

Transmission

Transmission Cooling - CTS Coupe & Wagon

DIAGNOSTIC INFORMATION AND PROCEDURES

TRANSMISSION FLUID COOLER FLUSHING AND FLOW TEST

GM studies indicate that plugged or restricted transmission oil coolers and pipes cause insufficient transmission lubrication and elevated operating temperatures which can lead to premature transmission failure. Many repeat repair cases could have been prevented by following published procedures for transmission oil cooler flushing and flow checking. This procedure includes flow checking and flushing the auxiliary transmission oil cooler, if equipped.

NOTE: Use the J 45096 flush and flow test tool or equivalent to flush and flow test the transmission oil cooler and the oil cooler pipes after the transaxle is removed for repairs.

Only GM Goodwrench DEXRON®VI automatic transmission fluid should be used when doing a repair on a GM transmission.

Time allowance for performing the cooler flow checking and flushing procedure has been included in the appropriate labor time guide operations since the 1987 model year. The service procedure steps for oil cooler flushing and flow testing are as follows:

Cooler Flow Check and Flushing Steps

1. Machine Set-up
2. Determine Minimum Flow Rate
3. Back Flush
4. Forward Flush
5. Flow Test
6. Code Recording Procedure
7. Clean-up

Special Tools

- **DT 45096** Transmission Oil Cooling System Flush and Flow Test Tool
- **DT 45096-30** Transmission Cooler Flush Adapter
- Shop air supply with water/oil filters, regulator and pressure gauge - minimum 90 psi
- Eye protection
- Rubber gloves

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

Machine Set-up

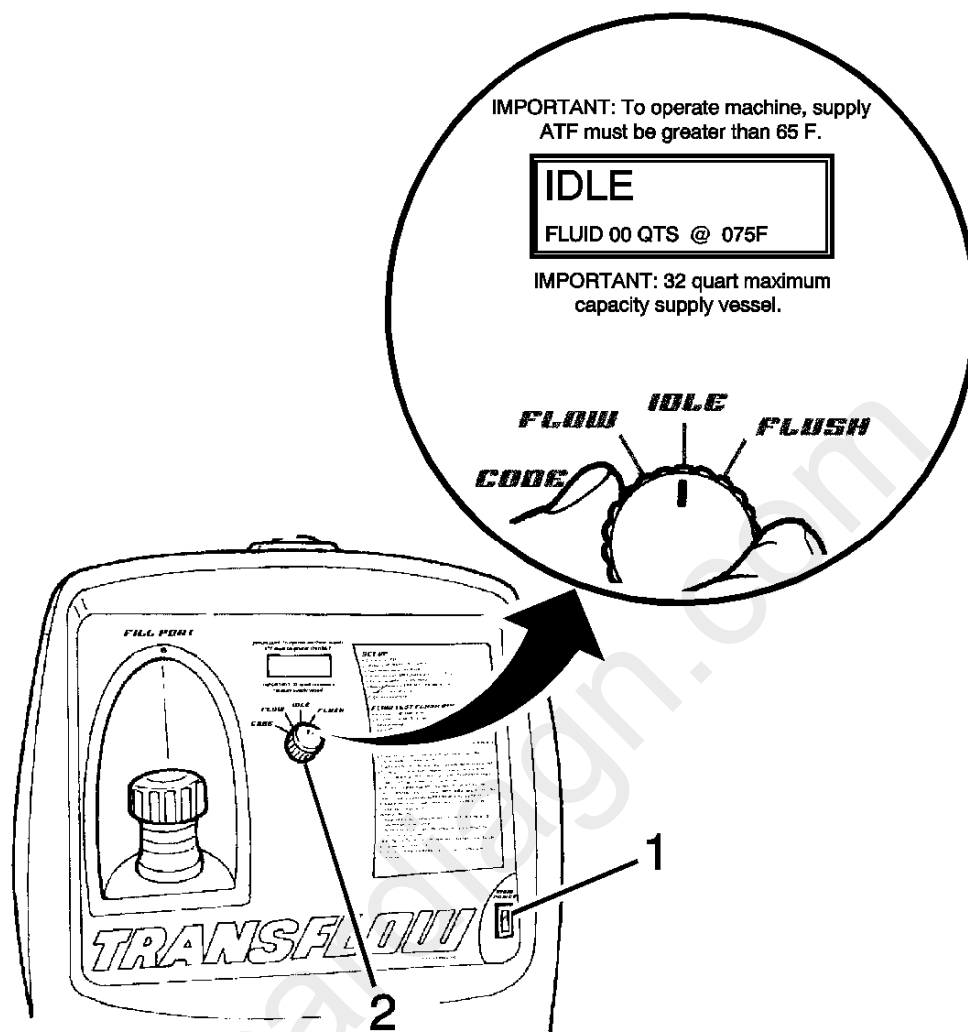


Fig. 1: View Of Main Power Switch & Main Function Switch
Courtesy of GENERAL MOTORS COMPANY

1. Verify that the main power switch (1) is in the OFF position.
2. Place the main function switch (2) in the IDLE position.

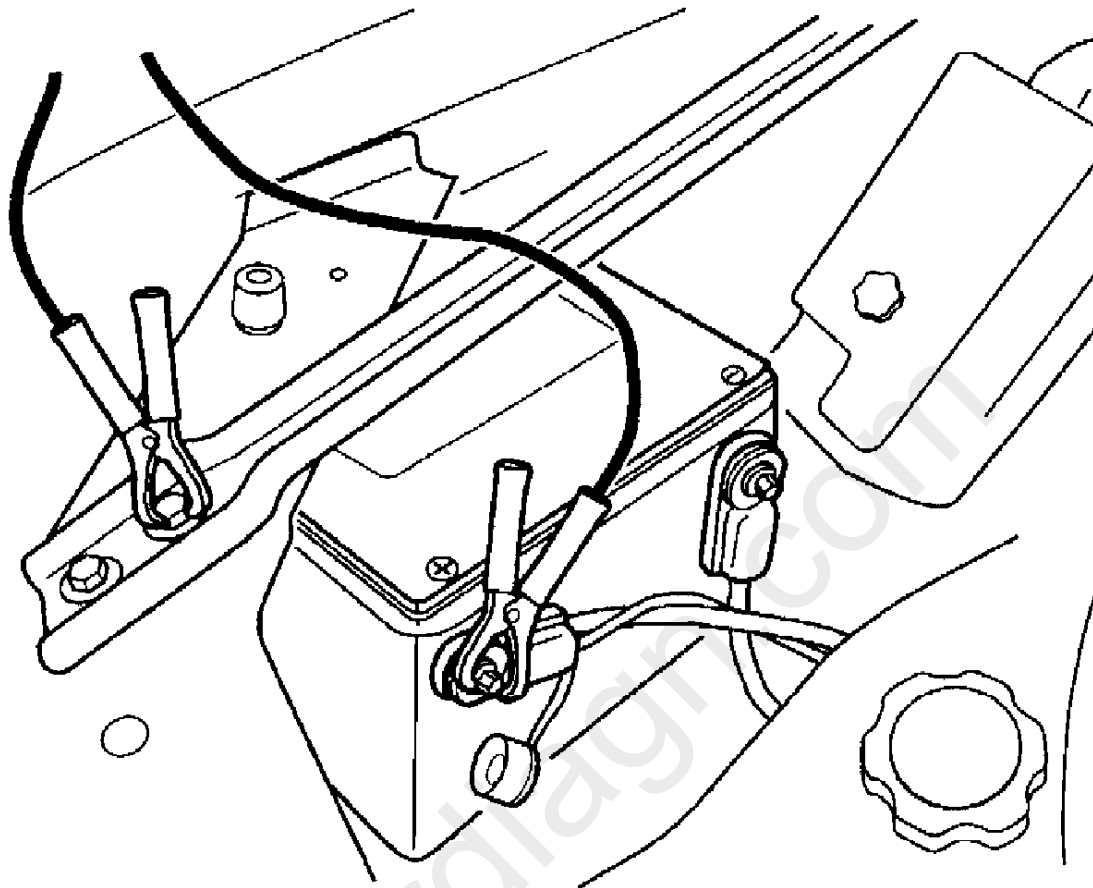


Fig. 2: Connecting To 12V DC Power Source
Courtesy of GENERAL MOTORS COMPANY

3. Connect **DT 45096** flush and flow test tool to the vehicle 12V DC power source by connecting the red battery clip to the positive, +, battery post on the vehicle and connect the negative lead to a known good chassis ground.
4. Turn the main power switch to the ON position.

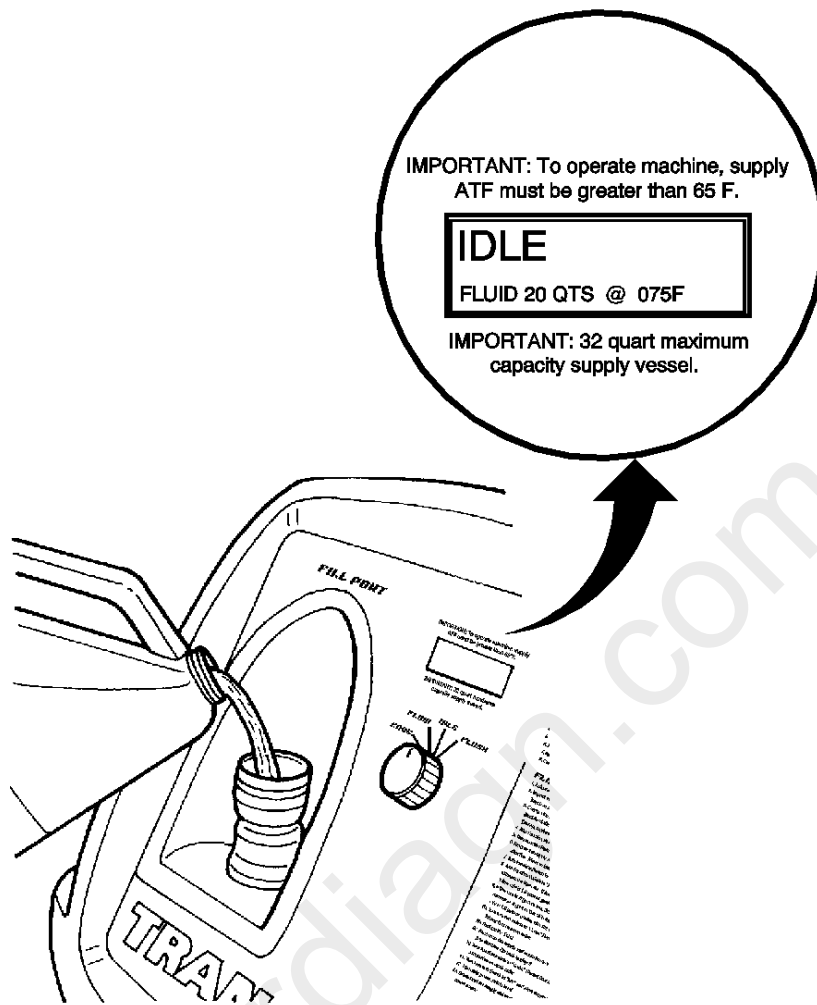


Fig. 3: Filling Supply Tank With Transmission Fluid
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Do not overfill the supply vessel. Damage to the unit may result. To verify the fluid level, view the LCD screen display while filling the unit, to ensure the fluid level does not exceed 30 L (32 qt).

5. Fill the supply tank with Dexron®VI through the fill port.
6. Reinstall and tighten the fill cap.

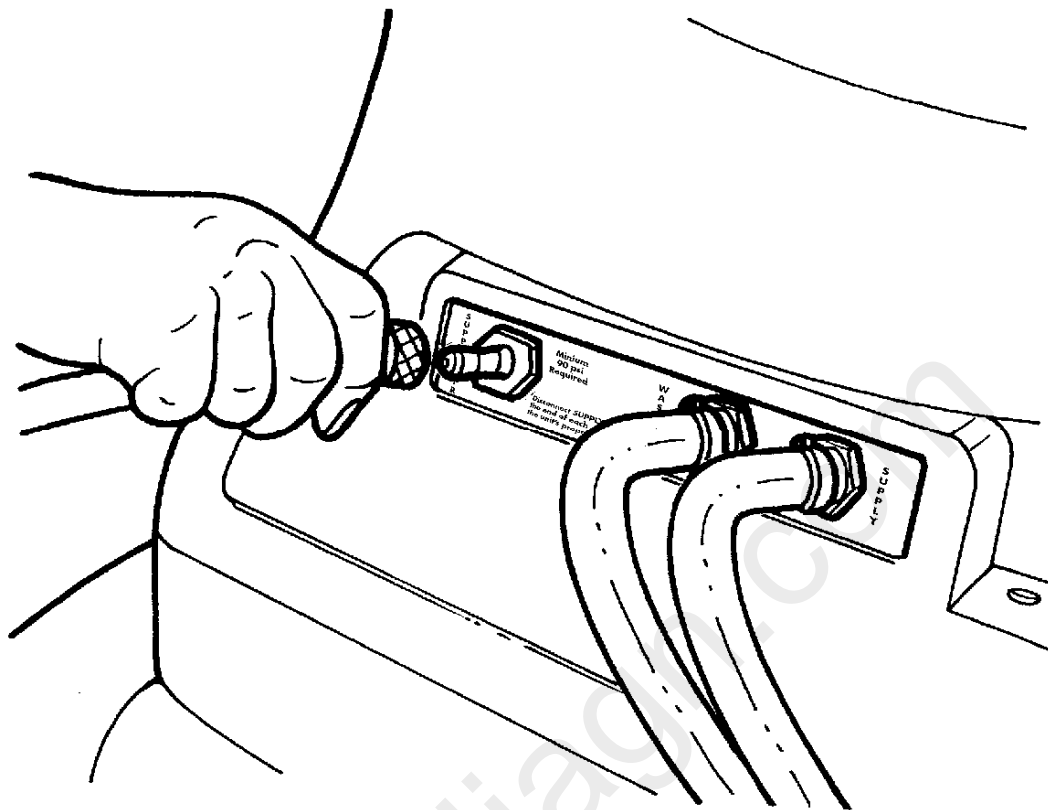


Fig. 4: Applying Shop Air Supply Hose To Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

