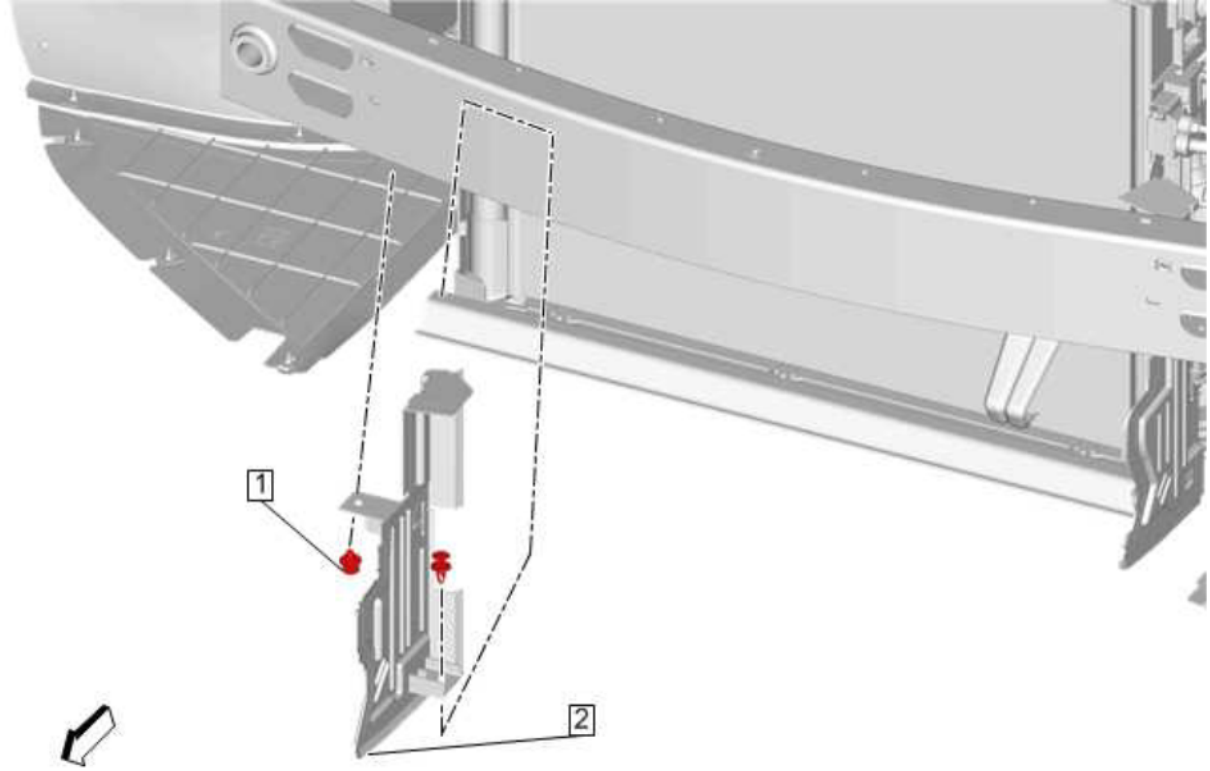


Fig. 199: Radiator Air Side Lower Baffle (LGW LGX LTG - Right Side)
Courtesy of GENERAL MOTORS COMPANY

9. Radiator Air Side Lower Baffle - Left Side (2)Â» Install - **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Left Side)** **Radiator Air Side Lower Baffle Replacement (LGW LGX LTG - Right Side)**

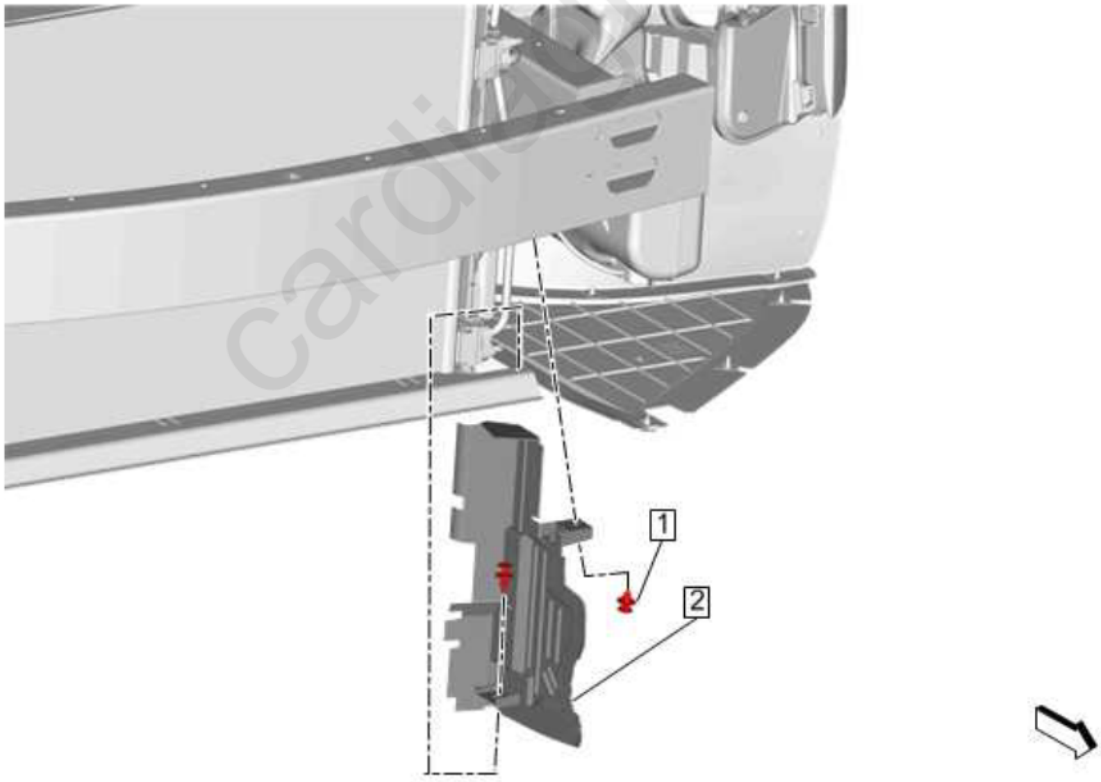


Fig. 200: Radiator Air Side Lower Baffle (LGW LGX LTG - Left Side)
Courtesy of GENERAL MOTORS COMPANY

10. Radiator Air Upper Baffle and Deflector (4)Â» Install - **Radiator Air Upper Baffle and Deflector Replacement (LGW LTG)**

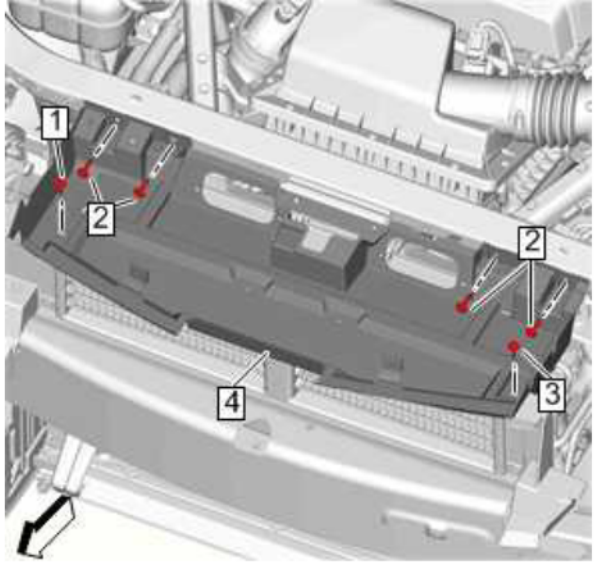


Fig. 201: Radiator Air Upper Baffle and Deflector
Courtesy of GENERAL MOTORS COMPANY

11. Install the front bumper fascia (4). Refer to **Front Bumper Fascia Replacement (Without UV3)** **Front Bumper Fascia Replacement (With UV3)**

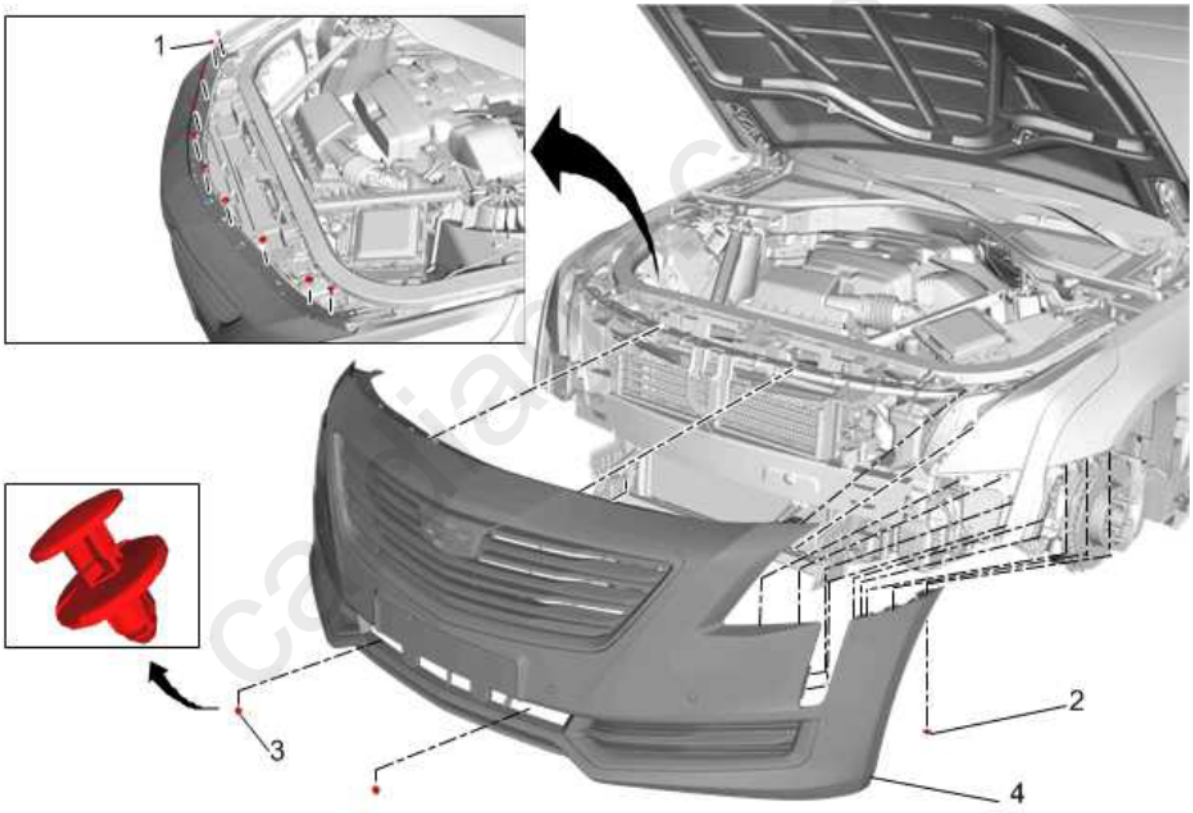


Fig. 202: Front Bumper Fascia
Courtesy of GENERAL MOTORS COMPANY

12. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
13. Inspect for refrigerant leaks.

AIR CONDITIONING CONDENSER BRACKET REPLACEMENT

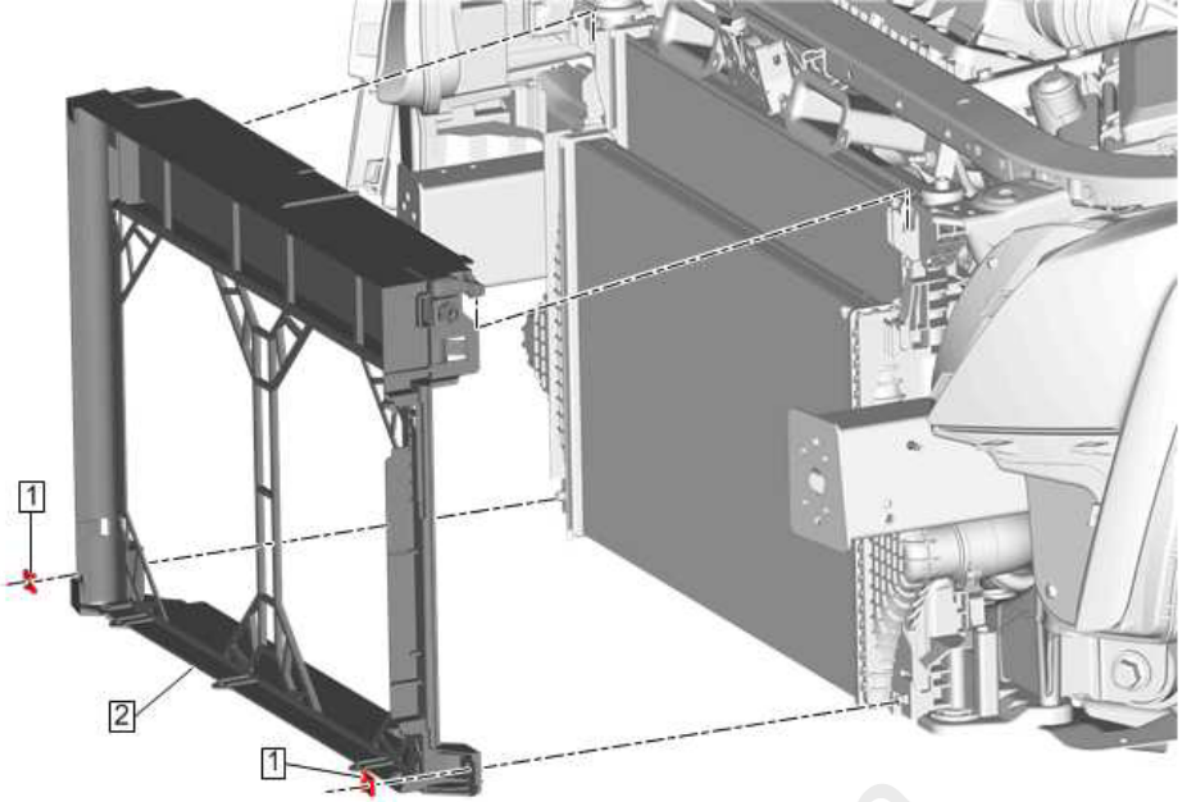


Fig. 203: Air Conditioning Condenser Bracket
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Air Conditioning Condenser ReplacementAir Conditioning Condenser Replacement (LTG with HP9) 2. Transmission Fluid Cooler Inlet and Outlet Pipe @ Transmission Fluid Auxiliary CoolerÂ» Remove - Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LTG) Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LTG With HP9) Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LGW)	
1	Air Conditioning Condenser Bracket Retainer [2x]
2	Air Conditioning Condenser Bracket

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (WITHOUT HP9 HYBRID)

Removal Procedure

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection
2. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging (R-134a) and/or Refrigerant Recovery and Recharging (R-1234yf)
3. Drain the cooling system. Refer to Cooling System Draining and Filling (Static without HP9) and/or Cooling System Draining and Filling (GE 47716 without HP9)
4. Air Inlet Grille Panel (2)Â» Remove - Air Inlet Grille Panel Replacement

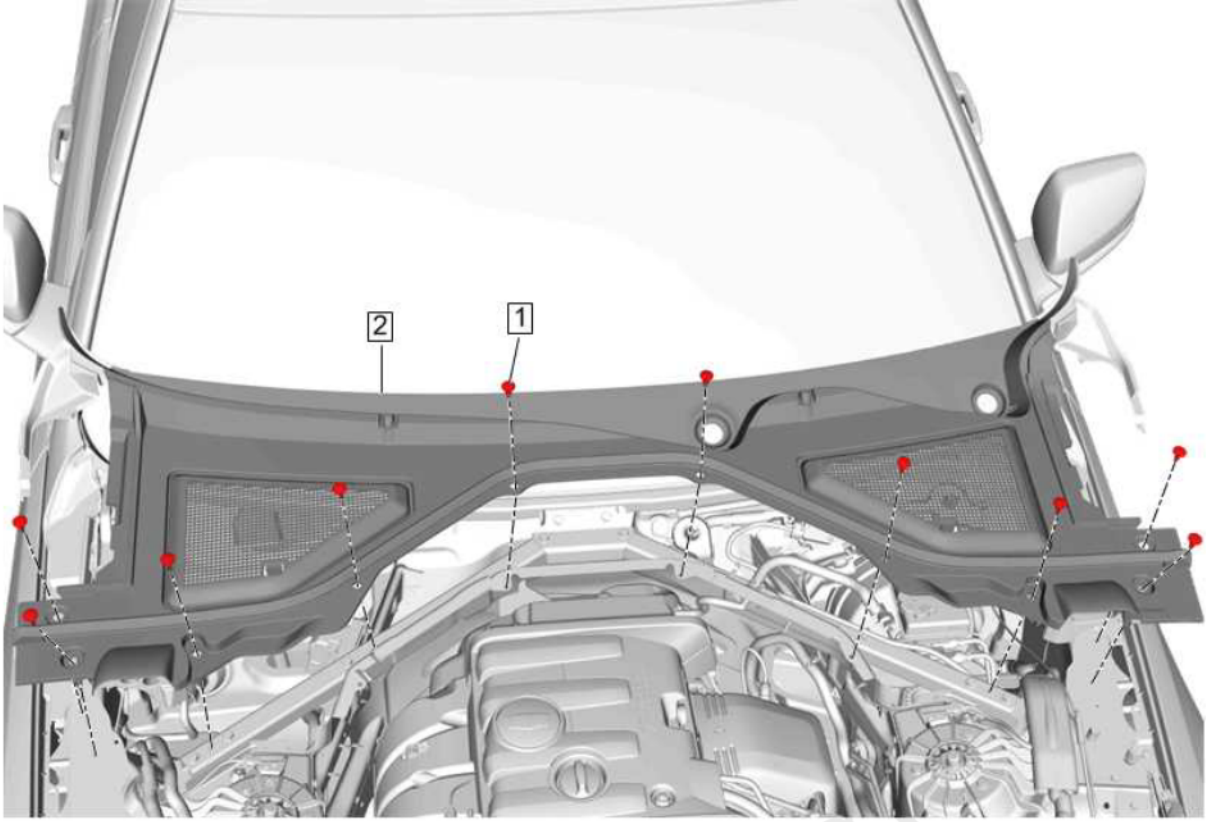


Fig. 204: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

5. Windshield Wiper Transmission (2)Â» Remove - **Windshield Wiper Transmission Replacement**

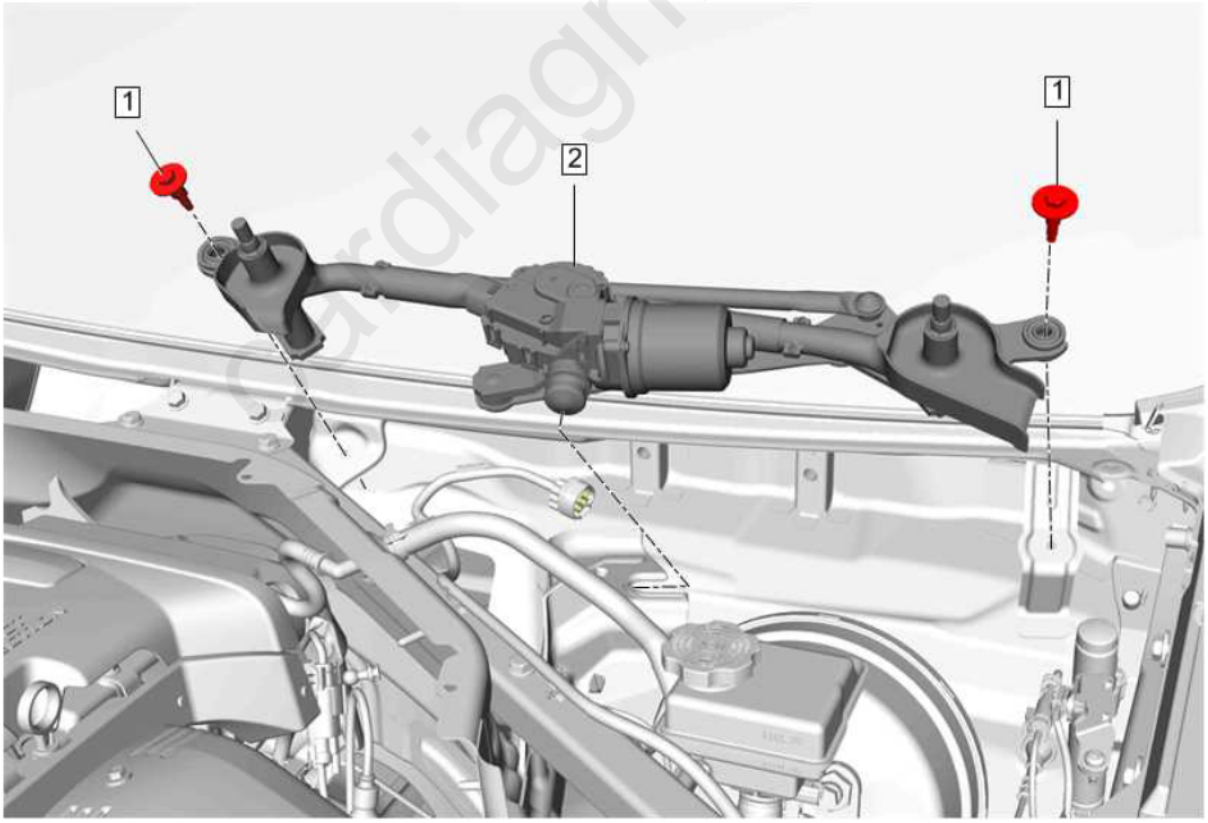


Fig. 205: Windshield Wiper Transmission
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Refrigerant Heat Exchanger (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Air Conditioning Refrigerant Heat Exchanger Replacement (LTG)Air Conditioning Refrigerant Heat Exchanger Replacement (LGW, LGX)**

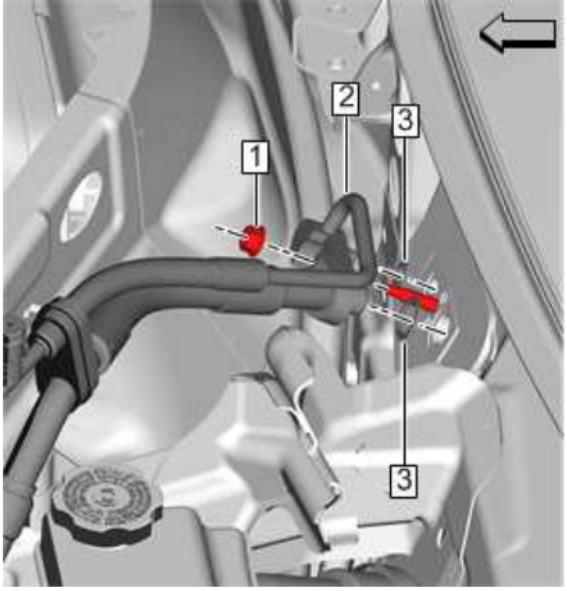


Fig. 206: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Heater Core TubeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)**

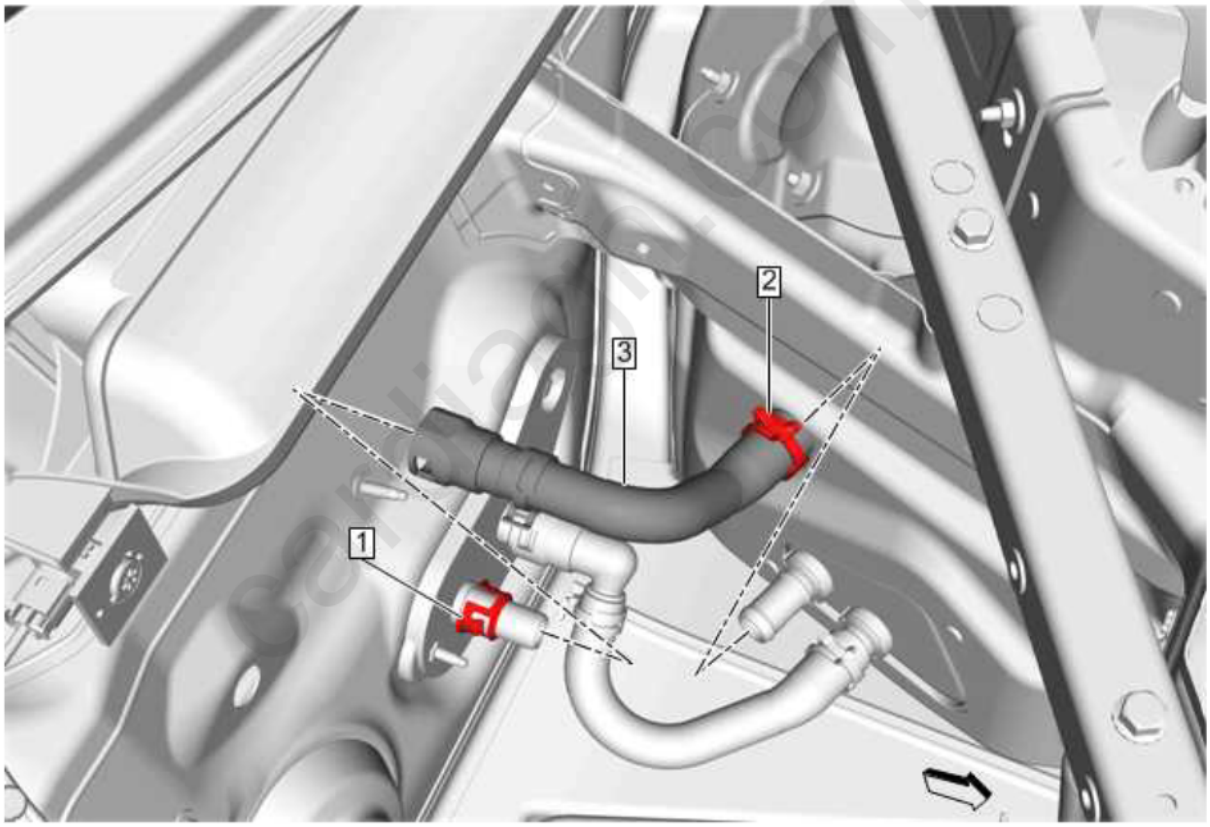


Fig. 207: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Outlet Hose (3) @ Heater Core TubeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)**

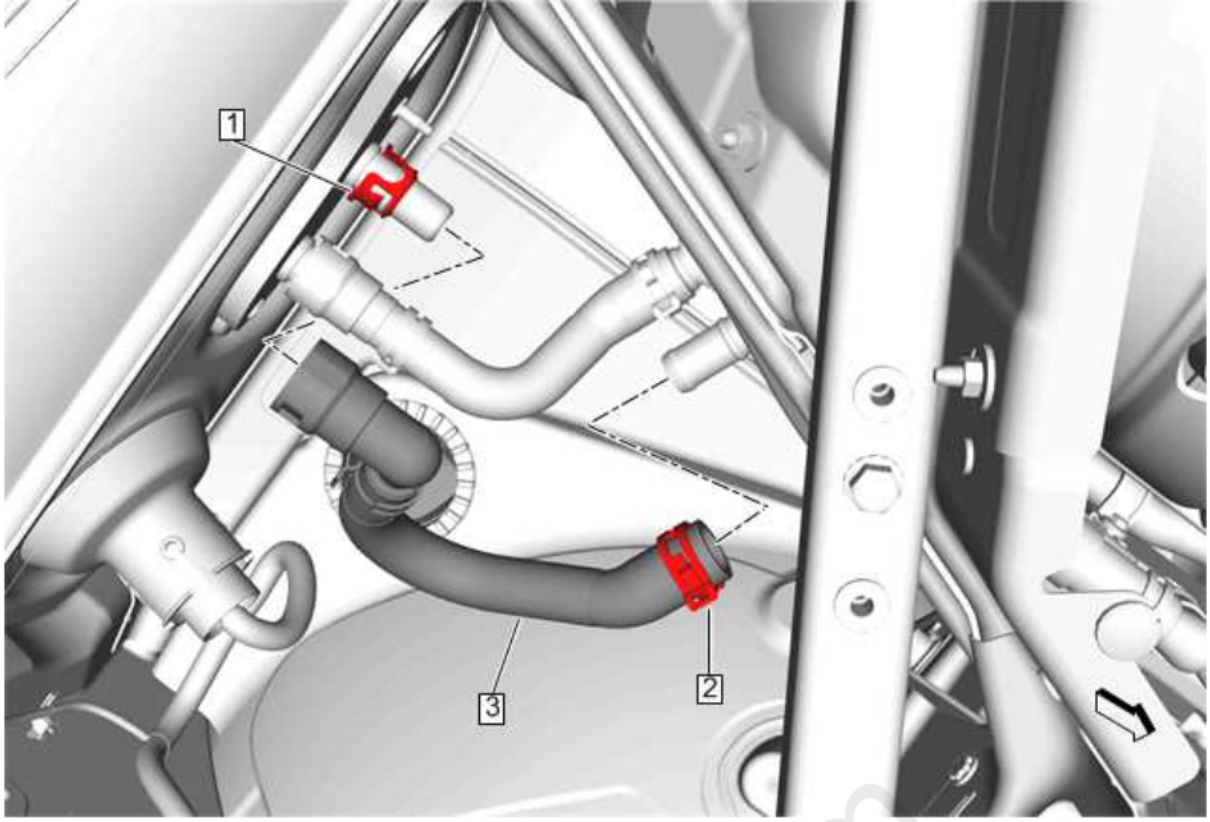


Fig. 208: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. From within the engine compartment, remove the heater and air conditioning evaporator and blower module bolt (1) securing the heater and air conditioning evaporator and blower module to the cowl panel.

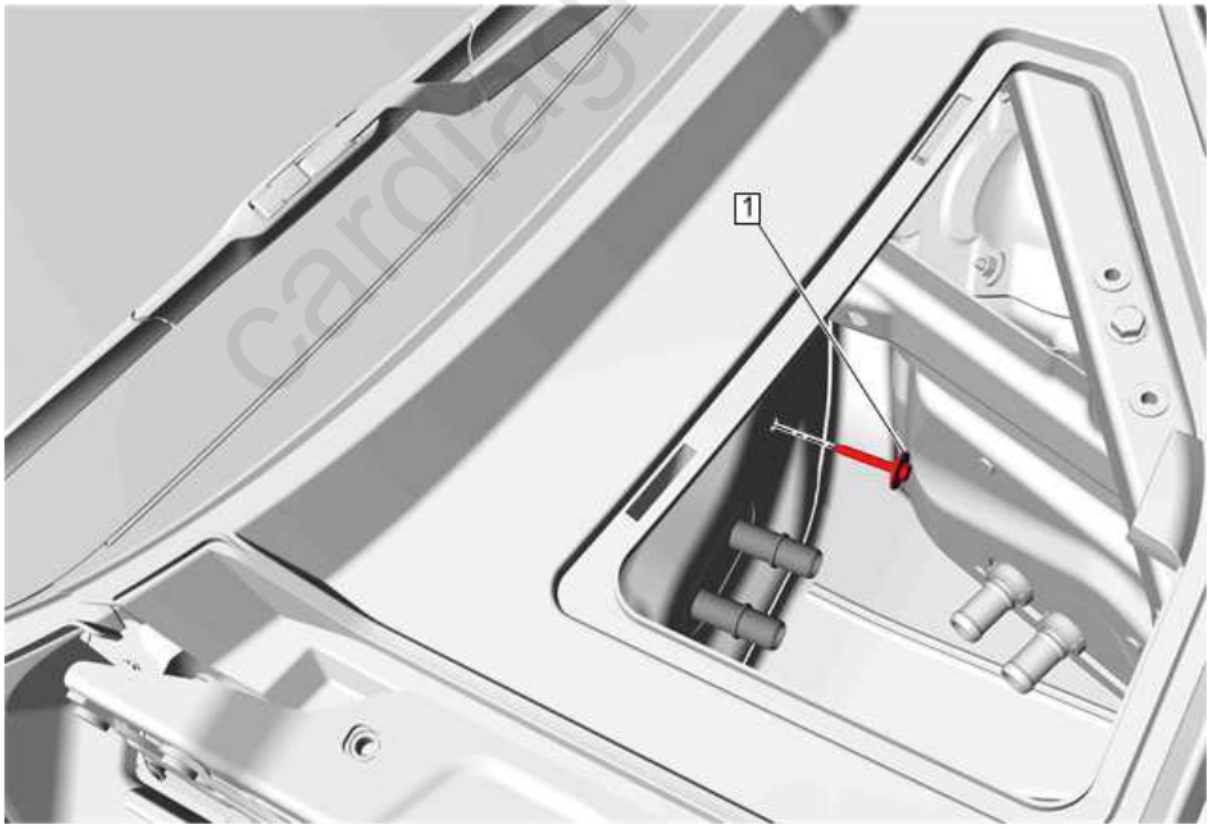


Fig. 209: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

10. 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.

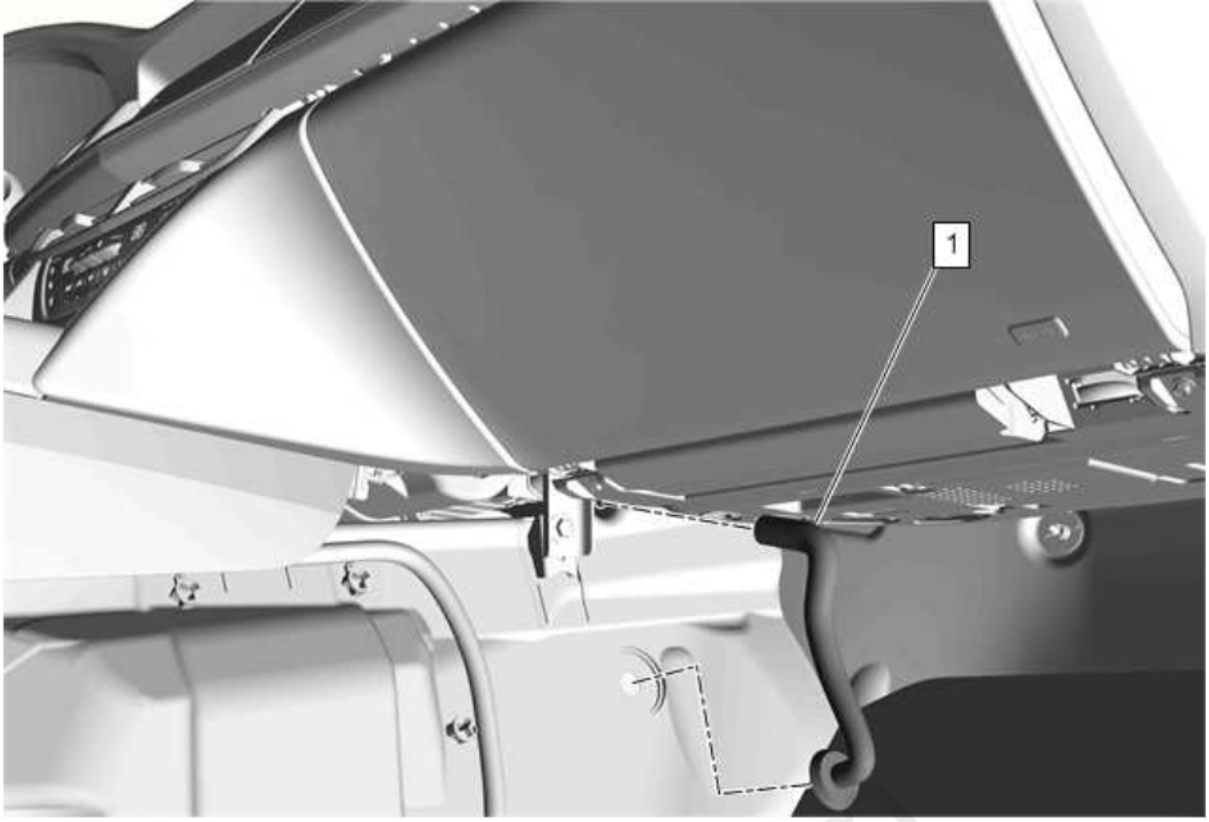


Fig. 210: Air Conditioning Evaporator and Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Always ensure the HVAC module drain tube is properly installed and secure following a repair. Residual moisture/water can collect inside the HVAC module. The residual moisture or water should not contact electrical modules, electrical connections, wiring, cables or carpeting. Use clean and absorbent shop clothes to protect these components while removing or installing the HVAC module drain tube and/or HVAC module. Moisture/water is a by-product of normal A/C system operation and can result in interior odors or corrosion/damage to electrical components.**

11. Air Conditioning Evaporator and Blower Module Drain Hose - Right Side (1)Â» Remove - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Right Side)**
12. Air Conditioning Evaporator and Blower Module Drain Hose - Left Side (1)Â» Remove - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Left Side)**

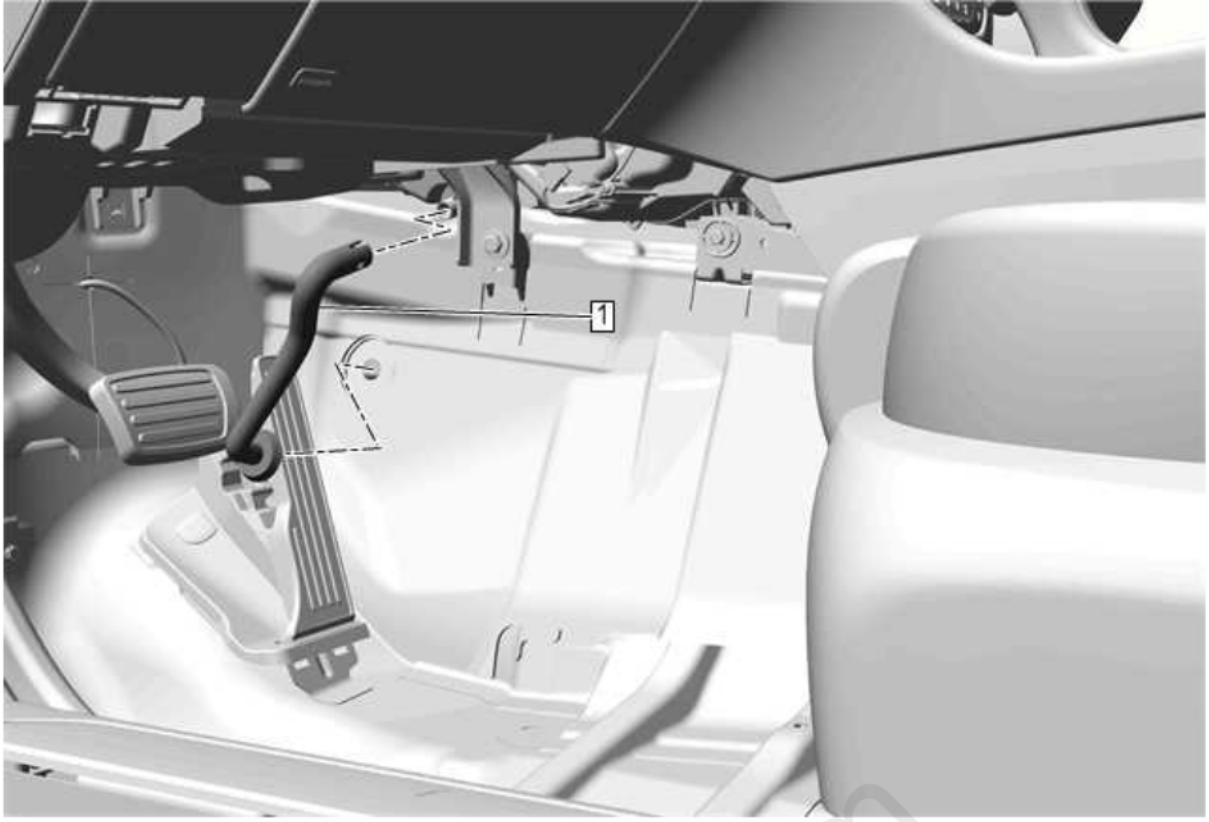


Fig. 211: Air Conditioning Evaporator And Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

13. Instrument Panel Carrier (1)Â» Remove - **Instrument Panel Carrier Replacement (UQH)** **Instrument Panel Carrier Replacement (UQA)**

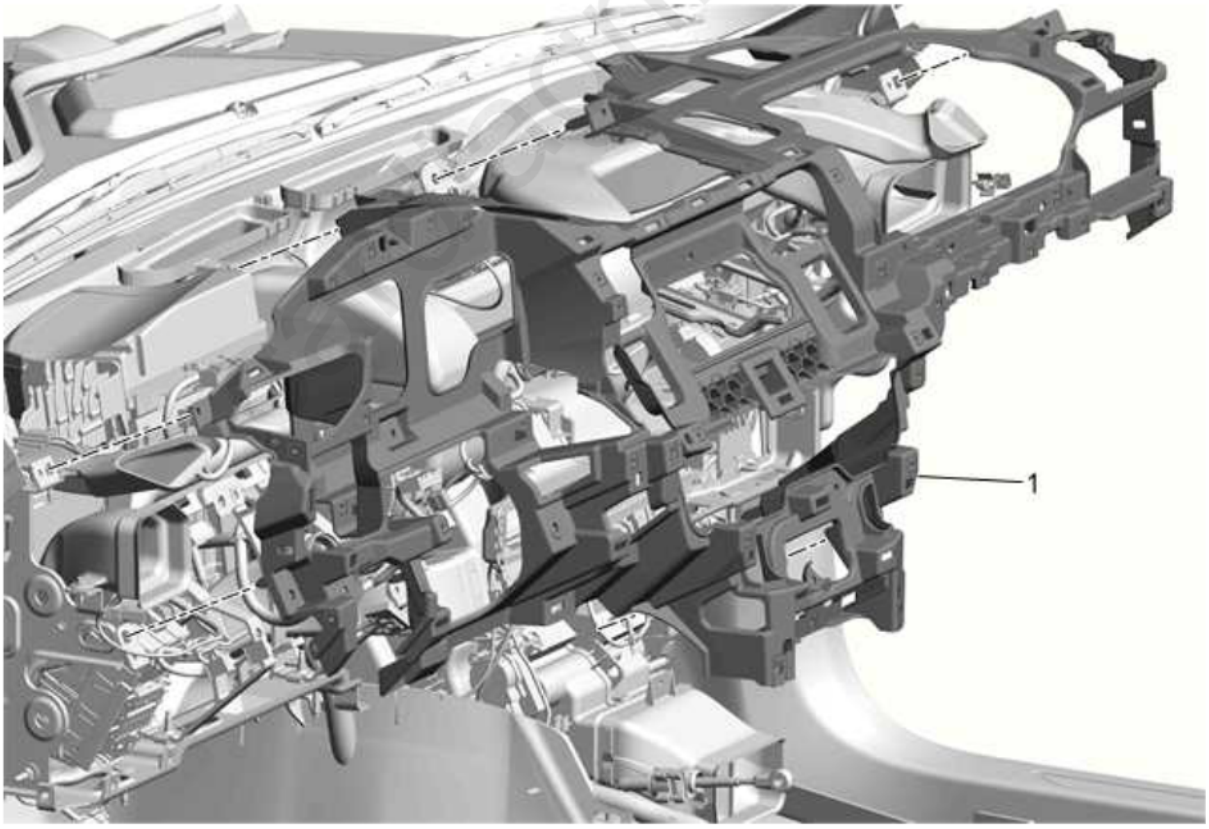


Fig. 212: Instrument Panel Carrier Assembly
Courtesy of GENERAL MOTORS COMPANY

14. Side Window Defogger Outlet Duct - Right Side (2)Â» Remove - **Side Window Defogger Outlet Duct Replacement - Right Side**

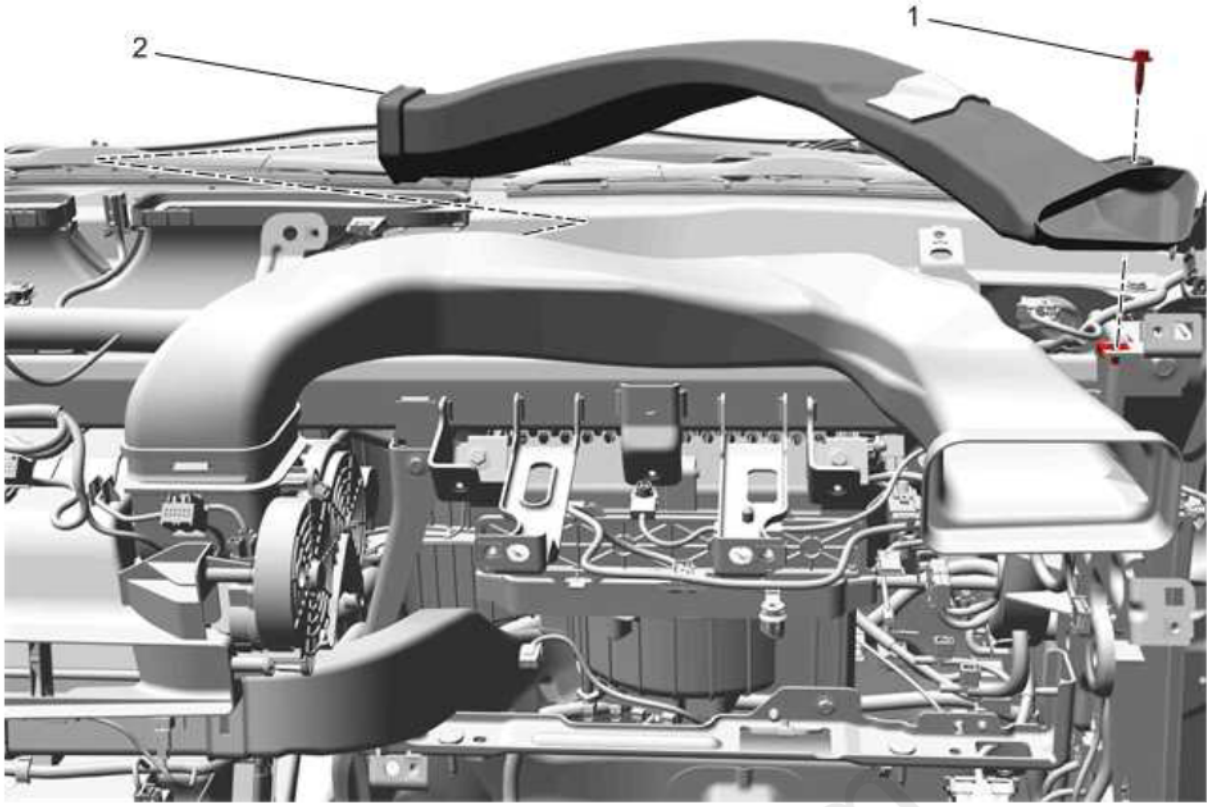


Fig. 213: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

15. Windshield Defroster Outlet Duct (1)Â» Remove - **Windshield Defroster Outlet Duct Replacement**

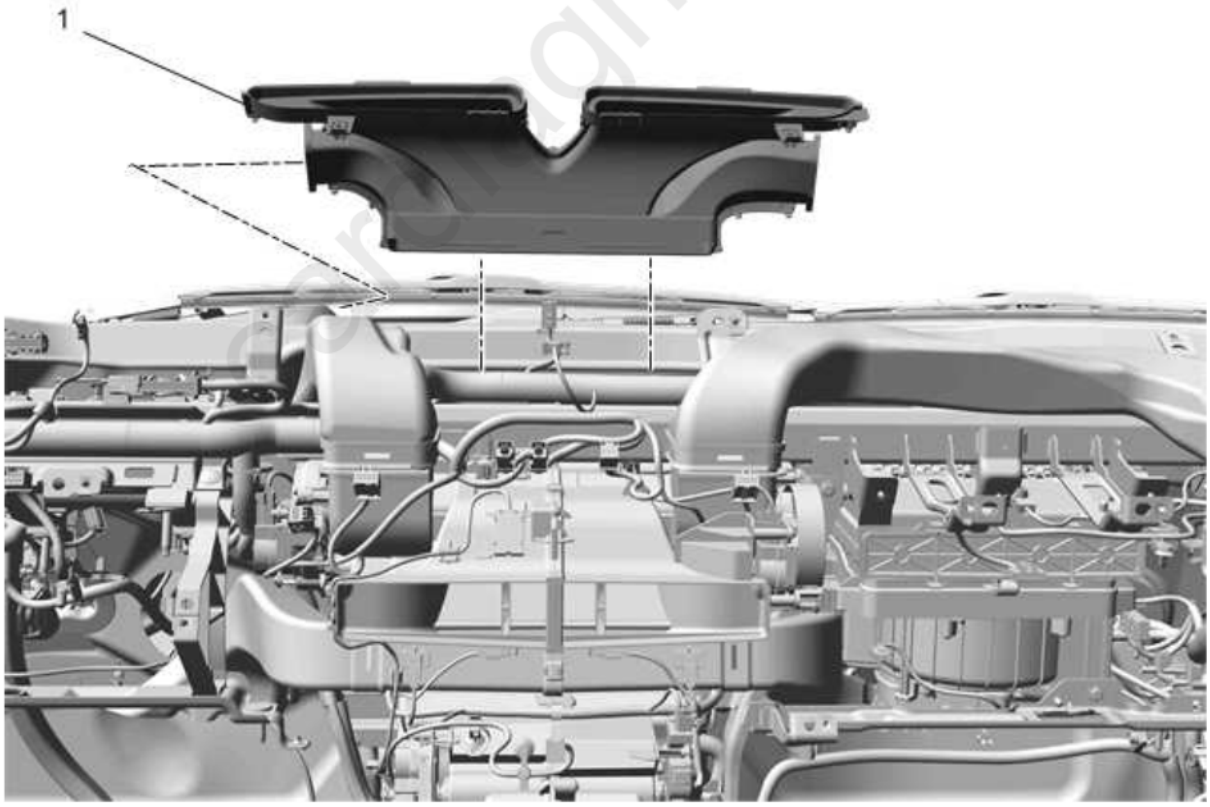


Fig. 214: Windshield Defroster Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

16. Instrument Panel Outer Air Outlet Duct - Right Side (2)Â» Remove - **Instrument Panel Outer Air Outlet Duct Replacement - Right Side**

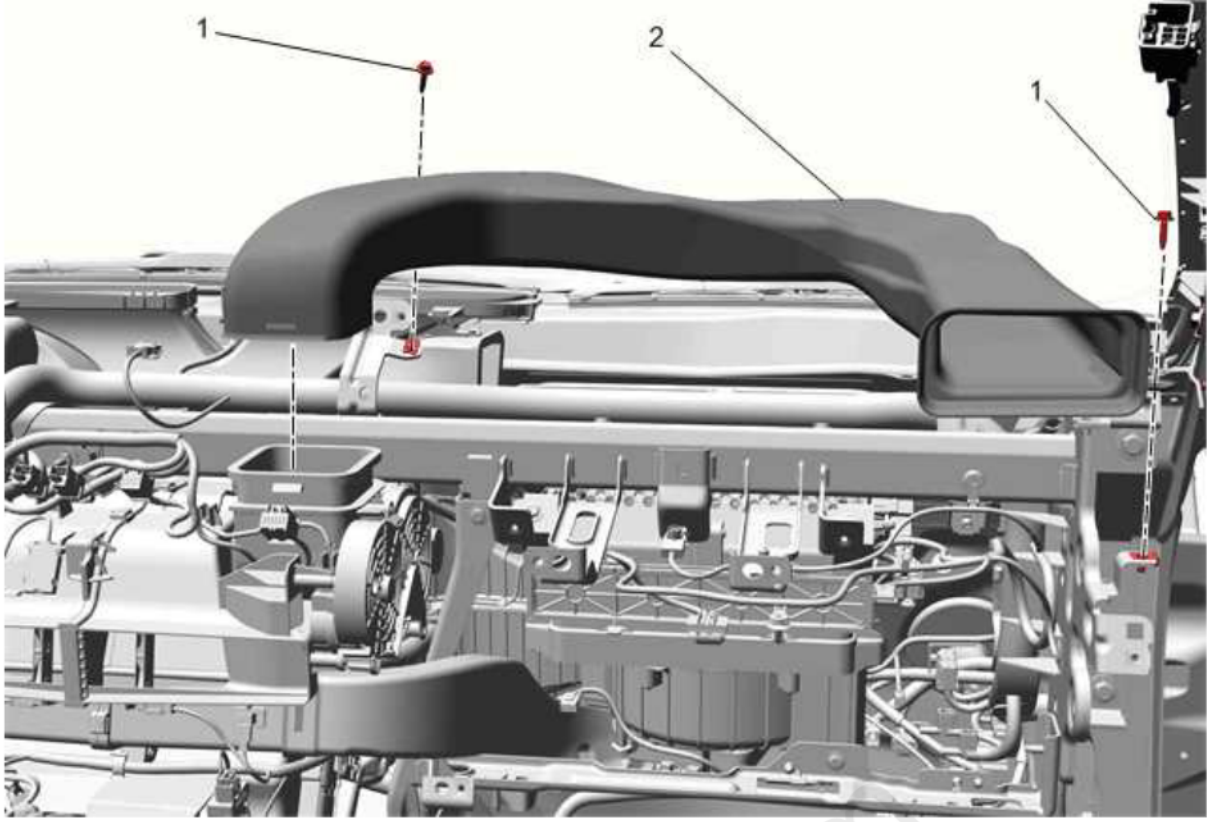


Fig. 215: Instrument Panel Outer Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

17. Instrument Panel Tie Bar (1)Â» Remove - **Instrument Panel Tie Bar Replacement**

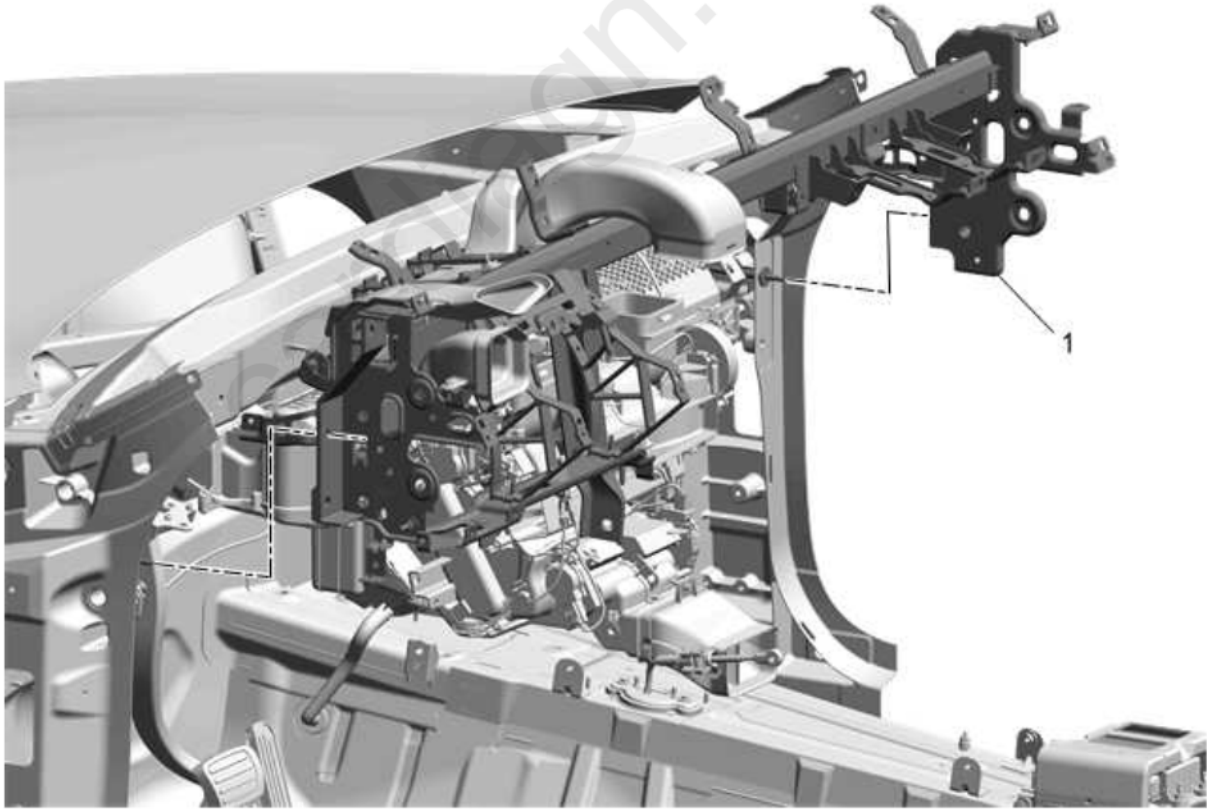


Fig. 216: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

18. Side Window Defogger Outlet Duct - Left Side (3)Â» Remove - **Side Window Defogger Outlet Duct Replacement - Left Side**

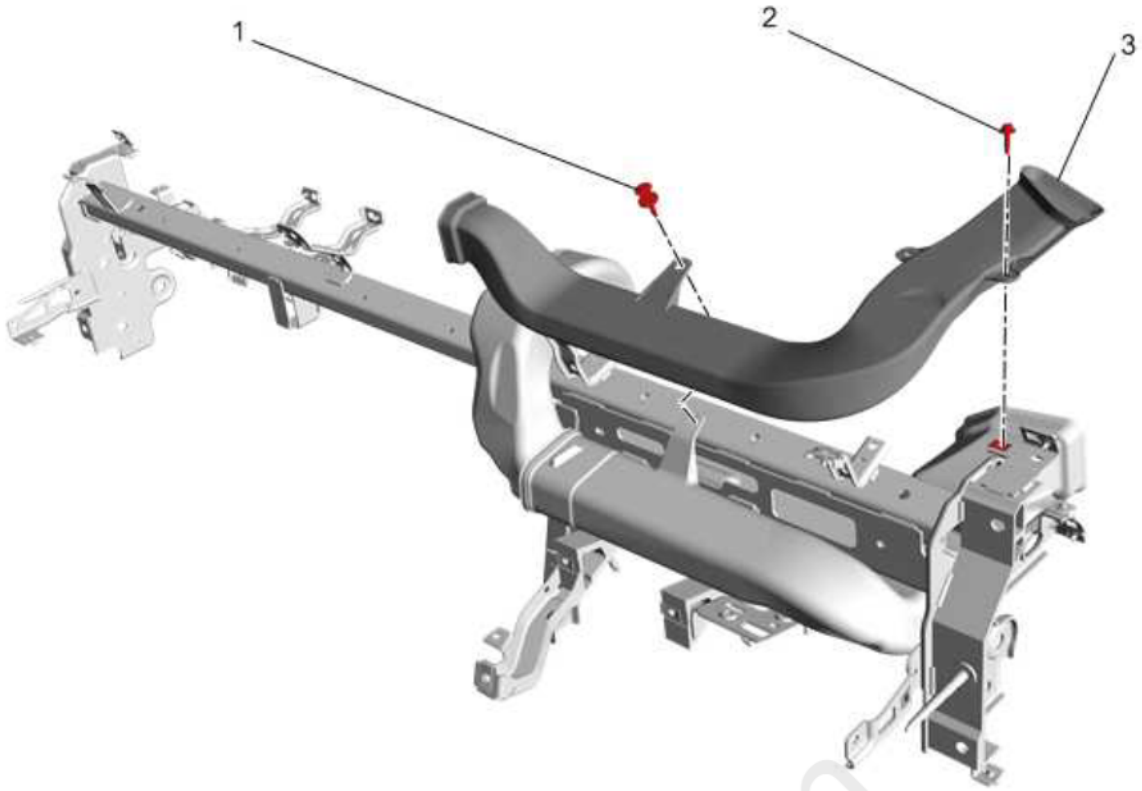


Fig. 217: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

19. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Remove - **Instrument Panel Outer Air Outlet Duct Replacement - Left Side**

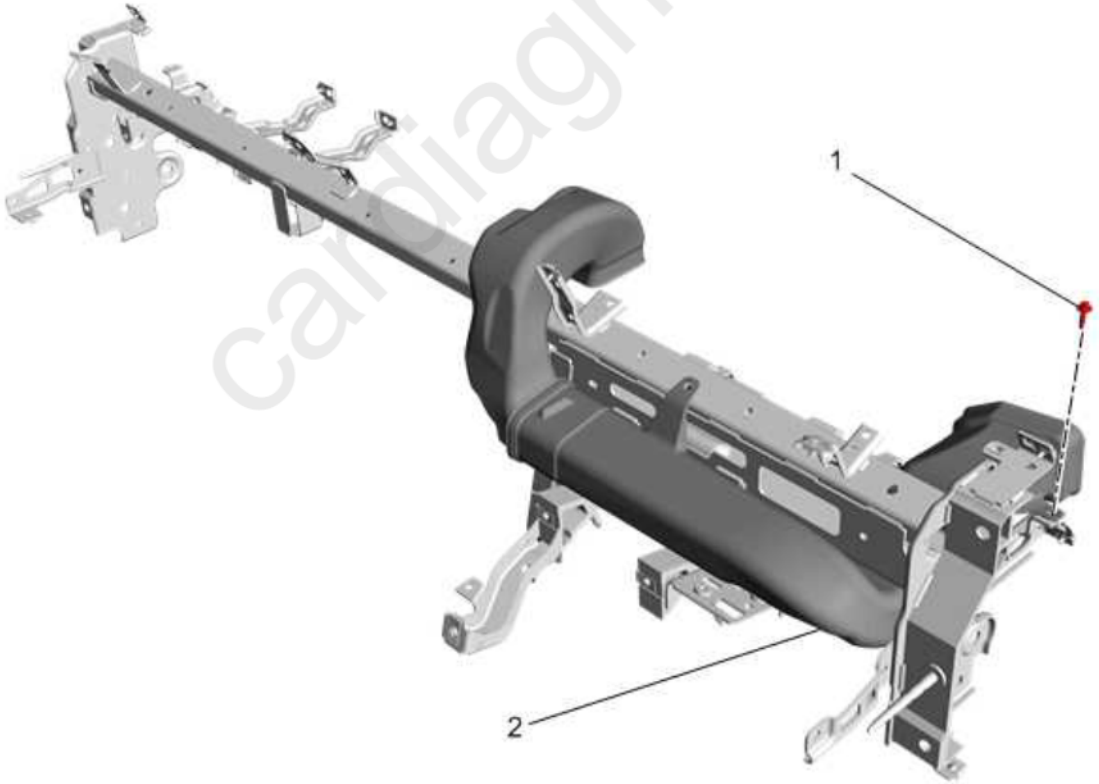


Fig. 218: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

20. Instrument Panel Center Support Bracket (1)Â» Remove - **Instrument Panel Center Support Bracket Replacement**

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Fig. 219: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

21. Floor Front Air Outlet Duct - Left Side (1)Â» Remove - **Floor Front Air Outlet Duct Replacement - Left Side**

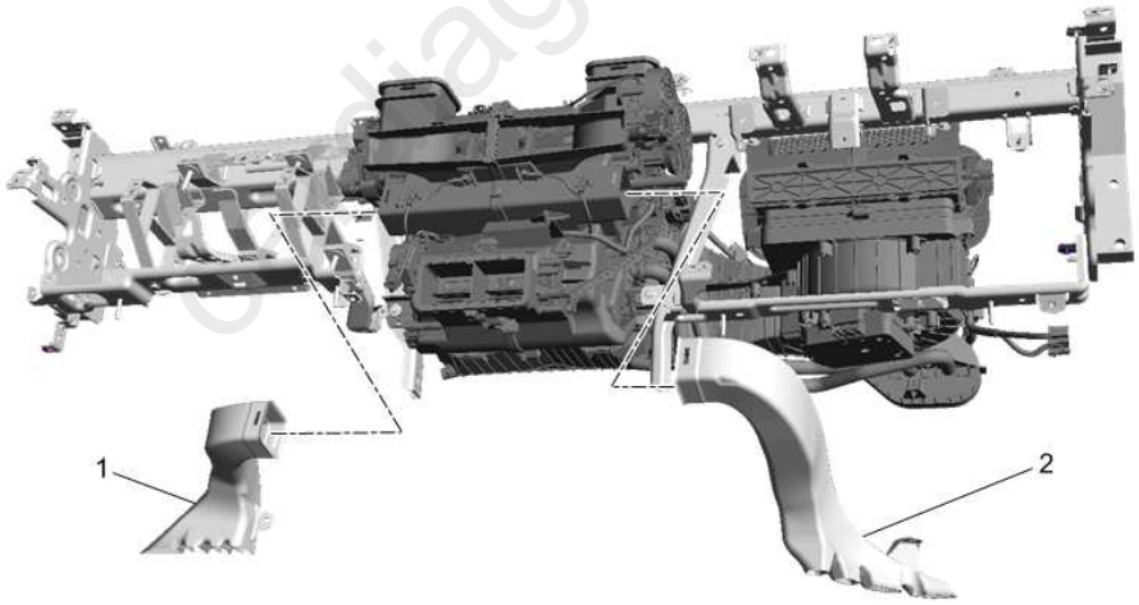


Fig. 220: Floor Front Air Outlet Ducts
Courtesy of GENERAL MOTORS COMPANY

22. Floor Front Air Outlet Duct - Right Side (2)Â» Remove - **Floor Front Air Outlet Duct Replacement - Right Side**
23. Heater and Air Conditioning Evaporator and Blower Module Nut (1)Â» Remove

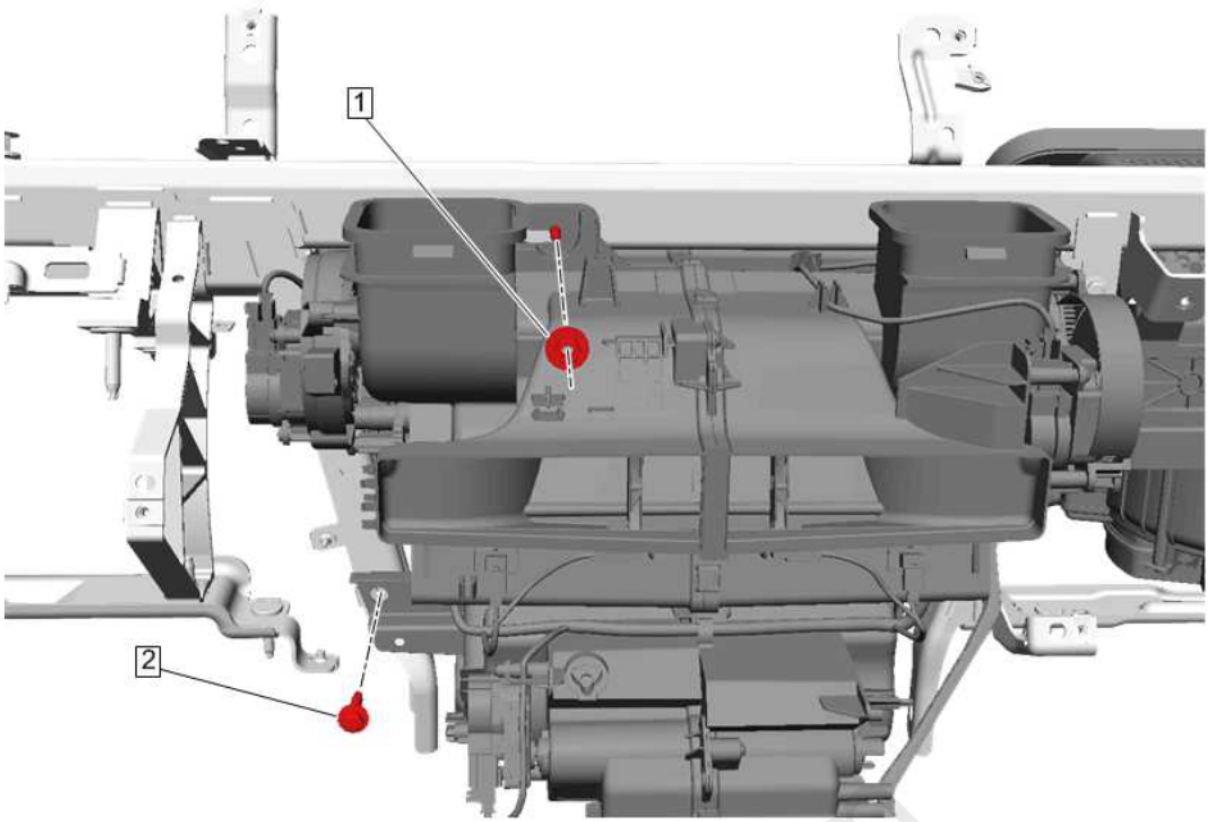


Fig. 221: Heater and Air Conditioning Evaporator and Blower Module Retainers
Courtesy of GENERAL MOTORS COMPANY

24. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Remove
25. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Remove [4x]

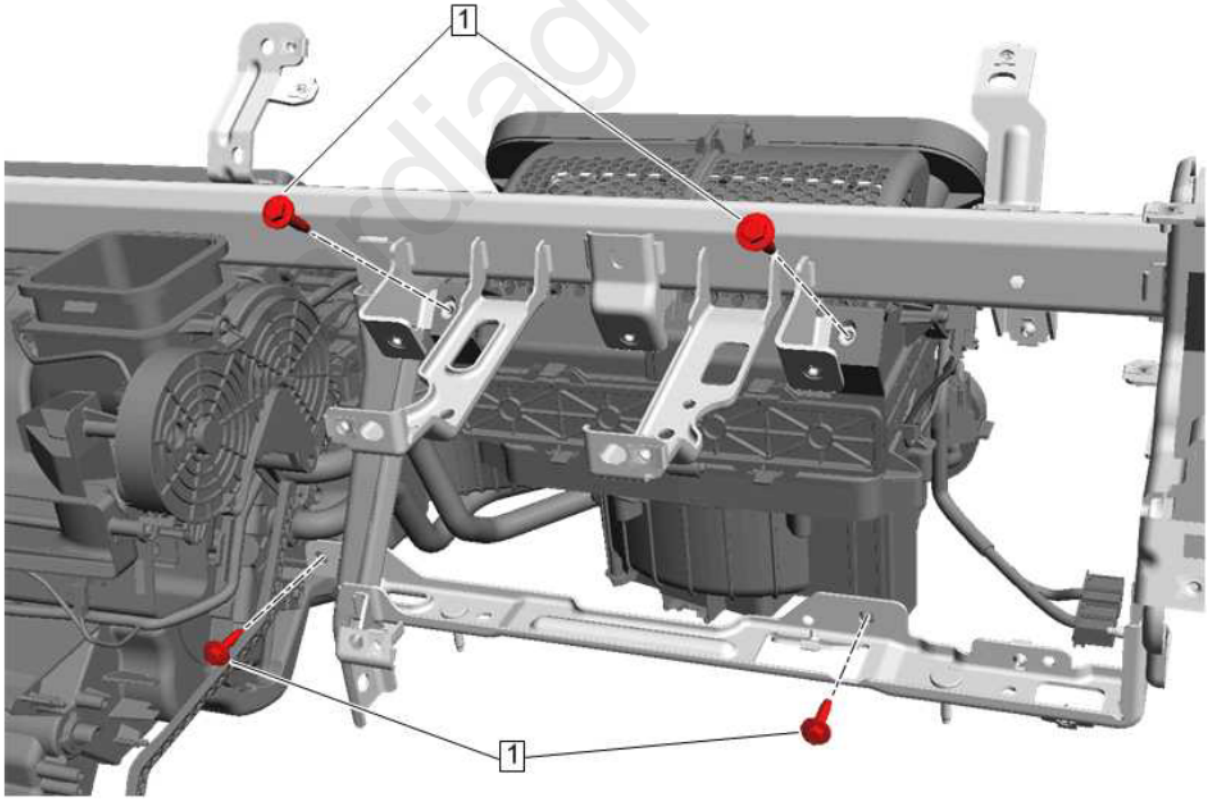


Fig. 222: Heater and Air Conditioning Evaporator and Blower Module Bolts
Courtesy of GENERAL MOTORS COMPANY

26. Heater and Air Conditioning Evaporator and Blower Module (1) @ Instrument Panel Tie BarÂ» Remove

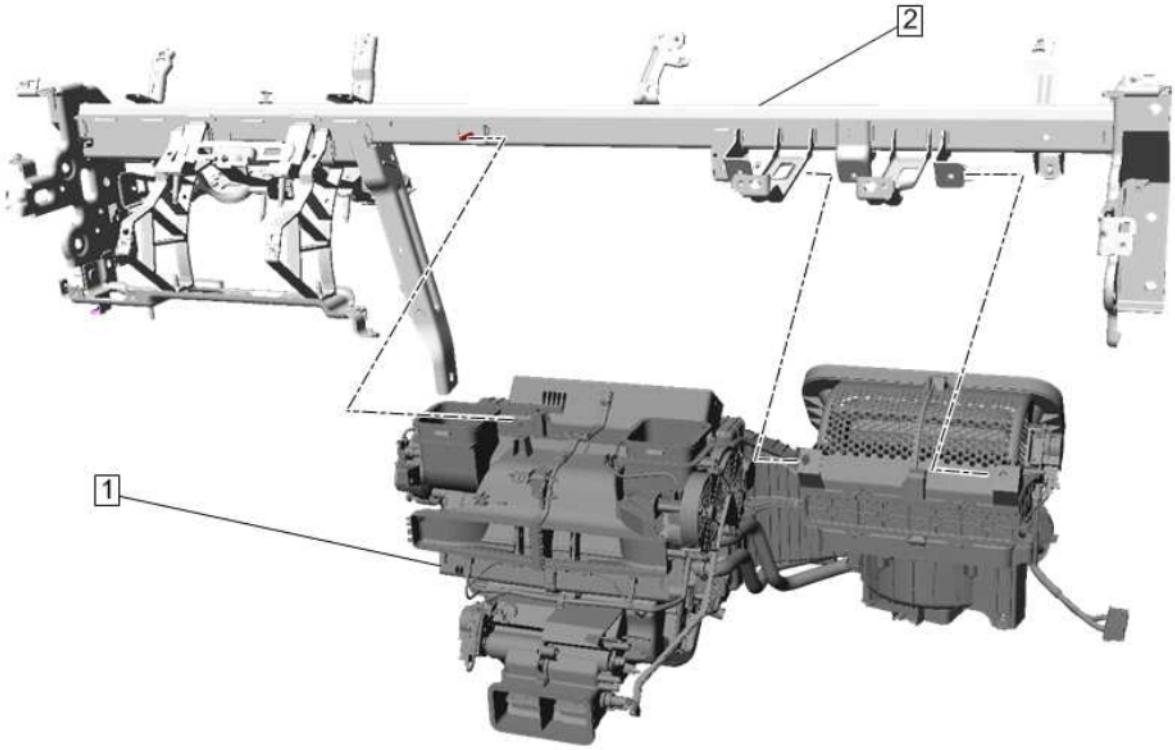


Fig. 223: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

27. Transfer components as necessary.

Installation Procedure

1. Heater and Air Conditioning Evaporator and Blower Module (1) @ Instrument Panel Tie BarÂ» Install

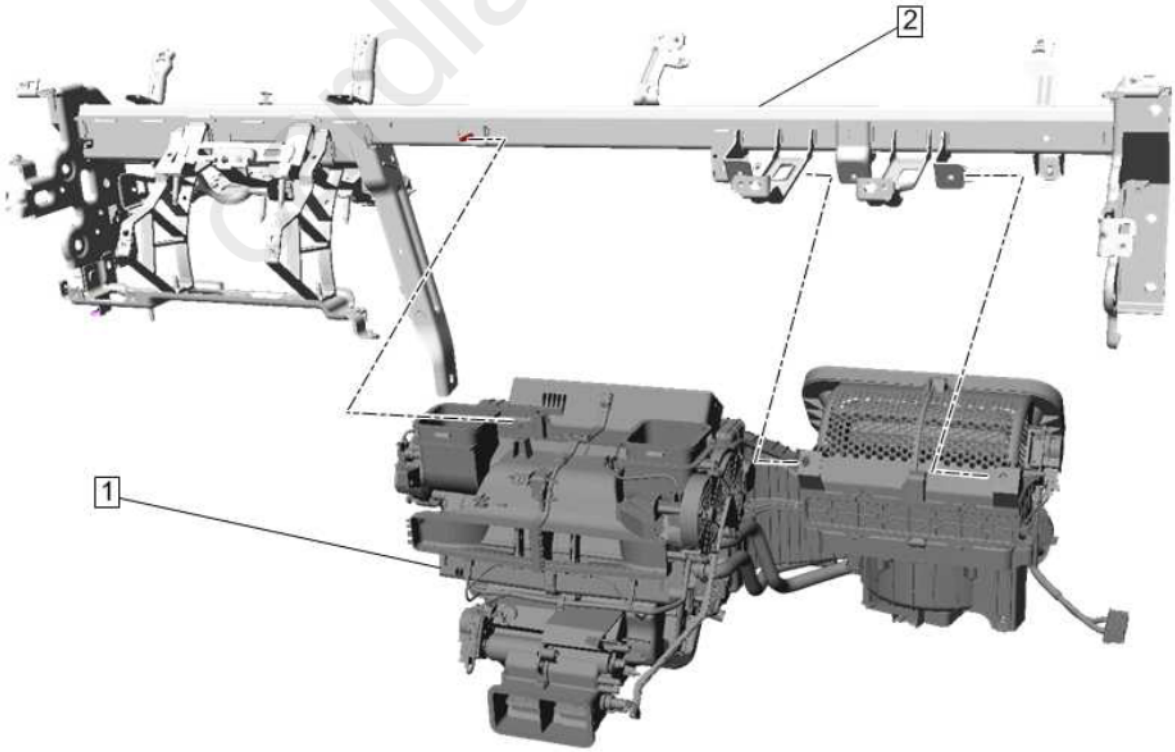


Fig. 224: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Verify air inlet housing upon installation of the heater and air conditioning evaporator and blower module does not snag the front**

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interior sound barrier causing damage to the air inlet housing.

2. Heater and Air Conditioning Evaporator and Blower Module Bolt (1)Â» Install and tighten [4x] 9.0 N.m (80 lb in)

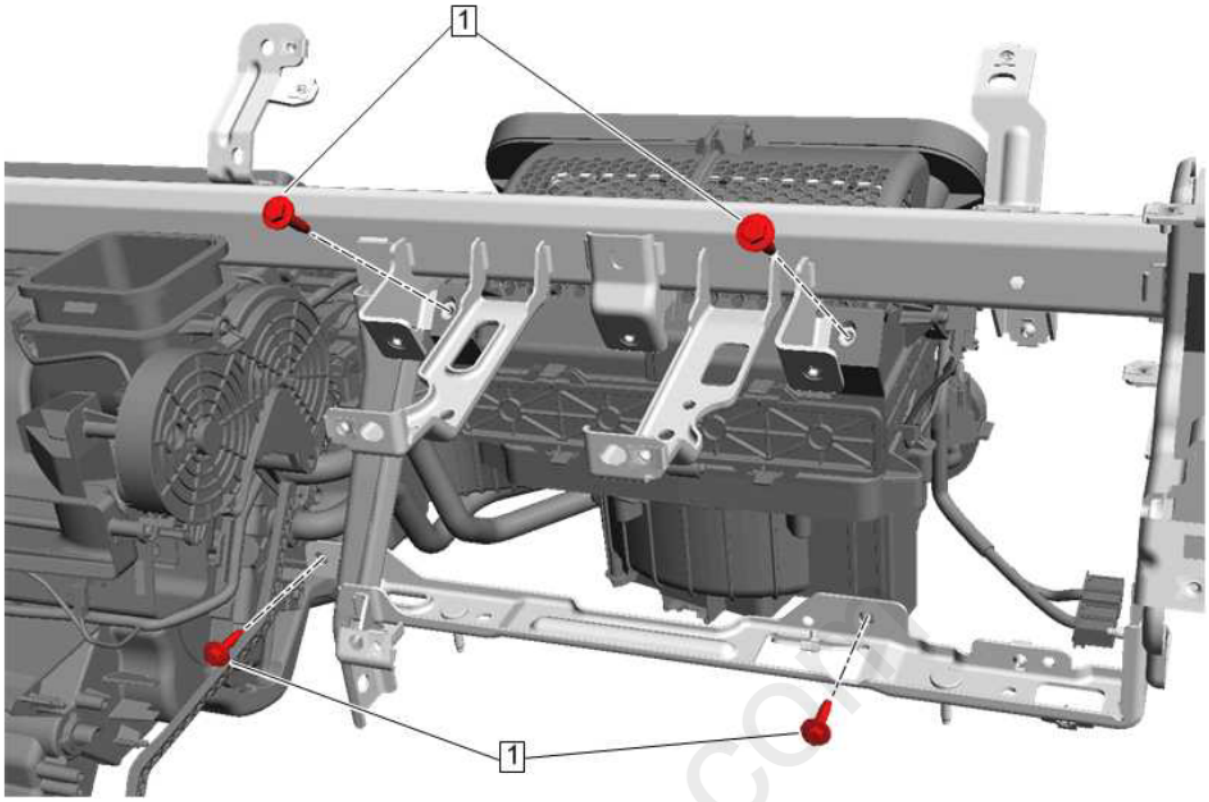


Fig. 225: Heater and Air Conditioning Evaporator and Blower Module Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Install and tighten 9.0 N.m (80 lb in)

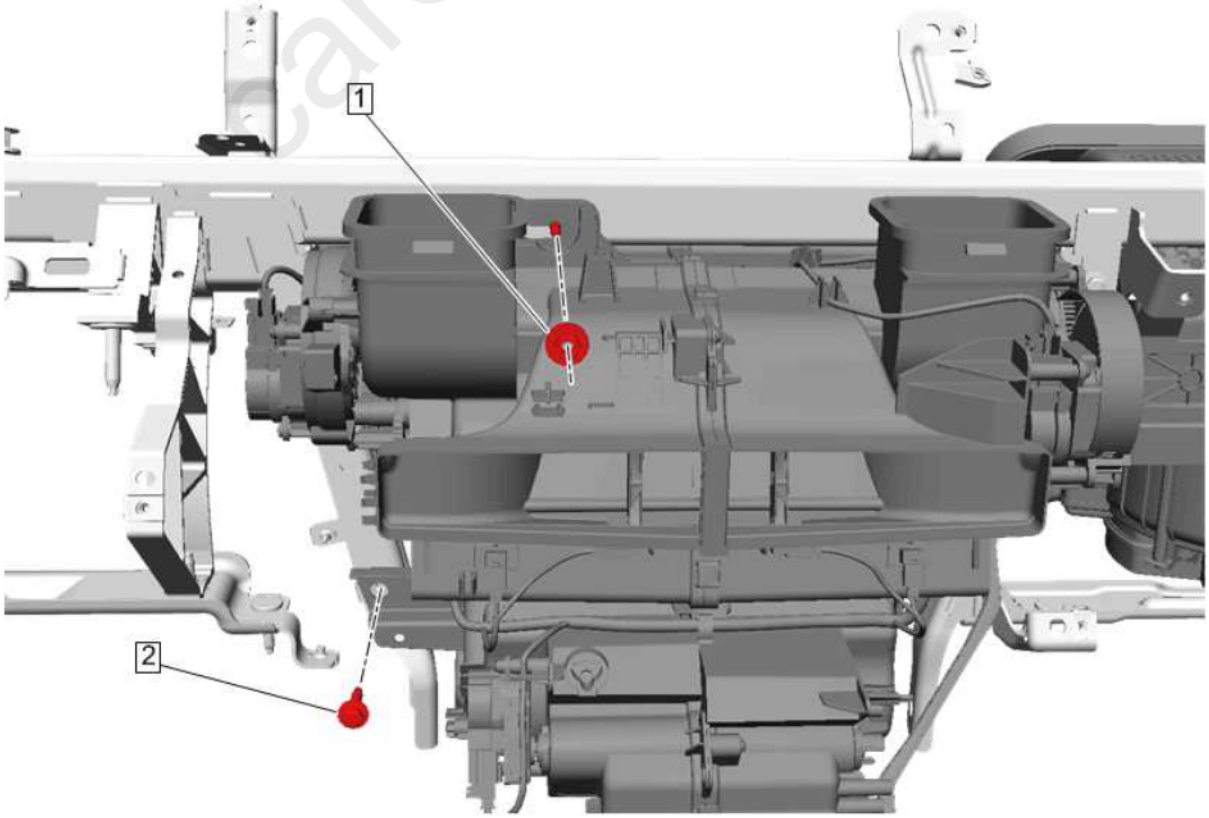


Fig. 226: Heater and Air Conditioning Evaporator and Blower Module Retainers
Courtesy of GENERAL MOTORS COMPANY

4. Heater and Air Conditioning Evaporator and Blower Module Nut (1)Â» Install and tighten 9.0 N.m (80 lb in)
5. Floor Front Air Outlet Duct - Left Side (1)Â» Install - **Floor Front Air Outlet Duct Replacement - Left Side**

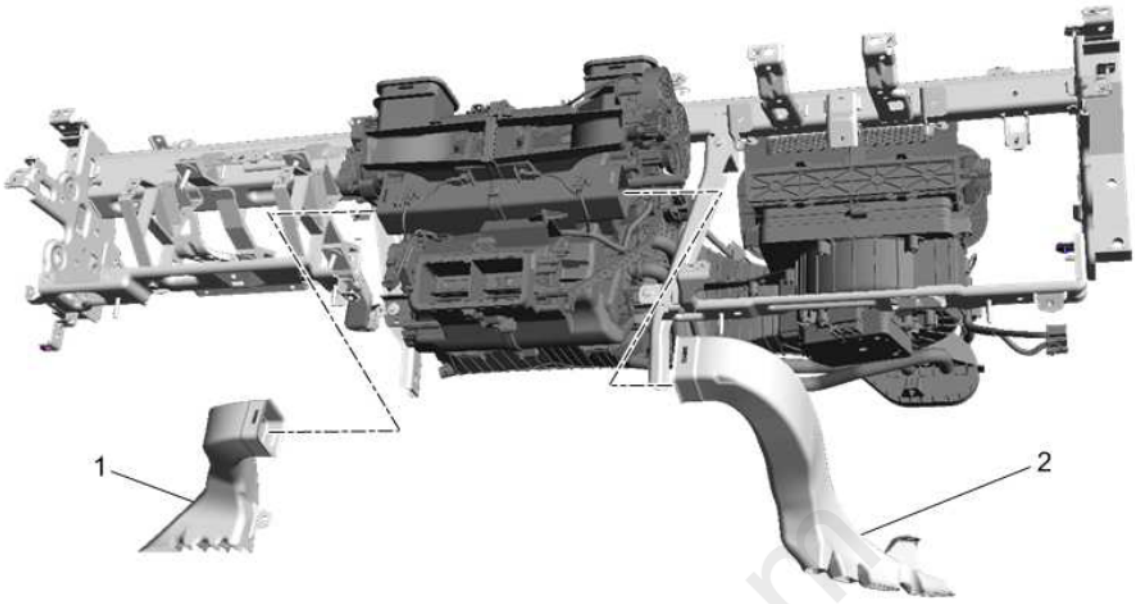


Fig. 227: Floor Front Air Outlet Ducts
Courtesy of GENERAL MOTORS COMPANY

6. Floor Front Air Outlet Duct - Right Side (2)Â» Install - **Floor Front Air Outlet Duct Replacement - Right Side**
7. Instrument Panel Center Support Bracket (1)Â» Install - **Instrument Panel Center Support Bracket Replacement**

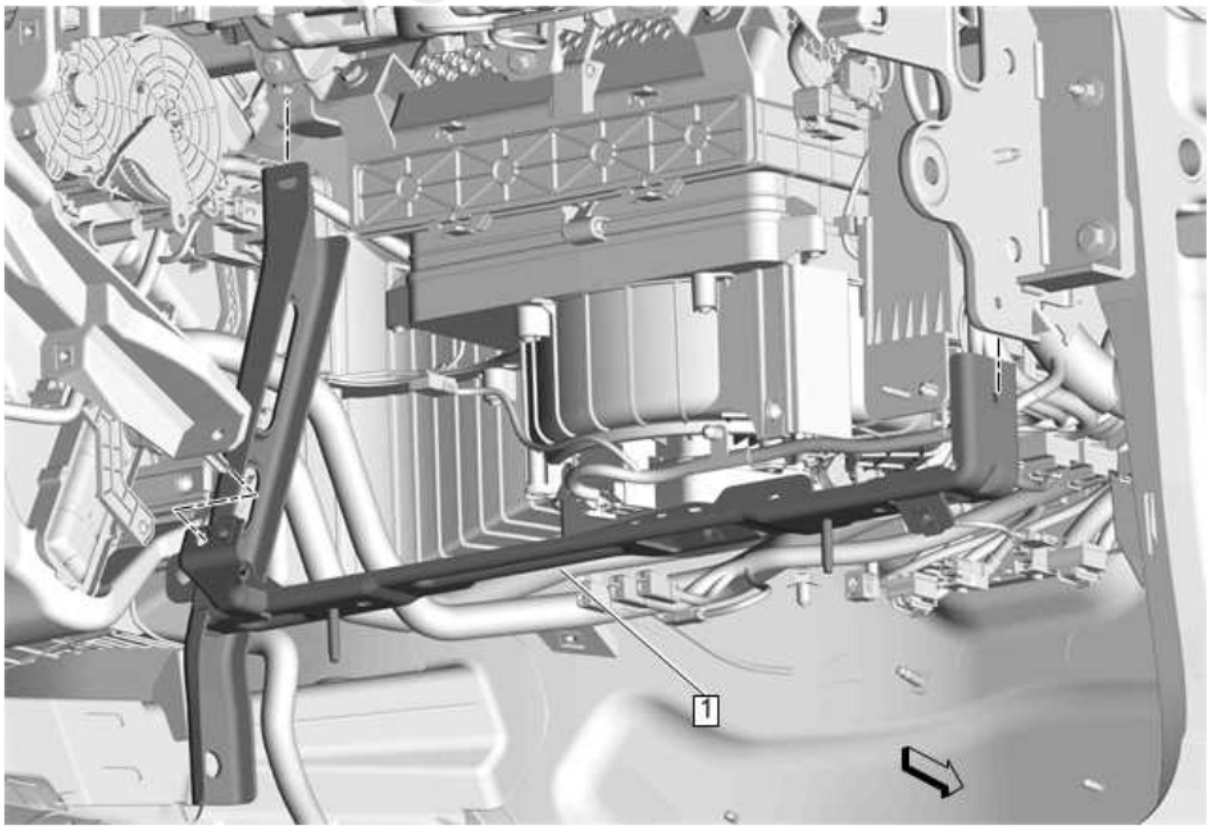


Fig. 228: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Install - **Instrument Panel Outer Air Outlet Duct Replacement - Left Side**

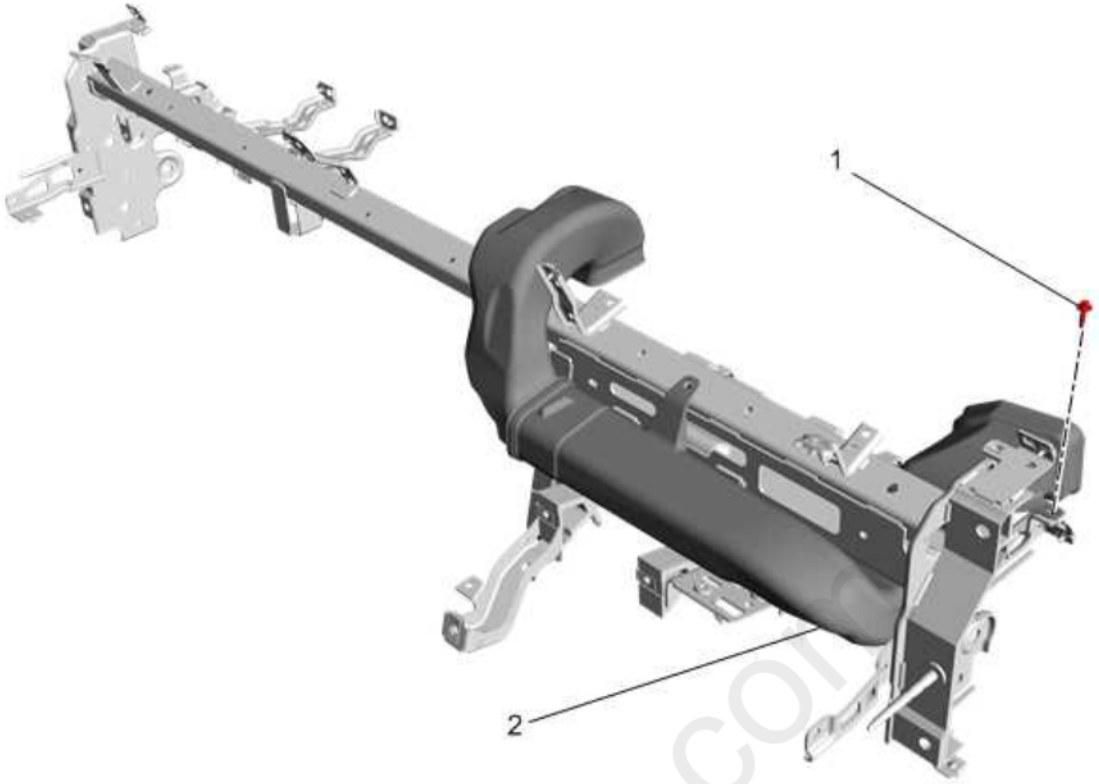


Fig. 229: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

9. Side Window Defogger Outlet Duct - Left Side (3)Â» Install - **Side Window Defogger Outlet Duct Replacement - Left Side**

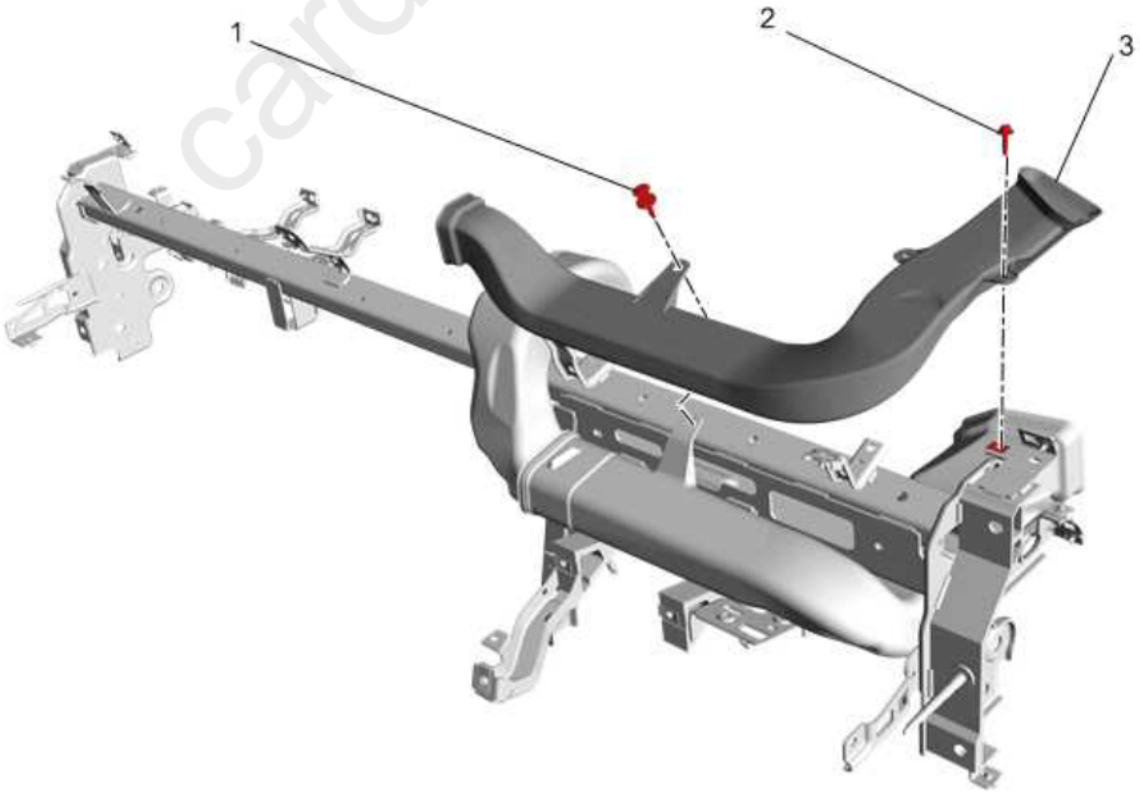


Fig. 230: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

10. Instrument Panel Tie Bar (1)Â» Install - **Instrument Panel Tie Bar Replacement**

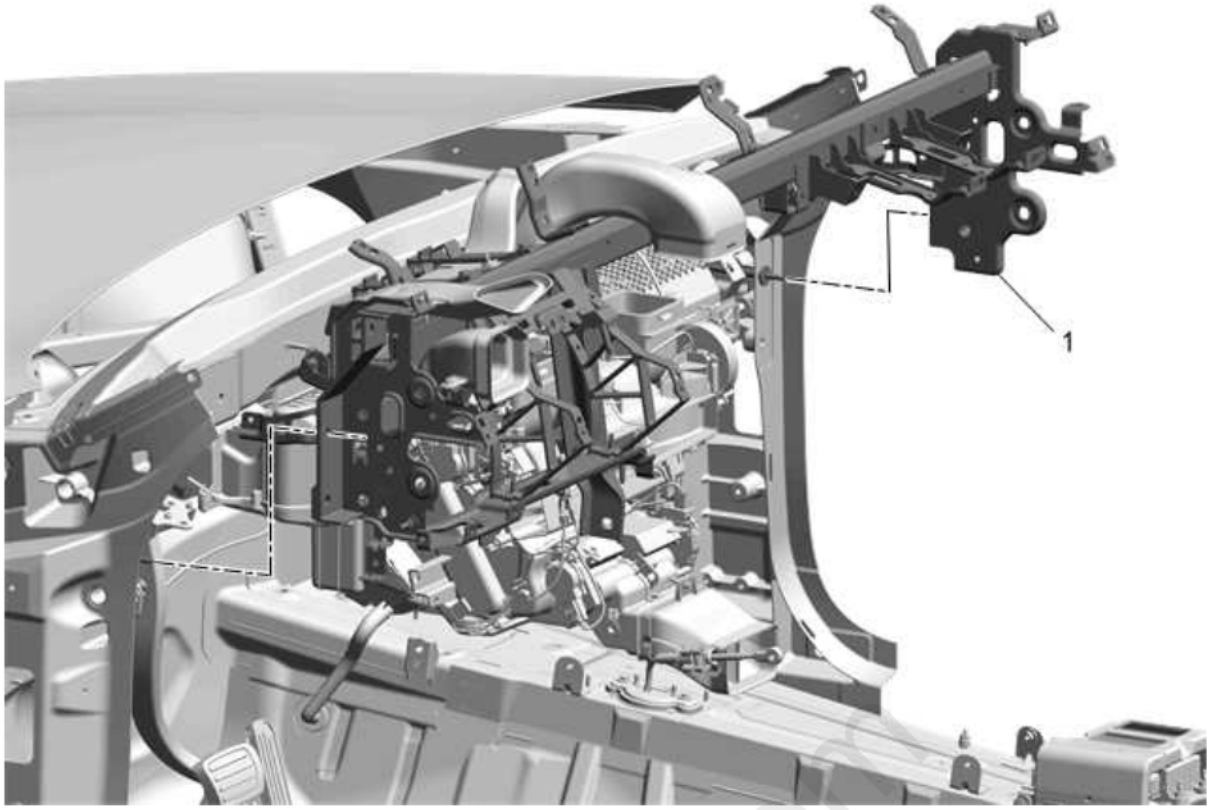


Fig. 231: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

11. Instrument Panel Outer Air Outlet Duct - Right Side (2)Â» Install - **Instrument Panel Outer Air Outlet Duct Replacement - Right Side**

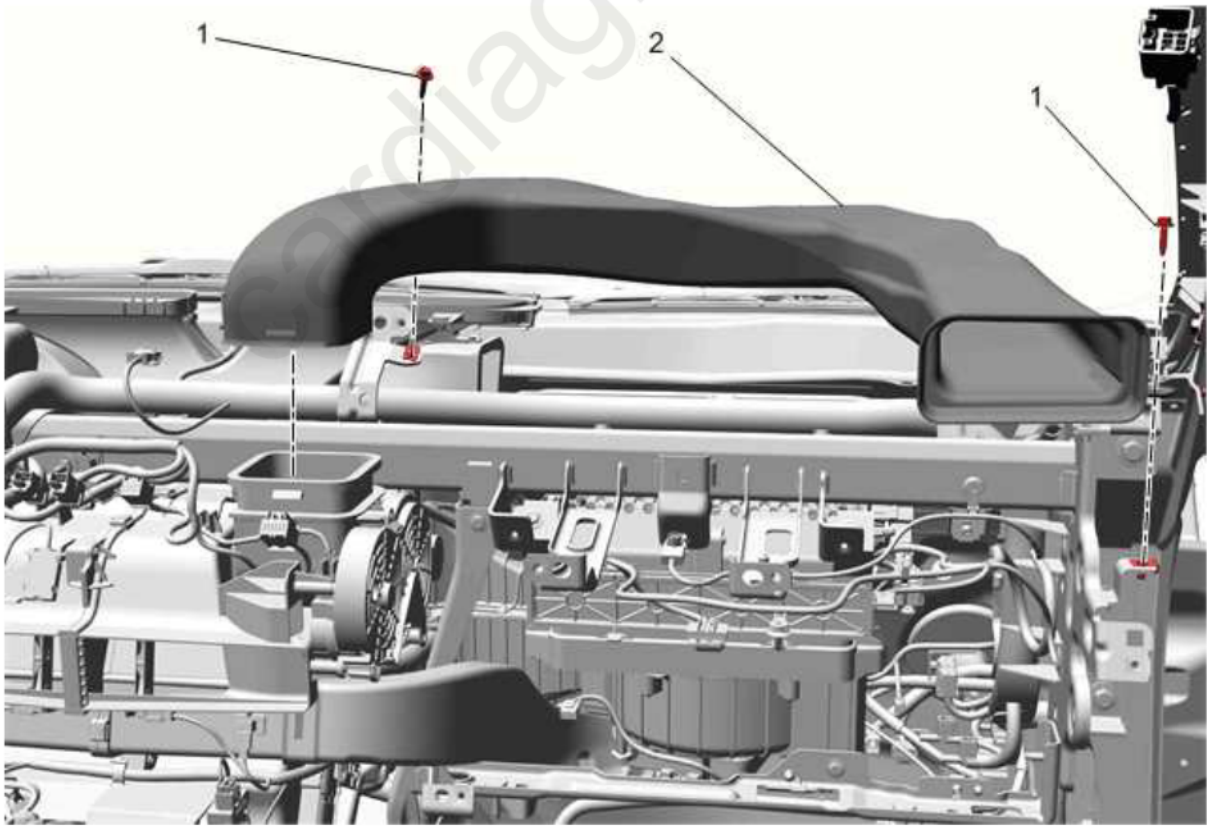


Fig. 232: Instrument Panel Outer Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

12. Windshield Defroster Outlet Duct (1)Â» Install - **Windshield Defroster Outlet Duct Replacement**

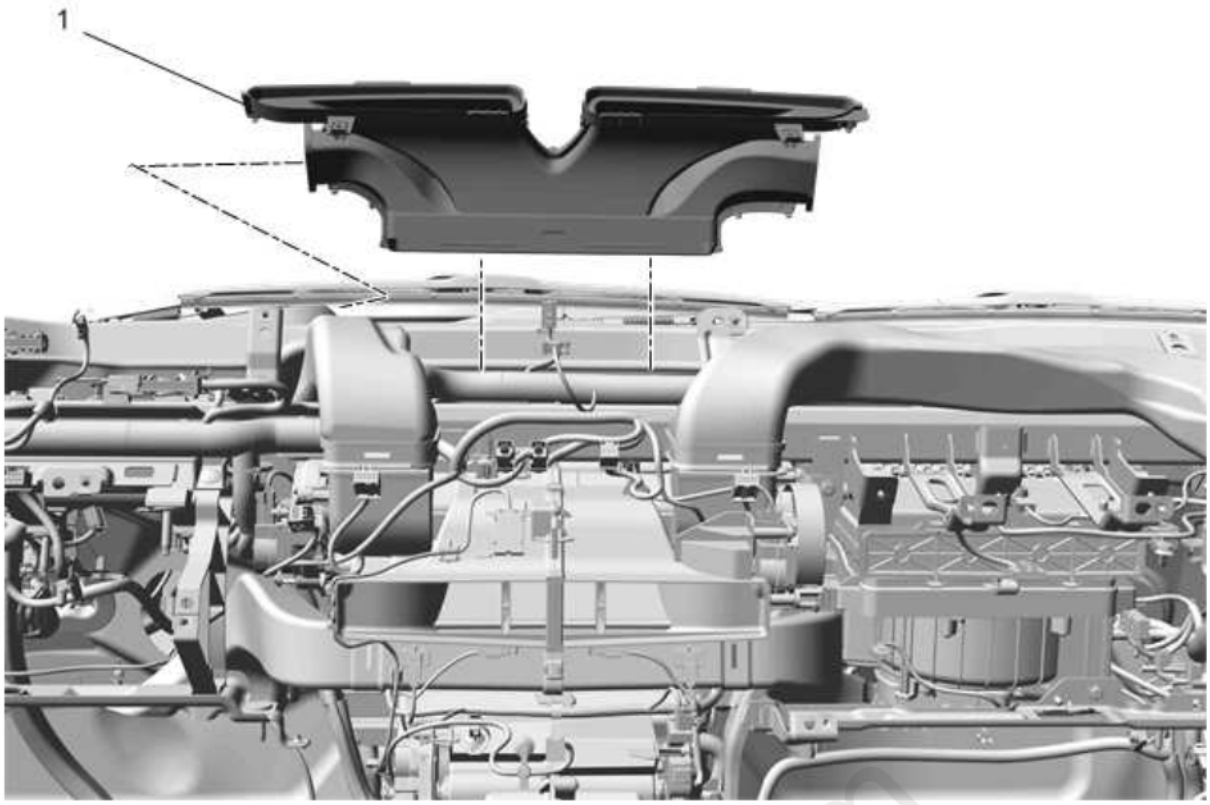


Fig. 233: Windshield Defroster Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

13. Side Window Defogger Outlet Duct - Right Side (2)Â» Install - **Side Window Defogger Outlet Duct Replacement - Right Side**

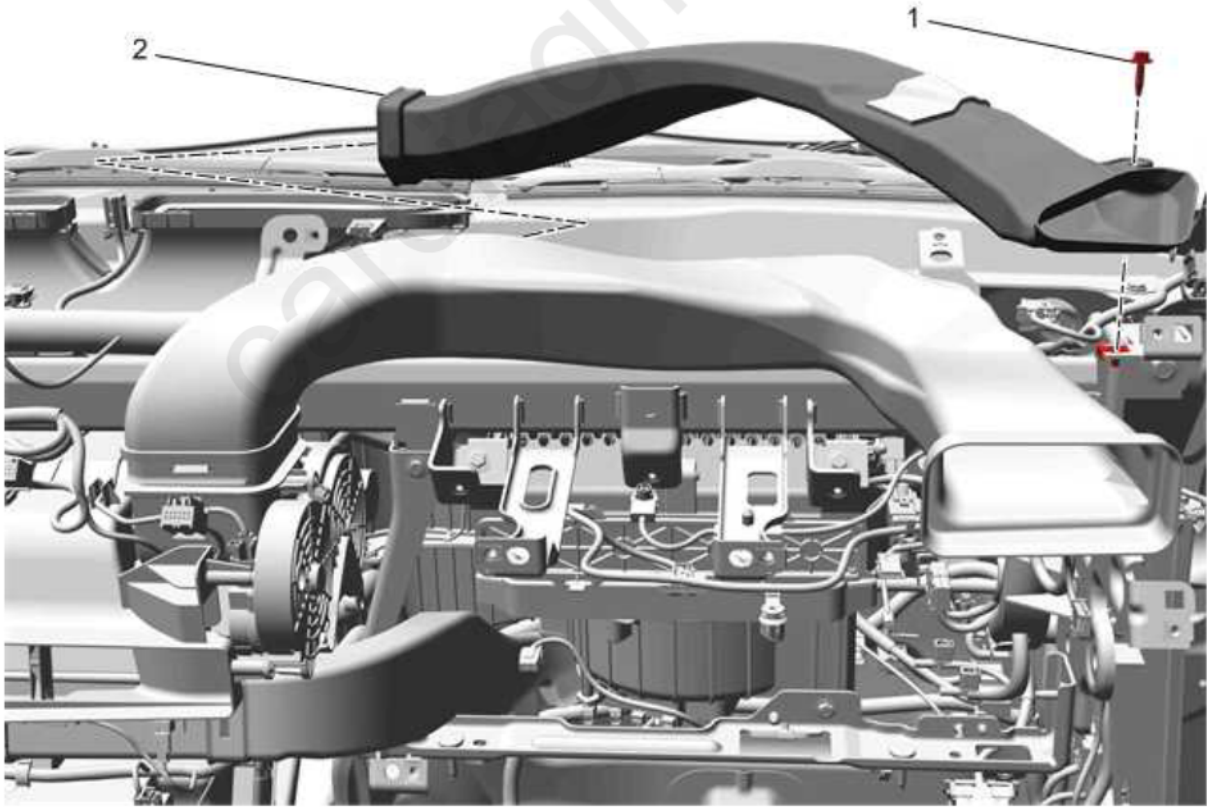


Fig. 234: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Instrument Panel Carrier (1)Â» Install - **Instrument Panel Carrier Replacement (UQH)**
Instrument Panel Carrier Replacement (UQA)

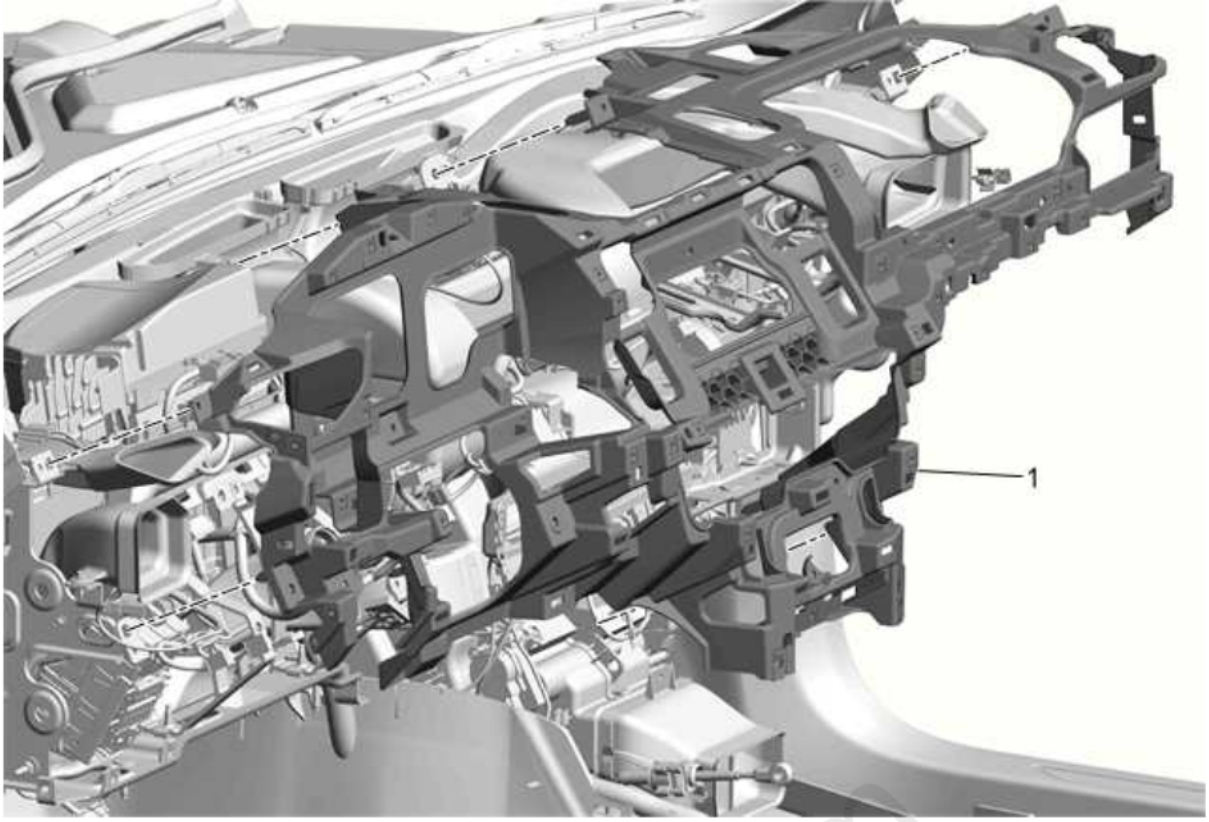


Fig. 235: Instrument Panel Carrier Assembly
Courtesy of GENERAL MOTORS COMPANY

15. Air Conditioning Evaporator and Blower Module Drain Hose - Left Side (1)Â» Install - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Left Side)**



Fig. 236: Air Conditioning Evaporator And Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Always ensure the HVAC module drain tube is properly installed and secure following a repair. Residual moisture/water can collect inside the HVAC module. The residual moisture or water should not contact electrical modules, electrical connections, wiring, cables or carpeting. Use clean and absorbent shop clothes to protect these components while removing or installing the HVAC module drain**

tube and/or HVAC module. Moisture/water is a by-product of normal A/C system operation and can result in interior odors or corrosion/damage to electrical components.

16. Air Conditioning Evaporator and Blower Module Drain Hose - Right Side (1)Â» Install - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Right Side)**

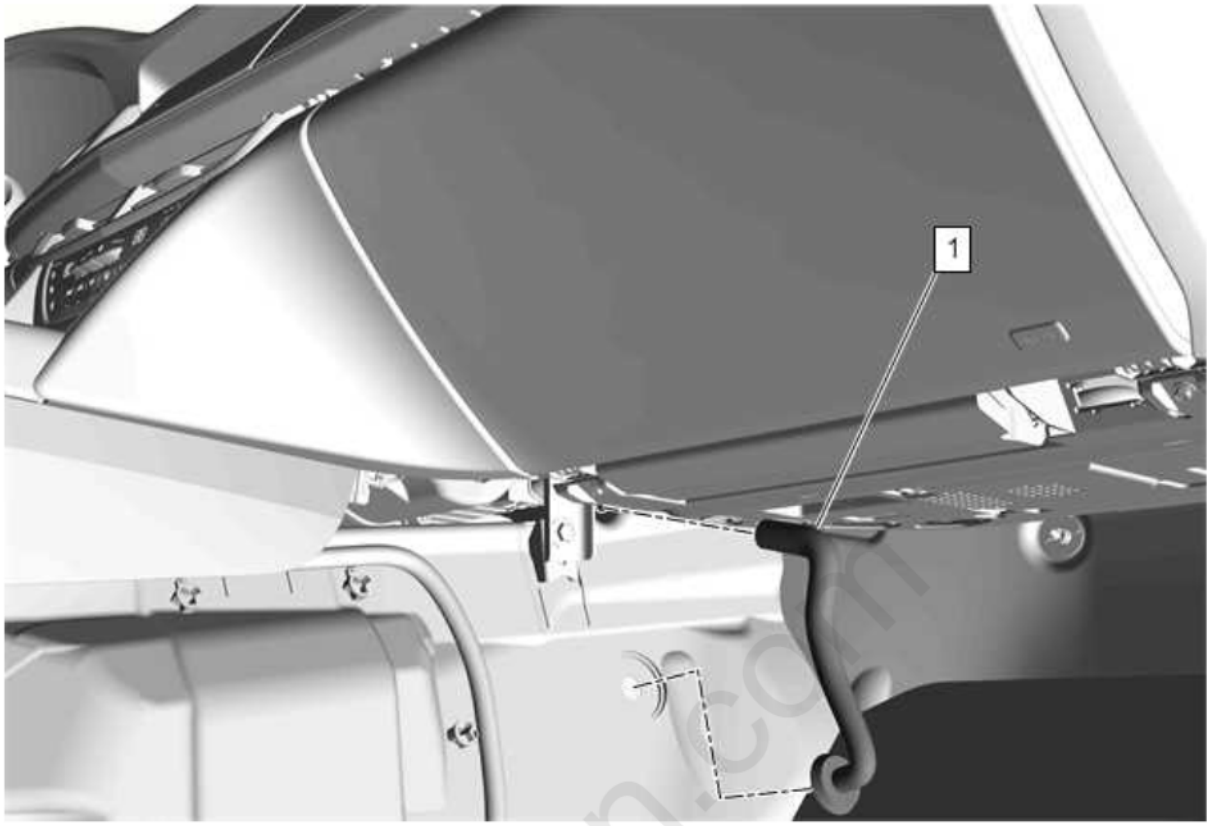


Fig. 237: Air Conditioning Evaporator and Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

17. From within the engine compartment, install the heater and air conditioning evaporator and blower module bolt (1) securing the heater and air conditioning evaporator and blower module to the cowl panel and tighten to 9 N.m (80 lb in).

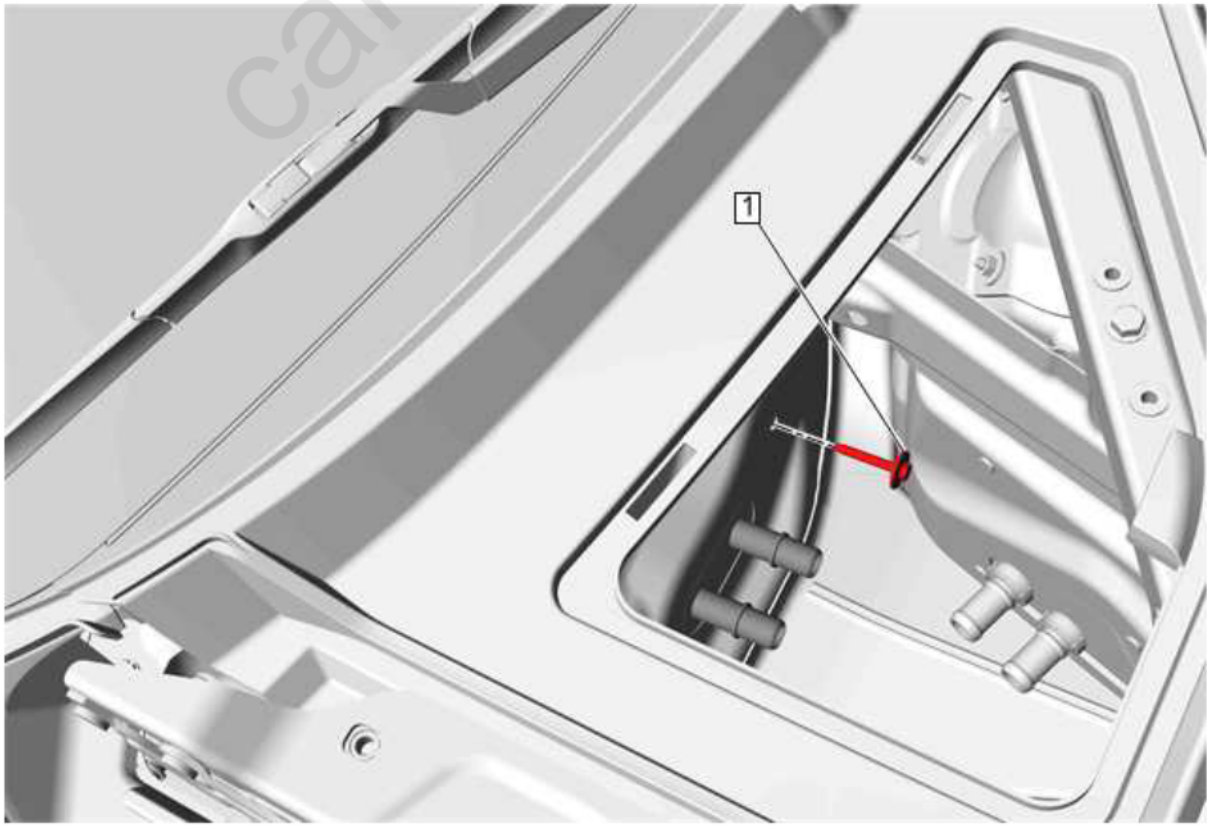


Fig. 238: Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

18. Heater Outlet Hose (3) @ Heater Core TubeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)**

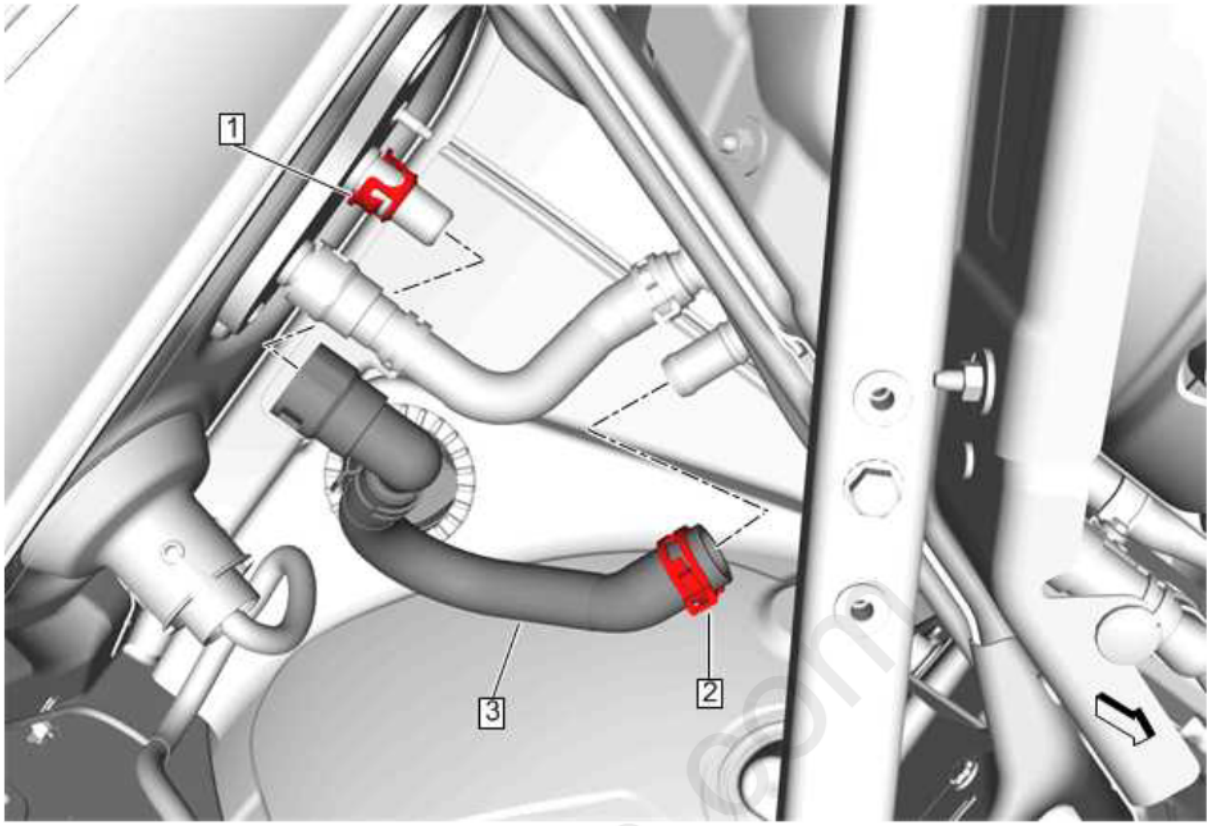


Fig. 239: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

19. Heater Inlet Hose (3) @ Heater Core TubeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)**

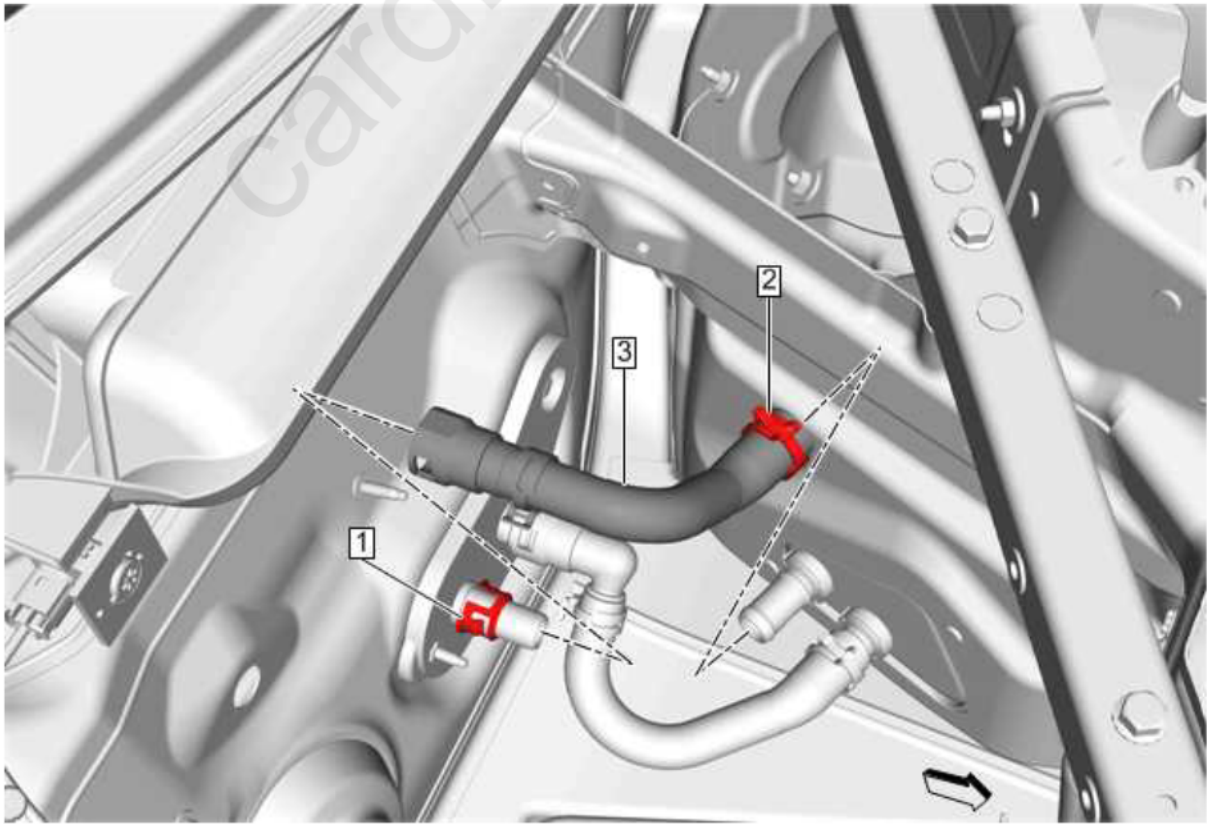


Fig. 240: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

20. Air Conditioning Refrigerant Heat Exchanger (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install - **Air Conditioning Refrigerant Heat Exchanger Replacement (LTG)Air Conditioning Refrigerant Heat Exchanger Replacement (LGW, LGX)**

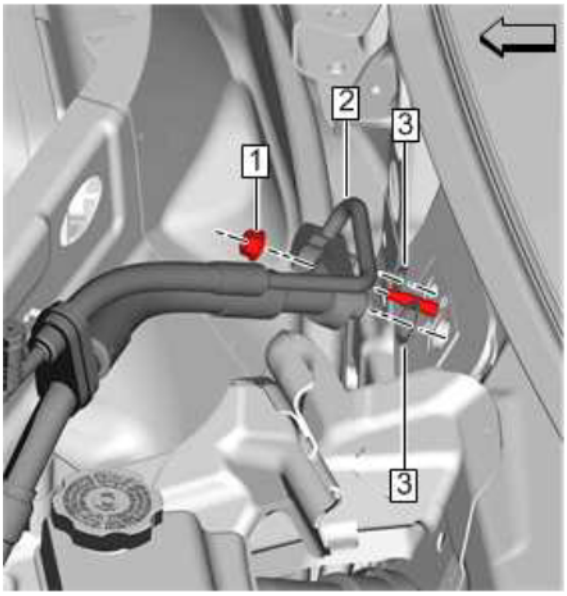


Fig. 241: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

21. Windshield Wiper Transmission (2)Â» Install - **Windshield Wiper Transmission Replacement**

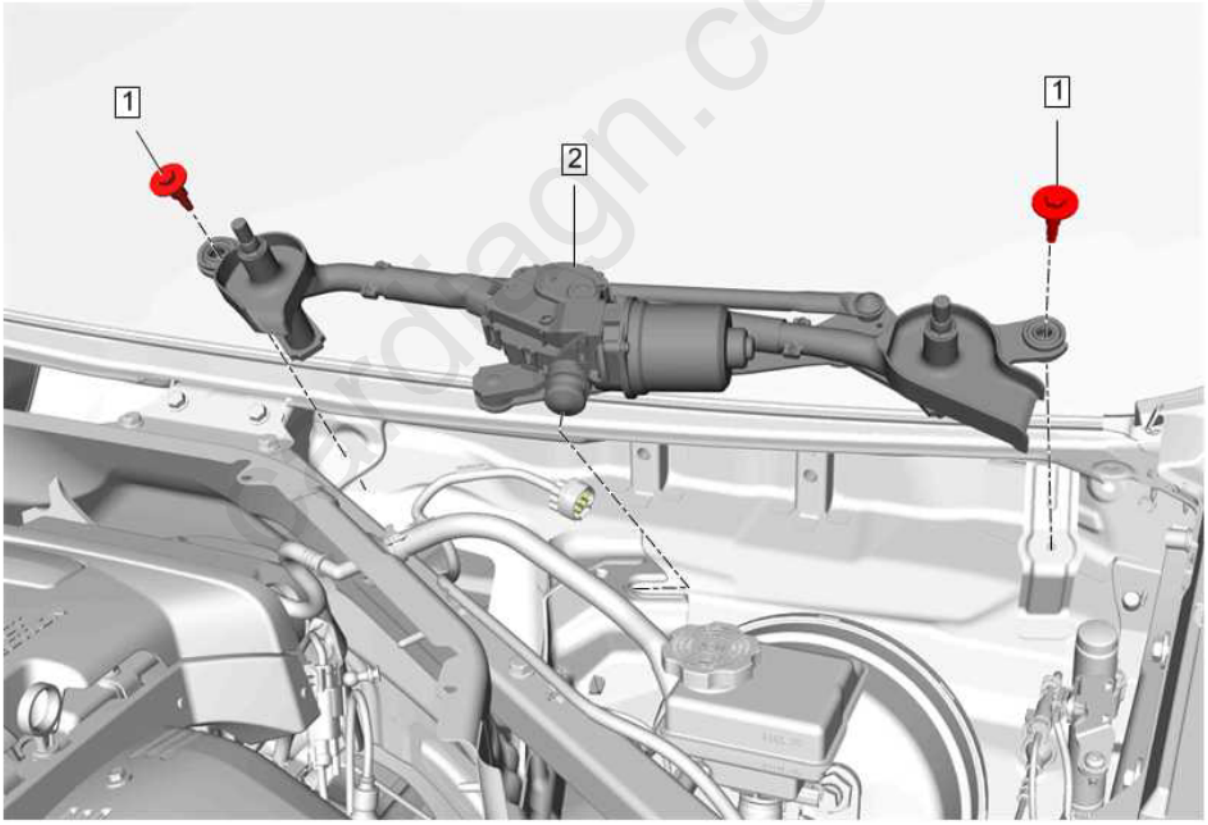


Fig. 242: Windshield Wiper Transmission
Courtesy of GENERAL MOTORS COMPANY

22. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

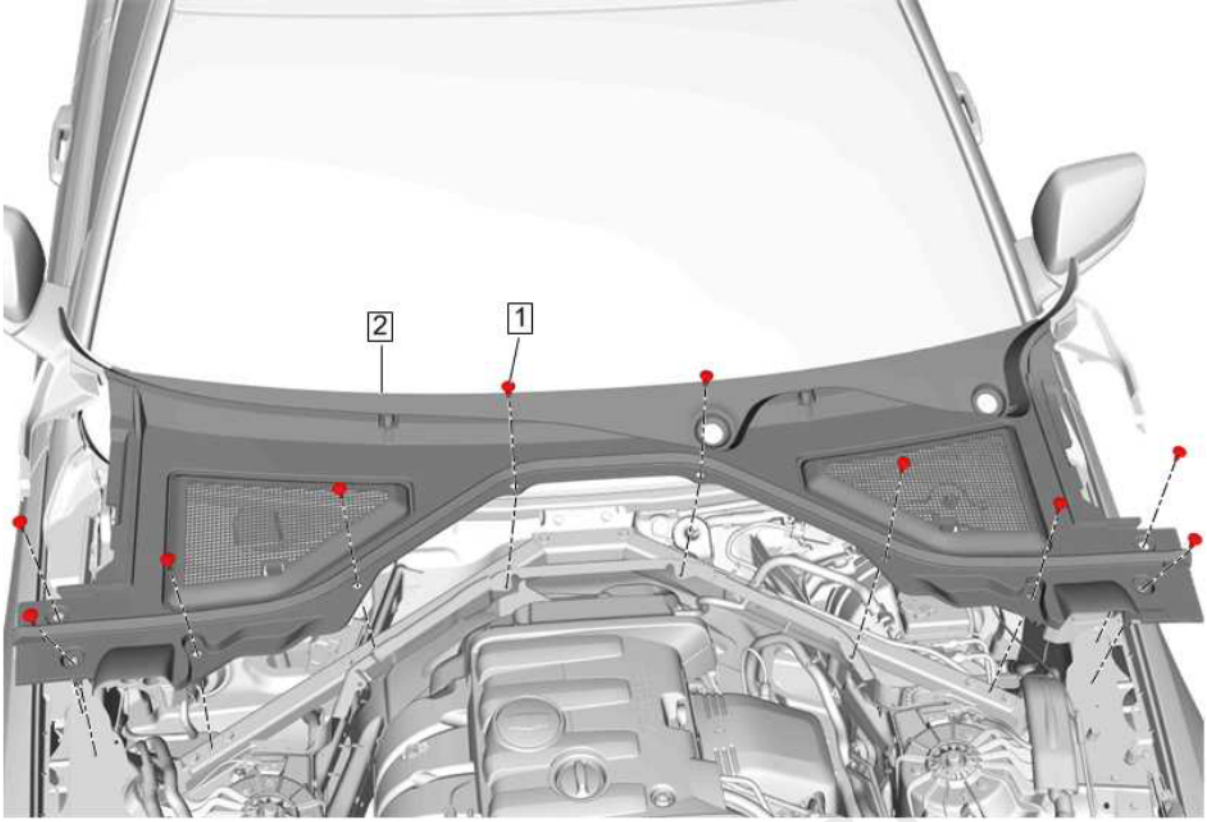


Fig. 243: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

23. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
24. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
25. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
26. Clear the DTCs from the heater and air conditioning remote control module.
27. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
28. Inspect for coolant leaks.
29. Inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER MODULE REMOVAL AND INSTALLATION (WITH HP9 HYBRID)

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
4. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

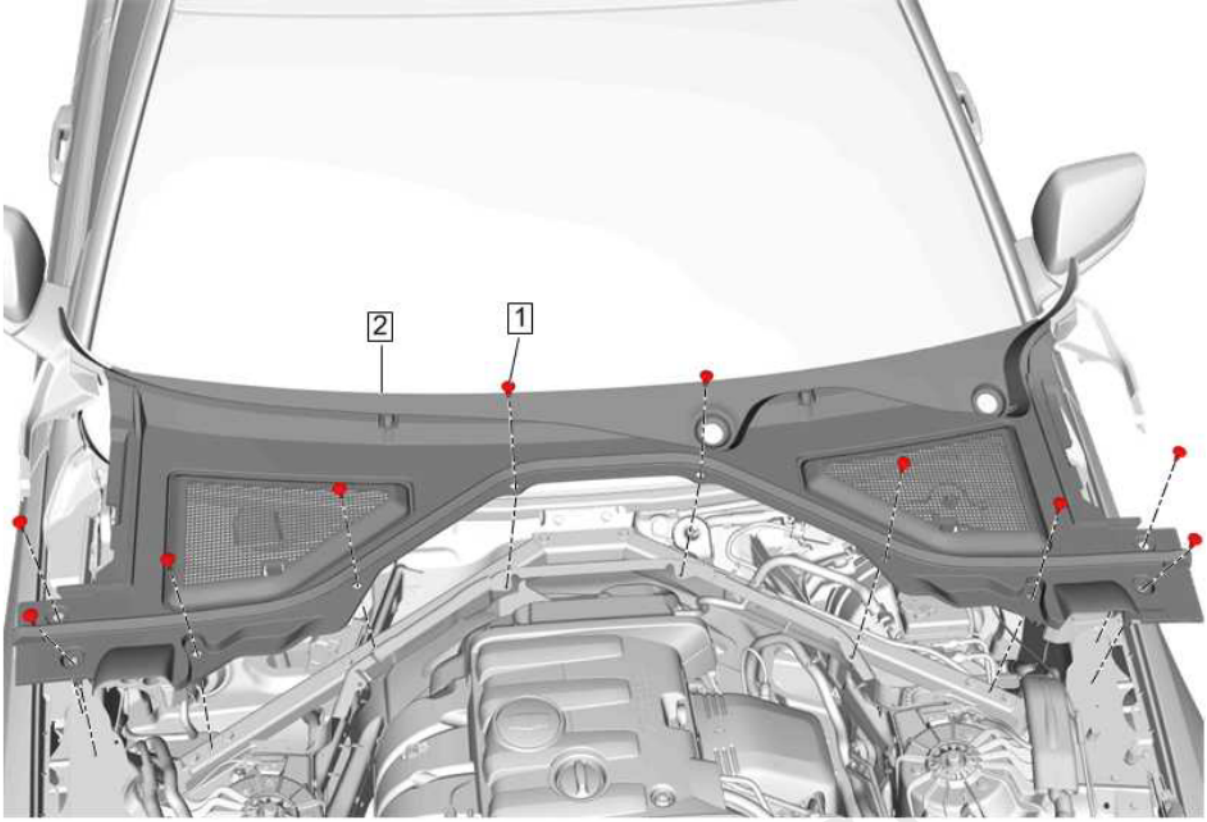


Fig. 244: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

5. Windshield Wiper Transmission (2)Â» Remove - **Windshield Wiper Transmission Replacement**

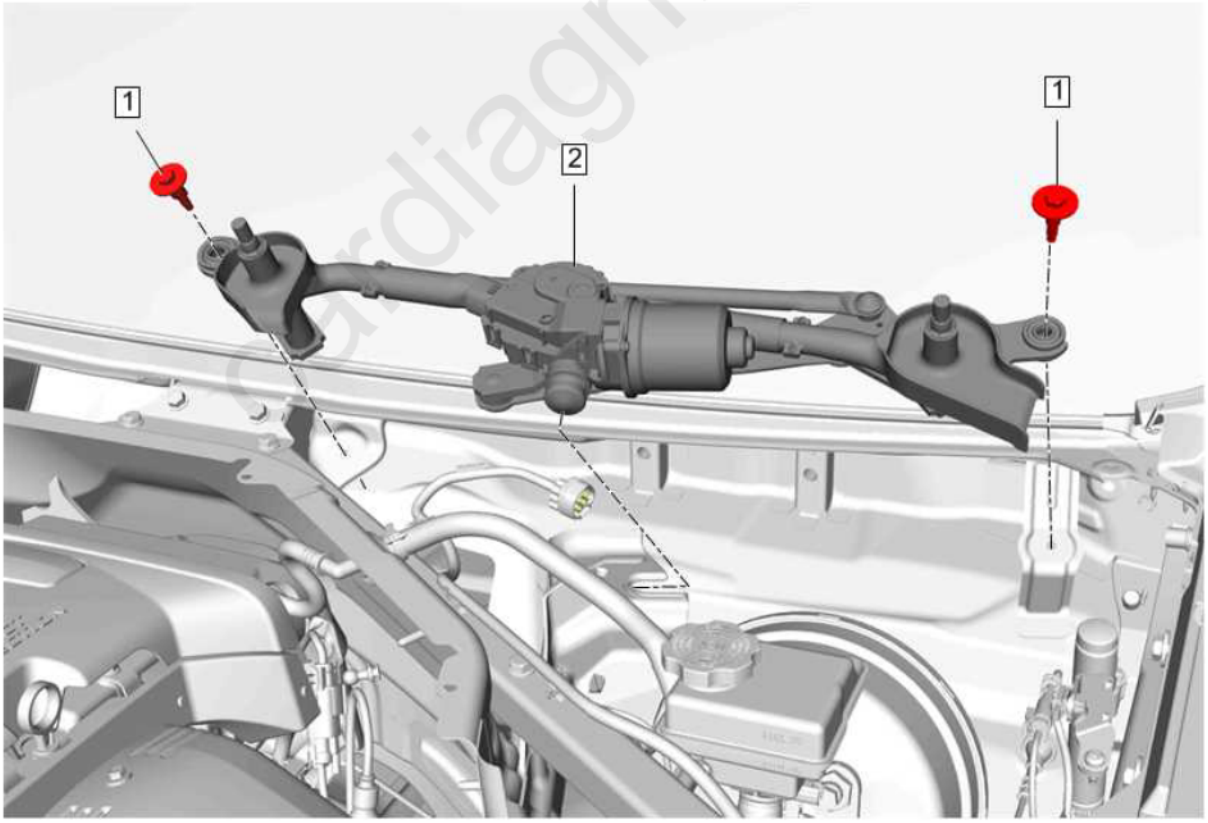


Fig. 245: Windshield Wiper Transmission
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Refrigerant Heat Exchanger (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

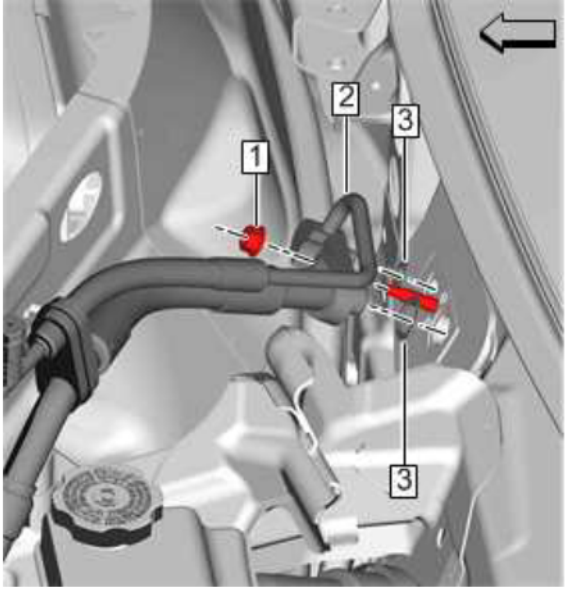


Fig. 246: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Heater Core TubeÂ» Remove - **Heater Inlet Hose Replacement (LTG with HP9)**

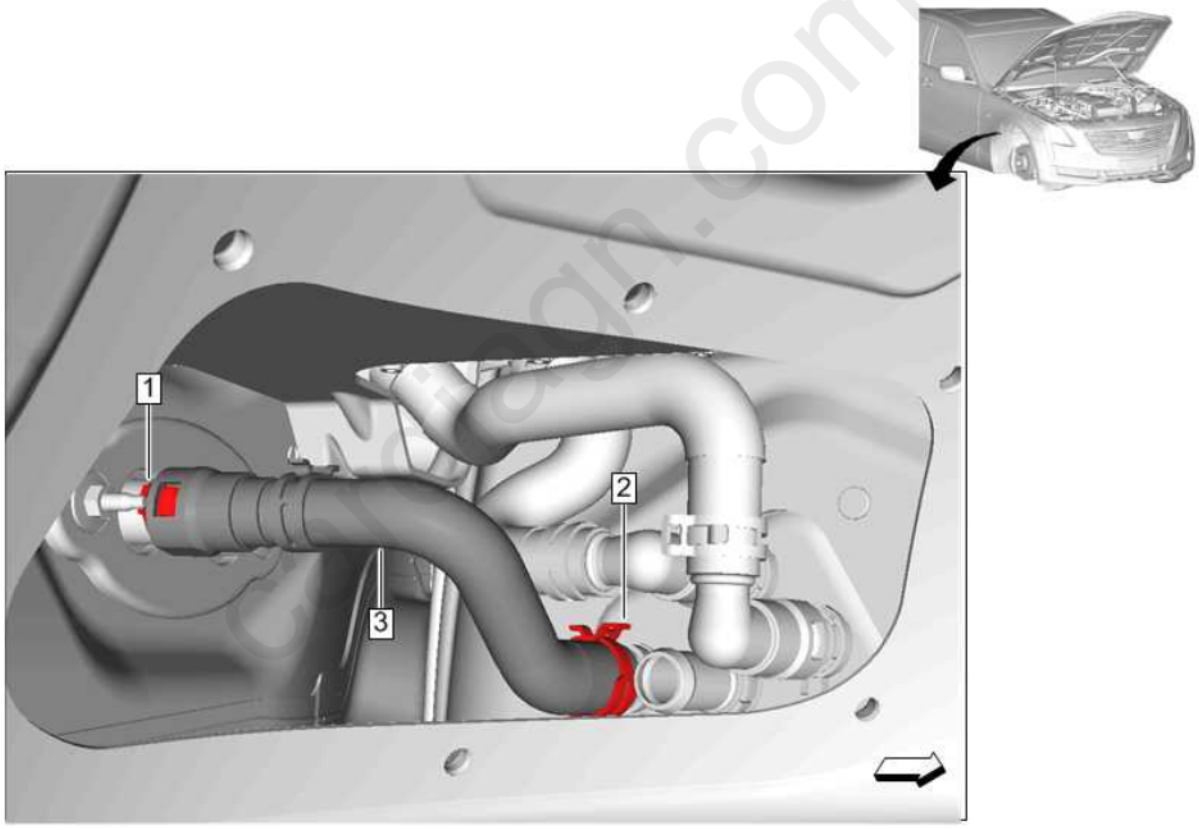


Fig. 247: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Outlet Hose (2) @ Heater Core TubeÂ» Remove - **Heater Outlet Hose Replacement (LTG with HP9)**

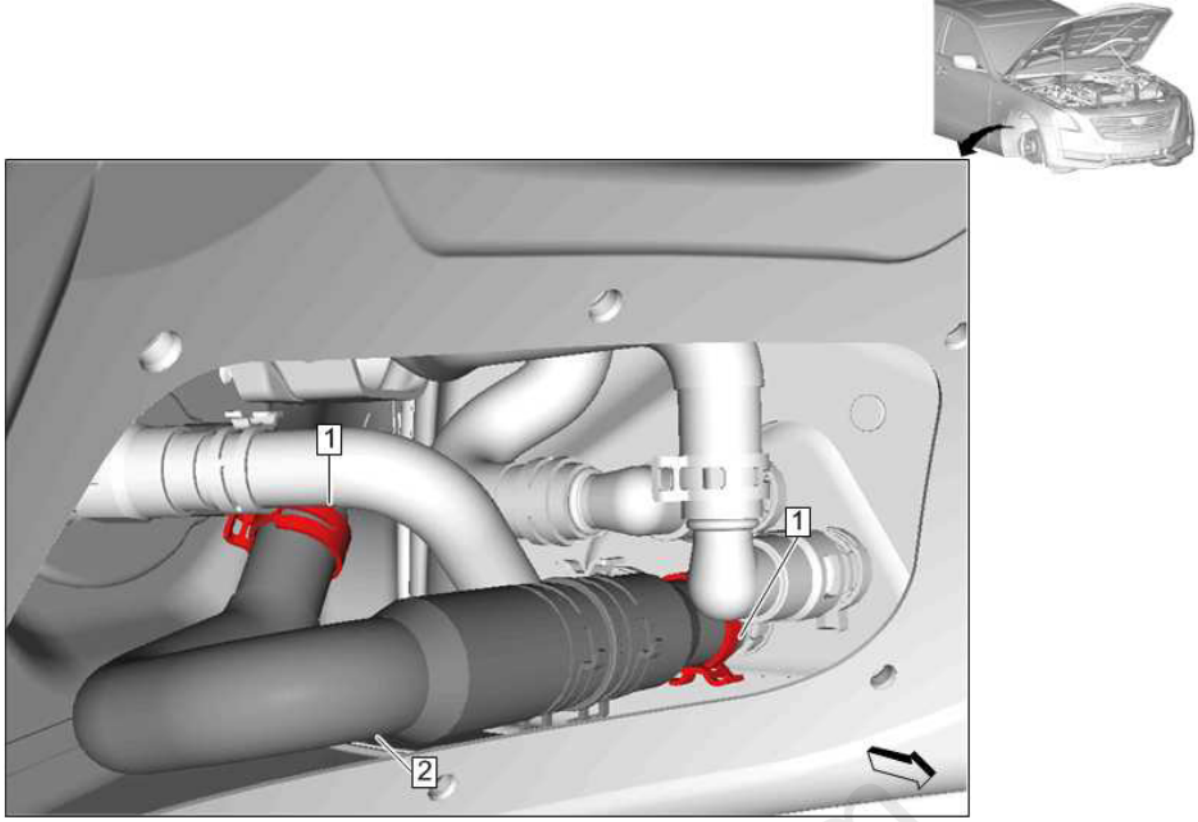


Fig. 248: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Drive Motor Generator Control Module Cooling Outlet Hose (3)Â» Remove - **Drive Motor Generator Control Module Cooling Outlet Hose Replacement**

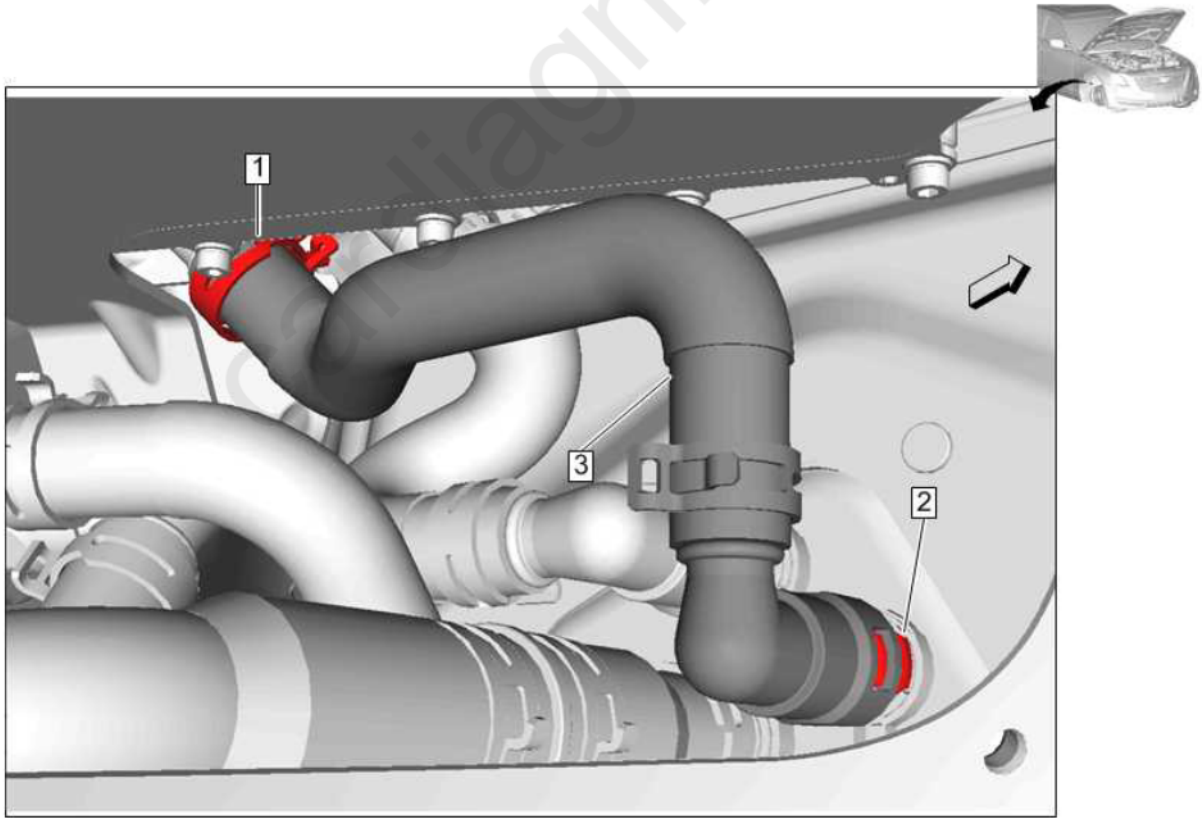


Fig. 249: Drive Motor Generator Control Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. From within the right front wheel well, remove the heater and air conditioning evaporator and blower module bolt (1) securing the heater and air conditioning evaporator and blower module to the cowl panel.

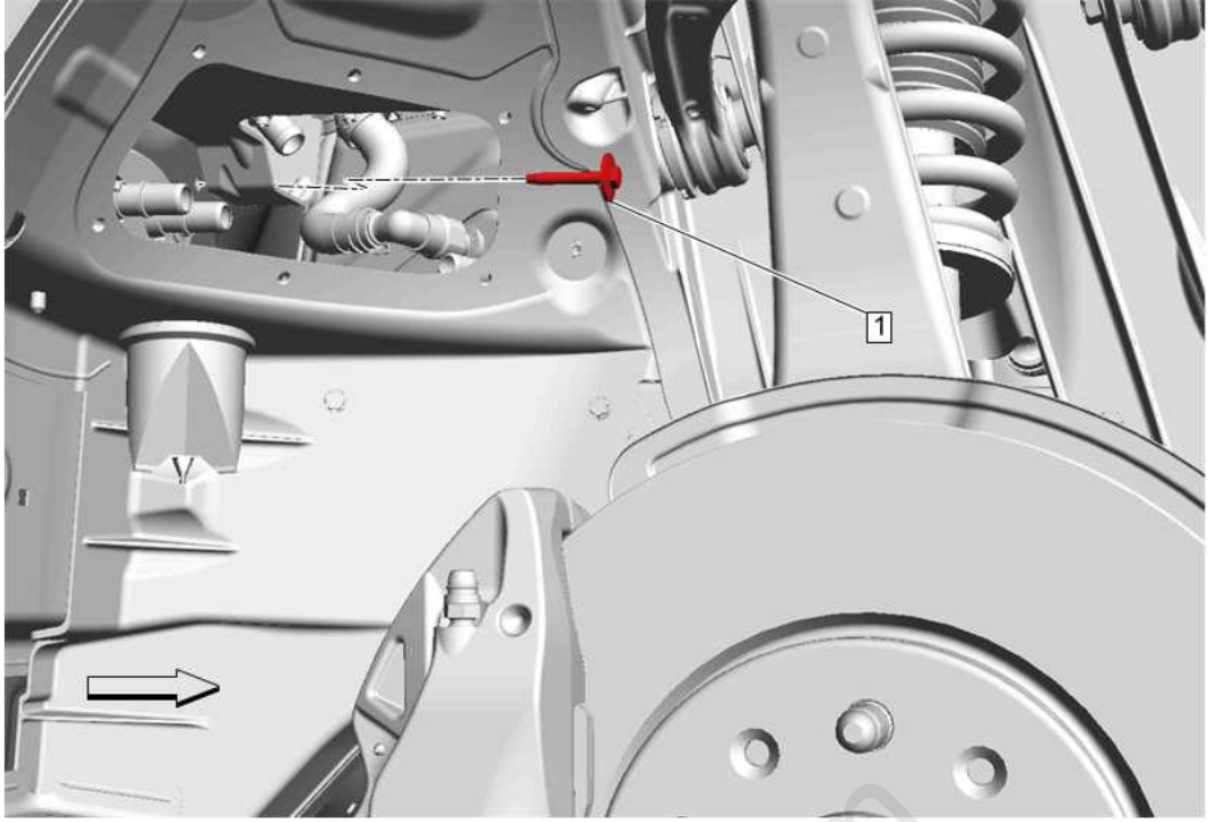


Fig. 250: Heater And Air Conditioning Evaporator And Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

11. 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.

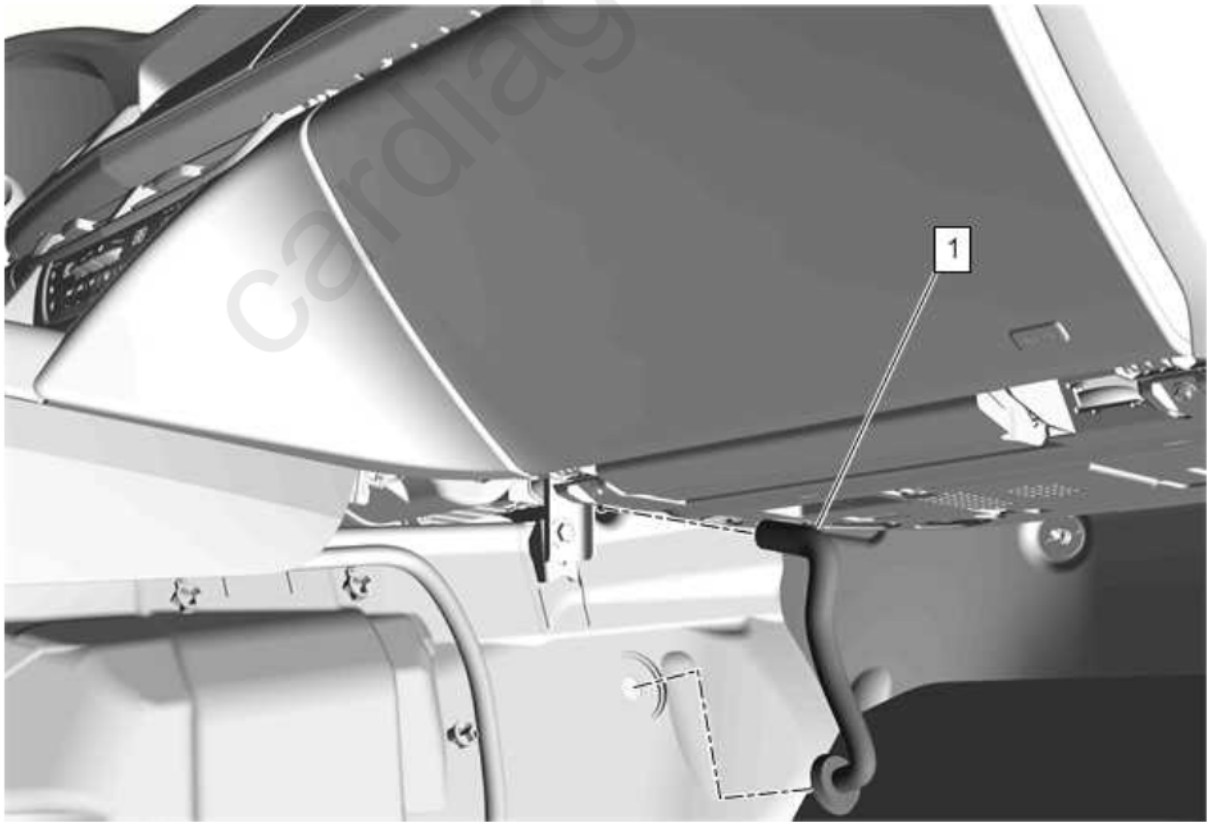


Fig. 251: Air Conditioning Evaporator and Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Always ensure the HVAC module drain tube is properly installed and secure following a repair. Residual moisture/water can collect inside the HVAC module. The residual moisture or water should not contact electrical modules, electrical connections, wiring, cables or**

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carpeting. Use clean and absorbent shop clothes to protect these components while removing or installing the HVAC module drain tube and/or HVAC module. Moisture/water is a by-product of normal A/C system operation and can result in interior odors or corrosion/damage to electrical components.

12. Air Conditioning Evaporator and Blower Module Drain Hose - Right Side (1)Â» Remove - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Right Side)**
13. Air Conditioning Evaporator and Blower Module Drain Hose - Left Side (1)Â» Remove - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Left Side)**

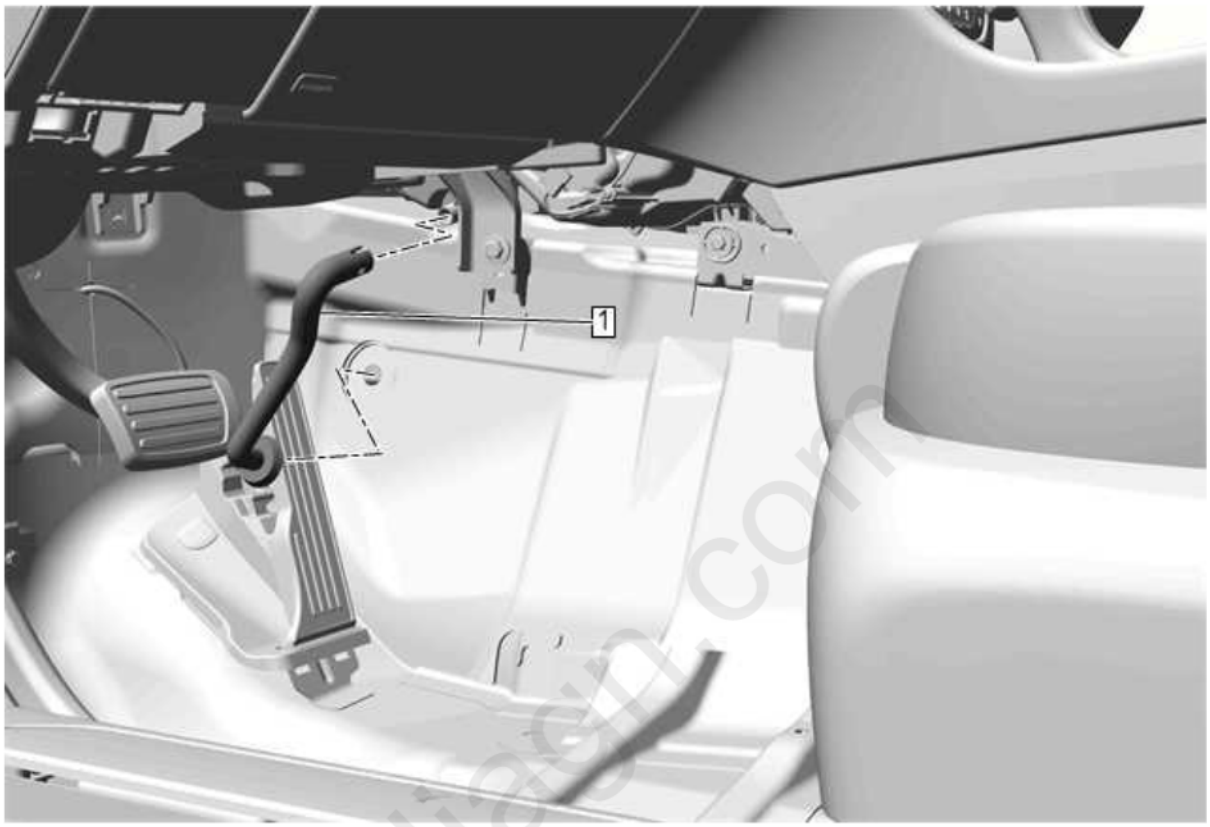


Fig. 252: Air Conditioning Evaporator And Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

14. Instrument Panel Carrier (1)Â» Remove - **Instrument Panel Carrier Replacement (UQH)** **Instrument Panel Carrier Replacement (UQA)**

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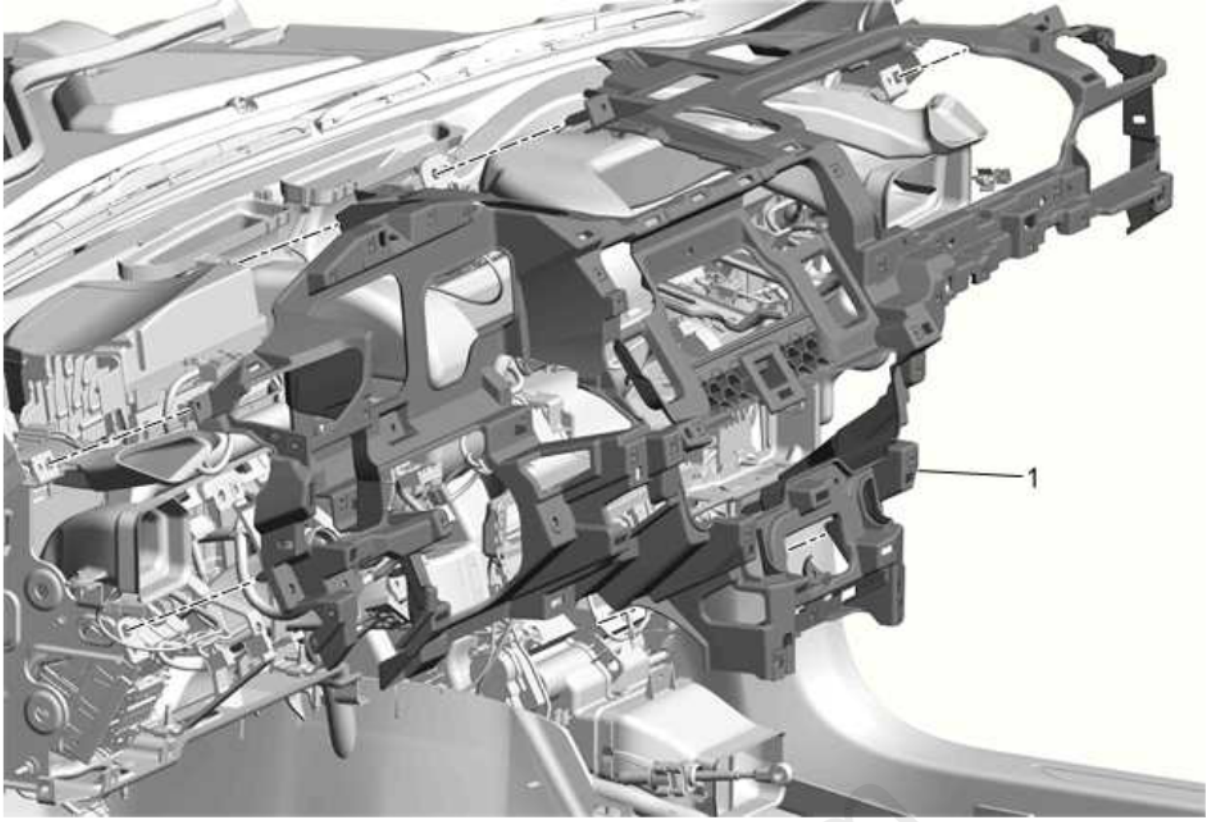


Fig. 253: Instrument Panel Carrier Assembly
Courtesy of GENERAL MOTORS COMPANY

15. Side Window Defogger Outlet Duct - Right Side (2)Â» Remove - **Side Window Defogger Outlet Duct Replacement - Right Side**

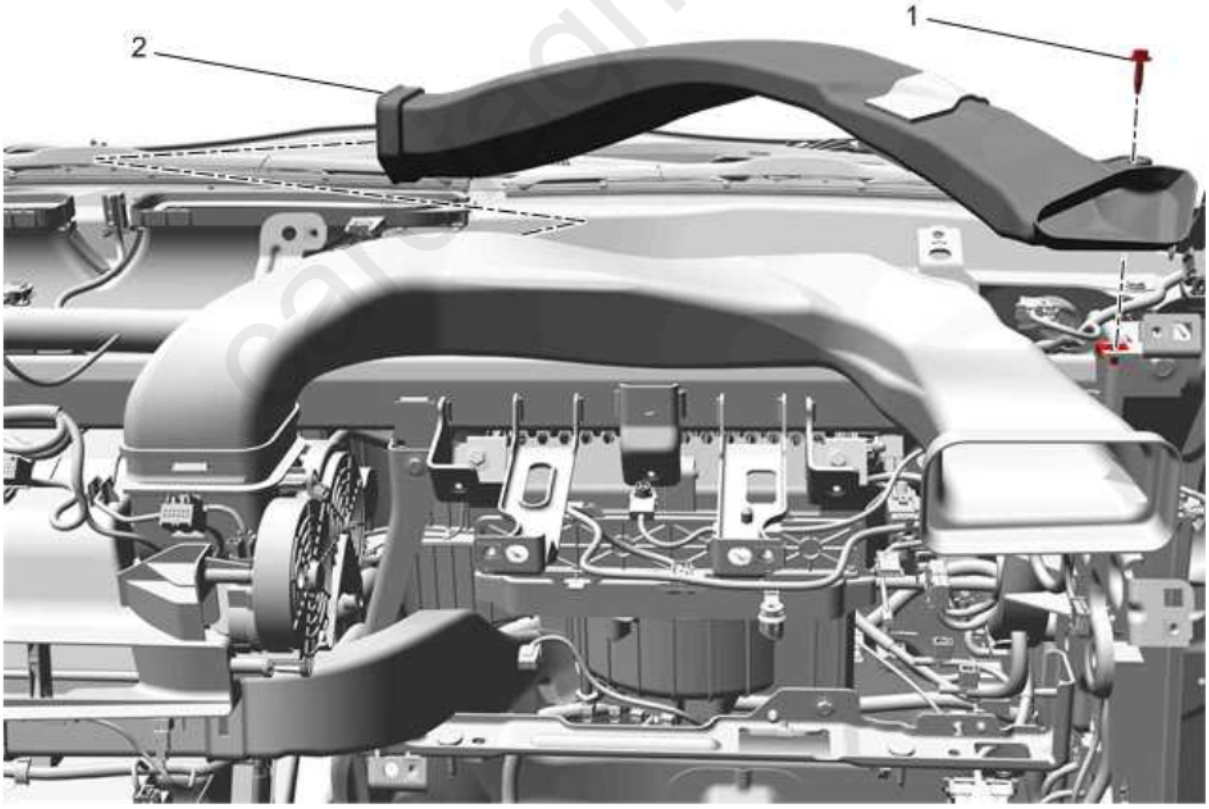


Fig. 254: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

16. Windshield Defroster Outlet Duct (1)Â» Remove - **Windshield Defroster Outlet Duct Replacement**

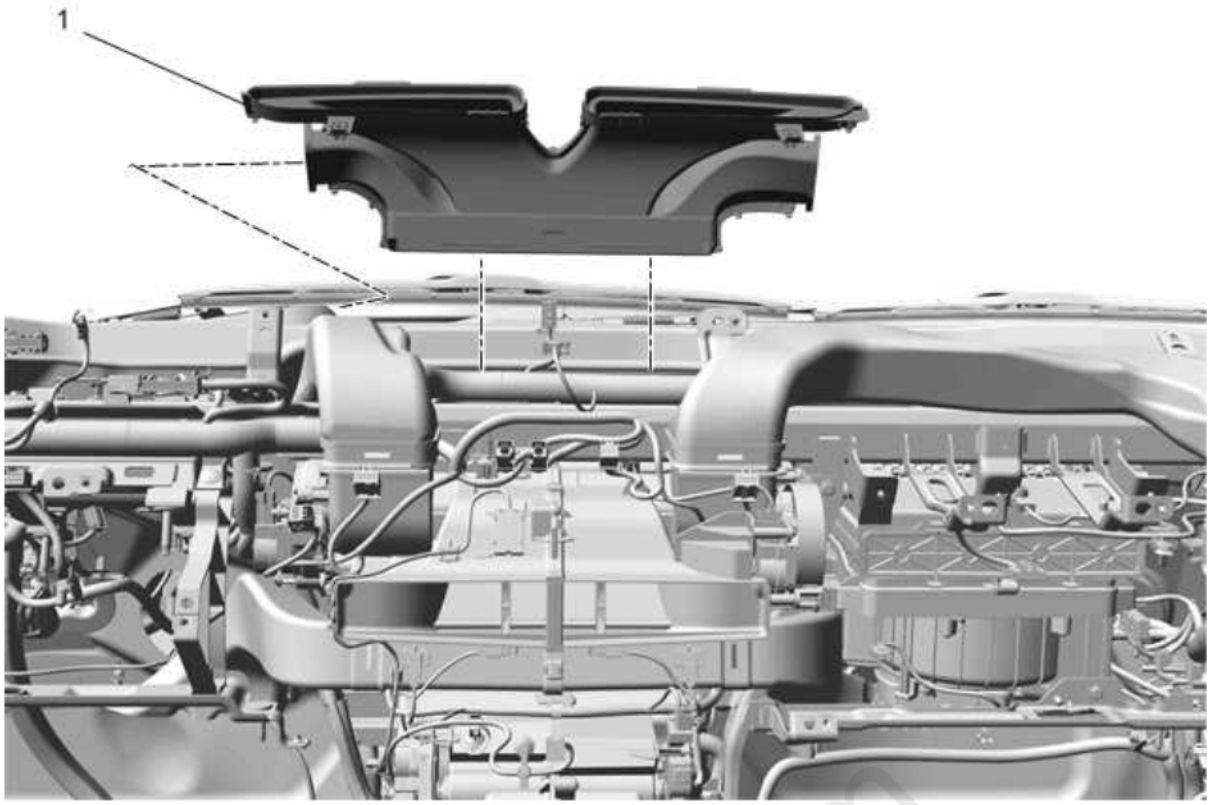


Fig. 255: Windshield Defroster Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

17. Instrument Panel Outer Air Outlet Duct - Right Side (2)Â» Remove - **Instrument Panel Outer Air Outlet Duct Replacement - Right Side**

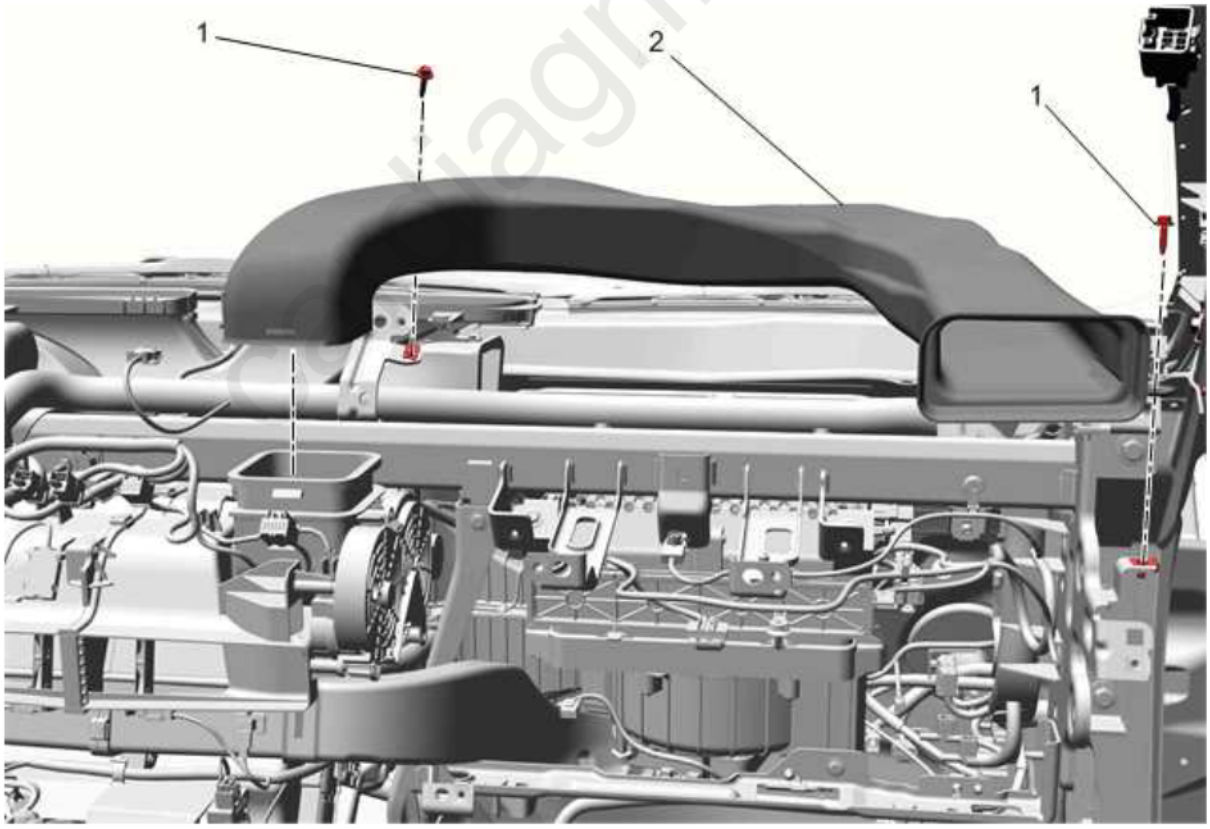


Fig. 256: Instrument Panel Outer Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

18. Instrument Panel Tie Bar (1)Â» Remove - **Instrument Panel Tie Bar Replacement**

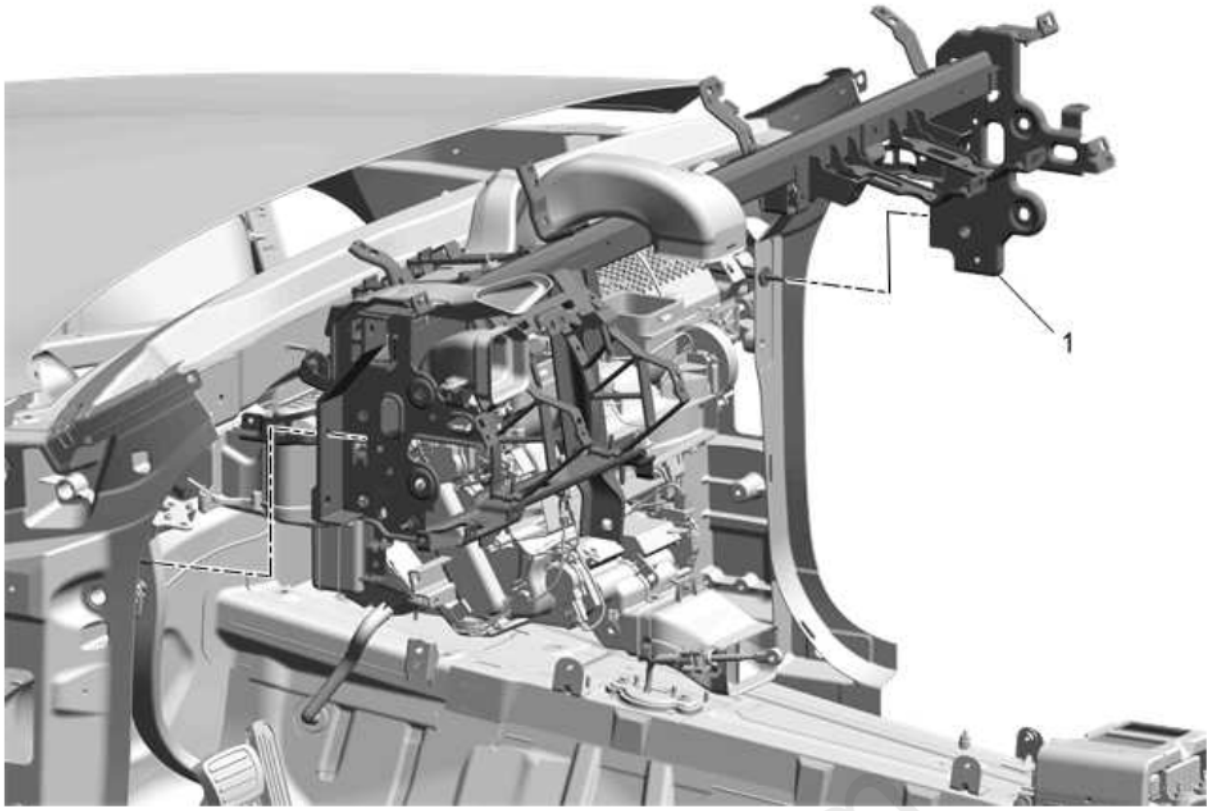


Fig. 257: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

19. Side Window Defogger Outlet Duct - Left Side (3)Â» Remove - **Side Window Defogger Outlet Duct Replacement - Left Side**

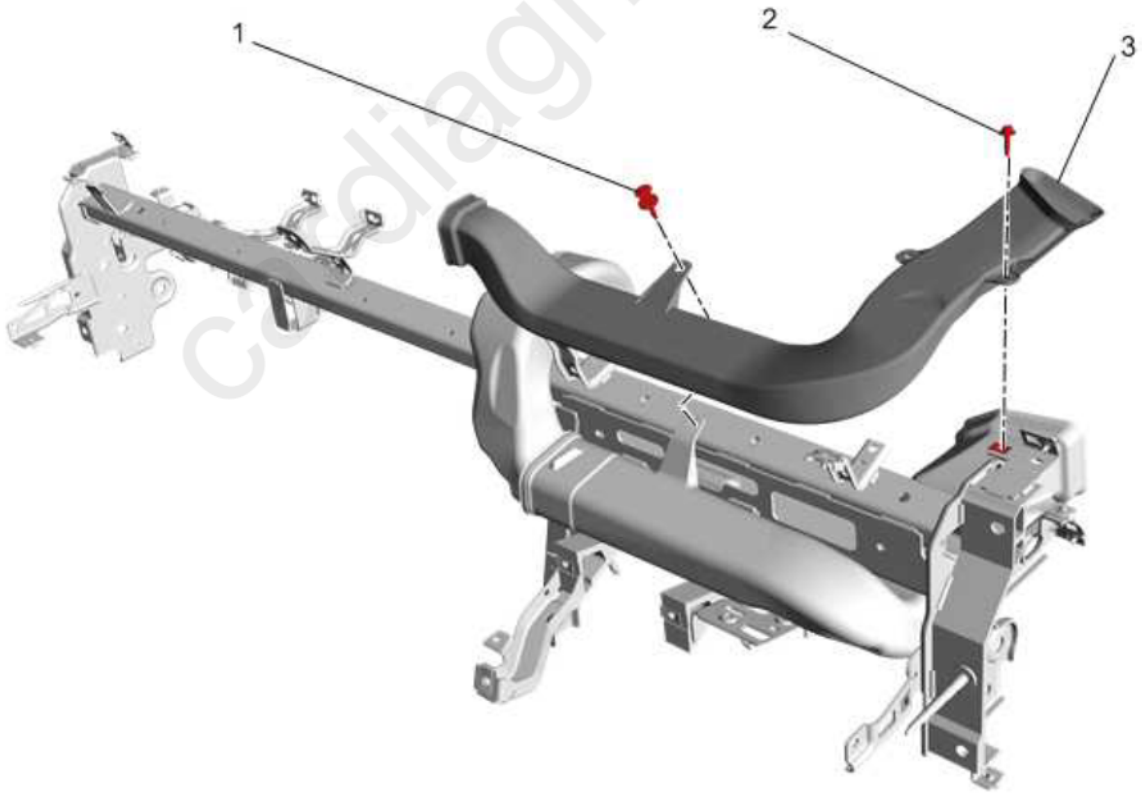


Fig. 258: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

20. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Remove - **Instrument Panel Outer Air Outlet Duct Replacement - Left Side**

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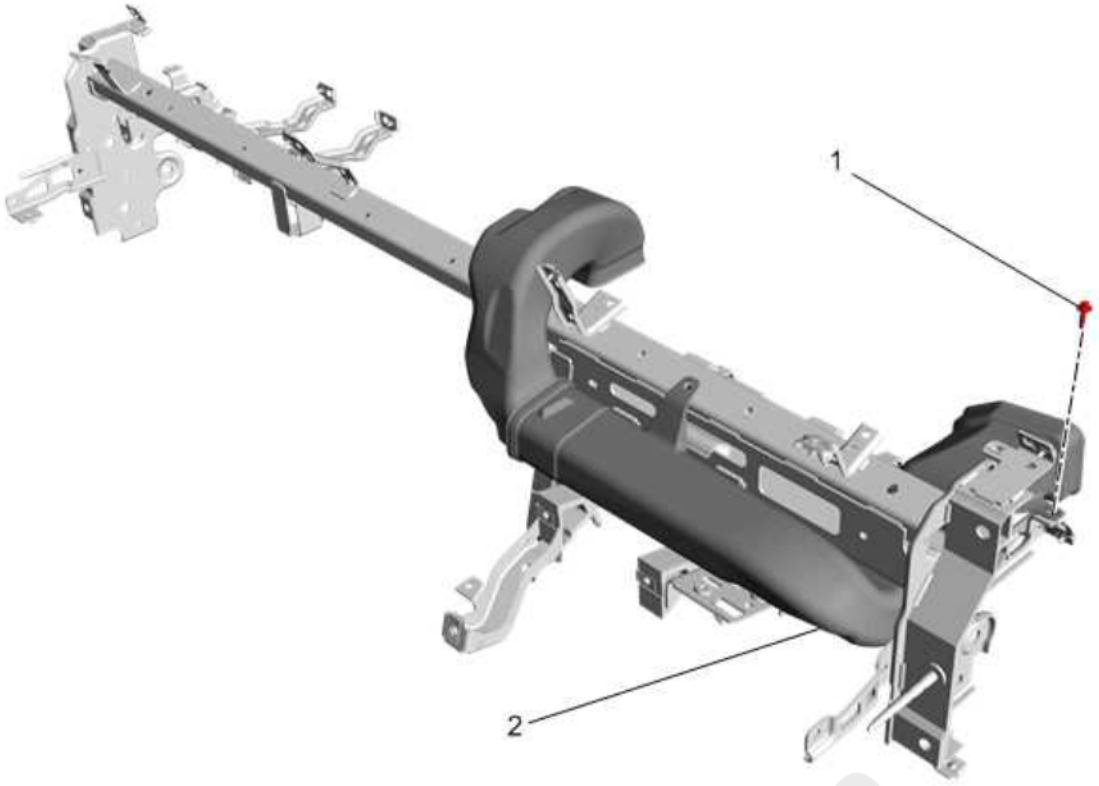


Fig. 259: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

21. Instrument Panel Center Support Bracket (1)Â» Remove - **Instrument Panel Center Support Bracket Replacement**



Fig. 260: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

22. Floor Front Air Outlet Duct - Left Side (1)Â» Remove - **Floor Front Air Outlet Duct Replacement - Left Side**

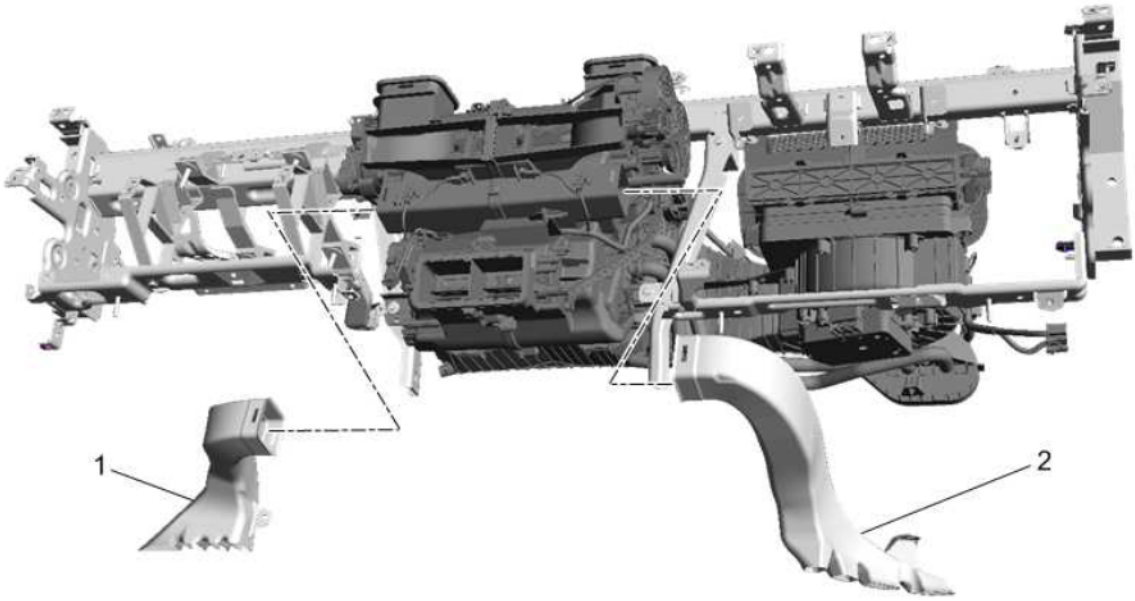


Fig. 261: Floor Front Air Outlet Ducts
Courtesy of GENERAL MOTORS COMPANY

23. Floor Front Air Outlet Duct - Right Side (2)Â» Remove - **Floor Front Air Outlet Duct Replacement - Right Side**
24. Heater and Air Conditioning Evaporator and Blower Module Nut (1)Â» Remove

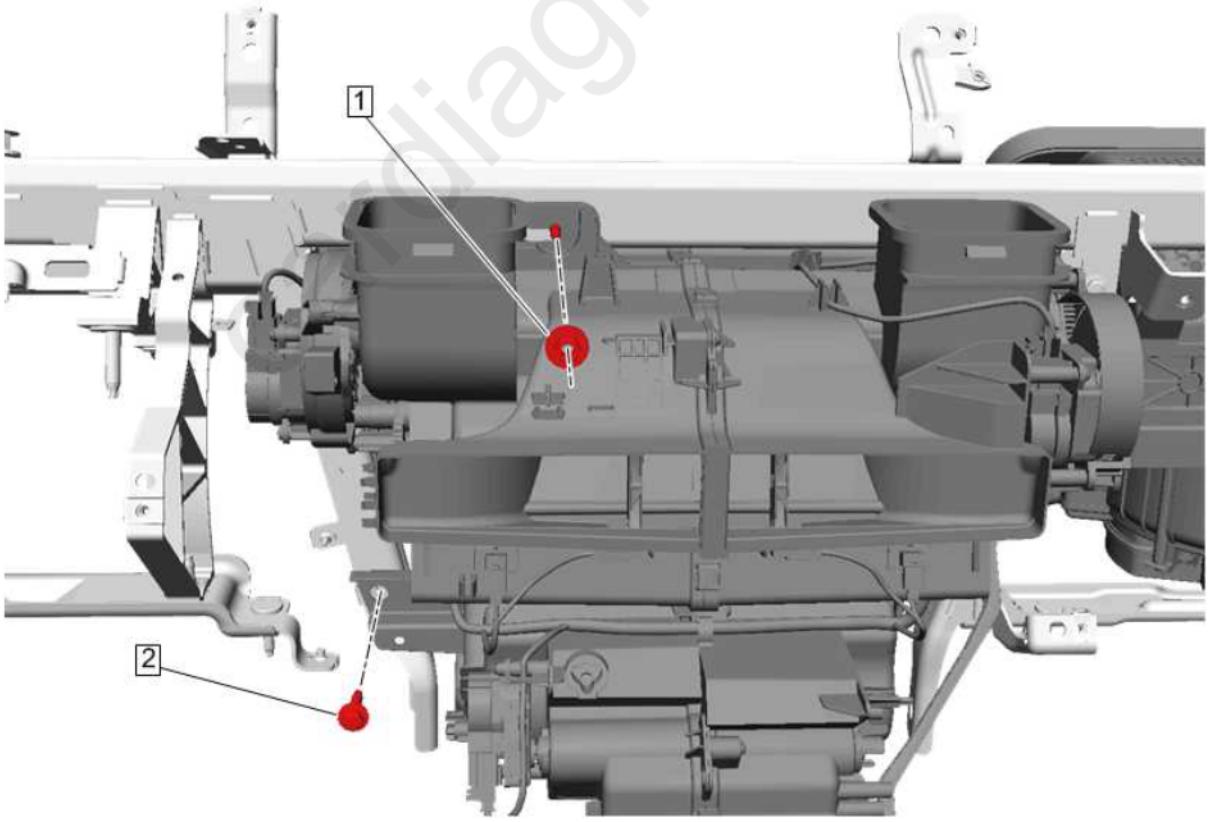


Fig. 262: Heater and Air Conditioning Evaporator and Blower Module Retainers
Courtesy of GENERAL MOTORS COMPANY

25. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Remove
26. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Remove [4x]

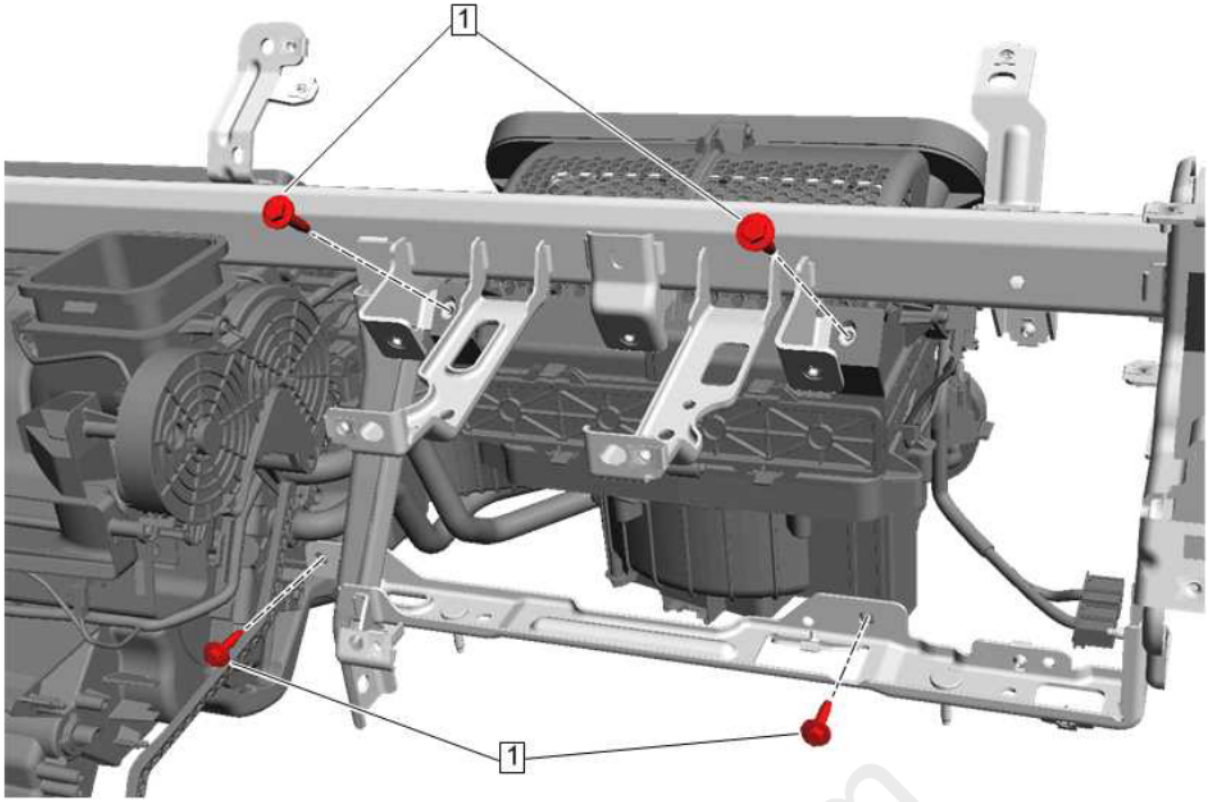


Fig. 263: Heater and Air Conditioning Evaporator and Blower Module Bolts
Courtesy of GENERAL MOTORS COMPANY

27. Heater and Air Conditioning Evaporator and Blower Module (1) @ Instrument Panel Tie BarÂ» Remove

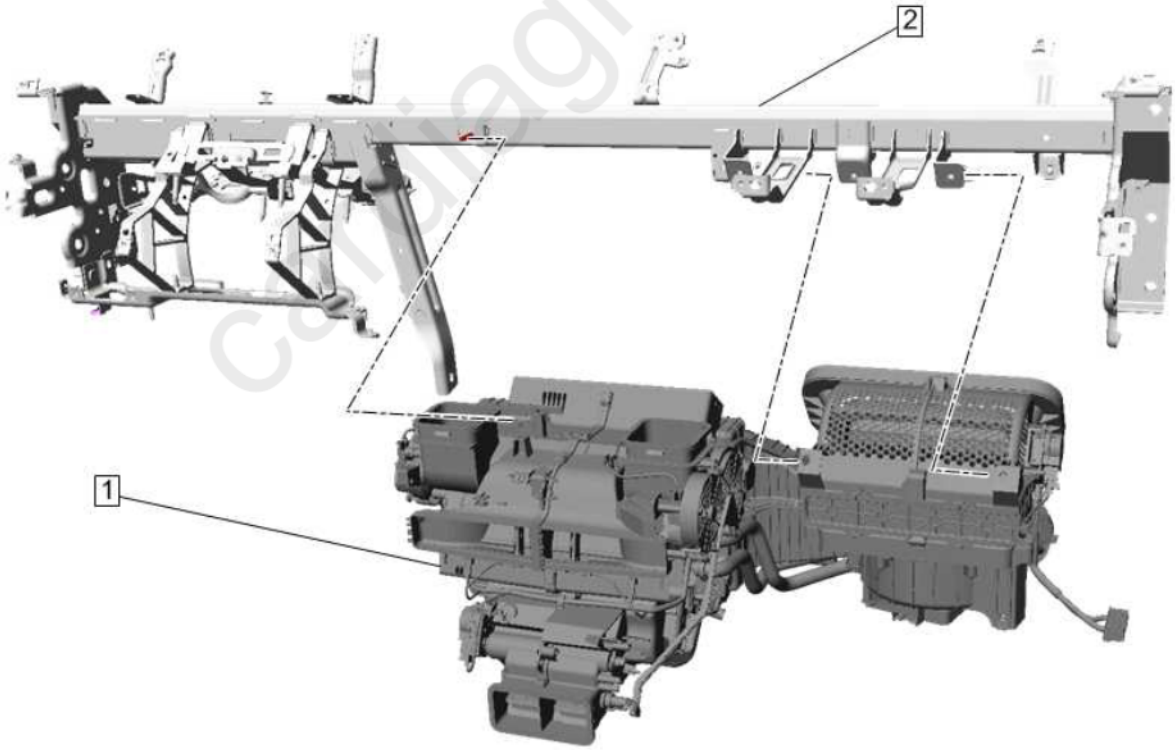


Fig. 264: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

28. Transfer components as necessary.

Installation Procedure

1. Heater and Air Conditioning Evaporator and Blower Module (1) @ Instrument Panel Tie BarÂ» Install

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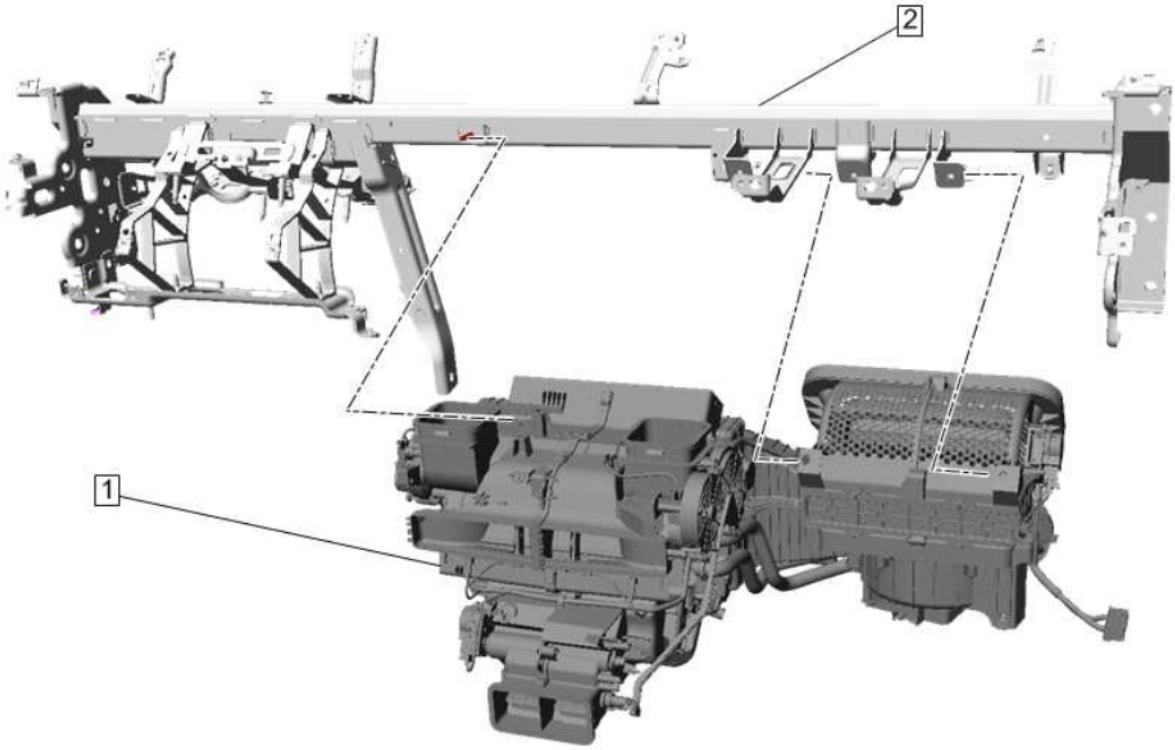


Fig. 265: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Verify air inlet housing upon installation of the heater and air conditioning evaporator and blower module does not snag the front interior sound barrier causing damage to the air inlet housing.**

2. Heater and Air Conditioning Evaporator and Blower Module Bolt (1)Â» Install and tighten [4x] 9.0 N.m (80 lb in)

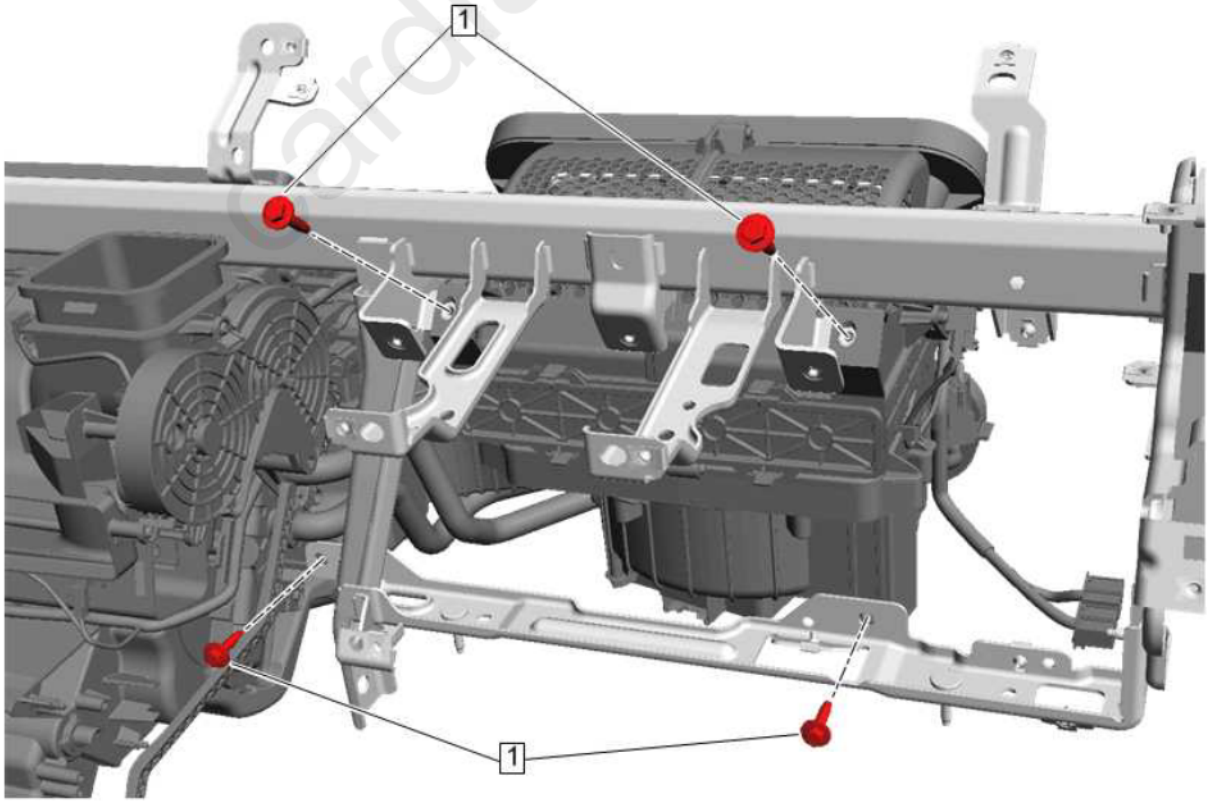


Fig. 266: Heater and Air Conditioning Evaporator and Blower Module Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

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3. Heater and Air Conditioning Evaporator and Blower Module Bolt (2)Â» Install and tighten 9.0 N.m (80 lb in)

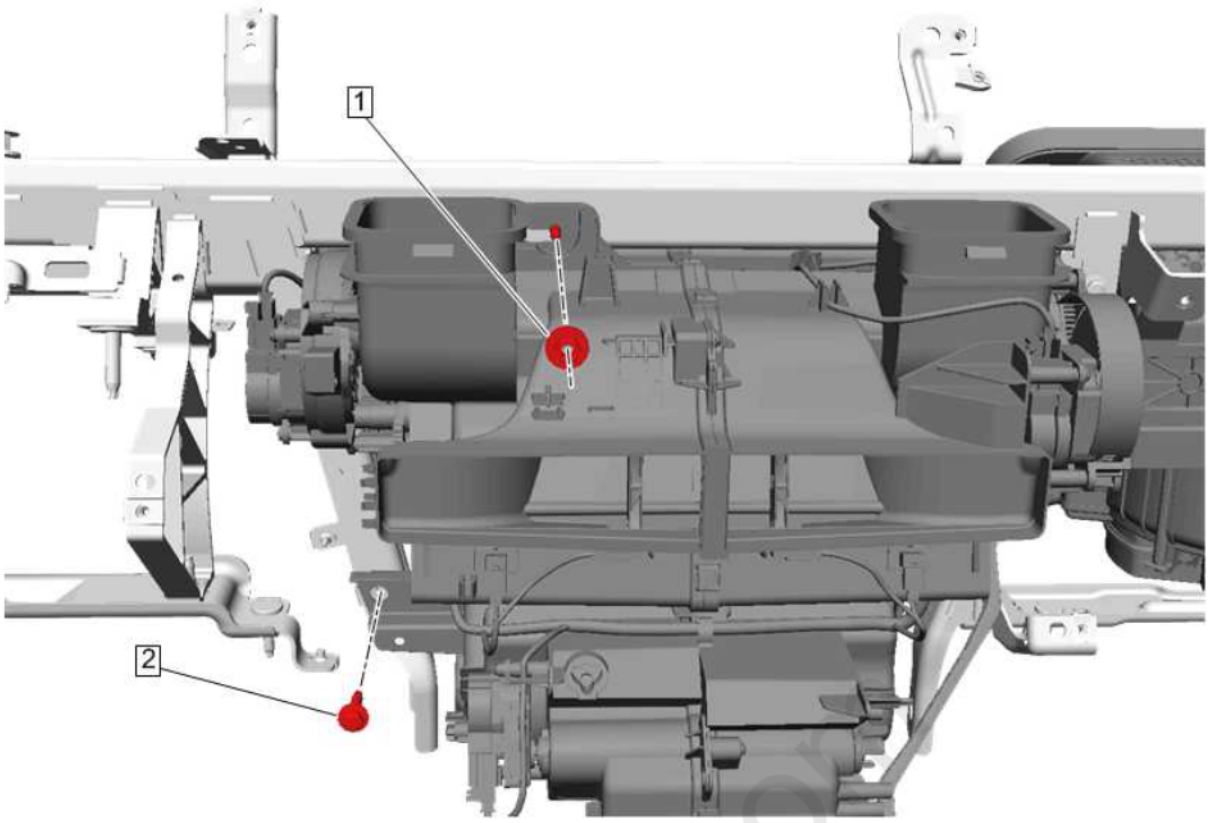


Fig. 267: Heater and Air Conditioning Evaporator and Blower Module Retainers
Courtesy of GENERAL MOTORS COMPANY

4. Heater and Air Conditioning Evaporator and Blower Module Nut (1)Â» Install and tighten 9.0 N.m (80 lb in)
5. Floor Front Air Outlet Duct - Left Side (1)Â» Install - **Floor Front Air Outlet Duct Replacement - Left Side**

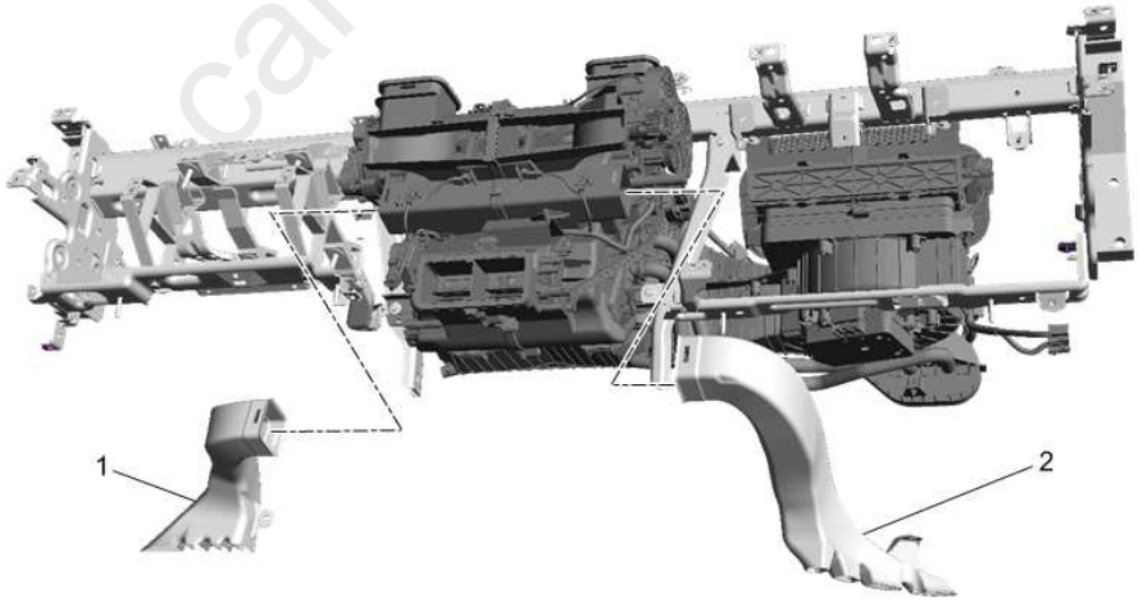


Fig. 268: Floor Front Air Outlet Ducts
Courtesy of GENERAL MOTORS COMPANY

6. Floor Front Air Outlet Duct - Right Side (2)Â» Install - **Floor Front Air Outlet Duct Replacement - Right Side**
7. Instrument Panel Center Support Bracket (1)Â» Install - **Instrument Panel Center Support Bracket Replacement**

