

2017 TRANSMISSION

Transmission Cooling - CT6

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
Transmission Fluid Cooler Thermal Bypass Valve Gasket

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Transmission Fluid Cooler Inlet and Outlet Pipe Fastener	9 N.m (80 lb in)
Transmission Fluid Cooler Pipe Connector	20 N.m (15 lb ft)
Transmission Fluid Cooler Thermal Bypass Valve Bolt	22 N.m (16 lb ft)

DIAGNOSTIC INFORMATION AND PROCEDURES

TRANSMISSION FLUID COOLER FLOW TEST AND FLUSHING (8L90)

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-45096-30** 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

1. Verify that the main power switch (1) is in the OFF position.

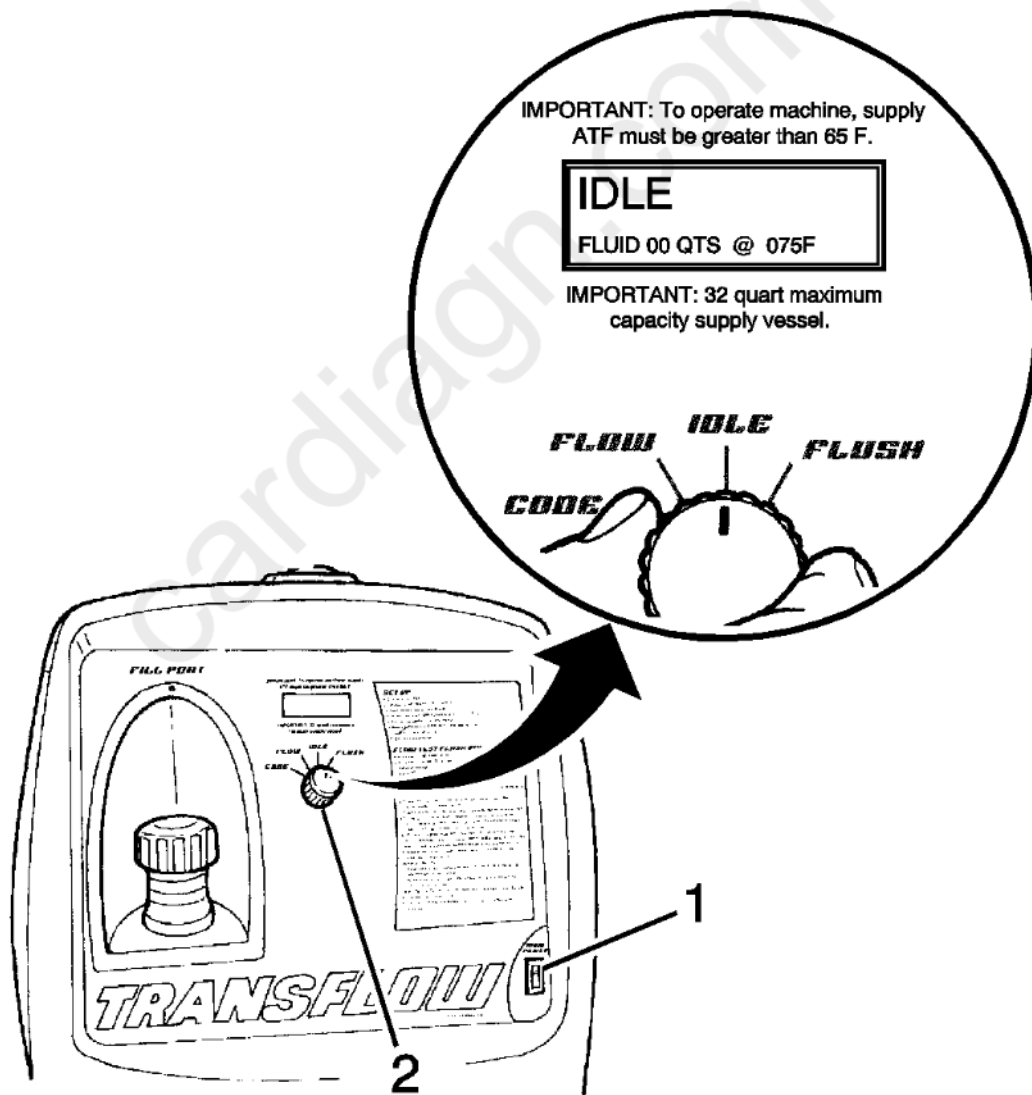


Fig. 1: View Of Main Power Switch & Main Function Switch
Courtesy of GENERAL MOTORS COMPANY

2. Place the main function switch (2) in the IDLE position.
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.

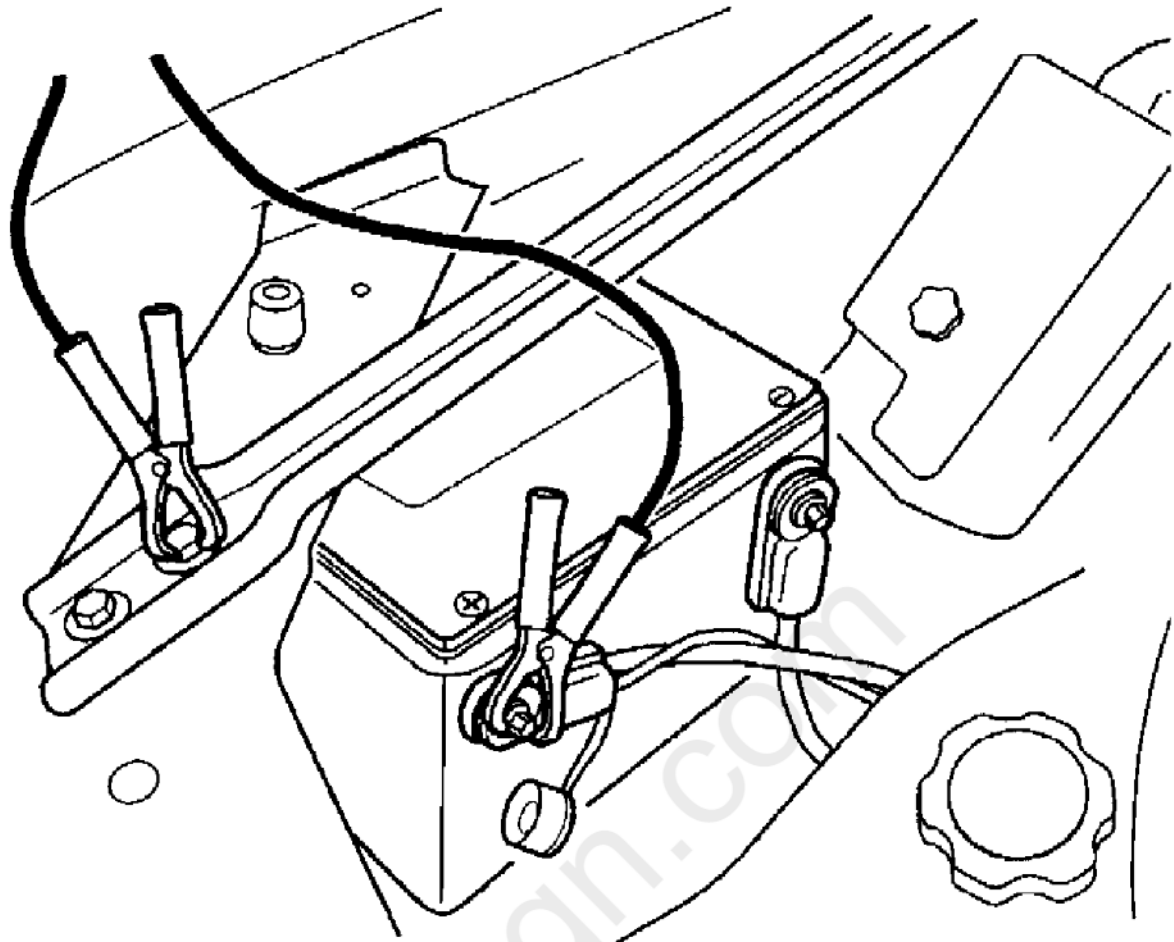


Fig. 2: Connecting To 12V DC Power Source
Courtesy of GENERAL MOTORS COMPANY

4. Turn the main power switch to the ON position.
5. Fill the supply tank with the appropriate GM automatic transmission fluid through the fill port.

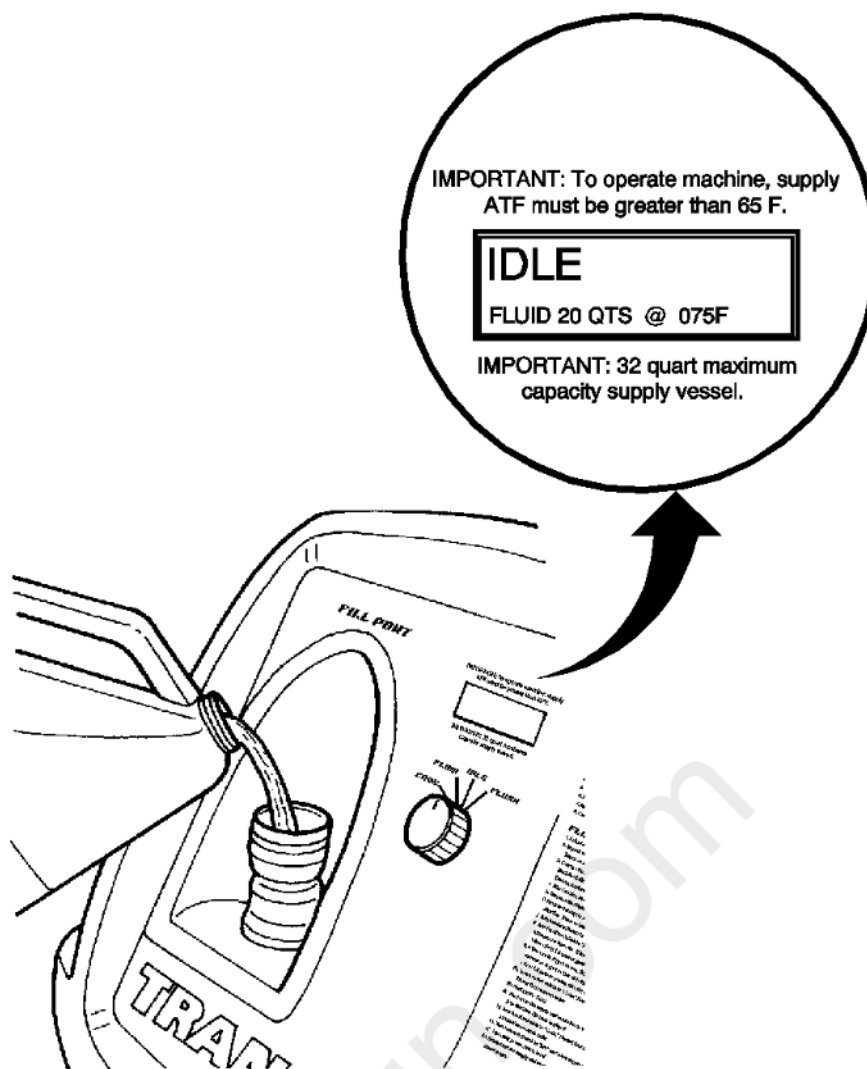


Fig. 3: Filling Supply Tank With Transmission Fluid

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).

6. Reinstall and tighten the fill cap.
7. Connect a shop air supply hose to the quick-disconnect on the rear panel marked SUPPLY AIR.

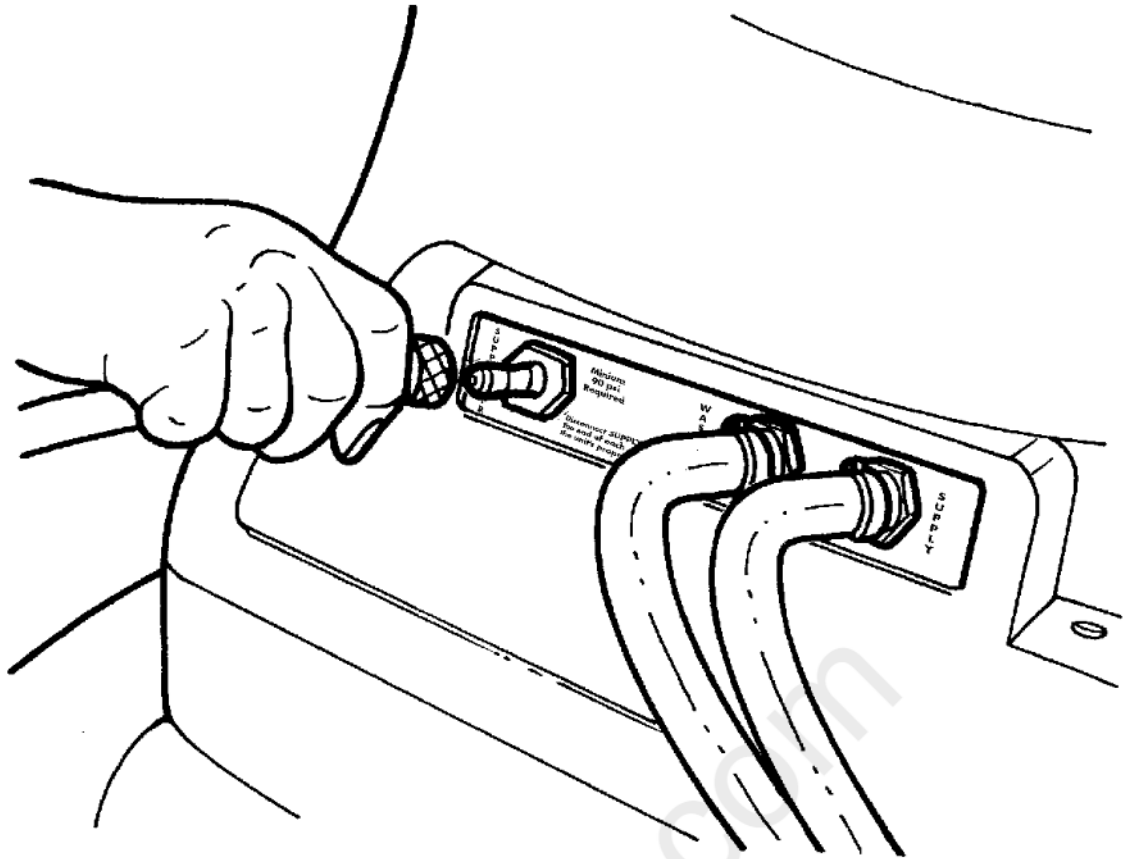


Fig. 4: Applying Shop Air Supply Hose To Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

Determine Minimum Flow Rate

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.

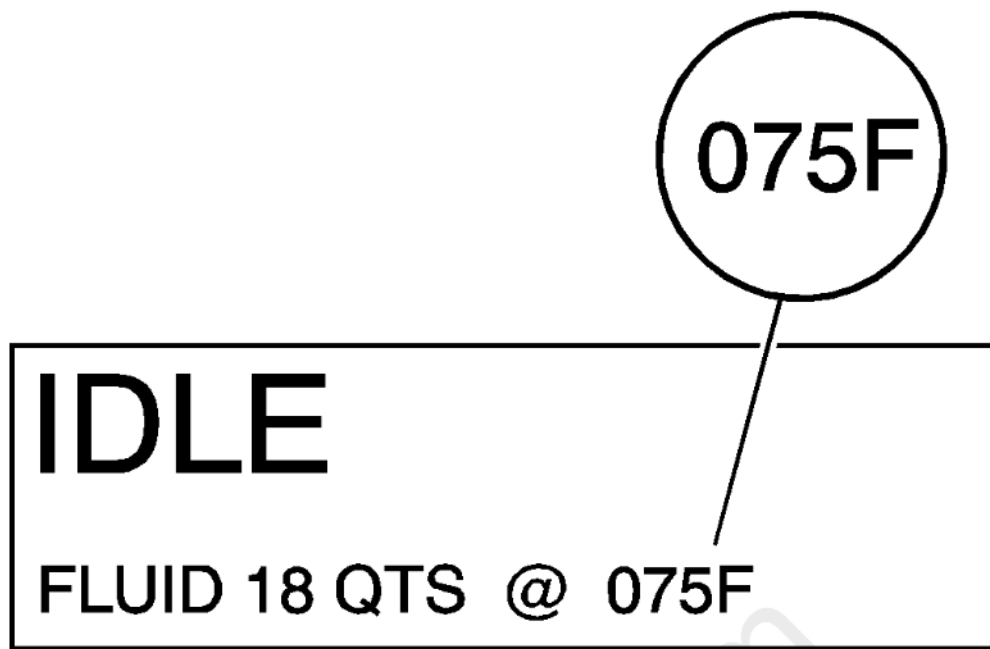


Fig. 5: Identifying Machine Display Of Automatic Transmission Fluid Temperature
Courtesy of GENERAL MOTORS COMPANY

2. Determine whether the transmission oil cooler is steel or aluminum by using a magnet (1) at the cooler flange (2) at the radiator.

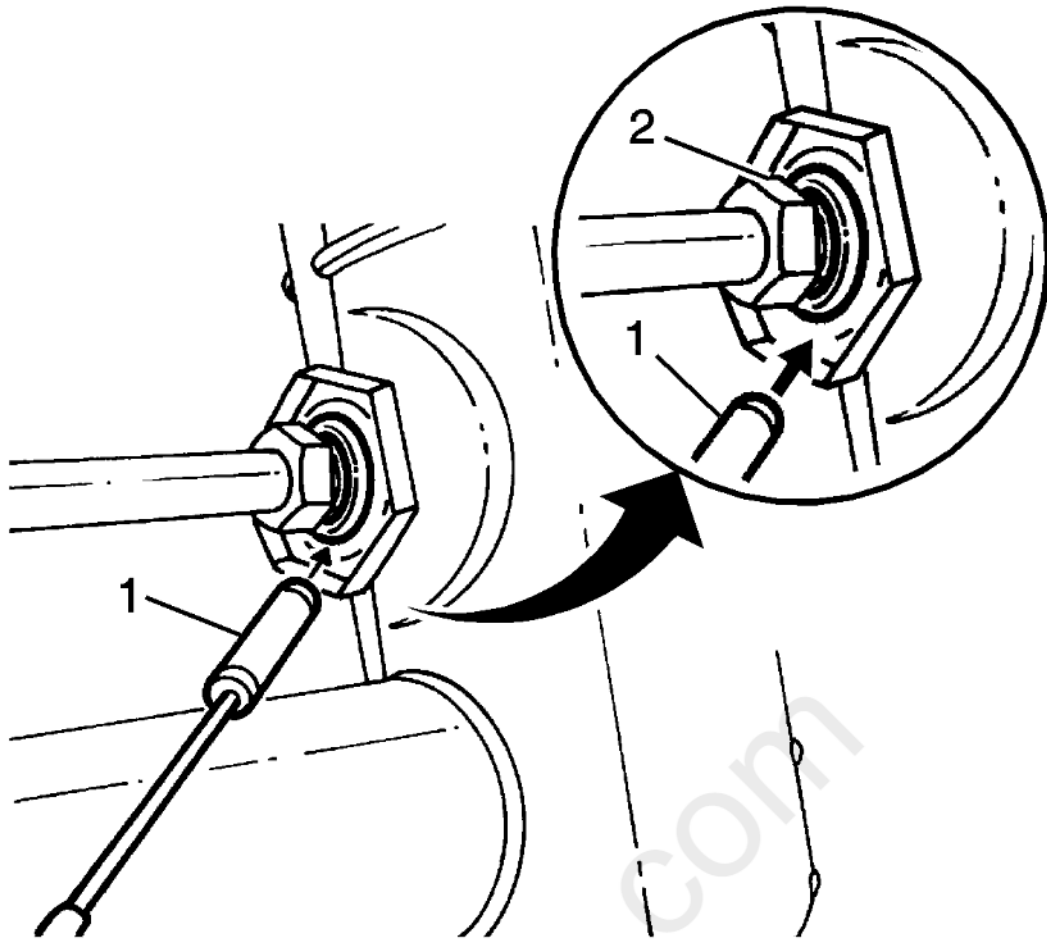


Fig. 6: Identifying Transmission Oil Cooler Metal Composition

Courtesy of GENERAL MOTORS COMPANY

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

- 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

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

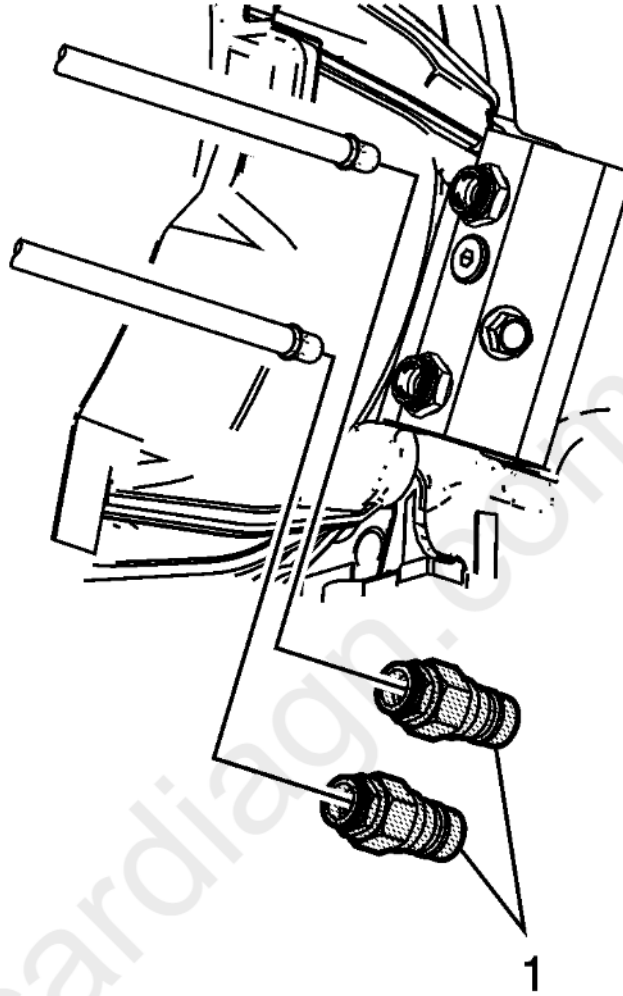


Fig. 7: Cooler Flushing Adapters

Courtesy of GENERAL MOTORS COMPANY

2. If equipped 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.
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.

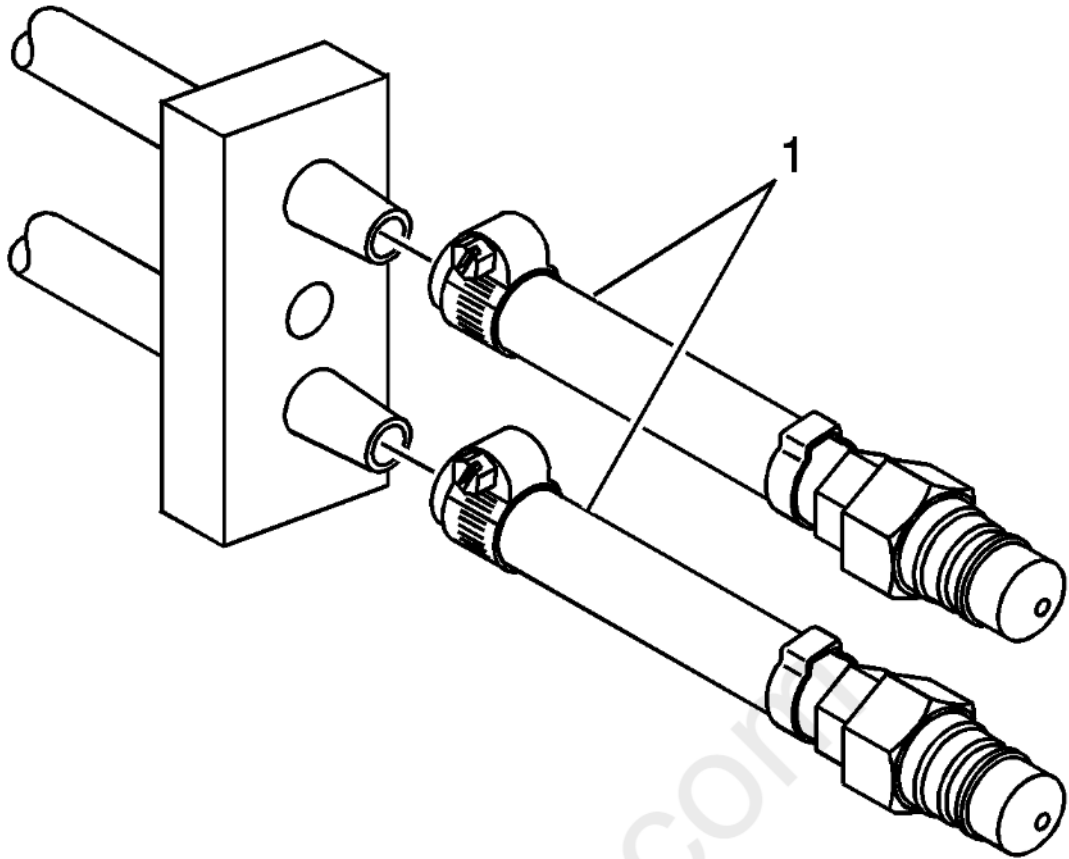


Fig. 8: Cooler Flush Adapters

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.

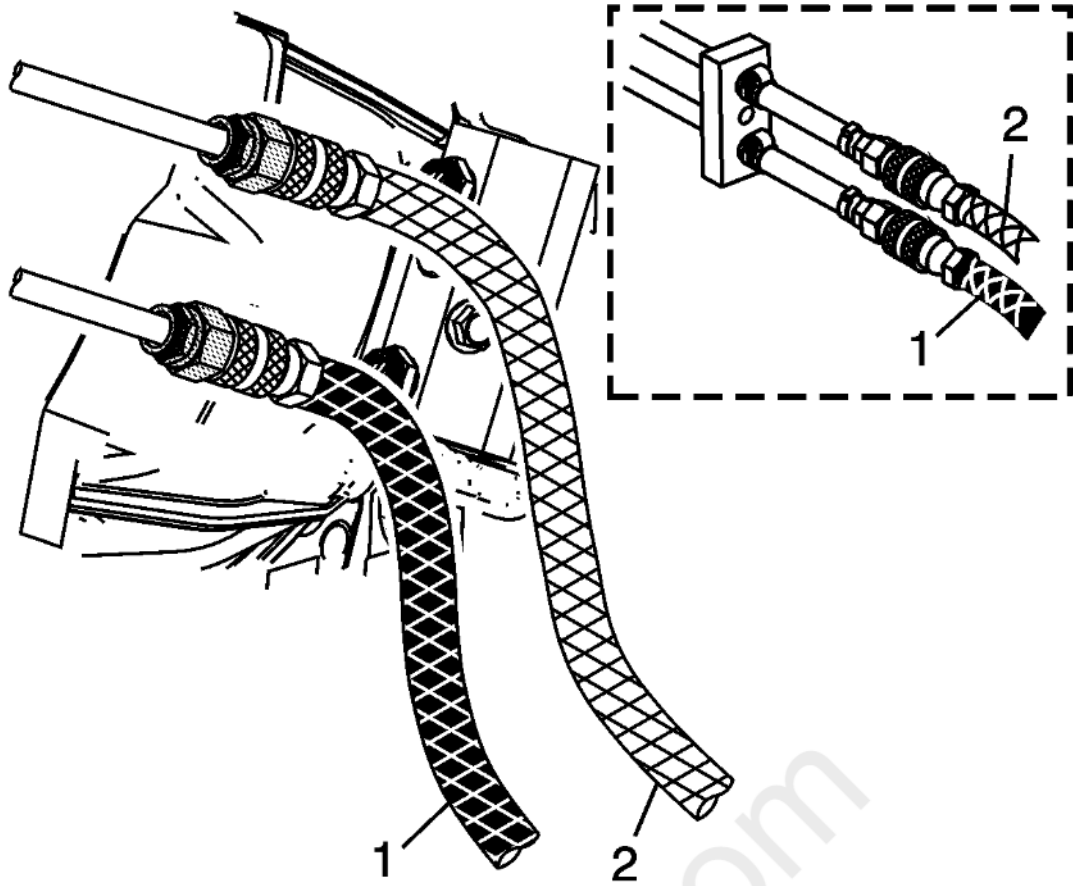


Fig. 9: Black Supply Hose

Courtesy of GENERAL MOTORS COMPANY

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

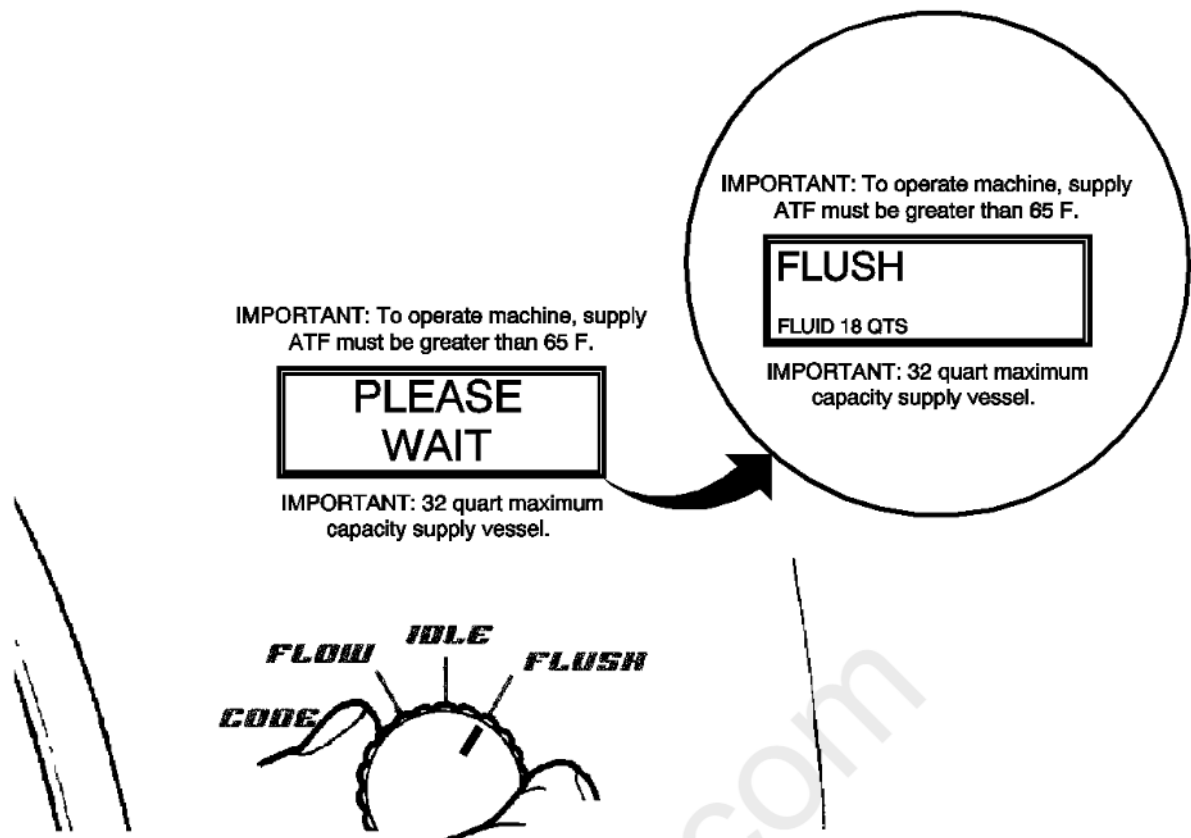


Fig. 10: View Of Main Function Switch FLUSH Position

Courtesy of GENERAL MOTORS COMPANY

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

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

IDLE

FLUID 16 QTS @ 075F

IMPORTANT: 32 quart maximum
capacity supply vessel.

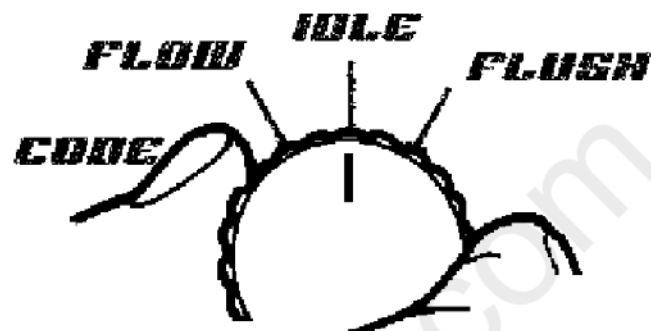


Fig. 11: View Of Main Function Switch IDLE Position
Courtesy of GENERAL MOTORS COMPANY

Forward Flush

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.

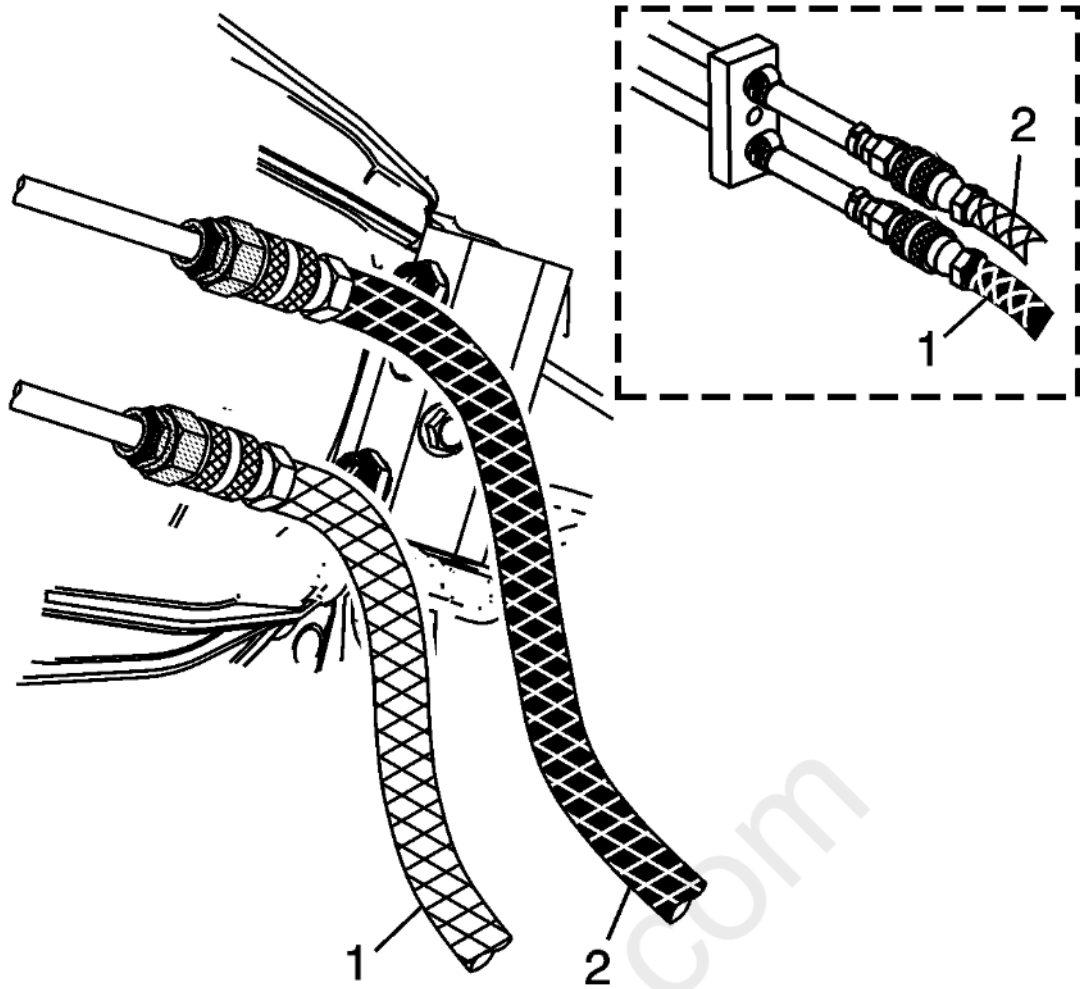


Fig. 12: Supply And Waste Hoses

Courtesy of GENERAL MOTORS COMPANY

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

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

Flow Test

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.