7. Connect a shop air supply hose to the quick-disconnect on the rear panel marked SUPPLY AIR.

Determine Minimum Flow Rate

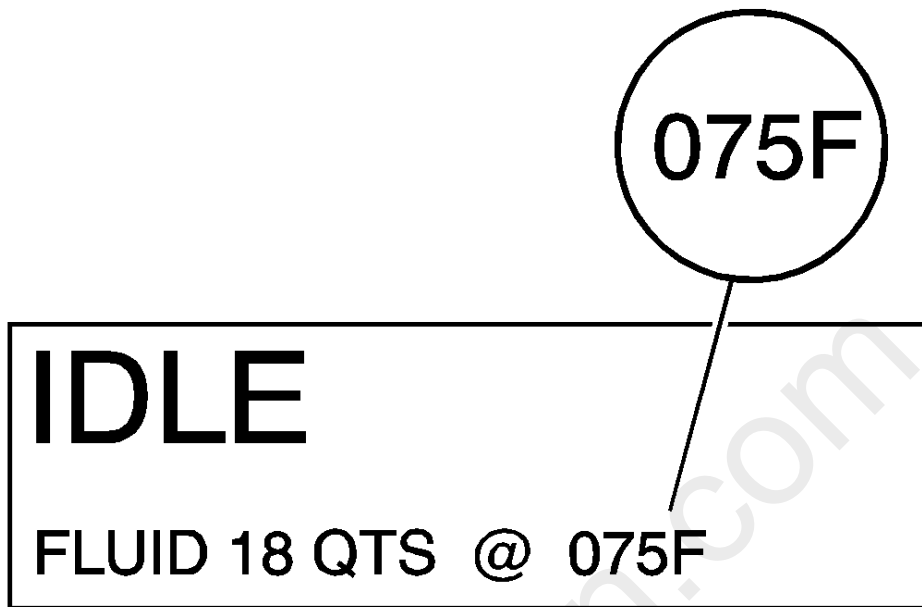


Fig. 5: Identifying Machine Display Of Automatic Transmission Fluid Temperature
Courtesy of GENERAL MOTORS COMPANY

1. From the machine display, identify the temperature of the automatic transmission fluid that is stored in the supply vessel of **DT 45096** flush and flow test tool.

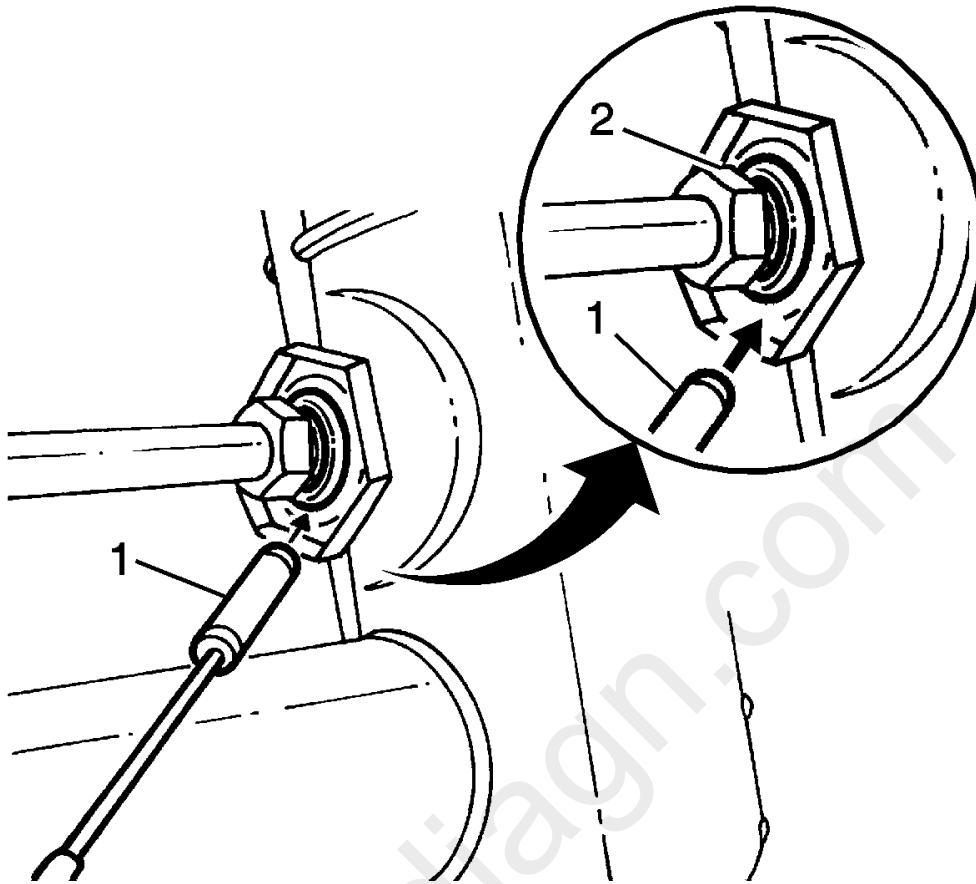


Fig. 6: Identifying Transmission Oil Cooler Metal Composition
Courtesy of GENERAL MOTORS COMPANY

2. Determine whether the transmission oil cooler is steel or aluminum by using a magnet (1) at the cooler flange (2) at the radiator.
3. Refer to the table below. Using the temperature from step 1, locate on either the Steel MINIMUM Flow Rate table or the Aluminum MINIMUM Flow Rate table the minimum flow rate in gallons per minutes (GPM). Record the minimum flow rate in GPMs and the supply fluid temperature for further reference.

Example

- Fluid temperature: 75°F
- Cooler type: Steel

The MINIMUM flow rate for this example would be 0.8 GPM.

4. Inspect transmission oil cooler lines for damage or kinks that could cause restricted oil flow. Repair as needed and refer to the appropriate GM service manual procedures.

Minimum Flow Rate in Gallons Per Minute (gpm)

Temperature Range	Steel	Aluminum
65 - 66°F	0.6 gpm	0.5 gpm
67 - 70°F	0.7 gpm	0.6 gpm
71 - 75°F	0.8 gpm	0.7 gpm
76 - 80°F	0.9 gpm	0.8 gpm
81 - 84°F	1.0 gpm	0.9 gpm
85 - 89°F	1.1 gpm	1.0 gpm
90 - 94°F	1.2 gpm	1.1 gpm
95 - 98°F	1.3 gpm	1.2 gpm
99 - 103°F	1.4 gpm	1.3 gpm
104 - 108°F	1.5 gpm	1.4 gpm
109 - 112°F	1.6 gpm	1.5 gpm
113 - 117°F	1.7 gpm	1.6 gpm
118 - 120°F	1.8 gpm	1.7 gpm

Back Flush Procedure

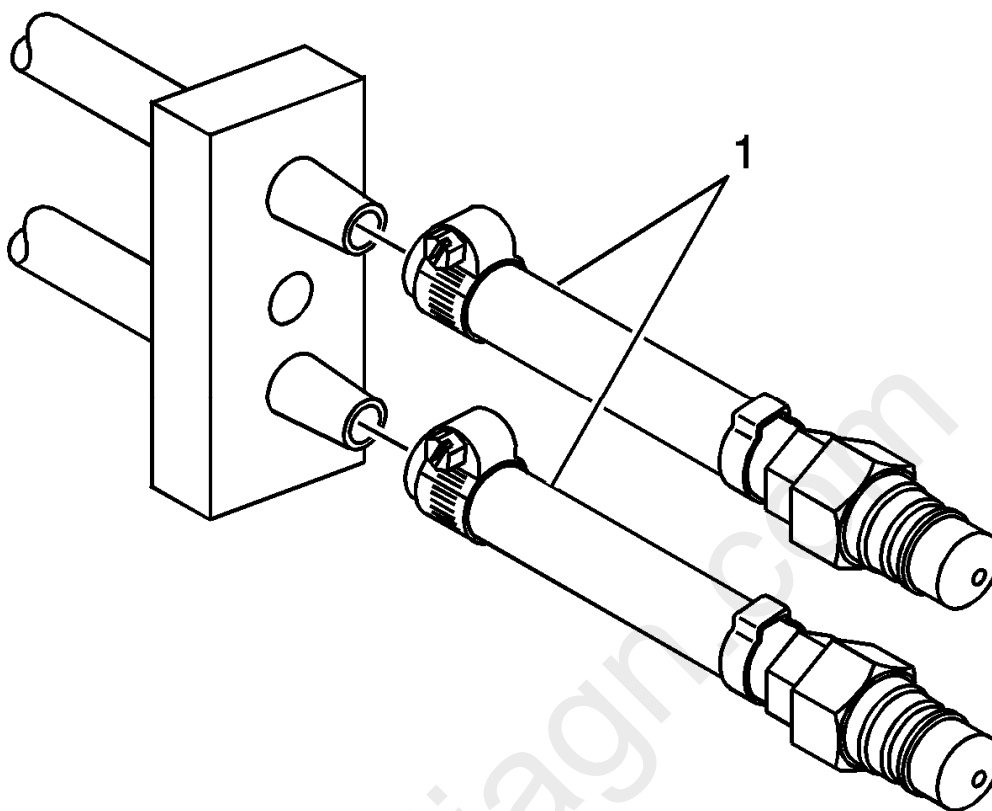


Fig. 7: Cooler Flush Adapter

Courtesy of GENERAL MOTORS COMPANY

1. Connect the **DT 45096-30** cooler flush adapter (1) to the vehicle transmission oil cooler supply and return lines at the transmission.

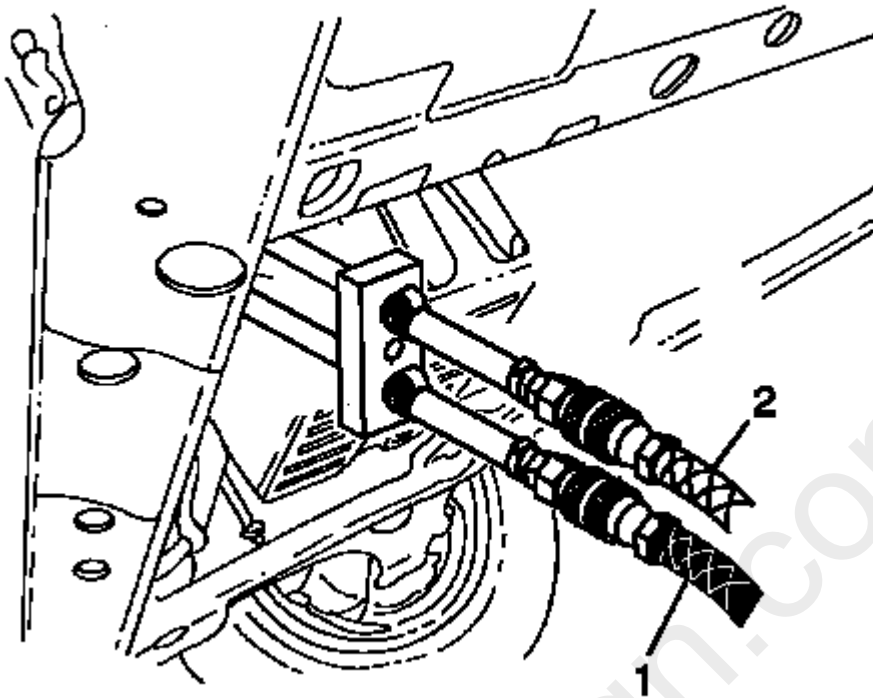


Fig. 8: Identifying Black Supply Hose & Clear Waste Hose
Courtesy of GENERAL MOTORS COMPANY

2. Connect the black supply hose (1) to the return line, bottom connector of the transmission, and the clear waste hose (2) to the feed line, top connector of the transmission, to the vehicle cooler lines. This is the reverse flow - backflush direction.