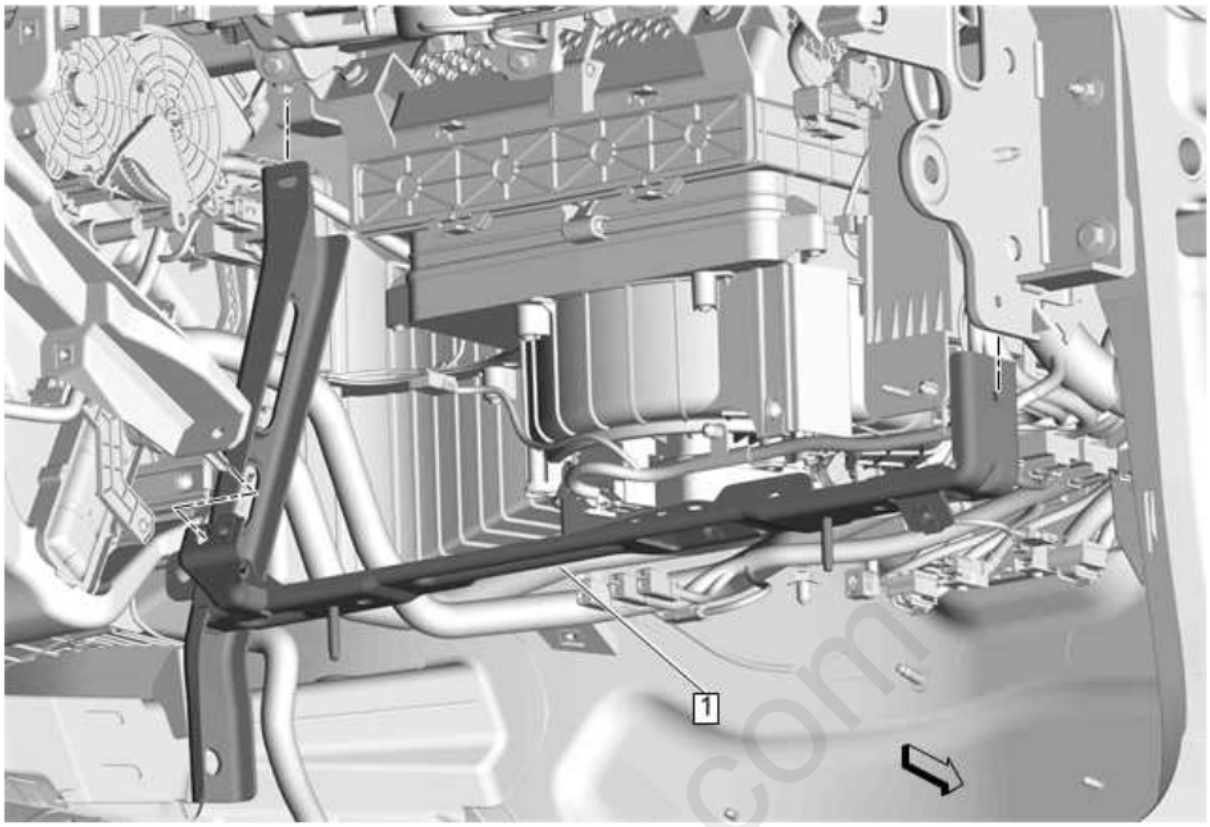


Fig. 269: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Install - **Instrument Panel Outer Air Outlet Duct Replacement - Left Side**

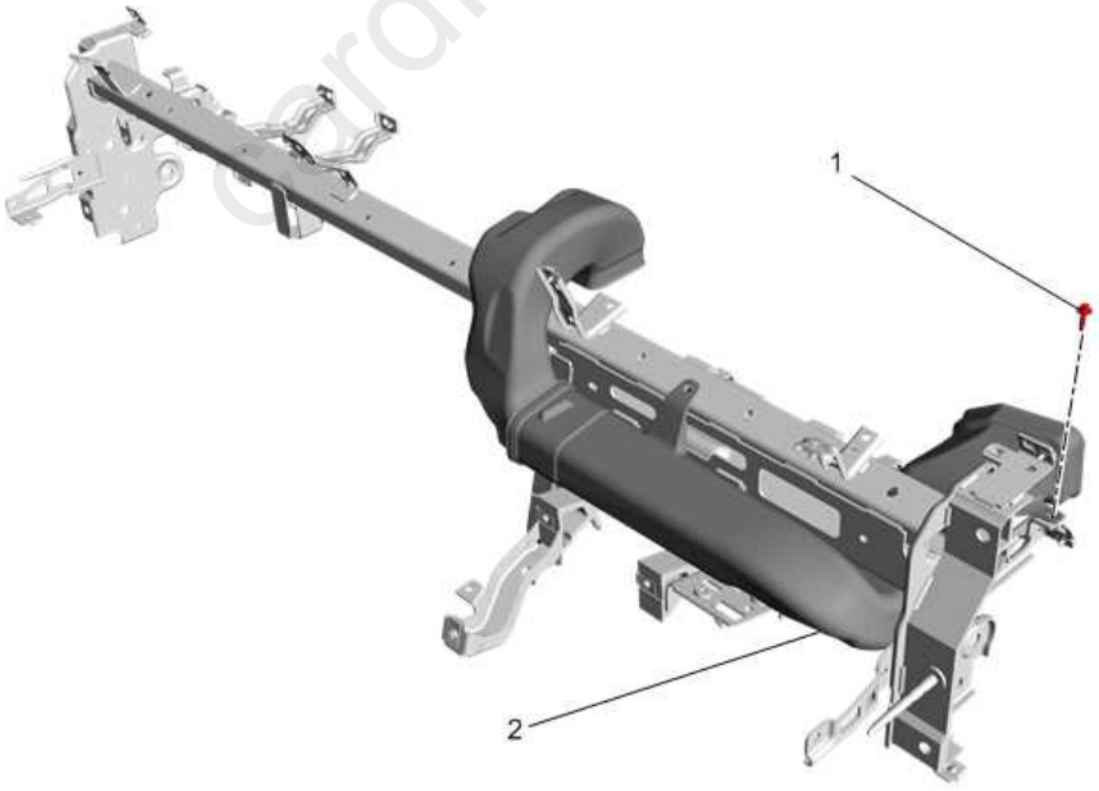


Fig. 270: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

9. Side Window Defogger Outlet Duct - Left Side (3)Â» Install - **Side Window Defogger Outlet Duct Replacement - Left Side**

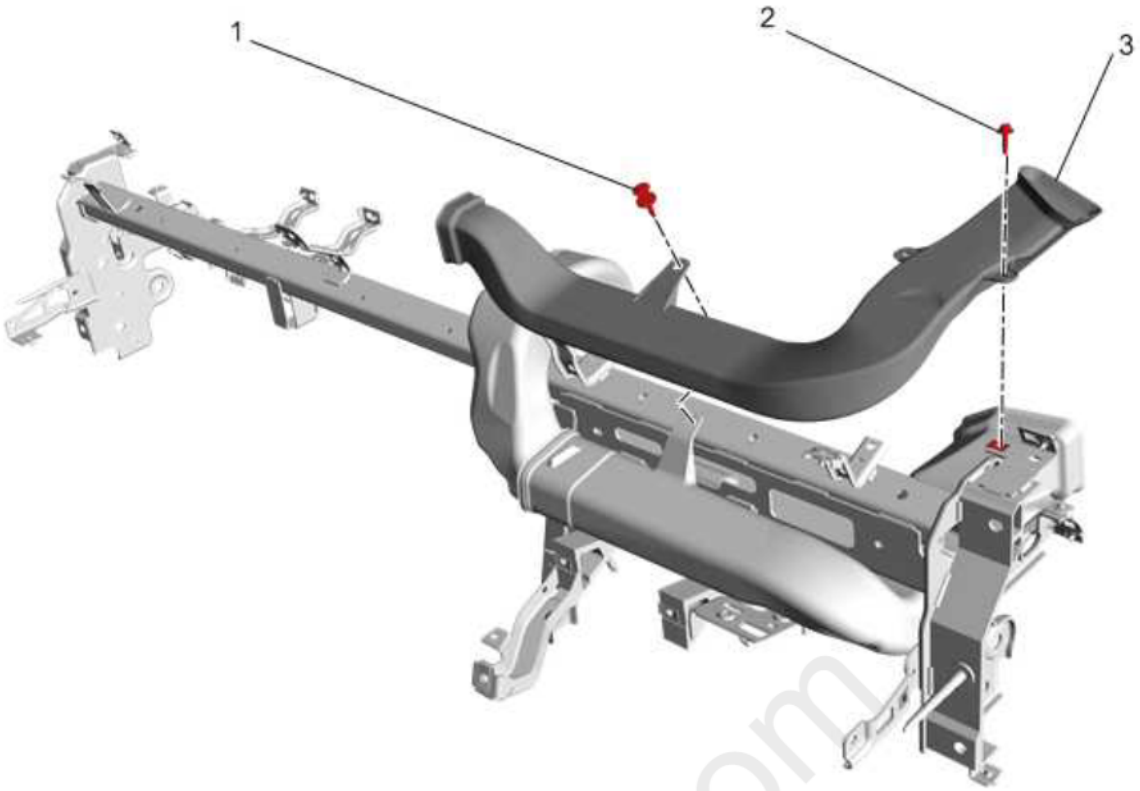


Fig. 271: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

10. Instrument Panel Tie Bar (1)Â» Install - **Instrument Panel Tie Bar Replacement**

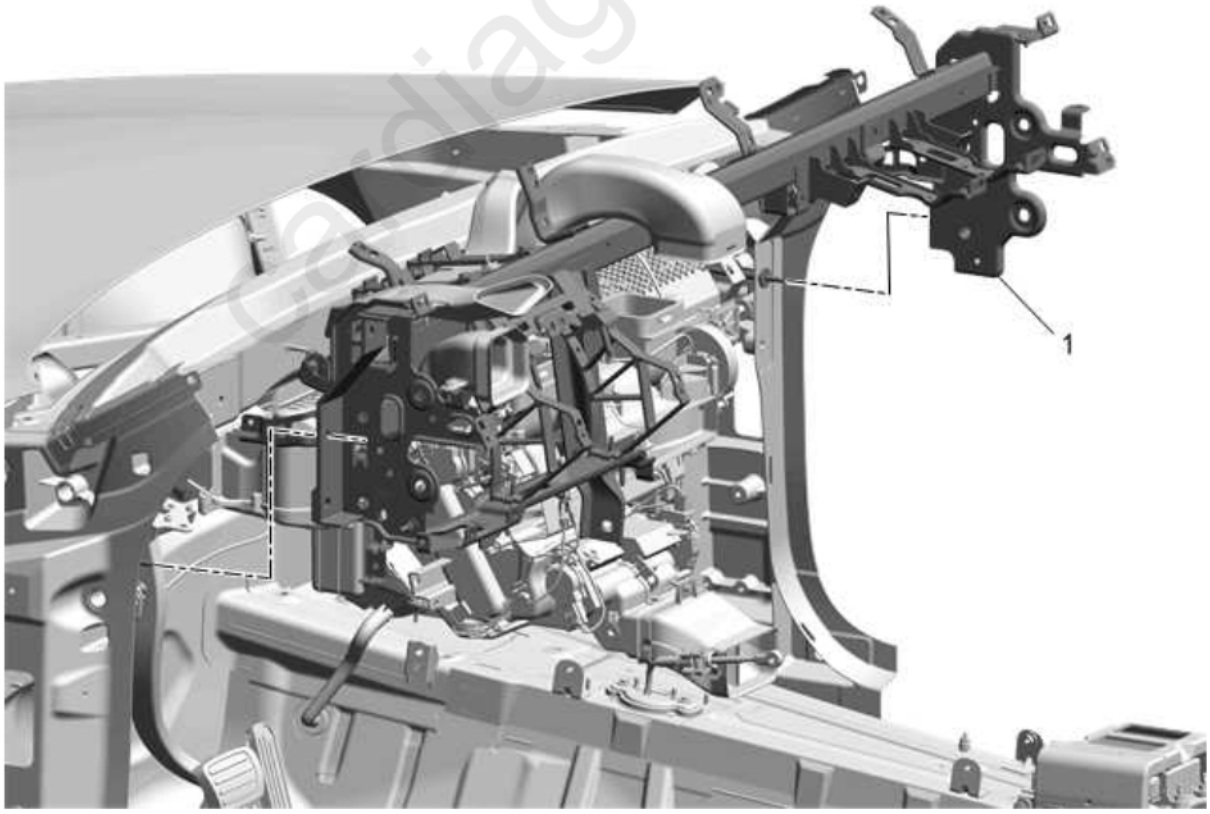


Fig. 272: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

11. Instrument Panel Outer Air Outlet Duct - Right Side (2)Â» Install - **Instrument Panel Outer Air Outlet Duct Replacement - Right Side**

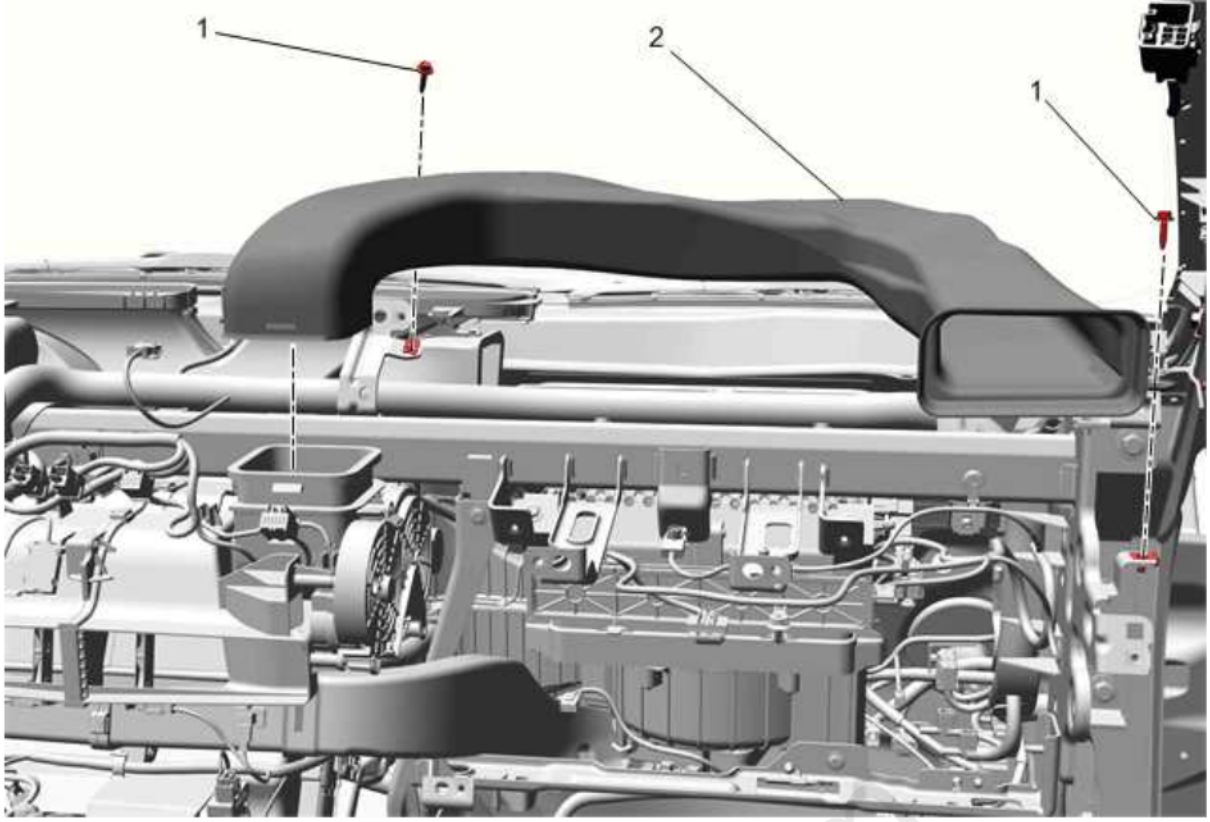


Fig. 273: Instrument Panel Outer Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

12. Windshield Defroster Outlet Duct (1)Â» Install - **Windshield Defroster Outlet Duct Replacement**

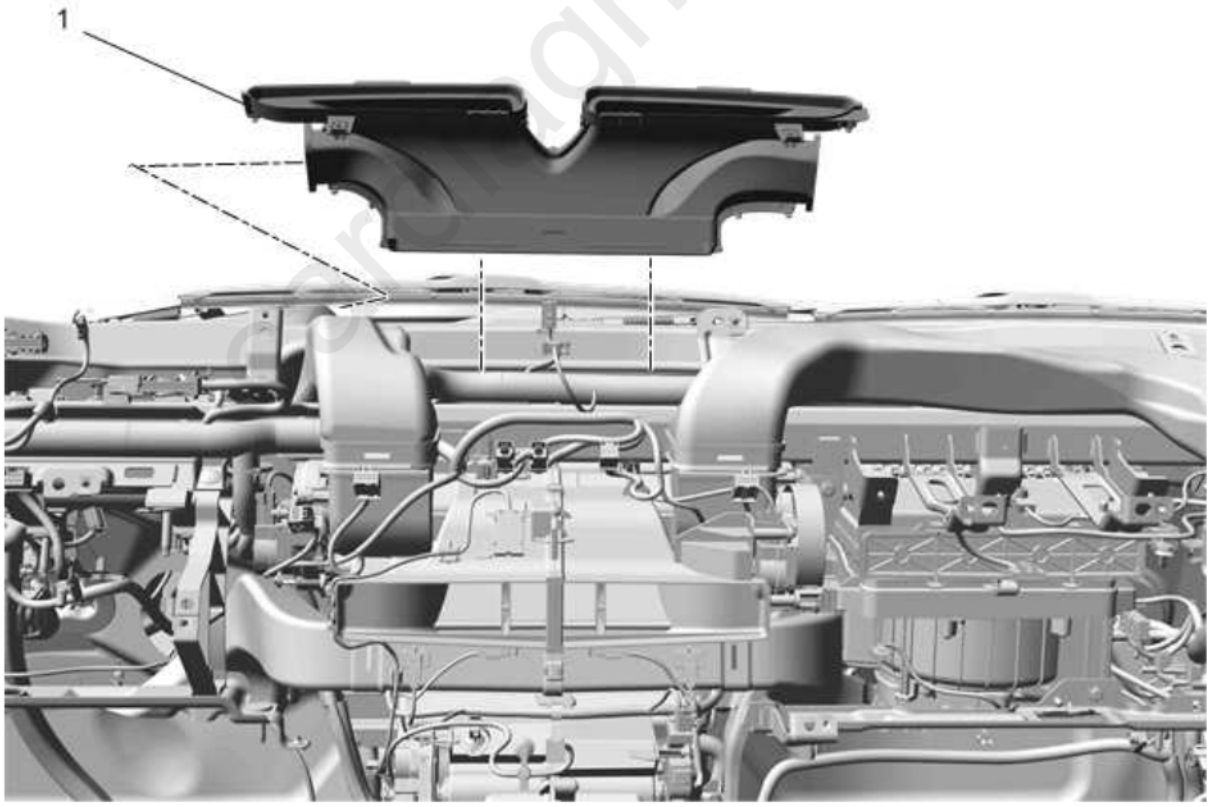


Fig. 274: Windshield Defroster Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

13. Side Window Defogger Outlet Duct - Right Side (2)Â» Install - **Side Window Defogger Outlet Duct Replacement - Right Side**

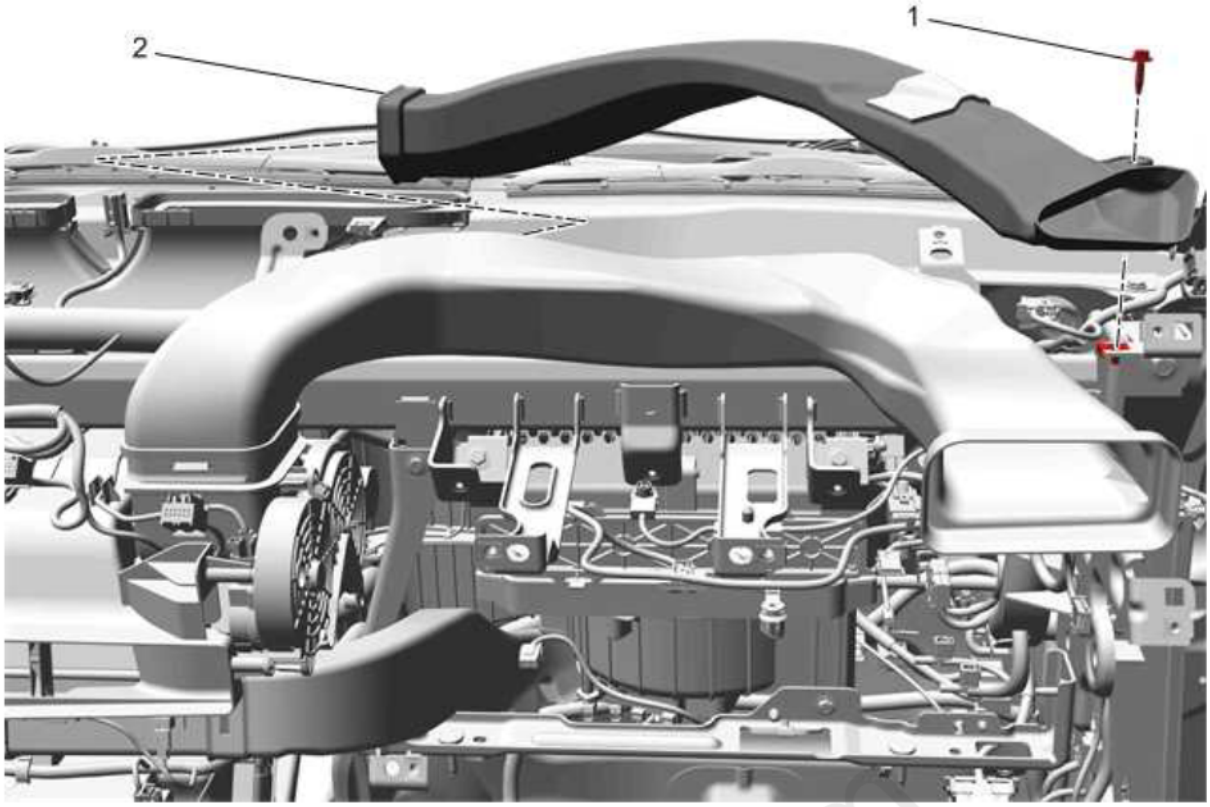


Fig. 275: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Instrument Panel Carrier (1)Â» Install - **Instrument Panel Carrier Replacement (UQH)** **Instrument Panel Carrier Replacement (UQA)**

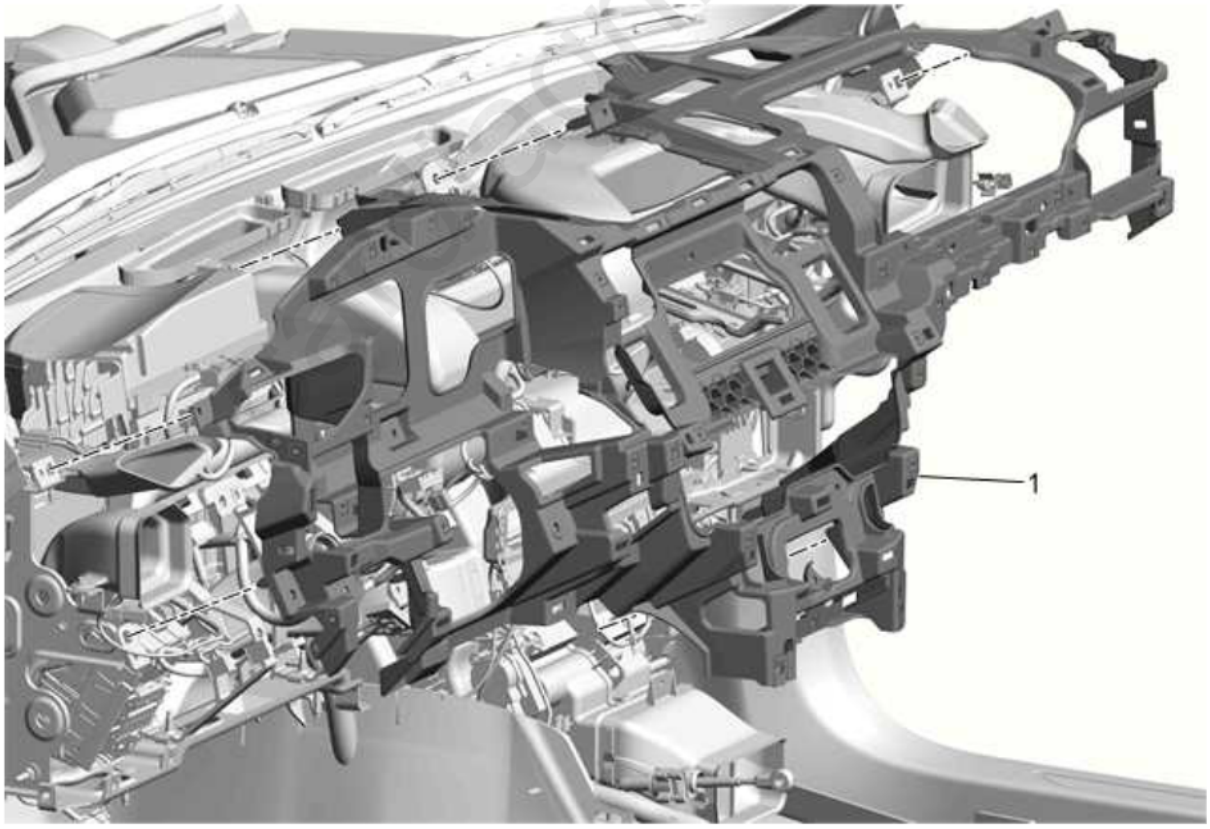


Fig. 276: Instrument Panel Carrier Assembly
Courtesy of GENERAL MOTORS COMPANY

15. Air Conditioning Evaporator and Blower Module Drain Hose - Left Side (1)Â» Install - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Left Side)**

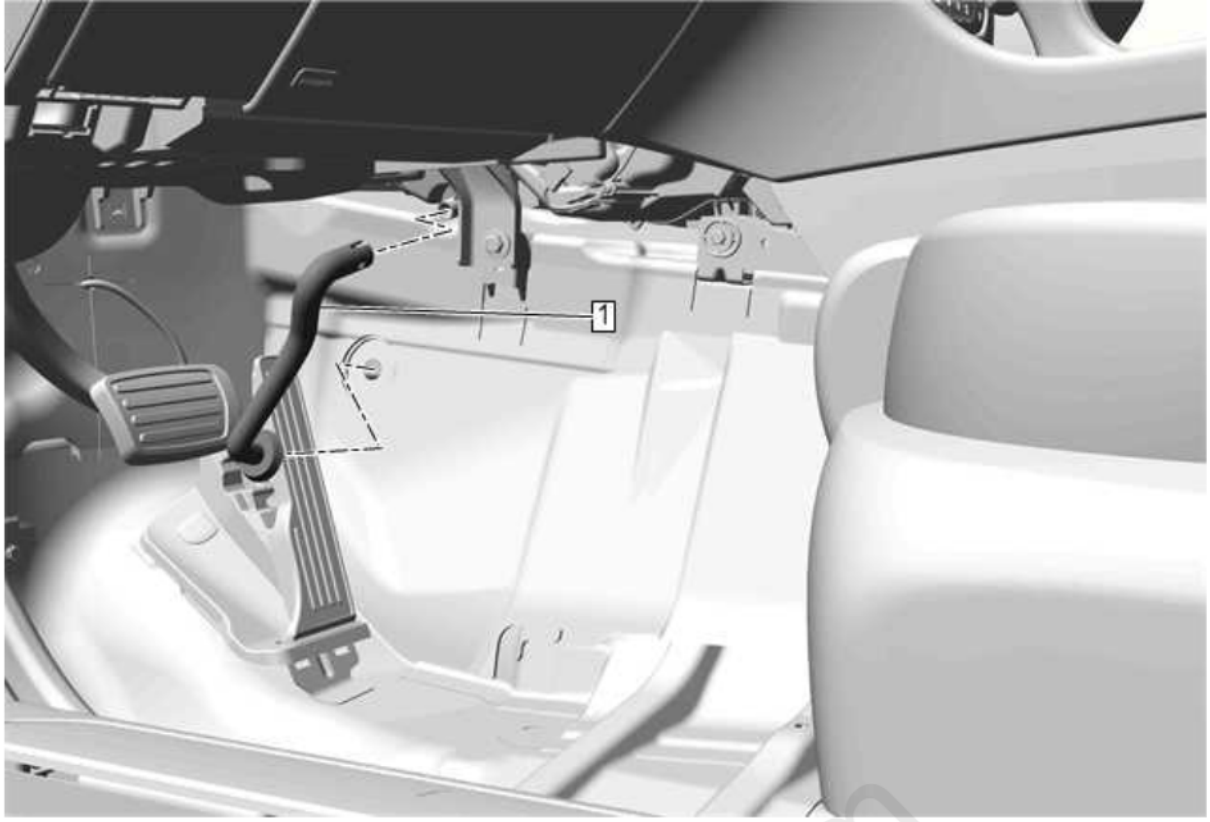


Fig. 277: Air Conditioning Evaporator And Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Always ensure the HVAC module drain tube is properly installed and secure following a repair. Residual moisture/water can collect inside the HVAC module. The residual moisture or water should not contact electrical modules, electrical connections, wiring, cables or carpeting. Use clean and absorbent shop clothes to protect these components while removing or installing the HVAC module drain tube and/or HVAC module. Moisture/water is a by-product of normal A/C system operation and can result in interior odors or corrosion/damage to electrical components.**

16. Air Conditioning Evaporator and Blower Module Drain Hose - Right Side (1)Â» Install - **Air Conditioning Evaporator and Blower Module Drain Hose Replacement (Right Side)**

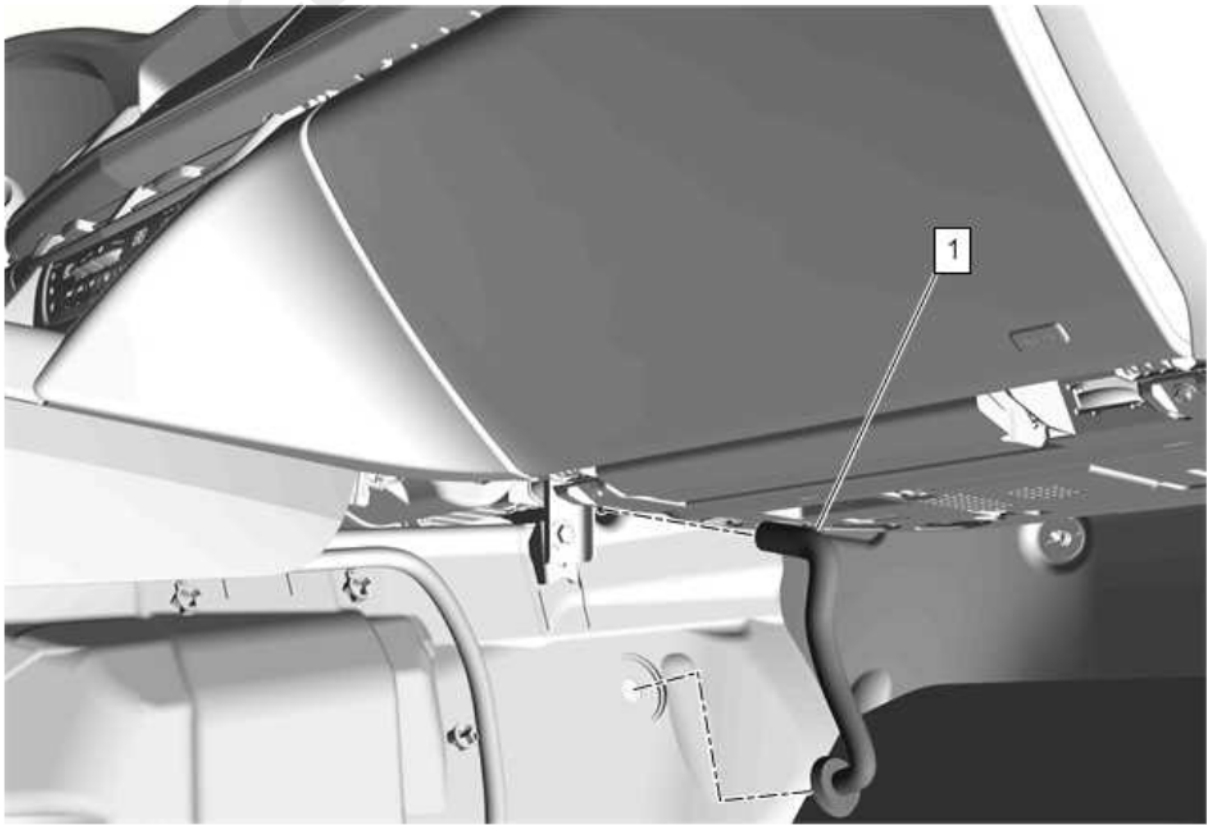


Fig. 278: Air Conditioning Evaporator and Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

17. From within the right front wheel well, install the heater and air conditioning evaporator and blower module bolt (1) securing the heater and air conditioning evaporator and blower module to the cowl panel and tighten to 9 N.m (80 lb in).

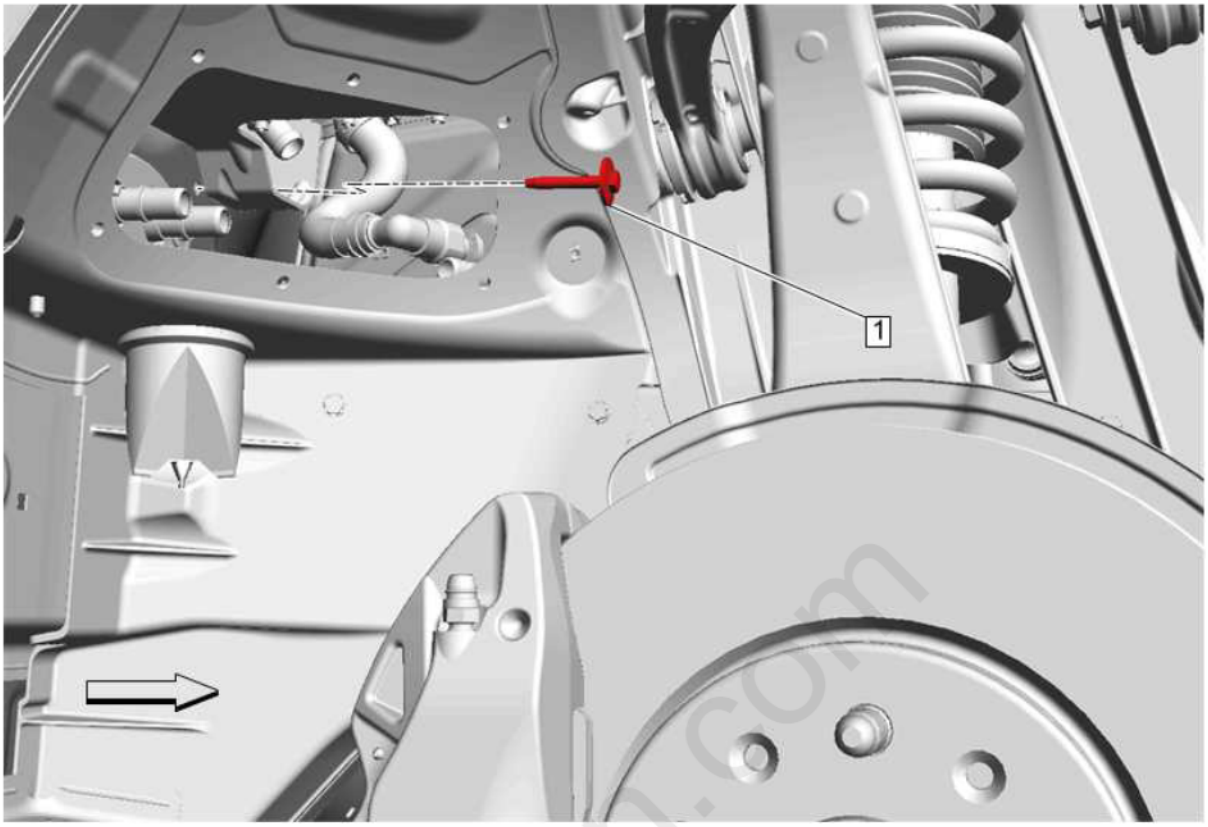


Fig. 279: Heater And Air Conditioning Evaporator And Blower Module Bolt
Courtesy of GENERAL MOTORS COMPANY

18. Drive Motor Generator Control Module Cooling Outlet Hose (3)Â» Install - **Drive Motor Generator Control Module Cooling Outlet Hose Replacement**

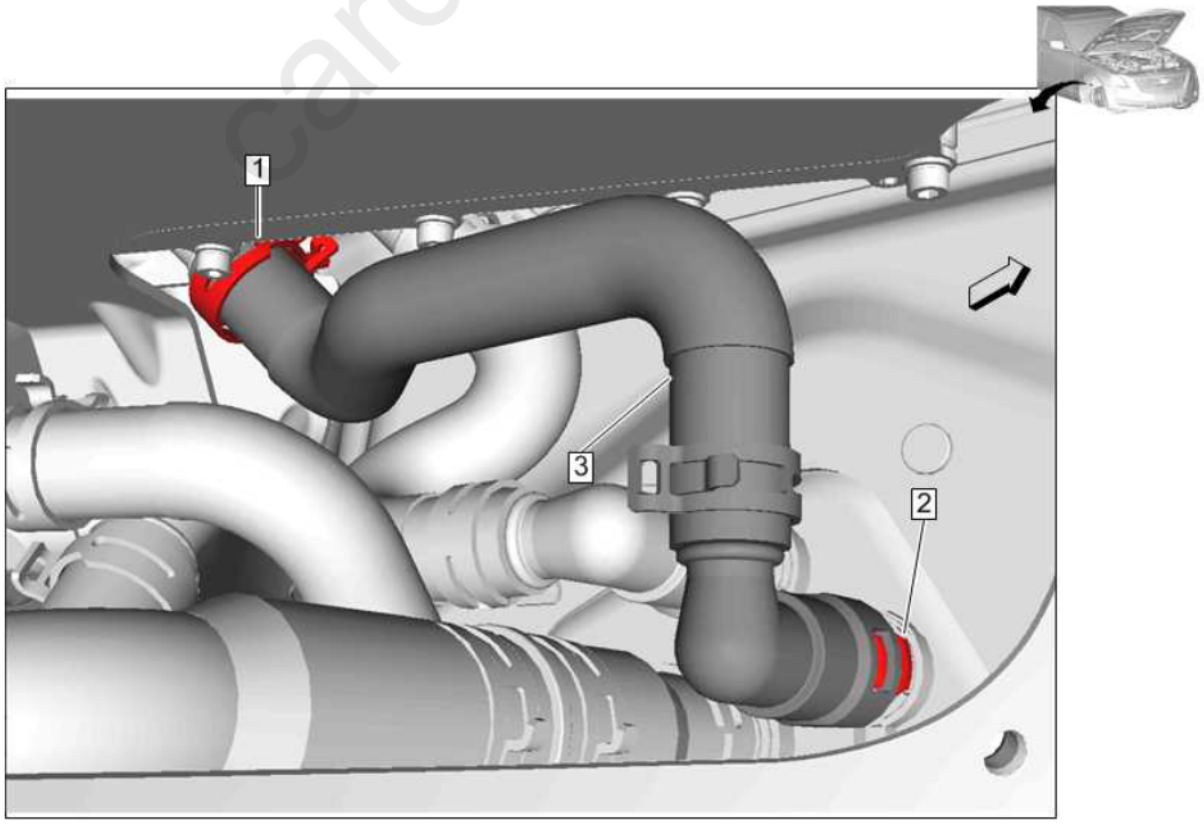


Fig. 280: Drive Motor Generator Control Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

19. Heater Outlet Hose (2) @ Heater Core TubeÂ» Install - **Heater Outlet Hose Replacement (LTG with HP9)**

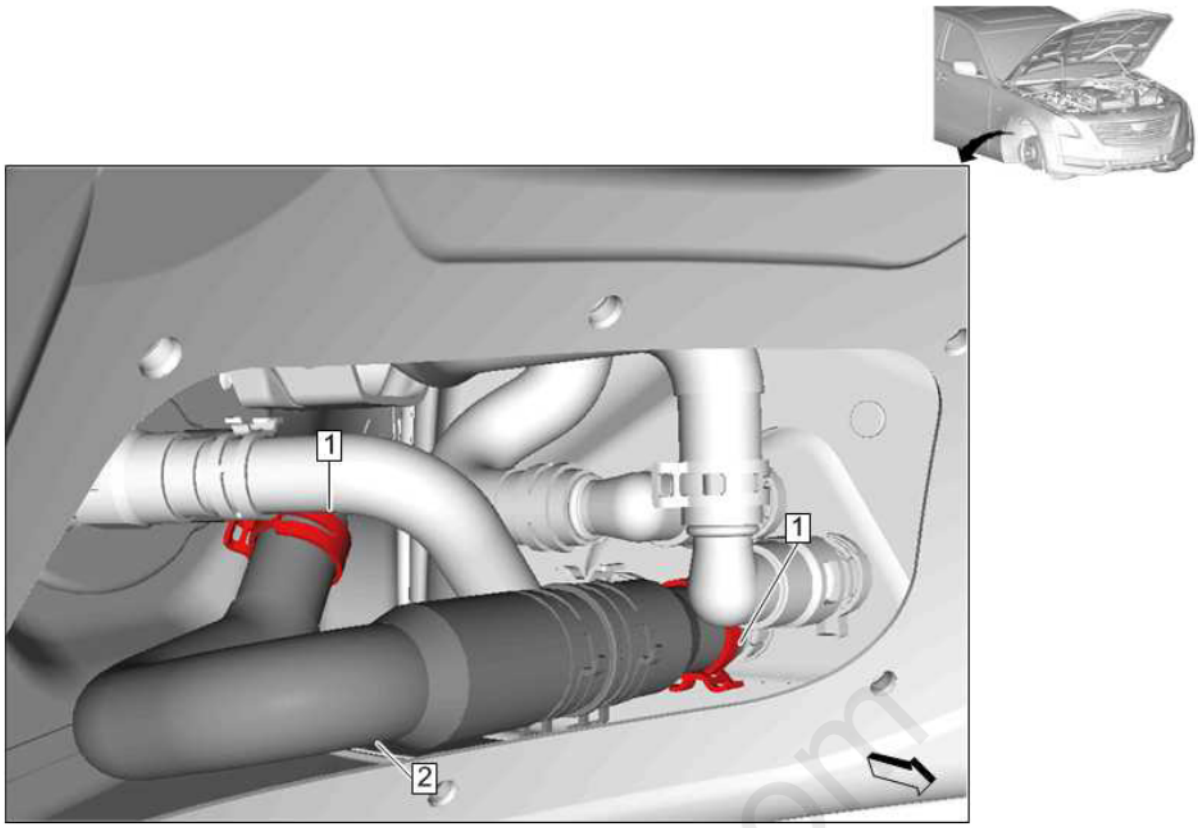


Fig. 281: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

20. Heater Inlet Hose (3) @ Heater Core TubeÂ» Install - **Heater Inlet Hose Replacement (LTG with HP9)**

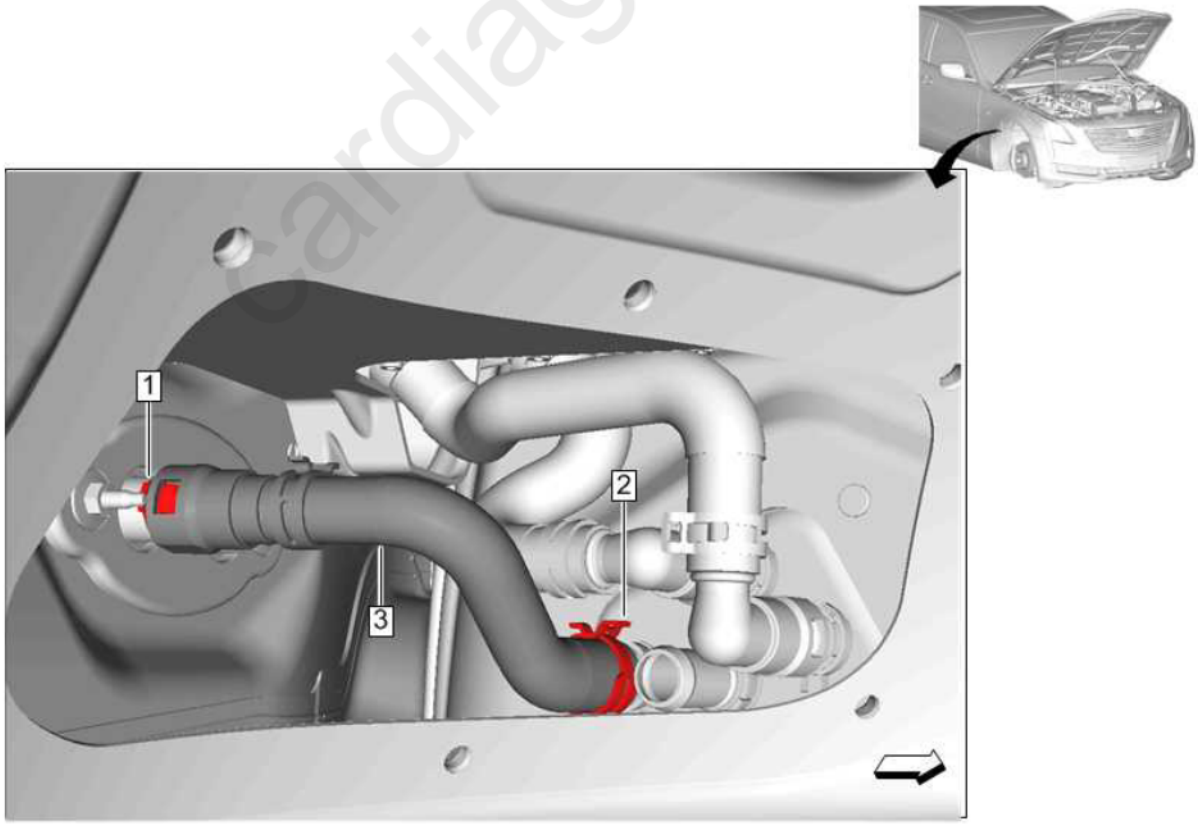


Fig. 282: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

21. Air Conditioning Refrigerant Heat Exchanger (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install - **Air Conditioning Refrigerant Heat Exchanger Replacement (HP9)**

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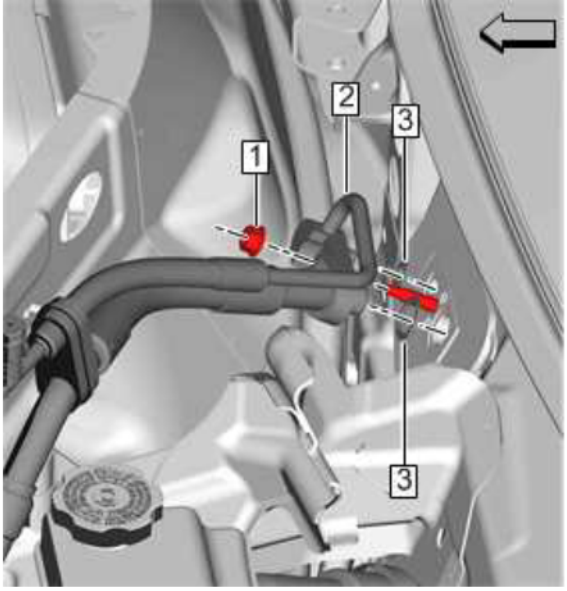


Fig. 283: Air Conditioning Refrigerant Heat Exchanger
Courtesy of GENERAL MOTORS COMPANY

22. Windshield Wiper Transmission (2)Â» Install - **Windshield Wiper Transmission Replacement**

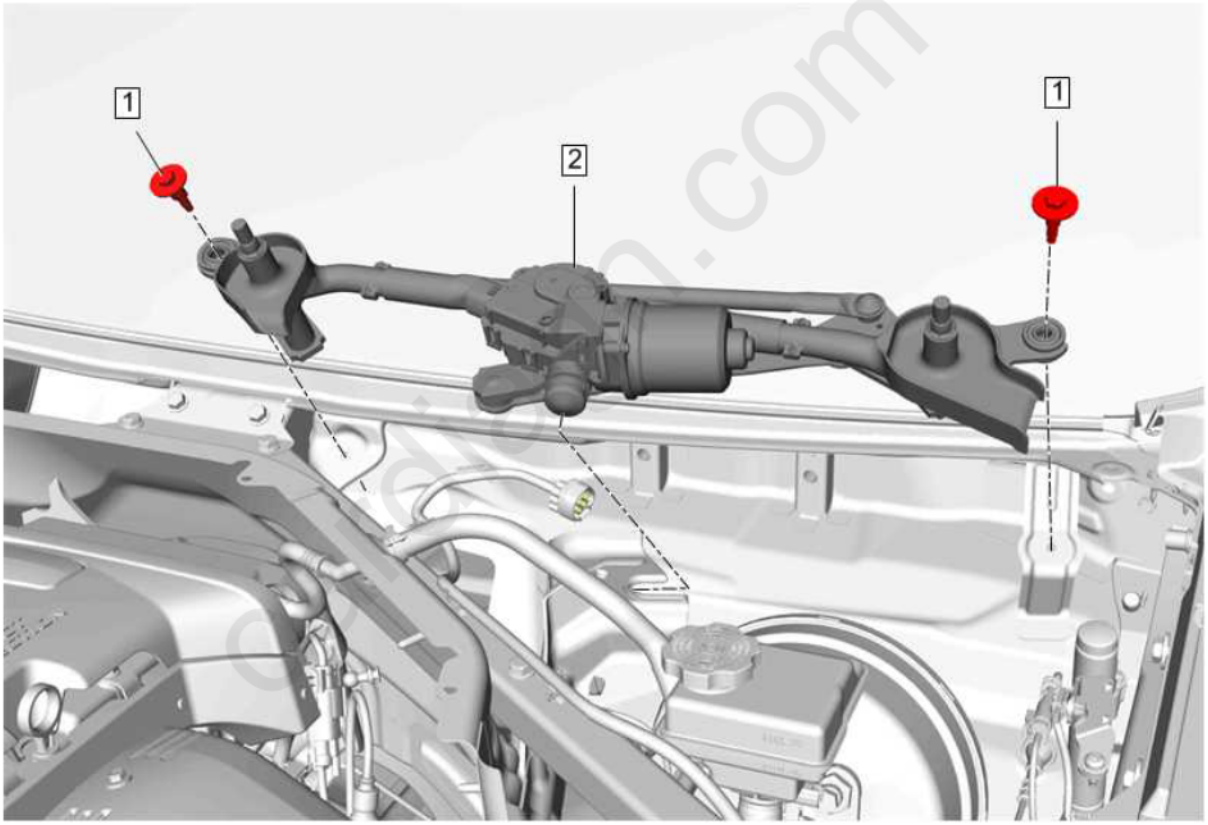


Fig. 284: Windshield Wiper Transmission
Courtesy of GENERAL MOTORS COMPANY

23. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

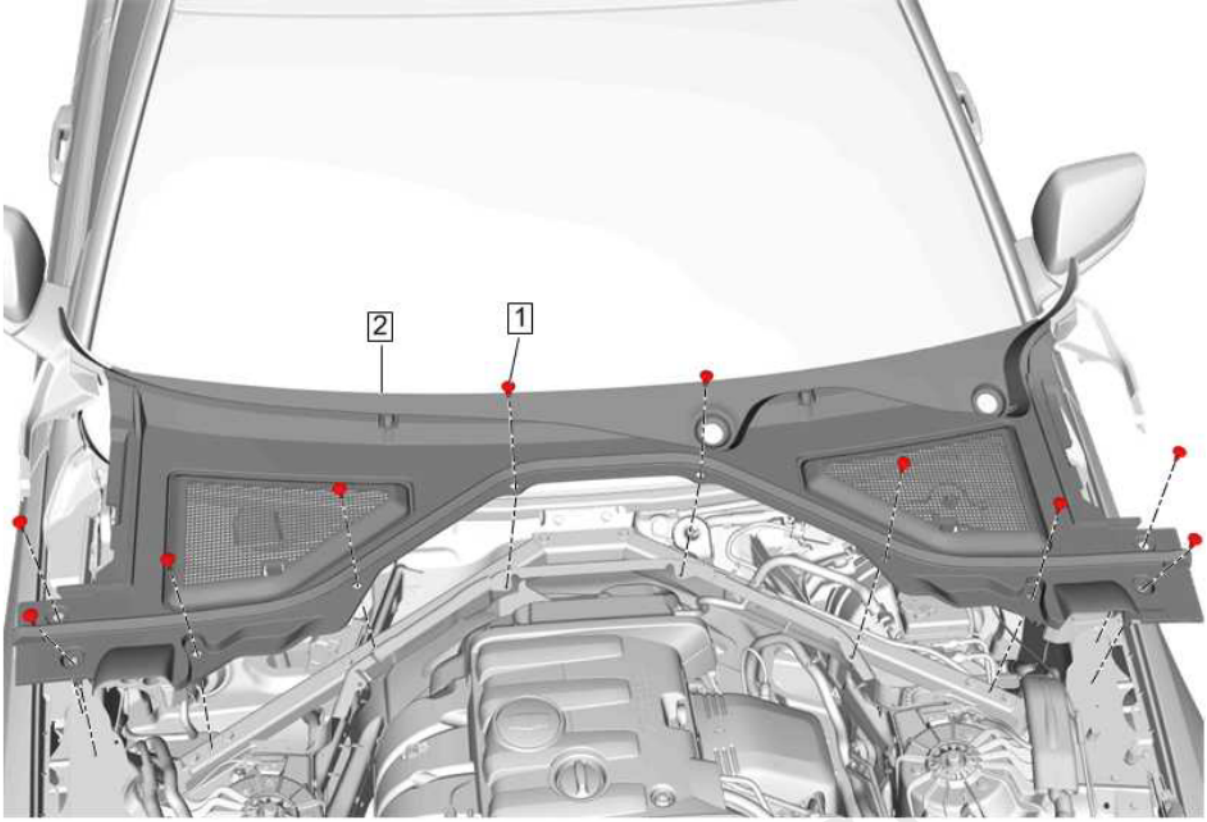


Fig. 285: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

24. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
25. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
26. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
27. Clear the DTCs from the heater and air conditioning remote control module.
28. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
29. Inspect for coolant leaks.
30. Inspect for refrigerant leaks.

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER UPPER CASE REPLACEMENT

Removal Procedure

1. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Remove
2. Disconnect the electrical connectors and detach the wiring harness as necessary.
3. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

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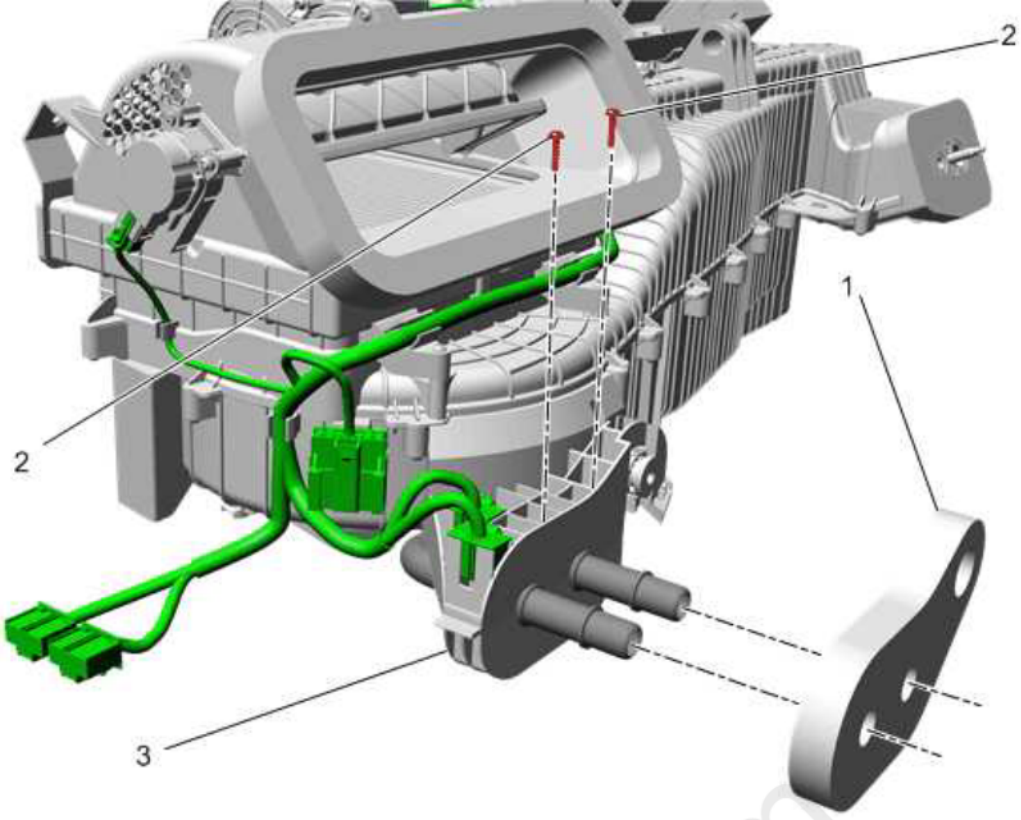


Fig. 286: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
5. Heater Core Tube Bracket (3)Â» Remove
6. Heater Core Bracket Fastener (1)Â» Remove [2x]

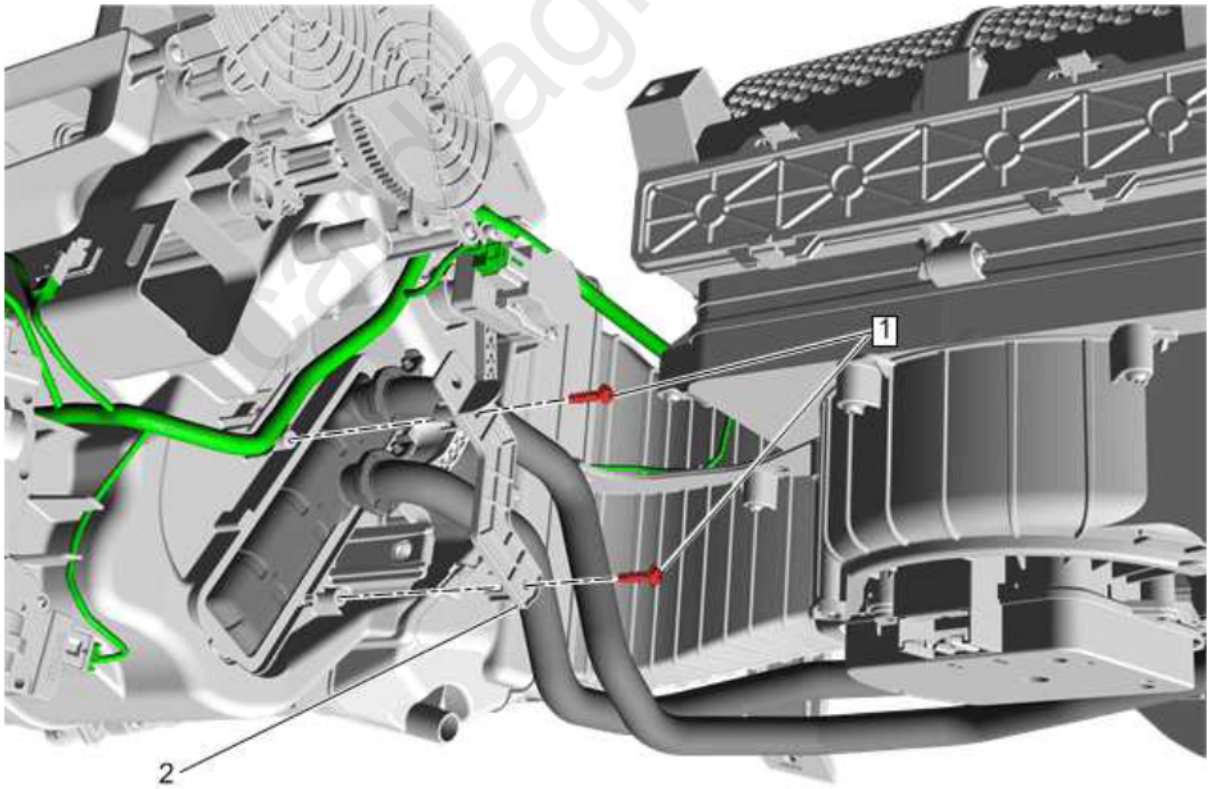


Fig. 287: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

7. Heater Core Bracket (2)Â» Remove
8. Heater Core (1)Â» Remove

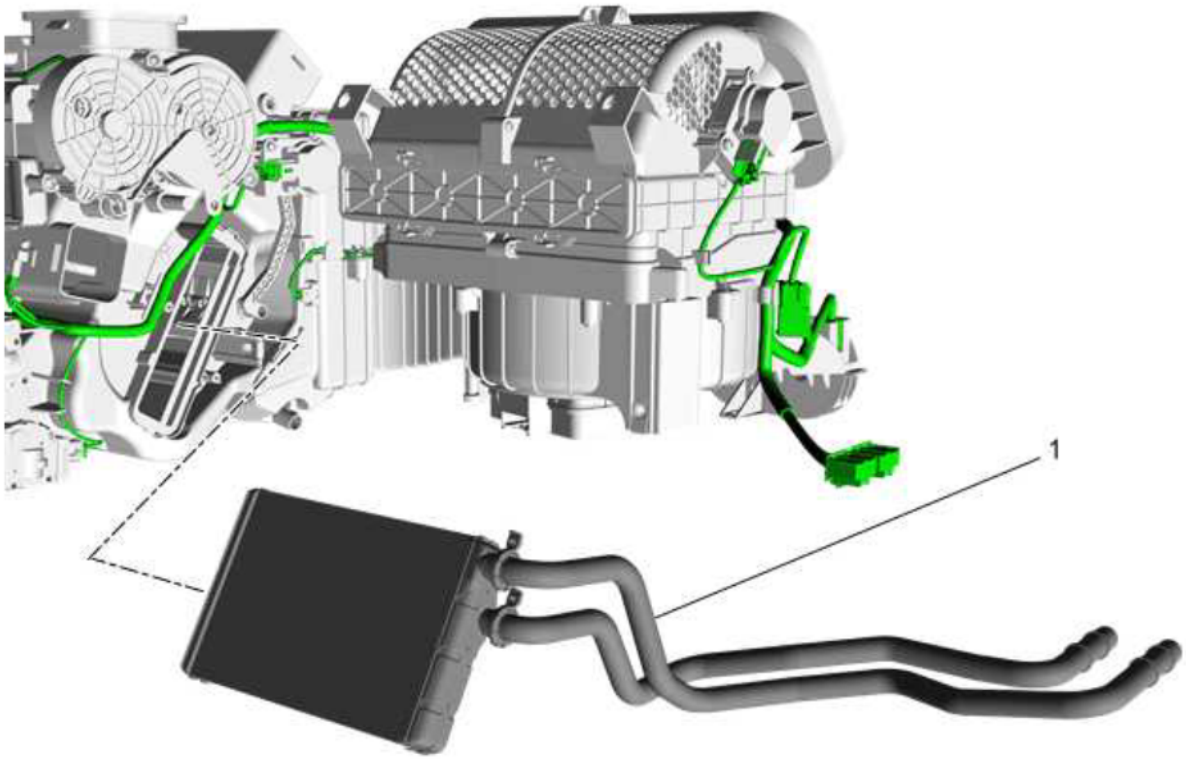


Fig. 288: Heater Core
Courtesy of GENERAL MOTORS COMPANY

9. Rotate the heater and air conditioning evaporator and blower module over so the bottom is facing upward.

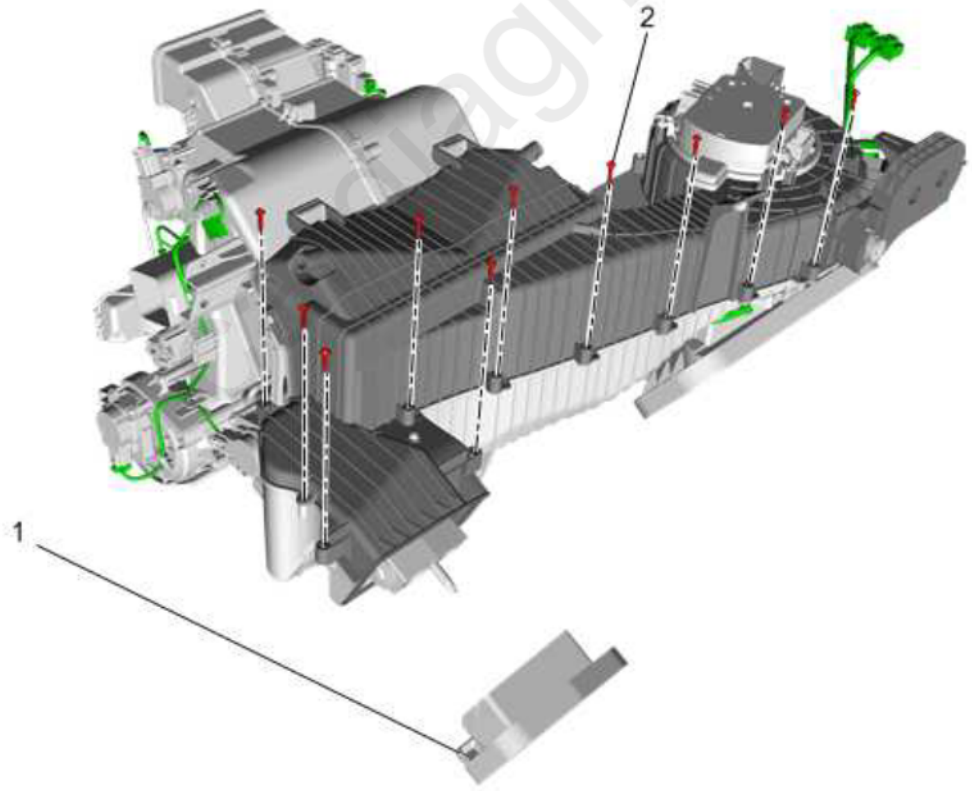


Fig. 289: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

10. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove
11. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Remove [10x]
12. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Remove [7x]

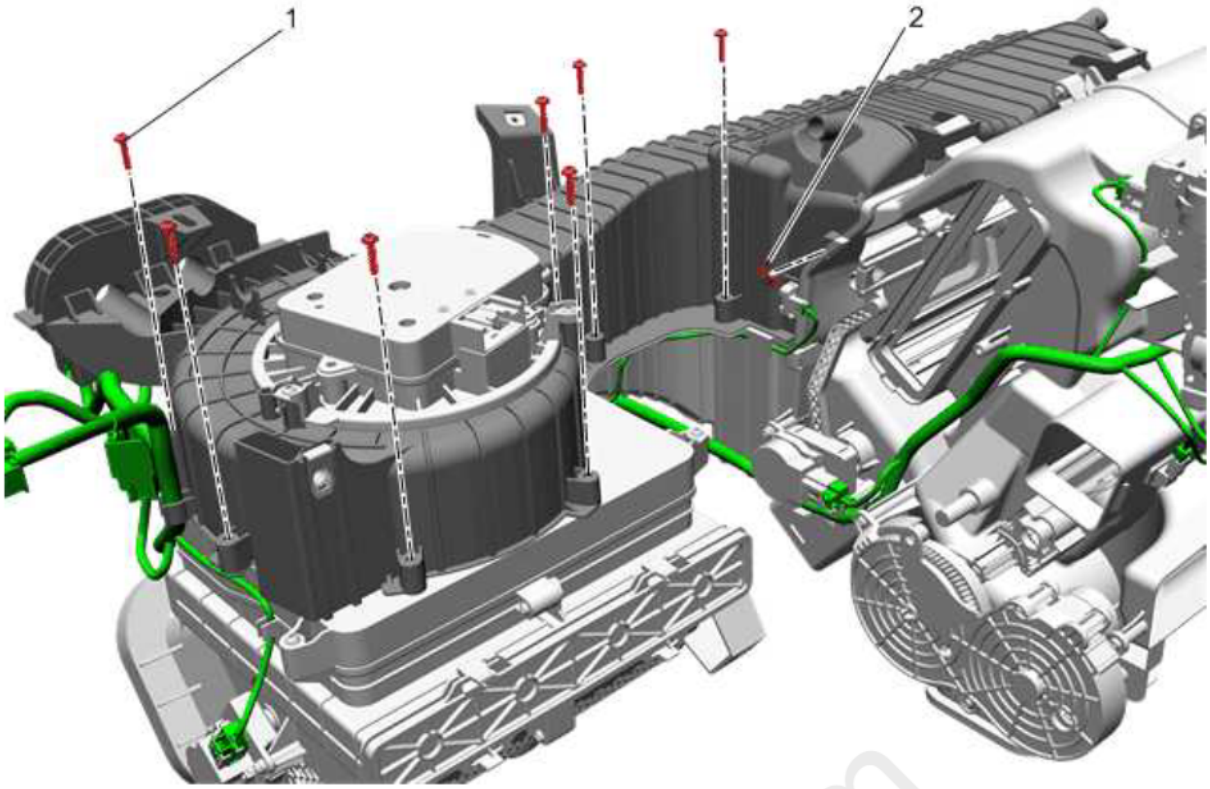


Fig. 290: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

13. Retainer Clip (2)Â» Remove
14. Retainer Clip (1)Â» Remove

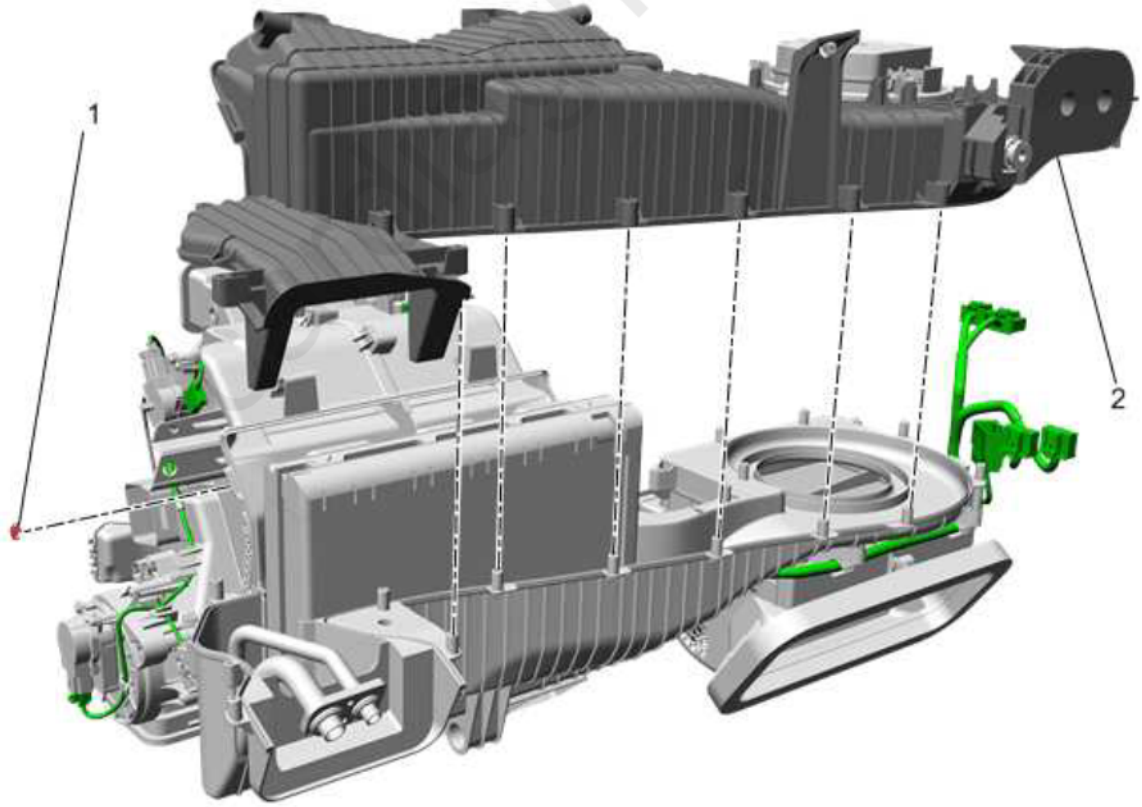


Fig. 291: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

15. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Remove
16. Air Conditioning Evaporator (1)Â» Remove

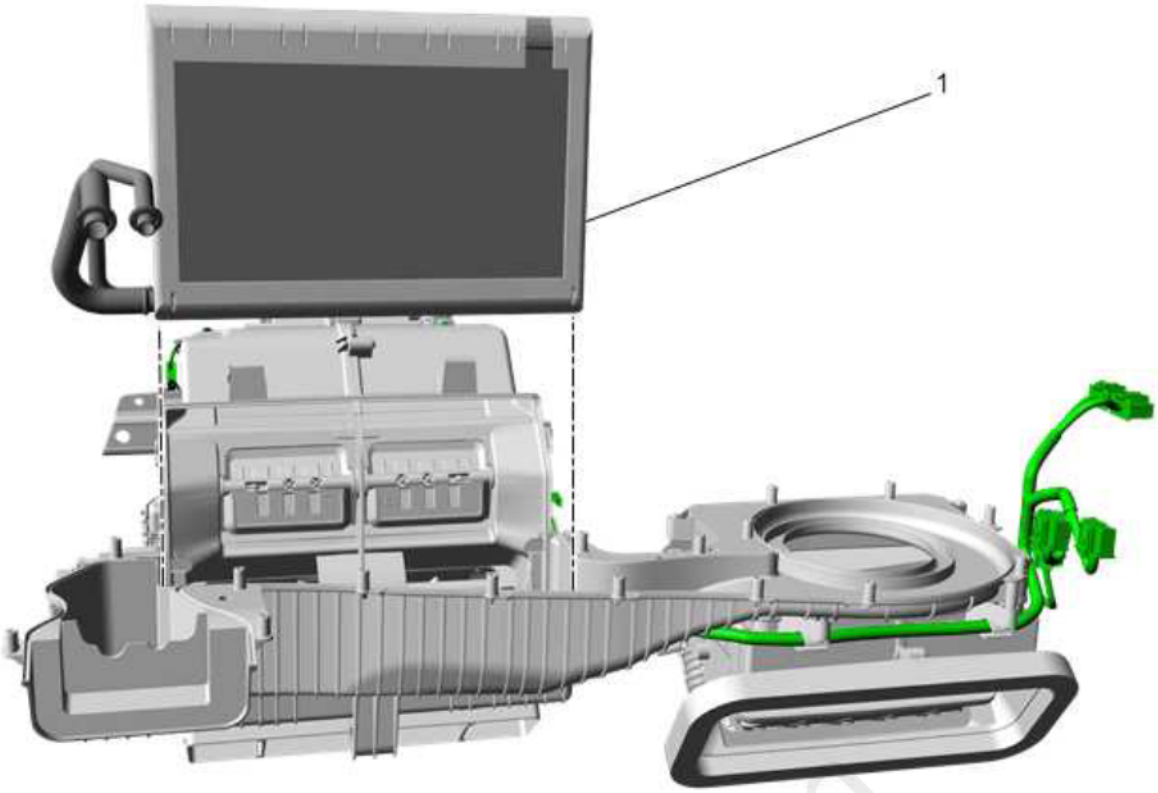


Fig. 292: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

17. Retainer Clip (1)Â» Remove [2x]

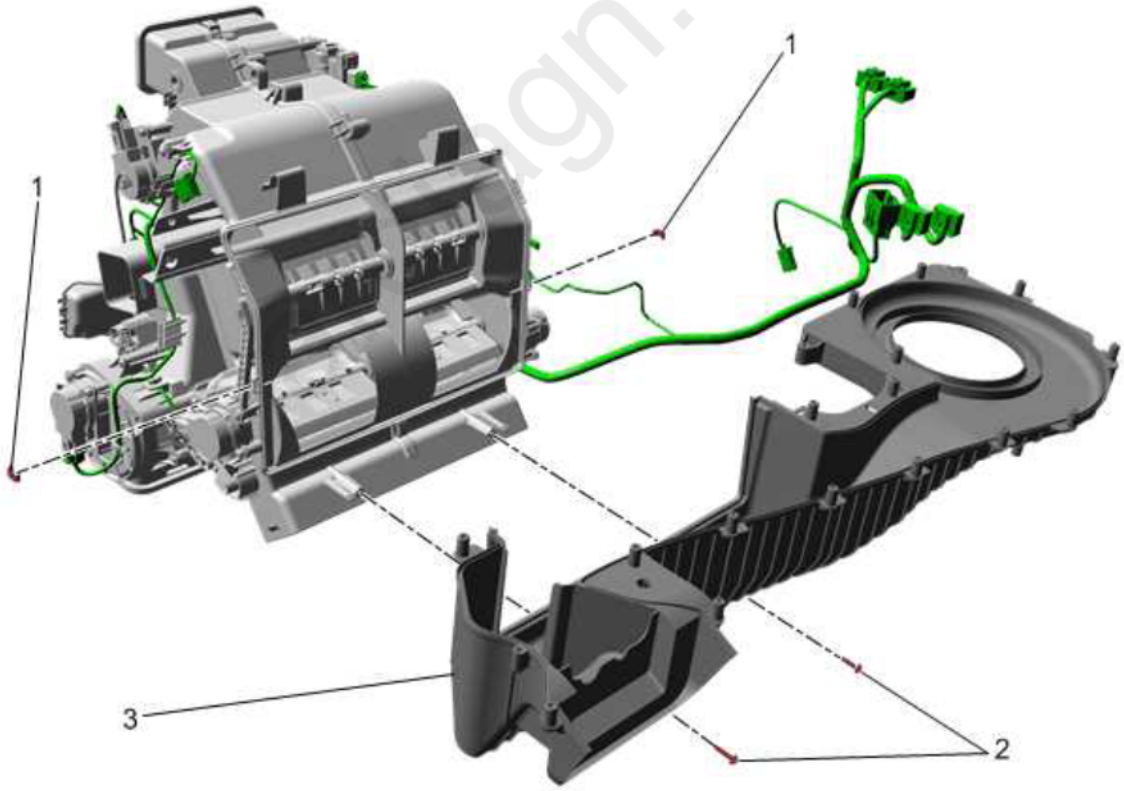


Fig. 293: Heater and Air Conditioning Evaporator and Blower Upper Case
Courtesy of GENERAL MOTORS COMPANY

18. Heater and Air Conditioning Evaporator and Blower Upper Case Screw (2)Â» Remove [2x]
19. Heater and Air Conditioning Evaporator and Blower Upper Case (3)Â» Remove

Installation Procedure

1. Heater and Air Conditioning Evaporator and Blower Upper Case (3)Â» Install

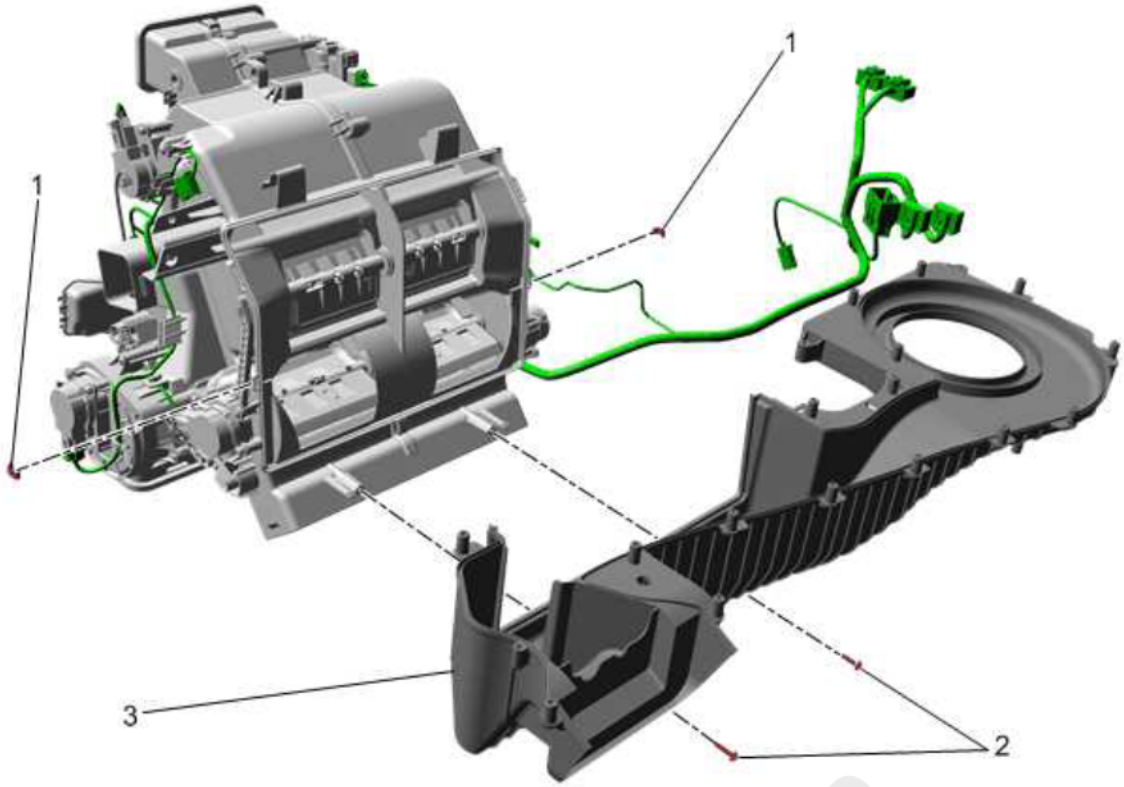


Fig. 294: Heater and Air Conditioning Evaporator and Blower Upper Case
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Heater and Air Conditioning Evaporator and Blower Upper Case Screw (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
3. Retainer Clip (1)Â» Install [2x]
4. Air Conditioning Evaporator (1)Â» Install

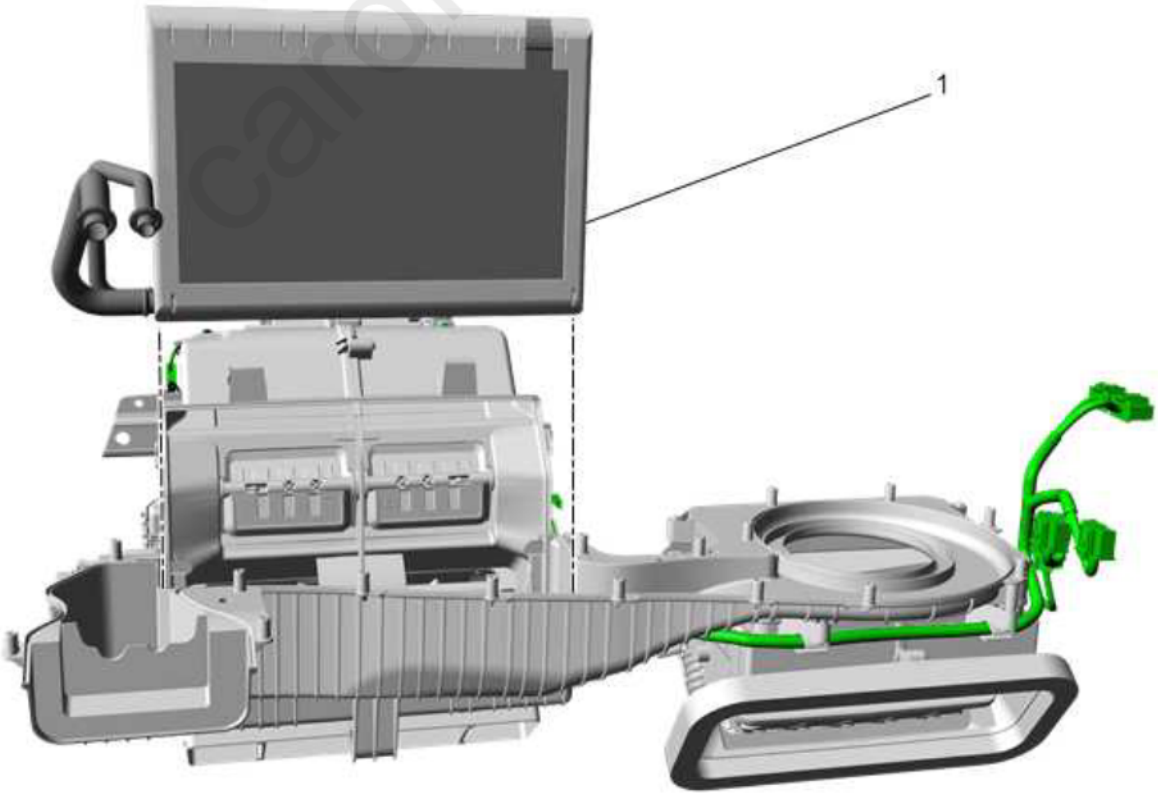


Fig. 295: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

5. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Install

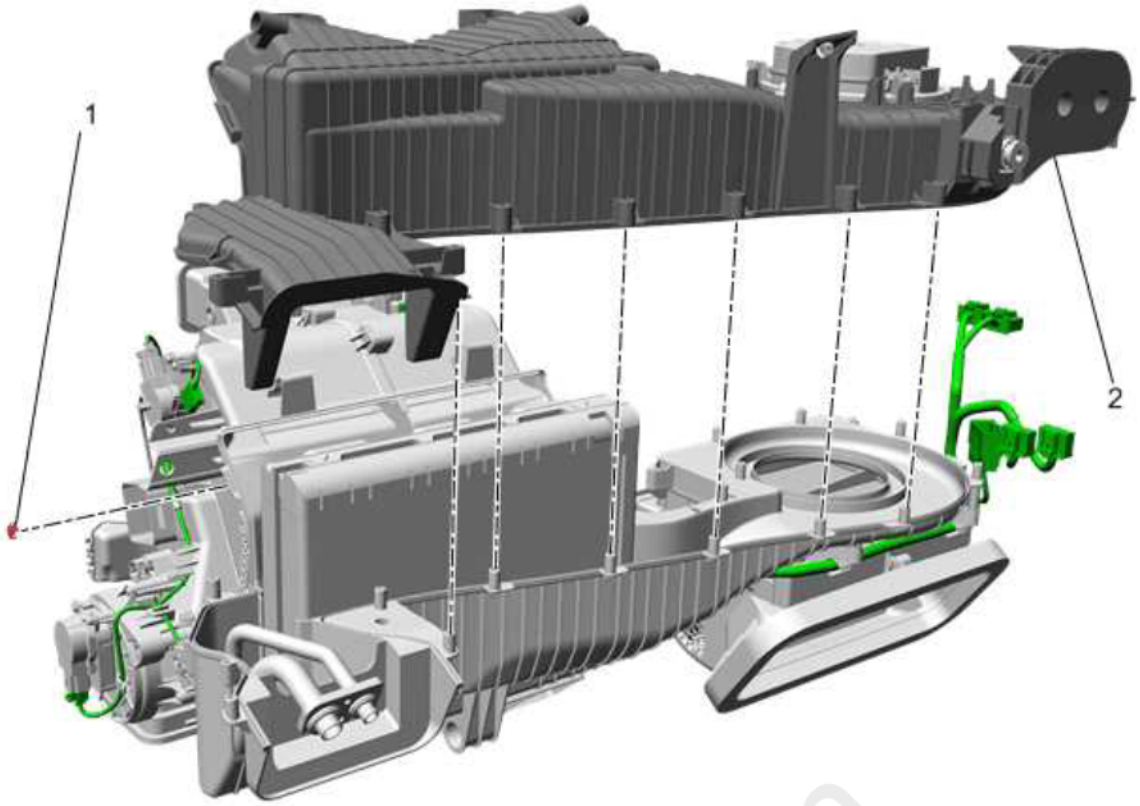


Fig. 296: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

6. Retainer Clip (1)Â» Install
7. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Install and tighten 2.5 N.m (22 lb in) [7x]

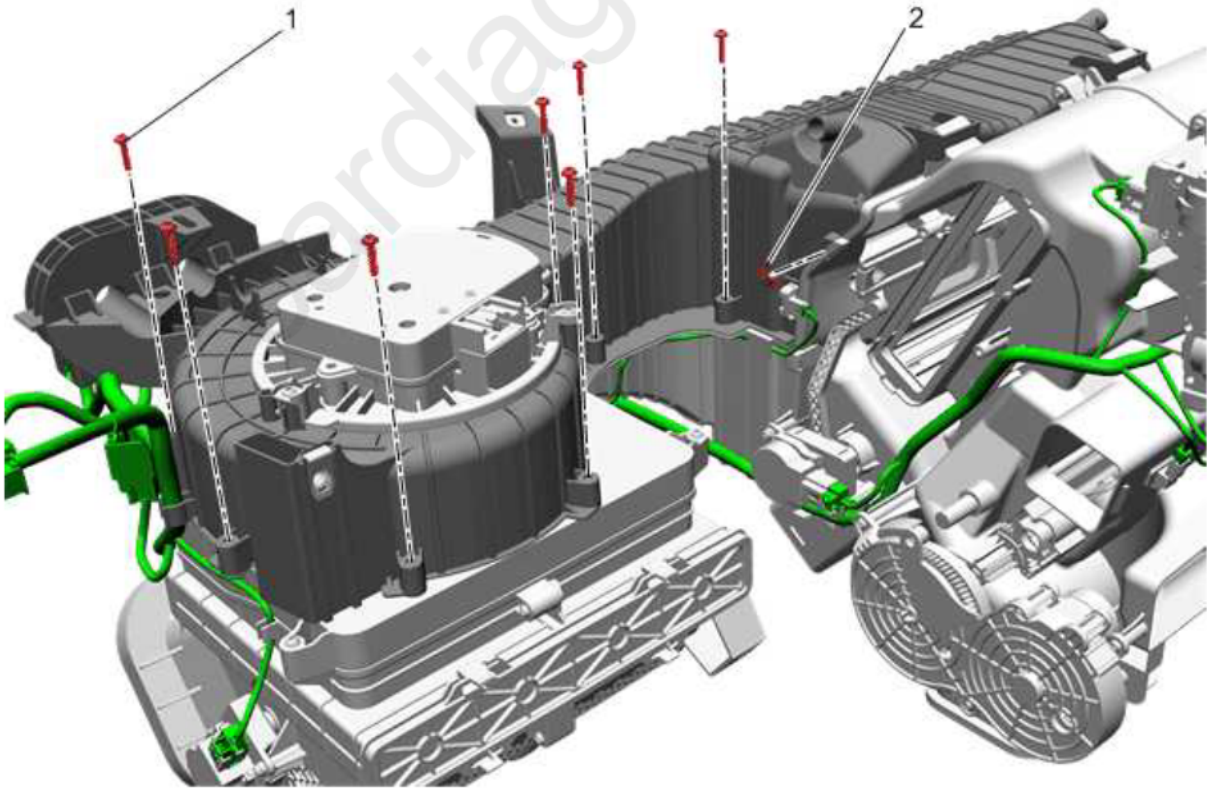


Fig. 297: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

8. Retainer Clip (2)Â» Install
9. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [10x]

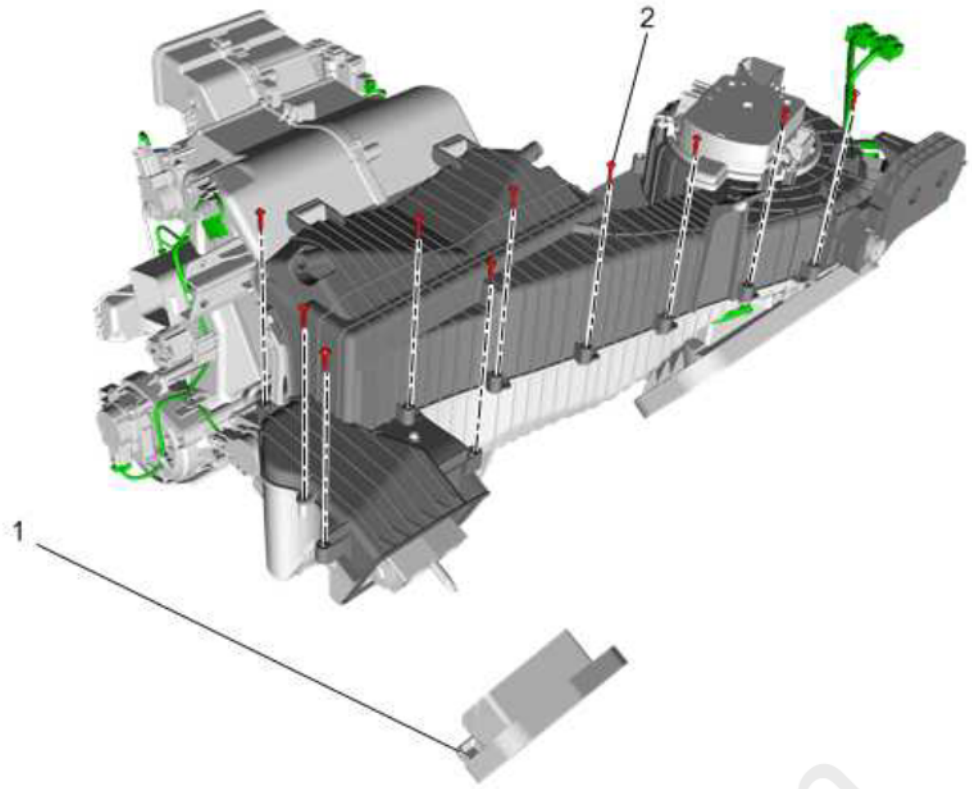


Fig. 298: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

10. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
11. Rotate the heater and air conditioning evaporator and blower module over so the top is facing upward.
12. Heater Core (1)Â» Install

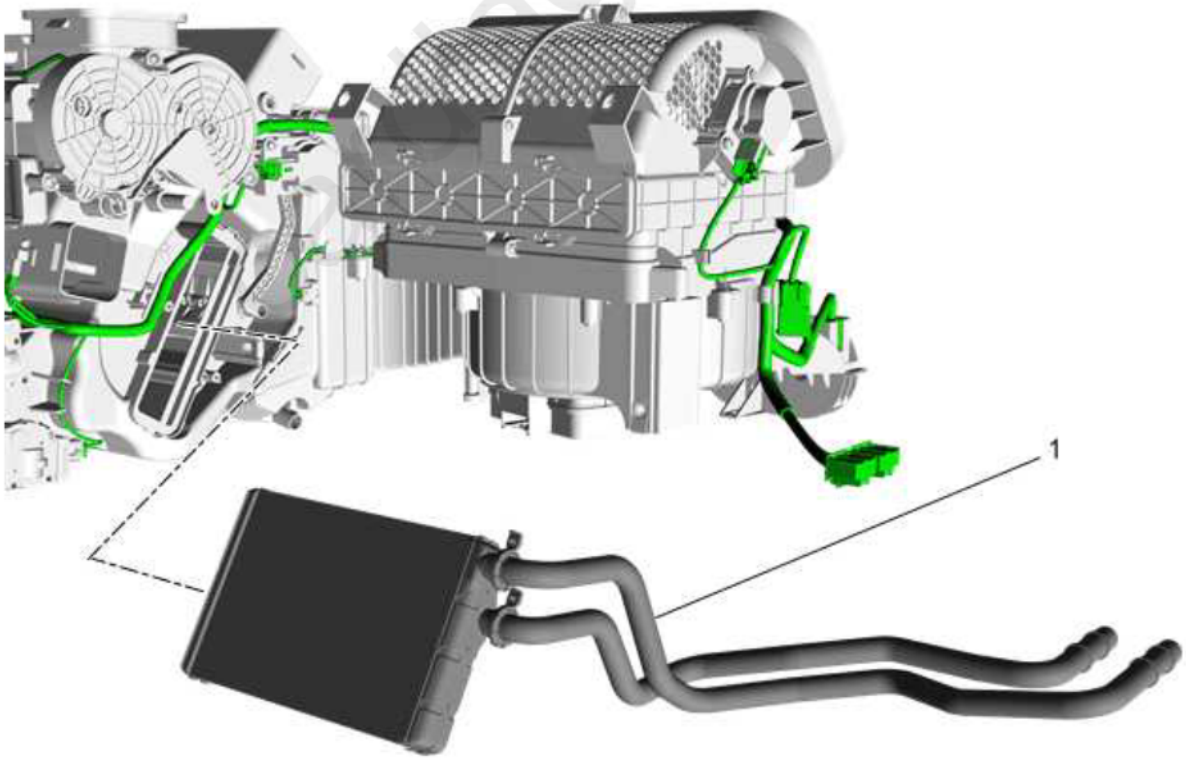


Fig. 299: Heater Core
Courtesy of GENERAL MOTORS COMPANY

13. Heater Core Bracket (2)Â» Install

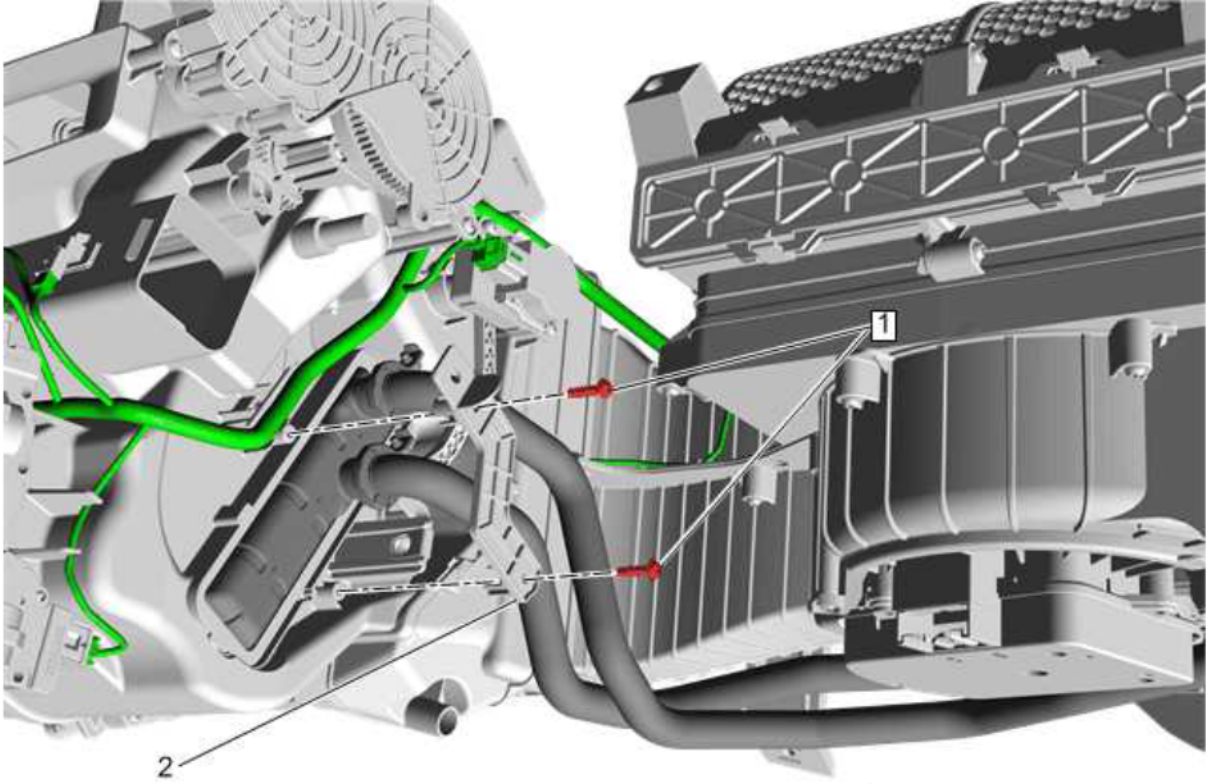


Fig. 300: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

14. Heater Core Bracket Fastener (1)Â» Install and tighten 1.5 N.m (13 lb in) [2x]
15. Heater Core Tube Bracket (3)Â» Install

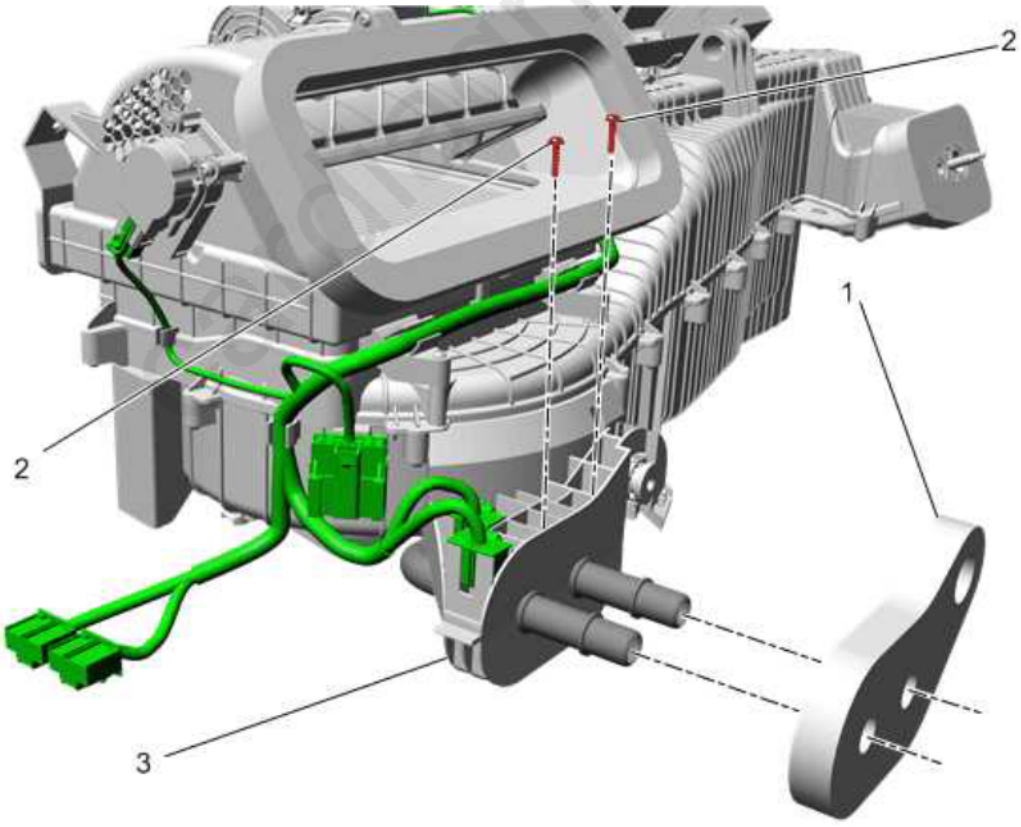


Fig. 301: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

16. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
17. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
18. Attach the wiring harness and connect the electrical connectors as necessary.
19. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module**

Removal and Installation (With HP9 Hybrid)Â» Install

HEATER AND AIR CONDITIONING EVAPORATOR AND BLOWER LOWER CASE REPLACEMENT

Removal Procedure

1. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)Â» Remove
2. Disconnect the electrical connectors and detach the wiring harness as necessary.
3. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

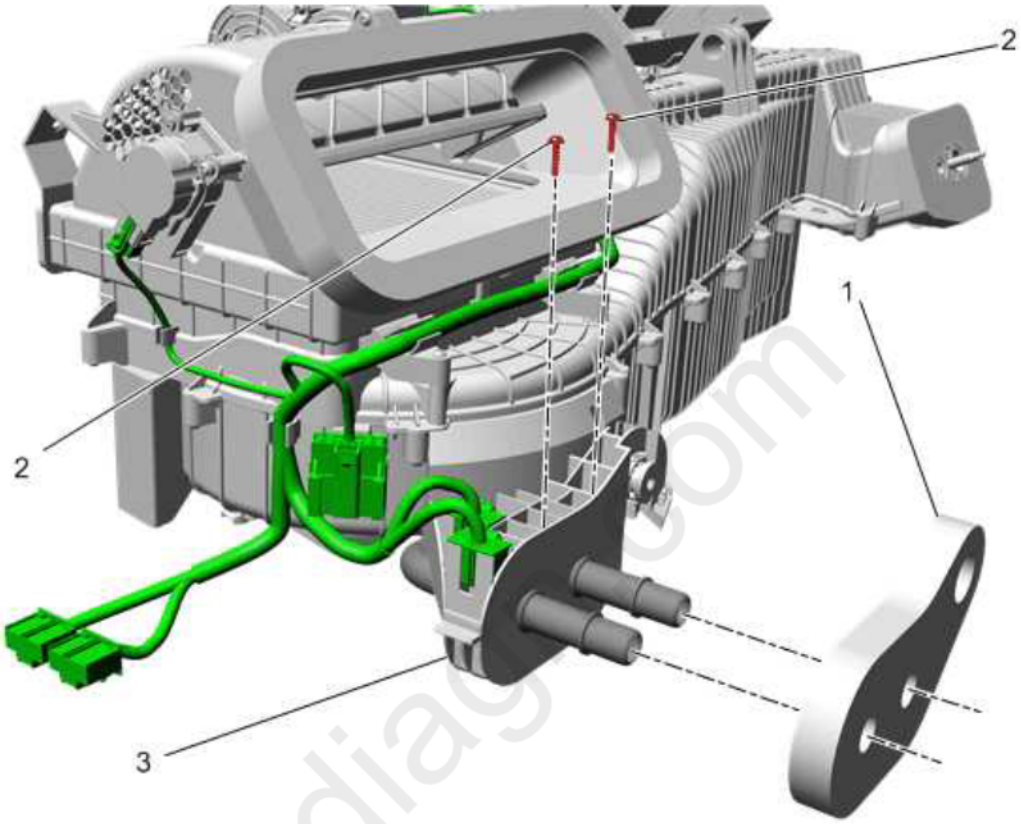


Fig. 302: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
5. Heater Core Tube Bracket (3)Â» Remove
6. Heater Core Bracket Fastener (1)Â» Remove [2x]

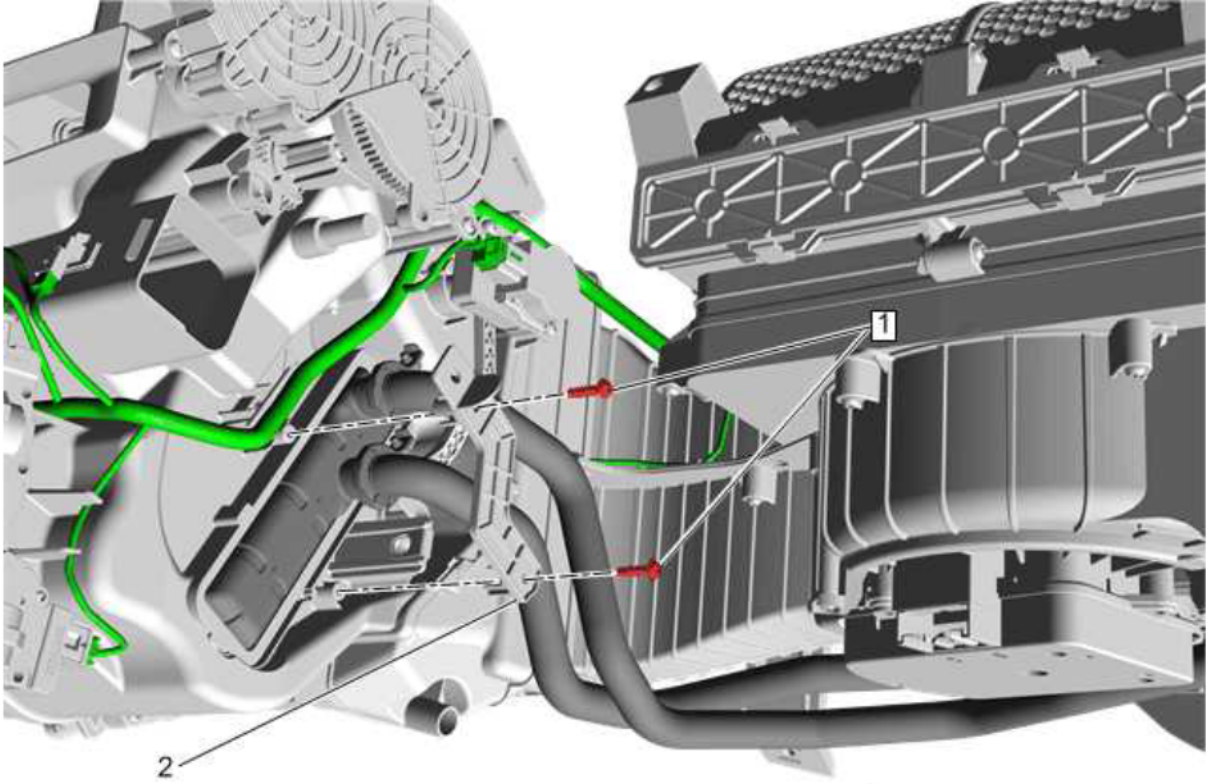


Fig. 303: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

7. Heater Core Bracket (2)Â» Remove
8. Heater Core (1)Â» Remove

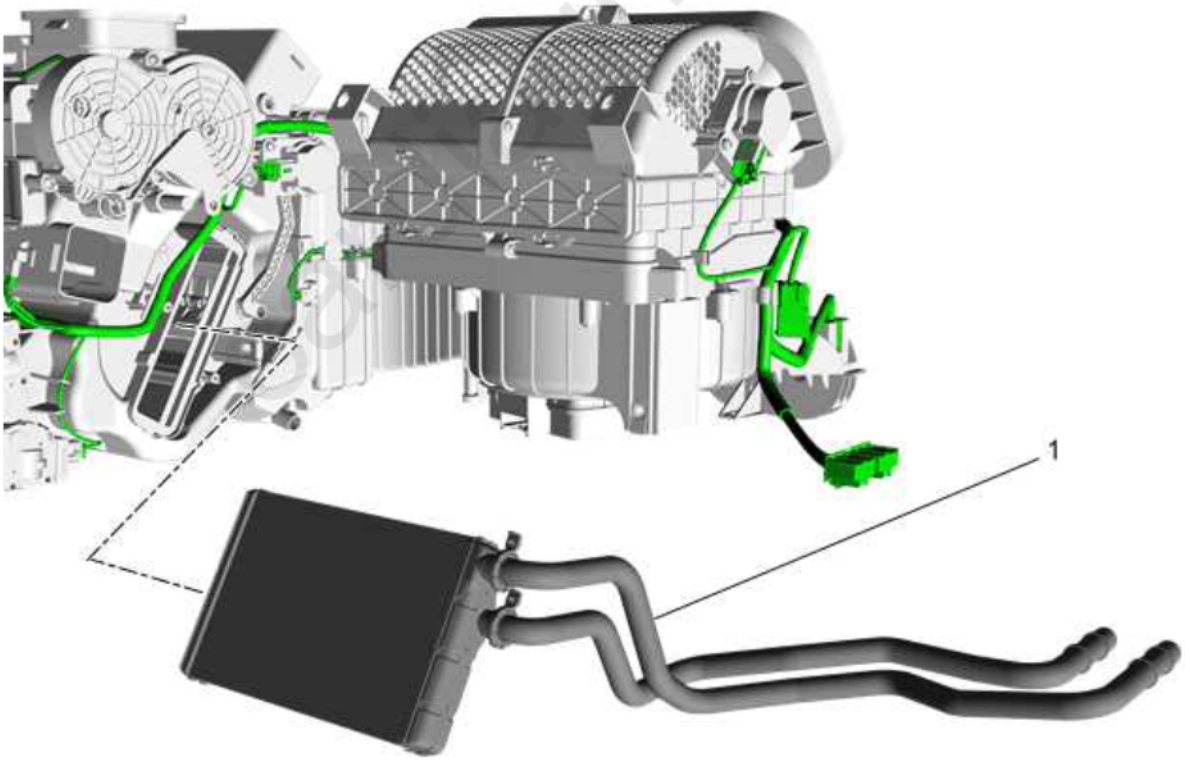


Fig. 304: Heater Core
Courtesy of GENERAL MOTORS COMPANY

9. Rotate the heater and air conditioning evaporator and blower module over so the bottom is facing upward.

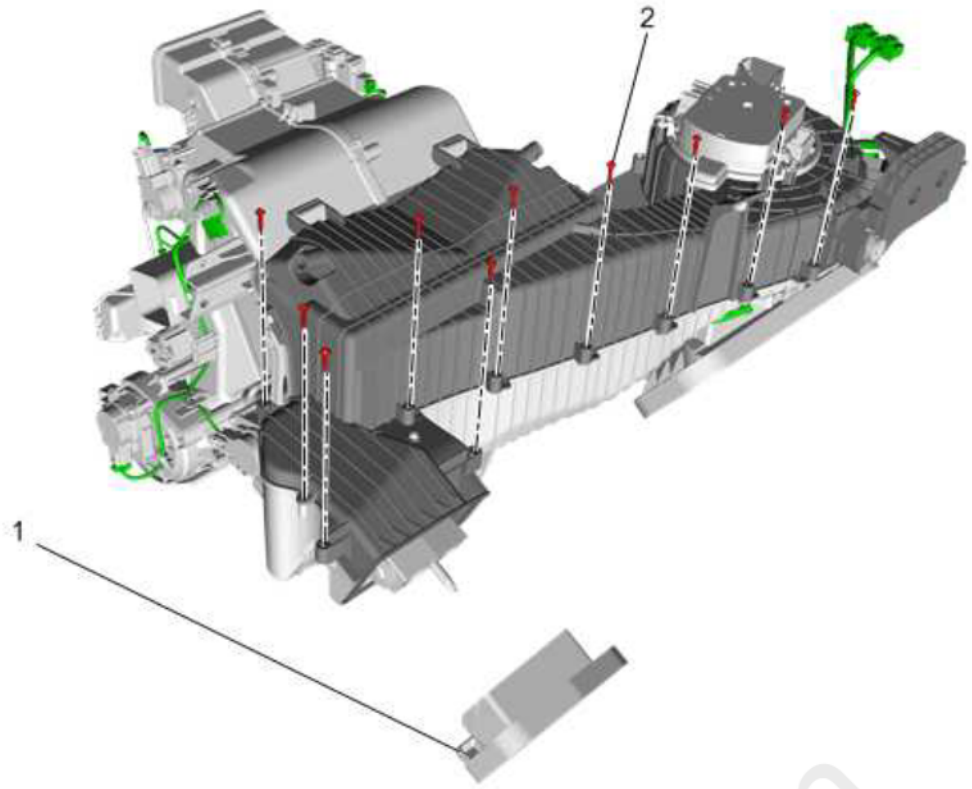


Fig. 305: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

10. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove
11. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Remove [10x]
12. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Remove [7x]

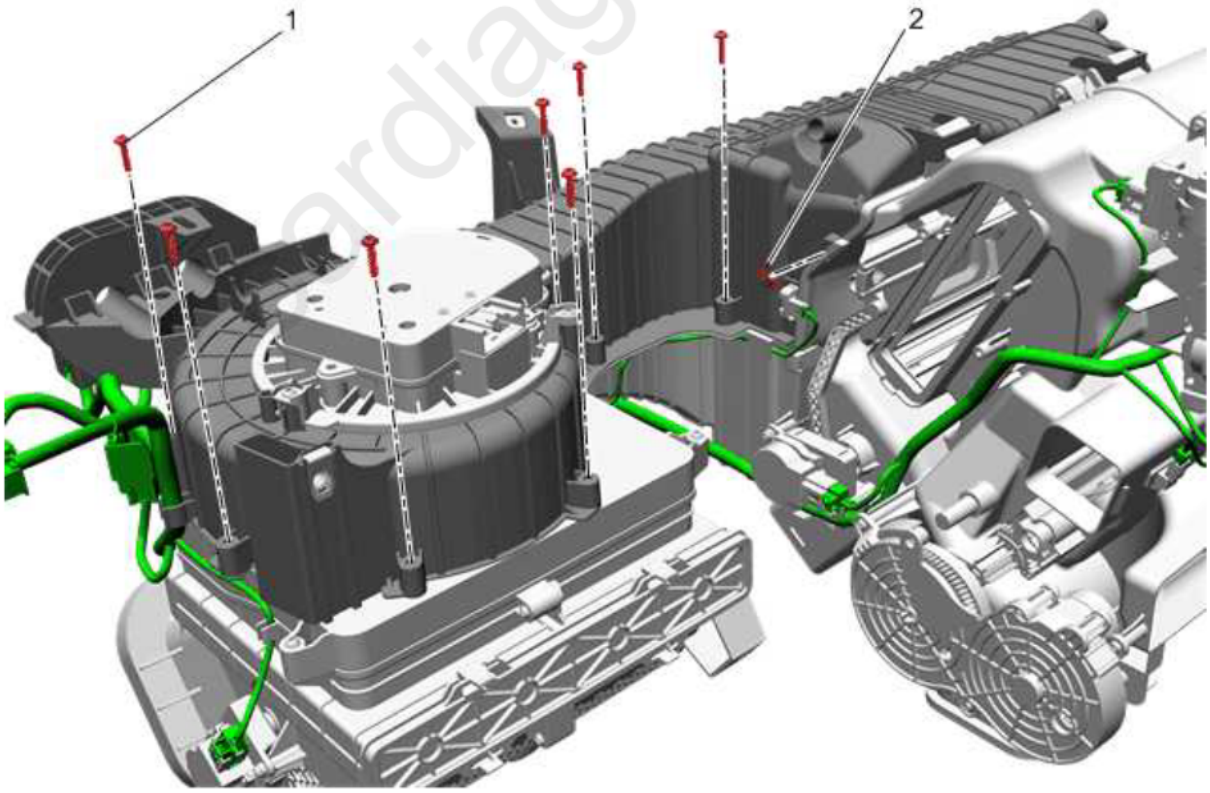


Fig. 306: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

13. Retainer Clip (2)Â» Remove
14. Retainer Clip (1)Â» Remove

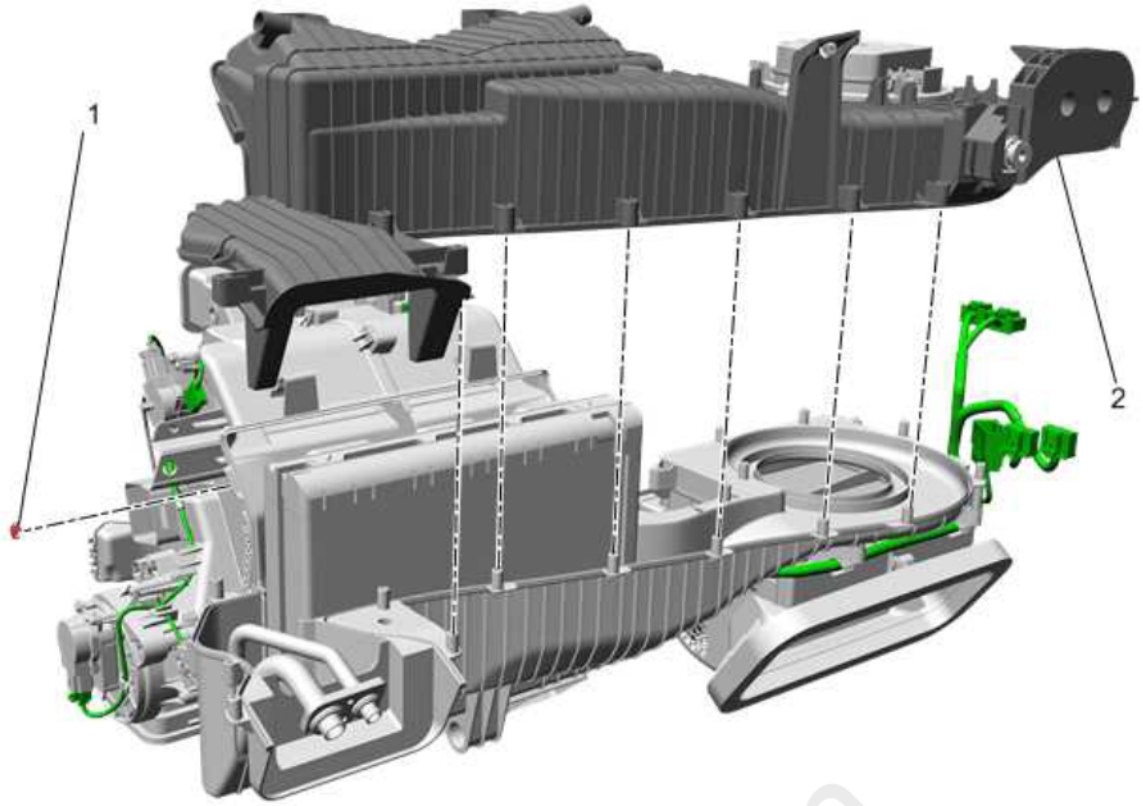


Fig. 307: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

15. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Remove
16. Transfer components as necessary.

Installation Procedure

1. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Install

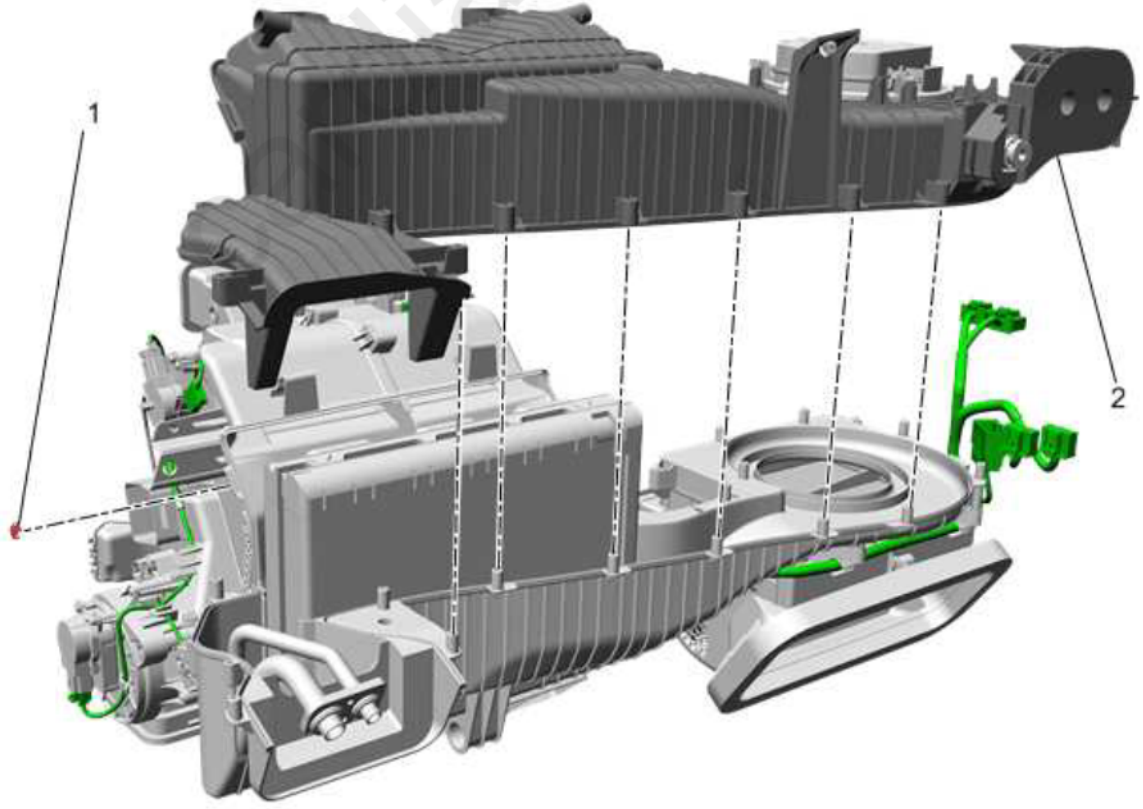


Fig. 308: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

2. Retainer Clip (1)Â» Install

3. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Install and tighten 2.5 N.m (22 lb in) [7x]

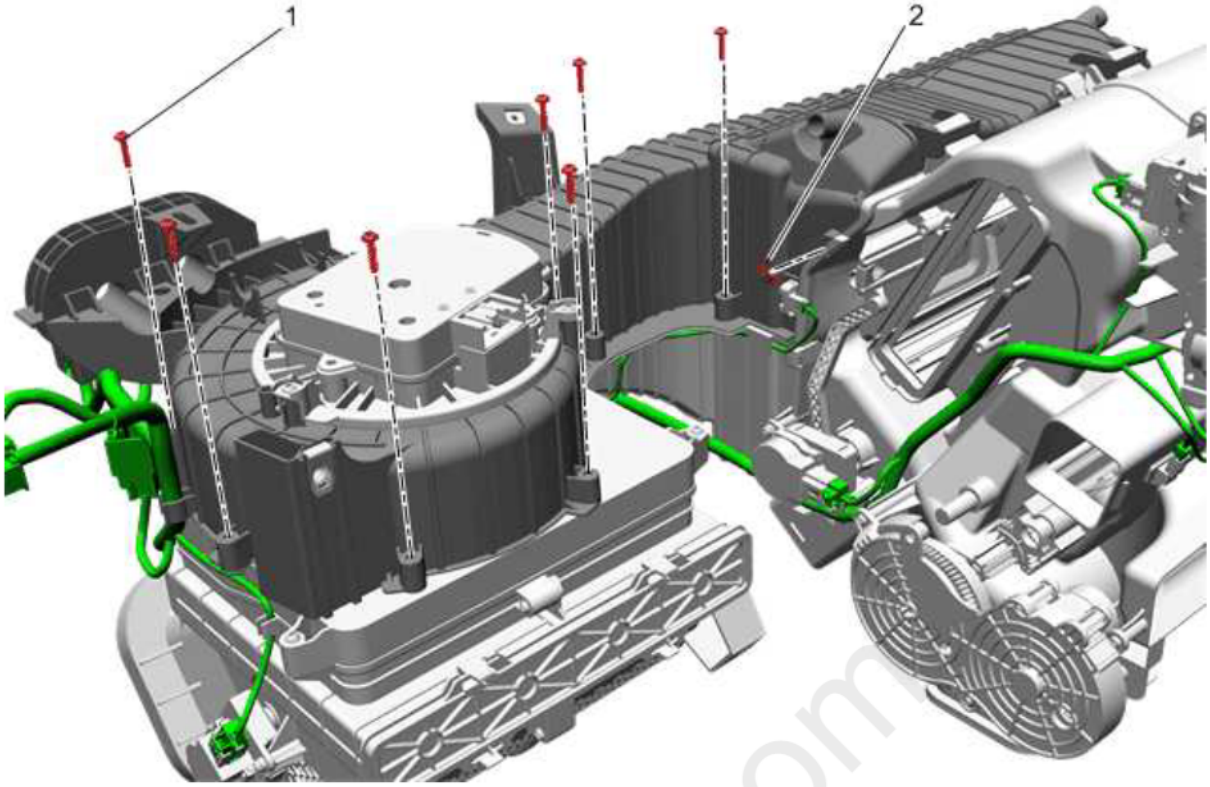


Fig. 309: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

4. Retainer Clip (2)Â» Install
5. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [10x]

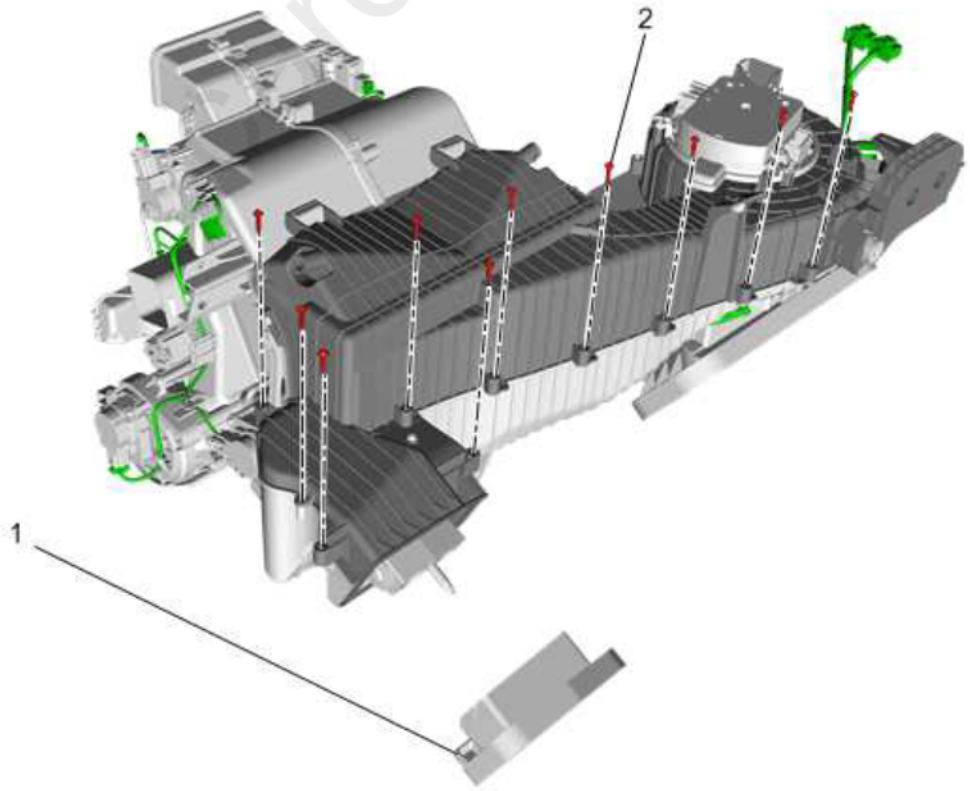


Fig. 310: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

6. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
7. Rotate the heater and air conditioning evaporator and blower module over so the top is facing upward.
8. Heater Core (1)Â» Install

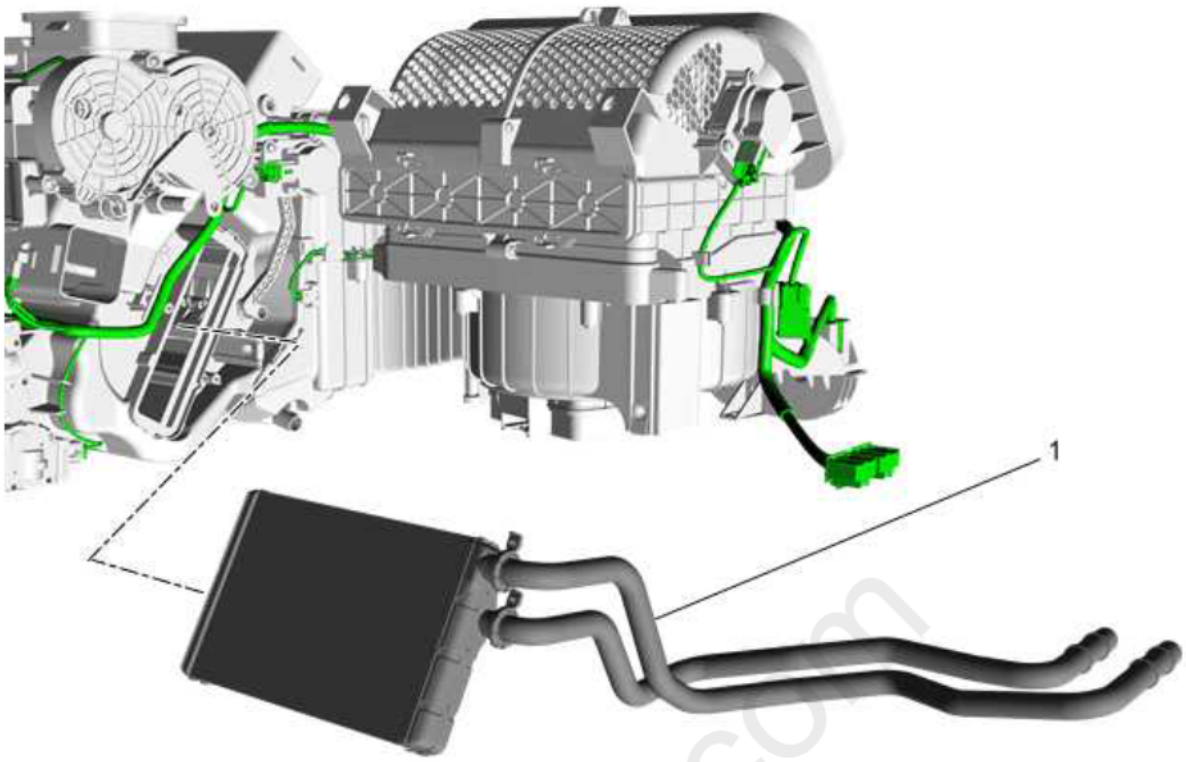


Fig. 311: Heater Core
Courtesy of GENERAL MOTORS COMPANY

9. Heater Core Bracket (2)Â» Install

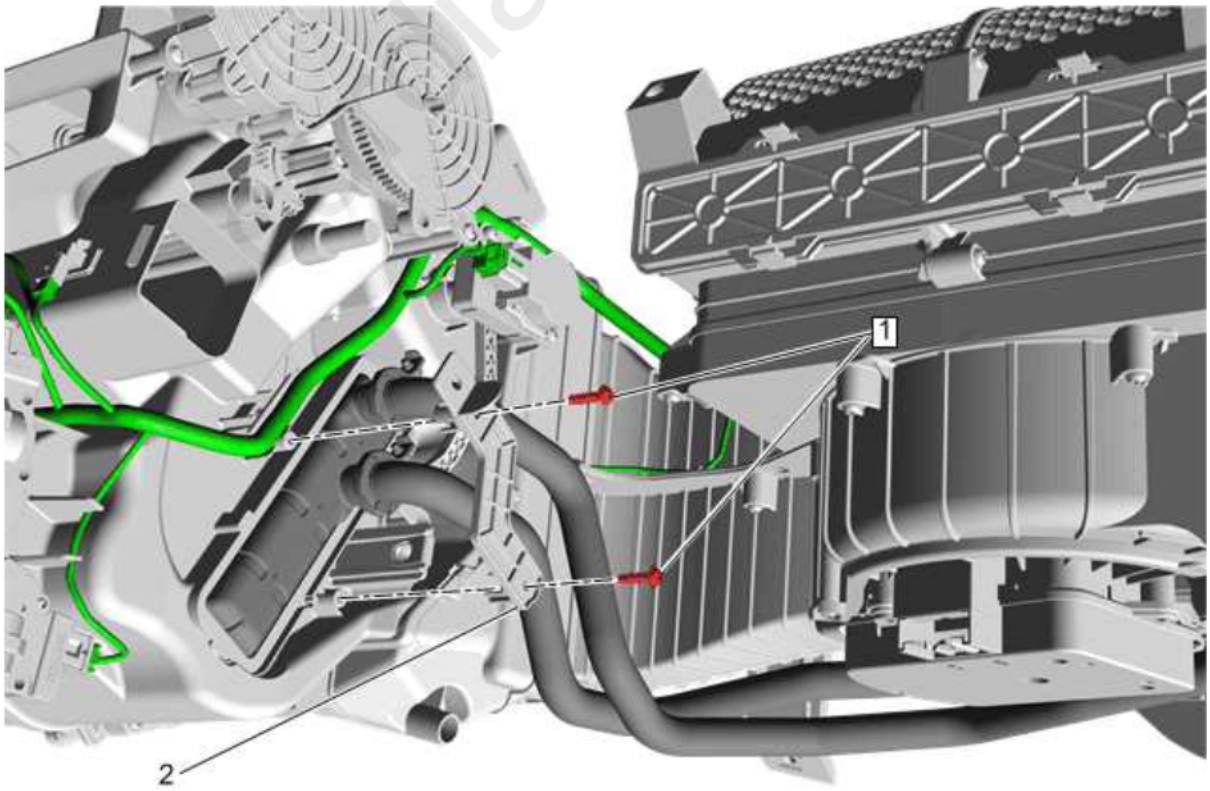


Fig. 312: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

10. Heater Core Bracket Fastener (1)Â» Install and tighten 1.5 N.m (13 lb in) [2x]

11. Heater Core Tube Bracket (3)Â» Install

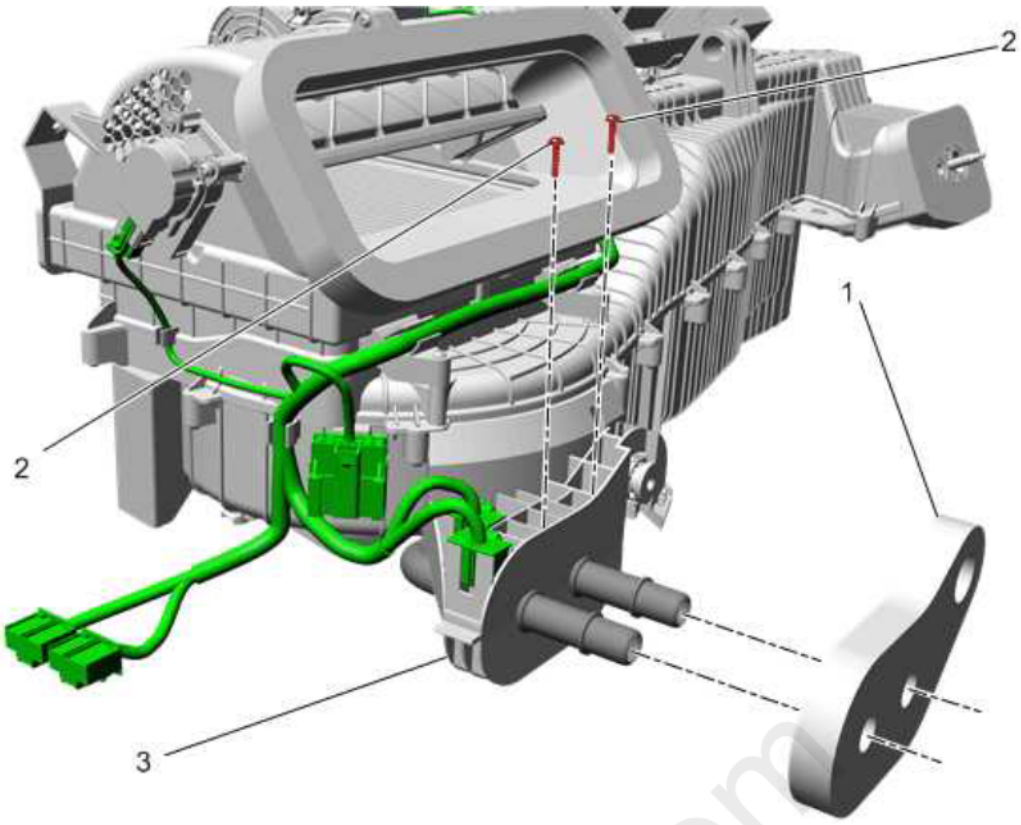


Fig. 313: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

12. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
13. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
14. Attach the wiring harness and connect the electrical connectors as necessary.
15. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Install

AIR CONDITIONING EVAPORATOR REPLACEMENT (R-134A)

Removal Procedure

1. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Remove
2. Disconnect the electrical connectors and detach the wiring harness as necessary.
3. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

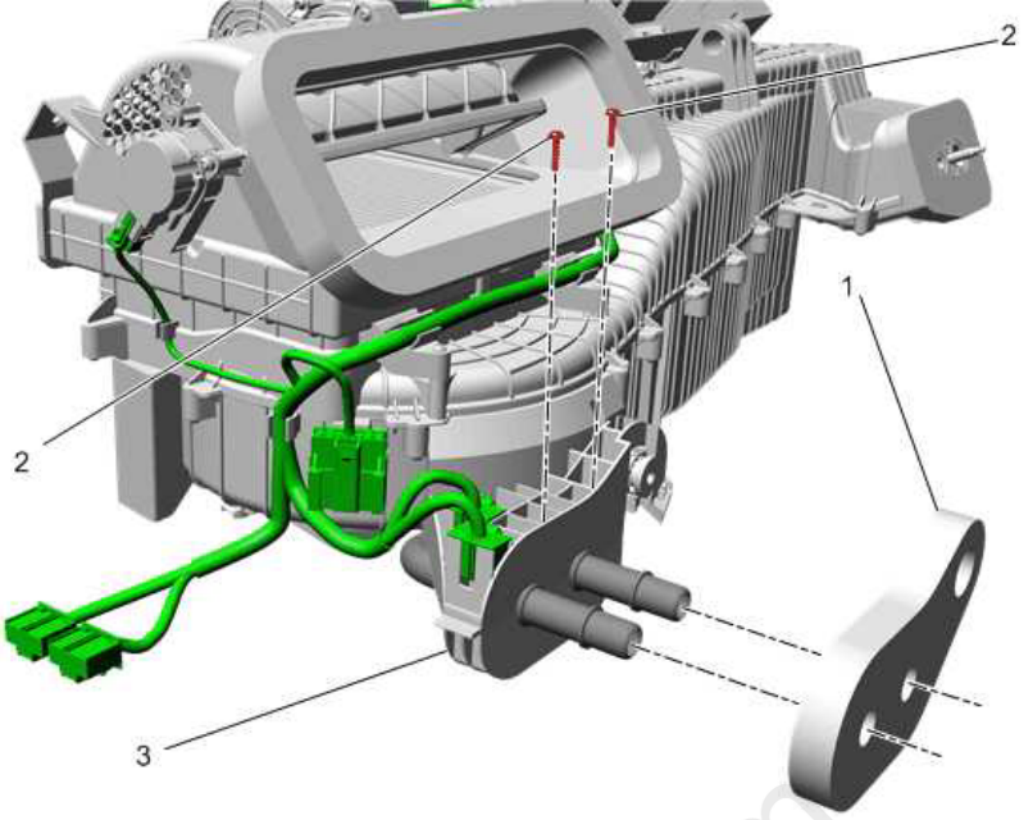


Fig. 314: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
5. Heater Core Tube Bracket (3)Â» Remove
6. Heater Core Bracket Fastener (1)Â» Remove [2x]

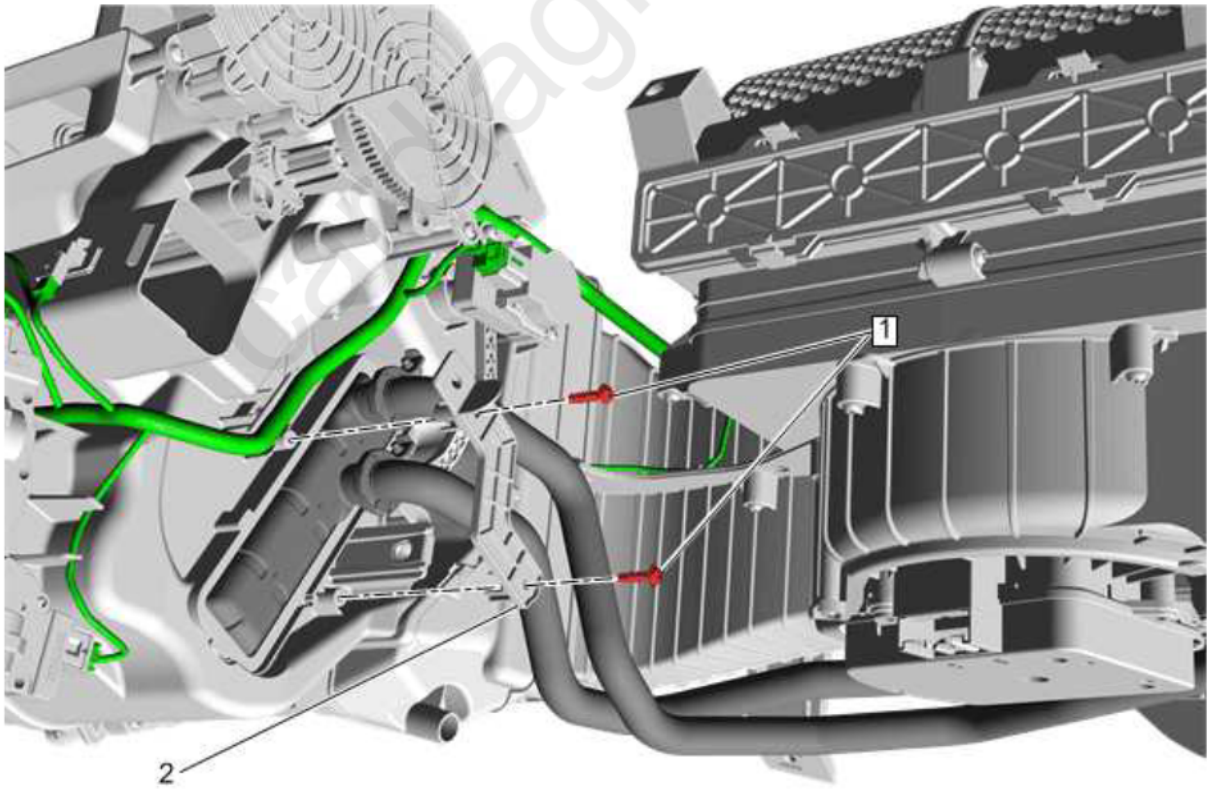


Fig. 315: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

7. Heater Core Bracket (2)Â» Remove
8. Heater Core (1)Â» Remove

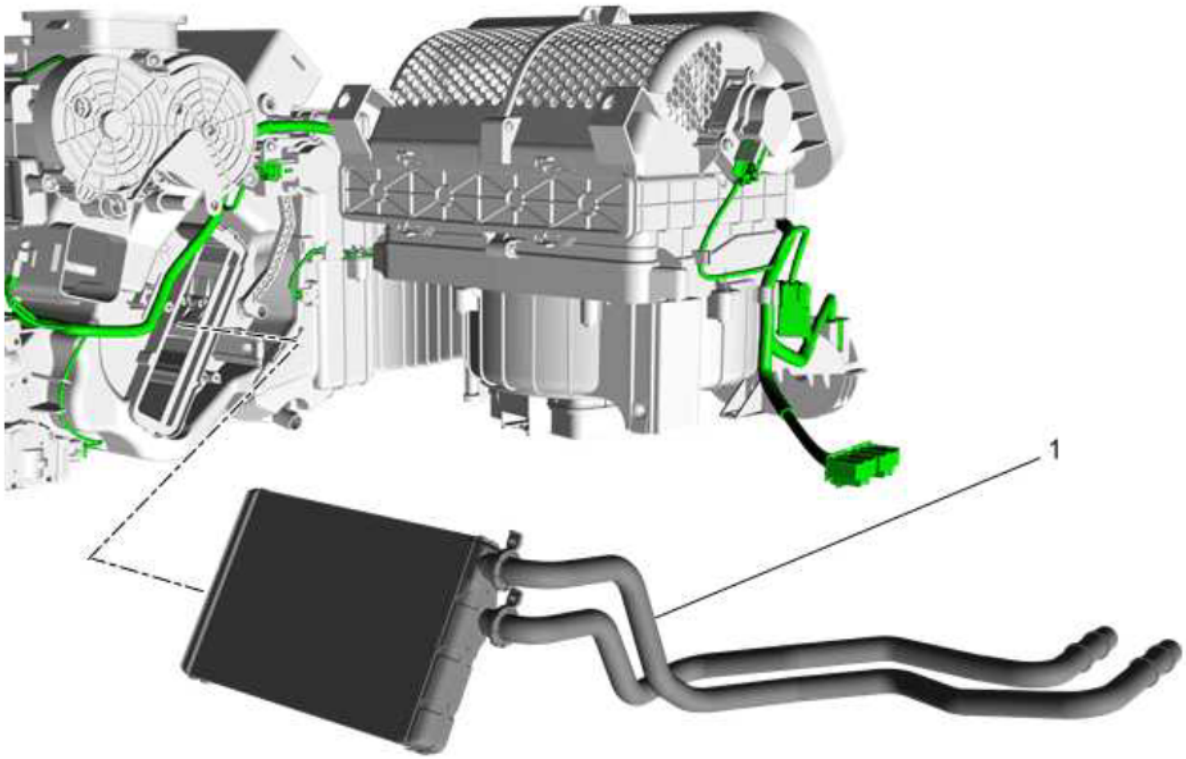


Fig. 316: Heater Core
Courtesy of GENERAL MOTORS COMPANY

9. Rotate the heater and air conditioning evaporator and blower module over so the bottom is facing upward.

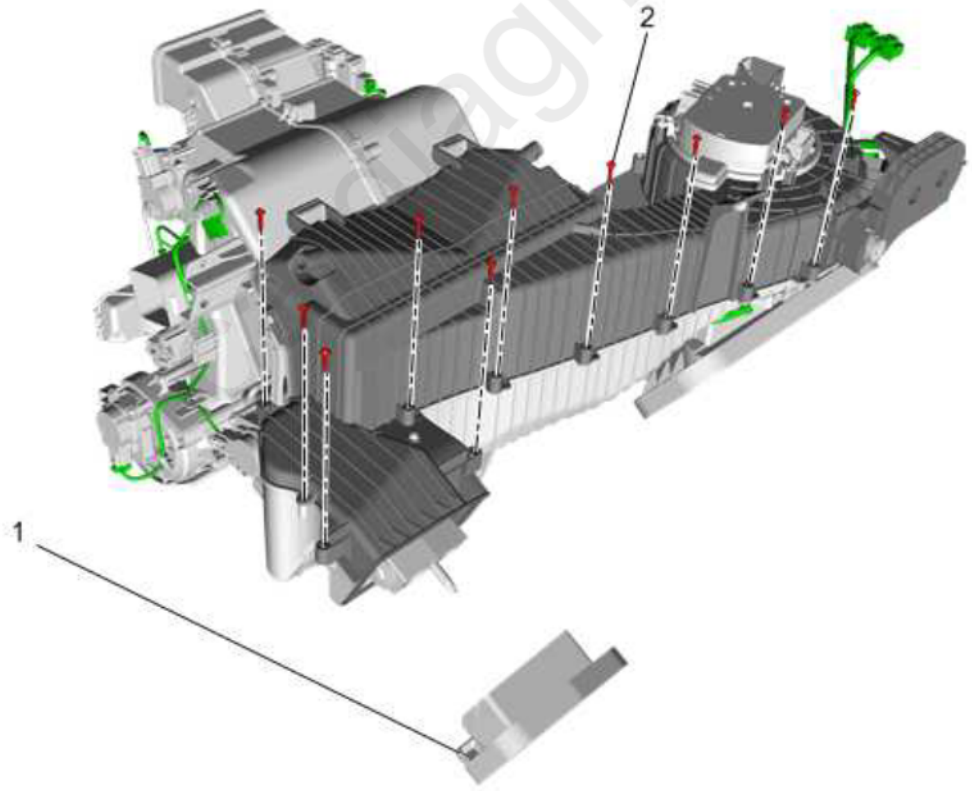


Fig. 317: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

10. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove
11. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Remove [10x]
12. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Remove [7x]

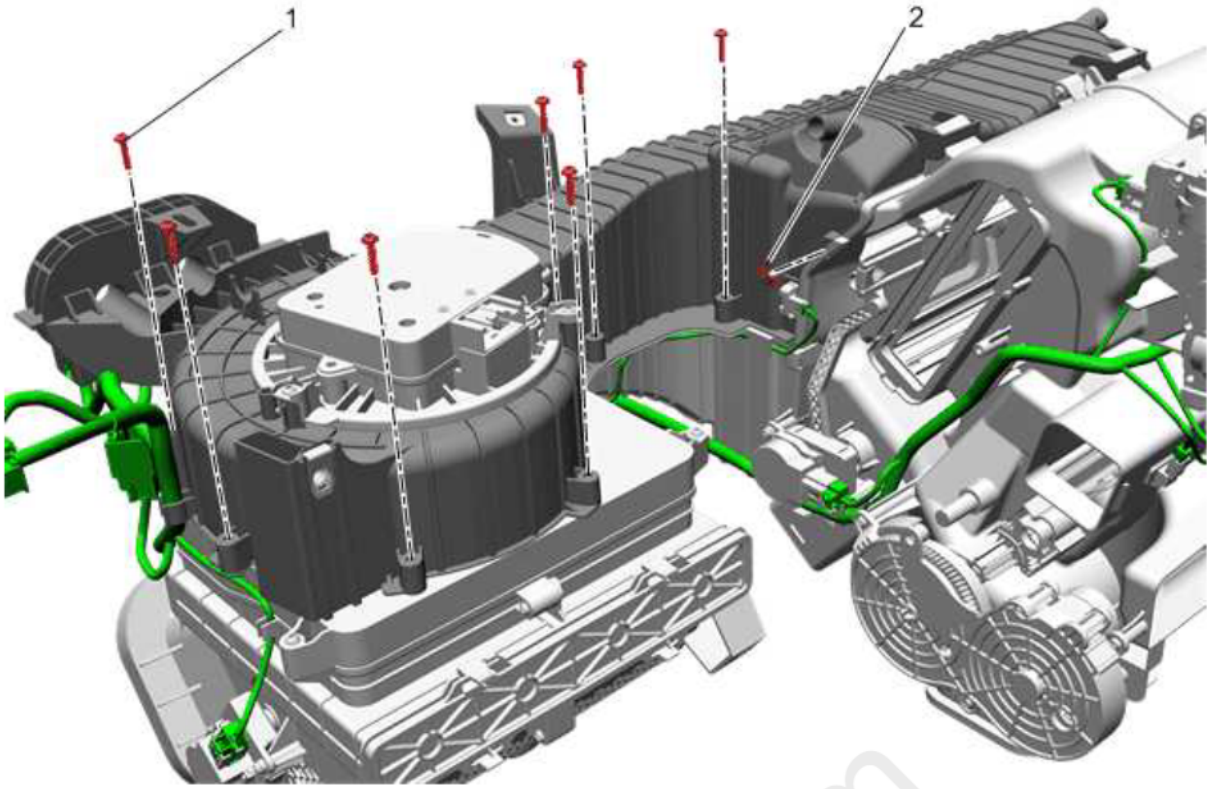


Fig. 318: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

13. Retainer Clip (2)Â» Remove
14. Retainer Clip (1)Â» Remove

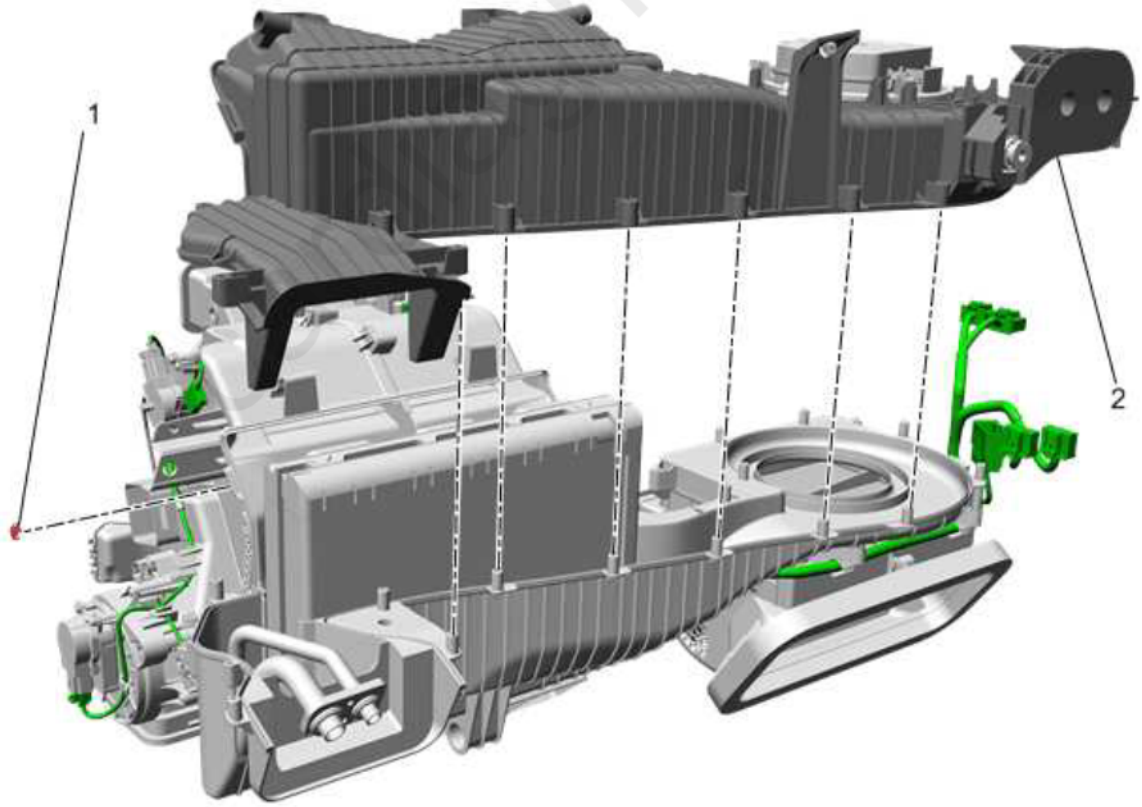


Fig. 319: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

15. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Remove
16. Air Conditioning Evaporator (1)Â» Remove

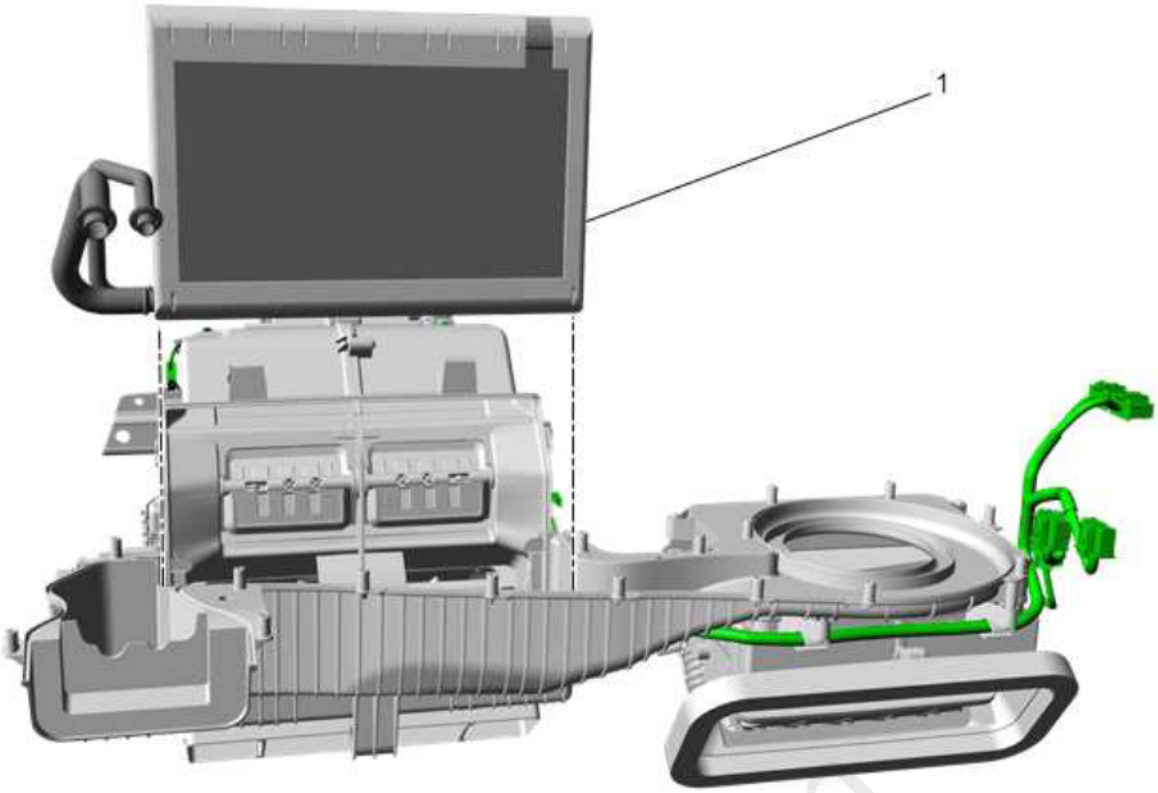


Fig. 320: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Air Conditioning Evaporator (1)Â» Install

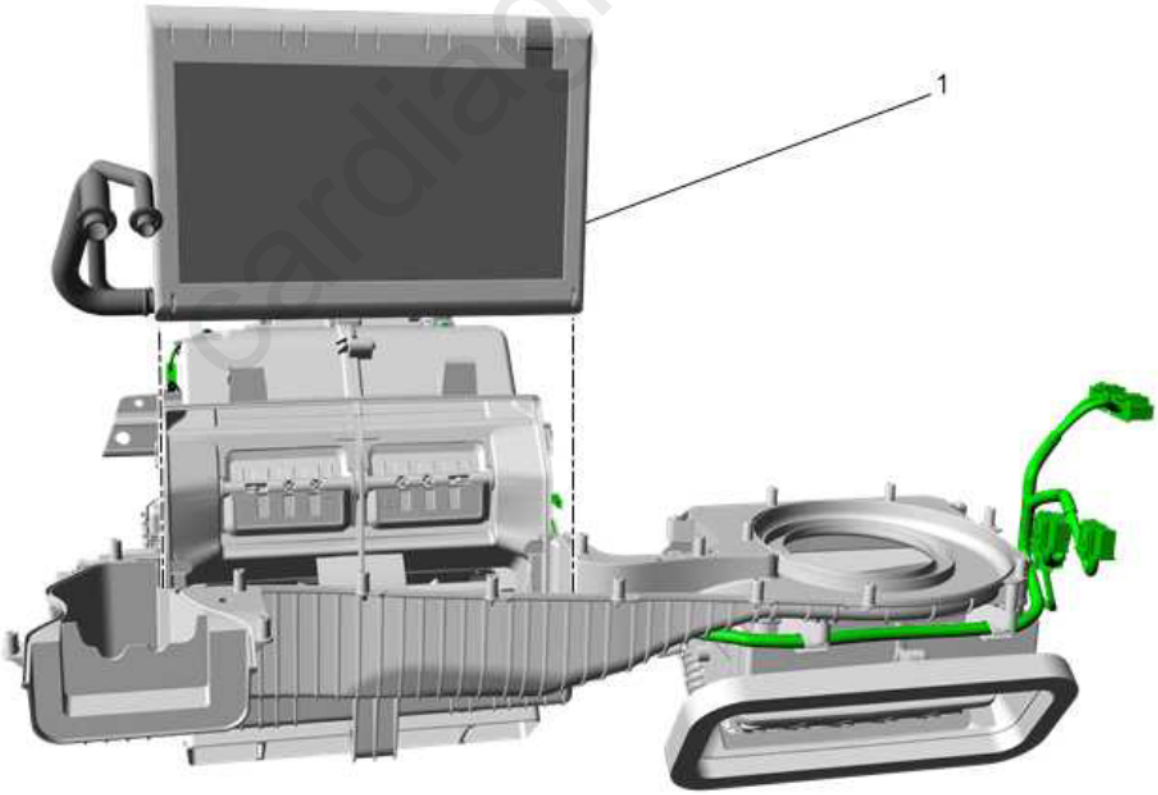


Fig. 321: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Install

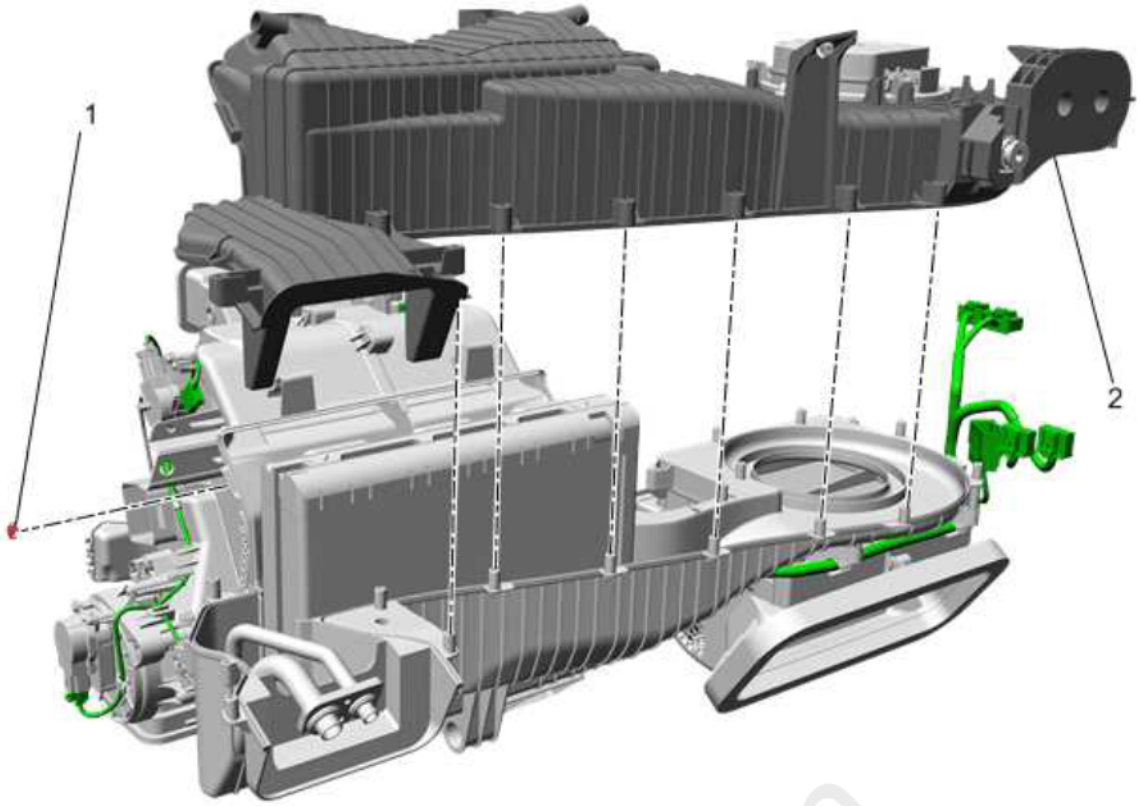


Fig. 322: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

3. Retainer Clip (1)Â» Install
4. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Install and tighten 2.5 N.m (22 lb in) [7x]

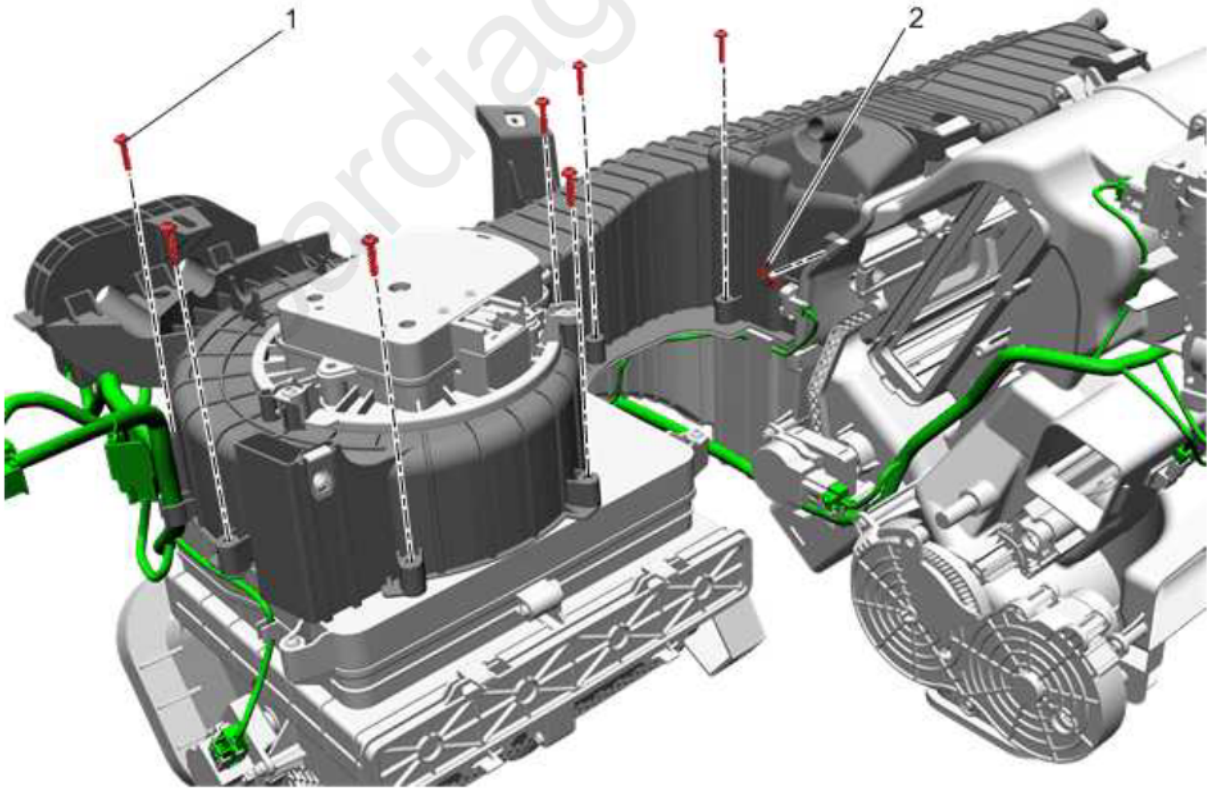


Fig. 323: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

5. Retainer Clip (2)Â» Install

6. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [10x]

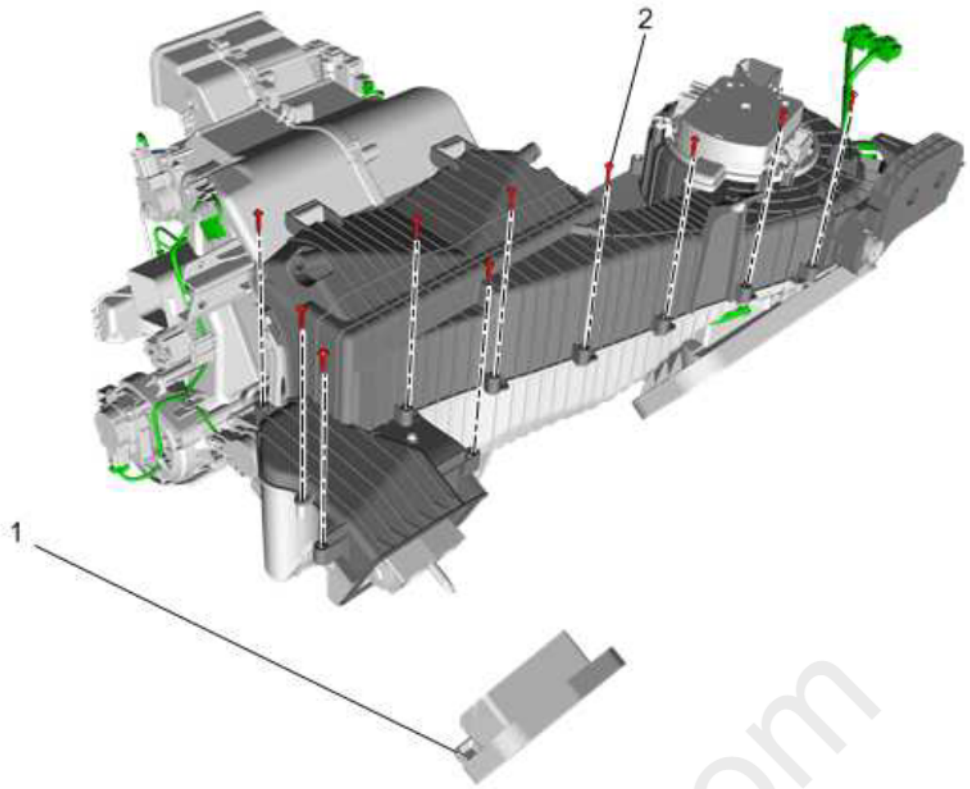


Fig. 324: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

7. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
8. Rotate the heater and air conditioning evaporator and blower module over so the top is facing upward.
9. Heater Core (1)Â» Install

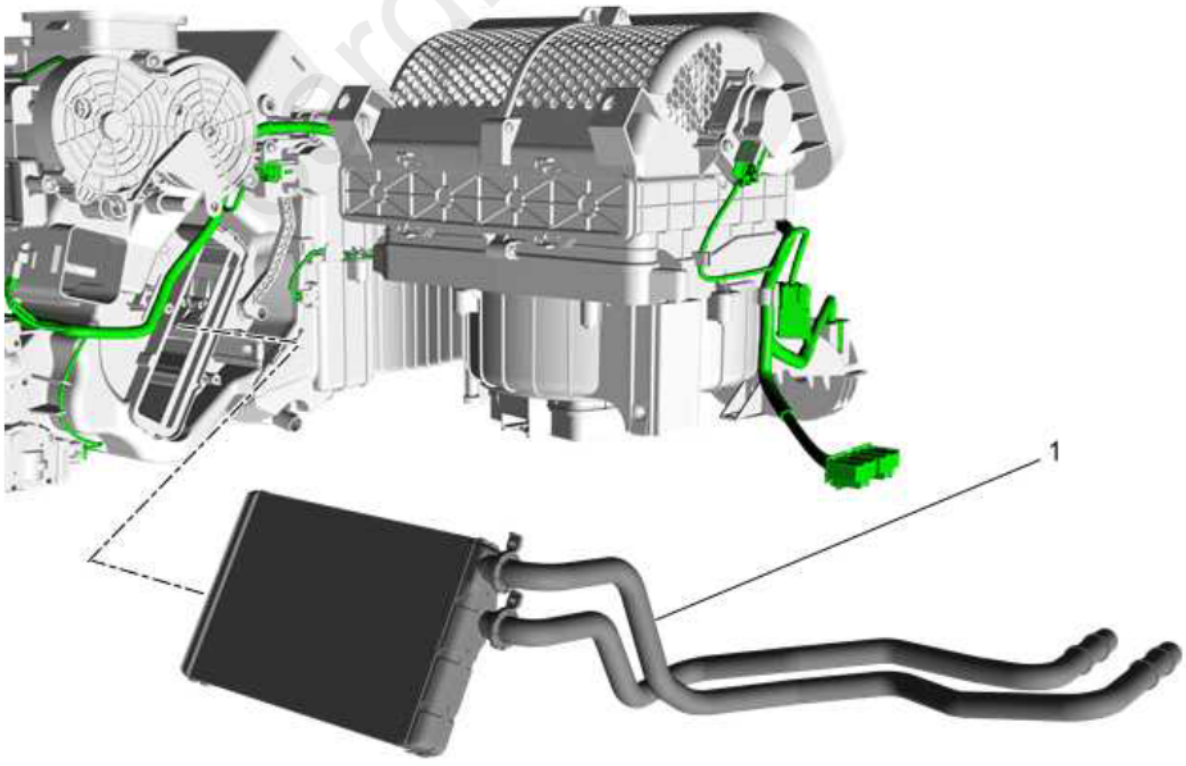


Fig. 325: Heater Core
Courtesy of GENERAL MOTORS COMPANY

10. Heater Core Bracket (2)Â» Install

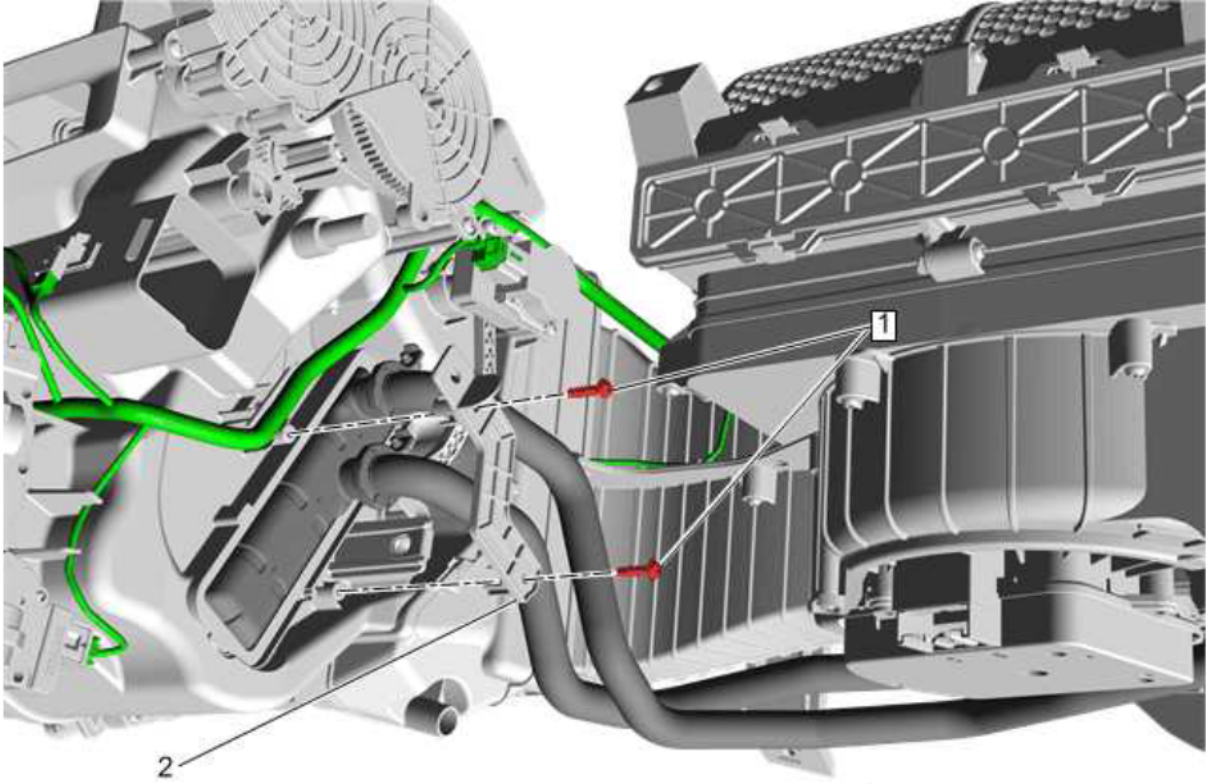


Fig. 326: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

11. Heater Core Bracket Fastener (1)Â» Install and tighten 1.5 N.m (13 lb in) [2x]
12. Heater Core Tube Bracket (3)Â» Install

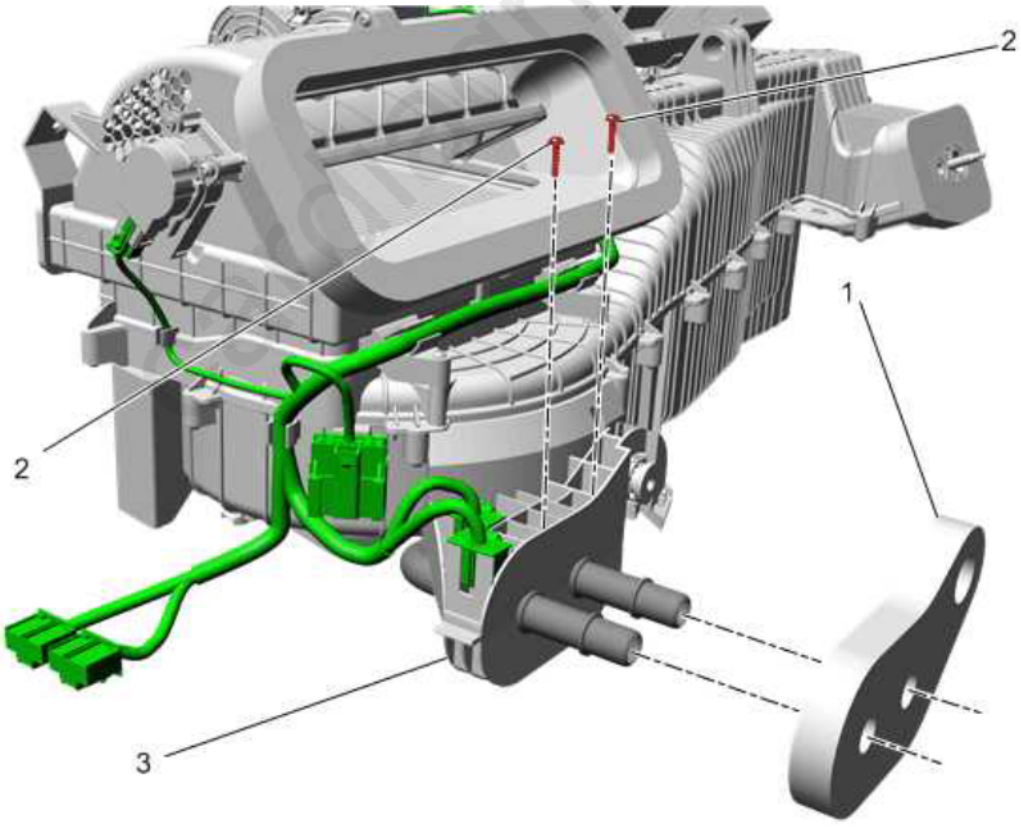


Fig. 327: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

13. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
14. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
15. Attach the wiring harness and connect the electrical connectors as necessary.
16. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module**

Removal and Installation (With HP9 Hybrid)Â» Install

AIR CONDITIONING EVAPORATOR REPLACEMENT (R-1234YF)

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

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

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

Leak Free Joints Inside the Passenger Compartment

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

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

Proper Disposal of the Replaced Evaporator

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

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

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

Removal Procedure

1. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)Â» Remove
2. Disconnect the electrical connectors and detach the wiring harness as necessary.
3. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

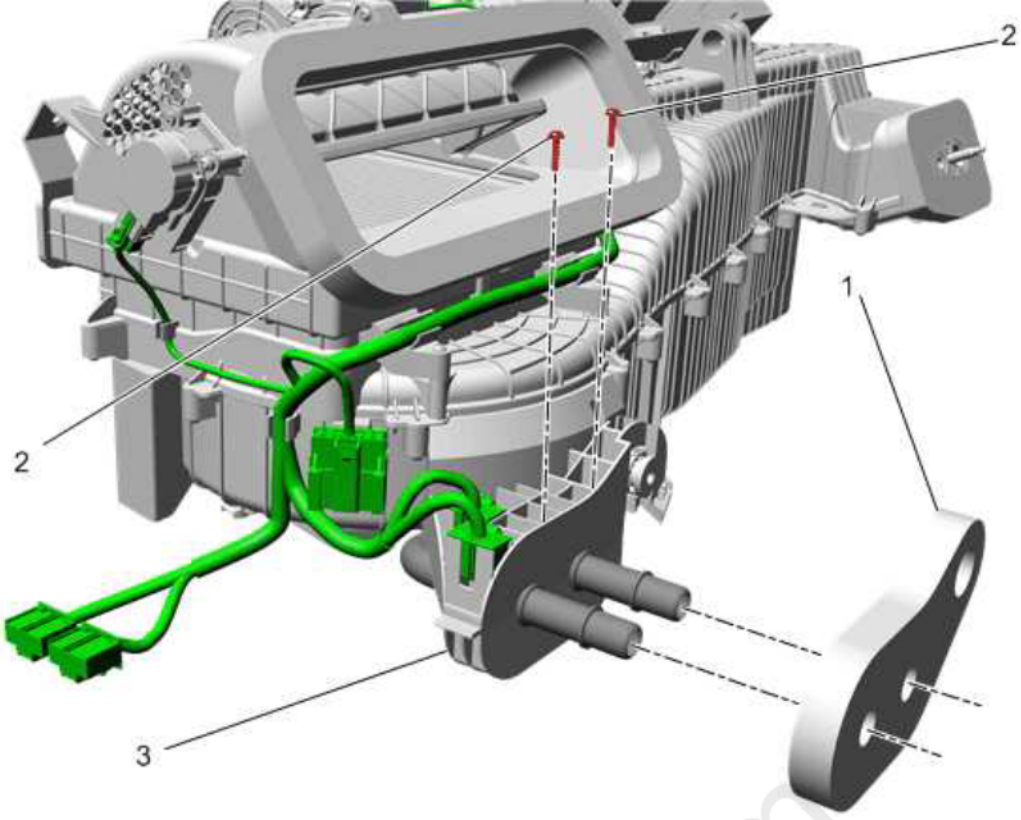


Fig. 328: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
5. Heater Core Tube Bracket (3)Â» Remove
6. Heater Core Bracket Fastener (1)Â» Remove [2x]

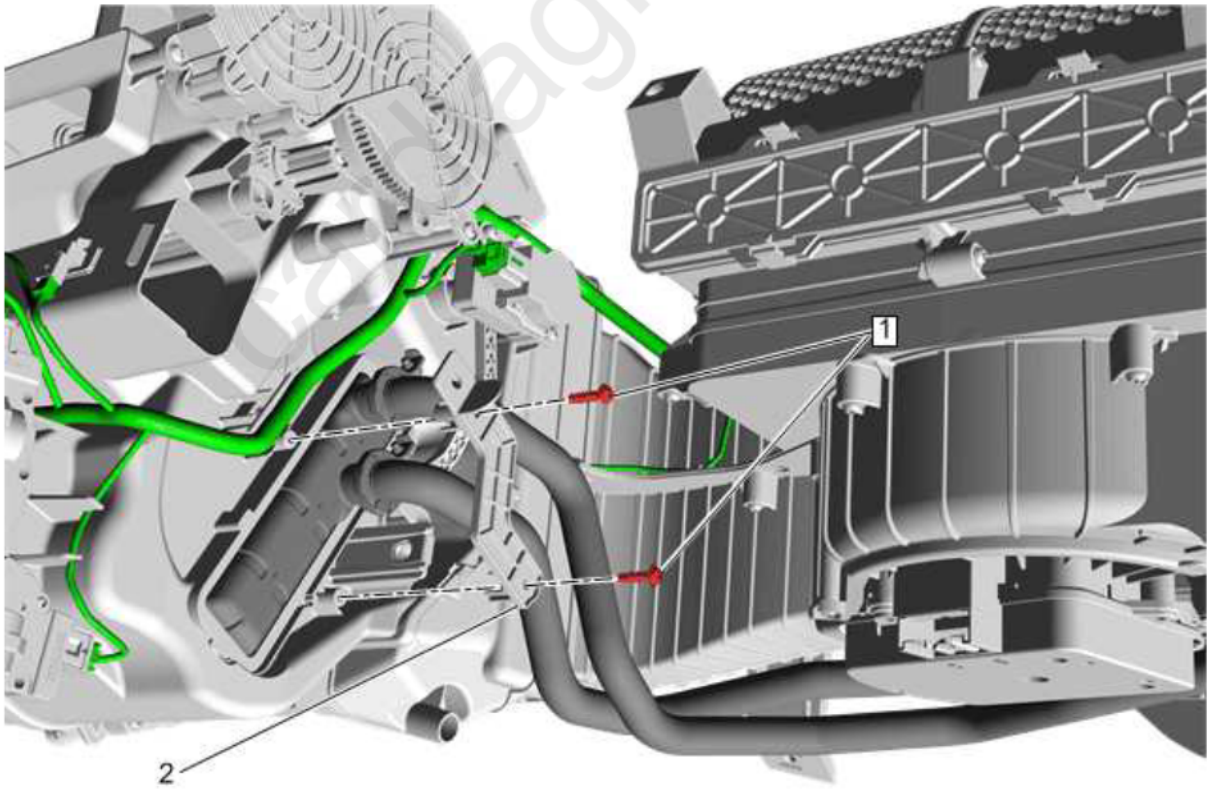


Fig. 329: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

7. Heater Core Bracket (2)Â» Remove
8. Heater Core (1)Â» Remove

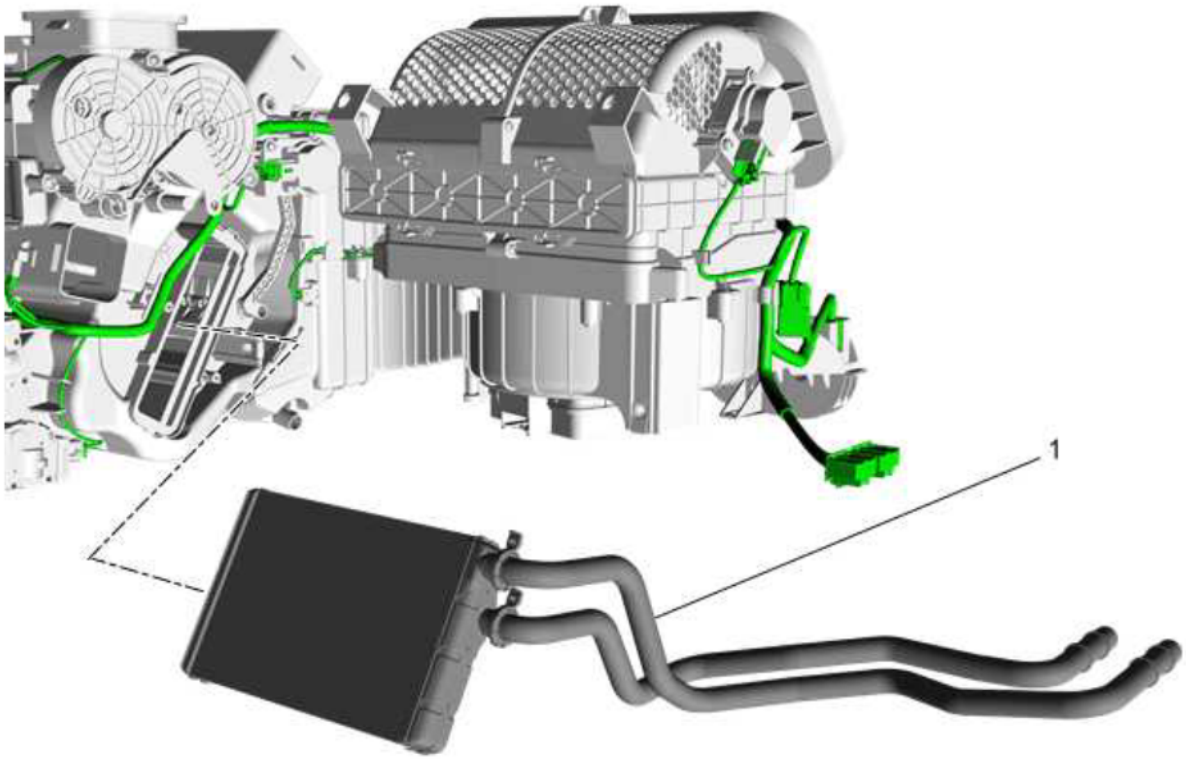


Fig. 330: Heater Core
Courtesy of GENERAL MOTORS COMPANY

9. Rotate the heater and air conditioning evaporator and blower module over so the bottom is facing upward.

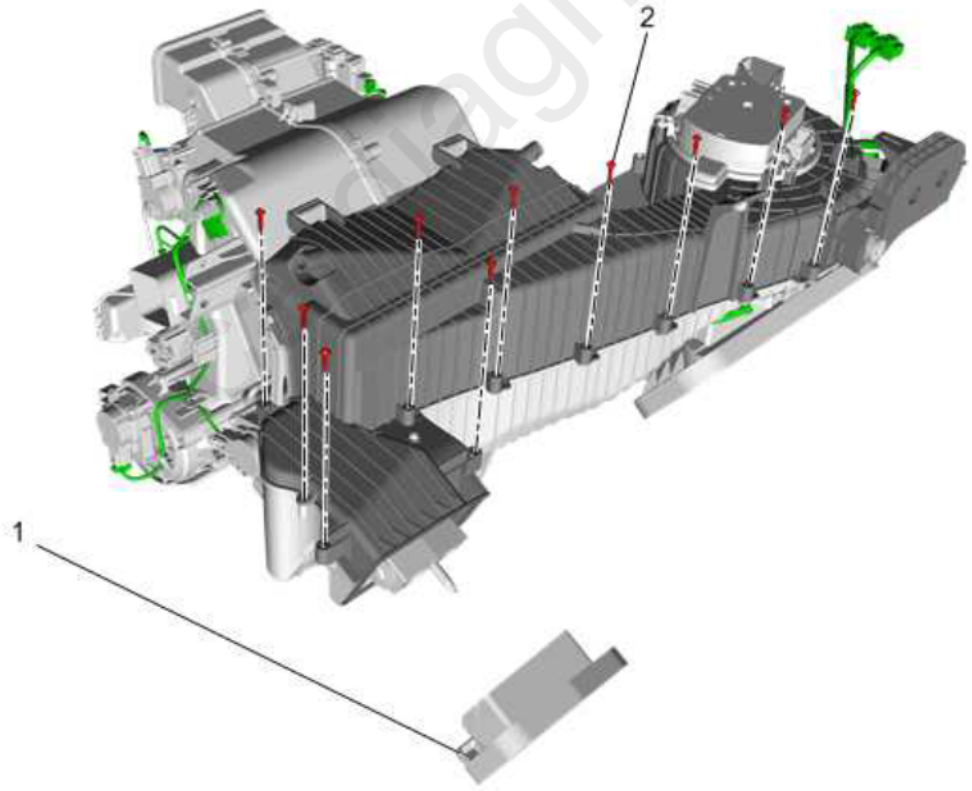


Fig. 331: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

10. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove
11. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Remove [10x]
12. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Remove [7x]

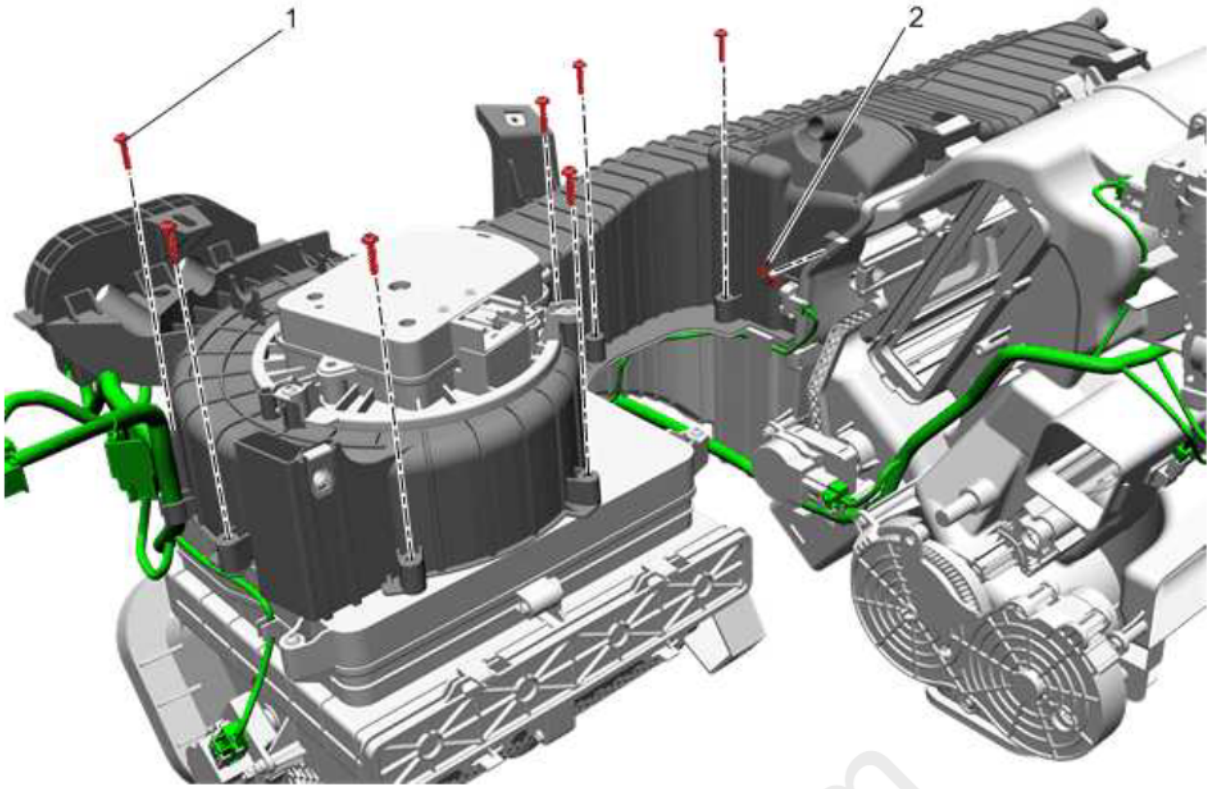


Fig. 332: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

13. Retainer Clip (2)Â» Remove
14. Retainer Clip (1)Â» Remove

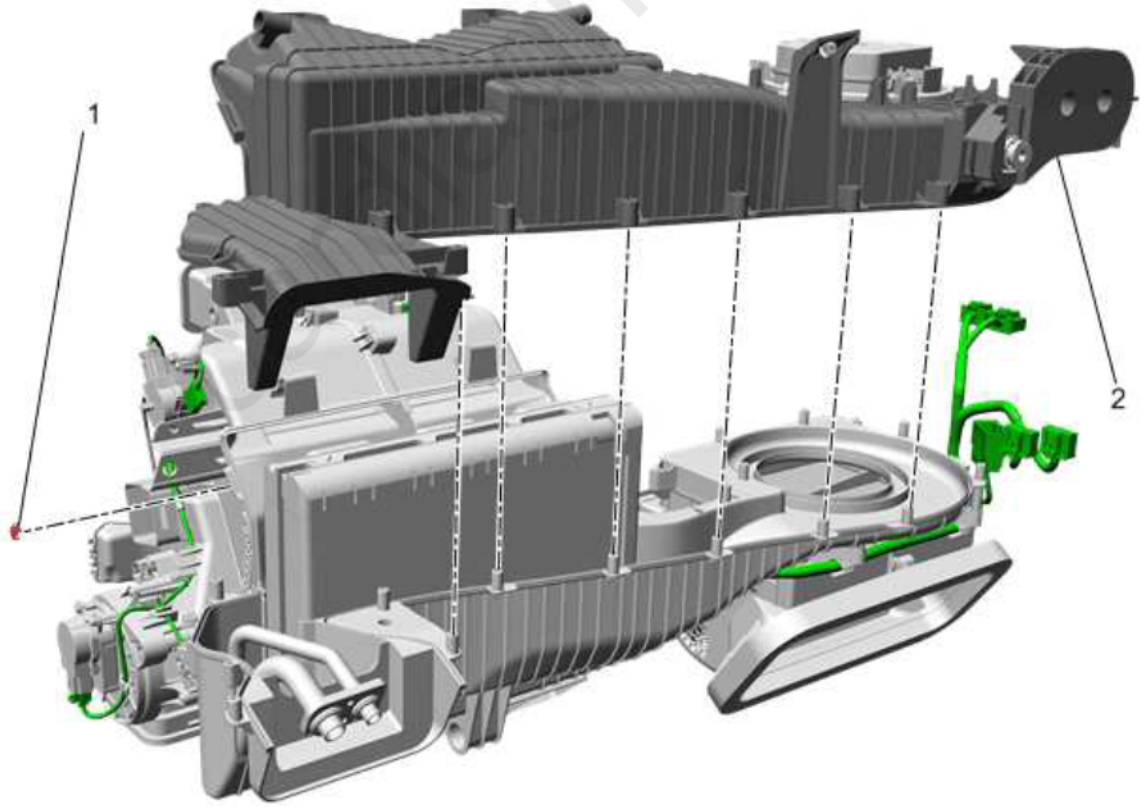


Fig. 333: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

15. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Remove
16. Air Conditioning Evaporator (1)Â» Remove

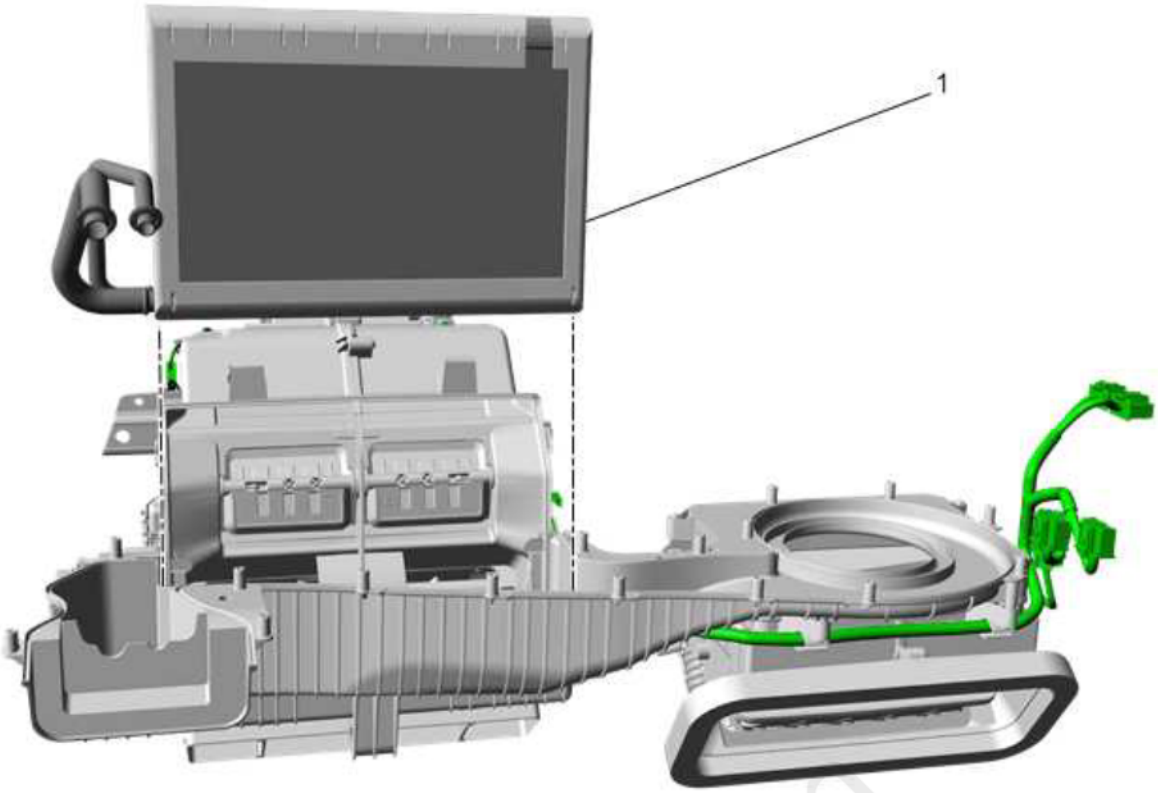


Fig. 334: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Air Conditioning Evaporator (1)Â» Install

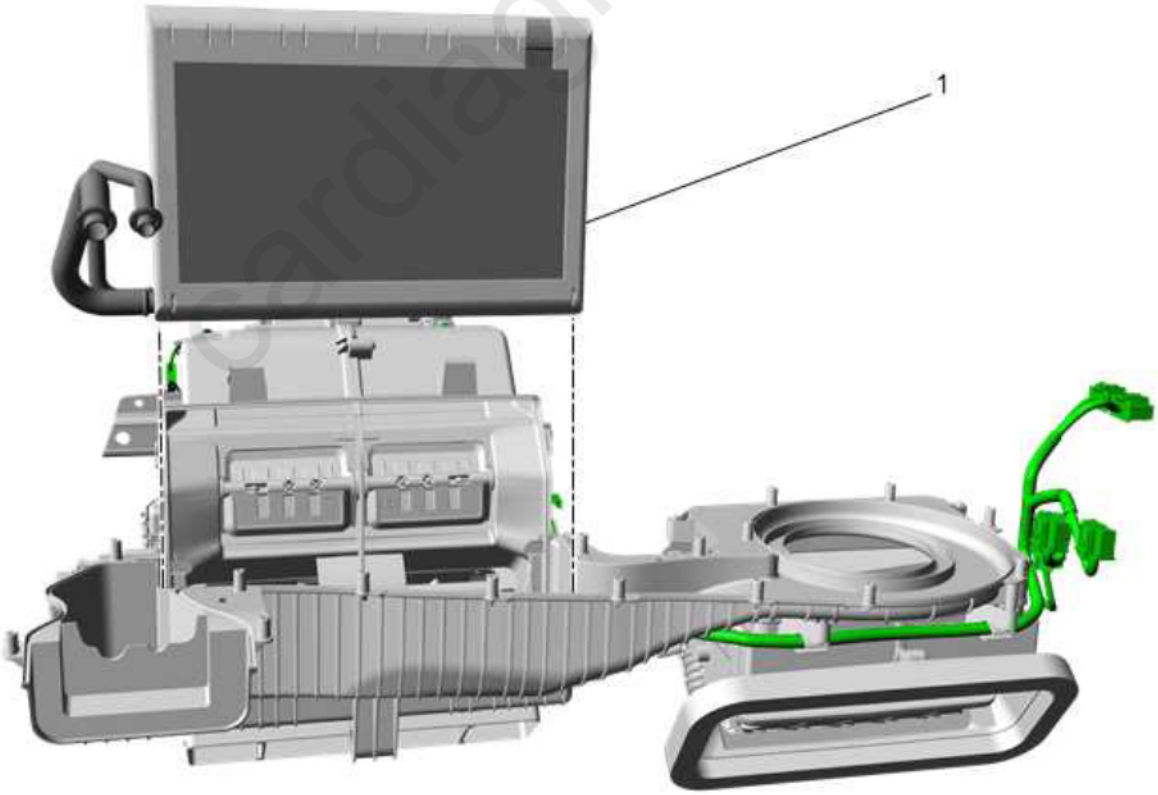


Fig. 335: Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Lower Case (2)Â» Install

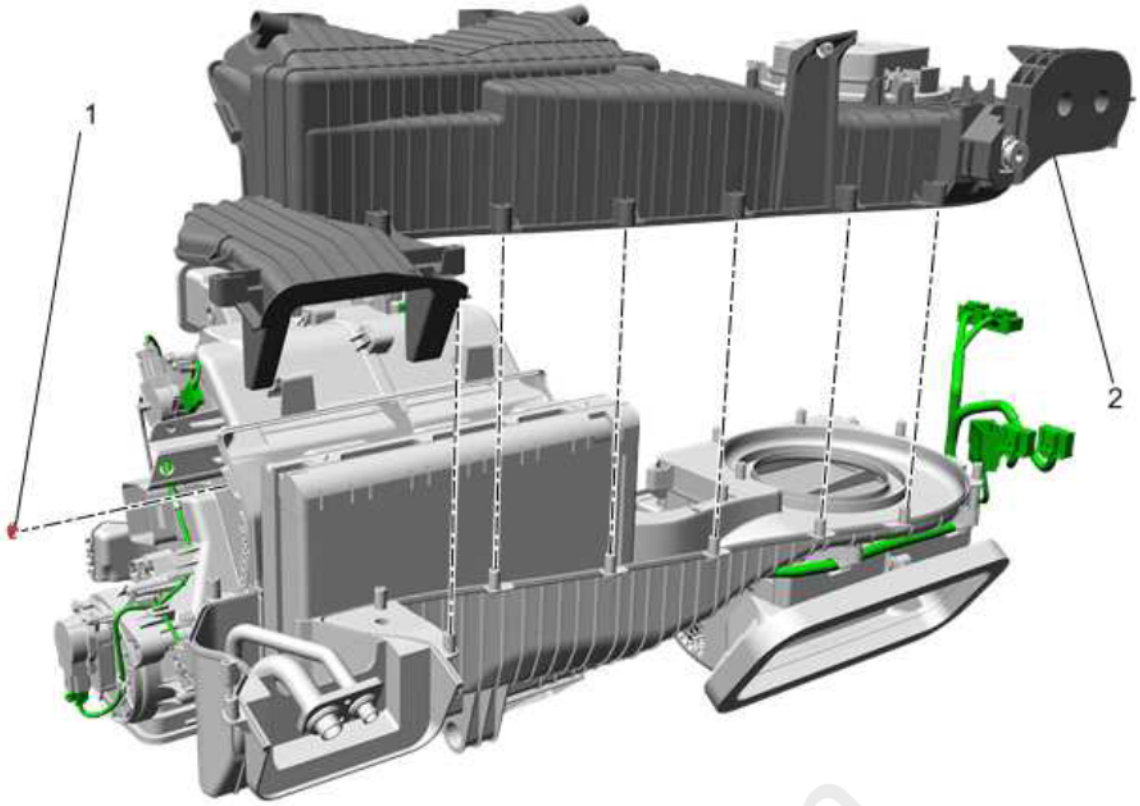


Fig. 336: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

3. Retainer Clip (1)Â» Install
4. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (1)Â» Install and tighten 2.5 N.m (22 lb in) [7x]

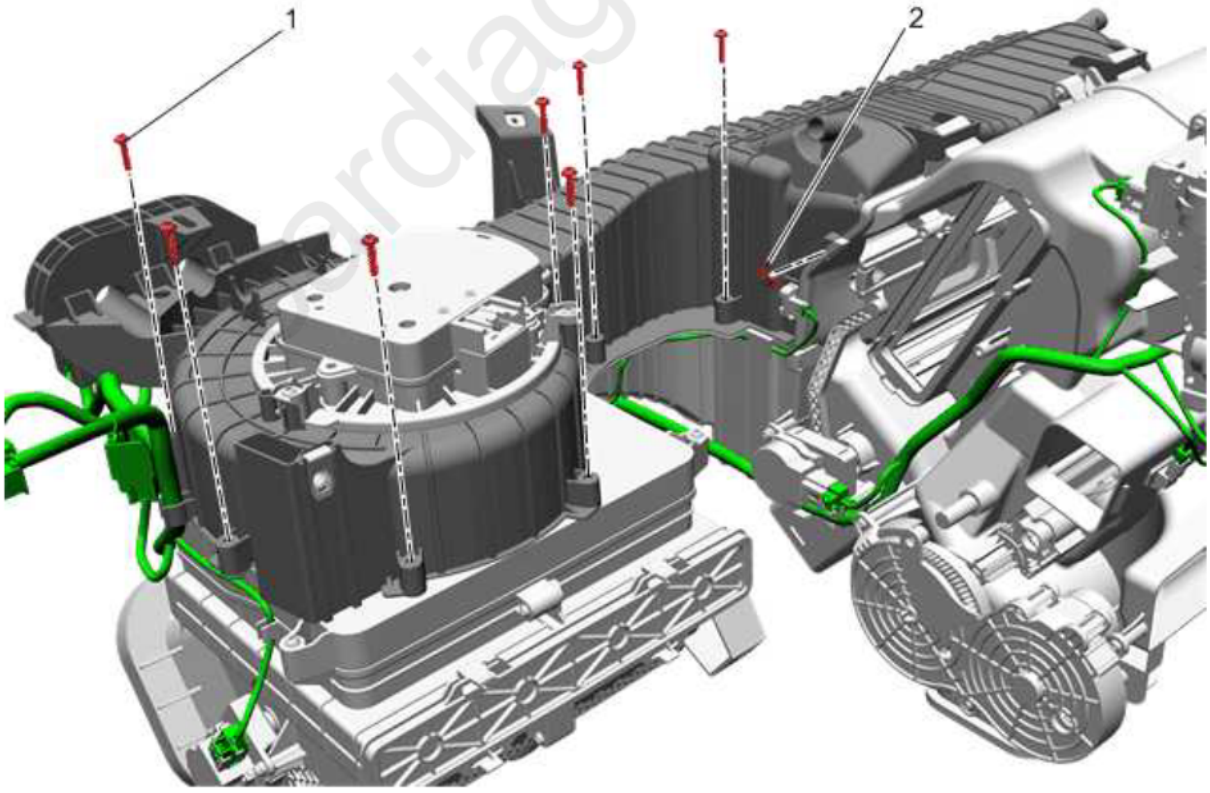


Fig. 337: Heater and Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

5. Retainer Clip (2)Â» Install

6. Heater and Air Conditioning Evaporator and Blower Lower Case Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [10x]

