

2006 Chevrolet Equinox LS

2006 HVAC Heating, Ventilation and Air Conditioning - Equinox & Torrent

2006 HVAC

Heating, Ventilation and Air Conditioning - Equinox & Torrent

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Air Inlet Assembly Screws	1.5 N.m	13 lb in
Air Outlet Duct Screws	1.5 N.m	13 lb in
Battery Box to Body Bolts	15 N.m	11 lb ft
Blower Case Assembly Screws	1.5 N.m	13 lb in
Blower Motor Resistor Screws	1.5 N.m	13 lb in
Blower Motor Screws	1.5 N.m	13 lb in
Compressor Clutch Bolt	20 N.m	15 lb ft
Compressor Clutch Coil Screws	4.9 N.m	43 lb in
Compressor Clutch Coil Connector Bracket Screw	3 N.m	27 lb in
Compressor Hose Assembly to Battery Box Nut	9 N.m	80 lb in
Compressor Hose Assembly to Compressor Nut	16 N.m	12 lb ft
Compressor Hose Assembly to Condenser Nut	22 N.m	16 lb ft
Compressor to Engine Bolts	50 N.m	37 lb ft
Compressor Pressure Relief Valve	9.8 N.m	87 lb in
Condenser to Radiator Bolts	9 N.m	80 lb in
CRFM Bracket Bolts	10 N.m	89 lb in
Evaporator Case Assembly Screws	1.5 N.m	13 lb in
Evaporator Outlet Hose to Compressor Hose Nut	22 N.m	16 lb ft
Evaporator Outlet Hose and Liquid Line Clamp Bracket Nut to TXV	16 N.m	12 lb ft
Front of Dash to HVAC Module Seal Nuts	9 N.m	80 lb in
Heater Core Cover Screws	1.5 N.m	13 lb in
HVAC Module to Cross Car Beam Nuts and Bolts	8 N.m	71 lb in
Intermediate Duct Fasteners	2.5 N.m	22 lb in
Liquid Line to Condenser Nut	22 N.m	16 lb ft
Liquid Line to Strut Tower Nut	9 N.m	80 lb in
Mode Actuator to Evaporator Case Screws	1.5 N.m	13 lb in

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Mode Cam Bracket to Evaporator Case Screws	1.5 N.m	13 lb in
Passenger Compartment Air Filter Housing Nuts	9 N.m	80 lb in
Receiver Dehydrator Upper Clamp Bolt to Condenser	4.2 N.m	37 lb in
Receiver Dehydrator to Condenser Bolt	6.5 N.m	58 lb in
Refrigerant Pressure Sensor to Compressor Hose Assembly	4 N.m	35 lb in
Surge Tank to Body Bolts	9 N.m	80 lb in
TXV Backing Plate Bolts	3.5 N.m	31 lb in

REFRIGERANT SYSTEM CAPACITIES

Refrigerant System Capacities

Application	Specification	
	Metric	English
PAG Oil GM P/N 12378526 for United States PAG Oil GM P/N 88900060 for Canada		
Abrupt Refrigerant Loss	65 ml	2.20 oz
Compressor Replacement		
• The Zexel model DKS17DS service compressor is precharged with the specified amount of PAG oil.	74 ml	2.50 oz
Condenser Replacement with the Receiver Dehydrator	60 ml	2 oz
Condenser Replacement without the Receiver Dehydrator	30 ml	1 oz
Evaporator Replacement	30 ml	1 oz
Receiver Dehydrator Replacement	30 ml	1 oz
Thermal Expansion Valve Replacement	20 ml	0.75 oz
• Total System PAG Oil Capacity	130 ml	4.40 oz
R-134a		
• Refrigerant Charge	0.59 kg	1.30 lb
Abrupt refrigerant loss due to a 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. If more than the specified amount of PAG oil was drained from a component, add the equal amount of oil drained.		

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - HEATING, VENTILATION AND AIR CONDITIONING

The HVAC system is divided into 2 separate sections. The first, heating, ventilation, and air conditioning, has all procedures that pertain to an HVAC component or function that is not specifically associated with the manual control system. The second, HVAC Systems - Manual, has all procedures specific to the Manual control system.

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** in Vehicle DTC Information.

The Diagnostic System Check will provide the identification of the control modules which command the system.

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

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

- **Air Delivery Description and Operation** in HVAC Systems - Manual
- **Air Temperature Description and Operation** in HVAC Systems - Manual

The Air Delivery Description and Operation contains the following topics:

- Air speed
- Air distribution

The Air Temperature Description and Operation contains the following topics:

- Heater Mode
- A/C Mode
- A/C cycle

LEAK TESTING**Tools Required**

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

- **J 46297** A/C Dye Injector Kit
- **J 46297-12** Replacement Dye Cartridges

Refrigerant Leak Testing

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

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

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

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

Fluorescent Leak Detector

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

IMPORTANT: PAG oil is water soluble.

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

Use the leak detection lamp in the following areas:

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

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

- Follow the instructions supplied with the **J 42220** . See **Special Tools**.
- To prevent false diagnosis in the future, thoroughly clean the residual dye from any

area where leaks were found. Use a rag and the approved **J 43872** .

Fluorescent Dye Injection

IMPORTANT: Use only fluorescent dye approved by General Motors.

- **J 41447** can be poured directly into a removed A/C component. See Special Tools.
- **J 46297-12** is injected into the low side port using **J 46297** .
- Not all of the fluorescent dyes are compatible with PAG oil. Some types of dye decrease the oil viscosity or may chemically react with the oil.
- R-134A leak detection dye requires time to work. Depending upon the leak rate, a leak may not become visible for between 15 minutes and 7 days.

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

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

Halogen Leak Detector

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

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

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

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

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

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

Follow the instructions supplied with the **J 39400-A** . See **Special Tools**.

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST

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

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

Test Description

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

- 1:** This step determines if the A/C system has at least the minimum refrigerant charge required to operate the system without damage.
- 2:** This step measures the performance of the A/C system.
- 3:** This step is to allow for vehicle variations as well as high ambient temperatures.

Air Conditioning (A/C) System Performance Test

Step	Action	Values	Yes	No
IMPORTANT: • The ambient air temperature must be at least 16°C (60°F). • Do not induce additional air flow across the front of the vehicle during the test. • If you were sent here from a DTC diagnostic table, clear the DTC upon completion of this test.				
1	1. Park the vehicle inside or in the shade. 2. Open the windows in order to ventilate the interior of the vehicle. 3. If the A/C system was operating, allow the A/C system to equalize for about 2 minutes. 4. Turn OFF the ignition. 5. Install the J 43600 . See Special Tools. 6. Record the ambient air temperature displayed on the J	More than 16°C (60° F) - 345 kPa (50 psi) More than 24°C (75° F) - 483 kPa (70 psi) More than		

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	43600 . See Special Tools. 7. Record the low and high side STATIC pressure readings. Are both the low side and high side pressures within the specified value?	33°C (90° F) - 690 kPa (100 psi)		
			Go to Step 2	Go to Leak Testing
2	IMPORTANT: Record the relative humidity and the ambient air temperature at the time of the test. 1. Close the vehicle doors and windows. 2. Open the drivers door window 12.7-15.2 cm (5-6 in). 3. Select the following HVAC control settings: • The A/C is ON • The coldest temperature setting • The maximum blower speed • Recirculation mode • The panel outlet mode • All panel outlets are OPEN 4. Install the temperature probes of the J 43600 in the left and right center panel air outlets. See Special Tools. 5. Apply the parking brake. 6. Place the transaxle/transmission in PARK. 7. Start the engine. 8. Operate the A/C system for 5 minutes. 9. Inspect A/C components for the following conditions: • Abnormal frost areas • Unusual noises IMPORTANT:	-		

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

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

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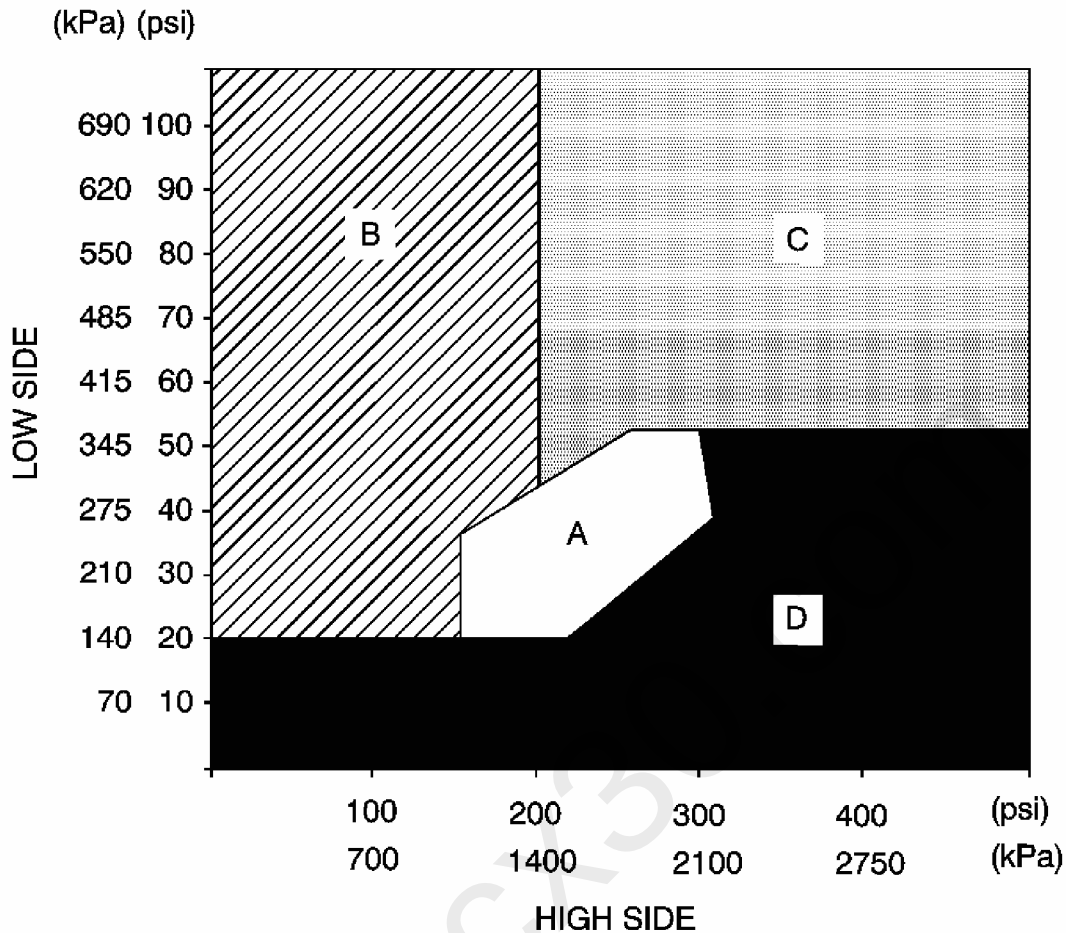


Fig. 1: A/C System Pressure - Zone Classification
 Courtesy of GENERAL MOTORS CORP.

A/C Performance Table

Ambient Temperature	Relative Humidity	Low Side Service Port Pressure	High Side Service Port Pressure	Maximum Left Center Discharge Air Temperature
13-18°C (55-65°F)	0-100%	151-241 kPa (22-35 psi)	1129-1350 kPa (164-196 psi)	12°C (52°F)
19-24°C (66-75°F)	Less than 40%	151-227 kPa (22-33 psi)	11198-1433 kPa (174-208 psi)	9°C (48°F)
	Greater than 40%	165-268 kPa (24-39 psi)	1233-1460 kPa (179-212 psi)	13°C (55°F)
	Less than 35%	165-248 kPa (24-36 psi)	1336-1529 kPa (194-222 psi)	12°C (52°F)

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25-29°C (76-85°F)	35-60%	186-261 kPa (27-38 psi)	1350-1688 kPa (196-245 psi)	13°C (54°F)
	Greater than 60%	199-282 kPa (29-41 psi)	1357-1550 kPa (197-225 psi)	14°C (57°F)
30-35°C (86-95°F)	Less than 30%	192-268 kPa (28-39 psi)	1446-1660 kPa (210-241 psi)	13°C (55°F)
	30-50%	199-282 kPa (29-41 psi)	1412-1660 kPa (205-241 psi)	14°C (57°F)
	Greater than 50%	220-303 kPa (32-44 psi)	1460-1660 kPa (212-241 psi)	17°C (61°F)
36-41°C (96-105°F)	Less than 20%	220-296 kPa (32-43 psi)	1577-1791 kPa (229-260 psi)	15°C (59°F)
	20-40%	227-303 kPa (33-44 psi)	1577-1777 kPa (229-258 psi)	17°C (61°F)
	Greater than 40%	241-310 kPa (35-45 psi)	1577-11770 kPa (229-257 psi)	18°C (64°F)
42-46°C (106-115°F)	Less than 20%	254-323 kPa (37-47 psi)	1708-1887 kPa (248-274 psi)	18°C (64°F)
	Greater than 20%	254-323 kPa (37-47 psi)	1708-1880 kPa (248-273 psi)	19°C (66°F)
47-49°C (116-120°F)	Below 30%	282-378 kPa (41-55 psi)	1812-2149 kPa (263-312 psi)	23°C (72°F)

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

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

Step	Action	Value	Yes	No
DEFINITION: The high and low side pressures may be normal or slightly less than normal.				
• Air Delivery Concern • Slight Refrigerant Under Charge • Refrigerant Contamination				
1	Were you sent here from the air conditioning (A/C) System Performance Test?	-	Go to Step 2	Go to Air Conditioning (A/C) System Performance Test
	Refer to the instrument panel outlet air temperatures recorded during the A/C			

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2	system performance test. Does the discharge air temperature between the right and left center instrument panel outlets vary by more than 1-2°C (2-3°F)?	-	Go to Step 7	Go to Step 3
3	Did the customer mention that the A/C system output temperatures are good at first, but then turn warm during extended drives?	-	Go to Step 4	Go to Step 5
4	Increase engine speed to 2,000 RPM. During extended operation of the A/C system, does the low side pressure decrease, possibly accompanied by heavy frost on the liquid line between the expansion device and the evaporator?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure Zone D	Go to Step 5
5	1. Refer to the pressures recorded during the A/C system performance test. 2. Inspect for the following conditions: CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. • The high side pressure is slightly greater than the specified pressure ranges but still within Zone A on the A/C Pressure-Zone Classification Chart in the A/C System Performance Test. Refer to Air Conditioning (A/C) System Performance Test. • The discharge line is hot. • The suction line is cool. Do the listed conditions exist?	-	Go to Step 7	Go to Step 6
	1. Refer to the pressures recorded			

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6	during the A/C system performance test. 2. Inspect for the following conditions: • The low side pressure is slightly lower than the specified pressure ranges but still within Zone A on the A/C Pressure-Zone Classification Chart in the A/C System Performance Test. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. • The discharge line is warm to hot. • The suction line is cool to warm. Do the listed conditions exist?	-	Go to Step 8	Go to Too Hot in Vehicle in HVAC Systems - Manual
7	The A/C system may be undercharged. 1. Leak test A/C system. Refer to <u>Leak Testing</u>. 2. Recharge the A/C system to specifications. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the action complete?	-	Go to Step 14	-
8	The A/C system may be contaminated. View the information screen on J 43600 for detection of foreign gases in the A/C system. See <u>Special Tools</u>. Do foreign gases exist?	-	Go to Step 9	Go to Step 10
	1. Evacuate the A/C system to a scavenging tank. Refer to <u>Refrigerant Recovery and</u>			

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9	<u>Recharging.</u> 2. Recharge the A/C system to specifications.	-		
	Is the action complete?		Go to Step 14	-
10	The A/C system may contain too much moisture or air. 1. Evacuate and recharge the A/C system to specifications. Refer to <u>Refrigerant Recovery and Recharging.</u> 2. Operate the A/C system and inspect the instrument panel outlet air temperatures. Refer to <u>Air Conditioning (A/C) System Performance Test.</u> Are the instrument panel outlet air temperatures within the specified ranges of the A/C Performance Test Table?	-		
			Go to Step 15	Go to Step 11
11	The A/C system may contain too much refrigerant oil. IMPORTANT: Operate the A/C system on low, in order to enhance oil flow to the high side of the system. 1. Operate the A/C system with the engine at idle speed and the blower speed on low for approximately 15 minutes. 2. Recover the refrigerant from the A/C system. Refer to <u>Refrigerant Recovery and Recharging.</u> 3. Remove the receiver dehydrator. Refer to <u>Receiver Dehydrator Replacement.</u> 4. Drain and measure the	148 ml (5 oz)		

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	refrigerant oil from the receiver dehydrator. Was more than the specified amount of refrigerant oil drained from the receiver?		Go to Step 12	Go to Step 13
12	1. Reinstall the receiver dehydrator. Refer to <u>Receiver Dehydrator Replacement</u>. 2. Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Are the actions complete?	-	Go to Step 14	-
13	1. Add the specified amount of refrigerant oil to the receiver dehydrator. Refer to <u>Refrigerant System Capacities</u>. 2. Install the receiver dehydrator. Refer to <u>Receiver Dehydrator Replacement</u>. 3. Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Are the actions complete?	-	Go to Step 14	-
14	1. Record the low and high side pressures and the instrument panel outlet air temperature. 2. Compare the instrument panel outlet air temperatures to those listed in the A/C System Performance Chart. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. Are the high and low side pressures and instrument panel outlet air temperatures within specifications?	-	Go to Step 15	Go to <u>Air Conditioning (A/C) System Performance Test</u>
	Operate the system in order to verify the repair.			Go to Symptoms -

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15	Did you find and correct the condition?	-	System OK	<u>HVAC Systems - Manual in HVAC Systems - Manual</u>
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AIR CONDITIONING (A/C) DIAGNOSTICS - PRESSURE ZONE B

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

Step	Action	Yes	No
DEFINITION: The low side pressure is higher than normal and the high side pressure is lower than normal. - Malfunctioning Air Conditioning (A/C) Compressor - Refrigerant Under Charge			
1	Were you sent here from the air conditioning (A/C) System Performance Test?	Go to Step 2	Go to <u>Air Conditioning (A/C) System Performance Test</u>
2	After continued operation of the A/C system, do the low and the high side pressures equalize or become static?	Go to Step 5	Go to Step 3
3	1. Refer to the pressures recorded during the A/C System Performance Test. 2. Inspect for the following conditions: CAUTION: Refer to <u>Moving Parts and Hot Surfaces Caution</u> in <u>Cautions and Notices</u>. - The low side pressure is equal to or greater than the specified pressure range of the A/C Performance Table. Refer to <u>Air Conditioning (A/C) System Performance Test</u> . - The high side pressure is less than the specified pressure range of the A/C Performance Table. Refer to <u>Air Conditioning (A/C) System</u>		

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	<u>Performance Test</u> . • The low side refrigerant line at the compressor feels cool to warm. • The high side refrigerant line at the compressor feels warm to hot.		
	Do the listed conditions exist?	Go to Step 5	Go to Step 4
4	1. Refer to the pressures recorded during the A/C System Performance Test. 2. Inspect for the following conditions: CAUTION: Refer to <u>Moving Parts and Hot Surfaces Caution</u> in Cautions and Notices. • The low side pressure is greater than the specified pressure range of the A/C Performance Table. Refer to <u>Air Conditioning (A/C) System Performance Test</u> . • The high side pressure is less than the specified pressure range of the A/C Performance Table. Refer to <u>Air Conditioning (A/C) System Performance Test</u> . • The low side refrigerant line at the compressor feels warm. • The high side refrigerant line at the compressor feels warm to hot.		Go to <u>Air Conditioning (A/C) System Performance Test</u>
	Do the listed conditions exist?	Go to Step 5	
5	The A/C system has a low refrigerant charge. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the action complete?	Go to Step 6	-
	1. After you perform the repairs, record the following: • The low and the high side pressures		

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6	The instrument panel outlet air temperature 2. Compare the pressures and the temperature to those listed in the A/C Performance Chart. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. Are the readings within the specified ranges found on the A/C Performance Chart?	Go to Step 13	Go to Step 7
7	The A/C compressor is malfunctioning. Remove the thermal expansion valve (TXV) and inspect for contamination. Refer to <u>Thermal Expansion Valve Replacement</u>. Did you find metal flakes on the TXV?	Go to Step 9	Go to Step 8
8	Inspect the TXV for a brown, powdery residue indicating desiccant in the A/C system. Is a brown, powdery residue present?	Go to Step 11	Go to Step 12
9	1. Remove the compressor hose from the compressor. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Inspect for metal flake contamination at the line connections and the compressor ports. Is metal flake contamination present?	Go to Step 10	Go to Step 12
10	1. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 2. Replace the TXV. Refer to <u>Thermal Expansion Valve Replacement</u>. 3. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the action complete?	Go to Step 13	-
	1. Replace the TXV. Refer to <u>Thermal Expansion Valve Replacement</u>. 2. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 3. Replace the receiver dehydrator. Refer		

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11	to <u>Receiver Dehydrator Replacement</u>. 4. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the action complete?	Go to Step 13	-
12	1. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 2. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the action complete?	Go to Step 13	-
13	Operate the system in order to verify the repair Did you find and correct the condition?	System OK	Go to <u>Symptoms - HVAC Systems - Manual</u> in HVAC Systems - Manual

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

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

Step	Action	Yes	No
DEFINITION: The low and the high side pressures are both higher than normal. • Restricted Condenser Air Flow • Cooling Fan Malfunction • Thermal Expansion Valve (TXV) Malfunction			
1	Were you sent here from the air conditioning (A/C) System Performance Test?	Go to Step 2	Go to <u>Air Conditioning (A/C) System Performance Test</u>
2	1. Start the engine. 2. Turn ON the A/C. 3. Inspect for proper cooling fan operation. Refer to <u>Cooling System Description and Operation</u> in Engine Cooling.		

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	Are the cooling fans ON and operating properly?	Go to Step 3	Go to Step 5
3	Visually inspect for the following conditions: • Damaged condenser cooling fins • Missing or misaligned air baffles • Restricted air flow Do any of these conditions exist?	Go to Step 4	Go to Step 6
4	Repair the air flow restriction. Is the action complete?	Go to Step 9	-
5	Repair the fault to the cooling fan operation. Refer to Cooling Fan Inoperative in Engine Cooling. Is the repair complete?	Go to Step 9	-
6	CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. Feel the liquid line on both sides of the thermal expansion valve (TXV). Are the temperatures on both sides of the TXV similar?	Go to Step 7	Go to Step 8
7	Replace the damaged or faulty TXV. Refer to Thermal Expansion Valve Replacement. Is the action complete?	Go to Step 9	-
8	1. Air is in the refrigerant system, or the system is overcharged. Refer to the view screen on J 43600 ACR 2000 Air Conditioning Service Center for foreign gas content in the refrigerant. See Special Tools. 2. Recover and recharge the A/C system. Refer to Refrigerant Recovery and Recharging. Is the action complete?	Go to Step 9	-
	1. Record the low and high side pressures and the instrument panel outlet air		

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9	temperature after you have performed the repairs. 2. Compare the pressures and the instrument panel outlet air temperature to those listed in the A/C Performance Chart. Refer to Air Conditioning (A/C) System Performance Test. Are the readings within the specified ranges listed in the A/C Performance Chart?	Go to Step 10	Go to Air Conditioning (A/C) System Performance Test
10	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual

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

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

Step	Action	Yes	No
DEFINITION: The low side pressure is lower than normal and the high side pressure is higher than normal. • A restriction in the Air Conditioning (A/C) system • Debris in the system			
1	Were you sent here from the air conditioning (A/C) System Performance Test?	Go to Step 2	Go to Air Conditioning (A/C) System Performance Test
2	CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. Feel the liquid line before the thermal expansion valve (TXV). Is the liquid line cold before the TXV?	Go to Step 3	Go to Step 8
	Feel along the surfaces of the following high side components: • The compressor hose between the compressor and the condenser		

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3	• The condenser • The liquid line between the condenser and the TXV Did you detect an abrupt drop in temperature along the surfaces of any of the listed components?	Go to Step 7	Go to Step 4
4	1. Feel the liquid line at the TXV location for extreme cold, possibly accompanied by heavy frost. 2. Feel along the liquid line beyond the TXV location for warm temperature. Is the liquid line extremely cold at the TXV location and warm beyond the TXV location?	Go to Step 11	Go to Step 5
5	Feel along the surfaces of the following low side components: • The evaporator inlet tube between the TXV and the evaporator core • The evaporator outlet tube between the evaporator core and the compressor suction hose • The compressor suction hose Did you feel an abrupt temperature change along the surfaces of any of the listed components?	Go to Step 7	Go to Step 6
6	Feel along the surfaces of the low and the high side components. • The evaporator inlet tube between the TXV and the evaporator core • The evaporator outlet hose between the TXV and the compressor • The compressor hose assembly • The condenser • The liquid line between the condenser		

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	and the TXV		
	Are the temperatures of these components only mildly warm?	Go to Step 14	Go to Step 8
7	1. Recover the refrigerant. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Remove the restriction from the component, or replace the component which produced an abrupt temperature drop. Is the action complete?	Go to Step 9	-
8	1. Recover the refrigerant and evacuate the system. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Record the weight of the recovered refrigerant. 3. Compare the weight of the recovered refrigerant with the system capacity. Refer to <u>Refrigerant System Capacities</u>. Is the weight of the recovered refrigerant charge greater than 75% of the total system capacity?	Go to Step 9	Go to Step 10
9	Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the cooling performance improved?	Go to Step 20	Go to Step 10
10	1. Leak test the system. Refer to <u>Leak Testing</u>. 2. Repair any leaks. Is the action complete?	Go to Step 20	-
11	The TXV is restricted. 1. Replace the TXV. Refer to <u>Thermal Expansion Valve Replacement</u>. 2. If the TXV was restricted, note the type of debris present.		

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	Are metal flakes present?	Go to Step 12	Go to Step 13
12	1. Remove the compressor hose assembly from the vehicle. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Inspect the hose for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. 3. Observe the amount of debris collected in the shop towel. Did a large amount of debris collect in the shop towel?	Go to Step 18	Go to Step 19
13	If the TXV was restricted with a brown or black residue, replace the receiver dehydrator. Refer to <u>Receiver Dehydrator Replacement</u>. Are the actions complete?	Go to Step 20	-
14	1. Recover the refrigerant. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Disconnect the compressor hose from the compressor. Refer to <u>Compressor Hose Assembly Replacement</u>. 3. Inspect for the presence of debris in the compressor suction port. Is debris present in the compressor suction port?	Go to Step 15	Go to Step 19
15	1. Remove the debris from the suction port. 2. Inspect the TXV for damage or debris. Refer to <u>Thermal Expansion Valve Replacement</u>. Did you find evidence of damage or debris?	Go to Step 17	Go to Step 16
	If the TXV does not show any signs of damage or debris, perform the following procedure:		

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16	1. Remove the compressor hose assembly from the vehicle. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Inspect the hose for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. 3. Observe the amount of debris collected in the shop towel. Did a large amount of debris collect in the shop towel?	Go to Step 18	Go to Step 19
17	1. Replace the TXV. Refer to <u>Thermal Expansion Valve Replacement</u>. 2. If the TXV was restricted, observe the type of debris present. Are metal flakes present?	Go to Step 12	Go to Step 13
18	If a large amount of debris was collected in the shop towel from the compressor hose assembly, replace the receiver dehydrator. Refer to <u>Receiver Dehydrator Replacement</u>. Is the action complete?	Go to Step 19	-
19	1. Install the compressor hose assembly. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Are the actions complete?	Go to Step 20	-
20	1. Record the low and the high side pressures and the instrument panel outlet air temperature after you perform the repairs. 2. Compare the pressures and the instrument panel outlet air temperature to those listed in the A/C Performance Chart. Refer to <u>Air Conditioning</u>		Go to Air

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	(A/C) System Performance Test. Are the readings within the specified ranges as shown on the A/C Performance Chart?	Go to Step 21	Conditioning (A/C) System Performance Test
21	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual

HEATING PERFORMANCE DIAGNOSTIC**Heating Performance Diagnostic**

Step	Action	Yes	No
DEFINITION: Heating system performance.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual
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. Allow the engine to idle. 2. Select the FLOOR mode. 3. Select the minimum blower speed. 4. Select the warmest temperature setting. 5. Feel the temperature of the inlet and outlet heater hoses at the heater core. Does the inlet heater hose feel warmer than the outlet heater hose?	Go to Step 7	Go to Step 4
	1. Install a thermometer into the center instrument panel air outlet. 2. Secure a thermometer to the heater core outlet hose. 3. Select the PANEL mode.		

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4	4. Select the maximum blower speed. 5. Select the warmest temperature setting. 6. Record the temperature at the following locations: • The center instrument panel air outlet • The heater core outlet hose 7. Compare the recorded temperatures. Are the 2 temperature readings about equal?	Go to Step 5	Go to Step 6
5	1. Inspect and repair the following areas of the vehicle for cold air leaks: • The cowl • The recirculation door • The HVAC module case 2. Perform the necessary repairs. Are the repairs complete?	Go to Step 10	-
6	1. Inspect the temperature door operation. Refer to Diagnostic System Check - Vehicle in Vehicle DTC Information. 2. Perform any necessary repairs. Are the repairs complete?	Go to Step 10	-
7	1. Turn OFF the engine. 2. Backflush the heater core. 3. Start the engine. 4. Select the FLOOR mode. 5. Select the minimum blower speed. 6. Select the warmest temperature setting. 7. Feel the temperature of the inlet and outlet heater hoses at the heater core. 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	-
	Repair the low engine temperature concern.		

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9	Refer to Engine Fails To Reach Normal Operating Temperature in Engine Cooling. Is the repair complete?	Go to Step 10	-
10	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

DEFROSTING INSUFFICIENT

Defrosting Insufficient

Step	Action	Yes	No
DEFINITION: Time required to defrost the windshield is longer than usual.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual
2	1. Start the engine. 2. Select the DEFROST mode. 3. Select the maximum blower speed. Does sufficient air flow from the defroster outlets?	Go to Step 3	Go to Step 11
3	Measure the engine operating temperature. Does engine reach normal operating temperature?	Go to Step 4	Go to Step 9
4	1. Select the minimum blower speed. 2. Select the warmest temperature setting. 3. Feel the temperature of the inlet and outlet hoses at the heater core. Does the inlet heater hose feel warmer than the outlet heater hose?	Go to Step 12	Go to Step 5
5	Is the vehicle equipped with air conditioning?	Go to Step 6	Go to Step 14
6	Test the operation of the A/C compressor clutch. Does the A/C compressor clutch engage?	Go to Step 8	Go to Step 7
7	Repair the A/C compressor clutch. Refer to HVAC Compressor Clutch Does Not		

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	Engage in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
8	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 10	Go to Step 13
9	Repair the low engine temperature concern. Refer to Engine Fails To Reach Normal Operating Temperature in Engine Cooling. Is the repair complete?	Go to Step 15	Go to Step 14
10	Inspect for correct operation of the recirculation door. Is the recirculation door operating correctly?	Go to Step 15	
11	Repair the air delivery concern. Refer to Air Delivery Improper in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
12	Repair the heating concern. Refer to Heating Performance Diagnostic . Is the repair complete?	Go to Step 15	-
13	Repair the A/C performance concern. Refer to Air Conditioning (A/C) System Performance Test . Is the repair complete?	Go to Step 15	-
14	Repair the recirculation door concern. Refer to Air Recirculation Malfunction in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
15	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

NOISE DIAGNOSIS - BLOWER MOTOR

Noise Diagnosis - Blower Motor

Step	Action	Yes	No
DEFINITION: Noise originating from the blower motor.			
1	Were you sent here from Symptoms or another diagnostic table?		Go to Symptoms - HVAC Systems

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		Go to Step 2	- Manual in HVAC Systems- Manual
2	Inspect the air inlet grille for debris. Is debris present?	Go to Step 8	Go to Step 3
3	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine OFF. 4. Cycle the blower motor through all of the speeds and modes in order to determine where and when the noise occurs. Is a noise evident during the blower operation?	Go to Step 4	Go to Step 11
4	Inspect for excessive vibration at each blower motor speed by feeling the blower case. Is excess vibration present?	Go to Step 6	Go to Step 5
5	Listen to the blower motor at each speed. Is the blower motor making a squeaking or chirping noise?	Go to Step 9	Go to Step 11
6	1. Remove the blower motor. Refer to <u>Blower Motor Replacement</u>. 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

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8	Remove the foreign material. Is the action complete?	Go to Step 10	-
9	Replace the blower motor. Refer to Blower Motor Replacement . Is the repair complete?	Go to Step 11	-
10	Install the blower motor. Refer to Blower Motor Replacement . Is the action complete?	Go to Step 11	-
11	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

NOISE DIAGNOSIS - AIR CONDITIONING (A/C) SYSTEM

Noise Diagnosis - Air Conditioning (A/C) System

Step	Action	Yes	No
DEFINITION: Noise originating from the A/C compressor, drive belt or the A/C lines.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual
2	A/C system noises can be generally categorized into 3 areas: • Screeching, Squealing, Chirping noises • Moaning noises • Vibration/Rattle noises 1. Start the engine. 2. Ensure that the A/C is ON. Is a screeching, squealing noise heard when the A/C is engaged?	Go to Step 3	Go to Step 9
3	With the engine OFF, inspect the drive belt for excessive wear. Refer to Drive Belt Excessive Wear Diagnosis in Engine Mechanical - 3.4L Is the drive belt excessively worn?	Go to Step 18	Go to Step 4
	Inspect the drive belt tension. Refer to Drive		

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4	Belt Tensioner Diagnosis in Engine Mechanical - 3.4L. Is the drive belt tension correct?	Go to Step 5	Go to Step 19
5	Inspect the drive belt for excessive oil coverage. Is the drive belt covered with oil?	Go to Step 17	Go to Step 6
6	1. Start the engine. 2. Ensure that the A/C is ON. 3. Inspect the compressor and the clutch. Is the A/C compressor locked up?	Go to Step 24	Go to Step 7
7	Is the A/C compressor clutch slipping?	Go to Step 23	Go to Step 8
8	CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. Using a stethoscope, listen to the A/C compressor for any abnormal noises. Is the compressor causing an abnormal noise?	Go to Step 15	Go to Step 10
9	Does a moaning noise exist when the A/C clutch is engaged?	Go to Step 10	Go to Step 12
10	Listen to the A/C compressor components and mounting for noise concerns using a stethoscope. Are any of these components loose, damaged or excessively worn?	Go to Step 20	Go to Step 11
11	1. Idle the engine. 2. Engage the A/C compressor clutch. 3. Using a stethoscope, move around the entire refrigerant plumbing system. Listening for any abnormal noises caused by a component of the A/C system touching another component. Are any of the A/C components grounding out and causing a vibration noise?	Go to Step 22	Go to Step 13
12	Does a vibration or rattle noise exist when the A/C clutch is engaged?	Go to Step 13	Go to Step 14
13	Does the noise stop when the A/C clutch is disengaged?	Go to Step 15	Go to Step 25
	1. Idle the engine in PARK with the A/C		

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14	compressor clutch engaged. 2. Using a stethoscope, move around the entire A/C system testing for any abnormal noises caused by a component. Do any of the A/C components cause an abnormal noise?	Go to Step 21	Go to Step 25
15	Verify that the A/C system is properly charged. Refer to Refrigerant System Capacities. Is the A/C system properly charged?	Go to Step 26	Go to Step 16
16	Recharge the A/C system to specification. Refer to Refrigerant Recovery and Recharging. Is the abnormal compressor noise still present?	Go to Step 24	Go to Step 26
17	Repair the oil leak. Refer to Oil Leak Diagnosis in Engine Mechanical - 3.4L. Is the repair complete?	Go to Step 26	-
18	Replace the drive belt. Refer to Drive Belt Replacement in Engine Mechanical - 3.4L. Is the repair complete?	Go to Step 26	-
19	Replace the drive belt tensioner. Refer to Drive Belt Tensioner Replacement in Engine Mechanical - 3.4L. Is the repair complete?	Go to Step 26	-
20	Repair or replace the A/C compressor mounting component. Is the repair complete?	Go to Step 26	-
21	Repair or replace the component which is causing the moaning concern as needed. Is the repair complete?	Go to Step 26	-
22	Correctly route or insulate the A/C component. Is the repair complete?	Go to Step 26	-
23	Replace the A/C compressor clutch. Refer to Compressor Clutch Assembly Replacement. Is the repair complete?	Go to Step 26	-
24	Replace the A/C compressor. Refer to Compressor Replacement.		

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	Is the repair complete?	Go to Step 26	-
25	The concern may be caused by an engine related component. Refer to Drive Belt Vibration Diagnosis in Engine Mechanical - 3.4L. Did you find and correct the condition?	Go to Step 26	-
26	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

NOISE DIAGNOSIS - HVAC MODULE

Noise Diagnosis - HVAC Module

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

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6	1. Remove the instrument panel center trim bezel. Refer to Trim Bezel Replacement - Center in Instrument Panel, Gages and Console. 2. Remove the center air outlet duct.		
	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	1. Install the center air outlet duct. 2. Install the I/P center trim bezel. Refer to Trim Bezel Replacement - Center in Instrument Panel, Gages and Console.		
	Is the action complete?	Go to Step 12	-
12	Operate the system to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

ODOR DIAGNOSIS

Odor Diagnosis

Step	Action	Yes	No
DEFINITION: Odor originating or noticed through the HVAC system.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual

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2	1. Sit inside the vehicle. 2. Close all of the doors and windows. 3. Start the engine. 4. Allow the engine idle at normal operating temperature. 5. Select the maximum blower speed. 6. Select the PANEL air outlet mode. 7. Select the coldest temperature setting. 8. Cycle through all of the blower speeds, modes and temperatures to define what type of odor is present. • Musty smell • Coolant smell • Oil smell		
	Does the odor have a musty smell?	Go to Step 3	Go to Step 8
3	Inspect the HVAC filter and the air inlet grille for debris. Is debris present?	Go to Step 4	Go to Step 5
4	Remove any debris. Is the action complete?	Go to Step 15	-
5	Inspect for wet carpeting. Is the carpet wet?	Go to Step 6	Go to Step 14
6	Inspect for the following conditions: • Water leaks around the windshield • Blockage of the HVAC module drain • Leaks around the door seals		
	Is a leak present?	Go to Step 7	Go to Step 14
7	Repair the leak as necessary. Is the repair complete?	Go to Step 15	-
8	Does the odor have a coolant smell?	Go to Step 9	Go to Step 12
9	Inspect the cooling system for leaks. Refer to Loss of Coolant in Engine Cooling. Is a leak present?	Go to Step 10	Go to Step 12
10	Inspect for coolant leaking inside the vehicle or for a film build-up on the windshield. Is the condition present?	Go to Step 11	Go to Step 15

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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
13	1. Inspect the engine compartment for any leaks. Refer to the following procedures: • Oil Leak Diagnosis in Engine Mechanical-3.4L • Fluid Leak Diagnosis in Automatic Transaxle-AF33-5. 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 or inside of the HVAC module. Refer to Odor Correction . Is the action complete?	Go to Step 15	-
15	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

REPAIR INSTRUCTIONS

ODOR CORRECTION

Eliminating Air Conditioning Odor

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

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

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

Deodorize the evaporator core using Deodorizing Aerosol Kit.

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

1. Ensure that the plenum which draws outside air into the HVAC module is clear of debris.
2. Disable the A/C compressor clutch operation by disconnecting the clutch coil electrical connector.
3. Dry the evaporator core by performing the following steps:
 1. Start the engine.
 2. Select the warmest temperature setting.
 3. Select the recirculation mode.
 4. Run the blower motor on high for 10 minutes.
4. Locate an area in the HVAC module case between the blower motor and the evaporator core downstream of the blower motor.
5. Drill a 3.175 mm (0.125 in) hole where the hole will not interfere with or damage the following components:
 - The blower motor
 - The evaporator core
 - Any other operating part the of system
6. Wear safety goggles and latex gloves in order to perform the following actions:
 1. Select the maximum blower speed.
 2. Insert the deodorizer extension tube into the hole to the mark on the extension tube.
 3. Use short spray bursts and vary the direction of spray for a 2-3 minute period of time.
7. Shut the engine OFF. Allow the vehicle to sit for 3-5 minutes.
8. Seal the 3.175 mm (0.125 in) hole with body sealer or RTV gasket compound.
9. Start the engine.
10. Operate the blower motor on high for 15-20 minutes to dry.
11. Reconnect the A/C compressor clutch coil electrical connector.
12. Verify proper clutch operation.

REFRIGERANT RECOVERY AND RECHARGING

Tools Required

J 43600 ACR 2000 Air Conditioning Service Center. See Special Tools.

CAUTION: Avoid breathing the A/C Refrigerant 134a (R-134a) and the lubricant vapor or the mist. Exposure may irritate the eyes, nose, and throat. Work in a well ventilated area. In order to remove R-134a from the A/C system, use service equipment

that is certified to meet the requirements of SAE J 2210 (R-134a recycling equipment). If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

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

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

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

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

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

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

The ACR 2000 has a built in A/C refrigerant identifier that will test for contamination, prior to recovery and will notify the technician if there are foreign gases present in the A/C

system. If foreign gases are present, the ACR 2000 will not recover the refrigerant from the A/C system.

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

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

A/C Refrigerant System Oil Charge Replenishing

If oil was removed from the A/C system during the recovery process or due to component replacement, the oil must be replenished. Oil can be added to the system by pouring the correct amount into the replaced component or into an open refrigerant line. For the proper quantities of oil to add to the A/C refrigerant system, refer to **Refrigerant System Capacities**.

FLUSHING

Tools Required

- **J 41447** R134A A/C Tracer Dye - Box of 24. See **Special Tools**.
- **J 42220** Universal 12V Leak Detection Lamp. See **Special Tools**.
- **J 43600** ACR 2000 Air Conditioning Service Center. See **Special Tools**.
- **J 45268** A/C Flush Adapter Kit
- **J 46297** A/C Dye Injector Kit
- **J 46297-12** Replacement Dye Cartridges

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

Flushing is intended to remove the following:

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

For 2005 there are two different designs for the Thermal Expansion Valve (TXV). The designs can be identified by the attachment methods used to retain the evaporator outlet hose and the liquid line to the TXV. For the second design, the A/C lines are retained to the TXV as a pair using a single nut.

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

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the thermal expansion valve (TXV). Refer to **Thermal Expansion Valve Replacement**.
3. Install the J 45268-115 in place of the TXV.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the TXV mounting bolts.

Tighten: Tighten the bolts to 3.5 N.m (31 lb in).

5. Connect the evaporator outlet hose and liquid line to the J 45268-115.
6. Install the evaporator outlet hose and liquid line nut to the TXV.

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

7. Remove the A/C compressor. Refer to **Compressor Replacement**.
8. Install sealing washers GM P/N 88928950 and 88928951 to J 45268-2.
9. Install J 45268-2 to the A/C compressor hose assembly.
10. Install the nut and bolt from the **J 45268** kit to the J 45268-2 and compressor hose assembly.

Tighten: Tighten the bolts to 22 N.m (16 lb ft).

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

Perform the following procedure:

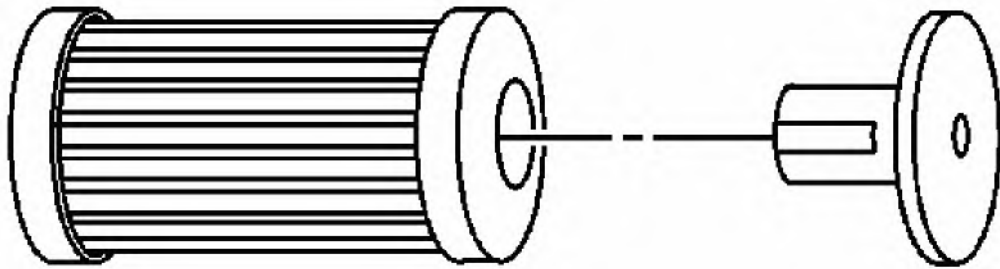


Fig. 2: View Of A/C Filter And Check Valve
Courtesy of GENERAL MOTORS CORP.

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

1. Service the filter with AC Delco P/N GF 470, before each flush.
2. Install the port plugs J 45268-9 onto the J 45268-10.
3. Install the fitting J 45268-7 onto the J 45268-10.
4. Install the fitting J 45268-8 onto the J 45268-10.
5. Connect J 45268-1 flush filter to the suction port of J 45268-7 flush adapter.
6. Connect the blue hose from the **J 43600** to the J 45268-1 flush filter adapter. See **Special Tools**.
7. Connect the red hose from the **J 43600** to the J 45268-8 flush adapter. See **Special Tools**.
12. Reverse flow refrigerant flush is recommended for desiccant bag failure. Replace the receiver dehydrator when the A/C flush is complete and perform the following procedure:

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

1. Service the filter with ACDelco P/N GF 470, before each flush.
2. Install the port plugs J 45268-9 onto the J 45268-10.
3. Install the fitting J 45268-7 onto the J 45268-10.
4. Install the fitting J 45268-8 onto the J 45268-10.
5. Connect J 45268-1 flush filter to the discharge port of J 45268-7 flush adapter.
6. Connect the blue hose from **J 43600** to the J 45268-1 flush filter adapter. See

Special Tools.

7. Connect the red hose from **J 43600** to the J 45268-8 flush adapter. See **Special Tools**.

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

13. Flush the A/C system. Follow the instructions supplied with the **J 43600** . See **Special Tools**.
14. Disconnect the red hose on the **J 43600** from the J 45268-2. See **Special Tools**.
15. Disconnect the blue hose on the **J 43600** from the J 45268-1. See **Special Tools**.
16. Remove J 45268-1 from the J 45268-2.
17. Remove the J 45268-2 from the A/C compressor hose assembly.
18. Remove the sealing washers, GM P/N 88928950 and 88928951 from the compressor hose.

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

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

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

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

22. Install the A/C compressor. Refer to **Compressor Replacement**.
23. Remove J 45268-115 from the evaporator pipes.
24. Inspect the TXV for debris. Clean or replace as needed.
25. Install the TXV. Refer to **Thermal Expansion Valve Replacement**.
26. Evacuate and recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
27. Leak test the fittings using **J 42220** . See **Special Tools**.

COMPRESSOR OIL BALANCING

Draining Procedure

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

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

Rotate the compressor shaft to assist in draining the compressor.

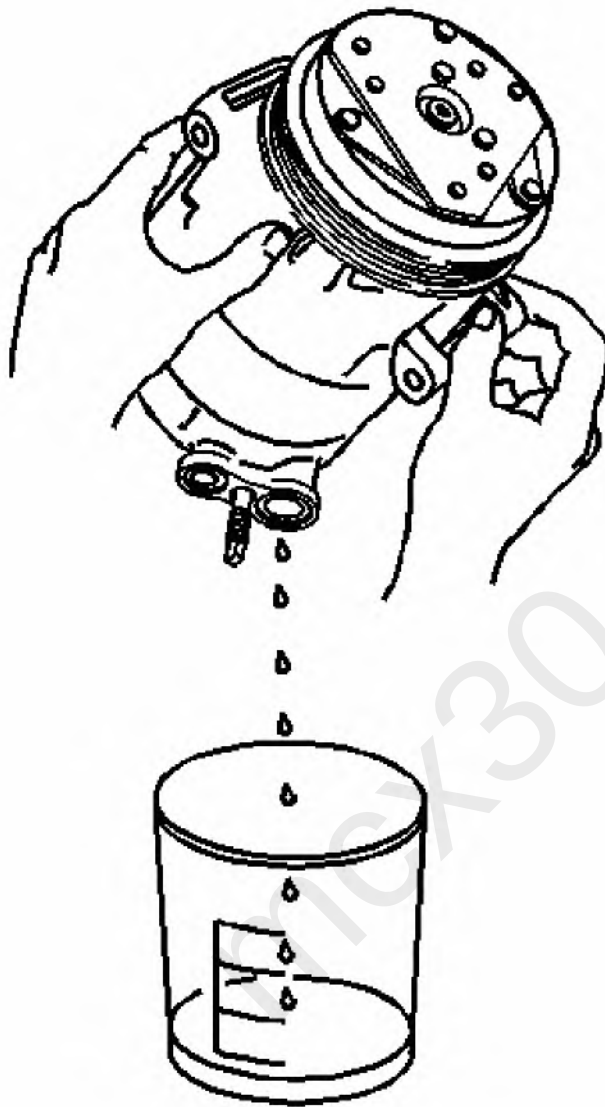


Fig. 3: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS CORP.

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

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

IMPORTANT: During the oil removal procedure, the condition of the oil should be evaluated. Compressor oil never breaks down unless something is wrong with the compressor or air

conditioning (A/C) system. If one or more of the following conditions exist, replace the compressor and receiver dehydrator.

3. Inspect the polyalkylene glycol (PAG) oil for the following conditions:
 - The color of the oil is dark brown or black.
 - There is a presence of foreign substances, metal fillings, etc. in the oil.

If the receiver-dehydrator is not replaced, damage to A/C compressor will occur.

4. Properly discard the used refrigerant oil.

Balancing Procedure

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

1. The replacement compressor is shipped with 120 ml (4.0 oz) of refrigerant oil.

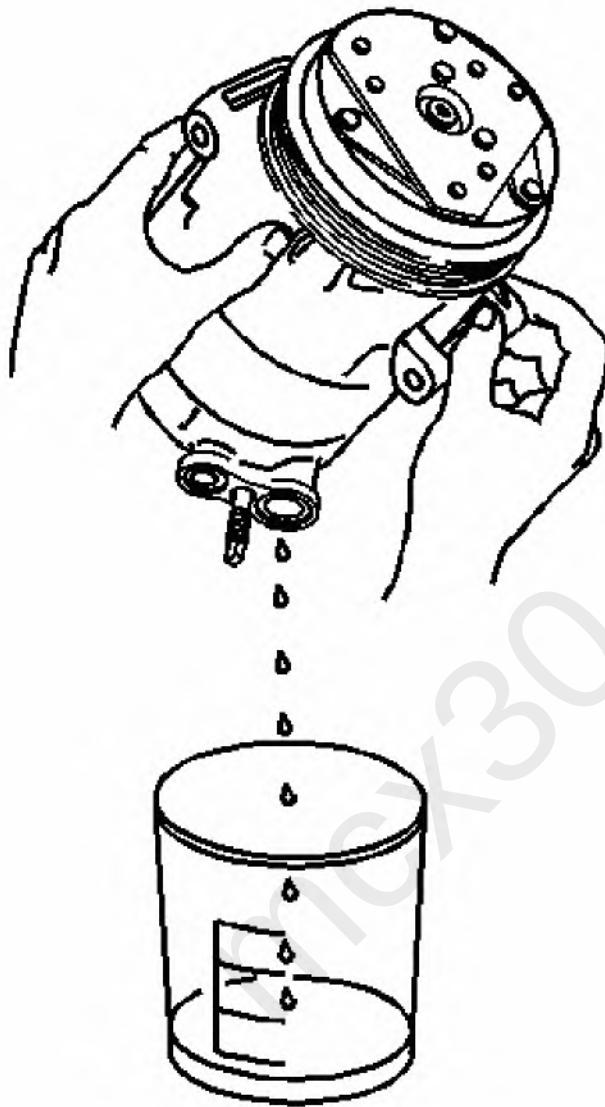


Fig. 4: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS CORP.

2. Compare the amount of refrigerant oil recorded during compressor removal to the amount of refrigerant oil shipped in the replacement compressor. If the amount of refrigerant oil drained and recorded from the removed compressor is:
 - Less than 120 ml (4.0 oz), leave the 120 ml (4.0 oz) in the replacement compressor.
 - More than 120 ml (4.0 oz), add to the compressor the difference between the 120 ml (4.0 oz) and the amount drained.

COMPRESSOR REPLACEMENT

Tools Required

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

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnect/Connect Procedure** .
3. Remove the accessory drive belt from the compressor pulley. Refer to **Drive Belt Replacement** for the 3.4L engine.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .

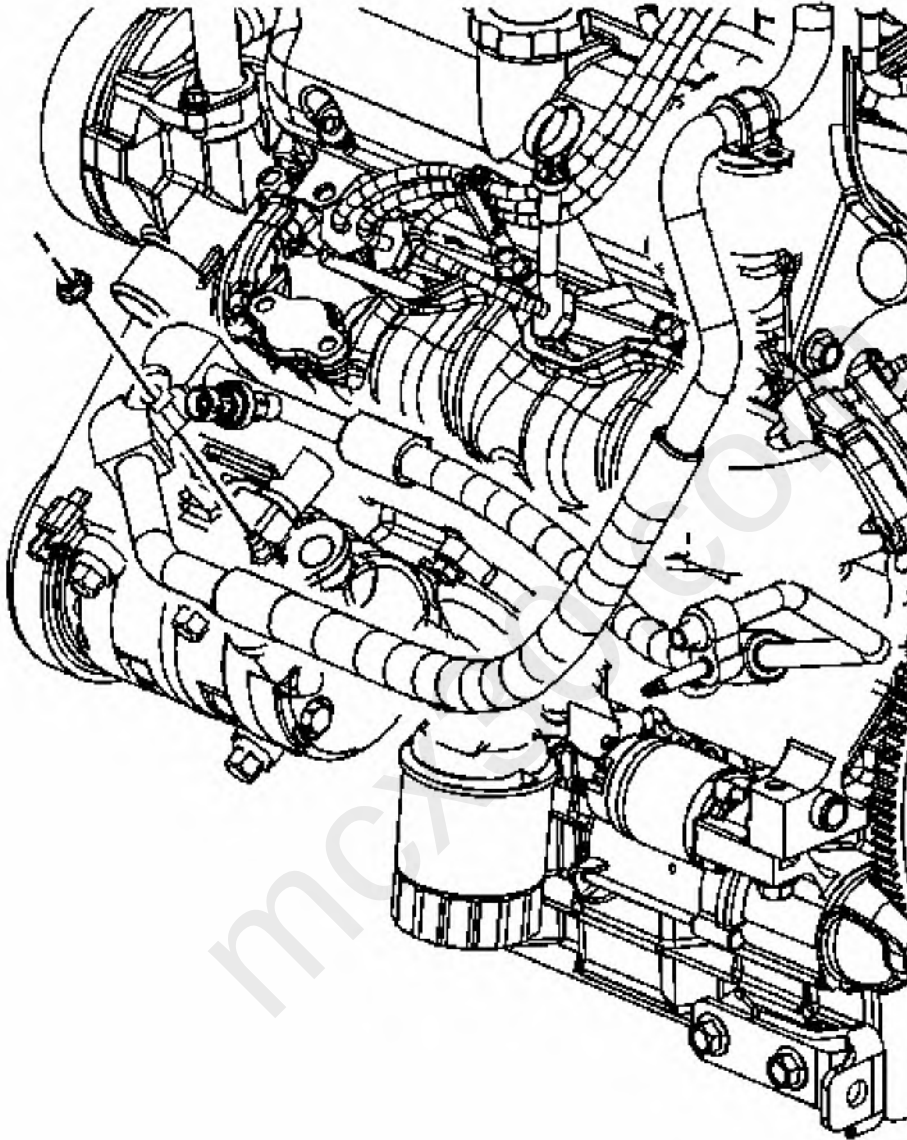


Fig. 5: View Of Compressor Hose Nut On Compressor
Courtesy of GENERAL MOTORS CORP.

5. Remove the compressor hose nut from the compressor.
6. Remove the compressor hose from the compressor.
7. Disconnect the electrical connector from the compressor.
8. Remove and discard the seal washers from the compressor. Refer to **Sealing Washer Replacement**.

9. Install a shipping cap on the compressor hose to prevent moisture/contamination.

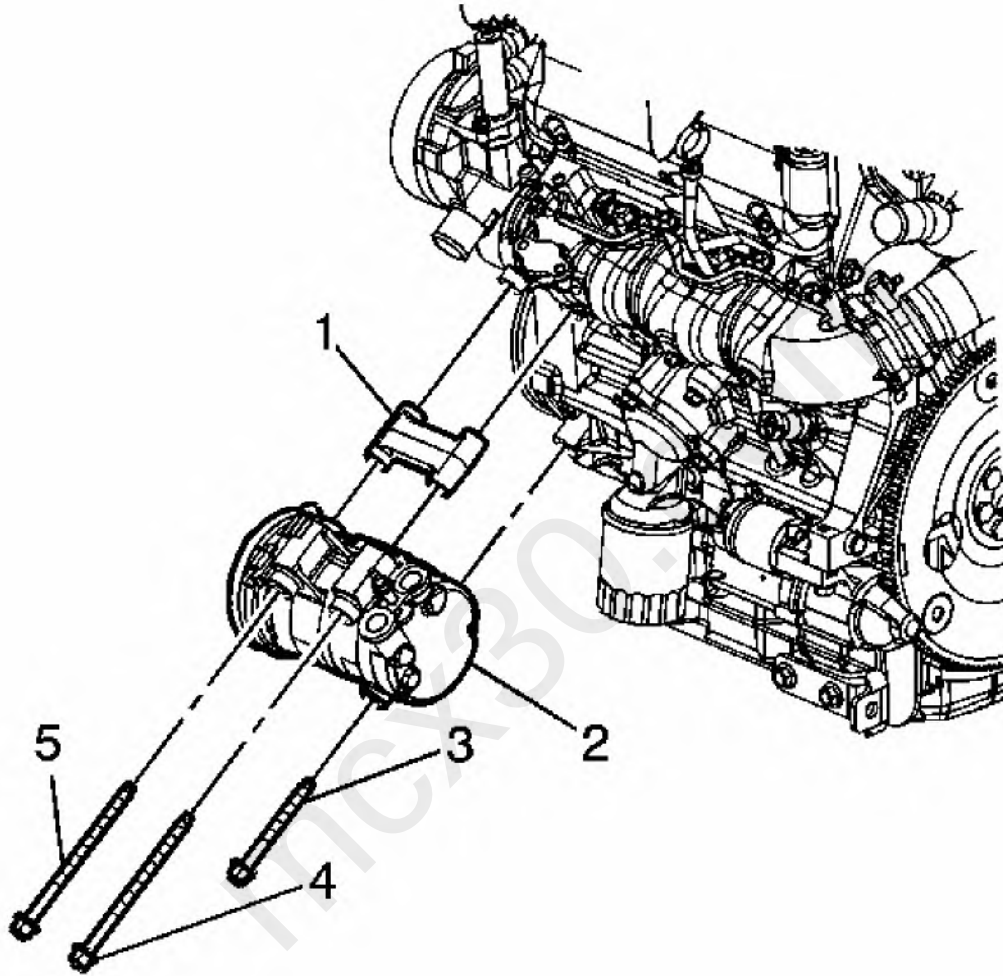


Fig. 6: View Of Compressor
Courtesy of GENERAL MOTORS CORP.

10. Install shipping cap to the compressor (2) prior to removal to prevent spillage of oil and contamination.
11. Remove the compressor bolts (3,4,5) from the compressor.
12. Remove the spacer bracket (1) from the compressor.
13. Remove the compressor (2) from the vehicle.
14. If replacing the compressor (2), balance the oil. Refer to **Compressor Oil Balancing**.

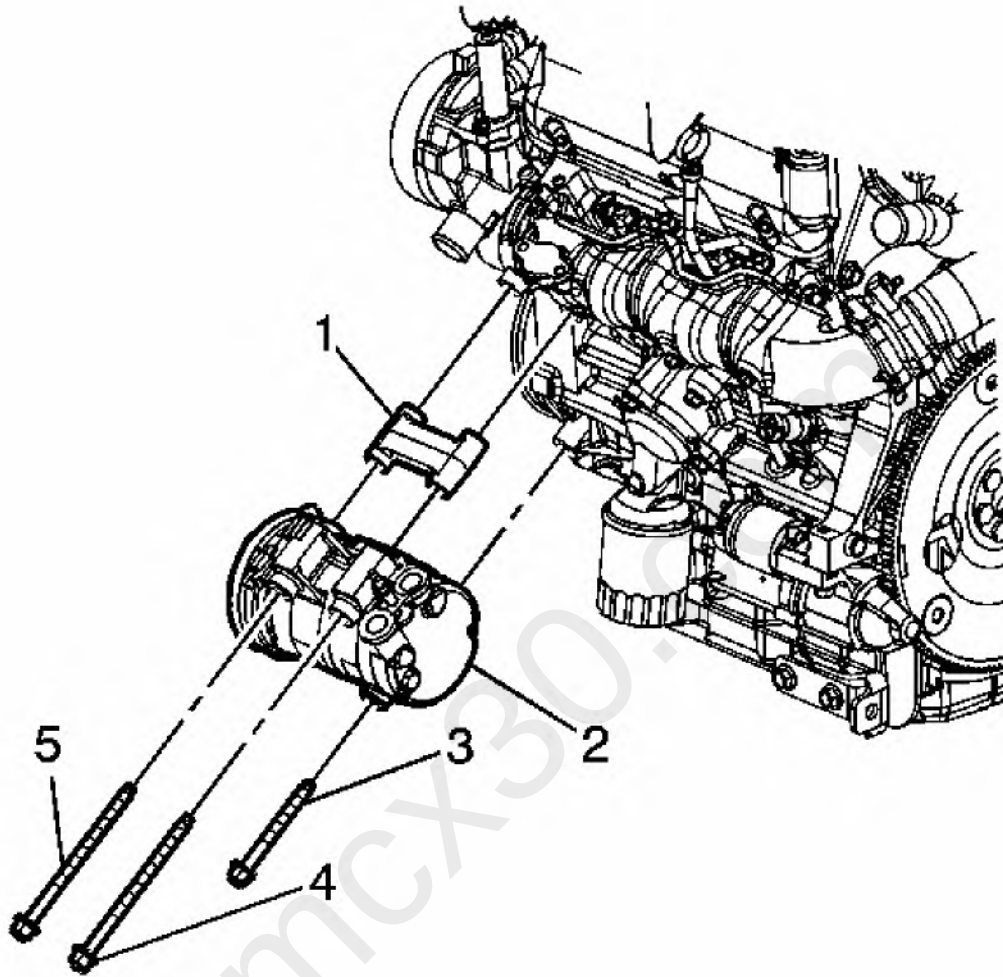


Fig. 7: View Of Compressor
Courtesy of GENERAL MOTORS CORP.

1. Add the proper amount of polyalkylene glycol (PAG) oil to the compressor (2). Refer to **Refrigerant System Capacities**.
2. Install caps on compressor (2) to prevent spillage during installation.
3. Install the compressor (2) to the vehicle.
4. Install the spacer bracket (1) between the engine and the compressor (2).

NOTE: Refer to Fastener Notice.

5. Install the compressor bolts to the compressor (2). Tighten the bolts in sequence.

Tighten:

1. Tighten the bolt (5) to 50 N.m (37 lb ft).
 2. Tighten the bolt (3) to 50 N.m (37 lb ft).
 3. Tighten the bolt (4) to 50 N.m (37 lb ft).
-
6. Remove the shipping cap from the compressor (2) and the compressor hose.
 7. Connect the electrical connector to the compressor (2).

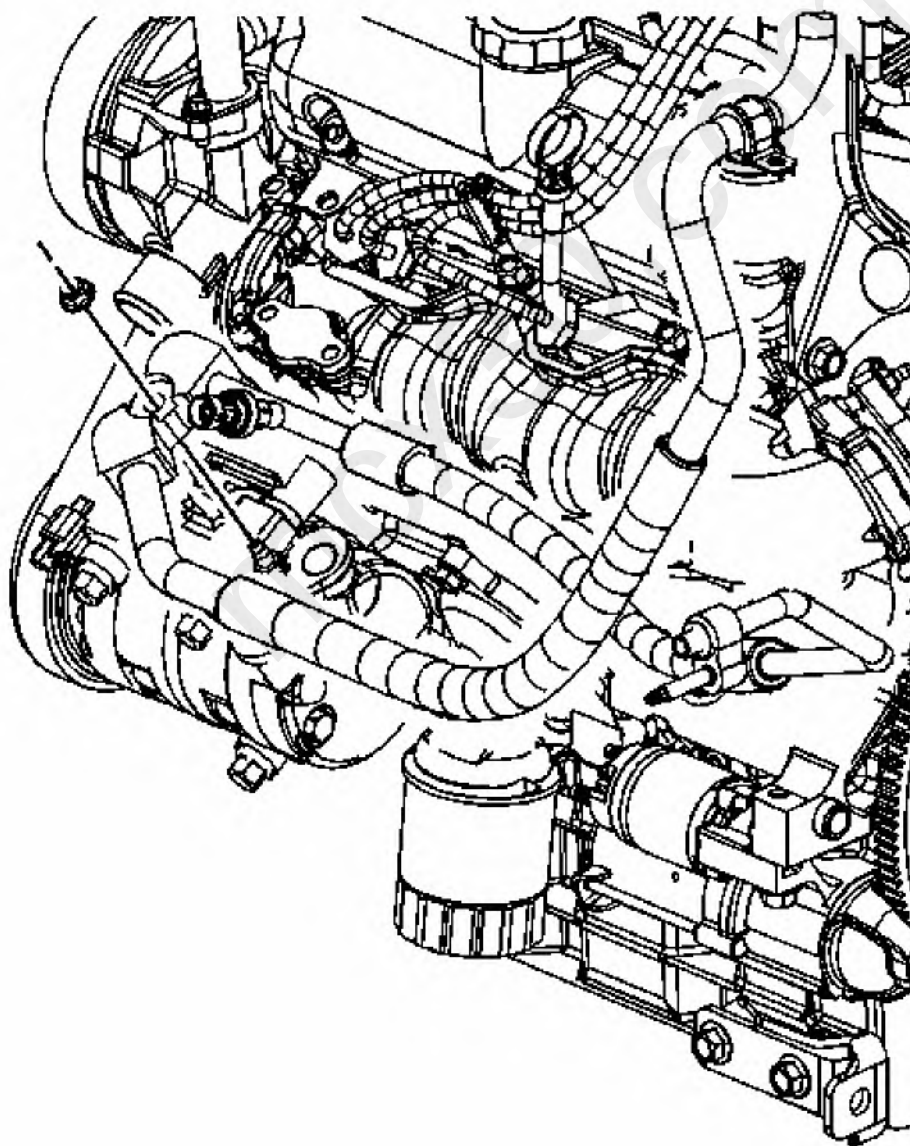


Fig. 8: View Of Compressor Hose Nut On Compressor
Courtesy of GENERAL MOTORS CORP.

8. Install new seal washers to the compressor. Refer to Sealing Washer Replacement.
9. Install compressor hose to the compressor.

NOTE: Refer to **Compressor Hose Clearance to the Exhaust Gas Recirculation (EGR) Pipe Notice**.

10. Position the compressor hose to the compressor and tighten the nut.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

11. Lower the vehicle. Refer to Lifting and Jacking the Vehicle.
12. Install the accessory drive belt to the compressor pulley. Refer to Drive Belt Replacement for the 3.4L engine.
13. Connect the negative battery cable. Refer to Battery Negative Cable Disconnect/Connect Procedure.
14. Recharge the A/C system. Refer to Refrigerant Recovery and Recharging.
15. Test the affected A/C joints for leaks using J 39400-A. See Special Tools.

COMPRESSOR CLUTCH ASSEMBLY REPLACEMENT

Tools Required

- J 25031-A Three Jaw Puller. See Special Tools.
- J 37872 Universal Spanner Wrench. See Special Tools.
- GE-47849 Clutch Remover. See Special Tools.
- GE-47850 Center Puller. See Special Tools.
- GE-47851 Armature Replacer. See Special Tools.

Removal Procedure

1. Remove the compressor from the vehicle. Refer to Compressor Replacement.

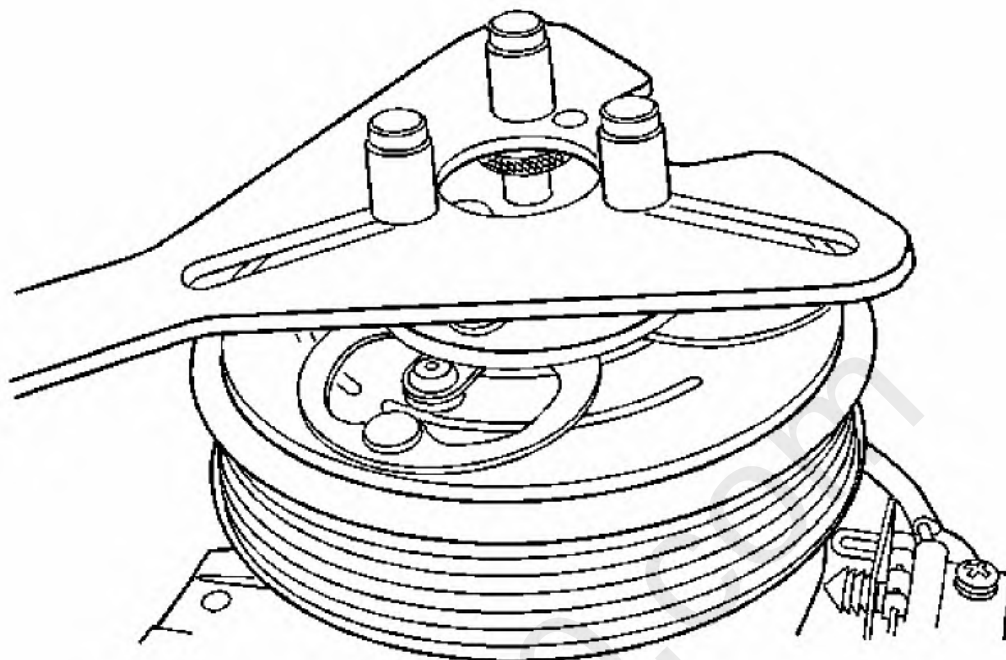


Fig. 9: View Of J 37872 Holding Compressor Clutch
Courtesy of GENERAL MOTORS CORP.

2. Use **J 37872** to hold the compressor clutch. See Special Tools.

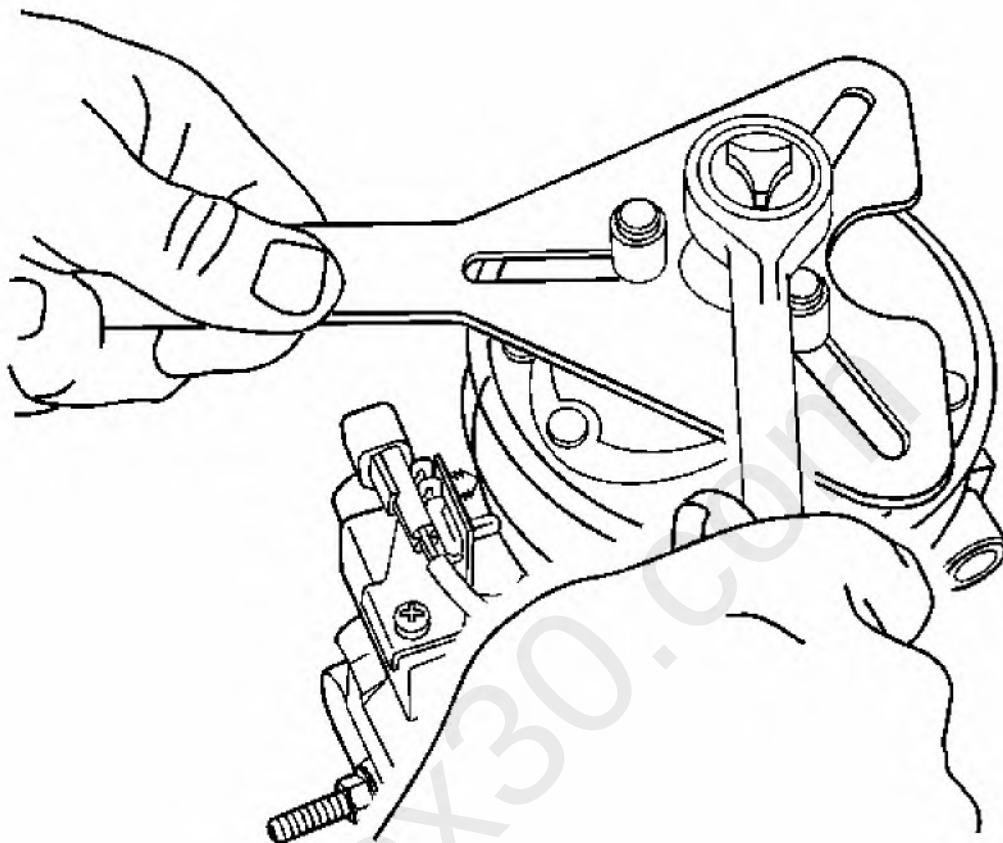


Fig. 10: View Of Compressor Clutch Bolt
Courtesy of GENERAL MOTORS CORP.

3. Remove the bolt retaining the compressor clutch to the compressor.

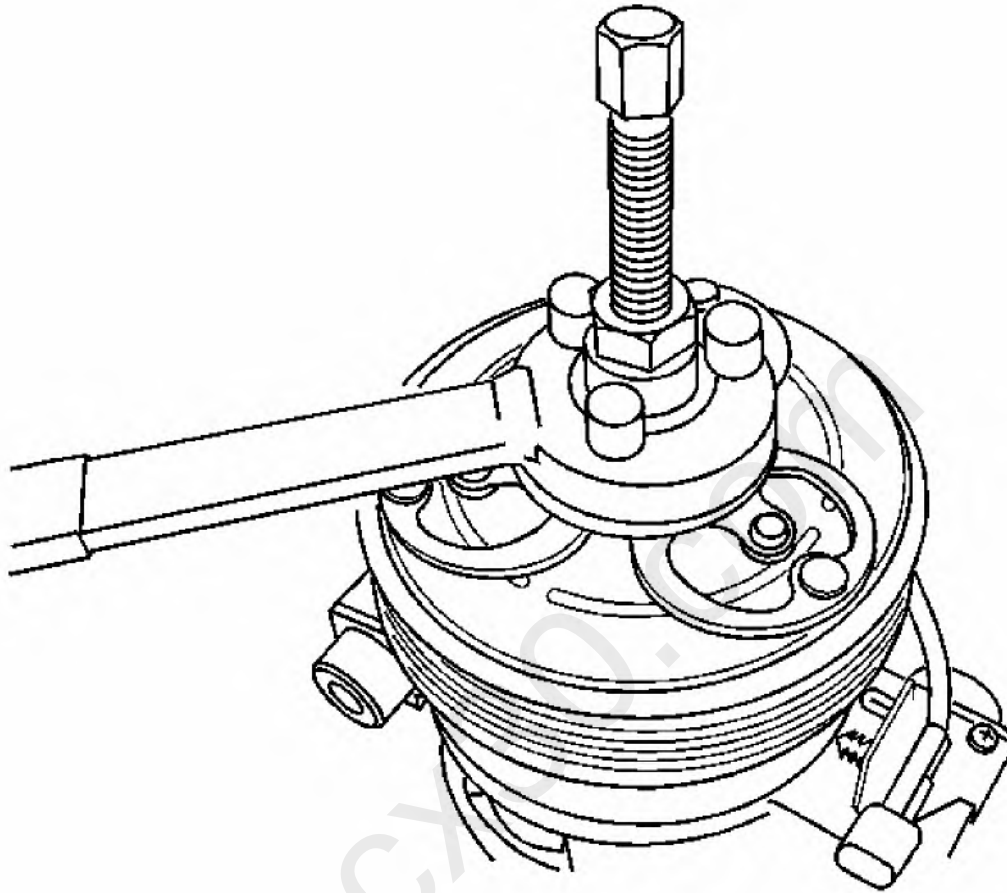


Fig. 11: View Of GE-47849 Removing Compressor Clutch
Courtesy of GENERAL MOTORS CORP.

4. Install **GE-47849** to the compressor clutch. See **Special Tools**.
5. Using **GE-47849** , remove the compressor clutch from the compressor. See **Special Tools**.
6. Remove the compressor clutch shims from the compressor shaft.

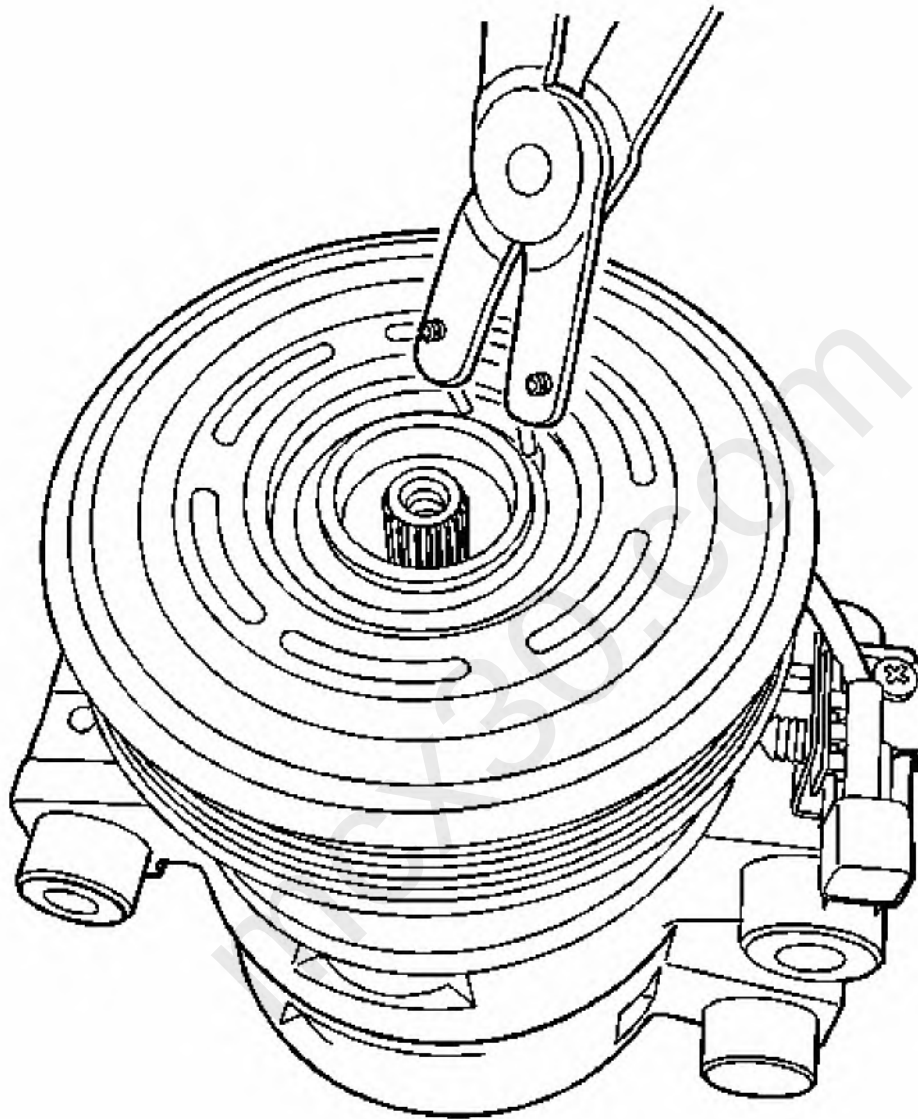


Fig. 12: View Of Compressor Pulley Snap Ring
Courtesy of GENERAL MOTORS CORP.

7. Remove the snap ring from the compressor pulley.
8. Using **GE-47850** with **J 25031-A** , remove the compressor pulley from the compressor. See **Special Tools**.

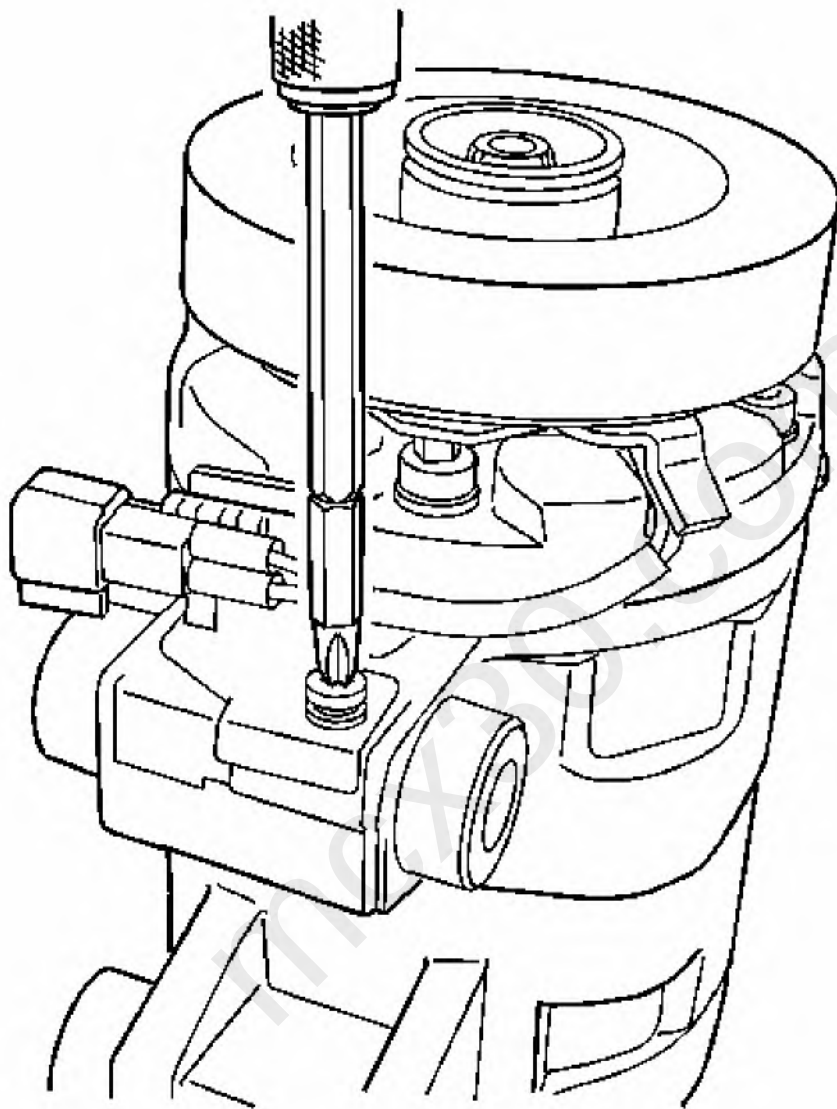


Fig. 13: View Of Clutch Field Coil Connector Bracket Screw
Courtesy of GENERAL MOTORS CORP.