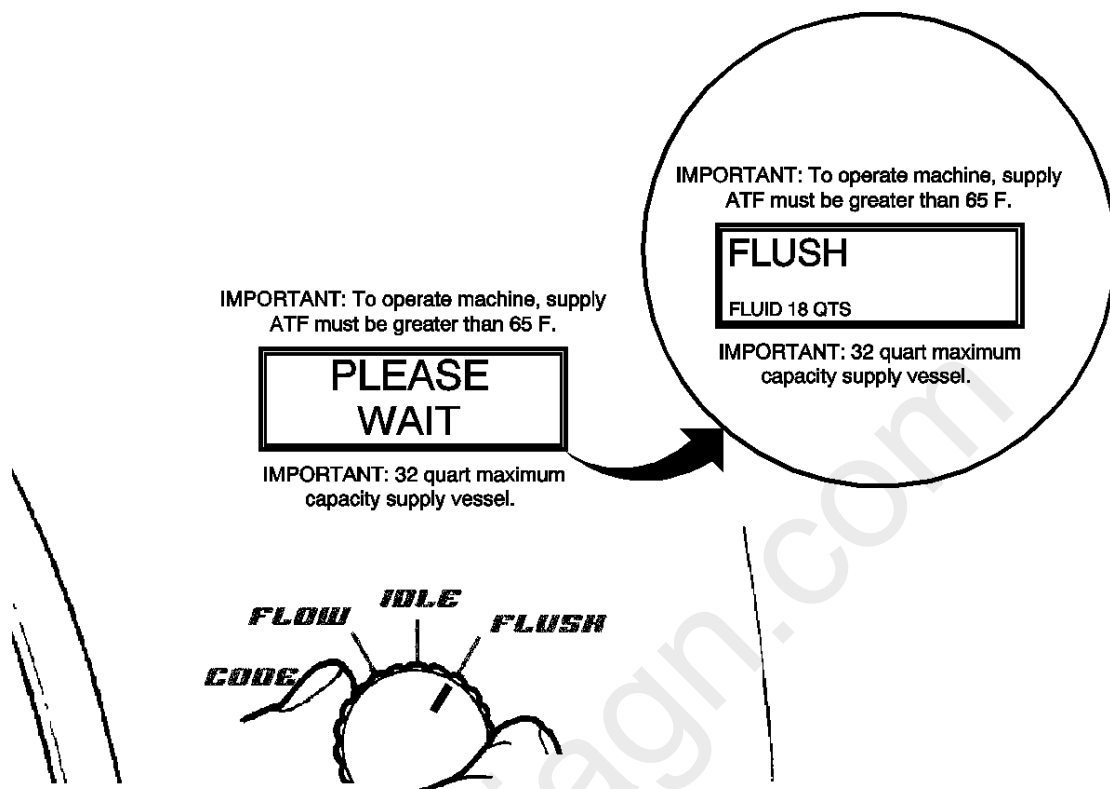


Fig. 9: View Of Main Function Switch FLUSH Position
Courtesy of GENERAL MOTORS COMPANY

3. Turn the main function switch to the FLUSH position. Allow the machine to operate for 30 seconds.

IMPORTANT: To operate machine, supply
ATF must be greater than 65 F.

IDLE

FLUID 16 QTS @ 075F

IMPORTANT: 32 quart maximum
capacity supply vessel.

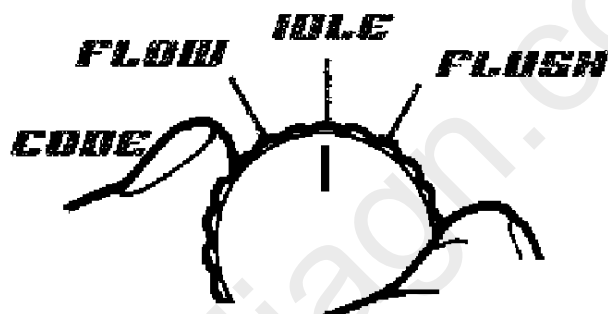


Fig. 10: View Of Main Function Switch IDLE Position
Courtesy of GENERAL MOTORS COMPANY

4. Turn the main function switch to the IDLE position and allow the supply vessel pressure to dissipate.

Forward Flush

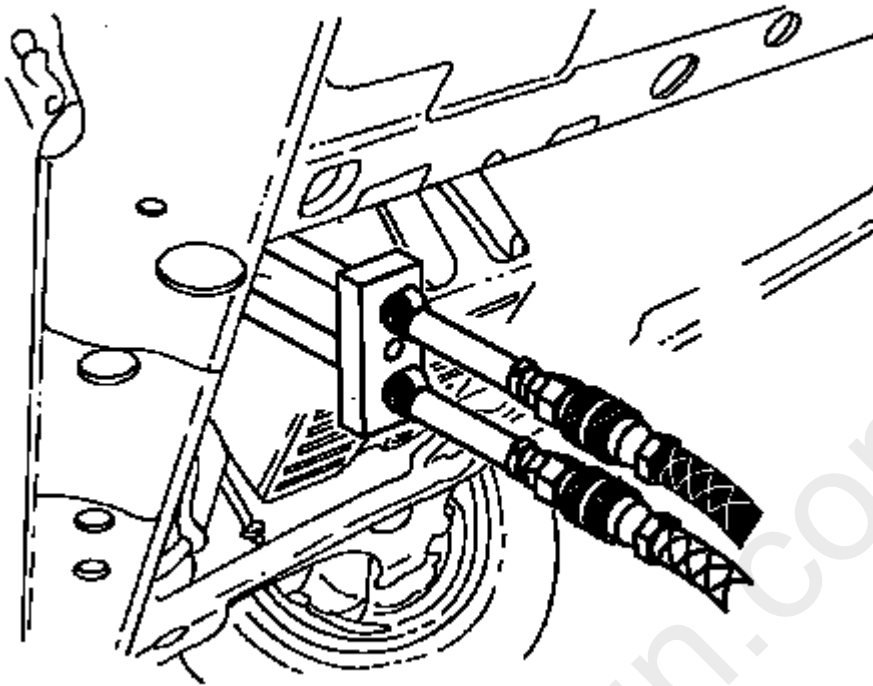


Fig. 11: Identifying Black Supply Hose & Clear Waste Hose
Courtesy of GENERAL MOTORS COMPANY

1. Disconnect the supply and waste hoses from the vehicle cooler lines. Reverse the supply and waste hoses to provide a normal flow direction.

IMPORTANT: To operate machine, supply
ATF must be greater than 65 F.

FLUSH

FLUID 18 QTS

IMPORTANT: 32 quart maximum
capacity supply vessel.

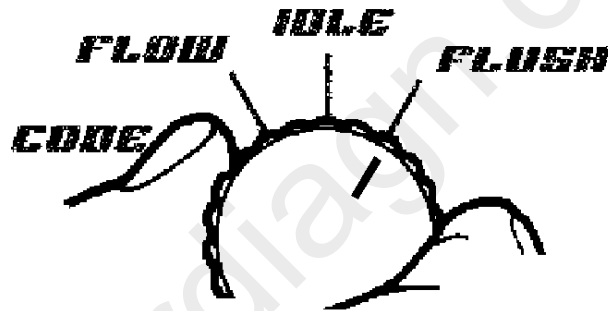


Fig. 12: View Of Main Function Switch FLUSH Position
Courtesy of GENERAL MOTORS COMPANY

2. Turn the main function switch to the FLUSH position and allow machine to operate for 30 seconds.

Flow Test

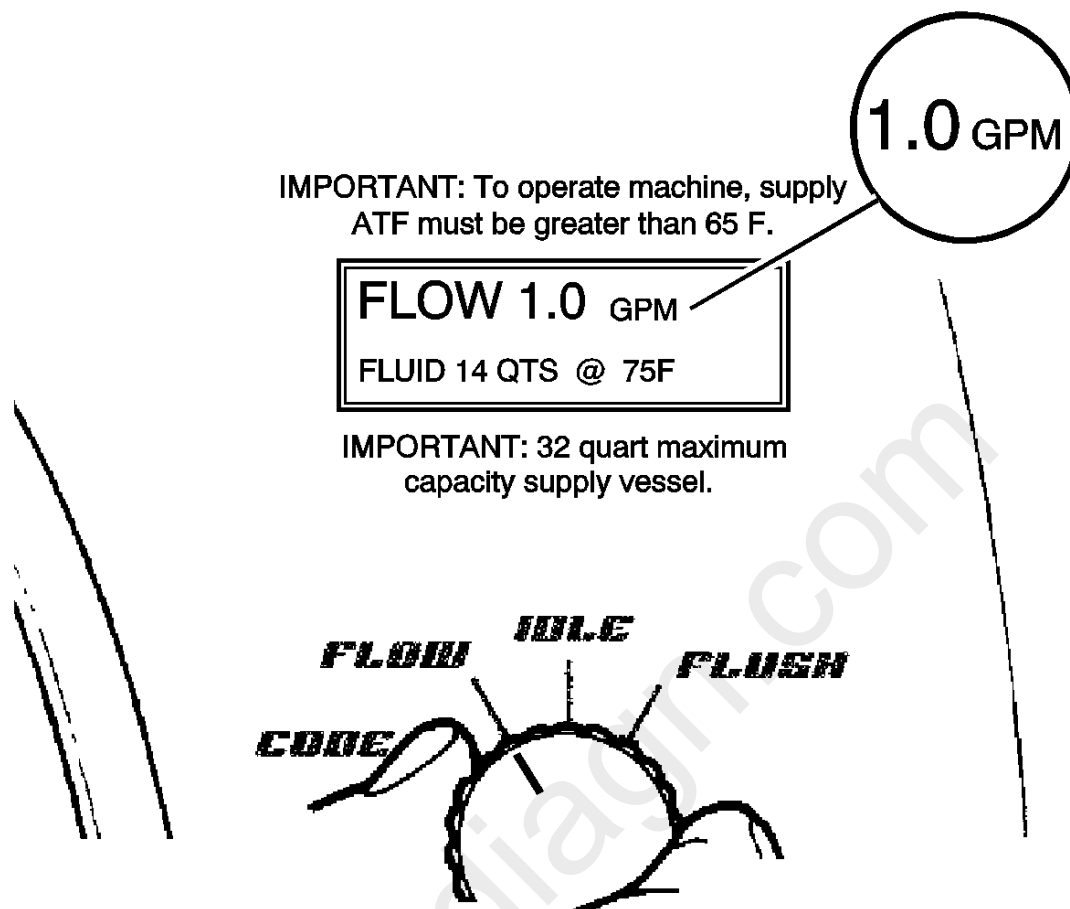


Fig. 13: View Of Main Function Switch FLOW Position
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the flow rate is less than 0.5 gpm, the LCD displays an error message. Refer to the Troubleshooting section of the operation manual.

1. Turn the main function switch to the FLOW position and allow the oil to flow for 15 seconds. Observe and note the flow rate; this is the TESTED flow rate.
2. Compare the TESTED flow rate to the MINIMUM flow rate information previously recorded.
 - If the TESTED flow rate is equal to or greater than the MINIMUM flow rate recorded, the oil cooling system is functioning properly. Perform Code Recording Procedure.
 - If the TESTED flow rate is less than the MINIMUM flow rate previously recorded, repeat the back flush and forward flush procedures.
3. If the TESTED flow rate is less than the MINIMUM flow rate after the second test, perform Code Recording Procedure.

1. Replace the transmission oil cooler.
2. Reconnect supply and waste hoses to the cooler lines in the normal flow direction. Perform Flow Test.
3. Perform Code Recording Procedure.

Code Recording Procedure

IMPORTANT: To operate machine, supply ATF must be greater than 65 F.

FLOW 1.0 @ 75F CYCLE 6
A10DFB2

IMPORTANT: 32 quart maximum capacity supply vessel.



Fig. 14: View Of Main Function Switch CODE Position
Courtesy of GENERAL MOTORS COMPANY

1. Turn the main function switch to the CODE position.

NOTE:

- If power is interrupted prior to the recording of the seven-character code, the code will be lost and the flow rate test will need to be repeated.

- The flow test must run for a minimum of 8-10 seconds and be above 0.5 GPM for a code to be generated.

2. Record TESTED flow rate, temperature, cycle and seven-character flow code information on repair order.

Clean-up

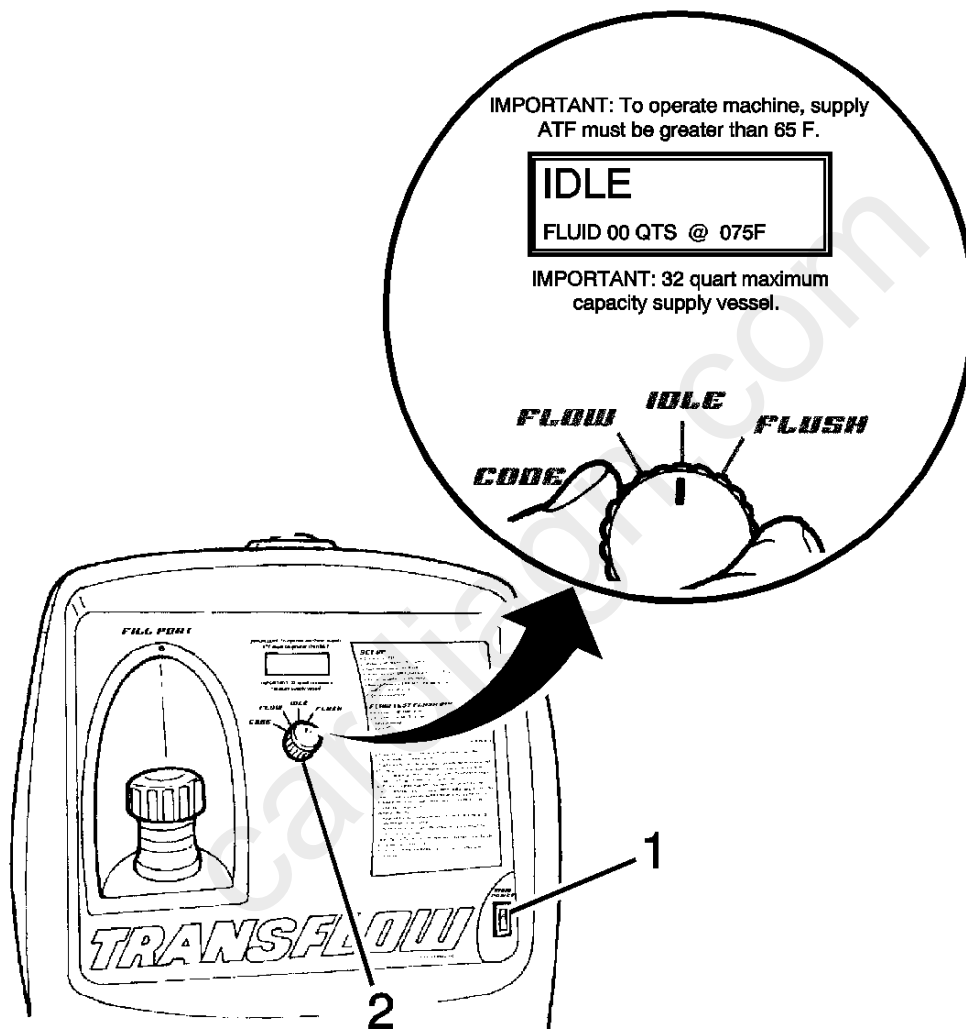


Fig. 15: View Of Main Power Switch & Main Function Switch
Courtesy of GENERAL MOTORS COMPANY

1. Turn the main function switch (2) to the IDLE position and allow the supply vessel pressure to dissipate.
2. Turn the main power switch (1) to the OFF position.

