

TRANSMISSION

Transmission Cooling - Canyon, Colorado

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Transmission Fluid Cooler Pipe Bolt	22 N.m	(16 lb ft)
Transmission Fluid Cooler Pipe Clip Bolt (LCV)	58 N.m	(43 lb ft)
Transmission Fluid Cooler Pipe Clip Bolt (LFX)	22 N.m	(16 lb ft)
Transmission Fluid Cooler Pipe Clip Bolt (LWN)	11 N.m	(97 lb in)

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 DT-45096 transmission oil cooling system flush and flow test tool or equivalent 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

96 Transmission Oil Cooling System Flush and Flow Test Tool

- **DT-45096-30** Transmission Cooler Flush Adapter
- **J-35944-200A** Cooler Flushing Adapter
- Shop air supply with water/oil filters, regulator and pressure gauge - minimum 90 psi
- Eye protection
- Rubber gloves

Machine Set-up

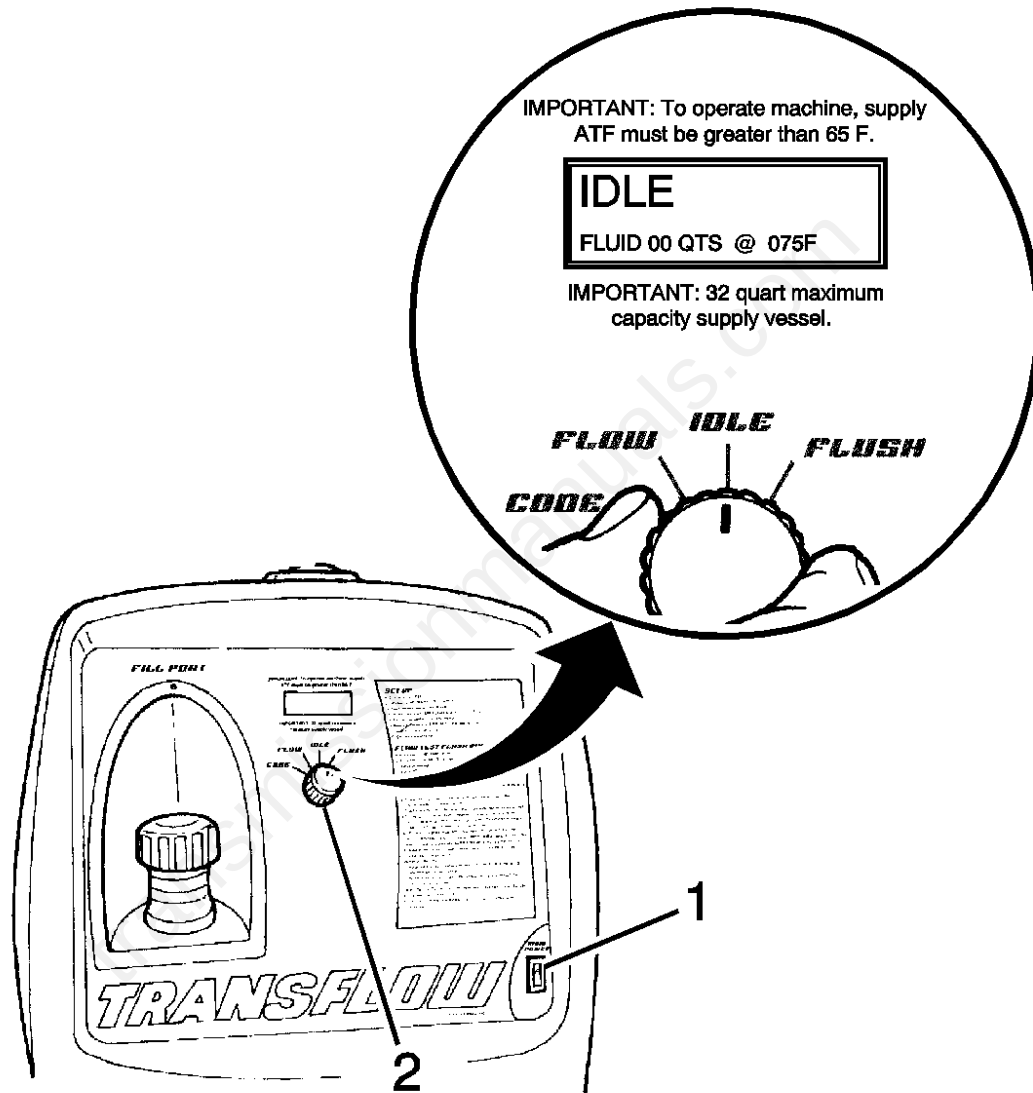


Fig. 1: View Of Main Power Switch & Main Function Switch
Courtesy of GENERAL MOTORS COMPANY

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

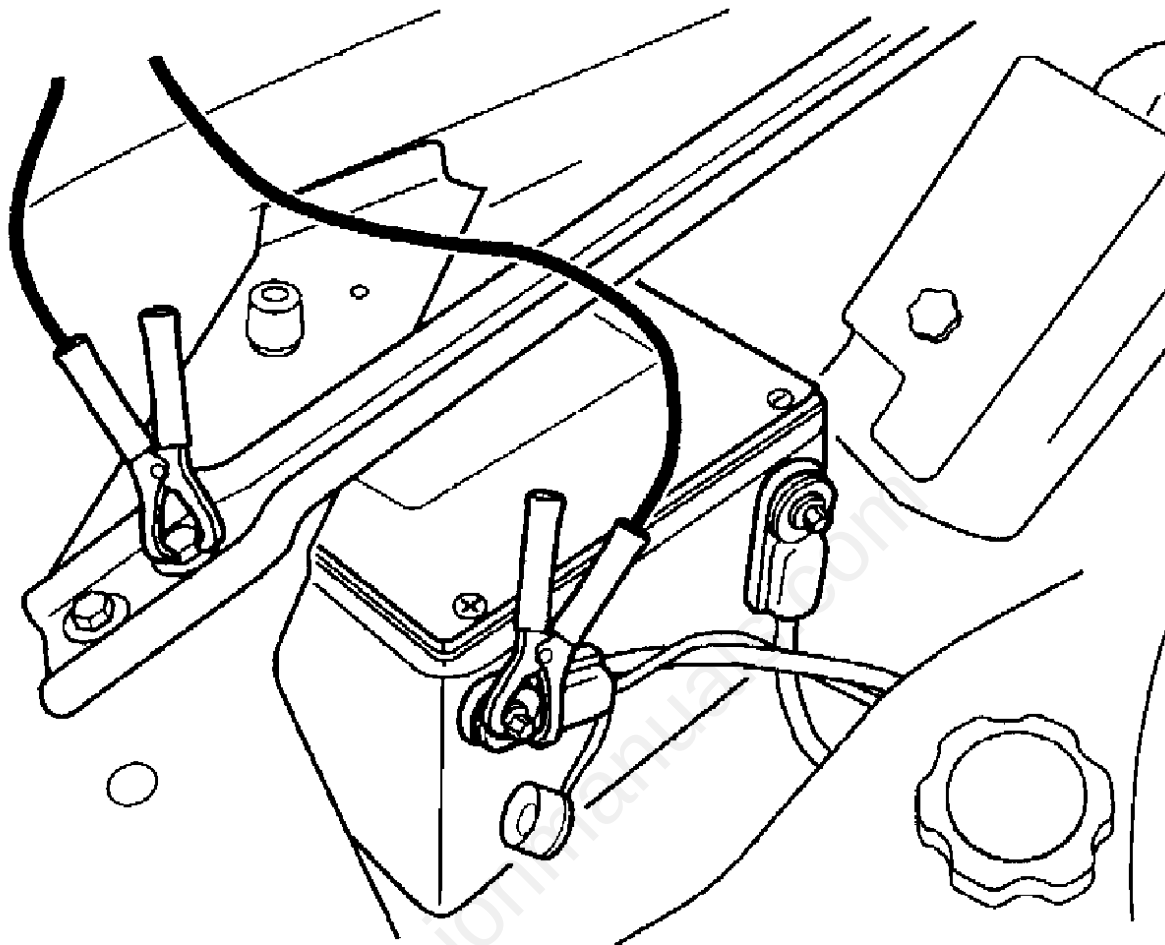


Fig. 2: Connecting To 12V DC Power Source
Courtesy of GENERAL MOTORS COMPANY

3. Connect **DT-45096** transmission oil cooling system 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.

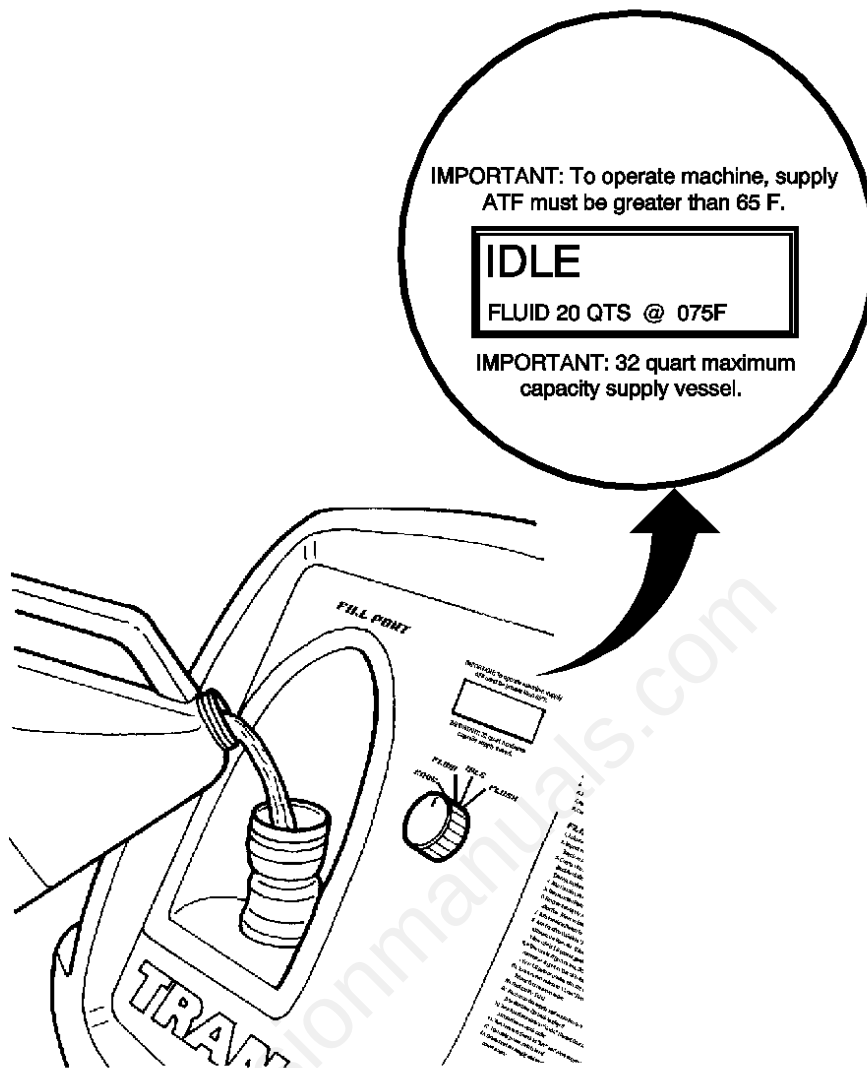


Fig. 3: Filling Supply Tank With Transmission Fluid

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.

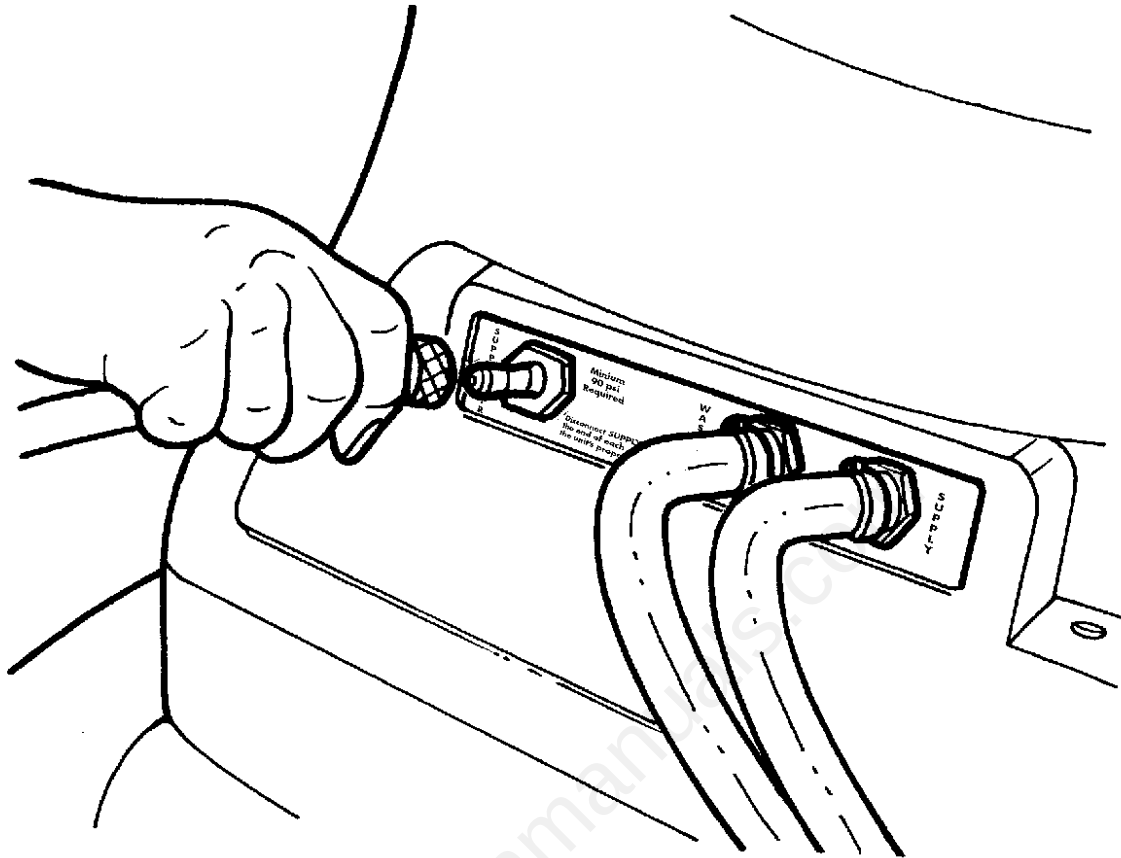


Fig. 4: View Of Shop Air Supply Hose & Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

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

Determine Minimum Flow Rate

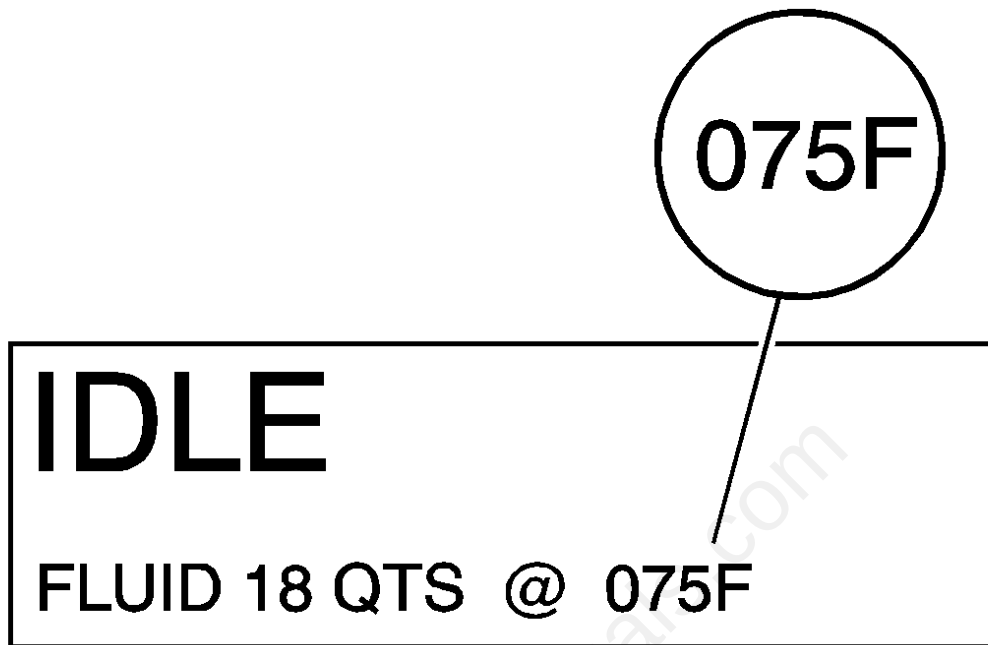


Fig. 5: Identifying Machine Display Of Automatic Transmission Fluid Temperature
Courtesy of GENERAL MOTORS COMPANY

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.

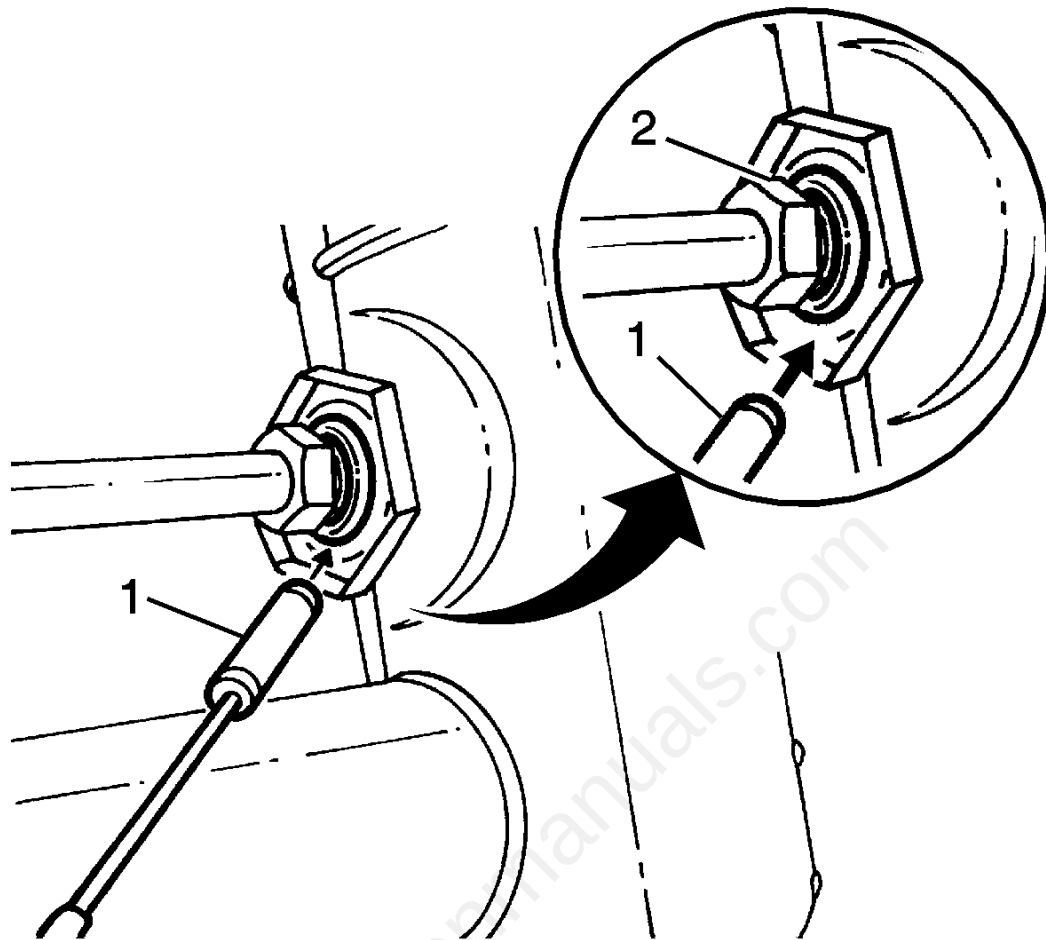


Fig. 6: Identifying Transmission Oil Cooler Metal Composition

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

Temperature Range	Steel	Aluminum
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

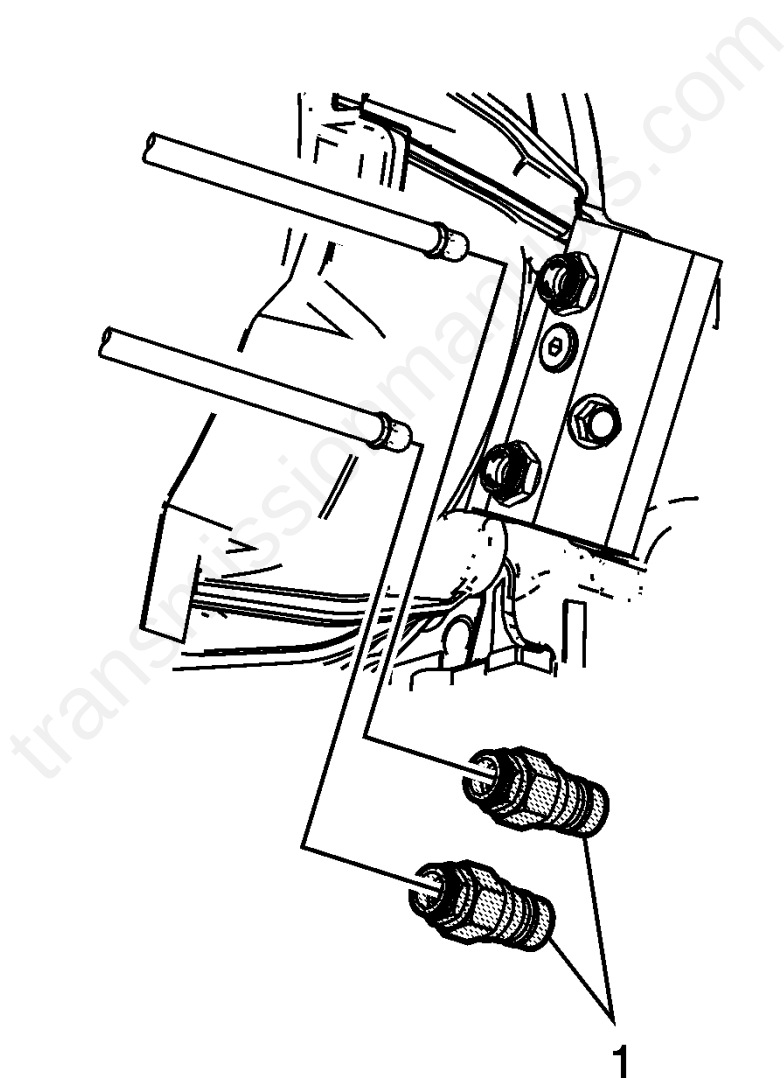


Fig. 7: Cooler Flushing Adapters

Courtesy of GENERAL MOTORS COMPANY

1. If equipped with bypass valve, disconnect the oil cooler lines from the bypass valve.

ped with bypass valve, connect the **J-35944-200A** cooler flushing adapter (1) to the vehicle transmission oil cooler supply and return lines at the transmission.

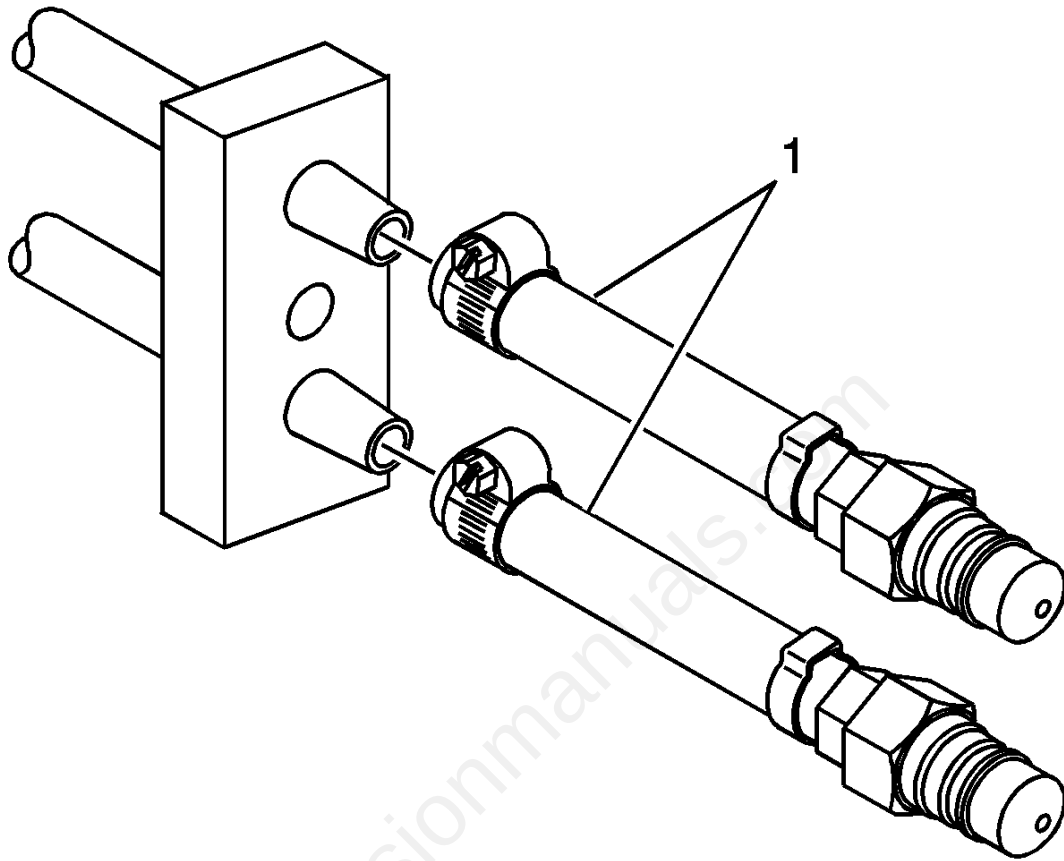


Fig. 8: Cooler Flush Adapters

Courtesy of GENERAL MOTORS COMPANY

3. If not equipped with the bypass valve, connect the **DT-45096-30** cooler flush adapter (1) to the vehicle transmission oil cooler supply and return lines at the transmission.

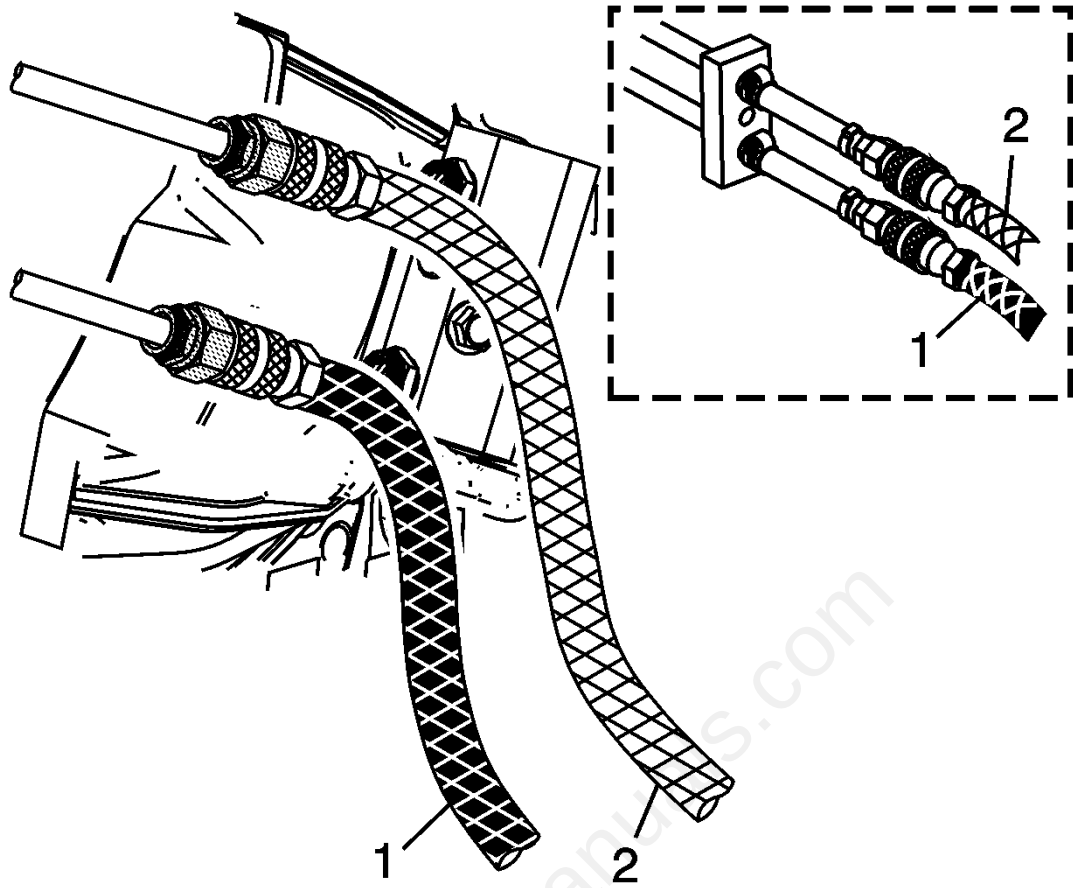


Fig. 9: Black Supply Hose

Courtesy of GENERAL MOTORS COMPANY

4. 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.

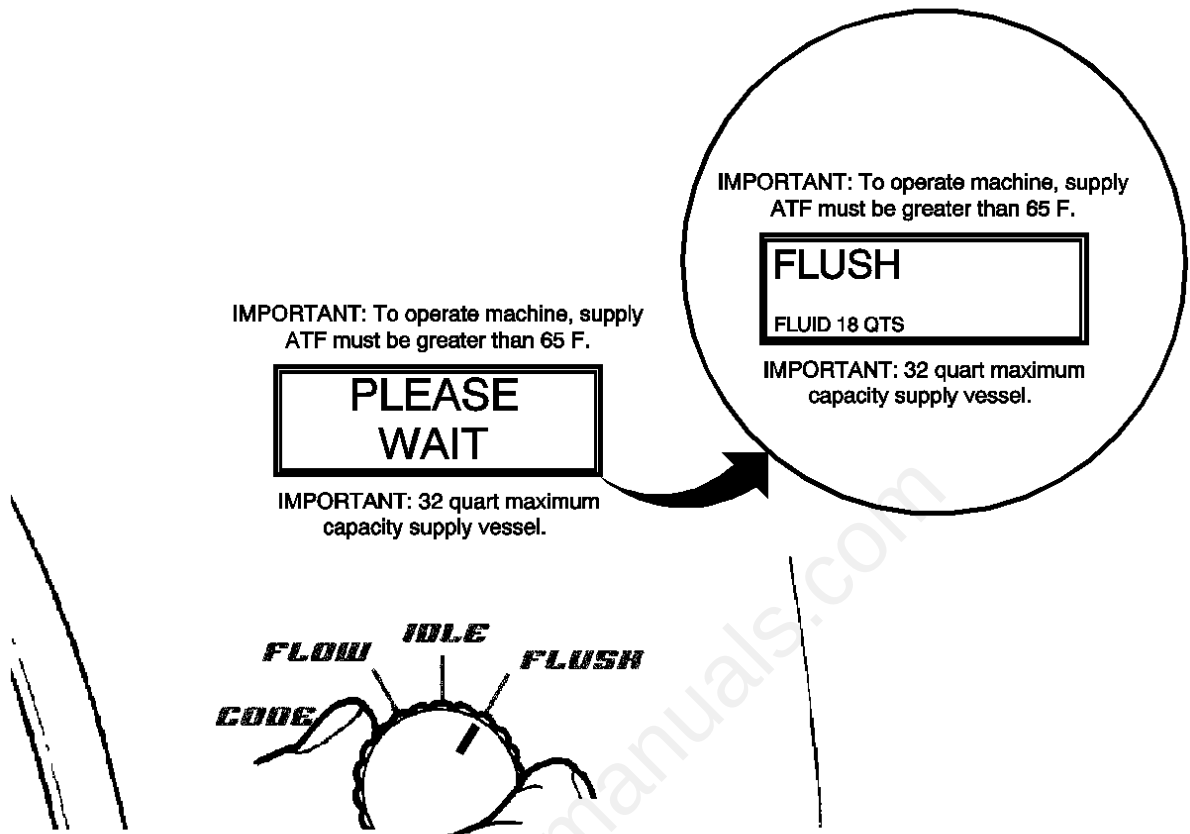


Fig. 10: View Of Main Function Switch FLUSH Position
Courtesy of GENERAL MOTORS COMPANY

5. 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.

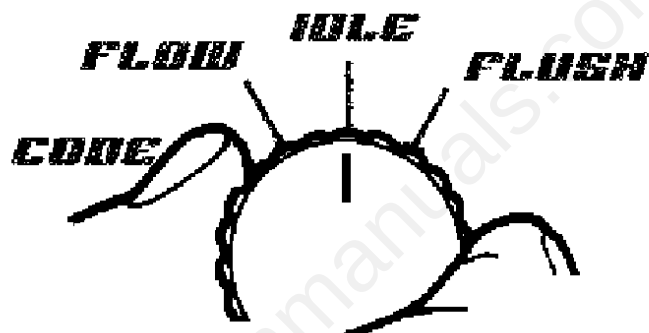


Fig. 11: View Of Main Function Switch IDLE Position

Courtesy of GENERAL MOTORS COMPANY

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

Forward Flush

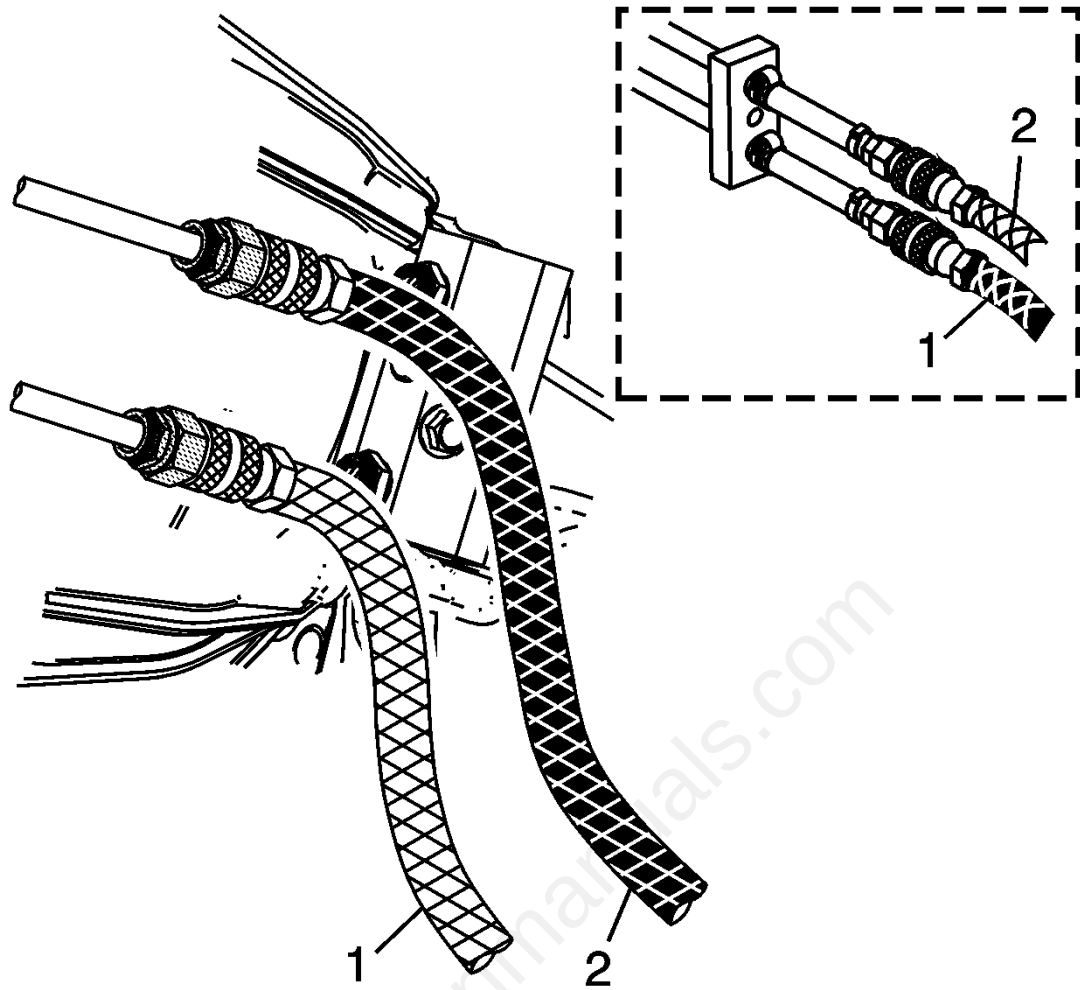


Fig. 12: Supply And Waste Hoses

Courtesy of GENERAL MOTORS COMPANY

1. Disconnect the supply and waste hoses from the vehicle cooler lines. Reverse the supply hose (2) and waste hose (1) 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.

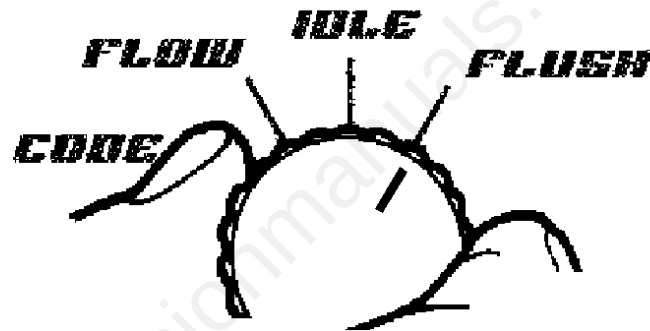


Fig. 13: View Of Main Function Switch FLUSH Position

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

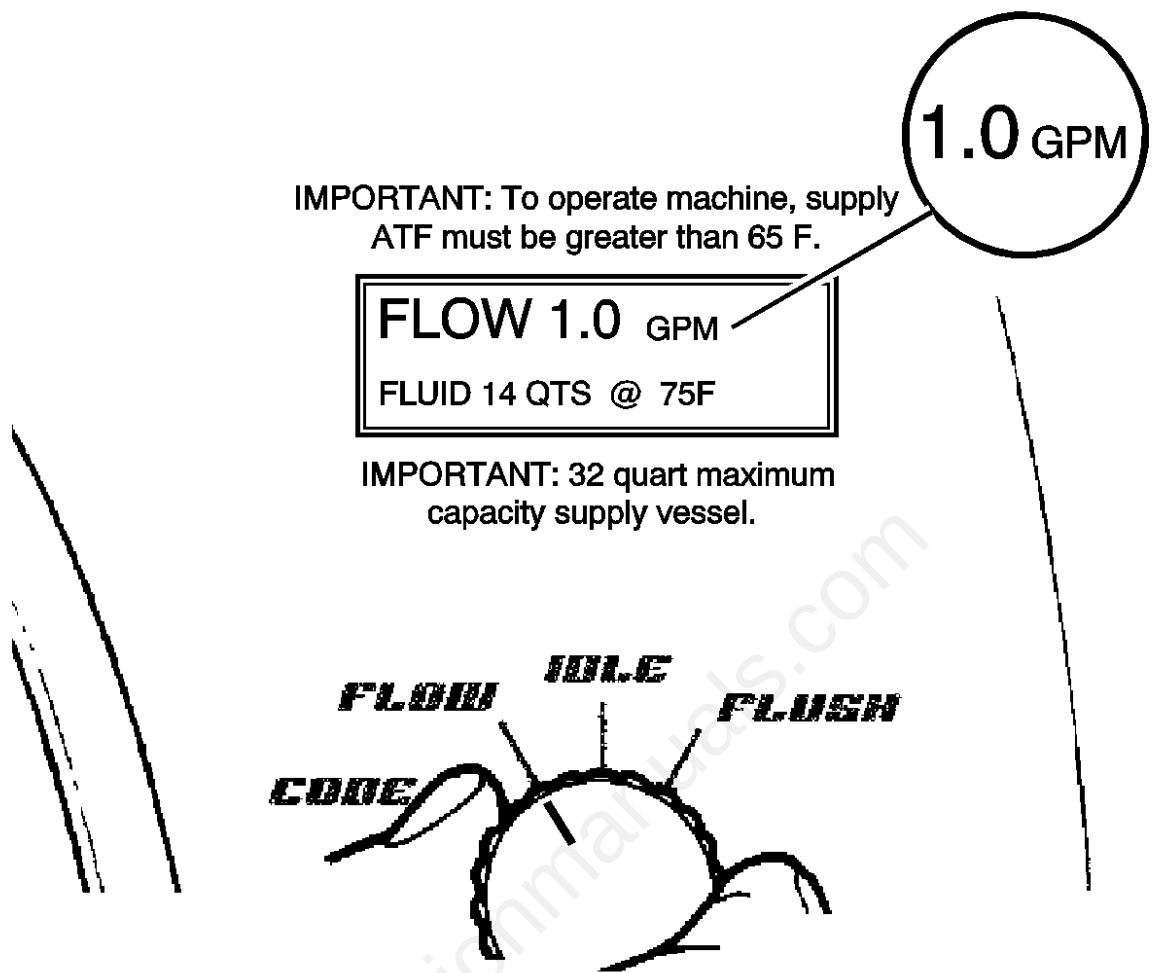


Fig. 14: View Of Main Function Switch FLOW Position

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.

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.

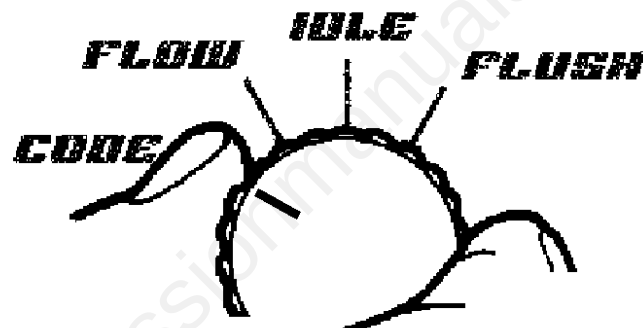


Fig. 15: View Of Main Function Switch CODE Position

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

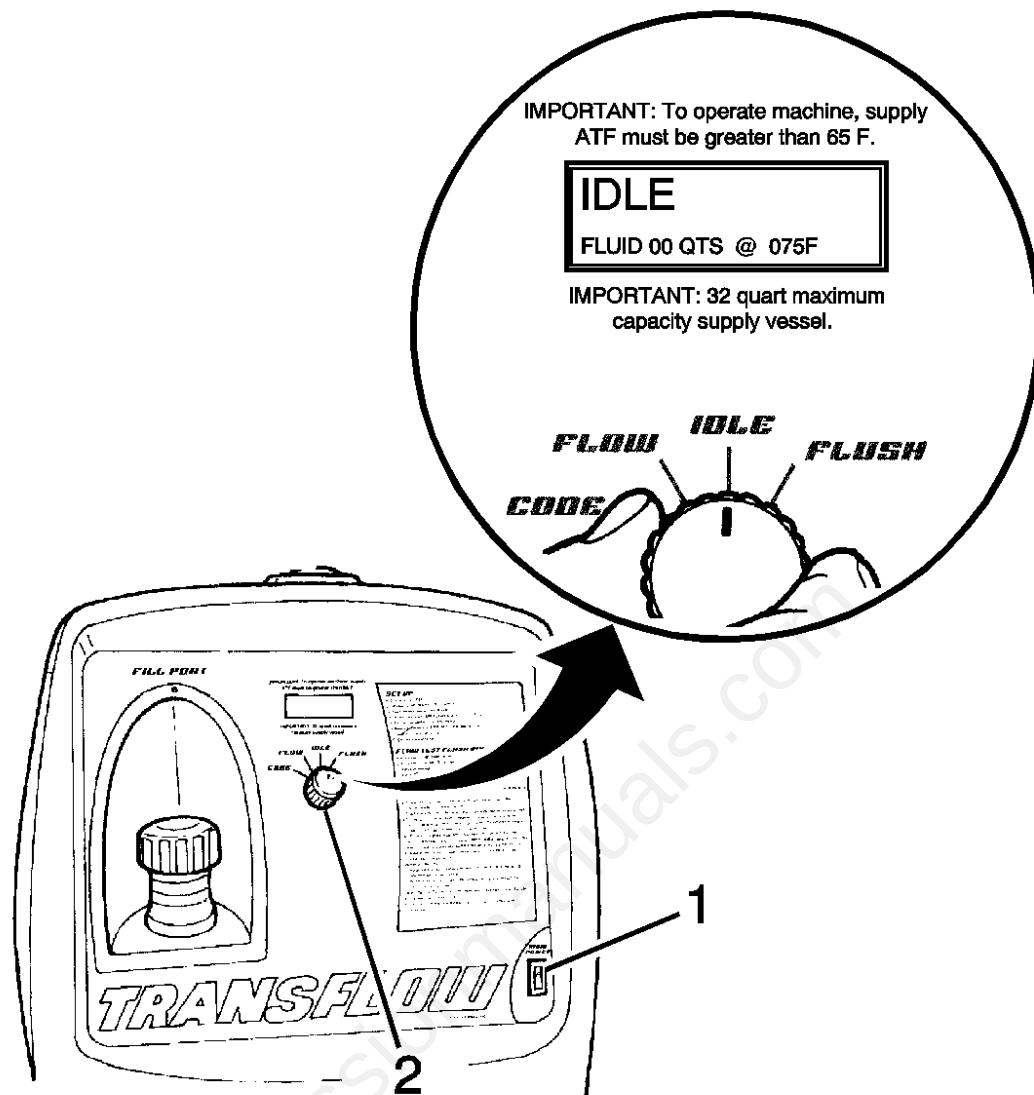


Fig. 16: View Of Main Power Switch & Main Function Switch

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.
- 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.

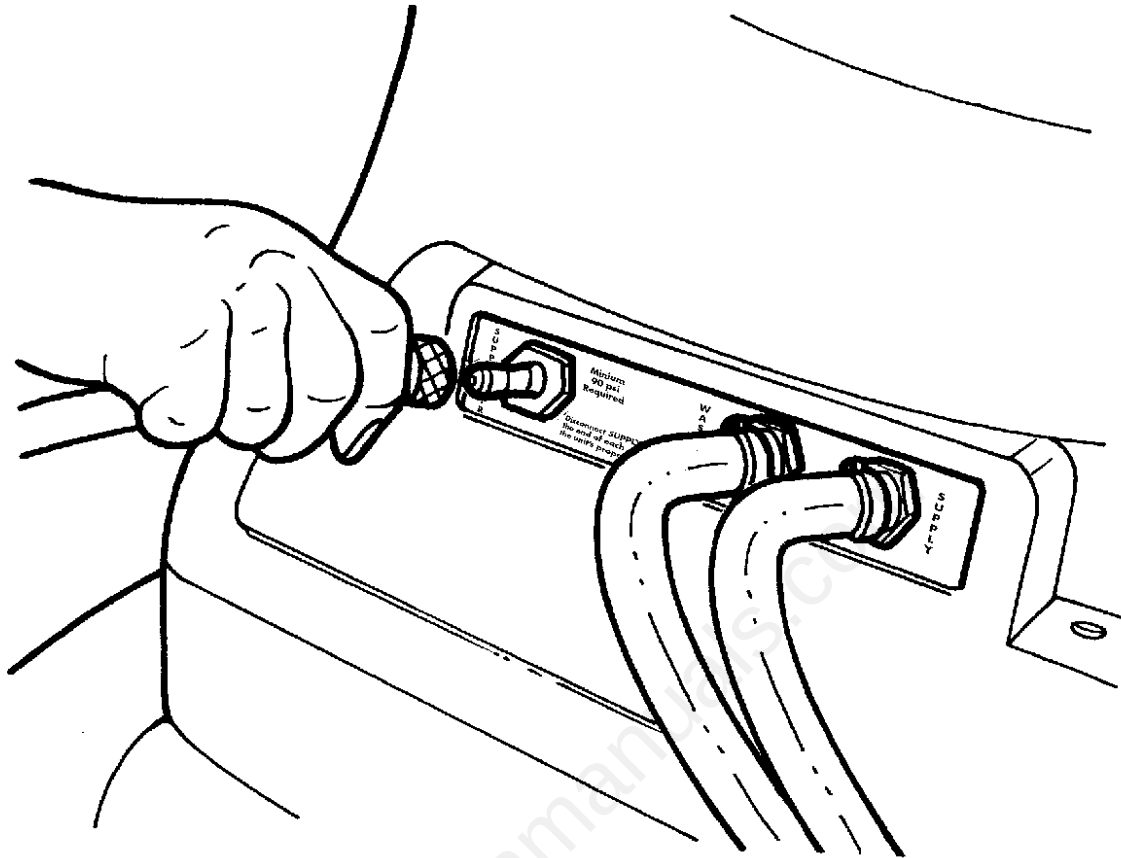


Fig. 17: View Of Shop Air Supply Hose & Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the air supply hose from **DT-45096** flush and flow test tool.
5. Remove the **DT-45096-30** or the **J-35944-200A** adapters.
6. Dispose of the waste automatic transmission fluid in accordance with all applicable federal, state, and local requirements.

REPAIR INSTRUCTIONS

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

Removal Procedure

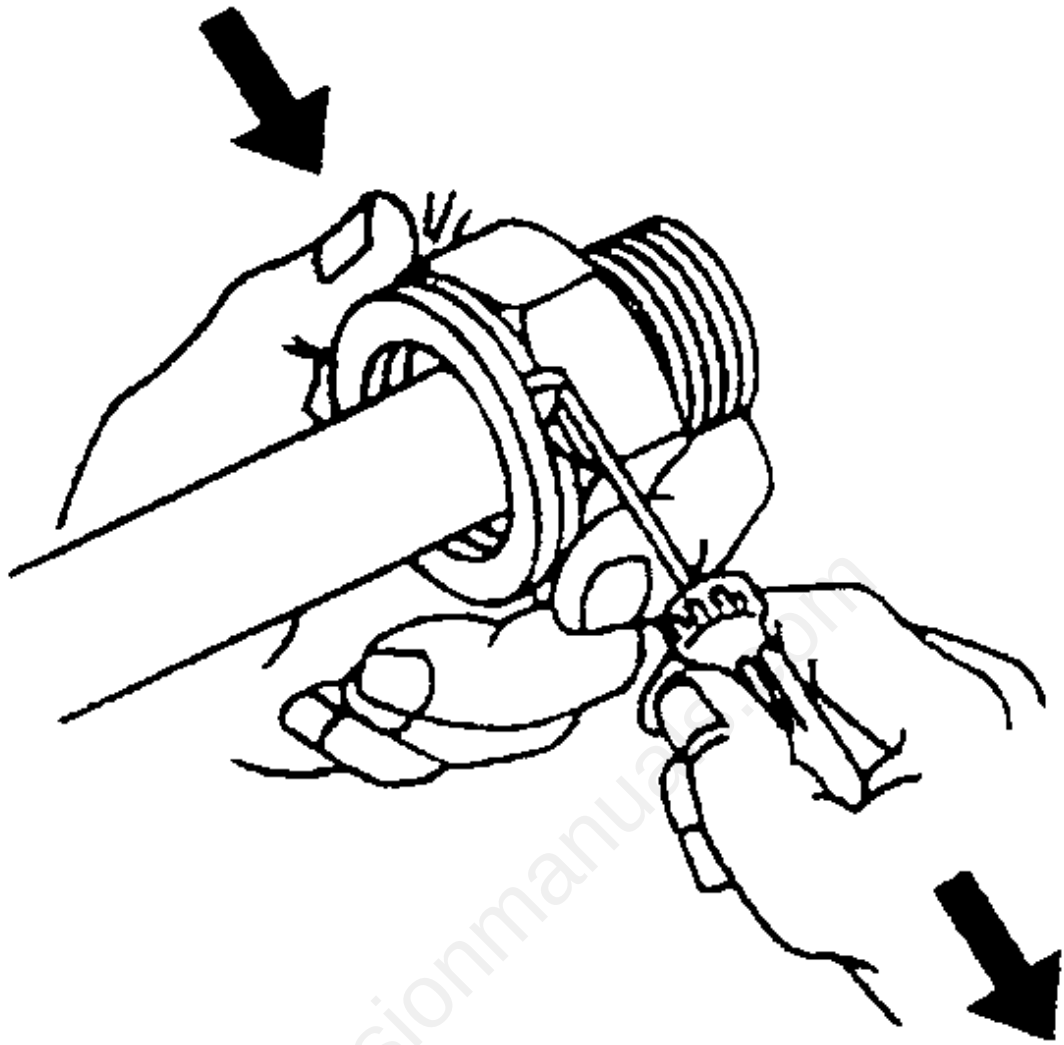


Fig. 18: Quick Connect Fitting Retaining Ring
Courtesy of GENERAL MOTORS COMPANY

NOTE: Perform the following procedure when removing the retaining rings and cooler lines from the quick connect fittings located on the radiator and/or the transmission.

1. Pull the plastic cap back from the quick connect fitting and down along the cooler line about 5 cm (2 in).
2. Using a bent-tip screwdriver, pull on one of the open ends of the retaining ring in order to rotate the retaining ring around the quick connect fitting until the retaining ring is out of position and can be completely removed.
3. Remove the retaining ring from the quick connect fitting.
4. Discard the retaining ring.

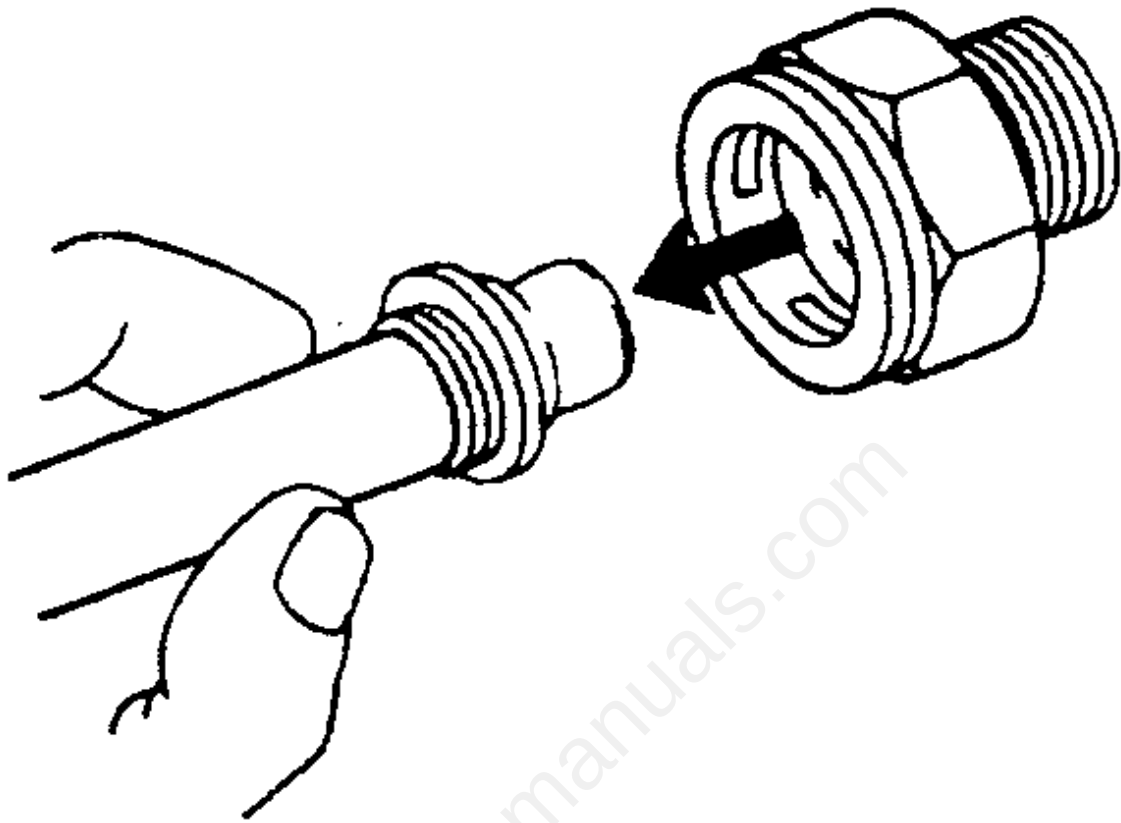


Fig. 19: Cooler Line & Quick Connect Fitting
Courtesy of GENERAL MOTORS COMPANY

5. Pull the cooler line straight out from the quick connect fitting.

Installation Procedure

NOTE:

- Do not reuse any of the existing oil lines or oil line fittings if there is excessive corrosion.
- Do not reuse any of the existing retaining rings that were removed from the existing quick connect fittings. Install new retaining rings.
- Ensure the following procedures are performed when installing the new retaining rings onto the fittings.

1. Install a new retaining ring into the quick connect fitting using the following procedure:

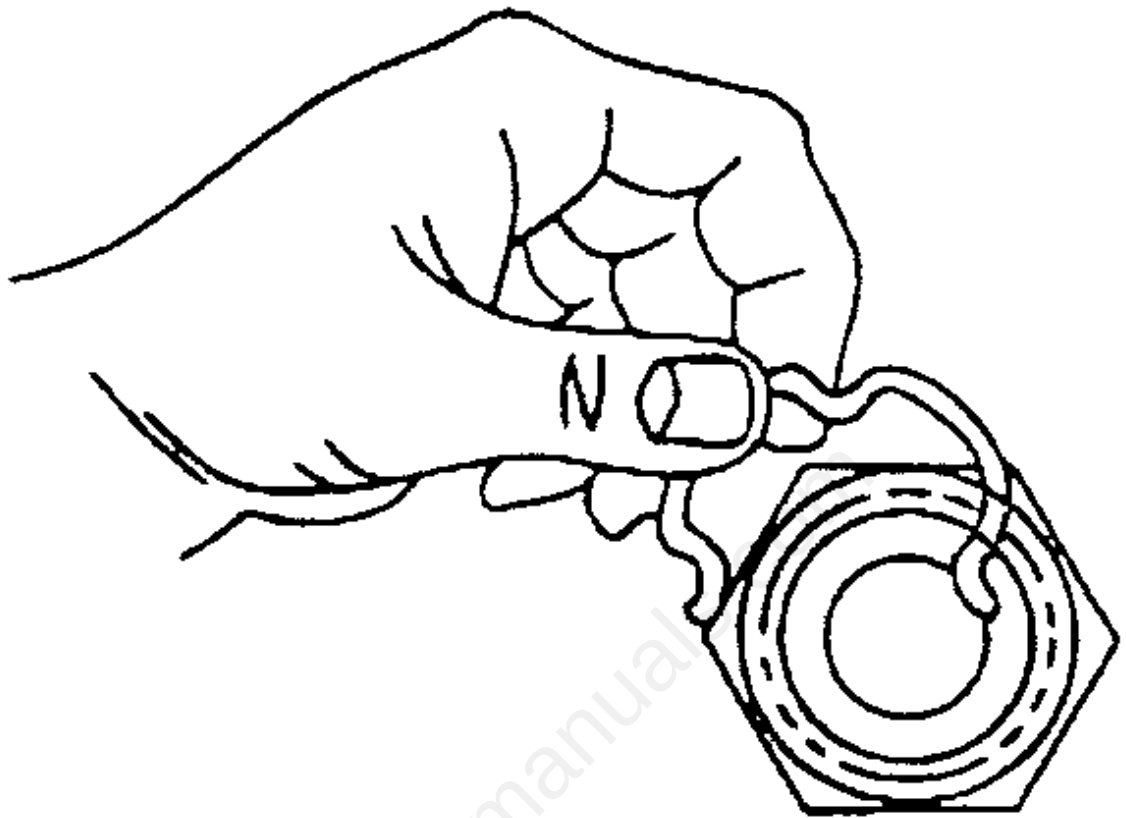


Fig. 20: Quick Connect Retainer

Courtesy of GENERAL MOTORS COMPANY

1. Hook one of the open ends of the retaining ring in one of the slots in the quick connect fitting.

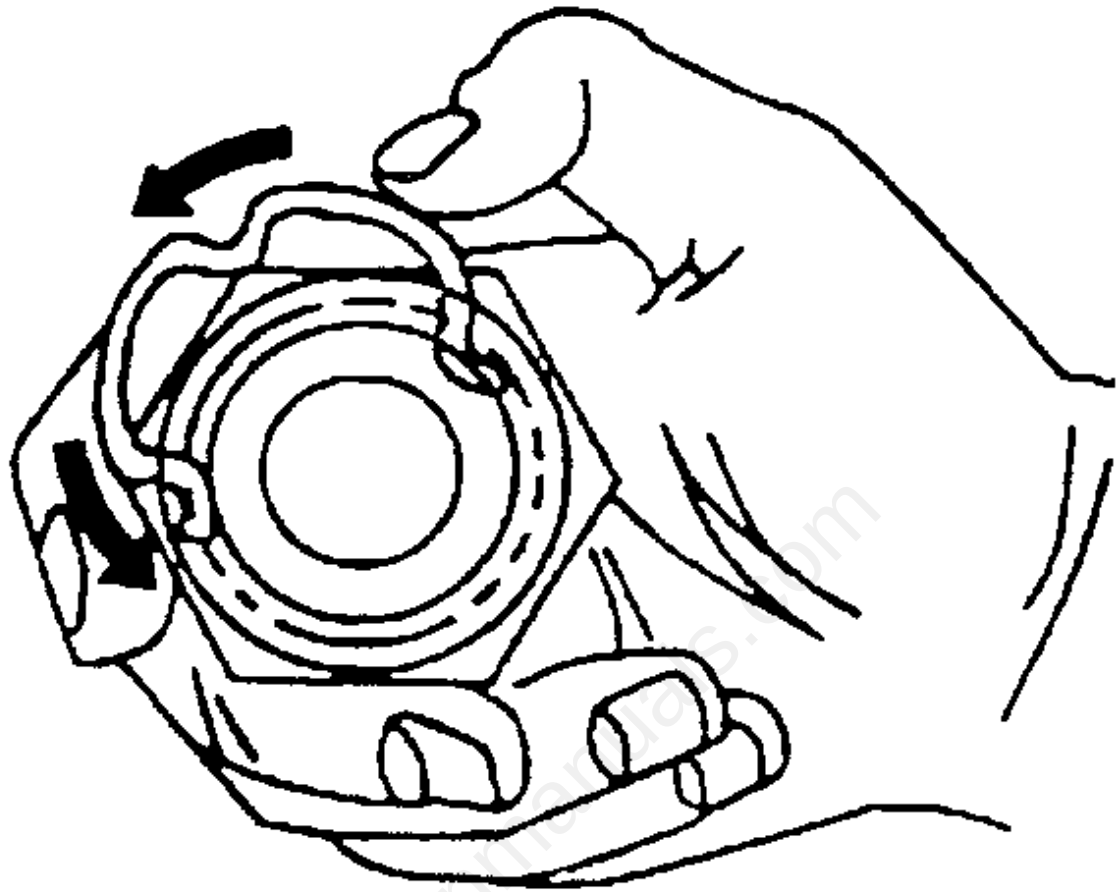


Fig. 21: Rotating Retaining Ring Around Fitting
Courtesy of GENERAL MOTORS COMPANY

2. Rotate the retaining ring around the fitting until the retaining ring is positioned with all three ears through the three slots on the fitting.

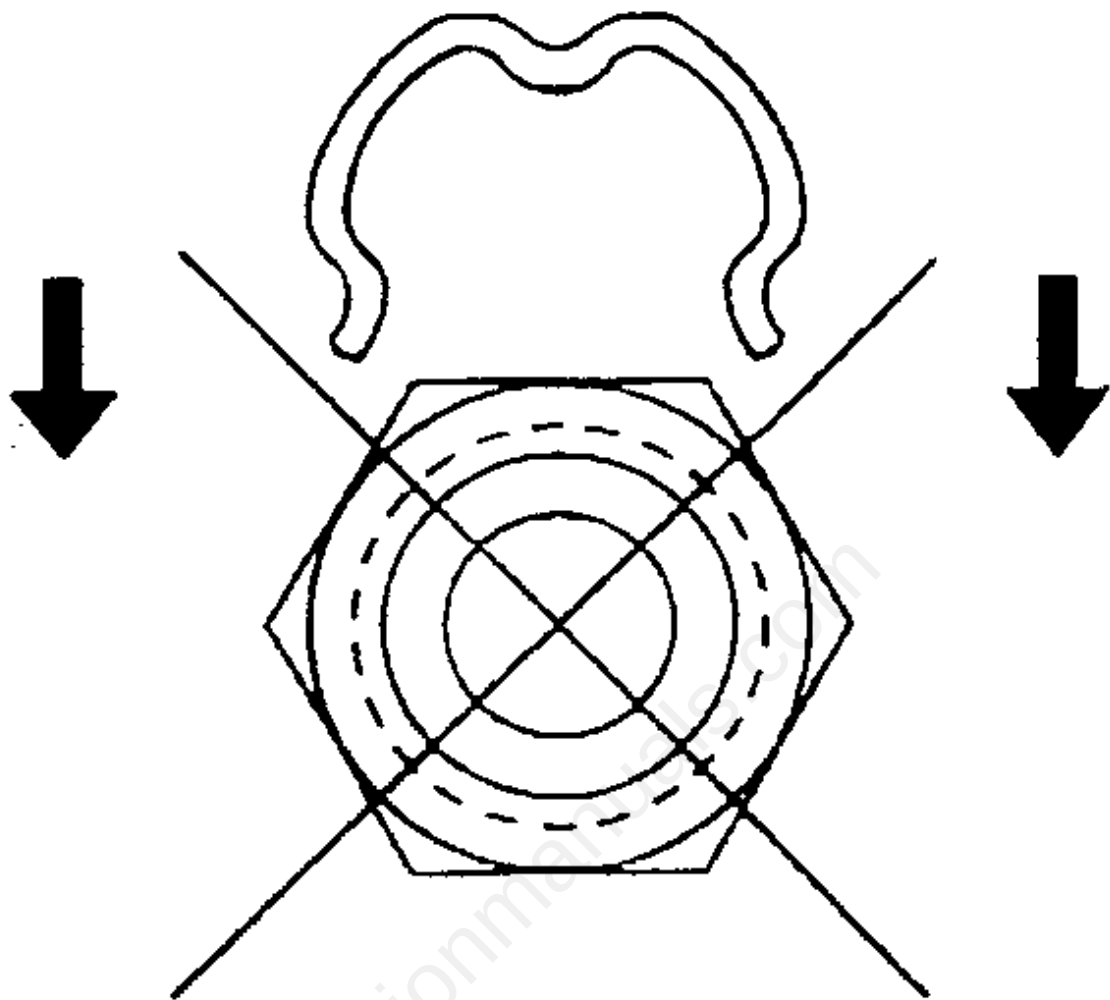


Fig. 22: Improper Installation Of Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

3. Do not install the new retaining ring onto the fitting by pushing the retaining ring.

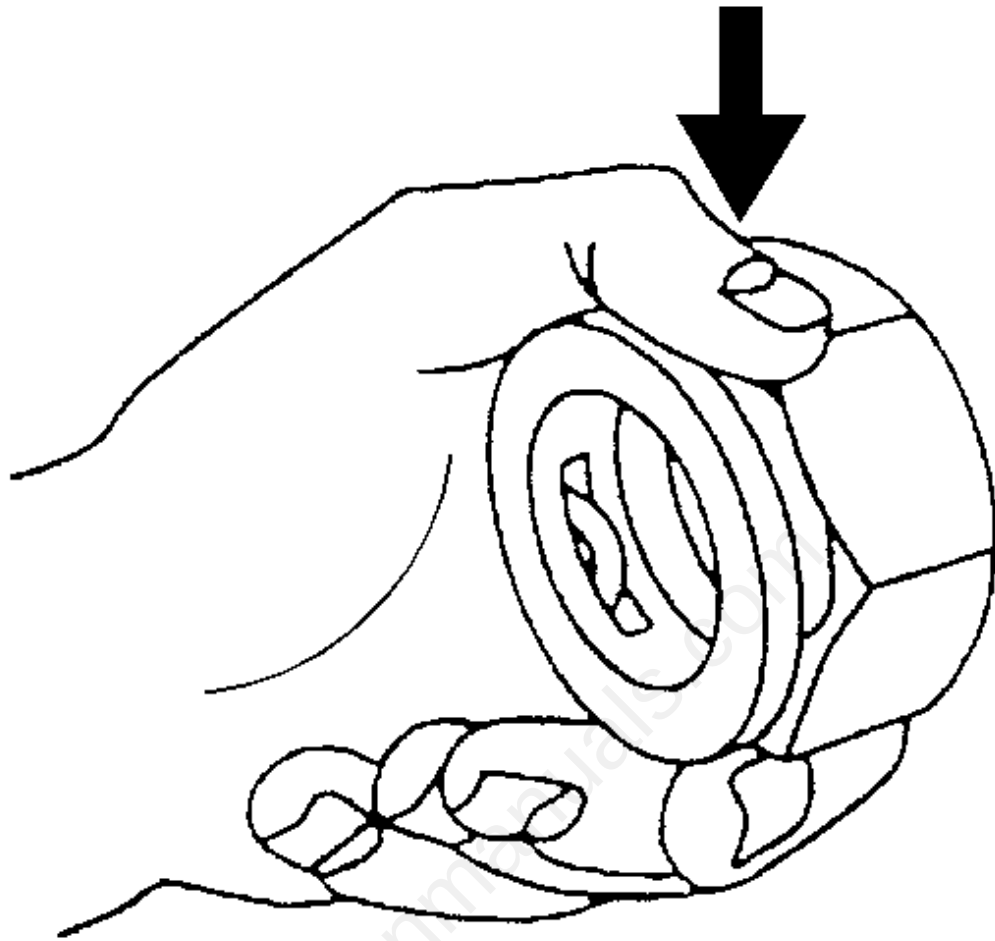


Fig. 23: Ensuring Retaining Ring Is Seated Correctly
Courtesy of GENERAL MOTORS COMPANY

4. Ensure that the three retaining ring ears are seen from inside the fitting and that the retaining ring moves freely in the fitting slots.

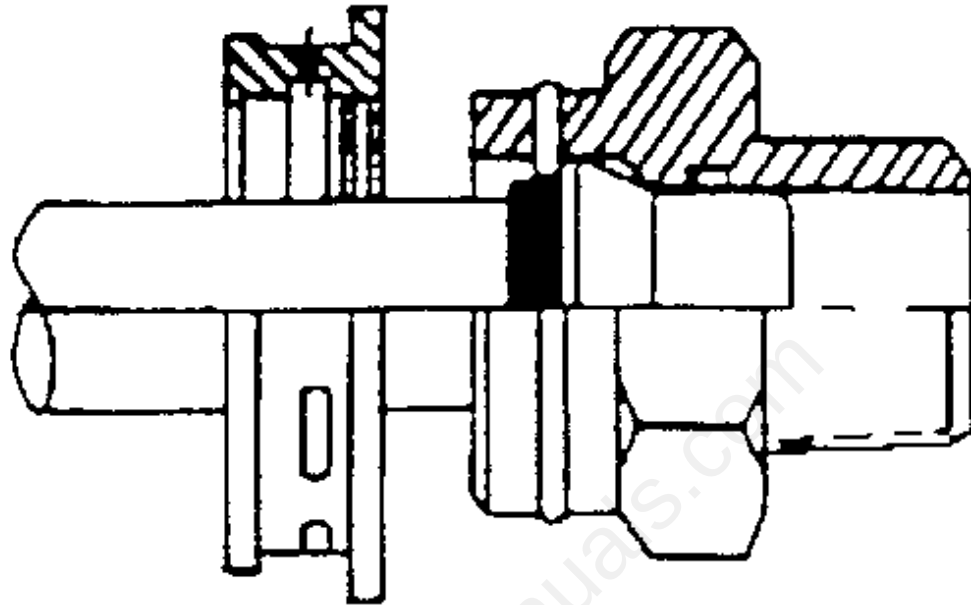


Fig. 24: View Of Cooler Line Quick Connect Fitting
Courtesy of GENERAL MOTORS COMPANY

2. Install the cooler line into the quick connect fitting.
3. Insert the cooler line end into the quick connect fitting until a click is either heard or felt.

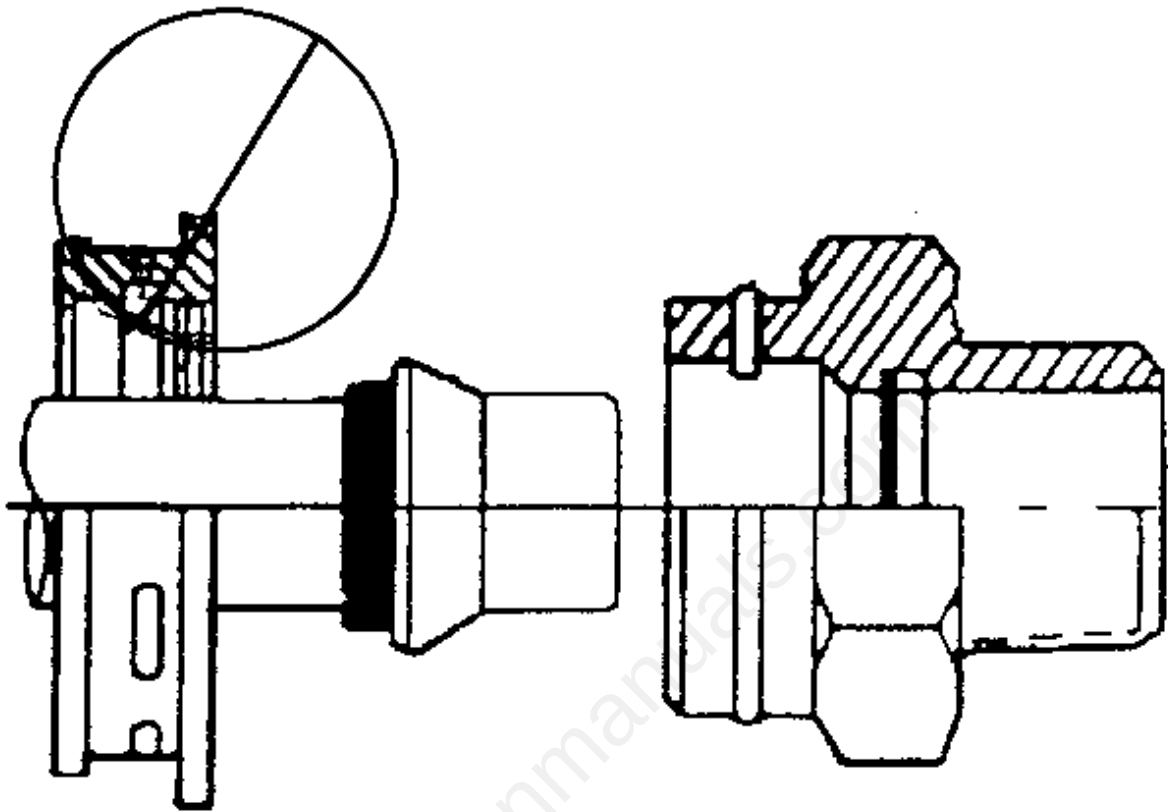


Fig. 25: Cooler Line And Fitting Caution

Courtesy of GENERAL MOTORS COMPANY

4. Do not use the plastic cap on the cooler line in order to install the cooler line into the fitting.
5. Pull back sharply on the cooler line in order to ensure that the cooler line is fastened into the quick connect fitting.

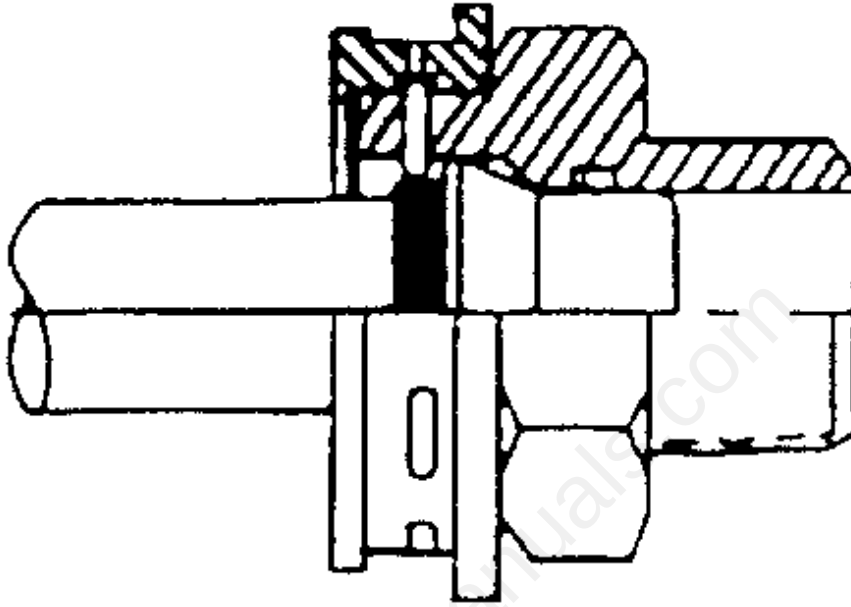


Fig. 26: View Of Cooler Line & Plastic Cap

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not manually depress the retaining clip when installing the plastic cap.

6. Position (snap) the plastic cap onto the fitting. Do not manually depress the retaining ring when installing the plastic cap onto the quick connect fitting.
7. Ensure that the plastic cap is fully seated against the fitting.

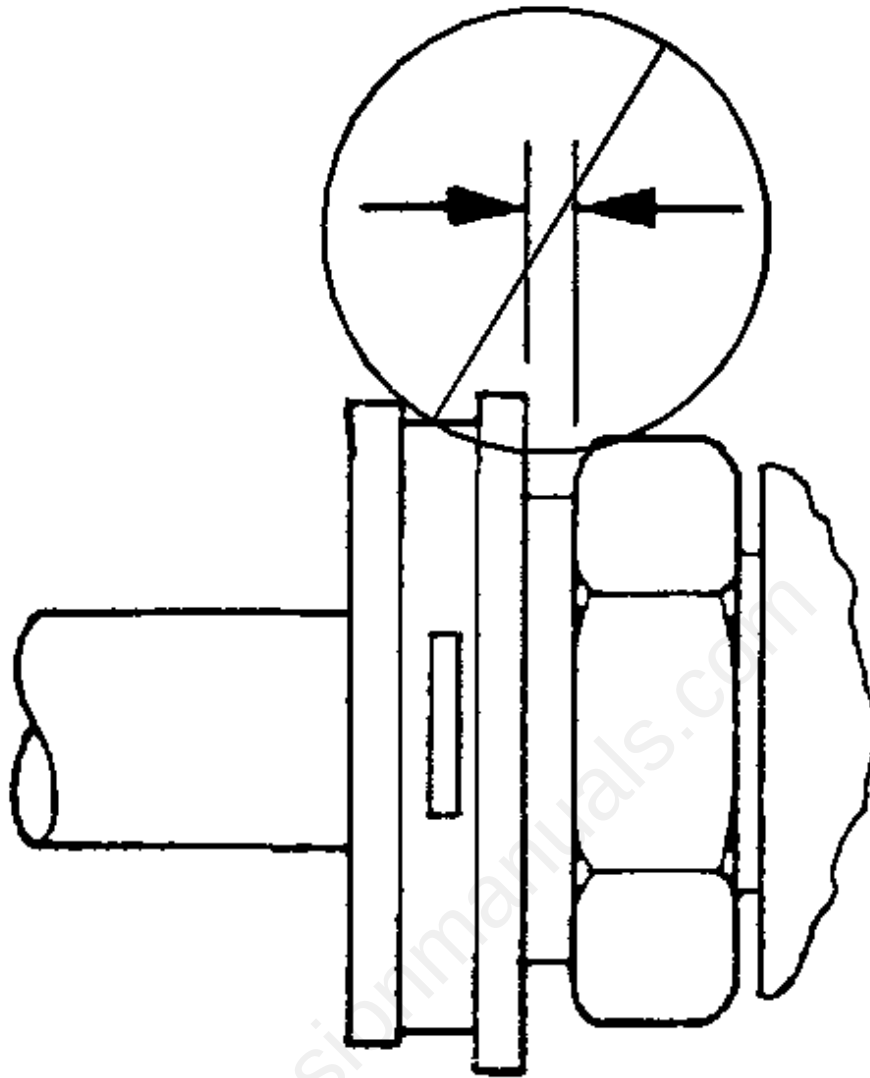


Fig. 27: Checking For Gap Between Cap & Fitting
Courtesy of GENERAL MOTORS COMPANY

8. Ensure that no gap is present between the cap and the fitting.

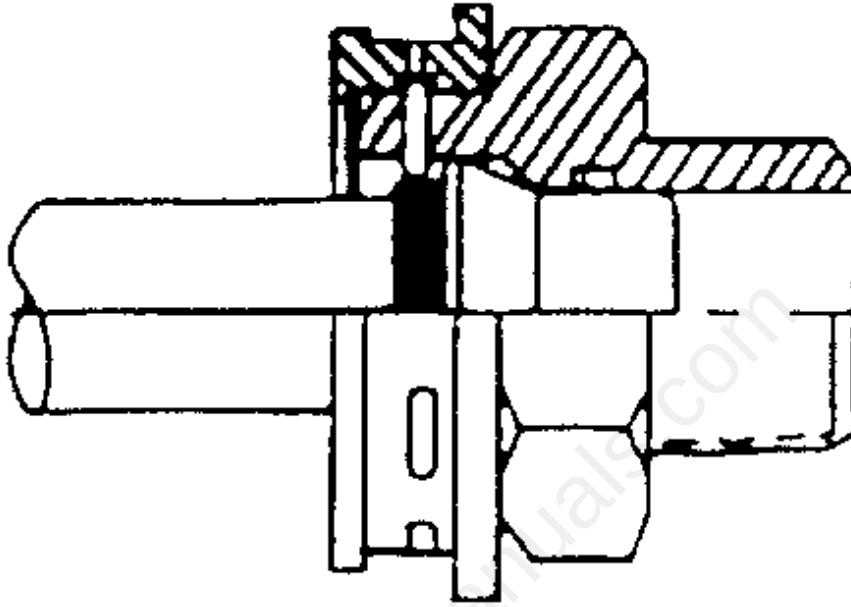


Fig. 28: View Of Cooler Line & Plastic Cap

Courtesy of GENERAL MOTORS COMPANY

9. Ensure that the yellow identification band on the tube is hidden within the quick connect fitting.

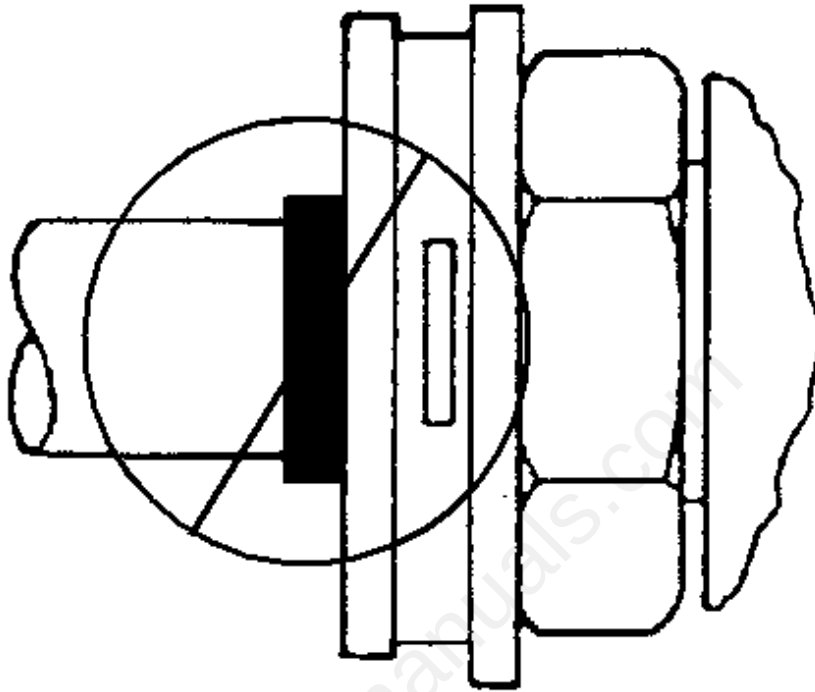


Fig. 29: Improper Joint Seating

Courtesy of GENERAL MOTORS COMPANY

10. A hidden yellow identification band indicates proper joint seating.
11. Fill the transmission to the proper level with DEXRON® VI transmission fluid.

TRANSMISSION FLUID COOLER INLET AND OUTLET PIPE REPLACEMENT (LFX)

Removal Procedure

1. Reposition any wiring harnesses out of the way of the transmission fluid cooler inlet and outlet pipe as necessary.

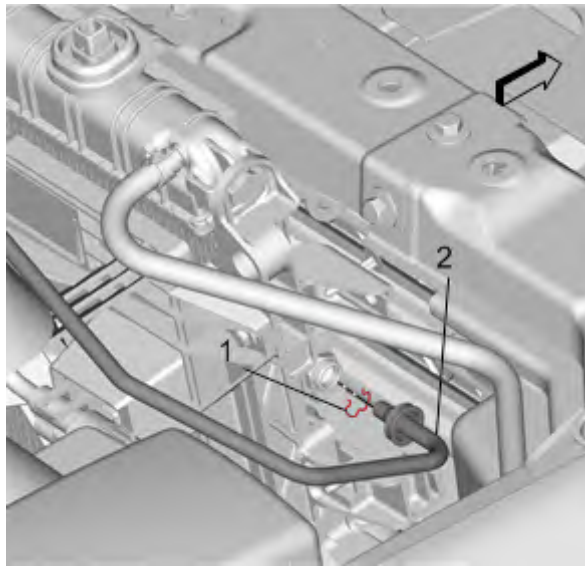


Fig. 30: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

2. Remove Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser
Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

3. Remove Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser

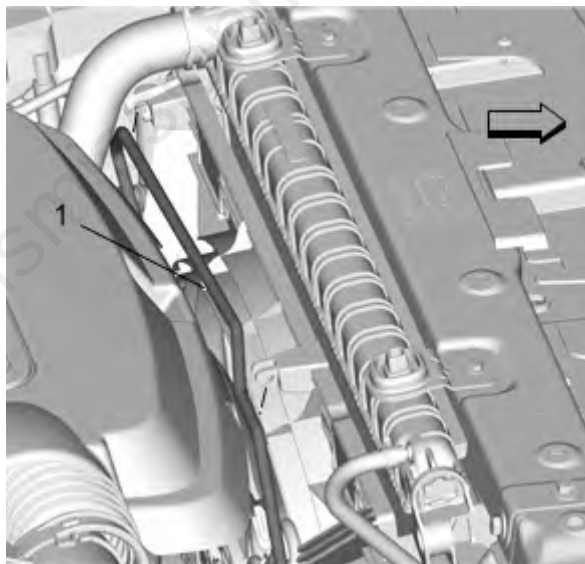


Fig. 31: Engine Coolant Fan Shroud

Courtesy of GENERAL MOTORS COMPANY

4. Unclip the transmission fluid cooler inlet and outlet pipe from the engine coolant fan shroud.(1)

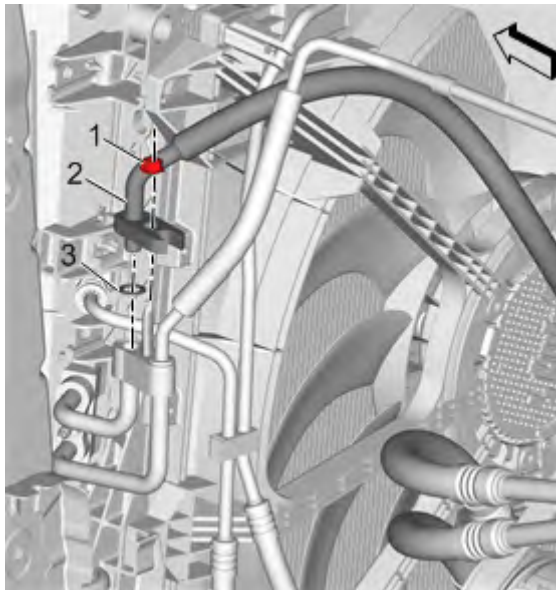


Fig. 32: Air Conditioning Compressor Hose Nut And Air Conditioning Compressor Hose
Courtesy of GENERAL MOTORS COMPANY

5. Separate Air Conditioning Compressor Hose (2) @Air Conditioning Condenser **Air Conditioning Compressor Hose Replacement (LFX)**

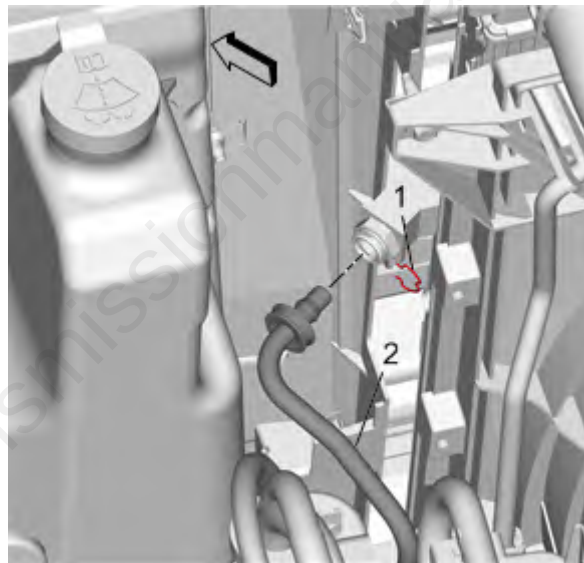


Fig. 33: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

6. Remove Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1)@Air Conditioning Condenser. **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

7. Remove Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser.
8. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
9. Reposition any wiring harnesses out of the way of the transmission fluid cooler inlet and outlet pipe as necessary.

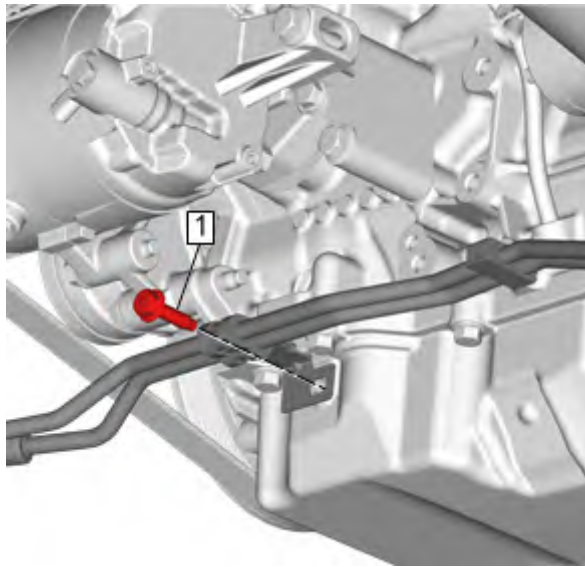


Fig. 34: Transmission Fluid Cooler Pipe Clip Bolt
Courtesy of GENERAL MOTORS COMPANY

10. Remove the transmission fluid cooler pipe clip bolt (1) from the engine oil pan.

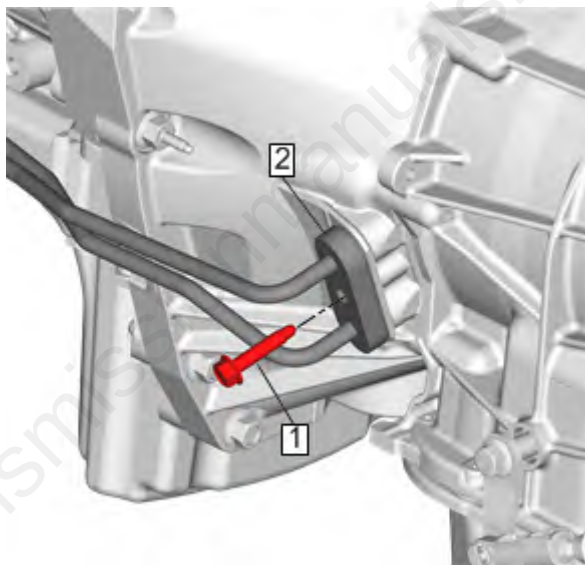


Fig. 35: Transmission Fluid Cooler Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

11. Remove the transmission fluid cooler pipe bolt (1) from the transmission.

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

12. Remove the transmission fluid cooler inlet and outlet pipe (2) from the transmission.

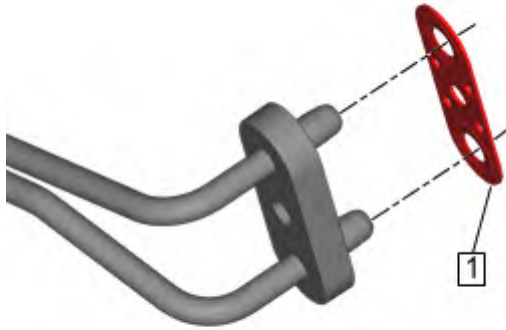


Fig. 36: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
Courtesy of GENERAL MOTORS COMPANY

13. Remove the transmission fluid cooler inlet and outlet pipe seal (1).

DISCARD the seal.

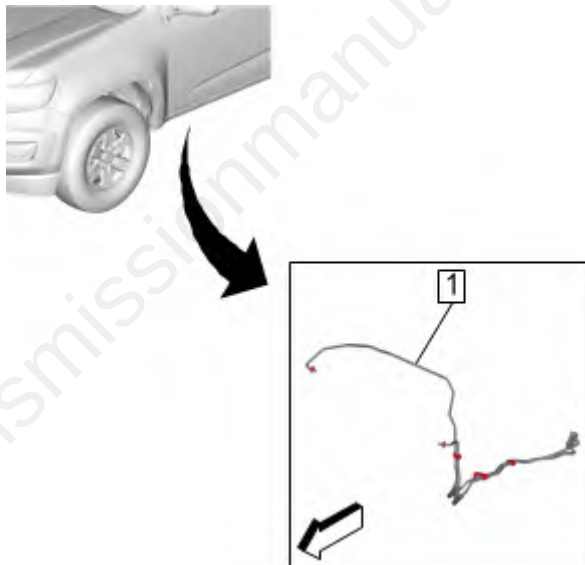


Fig. 37: Transmission Fluid Cooler Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

14. Remove the transmission fluid cooler inlet and outlet pipe (1) from the vehicle.

Installation Procedure

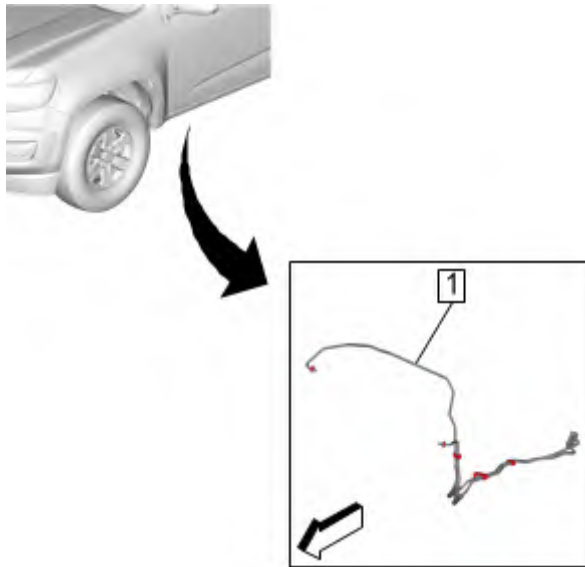


Fig. 38: Transmission Fluid Cooler Inlet And Outlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

1. Position the transmission fluid cooler inlet and outlet pipe (1) on the vehicle.

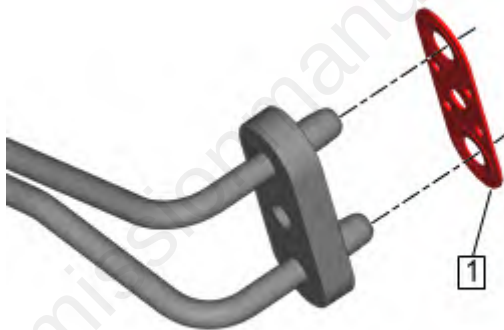


Fig. 39: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
 Courtesy of GENERAL MOTORS COMPANY

2. Install a NEW transmission fluid cooler inlet and outlet pipe seal (1).

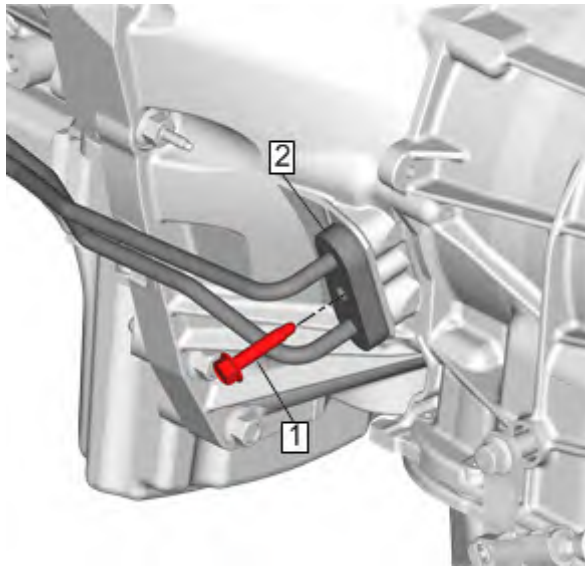


Fig. 40: Transmission Fluid Cooler Pipe Bolt
 Courtesy of GENERAL MOTORS COMPANY

3. Install the transmission fluid cooler inlet and outlet pipe (2) in the transmission.

CAUTION: Refer to [Fastener Caution](#) .

4. Install the transmission fluid cooler pipe bolt (1) in the transmission and tighten to 22 N.m (16 lb ft).

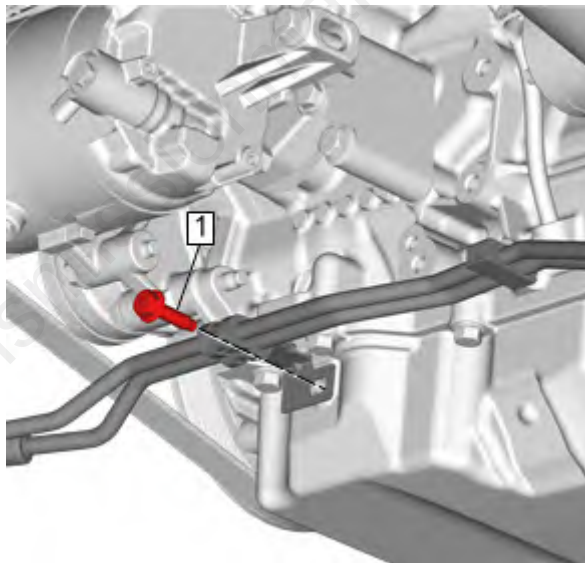


Fig. 41: Transmission Fluid Cooler Pipe Clip Bolt
 Courtesy of GENERAL MOTORS COMPANY

5. Install the transmission fluid cooler pipe clip bolt (1) in the engine oil pan and tighten to 22 N.m (16 lb ft).
6. Route any wiring harnesses previously moved to their original routing as necessary.

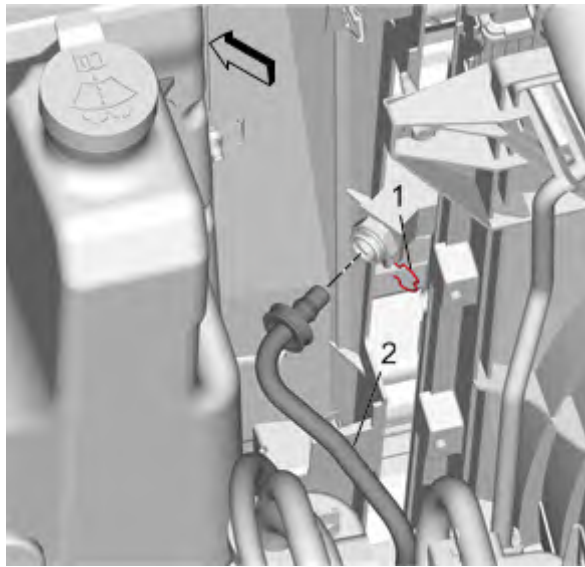


Fig. 42: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

7. Install Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser
Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection
8. Install Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser

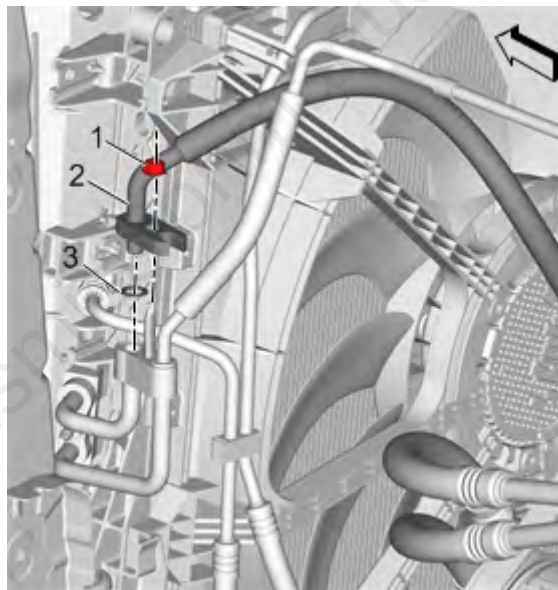


Fig. 43: Air Conditioning Compressor Hose Nut And Air Conditioning Compressor Hose

Courtesy of GENERAL MOTORS COMPANY

9. Install Air Conditioning Compressor Hose (2) @Air Conditioning Condenser Air Conditioning Compressor Hose Replacement (LFX)

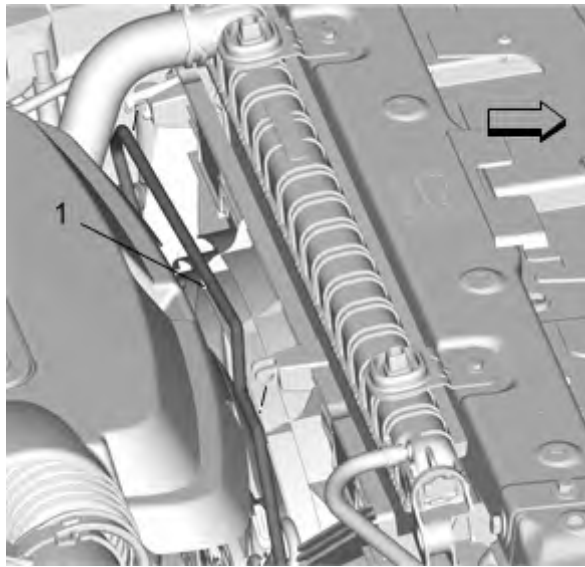


Fig. 44: Engine Coolant Fan Shroud

Courtesy of GENERAL MOTORS COMPANY

10. Clip the transmission fluid cooler inlet and outlet pipe to the engine coolant fan shroud (1)

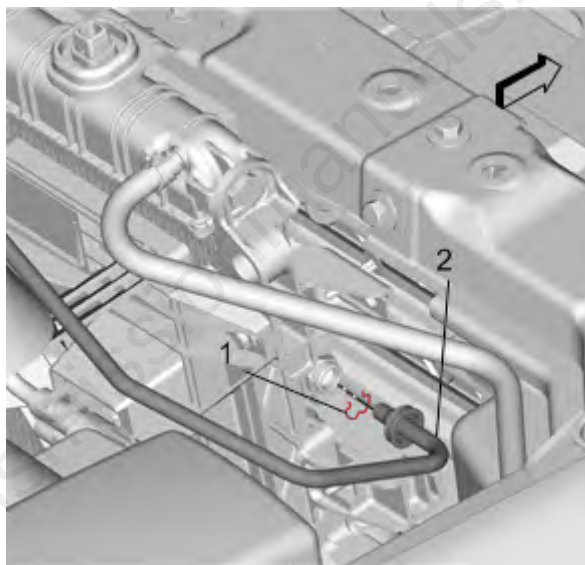


Fig. 45: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

11. Install Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser. **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**
12. Install Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser
13. Route any wiring harnesses previously moved to their original routing as necessary.
14. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Level and Condition Check**
15. Inspect for transmission fluid leaks.

TRANSMISSION FLUID COOLER INLET AND OUTLET PIPE REPLACEMENT (LCV)

Removal Procedure

on any wiring harnesses out of the way of the transmission fluid cooler inlet and outlet pipe as necessary.

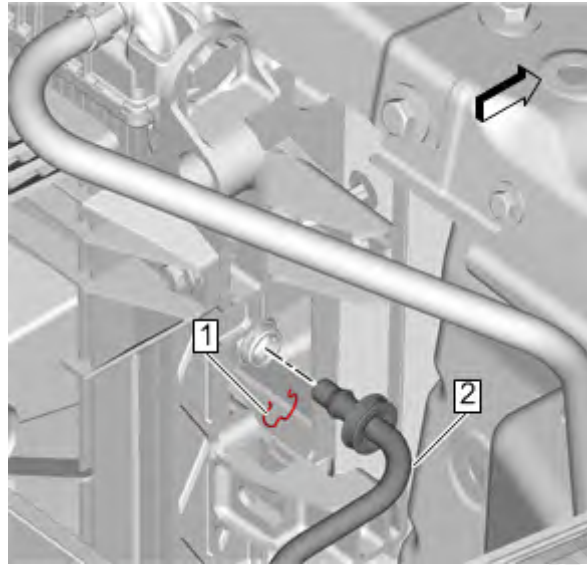


Fig. 46: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

2. Remove Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser
Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection

NOTE: **Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.**

3. Remove Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser

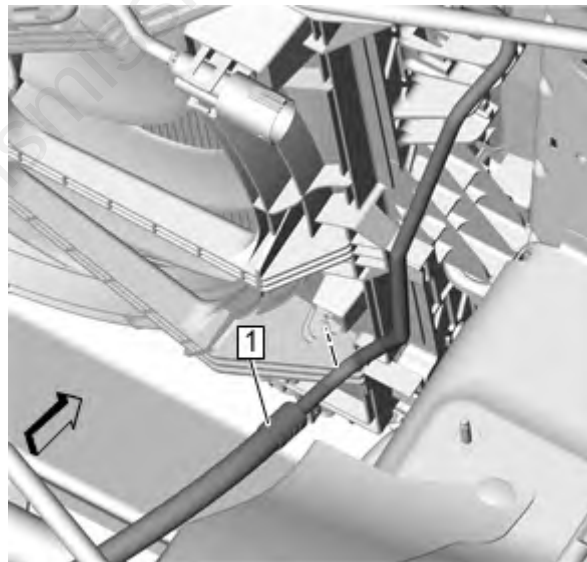


Fig. 47: Engine Coolant Fan Shroud

Courtesy of GENERAL MOTORS COMPANY

4. Unclip the transmission fluid cooler inlet and outlet pipe from the engine coolant fan shroud (1).

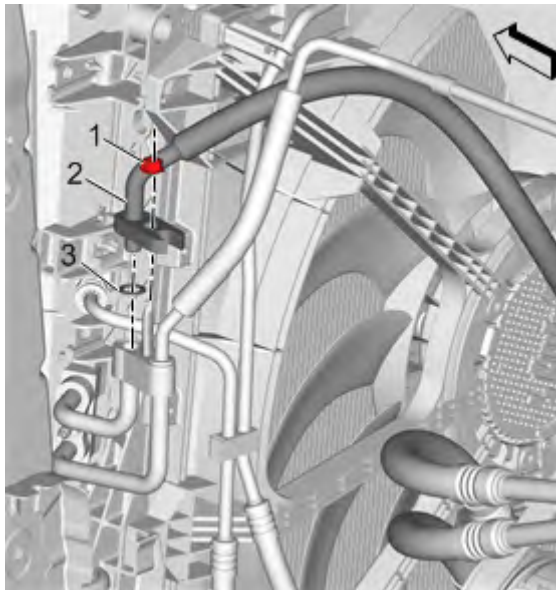


Fig. 48: Air Conditioning Compressor Hose Nut And Air Conditioning Compressor Hose
 Courtesy of GENERAL MOTORS COMPANY

5. Separate Air Conditioning Compressor Hose (2) @Air Conditioning Condenser **Air Conditioning Compressor Hose Replacement (LCV)**

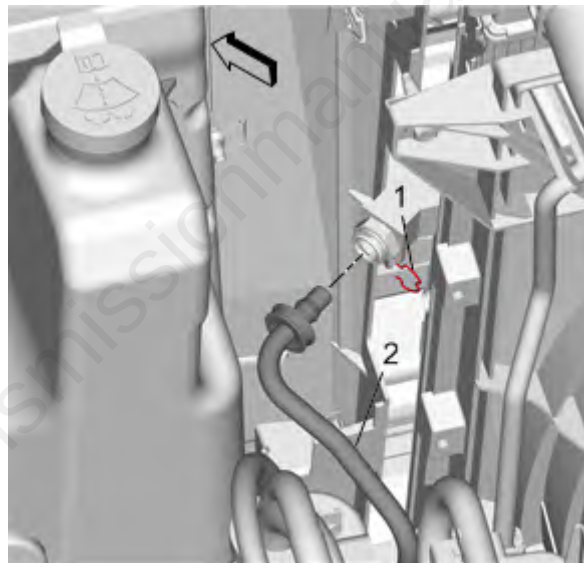


Fig. 49: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

6. Remove Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

7. Remove Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser

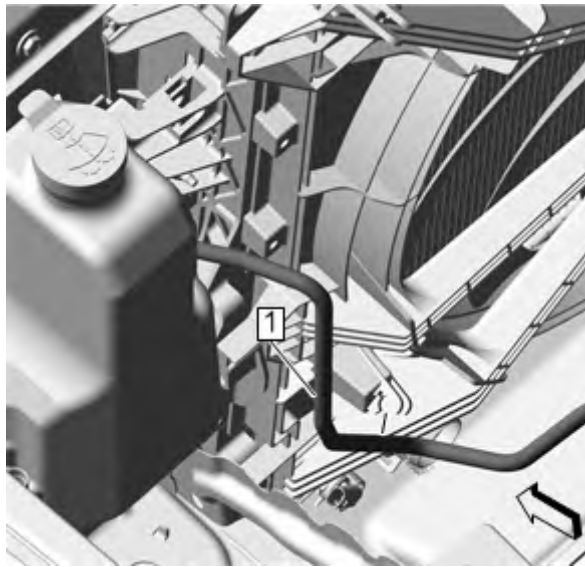


Fig. 50: Engine Coolant Fan Shroud

Courtesy of GENERAL MOTORS COMPANY

8. Unclip the transmission fluid cooler inlet and outlet pipe from the engine coolant fan shroud (1).
9. Raise and support the vehicle. [Lifting and Jacking the Vehicle](#)
10. Remove Underbody Splash Shield. [Underbody Splash Shield Replacement](#)
11. Reposition any wiring harnesses out of the way of the transmission fluid cooler inlet and outlet pipe as necessary.

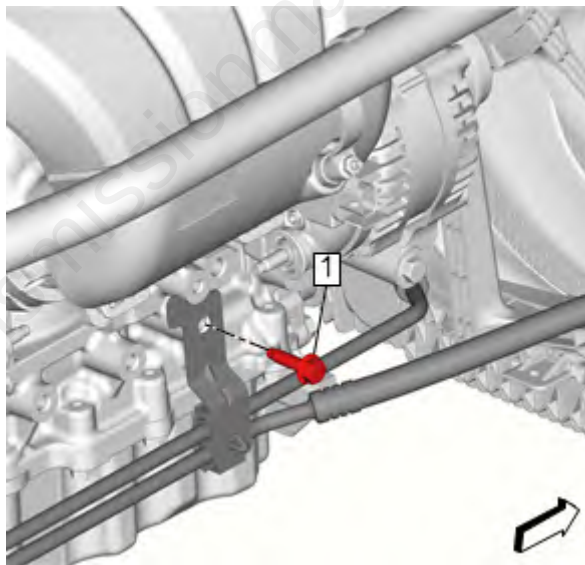


Fig. 51: Transmission Fluid Cooler Pipe Clip Bolt

Courtesy of GENERAL MOTORS COMPANY

12. Remove the transmission fluid cooler pipe clip bolt (1) from the engine oil pan.

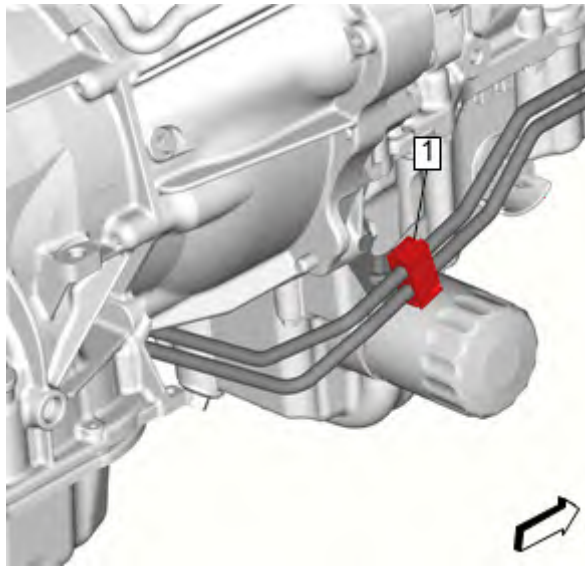


Fig. 52: Plastic Transmission Fluid Cooler Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

13. Open the plastic transmission fluid cooler pipe clip (1).

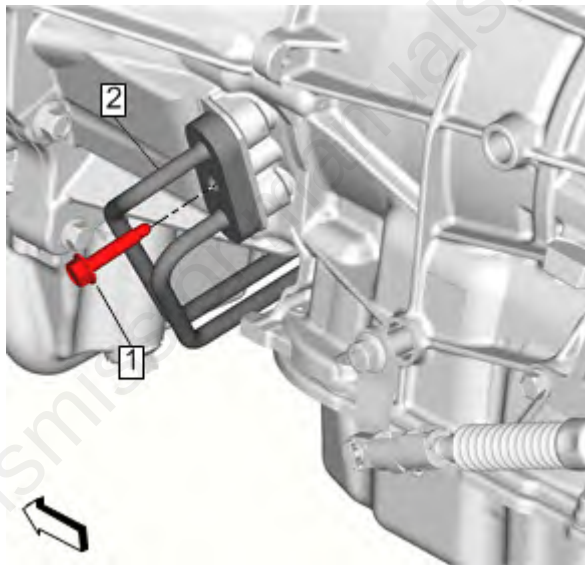


Fig. 53: Transmission Fluid Cooler Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

14. Remove the transmission fluid cooler pipe bolt (1) from the transmission.

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

15. Remove the transmission fluid cooler inlet and outlet pipe (2) from the transmission.

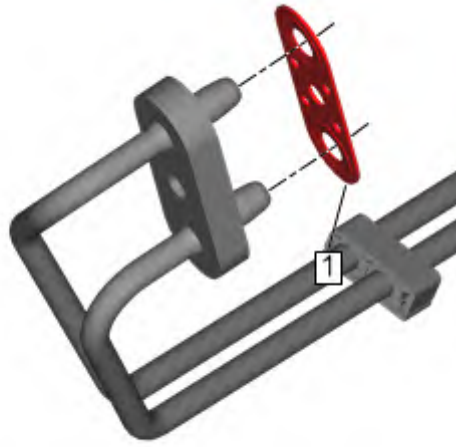


Fig. 54: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
 Courtesy of GENERAL MOTORS COMPANY

16. Remove the transmission fluid cooler inlet and outlet pipe seal (1).

DISCARD the seal.

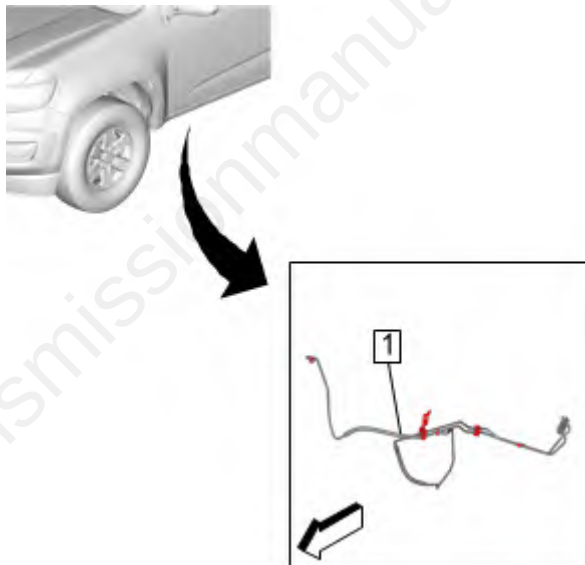


Fig. 55: Transmission Fluid Cooler Inlet And Outlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

17. Remove the transmission fluid cooler inlet and outlet pipe (1) from the vehicle.

Installation Procedure

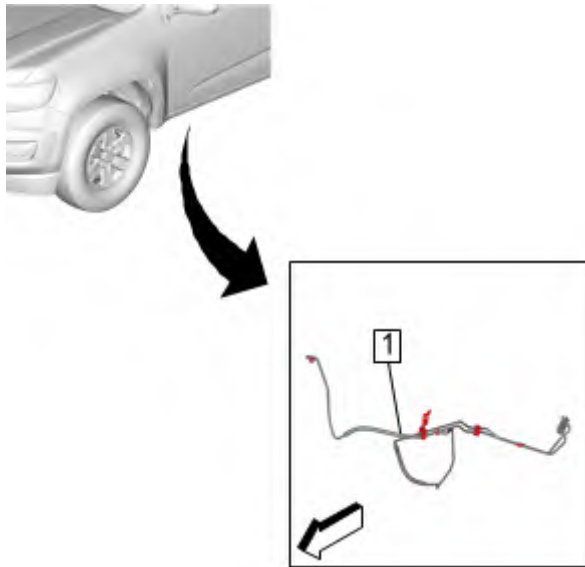


Fig. 56: Transmission Fluid Cooler Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

1. Position the transmission fluid cooler inlet and outlet pipe (1) on the vehicle.

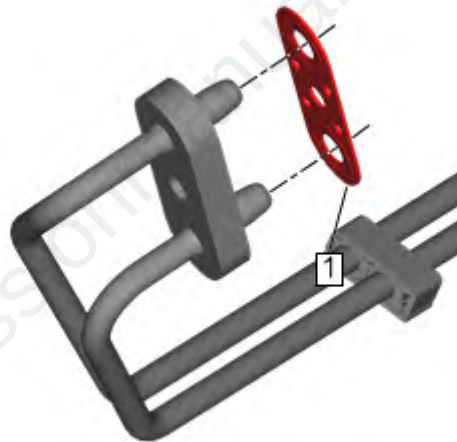


Fig. 57: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
Courtesy of GENERAL MOTORS COMPANY

2. Install a NEW transmission fluid cooler inlet and outlet pipe seal (1).

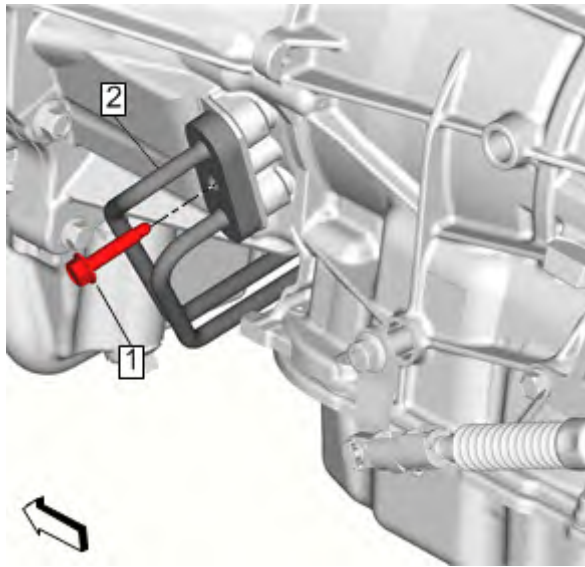


Fig. 58: Transmission Fluid Cooler Pipe Bolt
 Courtesy of GENERAL MOTORS COMPANY

3. Install the transmission fluid cooler inlet and outlet pipe (2) in the transmission.

CAUTION: Refer to [Fastener Caution](#) .

4. Install the transmission fluid cooler pipe bolt (1) in the transmission and tighten to 22 N.m (16 lb ft).

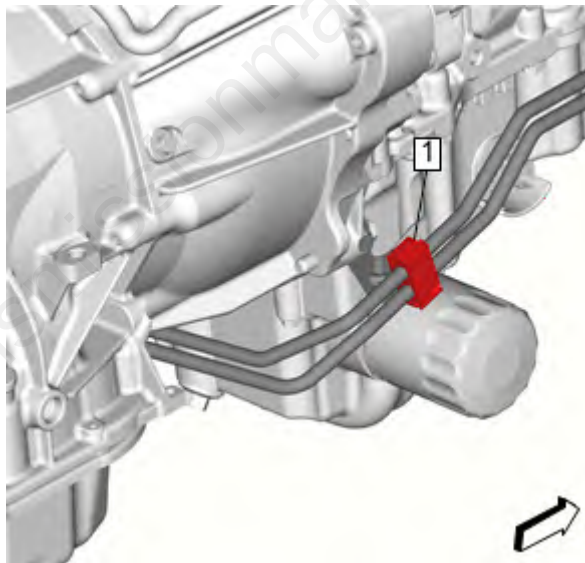


Fig. 59: Plastic Transmission Fluid Cooler Pipe Clip
 Courtesy of GENERAL MOTORS COMPANY

5. Close the plastic transmission fluid cooler pipe clip (1).

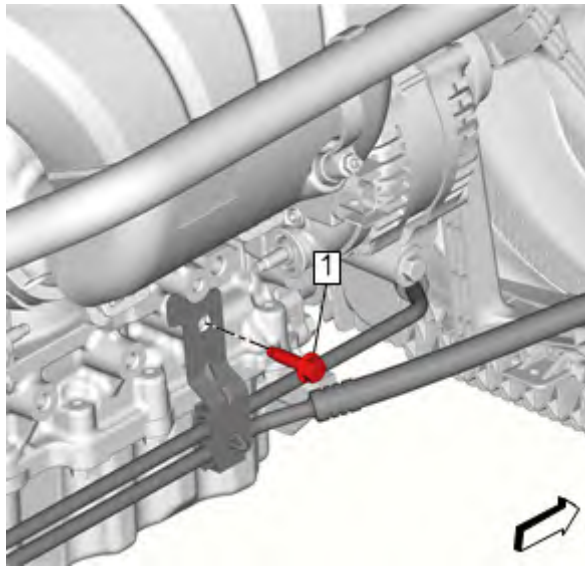


Fig. 60: Transmission Fluid Cooler Pipe Clip Bolt
 Courtesy of GENERAL MOTORS COMPANY

6. Install the transmission fluid cooler pipe clip bolt (1) in the engine oil pan and tighten to 58 N.m (43 lb ft).
7. Route any wiring harnesses previously moved to their original routing as necessary.
8. Install Underbody Splash Shield. **Underbody Splash Shield Replacement**

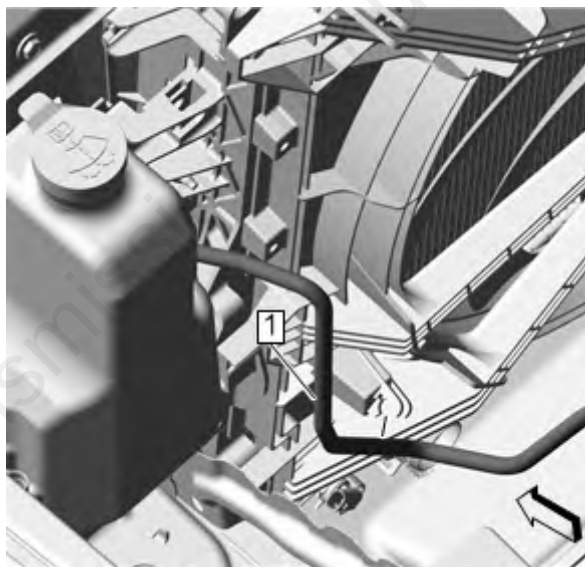


Fig. 61: Engine Coolant Fan Shroud
 Courtesy of GENERAL MOTORS COMPANY

9. Clip the transmission fluid cooler inlet and outlet pipe to the engine coolant fan shroud.(1)

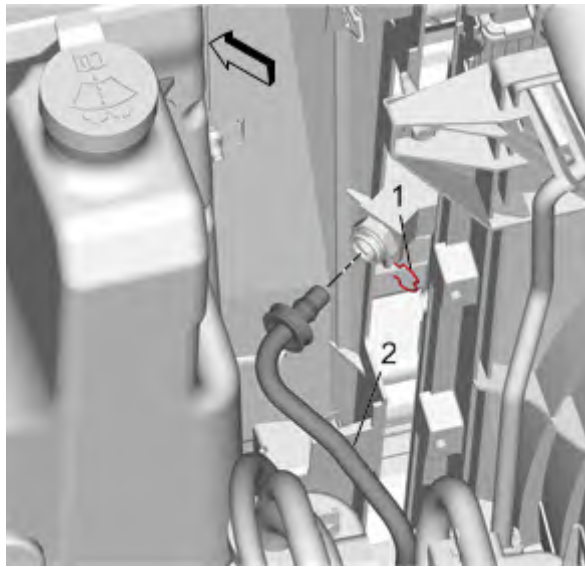


Fig. 62: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser
- Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**
11. Install Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser

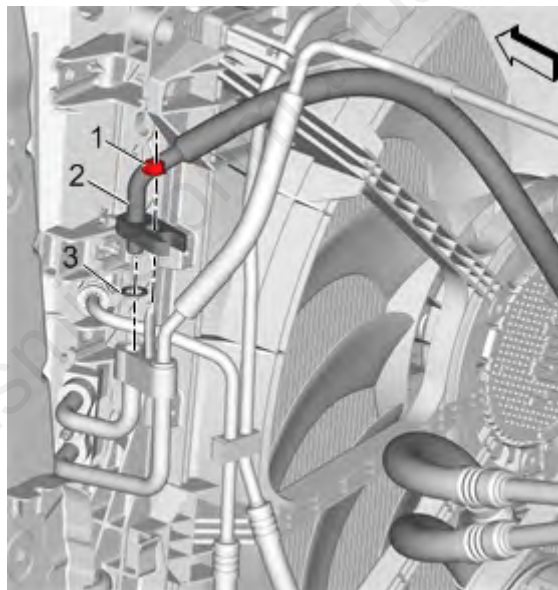


Fig. 63: Air Conditioning Compressor Hose Nut And Air Conditioning Compressor Hose

Courtesy of GENERAL MOTORS COMPANY

12. Install Air Conditioning Compressor Hose (2) @Air Conditioning Condenser **Air Conditioning Compressor Hose Replacement (LCV)**

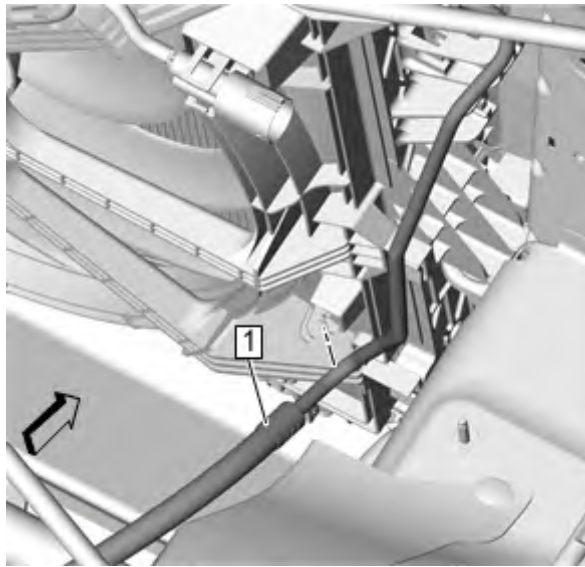


Fig. 64: Engine Coolant Fan Shroud

Courtesy of GENERAL MOTORS COMPANY

13. Clip the transmission fluid cooler inlet and outlet pipe to the engine coolant fan shroud.(1)

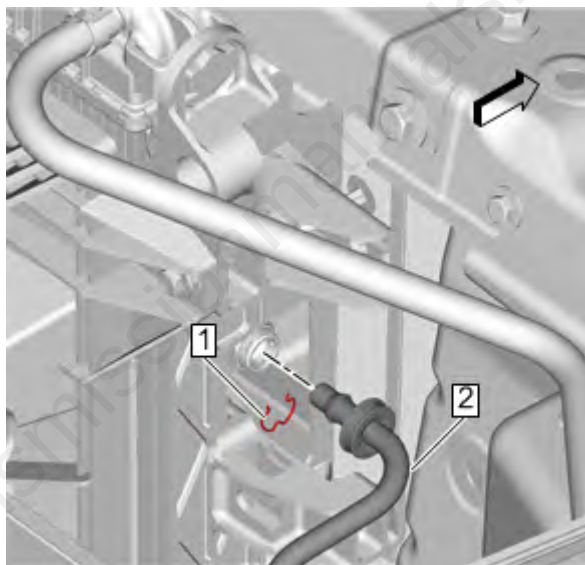


Fig. 65: Transmission Fluid Cooler Inlet And Outlet Pipe Retaining Clip

Courtesy of GENERAL MOTORS COMPANY

14. Install Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (1) @Air Conditioning Condenser
Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection
15. Install Transmission Fluid Cooler Inlet and Outlet Pipe (2) @Air Conditioning Condenser
16. Route any wiring harnesses previously moved to their original routing as necessary.
17. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Level and Condition Check**
18. Inspect for transmission fluid leaks.

TRANSMISSION FLUID COOLER INLET AND OUTLET PIPE REPLACEMENT (LWN)

Removal Procedure

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

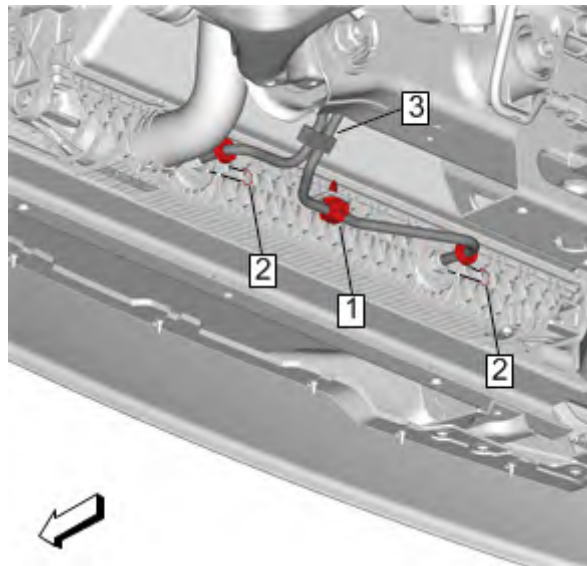


Fig. 66: Transmission Fluid Cooler Inlet and Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

3. Open the plastic transmission fluid cooler pipe clip (1).
4. Remove Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (2) @Radiator. [Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection](#)

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

5. Remove Transmission Fluid Cooler Inlet and Outlet Pipe (3) @Radiator.

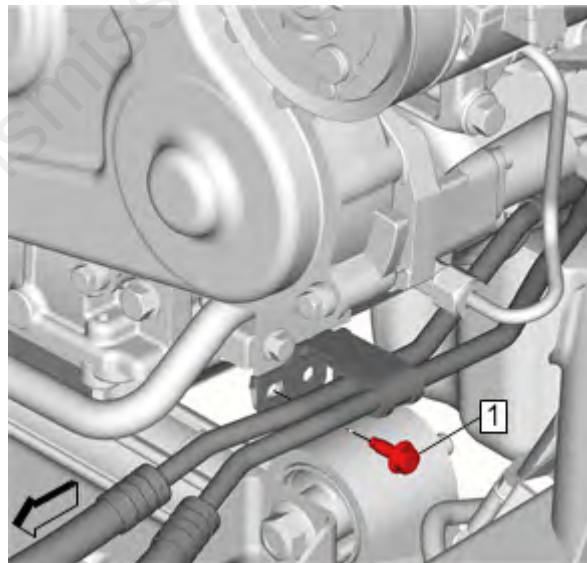


Fig. 67: Transmission Fluid Cooler Pipe Clip Bolt And Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Remove the transmission fluid cooler pipe clip bolt (1) from the bracket.

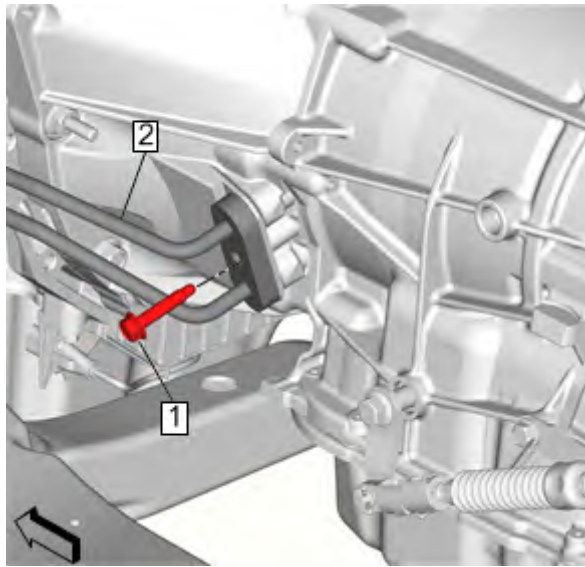


Fig. 68: Transmission Fluid Cooler Pipe Bolt
 Courtesy of GENERAL MOTORS COMPANY

7. Remove the transmission fluid cooler pipe bolt (1).

NOTE: Cover or plug all open transmission fluid cooler pipe connection points to help avoid any accidental contamination.

8. Remove the transmission fluid cooler inlet and outlet pipe (2) from the transmission.

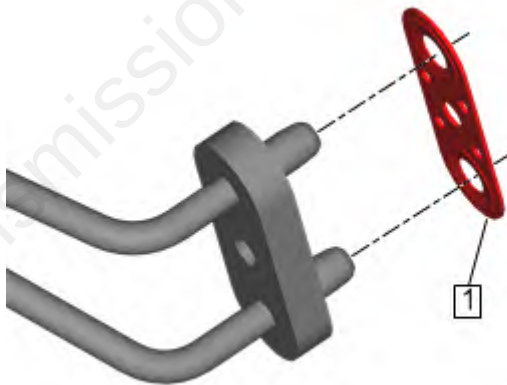


Fig. 69: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
 Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission fluid cooler inlet and outlet pipe seal (1).

DISCARD the seal.

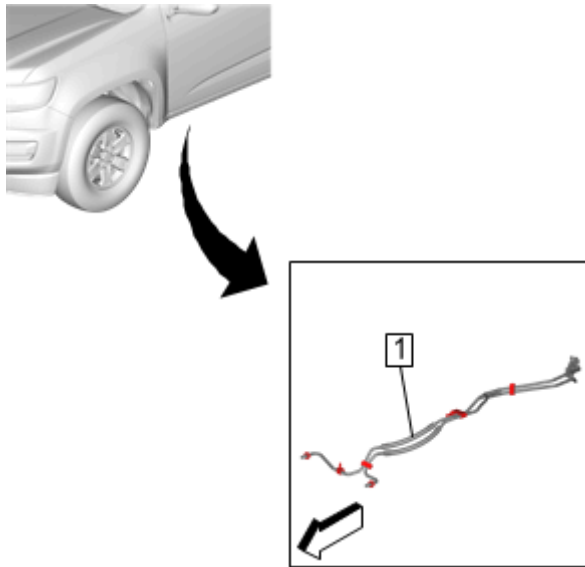


Fig. 70: Transmission Fluid Cooler Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

10. Remove the transmission fluid cooler inlet and outlet pipe (1) from the vehicle.

Installation Procedure

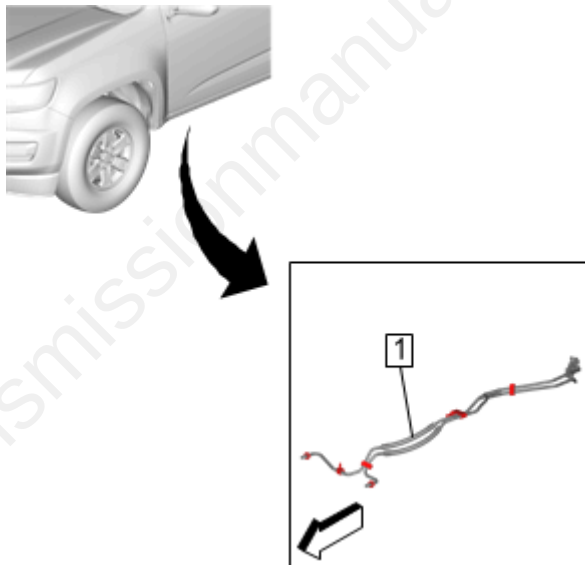


Fig. 71: Transmission Fluid Cooler Inlet And Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

1. Position the transmission fluid cooler inlet and outlet pipe (1) on the vehicle.

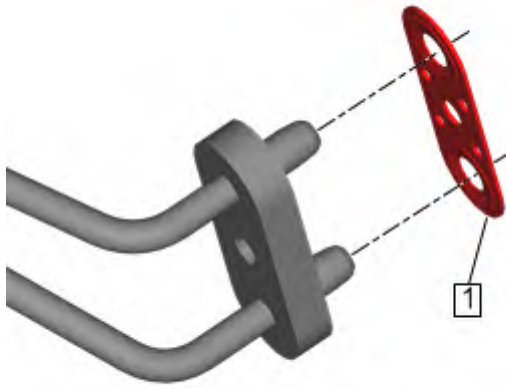


Fig. 72: Transmission Fluid Cooler Inlet And Outlet Pipe Seal
 Courtesy of GENERAL MOTORS COMPANY

2. Install a NEW transmission fluid cooler inlet and outlet pipe seal (1).

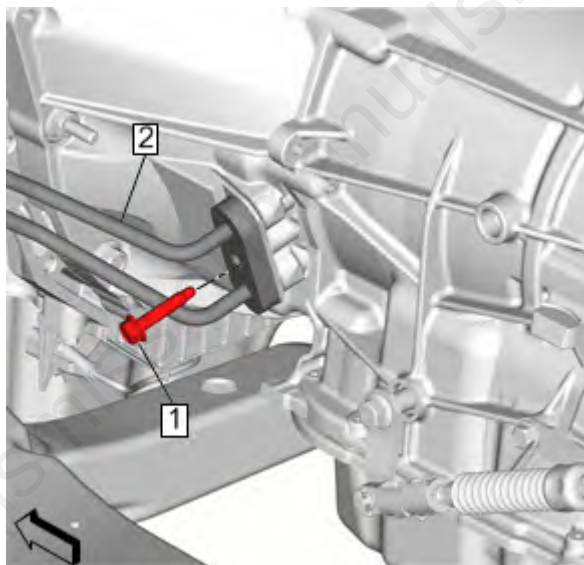


Fig. 73: Transmission Fluid Cooler Pipe Bolt
 Courtesy of GENERAL MOTORS COMPANY

3. Install the transmission fluid cooler inlet and outlet pipe (2) in the transmission.

CAUTION: Refer to [Fastener Caution](#) .

4. Install the transmission fluid cooler pipe bolt (1) and tighten to 22 N.m (16 lb ft).

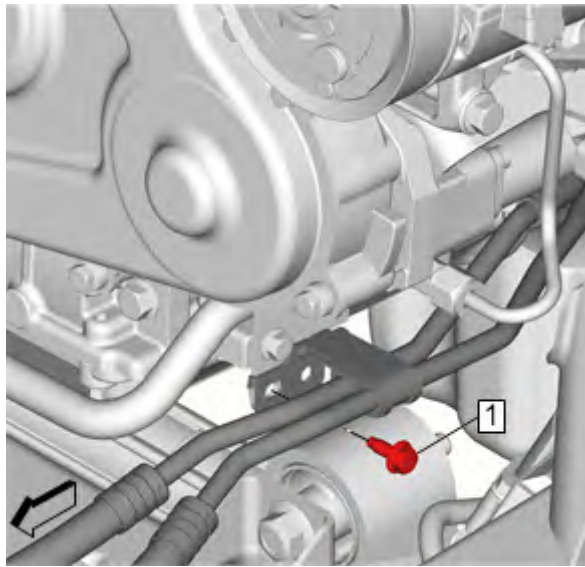


Fig. 74: Transmission Fluid Cooler Pipe Clip Bolt And Bracket
 Courtesy of GENERAL MOTORS COMPANY

5. Install the transmission fluid cooler pipe clip bolt (1) in the bracket and tighten to 11 N.m (97 lb in).

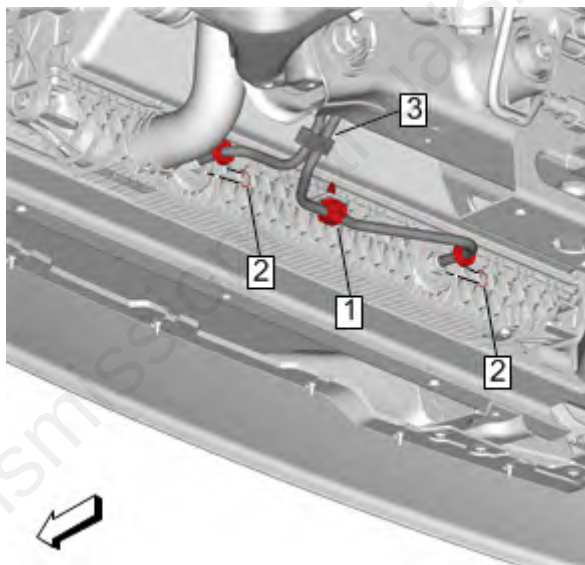


Fig. 75: Transmission Fluid Cooler Inlet and Outlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

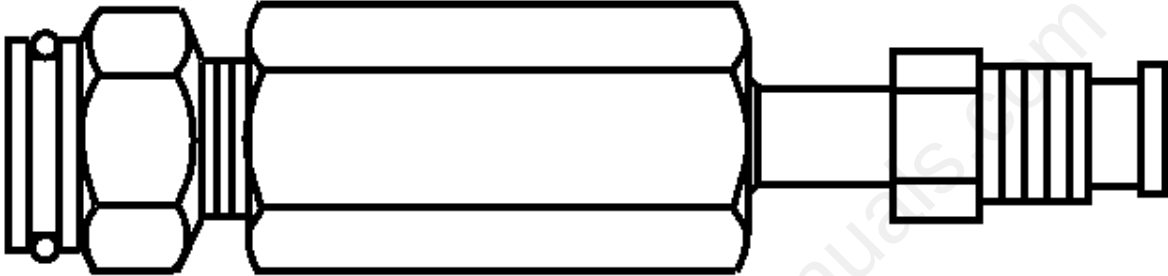
6. Install Transmission Fluid Cooler Inlet and Outlet Pipe Retaining Clip (2) @Radiator **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**
7. Install Transmission Fluid Cooler Inlet and Outlet Pipe (3) @Radiator
8. Close the plastic transmission fluid cooler pipe clip (1).
9. Install Underbody Splash Shield.**Underbody Splash Shield Replacement**
10. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Level and Condition Check**
11. Inspect for transmission fluid leaks.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	DT-45096 J-45096 Transmission Cooler Flusher

Illustration	Tool Number/ Description
 The image shows two blue metal flush adapters. Each adapter has a long, straight body with a flange at one end and a threaded section at the other. The adapters are positioned diagonally, with one slightly above and to the right of the other. A faint watermark 'transmissionmanuals.com' is visible across the image.	DT-45096-30 J-45096-30 Cooler Line Flush Adapters

Illustration	Tool Number/ Description
	J-35944-200- A Cooler Flushing Adapter