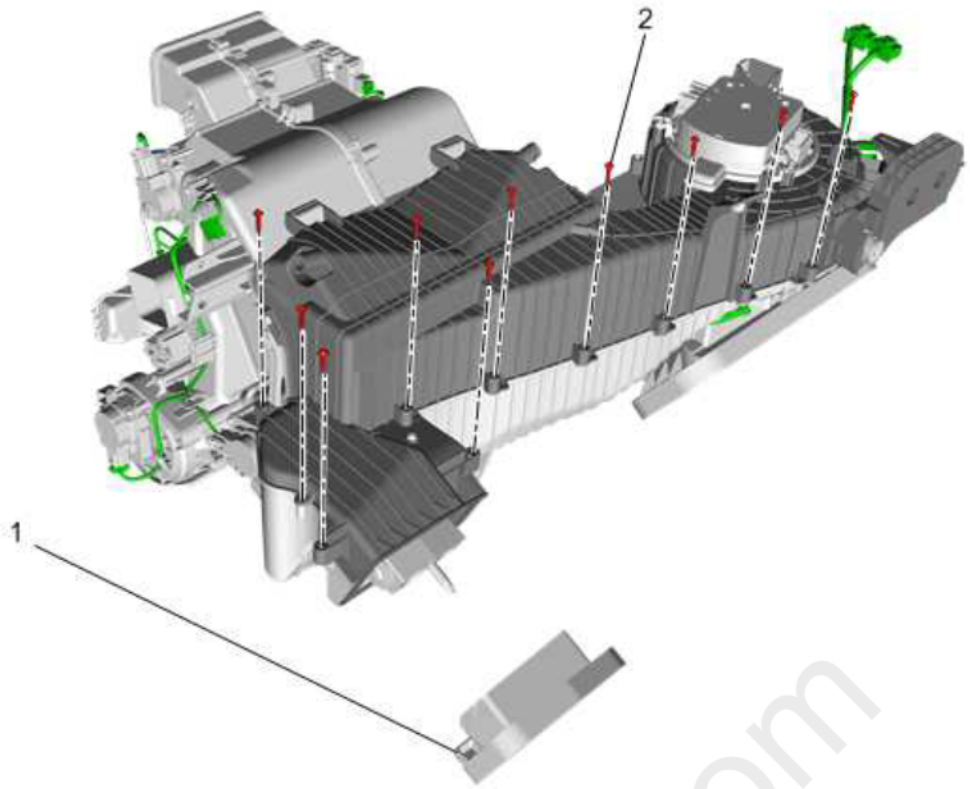


Fig. 338: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

7. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
8. Rotate the heater and air conditioning evaporator and blower module over so the top is facing upward.
9. Heater Core (1)Â» Install

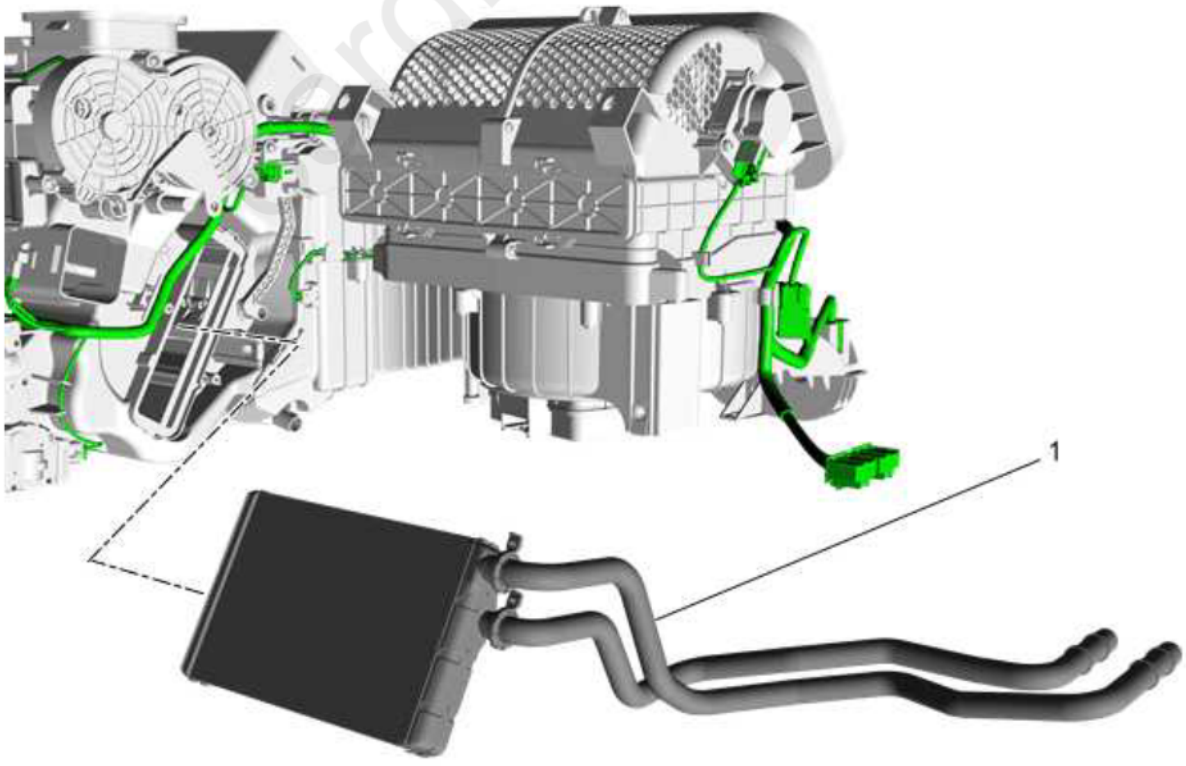


Fig. 339: Heater Core
Courtesy of GENERAL MOTORS COMPANY

10. Heater Core Bracket (2)Â» Install

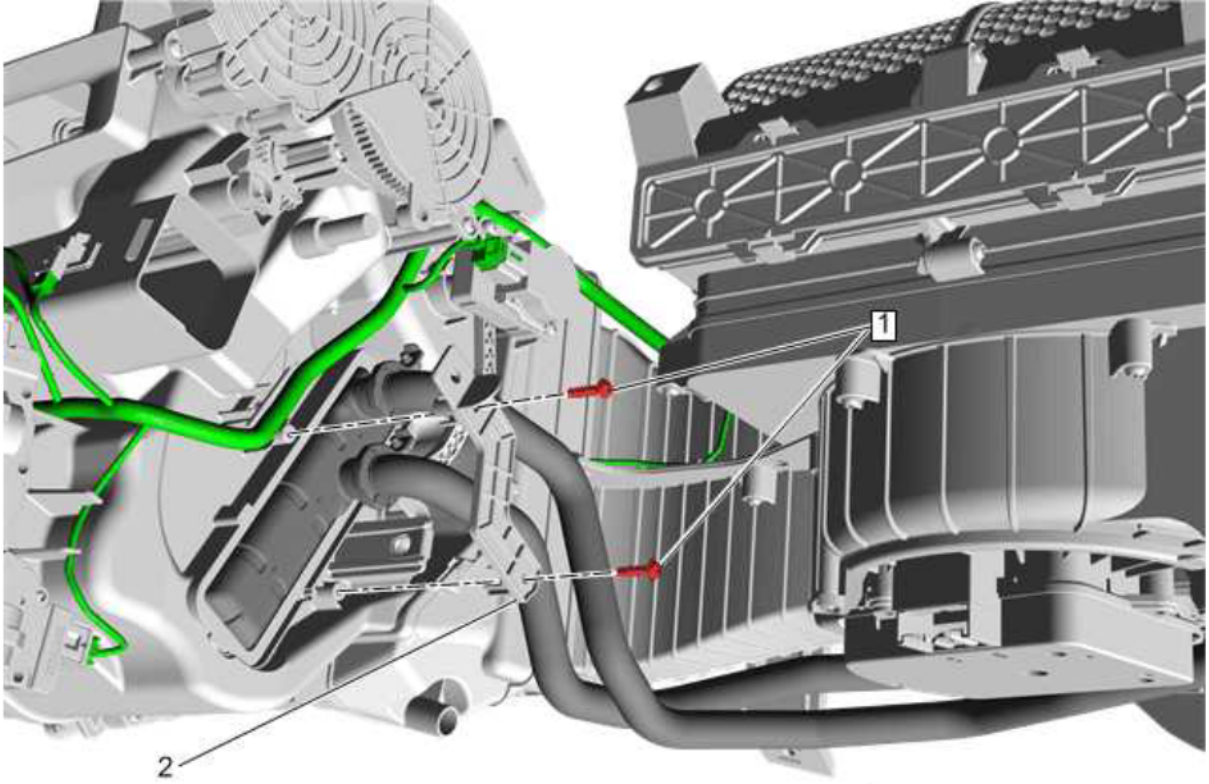


Fig. 340: Heater Core Bracket and Fasteners
Courtesy of GENERAL MOTORS COMPANY

11. Heater Core Bracket Fastener (1)Â» Install and tighten 1.5 N.m (13 lb in) [2x]
12. Heater Core Tube Bracket (3)Â» Install

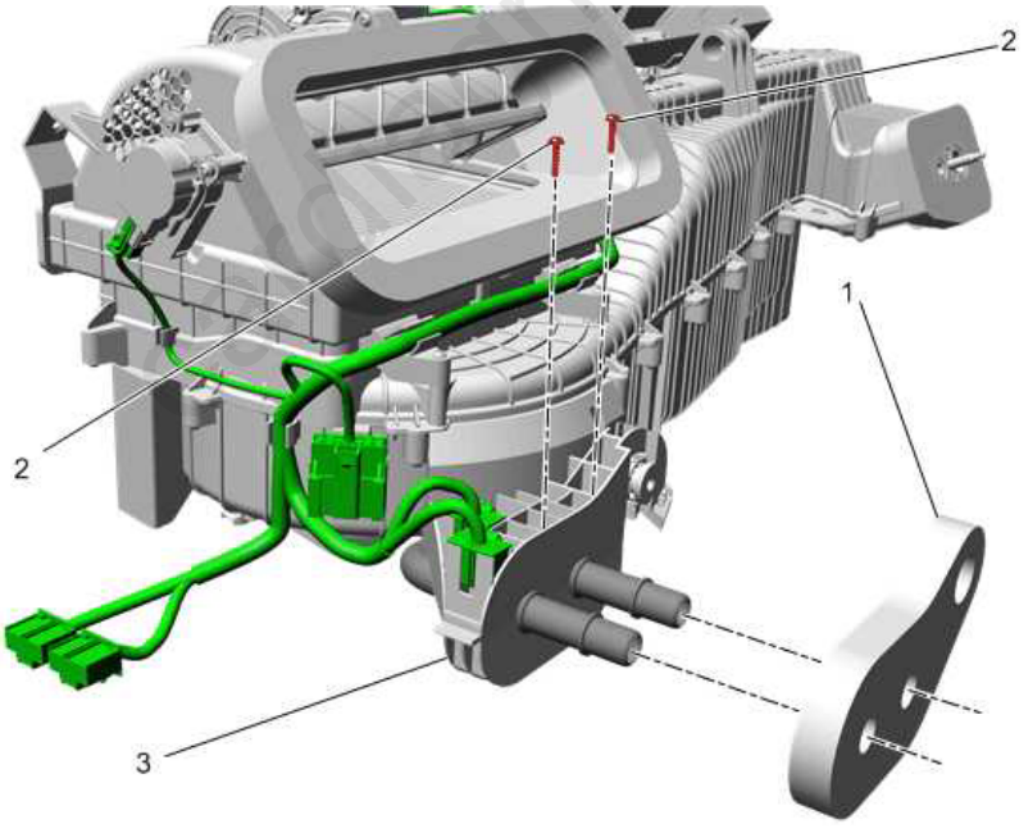


Fig. 341: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

13. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
14. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
15. Attach the wiring harness and connect the electrical connectors as necessary.
16. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module**

Removal and Installation (With HP9 Hybrid)Â» Install

AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN HOSE REPLACEMENT (RIGHT SIDE)

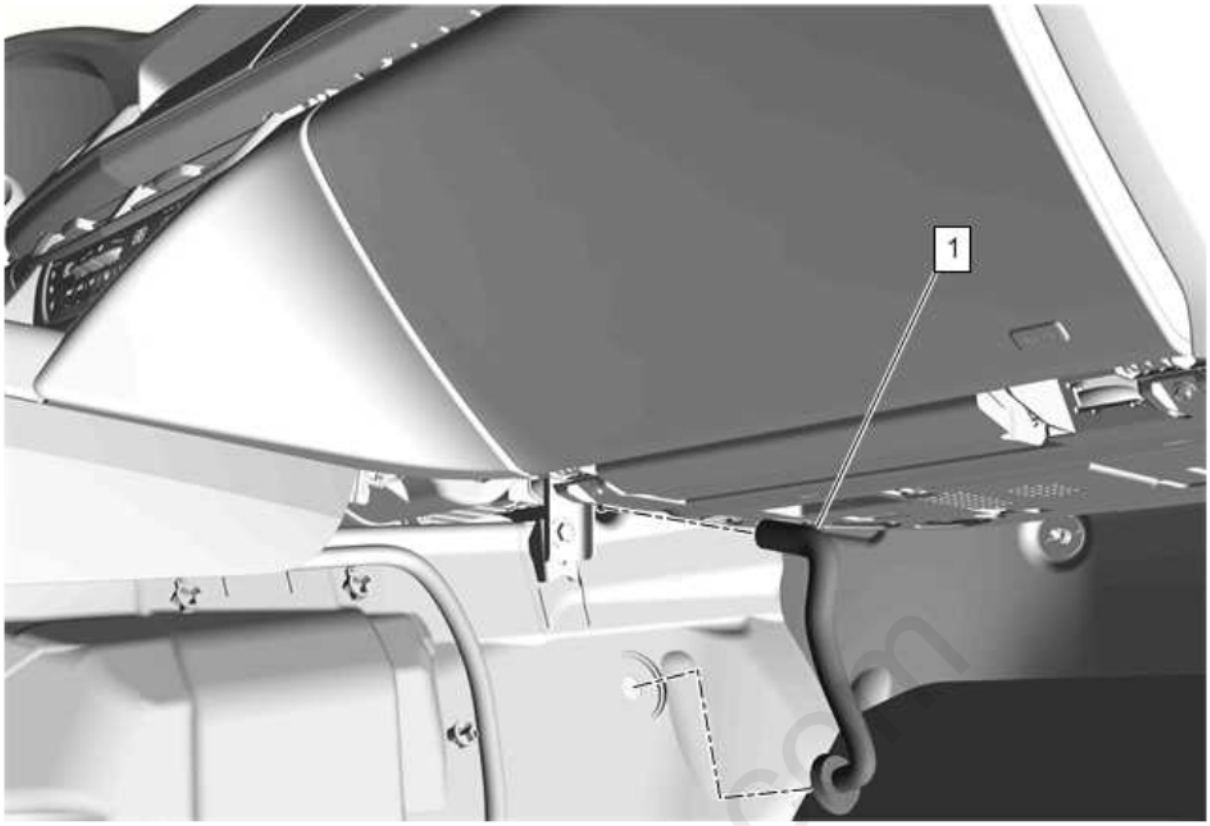


Fig. 342: Air Conditioning Evaporator and Blower Module Drain Hose
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Pull back the right front carpet to gain access to air conditioning evaporator and blower module drain hose.	
1	Air Conditioning Evaporator and Blower Module Drain Hose

AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN HOSE REPLACEMENT (LEFT SIDE)

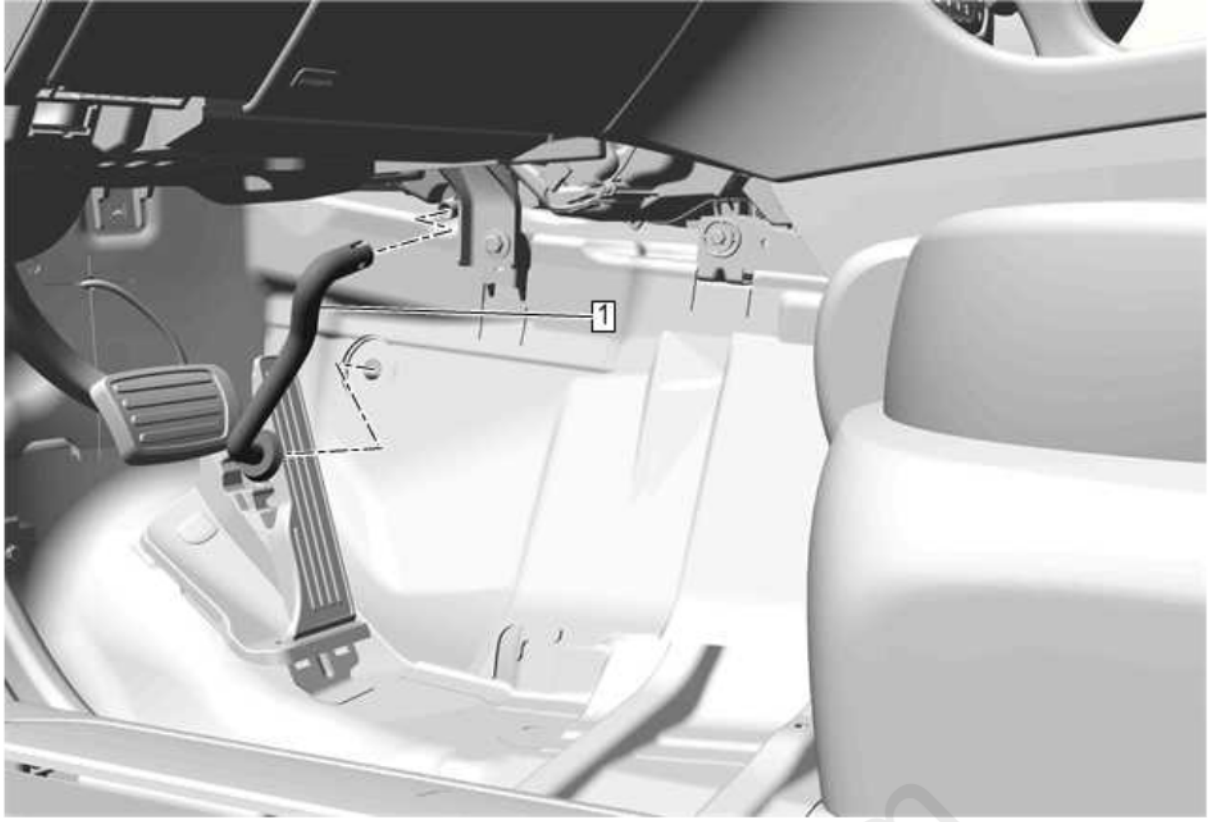


Fig. 343: Air Conditioning Evaporator And Blower Module Drain Hose (Left Side)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Pull back the left front carpet to gain access to air conditioning evaporator and blower module drain hose.	
1	Air Conditioning Evaporator and Blower Module Drain Hose

HEATER WATER BYPASS VALVE REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Radiator Surge Tank (3)Â» Remove - **Radiator Surge Tank Replacement (LTG with HP9)**

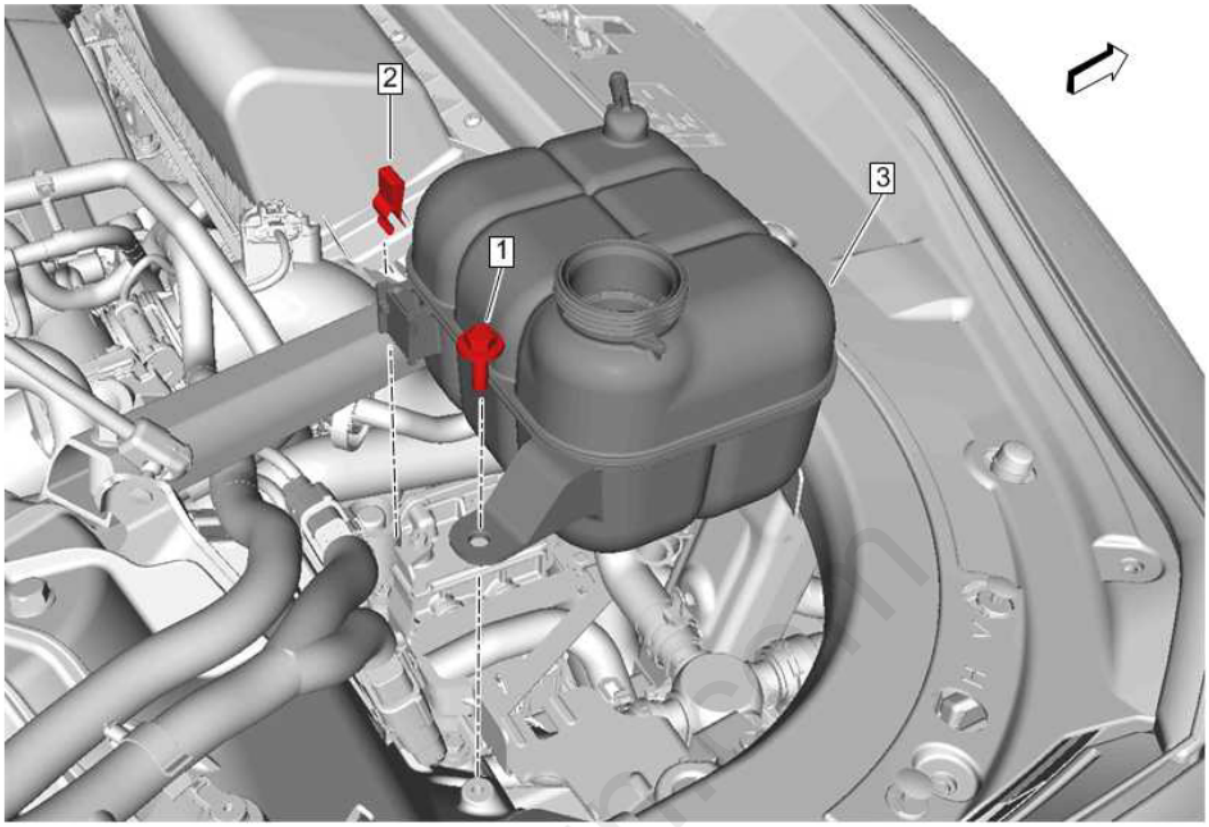


Fig. 344: Radiator Surge Tank (LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Remove - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)** and/or **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

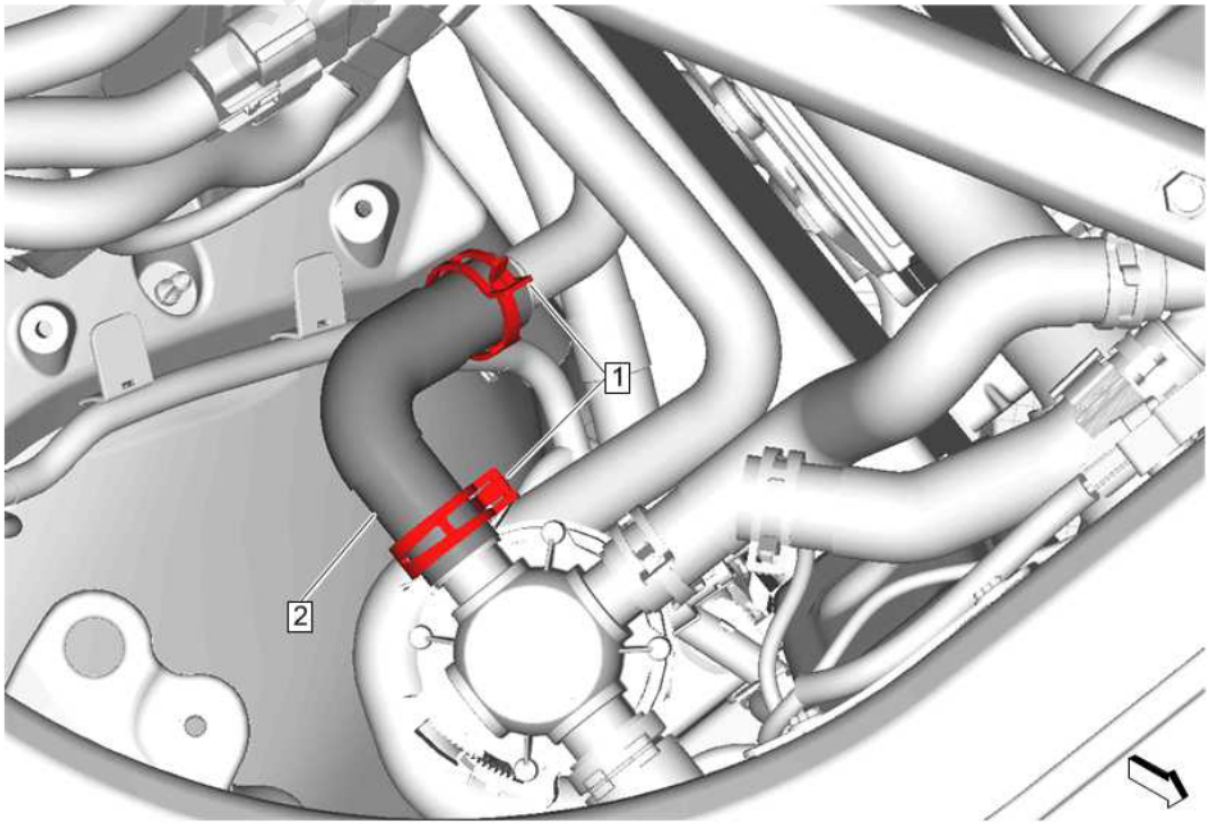


Fig. 345: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Remove - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

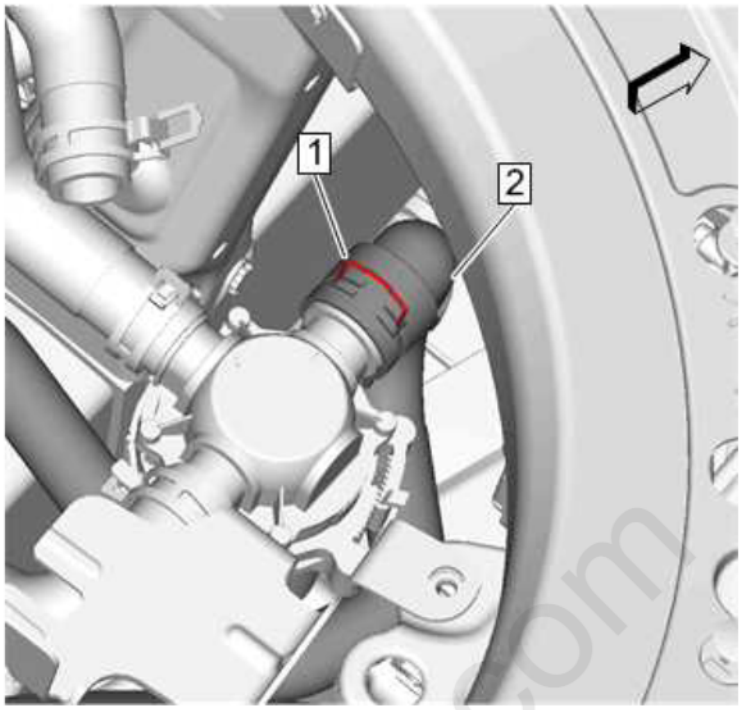


Fig. 346: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Hose (4) @ Heater Water Bypass ValveÂ» Remove - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

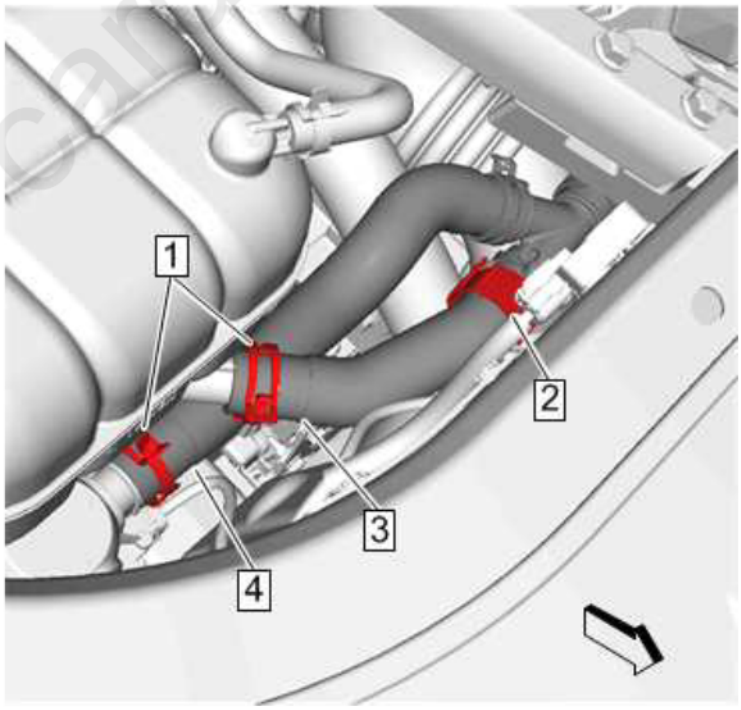


Fig. 347: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

7. Disconnect the electrical connector.
8. Heater Water Bypass Valve (1) @ Radiator Surge Tank BracketÂ» Remove

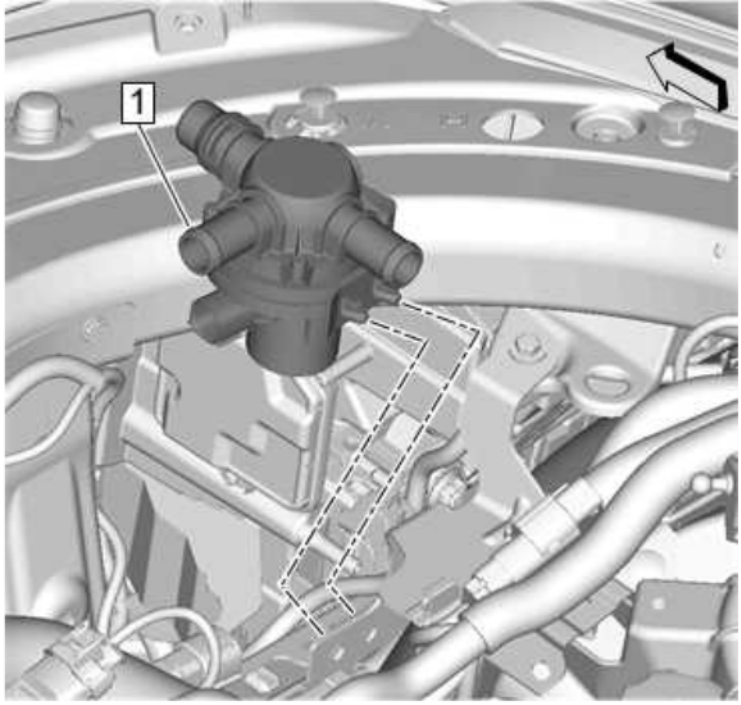


Fig. 348: Heater Water Bypass Valve
Courtesy of GENERAL MOTORS COMPANY

9. Heater Water Bypass Valve (1)Â» Remove

Installation Procedure

1. Heater Water Bypass Valve (1) @ Radiator Surge Tank BracketÂ» Install

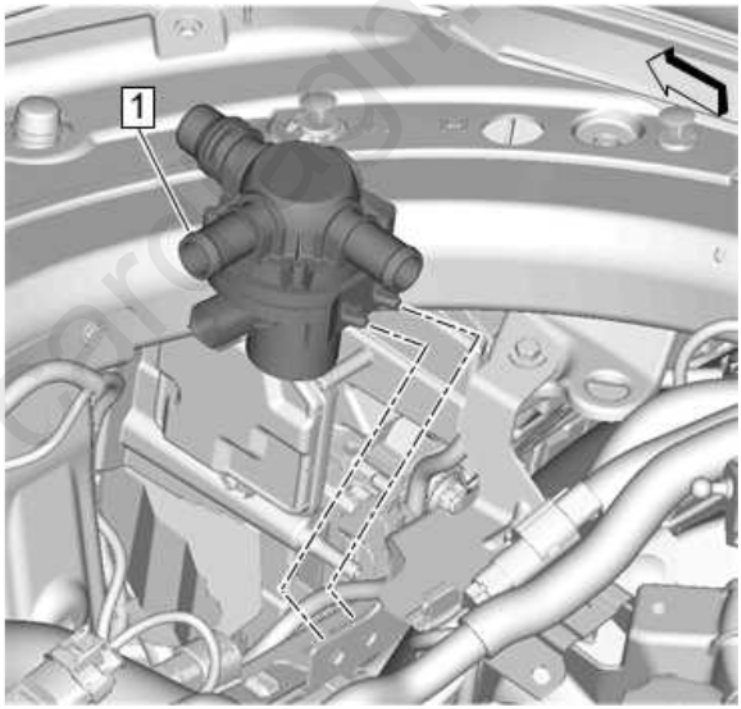


Fig. 349: Heater Water Bypass Valve
Courtesy of GENERAL MOTORS COMPANY

2. Connect the electrical connector.
3. Heater Water Auxiliary Pump Hose (4) @ Heater Water Bypass ValveÂ» Install - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

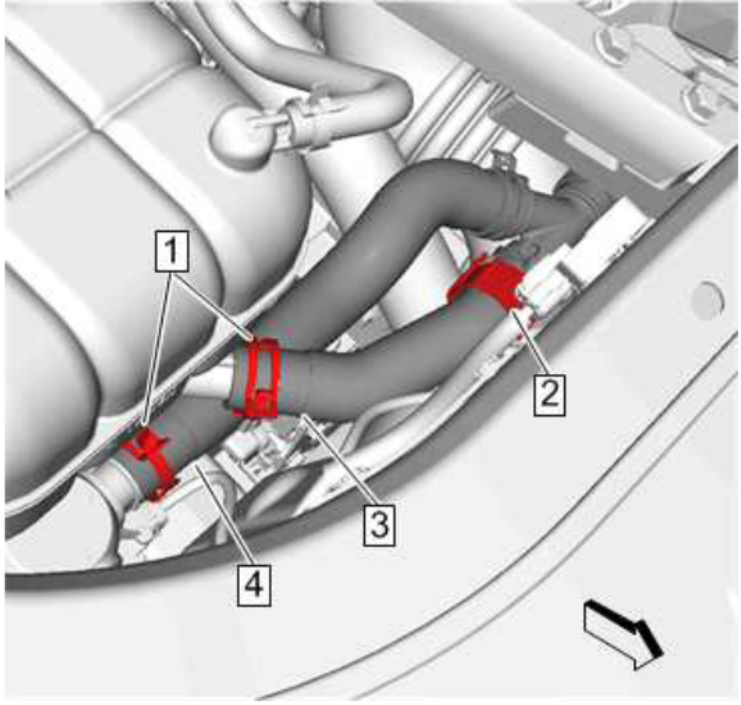


Fig. 350: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Install - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

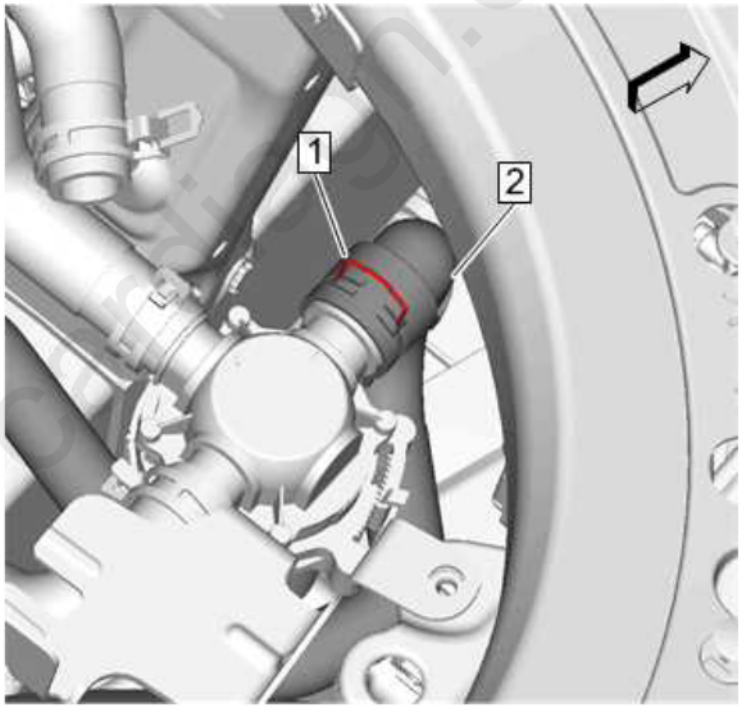


Fig. 351: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Install - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

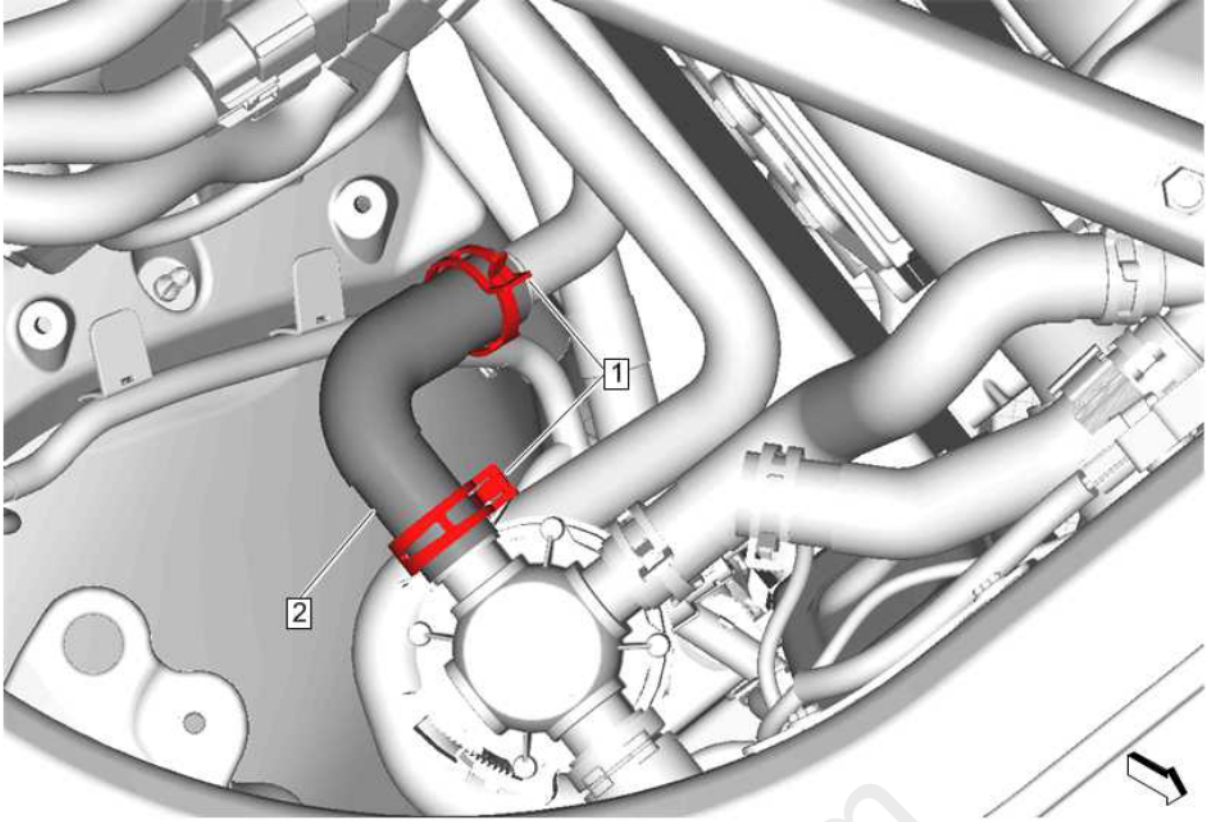


Fig. 352: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Radiator Surge Tank (3)Â» Install - Radiator Surge Tank Replacement (LTG with HP9)

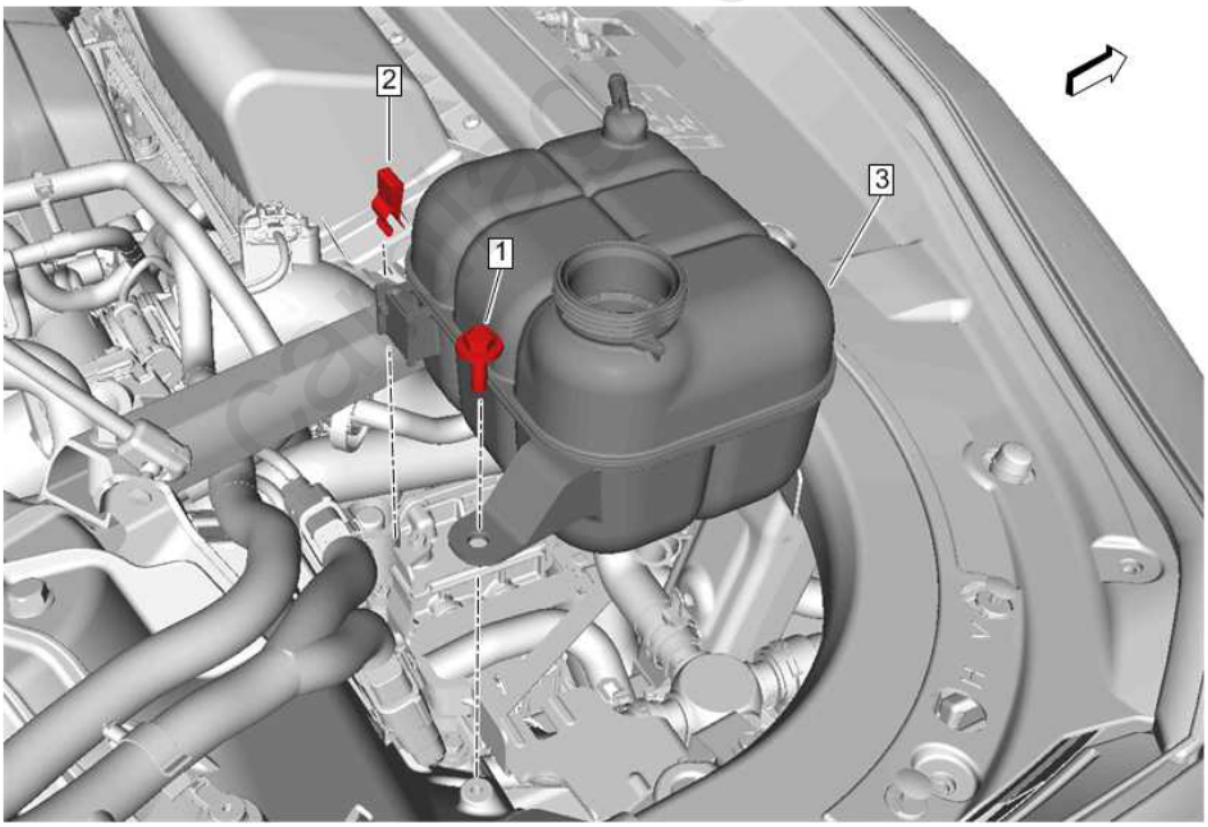


Fig. 353: Radiator Surge Tank (LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

7. Fill the cooling system. Refer to Cooling System Draining and Filling (Static LTG with HP9) and/or Cooling System Draining and Filling (GE 47716 LTG with HP9)
8. Enable the high voltage system. Refer to High Voltage Enabling
9. Start the engine and check for coolant leaks.

HEATER INLET HOSE REPLACEMENT (AT HEATER CORE INLET TUBE LGW LTG WITHOUT HP9)

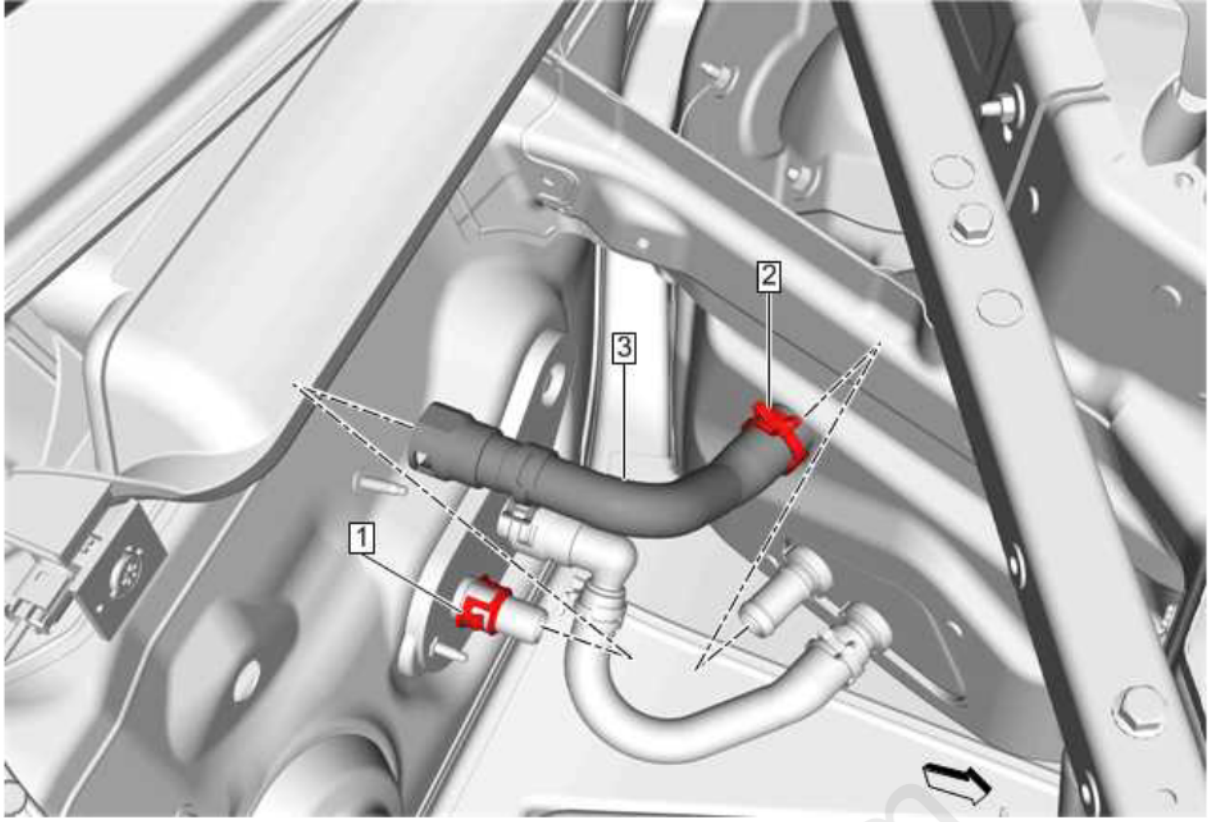


Fig. 354: Heater Inlet Hose (At Heater Core Inlet Tube LGW LTG without HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Inlet Grille Panel Access Hole Cover Replacement** - Right Side	
1	Heater Inlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Inlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

HEATER INLET HOSE REPLACEMENT (AUXILIARY HEATER INLET AND OUTLET PIPE TO AUXILIARY AIR CONDITIONING EVAPORATOR INTERMEDIATE TUBE LGW LGX)

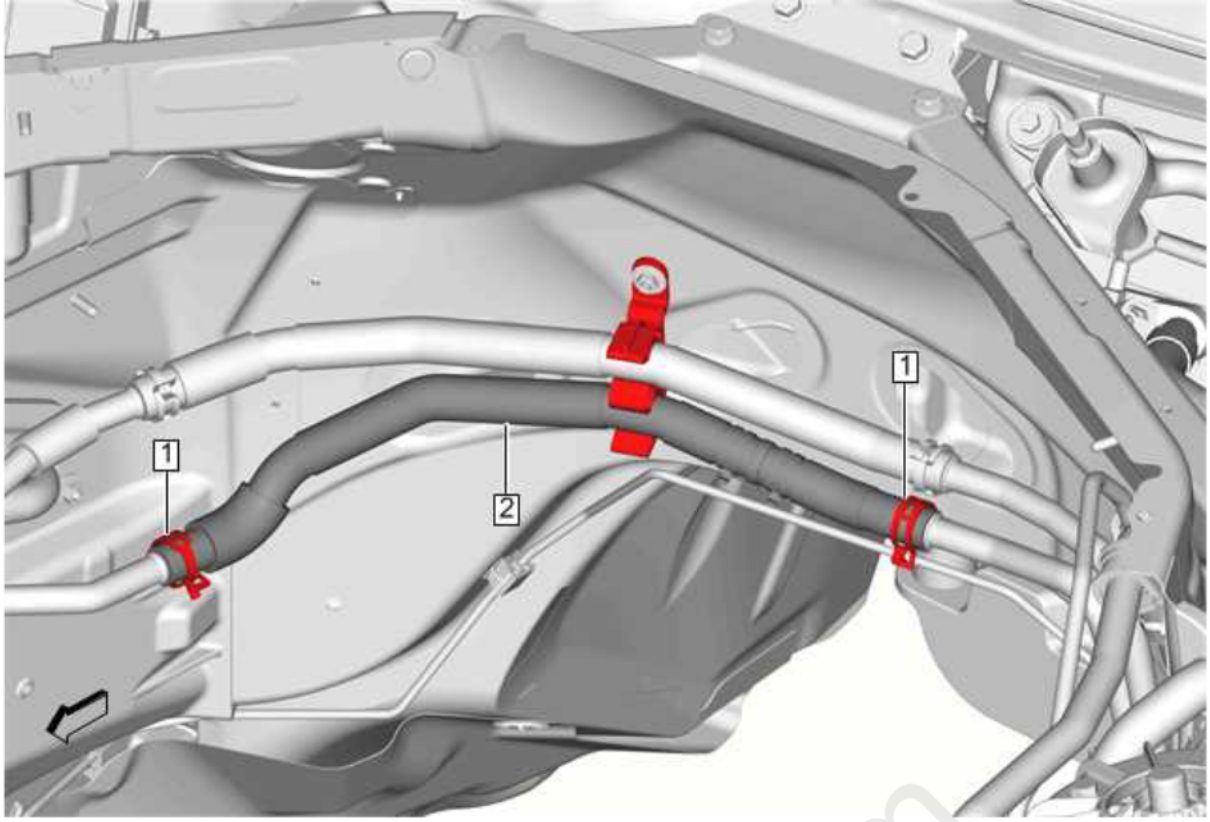


Fig. 355: Heater Inlet Hose (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Engine Replacement (LGW) Engine Replacement (LGX)	
1	Heater Inlet Hose Clamp [2x]
2	Heater Inlet Hose **Procedure** 1. Heater Inlet Hose @ Heater Outlet Hose RetainerÂ» Remove 2. Fill the cooling system to the proper level. Refer to Cooling System Draining and Filling (Static without HP9) and/or Cooling System Draining and Filling (GE 47716 without HP9) 3. Inspect for coolant leaks.

HEATER INLET HOSE REPLACEMENT (AT HEATER CORE INLET TUBE LGX)

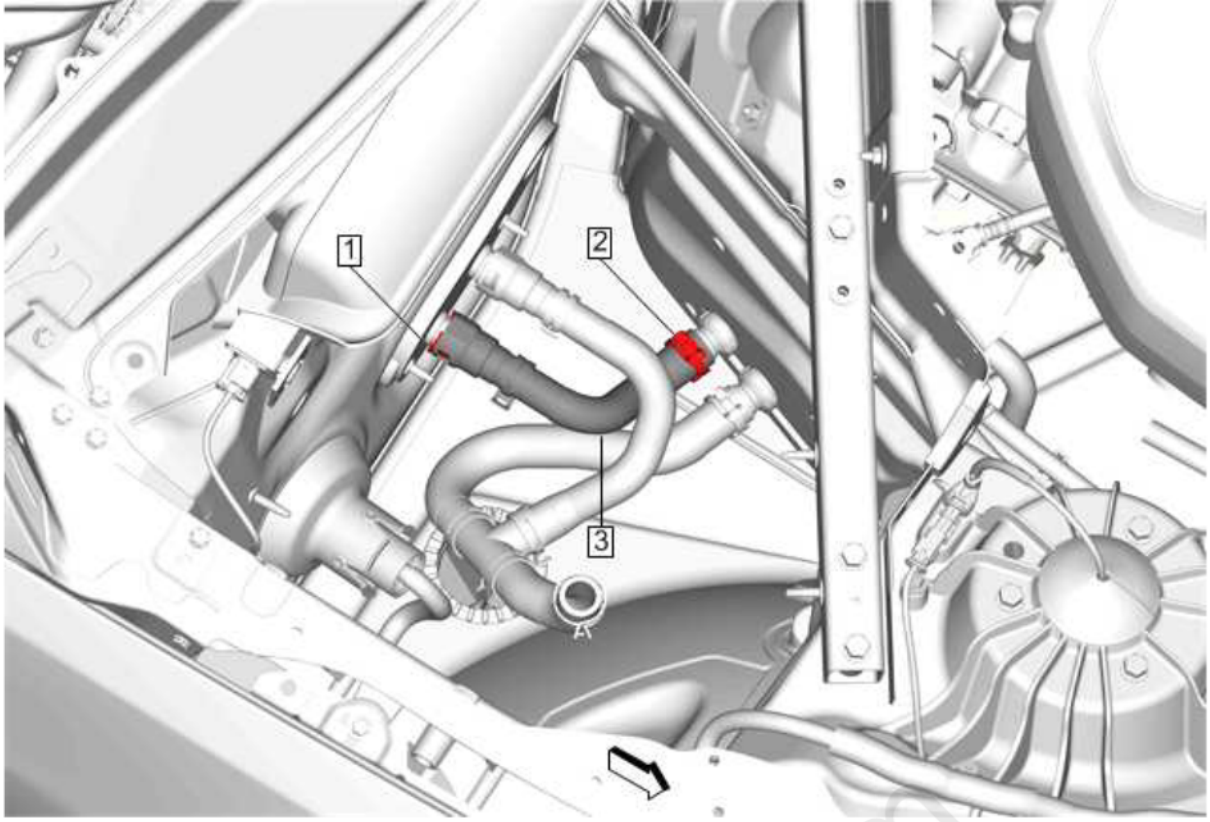


Fig. 356: Heater Inlet Hose (At Heater Core Inlet Tube LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Inlet Grille Panel Replacement** Â» Remove 3. **Transfer Case Control Module Bracket Replacement** Â» Remove	
1	Heater Inlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Inlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

HEATER INLET HOSE REPLACEMENT (LTG WITH HP9)

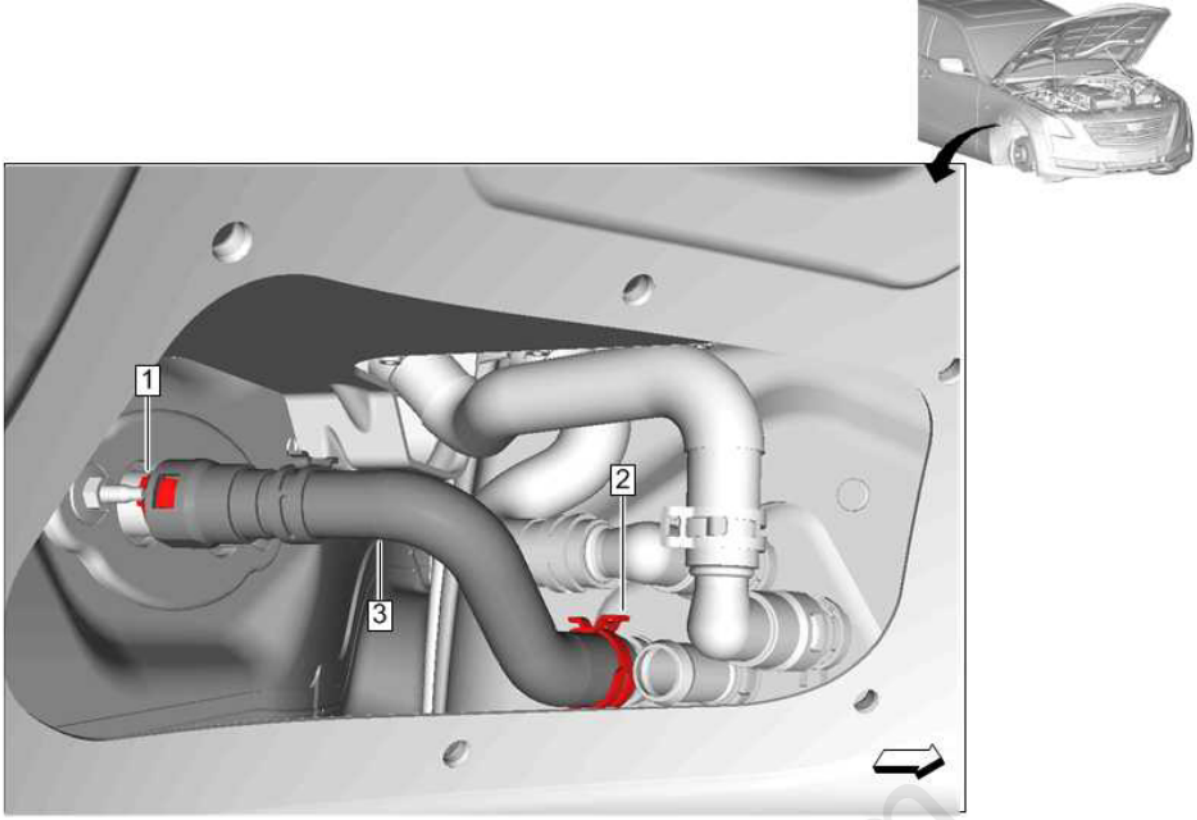


Fig. 357: Heater Inlet Hose (LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name

WARNING:

Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Preliminary Procedures

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. **Front Wheelhouse Front Panel Replacement (HP9)**

1	Heater Inlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Inlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)** 2. Enable the high voltage system. Refer to **High Voltage Enabling** 3. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET HOSE REPLACEMENT (LTG WITHOUT HP9)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Auxiliary Heater Inlet Hose Clamp (1) @ Radiator Inlet PipeÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

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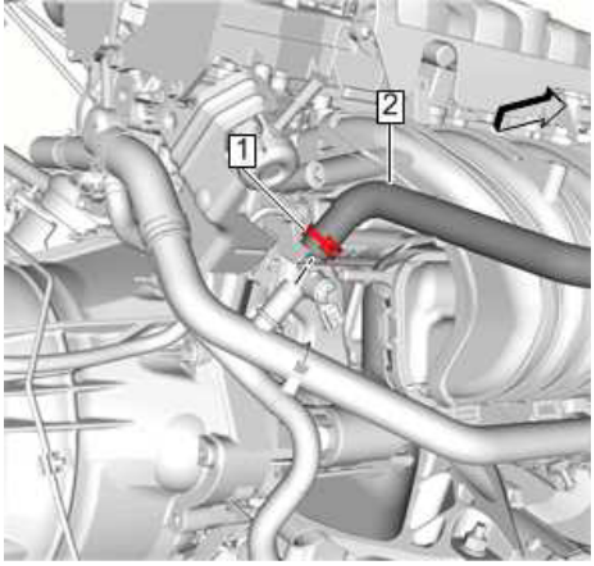


Fig. 358: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Inlet Hose (2) @ Radiator Inlet PipeÂ» Remove
4. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
5. Auxiliary Heater Inlet Hose Retainer (1)Â» Disengage

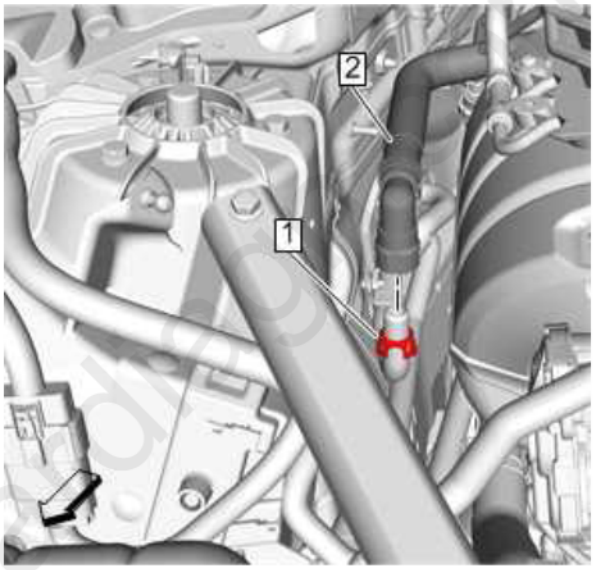


Fig. 359: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove

Installation Procedure

1. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

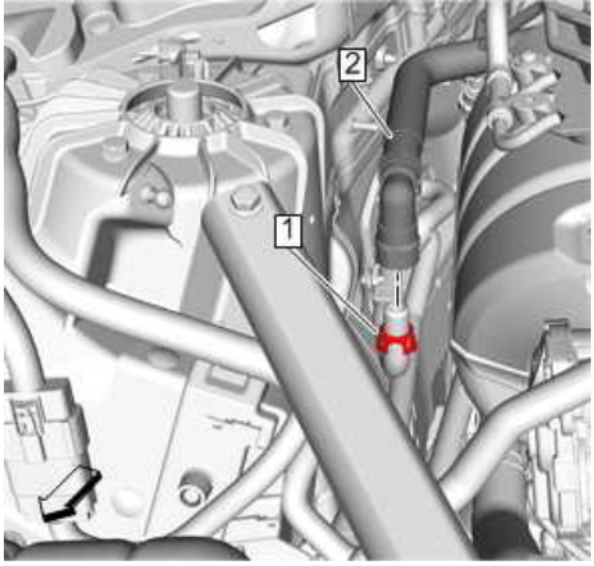


Fig. 360: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Heater Inlet Hose Retainer (1)Â» Engage
3. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle**
4. Auxiliary Heater Inlet Hose (2) @ Radiator Inlet PipeÂ» Install

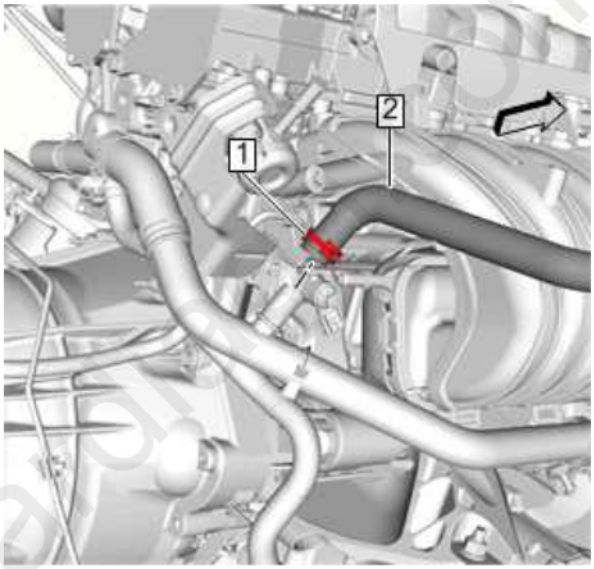


Fig. 361: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Heater Inlet Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
6. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
7. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET HOSE REPLACEMENT (LGW)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Front Axle Propeller ShaftÂ» Remove - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
3. Auxiliary Heater Inlet Hose Clamp (1) @ Auxiliary Heater Inlet HoseÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

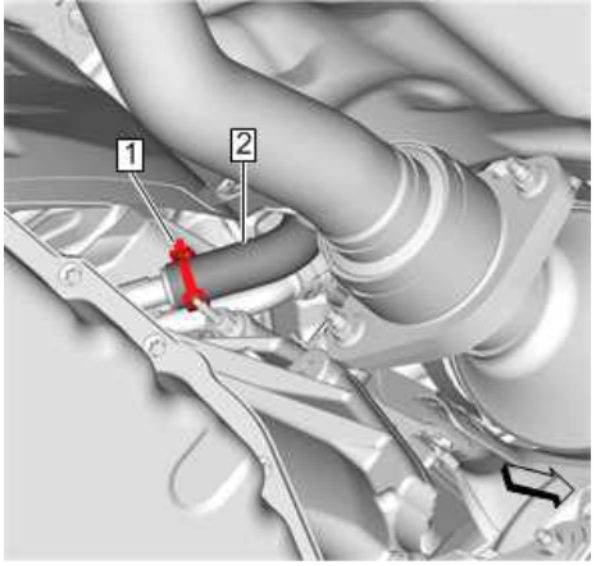


Fig. 362: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Heater Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Remove
5. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
6. Air Cleaner Assembly (1)Â» Remove - **Air Cleaner Assembly Replacement (LGW)**

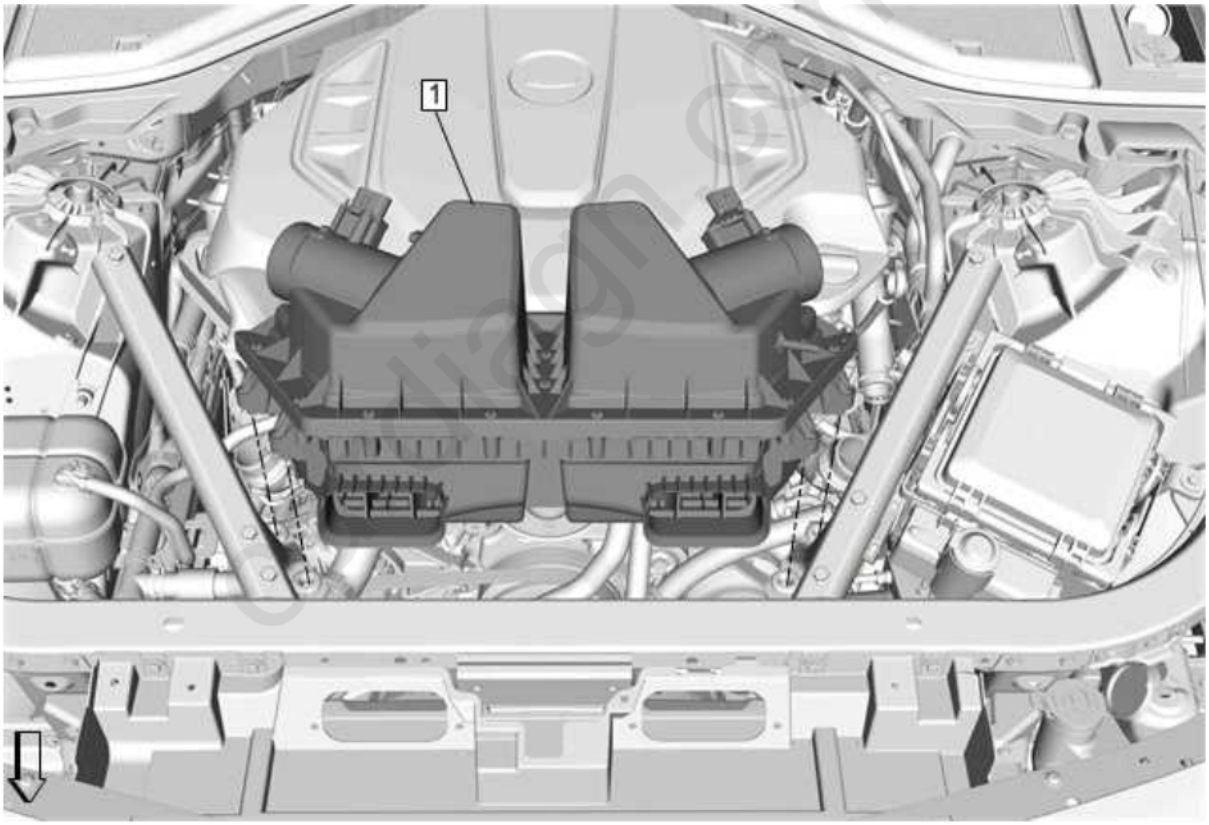


Fig. 363: Air Cleaner Assembly (LGW)
Courtesy of GENERAL MOTORS COMPANY

7. Air Cleaner Outlet Rear DuctÂ» Remove - **Air Cleaner Outlet Rear Duct Replacement (LGW)**
8. Auxiliary Heater Inlet Hose Retainer (1) @ Auxiliary Heater Inlet HoseÂ» Disengage

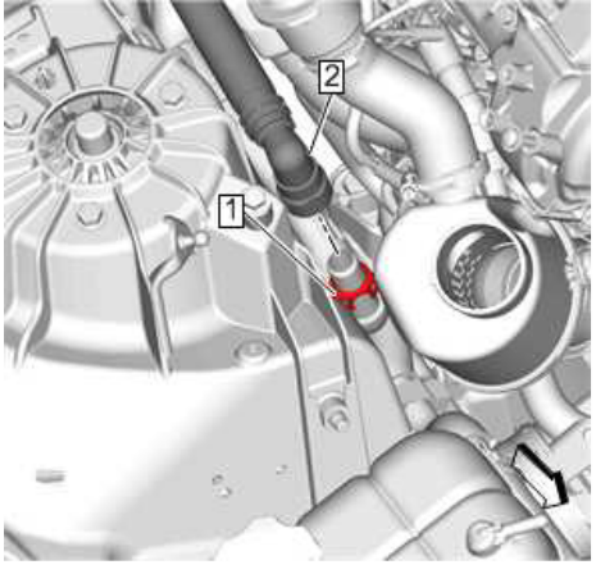


Fig. 364: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove

Installation Procedure

1. Auxiliary Heater Inlet HoseÂ» Install
2. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

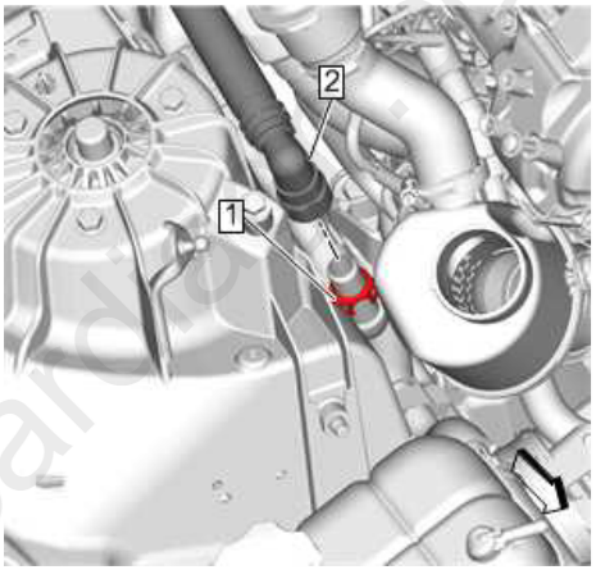


Fig. 365: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Inlet Hose Retainer (1) @ Auxiliary Heater Inlet HoseÂ» Engage
4. Air Cleaner Outlet Rear DuctÂ» Install - **Air Cleaner Outlet Rear Duct Replacement (LGW)**
5. Air Cleaner Assembly (1)Â» Install - **Air Cleaner Assembly Replacement (LGW)**

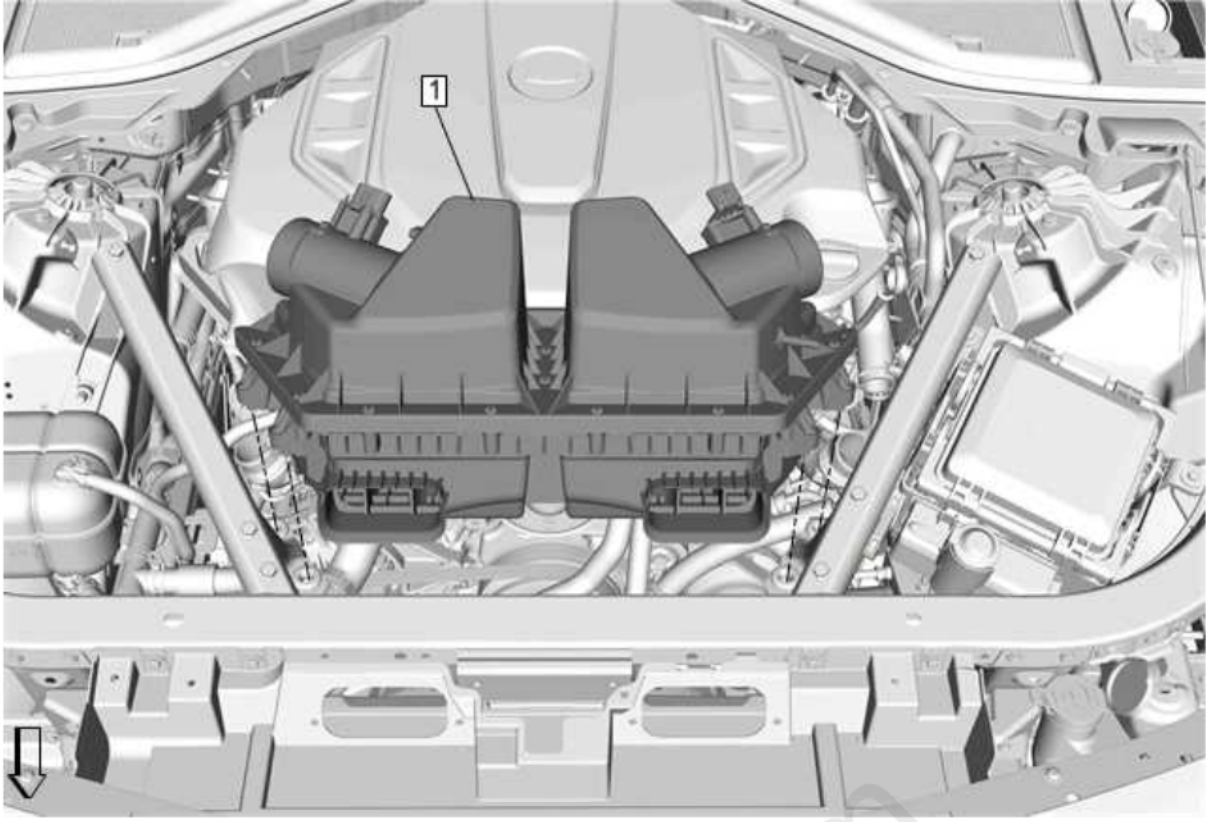


Fig. 366: Air Cleaner Assembly (LGW)
Courtesy of GENERAL MOTORS COMPANY

6. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**
7. Auxiliary Heater Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Install

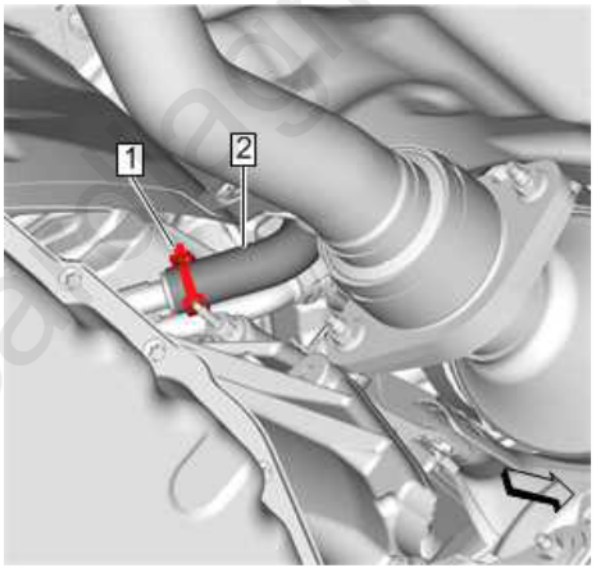


Fig. 367: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Heater Inlet Hose Clamp (1) @ Auxiliary Heater Inlet HoseÂ» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
9. Front Axle Propeller ShaftÂ» Install - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
10. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
11. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET HOSE REPLACEMENT (LGX)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**

2. Front Axle Propeller ShaftÂ» Remove - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
3. Auxiliary Heater Inlet Hose Clamp (1) @ Auxiliary Heater Inlet HoseÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

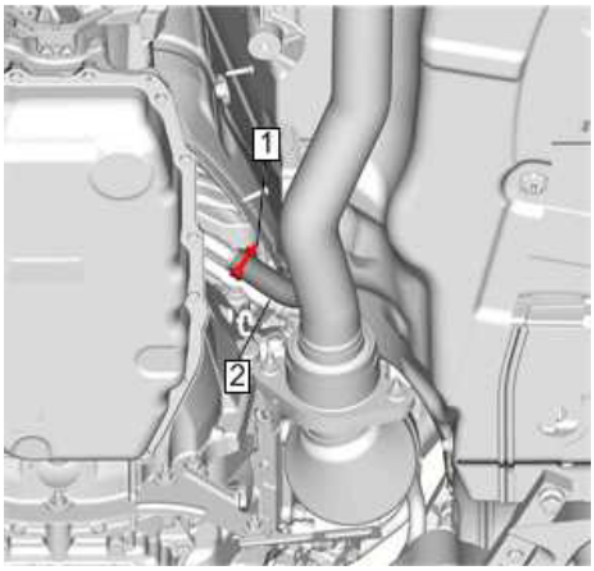


Fig. 368: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Heater Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Remove
5. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
6. Air Cleaner Assembly (1)Â» Remove - **Air Cleaner Assembly Replacement (LGX)**
7. Auxiliary Heater Inlet Hose Retainer (1) @ Auxiliary Heater Inlet HoseÂ» Disengage

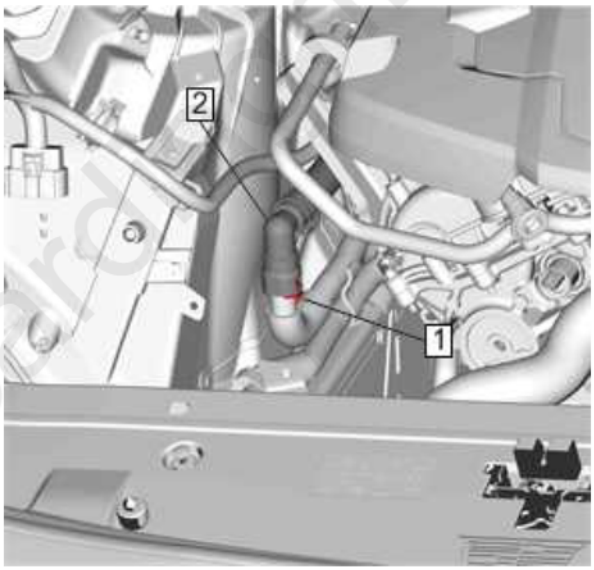


Fig. 369: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove

Installation Procedure

1. Auxiliary Heater Inlet HoseÂ» Install
2. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

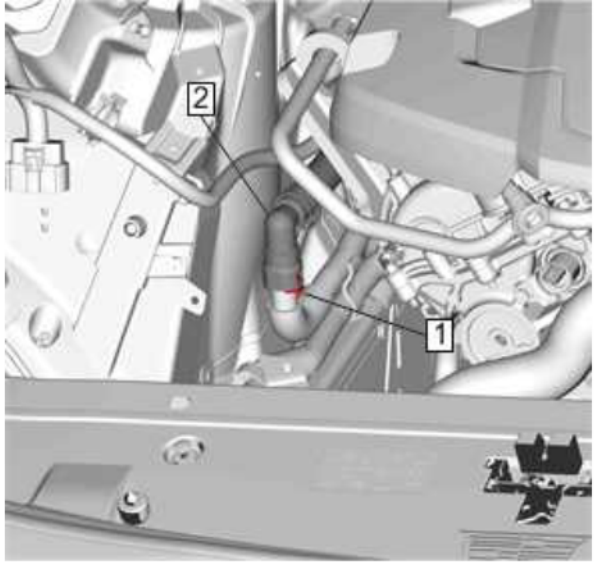


Fig. 370: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Inlet Hose Retainer (1) @ Auxiliary Heater Inlet HoseÂ» Engage
4. Air Cleaner Assembly (1)Â» Install - **Air Cleaner Assembly Replacement (LGX)**
5. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**
6. Auxiliary Heater Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Install

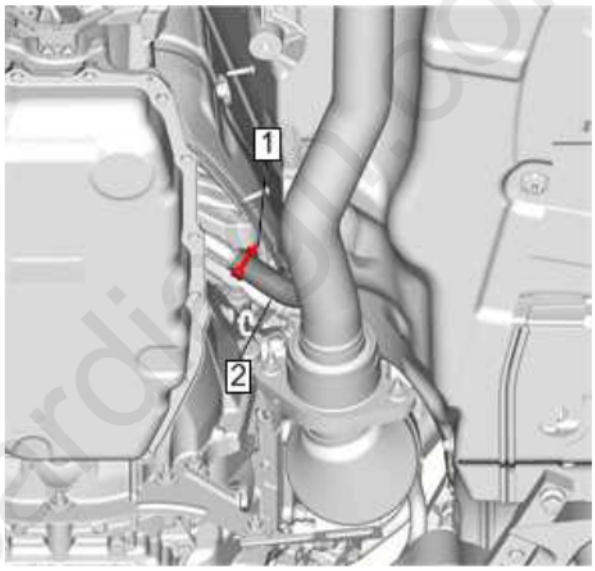


Fig. 371: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Heater Inlet Hose Clamp (1) @ Auxiliary Heater Inlet HoseÂ» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
8. Front Axle Propeller ShaftÂ» Install - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
9. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
10. Start the engine and check for coolant leaks.

AUXILIARY HEATER OUTLET HOSE REPLACEMENT (LTG WITHOUT HP9)

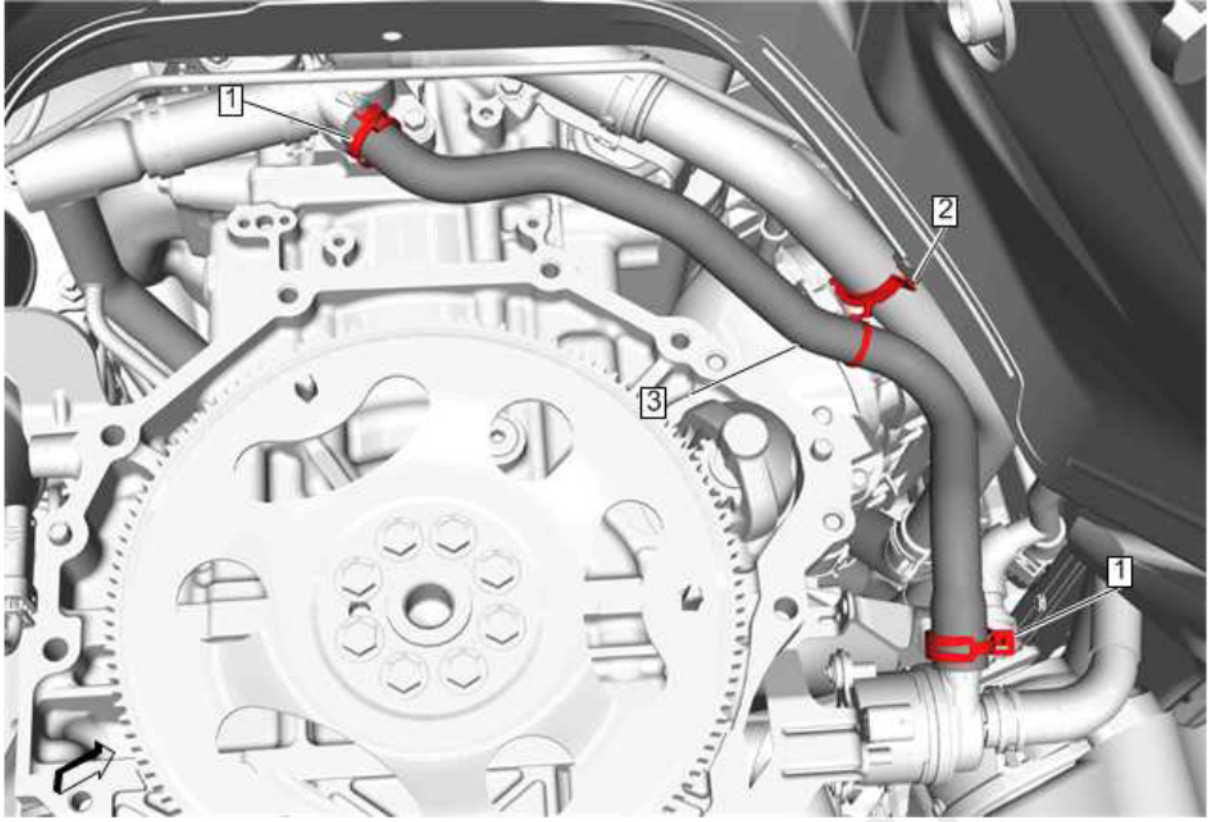


Fig. 372: Auxiliary Heater Outlet Hose (LTG without HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Transmission Replacement (LTG Engine)**	
1	Auxiliary Heater Outlet Hose Clamp [2x] **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
2	Auxiliary Heater Outlet Hose Clip
3	Auxiliary Heater Outlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

AUXILIARY HEATER OUTLET HOSE REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Engine Lower Front Splash Shield (2)Â» Remove - **Engine Lower Front Splash Shield Replacement (LTG)**

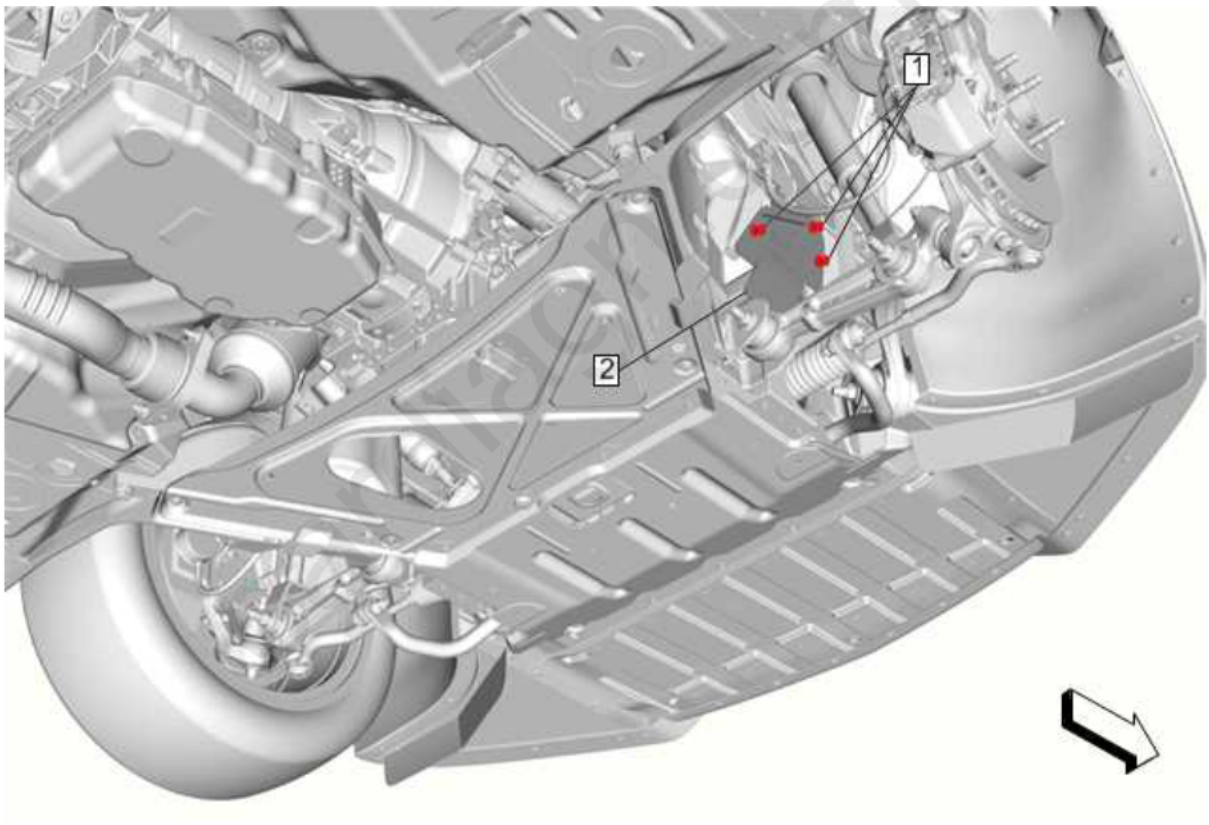


Fig. 373: Engine Lower Front Splash Shield (LTG)
Courtesy of GENERAL MOTORS COMPANY

4. Drivetrain and Front Suspension Cradle Plate (3)Â» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

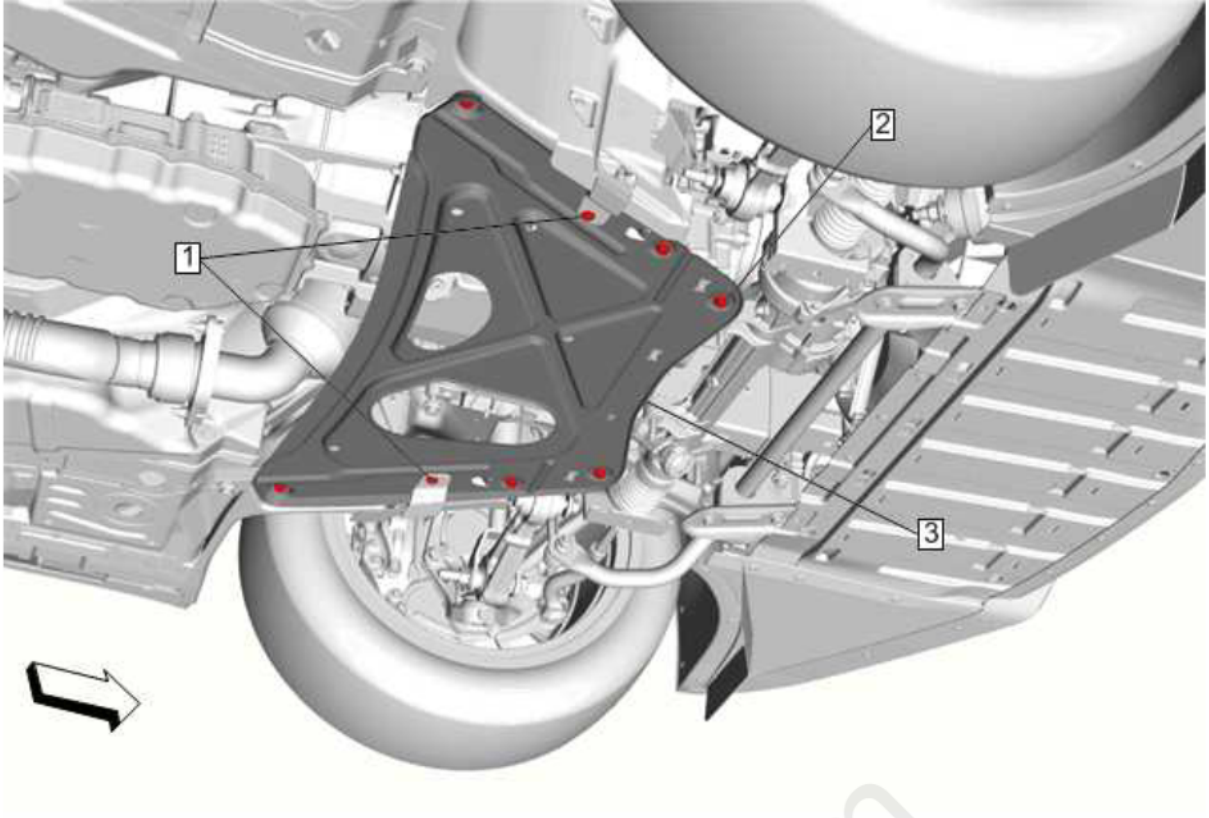


Fig. 374: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Heater Outlet Hose Retainer (1) @ Auxiliary Heater Outlet HoseÂ» Disengage

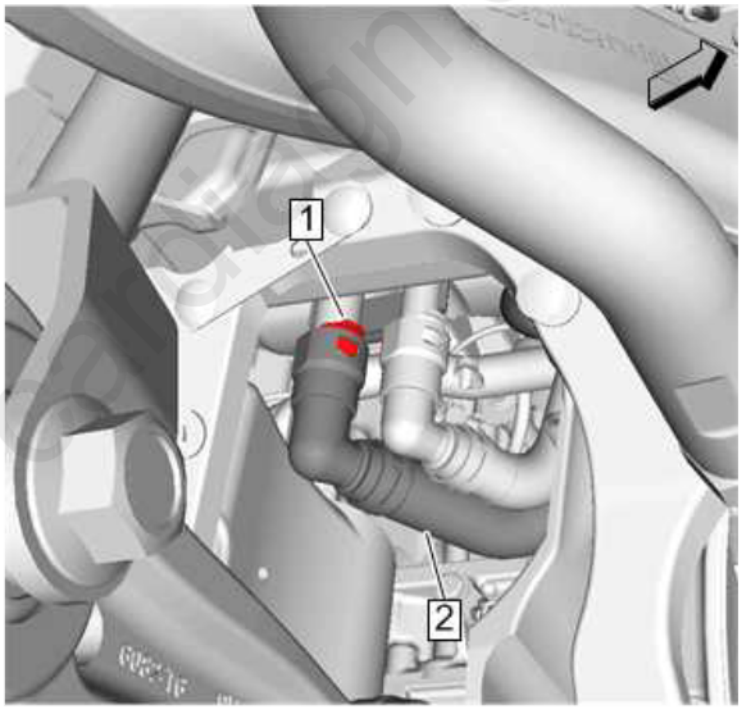


Fig. 375: Auxiliary Heater Outlet Hose Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove
7. Auxiliary Heater Outlet Hose Retainer (1) @ Auxiliary Heater Outlet HoseÂ» Disengage

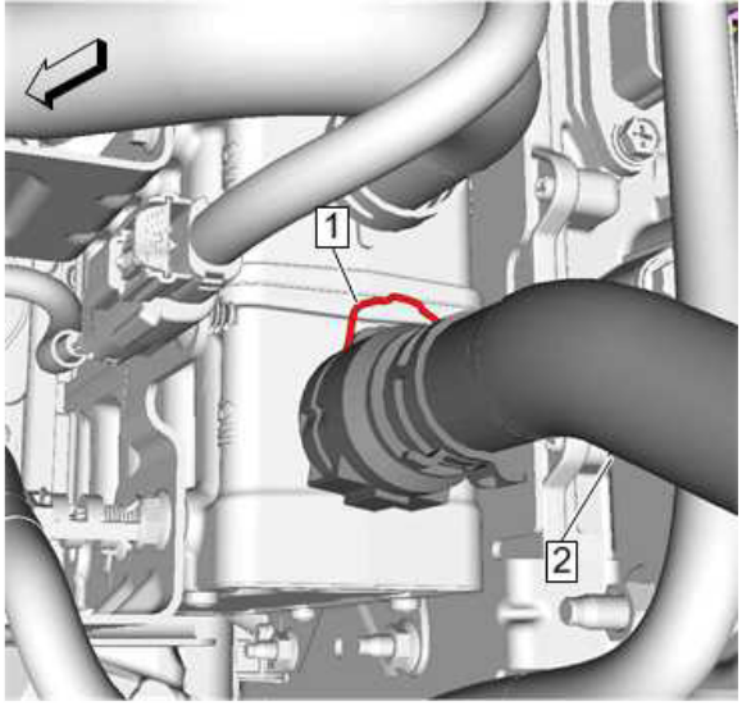


Fig. 376: Auxiliary Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Heater Outlet Hose (2) @ Heater Coolant HeaterÂ» Remove
9. Auxiliary Heater Outlet Hose (2)Â» Remove

Installation Procedure

1. Auxiliary Heater Outlet Hose (2) @ Heater Coolant HeaterÂ» Install

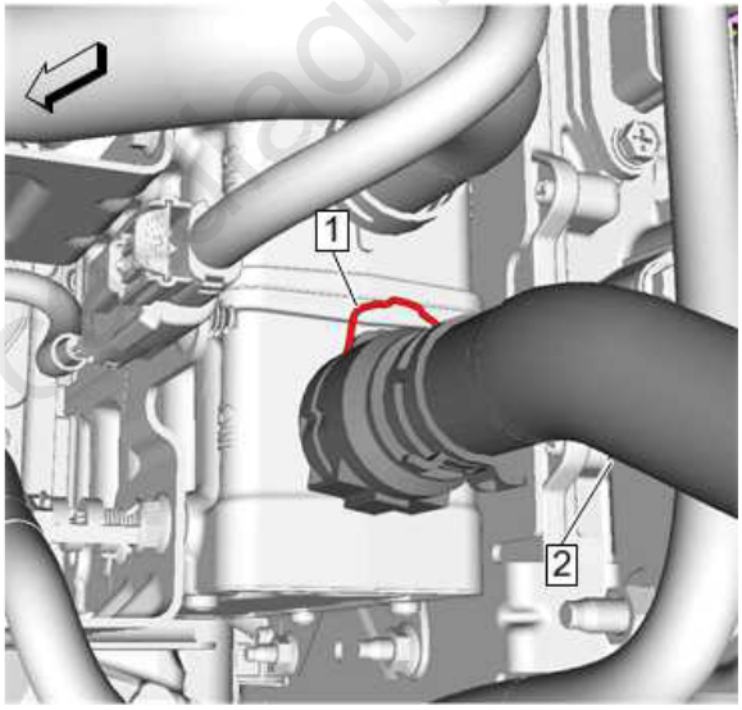


Fig. 377: Auxiliary Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Heater Outlet Hose Retainer (1) @ Auxiliary Heater Outlet HoseÂ» Engage
3. Auxiliary Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install

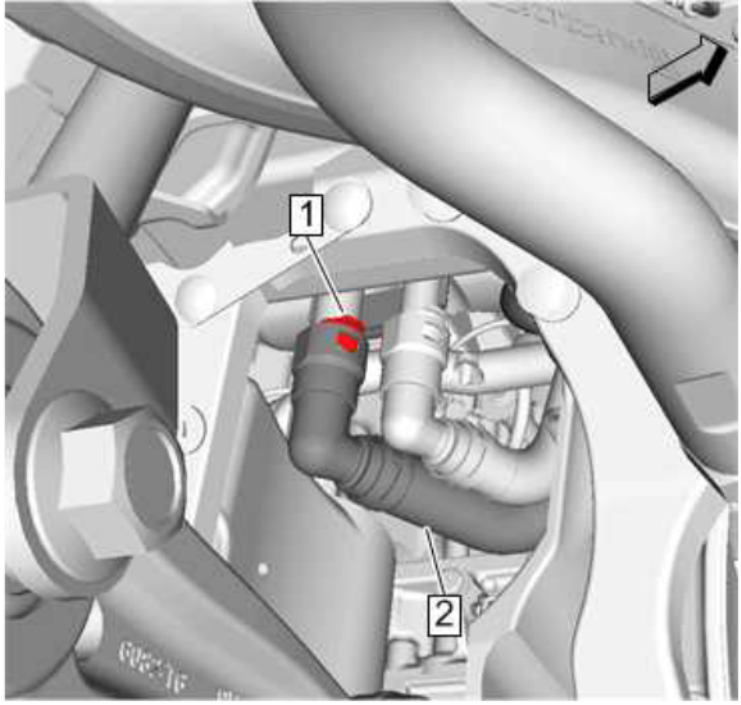


Fig. 378: Auxiliary Heater Outlet Hose Retainer
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Heater Outlet Hose Retainer (1) @ Auxiliary Heater Outlet HoseÂ» Engage
5. Drivetrain and Front Suspension Cradle Plate (3)Â» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

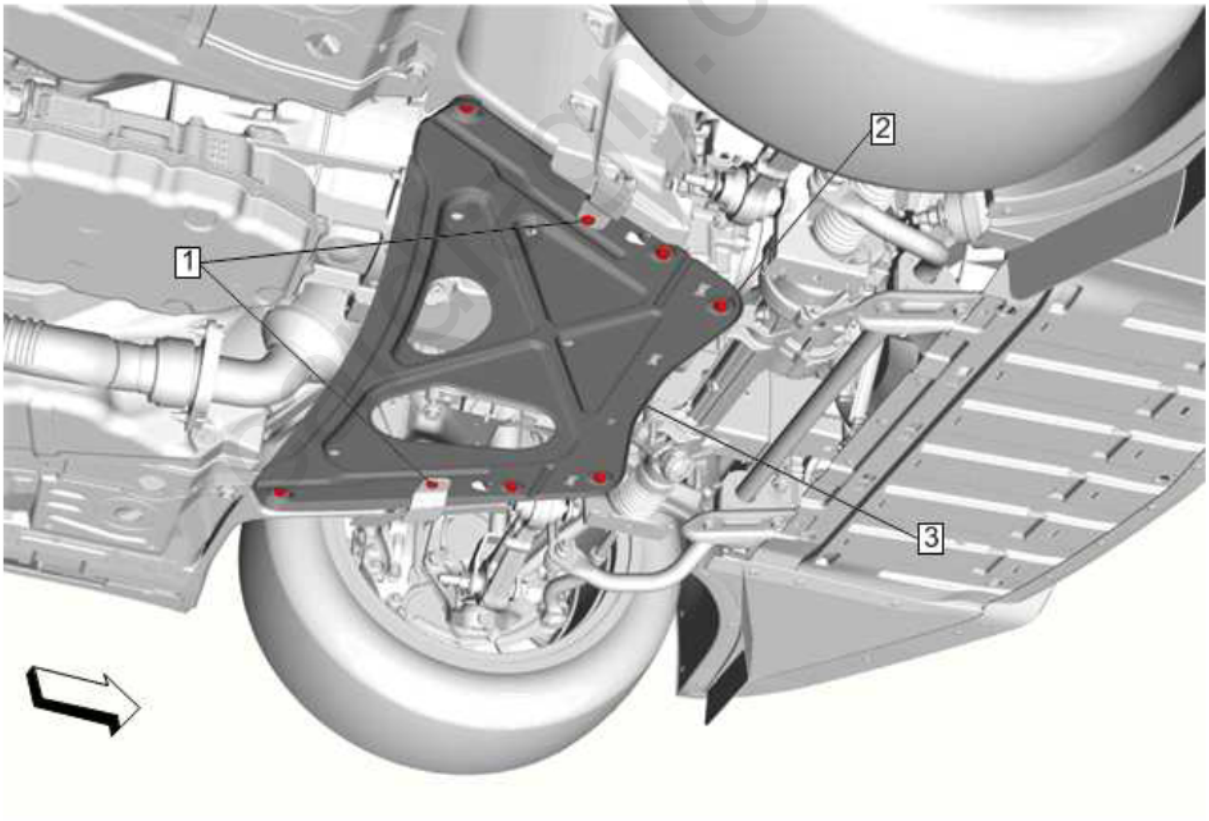


Fig. 379: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

6. Engine Lower Front Splash Shield (2)Â» Install - **Engine Lower Front Splash Shield Replacement (LTG)**

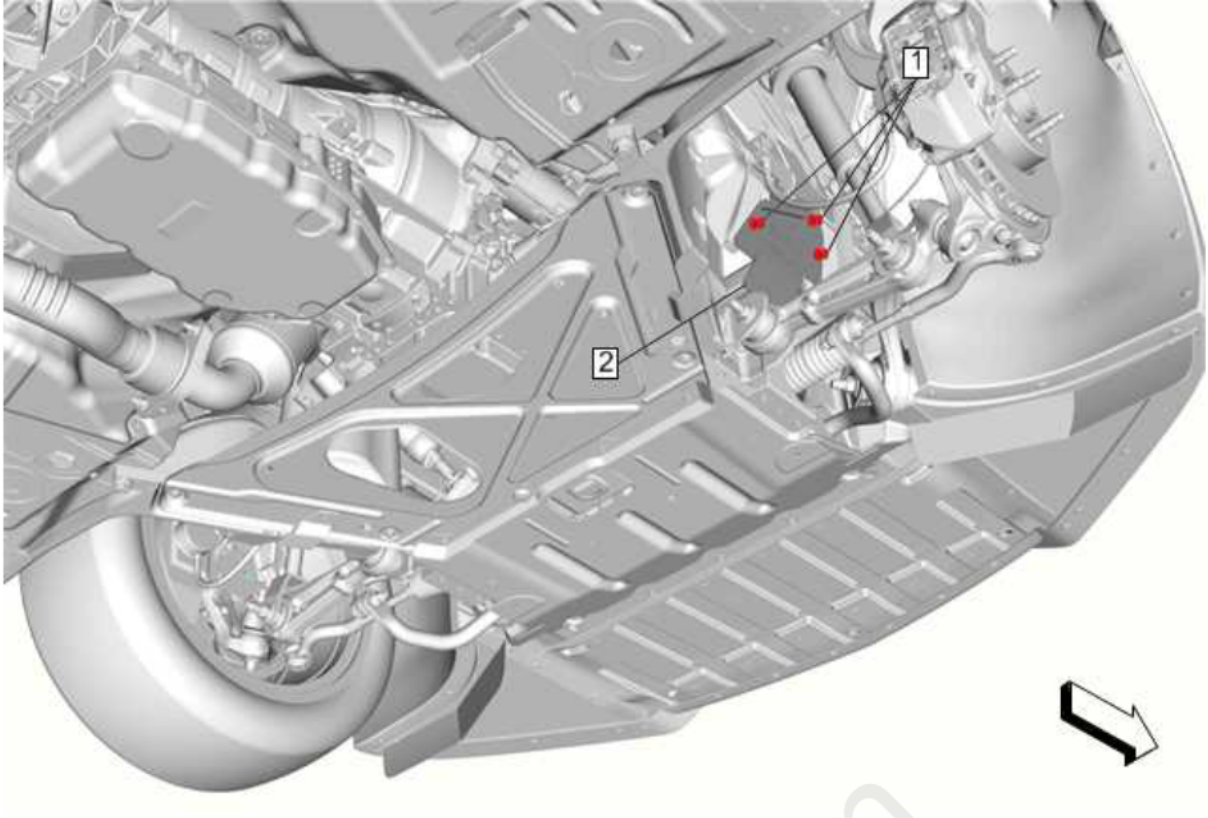


Fig. 380: Engine Lower Front Splash Shield (LTG)
Courtesy of GENERAL MOTORS COMPANY

7. Fill the cooling system. Refer to Cooling System Draining and Filling (Static LTG with HP9) Cooling System Draining and Filling (GE 47716 LTG with HP9)
8. Enable the high voltage system. Refer to High Voltage Enabling
9. Start the engine and check for coolant leaks.

HEATER INLET AND OUTLET PIPE REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Remove - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

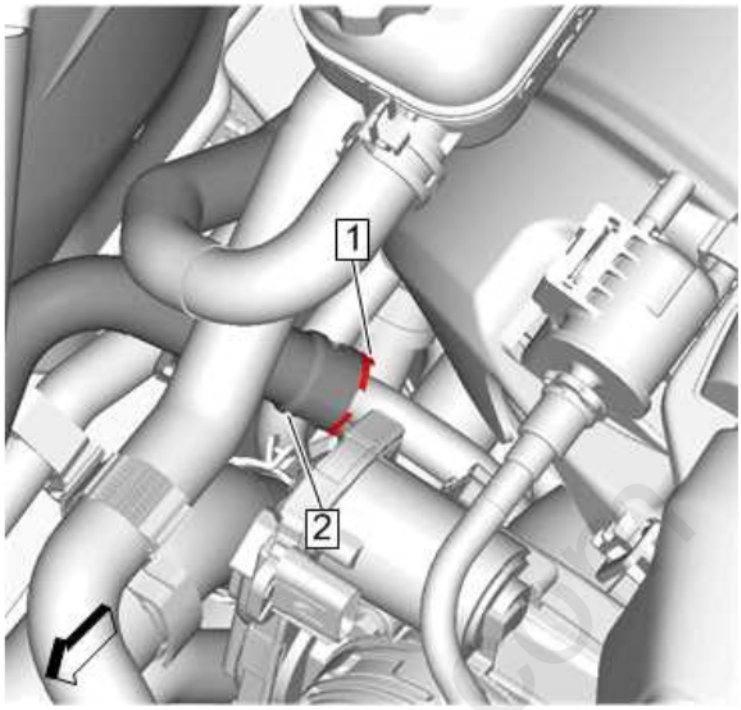


Fig. 381: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Drivetrain and Front Suspension Cradle Plate (3)Â» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

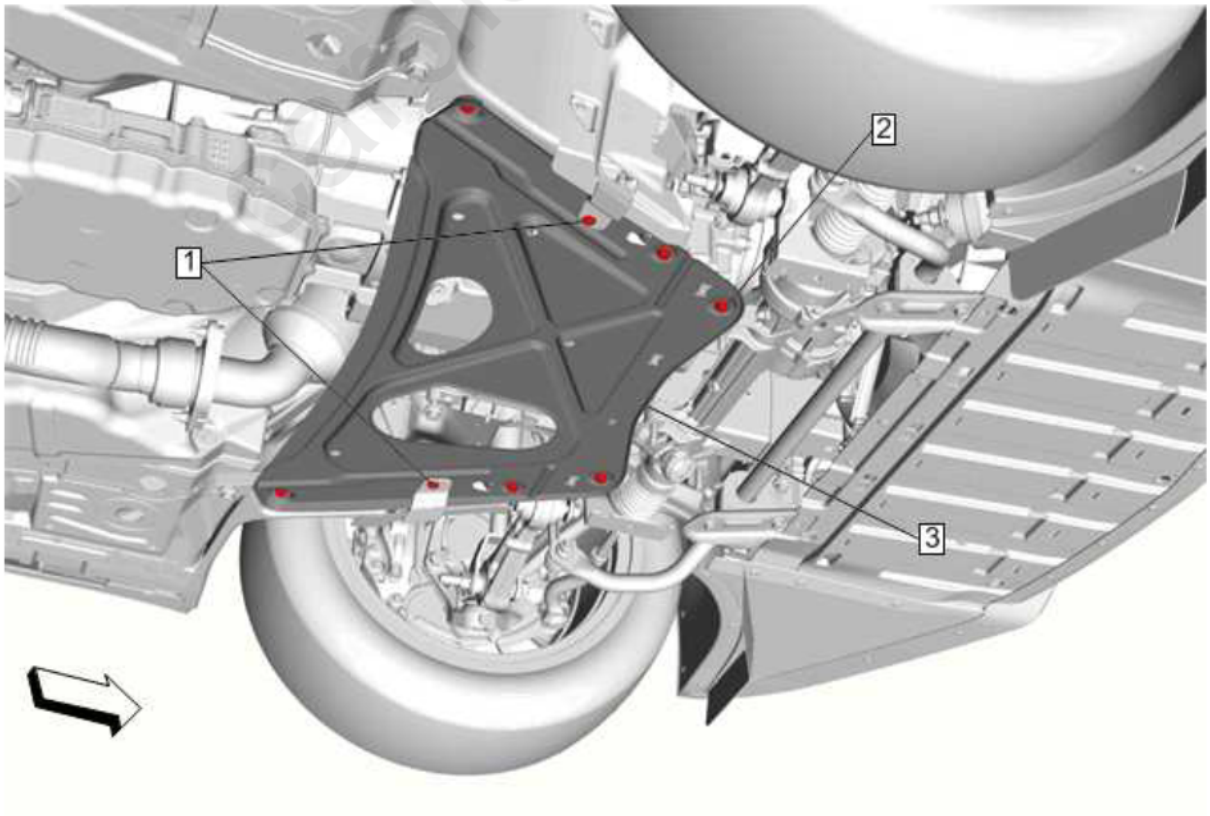


Fig. 382: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet and Outlet Pipe Bolt (1) @ Radiator Inlet PipeÂ» Remove

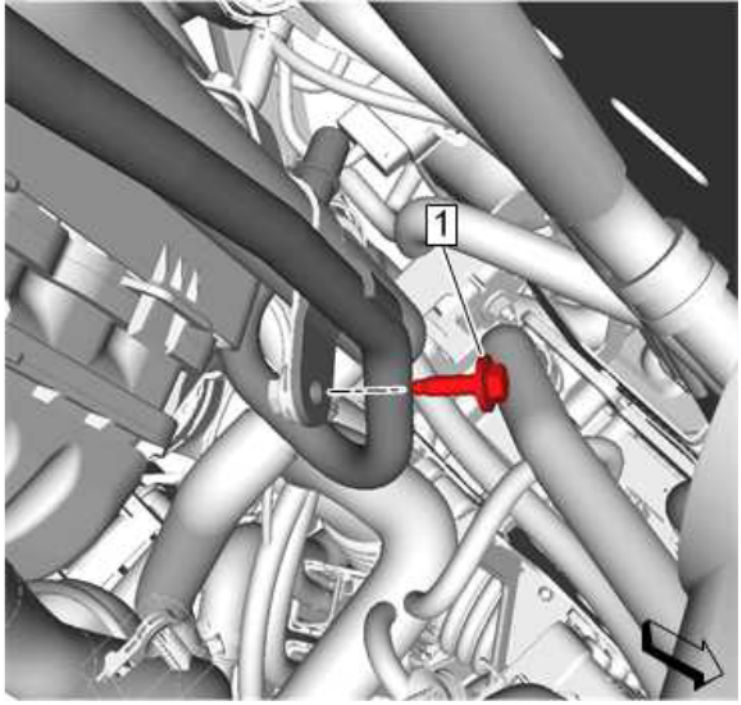


Fig. 383: Heater Inlet and Outlet Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

6. TransmissionÂ» Remove - **Transmission Replacement**
7. Heater Inlet and Outlet Pipe Clamp (1)Â» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

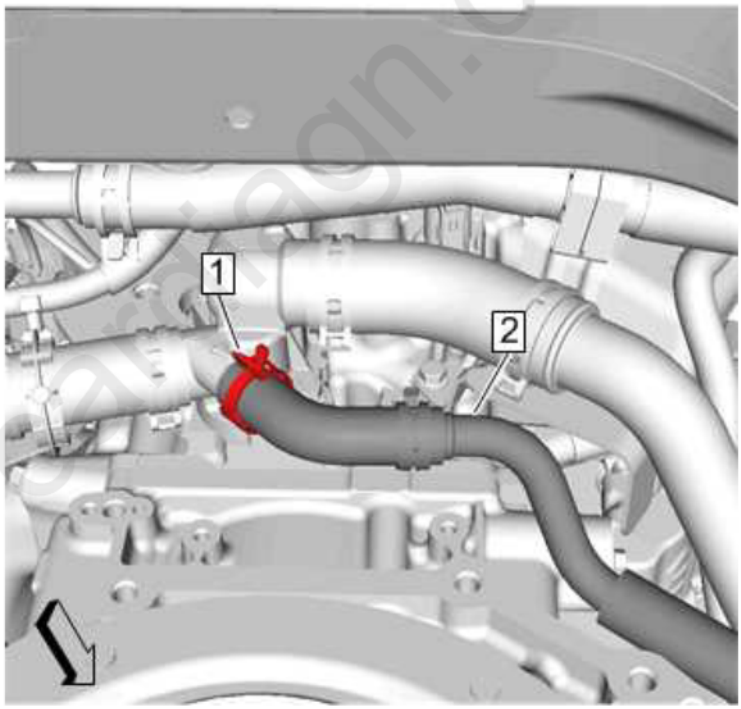


Fig. 384: Heater Inlet and Outlet Pipe Clamp
Courtesy of GENERAL MOTORS COMPANY

8. Heater Inlet and Outlet Pipe (2) @ Water OutletÂ» Remove
9. Heater Inlet and Outlet Pipe (2)Â» Remove
10. Transfer components as necessary.

Installation Procedure

1. Heater Inlet and Outlet Pipe (2) @ Water OutletÂ» Install

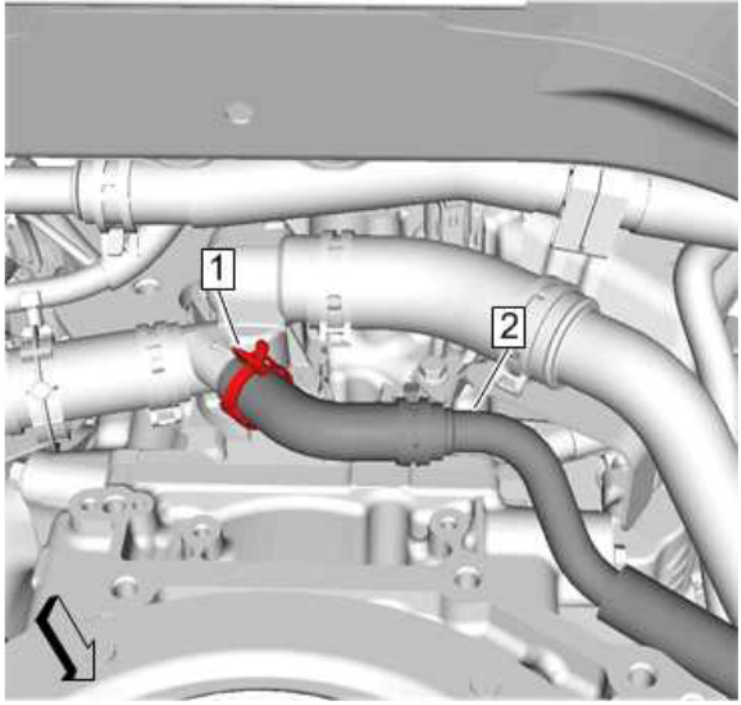


Fig. 385: Heater Inlet and Outlet Pipe Clamp
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet and Outlet Pipe Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
3. TransmissionÂ» Install - **Transmission Replacement**
4. Heater Inlet and Outlet Pipe Bolt (1) @ Radiator Inlet PipeÂ» Install and tighten 9 N.m (80 lb in)

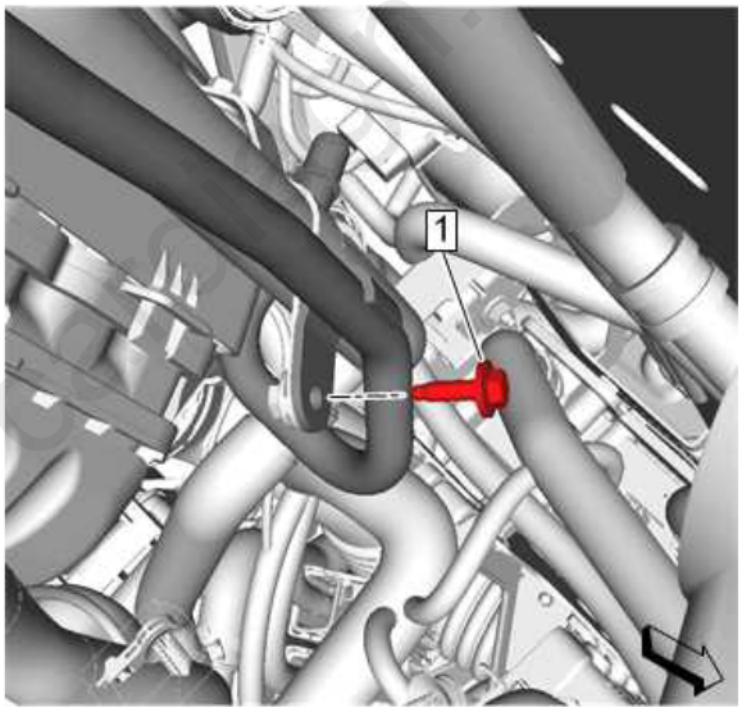


Fig. 386: Heater Inlet and Outlet Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

5. Drivetrain and Front Suspension Cradle Plate (3)Â» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

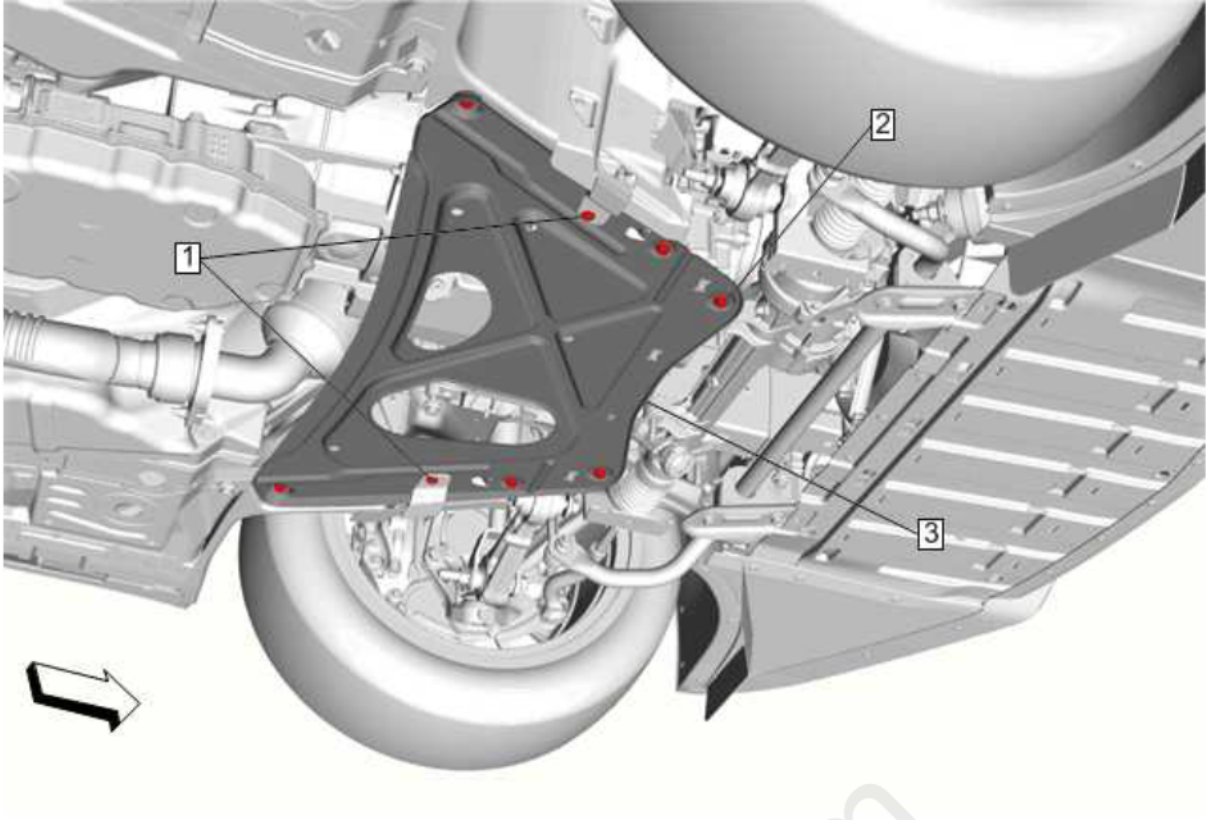


Fig. 387: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Install - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

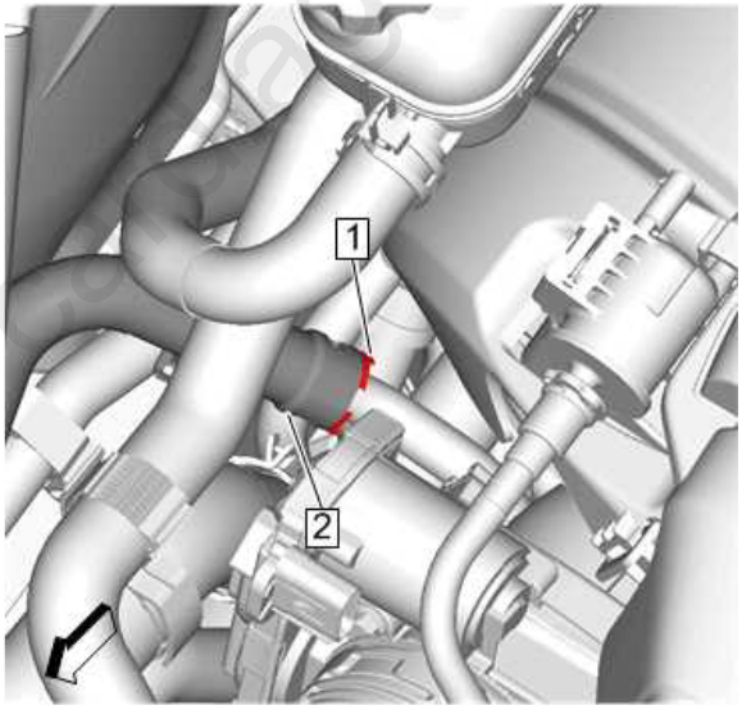


Fig. 388: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
8. Enable the high voltage system. Refer to **High Voltage Enabling**
9. Start the engine and check for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (AT HEATER CORE TUBE LGW LTG WITHOUT HP9)

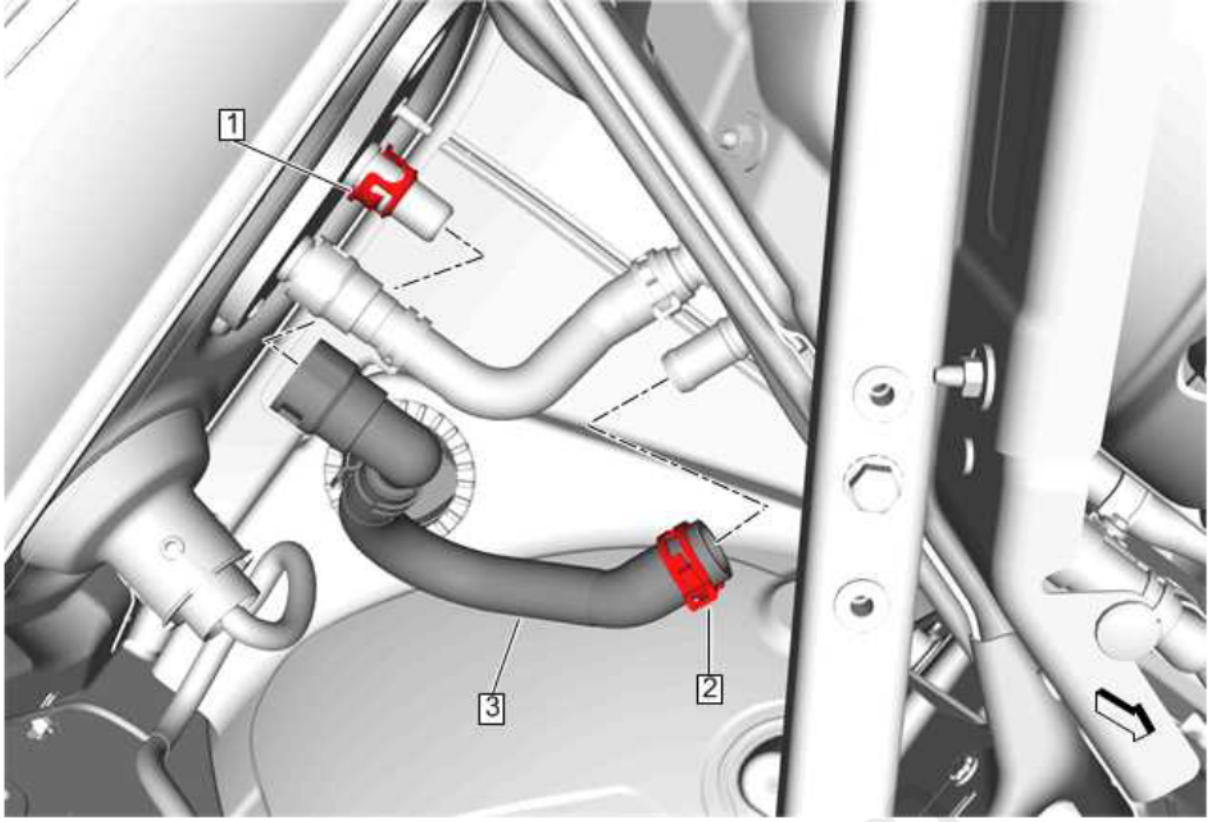


Fig. 389: Heater Outlet Hose (At Heater Core Tube LGW LTG without HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Inlet Grille Panel Access Hole Cover Replacement** - Right Side	
1	Heater Outlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Outlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Outlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (AUXILIARY HEATER INLET AND OUTLET PIPE TO AUXILIARY AIR CONDITIONING EVAPORATOR INTERMEDIATE TUBE LGW LGX)

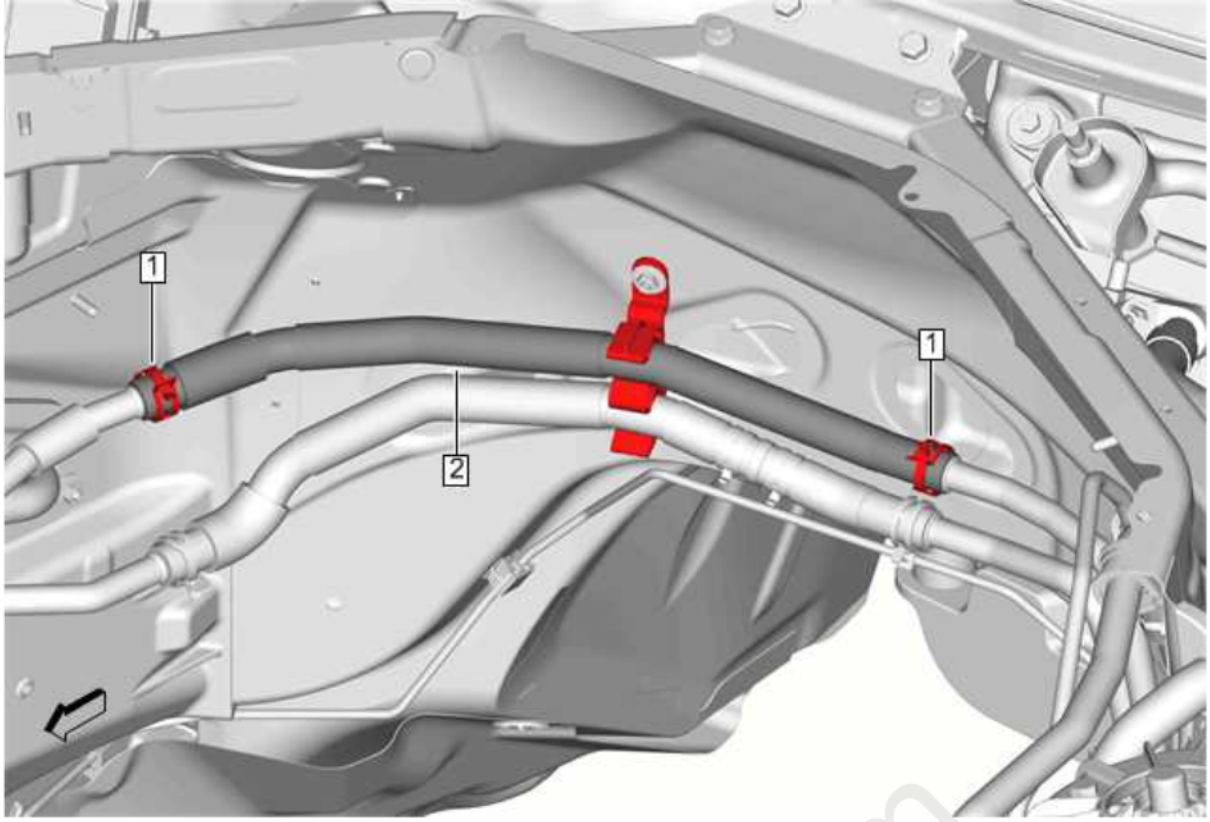


Fig. 390: Heater Outlet Hose (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Engine Replacement (LGW) Engine Replacement (LGX)	
1	Heater Outlet Hose Clamp [2x]
2	Heater Outlet Hose **Procedure** 1. Heater Outlet Hose @ Heater Outlet Hose RetainerÂ» Remove 2. Fill the cooling system to the proper level. Refer to Cooling System Draining and Filling (Static without HP9) and/or Cooling System Draining and Filling (GE 47716 without HP9) 3. Inspect for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (AT HEATER CORE TUBE LGX)

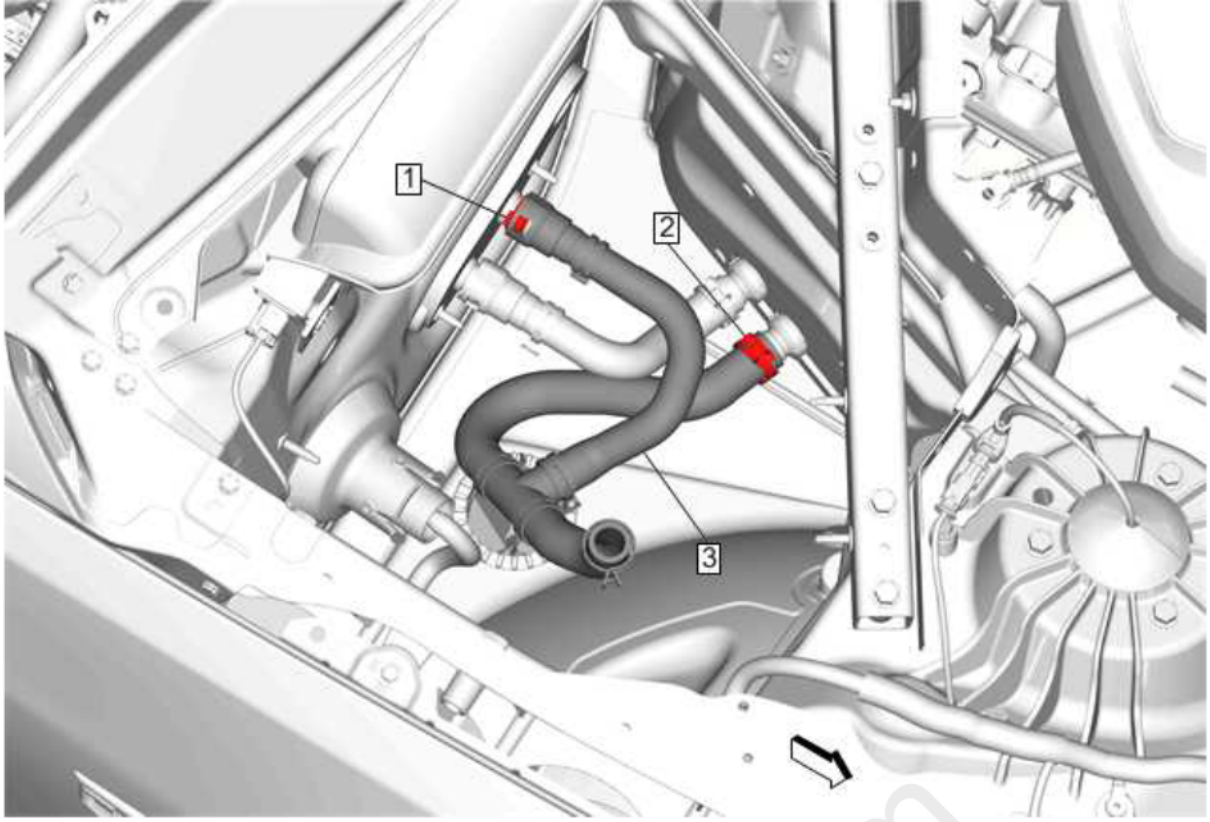


Fig. 391: Heater Outlet Hose (At Heater Core Tube LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Inlet Grille Panel Replacement** Â» Remove 3. **Radiator Surge Tank Replacement (LGX)** Â» Remove 4. **Transfer Case Control Module Bracket Replacement** Â» Remove	
1	Heater Outlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Outlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Outlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

HEATER OUTLET HOSE REPLACEMENT (LTG WITH HP9)

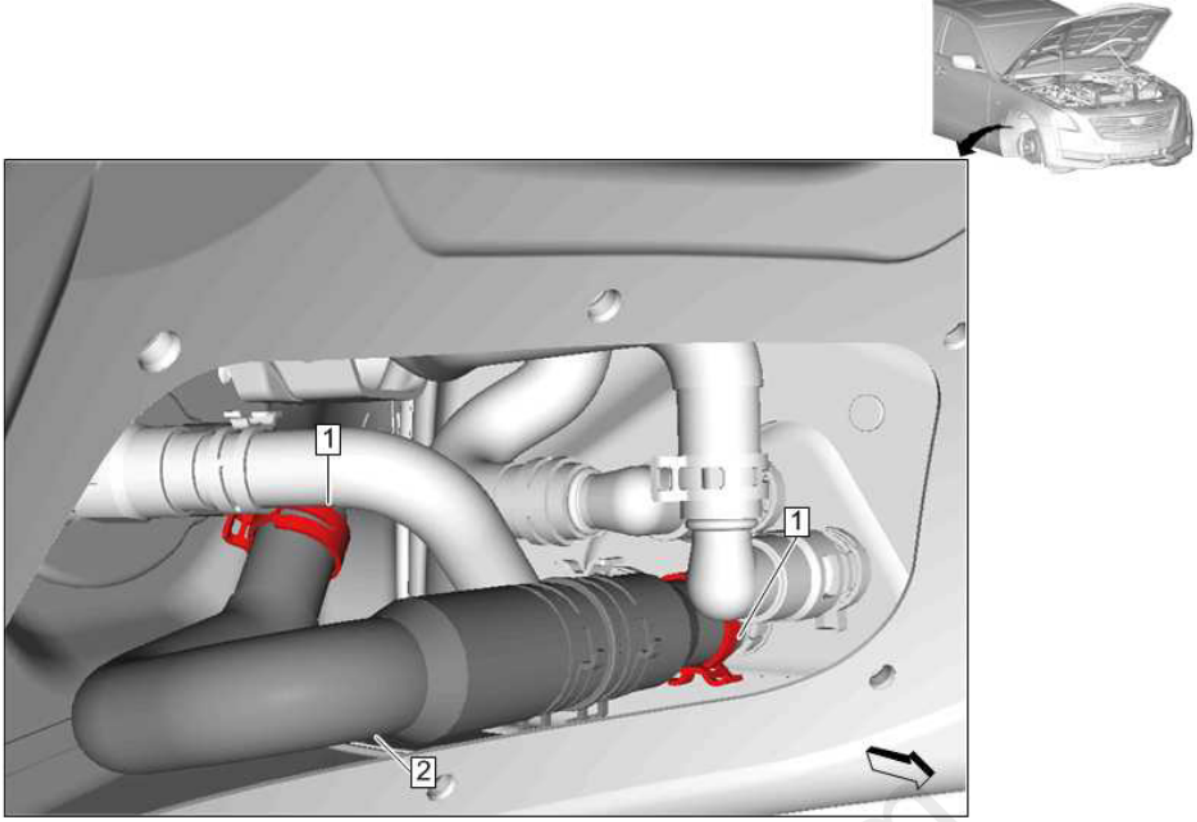


Fig. 392: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name

	WARNING:
	Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.
	
	The High Voltage Disabling procedure includes the following steps:
	• **Identify how to disable high voltage.**
	• **Identify how to test for the presence of high voltage.**
	• **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**
	
	Before working on any high voltage system, be sure to wear the following Personal Protection Equipment:
	• **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**
	
	Failure to follow the procedures may result in serious injury or death.
	
	Preliminary Procedures
	1. Disable the high voltage system. Refer to **High Voltage Disabling**
	2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
	3. **Front Wheelhouse Front Panel Replacement (HP9)**

1	Heater Outlet Hose Clamp [2x] **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
2	Heater Outlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)** 2. Enable the high voltage system. Refer to **High Voltage Enabling** 3. Start the engine and check for coolant leaks.

HEATER INLET PIPE CONNECTOR REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**

- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the engine cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Drain the power electronics and auxiliary radiator cooling system. Refer to **Power Electronics and Auxiliary Radiator Drain and Fill (LTG HP9)**
4. Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Heater Outlet Hose Replacement (LTG with HP9)**

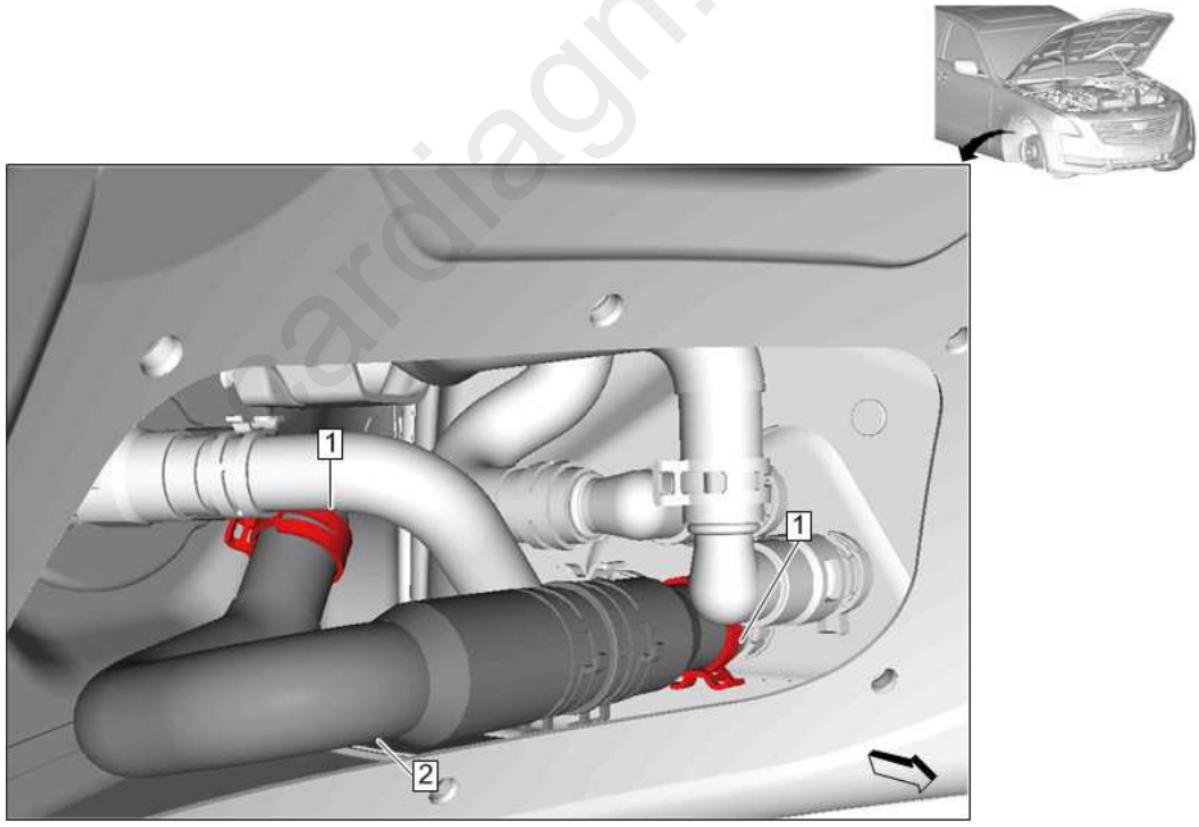


Fig. 393: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet Hose (3) @ Heater Inlet Pipe ConnectorÂ» Remove - **Heater Inlet Hose Replacement (LTG with HP9)**

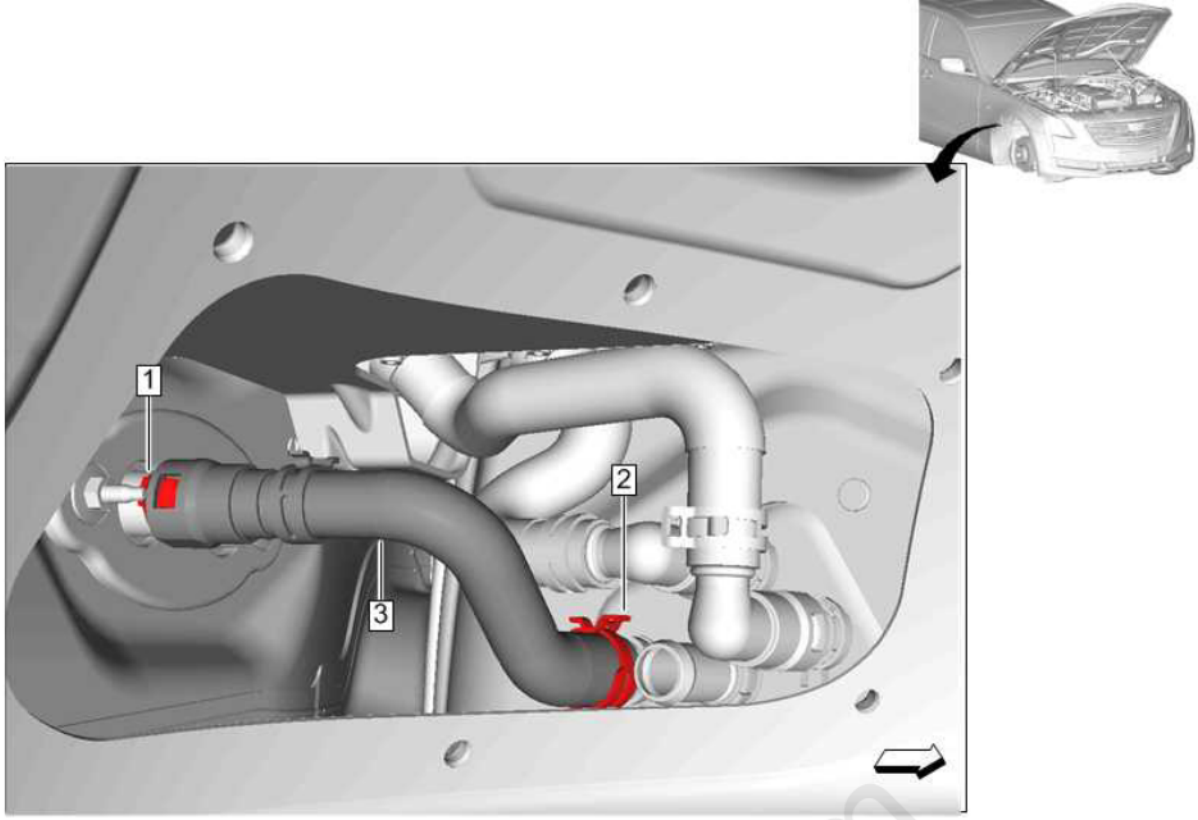


Fig. 394: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Drive Motor Generator Control Module Cooling Outlet Hose (6) @ Heater Inlet Pipe ConnectorÂ» Remove - **Drive Motor Generator Control Module Cooling Outlet Hose Replacement**

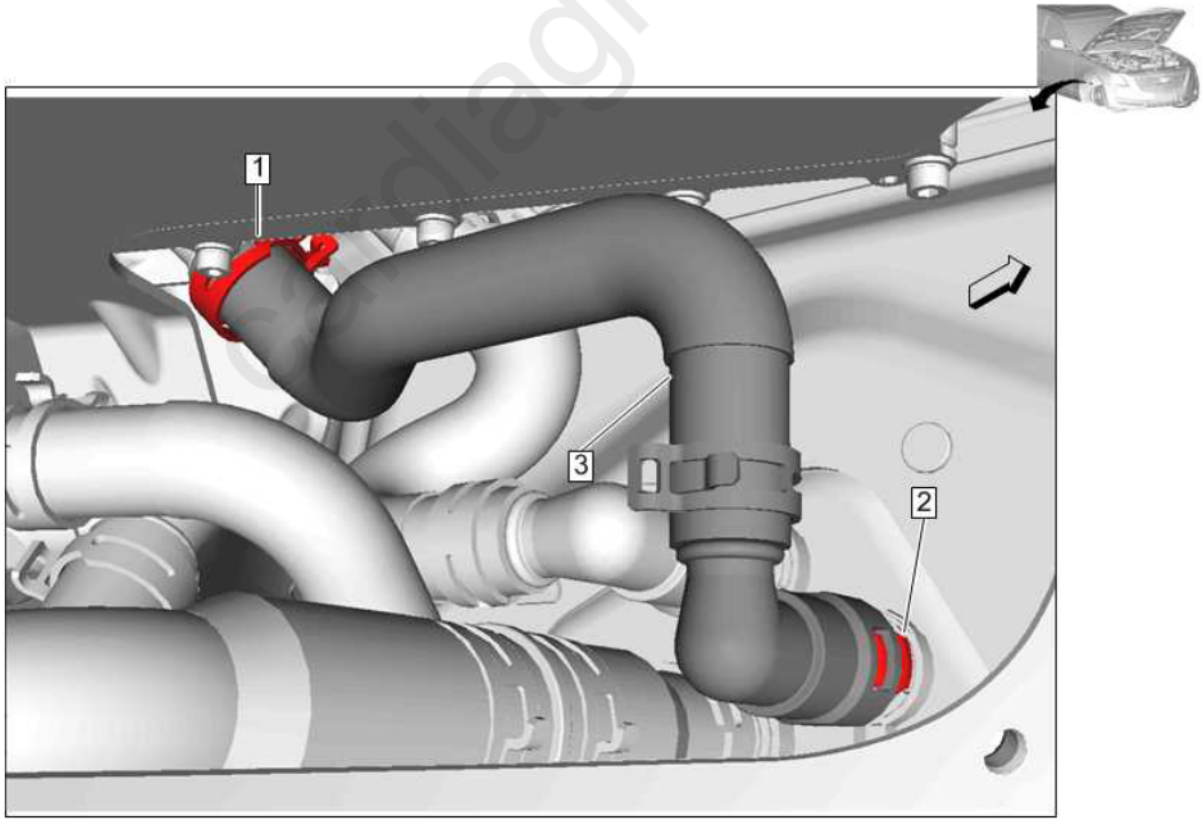


Fig. 395: Drive Motor Generator Control Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Drive Motor Power Inverter Module Cooling Inlet Hose (3) @ Heater Inlet Pipe ConnectorÂ» Remove - **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Drive Motor Power Inverter Module to Heater Inlet Pipe Connector)** and/or **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Heater Inlet Pipe Connector Auxiliary Air Conditioning Evaporator Intermediate Tube to Heater Inlet Pipe Connector)**

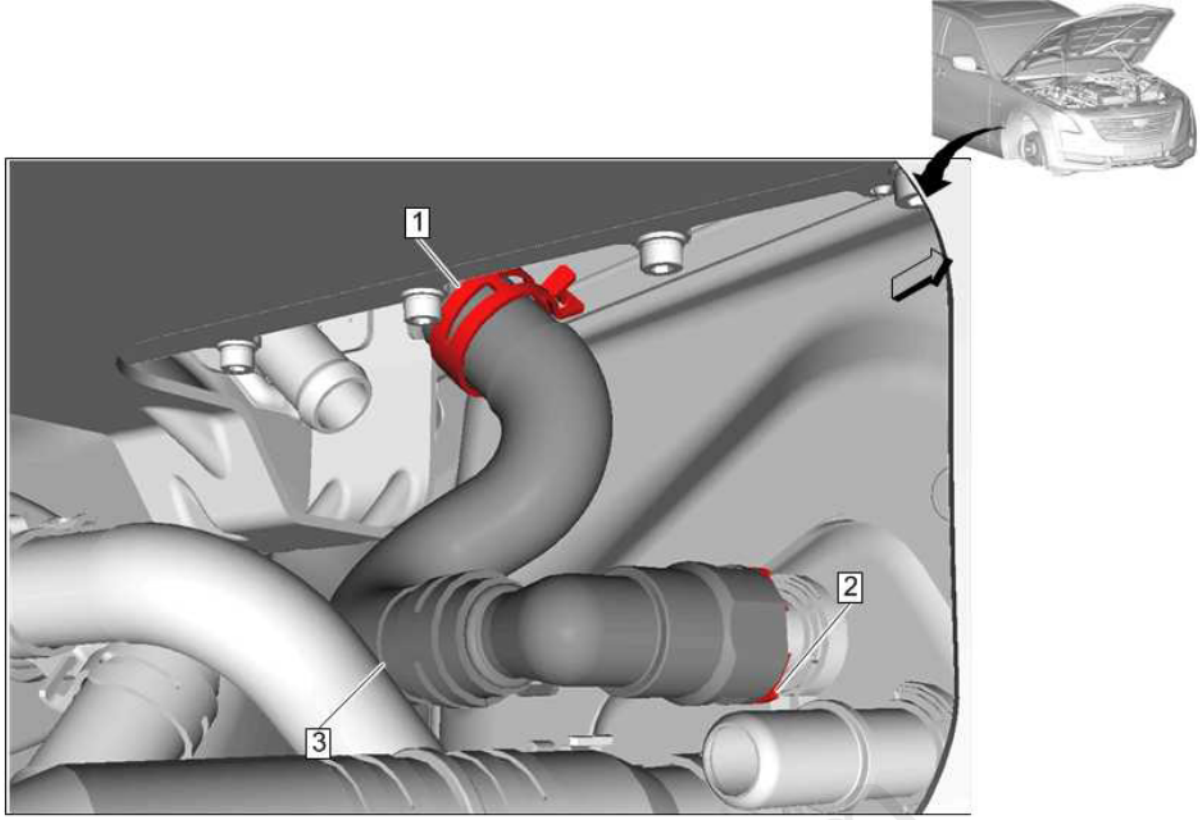


Fig. 396: Drive Motor Power Inverter Module Cooling Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Auxiliary Heater Outlet Hose Replacement (LTG with HP9)**

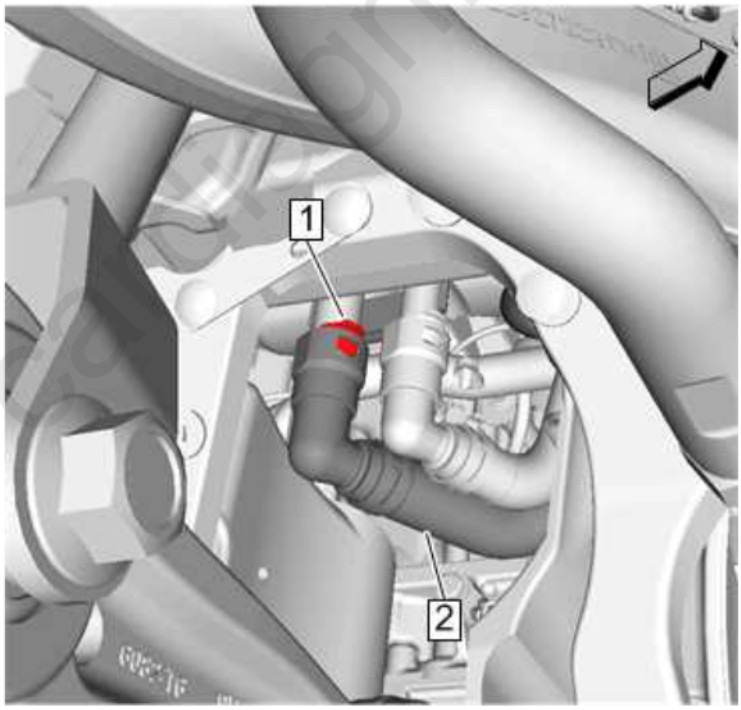


Fig. 397: Auxiliary Heater Outlet Hose Retainer
Courtesy of GENERAL MOTORS COMPANY

9. Generator Control Module Coolant Radiator Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Generator Control Module Coolant Radiator Hose Replacement**

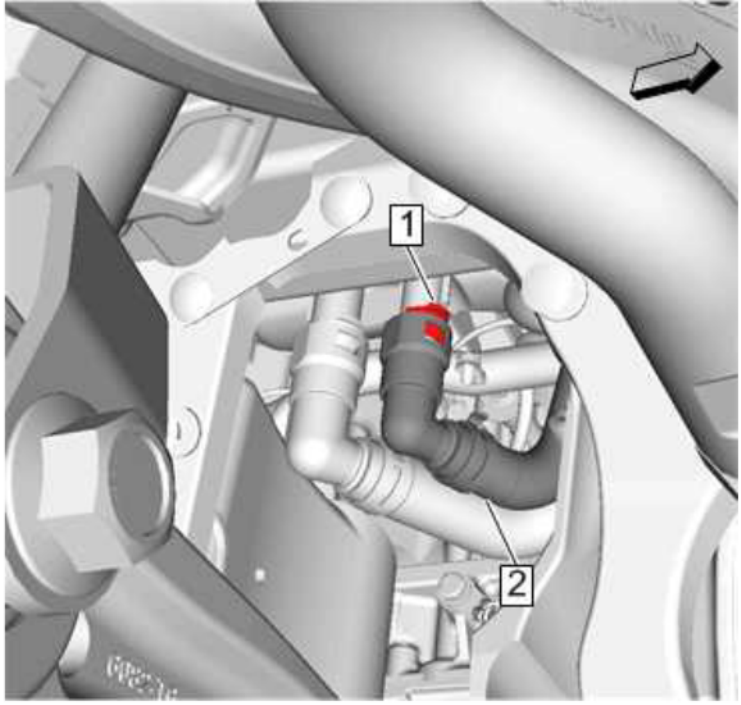


Fig. 398: Generator Control Module Coolant Radiator Hose
Courtesy of GENERAL MOTORS COMPANY

10. Generator Control Module Coolant Tank Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Generator Control Module Coolant Tank Hose Replacement**

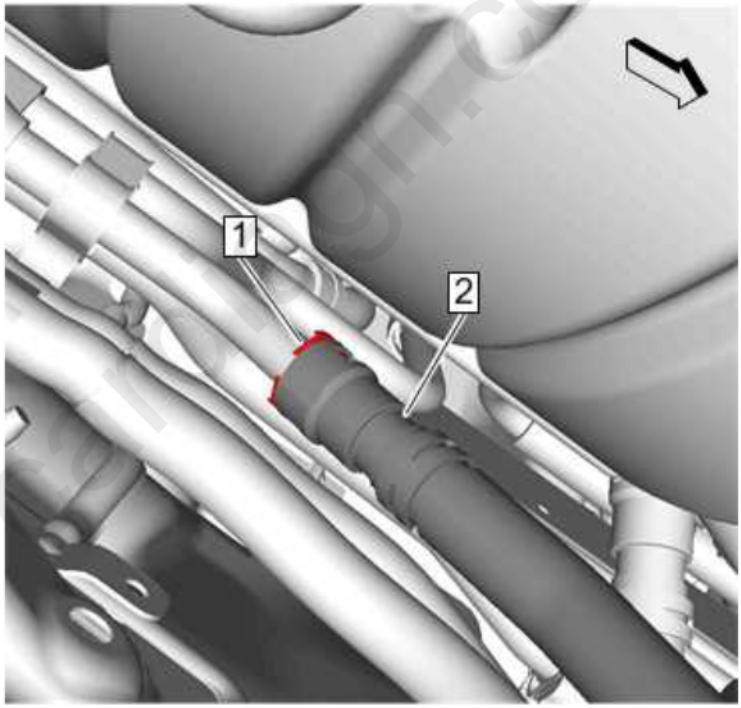


Fig. 399: Generator Control Module Coolant Tank Hose
Courtesy of GENERAL MOTORS COMPANY

11. Drive Motor Power Inverter Module Cooling Inlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Drive Motor Power Inverter Module to Heater Inlet Pipe Connector)** and/or **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Heater Inlet Pipe Connector Auxiliary Air Conditioning Evaporator Intermediate Tube to Heater Inlet Pipe Connector)**

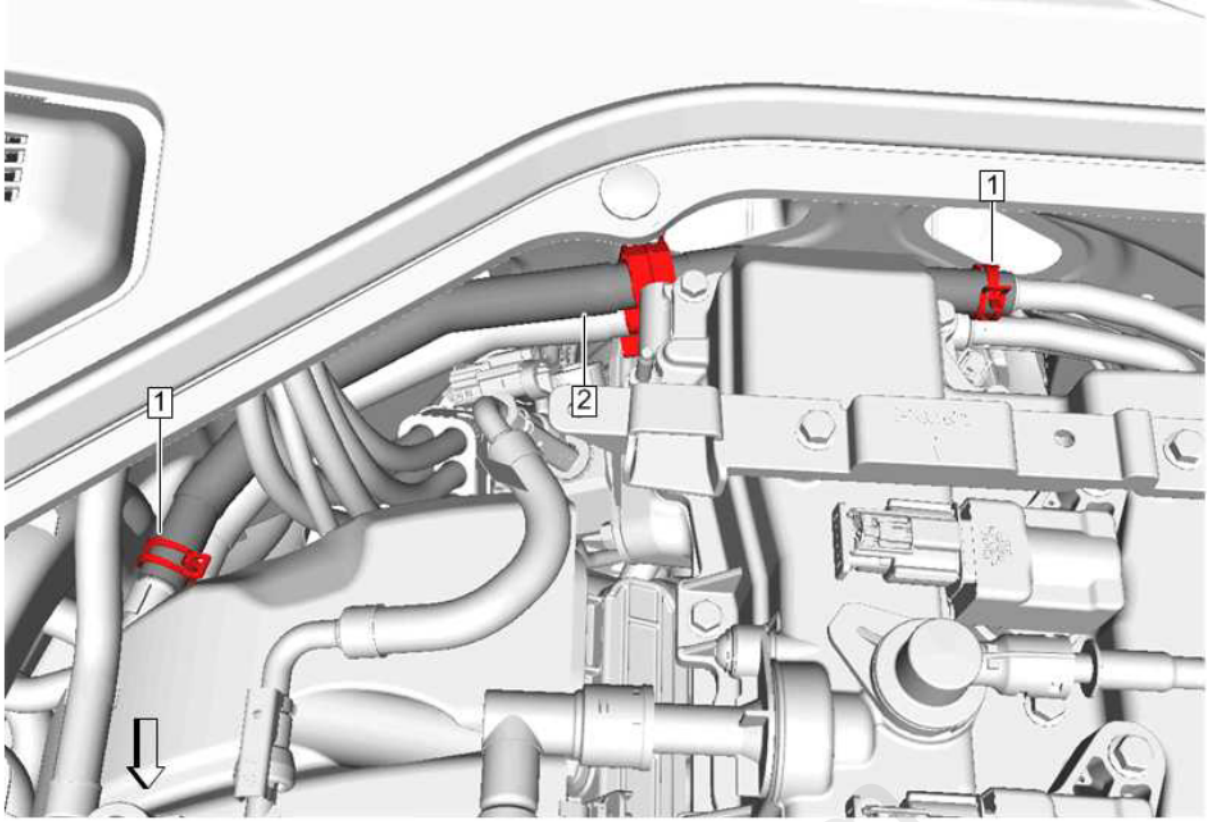


Fig. 400: Drive Motor Power Inverter Module Cooling Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

12. Drive Motor Power Inverter Module Cooling Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Drive Motor Power Inverter Module Cooling Outlet Hose Replacement**

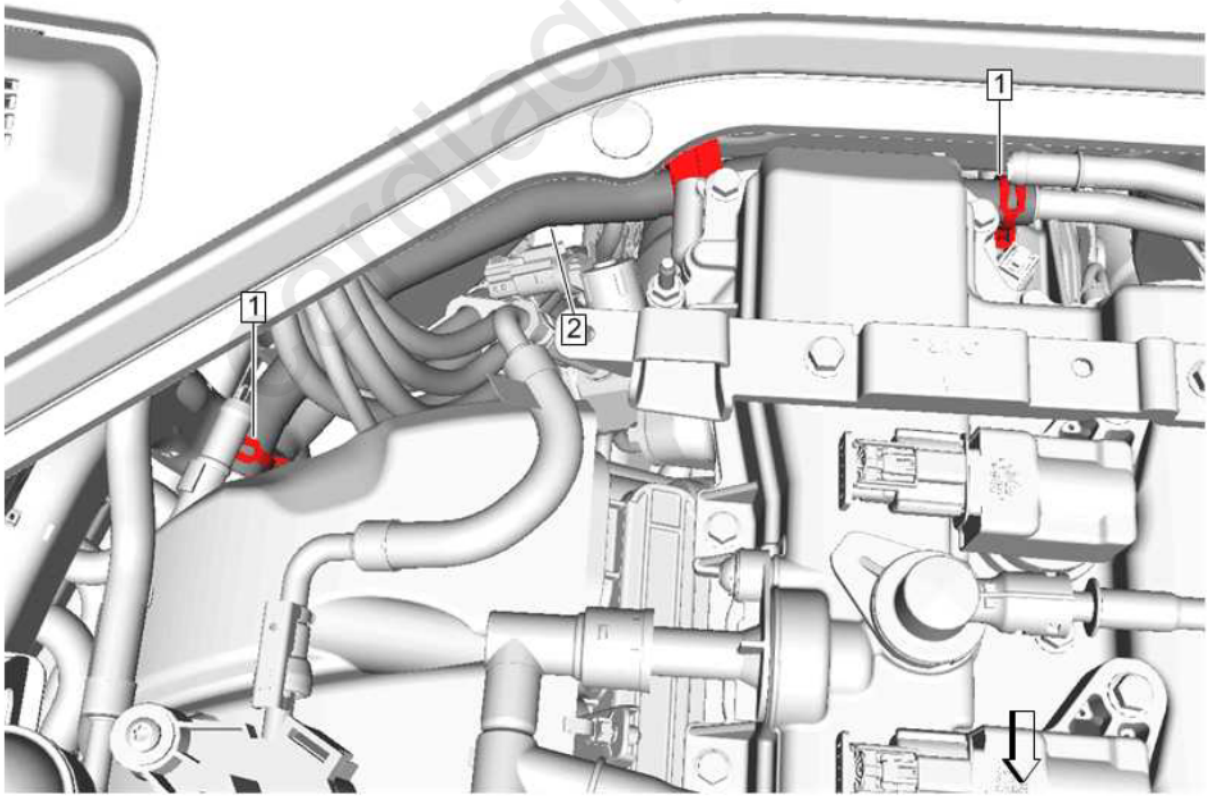


Fig. 401: Drive Motor Power Inverter Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Remove - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

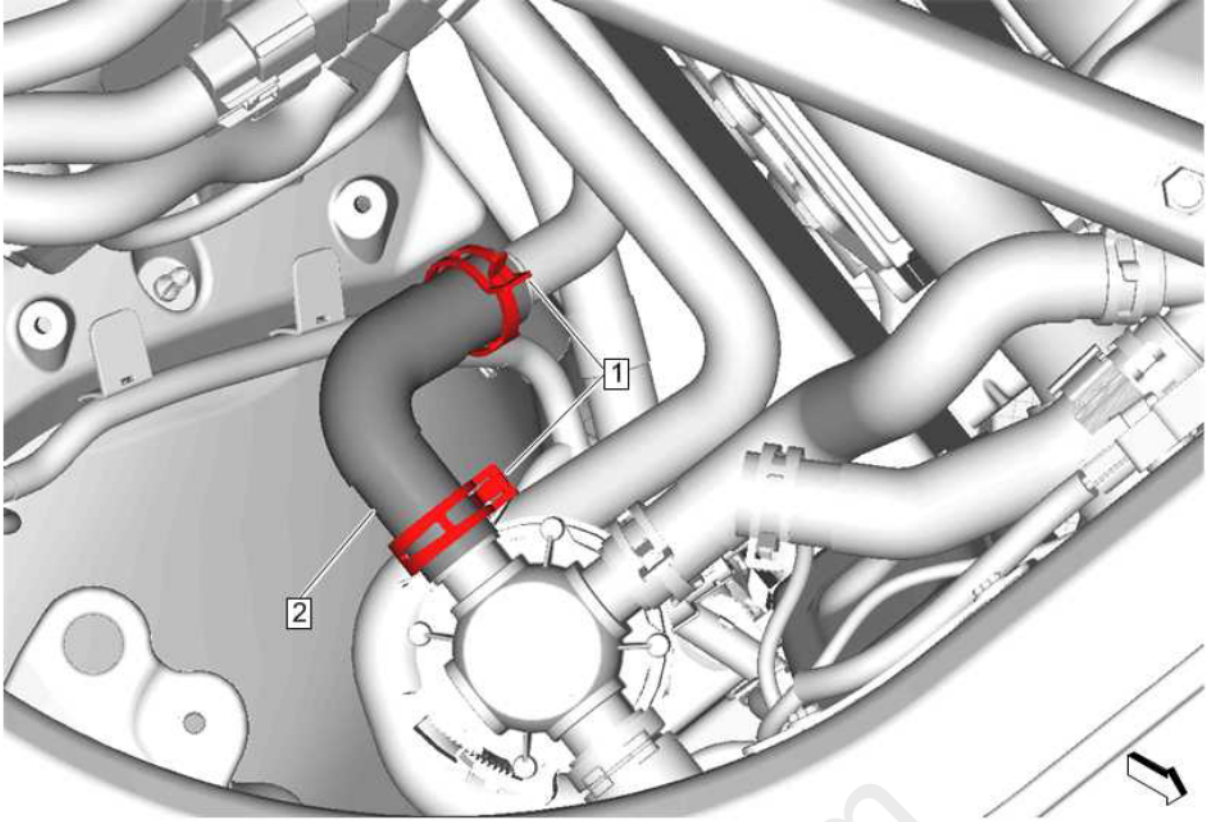


Fig. 402: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

14. Clip (1) @ Front Compartment Side RailÂ» Remove

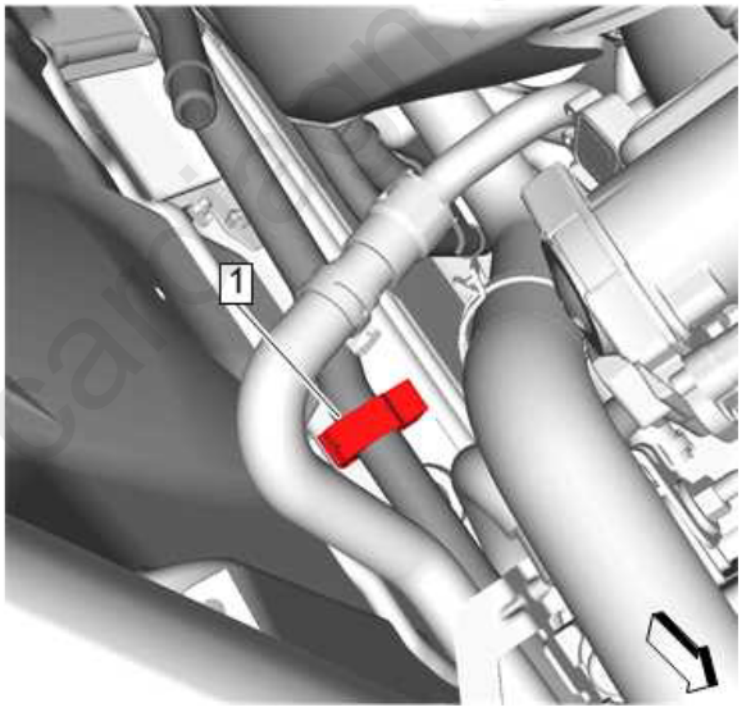


Fig. 403: Clip
Courtesy of GENERAL MOTORS COMPANY

15. Heater Inlet Pipe Connector Bolt (1)Â» Remove

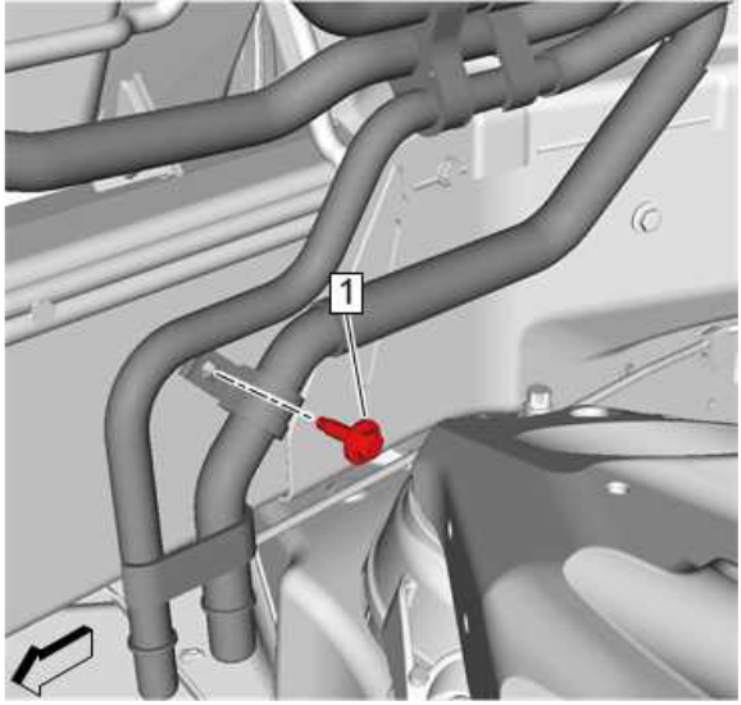


Fig. 404: Heater Inlet Pipe Connector Bolt
Courtesy of GENERAL MOTORS COMPANY

16. Battery Positive and Negative Cable (1) @ Front Wheelhouse Panel BraceÂ» Remove and position aside - **300-Volt Battery Positive and Negative Cable Replacement**

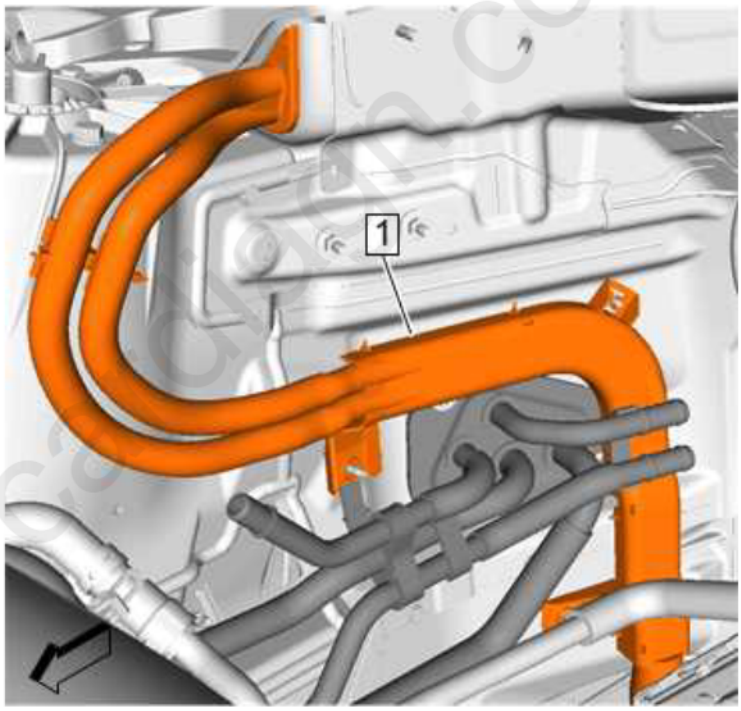


Fig. 405: Battery Positive and Negative Cable
Courtesy of GENERAL MOTORS COMPANY

17. Heater Inlet Pipe Connector Nut (1)Â» Remove [2x]

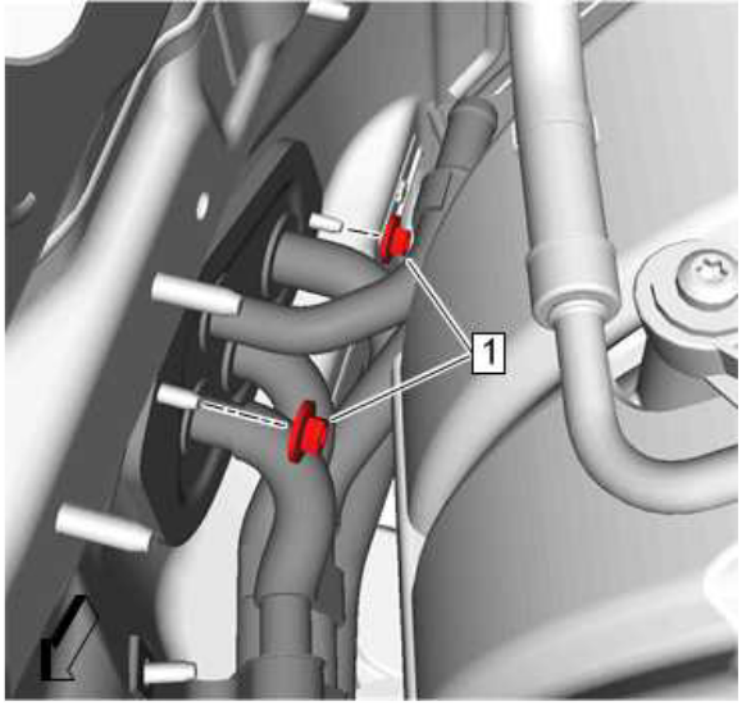


Fig. 406: Heater Inlet Pipe Connector Nut
Courtesy of GENERAL MOTORS COMPANY

18. Heater Inlet Pipe Connector (1) @ Front Wheelhouse Panel BraceÂ» Remove

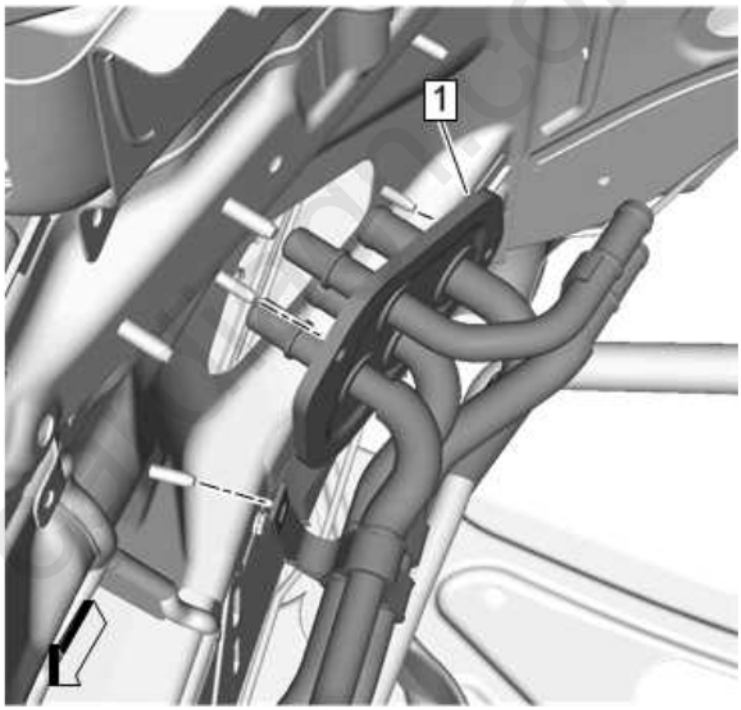


Fig. 407: Heater Inlet Pipe Connector
Courtesy of GENERAL MOTORS COMPANY

19. Heater Inlet Pipe Connector (1)Â» Remove
20. Transfer components as necessary.

Installation Procedure

1. Heater Inlet Pipe Connector (1) @ Front Wheelhouse Panel BraceÂ» Install

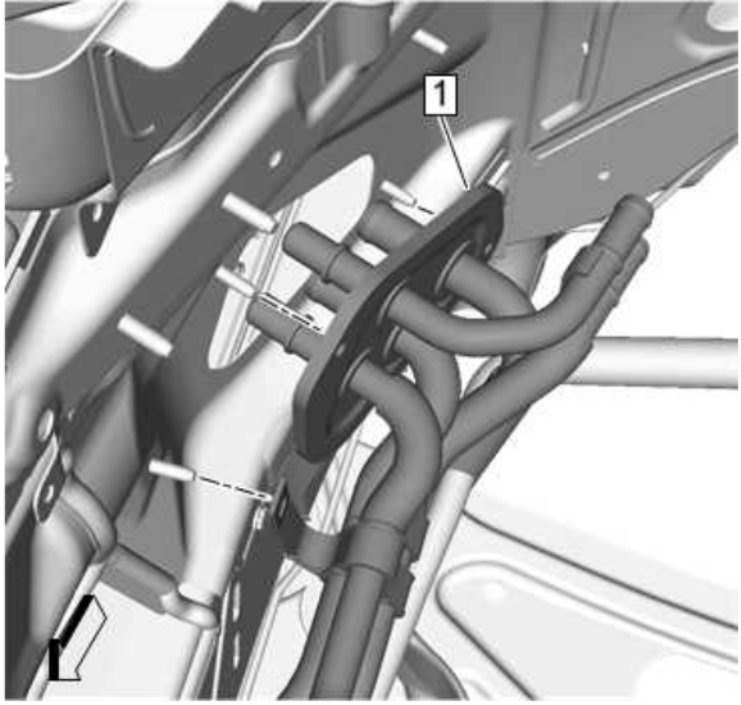


Fig. 408: Heater Inlet Pipe Connector
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Connector Nut (1)Â» Install and tighten [2x] 9 N.m (80 lb in)

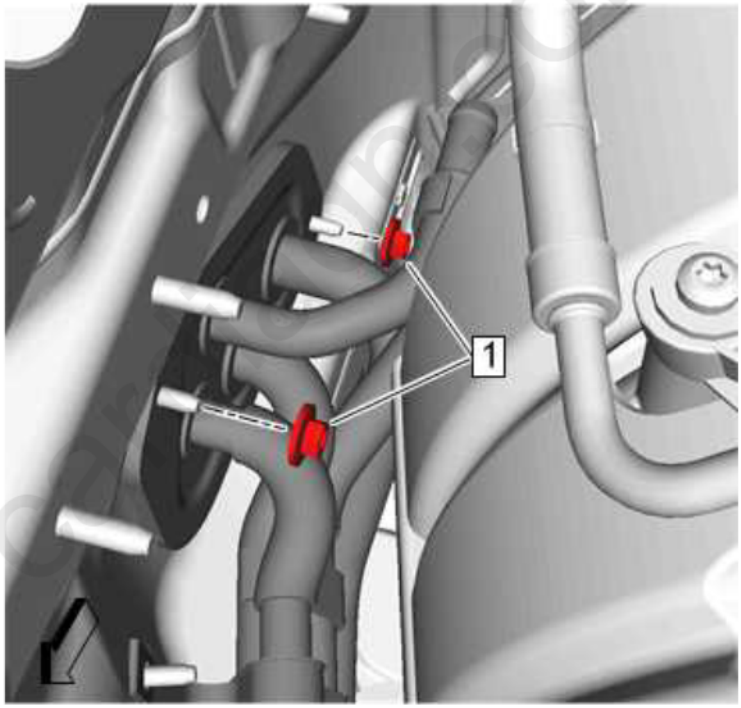


Fig. 409: Heater Inlet Pipe Connector Nut
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Battery Positive and Negative Cable (1) @ Front Wheelhouse Panel BraceÂ» Install - **300-Volt Battery Positive and Negative Cable Replacement**

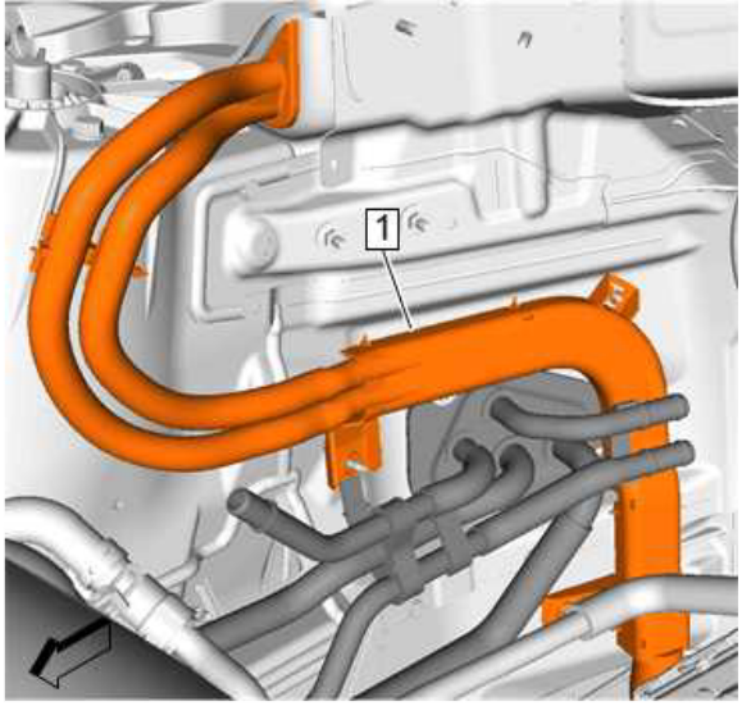


Fig. 410: Battery Positive and Negative Cable
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Pipe Connector Bolt (1)Â» Install and tighten 9 N.m (80 lb in)

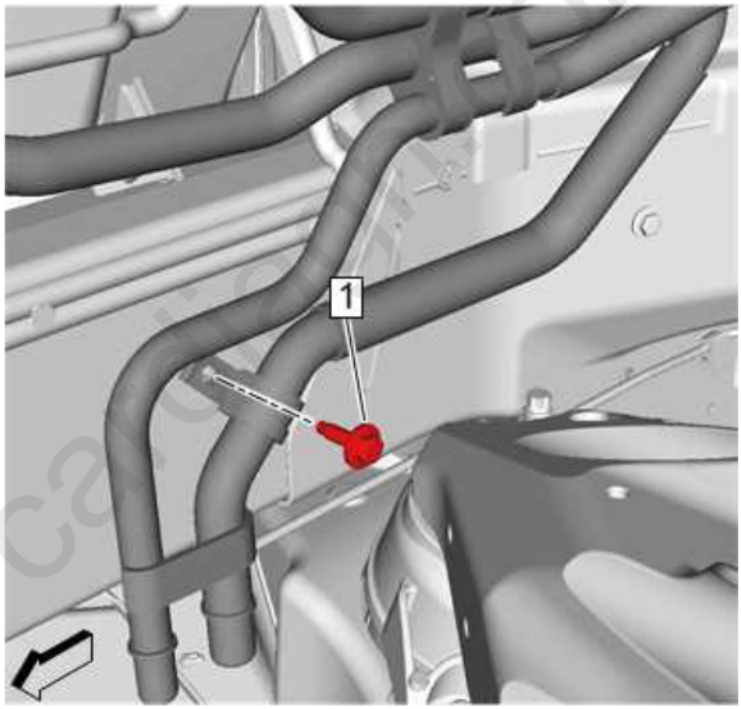


Fig. 411: Heater Inlet Pipe Connector Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Clip (1) @ Front Compartment Side RailÂ» Install

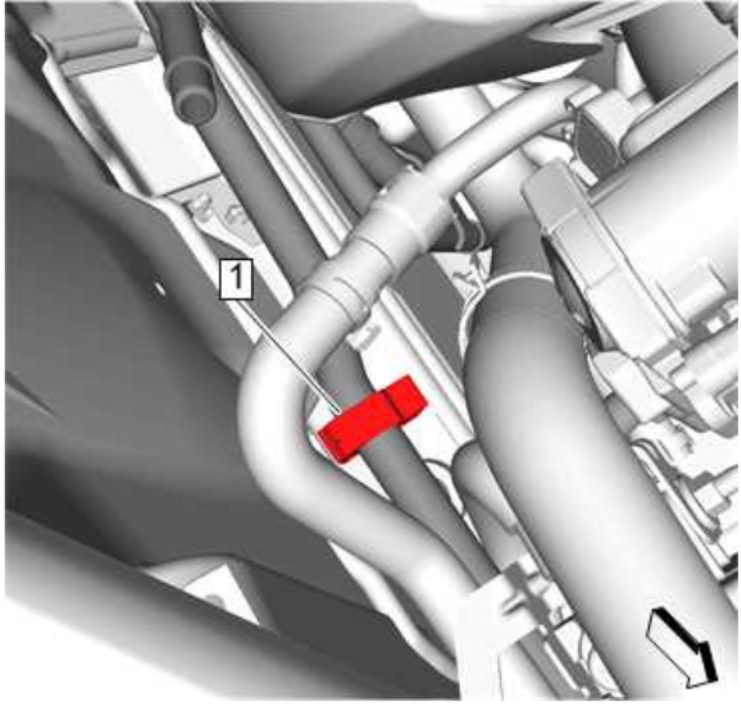


Fig. 412: Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve to Auxiliary Heater Inlet Pipe LTG with HP9)Heater Water Shutoff Valve Inlet Hose Replacement (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)**

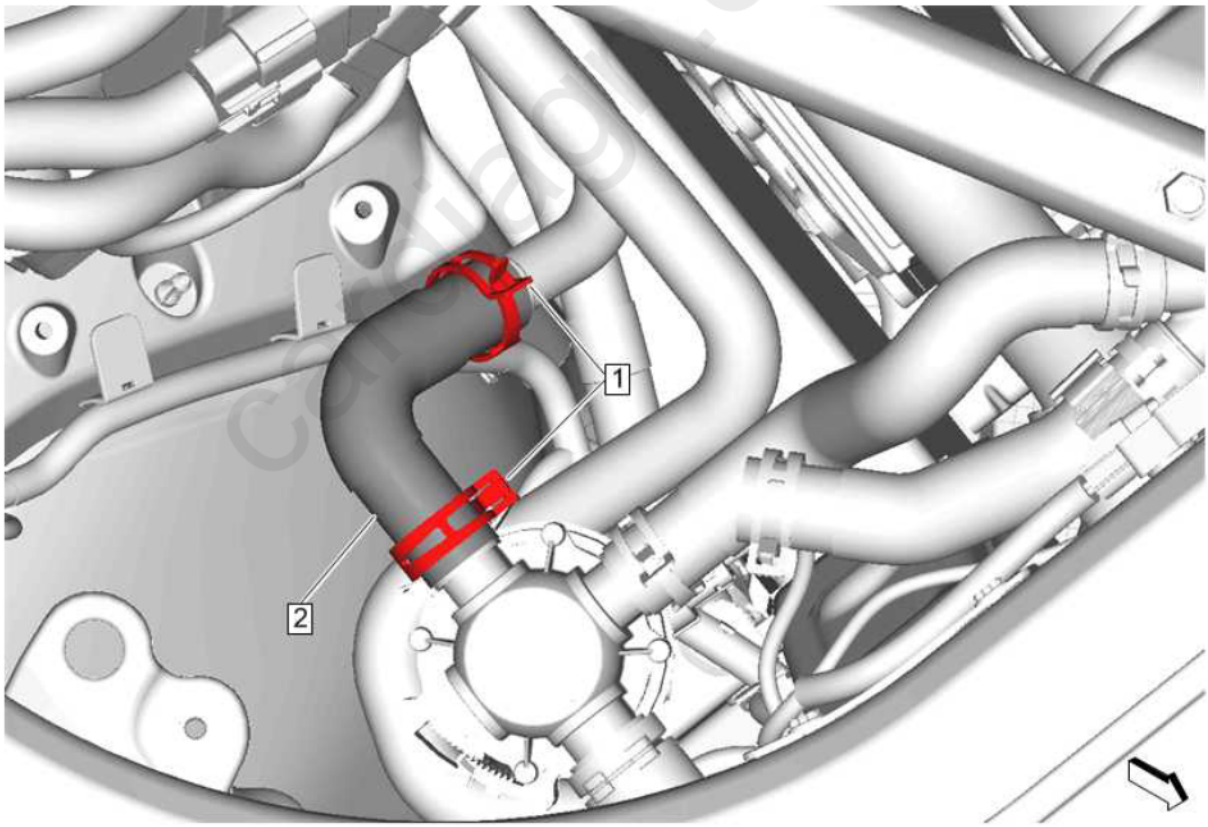


Fig. 413: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Drive Motor Power Inverter Module Cooling Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Drive Motor Power Inverter Module Cooling Outlet Hose Replacement**

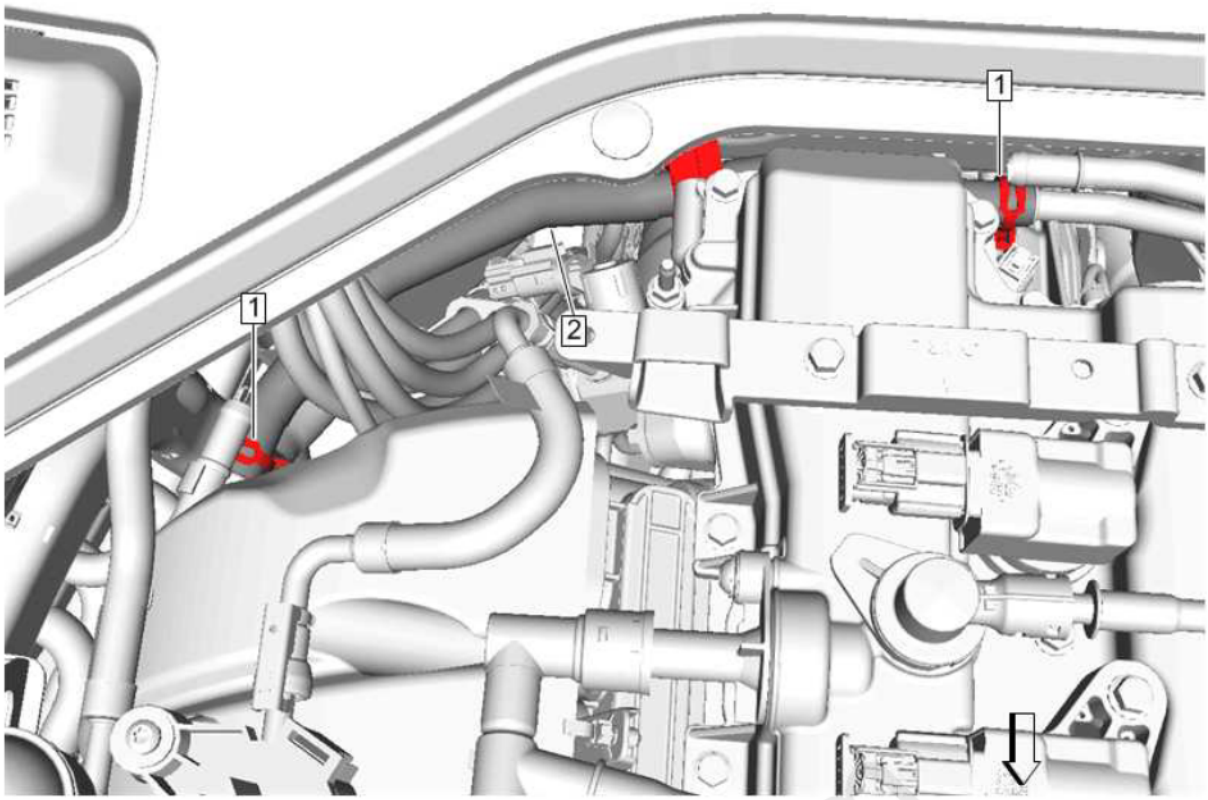


Fig. 414: Drive Motor Power Inverter Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Drive Motor Power Inverter Module Cooling Inlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Drive Motor Power Inverter Module to Heater Inlet Pipe Connector)** **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Heater Inlet Pipe Connector Auxiliary Air Conditioning Evaporator Intermediate Tube to Heater Inlet Pipe Connector)**

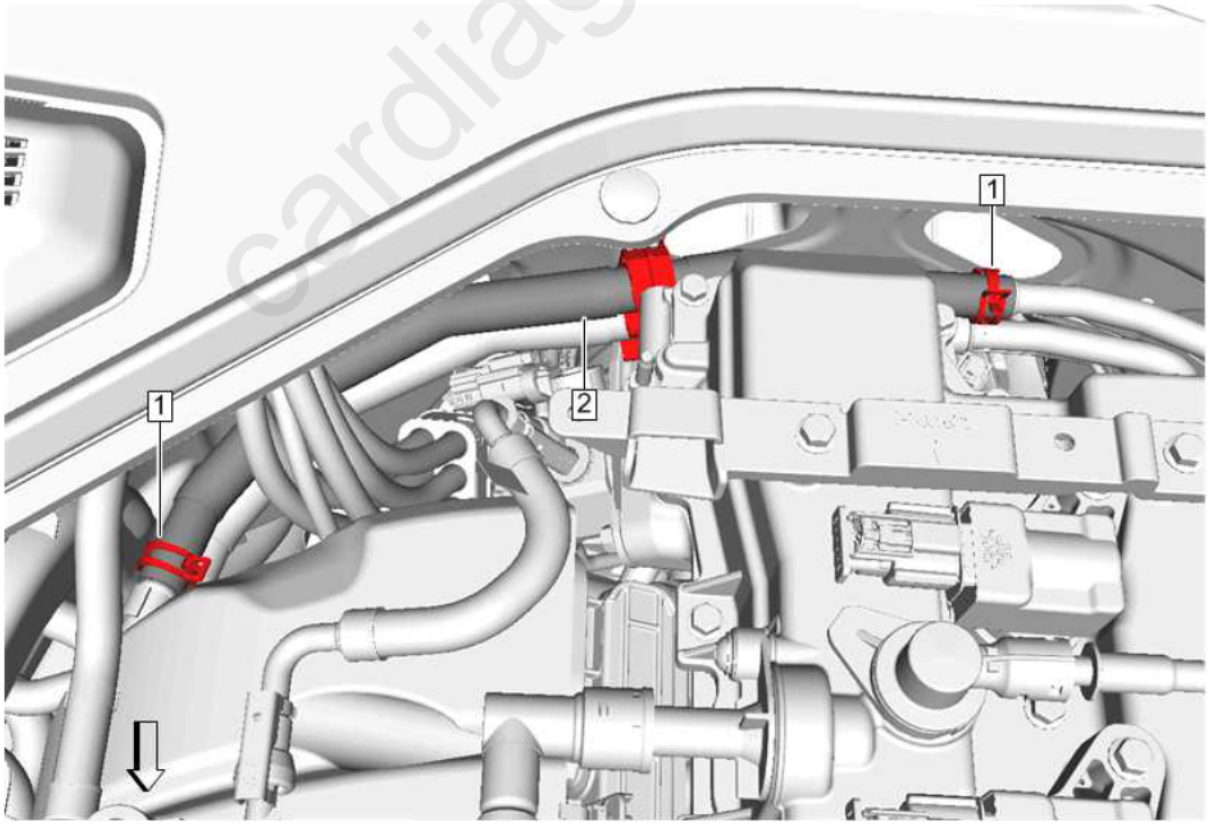


Fig. 415: Drive Motor Power Inverter Module Cooling Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Generator Control Module Coolant Tank Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Generator Control Module Coolant Tank Hose Replacement**

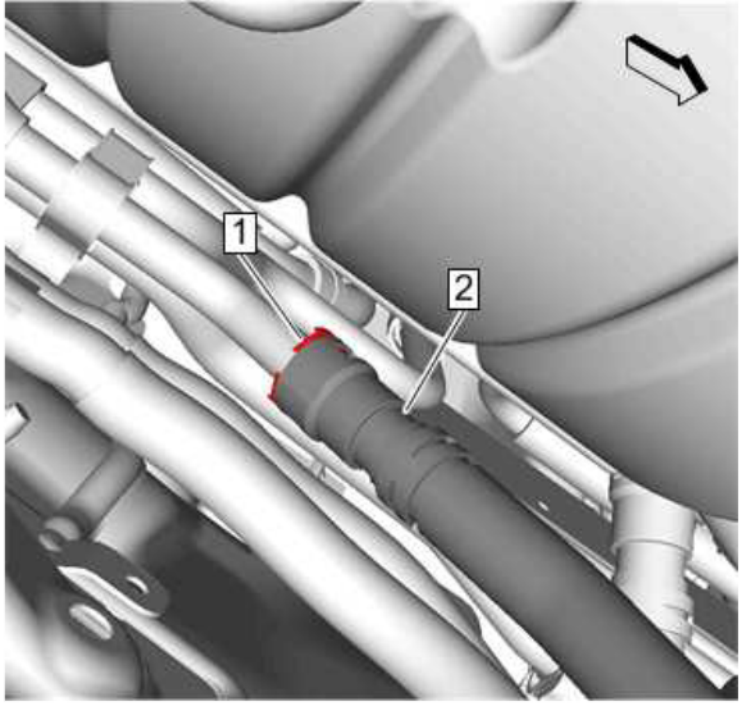


Fig. 416: Generator Control Module Coolant Tank Hose
Courtesy of GENERAL MOTORS COMPANY

10. Generator Control Module Coolant Radiator Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Generator Control Module Coolant Radiator Hose Replacement**

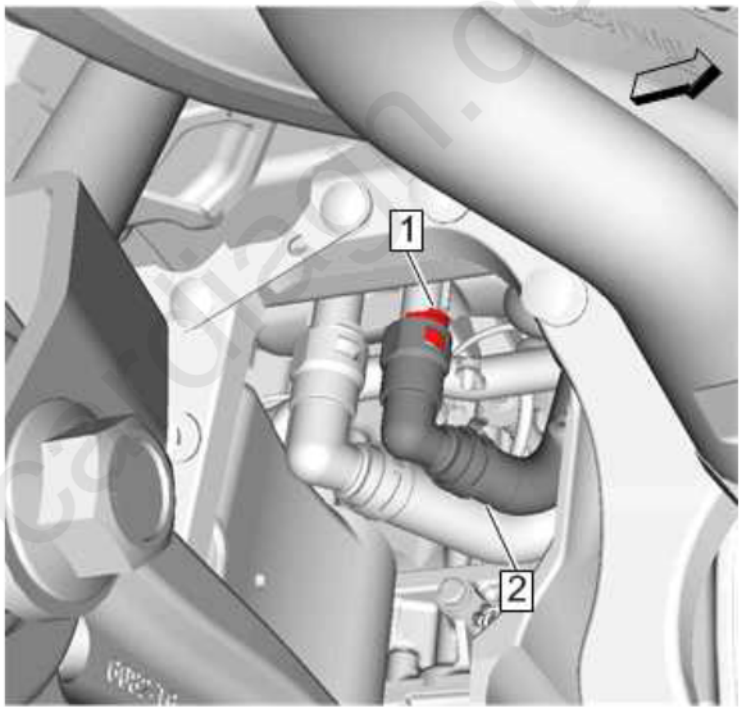


Fig. 417: Generator Control Module Coolant Radiator Hose
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Auxiliary Heater Outlet Hose Replacement (LTG with HP9)**

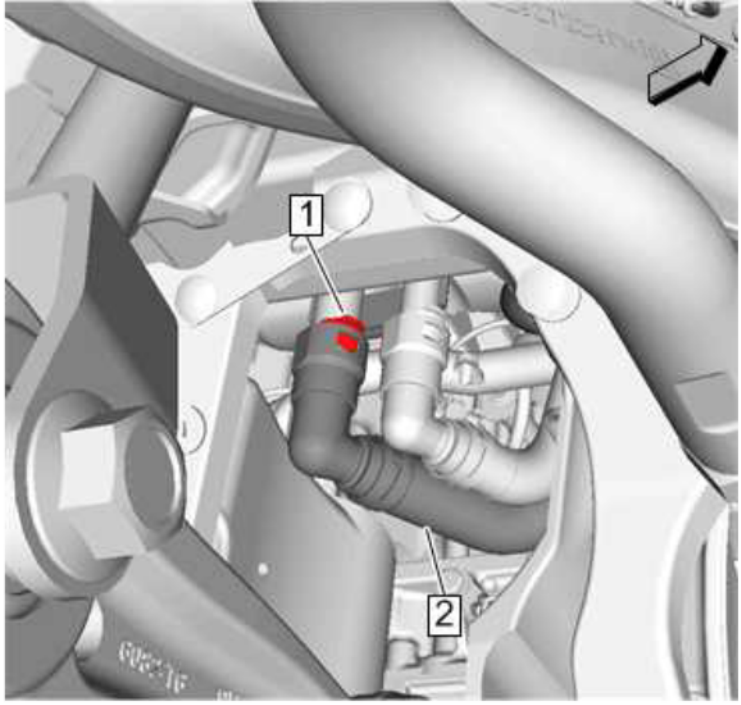


Fig. 418: Auxiliary Heater Outlet Hose Retainer
Courtesy of GENERAL MOTORS COMPANY

12. Drive Motor Power Inverter Module Cooling Inlet Hose (3) @ Heater Inlet Pipe ConnectorÂ» Install - **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Drive Motor Power Inverter Module to Heater Inlet Pipe Connector)** **Drive Motor Power Inverter Module Cooling Inlet Hose Replacement (Heater Inlet Pipe Connector Auxiliary Air Conditioning Evaporator Intermediate Tube to Heater Inlet Pipe Connector)**

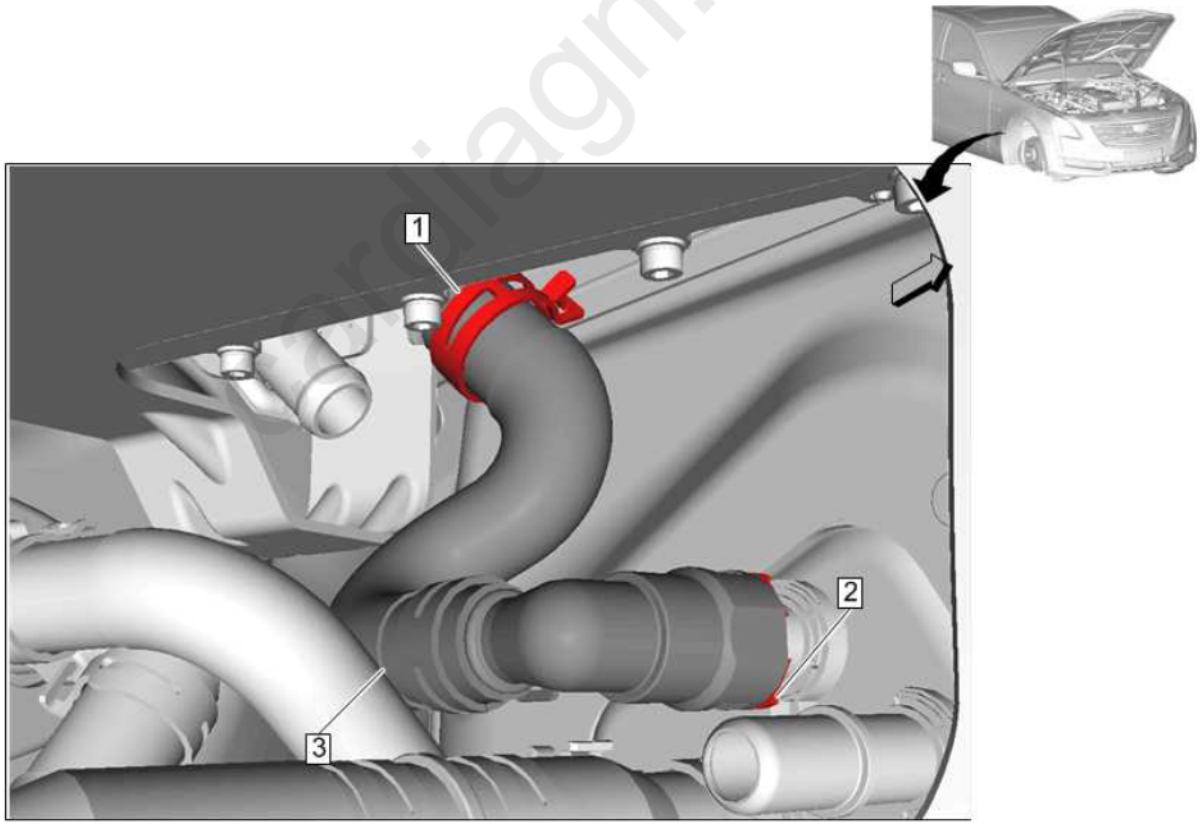


Fig. 419: Drive Motor Power Inverter Module Cooling Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Drive Motor Generator Control Module Cooling Outlet Hose (3) @ Heater Inlet Pipe ConnectorÂ» Install - **Drive Motor Generator Control Module Cooling Outlet Hose Replacement**

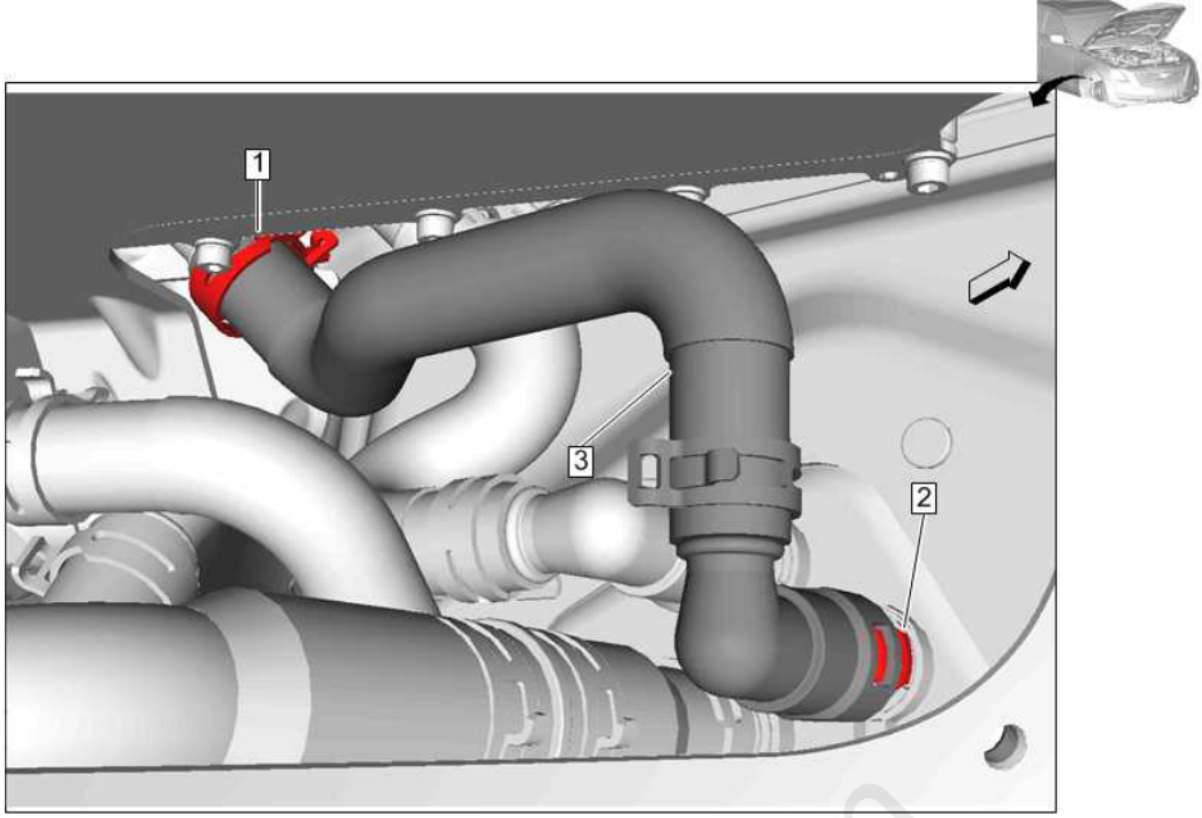


Fig. 420: Drive Motor Generator Control Module Cooling Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

14. Heater Inlet Hose (3) @ Heater Inlet Pipe ConnectorÂ» Install - **Heater Inlet Hose Replacement (LTG with HP9)**

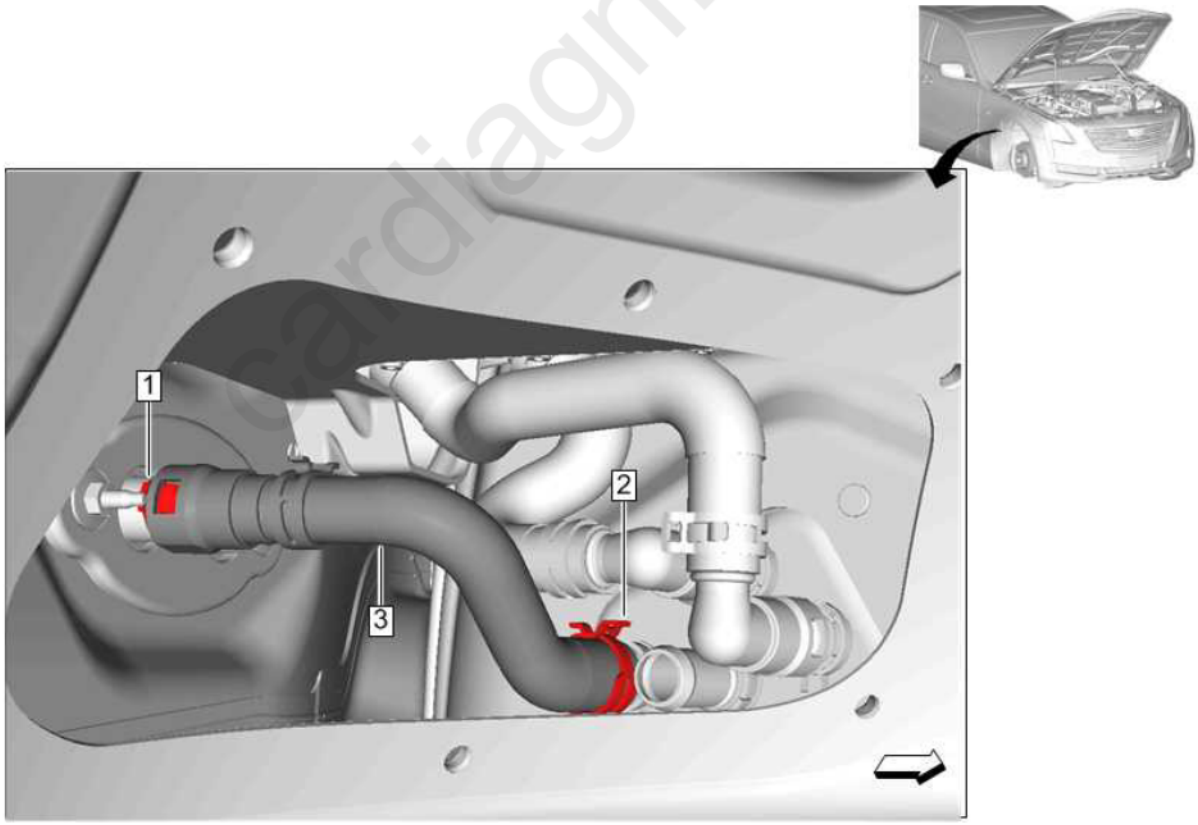


Fig. 421: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

15. Heater Outlet Hose (2) @ Heater Inlet Pipe ConnectorÂ» Install - **Heater Outlet Hose Replacement (LTG with HP9)**

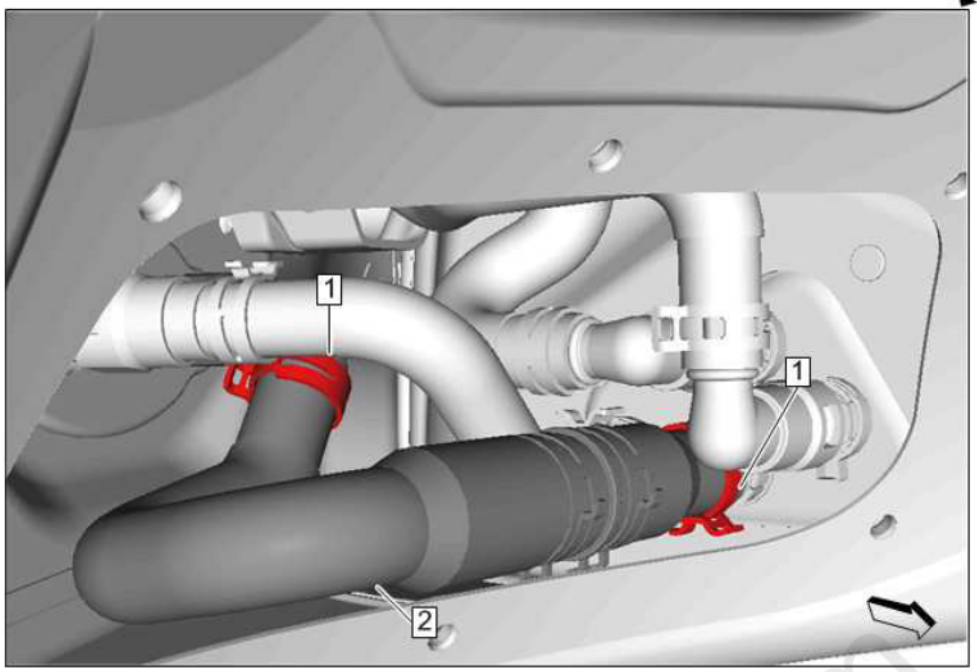


Fig. 422: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

16. Enable the high voltage system. Refer to **High Voltage Enabling**
17. Fill the engine cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
18. Fill the power electronics and auxiliary radiator cooling system. Refer to **Power Electronics and Auxiliary Radiator Drain and Fill (LTG HP9)**
19. Enable the high voltage system. Refer to **High Voltage Enabling**
20. Start the engine and check for coolant leaks.