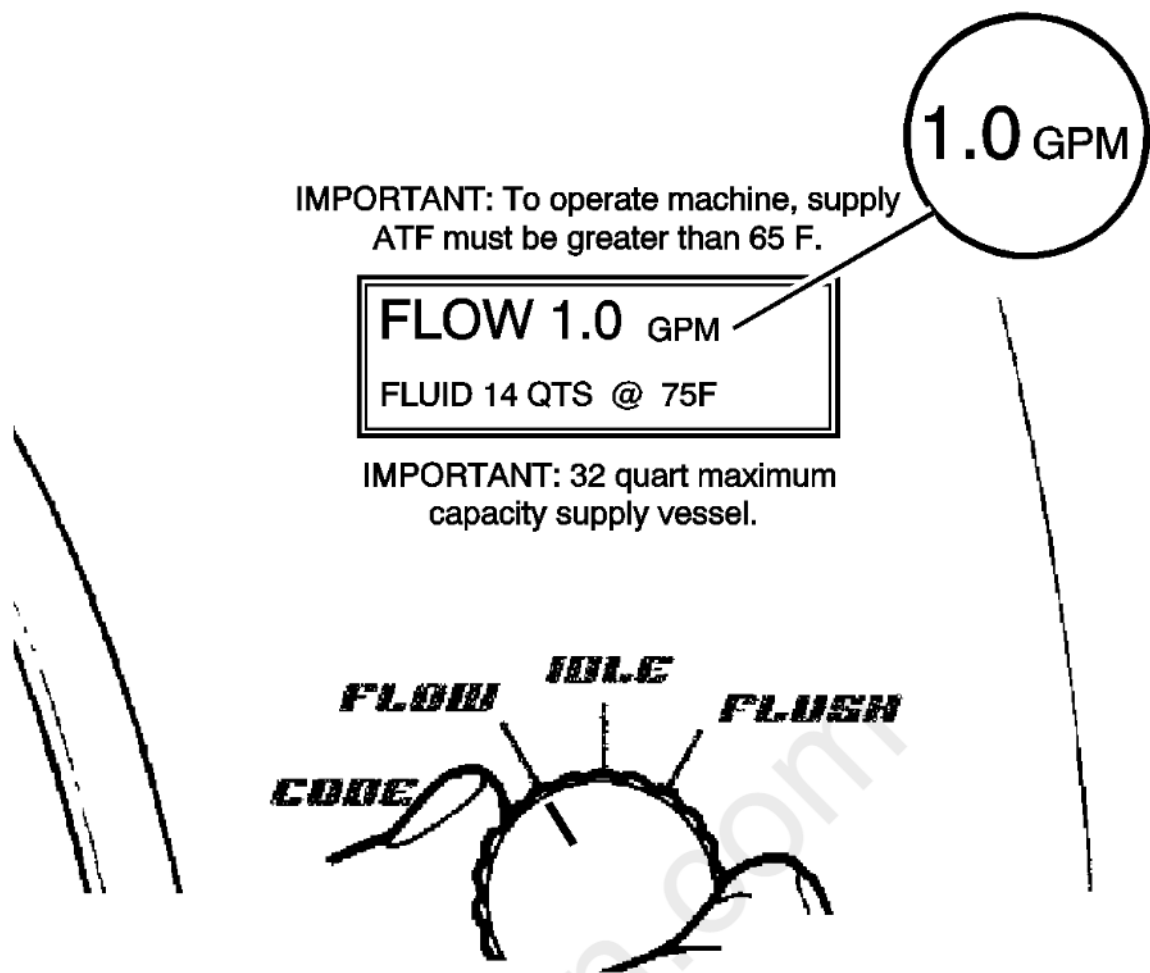


Fig. 14: View Of Main Function Switch FLOW Position

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.

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

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

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

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

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.

Clean-up

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

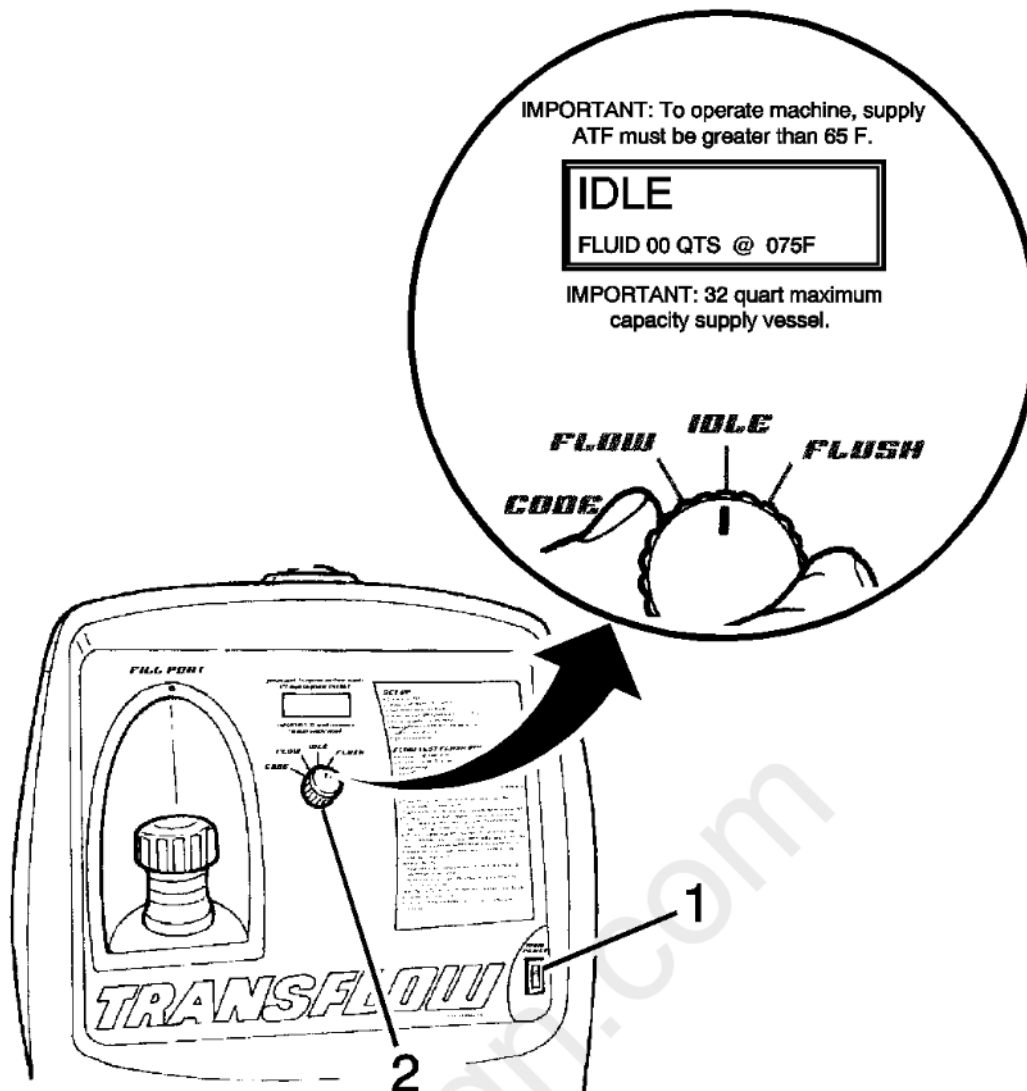


Fig. 16: View Of Main Power Switch & Main Function Switch

Courtesy of GENERAL MOTORS COMPANY

2. Turn the main power switch (1) to the OFF position.
3. Disconnect the supply and waste hoses and the 12-volt power source from the vehicle.

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.

4. Disconnect the air supply hose from DT-45096 flush and flow test tool.

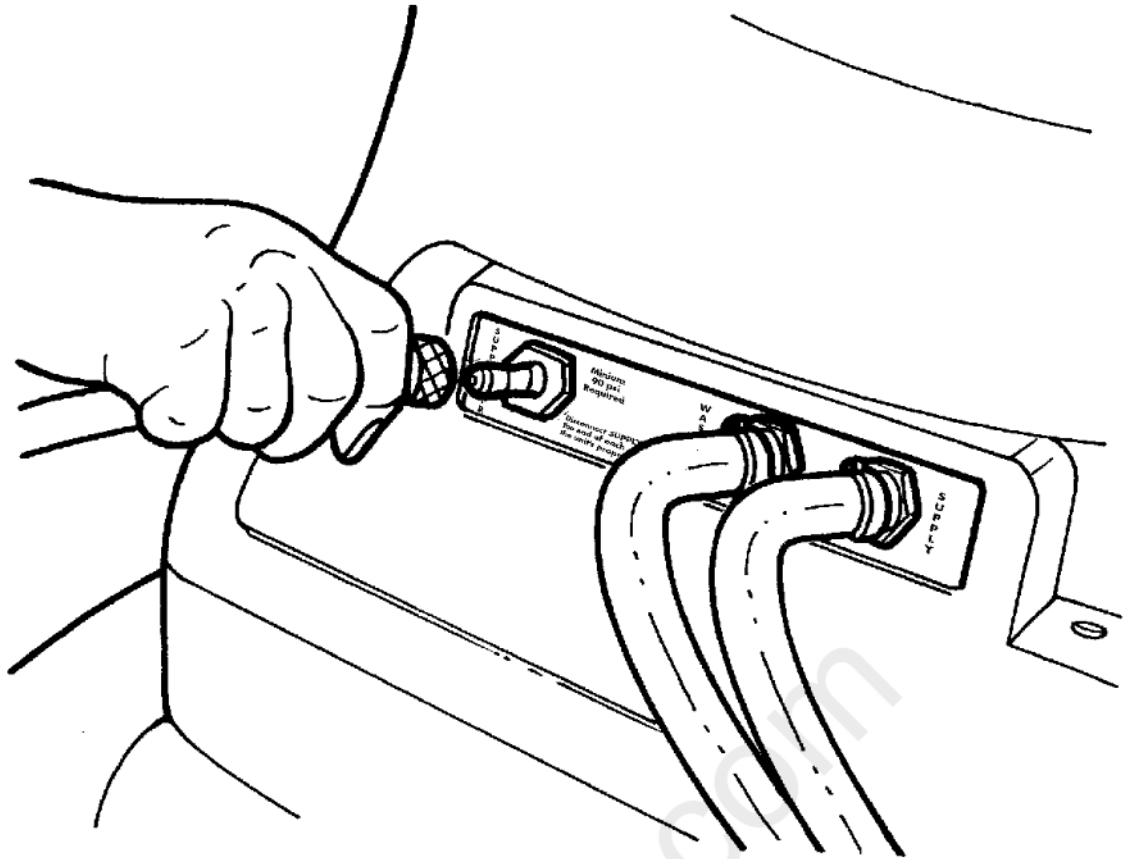


Fig. 17: Applying Shop Air Supply Hose To Quick-Disconnect
 Courtesy of GENERAL MOTORS COMPANY

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.

TRANSMISSION FLUID COOLER FLOW TEST AND FLUSHING (4EL70)

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-45096-30** 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

1. Verify that the main power switch (1) is in the OFF position.

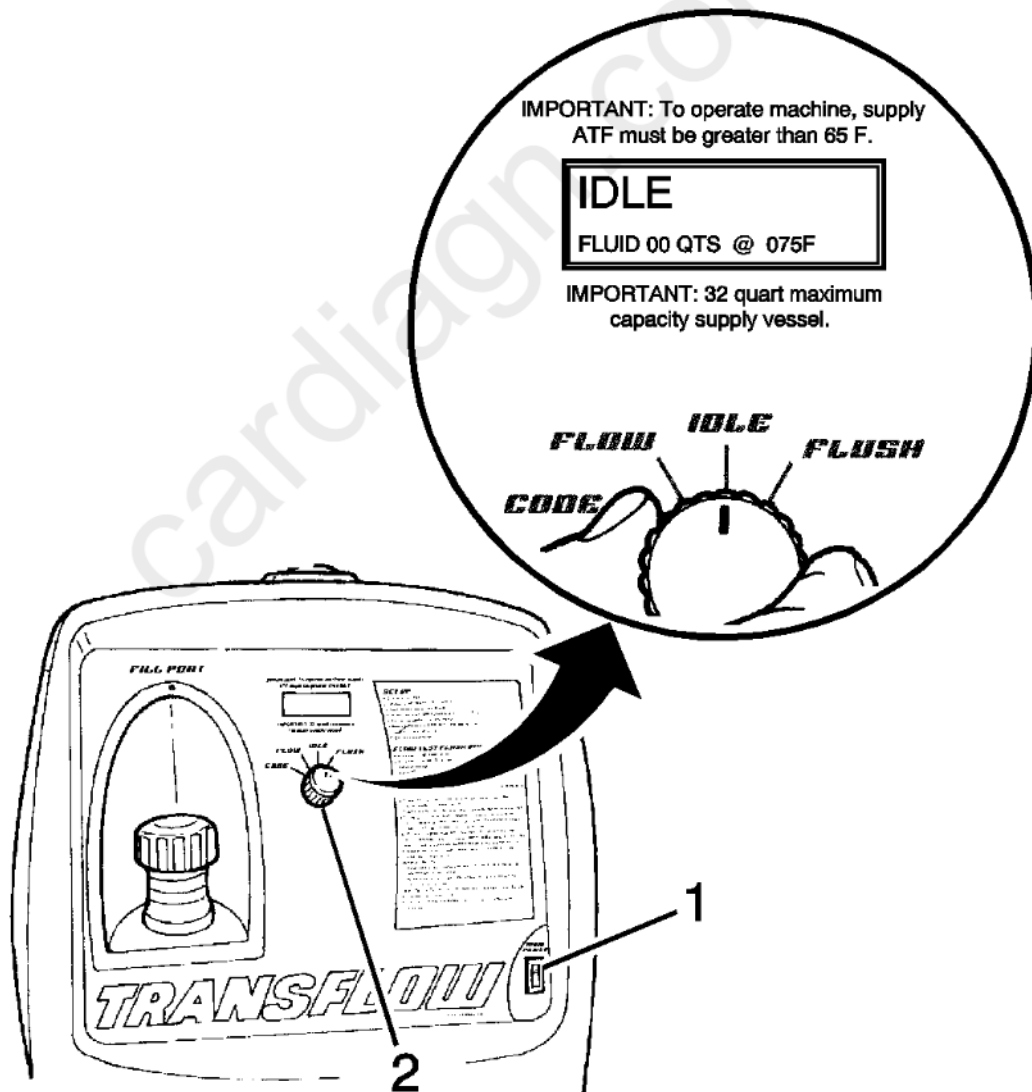


Fig. 18: View Of Main Power Switch & Main Function Switch
Courtesy of GENERAL MOTORS COMPANY

2. Place the main function switch (2) in the IDLE position.

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.

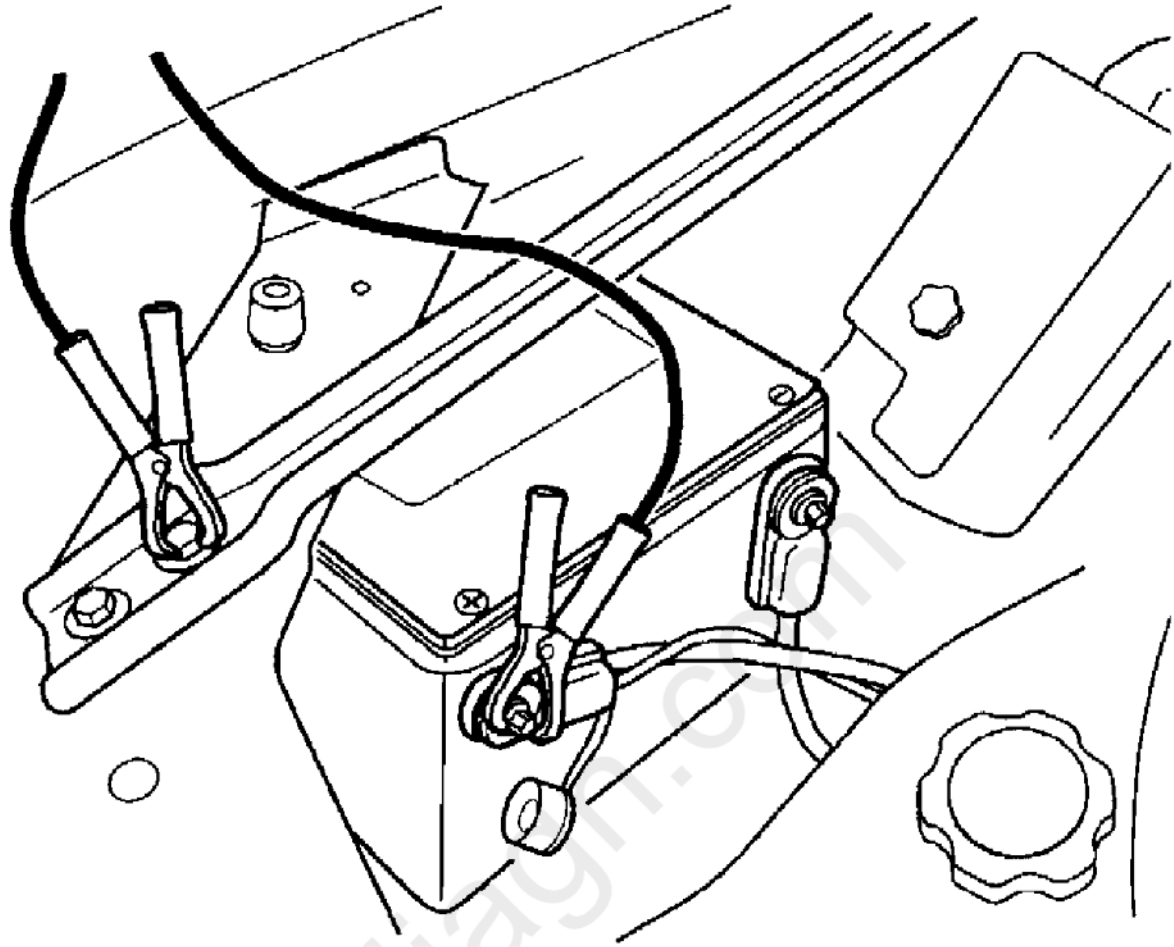


Fig. 19: Connecting To 12V DC Power Source

Courtesy of GENERAL MOTORS COMPANY

4. Turn the main power switch to the ON position.
5. Fill the supply tank with the appropriate GM automatic transmission fluid through the fill port.

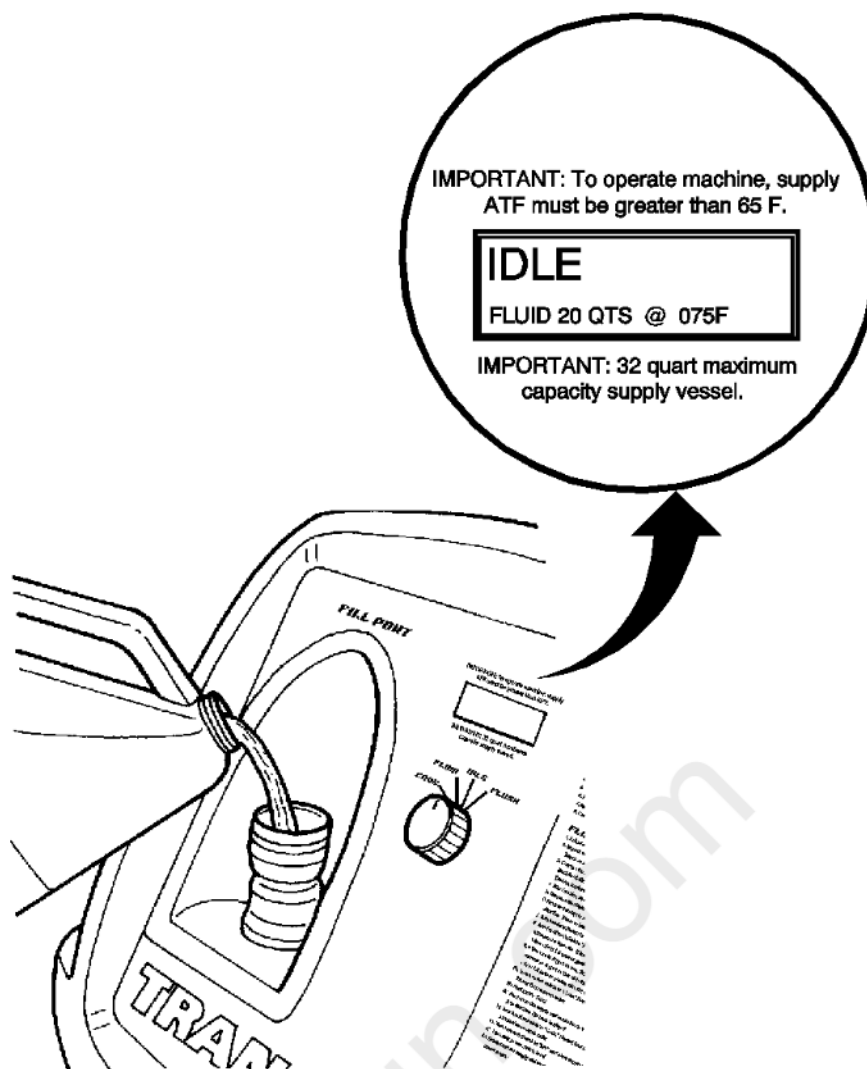


Fig. 20: Filling Supply Tank With Transmission Fluid
 Courtesy of GENERAL MOTORS COMPANY

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).

6. Reinstall and tighten the fill cap.
7. Connect a shop air supply hose to the quick-disconnect on the rear panel marked SUPPLY AIR.

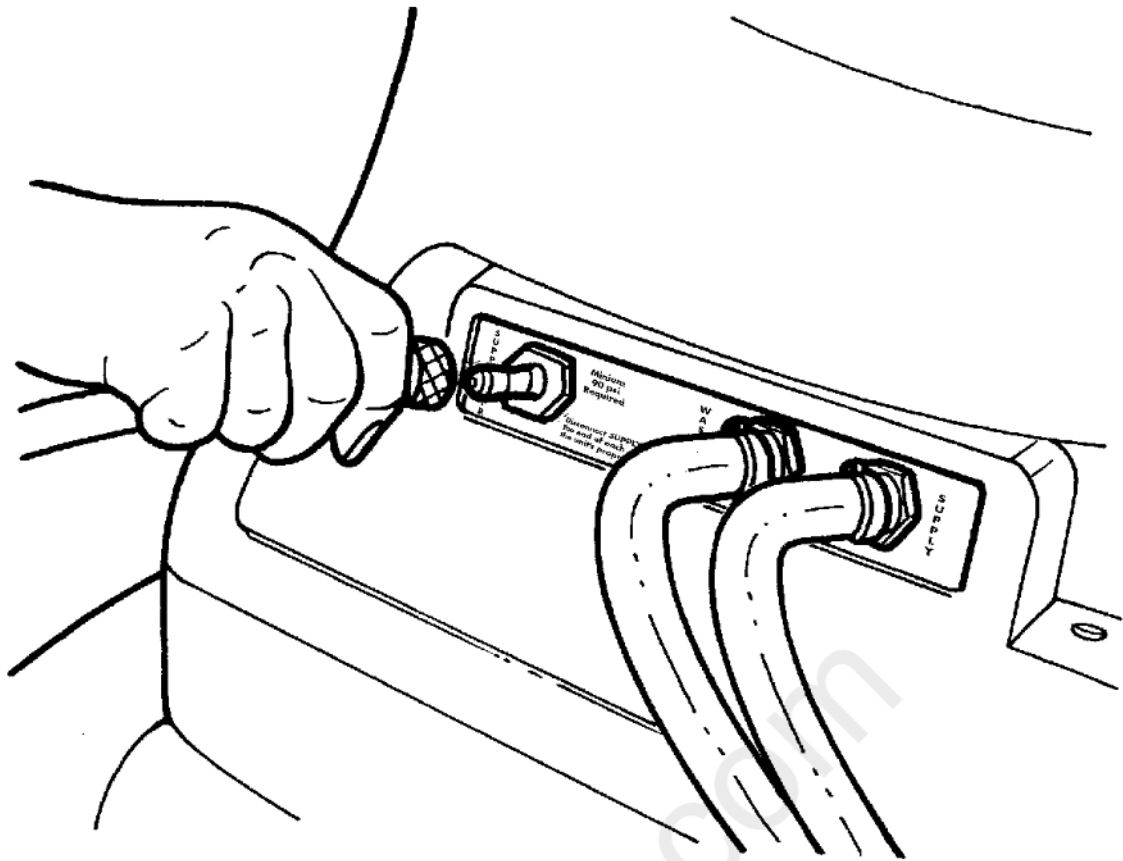


Fig. 21: Applying Shop Air Supply Hose To Quick-Disconnect
Courtesy of GENERAL MOTORS COMPANY

Determine Minimum Flow Rate

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.

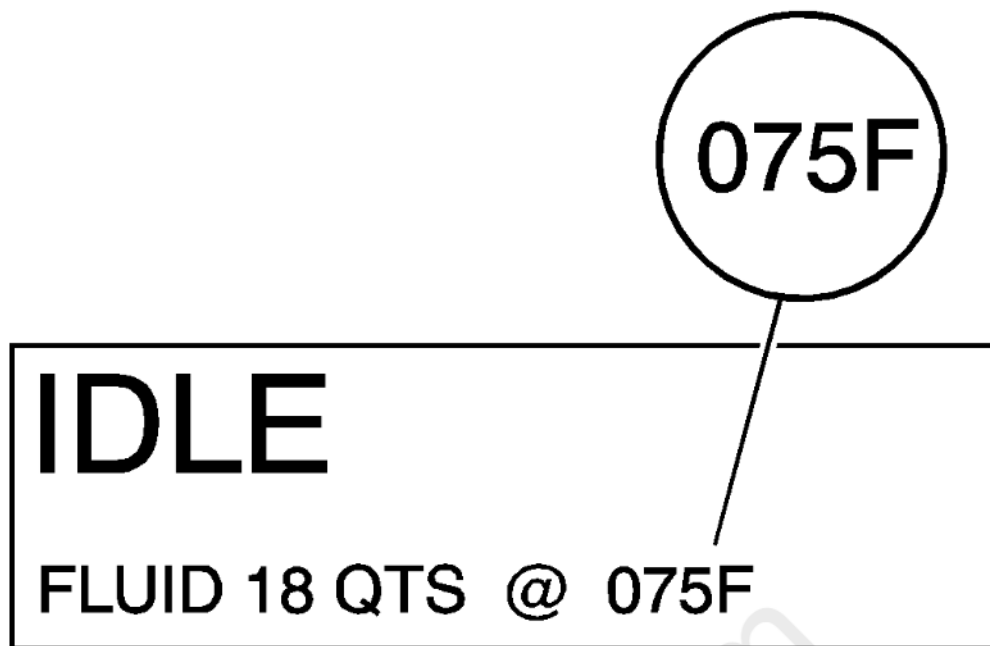


Fig. 22: Identifying Machine Display Of Automatic Transmission Fluid Temperature
Courtesy of GENERAL MOTORS COMPANY

2. Determine whether the transmission oil cooler is steel or aluminum by using a magnet (1) at the cooler flange (2) at the radiator.

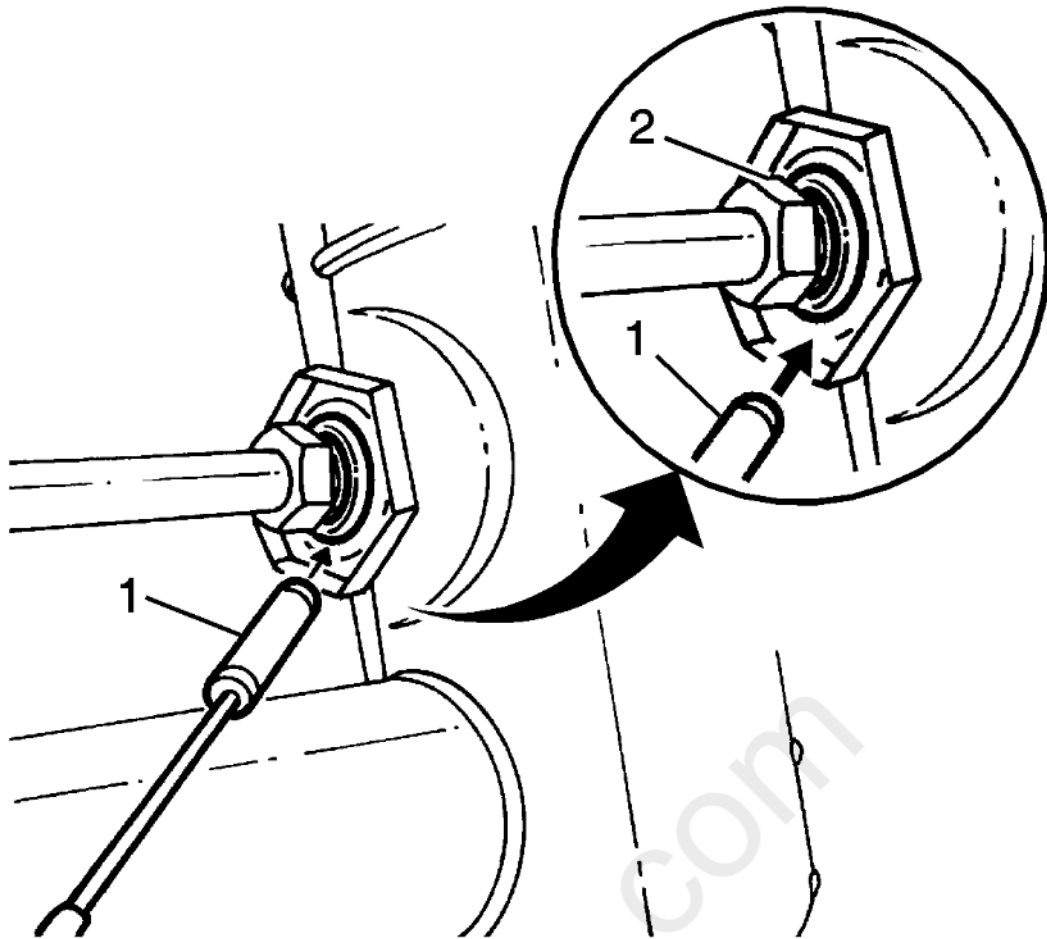


Fig. 23: Identifying Transmission Oil Cooler Metal Composition

Courtesy of GENERAL MOTORS COMPANY

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

- 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

1. Disconnect the oil cooler lines (1, 2) from the bypass valve (3). Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG With HP9\)](#) and/or [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LGW\)](#).

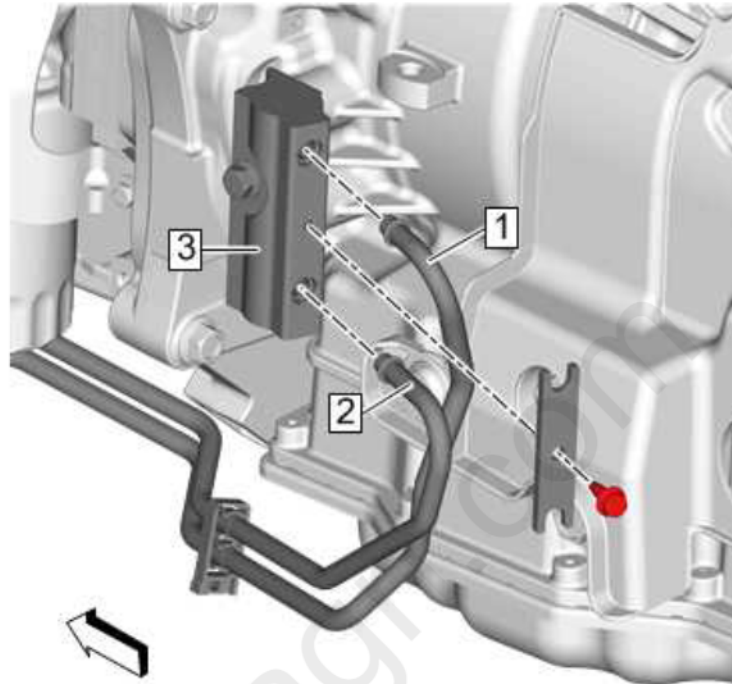


Fig. 24: Oil Cooler Lines And Bypass Valve

Courtesy of GENERAL MOTORS COMPANY

2. Connect the **DT-45096-30** cooler flush adapter (3) to the vehicle transmission oil cooler supply line (2) and return line (1) at the transmission.