9. Remove the clutch field coil connector bracket screw from the compressor.

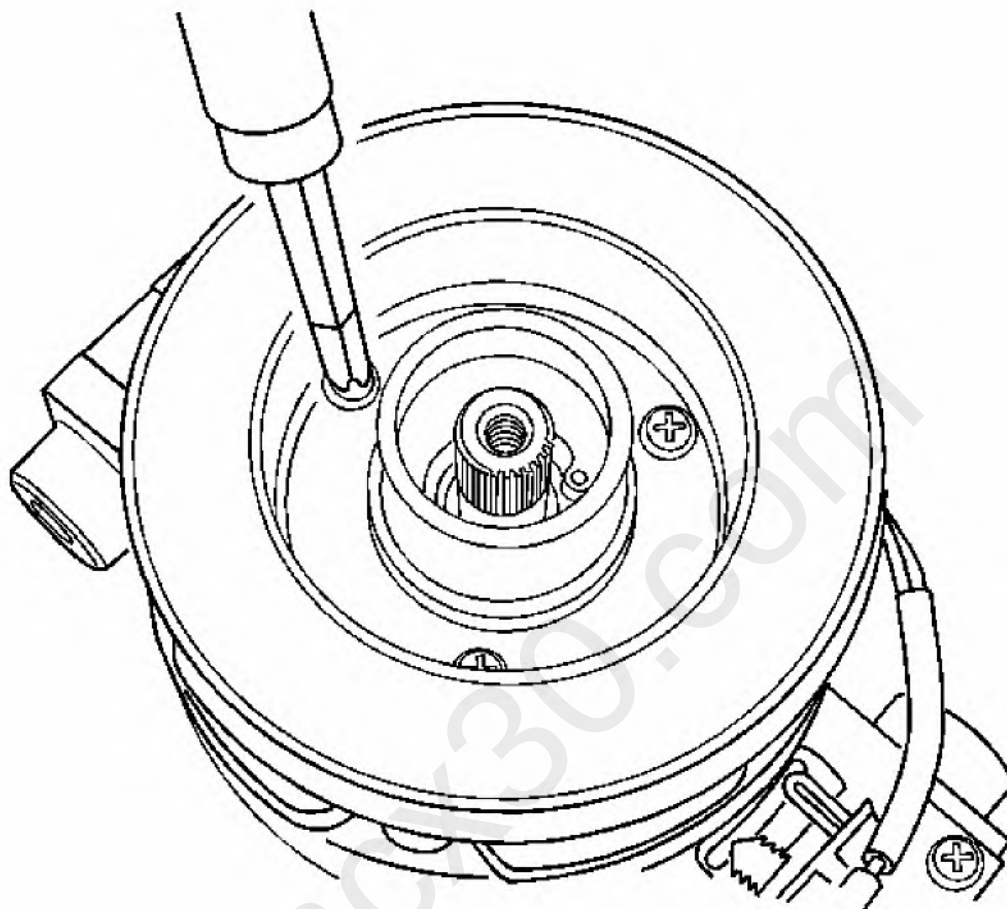


Fig. 14: View Of Clutch Field Coil Screws
Courtesy of GENERAL MOTORS CORP.

10. Remove the clutch field coil screws from the compressor.

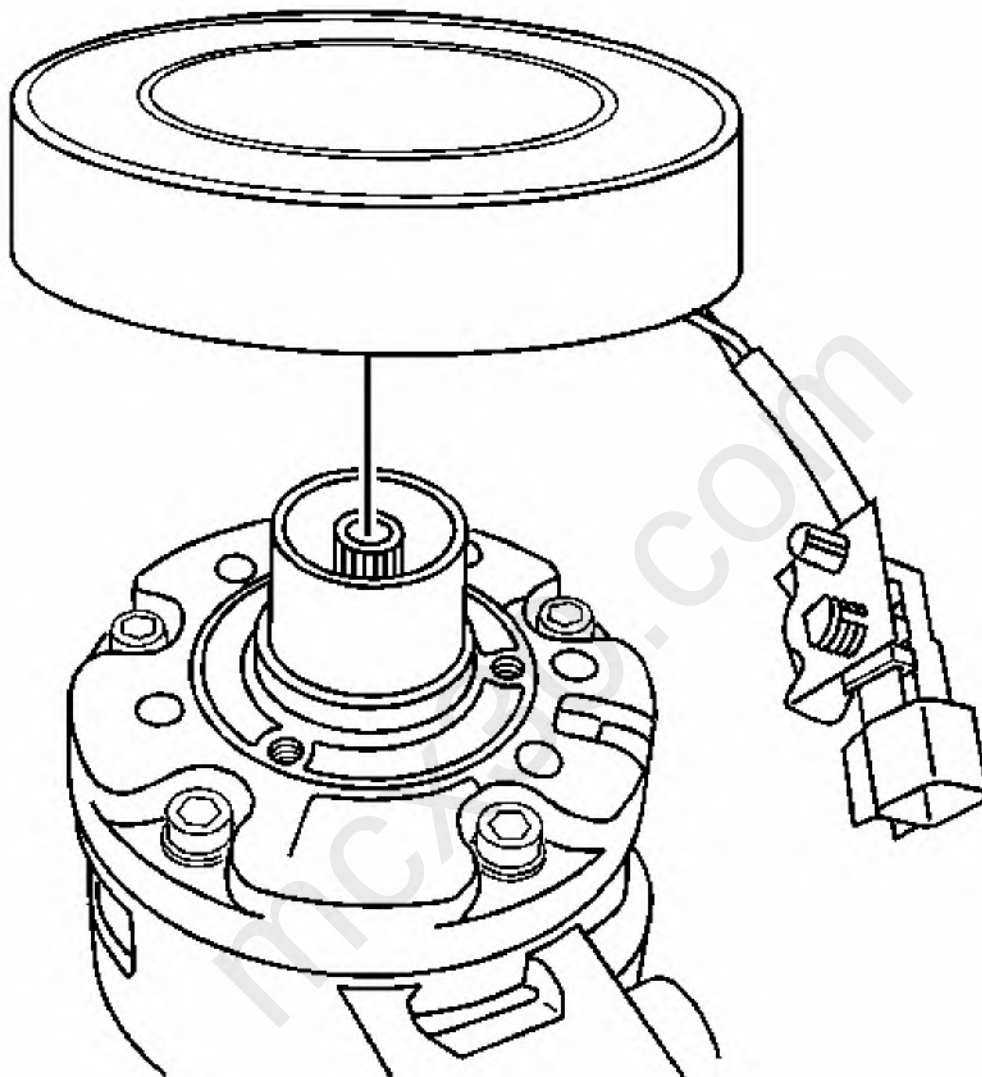


Fig. 15: View Of Clutch Field Coil
Courtesy of GENERAL MOTORS CORP.

11. Remove the clutch field coil from the compressor.

Installation Procedure

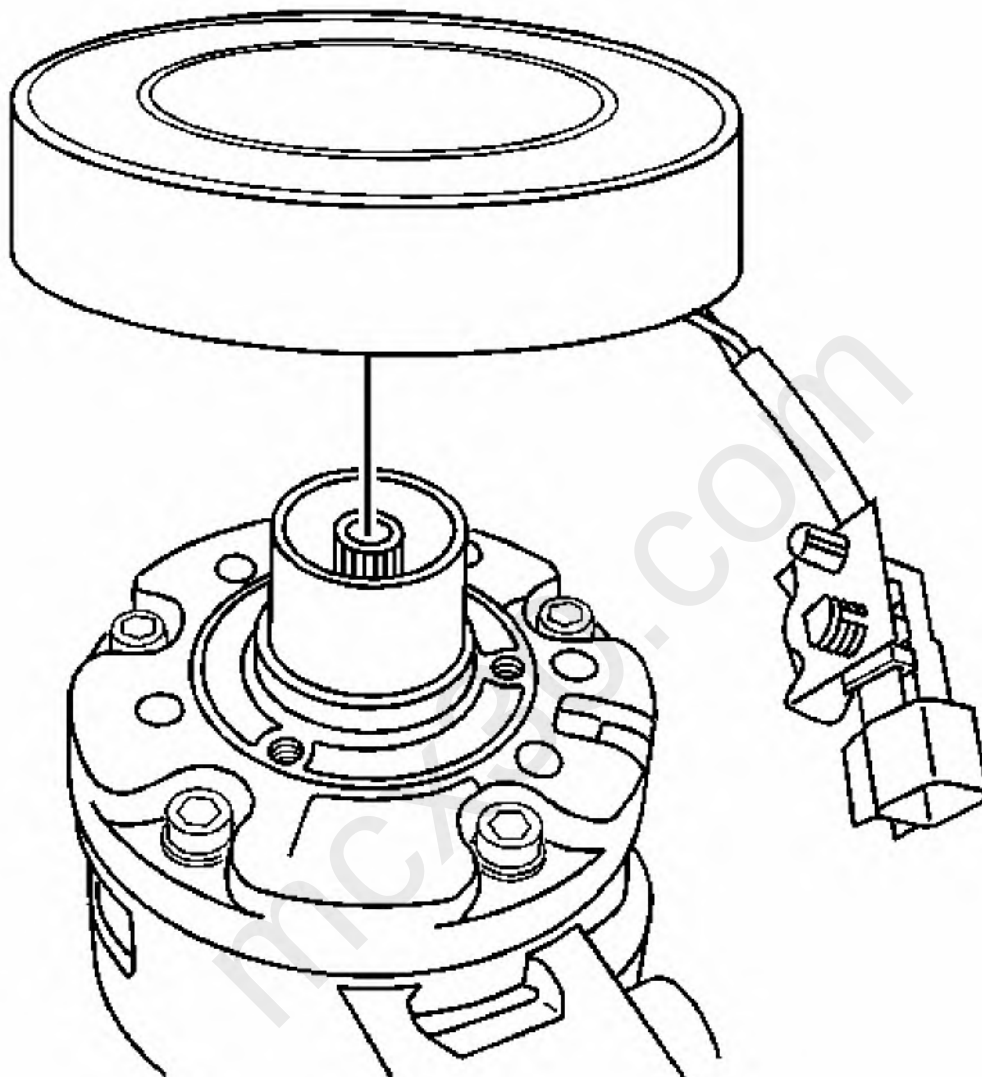


Fig. 16: View Of Clutch Field Coil
Courtesy of GENERAL MOTORS CORP.

1. Clean the clutch field coil and the pulley mounting surfaces.
2. Install the clutch field coil to the compressor.

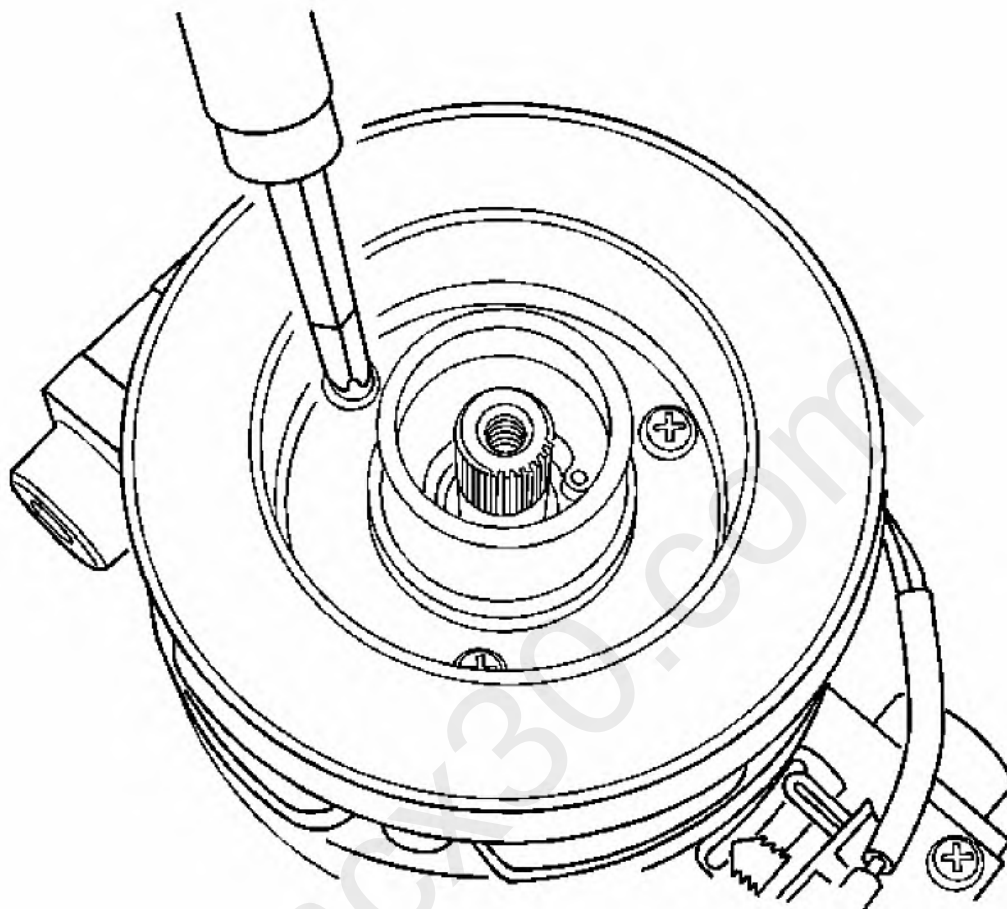


Fig. 17: View Of Clutch Field Coil Screws
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice.

3. Install the clutch field coil screws to the compressor.

Tighten: Tighten the screws to 4.9 N.m (43 lb in).

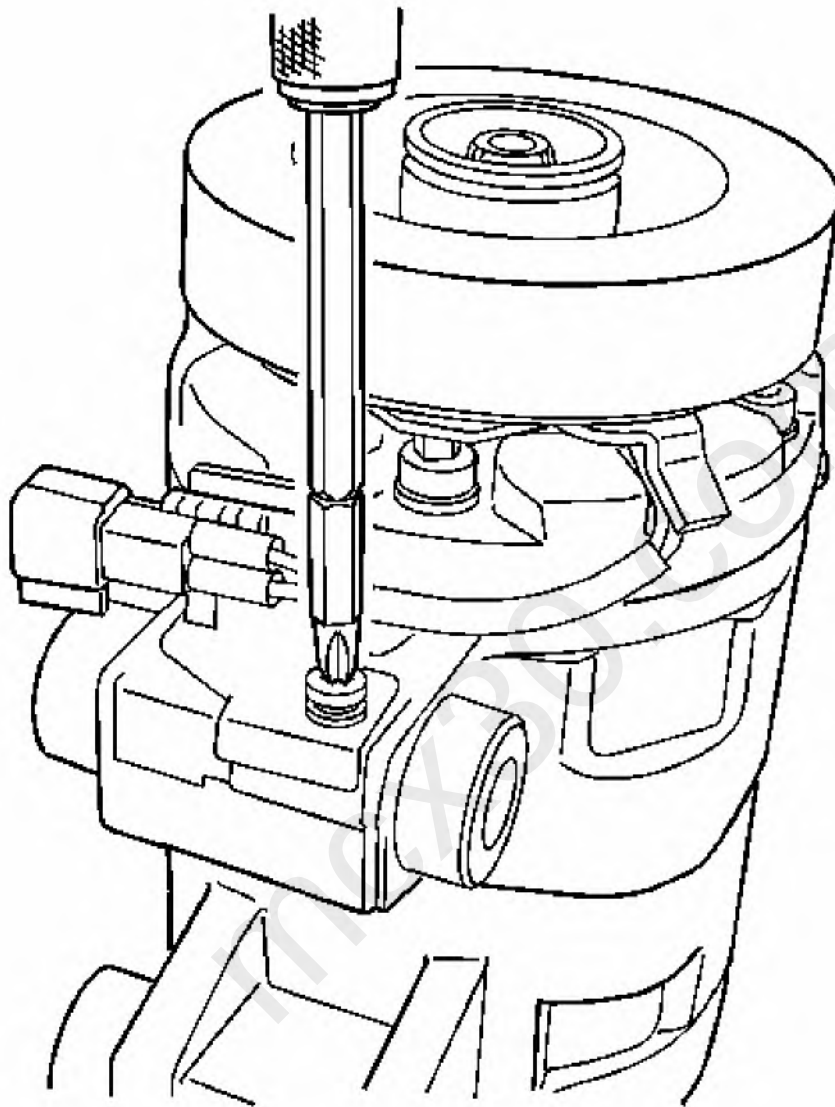


Fig. 18: View Of Clutch Field Coil Connector Bracket Screw
Courtesy of GENERAL MOTORS CORP.

4. Install the clutch field coil connector bracket screw to the compressor.

Tighten: Tighten the screws to 3 N.m (27 lb in).

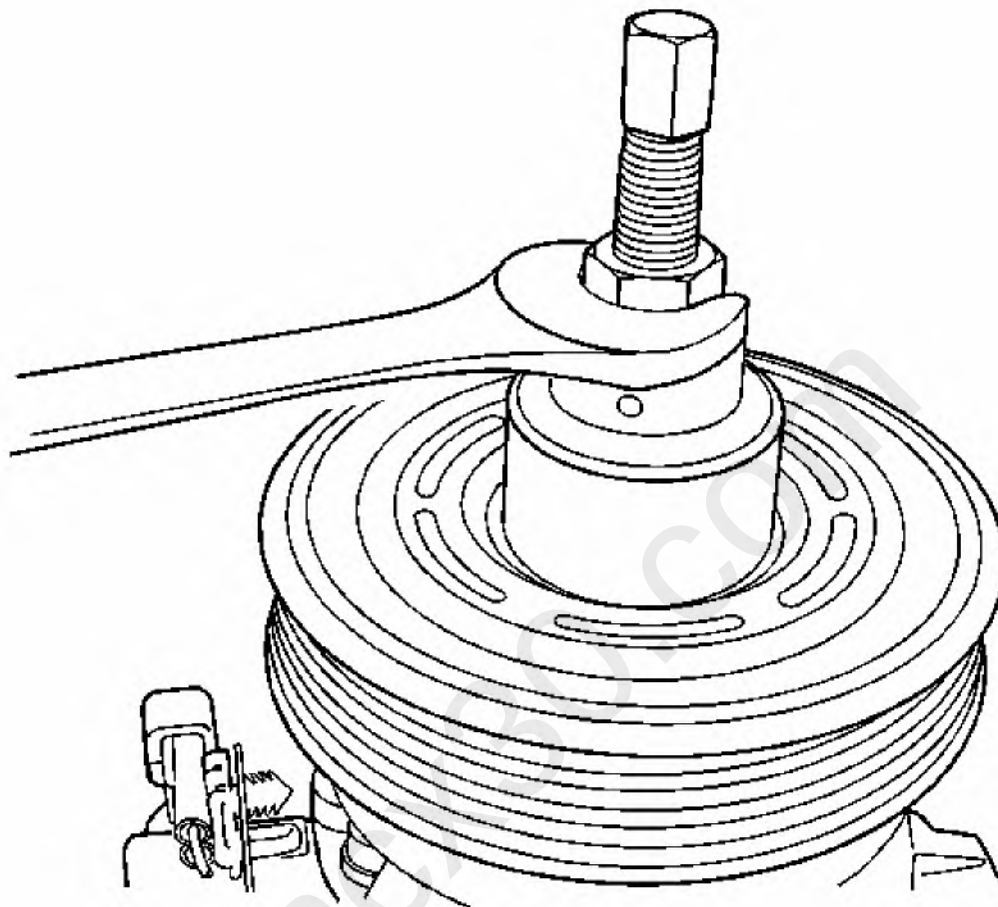


Fig. 19: View Of GE-47851 Installing The Compressor Pulley
Courtesy of GENERAL MOTORS CORP.

5. Using **GE-47851** , install the compressor pulley to the compressor. See **Special Tools**.

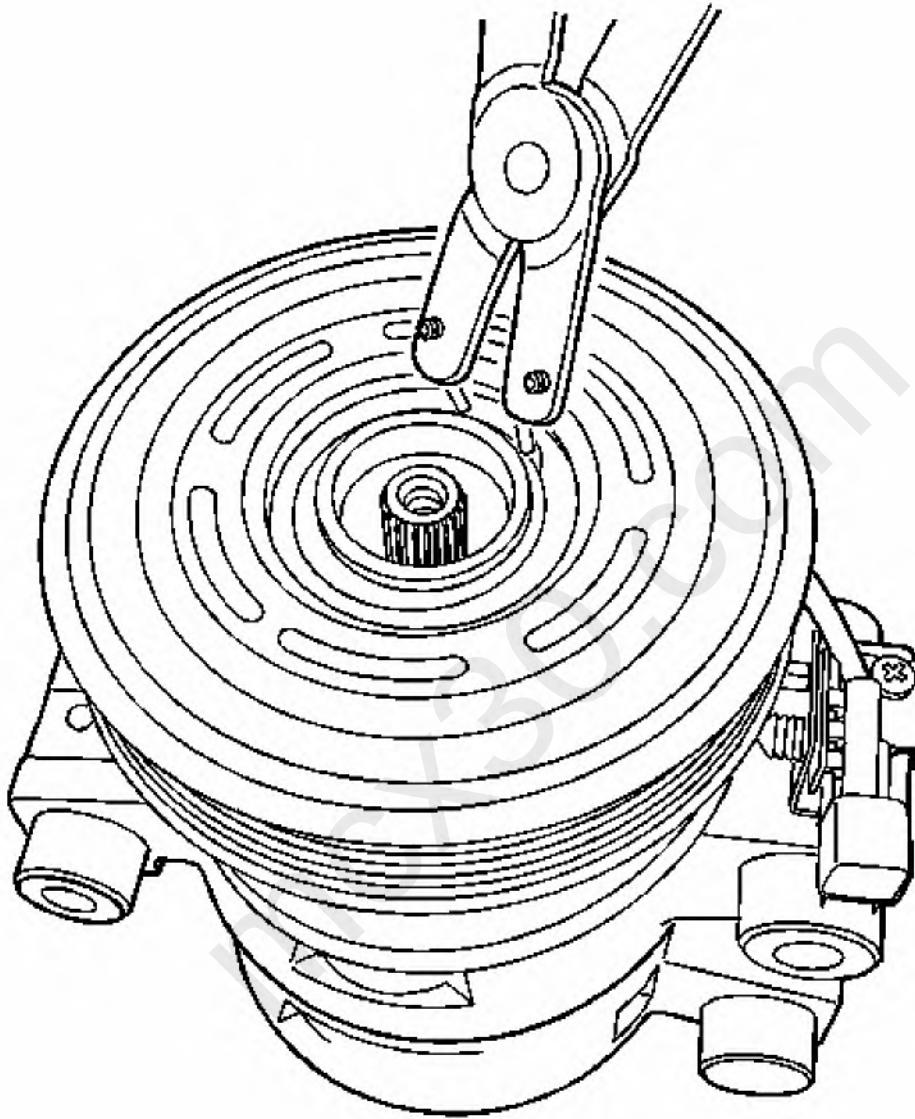


Fig. 20: View Of Compressor Pulley Snap Ring
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure that the compressor pulley snap ring is installed with the rounded edge face up.

6. Install the snap ring to the compressor pulley.
7. Install the compressor clutch shims to the compressor shaft.
8. Align the compressor clutch with the compressor shaft and install to the compressor.

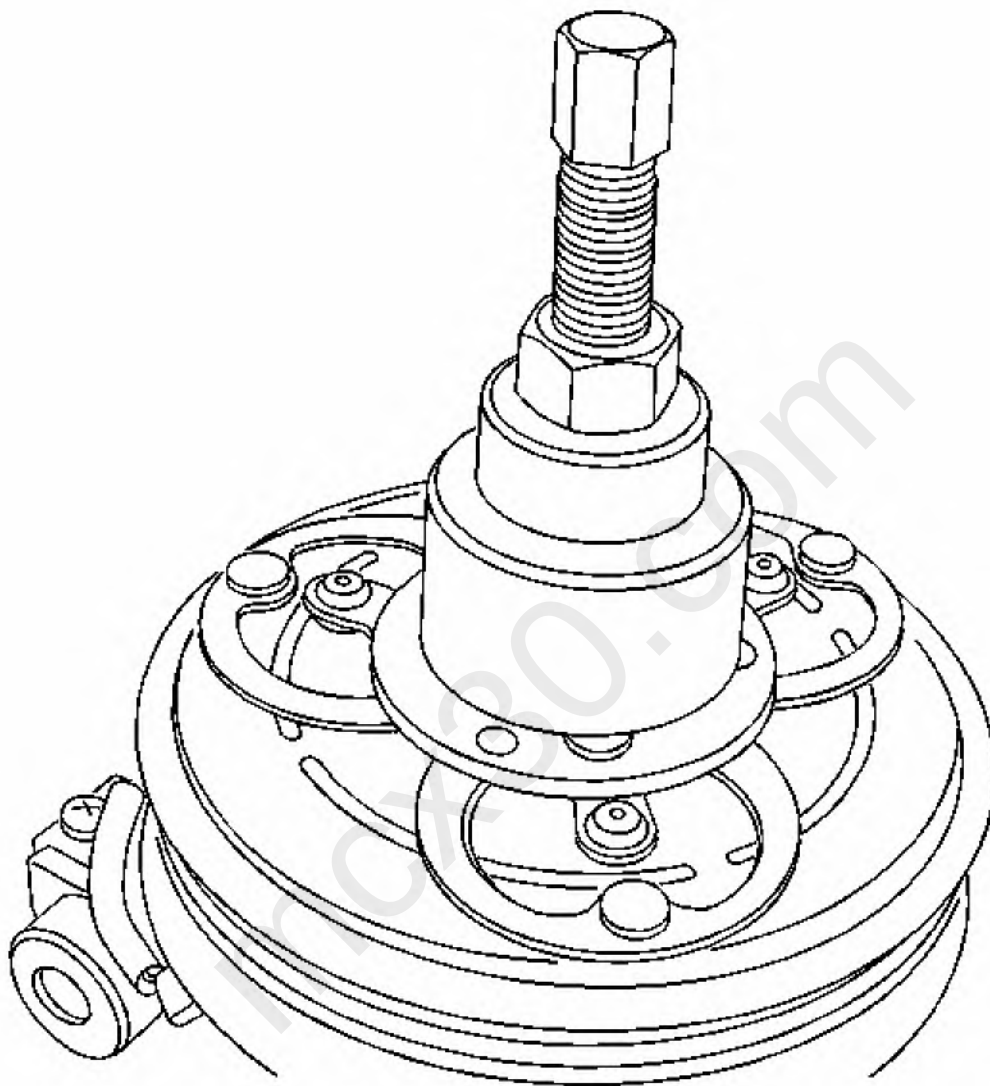


Fig. 21: View Of GE-47851 Installing The Compressor Clutch
Courtesy of GENERAL MOTORS CORP.

9. Using **GE-47851** , install the compressor clutch to the compressor. See **Special Tools**.

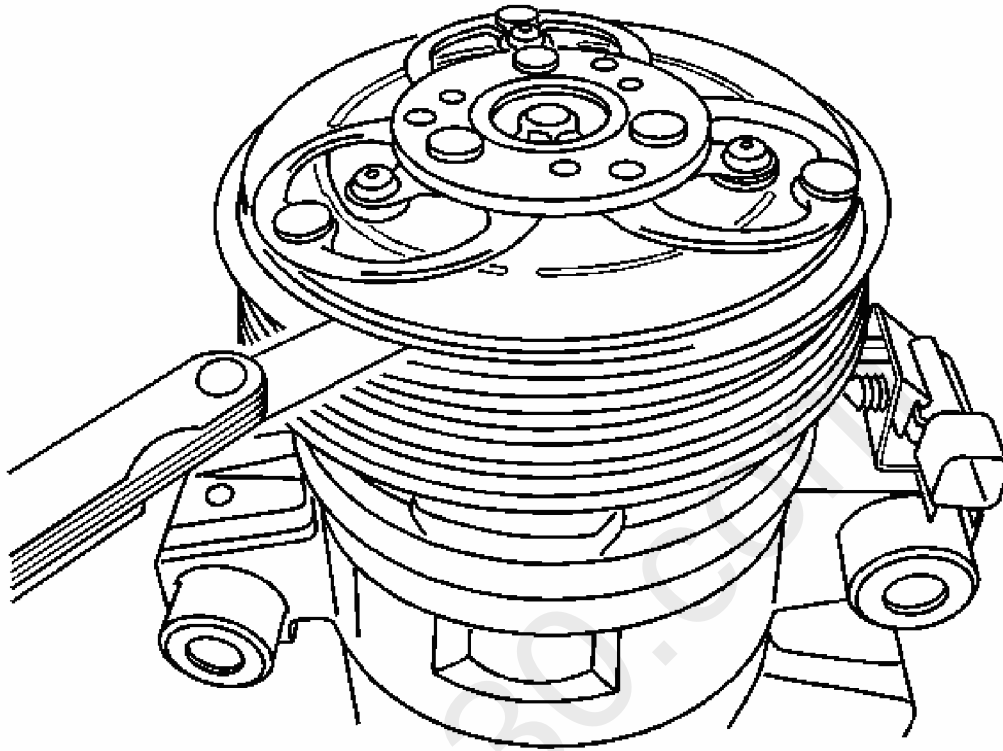


Fig. 22: Checking Compressor Clutch To Compressor Pulley Clearance
Courtesy of GENERAL MOTORS CORP.

10. Using a feeler gauge, check the clearance between the compressor clutch and the compressor pulley. Ensure the clearance is 0.3 mm to 0.6 mm (0.012 in to 0.024 in).
11. Once the correct air gap is obtained, install the new clutch bolt.
12. Using **J 37872** to hold the compressor clutch, tighten the clutch bolt. See **Special Tools**.

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

13. After the clutch bolt is installed, verify that the compressor pulley spins freely.
14. Install the compressor to the vehicle. Refer to **Compressor Replacement**.

COMPRESSOR PRESSURE RELIEF VALVE REPLACEMENT

Tools Required

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

Removal Procedure

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

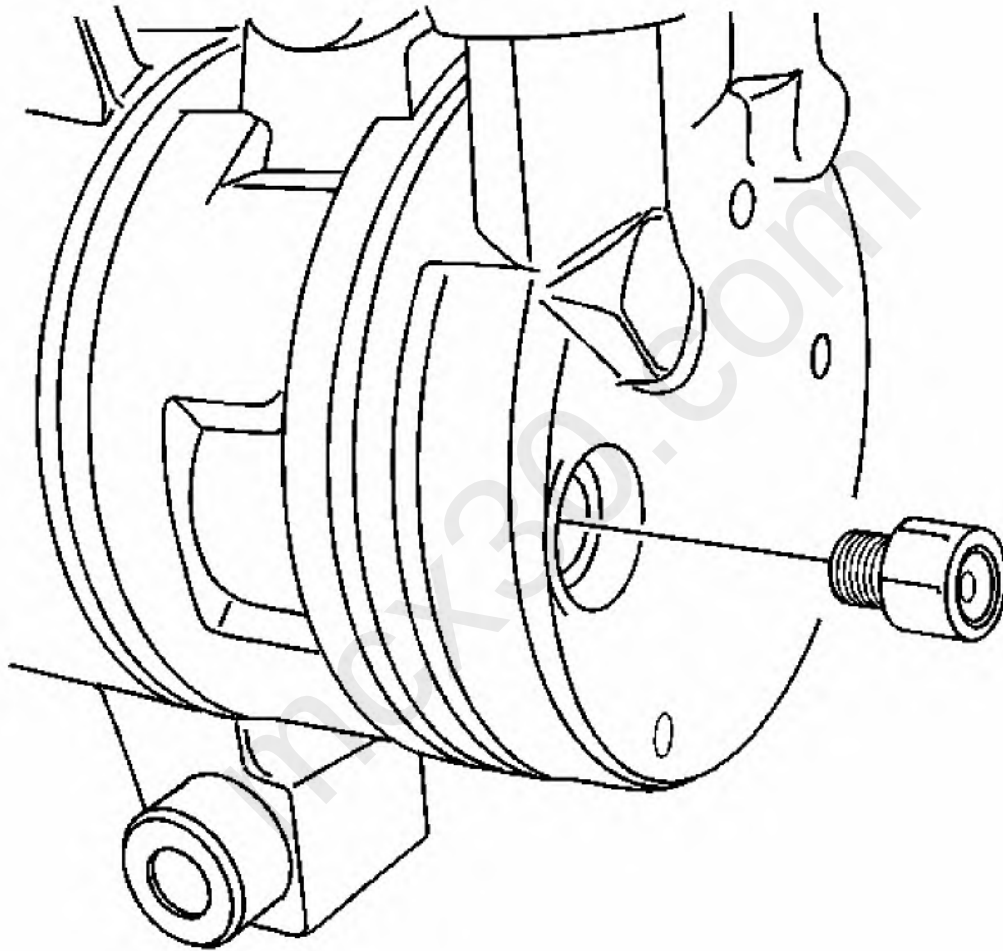


Fig. 23: View Of Pressure Relief Valve
Courtesy of GENERAL MOTORS CORP.

3. Remove the pressure relief valve from the compressor.
4. Remove and discard the O-ring from the pressure relief valve. Refer to **O-Ring Replacement**.

Installation Procedure

IMPORTANT: Lubricate the new O-ring prior to installation on the

compressor hose.

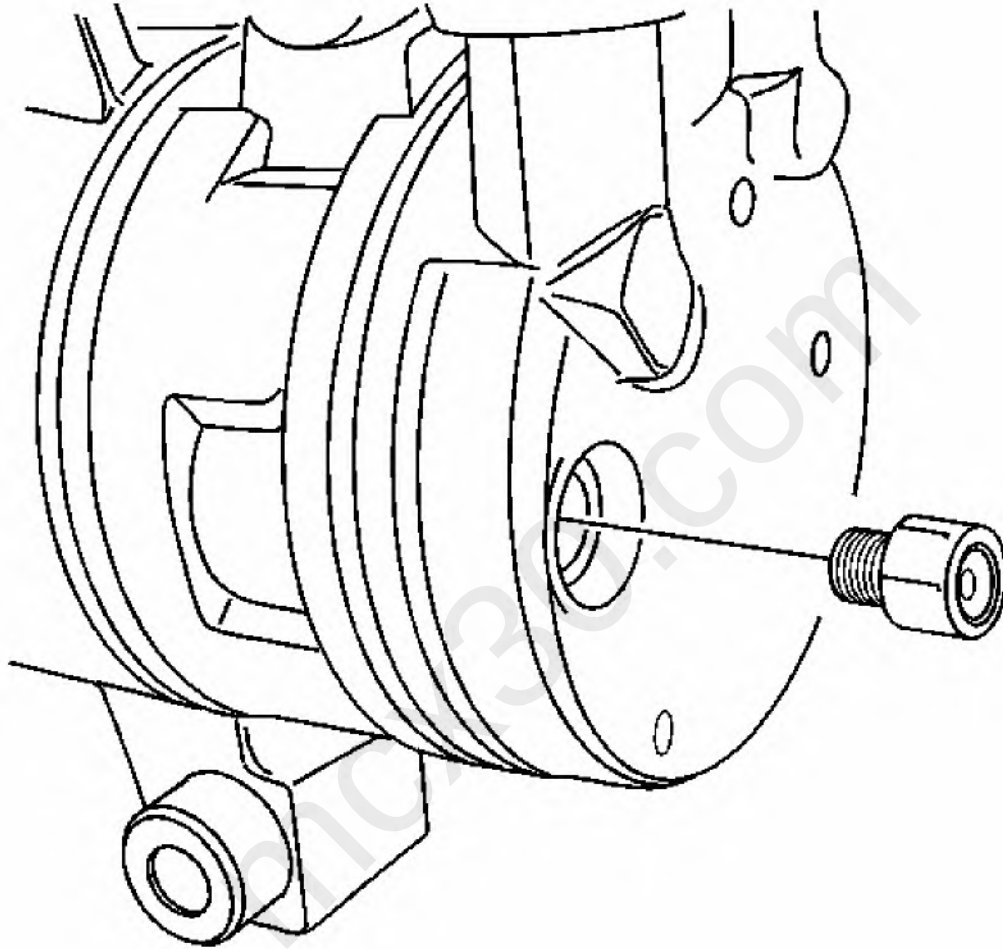


Fig. 24: View Of Pressure Relief Valve
Courtesy of GENERAL MOTORS CORP.

1. Lightly coat the new O-ring with mineral base 525 viscosity refrigerant oil.
2. Install the new O-ring to the pressure relief valve. Refer to **O-Ring Replacement**.

NOTE: Refer to Fastener Notice.

3. Install the pressure relief valve to the compressor.

Tighten: Tighten the pressure relief valve to 9.8 N.m (87 lb in).

4. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
6. Test the affected A/C joint for leaks using J 39400-A . See **Special Tools**.

SEALING WASHER REPLACEMENT

Removal Procedure

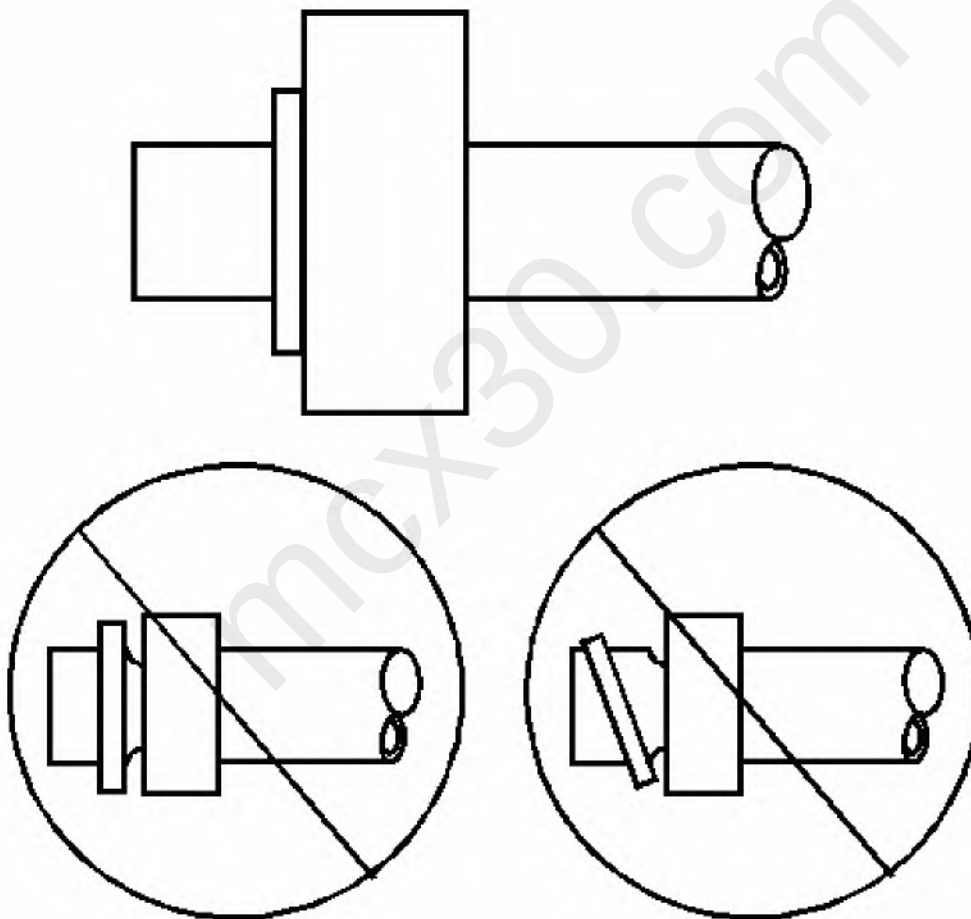


Fig. 25: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT: Cap or tape the open A/C refrigerant components

immediately to prevent system contamination.

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

IMPORTANT: DO NOT reuse sealing washer.

4. Discard the sealing washer.

Installation Procedure

IMPORTANT: Flat washer type seals do not require lubrication.

1. Inspect the new seal washer for any signs of cracks, cuts, or damage.
Do not use a damaged seal washer.
2. Remove the cap or tape from the A/C refrigerant components.

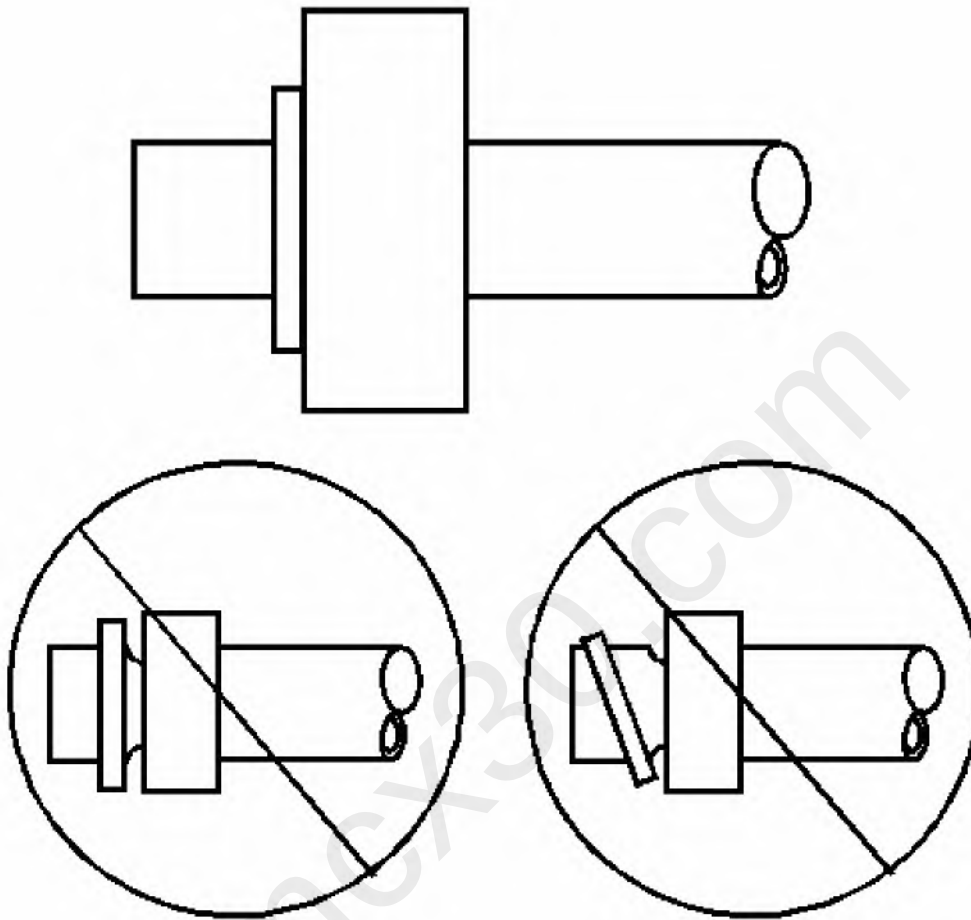


Fig. 26: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

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

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

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

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

procedure.

O-RING REPLACEMENT

Removal Procedure

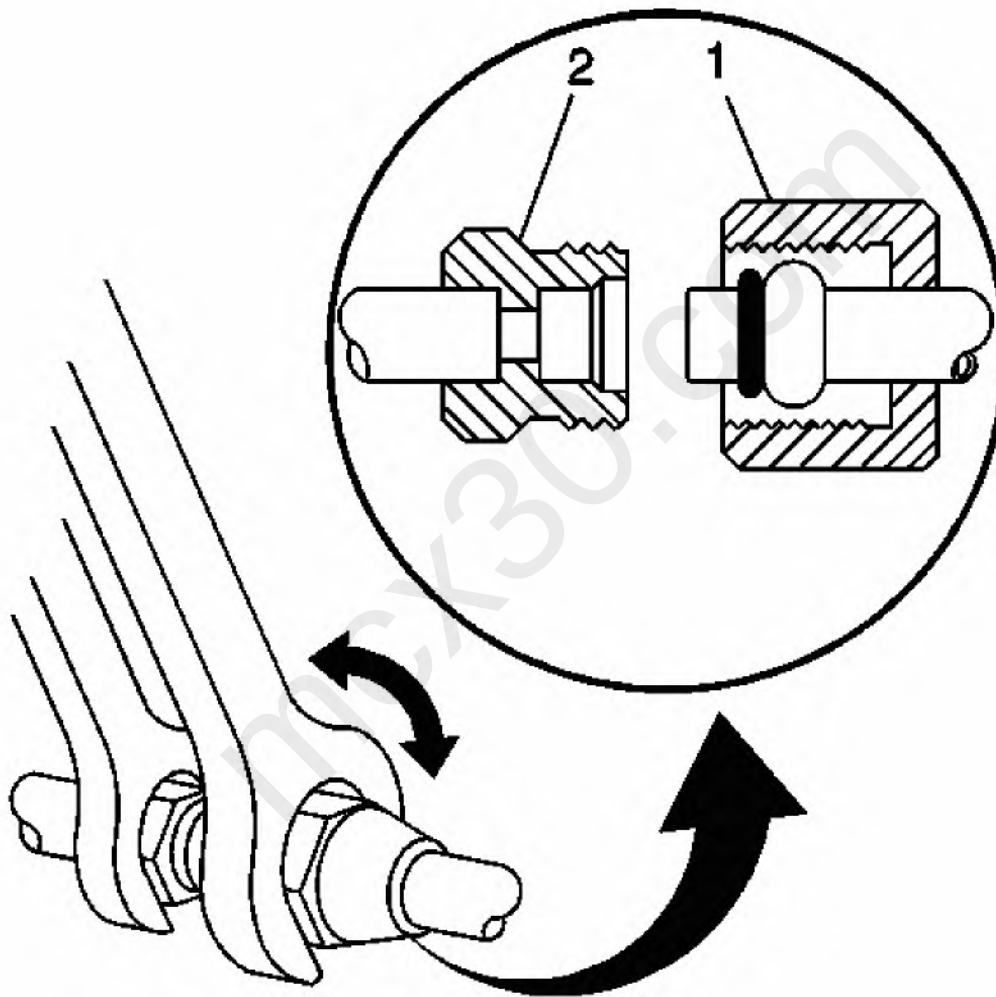


Fig. 27: Disassembling/Reassembling A/C Line Fittings
Courtesy of GENERAL MOTORS CORP.

1. Disassemble the A/C refrigerant components. Refer to the appropriate repair procedure
 - For compression style fittings use a back up wrench on the fitting (2) and loosen the fitting nut (1).
 - For banjo style fittings remove the bolt retaining the banjo type fitting.
2. Remove the O-ring seal from the A/C refrigerant component.

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

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

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

Installation Procedure

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

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

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

IMPORTANT: DO NOT reuse O-ring seals.

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

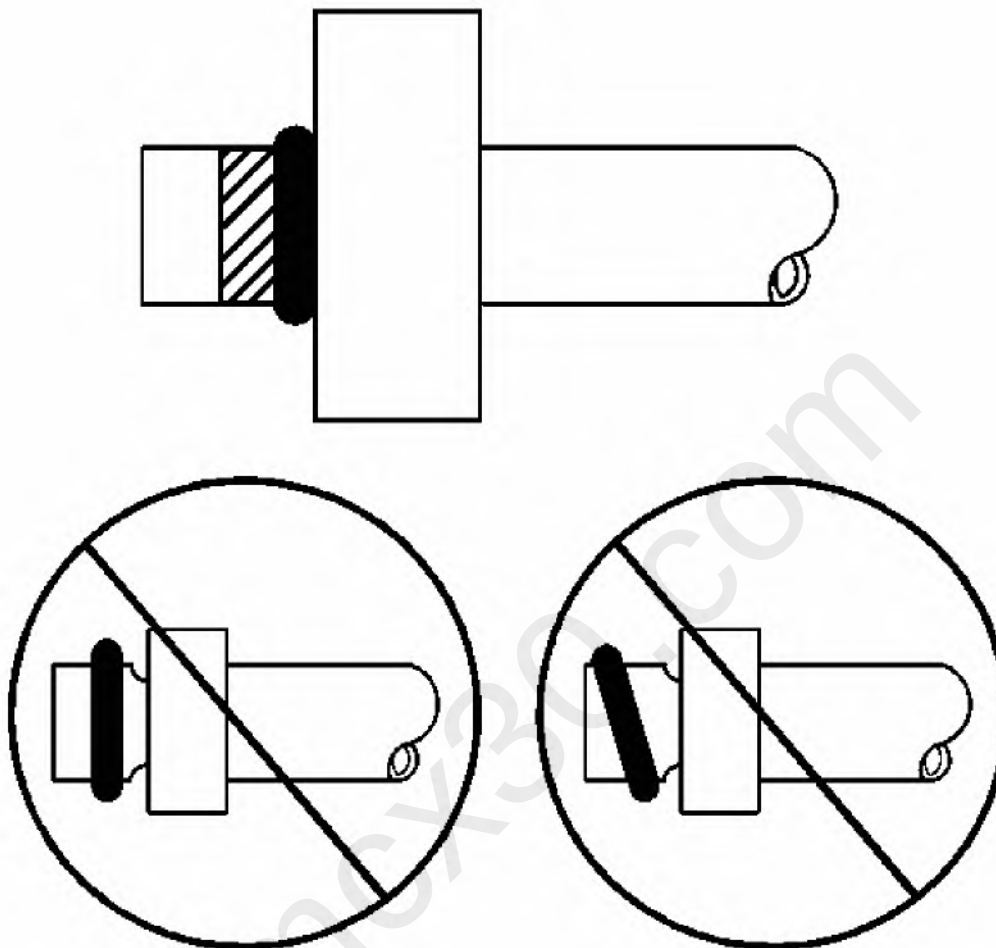


Fig. 28: Identifying Proper Seating Of A/C Refrigerant O-Ring
Courtesy of GENERAL MOTORS CORP.

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

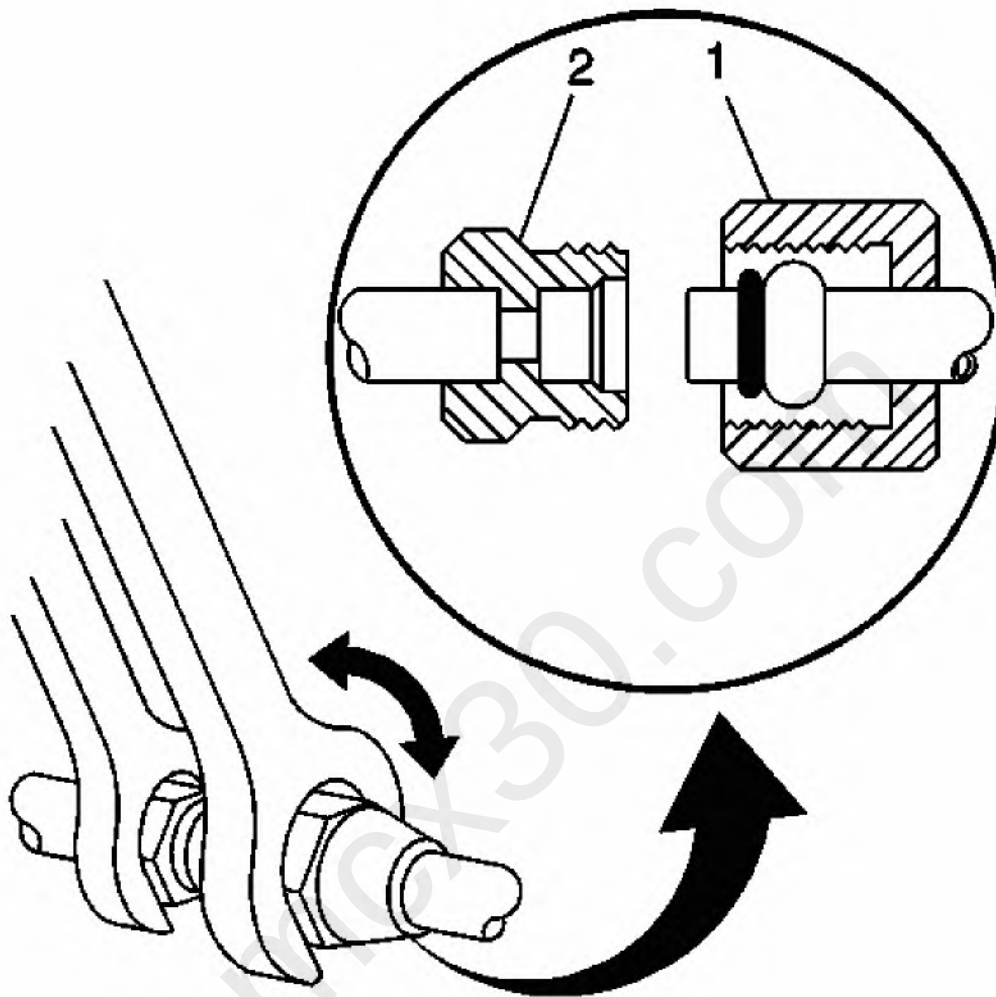


Fig. 29: Disassembling/Reassembling A/C Line Fittings
Courtesy of GENERAL MOTORS CORP.

7. Assemble the A/C components.

Refer to the appropriate repair procedure.

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

Tools Required

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

Removal Procedures

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the left headlamp. Refer to **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Equinox)** or **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Torrent)** .

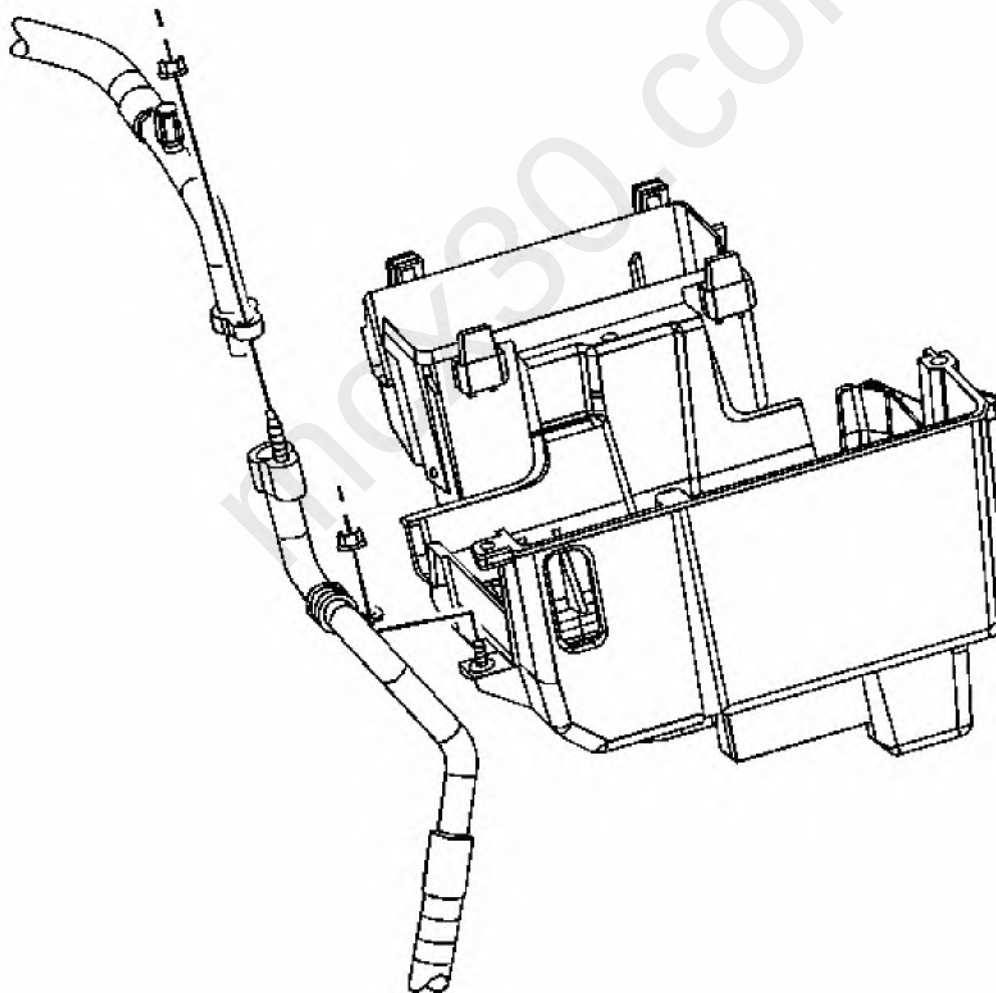


Fig. 30: View Of Compressor Hose Retainer Nut On Battery Box
Courtesy of GENERAL MOTORS CORP.

3. Remove the compressor hose retainer nut from the battery box.
4. Remove the evaporator outlet hose nut from the evaporator outlet hose.
5. Remove the evaporator outlet hose from the compressor hose.
6. Install a protective cap to the evaporator outlet hose to prevent contamination and desiccant saturation.

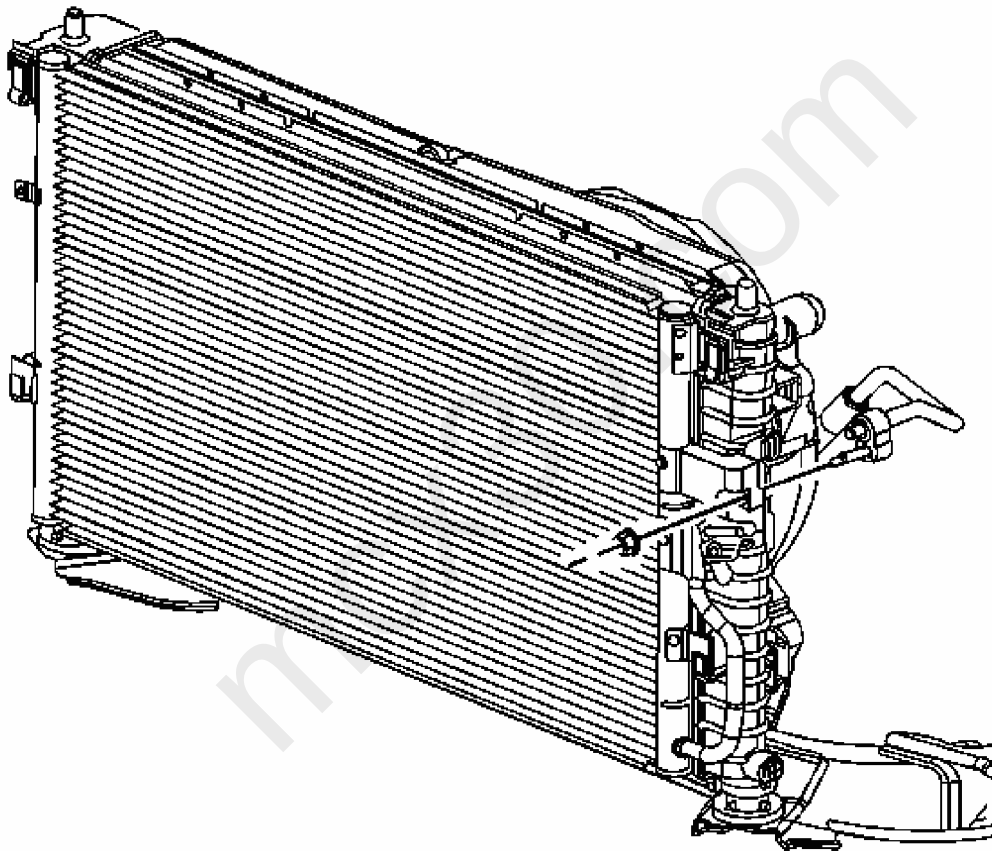


Fig. 31: View Of Compressor Hose Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

7. Remove the compressor hose nut from the condenser.
8. Remove the compressor hose from the condenser.
9. Install a protective cap to the condenser to prevent contamination and desiccant saturation.
10. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .

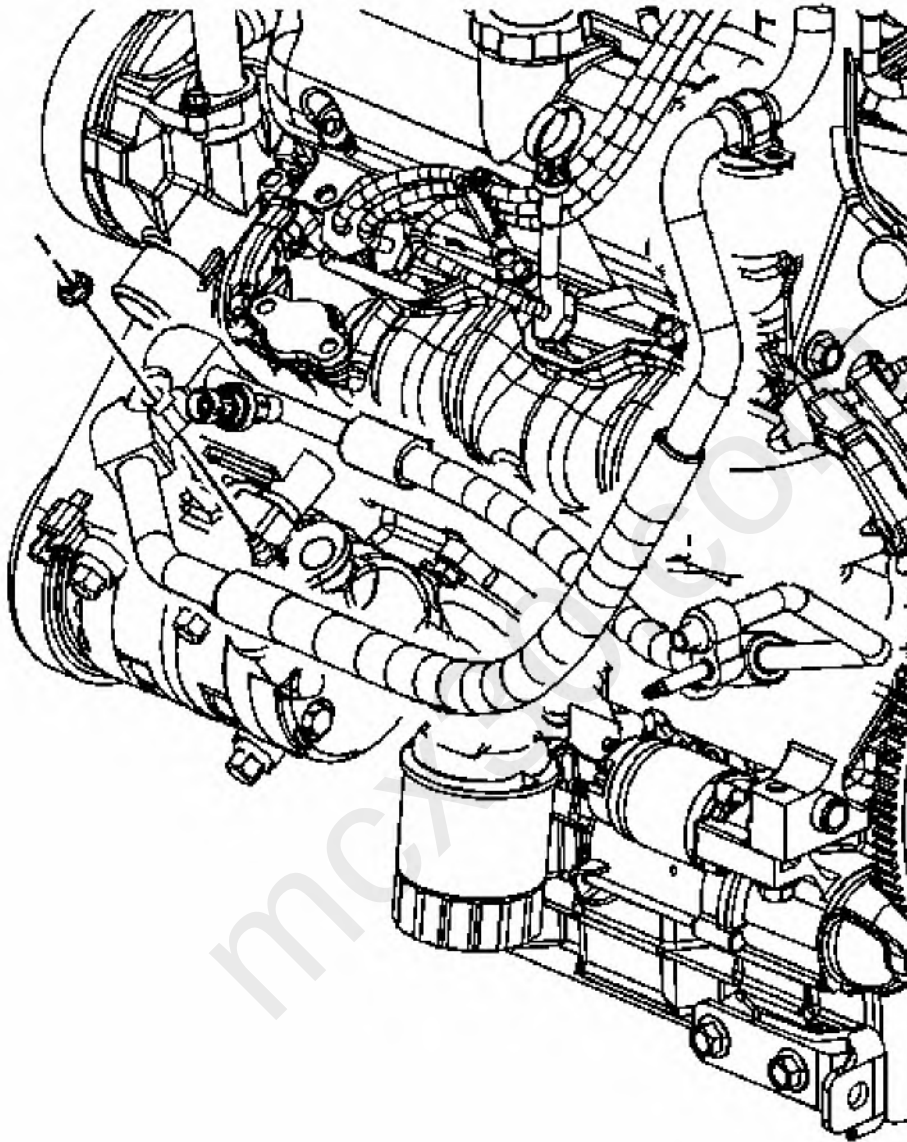


Fig. 32: View Of Compressor Hose Nut On Compressor
Courtesy of GENERAL MOTORS CORP.

11. Disconnect the electrical connector from the pressure transducer.
12. Remove the compressor hose nut at the compressor.
13. Remove the compressor hose from the compressor.
14. Install a protective cap to the compressor to prevent contamination and desiccant saturation.

15. Remove the compressor hose from the vehicle.
16. Remove and discard the sealing washers from the compressor hose. Refer to **Sealing Washer Replacement**.

Installation Procedure

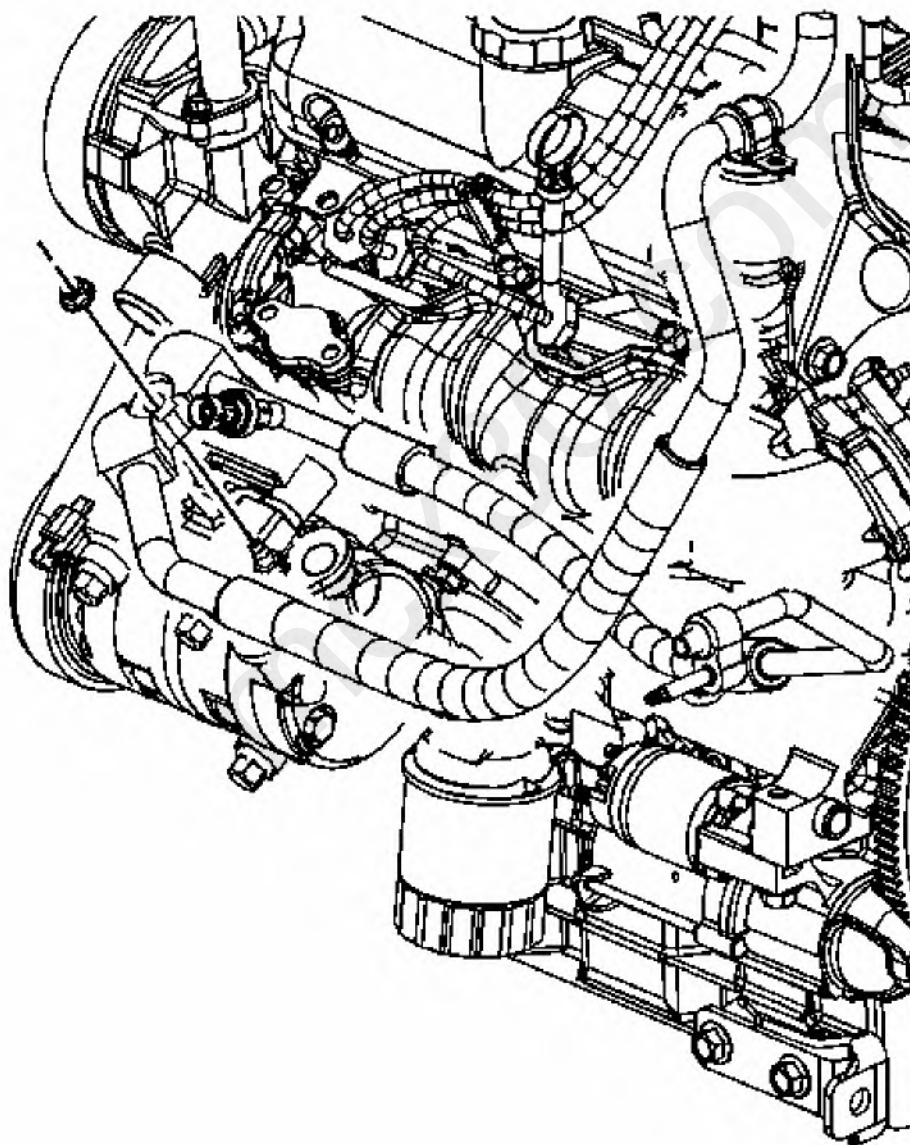


Fig. 33: View Of Compressor Hose Nut On Compressor
Courtesy of GENERAL MOTORS CORP.

1. Remove protective cap from compressor end of the compressor hose and the compressor.
2. Install new seal washers to the compressor hose. Refer to **Sealing Washer Replacement**.
3. Install the compressor hose to the compressor.

NOTE: Refer to Fastener Notice.

4. Install the compressor hose nut to the compressor.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

5. Connect the electrical connector to the pressure transducer.

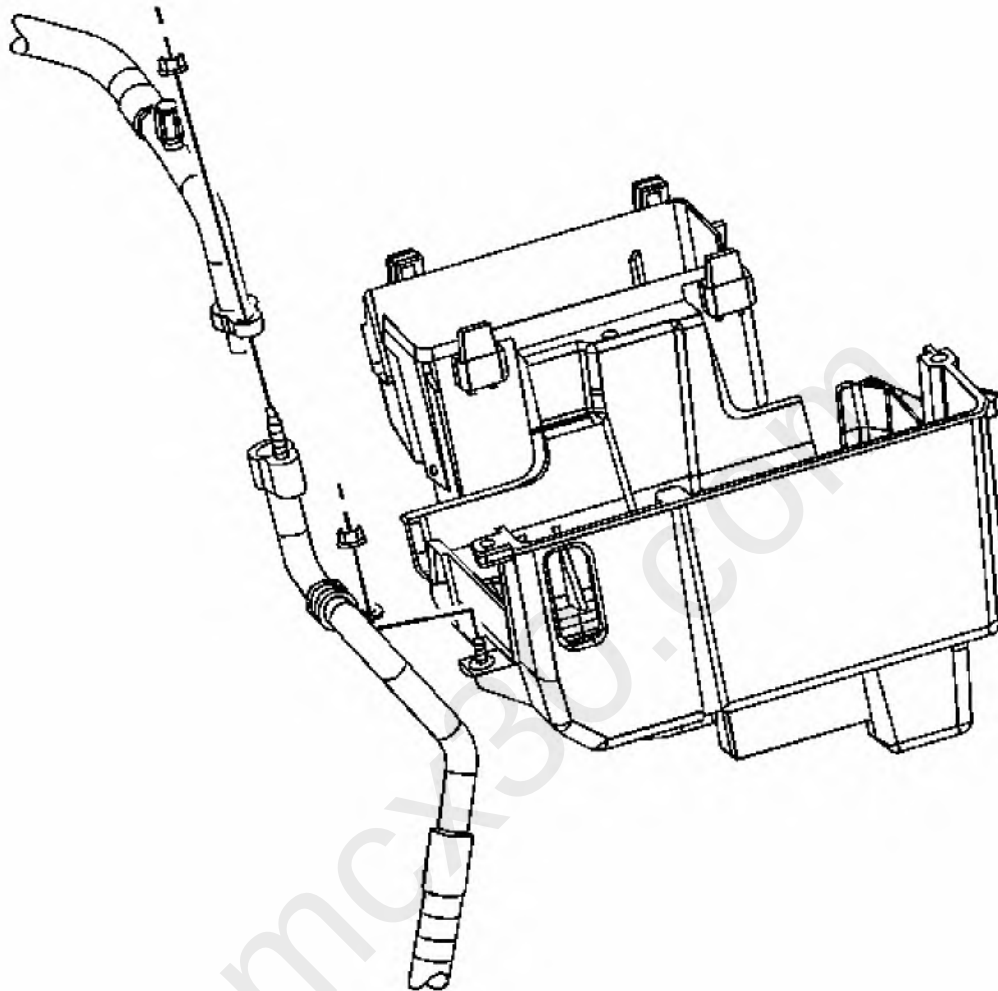


Fig. 34: View Of Compressor Hose Retainer Nut On Battery Box
Courtesy of GENERAL MOTORS CORP.

6. Lower the vehicle.
7. Position the compressor hose in the vehicle.
8. Install a new sealing washer to the evaporator outlet hose. Refer to **Sealing Washer Replacement**.
9. Install the evaporator outlet hose to the compressor hose.
10. Install the evaporator outlet hose nut to the evaporator outlet hose.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

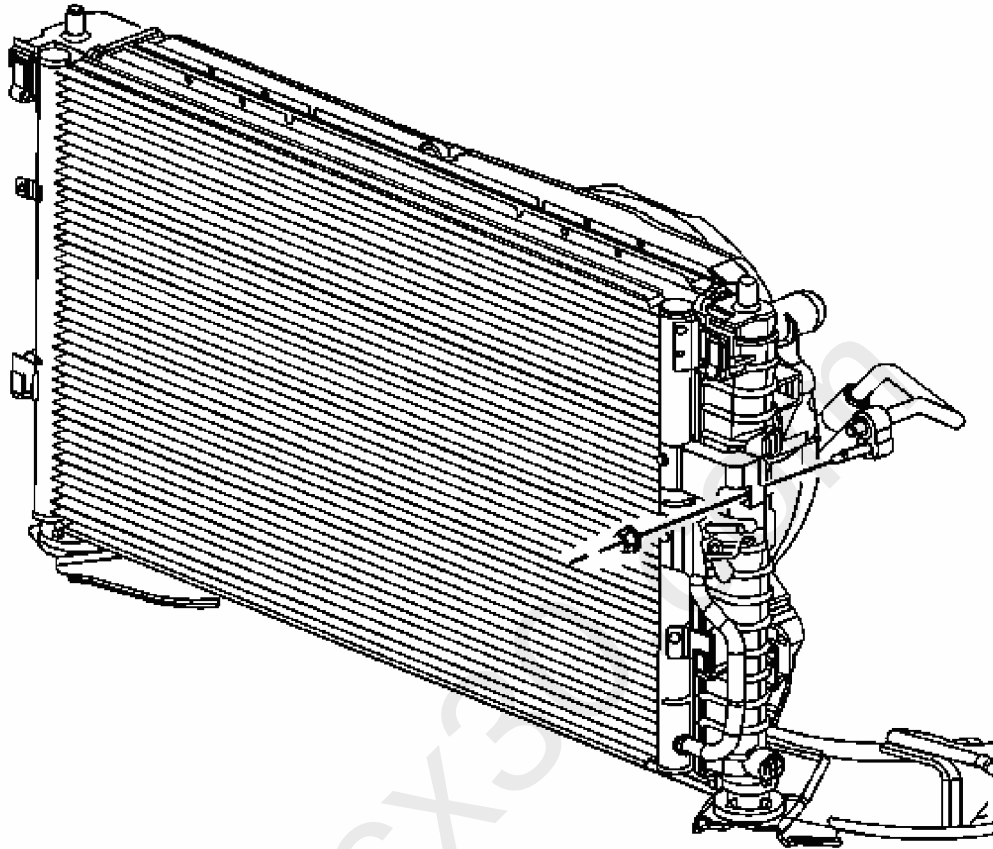


Fig. 35: View Of Compressor Hose Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

11. Install a new sealing washer to the compressor hose at the condenser.
12. Install the compressor hose to the condenser.
13. Install the compressor hose nut to the condenser.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

14. Install the compressor hose retainer nut to the battery box.

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

15. Install the left headlamp. Refer to **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Equinox)** or **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Torrent)** .

16. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
17. Test the affected A/C joints for leaks using **J 39400-A** . See **Special Tools**.

LIQUID LINE REPLACEMENT

Tools Required

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

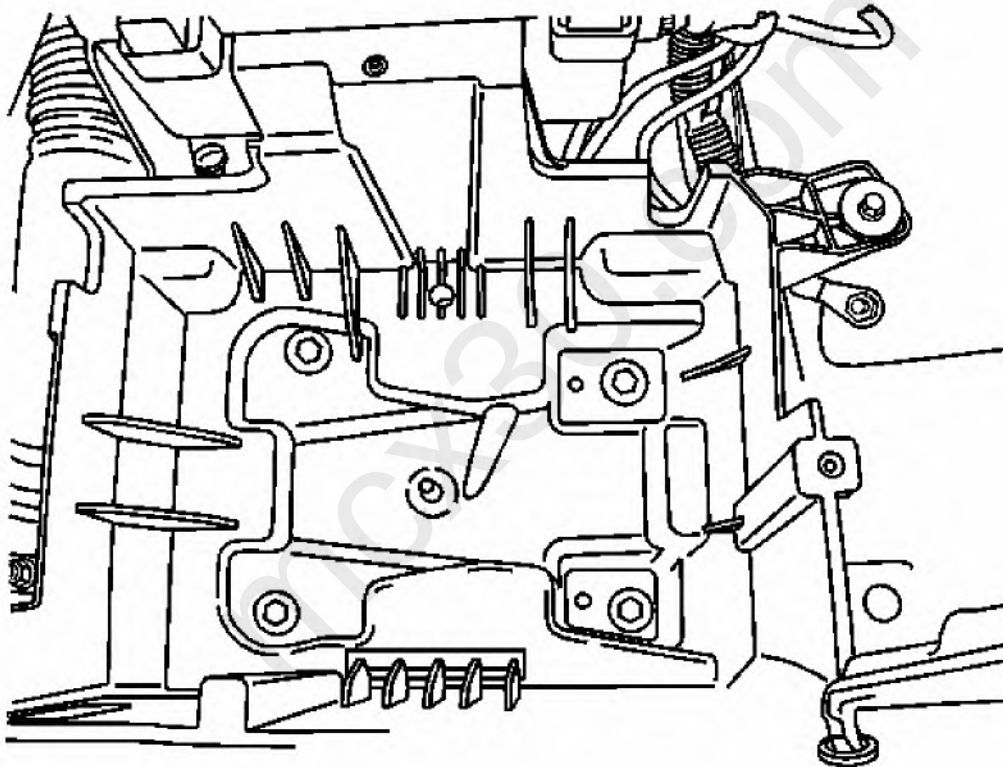


Fig. 36: Battery Box & Components
Courtesy of GENERAL MOTORS CORP.

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the left headlamp. Refer to **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Equinox) or Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Torrent)** .
3. Remove the surge tank. Refer to **Surge Tank Replacement** .
4. Remove the washer bottle. Refer to **Washer Pump/Reservoir Replacement** .

5. Remove the battery. Refer to **Battery Replacement** .
6. Remove the battery box bolts from the battery box.
7. Disconnect the negative battery cable nut from the wheelhouse.

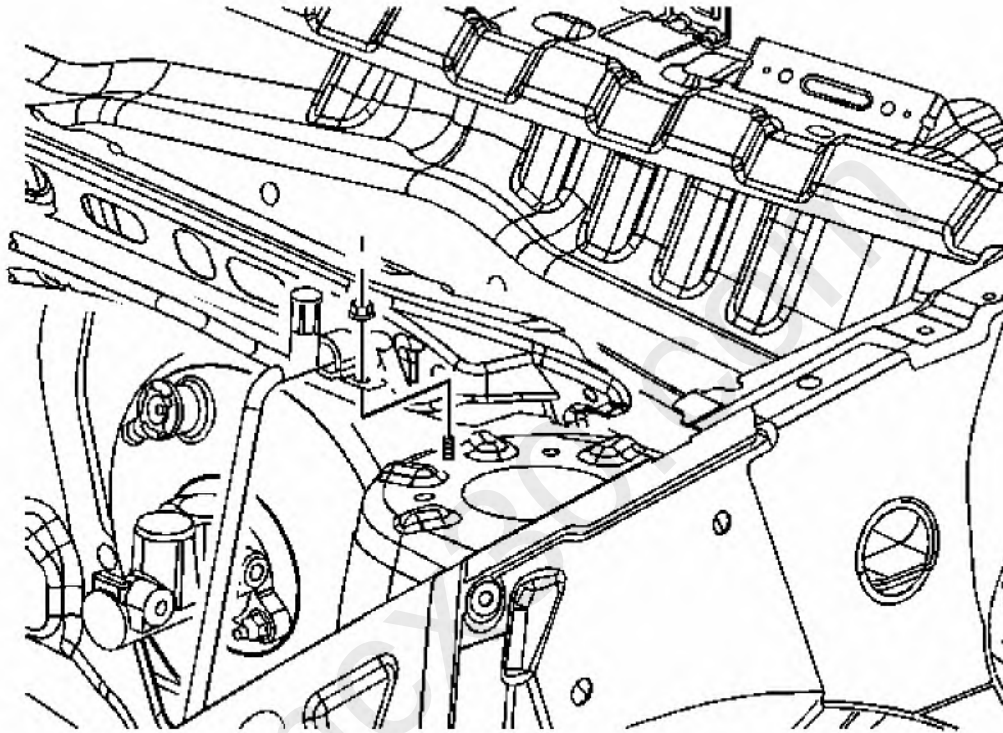


Fig. 37: View Of Liquid Line Nut On Strut Tower
Courtesy of GENERAL MOTORS CORP.

8. Remove the nut retaining the liquid line to the strut tower.
9. Disconnect the harness and vent hose retainers from the liquid line.