HEATER CORE TUBE REPLACEMENT (AUXILIARY)

Removal Procedure

1. Auxiliary Air Conditioning Evaporator and Blower ModuleÂ» Remove - **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation**

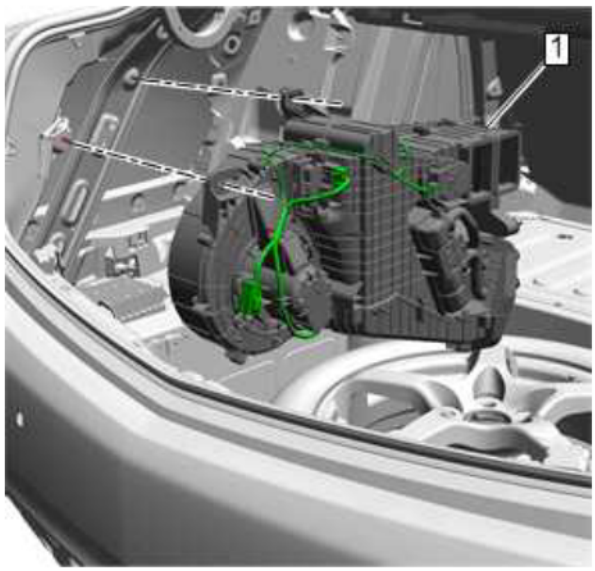


Fig. 423: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Heater Core Tube Bracket Screw (2)Â» Remove

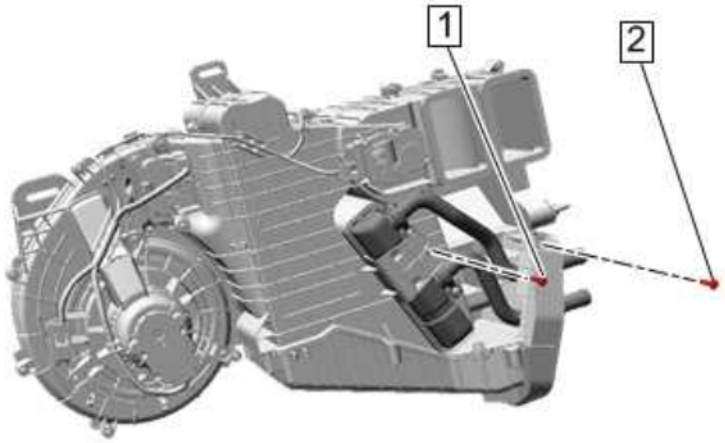


Fig. 424: Auxiliary Heater Core Tube Bracket Screw
Courtesy of GENERAL MOTORS COMPANY

3. Swing the auxiliary heater core tube bracket (5) open.

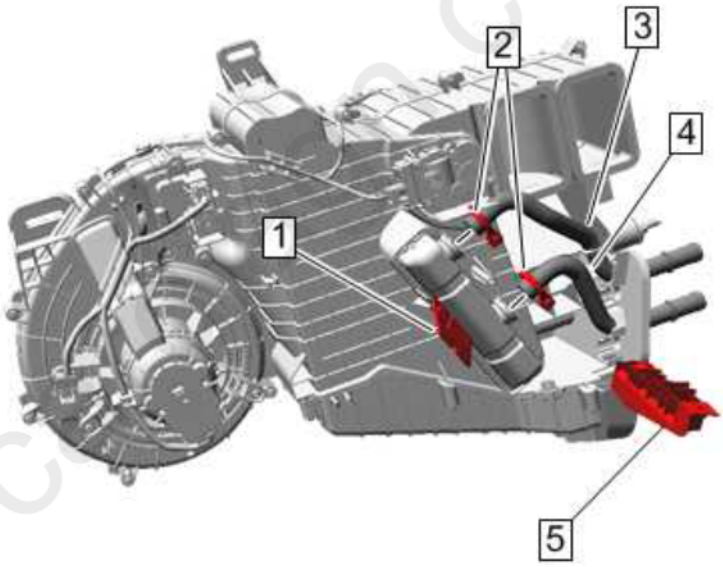


Fig. 425: Auxiliary Heater Core Tube Bracket And Heater Core Tube Clamps
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Tube Clamp (2)Â» Remove [2x]
5. Heater Core Inlet Tube (3) @ Auxiliary Heater CoreÂ» Remove
6. Heater Core Outlet Tube (4) @ Auxiliary Heater CoreÂ» Remove
7. Remove and DISCARD the O-ring seal. [2x]

Installation Procedure

1. Install a NEW O-ring seal. [2x]

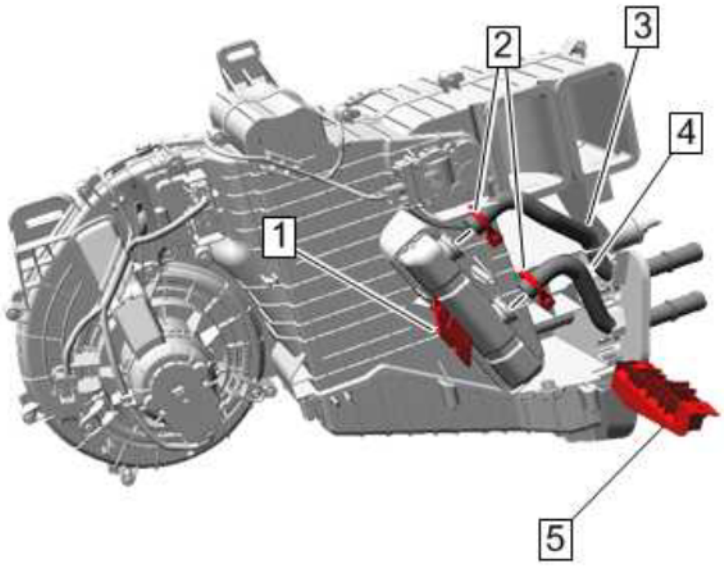


Fig. 426: Auxiliary Heater Core Tube Bracket And Heater Core Tube Clamps
Courtesy of GENERAL MOTORS COMPANY

2. Heater Core Outlet Tube (4) @ Auxiliary Heater CoreÂ» Install
3. Heater Core Inlet Tube (3) @ Auxiliary Heater CoreÂ» Install
4. Heater Core Tube Clamp (2)Â» Install and tighten [2x] 1.3 N.m (12 lb in)
5. Swing the auxiliary heater core tube bracket (5) close.
6. Auxiliary Heater Core Tube Bracket Screw (2)Â» Install and tighten 1.3 N.m (12 lb in)

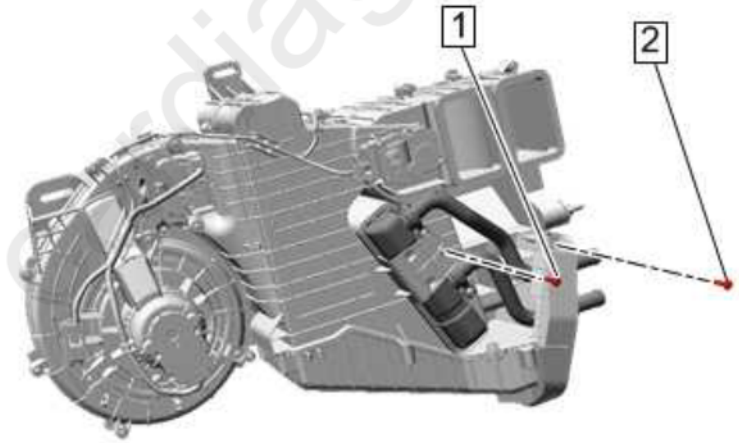


Fig. 427: Auxiliary Heater Core Tube Bracket Screw
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Air Conditioning Evaporator and Blower ModuleÂ» Install - **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation**

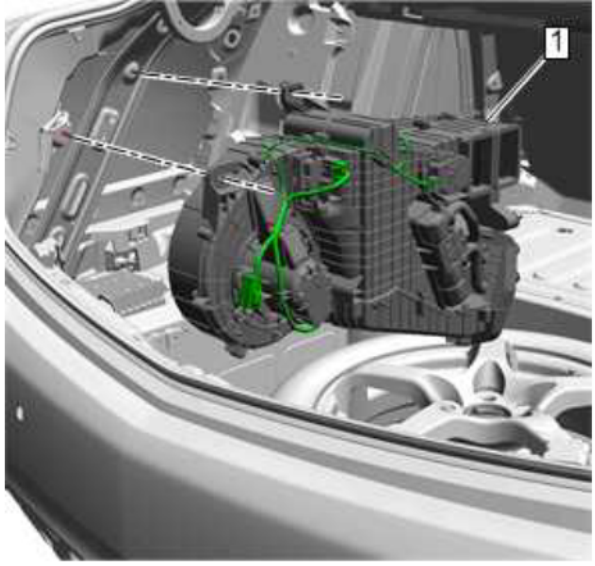


Fig. 428: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

HEATER CORE OUTLET TUBE REPLACEMENT

Removal Procedure

1. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)Â» Remove
2. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

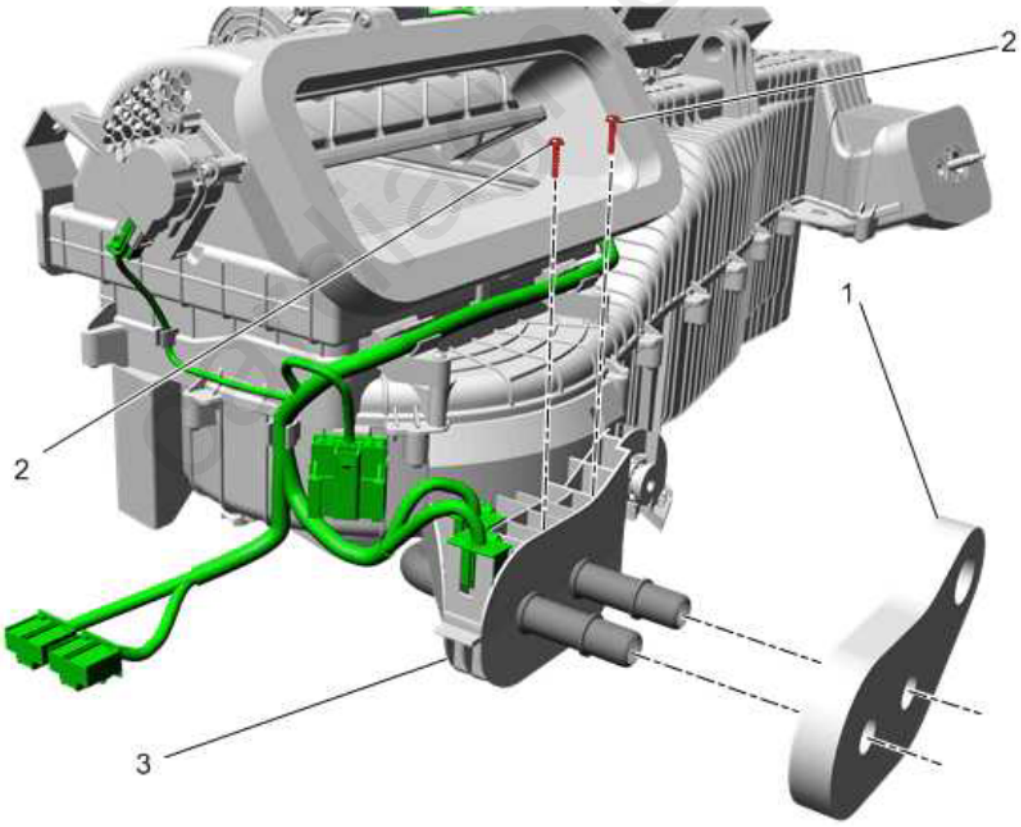


Fig. 429: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

3. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
4. Heater Core Tube Bracket (3)Â» Remove
5. Heater Core Tube Clamp Screw (1)Â» Remove

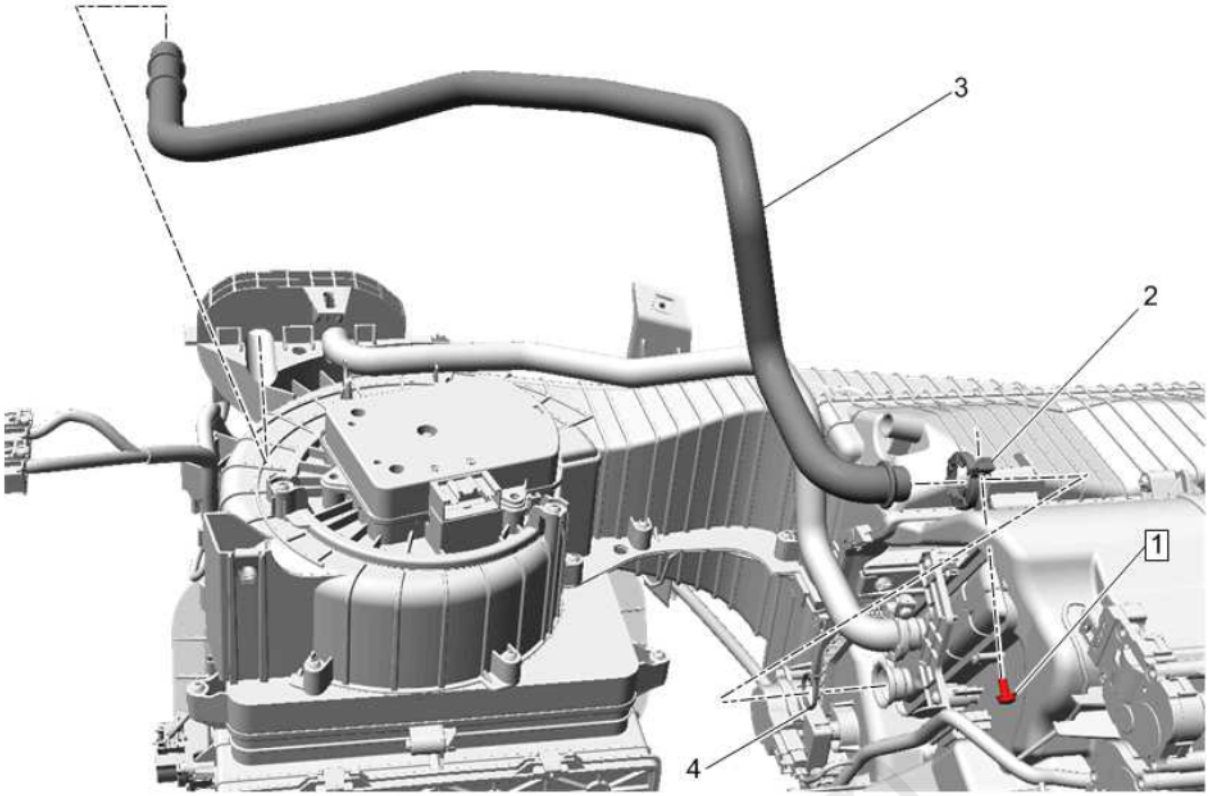


Fig. 430: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

6. Heater Core Inlet Tube Clamp (2)Â» Remove
7. Heater Core Inlet Tube (3)Â» Remove
8. Heater Core Inlet Tube O-Ring Seal (4)Â» Remove and DISCARD
9. Heater Core Tube Clamp Screw (1)Â» Remove

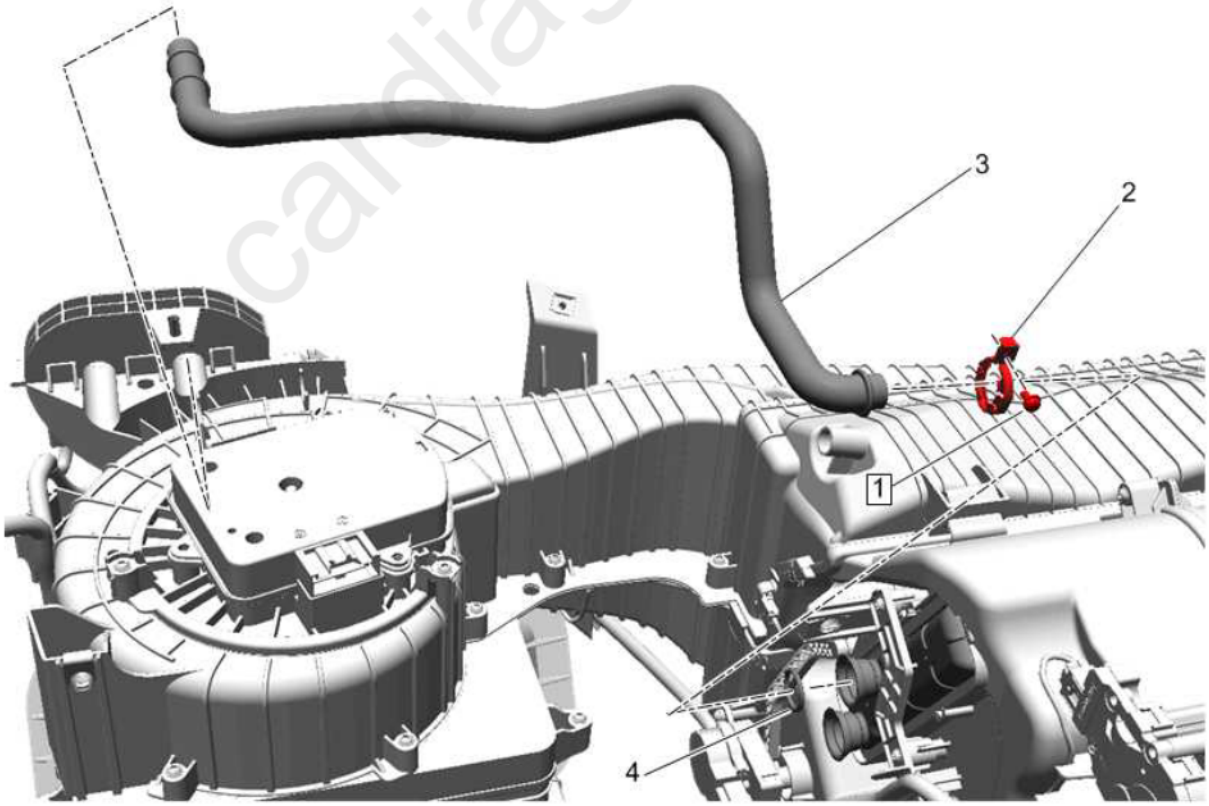


Fig. 431: Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

10. Heater Core Outlet Tube Clamp (2)Â» Remove
11. Heater Core Outlet Tube (3)Â» Remove
12. Heater Core Outlet Tube O-Ring Seal (4)Â» Remove and DISCARD

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Installation Procedure

1. Install a NEW O-ring seal. (4)

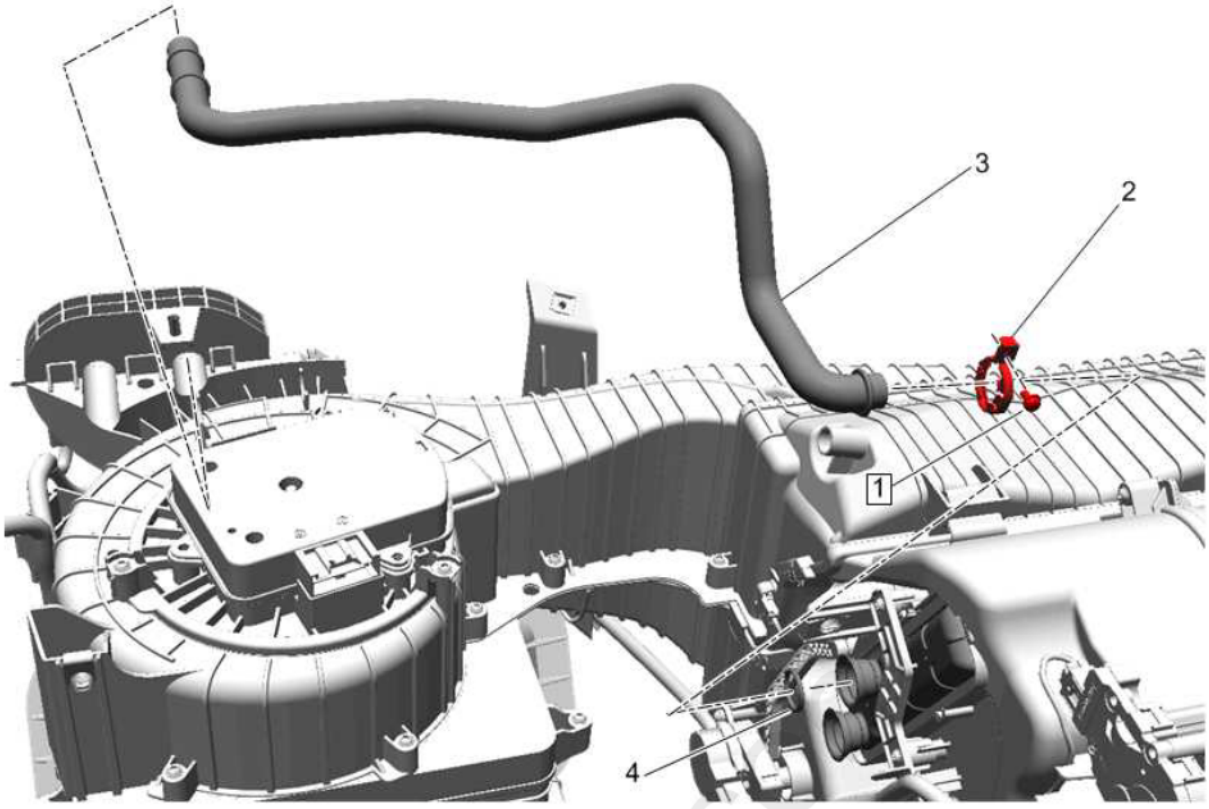


Fig. 432: Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Heater Core Outlet Tube (3)Â» Install
3. Heater Core Outlet Tube Clamp (2)Â» Install
4. Heater Core Tube Clamp Screw (1)Â» Install and tighten 2.0 N.m (18 lb in)
5. Install a NEW O-ring seal. (4)

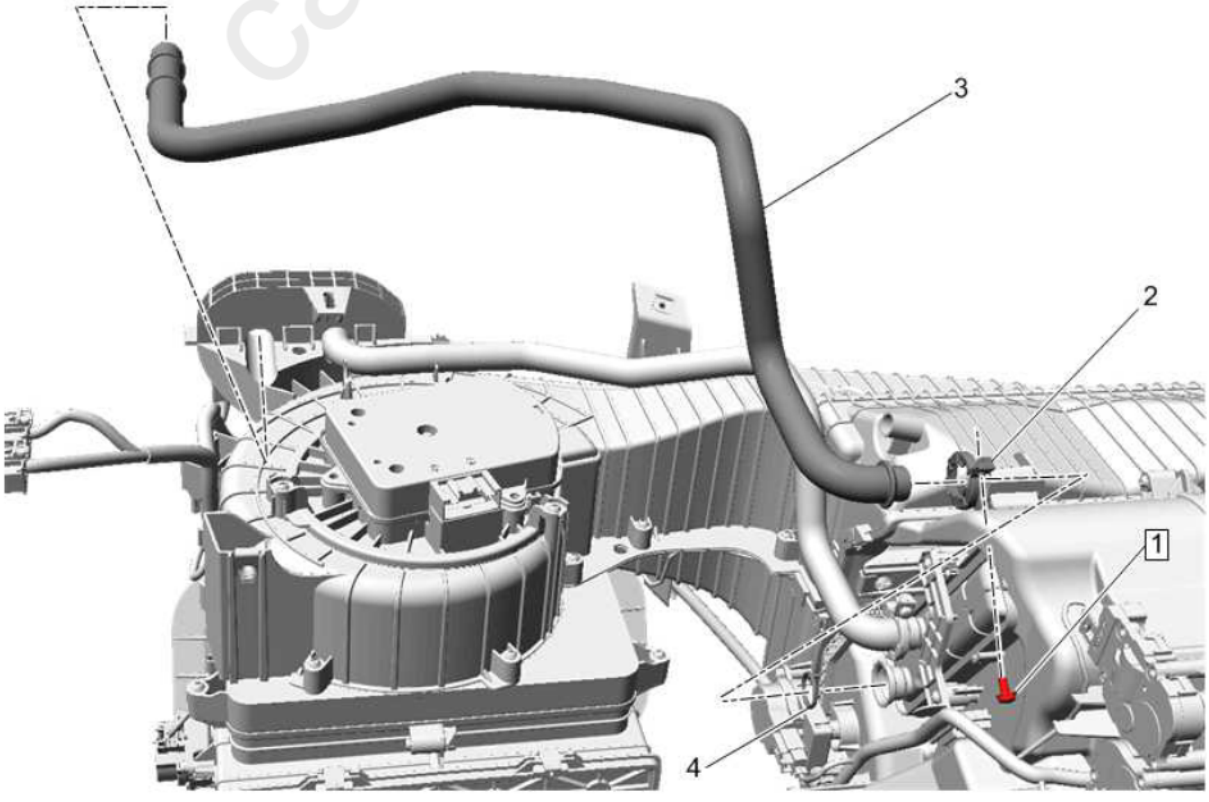


Fig. 433: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

6. Heater Core Inlet Tube (3)Â» Install
7. Heater Core Inlet Tube Clamp (2)Â» Install
8. Heater Core Tube Clamp Screw (1)Â» Install and tighten 2.0 N.m (18 lb in)
9. Heater Core Tube Bracket (3)Â» Install

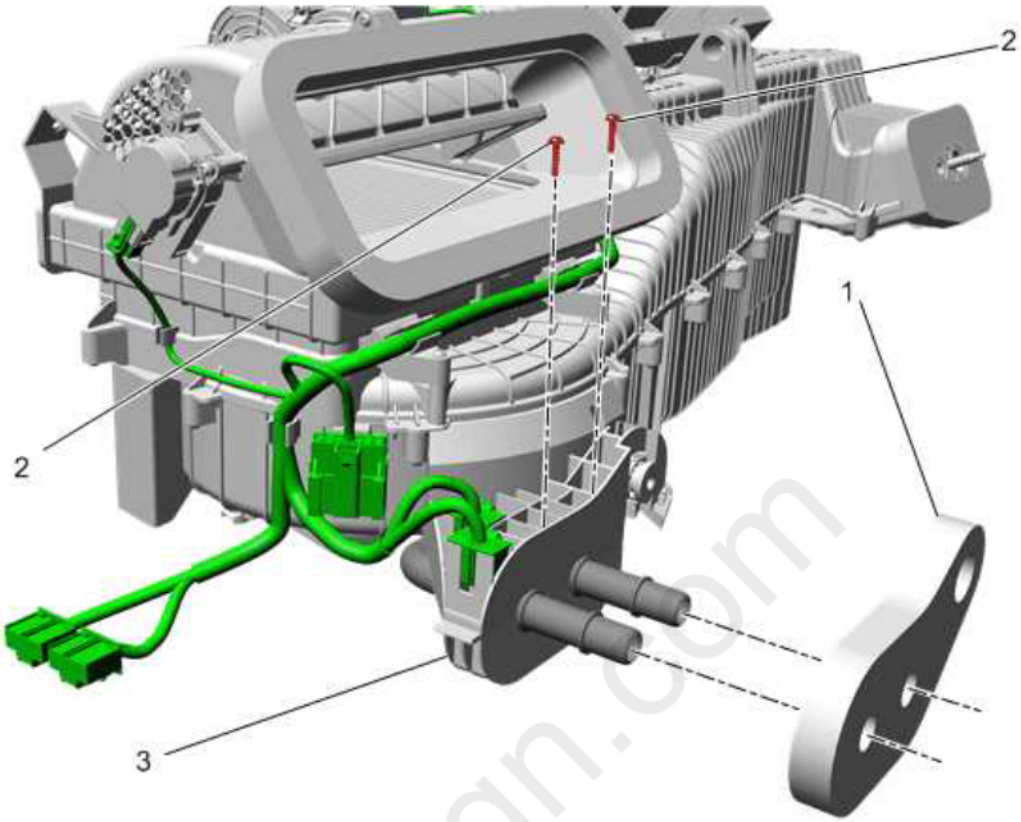


Fig. 434: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

10. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
11. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
12. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Install

HEATER CORE INLET TUBE REPLACEMENT

Removal Procedure

1. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Remove
2. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Remove

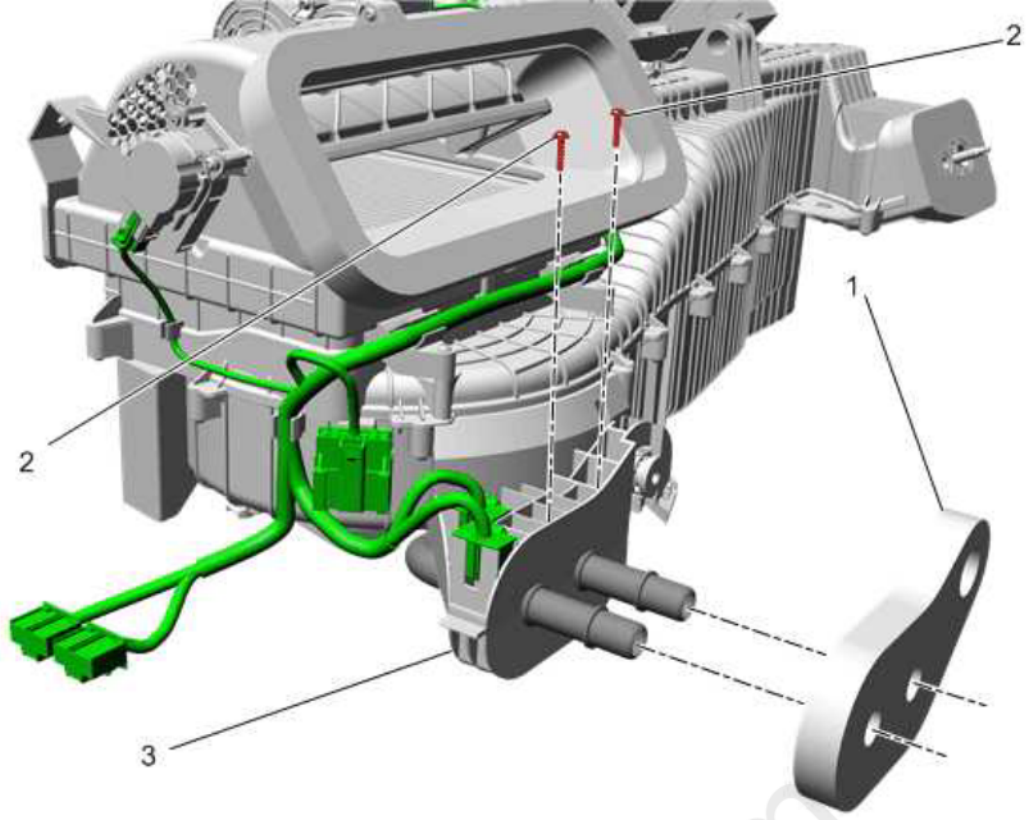


Fig. 435: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

3. Heater Core Tube Bracket Fastener (2)Â» Remove [2x]
4. Heater Core Tube Bracket (3)Â» Remove
5. Heater Core Tube Clamp Screw (1)Â» Remove

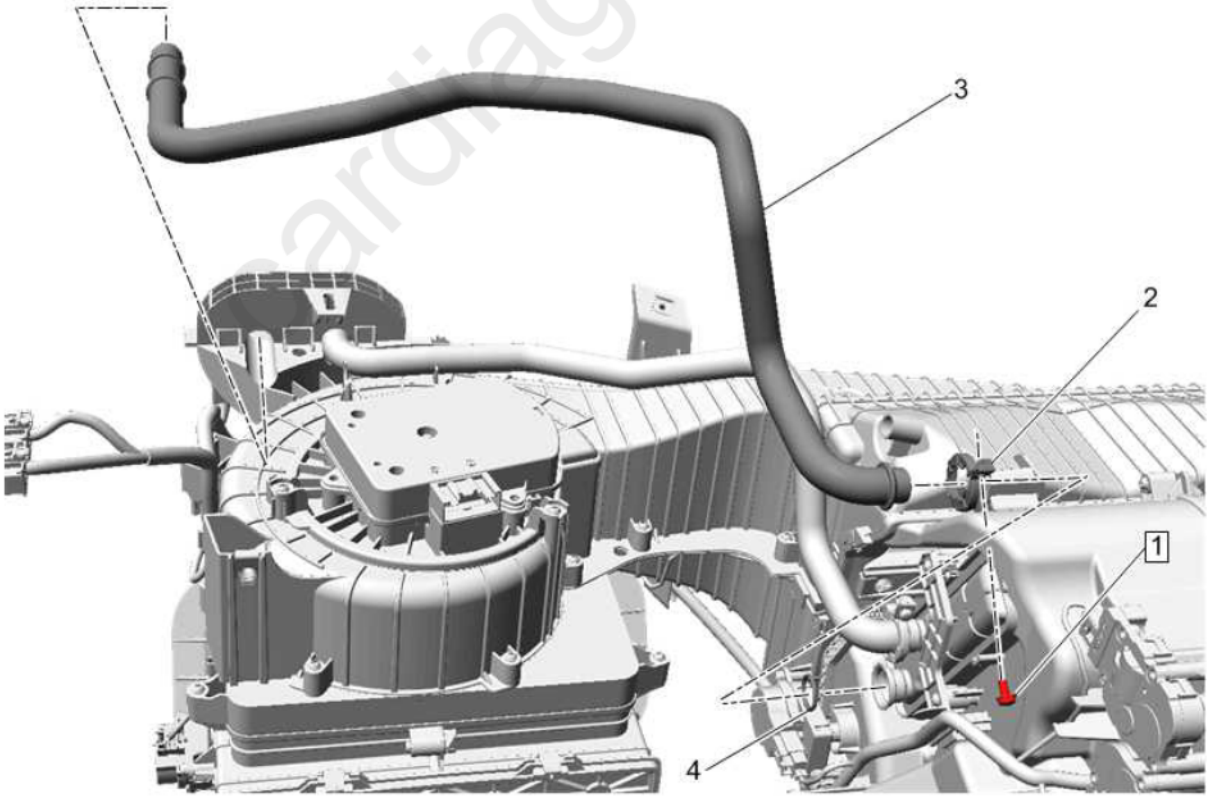


Fig. 436: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

6. Heater Core Inlet Tube Clamp (2)Â» Remove
7. Heater Core Inlet Tube (3)Â» Remove
8. Heater Core Inlet Tube O-Ring Seal (4)Â» Remove and DISCARD

Installation Procedure

1. Install a NEW O-ring seal. (4)

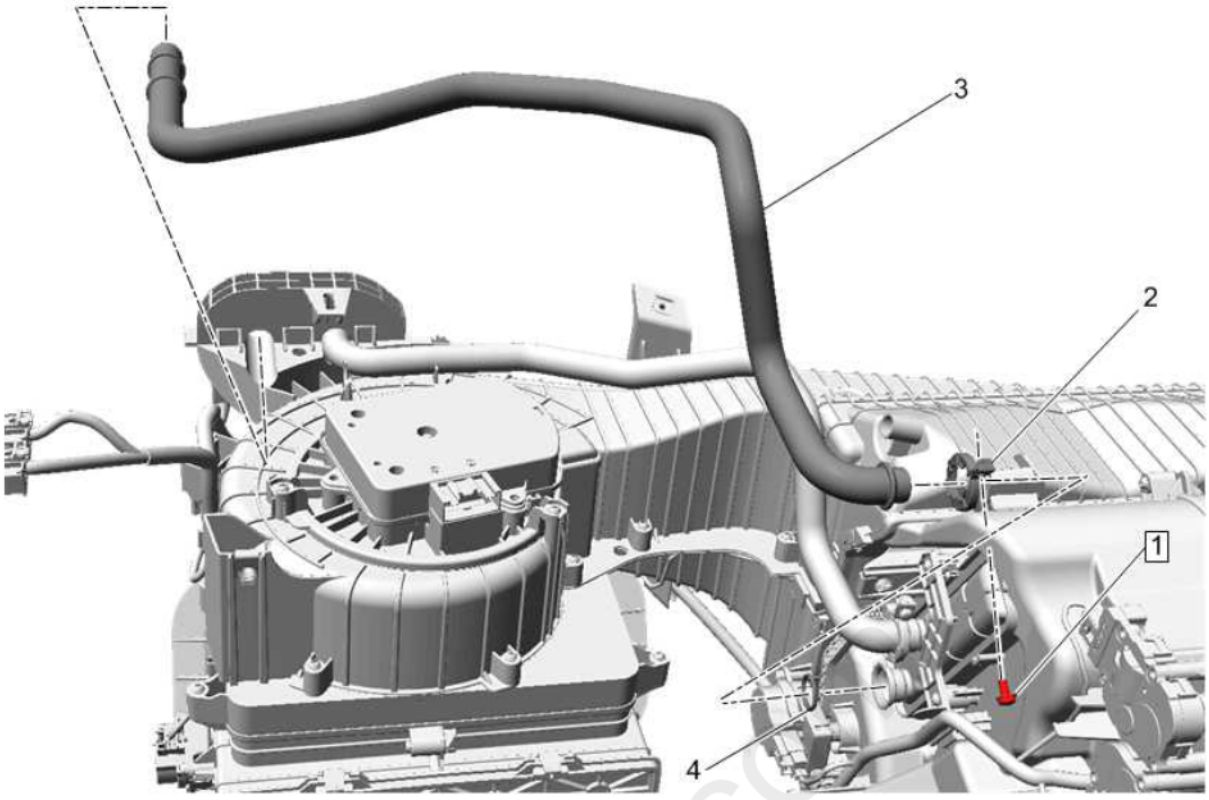


Fig. 437: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Heater Core Inlet Tube (3)Â» Install
3. Heater Core Inlet Tube Clamp (2)Â» Install
4. Heater Core Tube Clamp Screw (1)Â» Install and tighten 2.0 N.m (18 lb in)
5. Heater Core Tube Bracket (3)Â» Install

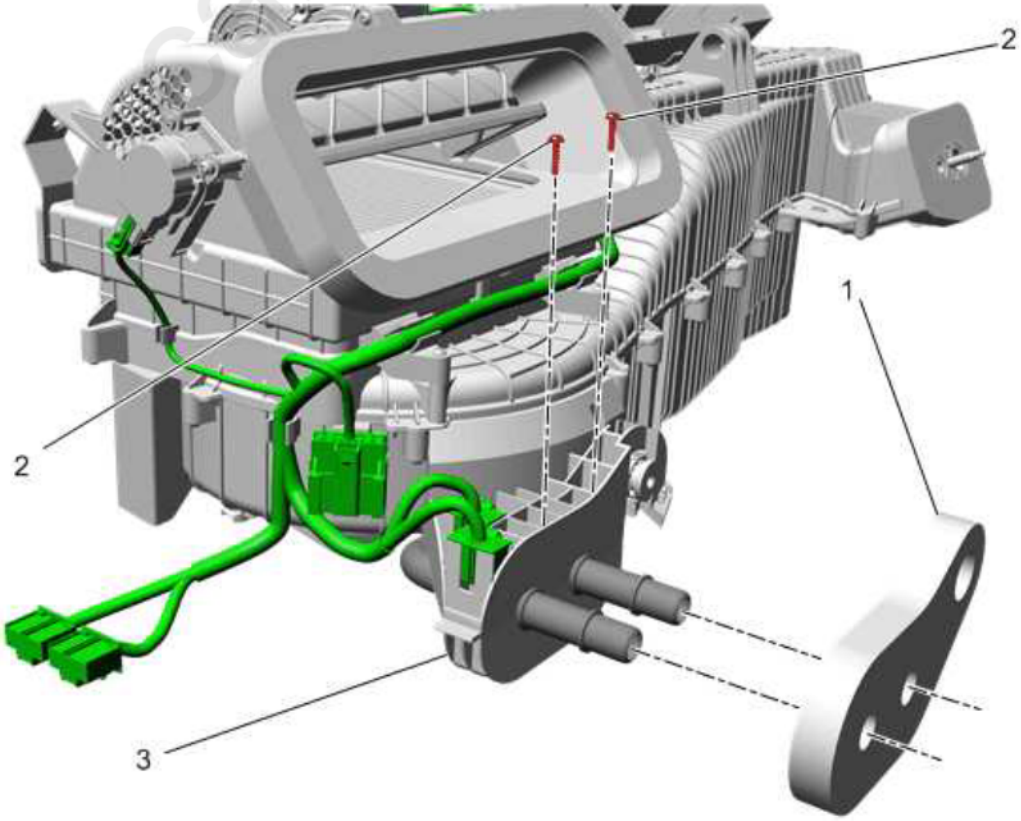


Fig. 438: Heater and Air Conditioning Evaporator and Blower Module Seal
Courtesy of GENERAL MOTORS COMPANY

6. Heater Core Tube Bracket Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]
7. Heater and Air Conditioning Evaporator and Blower Module Seal (1)Â» Install
8. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**Â» Install

HEATER COOLANT PUMP REPLACEMENT (LTG WITHOUT HP9)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Heater Water Auxiliary Pump Inlet Hose Clamp (1) @ Heater Coolant PumpÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

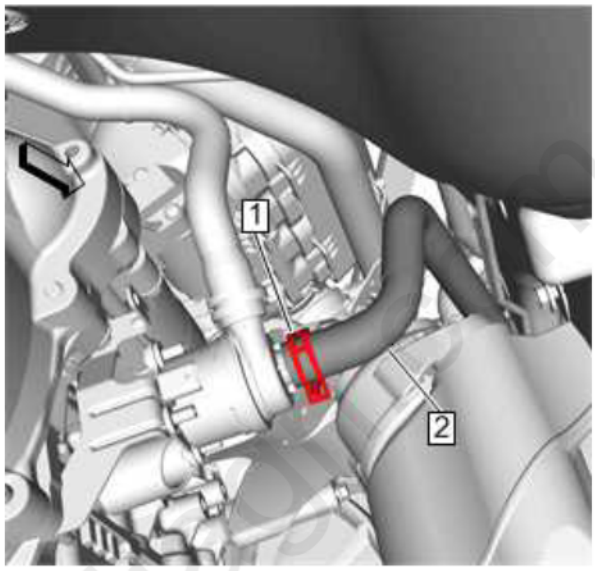


Fig. 439: Heater Water Auxiliary Pump Inlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

3. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Remove
4. Auxiliary Heater Outlet Hose Clamp (1) @ Heater Coolant PumpÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

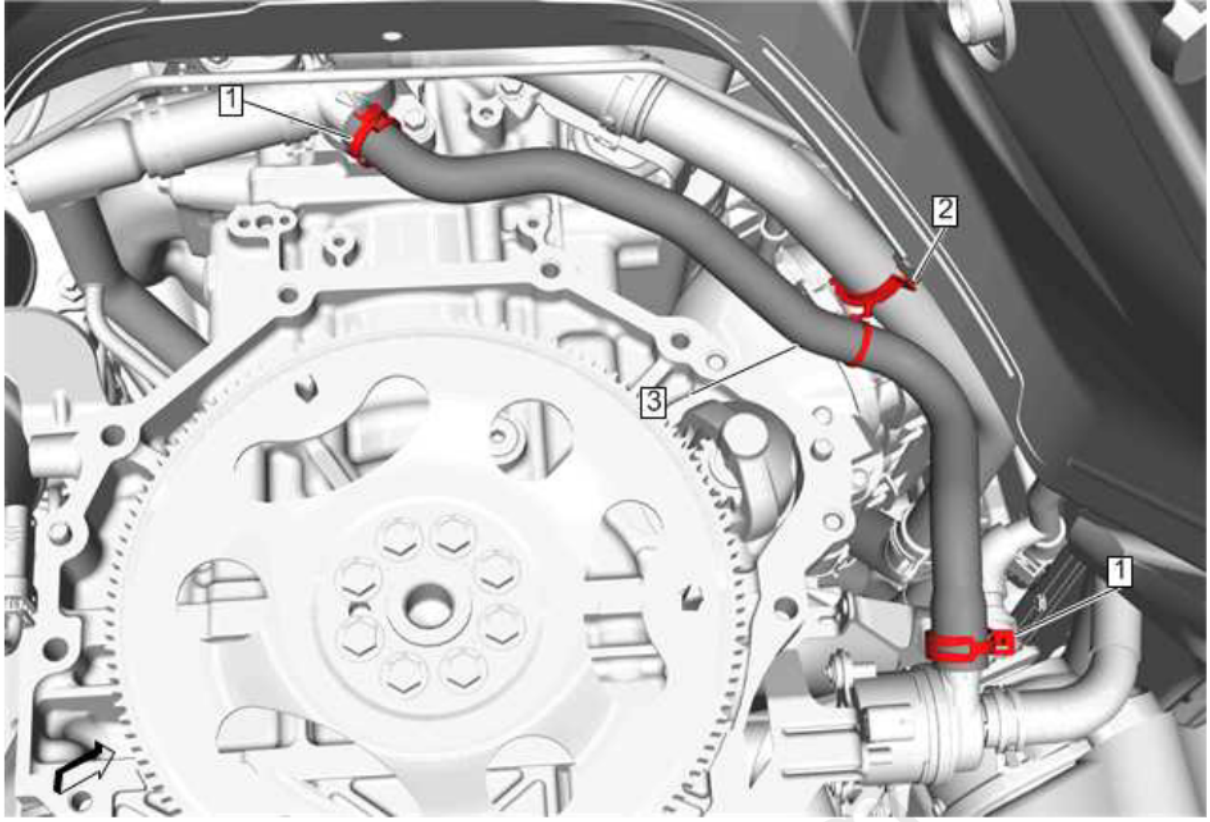


Fig. 440: Auxiliary Heater Outlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Heater Outlet Hose (3) @ Heater Coolant PumpÂ» Remove
6. Heater Coolant Pump Nut (1)Â» Remove

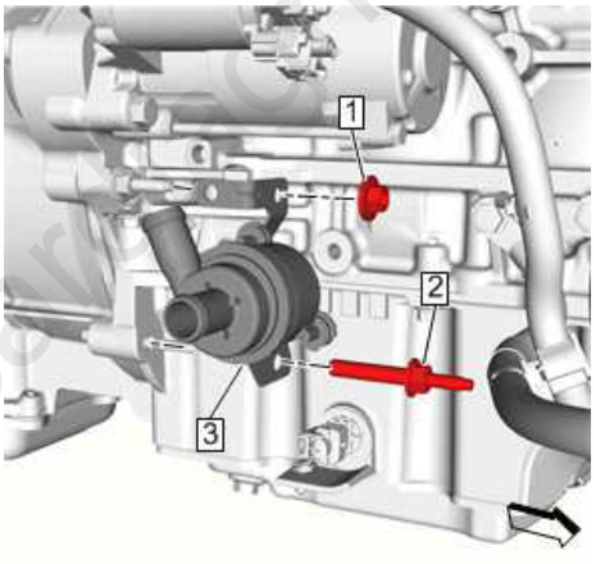


Fig. 441: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

7. Transmission Stud (2)Â» Remove
8. Electrical Connector @ Heater Coolant PumpÂ» Remove
9. Heater Coolant Pump (3)Â» Remove

Installation Procedure

1. Heater Coolant Pump (3)Â» Install

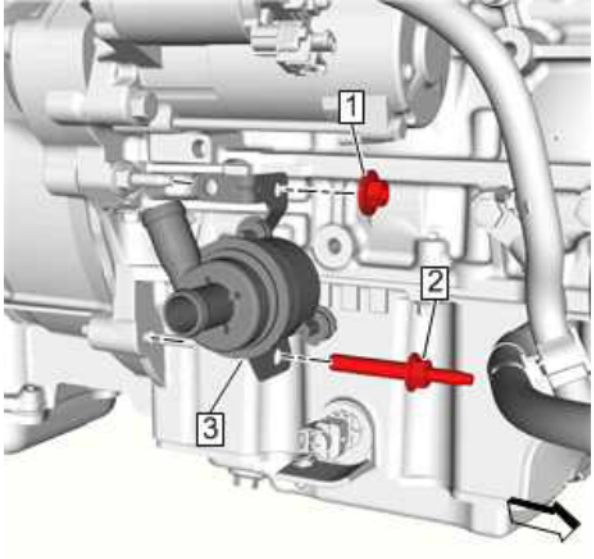


Fig. 442: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

2. Transmission Stud (2)Â» Install and tighten 58 N.m (43 lb ft)

CAUTION: **Refer to Fastener Caution .**

3. Heater Coolant Pump Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
4. Electrical Connector @ Heater Coolant PumpÂ» Install
5. Auxiliary Heater Outlet Hose (3) @ Heater Coolant PumpÂ» Install

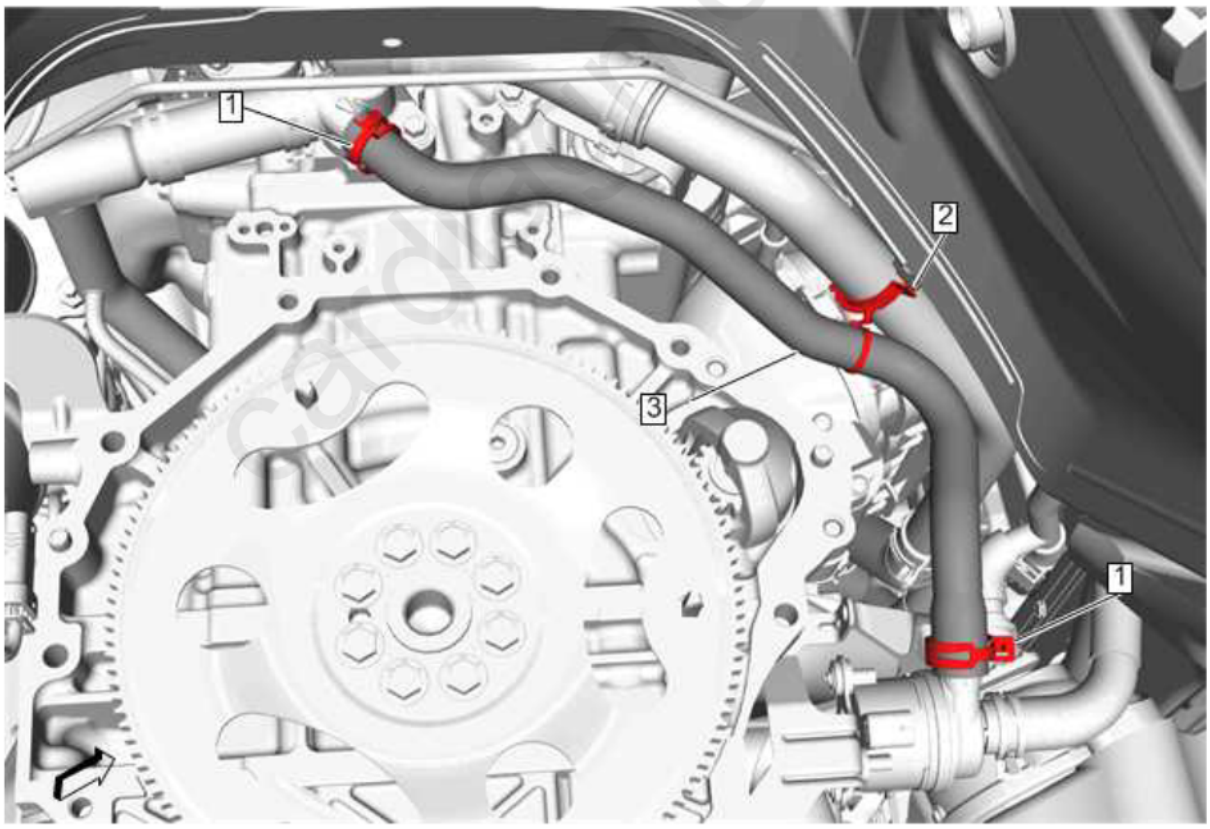


Fig. 443: Auxiliary Heater Outlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Heater Outlet Hose Clamp (1) @ Heater Coolant PumpÂ» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
7. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Install

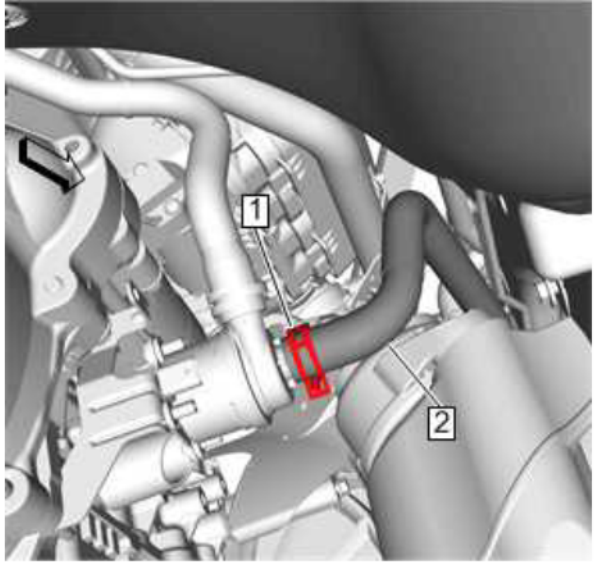


Fig. 444: Heater Water Auxiliary Pump Inlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Inlet Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
9. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
10. Start the engine and check for coolant leaks.

HEATER COOLANT PUMP REPLACEMENT (LGW)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Air Cleaner Assembly (1)Â» Remove - **Air Cleaner Assembly Replacement (LGW)**

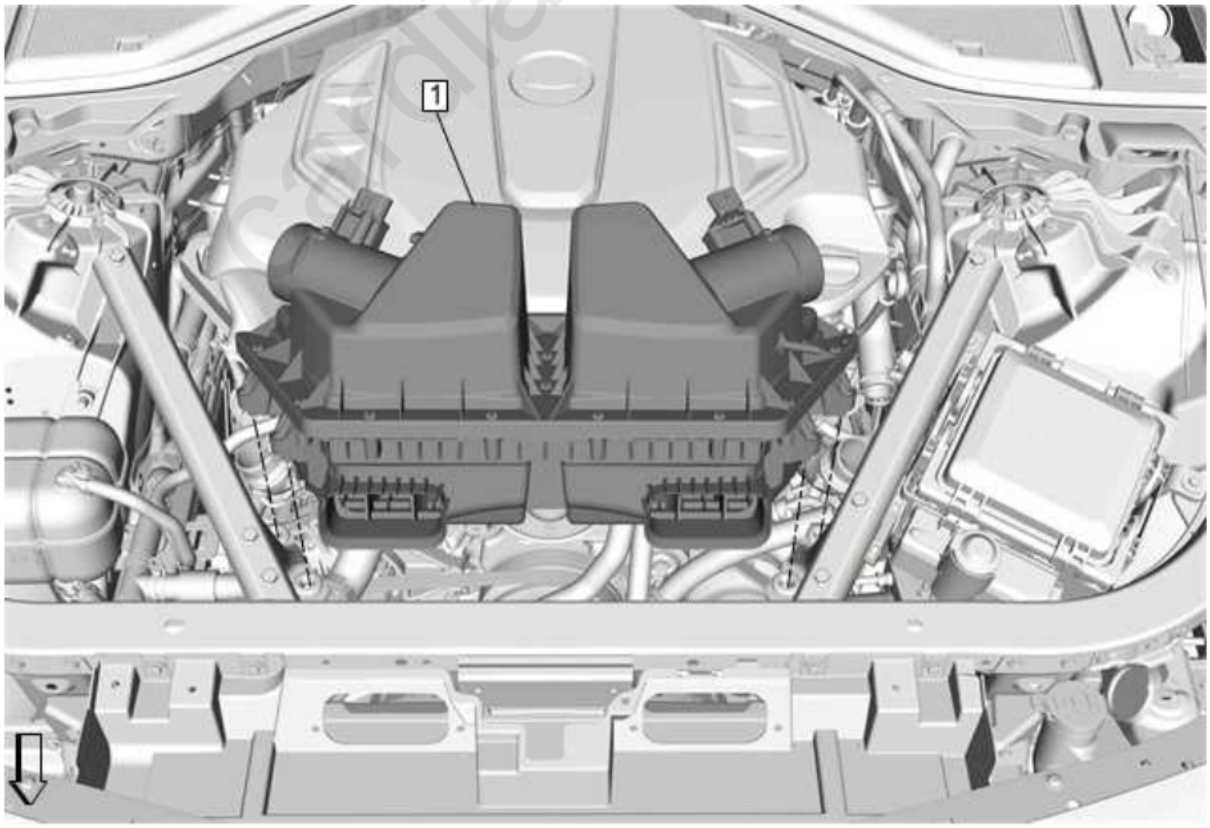


Fig. 445: Air Cleaner Assembly (LGW)
Courtesy of GENERAL MOTORS COMPANY

3. Air Cleaner Outlet Rear DuctÂ» Remove - **Air Cleaner Outlet Rear Duct Replacement (LGW)**

4. Engine Control Module Bracket (2)Â» Remove - **Engine Control Module Bracket Replacement (LGW)**

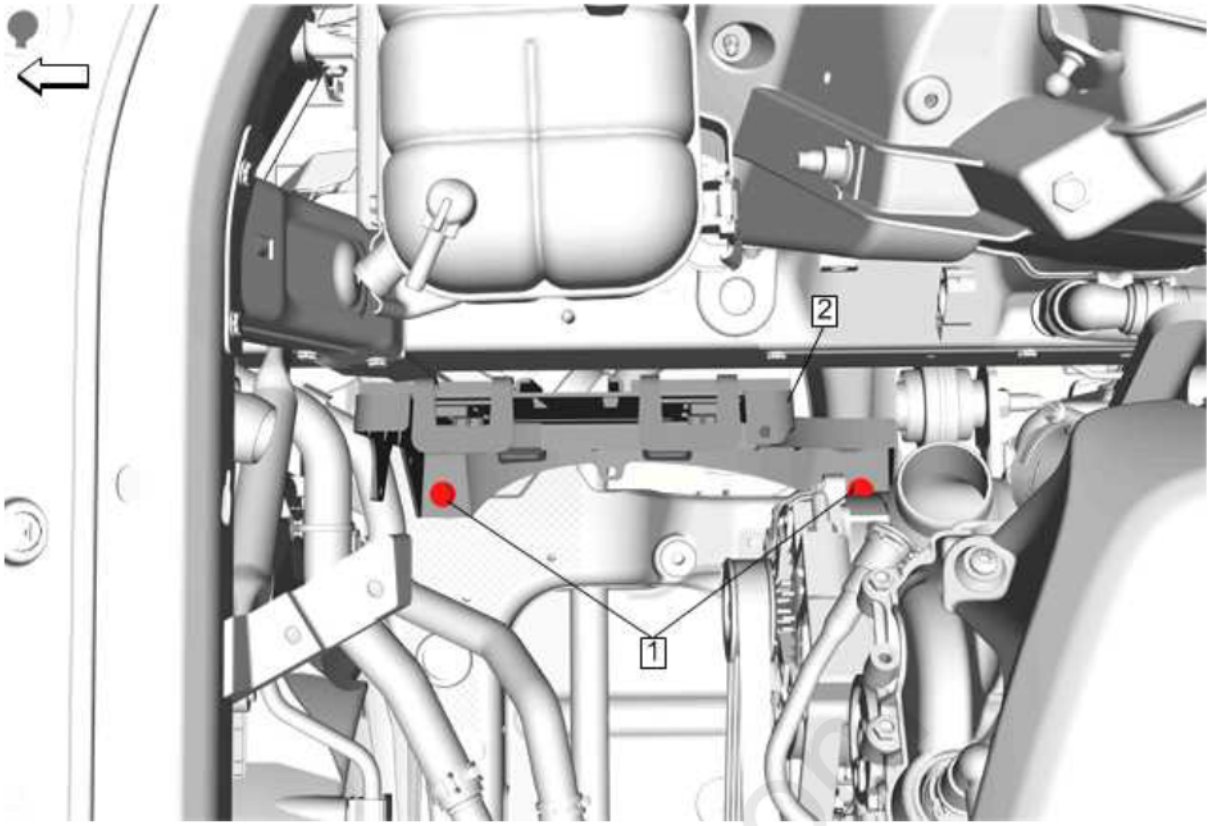


Fig. 446: Engine Control Module Bracket (LGW)
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Inlet Hose (3) @ Heater Coolant Pump Remove - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGW)**

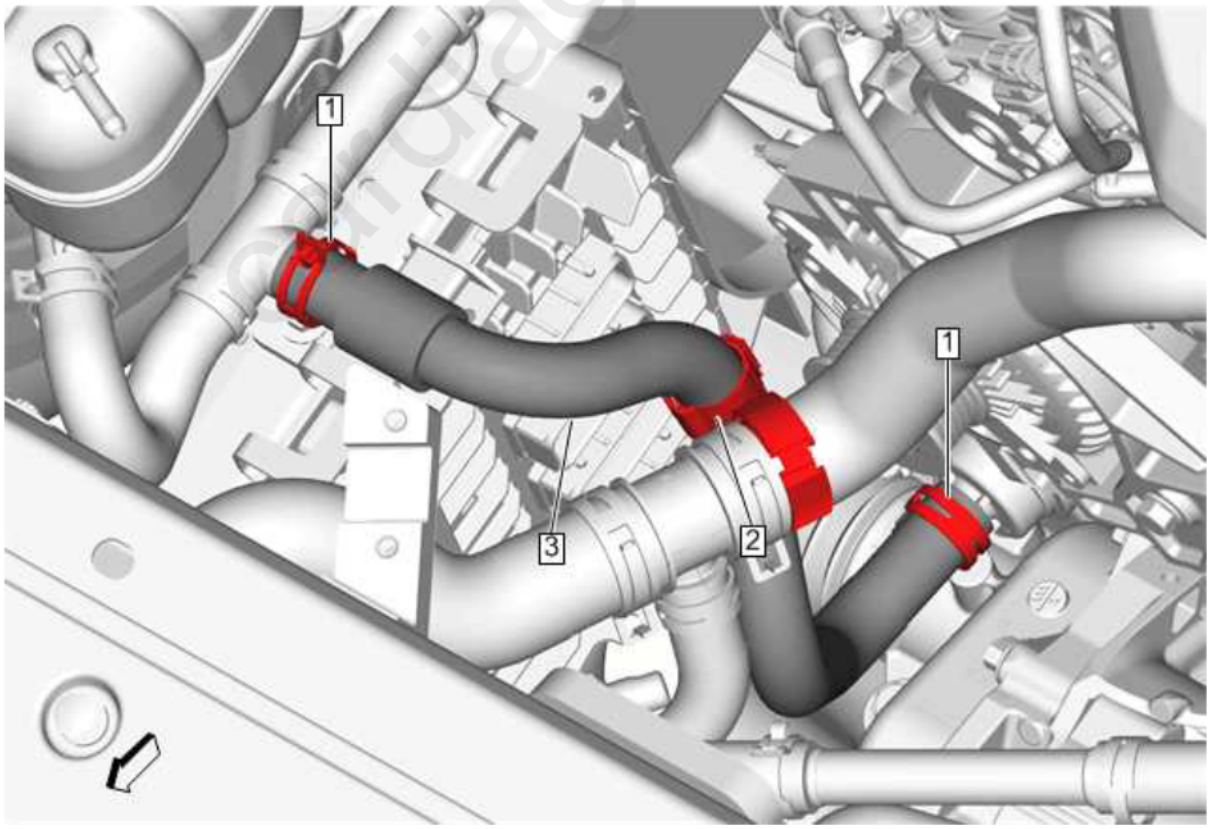


Fig. 447: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Bypass Inlet Hose (2) @ Heater Coolant PumpÂ» Remove - **Heater Water Bypass Inlet Hose Replacement (LGW)**

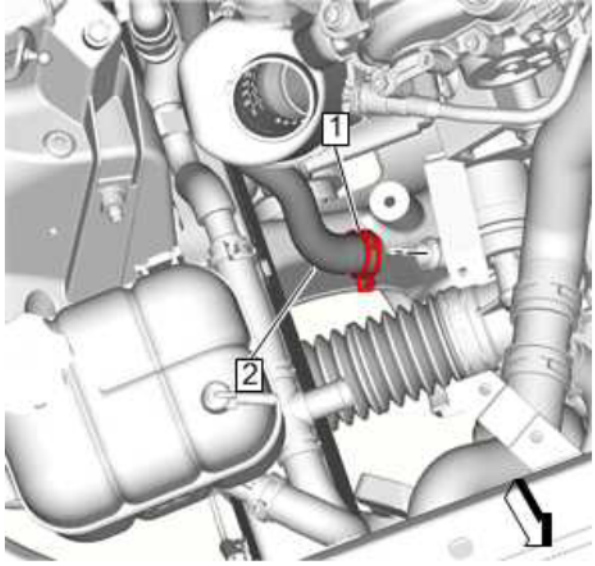


Fig. 448: Heater Water Bypass Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Electrical Connector @ Heater Coolant PumpÂ» Disconnect
8. Wiring Harness @ Heater Coolant PumpÂ» Remove
9. Heater Coolant Pump Bolt (1) @ Heater Coolant PumpÂ» Remove [2x]

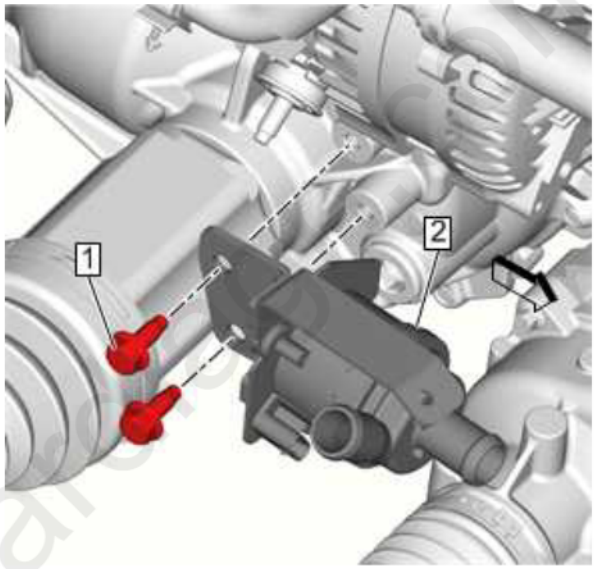


Fig. 449: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

10. Heater Coolant Pump (2)Â» Remove

Installation Procedure

1. Heater Coolant Pump (2)Â» Install

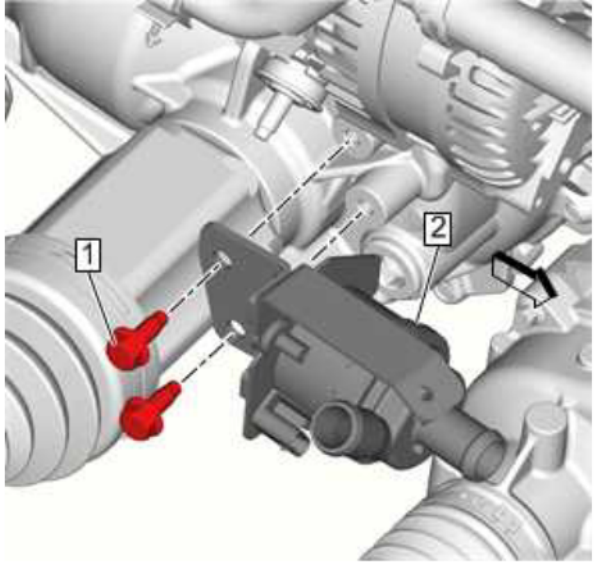


Fig. 450: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

2. Heater Coolant Pump Bolt (1) @ Heater Coolant PumpÂ» Install and tighten [2x] 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

3. Wiring Harness @ Heater Coolant PumpÂ» Install
4. Electrical Connector @ Heater Coolant PumpÂ» Install
5. Heater Water Bypass Inlet Hose (2) @ Heater Coolant PumpÂ» Install - **Heater Water Bypass Inlet Hose Replacement (LGW)**

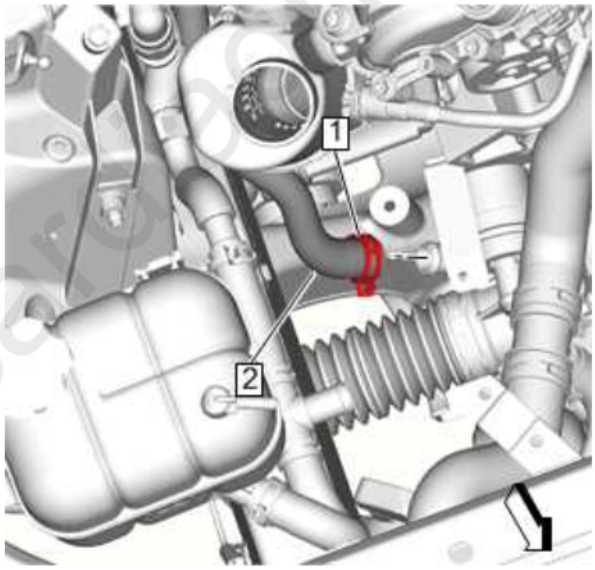


Fig. 451: Heater Water Bypass Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Inlet Hose (3) @ Heater Coolant Pump Install - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGW)**

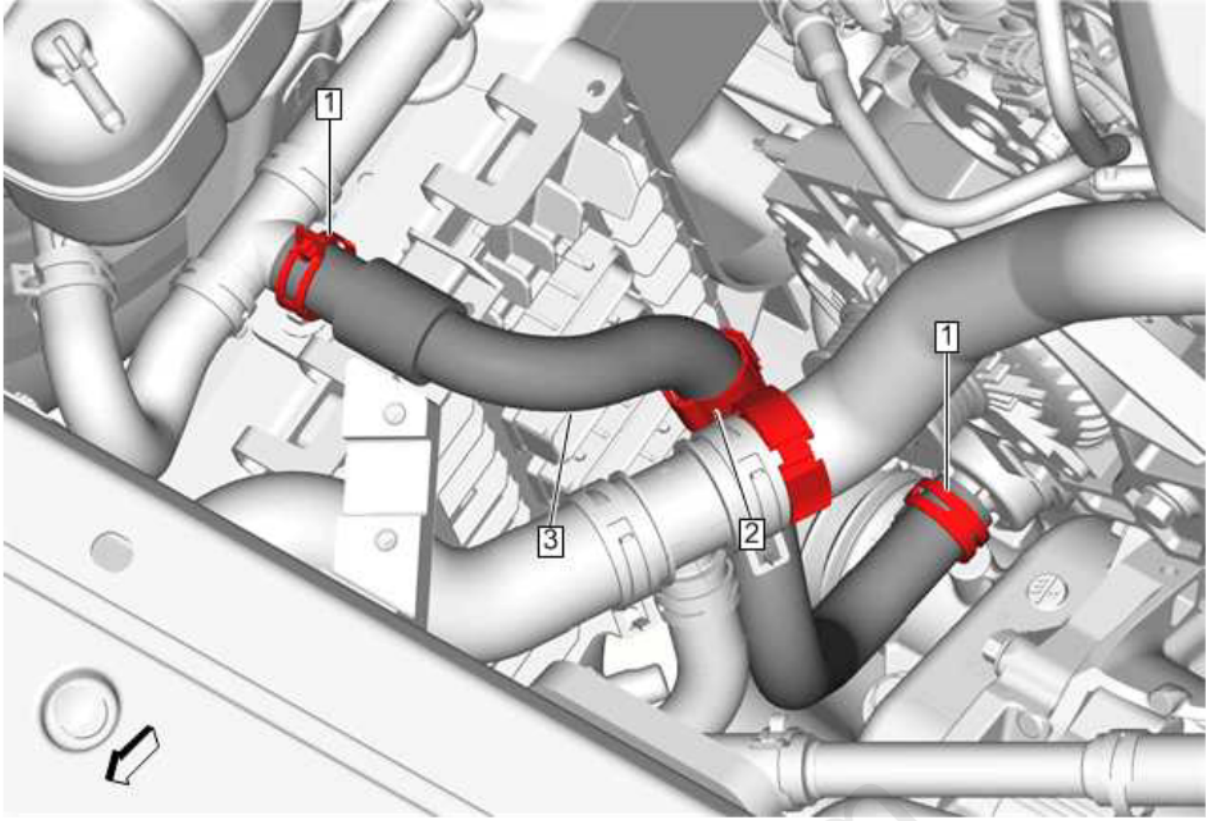


Fig. 452: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Engine Control Module Bracket (2)Â» Install - **Engine Control Module Bracket Replacement (LGW)**

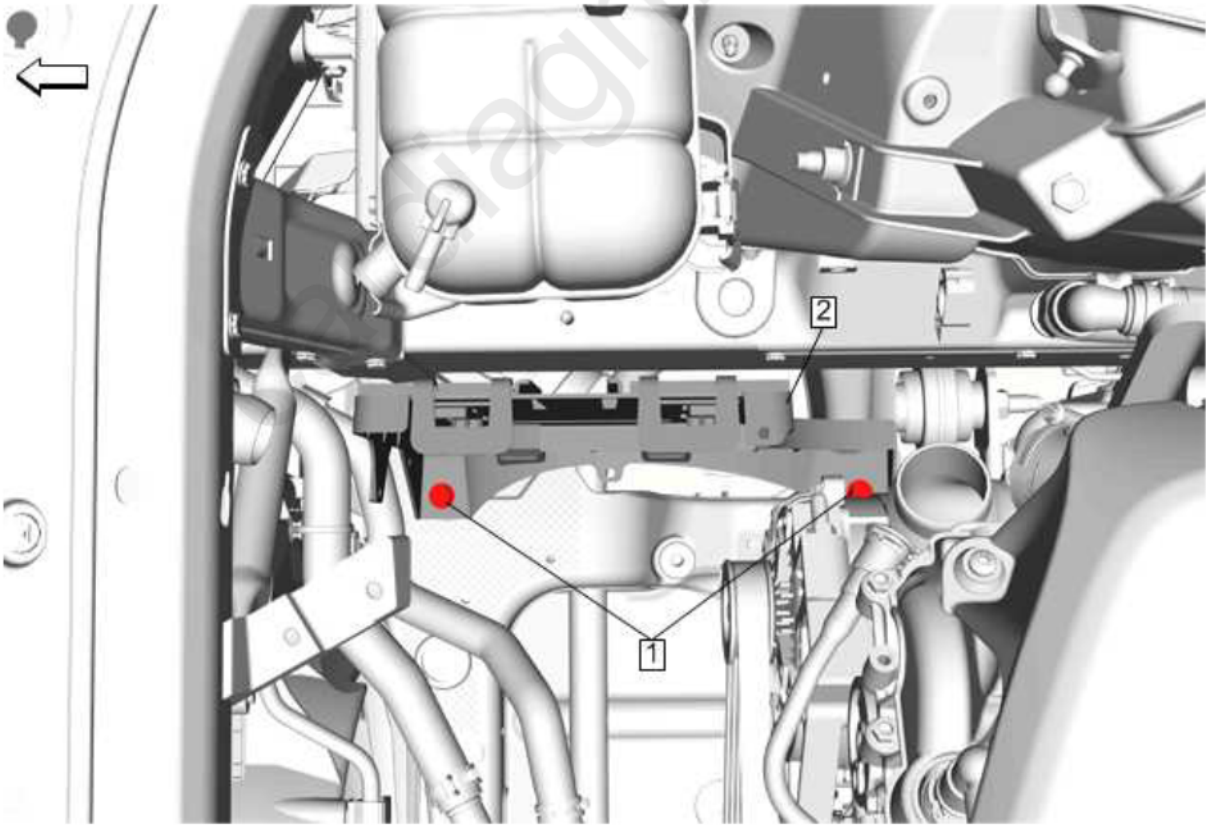


Fig. 453: Engine Control Module Bracket (LGW)
Courtesy of GENERAL MOTORS COMPANY

8. Air Cleaner Outlet Rear DuctÂ» Install - **Air Cleaner Outlet Rear Duct Replacement (LGW)**
9. Air Cleaner Assembly (1)Â» Install - **Air Cleaner Assembly Replacement (LGW)**

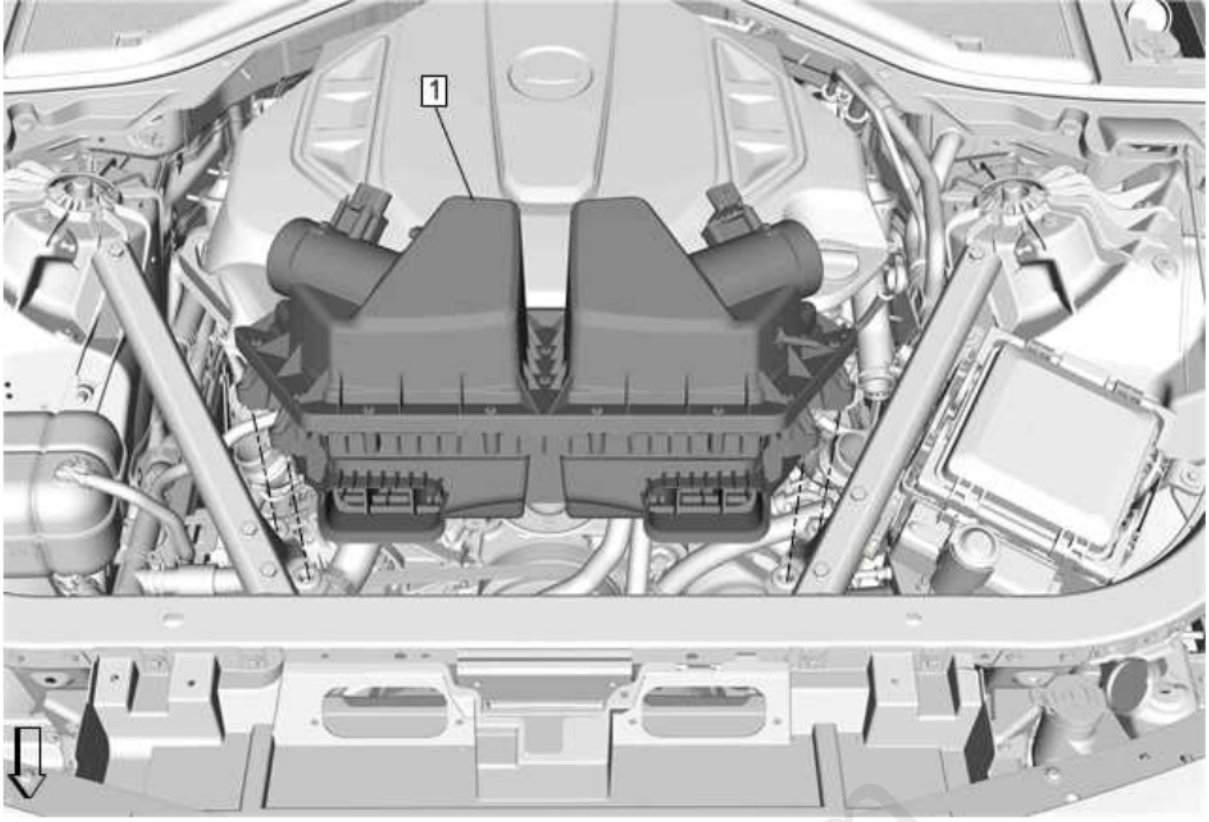


Fig. 454: Air Cleaner Assembly (LGW)
Courtesy of GENERAL MOTORS COMPANY

10. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** **Cooling System Draining and Filling (GE 47716 without HP9)**
11. Start the engine and check for coolant leaks.

HEATER COOLANT PUMP REPLACEMENT (LGX)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Air Cleaner AssemblyÂ» Remove - **Air Cleaner Assembly Replacement (LGX)**
3. Engine Front Splash Shield - Right Side - Front (4)Â» Remove - **Engine Front Splash Shield Replacement - Right Side (Front)**

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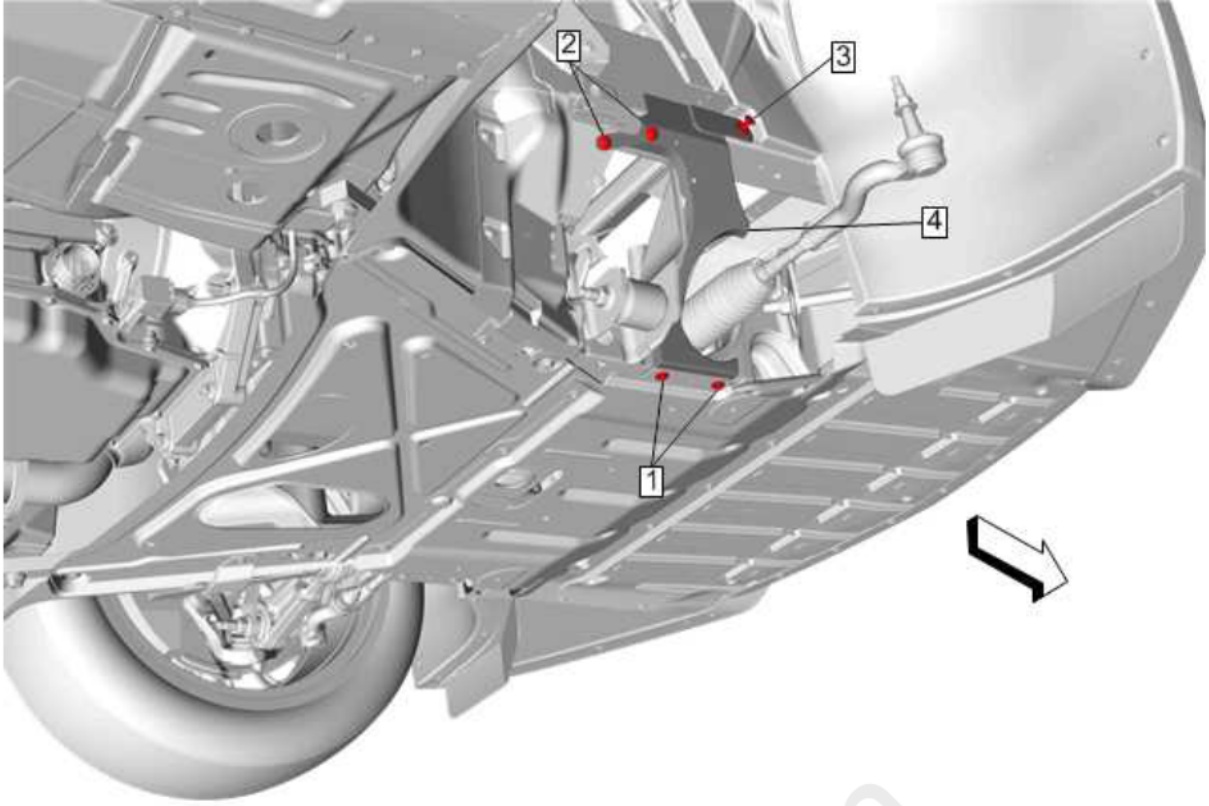


Fig. 455: Engine Front Splash Shield - Right Side (Front)
Courtesy of GENERAL MOTORS COMPANY

4. Engine Front Splash Shield - Right Side - Rear (4)Â» Remove - **Engine Front Splash Shield Replacement - Right Side (Rear)**

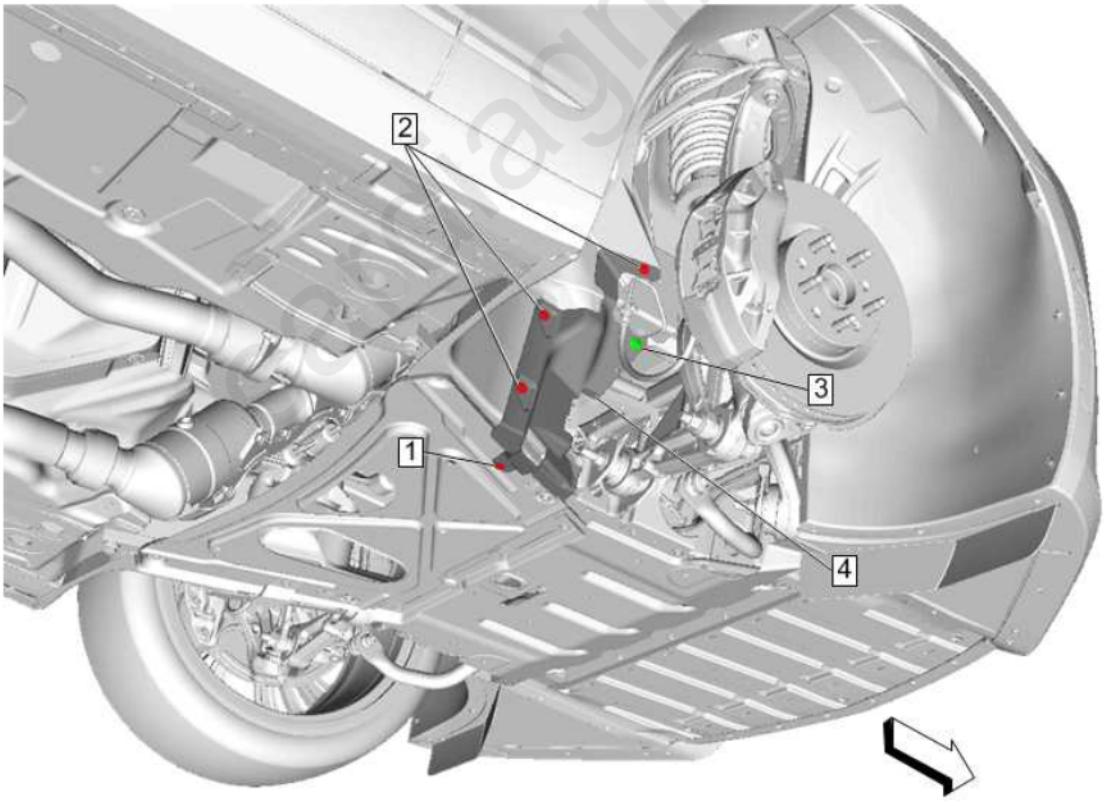


Fig. 456: Engine Front Splash Shield - Right Side (Rear)
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Inlet Hose Clamp (1) @ Heater Coolant PumpÂ» Remove - **Hose Clamp Replacement Guidelines - Spring Type**

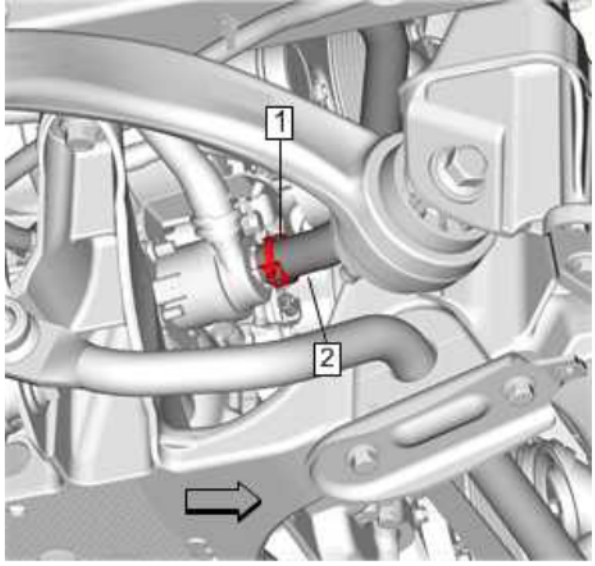


Fig. 457: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Remove
7. Heater Water Auxiliary Pump Outlet Hose Clamp (1) @ Heater Coolant PumpÂ» Remove - **Hose Clamp Replacement Guidelines - Spring Type**

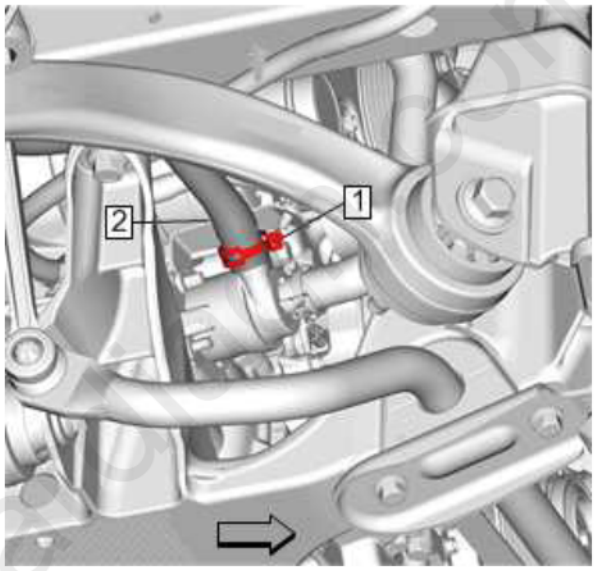


Fig. 458: Heater Water Auxiliary Pump Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Outlet Hose (2) @ Heater Coolant PumpÂ» Remove
9. Electrical Connector @ Heater Coolant PumpÂ» Disconnect
10. Wiring Harness @ Heater Coolant PumpÂ» Remove
11. Heater Coolant Pump Bracket Bolt (1) @ Heater Coolant Pump (2)Â» Remove [2x]

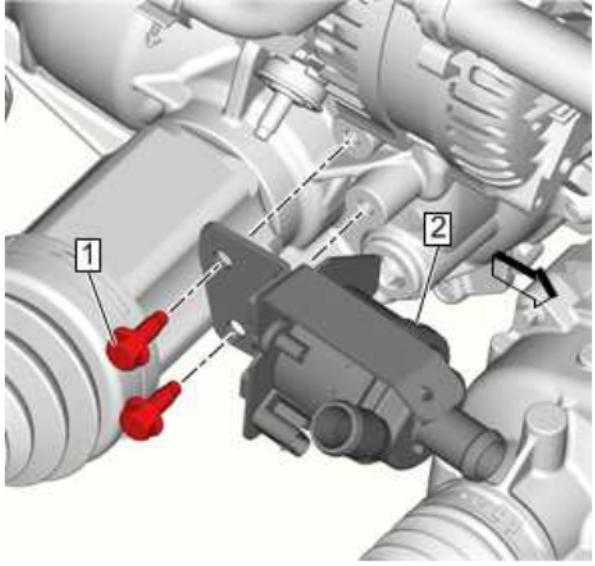


Fig. 459: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

12. Heater Coolant Pump (2)Â» Remove

Installation Procedure

1. Heater Coolant Pump (2)Â» Install

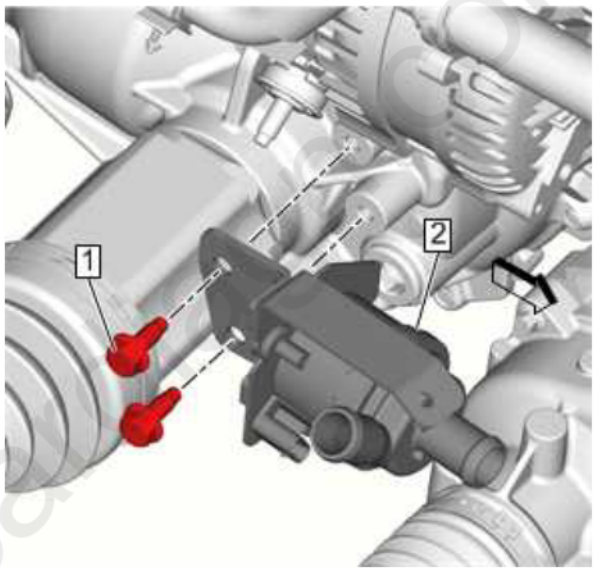


Fig. 460: Heater Coolant Pump
Courtesy of GENERAL MOTORS COMPANY

2. Heater Coolant Pump Bracket Bolt (1) @ Heater Coolant Pump (2)Â» Install and tighten [2x] 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

3. Wiring Harness @ Heater Coolant PumpÂ» Install
4. Electrical Connector @ Heater Coolant PumpÂ» Install
5. Heater Water Auxiliary Pump Outlet Hose (2) @ Heater Coolant PumpÂ» Install

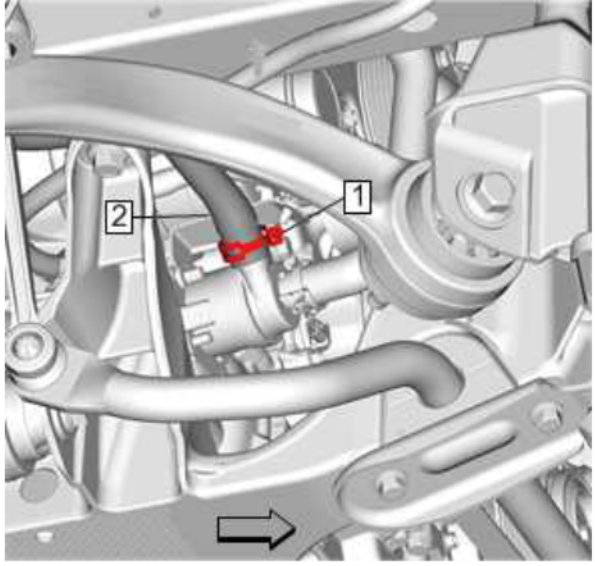


Fig. 461: Heater Water Auxiliary Pump Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Outlet Hose Clamp (1) @ Heater Coolant PumpÂ» Install - **Hose Clamp Replacement Guidelines - Spring Type**
7. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Install

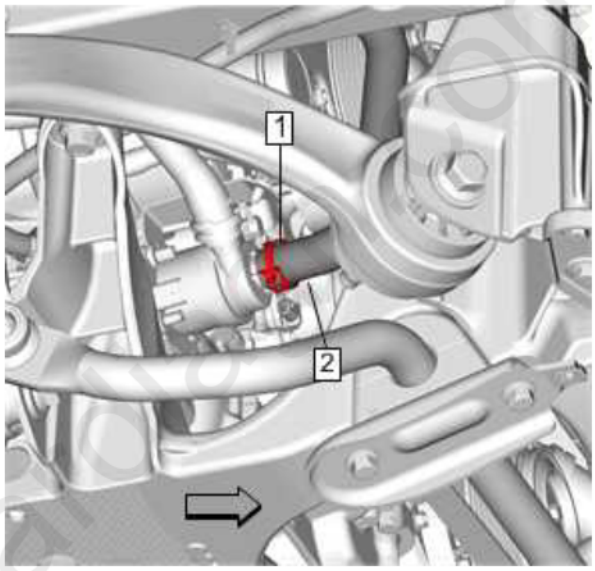


Fig. 462: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Inlet Hose Clamp (1) @ Heater Coolant PumpÂ» Install - **Hose Clamp Replacement Guidelines - Spring Type**
9. Engine Front Splash Shield - Right Side - Rear (4)Â» Install - **Engine Front Splash Shield Replacement - Right Side (Rear)**

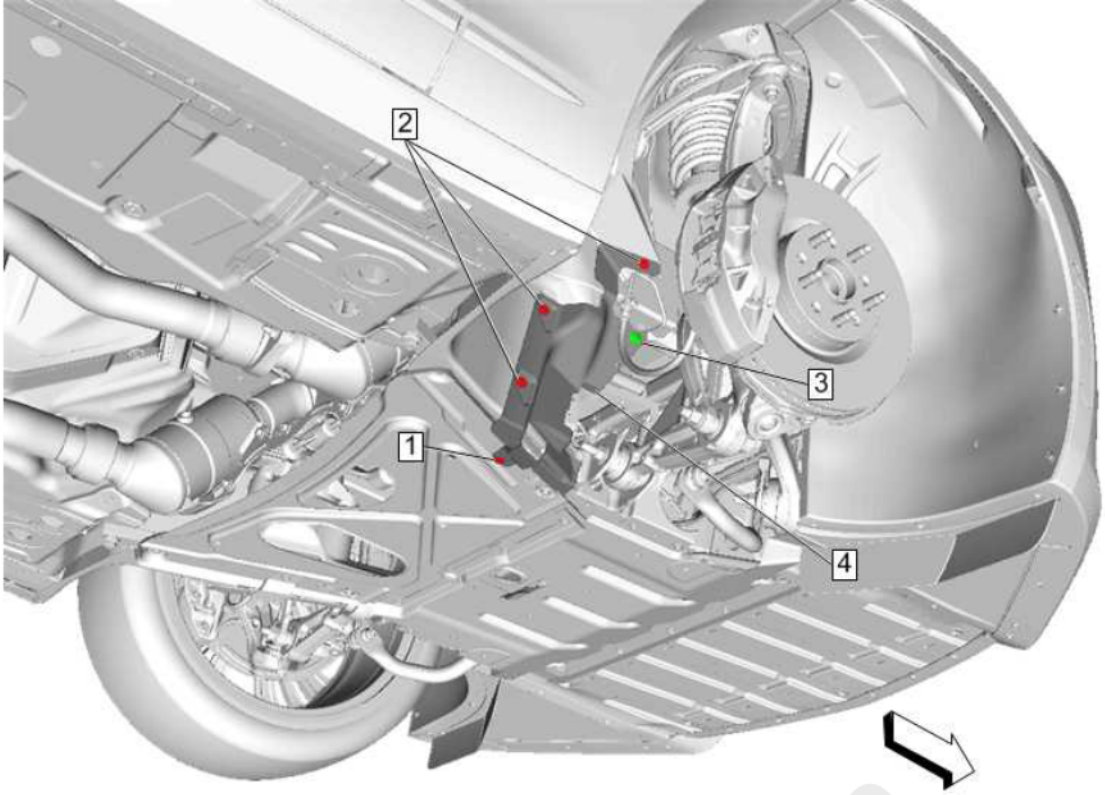


Fig. 463: Engine Front Splash Shield - Right Side (Rear)
Courtesy of GENERAL MOTORS COMPANY

10. Engine Front Splash Shield - Right Side- Front (4)Â» Install - **Engine Front Splash Shield Replacement - Right Side (Front)**

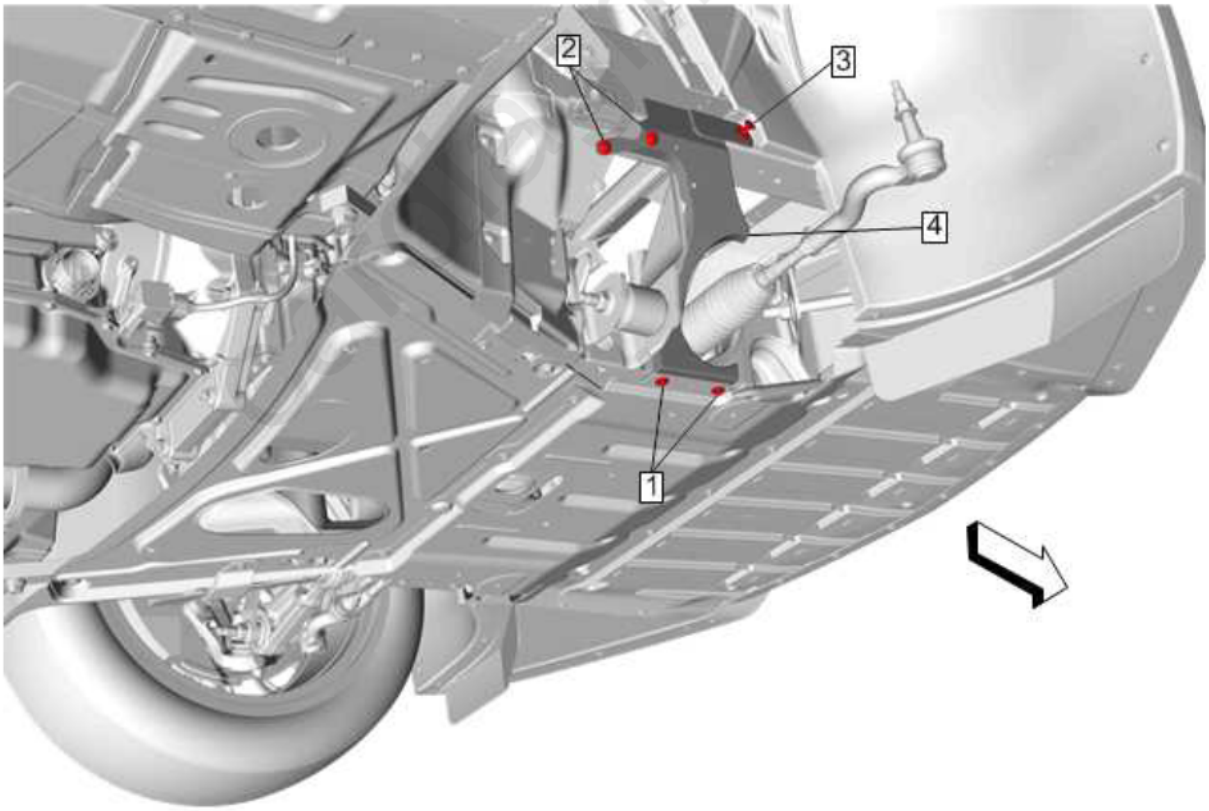


Fig. 464: Engine Front Splash Shield - Right Side (Front)
Courtesy of GENERAL MOTORS COMPANY

11. Air Cleaner AssemblyÂ» Install - **Air Cleaner Assembly Replacement (LGX)**
12. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
13. Start the engine and check for coolant leaks.

HEATER COOLANT PUMP REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Air Cleaner Assembly (2)Â» Remove - **Air Cleaner Assembly Replacement**

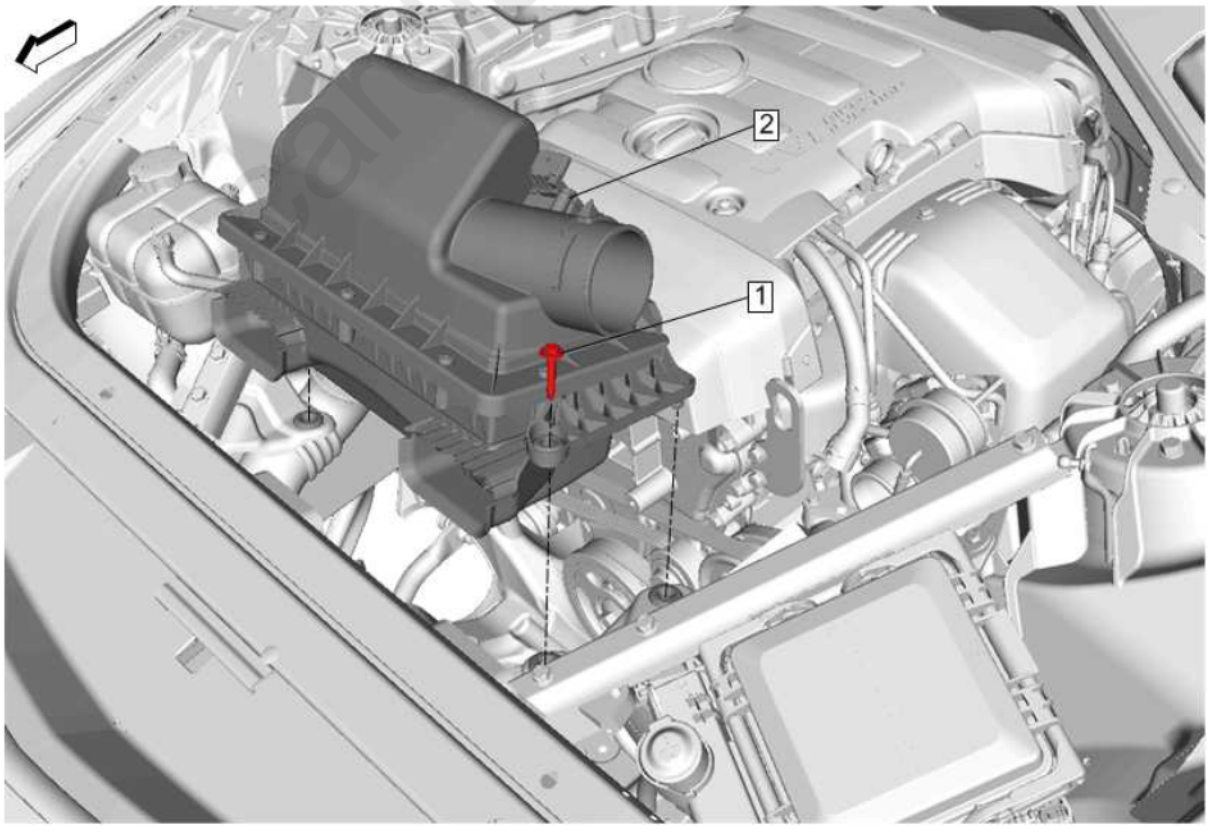


Fig. 465: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Generator Control Module Coolant Pump Bracket (3)Â» Remove - **Generator Control Module Coolant Pump Bracket Replacement (At Heater Coolant Pump) Generator Control Module Coolant Pump Bracket Replacement (At Generator Control Module Coolant Pump)**

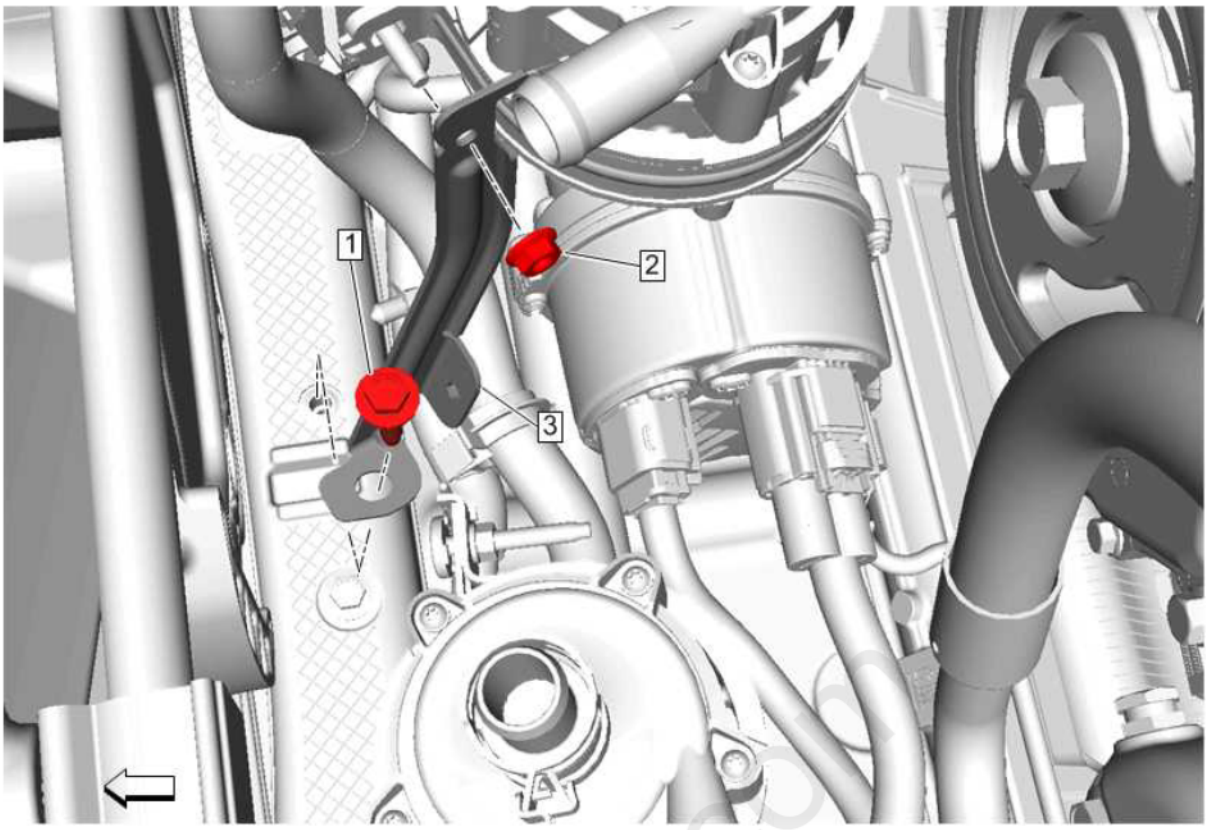


Fig. 466: Generator Control Module Coolant Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Remove - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

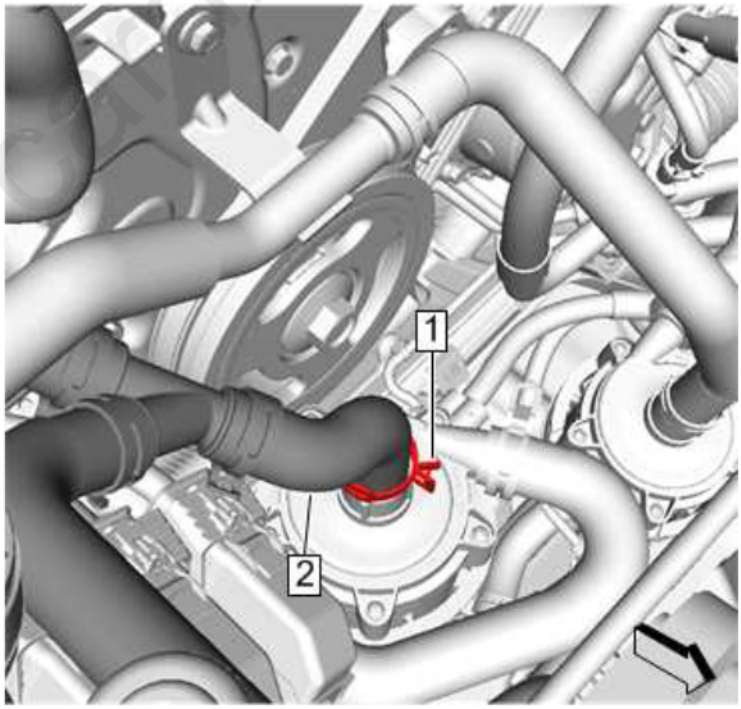


Fig. 467: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Remove - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to**

Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)

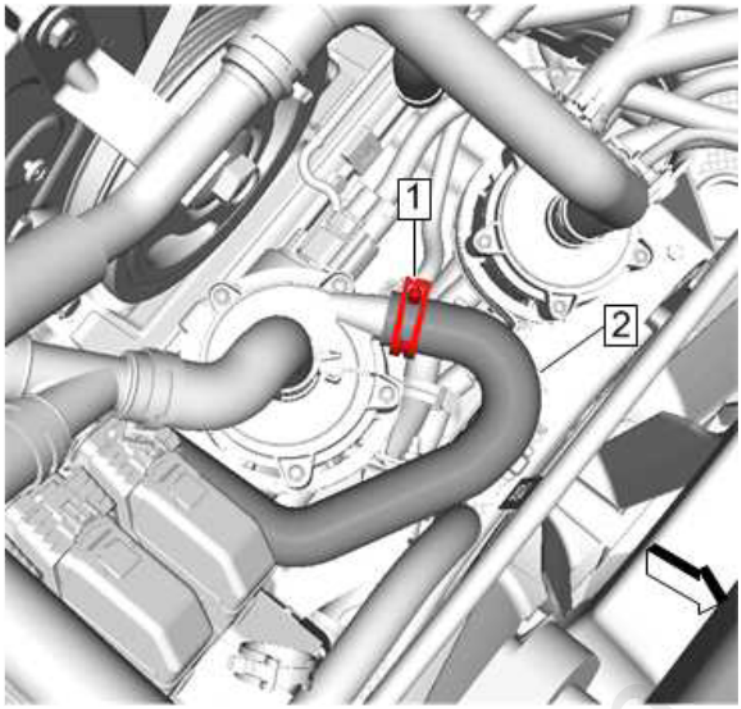


Fig. 468: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

7. Disconnect the electrical connector.
8. Heater Coolant Pump Nut (2) @ Heater Coolant PumpÂ» Remove

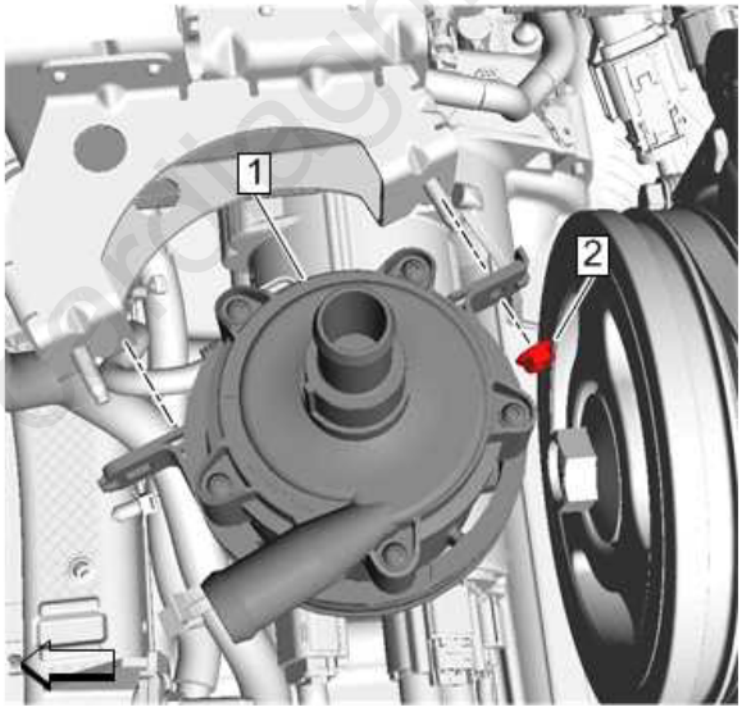


Fig. 469: Heater Coolant Pump And Nut
Courtesy of GENERAL MOTORS COMPANY

9. Heater Coolant Pump (1) @ Heater Water Auxiliary Pump BracketÂ» Remove
10. Heater Coolant Pump (1)Â» Remove

Installation Procedure

1. Heater Coolant Pump (1) @ Heater Water Auxiliary Pump BracketÂ» Install

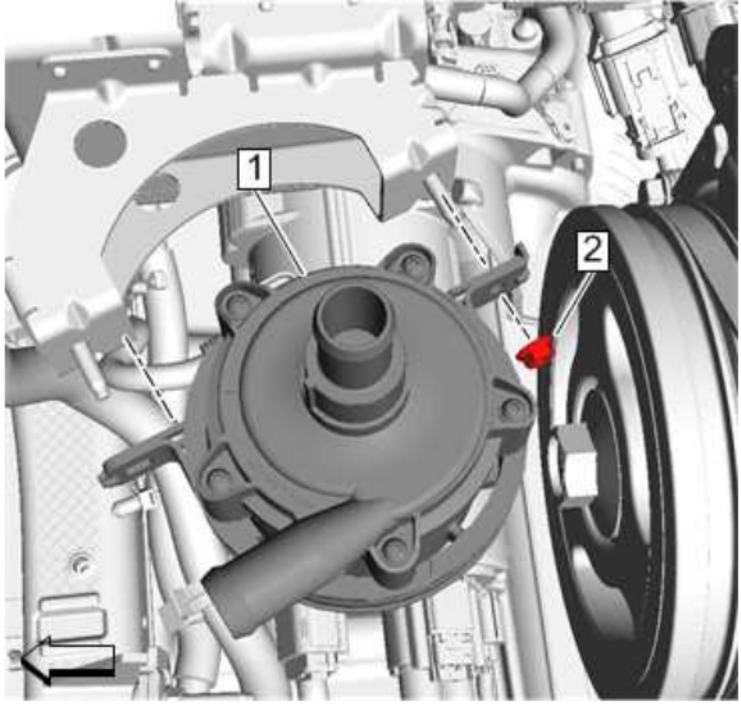


Fig. 470: Heater Coolant Pump And Nut
Courtesy of GENERAL MOTORS COMPANY

2. Heater Coolant Pump Nut (2) @ Heater Coolant PumpÂ» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

3. Connect the electrical connector.
4. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Install - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

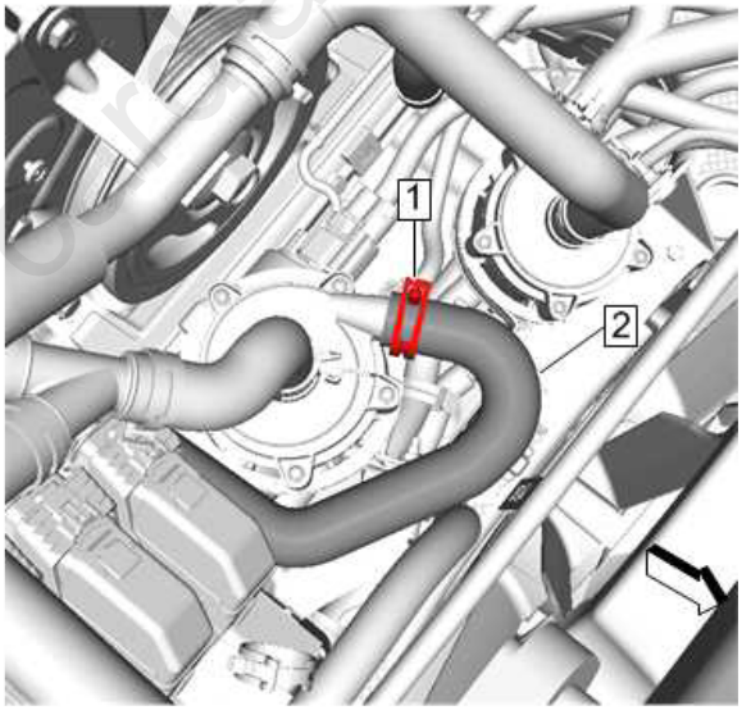


Fig. 471: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Install - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

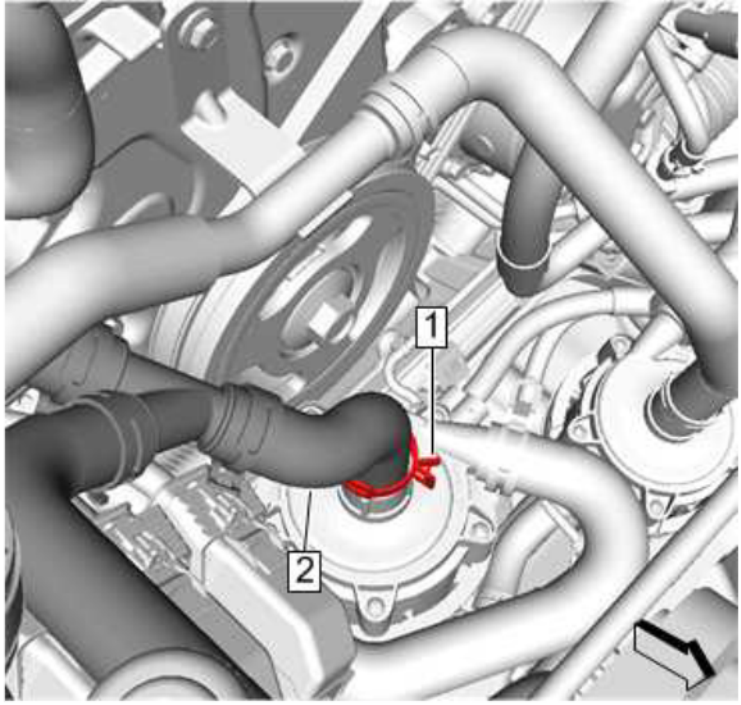


Fig. 472: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

6. Generator Control Module Coolant Pump Bracket (3)Â» Install - **Generator Control Module Coolant Pump Bracket Replacement (At Heater Coolant Pump)** **Generator Control Module Coolant Pump Bracket Replacement (At Generator Control Module Coolant Pump)**

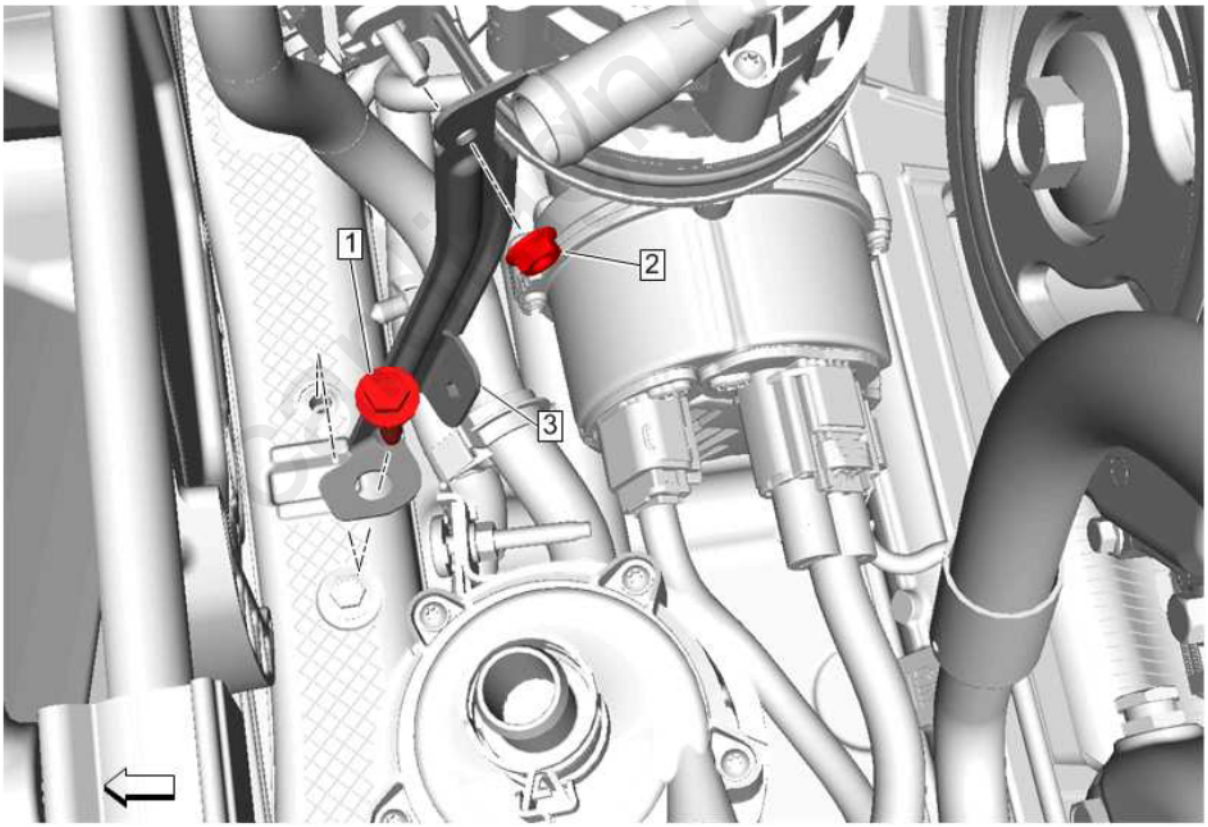


Fig. 473: Generator Control Module Coolant Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

7. Air Cleaner Assembly (2)Â» Install - **Air Cleaner Assembly Replacement**

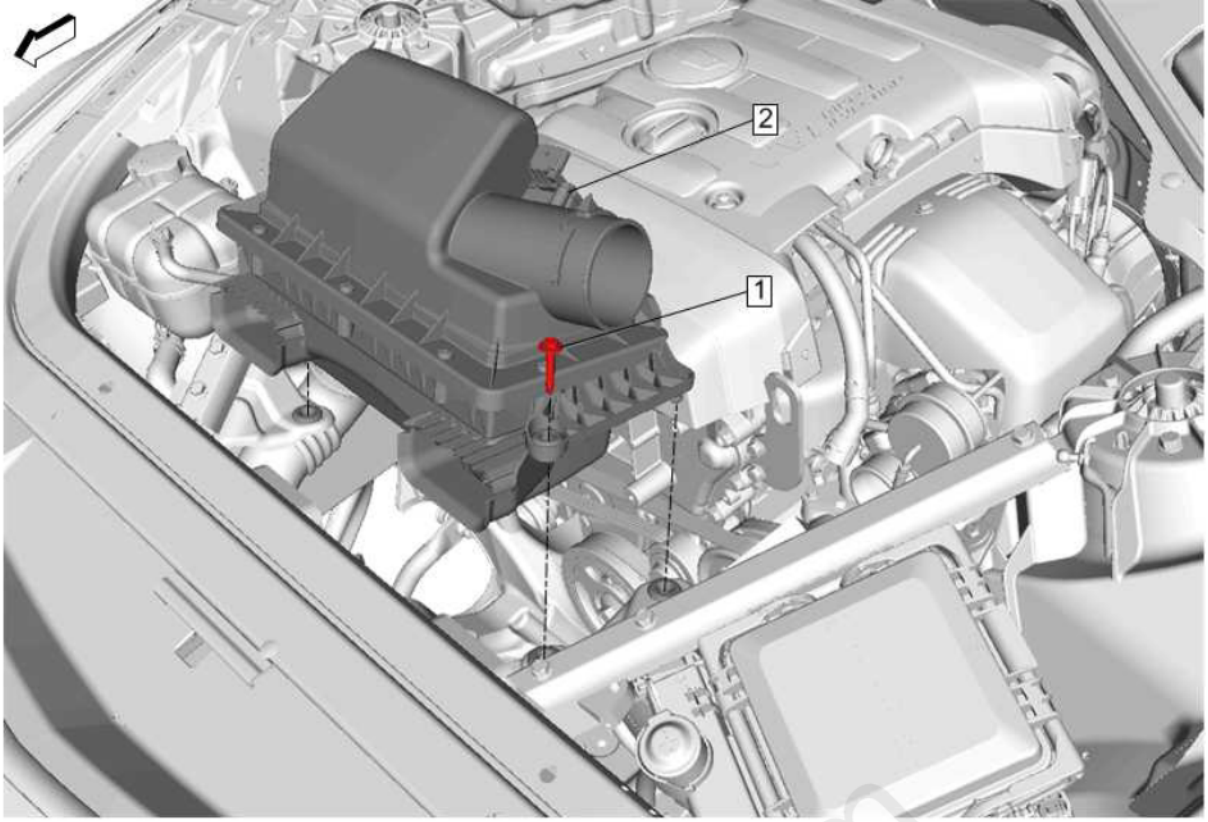


Fig. 474: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

8. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
9. Enable the high voltage system. Refer to **High Voltage Enabling**
10. Start the engine and check for coolant leaks.

AIR INLET DEFLECTOR WATER DEFLECTOR REPLACEMENT

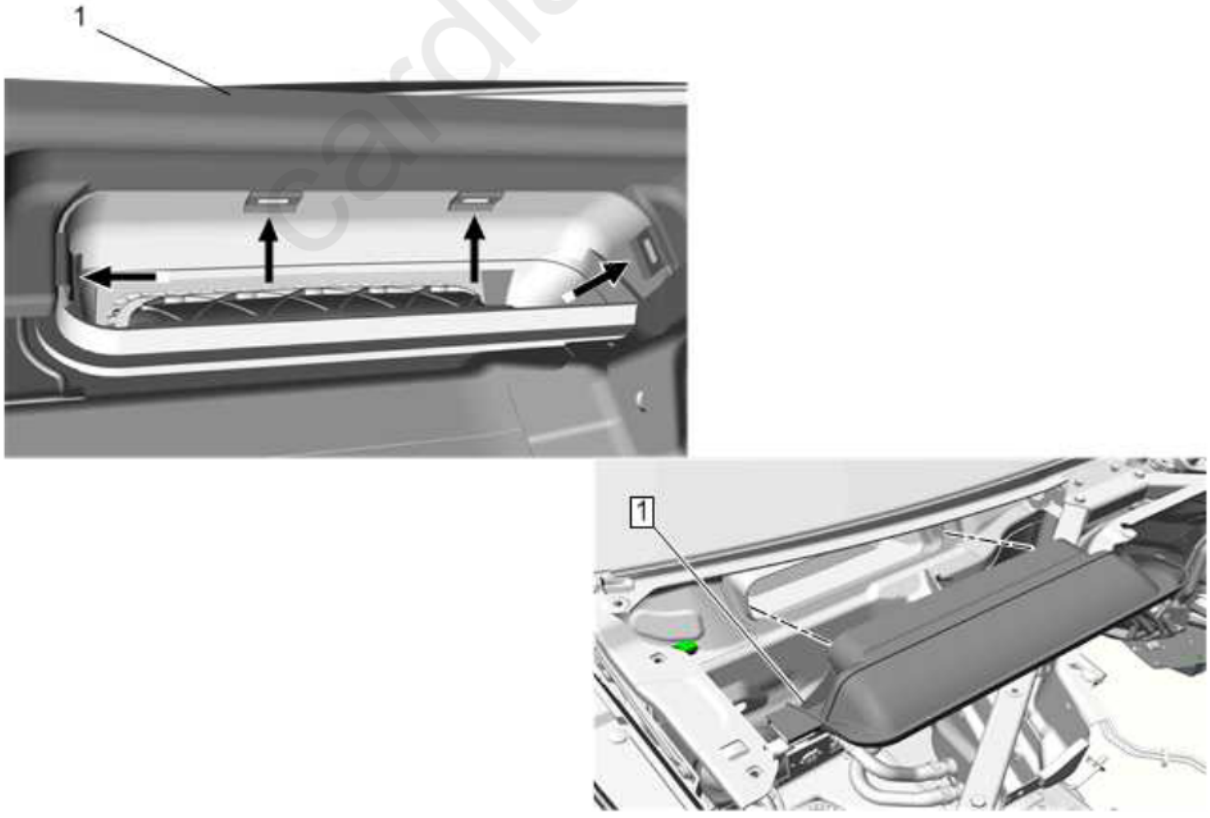


Fig. 475: Air Inlet Deflector Water Deflector
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedure Air Inlet Grille Panel Replacement	
1	Air Inlet Deflector Water Deflector **Procedure** 1. Un-clip the air inlet deflector water deflector from the air inlet deflector water deflector retainer. 2. Disconnect the electrical connector. 3. Transfer components as necessary.

AIR INLET DEFLECTOR WATER DEFLECTOR RETAINER REPLACEMENT

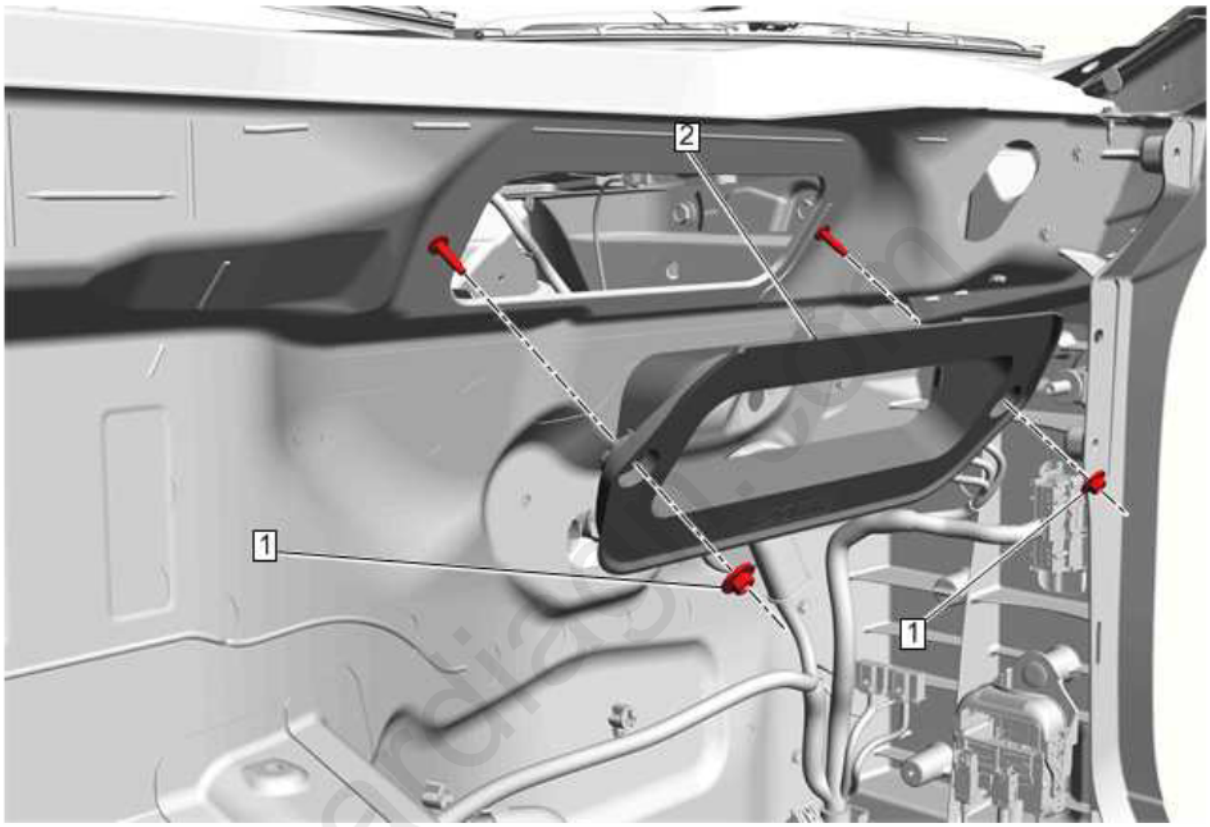


Fig. 476: Air Inlet Deflector Water Deflector Retainer
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid) 2. Air Inlet Deflector Water Deflector Replacement	
1	Air Inlet Deflector Water Deflector Retainer Nut [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 9 N.m (80 lb in)
2	Air Inlet Deflector Water Deflector Retainer

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT

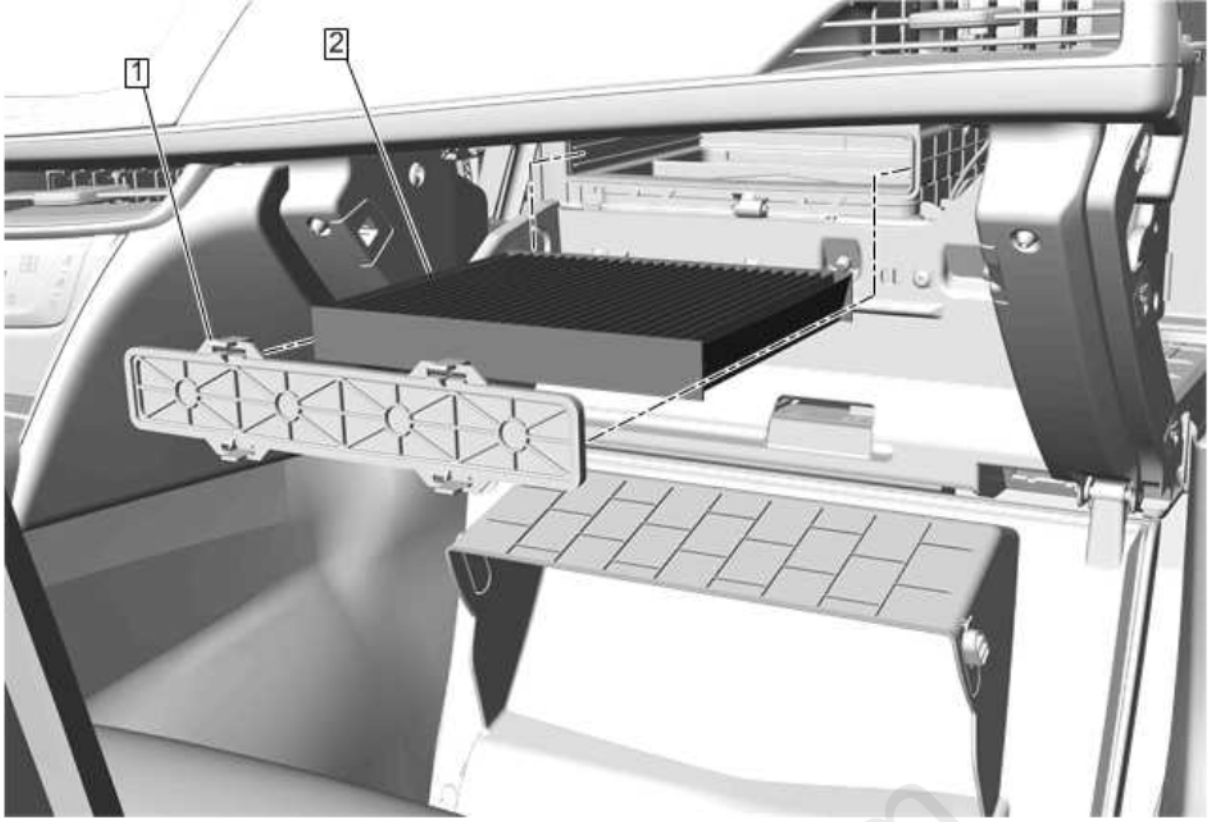


Fig. 477: Passenger Compartment Air Filter
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Compartment Shelf Replacement (without RPO WCN) Instrument Panel Compartment Shelf Replacement (with RPO WCN)	
1	Passenger Compartment Air Filter Cover
2	Passenger Compartment Air Filter

PASSENGER COMPARTMENT AIR FILTER MODULE REPLACEMENT (KEM)

Removal Procedure

1. Radio Controls (2)Â» Remove - Radio Control Assembly Replacement

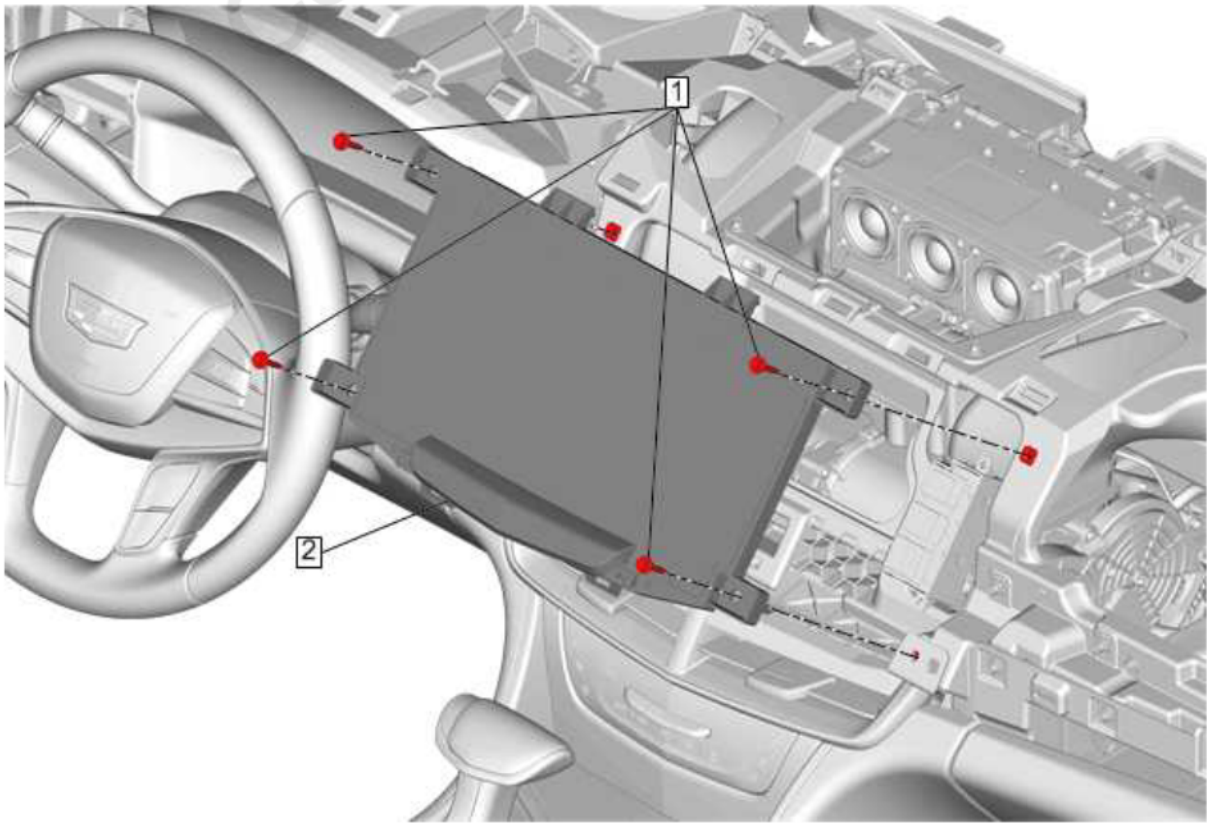


Fig. 478: Radio Control Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Passenger Compartment Air Filter Module Sensor (1)Â» Remove

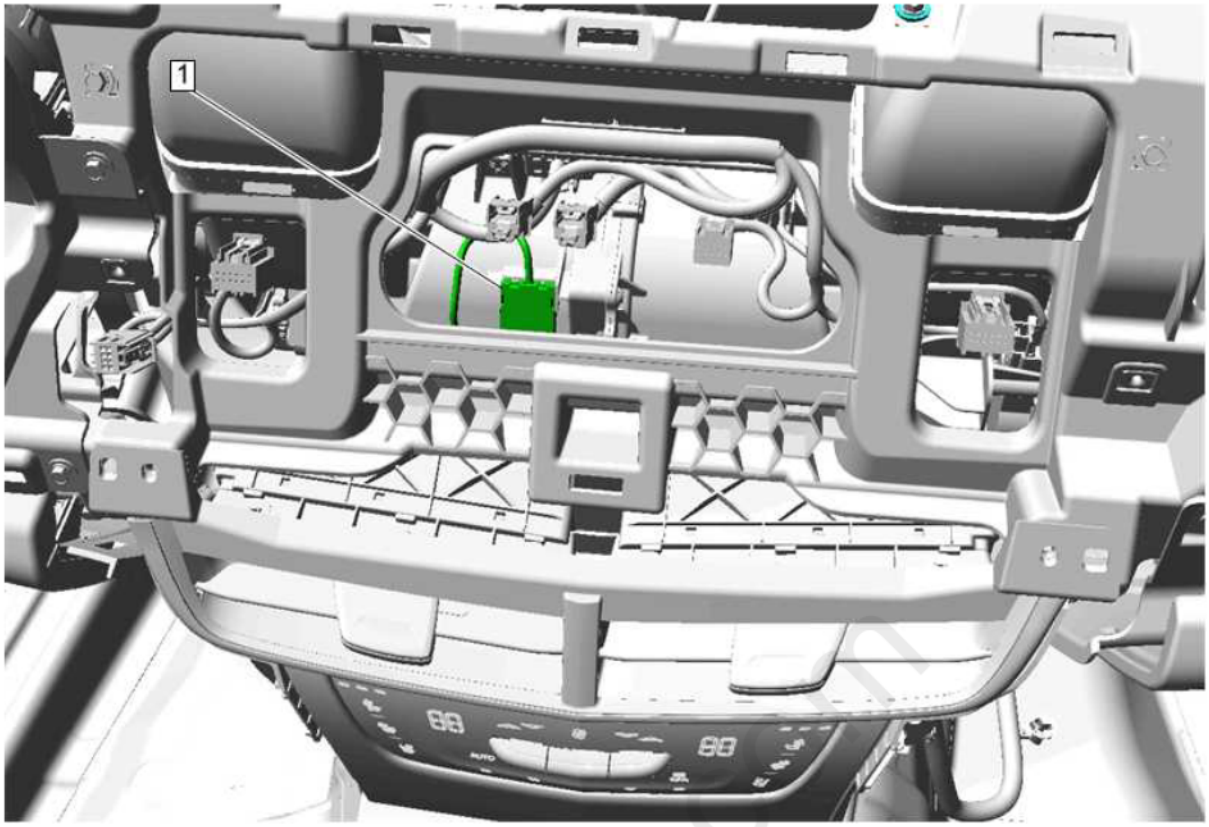


Fig. 479: Passenger Compartment Air Filter Module Sensor
Courtesy of GENERAL MOTORS COMPANY

3. Instrument Panel Lower Trim Panel Replacement - Left Side (3)Â» Remove - **Instrument Panel Lower Trim Panel Insulator Replacement - Left Side**

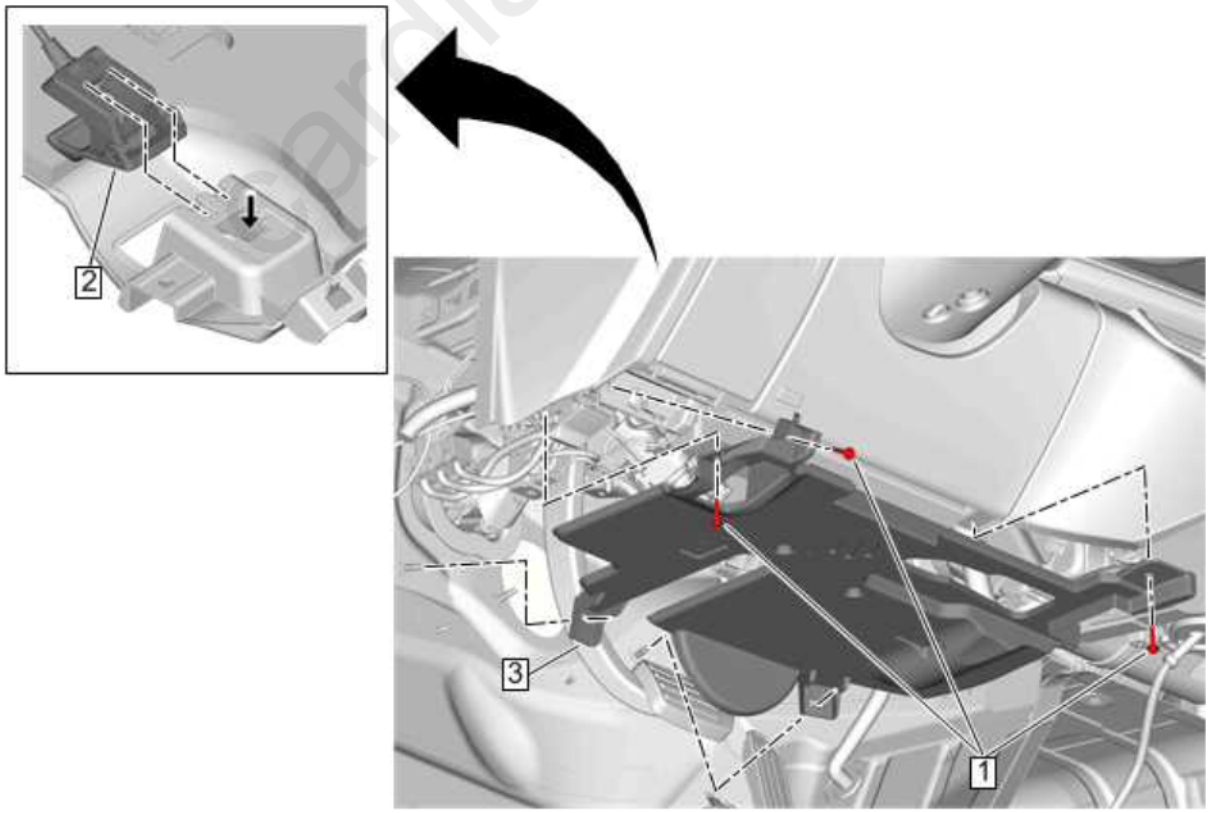


Fig. 480: Instrument Panel Lower Trim Panel Insulator - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Front Floor Console Extension Panel - Left (2)Â» Remove - **Front Floor Console Extension Panel Replacement - Left Side**

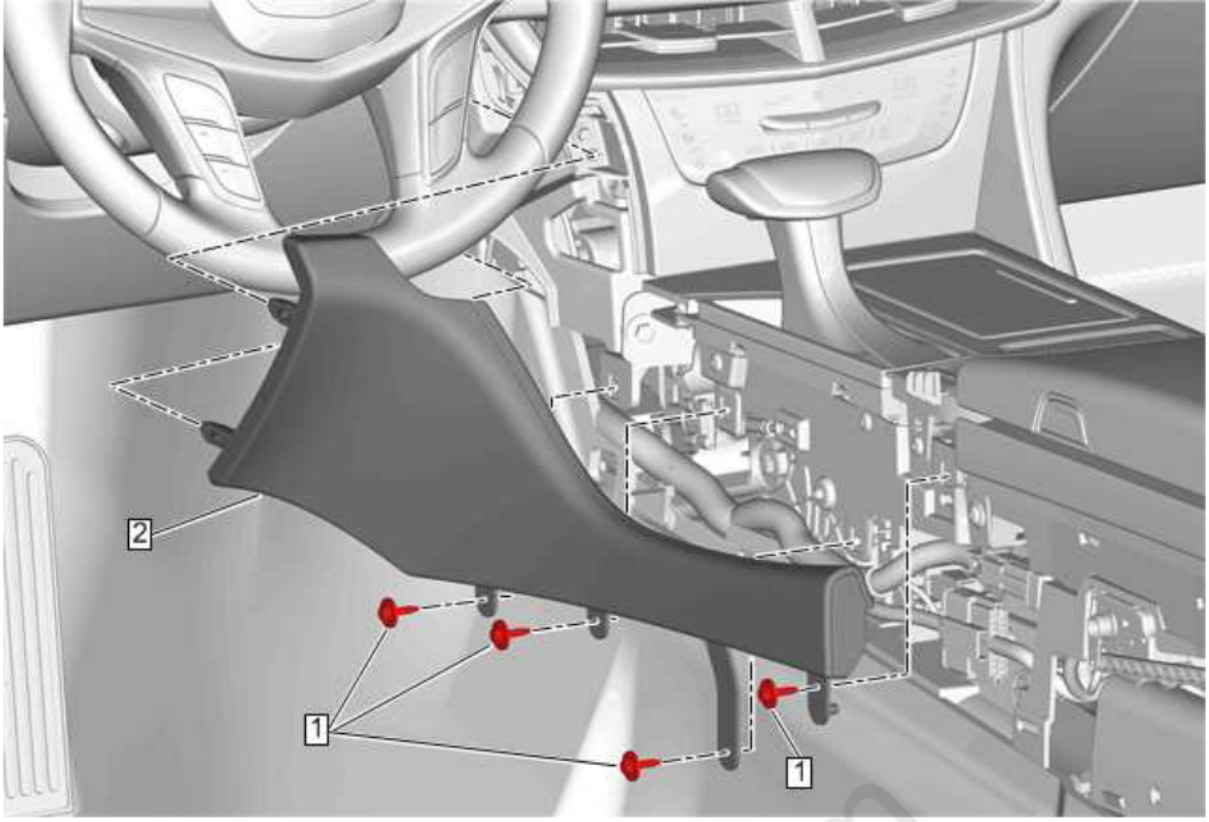


Fig. 481: Front Floor Console Extension Panel - Left Side
Courtesy of GENERAL MOTORS COMPANY

5. Pull the carpet back to gain access to the passenger compartment air filter module.
6. Disconnect the electrical connector.
7. Passenger Compartment Air Filter Module Fastener (1)Â» Remove [2x]

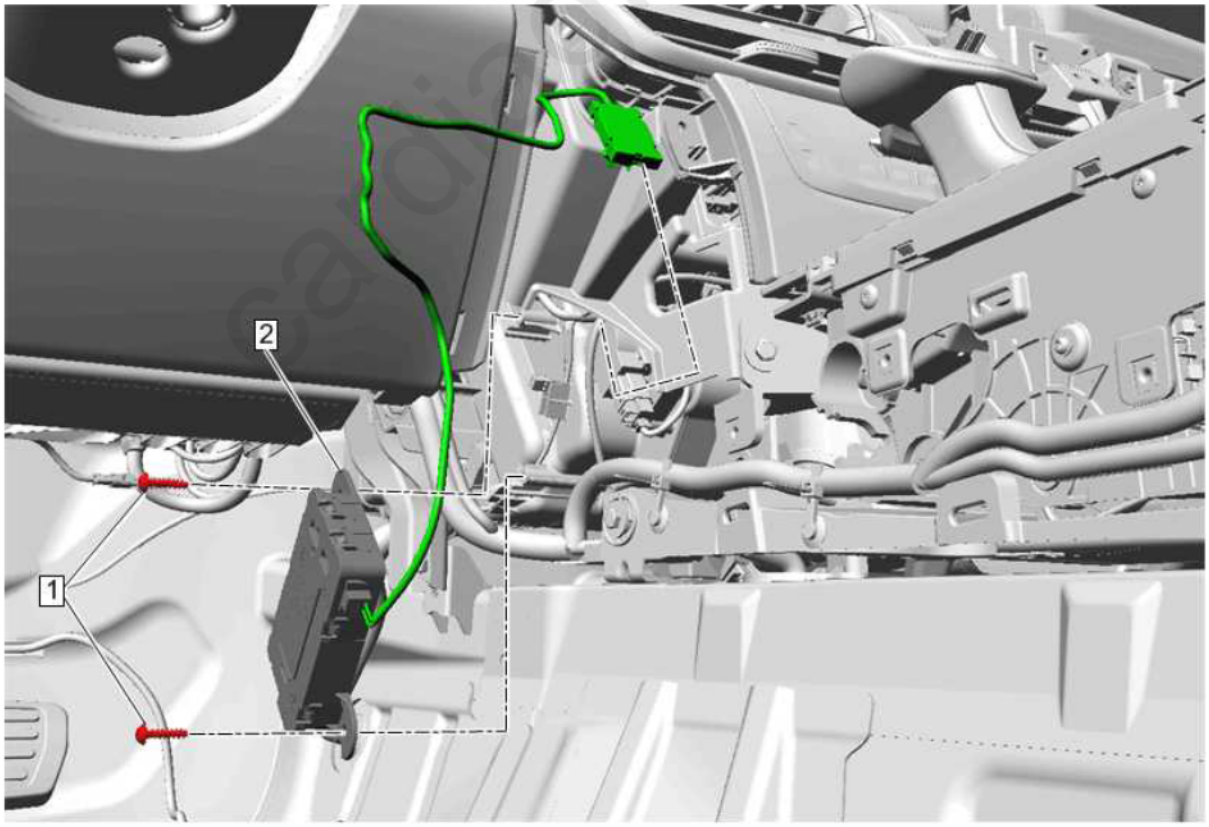


Fig. 482: Passenger Compartment Air Filter Module
Courtesy of GENERAL MOTORS COMPANY

8. Passenger Compartment Air Filter Module (2)Â» Remove
9. Maneuver the passenger compartment air filter module sensor out from behind the instrument panel.

Installation Procedure

1. Maneuver the passenger compartment air filter module sensor back behind the instrument panel and into the sensor proper position.

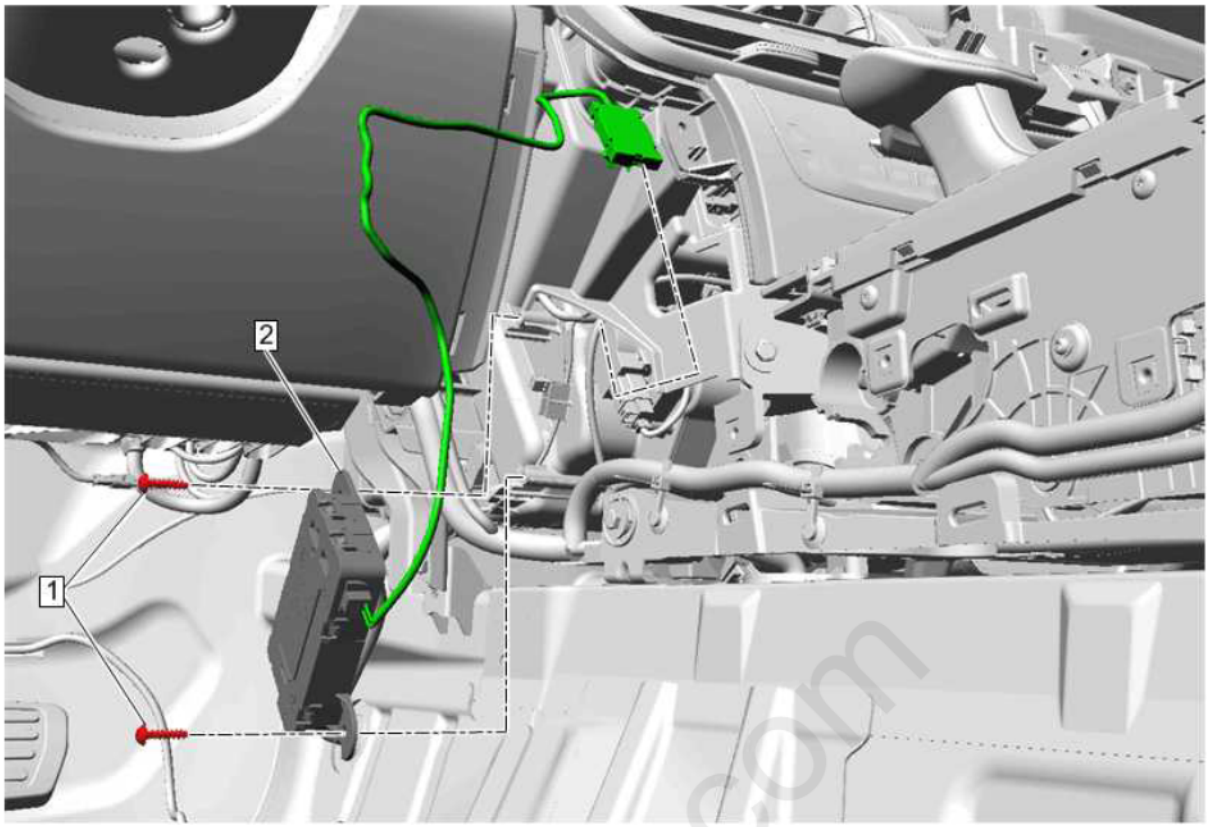


Fig. 483: Passenger Compartment Air Filter Module
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Passenger Compartment Air Filter Module (2)Â» Install
3. Passenger Compartment Air Filter Module Fastener (1)Â» Install and tighten [2x] 1.3 N.m (12 lb in)
4. Connect the electrical connector.
5. Position the carpet back to its original position.
6. Front Floor Console Extension Panel - Left (2)Â» Install - **Front Floor Console Extension Panel Replacement - Left Side**

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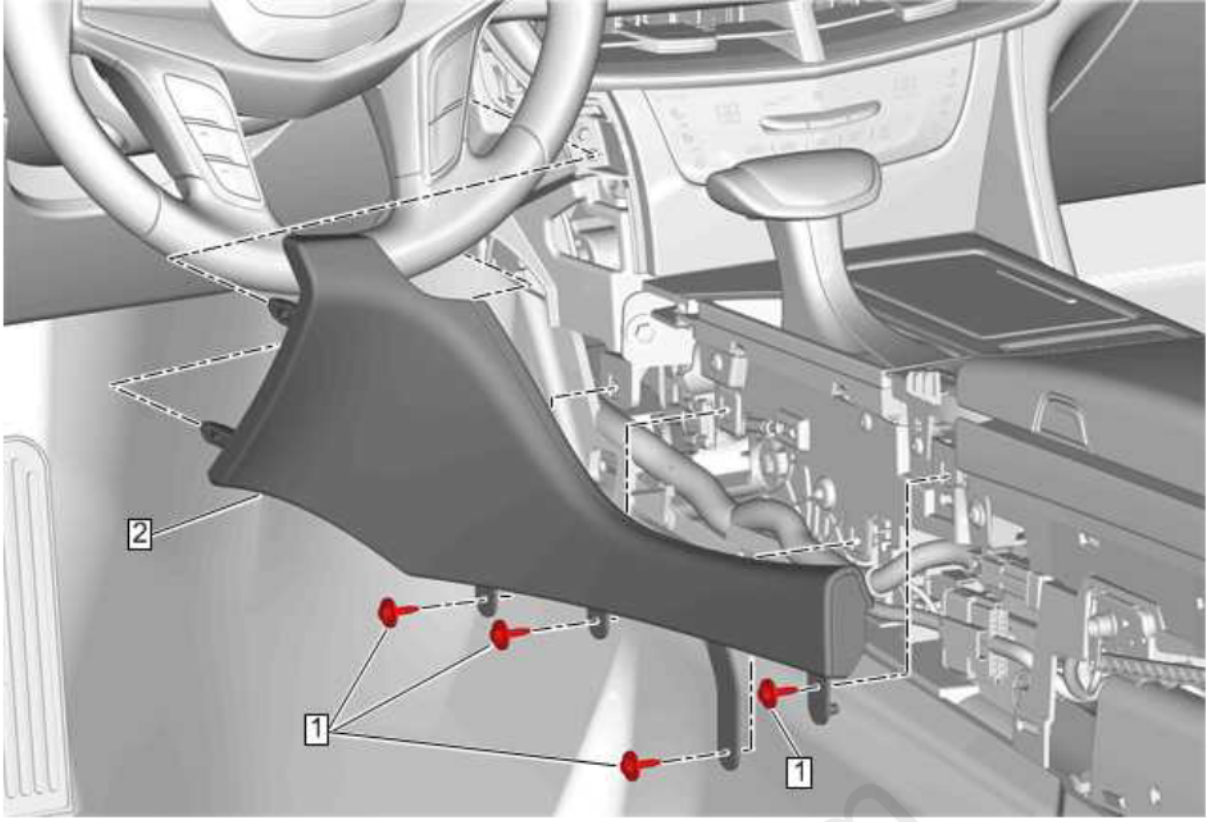


Fig. 484: Front Floor Console Extension Panel - Left Side
Courtesy of GENERAL MOTORS COMPANY

7. Instrument Panel Lower Trim Panel Replacement - Left Side (3)Â» Install - **Instrument Panel Lower Trim Panel Insulator Replacement - Left Side**

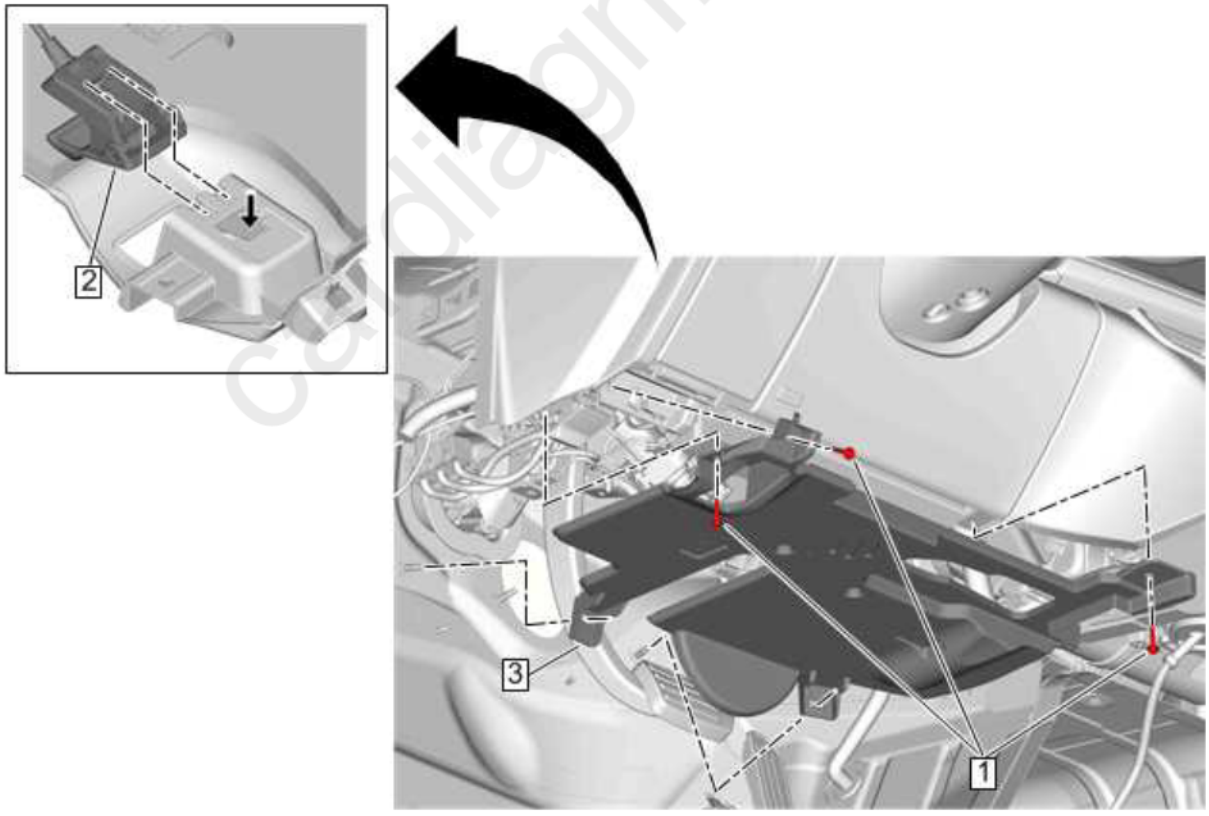


Fig. 485: Instrument Panel Lower Trim Panel Insulator - Left Side
Courtesy of GENERAL MOTORS COMPANY

8. Passenger Compartment Air Filter Module Sensor (1)Â» Install

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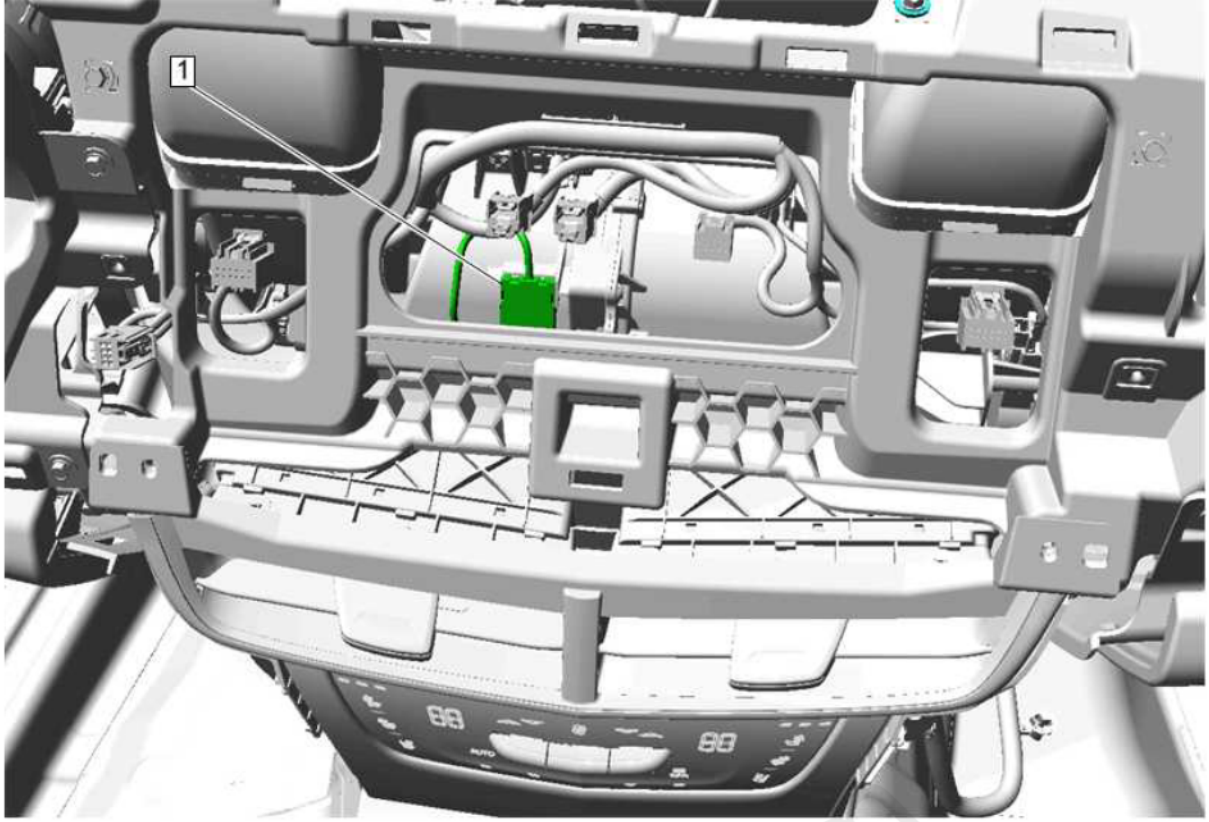


Fig. 486: Passenger Compartment Air Filter Module Sensor
Courtesy of GENERAL MOTORS COMPANY

9. Radio Controls (2)Â» Install - **Radio Control Assembly Replacement**

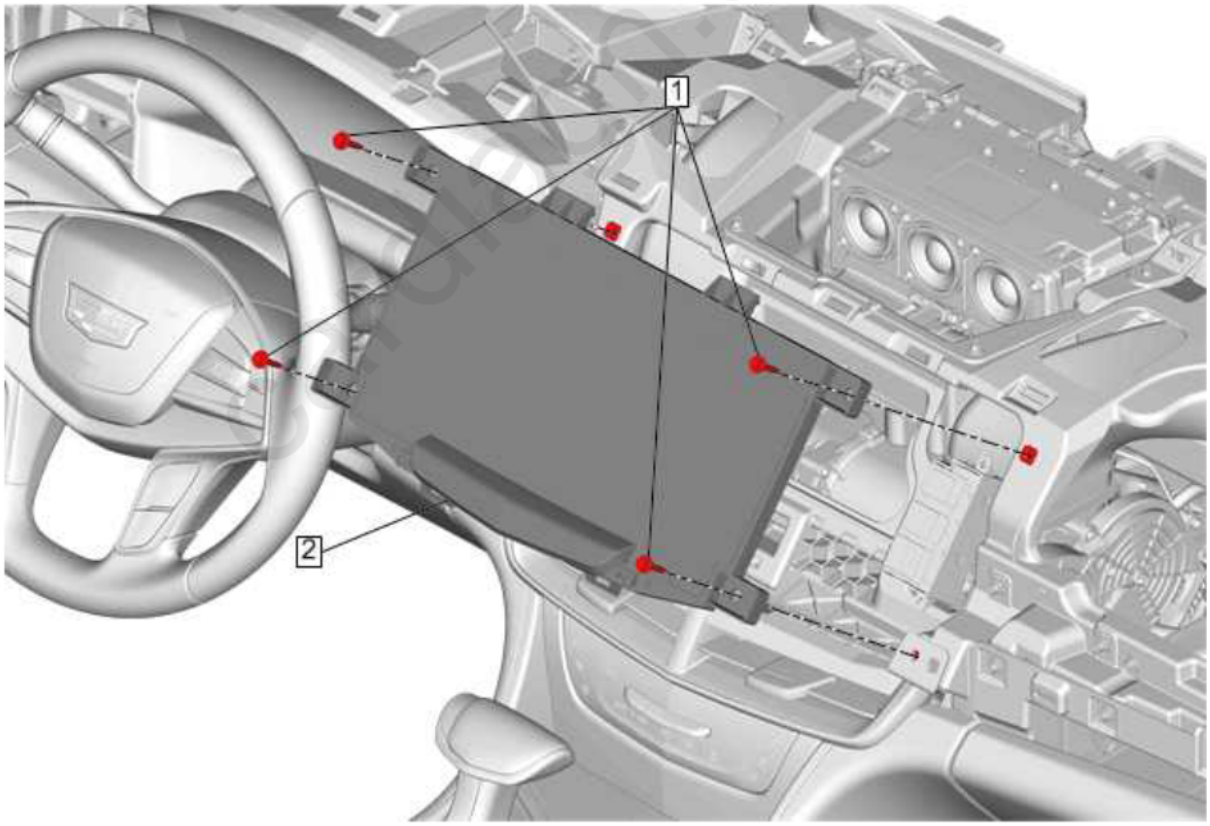


Fig. 487: Radio Control Assembly
Courtesy of GENERAL MOTORS COMPANY

10. Clear the DTCs from the heater and air conditioning remote control module.

AIR INLET HOUSING REPLACEMENT

Removal Procedure

1. **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module**

Removal and Installation (With HP9 Hybrid)Â» Remove

2. Disconnect the electrical connector.

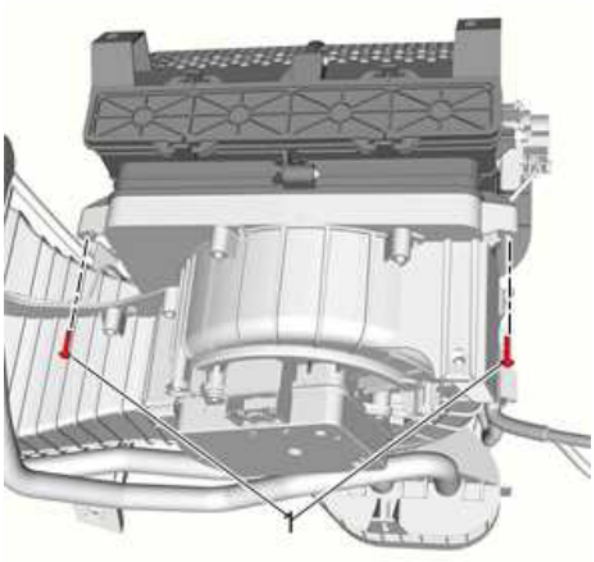


Fig. 488: Air Inlet Housing Fasteners
Courtesy of GENERAL MOTORS COMPANY

3. Air Inlet Housing Fastener (1)Â» Remove [2x]
4. Remove the air inlet housing assembly seal (1).

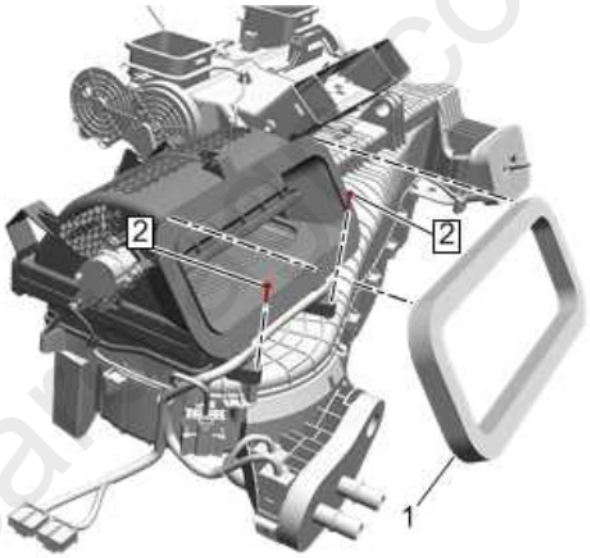


Fig. 489: Air Inlet Housing Assembly Seal and Fasteners
Courtesy of GENERAL MOTORS COMPANY

5. Air Inlet Housing Fastener (2)Â» Remove [2x]
6. Air Inlet Housing Assembly (1)Â» Remove

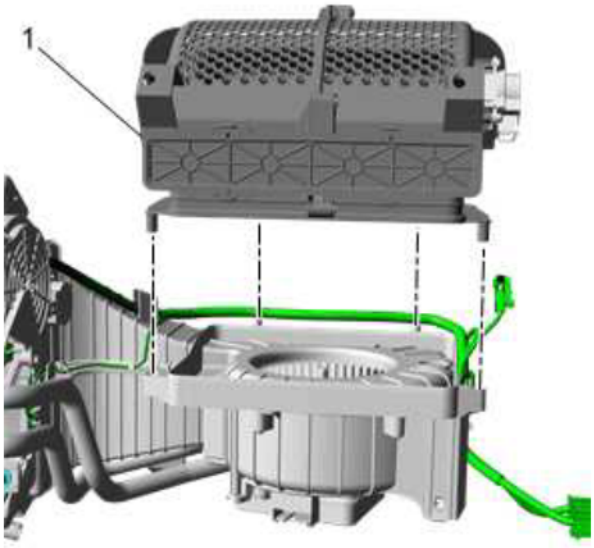


Fig. 490: Air Inlet Housing Assembly
Courtesy of GENERAL MOTORS COMPANY

7. Transfer components as necessary.

Installation Procedure

1. Air Inlet Housing Assembly (1)Â» Install

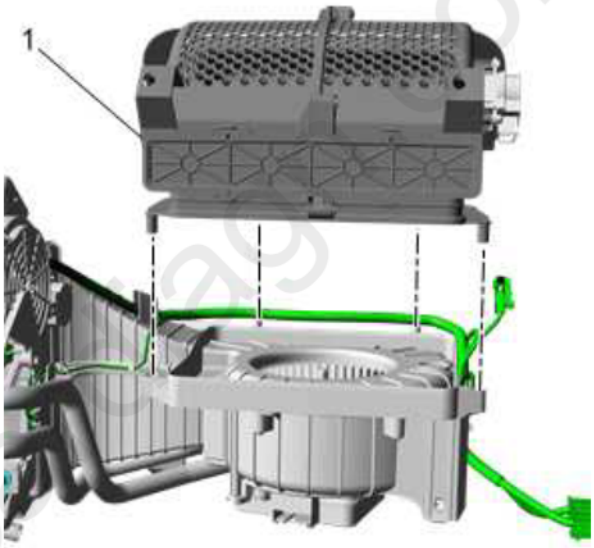


Fig. 491: Air Inlet Housing Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Air Inlet Housing Fastener (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]

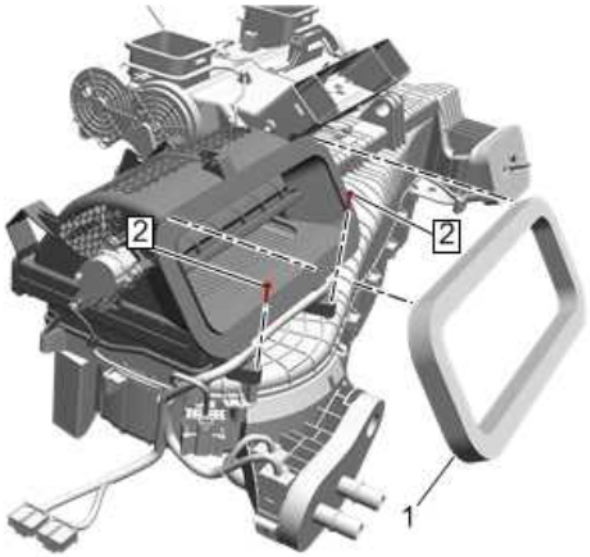


Fig. 492: Air Inlet Housing Assembly Seal and Fasteners
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Install the air inlet housing assembly seal (1).
4. Air Inlet Housing Fastener (1)Â» Install and tighten 2.5 N.m (22 lb in) [2x]

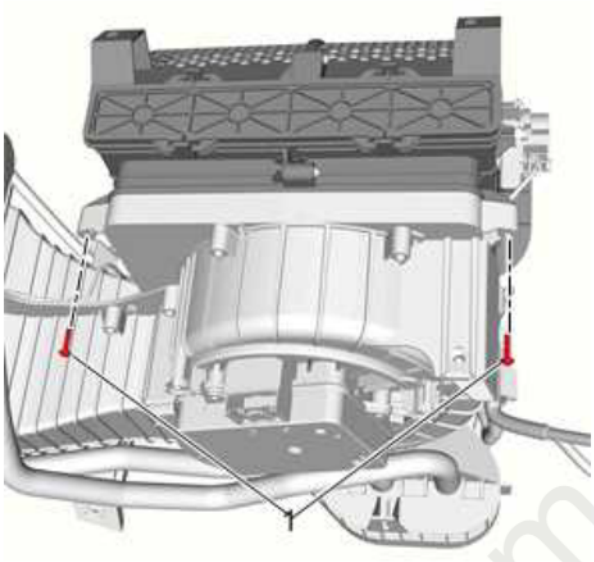


Fig. 493: Air Inlet Housing Fasteners
Courtesy of GENERAL MOTORS COMPANY

5. Connect the electrical connector.
6. Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)Â» Install

BLOWER MOTOR REPLACEMENT

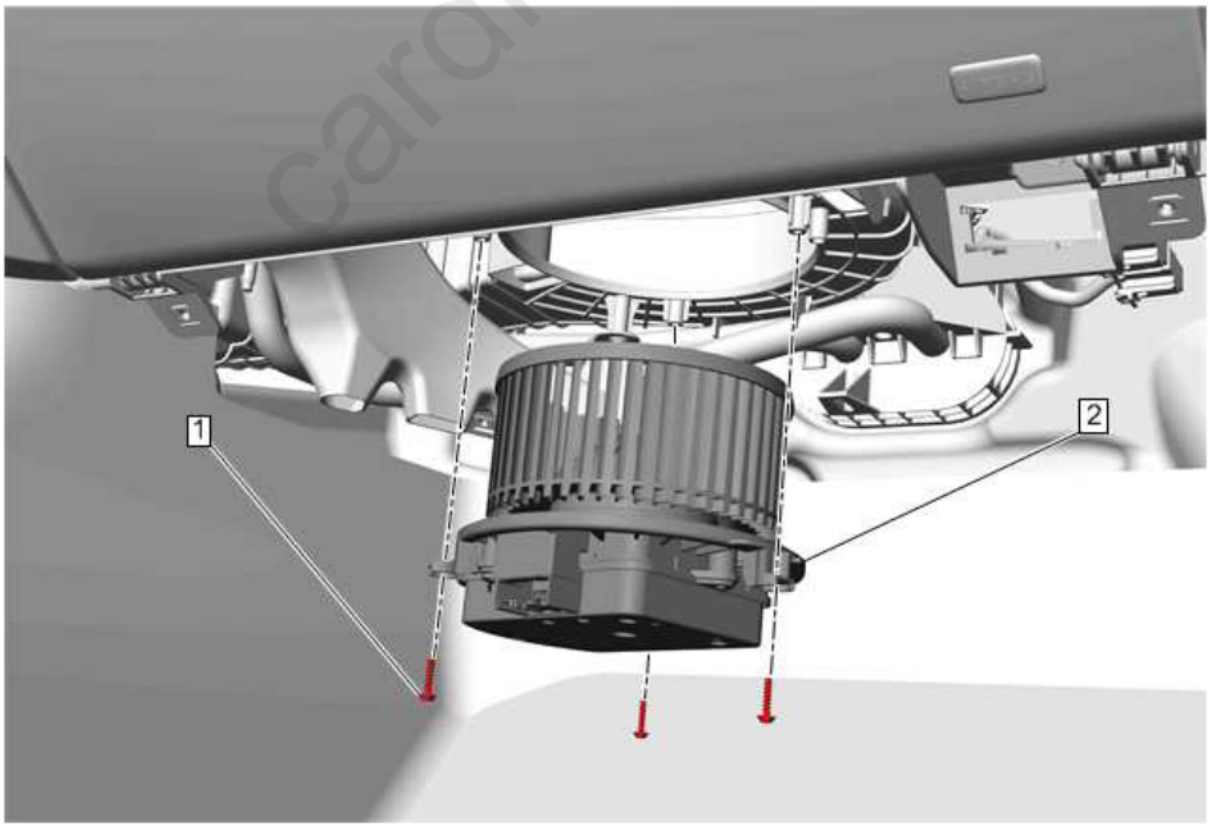


Fig. 494: Blower Motor
Courtesy of GENERAL MOTORS COMPANY

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Call out	Component Name
Preliminary Procedure **Instrument Panel Lower Airbag Replacement - Passenger Side**	
1	Blower Motor Bolt [3x] **CAUTION:** **Refer to Fastener Caution .** Tighten 2.5 N.m (22 lb in)
2	Blower Motor

AIR DISTRIBUTOR CASE REPLACEMENT

Removal Procedure

1. Heater and Air Conditioning Evaporator and Blower Module (1)Â» Remove - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**

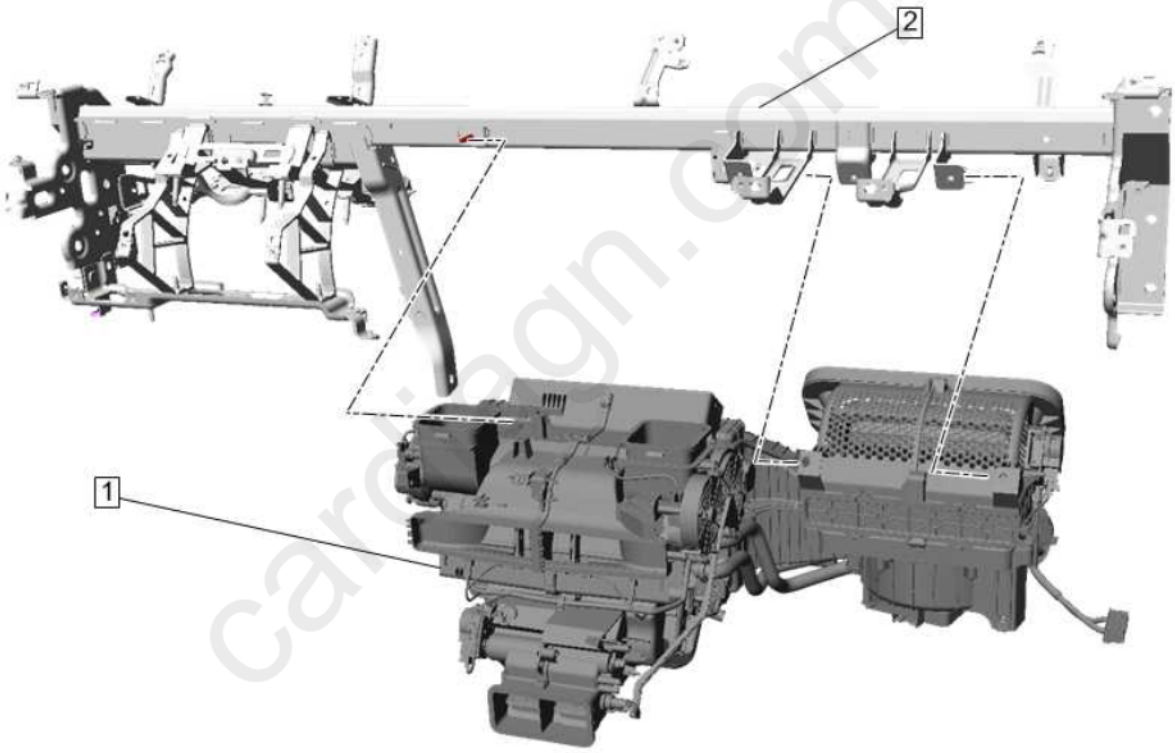


Fig. 495: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Upper Case Screw (2)Â» Remove [2x]

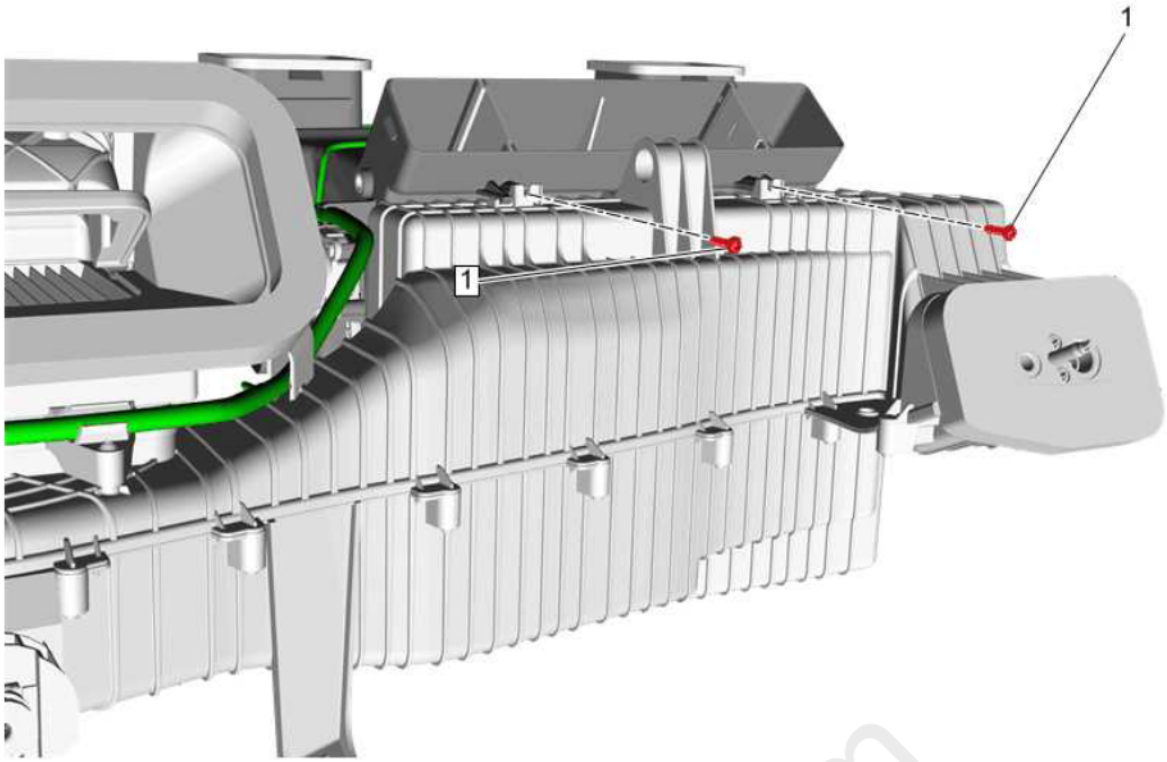


Fig. 496: Heater and Air Conditioning Evaporator and Blower Upper Case Screws
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Wiring Harness @ Air Distributor CaseÂ» Remove
4. Heater Core (3)Â» Remove - **Heater Core Replacement**

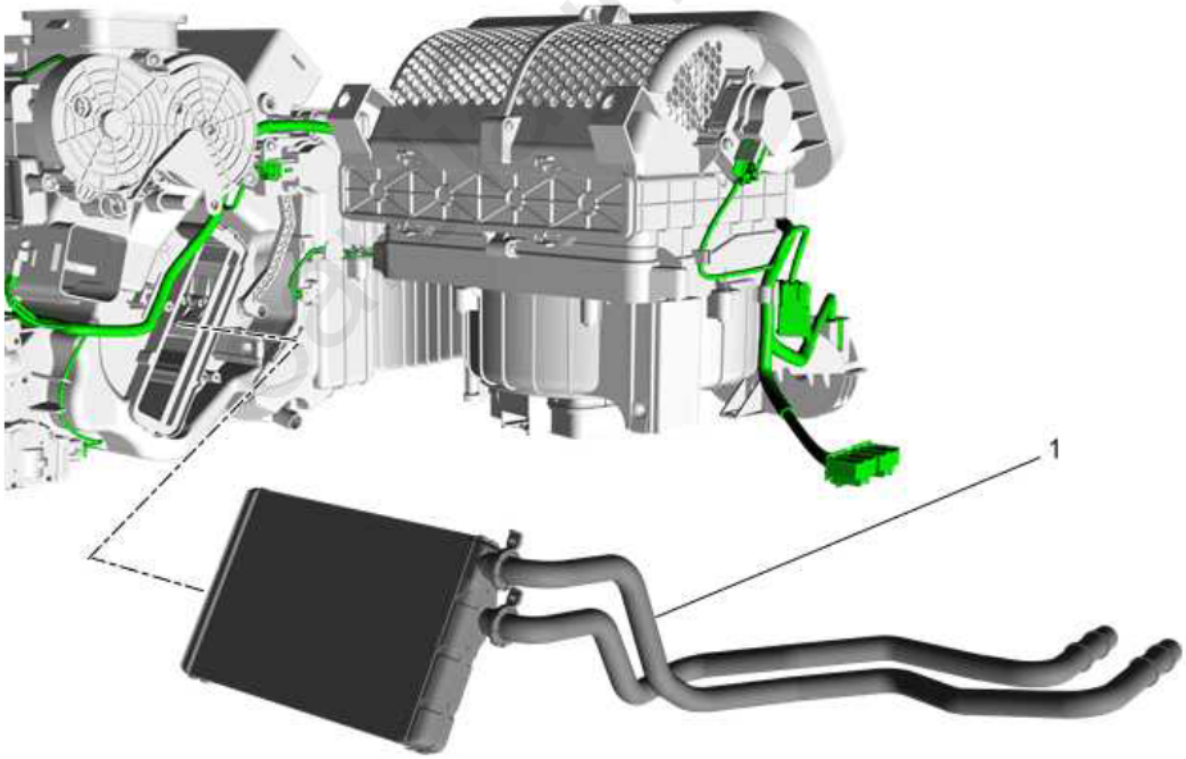


Fig. 497: Heater Core
Courtesy of GENERAL MOTORS COMPANY

5. Retainer Clip (1)Â» Remove [2x]

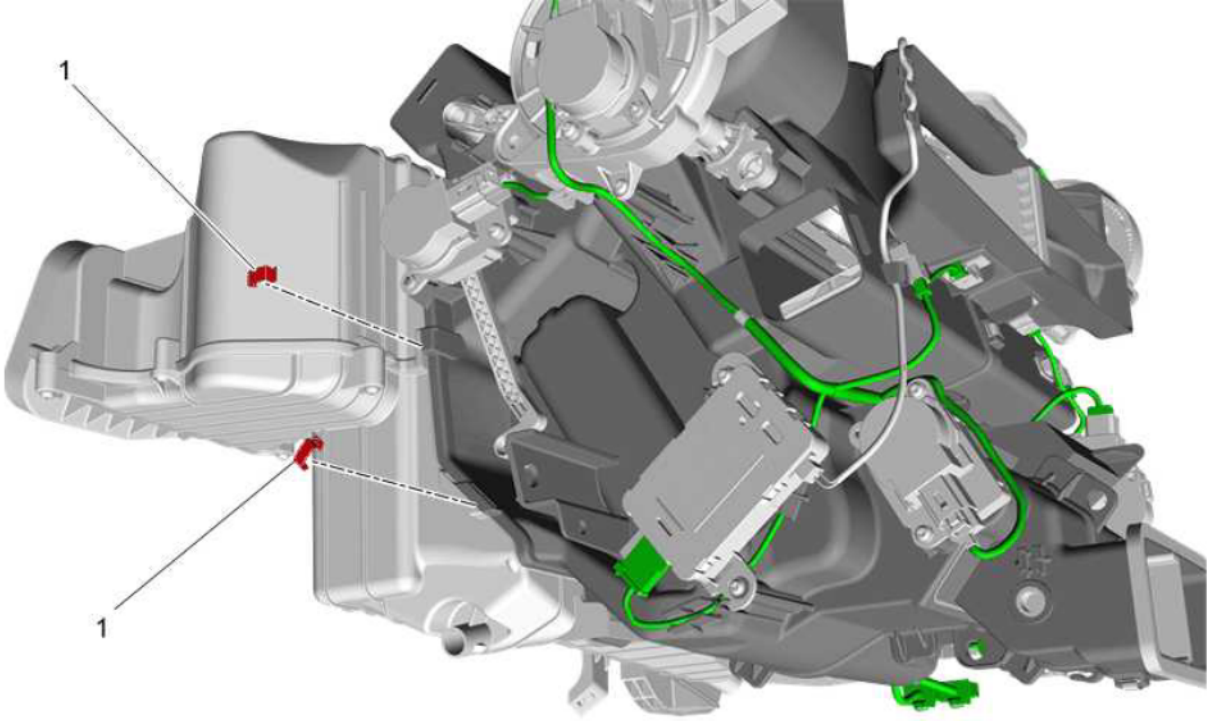


Fig. 498: Retainer Clips
Courtesy of GENERAL MOTORS COMPANY

6. Retainer Clip (1)Â» Remove [2x]

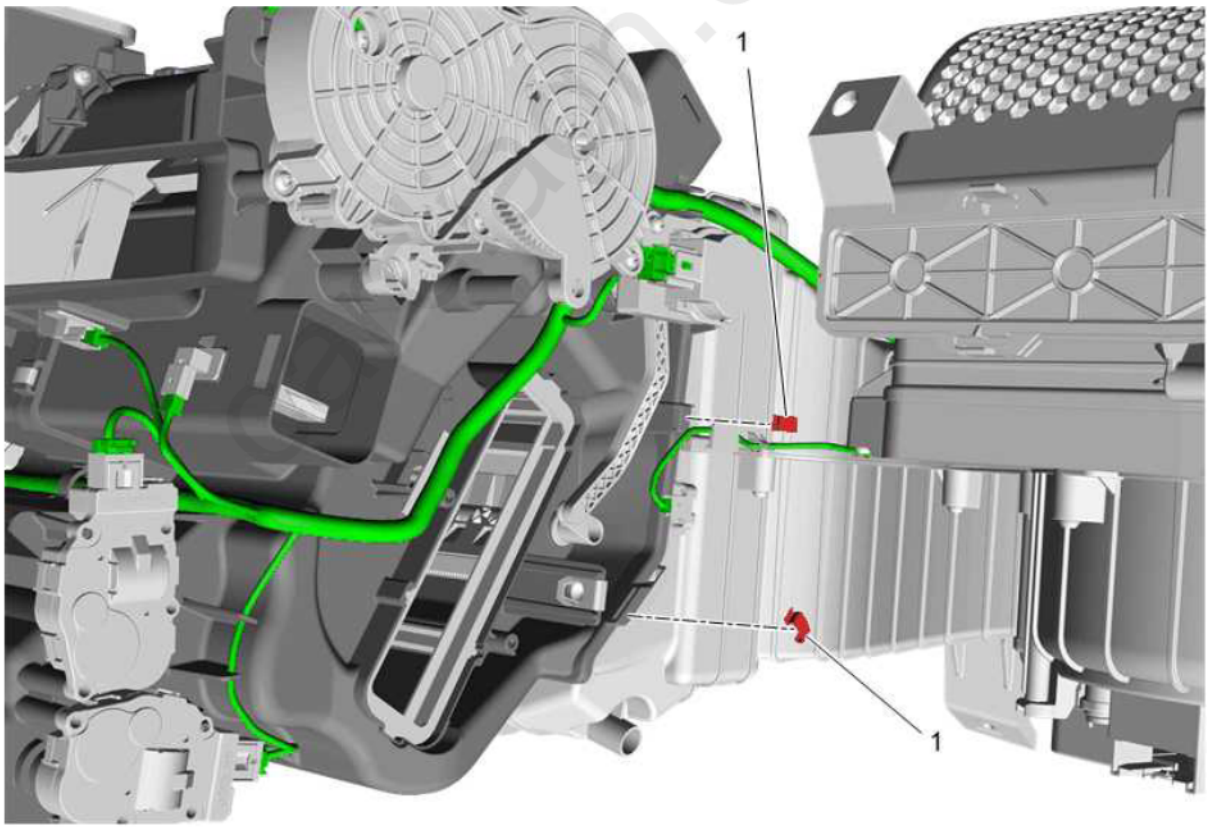


Fig. 499: Retainer Clips
Courtesy of GENERAL MOTORS COMPANY

7. Air Distributor Case (1)Â» Remove

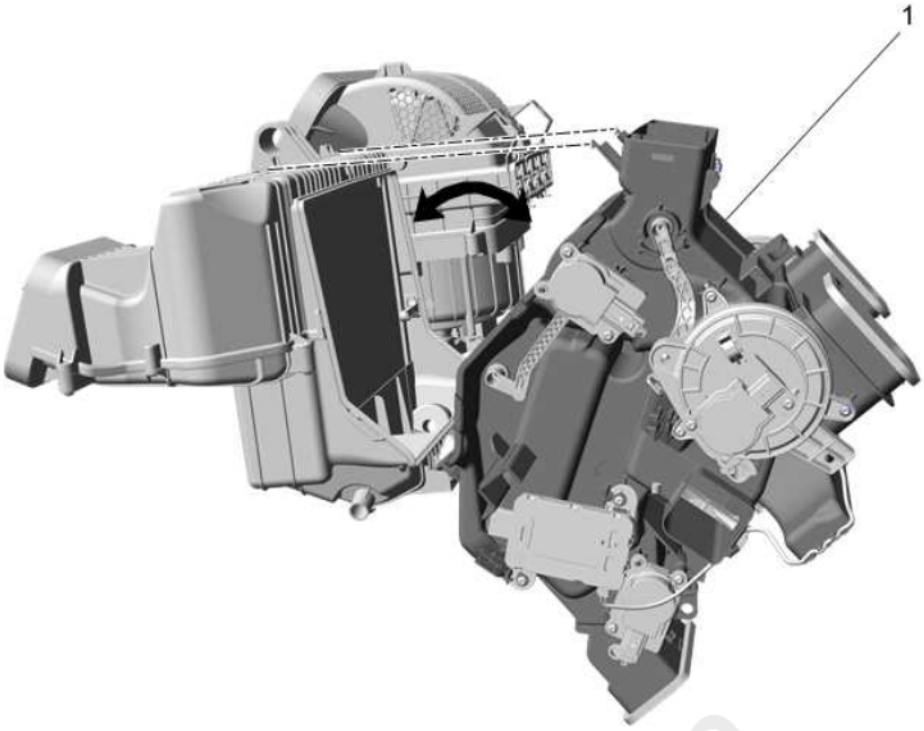


Fig. 500: Air Distributor Case
Courtesy of GENERAL MOTORS COMPANY

8. Transfer components as necessary.

Installation Procedure

1. Air Distributor Case (1)Â» Install

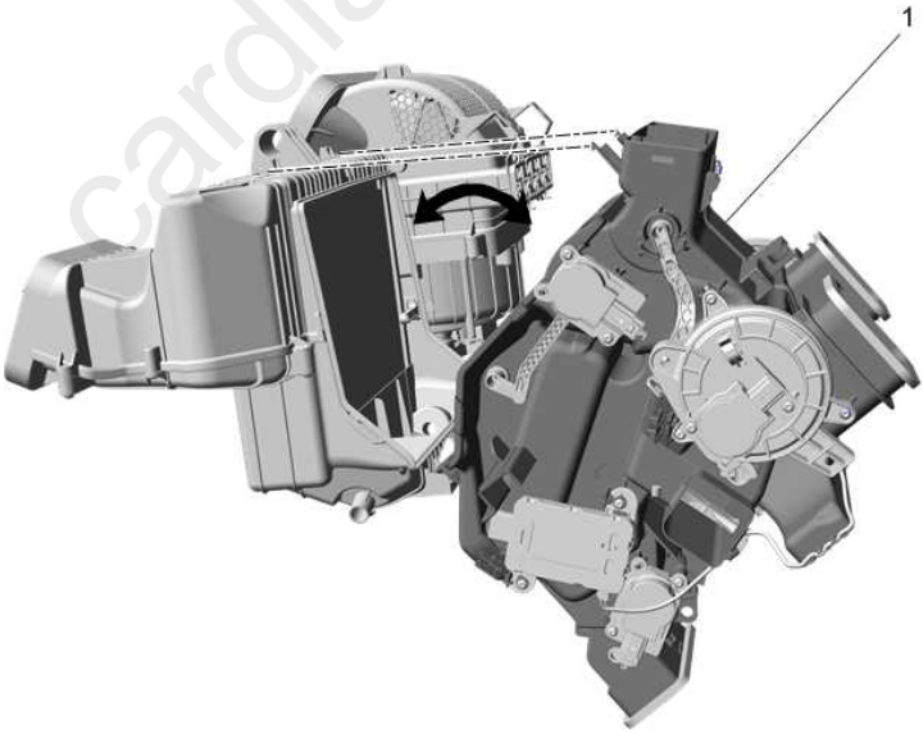


Fig. 501: Air Distributor Case
Courtesy of GENERAL MOTORS COMPANY

2. Heater and Air Conditioning Evaporator and Blower Upper Case Screw (2)Â» Install and tighten 2.5 N.m (22 lb in) [2x]

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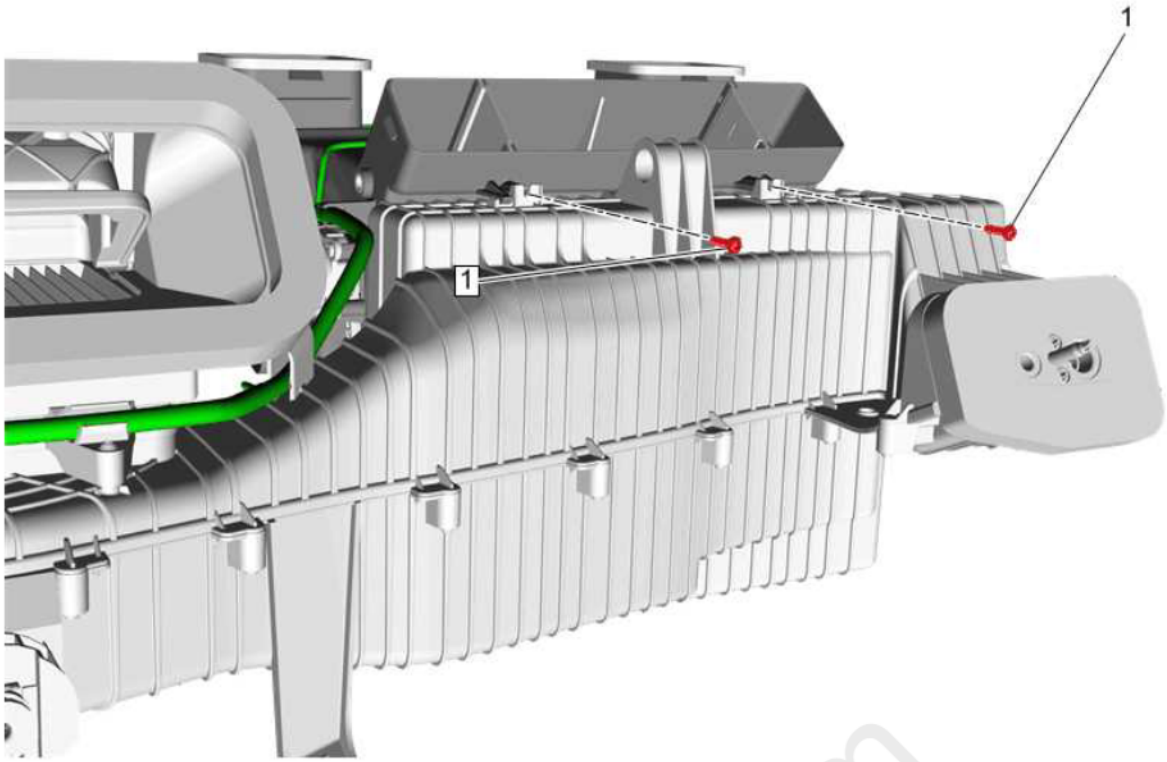


Fig. 502: Heater and Air Conditioning Evaporator and Blower Upper Case Screws
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Retainer Clip (1)Â» Install [2x]

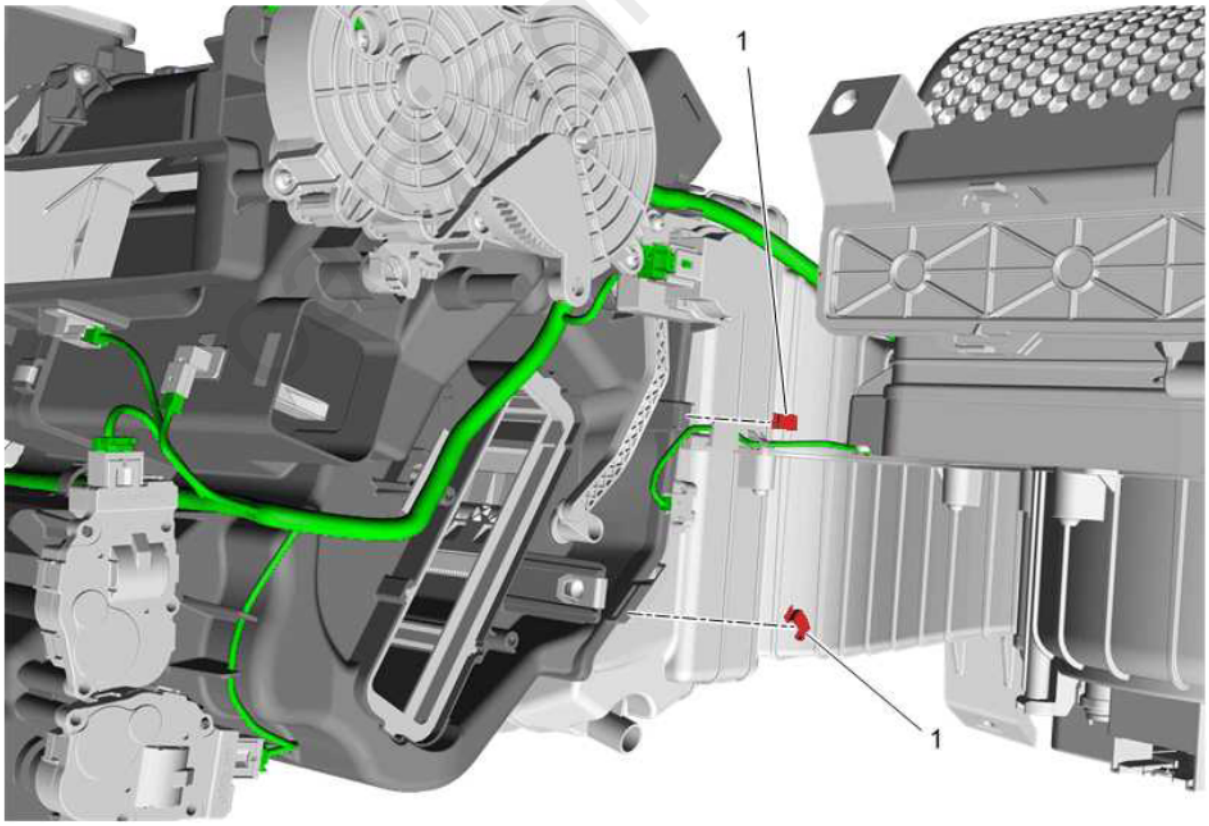


Fig. 503: Retainer Clips
Courtesy of GENERAL MOTORS COMPANY

4. Retainer Clip (1)Â» Install [2x]

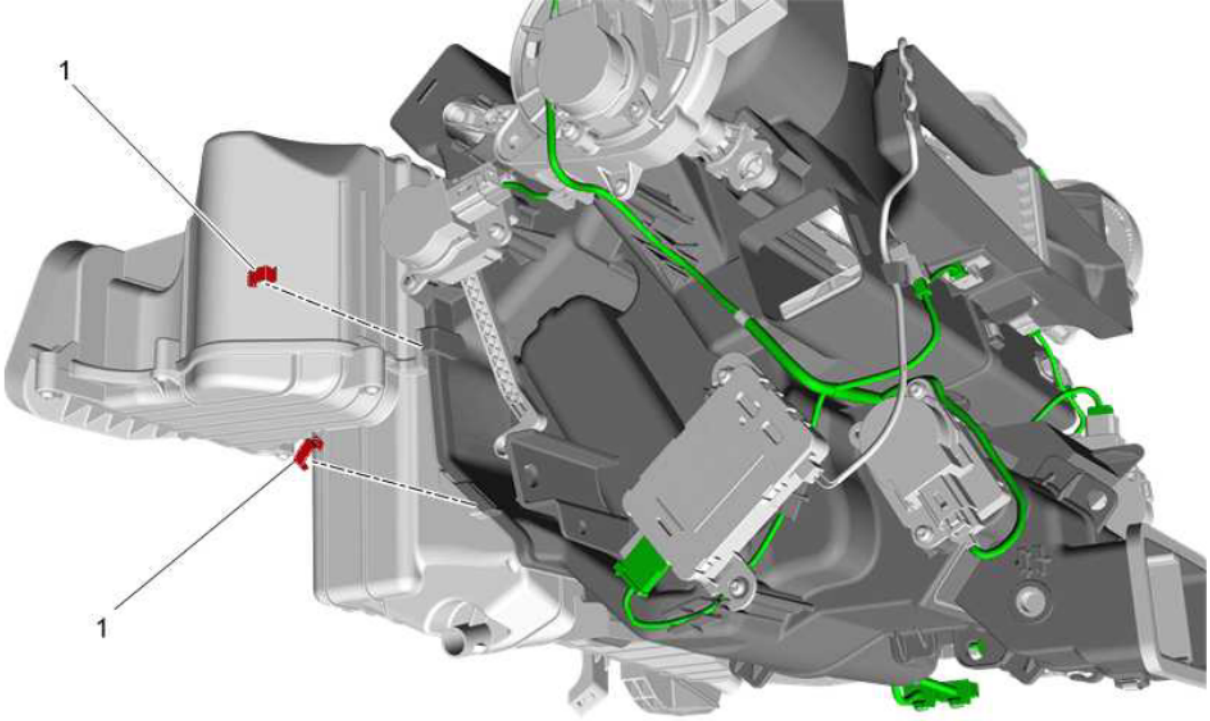


Fig. 504: Retainer Clips
Courtesy of GENERAL MOTORS COMPANY

5. Heater Core (3)Â» Install - **Heater Core Replacement**

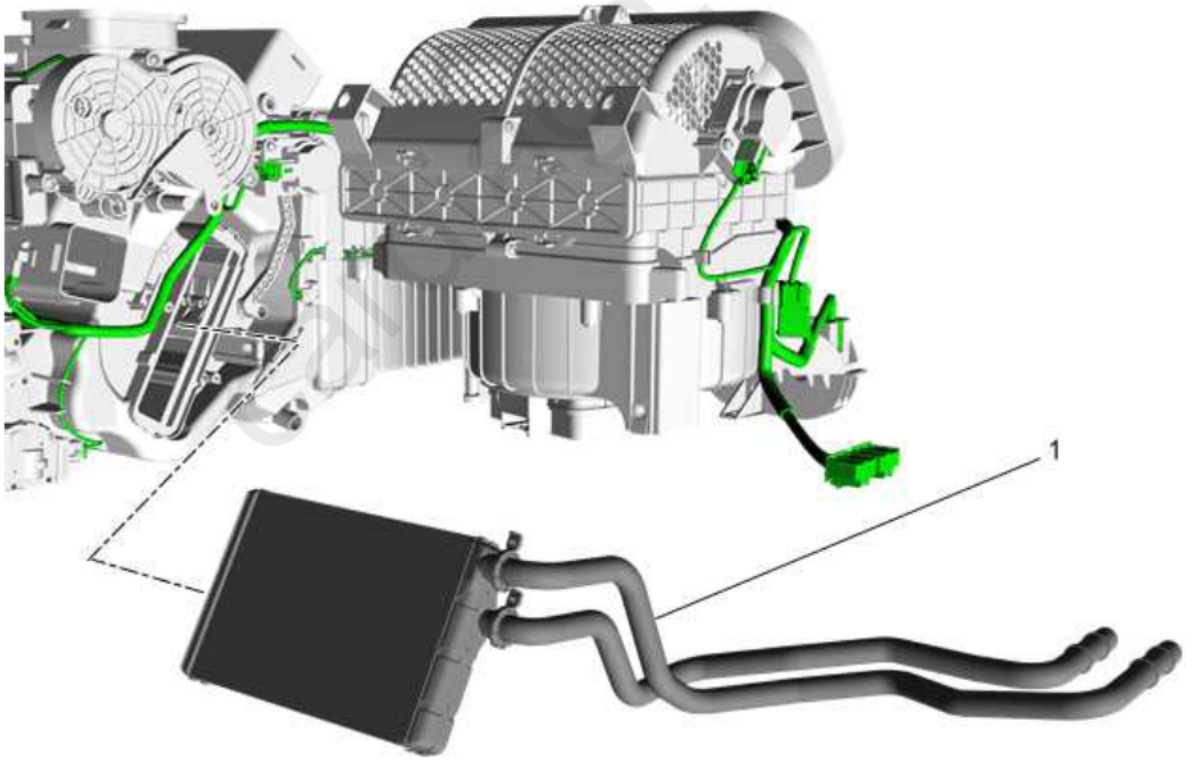


Fig. 505: Heater Core
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Wiring Harness @ Air Distributor CaseÂ» Install
7. Heater and Air Conditioning Evaporator and Blower Module (1)Â» Install - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (Without HP9 Hybrid)Heater and Air Conditioning Evaporator and Blower Module Removal and Installation (With HP9 Hybrid)**

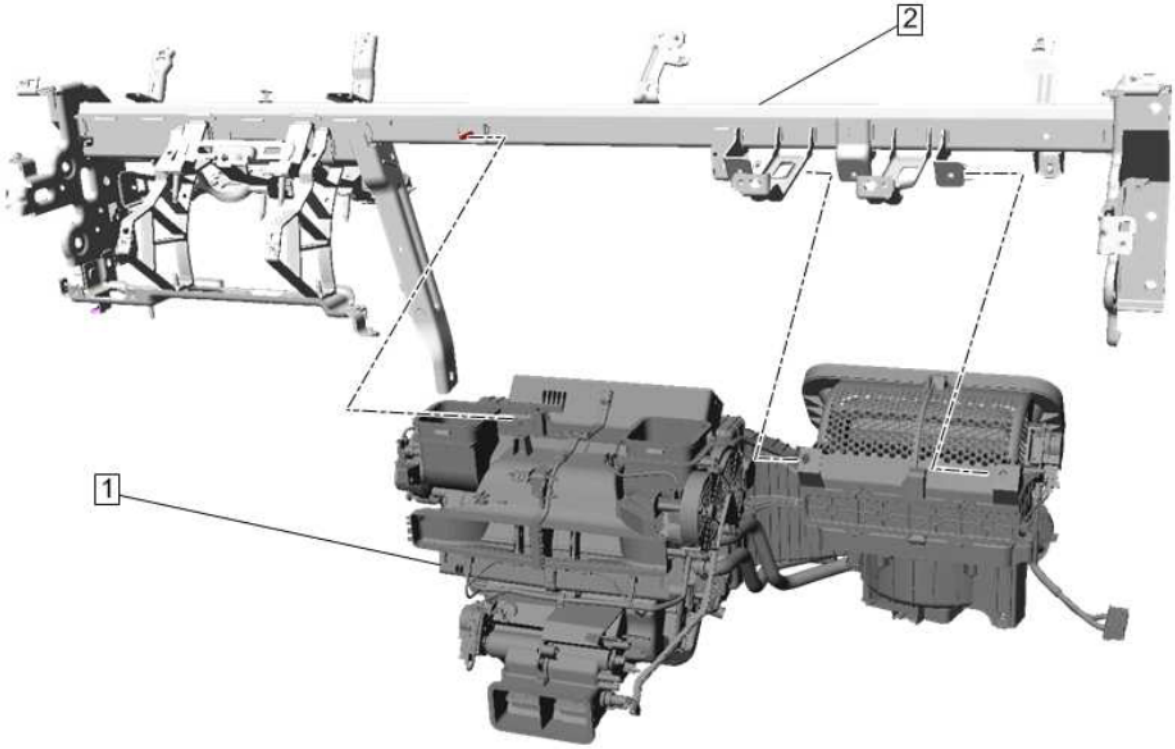


Fig. 506: Heater and Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - LEFT SIDE

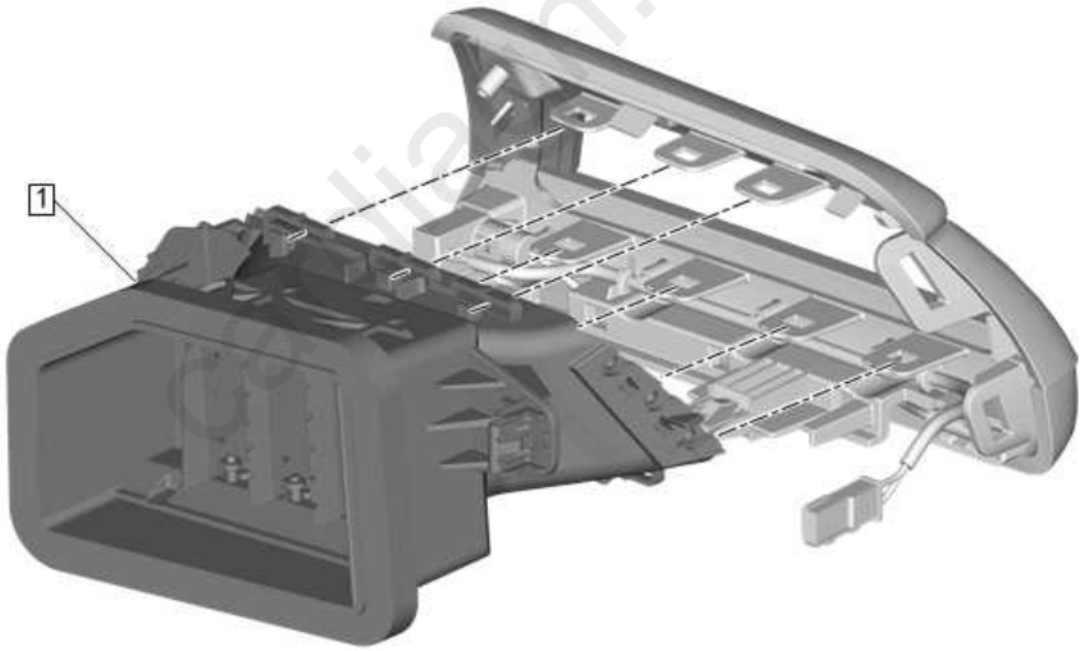


Fig. 507: Instrument Panel Outer Air Outlet - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Lower Trim Plate Applique Replacement - Left Side	
1	Instrument Panel Outer Air Outlet - Left Side **Procedure** Release the plastic retaining tabs.