NOTE: A small amount of water may drain from the bottom of the unit when the air supply is disconnected. This is a normal operation of the built-in water

separator.

3. Disconnect the supply and waste hoses and the 12-volt power source from the vehicle.

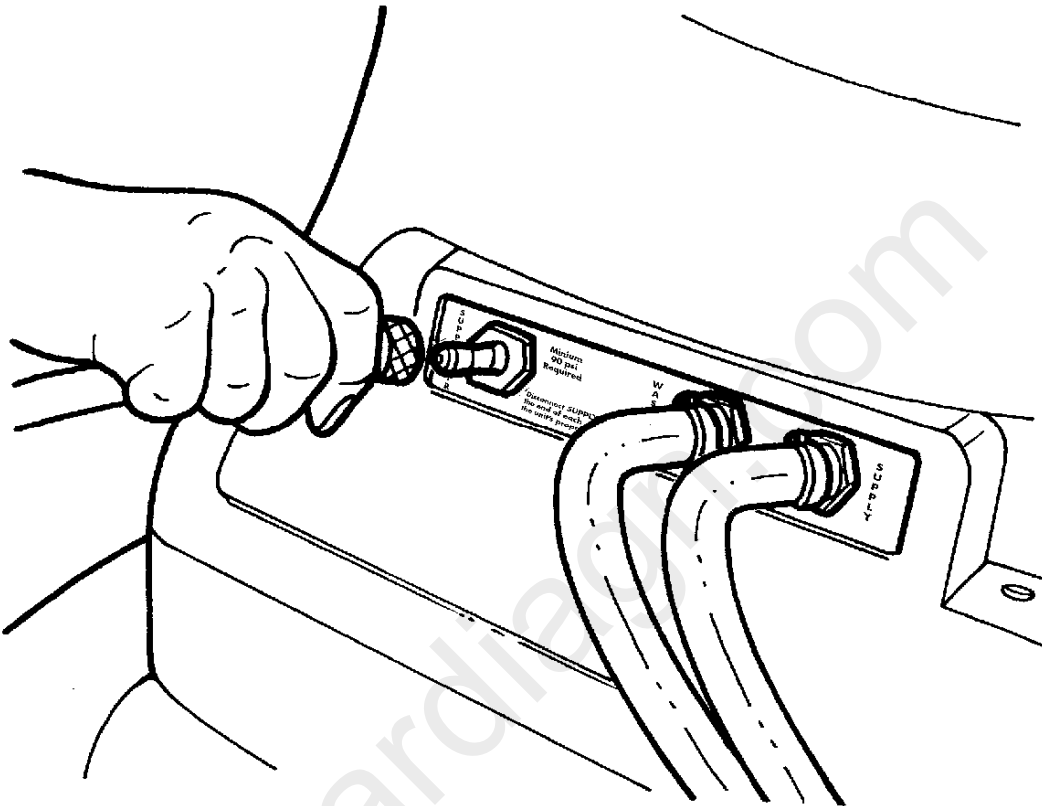


Fig. 16: Applying Shop Air Supply Hose To Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the air supply hose from J 45096 flush and flow test tool.
5. Dispose of the waste ATF in accordance with all applicable federal, state, and local requirements.

REPAIR INSTRUCTIONS

TRANSMISSION FLUID COOLER PIPE SEAL REPLACEMENT

Special Tools

- **DT-45201** Cooler Line Seal Remover
- **DT-47770** Seal Installer

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

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the left catalytic converter. Refer to **Catalytic Converter Replacement - Left Side (LSA)** , **Catalytic Converter Replacement - Left Side (LFW,LFX)** .

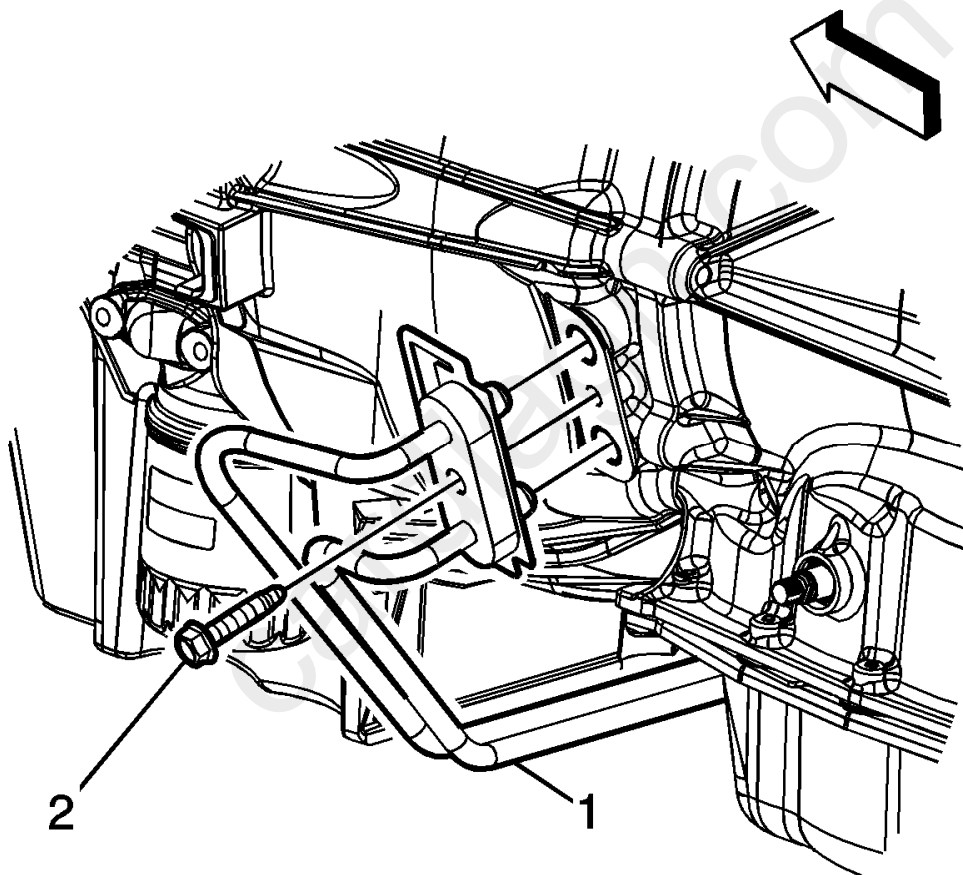


Fig. 17: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Remove the transmission fluid cooler pipe bolt (2) from the transmission.
4. Remove the transmission fluid cooler pipes from the transmission.