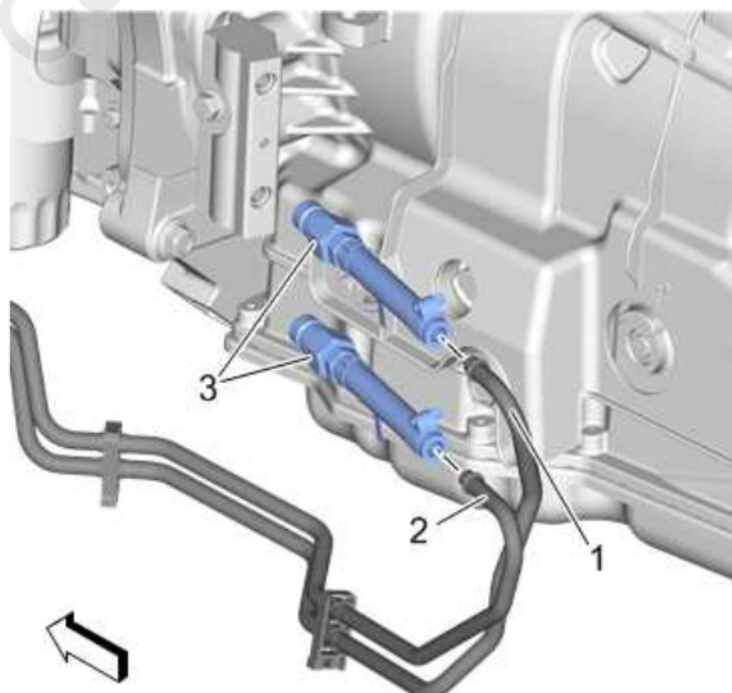


Fig. 25: Cooler Flush Adapter

Courtesy of GENERAL MOTORS COMPANY

NOTE:

A commercially available barbed fitting and 1/2 inch ID rubber hose can be used to connect the vehicle transmission oil cooler supply line (2) and return line (1) at the transmission instead of DT-45096-30 cooler flush adapter.

3. Connect the black supply hose to the transmission cooler outlet - return line (1) and the clear waste hose to the transmission cooler inlet - feed line (2). This is the reverse flow - backflush direction.
4. Turn the main function switch to the FLUSH position. Allow the machine to operate for 30 seconds.

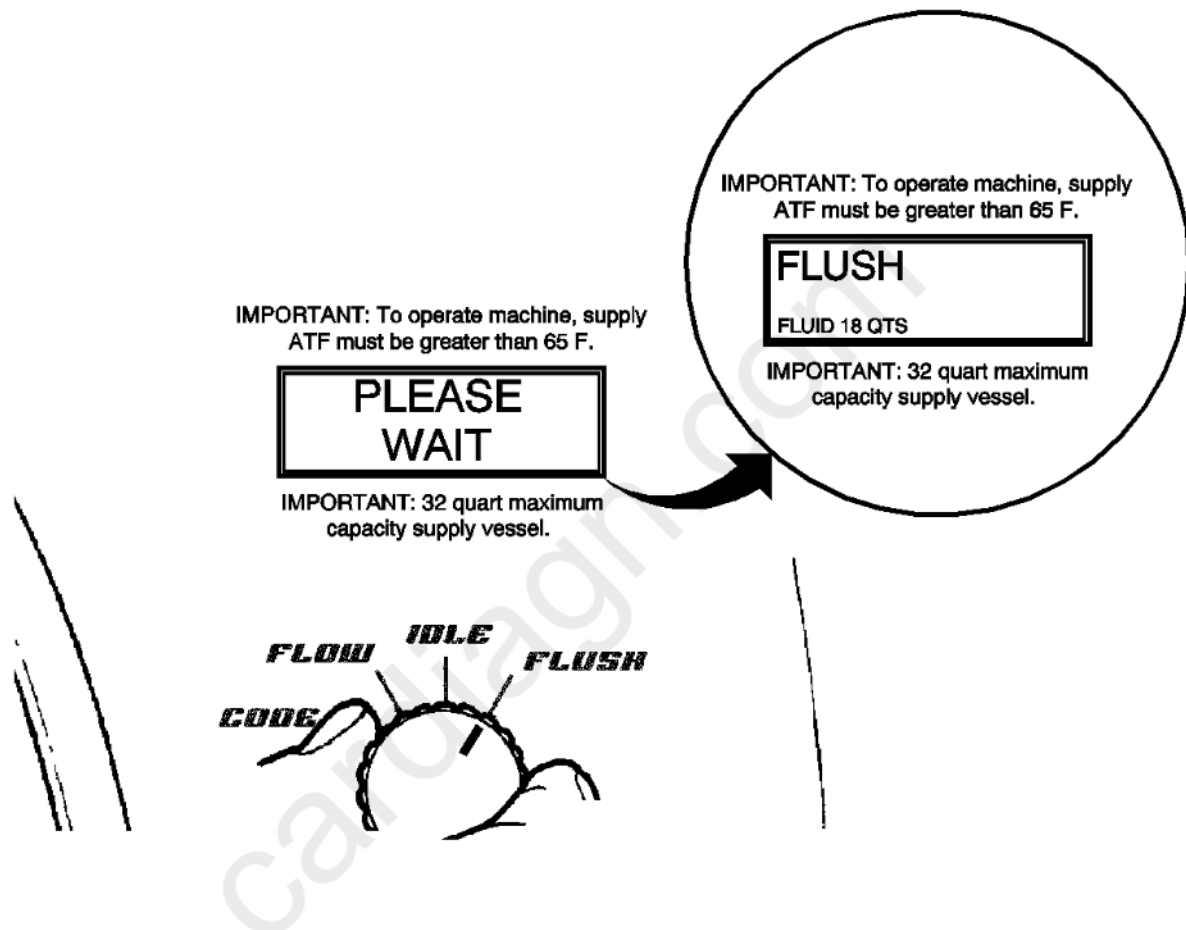


Fig. 26: View Of Main Function Switch FLUSH Position

Courtesy of GENERAL MOTORS COMPANY

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

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

Forward Flush

1. Disconnect the supply and waste hoses from the transmission cooler lines.

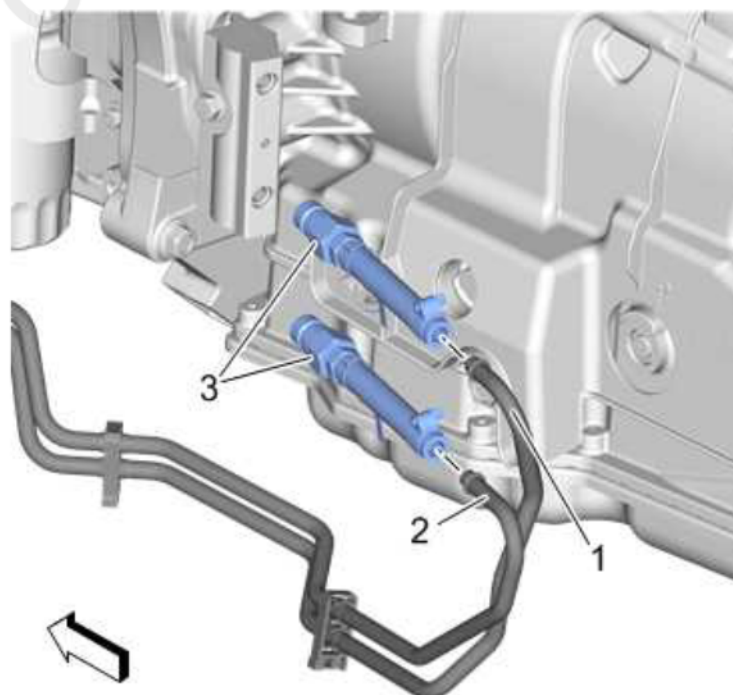


Fig. 28: Cooler Flush Adapter

Courtesy of GENERAL MOTORS COMPANY

2. Connect the black supply hose to the transmission cooler inlet - feed line (2) and clear waste hose to the transmission cooler outlet - return line (1) to provide a normal flow direction.
3. Turn the main function switch to the FLUSH position and allow machine to operate for 30 seconds.

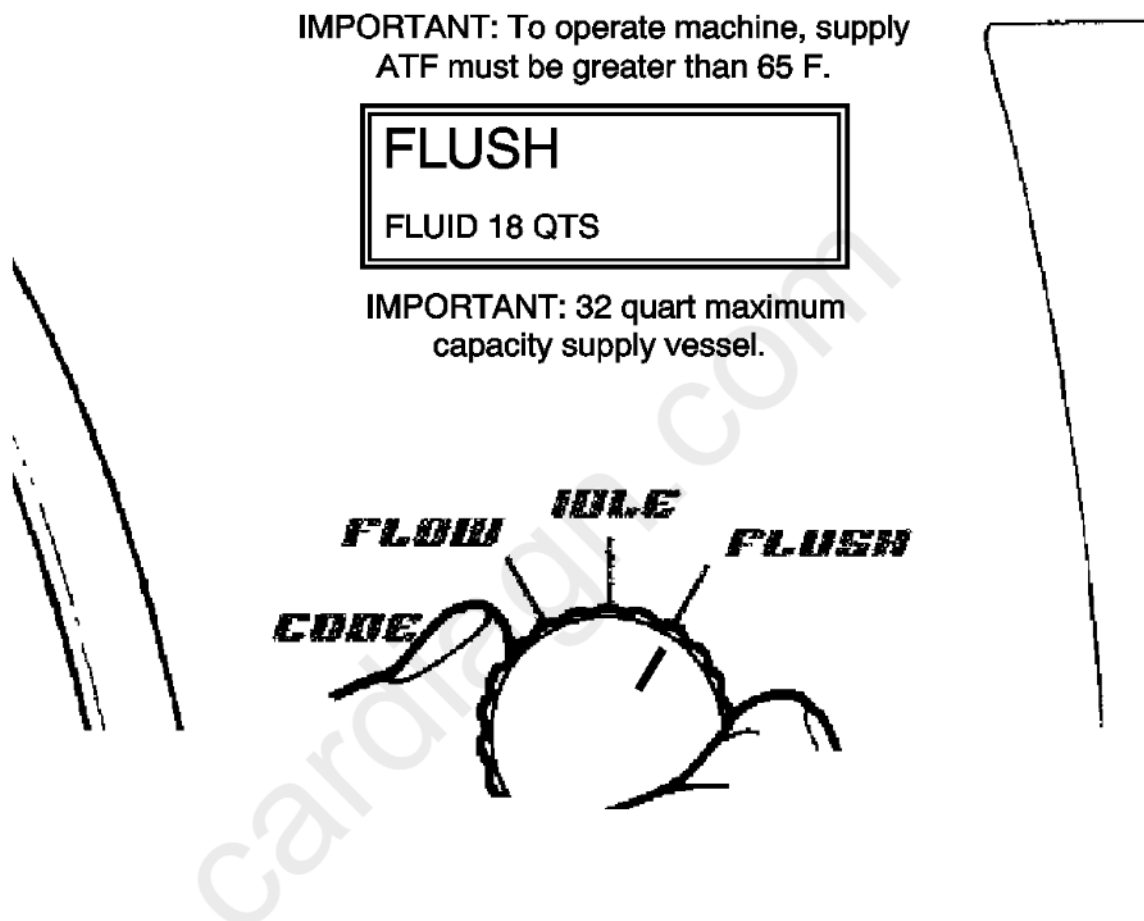


Fig. 29: View Of Main Function Switch FLUSH Position

Courtesy of GENERAL MOTORS COMPANY

Flow Test

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.

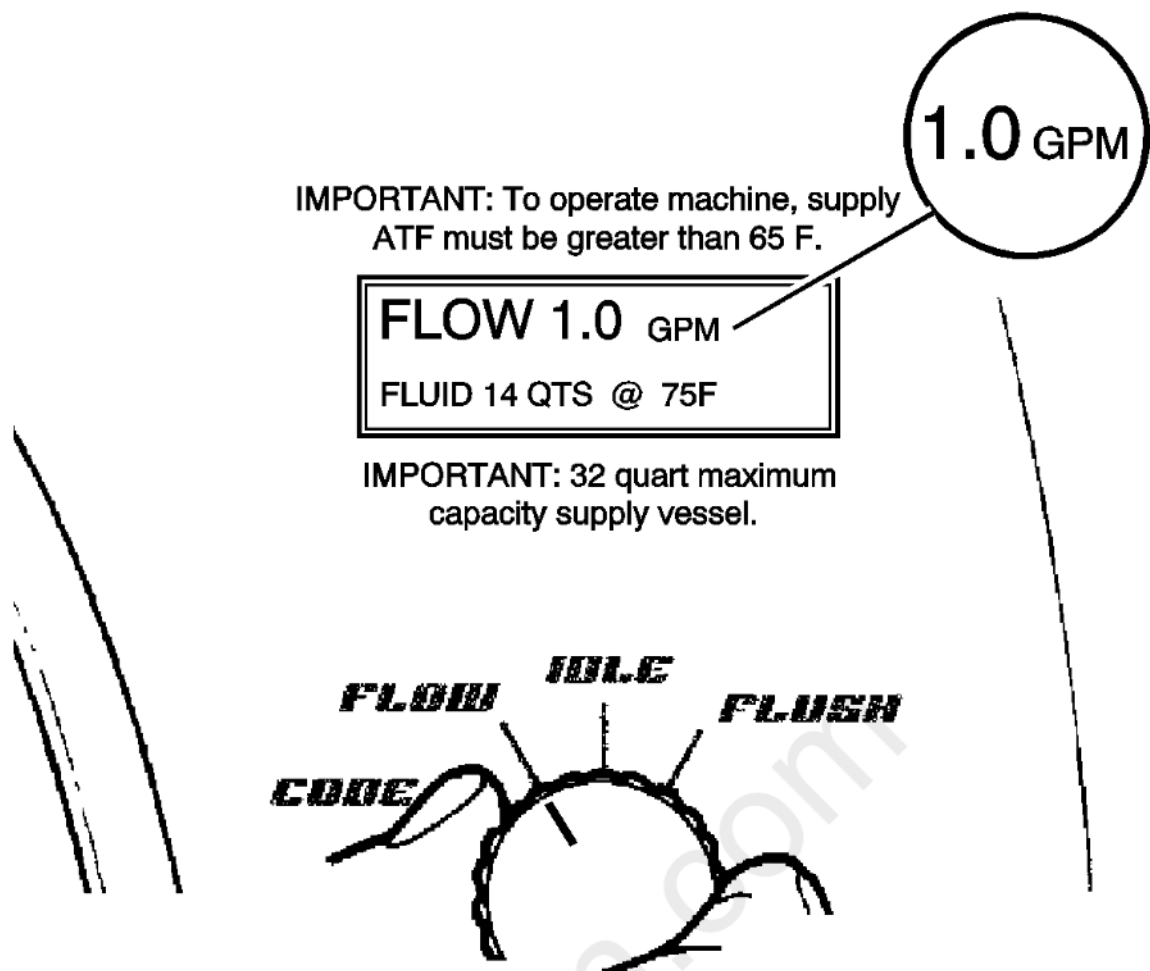


Fig. 30: View Of Main Function Switch FLOW Position

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.

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

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

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. 31: View Of Main Function Switch CODE Position

Courtesy of GENERAL MOTORS COMPANY

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

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.

Clean-up

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

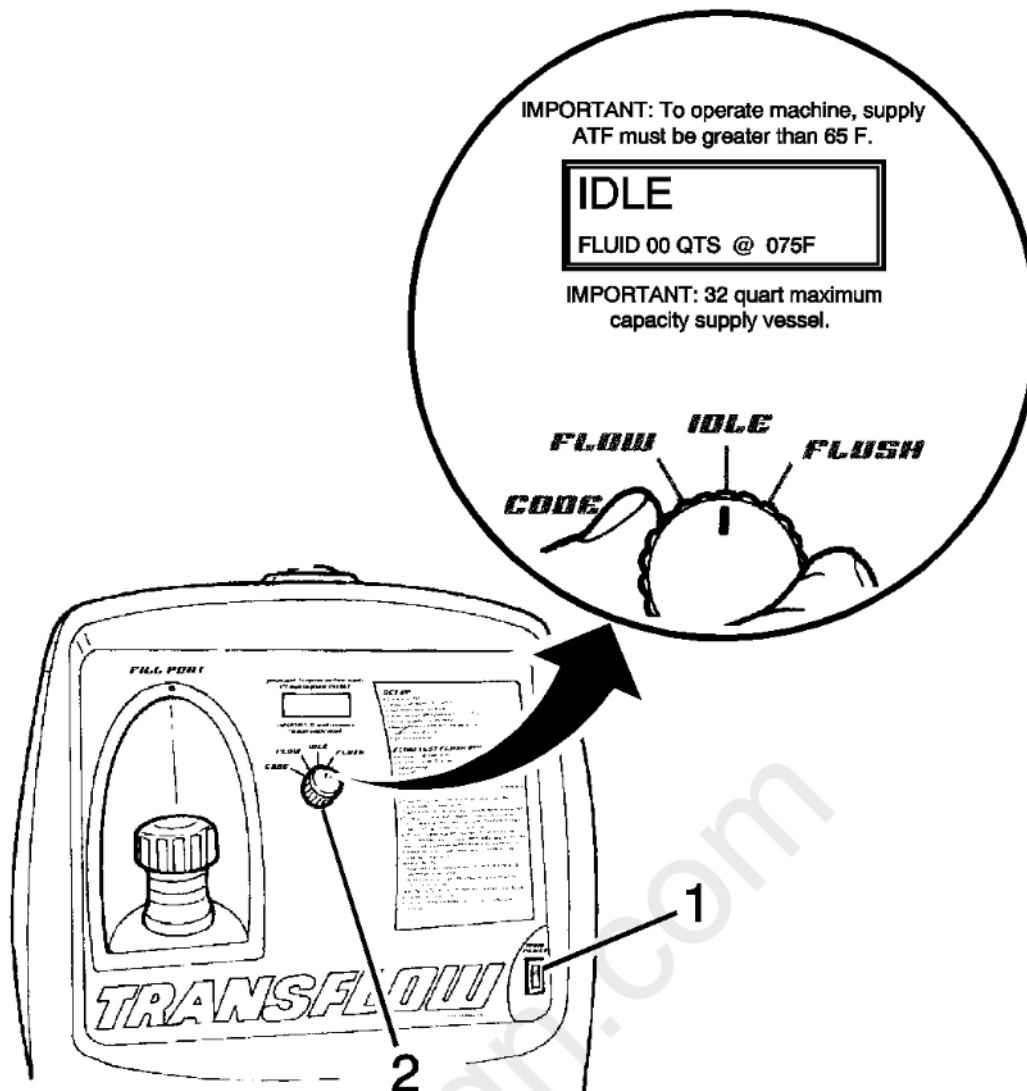


Fig. 32: View Of Main Power Switch & Main Function Switch

Courtesy of GENERAL MOTORS COMPANY

2. Turn the main power switch (1) to the OFF position.
3. Disconnect the supply and waste hoses and the 12-volt power source from the vehicle.

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.

4. Disconnect the air supply hose from **DT-45096** flush and flow test tool.

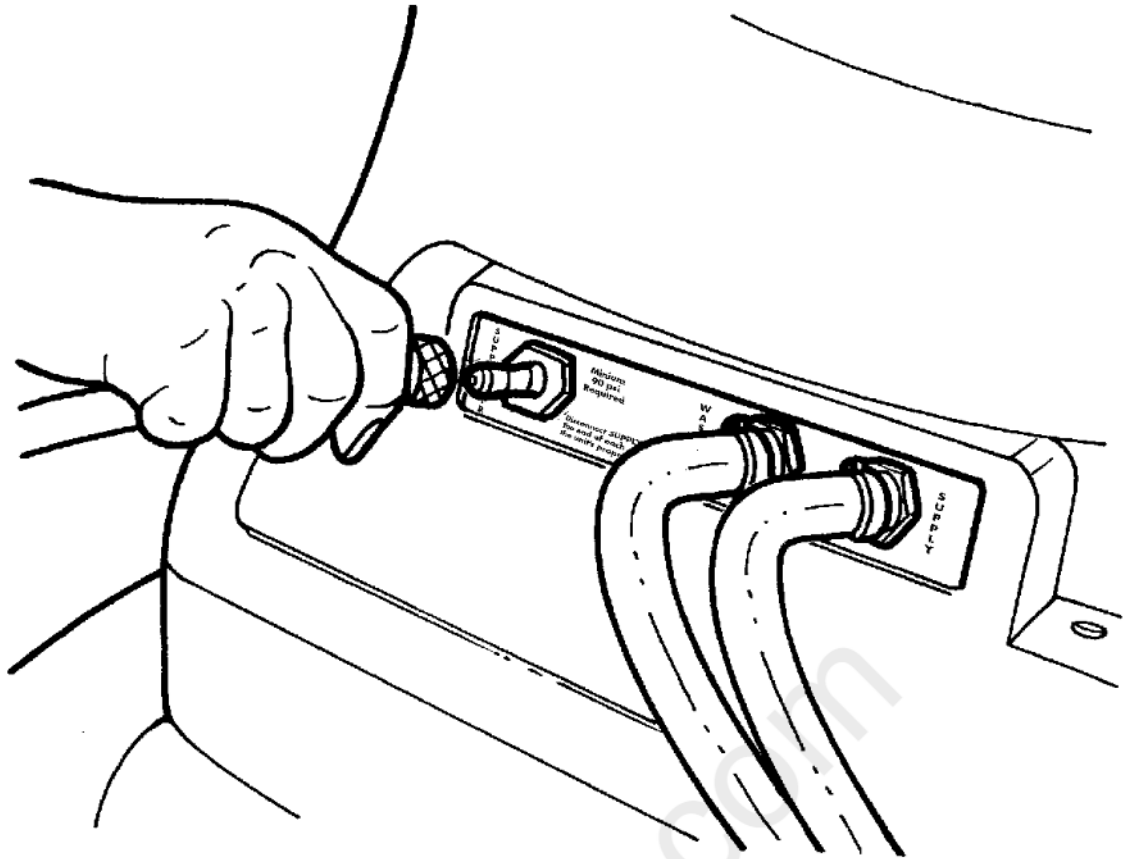
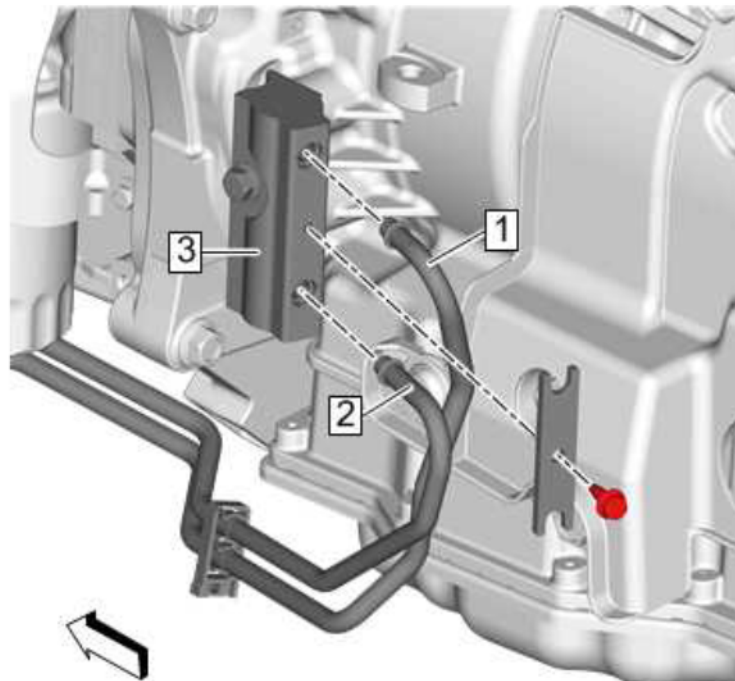


Fig. 33: Applying Shop Air Supply Hose To Quick-Disconnect
 Courtesy of GENERAL MOTORS COMPANY

5. Remove the **DT-45096-30** adapter.
6. Connect the oil cooler lines (1, 2) to the bypass valve (3). Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG With HP9\)](#) and/or [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LGW\)](#).



7. Dispose of the waste automatic transmission fluid in accordance with all applicable federal, state and local requirements.

REPAIR INSTRUCTIONS

TRANSMISSION FLUID COOLER PIPE SEAL REPLACEMENT

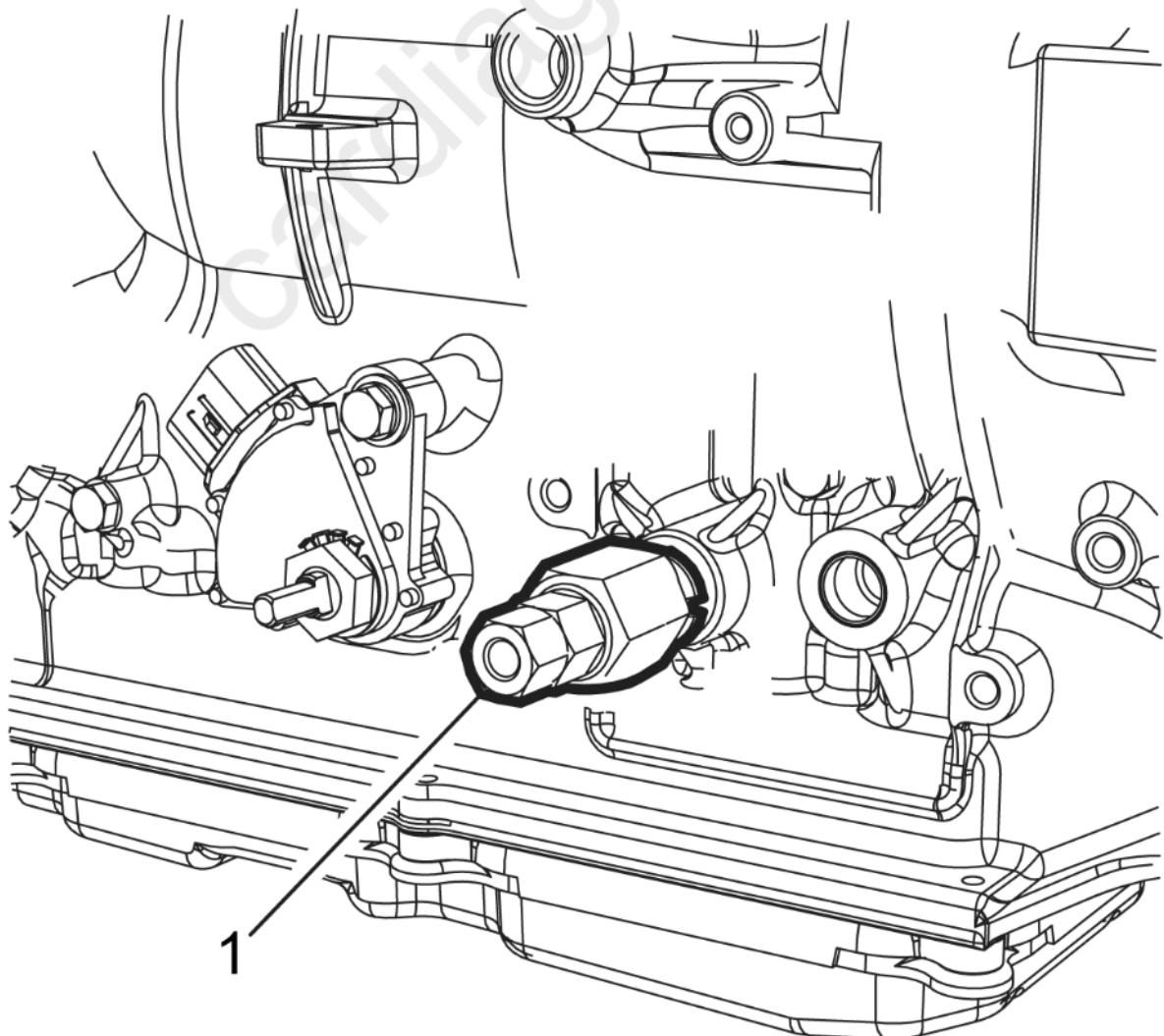
Special Tools

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

For equivalent regional tools, [Special Tools](#).

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Place a drain pan under the transmission.
3. Remove the transmission fluid cooler inlet and outlet pipe bolt from the transmission. Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG With HP9\)](#) and/or [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LGW\)](#).
4. Disconnect the transmission fluid cooler inlet and outlet pipe from the transmission.
5. Remove and discard the transmission fluid cooler inlet and outlet pipe fitting seal.
6. Use **DT-45201** remover (1) to remove the transmission oil cooler line seals from the transmission.



Installation Procedure

1. Use **DT-47770** installer (1) to install the cooler plug seal.

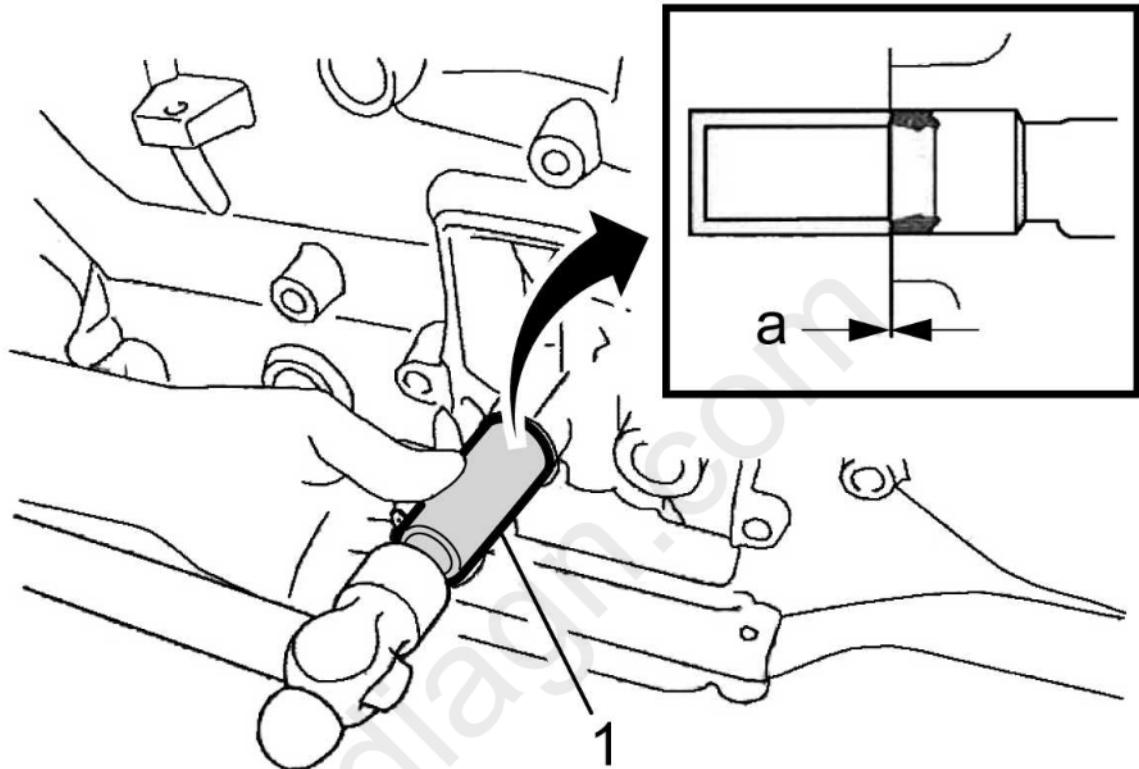


Fig. 36: Installing Transmission Oil Cooler Line Seal
Courtesy of GENERAL MOTORS COMPANY

NOTE: Dimension a is 0-0.3 mm (0-0.0118 in) to the surface of the transmission case.

2. Install a NEW transmission fluid cooler inlet and outlet pipe fitting seal.
3. Connect the transmission fluid cooler inlet and outlet pipe the transmission.
4. Install the transmission fluid cooler inlet and outlet pipe bolt. [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LTG With HP9\)](#) and/or [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LGW\)](#)

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

5. Remove the drain pan.
6. Fill the transmission to the proper level with transmission fluid. Refer to [Transmission Fluid Level and Condition Check](#) .

TRANSMISSION FLUID AUXILIARY COOLER REPLACEMENT (LTG, LGW, LGX)

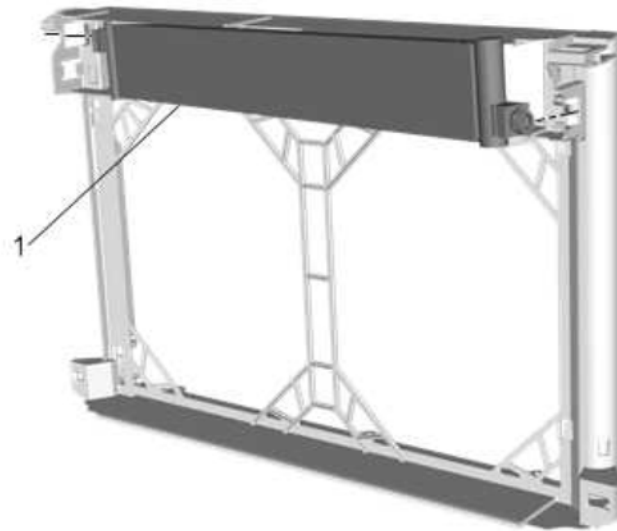


Fig. 37: Transmission Fluid Auxiliary Cooler (LTG, LGW, LGX)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Air Conditioning Condenser Bracket» Remove - <u>Air Conditioning Condenser Bracket Replacement</u>	
1	Transmission Fluid Auxiliary Cooler Procedure 1. Spread the cooler retaining clips to allow for cooler removal. 2. Pull rearward to disengage the clips.