INSTRUMENT PANEL CENTER AIR OUTLET REPLACEMENT

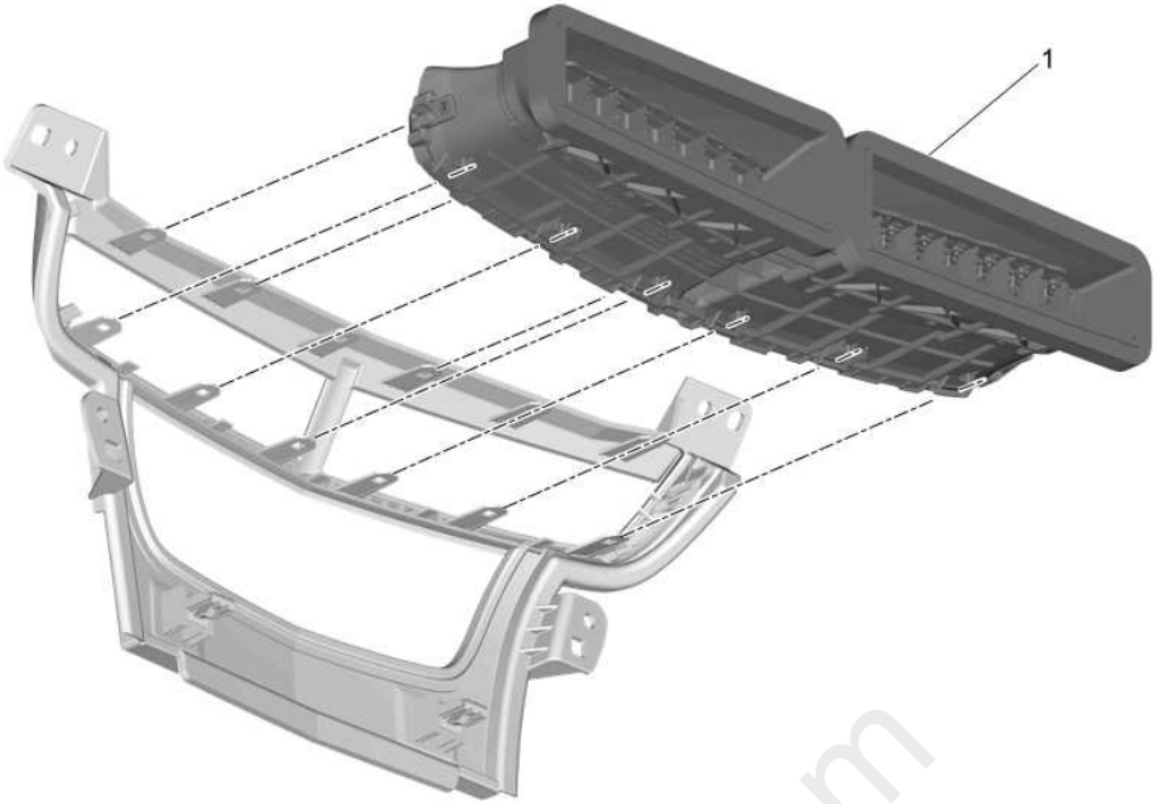
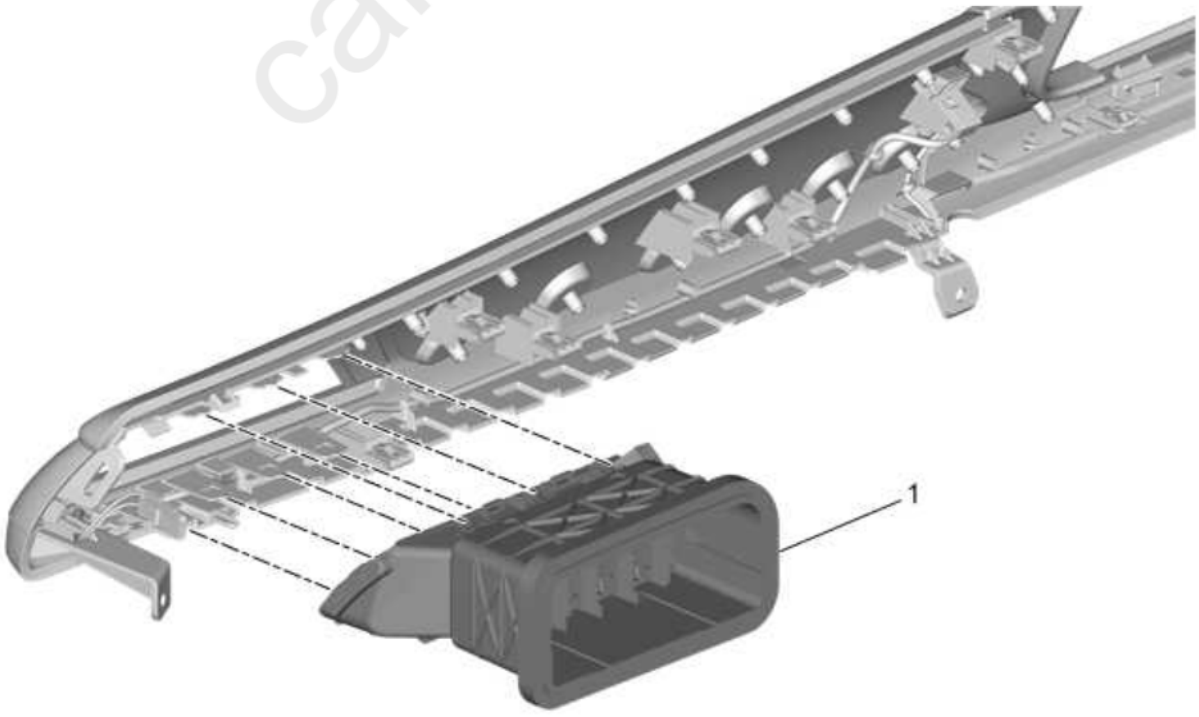


Fig. 508: Instrument Panel Center Air Outlet
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Instrument Panel Trim Plate Replacement**	
1	Instrument Panel Center Air Outlet **Procedure** Release the plastic retaining tabs.

INSTRUMENT PANEL OUTER AIR OUTLET REPLACEMENT - RIGHT SIDE



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Fig. 509: Instrument Panel Outer Air Outlet - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Lower Trim Plate Applique Replacement - Right Side	
1	Instrument Panel Outer Air Outlet - Right Side **Procedure** Release the plastic retaining tabs.

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE

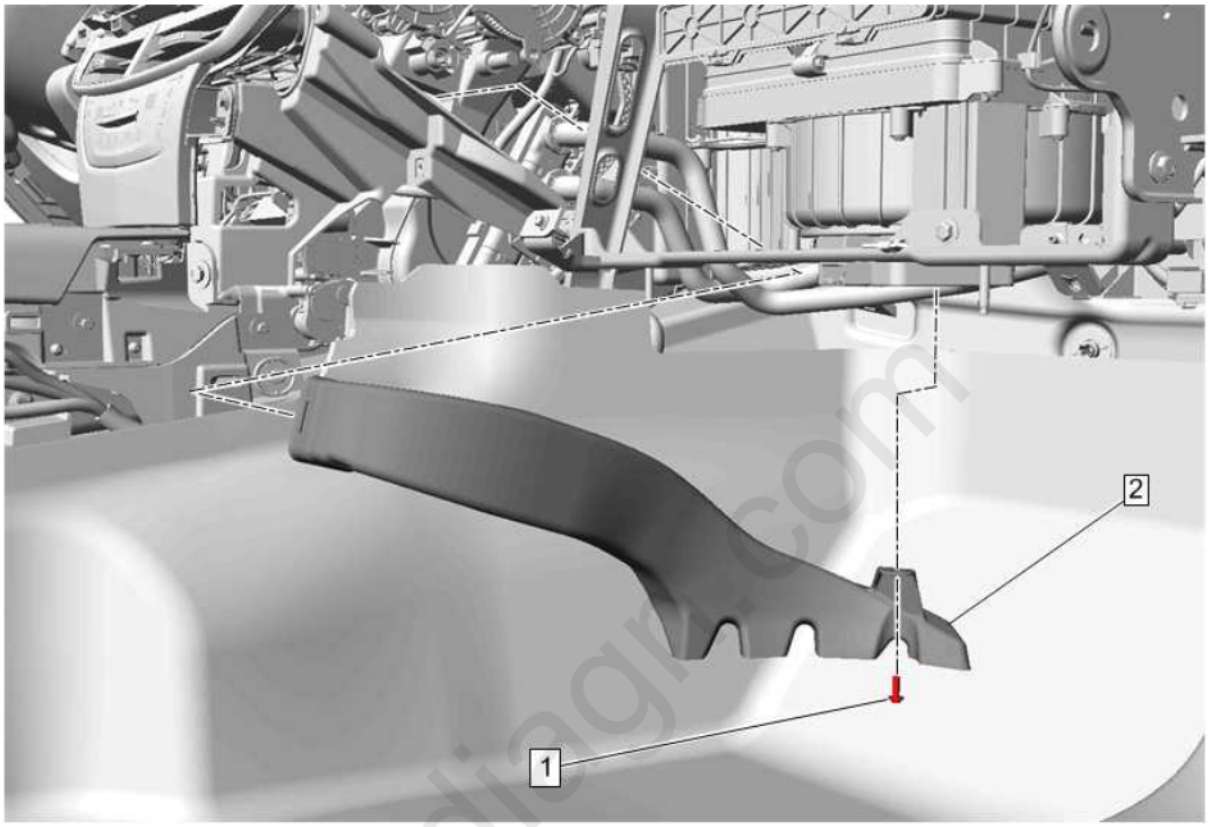


Fig. 510: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Compartment Replacement	
1	Floor Front Air Outlet Duct Fastener **CAUTION:** Refer to Fastener Caution . **Tighten** 2.5 N.m (22 lb in)
2	Floor Front Air Outlet Duct - Right Side

FLOOR FRONT AIR OUTLET DUCT REPLACEMENT - LEFT SIDE

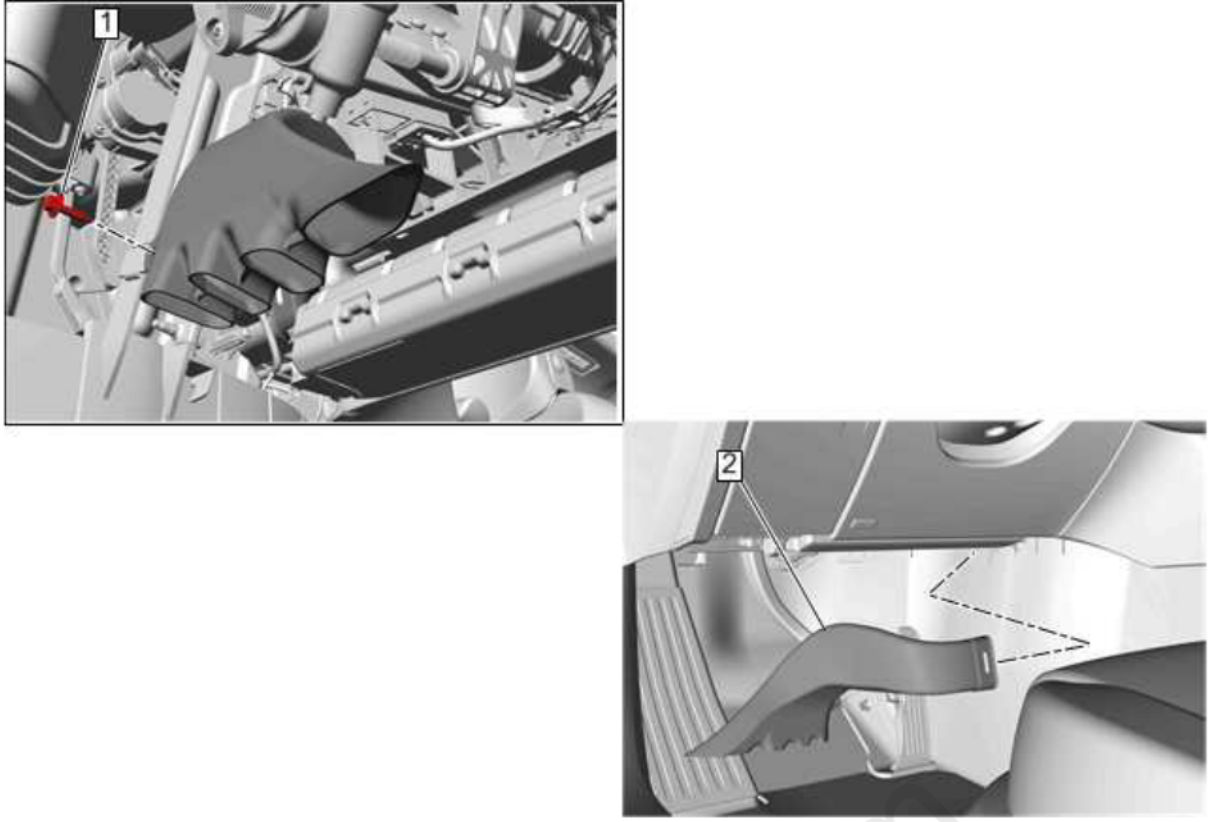


Fig. 511: Floor Front Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Lower Trim Panel Insulator Replacement - Left Side	
1	Floor Front Air Outlet Duct Fastener **CAUTION:** Refer to Fastener Caution . **Tighten** 2.5 N.m (22 lb in)
2	Floor Front Air Outlet Duct - Left Side

FRONT FLOOR CONSOLE REAR AIR DUCT REPLACEMENT (ADAPTER)

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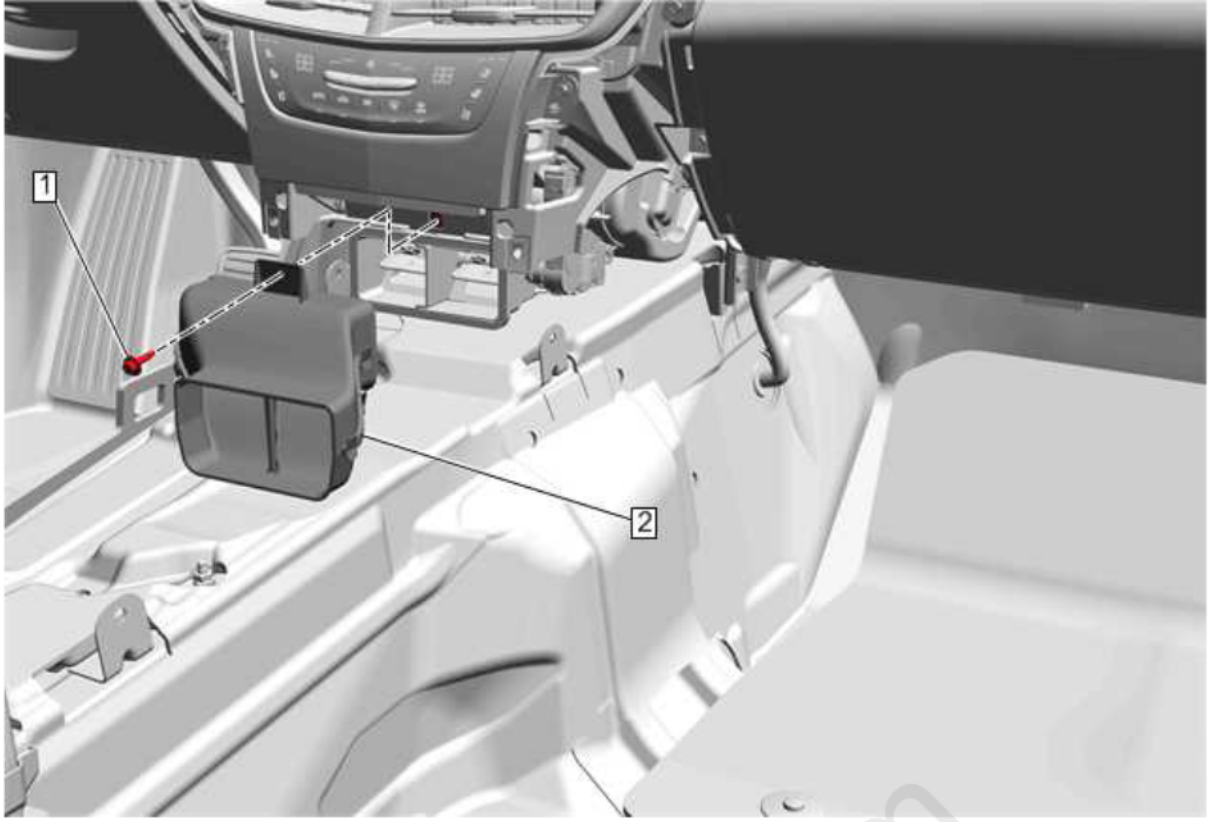


Fig. 512: Front Floor Console Rear Air Duct (Adapter)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Floor Console Replacement	
1	Floor Front Air Outlet Duct Adapter Bolt **CAUTION:** Refer to Fastener Caution . **Tighten** 2.5 N.m (22 lb in)
2	Front Floor Console Rear Air Duct

FRONT FLOOR CONSOLE REAR AIR OUTLET REPLACEMENT

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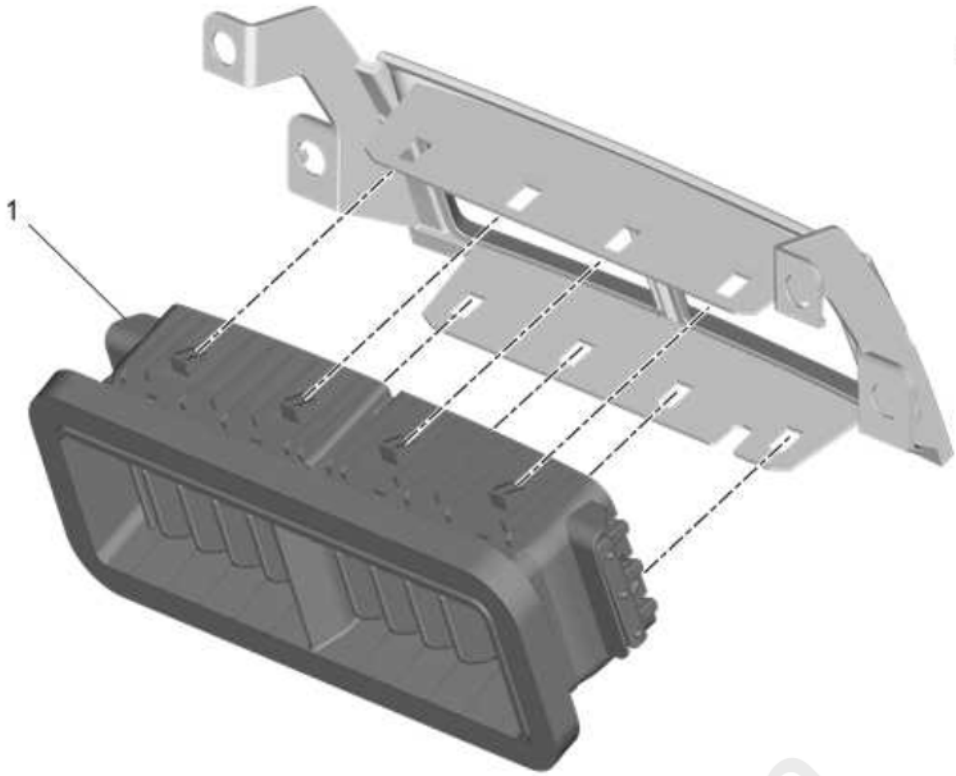


Fig. 513: Front Floor Console Rear Air Outlet
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Floor Console Rear Trim Plate Replacement (Rear HVAC Vent Cover) Front Floor Console Rear Trim Plate Replacement (Rear Upper Blank Plate)	
1	Front Floor Console Rear Air Outlet **Procedure** Release the plastic retaining tabs.

INSTRUMENT PANEL OUTER AIR OUTLET DUCT REPLACEMENT - LEFT SIDE

Removal Procedure

1. Remove the instrument panel tie bar assembly from the vehicle (1). Refer to Instrument Panel Tie Bar Replacement

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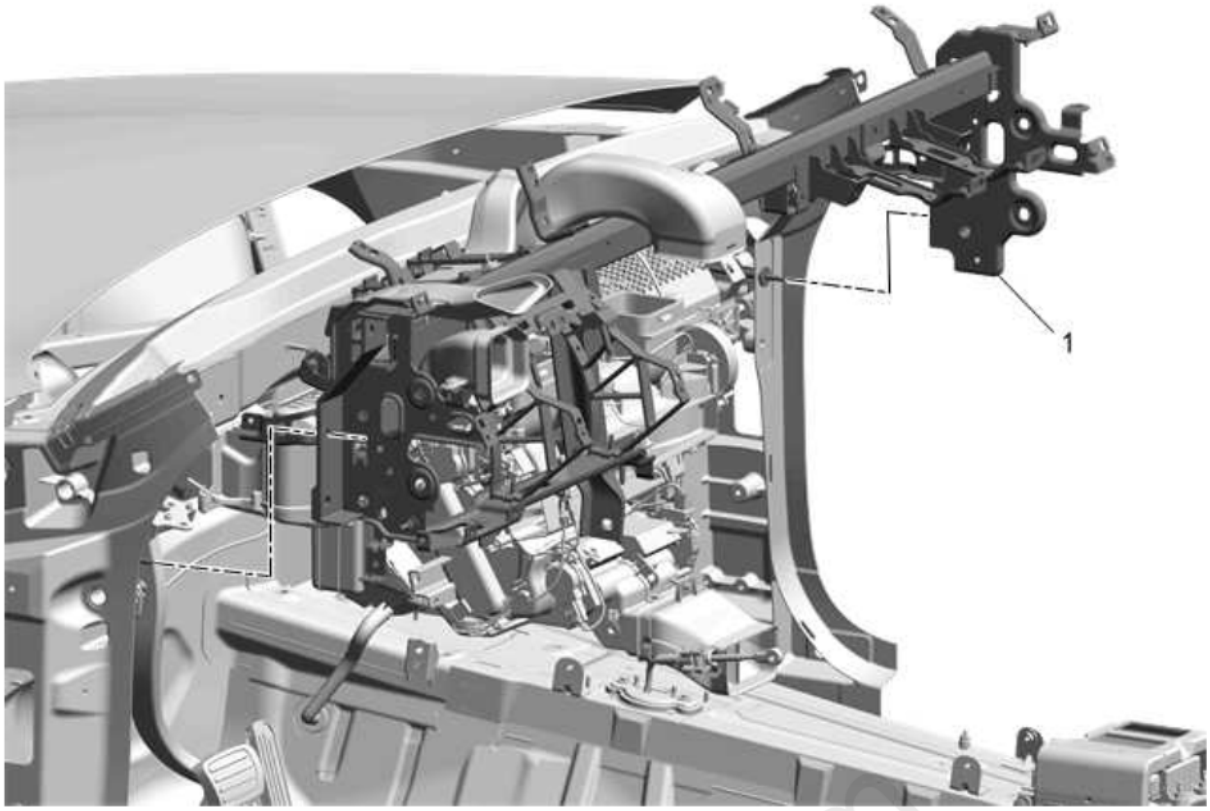


Fig. 514: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Instrument Panel Tie Bar Bracket (2, 3)Â» Remove - **Instrument Panel Tie Bar Bracket Replacement**

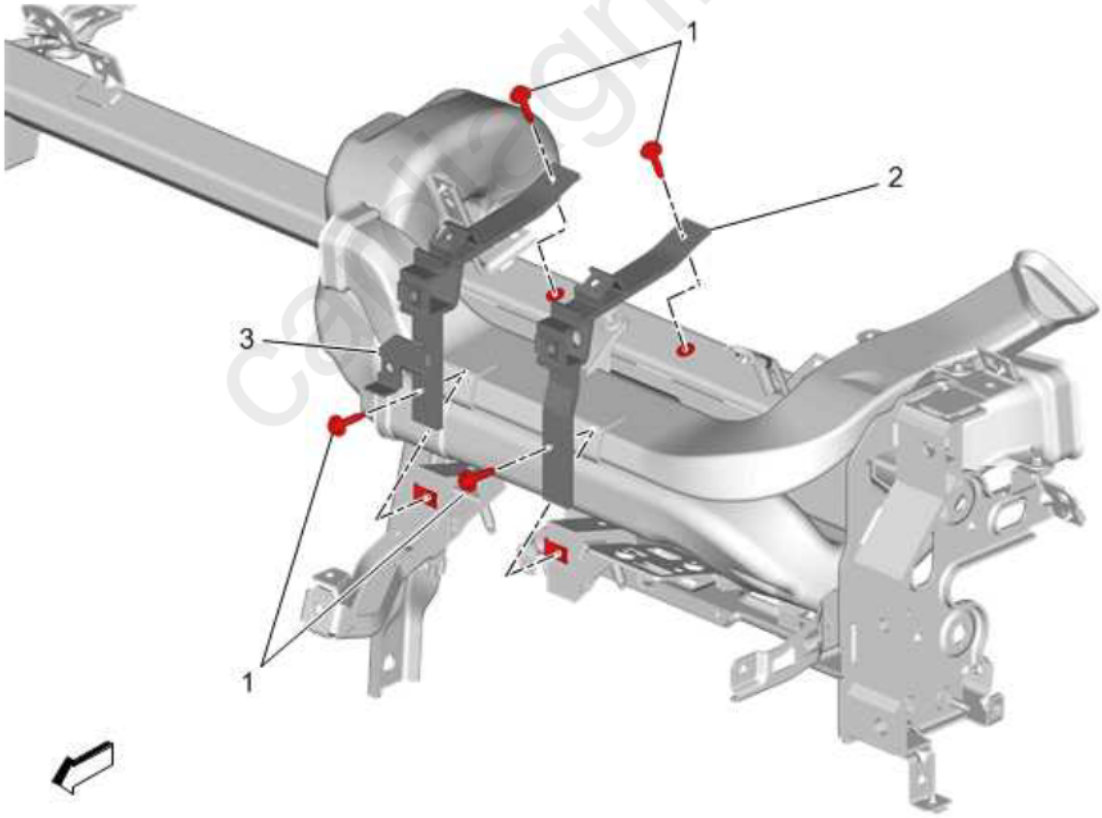


Fig. 515: Instrument Panel Tie Bar Bracket
Courtesy of GENERAL MOTORS COMPANY

3. Push Pin (1)Â» Remove

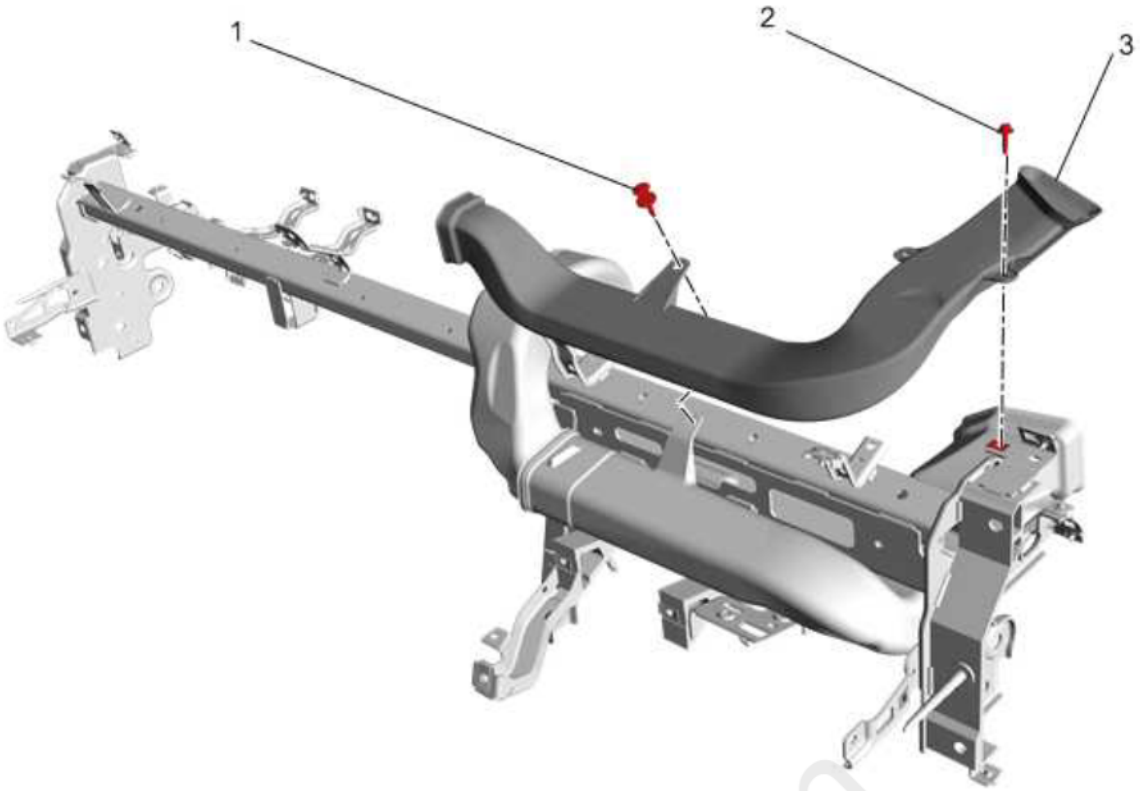


Fig. 516: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Side Window Defogger Outlet Duct Bolt (2)Â» Remove
5. Side Window Defogger Outlet Duct - Left Side (3)Â» Remove
6. Instrument Panel Outer Air Outlet Duct Bolt (1)Â» Remove

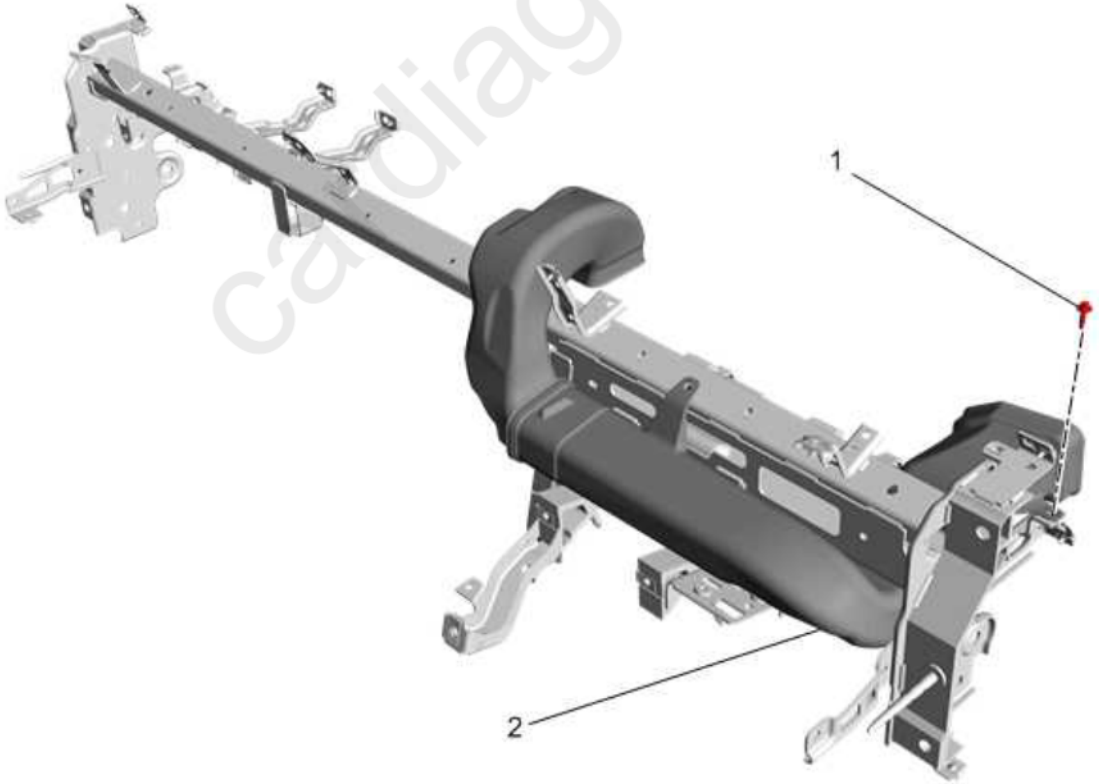


Fig. 517: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

7. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Remove

Installation Procedure

1. Instrument Panel Outer Air Outlet Duct - Left Side (2)Â» Install

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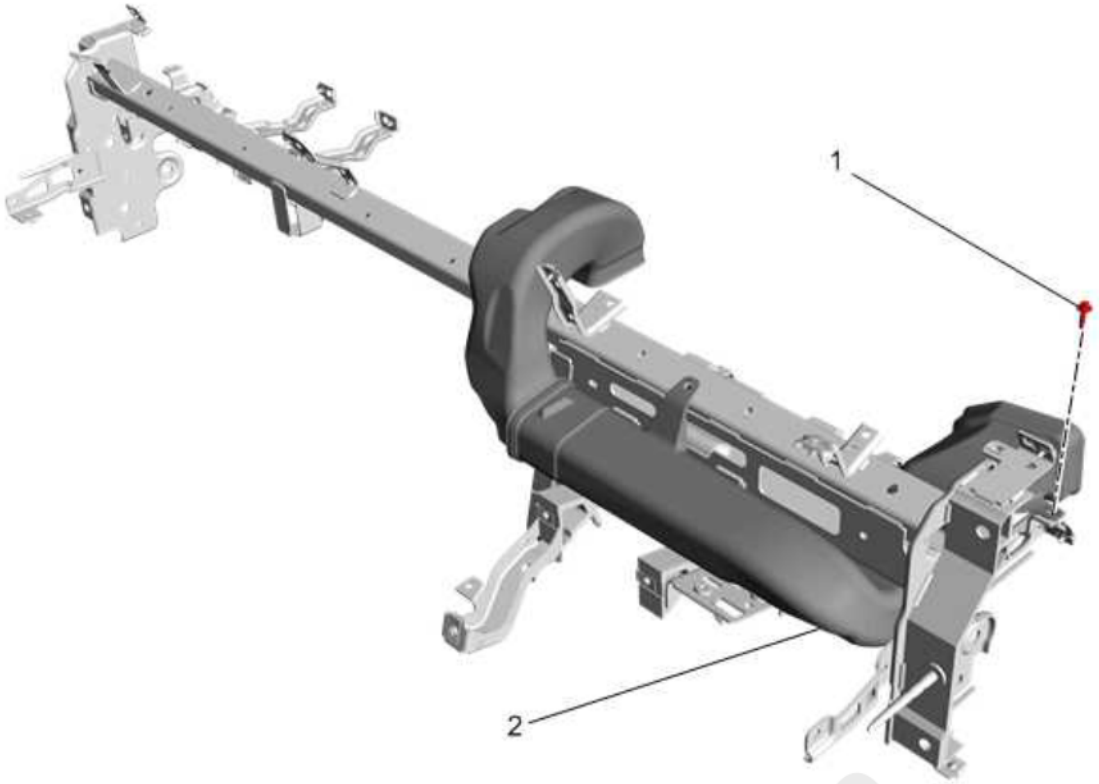


Fig. 518: Instrument Panel Outer Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Instrument Panel Outer Air Outlet Duct Bolt (1)Â» Install and tighten 2.5 N.m (22 lb in)
3. Side Window Defogger Outlet Duct - Left Side (3)Â» Install

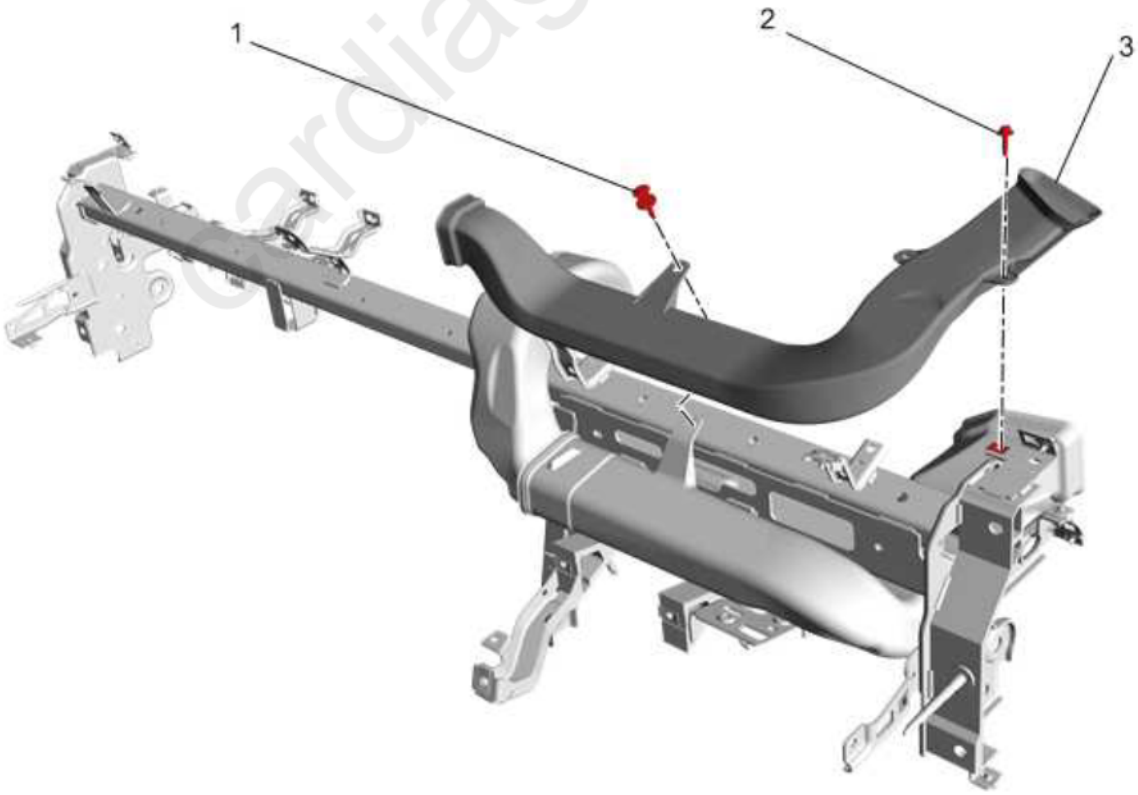


Fig. 519: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Side Window Defogger Outlet Duct Bolt (2)Â» Install and tighten 2.5 N.m (22 lb in)
5. Push Pin (1)Â» Install

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6. Instrument Panel Tie Bar Bracket (2, 3)Â» Install - **Instrument Panel Tie Bar Bracket Replacement**

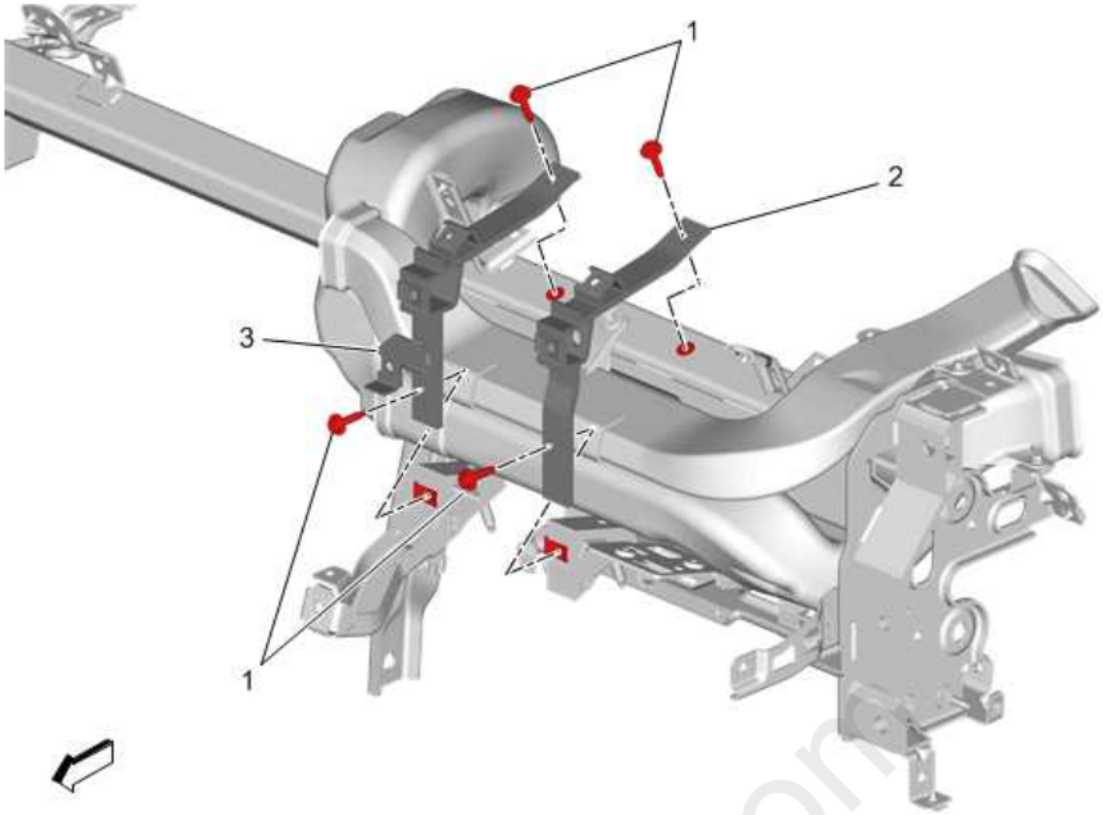


Fig. 520: Instrument Panel Tie Bar Bracket
Courtesy of GENERAL MOTORS COMPANY

7. Instrument Panel Tie Bar (1)Â» Install - **Instrument Panel Tie Bar Replacement**

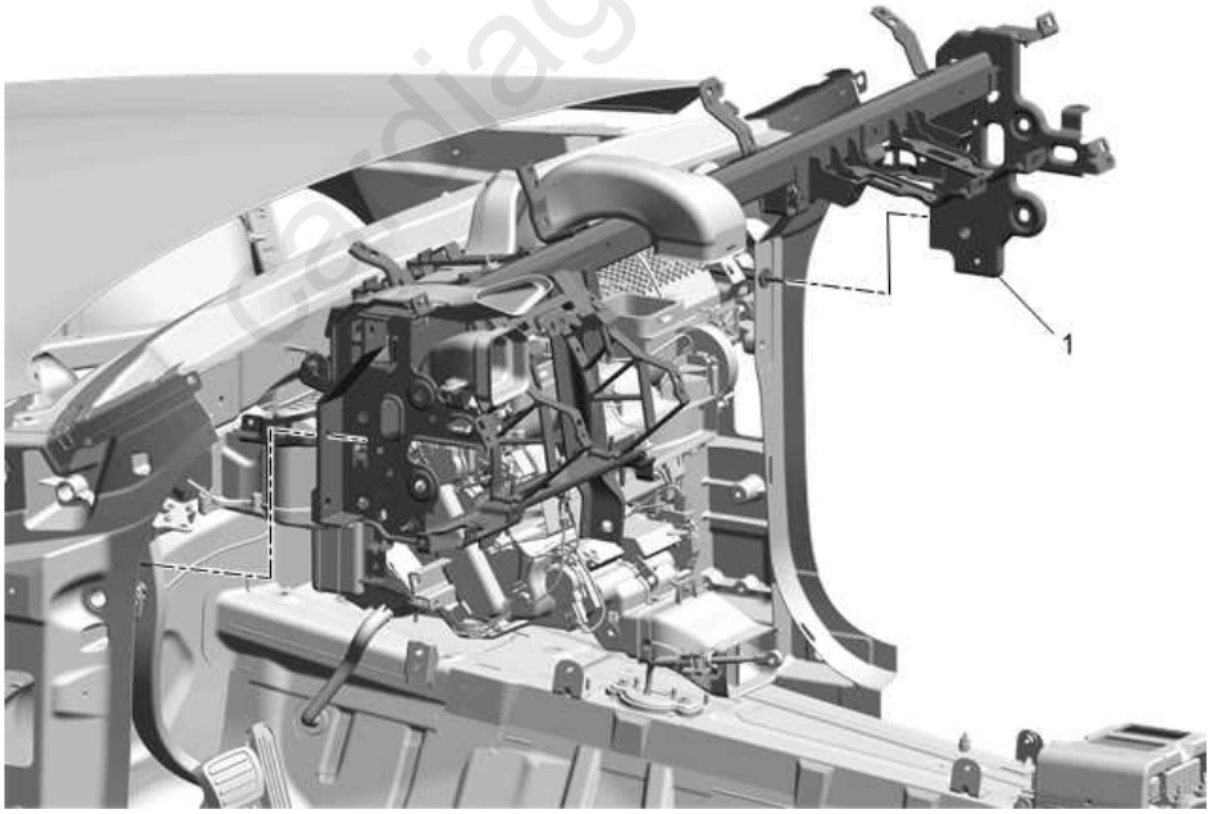


Fig. 521: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

INSTRUMENT PANEL OUTER AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE

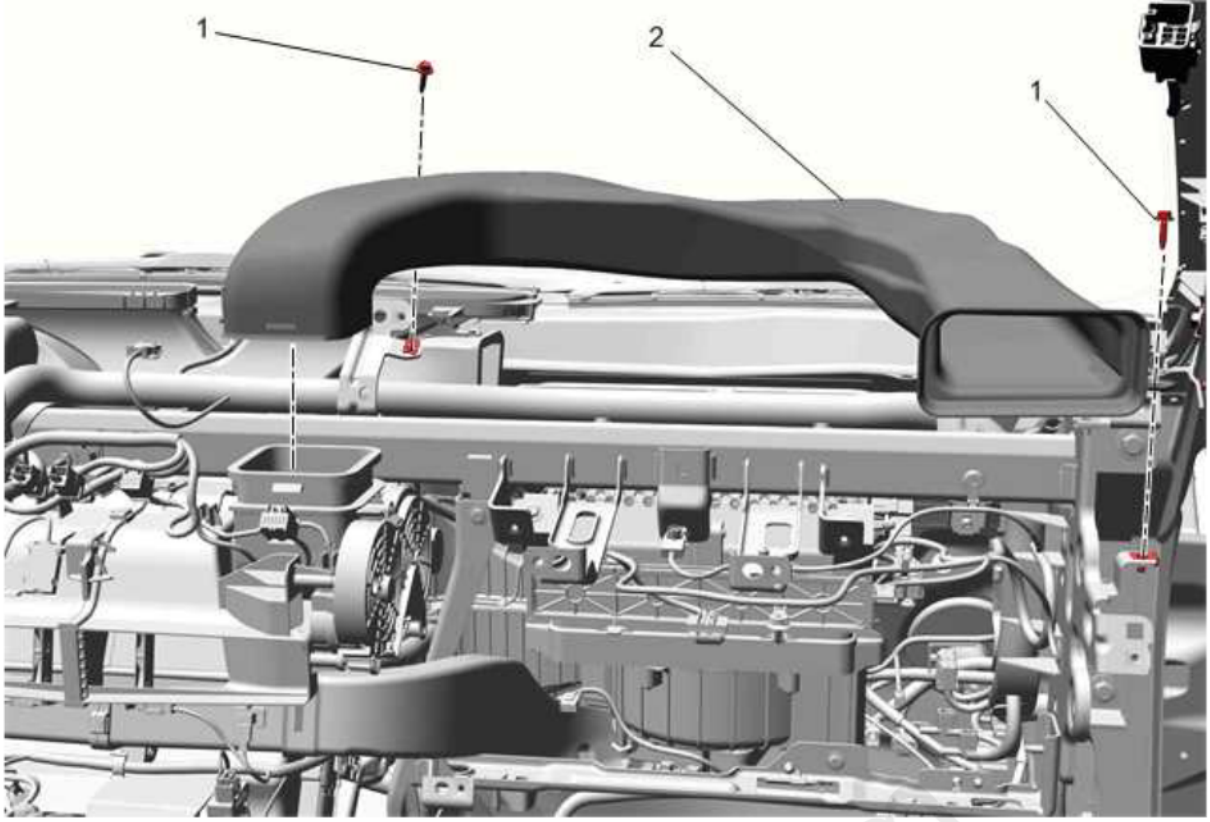


Fig. 522: Instrument Panel Outer Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Side Window Defogger Outlet Duct Replacement - Right Side	
1	Instrument Panel Outer Air Outlet Duct Bolt [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Instrument Panel Outer Air Outlet Duct - Right Side

WINDSHIELD DEFROSTER OUTLET DUCT REPLACEMENT

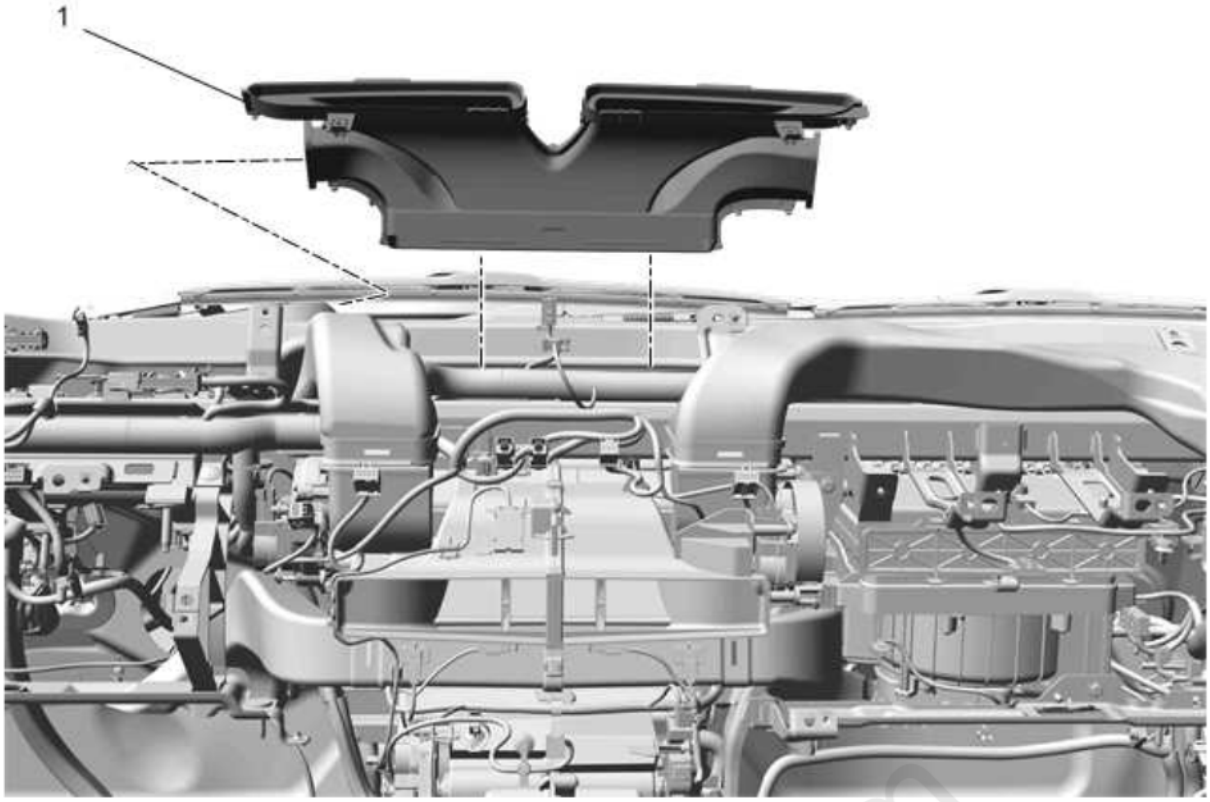


Fig. 523: Windshield Defroster Outlet Duct
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Side Window Defogger Outlet Duct Replacement - Right Side	
1	Windshield Defroster Outlet Duct **Procedure** Disconnect the windshield defroster outlet duct from the left side window defogger outlet duct and maneuver out from behind the instrument panel tie bar.

SIDE WINDOW DEFOGGER OUTLET DUCT REPLACEMENT - LEFT SIDE

Removal Procedure

1. Remove the instrument panel tie bar assembly from the vehicle. (1) Refer to Instrument Panel Tie Bar Replacement

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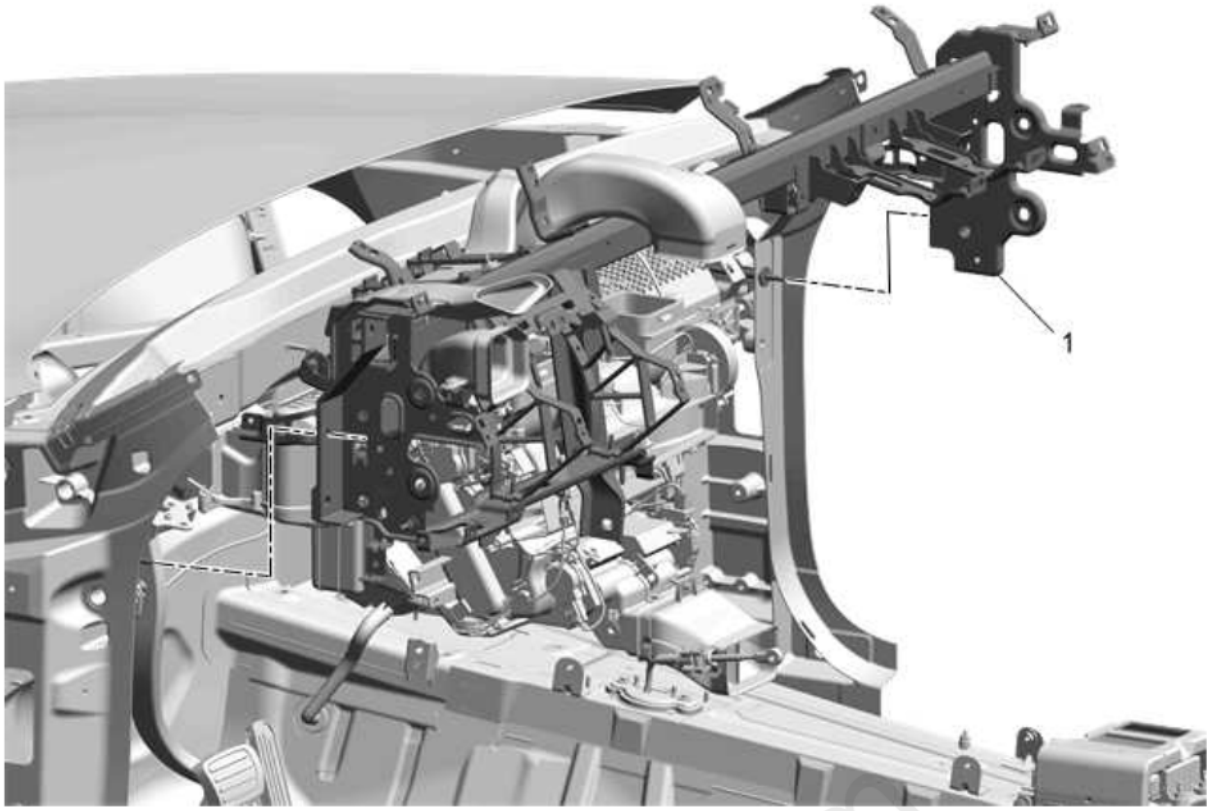


Fig. 524: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Instrument Panel Tie Bar Bracket (2, 3)Â» Remove - **Instrument Panel Tie Bar Bracket Replacement**

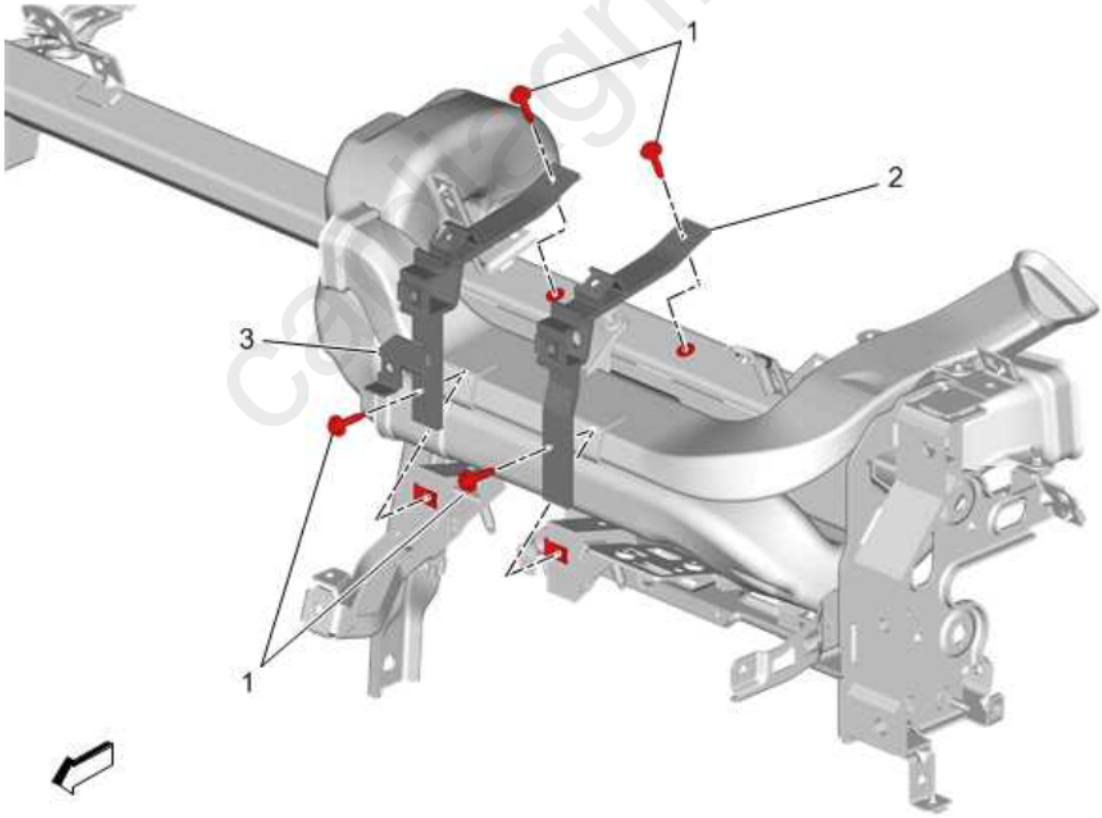


Fig. 525: Instrument Panel Tie Bar Bracket
Courtesy of GENERAL MOTORS COMPANY

3. Push Pin (1)Â» Remove

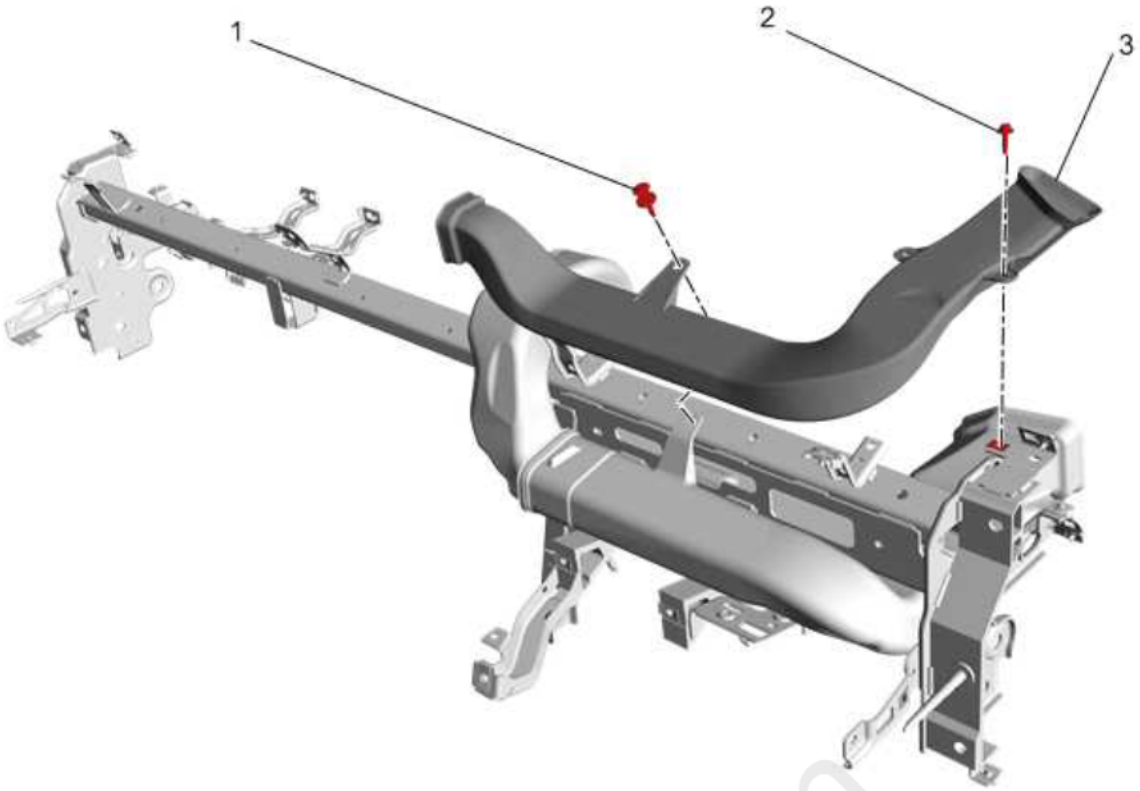


Fig. 526: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Side Window Defogger Outlet Duct Bolt (4)Â» Remove
5. Side Window Defogger Outlet Duct - Left Side (5)Â» Remove

Installation Procedure

1. Side Window Defogger Outlet Duct - Left Side (3)Â» Install

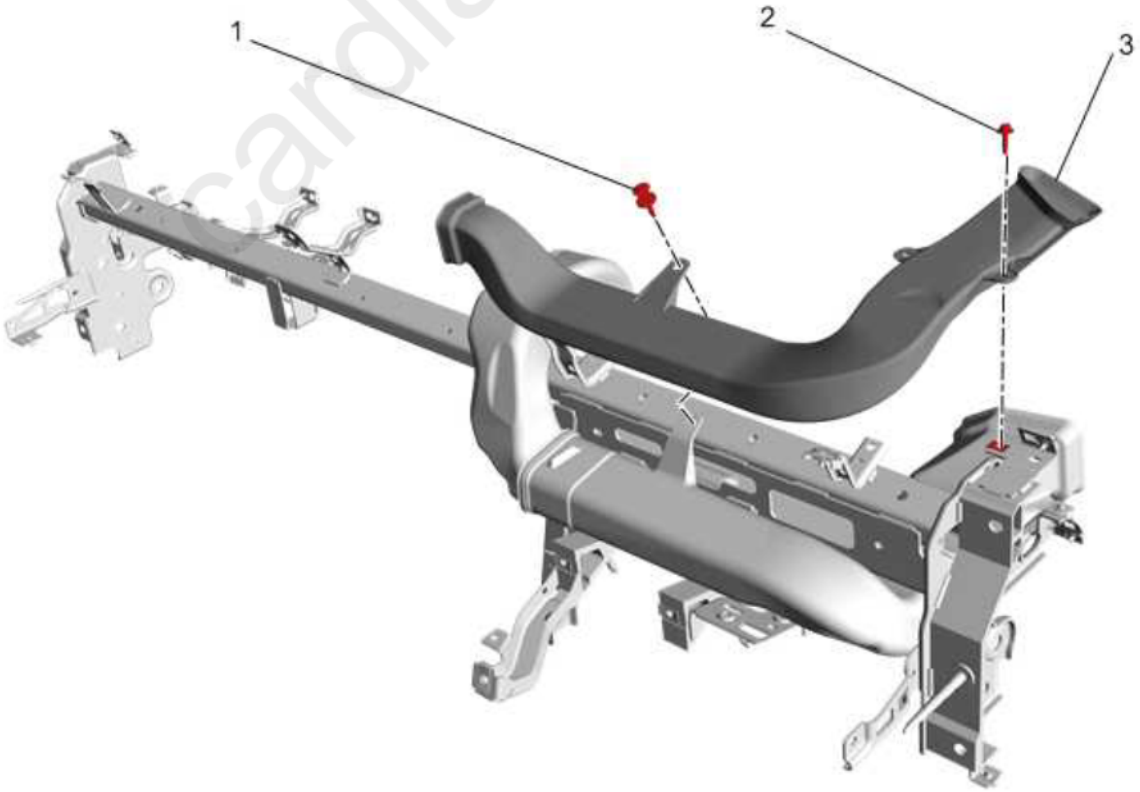


Fig. 527: Side Window Defogger Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

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2. Side Window Defogger Outlet Duct Bolt (2)Â» Install and tighten 2.5 N.m (22 lb in)
3. Push Pin (1)Â» Install
4. Instrument Panel Tie Bar Bracket (2, 3)Â» Install - **Instrument Panel Tie Bar Bracket Replacement**

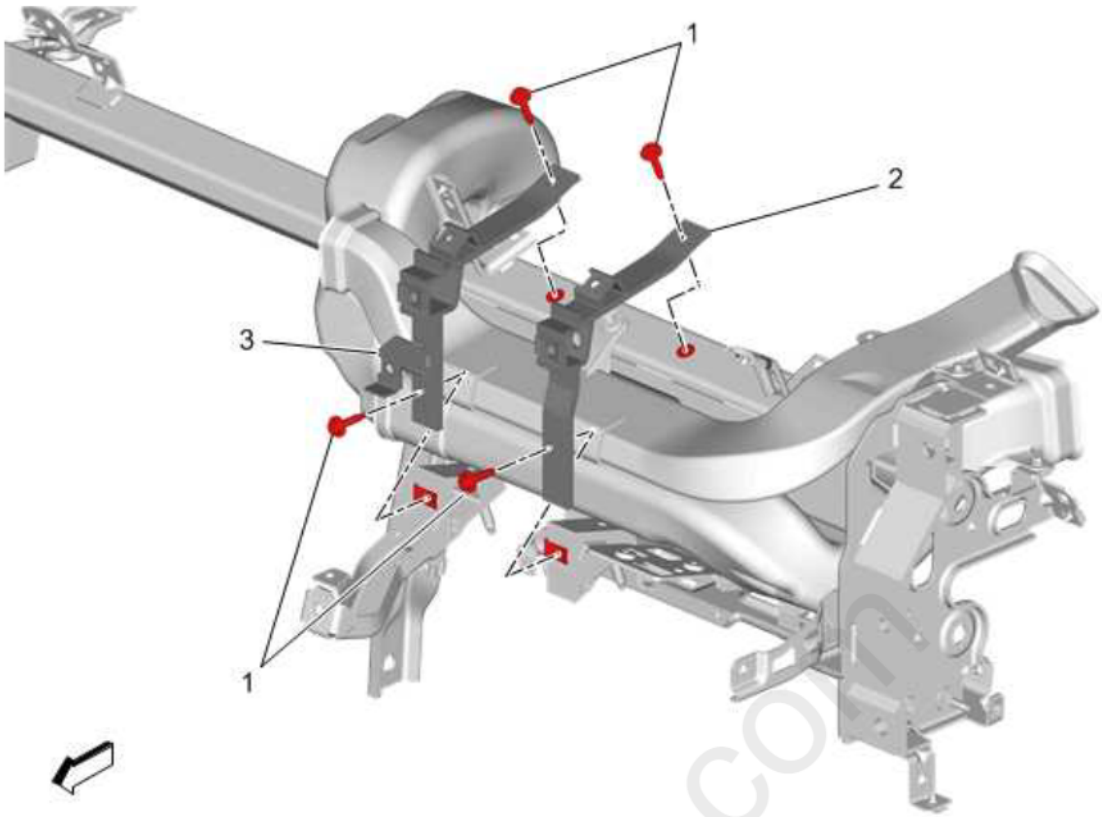


Fig. 528: Instrument Panel Tie Bar Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Instrument Panel Tie Bar (1)Â» Install - **Instrument Panel Tie Bar Replacement**

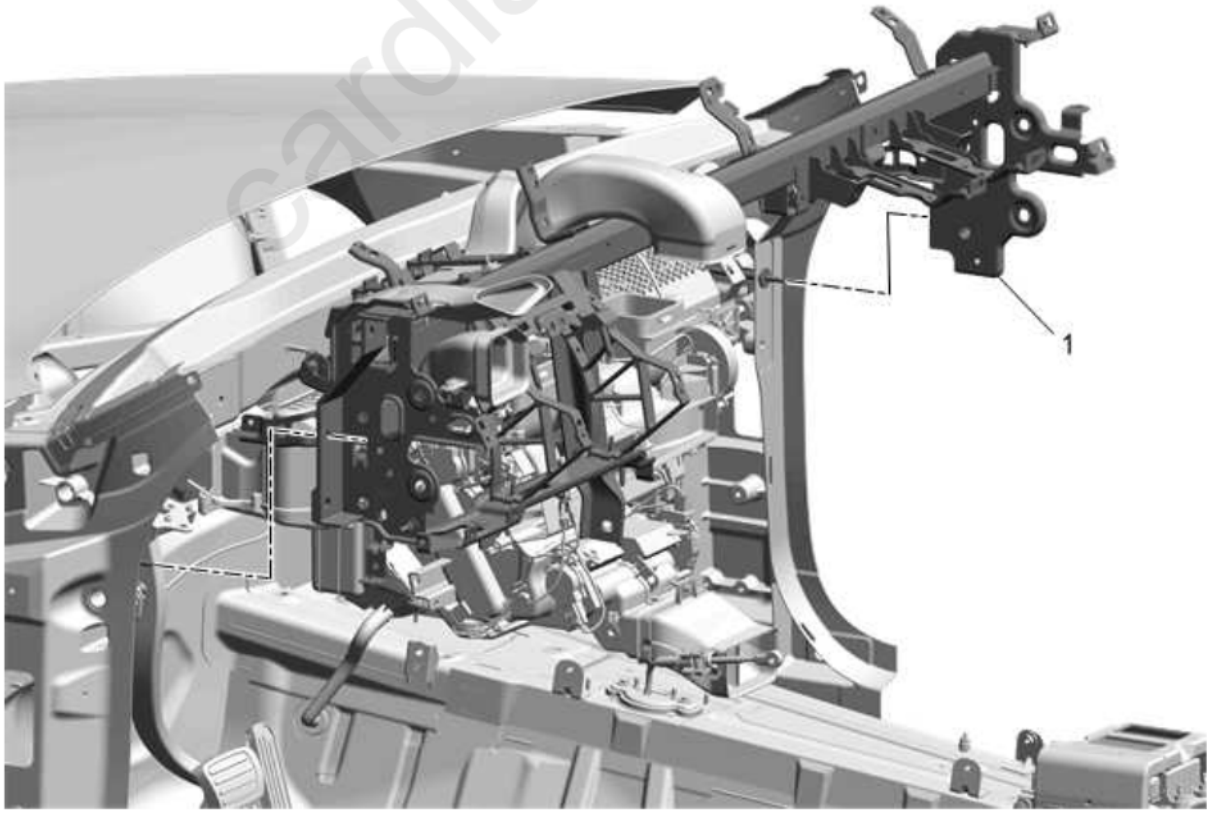


Fig. 529: Instrument Panel Tie Bar Assembly
Courtesy of GENERAL MOTORS COMPANY

SIDE WINDOW DEFOGGER OUTLET DUCT REPLACEMENT - RIGHT SIDE

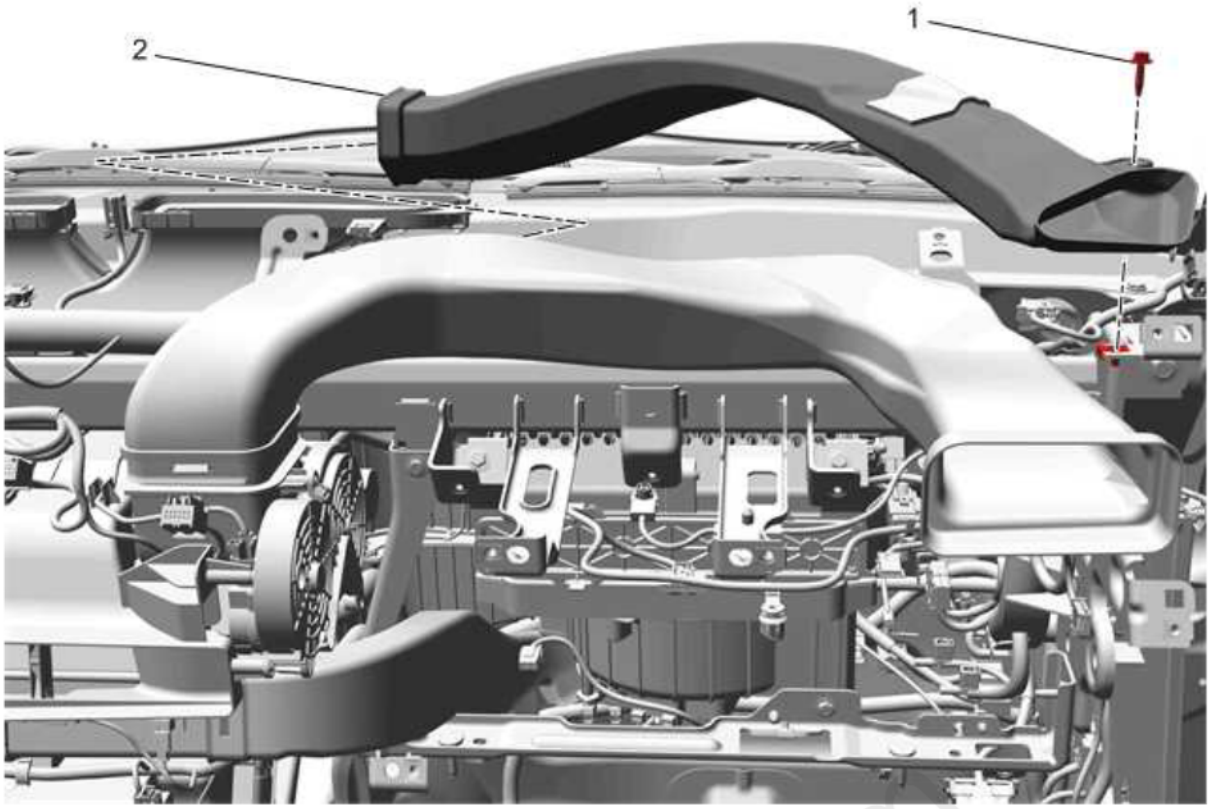


Fig. 530: Side Window Defogger Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Instrument Panel Carrier Replacement (UQH) Instrument Panel Carrier Replacement (UQA)	
1	Side Window Defogger Outlet Duct Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Side Window Defogger Outlet Duct - Right Side

FLOOR REAR AIR OUTLET DUCT REPLACEMENT (ADAPTOR)

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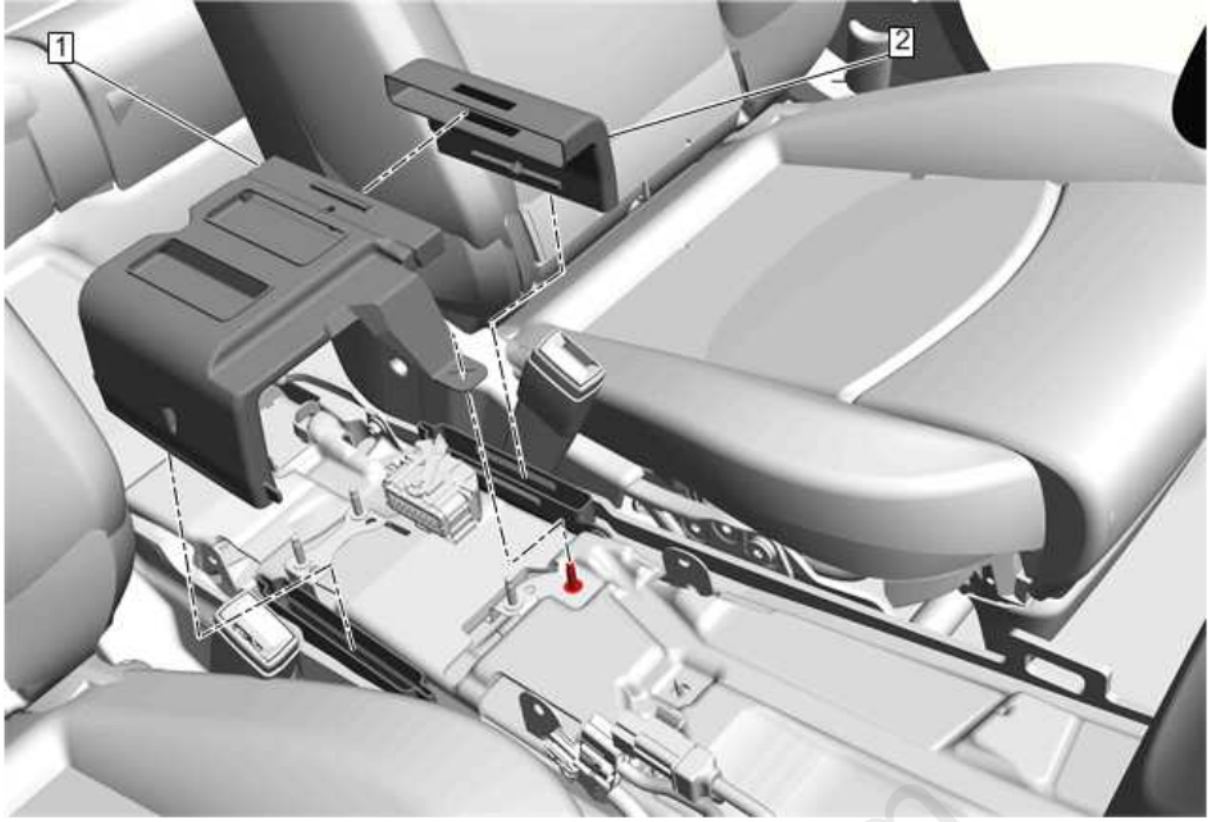


Fig. 531: Floor Rear Air Outlet Duct (Adapter)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Floor Console Replacement	
1	Floor Rear Air Outlet Duct - Right Upper
2	Floor Rear Air Outlet Duct - Center

FLOOR REAR AIR OUTLET DUCT REPLACEMENT - LEFT SIDE

Removal Procedure

1. Driver or Passenger Seat Removal and Installation - Left SideÂ» Remove
2. Auxiliary Floor Air Outlet (1)Â» Remove

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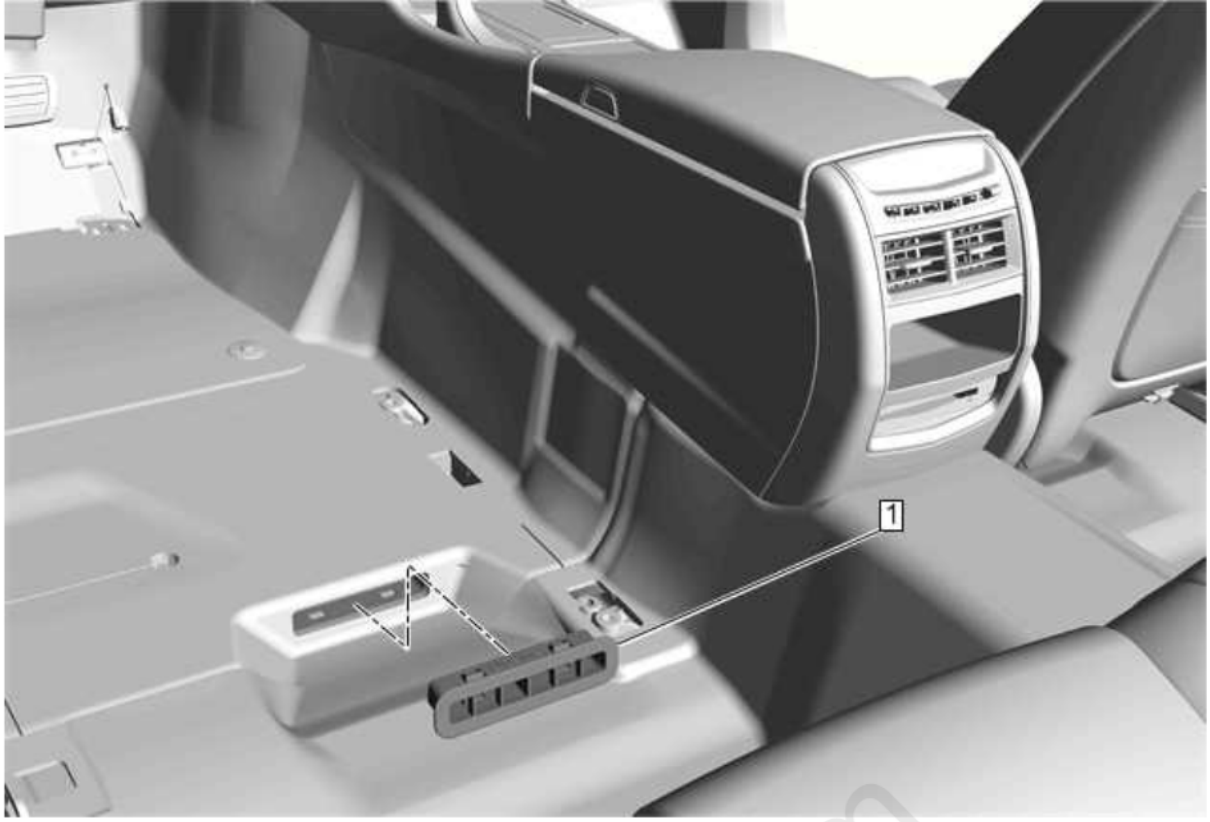


Fig. 532: Auxiliary Floor Air Outlet
Courtesy of GENERAL MOTORS COMPANY

3. Front Floor Panel Carpet (1) - Left SideÂ» Remove - **Front Floor Panel Carpet Replacement - Left Side**

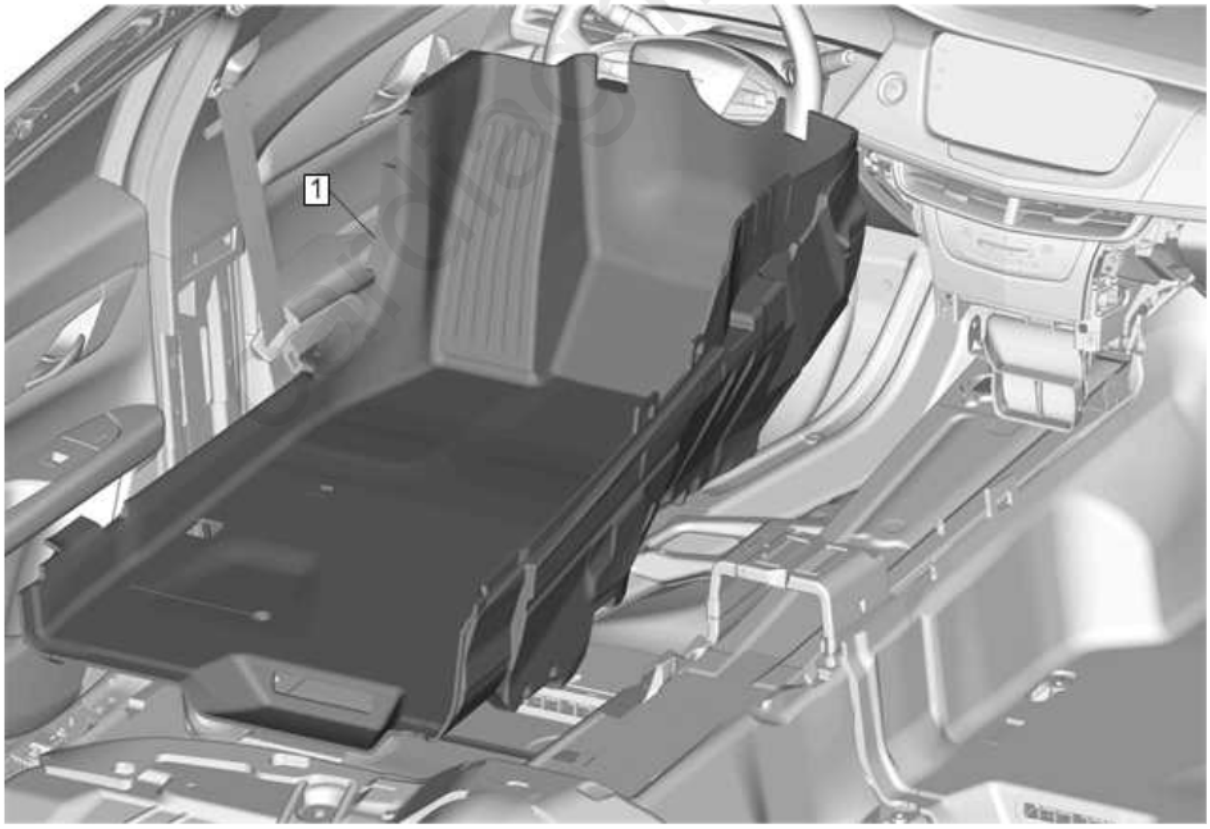


Fig. 533: Front Floor Panel Carpet - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Floor Rear Air Outlet Duct Retainer (1) [2x]Â» Remove

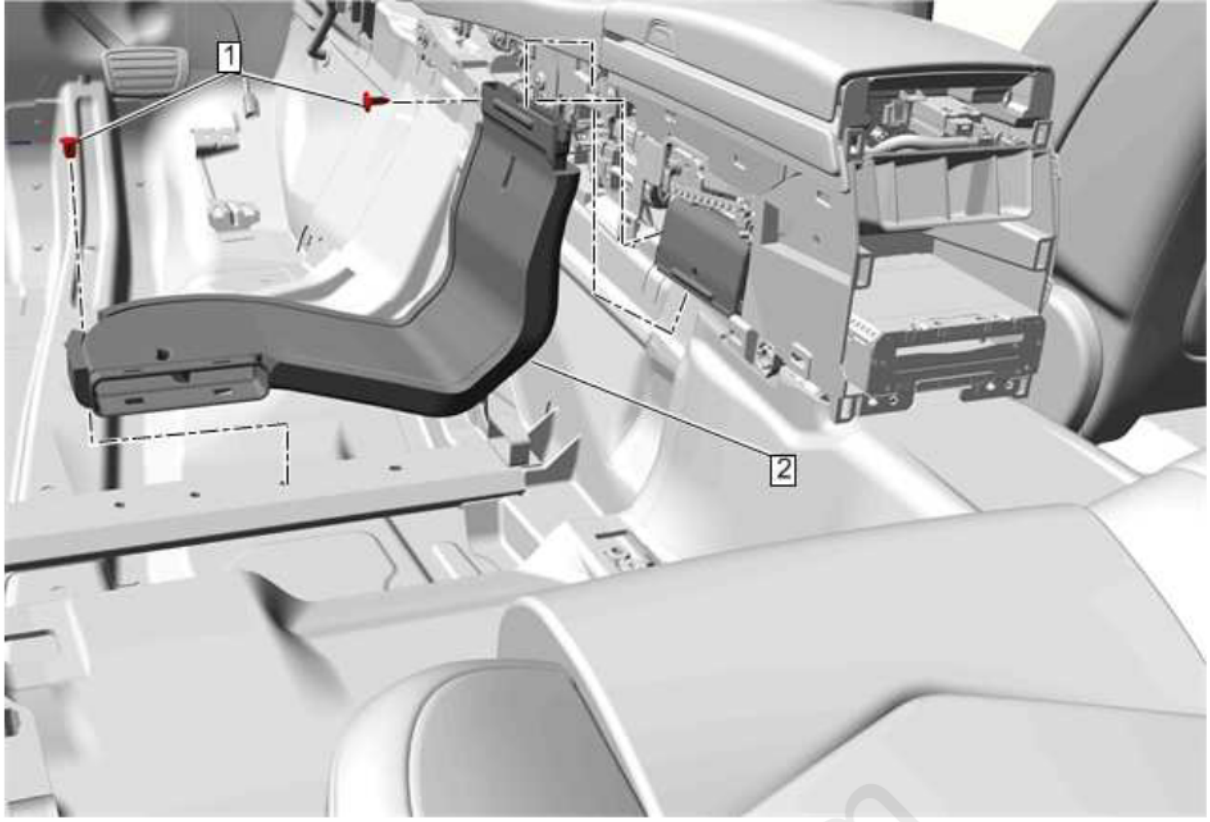


Fig. 534: Floor Rear Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

5. Floor Rear Air Outlet Duct (2) - Left SideÂ» Remove

Installation Procedure

1. Floor Rear Air Outlet Duct (2) - Left SideÂ» Install

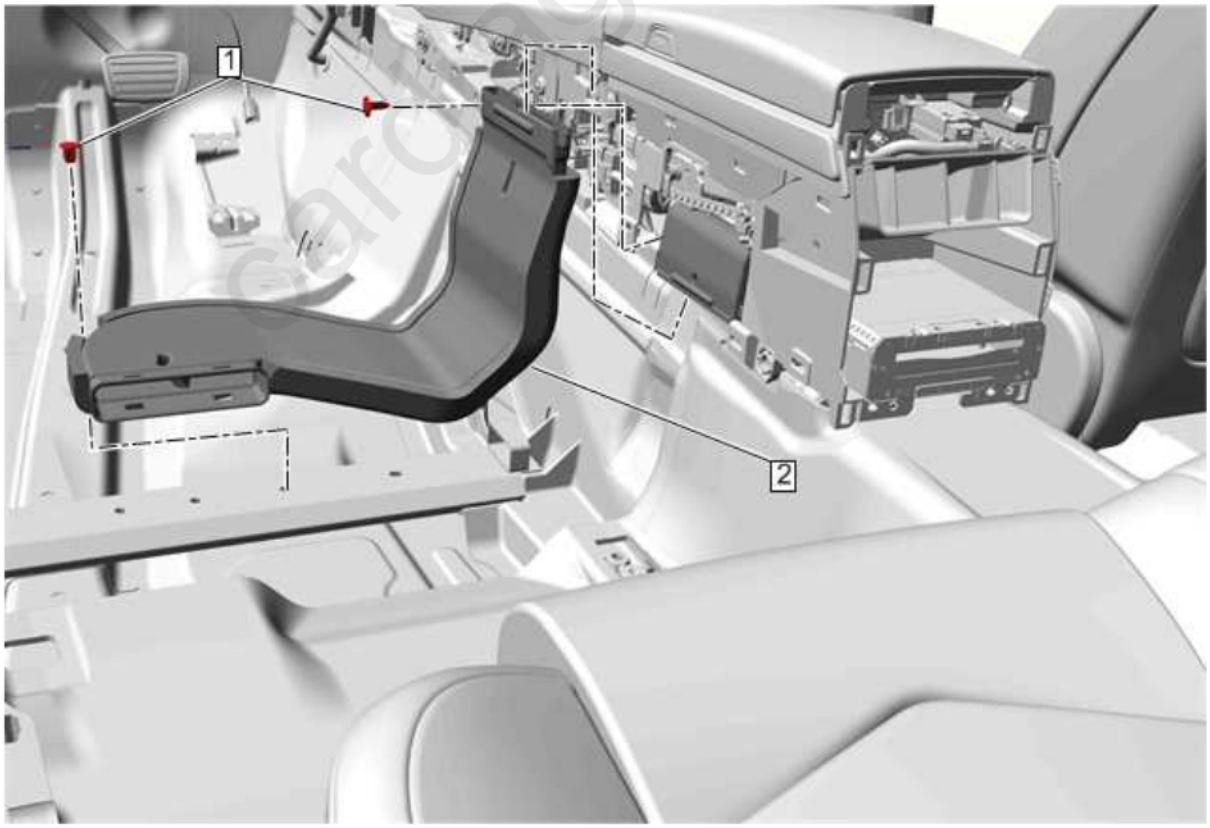


Fig. 535: Floor Rear Air Outlet Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

2. Floor Rear Air Outlet Duct Retainer (1) [2x]Â» Install
3. Front Floor Panel Carpet (1) - Left SideÂ» Install - **Front Floor Panel Carpet Replacement - Left Side**

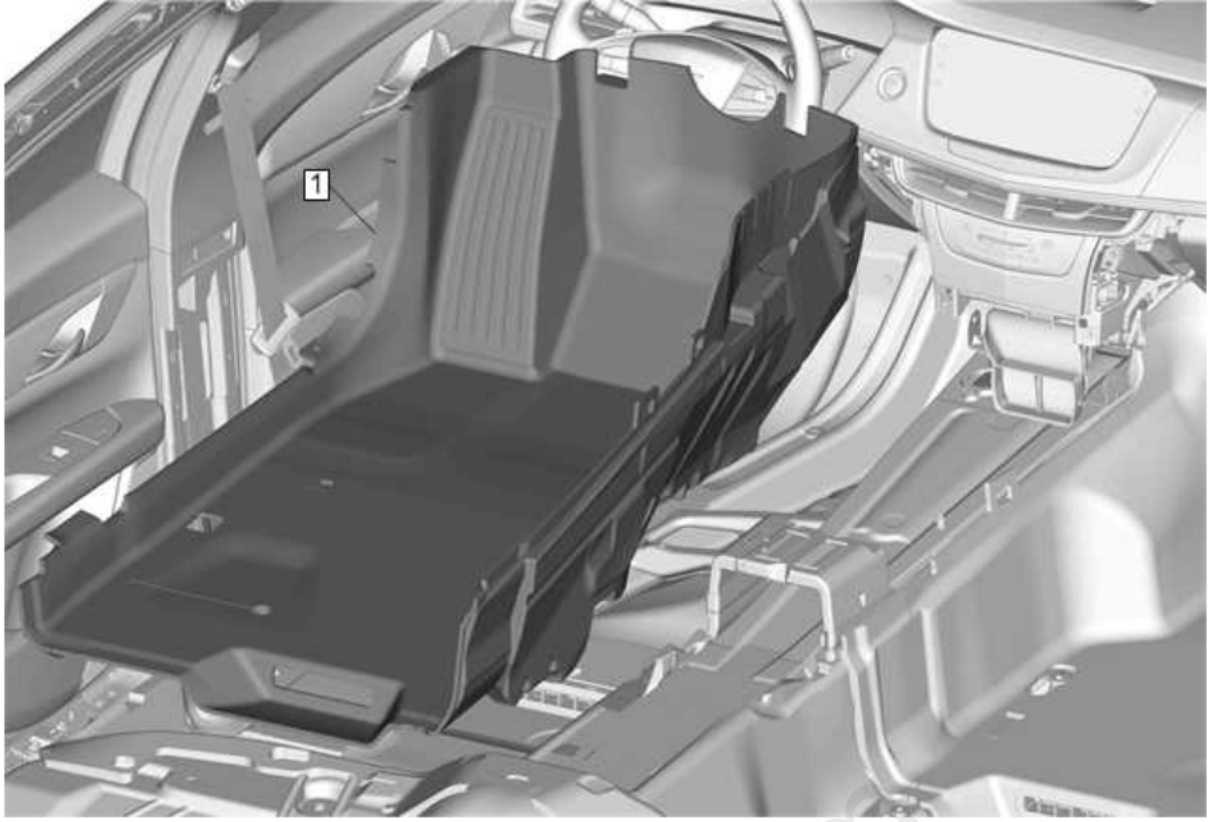


Fig. 536: Front Floor Panel Carpet - Left Side
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Floor Air Outlet (1)Â» Install

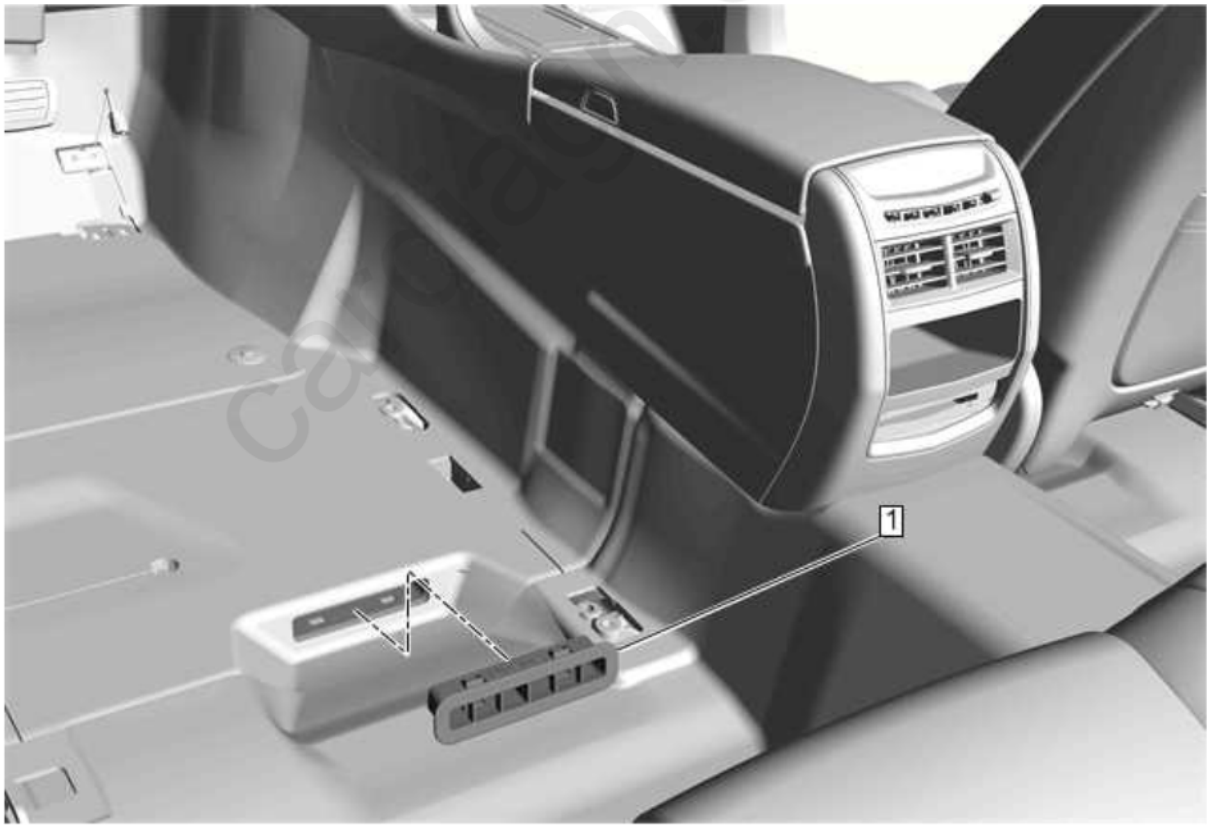


Fig. 537: Auxiliary Floor Air Outlet
Courtesy of GENERAL MOTORS COMPANY

5. Driver or Passenger Seat Removal and Installation - Left SideÂ» Install

FLOOR REAR AIR OUTLET DUCT REPLACEMENT - RIGHT SIDE

Removal Procedure

1. Driver or Passenger Seat Removal and Installation - Right SideÂ» Remove

2. Auxiliary Floor Air Outlet (1)Â» Remove

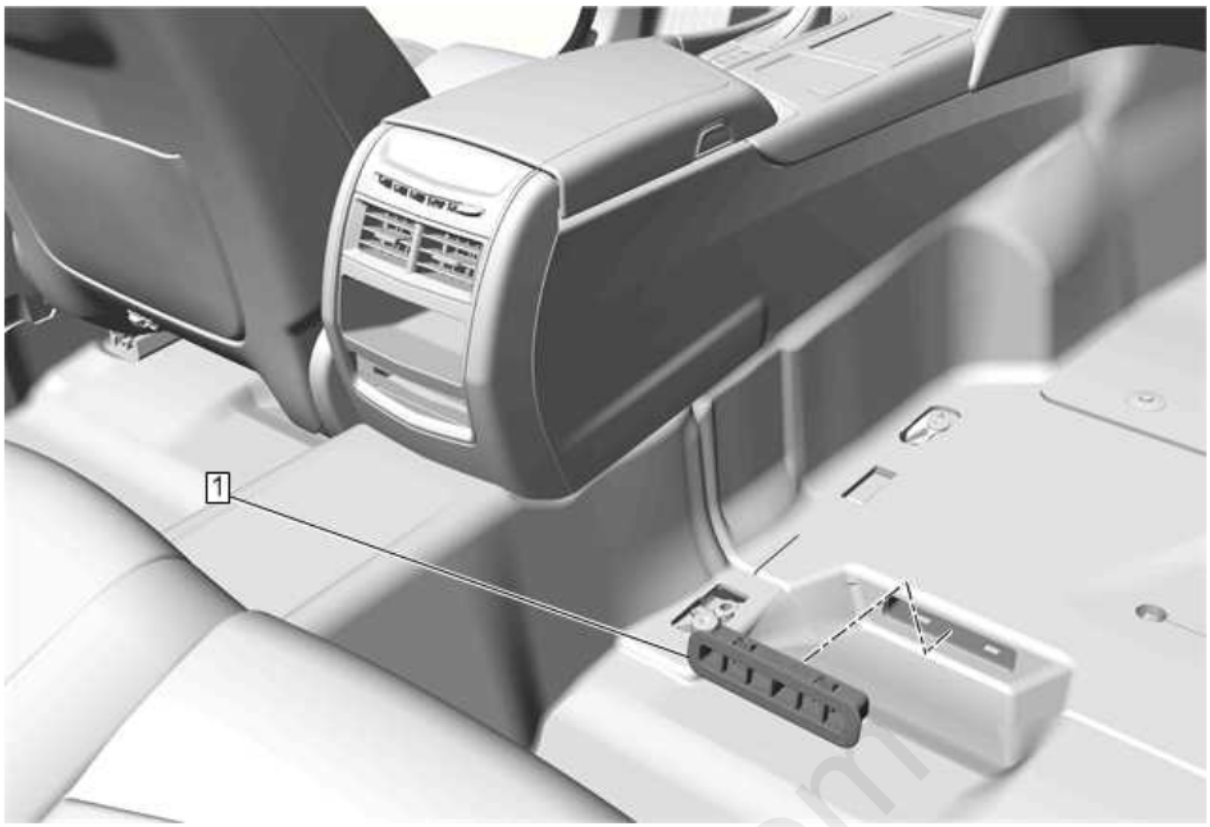


Fig. 538: Auxiliary Floor Air Outlet
Courtesy of GENERAL MOTORS COMPANY

3. Front Floor Panel Carpet (1) - Right SideÂ» Remove - **Front Floor Panel Carpet Replacement - Right Side**

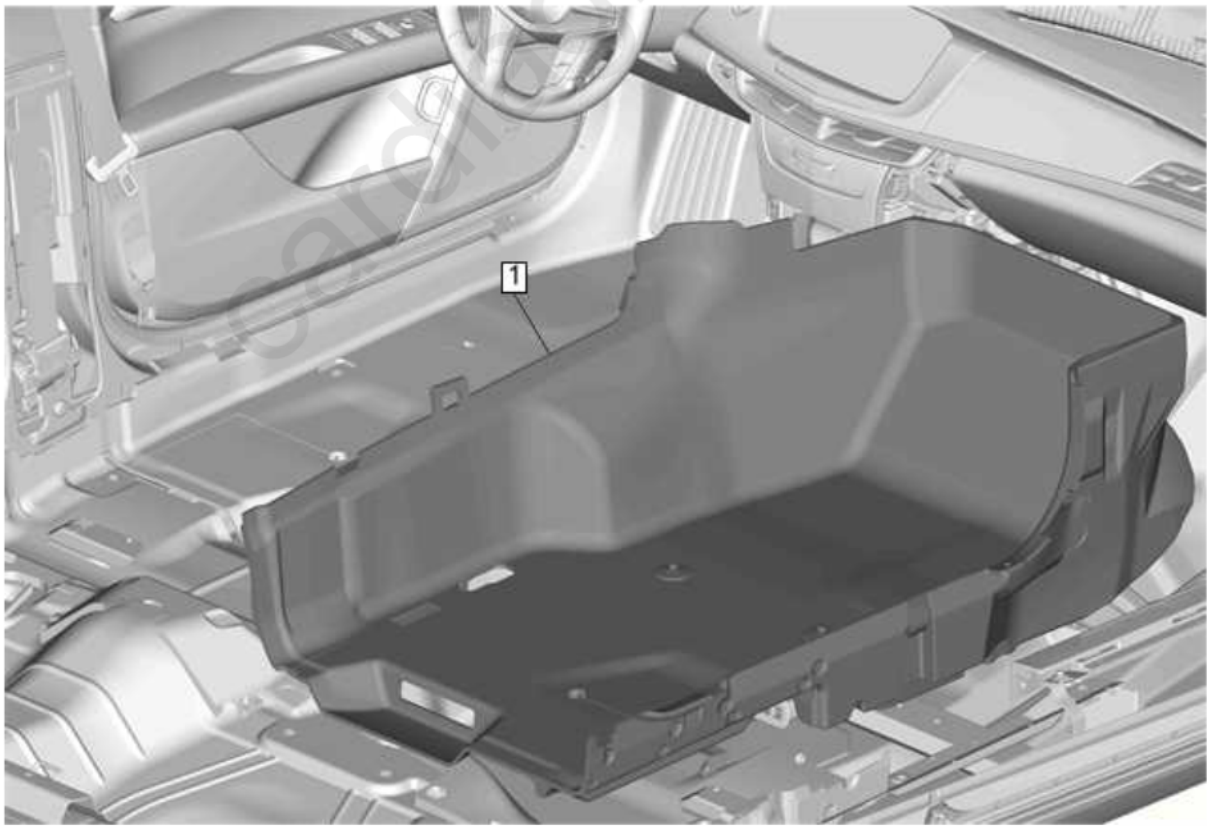


Fig. 539: Front Floor Panel Carpet - Right Side
Courtesy of GENERAL MOTORS COMPANY

4. Floor Rear Air Outlet Duct Retainer (1)Â» Remove

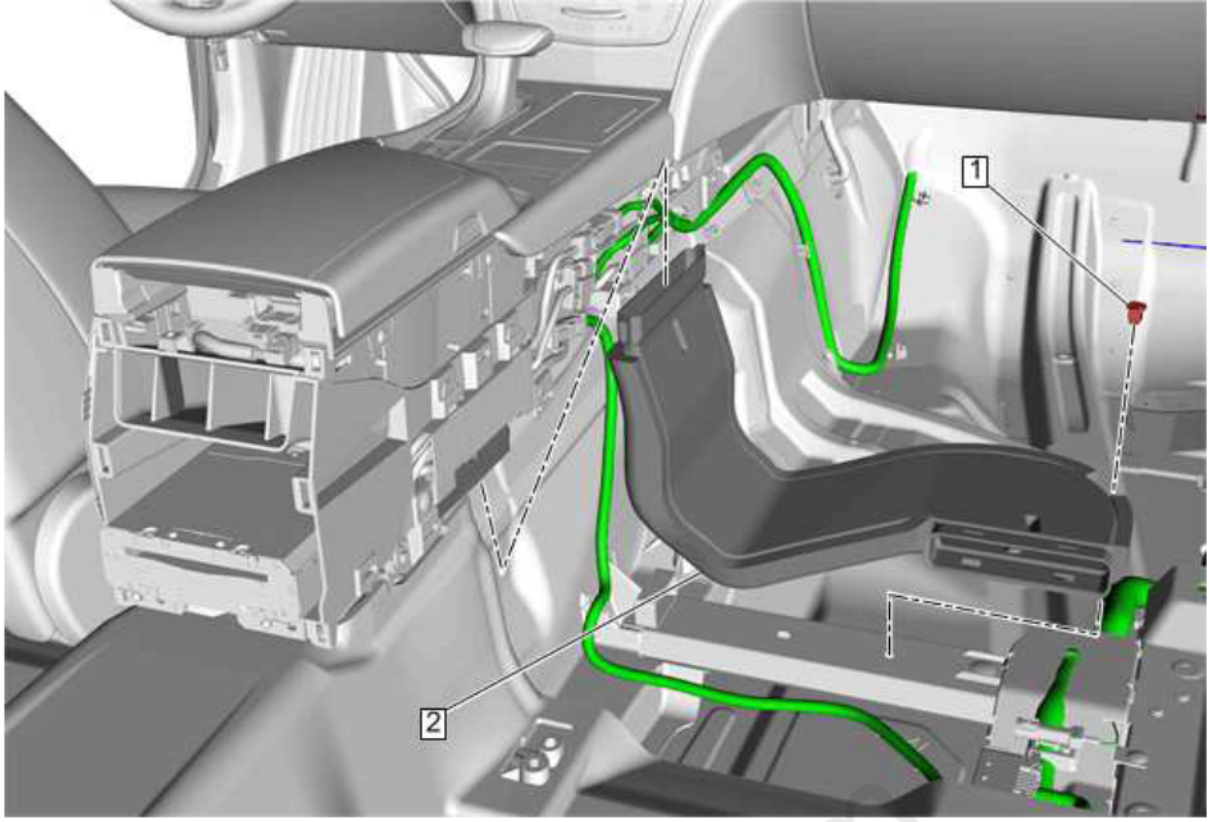


Fig. 540: Floor Rear Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

5. Floor Rear Air Outlet Duct (2) - Right SideÂ» Remove

Installation Procedure

1. Floor Rear Air Outlet Duct (2) - Right SideÂ» Install

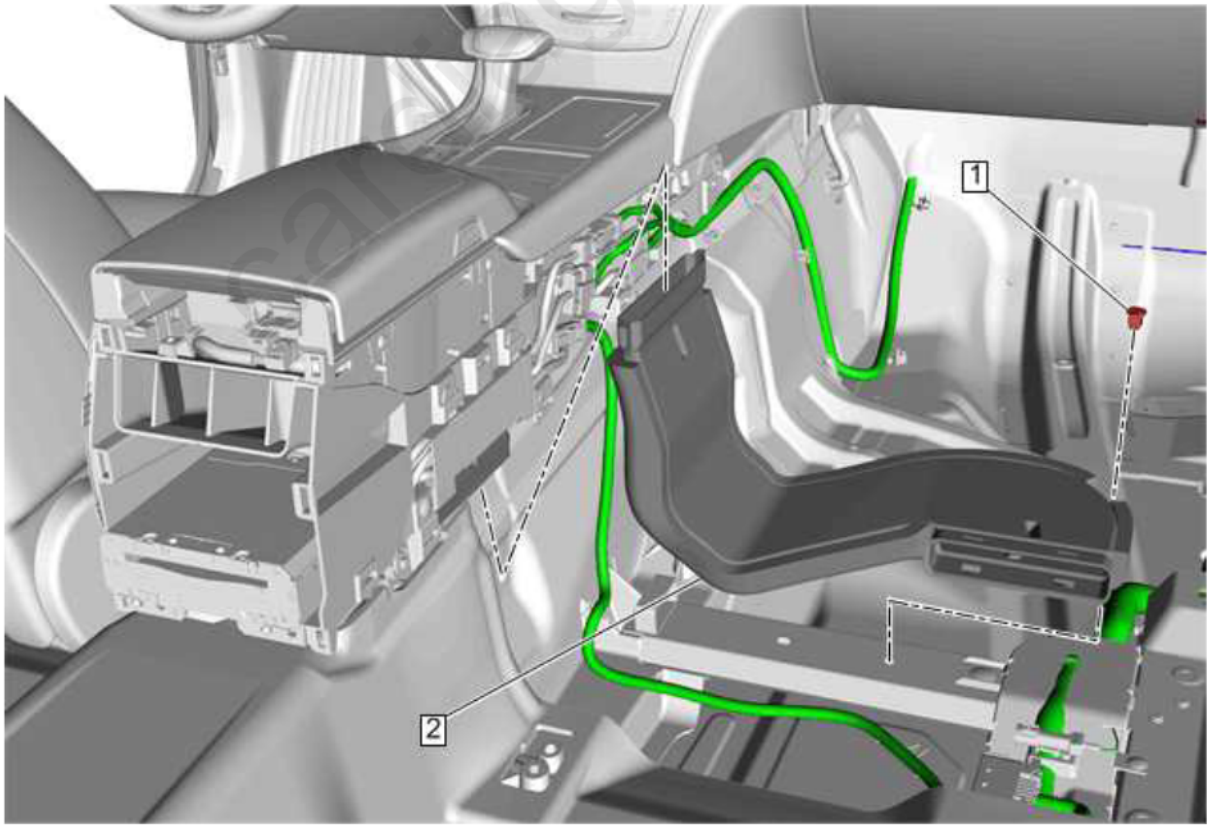


Fig. 541: Floor Rear Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

2. Floor Rear Air Outlet Duct Retainer (1)Â» Install
3. Front Floor Panel Carpet (1) - Right SideÂ» Install - **Front Floor Panel Carpet Replacement - Right Side**

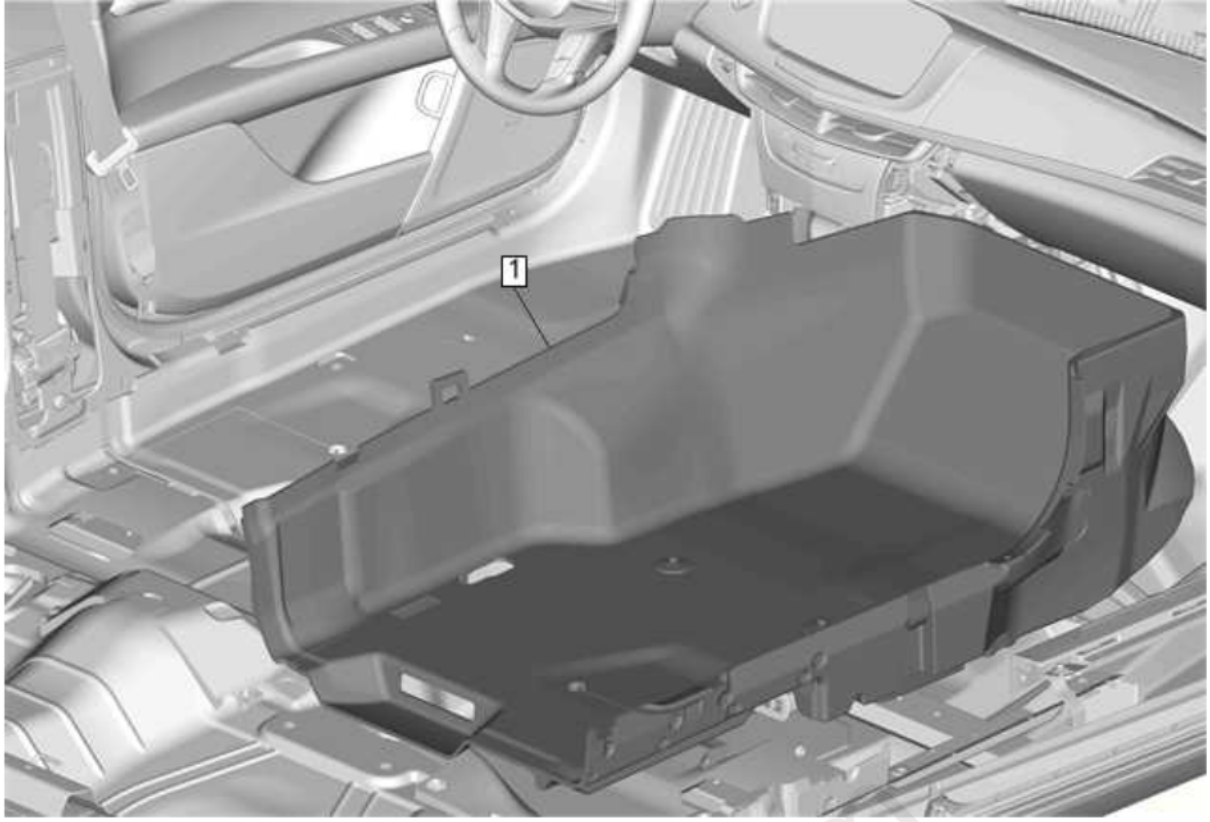


Fig. 542: Front Floor Panel Carpet - Right Side
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Floor Air Outlet (1)Â» Install

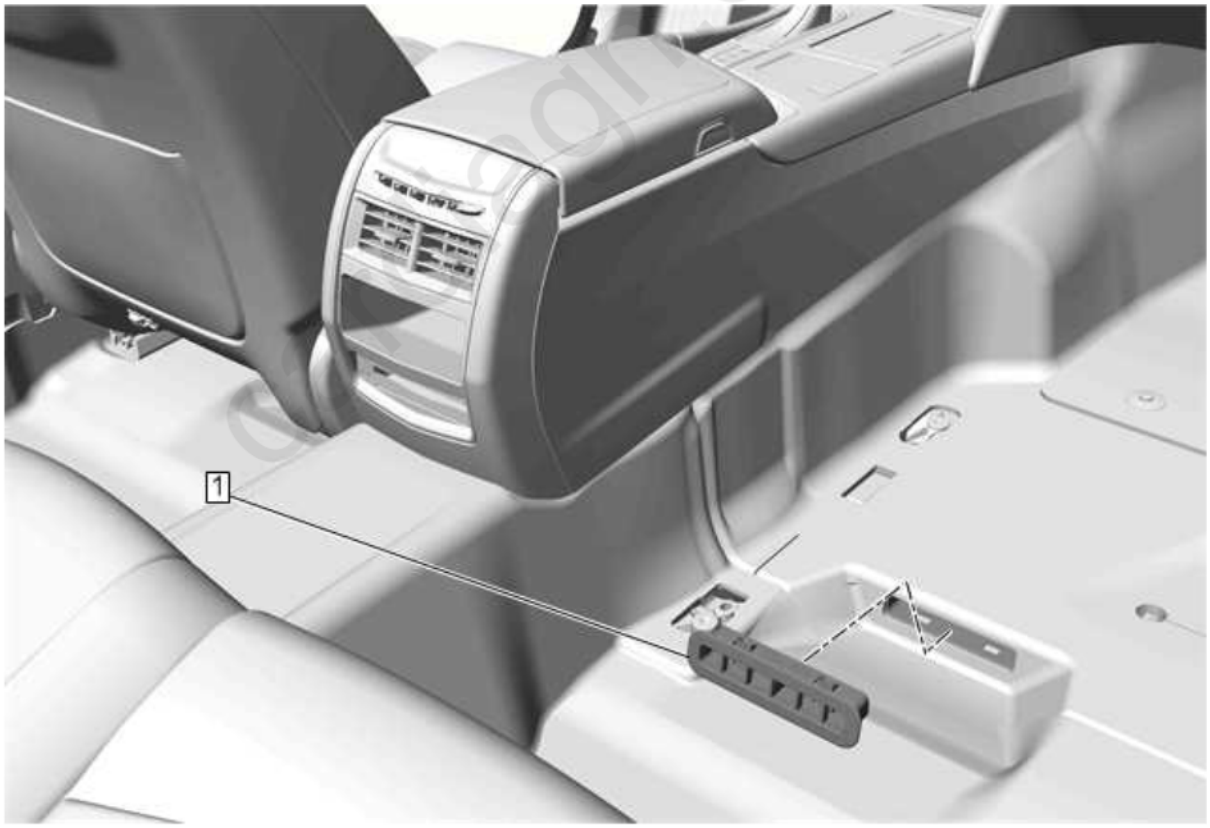


Fig. 543: Auxiliary Floor Air Outlet
Courtesy of GENERAL MOTORS COMPANY

5. Driver or Passenger Seat Removal and Installation - Right SideÂ» Install

HEATER CORE REPLACEMENT

Removal Procedure

1. Instrument Panel Center Support Bracket (1)Â» Remove - Instrument Panel Center Support Bracket Replacement



Fig. 544: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Floor Front Air Outlet Duct - Right Side (2)Â» Remove - **Floor Front Air Outlet Duct Replacement - Right Side**

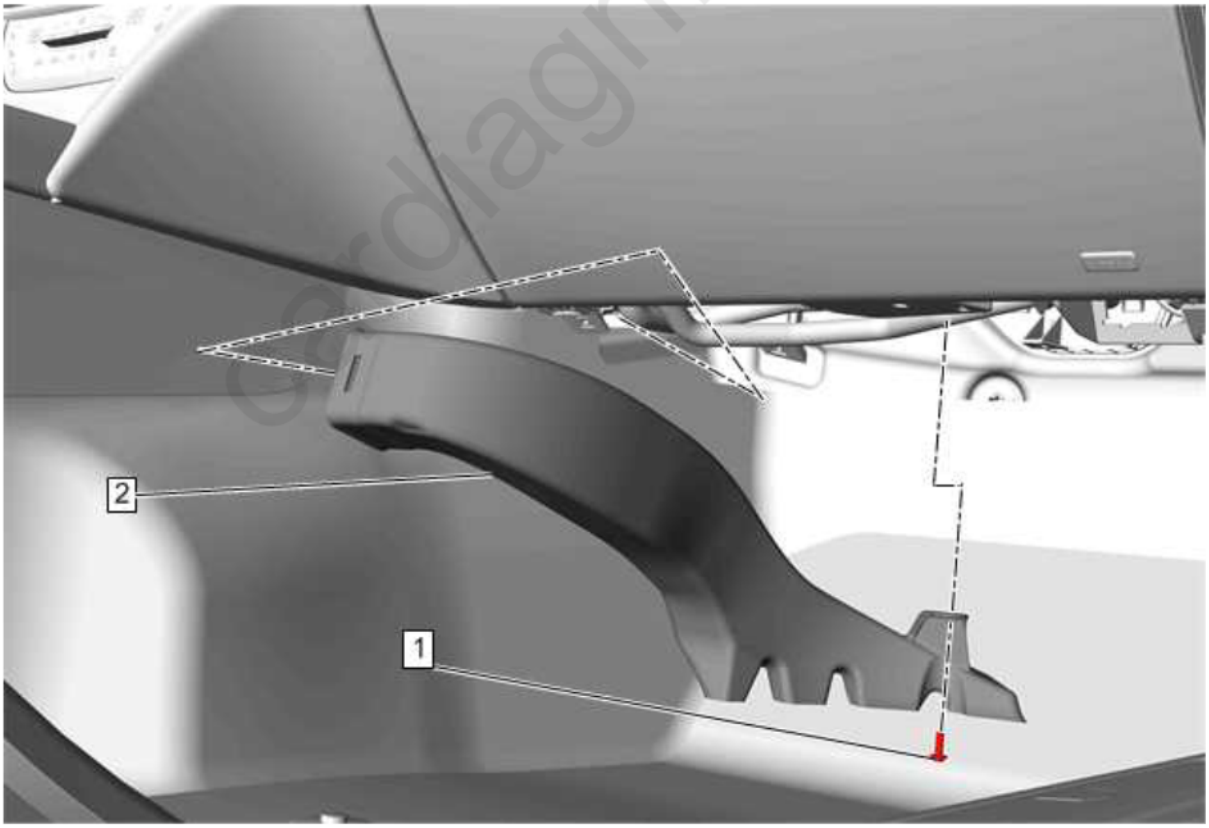


Fig. 545: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

3. Heater Core Outlet Tube (3) @ Heater CoreÂ» Remove - **Heater Core Outlet Tube Replacement**

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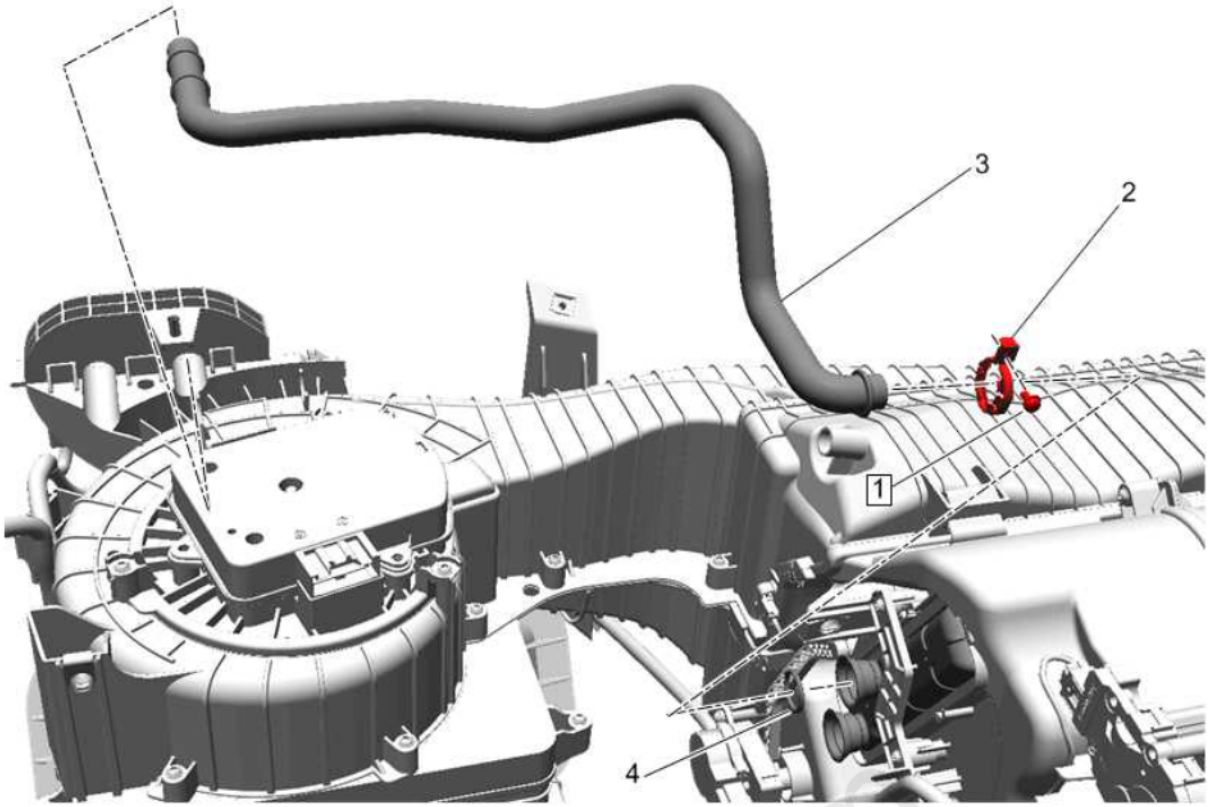


Fig. 546: Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

4. Heater Core Inlet Tube (3) @ Heater CoreÂ» Remove - **Heater Core Inlet Tube Replacement**

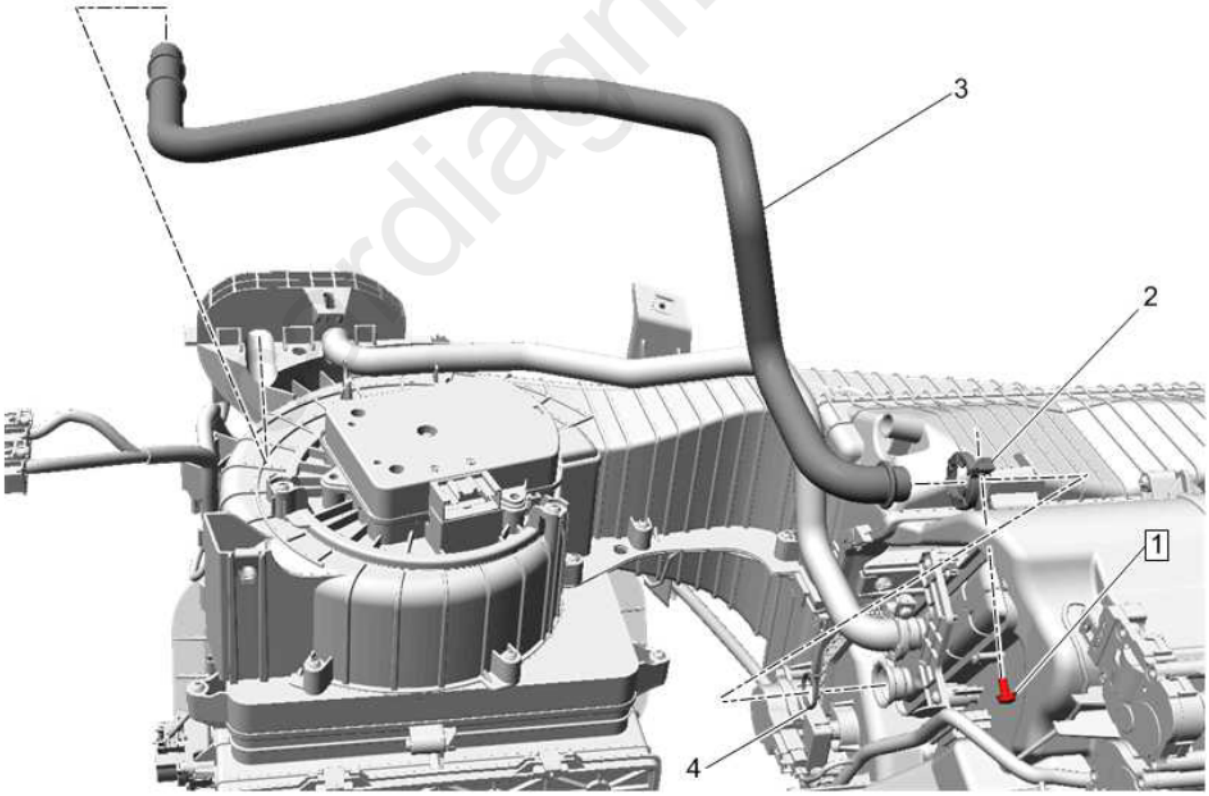


Fig. 547: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

5. Heater Core Bracket Fastener (1)Â» Remove [2x]

rdiagn.com

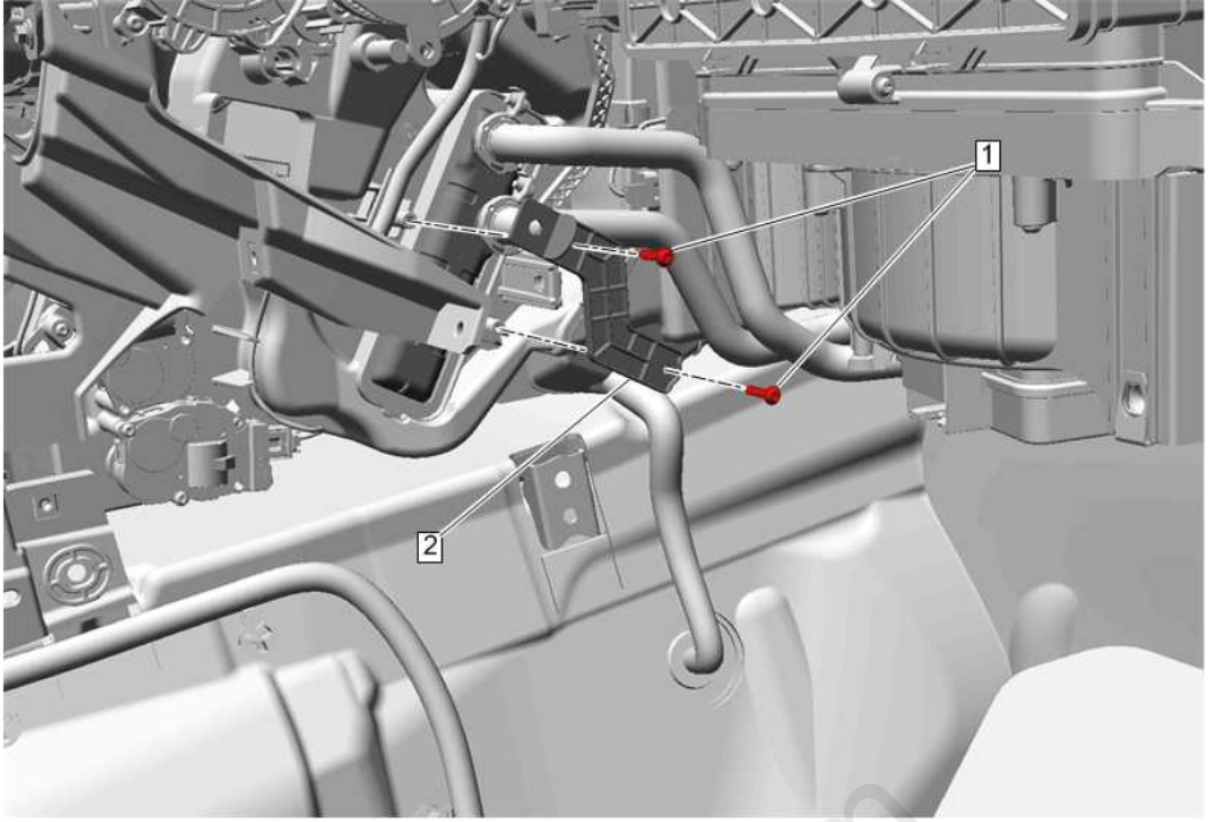


Fig. 548: Heater Core Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Heater Core Bracket (2)Â» Remove
7. Heater Core (1)Â» Remove

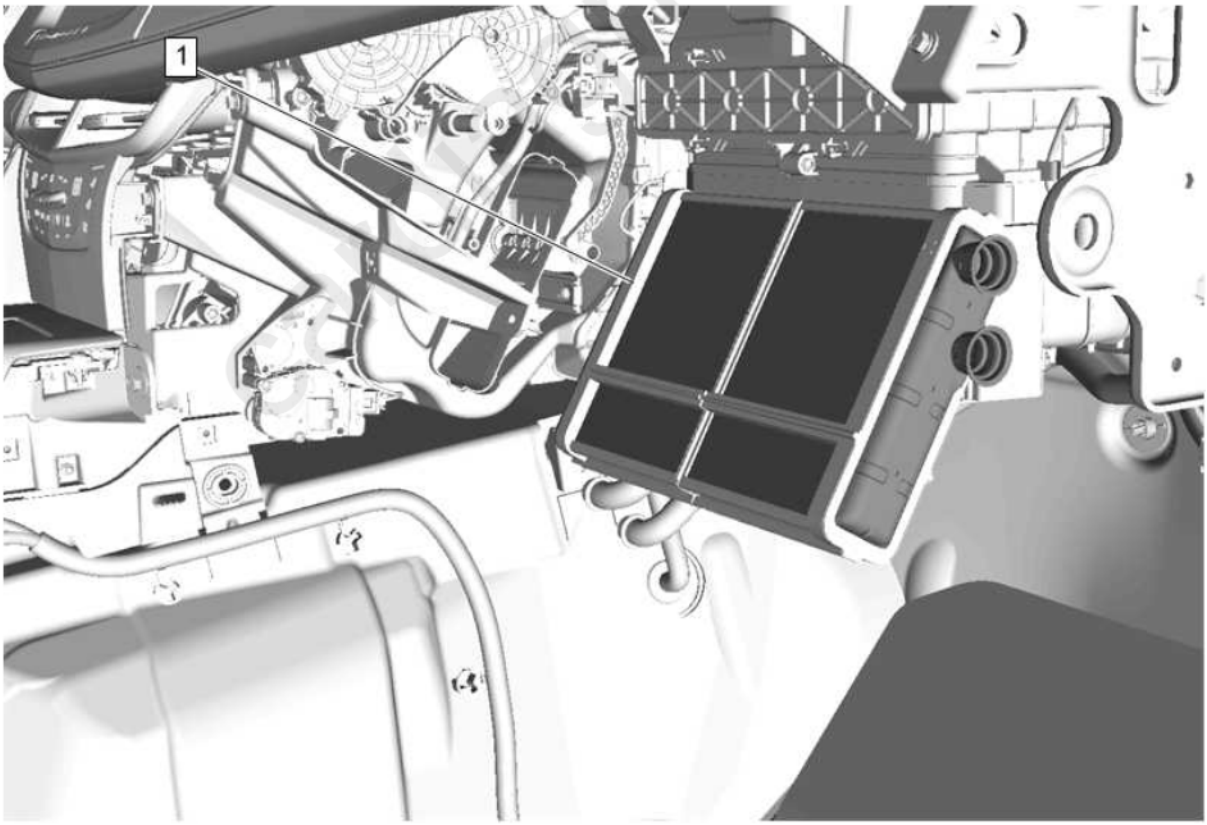


Fig. 549: Heater Core
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Heater Core (1)Â» Install

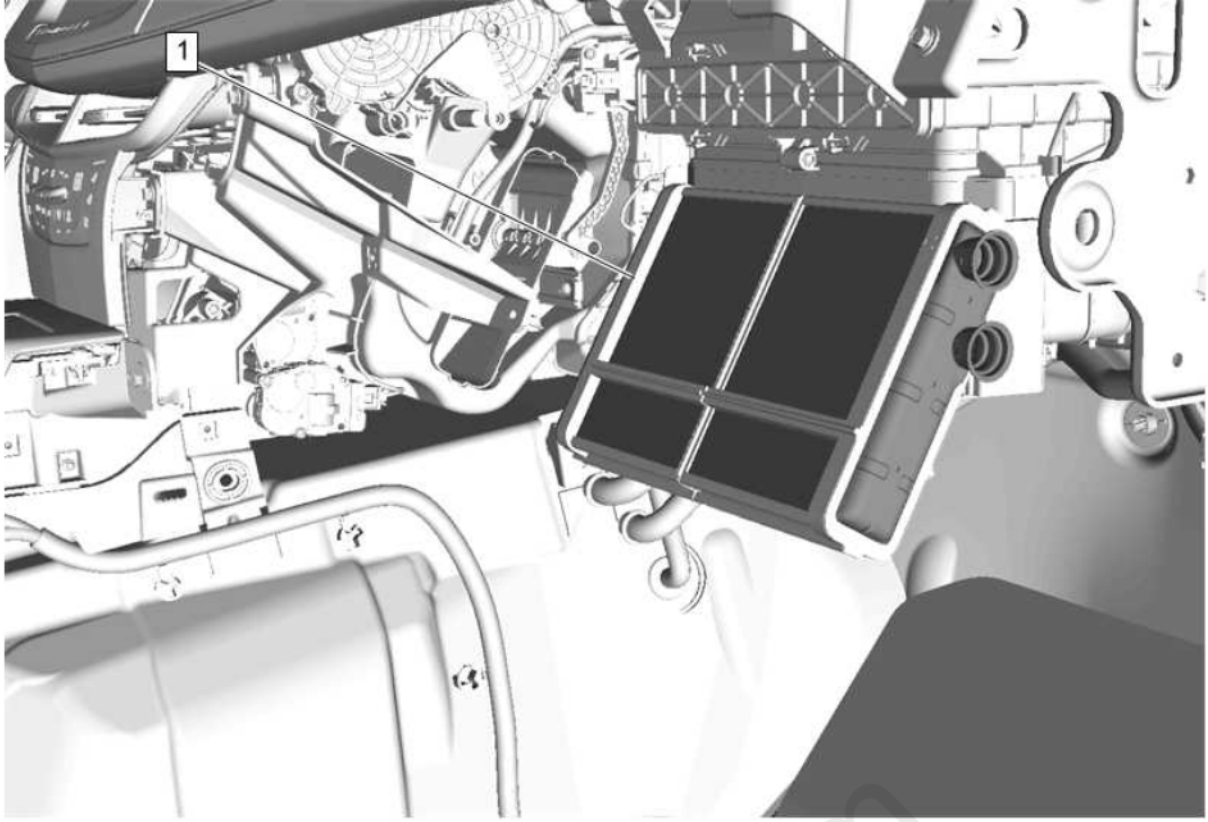


Fig. 550: Heater Core
Courtesy of GENERAL MOTORS COMPANY

2. Heater Core Bracket (2)Â» Install

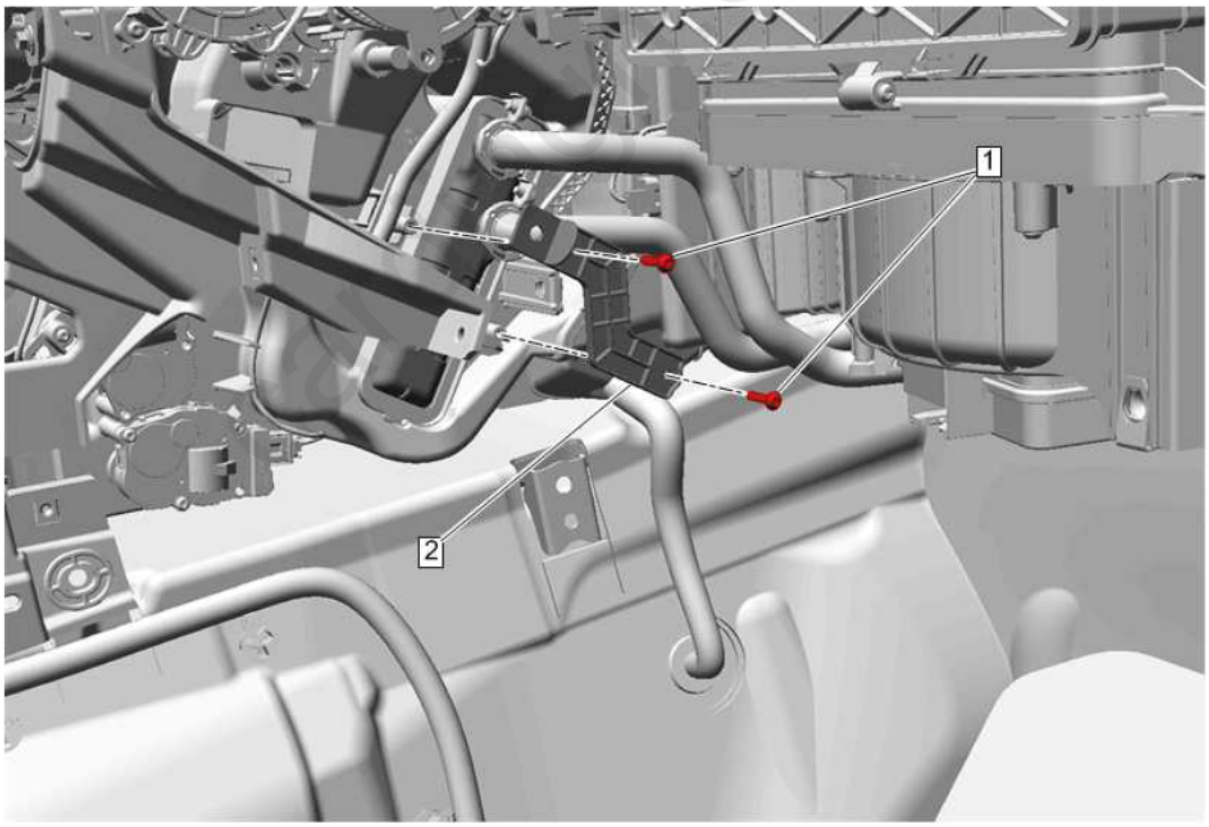


Fig. 551: Heater Core Bracket
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Heater Core Bracket Fastener (1)Â» Install and tighten [2x] 1.5 N.m (13 lb in)
4. Heater Core Inlet Tube (3) @ Heater CoreÂ» Install - **Heater Core Inlet Tube Replacement**

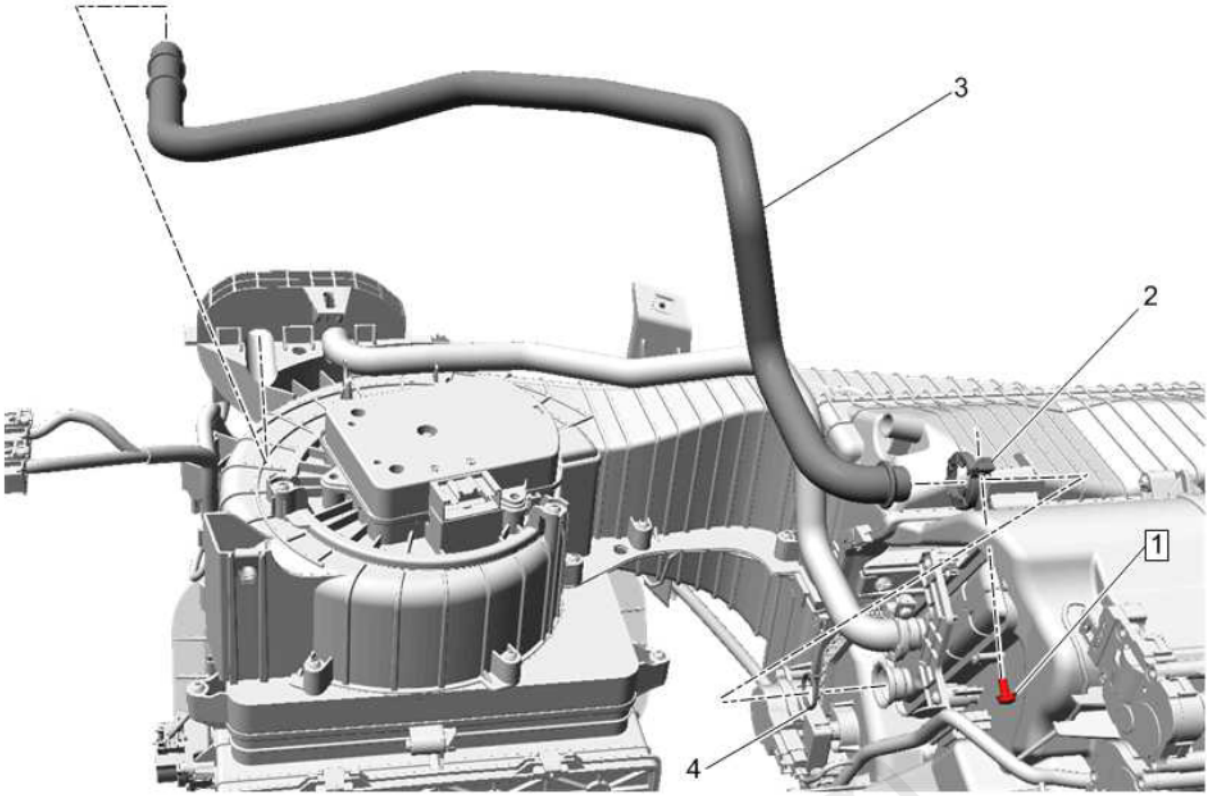


Fig. 552: Heater Core Inlet Tube
Courtesy of GENERAL MOTORS COMPANY

5. Heater Core Outlet Tube (3) @ Heater CoreÂ» Install - **Heater Core Outlet Tube Replacement**

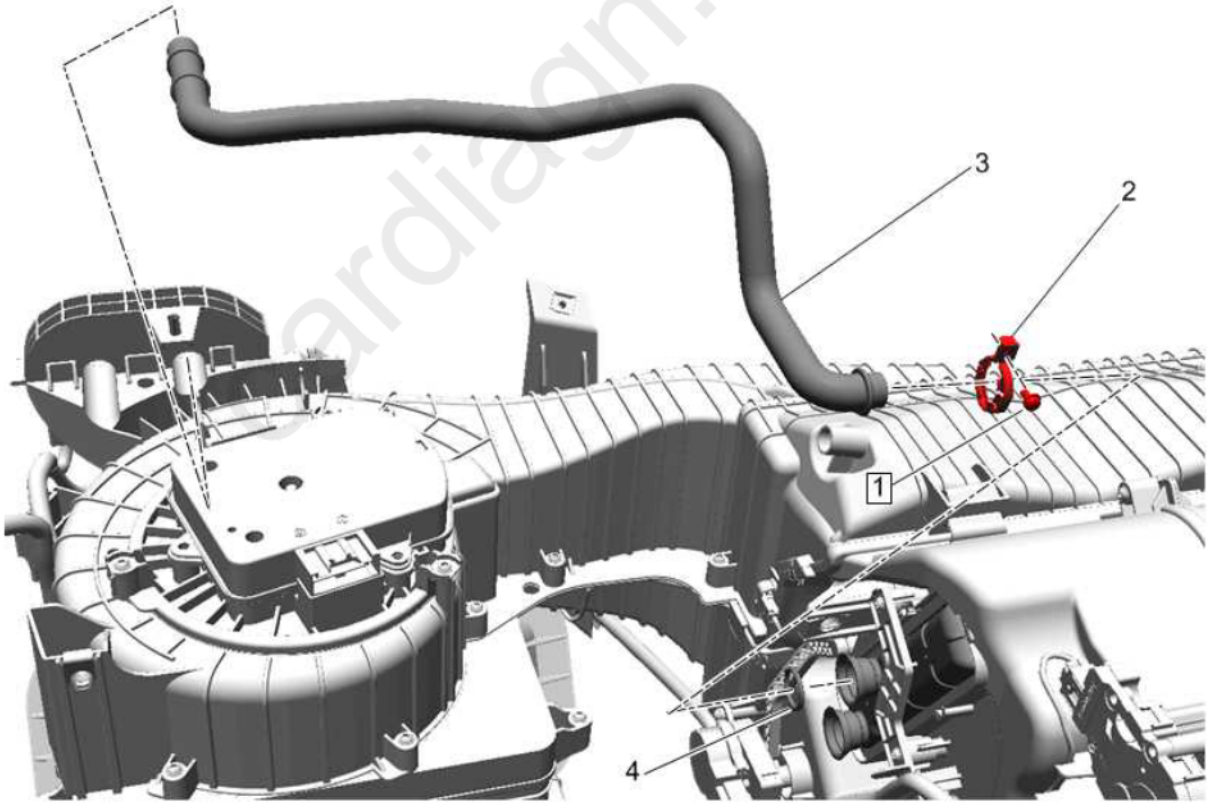


Fig. 553: Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

6. Floor Front Air Outlet Duct - Right Side (2)Â» Install - **Floor Front Air Outlet Duct Replacement - Right Side**

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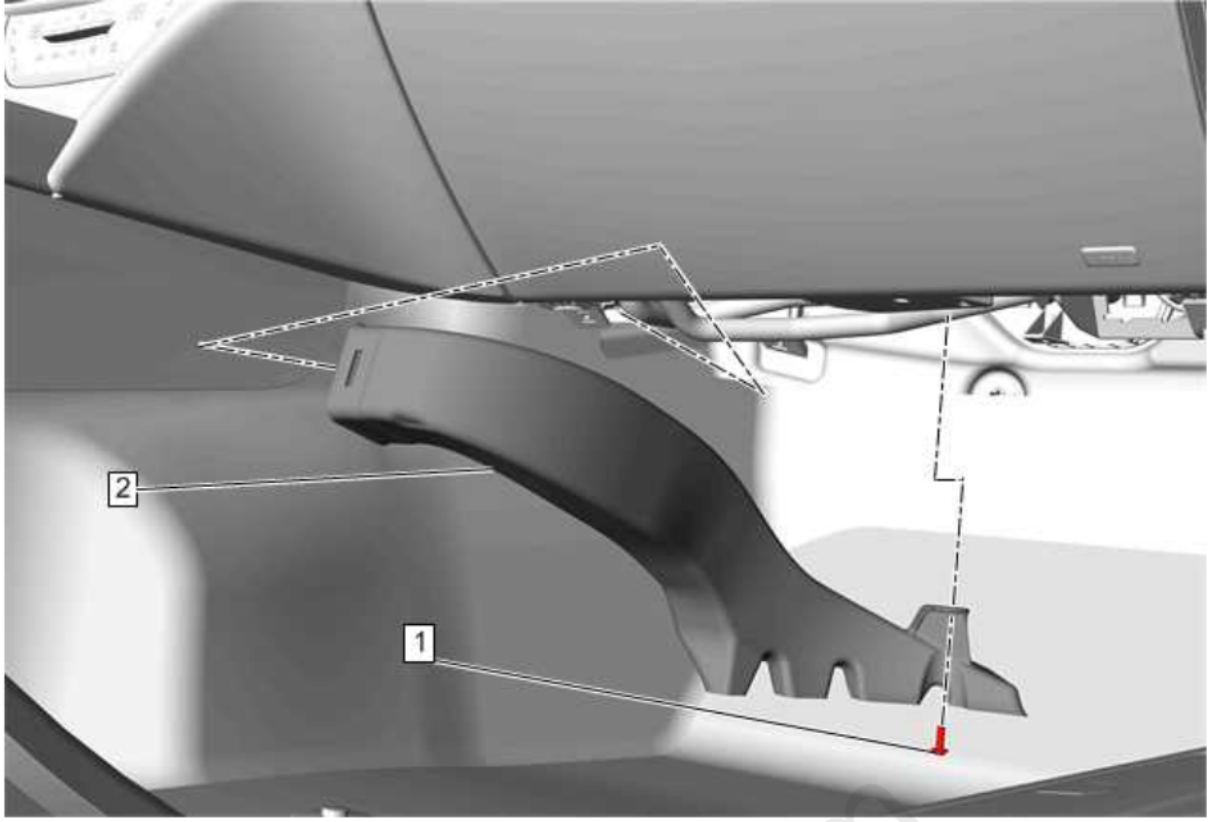


Fig. 554: Floor Front Air Outlet Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

7. Instrument Panel Center Support Bracket (1)Â» Install - **Instrument Panel Center Support Bracket Replacement**



Fig. 555: Instrument Panel Center Support Bracket
Courtesy of GENERAL MOTORS COMPANY

HEATER COOLANT HEATER REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Heater Water Auxiliary Pump Hose (1) @ Heater Coolant HeaterÂ» Remove - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

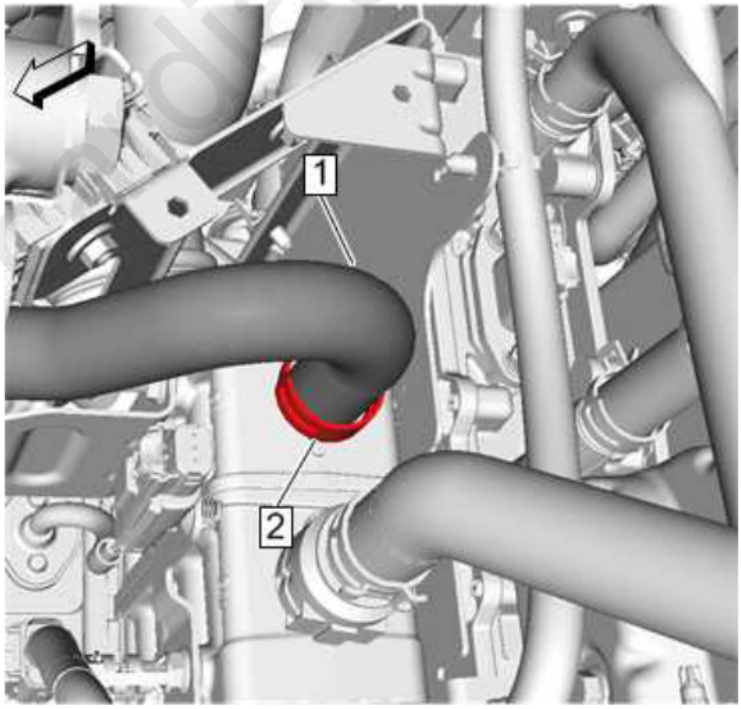


Fig. 556: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Heater Outlet Hose (2) @ Heater Coolant HeaterÂ» Remove - **Auxiliary Heater Outlet Hose Replacement (LTG with HP9)**

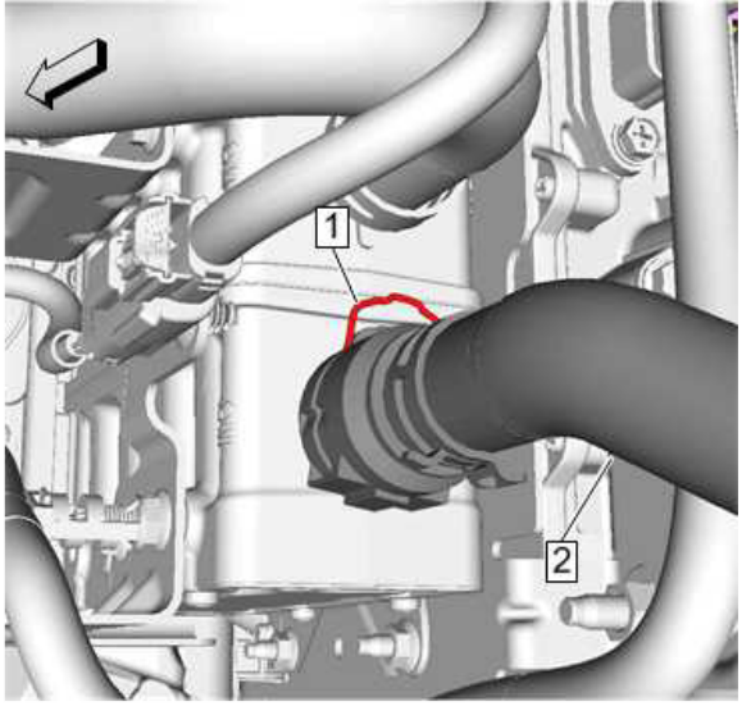


Fig. 557: Auxiliary Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Disconnect the electrical connectors.
6. Reposition the wiring harness.
7. Heater Water Auxiliary Pump Bracket (1) @ Heater Coolant HeaterÂ» Remove - **Heater Water Auxiliary Pump Bracket Replacement (LTG with HP9)**

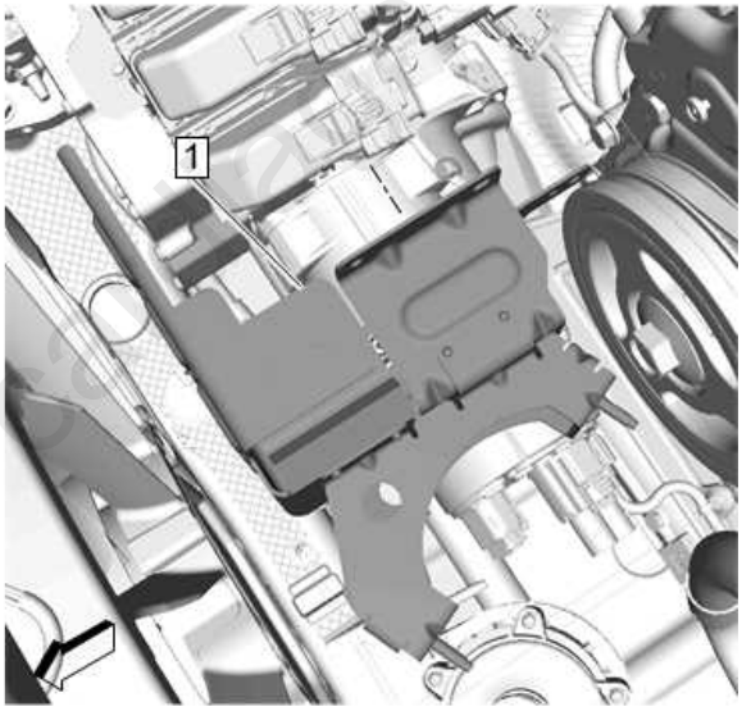


Fig. 558: Heater Water Auxiliary Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Heater Coolant Heater Nut (1) @ Accessory DC Power Control Module BracketÂ» Remove [2x]

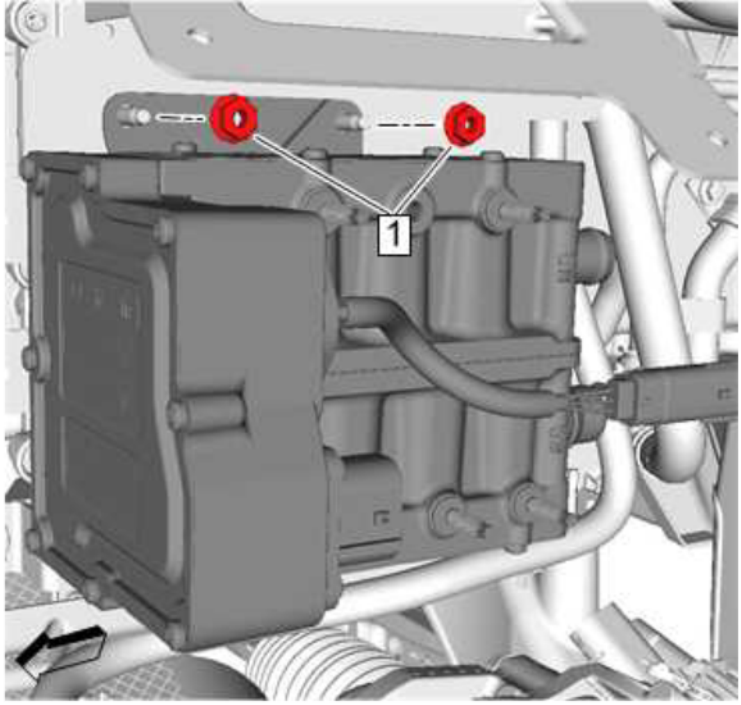


Fig. 559: Heater Coolant Heater Nut
Courtesy of GENERAL MOTORS COMPANY

9. Heater Coolant Heater Nut (1) @ Accessory DC Power Control Module BracketÂ» Remove [2x]

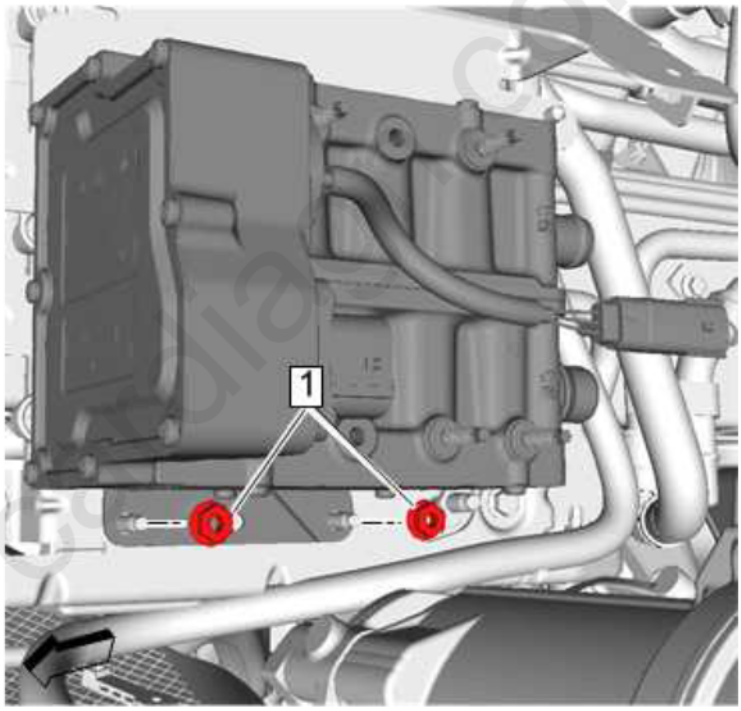


Fig. 560: Heater Coolant Heater Nut
Courtesy of GENERAL MOTORS COMPANY

10. Heater Coolant Heater (1) @ Accessory DC Power Control Module BracketÂ» Remove

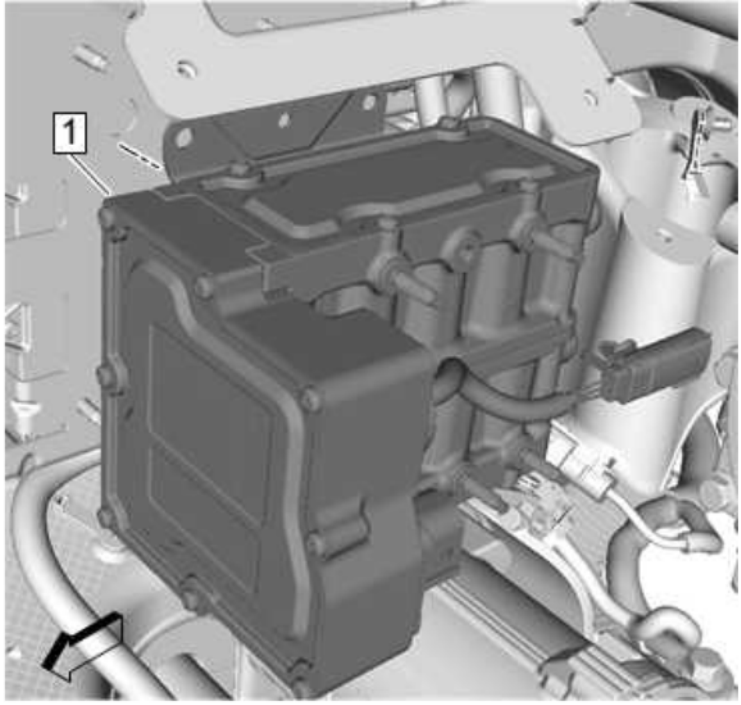


Fig. 561: Heater Coolant Heater
Courtesy of GENERAL MOTORS COMPANY

11. Heater Coolant Heater (1)Â» Remove

Installation Procedure

1. Heater Coolant Heater (1) @ Accessory DC Power Control Module BracketÂ» Install

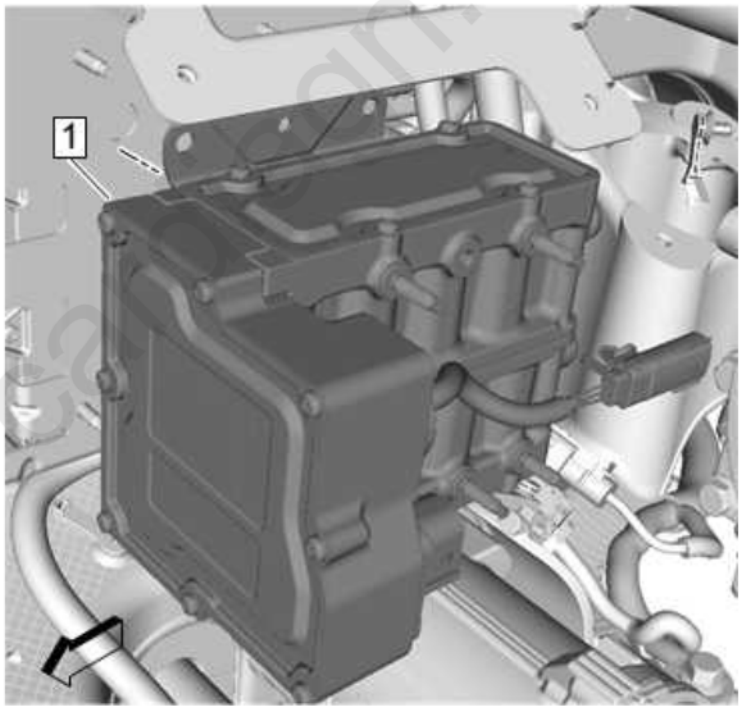


Fig. 562: Heater Coolant Heater
Courtesy of GENERAL MOTORS COMPANY

2. Heater Coolant Heater Nut (1) @ Accessory DC Power Control Module BracketÂ» Install and tighten [2x] 9 N.m (80 lb in)

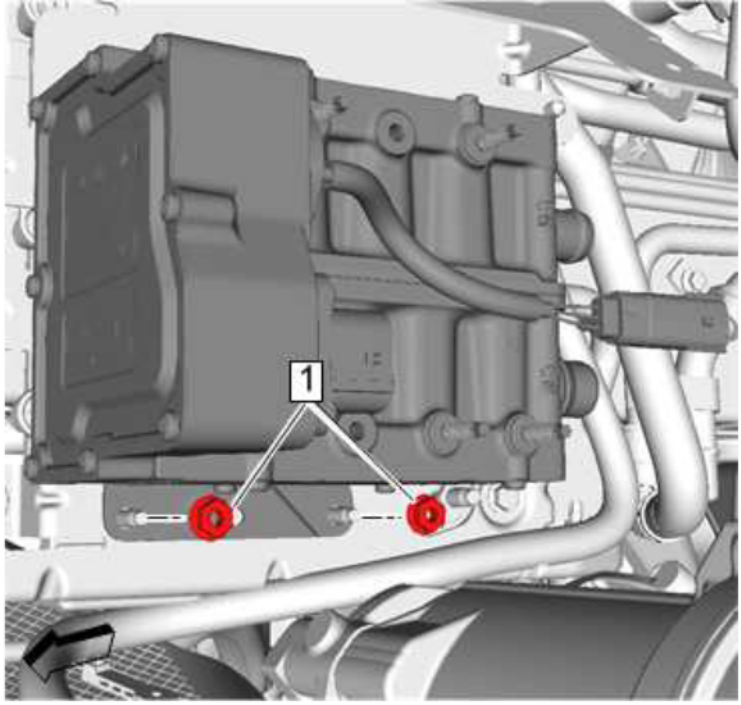


Fig. 563: Heater Coolant Heater Nut
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Heater Coolant Heater Nut (1) @ Accessory DC Power Control Module BracketÂ» Install and tighten [2x] 9 N.m (80 lb in)

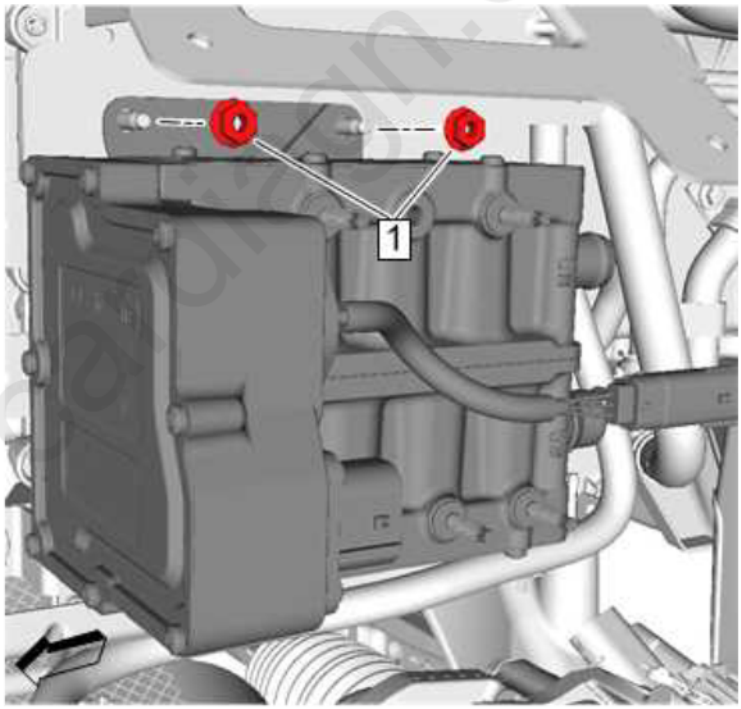


Fig. 564: Heater Coolant Heater Nut
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Bracket (1) @ Heater Coolant HeaterÂ» Install - Heater Water Auxiliary Pump Bracket Replacement (LTG with HP9)

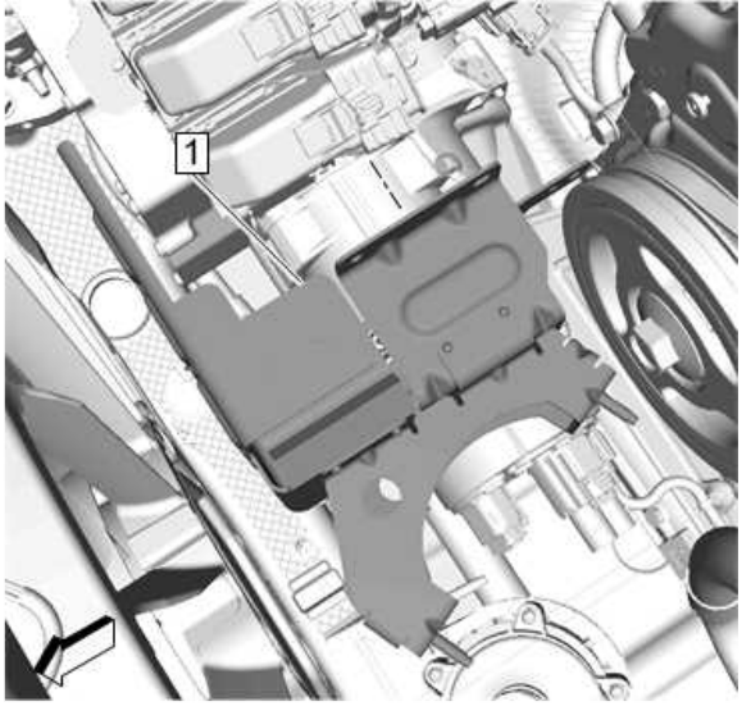


Fig. 565: Heater Water Auxiliary Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Connect the electrical connectors.
6. Reposition the wiring harness.
7. Auxiliary Heater Outlet Hose (2) @ Heater Coolant HeaterÂ» Install - **Auxiliary Heater Outlet Hose Replacement (LTG with HP9)**

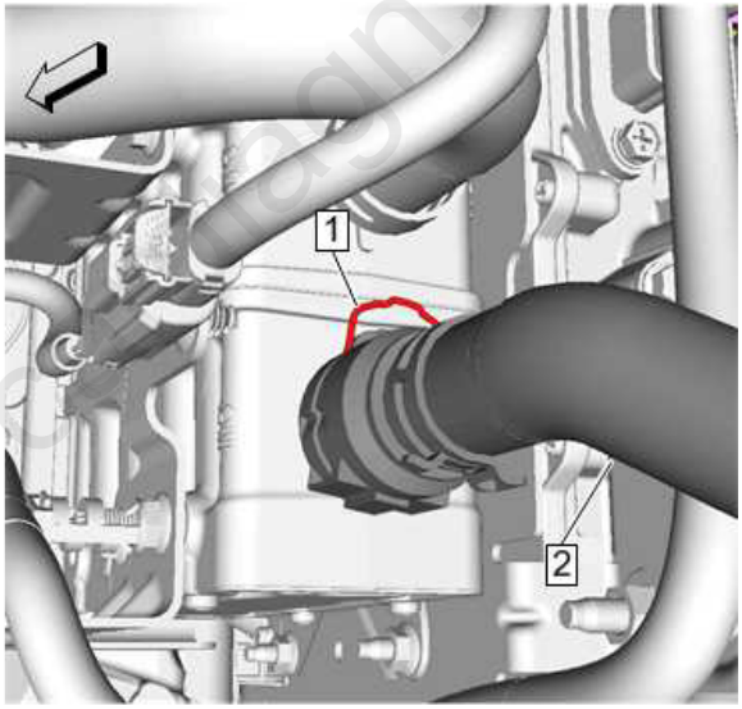


Fig. 566: Auxiliary Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Hose (1) @ Heater Coolant HeaterÂ» Install - **Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Surge Tank to Heater Coolant Pump to Radiator Inlet Pipe)Heater Water Auxiliary Pump Hose Replacement (LTG with HP9 Heater Coolant Heater to Heater Coolant Pump)**

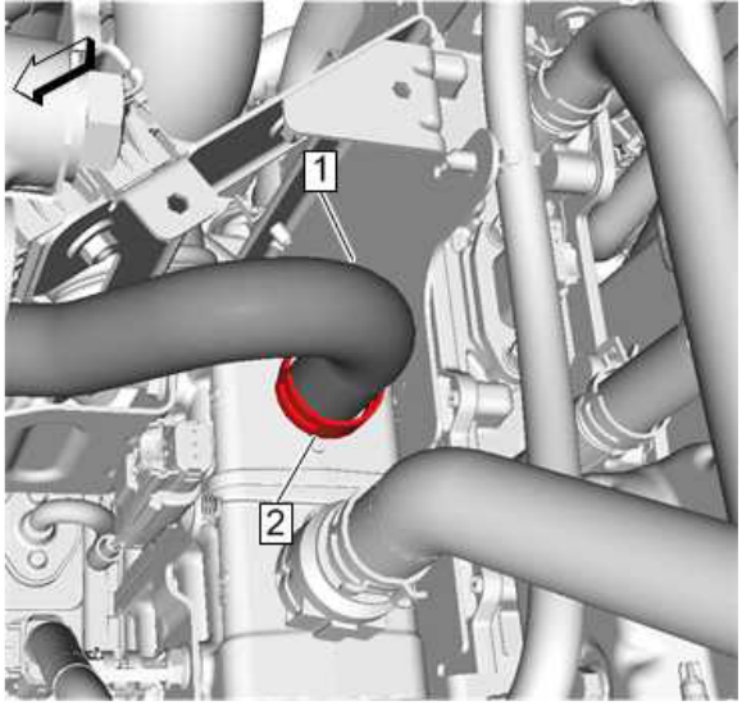


Fig. 567: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

9. Fill the cooling system. Refer to Cooling System Draining and Filling (Static LTG with HP9) and/or Cooling System Draining and Filling (GE 47716 LTG with HP9)
10. Enable the high voltage system. Refer to High Voltage Enabling
11. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP BRACKET REPLACEMENT (LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (50 feet) of the vehicle, either indoors or outdoors.**
- **Certified and up-to-date Class "0" Insulation gloves rated at 1000 V with leather protectors.**
  - **Visually and functionally inspect the gloves before use.**
  - **Wear the Insulation gloves with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to High Voltage Disabling

2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Heater Coolant Pump (1)Â» Remove - **Heater Coolant Pump Replacement (LTG with HP9)**

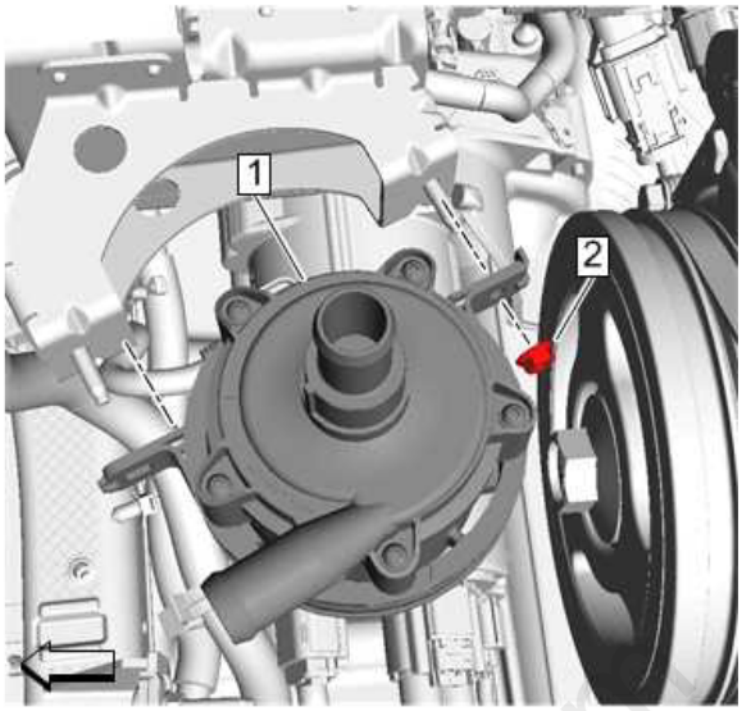


Fig. 568: Heater Coolant Pump And Nut
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Bracket Nut (1)Â» Remove [2x]

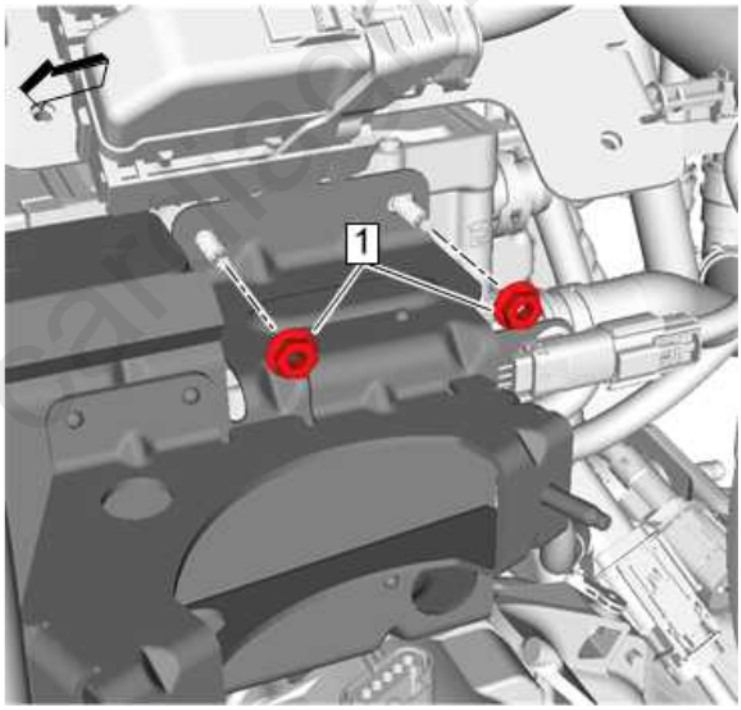


Fig. 569: Heater Water Auxiliary Pump Bracket Nuts
Courtesy of GENERAL MOTORS COMPANY

5. Engine Wiring Harness @ Heater Water Auxiliary Pump BracketÂ» Remove
6. Reposition the wiring harness.
7. Heater Water Auxiliary Pump Bracket Nut (1)Â» Remove [2x]

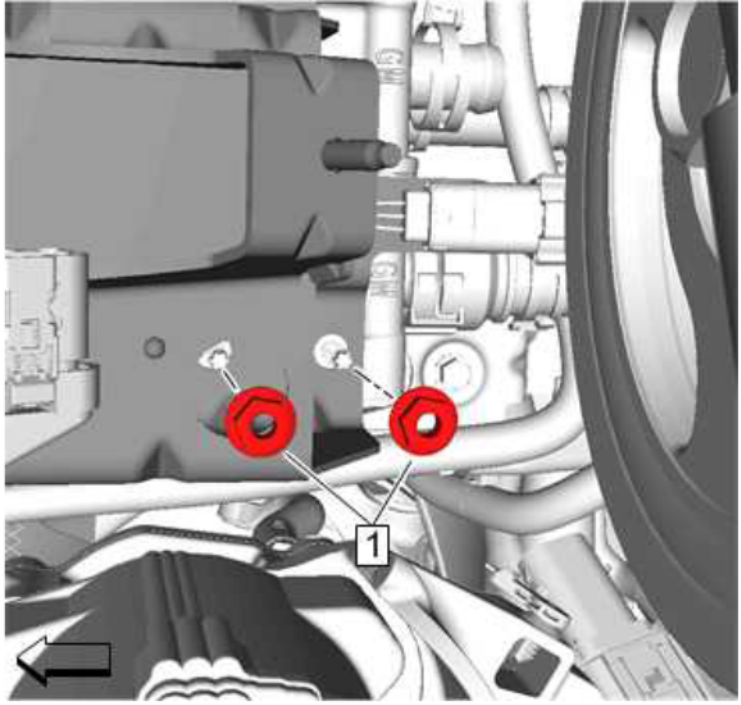


Fig. 570: Heater Water Auxiliary Pump Bracket Nuts
Courtesy of GENERAL MOTORS COMPANY

8. Charge Air Cooler Outlet Air Tube (2)Â» Remove - **Charge Air Cooler Outlet Air Tube Replacement**

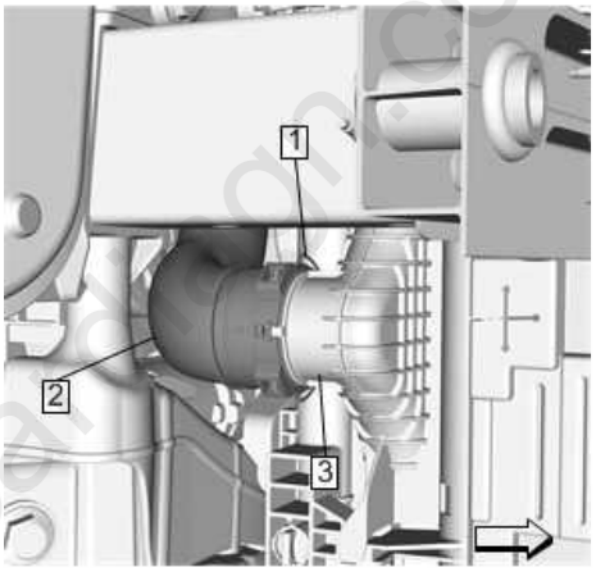


Fig. 571: Charge Air Cooler Outlet Air Tube And Charge Air Cooler Radiator
Courtesy of GENERAL MOTORS COMPANY

9. Heater Water Auxiliary Pump Bracket Bolt (1)Â» Remove [2x]

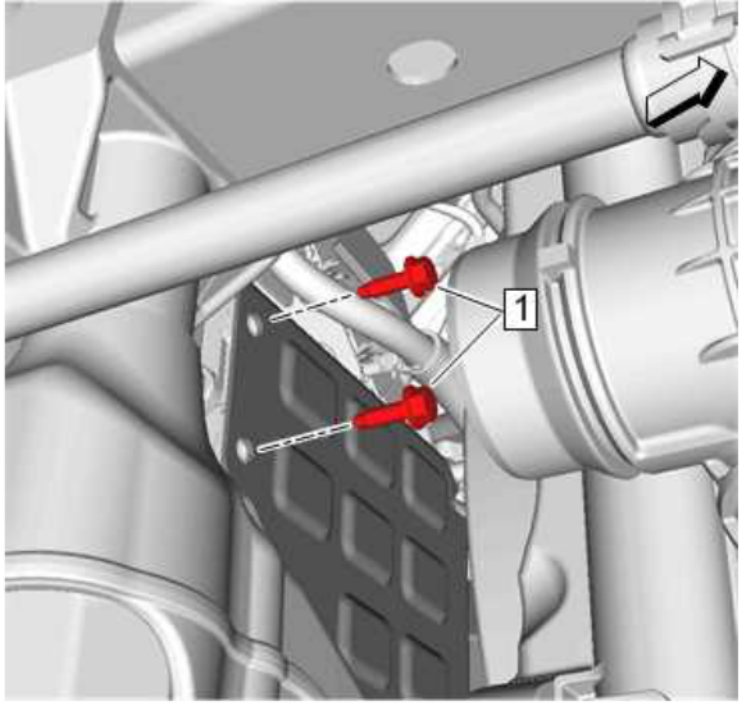


Fig. 572: Heater Water Auxiliary Pump Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

10. Heater Water Auxiliary Pump Bracket (1) @ Heater Coolant HeaterÂ» Remove

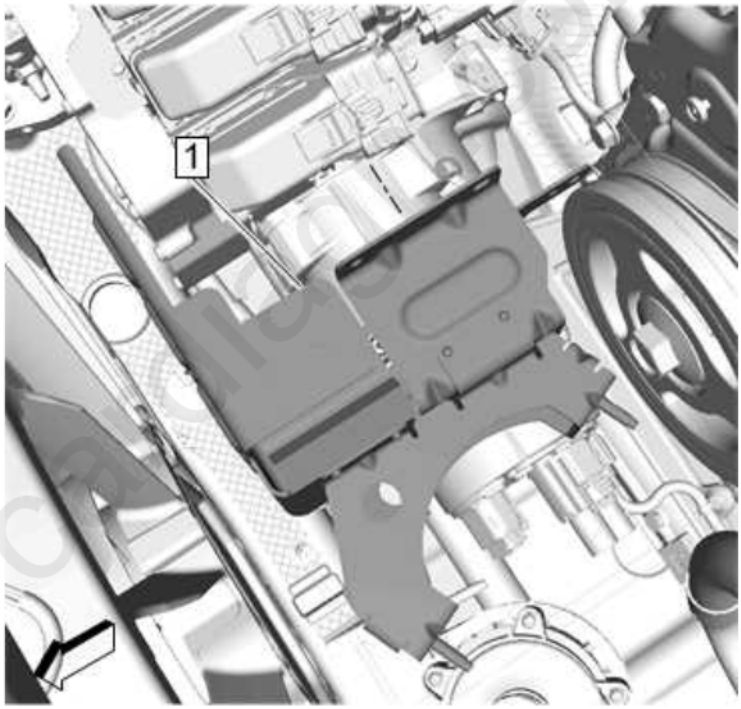


Fig. 573: Heater Water Auxiliary Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

11. Heater Water Auxiliary Pump Bracket (1)Â» Remove

Installation Procedure

1. Heater Water Auxiliary Pump Bracket (1) @ Heater Coolant HeaterÂ» Install

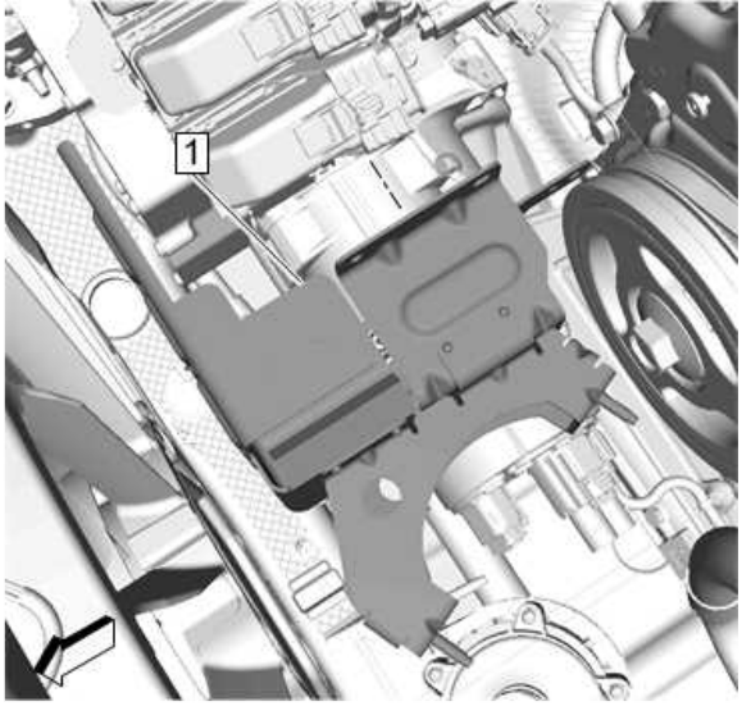


Fig. 574: Heater Water Auxiliary Pump Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Heater Water Auxiliary Pump Bracket Bolt (1)Â» Install and tighten [2x] 9 N.m (80 lb in)

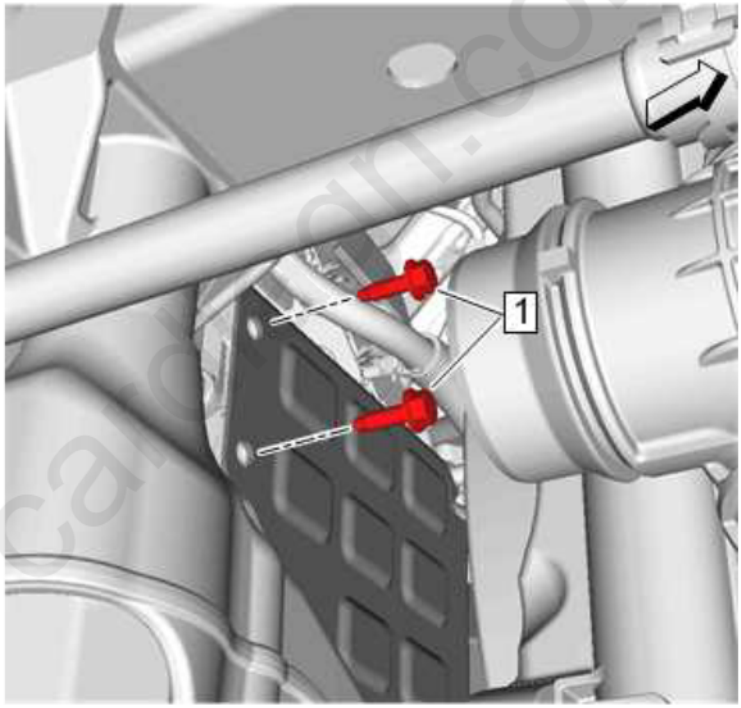


Fig. 575: Heater Water Auxiliary Pump Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Charge Air Cooler Outlet Air Tube (2)Â» Install - **Charge Air Cooler Outlet Air Tube Replacement**

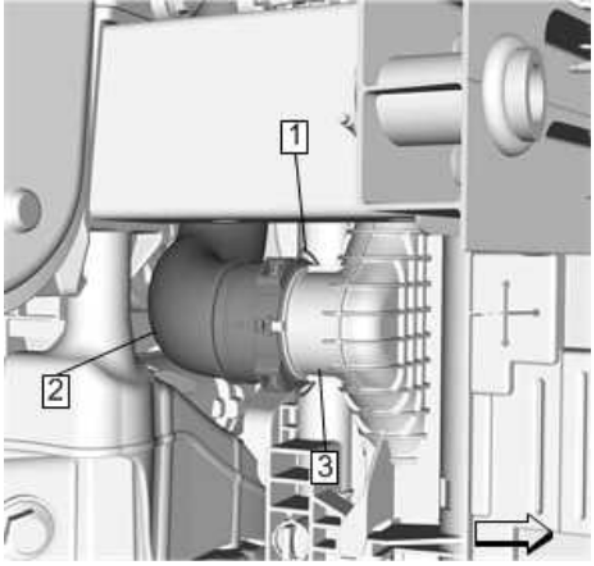


Fig. 576: Charge Air Cooler Outlet Air Tube And Charge Air Cooler Radiator
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Bracket Nut (1)Â» Install and tighten [2x] 9 N.m (80 lb in)

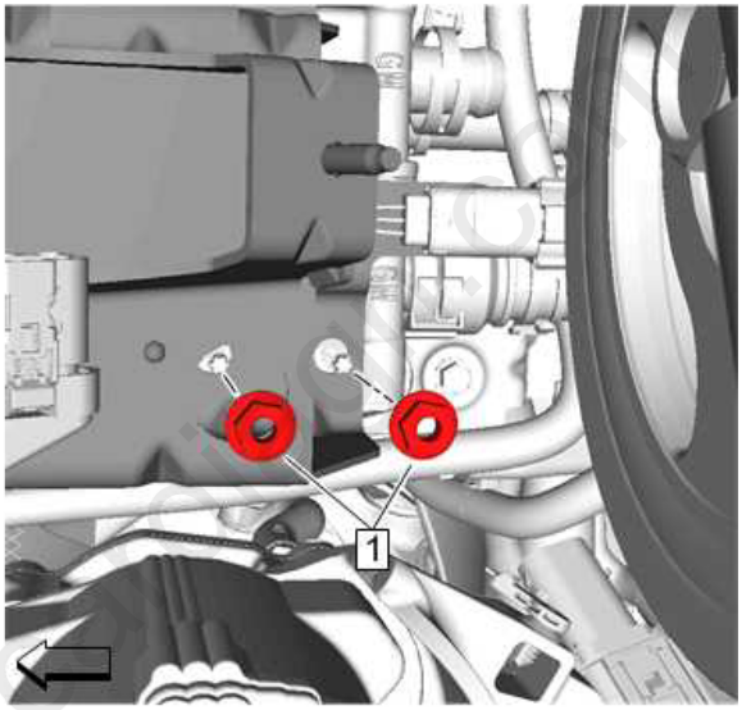


Fig. 577: Heater Water Auxiliary Pump Bracket Nuts
Courtesy of GENERAL MOTORS COMPANY

5. Engine Wiring Harness @ Heater Water Auxiliary Pump BracketÂ» Install
6. Reposition the wiring harness.
7. Heater Water Auxiliary Pump Bracket Nut (1)Â» Install and tighten [2x] 9 N.m (80 lb in)

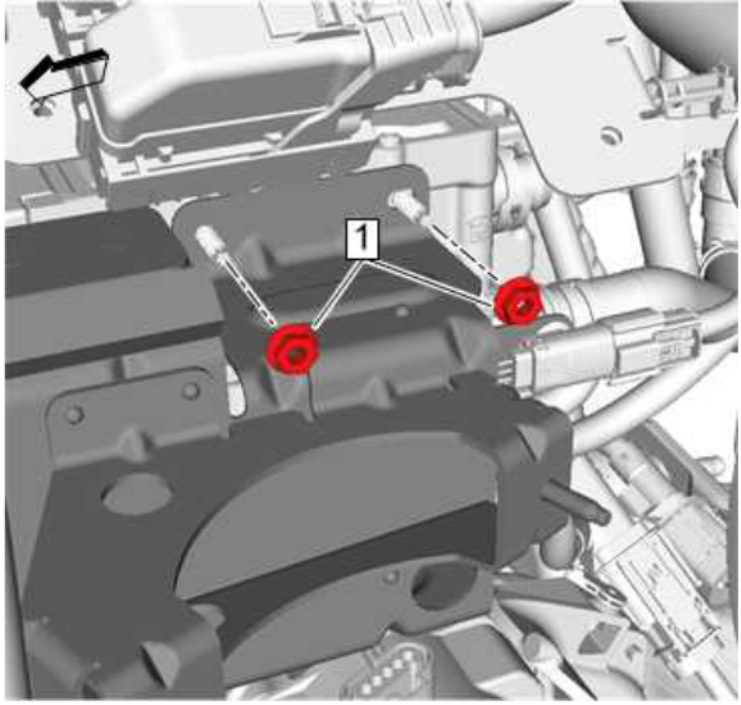


Fig. 578: Heater Water Auxiliary Pump Bracket Nuts
Courtesy of GENERAL MOTORS COMPANY

8. Heater Coolant Pump (1)Â» Install - **Heater Coolant Pump Replacement (LTG with HP9)**

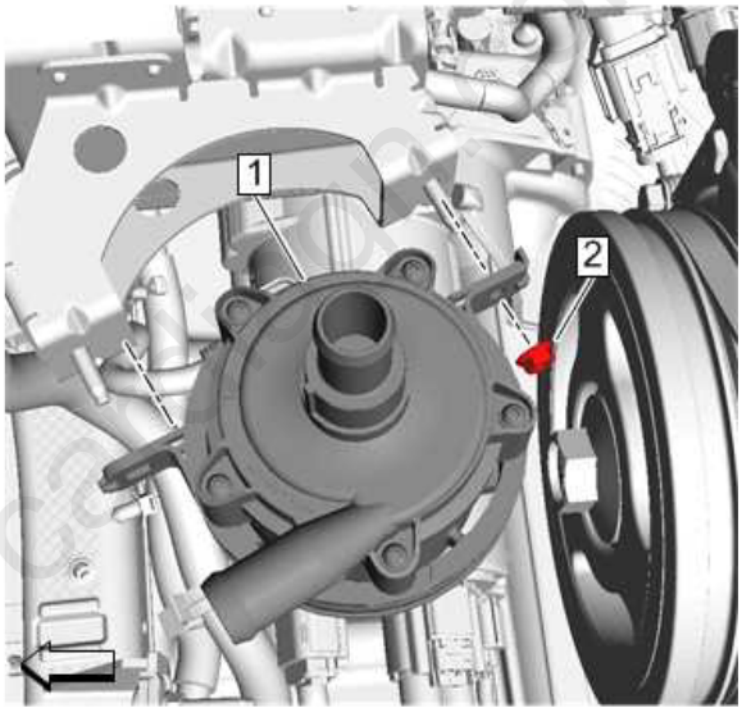


Fig. 579: Heater Coolant Pump And Nut
Courtesy of GENERAL MOTORS COMPANY

9. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
10. Enable the high voltage system. Refer to **High Voltage Enabling**
11. Start the engine and check for coolant leaks.