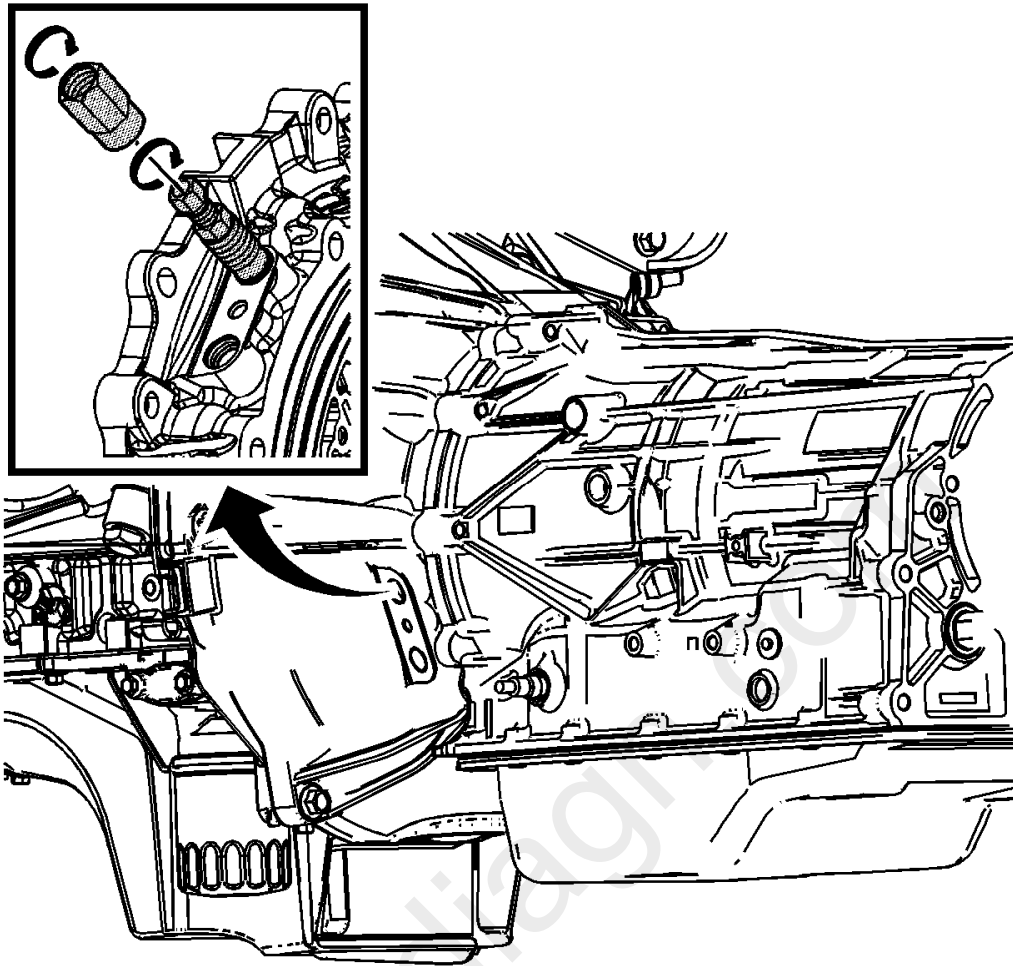


Fig. 18: Transmission Fluid Cooler Pipe Seals
Courtesy of GENERAL MOTORS COMPANY

5. Using **DT-45201** remover , remove the transmission fluid cooler pipe seals from the transmission.

Installation Procedure

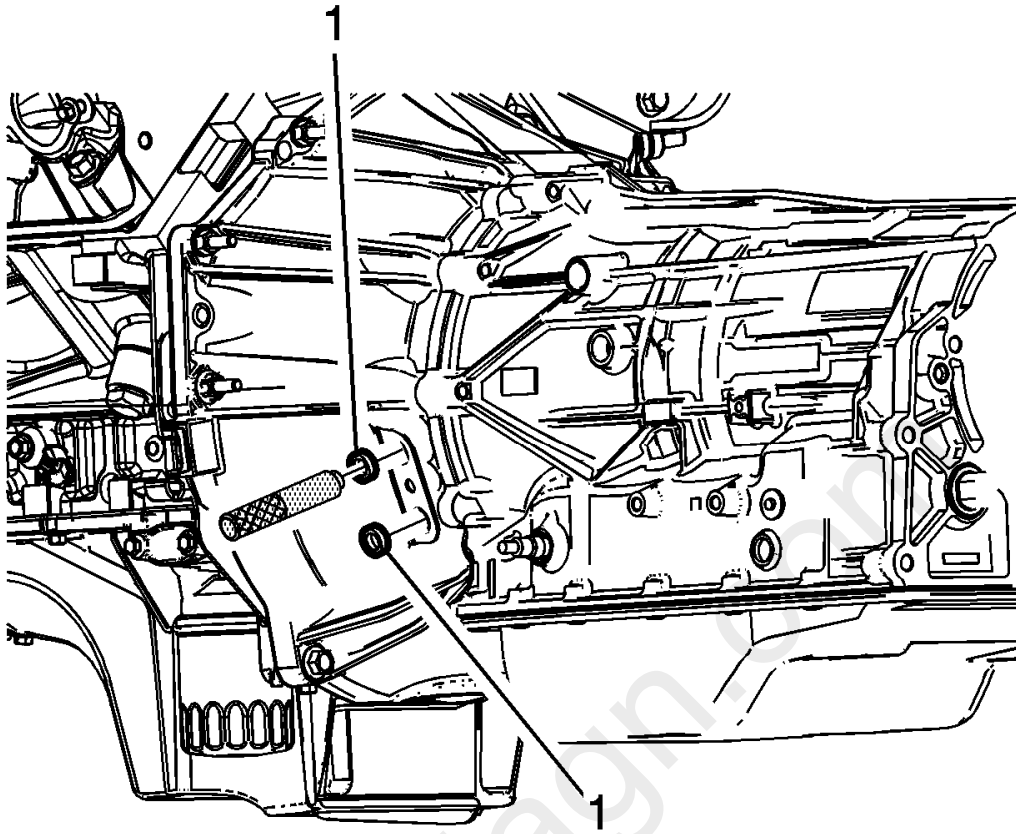


Fig. 19: Transmission Fluid Cooler Pipe Seals
Courtesy of GENERAL MOTORS COMPANY

1. Using **DT-47770** installer , install the transmission fluid cooler pipe seals (1) in the transmission.

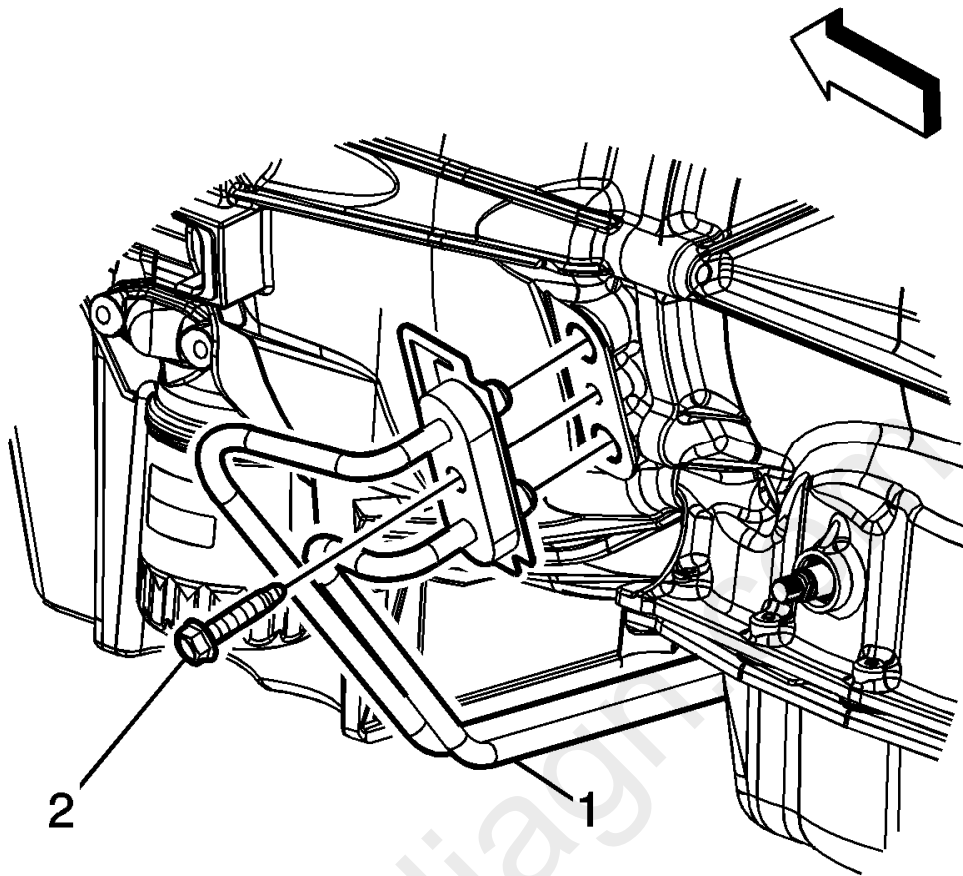


Fig. 20: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

2. Install transmission fluid cooler pipes (1) the to the transmission.

CAUTION: Refer to Fastener Caution .

3. Install the transmission fluid cooler pipe bolt (2) to the transmission and tighten to 22 (16 lb ft).
4. Install the left catalytic converter. Refer to Catalytic Converter Replacement - Left Side (LSA) , Catalytic Converter Replacement - Left Side (LFW,LFX) .
5. Lower the vehicle.
6. Check the transmission fluid level.

TRANSMISSION FLUID AUXILIARY COOLER REPLACEMENT

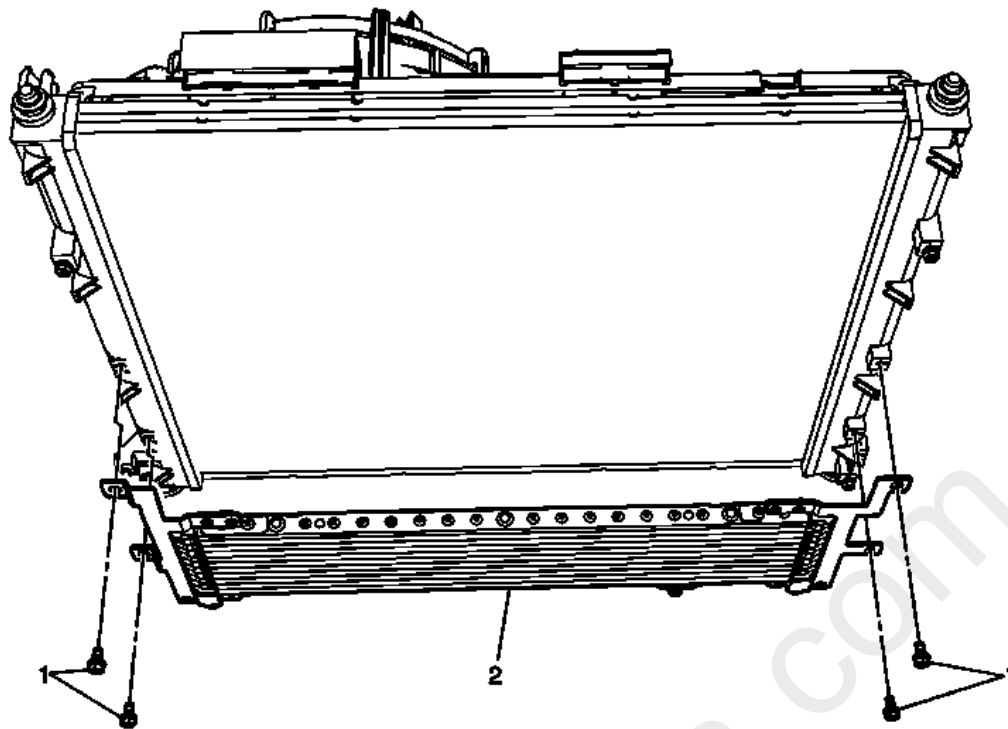


Fig. 21: Transmission Fluid Auxiliary Cooler
Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Auxiliary Cooler Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the condenser to access the transmission oil cooler. Refer to <u>Air Conditioning Condenser Replacement</u> . 2. Remove the air cleaner assembly. Refer to <u>Air Cleaner Assembly Replacement</u> . 3. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Remove the front air deflector. Refer to <u>Front Air Deflector Replacement</u> . 5. Remove front compartment sight shield. Refer to <u>Front Compartment Sight Shields Replacement</u> . 6. Remove transmission fluid cooler pipes. Refer to <u>Transmission Fluid Cooler Hose/Pipe Replacement (With VO3)</u>, <u>Transmission Fluid Cooler Hose/Pipe Replacement (Without VO3)</u>, and <u>Transmission Fluid Auxiliary Cooler Pipe Replacement (With VO3)</u>.	
1	Transmission Oil Cooler Bolts (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> . Tighten

	5 N.m (44 lb in)
2	Transmission Oil Cooler

TRANSMISSION FLUID AUXILIARY COOLER PIPE REPLACEMENT (WITH VO3)

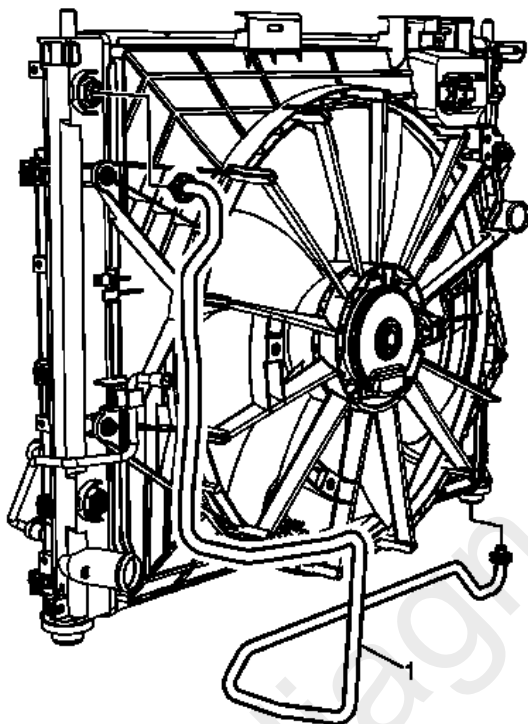


Fig. 22: Transmission Fluid Auxiliary Cooler Pipe (With VO3)
 Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Auxiliary Cooler Pipe Replacement (With VO3)

Callout	Component Name
Preliminary Procedures 1. Reposition the condenser to access the transmission oil cooler auxiliary inlet pipe. Refer to <u>Air Conditioning Condenser Replacement</u> . 2. Remove the air cleaner assembly. Refer to <u>Air Cleaner Assembly Replacement</u> . 3. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Remove the front air deflector. Refer to <u>Front Air Deflector Replacement</u> . 5. Remove front compartment sight shield. Refer to <u>Front Compartment Sight Shields Replacement</u> . TIP: It is not necessary to discharge the refrigerant from the air conditioning (A/C) system during auxiliary transmission oil cooler (TOC) auxiliary inlet pipe replacement. Remove the A/C condenser mounting bolts and reposition the condenser.	
1	Transmission Fluid Auxiliary Oil Cooler Inlet Pipe

TRANSMISSION FLUID AUXILIARY COOLER INLET PIPE REPLACEMENT

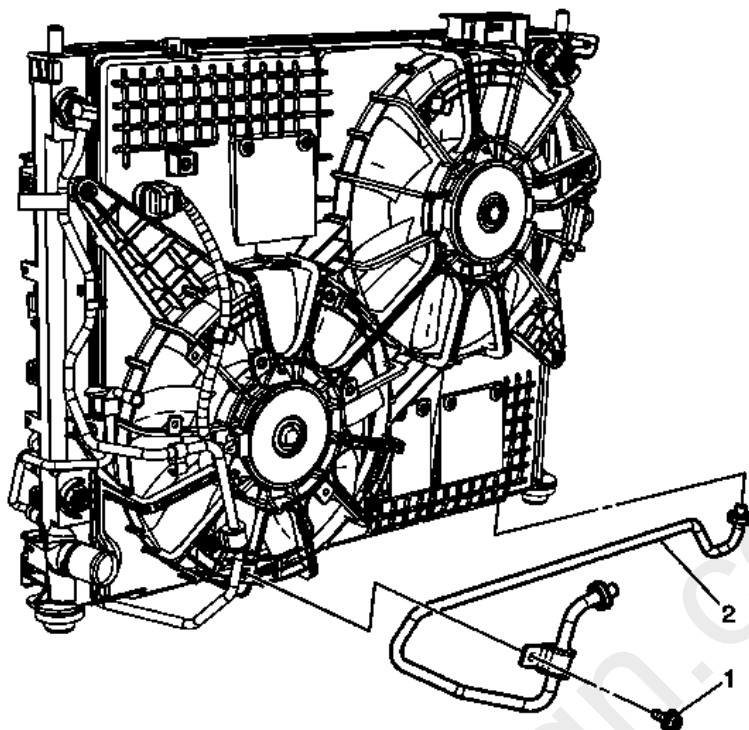


Fig. 23: Identifying Transmission Fluid Auxiliary Cooler Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Auxiliary Cooler Inlet Pipe Replacement

Callout	Component Name
Preliminary Procedures	
1. Reposition the condenser to access the transmission oil cooler auxiliary inlet pipe. Refer to <u>Air Conditioning Condenser Replacement</u> . 2. Remove the air cleaner assembly. Refer to <u>Air Cleaner Assembly Replacement</u> . 3. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Remove the front air deflector. Refer to <u>Front Air Deflector Replacement</u> . 5. Remove front compartment sight shield. Refer to <u>Front Compartment Sight Shields Replacement</u> . 6. Remove transmission fluid cooler pipes. Refer to <u>Transmission Fluid Cooler Hose/Pipe Replacement (With VO3)</u>, <u>Transmission Fluid Cooler Hose/Pipe Replacement (Without VO3)</u>.	
NOTE: It is not necessary to discharge the refrigerant from the air conditioning (A/C) system during auxiliary transmission oil cooler (TOC) auxiliary inlet pipe replacement. Remove the A/C condenser mounting bolts and reposition the condenser.	