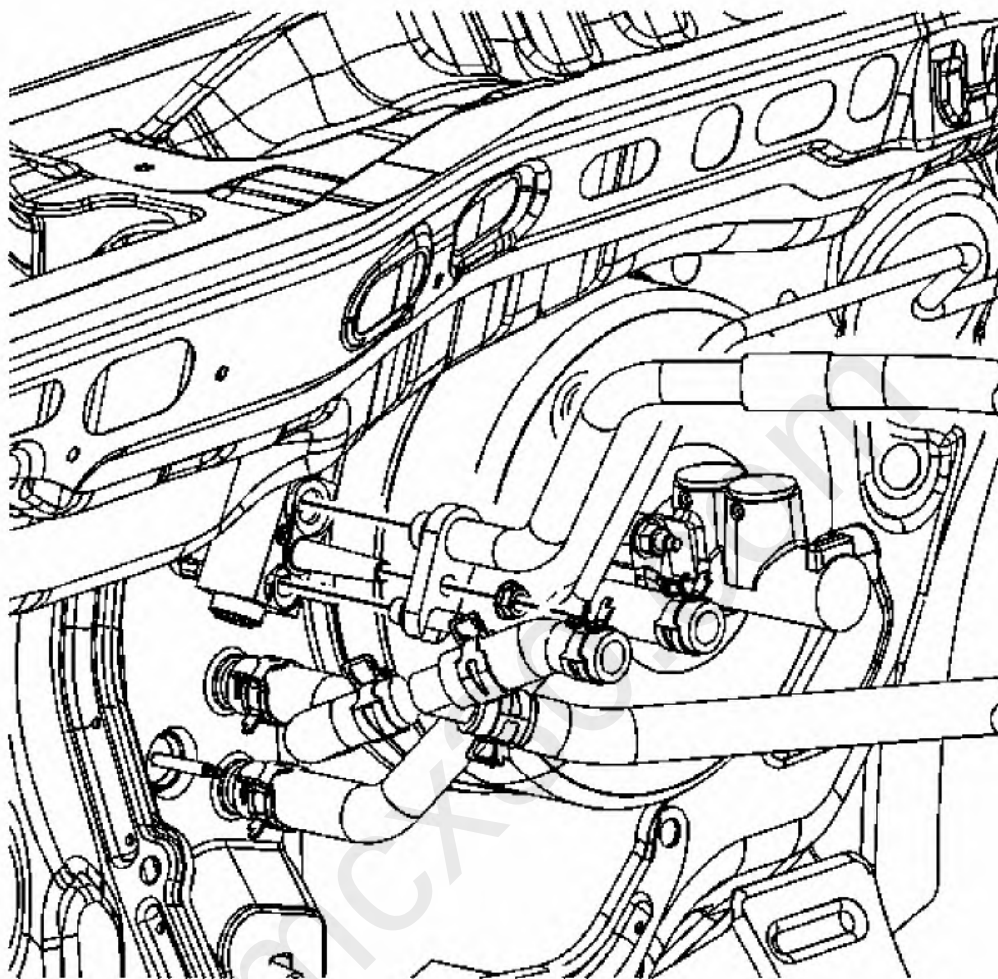


Fig. 38: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

10. Remove the evaporator outlet hose and liquid line retainer plate nut from the TXV.
11. Remove the evaporator outlet hose and liquid line from the TXV.

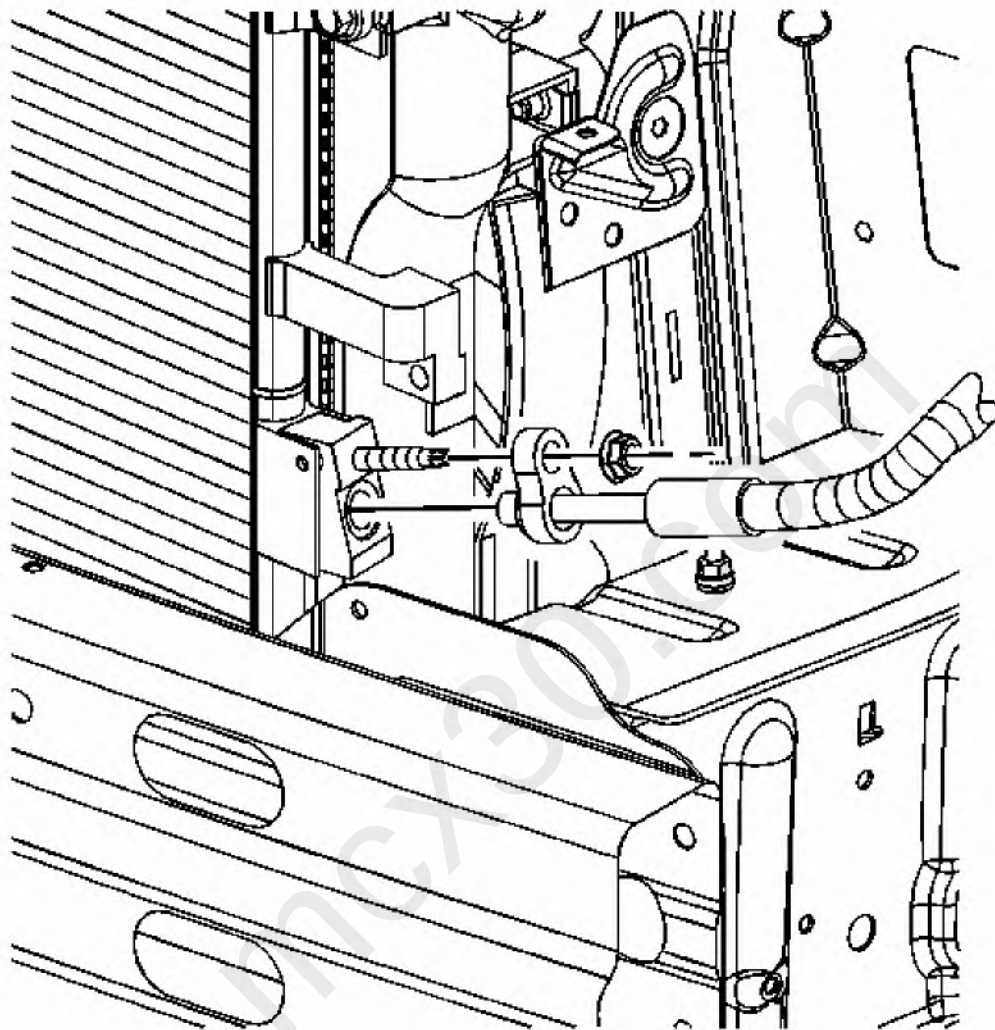


Fig. 39: View Of Liquid Line Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

12. Remove the liquid line nut from the condenser.
13. Remove the liquid line from the condenser.

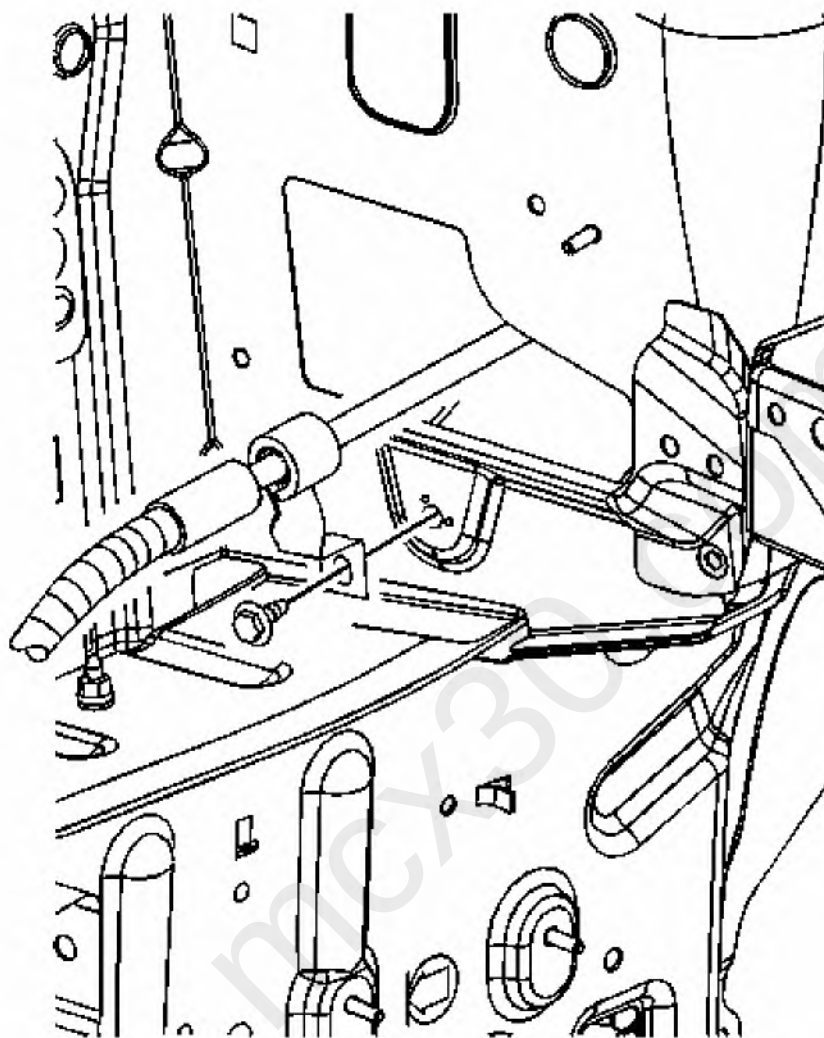


Fig. 40: View Of Liquid Line Bolt On Body
Courtesy of GENERAL MOTORS CORP.

14. Remove the bolt retaining the liquid line to the body.

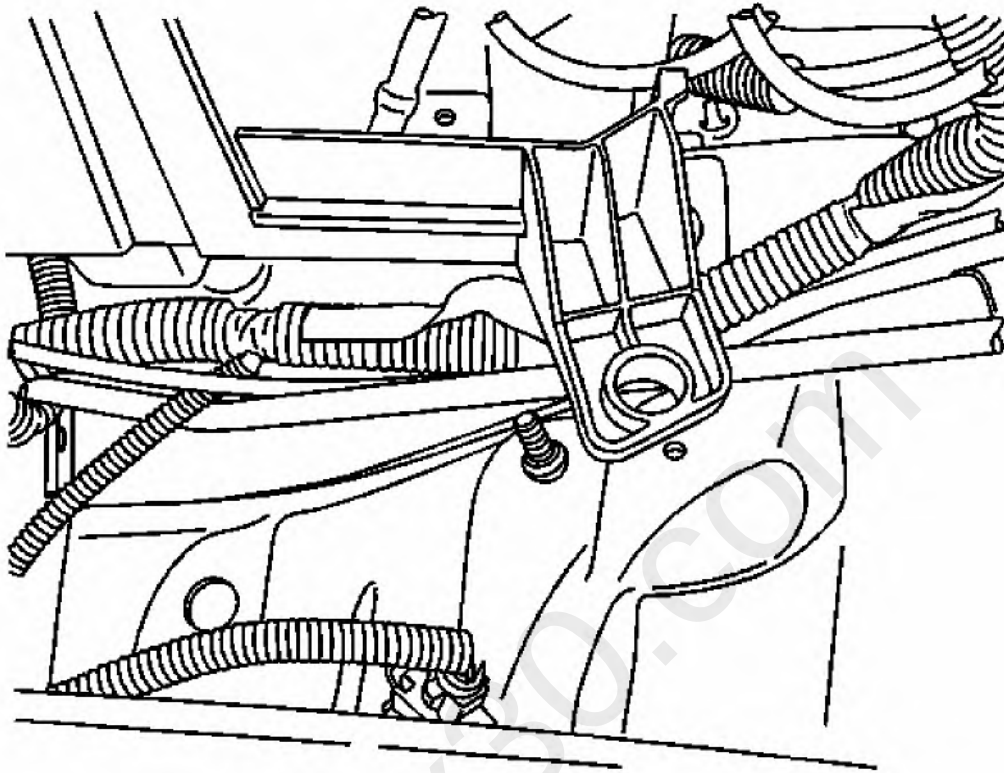


Fig. 41: Liquid Line, Battery Box & Ground Lug
Courtesy of GENERAL MOTORS CORP.

15. Position the battery box inboard to allow for routing of the liquid line.
16. Route the liquid line above the battery box and the ground lug.
17. Lift the rear portion of the liquid line upward and remove the liquid line from the vehicle.
18. Remove and discard the sealing washer from the liquid line. Refer to **Sealing Washer Replacement**.
19. Install protective caps to the condenser, the evaporator outlet hose, and the TXV to prevent contamination and desiccant saturation.

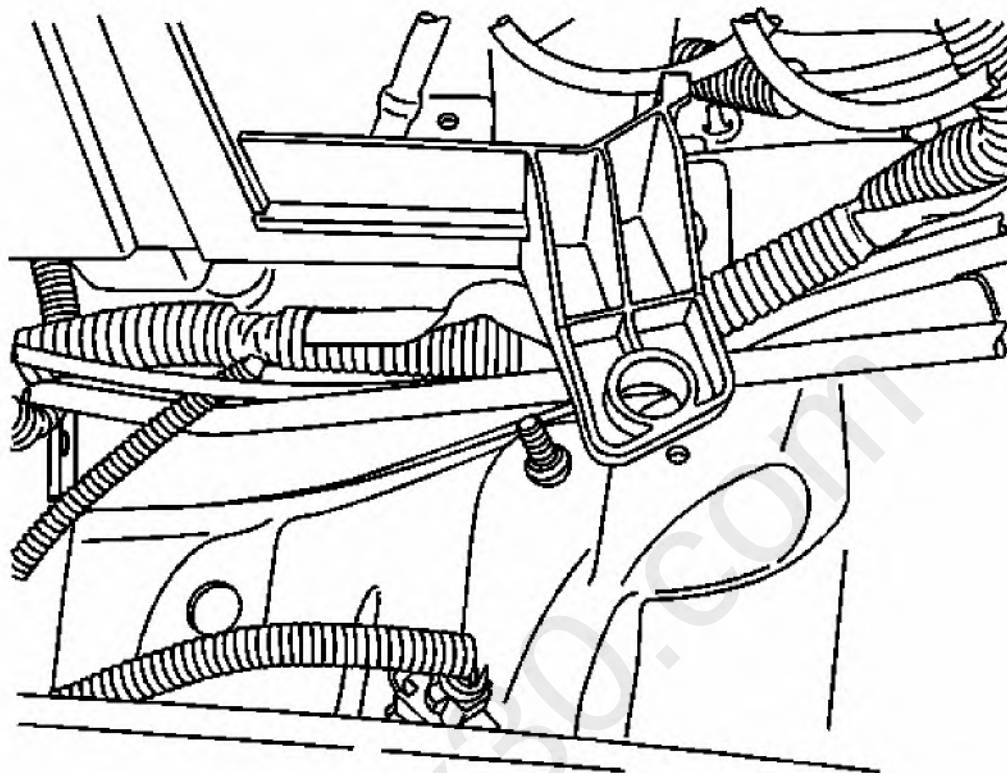


Fig. 42: Liquid Line, Battery Box & Ground Lug
Courtesy of GENERAL MOTORS CORP.

1. Route the liquid line below the battery box and the ground lug.

NOTE: Refer to Fastener Notice.

2. Connect the negative battery cable nut to the wheelhouse.

Tighten: Tighten the nut to 12 N.m (106 lb in).

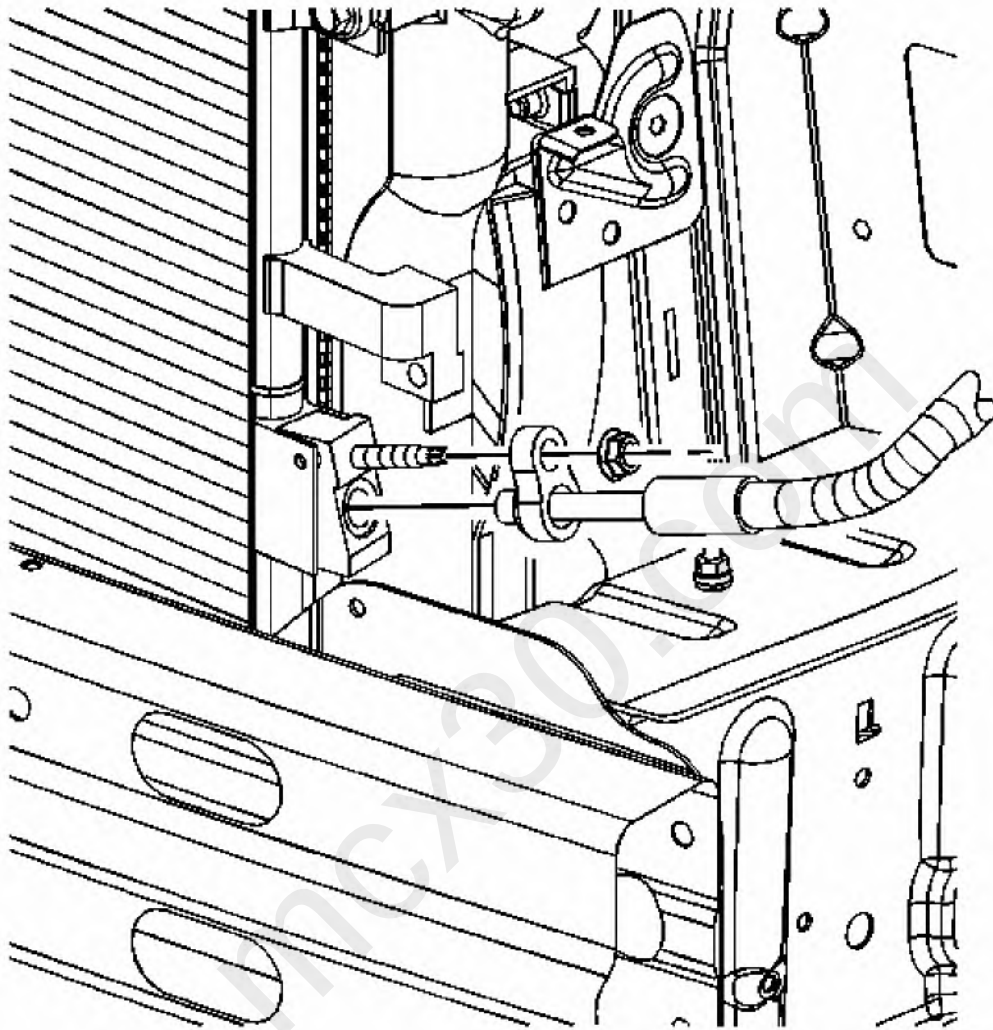


Fig. 43: View Of Liquid Line Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

3. Remove the protective caps from the condenser, the evaporator outlet hose, and the TXV.
4. Install the new sealing washer to the liquid line. Refer to **Sealing Washer Replacement**.
5. Route the condenser end of the liquid line into position.
6. Install the liquid line to the condenser.

IMPORTANT: Use a large pair of pliers to hold the fitting while tightening the nut. Be careful not to twist the line.

7. Install the liquid line nut to the condenser.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

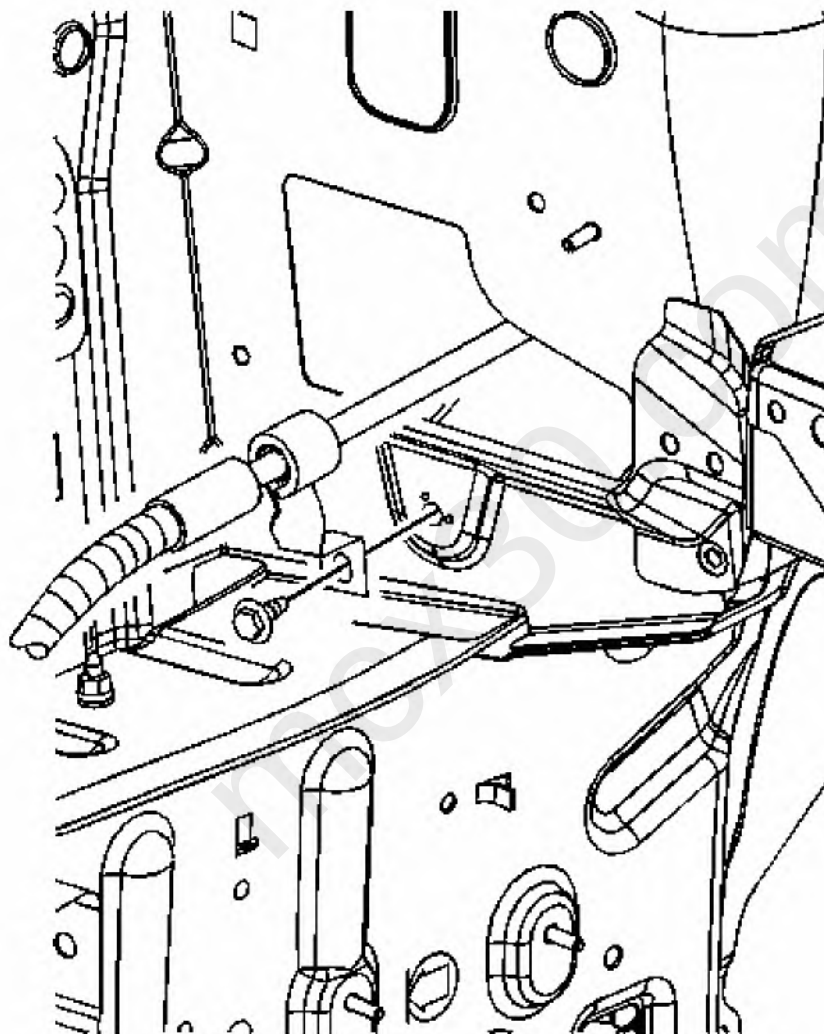


Fig. 44: View Of Liquid Line Bolt On Body
Courtesy of GENERAL MOTORS CORP.

8. Install the bolt to retain the liquid line to the body.

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

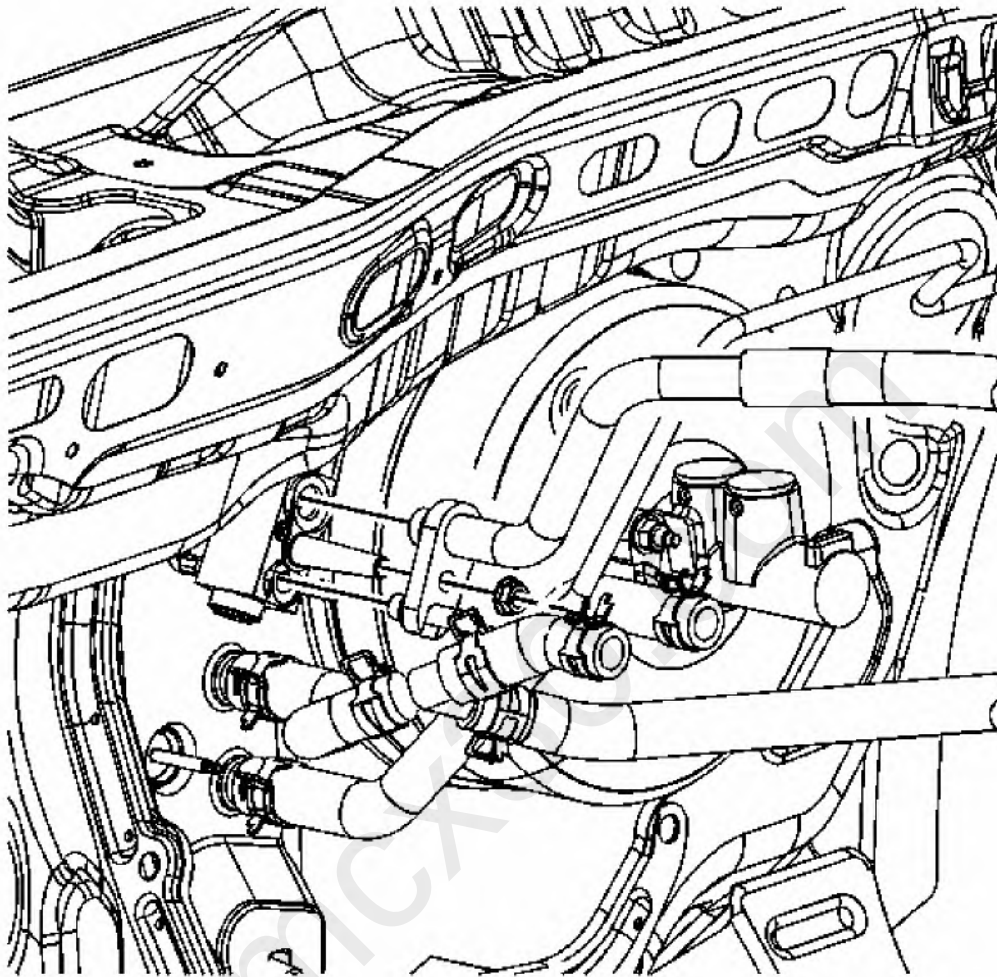


Fig. 45: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

9. Remove the protective cap from the TXV, the liquid line, and the evaporator outlet hose.
10. Install new seal washers to the liquid line and the evaporator outlet hose. Refer to **Sealing Washer Replacement**.
11. Install the liquid line and the evaporator outlet hose to the TXV.
12. Install the liquid line and evaporator outlet hose retainer plate nut to the TXV.

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

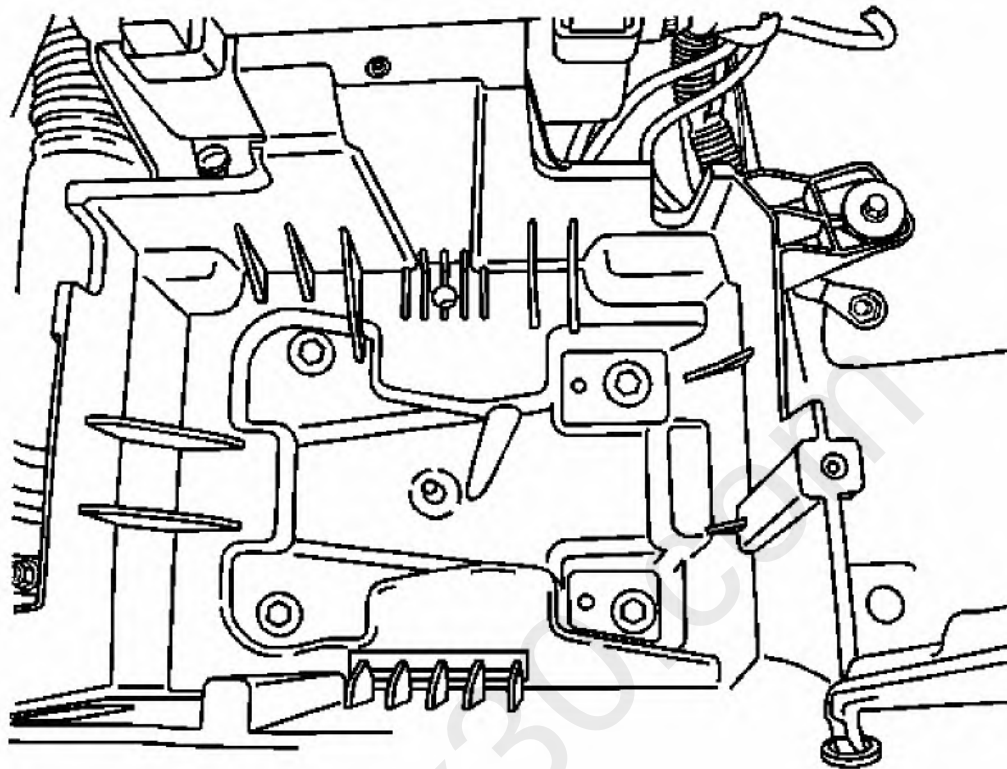


Fig. 46: Battery Box & Components
Courtesy of GENERAL MOTORS CORP.

13. Install the four battery box bolts to the inside of the battery box.

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

14. Install the battery box bolt to the outside of the battery box.

Tighten: Tighten the nut to 10 N.m (86 lb in).

15. Install the battery. Refer to **Battery Replacement** .

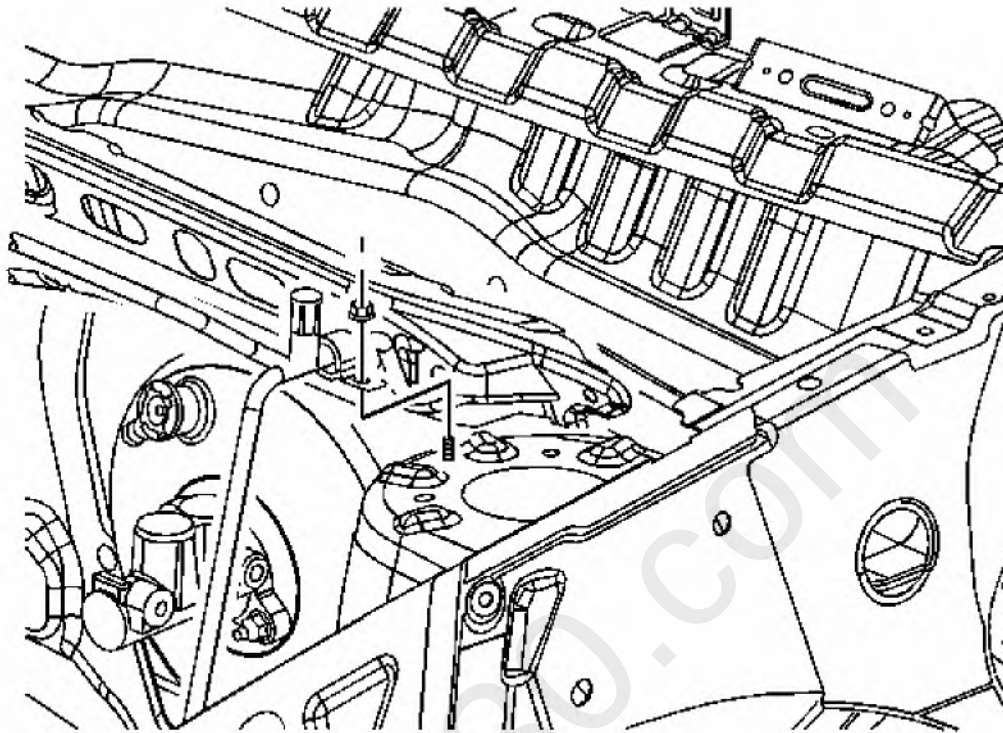


Fig. 47: View Of Liquid Line Nut On Strut Tower
Courtesy of GENERAL MOTORS CORP.

16. Install the liquid line to the strut tower.
17. Install the liquid line nut to the strut tower.

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

18. Connect the harness and vent hose retainers to the liquid line.
19. Install the surge tank. Refer to **Surge Tank Replacement**.
20. Install the washer bottle. Refer to **Washer Pump/Reservoir Replacement**.
21. Install the left headlamp. Refer to **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Equinox)** or **Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarker, Park, Turn Signal Bulb Replacement (Torrent)**.
22. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
23. Test the affected A/C joints for leaks using J 39400-A. See **Special Tools**.

Tools Required

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

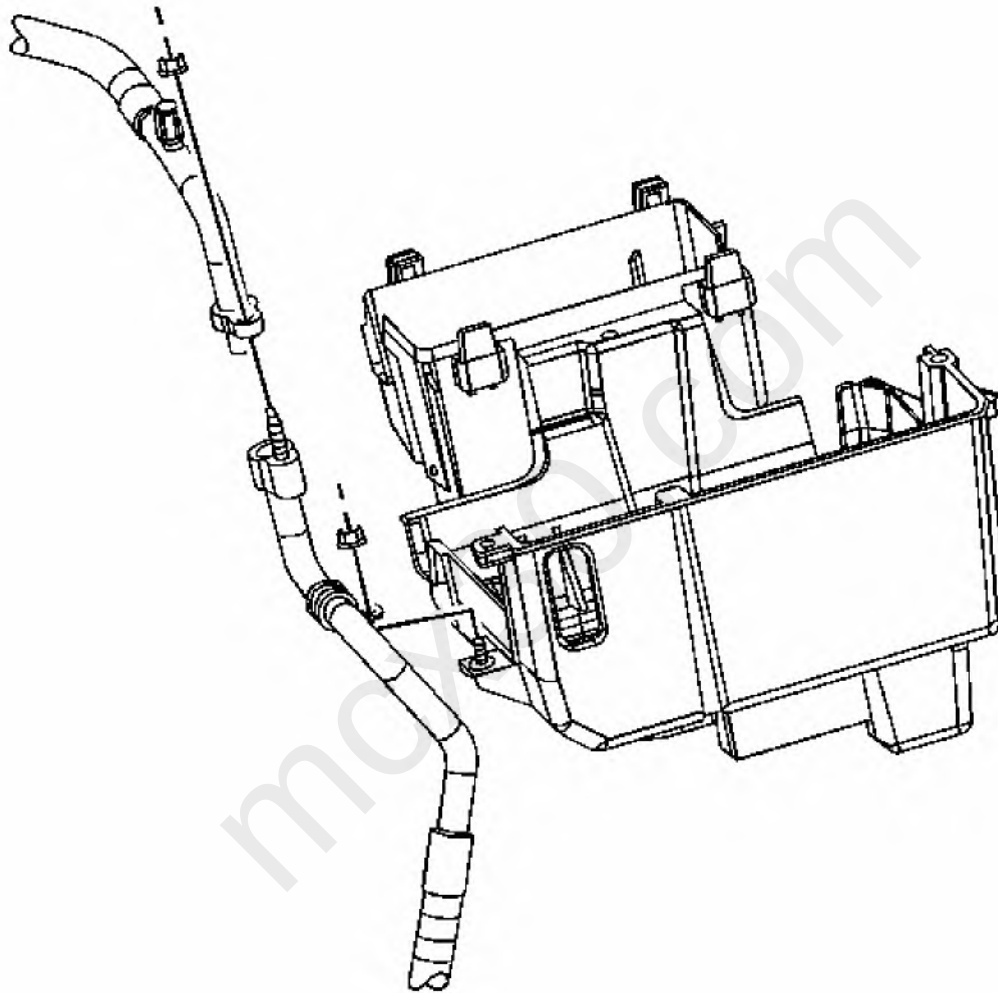


Fig. 48: View Of Compressor Hose Retainer Nut On Battery Box
Courtesy of GENERAL MOTORS CORP.

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

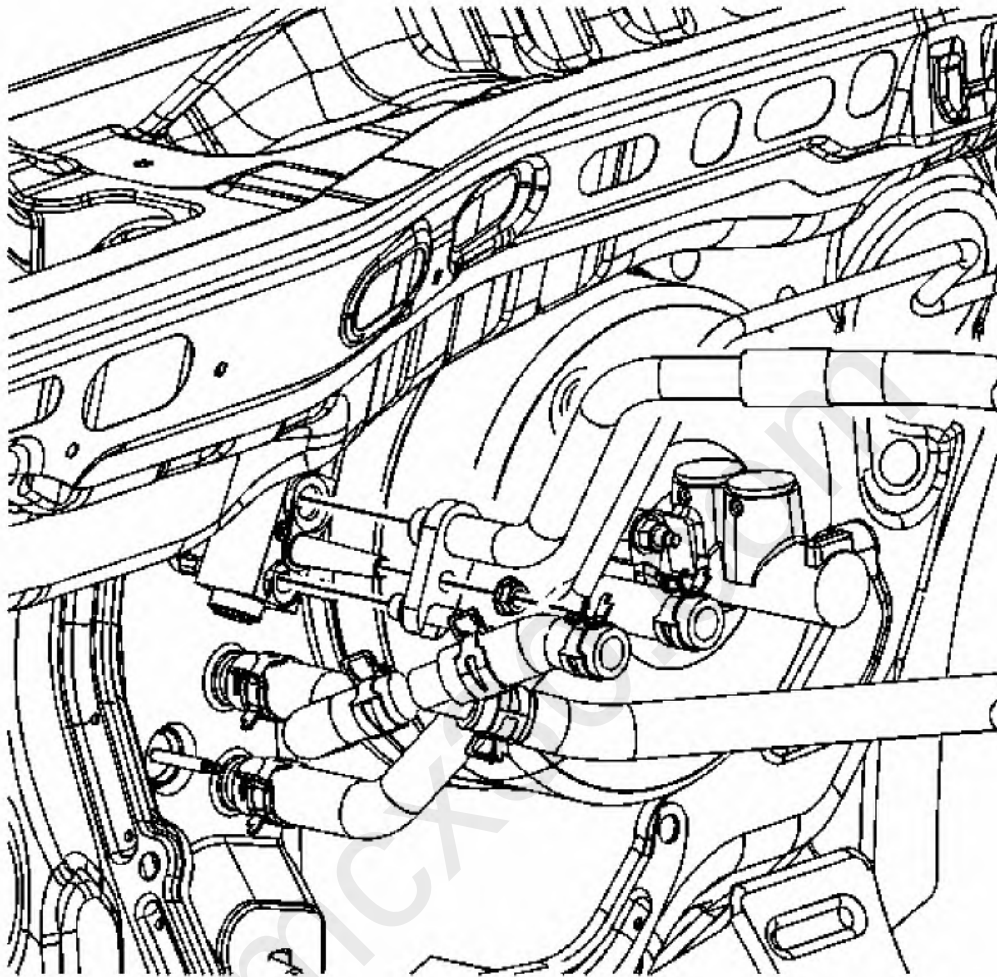


Fig. 49: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

4. Remove the evaporator outlet hose and liquid line retainer plate nut from the TXV.
5. Remove the evaporator outlet hose and liquid line from the TXV.
6. Remove evaporator outlet hose from the vehicle.
7. Remove and discard the sealing washers from the evaporator outlet hose and the compressor hose. Refer to **Sealing Washer Replacement**.
8. Install protective caps to the TXV, the liquid line, and the compressor hose to prevent contamination and desiccant saturation.

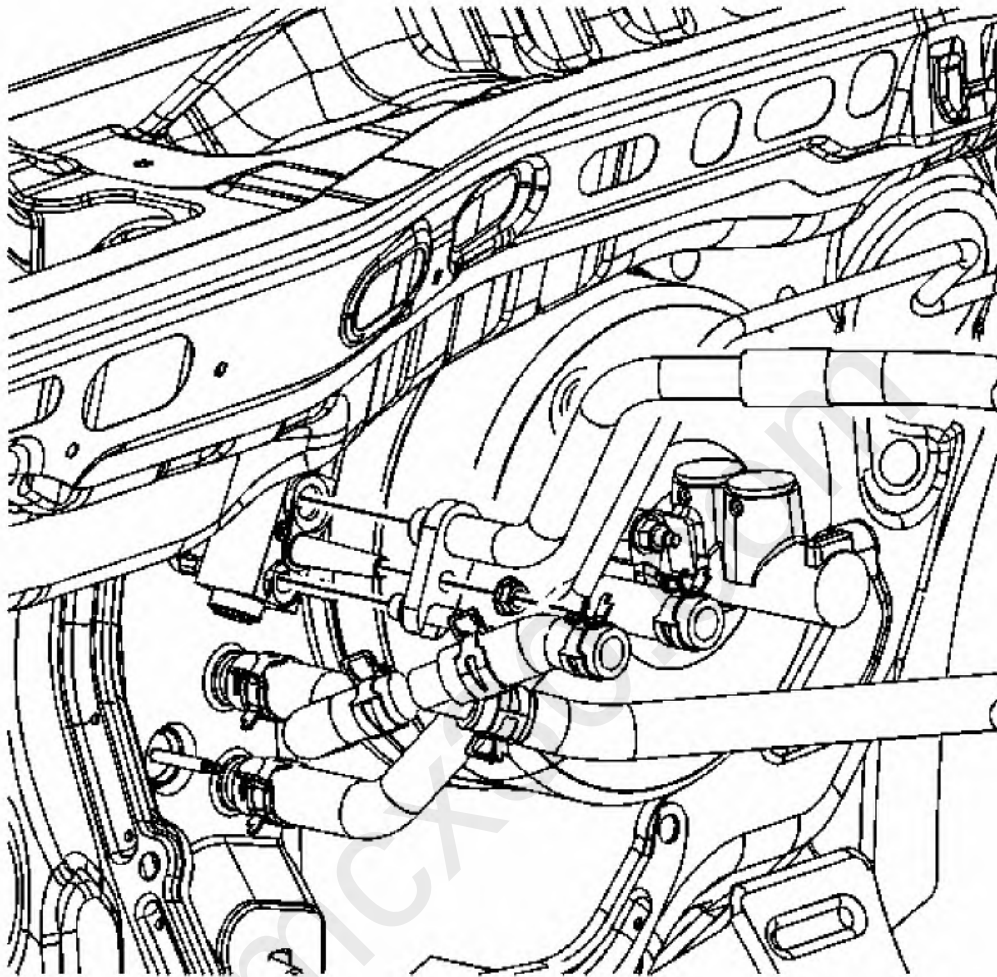


Fig. 50: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

1. Remove the protective caps from the TXV, the liquid line, and the compressor hose.
2. Install new sealing washers to the evaporator outlet hose, liquid line, and the compressor hose. Refer to **Sealing Washer Replacement**.
3. Install the evaporator outlet hose and the liquid line to the TXV.

NOTE: Refer to Fastener Notice.

4. Install the evaporator outlet hose and the liquid line nut to the TXV.

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

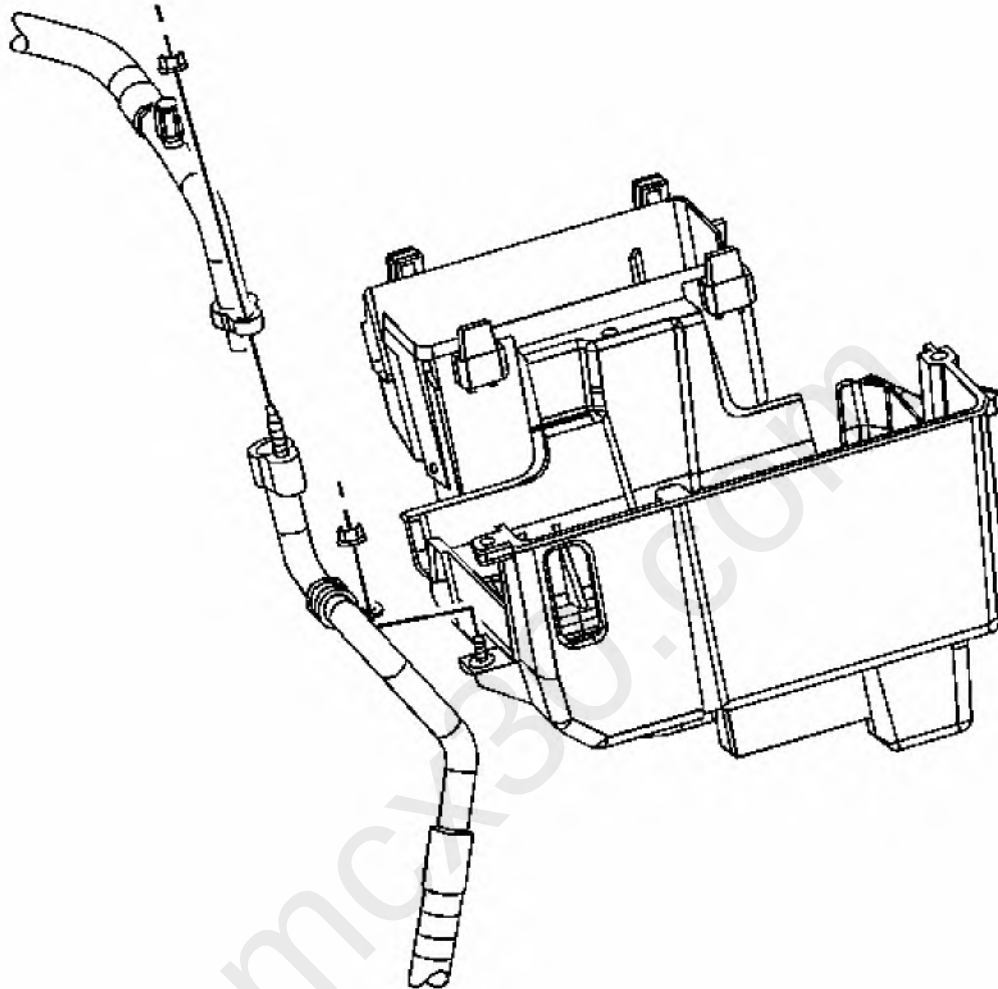


Fig. 51: View Of Compressor Hose Retainer Nut On Battery Box
Courtesy of GENERAL MOTORS CORP.

5. Install the evaporator outlet hose to the compressor hose.
6. Install the evaporator outlet hose nut to the evaporator outlet hose.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

7. Recharge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
8. Test the affected A/C joints for leaks using **J 39400-A** . See **Special Tools**.

SERVICE PORT VALVE CORE REPLACEMENT

Tools Required

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

Removal Procedure

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

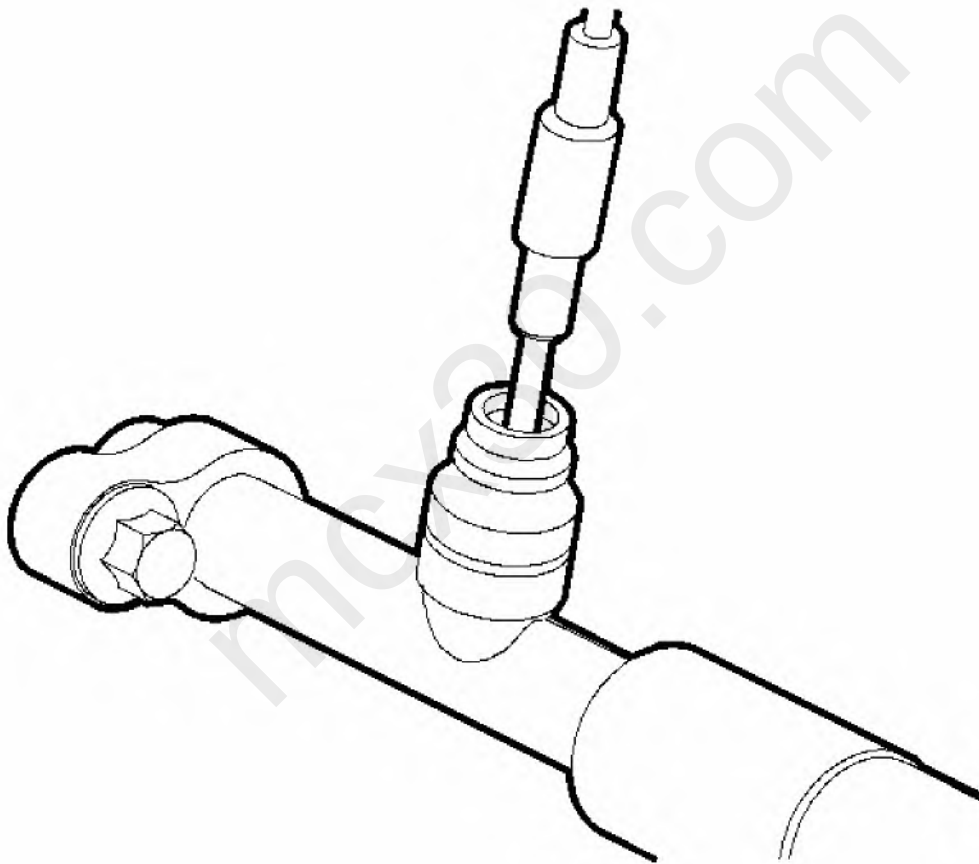


Fig. 52: Equivalent & Valve Core
Courtesy of GENERAL MOTORS CORP.

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

Installation Procedure

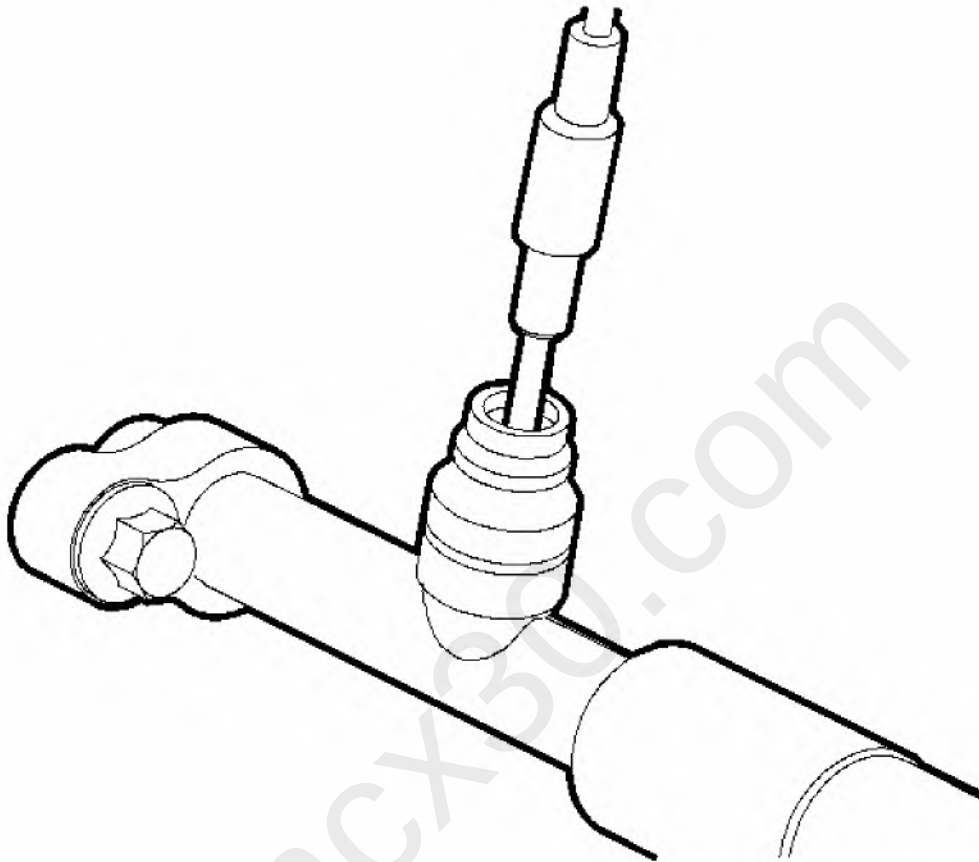


Fig. 53: Equivalent & Valve Core
Courtesy of GENERAL MOTORS CORP.

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

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

3. Test the affected A/C fittings for leaks using **J 39400-A** . See **Special Tools**.

RECEIVER DEHYDRATOR REPLACEMENT

Tools Required

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

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the front bumper fascia. Refer to **Fascia Replacement - Front Bumper (Equinox)** or **Fascia Replacement - Front Bumper (Torrent)** .

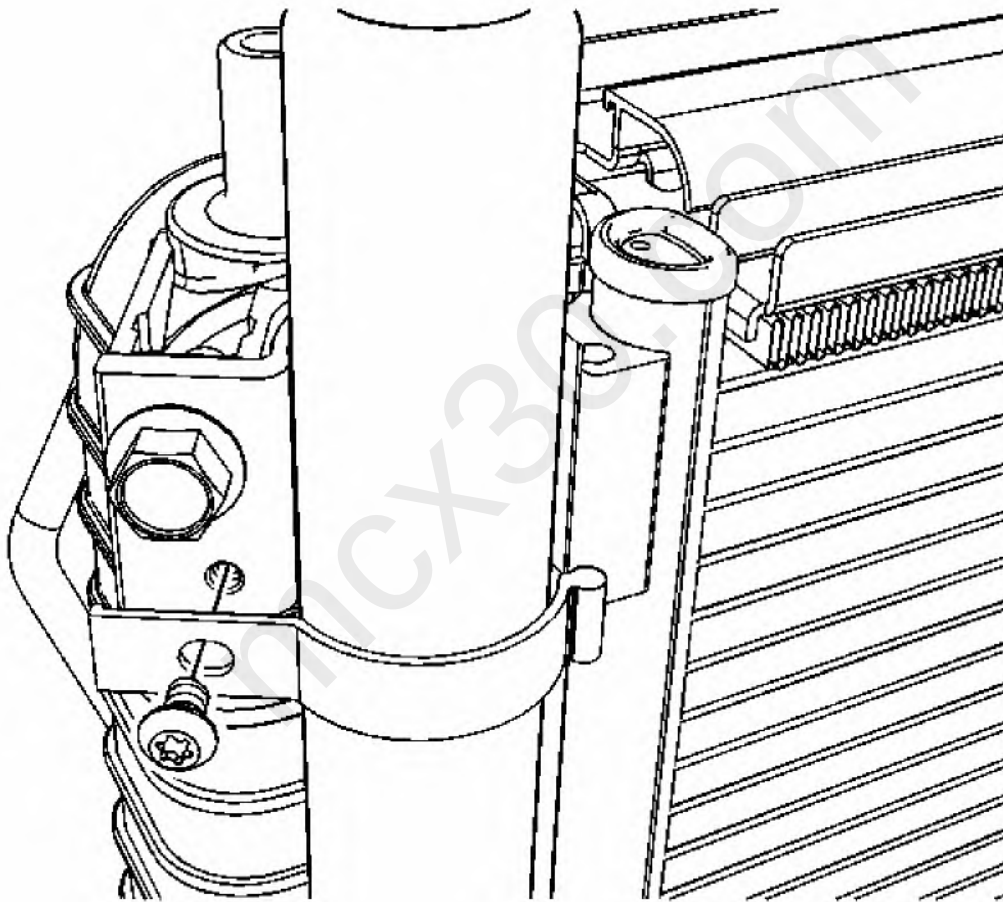


Fig. 54: View Of Receiver Dehydrator Mounting Clamp Bolt On Condenser
Courtesy of GENERAL MOTORS CORP.

3. Remove the bolt retaining the receiver dehydrator mounting clamp to the condenser.
4. Remove the receiver dehydrator mounting clamp from the condenser.

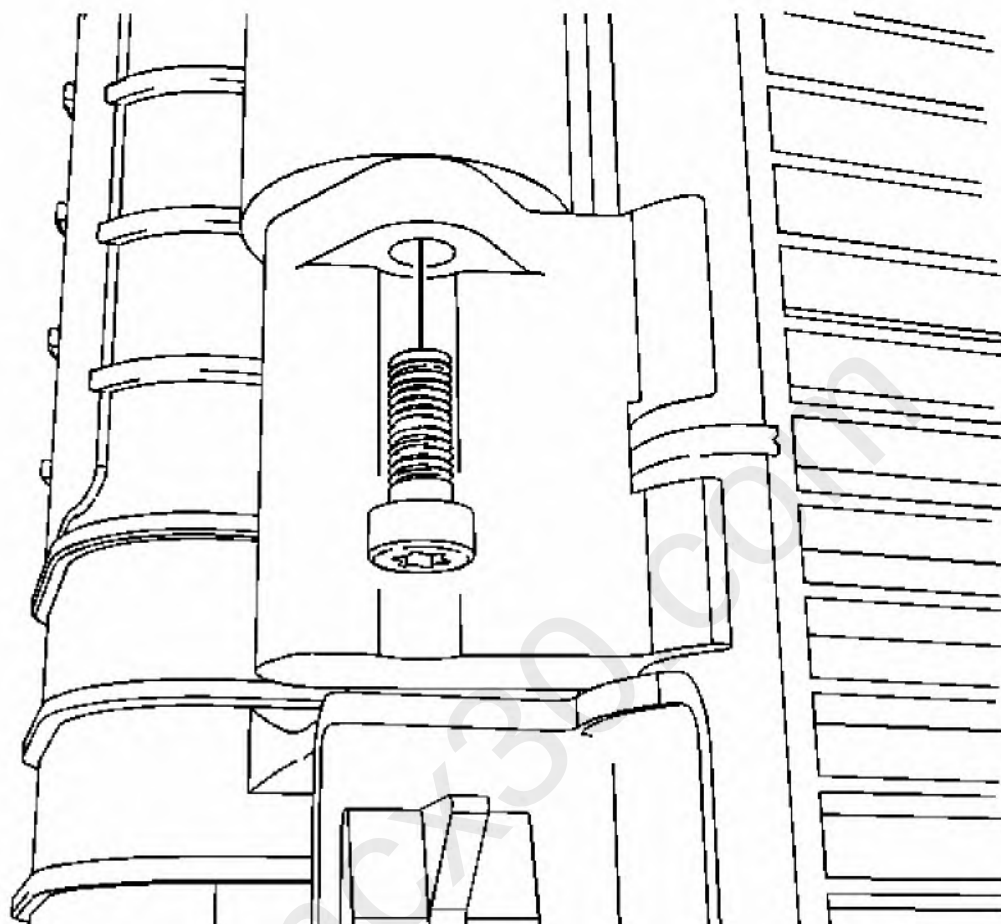


Fig. 55: View Of Lower Receiver Dehydrator Bolt On Condenser
Courtesy of GENERAL MOTORS CORP.

5. Remove the lower receiver dehydrator bolt from the condenser.

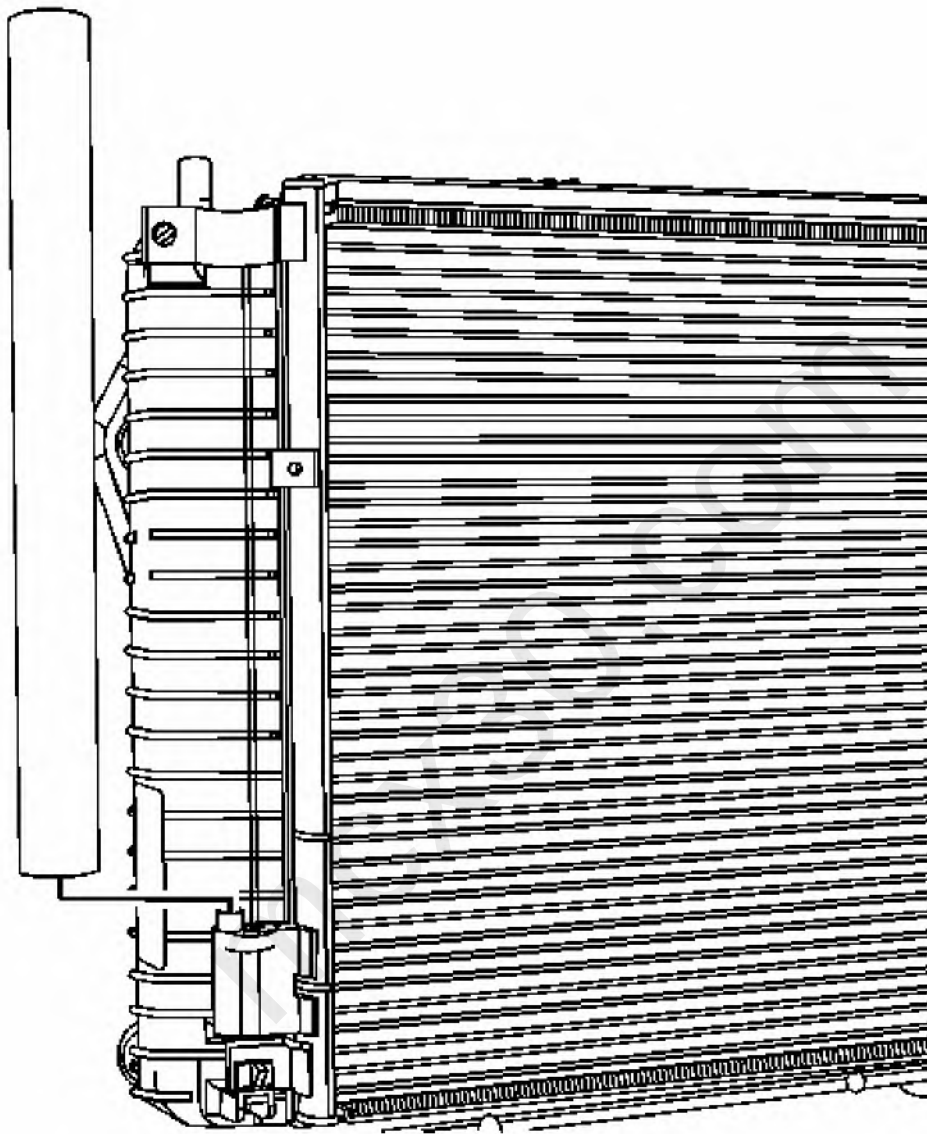


Fig. 56: View Of Receiver Dehydrator
Courtesy of GENERAL MOTORS CORP.

6. Remove the receiver dehydrator from the condenser.
7. Install protective caps to the condenser to prevent contamination and desiccant saturation.

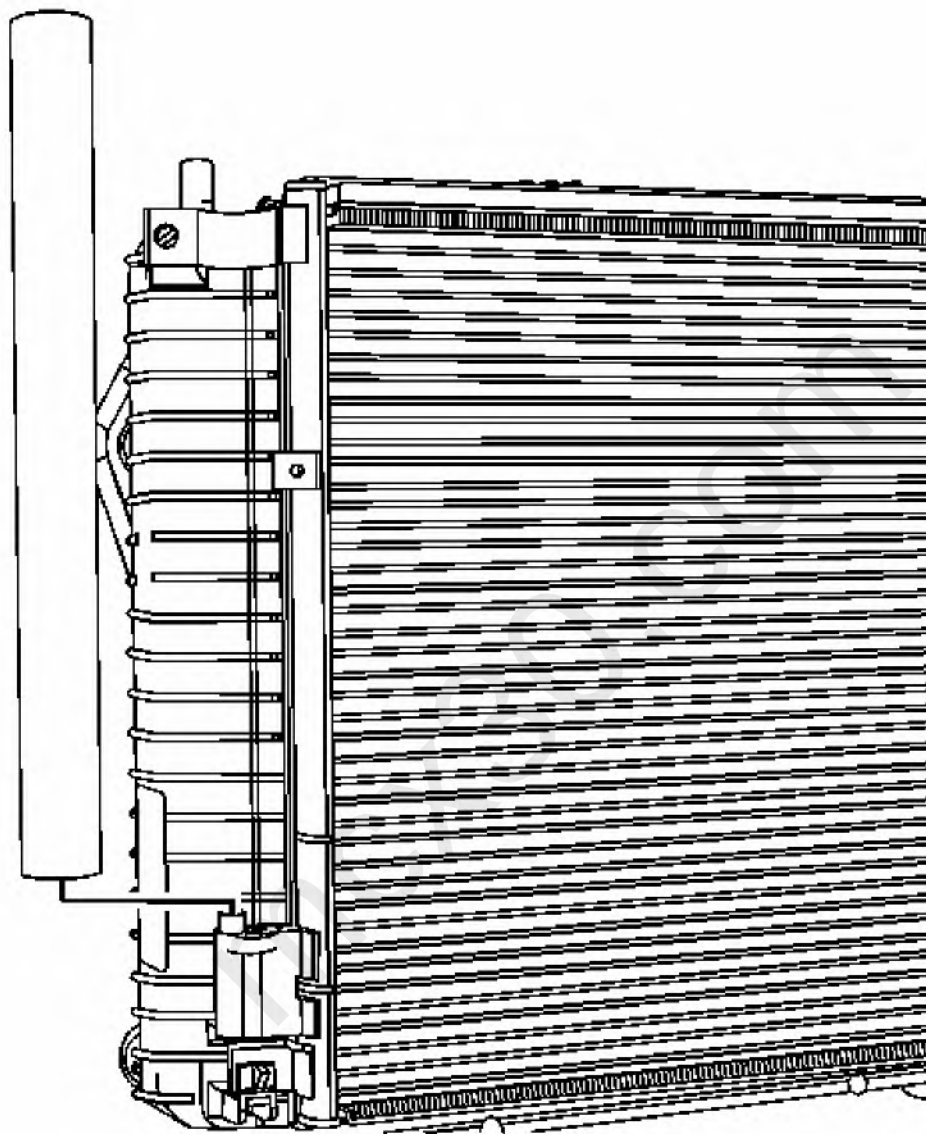


Fig. 57: View Of Receiver Dehydrator
Courtesy of GENERAL MOTORS CORP.

1. Remove the protective caps from the condenser.
2. Add the specified amount of PAG oil to the receiver dehydrator. Refer to **Refrigerant System Capacities**.
3. Install new O-rings to the receiver dehydrator. Refer to **O-Ring Replacement**.
4. Install the receiver dehydrator to the condenser.

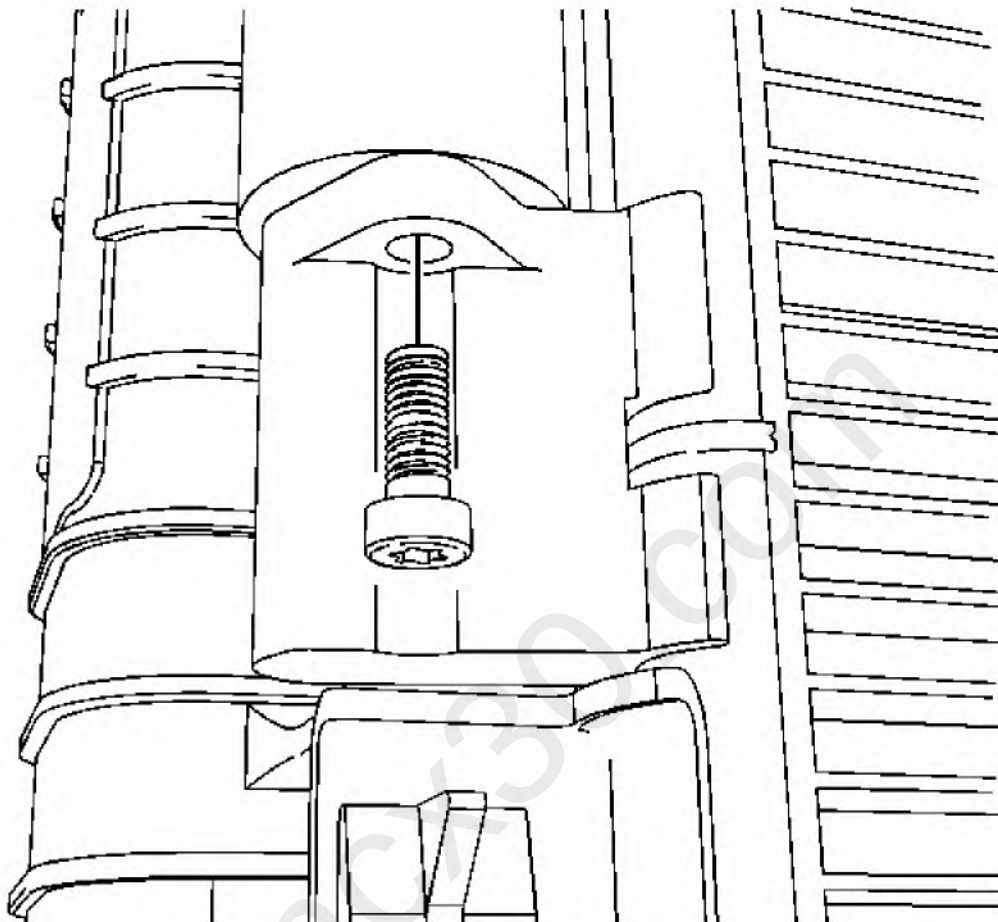


Fig. 58: View Of Lower Receiver Dehydrator Bolt On Condenser
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice.

5. Install the lower receiver dehydrator bolt to the condenser.

Tighten: Tighten the bolt to 6.5 N.m (58 lb in).

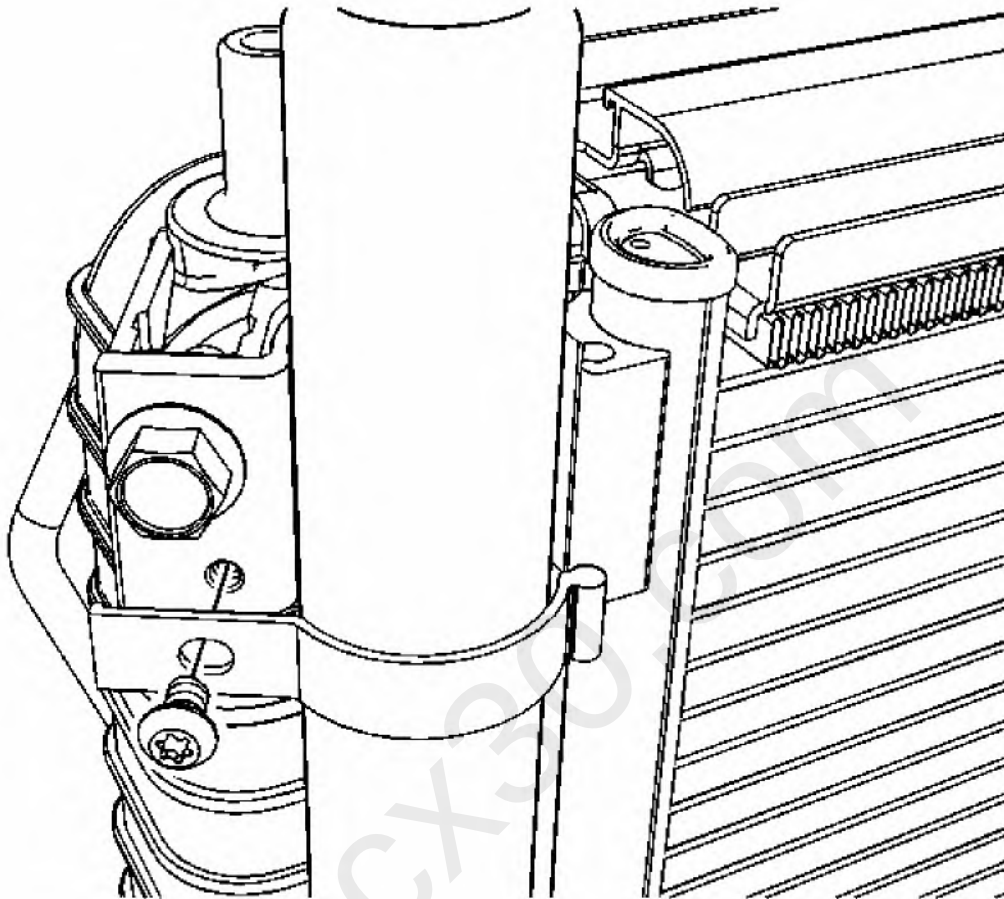


Fig. 59: View Of Receiver Dehydrator Mounting Clamp Bolt On Condenser
Courtesy of GENERAL MOTORS CORP.

6. Install the receiver dehydrator mounting clamp to the condenser.
7. Install the receiver dehydrator mounting clamp bolt to the condenser.

Tighten: Tighten the bolt to 4.2 N.m (37 lb in).

8. Install the front bumper fascia. Refer to **Fascia Replacement - Front Bumper (Equinox)** or **Fascia Replacement - Front Bumper (Torrent)**.
9. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
10. Test the affected A/C joints for leaks using **J 39400-A**. See **Special Tools**.

Tools Required

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

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

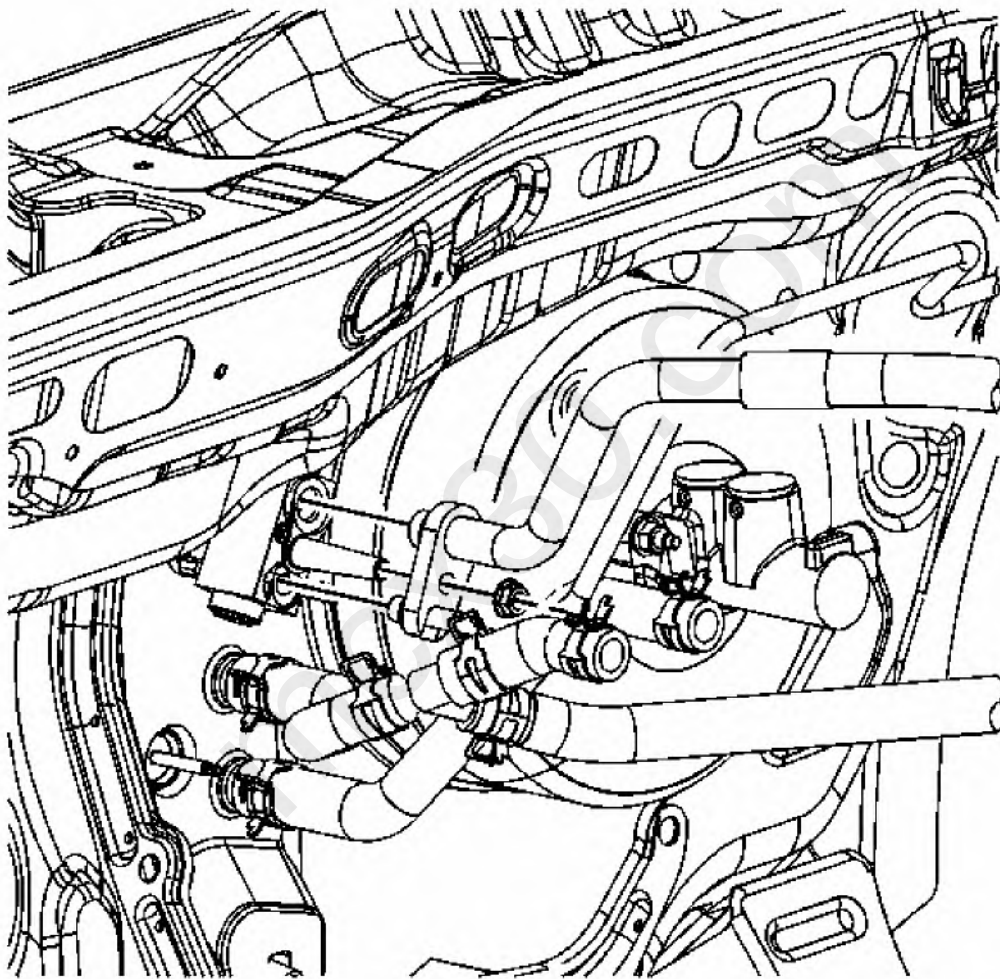


Fig. 60: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When removing the thermal expansion valve (TXV), keep dirt and foreign material from getting on or into the sealing surfaces. Clean tools and a clean work area are important for proper service. The TXV seal area should be cleaned before any repairs are performed. The parts must be kept

clean at all times and any parts to be assembled should be cleaned with a non-petroleum based solvent and dried with air. Use only lint free cloths to wipe parts. Do not allow solvent to enter evaporator or hoses.

2. Remove the evaporator outlet hose and liquid line retainer plate nut from the TXV.
3. Remove the evaporator outlet hose and liquid line from the TXV.
4. Remove and discard the sealing washers from the evaporator outlet hose and liquid line.
5. Install protective caps to the evaporator outlet hose and the liquid line to prevent contamination and desiccant saturation. Refer to **Sealing Washer Replacement**.

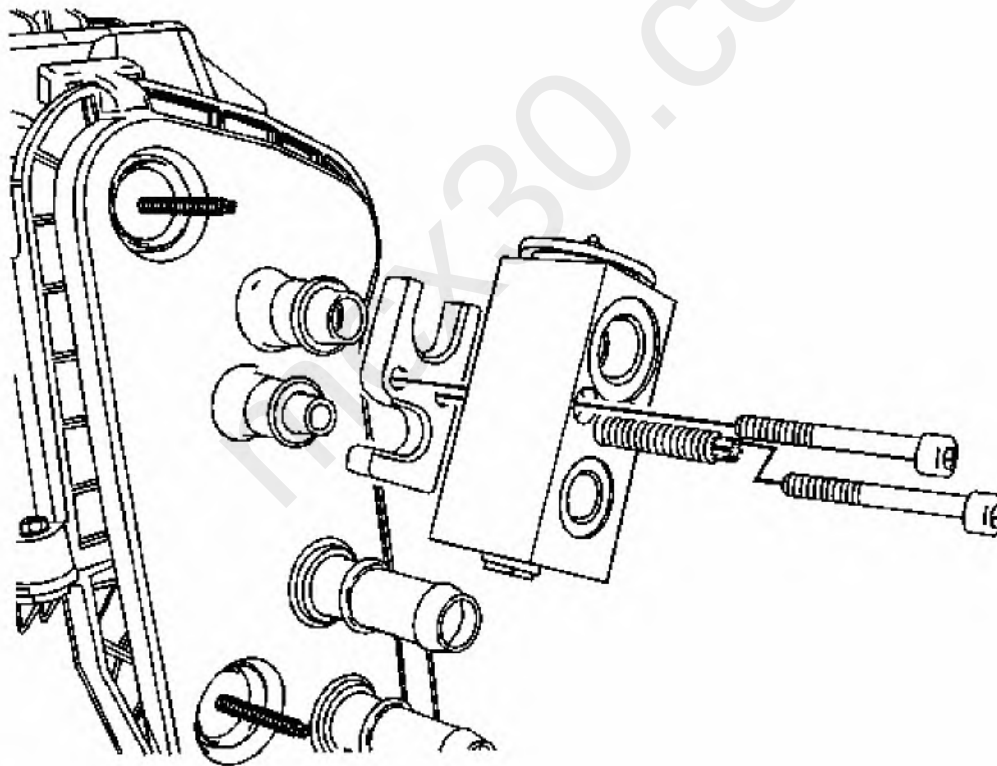


Fig. 61: View Of TXV And Backing Plate
Courtesy of GENERAL MOTORS CORP.

6. Remove the TXV bolts from the backing plate.
7. Remove the TXV and the backing plate from the vehicle.
8. Remove and discard the seal washers from the evaporator pipes. Refer to **Sealing**

Washer Replacement.

9. Install a protective cap to the evaporator pipes to prevent contamination and desiccant saturation.

Installation Procedure

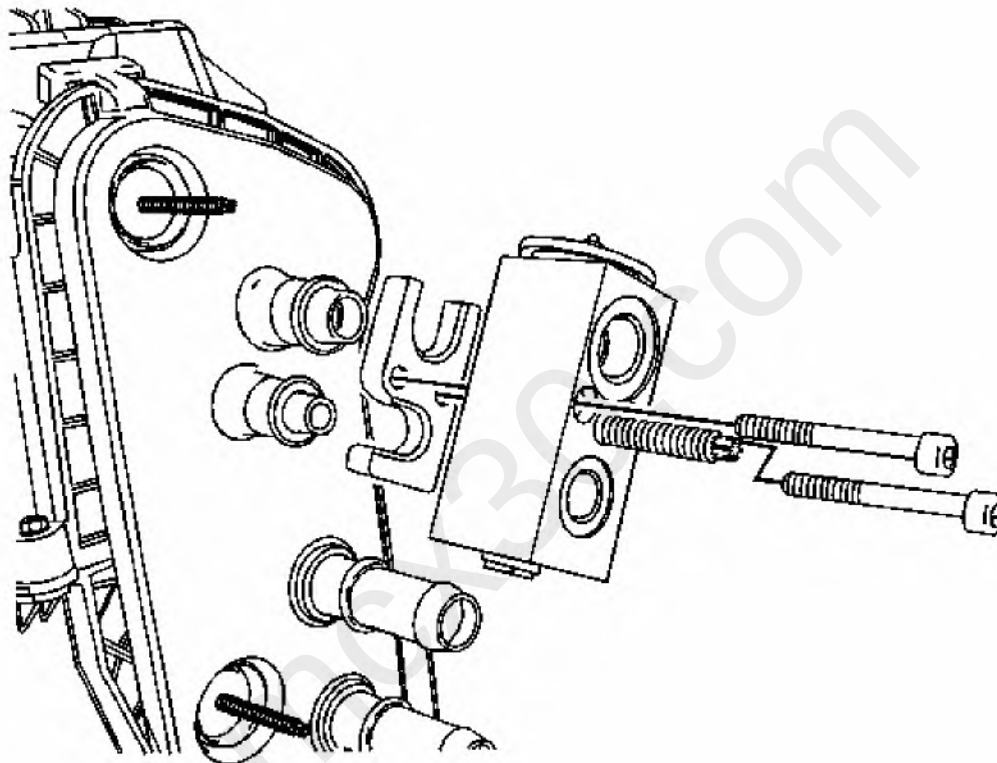


Fig. 62: View Of TXV And Backing Plate
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use only lint free cloths to wipe parts. Do not allow any solvent to enter evaporator or hoses.

1. Remove the protective caps from the evaporator pipes and ensure the seal areas are clean, dry and lint free.
2. Install new seal washers to the evaporator pipes. Refer to **Sealing Washer Replacement.**
3. Remove the protective caps from the TXV.
4. Install the TXV and the backing plate to the evaporator pipes.

NOTE: Refer to Fastener Notice.

5. Install the TXV bolts to the backing plate.

Tighten: Tighten the bolts to 3.5 N.m (31 lb in).

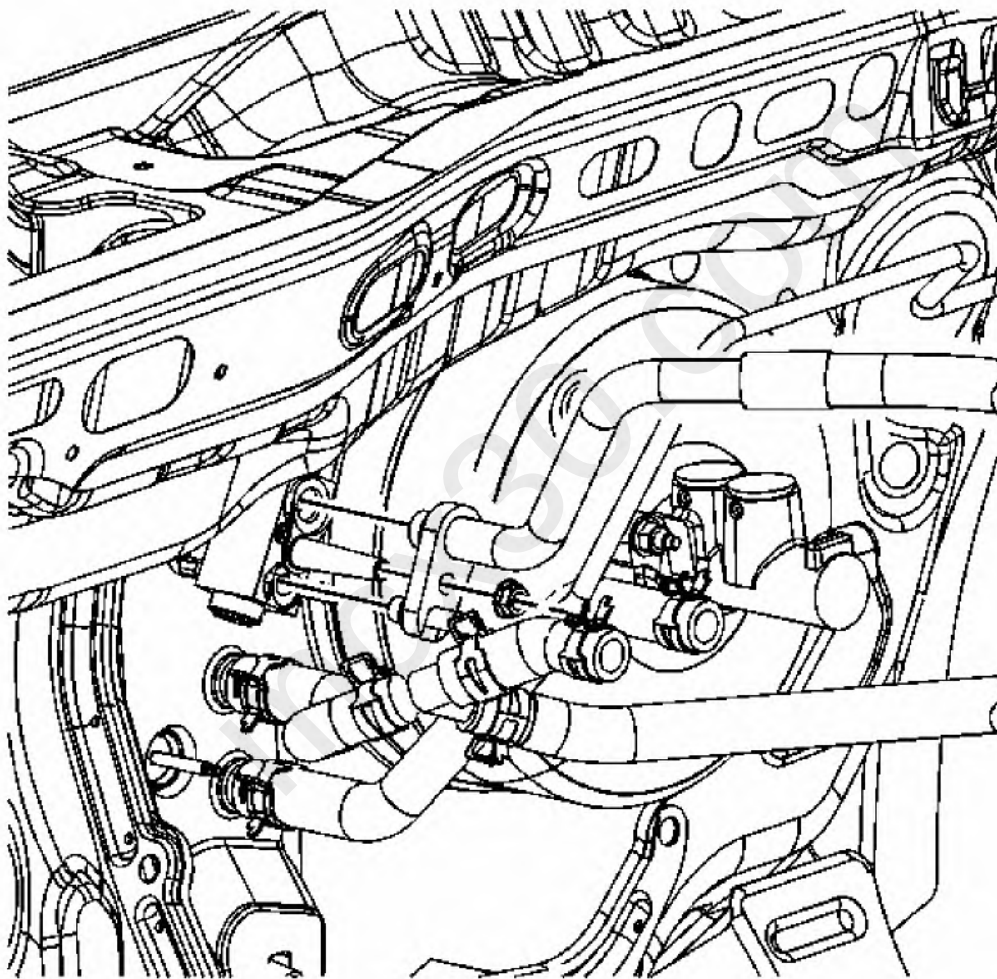


Fig. 63: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

6. Remove the protective caps from the liquid line and the evaporator outlet hose.
7. Install new seal washers to the liquid line and the evaporator outlet hose. Refer to **Sealing Washer Replacement**.
8. Install the liquid line and the evaporator outlet hose to the TXV.