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

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**

2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
4. Remove the rear half of the left rear wheelhouse liner (2) and position out of the way to gain access to the auxiliary air conditioning evaporator and blower module components. Refer to **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

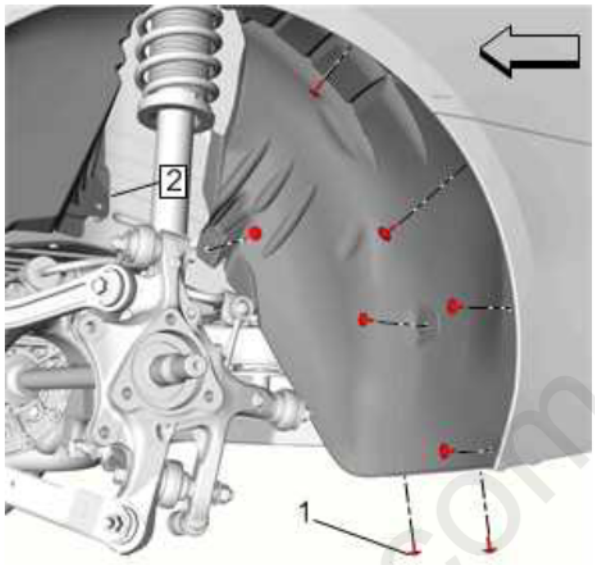


Fig. 580: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Remove - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

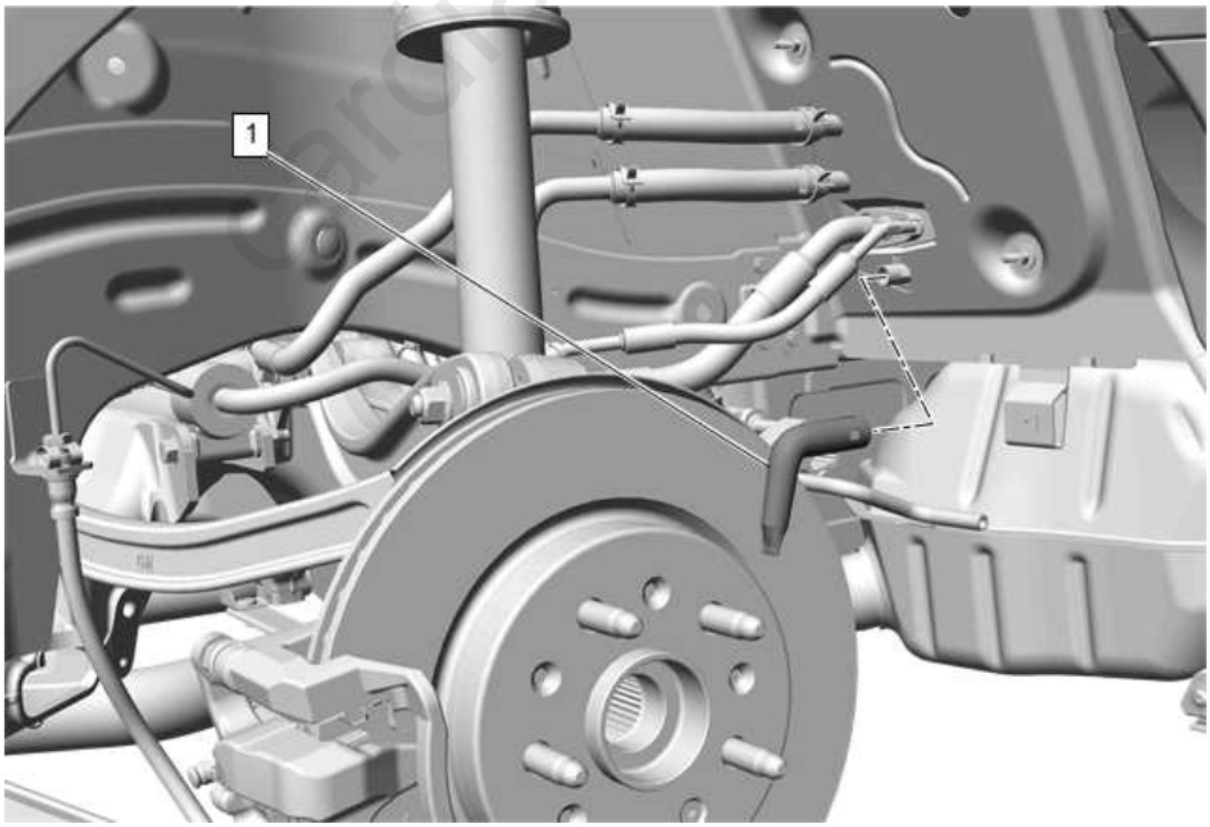


Fig. 581: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Hose Nut (1)Â» Remove

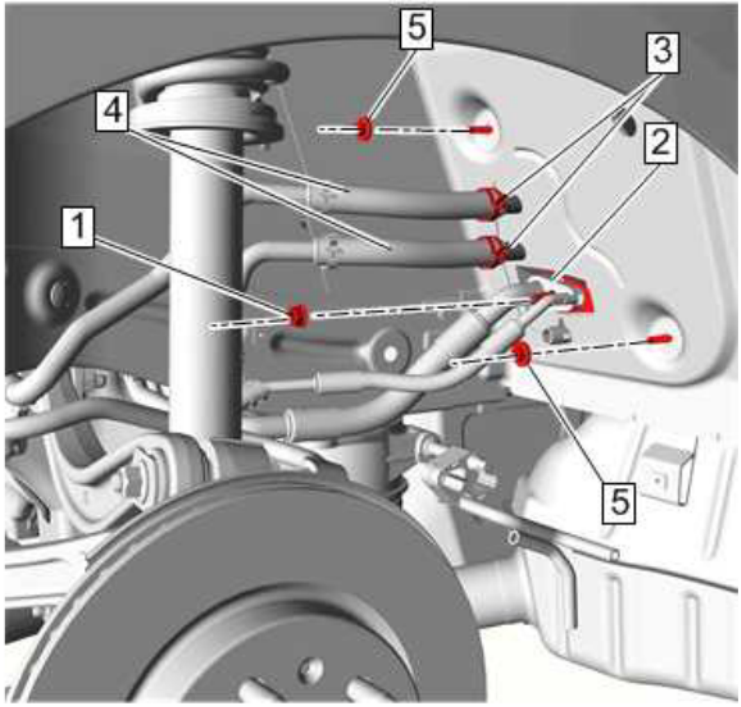


Fig. 582: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove - **Auxiliary Air Conditioning Evaporator Intermediate Tube Replacement**
8. Remove and DISCARD the sealing washer. [2x] **Air Conditioning System Seal Replacement**
9. Remove the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
10. Remove the auxiliary heater hoses (4) from the auxiliary heater core tubes.
11. Air Distributor Nut (5)Â» Remove [2x]
12. Rear Compartment Side Trim - Left (2)Â» Remove - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**

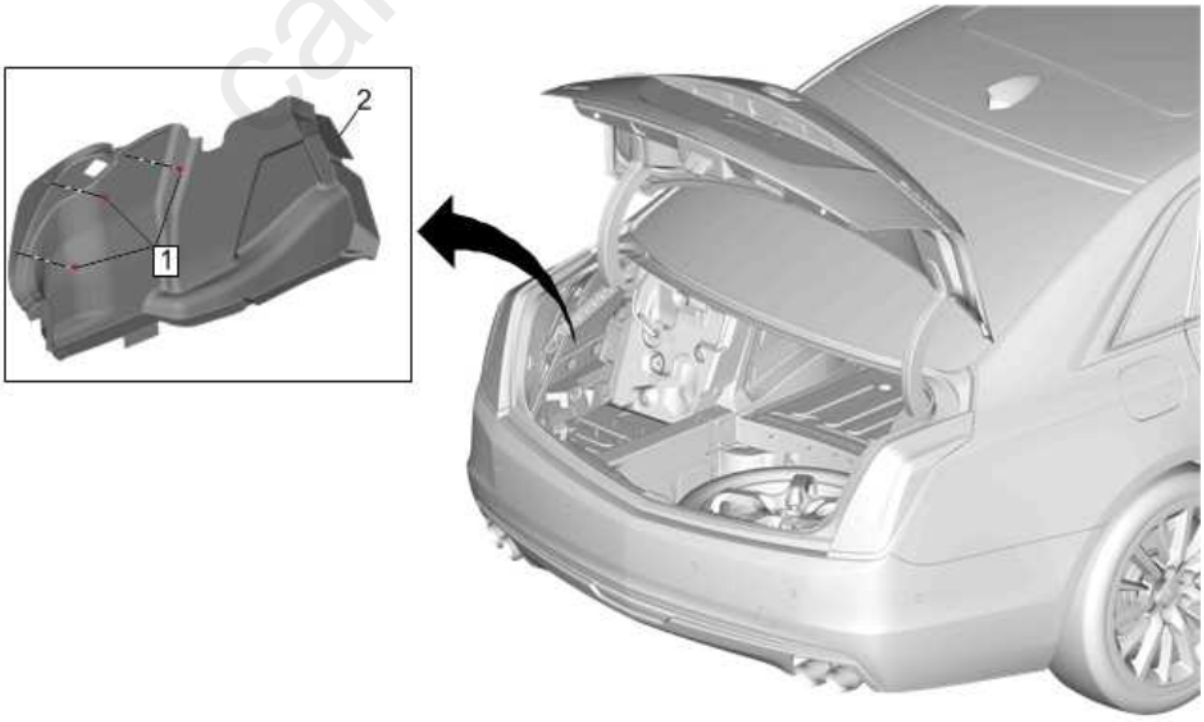


Fig. 583: Rear Compartment Side Trim - Left
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Remove

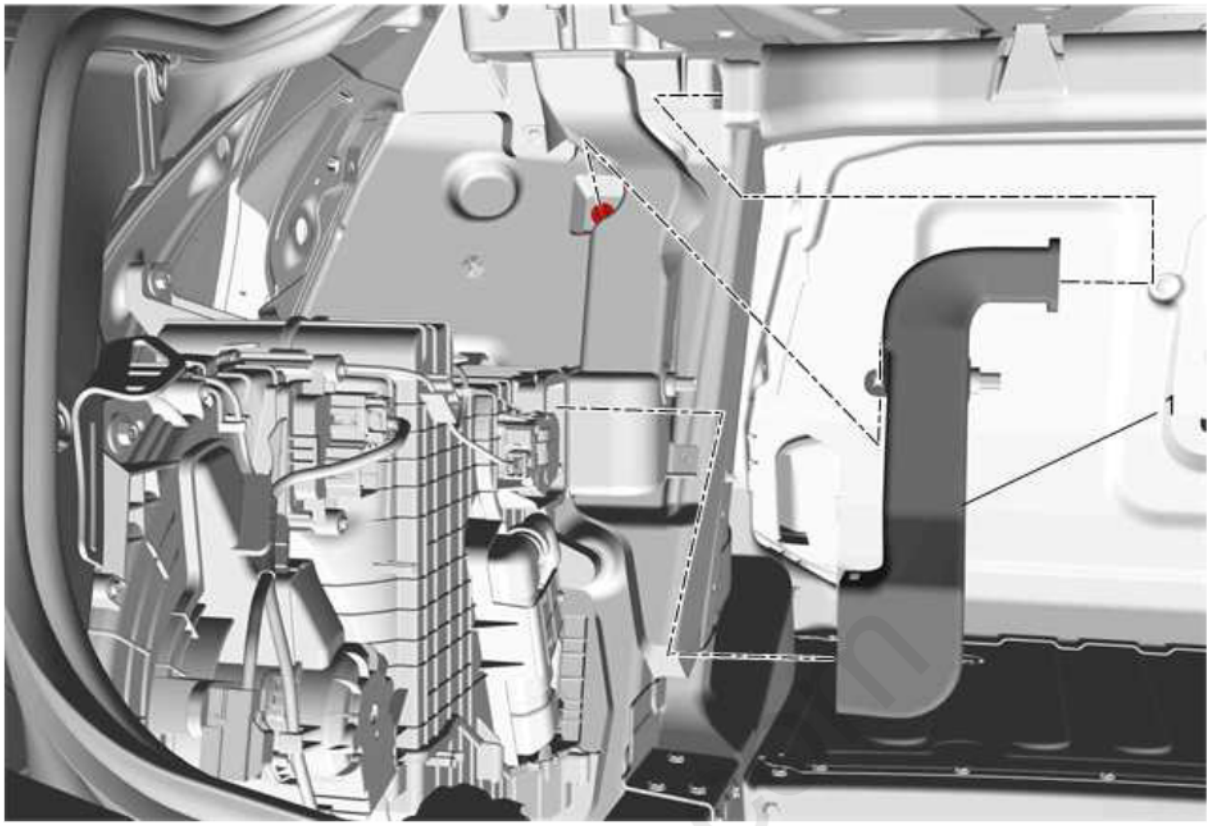


Fig. 584: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Remove

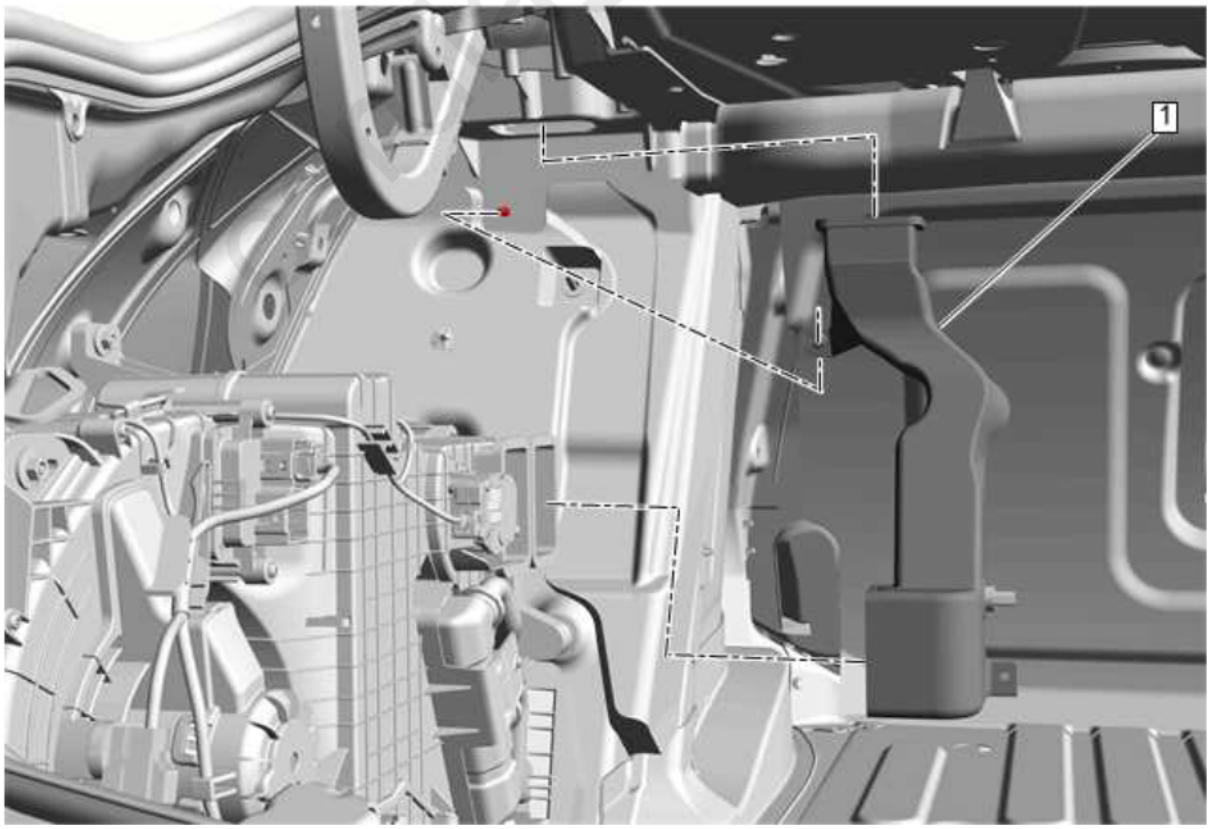


Fig. 585: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Air Distributor Nut (2)Â» Remove [2x]

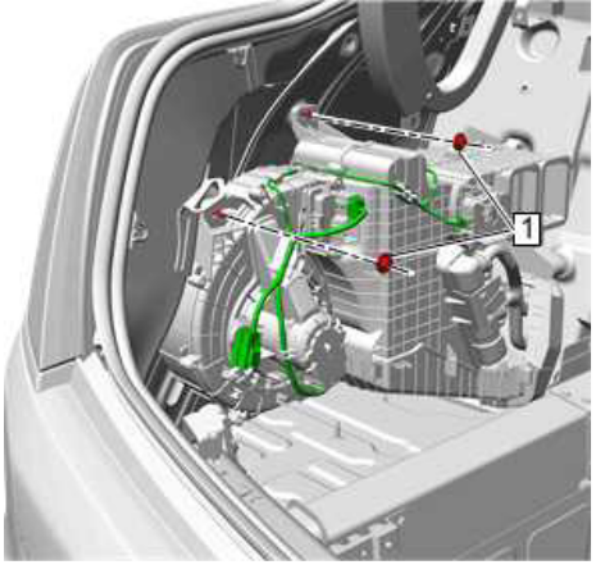


Fig. 586: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect all electrical connectors.
17. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Remove

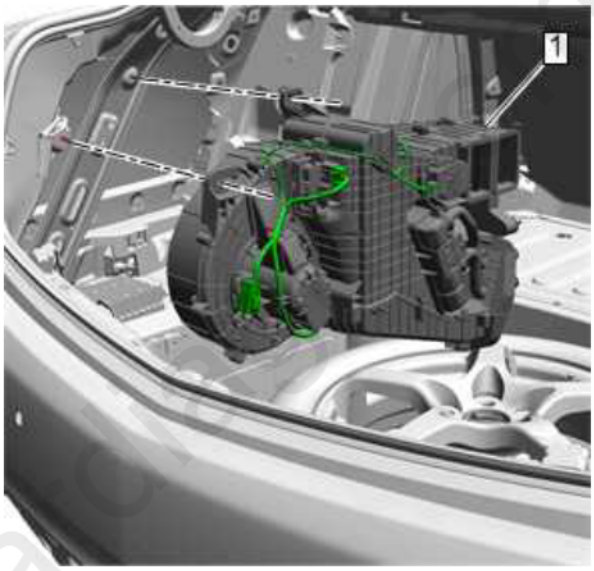


Fig. 587: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

18. Transfer components as necessary.

Installation Procedure

1. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Install

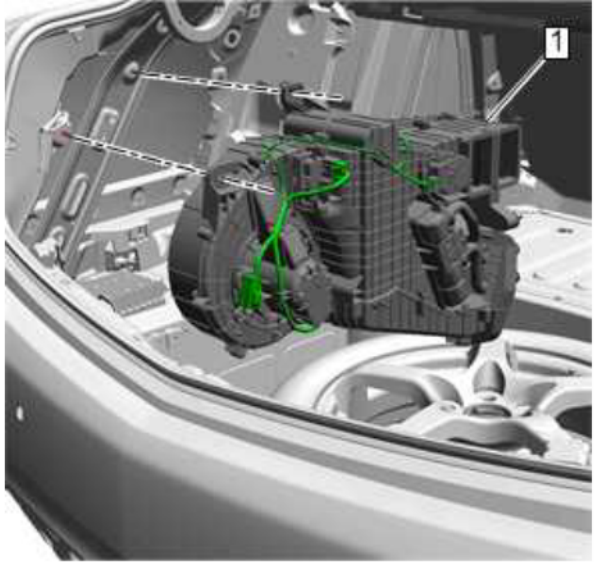


Fig. 588: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

2. Air Distributor Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]

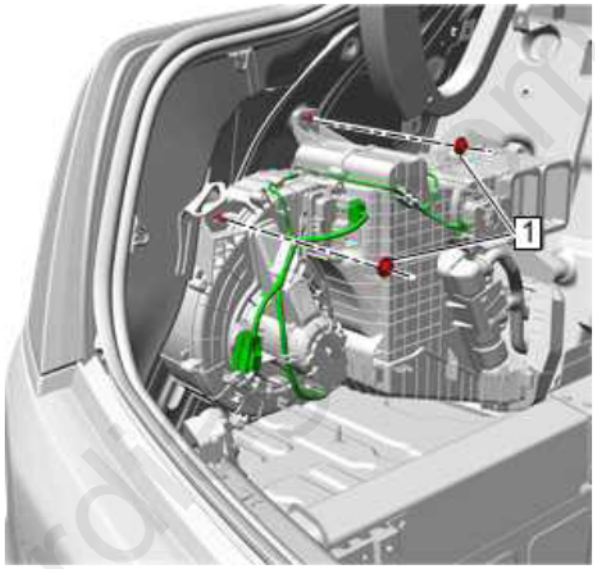


Fig. 589: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Connect the electrical connectors.
4. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Install



Fig. 590: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Install

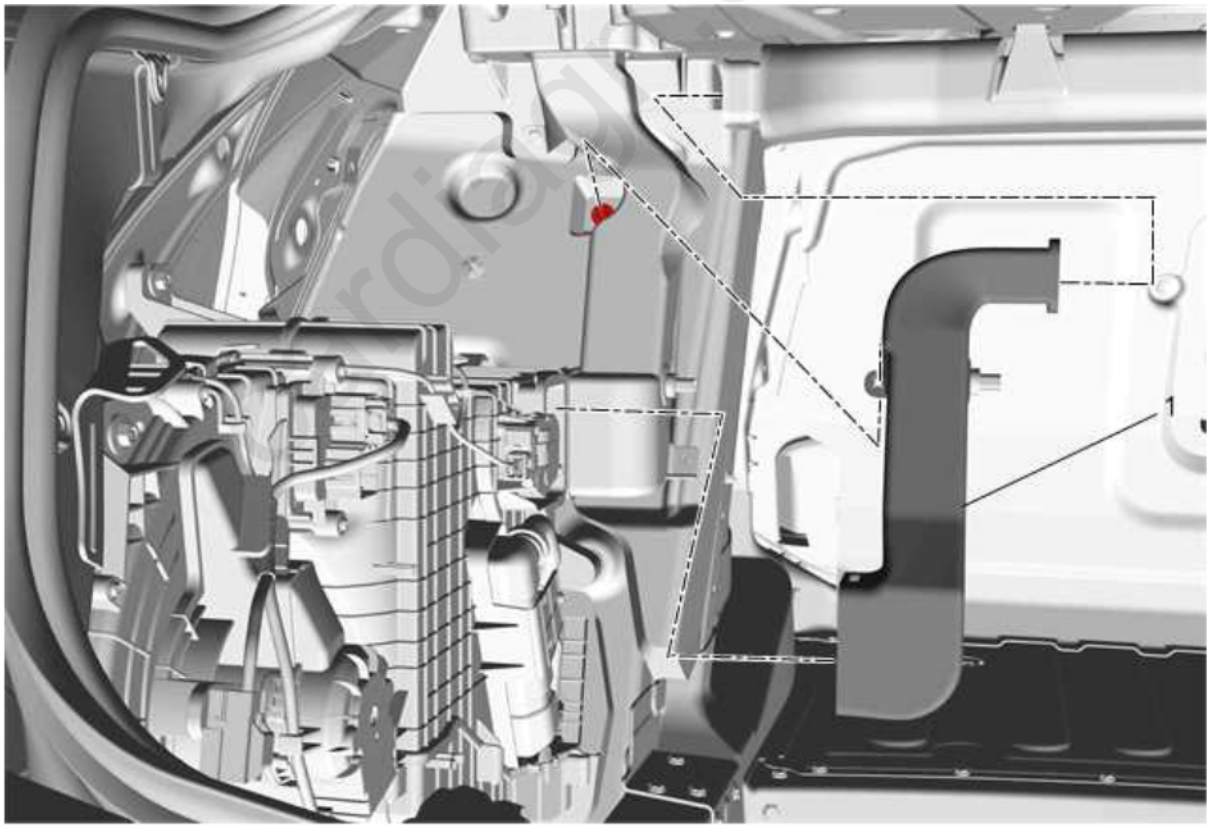


Fig. 591: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Rear Compartment Side Trim - Left (2)Â» Install - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**

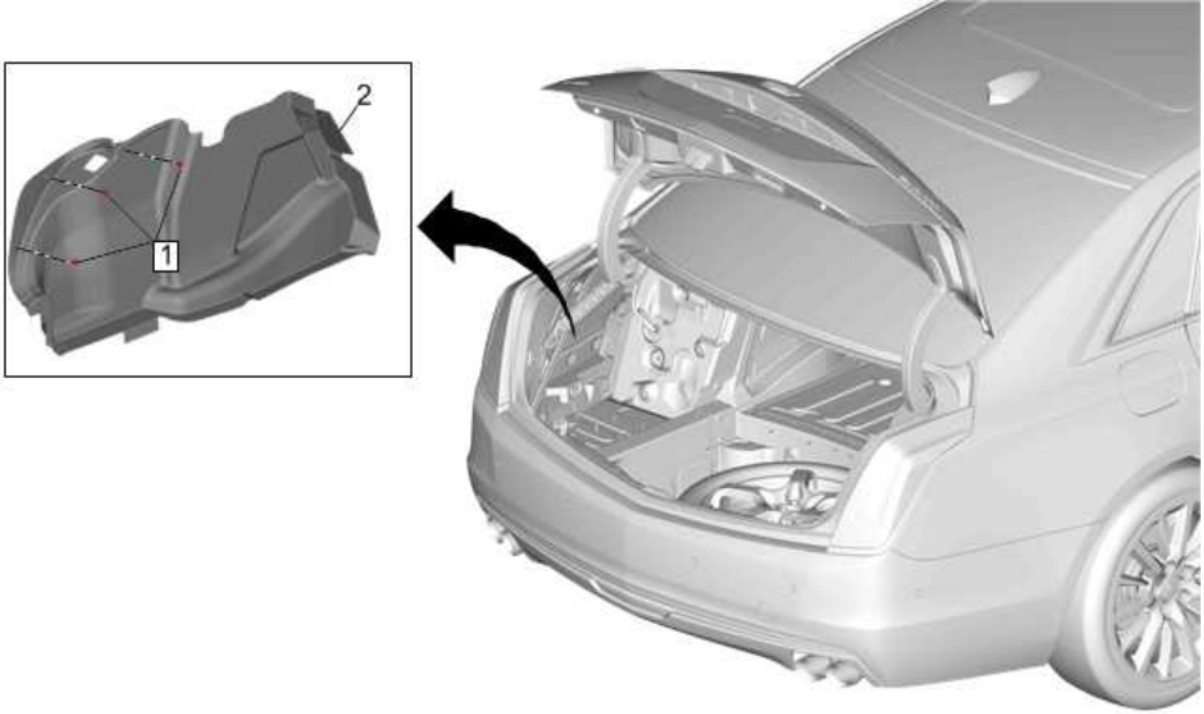


Fig. 592: Rear Compartment Side Trim - Left
Courtesy of GENERAL MOTORS COMPANY

7. Air Distributor Nut (5)Â» Install and tighten 9 N.m (80 lb in) [2x]

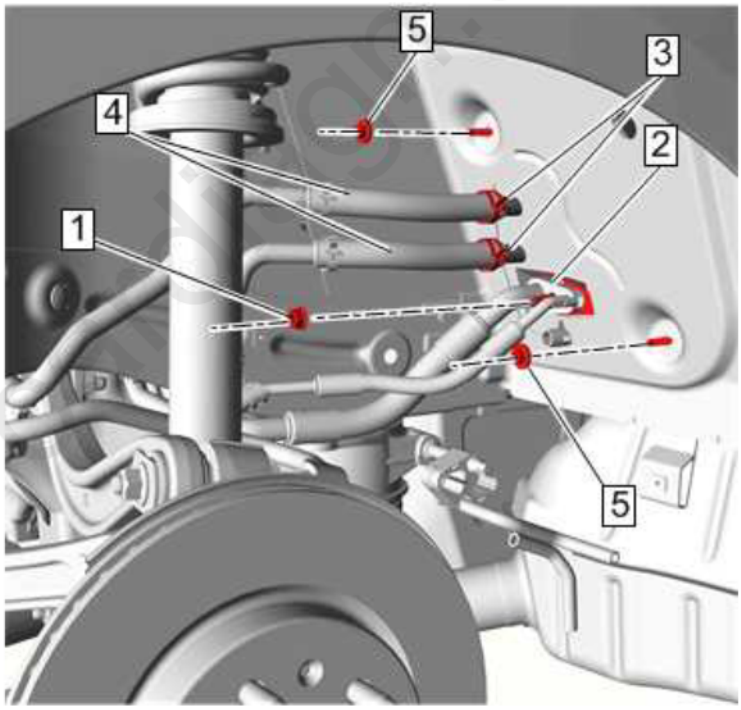


Fig. 593: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

8. Install the auxiliary heater hoses (4) from the auxiliary heater core tubes.
9. Install the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
10. Install NEW sealing washers [2x]. Refer to **Air Conditioning System Seal Replacement**
11. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install - **Auxiliary Air Conditioning Evaporator Intermediate Tube Replacement**

12. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten - **Auxiliary Air Conditioning Evaporator Intermediate Tube Replacement**
13. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Install - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

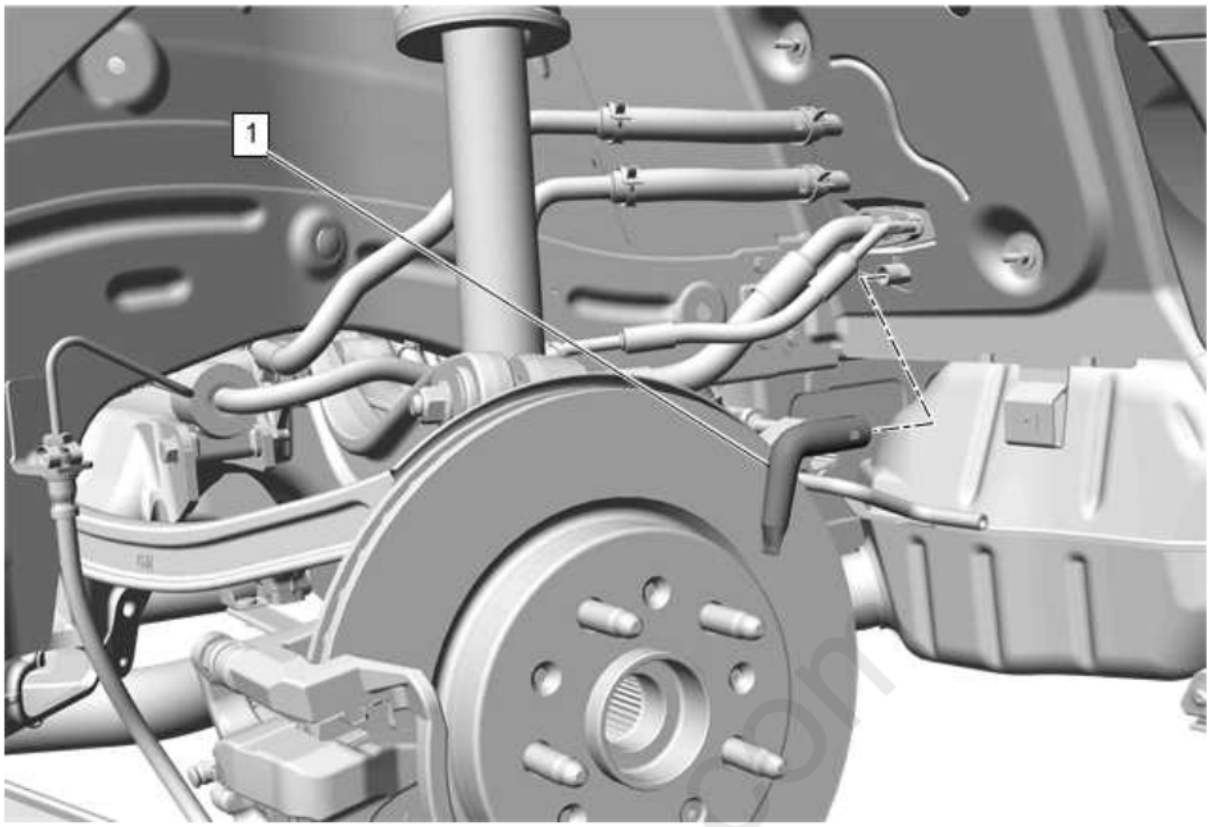


Fig. 594: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

14. Rear Wheelhouse Liner - Left (2)Â» Install - **Rear Wheelhouse Liner Replacement (LTG)** **Rear Wheelhouse Liner Replacement (LGX, LGW)**

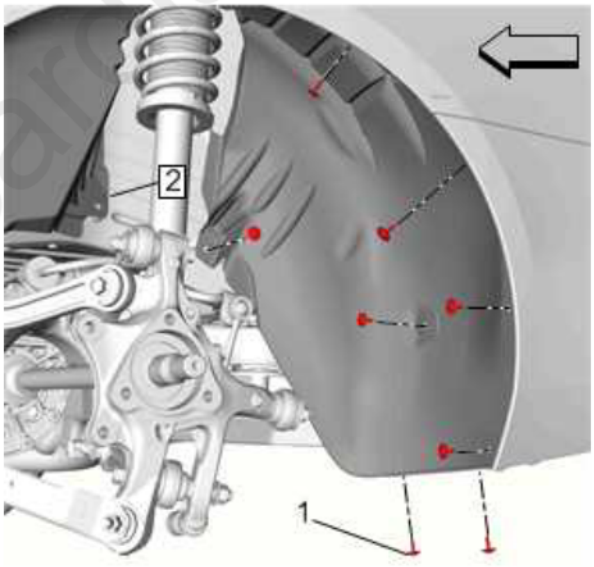


Fig. 595: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

15. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
16. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**

17. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
18. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
19. Clear the DTCs.
20. Inspect for coolant leaks.
21. Inspect for refrigerant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LTG WITH CJ2)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
2. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
3. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

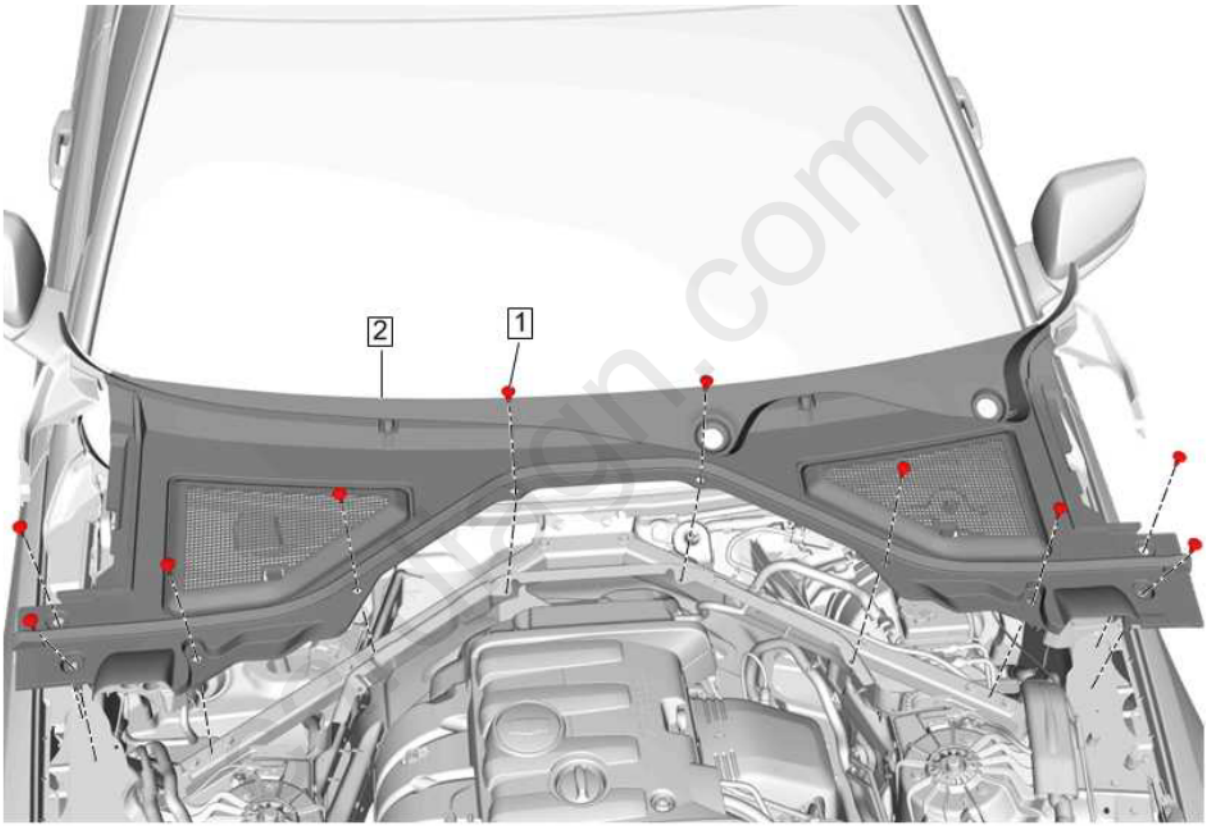


Fig. 596: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

4. Radiator Surge Tank Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Radiator Surge Tank Inlet Hose Replacement (LTG without HP9)**

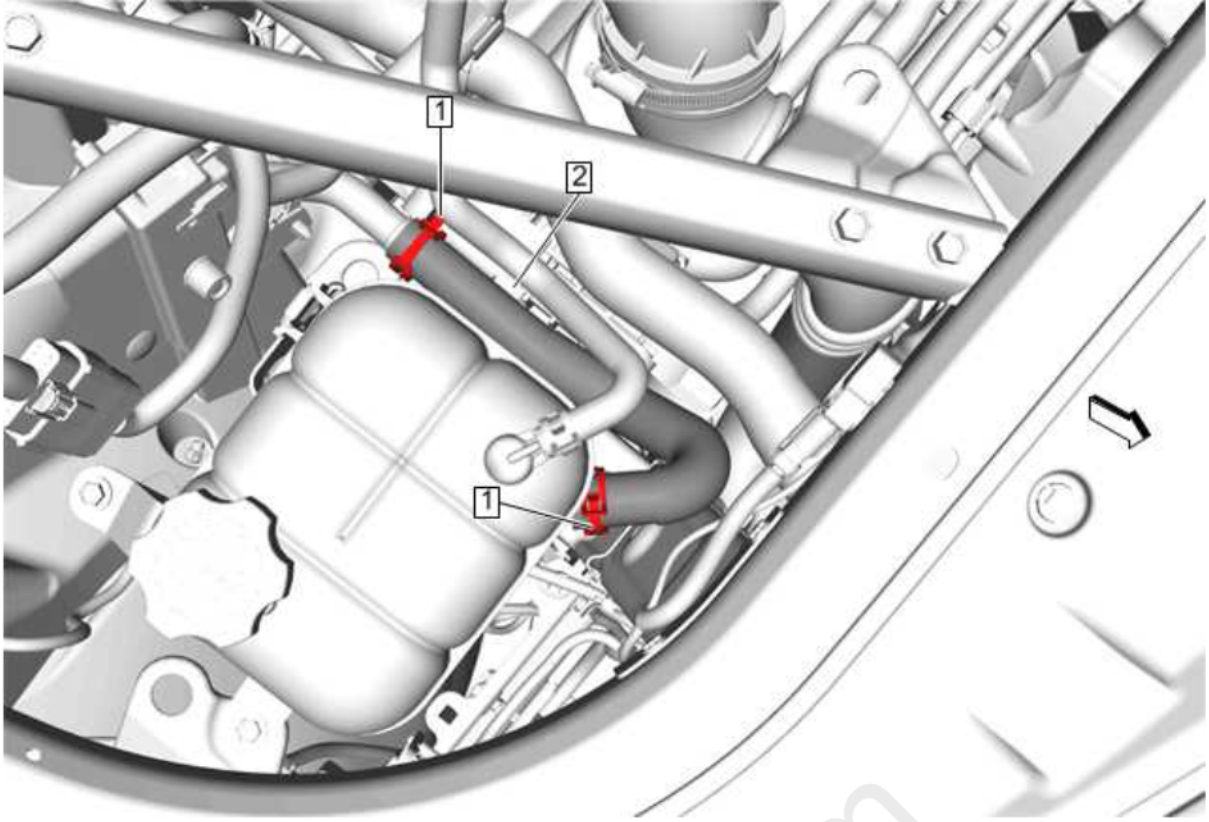


Fig. 597: Radiator Surge Tank Inlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Water Auxiliary Pump Inlet Hose Replacement (LTG)**

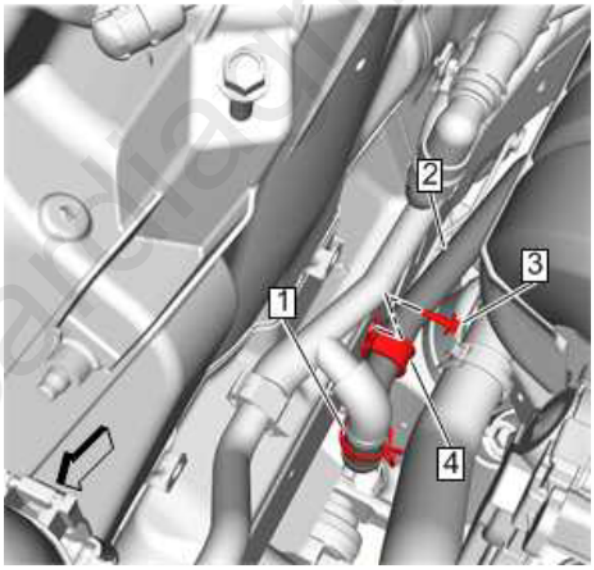


Fig. 598: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LTG without HP9)**

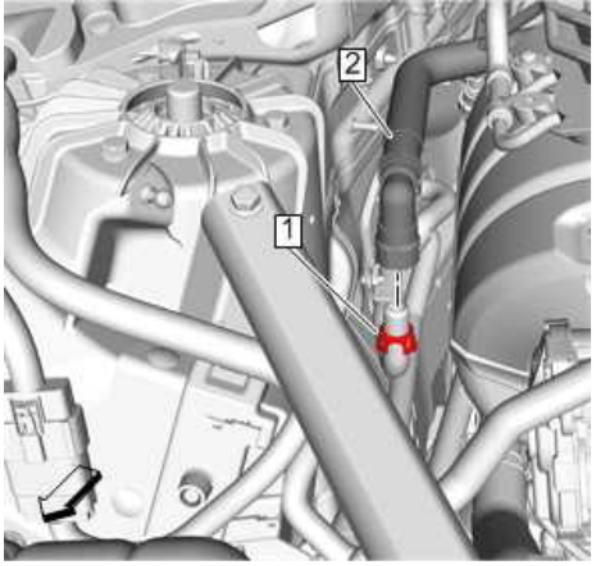


Fig. 599: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (LTG with HP9)**

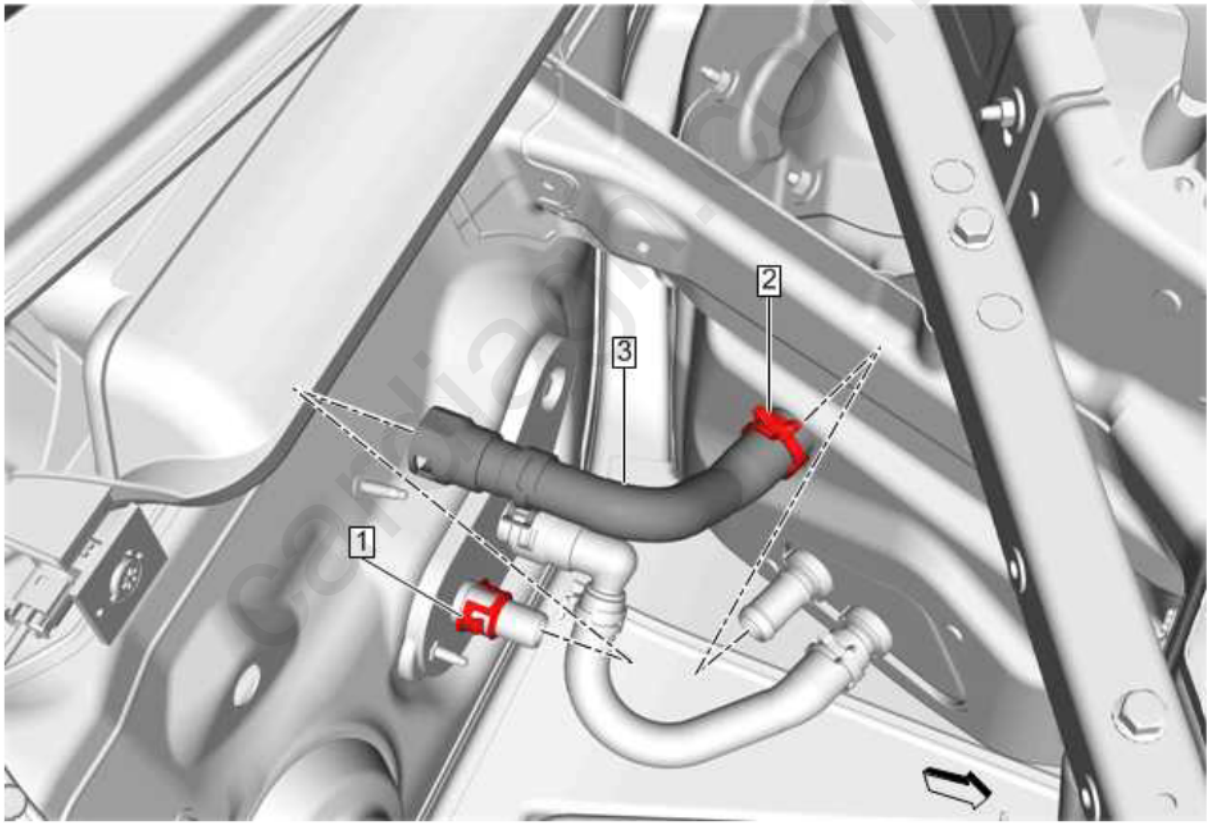


Fig. 600: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (LTG with HP9)**

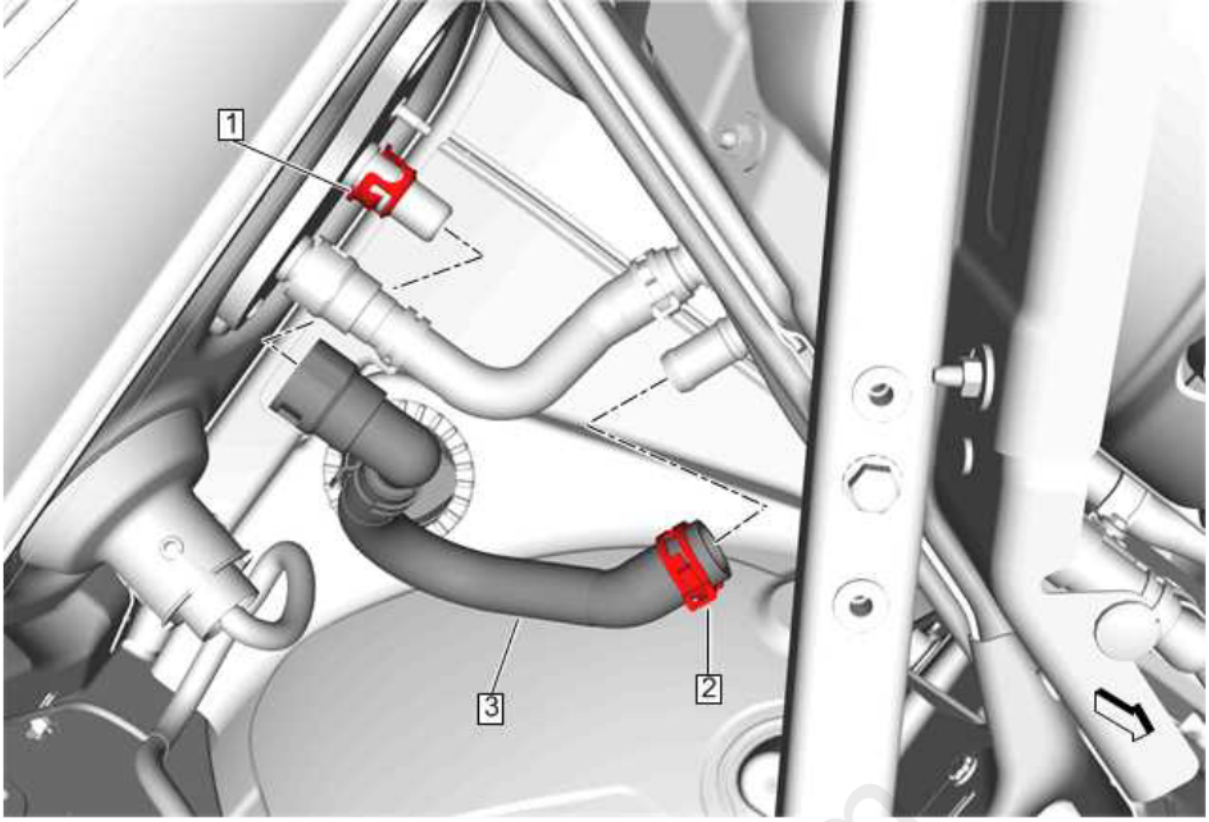


Fig. 601: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

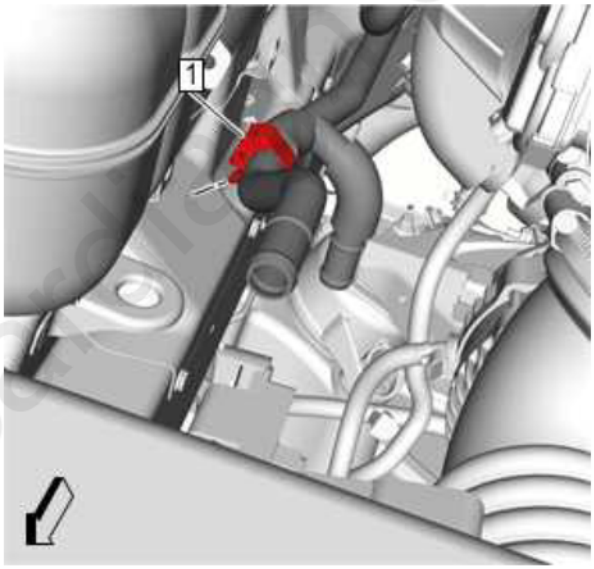


Fig. 602: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

10. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

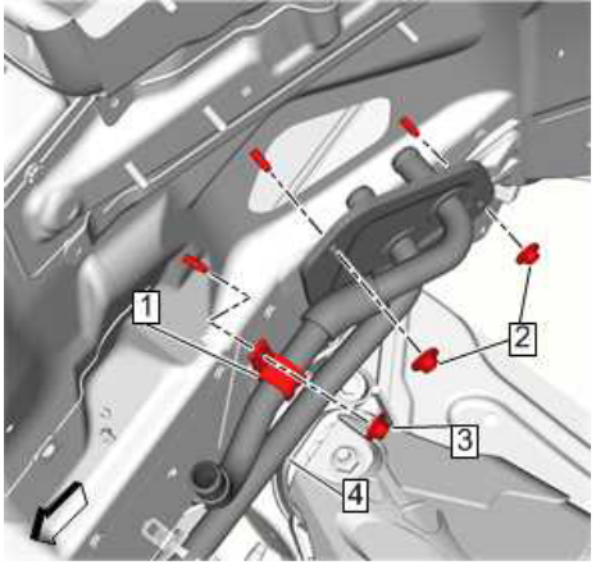


Fig. 603: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
12. Heater Inlet Pipe Clip (1)Â» Remove
13. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
14. Auxiliary Heater Inlet and Outlet Pipe (1)Â» Remove

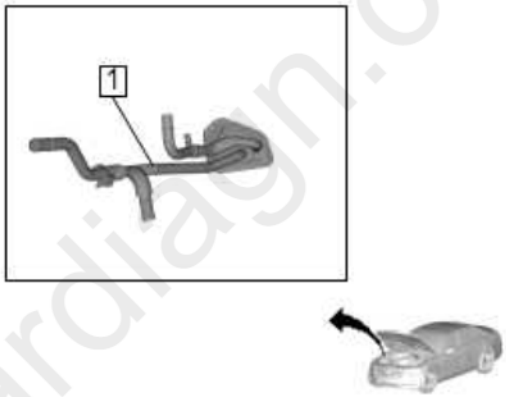


Fig. 604: Auxiliary Heater Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

15. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (1)Â» Install

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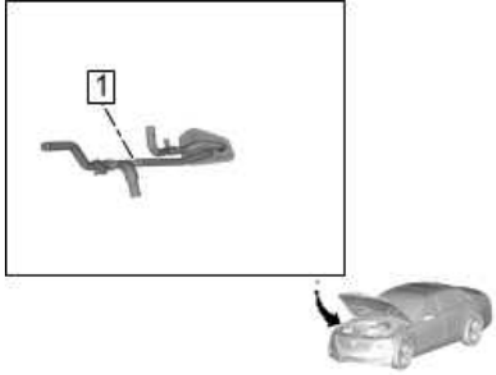


Fig. 605: Auxiliary Heater Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

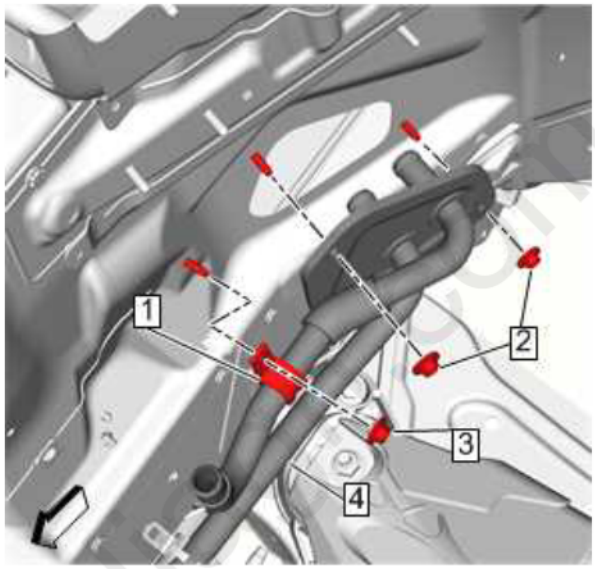


Fig. 606: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

3. Heater Inlet Pipe Clip (1)Â» Install
4. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

5. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]
6. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

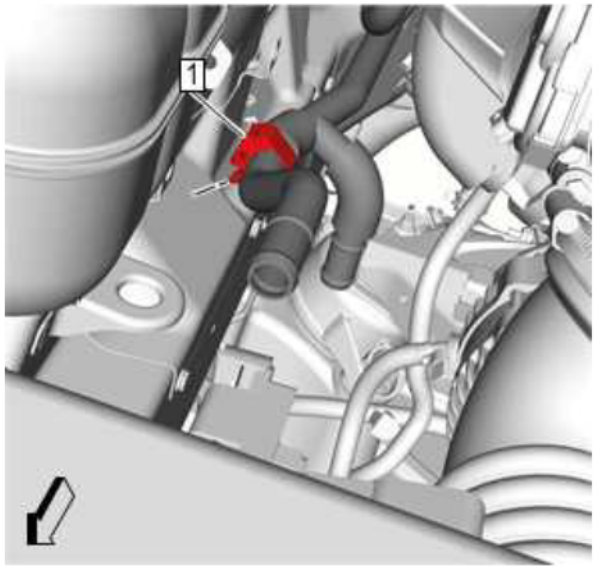


Fig. 607: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

7. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (LTG with HP9)**

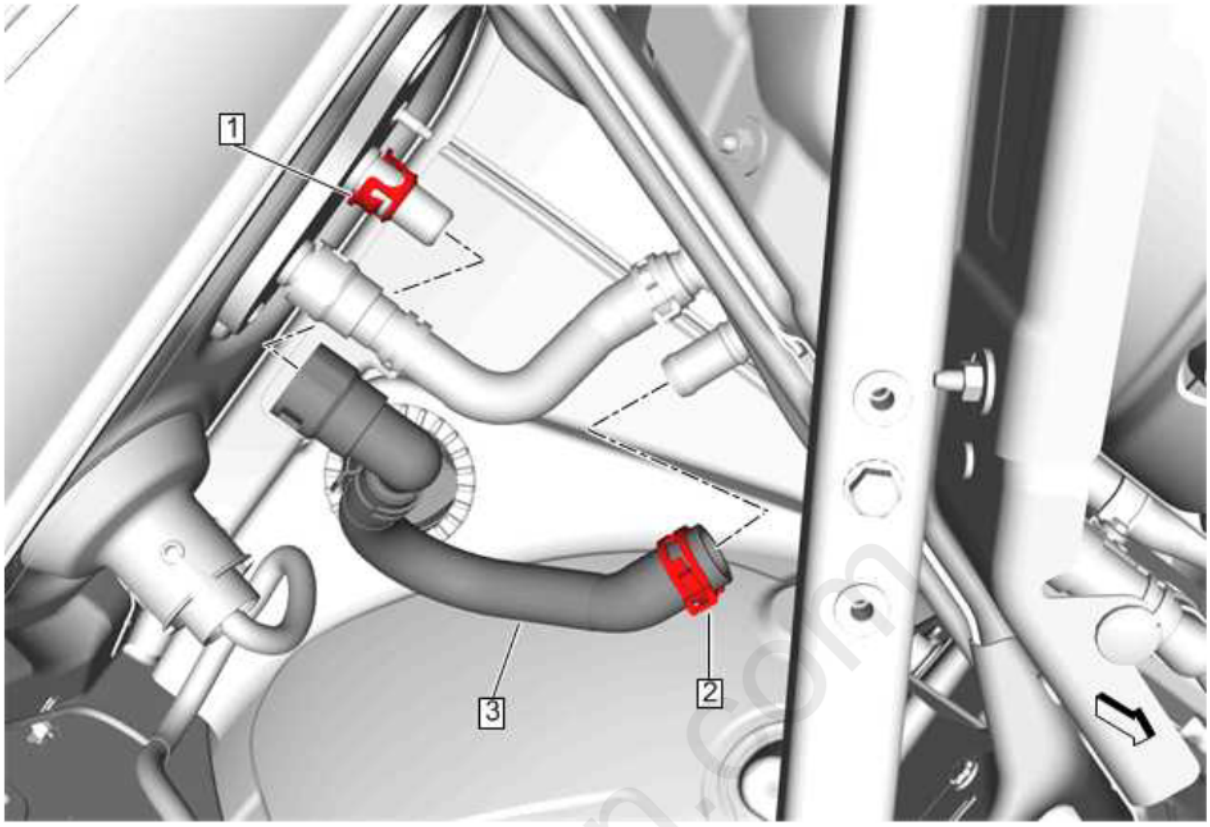


Fig. 608: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (LTG with HP9)**

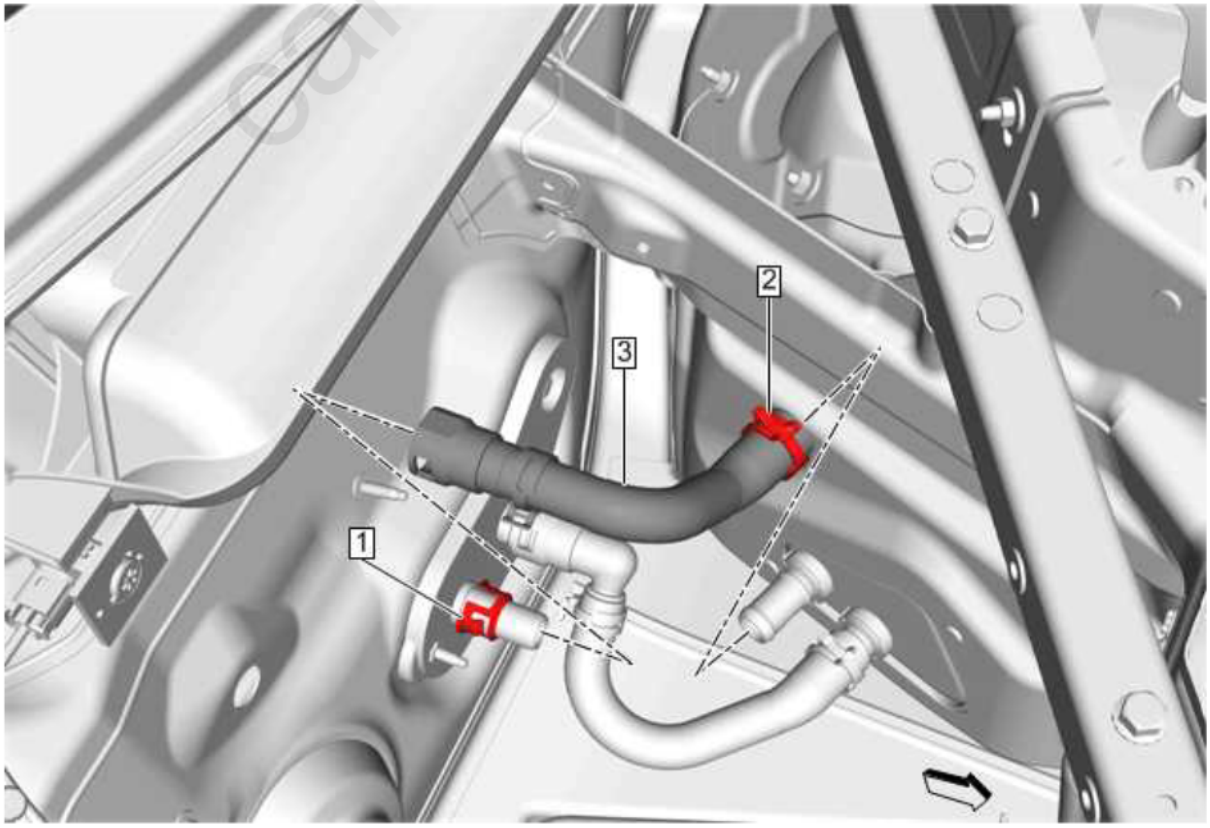


Fig. 609: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LTG without HP9)**

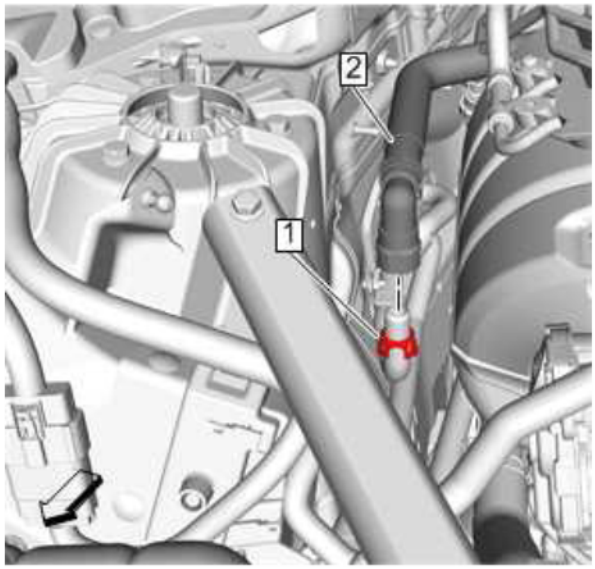


Fig. 610: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Water Auxiliary Pump Inlet Hose Replacement (LTG)**

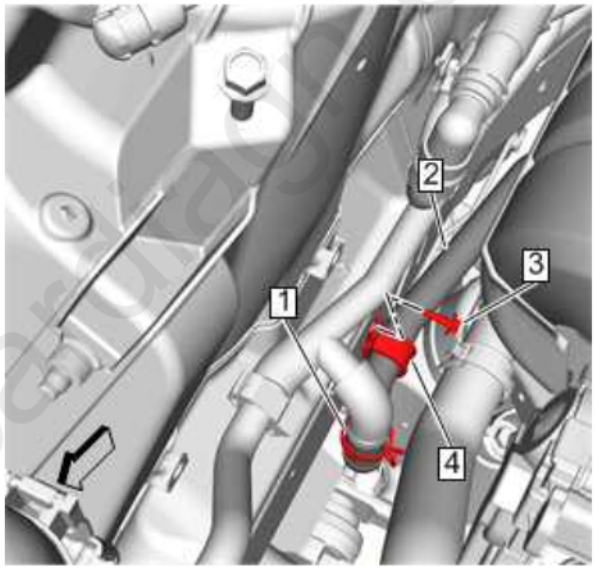


Fig. 611: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

11. Radiator Surge Tank Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Radiator Surge Tank Inlet Hose Replacement (LTG without HP9)**

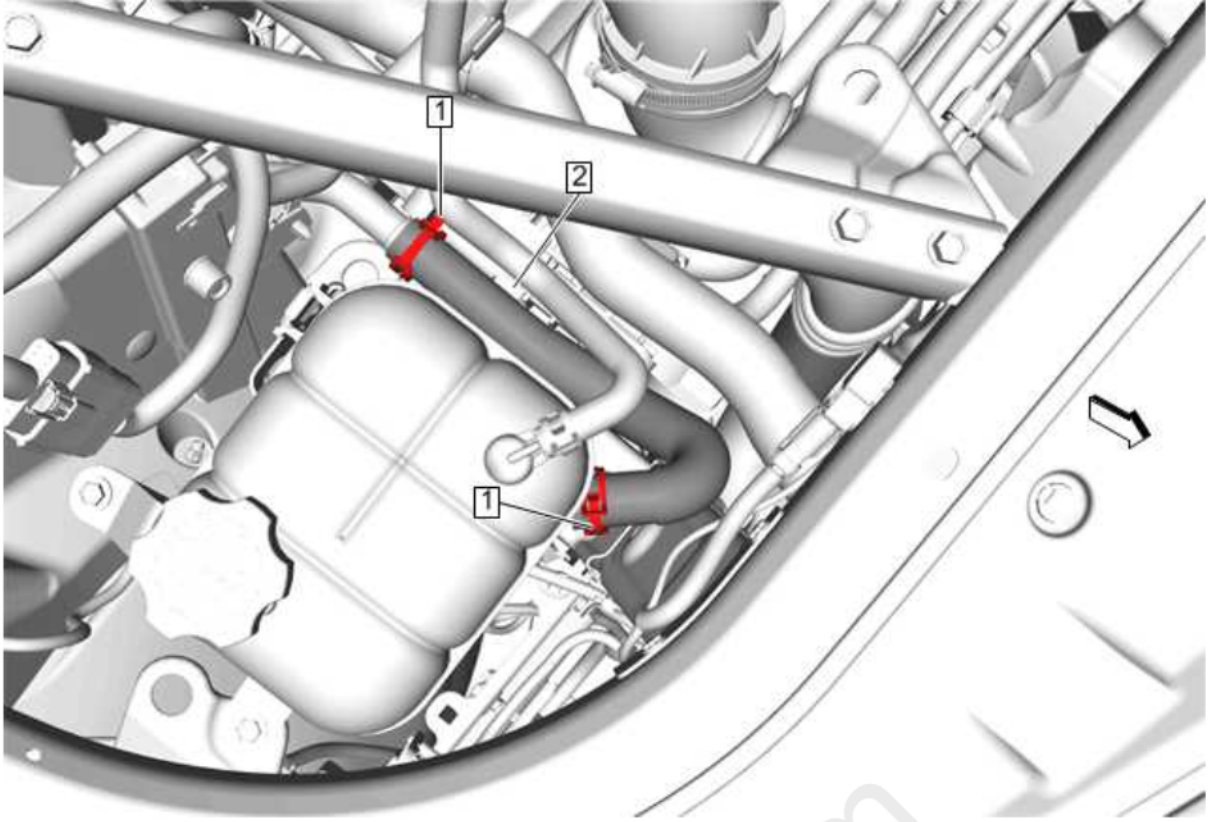


Fig. 612: Radiator Surge Tank Inlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

12. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

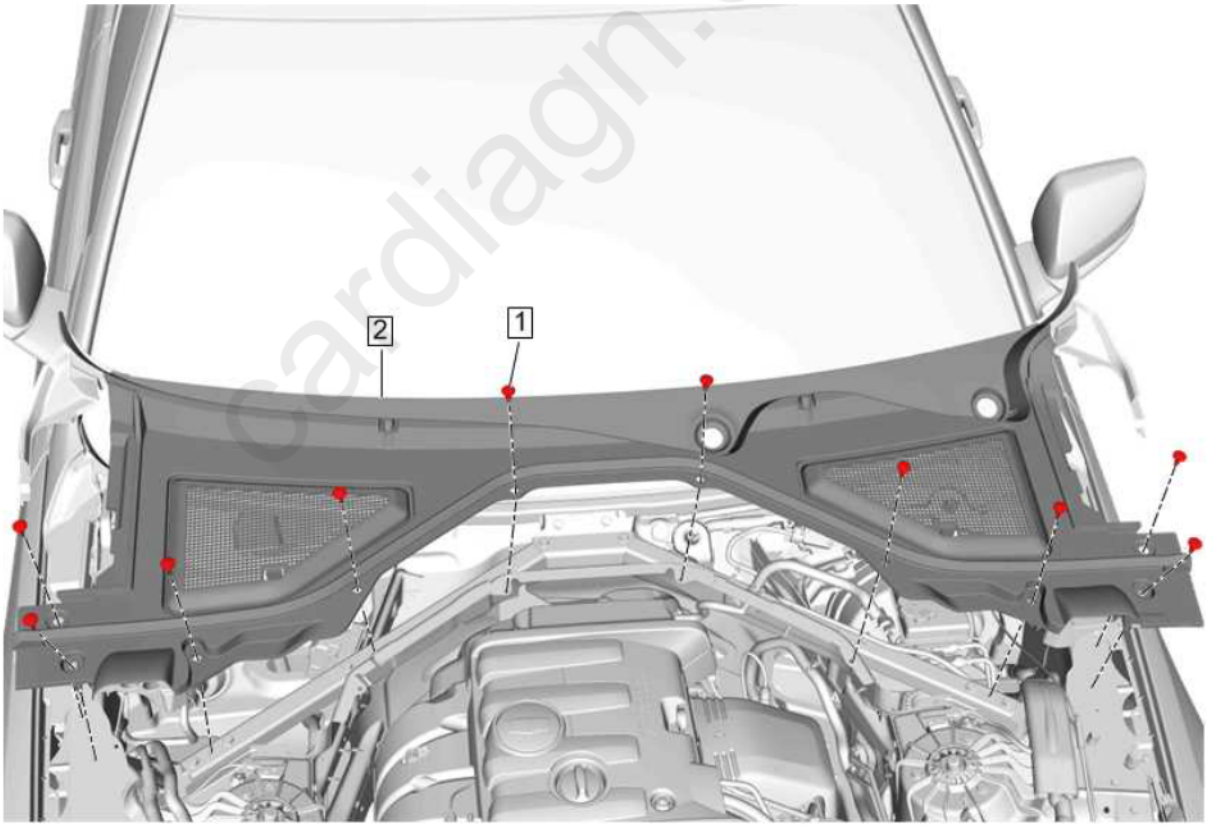


Fig. 613: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

13. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
14. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LGW WITH C24)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Front Axle Propeller ShaftÂ» Remove - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
3. Heater Inlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

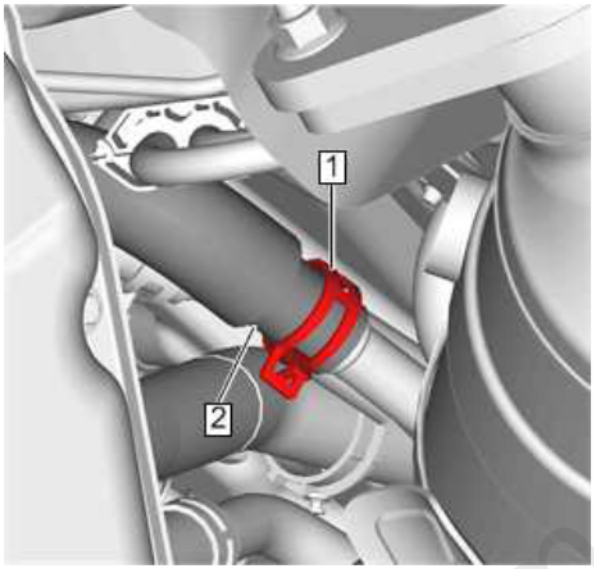


Fig. 614: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
5. Heater Outlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

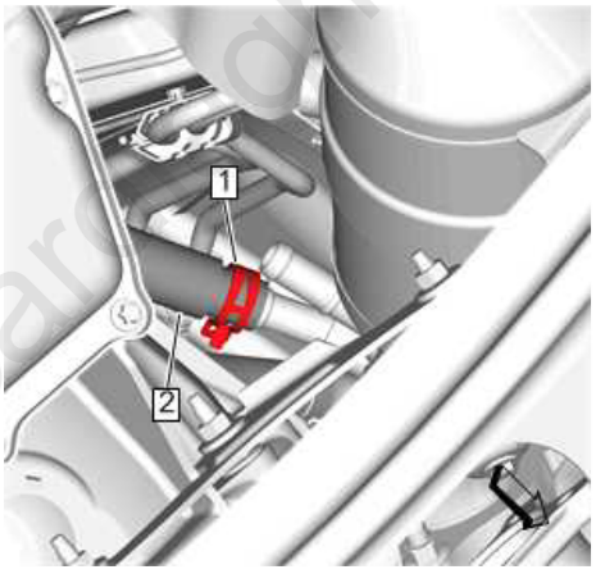


Fig. 615: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
7. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
8. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

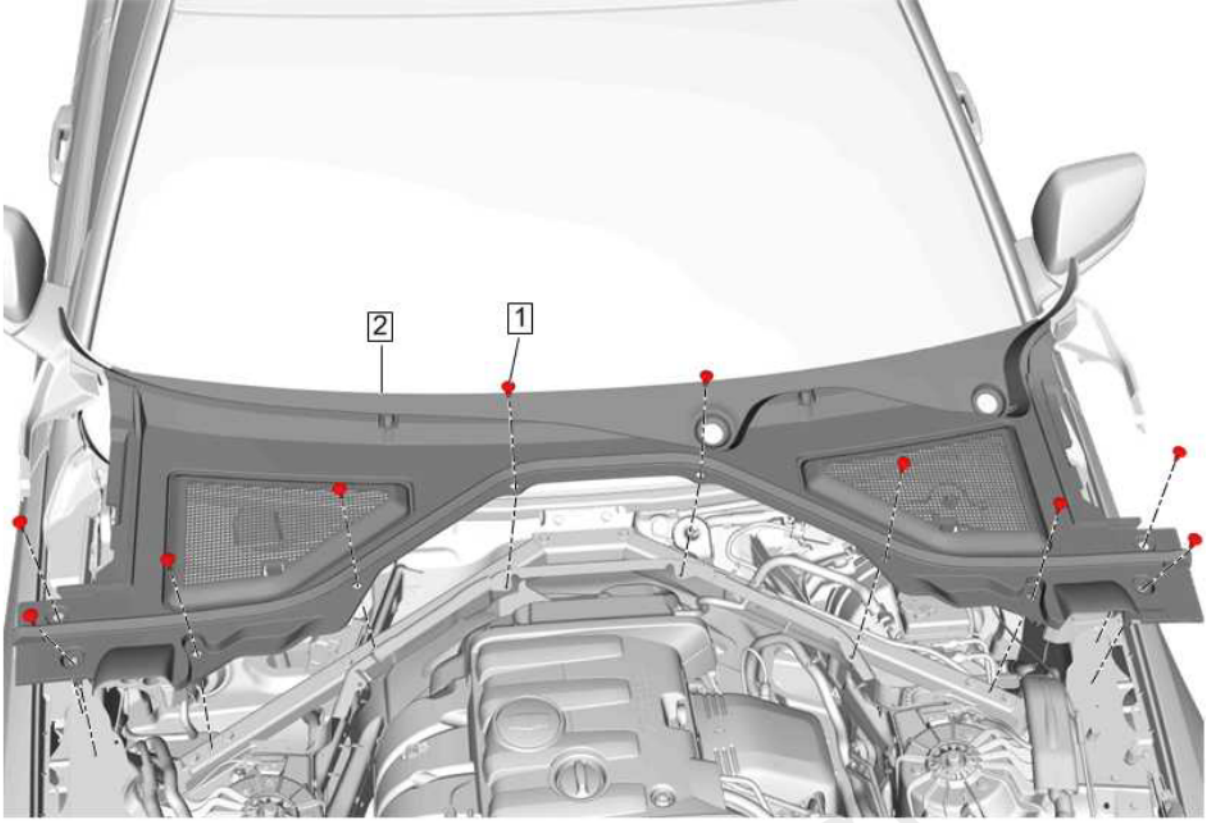


Fig. 616: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LGW)**

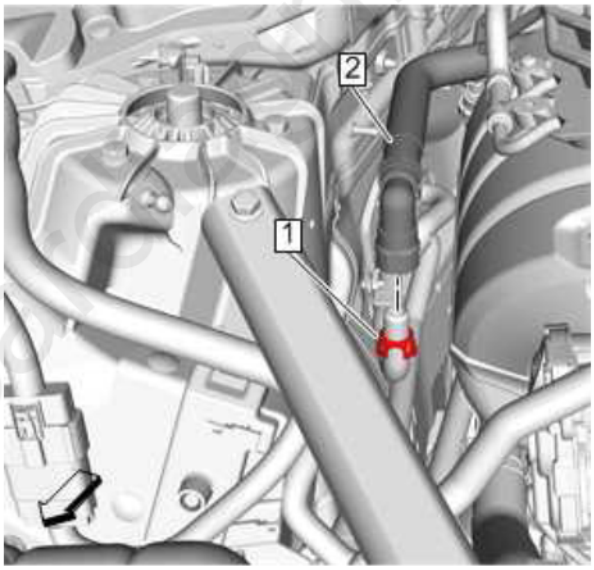


Fig. 617: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Radiator Surge Tank Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Radiator Surge Tank Inlet Hose Replacement (LGW)**

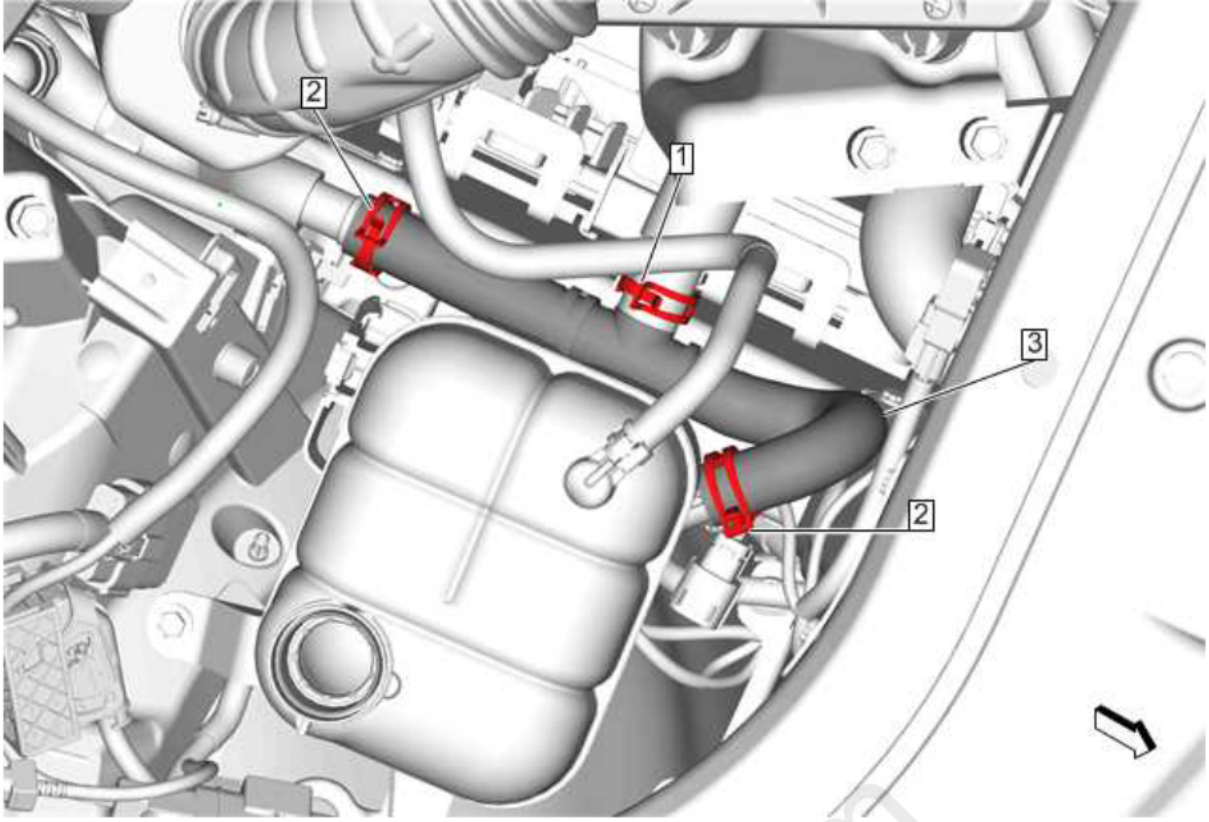


Fig. 618: Radiator Surge Tank Inlet Hose (LGW)
Courtesy of GENERAL MOTORS COMPANY

11. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

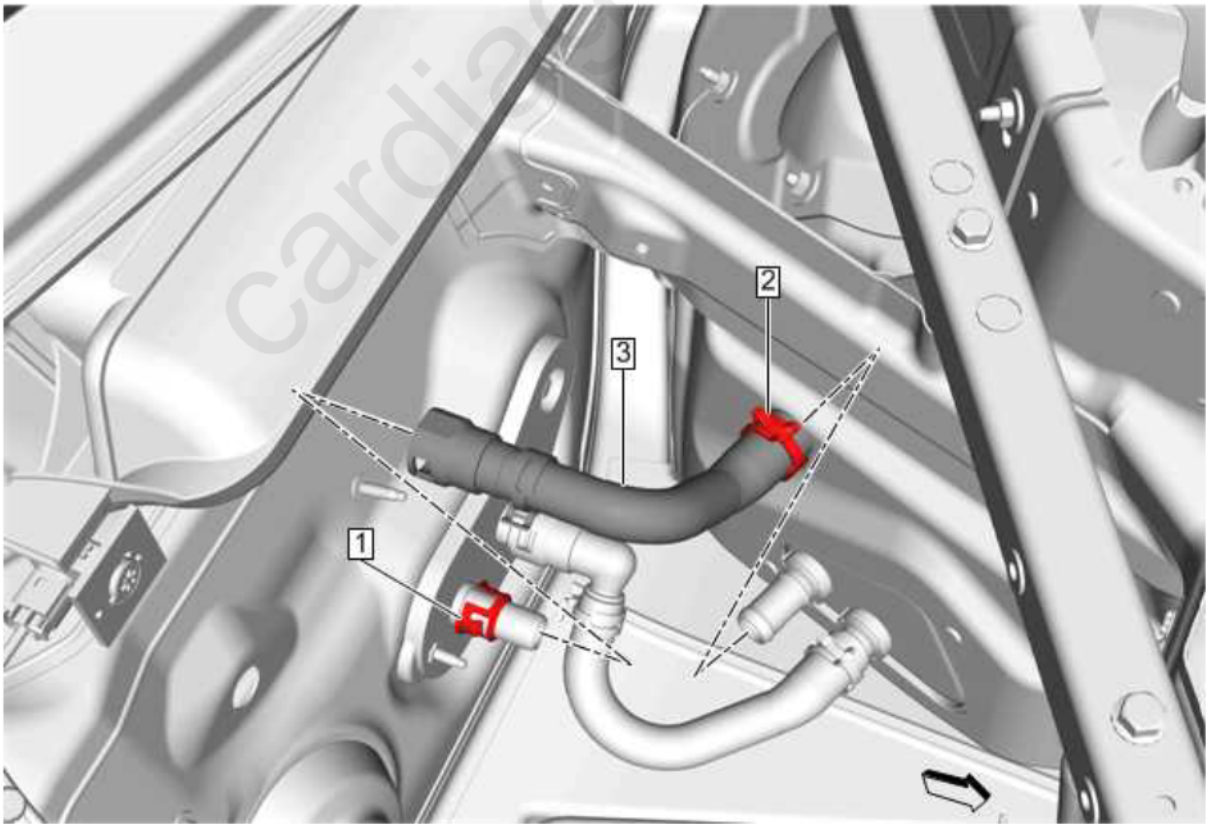


Fig. 619: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

12. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

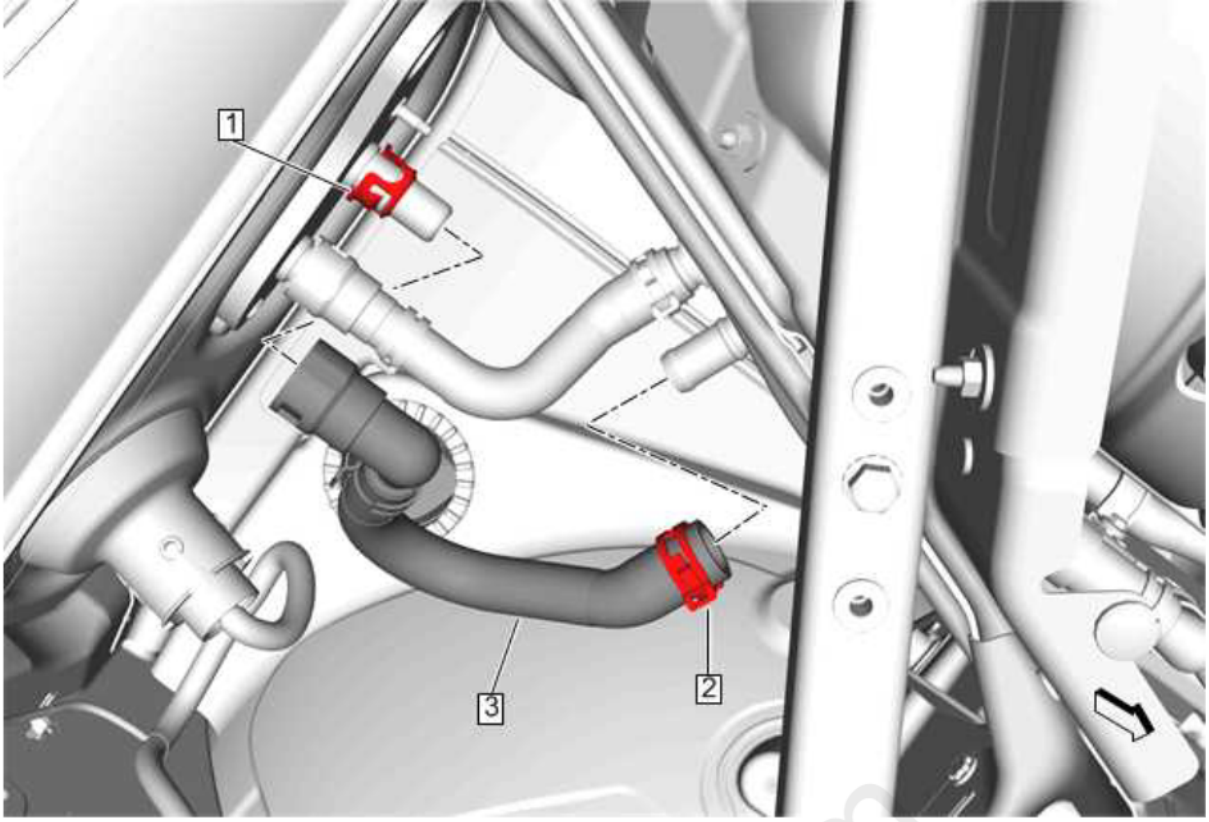


Fig. 620: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

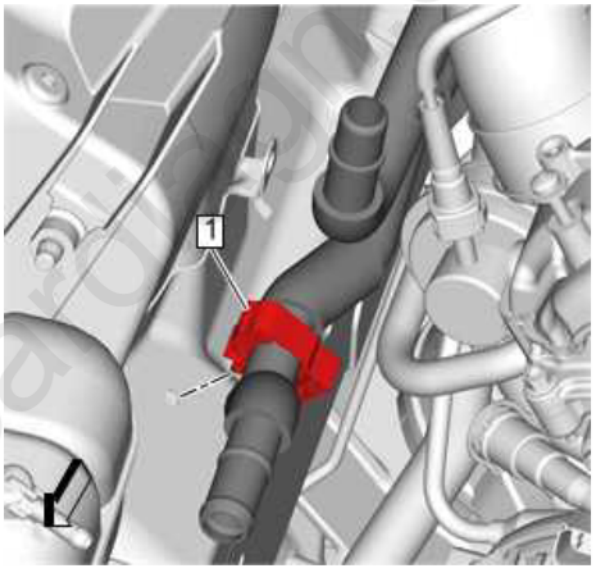


Fig. 621: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

14. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

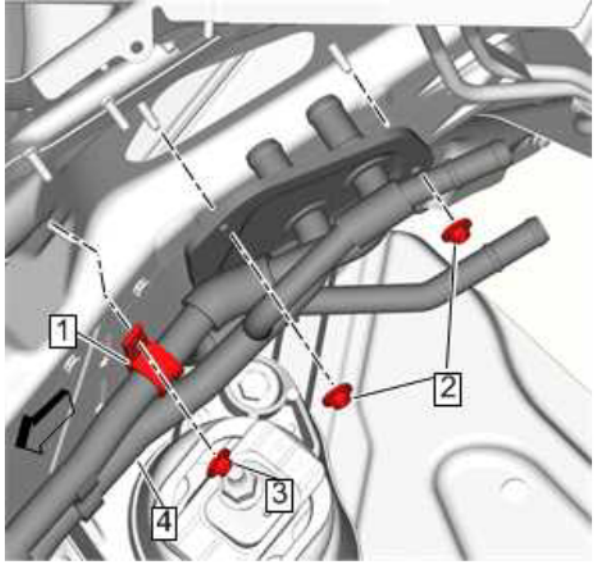


Fig. 622: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
16. Heater Inlet Pipe Clip (1)Â» Remove
17. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
18. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

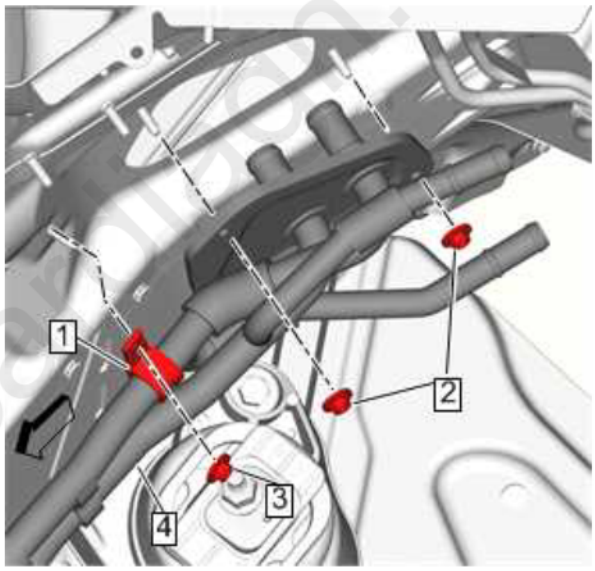


Fig. 623: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Clip (1)Â» Install
3. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

4. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]
5. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

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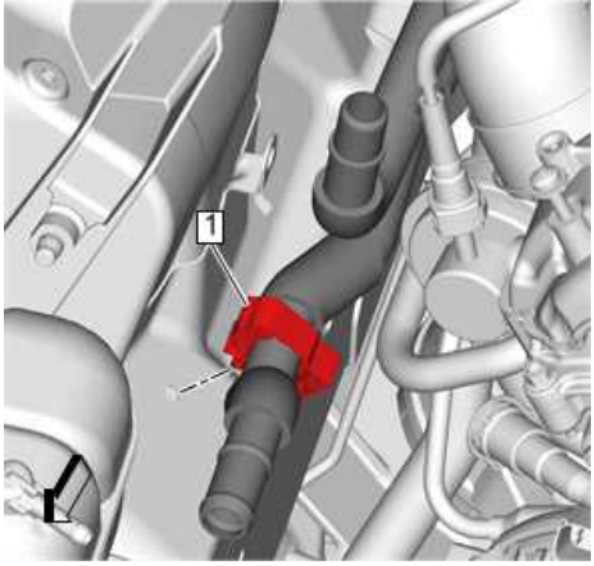


Fig. 624: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

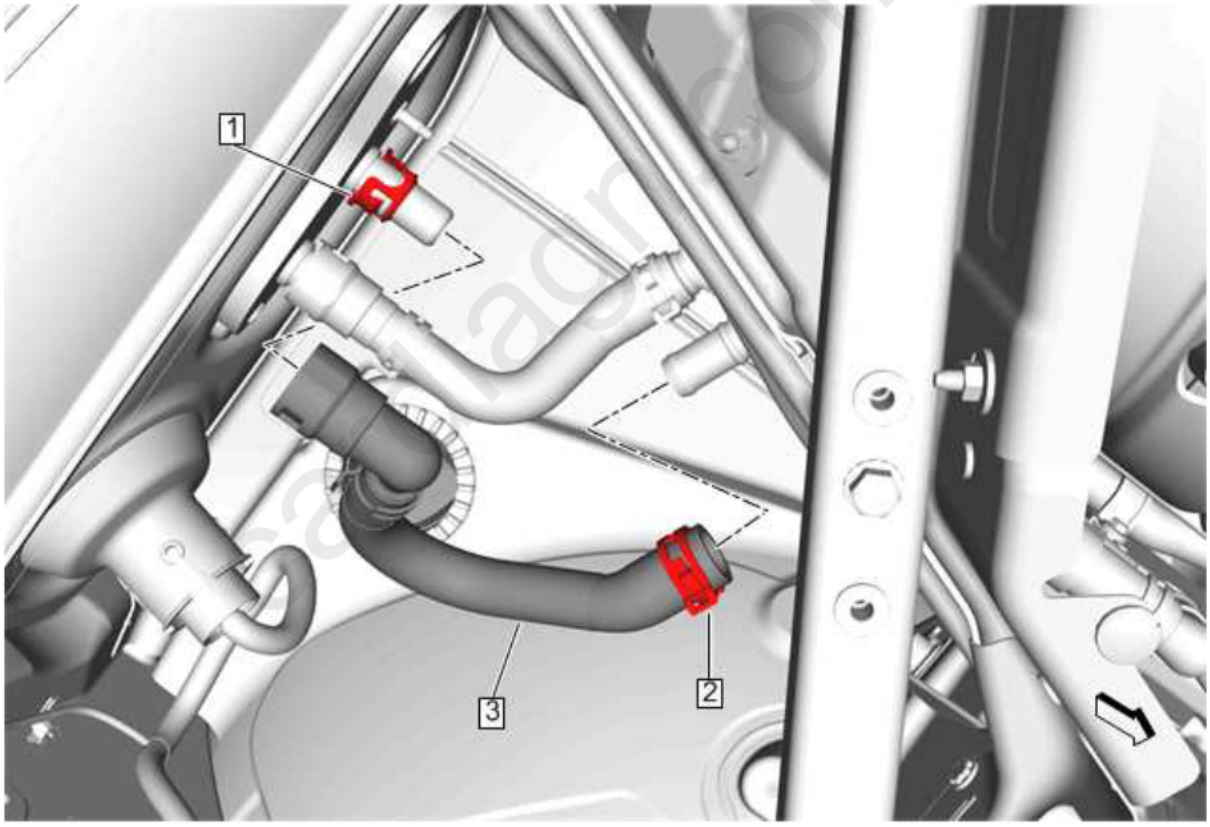


Fig. 625: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

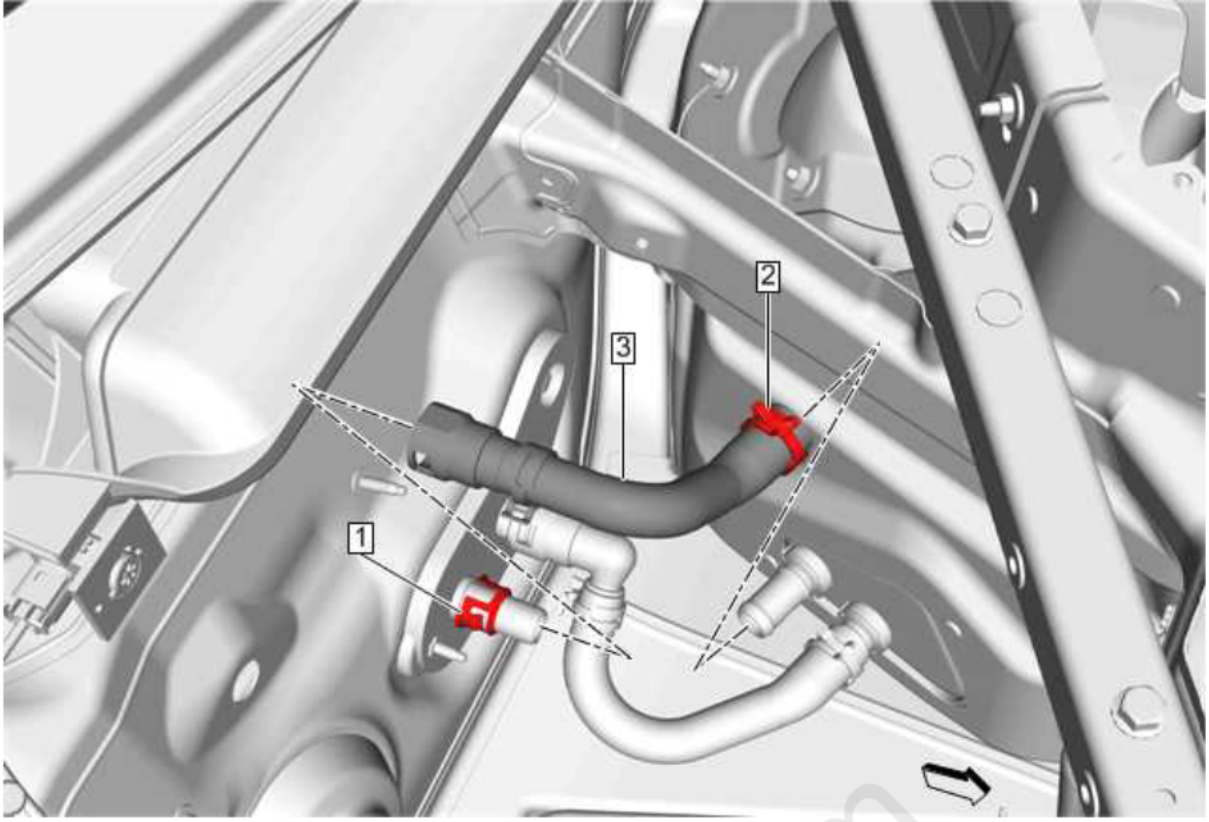


Fig. 626: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Surge Tank Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Radiator Surge Tank Inlet Hose Replacement (LGW)**

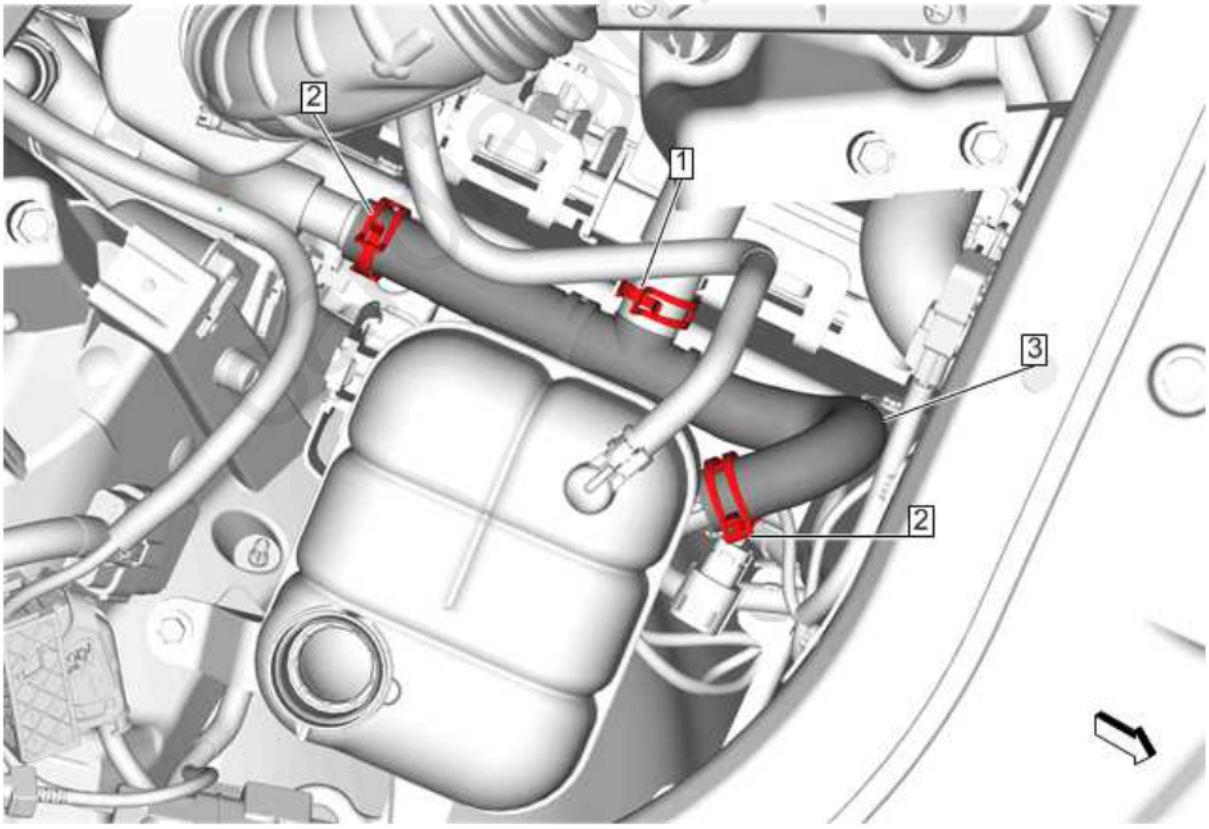


Fig. 627: Radiator Surge Tank Inlet Hose (LGW)
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LGW)**

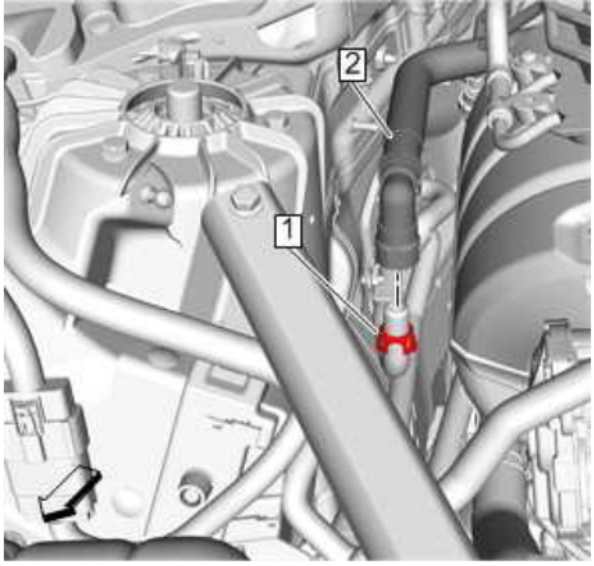


Fig. 628: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

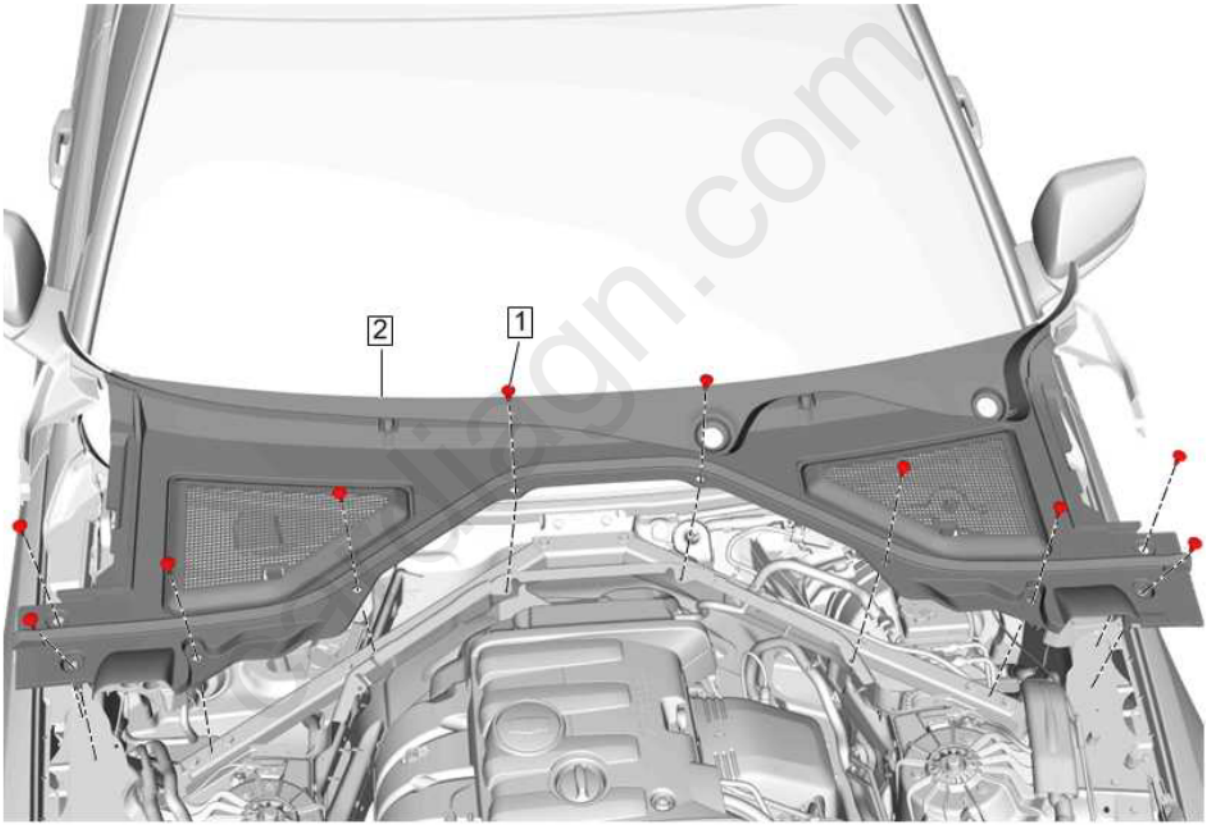


Fig. 629: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

11. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**
12. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

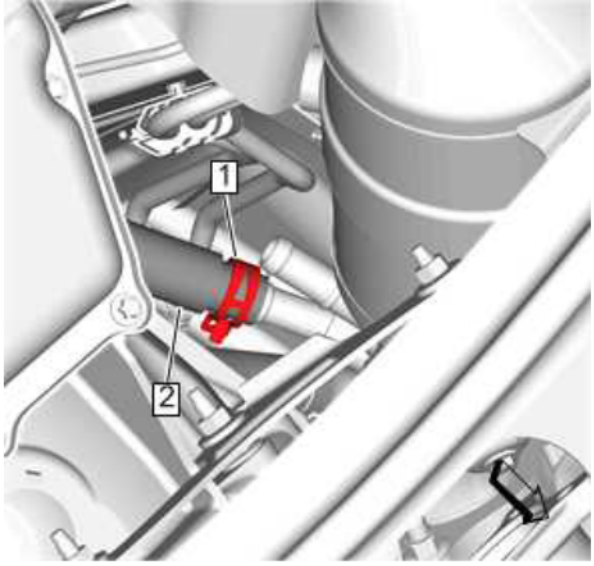


Fig. 630: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Heater Outlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**
14. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

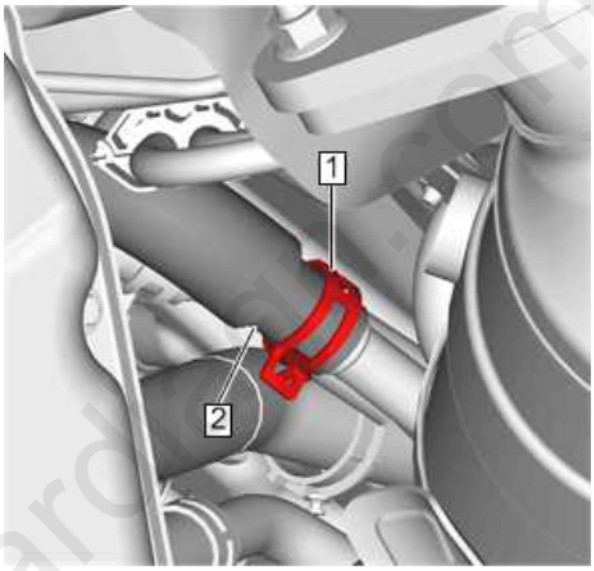


Fig. 631: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

15. Heater Inlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**
16. Front Axle Propeller ShaftÂ» Install - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
17. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
18. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
19. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LGX, WITH C24)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Front Axle Propeller ShaftÂ» Remove - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
3. Heater Inlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

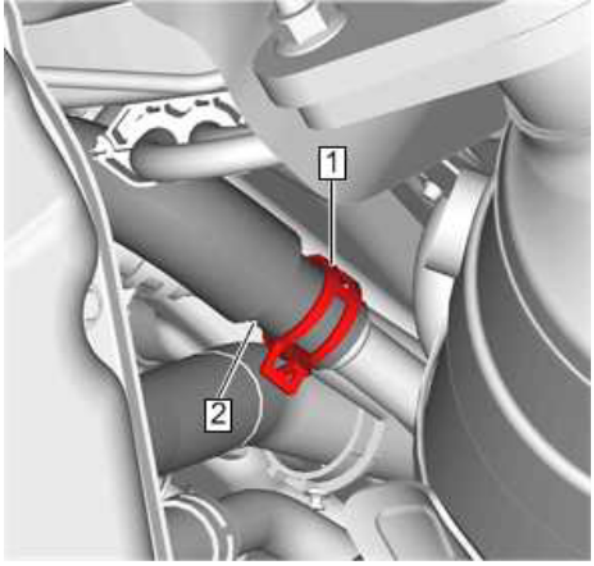


Fig. 632: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
5. Heater Outlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

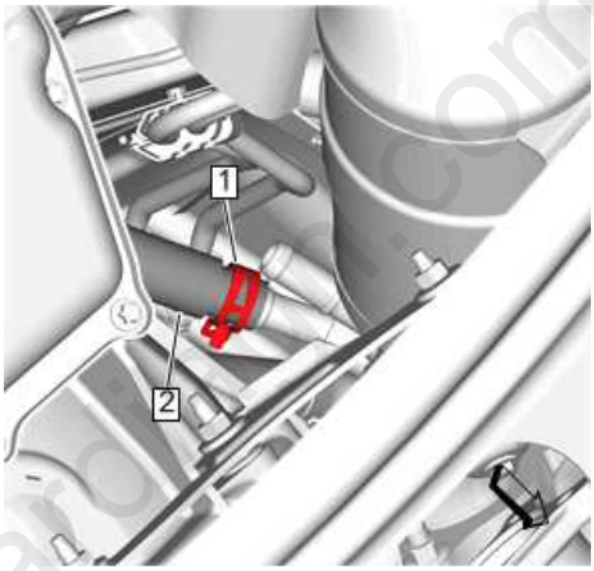


Fig. 633: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
7. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
8. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

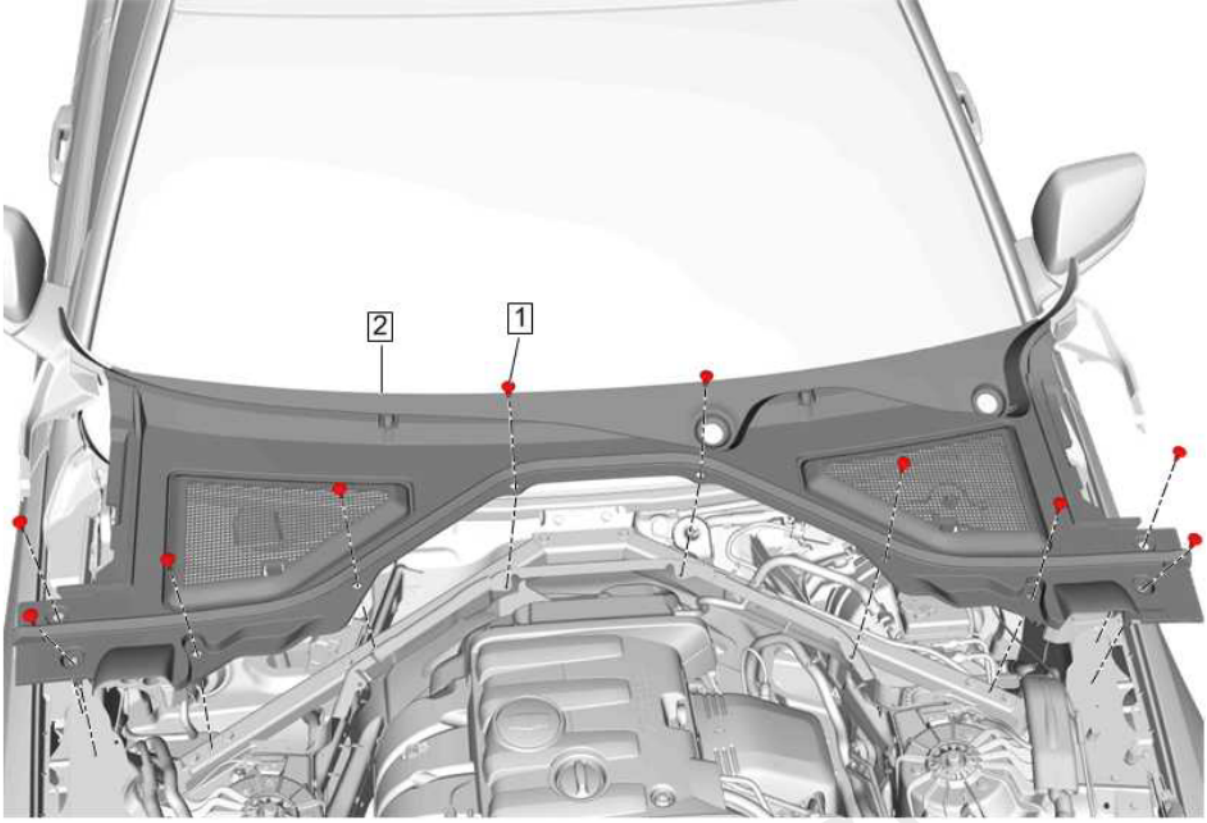


Fig. 634: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LGX)**

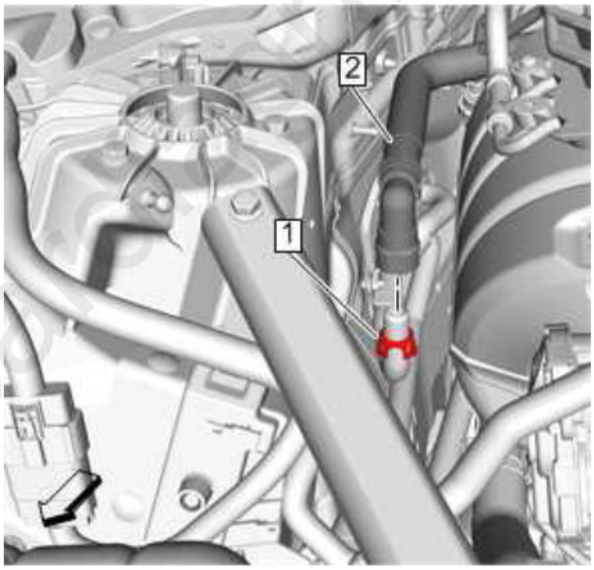


Fig. 635: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Heater Water Auxiliary Pump Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Disconnect - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGX)**

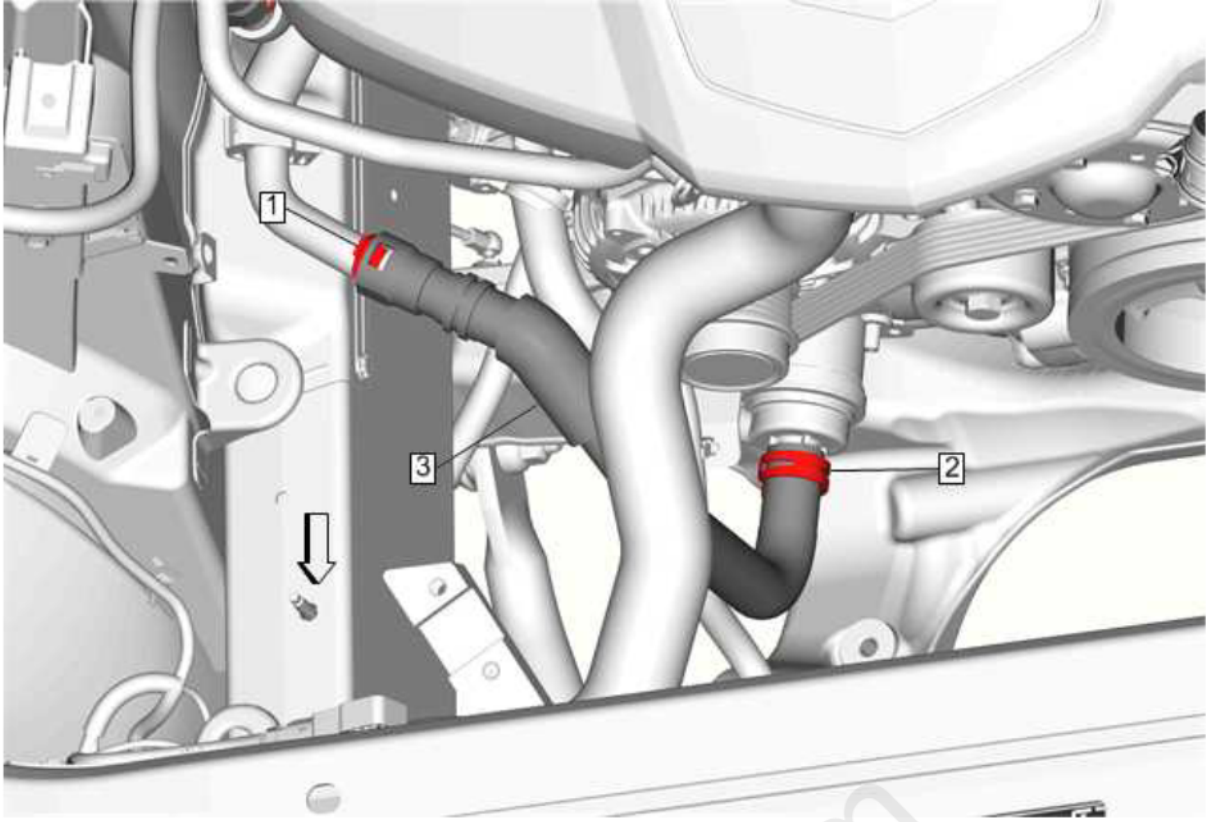


Fig. 636: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

11. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)**

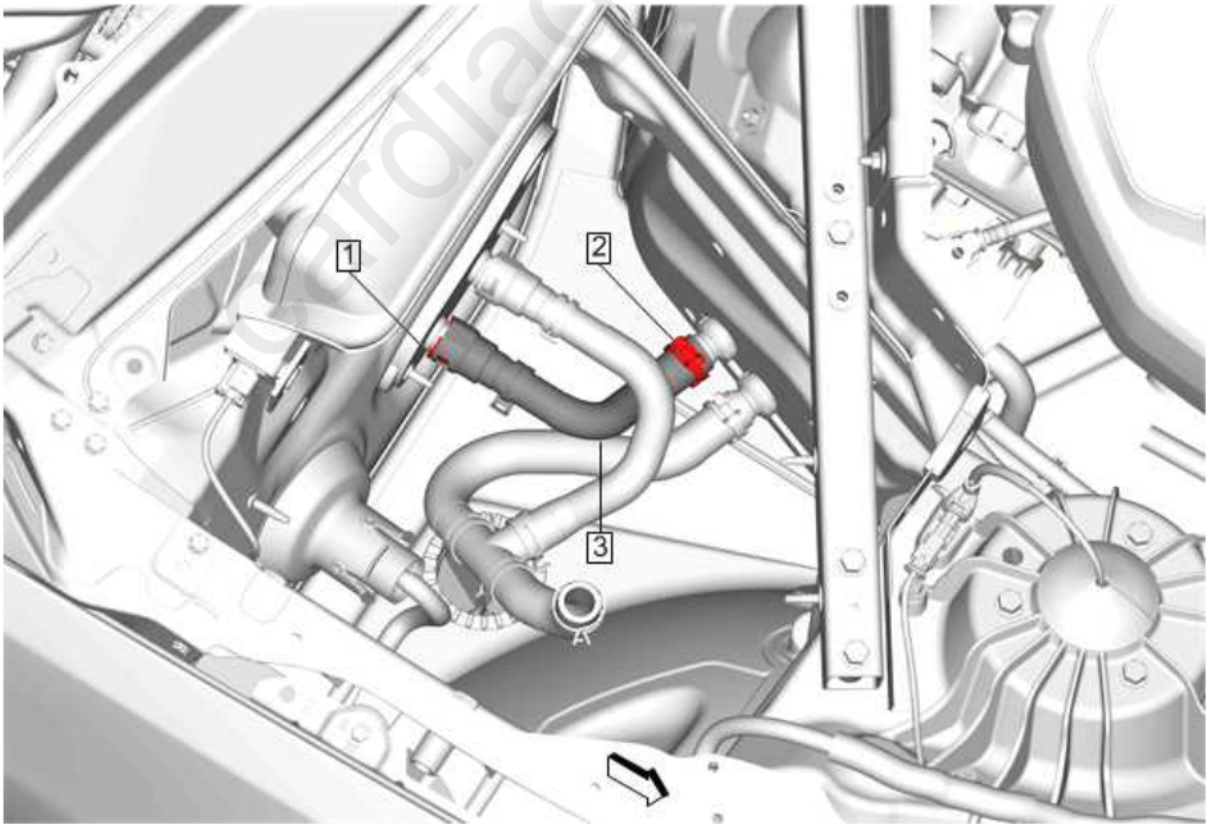


Fig. 637: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

12. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)**

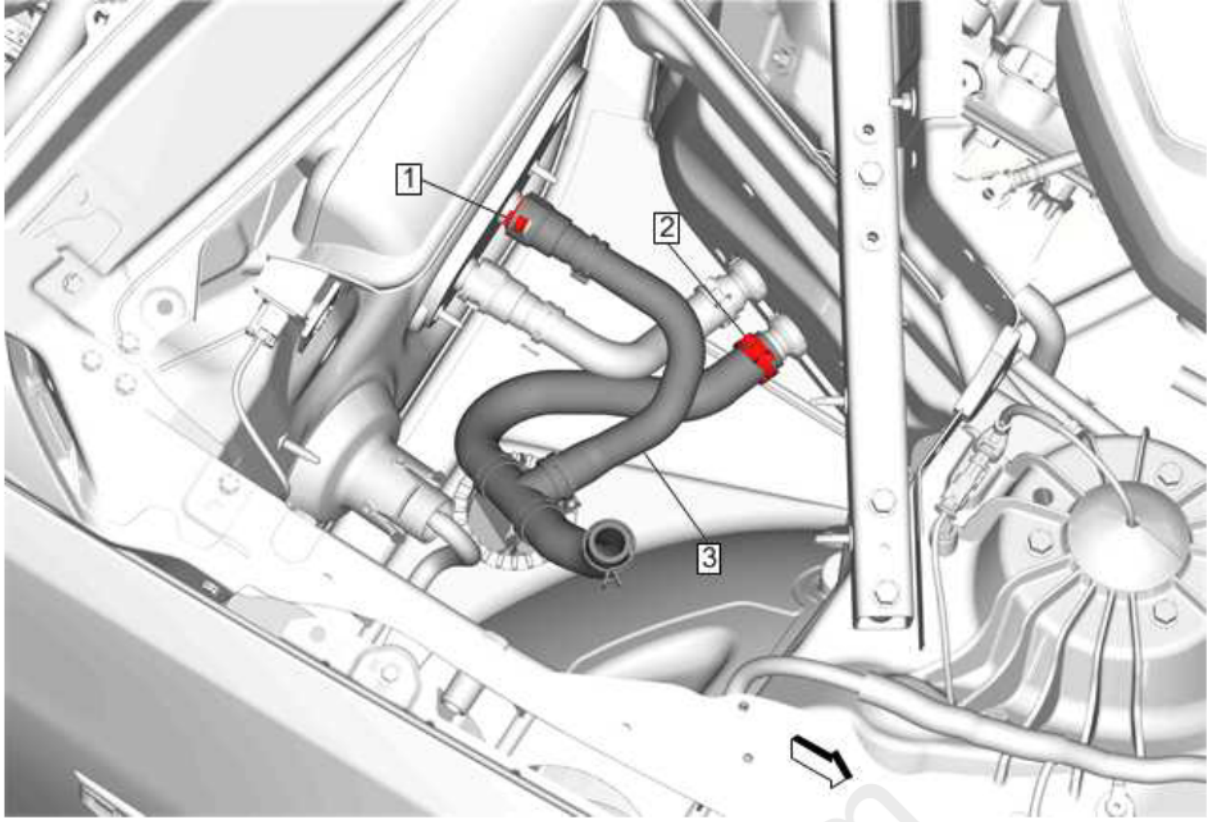


Fig. 638: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

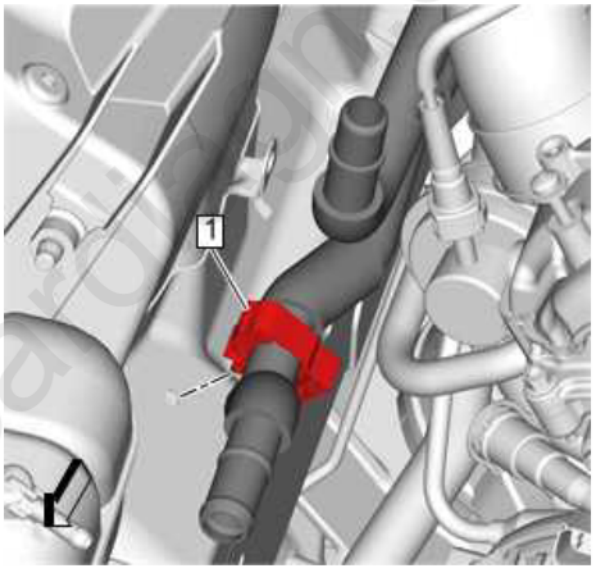


Fig. 639: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

14. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

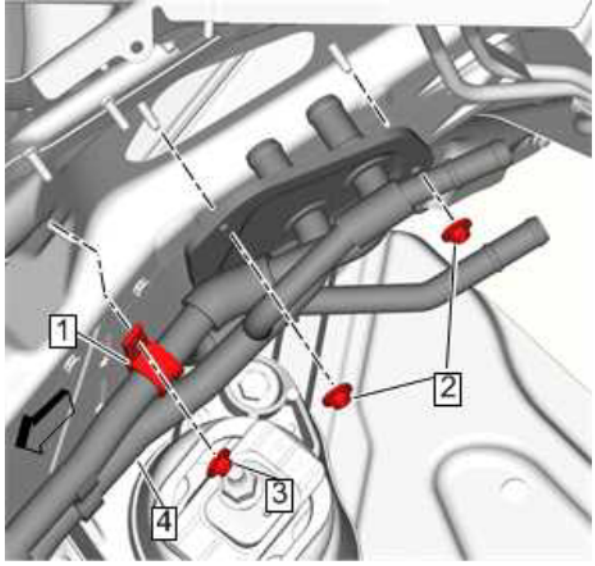


Fig. 640: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
16. Heater Inlet Pipe Clip (1)Â» Remove
17. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
18. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

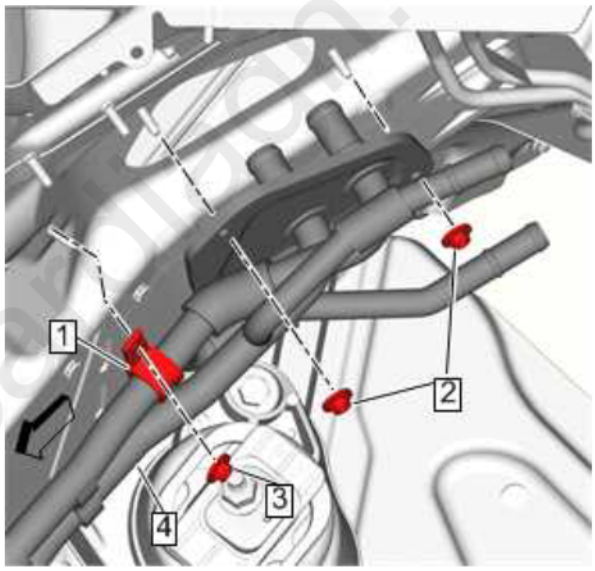


Fig. 641: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Clip (1)Â» Install
3. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

4. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]
5. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

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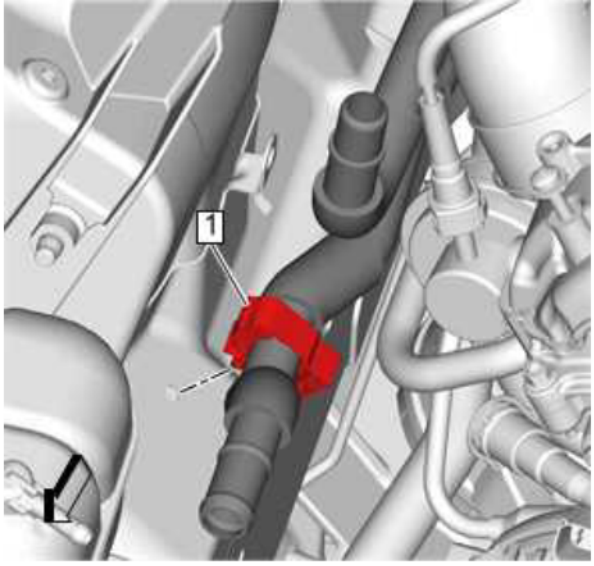


Fig. 642: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)**

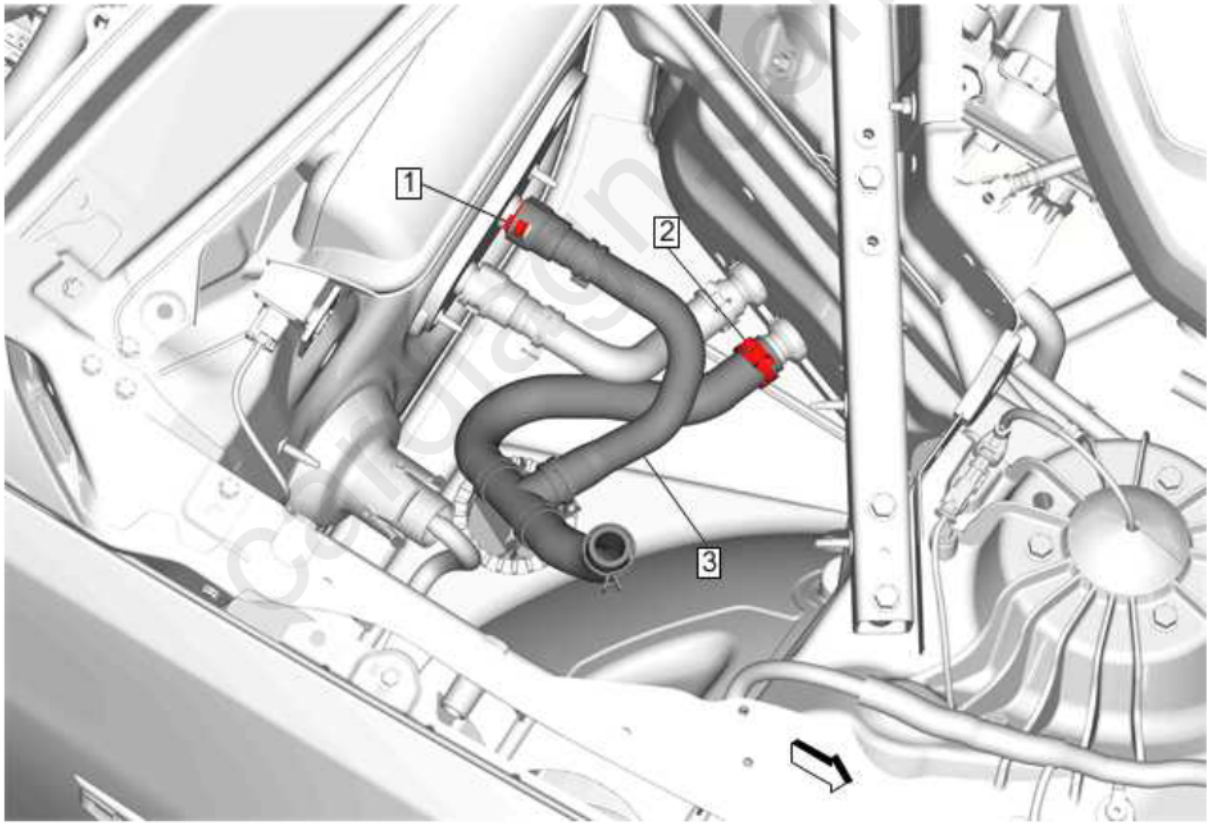


Fig. 643: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)**

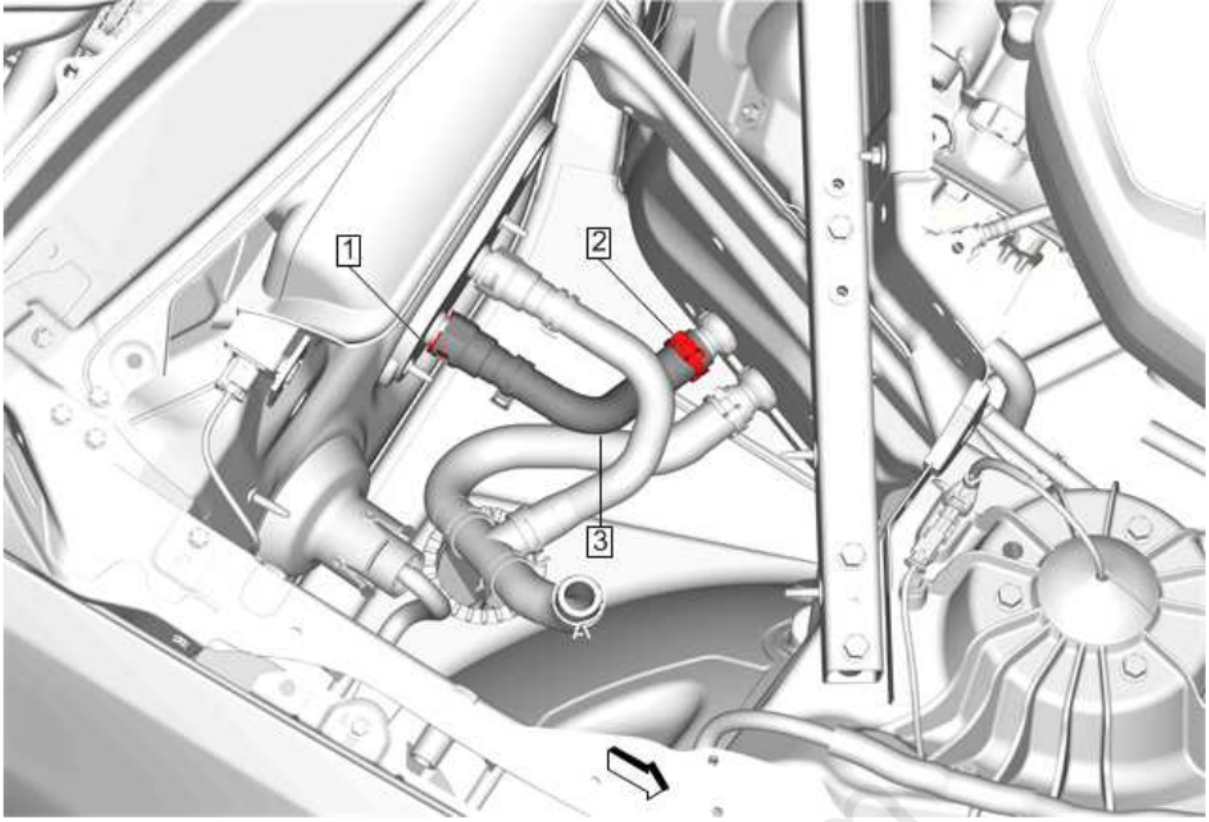


Fig. 644: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Connect - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGX)**

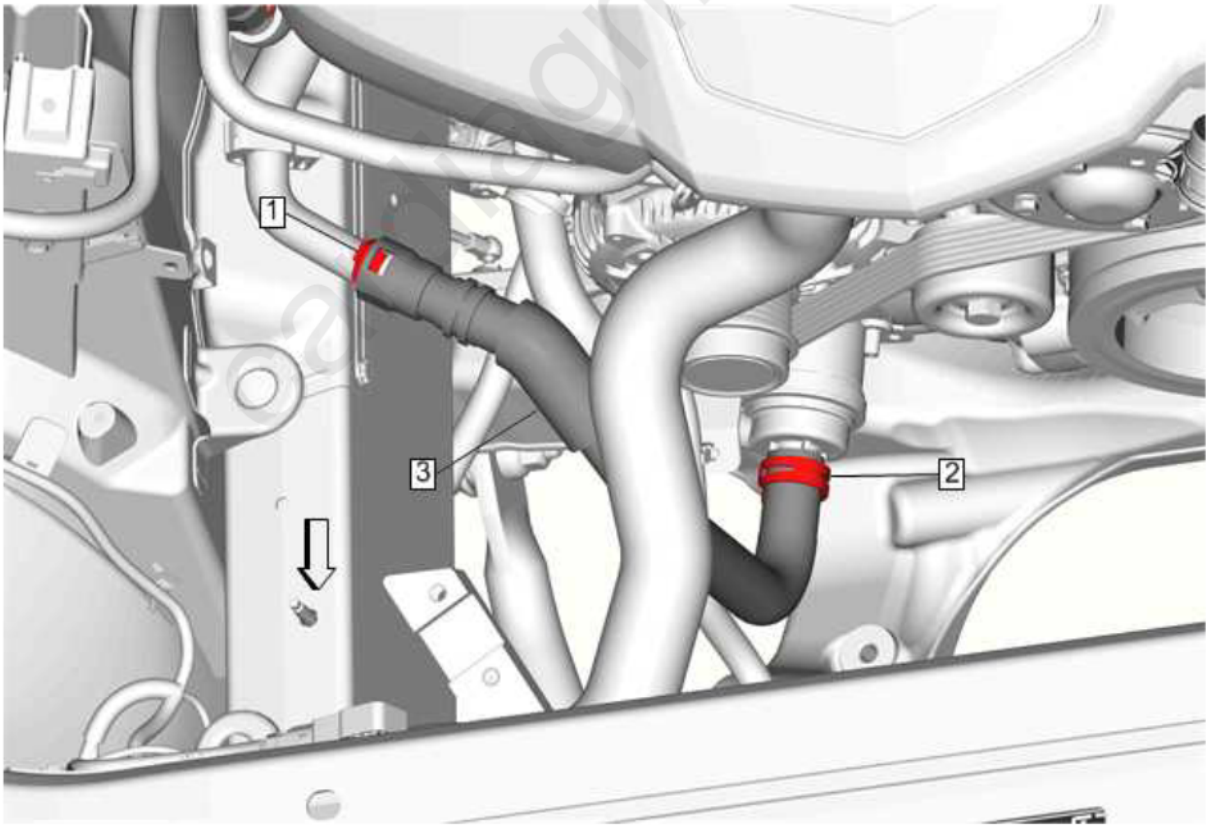


Fig. 645: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LGX)**

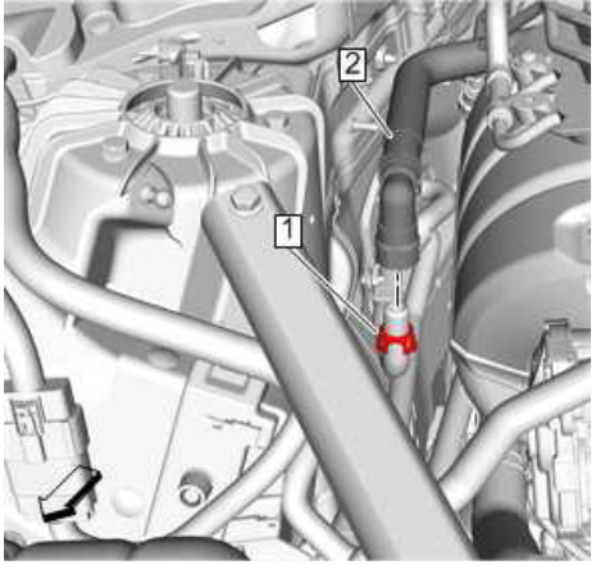


Fig. 646: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

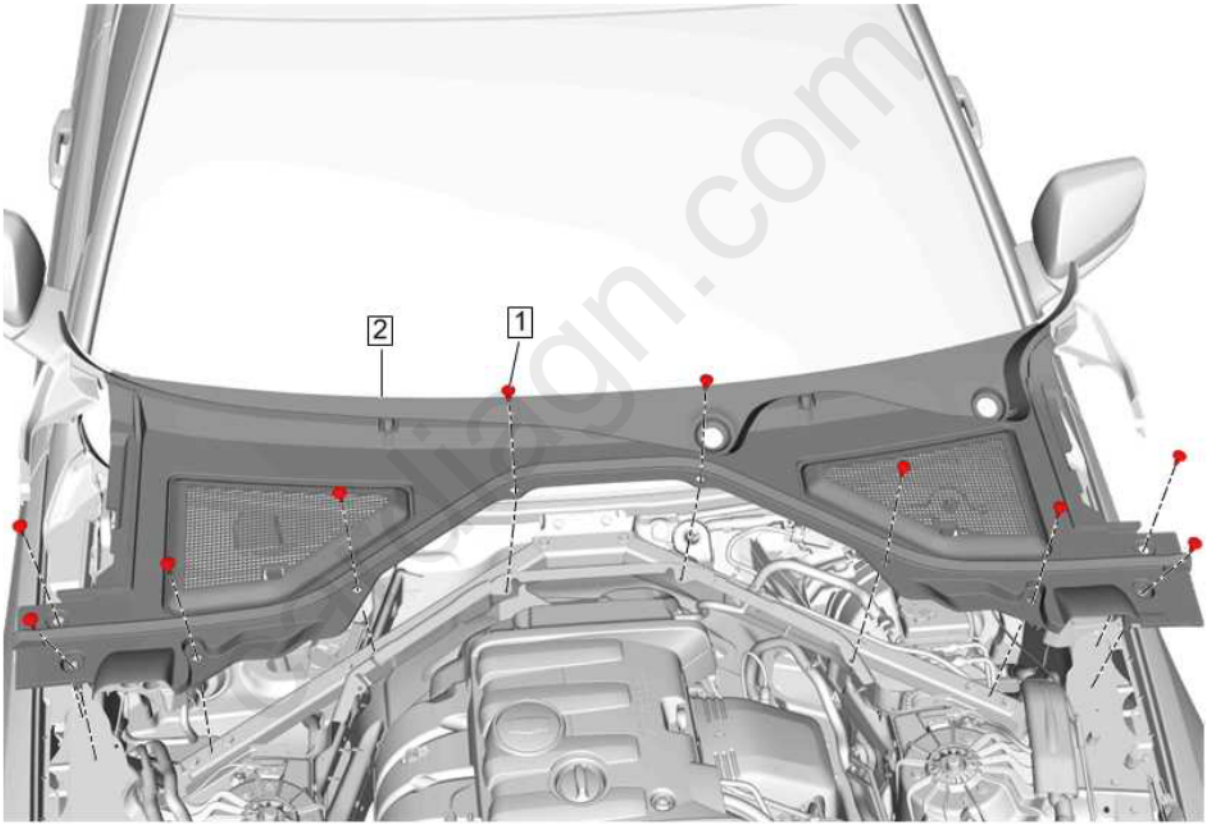


Fig. 647: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

11. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

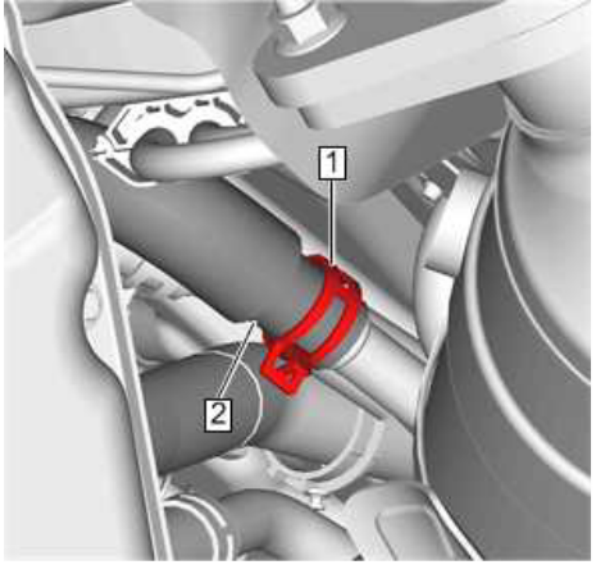


Fig. 648: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

12. Heater Inlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**
13. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**
14. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

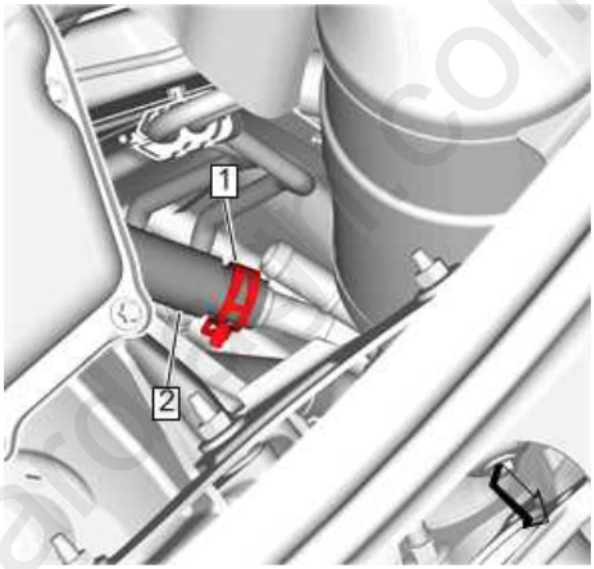


Fig. 649: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

15. Heater Outlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**

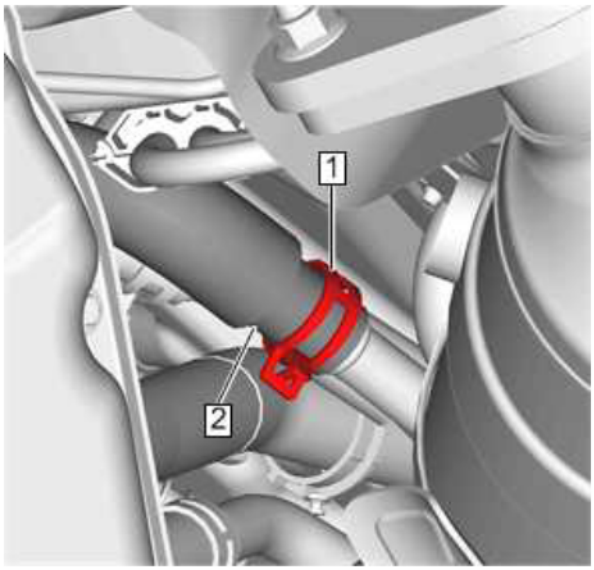


Fig. 650: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

16. Front Axle Propeller ShaftÂ» Install - **Front Axle Propeller Shaft Replacement (LGX, LGW)**
17. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
18. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
19. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LTG WITH C24)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
2. Heater Inlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

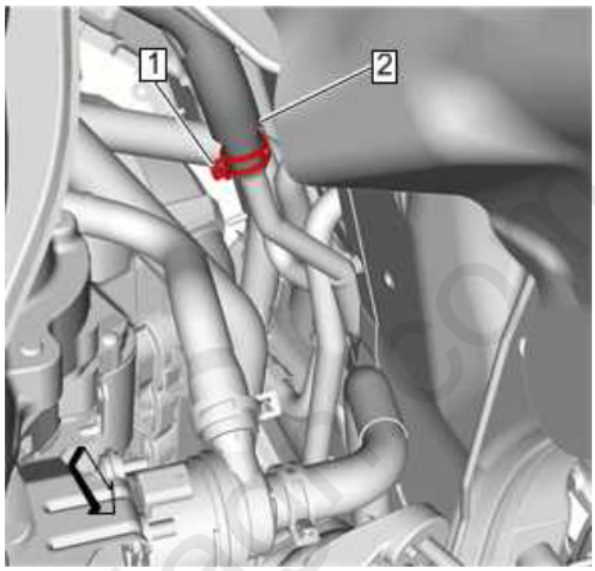


Fig. 651: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

3. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
4. Heater Outlet Hose Clamp (1) Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

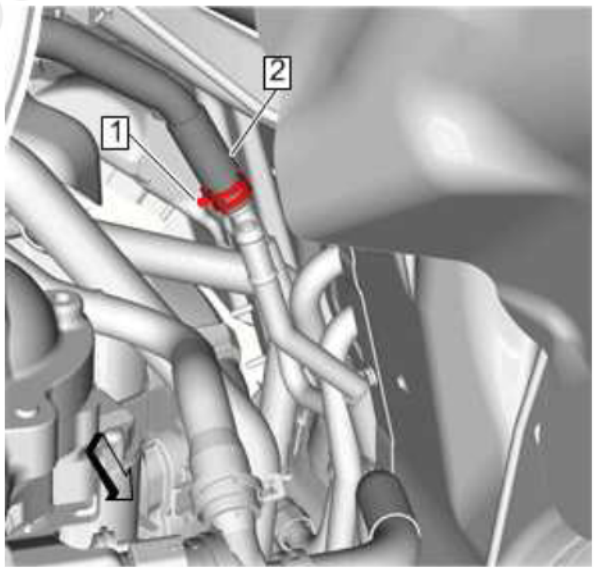


Fig. 652: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
6. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**

7. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

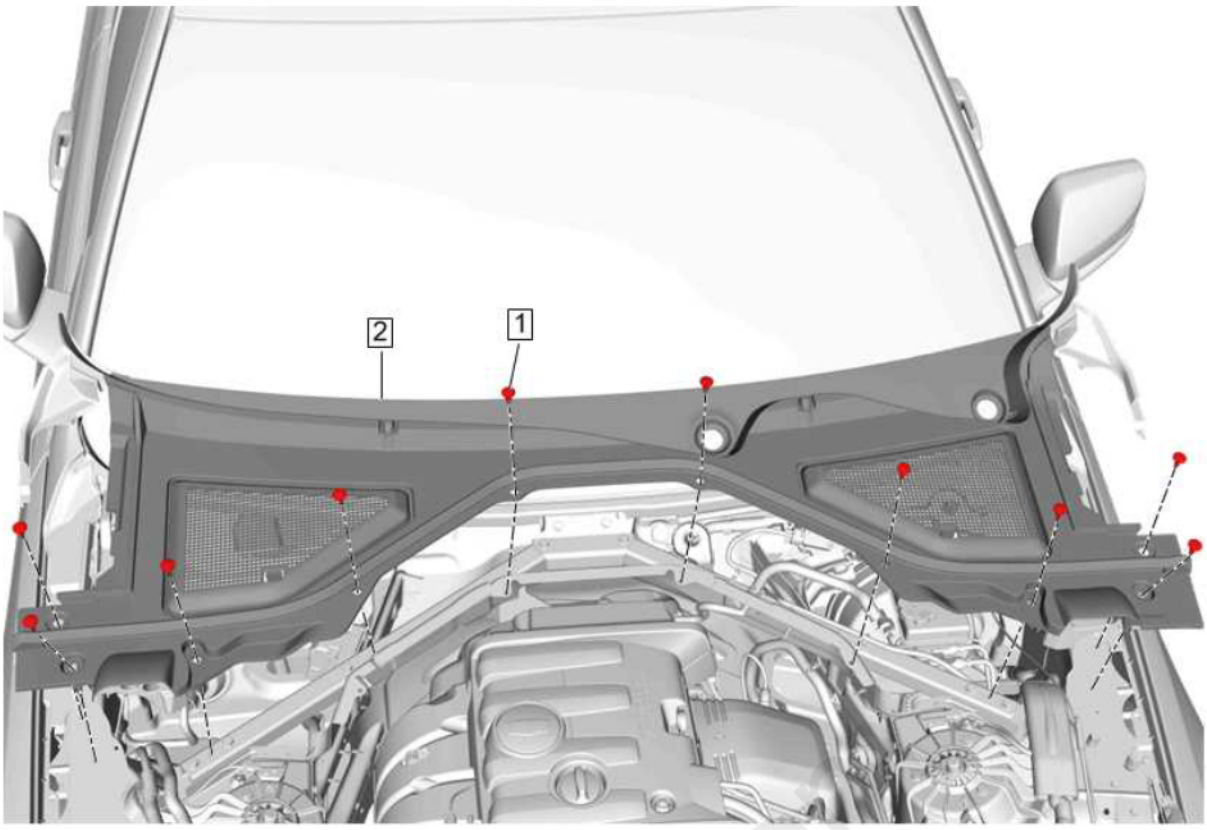


Fig. 653: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Surge Tank Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Radiator Surge Tank Inlet Hose Replacement (LTG without HP9)**

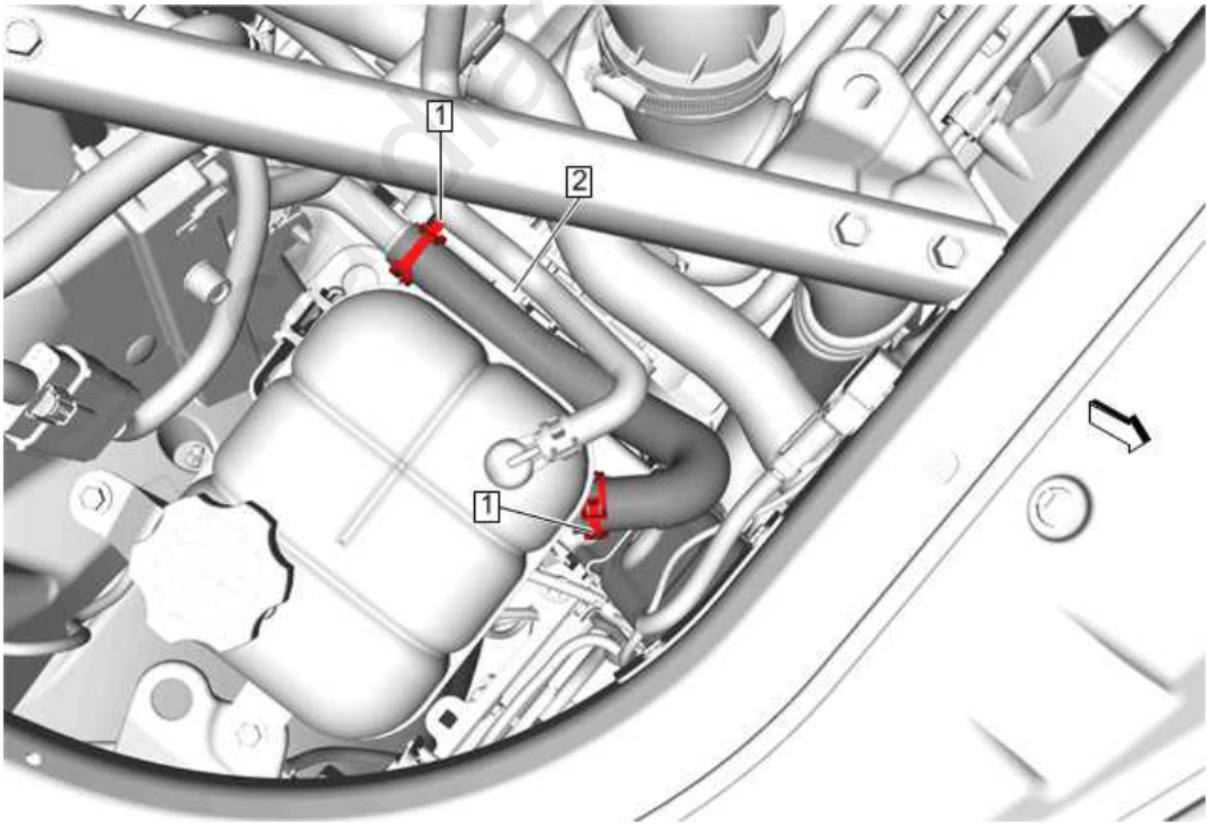


Fig. 654: Radiator Surge Tank Inlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

9. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Water Auxiliary Pump Inlet Hose Replacement (LTG)**

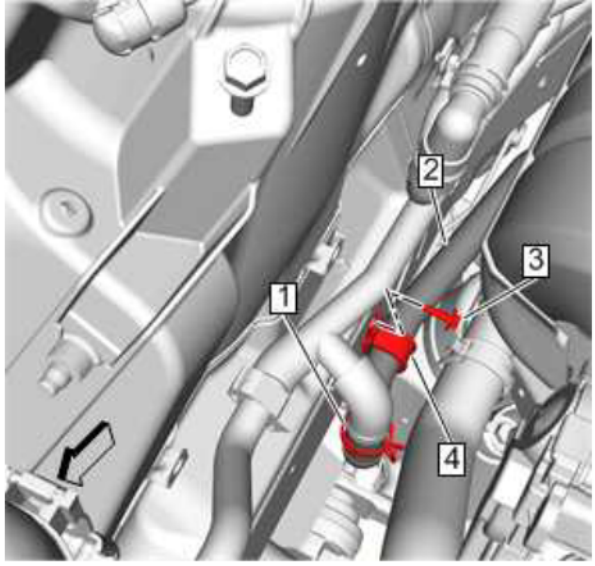


Fig. 655: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LTG without HP9)**

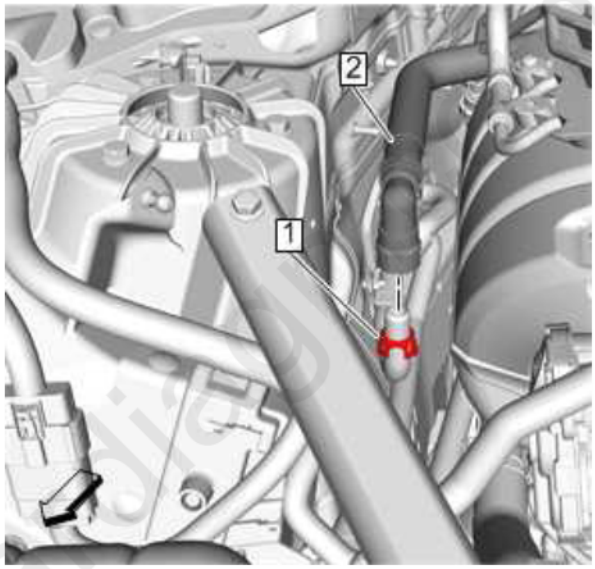


Fig. 656: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

11. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (LTG with HP9)**

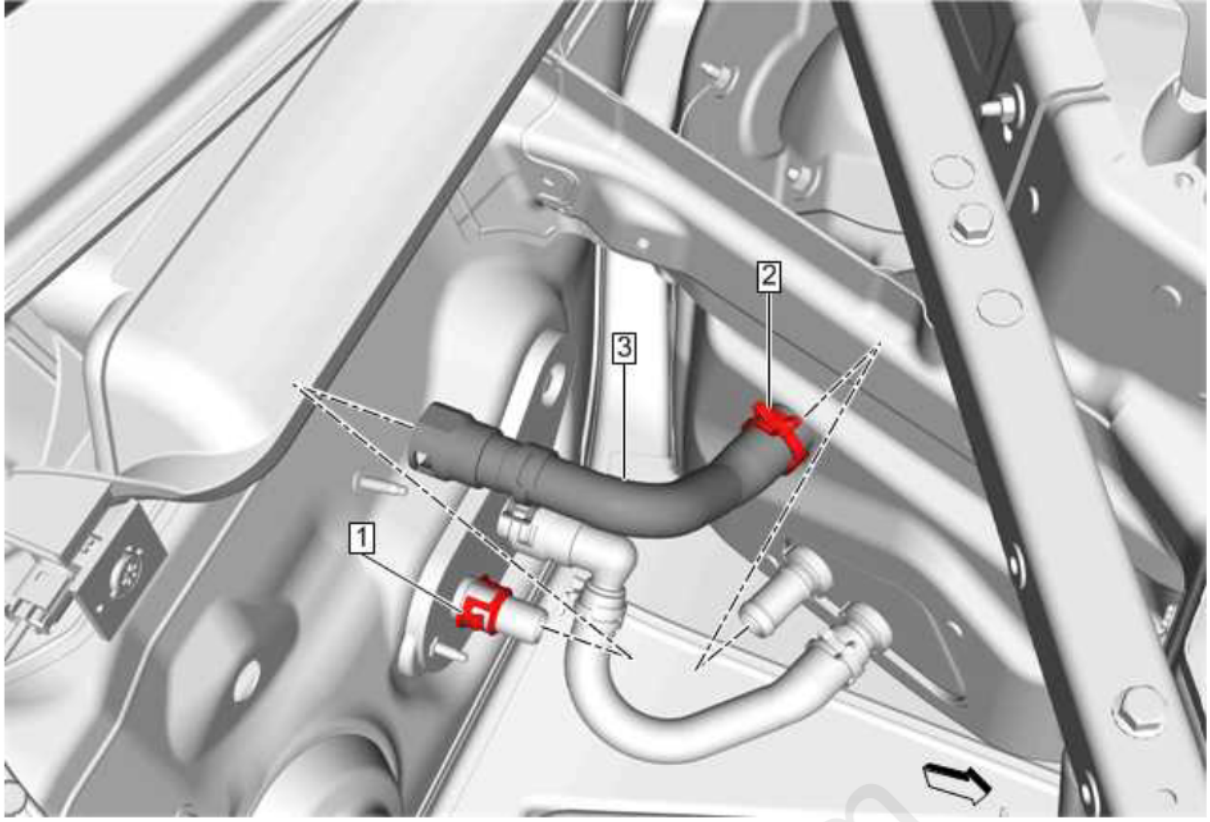


Fig. 657: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

12. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (LTG with HP9)**

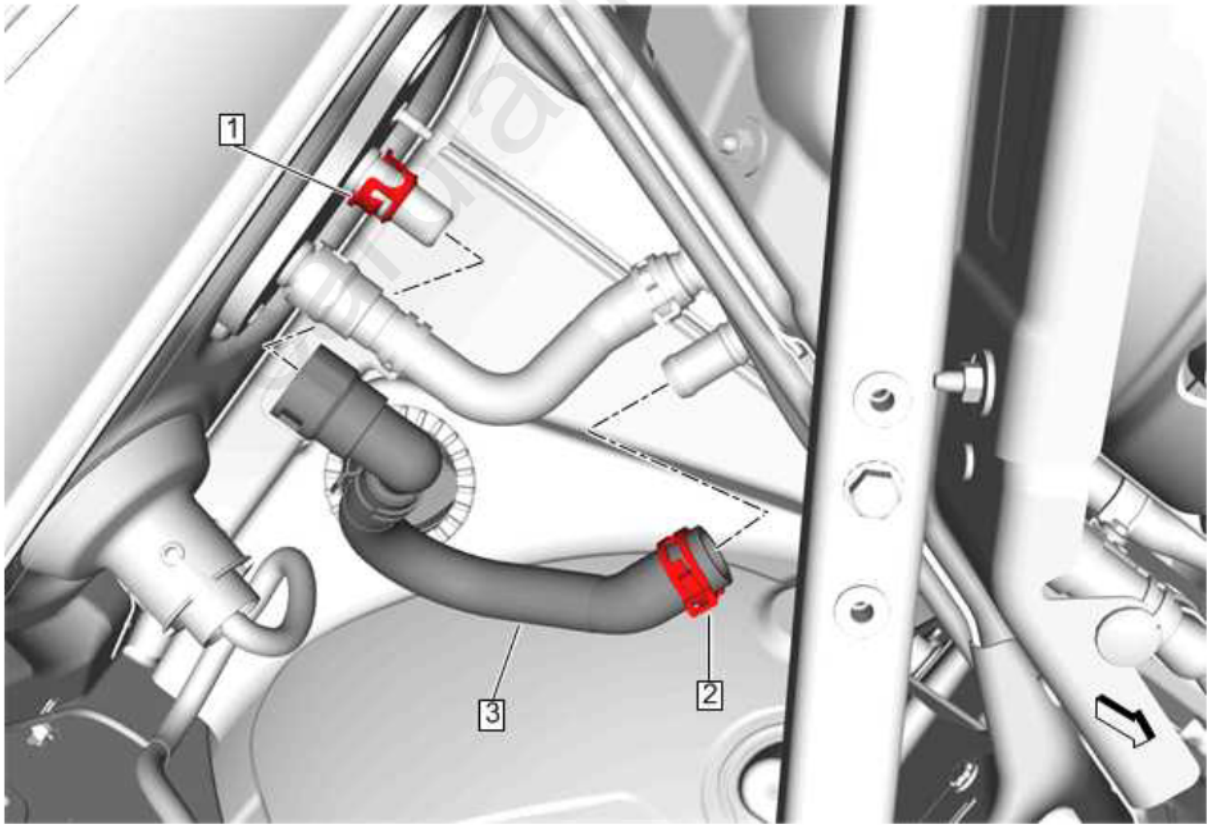


Fig. 658: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

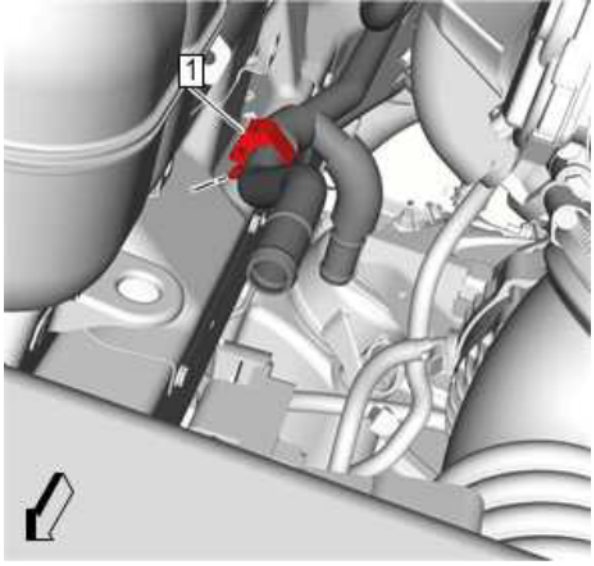


Fig. 659: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

14. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

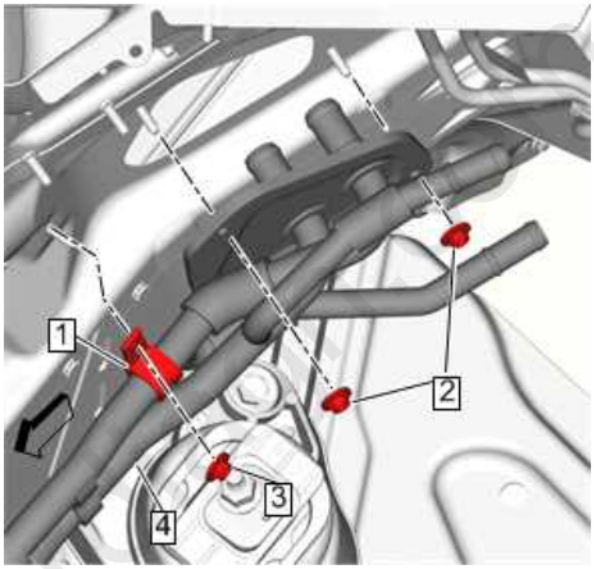


Fig. 660: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
16. Heater Inlet Pipe Clip (1)Â» Remove
17. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
18. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

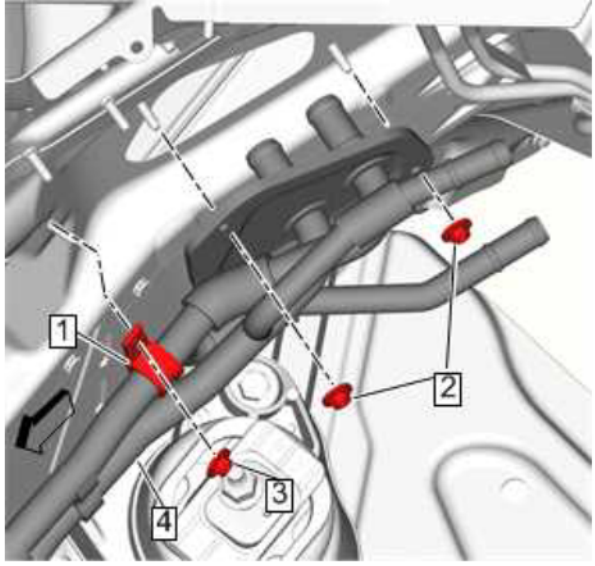


Fig. 661: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Clip (1)Â» Install
3. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

4. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten [2x] 9 N.m (80 lb in)
5. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

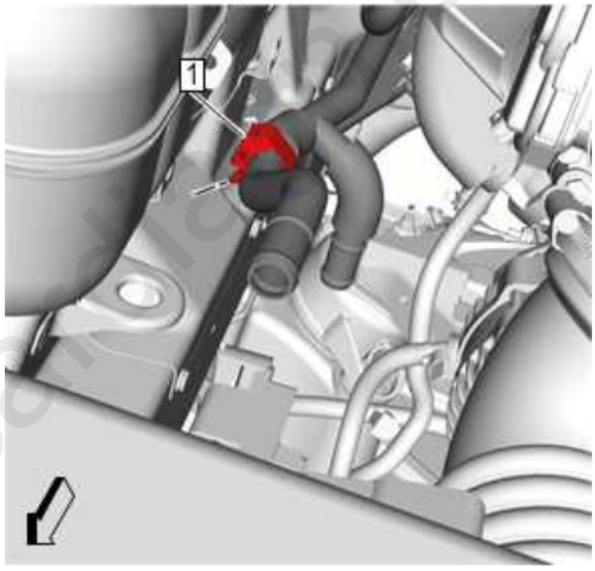


Fig. 662: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (LTG with HP9)**

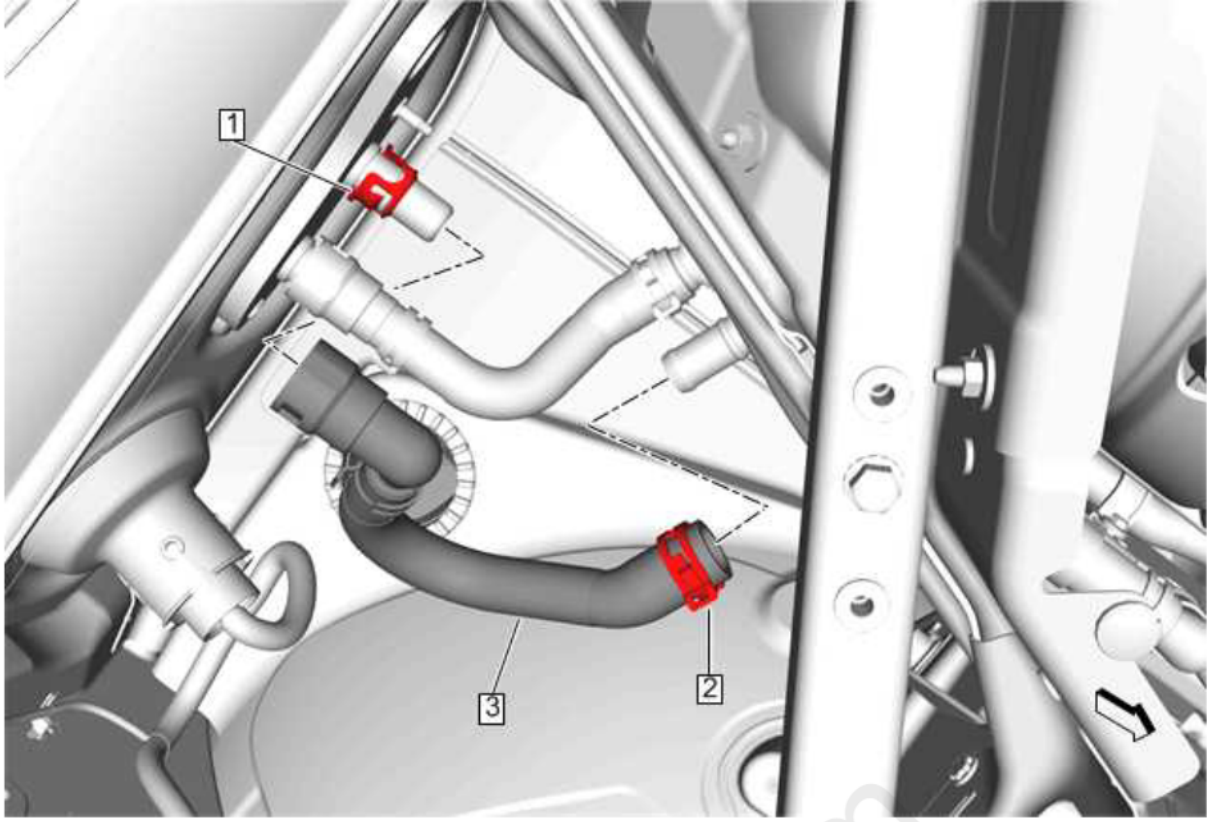


Fig. 663: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (LTG with HP9)**

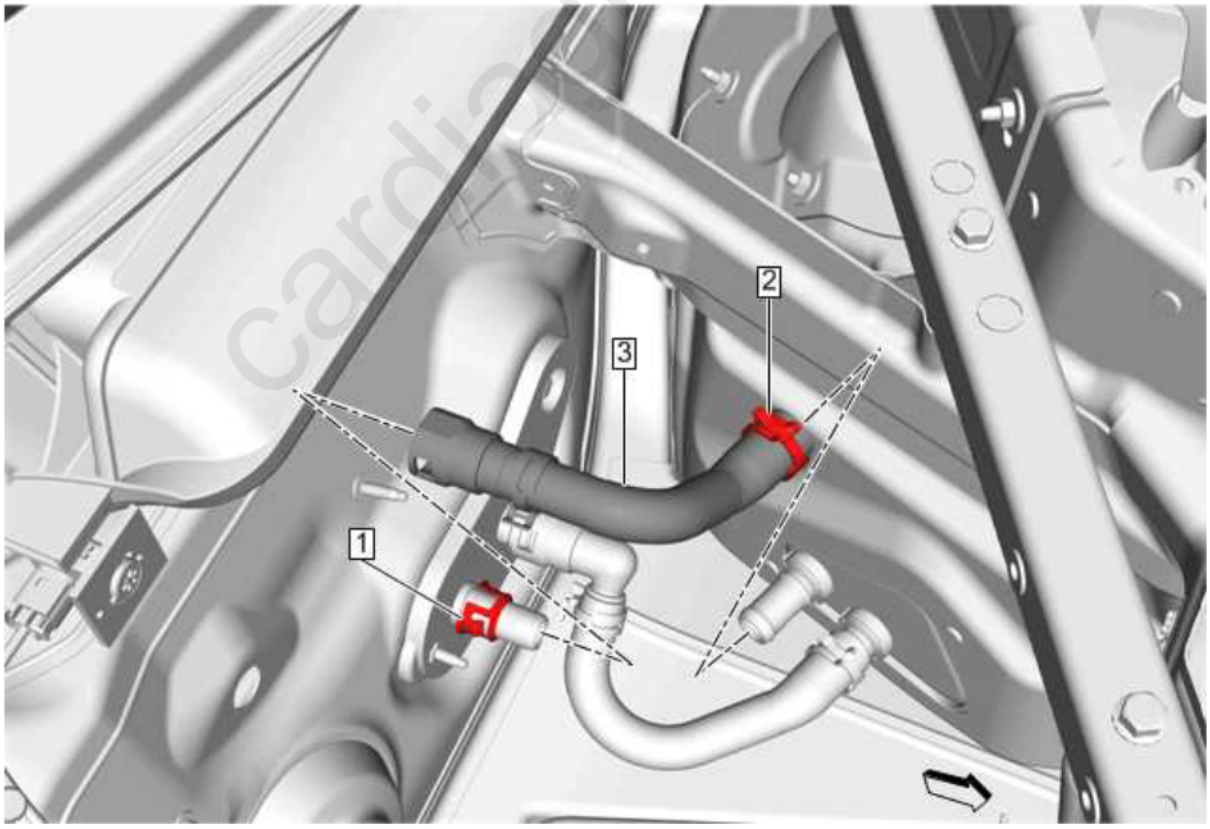


Fig. 664: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LTG without HP9)**

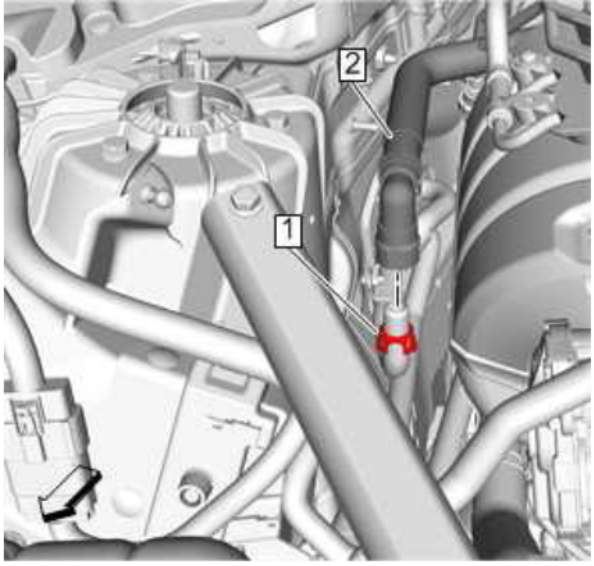


Fig. 665: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Water Auxiliary Pump Inlet Hose Replacement (LTG)**

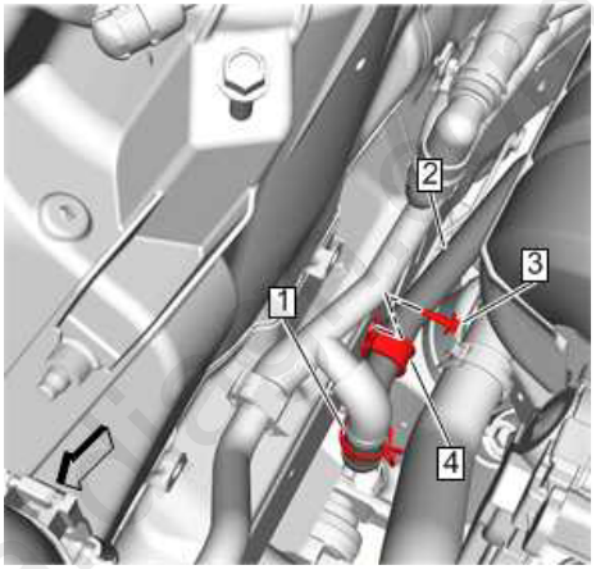


Fig. 666: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Radiator Surge Tank Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Radiator Surge Tank Inlet Hose Replacement (LTG without HP9)**

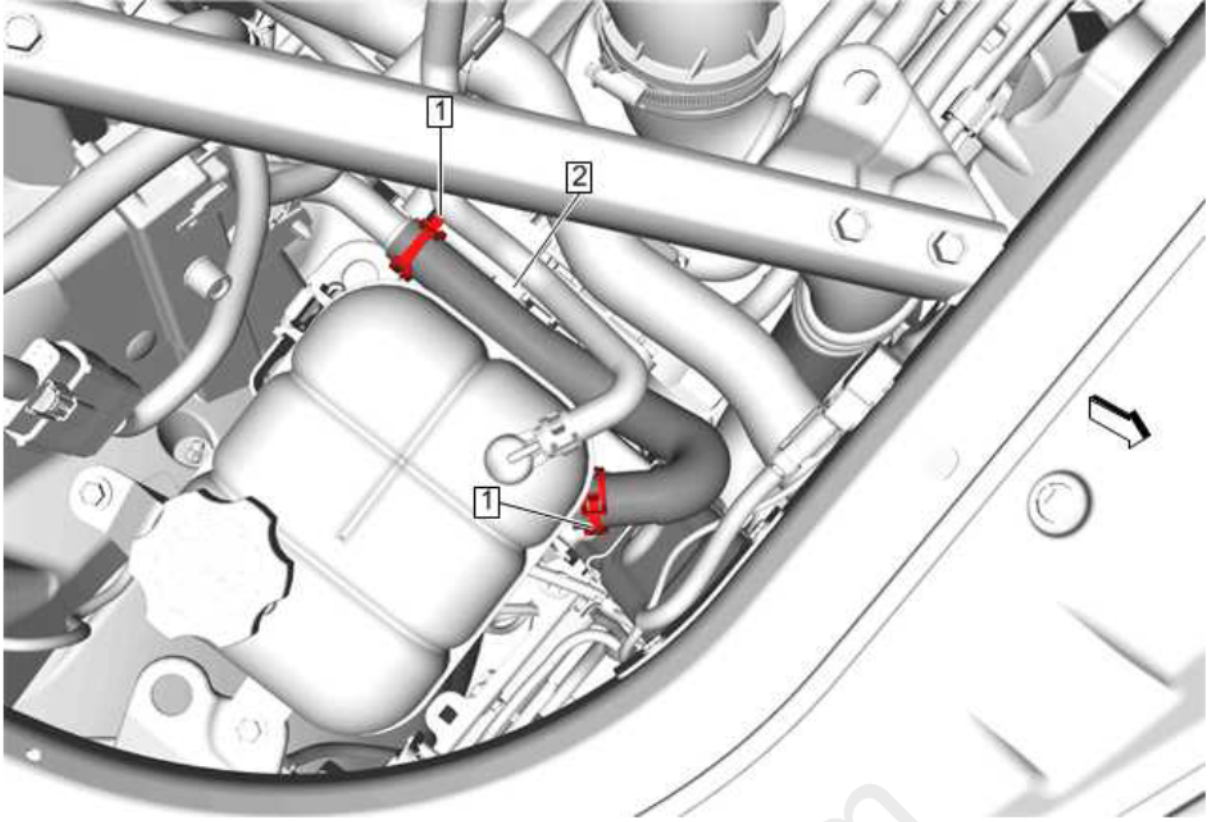


Fig. 667: Radiator Surge Tank Inlet Hose (LTG)
Courtesy of GENERAL MOTORS COMPANY

11. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

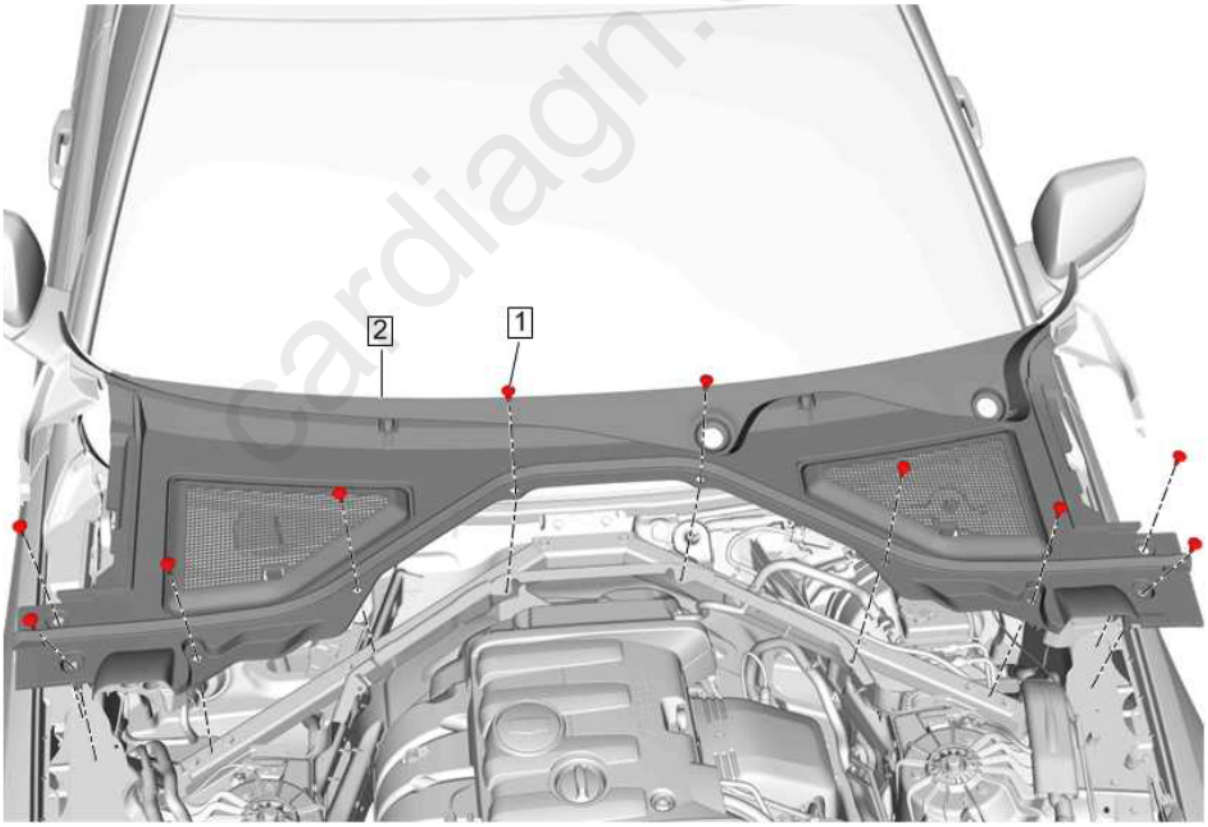


Fig. 668: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

12. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**
13. Heater Outlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

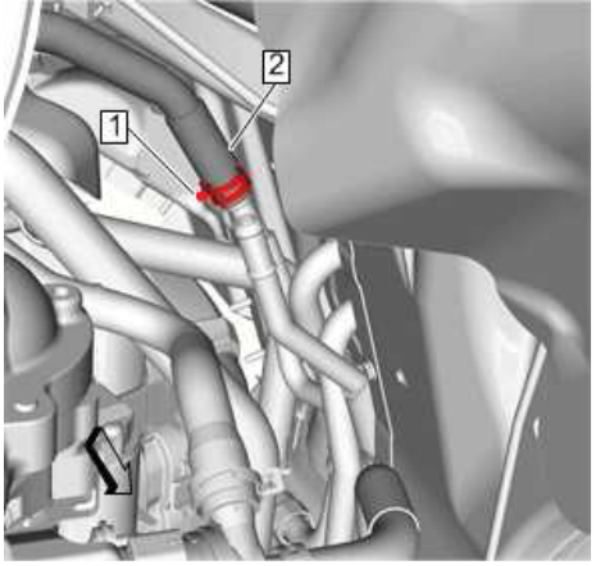


Fig. 669: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

14. Heater Outlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**
15. Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

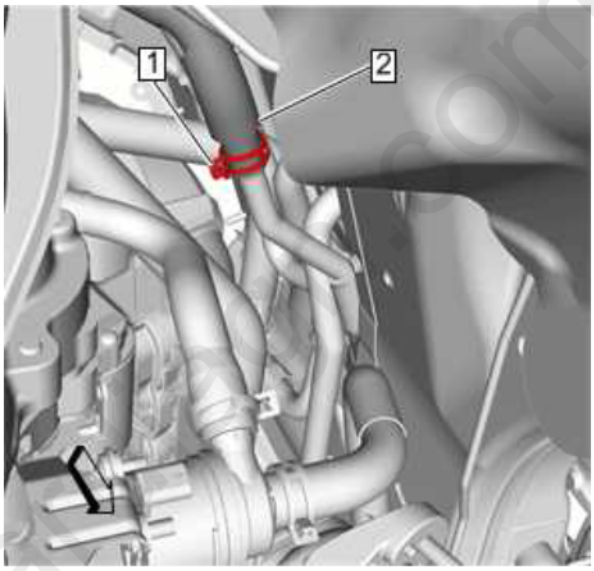


Fig. 670: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

16. Heater Inlet Hose Clamp (1) Engage - **Hose Clamp Replacement Guidelines - Spring Type**
17. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
18. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
19. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LGW WITH CJ2)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

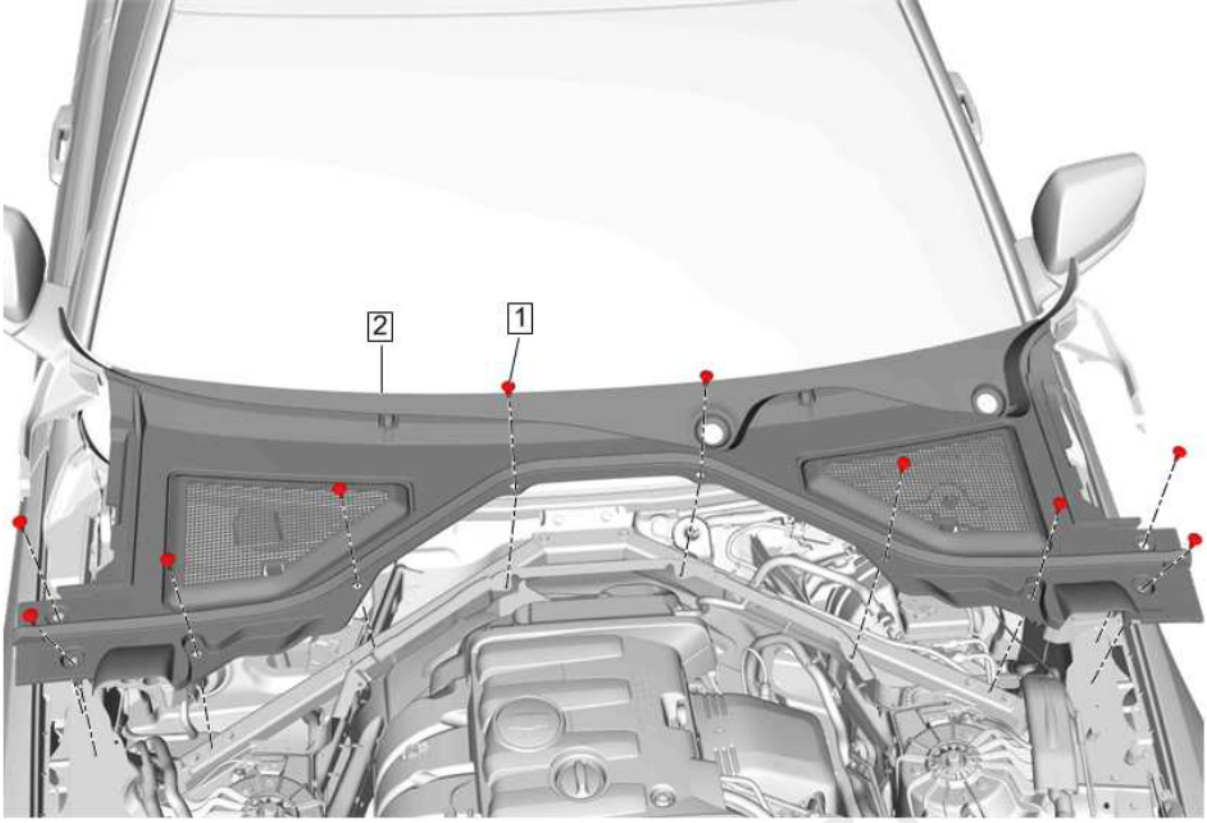


Fig. 671: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LGW)**

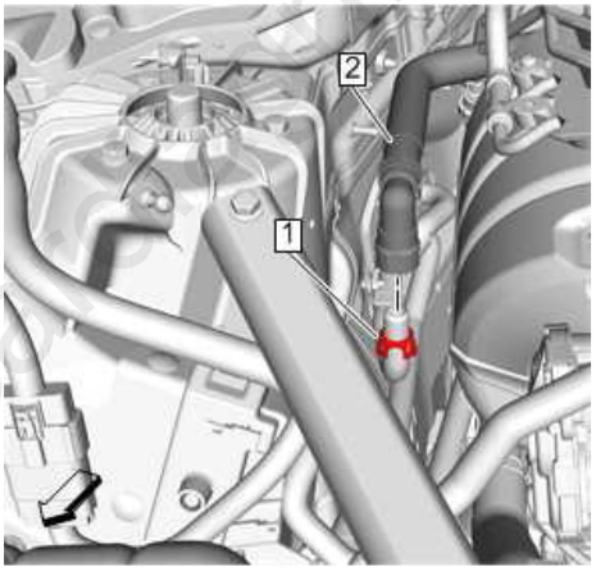


Fig. 672: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Radiator Surge Tank Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Radiator Surge Tank Inlet Hose Replacement (LGW)**

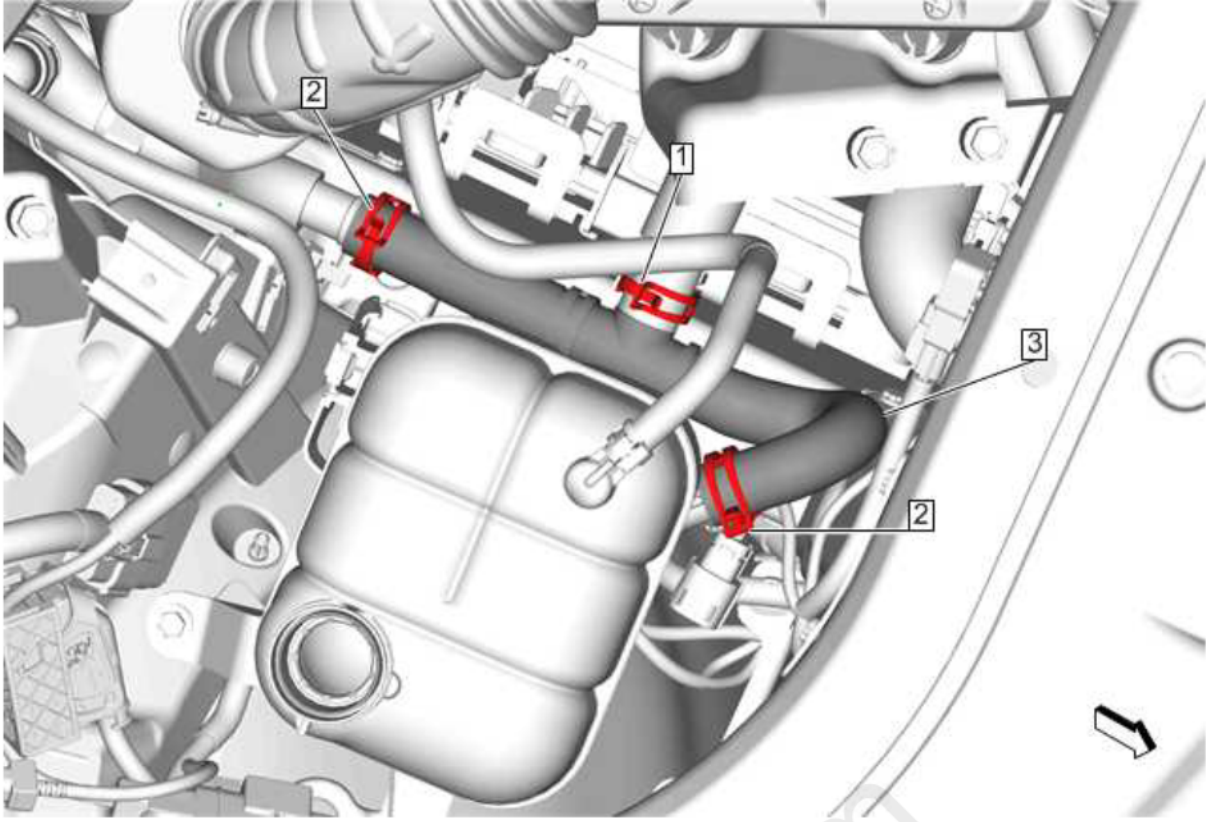


Fig. 673: Radiator Surge Tank Inlet Hose (LGW)
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

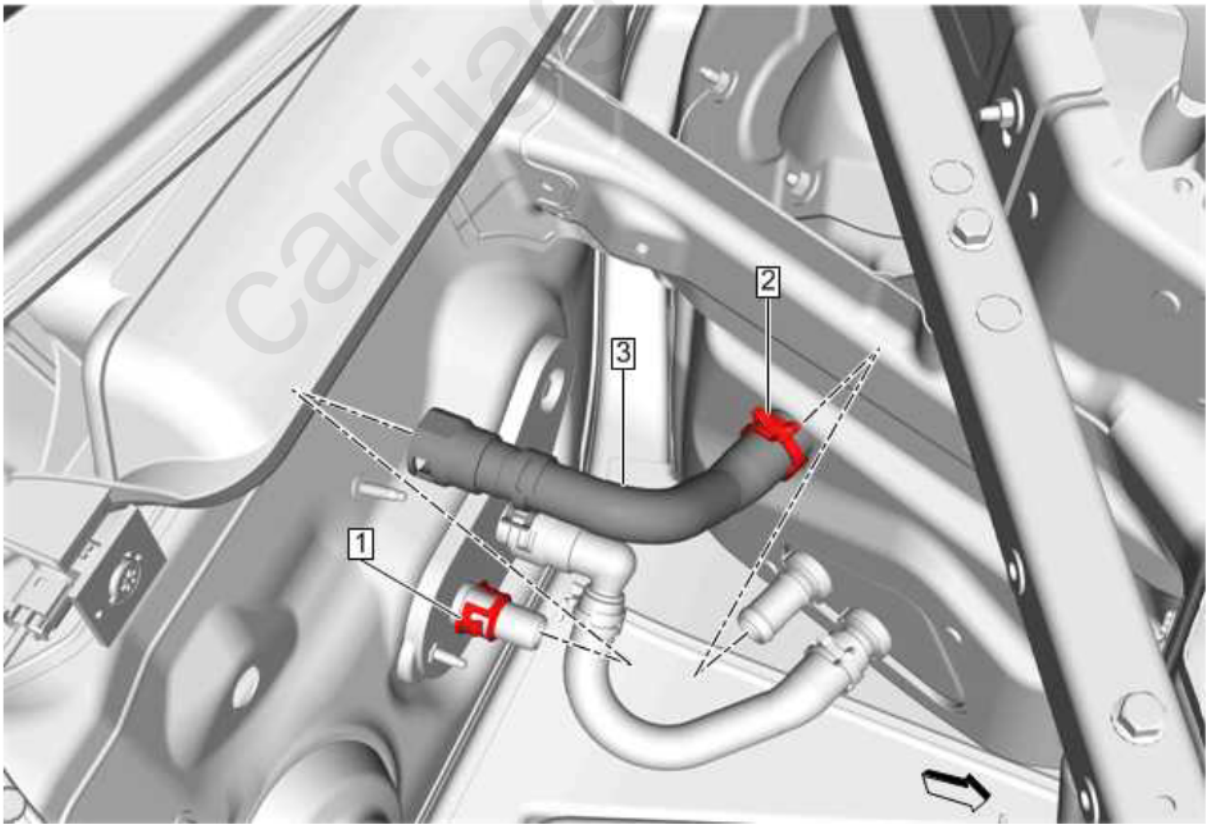


Fig. 674: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

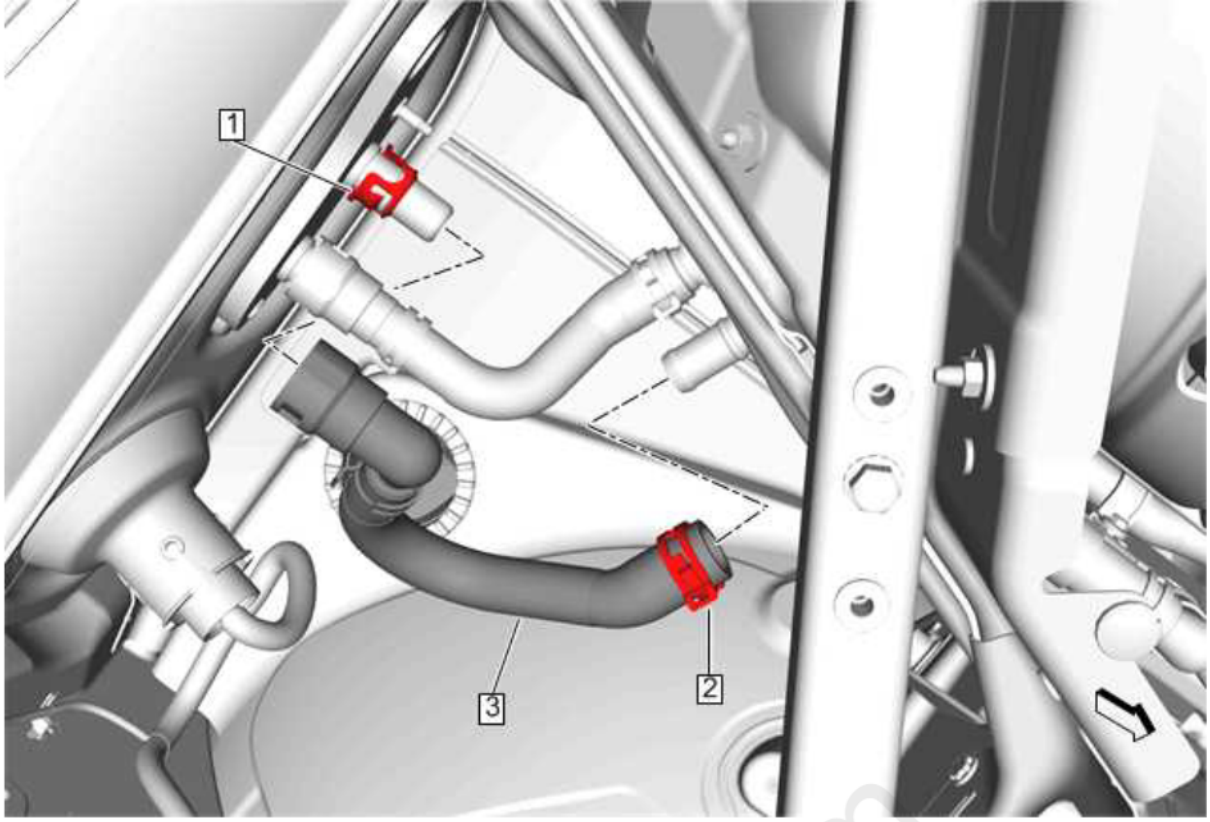


Fig. 675: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

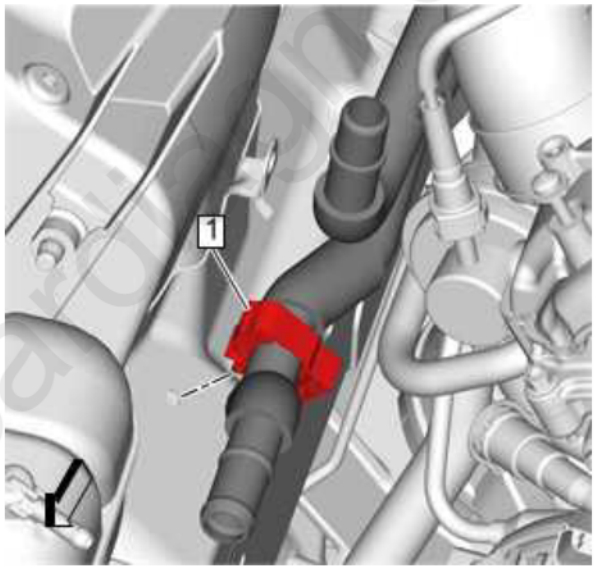


Fig. 676: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

8. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

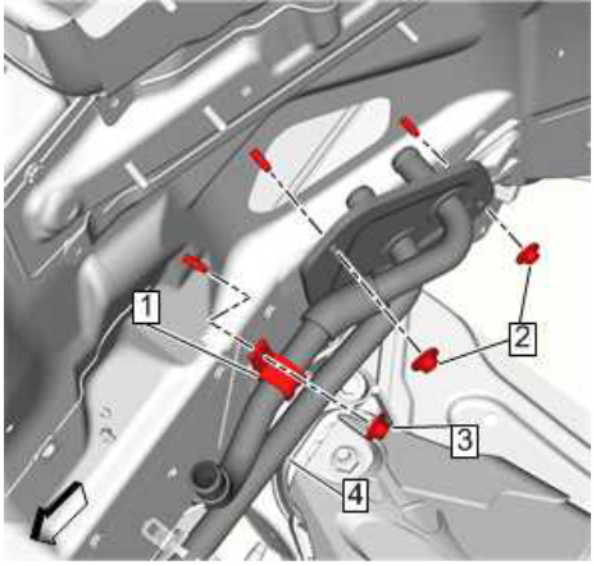


Fig. 677: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
10. Heater Inlet Pipe Clip (1)Â» Remove
11. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
12. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

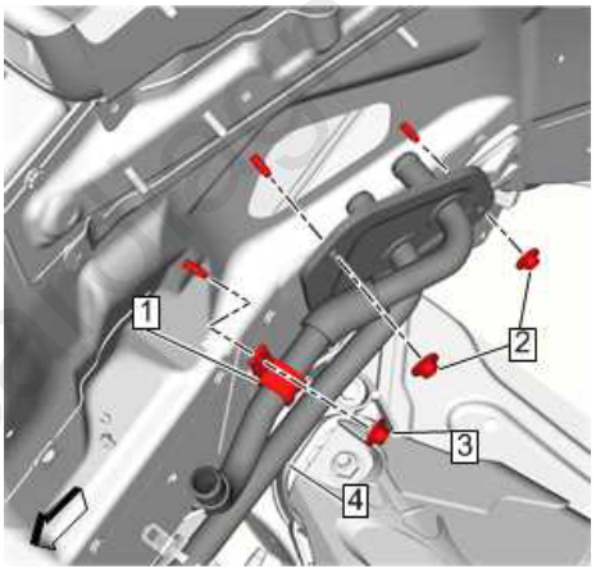


Fig. 678: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Clip (1)Â» Install
3. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

4. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten 9 N.m (80 lb in)
5. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

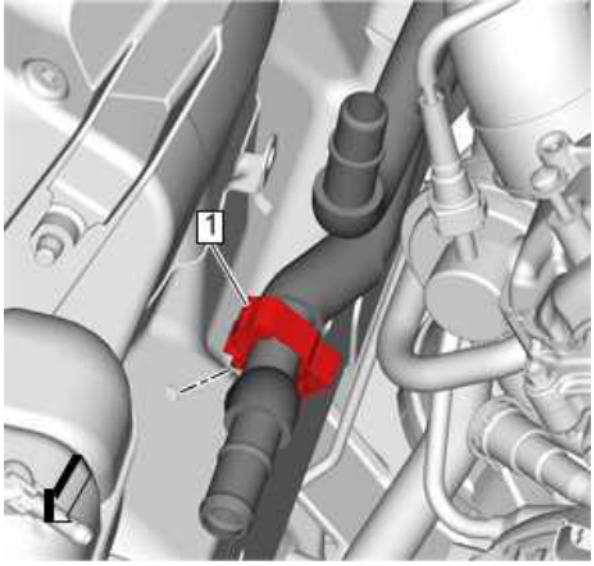


Fig. 679: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (At Heater Core Tube LGW LTG without HP9)Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

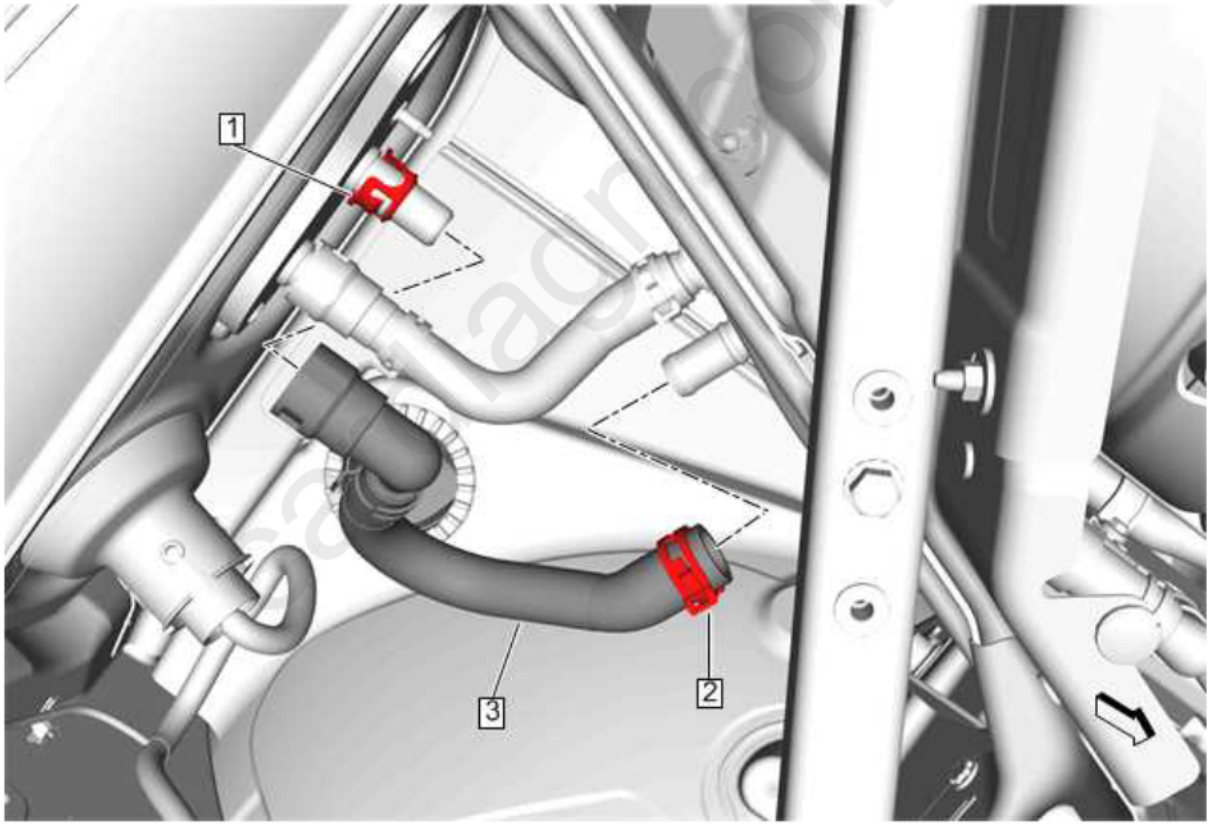


Fig. 680: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGW LTG without HP9)Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)**

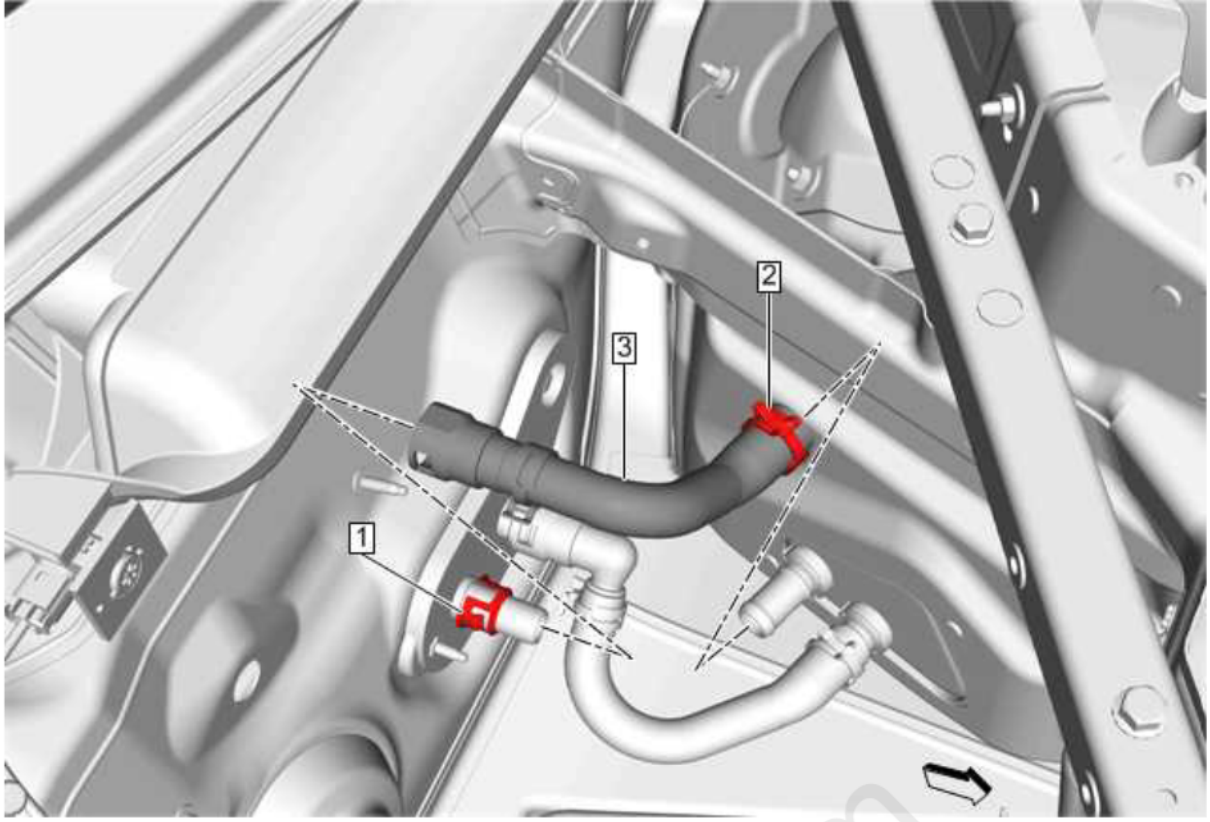


Fig. 681: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Radiator Surge Tank Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Radiator Surge Tank Inlet Hose Replacement (LGW)**

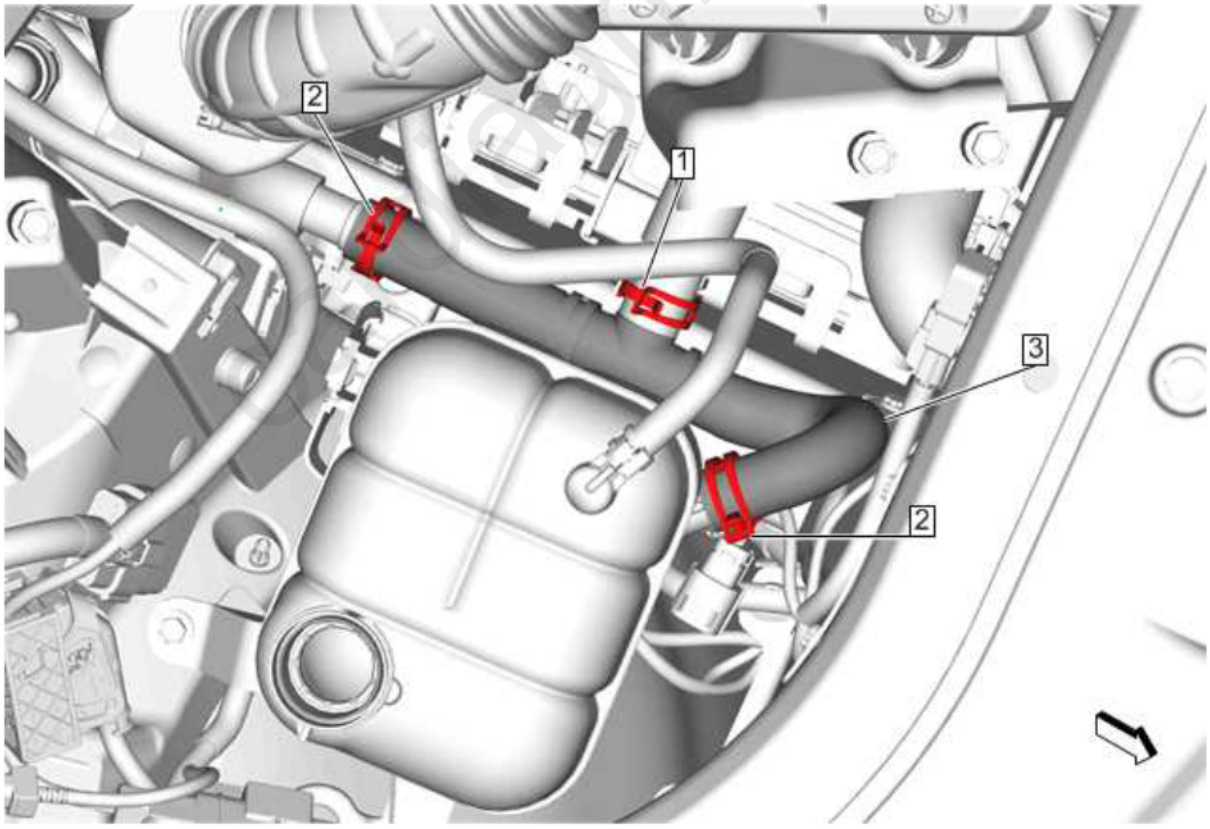


Fig. 682: Radiator Surge Tank Inlet Hose (LGW)
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LGW)**

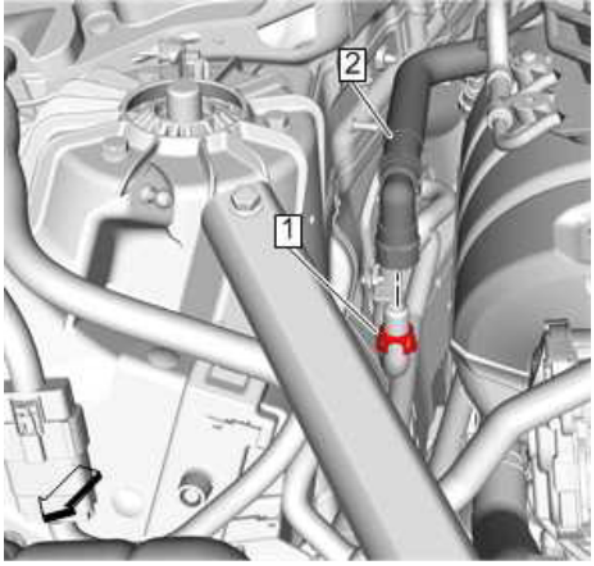


Fig. 683: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

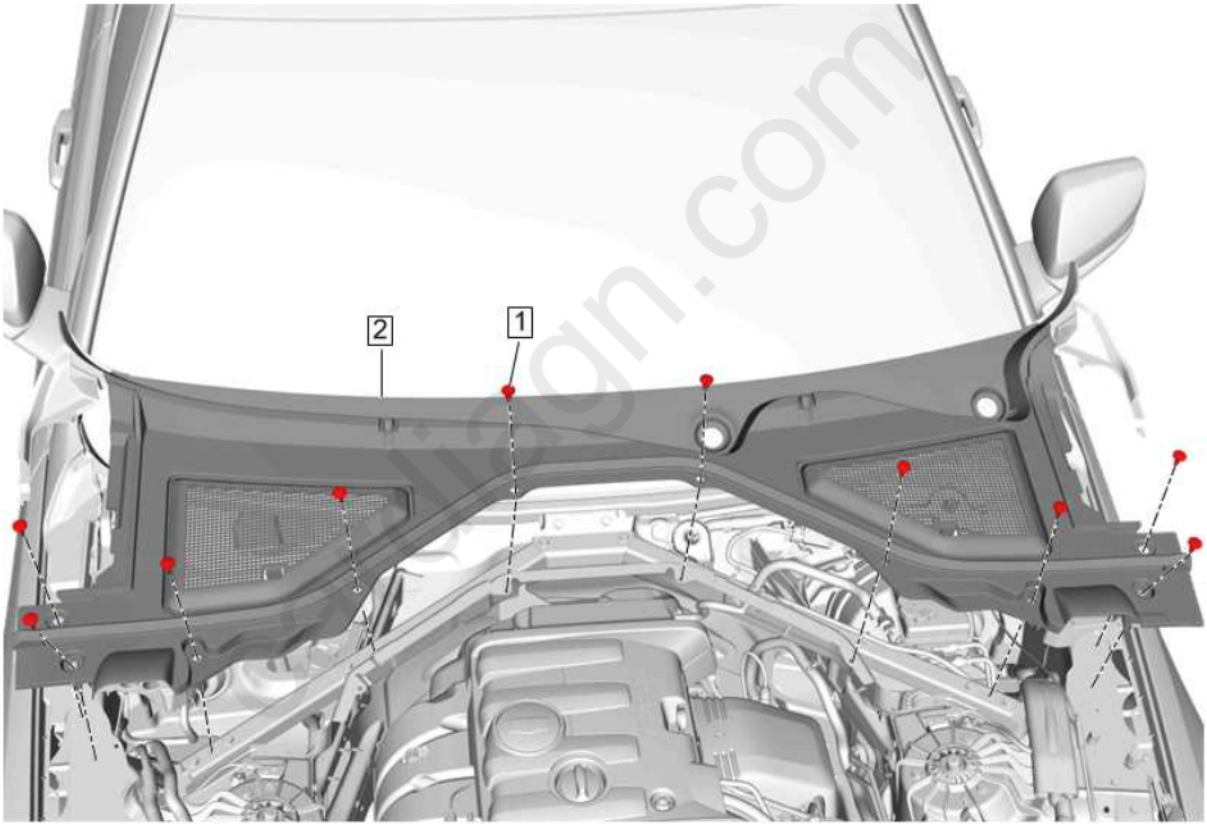


Fig. 684: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

11. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
12. Start the engine and check for coolant leaks.

AUXILIARY HEATER INLET AND OUTLET PIPE REPLACEMENT (LGX, WITH CJ2)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
2. Air Inlet Grille Panel (2)Â» Remove - **Air Inlet Grille Panel Replacement**

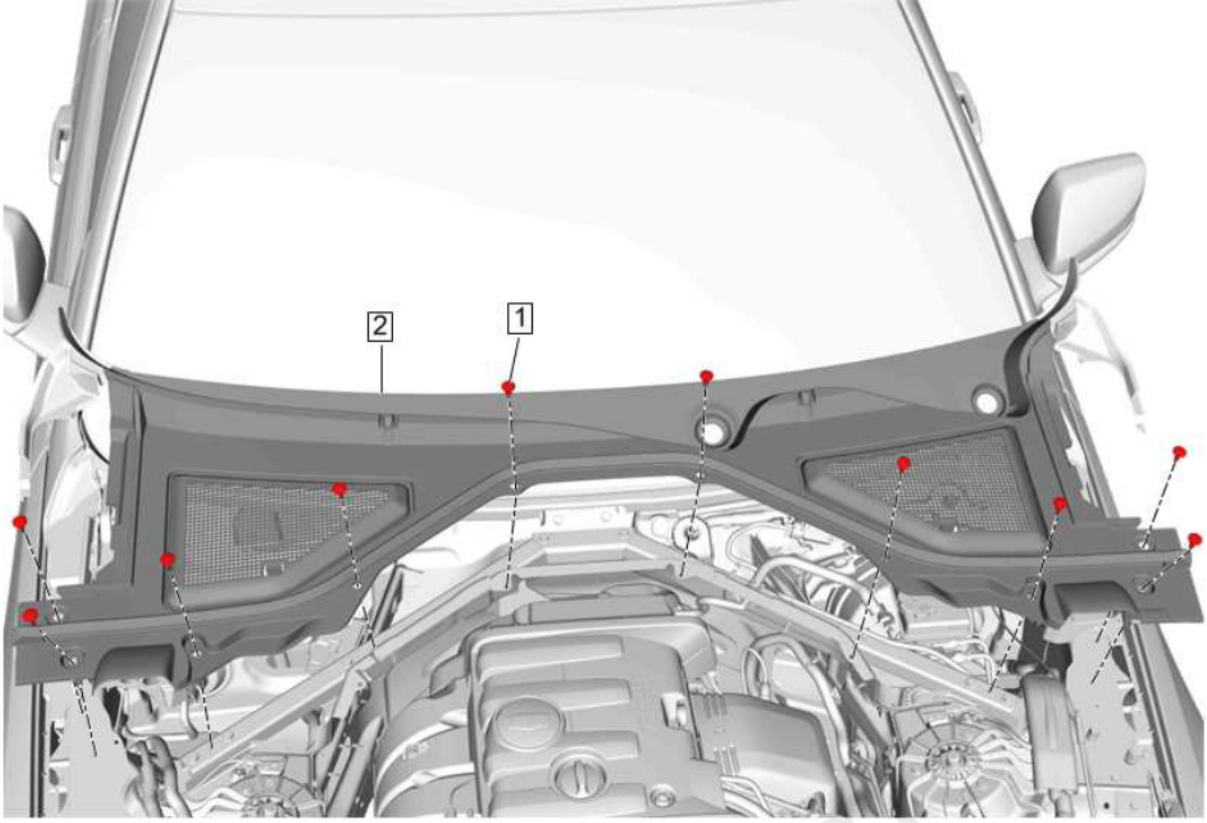


Fig. 685: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Auxiliary Heater Inlet Hose Replacement (LGX)**

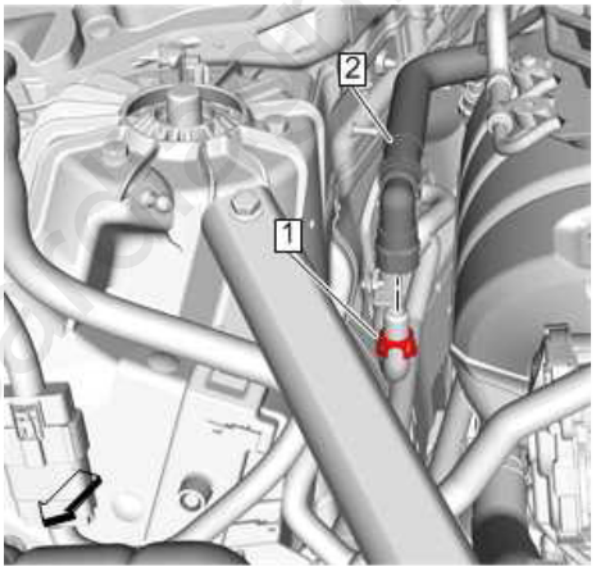


Fig. 686: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Disconnect - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGX)**

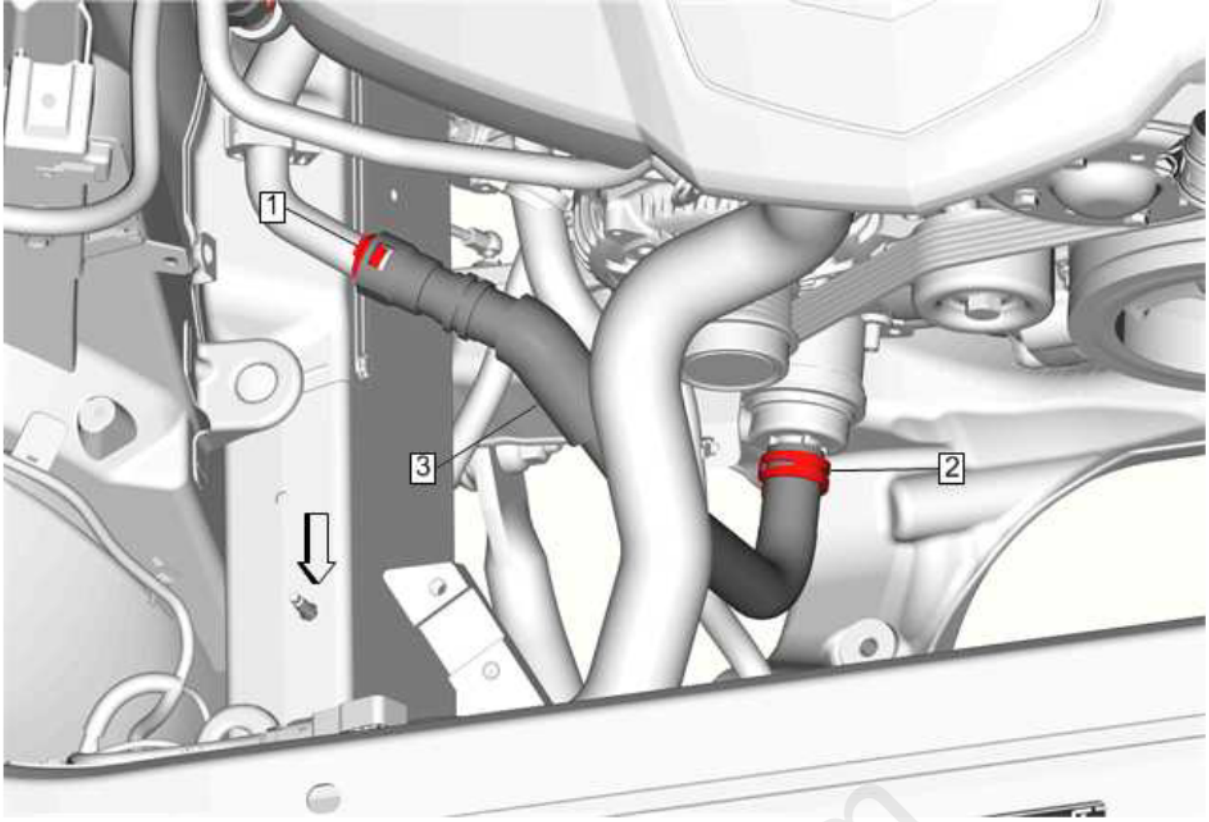


Fig. 687: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)**

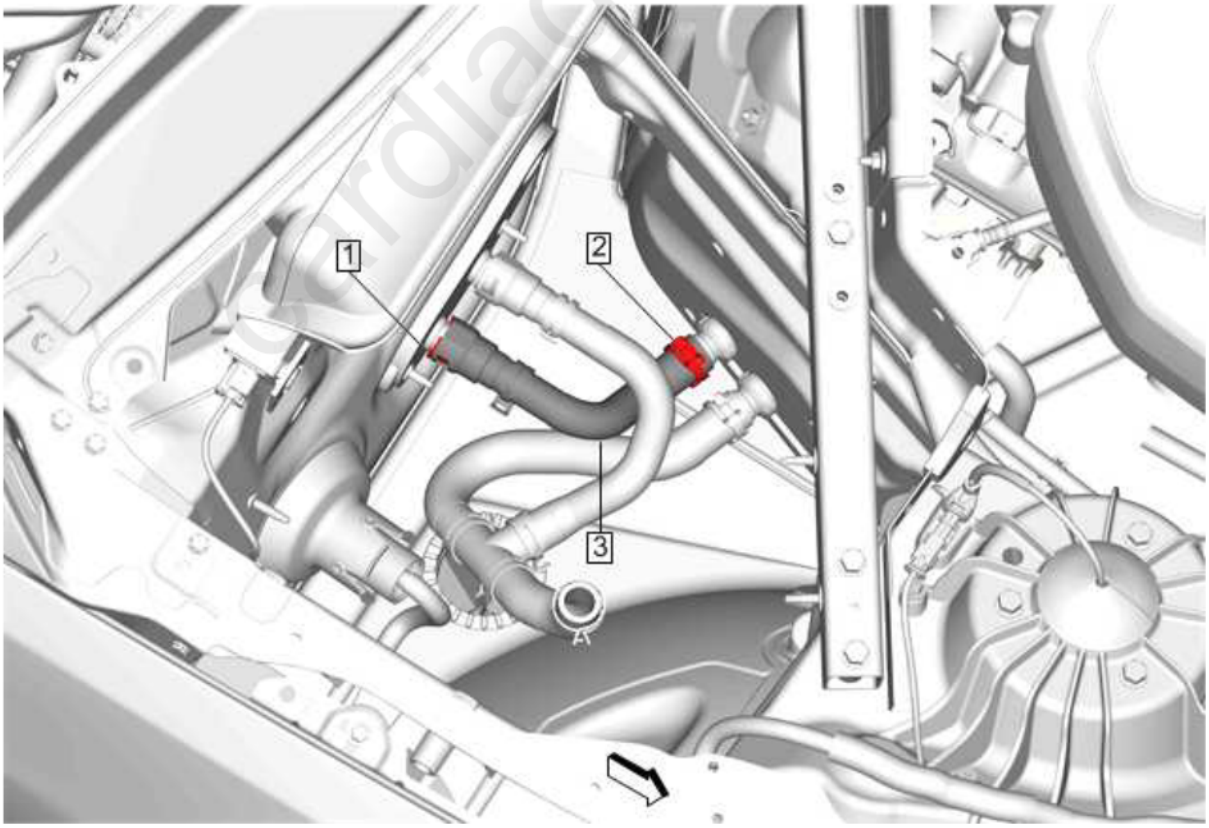


Fig. 688: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove - **Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)**

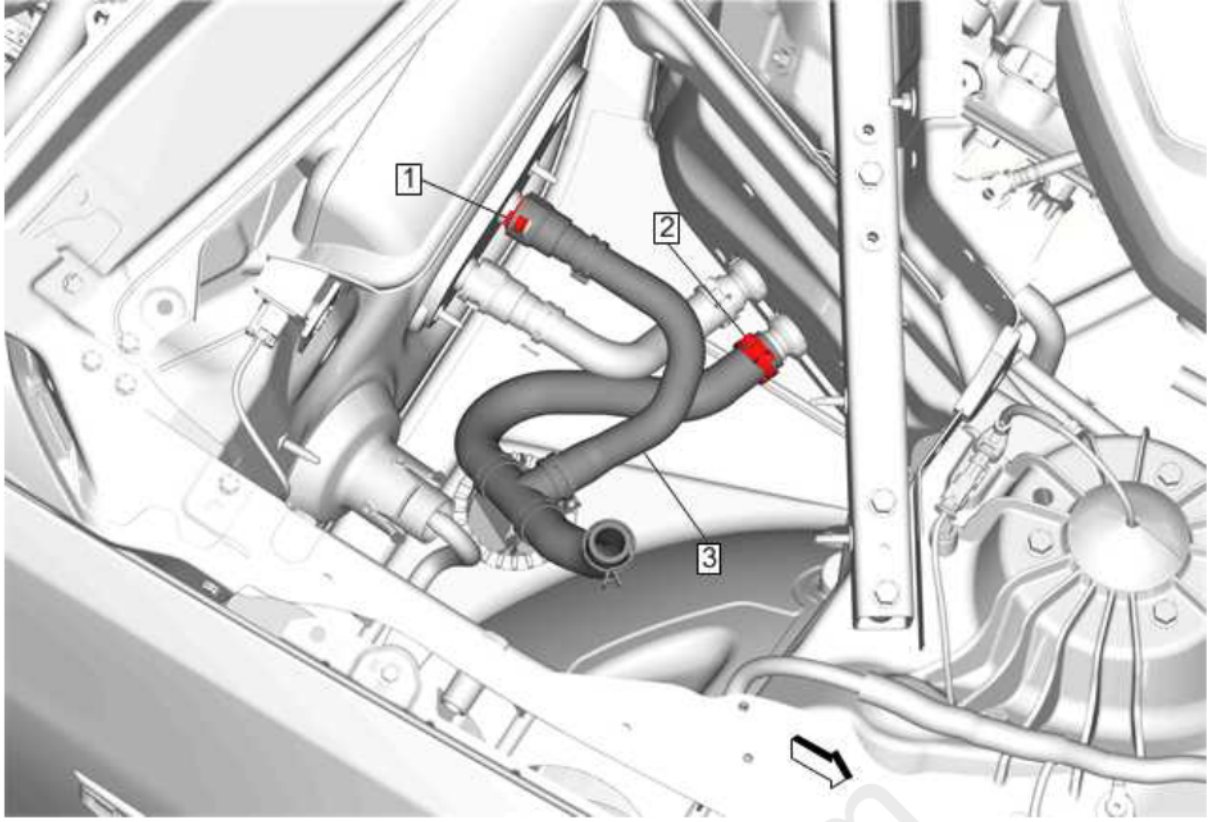


Fig. 689: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Remove

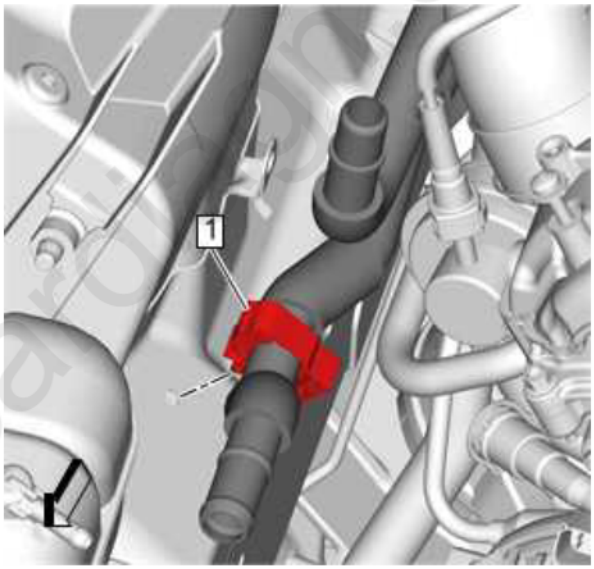


Fig. 690: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

8. Heater Inlet and Outlet Pipe Nut (2)Â» Remove [2x]

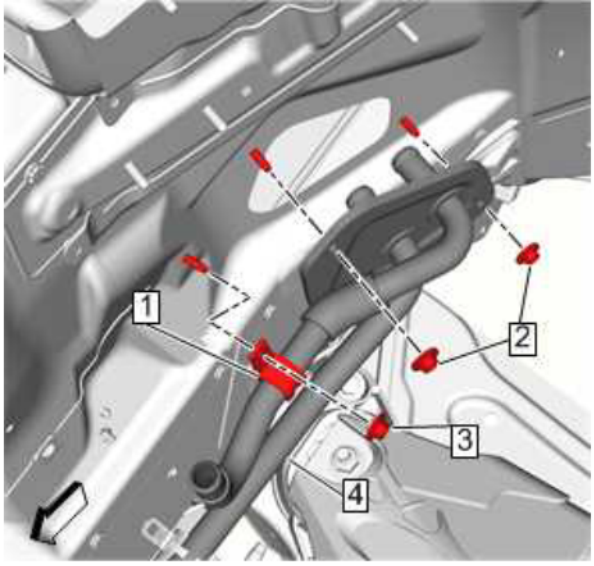


Fig. 691: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet and Outlet Hose Clip Nut (3)Â» Remove
10. Heater Inlet Pipe Clip (1)Â» Remove
11. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Remove
12. Transfer components as necessary.

Installation Procedure

1. Auxiliary Heater Inlet and Outlet Pipe (4)Â» Install

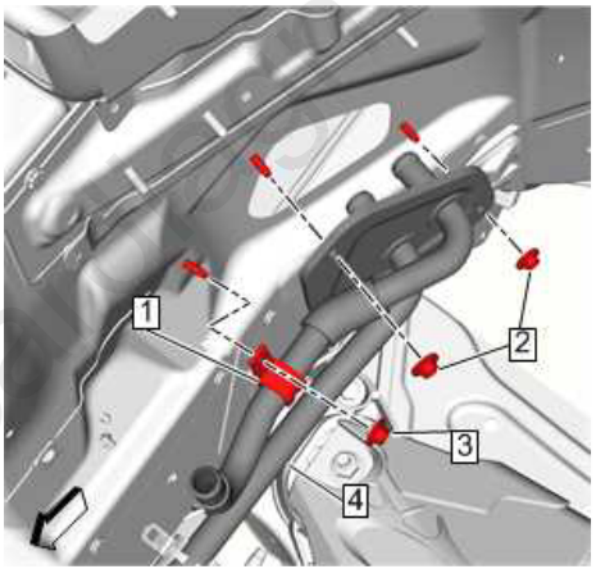


Fig. 692: Auxiliary Heater Inlet And Outlet Pipe With Retainers
Courtesy of GENERAL MOTORS COMPANY

2. Heater Inlet Pipe Clip (1)Â» Install
3. Heater Inlet and Outlet Pipe Nut (3)Â» Install and tighten 9 N.m (80 lb in)

CAUTION: **Refer to Fastener Caution .**

4. Heater Inlet and Outlet Pipe Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]
5. Auxiliary Heater Inlet and Outlet Pipe Clip (1)Â» Install

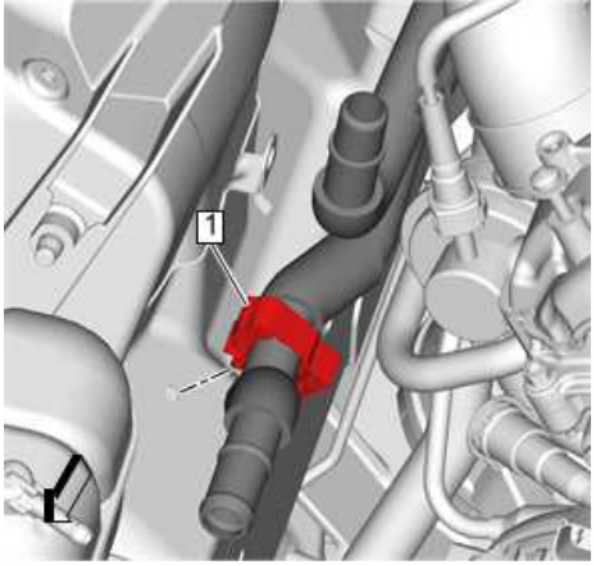


Fig. 693: Auxiliary Heater Inlet and Outlet Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

6. Heater Outlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Outlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Outlet Hose Replacement (At Heater Core Tube LGX)**

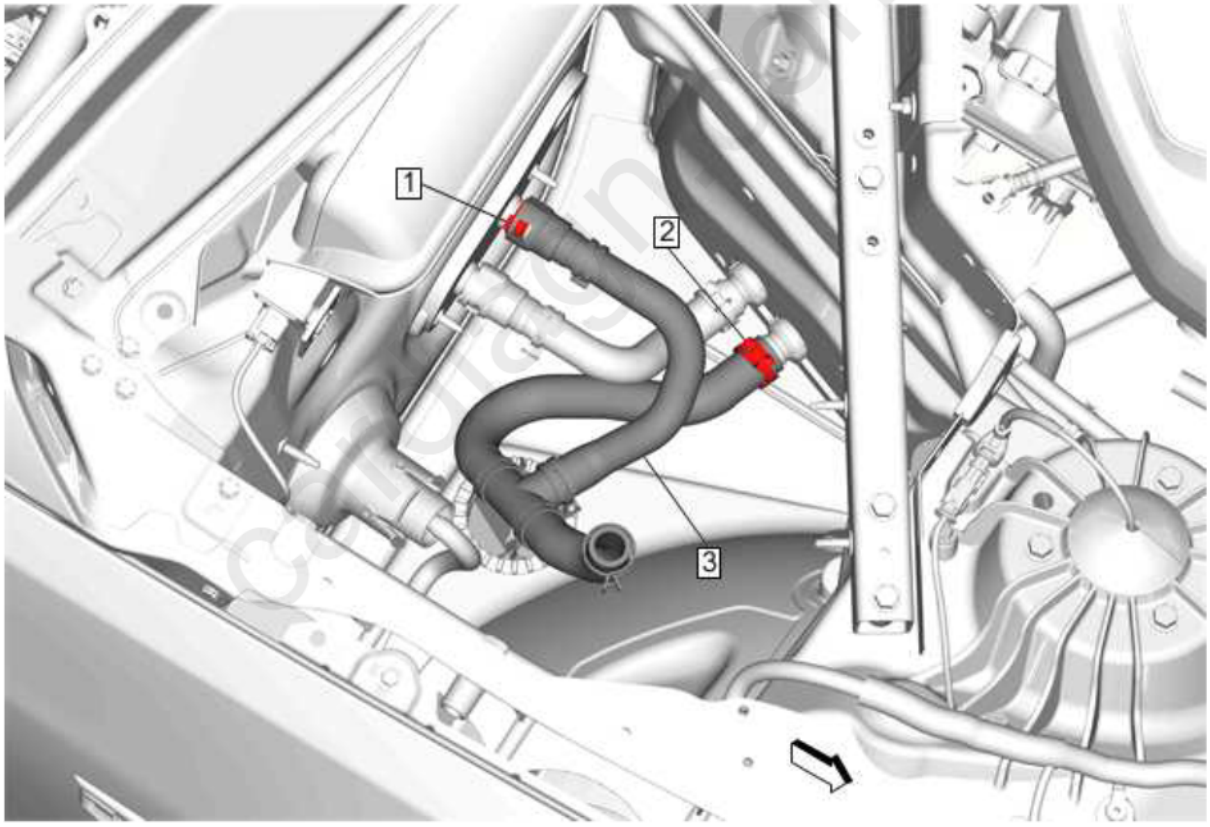


Fig. 694: Heater Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Heater Inlet Hose Replacement (Auxiliary Heater Inlet and Outlet Pipe to Auxiliary Air Conditioning Evaporator Intermediate Tube LGW LGX)Heater Inlet Hose Replacement (At Heater Core Inlet Tube LGX)**

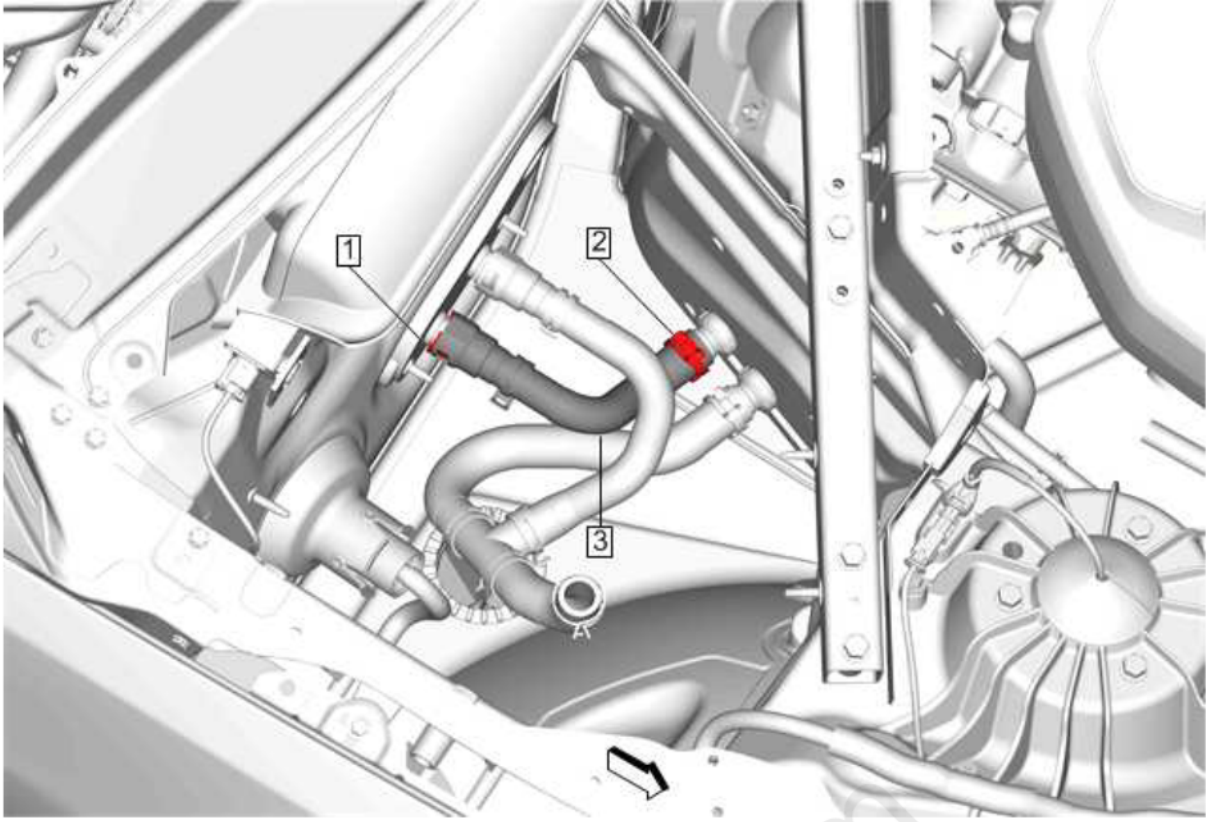


Fig. 695: Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Inlet Hose (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Connect - **Heater Water Auxiliary Pump Inlet Hose Replacement (LGX)**

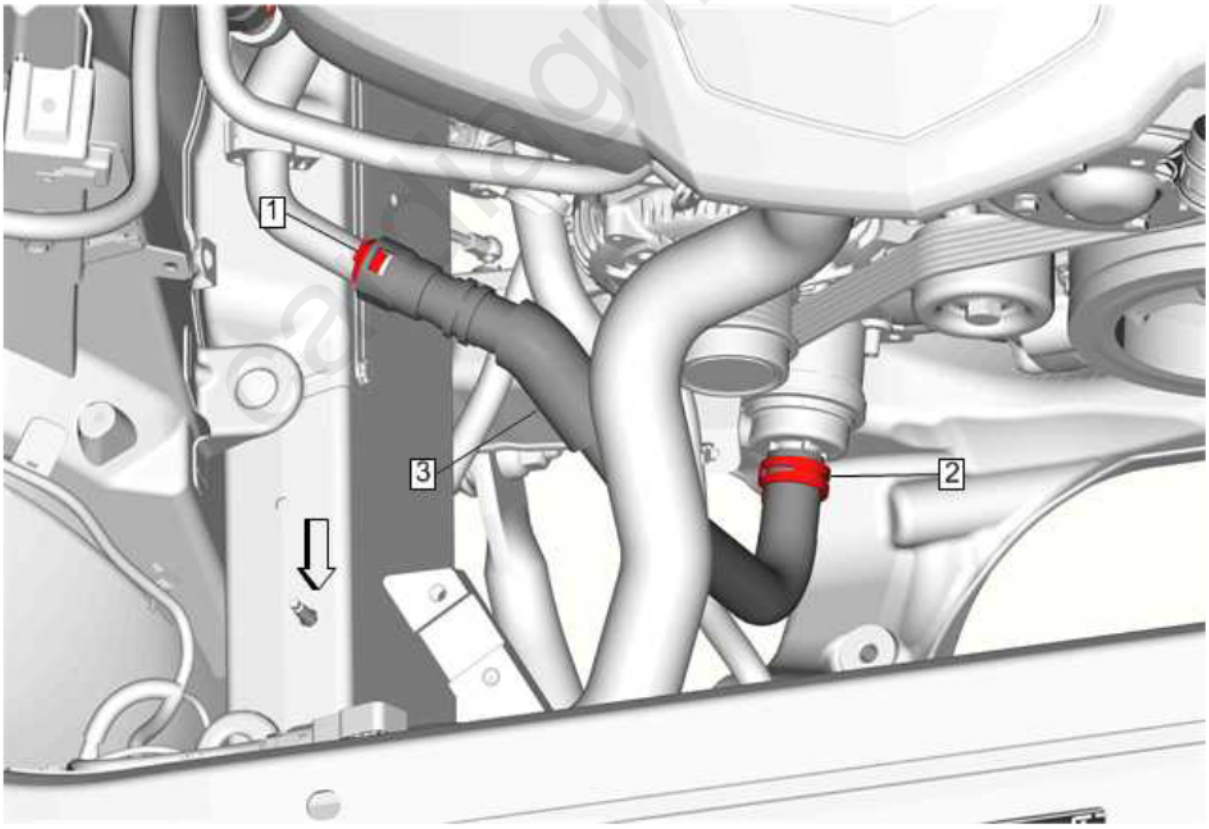


Fig. 696: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install - **Auxiliary Heater Inlet Hose Replacement (LGX)**

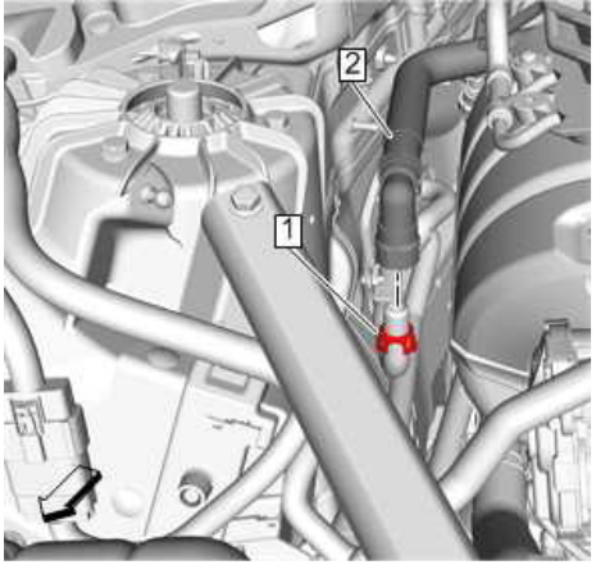


Fig. 697: Auxiliary Heater Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

10. Air Inlet Grille Panel (2)Â» Install - **Air Inlet Grille Panel Replacement**

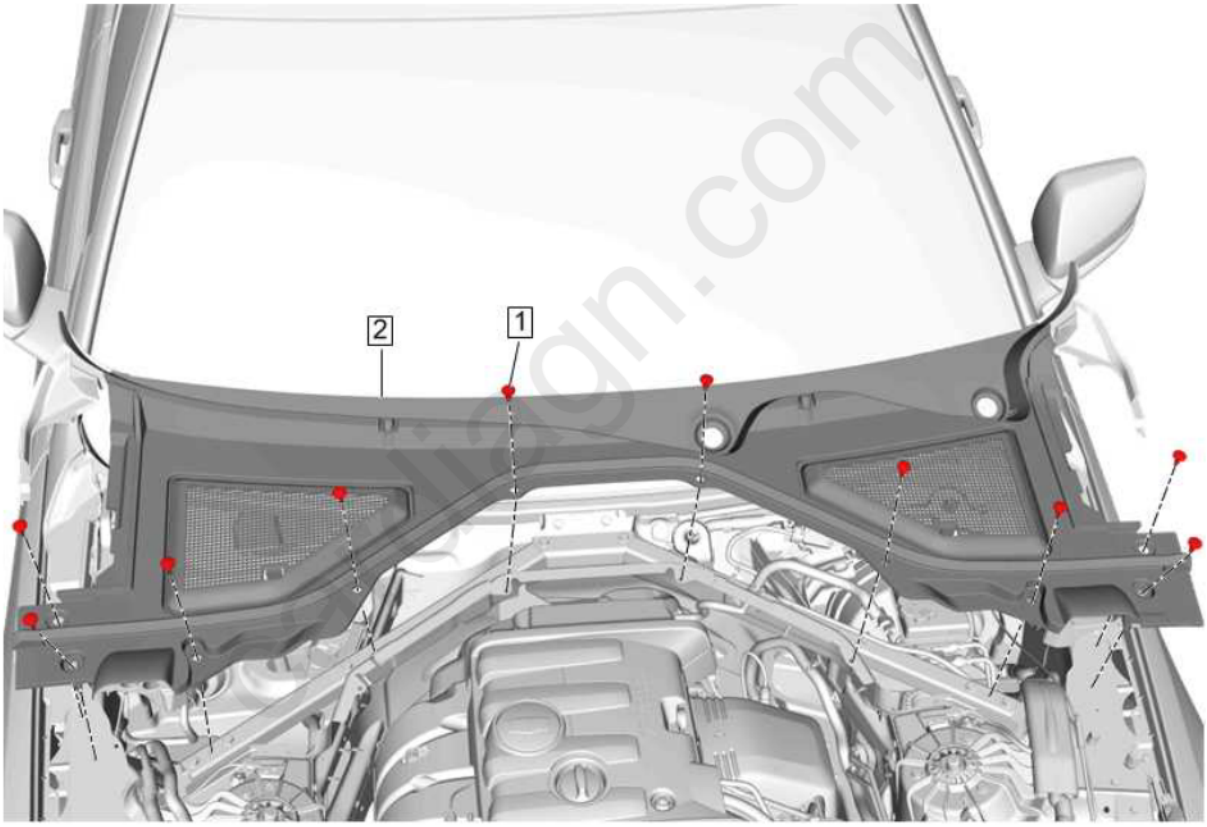


Fig. 698: Air Inlet Grille Panel
Courtesy of GENERAL MOTORS COMPANY

11. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)**
12. Start the engine and check for coolant leaks.

AUXILIARY BLOWER MOTOR CONTROL REPLACEMENT

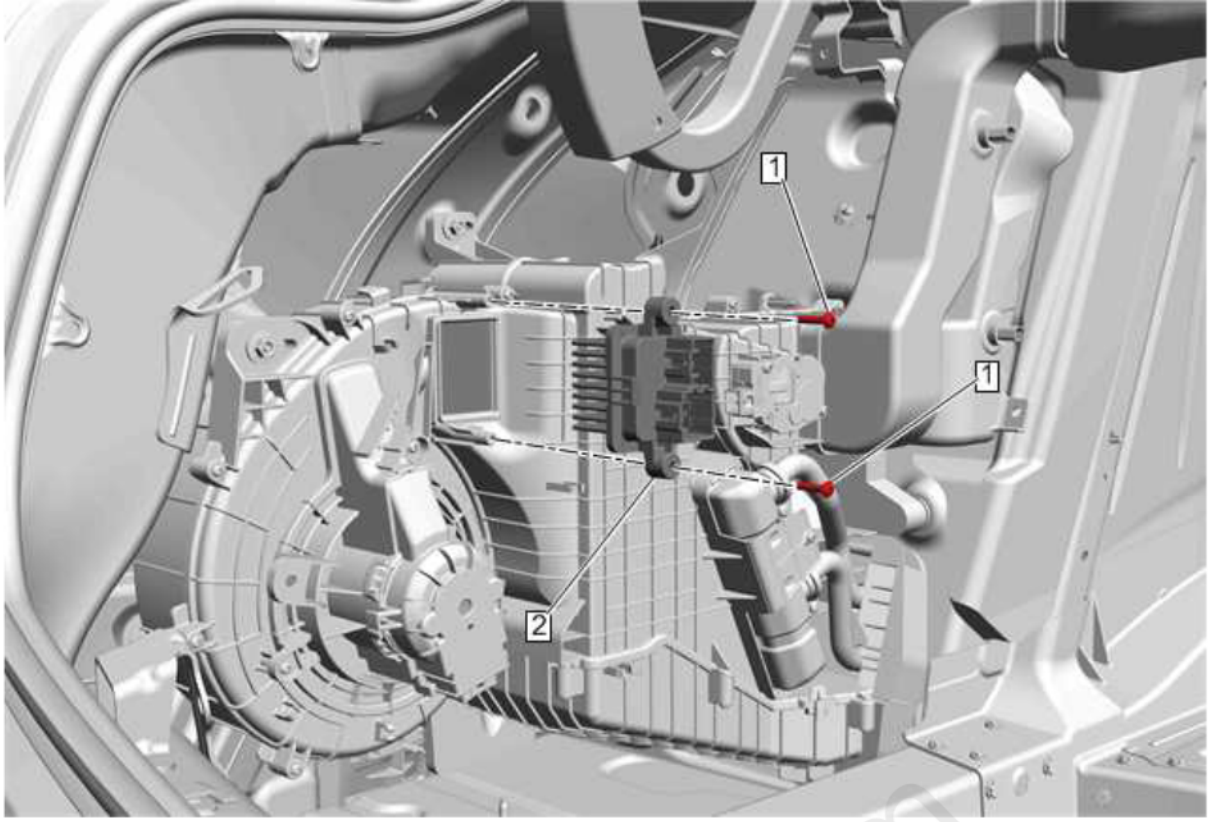


Fig. 699: Auxiliary Blower Motor Control
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)	
1	Auxiliary Blower Motor Control Module Bolt [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1.5 N.m (13 lb in)
2	Auxiliary Blower Motor Control **Procedure** Disconnect the electrical connectors.

AUXILIARY BLOWER MOTOR REPLACEMENT

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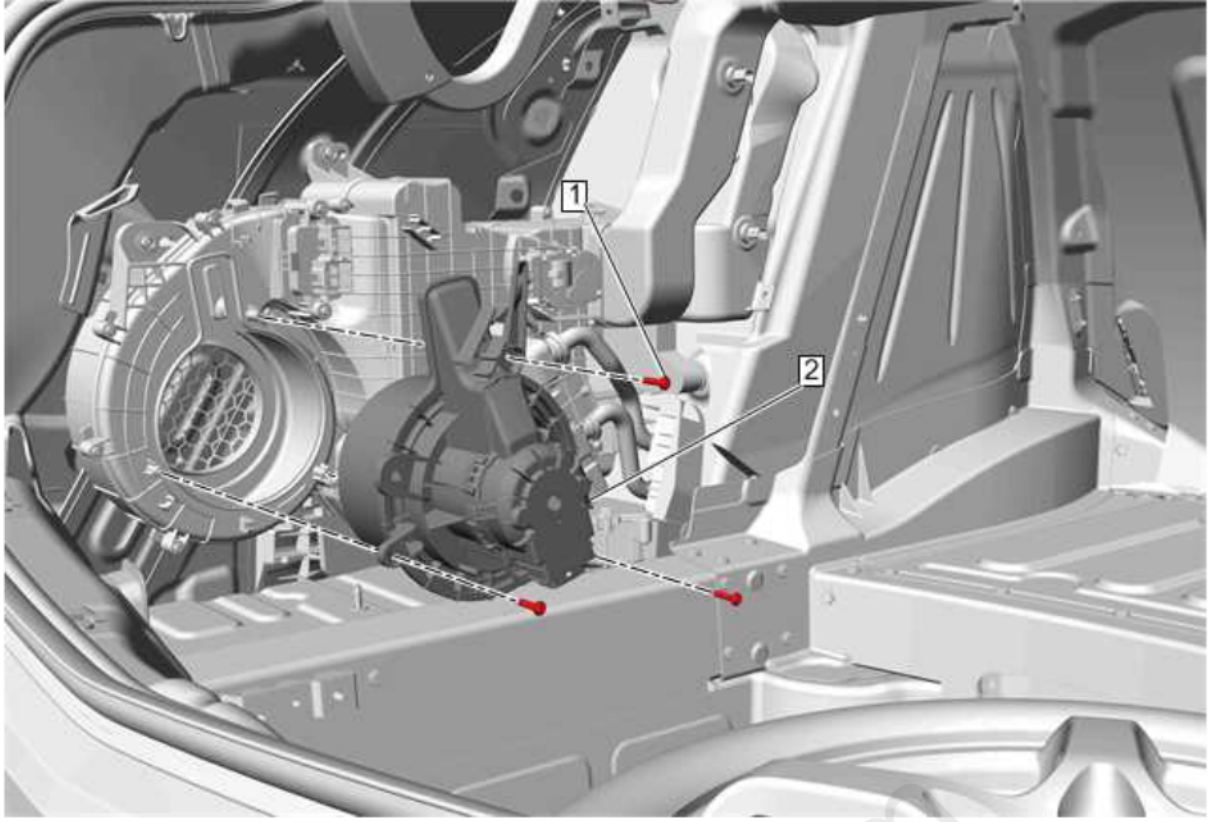


Fig. 700: Auxiliary Blower Motor
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)	
1	Auxiliary Blower Motor Fastener [3x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1.5 N.m (13 lb in)
2	Auxiliary Blower Motor **Procedure** Disconnect the electrical connectors.

AUXILIARY AIR CONDITIONING AIR OUTLET REPLACEMENT (LEFT)

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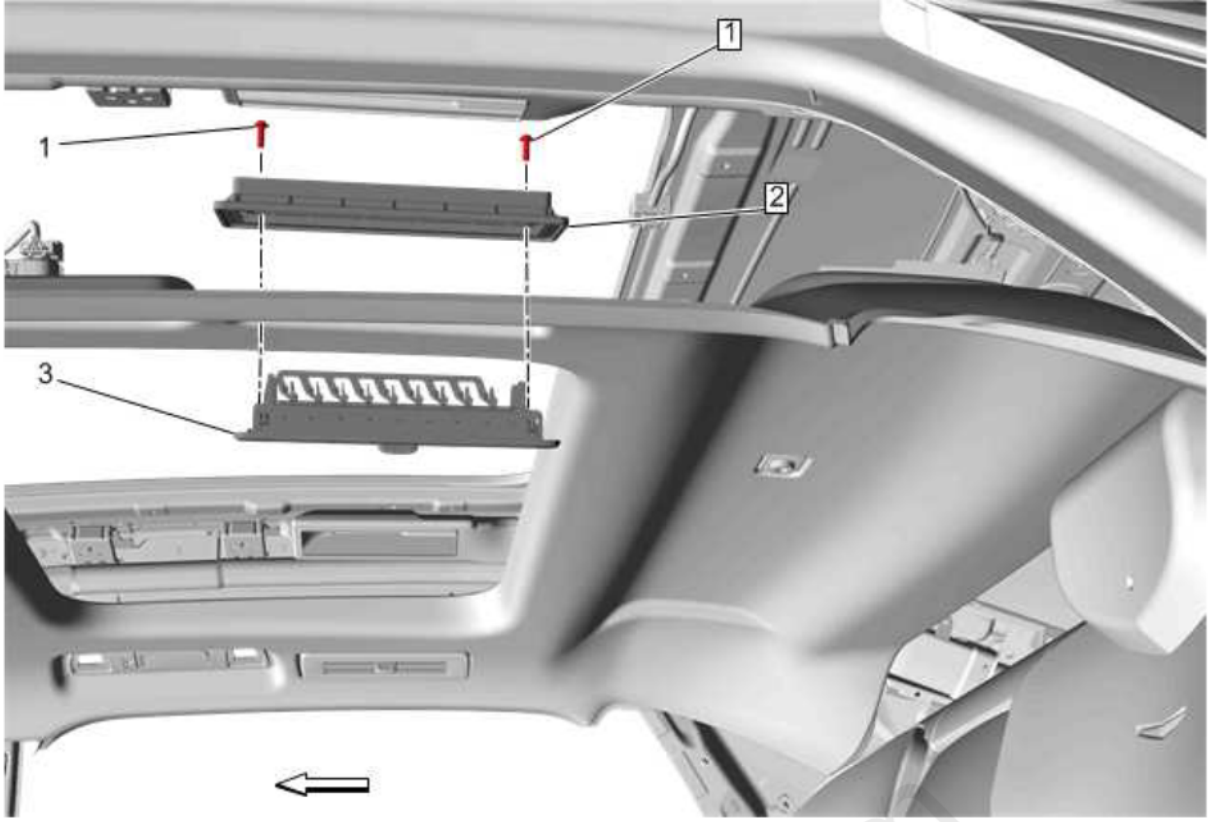


Fig. 701: Auxiliary Air Conditioning Air Outlet (Left)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Lower the headlining trim panel. Refer to Headlining Trim Panel Replacement (Without C3U) and/or Headlining Trim Panel Replacement (With C3U)	
1	Auxiliary Air Conditioning Air Outlet Duct Fastener [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Auxiliary Air Conditioning Air Outlet Bracket
3	Auxiliary Air Conditioning Air Outlet Duct - Left Side

AUXILIARY AIR CONDITIONING AIR OUTLET REPLACEMENT (RIGHT)

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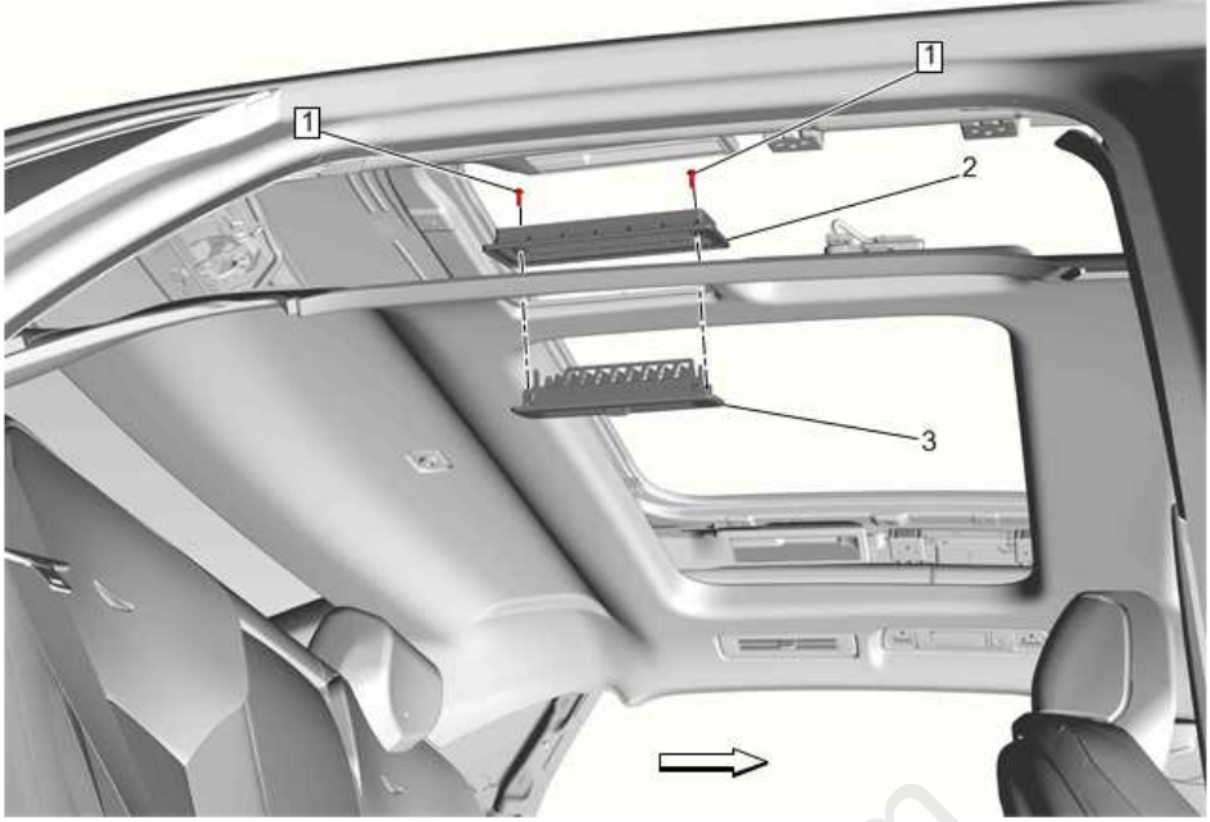


Fig. 702: Auxiliary Air Conditioning Air Outlet (Right)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Lower the headlining trim panel. Refer to **Headlining Trim Panel Replacement (Without C3U)** and/or **Headlining Trim Panel Replacement (With C3U)**	
1	Auxiliary Air Conditioning Air Outlet Duct Fastener [2x] **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Auxiliary Air Conditioning Air Outlet Bracket
3	Auxiliary Air Conditioning Air Outlet Duct - Right Side

AUXILIARY AIR CONDITIONING AIR OUTLET DUCT REPLACEMENT (RIGHT SIDE)

Removal Procedure

1. It is only necessary to lower the headlining. Only do those steps in the headlining procedure that will allow access to the component being removed. Refer to **Headlining Trim Panel Replacement (Without C3U)** and/or **Headlining Trim Panel Replacement (With C3U)**

   NOTE: **The headlining trim panel does not have to be removed from vehicle.**

2. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Remove

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Fig. 703: Retainers
Courtesy of GENERAL MOTORS COMPANY

3. Wiring Harness Retainer (2)Â» Remove
4. Auxiliary Air Conditioning Air Outlet Upper Duct Bolt (3)Â» Remove
5. Auxiliary Air Conditioning Air Outlet Upper Duct-Right Side (1)Â» Remove

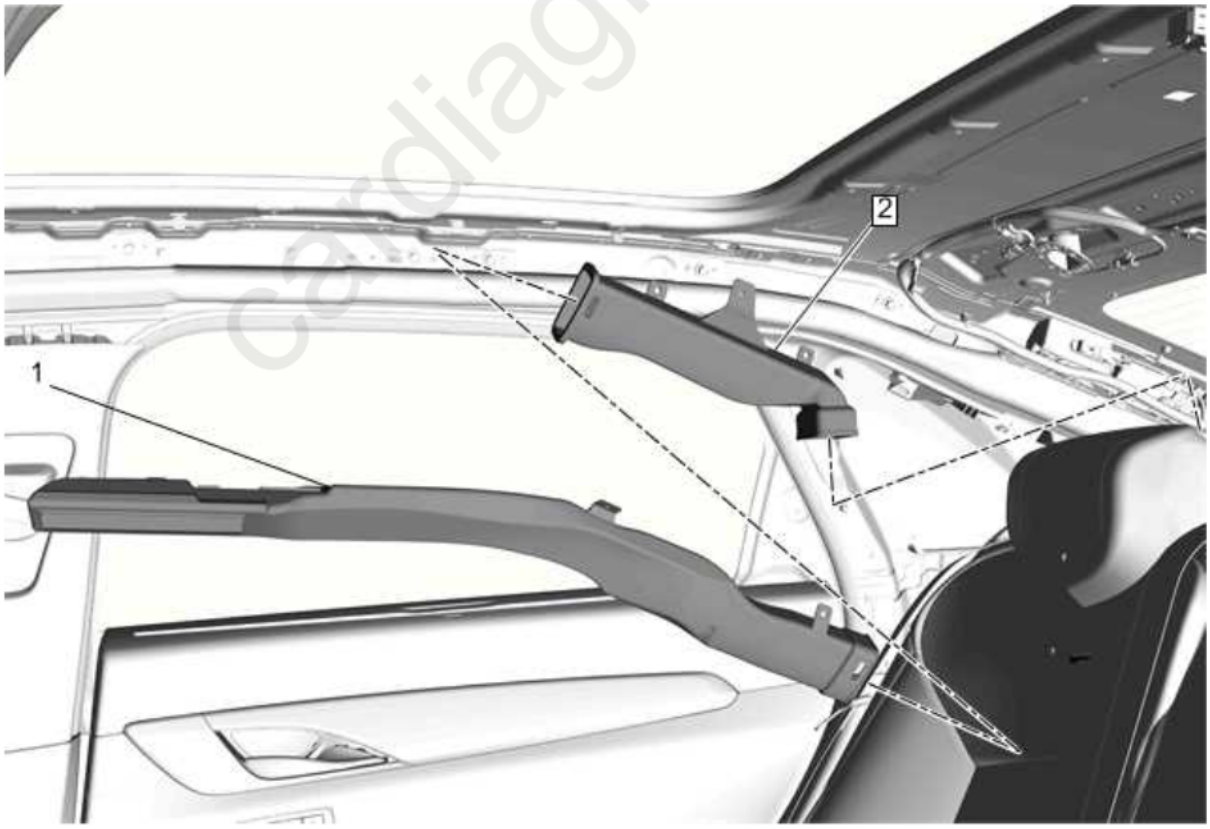


Fig. 704: Auxiliary Air Conditioning Air Outlet Ducts - Right Side
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Air Conditioning Air Outlet Duct - Right Side (2)Â» Remove

Installation Procedure

1. Auxiliary Air Conditioning Air Outlet Duct - Right Side (2)Â» Install

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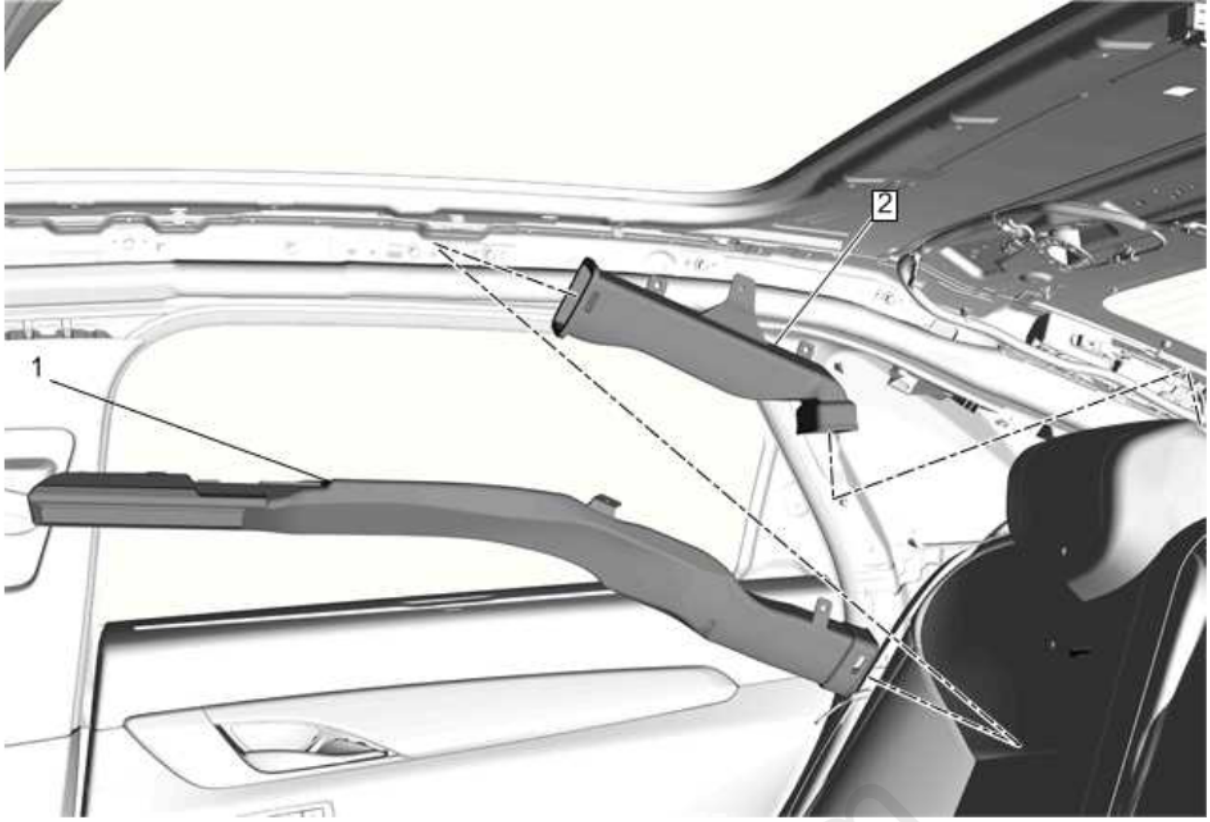


Fig. 705: Auxiliary Air Conditioning Air Outlet Ducts - Right Side
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Air Conditioning Air Outlet Upper Duct - Right Side (1)Â» Install
3. Auxiliary Air Conditioning Air Outlet Upper Duct Bolt (3)Â» Install and tighten 2.5 N.m (22 lb in)



Fig. 706: Retainers
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

4. Wiring Harness Retainer (2)Â» Install
5. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Install

6. Headlining Trim PanelÂ» Install - **Headlining Trim Panel Replacement (Without C3U)** and/or **Headlining Trim Panel Replacement (With C3U)**

AUXILIARY AIR CONDITIONING AIR OUTLET DUCT REPLACEMENT (LEFT SIDE)

Removal Procedure

1. It is only necessary to lower the headlining. Only do those steps in the headlining procedure that will allow access to the component being removed. Refer to **Headlining Trim Panel Replacement (Without C3U)** and/or **Headlining Trim Panel Replacement (With C3U)**

NOTE: **The headlining trim panel does not have to be removed from vehicle.**

2. Auxiliary Air Conditioning Air Outlet Upper Duct Bolt (1)Â» Remove

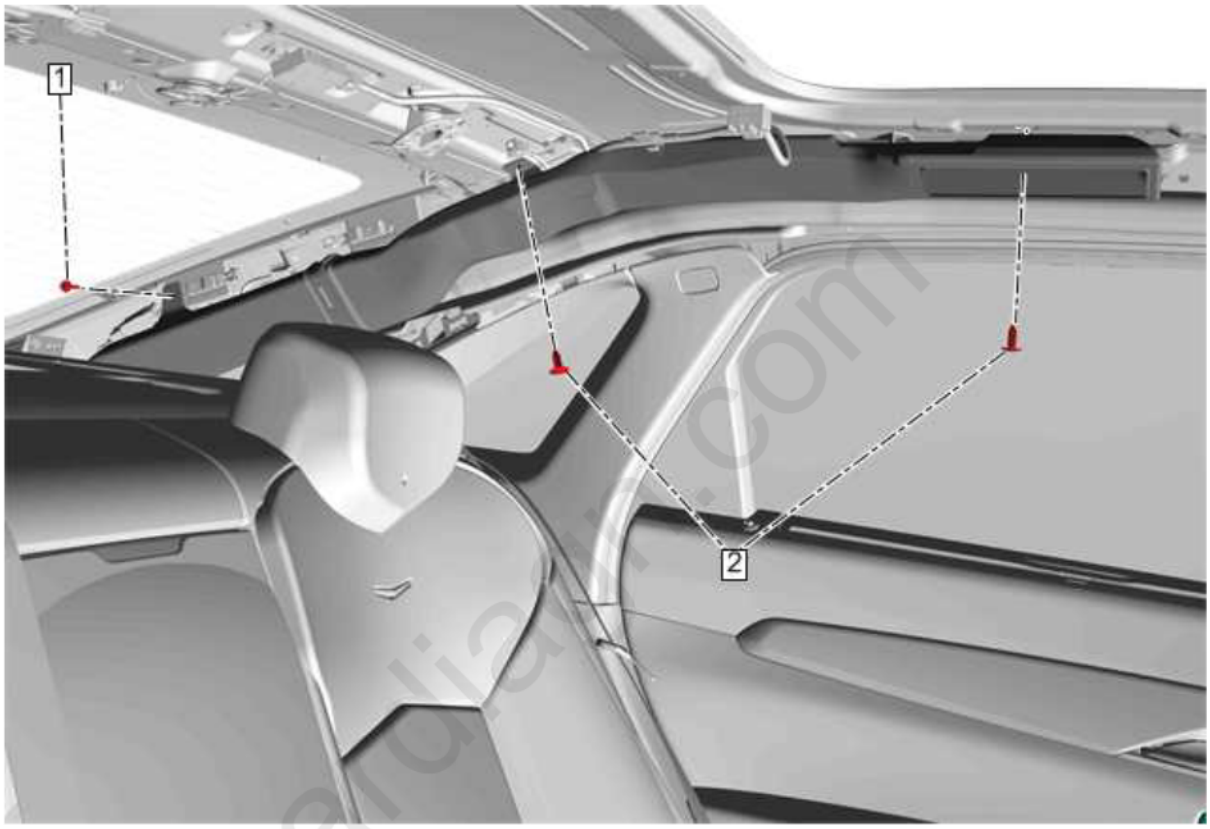


Fig. 707: Retainers
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Air Conditioning Air Outlet Duct Retainer (2)Â» Remove [2x]
4. Auxiliary Air Conditioning Air Outlet Upper Duct - Left Side (1)Â» Remove

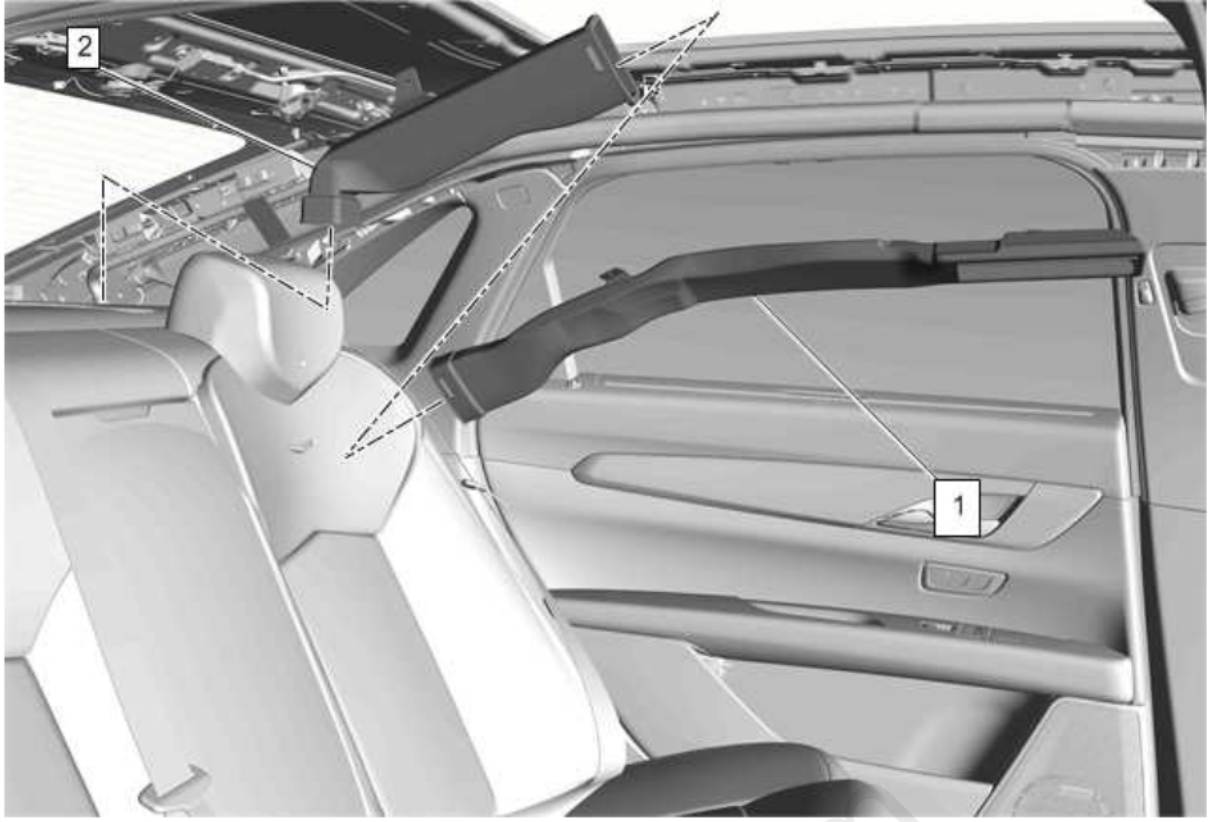


Fig. 708: Auxiliary Air Conditioning Air Outlet Ducts - Left Side
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Air Outlet Duct - Left Side (2)Â» Remove

Installation Procedure

1. Auxiliary Air Conditioning Air Outlet Duct - Left Side (2)Â» Install

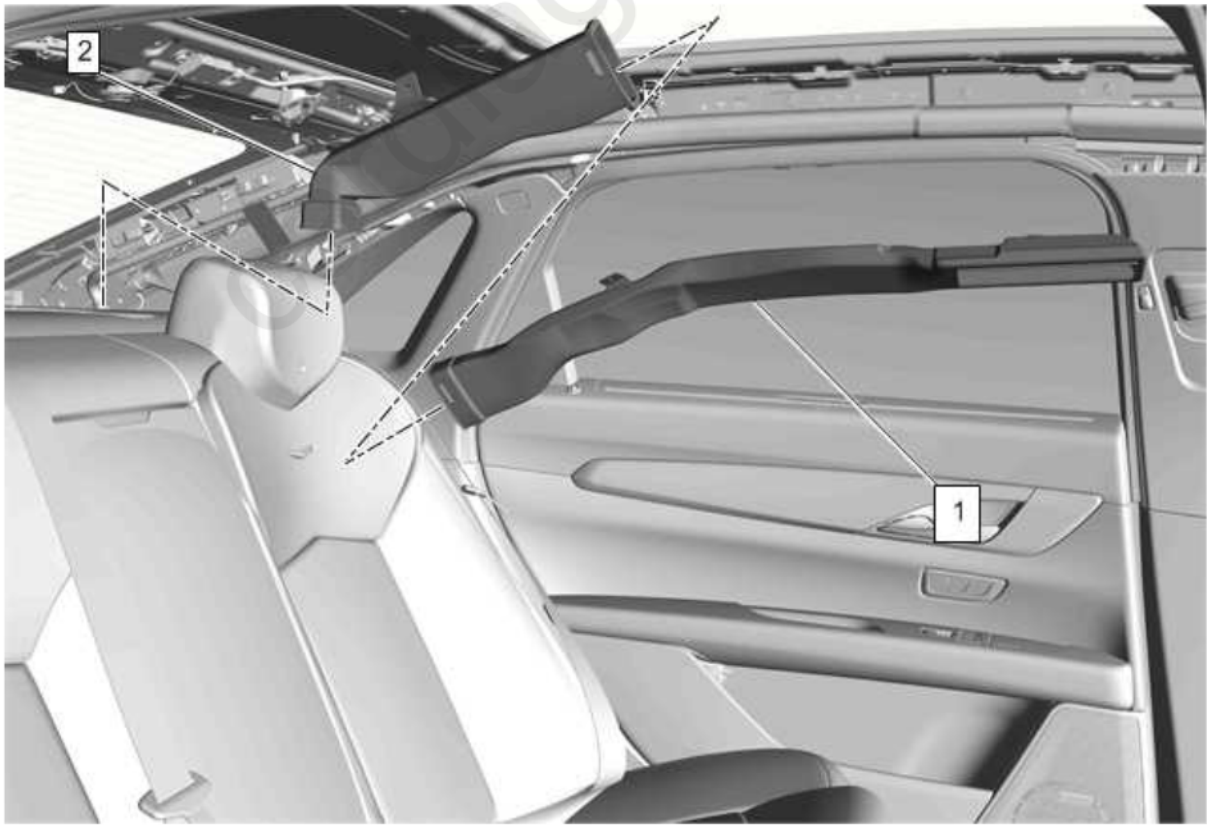


Fig. 709: Auxiliary Air Conditioning Air Outlet Ducts - Left Side
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Air Conditioning Air Outlet Upper Duct - Left Side (1)Â» Install
3. Auxiliary Air Conditioning Air Outlet Duct Retainer (2)Â» Install [2x]

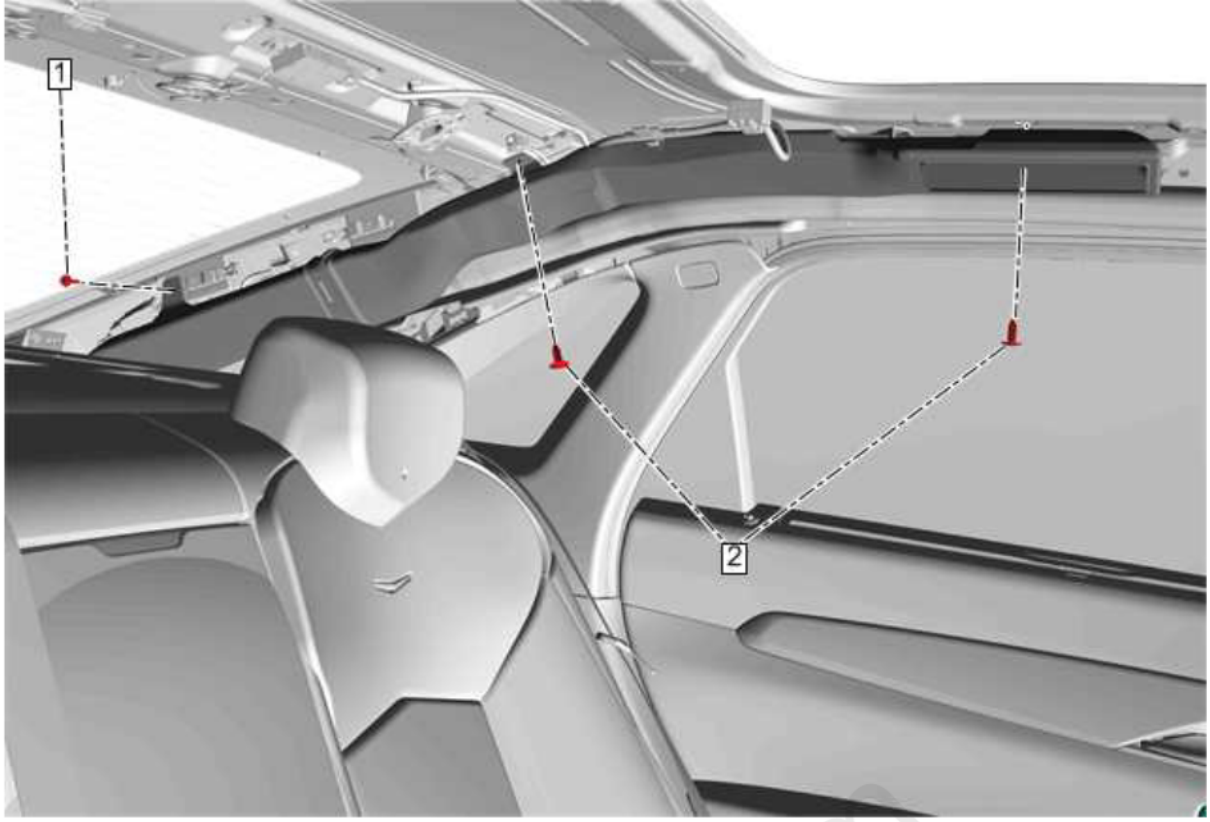


Fig. 710: Retainers
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

4. Auxiliary Air Conditioning Air Outlet Upper Duct Bolt (4)Â» Install and tighten 2.5 N.m (22 lb in)
5. Headlining Trim PanelÂ» Install - Headlining Trim Panel Replacement (Without C3U) and/or Headlining Trim Panel Replacement (With C3U)

AUXILIARY AIR CONDITIONING AIR LOWER DUCT REPLACEMENT (RIGHT SIDE)

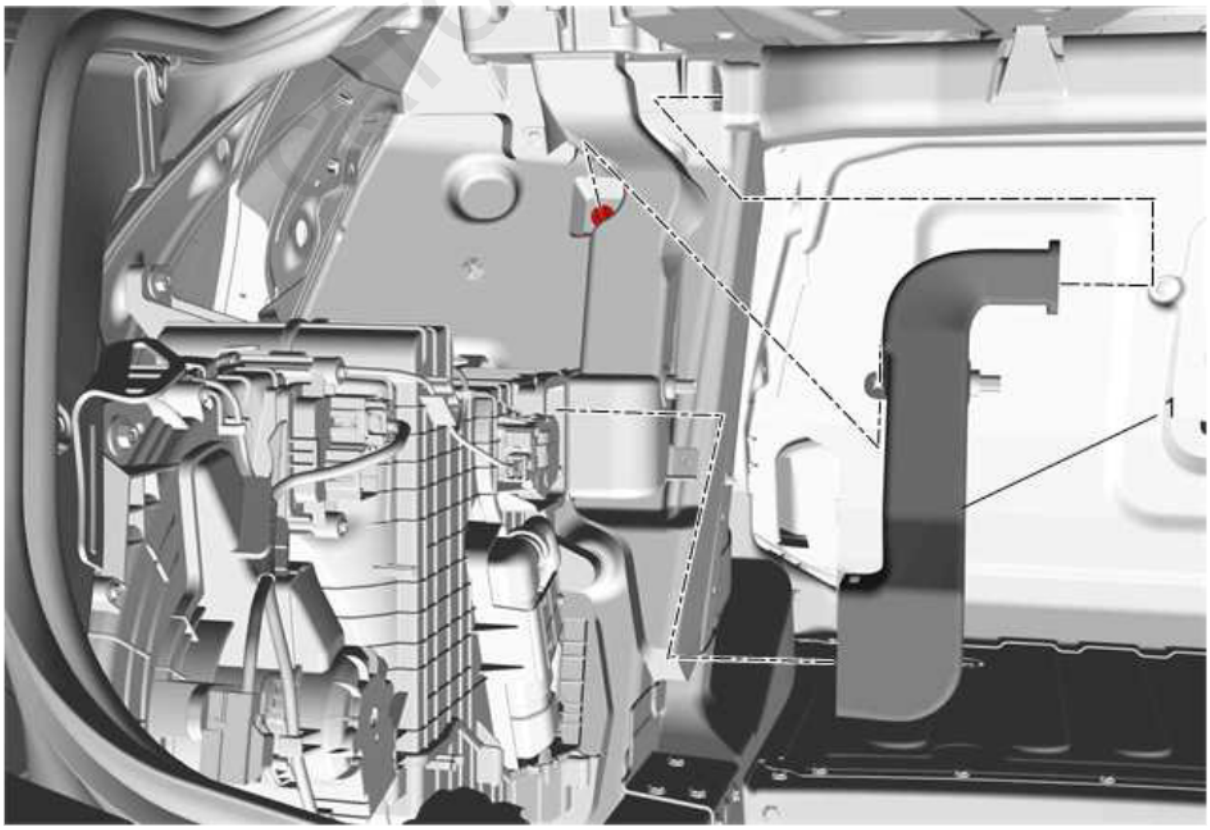


Fig. 711: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)	
1	Auxiliary Air Conditioning Air Lower Duct - Right Side **Procedure** Disconnect the electrical connector.

AUXILIARY AIR CONDITIONING AIR LOWER DUCT REPLACEMENT (LEFT SIDE)

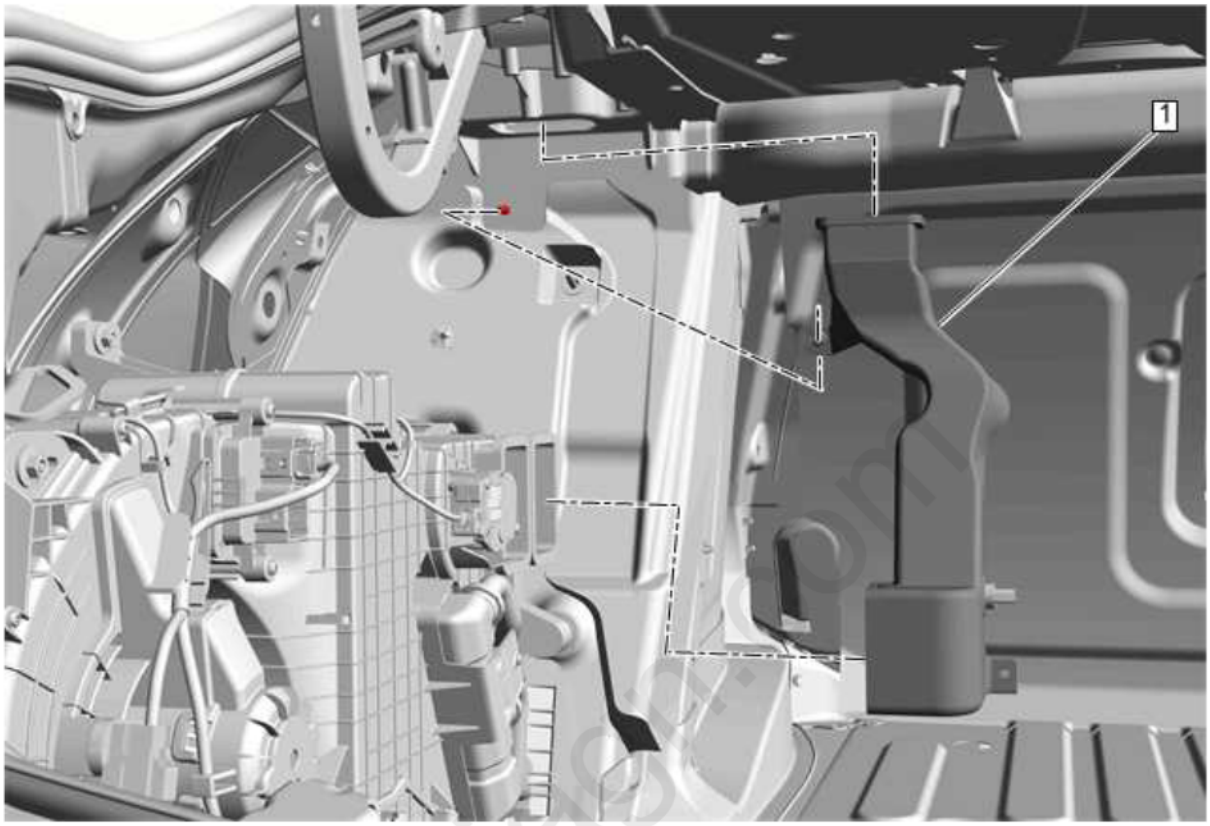


Fig. 712: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Auxiliary Air Conditioning Air Lower Duct Replacement (Right Side) - Right Side	
1	Auxiliary Air Conditioning Air Lower Duct - Left Side **Procedure** Disconnect the electrical connector.

AUXILIARY AIR CONDITIONING AIR OUTLET CENTER DUCT REPLACEMENT

Removal Procedure

1. Auxiliary Air Conditioning Air Lower Duct - Right Side (1)Â» Remove - Auxiliary Air Conditioning Air Lower Duct Replacement (Right Side)

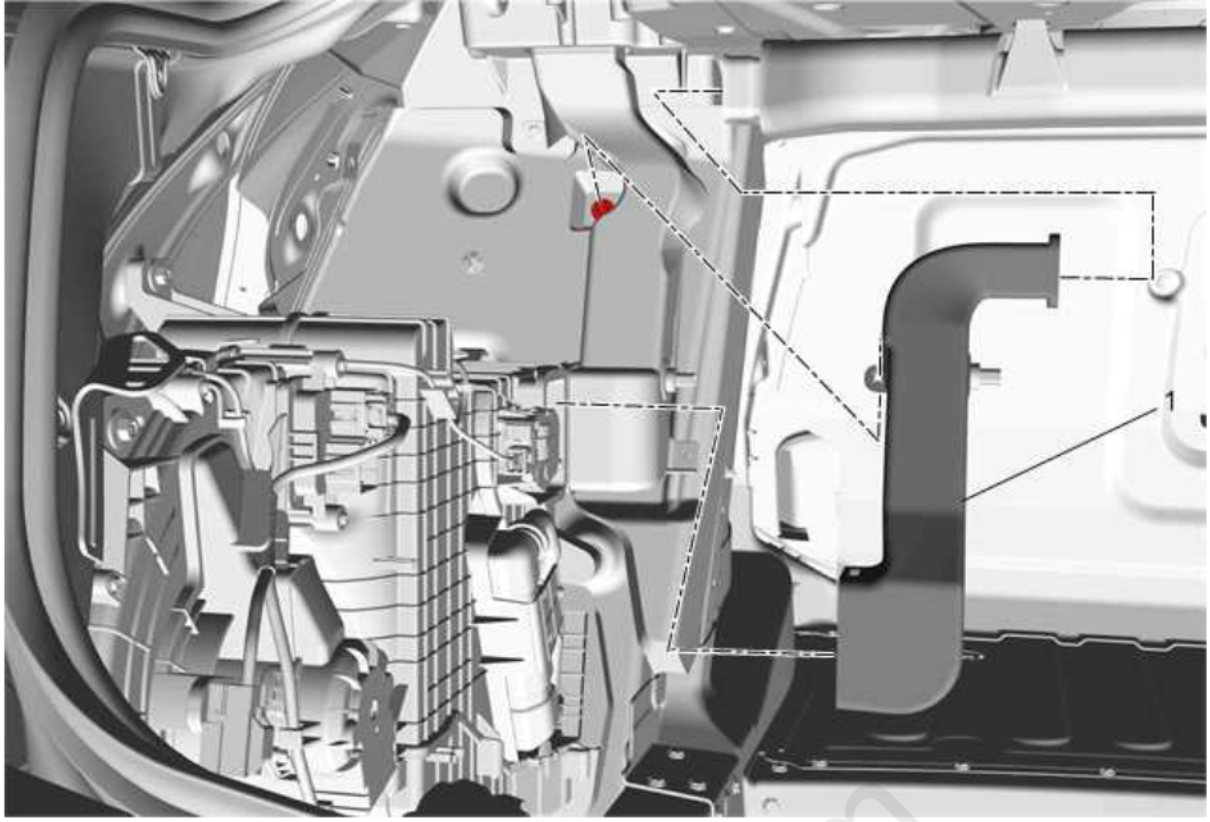


Fig. 713: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

2. **Rear Compartment Side Trim Replacement - Right Side (Without HP9)** **Rear Compartment Side Trim Replacement - Right Side (With HP9)** Â» Remove
3. Rear Window Panel Trim (1)Â» Remove - **Rear Window Panel Trim Replacement**

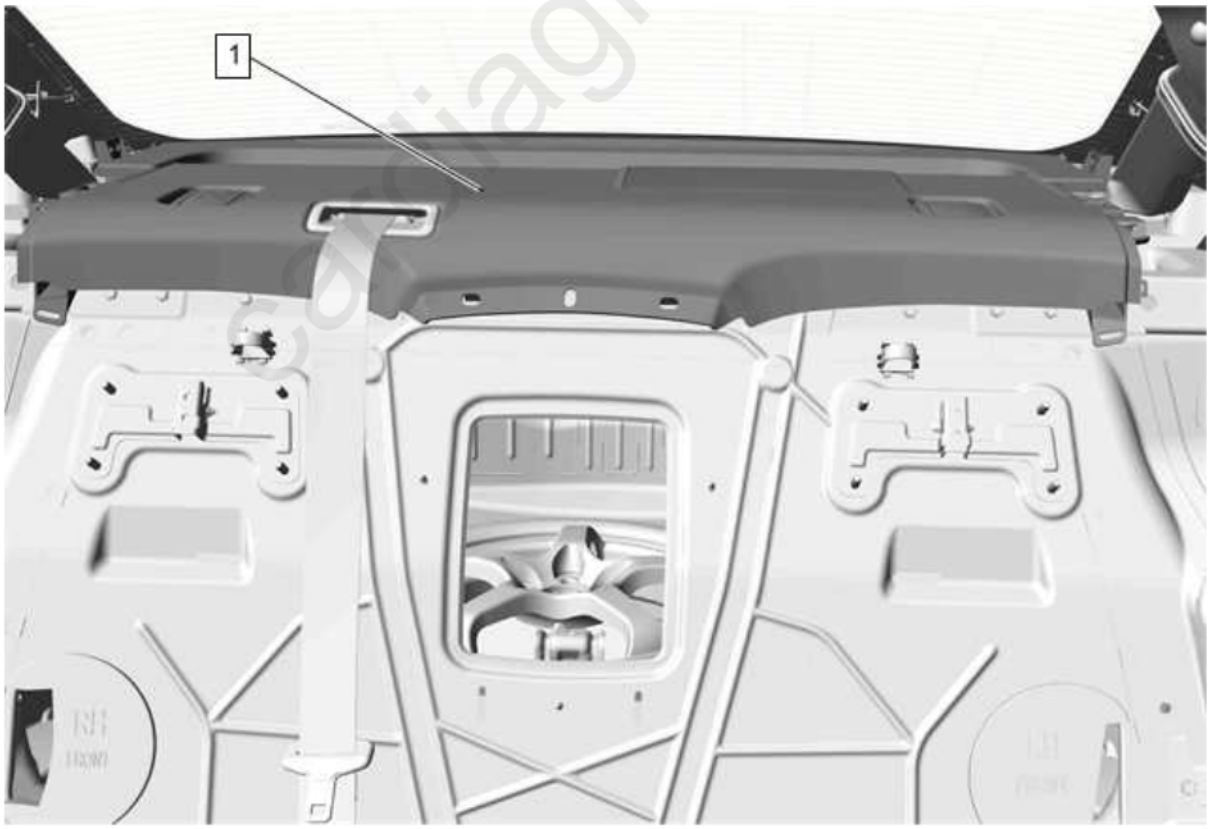


Fig. 714: Rear Window Panel Trim
Courtesy of GENERAL MOTORS COMPANY

4. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Remove [2x]

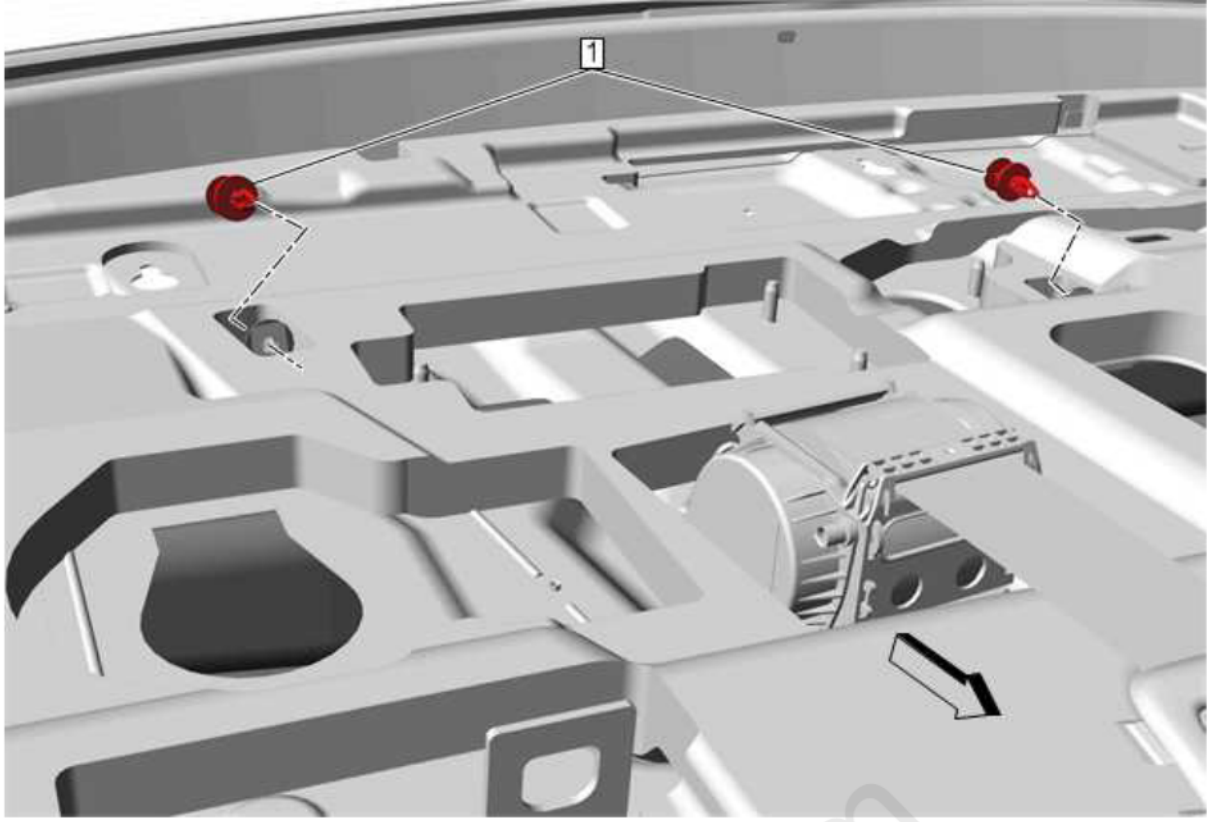


Fig. 715: Auxiliary Air Conditioning Air Outlet Duct Retainer
Courtesy of GENERAL MOTORS COMPANY

NOTE: **With the help of an assistant hold the auxiliary air conditioning outlet duct in place during the removal and installation of the duct.**

5. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Remove

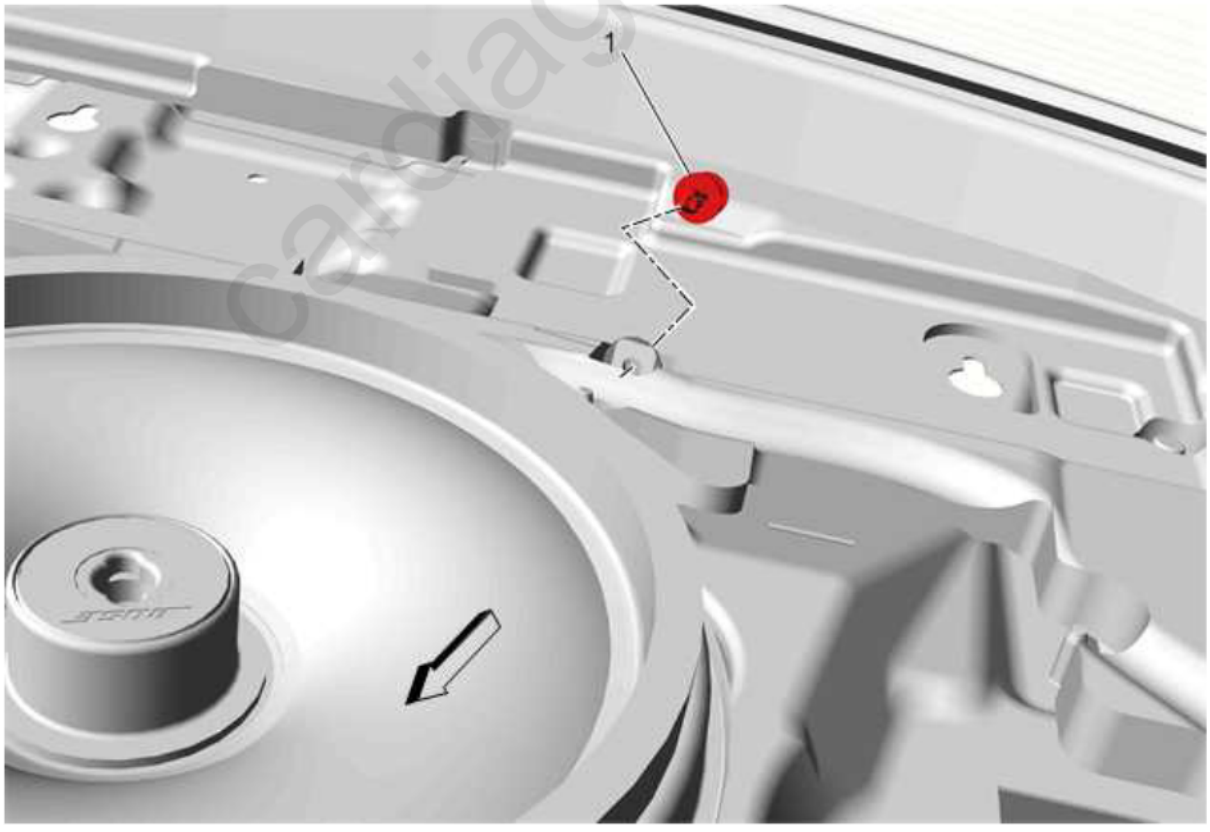


Fig. 716: Auxiliary Air Conditioning Air Outlet Duct Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Auxiliary Air Conditioning Air Outlet Center Duct (1)Â» Remove

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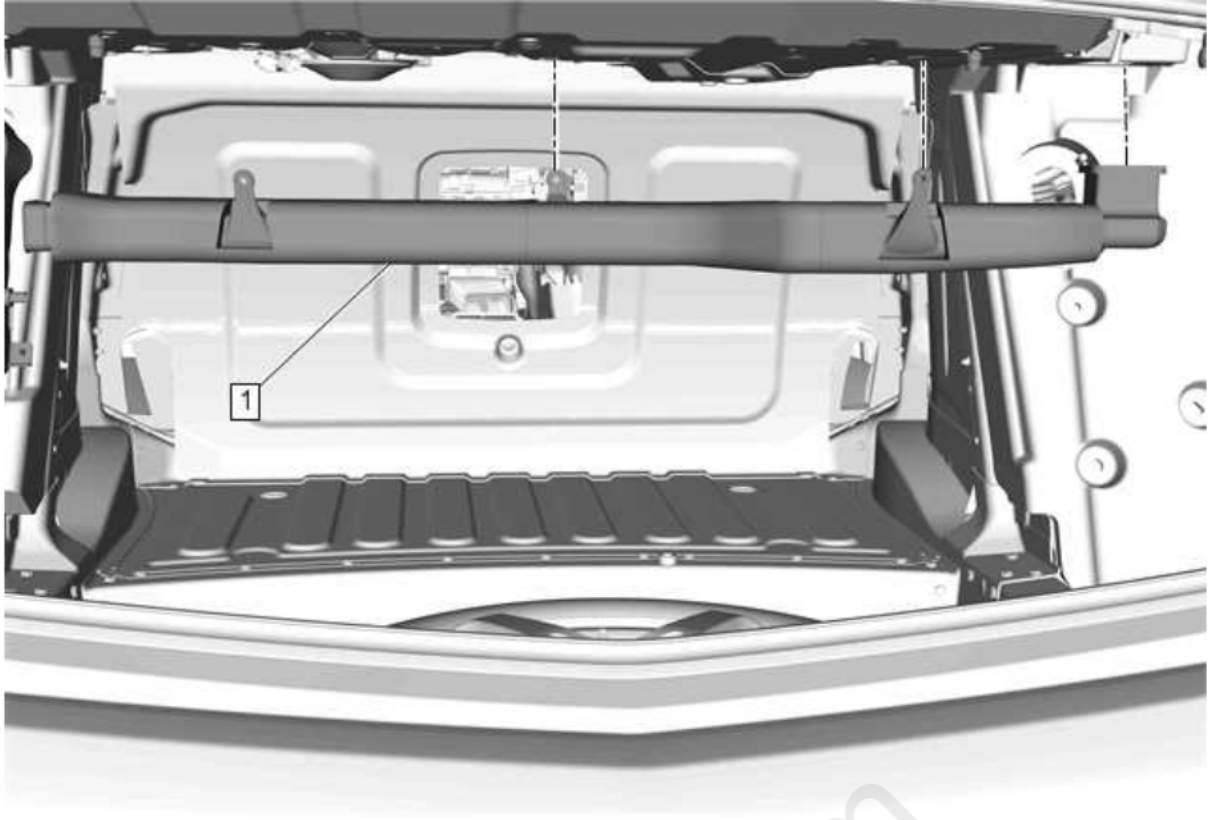


Fig. 717: Auxiliary Air Conditioning Air Outlet Center Duct
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Auxiliary Air Conditioning Air Outlet Center Duct (1)Â» Install

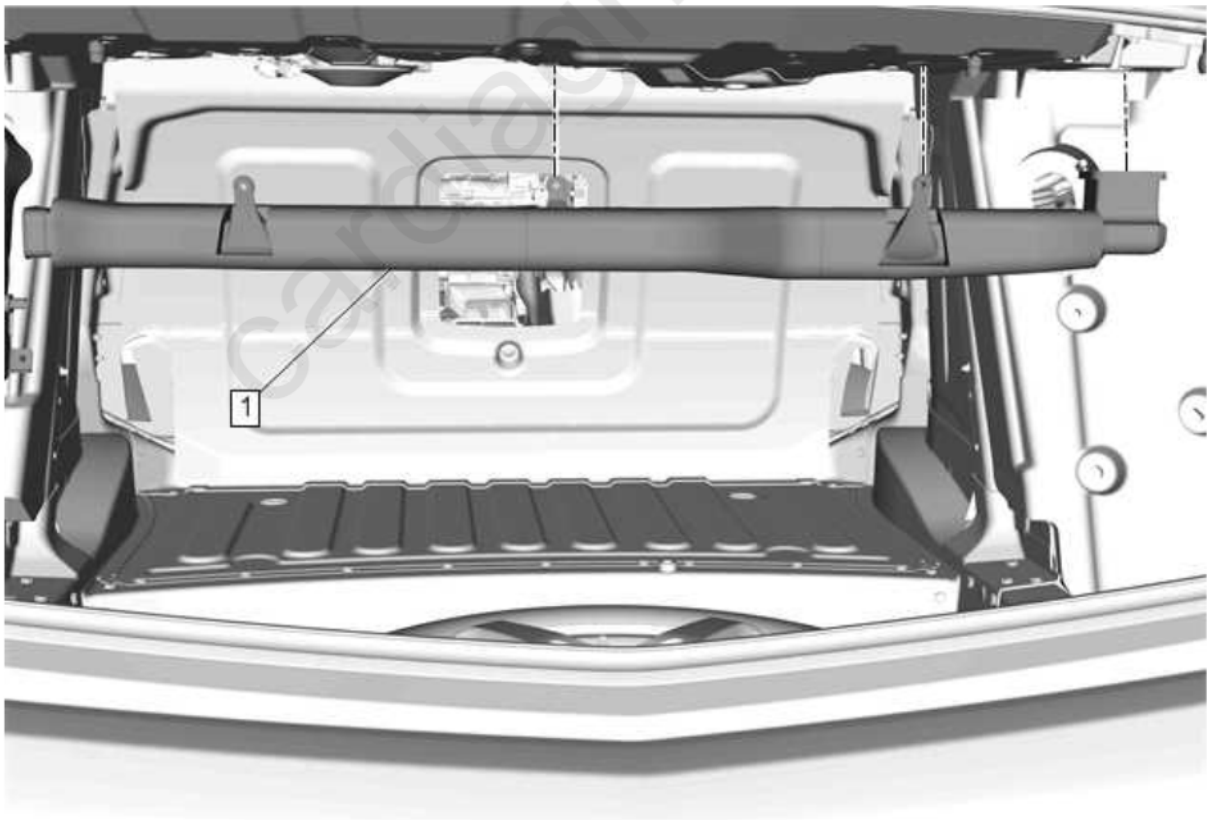


Fig. 718: Auxiliary Air Conditioning Air Outlet Center Duct
Courtesy of GENERAL MOTORS COMPANY

NOTE: **With the help of an assistant hold the auxiliary air conditioning outlet duct in place during the removal and installation of the duct.**

2. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Install

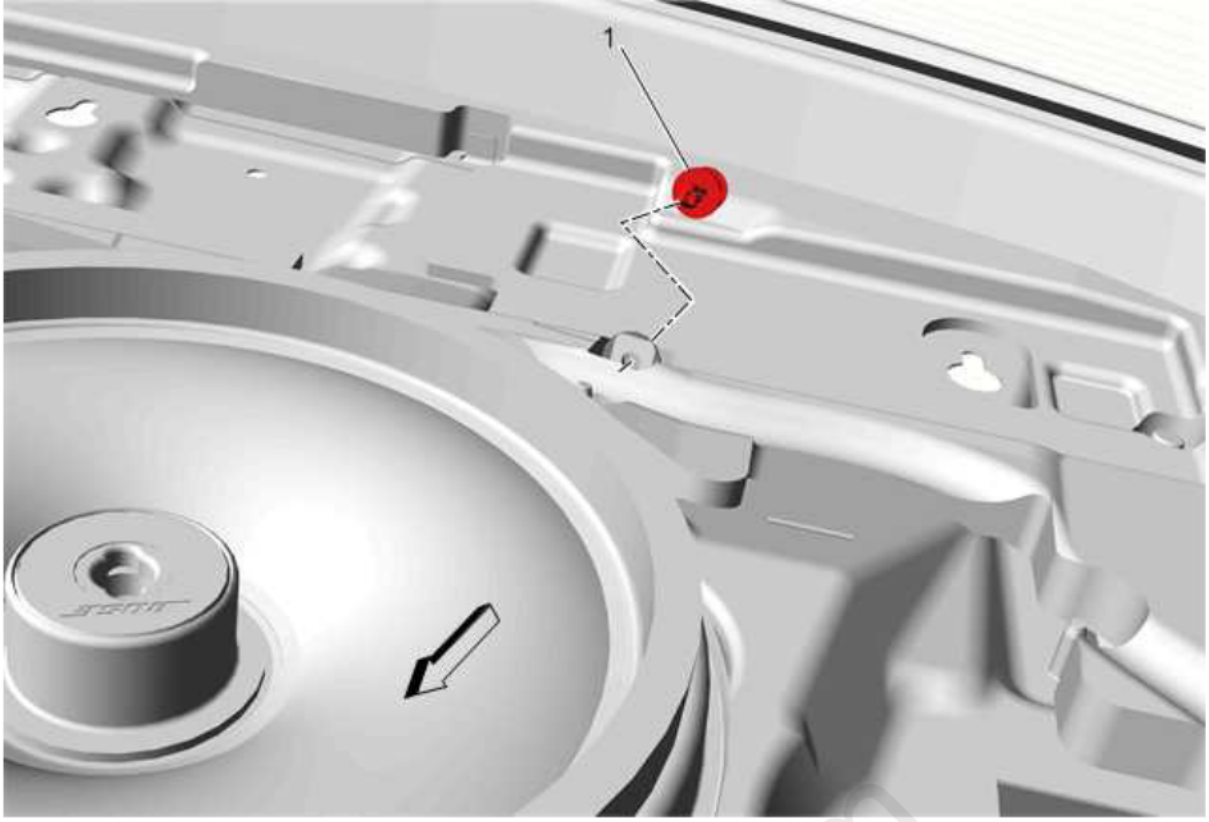


Fig. 719: Auxiliary Air Conditioning Air Outlet Duct Retainer
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Air Conditioning Air Outlet Duct Retainer (1)Â» Install [2x]

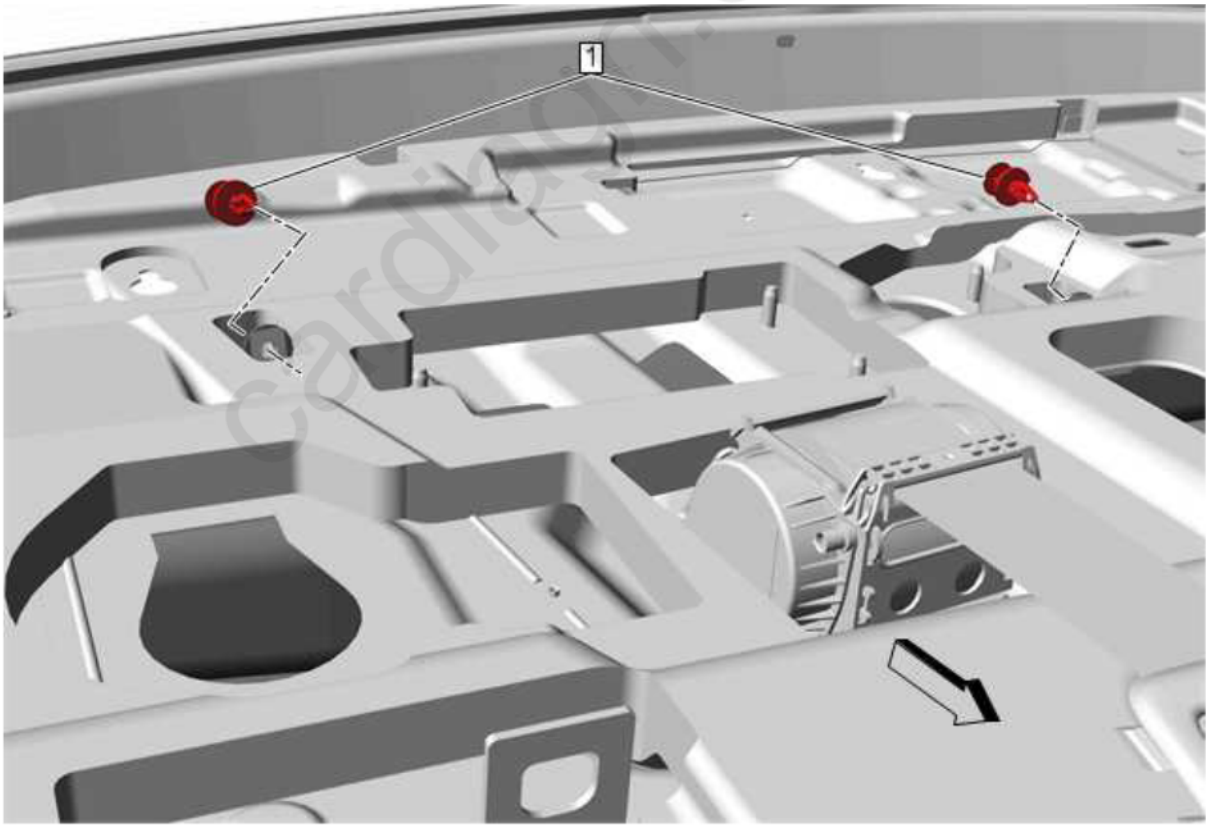


Fig. 720: Auxiliary Air Conditioning Air Outlet Duct Retainer
Courtesy of GENERAL MOTORS COMPANY

4. Rear Window Panel Trim (1)Â» Install - **Rear Window Panel Trim Replacement**

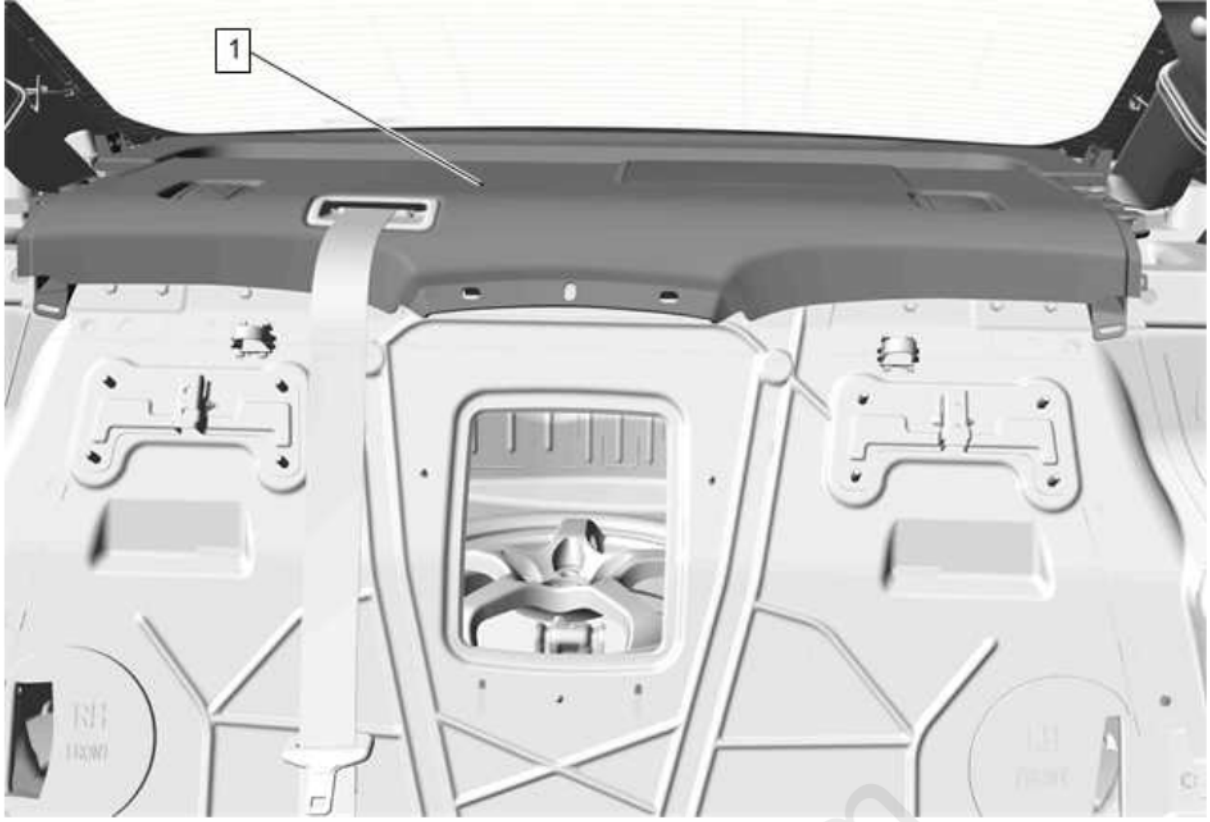


Fig. 721: Rear Window Panel Trim
Courtesy of GENERAL MOTORS COMPANY

5. Rear Compartment Side Trim Replacement - Right Side (Without HP9) Rear Compartment Side Trim Replacement - Right Side (With HP9) Â» Install
6. Auxiliary Air Conditioning Air Lower Duct - Right Side (1)Â» Install - Auxiliary Air Conditioning Air Lower Duct Replacement (Right Side)

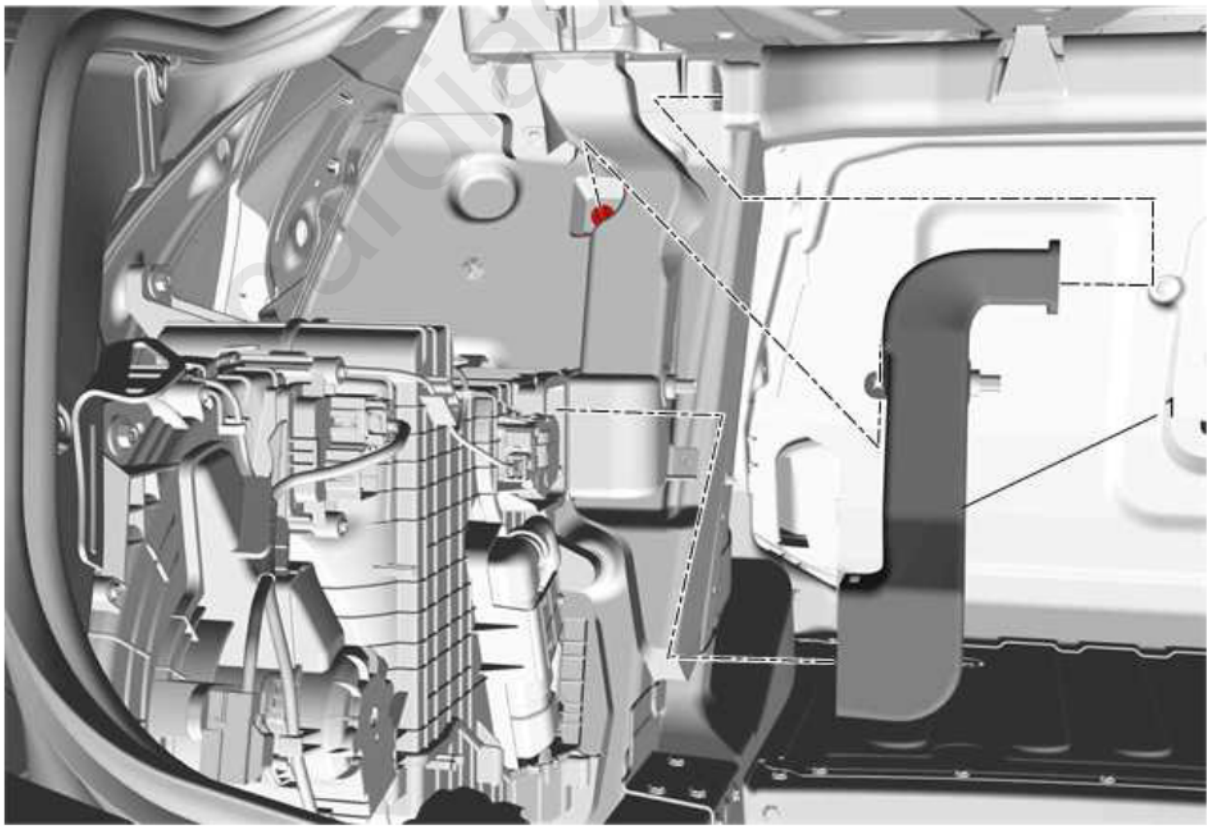


Fig. 722: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

AUXILIARY HEATER CORE REPLACEMENT

Removal Procedure

1. Auxiliary Air Conditioning Evaporator and Blower ModuleÂ» Remove - **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation**

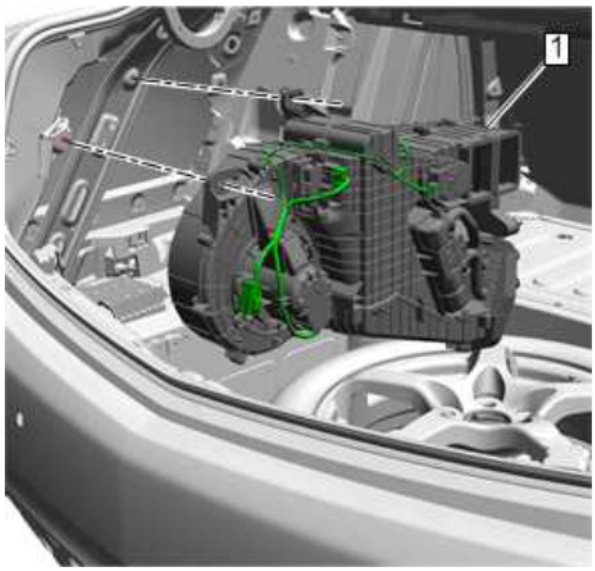


Fig. 723: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Heater Core Cover Screw (1)Â» Remove

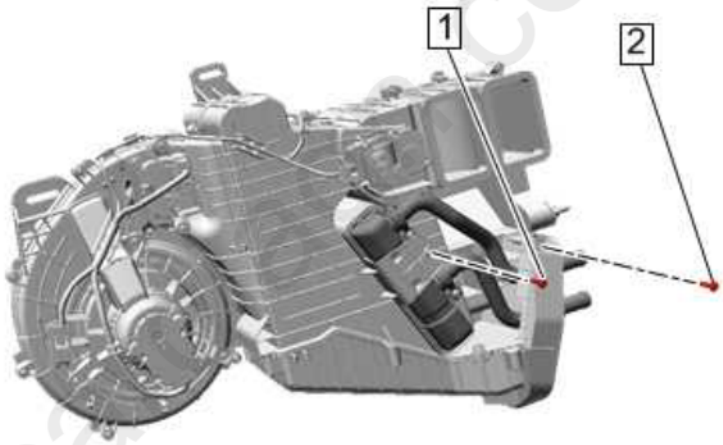


Fig. 724: Auxiliary Heater Core Tube Bracket Screw
Courtesy of GENERAL MOTORS COMPANY

3. Auxiliary Heater Core Tube Bracket Screw (2)Â» Remove
4. Swing the auxiliary heater core cover (1) open.

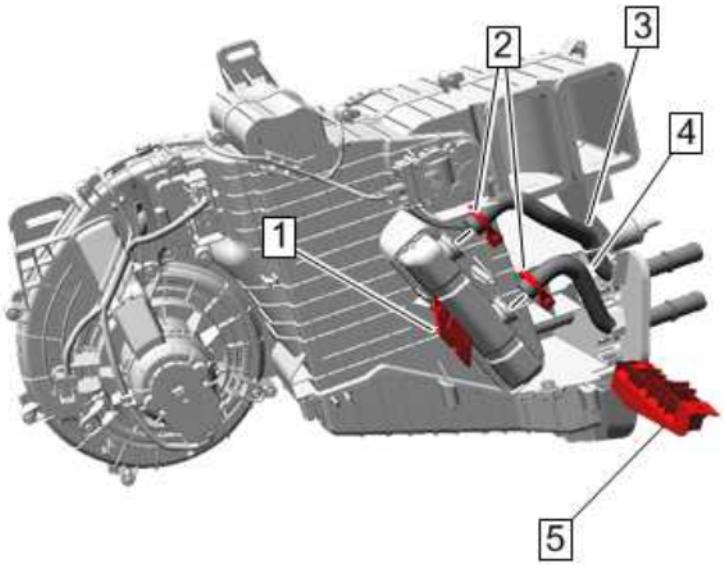


Fig. 725: Auxiliary Heater Core Tube Bracket And Heater Core Tube Clamps
Courtesy of GENERAL MOTORS COMPANY

5. Swing the auxiliary heater core tube bracket (5) open.
6. Heater Core Tube Clamp (2)Â» Remove [2x]
7. Heater Core Inlet Tube (3) @ Auxiliary Heater CoreÂ» Remove
8. Heater Core Outlet Tube (4) @ Auxiliary Heater CoreÂ» Remove
9. Remove and DISCARD the O-ring seal. [2x]
10. Auxiliary Heater Core (1)Â» Remove

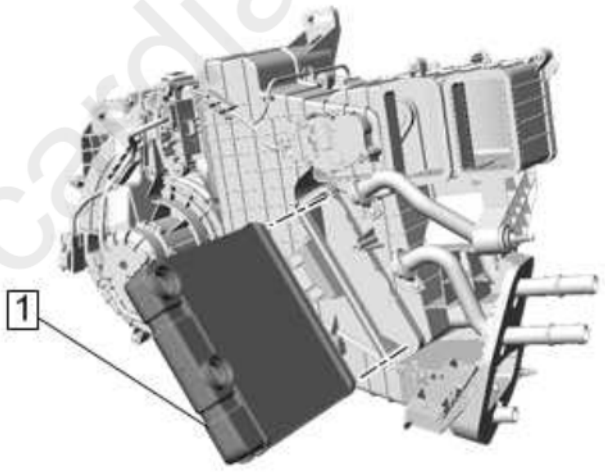


Fig. 726: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Auxiliary Heater Core (1)Â» Install

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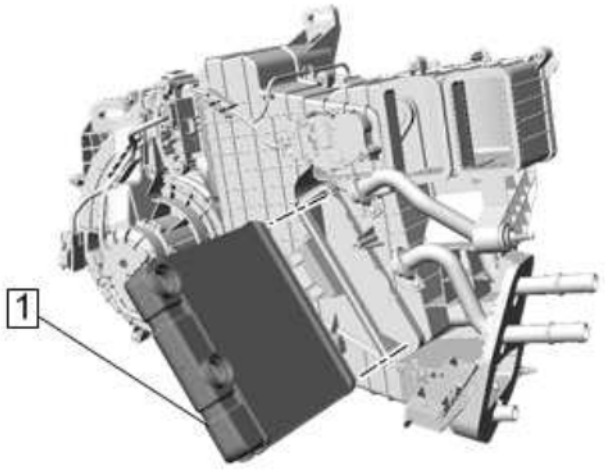


Fig. 727: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

2. Install a NEW O-ring seal. [2x]

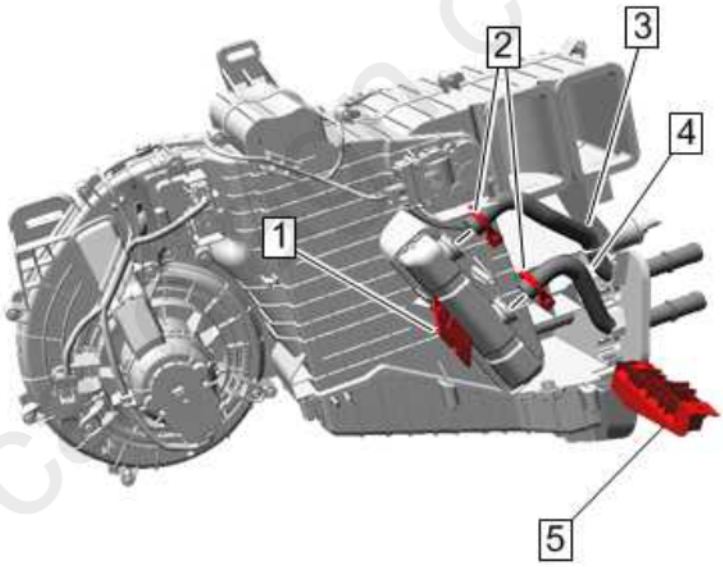


Fig. 728: Auxiliary Heater Core Tube Bracket And Heater Core Tube Clamps
Courtesy of GENERAL MOTORS COMPANY

3. Heater Core Outlet Tube (4) @ Auxiliary Heater CoreÂ» Install
4. Heater Core Inlet Tube (3) @ Auxiliary Heater CoreÂ» Install
5. Heater Core Tube Clamp (2)Â» Install and tighten [2x] 1.3 N.m (12 lb in)
6. Swing the auxiliary heater core tube bracket (5) close.
7. Swing the auxiliary heater core cover (1) close.
8. Auxiliary Heater Core Cover Screw (1)Â» Install and tighten 1.3 N.m (12 lb in)

CAUTION: **Refer to Fastener Caution**

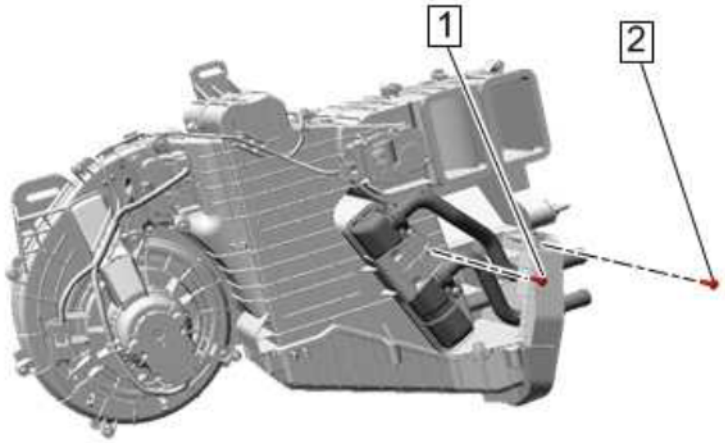


Fig. 729: Auxiliary Heater Core Tube Bracket Screw
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Heater Core Tube Bracket Screw (2)Â» Install and tighten 1.3 N.m (12 lb in)
10. Auxiliary Air Conditioning Evaporator and Blower ModuleÂ» Install - **Auxiliary Air Conditioning (A/C) Evaporator and Blower Module Assembly Removal and Installation**

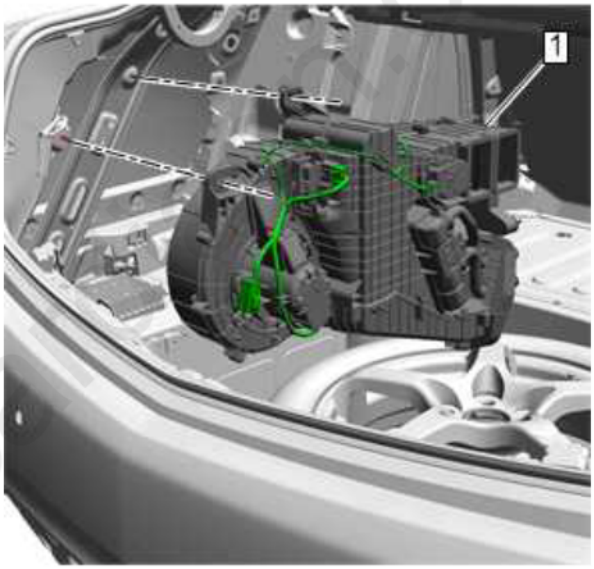


Fig. 730: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

AUXILIARY AIR CONDITIONING EVAPORATOR REPLACEMENT (R-134A)

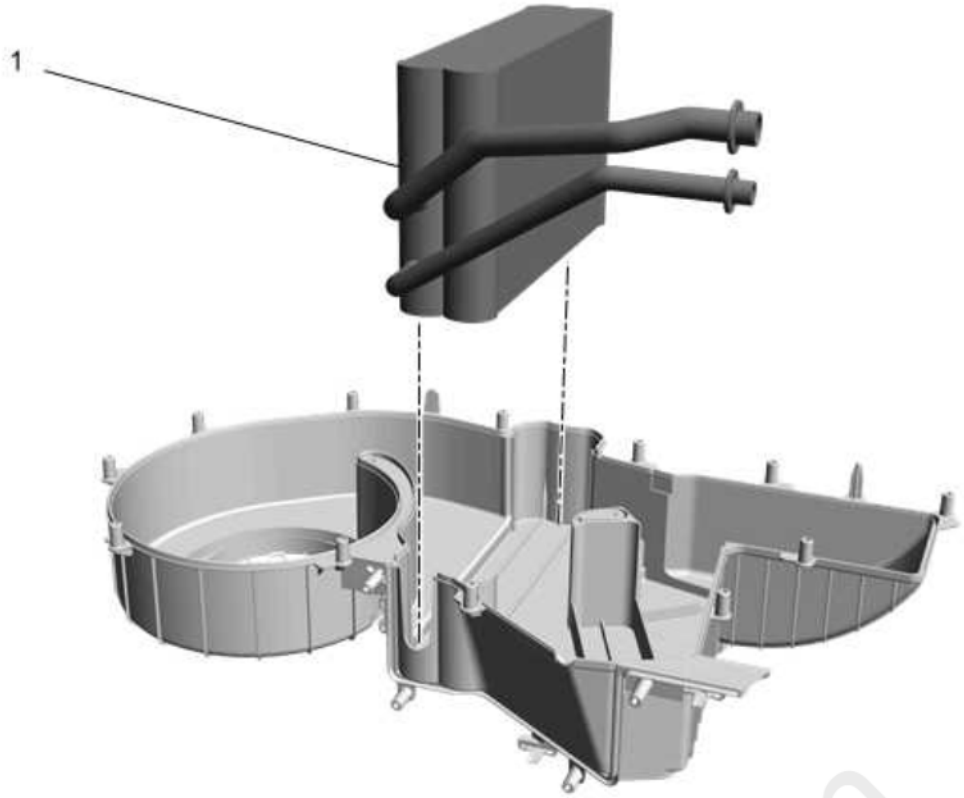


Fig. 731: Auxiliary Air Conditioning Evaporator (R-134a)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Auxiliary Air Conditioning Evaporator and Blower Case Replacement - Outboard	
1	Auxiliary Air Conditioning Evaporator

AUXILIARY AIR CONDITIONING EVAPORATOR REPLACEMENT (R1234YF)

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

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

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

Removal Procedure

1. Auxiliary Air Conditioning Evaporator and Blower Case (1) - OutboardÂ» Remove - Auxiliary Air Conditioning Evaporator and Blower Case Replacement - Outboard.

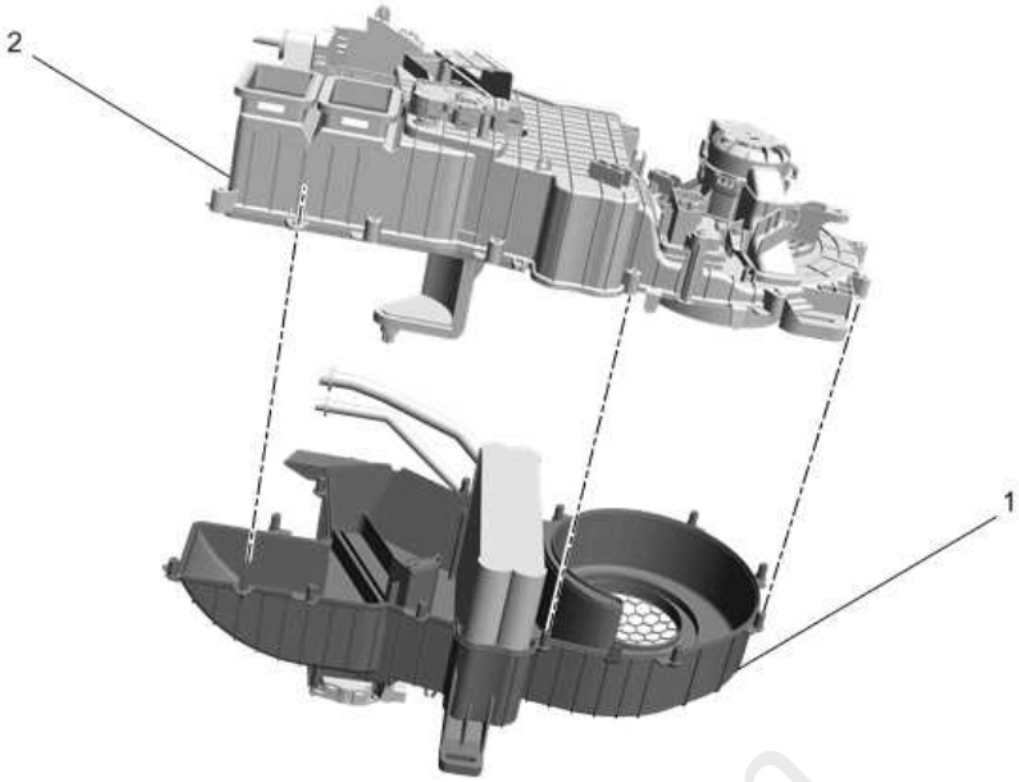


Fig. 732: Auxiliary Air Conditioning Evaporator And Blower Case - Outboard
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Air Conditioning Evaporator (1)Â» Remove

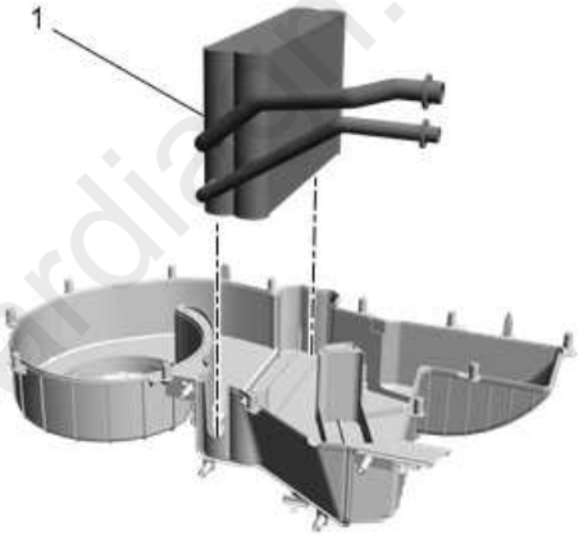


Fig. 733: Auxiliary Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Auxiliary Air Conditioning Evaporator (1)Â» Install

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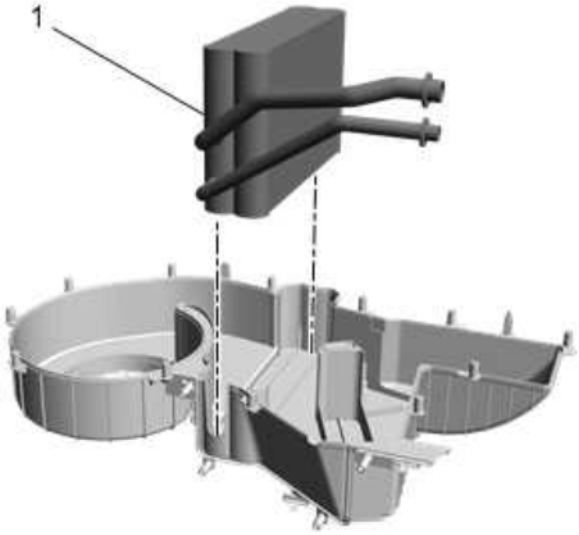


Fig. 734: Auxiliary Air Conditioning Evaporator
Courtesy of GENERAL MOTORS COMPANY

2. Auxiliary Air Conditioning Evaporator and Blower Case (1) - OutboardÂ» Install - **Auxiliary Air Conditioning Evaporator and Blower Case Replacement - Outboard**.

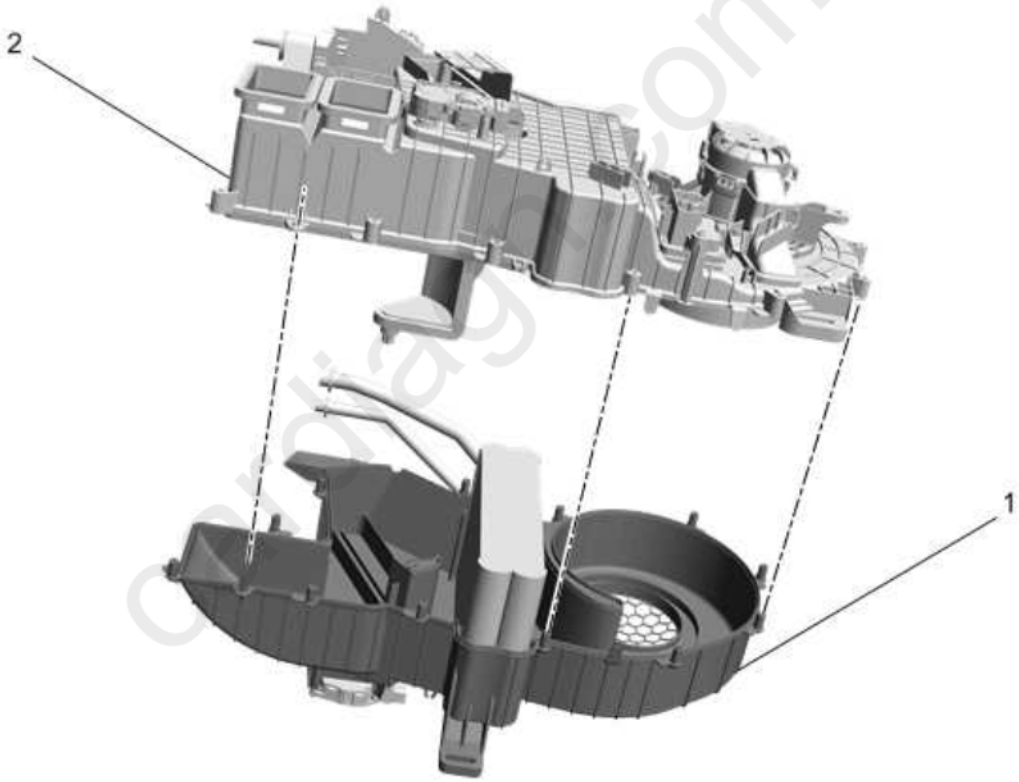


Fig. 735: Auxiliary Air Conditioning Evaporator And Blower Case - Outboard
Courtesy of GENERAL MOTORS COMPANY

Replacement Evaporator Label Requirements

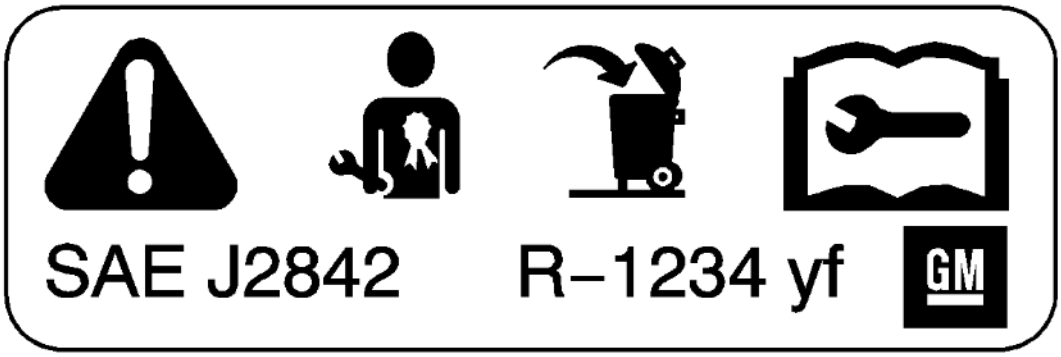


Fig. 736: Replacement Evaporator Label
Courtesy of GENERAL MOTORS COMPANY

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

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

Leak Free Joints Inside the Passenger Compartment

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

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

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- 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.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - INBOARD

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
4. Remove the rear half of the left rear wheelhouse liner (2) and position out of the way to gain access to the auxiliary air conditioning evaporator and blower module components. Refer to **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

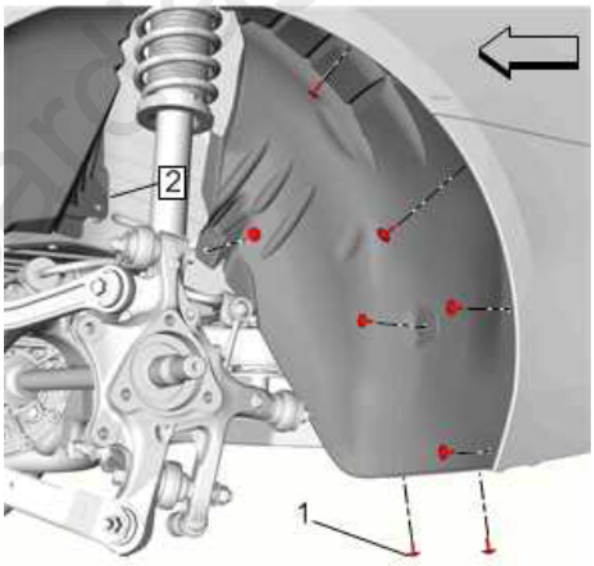


Fig. 737: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Remove - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

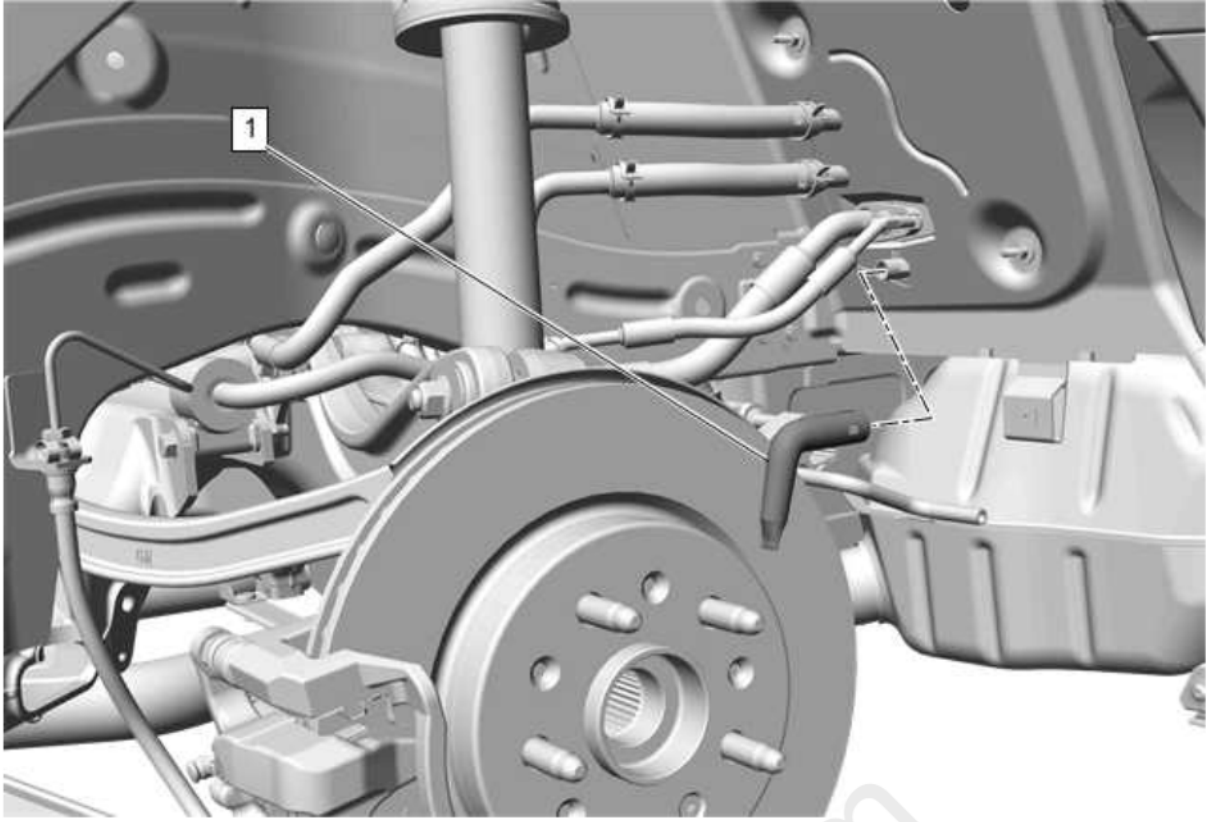


Fig. 738: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Hose Nut (1)Â» Remove

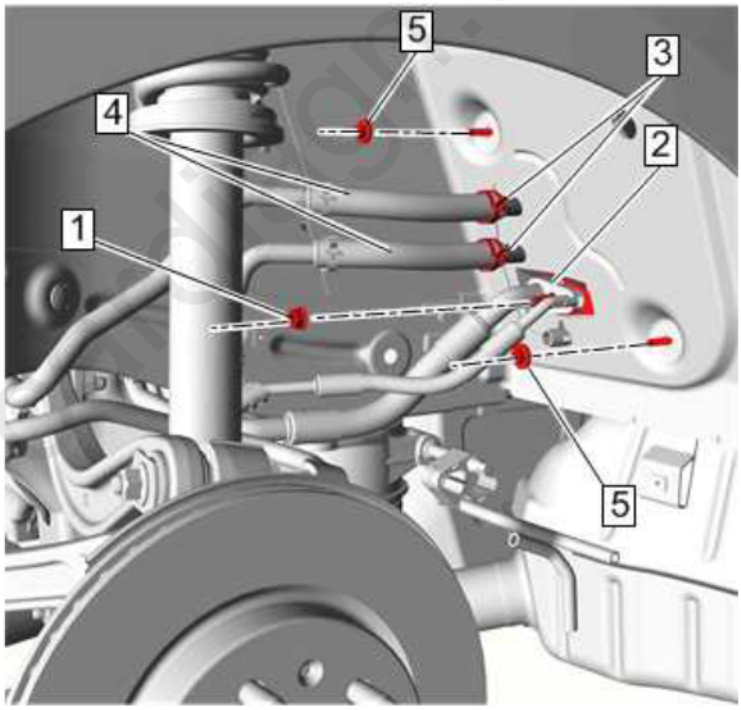


Fig. 739: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove
8. Remove and DISCARD the sealing washer. [2x] **Air Conditioning System Seal Replacement**
9. Remove the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
10. Remove the auxiliary heater hoses (4) from the auxiliary heater core tubes.
11. Air Distributor Nut (5)Â» Remove [2x]

12. Rear Compartment Side Trim - Left (2)Â» Remove - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**

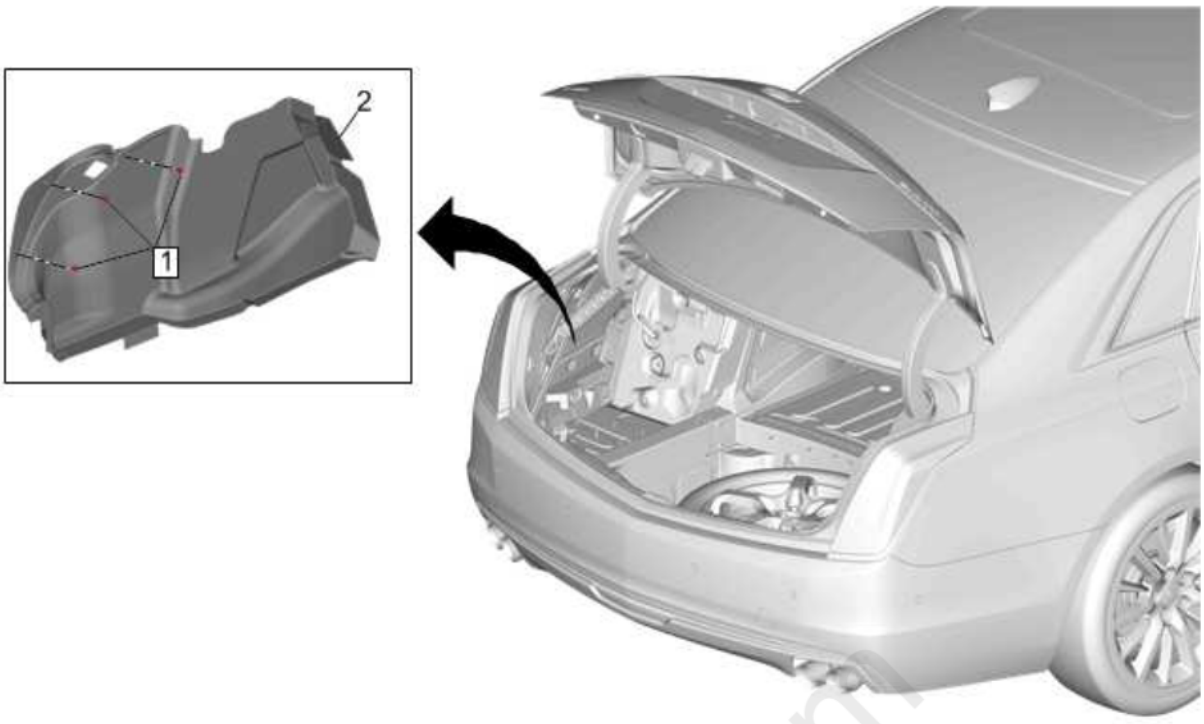


Fig. 740: Rear Compartment Side Trim - Left Side
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Remove

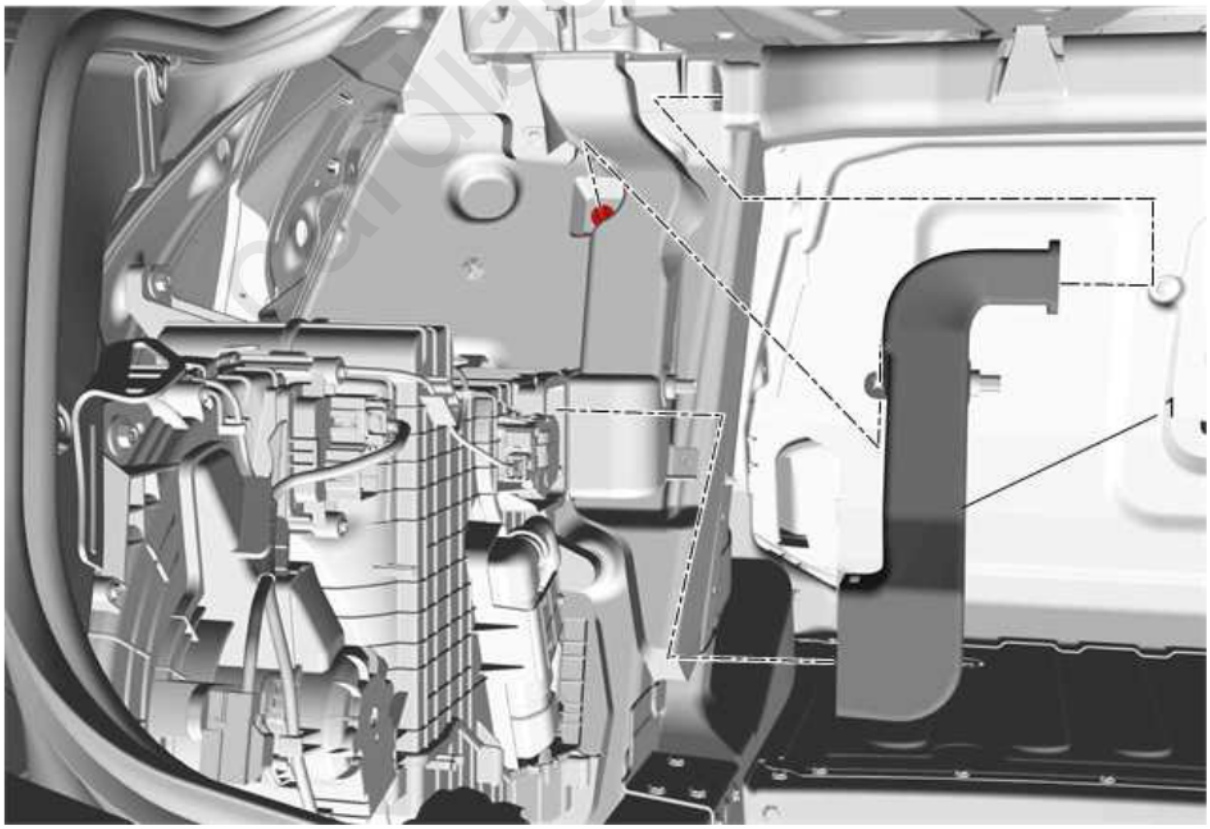


Fig. 741: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Auxiliary Air Conditioning Air Lower Duct (1) - Left Side Â» Remove

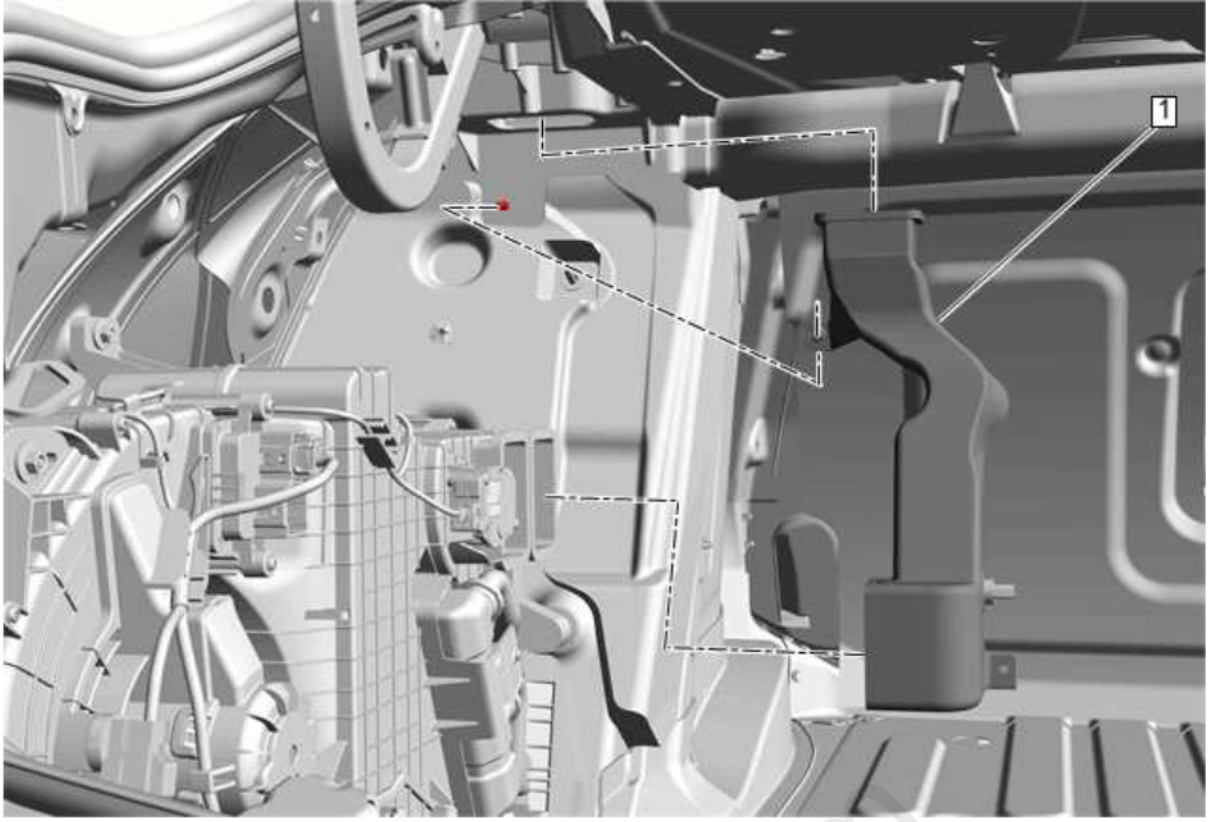


Fig. 742: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Air Distributor Nut (1)Â» Remove [2x]

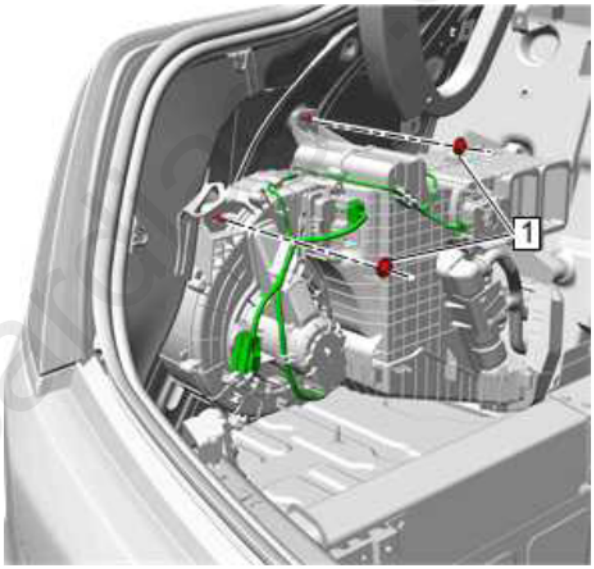


Fig. 743: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect all electrical connectors.
17. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Remove

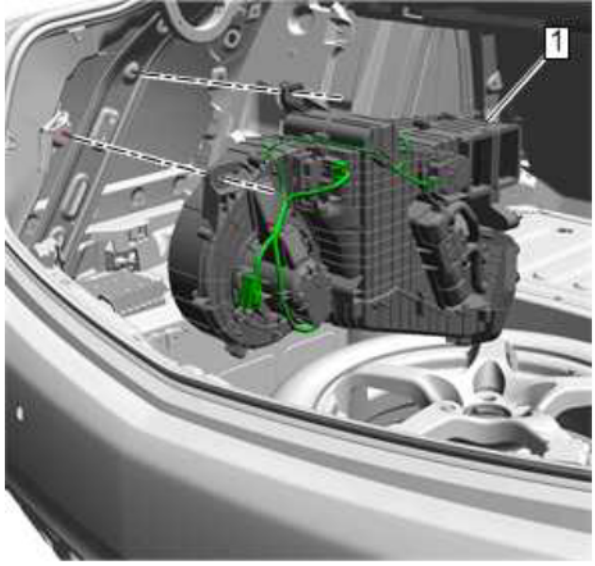


Fig. 744: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

18. Remove the auxiliary air conditioning evaporator and blower lower case (4). Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement**

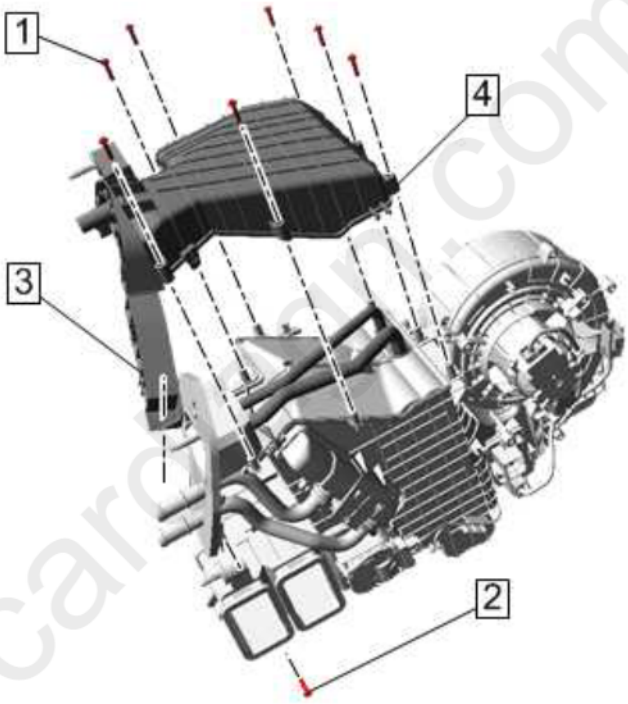


Fig. 745: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

19. Air Conditioning Evaporator Thermal Expansion Valve (2)Â» Remove - **Air Conditioning Evaporator Thermal Expansion Valve ReplacementAir Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**

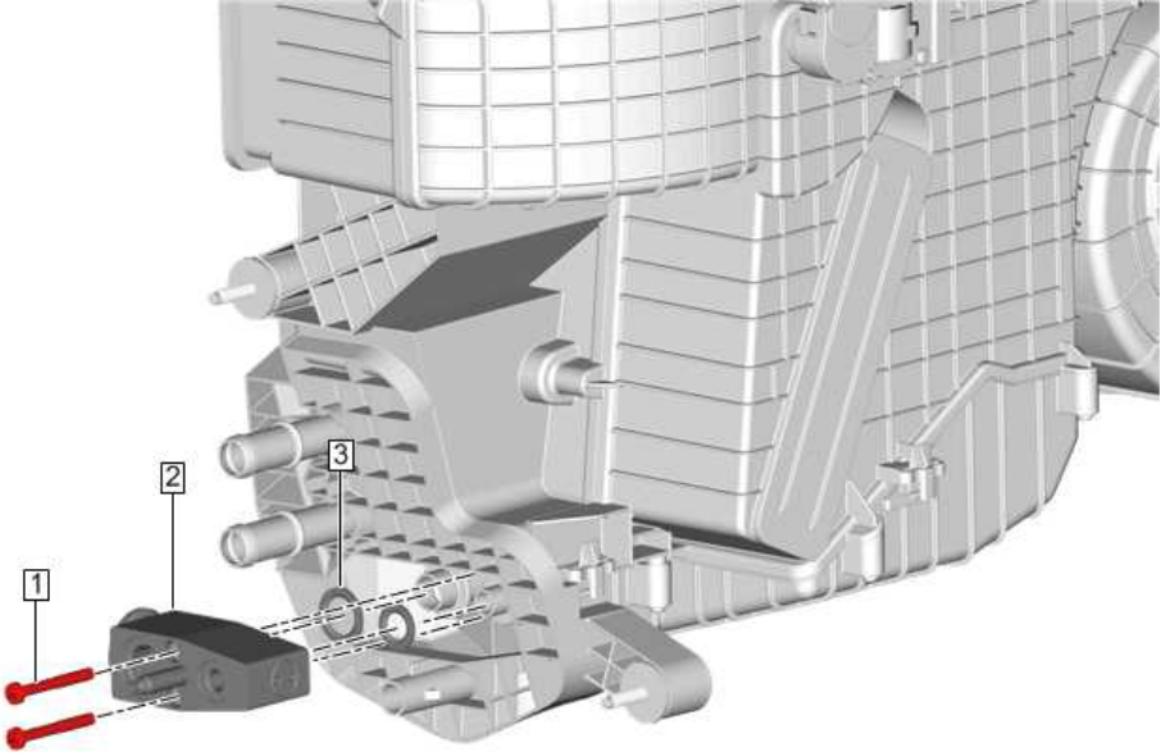


Fig. 746: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

20. Heater Core Inlet Tube (3) & Heater Core Outlet Tube (5)Â» Remove - **Heater Core Tube Replacement (Auxiliary)**

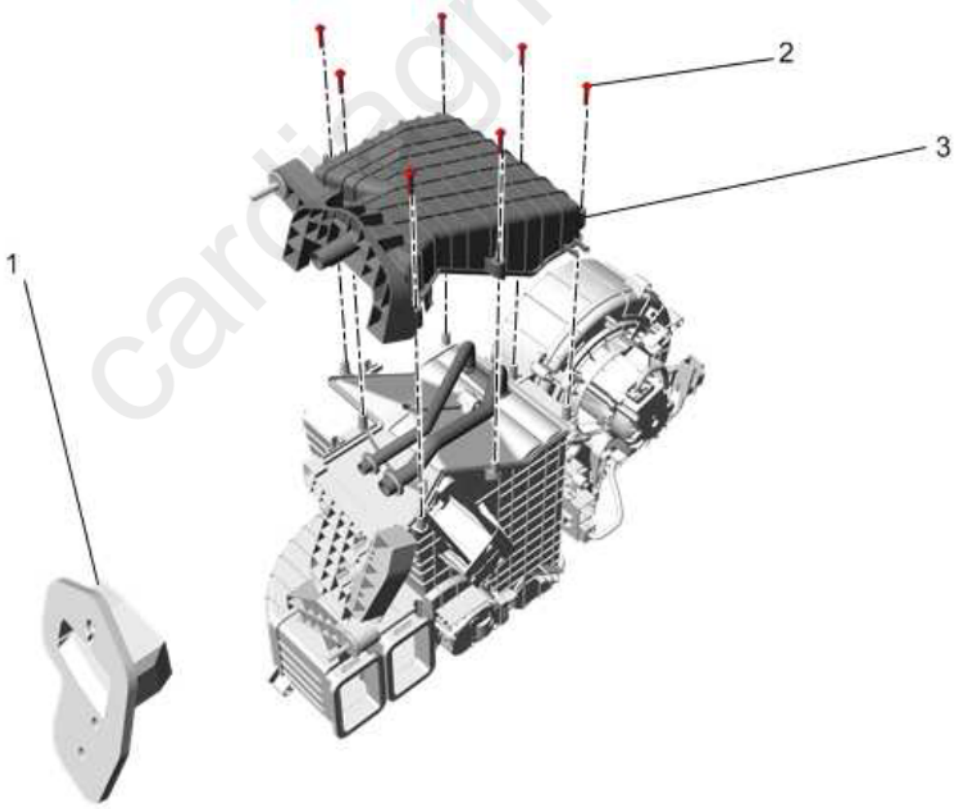


Fig. 747: Auxiliary Air Conditioning Evaporator and Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

21. Auxiliary Heater Core (1)Â» Remove - **Auxiliary Heater Core Replacement**

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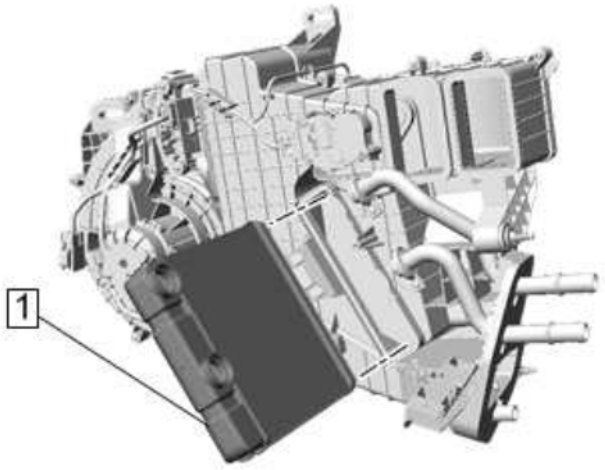


Fig. 748: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

22. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [8x]Â» Remove

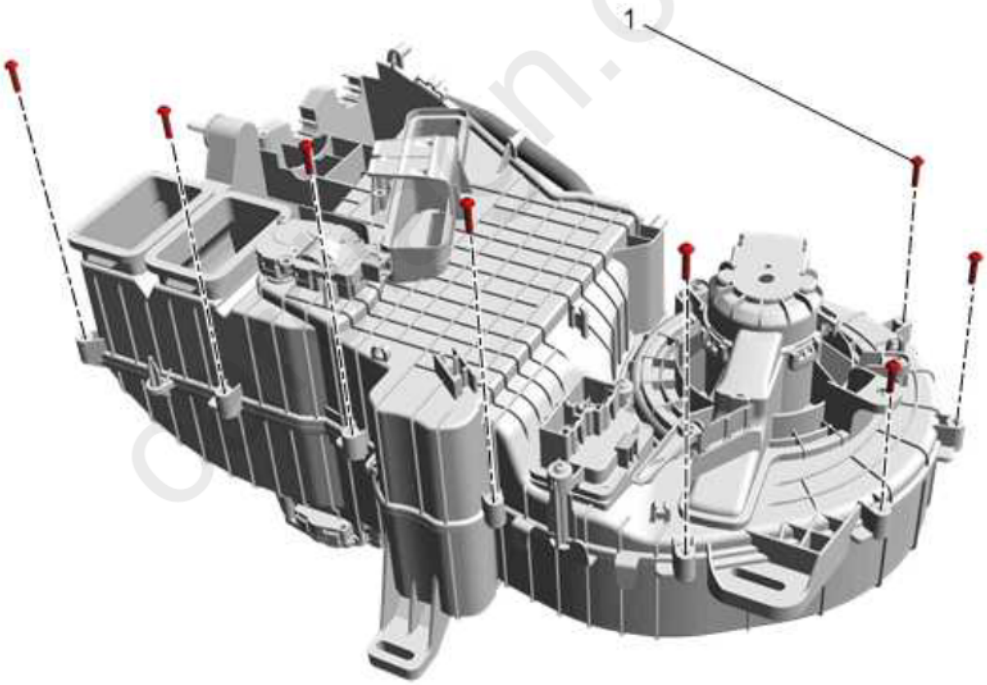


Fig. 749: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

23. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [6x]Â» Remove

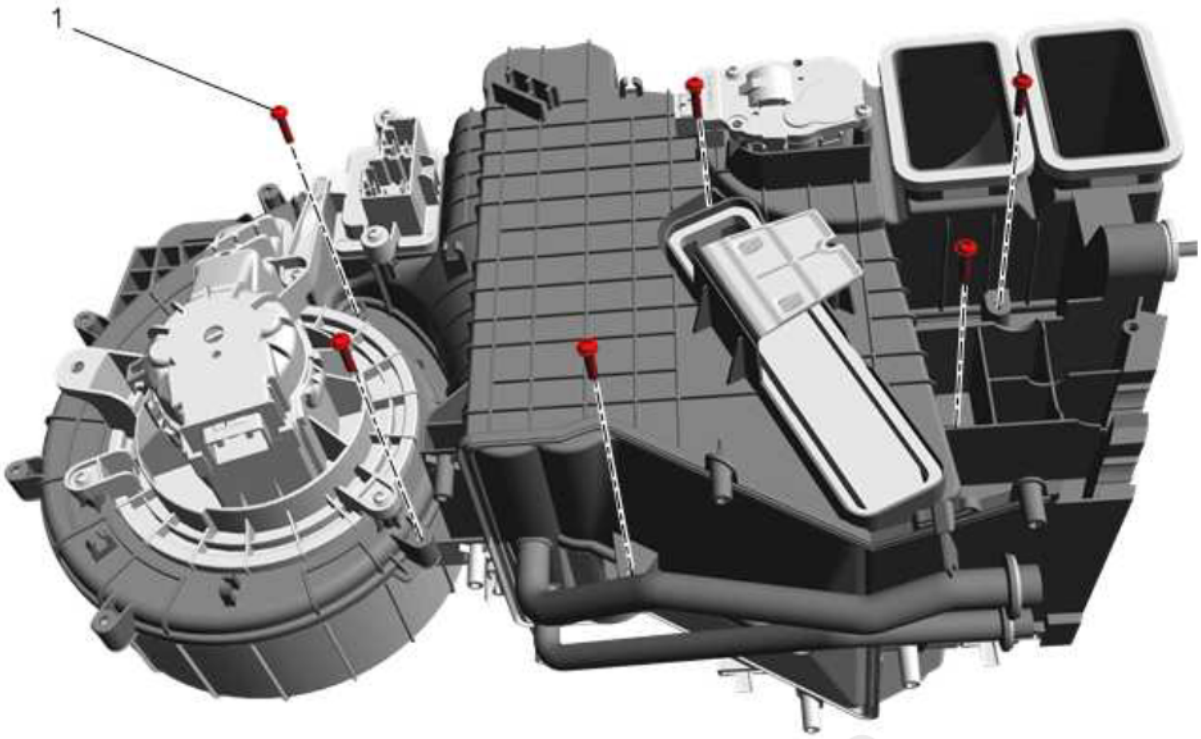


Fig. 750: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

24. Auxiliary Air Conditioning Evaporator and Blower Case (1) - Inboard @ Auxiliary Air Conditioning Evaporator and Blower Case - OutboardÂ» Remove

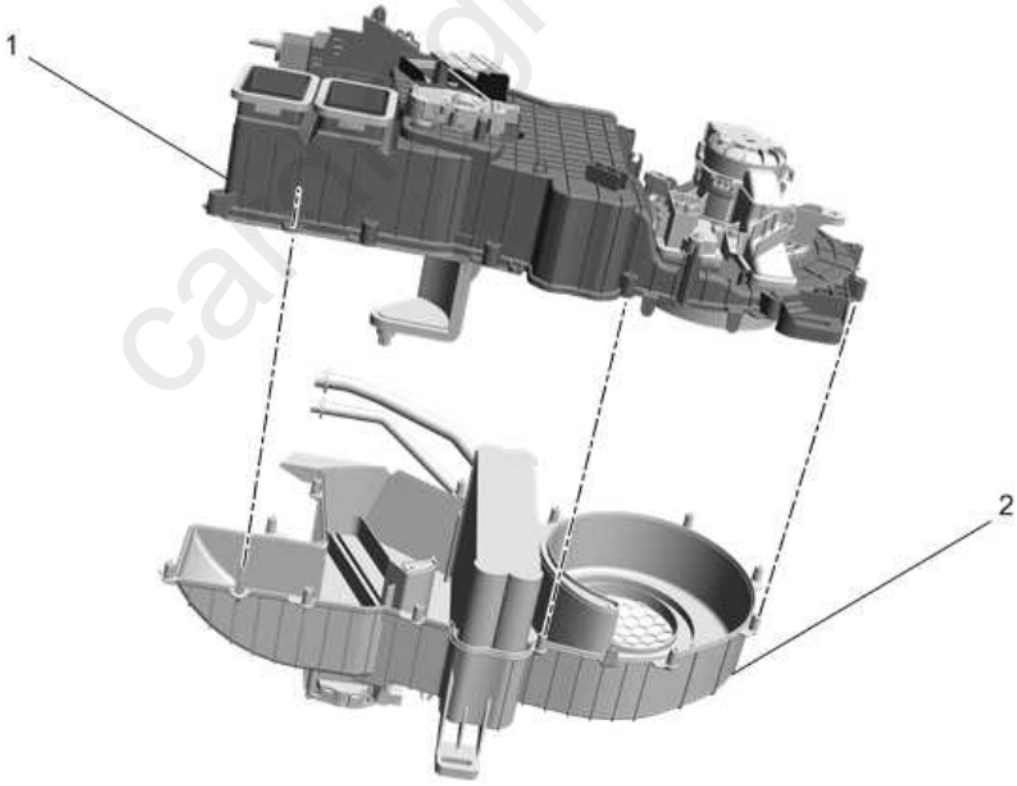


Fig. 751: Auxiliary Air Conditioning Evaporator and Blower Case - Inboard
Courtesy of GENERAL MOTORS COMPANY

25. Remove and inspect the right side auxiliary temperature door (1) and replace as necessary.

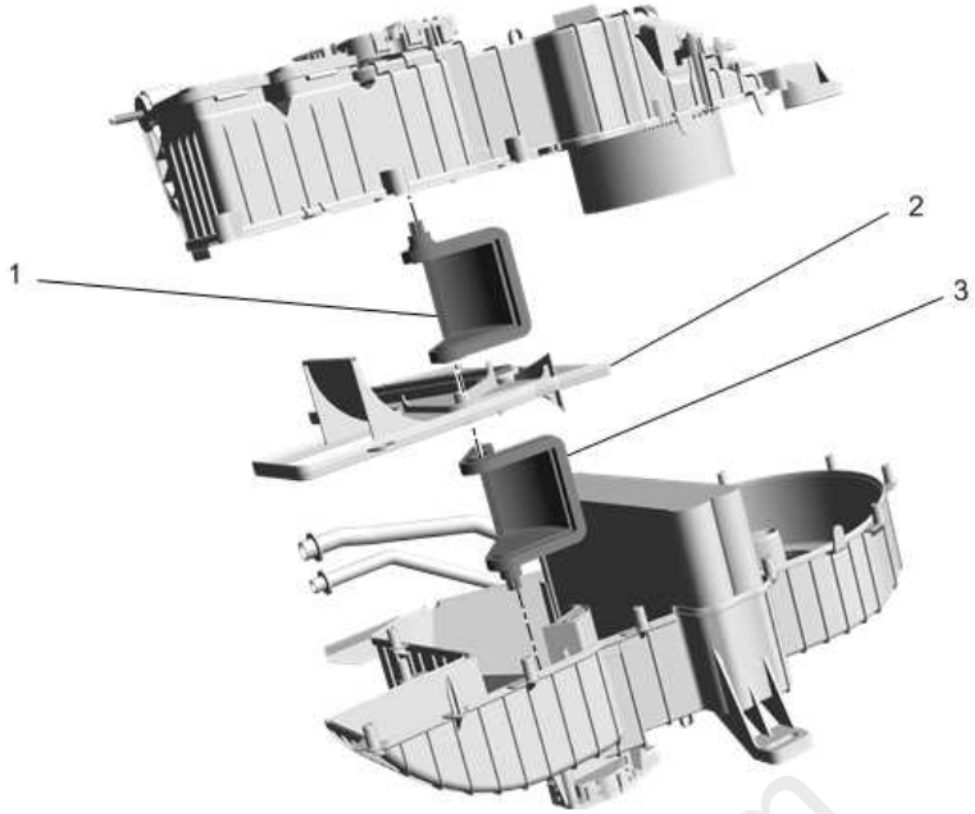


Fig. 752: Auxiliary Temperature Doors and Divider Plate
Courtesy of GENERAL MOTORS COMPANY

26. Remove and inspect the divider plate (2) and replace as necessary
27. Remove and inspect the left side auxiliary temperature door (3) and replace as necessary.
28. Transfer components as necessary.

Installation Procedure

1. Install the left side auxiliary temperature door (3).

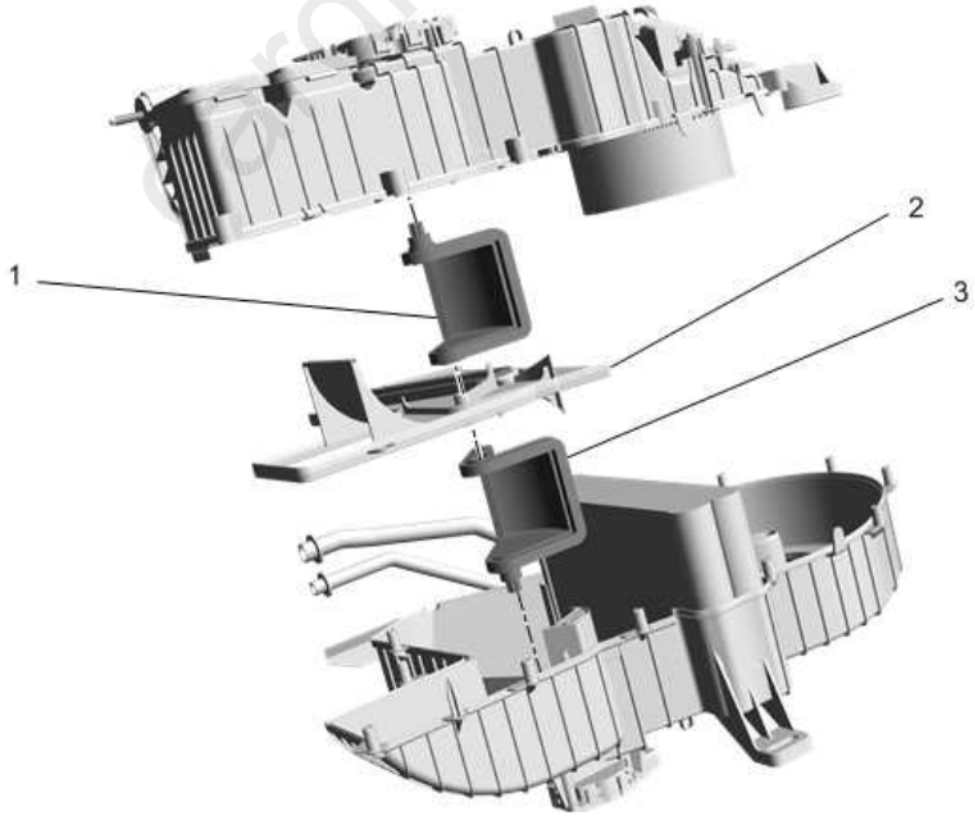


Fig. 753: Auxiliary Temperature Doors and Divider Plate
Courtesy of GENERAL MOTORS COMPANY

2. Install the divider plate (2).

3. Install the right side auxiliary temperature door (1).
4. Auxiliary Air Conditioning Evaporator and Blower Case (1) - Inboard @ Auxiliary Air Conditioning Evaporator and Blower Case - OutboardÂ» Install

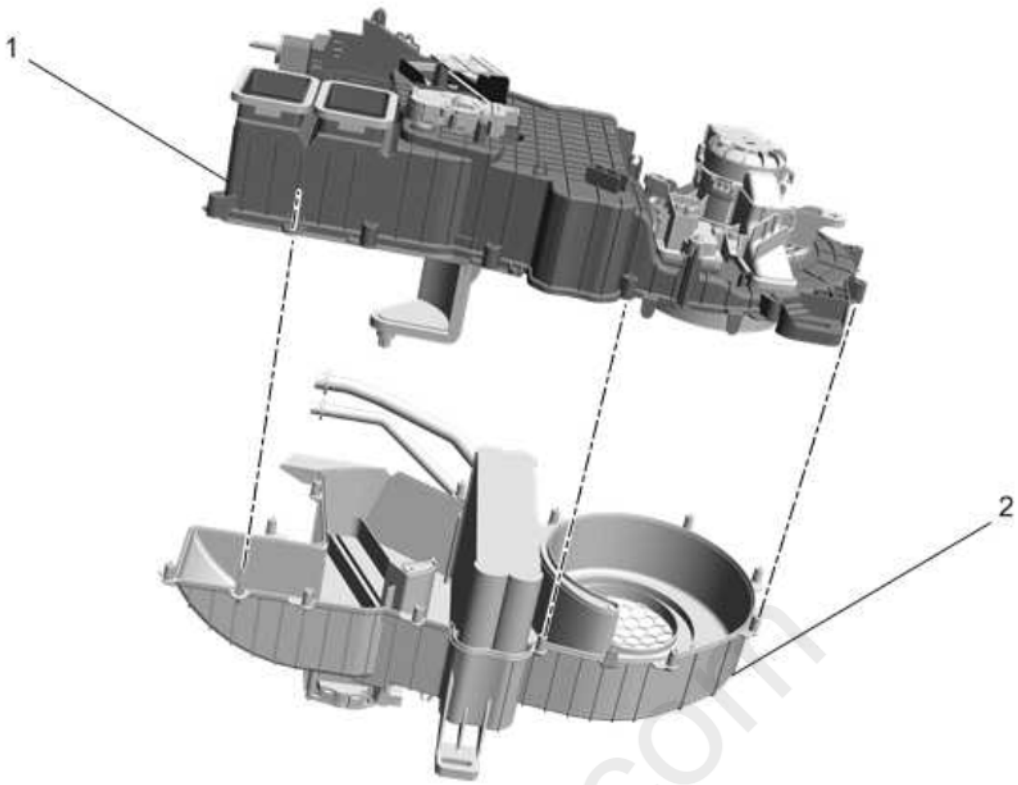


Fig. 754: Auxiliary Air Conditioning Evaporator and Blower Case - Inboard
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [6x]Â» Install and tighten 1.3 N.m (12 lb in)

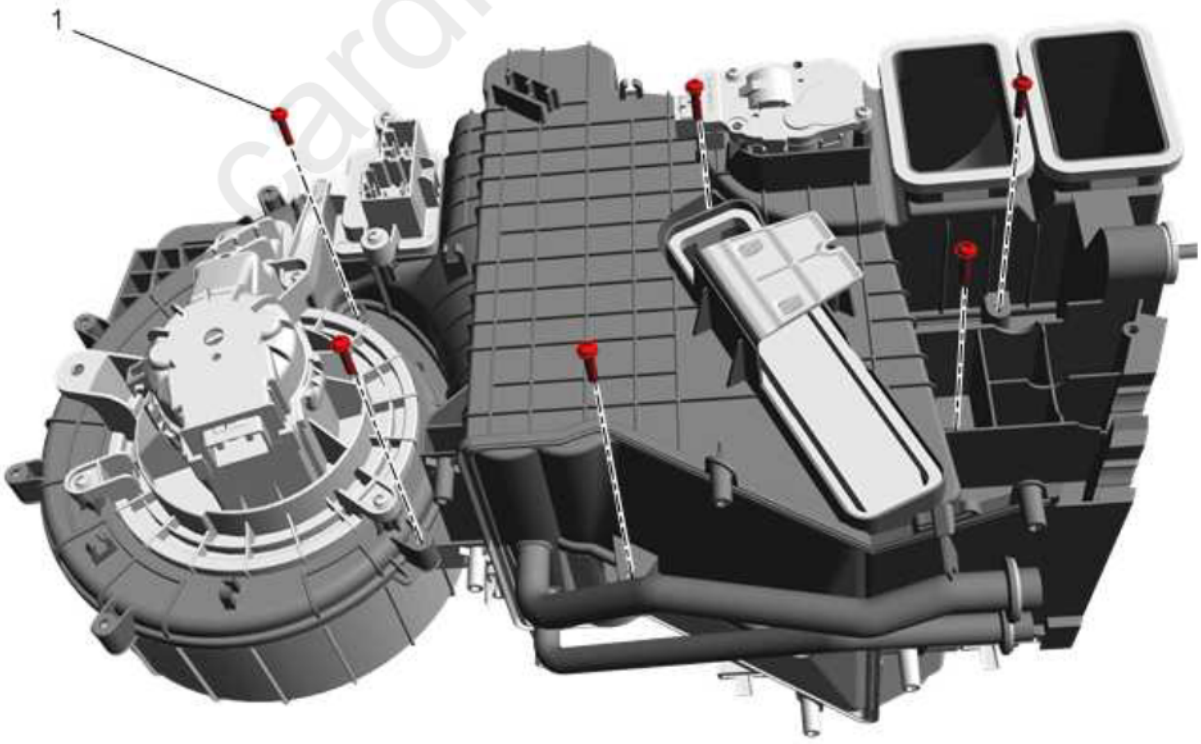


Fig. 755: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

6. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [8x]Â» Install and tighten 1.3 N.m (12 lb in)

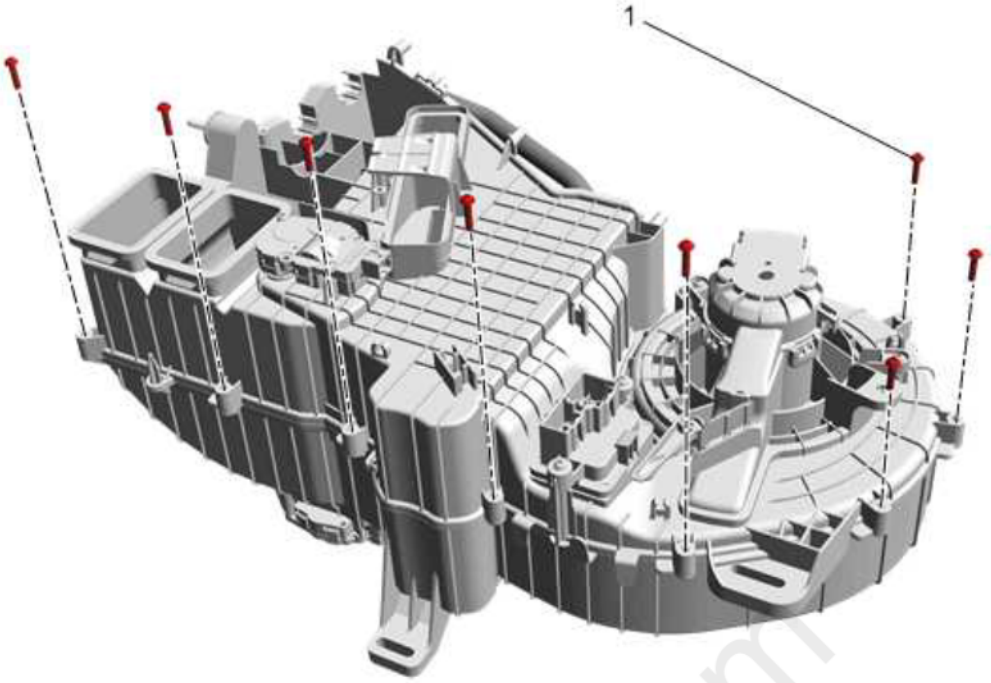


Fig. 756: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Heater Core (1)Â» Install - **Auxiliary Heater Core Replacement**

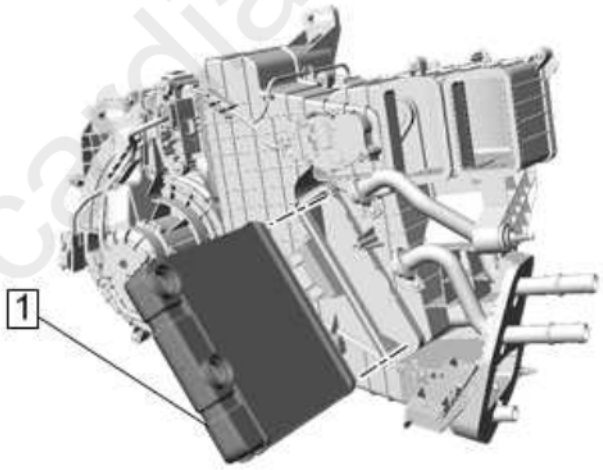


Fig. 757: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

8. Heater Core Inlet Tube (3) & Heater Core Outlet Tube (5)Â» Install - **Heater Core Tube Replacement (Auxiliary)**

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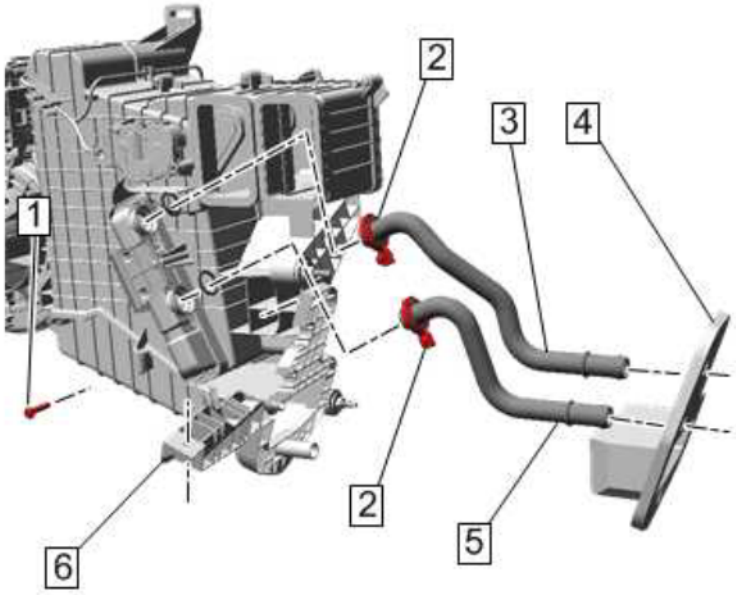


Fig. 758: Heater Core Inlet Tube & Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

9. Install the auxiliary air conditioning evaporator and blower lower case (3). Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement**

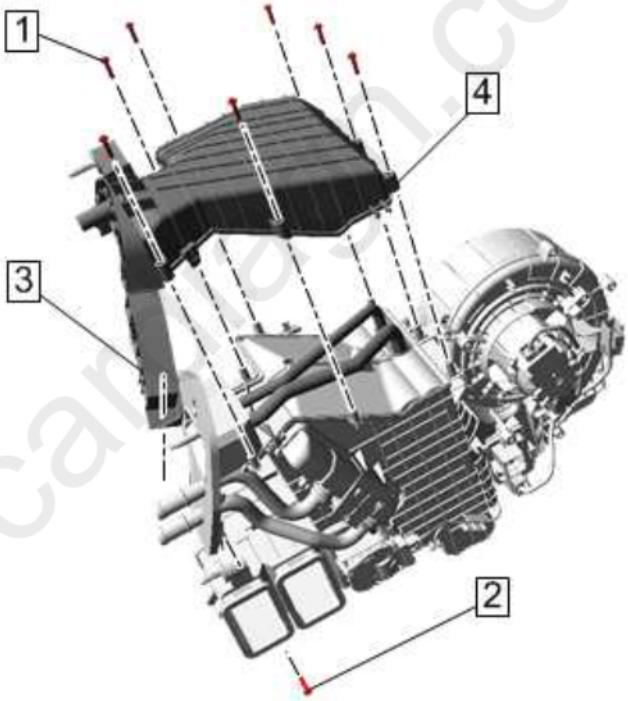


Fig. 759: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Evaporator Thermal Expansion Valve (2)Â» Install - **Air Conditioning Evaporator Thermal Expansion Valve ReplacementAir Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary with HP9)**

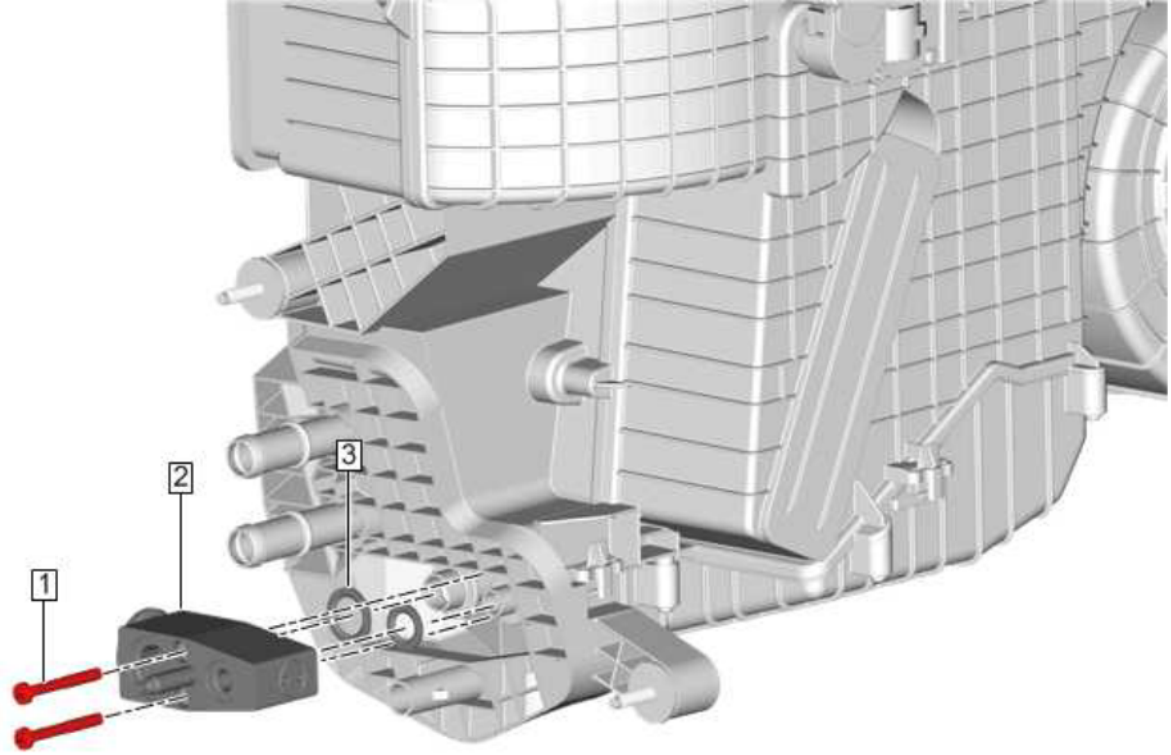


Fig. 760: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Install

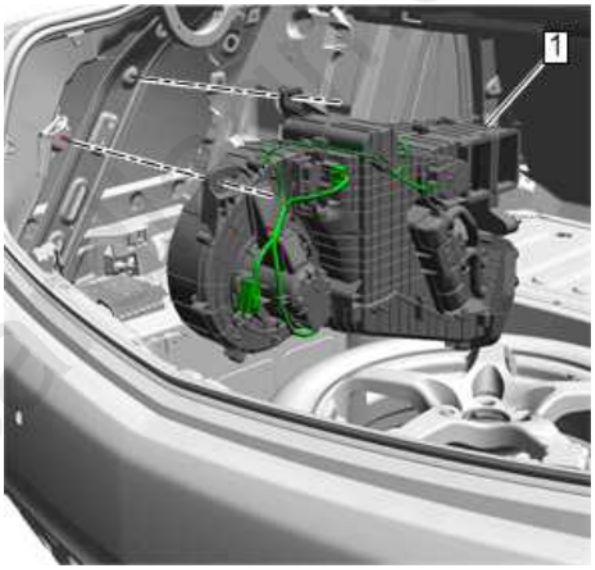


Fig. 761: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

12. Air Distributor Nut (1)Â» Install and tighten [2x] 9 N.m (80 lb in)

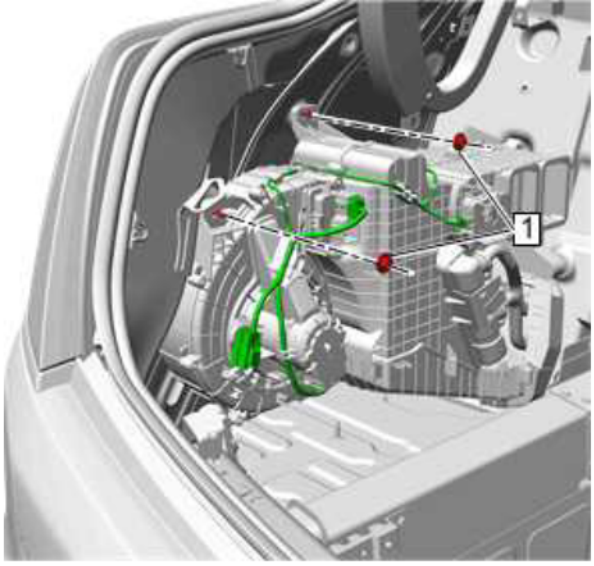


Fig. 762: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

13. Connect the electrical connectors.
14. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Install

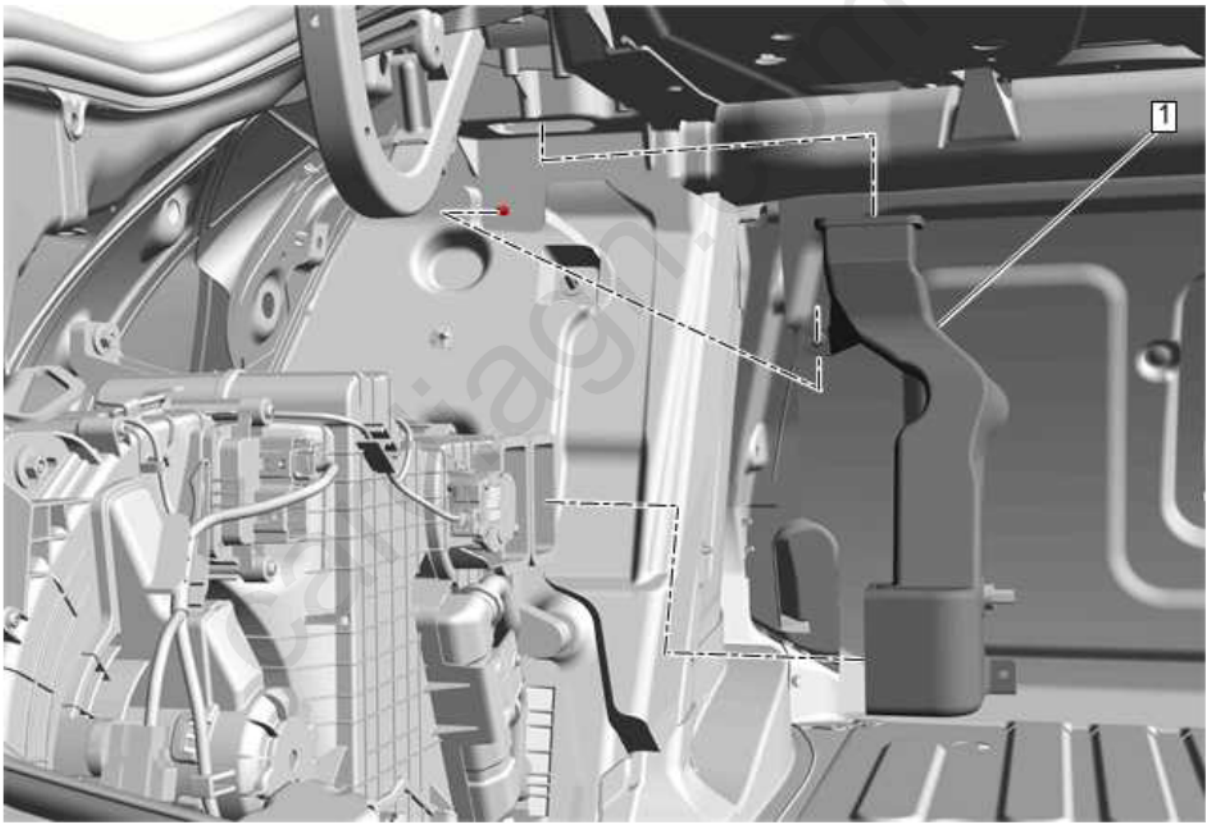


Fig. 763: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Install

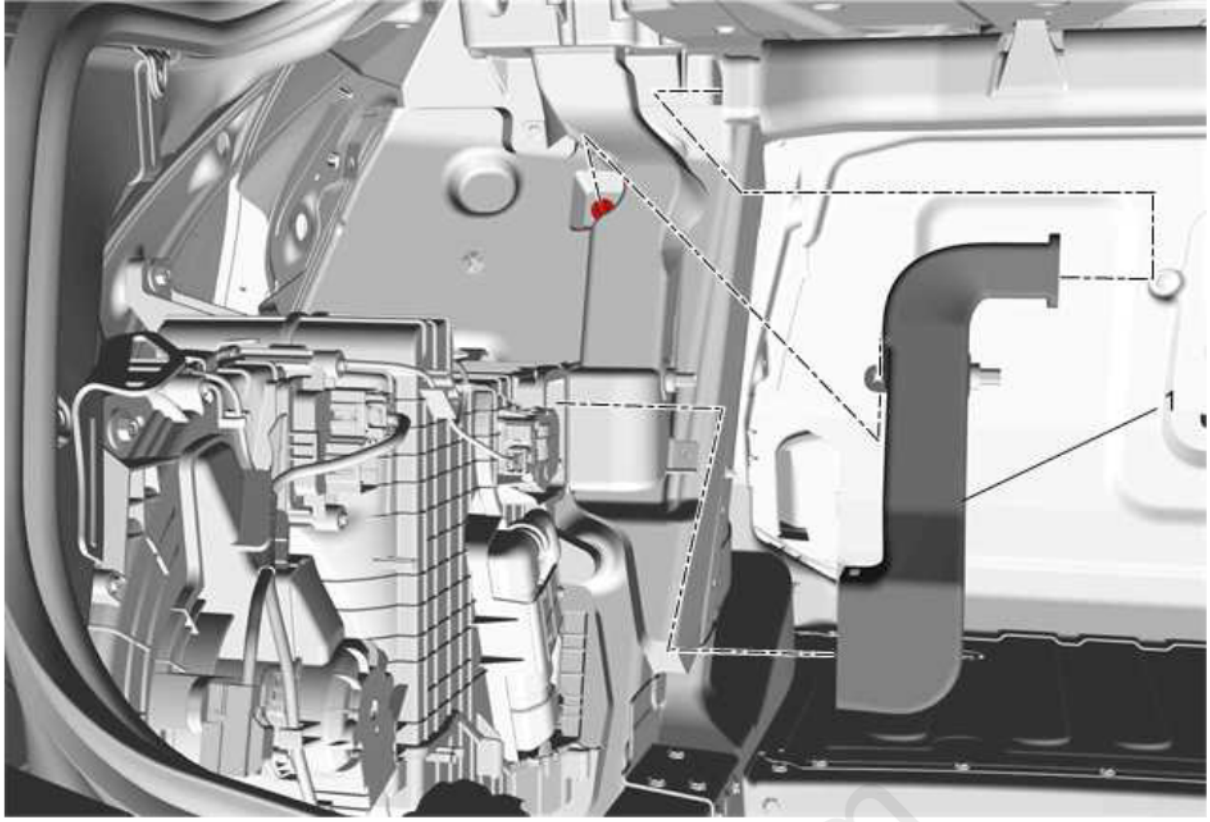


Fig. 764: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

16. Rear Compartment Side Trim - Left (2)Â» Install - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**



Fig. 765: Rear Compartment Side Trim - Left
Courtesy of GENERAL MOTORS COMPANY

17. Air Distributor Nut (5)Â» Install and tighten [2x] 9 N.m (80 lb in)

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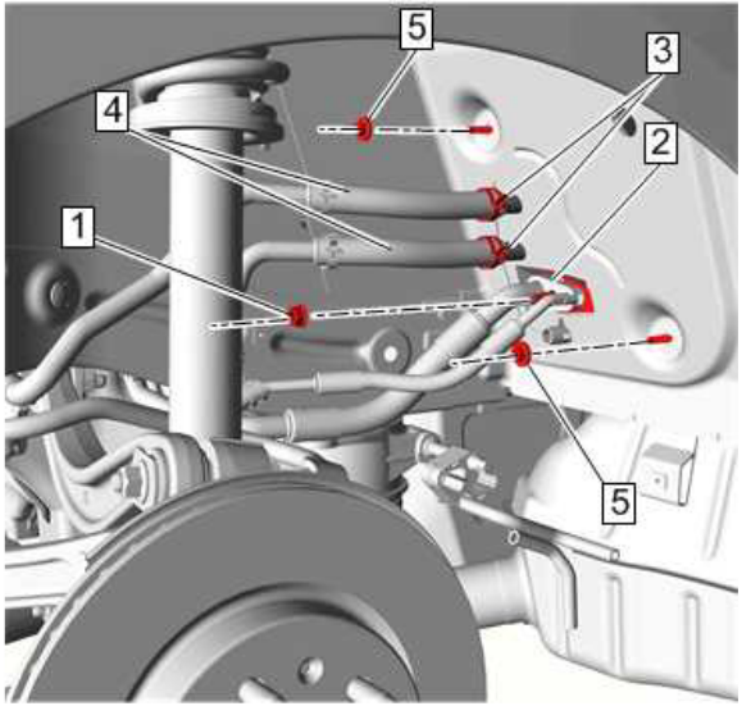


Fig. 766: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

18. Install the auxiliary heater hoses (4) to the auxiliary heater core tubes.
19. Install the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
20. Install NEW sealing washers [2x]. Refer to **Air Conditioning System Seal Replacement**
21. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install
22. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
23. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Install - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

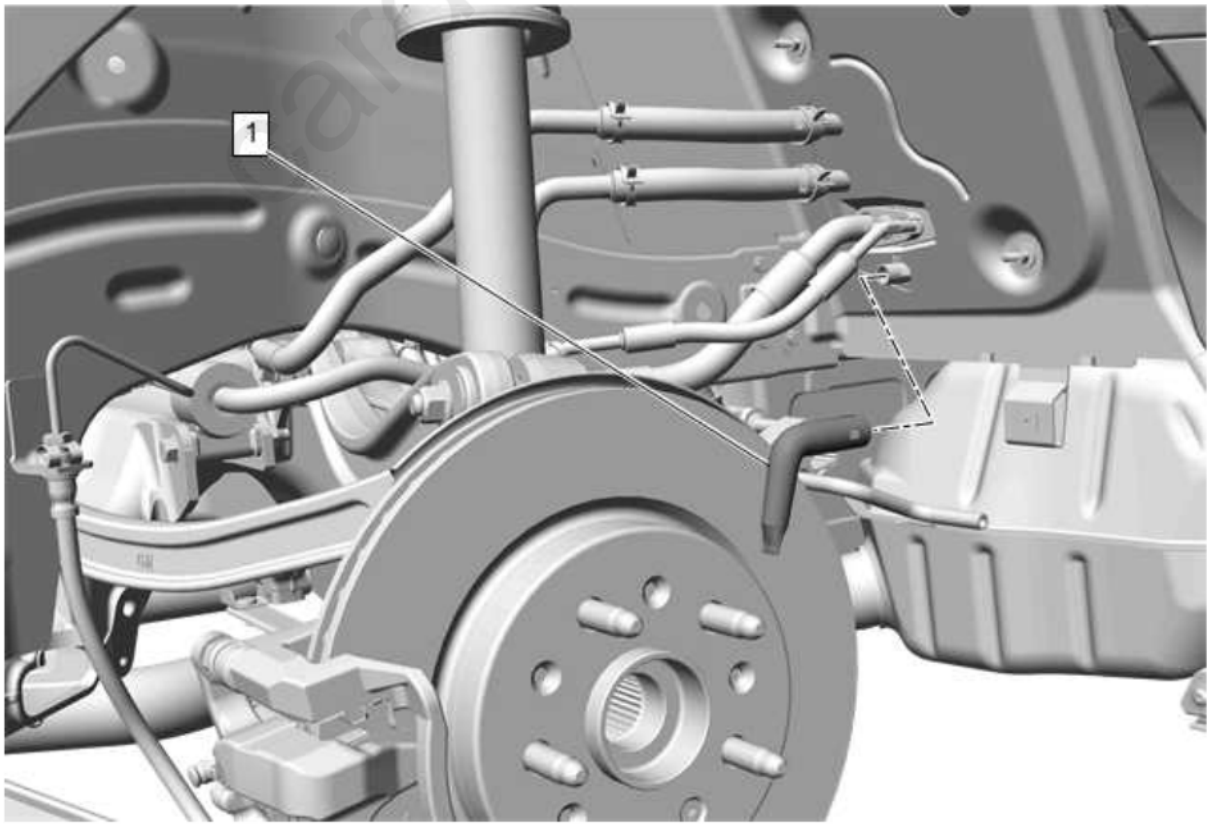


Fig. 767: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

24. Rear Wheelhouse Liner (2)Â» Install - **Rear Wheelhouse Liner Replacement (LTG)** **Rear Wheelhouse Liner Replacement (LGX, LGW)**

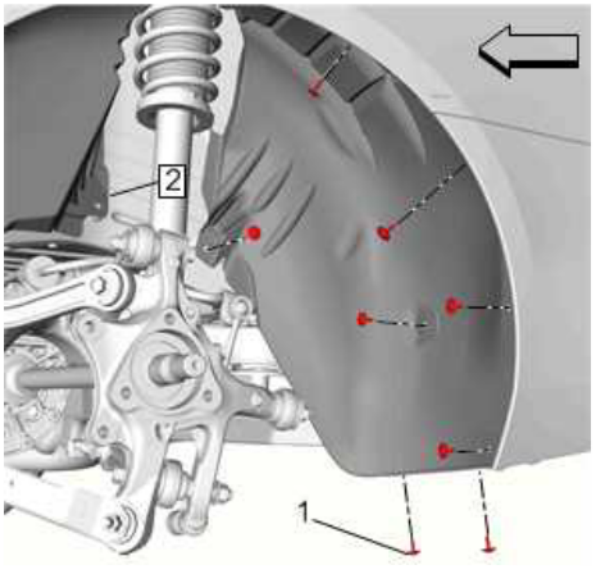


Fig. 768: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

25. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
26. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
27. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
28. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
29. Clear the DTCs.
30. Inspect for coolant leaks.
31. Inspect for refrigerant leaks.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER CASE REPLACEMENT - OUTBOARD

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
4. Remove the rear half of the left rear wheelhouse liner (2) and position out of the way to gain access to the auxiliary air conditioning evaporator and blower module components. Refer to **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

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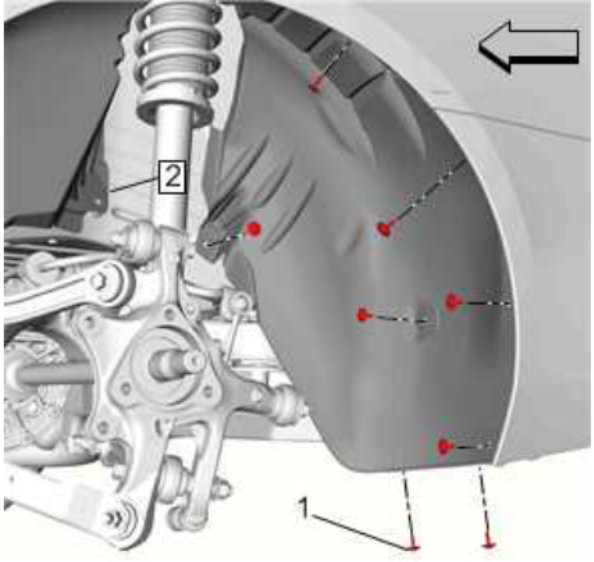


Fig. 769: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Remove - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

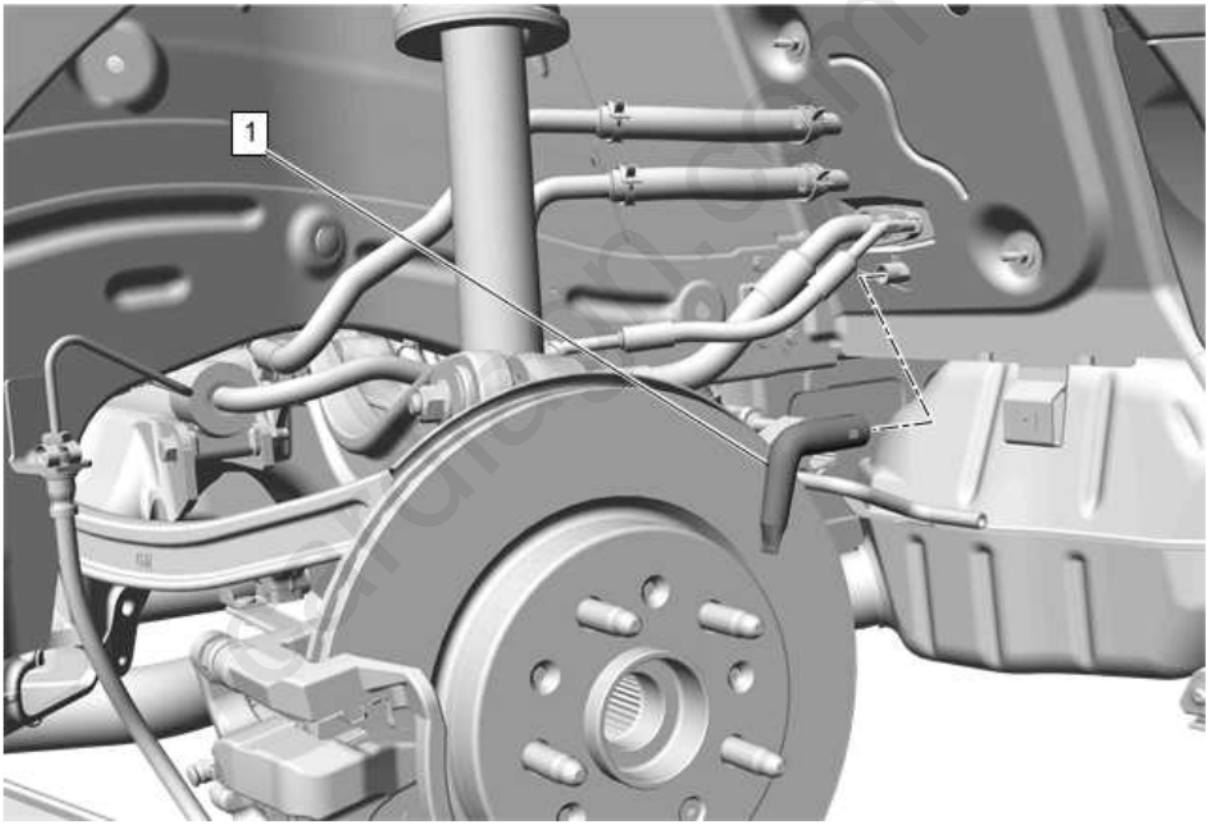


Fig. 770: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Hose Nut (1)Â» Remove

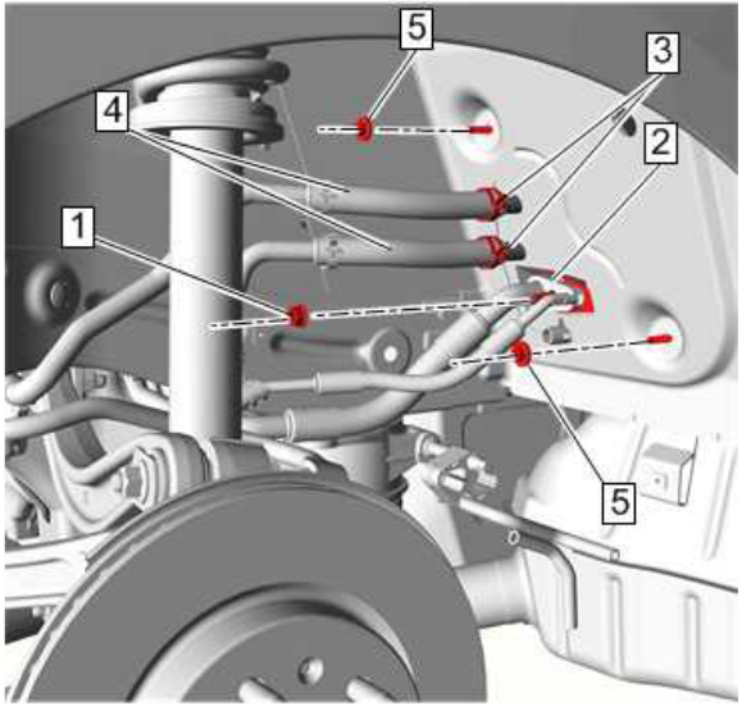


Fig. 771: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove
8. Remove and DISCARD the sealing washer [2x]. Refer to **Air Conditioning System Seal Replacement**
9. Remove the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
10. Remove the auxiliary heater hoses (4) from the auxiliary heater core tubes.
11. Air Distributor Nut (5)Â» Remove [2x]
12. Rear Compartment Side Trim - Left (2)Â» Remove - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**

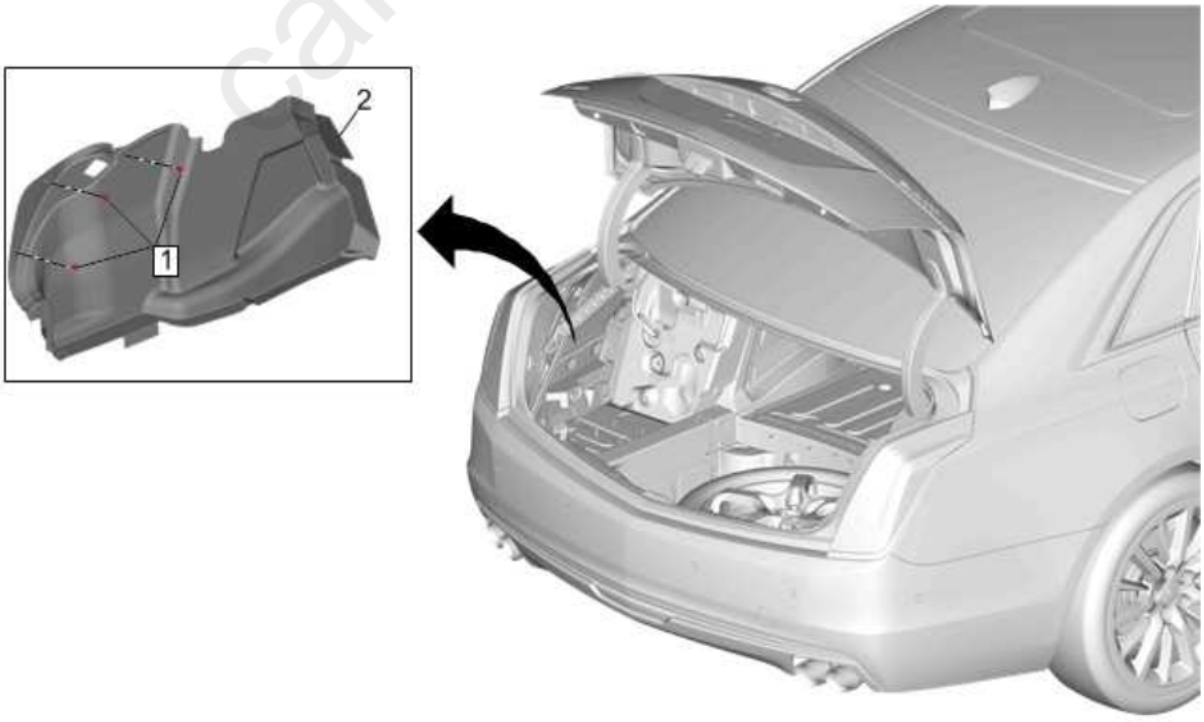


Fig. 772: Rear Compartment Side Trim - Left
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Remove

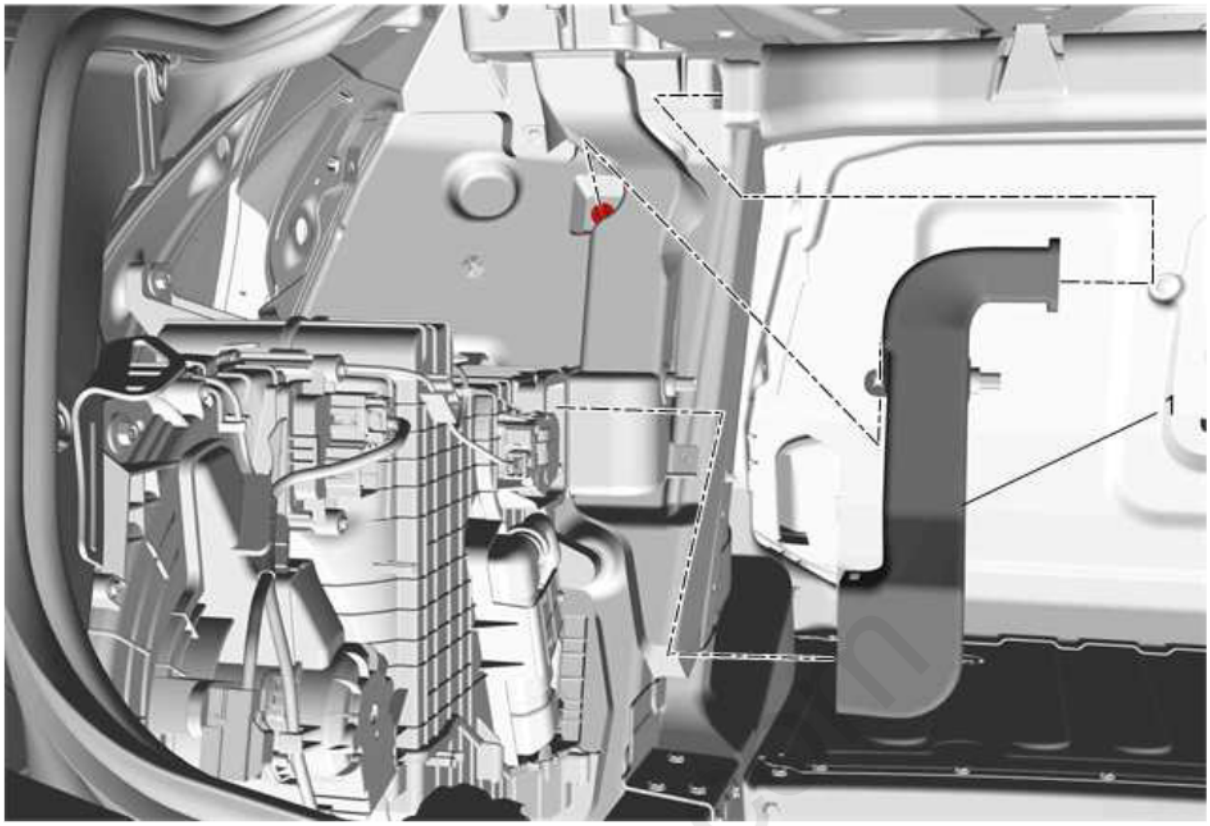


Fig. 773: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Remove

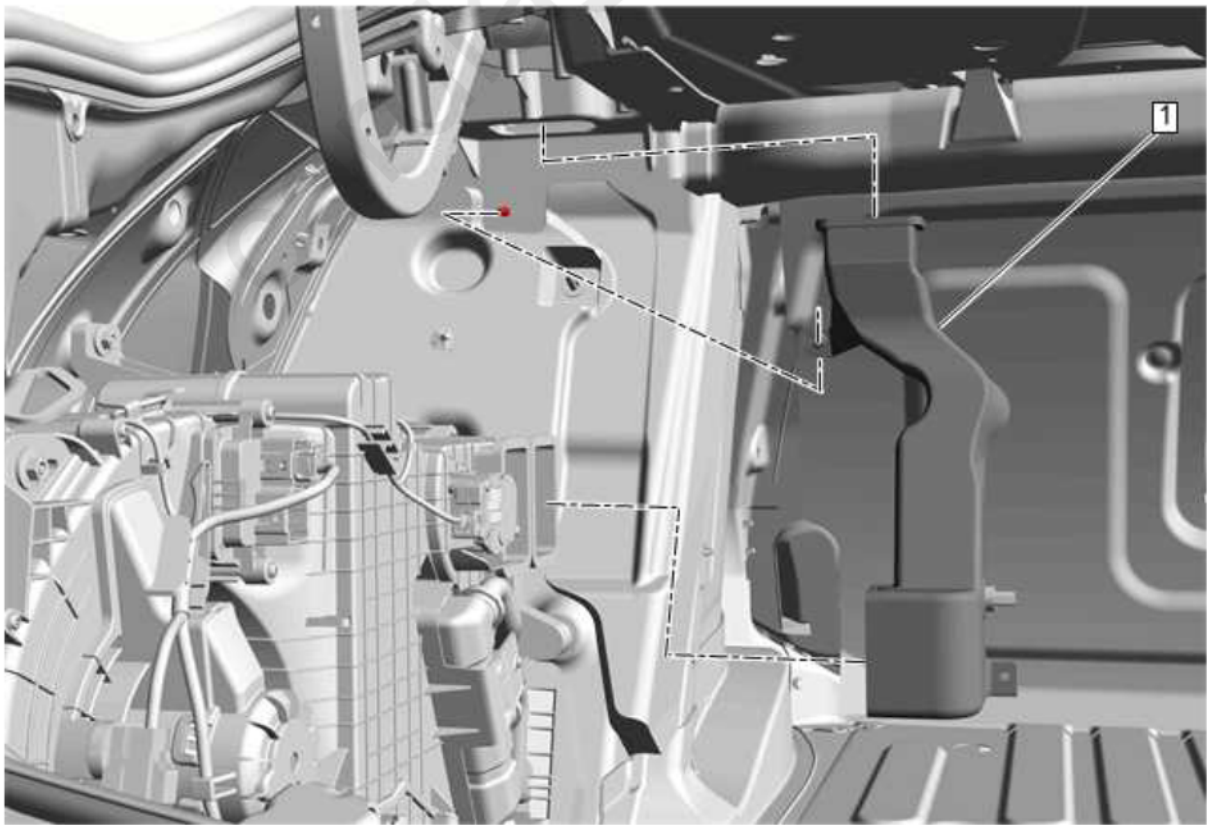


Fig. 774: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Air Distributor Nut (1)Â» Remove [2x]

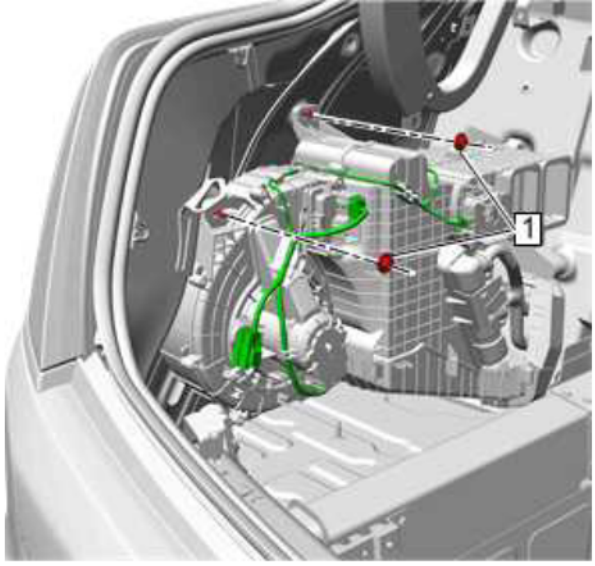


Fig. 775: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect all electrical connectors.
17. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Remove

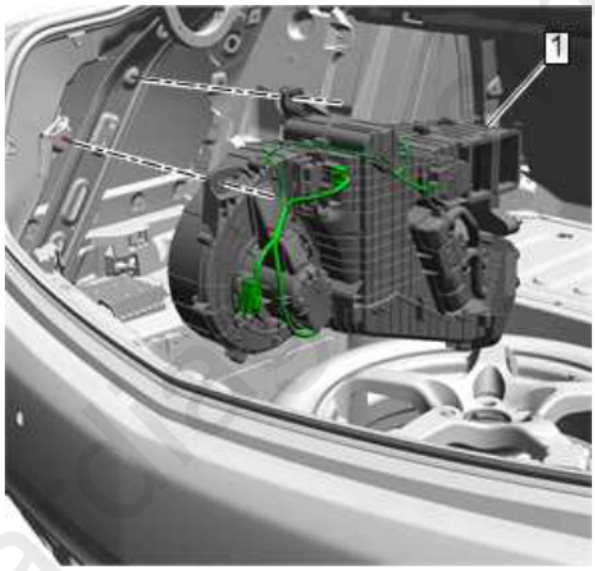


Fig. 776: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

18. Remove the auxiliary air conditioning evaporator and blower lower case (4). Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement**

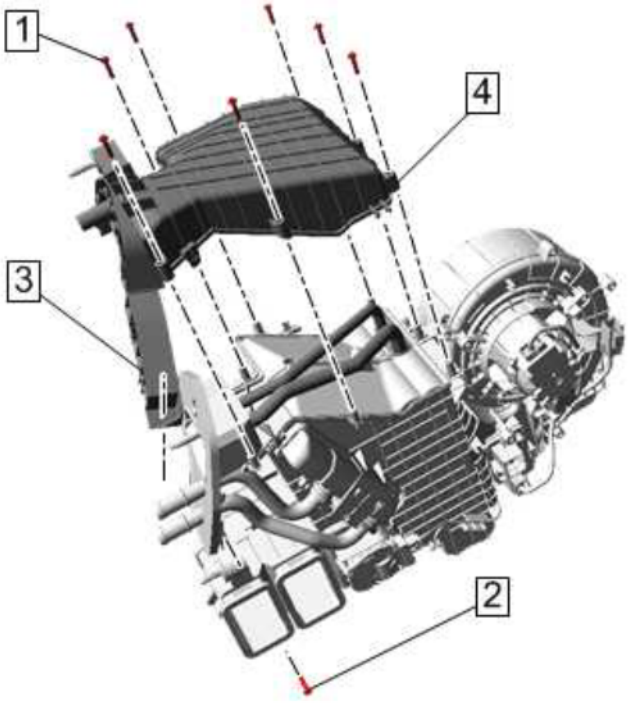


Fig. 777: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

19. Air Conditioning Evaporator Thermal Expansion Valve (2)Â» Remove - **Air Conditioning Evaporator Thermal Expansion Valve Replacement** and/or **Air Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)**.

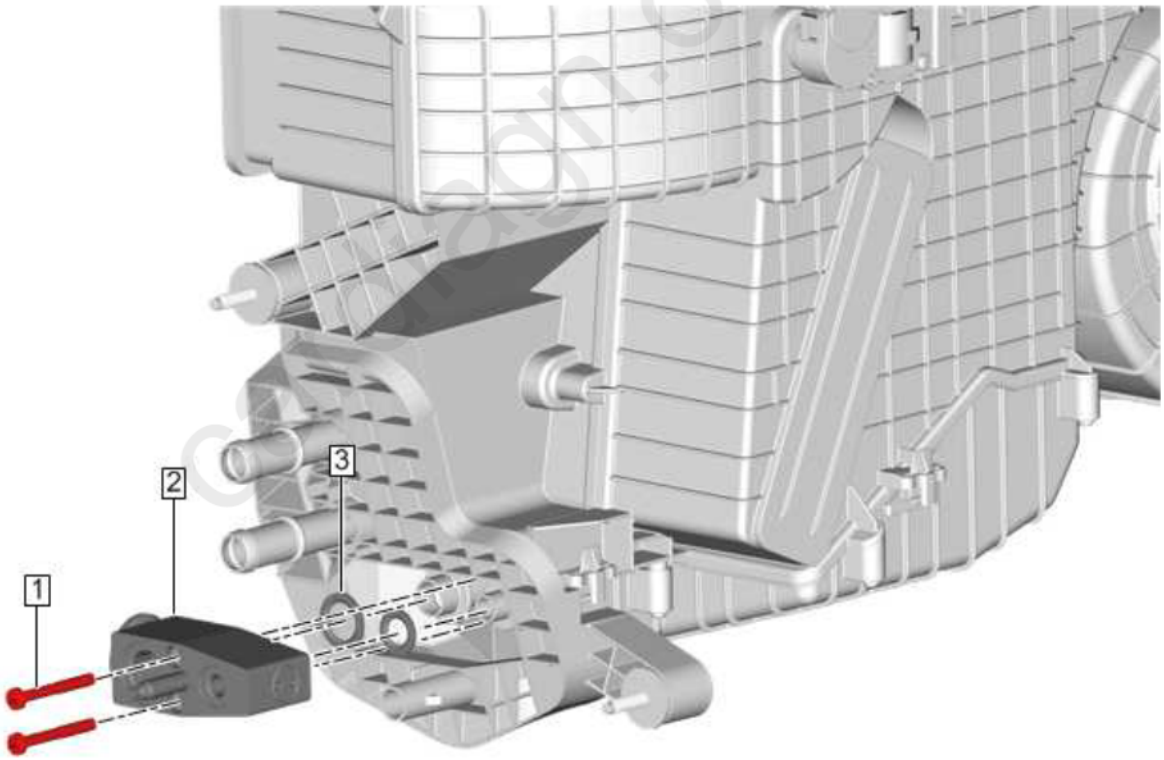


Fig. 778: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

20. Heater Core Inlet Tube (3) & Heater Core Outlet Tube (5)Â» Remove - **Heater Core Tube Replacement (Auxiliary)**

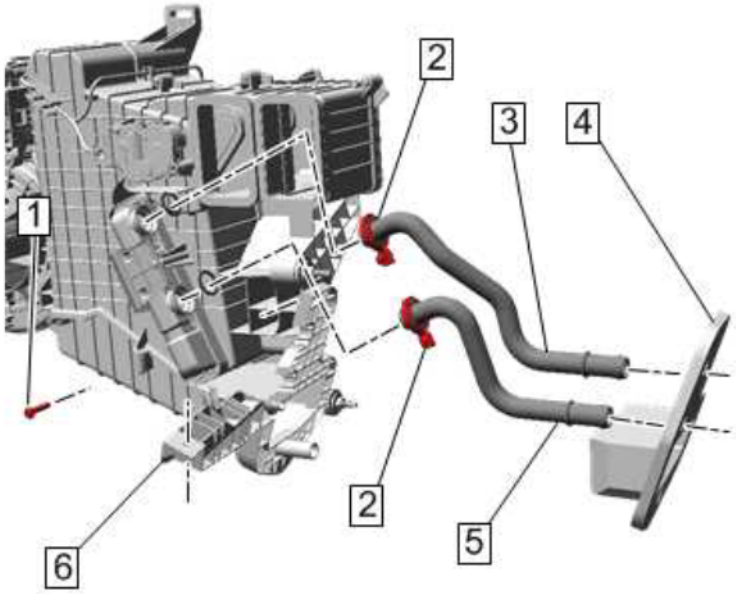


Fig. 779: Heater Core Inlet Tube & Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

21. Auxiliary Heater Core (1)Â» Remove - **Auxiliary Heater Core Replacement**

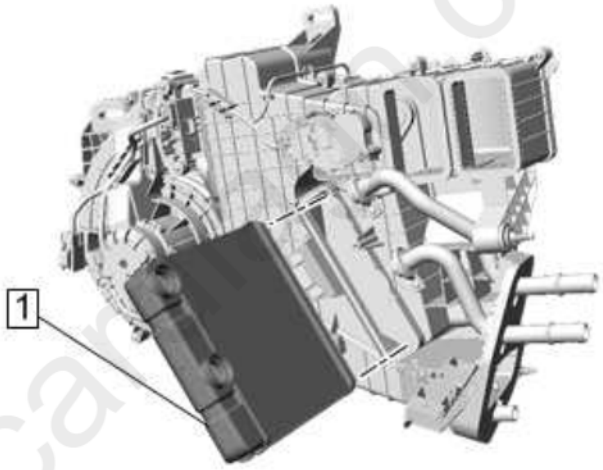


Fig. 780: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

22. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [8x]Â» Remove

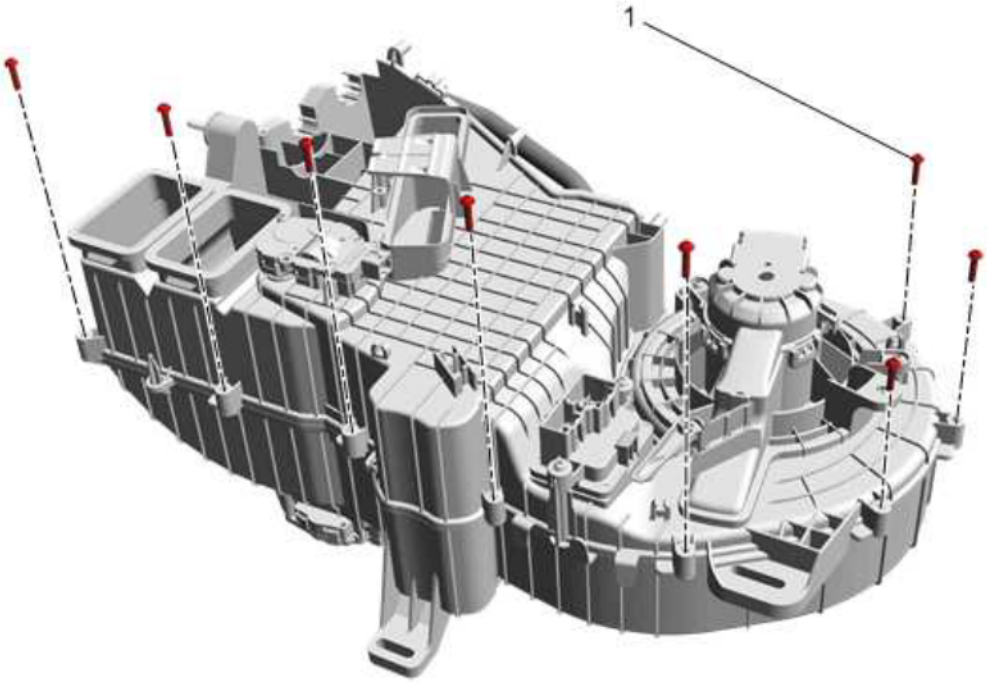


Fig. 781: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

23. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [6x]Â» Remove

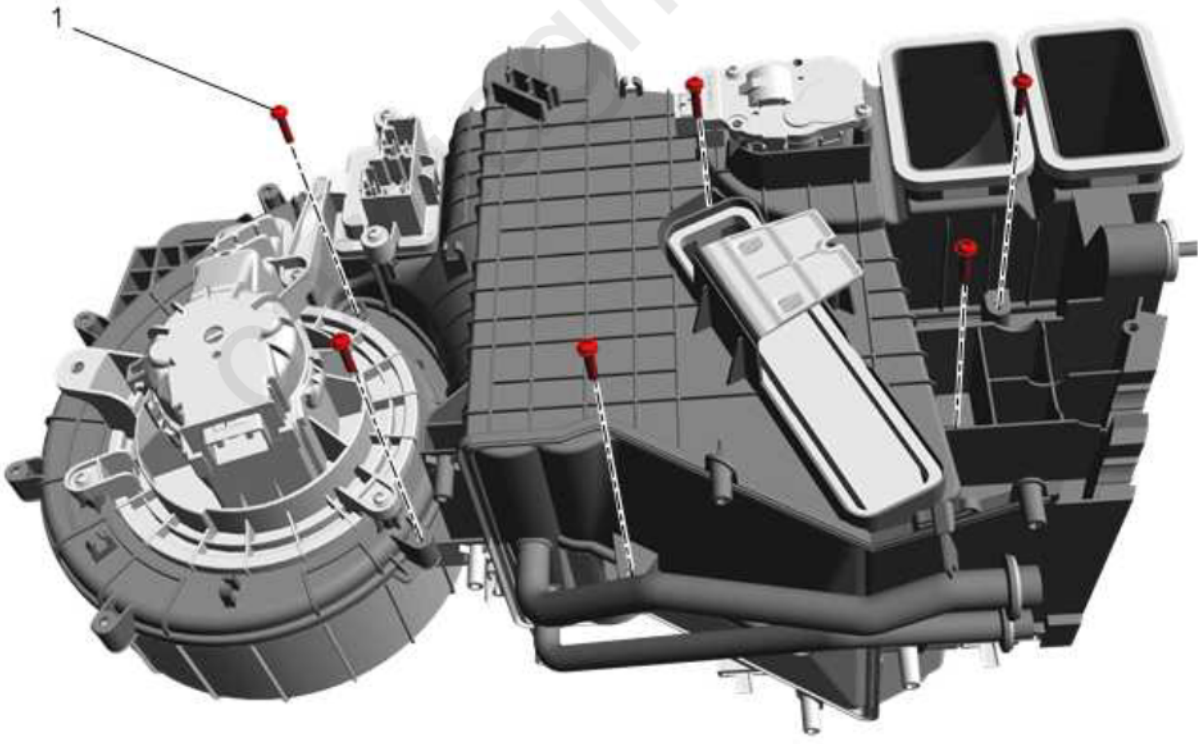


Fig. 782: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

24. Auxiliary Air Conditioning Evaporator and Blower Case (1) - Outboard @ Auxiliary Air Conditioning Evaporator and Blower Case - InboardÂ» Remove

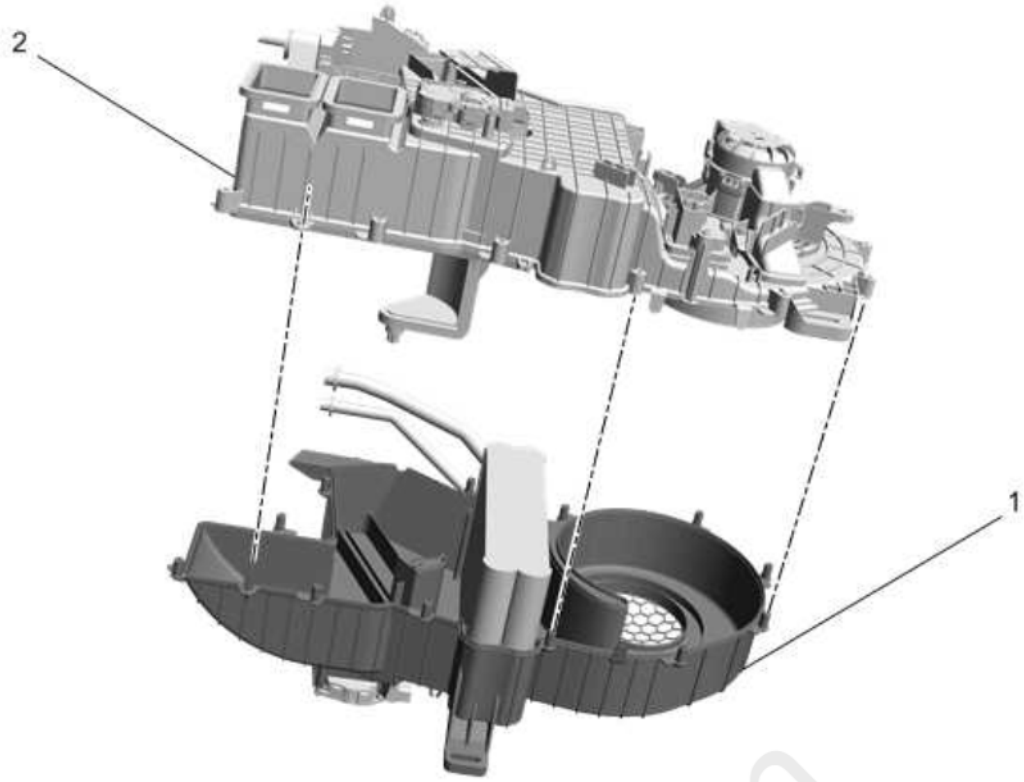


Fig. 783: Auxiliary Air Conditioning Evaporator And Blower Case - Outboard
Courtesy of GENERAL MOTORS COMPANY

25. Remove and inspect the right side auxiliary temperature door (1) and replace as necessary.

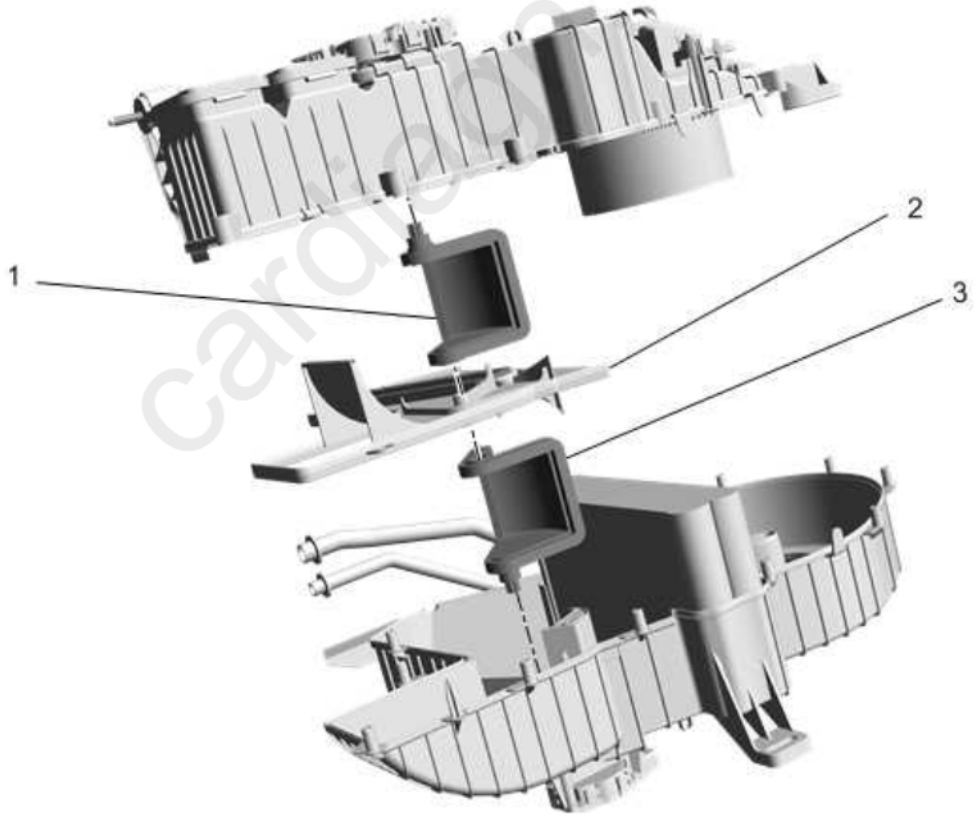


Fig. 784: Auxiliary Temperature Doors and Divider Plate
Courtesy of GENERAL MOTORS COMPANY

26. Remove and inspect the divider plate (2) and replace as necessary
27. Remove and inspect the left side auxiliary temperature door (3) and replace as necessary.
28. Transfer components as necessary.

Installation Procedure

1. Install the left side auxiliary temperature door (3).

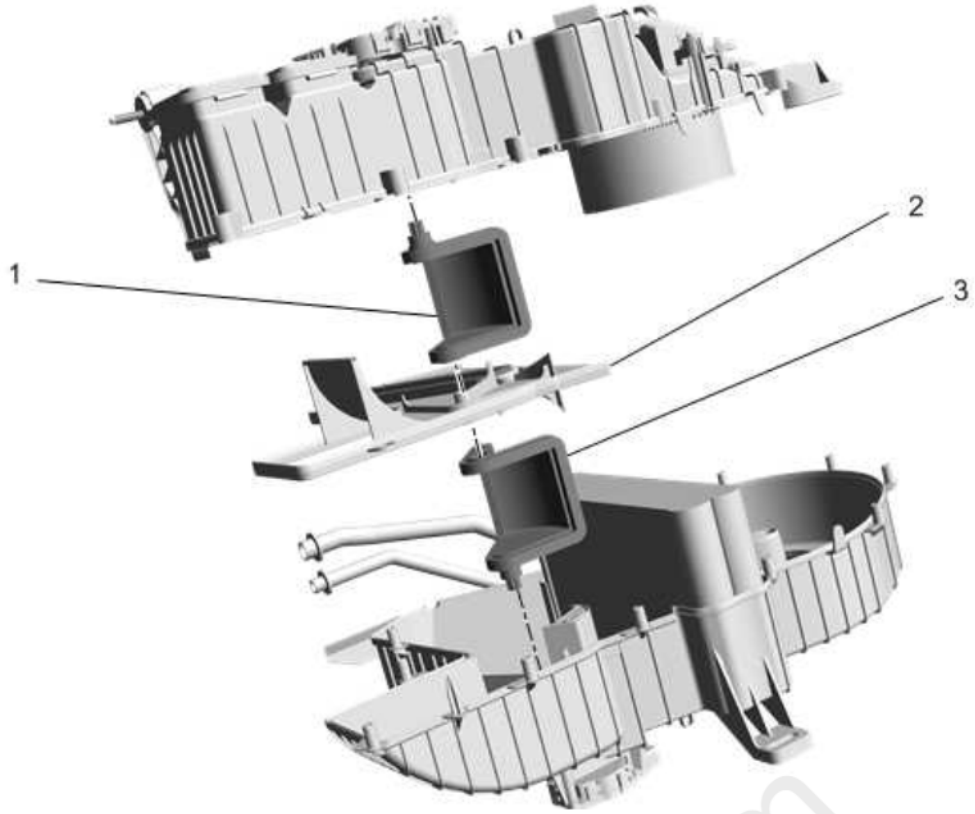


Fig. 785: Auxiliary Temperature Doors and Divider Plate
Courtesy of GENERAL MOTORS COMPANY

2. Install the divider plate (2).
3. Install the right side auxiliary temperature door (1).
4. Auxiliary Air Conditioning Evaporator and Blower Case (1) - Outboard @ Auxiliary Air Conditioning Evaporator and Blower Case - InboardÂ» Install

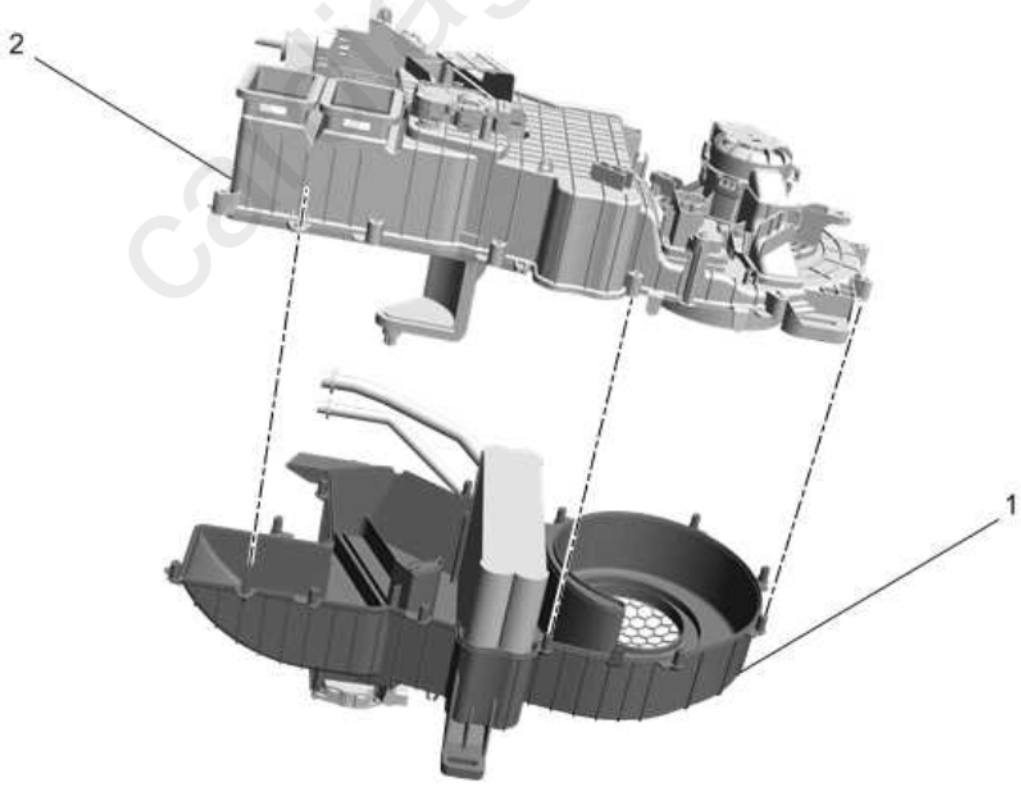


Fig. 786: Auxiliary Air Conditioning Evaporator And Blower Case - Outboard
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [6x]Â» Install and tighten 1.3 N.m (12 lb in)

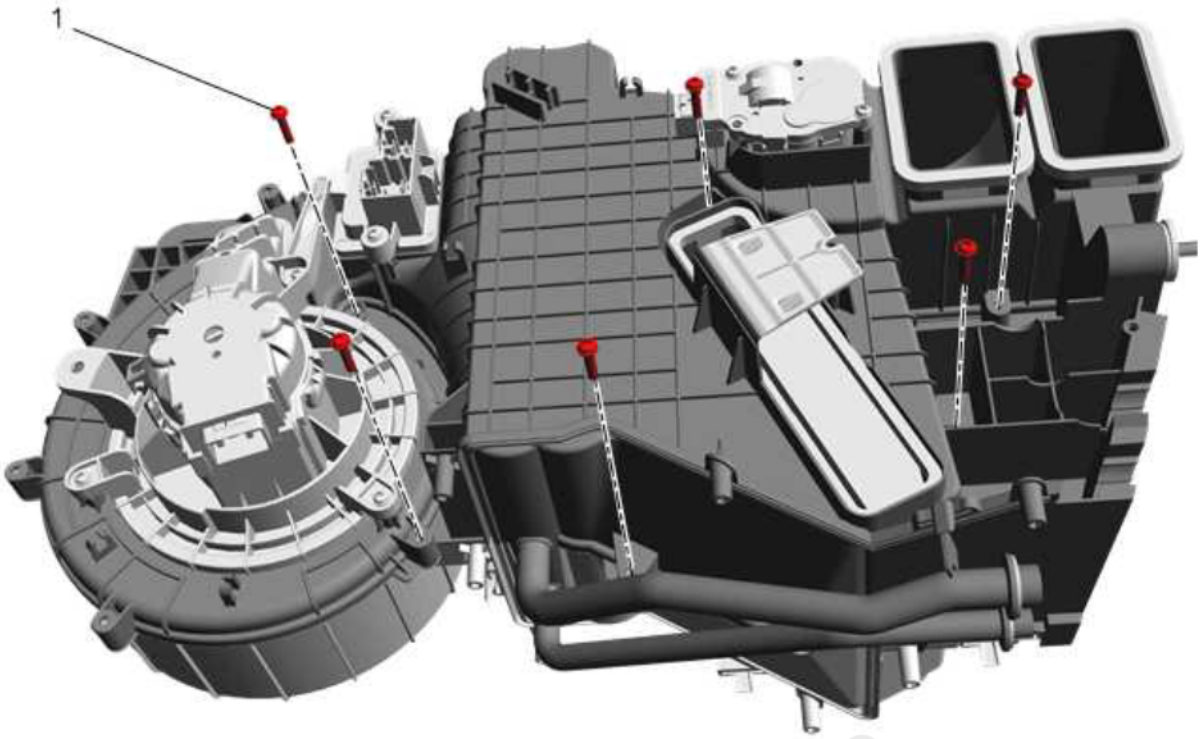


Fig. 787: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

6. Auxiliary Air Conditioning Evaporator and Blower Module Screw (1) [8x]Â» Install and tighten 1.3 N.m (12 lb in)

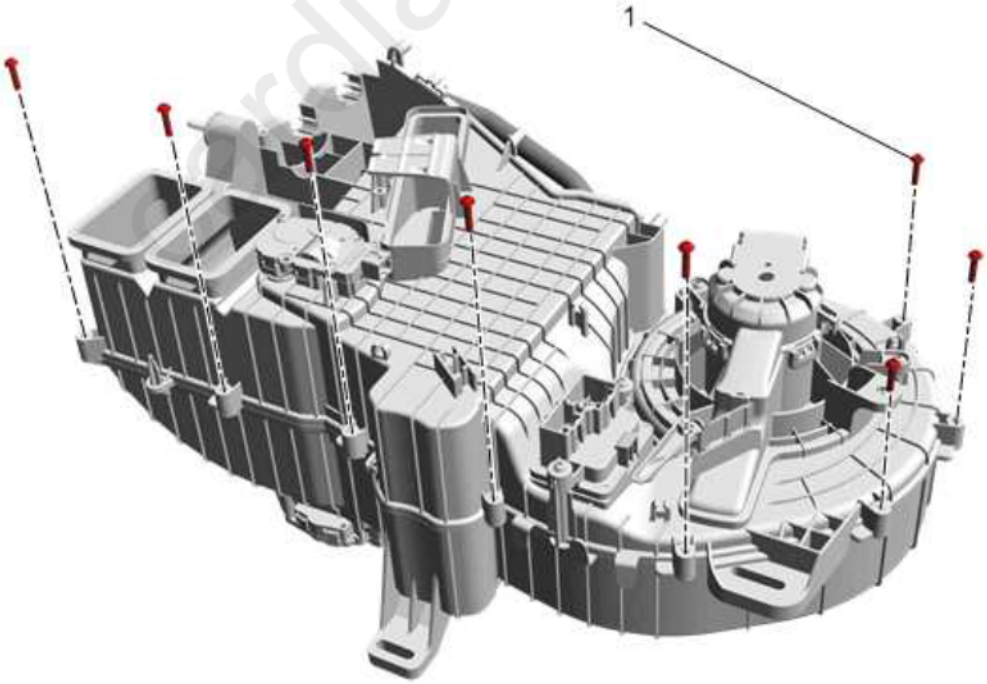


Fig. 788: Auxiliary Air Conditioning Evaporator and Blower Module Screw
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Heater Core (1)Â» Install - **Auxiliary Heater Core Replacement**

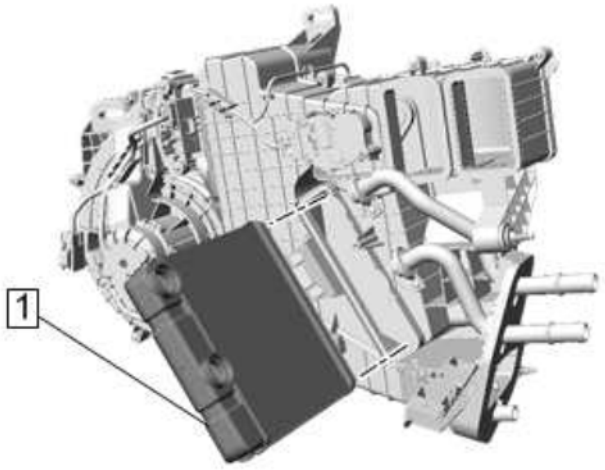


Fig. 789: Auxiliary Heater Core
Courtesy of GENERAL MOTORS COMPANY

8. Heater Core Inlet Tube (3) & Heater & Heater Core Outlet Tube (5)Â» Install - **Heater Core Tube Replacement (Auxiliary)**

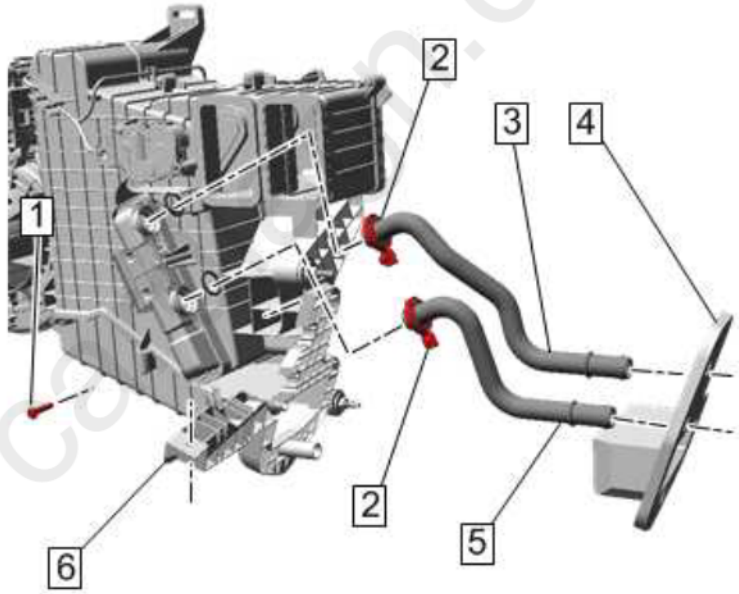


Fig. 790: Heater Core Inlet Tube & Heater Core Outlet Tube
Courtesy of GENERAL MOTORS COMPANY

9. Install the auxiliary air conditioning evaporator and blower lower case (4). Refer to **Auxiliary Air Conditioning Evaporator and Blower Lower Case Replacement**

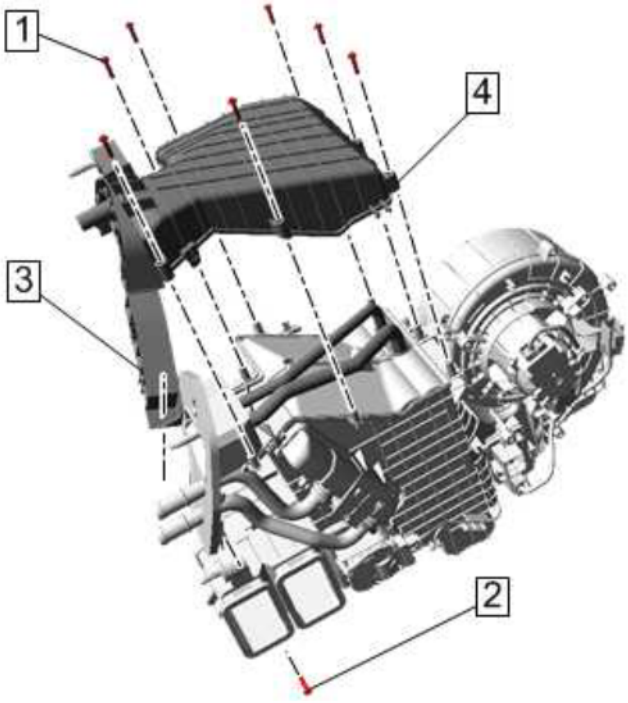


Fig. 791: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

10. Air Conditioning Evaporator Thermal Expansion Valve (2)Â» Install - **Air Conditioning Evaporator Thermal Expansion Valve ReplacementAir Conditioning Evaporator Thermal Expansion Valve Replacement (Auxiliary)**

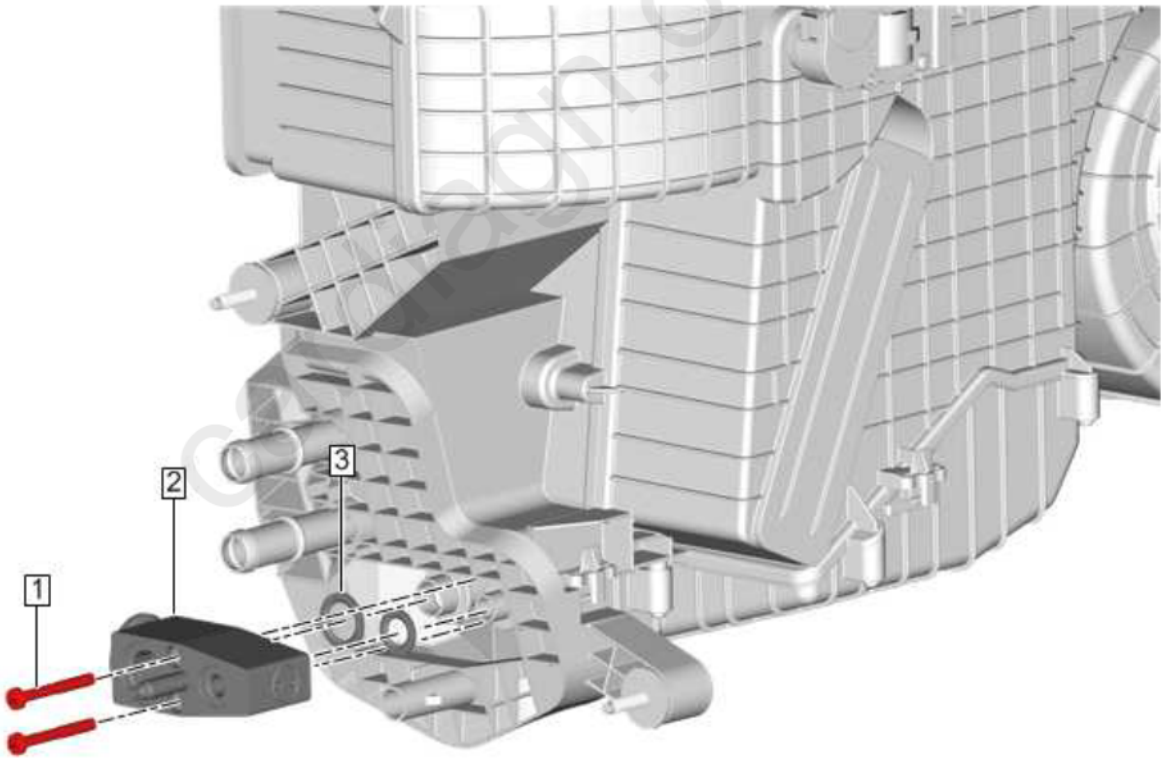


Fig. 792: Air Conditioning Evaporator Thermal Expansion Valve (Auxiliary)
Courtesy of GENERAL MOTORS COMPANY

11. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Install

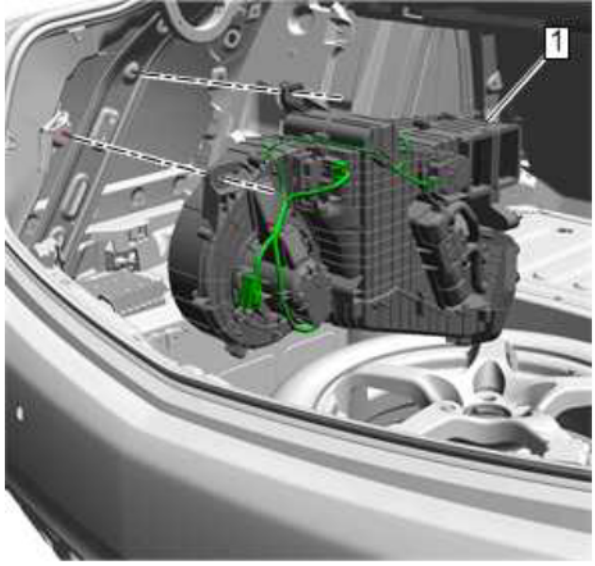


Fig. 793: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

12. Air Distributor Nut (1)Â» Install and tighten 9 N.m (80 lb in) [2x]

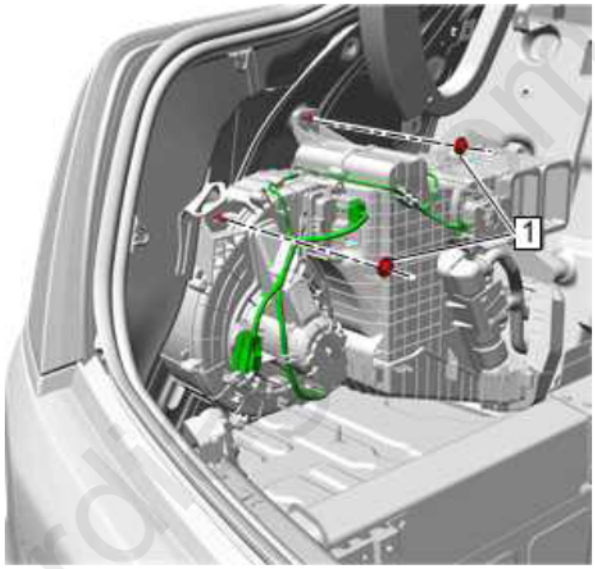


Fig. 794: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

13. Connect the electrical connectors.
14. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Install



Fig. 795: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Install

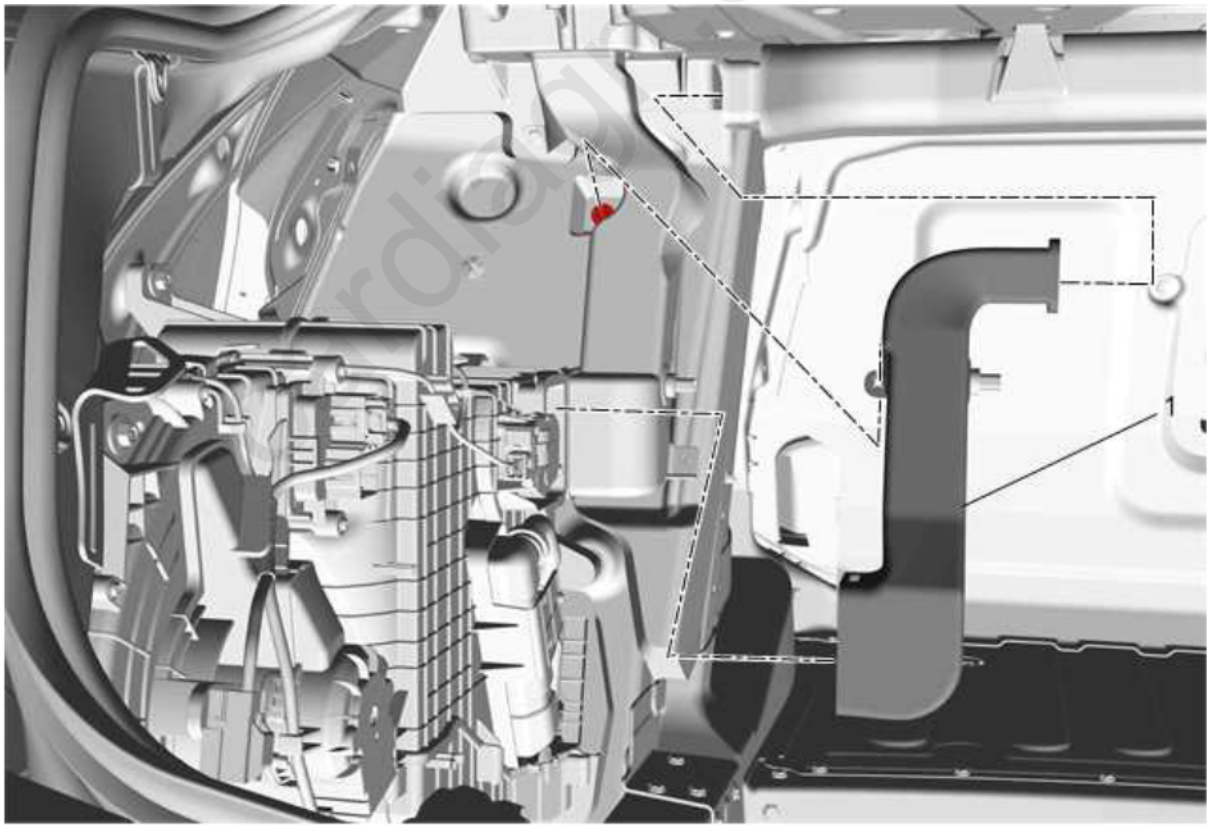


Fig. 796: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

16. Rear Compartment Side Trim - Left (2)Â» Install - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**
17. Air Distributor Nut (5)Â» Install and tighten 9 N.m (80 lb in)

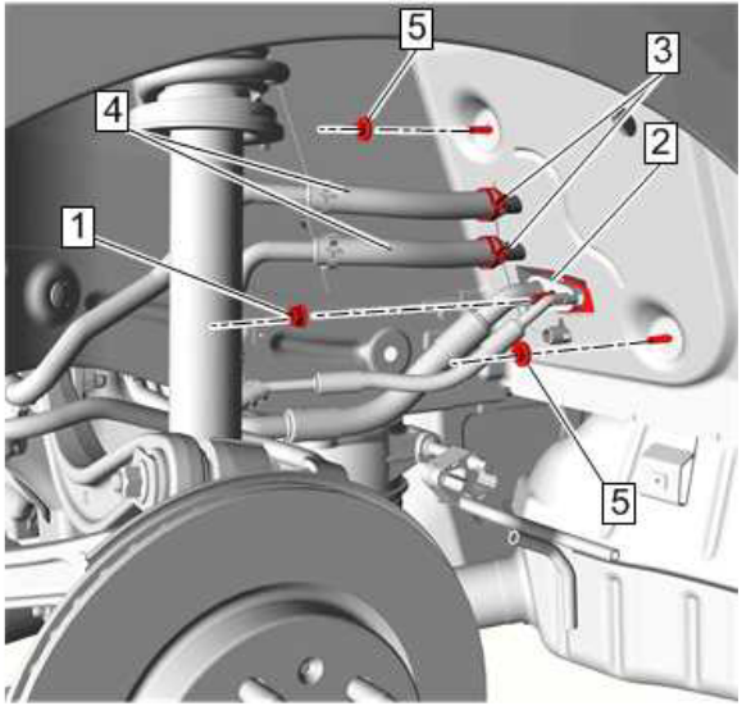


Fig. 797: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

18. Install the auxiliary heater hoses (4) to the auxiliary heater core tubes.
19. Install the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
20. Install NEW sealing washers [2x]. Refer to **Air Conditioning System Seal Replacement**
21. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install
22. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
23. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Install - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

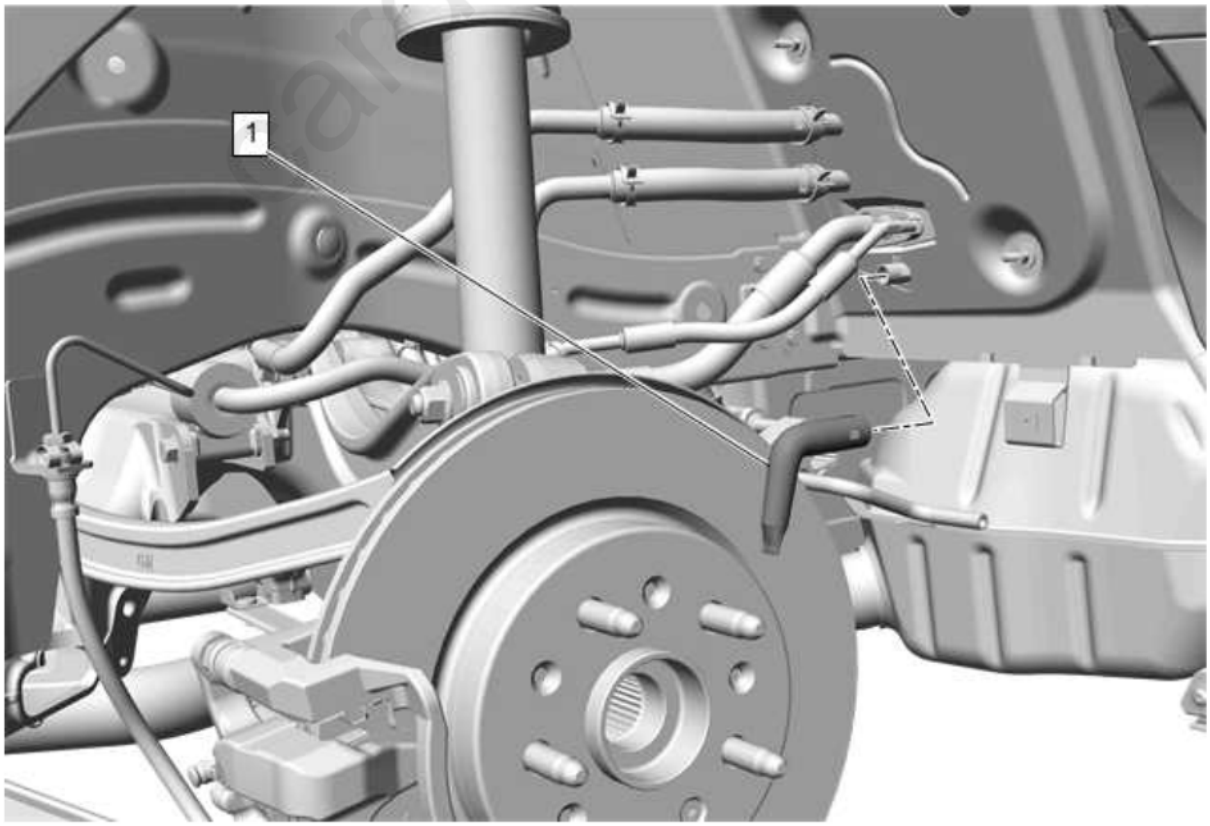


Fig. 798: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

24. Rear Wheelhouse Liner - Left (2)Â» Install - **Rear Wheelhouse Liner Replacement (LTG)** **Rear Wheelhouse Liner Replacement (LGX, LGW)**

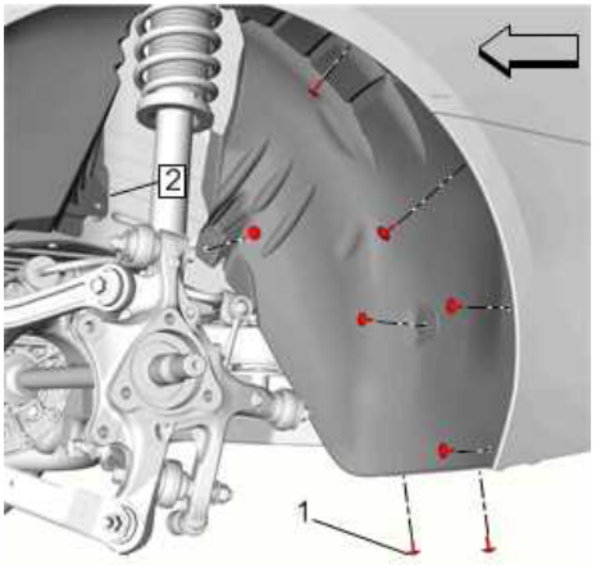


Fig. 799: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

25. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
26. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
27. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)Refrigerant Recovery and Recharging (R-1234yf)**
28. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
29. Clear the DTCs.
30. Inspect for coolant leaks.
31. Inspect for refrigerant leaks.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER LOWER CASE REPLACEMENT

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
3. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
4. Remove the rear half of the left rear wheelhouse liner (2) and position out of the way to gain access to the auxiliary air conditioning evaporator and blower module components. Refer to **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

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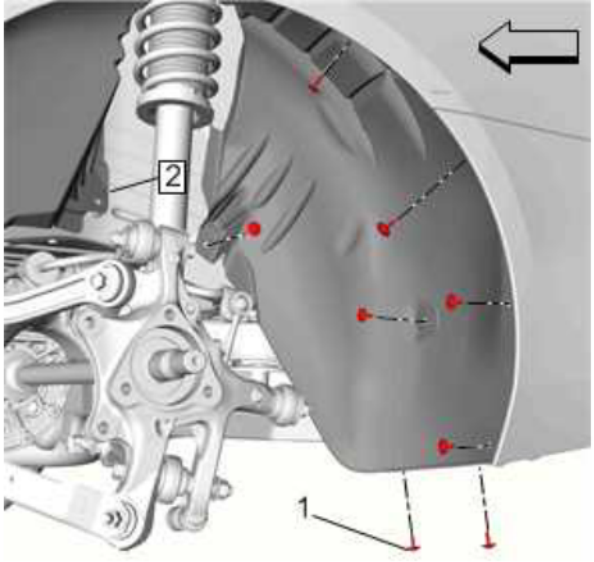


Fig. 800: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Remove - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

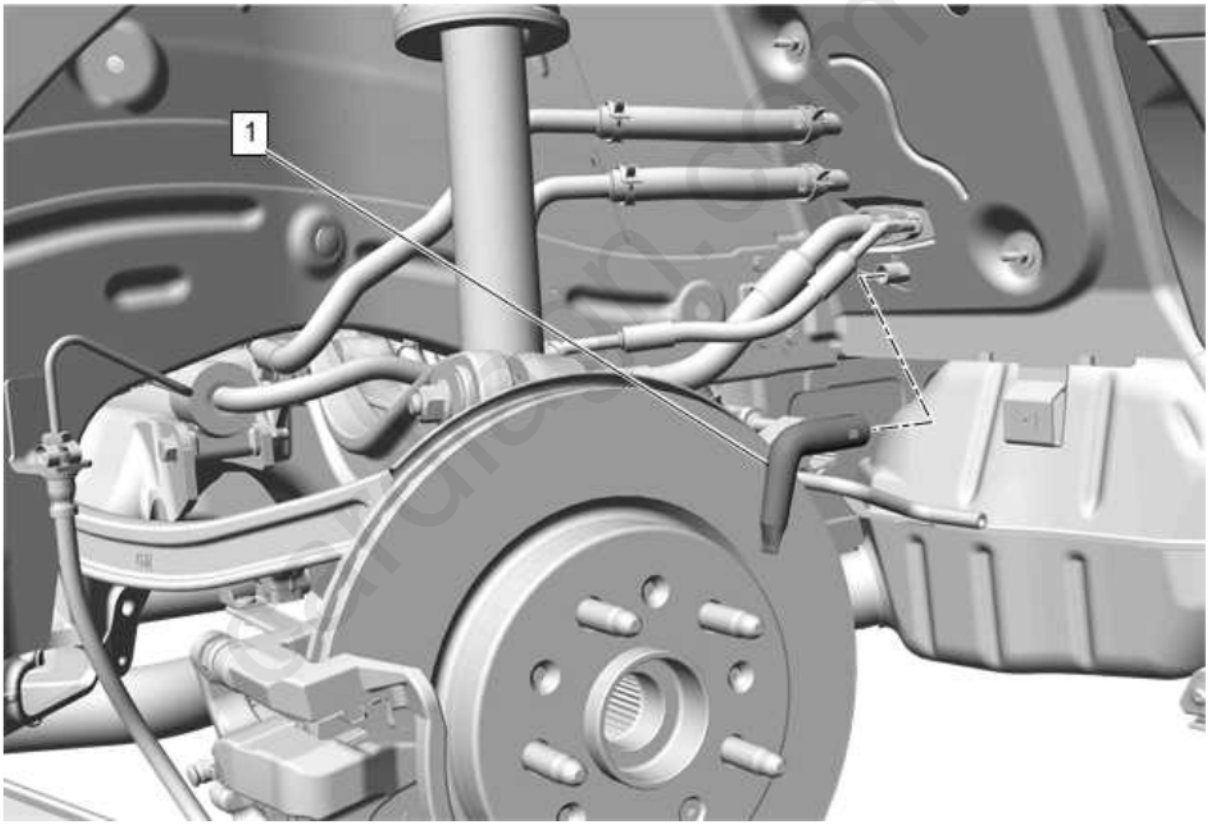


Fig. 801: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Hose Nut (1)Â» Remove

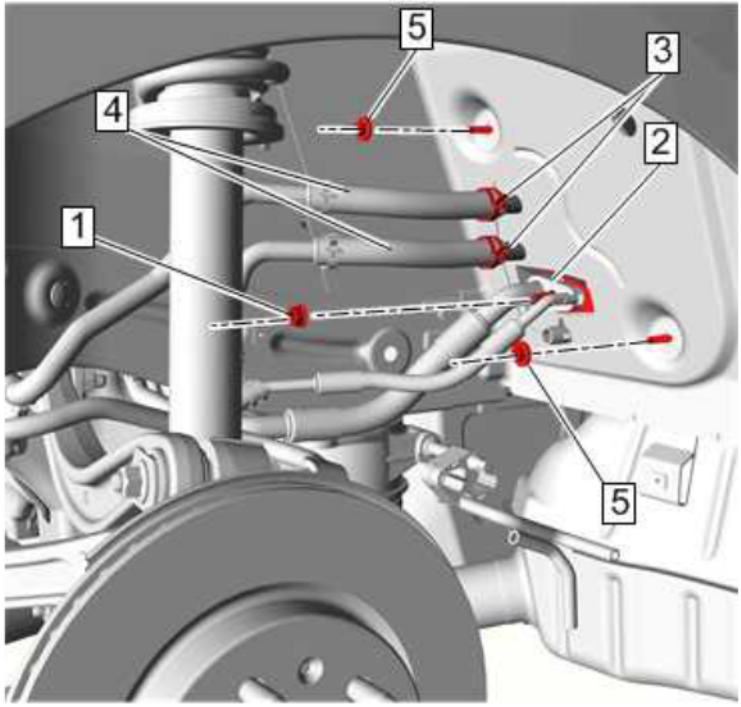


Fig. 802: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

7. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Remove
8. Remove and DISCARD the sealing washer [2x]. Refer to **Air Conditioning System Seal Replacement**
9. Remove the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
10. Remove the auxiliary heater hoses (4) from the auxiliary heater core tubes.
11. Air Distributor Nut (5)Â» Remove [2x]
12. Rear Compartment Side Trim - Left (2)Â» Remove - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**

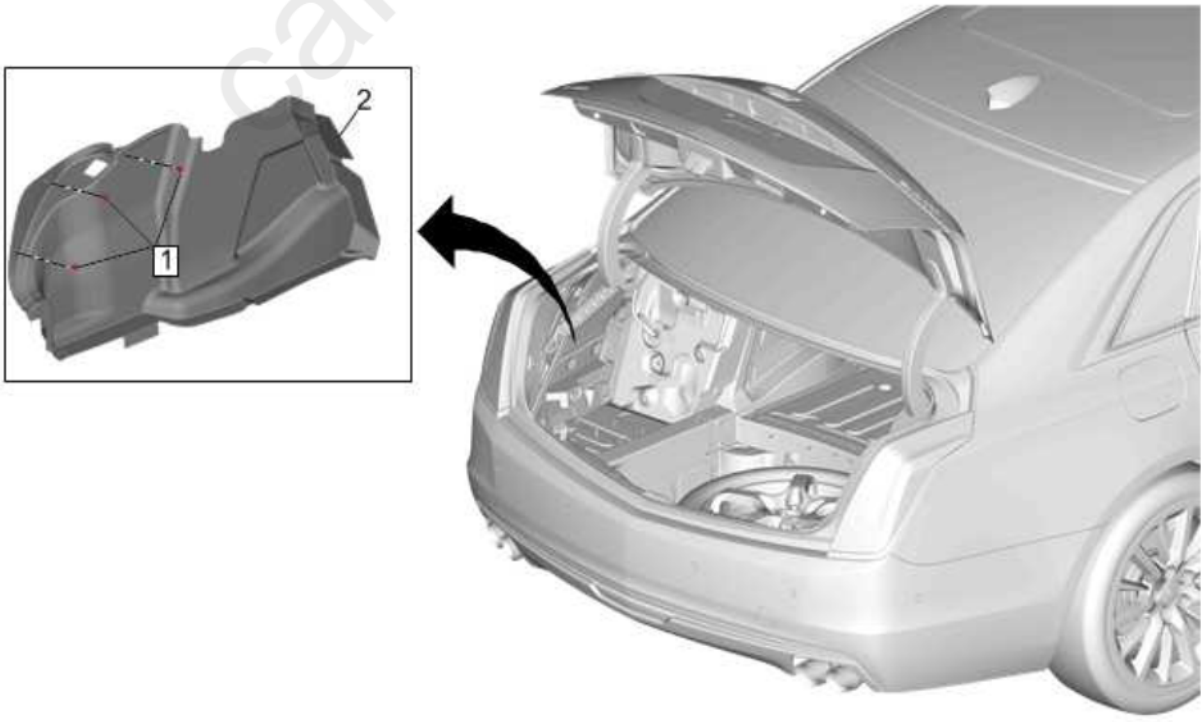


Fig. 803: Rear Compartment Side Trim - Left
Courtesy of GENERAL MOTORS COMPANY

13. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Remove

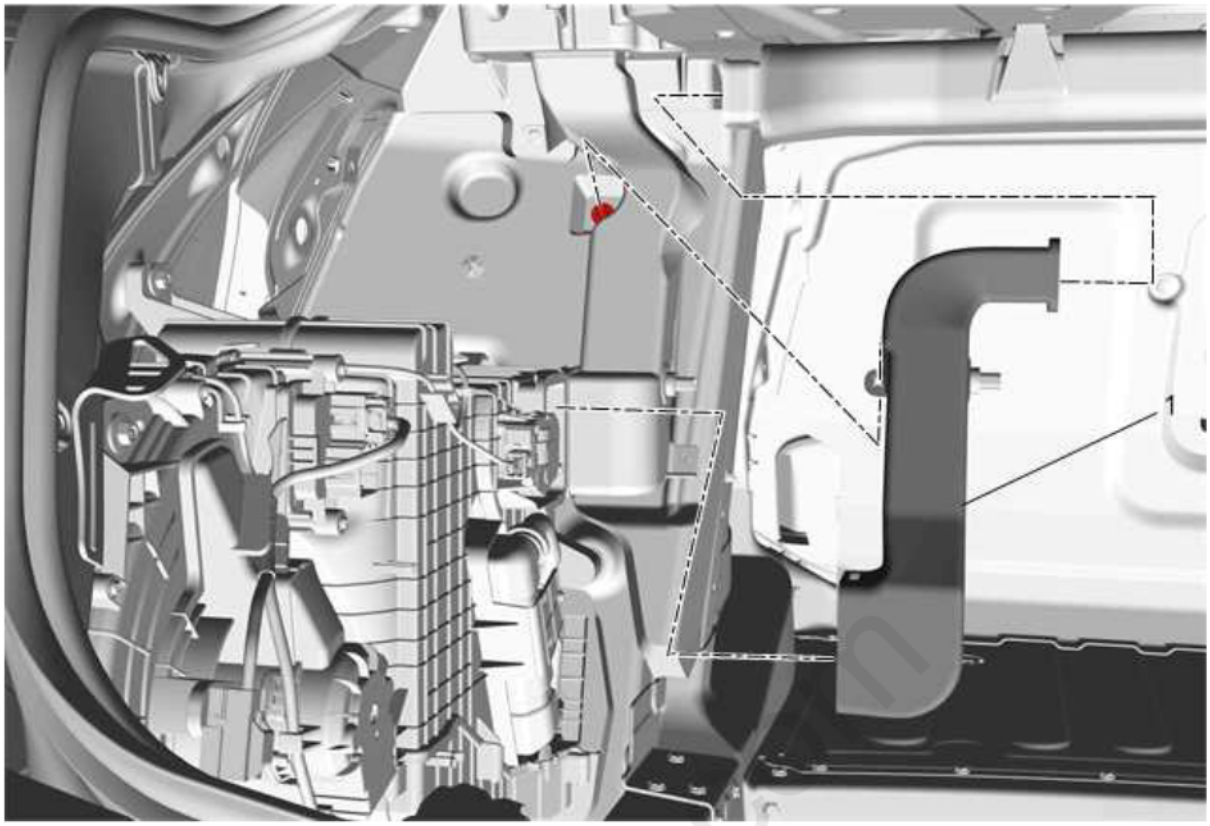


Fig. 804: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

14. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Remove

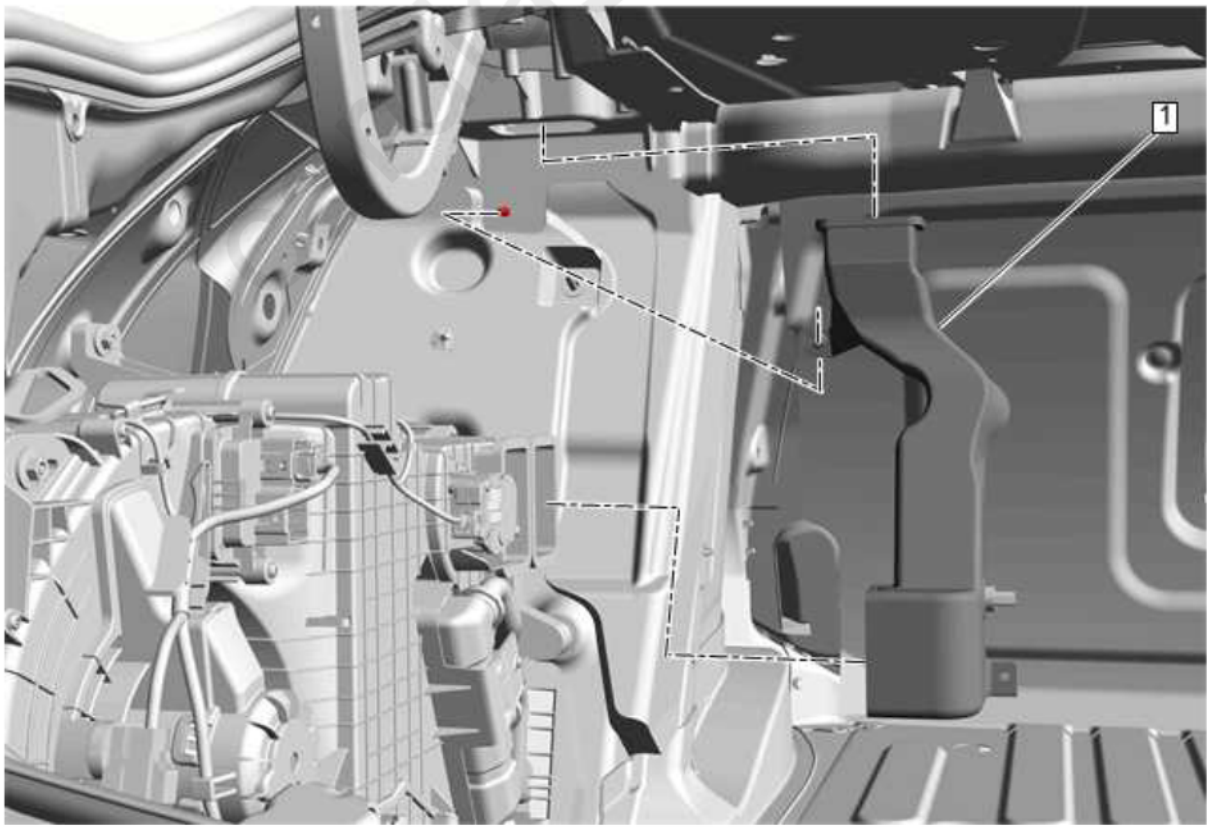


Fig. 805: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

15. Air Distributor Nut (2)Â» Remove [2x]

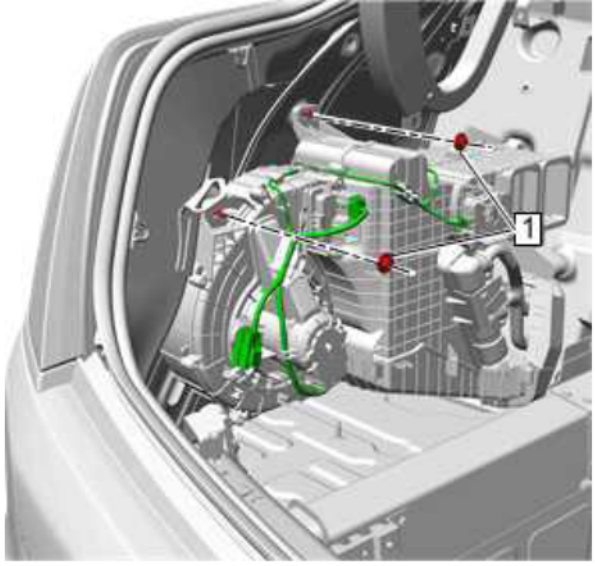


Fig. 806: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect all electrical connectors.
17. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Remove

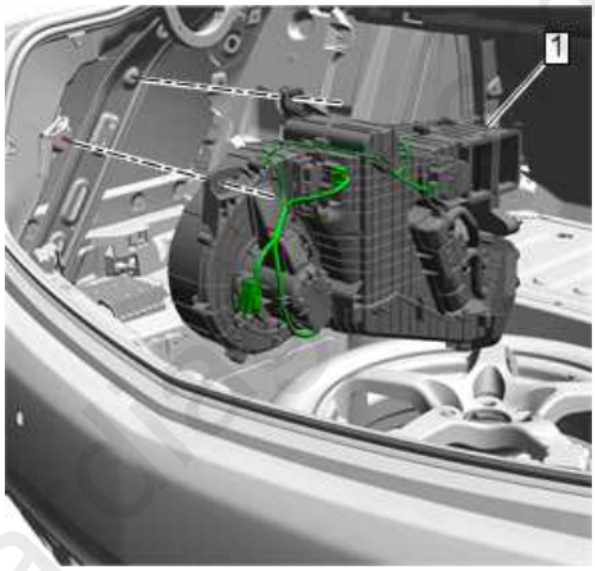


Fig. 807: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

18. Remove the auxiliary air conditioning evaporator and blower module screw (1) [7x].

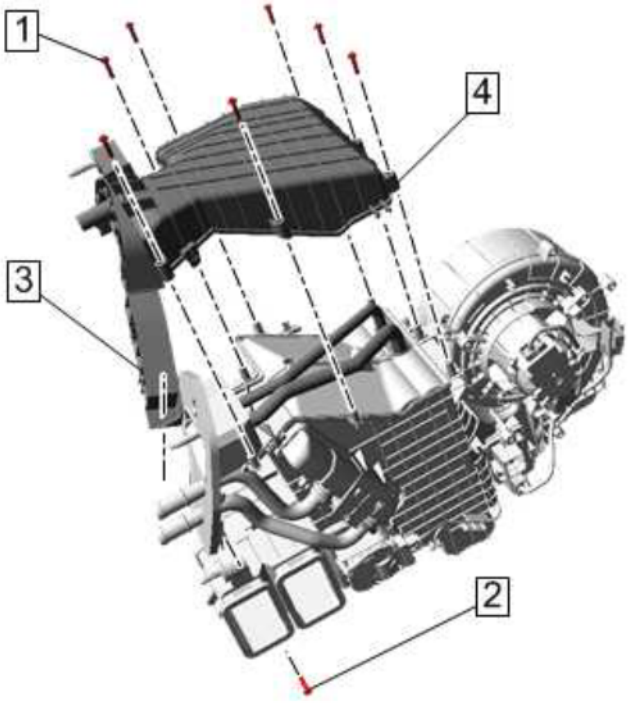


Fig. 808: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

19. Auxiliary Heater Core Tube Bracket Screw (2)Â» Remove
20. Rotate the auxiliary heater core tube bracket (3) open.
21. Remove the auxiliary air conditioning evaporator and blower lower case (3).
22. Transfer components as necessary.

Installation Procedure

1. Install the auxiliary air conditioning evaporator and blower lower case (3).

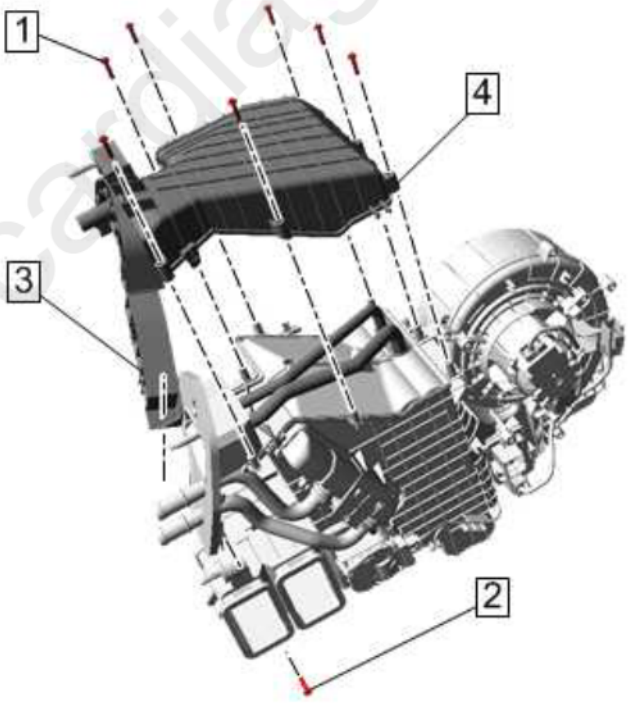


Fig. 809: Auxiliary Air Conditioning Evaporator And Blower Lower Case
Courtesy of GENERAL MOTORS COMPANY

2. Install the auxiliary air conditioning evaporator and blower module screw (2) [7x] and tighten to 1.3 N.m (12 lb in).

CAUTION: **Refer to Fastener Caution .**

3. Rotate the auxiliary heater core tube bracket (3) close.

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4. Auxiliary Heater Core Tube Bracket Screw (2)Â» Install and tighten 1.3 N.m (12 lb in)

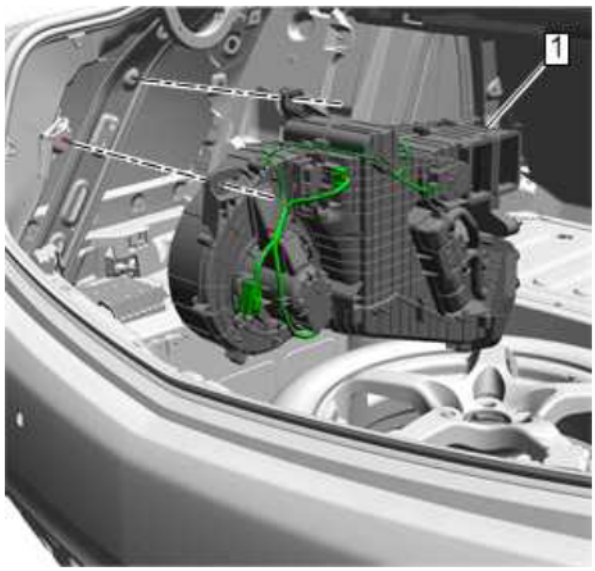


Fig. 810: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

5. Auxiliary Air Conditioning Evaporator and Blower Module (1)Â» Install

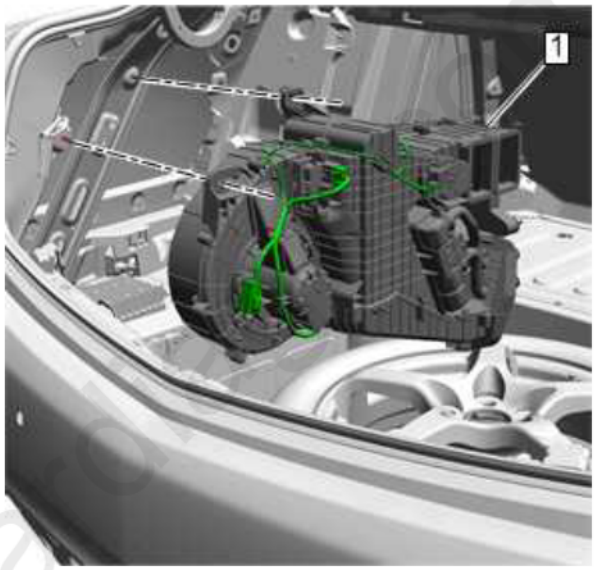


Fig. 811: Auxiliary Air Conditioning Evaporator and Blower Module
Courtesy of GENERAL MOTORS COMPANY

6. Air Distributor Nut (2)Â» Install and tighten 9 N.m (80 lb in) [2x]

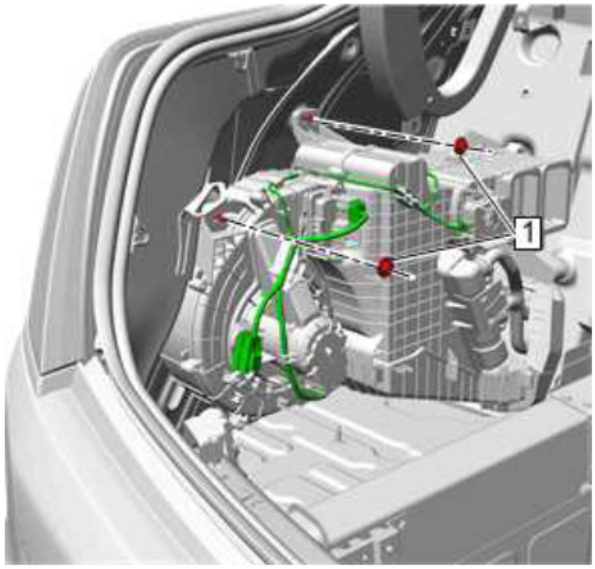


Fig. 812: Air Distributor Nuts
Courtesy of GENERAL MOTORS COMPANY

7. Connect the electrical connectors.
8. Auxiliary Air Conditioning Air Lower Duct (1) - Left SideÂ» Install

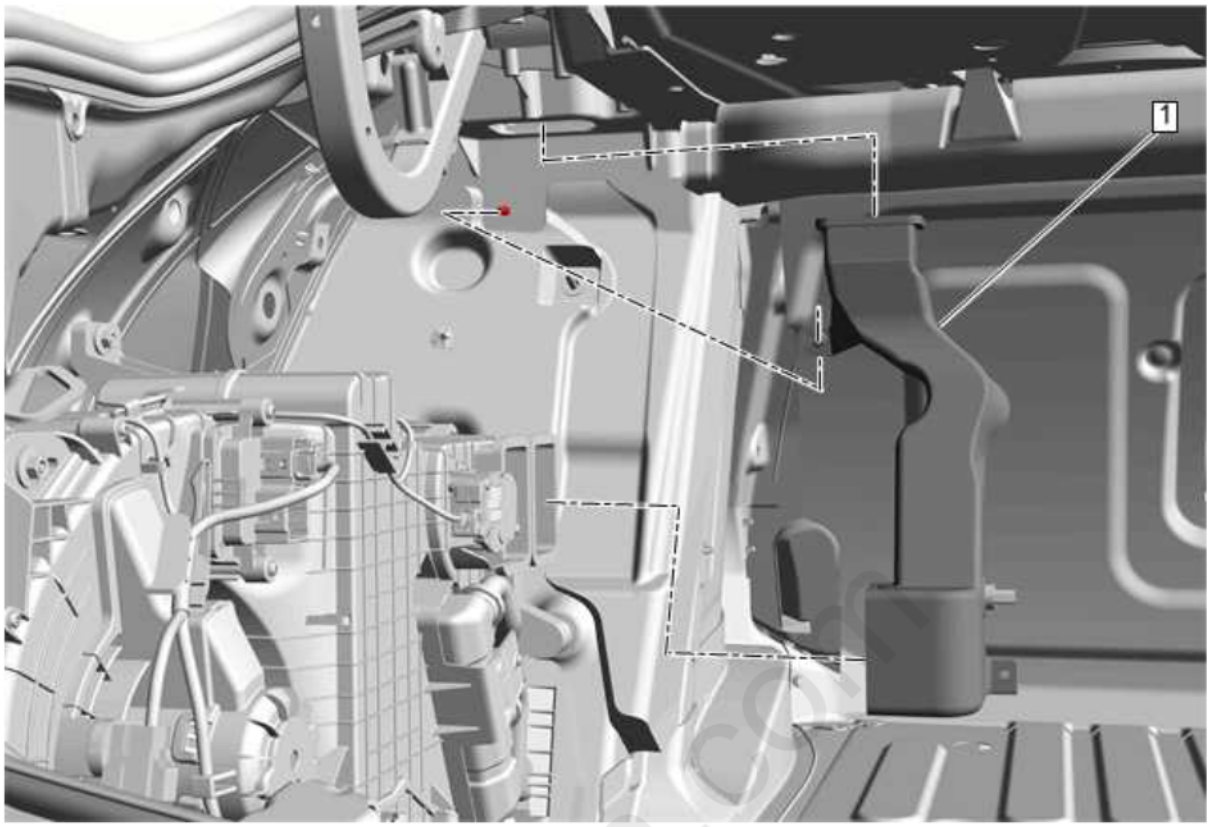


Fig. 813: Auxiliary Air Conditioning Air Lower Duct - Left Side
Courtesy of GENERAL MOTORS COMPANY

9. Auxiliary Air Conditioning Air Lower Duct (1) - Right SideÂ» Install

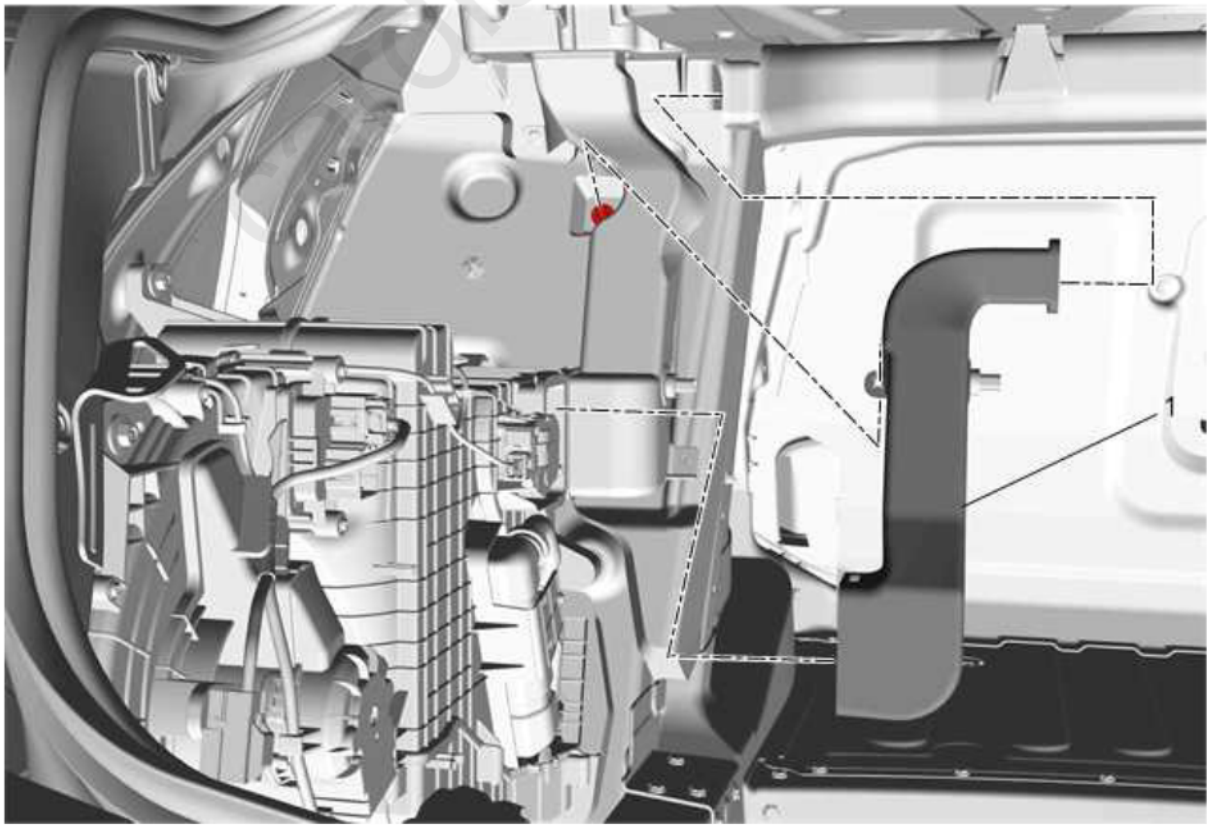


Fig. 814: Auxiliary Air Conditioning Air Lower Duct - Right Side
Courtesy of GENERAL MOTORS COMPANY

10. Rear Compartment Side Trim - Left (2)Â» Install - **Rear Compartment Side Trim Replacement - Left Side (Without HP9)** **Rear Compartment Side Trim Replacement - Left Side (With HP9)**
11. Air Distributor Nut (5)Â» Install and tighten 9 N.m (80 lb in) [2x]

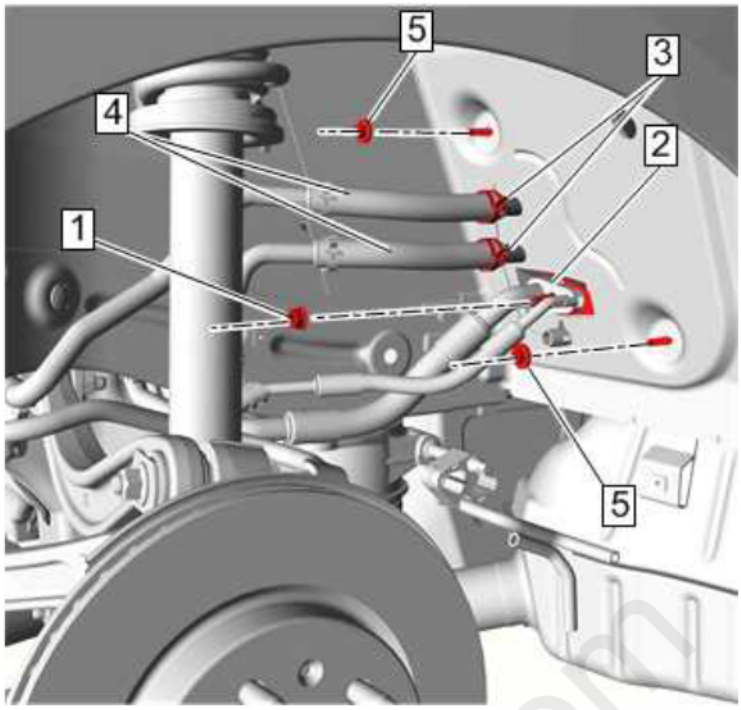


Fig. 815: Auxiliary Air Conditioning Evaporator Intermediate Tube And Auxiliary Heater Hoses
Courtesy of GENERAL MOTORS COMPANY

12. Install the auxiliary heater hoses (4) to the auxiliary heater core tubes.
13. Install the auxiliary heater hose clamps (3). Refer to **Hose Clamp Replacement Guidelines - Spring Type**
14. Install NEW sealing washers [2x]. Refer to **Air Conditioning System Seal Replacement**
15. Auxiliary Air Conditioning Evaporator Intermediate Tube (2) @ Air Conditioning Evaporator Thermal Expansion ValveÂ» Install
16. Air Conditioning Evaporator Hose Nut (1)Â» Install and tighten 22 N.m (16 lb ft)
17. Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve (1)Â» Install - **Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve Replacement**

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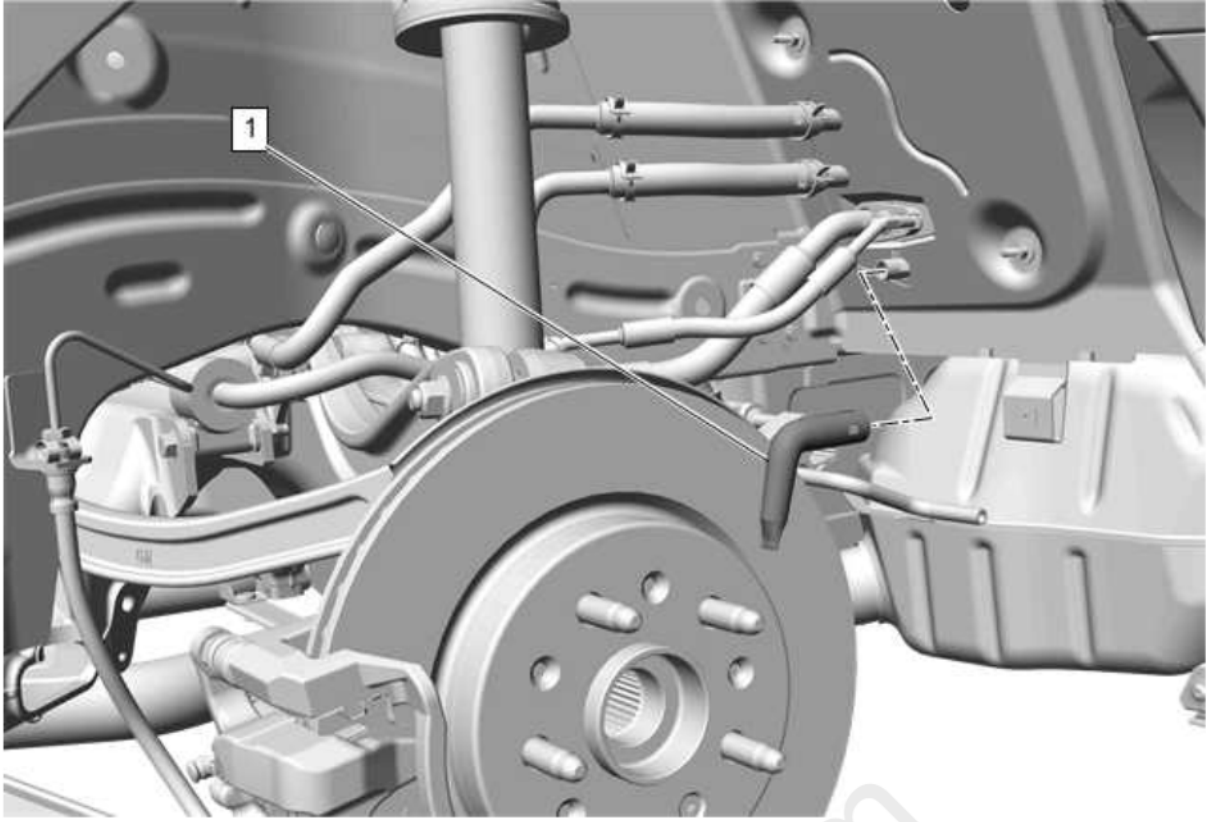


Fig. 816: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

18. Rear Wheelhouse Liner (2)Â» Install - **Rear Wheelhouse Liner Replacement (LTG)** **Rear Wheelhouse Liner Replacement (LGX, LGW)**

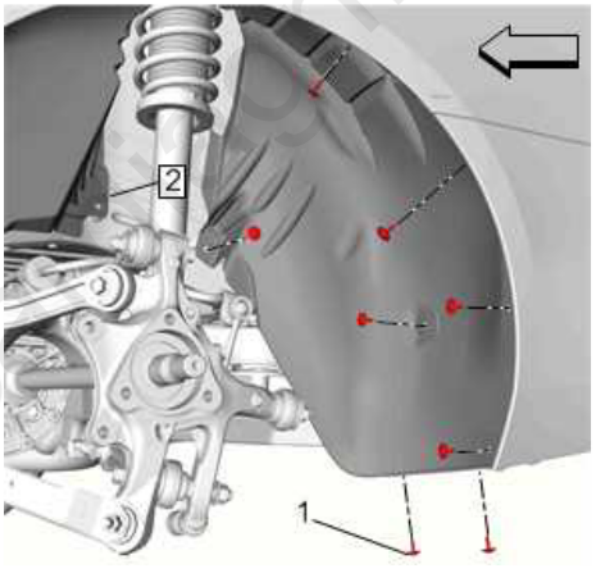


Fig. 817: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

19. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
20. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** , **Cooling System Draining and Filling (GE 47716 without HP9)** , **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
21. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
22. Perform the actuator calibration procedure. Refer to **Actuator Recalibration**
23. Clear the DTCs.
24. Inspect for coolant leaks.

25. Inspect for refrigerant leaks.

AIR CONDITIONING EVAPORATOR CONNECTOR HOSE/TUBE AND COMPRESSOR HOSE REPLACEMENT

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
2. Air Cleaner Outlet DuctÂ» Remove - **Air Cleaner Outlet Duct Replacement**
3. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Nut (3) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove

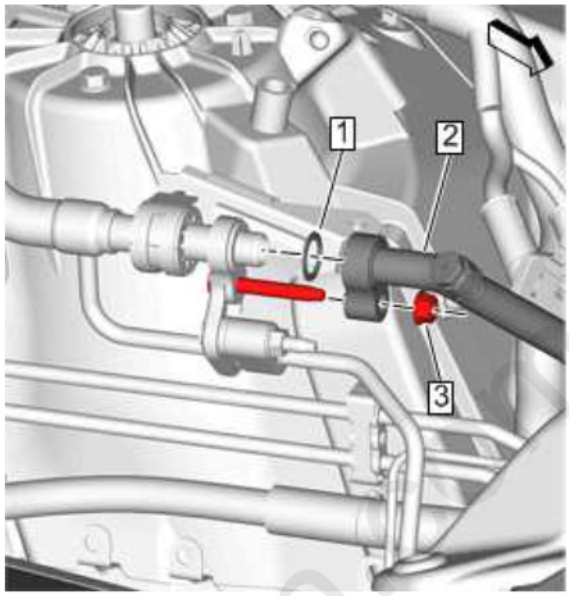


Fig. 818: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

4. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Remove
5. Remove and DISCARD the sealing washer (1). Refer to **Air Conditioning System Seal Replacement**
6. Disconnect the electrical connector.
7. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Nut (3) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Remove

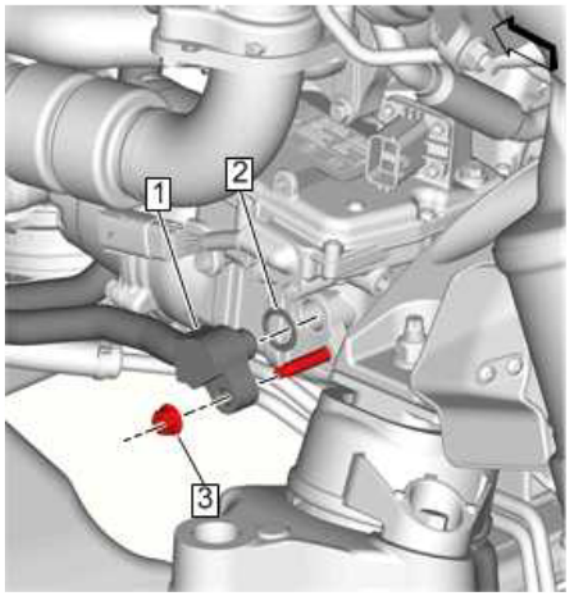


Fig. 819: Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

8. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Remove
9. Remove and DISCARD the sealing washer. (2)
10. Remove the air conditioning compressor evaporator connector hose/tube and compressor hose (1) from the vehicle.

Installation Procedure

1. Install the air conditioning compressor evaporator connector hose/tube and compressor hose to the vehicle.
2. Install NEW sealing washers. (2)

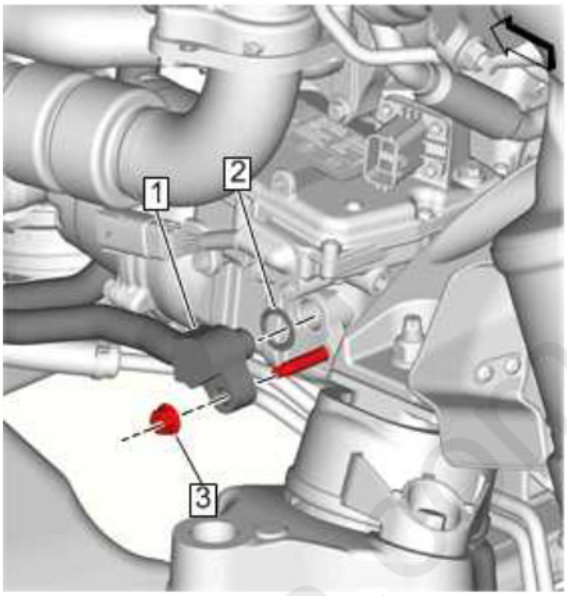


Fig. 820: Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

3. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (1) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Install
4. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Nut (3) @ Air Conditioning and Drive Motor Battery Cooling CompressorÂ» Install and tighten 22 N.m (16 lb ft)

CAUTION: **Refer to Fastener Caution .**

5. Install NEW sealing washers. (1)

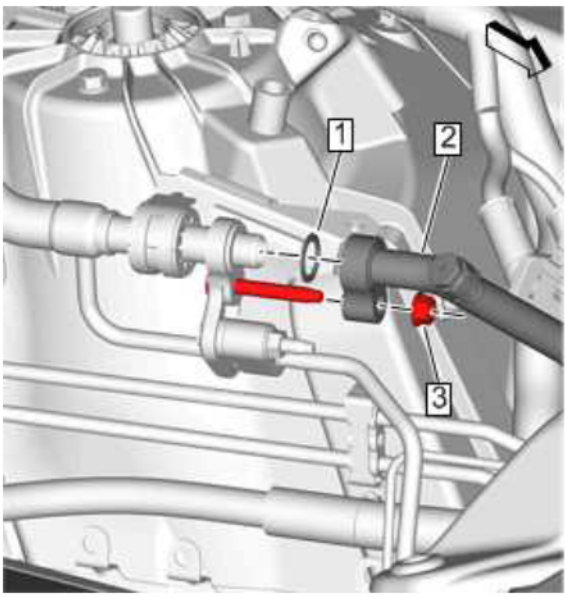


Fig. 821: Air Conditioning Compressor and Condenser Hose and Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose (2) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install
7. Air Conditioning Evaporator Connector Hose/Tube and Compressor Hose Nut (3) @ Air Conditioning Refrigerant Heat ExchangerÂ» Install and tighten 22 N.m (16 lb ft)
8. Connect the electrical connector.
9. Air Cleaner Outlet DuctÂ» Install - **Air Cleaner Outlet Duct Replacement**
10. Recharge the refrigerant. Refer to **Refrigerant Recovery and Recharging (R-134a)** and/or **Refrigerant Recovery and Recharging (R-1234yf)**
11. Inspect for refrigerant leaks.

AUXILIARY AIR CONDITIONING EVAPORATOR AND BLOWER MODULE DRAIN VALVE REPLACEMENT

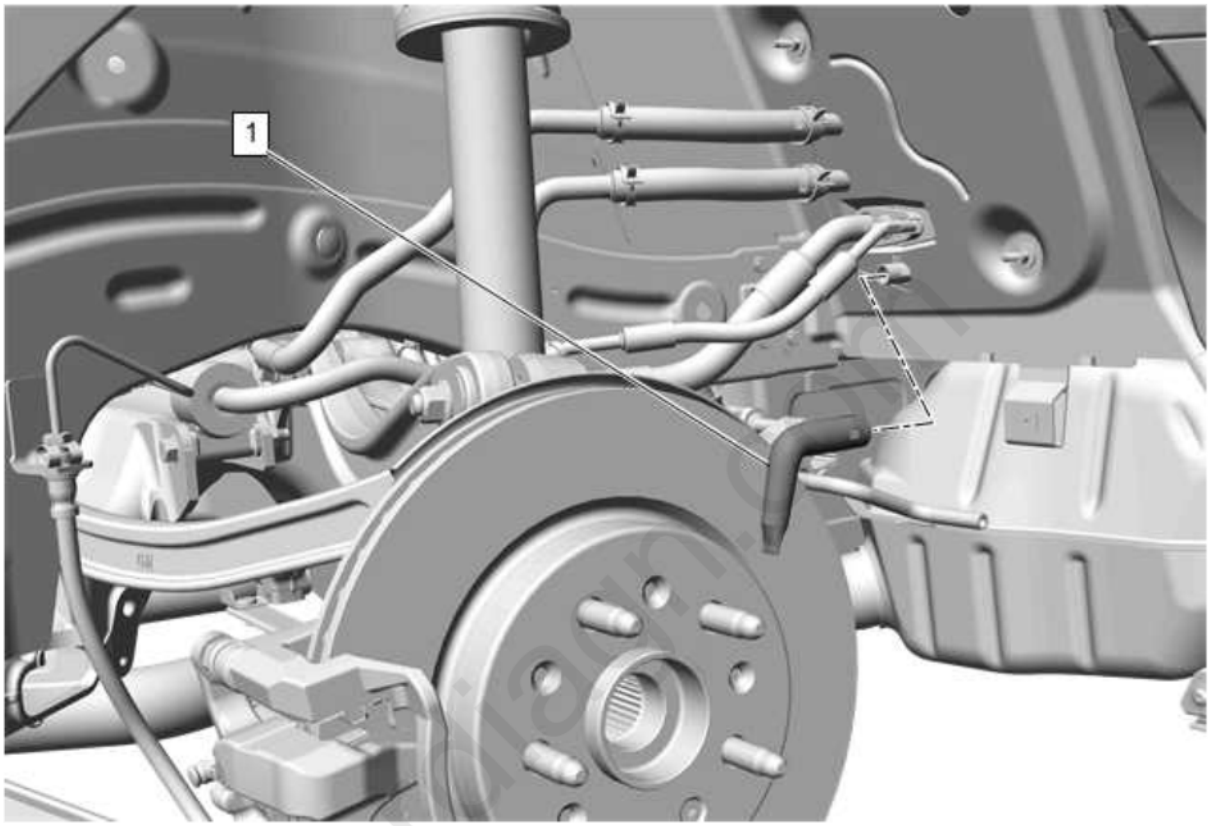


Fig. 822: Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Rear Wheelhouse Liner Replacement (LTG)** **Rear Wheelhouse Liner Replacement (LGX, LGW)** - Left Side	
1	Auxiliary Air Conditioning Evaporator and Blower Module Drain Valve

AUXILIARY AIR CONDITIONING WIRING HARNESS REPLACEMENT

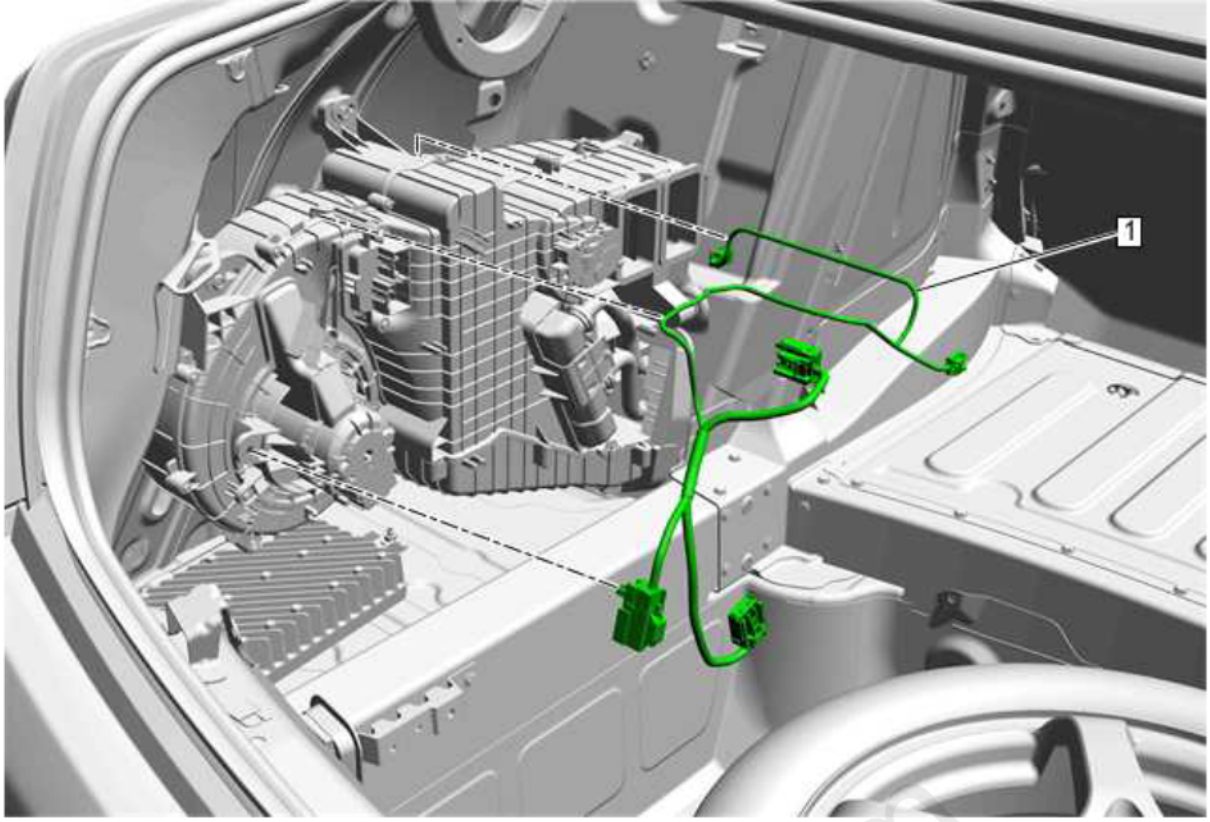


Fig. 823: Auxiliary Air Conditioning Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Compartment Side Trim Replacement - Left Side (Without HP9) Rear Compartment Side Trim Replacement - Left Side (With HP9)	
1	Auxiliary Air Conditioning Wiring Harness **Procedure** Disconnect the electrical connectors.

HEATER WATER SHUTOFF VALVE INLET HOSE REPLACEMENT (HEATER WATER BYPASS VALVE TO AUXILIARY HEATER INLET PIPE LTG WITH HP9)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Radiator Surge Tank (3)Â» Remove - **Radiator Surge Tank Replacement (LTG with HP9)**

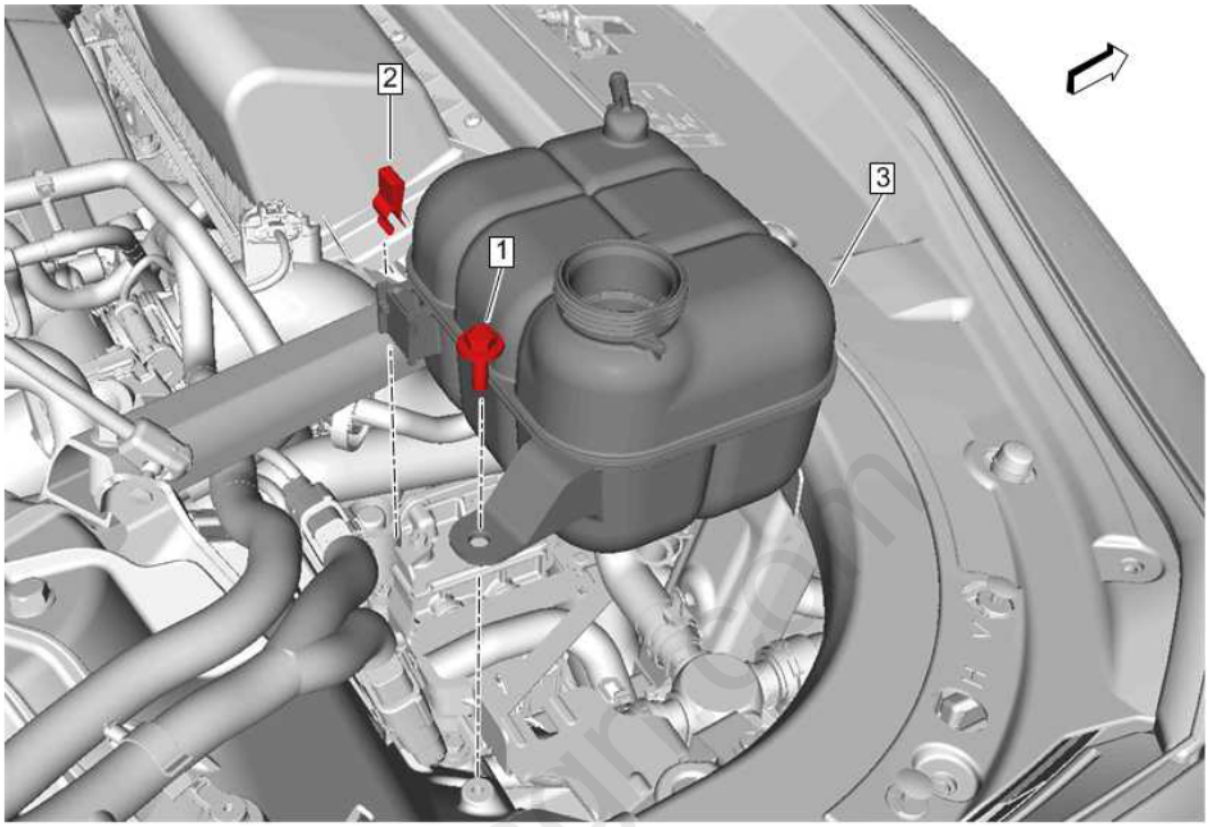


Fig. 824: Radiator Surge Tank (LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Shutoff Valve Inlet Hose Retainer (1)Â» Disengage

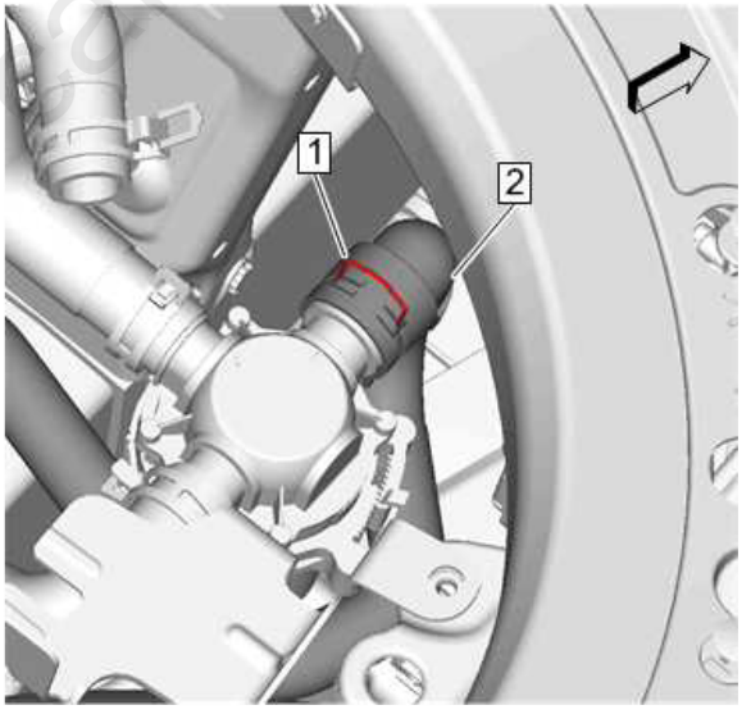


Fig. 825: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Remove

6. Heater Water Shutoff Valve Inlet Hose Retainer (1)Â» Disengage

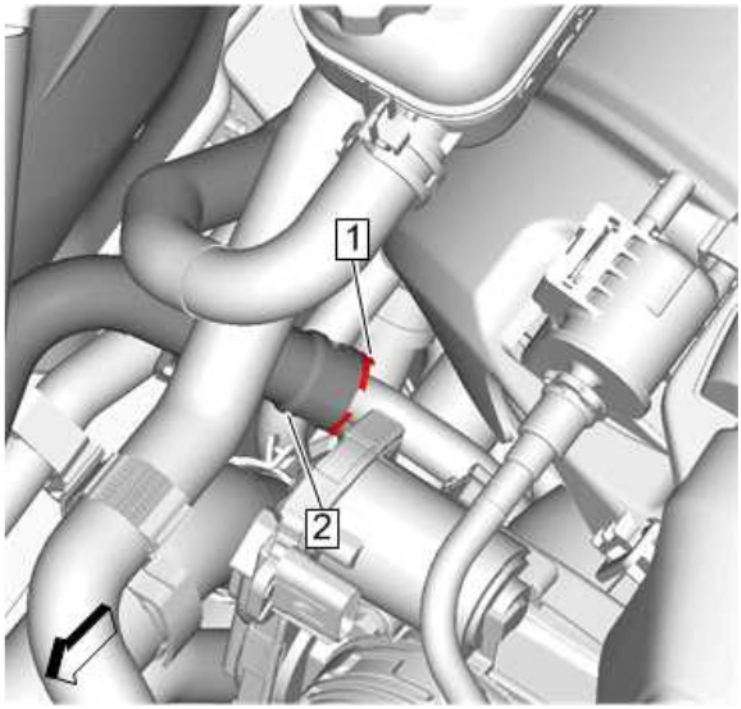


Fig. 826: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

7. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Remove
8. Heater Water Shutoff Valve Inlet Hose (2)Â» Remove

Installation Procedure

1. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Inlet and Outlet PipeÂ» Install

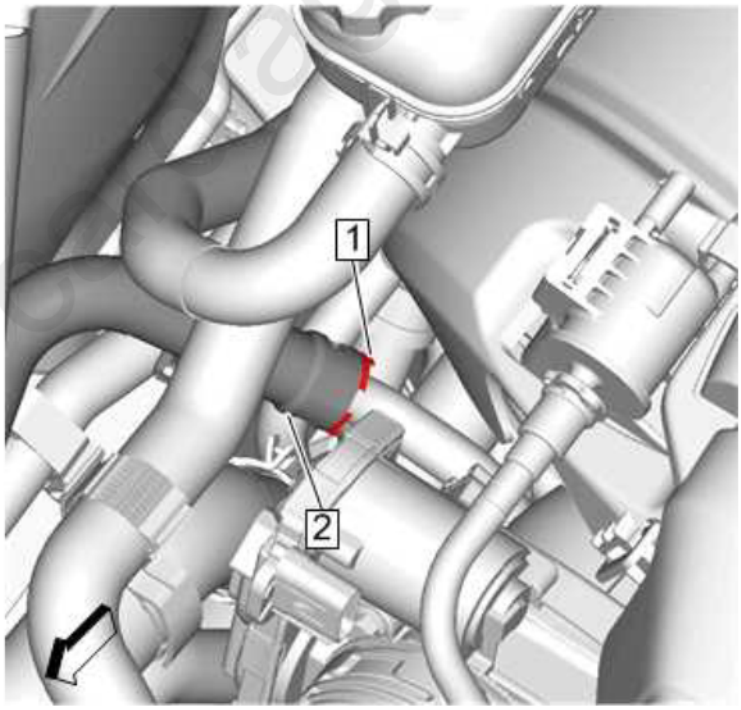


Fig. 827: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

2. Heater Water Shutoff Valve Inlet Hose Retainer (1)Â» Engage
3. Heater Water Shutoff Valve Inlet Hose (2) @ Heater Water Bypass ValveÂ» Install

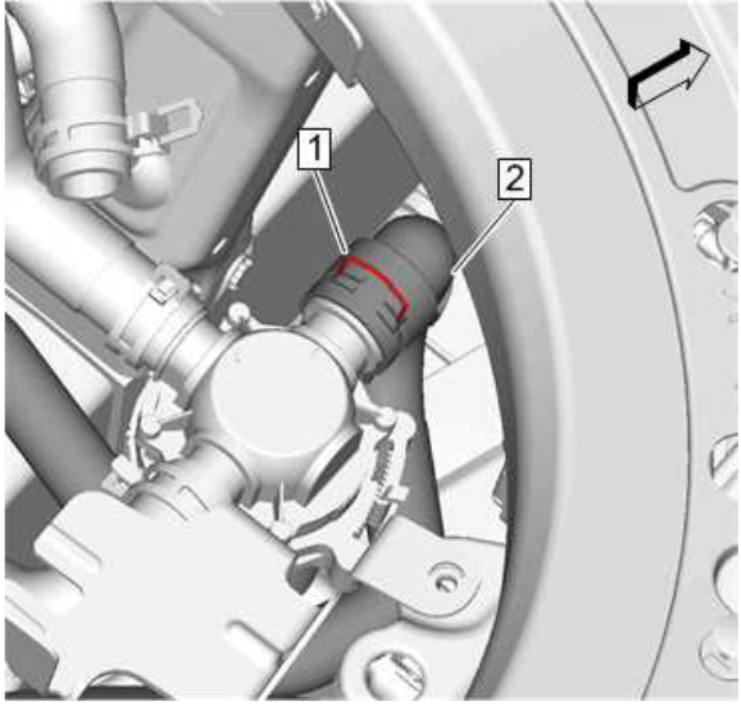


Fig. 828: Heater Water Shutoff Valve Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Shutoff Valve Inlet Hose Retainer (1)Â» Engage
5. Radiator Surge Tank (3)Â» Install - **Radiator Surge Tank Replacement (LTG with HP9)**

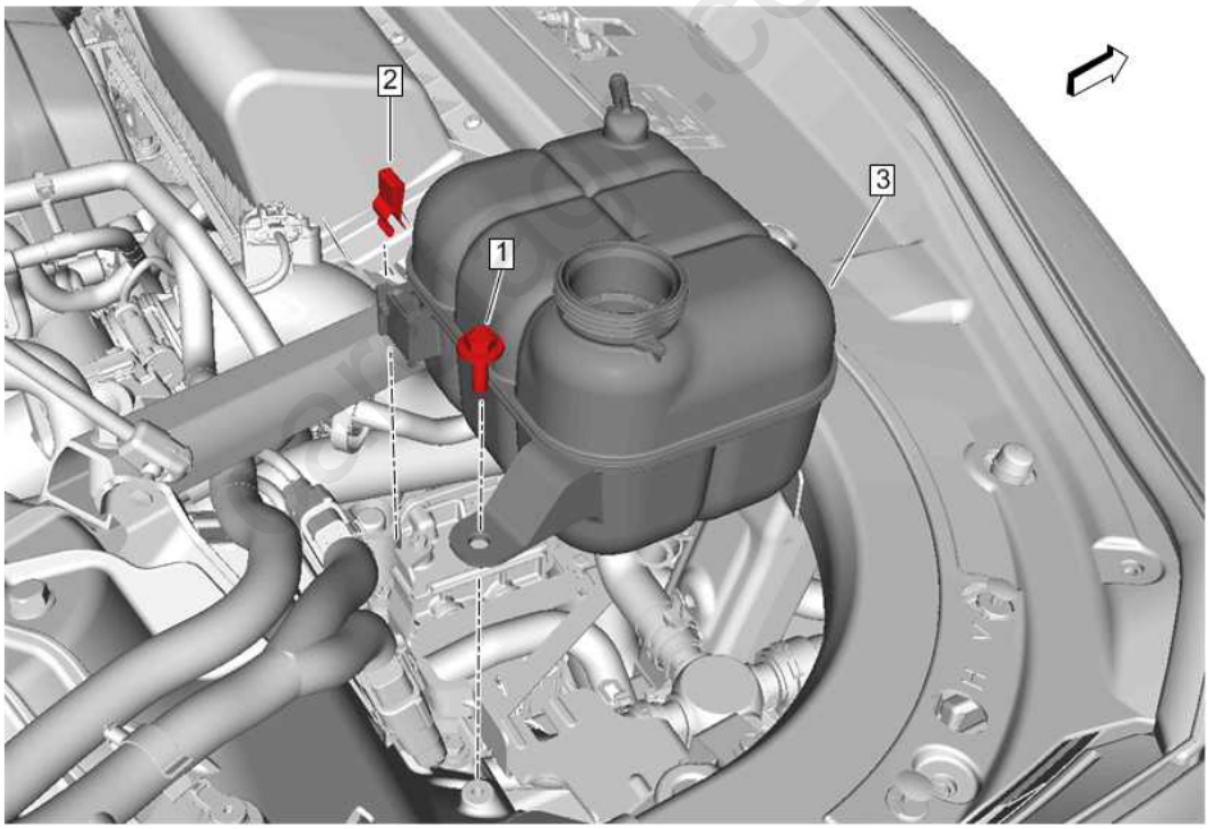


Fig. 829: Radiator Surge Tank (LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

6. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
7. Enable the high voltage system. Refer to **High Voltage Enabling**
8. Start the engine and check for coolant leaks.

HEATER WATER SHUTOFF VALVE INLET HOSE REPLACEMENT (HEATER WATER BYPASS VALVE TO HEATER INLET PIPE CONNECTOR LTG WITH HP9)

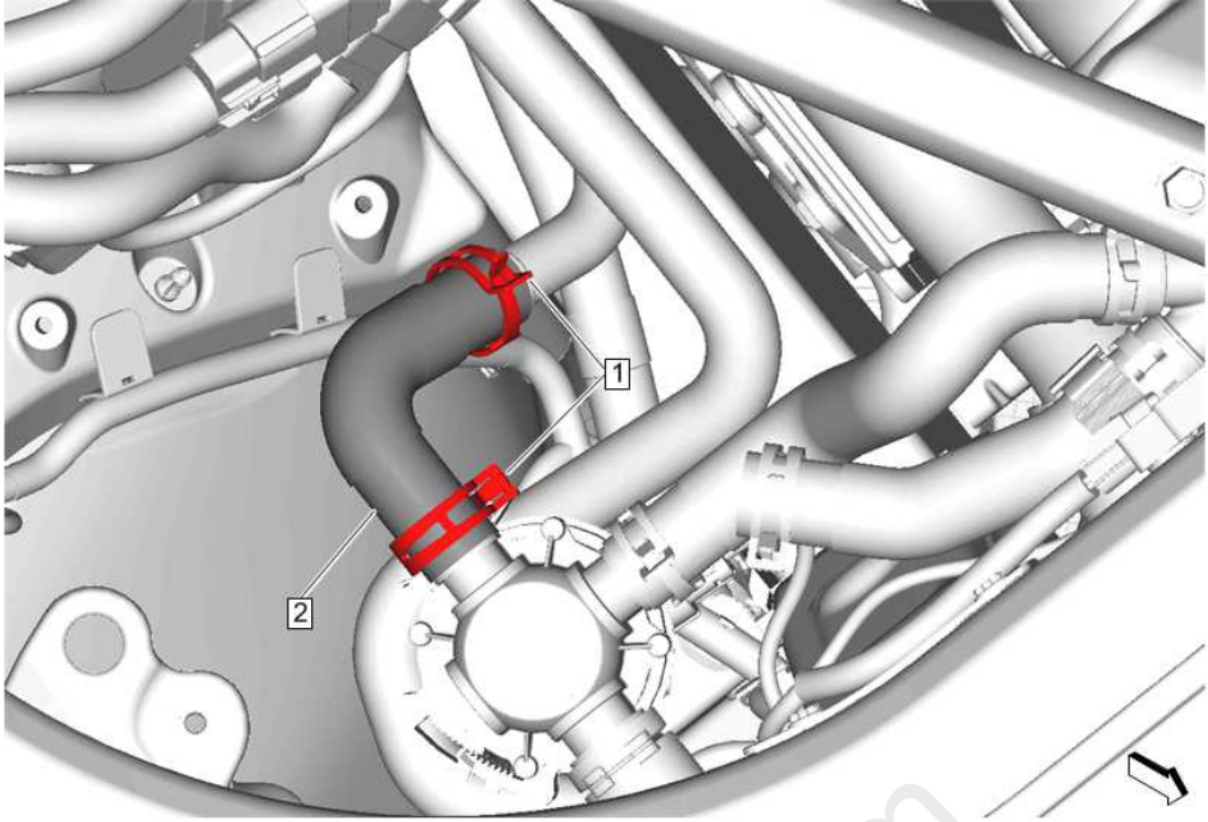


Fig. 830: Heater Water Shutoff Valve Inlet Hose (Heater Water Bypass Valve To Heater Inlet Pipe Connector LTG with HP9)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name

WARNING:

Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Preliminary Procedures

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. **Radiator Surge Tank Replacement (LTG with HP9)**

1	Heater Water Shutoff Valve Inlet Hose Clamp [2x] **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
2	Heater Water Shutoff Valve Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)** 2. Enable the high voltage system. Refer to **High Voltage Enabling** 3. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP HOSE REPLACEMENT (LTG WITH HP9 SURGE TANK TO HEATER COOLANT PUMP TO RADIATOR INLET PIPE)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**

- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Air Cleaner Assembly (2)Â» Remove - **Air Cleaner Assembly Replacement**

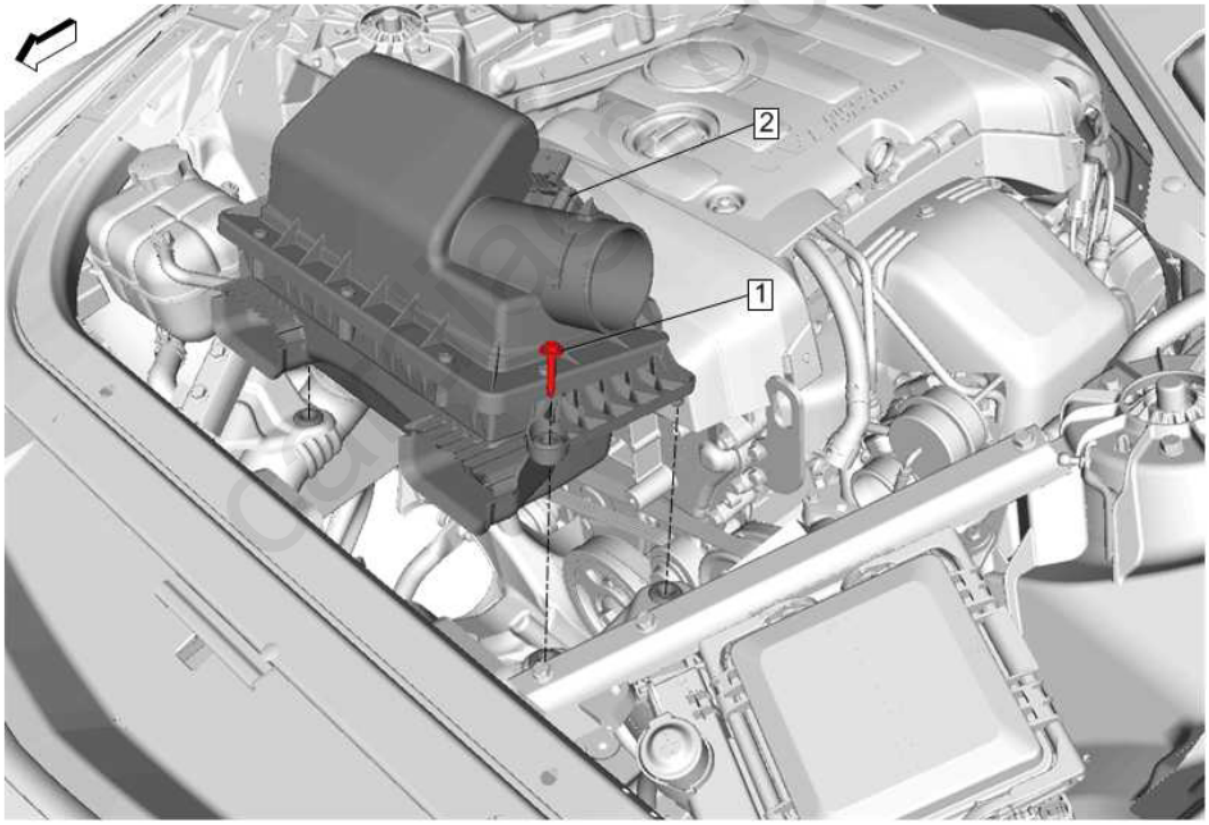


Fig. 831: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Hose Clamp (1)Â» Disengage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**

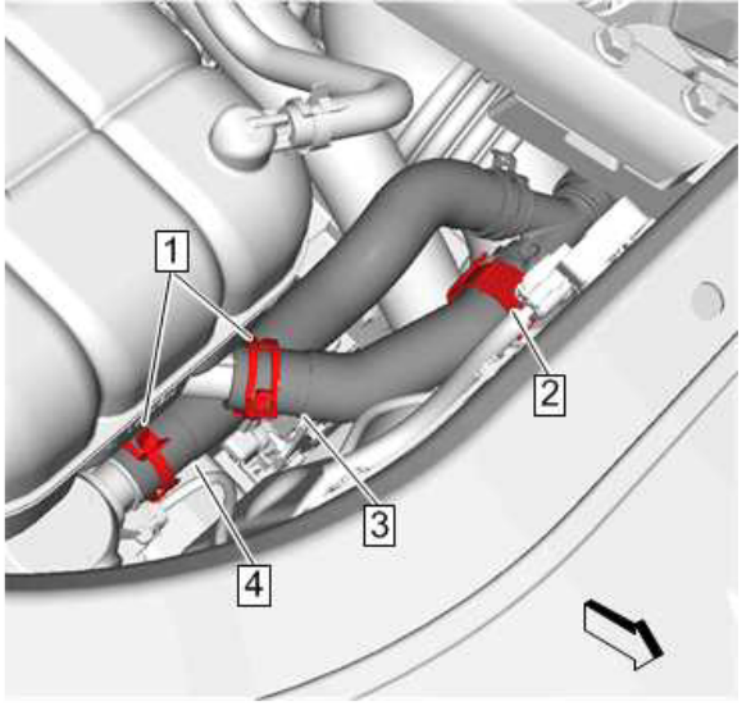


Fig. 832: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

5. Radiator Inlet Hose Retainer (2) @ Heater Water Auxiliary Pump Hose (3)Â» Remove
6. Heater Water Auxiliary Pump Hose (3) @ Radiator Surge TankÂ» Remove
7. Heater Water Auxiliary Pump Hose (4) @ Heater Water Bypass ValveÂ» Remove
8. Heater Water Auxiliary Pump Hose Clamp (1)Â» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

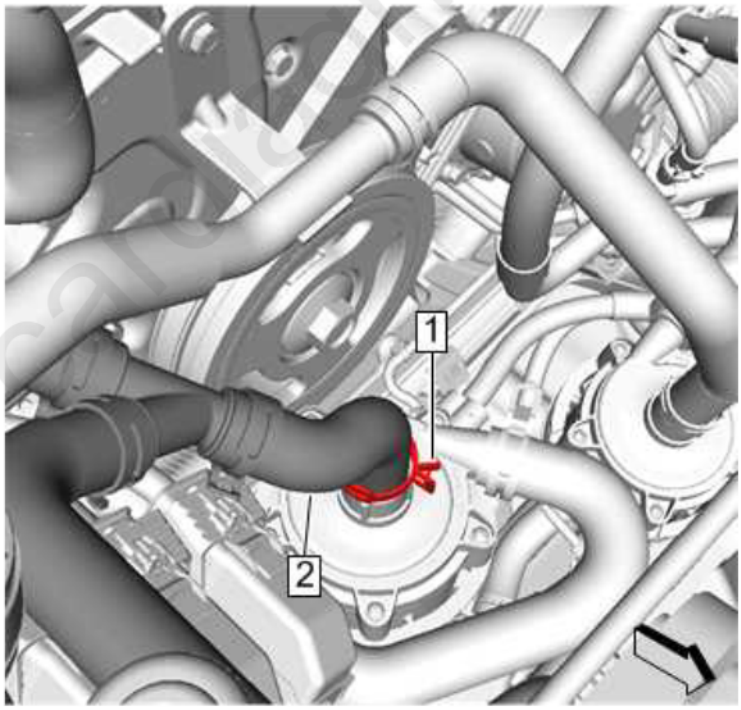


Fig. 833: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

9. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Remove
10. Heater Water Auxiliary Pump Hose Clamp (1)Â» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

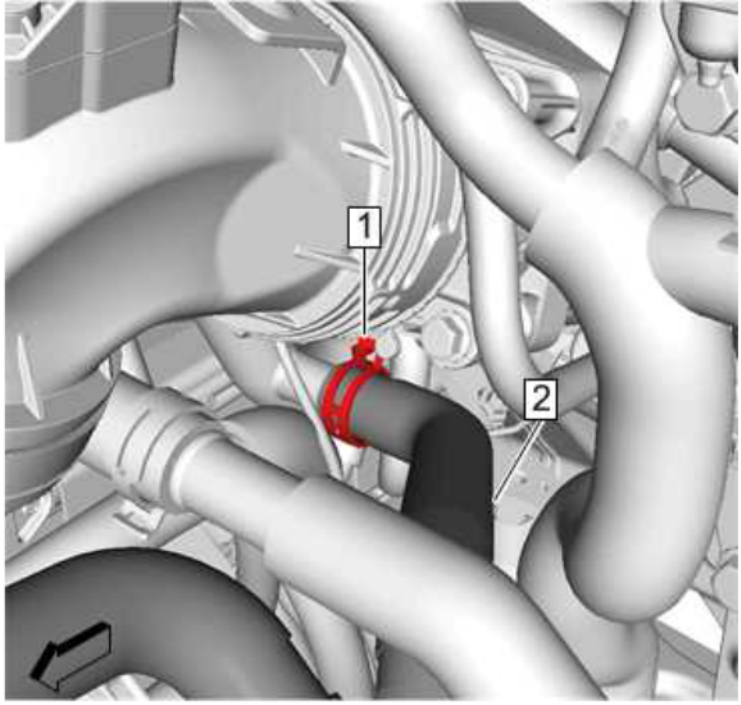


Fig. 834: Heater Water Auxiliary Pump Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

11. Heater Water Auxiliary Pump Hose (2) @ Radiator Inlet PipeÂ» Remove
12. Heater Water Auxiliary Pump Hose (2)Â» Remove

Installation Procedure

1. Heater Water Auxiliary Pump Hose (2) @ Radiator Inlet PipeÂ» Install

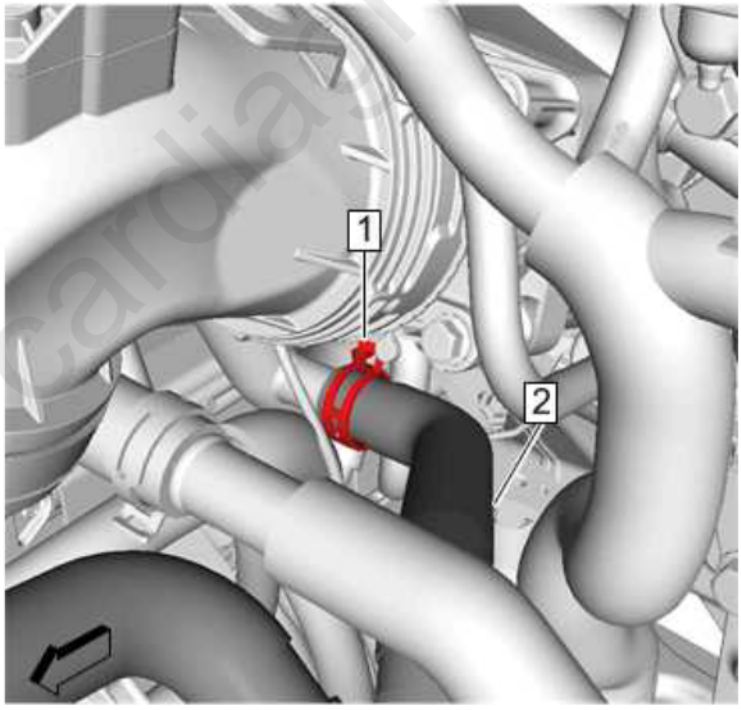


Fig. 835: Heater Water Auxiliary Pump Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

2. Heater Water Auxiliary Pump Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
3. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Install

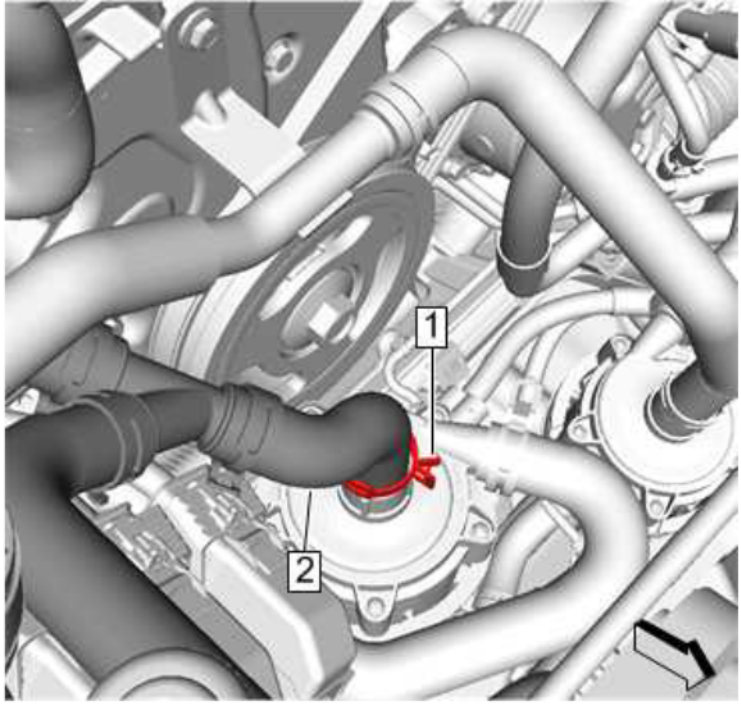


Fig. 836: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
5. Heater Water Auxiliary Pump Hose (4) @ Heater Water Bypass ValveÂ» Install

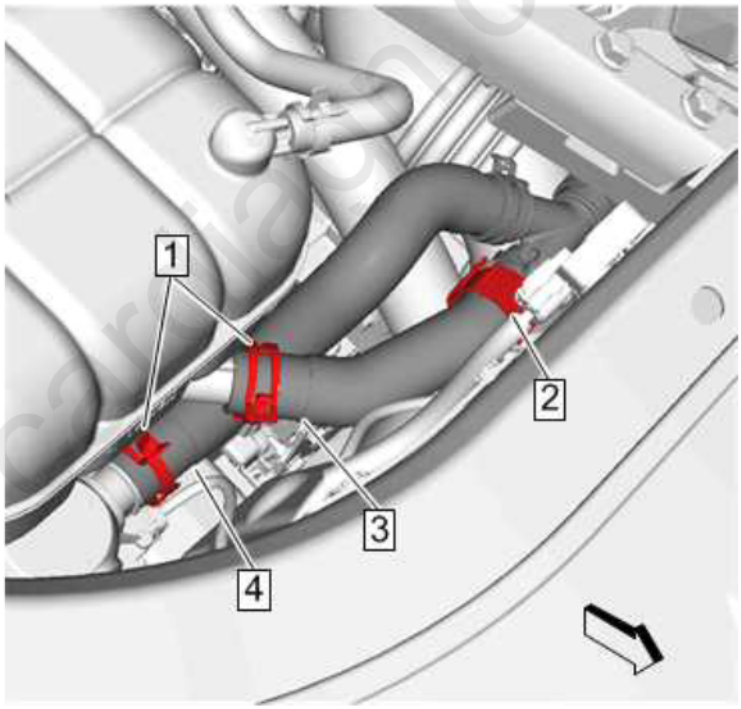


Fig. 837: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Hose (3) @ Radiator Surge TankÂ» Install
7. Radiator Inlet Hose Retainer (2) @ Heater Water Auxiliary Pump Hose (3)Â» Install
8. Heater Water Auxiliary Pump Hose Clamp (1)Â» Engage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**
9. Air Cleaner Assembly (2)Â» Install - **Air Cleaner Assembly Replacement**

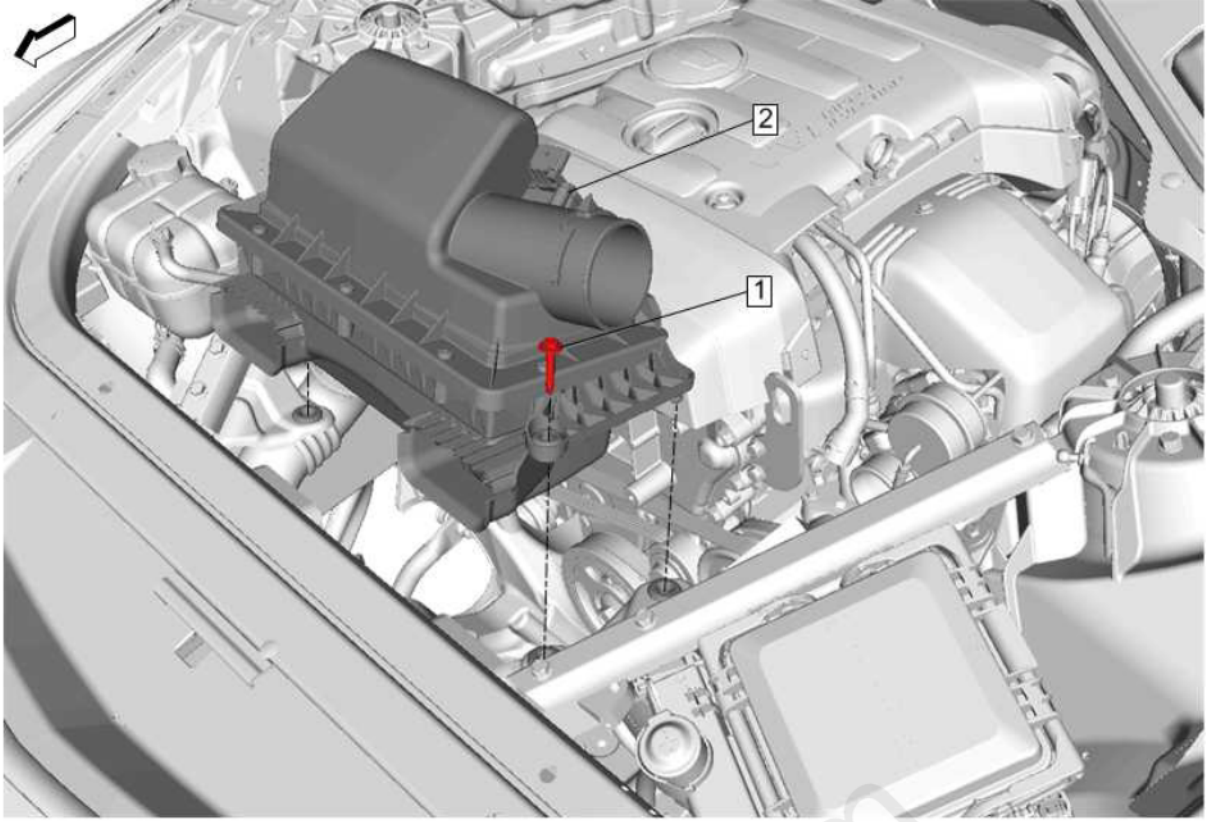


Fig. 838: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

10. Fill the cooling system. Refer to Cooling System Draining and Filling (Static LTG with HP9) and/or Cooling System Draining and Filling (GE 47716 LTG with HP9)
11. Enable the high voltage system. Refer to High Voltage Enabling
12. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP HOSE REPLACEMENT (LTG WITH HP9 HEATER COOLANT HEATER TO HEATER COOLANT PUMP)

WARNING: **Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.**

The High Voltage Disabling procedure includes the following steps:

- **Identify how to disable high voltage.**
- **Identify how to test for the presence of high voltage.**
- **Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.**

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

- **Safety glasses with appropriate side shields when within 15 meters (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 with leather protectors at all times when working with the high voltage battery assembly, whether the system is energized or not.**

Failure to follow the procedures may result in serious injury or death.

Removal Procedure

1. Disable the high voltage system. Refer to **High Voltage Disabling**
2. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
3. Drivetrain and Front Suspension Cradle Plate (3)Â» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

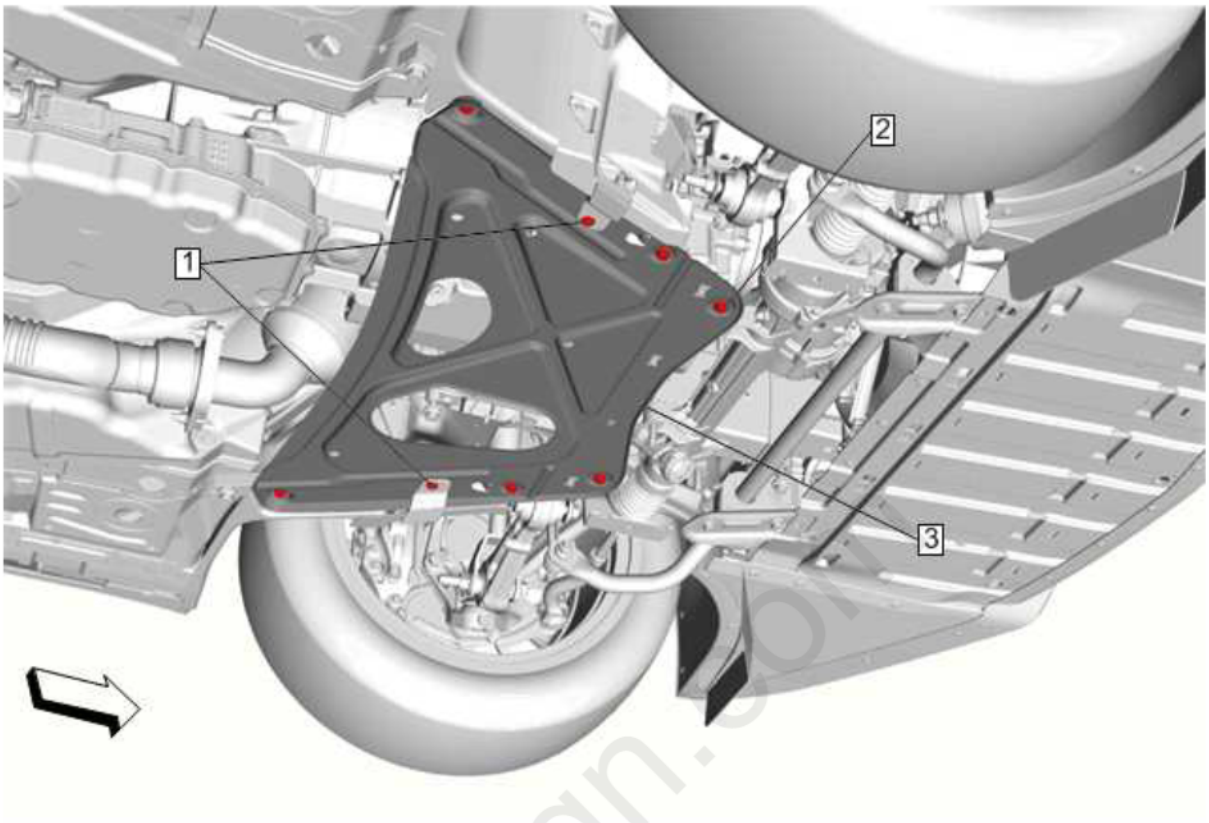


Fig. 839: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Hose Clamp (2) @ Heater Water Auxiliary Pump HoseÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

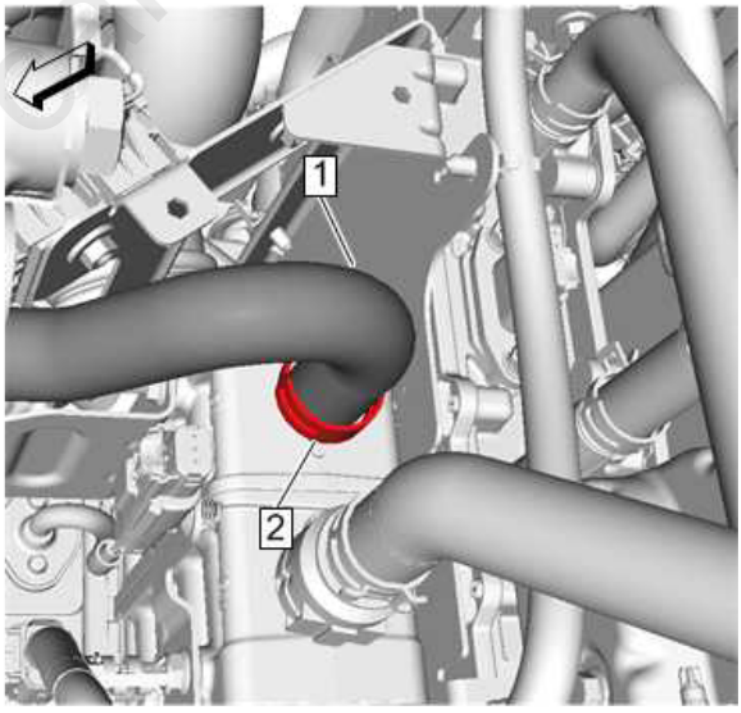


Fig. 840: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Hose (1) @ Heater Coolant HeaterÂ» Remove

6. Air Cleaner Assembly (2)Â» Remove - **Air Cleaner Assembly Replacement**

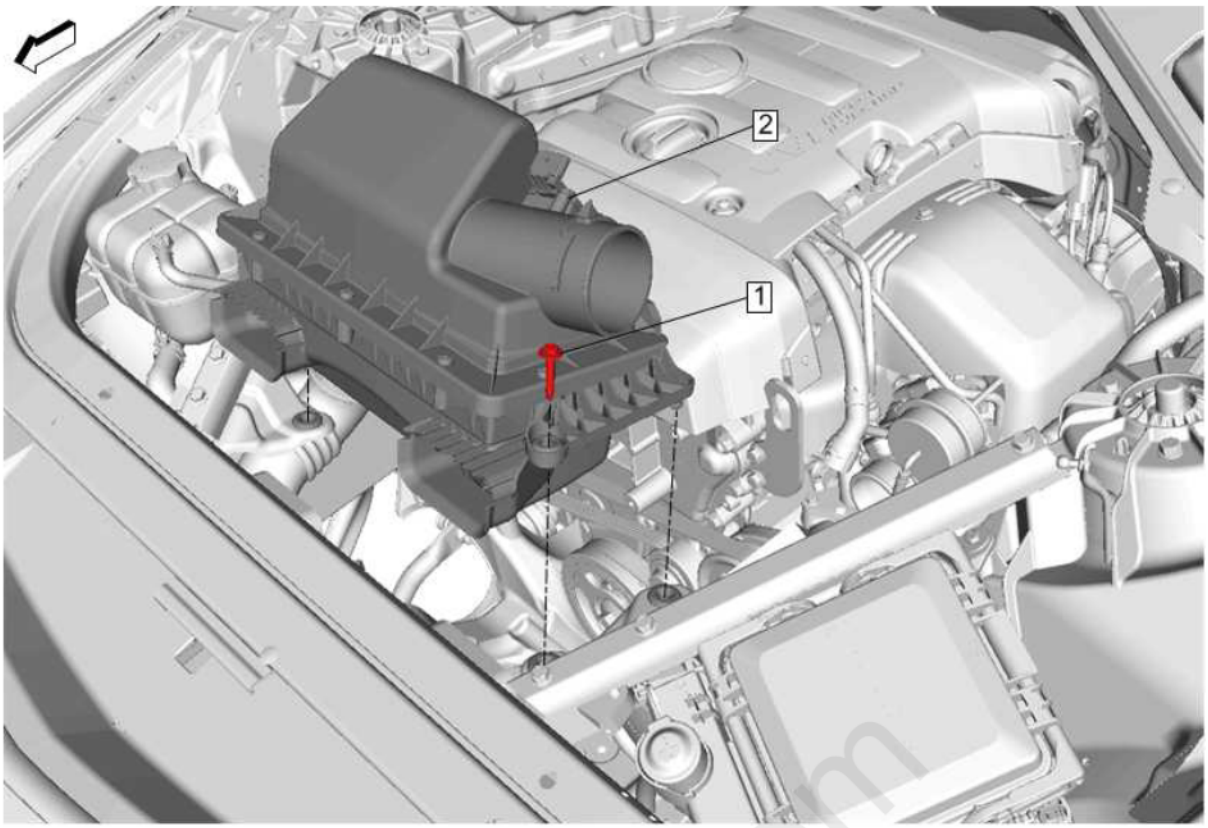


Fig. 841: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

7. Heater Water Auxiliary Pump Hose Clamp (1) @ Heater Water Auxiliary Pump HoseÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

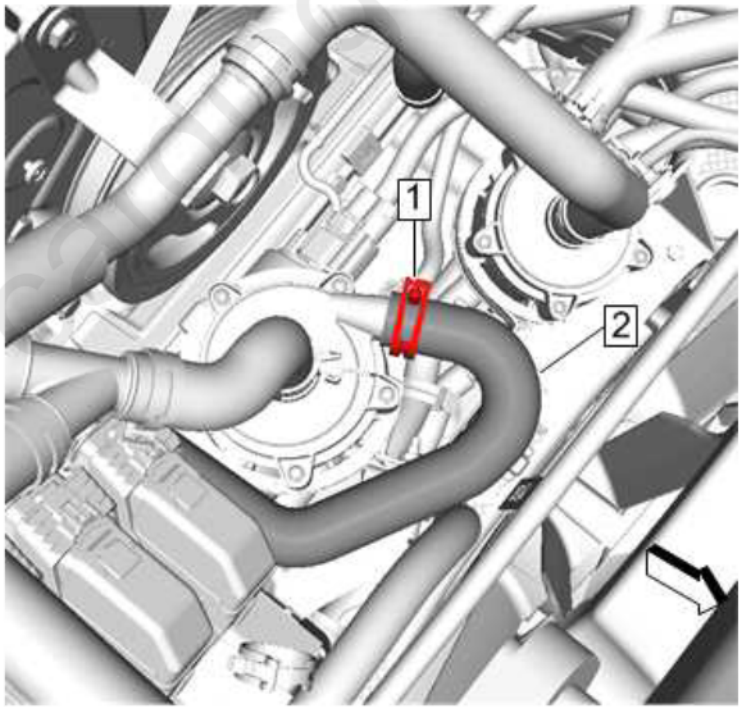


Fig. 842: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

8. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Remove
9. Generator Control Module Coolant Radiator Hose (2)Â» Remove

Installation Procedure

1. Heater Water Auxiliary Pump Hose (2) @ Heater Coolant PumpÂ» Install

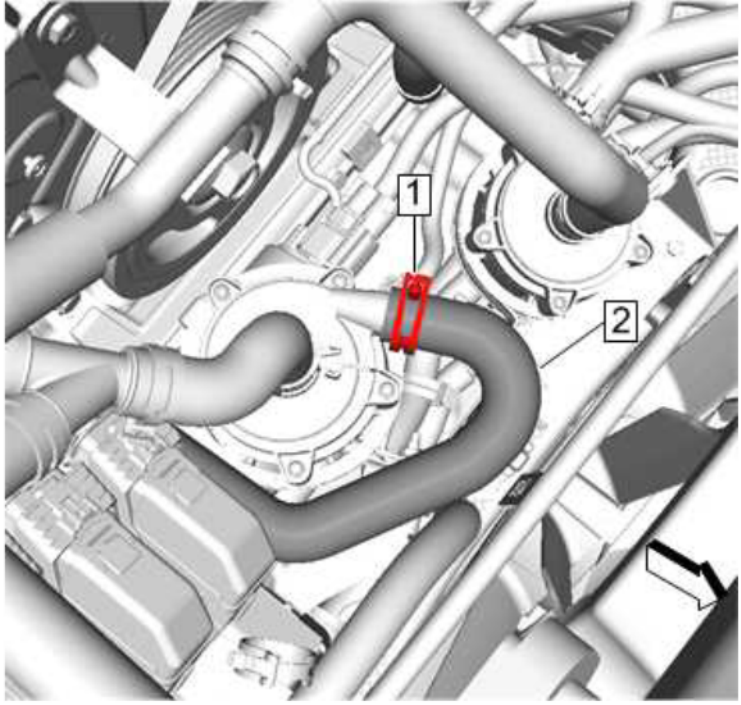


Fig. 843: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

2. Heater Water Auxiliary Pump Hose Clamp (1) @ Heater Water Auxiliary Pump HoseÂ» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
3. Air Cleaner Assembly (2)Â» Install - **Air Cleaner Assembly Replacement**

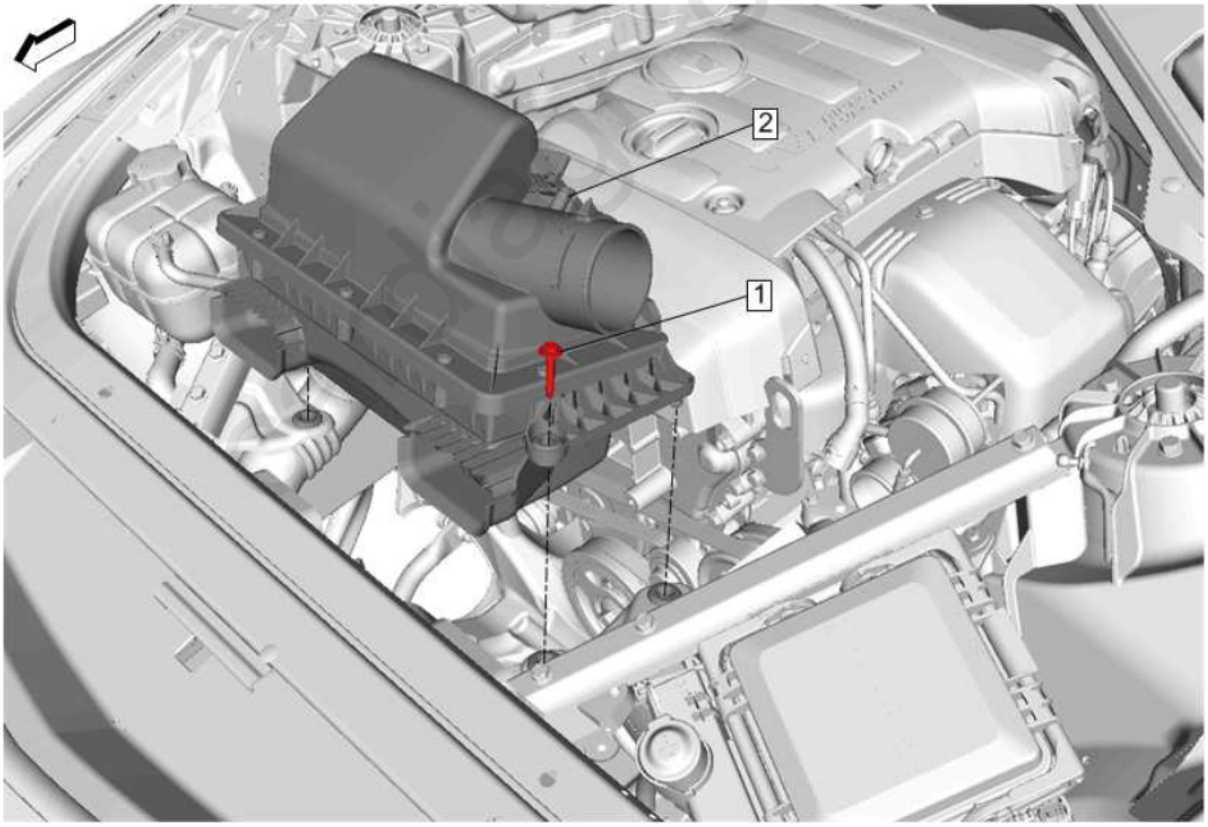


Fig. 844: Air Cleaner Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Heater Water Auxiliary Pump Hose (1) @ Heater Coolant HeaterÂ» Install

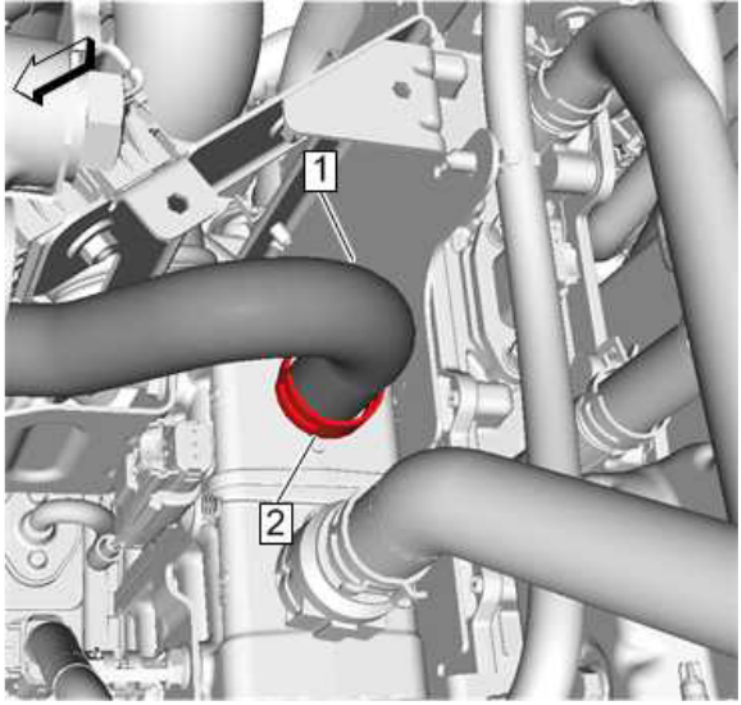


Fig. 845: Heater Water Auxiliary Pump Hose
Courtesy of GENERAL MOTORS COMPANY

5. Heater Water Auxiliary Pump Hose Clamp (2) @ Heater Water Auxiliary Pump HoseÂ» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
6. Drivetrain and Front Suspension Cradle Plate (3)Â» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

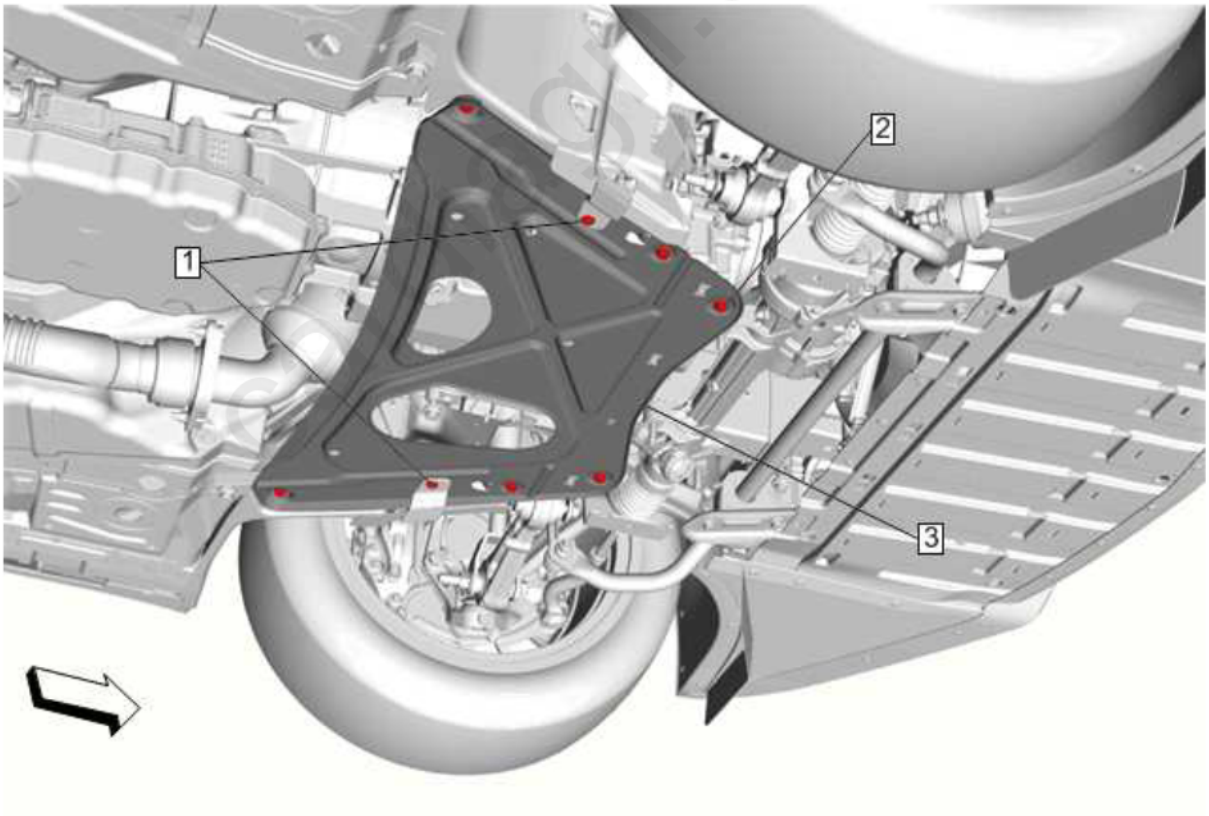


Fig. 846: Drivetrain and Front Suspension Cradle Plate
Courtesy of GENERAL MOTORS COMPANY

7. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
8. Enable the high voltage system. Refer to **High Voltage Enabling**
9. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP INLET HOSE REPLACEMENT (LTG)

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
2. Heater Water Auxiliary Pump Inlet Hose Clamp (1) @ Heater Coolant PumpÂ» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

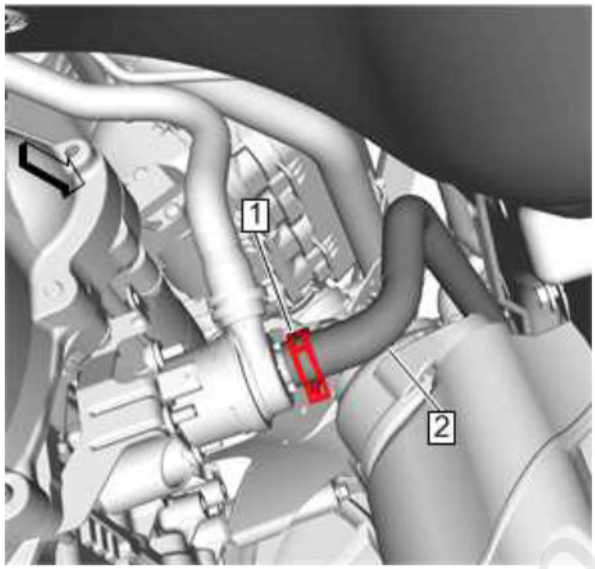


Fig. 847: Heater Water Auxiliary Pump Inlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

3. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Remove
4. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**
5. Heater Water Auxiliary Pump Inlet Hose Clamp (1)Â» Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

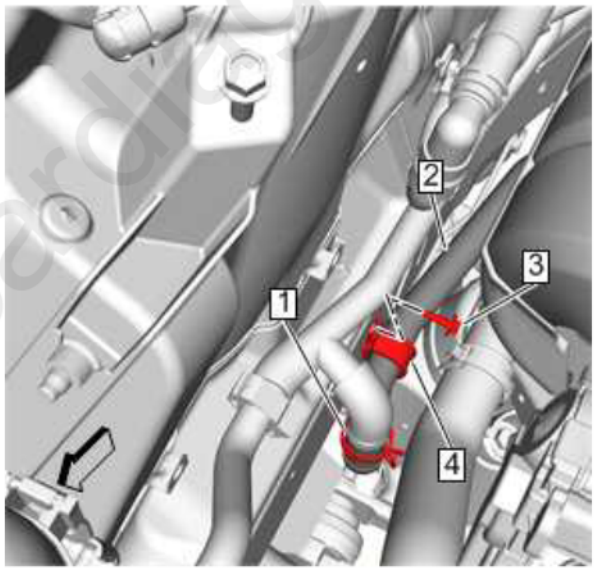


Fig. 848: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

6. Heater Water Auxiliary Pump Inlet Hose Clip Bolt (3)Â» Remove
7. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Remove
8. Heater Water Auxiliary Pump Inlet Hose (2)Â» Remove
9. Transfer components as necessary.

Installation Procedure

1. Heater Water Auxiliary Pump Inlet Hose (2)Â» Install

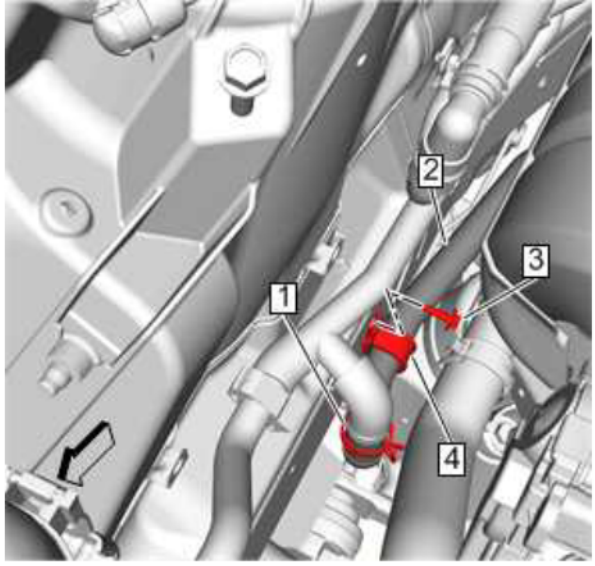


Fig. 849: Heater Water Auxiliary Pump Inlet Hose
Courtesy of GENERAL MOTORS COMPANY

2. Heater Water Auxiliary Pump Inlet Hose (2) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install

CAUTION: **Refer to Fastener Caution .**

3. Auxiliary Heater Inlet Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
4. Heater Water Auxiliary Pump Inlet Hose Clip Bolt (3) @ Auxiliary Heater Inlet and Outlet PipeÂ» Install and tighten 9 N.m (80 lb in)
5. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle**
6. Heater Water Auxiliary Pump Inlet Hose (2) @ Heater Coolant PumpÂ» Install

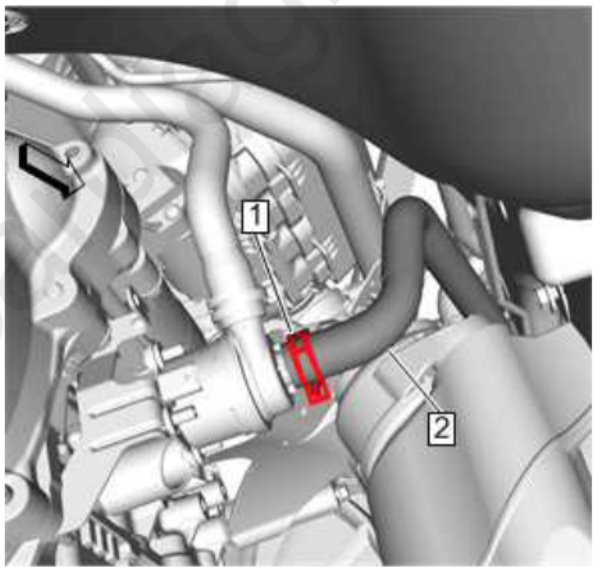


Fig. 850: Heater Water Auxiliary Pump Inlet Hose Clamp
Courtesy of GENERAL MOTORS COMPANY

7. Heater Water Auxiliary Pump Inlet Hose Clamp (1)Â» Engage - **Hose Clamp Replacement Guidelines - Spring Type**
8. Fill the cooling system. Refer to **Cooling System Draining and Filling (Static LTG with HP9)** and/or **Cooling System Draining and Filling (GE 47716 LTG with HP9)**
9. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP INLET HOSE REPLACEMENT (LGW)

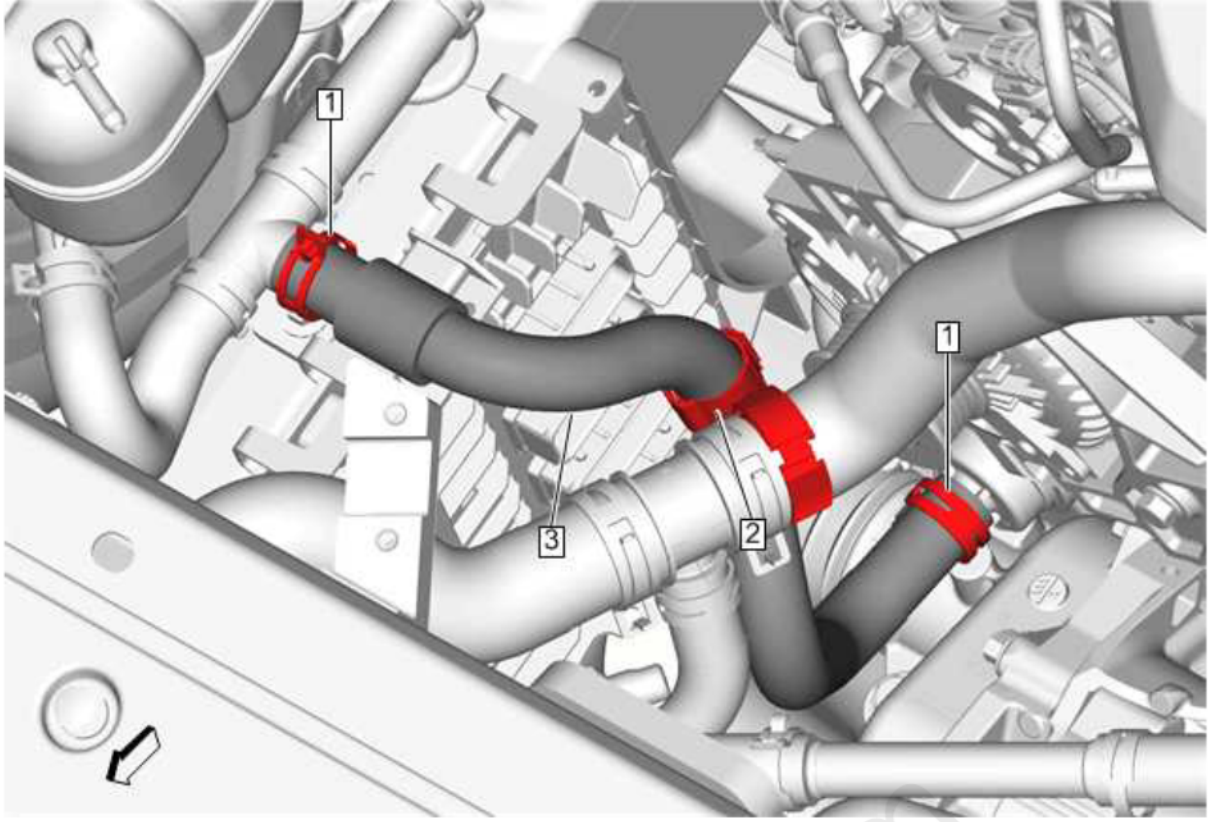


Fig. 851: Heater Water Auxiliary Pump Inlet Hose (LGW)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Cleaner Assembly Replacement (LGW)**	
1	Heater Water Auxiliary Pump Inlet Hose Clamp [2x] **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
2	Radiator Inlet Hose Clip
3	Heater Water Auxiliary Pump Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

HEATER WATER AUXILIARY PUMP INLET HOSE REPLACEMENT (LGX)

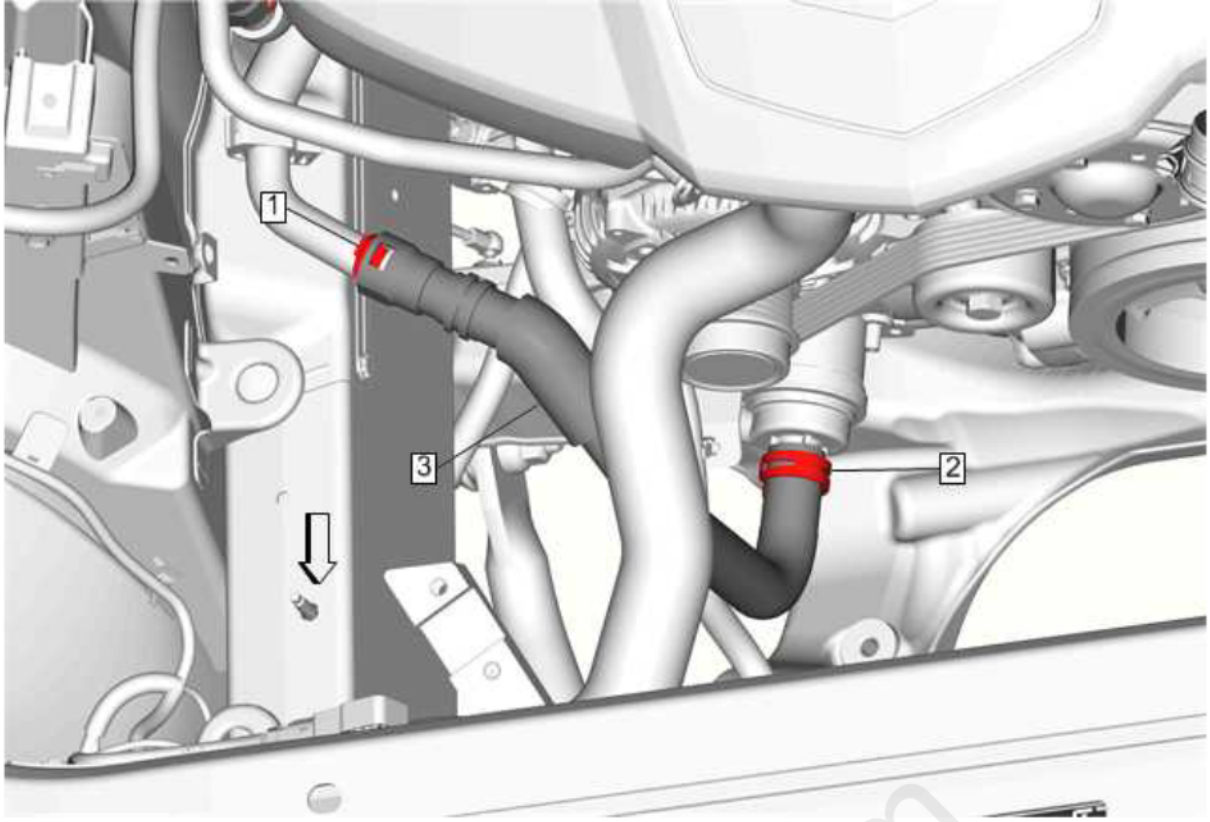


Fig. 852: Heater Water Auxiliary Pump Inlet Hose (LGX)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. **Air Cleaner Assembly Replacement (LGX)**	
1	Heater Water Auxiliary Pump Inlet Hose Retainer **Procedure** Squeeze the plastic quick connect fitting release tabs.
2	Heater Water Auxiliary Pump Inlet Hose Clamp **Procedure** **Hose Clamp Replacement Guidelines - Spring Type**
3	Heater Water Auxiliary Pump Inlet Hose **Procedure** 1. Fill the cooling system to the proper level. Refer to **Cooling System Draining and Filling (Static without HP9)** and/or **Cooling System Draining and Filling (GE 47716 without HP9)** 2. Start the engine and check for coolant leaks.

DESCRIPTION AND OPERATION

HEATING AND AIR CONDITIONING SYSTEM DESCRIPTION AND OPERATION

Engine Coolant

Engine coolant is the key element of the heating system. The thermostat controls engine operating coolant temperature. The thermostat also creates a restriction for the cooling system that promotes a positive coolant flow and helps prevent cavitation. Coolant enters the heater core through the inlet heater hose, in a pressurized state.

The heater core is located inside the HVAC module. The heat of the coolant flowing through the heater core is absorbed by the ambient air drawn through the HVAC module. Heated air is distributed to the passenger compartment, through the HVAC module, for passenger comfort.

The amount of heat delivered to the passenger compartment is controlled by opening or closing the HVAC module air temperature door. The coolant exits the heater core through the return heater hose and recirculated back through the engine cooling system.

A/C Cycle

Refrigerant is the key element in an air conditioning system. R-134a and R-1234yf are very low temperature gases that can transfer the undesirable heat and moisture 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 on the vapor refrigerant. 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 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 and aluminum cooling fins, which allows rapid heat transfer for the refrigerant. The semi-cooled liquid refrigerant exits the condenser and flows through the evaporator hose, to the thermal expansion valve.

The thermal expansion valve is attached between the evaporator tubes and evaporator hose. The thermal expansion valve is the dividing point for the high and the low pressure sides of the A/C system. As the refrigerant passes through the thermal expansion valve, the pressure of the refrigerant is lowered. Due to the pressure differential of the liquid refrigerant, the refrigerant will begin to vaporize at the thermal expansion valve. The thermal expansion valve also meters the amount of liquid refrigerant that can flow into the evaporator.

Refrigerant exiting the thermal expansion valve 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 of the evaporator core. The boiling refrigerant absorbs heat from the ambient air and draws moisture onto the evaporator. The refrigerant exits the evaporator back through the thermal expansion valve, through the outlet line of the evaporator hose, into the suction line and back to the compressor, in a vapor state completing the A/C cycle of heat removal. At the compressor, the refrigerant is compressed again and the cycle of heat removal is repeated.

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

HEATING AND AIR CONDITIONING SYSTEM DESCRIPTION AND OPERATION (WITH HP9)

Heating

The heating system uses the engine and a high voltage heater to provide heat to the passenger compartment. The high voltage heater is used when the engine is not running or when the engine is cold and passenger compartment heat is requested. The high voltage heater provides different levels of heat depending on the amount of heat needed and outside temperature.

The HVAC Control Module turns on the coolant pump and monitors the temperature sensors in the passenger compartment, outside air, engine radiator, high voltage heater and the engine to determine the

position of the coolant flow control valve and if the high voltage heater is needed. Passenger compartment heat is provided by air flowing through the heater core. The heater core is heated by coolant from either the engine or the high voltage heater.

The engine cooling system circulates a 50/50 mixture of Dex-cool and deionized water.

Air Conditioning

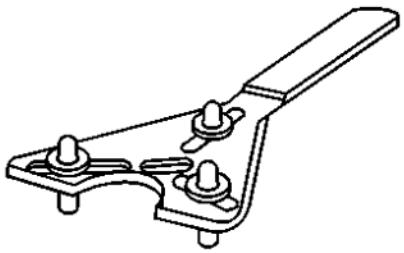
The A/C system uses the refrigerant R-134a which is a gas at very low temperatures and can transfer heat from the passenger compartment and high voltage battery to the outside air. The A/C system is mechanically protected with the use of a high pressure relief valve on the A/C compressor. If the refrigerant pressure sensor were to fail or if the A/C system becomes restricted and the refrigerant pressure continued to rise, the high pressure relief will open and release refrigerant from the system.

The high voltage electric A/C compressor is a self-contained high voltage inverter, electric motor and direct coupled compressor. The electric A/C compressor has the ability to run and provide cooling performance while the vehicle engine is not running. This feature enables the electric A/C compressor to run at a speed independent of the engine. The electronic climate control module and the Vehicle Integration Control Module (VICM) will command the electric A/C compressor to a speed necessary to maintain a desired cooling level rather than cycle the electric A/C compressor on and off.

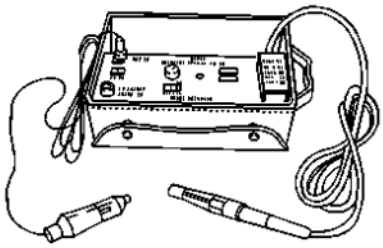
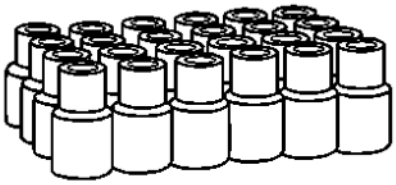
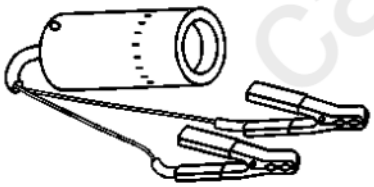
The electric A/C compressor builds pressure and adds heat to the refrigerant gas. The refrigerant gas flows from the electric A/C compressor to the condenser where heat is transferred to the outside air when the refrigerant condenses from a gas to a liquid. The liquid refrigerant then flows to a thermal expansion valve (TXV) on the battery chiller. The TXV lowers the pressure of the liquid refrigerant which makes the refrigerant expand from a liquid to a vapor. The low pressure refrigerant vapor flows into the battery chiller and begins to boil and change into a gas as the refrigerant absorbs heat from the battery coolant also flowing inside the battery chiller. The battery coolant and refrigerant are separated by several plates inside the battery chiller. The liquid refrigerant also flows to a second TXV on the evaporator. The low pressure refrigerant vapor flows from the TXV into the evaporator and begins to boil and change into a gas as the refrigerant absorbs heat from the passenger compartment air that is flowing through the outside of the evaporator. The moister in the passenger compartment air condenses on the outside of the evaporator and flows down to the bottom of the HVAC module where it drains outside the passenger compartment through a drain hose. The low pressure refrigerant gas then flows from the battery chiller and the evaporator back to the electric A/C compressor where the cycle is repeated.

SPECIAL TOOLS AND EQUIPMENT

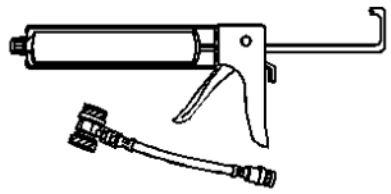
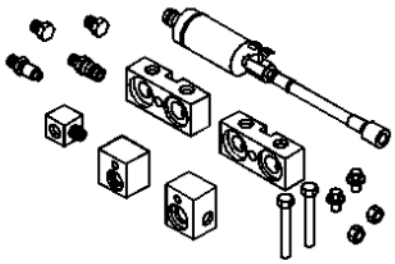
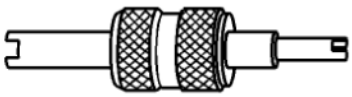
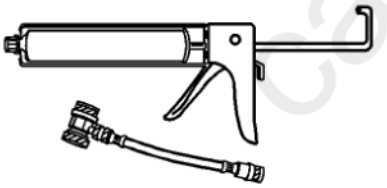
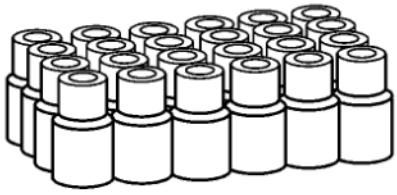
SPECIAL TOOLS

Illustration	Tool Number/Description
	CH 37872 J 37872 Universal Spanner Wrench

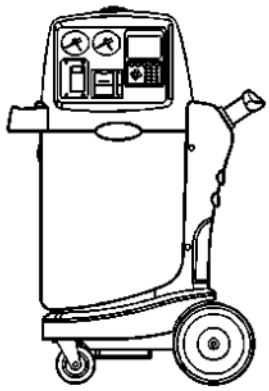
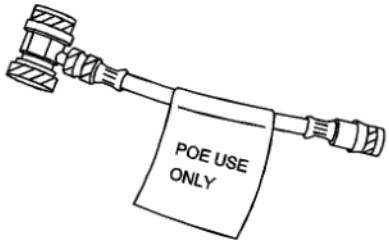
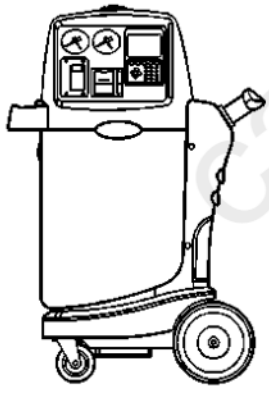
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Illustration	Tool Number/Description
	BO 38185 J 38185 Hose Clamp Pliers
	GE 39400-A J 39400-A Halogen Leak Detector
	GE 41447 J 41447 R-134a A/C Tracer Dye - Box of 24
	GE 42220 J 42220 Universal 12V Leak Detection Lamp
	GE 43872 J 43872 Fluorescent Dye Cleaner

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Illustration	Tool Number/Description
	GE 45037 J 45037 A/C Oil Injector
	GE 45268 J 45268 A/C Flushing Adapter Kit
	GE 46246 J 46246 Valve Core Tool
	GE 46297 J 46297 A/C Dye Injector Kit
	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
	GE 48997 POE oil injector hose
	GE 50078 Electronic Leak Detector
	GE 8800 J 43600 ACR 2000 Air Conditioning Service Center
	EL-47955 J-2534 Multi Diagnostic Interface MDI

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