1	Transmission Fluid Auxiliary Oil Cooler Inlet Pipe Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 5 N.m (44 lb in)
2	Transmission Fluid Auxiliary Oil Cooler Inlet Pipe

TRANSMISSION FLUID AUXILIARY COOLER OUTLET HOSE REPLACEMENT

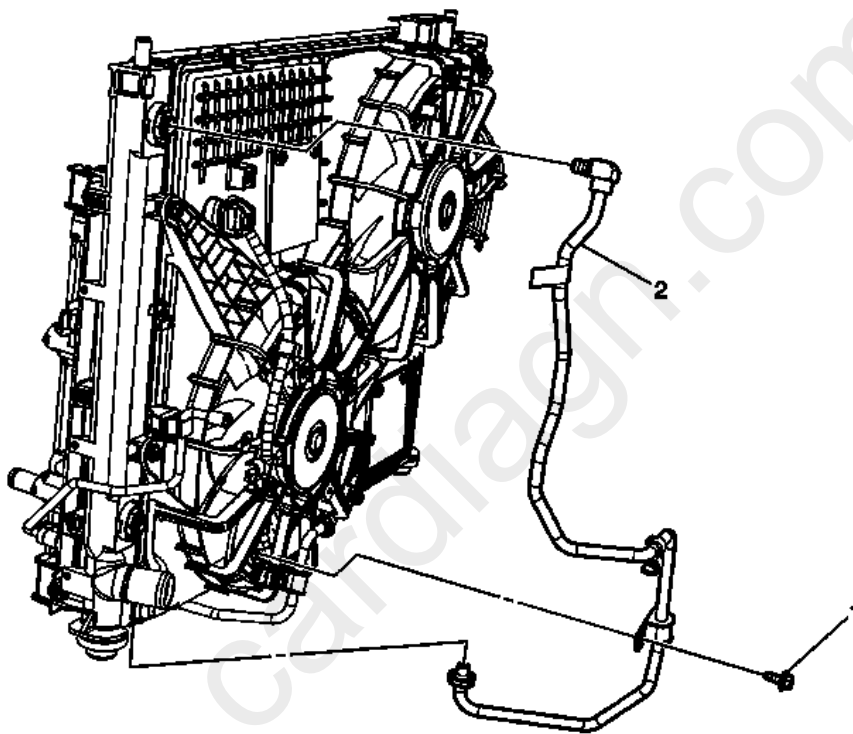


Fig. 24: Identifying Transmission Fluid Auxiliary Cooler Outlet Hose
Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Auxiliary Cooler Outlet Hose Replacement

Callout	Component Name
Preliminary Procedures	
1. Reposition the condenser to access the transmission oil cooler auxiliary inlet pipe. Refer to <u>Air Conditioning Condenser Replacement</u> . 2. Remove the air cleaner assembly. Refer to <u>Air Cleaner Assembly Replacement</u> . 3. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Remove the front air deflector. Refer to <u>Front Air Deflector Replacement</u> .	

5. Remove front compartment sight shield. Refer to **Front Compartment Sight Shields Replacement** .

TIP: It is not necessary to discharge the refrigerant from the air conditioning (A/C) system during auxiliary transmission oil cooler (TOC) auxiliary outlet pipe replacement. Remove the A/C condenser mounting bolts and reposition the condenser.

1	Transmission Fluid Auxiliary Oil Cooler Outlet Pipe Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 5 N.m (44 lb in)
2	Transmission Fluid Auxiliary Oil Cooler Outlet Pipe

TRANSMISSION FLUID COOLER HOSE/PIPE QUICK-CONNECT FITTING DISCONNECTION AND CONNECTION

Special Tools

J 41623-B Cooler Quick Connect Tool

Removal Procedure

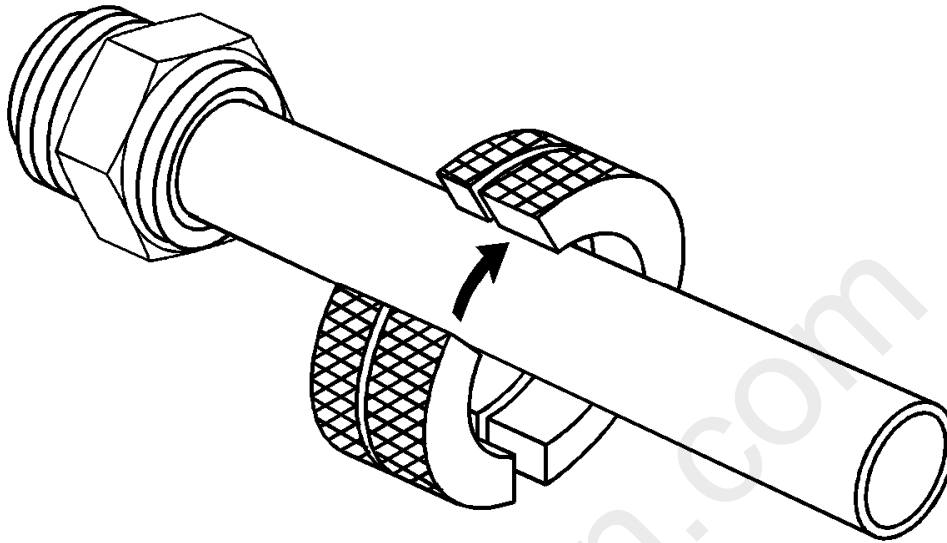


Fig. 25: Cooler Quick Connect Tool & Generator Cooling Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

1. Install the **J 41623-B** cooler quick connect tool onto the transmission oil cooler (TOC) pipe.

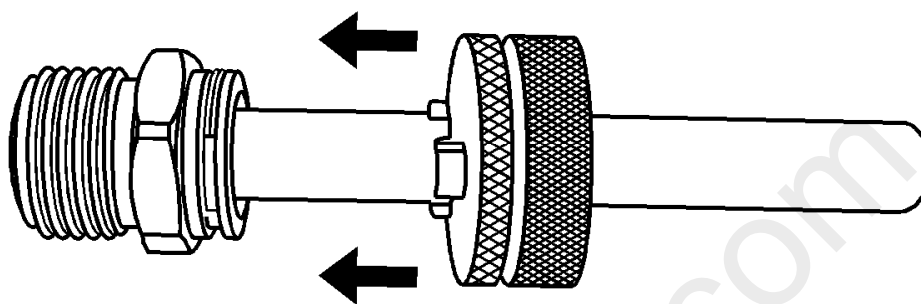


Fig. 26: Sliding Cooler Quick Connect Tool Toward Generator Cooling Inlet Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

2. Slide the **J 41623-B** cooler quick connect tool toward the TOC pipe fitting.

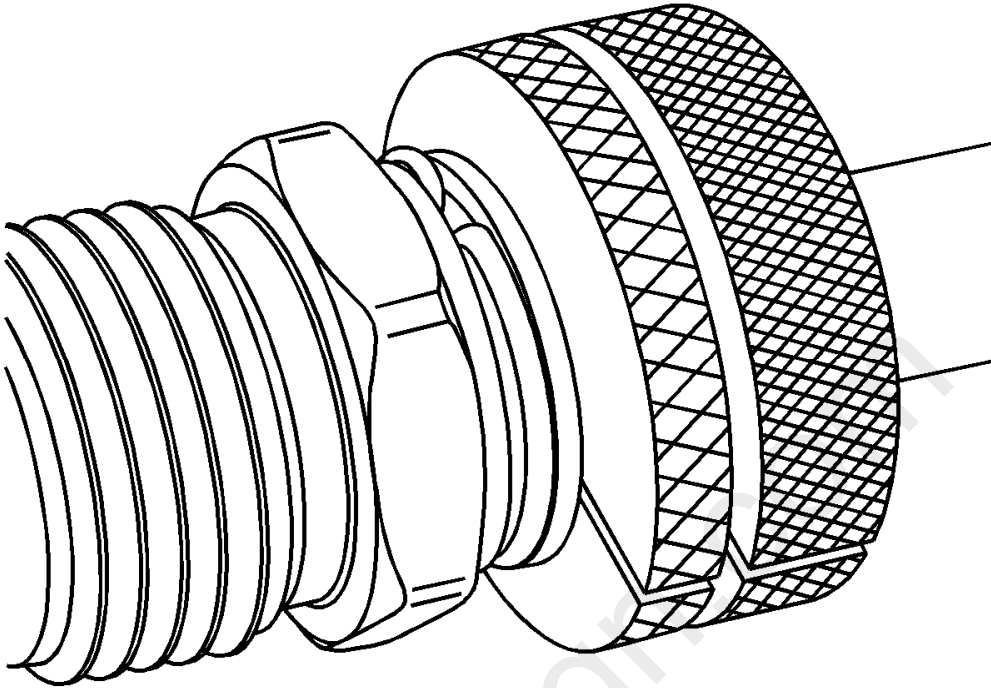


Fig. 27: Rotating Quick-Connect On Coolant Pipe
Courtesy of GENERAL MOTORS COMPANY

IMPORTANT: Rotate the J 41623-B cooler quick connect tool to engage the TOC pipe fitting's retainer slots.

The J 41623-B cooler quick connect tool should be nearly flush with the fitting.

3. Connect the **J 41623-B** cooler quick connect tool onto the TOC pipe fitting.

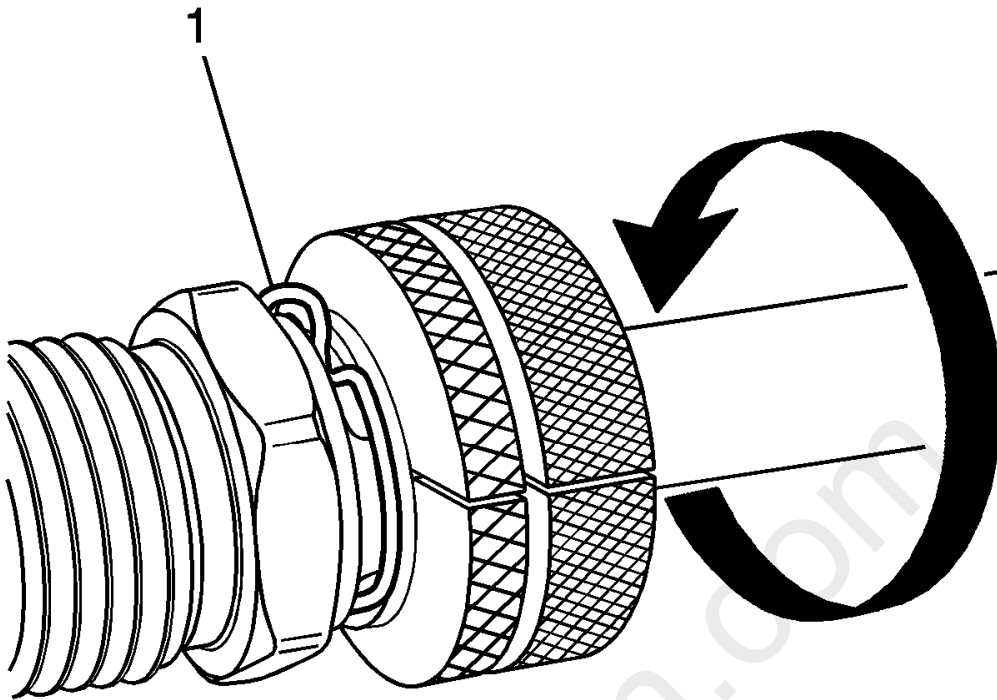


Fig. 28: Rotating Quick-Connect Until Retainer Clip Rises Above Fitting Retainer Seat
Courtesy of GENERAL MOTORS COMPANY

4. Rotate the **J 41623-B** cooler quick connect tool until the retainer clip (1) rises above the fitting retainer seat.

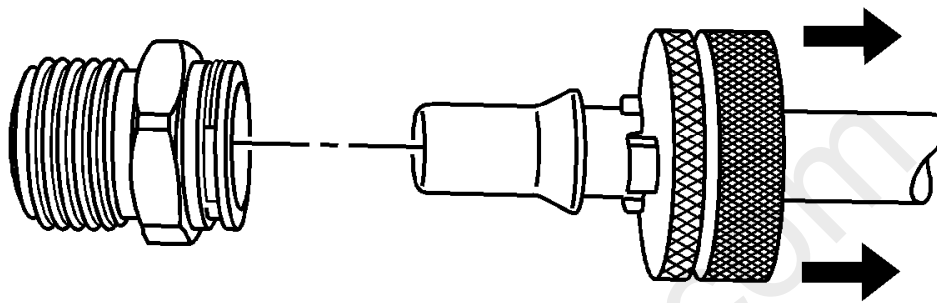


Fig. 29: Cooler Quick Connect Tool & Generator Cooling Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

5. Pull back on the TOC pipe to disengage the pipe from the TOC pipe fitting.
6. Remove the **J 41623-B** cooler quick connect tool from the TOC pipe.

Installation Procedure

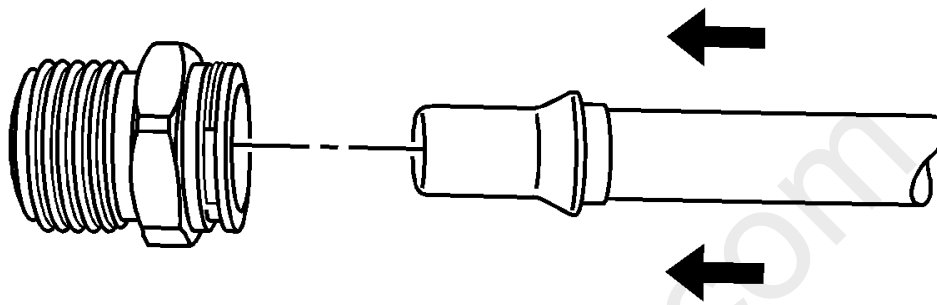


Fig. 30: View Of Generator Cooling Inlet Pipe & Generator Cooling Inlet Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

IMPORTANT: Inspect the TOC pipe fitting and retaining clip for signs of wear or damage. Replace the components if necessary.

1. Install the TOC pipe into the TOC pipe fitting.

A distinct snap should be heard or felt when assembling the TOC pipe to the fitting.

2. To ensure the cooler line is properly installed, give the cooler pipe a gentle pull.

TRANSMISSION FLUID COOLER HOSE/PIPE REPLACEMENT (WITH VO3 - EXTRA CAPACITY COOLING)

Removal Procedure

1. Remove the air cleaner assembly. Refer to [Air Cleaner Assembly Replacement](#) .

2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Remove the front air deflector. Refer to **Front Air Deflector Replacement** .
4. Remove the front compartment lower noise shield. Refer to **Front Compartment Lower Noise Shield Replacement (All Wheel Drive)** , **Front Compartment Lower Noise Shield Replacement (Rear Wheel Drive)** .

