

2017 TRANSMISSION
Transmission Cooling - Impala

SPECIFICATIONS

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

NOTE: <i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i>	
Application	
Transmission Fluid Cooler Pipe Fitting Retainer	
Transmission Fluid Cooler Pipe Fitting Seal	

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Transmission Fluid Cooler Pipe Connector	24 N.m (18 lb ft)
Transmission Fluid Cooler Pipe Nut	22 N.m (16 lb ft)

DIAGNOSTIC INFORMATION AND PROCEDURES

TRANSMISSION FLUID COOLER FLOW TEST AND FLUSHING

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 DT-45096 transmission oil cooling system flush and flow test tool to flush and flow test the transmission oil cooler and the oil cooler pipes after the transmission is removed for repairs.

Only use the appropriate GM automatic transmission fluid when doing a repair on a GM transmission.

If the fluid in the **DT-45096** transmission oil cooling system flush and flow test tool is different than what is used in the transmission, after performing the flush and flow test, use compressed air to blow the residual transmission fluid out of the oil cooler and lines.

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-45096-50** Transmission Cooler Flush Adapter
- Shop air supply with water/oil filters, regulator and pressure gauge - minimum 90 psi
- Eye protection
- Rubber gloves

Machine Set-up

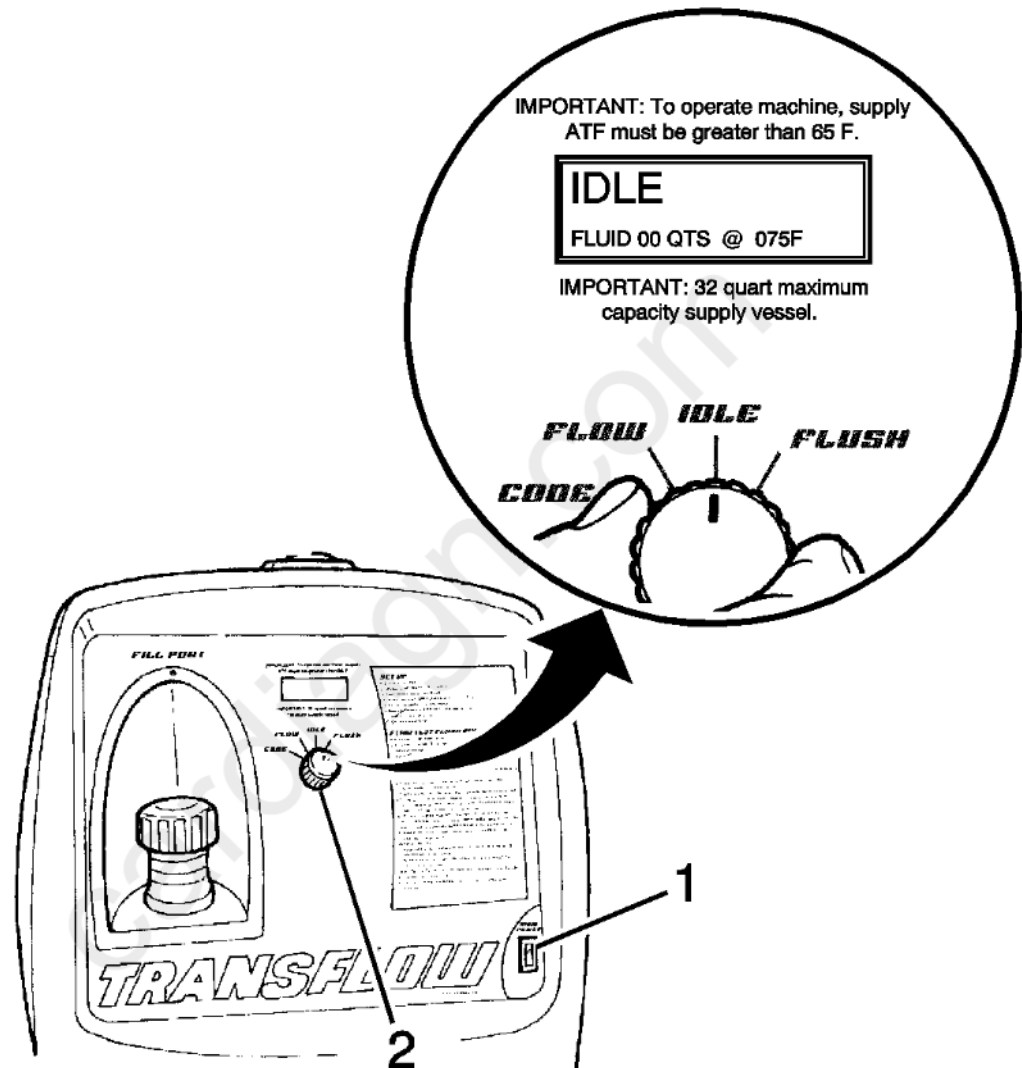


Fig. 1: Main Power Switch And Main Function Switch

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.

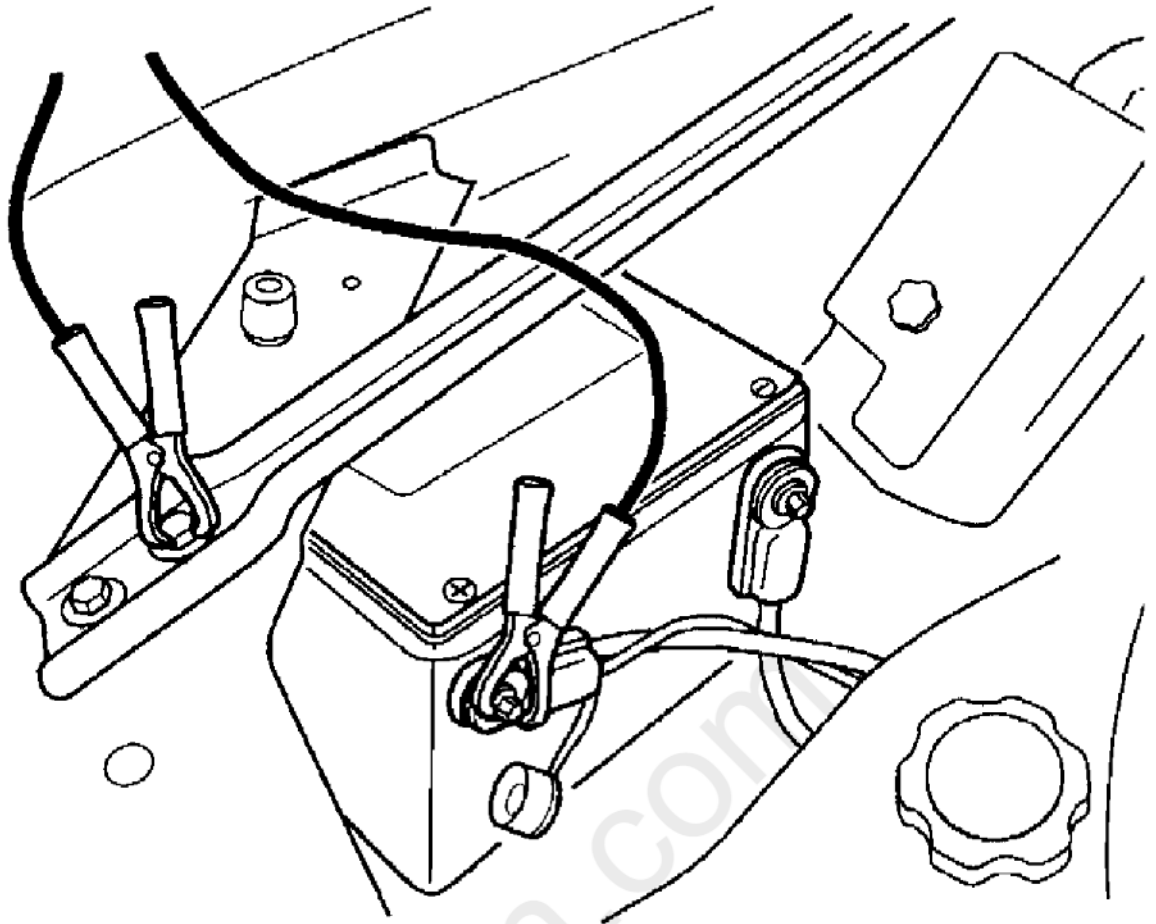


Fig. 2: Connecting Flush And Flow Test Tool To 12V DC Power Source
Courtesy of GENERAL MOTORS COMPANY

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.

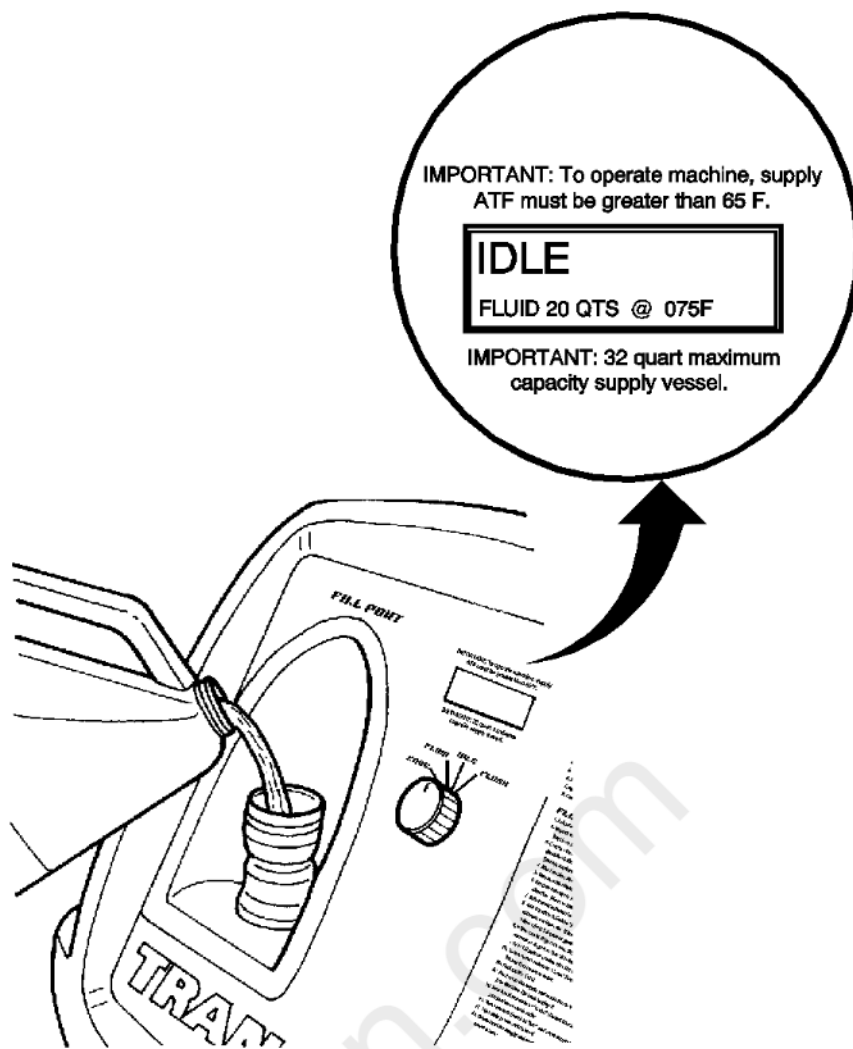


Fig. 3: Filling Supply Tank With Transmission Fluid

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 the appropriate GM automatic transmission fluid through the fill port.
6. Reinstall and tighten the fill cap.

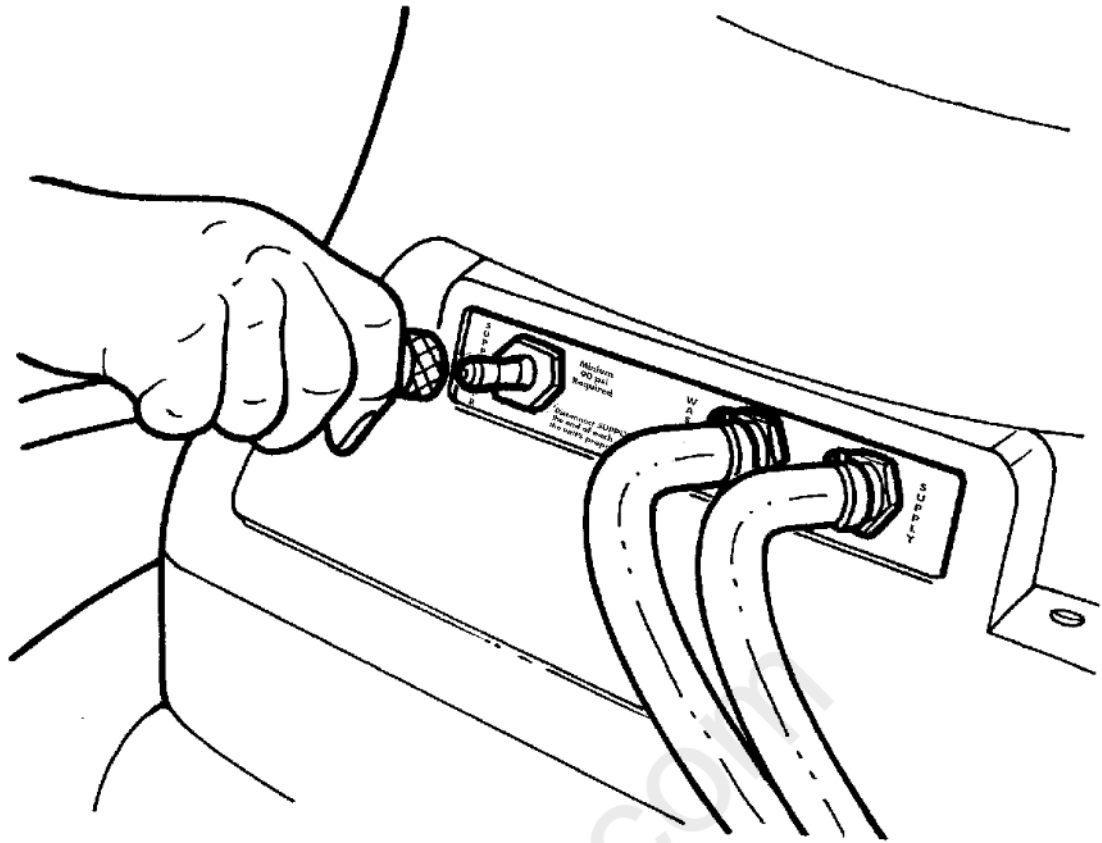


Fig. 4: Shop Air Supply Hose And Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

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

Determine Minimum Flow Rate

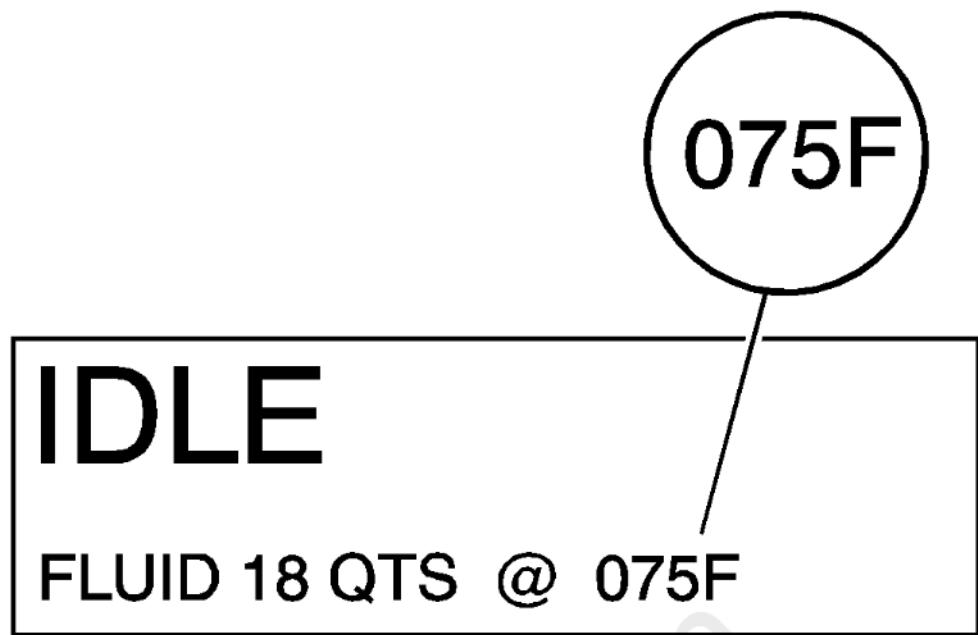


Fig. 5: Machine Display Of Automatic Transmission Fluid Temperature

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.

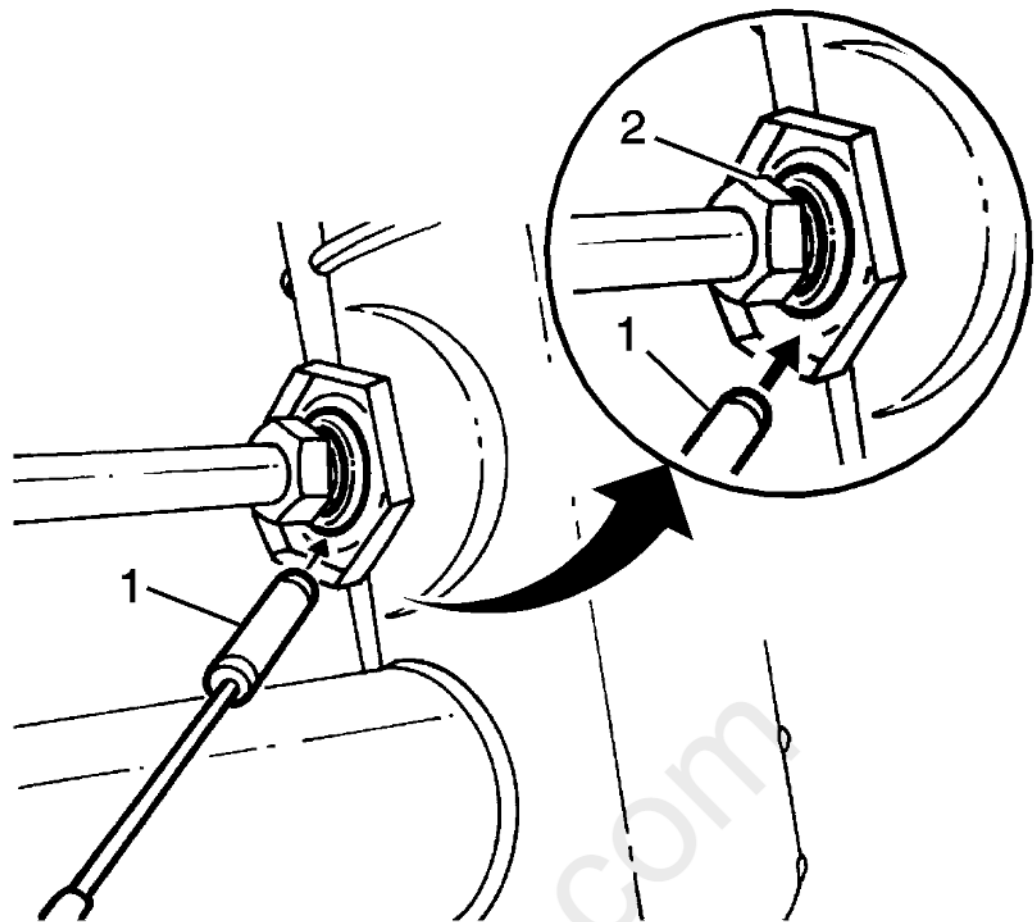


Fig. 6: Determining Transmission Oil Cooler Metal Composition

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

Temperature Range	Steel	Aluminum
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

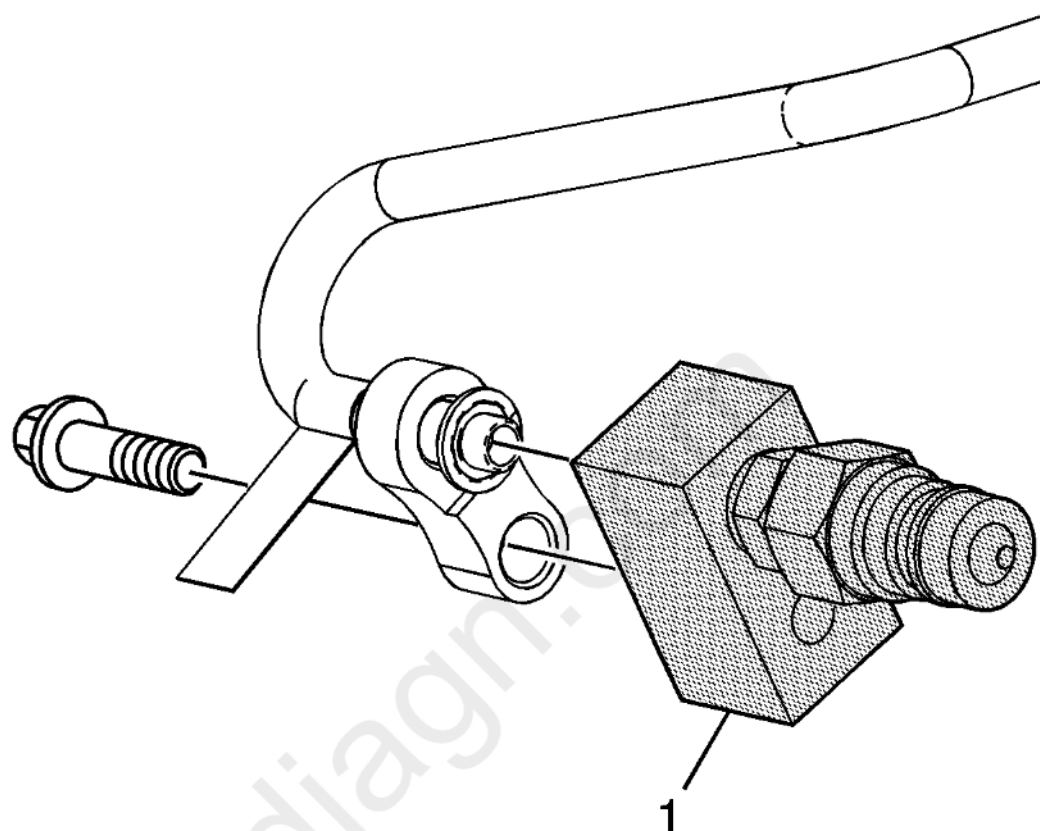


Fig. 7: Cooler Flush Adapter

Courtesy of GENERAL MOTORS COMPANY

1. Connect the **DT-45096-50** cooler flush adapter (1) to the vehicle transmission oil cooler supply and return lines at the transmission.

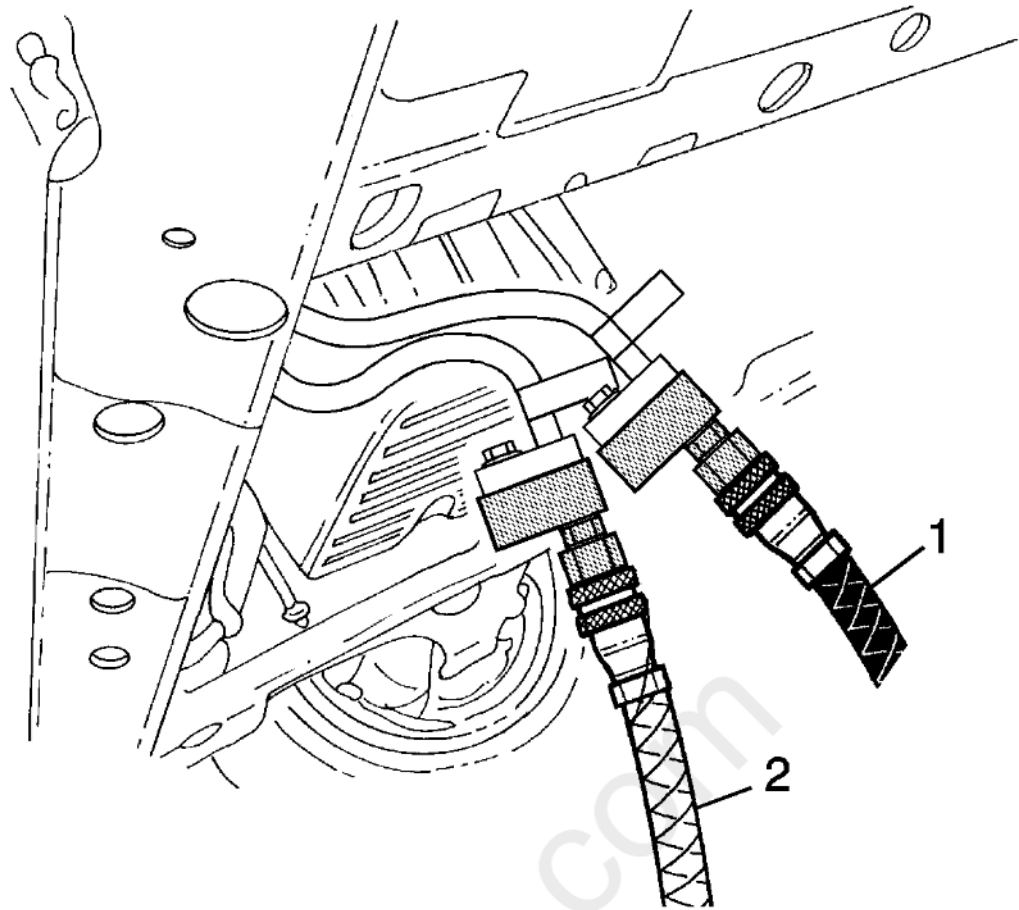


Fig. 8: Black Supply Hose And Clear Waste Hose
Courtesy of GENERAL MOTORS COMPANY

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

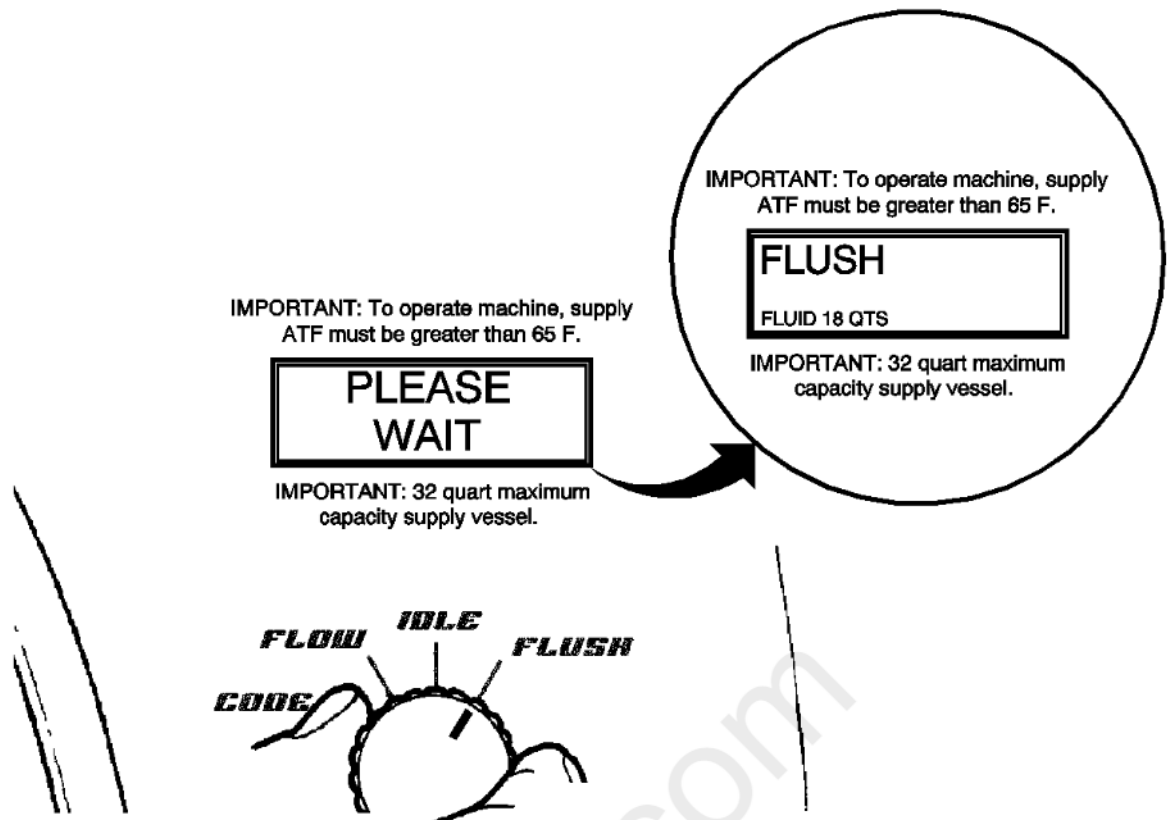


Fig. 9: Main Function Switch To FLUSH Position

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: Main Function Switch To 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

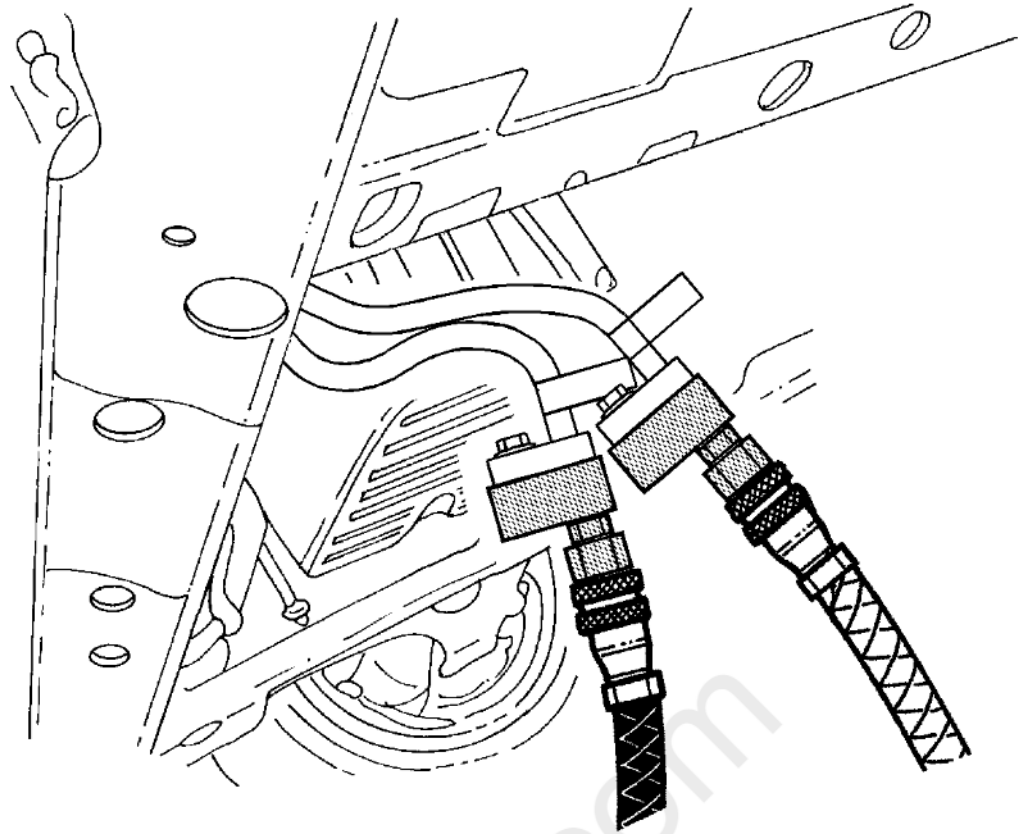


Fig. 11: Supply And Waste Hoses

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.

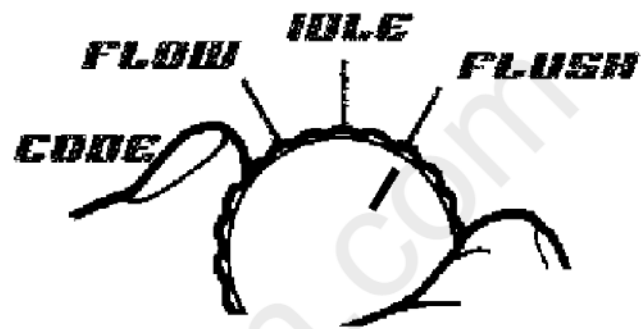


Fig. 12: Main Function Switch To FLUSH Position

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

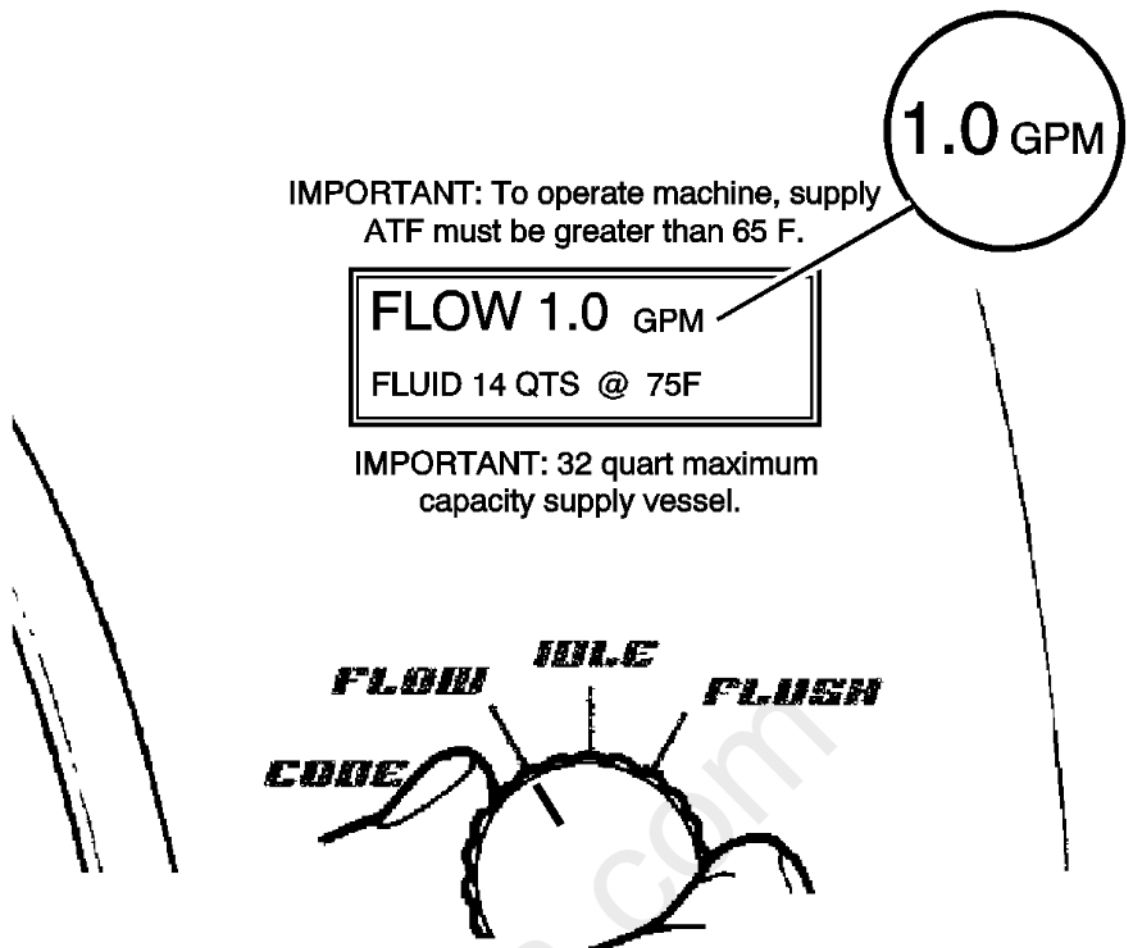


Fig. 13: Main Function Switch To FLOW Position

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: Main Function Switch To 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

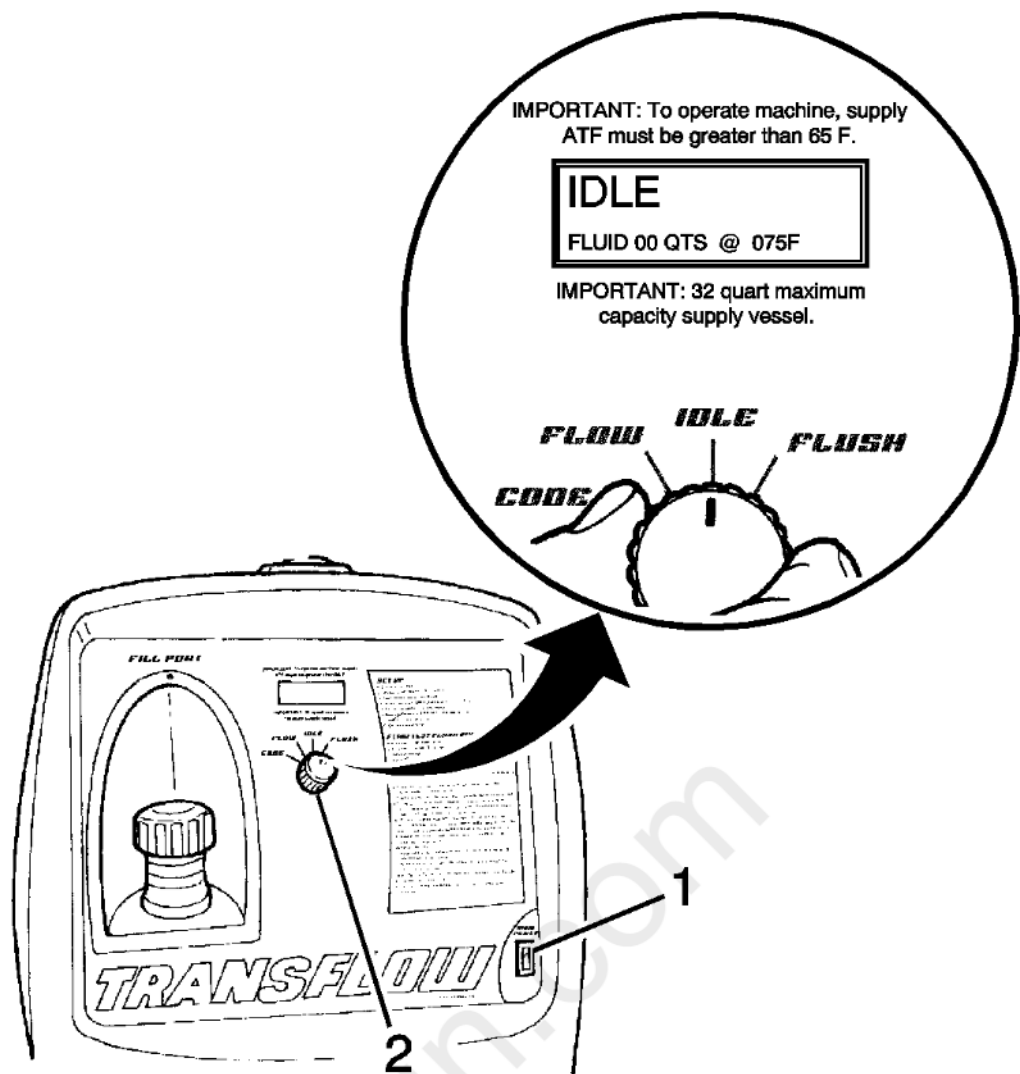


Fig. 15: Main Power Switch And Main Function Switch

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.
- If the fluid in the DT-45096 transmission oil cooling system flush and flow test tool is different than what is used in the transmission, use compressed air to blow the residual transmission fluid out of the oil cooler and lines.

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

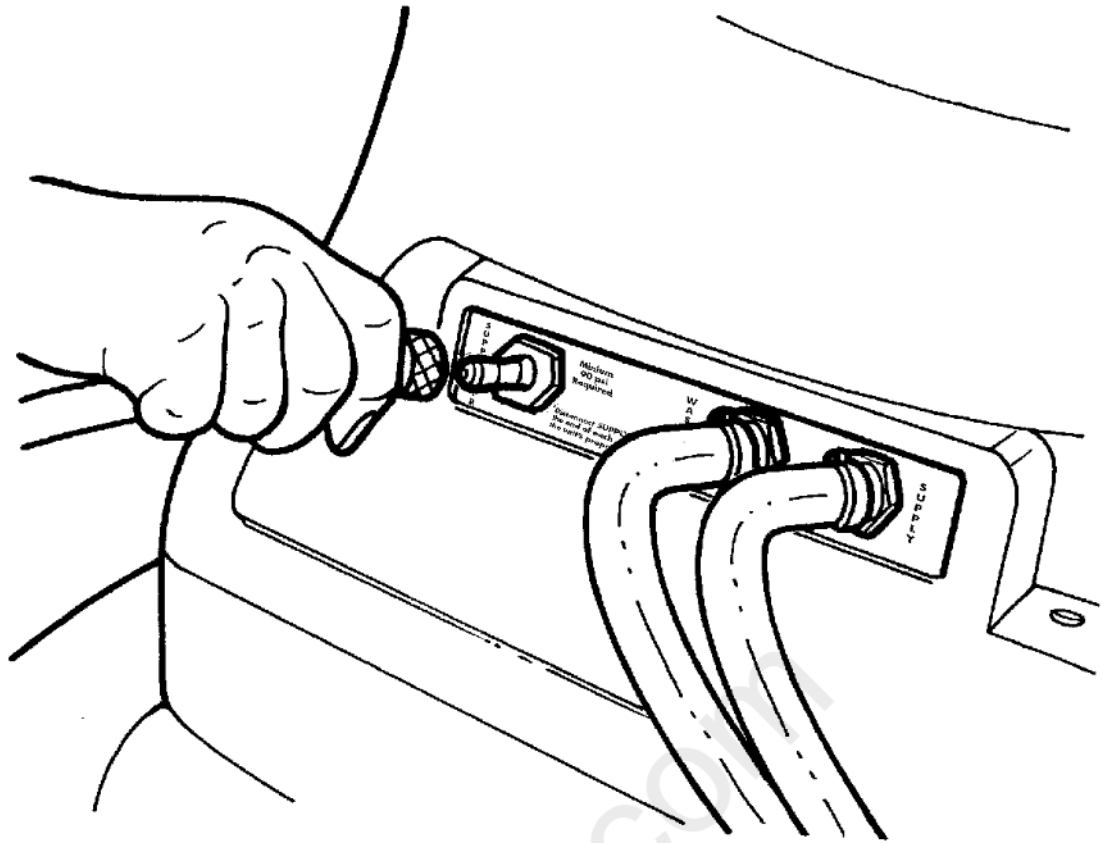


Fig. 16: Shop Air Supply Hose And Quick-Disconnect
 Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the air supply hose from **DT-45096** flush and flow test tool.
5. Remove the **DT-45096 - 50** adapters.
6. Dispose of the waste automatic transmission fluid in accordance with all applicable federal, state, and local requirements.

TRANSMISSION FLUID COOLER FLOW TEST AND FLUSHING (6T40/6T45)

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 **DT-45096** transmission oil cooling system flush and flow test tool to flush and flow test the transmission oil cooler and the oil cooler pipes after the transmission is removed for repairs.

Only use the appropriate GM automatic transmission fluid when doing a repair on a GM transmission.

If the fluid in the **DT-45096** transmission oil cooling system flush and flow test tool is different than what is used in the transmission, after performing the flush and flow test, use compressed air to blow the residual transmission fluid out of the oil cooler and lines.

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:

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1. Machine Set-up
2. Determine Minimum Flow Rate
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6. Code Recording Procedure
7. Clean-up

Special Tools

- **DT-45096** Transmission Oil Cooling System Flush and Flow Test Tool
- **DT-45096-50** Transmission Cooler Flush Adapter
- Shop air supply with water/oil filters, regulator and pressure gauge - minimum 90 psi
- Eye protection
- Rubber gloves

Machine Set-up

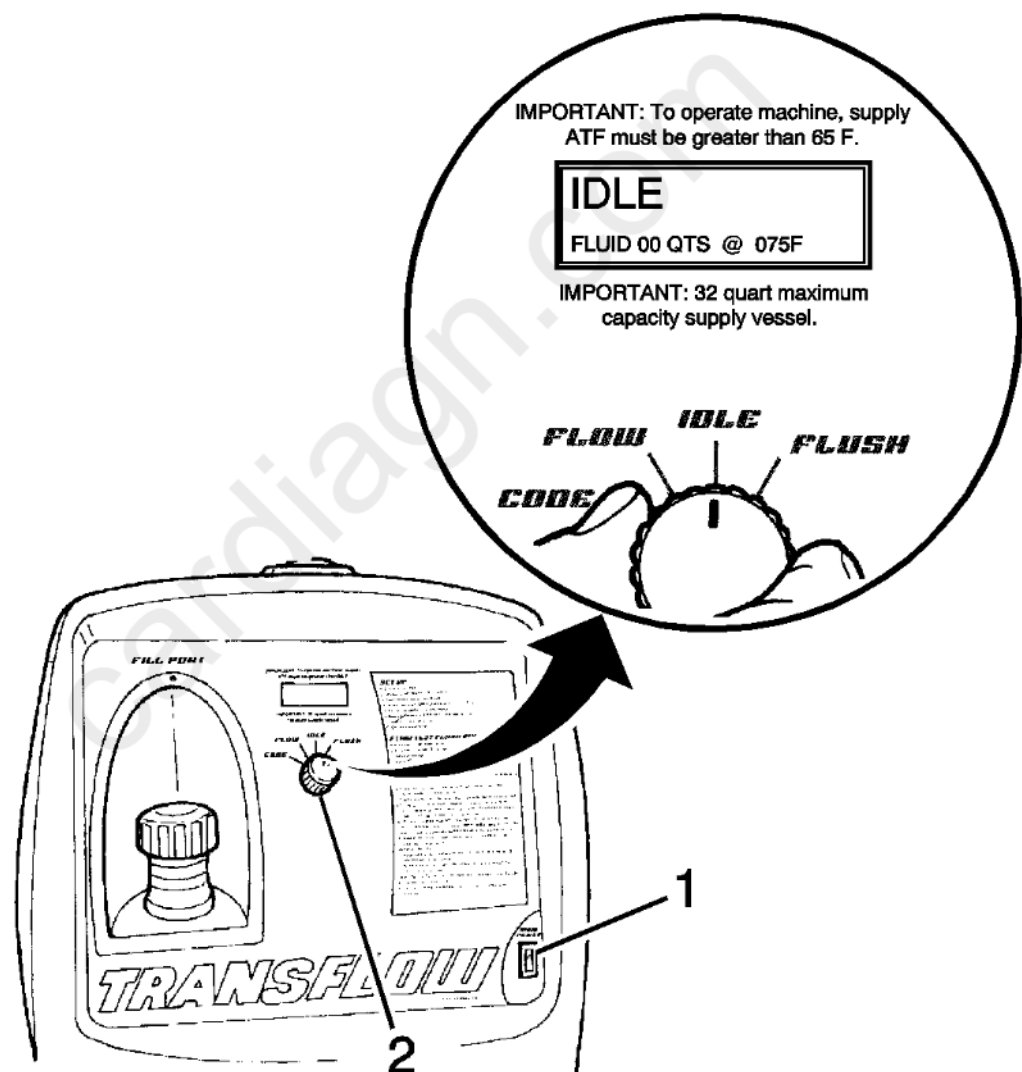


Fig. 17: Main Power Switch And Main Function Switch

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.

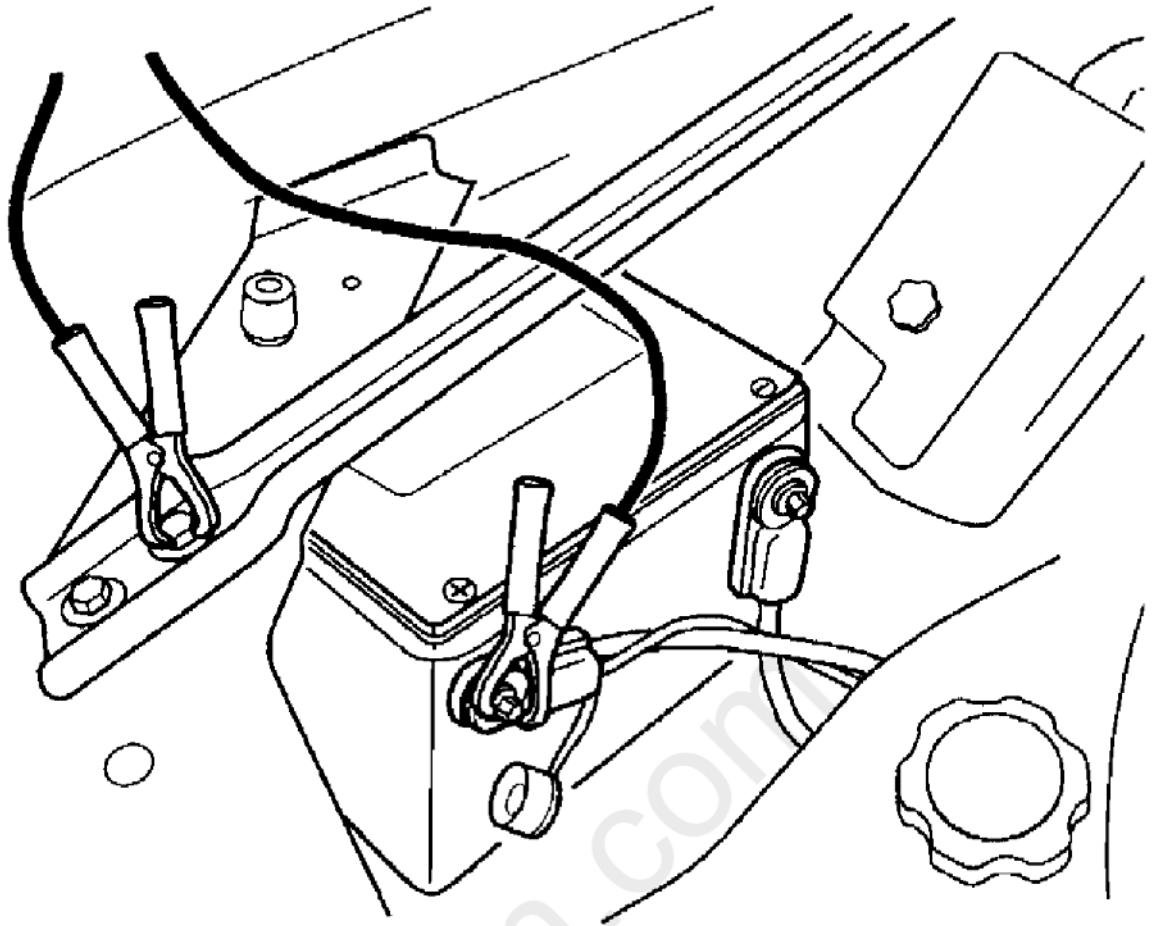


Fig. 18: Connecting Flush And Flow Test Tool To 12V DC Power Source
Courtesy of GENERAL MOTORS COMPANY

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.

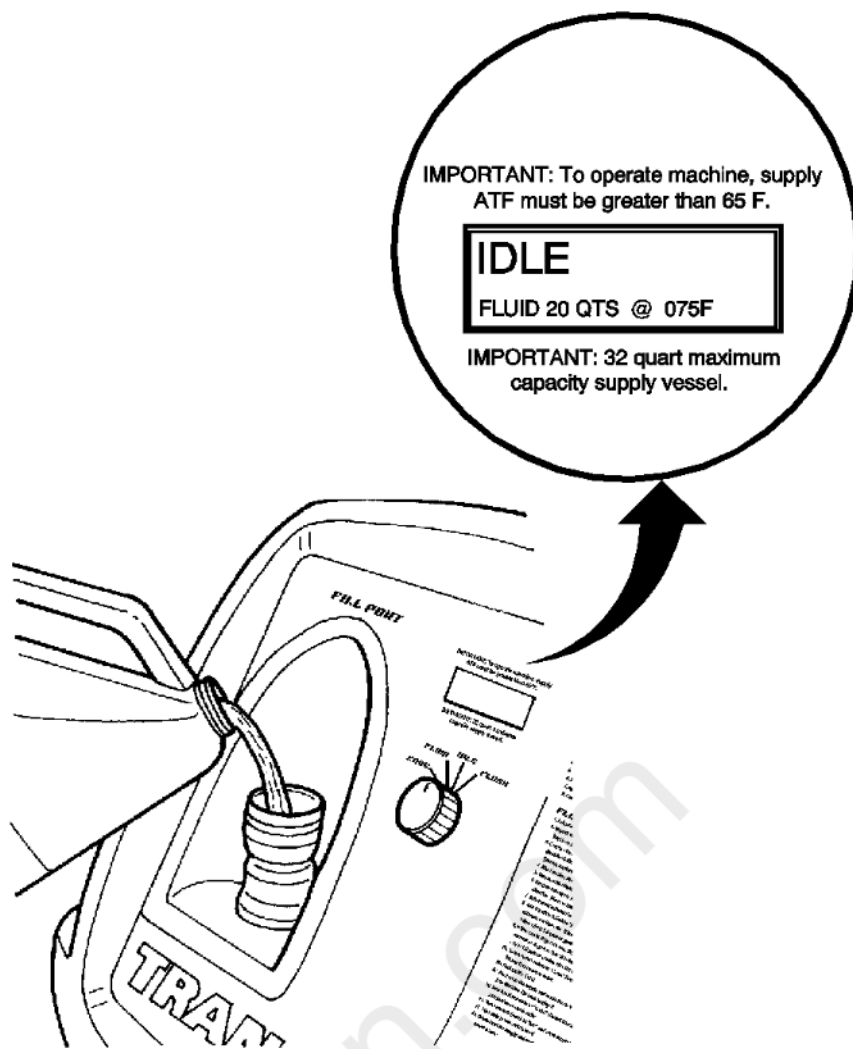


Fig. 19: Filling Supply Tank With Transmission Fluid
 Courtesy of GENERAL MOTORS COMPANY

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 the appropriate GM automatic transmission fluid through the fill port.
6. Reinstall and tighten the fill cap.

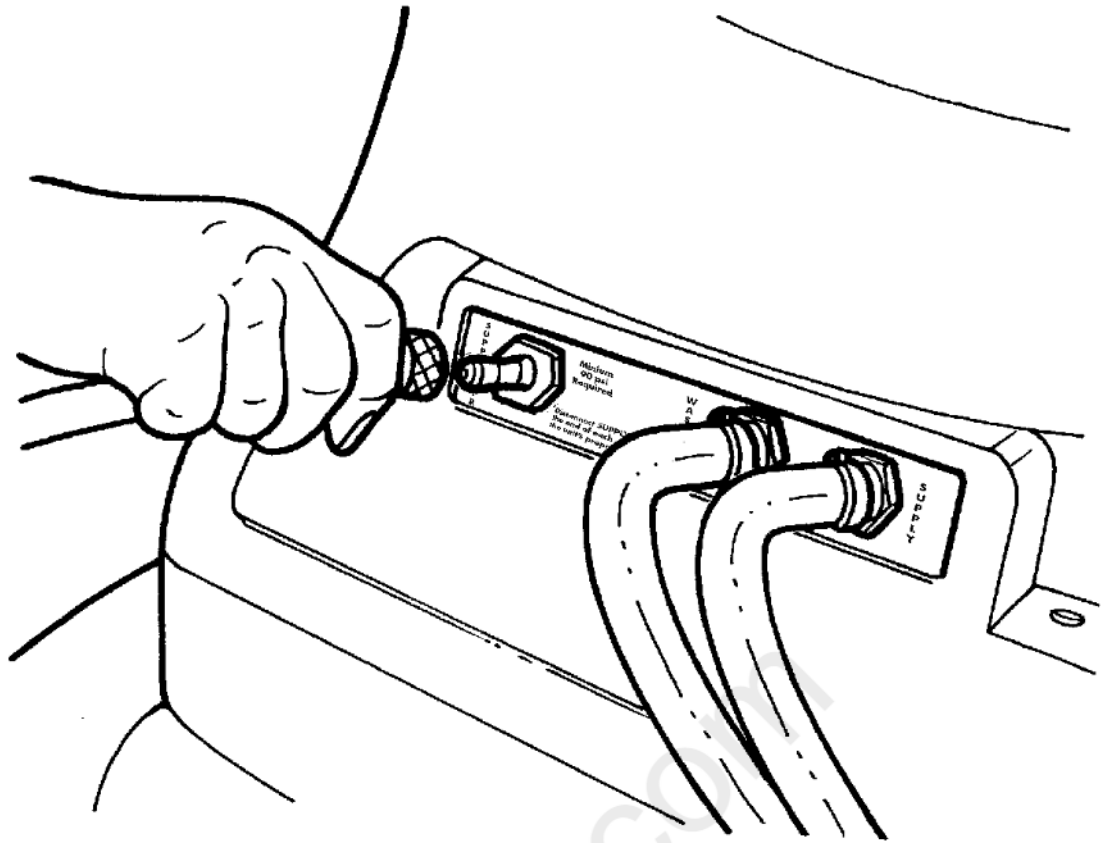


Fig. 20: Shop Air Supply Hose And Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

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

Determine Minimum Flow Rate

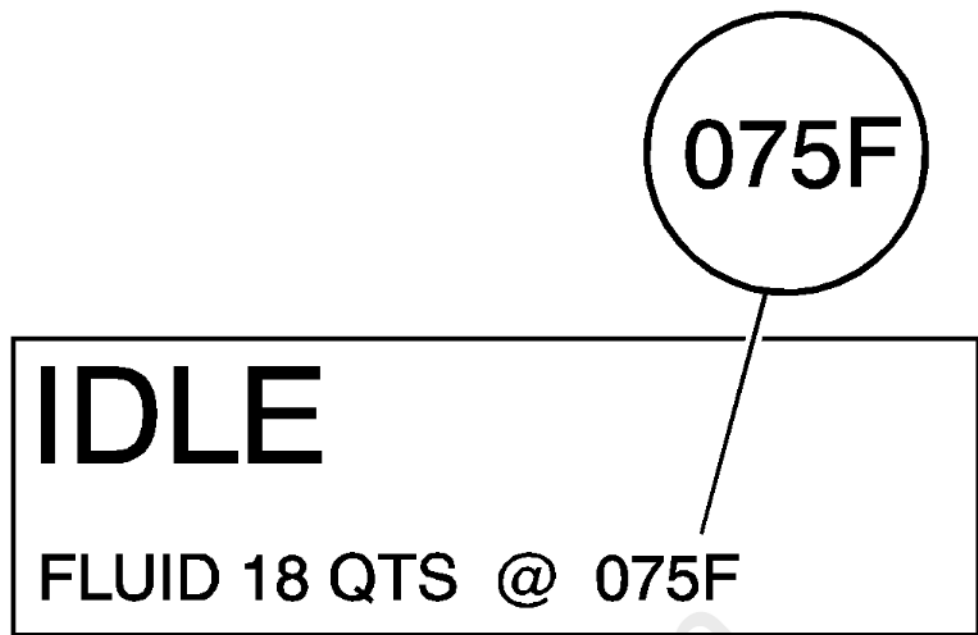


Fig. 21: Machine Display Of Automatic Transmission Fluid Temperature

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.

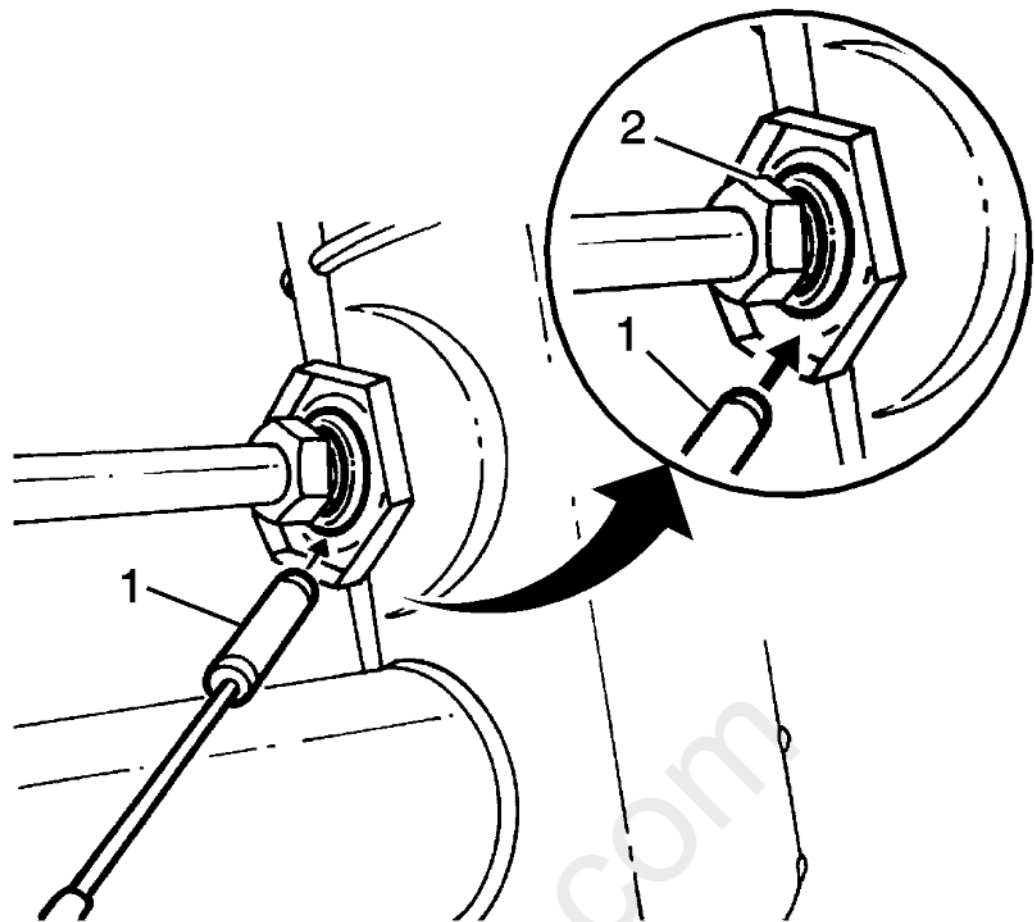


Fig. 22: Determining Transmission Oil Cooler Metal Composition
Courtesy of GENERAL MOTORS COMPANY

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

Temperature Range	Steel	Aluminum
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

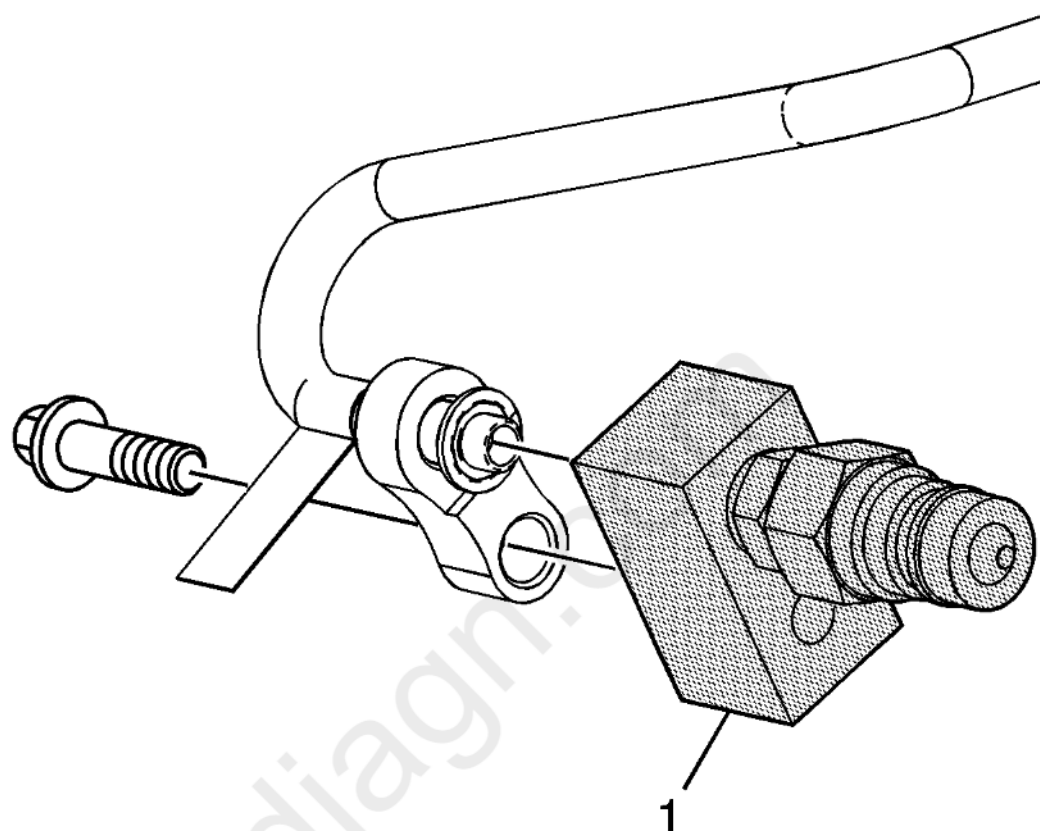


Fig. 23: Cooler Flush Adapter

Courtesy of GENERAL MOTORS COMPANY

1. Connect the **DT-45096-50** cooler flush adapter (1) to the vehicle transmission oil cooler supply and return lines at the transmission.

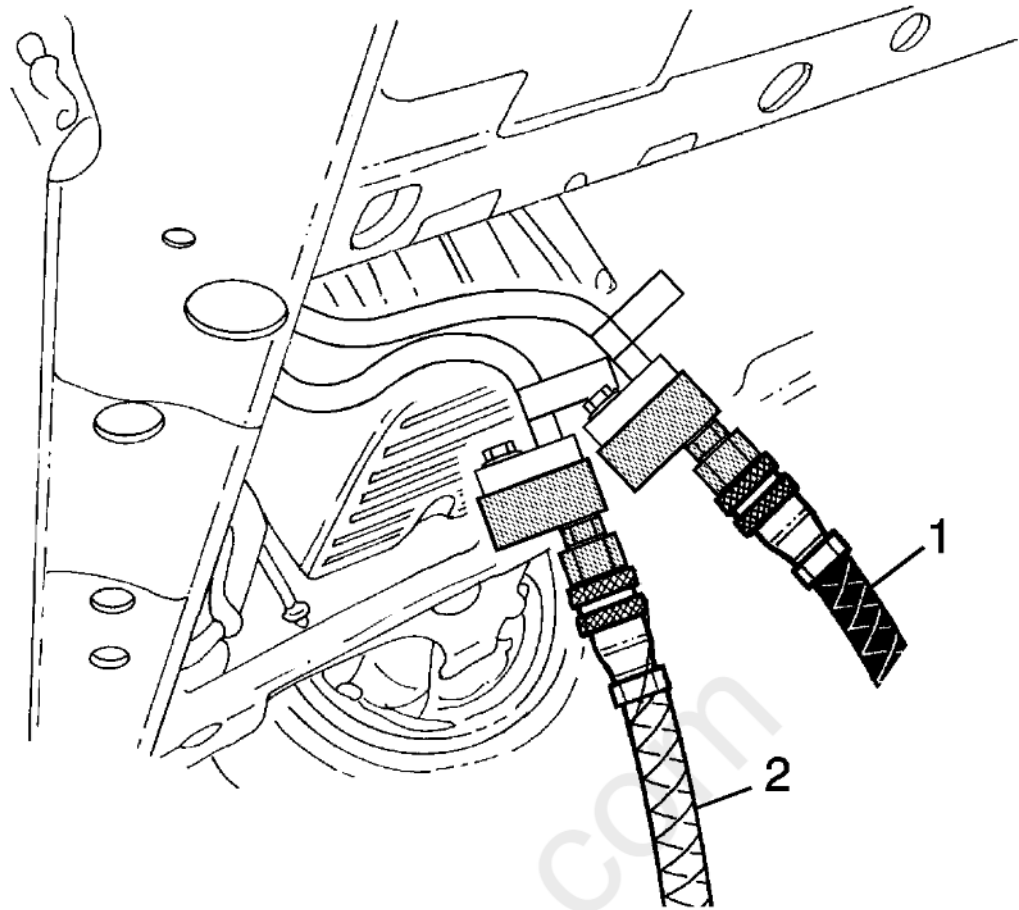


Fig. 24: Black Supply Hose And Clear Waste Hose

Courtesy of GENERAL MOTORS COMPANY

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

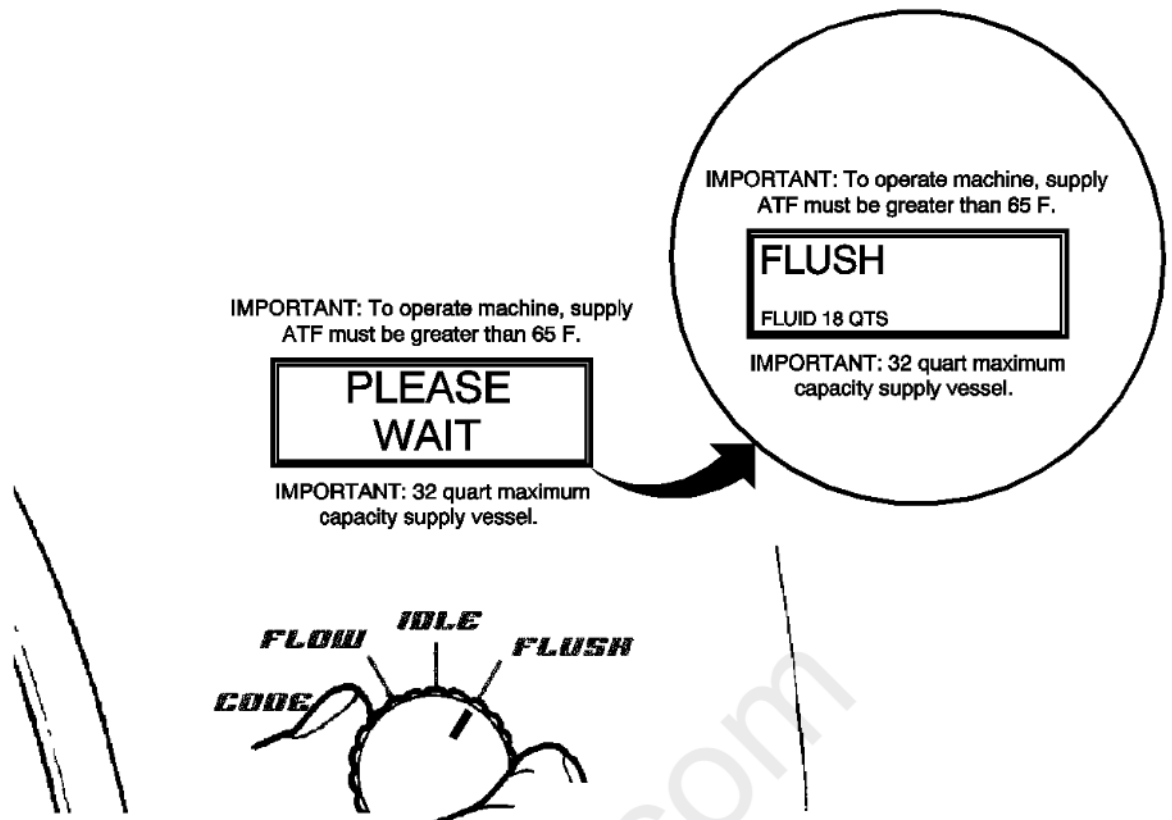


Fig. 25: Main Function Switch To FLUSH Position

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. 26: Main Function Switch To 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

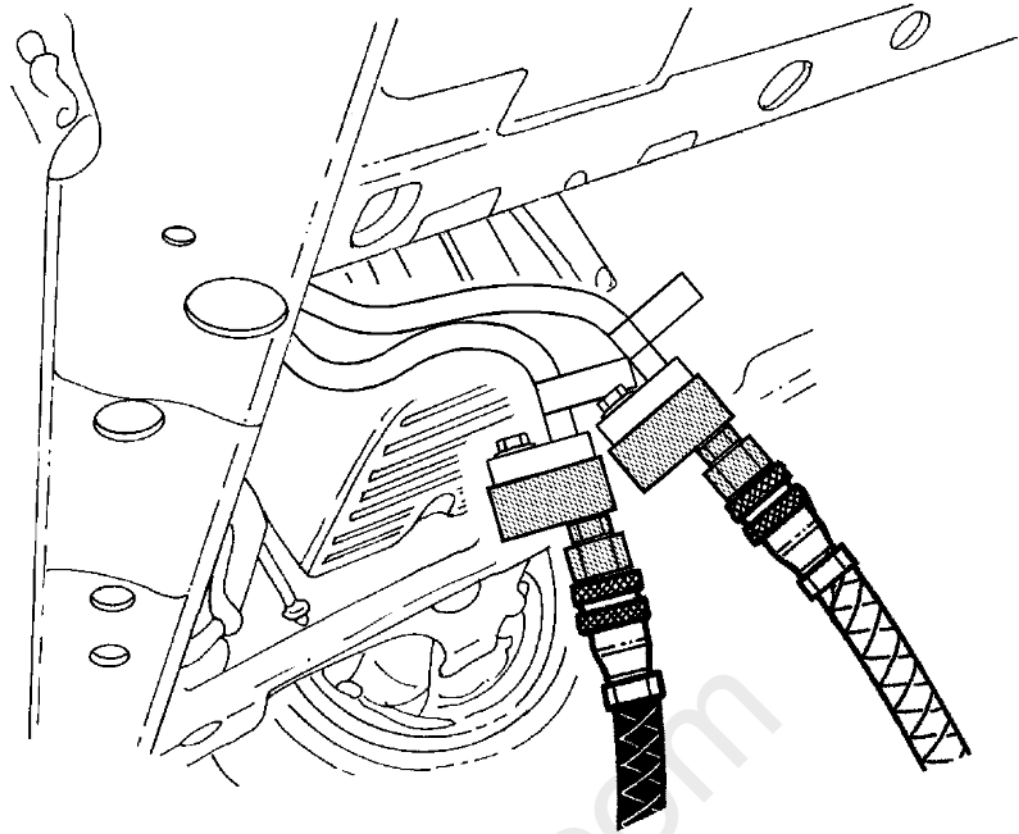


Fig. 27: Supply And Waste Hoses

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.

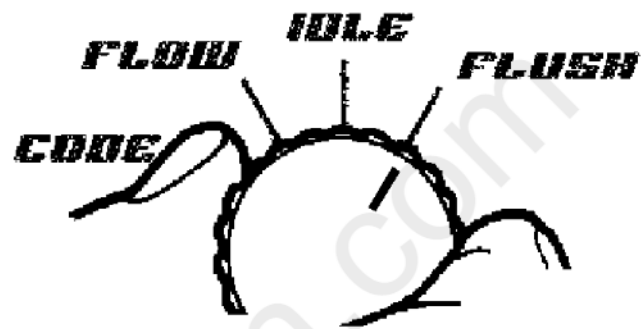


Fig. 28: Main Function Switch To FLUSH Position

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

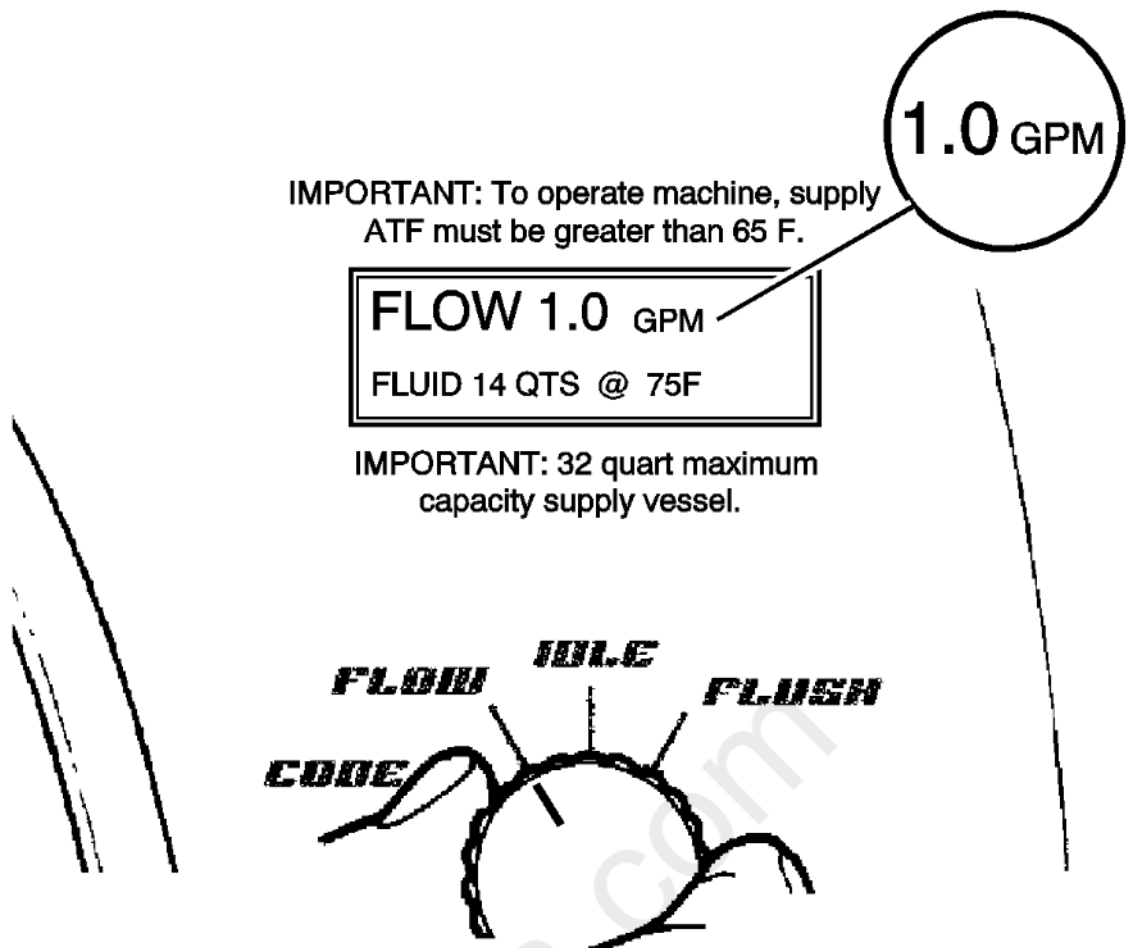


Fig. 29: Main Function Switch To FLOW Position

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. 30: Main Function Switch To 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

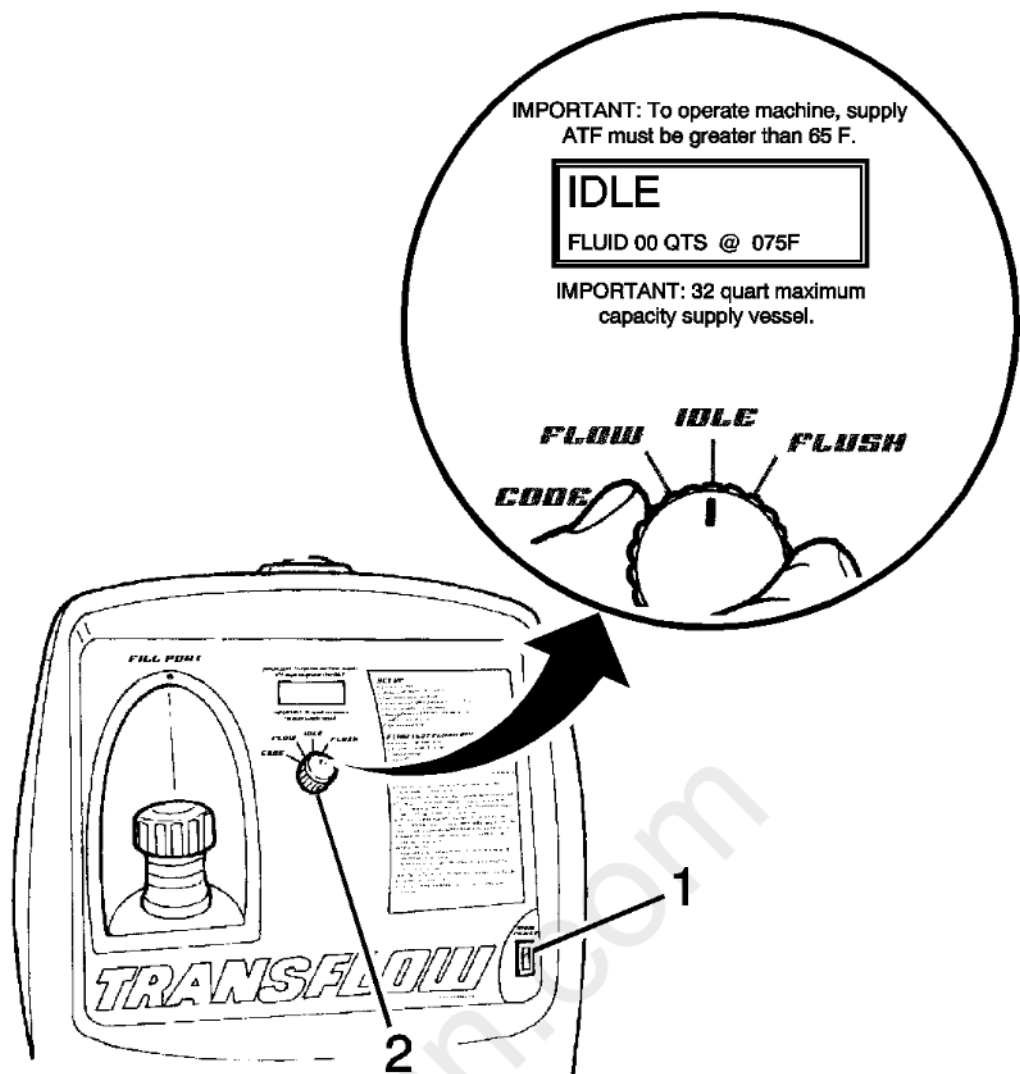


Fig. 31: Main Power Switch And Main Function Switch

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.
- If the fluid in the DT-45096 transmission oil cooling system flush and flow test tool is different than what is used in the transmission, use compressed air to blow the residual transmission fluid out of the oil cooler and lines.

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

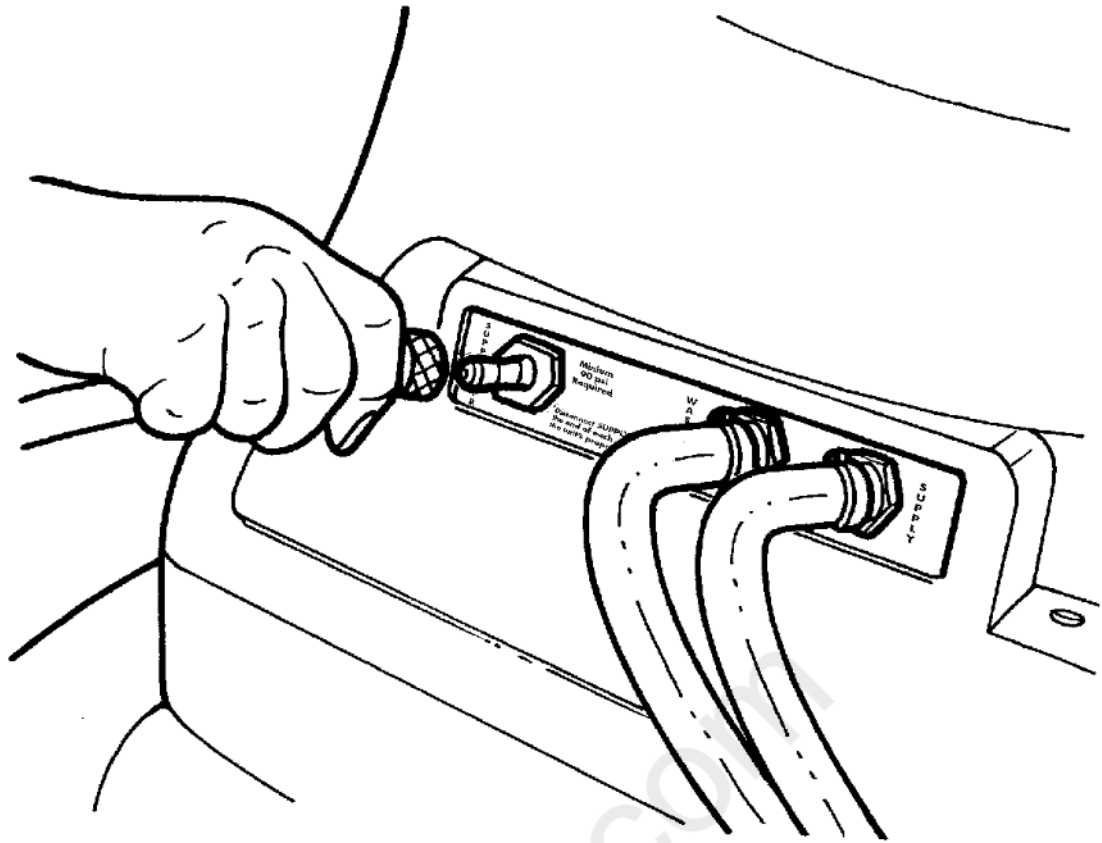


Fig. 32: Shop Air Supply Hose And Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the air supply hose from **DT-45096** flush and flow test tool.
5. Remove the **DT-45096 - 50** adapters.
6. Dispose of the waste automatic transmission fluid in accordance with all applicable federal, state, and local requirements.

REPAIR INSTRUCTIONS

TRANSMISSION FLUID COOLER PIPE CONNECTOR REPLACEMENT - RADIATOR

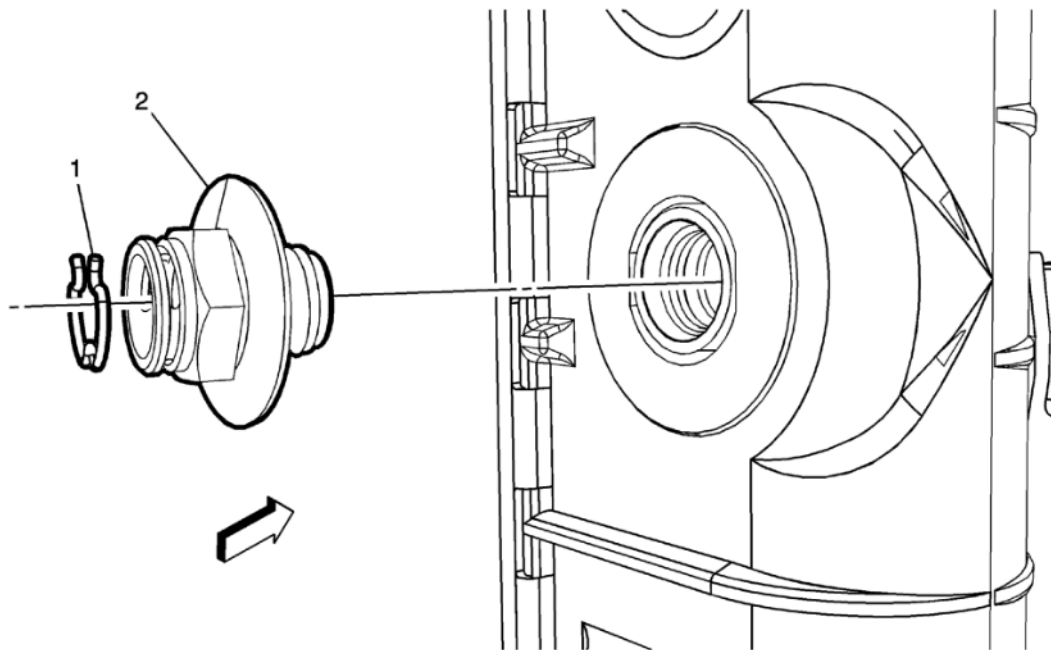


Fig. 33: Transmission Fluid Cooler Pipe Connector - Radiator

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Drain the cooling system. Refer to Cooling System Draining and Filling (Vacuum and Fill) Cooling System Draining and Filling (Static) .	
NOTE: Do not remove the upper and lower transmission fluid cooler pipe connectors from the radiator at the same time otherwise the transmission fluid cooler may fall inside the radiator end tank.	
1	Transmission Fluid Cooler Pipe Connector Retaining Clip Procedure 1. Remove the transmission fluid cooler pipe connector retaining clip. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection. 2. Remove the attached transmission fluid cooler hose/pipe from the cooler pipe connector. Refer to the appropriate transmission fluid cooler hose/pipe procedure.
2	Transmission Fluid Cooler Pipe Connector CAUTION: Refer to Fastener Caution . NOTE: The correct thread engagement is critical. Cross-threaded fittings can achieve proper tightness and still leak. Tighten 24 N.m (18 lb ft)

Special Tools

- **DT-28585** Universal Snap Ring Remover for the 5/8 inch Line
- **DT-41623-B** 3/8 inch Line Quick Release Tool

Removal Procedure

1. Remove the plastic cap from the quick connect fitting by pulling the cap back along the pipe.

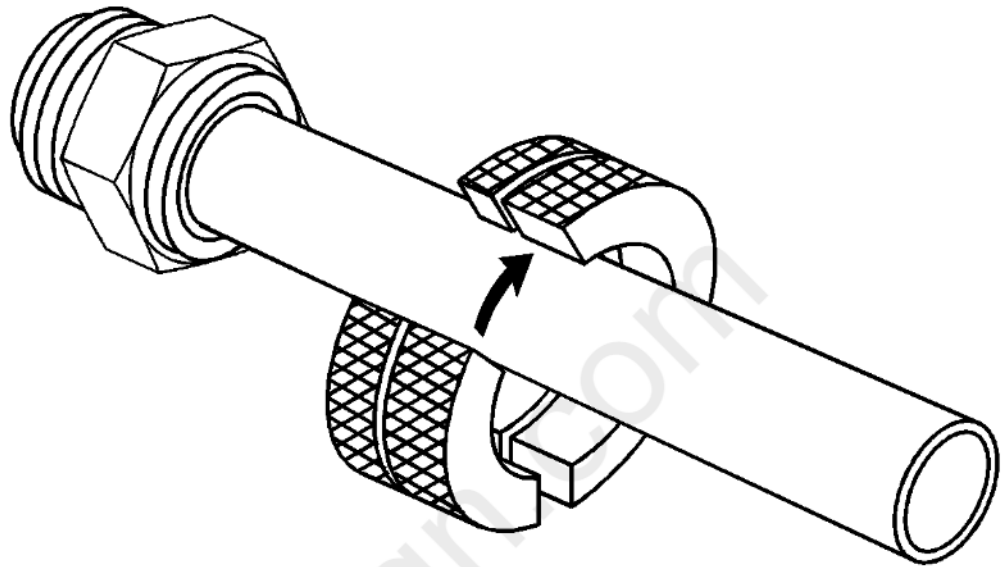


Fig. 34: Special Tool On Transmission Oil Cooler Pipe
Courtesy of GENERAL MOTORS COMPANY

2. Install the **DT-41623-B** 3/8 inch line quick release tool onto the transmission oil cooler (TOC) pipe, or use the **DT-28585** universal snap ring remover for the 5/8 inch line.

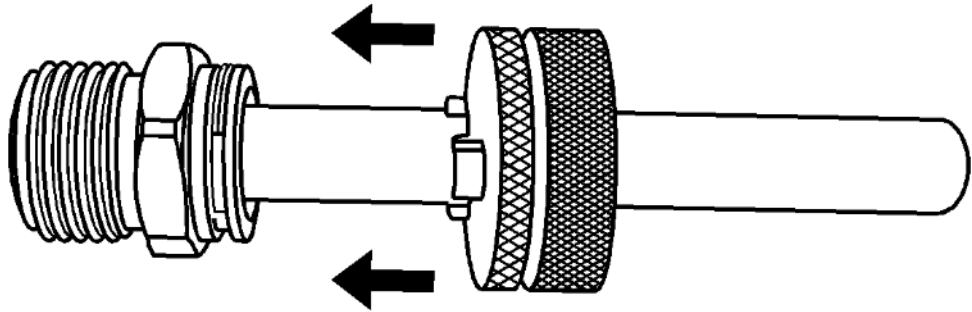


Fig. 35: Sliding Special Tool Toward TOC Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

3. Slide the **DT-41623-B** 3/8 inch line quick release tool toward the TOC pipe fitting, or use the **DT-28585** universal snap ring remover for the 5/8 inch line.

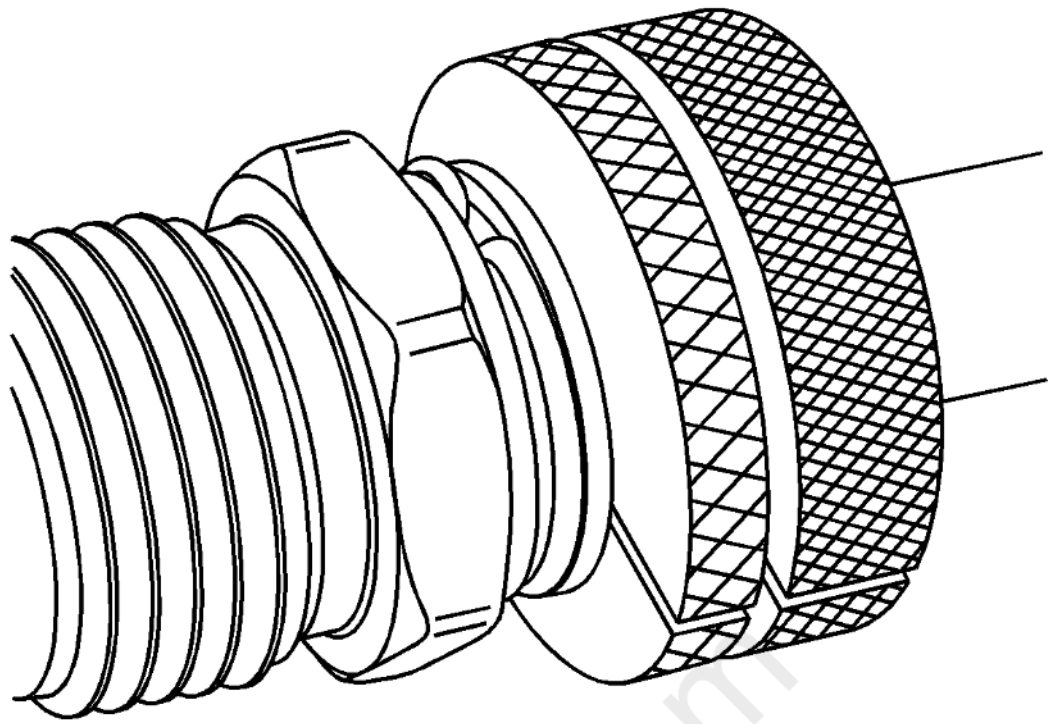


Fig. 36: Rotating Special Tool On Pipe

Courtesy of GENERAL MOTORS COMPANY

NOTE: Rotate the DT-41623-B 3/8 inch line quick release tool to engage the TOC pipe fitting's retainer slots.

The DT-41623-B 3/8 inch line quick release tool should be nearly flush with the fitting.

4. Connect the **DT-41623-B** 3/8 inch line quick release tool onto the TOC pipe fitting.

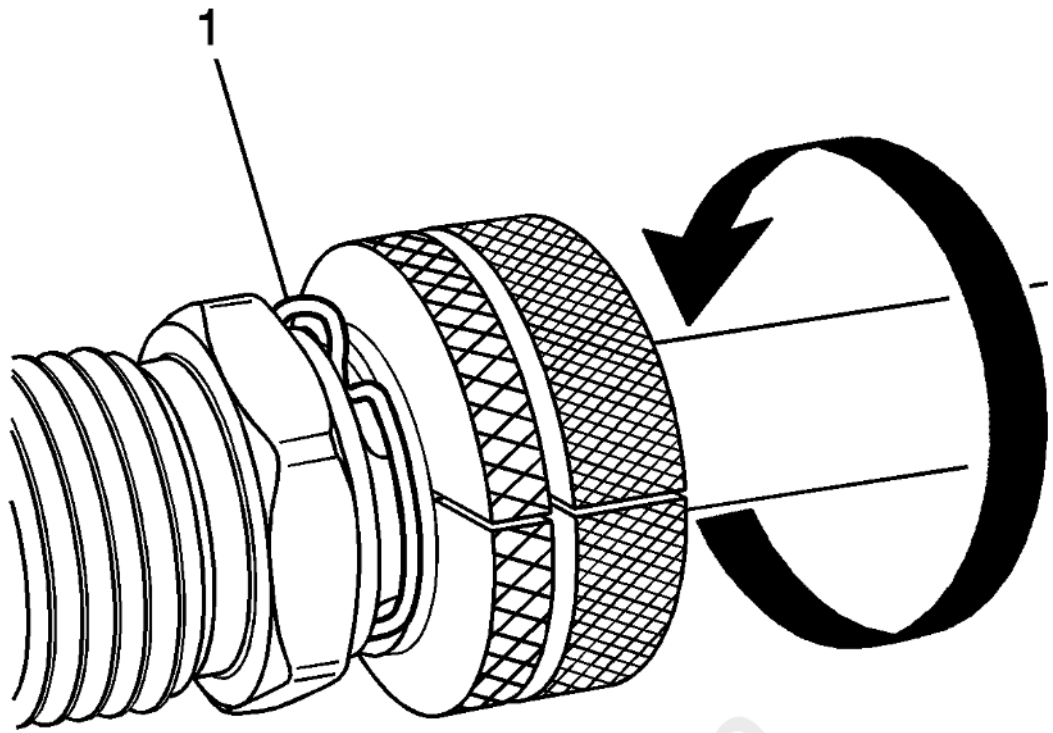


Fig. 37: Rotating Tool Until Retainer Clip Rises Above Fitting Retainer Seat
Courtesy of GENERAL MOTORS COMPANY

5. Rotate the **DT-41623-B** 3/8 inch line quick release tool or use the **DT-28585** universal snap ring remover for the 5/8 inch line until the retainer clip (1) rises above the fitting retainer seat.

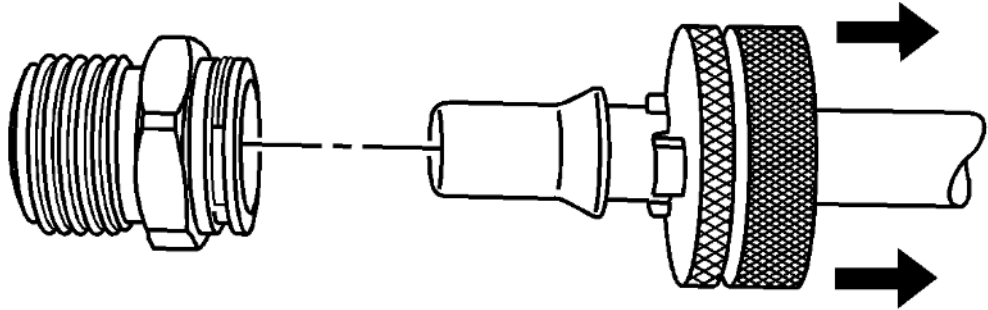


Fig. 38: Disengaging Pipe From TOC Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

6. Pull back on the TOC pipe to disengage the pipe from the TOC pipe fitting.
7. Remove the **DT-41623-B** 3/8 inch line quick release tool or the **DT-28585** universal snap ring remover for the 5/8 inch line from the TOC pipe.

Installation Procedure

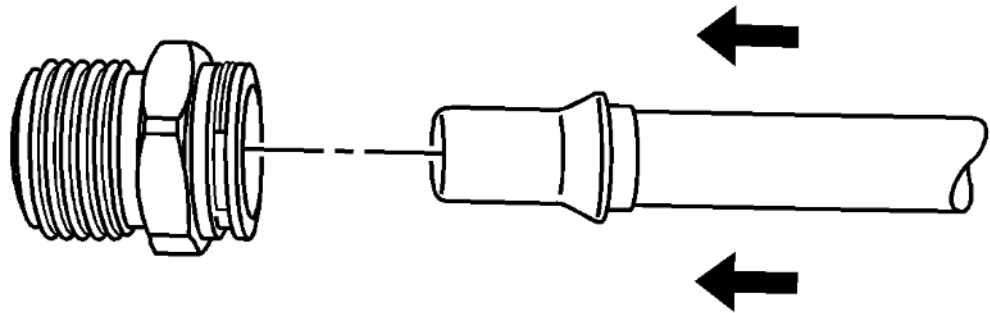


Fig. 39: Installing TOC Pipe Into TOC Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

NOTE: Discard the TOC retaining clip and install a new retaining clip.

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. Install the plastic cap onto the quick connect fitting. The plastic cap should snap onto fitting and spin freely by hand.
3. To ensure the cooler line is properly installed, give the cooler pipe a gentle pull.

TRANSMISSION FLUID COOLER INLET PIPE REPLACEMENT (LFX)

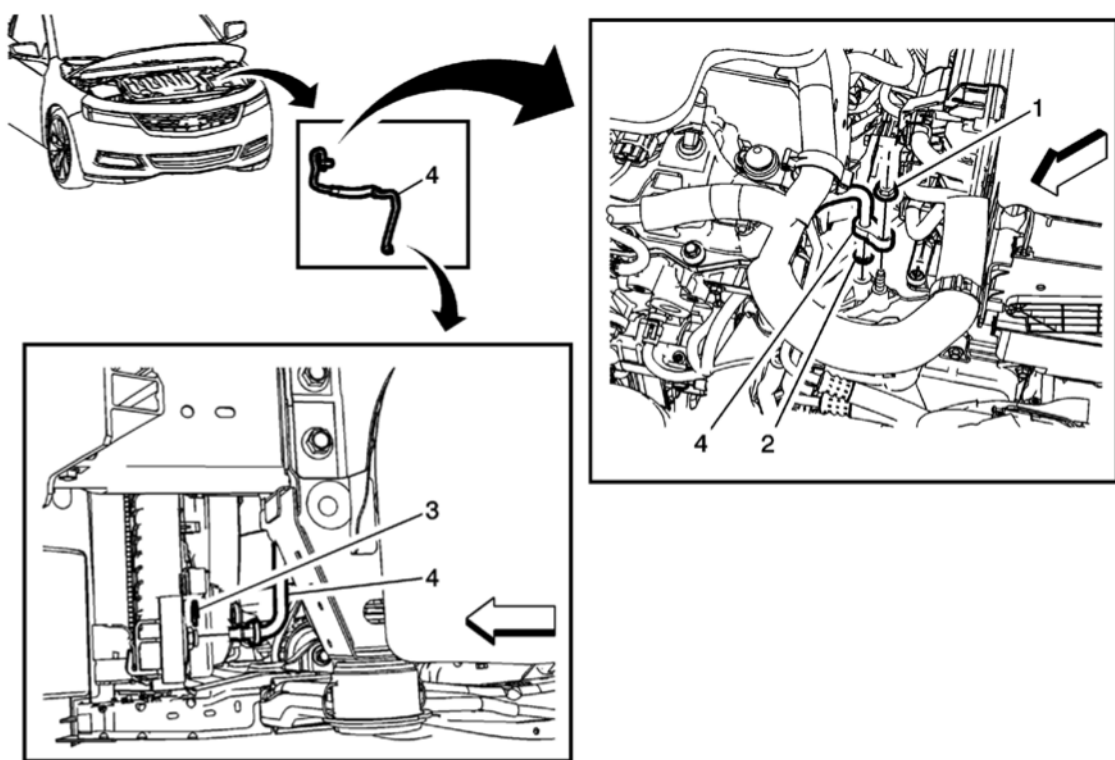


Fig. 40: Transmission Fluid Cooler Inlet Pipe (LFX)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front compartment front sight shield. Refer to Front Compartment Front Sight Shield Replacement. 2. Remove the left front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement. 3. Cap the fittings and plug the holes when removing the transmission fluid cooler inlet pipe. 4. Place a drain pan under the transmission fluid cooler inlet pipe.	
1	Transmission Fluid Cooler Inlet Pipe Nut CAUTION: Refer to Fastener Caution . Tighten 22 N.m (16 lb ft)
2	Transmission Fluid Cooler Inlet Pipe Seal Procedure Remove and discard the sealing washers and replace with a NEW sealing washer.
3	Transmission Fluid Cooler Inlet Pipe Retaining Clip Procedure Remove the transmission fluid cooler inlet pipe retaining clip. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection .
4	Transmission Fluid Cooler Inlet Pipe Procedure 1. Note the routing of the transmission fluid cooler inlet pipe to ensure proper installation. 2. Remove the transmission fluid cooler inlet pipe from the retaining clips securing the pipe to the transmission and fan shroud. 3. Inspect the transmission fluid level. Refer to Transmission Fluid Level and Condition Check.

TRANSMISSION FLUID COOLER INLET PIPE REPLACEMENT (LCV)

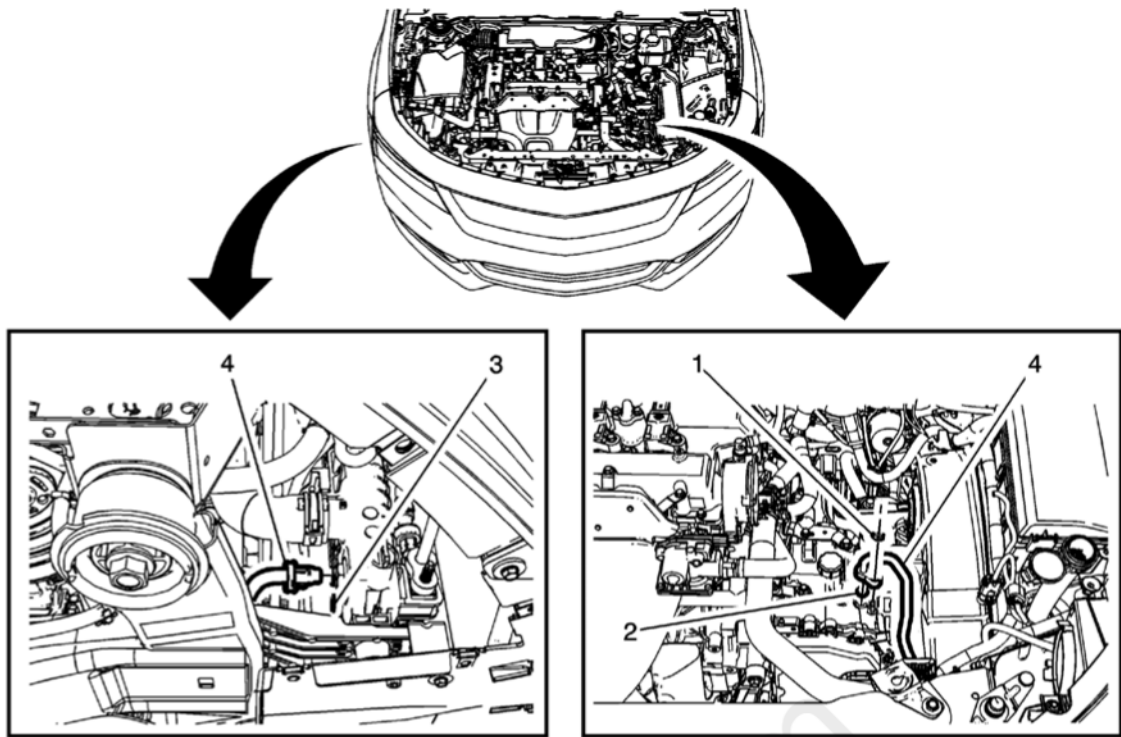


Fig. 41: Transmission Fluid Cooler Inlet Pipe (LCV)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the battery tray. Refer to Battery Tray Replacement . 2. Remove the front compartment front sight shield. Refer to Front Compartment Front Sight Shield Replacement . 3. Remove the right front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement . 4. Cap the fittings and plug the holes when removing the transmission fluid cooler inlet pipe. 5. Place a drain pan under the transmission fluid cooler inlet pipe.	
1	Transmission Fluid Cooler Inlet Pipe Nut CAUTION: Refer to Fastener Caution . Tighten 22 N.m (16 lb ft)
2	Transmission Fluid Cooler Inlet Pipe Seal Procedure Remove and discard the sealing washers and replace with a NEW sealing washer.
3	Transmission Fluid Cooler Inlet Pipe Retaining Clip Procedure Remove the transmission fluid cooler inlet pipe retaining clip. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection.

Callout	Component Name
4	Transmission Fluid Cooler Inlet Pipe Procedure 1. Note the routing of the transmission fluid cooler inlet pipe to ensure proper installation. 2. Remove the transmission fluid cooler inlet pipe from the retaining clips securing the pipe to the transmission and fan shroud. 3. Inspect the transmission fluid level. Refer to Transmission Fluid Level and Condition Check.

TRANSMISSION FLUID COOLER OUTLET PIPE REPLACEMENT (LFX)

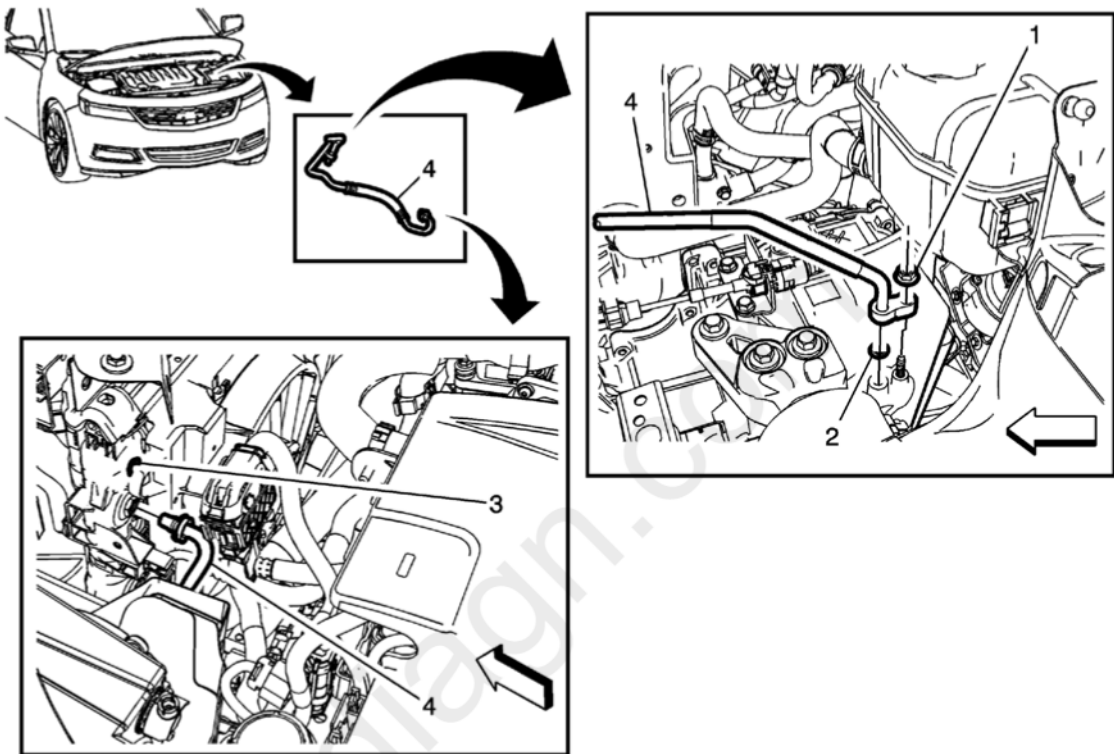


Fig. 42: Transmission Fluid Cooler Outlet Pipe (LFX)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front compartment front sight shield. Refer to Front Compartment Front Sight Shield Replacement. 2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement (LFX). 3. Remove the range selector lever cable bracket. Refer to Range Selector Lever Cable Bracket Replacement. 4. Cap the fittings and plug the holes when removing the transmission fluid cooler outlet pipe. 5. Place a drain pan under the transmission fluid cooler outlet pipe.	
1	Transmission Fluid Cooler Outlet Pipe Nut CAUTION: Refer to Fastener Caution . Tighten 22 N.m (16 lb ft)

Callout	Component Name
2	Transmission Fluid Cooler Outlet Pipe Seal Procedure Remove and discard the sealing washer and replace with a NEW sealing washer.
3	Transmission Fluid Cooler Outlet Pipe Retaining Clip Procedure Remove the transmission fluid cooler outlet pipe retaining clip. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection .
4	Transmission Fluid Cooler Outlet Pipe Procedure 1. Note the routing of the transmission fluid cooler outlet pipe to ensure proper installation. 2. Remove the transmission fluid cooler outlet pipe from the retaining clips securing the pipe to the transmission and fan shroud. 3. Inspect the transmission fluid level. Refer to Transmission Fluid Level and Condition Check.

TRANSMISSION FLUID COOLER OUTLET PIPE REPLACEMENT (LCV)

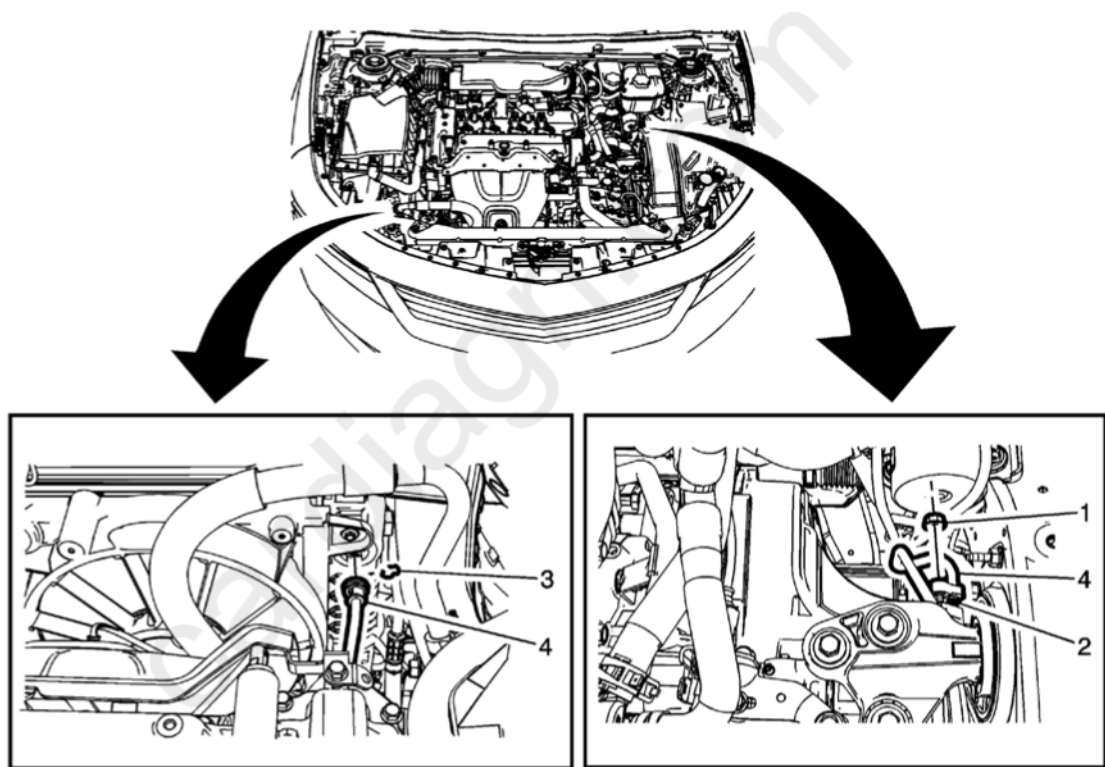


Fig. 43: Transmission Fluid Cooler Outlet Pipe (LCV)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Remove the battery tray. Refer to Battery Tray Replacement. 2. Remove the front compartment front sight shield. Refer to Front Compartment Front Sight Shield Replacement. 3. Cap the fittings and plug the holes when removing the transmission fluid cooler outlet pipe. 4. Place a drain pan under the transmission fluid cooler outlet pipe.	

Callout	Component Name
1	Transmission Fluid Cooler Outlet Pipe Nut CAUTION: Refer to Fastener Caution . Tighten 22 N.m (16 lb ft)
2	Transmission Fluid Cooler Outlet Pipe Seal Procedure Remove and discard the sealing washer and replace with a NEW sealing washer.
3	Transmission Fluid Cooler Outlet Pipe Retaining Clip Procedure Remove the transmission fluid cooler outlet pipe retaining clip. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection .
4	Transmission Fluid Cooler Outlet Pipe Procedure 1. Note the routing of the transmission fluid cooler outlet pipe to ensure proper installation. 2. Remove the transmission fluid cooler outlet pipe from the retaining clips securing the pipe to the transmission and fan shroud. 3. Inspect the transmission fluid level. Refer to Transmission Fluid Level and Condition Check .

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description
	DT 28585 J 28585 Snap Ring Remover

Illustration	Tool Number/Description
 A blue medical probe, likely a Doppler probe, is shown. It has a long, thin shaft that curves slightly at the tip. The handle is thicker and has a flared, ergonomic shape. The entire device is colored a solid blue. A large, light gray watermark reading 'cardiagn.com' is oriented diagonally across the image.	

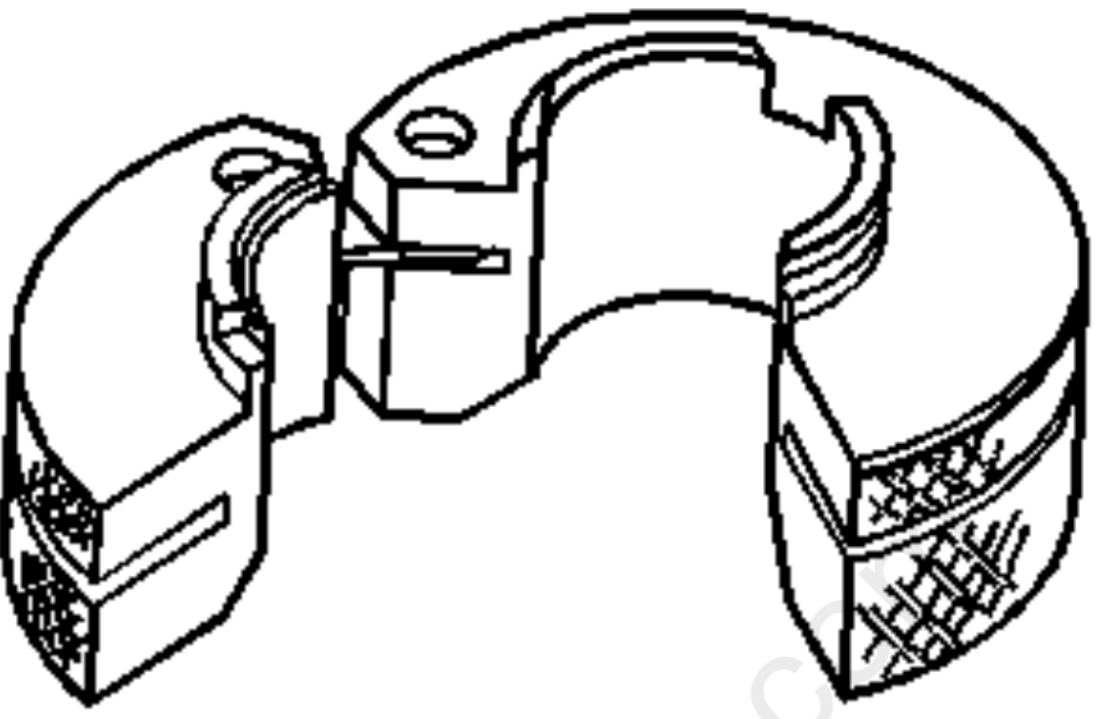
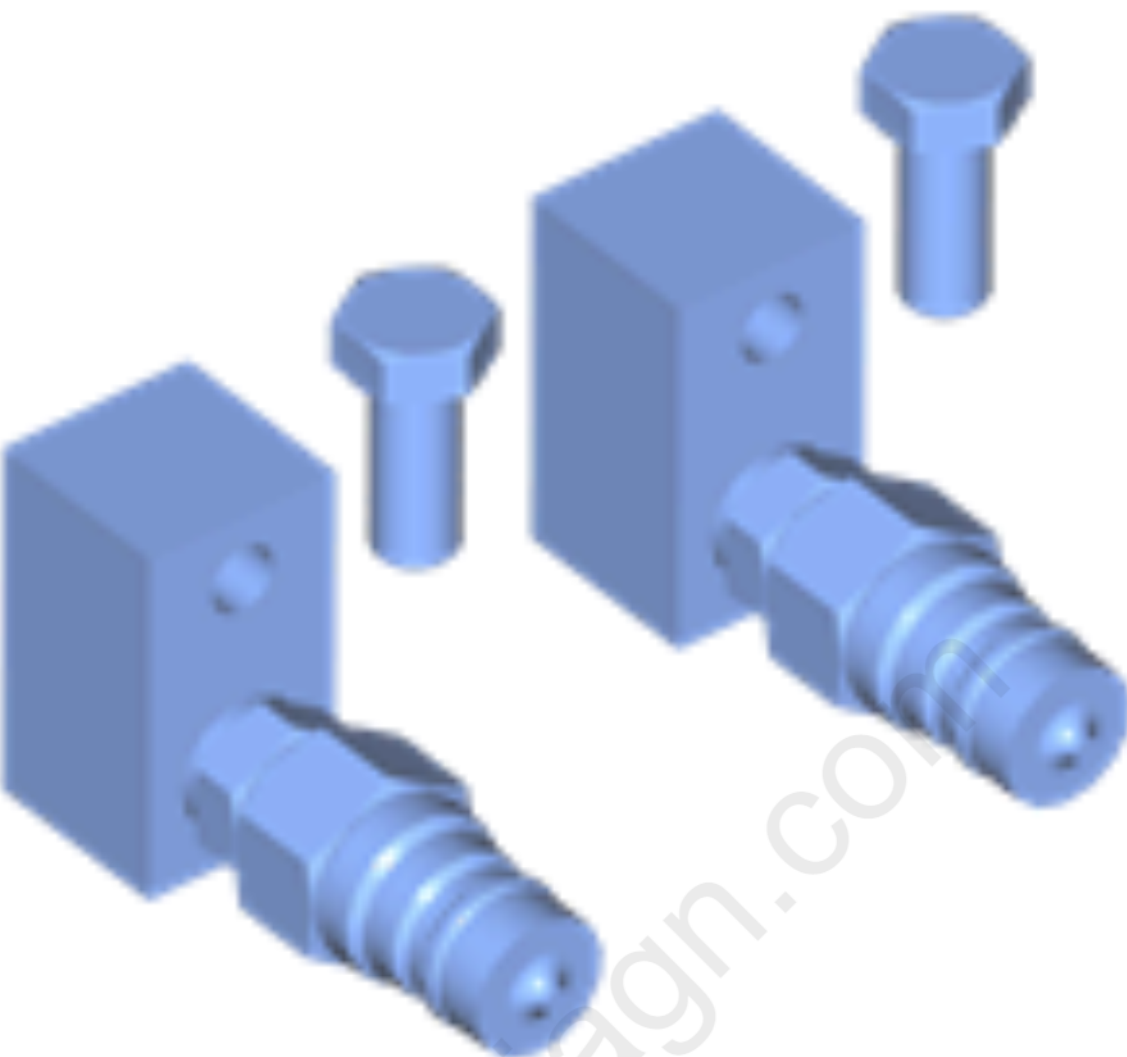
Illustration	Tool Number/Description
	DT 41623-B J 41623-B Cooler Line Seal Installer
	DT 45096 J 45096 Transmission Oil Cooling System Flush and Flow Test Tool



Illustration	Tool Number/Description
	DT 45096-50 J 45096-50 Transmission Cooler Flush Adapter