9. Install the liquid line and evaporator outlet hose retainer plate nut to the TXV.

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

10. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
11. Test the affected A/C joints for leaks using **J 39400-A** . See **Special Tools**.

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT

Removal Procedure

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

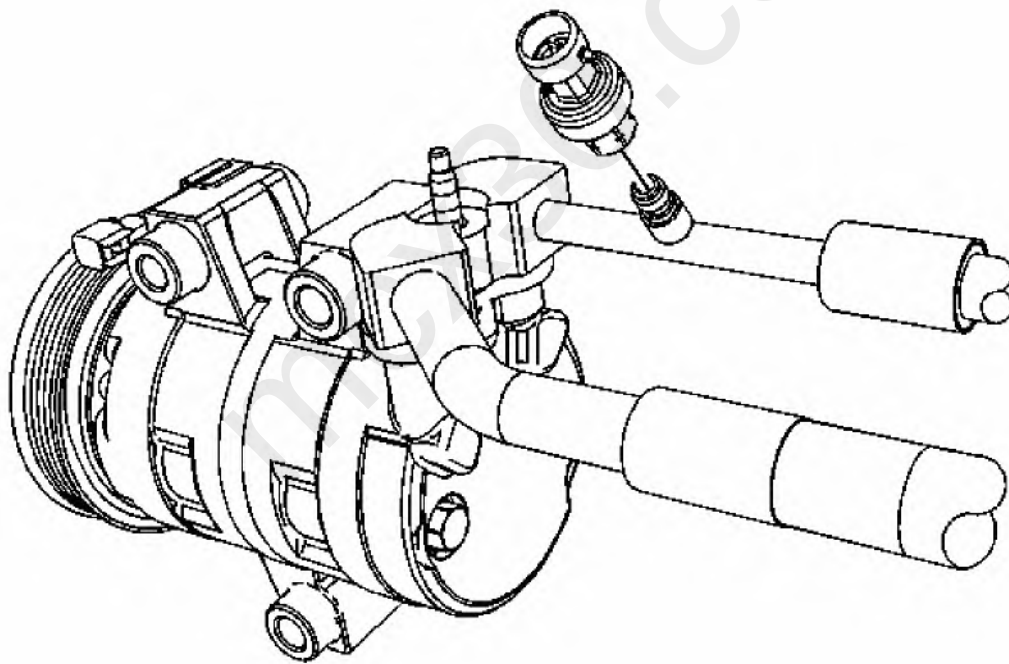


Fig. 64: View Of Refrigerant Pressure Sensor On Compressor Hose
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector from the refrigerant pressure sensor.
3. Remove the refrigerant pressure sensor from the compressor hose.

Installation Procedure

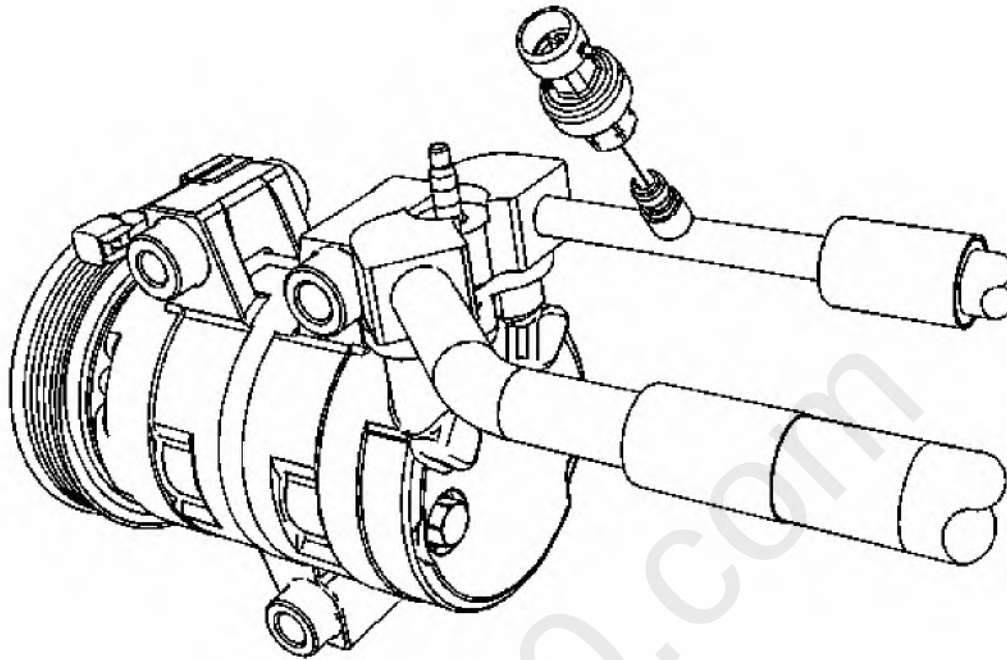


Fig. 65: View Of Refrigerant Pressure Sensor On Compressor Hose
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use R-12 refrigerant oil (mineral) to lubricate O-rings. Use of R-134a polyalkylene glycol (PAG) oil will cause premature corrosion of fitting joints.

1. Lubricate the refrigerant pressure sensor O-ring with mineral oil. Refer to **O-Ring Replacement**.

NOTE: Refer to Fastener Notice.

2. Hand start the refrigerant pressure sensor to the compressor hose, taking care not to pinch the O-ring and tighten.

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

3. Install the electrical connector to the refrigerant pressure sensor.
4. Lower the vehicle.

Removal Procedure

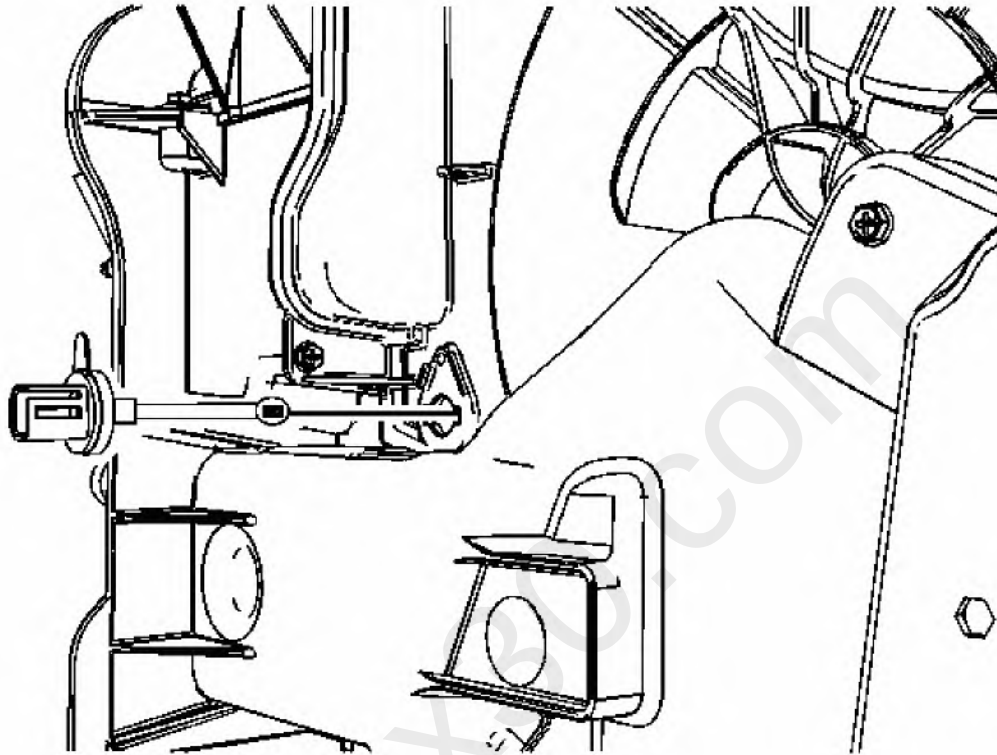


Fig. 66: View Of Refrigerant Low Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

1. Remove the left side insulator/closeout panel. Refer to **Closeout/Insulator Panel Replacement - Left** .
2. Disconnect the temperature sensor connector from the temperature sensor.
3. Twist the temperature sensor one quarter turn to disengage from the evaporator case assembly.
4. Remove the temperature sensor from the evaporator case assembly.

Installation Procedure

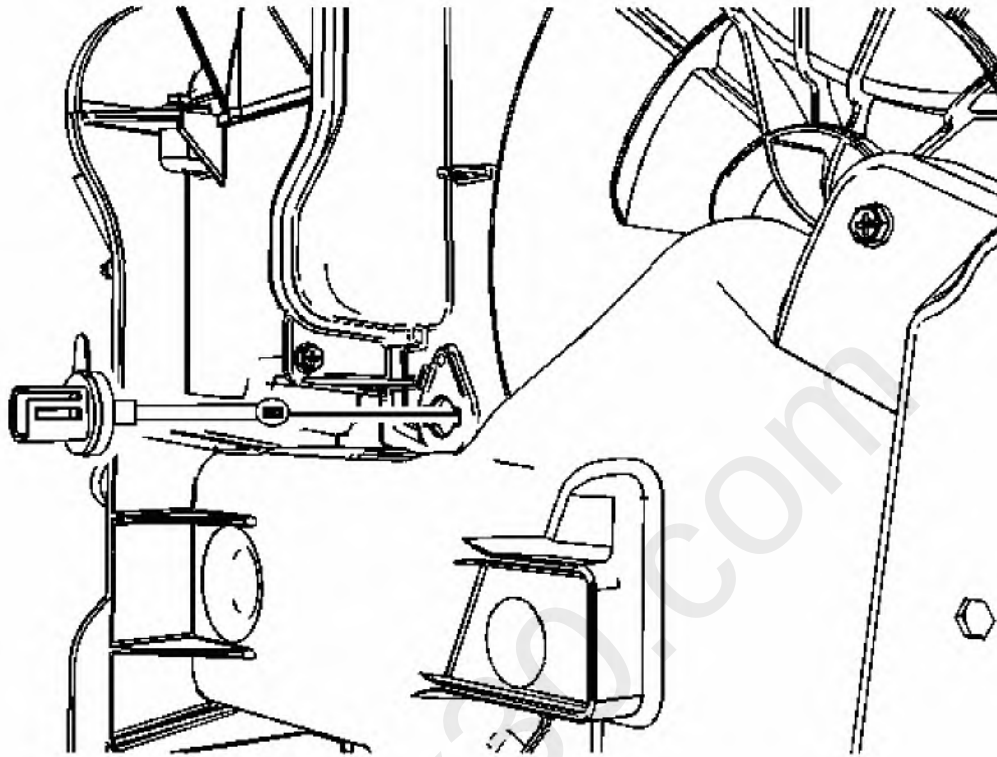


Fig. 67: View Of Refrigerant Low Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

1. Install the temperature sensor to the evaporator case assembly.
2. Twist the temperature sensor one quarter turn to engage to the evaporator case assembly.
3. Install the temperature sensor connector to the temperature sensor.
4. Install the left side insulator/closeout panel. Refer to **Closeout/Insulator Panel Replacement - Left**.

CONDENSER REPLACEMENT

Tools Required

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

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the front fascia. Refer to **Fascia Replacement - Front Bumper (Equinox) or**

Fascia Replacement - Front Bumper (Torrent) .

3. For Pontiac models, remove the hood latch. Refer to **Hood Latch Replacement** .

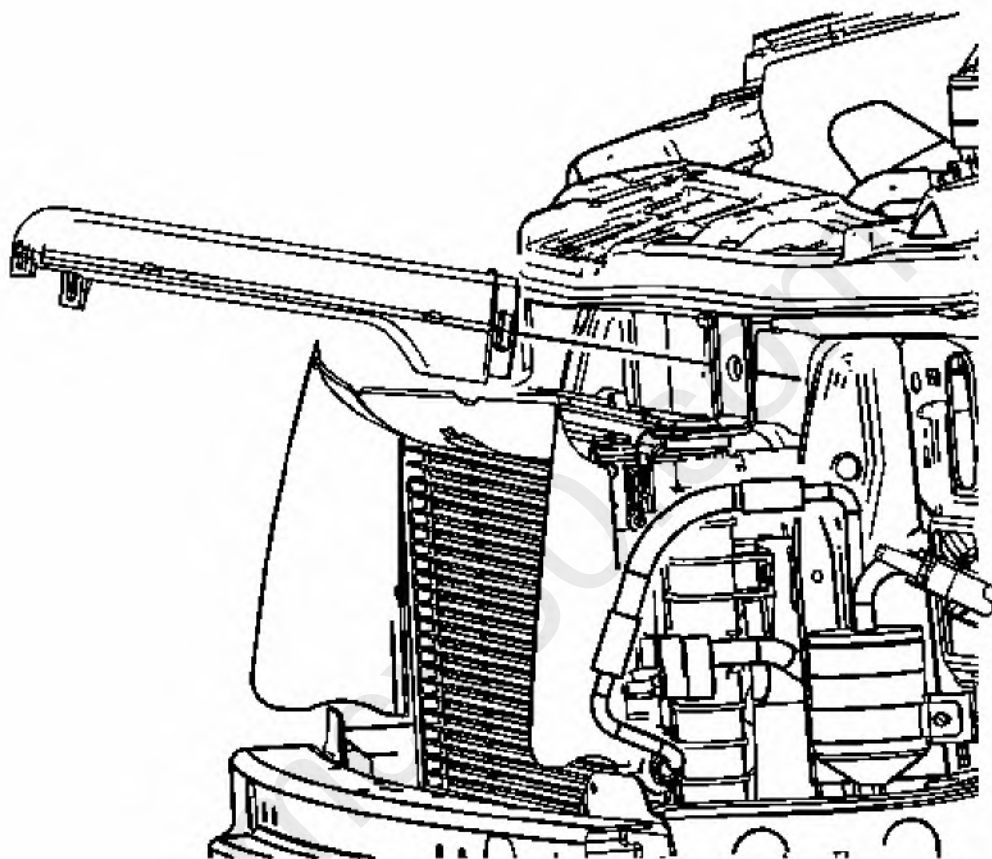


Fig. 68: View Of Battery Box Air Inlet Duct
Courtesy of GENERAL MOTORS CORP.

4. Remove the battery box air duct.

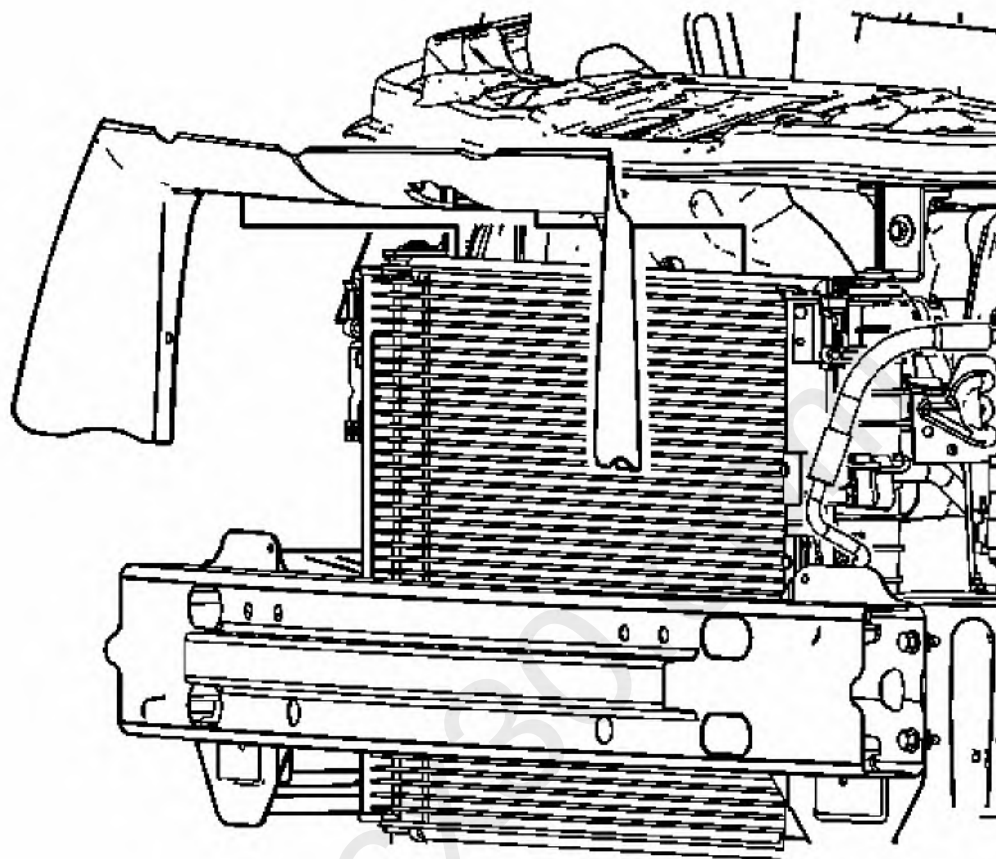


Fig. 69: View Of CRFM Closeout Panel
Courtesy of GENERAL MOTORS CORP.

5. Remove the condenser radiator fan module (CRFM) closeout panel.

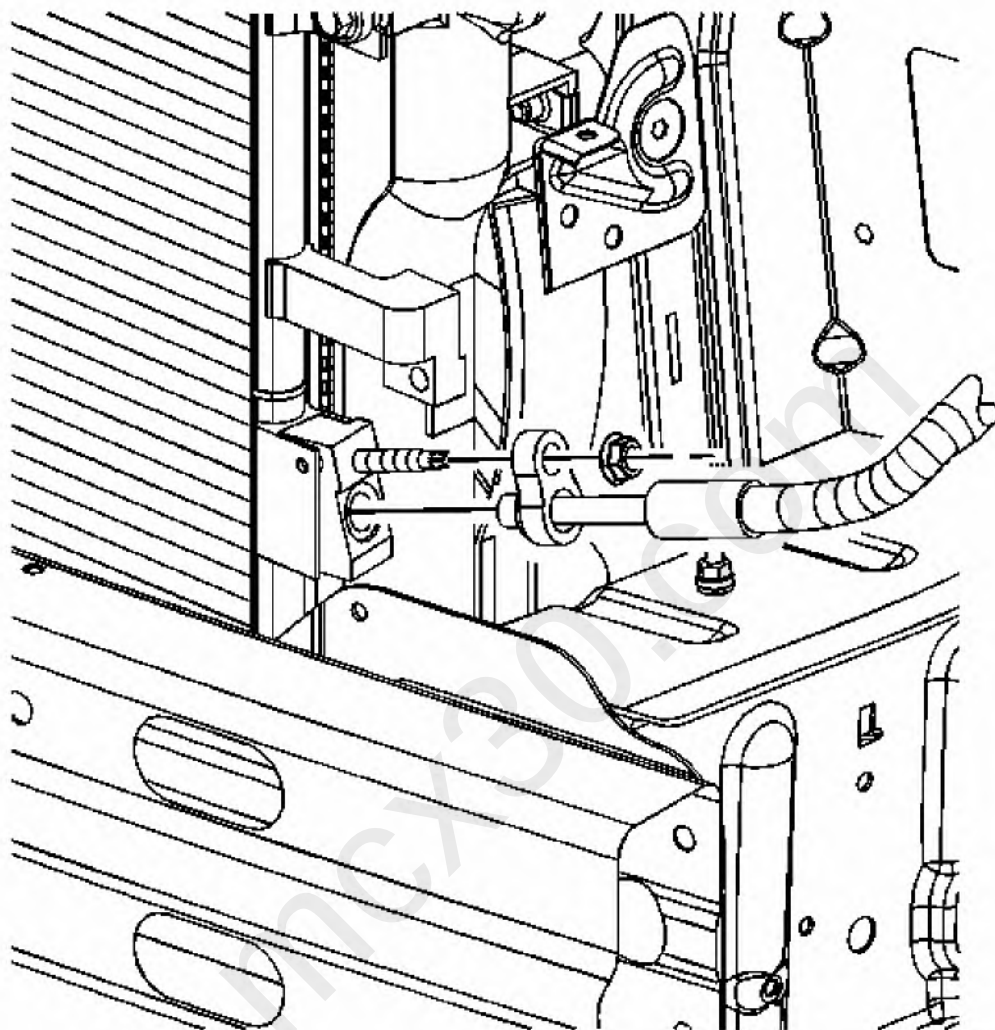


Fig. 70: View Of Liquid Line Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

6. Remove the liquid line nut from the condenser.
7. Remove the liquid line from the condenser.
8. Install a protective cap to the liquid line to prevent contamination and desiccant saturation.

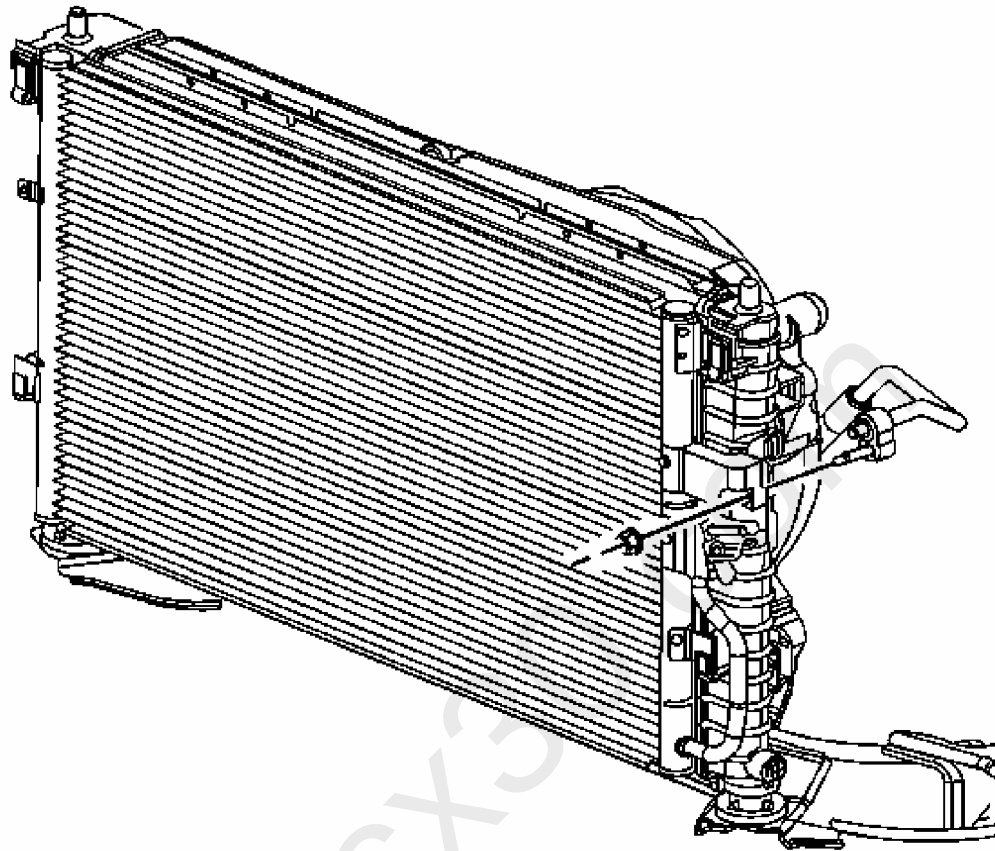


Fig. 71: View Of Compressor Hose Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

9. Remove the compressor hose nut from the condenser.
10. Remove the compressor hose from the condenser.
11. Install a protective cap to the compressor hose to prevent contamination and desiccant saturation.

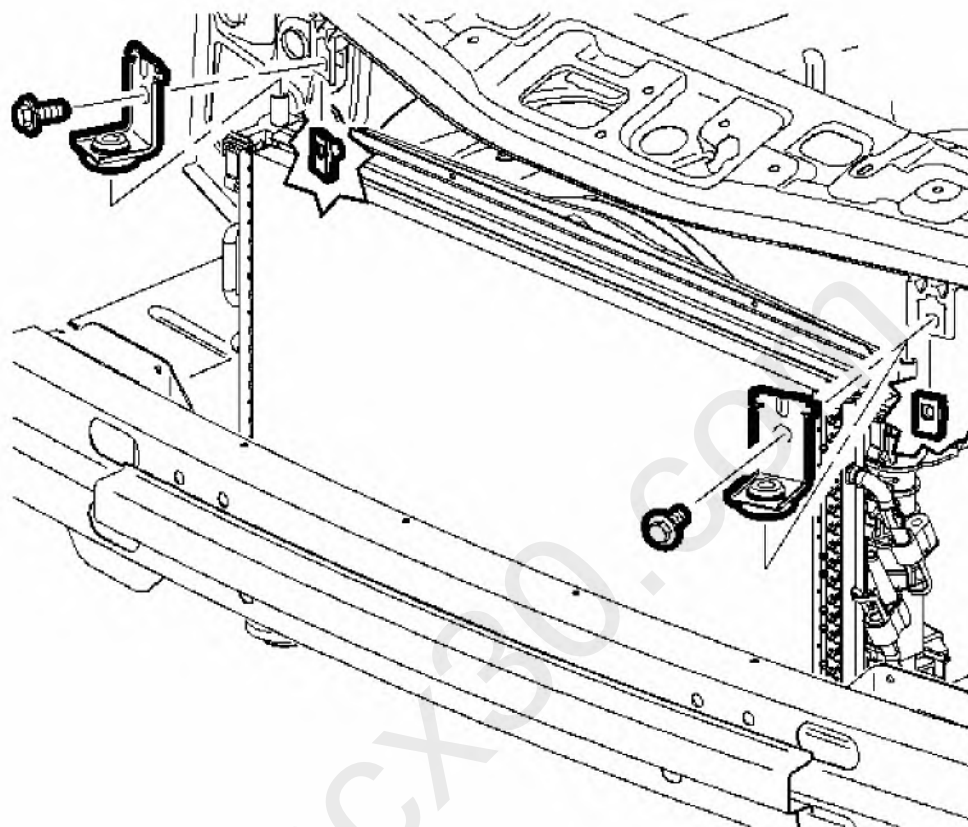


Fig. 72: View Of CRFM Mounting Brackets To The Radiator Support
Courtesy of GENERAL MOTORS CORP.

12. Remove the CRFM bracket bolts from the radiator support.
13. Remove the CRFM brackets from the vehicle.

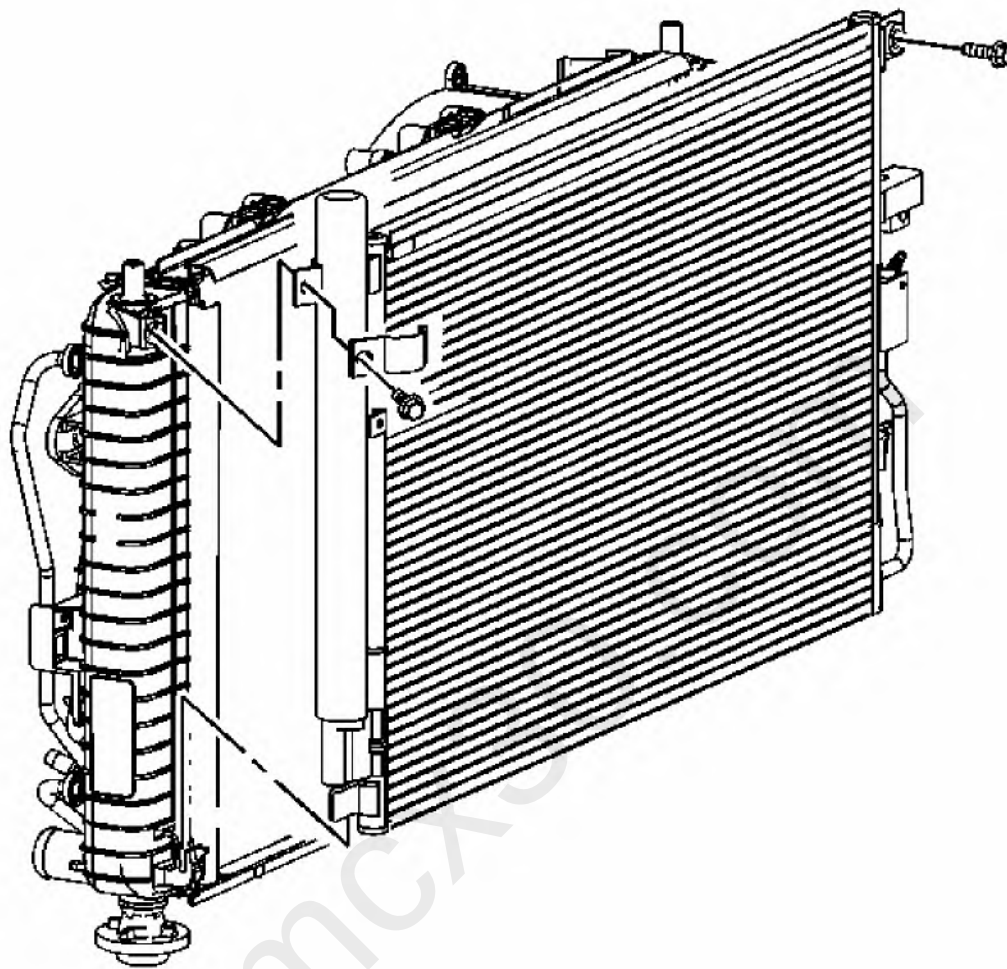


Fig. 73: View Of Condenser
Courtesy of GENERAL MOTORS CORP.

14. Remove the bolts retaining the top of the condenser to the radiator.
15. Remove the condenser from the vehicle.

Installation Procedure

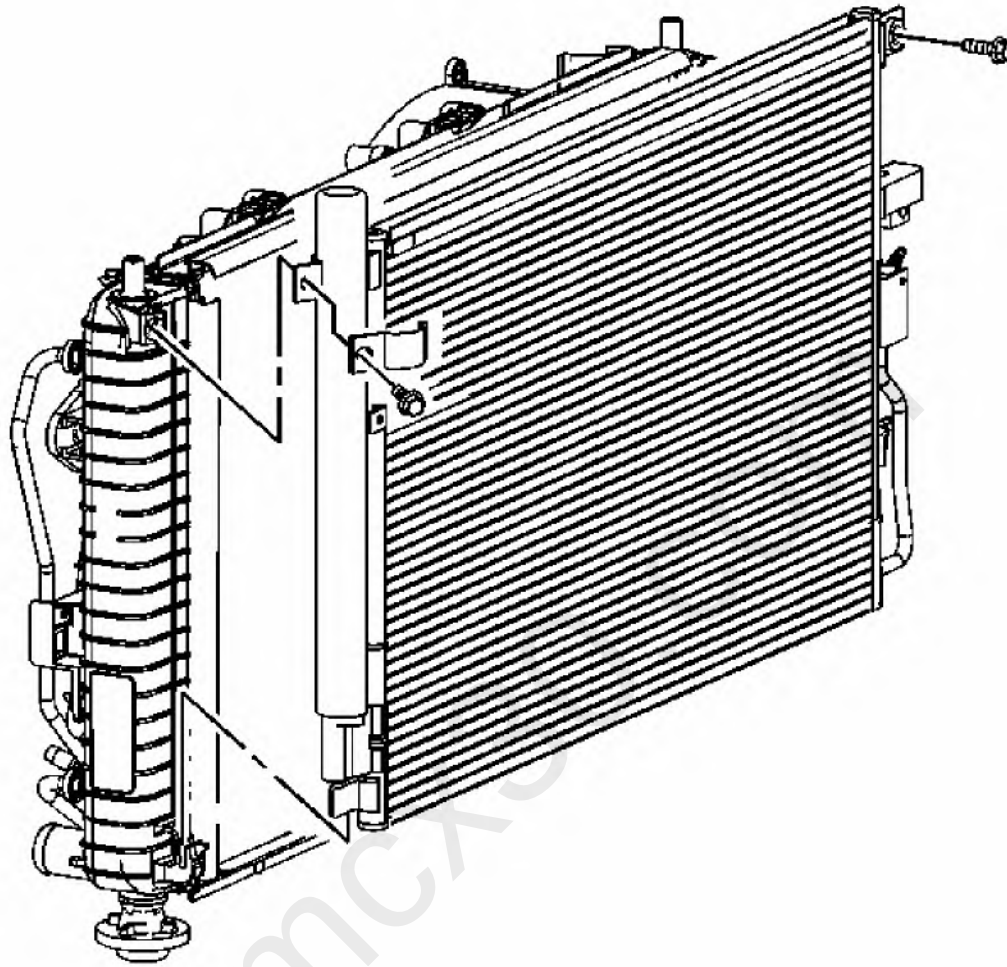


Fig. 74: View Of Condenser
Courtesy of GENERAL MOTORS CORP.

1. Add the specified amount of PAG oil to the condenser. Refer to **Refrigerant System Capacities**.
2. Inspect the radiator to condenser seals for the proper position.
3. Install the condenser to the lower retention clips on the radiator.

NOTE: **Refer to Fastener Notice.**

4. Install the bolts to retain the top of the condenser to the radiator.

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

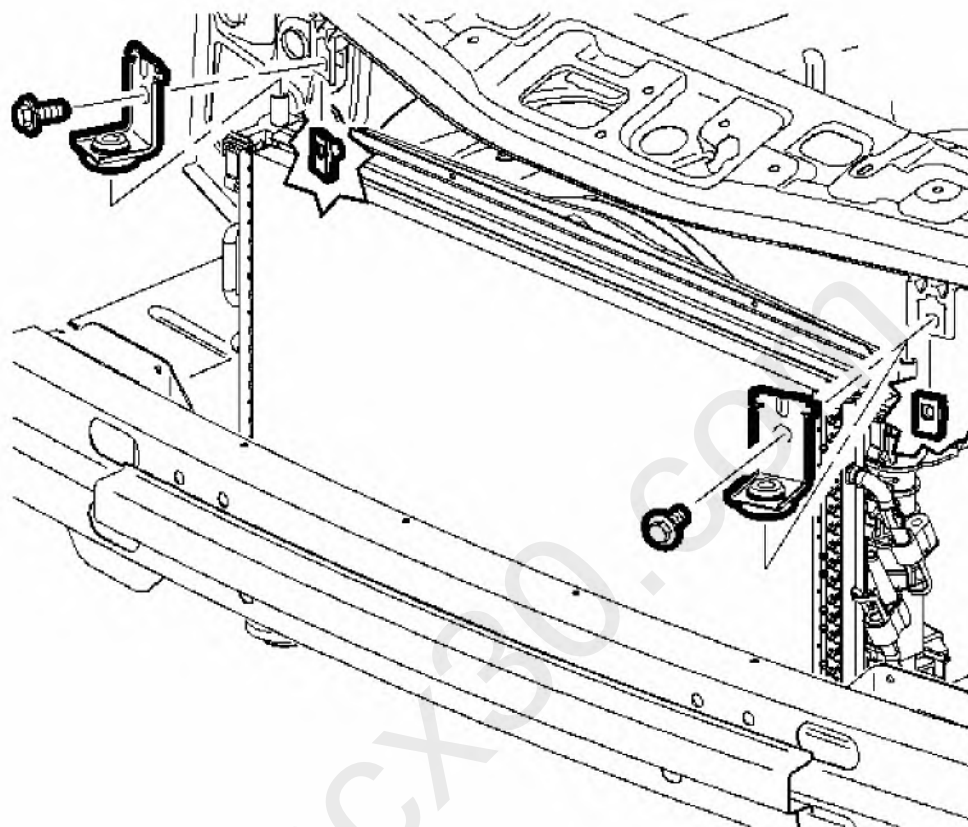


Fig. 75: View Of CRFM Mounting Brackets To The Radiator Support
Courtesy of GENERAL MOTORS CORP.

5. Install the CRFM brackets to the vehicle.
6. Install the CRFM bracket bolts to the radiator support.

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

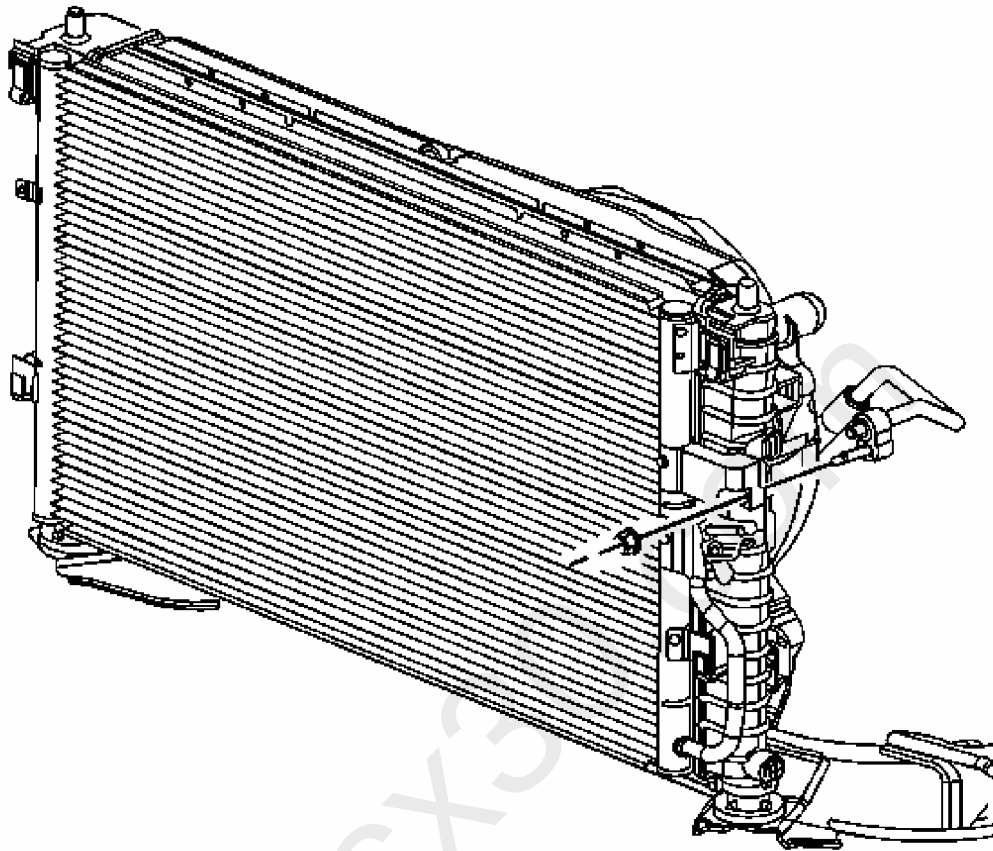


Fig. 76: View Of Compressor Hose Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

7. Remove the protective cap from the compressor hose.
8. Install a new sealing washer to the compressor hose. Refer to **Sealing Washer Replacement**.
9. Install the compressor hose to the condenser.
10. Install compressor hose nut to the condenser.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

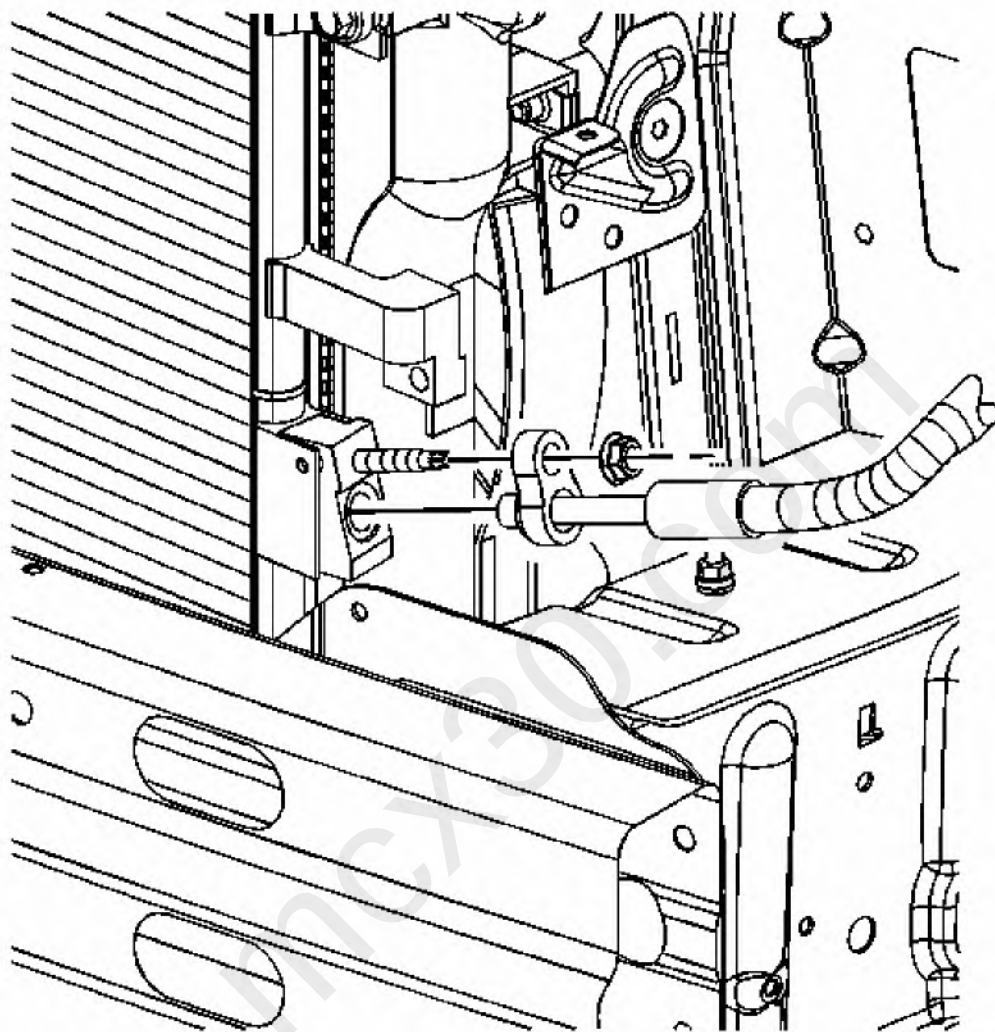


Fig. 77: View Of Liquid Line Nut On Condenser
Courtesy of GENERAL MOTORS CORP.

11. Install a new seal washer to the liquid line. Refer to **Sealing Washer Replacement**.
12. Install the liquid line to the condenser.
13. Install the liquid line nut to the condenser.

Tighten: Tighten the nut to 22 N.m (16 lb ft).

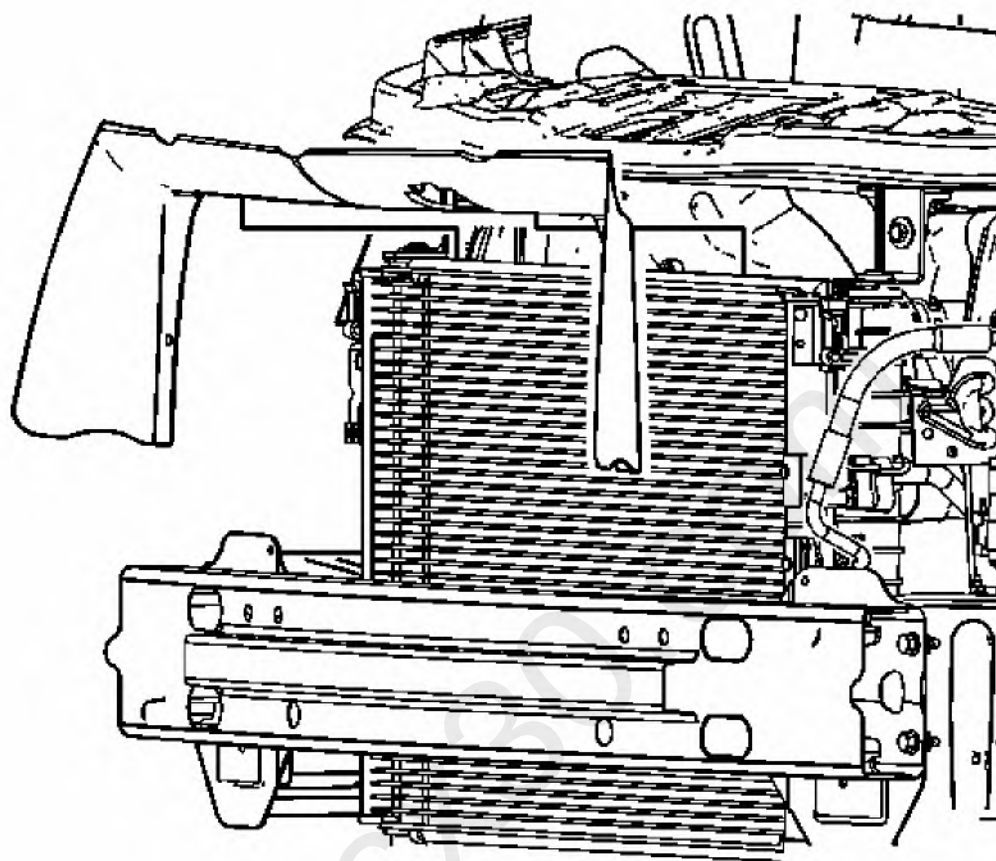


Fig. 78: View Of CRFM Closeout Panel
Courtesy of GENERAL MOTORS CORP.

14. Install the CRFM closeout panel.

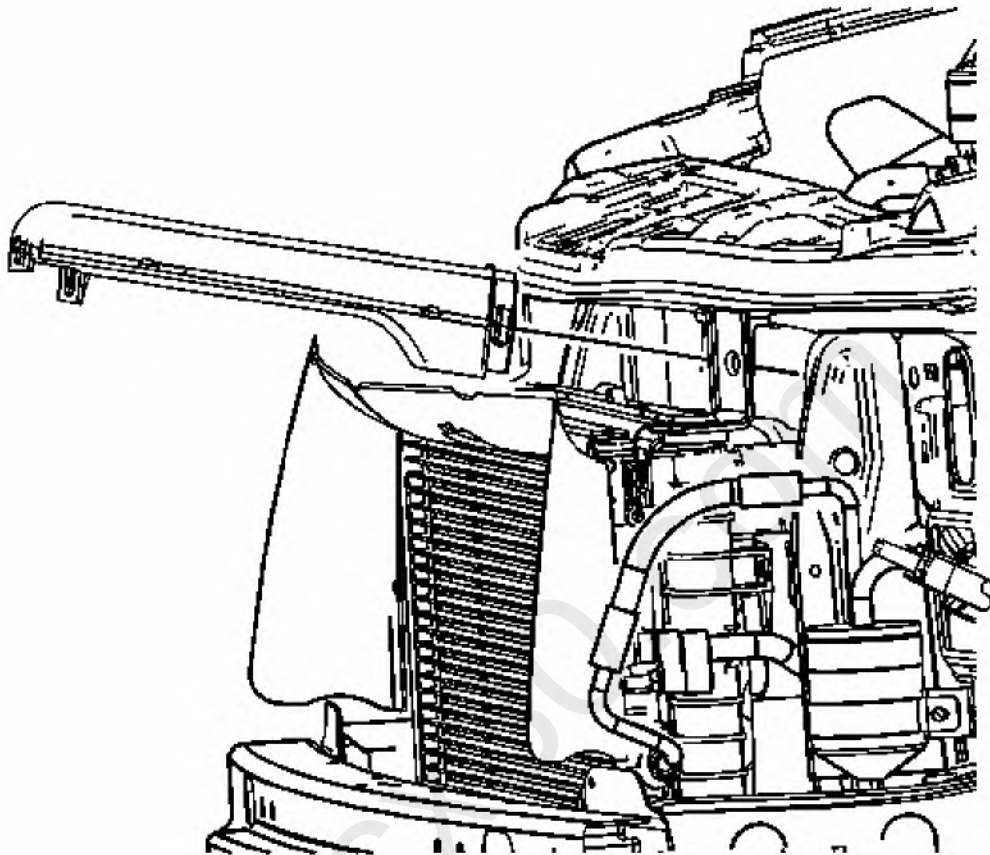


Fig. 79: View Of Battery Box Air Inlet Duct
Courtesy of GENERAL MOTORS CORP.

15. Install the battery box air duct.
16. For Pontiac models, install the hood latch assembly. Refer to **Hood Latch Replacement** .
17. Install the front fascia. Refer to **Fascia Replacement - Front Bumper (Equinox)** or **Fascia Replacement - Front Bumper (Torrent)** .
18. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
19. Test the affected A/C joints leaks using **J 39400-A** . See **Special Tools**.

AIR CONDITIONING (A/C) EVAPORATOR CASE ASSEMBLY REPLACEMENT

Removal Procedure

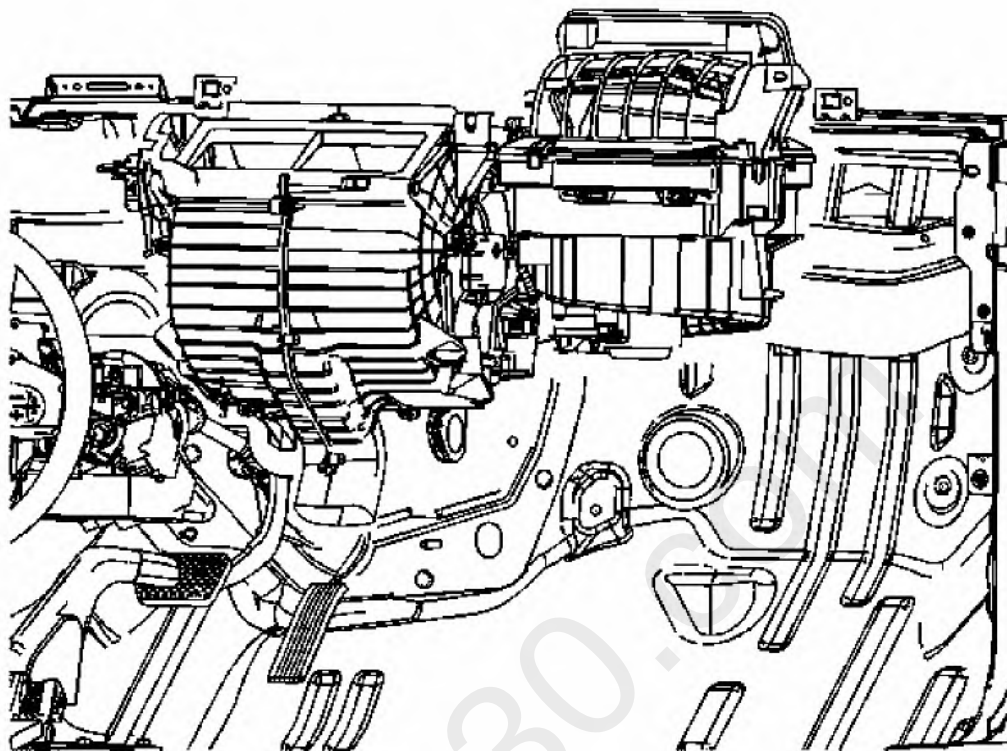


Fig. 80: View Of HVAC Module
Courtesy of GENERAL MOTORS CORP.

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

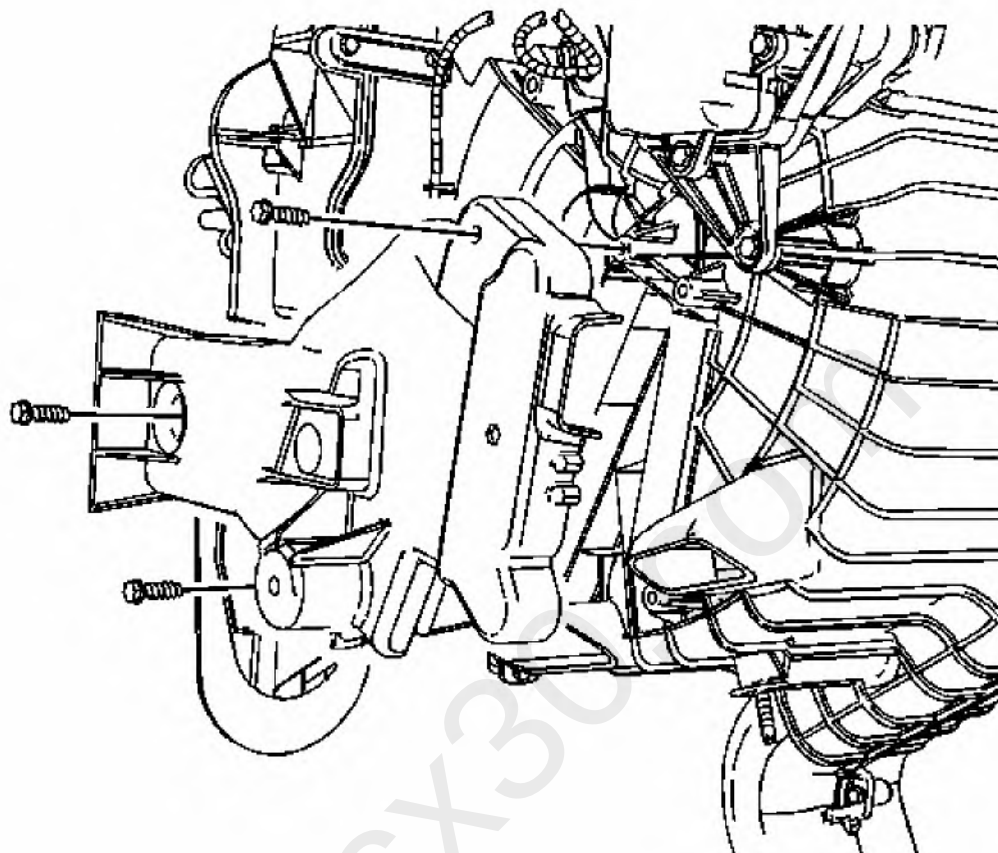


Fig. 81: View Of Heater Core Cover Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the heater core cover screws from the evaporator case assembly.
3. Remove the heater core cover from the evaporator case assembly.

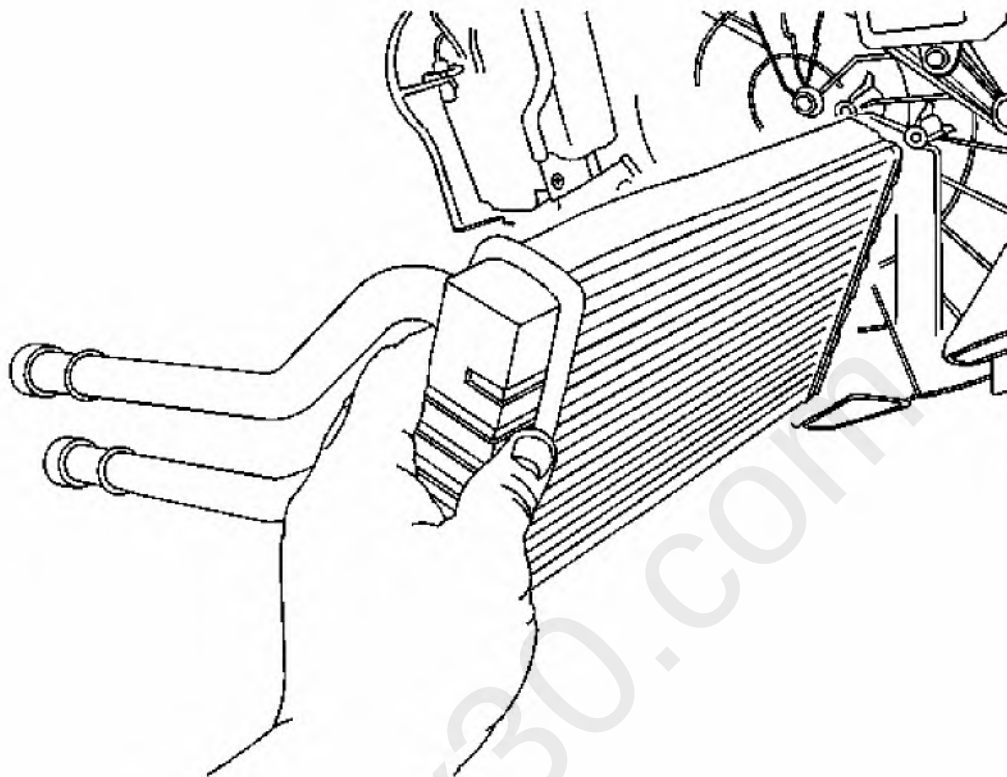


Fig. 82: View Of Heater Core
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core from the HVAC module.

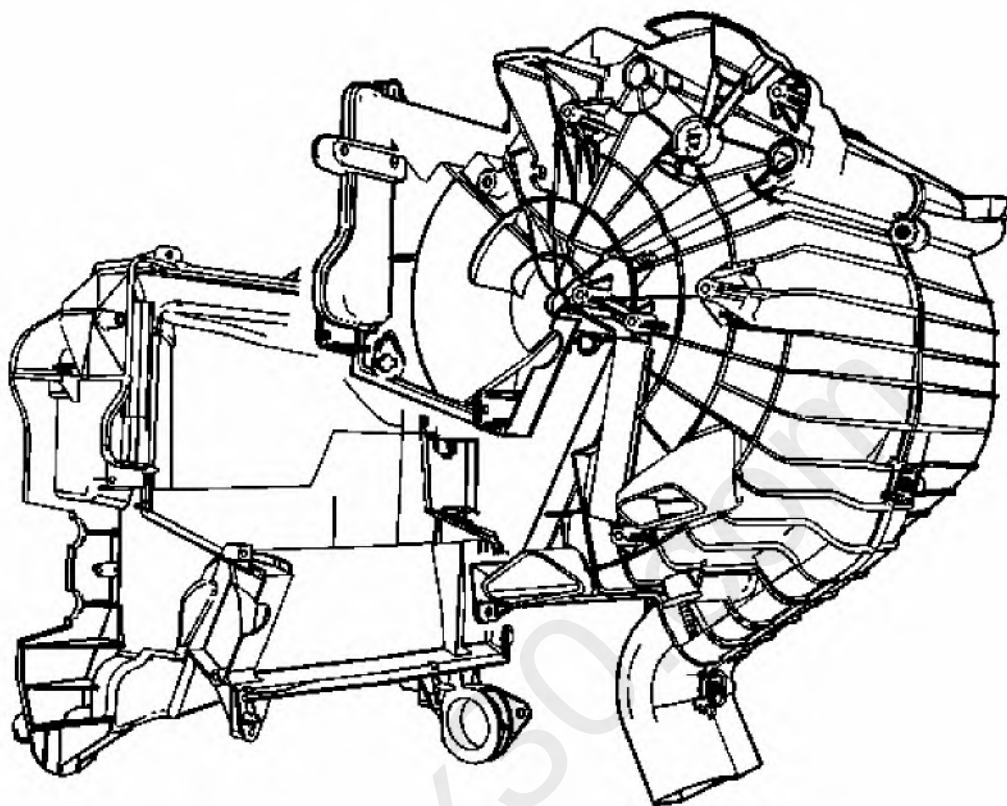


Fig. 83: View Of Evaporator Case Assembly
Courtesy of GENERAL MOTORS CORP.

5. Remove the evaporator case assembly screws from the blower case assembly.
6. Remove the evaporator case assembly from the blower case assembly.

Installation Procedure

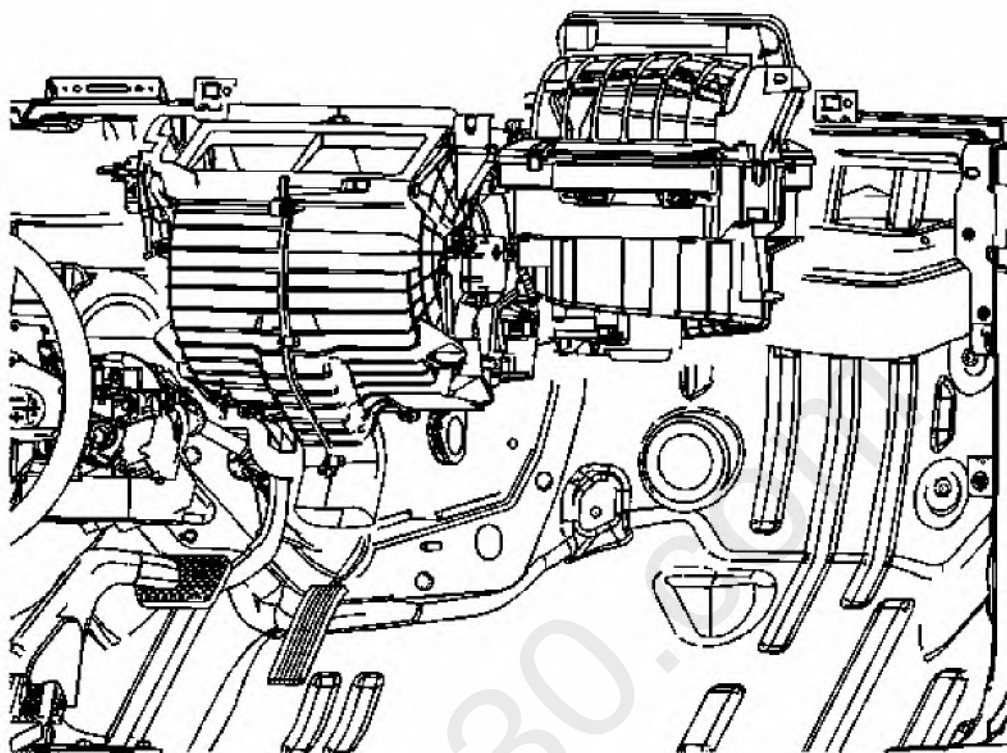


Fig. 84: View Of HVAC Module
Courtesy of GENERAL MOTORS CORP.

1. Install evaporator case assembly to the blower case assembly.

NOTE: Refer to Fastener Notice.

2. Install evaporator case assembly screws to the blower case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

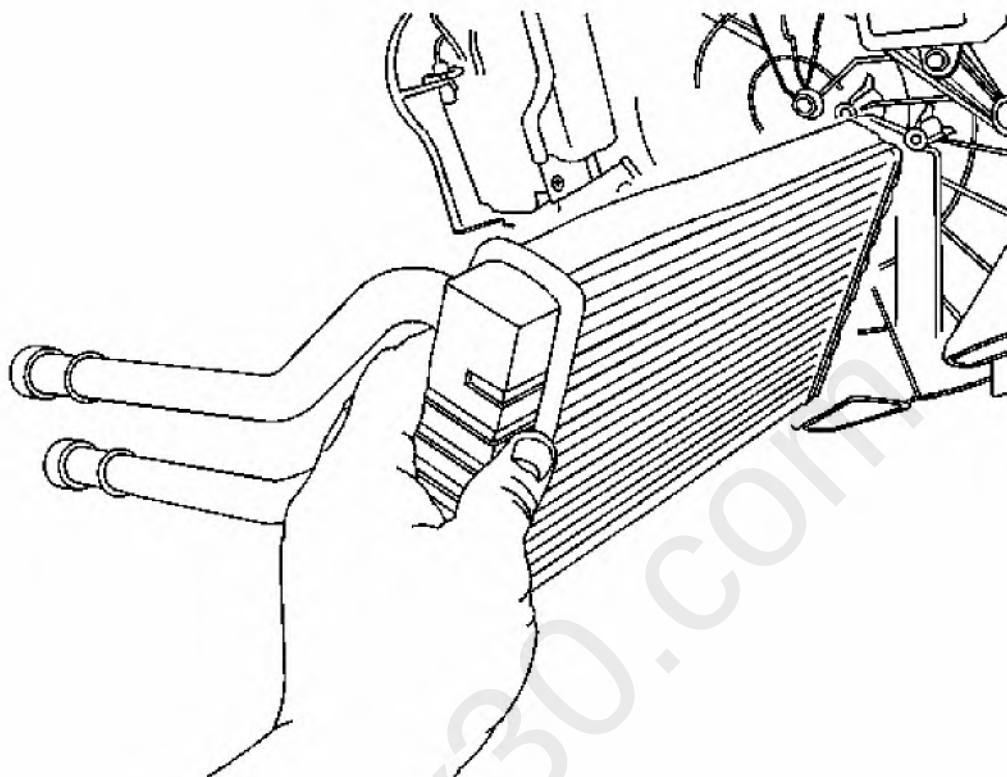


Fig. 85: View Of Heater Core
Courtesy of GENERAL MOTORS CORP.

3. Install heater core to the HVAC module.

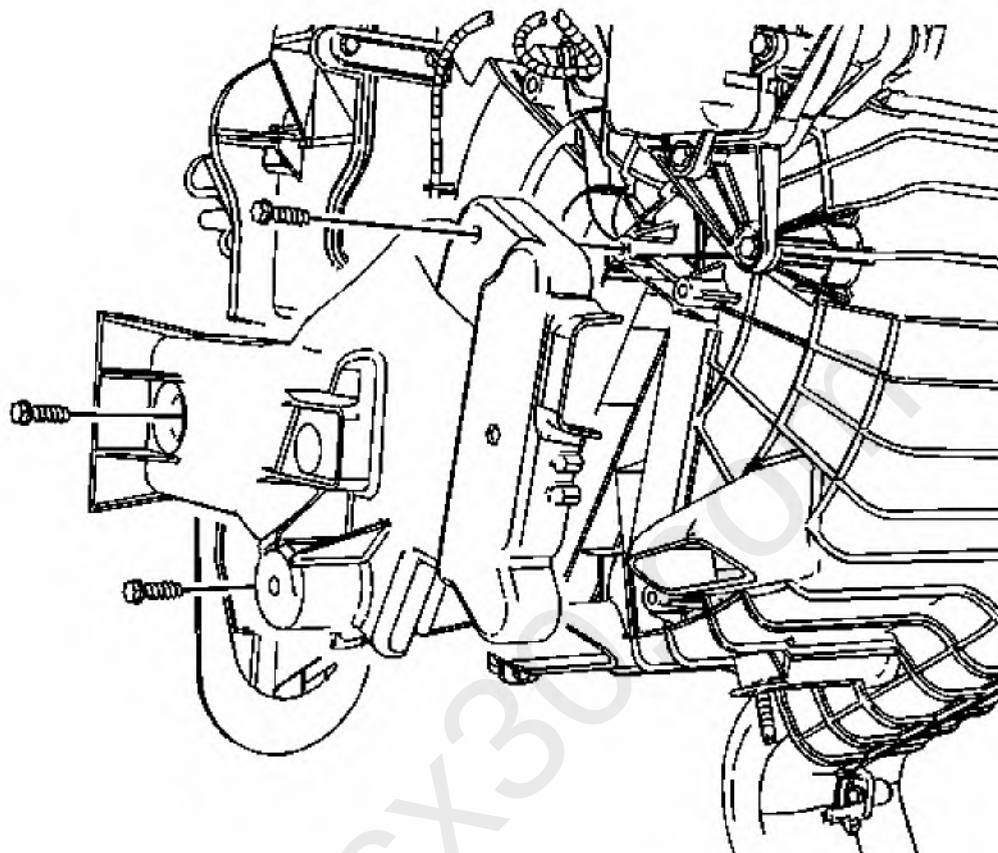


Fig. 86: View Of Heater Core Cover Screws
Courtesy of GENERAL MOTORS CORP.

4. Install heater core cover.
5. Install heater core cover screws.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

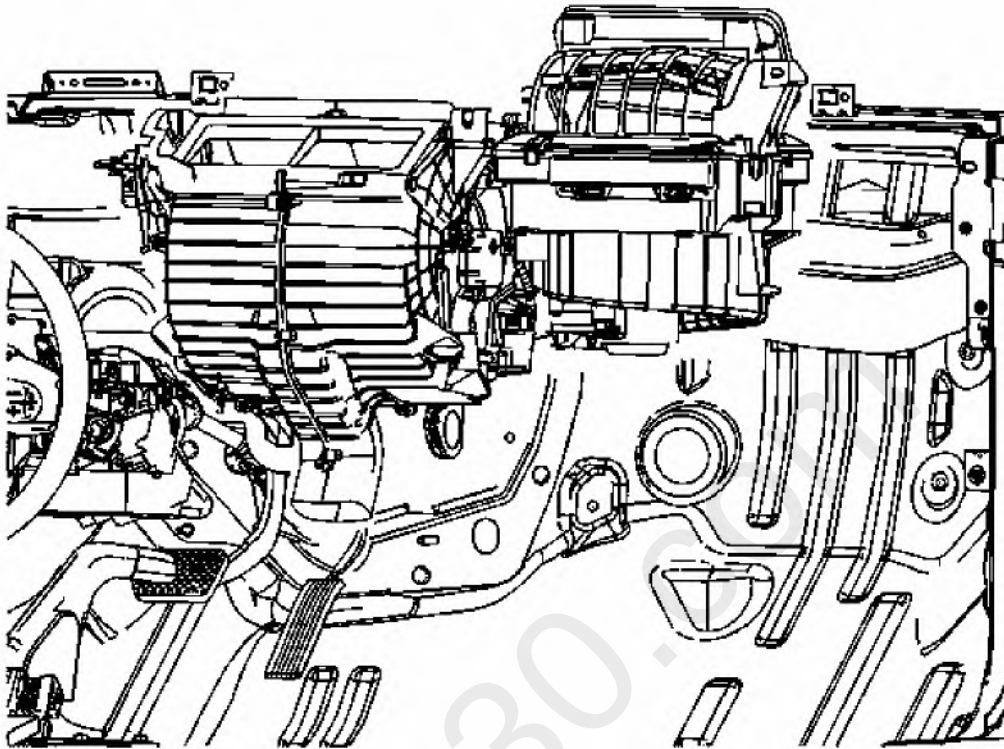


Fig. 87: View Of HVAC Module
Courtesy of GENERAL MOTORS CORP.

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

BLOWER CASE ASSEMBLY REPLACEMENT

Removal Procedure

1. Remove the HVAC module assembly. Refer to **HVAC Module Assembly Replacement**.
2. Remove the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
3. Remove the air inlet assembly. Refer to **Air Inlet Assembly Replacement**.
4. Remove the HVAC module wire harness from the blower case assembly.

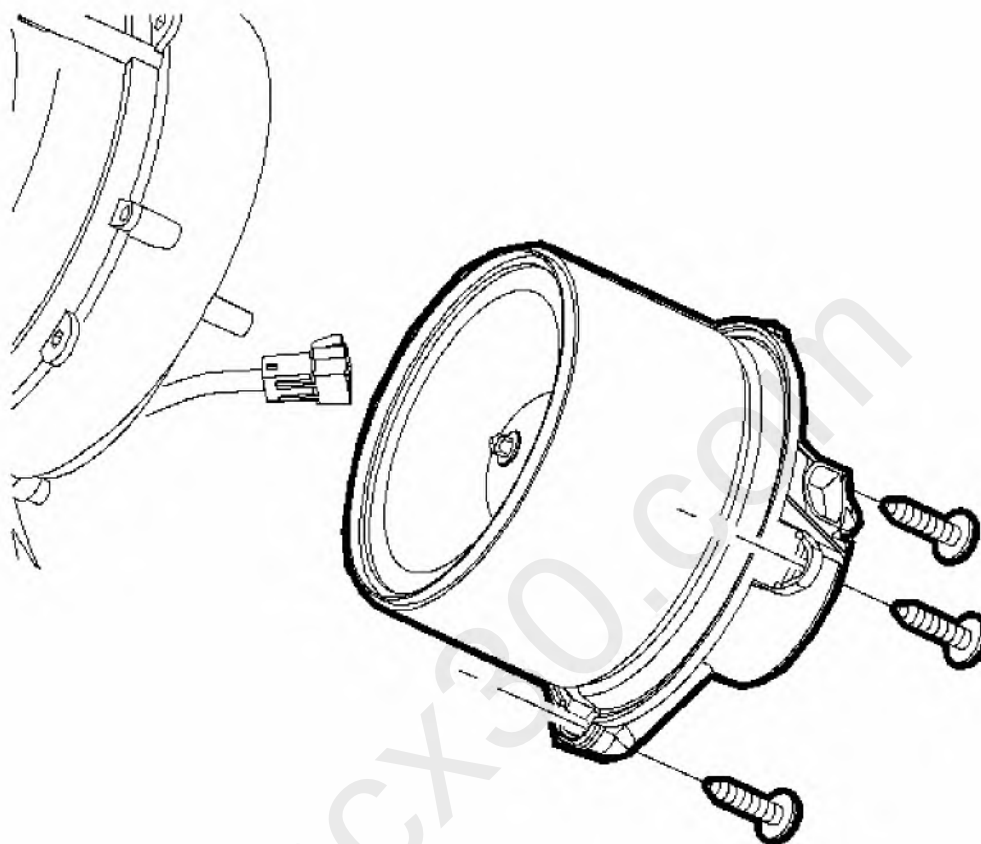


Fig. 88: Blower Motor Screws & Blower Case Assembly
Courtesy of GENERAL MOTORS CORP.

5. Remove the blower motor screws from the blower case assembly.
6. Remove the blower motor from the blower case assembly.

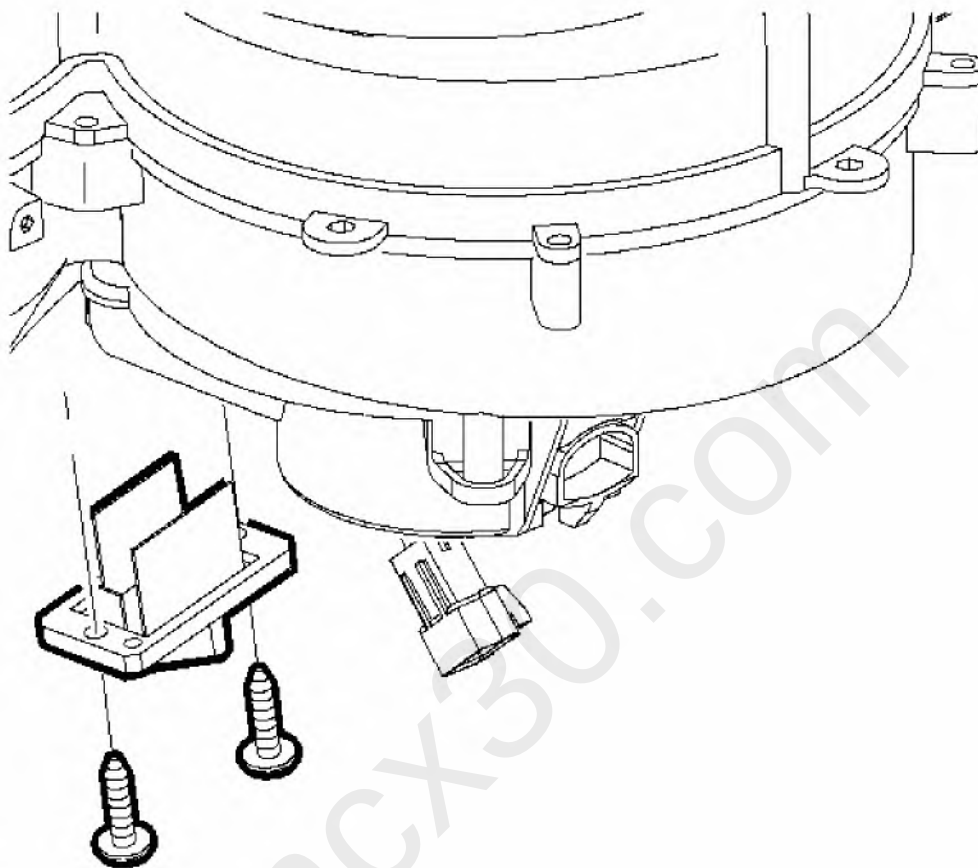


Fig. 89: Blower Motor Resistor, Screws & Blower Case Assembly
Courtesy of GENERAL MOTORS CORP.

7. Remove the blower motor resistor screws from the blower case assembly.
8. Remove the blower motor resistor from the blower case assembly.

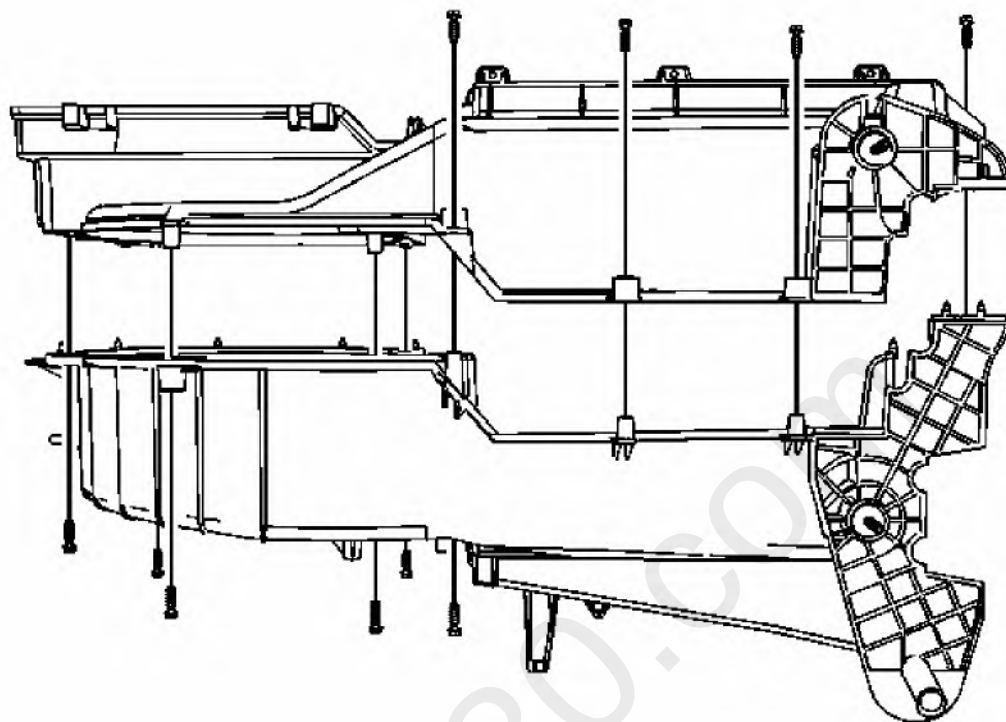


Fig. 90: View Of Blower Case Assembly Halves
Courtesy of GENERAL MOTORS CORP.

9. Remove the screws retaining the two halves of the blower case assembly.
10. Separate the two halves of the blower case assembly.
11. Remove the evaporator core from the blower case assembly.

Installation Procedure

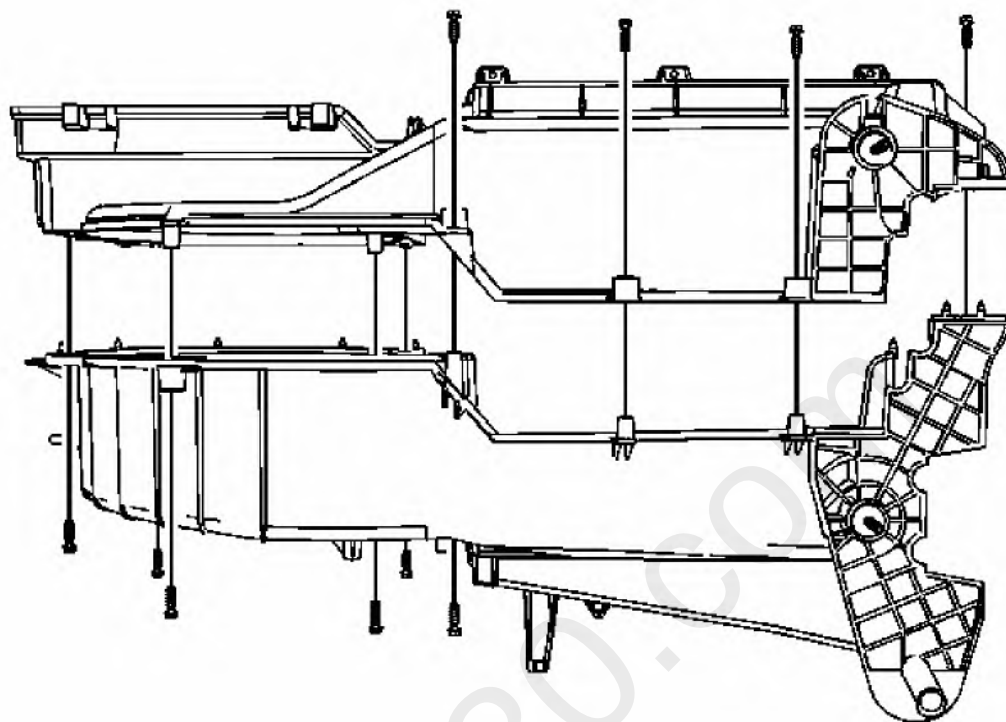


Fig. 91: View Of Blower Case Assembly Halves
Courtesy of GENERAL MOTORS CORP.

1. Install the evaporator core to the blower case assembly.
2. Assemble the two halves of the blower case assembly.

NOTE: Refer to Fastener Notice.

3. Install the screws to retain the two halves of the blower case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

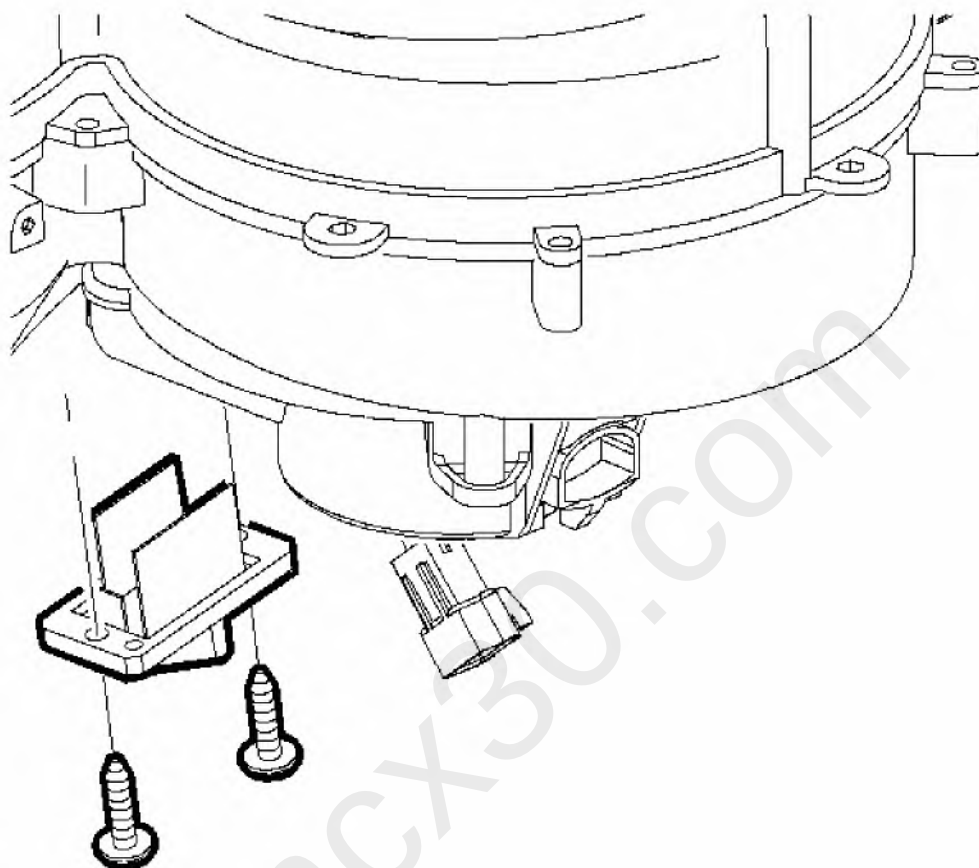


Fig. 92: Blower Motor Resistor, Screws & Blower Case Assembly
Courtesy of GENERAL MOTORS CORP.

4. Install the blower motor resistor to the blower case assembly.
5. Install the blower motor resistor screws to the blower case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

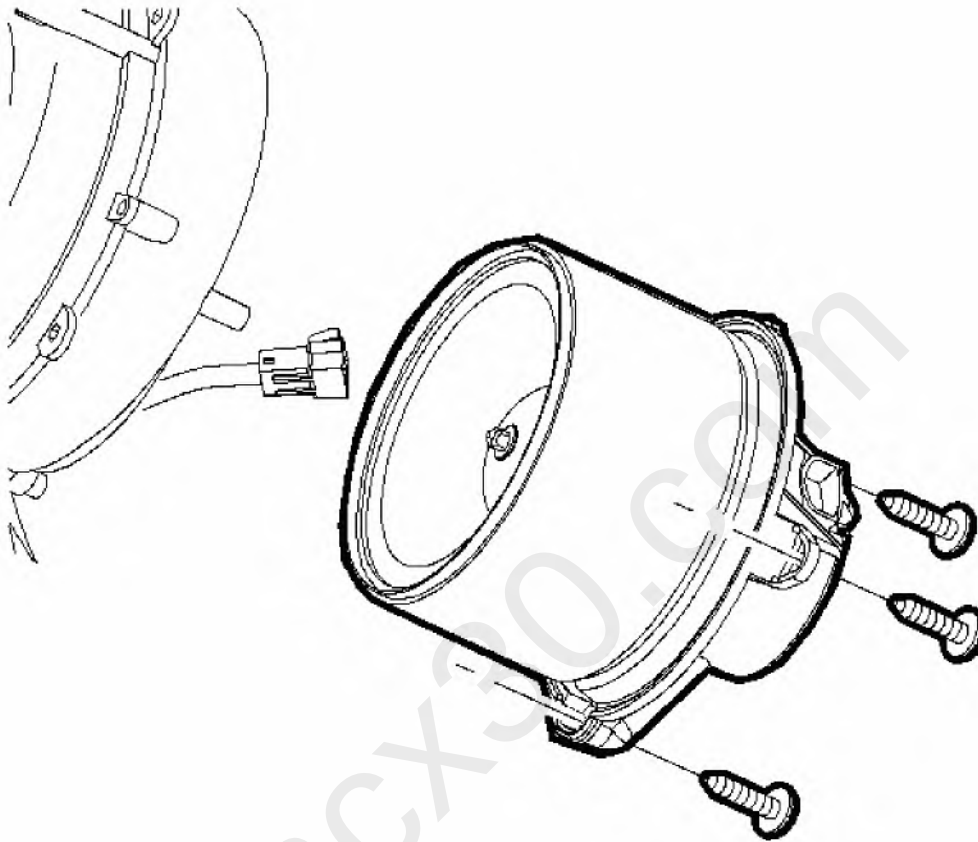


Fig. 93: Blower Motor Screws & Blower Case Assembly
Courtesy of GENERAL MOTORS CORP.

6. Install the blower motor to the blower case assembly.
7. Install the blower motor screws to the blower case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

8. Install the HVAC module wire harness from the blower case assembly.
9. Install the air inlet assembly. Refer to **Air Inlet Assembly Replacement**.
10. Install the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
11. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

HVAC MODULE ASSEMBLY REPLACEMENT

Tools Required

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

1. Disable the frontal and curtain air bags. Refer to **SIR Disabling and Enabling Zone 2** , **SIR Disabling and Enabling Zone 3** , **SIR Disabling and Enabling Zone 5** , and **SIR Disabling and Enabling Zone 6** .
2. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
3. Drain the engine coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .

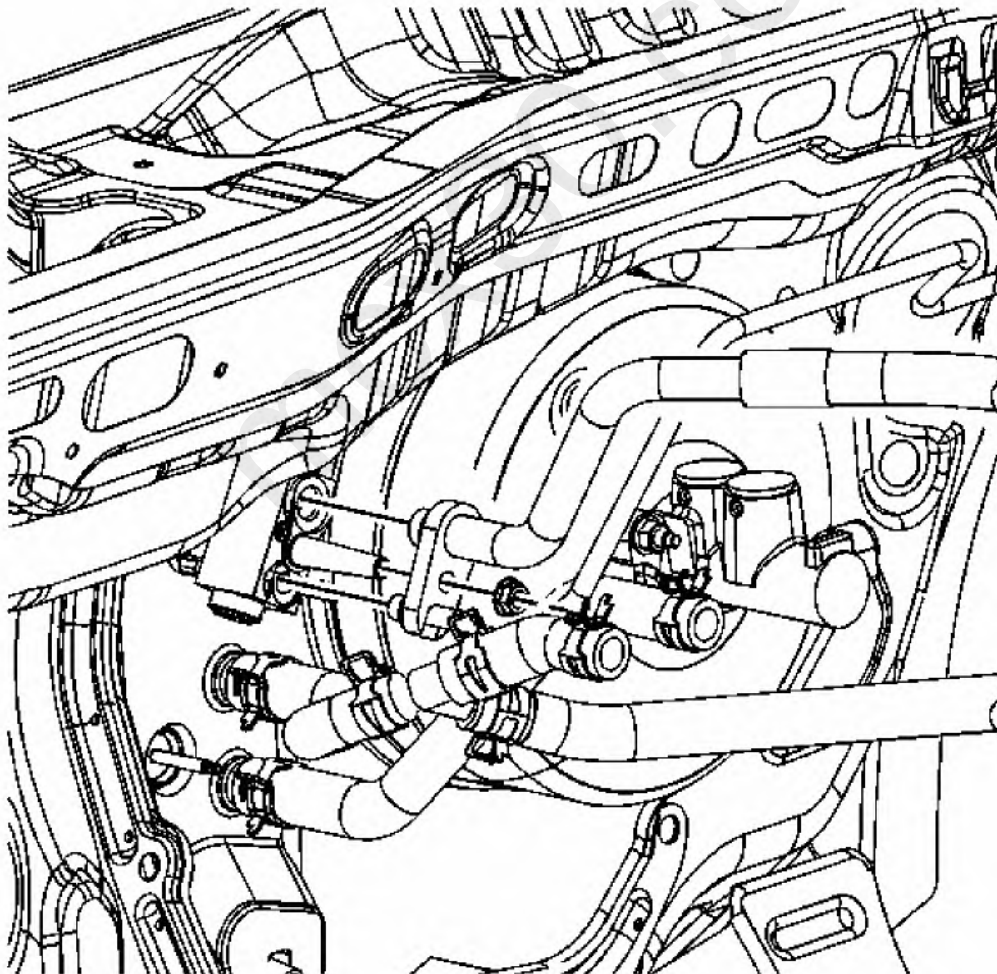


Fig. 94: View Of Evaporator Outlet Hose And Liquid Line At TXV

Courtesy of GENERAL MOTORS CORP.

4. Remove the evaporator outlet hose and liquid line nut from the thermal expansion valve (TXV).
5. Remove the evaporator outlet hose from the TXV.
6. Remove and discard the sealing washer from the evaporator outlet hose. Refer to **Sealing Washer Replacement**.
7. Remove the evaporator outlet hose and liquid line from the TXV.
8. Remove and discard the sealing washer from the liquid line. Refer to **Sealing Washer Replacement**.
9. Install a protective caps to the evaporator outlet hose and the liquid line to prevent contamination and desiccant saturation.

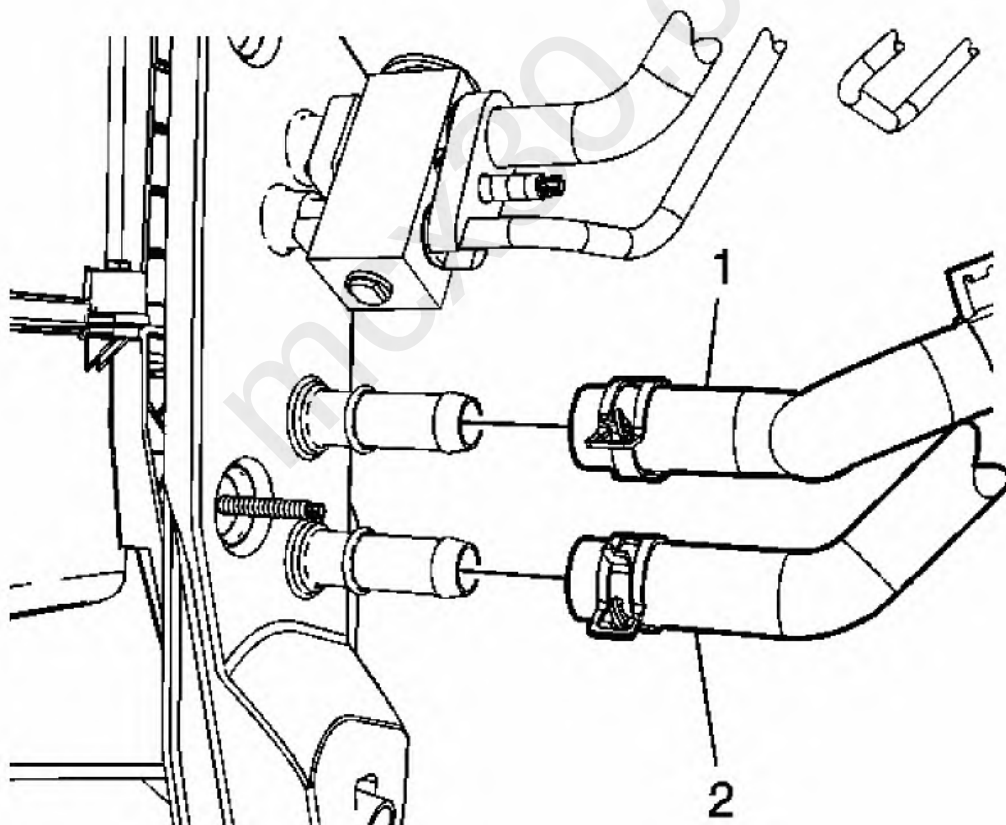


Fig. 95: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

10. Reposition the heater outlet hose clamp at the heater core.

11. Remove the heater outlet hose from the heater core.
12. Reposition the heater inlet hose clamp at the heater core.
13. Remove the heater inlet hose at the heater core.
14. Plug the heater core and the evaporator core with clean towels to prevent spillage when the HVAC module is removed.

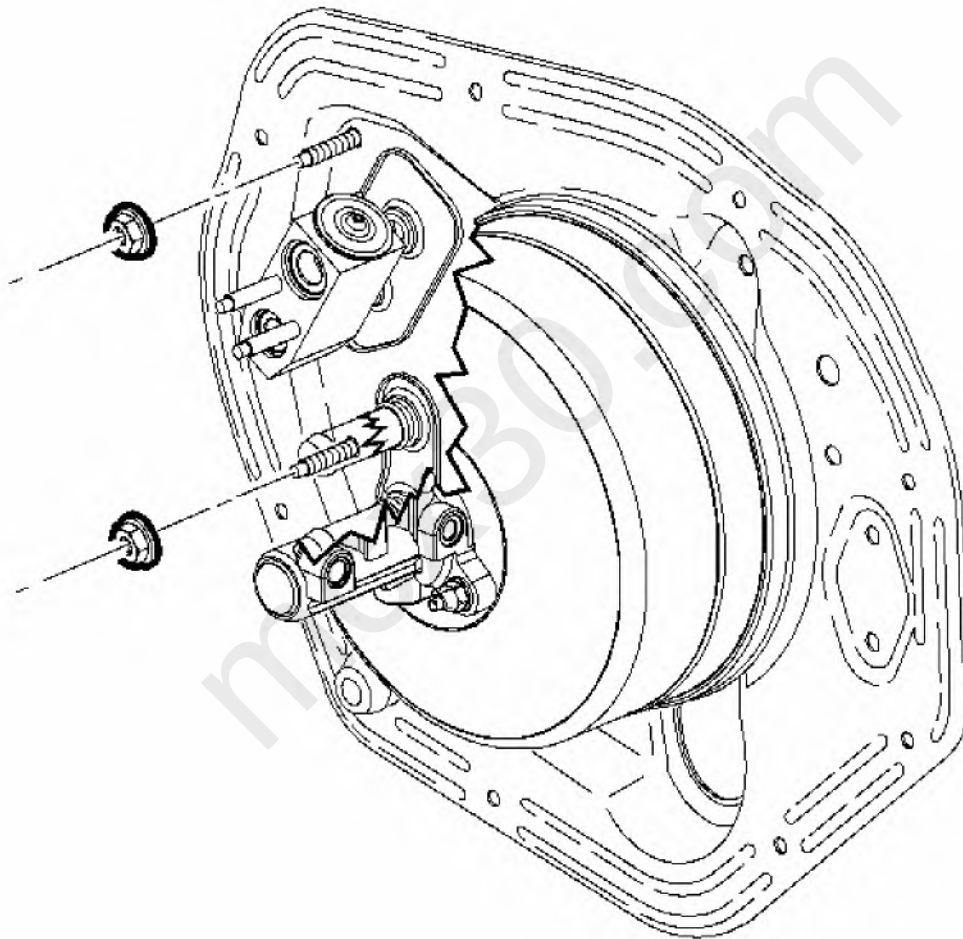


Fig. 96: HVAC Module Seal & Nuts
Courtesy of GENERAL MOTORS CORP.

15. Remove the HVAC module seal nuts from the front of dash.
16. Remove the instrument panel (I/P) retainer. Refer to **Instrument Panel (I/P) Retainer Replacement**.
17. Remove the shift control bracket. Refer to **Shift Control Replacement** for the AF33-5

transaxle.

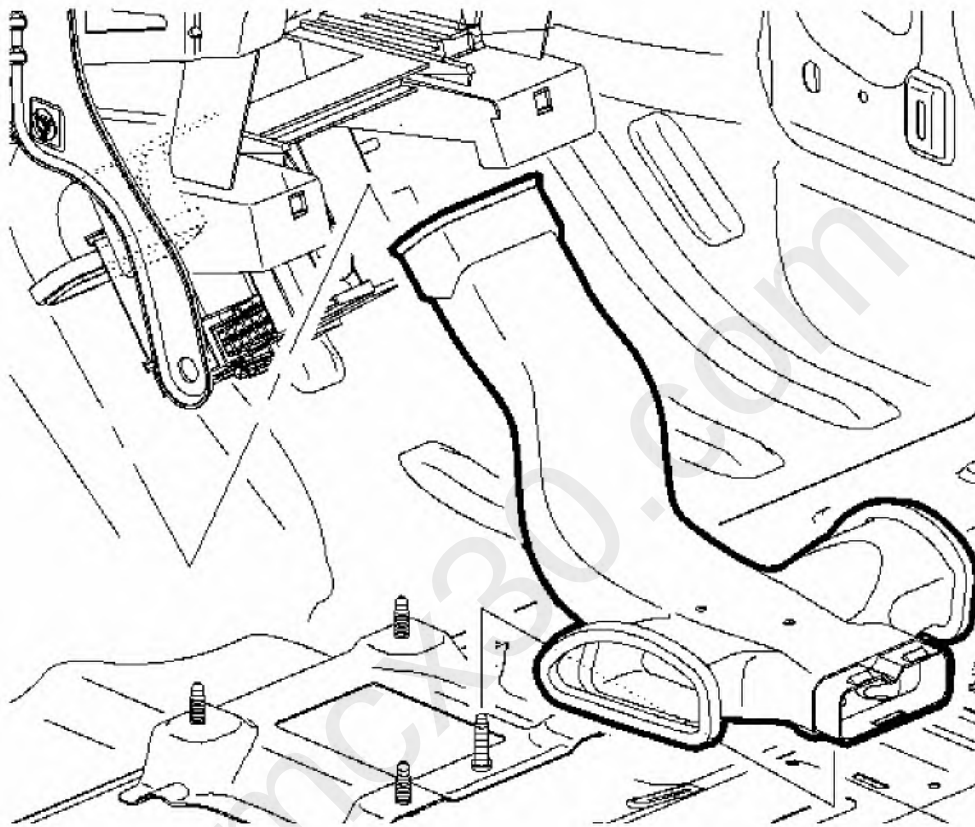


Fig. 97: Center Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

18. Remove the center floor air outlet duct by sliding the duct forward then up at the rear.

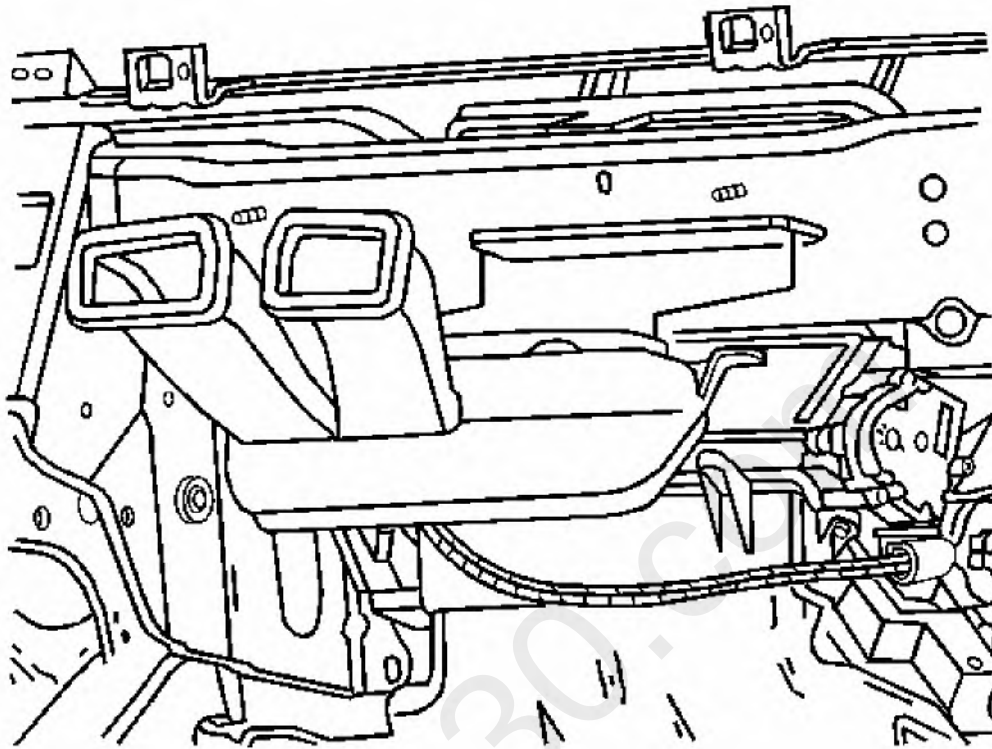


Fig. 98: View Of Center Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

19. Remove the center I/P air outlet duct retainers from the instrument panel tie bar.
20. Remove the center I/P air outlet duct from the instrument panel tie bar.
21. Remove the instrument panel tie bar. Refer to **Instrument Panel Tie Bar Replacement** .
22. Disconnect the blower motor electrical connector from the I/P wire harness.
23. Disconnect the blower motor resistor electrical connector from the I/P wire harness.
24. Disconnect the HVAC module electrical connector from the I/P wire harness.

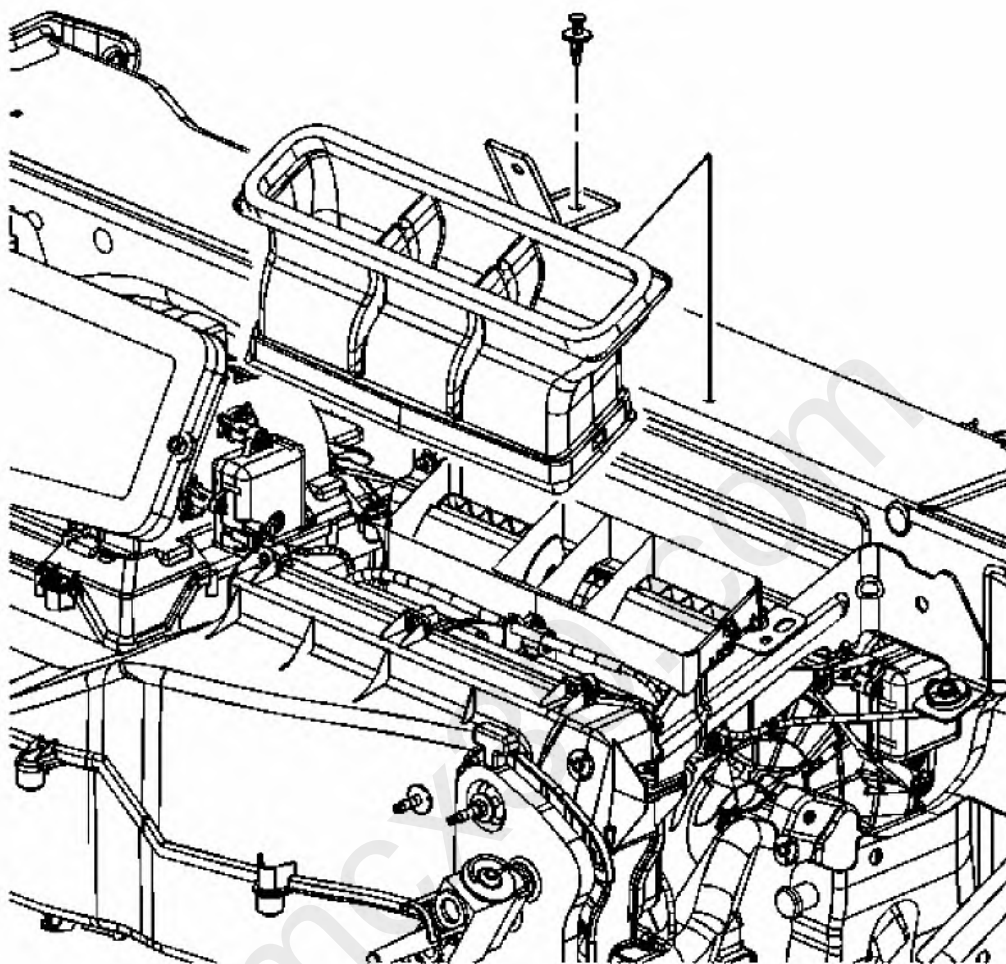


Fig. 99: View Of Defroster Duct
Courtesy of GENERAL MOTORS CORP.

25. Remove the defroster duct retainer from the instrument panel tie bar.
26. Remove the defroster duct from the HVAC module.
27. Disconnect the I/P wire harness clips from the HVAC module.

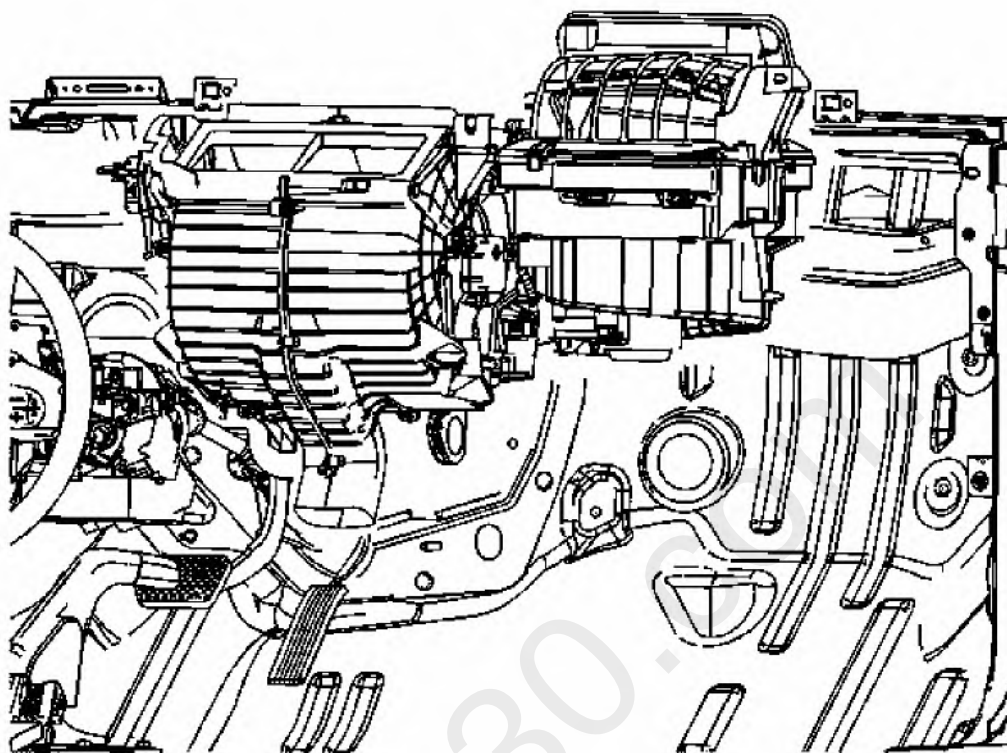


Fig. 100: View Of HVAC Module
Courtesy of GENERAL MOTORS CORP.

28. Remove the HVAC module from the vehicle.

Installation Procedure

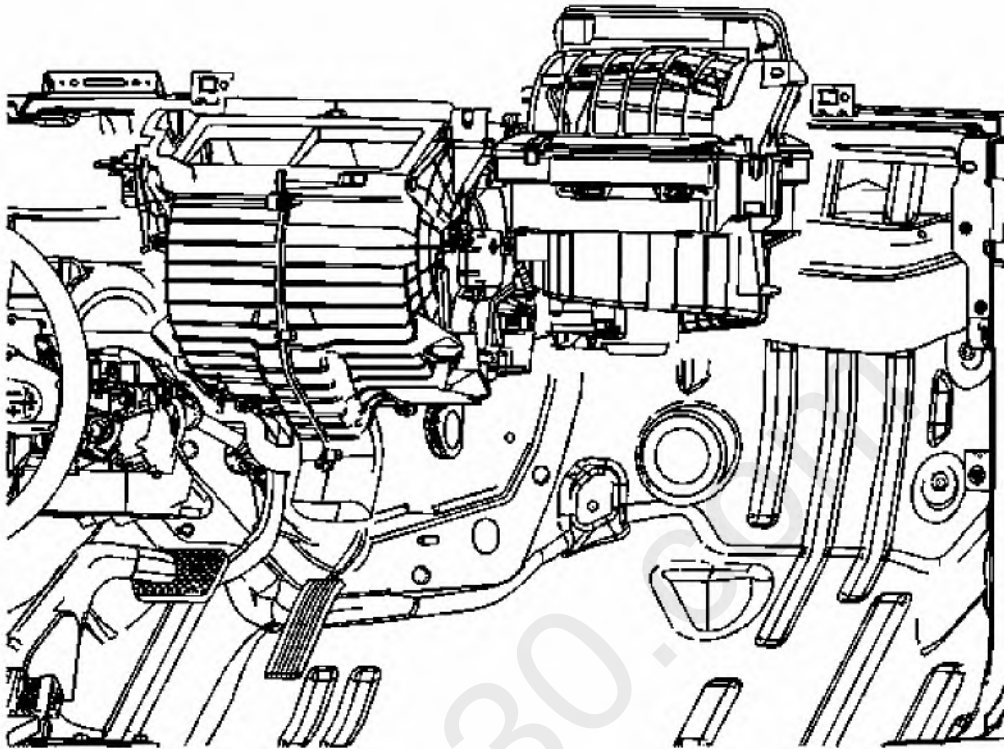


Fig. 101: View Of HVAC Module
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Make sure the HVAC module seals are flush and even as they meet their mating surfaces. This will reduce the chance of leaks and ensure proper fit.

1. Inspect the front of dash seal for proper alignment.
2. Inspect the seal mating surfaces to ensure there are no obstructions.
3. Position the HVAC module in the vehicle.
4. Install, but do not tighten, the seal nuts to the front of dash.
5. Install the instrument panel tie bar. Refer to **Instrument Panel Tie Bar Replacement** .

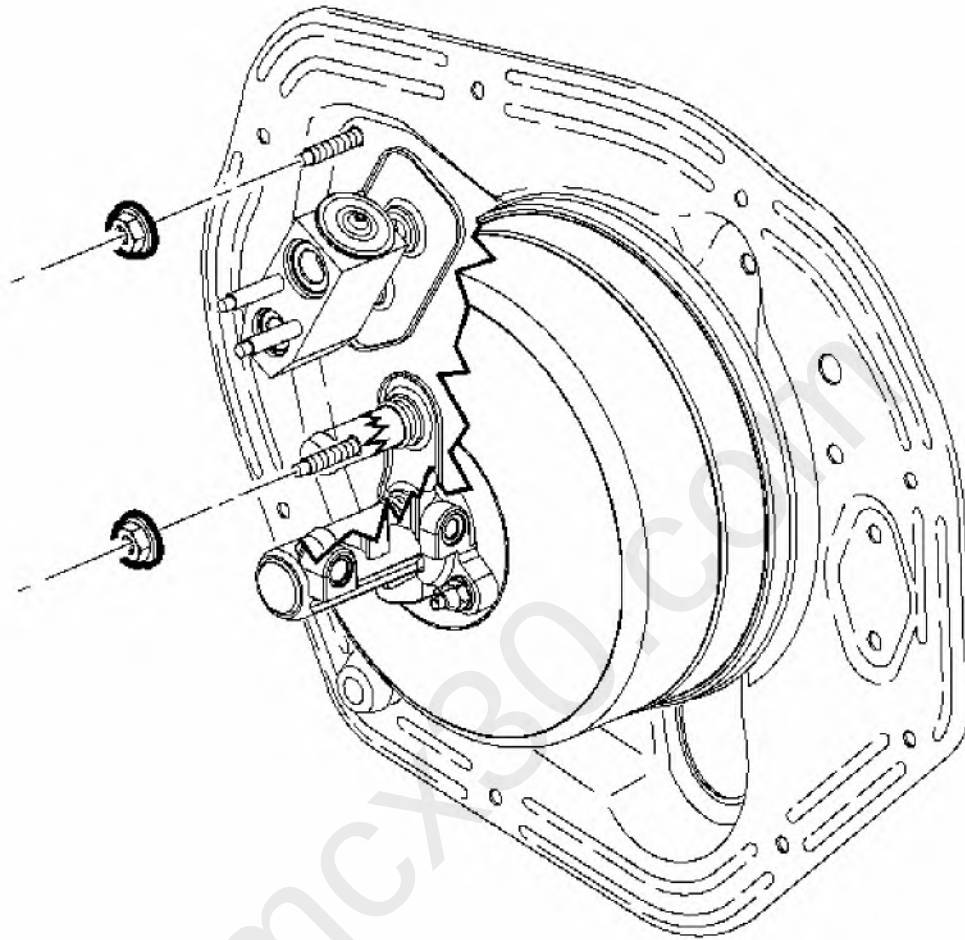


Fig. 102: HVAC Module Seal & Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice.

IMPORTANT: New front of dash seal nuts must be used to prevent leaks.

6. Tighten the HVAC module seal nuts to the front of dash. Draw the HVAC module to the front of dash evenly by alternating between the seal nuts.

Tighten: Tighten the nuts to 8 N.m (71 lb in).

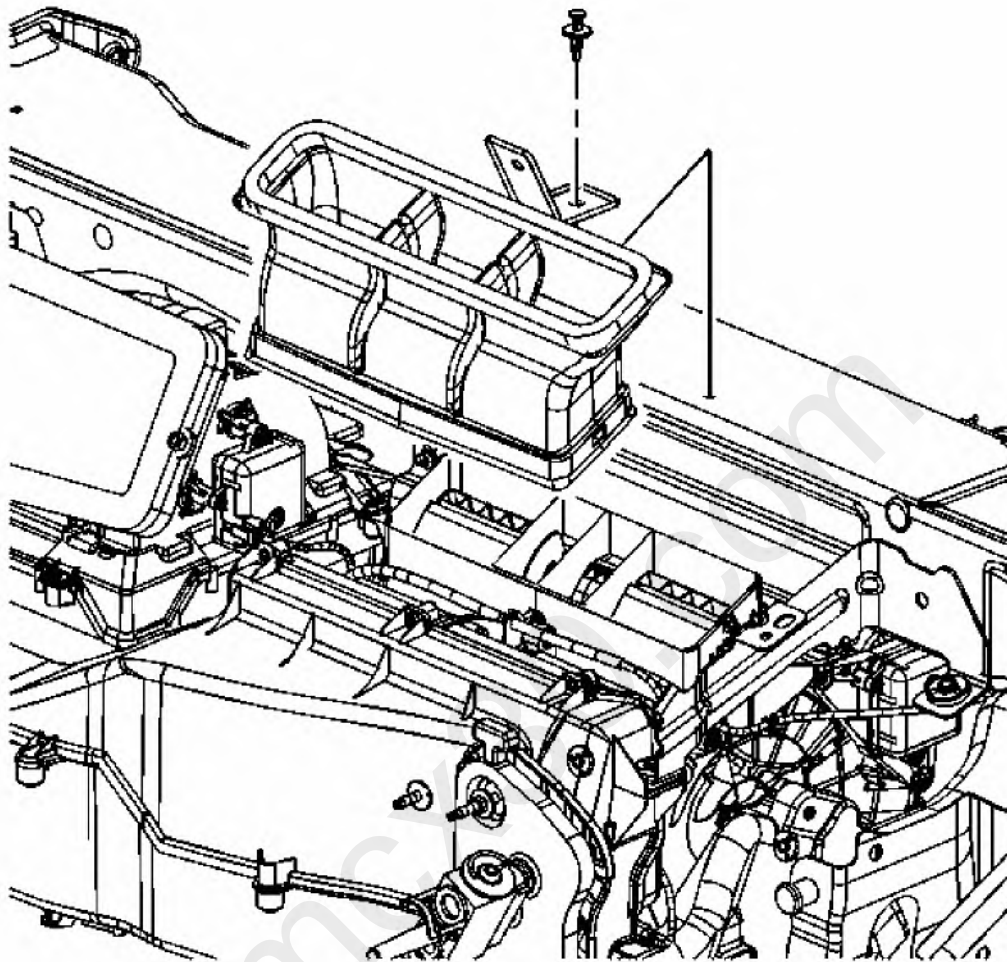


Fig. 103: View Of Defroster Duct
Courtesy of GENERAL MOTORS CORP.

7. Install the defroster duct to the HVAC module.
8. Install the defroster duct retainer to the instrument panel tie bar.
9. Connect the I/P wire harness clips to the HVAC module.
10. Connect the blower motor electrical connector to the I/P wire harness.
11. Connect the blower motor resistor electrical connector to the I/P wire harness.
12. Connect the HVAC module electrical connector to the I/P wire harness.

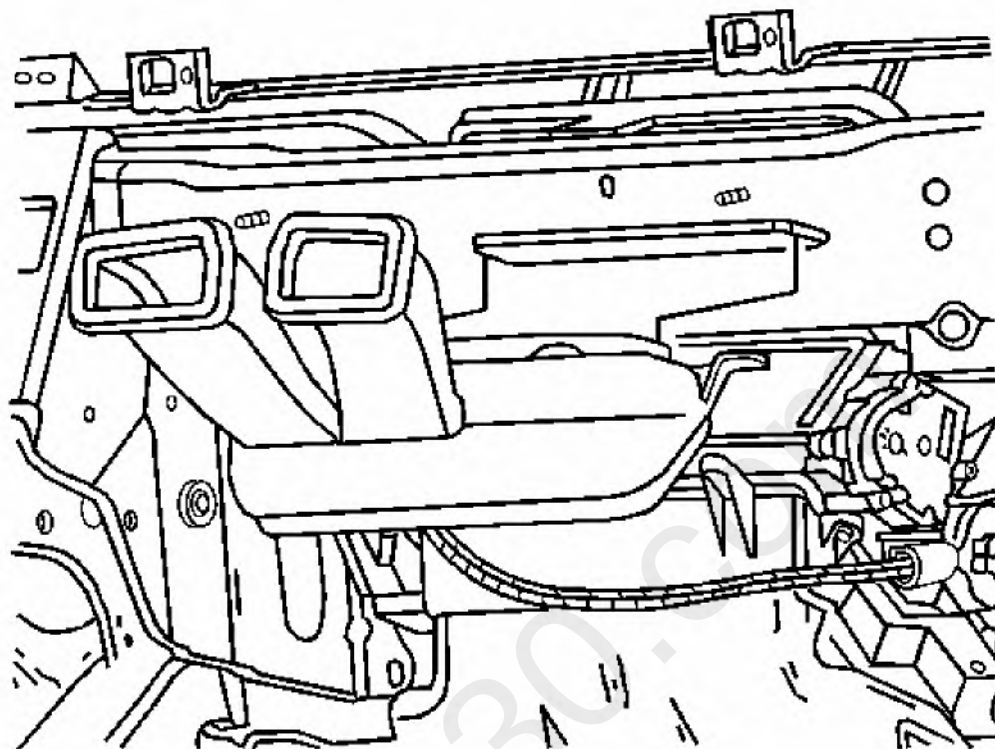


Fig. 104: View Of Center Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

13. Install the center I/P duct to the instrument panel tie bar.
14. Install the center I/P duct retainers to the instrument panel tie bar.

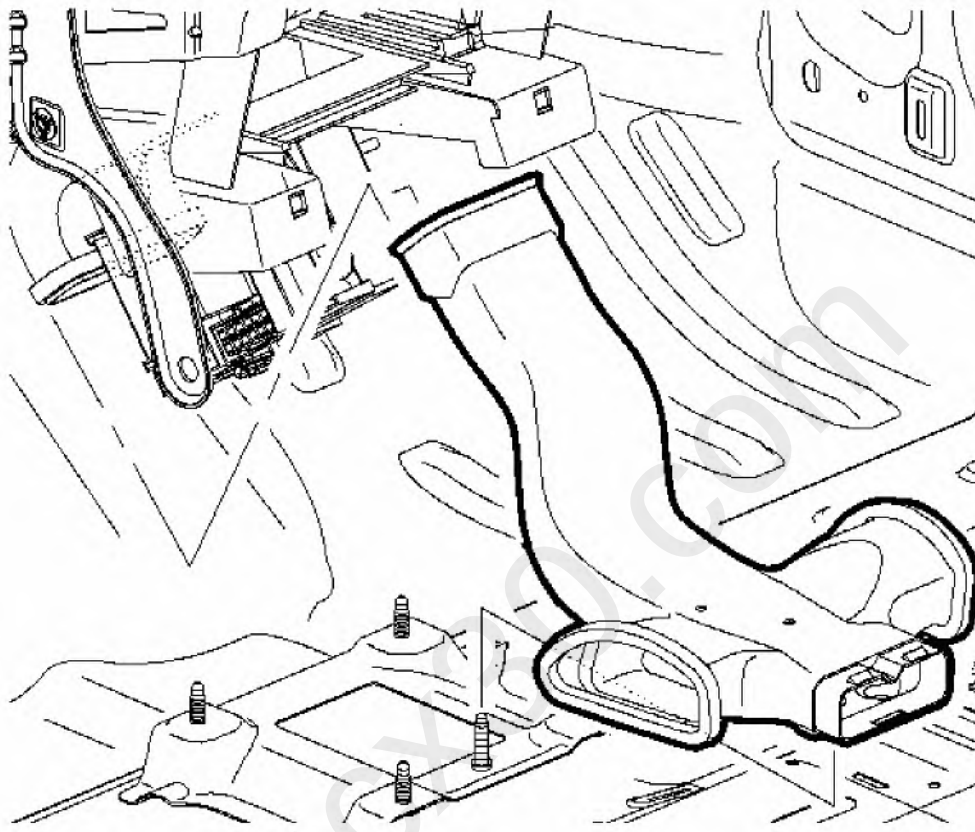


Fig. 105: Center Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

15. Install the center floor air outlet by sliding forward onto the front floor air outlet then down and rearward over the rear floor air outlet.
16. Install the shift control bracket. Refer to **Shift Control Replacement** for the AF33-5 transaxle.
17. Install the I/P retainer. Refer to **Instrument Panel (I/P) Retainer Replacement** .

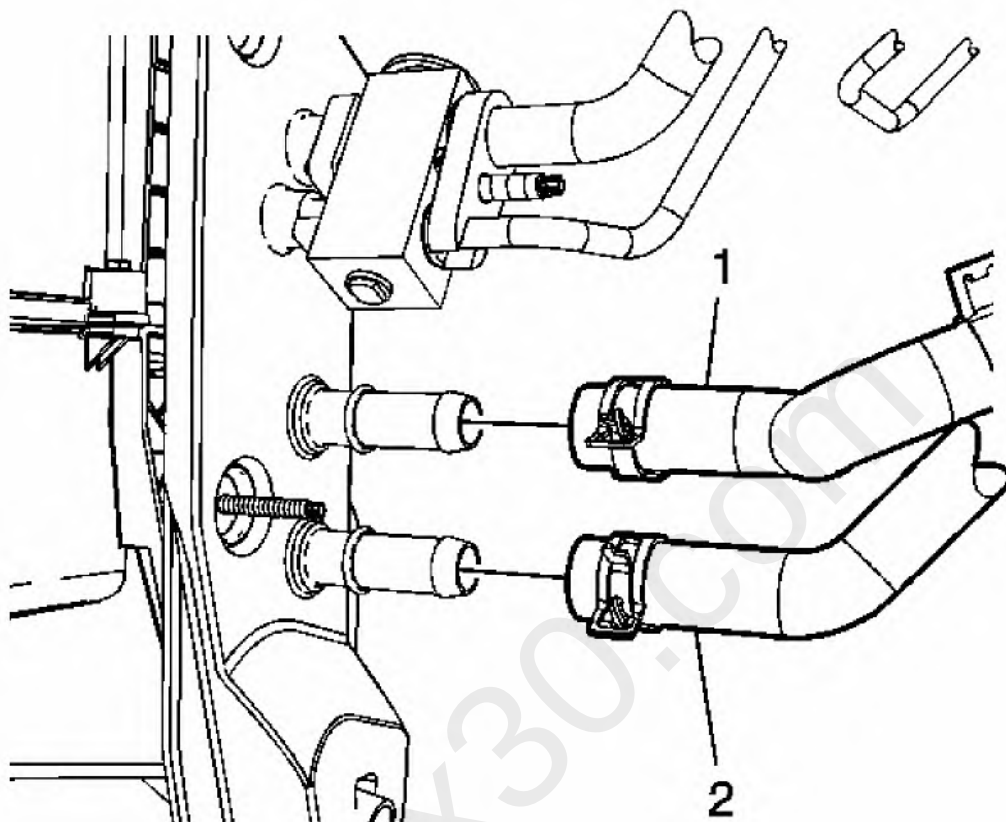


Fig. 106: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

18. Install the heater inlet hose to the heater core.
19. Install the heater inlet hose clamp to the heater core.
20. Install the heater outlet hose to heater core outlet.
21. Install the heater outlet hose clamp to the heater core.

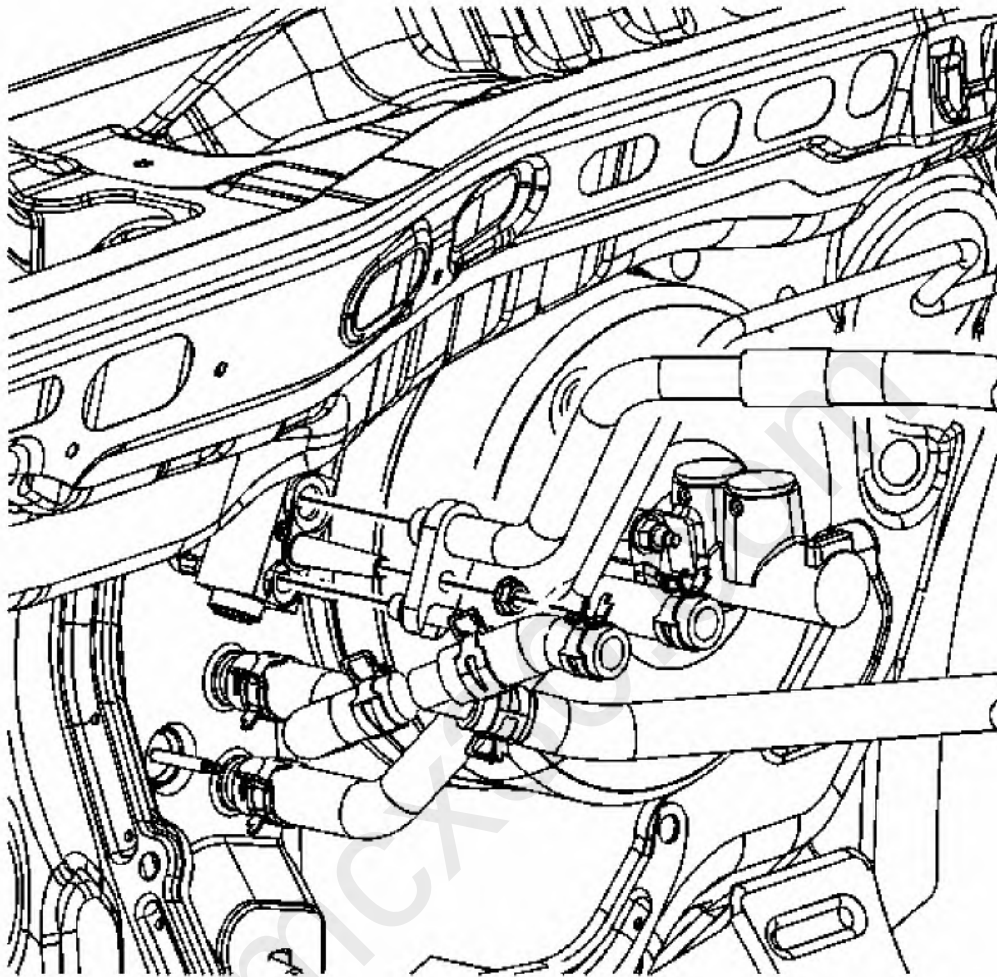


Fig. 107: View Of Evaporator Outlet Hose And Liquid Line At TXV
Courtesy of GENERAL MOTORS CORP.

22. Ensure the mating surfaces are clean and free of debris, and install new seal washers to the evaporator outlet hose and the liquid line. Refer to **Sealing Washer Replacement**.
23. Install the evaporator outlet hose and the liquid line to the TXV.
24. Install the evaporator outlet hose and liquid line nut to the TXV.

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

25. Enable the frontal and curtain air bags. Refer to **SIR Disabling and Enabling Zone 2** , **SIR Disabling and Enabling Zone 3** , **SIR Disabling and Enabling Zone 5** , and **SIR Disabling and Enabling Zone 6** .
26. Fill the coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or

Draining and Filling Cooling System (GE 47716 Fill) .

27. Evacuate and charge the A/C system. Refer to **Refrigerant Recovery and Recharging**.
28. Test the affected A/C joints for leaks using **J 39400-A** . See **Special Tools**.

EVAPORATOR CORE REPLACEMENT

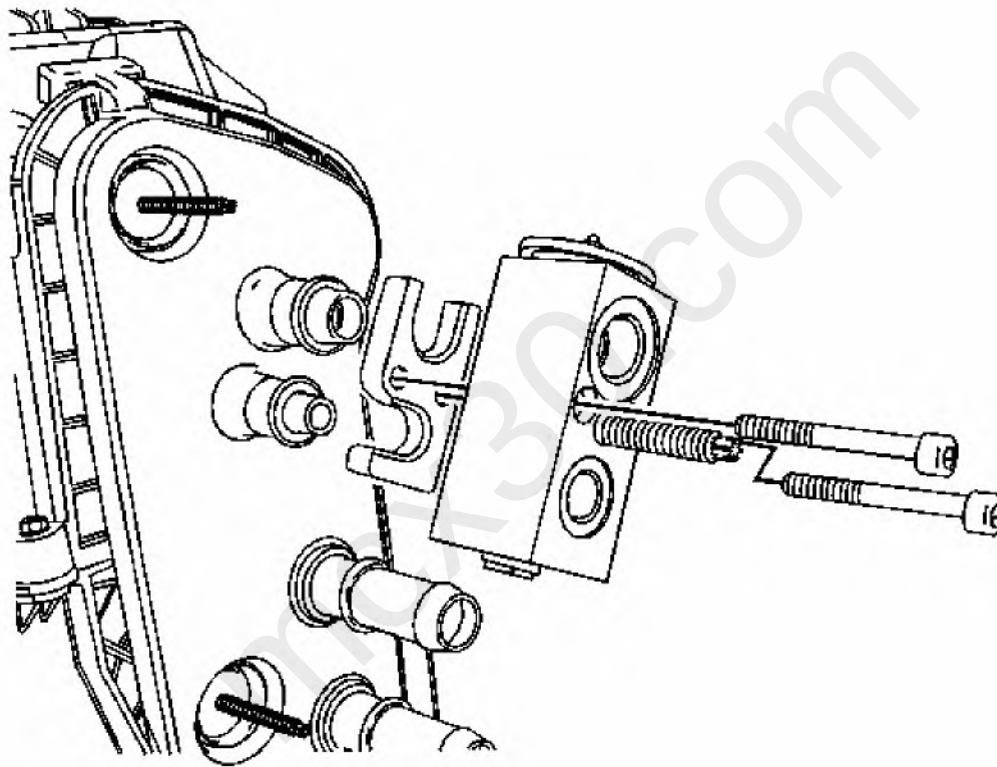


Fig. 108: View Of TXV And Backing Plate
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. Remove the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
3. Remove the thermal expansion valve (TXV) bolts from the backing plate.
4. Remove the TXV and the backing plate from the evaporator pipes.
5. Remove the seal washers from evaporator pipes. Refer to **Sealing Washer Replacement**.
6. Remove the HVAC module front of dash seal.

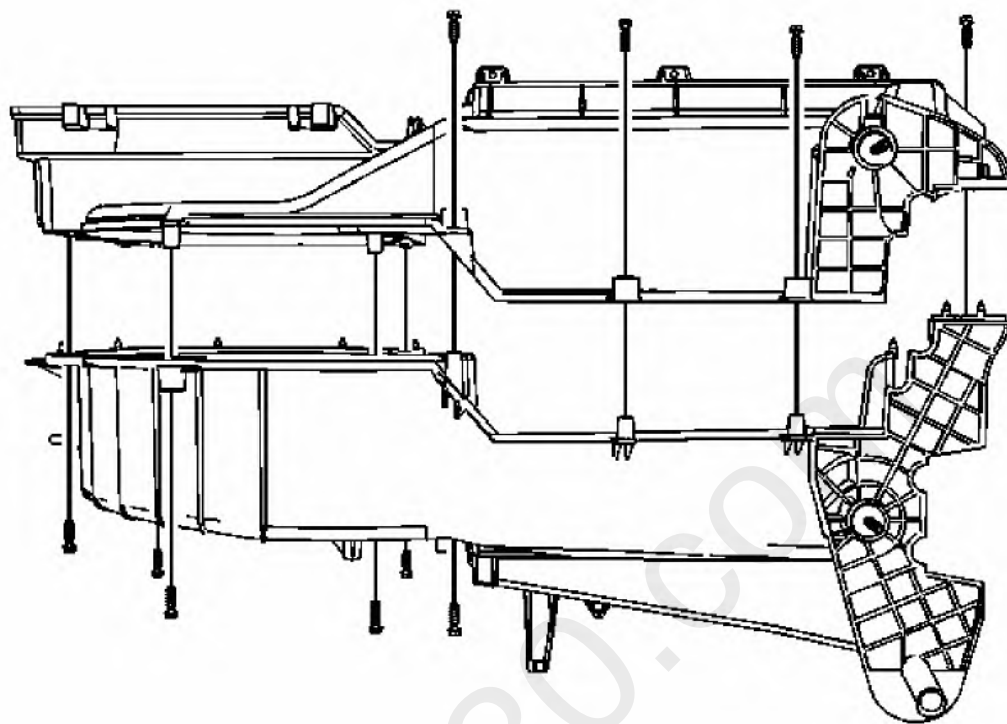


Fig. 109: View Of Blower Case Assembly Halves
Courtesy of GENERAL MOTORS CORP.

7. Remove the screws retaining the two halves of the blower case assembly.
8. Separate the two halves of the blower case assembly.

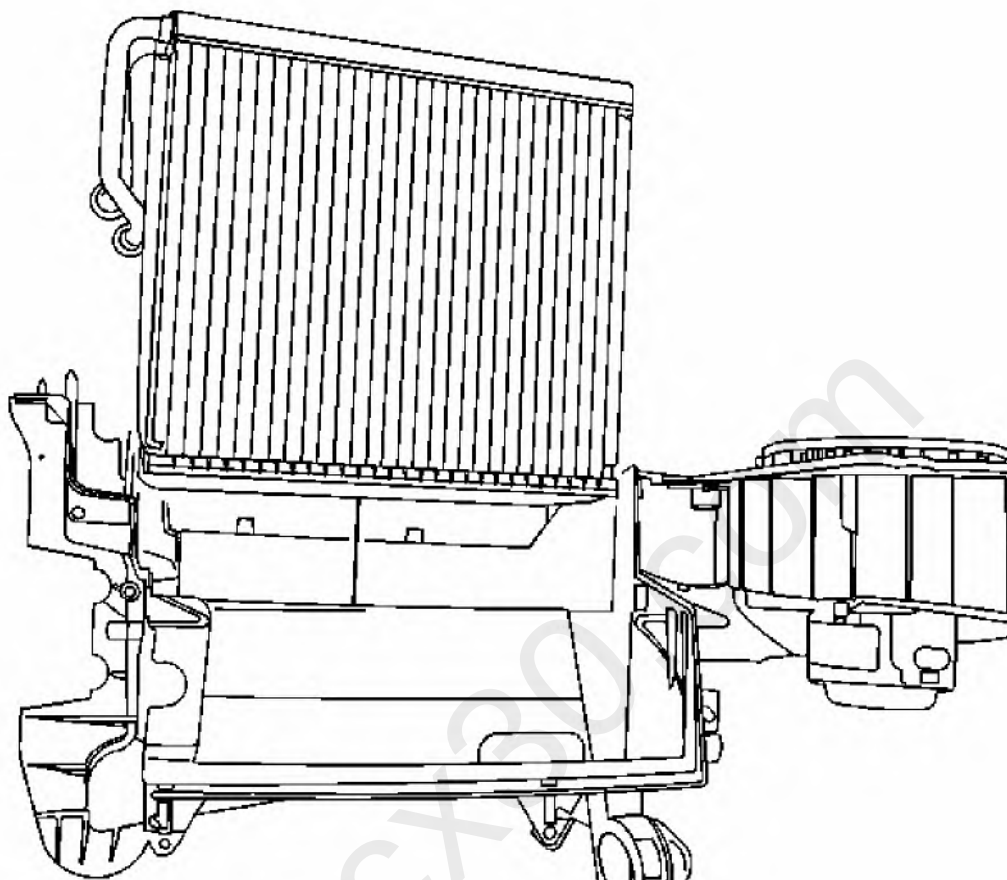


Fig. 110: View Of Evaporator Core
Courtesy of GENERAL MOTORS CORP.

9. Remove the evaporator core from the blower case assembly.

Installation Procedure

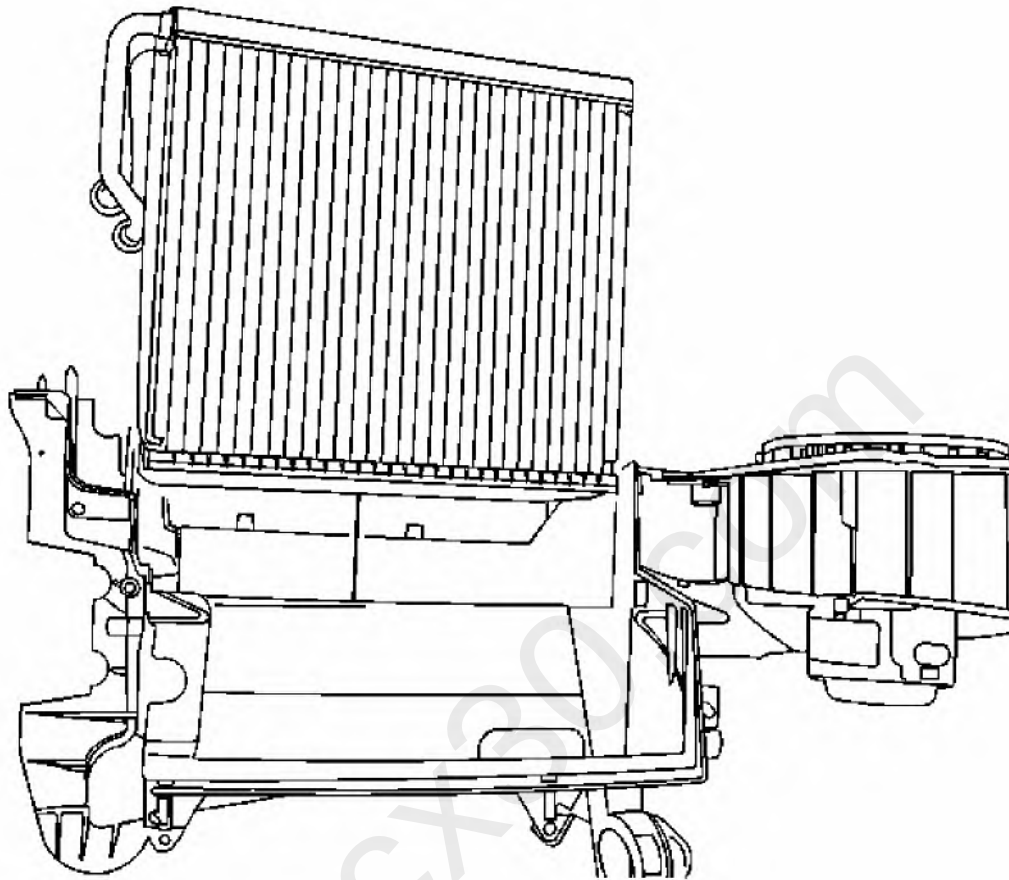


Fig. 111: View Of Evaporator Core
Courtesy of GENERAL MOTORS CORP.

1. Add the proper of polyalkylene glycol (PAG) oil to the evaporator core. Refer to **Refrigerant System Capacities**.
2. Inspect the seal around the evaporator core. Make sure the seal is in correct position and retained properly.
3. Install the evaporator core to the blower case assembly.

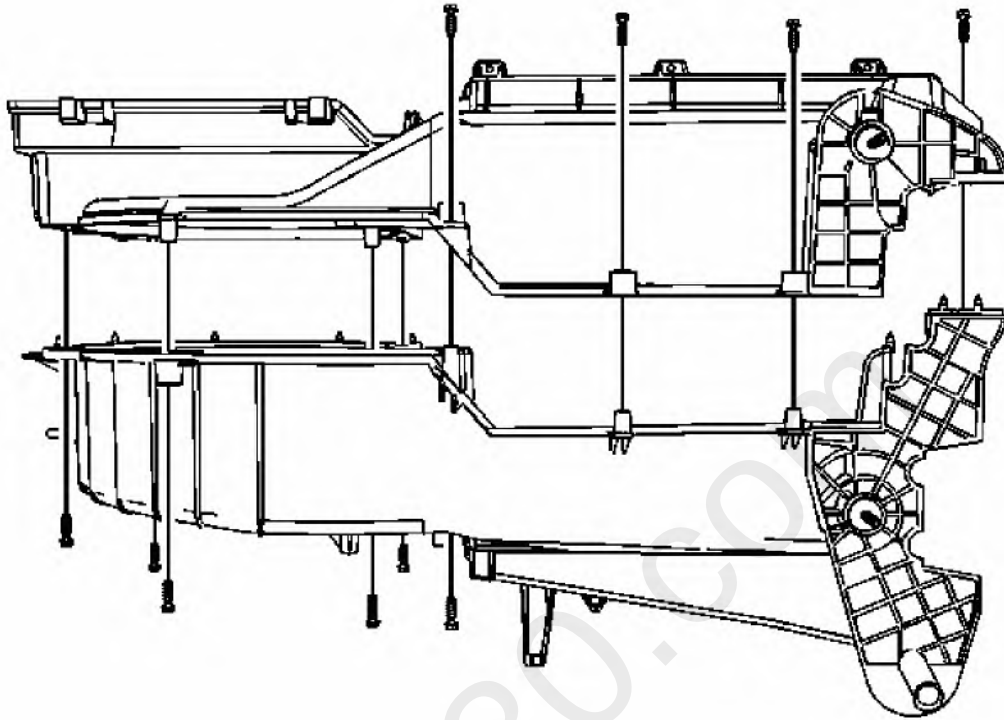


Fig. 112: View Of Blower Case Assembly Halves
Courtesy of GENERAL MOTORS CORP.

4. Assemble the two halves of the blower case assembly.

NOTE: Refer to Fastener Notice.

5. Install the blower case assembly screws.

Tighten: Tighten the screw to 1.5 N.m (13 lb in).

6. Install the HVAC module front of dash seal.

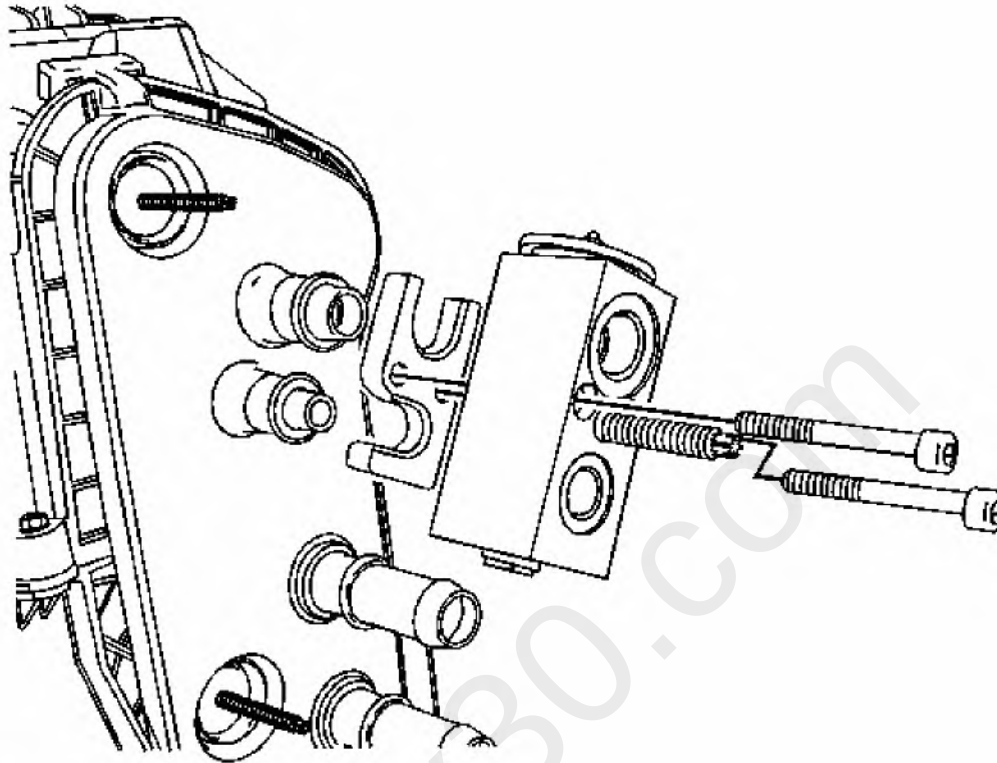


Fig. 113: View Of TXV And Backing Plate
Courtesy of GENERAL MOTORS CORP.

7. Install new seal washers to the evaporator pipes. Refer to **Sealing Washer Replacement**.
8. Install the TXV and the backing plate to the evaporator pipes.
9. Install the TXV screws to the backing plate.

Tighten: Tighten the screws to 3.5 N.m (31 lb in).

10. Install the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
11. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

HEATER HOSE REPLACEMENT - INLET

Removal Procedure

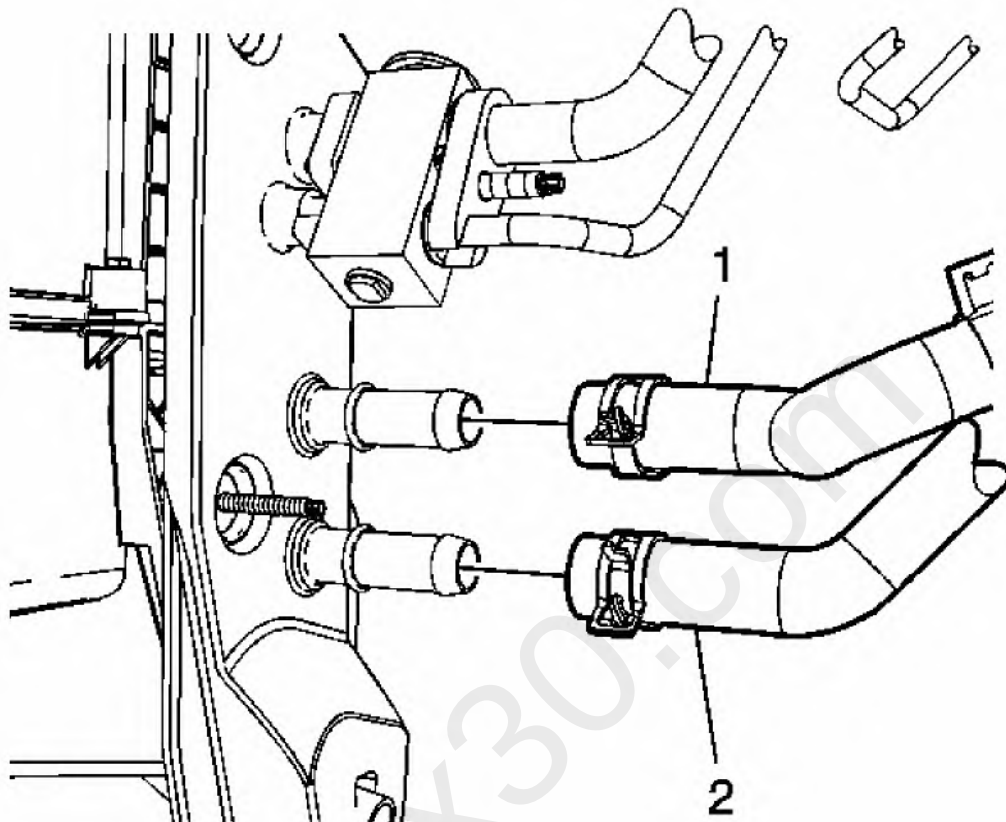


Fig. 114: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

1. Drain the cooling system. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .
2. Remove the heater inlet hose clamp from the heater core.
3. Remove the heater inlet hose (2) from the heater core.

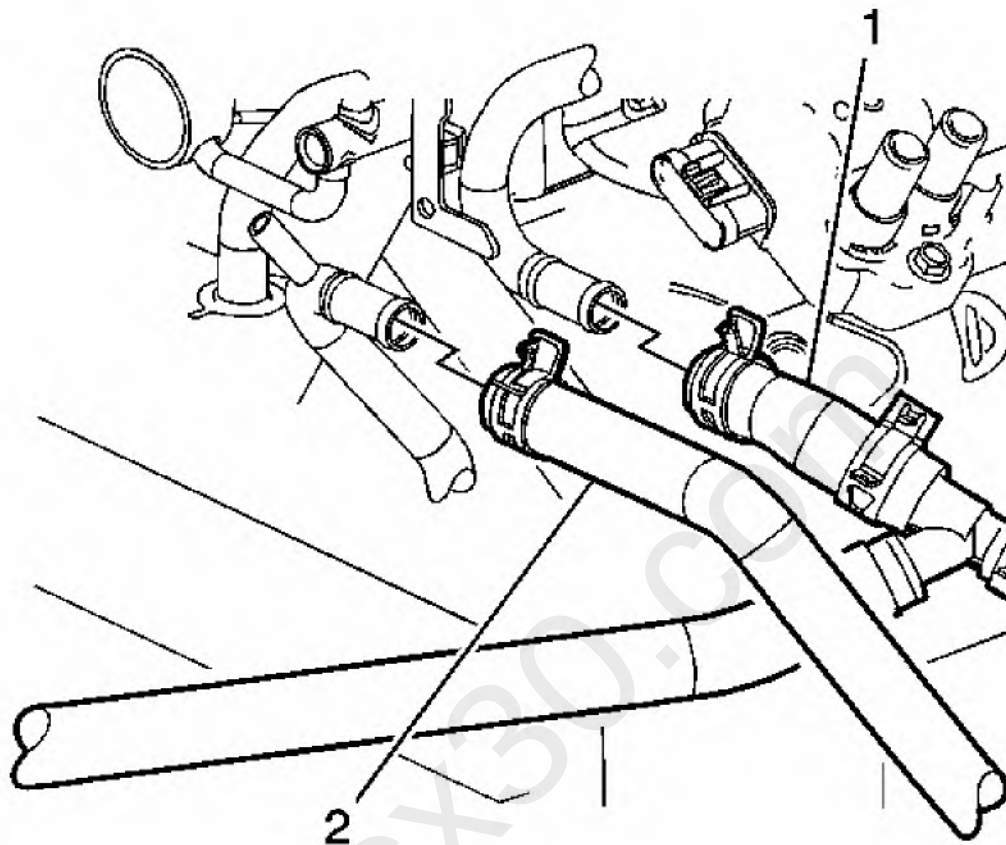


Fig. 115: Heater Hoses At Engine
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater inlet hose clamp from the engine.
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose (2) from the vehicle.

Installation Procedure

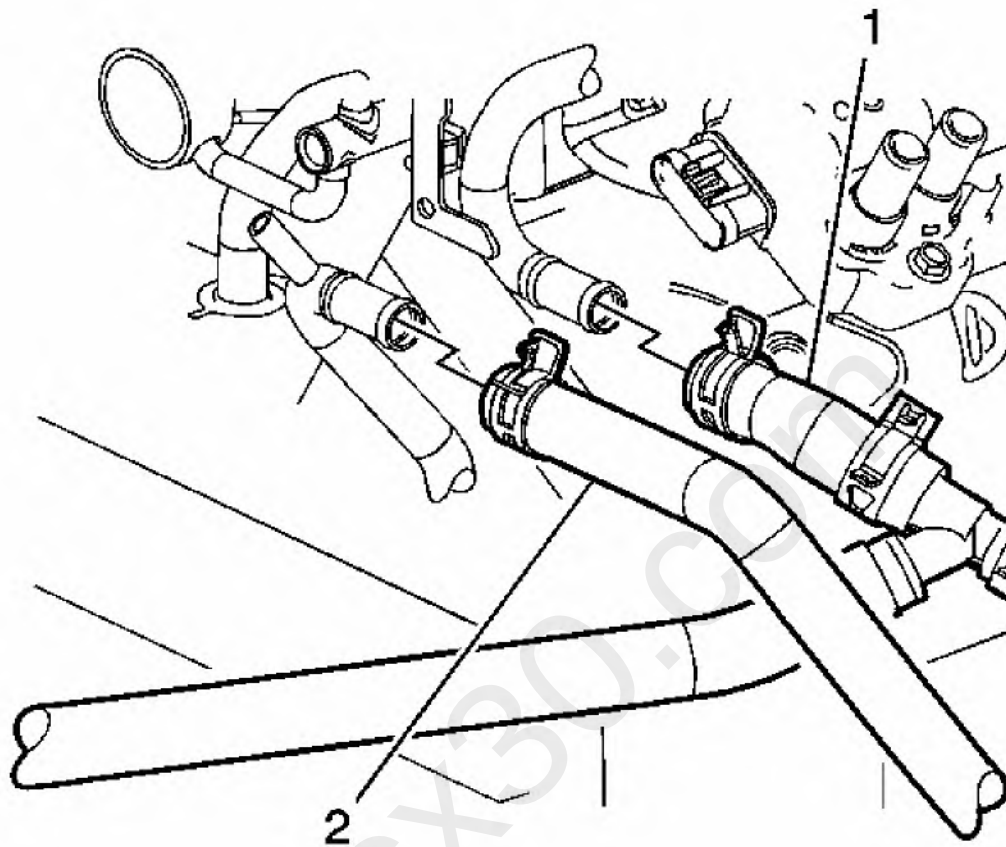


Fig. 116: Heater Hoses At Engine
Courtesy of GENERAL MOTORS CORP.

1. Install the heater inlet hose (2) to the vehicle.
2. Install the heater inlet hose (2) to the engine.
3. Install the heater inlet hose clamp to the engine.

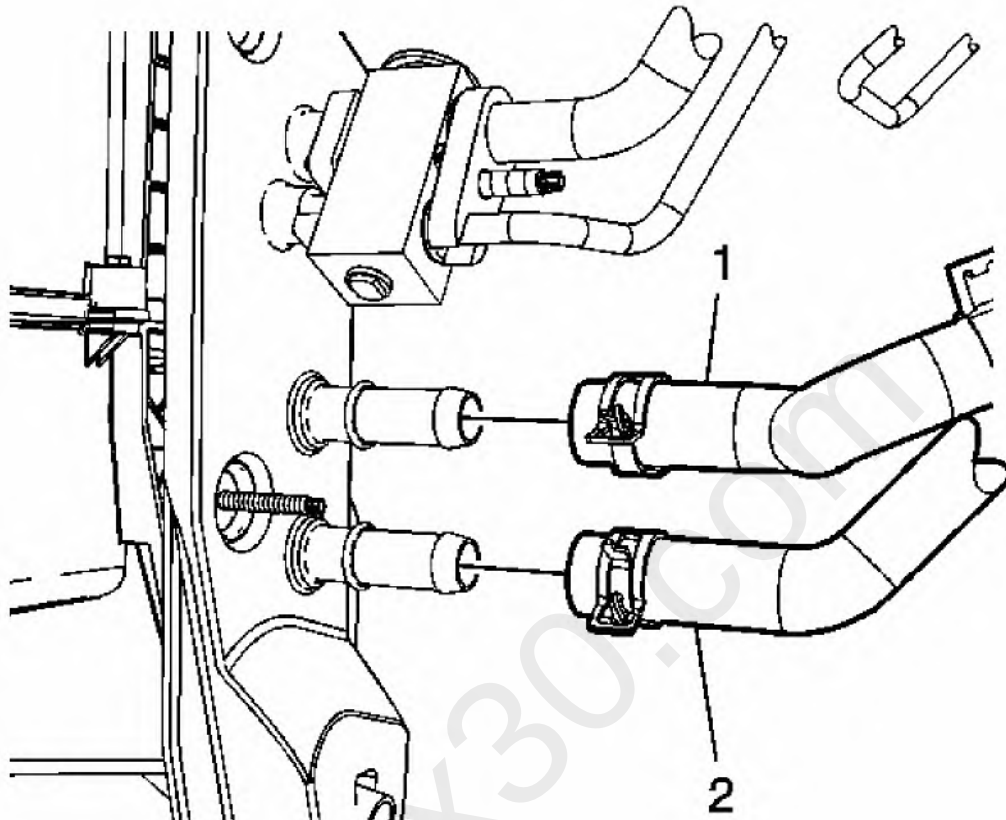


Fig. 117: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

4. Install the heater inlet hose (2) to the heater core.
5. Install the heater inlet hose clamp to the heater core.
6. Fill the cooling system. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .

HEATER HOSE REPLACEMENT - OUTLET

Removal Procedure

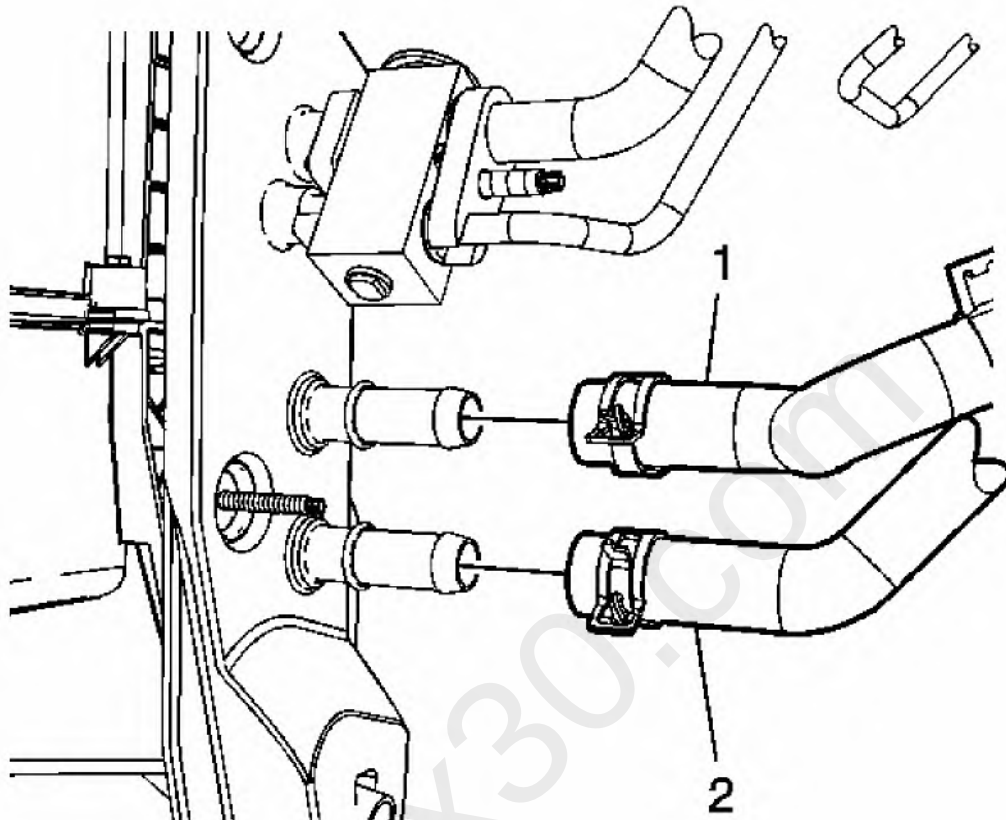


Fig. 118: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

1. Drain the engine coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .
2. Remove the heater outlet hose clamp from the heater core.
3. Remove the heater outlet hose (1) from the heater core.

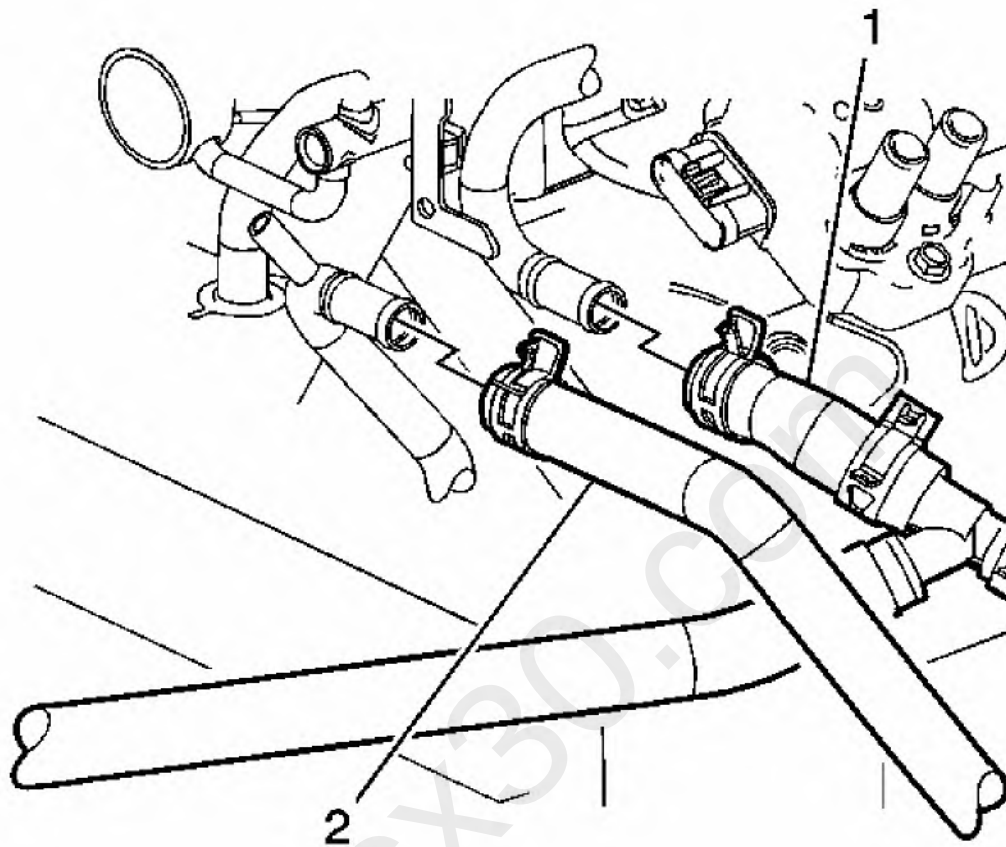


Fig. 119: Heater Hoses At Engine
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater outlet hose clamp from the engine.
5. Remove the heater outlet hose (1) from the engine.
6. Position the loose end of the heater outlet hose (1) outboard to ease in the removal of the surge tank.

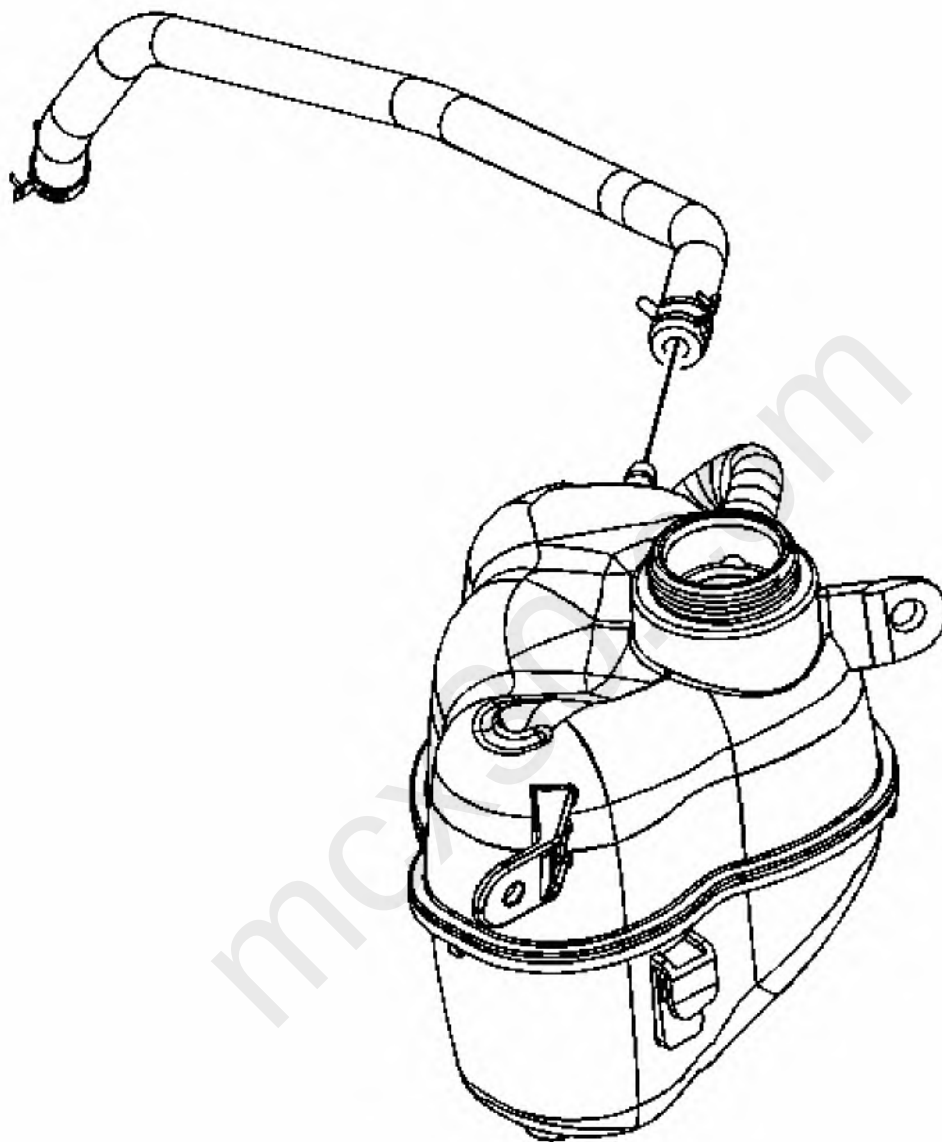


Fig. 120: Surge Tank Inlet Hose & Surge Tank
Courtesy of GENERAL MOTORS CORP.

7. Remove the surge tank inlet hose clamp from the surge tank.
8. Disconnect the surge tank inlet hose from the surge tank.

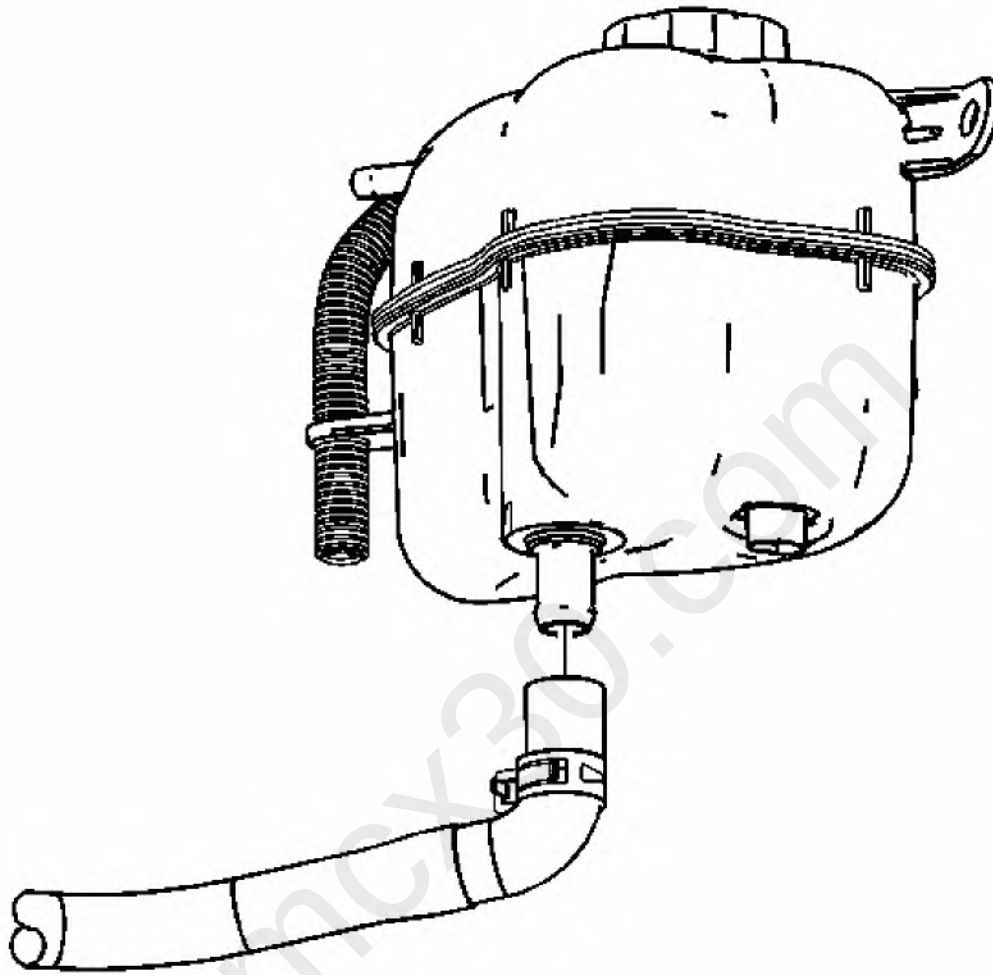


Fig. 121: View Of Surge Tank & Heater Outlet Hose
Courtesy of GENERAL MOTORS CORP.

9. Remove the surge tank bolts from the surge tank.
10. Lift the surge tank to gain access to the heater outlet hose.
11. Remove the heater outlet hose clamp from the surge tank.
12. Remove the heater outlet hose from the surge tank.
13. Remove the surge tank from the vehicle.
14. Remove the heater outlet hose clamp from the hose. This will aid in routing the heater outlet hose from the vehicle.
15. Remove the heater outlet hose from the vehicle.

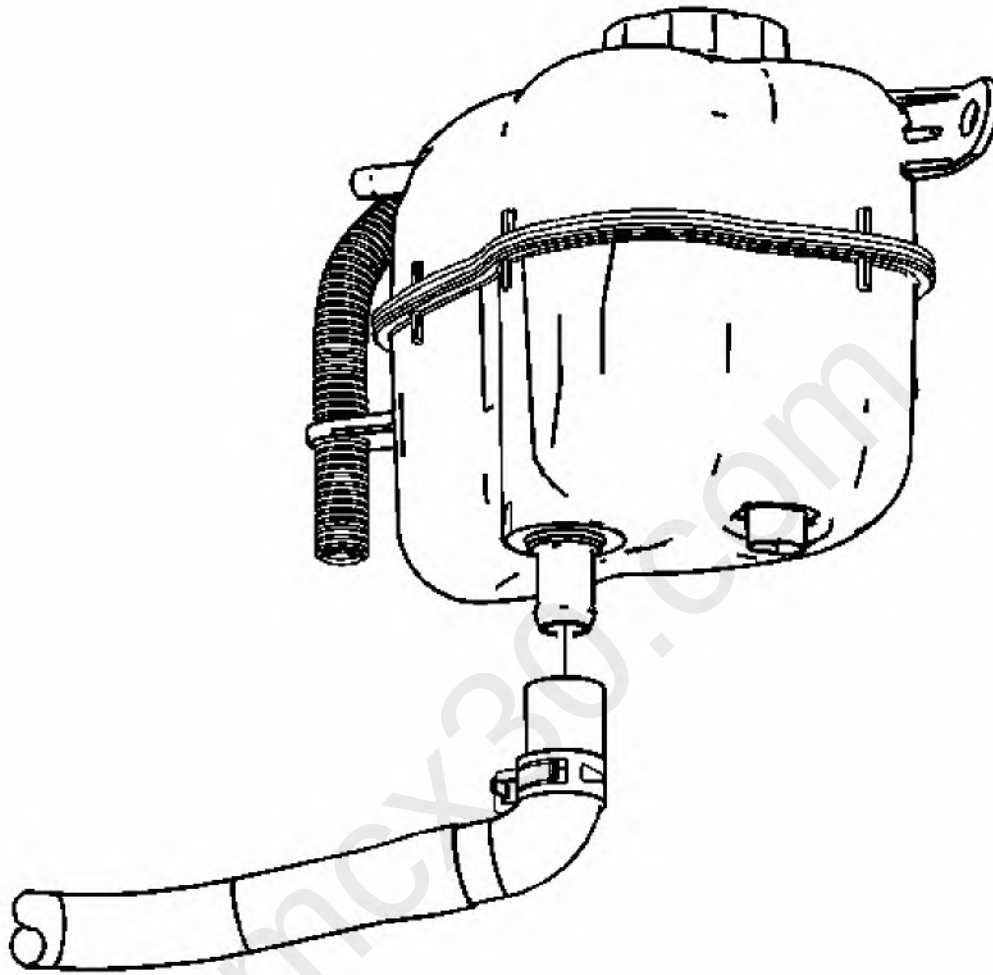


Fig. 122: View Of Surge Tank & Heater Outlet Hose
Courtesy of GENERAL MOTORS CORP.

1. Install the heater outlet hose to the vehicle. Route the hose into position for attachment to the surge tank.
2. Install the heater outlet hose clamp to the hose.
3. Install the heater outlet hose to the surge tank.
4. Install the surge tank to the vehicle.

NOTE: Refer to Fastener Notice.

5. Install the surge tank bolts to the surge tank.

Tighten: Tighten the bolts to 8 N.m (71 lb in).

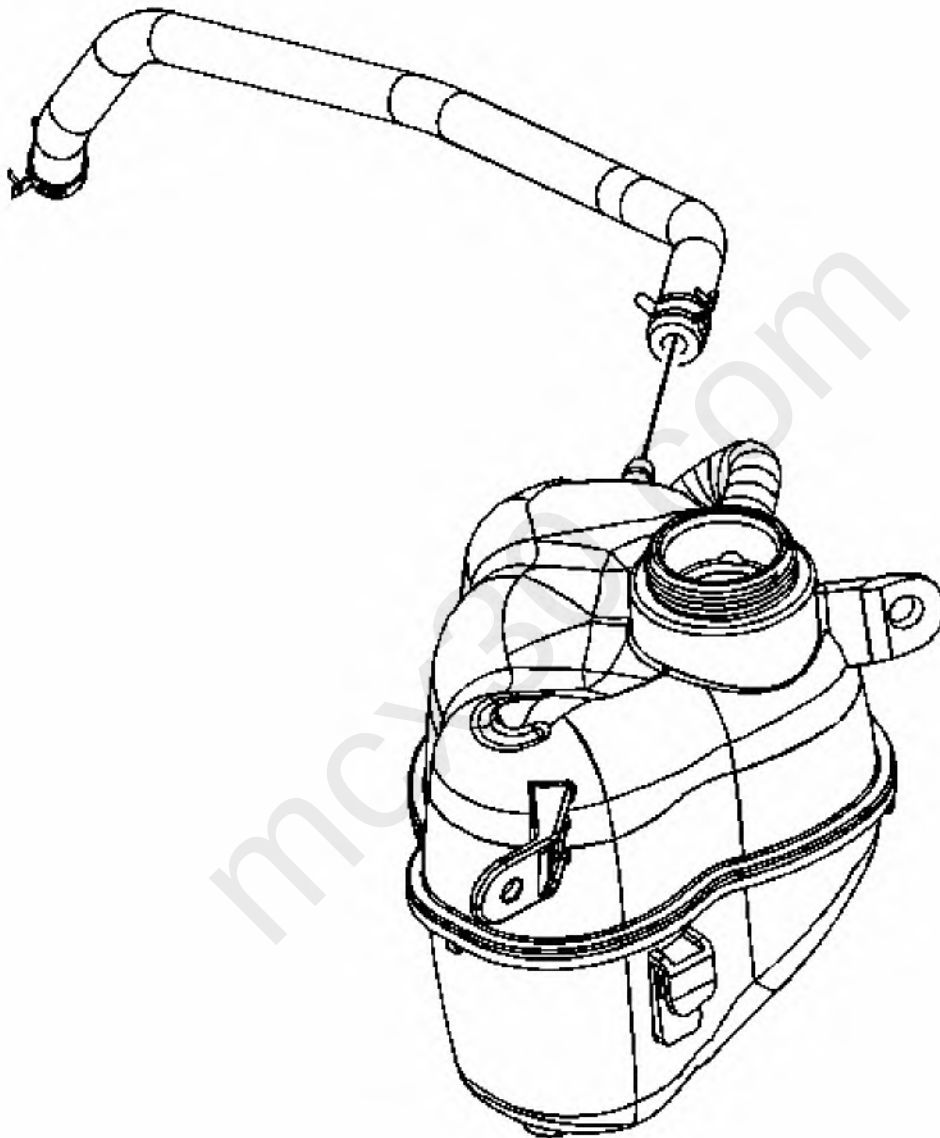


Fig. 123: Surge Tank Inlet Hose & Surge Tank
Courtesy of GENERAL MOTORS CORP.

6. Connect the surge tank inlet hose to the surge tank.
7. Install the surge tank inlet hose clamp to the surge tank.

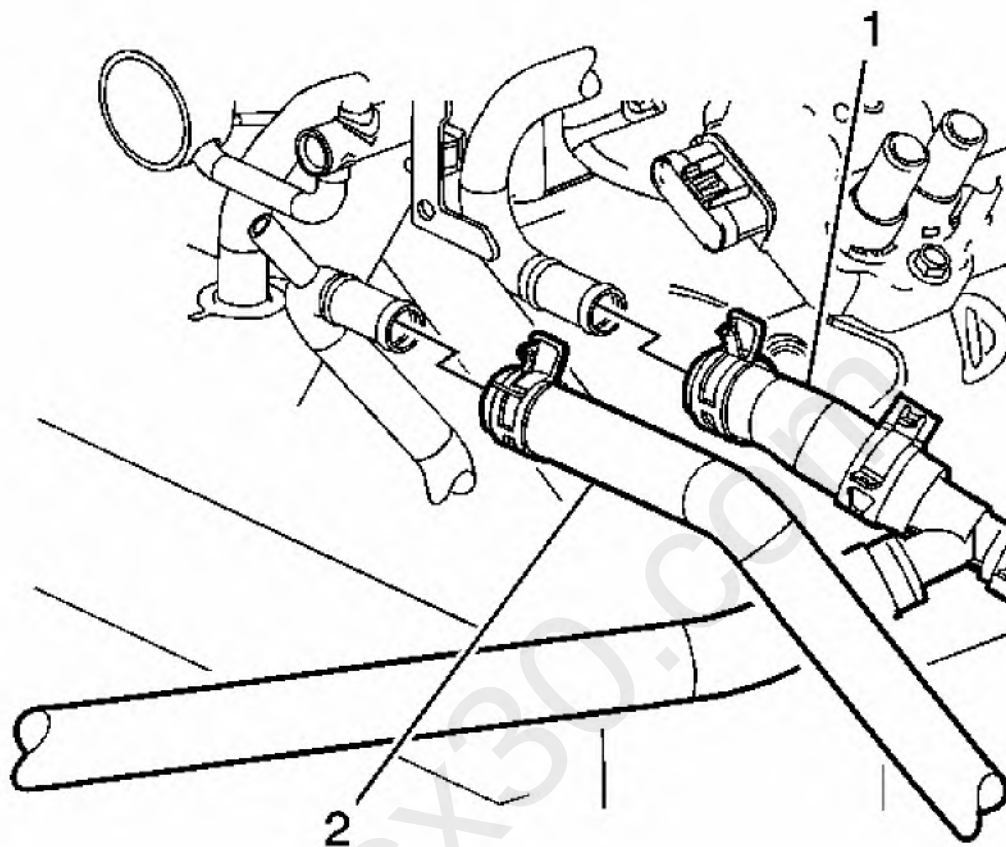


Fig. 124: Heater Hoses At Engine
Courtesy of GENERAL MOTORS CORP.

8. Install the heater outlet hose (1) to the engine.
9. Install the heater outlet hose clamp to the engine.

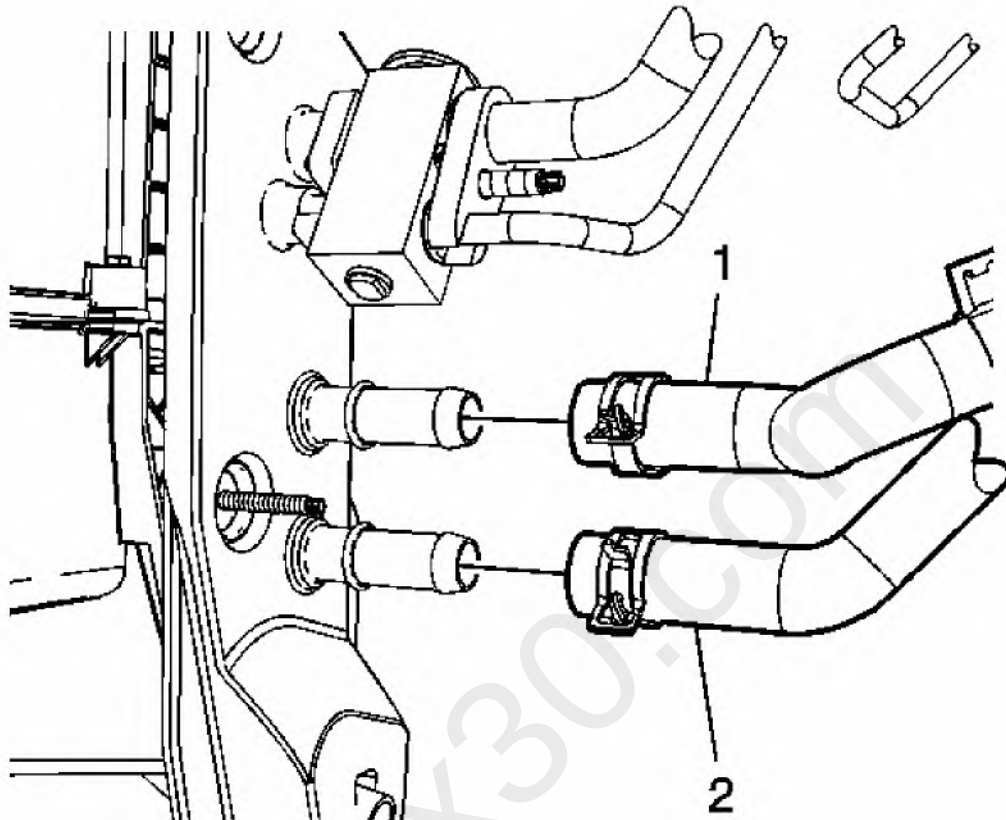


Fig. 125: Heater Hoses At Heater Core
Courtesy of GENERAL MOTORS CORP.

10. Install the heater outlet hose (1) to the heater core.
11. Install the heater outlet hose clamp to the heater core.
12. Fill the engine coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .

PASSENGER COMPARTMENT AIR FILTER HOUSING REPLACEMENT

Removal Procedure

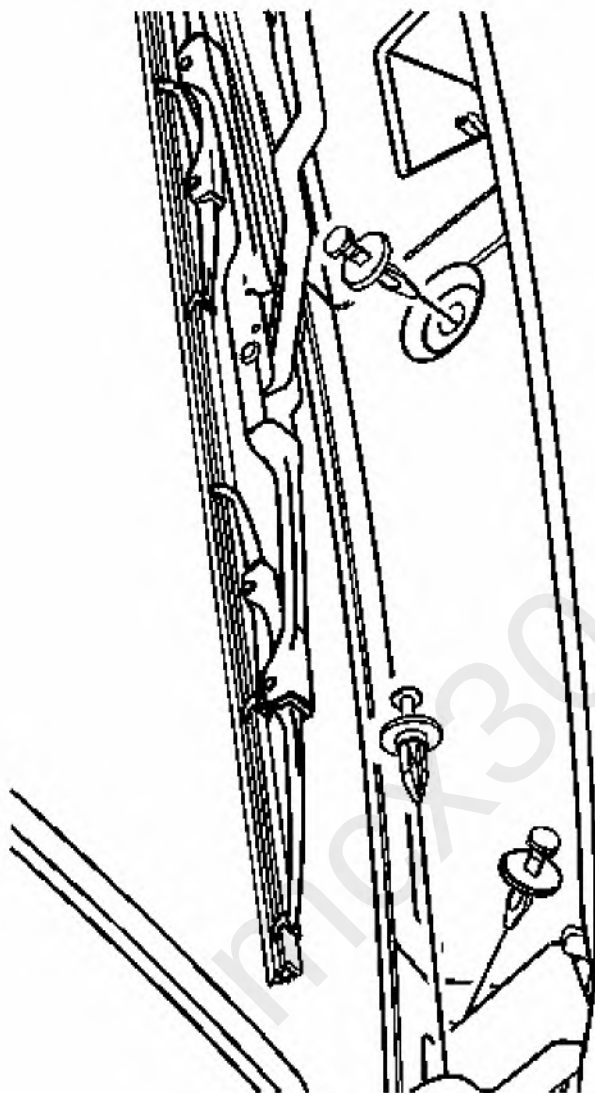


Fig. 126: View Of RH Air Inlet Panel Push Pins (Rear)
Courtesy of GENERAL MOTORS CORP.

1. Remove the push pins from the rear of the RH air inlet panel.

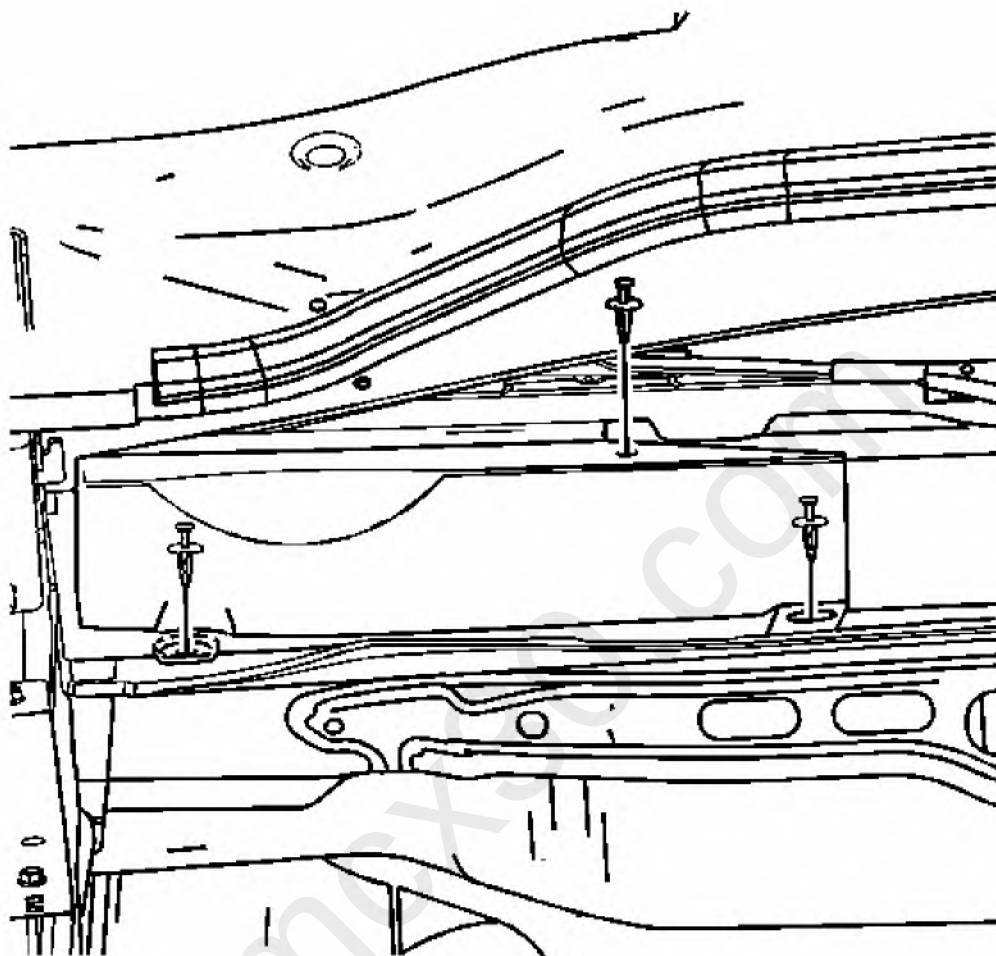


Fig. 127: View Of RH Air Inlet Panel Push Pins (Front)
Courtesy of GENERAL MOTORS CORP.

2. Open the hood.
3. Remove the push pins from the top and forward edge of the RH air inlet panel.

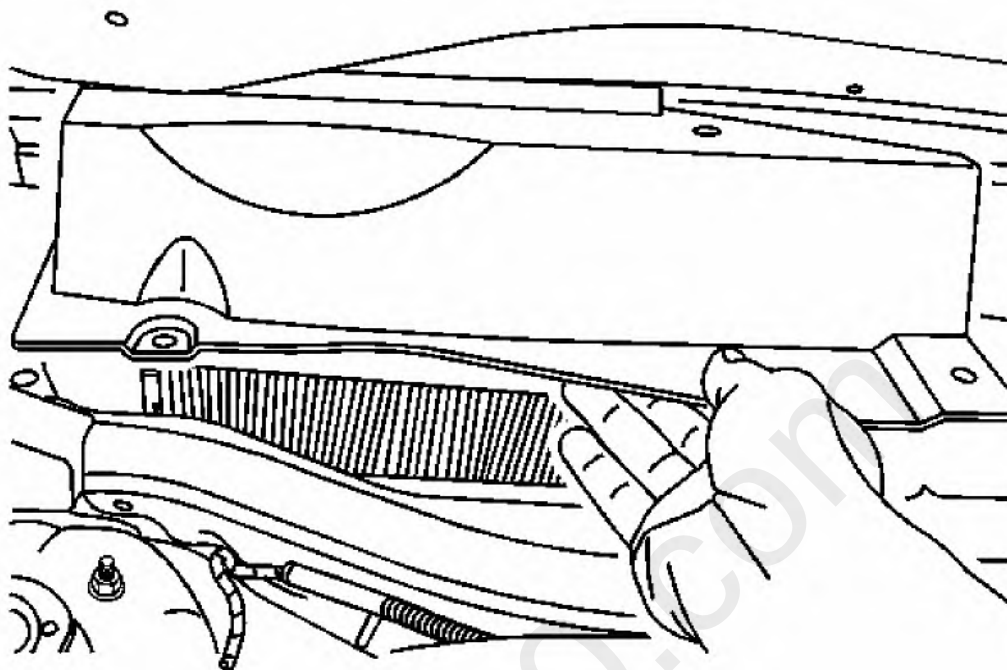


Fig. 128: Removing/Installing RH Air Inlet Panel
Courtesy of GENERAL MOTORS CORP.

4. Remove the RH air inlet panel.
5. Remove the LH air inlet panel. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.

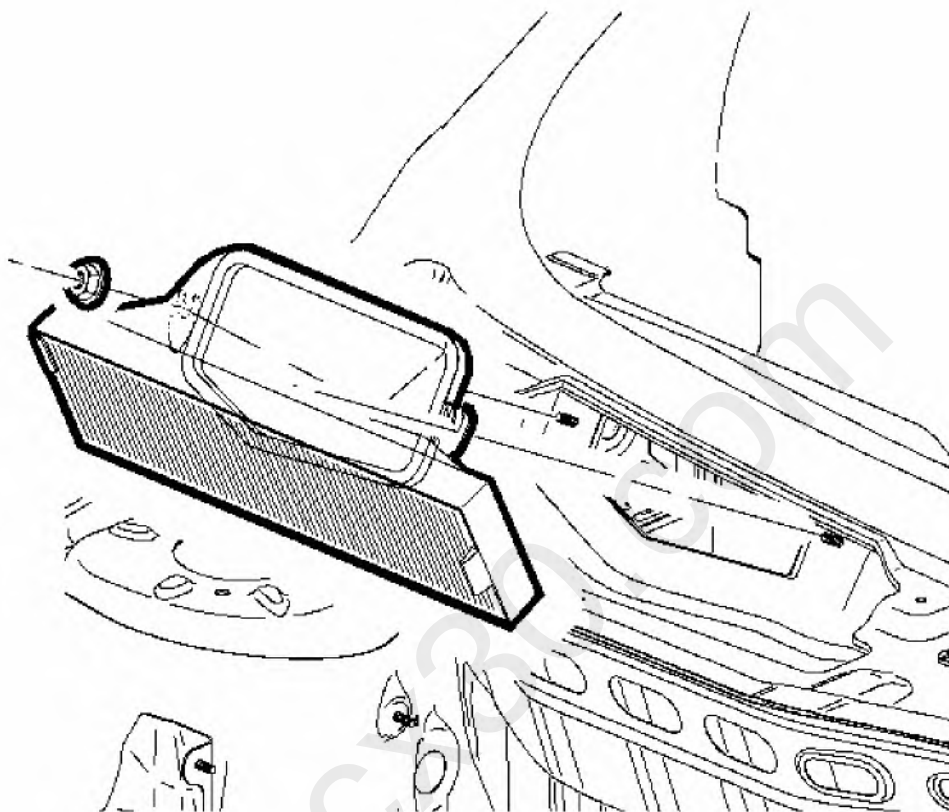


Fig. 129: Filter Housing & Nuts
Courtesy of GENERAL MOTORS CORP.

6. Remove the filter housing nuts from the vehicle.
7. Remove the filter housing from the vehicle.

Installation Procedure

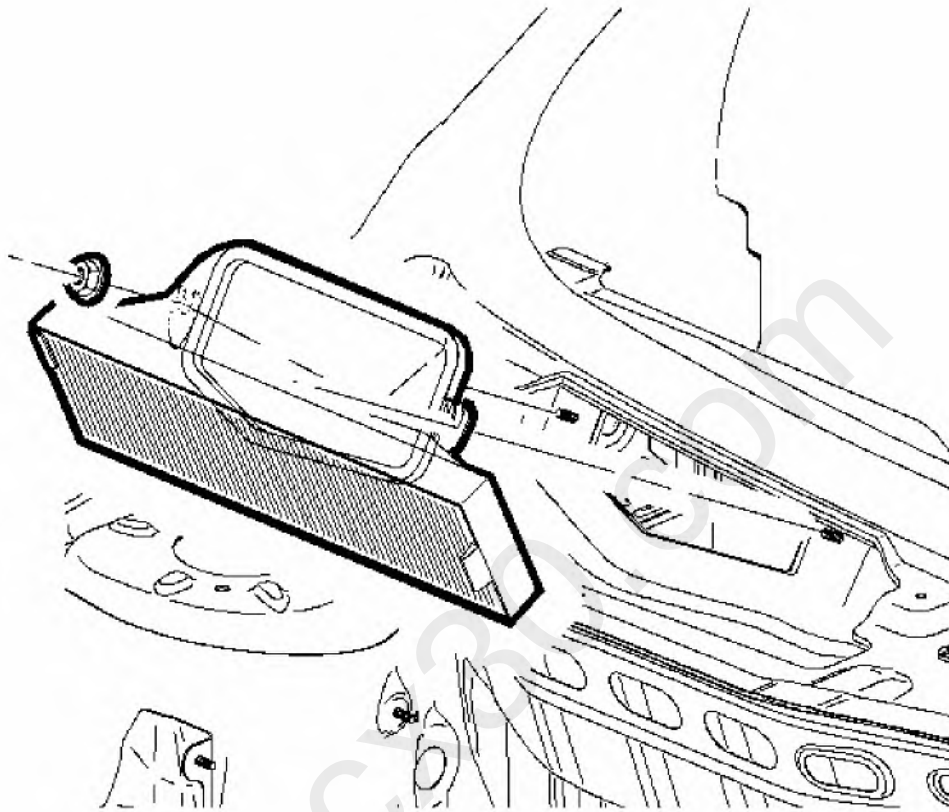


Fig. 130: Filter Housing & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Inspect the foam seal. If the seal is damaged, replace the seal using Kent Industries adhesive back foam tape P/N 46485 (or equivalent).
2. Install the filter housing to the vehicle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: New seal nuts must be used when installing passenger compartment air filter housing to prevent leaks.

3. Install the new seal nuts to the filter housing.

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

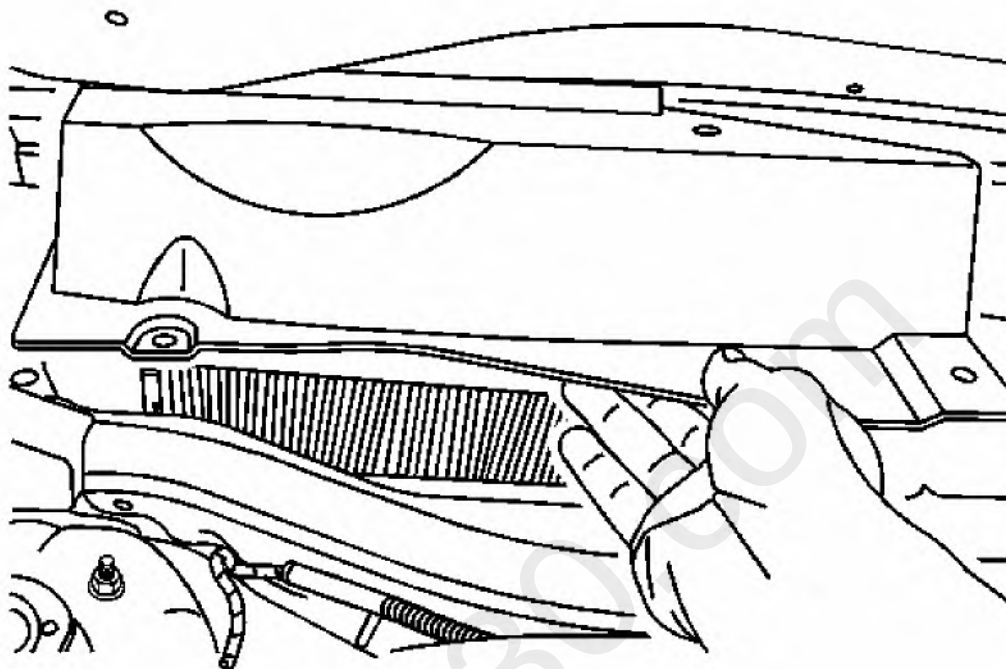


Fig. 131: Removing/Installing RH Air Inlet Panel
Courtesy of GENERAL MOTORS CORP.

4. Install the LH air inlet panel. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.
5. Install the RH air inlet panel.

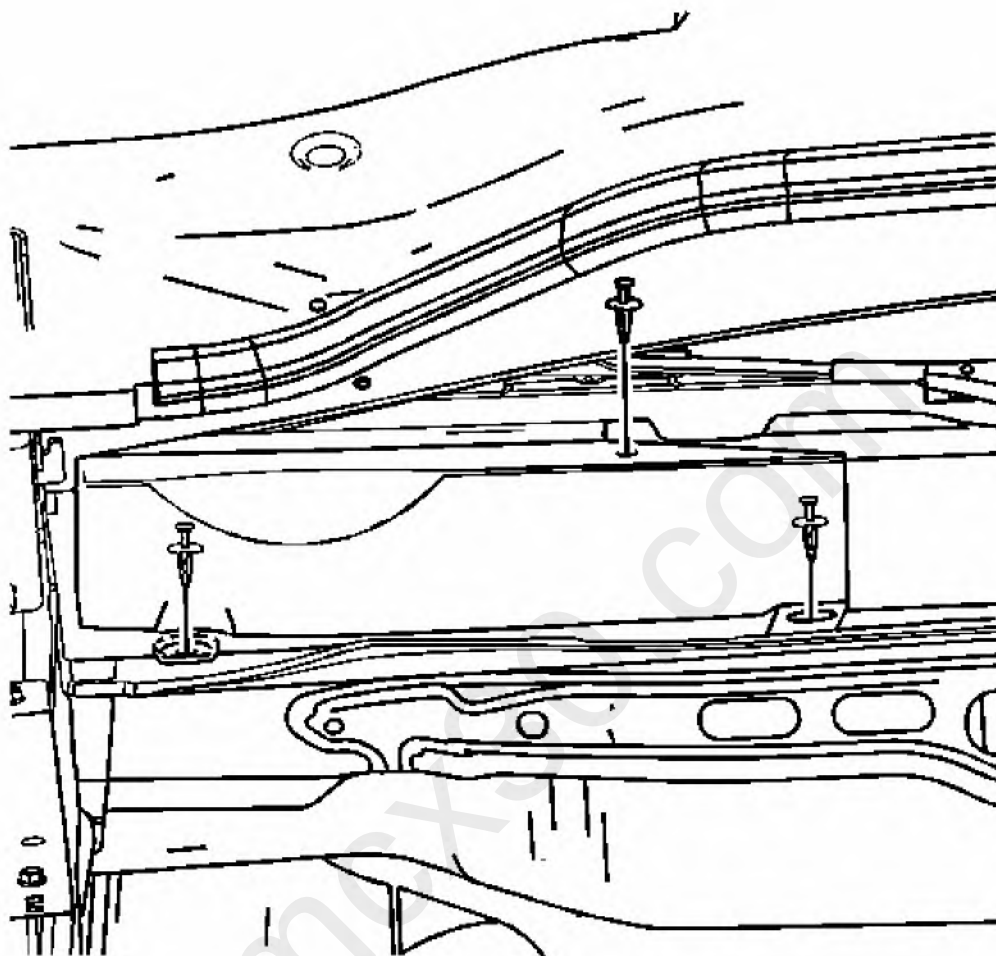


Fig. 132: View Of RH Air Inlet Panel Push Pins (Front)
Courtesy of GENERAL MOTORS CORP.

6. Install the push pins to the top and forward edge of the RH air inlet panel.
7. Close the hood.

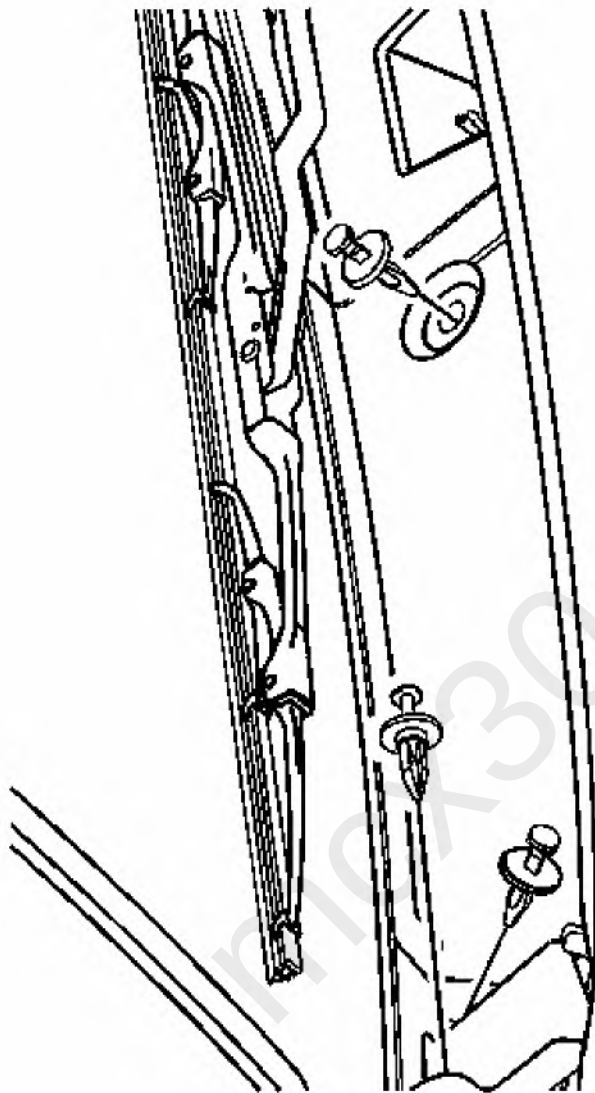


Fig. 133: View Of RH Air Inlet Panel Push Pins (Rear)
Courtesy of GENERAL MOTORS CORP.

8. Install the push pins to the rear of the RH air inlet panel.

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT

Removal Procedure

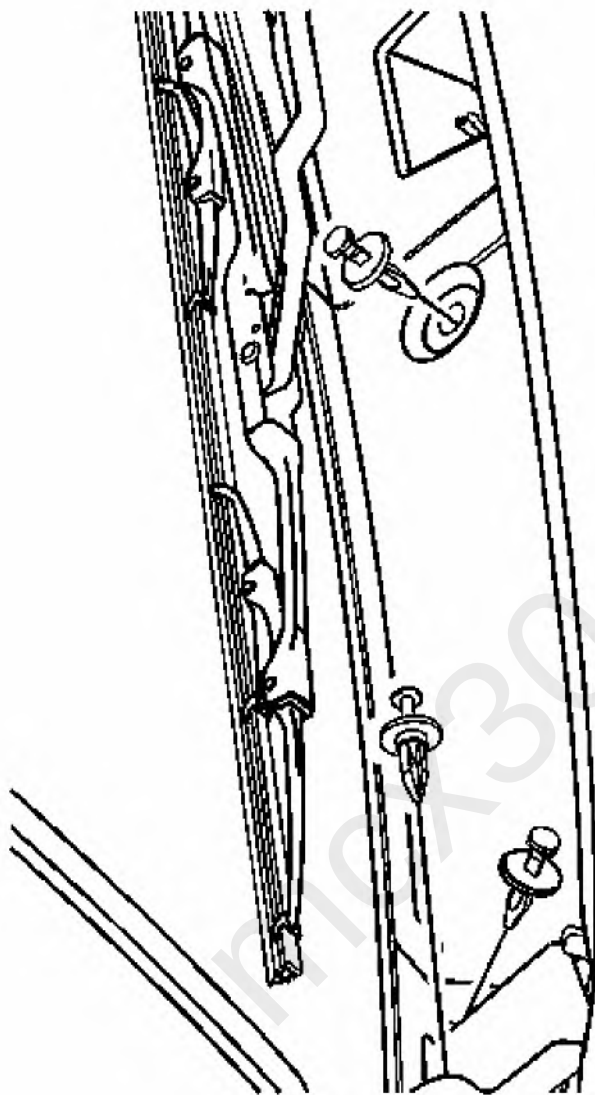


Fig. 134: View Of RH Air Inlet Panel Push Pins (Rear)
Courtesy of GENERAL MOTORS CORP.

1. Remove the push pins from the rear of the RH air inlet panel.

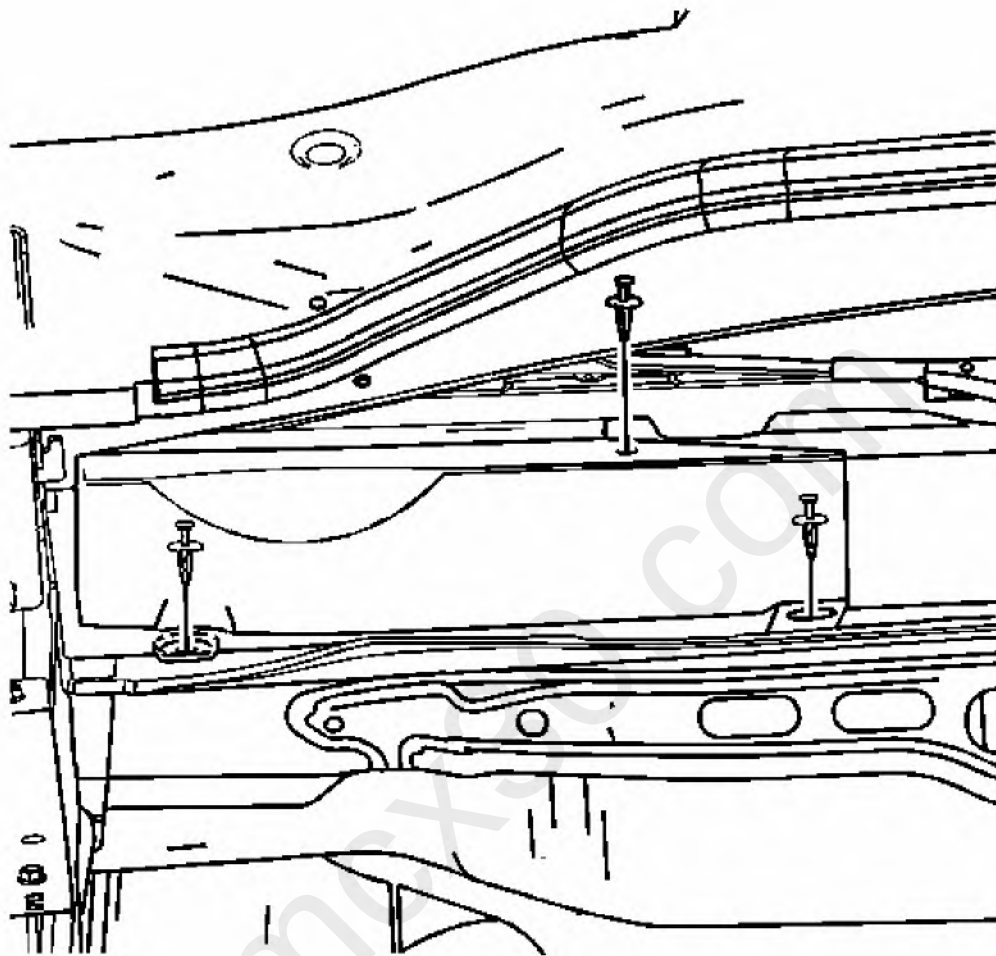


Fig. 135: View Of RH Air Inlet Panel Push Pins (Front)
Courtesy of GENERAL MOTORS CORP.

2. Open the hood.
3. Remove the push pins from the top and forward edge of the RH air inlet panel.

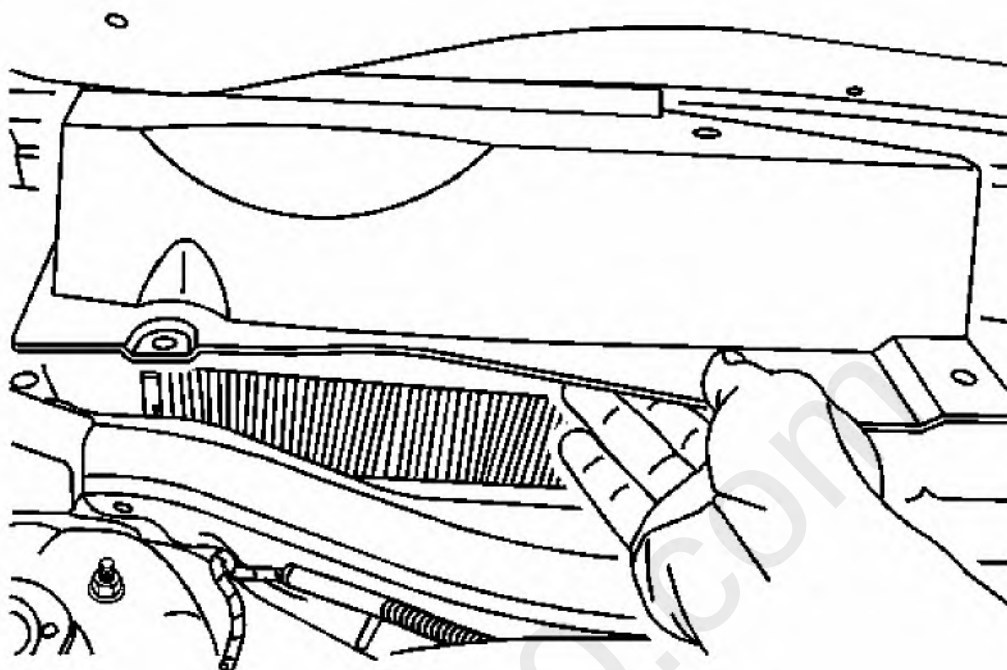


Fig. 136: Removing/Installing RH Air Inlet Panel
Courtesy of GENERAL MOTORS CORP.

4. Remove the RH air inlet panel.

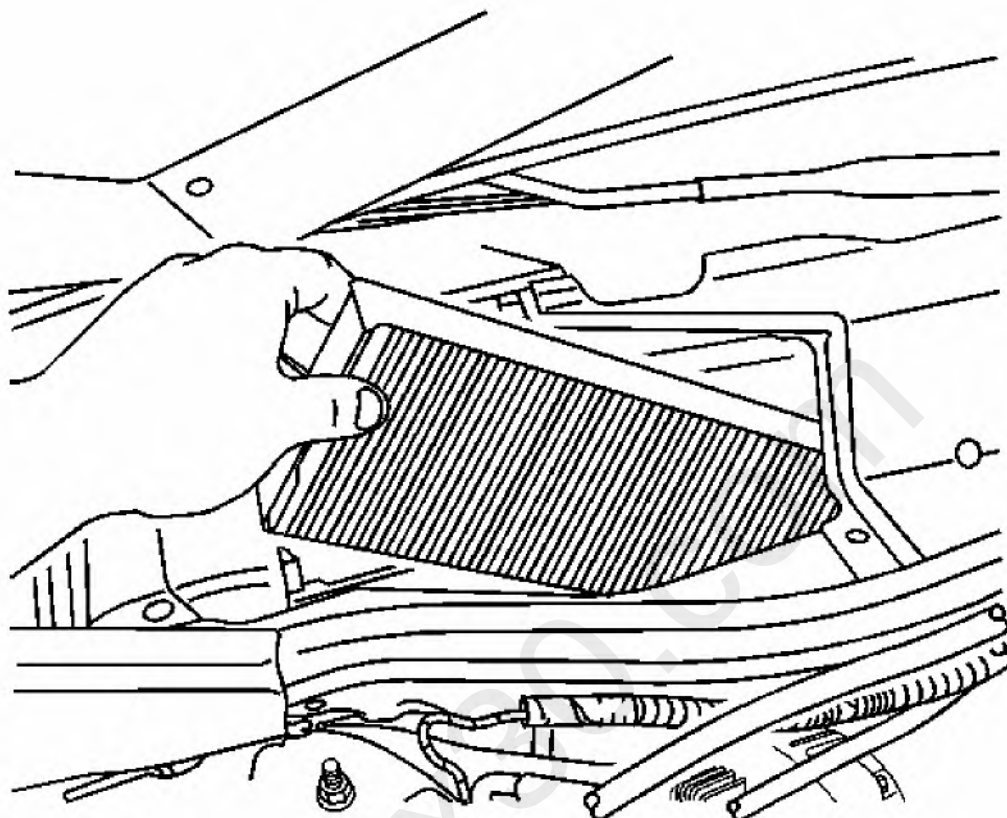


Fig. 137: View Of Filter
Courtesy of GENERAL MOTORS CORP.

5. Remove the filter from the filter housing by depressing the release tab at the inboard edge of the filter housing.
6. Remove the filter from the vehicle.

Installation Procedure

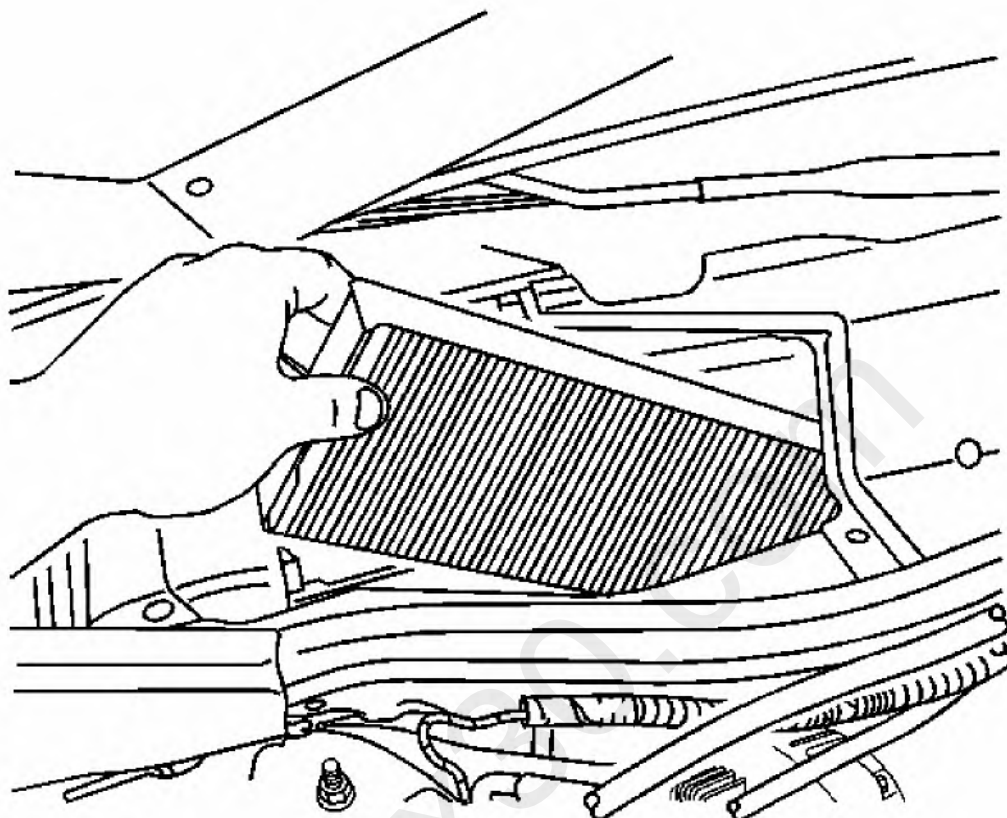


Fig. 138: View Of Filter
Courtesy of GENERAL MOTORS CORP.

1. Install the filter to the vehicle.

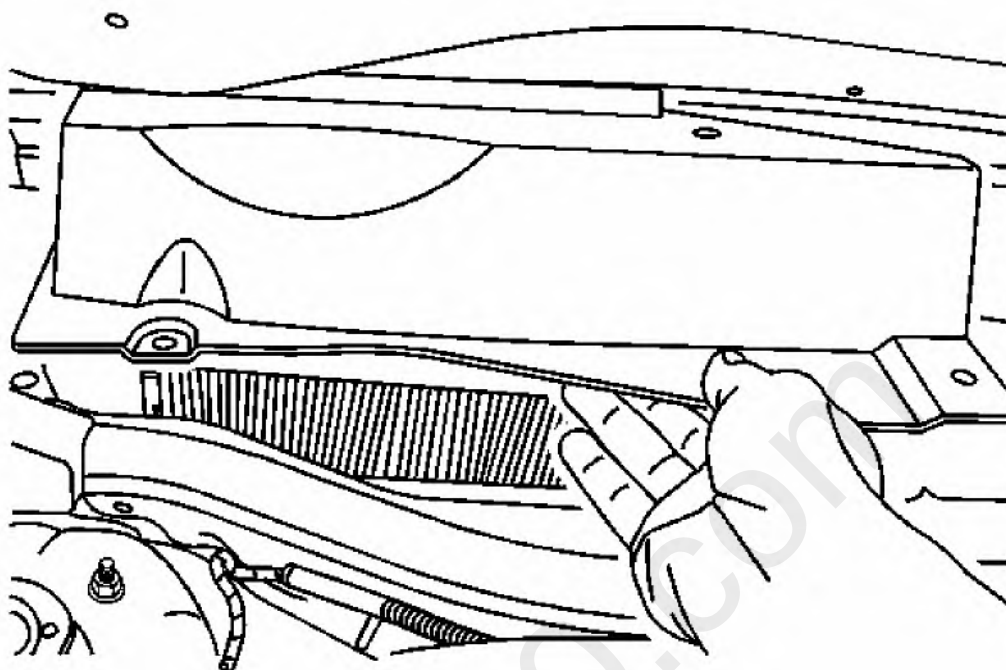


Fig. 139: Removing/Installing RH Air Inlet Panel
Courtesy of GENERAL MOTORS CORP.

2. Install the RH air inlet panel.

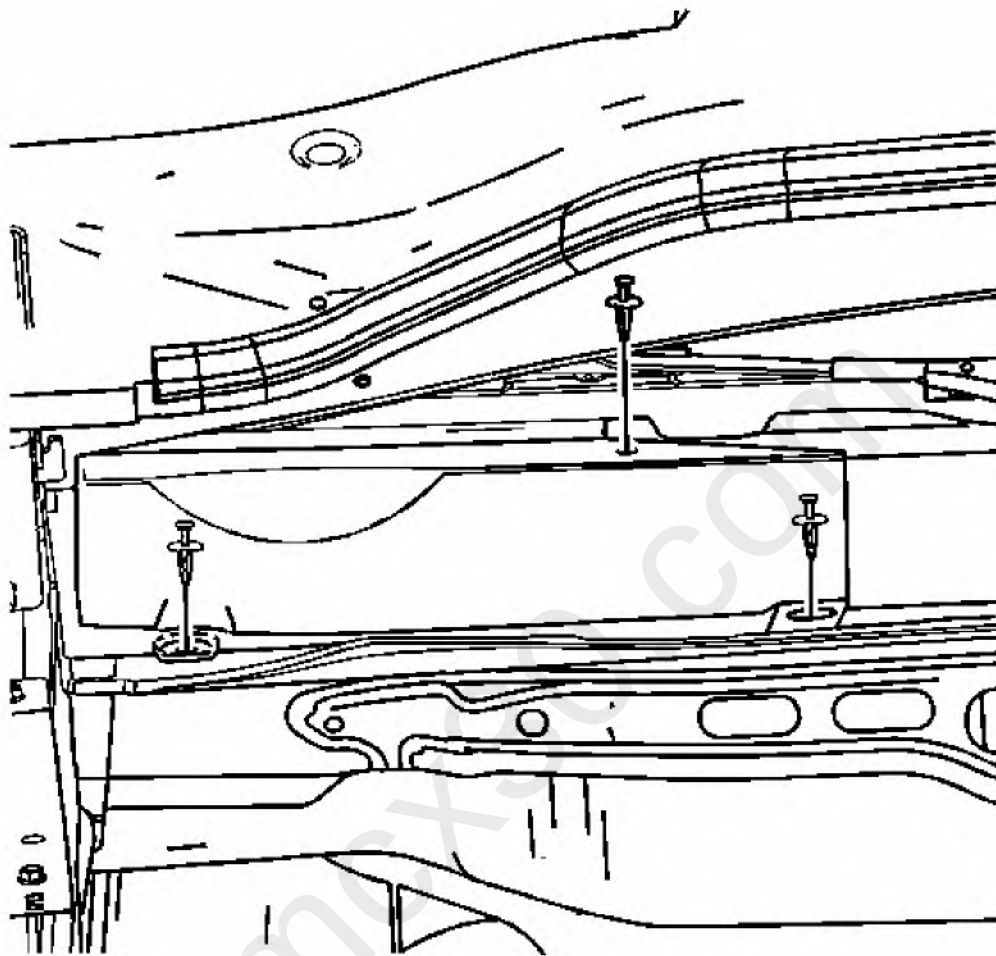


Fig. 140: View Of RH Air Inlet Panel Push Pins (Front)
Courtesy of GENERAL MOTORS CORP.

3. Install the push pins to the top and forward edge of the RH air inlet panel.
4. Close the hood.

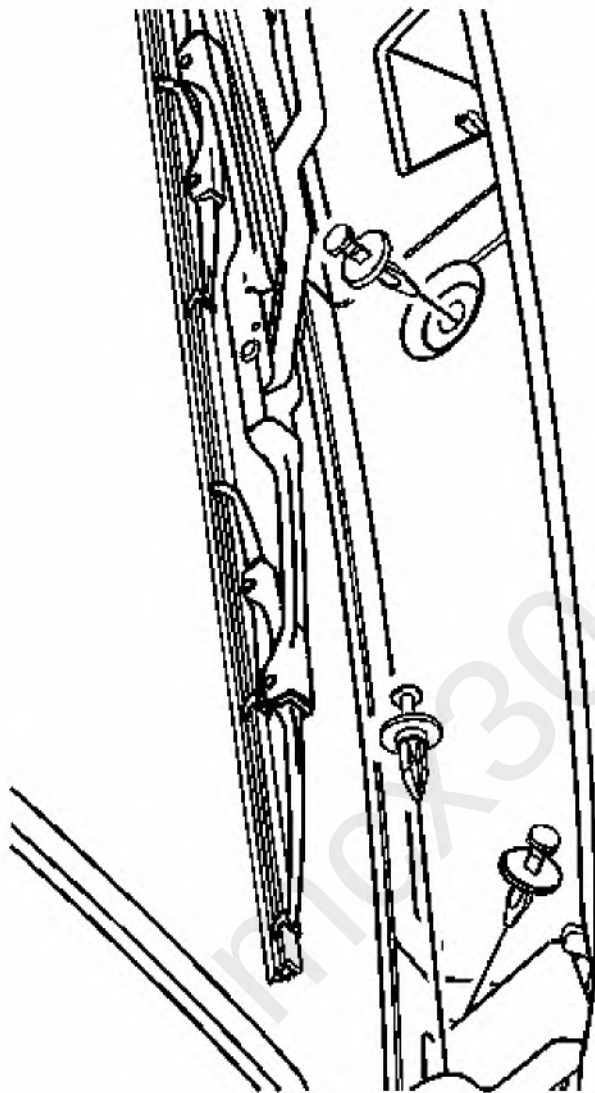


Fig. 141: View Of RH Air Inlet Panel Push Pins (Rear)
Courtesy of GENERAL MOTORS CORP.

5. Install the push pins to the rear of the RH air inlet panel.

AIR INLET ASSEMBLY REPLACEMENT

Removal Procedure

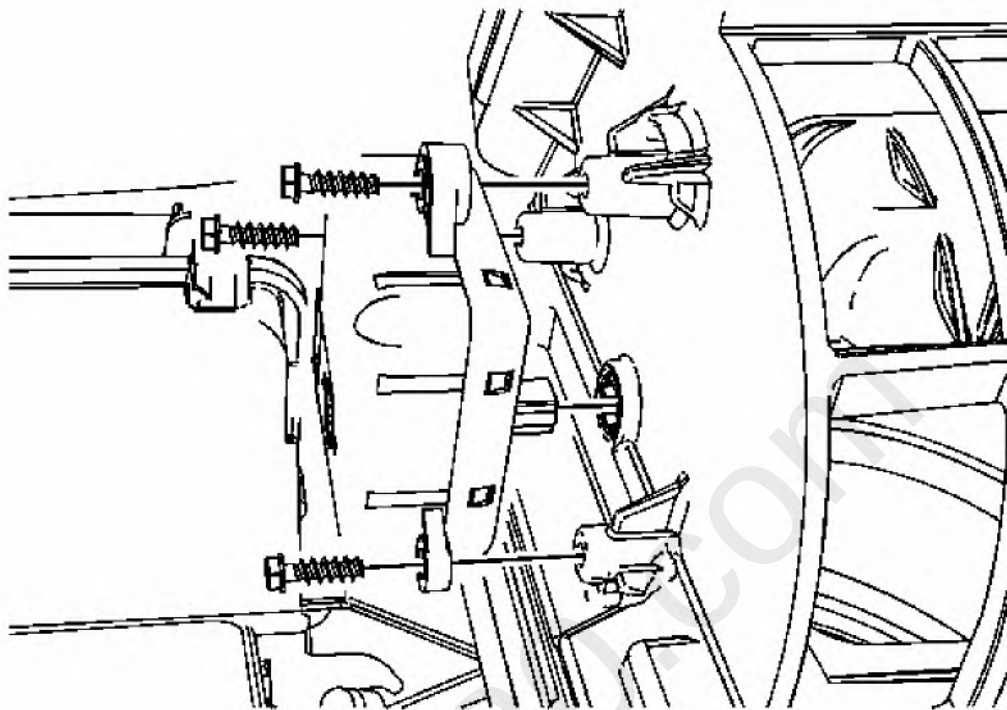


Fig. 142: View Of Recirculation Actuator Screws
Courtesy of GENERAL MOTORS CORP.

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

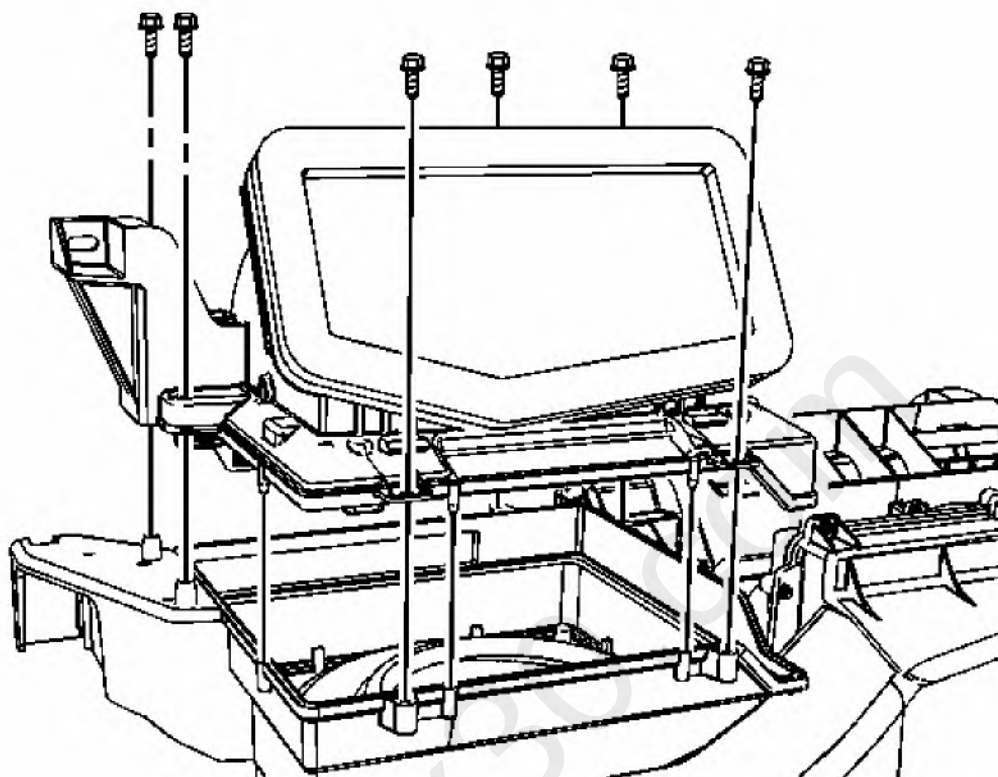


Fig. 143: View Of Air Inlet Assembly Screws
Courtesy of GENERAL MOTORS CORP.

5. Remove the air inlet assembly screws.
6. Remove the air inlet assembly.

Installation Procedure

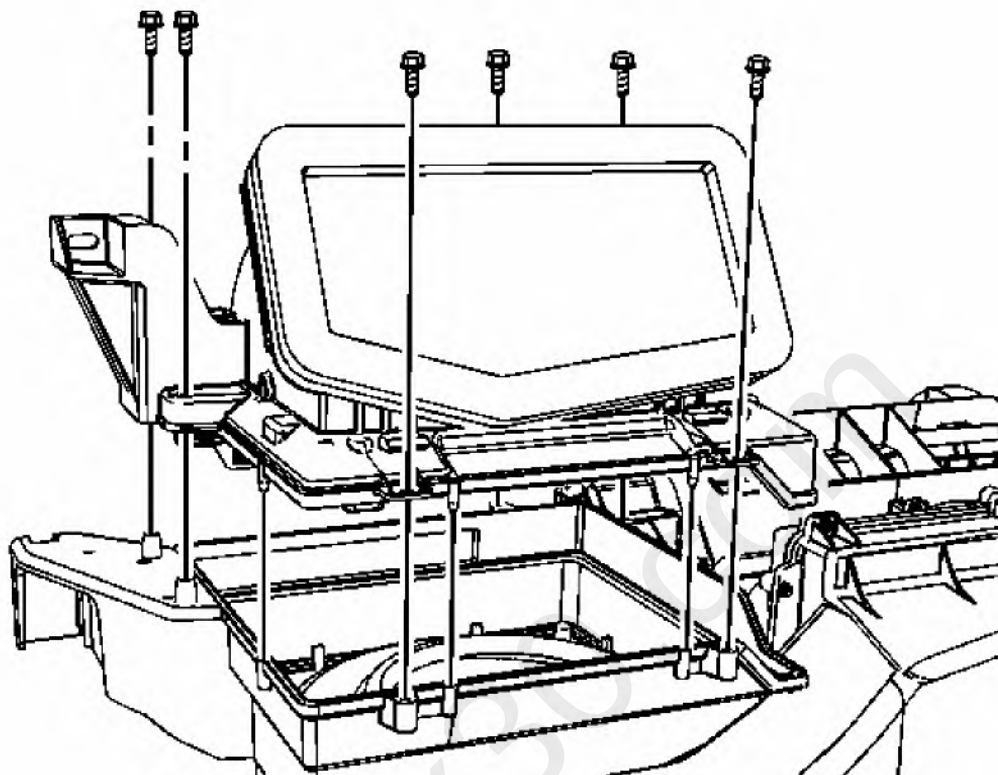


Fig. 144: View Of Air Inlet Assembly Screws
Courtesy of GENERAL MOTORS CORP.

1. Install the air inlet assembly.

NOTE: Refer to Fastener Notice.

2. Install the air inlet assembly screws.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

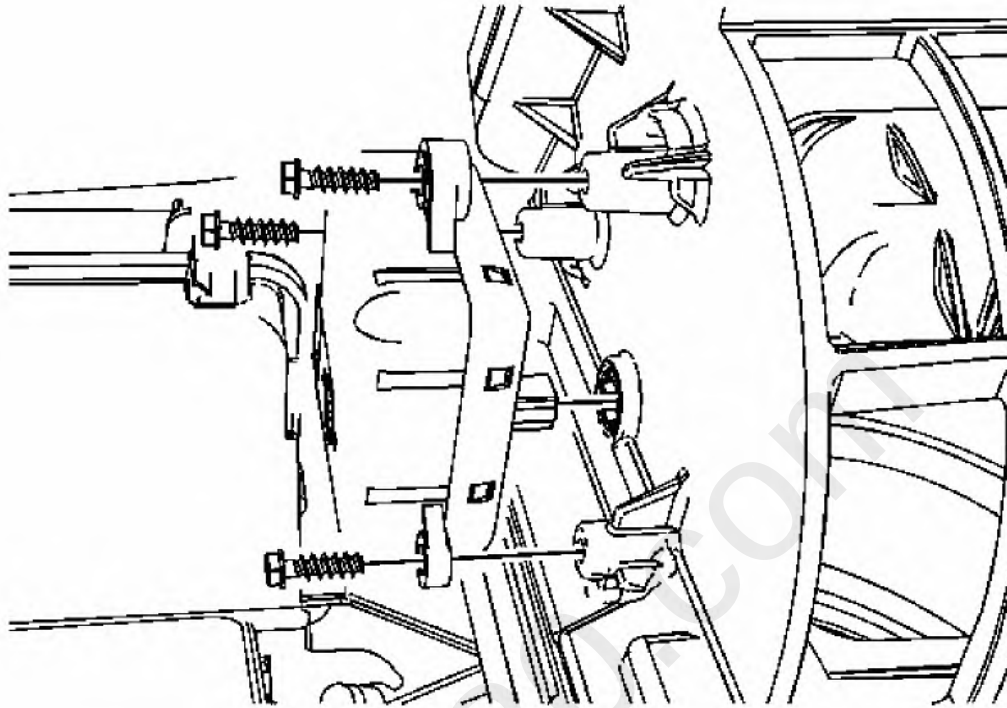


Fig. 145: View Of Recirculation Actuator Screws
Courtesy of GENERAL MOTORS CORP.

3. Install the recirculation actuator.
4. Install the recirculation actuator screws.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

5. Install the electrical connector to the recirculation actuator.
6. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

BLOWER MOTOR RESISTOR REPLACEMENT

Removal Procedure

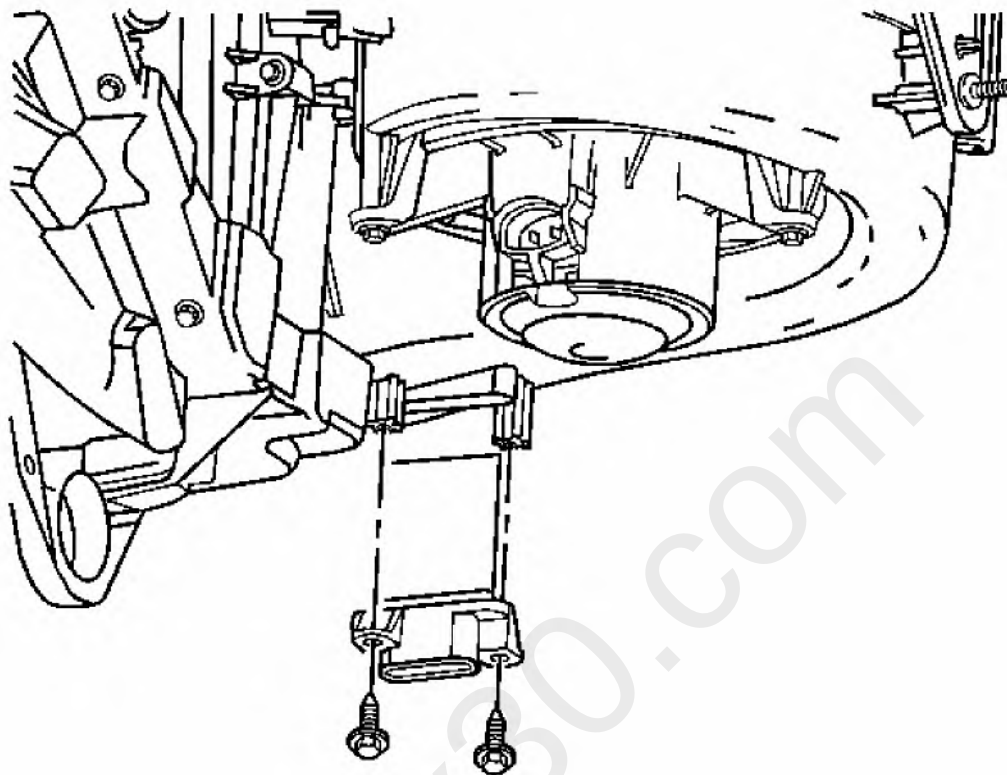


Fig. 146: View Of Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

1. Disconnect the electrical connector from the blower motor resistor.
2. Remove the blower motor resistor screws from the HVAC module.
3. Remove the blower motor resistor from the HVAC module.

Installation Procedure

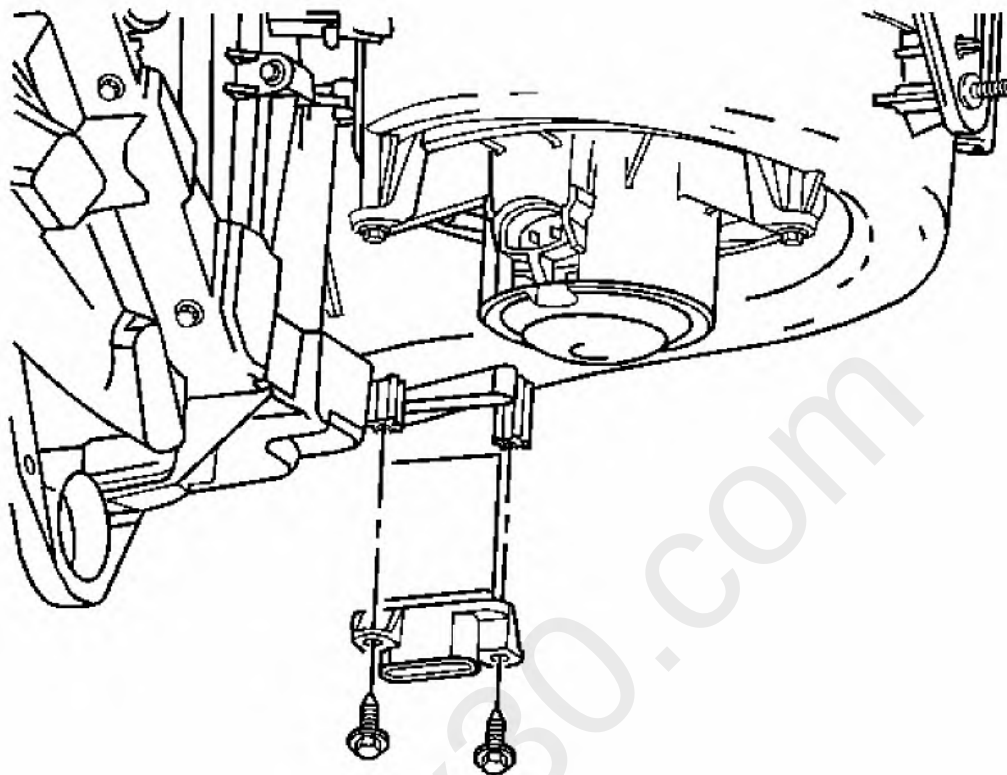


Fig. 147: View Of Blower Motor Resistor
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor resistor to the HVAC module.

NOTE: Refer to Fastener Notice.

2. Install the blower motor resistor screws to the HVAC module.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

3. Connect the electrical connector to the blower motor resistor.

BLOWER MOTOR REPLACEMENT

Removal Procedure

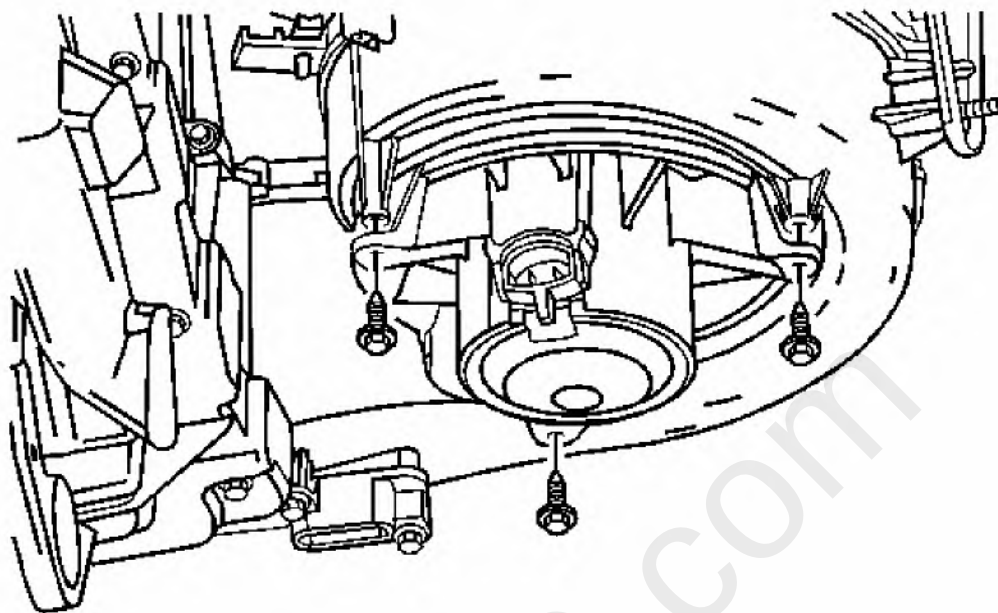


Fig. 148: View Of Blower Motor & Screws
Courtesy of GENERAL MOTORS CORP.

1. Disconnect the electrical connector from the blower motor.
2. Remove the blower motor screws from the HVAC module.
3. Remove the blower motor from the HVAC module.

Installation Procedure

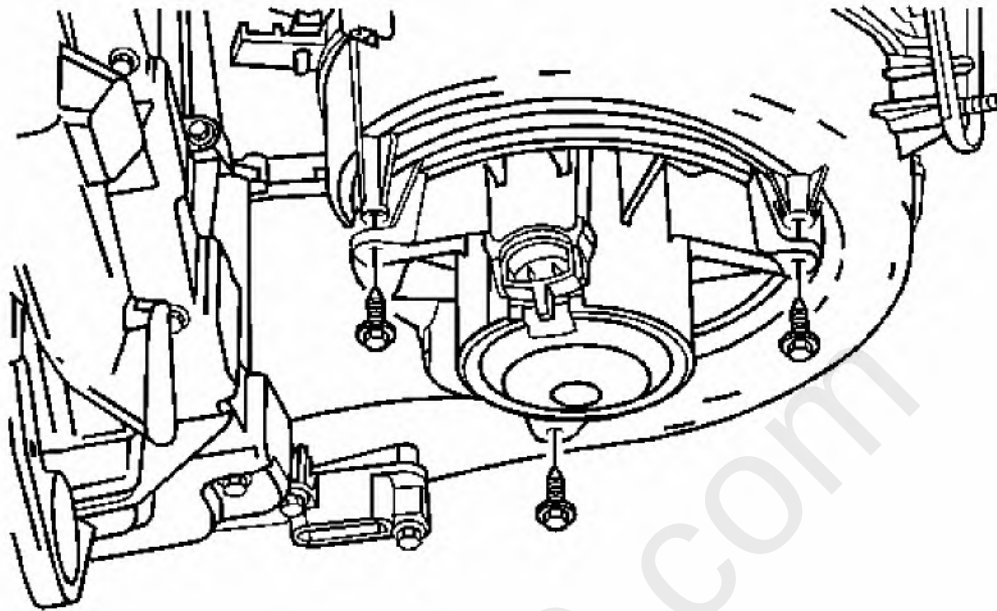


Fig. 149: View Of Blower Motor & Screws
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor to the HVAC module.

NOTE: Refer to Fastener Notice .

2. Install the blower motor screws to the HVAC module.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

3. Connect the electrical connector to the blower motor.

AIR OUTLET REPLACEMENT - INSTRUMENT PANEL

Removal Procedure

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

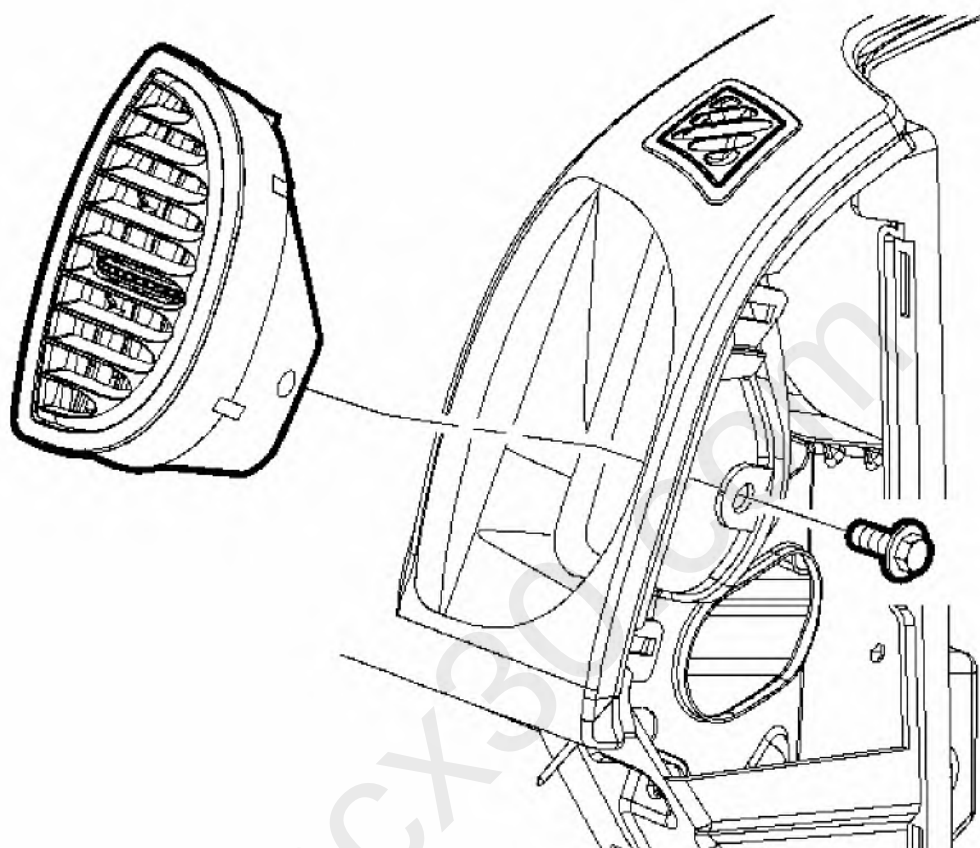


Fig. 150: Removing/Installing Right Air Outlet Screw
Courtesy of GENERAL MOTORS CORP.

2. Depress the locking tabs on the outlet.
3. Carefully slide the outlet out of the I/P trim and the surrounding outlet bezel.

Installation Procedure

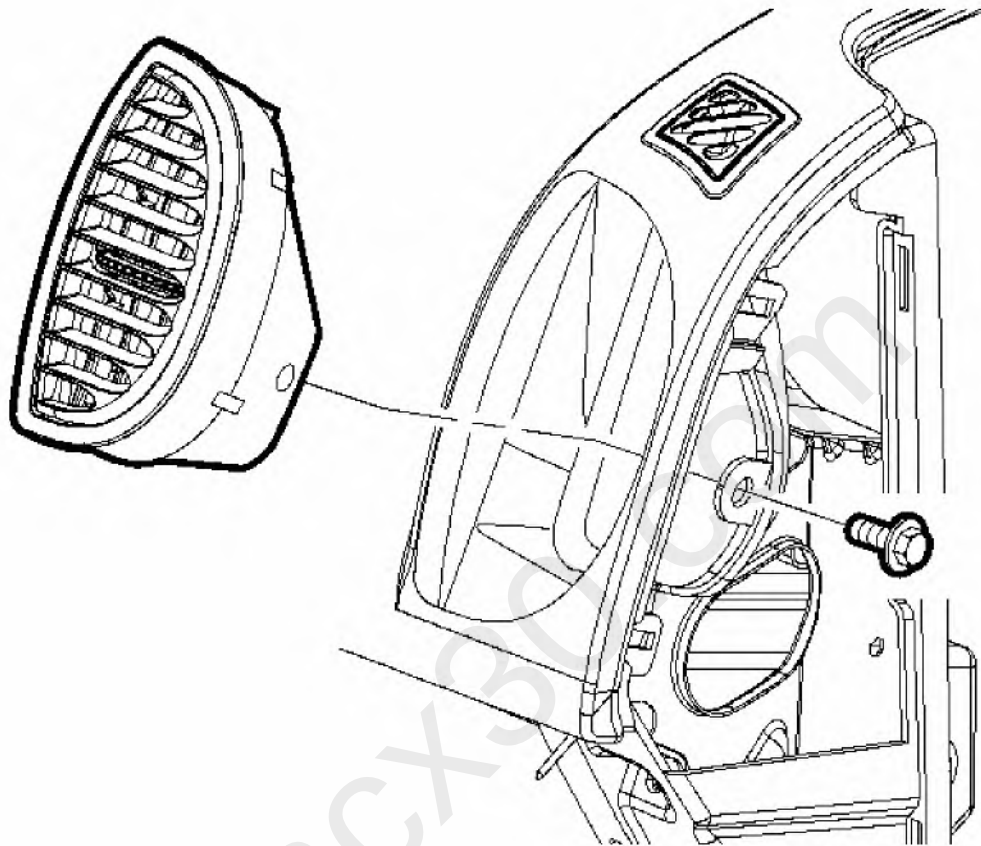


Fig. 151: Removing/Installing Right Air Outlet Screw
Courtesy of GENERAL MOTORS CORP.

1. Install the outlet to the I/P trim panel. The outlet will snap into place.
2. Install the I/P upper trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** in Instrument Panel, Gages, and Console.

AIR OUTLET DUCT REPLACEMENT - INSTRUMENT PANEL (I/P) - UPPER LEFT

Removal Procedure

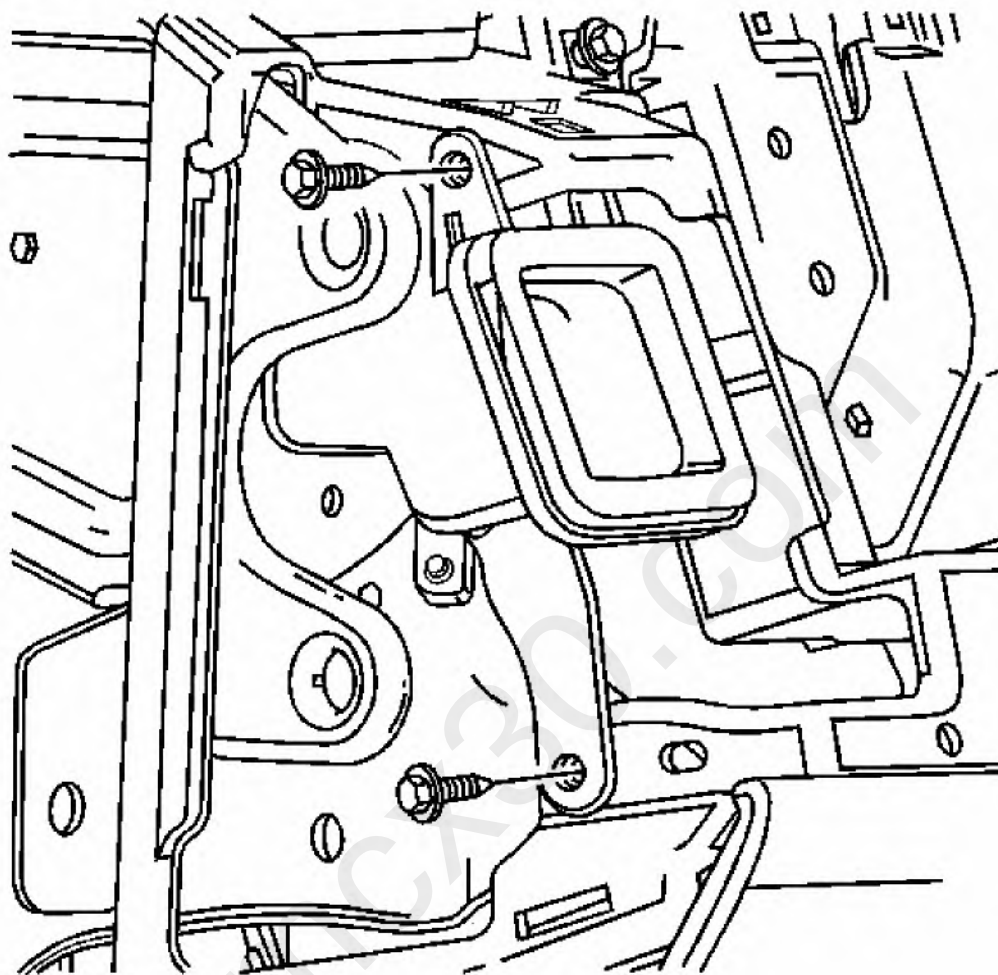


Fig. 152: LH Air Outlet Duct & Screws
Courtesy of GENERAL MOTORS CORP.

1. Remove the LH I/P trim panel. Refer to **Instrument Panel (I/P) Trim Panel Replacement - Lower Left** in Instrument Panel, Gages, and Console.
2. Remove the LH air outlet duct screws from the instrument panel retainer.

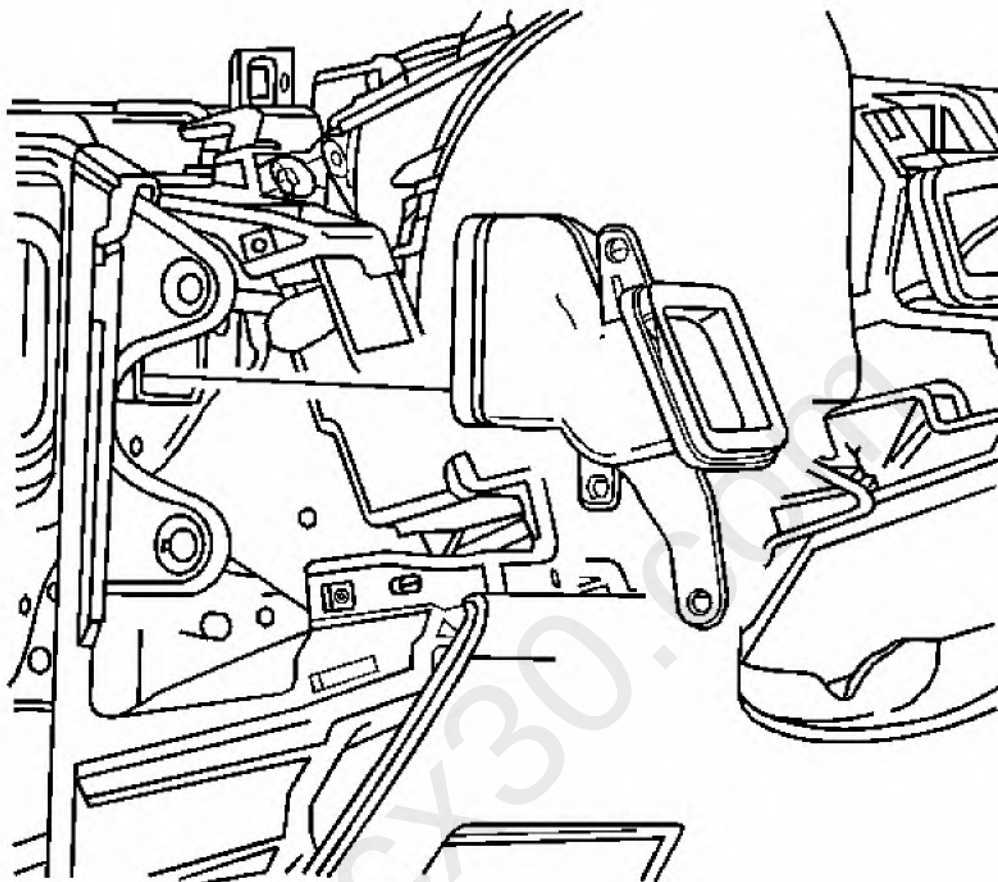


Fig. 153: LH Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

3. Remove the LH air outlet duct from the instrument panel retainer.

Installation Procedure

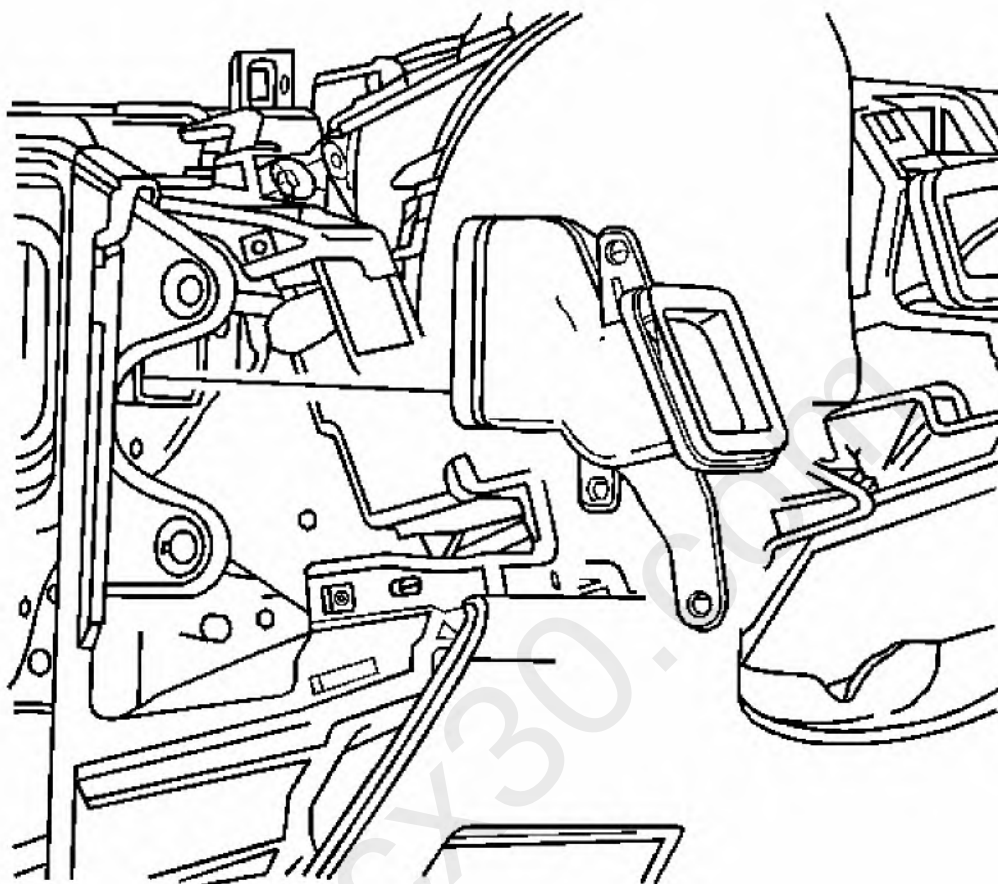


Fig. 154: LH Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.
2. Install the LH air outlet duct to the instrument panel retainer.

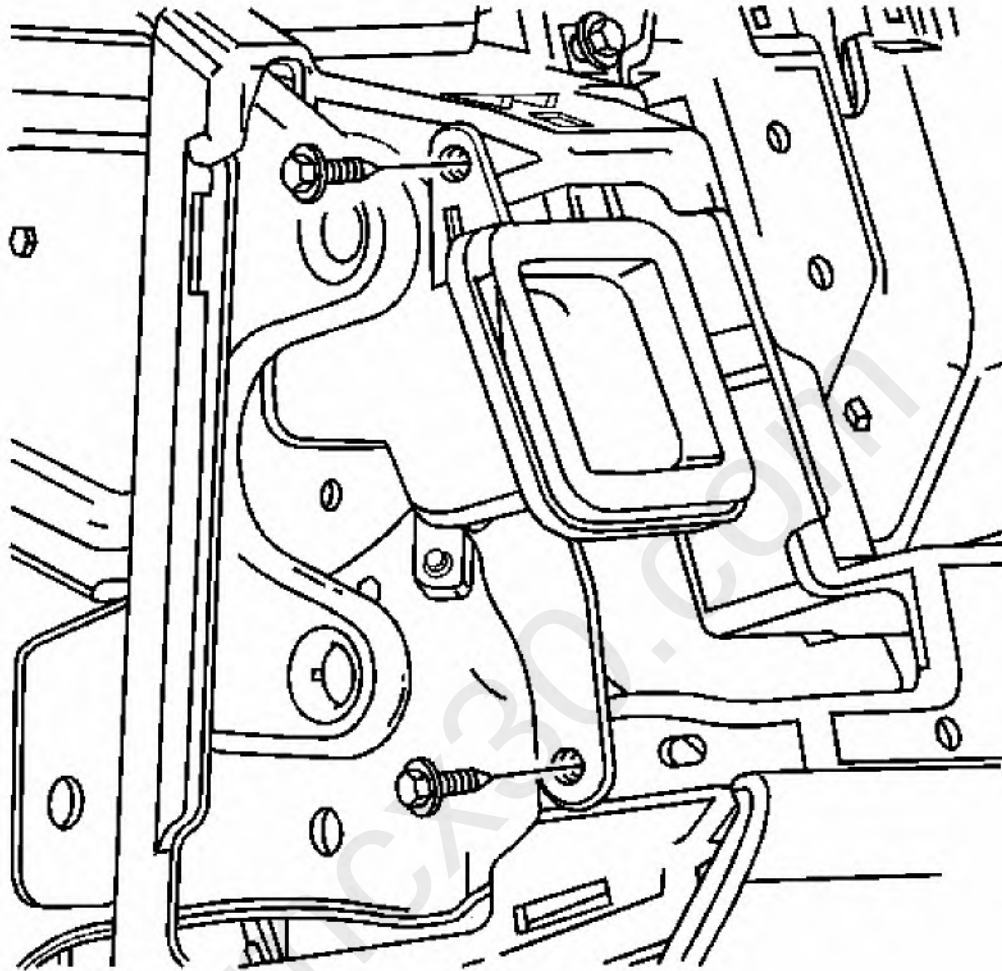


Fig. 155: LH Air Outlet Duct & Screws
Courtesy of GENERAL MOTORS CORP.

3. Install the LH air outlet duct screws to the instrument panel retainer.

Tighten: Tighten the screws to 1 N.m (9 lb in).

4. Install the LH I/P trim panel. Refer to **Instrument Panel (I/P) Trim Panel Replacement - Lower Left** in Instrument Panel, Gages, and Console.

AIR OUTLET DUCT REPLACEMENT - INSTRUMENT PANEL (I/P) - UPPER RIGHT

Removal Procedure

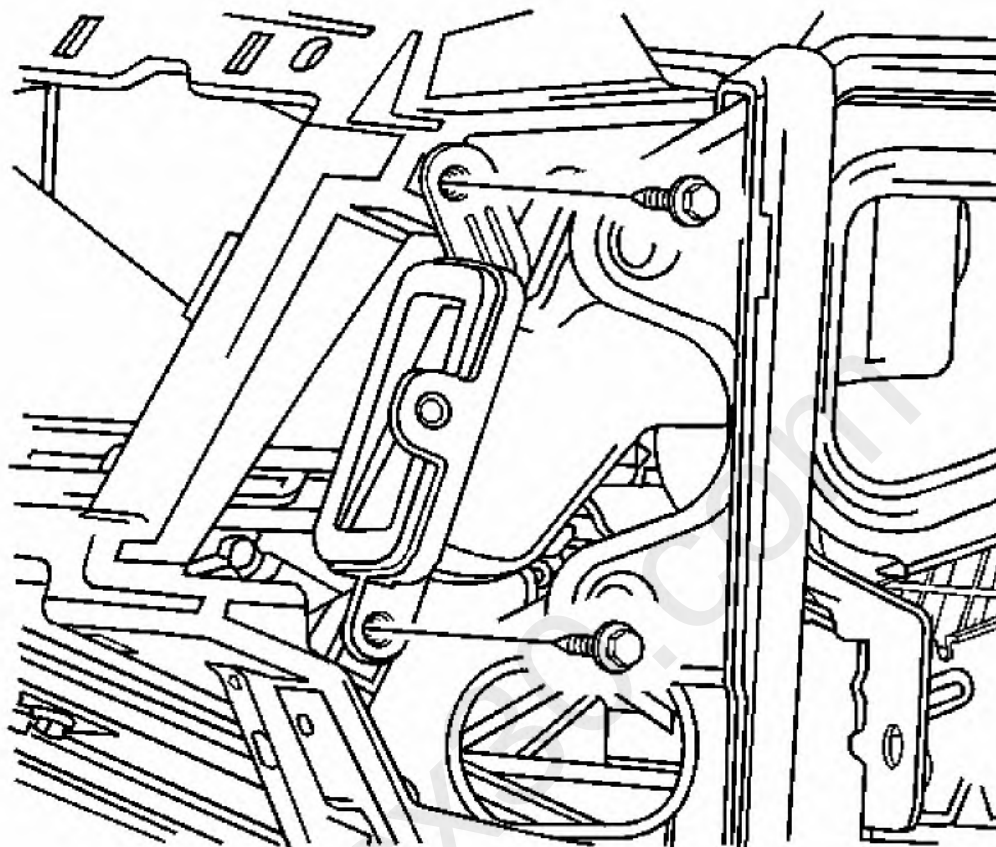


Fig. 156: RH Air Outlet Duct & Screws
Courtesy of GENERAL MOTORS CORP.

1. Remove the RH I/P trim panel. Refer to **Instrument Panel (I/P) Trim Panel Replacement - Lower Right** in Instrument Panel, Gages, and Console.
2. Remove the RH air outlet duct screws from the instrument panel retainer.

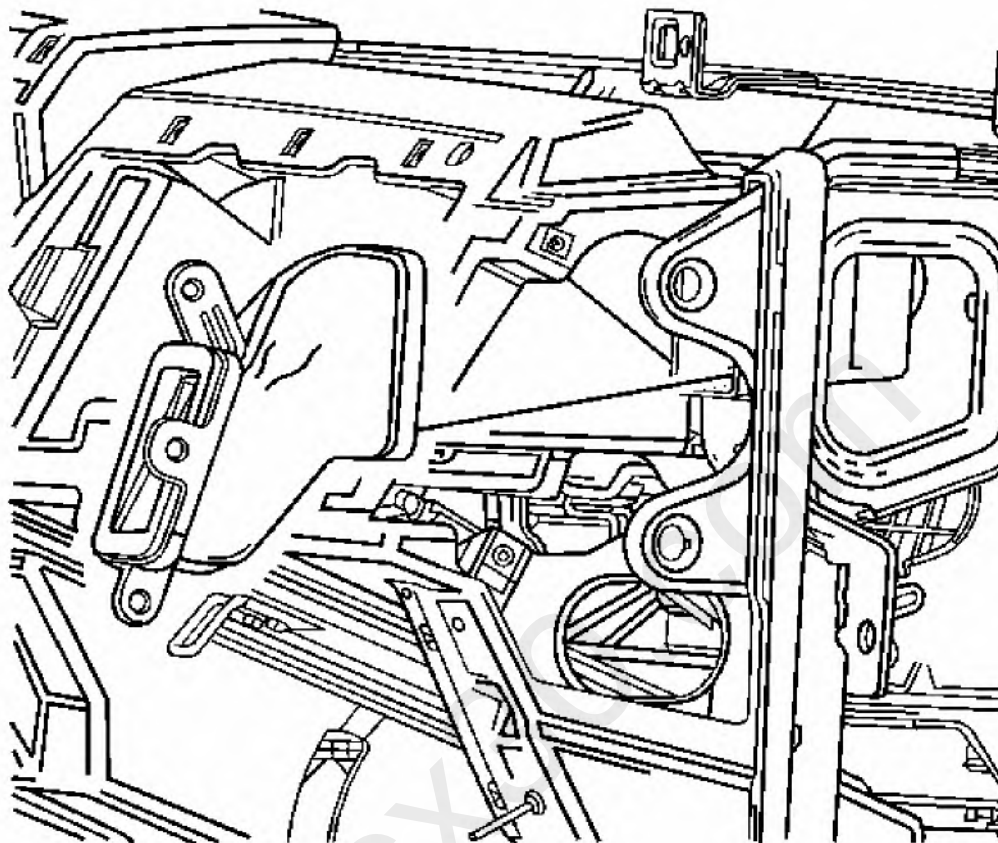


Fig. 157: RH Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

3. Remove the RH air outlet duct from the instrument panel retainer.

Installation Procedure

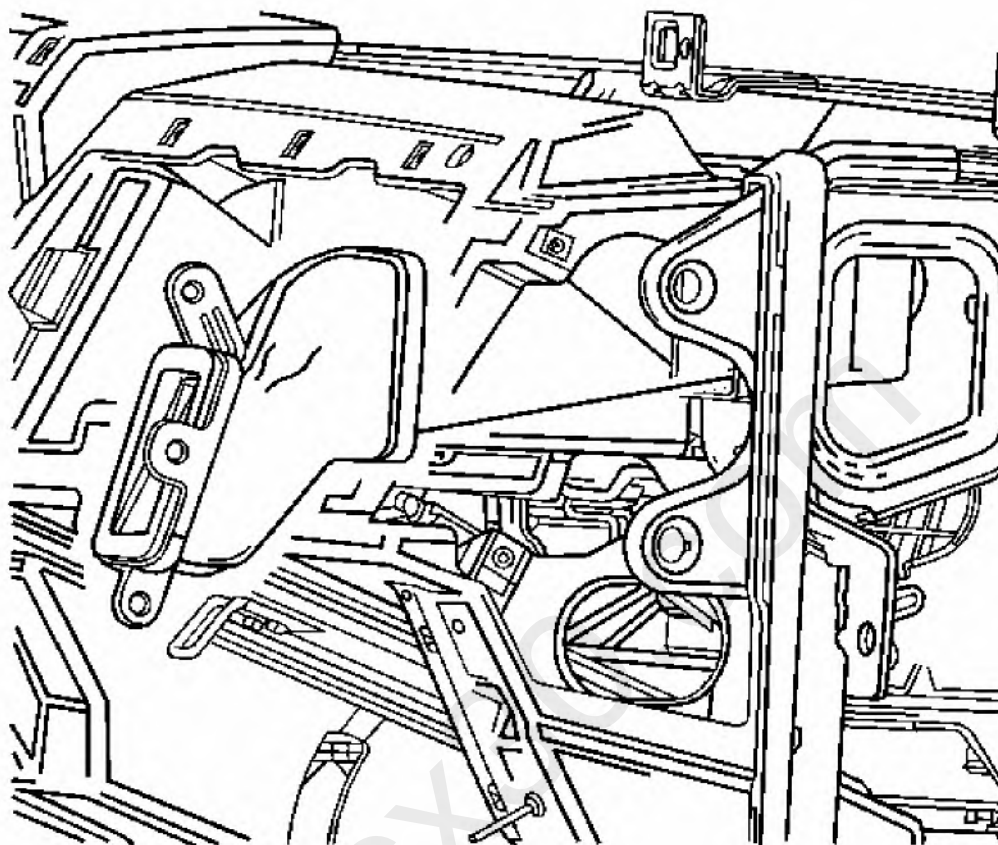


Fig. 158: RH Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.
2. Install the RH air outlet duct to the instrument panel retainer.

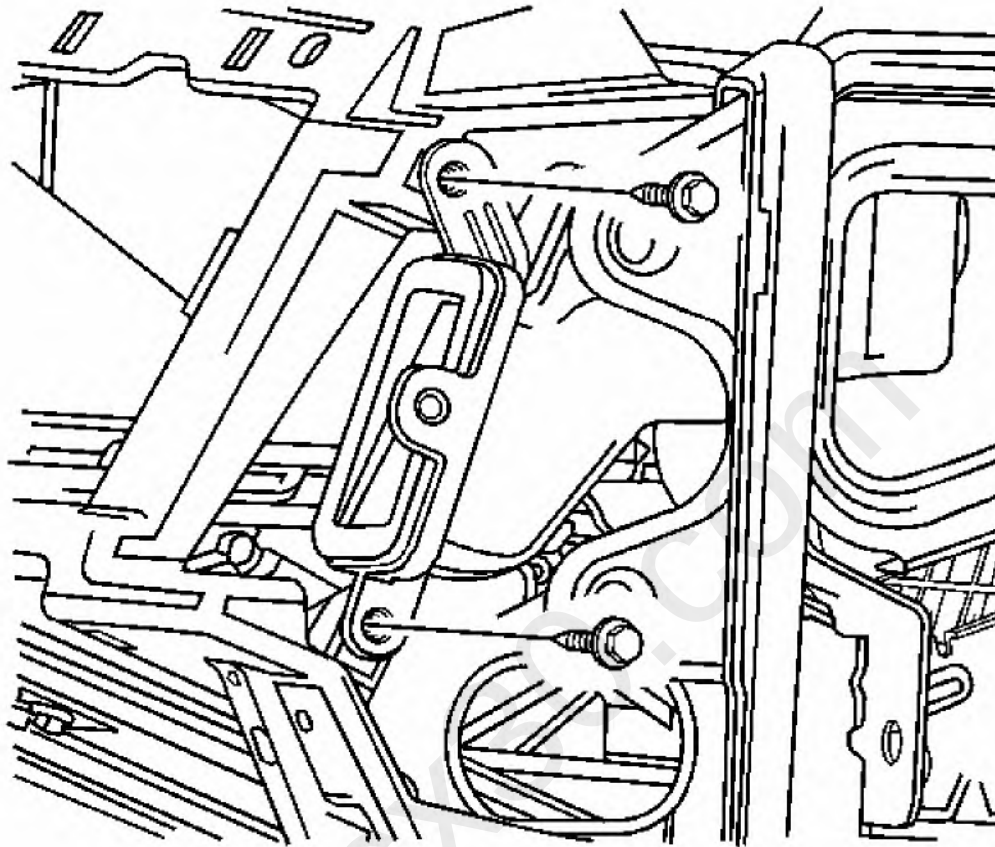


Fig. 159: RH Air Outlet Duct & Screws
Courtesy of GENERAL MOTORS CORP.

3. Install the RH air outlet duct screws to the instrument panel retainer.

Tighten: Tighten the screws to 1 N.m (9 lb in).

4. Install the RH I/P trim panel. Refer to **Instrument Panel (I/P) Trim Panel Replacement - Lower Right** in Instrument Panel, Gages, and Console.

AIR OUTLET REPLACEMENT - CENTER FLOOR

Removal Procedure

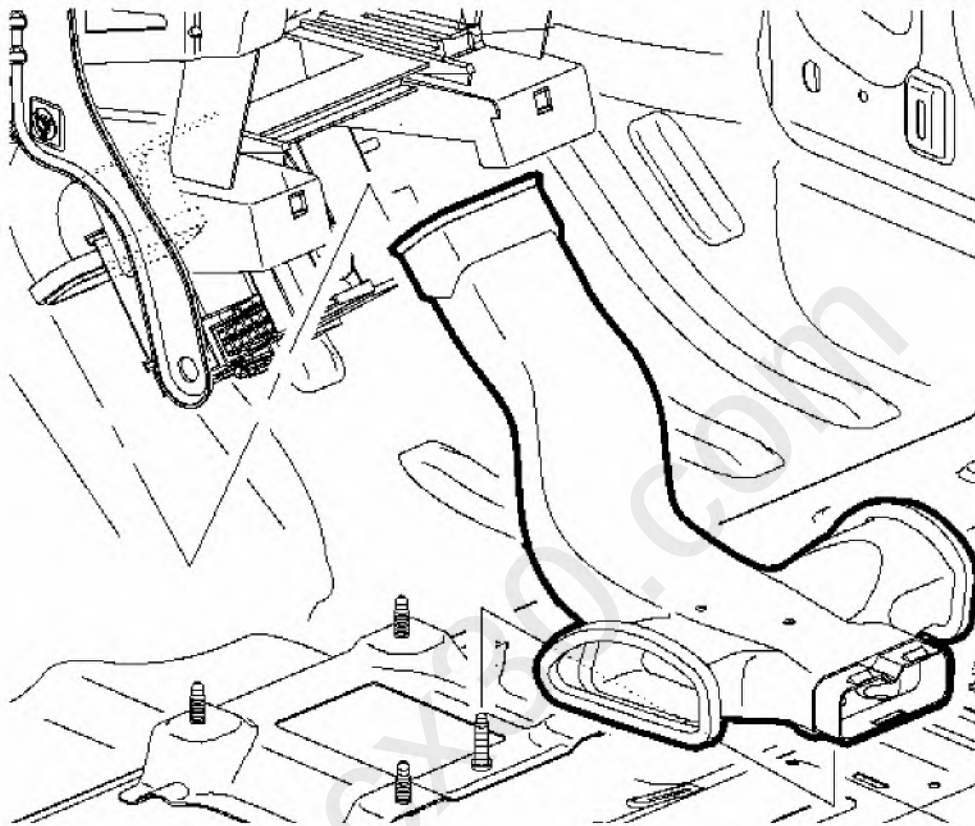


Fig. 160: Center Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the shift control. Refer to **Shift Control Replacement** in Automatic Transmission - AF33-5.
2. Slide the center floor air outlet duct forward enough to clear the rear floor air outlet duct, and then up, and rearward to remove.

Installation Procedure

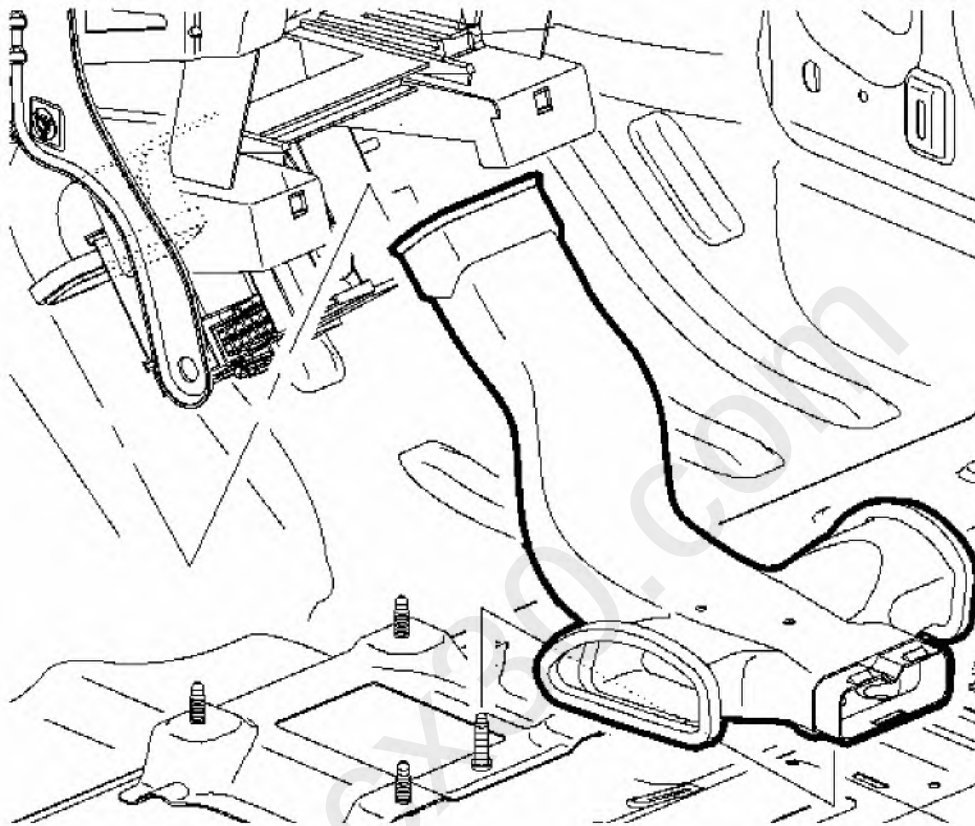


Fig. 161: Center Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

1. Slide the center floor air outlet duct forward enough to clear rear floor air duct, and then down, and rearward to install.
2. Install the shift control. Refer to **Shift Control Replacement** in Automatic Transmission - AF33-5.

AIR OUTLET REPLACEMENT - REAR FLOOR

Removal Procedure

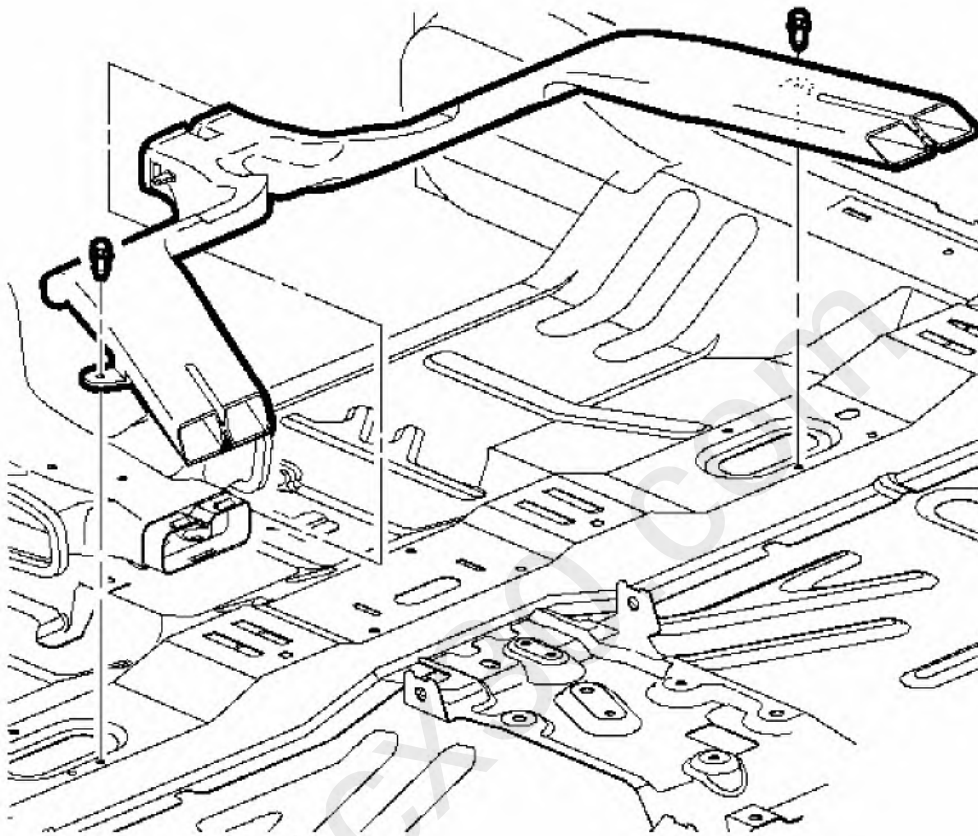


Fig. 162: Rear Floor Air Outlet & Push Pins
Courtesy of GENERAL MOTORS CORP.

1. Remove the front seats. Refer to **Seat Replacement - Front Bucket** in Seats.
2. Remove the floor console. Refer to **Console Replacement** in Instrument Panel, Gages, and Console.
3. Partially remove the floor carpet from the front footwells to the B-pillars.
4. Remove the rear floor air outlet push pins from the floor pan.
5. Remove the rear floor air outlet from the floor pan.

Installation Procedure

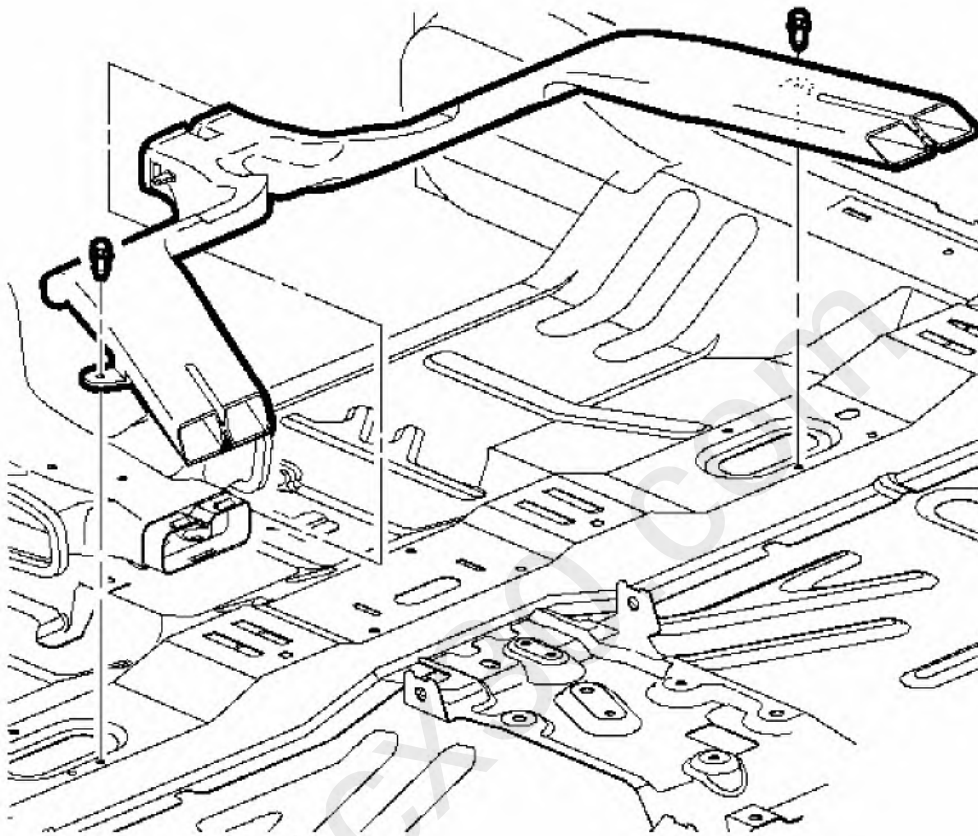


Fig. 163: Rear Floor Air Outlet & Push Pins
Courtesy of GENERAL MOTORS CORP.

1. Install the rear floor air outlet to the floor pan.
2. Install the rear floor air outlet push pins to the floor pan.
3. Install the floor carpet to the B-pillars and the front footwells.
4. Install the floor console. Refer to **Console Replacement** in Instrument Panel, Gages, and Console.
5. Install the front seats. Refer to **Seat Replacement - Front Bucket** in Seats.

AIR OUTLET DUCT REPLACEMENT - CENTER

Removal Procedure

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

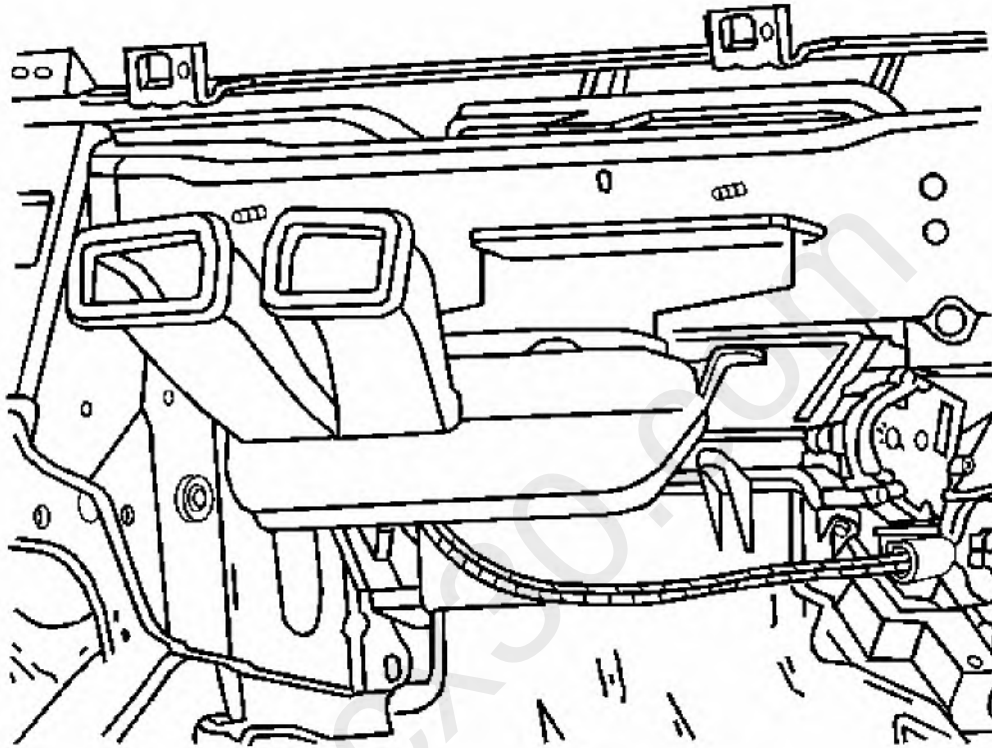


Fig. 164: View Of Center Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

2. Remove the center air outlet duct push pins from the cross car beam.
3. Remove the center air outlet duct from the cross car beam.

Installation Procedure

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.

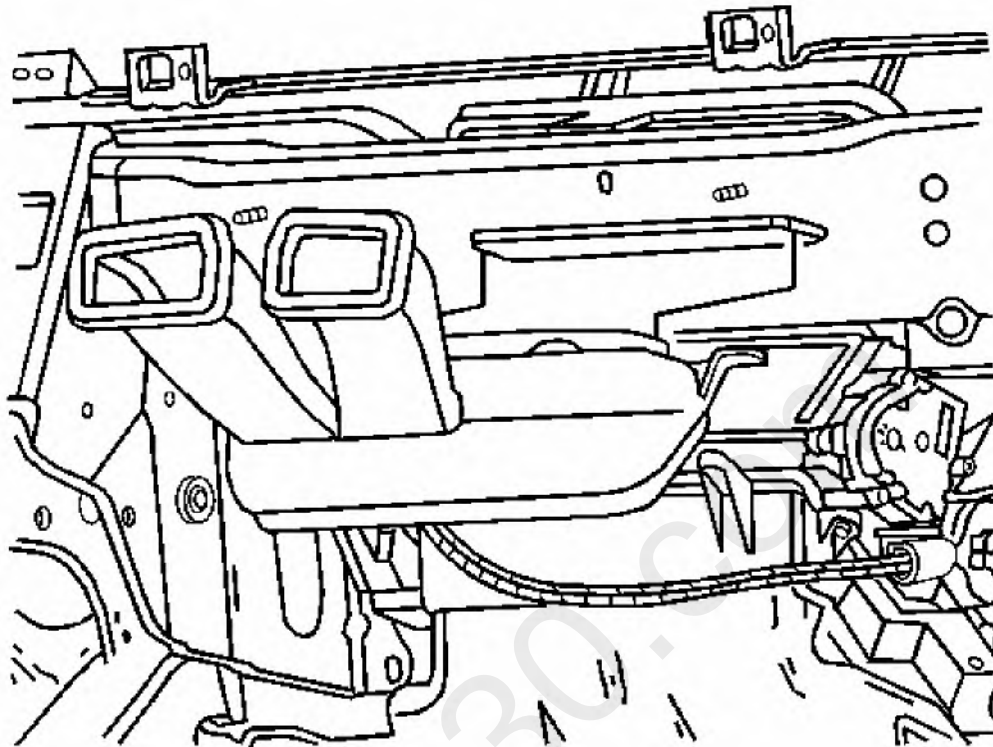


Fig. 165: View Of Center Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.

2. Install the center air outlet duct to the cross car beam.
3. Install the center air outlet duct push pins to the cross car beam.
4. Install the instrument panel retainer. Refer to **Instrument Panel (I/P) Retainer Replacement** in Instrument Panel, Gages, and Console.

DEFROSTER DUCT REPLACEMENT - WINDSHIELD

Removal Procedure

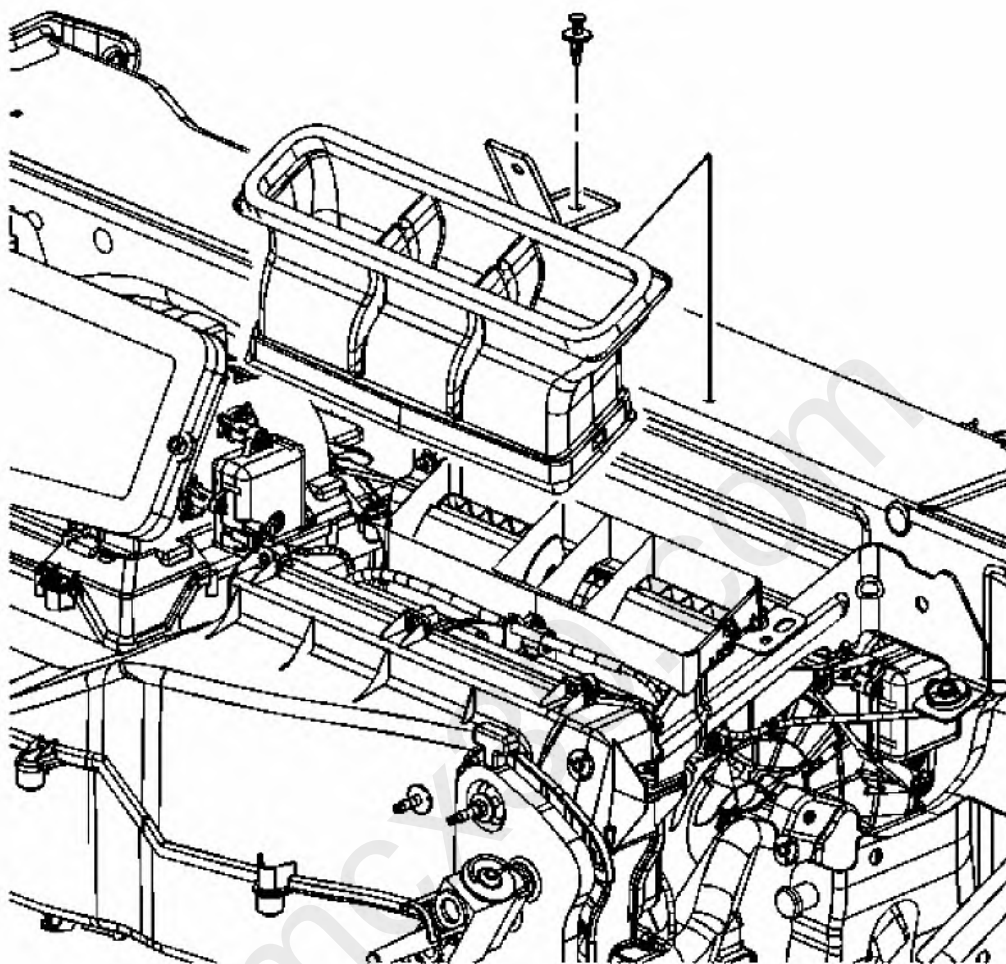


Fig. 166: View Of Defroster Duct
Courtesy of GENERAL MOTORS CORP.

1. Remove the instrument panel upper trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** .
2. Remove the windshield defrost duct from the HVAC module.

Installation Procedure

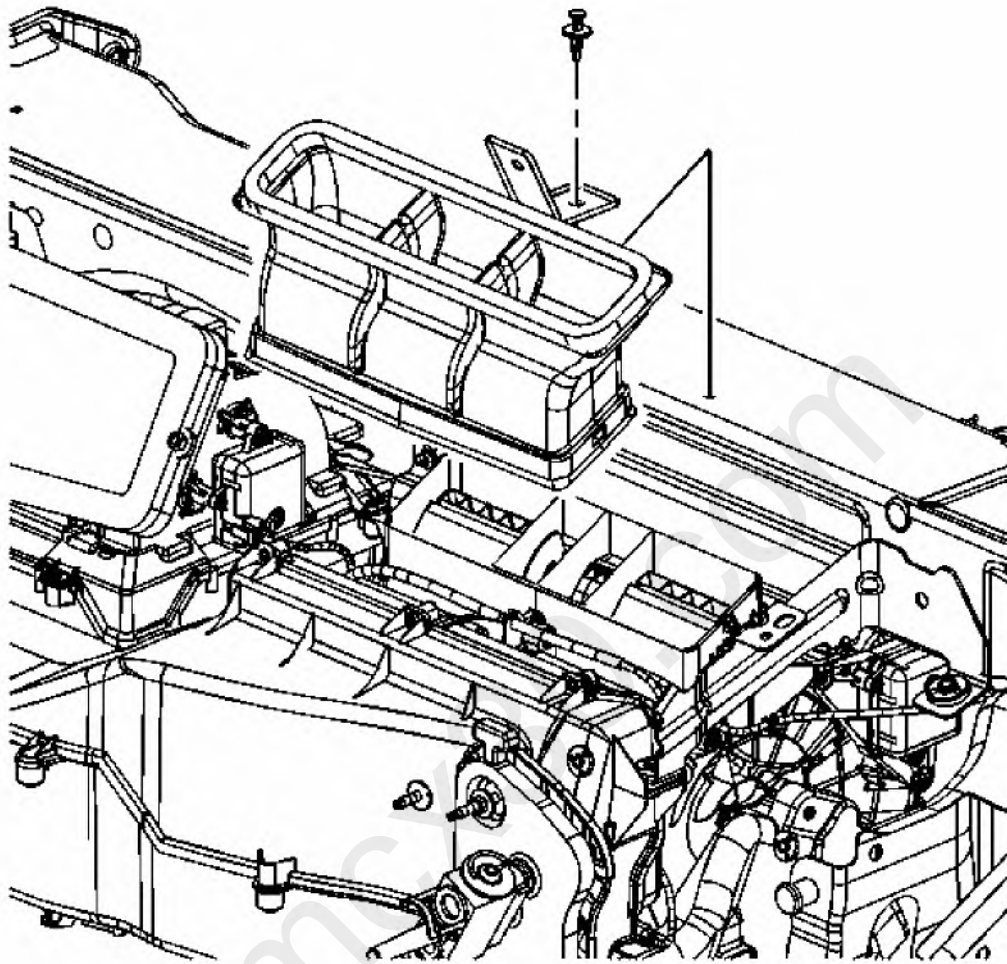


Fig. 167: View Of Defroster Duct
Courtesy of GENERAL MOTORS CORP.

1. Inspect the windshield defrost duct seals. If damaged, replace using Kent Industries adhesive back foam tape P/N 46485 or equivalent.
2. Install the windshield defrost duct to the HVAC module.
3. Install the instrument panel upper trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** .

DEFOGGER OUTLET DUCT REPLACEMENT - SIDE WINDOW, LH

Removal Procedure

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

Console.

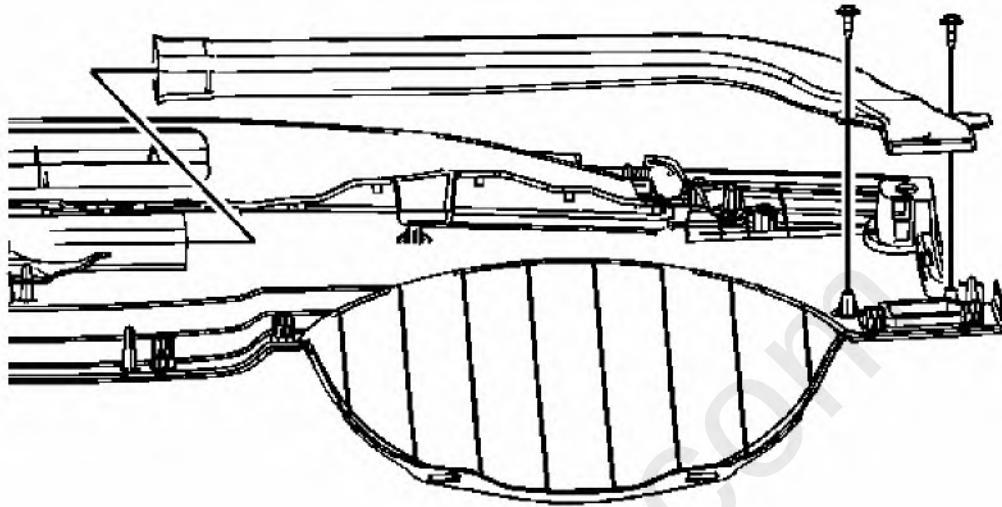


Fig. 168: View Of LH Defogger Duct & Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the LH defogger duct screws from the I/P upper trim panel.
3. Remove the LH defogger duct from the I/P upper trim panel.

Installation Procedure

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.

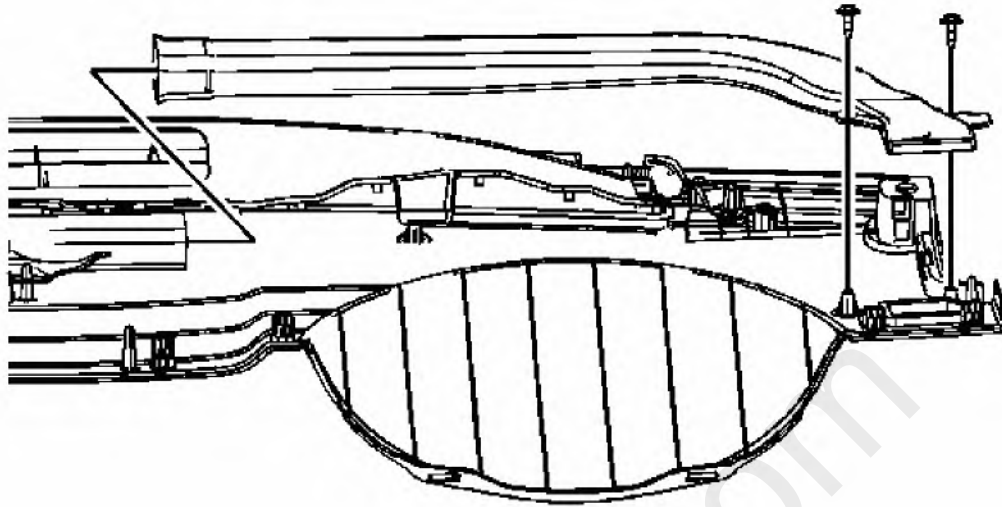


Fig. 169: View Of LH Defogger Duct & Screws
Courtesy of GENERAL MOTORS CORP.

2. Install the LH defogger duct to the I/P upper trim panel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the LH defogger duct screws to the I/P upper trim panel.

Tighten: Tighten the screws to 1 N.m (9 lb in).

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

DEFOGGER OUTLET DUCT REPLACEMENT - SIDE WINDOW, RH

Removal Procedure

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

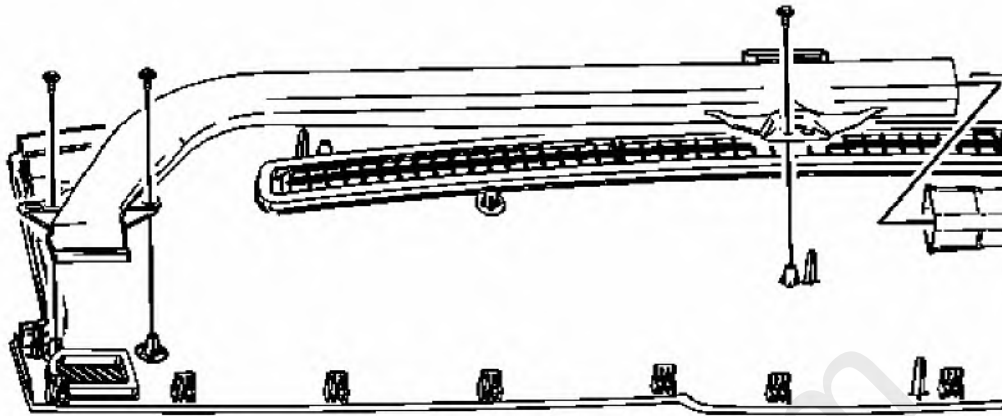


Fig. 170: View Of RH Defogger Duct & Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the RH defogger duct screws from the I/P upper trim panel.
3. Remove the RH defogger duct from the I/P upper trim panel.

Installation Procedure

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.

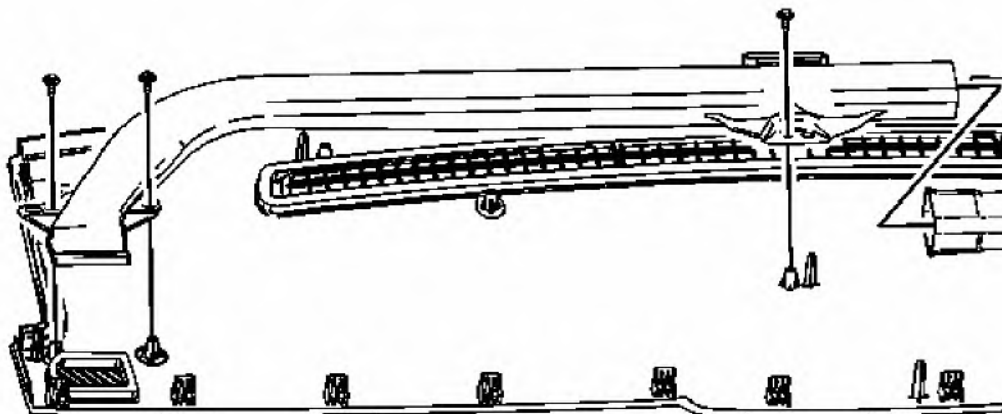


Fig. 171: View Of RH Defogger Duct & Screws

Courtesy of GENERAL MOTORS CORP.

2. Install the RH defogger duct to the I/P upper trim panel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the RH defogger duct screws to the I/P upper trim panel.

Tighten: Tighten the screws to 1 N.m (9 lb in).

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

AIR OUTLET REPLACEMENT - DEFROSTER

Removal Procedure

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

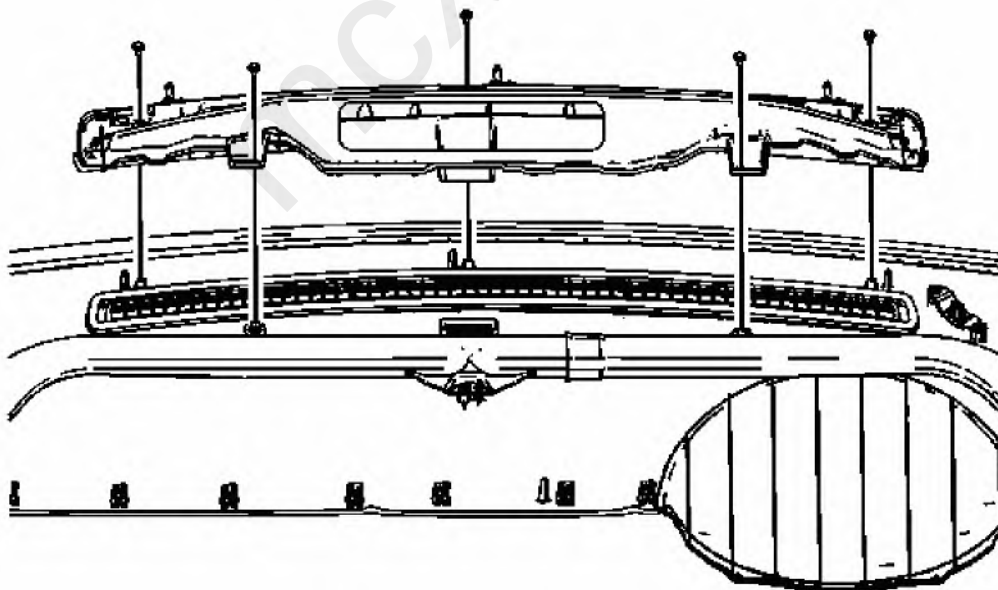


Fig. 172: View Of Defroster Air Outlet & Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the defroster air outlet screws from the I/P upper trim panel.
3. Remove the defroster air outlet from the I/P upper trim panel.

Installation Procedure

1. Inspect the seals, and replace if damaged, using Kent Industries adhesive backed foam tape P/N 46485 or equivalent.

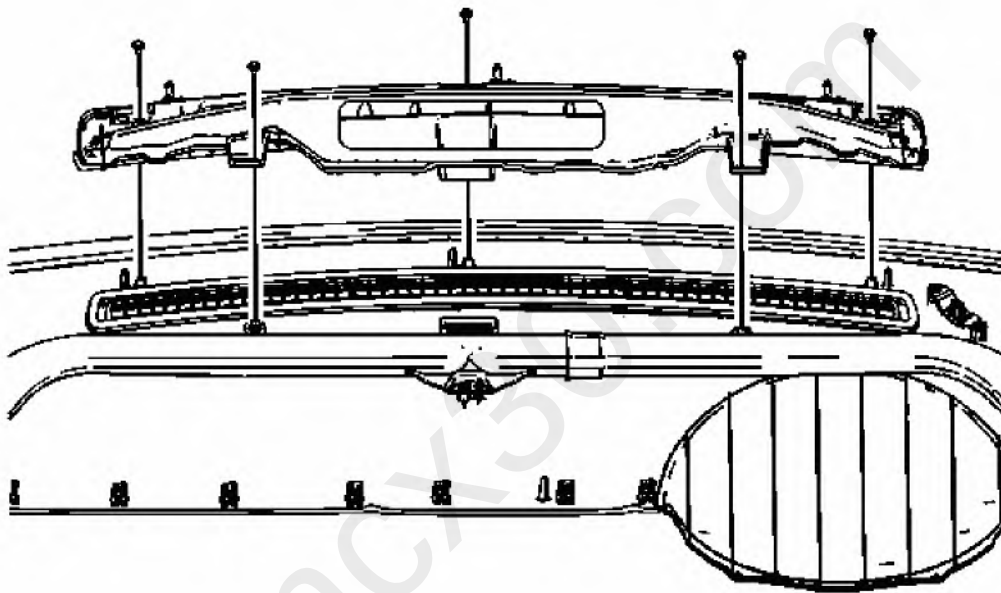


Fig. 173: View Of Defroster Air Outlet & Screws
Courtesy of GENERAL MOTORS CORP.

2. Install the defroster air outlet to the I/P upper trim panel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the defroster air outlet screws to the I/P upper trim panel.

Tighten: Tighten the screws to 1 N.m (9 lb in).

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

Removal Procedure

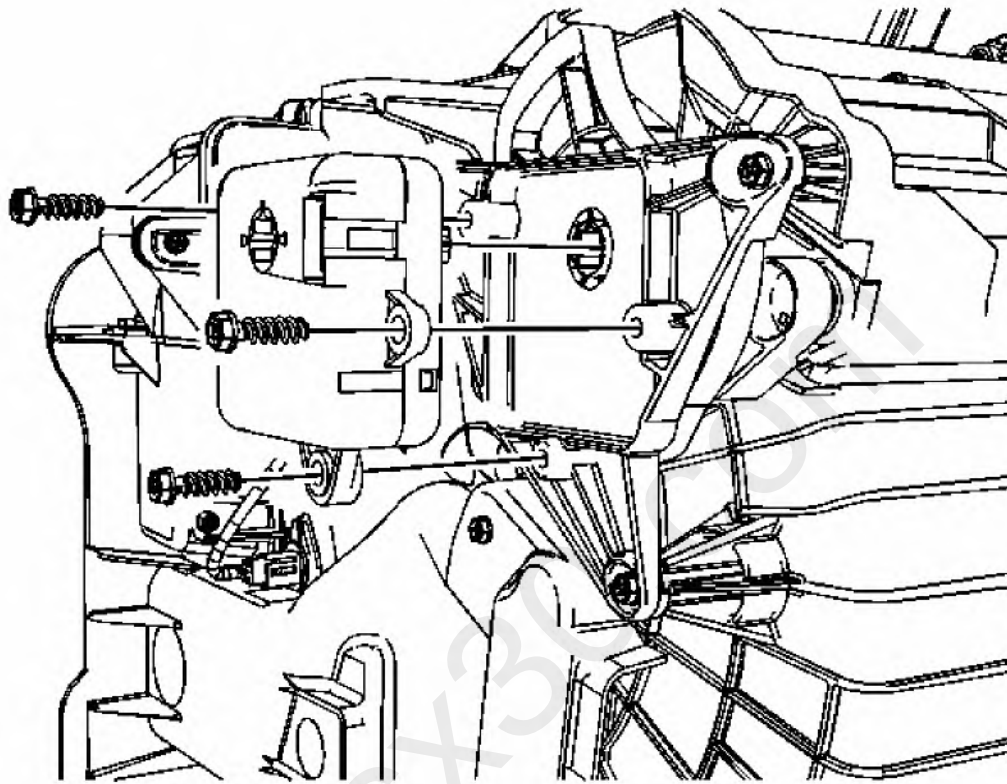


Fig. 174: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. Remove the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
3. Remove the mode actuator screws from the evaporator case assembly.
4. Remove the mode actuator from the evaporator case assembly.

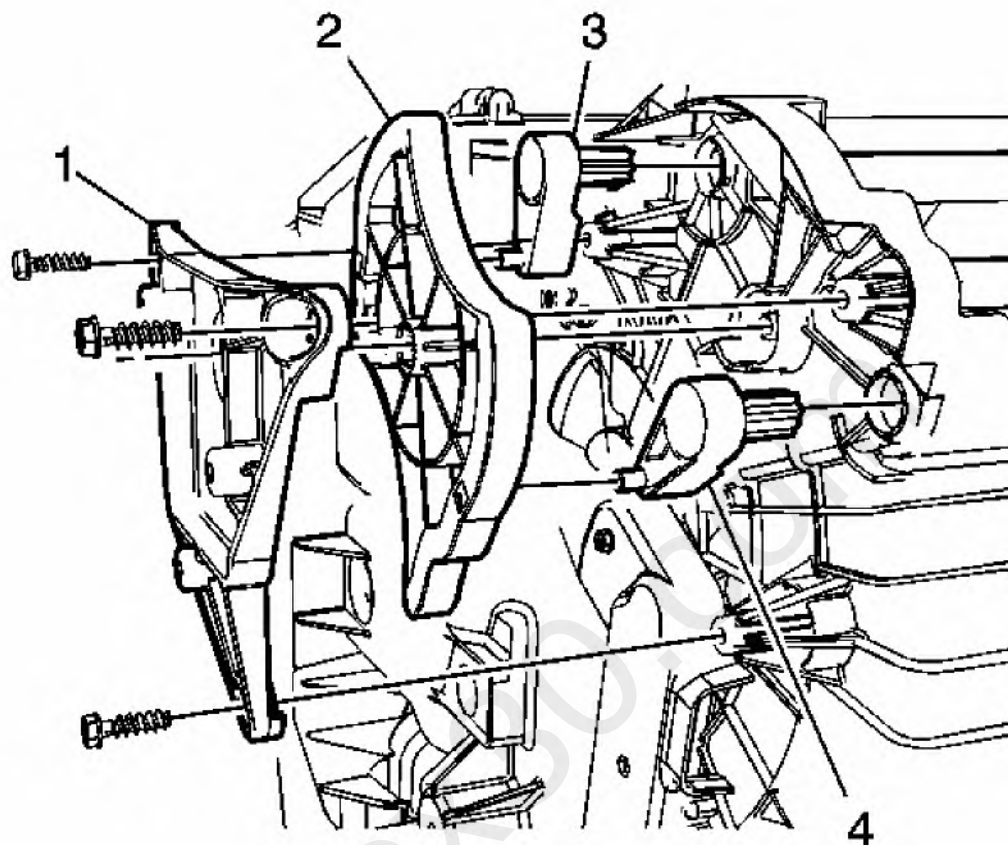


Fig. 175: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

5. Remove the screws retaining the mode cam bracket (1) from the evaporator case assembly.
6. Remove the mode cam bracket (1) from the evaporator case assembly.
7. Remove the mode cam (2) and the mode cam levers (1) from the evaporator case assembly.

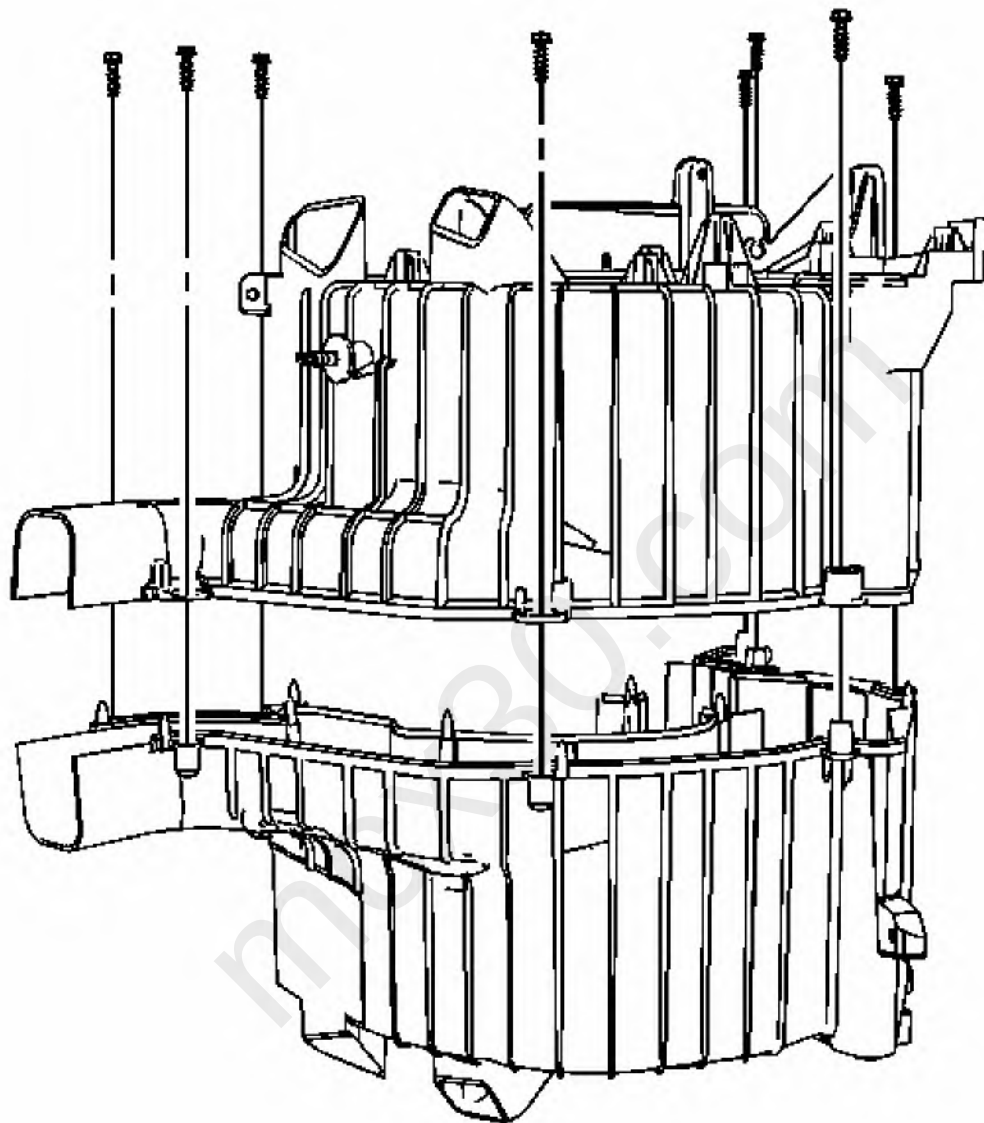


Fig. 176: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws retaining the two evaporator case halves.
9. Separate the evaporator case halves.

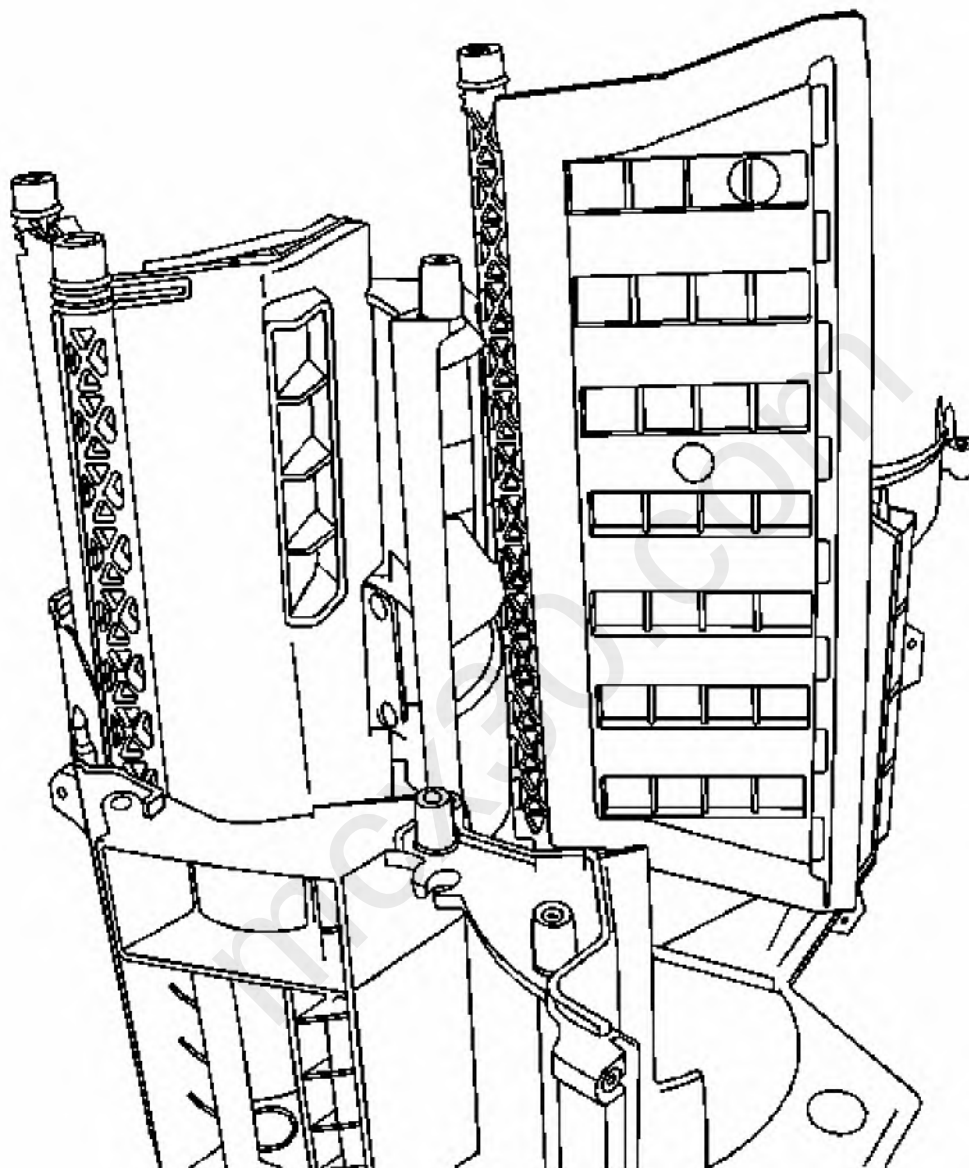


Fig. 177: View Of Temperature Door
Courtesy of GENERAL MOTORS CORP.

10. Remove the temperature door from the evaporator case assembly.

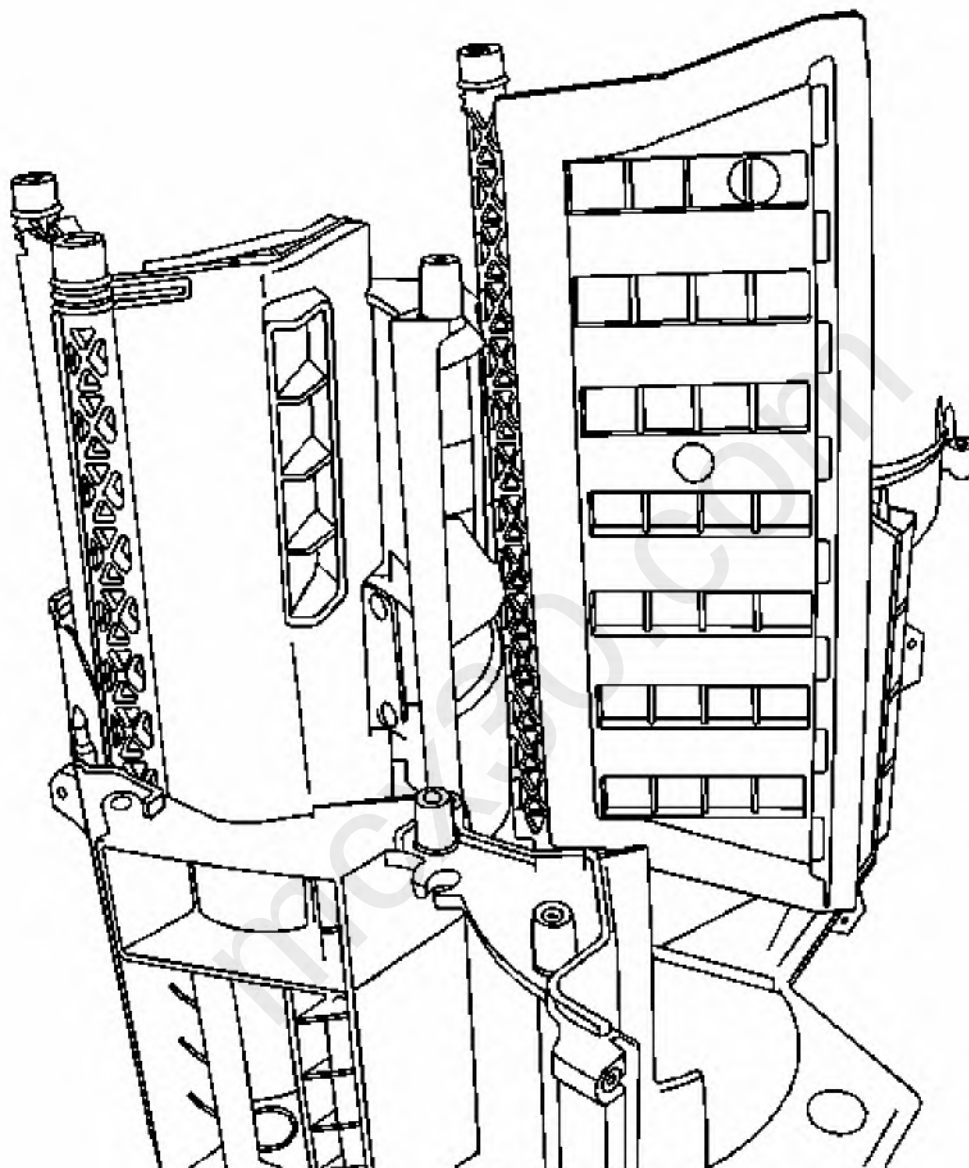


Fig. 178: View Of Temperature Door
Courtesy of GENERAL MOTORS CORP.

1. Install the temperature door to the evaporator case assembly.

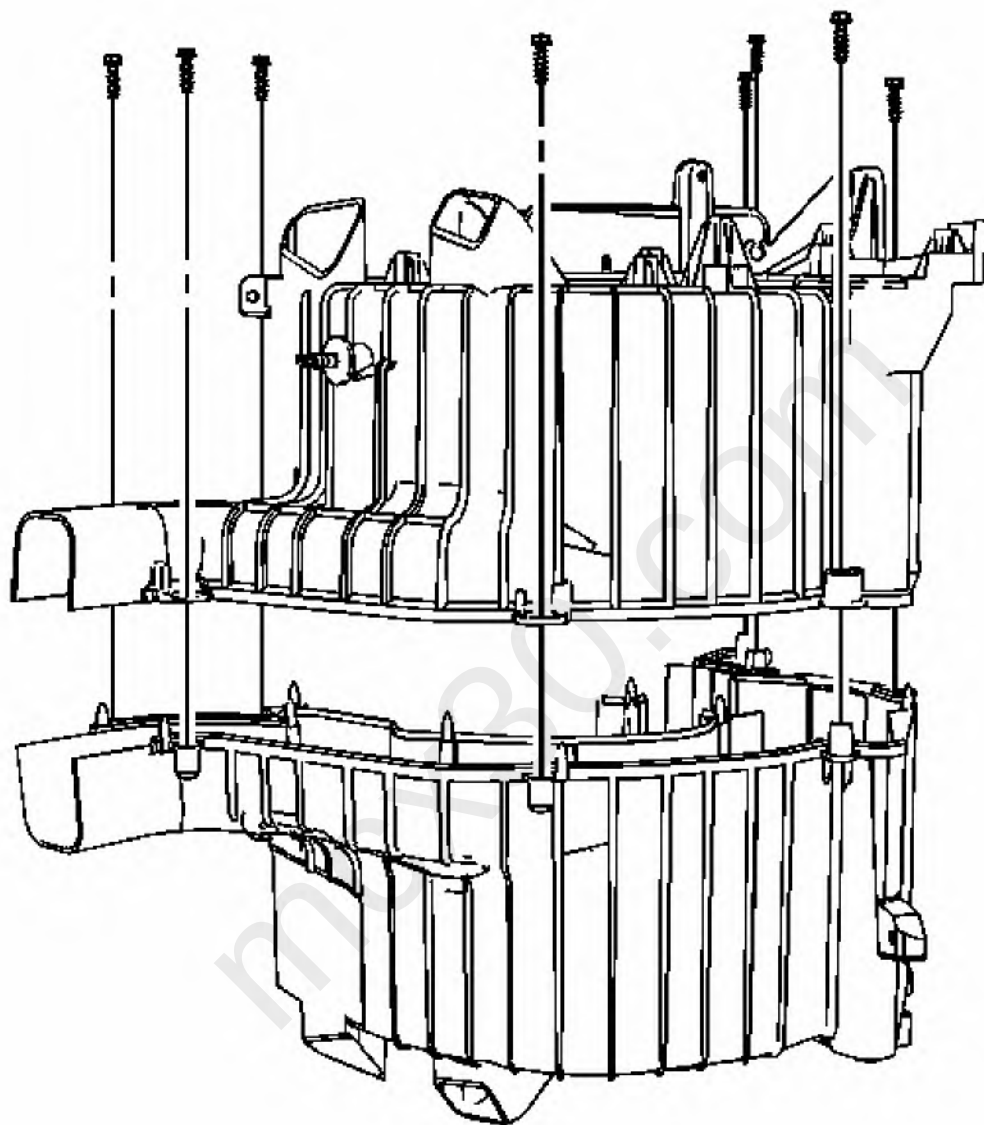


Fig. 179: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

2. Assemble the evaporator case halves..

NOTE: Refer to Fastener Notice.

3. Install the screws to retain the evaporator case halves.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

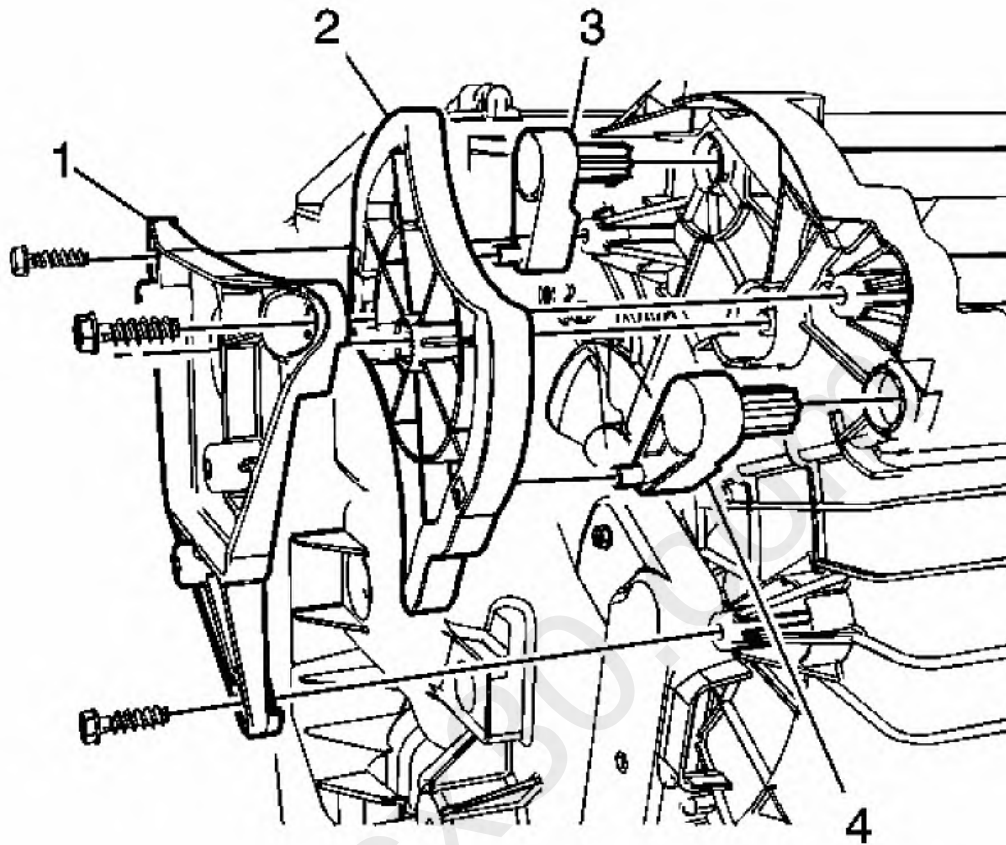


Fig. 180: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

4. Install the mode cam levers (3) to the evaporator case assembly.
5. Align and install the mode cam (2) to the mode cam levers (3). Rotate the mode cam (2) to verify mode door operation.
6. Install the mode cam bracket (1) to the evaporator case assembly.
7. Install the mode cam bracket screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

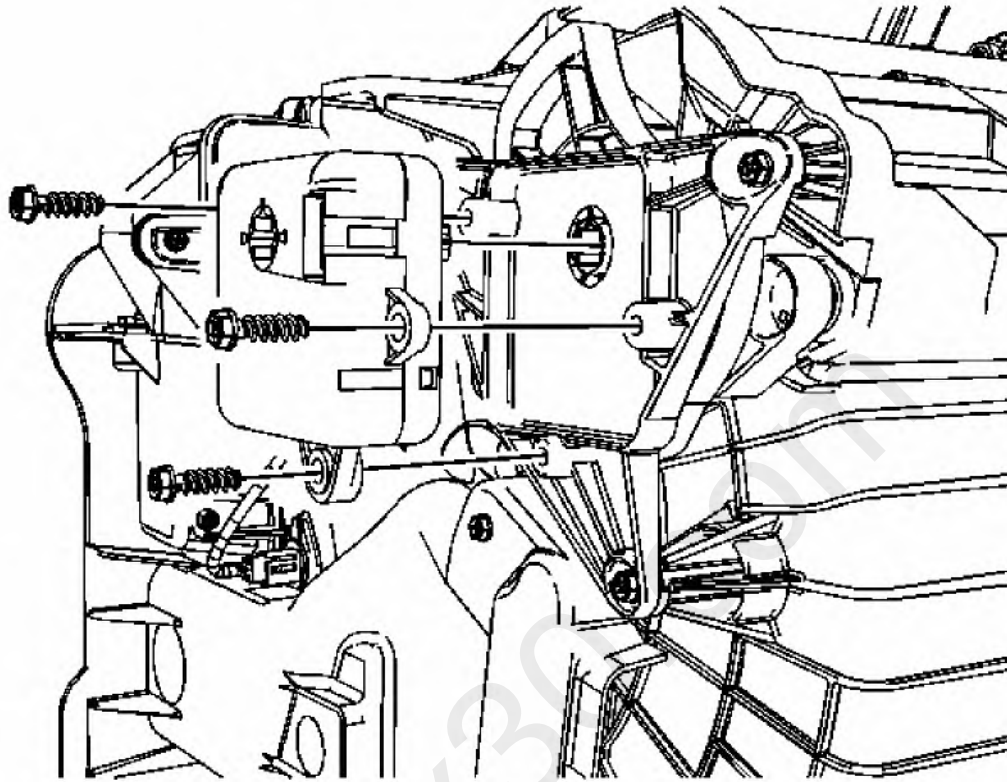


Fig. 181: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

8. Install the mode actuator to the evaporator case assembly.
9. Install the mode actuator screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

10. Install the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
11. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

DEFROSTER DOOR REPLACEMENT

Removal Procedure

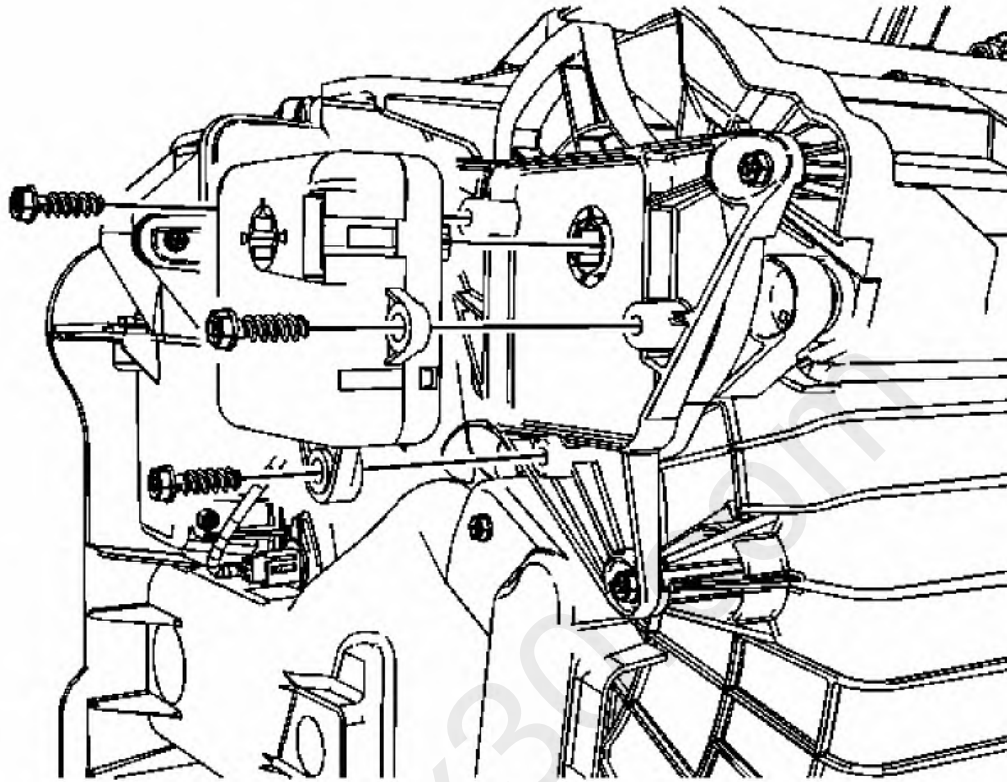


Fig. 182: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. Remove the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
3. Remove the mode actuator screws from the evaporator case assembly.
4. Remove the mode actuator from the evaporator case assembly.

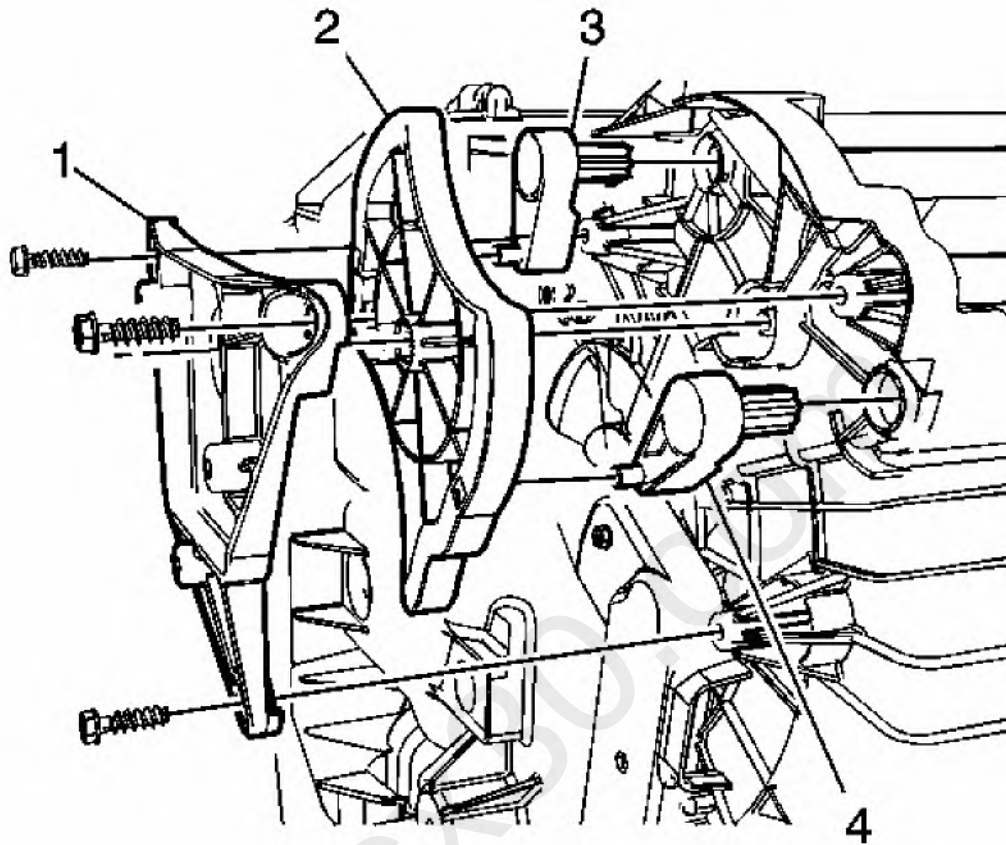


Fig. 183: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

5. Remove the screws retaining the mode cam bracket (1) from the evaporator case assembly.
6. Remove the mode cam bracket (1) from the evaporator case assembly.
7. Remove the mode cam (2) and the mode cam levers (1) from the evaporator case assembly.

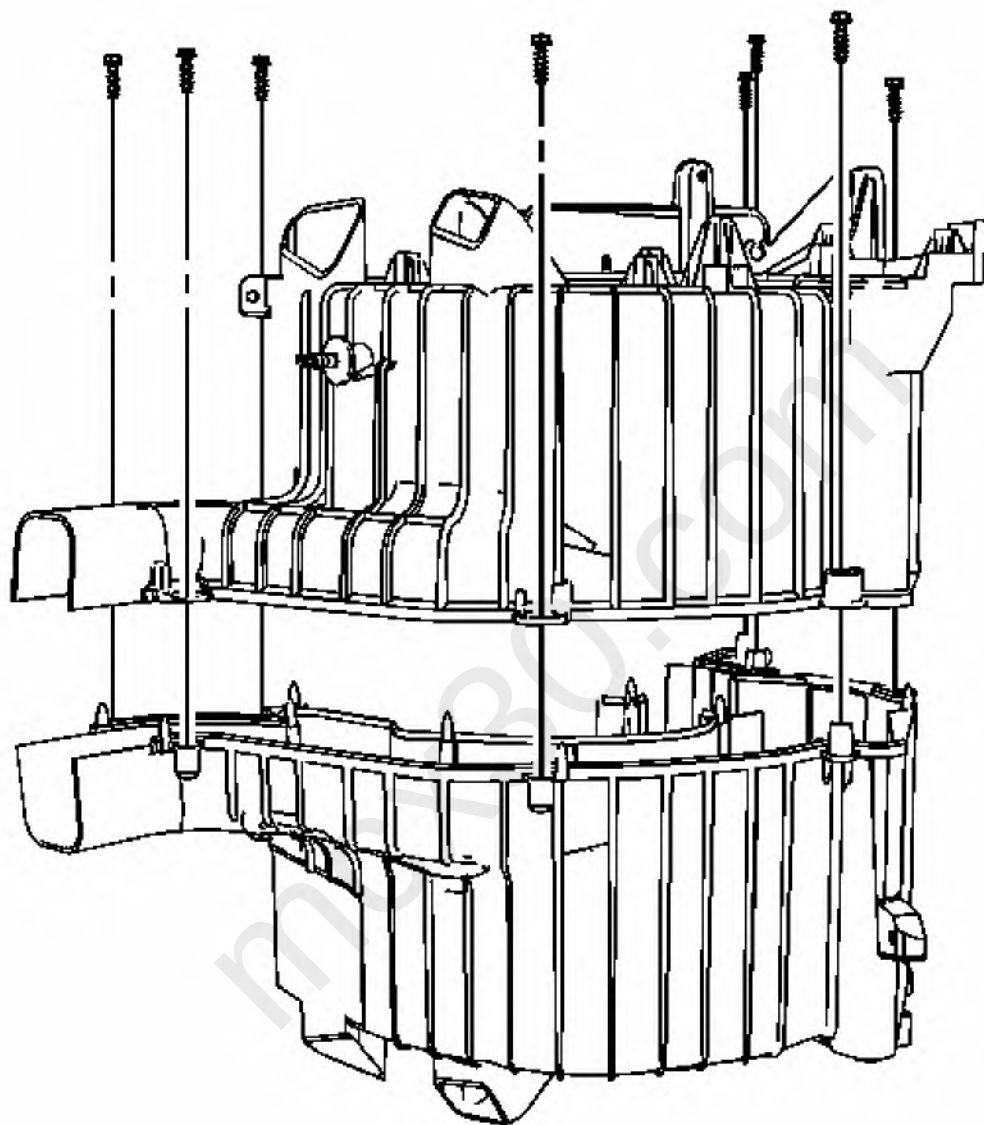


Fig. 184: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws retaining the two evaporator case halves.
9. Separate the evaporator case halves.

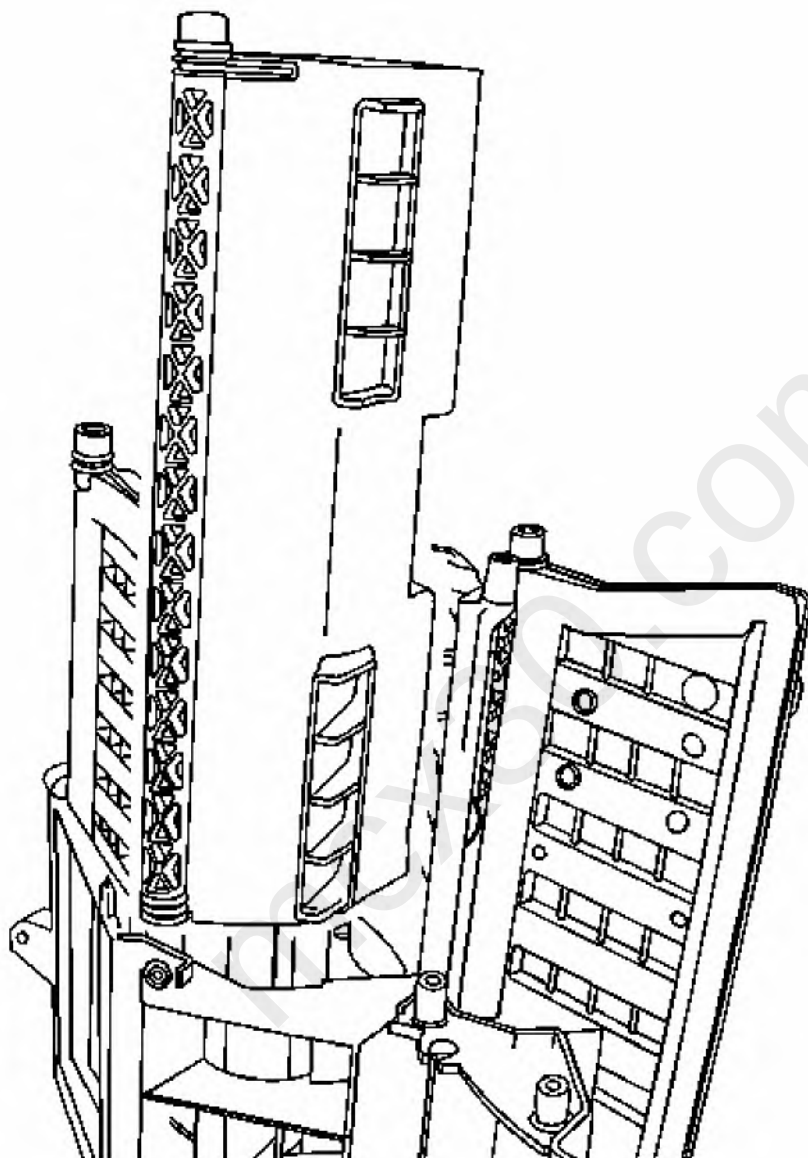


Fig. 185: View Of Defroster Door
Courtesy of GENERAL MOTORS CORP.

10. Remove the defroster door from the evaporator case assembly.

Installation Procedure

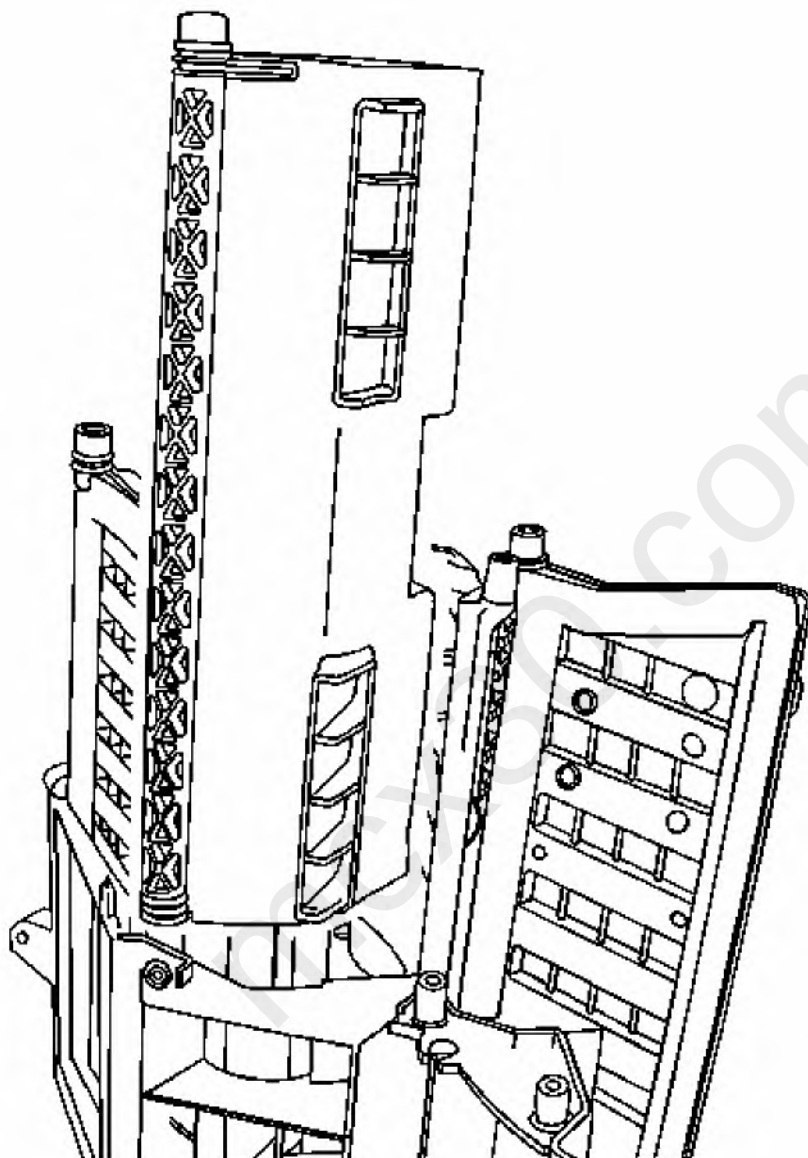


Fig. 186: View Of Defroster Door
Courtesy of GENERAL MOTORS CORP.

1. Install the defroster door to the evaporator case assembly.

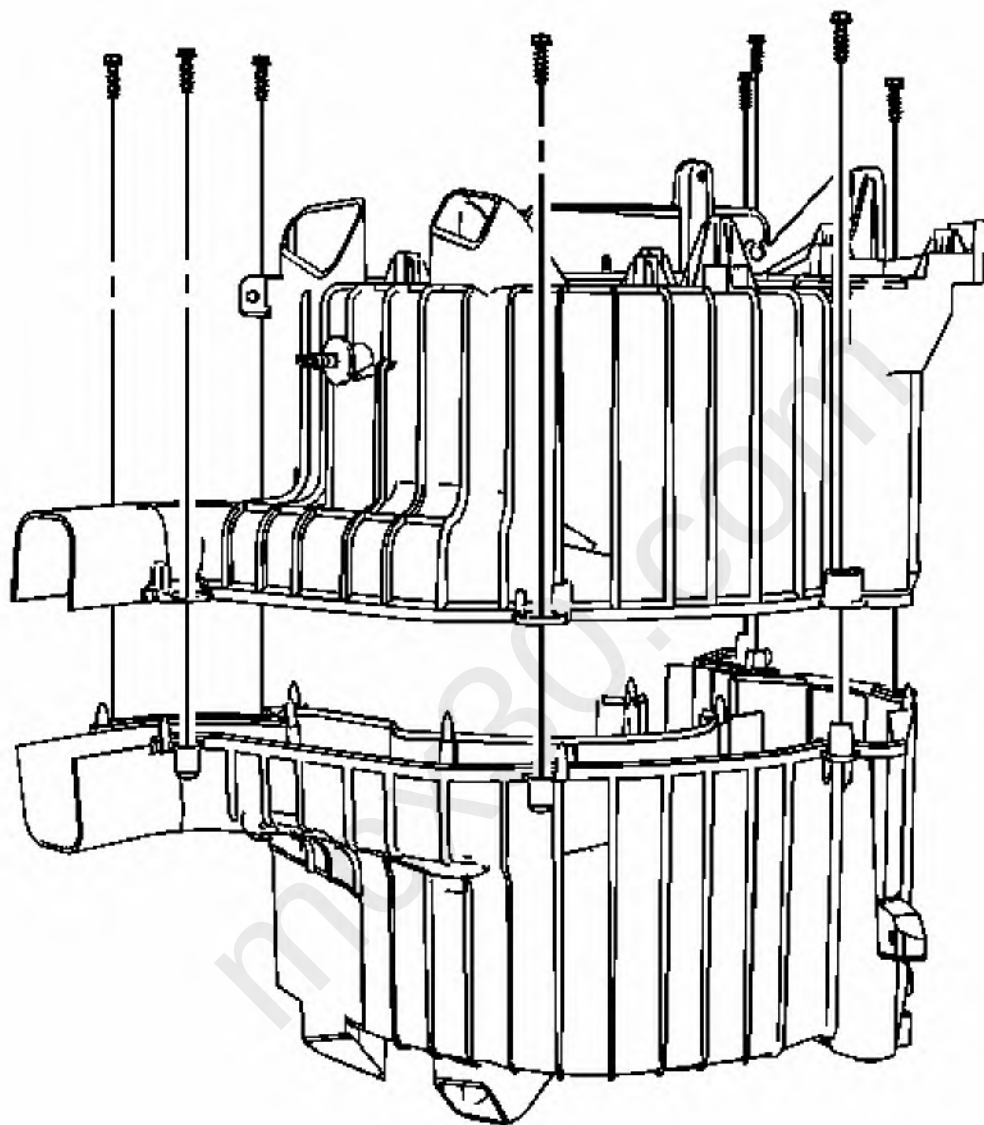


Fig. 187: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

2. Assemble the evaporator case halves..

NOTE: Refer to Fastener Notice.

3. Install the screws to retain the evaporator case halves.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

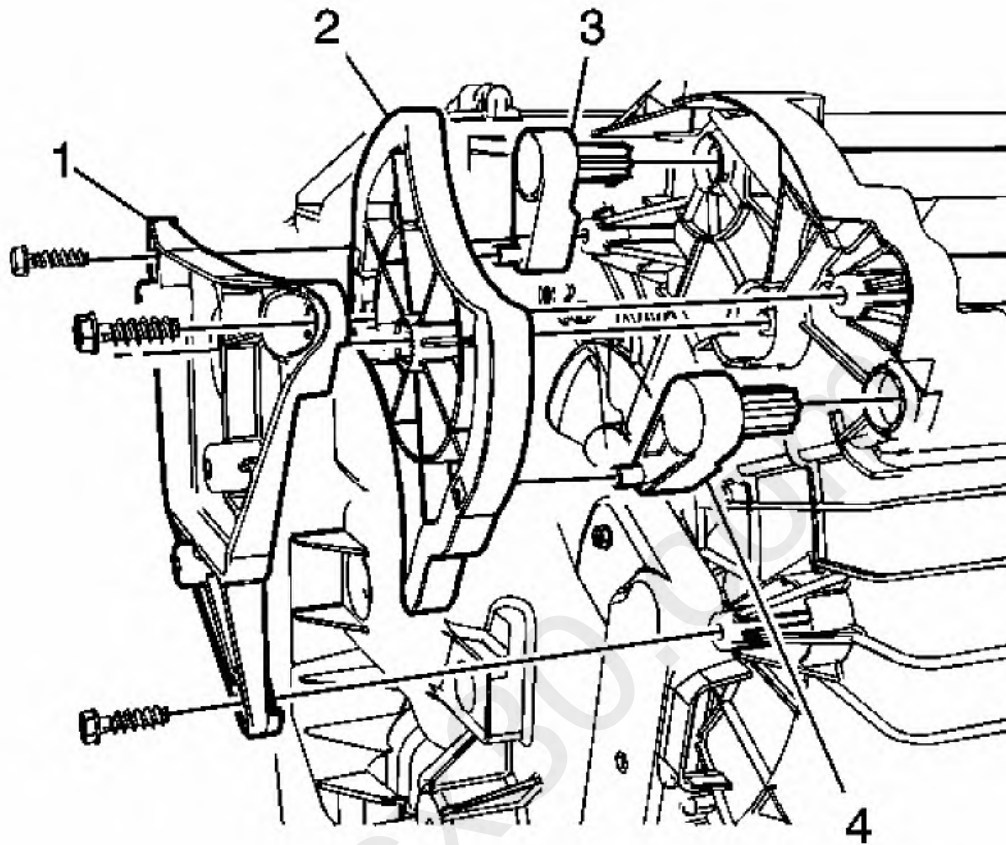


Fig. 188: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

4. Install the mode cam levers (3) to the evaporator case assembly.
5. Align and install the mode cam (2) to the mode cam levers (3). Rotate the mode cam (2) to verify mode door operation.
6. Install the mode cam bracket (1) to the evaporator case assembly.
7. Install the mode cam bracket screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

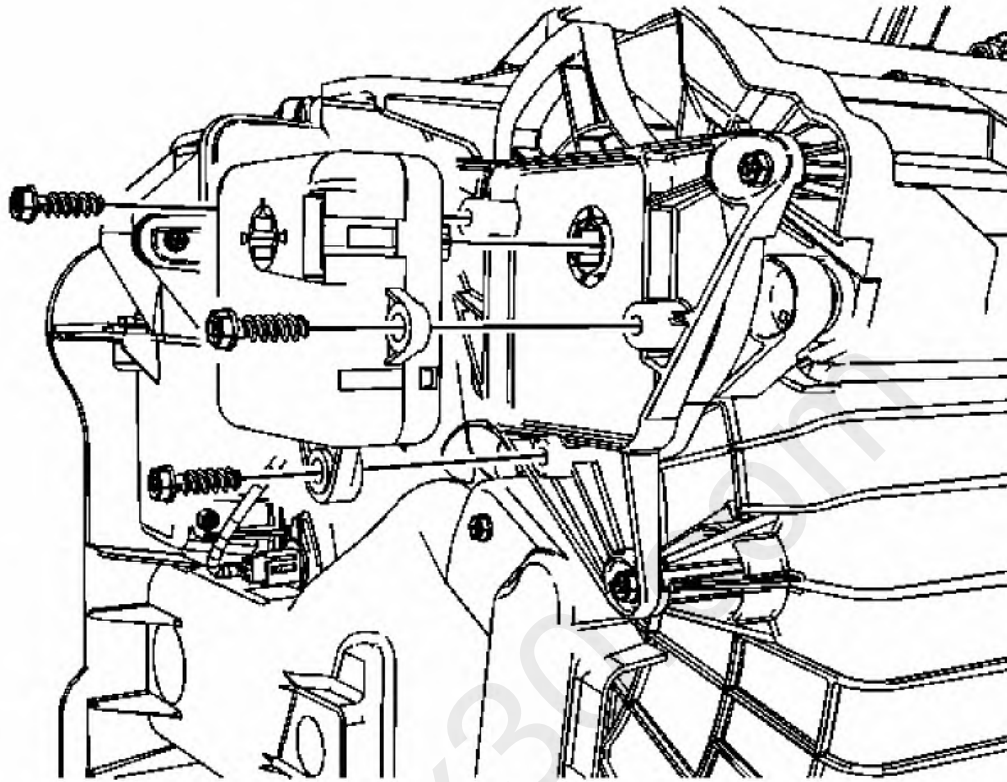


Fig. 189: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

8. Install the mode actuator to the evaporator case assembly.
9. Install the mode actuator screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

10. Install the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
11. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

PANEL AIR DOOR REPLACEMENT

Removal Procedure

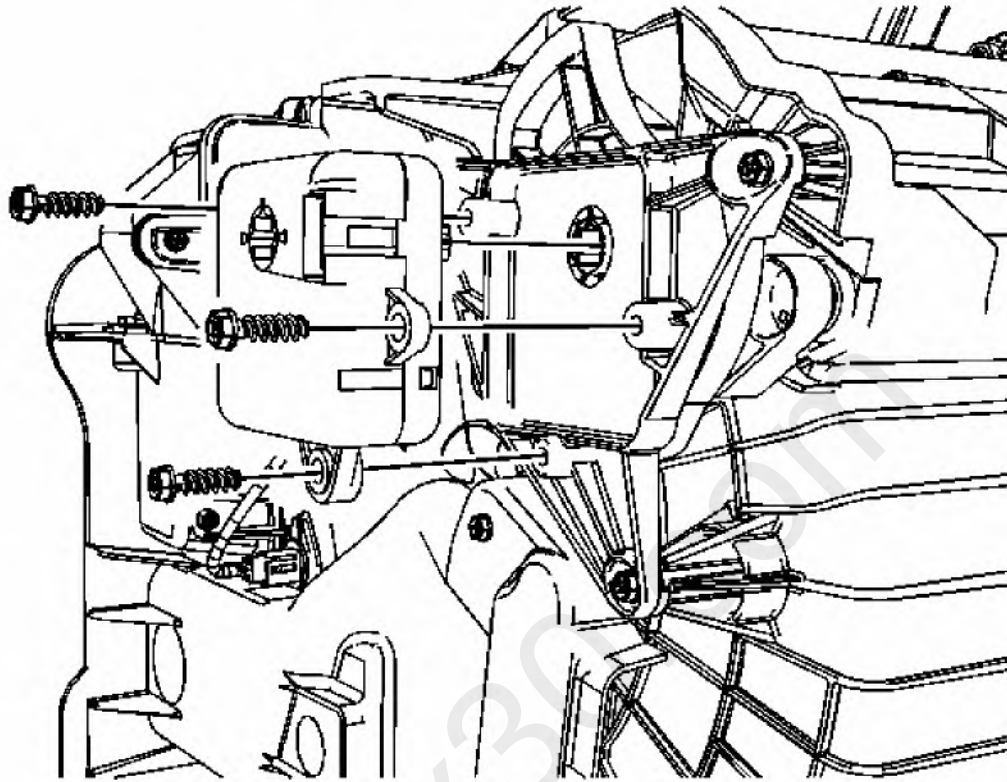


Fig. 190: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

1. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**.
2. Remove the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
3. Remove the mode actuator screws from the evaporator case assembly.
4. Remove the mode actuator from the evaporator case assembly.

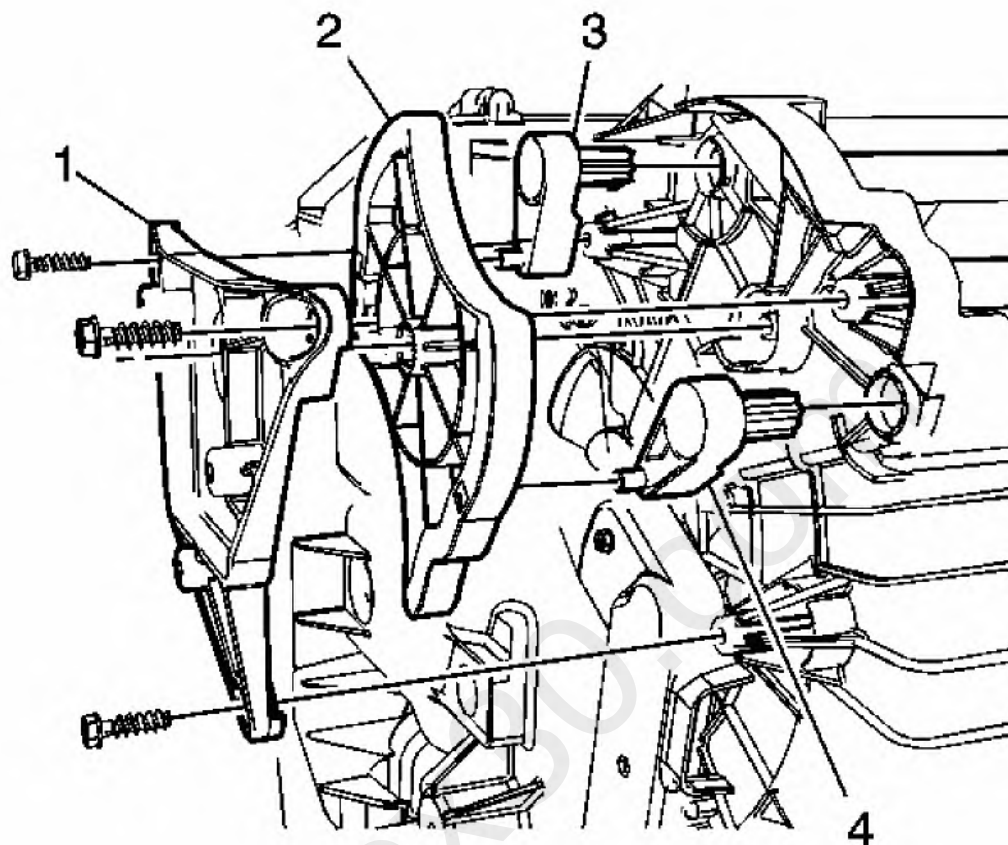


Fig. 191: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

5. Remove the screws retaining the mode cam bracket (1) from the evaporator case assembly.
6. Remove the mode cam bracket (1) from the evaporator case assembly.
7. Remove the mode cam (2) and the mode cam levers (1) from the evaporator case assembly.

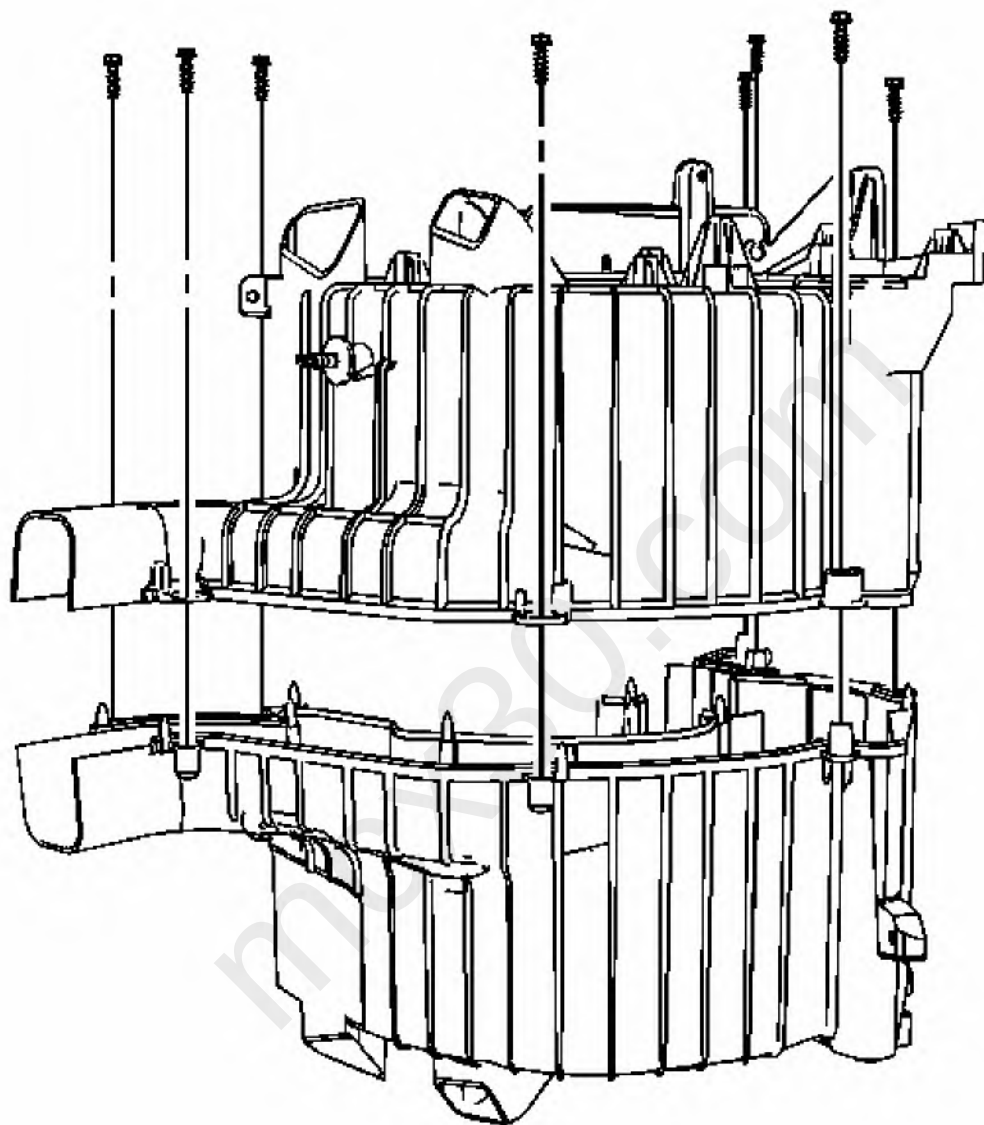


Fig. 192: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

8. Remove the screws retaining the two evaporator case halves.
9. Separate the evaporator case halves.

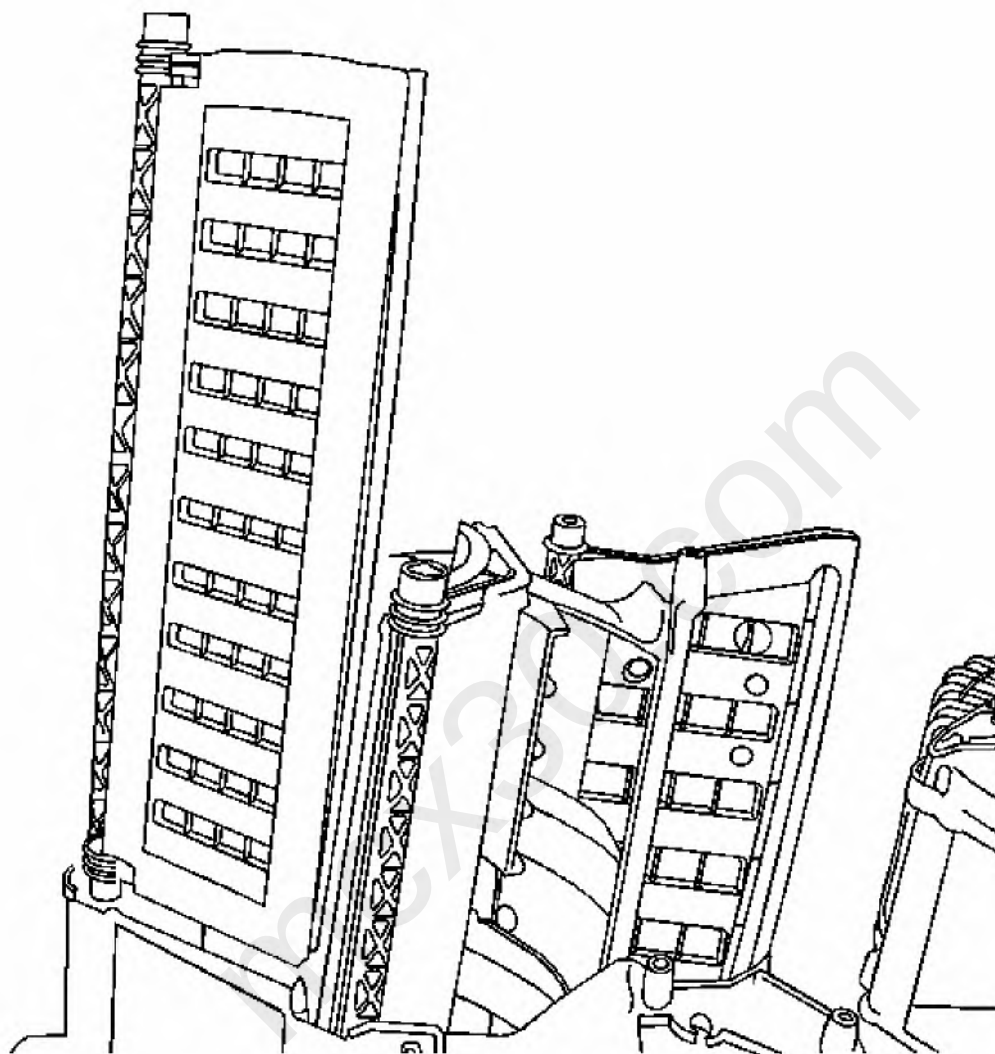


Fig. 193: View Of Panel Air Door
Courtesy of GENERAL MOTORS CORP.

10. Remove the panel air door from the evaporator case assembly.

Installation Procedure

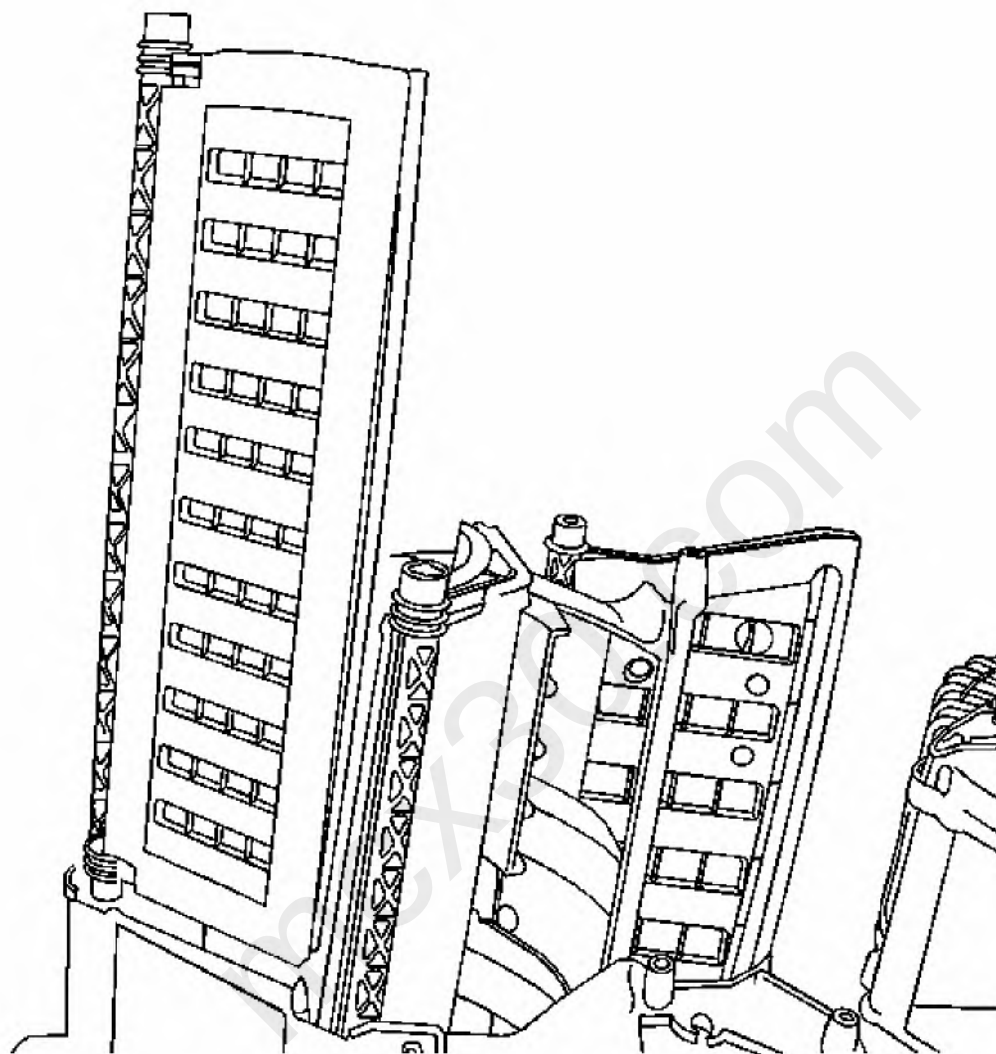


Fig. 194: View Of Panel Air Door
Courtesy of GENERAL MOTORS CORP.

1. Install the panel air door to the evaporator case assembly.

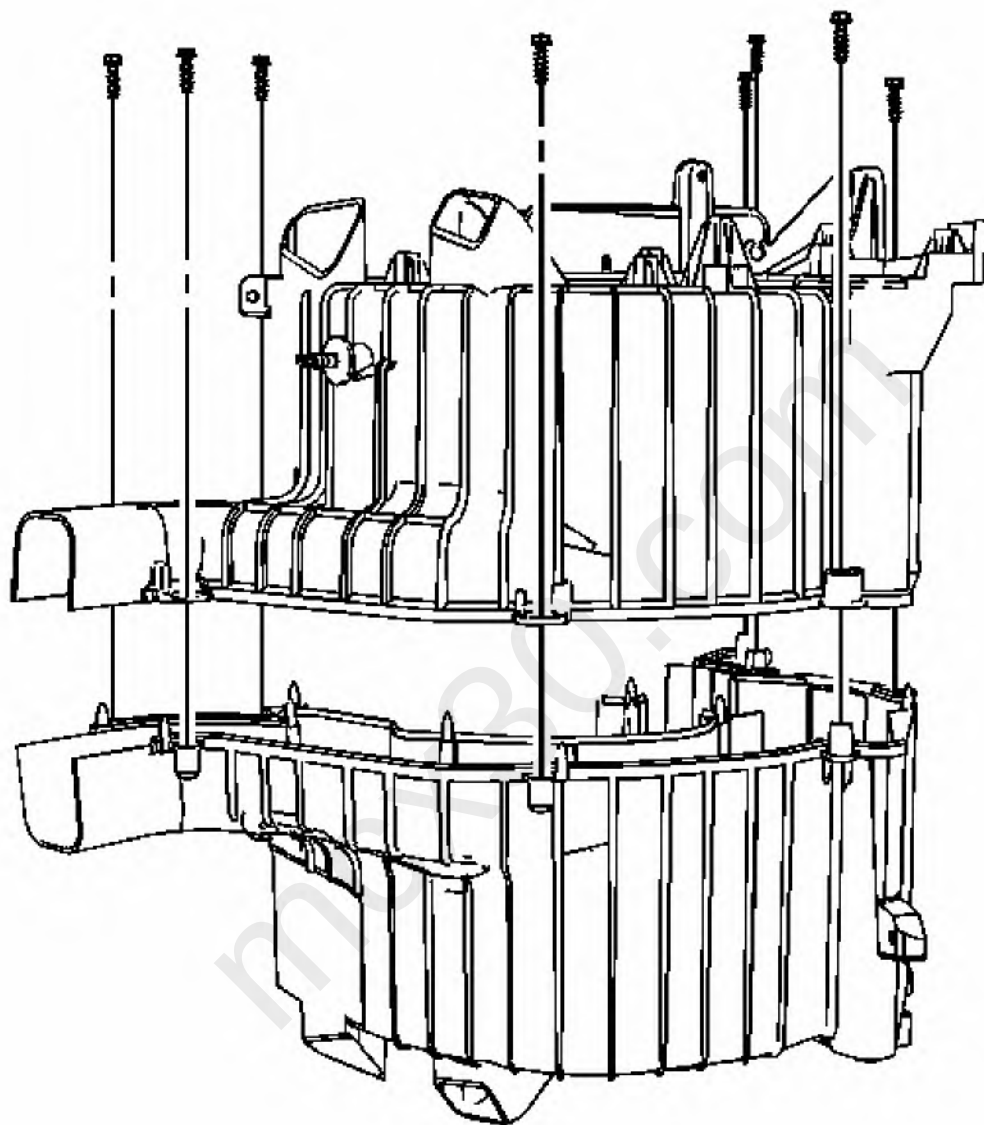


Fig. 195: View Of Evaporator Case Halves
Courtesy of GENERAL MOTORS CORP.

2. Assemble the evaporator case halves..

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to retain the evaporator case halves.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

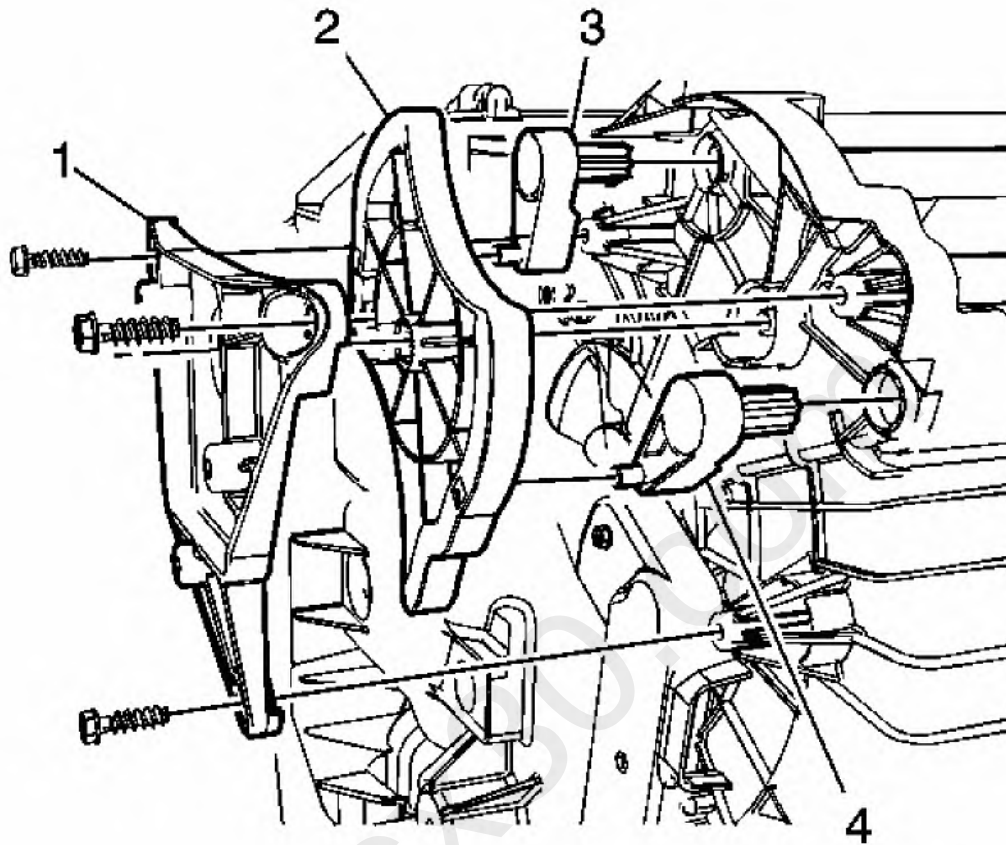


Fig. 196: Mode Cam Components
Courtesy of GENERAL MOTORS CORP.

4. Install the mode cam levers (3) to the evaporator case assembly.
5. Align and install the mode cam (2) to the mode cam levers (3). Rotate the mode cam (2) to verify mode door operation.
6. Install the mode cam bracket (1) to the evaporator case assembly.
7. Install the mode cam bracket screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

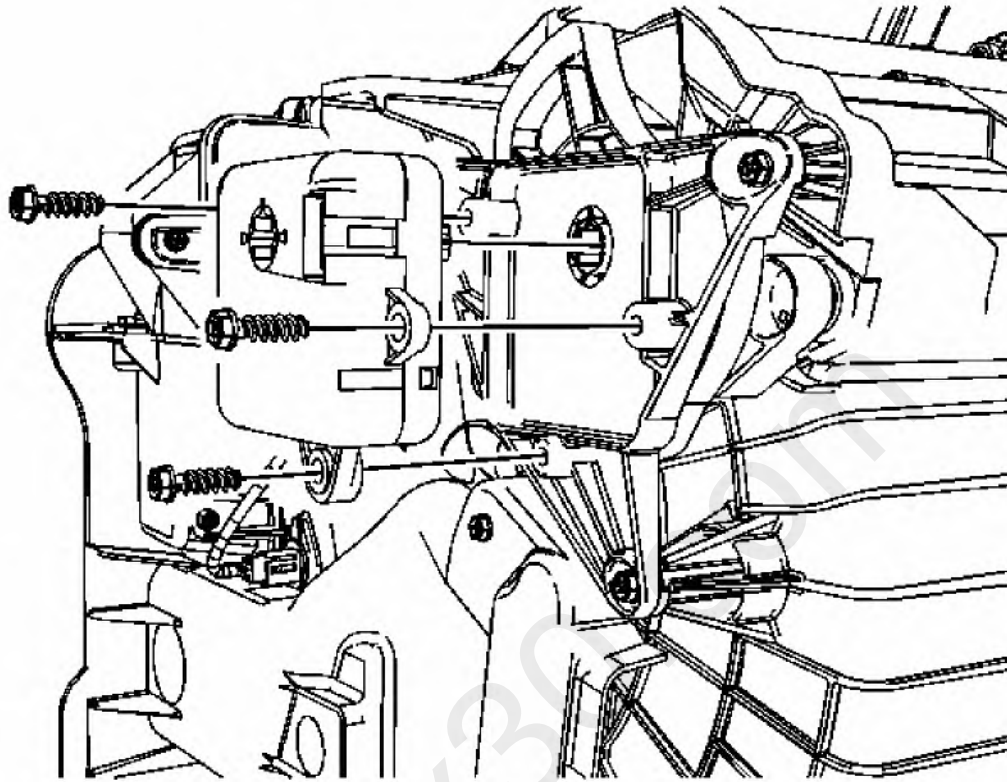


Fig. 197: Mode Actuator
Courtesy of GENERAL MOTORS CORP.

8. Install the mode actuator to the evaporator case assembly.
9. Install the mode actuator screws to the evaporator case assembly.

Tighten: Tighten the screws to 1.5 N.m (13 lb in).

10. Install the evaporator case assembly. Refer to **Air Conditioning (A/C) Evaporator Case Assembly Replacement**.
11. Install the HVAC module. Refer to **HVAC Module Assembly Replacement**.

HEATER CORE REPLACEMENT

Removal Procedure

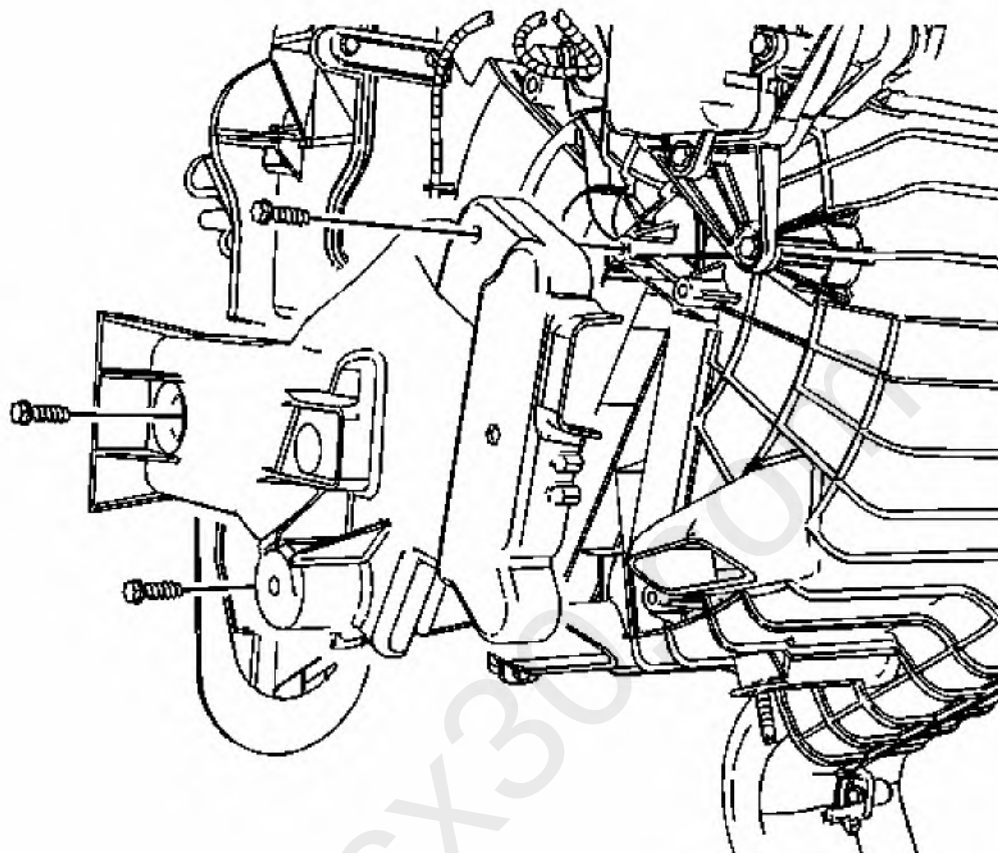


Fig. 198: View Of Heater Core Cover Screws
Courtesy of GENERAL MOTORS CORP.

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

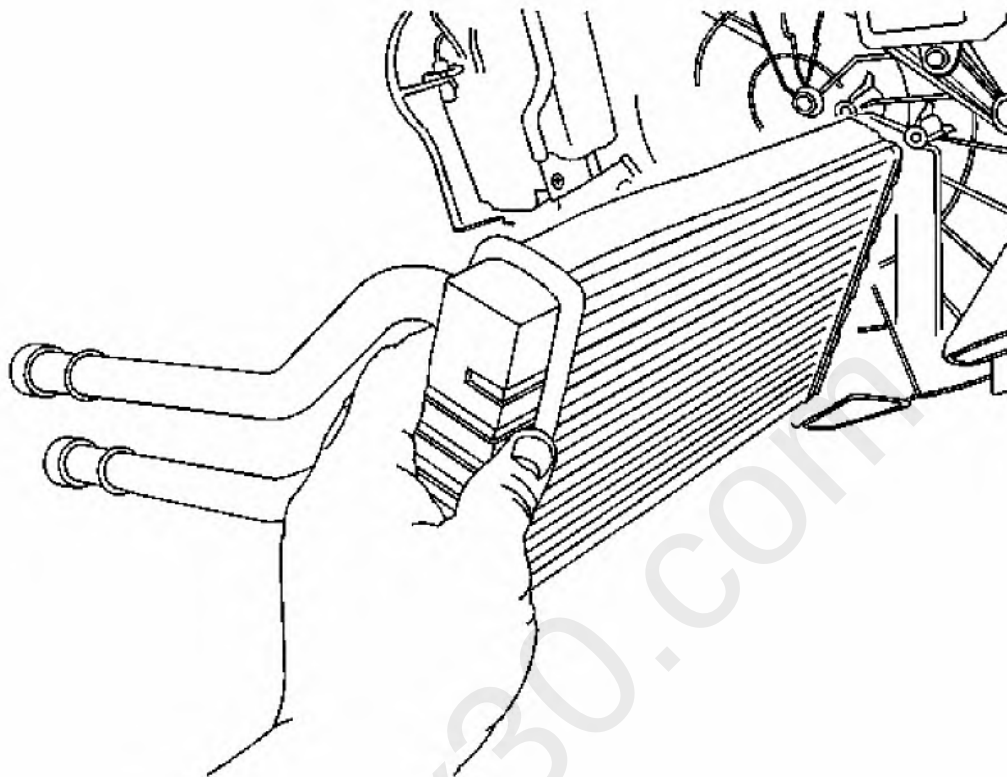


Fig. 199: View Of Heater Core
Courtesy of GENERAL MOTORS CORP.

4. Remove the heater core from the HVAC module.

Installation Procedure

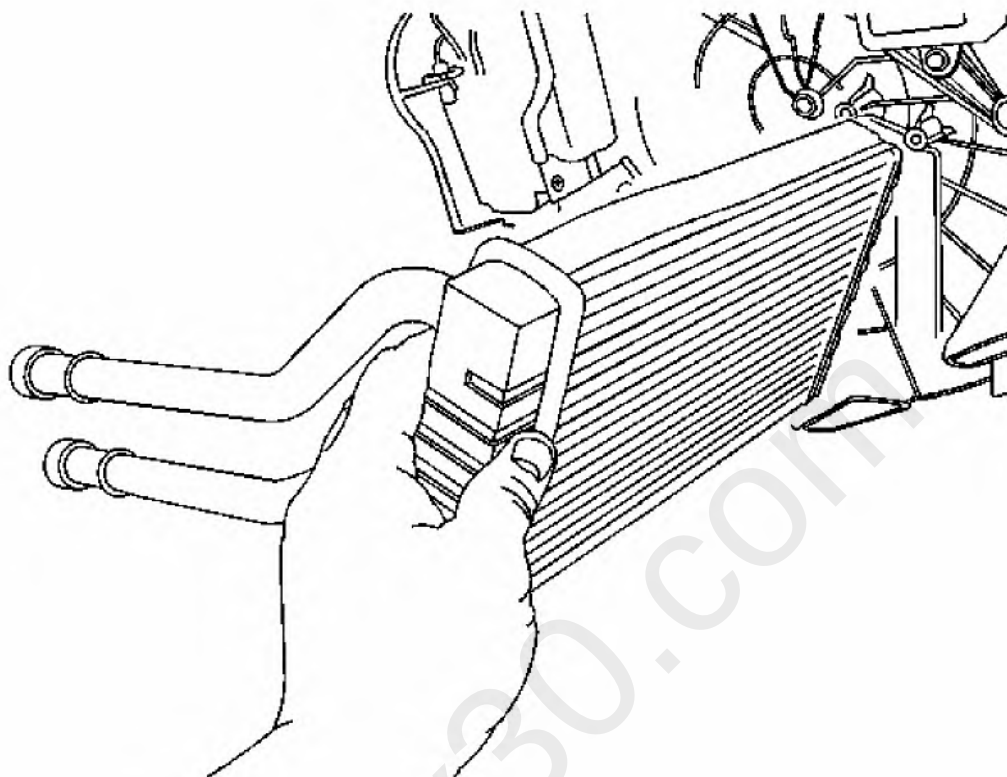


Fig. 200: View Of Heater Core
Courtesy of GENERAL MOTORS CORP.

1. Install the heater core to the HVAC module.

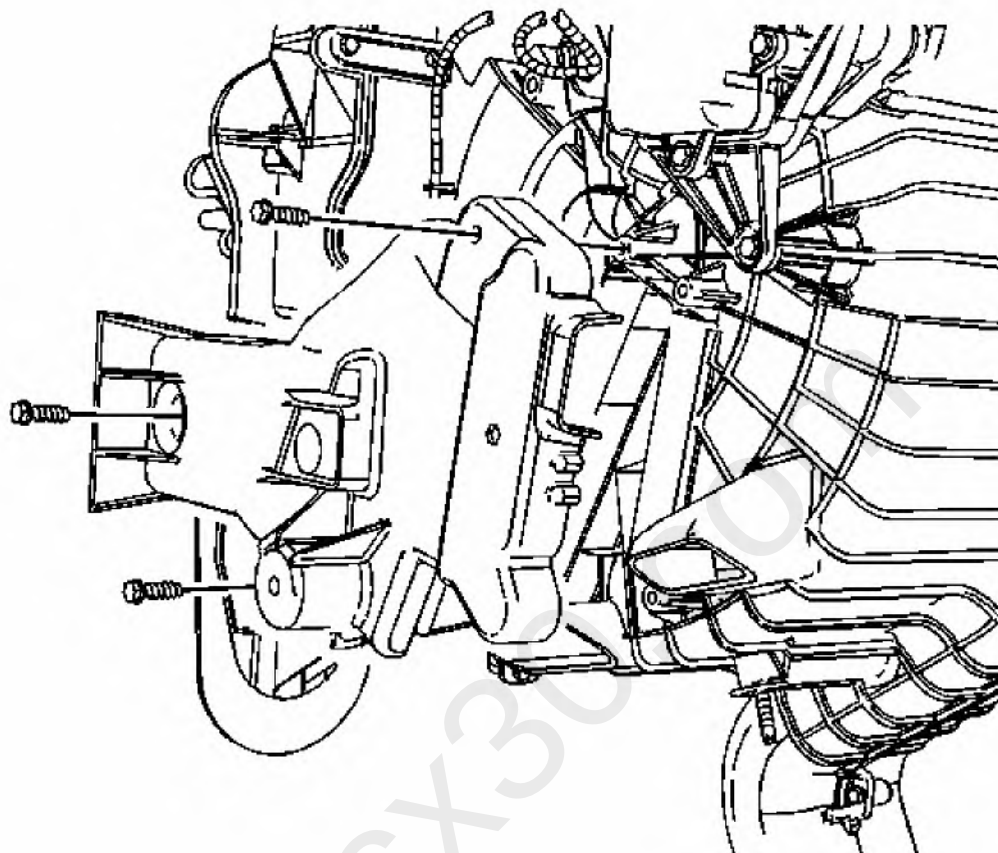


Fig. 201: View Of Heater Core Cover Screws
Courtesy of GENERAL MOTORS CORP.

2. Install the heater core cover to the HVAC module.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the heater core cover screws to the HVAC module.

Tighten: Tighten the screw to 1.5 N.m (13 lb in).

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

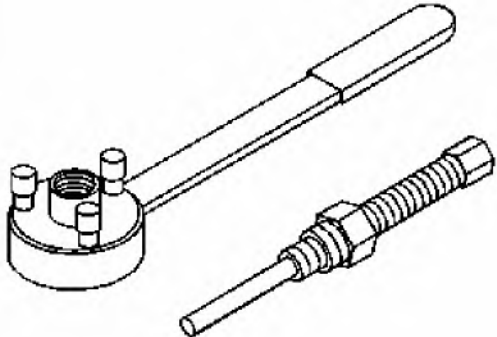
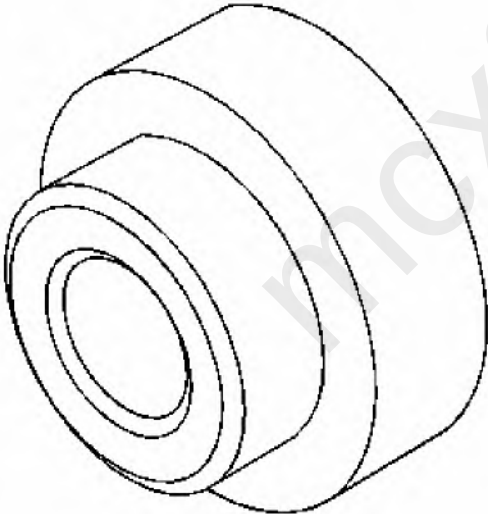
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

2006 Chevrolet Equinox LS

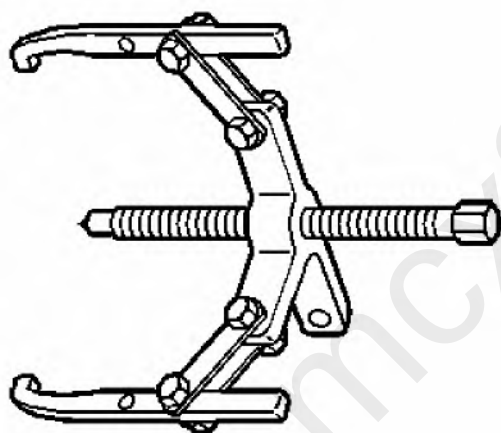
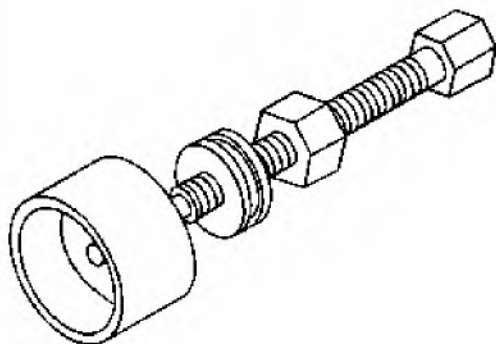
2006 HVAC Heating, Ventilation and Air Conditioning - Equinox & Torrent

Special Tools

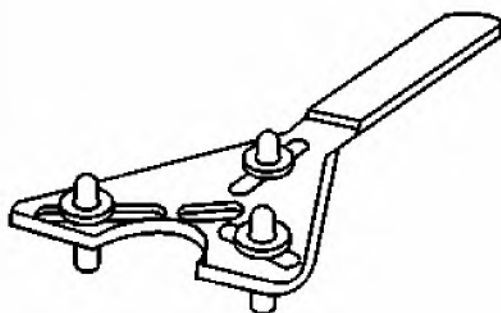
Illustration	Tool Number/Description
	GE 47849 Clutch Remover
	GE 47850 Center Puller
	GE 47851 Armature Installer

2006 Chevrolet Equinox LS

2006 HVAC Heating, Ventilation and Air Conditioning - Equinox & Torrent



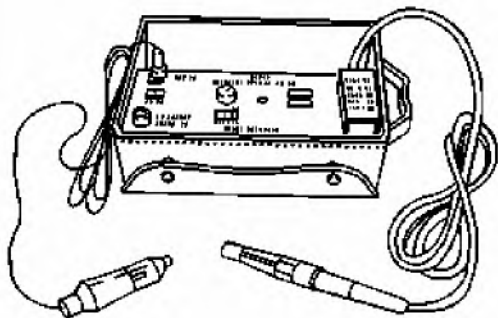
J 25031-A
Three Jaw Puller



J 37872
Universal Spanner Wrench

2006 Chevrolet Equinox LS

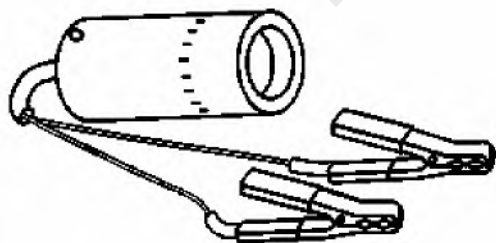
2006 HVAC Heating, Ventilation and Air Conditioning - Equinox & Torrent



J 39400-A
Halogen Leak Detector



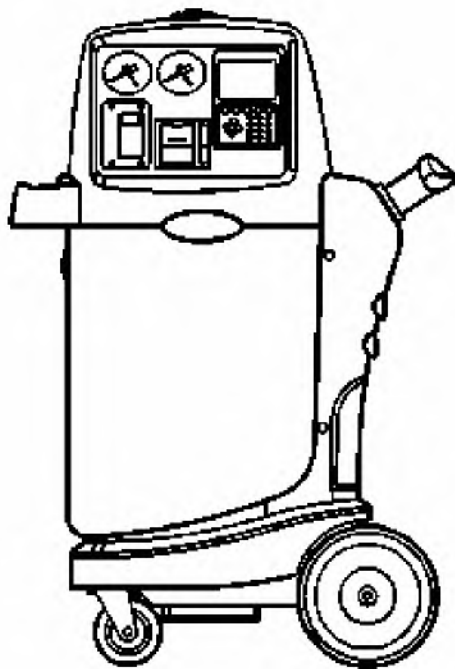
J 41447
R-134A A/C Tracer Dye-Box of 24



J 42220
Universal 12V Leak Detection Lamp

2006 Chevrolet Equinox LS

2006 HVAC Heating, Ventilation and Air Conditioning - Equinox & Torrent



J 43600
ACR 2000 Air Conditioning Service
Center