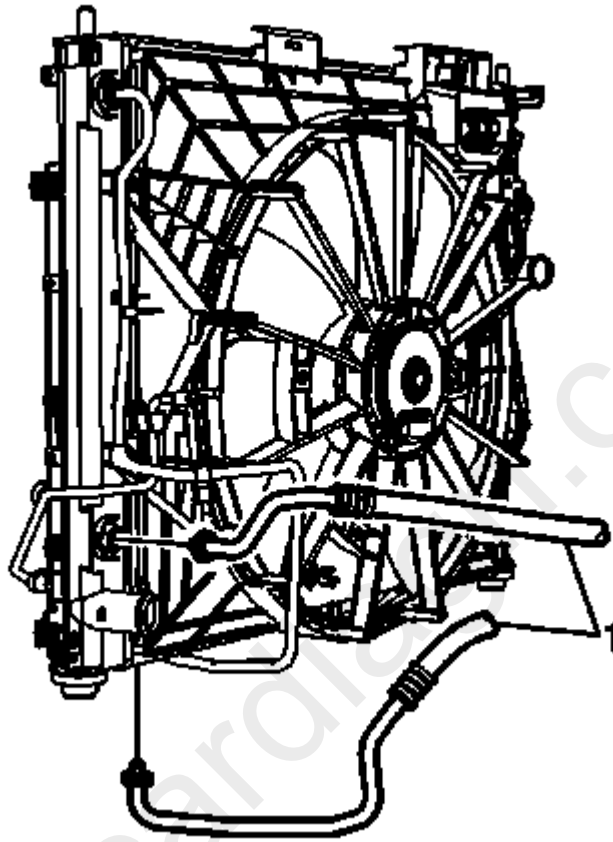


Fig. 31: Identifying Transmission Cooler Lines
Courtesy of GENERAL MOTORS COMPANY

5. Disconnect the transmission cooler lines (1). Refer to **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection.**

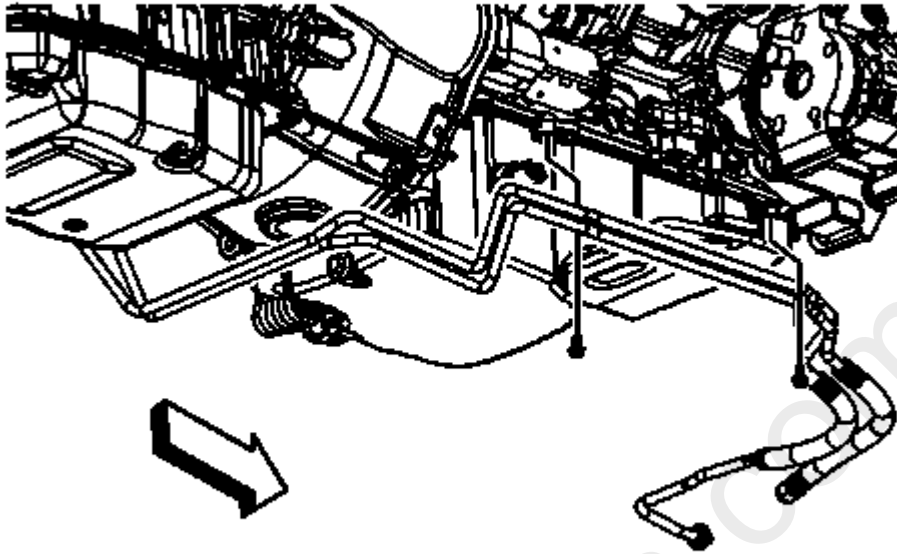


Fig. 32: View Of Transmission Cooler Line Bolts
Courtesy of GENERAL MOTORS COMPANY

6. Remove the transmission cooler line bolts.

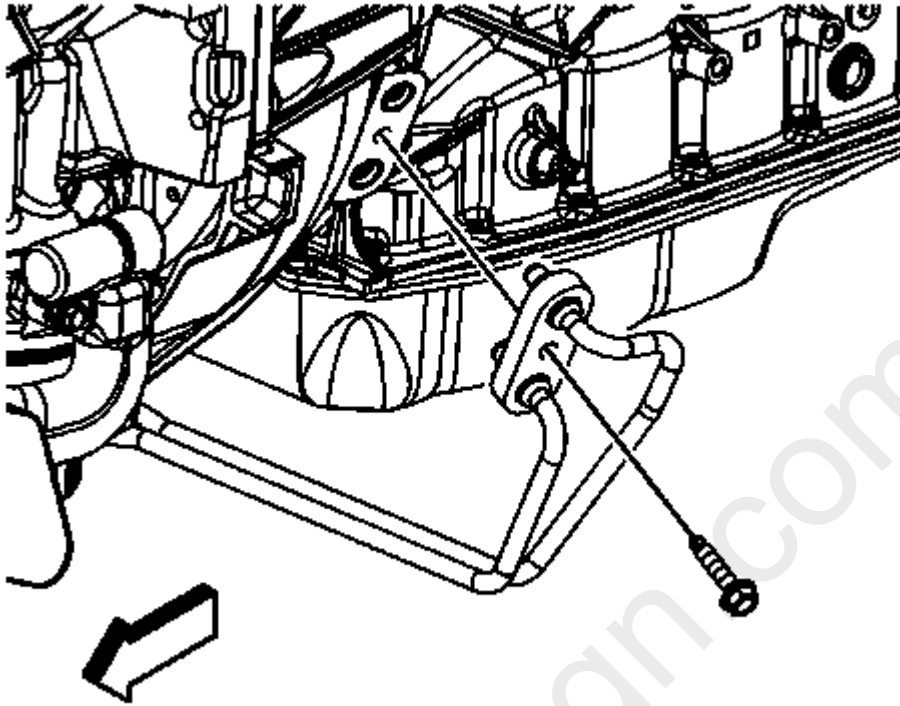


Fig. 33: View Of Transmission Cooler Line Bolt
Courtesy of GENERAL MOTORS COMPANY

7. Remove the transmission cooler lines bolt.
8. Remove the transmission cooler lines from the vehicle.

Installation Procedure

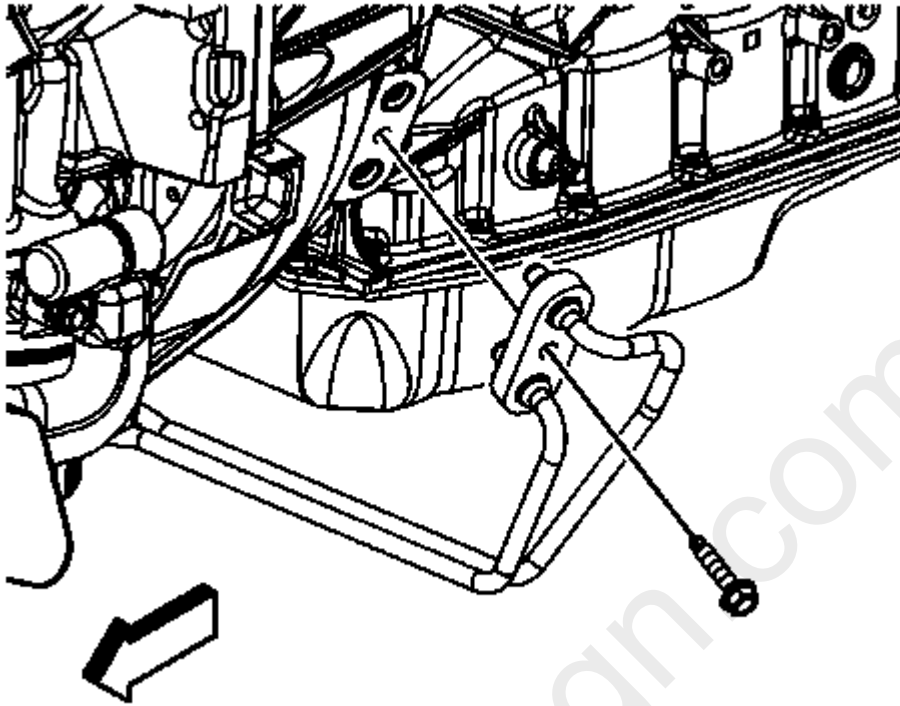


Fig. 34: View Of Transmission Cooler Line Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission cooler lines to the vehicle.

CAUTION: Refer to Fastener Caution .

2. Install the transmission cooler lines bolt and tighten to 22 N.m (16 lb ft).

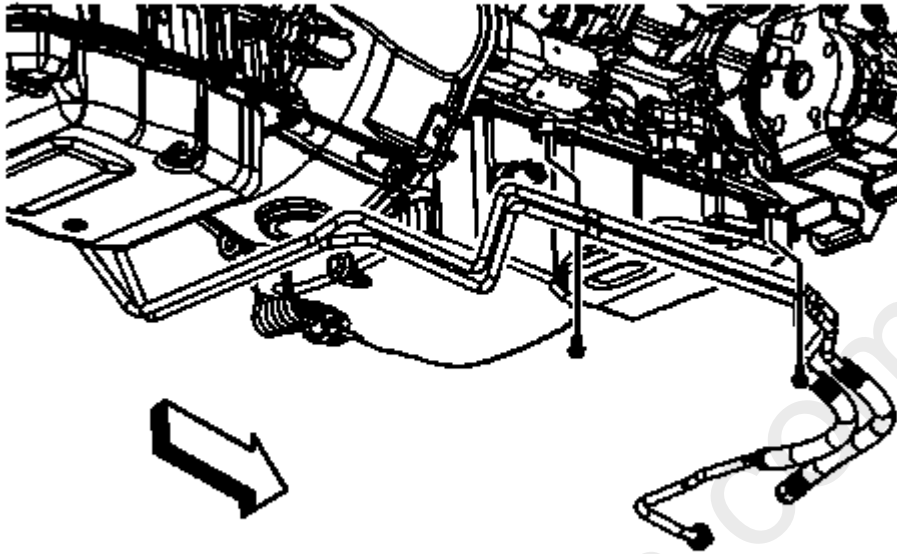


Fig. 35: View Of Transmission Cooler Line Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Install the transmission cooler line bolts.

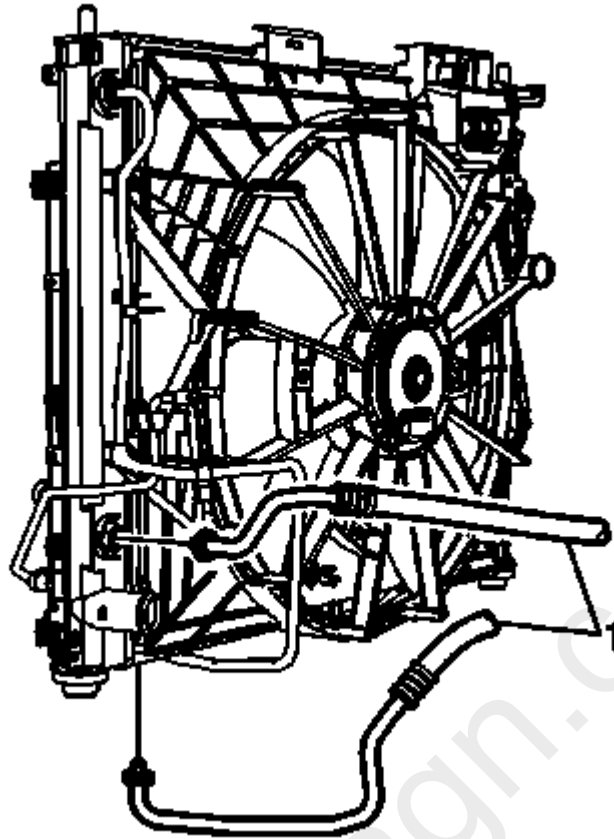


Fig. 36: Identifying Transmission Cooler Lines
Courtesy of GENERAL MOTORS COMPANY

4. Connect the transmission cooler lines (1). Refer to **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**.
5. Install the front compartment lower noise shield. Refer to **Front Compartment Lower Noise Shield Replacement (All Wheel Drive)** , **Front Compartment Lower Noise Shield Replacement (Rear Wheel Drive)** .
6. Install the front air deflector. Refer to **Front Air Deflector Replacement** .
7. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .
8. Install the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .

TRANSMISSION FLUID COOLER HOSE/PIPE REPLACEMENT (WITHOUT VO3 - EXTRA CAPACITY COOLING)

Removal Procedure

1. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Remove the front air deflector. Refer to **Front Air Deflector Replacement** .

4. Remove the front compartment lower noise shield. Refer to **Front Compartment Lower Noise Shield Replacement (All Wheel Drive)** , **Front Compartment Lower Noise Shield Replacement (Rear Wheel Drive)** .
5. Remove the left lower engine mount bolts and raise the engine slightly. Refer to **Engine Mount Replacement - Left Side (RWD)** , **Engine Mount Replacement - Left Side (AWD)** .
6. Disconnect the intermediate steering shaft from the steering gear. Refer to **Lower Intermediate Steering Shaft Replacement** .
7. Remove the Air Conditioning Compressor. Refer to **Air Conditioning Compressor Replacement (LSA)** , **Air Conditioning Compressor Replacement (LFW LFX)** .