TRANSMISSION FLUID COOLER THERMAL BYPASS VALVE REPLACEMENT

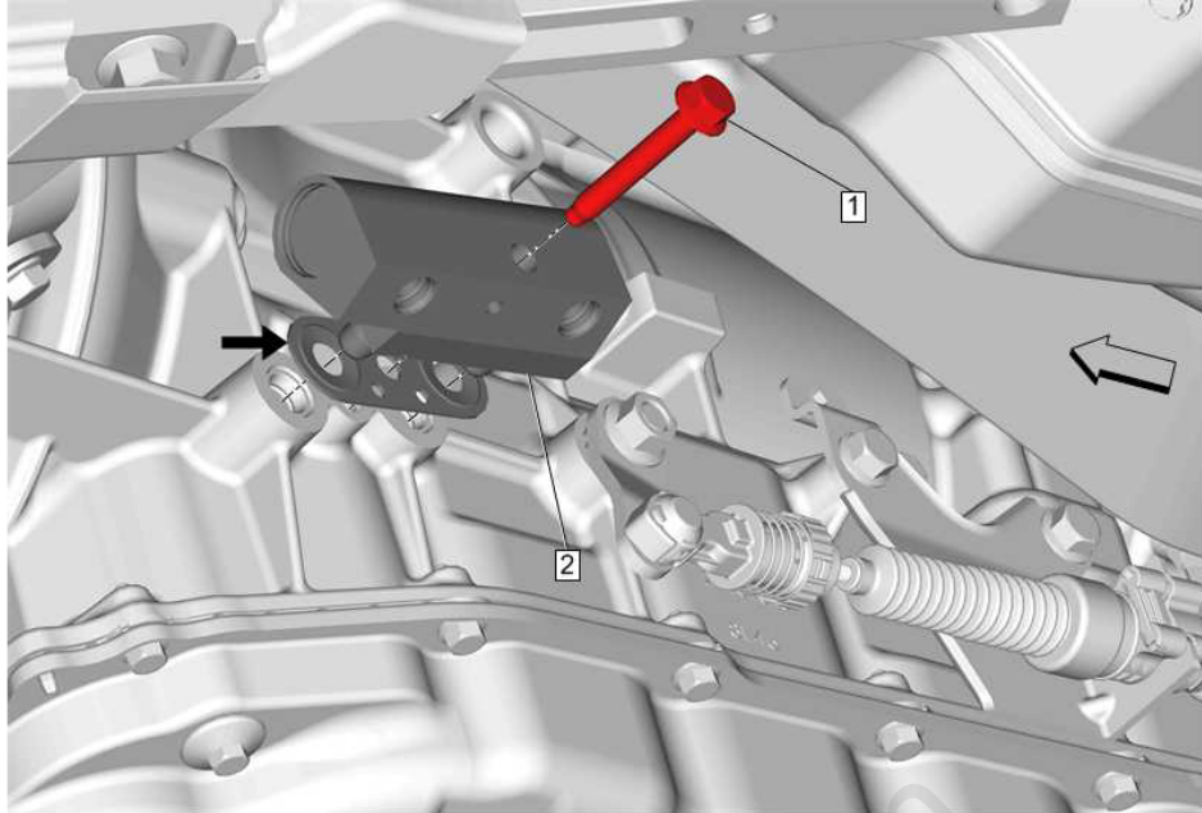


Fig. 38: Transmission Fluid Cooler Thermal Bypass Valve
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Place a drain pan under the vehicle. 2. Transmission Fluid Cooler Inlet and Outlet Pipe @ Transmission Fluid Cooler Thermal Bypass Valve» Separate - Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LTG)Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LTG With HP9)Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LGW).	
1	Transmission Fluid Cooler Thermal Bypass Valve Bolt CAUTION: Refer to Fastener Caution . Tighten 22 N.m (16 lb ft)
2	Transmission Fluid Cooler Thermal Bypass Valve Procedure 1. Remove and DISCARD the seal. 2. Install a NEW seal. 3. Check the transmission fluid level. Refer to Transmission Fluid Level and Condition Check

TRANSMISSION FLUID COOLER PIPE CONNECTOR REPLACEMENT - AUXILIARY COOLER

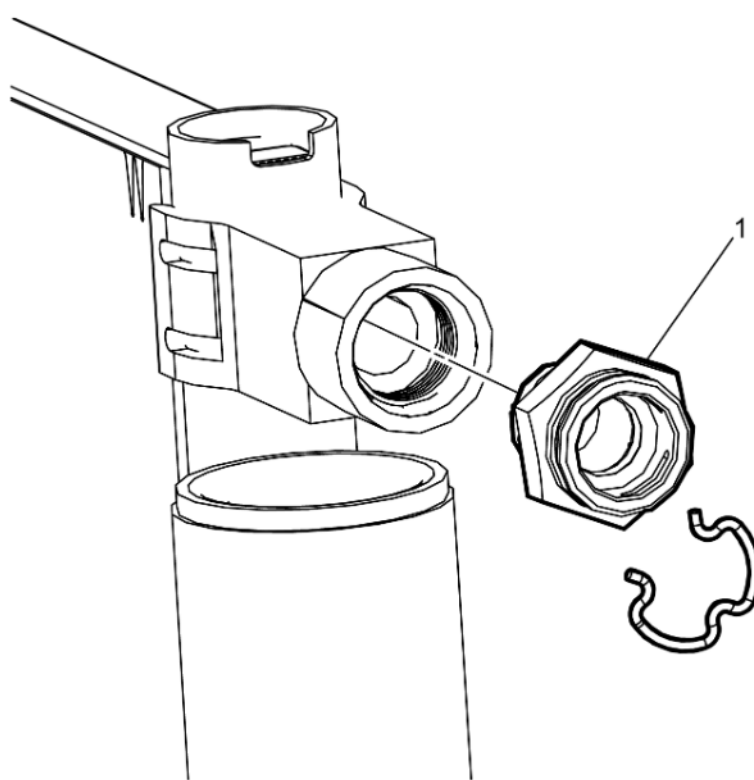


Fig. 39: Transmission Fluid Cooler Pipe Connector - Auxiliary Cooler

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Place a drain pan under the transmission fluid cooler pipe. 2. Remove the transmission fluid cooler pipe from the auxiliary oil cooler. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection. 3. Cap the fittings and plug the holes when removing the transmission fluid cooler pipe from the auxiliary oil cooler.	
1	Transmission Fluid Cooler Pipe Connector CAUTION: Refer to Fastener Caution . Procedure 1. Inspect the transmission fluid level. 2. Inspect for transmission fluid leaks. NOTE: The correct thread engagement is critical, hand start the fitting. Cross-threaded fittings can achieve proper tightness and still leak. Tighten 20 N.m (15 lb ft)

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

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.
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.

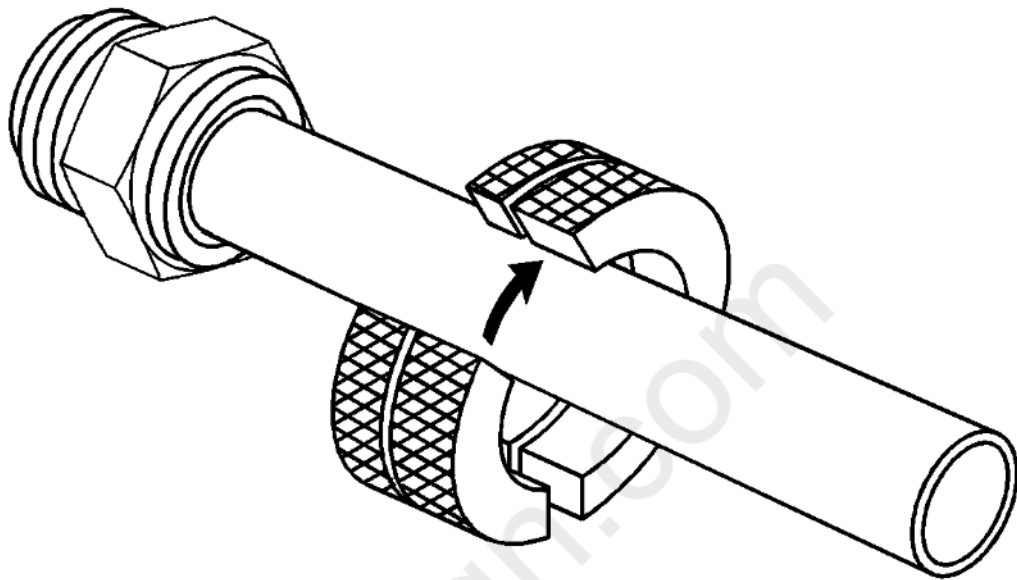


Fig. 40: Generator Cooling Inlet Pipe

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.

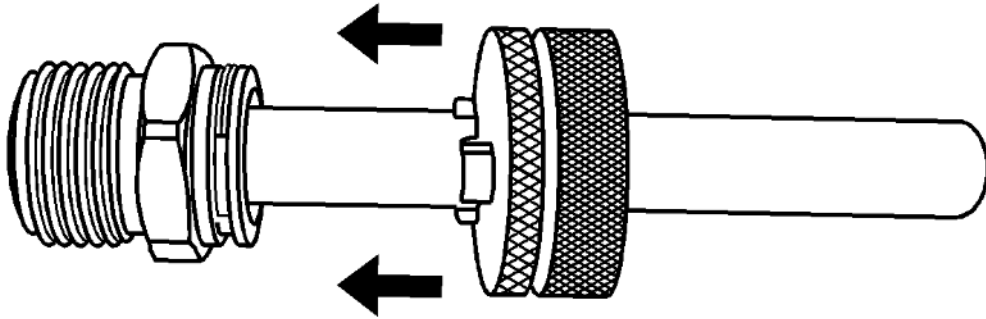


Fig. 41: Sliding J 41623-B Toward Generator Cooling Inlet Pipe Fitting
Courtesy of GENERAL MOTORS COMPANY

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

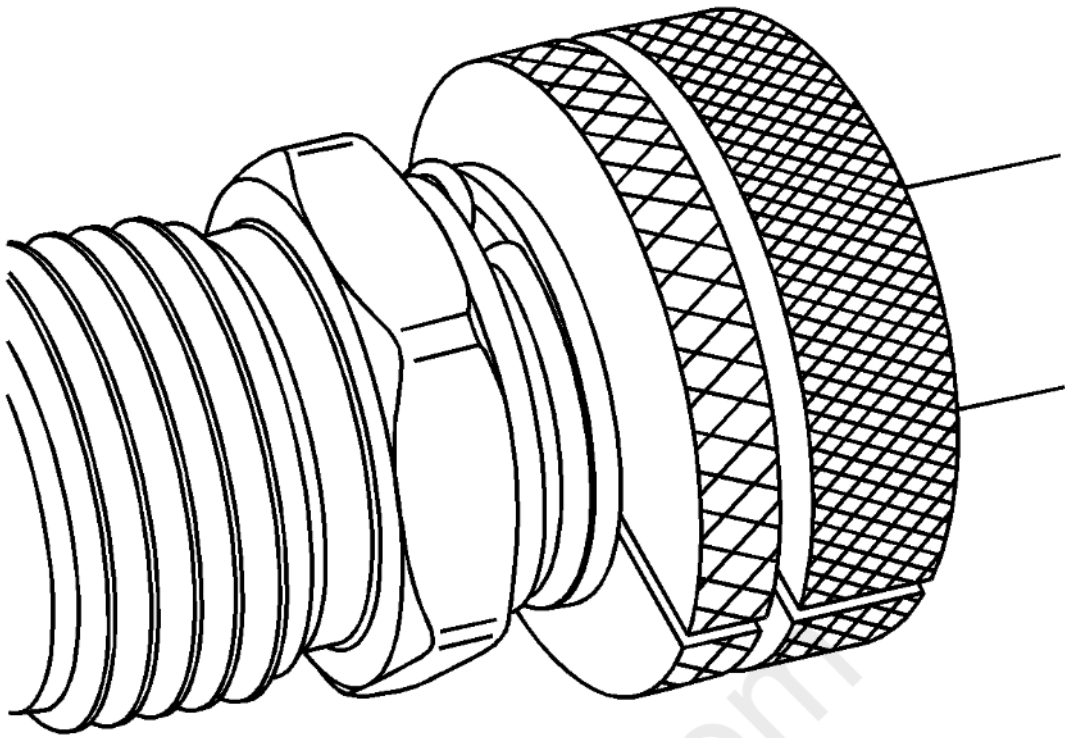


Fig. 42: Rotating J 41623-B On Coolant Pipe

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.

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.

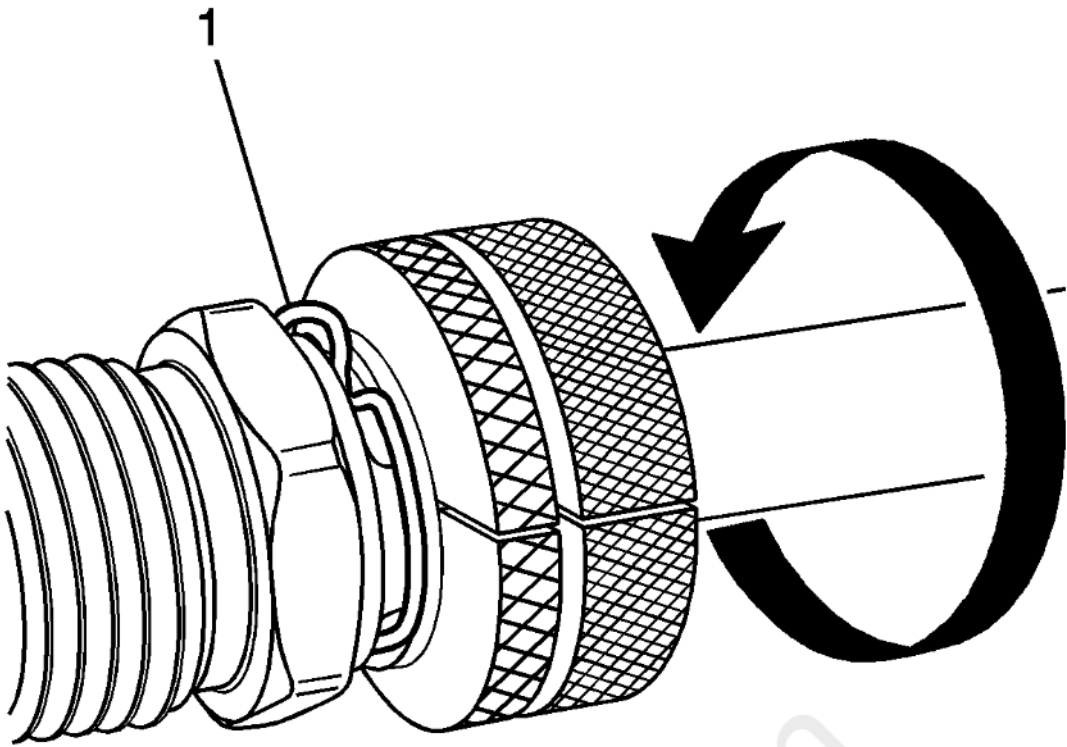


Fig. 43: Identifying Retainer Clip

Courtesy of GENERAL MOTORS COMPANY

6. Pull back on the TOC pipe to disengage the pipe from the TOC pipe fitting.

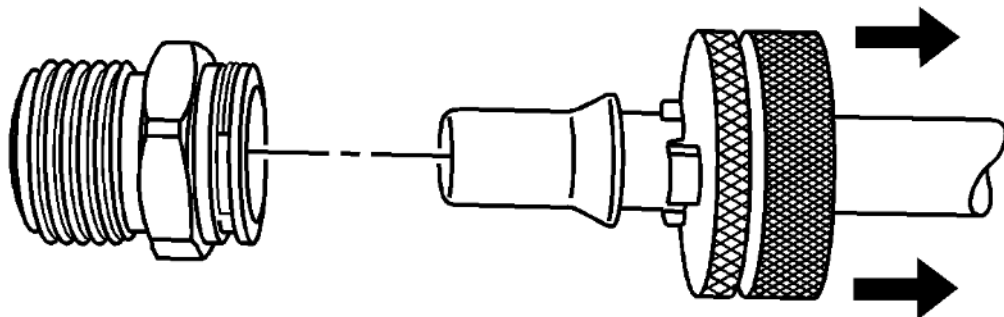


Fig. 44: Generator Cooling Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

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

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

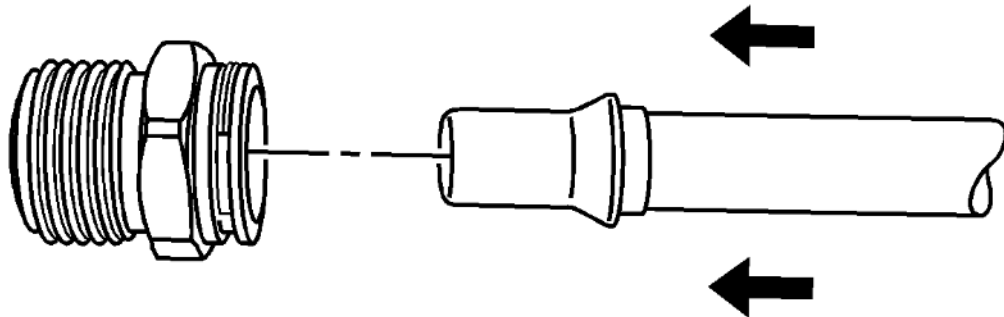


Fig. 45: View Of Generator Cooling Inlet Pipe & Generator Cooling Inlet Pipe Fitting
 Courtesy of GENERAL MOTORS COMPANY

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

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 AND OUTLET PIPE REPLACEMENT (LTG)

Removal Procedure

1. **Underbody Front Air Deflector Replacement** Â» Remove
2. **Drivetrain and Front Suspension Cradle Plate Replacement** Â» Remove
3. **Front Bumper Fascia Lower Stiffener Replacement** Â» Remove
4. Transmission Fluid Cooler Thermal Bypass Keeper Plate Bolt (2) @ Transmission Fluid Cooler Thermal Bypass Valve Â» Remove

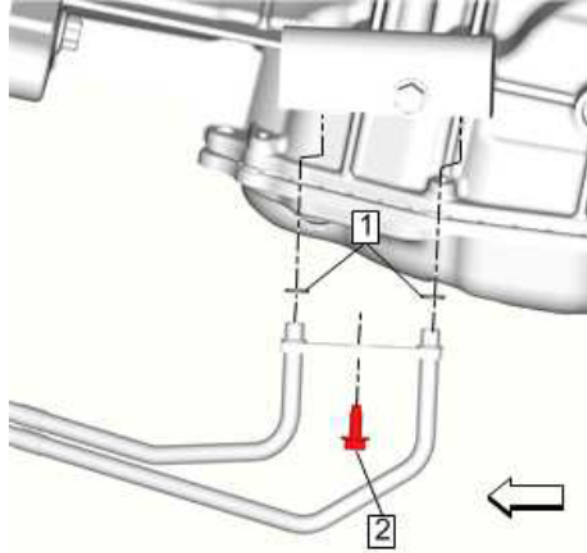


Fig. 46: Transmission Fluid Cooler Thermal Bypass Keeper Plate Bolt And O-Ring Seals
 Courtesy of GENERAL MOTORS COMPANY

5. Remove and DISCARD the O-ring seal. (1) @ Transmission Fluid Cooler Thermal Bypass Valve.

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

6. Transmission Fluid Cooler Pipe Clip (1) @ Transmission Fluid Cooler Pipe Bracket» Remove

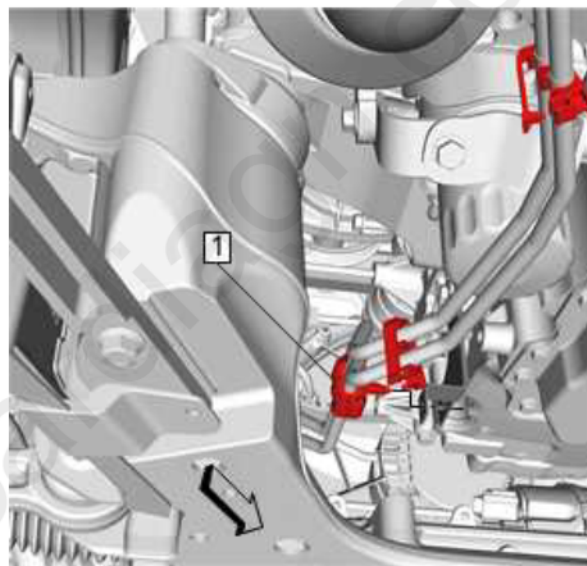


Fig. 47: Transmission Fluid Cooler Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

7. Remove the supports and lower the vehicle.
8. **Front Compartment Front Sight Shield Replacement** » Remove
9. **Air Cleaner Assembly Replacement** » Remove
10. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud» Remove [4x]

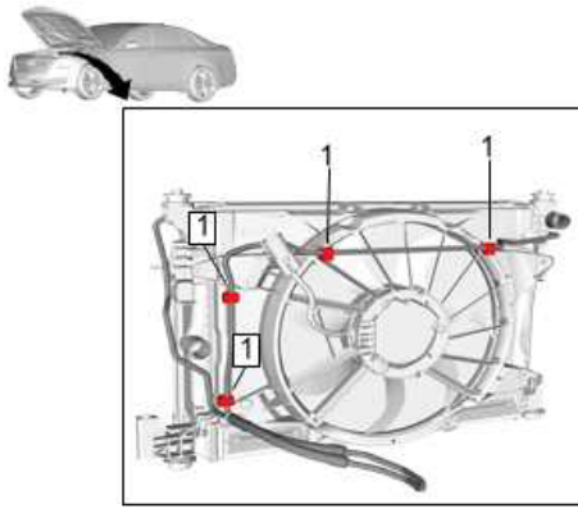


Fig. 48: Transmission Fluid Cooler Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

11. Transmission Fluid Cooler Inlet Pipe Clip (1) @ Transmission Fluid Cooler Fitting» Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

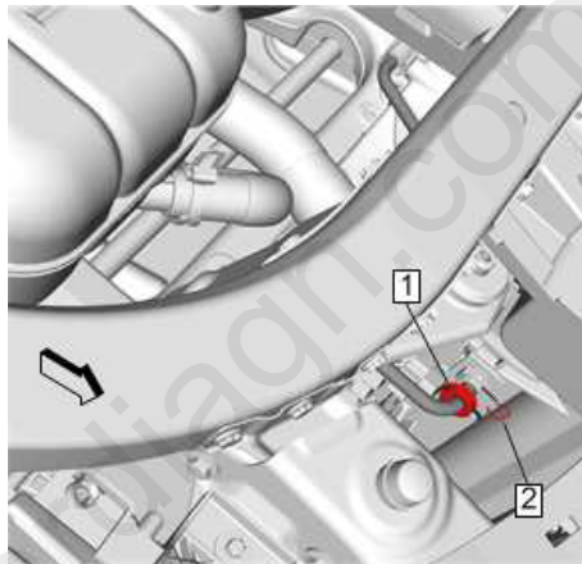


Fig. 49: Transmission Fluid Cooler Inlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

12. Transmission Fluid Cooler Outlet Pipe Clip (1) @ Transmission Fluid Cooler Fitting» Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

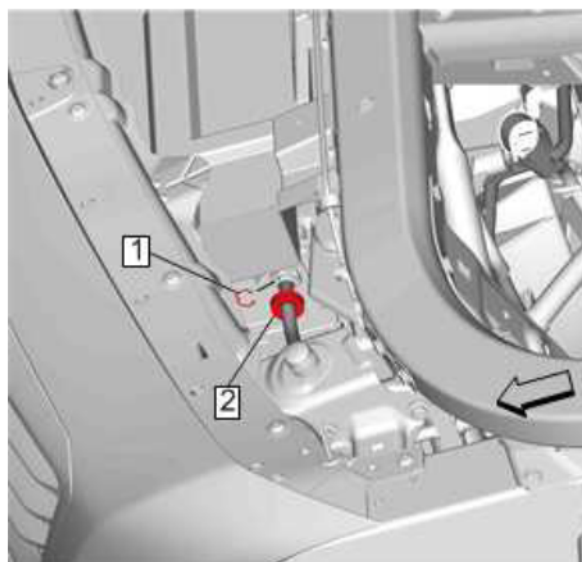


Fig. 50: Transmission Fluid Cooler Outlet Pipe And Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

13. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
14. Transmission Fluid Cooler Inlet and Outlet Pipe» Remove

Installation Procedure

1. Position the transmission fluid cooler inlet and outlet pipe on the vehicle.
2. Transmission Fluid Cooler Pipe Clip (1) @ Transmission Fluid Cooler Pipe Bracket» Install

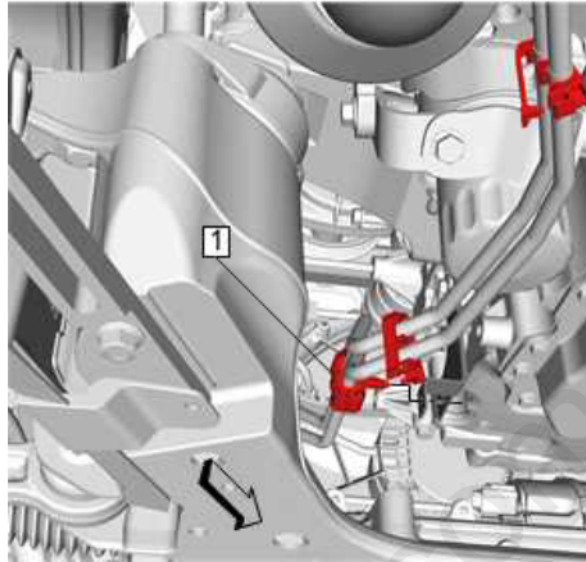


Fig. 51: Transmission Fluid Cooler Pipe Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

3. Install NEW O-ring seals (1) @ Transmission Fluid Cooler Thermal Bypass Valve.

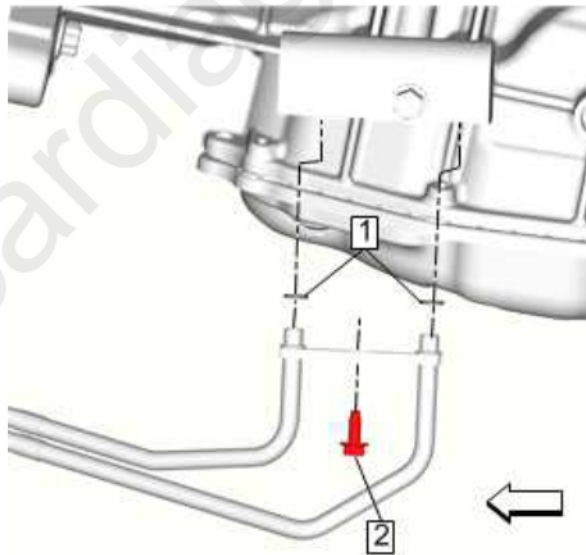


Fig. 52: Transmission Fluid Cooler Thermal Bypass Keeper Plate Bolt And O-Ring Seals
Courtesy of GENERAL MOTORS COMPANY

4. Transmission Fluid Cooler Pipe Bolt (2) @ Transmission Fluid Cooler Thermal Bypass Valve» Install and tighten 9 N.m (80 lb in)
5. Remove the supports and lower the vehicle.
6. Transmission Fluid Cooler Inlet Pipe Clip (1) @ Transmission Fluid Cooler Fitting» Install - [Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection](#)

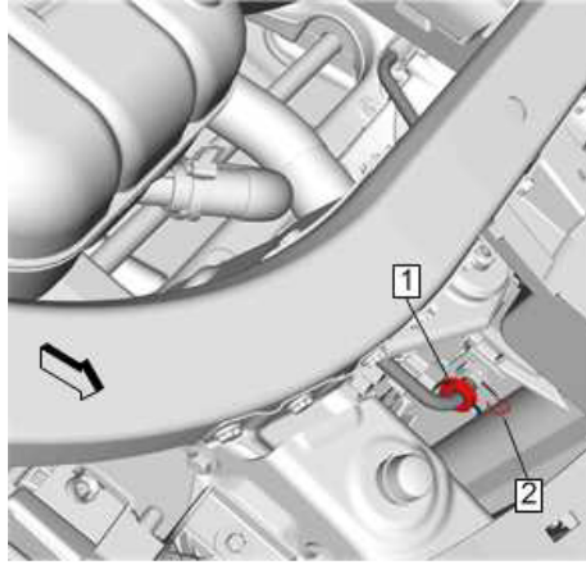


Fig. 53: Transmission Fluid Cooler Inlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

7. Transmission Fluid Cooler Outlet Pipe Clip (1) @ Transmission Fluid Cooler Fitting» Install - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection.**

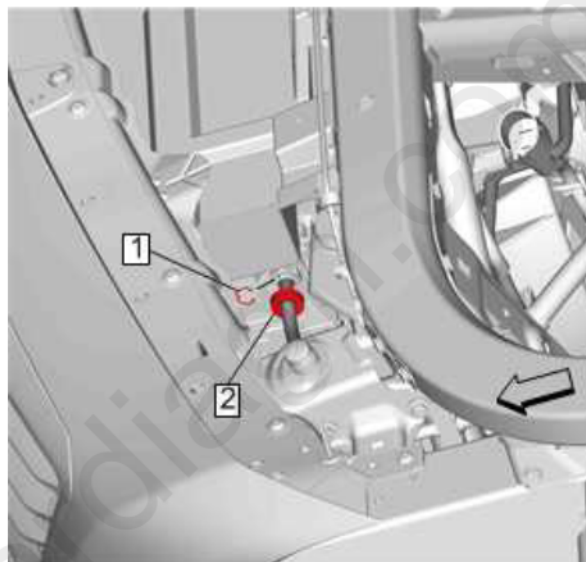


Fig. 54: Transmission Fluid Cooler Outlet Pipe And Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

8. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud Install [4x]

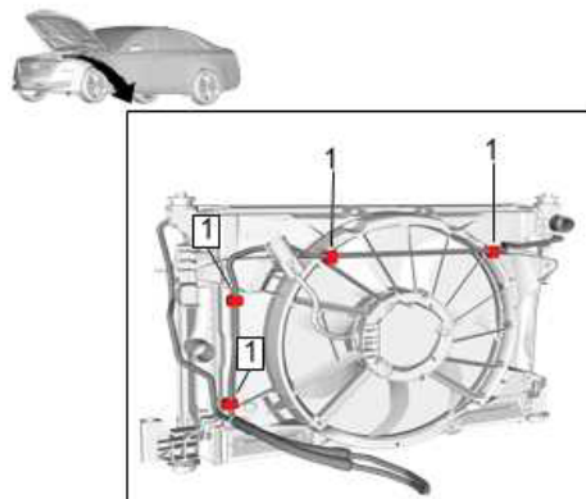


Fig. 55: Transmission Fluid Cooler Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

9. [Air Cleaner Assembly Replacement](#) A» Install
10. [Front Compartment Front Sight Shield Replacement](#) A» Install
11. Check the transmission fluid level. Refer to [Transmission Fluid Fill Procedure](#)
12. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
13. Inspect for transmission fluid leaks.
14. [Front Bumper Fascia Lower Stiffener Replacement](#) A» Install
15. [Drivetrain and Front Suspension Cradle Plate Replacement](#) A» Install
16. [Underbody Front Air Deflector Replacement](#) A» Install
17. Remove the supports and lower the vehicle.

TRANSMISSION FLUID COOLER INLET AND OUTLET PIPE REPLACEMENT (LTG WITH HP9)

Removal Procedure

1. Front Compartment Front Sight Shield (3) A» Remove - [Front Compartment Front Sight Shield Replacement](#)

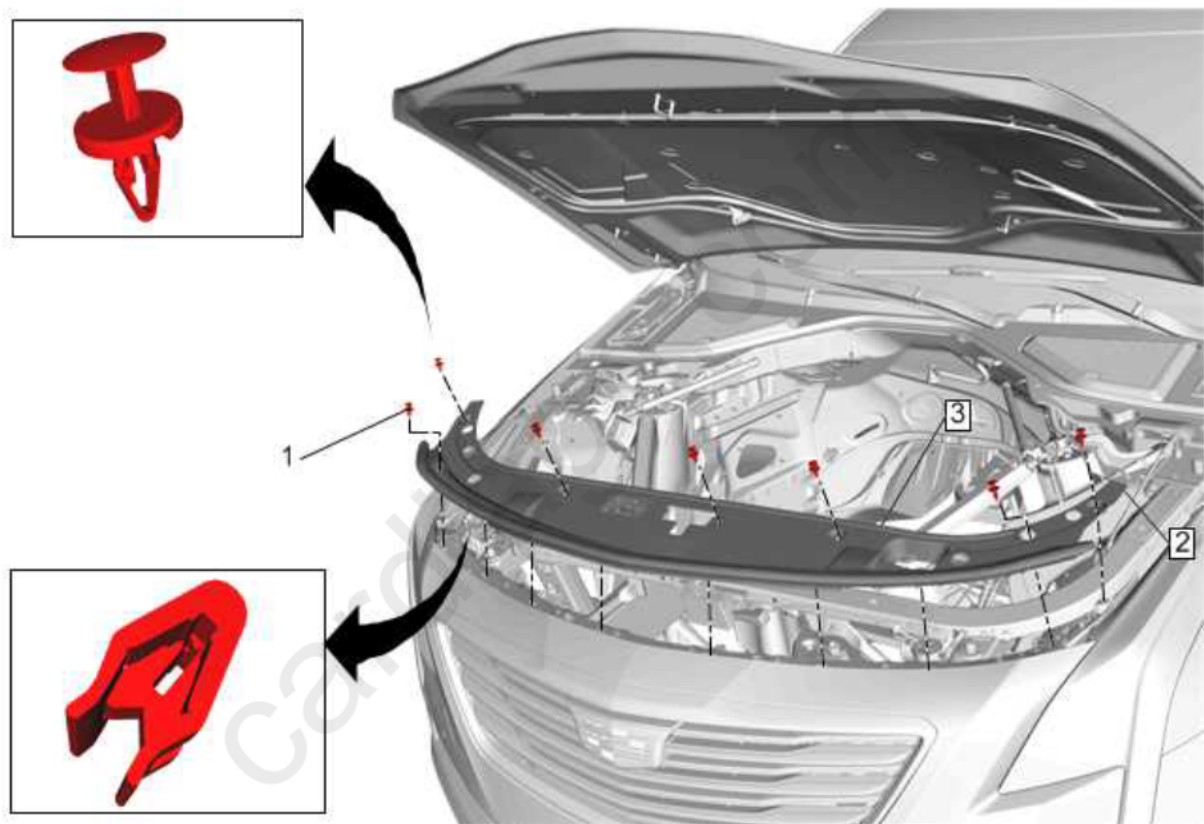


Fig. 56: Front Compartment Front Sight Shield

Courtesy of GENERAL MOTORS COMPANY

2. Air Cleaner Assembly (2) A» Remove - [Air Cleaner Assembly Replacement \(LGW\)](#) and/or [Air Cleaner Assembly Replacement \(LGX\)](#)

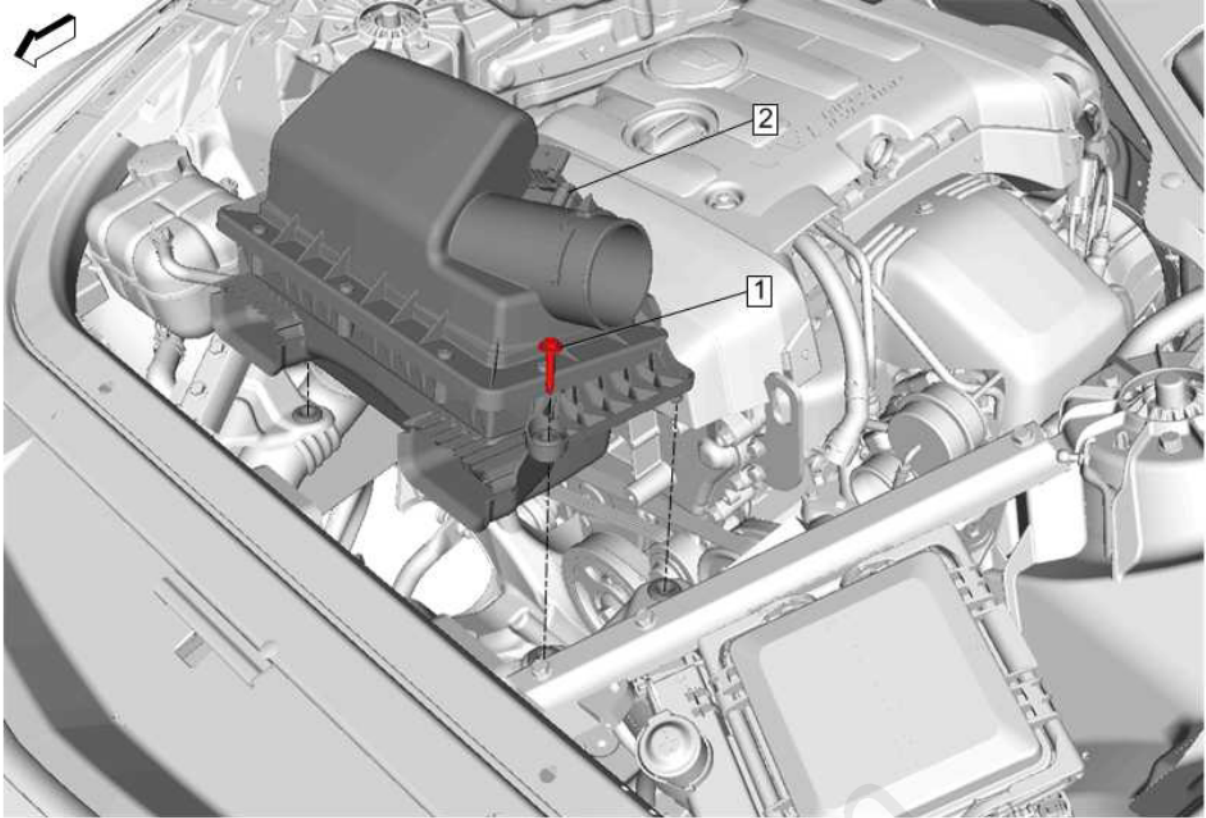


Fig. 57: Air Cleaner Assembly

Courtesy of GENERAL MOTORS COMPANY

3. Underbody Front Air Deflector (4) » Remove - **Underbody Front Air Deflector Replacement**

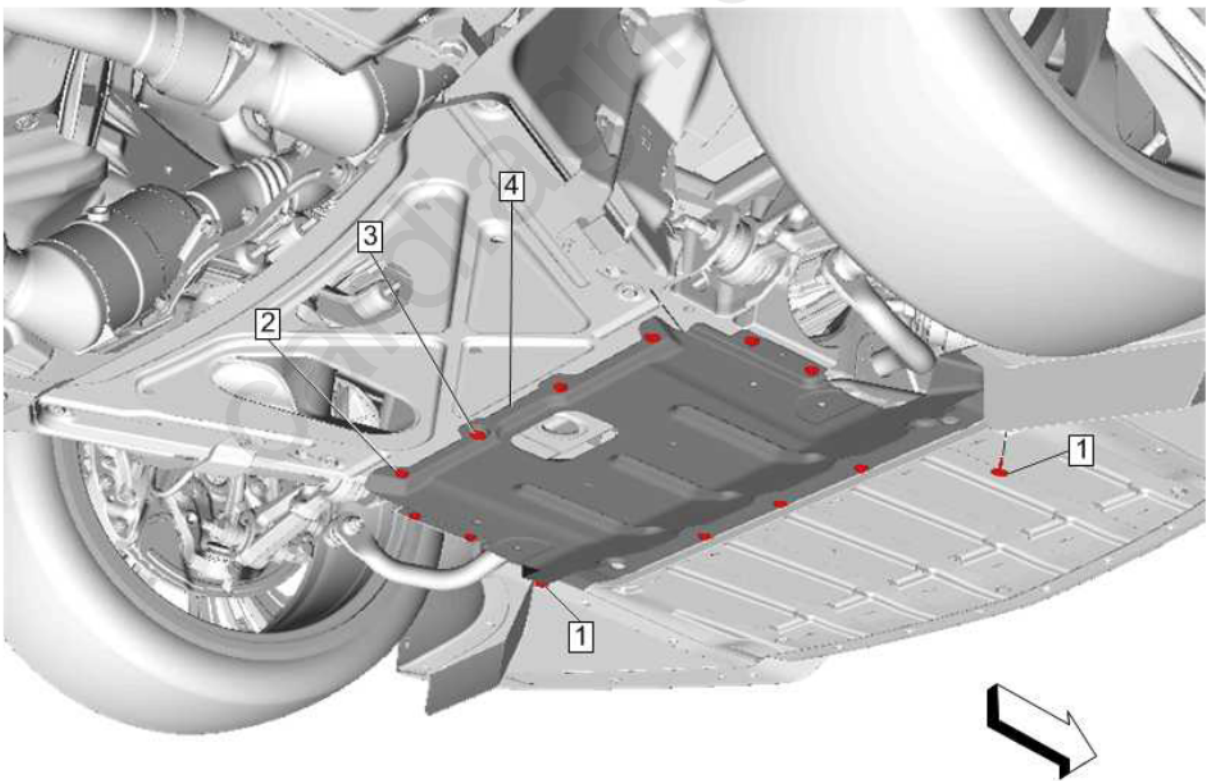


Fig. 58: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

4. Drivetrain and Front Suspension Cradle Plate (3) » Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

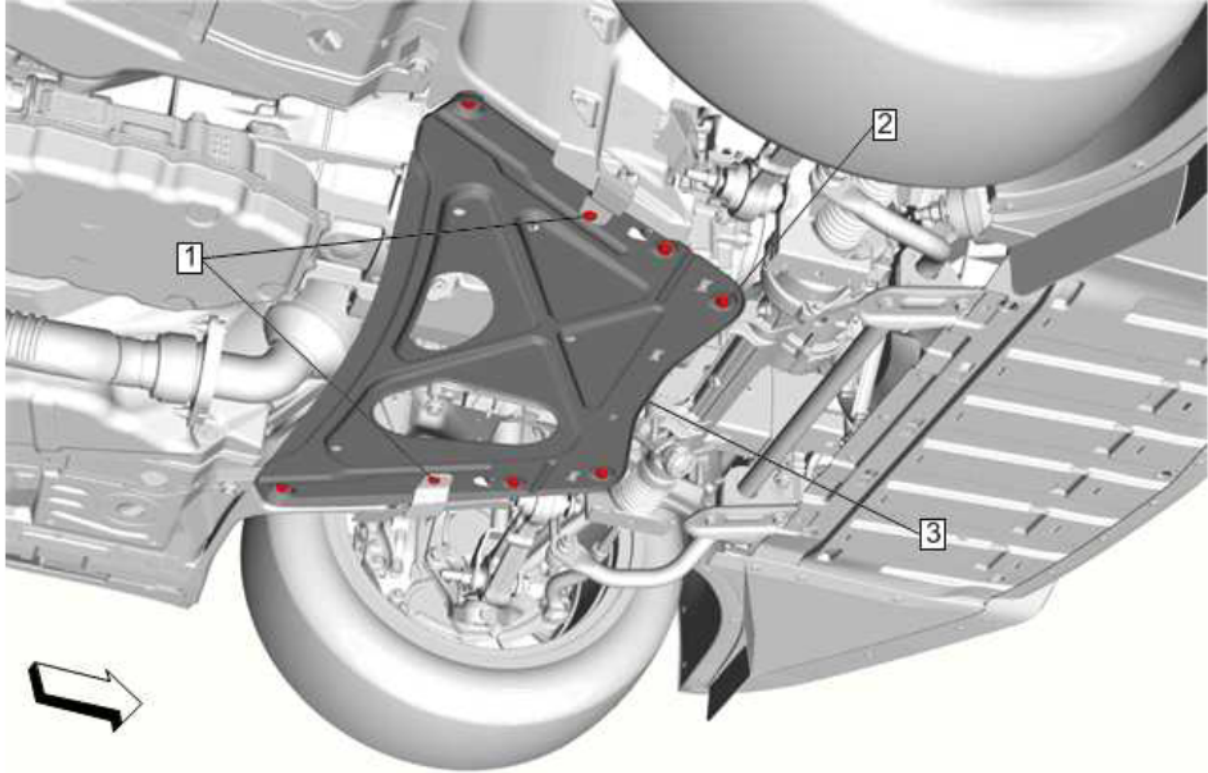


Fig. 59: Drivetrain and Front Suspension Cradle Plate

Courtesy of GENERAL MOTORS COMPANY

5. Front Bumper Fascia Lower Stiffener (3)» Remove - **Front Bumper Fascia Lower Stiffener Replacement**

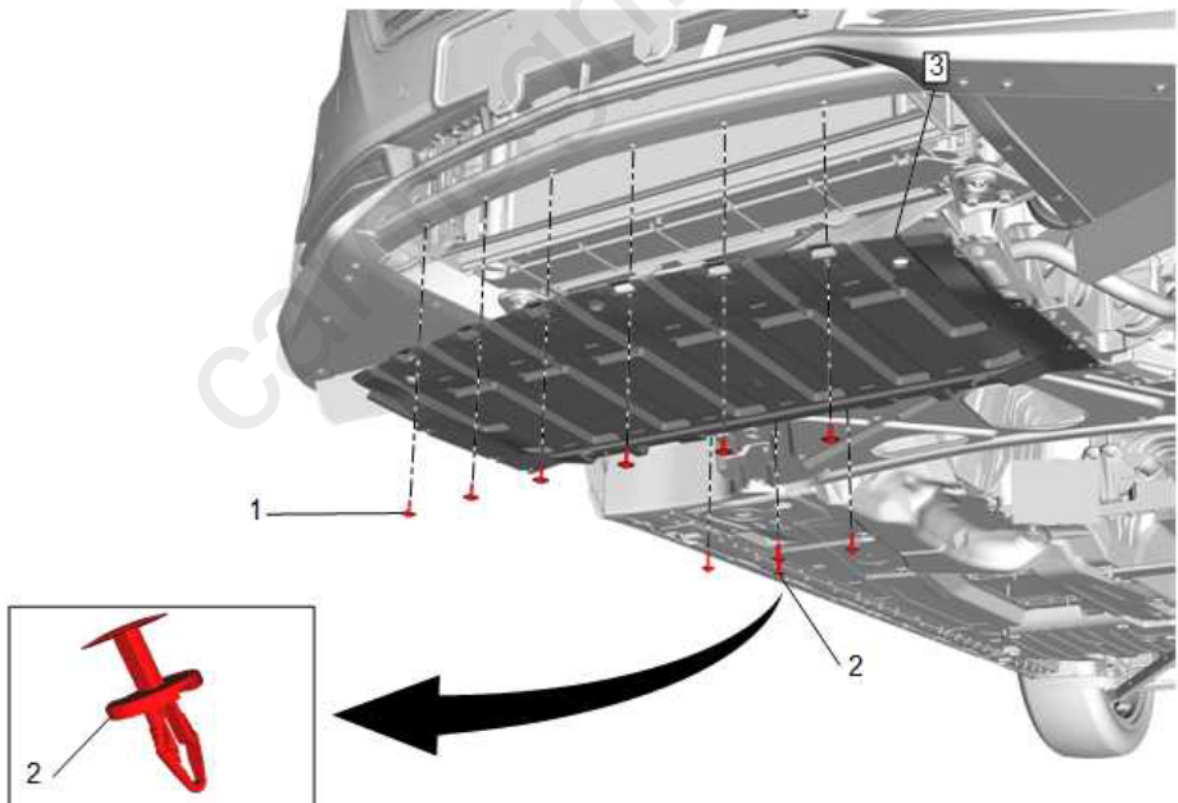


Fig. 60: Front Bumper Fascia Lower Stiffener

Courtesy of GENERAL MOTORS COMPANY

6. Remove the supports and lower the vehicle.
7. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Condenser» Remove - **Air Conditioning Condenser and Evaporator Hose Replacement (LTG)**

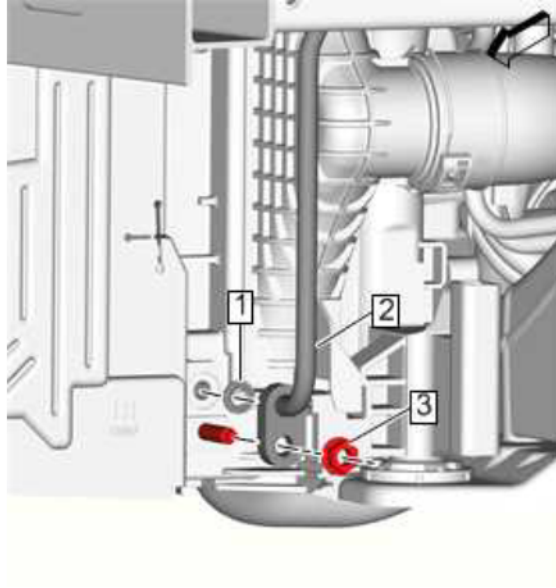


Fig. 61: Air Conditioning Condenser and Evaporator Hose
 Courtesy of GENERAL MOTORS COMPANY

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

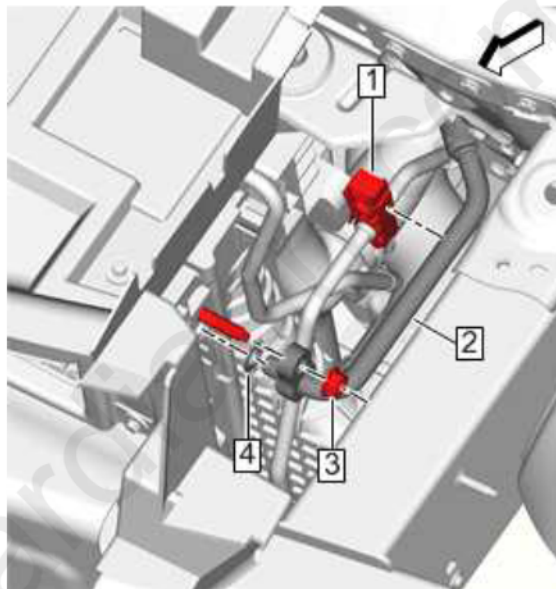


Fig. 62: Air Conditioning Compressor and Condenser Hose
 Courtesy of GENERAL MOTORS COMPANY

9. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud» Remove [4x]

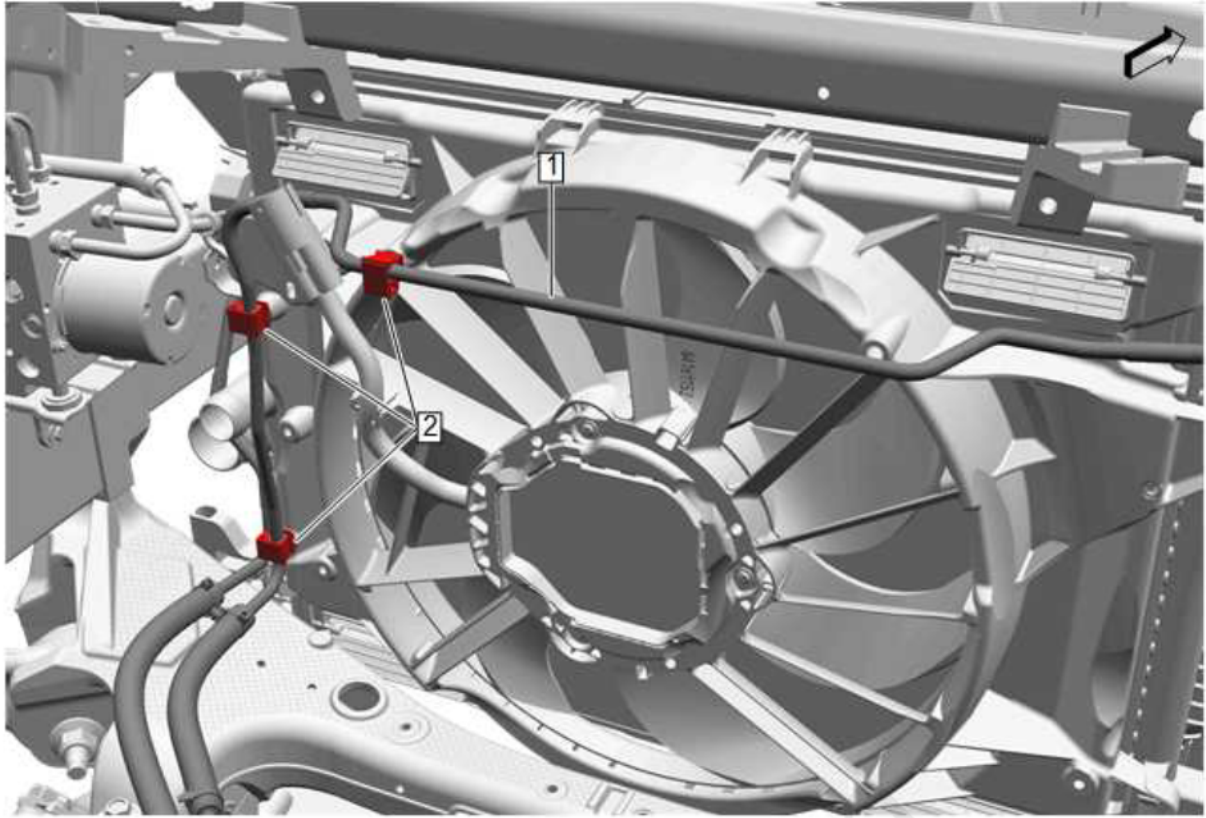


Fig. 63: Transmission Fluid Cooler Pipe Clips
 Courtesy of GENERAL MOTORS COMPANY

10. Transmission Fluid Cooler Inlet Pipe (2) @ Transmission Fluid Cooler Fitting (1) » Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

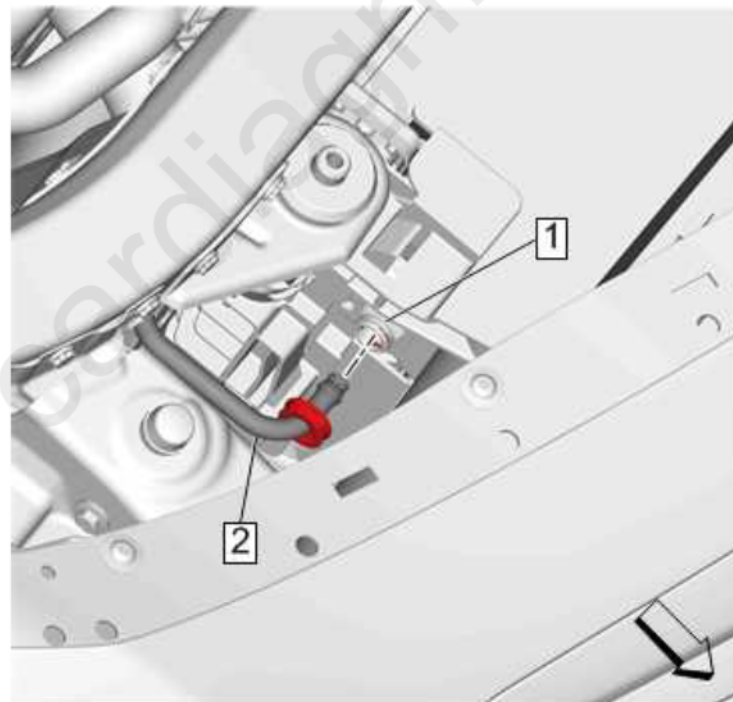


Fig. 64: Transmission Fluid Cooler Inlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

11. Cap the fittings and plug the holes when removing the transmission fluid cooler pipes.
 12. Transmission Fluid Cooler Outlet Pipe (2) @ Transmission Fluid Cooler Fitting (1) » Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

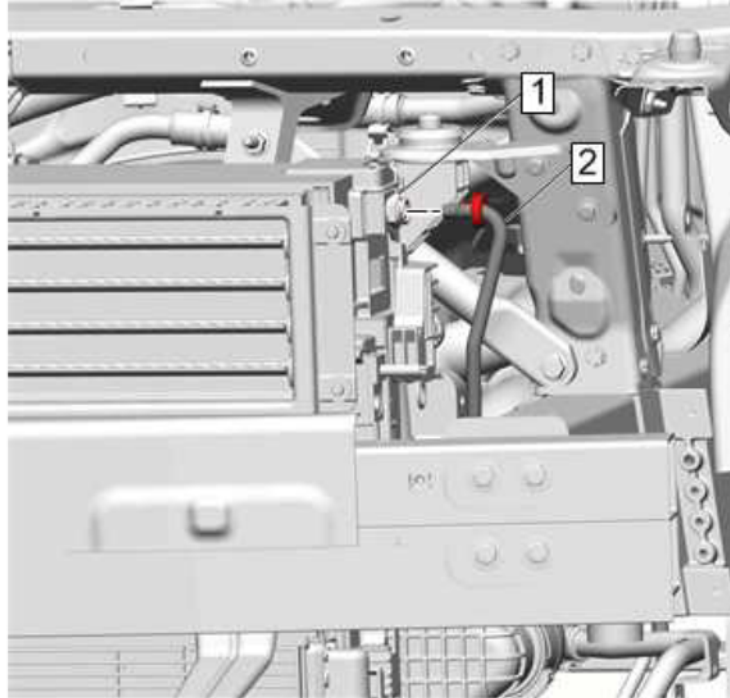


Fig. 65: Transmission Fluid Cooler Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

13. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
14. Transmission Fluid Cooler Pipe Clip (2) @ Transmission Fluid Cooler Pipe Bracket (1)»
 Remove

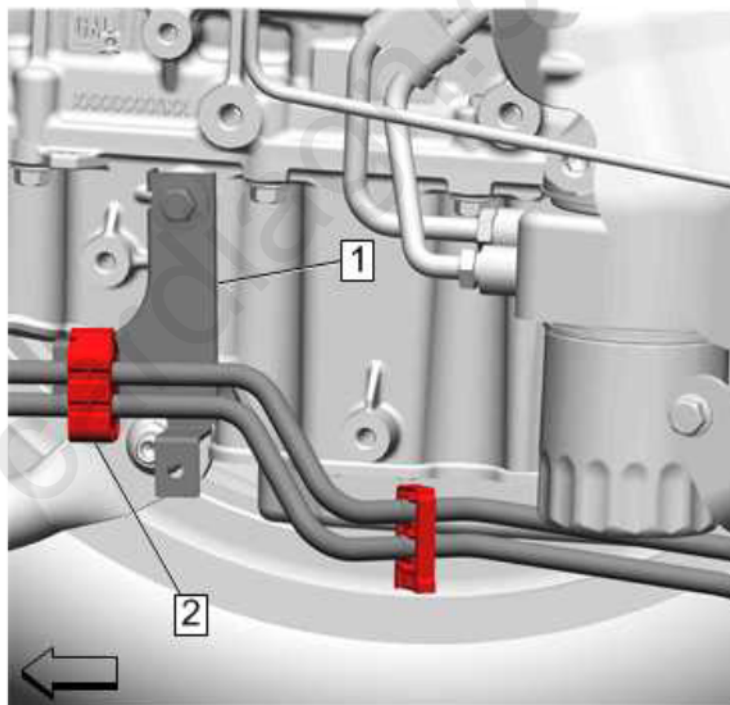


Fig. 66: Transmission Fluid Cooler Pipe Clip
Courtesy of GENERAL MOTORS COMPANY

15. Transmission Fluid Cooler Pipe Bolt (1) @ Transmission Fluid Cooler Thermal Bypass Valve»
 Remove

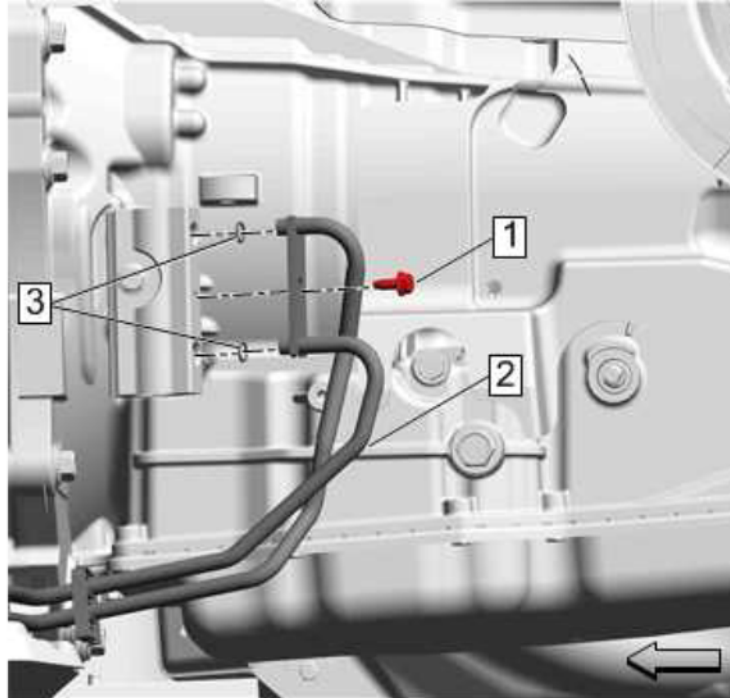


Fig. 67: Transmission Fluid Cooler Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

16. Transmission Fluid Cooler Pipe Fitting Seal (3) » Remove and DISCARD [2x]
17. Transmission Fluid Cooler Inlet and Outlet Pipe (2) » Remove

Installation Procedure

1. Remove the caps from the fittings and plugs from the holes before installing the transmission fluid cooler pipes.
2. Position the transmission fluid cooler inlet and outlet pipe (2) on the vehicle.
3. Transmission Fluid Cooler Pipe Fitting Seal (3) @ Transmission Fluid Cooler Thermal Bypass Valve » Install NEW seal rings. [2x]

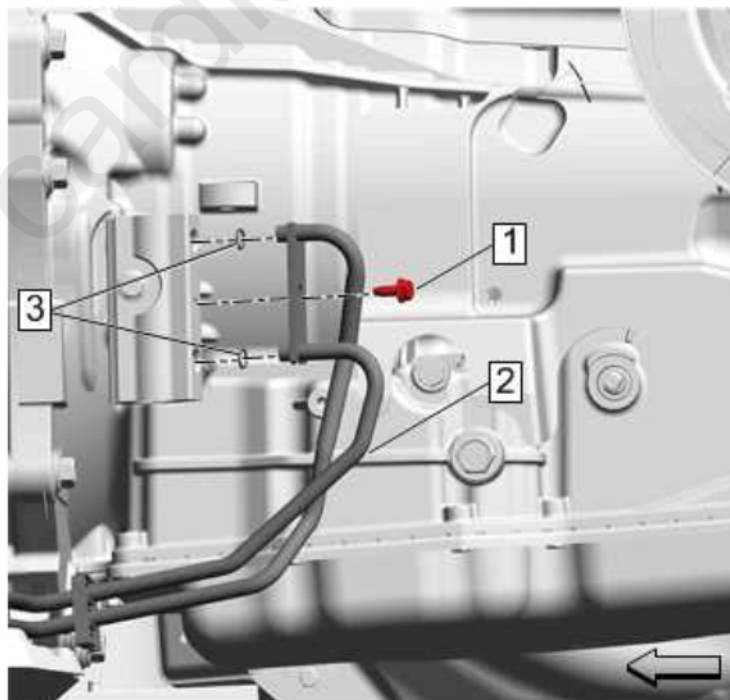


Fig. 68: Transmission Fluid Cooler Pipe Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Transmission Fluid Cooler Pipe Bolt (1) @ Transmission Fluid Cooler Thermal Bypass Valve » Install and tighten 9 N.m (80 lb in)
5. Transmission Fluid Cooler Pipe Clip (2) @ Transmission Fluid Cooler Pipe Bracket (1) » Install

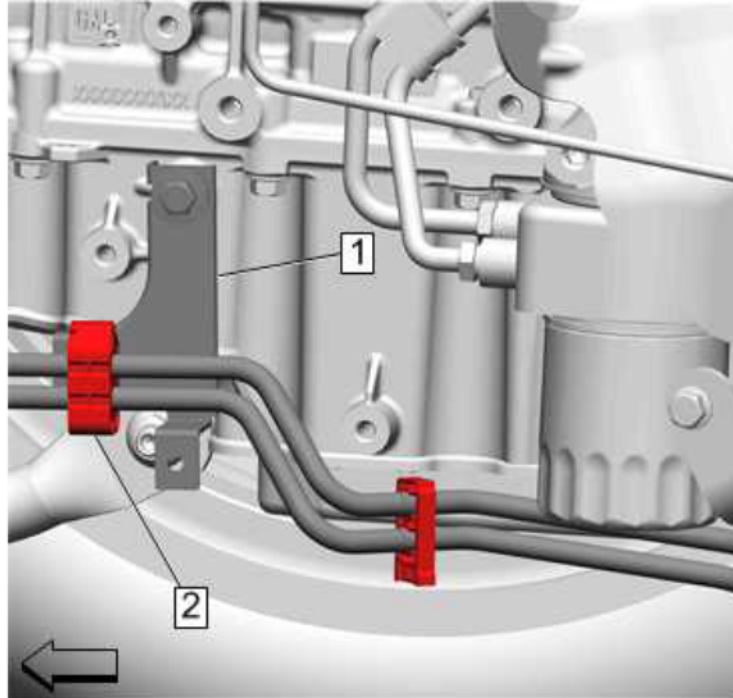


Fig. 69: Transmission Fluid Cooler Pipe Clip

Courtesy of GENERAL MOTORS COMPANY

6. Remove the supports and lower the vehicle.
7. Transmission Fluid Cooler Outlet Pipe (2) @ Transmission Fluid Cooler Fitting (1) » Install - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**.

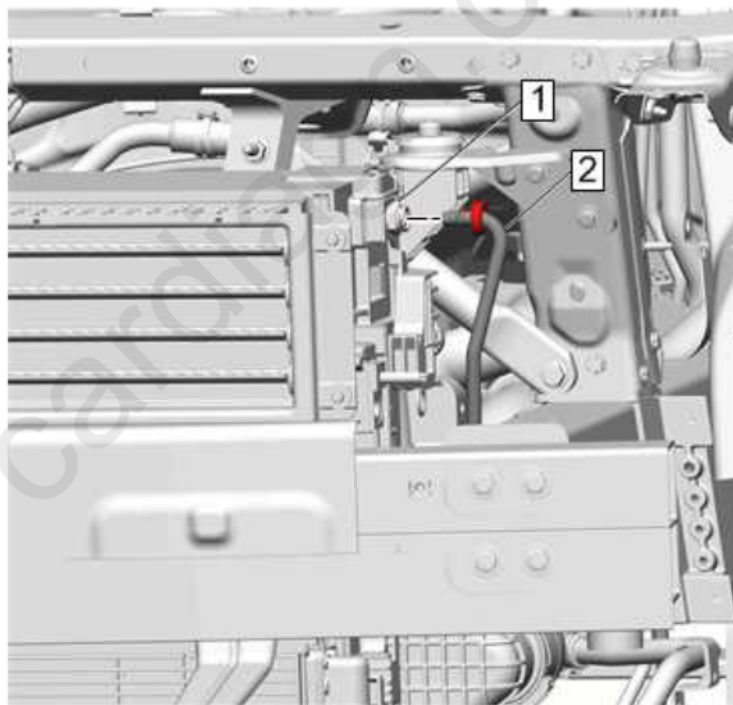


Fig. 70: Transmission Fluid Cooler Outlet Pipe

Courtesy of GENERAL MOTORS COMPANY

8. Transmission Fluid Cooler Inlet Pipe (2) @ Transmission Fluid Cooler Fitting (1) » Install - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

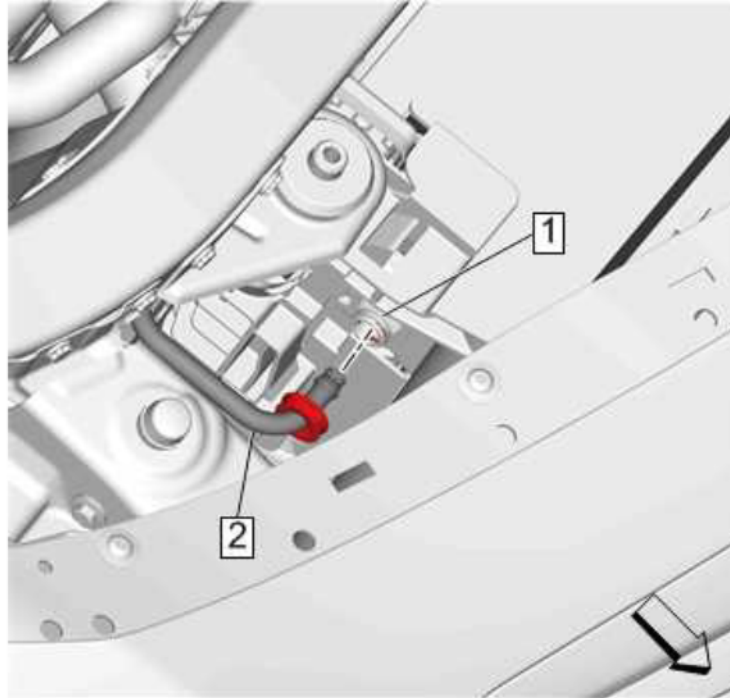


Fig. 71: Transmission Fluid Cooler Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

9. Transmission Fluid Cooler Inlet Pipe (2) @ Engine Coolant Fan Shroud

Install

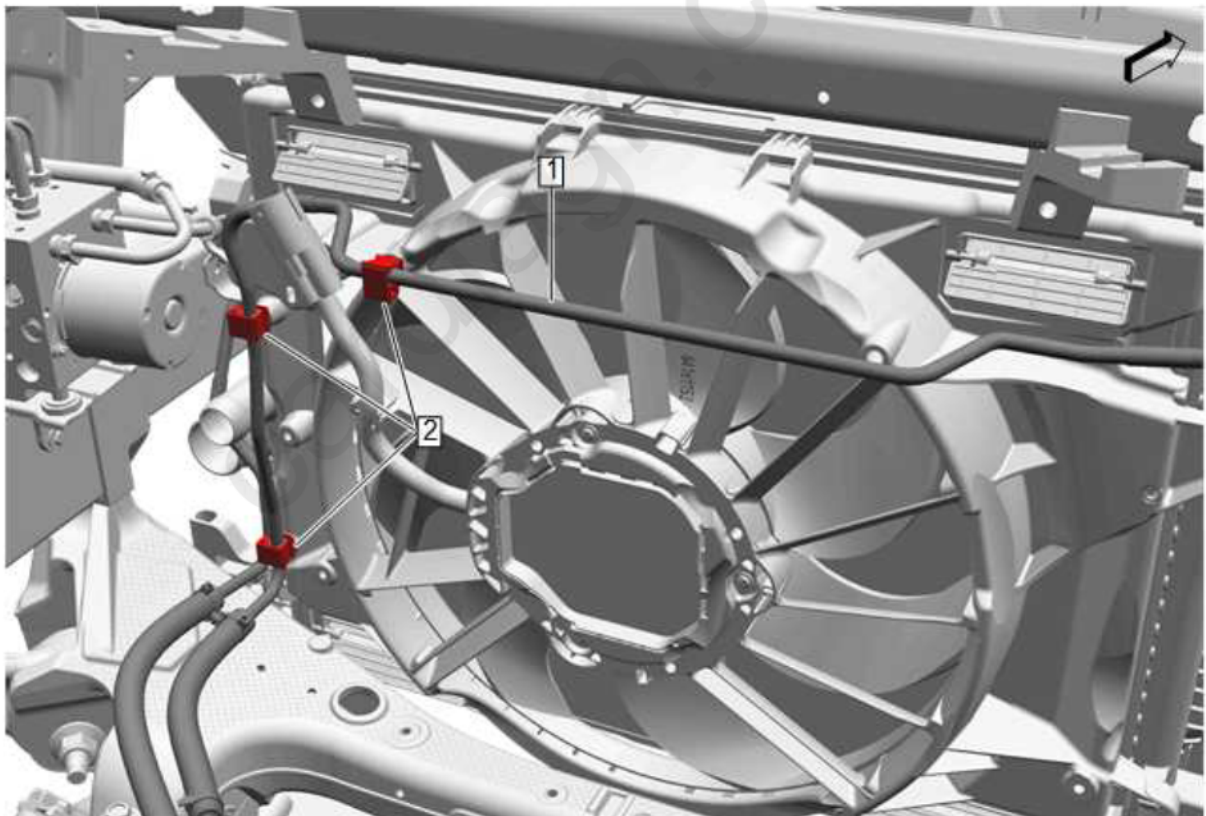


Fig. 72: Transmission Fluid Cooler Pipe Clips
Courtesy of GENERAL MOTORS COMPANY

10. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud» Install [4x]

11. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Condenser» Install -
Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)

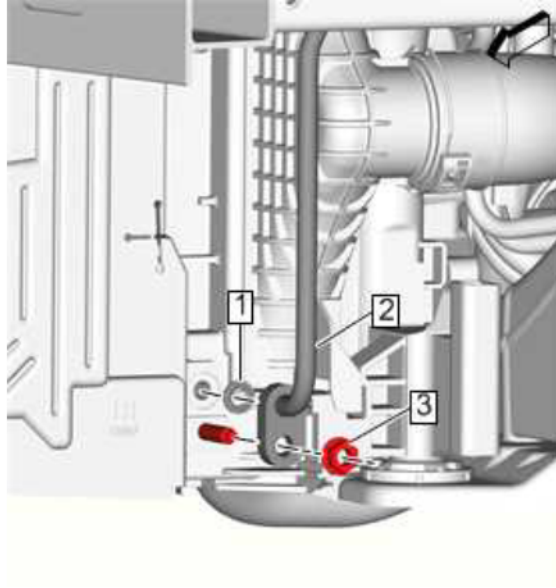


Fig. 73: Air Conditioning Condenser and Evaporator Hose
 Courtesy of GENERAL MOTORS COMPANY

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

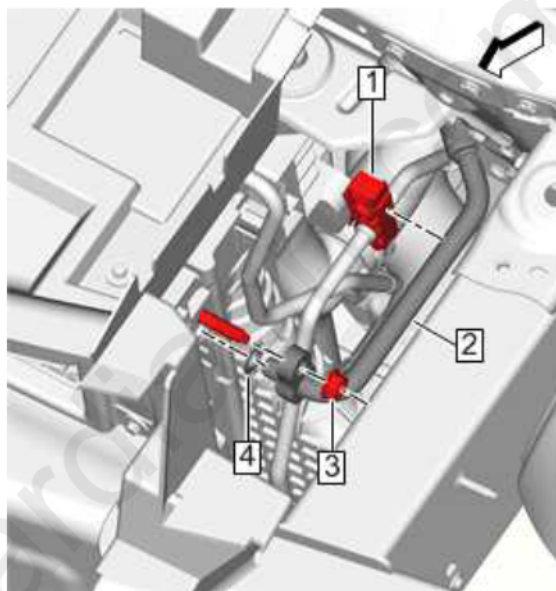


Fig. 74: Air Conditioning Compressor and Condenser Hose
 Courtesy of GENERAL MOTORS COMPANY

13. Air Cleaner Assembly (2)» Install - **Air Cleaner Assembly Replacement (LGW)**, **Air Cleaner Assembly Replacement (LGX)**

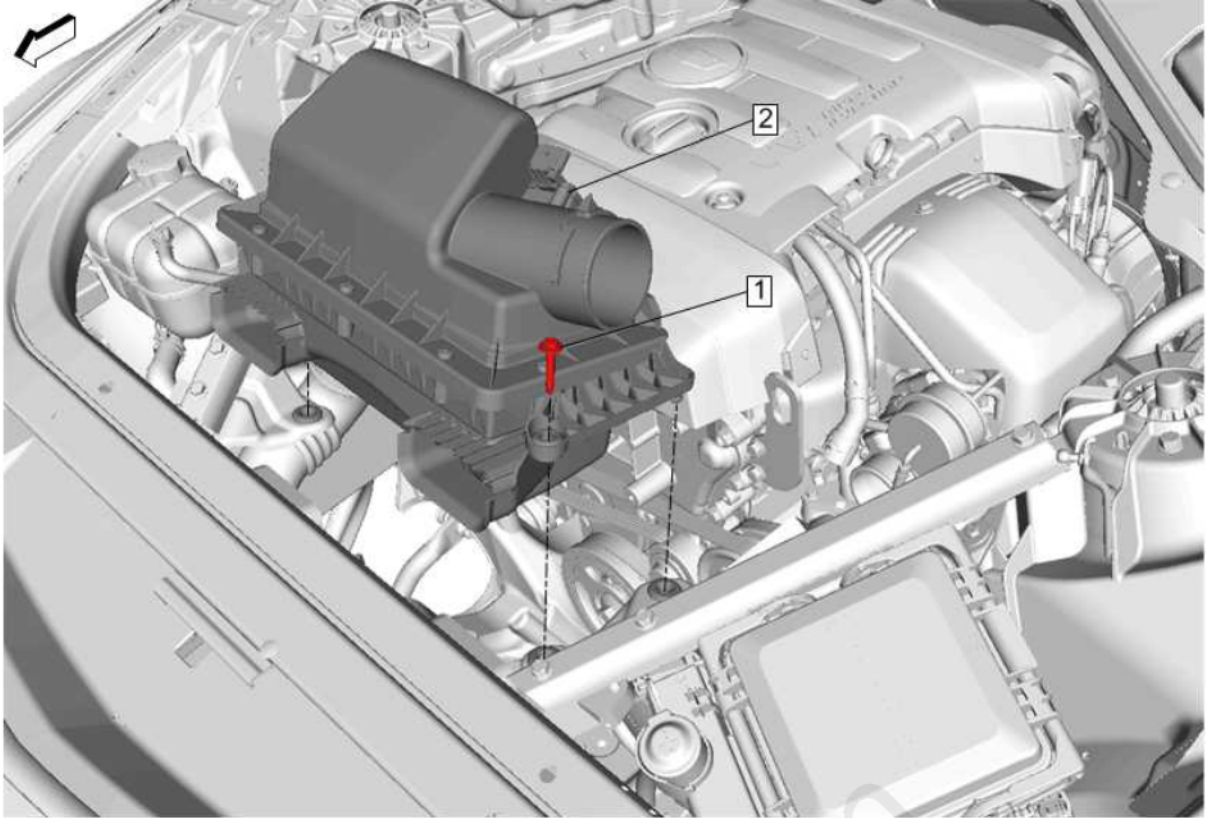


Fig. 75: Air Cleaner Assembly

Courtesy of GENERAL MOTORS COMPANY

14. Front Compartment Front Sight Shield (3)» Install - **Front Compartment Front Sight Shield Replacement**

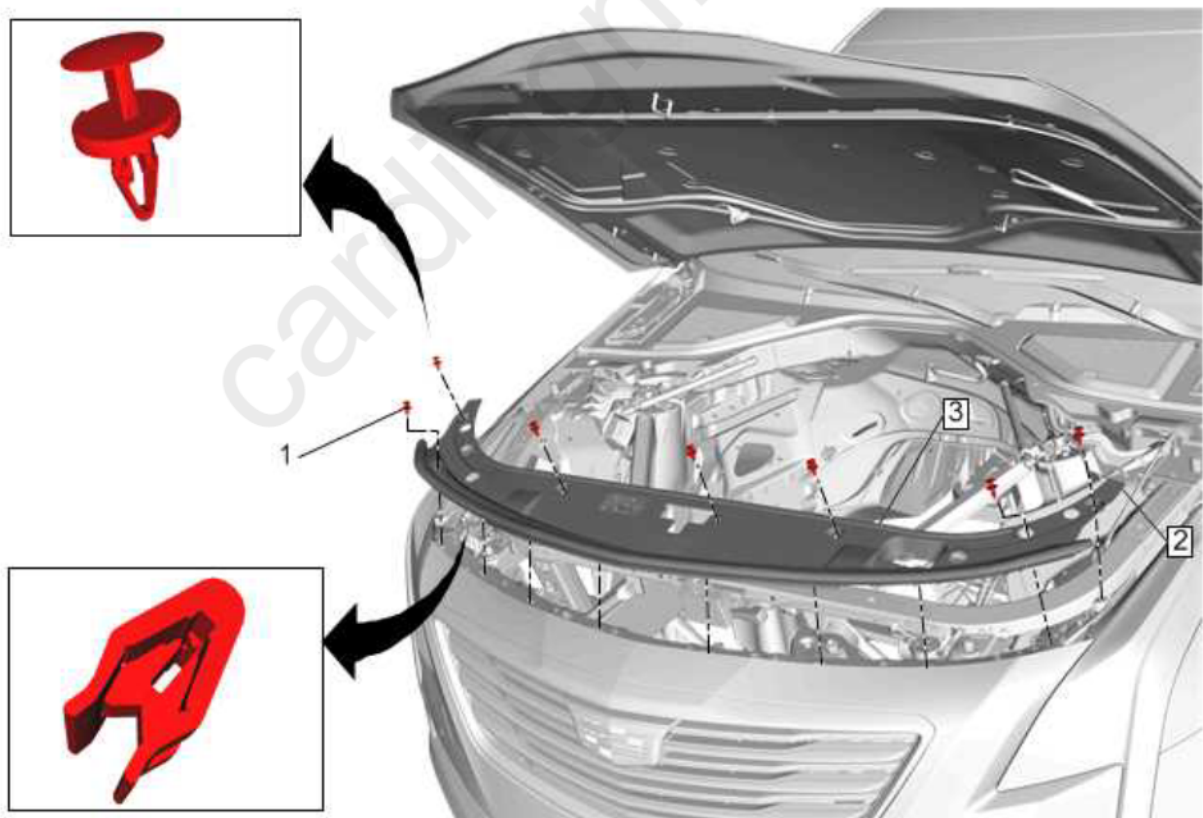


Fig. 76: Front Compartment Front Sight Shield

Courtesy of GENERAL MOTORS COMPANY

15. Front Bumper Fascia Lower Stiffener (3)» Install - **Front Bumper Fascia Lower Stiffener Replacement**

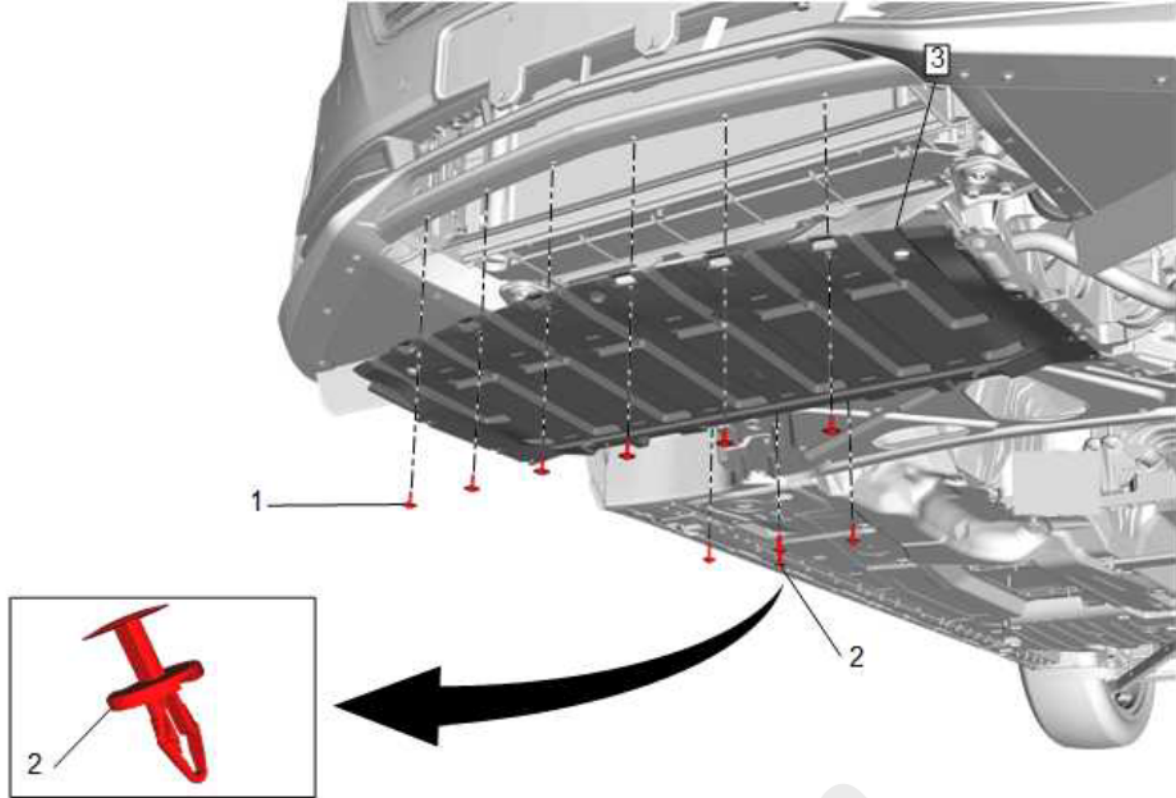


Fig. 77: Front Bumper Fascia Lower Stiffener
 Courtesy of GENERAL MOTORS COMPANY

16. Drivetrain and Front Suspension Cradle Plate (3)» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

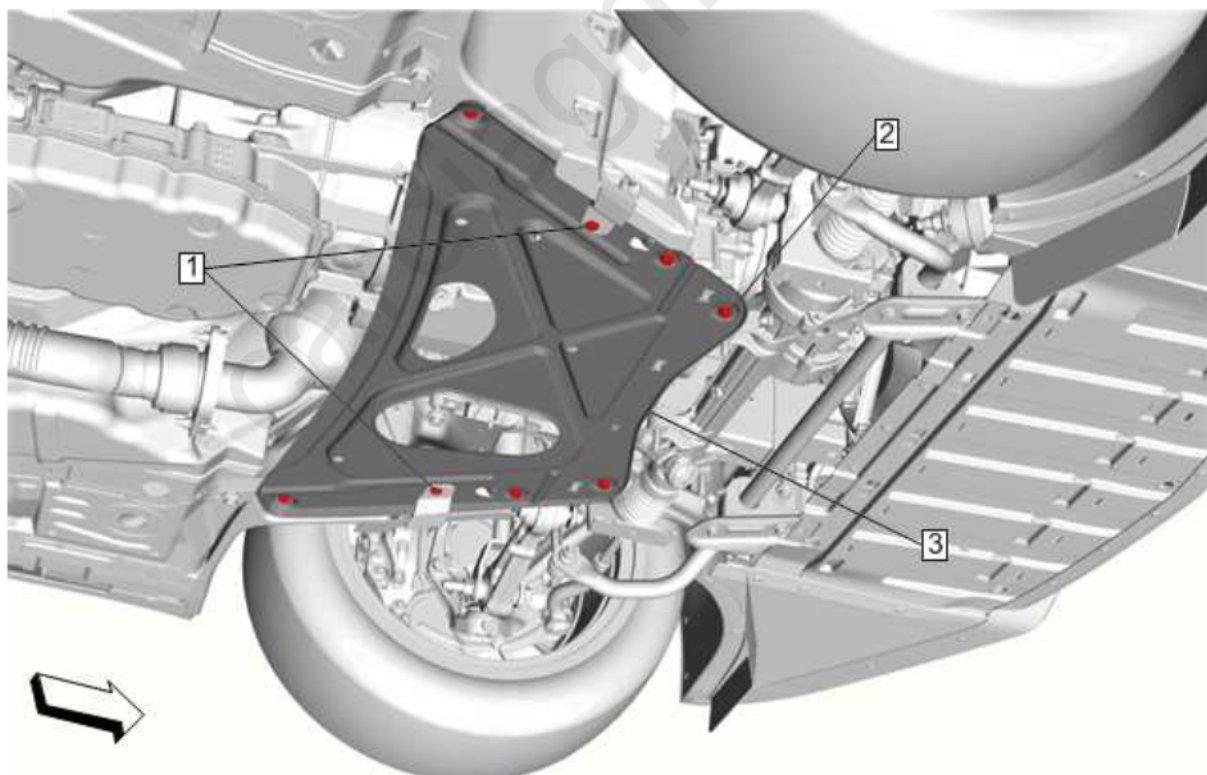


Fig. 78: Drivetrain and Front Suspension Cradle Plate
 Courtesy of GENERAL MOTORS COMPANY

17. Underbody Front Air Deflector (4)» Install - **Underbody Front Air Deflector Replacement**

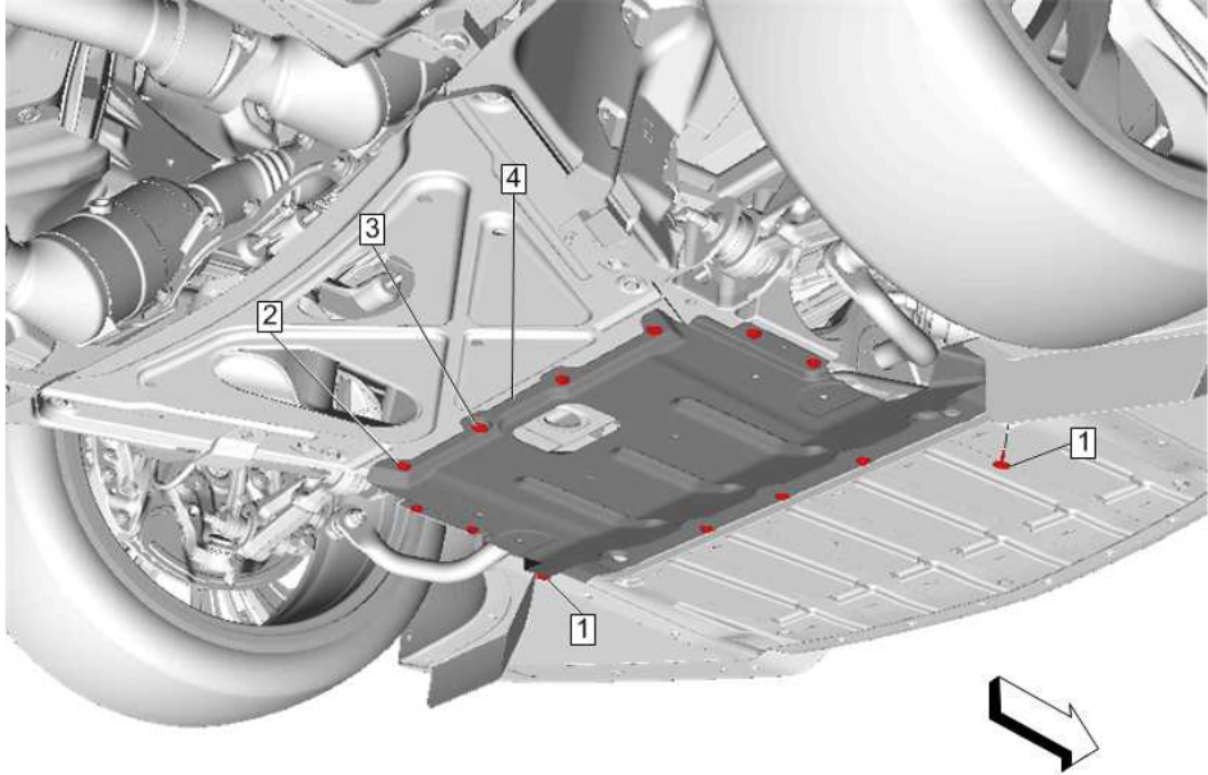


Fig. 79: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

18. Check the transmission fluid level. Refer to [Transmission Fluid Fill Procedure](#)

TRANSMISSION FLUID COOLER INLET AND OUTLET PIPE REPLACEMENT (LGW)

Removal Procedure

1. Radiator Air Upper Baffle and Deflector (4)» Remove - [Radiator Air Upper Baffle and Deflector Replacement \(LGW LTG\)](#)

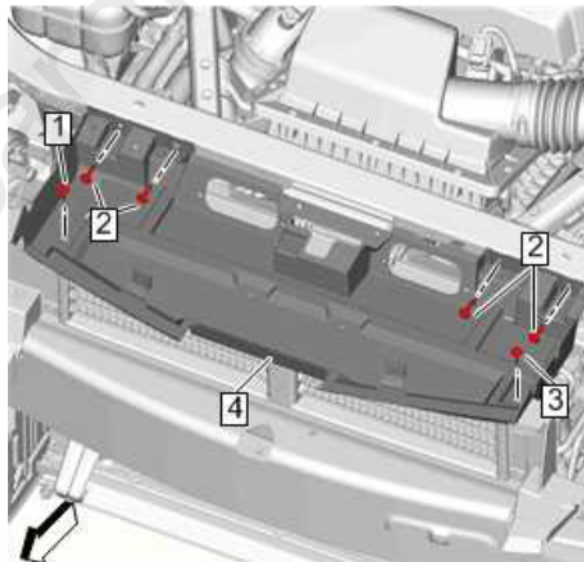


Fig. 80: Radiator Air Upper Baffle and Deflector

Courtesy of GENERAL MOTORS COMPANY

2. Front End Sheet Metal Cross Panel Reinforcement - Left (3)» Remove - [Front End Sheet Metal Cross Panel Reinforcement Replacement \(Left Hand - LGW, LGX\)](#) and [Front End Sheet Metal Cross Panel Reinforcement Replacement \(Right Hand - LGW, LGX\)](#)

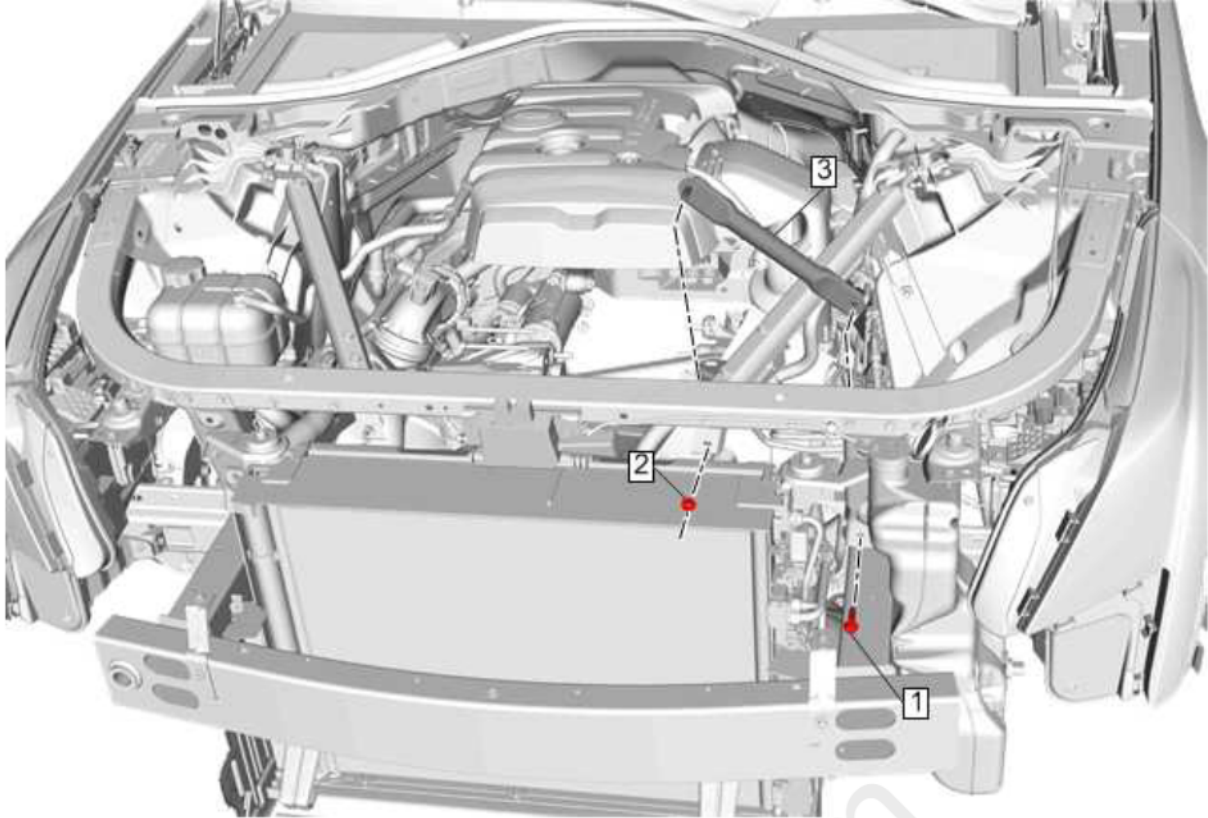


Fig. 81: Front End Sheet Metal Cross Panel Reinforcement (Left Hand)

Courtesy of GENERAL MOTORS COMPANY

3. Front End Sheet Metal Cross Panel Reinforcement- Right (3)» Remove - **Front End Sheet Metal Cross Panel Reinforcement Replacement (Left Hand - LGW, LGX)** and **Front End Sheet Metal Cross Panel Reinforcement Replacement (Right Hand - LGW, LGX)**

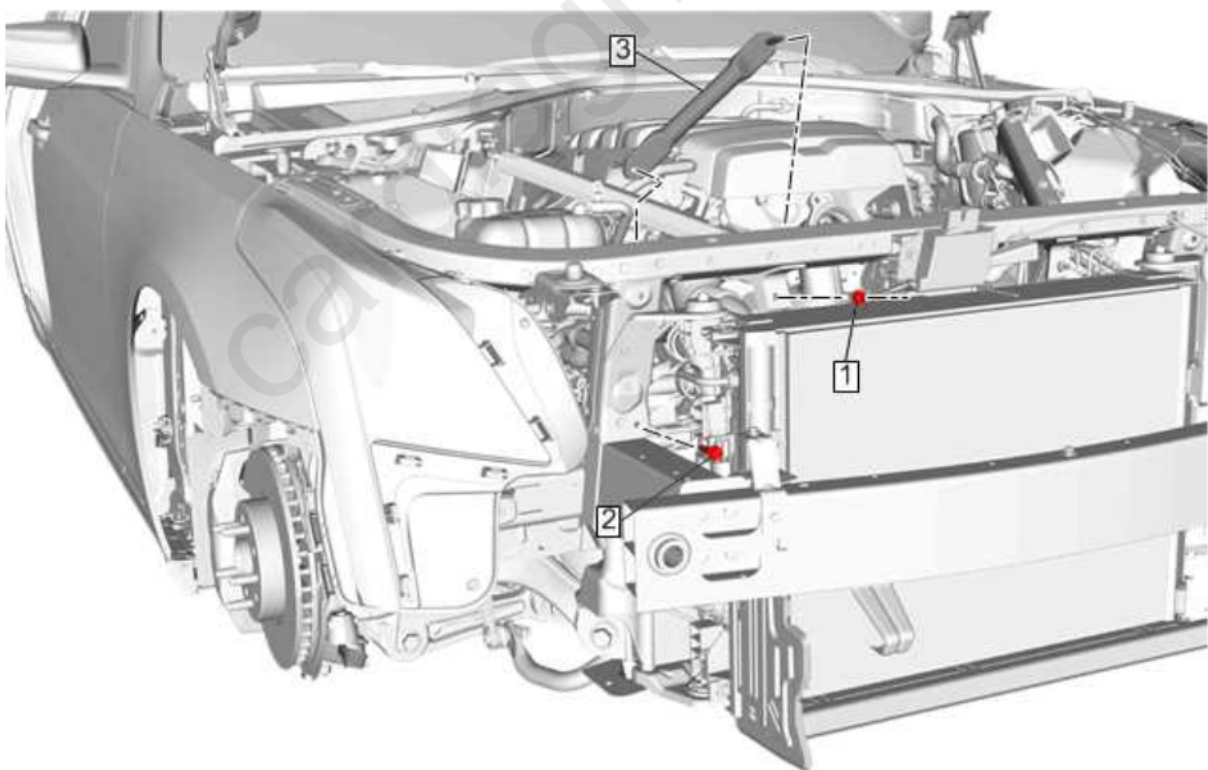


Fig. 82: Front End Sheet Metal Cross Panel Reinforcement (Right Hand)

Courtesy of GENERAL MOTORS COMPANY

4. Air Cleaner Assembly (1)» Remove - **Air Cleaner Assembly Replacement (LGW)**

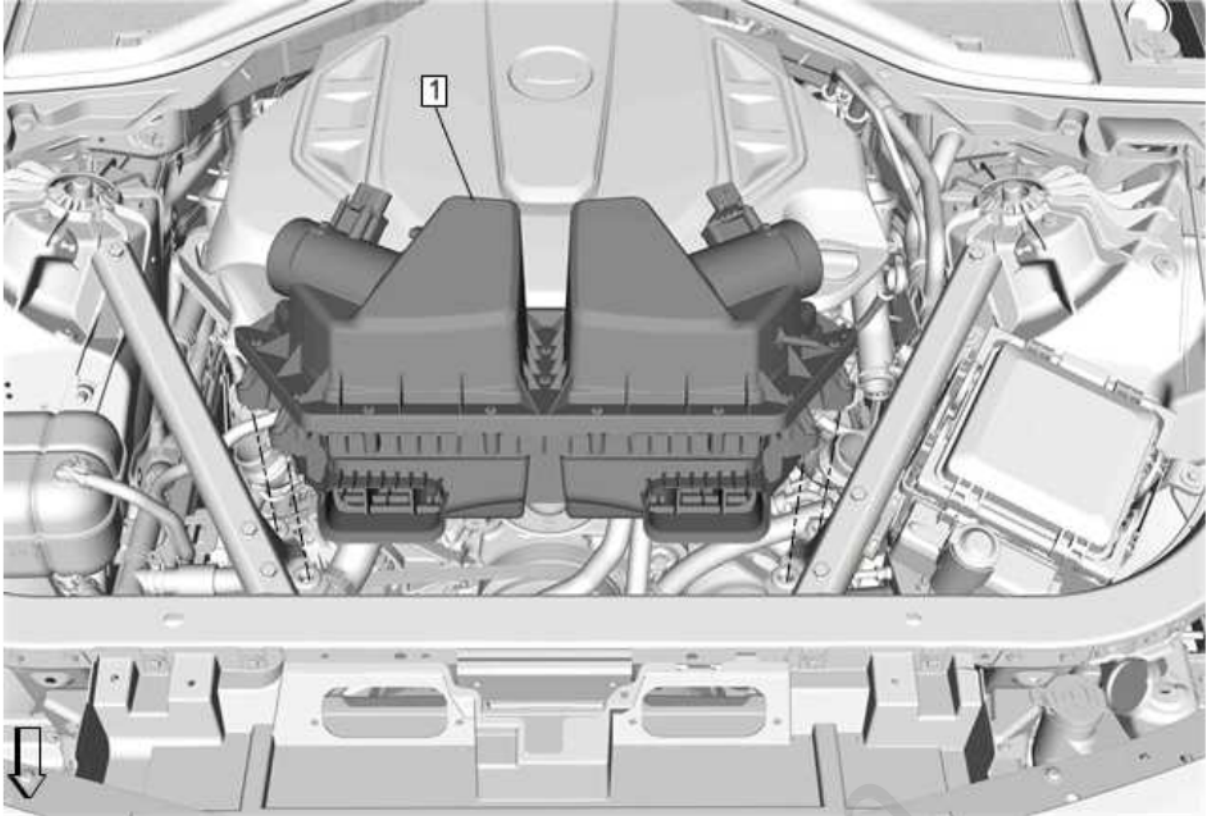


Fig. 83: Air Cleaner Assembly (LGW)

Courtesy of GENERAL MOTORS COMPANY

5. Remove the Left and Right Front Wheelhouse Panel Brace (2). Refer to **Front Wheelhouse Panel Brace Replacement (Rear)** and **Front Wheelhouse Panel Brace Replacement (Front)**

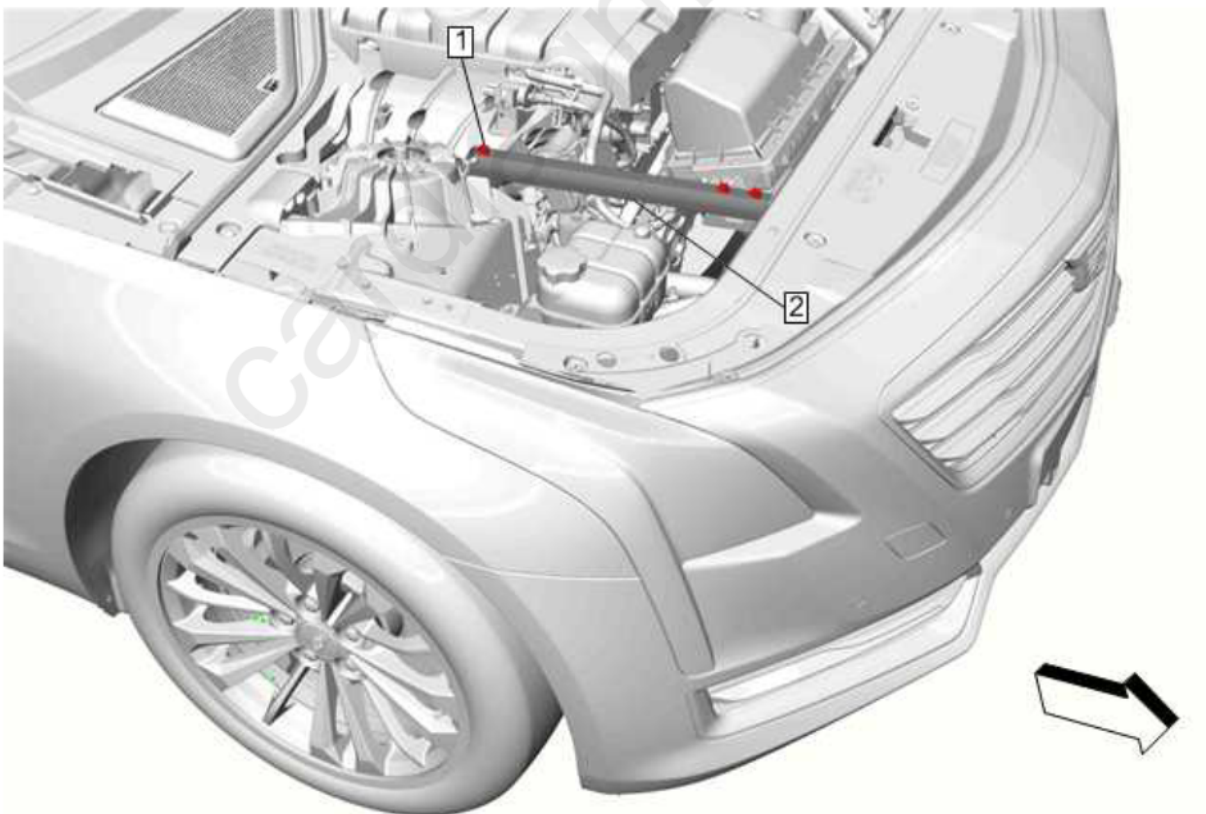


Fig. 84: Front Wheelhouse Panel Brace (Front)

Courtesy of GENERAL MOTORS COMPANY

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

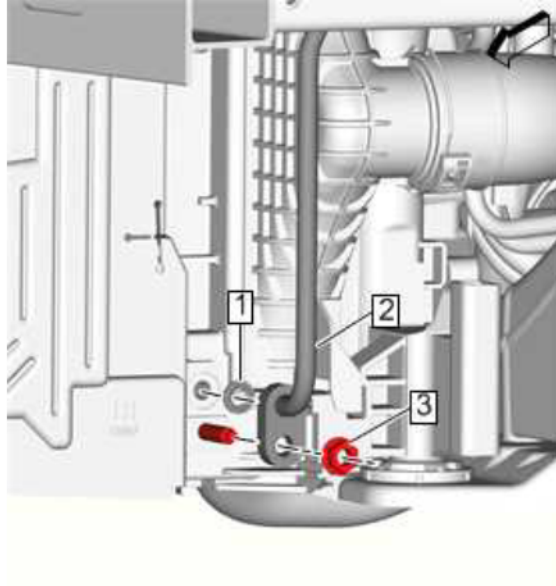


Fig. 85: Air Conditioning Condenser and Evaporator Hose
 Courtesy of GENERAL MOTORS COMPANY

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

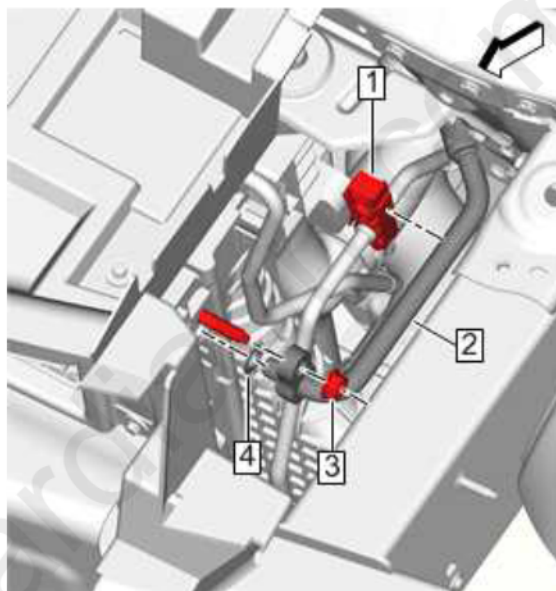


Fig. 86: Air Conditioning Compressor and Condenser Hose
 Courtesy of GENERAL MOTORS COMPANY

8. Engine Wiring Harness Junction Block (1)» Remove - **Engine Wiring Harness Junction Block Replacement**

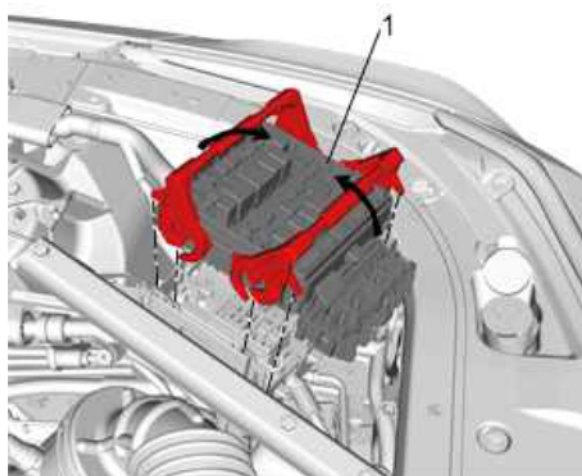


Fig. 87: Engine Wiring Harness Junction Block
Courtesy of GENERAL MOTORS COMPANY

9. Engine Wiring Harness Connector (1) @ Engine Wiring Harness Fuse Block Bracket (2)»
Remove and position aside

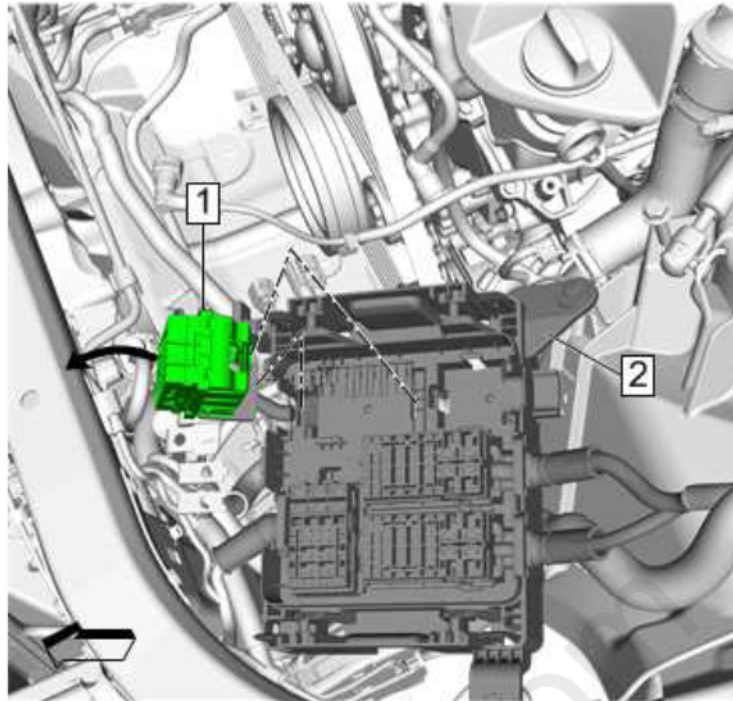


Fig. 88: Engine Wiring Harness Fuse Block Bracket and Wiring Harness Connector
Courtesy of GENERAL MOTORS COMPANY

10. Disconnect the engine cooling fan connector (1) and position out of the way.

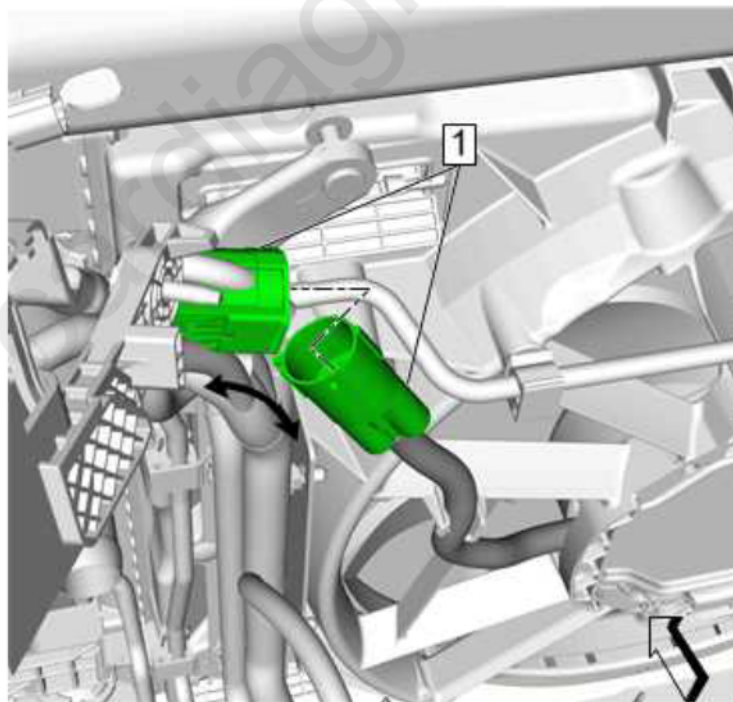


Fig. 89: Engine Cooling Fan Connector
Courtesy of GENERAL MOTORS COMPANY

11. Underbody Front Air Deflector (4)» Remove - **Underbody Front Air Deflector Replacement**

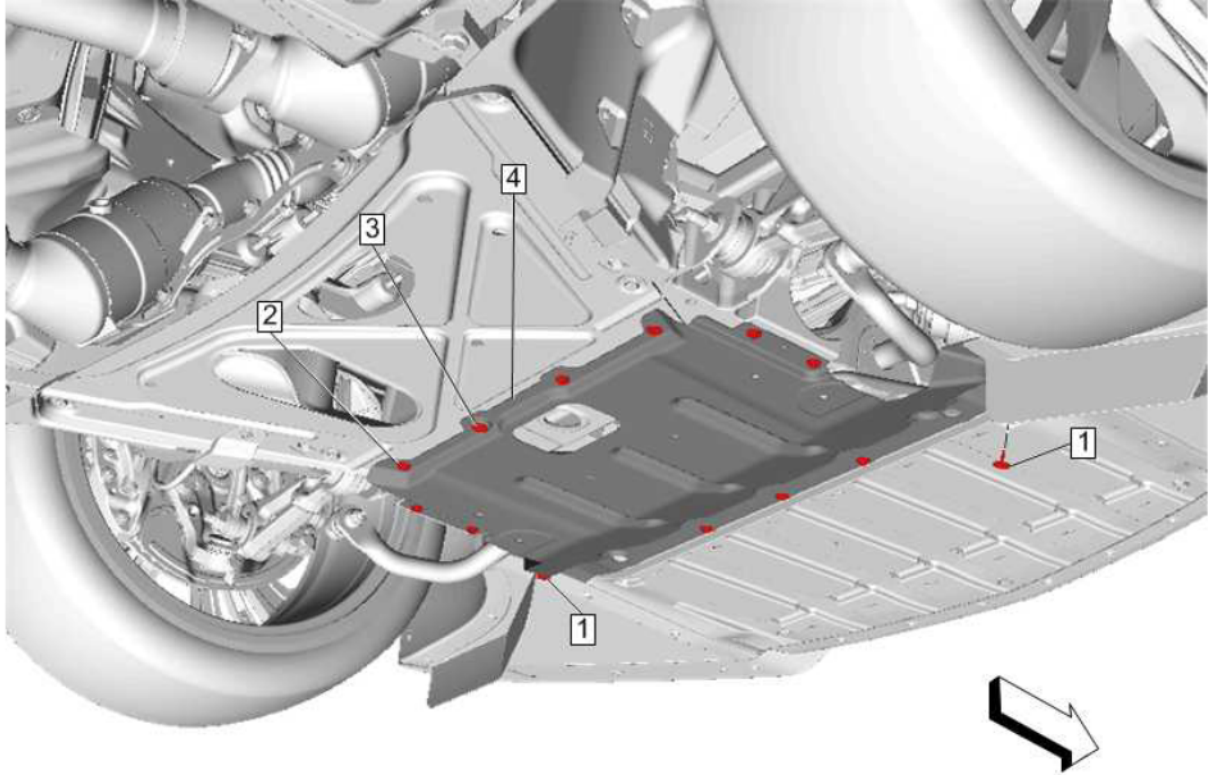


Fig. 90: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

12. Drivetrain and Front Suspension Cradle Plate (3)» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

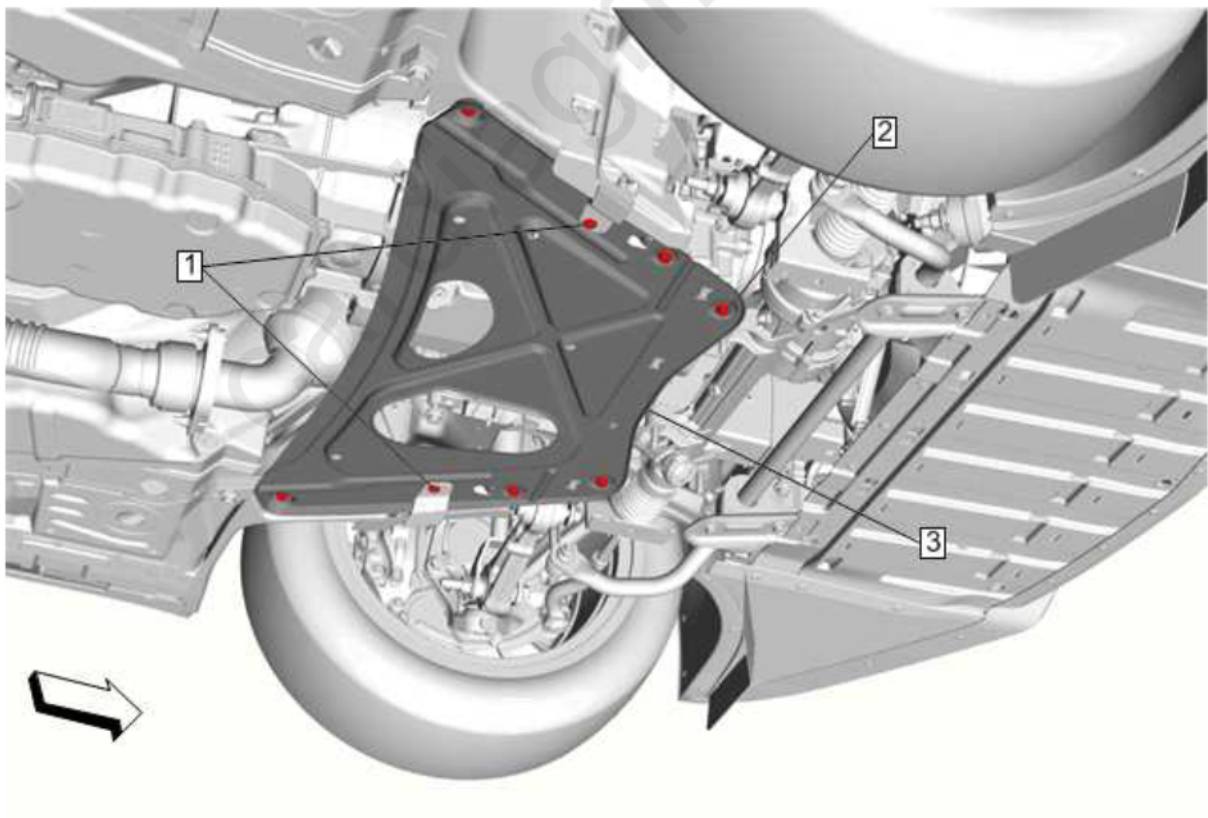


Fig. 91: Drivetrain and Front Suspension Cradle Plate

Courtesy of GENERAL MOTORS COMPANY

13. Front Bumper Fascia Lower Stiffener» Remove - **Front Bumper Fascia Lower Stiffener Replacement**

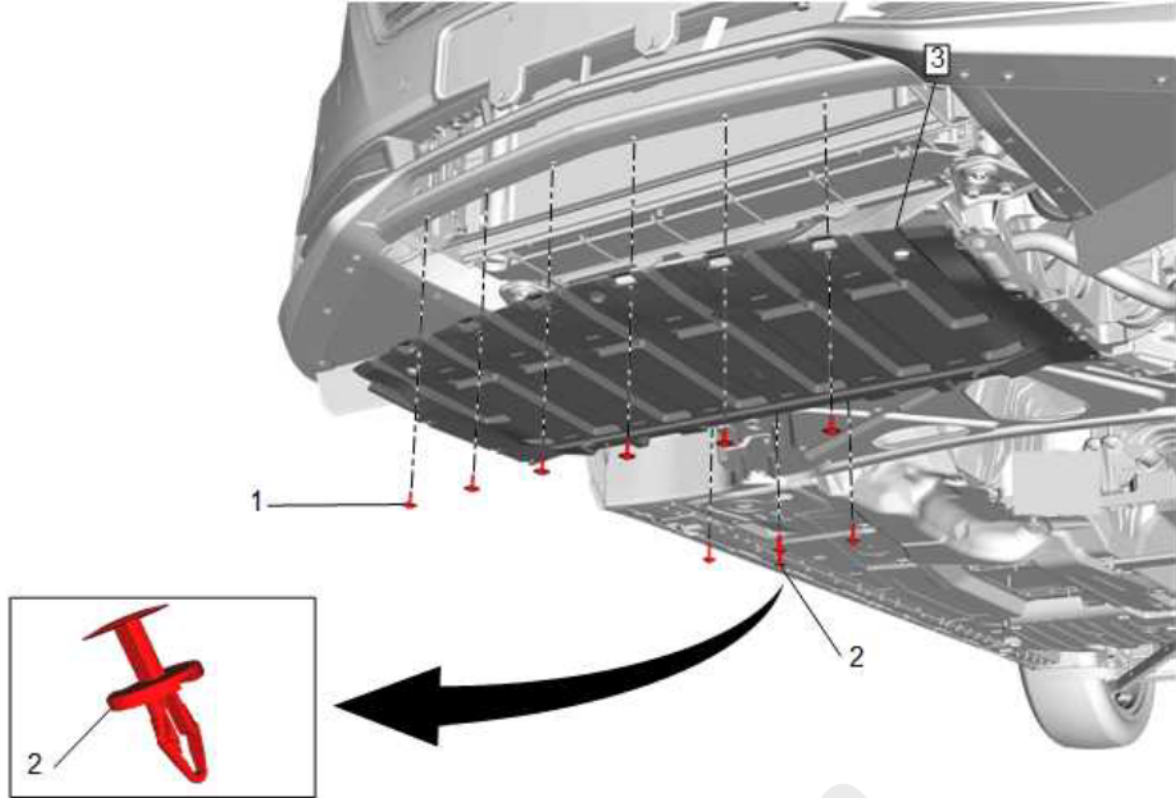


Fig. 92: Front Bumper Fascia Lower Stiffener
 Courtesy of GENERAL MOTORS COMPANY

14. Transmission Fluid Cooler Pipe Thermal Bypass Valve Keeper Plate Bolt (2) @ Transmission Fluid Cooler Thermal Bypass Valve» Remove

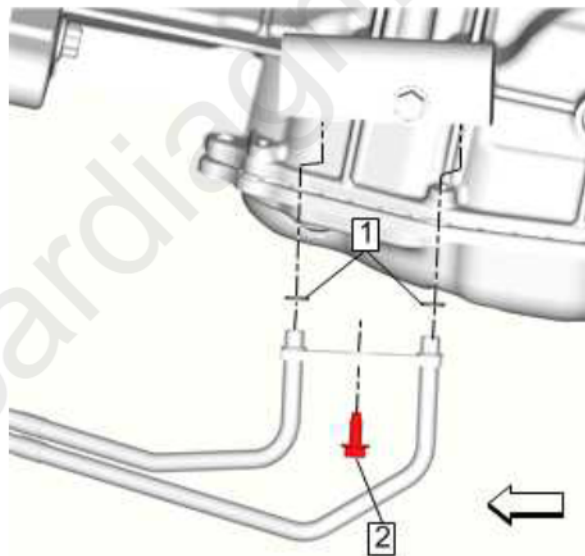


Fig. 93: Transmission Fluid Cooler Thermal Bypass Keeper Plate Bolt And O-Ring Seals
 Courtesy of GENERAL MOTORS COMPANY

15. Transmission Fluid Cooler Pipe Fitting Seal (1)» Remove and DISCARD [2x]

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

16. Transmission Fluid Cooler Pipe Clip (1) @ Transmission Fluid Cooler Pipe Bracket» Remove

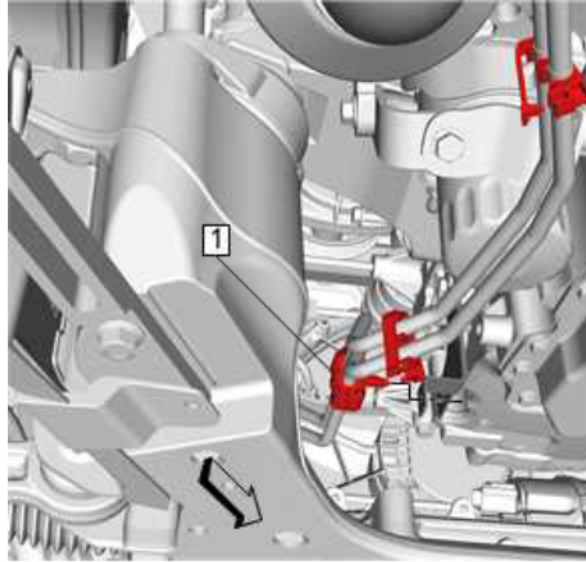


Fig. 94: Transmission Fluid Cooler Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

17. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud» Remove [4x]

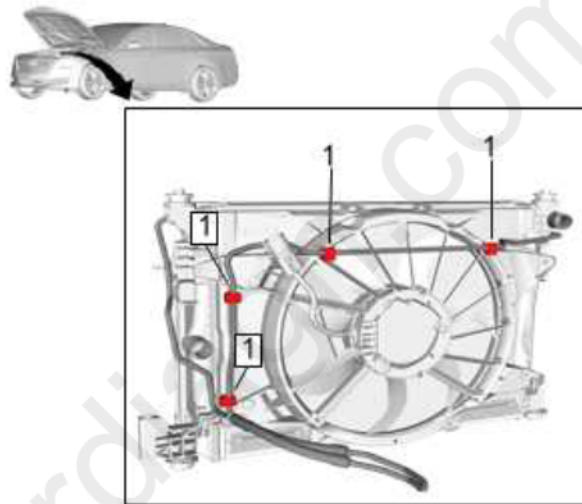


Fig. 95: Transmission Fluid Cooler Pipe Retaining Clip
 Courtesy of GENERAL MOTORS COMPANY

18. Transmission Fluid Cooler Pipe Fitting Retainer (1) @ Transmission Fluid Cooler Fitting»
 Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection**

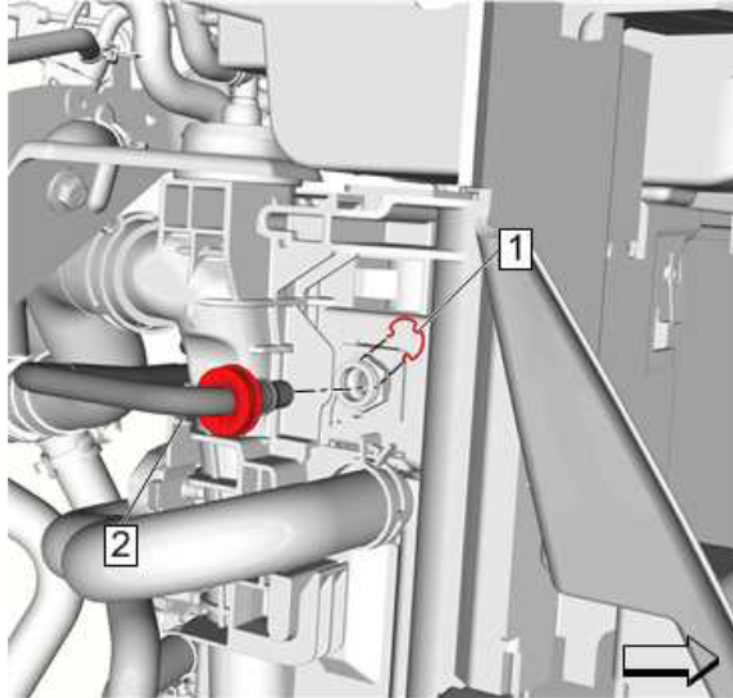


Fig. 96: Transmission Fluid Cooler Inlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

19. Transmission Fluid Cooler Inlet Pipe (2) » Remove
20. Transmission Fluid Cooler Pipe Fitting Retainer (1) @ Transmission Fluid Cooler Fitting » Remove - **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection.**

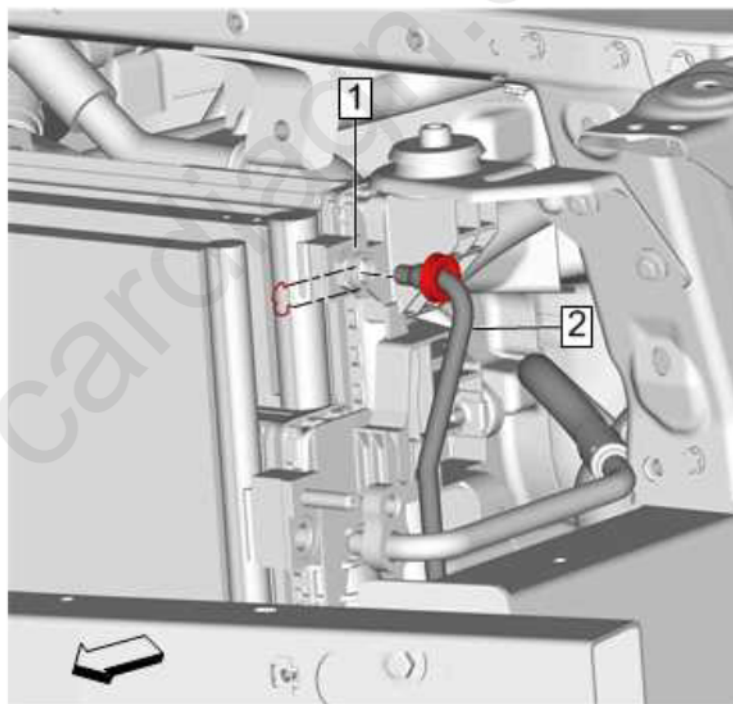


Fig. 97: Transmission Fluid Cooler Outlet Pipe
 Courtesy of GENERAL MOTORS COMPANY

21. Transmission Fluid Cooler Outlet Pipe (2) » Remove
22. Transmission Fluid Cooler Inlet and Outlet Pipe » Remove

Installation Procedure

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

NOTE: Remove covers or plugs from transmission fluid cooler pipe connection points

2. Transmission Fluid Cooler Pipe Fitting Retainer (1) @ Transmission Fluid Cooler Fitting» Install - [Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection](#).

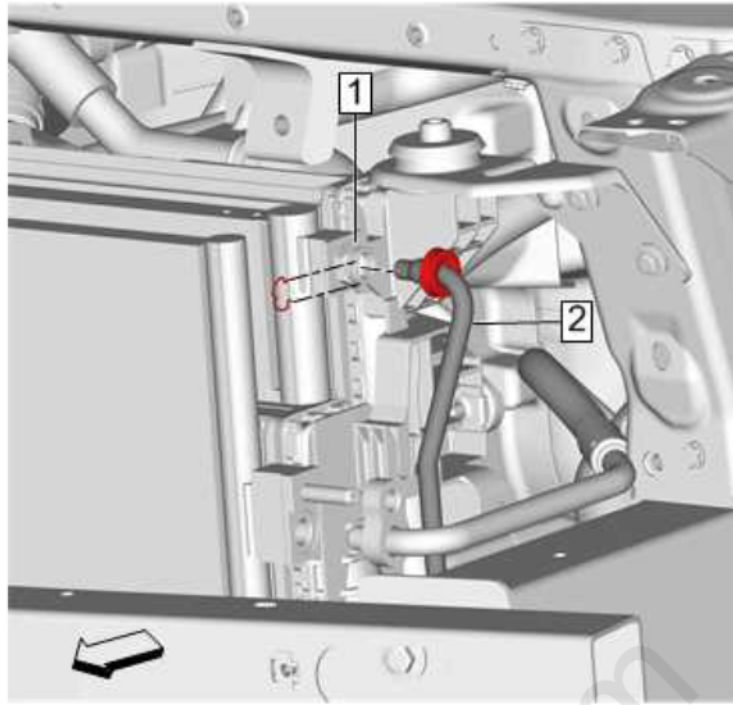


Fig. 98: Transmission Fluid Cooler Outlet Pipe
Courtesy of GENERAL MOTORS COMPANY

3. Transmission Fluid Cooler Outlet Pipe (2)» Install
4. Transmission Fluid Cooler Pipe Fitting Retainer (1) @ Transmission Fluid Cooler Fitting» Install - [Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection](#)

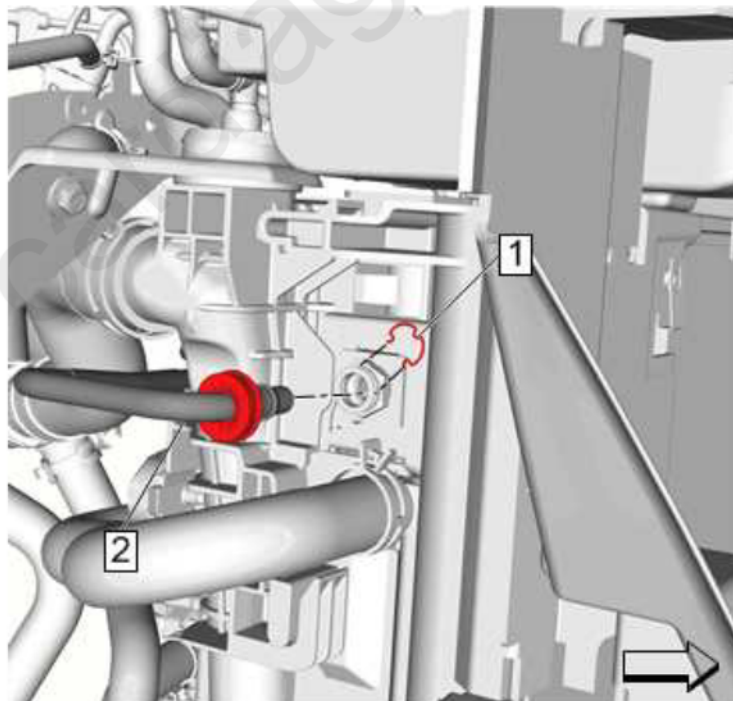


Fig. 99: Transmission Fluid Cooler Inlet Pipe
Courtesy of GENERAL MOTORS COMPANY

5. Transmission Fluid Cooler Inlet Pipe (2)» Install
6. Transmission Fluid Cooler Pipe Clip (1) @ Engine Coolant Fan Shroud» Install [4x]

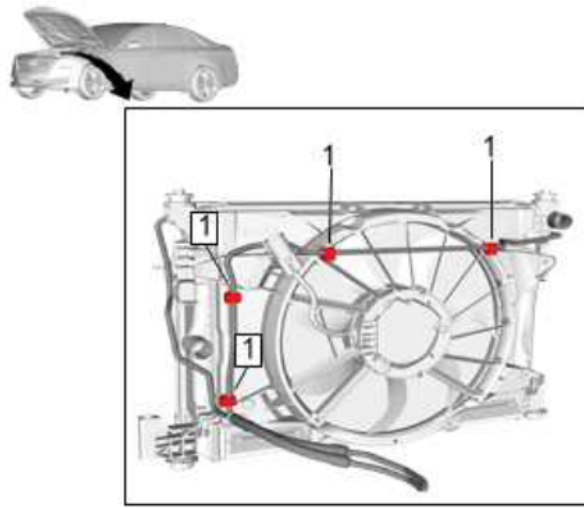


Fig. 100: Transmission Fluid Cooler Pipe Retaining Clip
Courtesy of GENERAL MOTORS COMPANY

7. Transmission Fluid Cooler Pipe Fitting Seal (1) Install NEW seals. [2x]

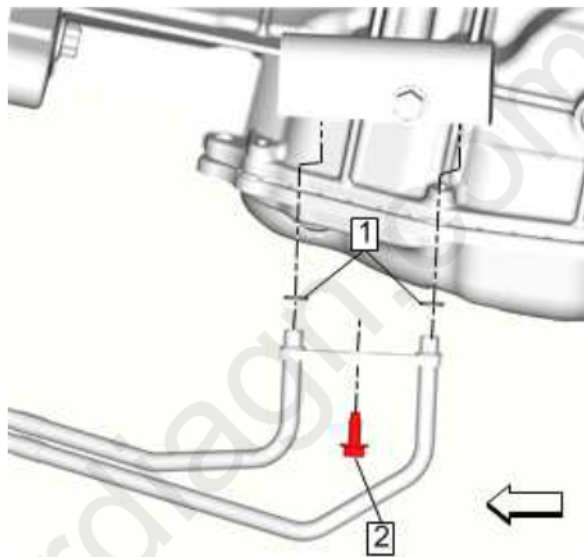
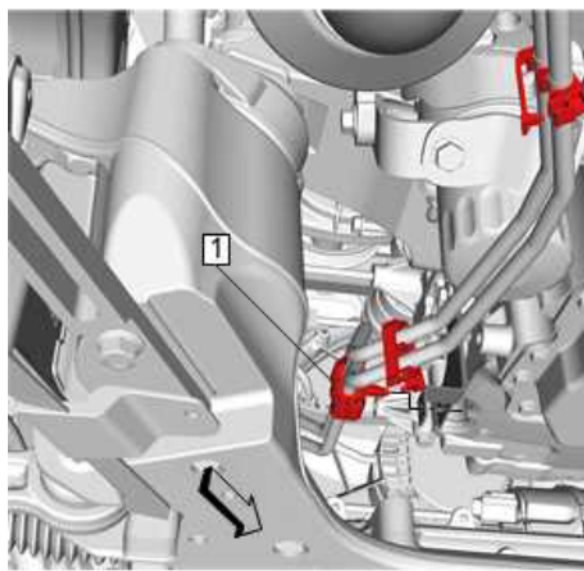


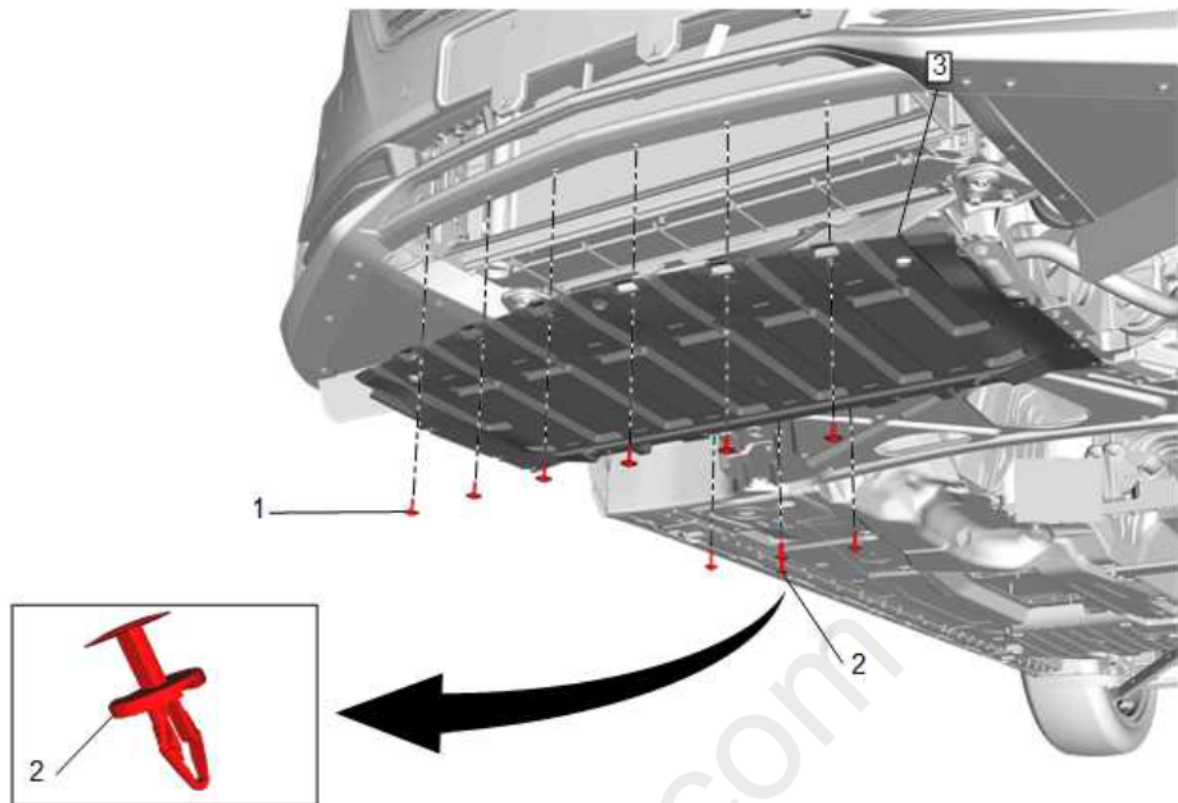
Fig. 101: Transmission Fluid Cooler Thermal Bypass Keeper Plate Bolt And O-Ring Seals
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

8. Transmission Fluid Cooler Pipe Bolt (2) @ Transmission Fluid Cooler Thermal Bypass Valve» Install and tighten 9 N.m (80 lb in)
9. Transmission Fluid Cooler Pipe Clip (1) @ Transmission Fluid Cooler Pipe Bracket» Install

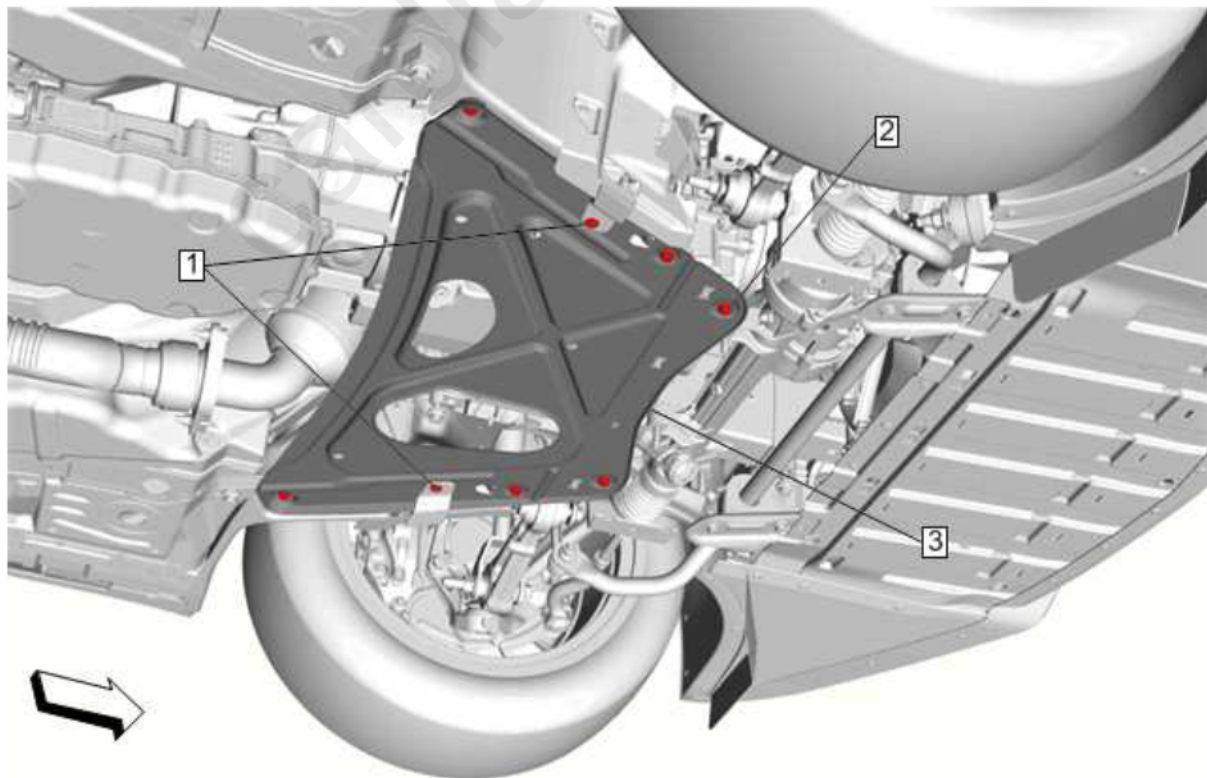


10. [Front Bumper Fascia Lower Stiffener Replacement](#) » Install



[Fig. 103: Front Bumper Fascia Lower Stiffener](#)
Courtesy of GENERAL MOTORS COMPANY

11. Drivetrain and Front Suspension Cradle Plate (3) » Install - [Drivetrain and Front Suspension Cradle Plate Replacement](#)



[Fig. 104: Drivetrain and Front Suspension Cradle Plate](#)
Courtesy of GENERAL MOTORS COMPANY

12. Underbody Front Air Deflector (4) » Install - [Underbody Front Air Deflector Replacement](#)

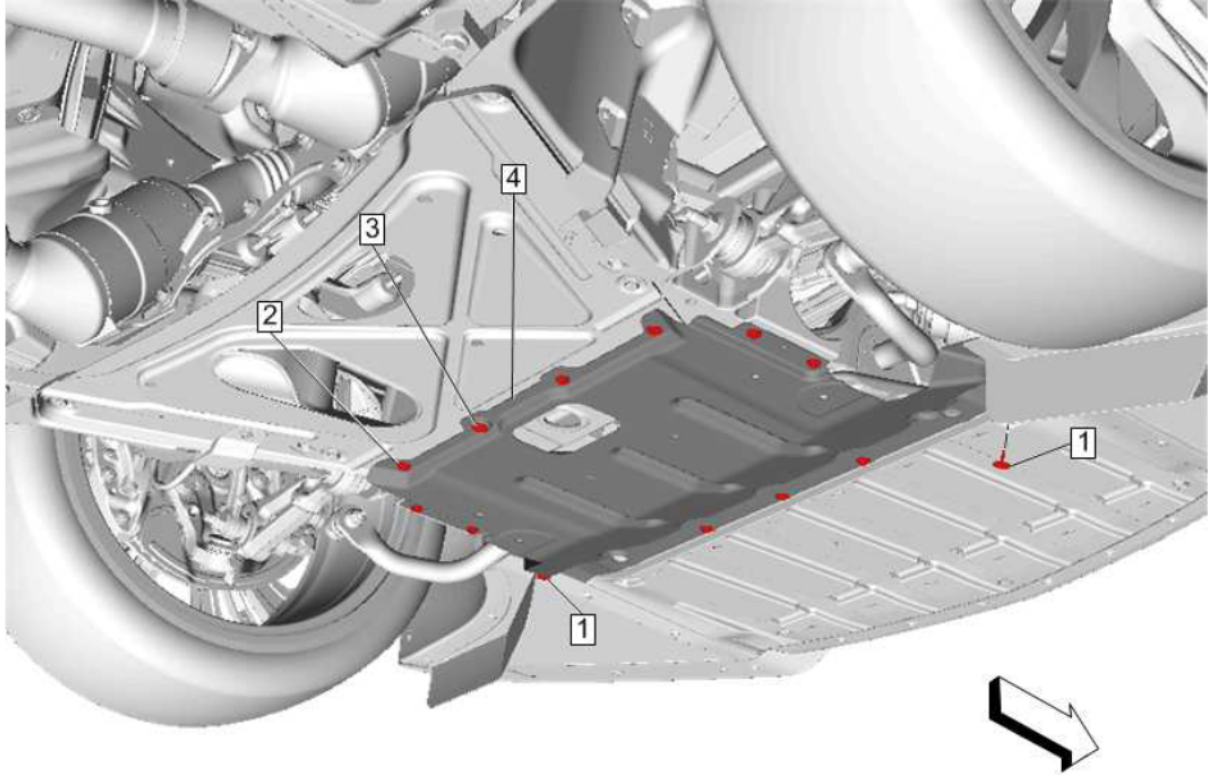


Fig. 105: Underbody Front Air Deflector
 Courtesy of GENERAL MOTORS COMPANY

13. Reposition and connect the engine cooling fan connector (1) to the engine wiring harness connector.

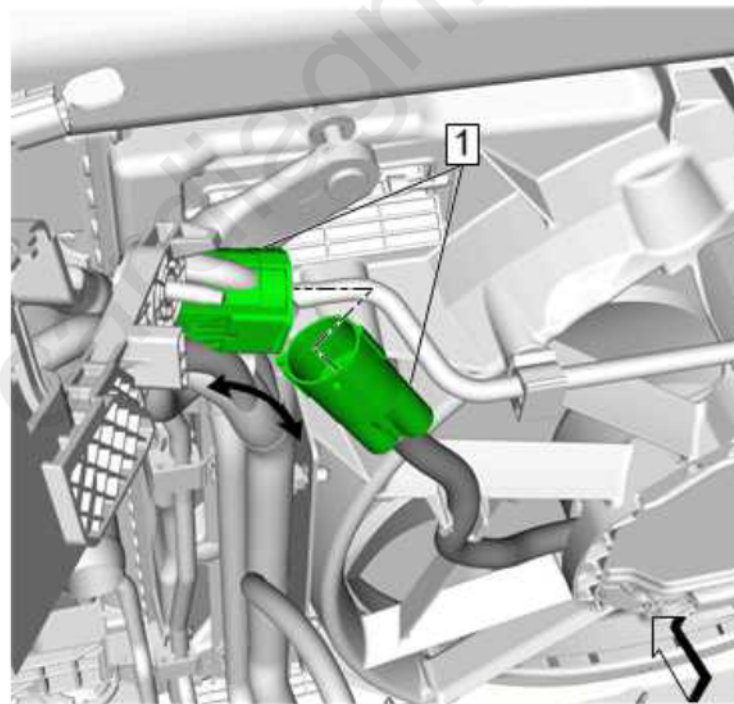


Fig. 106: Engine Cooling Fan Connector
 Courtesy of GENERAL MOTORS COMPANY

14. Engine Wiring Harness Connector (1) @ Engine Wiring Harness Fuse Block Bracket (2) » Install

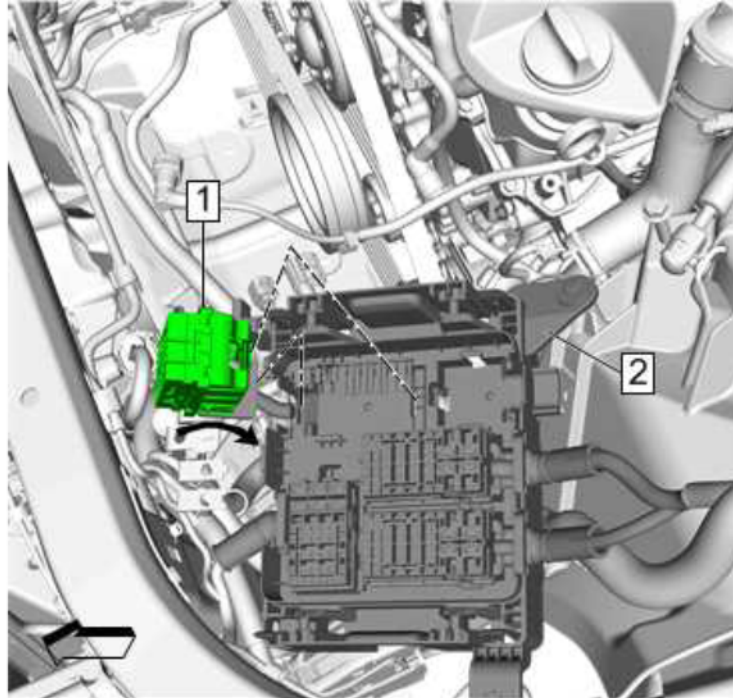


Fig. 107: Engine Wiring Harness Fuse Block Bracket and Wiring Harness Connector
 Courtesy of GENERAL MOTORS COMPANY

15. Engine Wiring Harness Junction Block (1) » Install - **Engine Wiring Harness Junction Block Replacement**

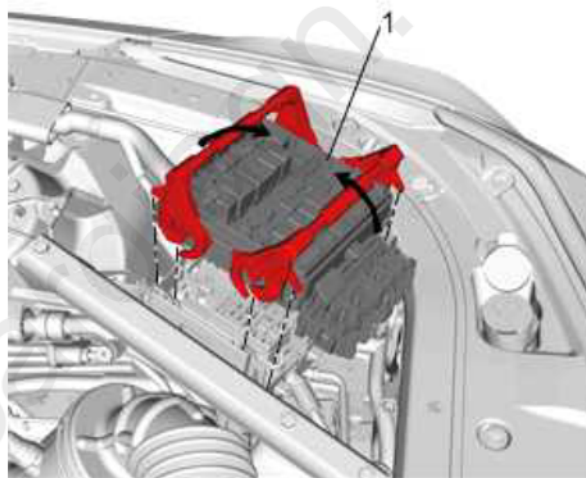


Fig. 108: Engine Wiring Harness Junction Block
 Courtesy of GENERAL MOTORS COMPANY

16. Air Conditioning Condenser and Evaporator Hose (2) @ Air Conditioning Condenser » Install - **Air Conditioning Condenser and Evaporator Hose Replacement (LGW, LGX)**

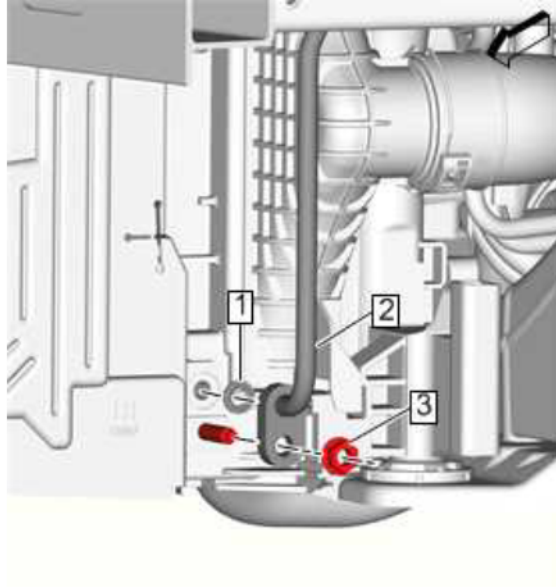


Fig. 109: Air Conditioning Condenser and Evaporator Hose
 Courtesy of GENERAL MOTORS COMPANY

17. Air Conditioning Compressor and Condenser Hose (2) @ Air Conditioning Condenser» Install - **Air Conditioning Compressor and Condenser Hose Replacement (LGW, LGX)**

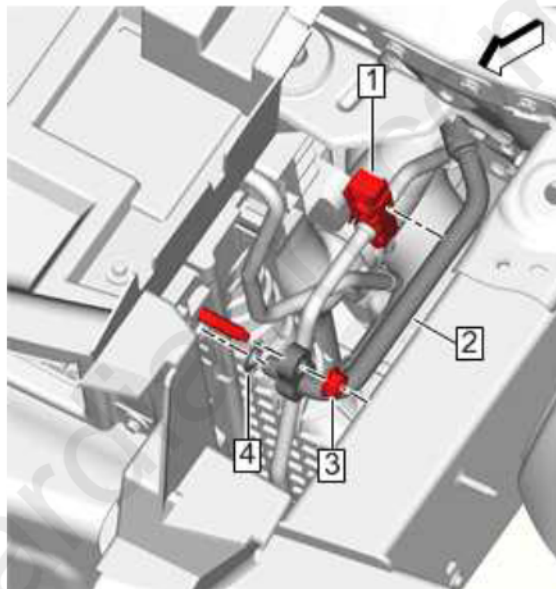


Fig. 110: Air Conditioning Compressor and Condenser Hose
 Courtesy of GENERAL MOTORS COMPANY

18. Install the Left and Right Front Wheelhouse Panel Brace (2). Refer to **Front Wheelhouse Panel Brace Replacement (Rear)** and **Front Wheelhouse Panel Brace Replacement (Front)**

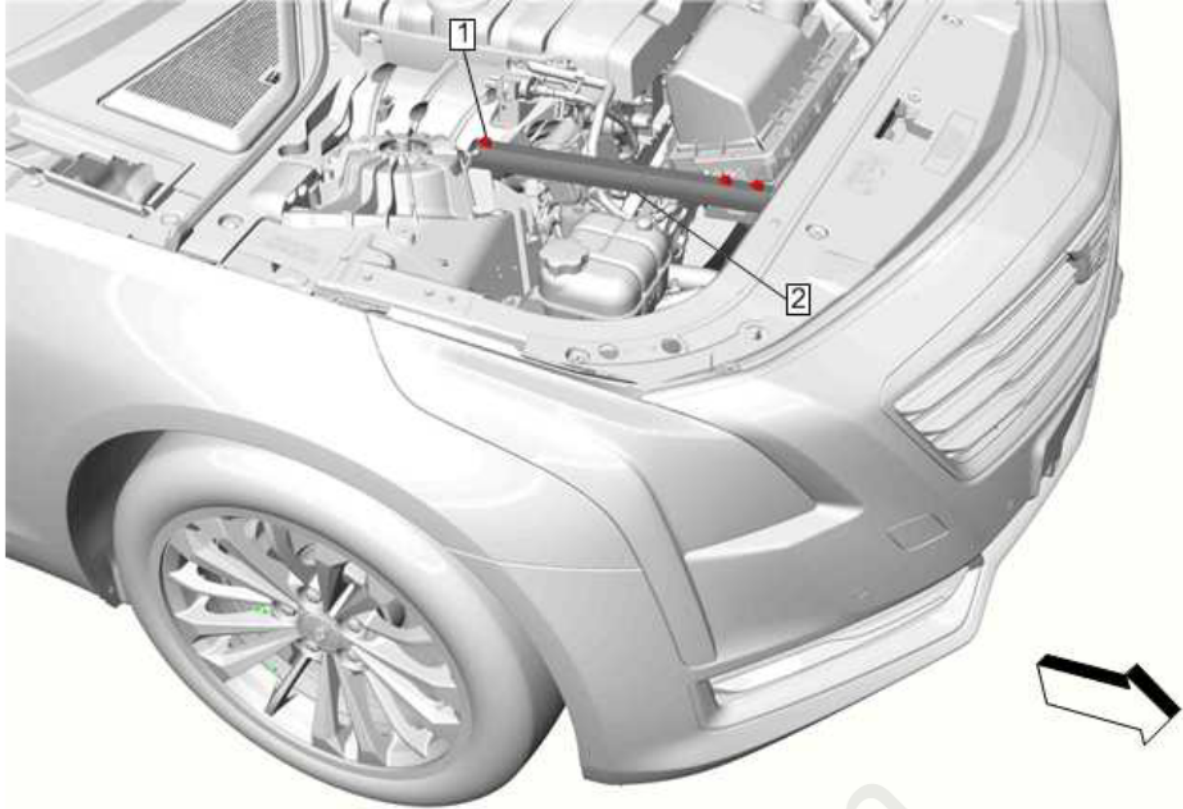


Fig. 111: Front Wheelhouse Panel Brace (Front)

Courtesy of GENERAL MOTORS COMPANY

19. Front End Sheet Metal Cross Panel Reinforcement - Left (3)» Install - **Front End Sheet Metal Cross Panel Reinforcement Replacement (Left Hand - LGW, LGX)** and/or **Front End Sheet Metal Cross Panel Reinforcement Replacement (Right Hand - LGW, LGX)**

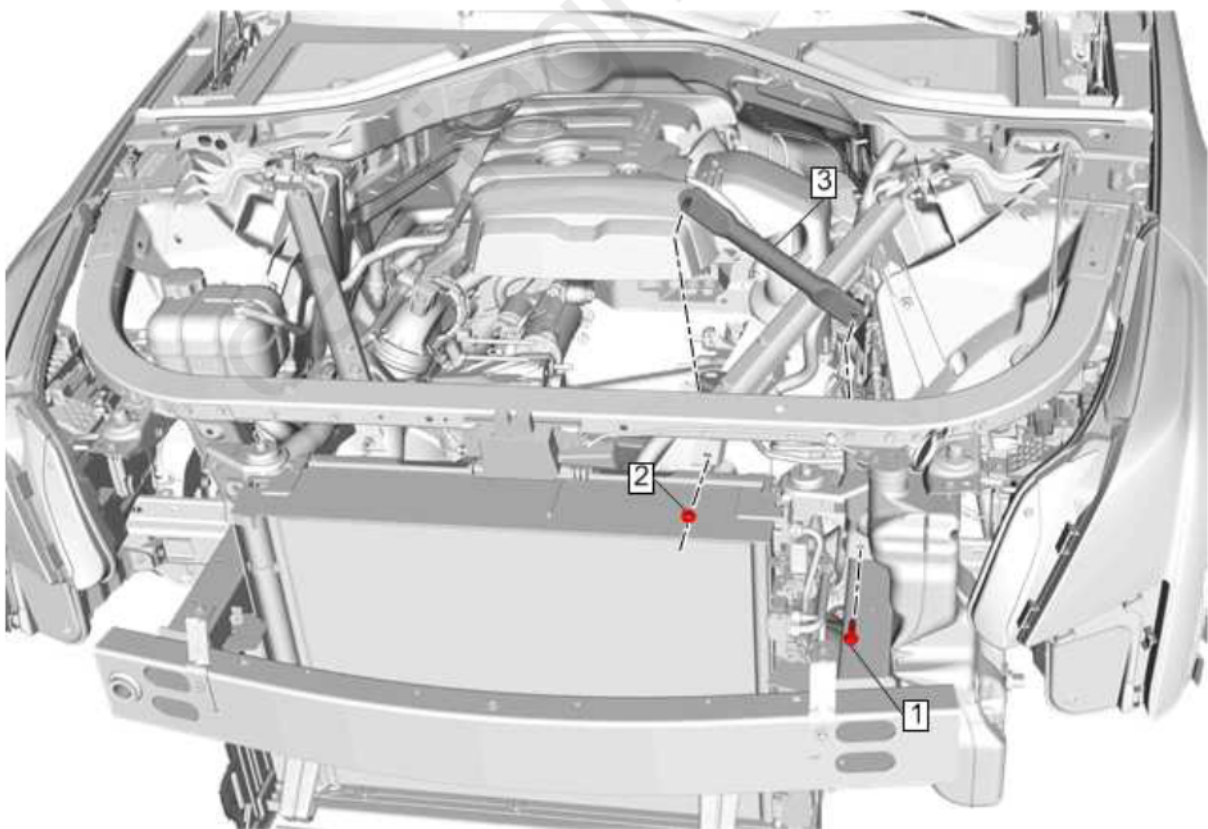


Fig. 112: Front End Sheet Metal Cross Panel Reinforcement (Left Hand)

Courtesy of GENERAL MOTORS COMPANY

20. Front End Sheet Metal Cross Panel Reinforcement- Right (3)» Install - **Front End Sheet Metal Cross Panel Reinforcement Replacement (Left Hand - LGW, LGX)** and/or **Front End Sheet Metal Cross Panel Reinforcement Replacement (Right Hand - LGW, LGX)**

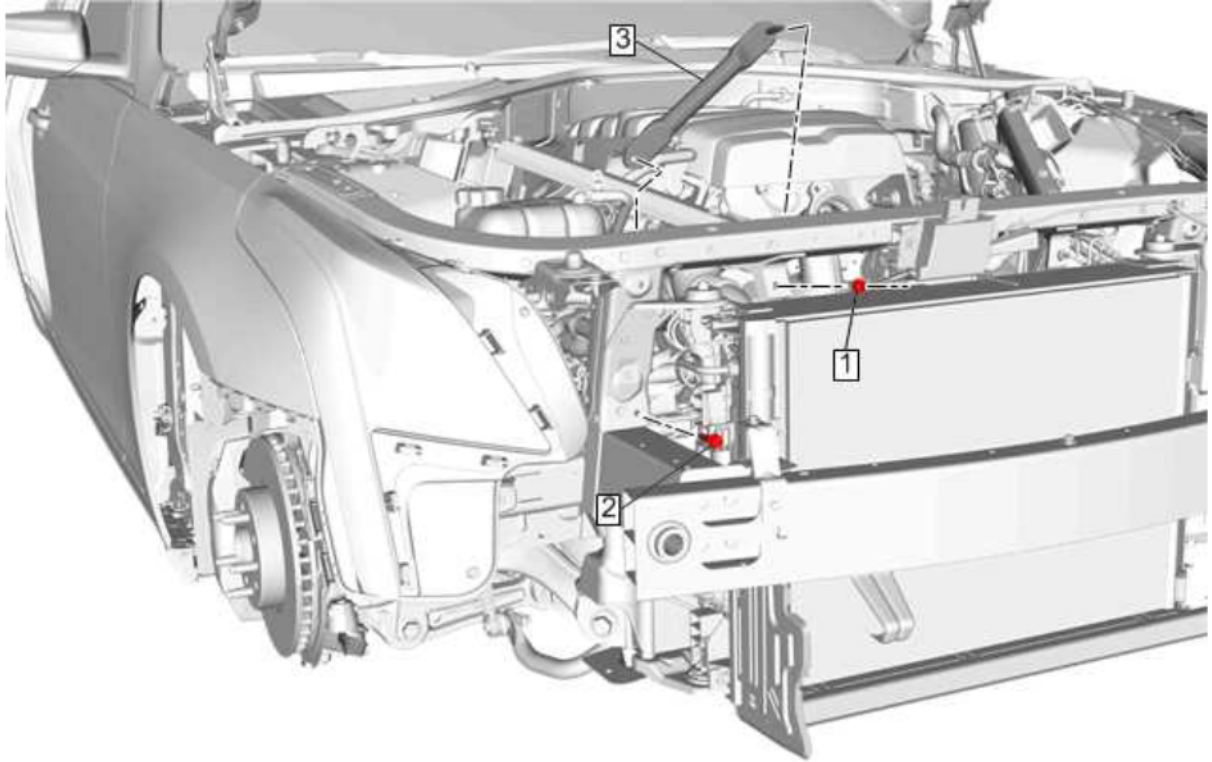


Fig. 113: Front End Sheet Metal Cross Panel Reinforcement (Right Hand)

Courtesy of GENERAL MOTORS COMPANY

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

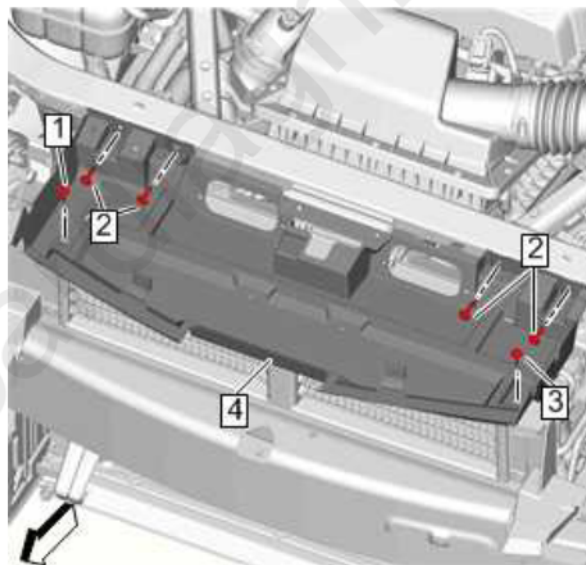


Fig. 114: Radiator Air Upper Baffle and Deflector

Courtesy of GENERAL MOTORS COMPANY

22. Air Cleaner Assembly (1)» Install - **Air Cleaner Assembly Replacement (LGW)**

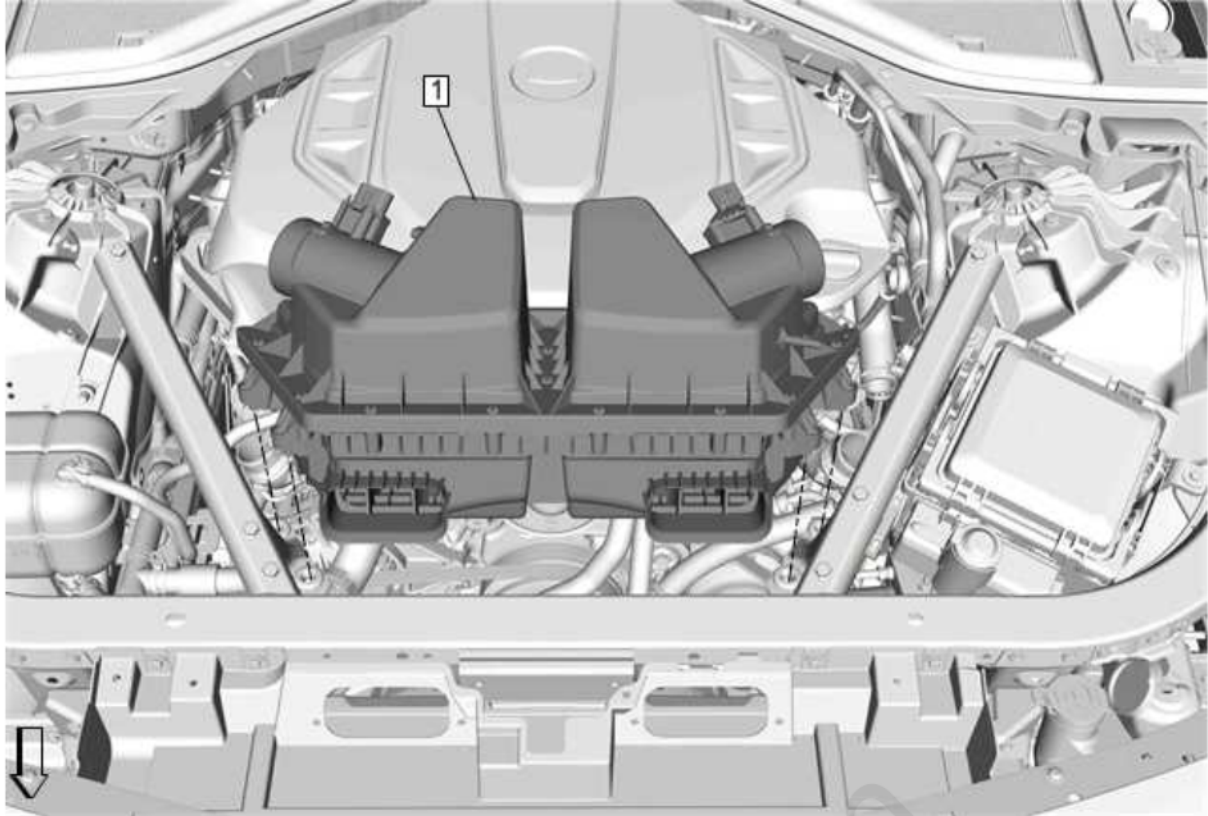


Fig. 115: Air Cleaner Assembly (LGW)

Courtesy of GENERAL MOTORS COMPANY

23. Check the transmission fluid level. Refer to [Transmission Fluid Fill Procedure](#)
24. Inspect for transmission fluid leaks.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

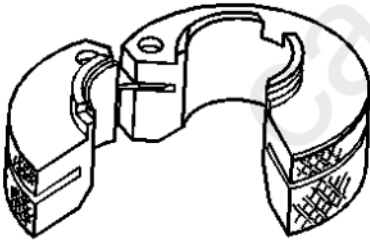
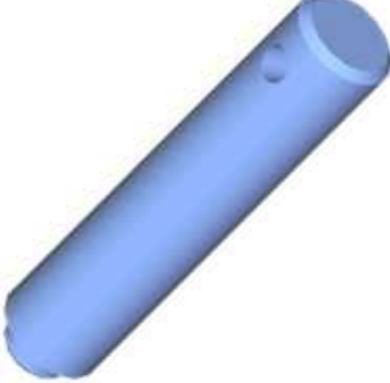
Illustration	Tool Number/Description
	DT 41623-B J 41623-B Cooler Quick Connect Tool
	DT 45096 J 45096 Transmission Oil Cooling System Flush and Flow Test Tool

Illustration	Tool Number/Description
	DT 45096-30 J 45096-30 Cooler Flushing Adapter
	DT 45201 J 45201 Cooler Line Seal Remover
	DT 47770 Seal Installer