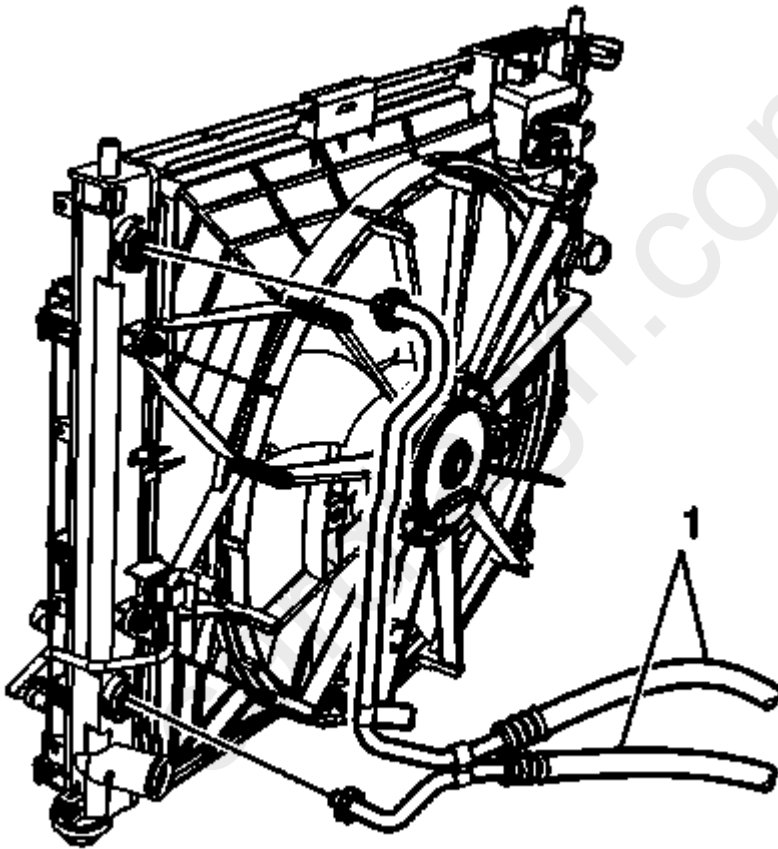


Fig. 37: Transmission Cooler Lines
Courtesy of GENERAL MOTORS COMPANY

8. Disconnect the transmission cooler lines (1). Refer to **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection.**

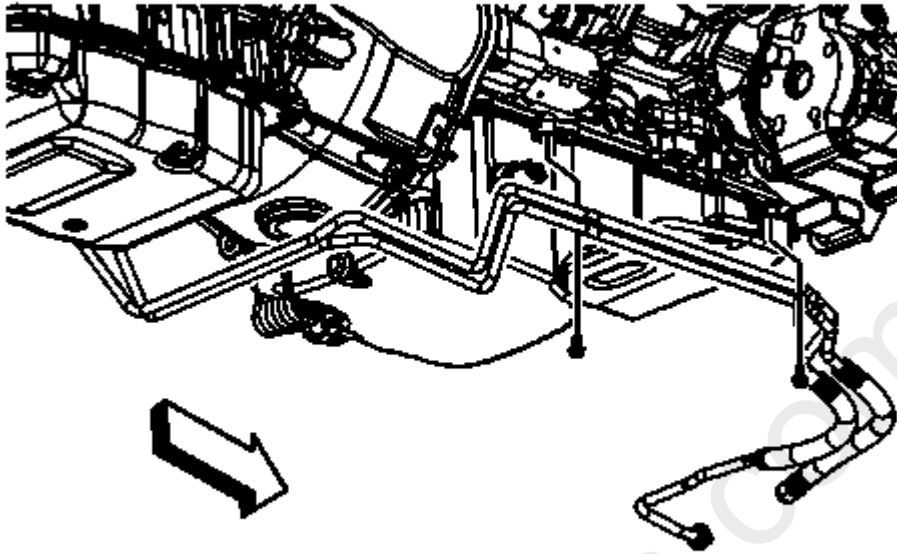


Fig. 38: View Of Transmission Cooler Line Bolts
Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission cooler line bolts.

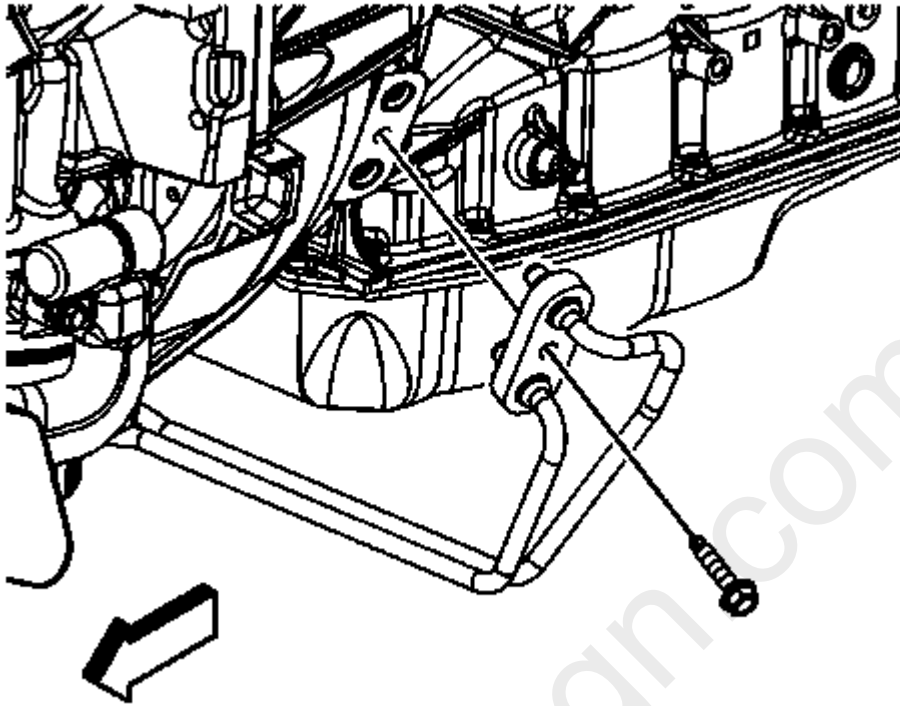


Fig. 39: View Of Transmission Cooler Line Bolt
Courtesy of GENERAL MOTORS COMPANY

10. Remove the transmission cooler lines bolt.
11. Remove the transmission cooler lines from the vehicle.

Installation Procedure

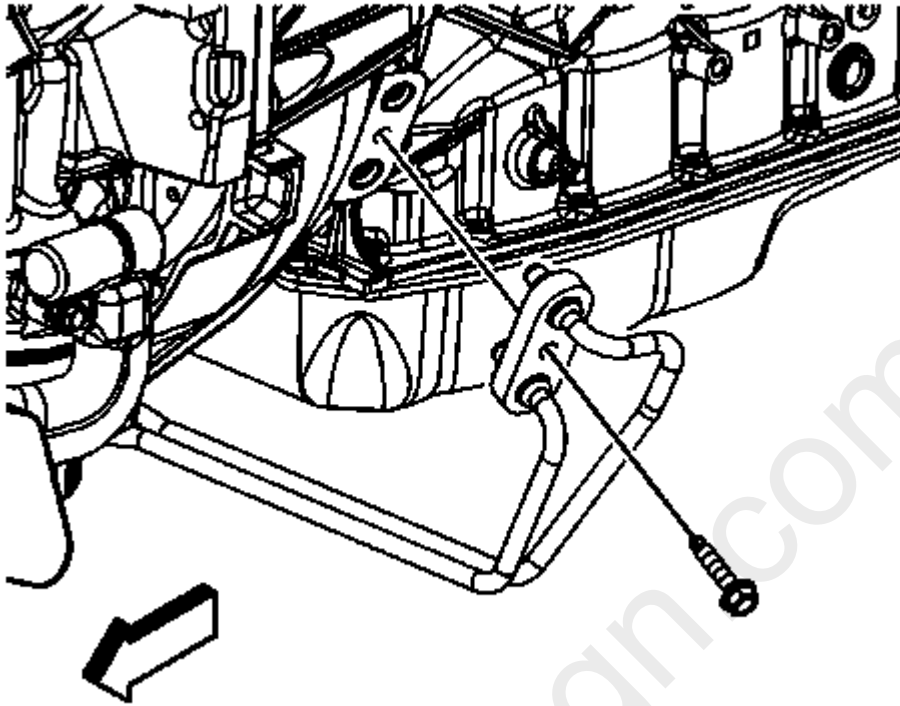


Fig. 40: View Of Transmission Cooler Line Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission cooler lines to the vehicle.

CAUTION: Refer to Fastener Caution .

2. Install the transmission cooler lines bolt and tighten to 22 N.m (16 lb ft).

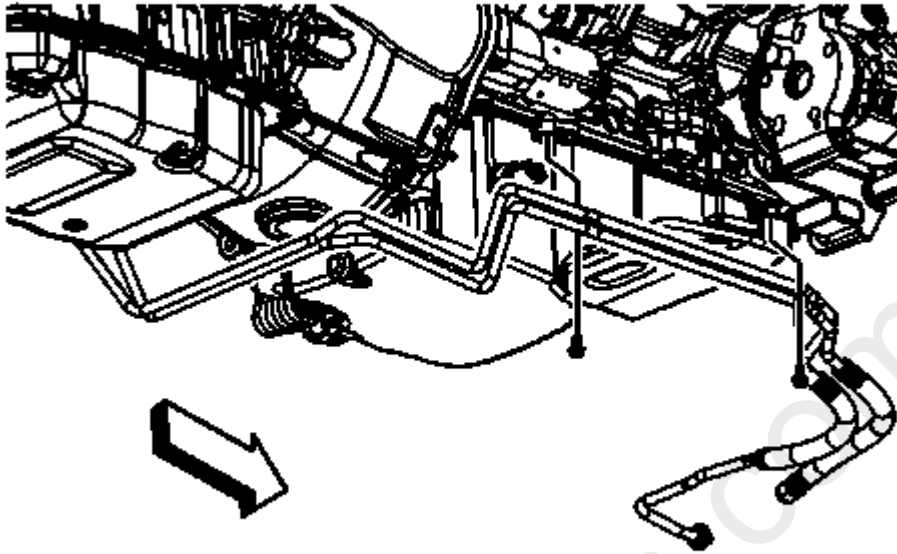


Fig. 41: View Of Transmission Cooler Line Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Install the transmission cooler line bolts.

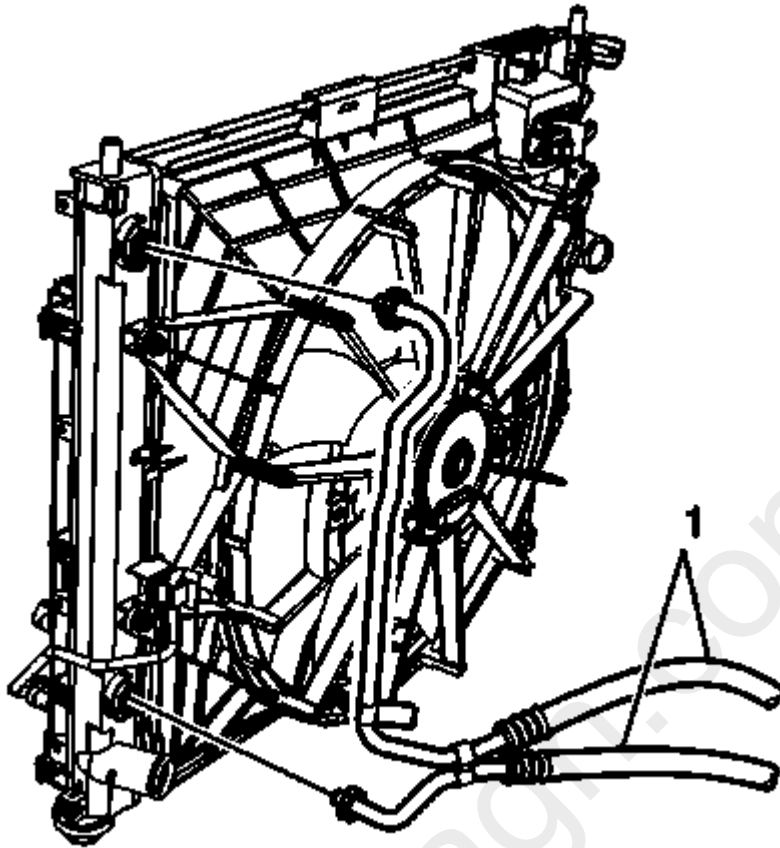


Fig. 42: Transmission Cooler Lines
Courtesy of GENERAL MOTORS COMPANY

4. Connect the transmission cooler lines (1). Refer to **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**.
5. Install the Air Conditioning Compressor. Refer to **Air Conditioning Compressor Replacement (LSA)** , **Air Conditioning Compressor Replacement (LFW LFX)** .
6. Connect the intermediate steering shaft to the steering gear. Refer to **Lower Intermediate Steering Shaft Replacement** .
7. Install the left lower engine mount bolts. Refer to **Engine Mount Replacement - Left Side (RWD)** , **Engine Mount Replacement - Left Side (AWD)** .
8. Install the front compartment lower noise shield. Refer to **Front Compartment Lower Noise Shield Replacement (All Wheel Drive)** , **Front Compartment Lower Noise Shield Replacement (Rear Wheel Drive)** .
9. Install the front air deflector. Refer to **Front Air Deflector Replacement** .
10. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .
11. Install the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .