

TRANSMISSION

Automatic Transmission - 6L50 (MYB) - Repair Instructions - On Vehicle - Canyon, Colorado

REPAIR INSTRUCTIONS - ON VEHICLE

CONNECTOR RECONNECTION - AUTOMATIC TRANSMISSION

Special Tools

EL-35616 Terminal Test Probe Kit

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

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut, or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to [Testing for Electrical Intermittents](#) for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.
- Refer to [Scan Tool Snapshot Procedure](#) for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel, and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

etting condition disconnect the suspect connector and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to both sides of the connector terminals. Then reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself, or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves, or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact, or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals, and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks, or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses, and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) , and [Power Distribution Schematics](#) .

- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point. Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) , and [Ground Distribution Schematics](#) .

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot, or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat
 - Circuit generated heat due to a poor connection, or high electrical load
 - Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay, or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to [Checking Aftermarket Accessories](#) .

an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.

- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
 - A new service control module is installed.
 - A control module from another vehicle is installed.
 - Revised software/calibration files have been released for this vehicle.

NOTE: DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.

- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to [Control Module References](#) for replacement, setup, and programming.

TRANSMISSION CONTROL LEVER KNOB REPLACEMENT

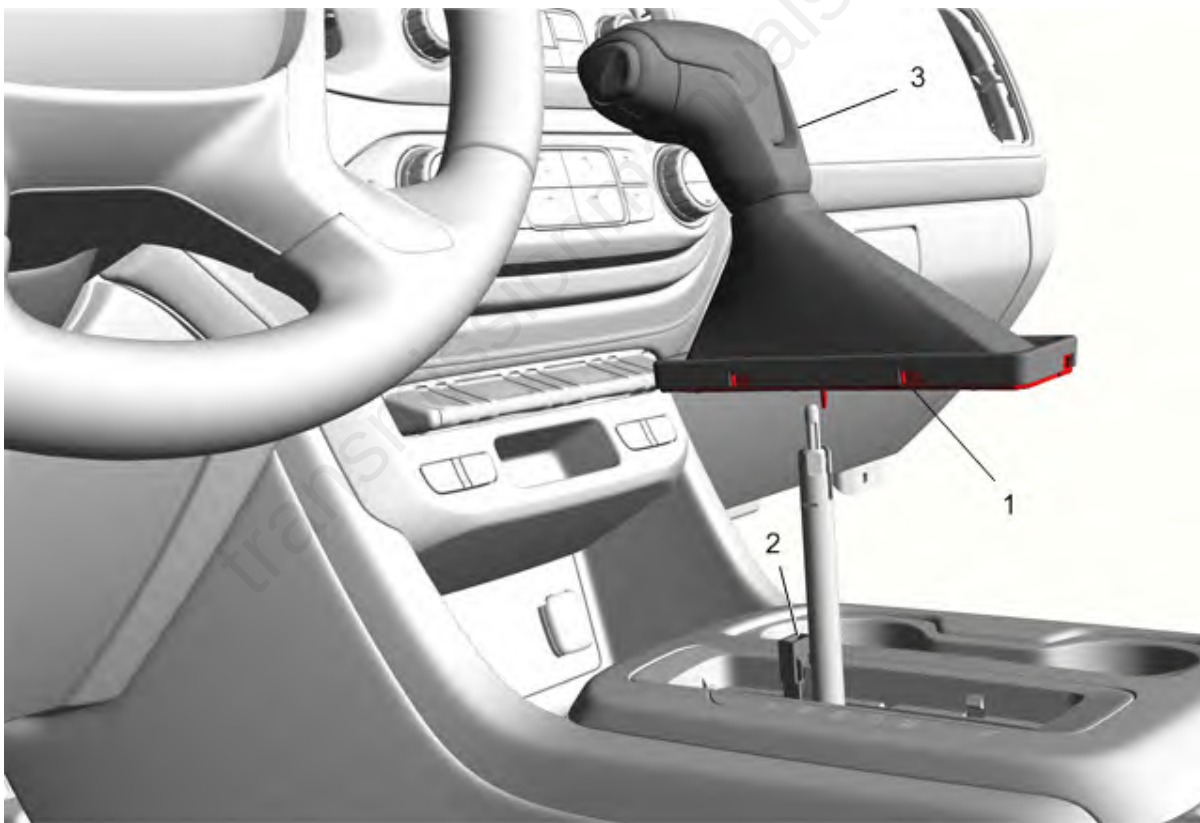


Fig. 1: Transmission Control Lever Knob

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Transmission Control Lever Knob Retainer (Qty: 6) Procedure Using a flat-bladed plastic trim tool, release the retaining clips securing the control lever boot.
2	Electrical connector

Component Name	
3	Transmission Control Lever Knob NOTE: • The control lever boot and knob are replaced as an assembly. • To remove the knob and boot assembly, pull upward and twist clockwise and counter-clockwise to release it from the transmission control shaft.

TRANSMISSION CONTROL REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.
2. Remove the front floor console cup holder opening trim plate (automatic transmission). [Front Floor Console Cup Holder Opening Trim Plate Replacement \(Automatic Transmission\)](#)

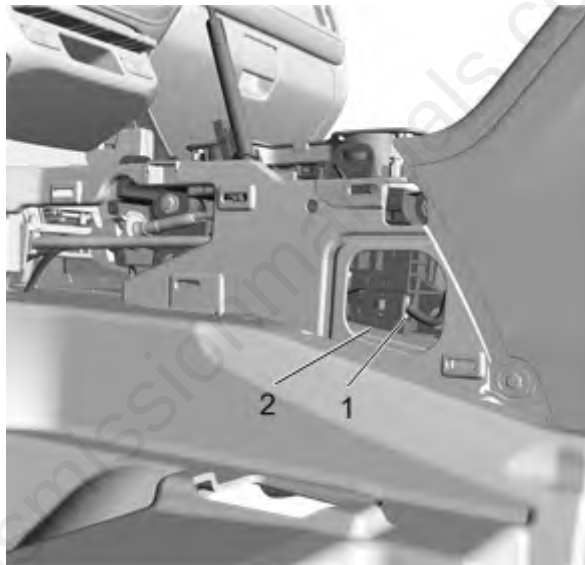


Fig. 2: Electrical Connector And Rear Of Transmission Control
 Courtesy of GENERAL MOTORS COMPANY

3. Disconnect the electrical connector (1) from the rear of the transmission control (2).

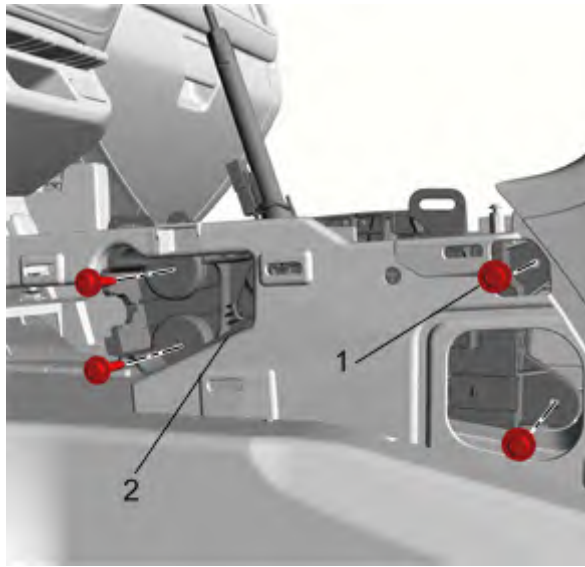


Fig. 3: Four Transmission Shift Control Fasteners
 Courtesy of GENERAL MOTORS COMPANY

4. Remove the four transmission shift control fasteners (1).

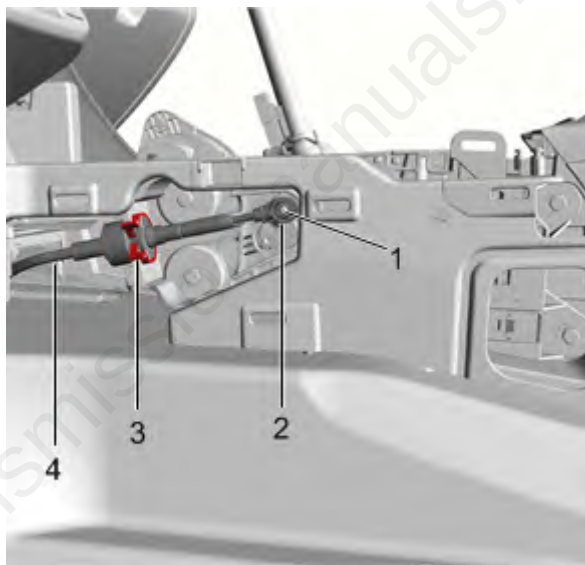


Fig. 4: Transmission Range Selector Lever Cable Terminal And Shift Lever Pin
 Courtesy of GENERAL MOTORS COMPANY

5. Disconnect the transmission range selector lever cable terminal (2) from the shift lever pin (1).
6. Release the transmission range selector lever cable retainer (3) and remove the transmission range selector cable (4) from the transmission control.

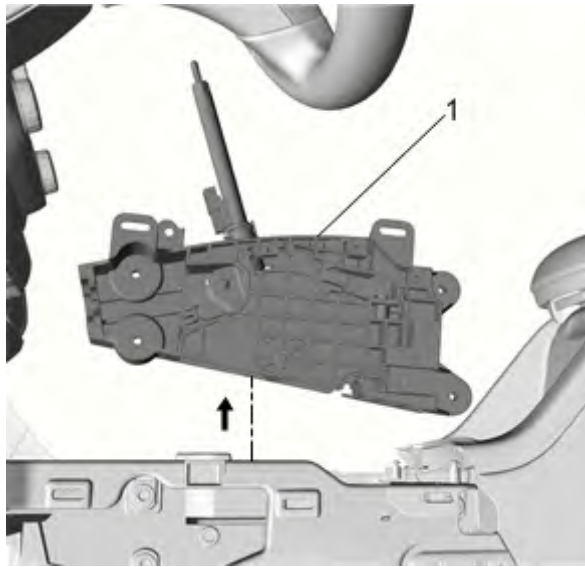


Fig. 5: Transmission Shift Control

Courtesy of GENERAL MOTORS COMPANY

7. Remove the transmission shift control (1) from the console.

Installation Procedure

1. Position the transmission shift control into the floor console.

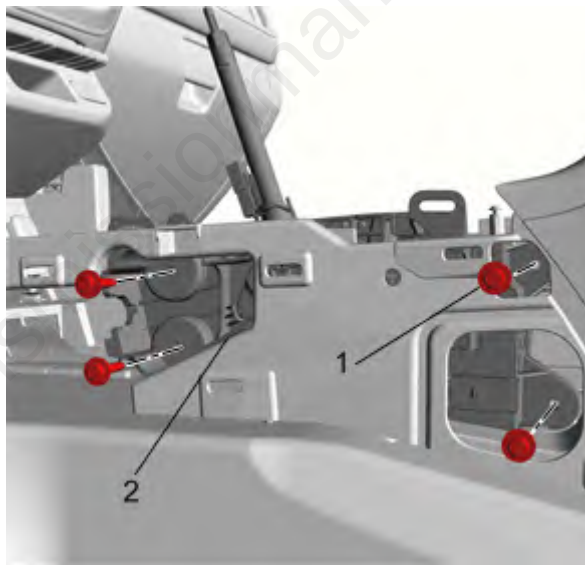


Fig. 6: Four Transmission Shift Control Fasteners

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

2. Install the transmission shift control fasteners (1) and tighten to 25 N.m (18 lb ft).

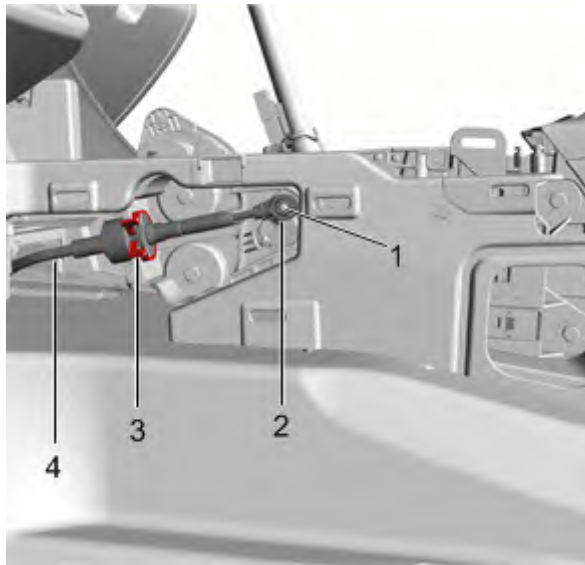


Fig. 7: Transmission Range Selector Lever Cable Terminal And Shift Lever Pin
 Courtesy of GENERAL MOTORS COMPANY

3. Lock the transmission range selector lever cable retainer (3) and connect the transmission range selector cable (4) to the transmission control.

WARNING: After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.

4. Connect the transmission range selector lever cable terminal (2) to the shift lever pin (1).

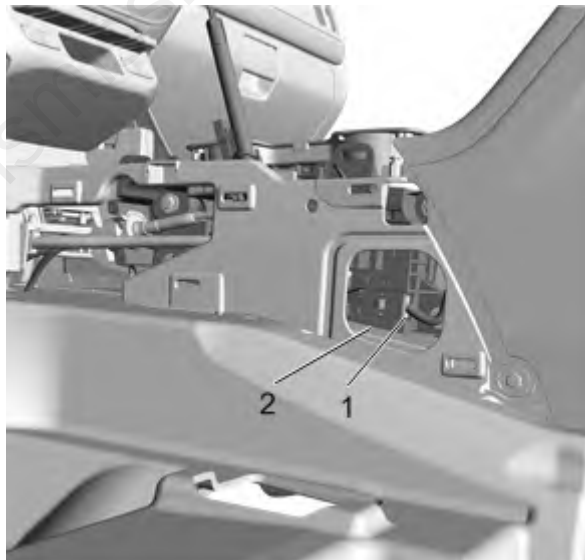


Fig. 8: Electrical Connector And Rear Of Transmission Control
 Courtesy of GENERAL MOTORS COMPANY

5. Connect the electrical connector (1) to the rear of the transmission control.
6. Install the front floor console cup holder opening trim plate (automatic transmission). [Front Floor Console Cup Holder Opening Trim Plate Replacement \(Automatic Transmission\)](#)

he automatic transmission range selector lever cable. Refer to [Range Selector Lever Cable Adjustment](#).

RANGE SELECTOR LEVER CABLE REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .

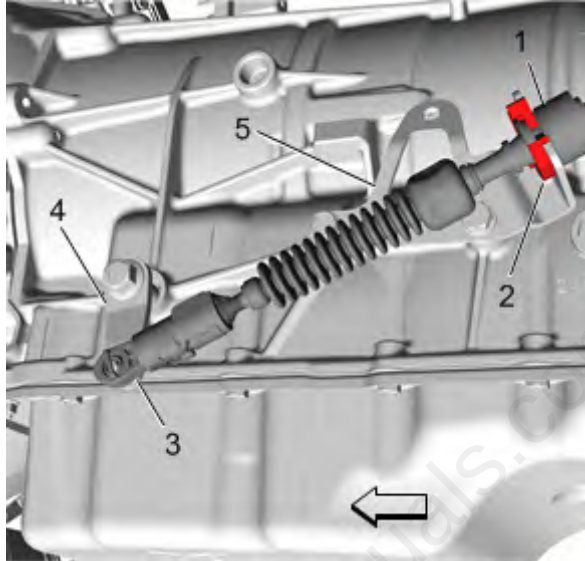


Fig. 9: Locking Retainer And Cable Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Using a flat bladed tool, remove the automatic transmission range selector cable terminal (3) from the automatic transmission range selector lever (4).
3. Squeeze the locking retainer (2) in order to release the range selector lever cable (1) from the cable bracket (5).
4. Remove the automatic transmission range selector cable (1) from the automatic transmission range selector cable bracket (5).
5. Lower the vehicle.
6. Using wheel chocks, block the tires.
7. Remove the floor rear air outlet duct (center). [Floor Rear Air Outlet Duct Replacement \(Center\)](#) .

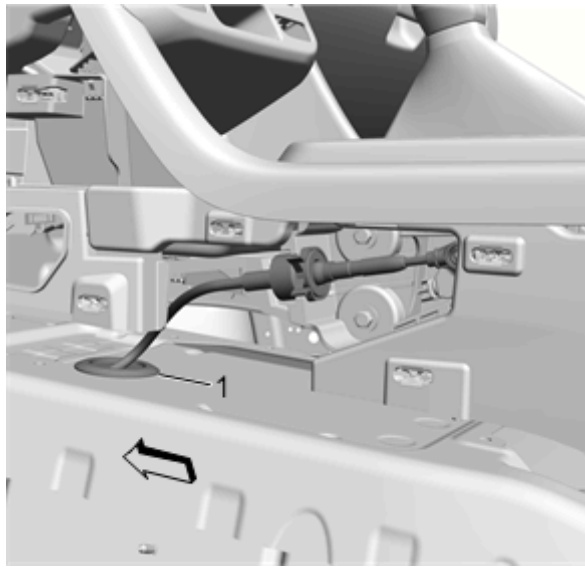


Fig. 10: Shift Cable Grommet

Courtesy of GENERAL MOTORS COMPANY

NOTE: Floor carpet not shown for clarity.

8. Using a flat bladed tool, release the shift cable grommet (1) from the floor pan.
9. Remove the shift cable from the vehicle.

Installation Procedure

1. Position the shift cable through the floor pan.

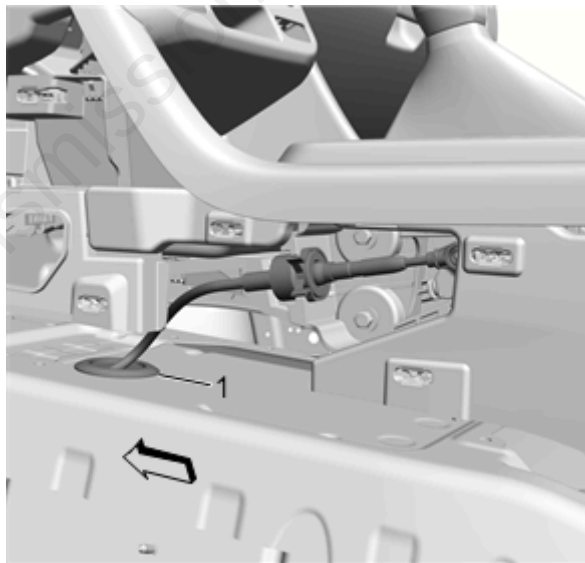


Fig. 11: Shift Cable Grommet

Courtesy of GENERAL MOTORS COMPANY

2. Install the automatic transmission range selector cable grommet (1) to the floor pan.
3. Install the floor rear air outlet duct (center). **Floor Rear Air Outlet Duct Replacement (Center)**.
4. Raise the vehicle.

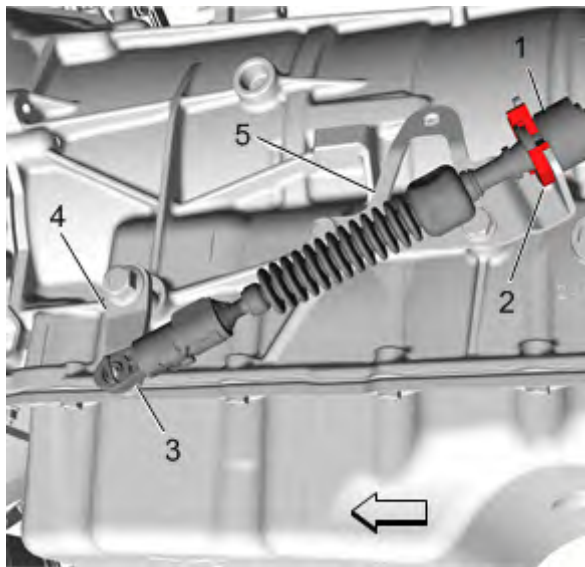


Fig. 12: Locking Retainer And Cable Bracket
Courtesy of GENERAL MOTORS COMPANY

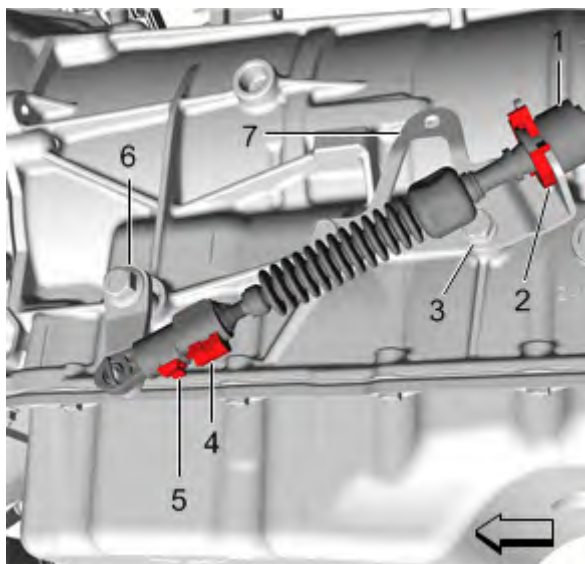
5. Properly route and position the automatic transmission range selector cable (1) to the transmission shift cable bracket (5).
6. Install the automatic transmission range selector cable terminal (3) to the transmission control shift lever (4).
7. Install the automatic transmission range selector cable retainer (2) to the transmission cable bracket (5).

WARNING: After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.

8. Adjust the automatic transmission range selector cable. Refer to [Range Selector Lever Cable Adjustment](#).

RANGE SELECTOR LEVER CABLE ADJUSTMENT

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).



2. Unlock the range selector lever cable adjustment clip (5).
3. Unlock the range selector lever cable adjustment retainer (4).
4. Ensure that the transmission manual shaft lever (6) is in the park (P) position.
5. Lower the vehicle.
6. Ensure that the transmission control is in the park (P) position.
7. Raise the vehicle.

CAUTION: Refer to Fastener Caution .

8. Hold the selector lever (6) on transmission to eliminate any play.
9. Lock the range selector lever cable adjustment retainer (4).
10. Lock the range selector lever cable adjustment clip (5).
11. Inspect the operation of the starting system with the shift lever in each position. The engine should only crank when the lever is in the PARK or NEUTRAL position.

RANGE SELECTOR LEVER CABLE BRACKET REPLACEMENT

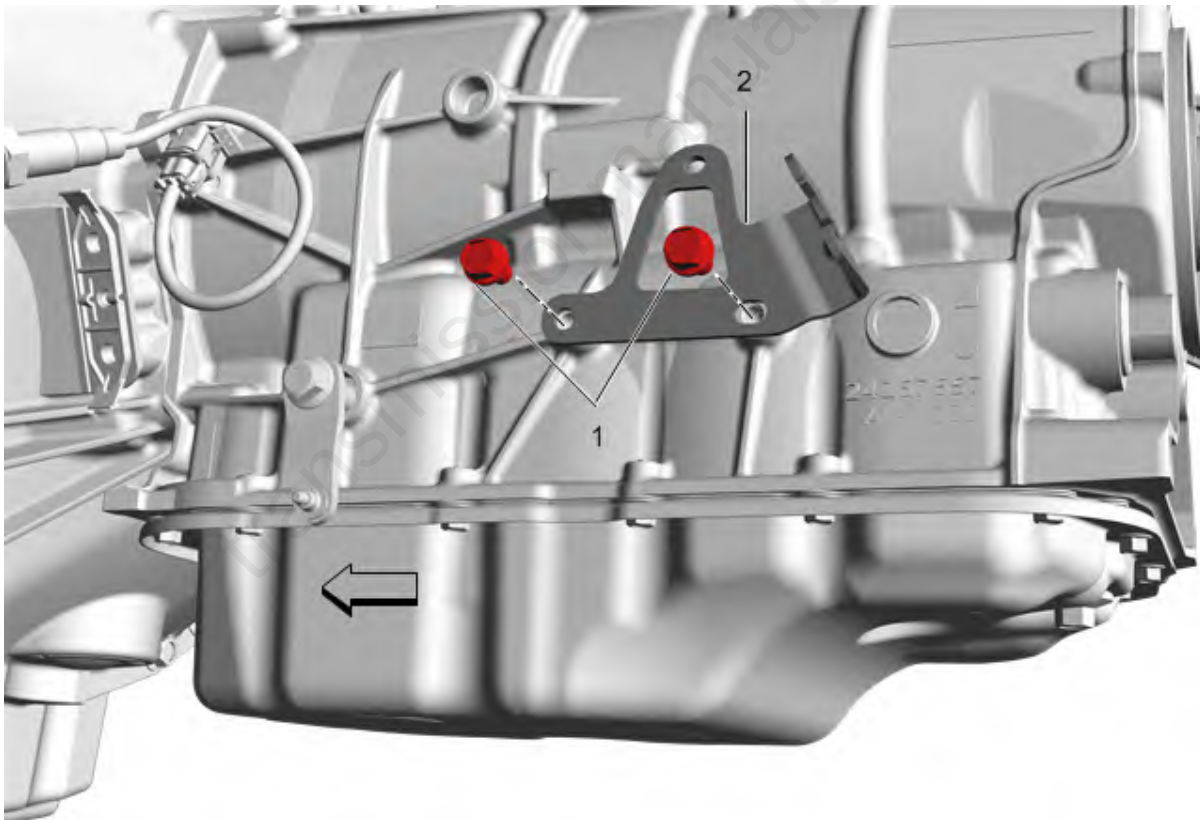


Fig. 14: Range Selector Lever Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Component Name	
Preliminary Procedures 1. Apply the park brake. 2. Shift the transmission into neutral. 3. Raise the vehicle. Refer to Lifting and Jacking the Vehicle . 4. Remove the transmission range selector cable from the range selector cable bracket. Refer to Range Selector Lever Cable Replacement.	
1	Transmission Range Selector Cable Bracket Bolt (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten 25 N.m (18 lb ft)
2	Transmission Range Selector Cable Bracket

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER REPLACEMENT

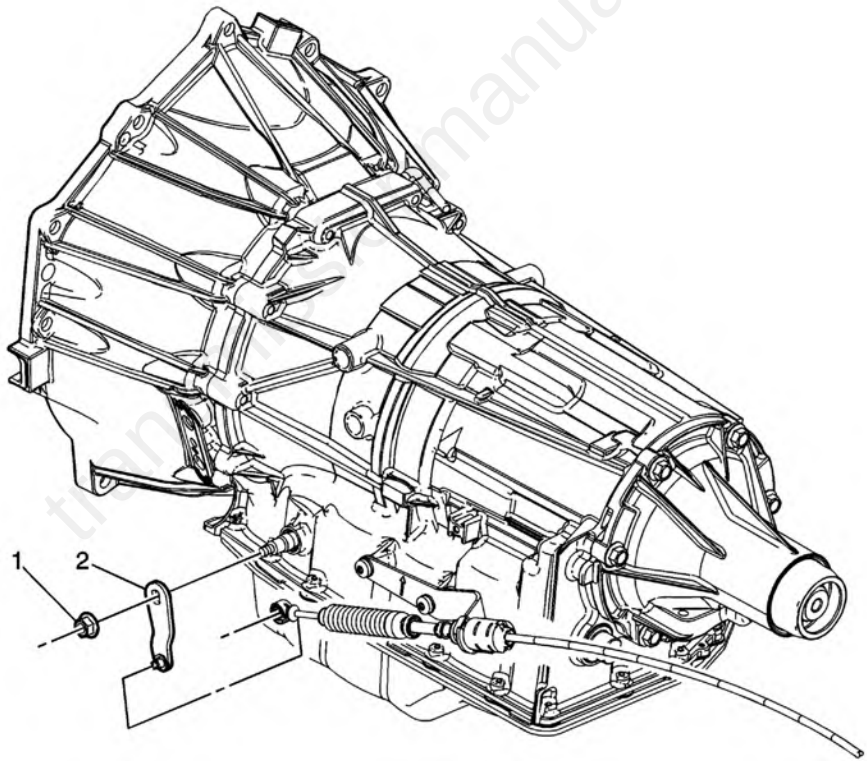


Fig. 15: View Of Transmission Range Selector Cable Lever & Nut
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Component Name

Preliminary Procedures

1. Apply the park brake.
2. Shift the transmission into neutral.
3. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .

WARNING:

After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.

4. Disconnect the transmission range selector cable from the range selector cable lever ball stud.

1	Transmission Range Selector Cable Lever Nut WARNING: Hold the transmission range selector lever while removing or installing the lever retaining nut. Failure to hold the lever can cause damage to the transmission internal park system components which could allow the vehicle to roll when placed in the park position. CAUTION: Refer to Fastener Caution . Tighten 25 N.m (18 lb ft)
2	Transmission Range Selector Cable Lever

AUTOMATIC TRANSMISSION FLUID PRESSURE TEST HOLE PLUG REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .

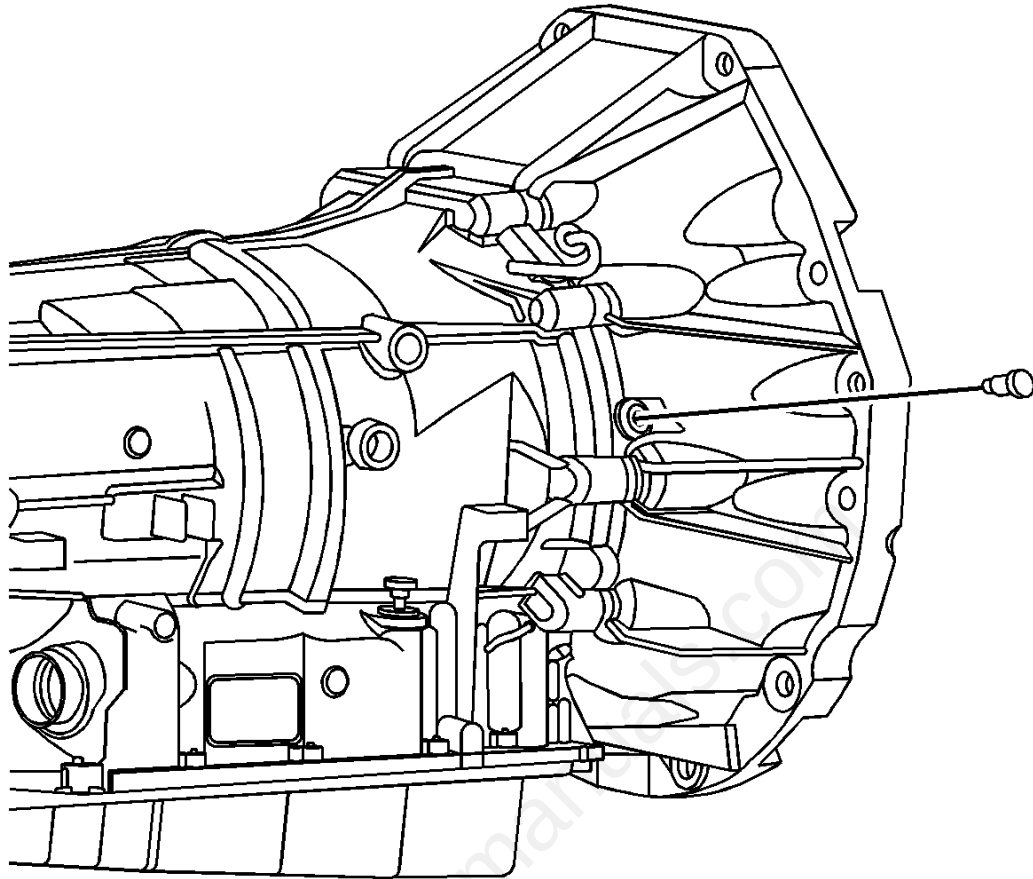


Fig. 16: View Of Oil Pressure Test Plug

Courtesy of GENERAL MOTORS COMPANY

2. Clean the surrounding area of the oil pressure test plug.
3. Remove the oil pressure test plug.

Installation Procedure

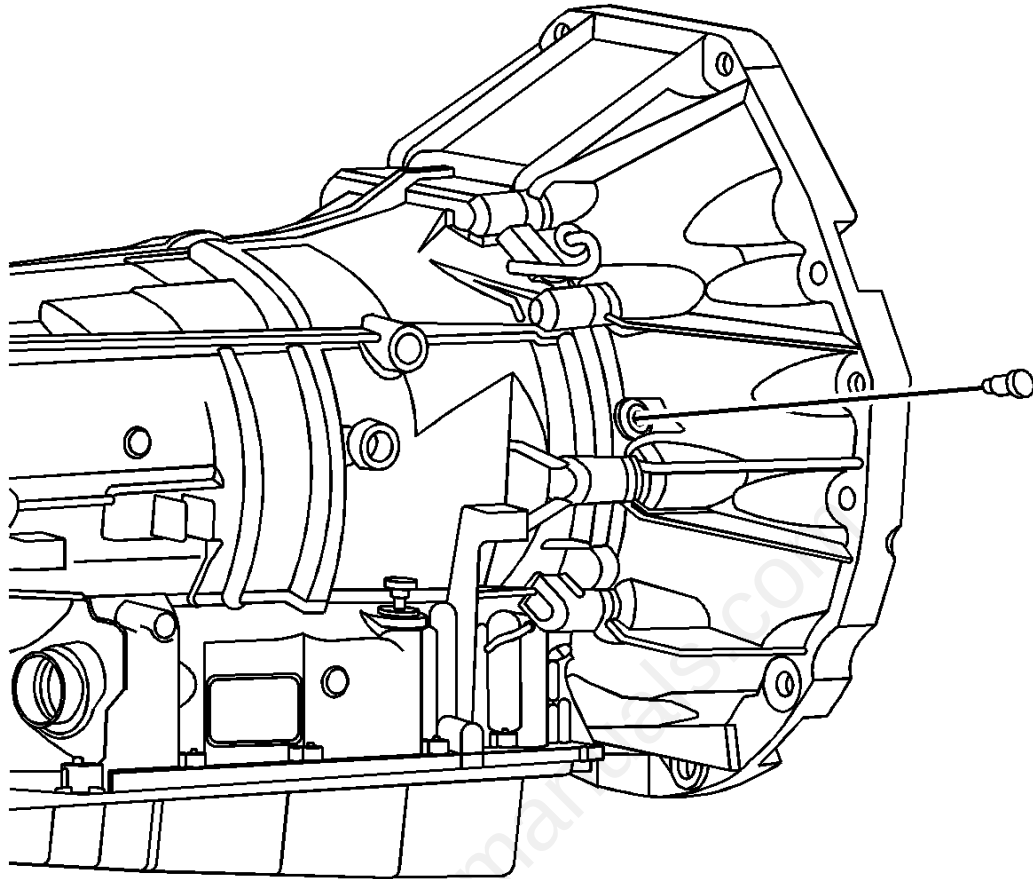


Fig. 17: View Of Oil Pressure Test Plug

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

1. Install the oil pressure test plug and tighten to 11 N.m (97 lb in).
2. Check the transmission fluid level (fill if necessary). Refer to **Transmission Fluid Level and Condition Check** .
3. Lower the vehicle.

AUTOMATIC TRANSMISSION ELECTRICAL CONNECTOR PASSAGE SLEEVE REPLACEMENT

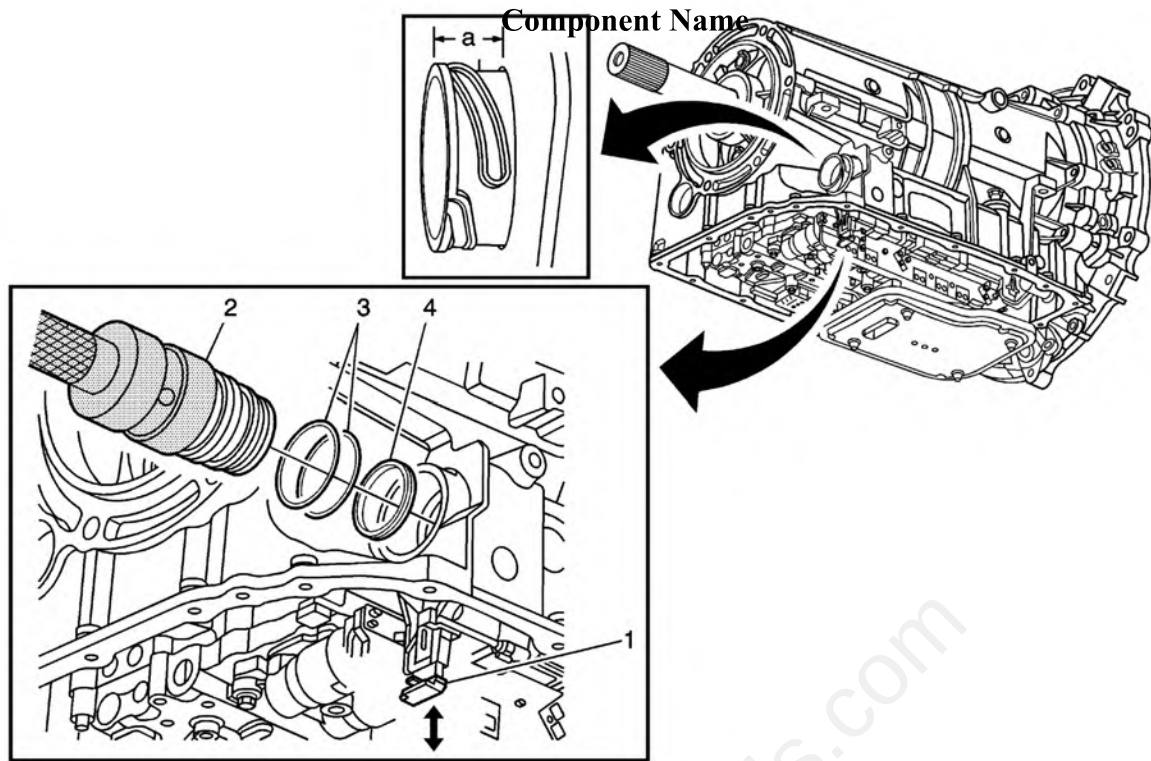


Fig. 18: Automatic Transmission Electrical Connector Passage Sleeve Component View

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
CAUTION: Orientate the alignment tab inside the passage sleeve with the slot in the electrical connector of the control solenoid valve assembly. Push the sleeve straight into the case bore and connector. Do NOT rotate the sleeve at any time. Ensure the sleeve is fully seated into the case. When the sleeve is properly installed, the distance from the case surface to the end of the sleeve should be 14-16 mm. Even though the correct electrical connections may still be maintained, failure to ensure proper installation of the sleeve may result in a fluid leak around the sleeve lip seal and into the sleeve cavity. Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the transmission oil pan. Refer to Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement. 3. Disconnect the vehicle wire harness electrical connector from the transmission electrical connector passage sleeve.	
1	Electrical Connector Slide Lock TIP: Pull down on the slide lock to remove the sleeve. Push up on the slide lock after sleeve installation.

CAUTION:

Use Dexron® VI transmission fluid only. Failure to use the proper fluid may result in transmission internal damage.

Preliminary Procedures

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Place a suitable drain pan under the transmission.
3. If equipped with LCV, remove the exhaust front pipe. Refer to [Exhaust Pipe Replacement \(LCV\)](#) [Exhaust Pipe Replacement](#).
4. If equipped with LFX, remove the three-way catalytic converter. Refer to [Three-Way Catalytic Converter Replacement \(LFX\)](#).

1	Transmission Fluid Pan Bolt (Qty: 17) CAUTION: Refer to Fastener Caution. NOTE: Tighten the bolts in the sequence shown. Tighten 9 N.m (80 lb in)
2	Transmission Fluid Pan Assembly Procedure 1. Fill the transmission with the proper fluid. Refer to Transmission General Specifications. 2. Fill the transmission with the proper amount of transmission fluid. Refer to Approximate Fluid Capacities, and Transmission Fluid Level and Condition Check.
3	Transmission Fluid Pan Gasket NOTE: The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused.
4	NEW Fluid Filter Assembly NOTE: Pull the fluid filter assembly straight out. Do not bend or twist the filter neck.

Component Name

5	NEW Fluid Filter Seal Assembly CAUTION: Do not damage the case sealing surface when removing the filter seal assembly. Procedure 1. Use a screwdriver or snap ring pliers to remove the filter seal. 2. Use the DT-47848 installer and the J-42183 handle to install the filter seal. 3. Lubricate the filter seal with transmission fluid before installing the filter. Special Tools • DT-47848 Seal Installer • J-42183 Driver Handle For equivalent regional tools, refer to Special Tools .
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TRANSMISSION MOUNT INSPECTION

CAUTION: In order to avoid oil pan damage and possible engine failure, insert a block of wood that spans the width of the oil pan bottom between the oil pan and the jack support.

1. Raise the transmission/transaxle in order to remove the weight from the transmission/transaxle mount and create slight tension in the rubber.
2. Observe the transmission/transaxle mount while raising the transmission/transaxle. Replace the transmission/transaxle mount if the transmission/transaxle mount exhibits any of the following conditions:

NOTE: Black paint on the rubber will crack with time, this does not constitute a failure.

- The hard rubber surface is covered with heat check cracks.
 - The rubber is separated from the metal plate of the transmission/transaxle mount.
 - The rubber is split through the center of the transmission/transaxle mount.
3. If there is movement between the metal plate of the transmission/transaxle mount and its attaching points, lower the transmission/transaxle on the transmission/transaxle mount. Tighten the bolts or nuts attaching the transmission/transaxle mount to the frame or transmission/transaxle mount bracket.

TRANSMISSION MOUNT REPLACEMENT (4WD)

Removal Procedure

1. Remove the transmission support crossmember. Refer to [Transmission Support Crossmember Replacement \(4WD\)](#) .

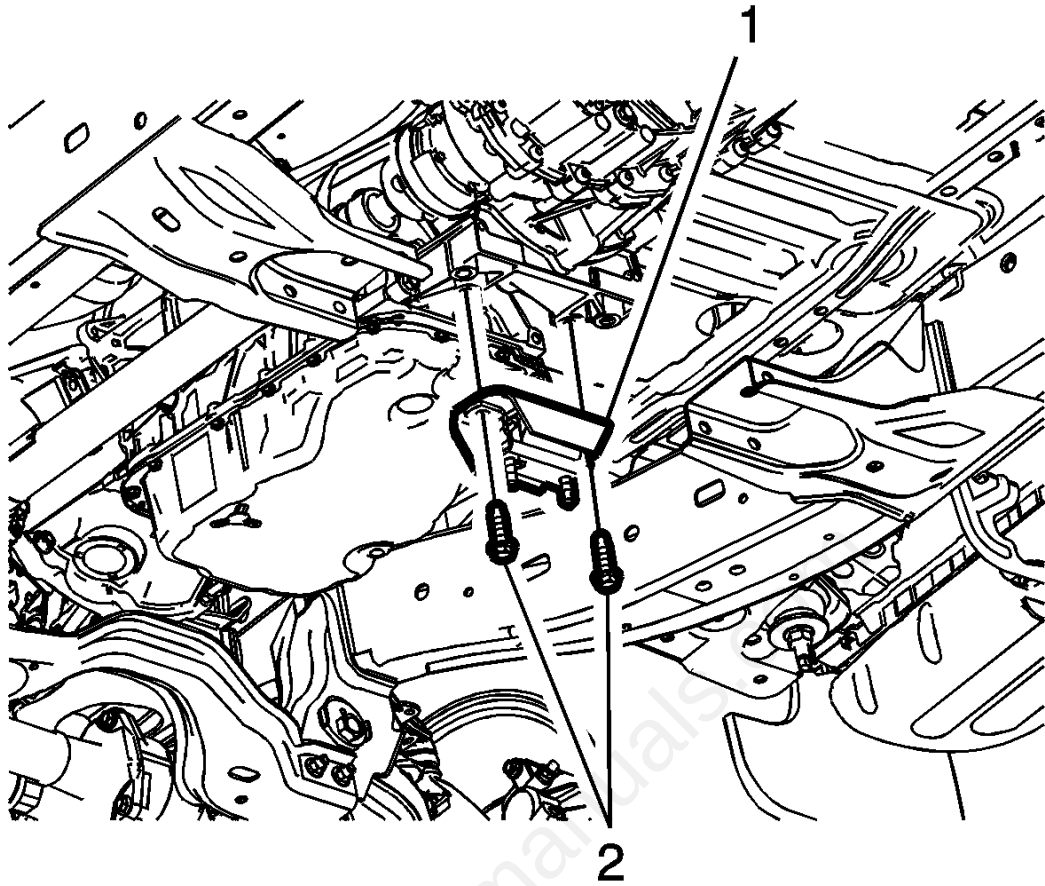


Fig. 20: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

2. Remove the transmission mount bolts (2).
3. Remove the transmission mount (1) from the vehicle.

Installation Procedure

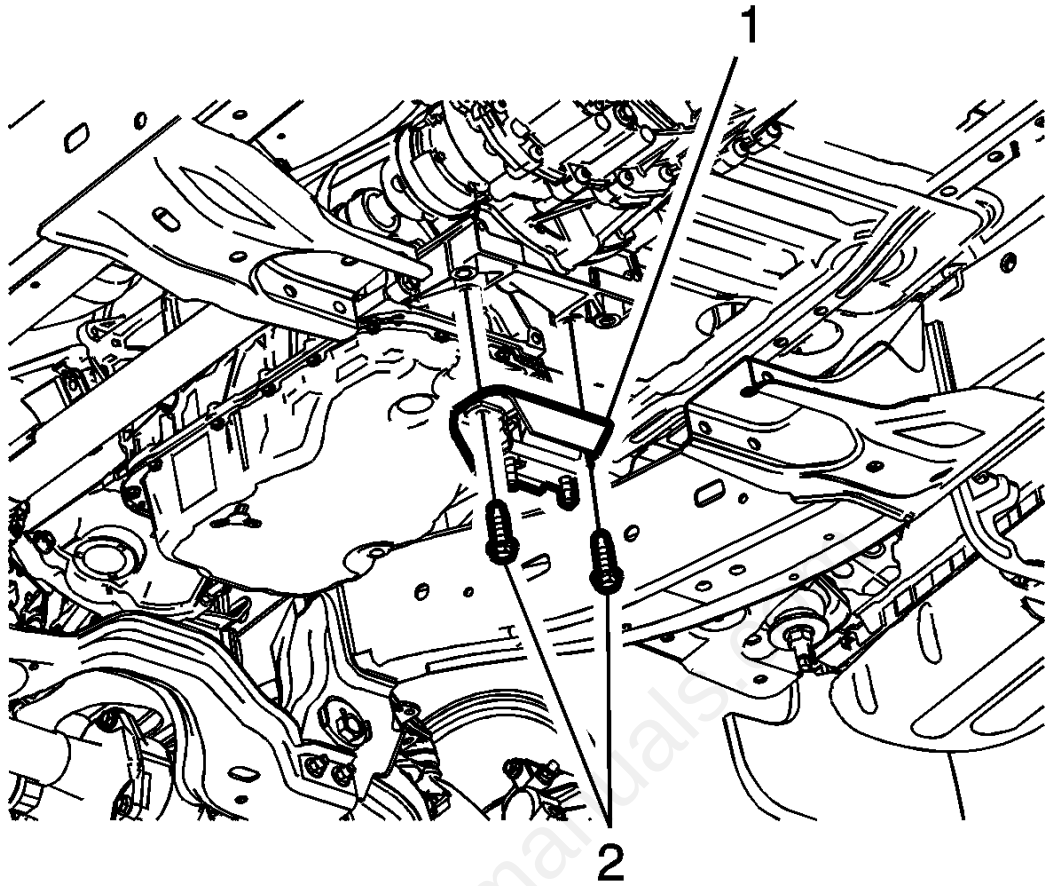


Fig. 21: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission mount (1) to the vehicle.

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

2. Install the bolts (2) and tighten to 55 N.m (41 lb ft).
3. Install the transmission support crossmember. Refer to [Transmission Support Crossmember Replacement \(4WD\)](#) .

TRANSMISSION MOUNT REPLACEMENT (2WD)

Removal Procedure

1. Remove the crossmember. Refer to [Transmission Support Crossmember Replacement \(2WD\)](#) .

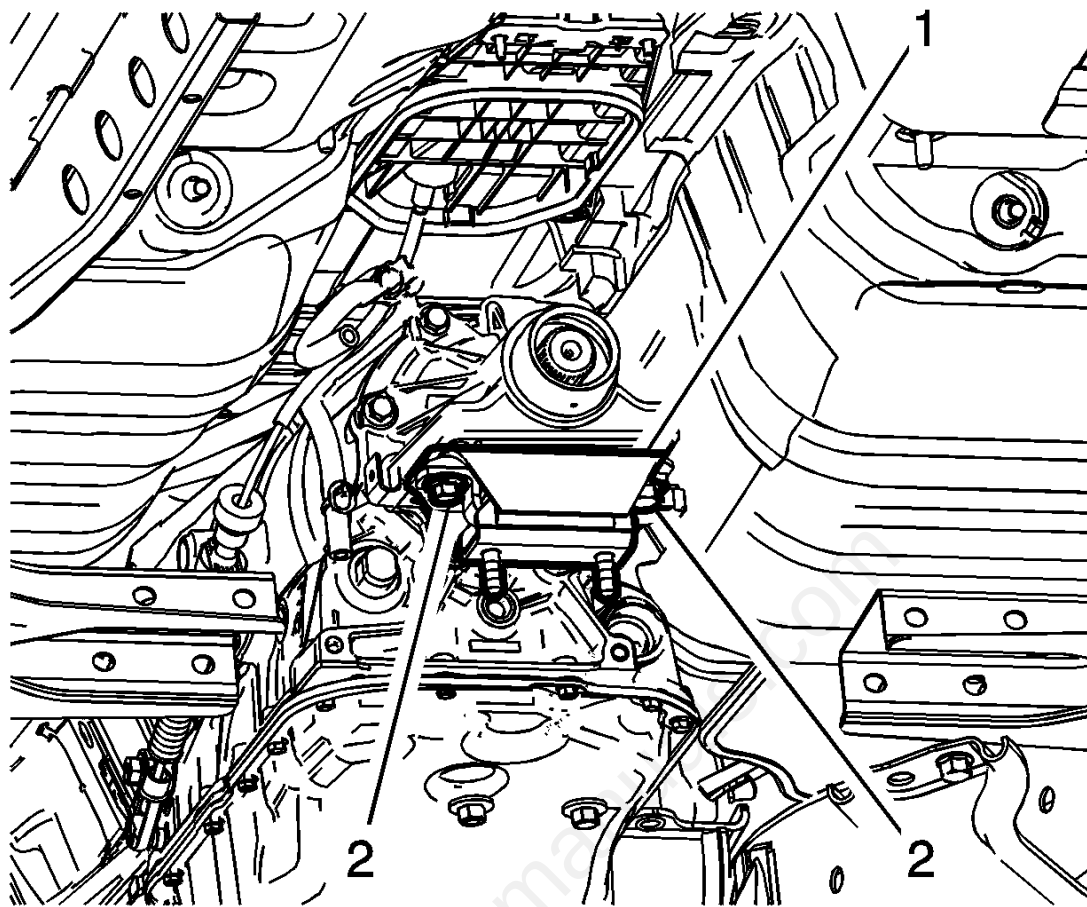


Fig. 22: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

2. Remove the transmission mount bolts (2).
3. Remove the transmission mount (1) from the vehicle.

Installation Procedure

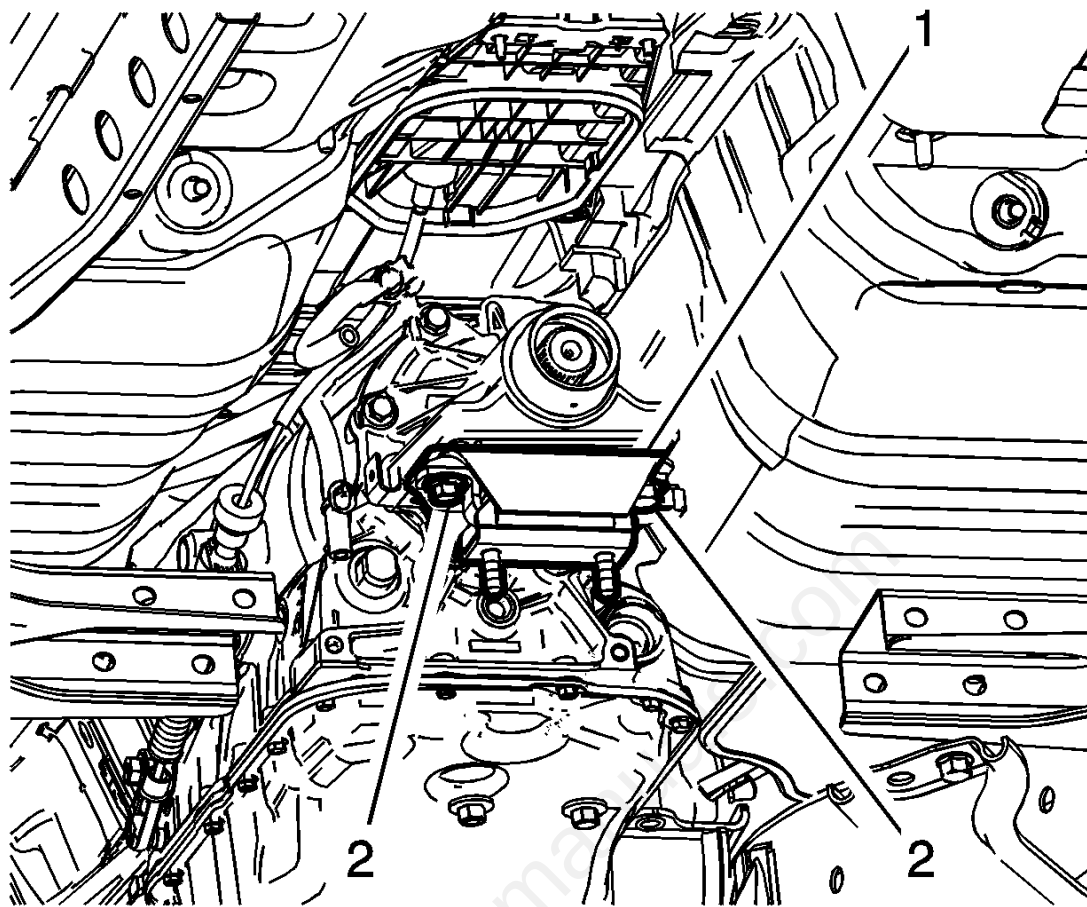


Fig. 23: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission mount (1) to the vehicle.

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

2. Install the bolts (2) and tighten to 58 N.m (42 lb ft).
3. Install the crossmember. Refer to [Transmission Support Crossmember Replacement \(2WD\)](#) .

CASE EXTENSION AND GASKET REPLACEMENT (2WD)

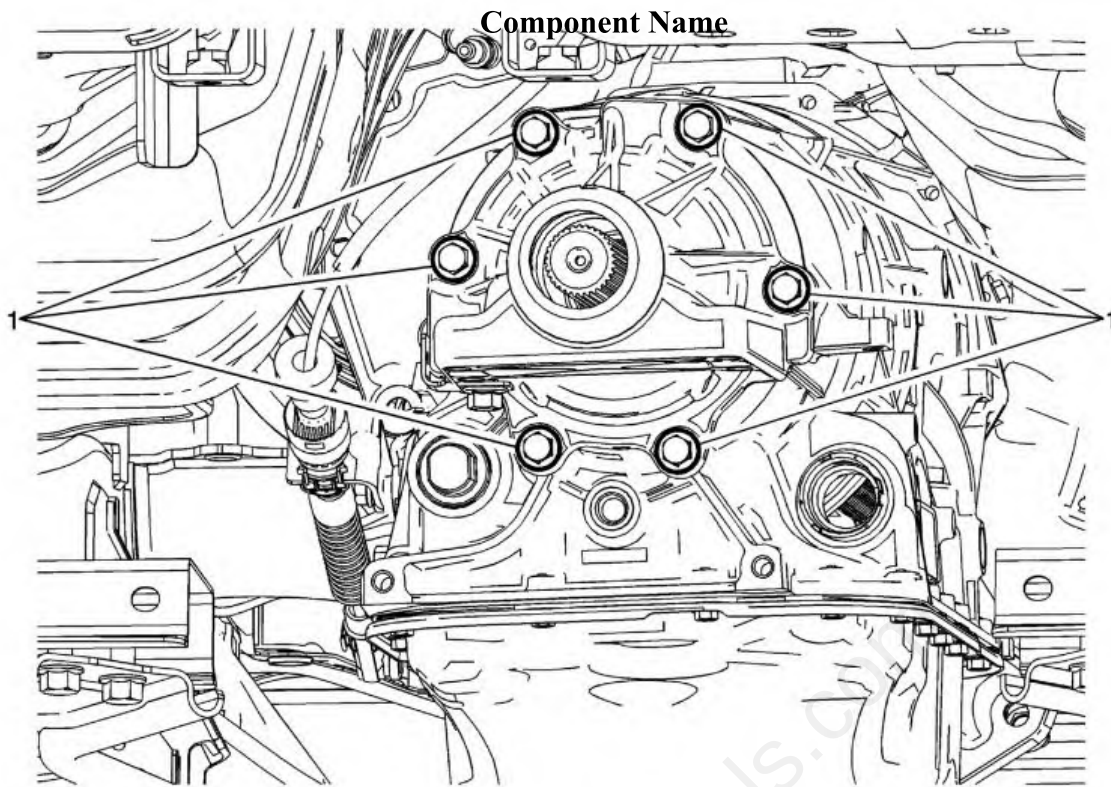


Fig. 24: Case Extension and Gasket
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the propeller shaft. 2. Remove the transmission mount. Refer to Transmission Mount Replacement (2WD) .	
1	Extension Case Fastener (Qty: 6) CAUTION: Refer to Fastener Caution . Tighten 55 N.m (41 lb ft)

CASE EXTENSION AND GASKET REPLACEMENT (4WD)

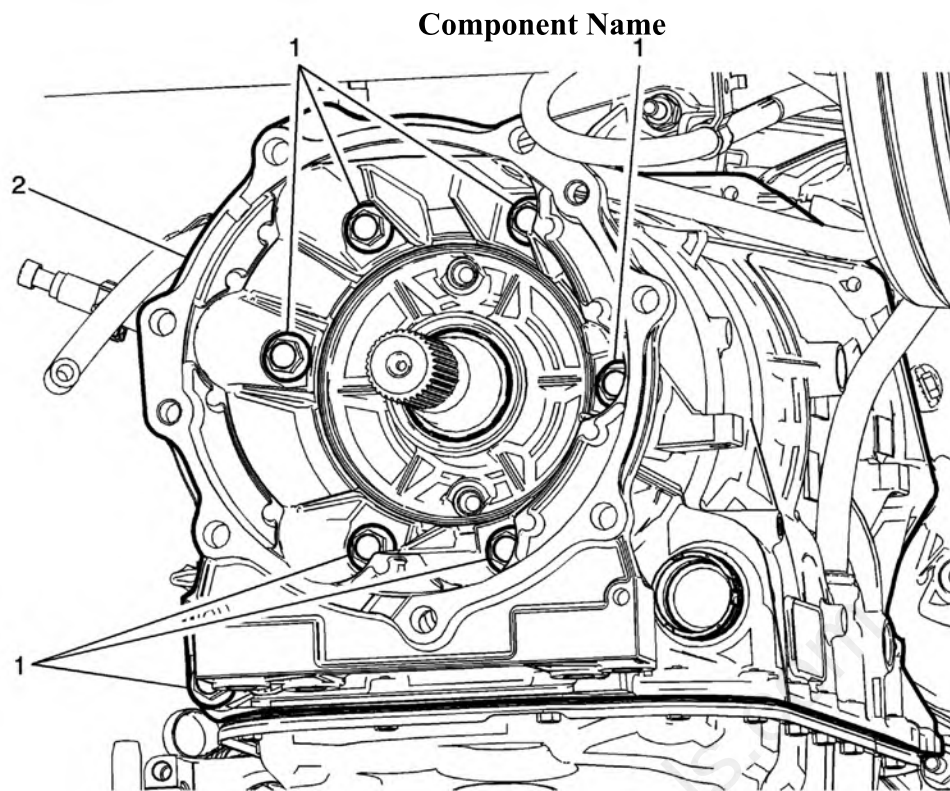


Fig. 25: Case Extension and Gasket

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the transfer case. Refer to Transfer Case Assembly Replacement . 2. Remove the transmission mount. Refer to Transmission Mount Replacement (4WD). 3. Use a suitable transmission jack to support the transmission. 4. Use a flat adaptor on the transmission jack to support the transmission resting on the fluid pan.	
1	Extension Case Fasteners (Qty: 7) CAUTION: Refer to Fastener Caution . Tighten 55 N.m (41 lb ft)
2	Extension Case

TRANSMISSION OUTPUT SHAFT SEAL REPLACEMENT

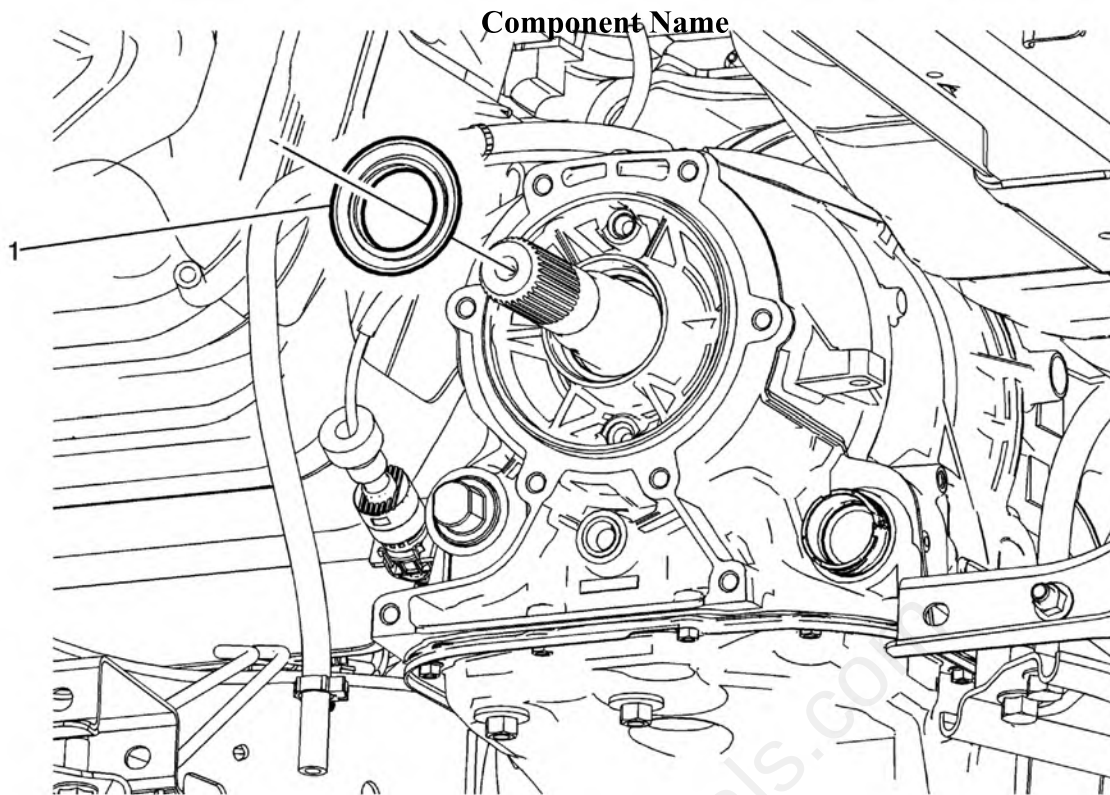


Fig. 26: Transmission Output Shaft Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the case extension. Refer to Case Extension and Gasket Replacement (2WD) Case Extension and Gasket Replacement (4WD) .	
1	Output Shaft Seal Procedure 1. Use the J-6125-B hammer and J-36825-A remover to remove the seal. Use care in order to avoid damaging the output shaft bushing. 2. Lubricate the seal with clean transmission fluid. 3. Use DT-50648 installer to install the seal. Special Tools • DT-50648 Case Seal Installer • J-6125-B Slide Hammer with Adaptor • J-36825-A Output Shaft Oil Seal Remover For equivalent regional tools, refer to Special Tools .

PROPELLER SHAFT FRONT SLIP YOKE OIL SEAL REPLACEMENT

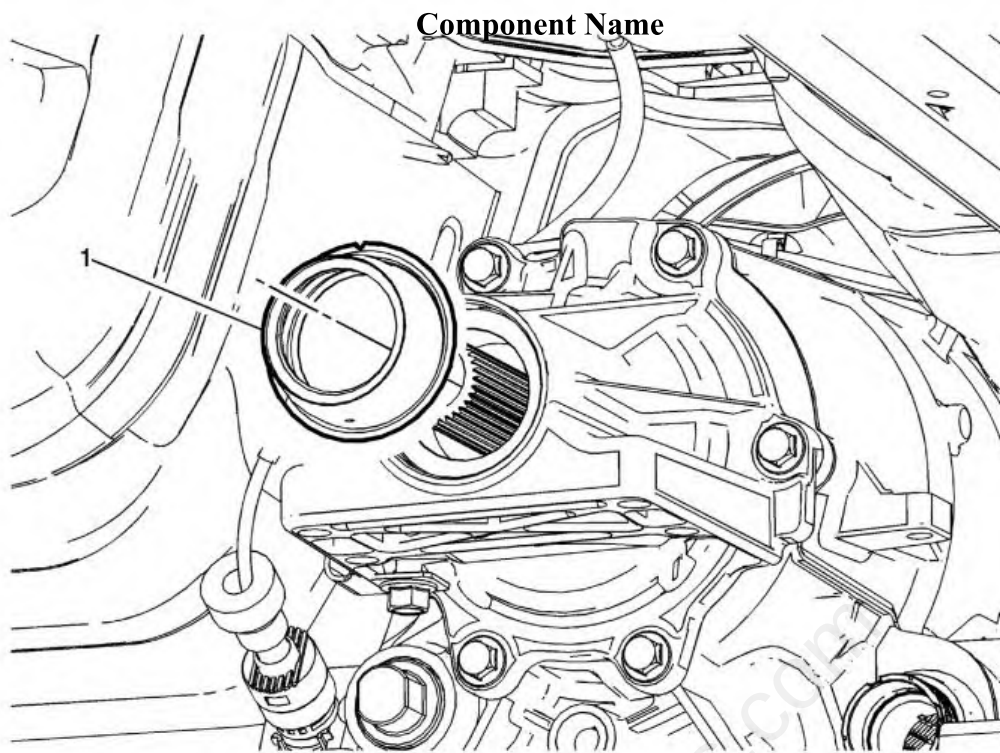


Fig. 27: Propeller Shaft Front Slip Yoke Oil Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the rear propeller shaft. Refer to Propeller Shaft Replacement (with MYB) Propeller Shaft Replacement (with N8D) .	
1	Propeller Shaft Front Slip Yoke Oil Seal Special Tools • J-8092 Driver Handle (6L90) • J-38869 Output Shaft Seal Installer (6L80) • J-45000 Seal Remover For equivalent regional tools, refer to Special Tools .

MANUAL SHIFT SHAFT AND SEAL REPLACEMENT

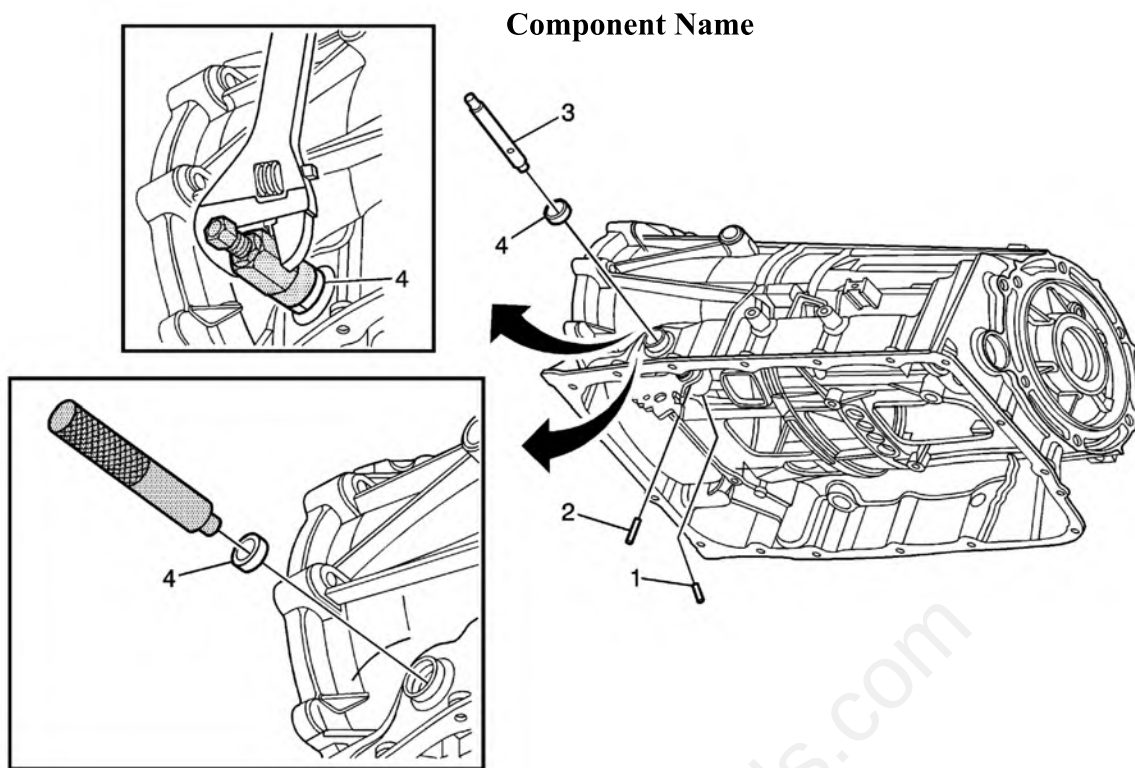


Fig. 28: Manual Shift Shaft & Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. If equipped with 4WD, remove the front axle propeller shaft. Refer to Front Axle Propeller Shaft Replacement . 3. Remove the transmission fluid pan. Refer to Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement. 4. Remove the control valve body. Refer to Control Valve Lower Body and Upper Body Replacement.	
1	Manual Shift Shaft Pin Procedure 1. Discard the pin. Replace with NEW pin. 2. "Walk" the pin out using side cutters.
2	Manual Shaft Detent Lever Hub Pin Procedure 1. Discard the pin. Replace with NEW pin. 2. "Walk" the pin out using side cutters.

Component Name	
3	Manual Shift Shaft NOTE: The manual shaft must be removed to replace the manual shaft seal.
4	Manual Shift Shaft Seal Procedure 1. Use the J 45201 cooler line seal remover to remove the seal from the transmission case. 2. Use the DT 47770 seal installer to install the seal into the transmission case. Special Tools • DT 47770 Seal Installer • J 45201 Cooler Line Seal Remover For equivalent regional tools, refer to Special Tools .

MANUAL SHIFT DETENT LEVER AND PARK PAWL ACTUATOR REPLACEMENT

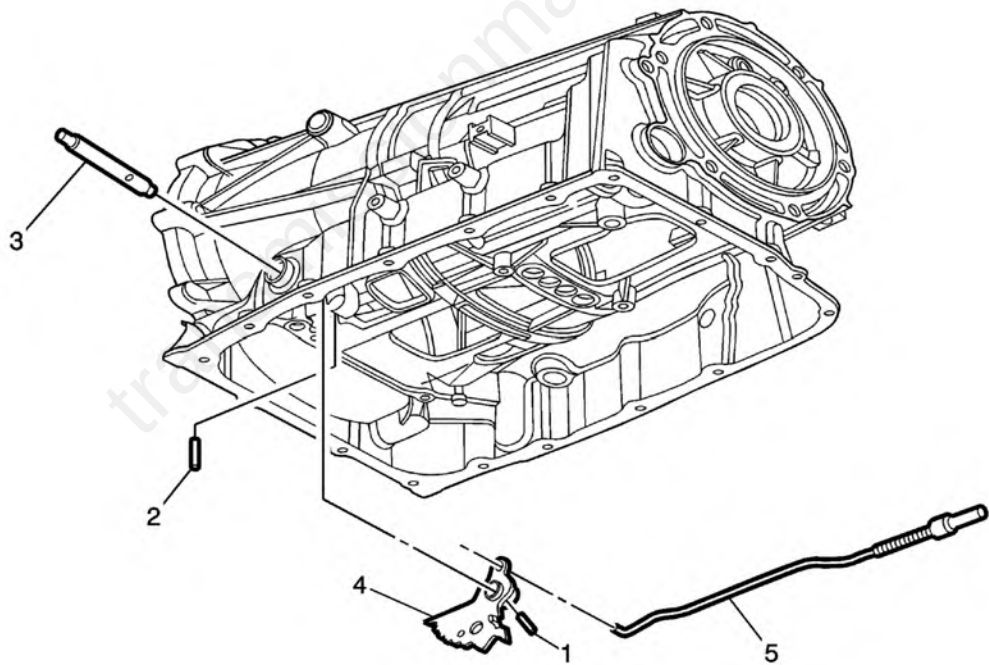


Fig. 29: Manual Shift Detent Lever And Park Pawl Actuator
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Preliminary Procedures

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. If equipped with 4WD, remove the front axle propeller shaft. Refer to [Front Axle Propeller Shaft Replacement](#) .
3. Remove the transmission fluid pan. Refer to [Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement](#).
4. Remove the manual shaft detent assembly roller. Refer to [Control Valve Lower Body and Upper Body Replacement](#).
5. If removal of the park pawl actuator guide is necessary, remove the case extension. Refer to [Case Extension and Gasket Replacement \(2WD\)](#)[Case Extension and Gasket Replacement \(4WD\)](#).

NOTE:

Do not remove the park pawl or park pawl spring. The park pawl and park pawl spring are not serviceable components.

1	Manual Shaft Detent Lever Hub Pin NOTE: • Discard the pin. Replace with NEW pin. • "Walk" the pin out using side cutters.
2	Manual Shift Shaft Pin NOTE: • Discard the pin. Replace with NEW pin. • "Walk" the pin out using side cutters.
3	Manual Shift Shaft
4	Manual Shaft Detent Lever Assembly
5	Park Pawl Actuator Assembly

MANUAL SHIFT SHAFT POSITION SWITCH REPLACEMENT

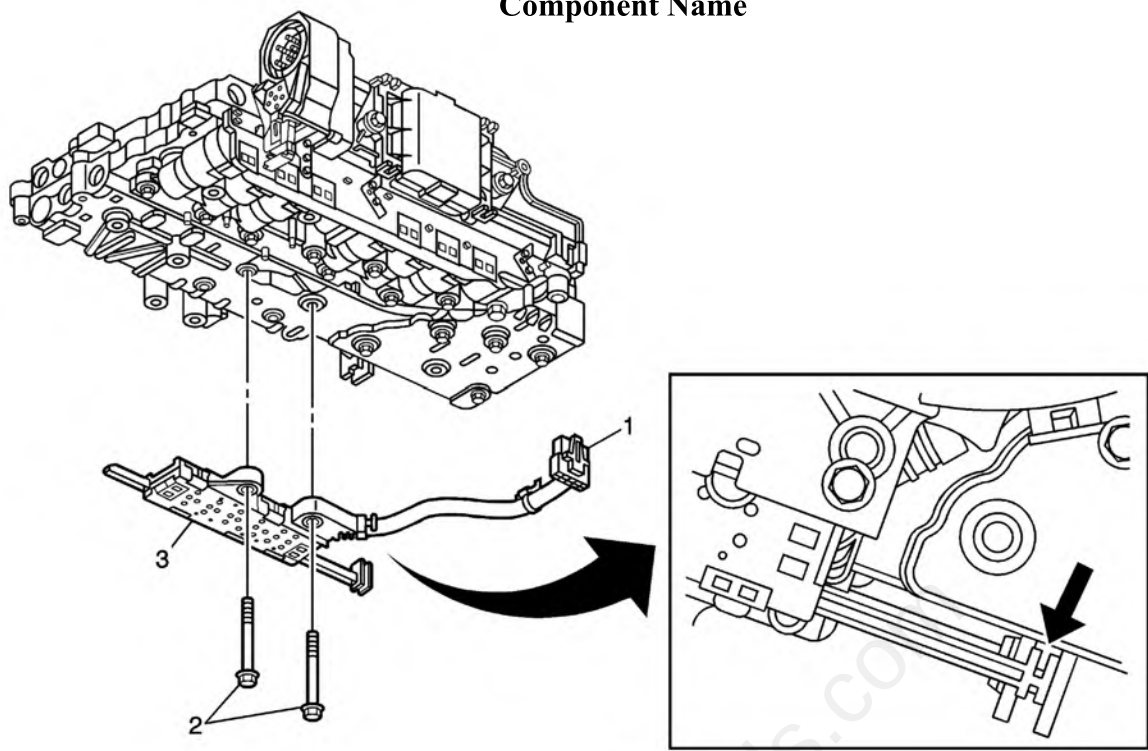


Fig. 30: Manual Shift Shaft Position Switch Component View

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the transmission fluid pan and filter. Refer to Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement .	
1	Manual Shift Shaft Position Switch Assembly Electrical Connector NOTE: • Release the connector lock before disconnecting. Engage the connector lock after connecting. • The wiring harness clip near the connector does not need to be replaced if broken or missing. The clip is used during manufacturing to keep the wire harness clear during an automated bolt installation process. If the clip is damaged, simply remove and discard.
2	Manual Shift Shaft Position Switch Assembly Bolts CAUTION: Refer to Fastener Caution . Tighten 12 N.m (106 lb in)

Component Name

3

Manual Shift Shaft Position Switch Assembly

Procedure

Align the switch activator slide with the manual valve link.

CONTROL SOLENOID VALVE AND TRANSMISSION CONTROL MODULE ASSEMBLY REPLACEMENT

Removal Procedure

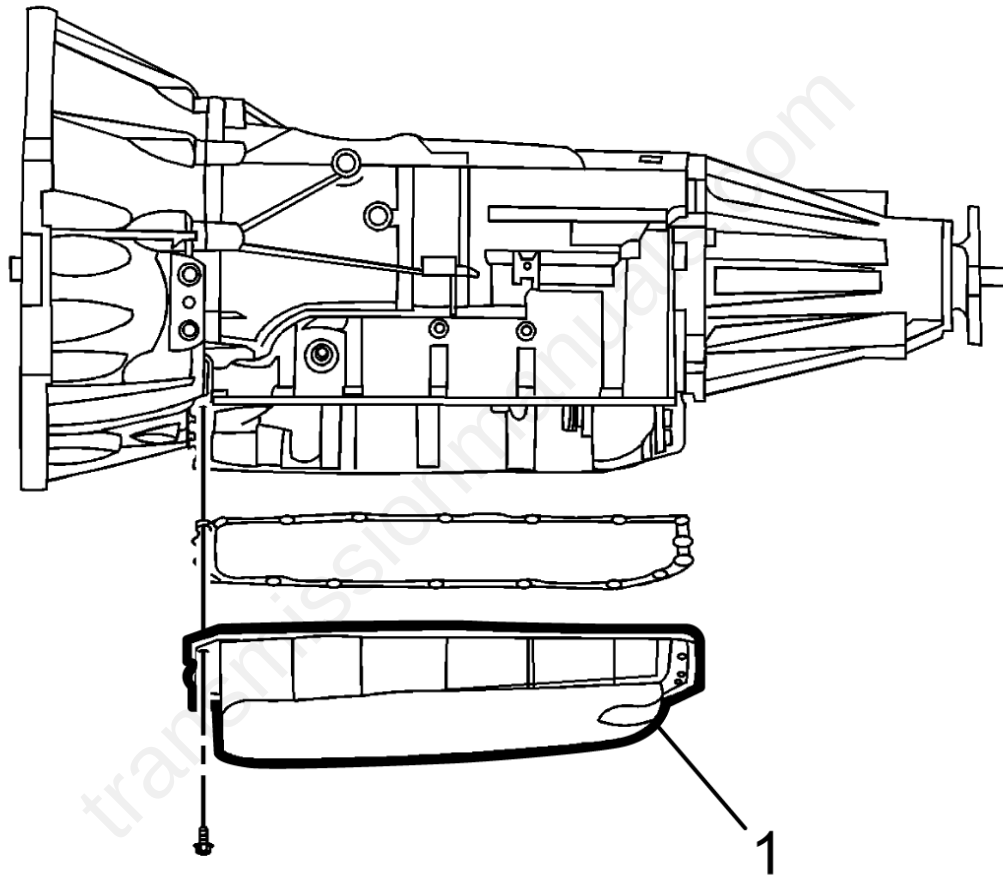


Fig. 31: View Of Transmission Oil Pan And Filter

Courtesy of GENERAL MOTORS COMPANY

NOTE:

The valve body must be removed from the transmission to replace the control solenoid valve and transmission control module assembly.

1. Remove the upper and lower control valve body assembly. Refer to [Control Valve Lower Body and Upper Body Replacement](#).
2. Remove the transmission oil pan and filter. Refer to [Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement](#).

: the electrical connector passage sleeve. Refer to [Automatic Transmission Electrical Connector Passage Sleeve Replacement](#).

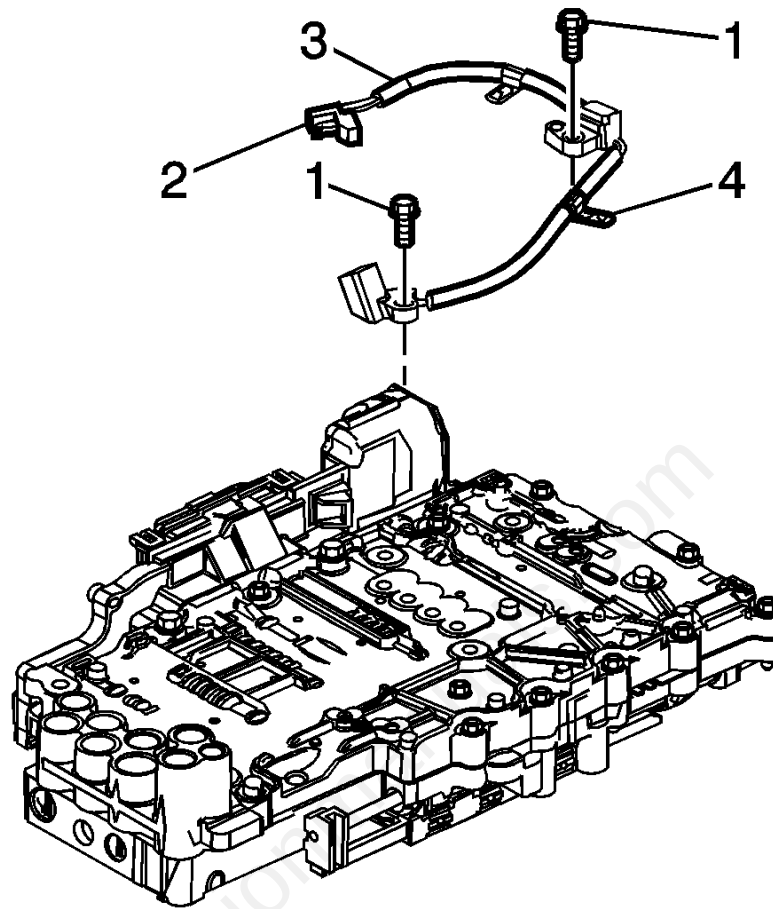


Fig. 32: View Of Speed Sensor Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

4. Disconnect the speed sensor electrical connector (2) from the control solenoid valve assembly.
5. Turn the control valve body assembly over.

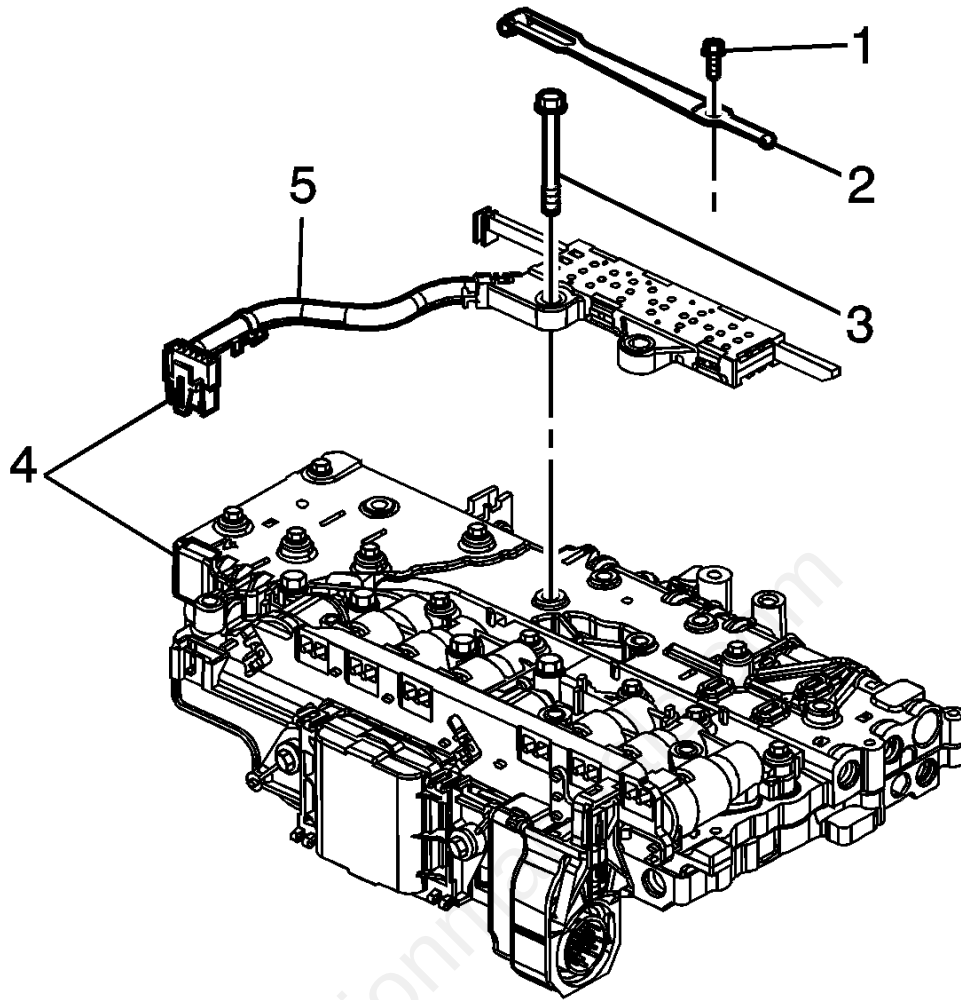


Fig. 33: Manual Shift Shaft Position Switch Connector

Courtesy of GENERAL MOTORS COMPANY

NOTE: Release the connector lock before disconnecting.

6. Disconnect the manual shift shaft position switch connector (4) from the control solenoid valve assembly.
7. Remove the bolt (3) and remove the manual shift shaft position switch assembly.

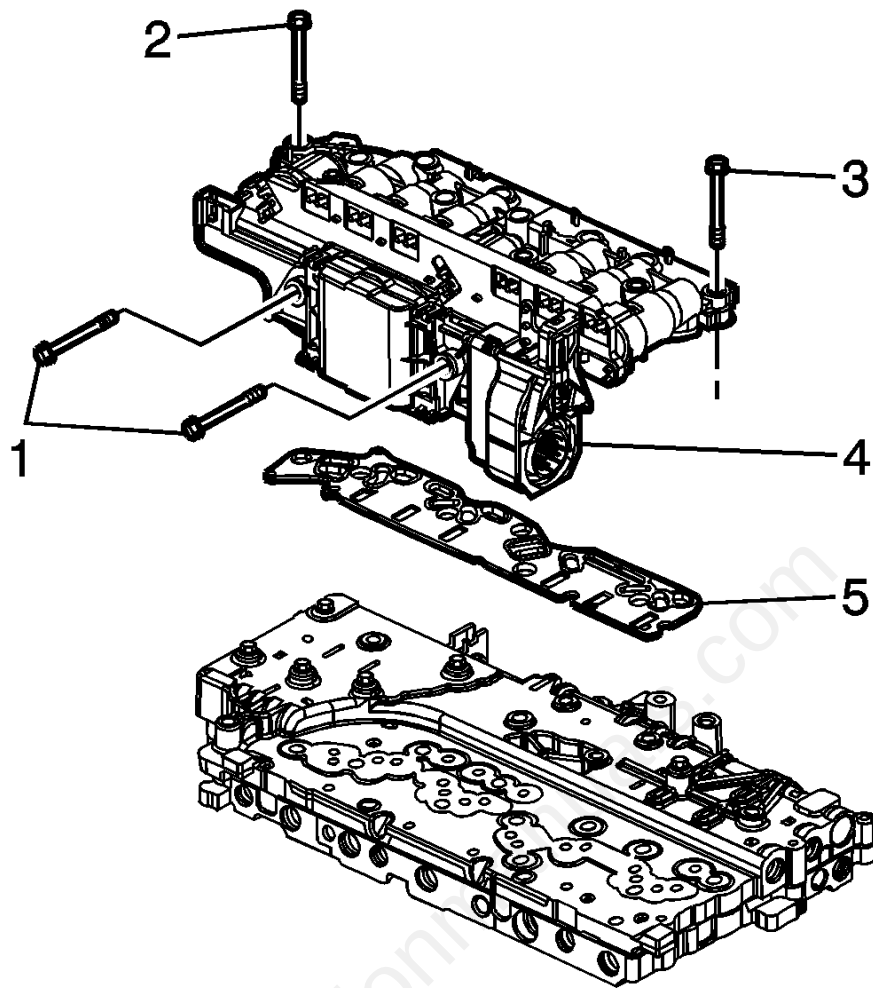


Fig. 34: View Of Control Valve Body Assembly

Courtesy of GENERAL MOTORS COMPANY

8. Remove the 2 bolts (1) from the "heat sink" side of the control solenoid valve assembly.

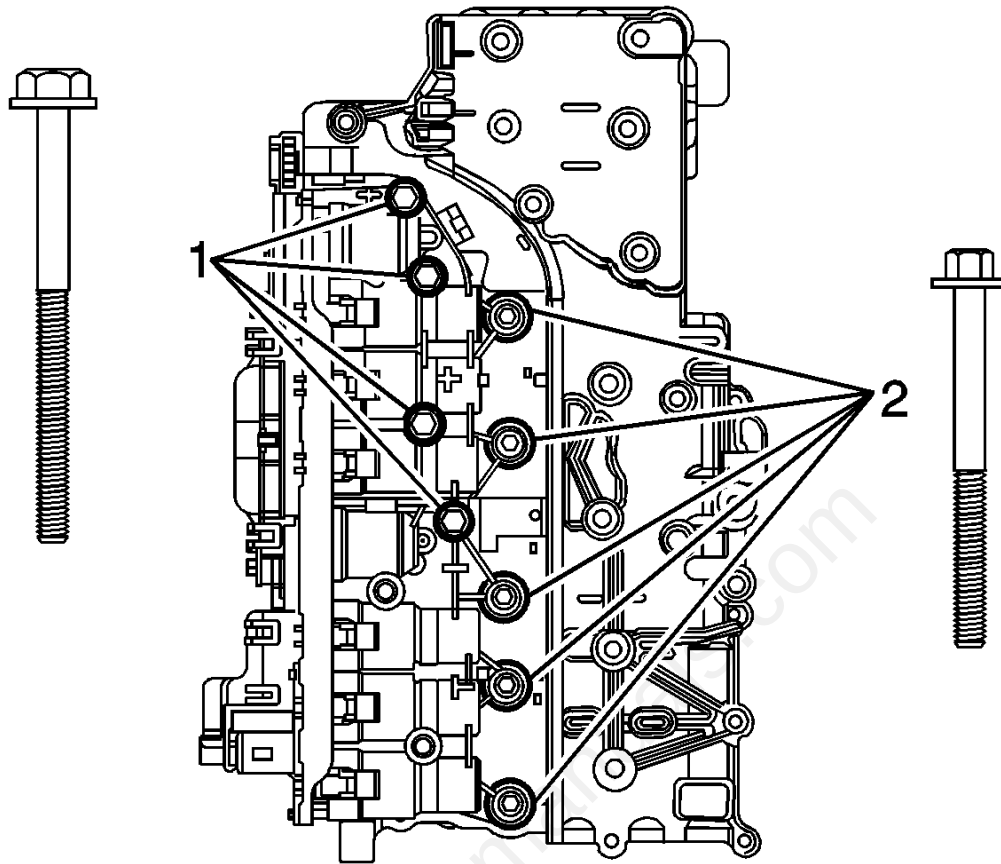


Fig. 35: View Of Bolts

Courtesy of **GENERAL MOTORS COMPANY**

9. Remove the 5 bolts (2) and the 4 bolts (1) securing the control solenoid valve assembly to the control valve body assembly.

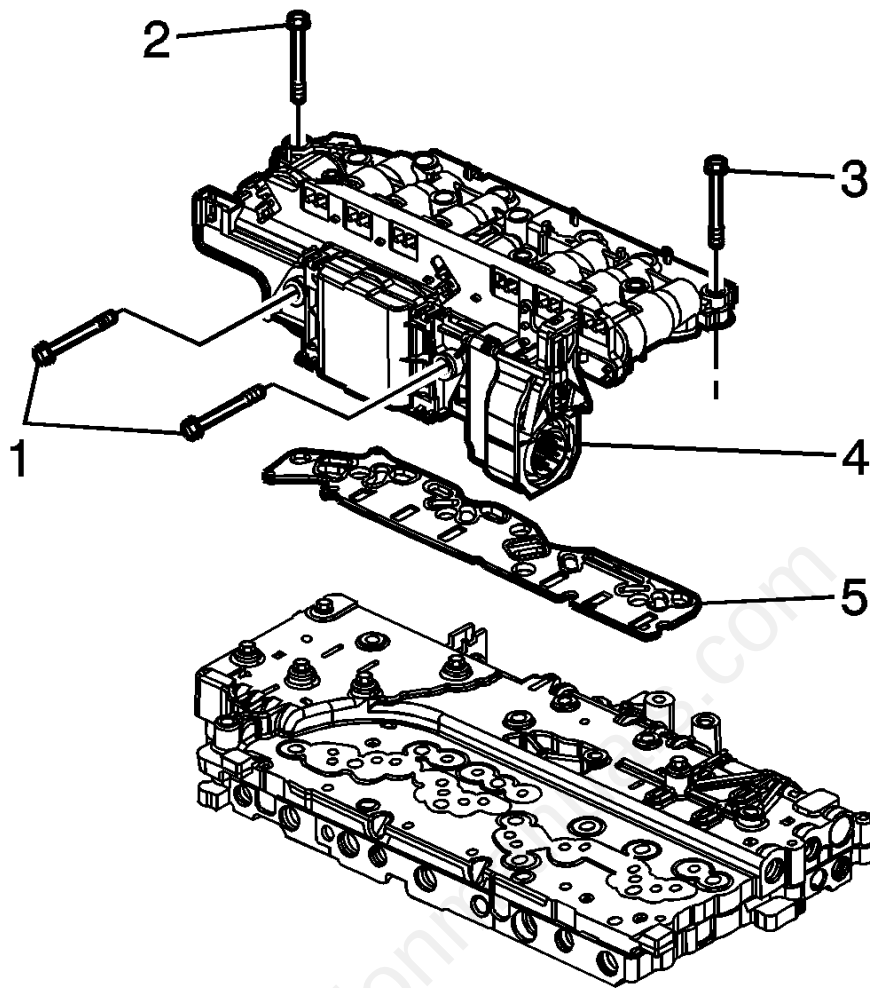


Fig. 36: View Of Control Valve Body Assembly
Courtesy of GENERAL MOTORS COMPANY

10. Remove the control valve body assembly.

CAUTION: Use care when removing or installing the filter plate assembly. A broken or missing retaining tab may not adequately secure the filter plate to the control solenoid valve assembly, resulting in possible damage or contamination.

11. Carefully remove and discard the filter plate assembly (5).

Installation Procedure

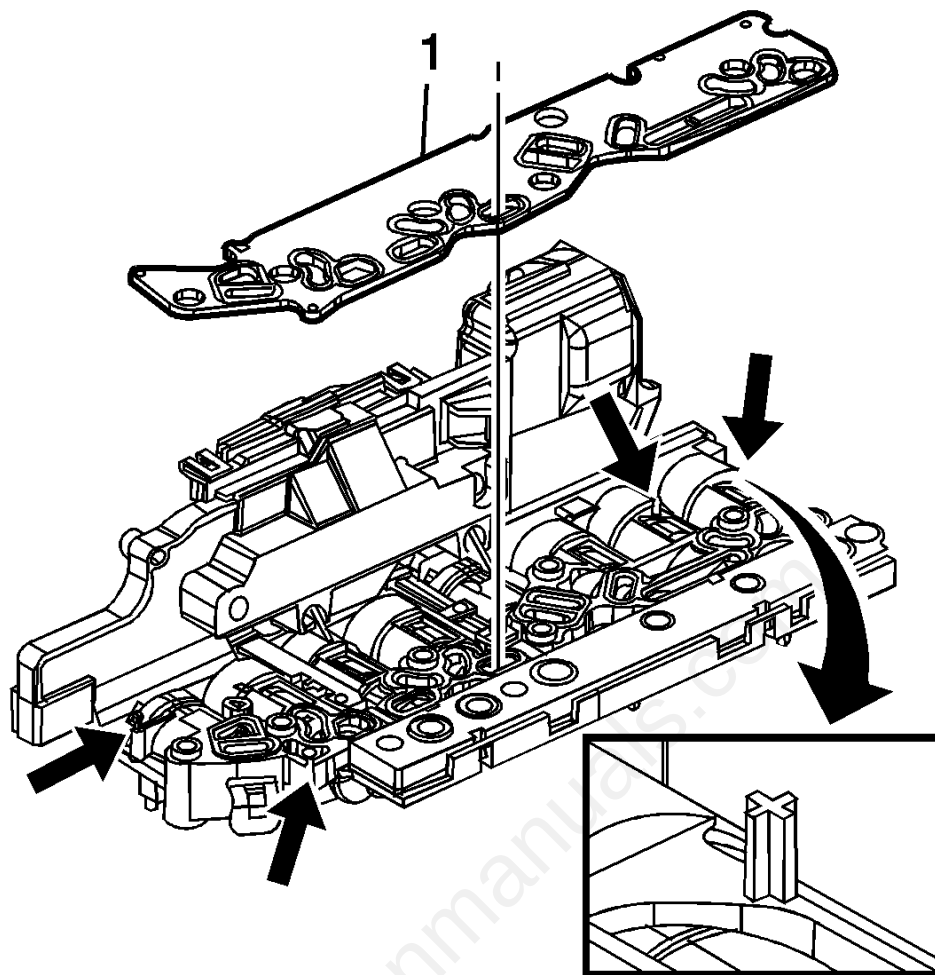


Fig. 37: View Of Filter Plate Assembly

Courtesy of GENERAL MOTORS COMPANY

NOTE: Inspect the 4 filter plate retaining tabs on the control solenoid valve assembly. A broken or missing tab may not adequately secure the filter plate to the control solenoid valve assembly.

1. Install a NEW filter plate assembly (1).

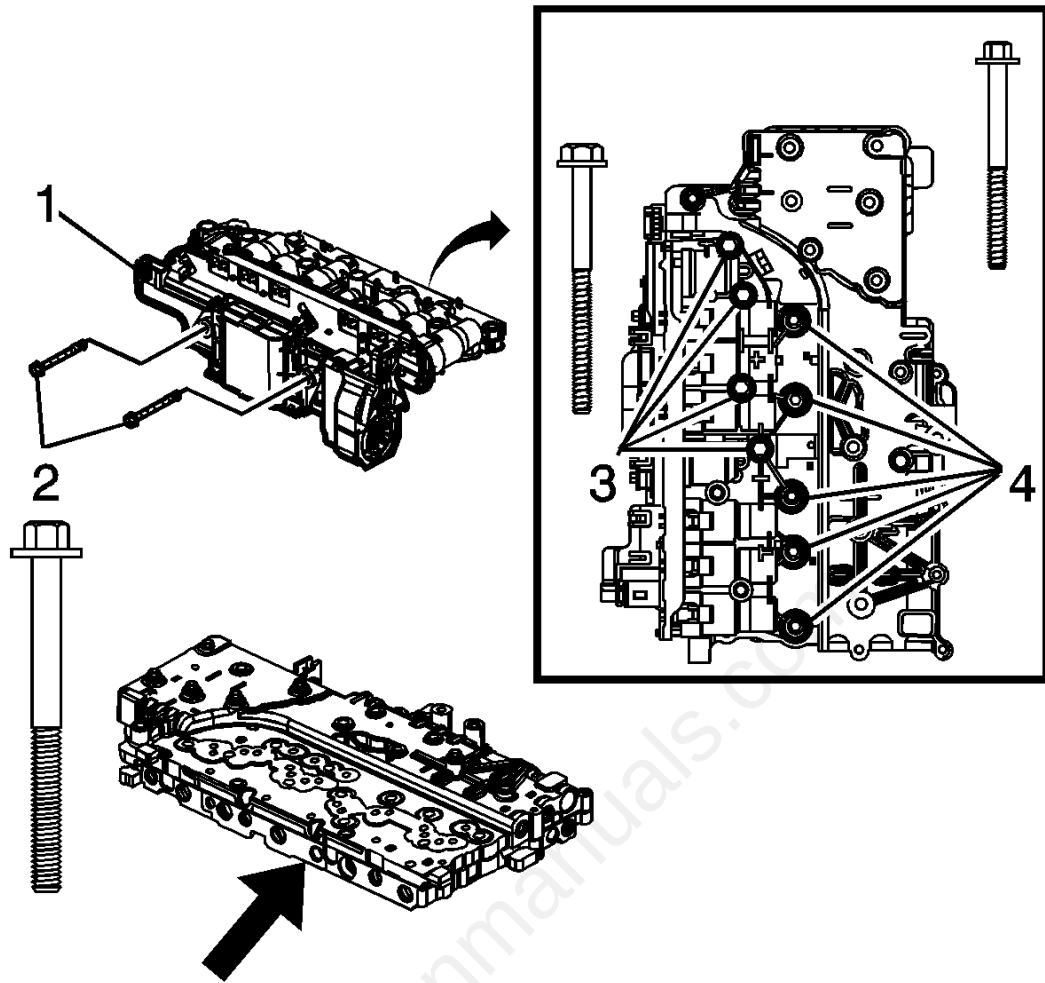


Fig. 38: View Of Control Solenoid Valve Assembly Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: Note the locator pin on the control valve lower body assembly.

2. Align the control solenoid valve assembly (1) to the control valve lower body assembly.
3. Install the 2 bolts (2), through the "heat sink" side of the control solenoid valve assembly (1). Hand tighten only.

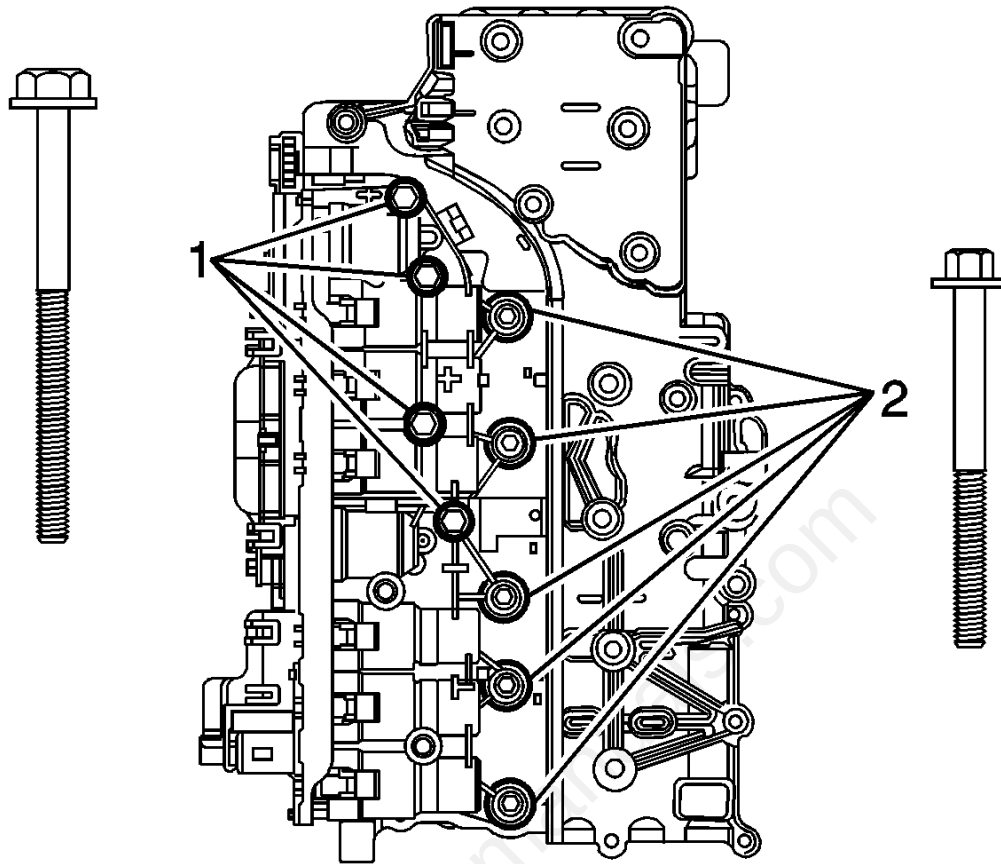


Fig. 39: View Of Bolts

Courtesy of **GENERAL MOTORS COMPANY**

4. Install the 4 bolts (1) and 5 bolts (2) securing the control solenoid valve assembly to the control valve lower body assembly. Hand tighten only.

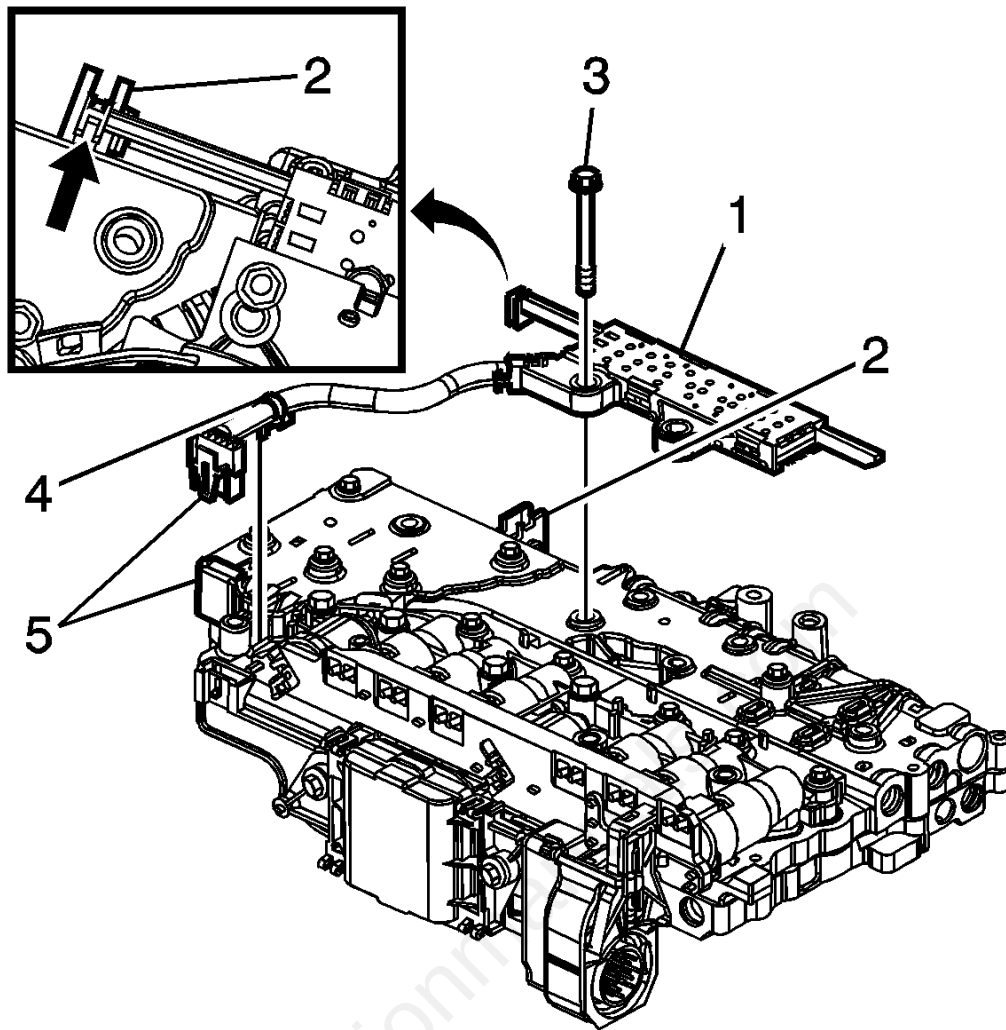


Fig. 40: View Of Manual Shift Shaft Position Switch Assembly

Courtesy of GENERAL MOTORS COMPANY

5. Install the manual shift shaft position switch assembly (1). Align the switch activator slide with the manual valve link. Secure with 1 bolt (3). Hand tighten only.

NOTE:

The wiring harness clip (4) on the manual shift shaft position switch does not need to be replaced if damaged or missing. The clip functions only as a manufacturing assembly aid to keep the harness clear during an automated bolt installation process. If the clip is damaged, simply remove and discard.

6. Connect and lock the manual shift shaft position switch electrical connector (5) to the control solenoid valve assembly and attach the wiring harness clip (4).

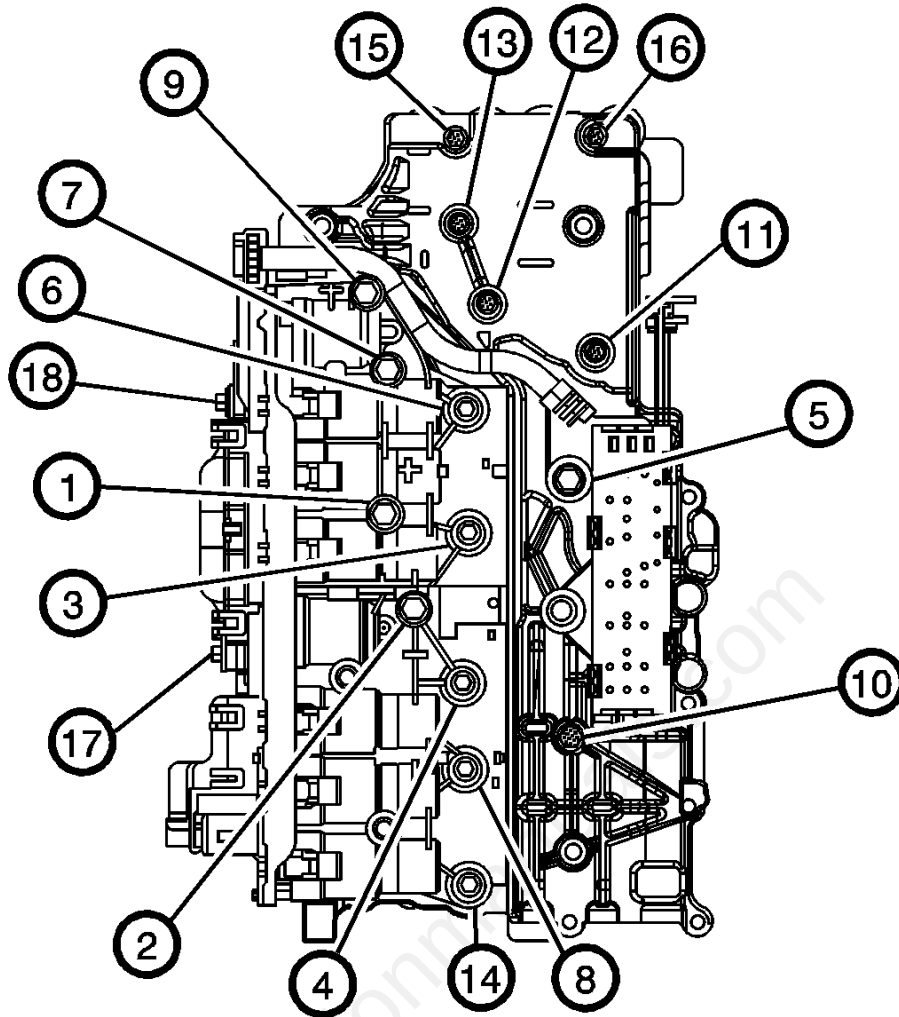


Fig. 41: Control Solenoid Valve Assembly Bolt Tightening Sequence

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Bolt torque sequencing is critical to the proper function of the control solenoid valve assembly. Failure to follow the required sequencing may result in transmission malfunction.

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

NOTE: When following the tightening sequence, skip over bolts 10, 11, 12, 13 and 15. These bolts are not removed for this procedure.

7. Tighten all bolts in the sequence shown. The 2 "heat sink" bolts (17, 18) must be tightened last.

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

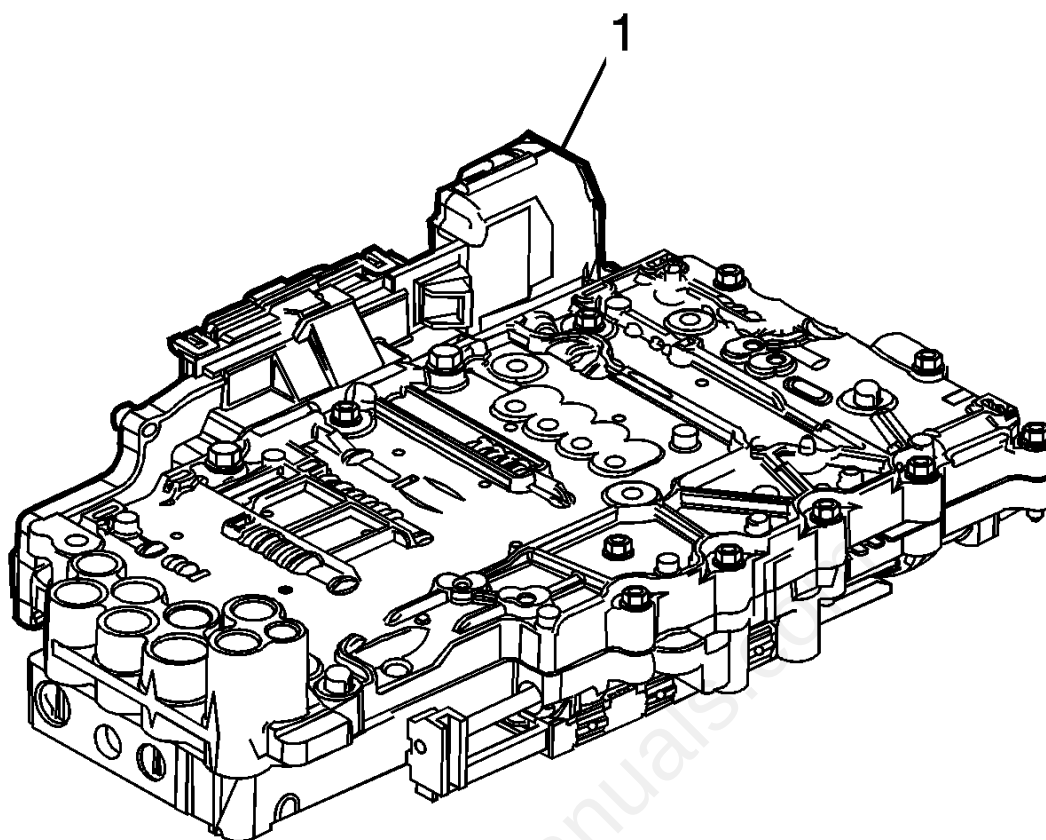


Fig. 42: View Of Control Solenoid Valve Assembly
Courtesy of GENERAL MOTORS COMPANY

8. Inspect the contact area between the "heat sink" area of the control solenoid valve assembly (1) and the valve body. There should be no visible gap. If a gap exists, loosen all 18 bolts and retighten in the sequence shown.

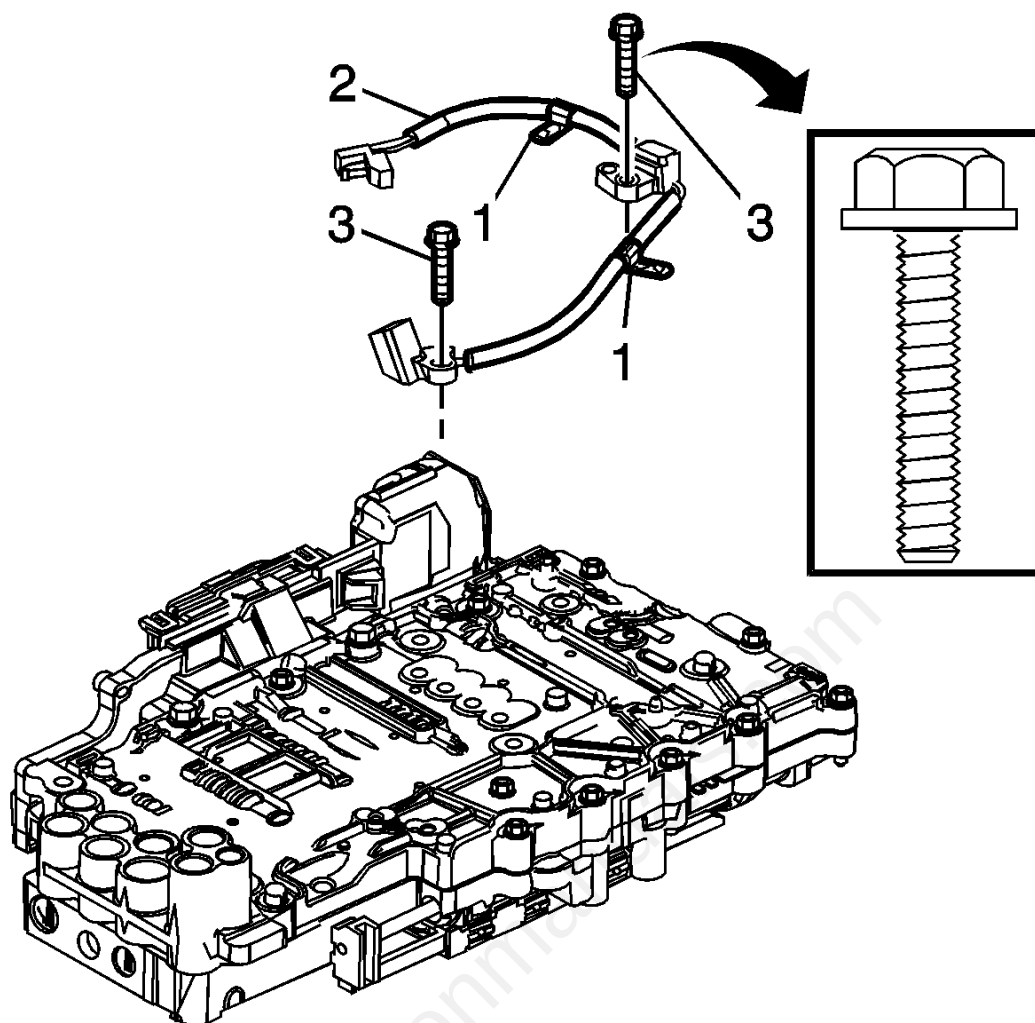


Fig. 43: View Of Output Speed Sensor Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

9. Inspect the 2 input and output speed sensor wiring harness clips (1) for damage. Replace if damaged.

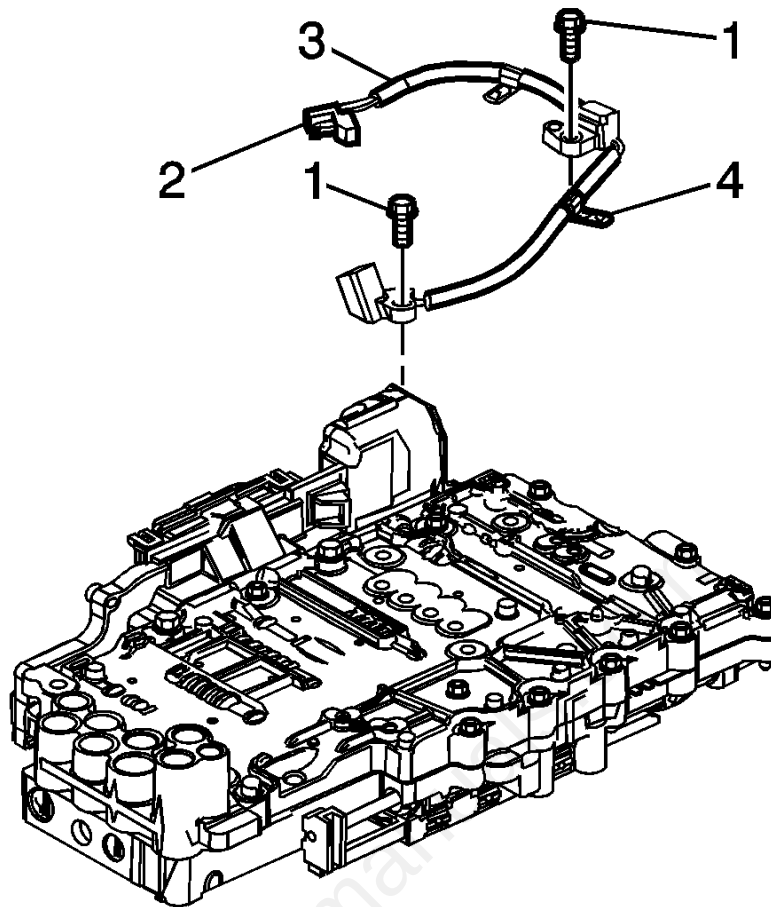


Fig. 44: View Of Speed Sensor Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

10. Connect the speed sensor electrical connector (2) to the control solenoid valve assembly.

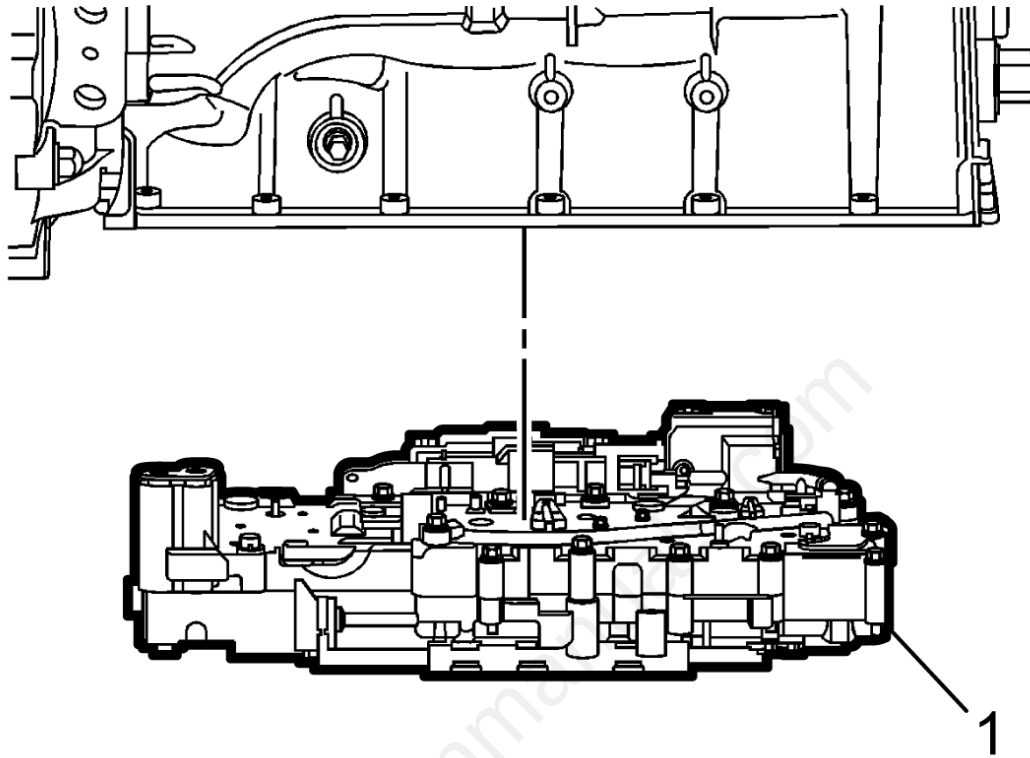


Fig. 45: Valve Body Assembly

Courtesy of GENERAL MOTORS COMPANY

11. Install the upper and lower control valve body assembly. Refer to [Control Valve Lower Body and Upper Body Replacement](#).
12. Install the electrical connector passage sleeve. Refer to [Automatic Transmission Electrical Connector Passage Sleeve Replacement](#).

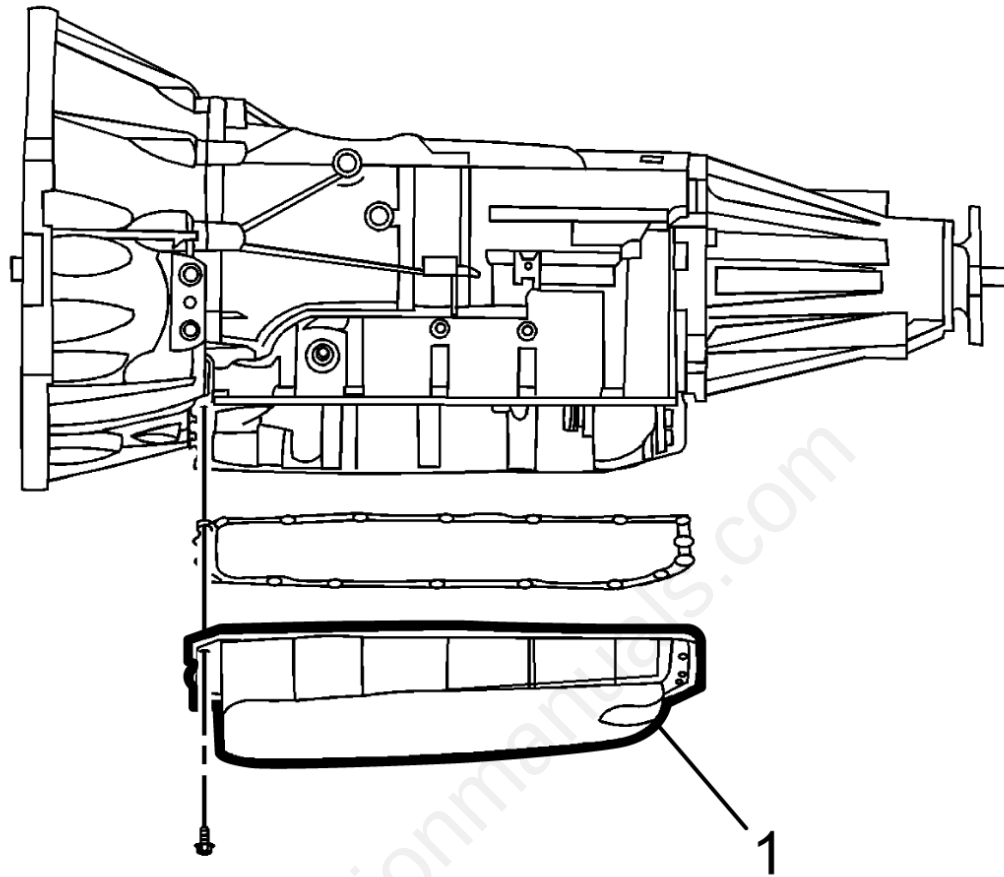


Fig. 46: View Of Transmission Oil Pan And Filter
Courtesy of GENERAL MOTORS COMPANY

13. Install the transmission oil pan and filter. Refer to [Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement](#).
14. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. Refer to [Service Programming System \(SPS\)](#) .

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

15. Perform the Reset Transmission Adapts. Refer to [Reset Transmission Adapts](#) .

VALVE LOWER BODY AND UPPER BODY REPLACEMENT

Component Name

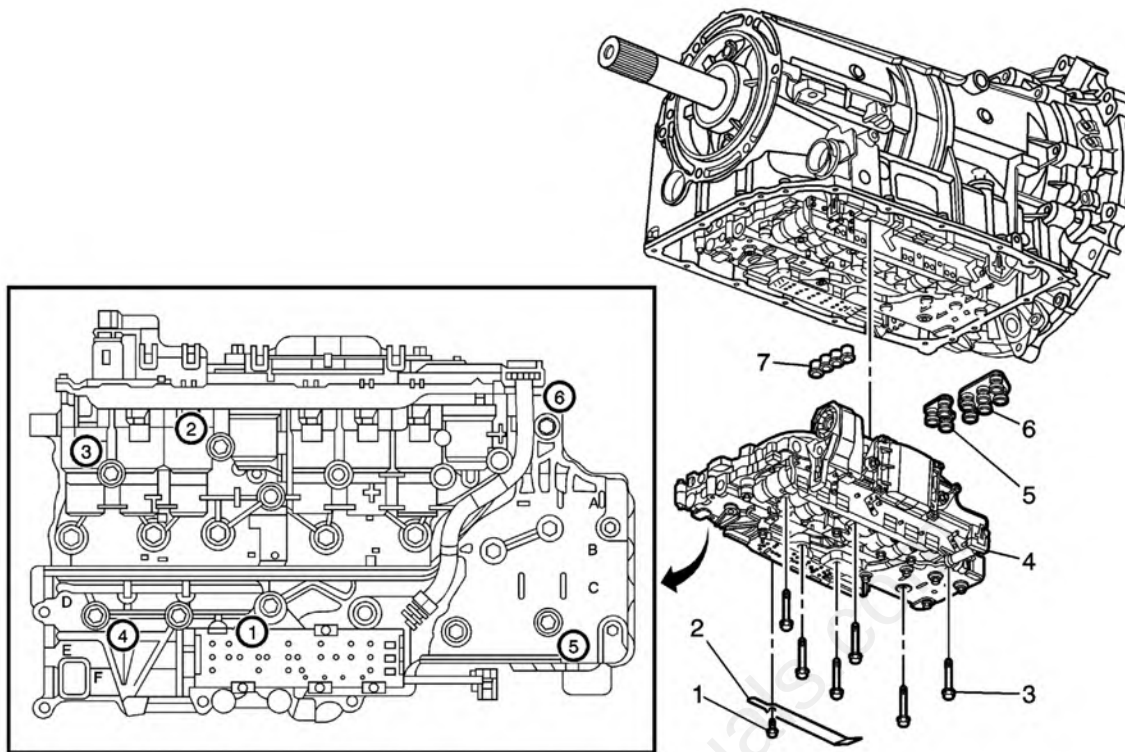


Fig. 47: View Of Control Valve Lower & Upper Body

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Remove the transmission electrical connector. Refer to Automatic Transmission Electrical Connector Passage Sleeve Replacement .	
1	Manual Shaft Detent Bolt CAUTION: Refer to Fastener Caution . Tighten 12 N.m (106 lb in)
2	Manual Shaft Detent Assembly

Component Name	
3	Control Valve Assembly Bolt (Qty: 6) Procedure - Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated. - Tighten in specified sequence. Tighten 8 N.m (71 lb in) Special Tools DT-48285 Valve Body Torx Plus Socket For equivalent regional tools, refer to Special Tools .
4	Control Valve Assembly
5	Fluid Pump Seal Procedure Discard seal and replace with new.
6	Fluid Pump Seal Procedure Discard seal and replace with new.
7	Center Support Fluid Passage Seal Procedure - Discard seal and replace with new. - It is recommended that transmission adaptive pressure (TAP) information be reset. Transmission performance may be affected as new TAP values are learned. Refer to Reset Transmission Adapts . - If replacing the control valve body assembly, remove the Control Solenoid Valve and Transmission Control Module Assembly Replacement, and the Manual Shift Shaft Position Switch Replacement.

INPUT AND OUTPUT SPEED SENSOR REPLACEMENT

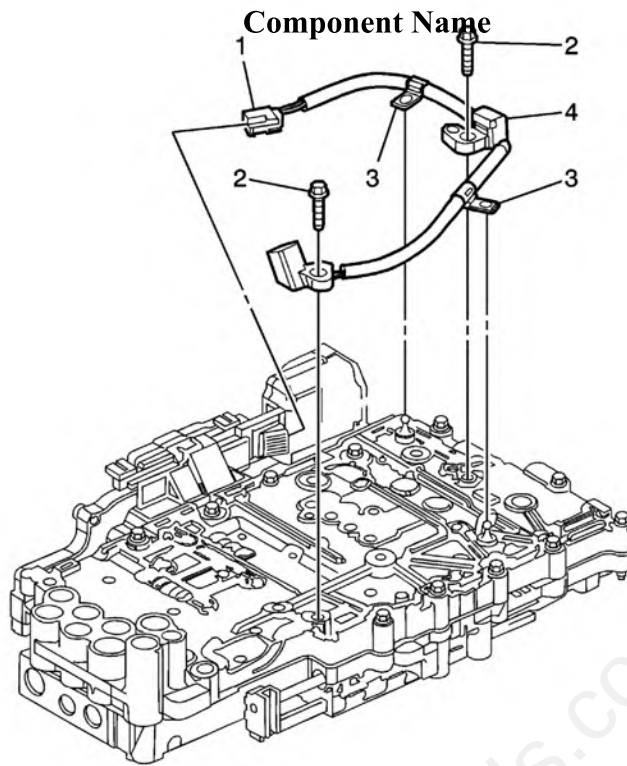


Fig. 48: Input And Output Speed Sensor
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the transmission fluid pan and filter. Refer to Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement. 3. Remove the upper and lower valve body assembly. Refer to Control Valve Lower Body and Upper Body Replacement.	
1	Speed Sensor Electrical Connector
2	Input and Output Speed Sensor Assembly Bolts (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten 12 N.m (106 lb in)
3	Input and Output Speed Sensor Assembly Clips (Qty: 2) TIP: Inspect the wiring harness clips for damage replace if necessary.
4	Input and Output Speed Sensor Assembly

TRANSMISSION REPLACEMENT (LFX ENGINE WITH FOUR WHEEL DRIVE)

Removal Procedure

1. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

- : the starter motor. Refer to [Starter Replacement \(LFX\)](#)
3. Remove the left and right catalytic converters. Refer to [Catalytic Converter Replacement - Left Side \(LFX\)](#) , and [Catalytic Converter Replacement - Right Side \(LFX\)](#) .
 4. Remove the flywheel inspection cover.
 5. Mark the position of the flywheel to the torque converter.
 6. Rotate the engine through the inspection cover opening using an appropriate tool.
 7. Remove the six flywheel to torque converter bolts.
 8. Remove the transfer case. Refer to [Transfer Case Assembly Replacement](#) .
 9. Support the transmission with a transmission jack.
 10. Remove the transmission crossmember. Refer to [Transmission Support Crossmember Replacement \(4WD\)](#) .

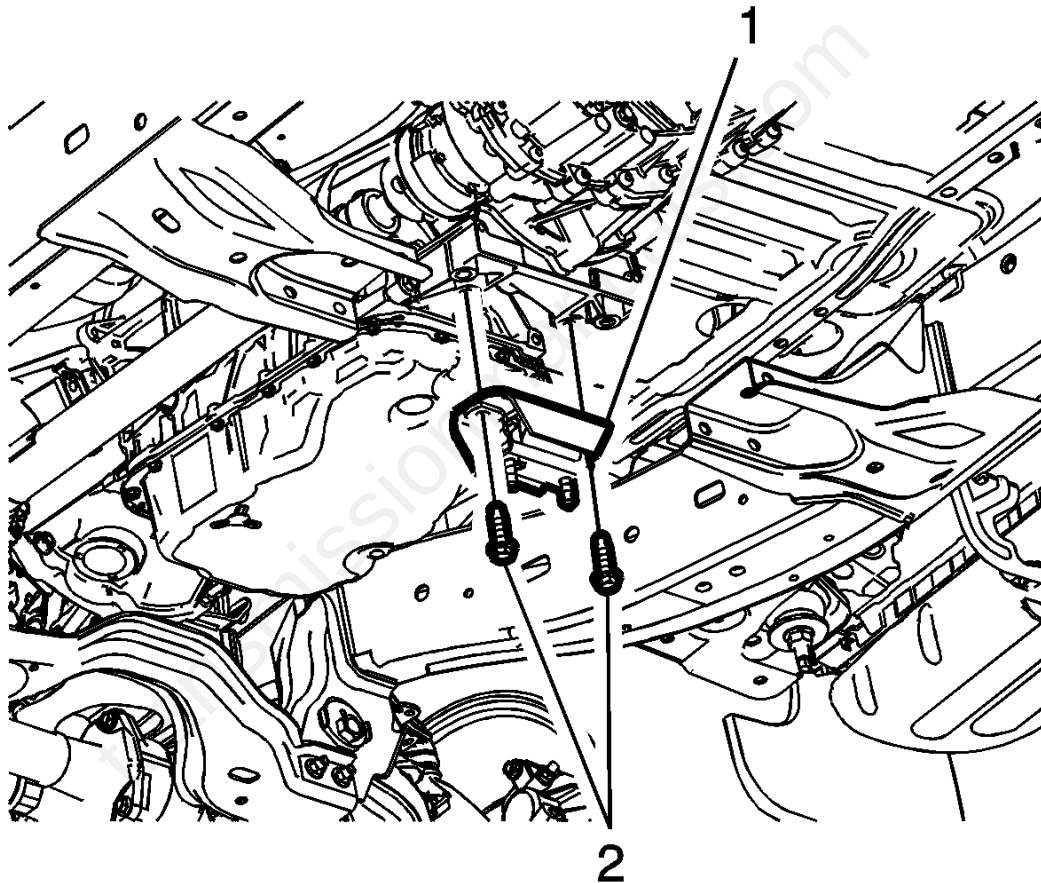


Fig. 49: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

11. Remove the transmission mount (1). Refer to [Transmission Mount Replacement \(4WD\)](#).

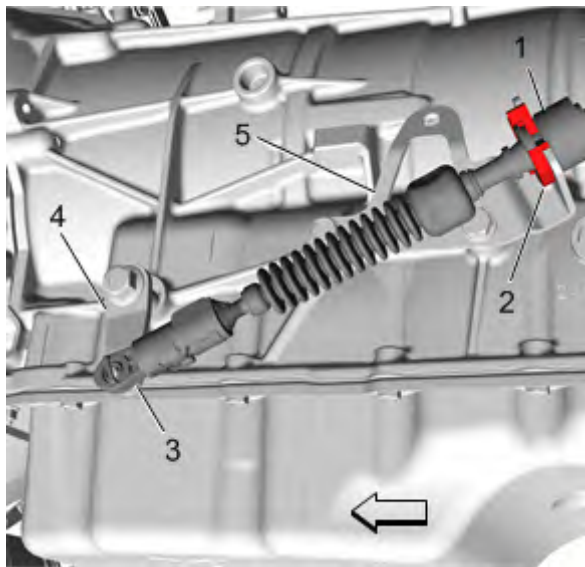


Fig. 50: Locking Retainer And Cable Bracket
 Courtesy of GENERAL MOTORS COMPANY

12. Remove the range selector cable (1) from the transmission. Refer to [Range Selector Lever Cable Replacement](#).

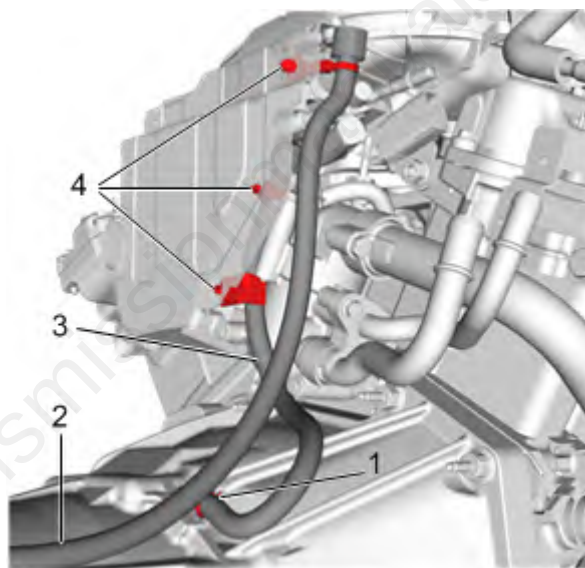


Fig. 51: Transmission Vent Hose
 Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the transmission vent hose (1) from the transmission.
14. Disconnect the transmission electrical connector from the transmission.
15. Remove the wire harness from the transmission.

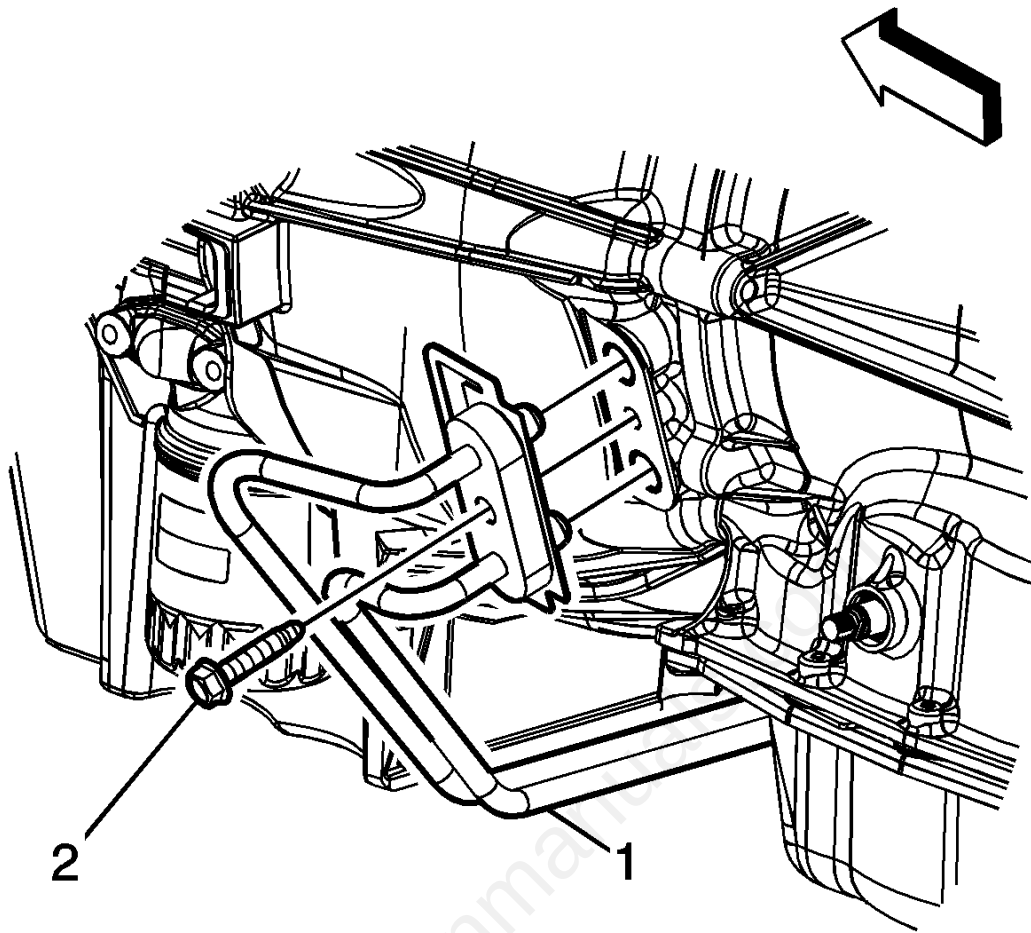


Fig. 52: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect the transmission oil cooler lines (1) from the transmission. Refer to **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LFX)** .
17. Plug the transmission oil cooler line connections in the transmission case.
18. Remove the nuts retaining the upper and lower fuel line brackets to the transmission studs and reposition the lines.
19. Lower the transmission to gain access to the top and sides of the transmission.

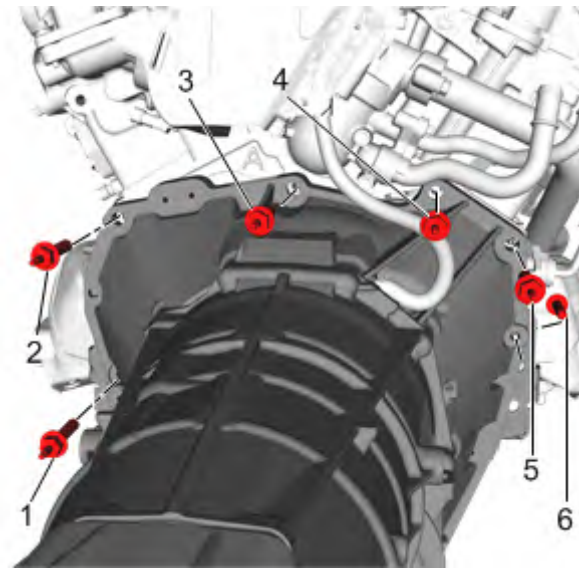


Fig. 53: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

20. Remove the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine.

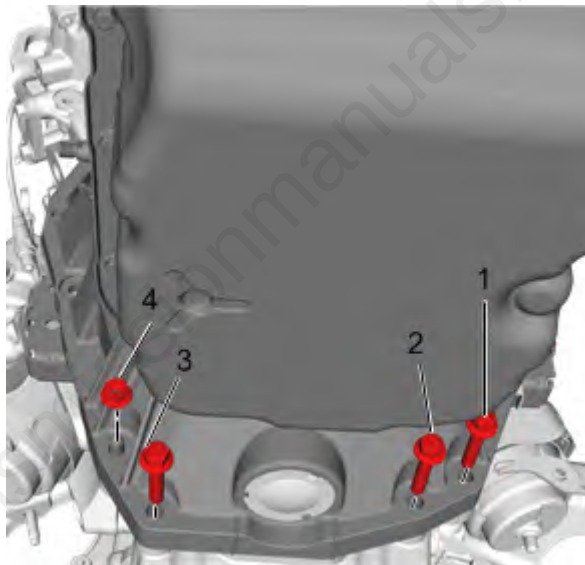


Fig. 54: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

21. Remove the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

22. Pull the transmission straight back.
23. Remove the transmission from the vehicle.
24. Transfer components as necessary.
25. Flush and flow test the transmission oil cooler and lines. Refer to [Transmission Fluid Cooler Flushing and Flow Test](#).

Installation Procedure

the transmission with a transmission jack.

2. Raise the transmission into place.
3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

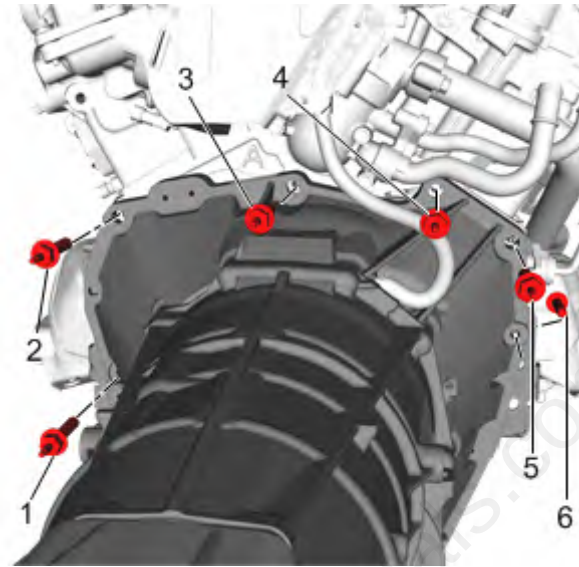


Fig. 55: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

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

4. Install the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

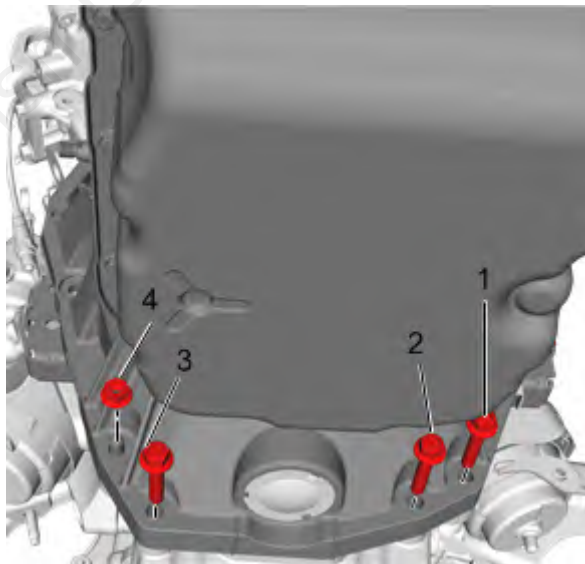


Fig. 56: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

5. Install the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

ing the torque converter bolts, clean the bolt threads and apply LOCTITE 242, or equivalent, to the threads prior to installation.

7. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).
8. Install the flywheel inspection cover.

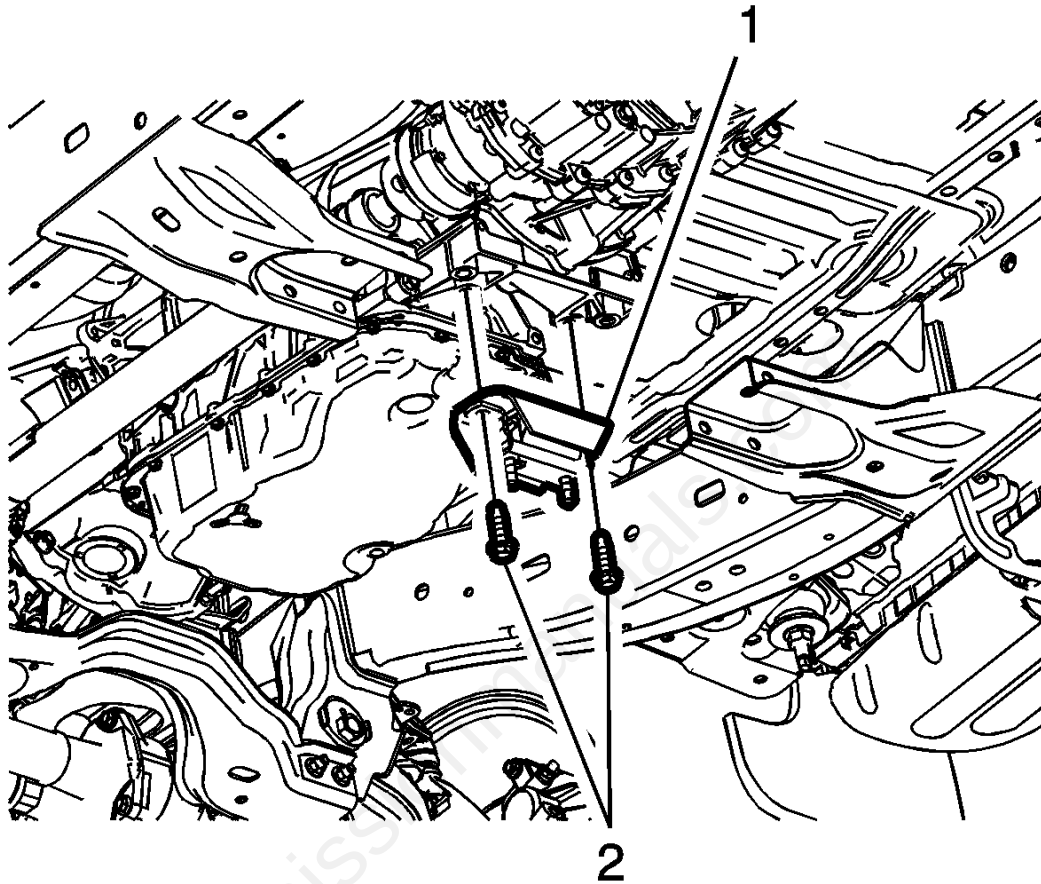


Fig. 57: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

9. Install the transmission mount (1). Refer to [**Transmission Mount Replacement \(4WD\)**](#).
10. Install the transmission crossmember. Refer to [**Transmission Support Crossmember Replacement \(4WD\)**](#).
11. Install the starter motor. Refer to [**Starter Replacement \(LFX\)**](#).

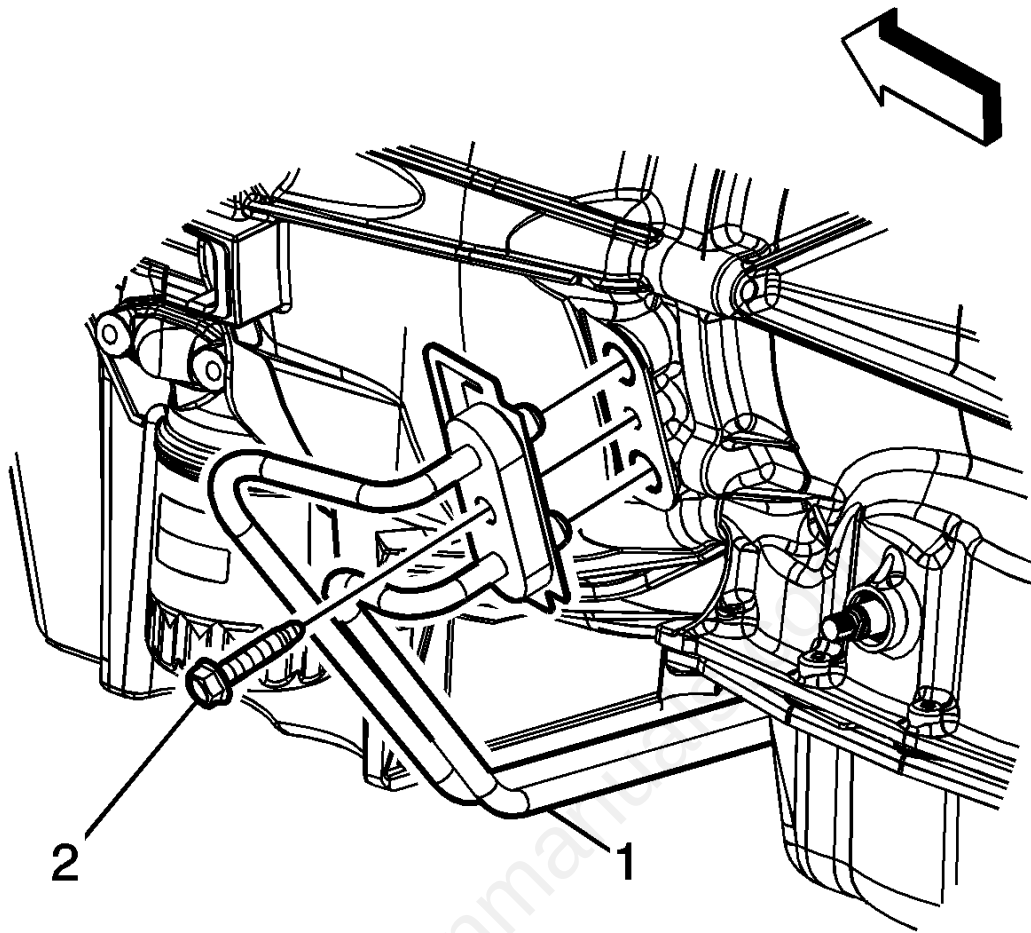
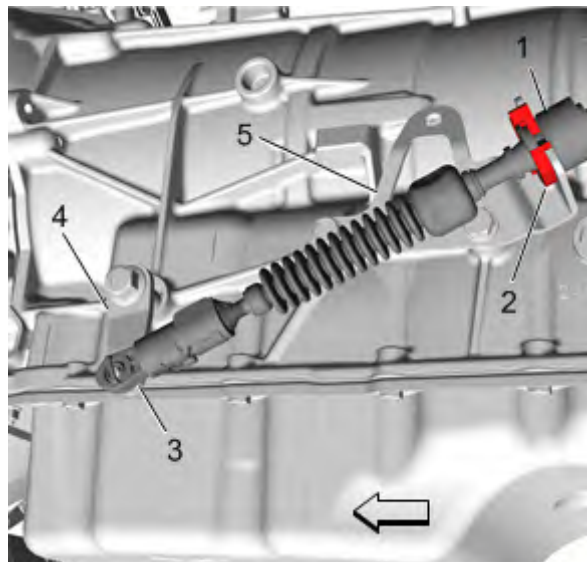


Fig. 58: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

12. Connect the transmission oil cooler lines (1) to the transmission. Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(LFX\)](#) .
13. Install the nuts retaining the upper and lower fuel line brackets to the transmission studs.



Locking Retainer And Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

14. Install the range selector cable (1) to the transmission. Refer to [Range Selector Lever Cable Replacement](#).
15. Install the wire harness to the transmission.
16. Connect the transmission electrical connector to the transmission.

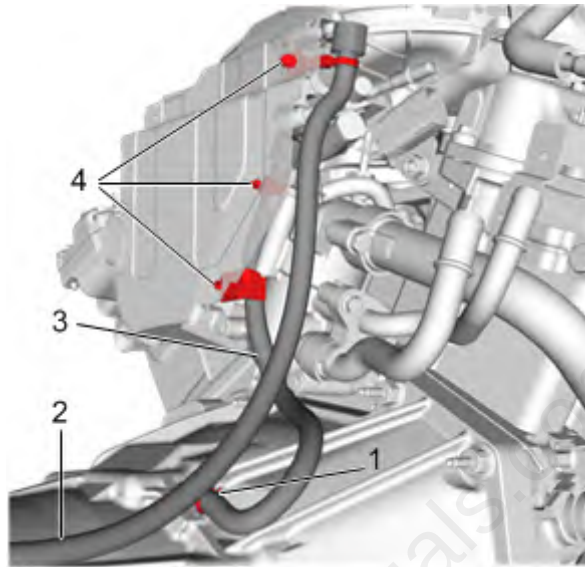


Fig. 60: Transmission Vent Hose

Courtesy of GENERAL MOTORS COMPANY

17. Connect the transmission vent hose (1) to the transmission.
18. Remove the transmission jack.
19. Install the transfer case. Refer to [Transfer Case Assembly Replacement](#).
20. Install the left and right catalytic converters. Refer to [Catalytic Converter Replacement - Left Side \(LFX\)](#), and [Catalytic Converter Replacement - Right Side \(LFX\)](#).
21. Lower the vehicle.
22. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
23. Fill the transmission to the proper level. Refer to [Transmission Fluid Level and Condition Check](#).
24. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. Refer to [Service Programming System \(SPS\)](#).

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

25. Perform the Reset Transmission Adapts. Refer to [Reset Transmission Adapts](#).

ION REPLACEMENT (LCV ENGINE WITH TWO WHEEL DRIVE)

Removal Procedure

1. Disconnect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#)
2. Remove the starter motor. [Starter Replacement \(LCV\)](#)
3. Remove the exhaust pipe. [Exhaust Pipe Replacement \(LCV\)](#)
4. Mark the position of the flywheel to the torque converter.
5. Remove the three flywheel to torque converter bolts.
6. Remove the rear propeller shaft. [Propeller Shaft Replacement \(with MYB\) Propeller Shaft Replacement \(with N8D\)](#)
7. Support the transmission with a transmission jack.
8. Remove the transmission crossmember. Refer to [Transmission Support Crossmember Replacement \(2WD\)](#)

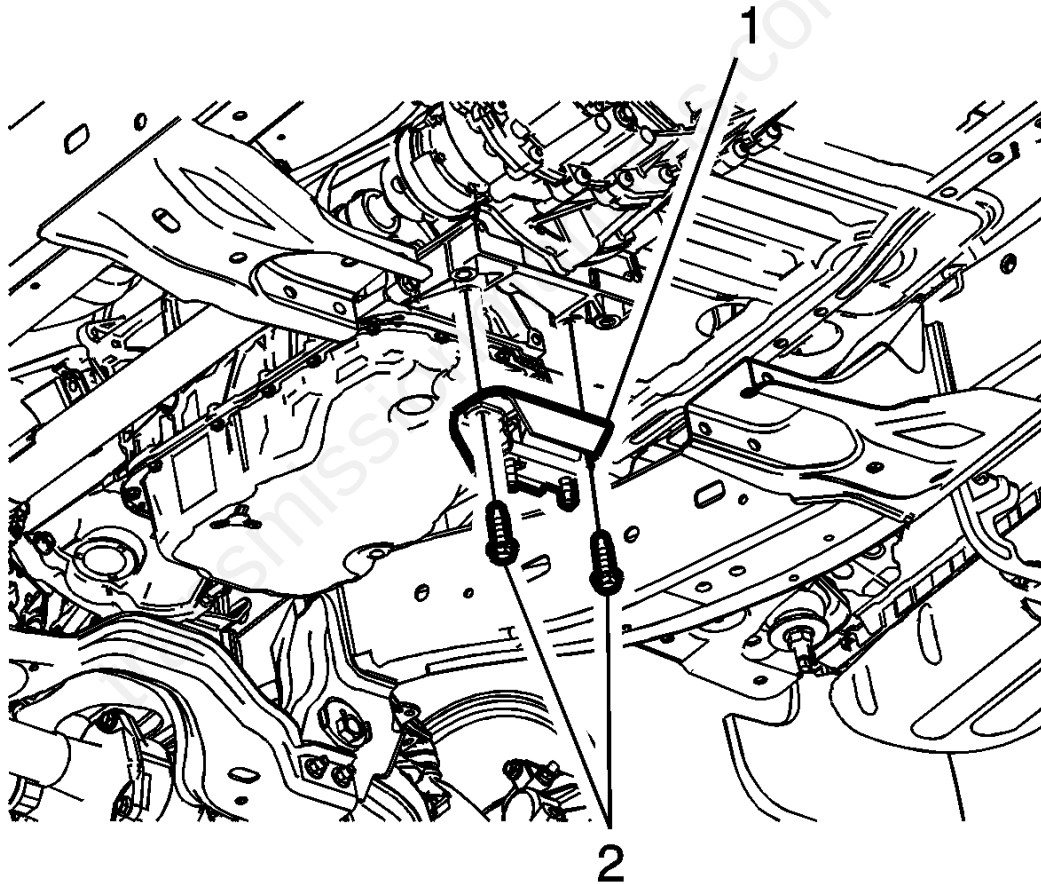


Fig. 61: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)

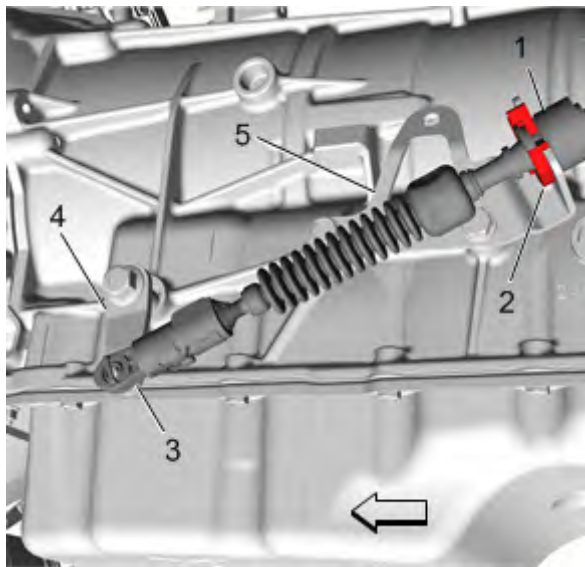


Fig. 62: Locking Retainer And Cable Bracket
Courtesy of GENERAL MOTORS COMPANY

10. Remove the range selector cable (1) from the transmission. **Range Selector Lever Cable Replacement**

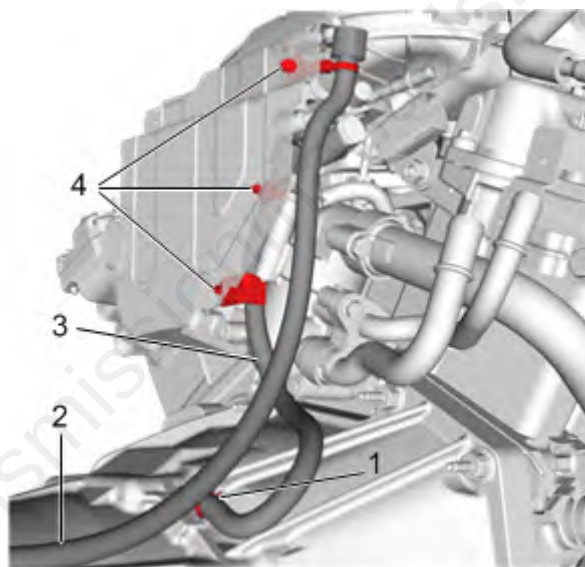


Fig. 63: Transmission Vent Hose
Courtesy of GENERAL MOTORS COMPANY

11. Disconnect the transmission vent hose (1) from the transmission.
12. Disconnect the transmission electrical connector from the transmission.
13. Remove the wire harness from the transmission.

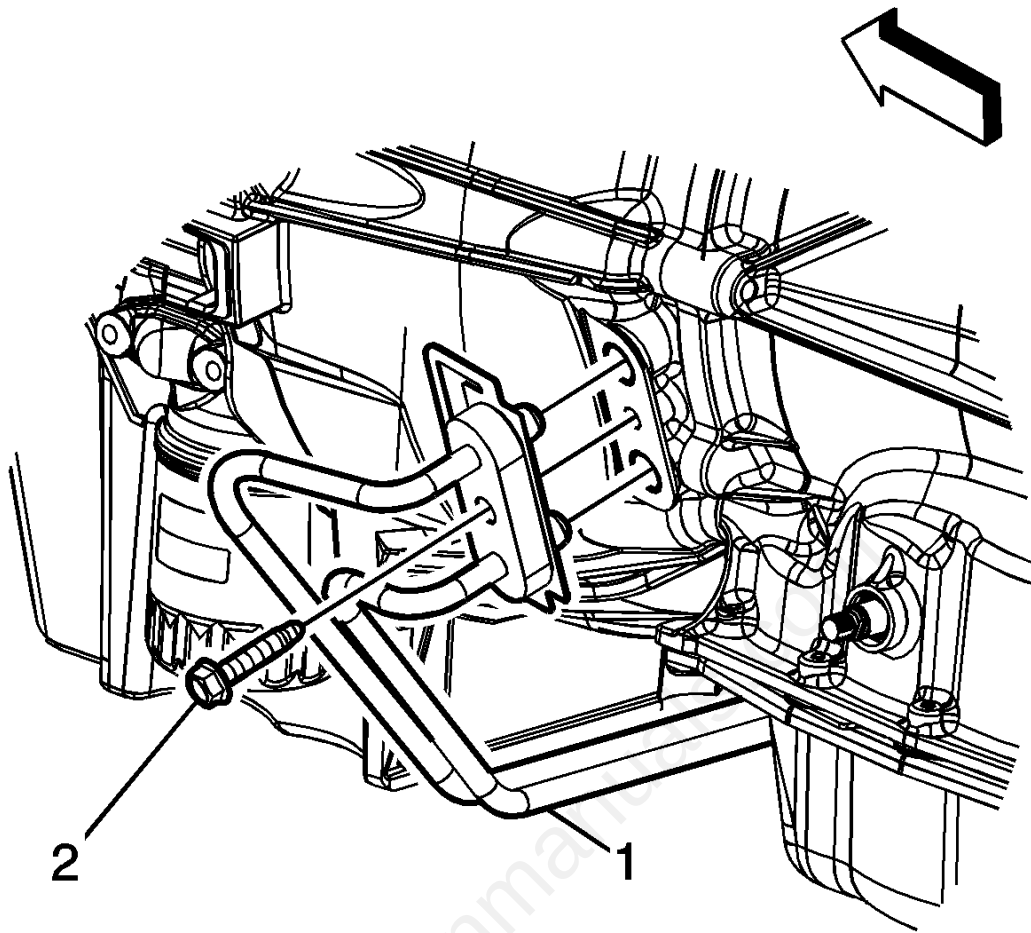


Fig. 64: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

14. Disconnect the transmission oil cooler lines (1) from the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LCV)**
15. Plug the transmission oil cooler line connections in the transmission case.
16. Lower the transmission to gain access to the top and sides of the transmission.

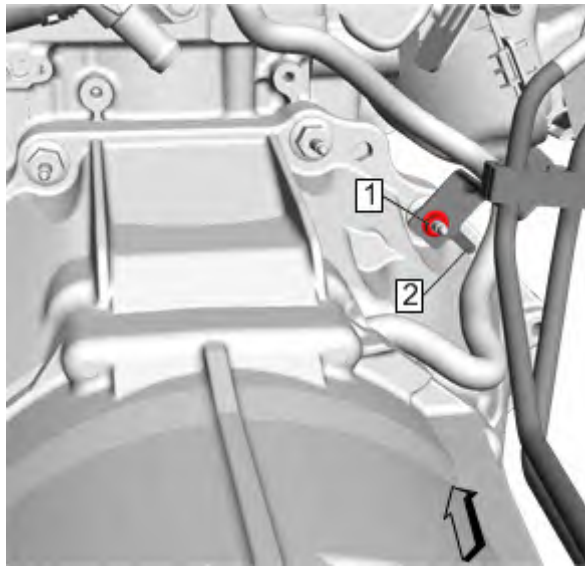


Fig. 65: Nut And Bracket

Courtesy of GENERAL MOTORS COMPANY

17. Remove the nut (1), then position the bracket (2) out of the way.

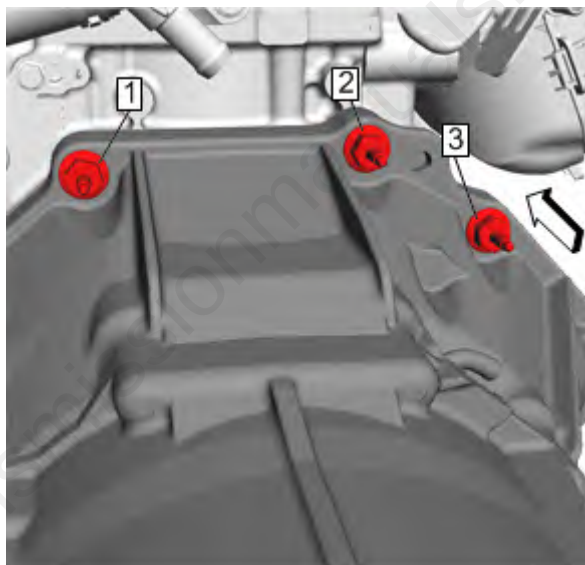


Fig. 66: 3 Upper Fasteners (1, 2, 3) Securing Transmission To Engine

Courtesy of GENERAL MOTORS COMPANY

18. Remove the 3 upper fasteners (1, 2, 3) securing the transmission to the engine.

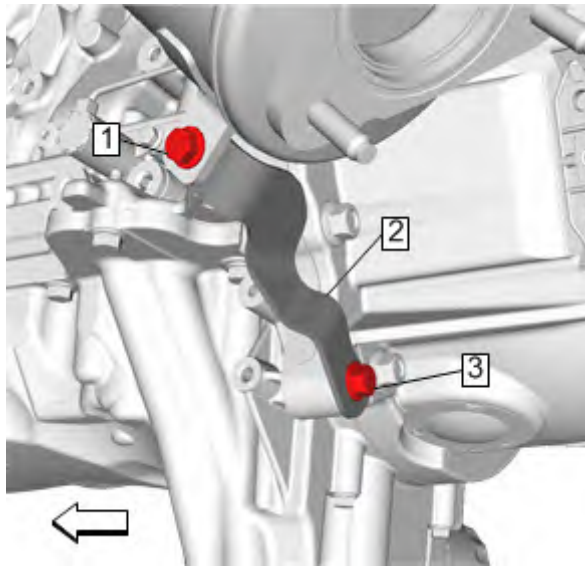


Fig. 67: Catalytic Converter Bracket
Courtesy of GENERAL MOTORS COMPANY

19. Remove the catalytic converter bracket (2).

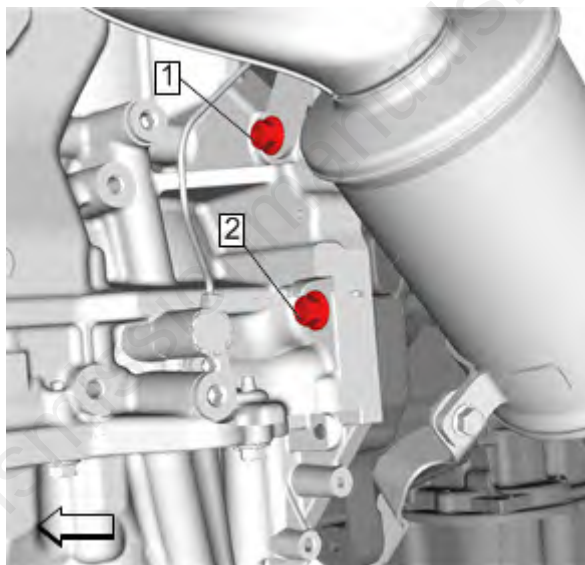


Fig. 68: 2 Left Side Fasteners (1, 2) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

20. Remove the 2 left side fasteners (1, 2) securing the transmission to the engine.

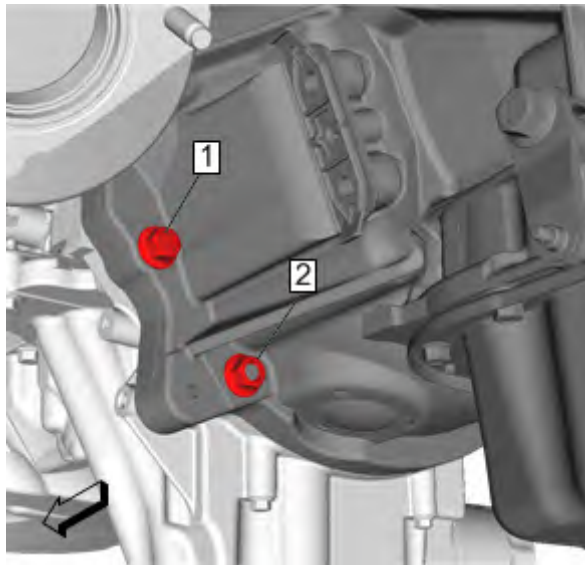


Fig. 69: 2 Left Lower Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

21. Remove the 2 left lower fasteners (1, 2) securing the transmission to the engine.

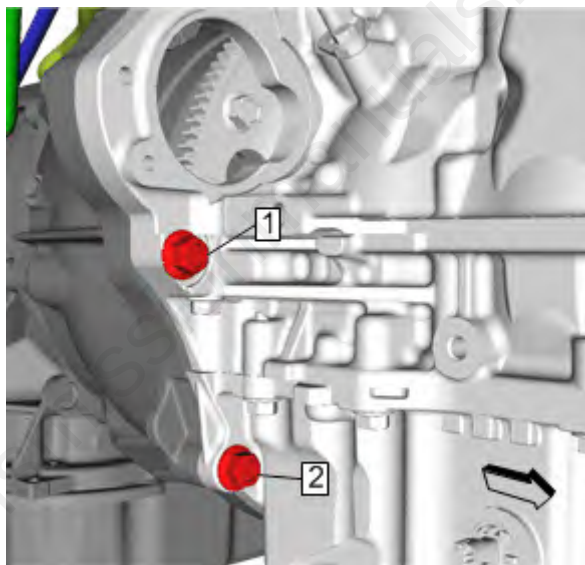


Fig. 70: 2 Right Side Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

22. Remove the 2 right side fasteners (1, 2) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

23. Pull the transmission straight back.
24. Remove the transmission from the vehicle.
25. Transfer components as necessary.
26. Flush and flow test the transmission oil cooler and lines. [Transmission Fluid Cooler Flushing and Flow Test](#)

Installation Procedure

the transmission with a transmission jack.

2. Raise the transmission into place.
3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

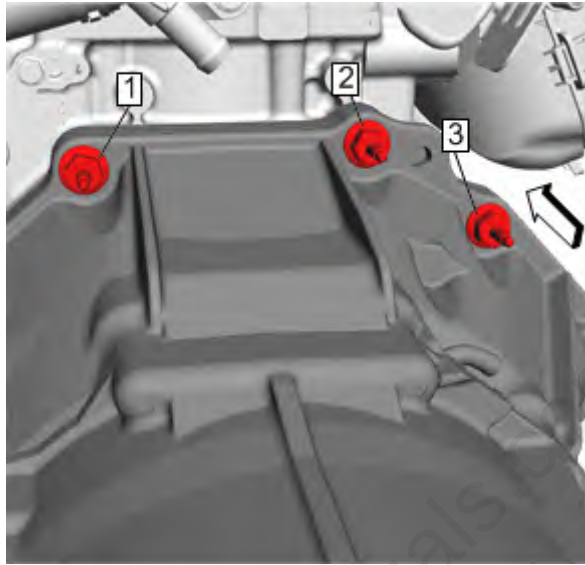


Fig. 71: 3 Upper Fasteners (1, 2, 3) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

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

4. Install the 3 upper fasteners (1, 2, 3) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

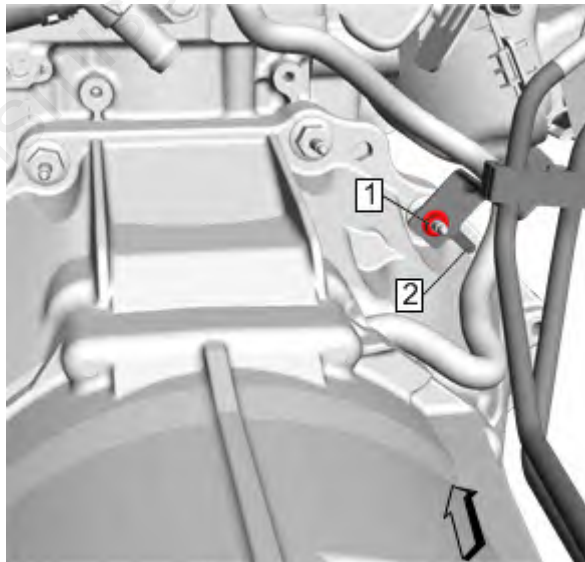


Fig. 72: Nut And Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Position the bracket (2) to the transmission.
6. Install the fastener (1) and tighten to 22 N.m (16 lb ft).

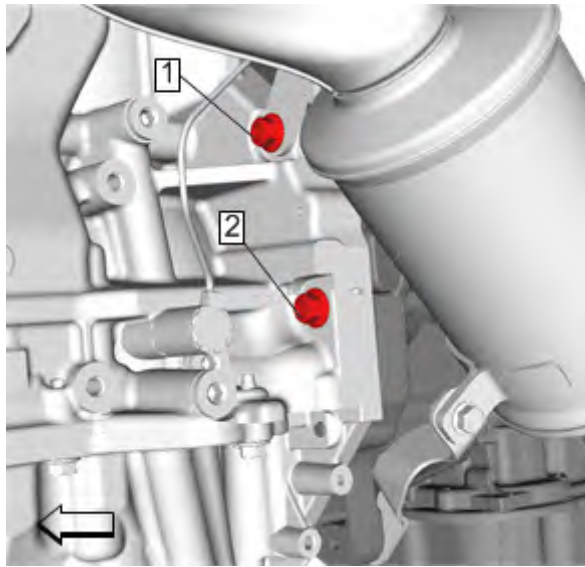


Fig. 73: 2 Left Side Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

7. Install the 2 left side fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

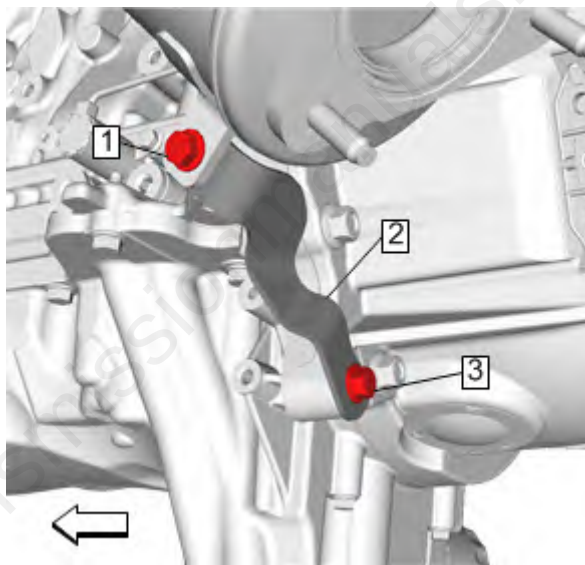


Fig. 74: Catalytic Converter Bracket
 Courtesy of GENERAL MOTORS COMPANY

8. Install the catalytic converter bracket (2) and tighten the nut to 22 N.m (16 lb ft).

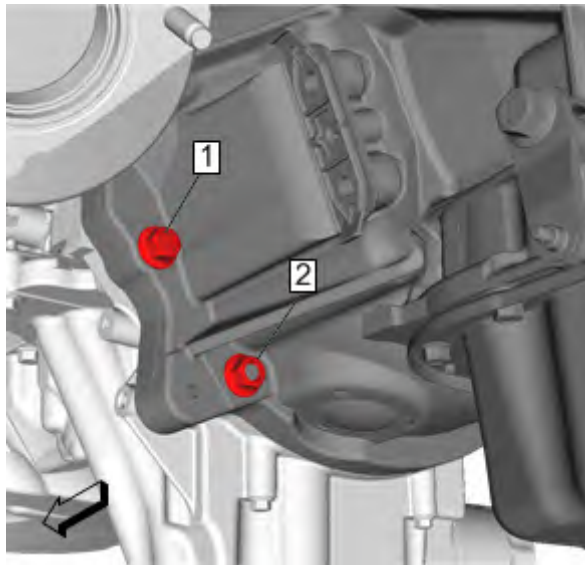


Fig. 75: 2 Left Lower Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

9. Install the 2 left lower fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

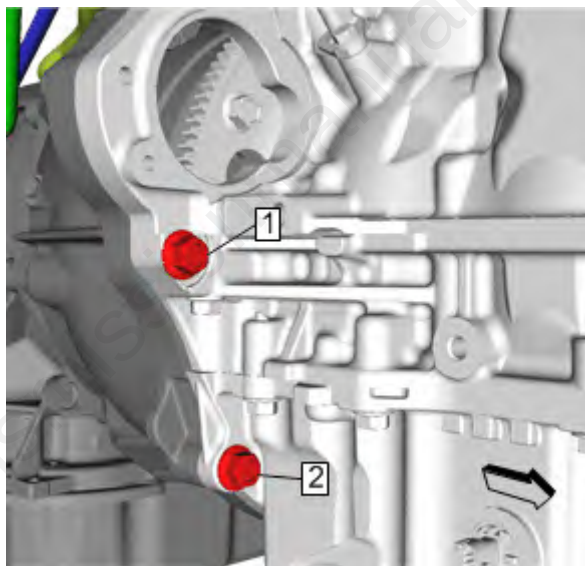


Fig. 76: 2 Right Side Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

10. Install the 2 right side fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).
11. If reusing the torque converter bolts, clean the bolt threads and apply LOCTITE 242, or equivalent, to the threads prior to installation.
12. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).

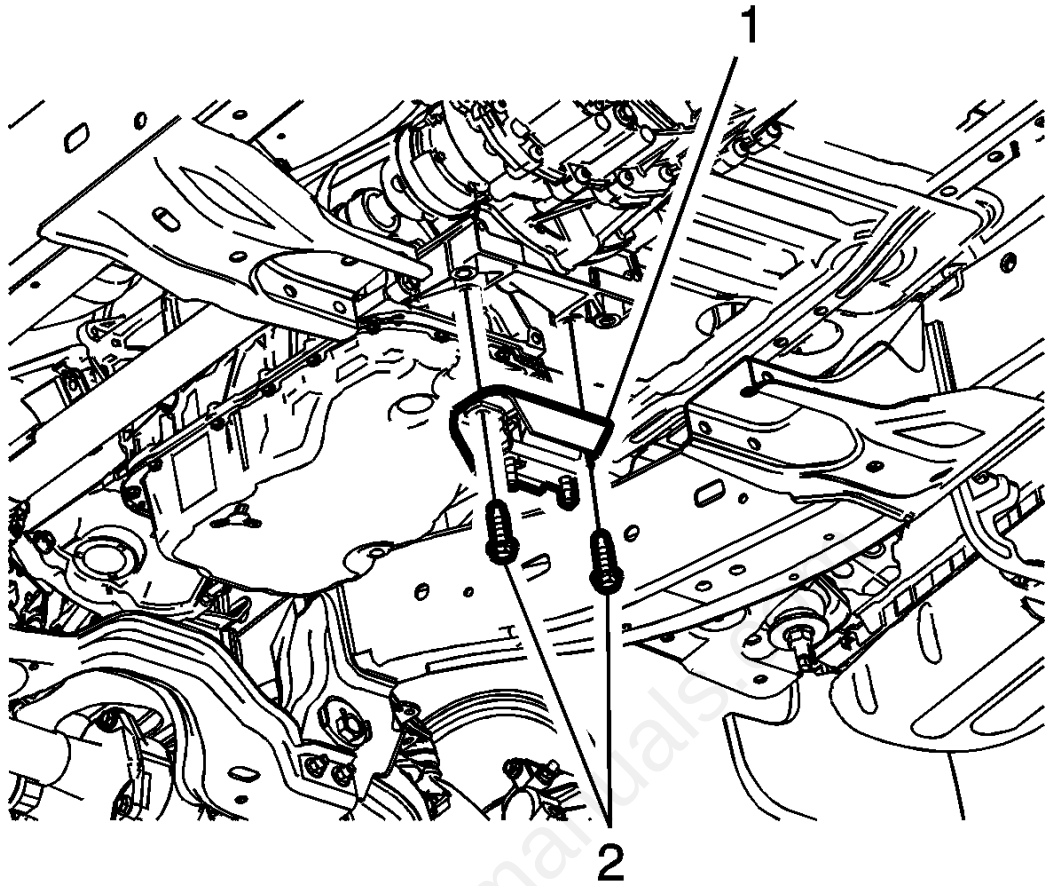


Fig. 77: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

13. Install the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)
14. Install the transmission crossmember. [Transmission Support Crossmember Replacement \(2WD\)](#)
15. Install the starter motor. [Starter Replacement \(LCV\)](#)

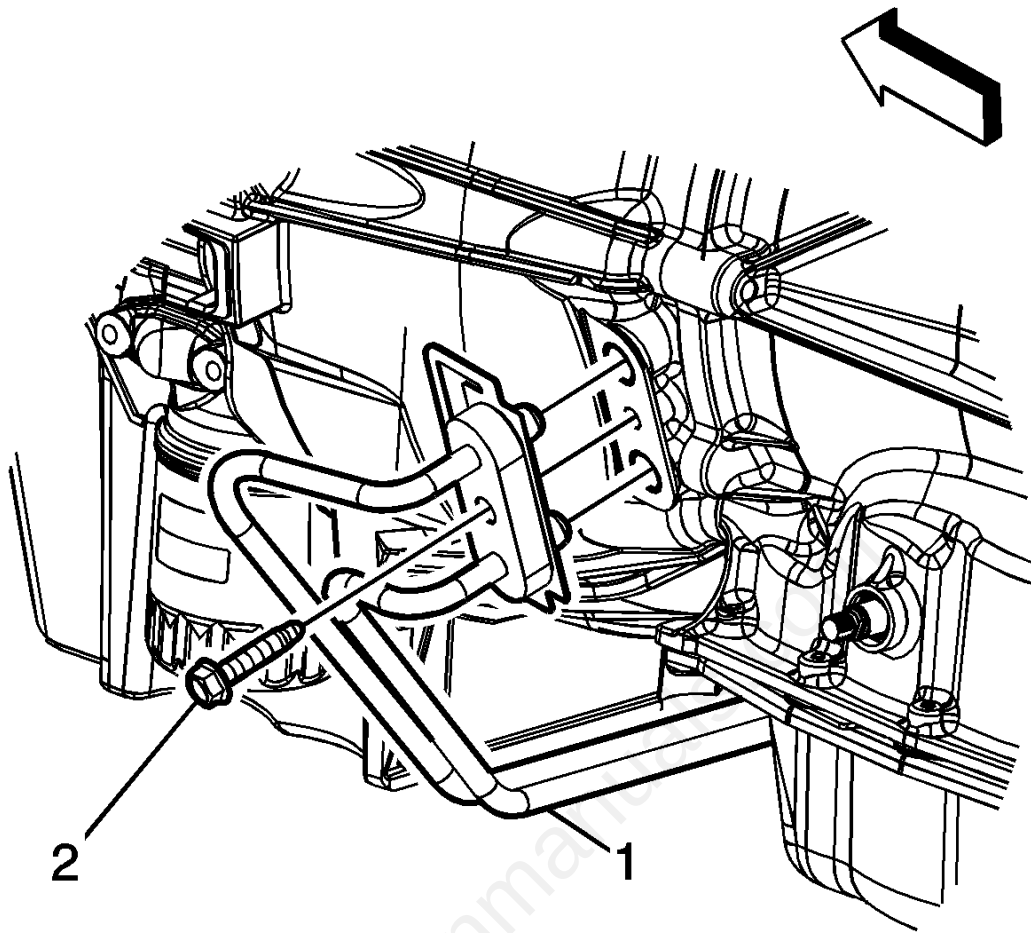
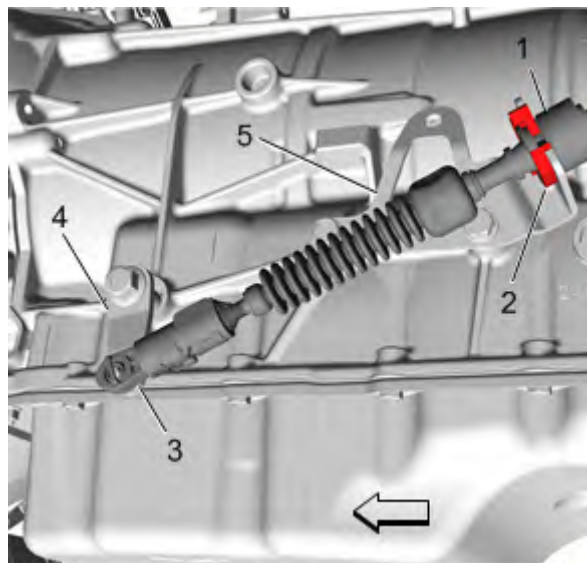


Fig. 78: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

16. Connect the transmission oil cooler lines (1) to the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LCV)**



Locking Retainer And Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

17. Install the range selector cable (1) to the transmission. [Range Selector Lever Cable Replacement](#)
18. Install the wire harness to the transmission.
19. Connect the transmission electrical connector to the transmission.

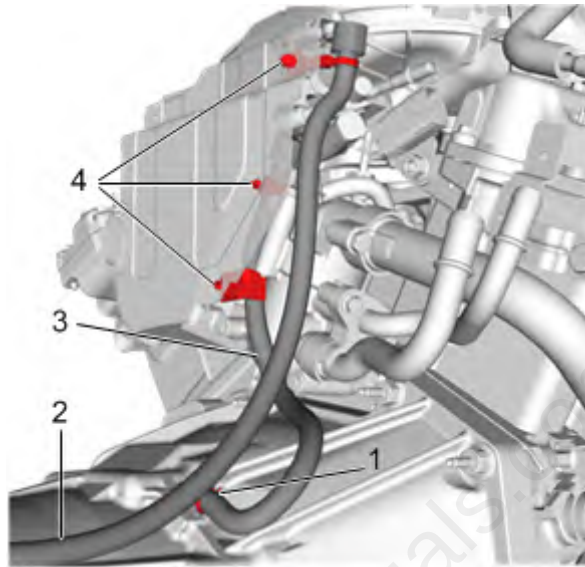


Fig. 80: Transmission Vent Hose

Courtesy of GENERAL MOTORS COMPANY

20. Connect the transmission vent hose (1) to the transmission.
21. Remove the transmission jack.
22. Install the rear propeller shaft. [Propeller Shaft Replacement \(with MYB\) Propeller Shaft Replacement \(with N8D\)](#)
23. Remove the exhaust pipe. [Exhaust Pipe Replacement \(LCV\)](#)
24. Lower the vehicle.
25. Connect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#) .
26. Fill the transmission to the proper level. [Transmission Fluid Level and Condition Check](#) .
27. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. [Service Programming System \(SPS\)](#) .

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

28. Perform the Reset Transmission Adapts. [Reset Transmission Adapts](#)

ION REPLACEMENT (LCV ENGINE WITH FOUR WHEEL DRIVE)

Removal Procedure

1. Disconnect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#)
2. Remove the starter motor. [Starter Replacement \(LCV\)](#)
3. Remove the exhaust pipe. [Exhaust Pipe Replacement \(LCV\)](#)
4. Mark the position of the flywheel to the torque converter.
5. Remove the three flywheel to torque converter bolts.
6. Remove the transfer case. [Transfer Case Assembly Replacement](#) .
7. Support the transmission with a transmission jack.
8. Remove the transmission crossmember. Refer to [Transmission Support Crossmember Replacement \(4WD\)](#)

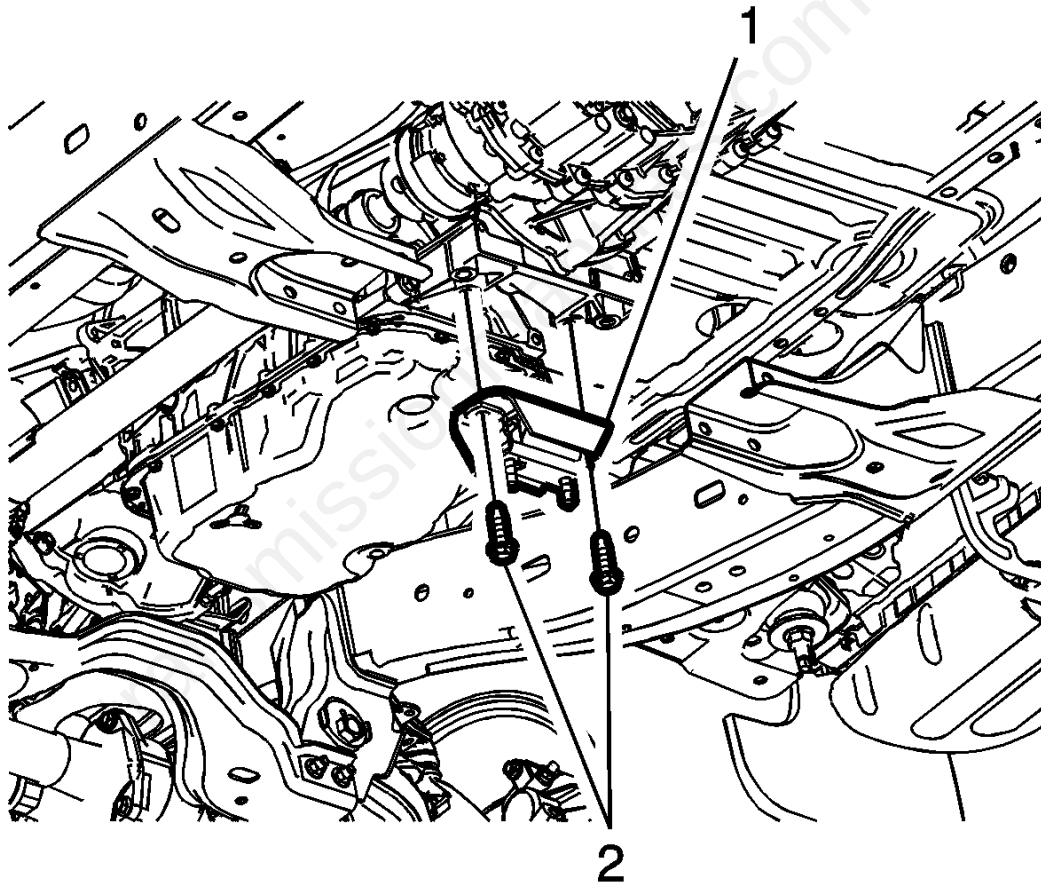


Fig. 81: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission mount (1). [Transmission Mount Replacement \(4WD\)](#)

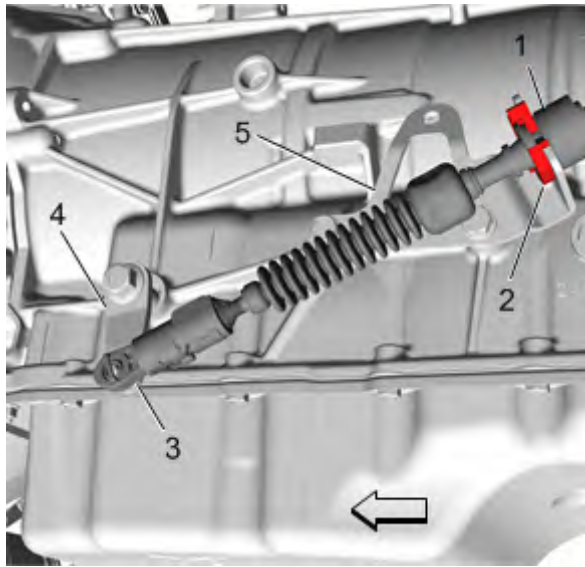


Fig. 82: Locking Retainer And Cable Bracket
 Courtesy of GENERAL MOTORS COMPANY

10. Remove the range selector cable (1) from the transmission. **Range Selector Lever Cable Replacement**

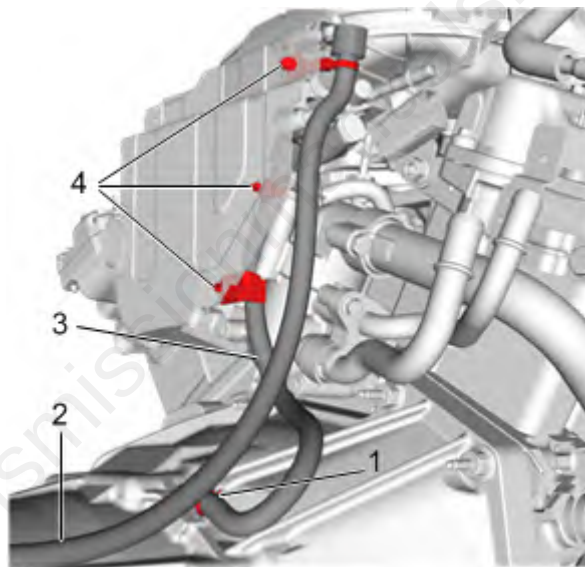


Fig. 83: Transmission Vent Hose
 Courtesy of GENERAL MOTORS COMPANY

11. Disconnect the transmission vent hose (1) from the transmission.
12. Disconnect the transmission electrical connector from the transmission.
13. Remove the wire harness from the transmission.

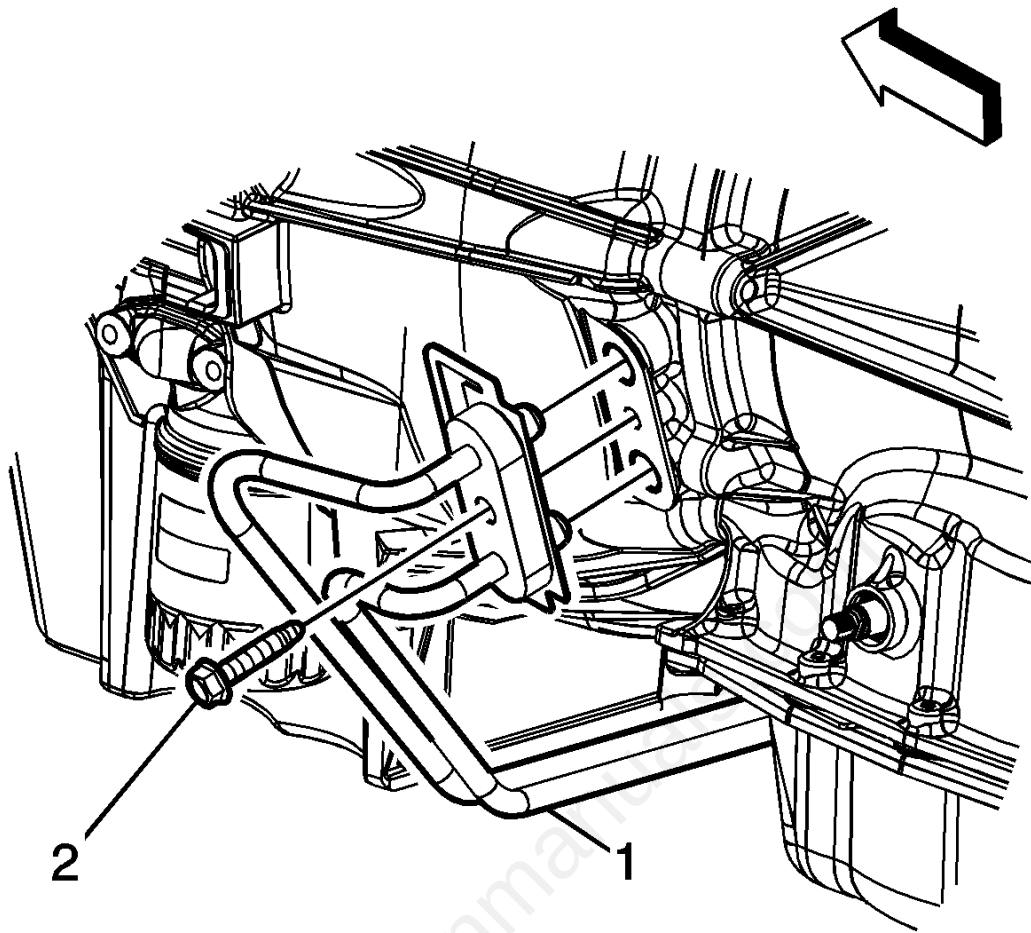


Fig. 84: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

14. Disconnect the transmission oil cooler lines (1) from the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LCV)**
15. Plug the transmission oil cooler line connections in the transmission case.
16. Lower the transmission to gain access to the top and sides of the transmission.

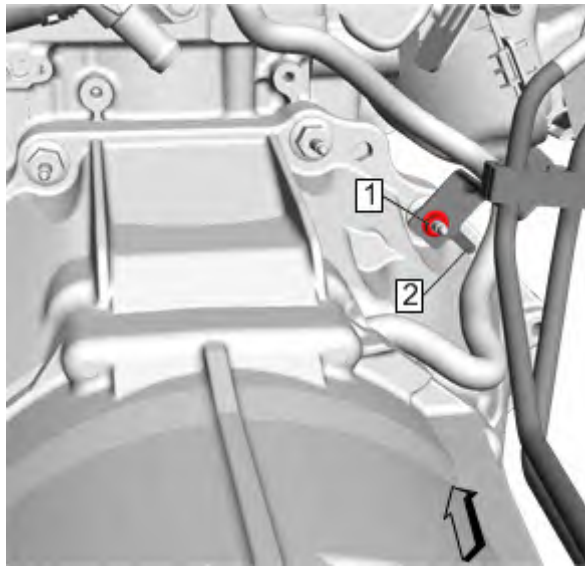


Fig. 85: Nut And Bracket

Courtesy of GENERAL MOTORS COMPANY

17. Remove the nut (1), then position the bracket (2) out of the way.

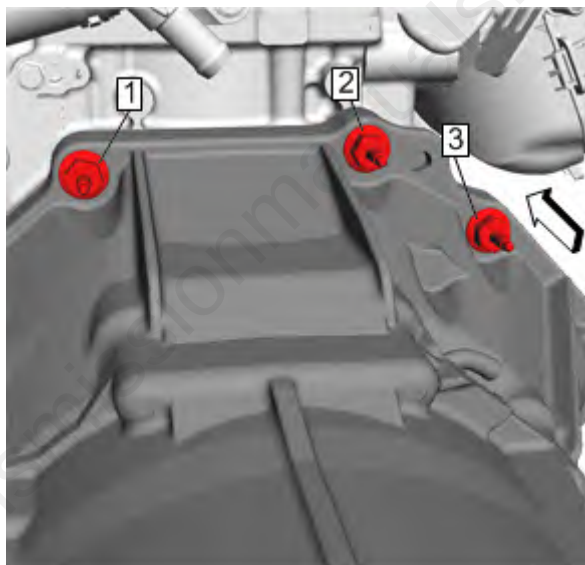


Fig. 86: 3 Upper Fasteners (1, 2, 3) Securing Transmission To Engine

Courtesy of GENERAL MOTORS COMPANY

18. Remove the 3 upper fasteners (1, 2, 3) securing the transmission to the engine.

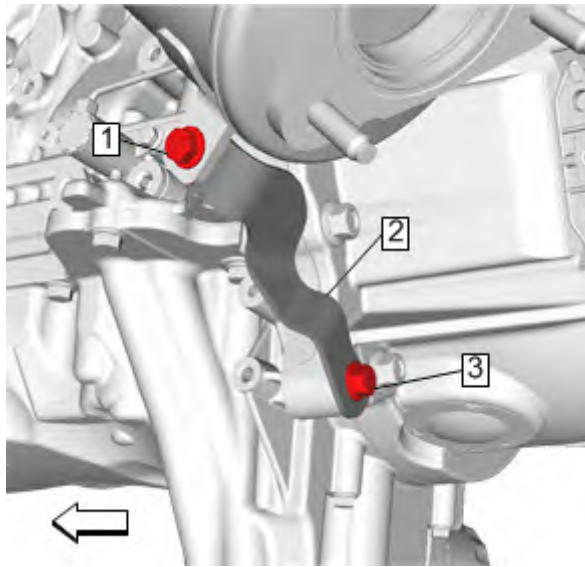


Fig. 87: Catalytic Converter Bracket

Courtesy of GENERAL MOTORS COMPANY

19. Remove the catalytic converter bracket (2).

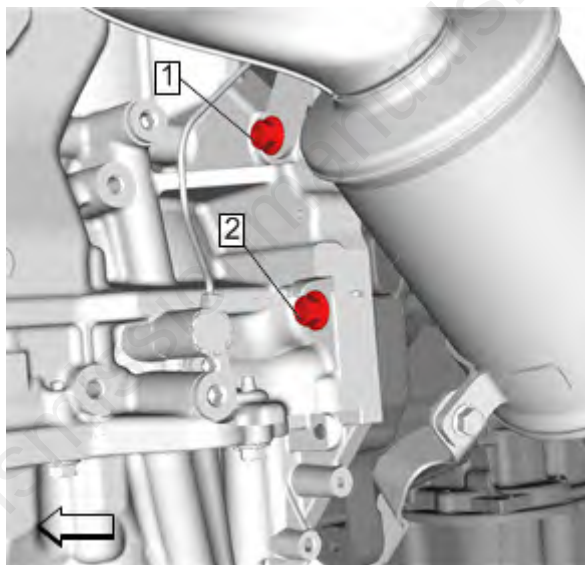


Fig. 88: 2 Left Side Fasteners (1, 2) Securing Transmission To Engine

Courtesy of GENERAL MOTORS COMPANY

20. Remove the 2 left side fasteners (1, 2) securing the transmission to the engine.

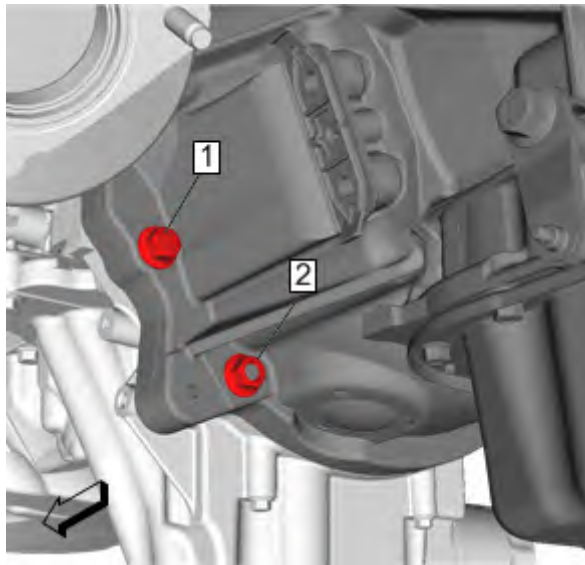


Fig. 89: 2 Left Lower Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

21. Remove the 2 left lower fasteners (1, 2) securing the transmission to the engine.

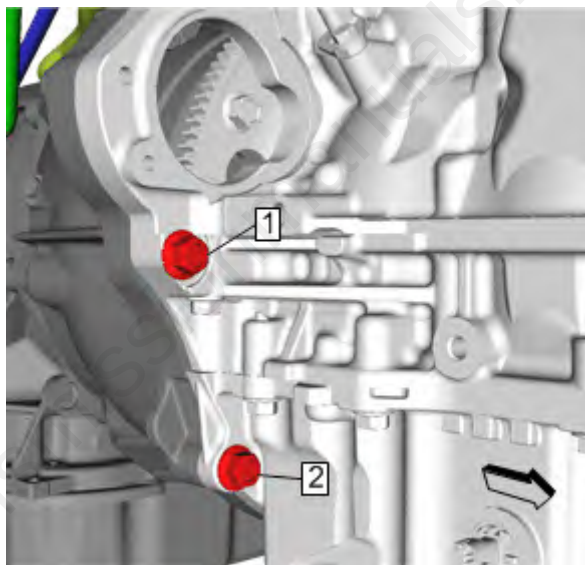


Fig. 90: 2 Right Side Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

22. Remove the 2 right side fasteners (1, 2) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

23. Pull the transmission straight back.
24. Remove the transmission from the vehicle.
25. Transfer components as necessary.
26. Flush and flow test the transmission oil cooler and lines. [Transmission Fluid Cooler Flushing and Flow Test](#)

Installation Procedure

the transmission with a transmission jack.

2. Raise the transmission into place.
3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

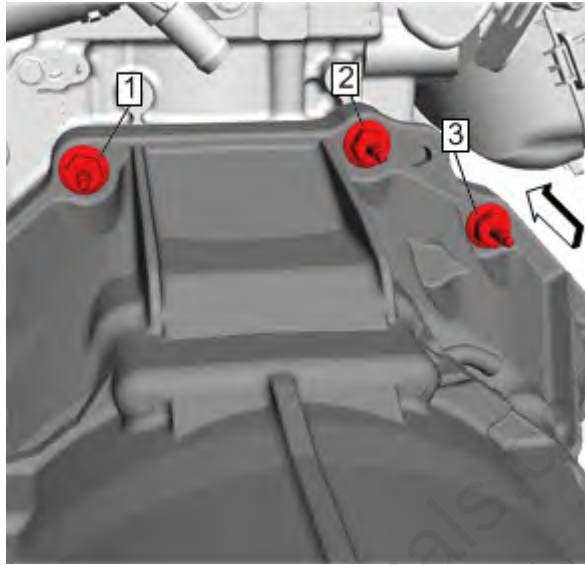


Fig. 91: 3 Upper Fasteners (1, 2, 3) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

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

4. Install the 3 upper fasteners (1, 2, 3) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

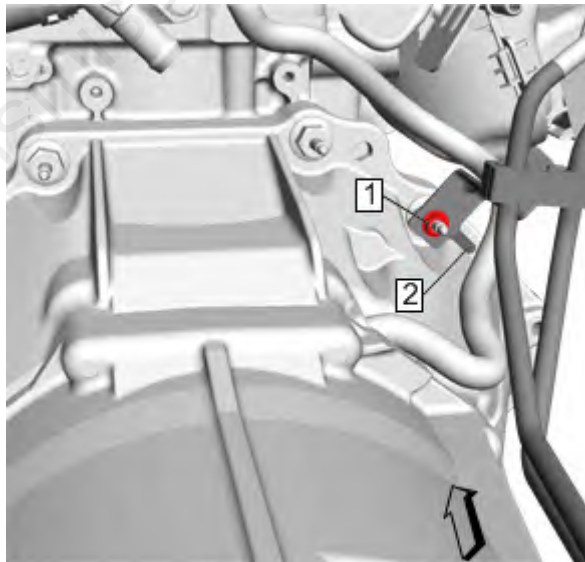


Fig. 92: Nut And Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Position the bracket (2) to the transmission.
6. Install the fastener (1) and tighten to 22 N.m (16 lb ft).

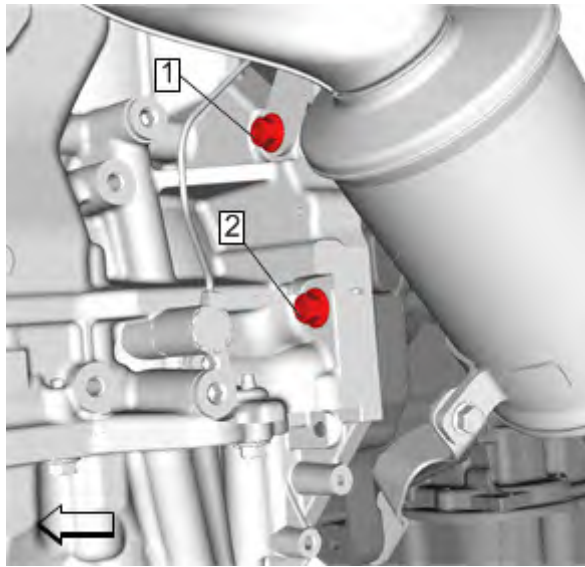


Fig. 93: 2 Left Side Fasteners (1, 2) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

7. Install the 2 left side fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

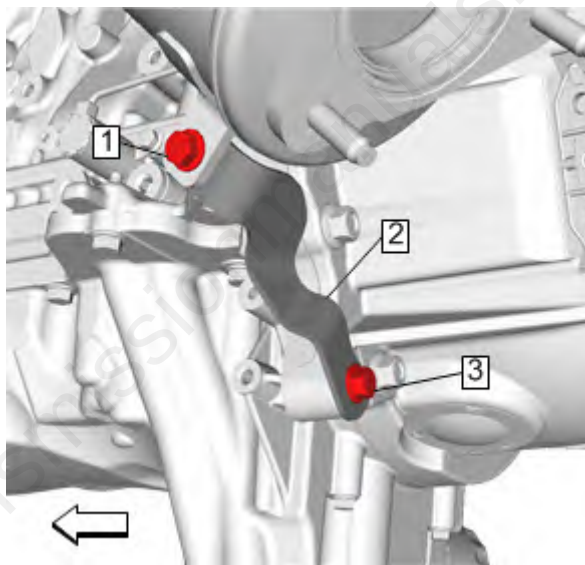


Fig. 94: Catalytic Converter Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Install the catalytic converter bracket (2) and tighten the nut to 22 N.m (16 lb ft).

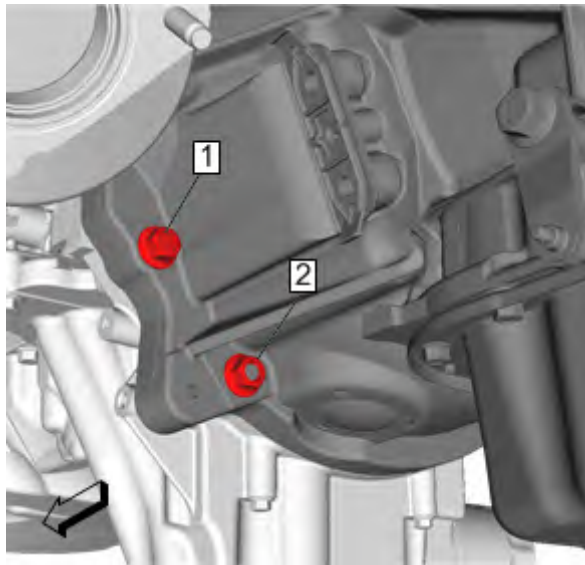


Fig. 95: 2 Left Lower Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

9. Install the 2 left lower fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

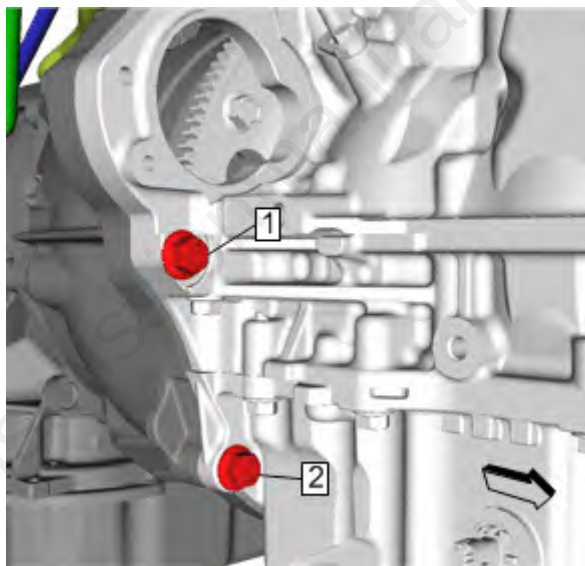


Fig. 96: 2 Right Side Fasteners (1, 2) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

10. Install the 2 right side fasteners (1, 2) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).
11. If reusing the torque converter bolts, clean the bolt threads and apply LOCTITE 242, or equivalent, to the threads prior to installation.
12. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).

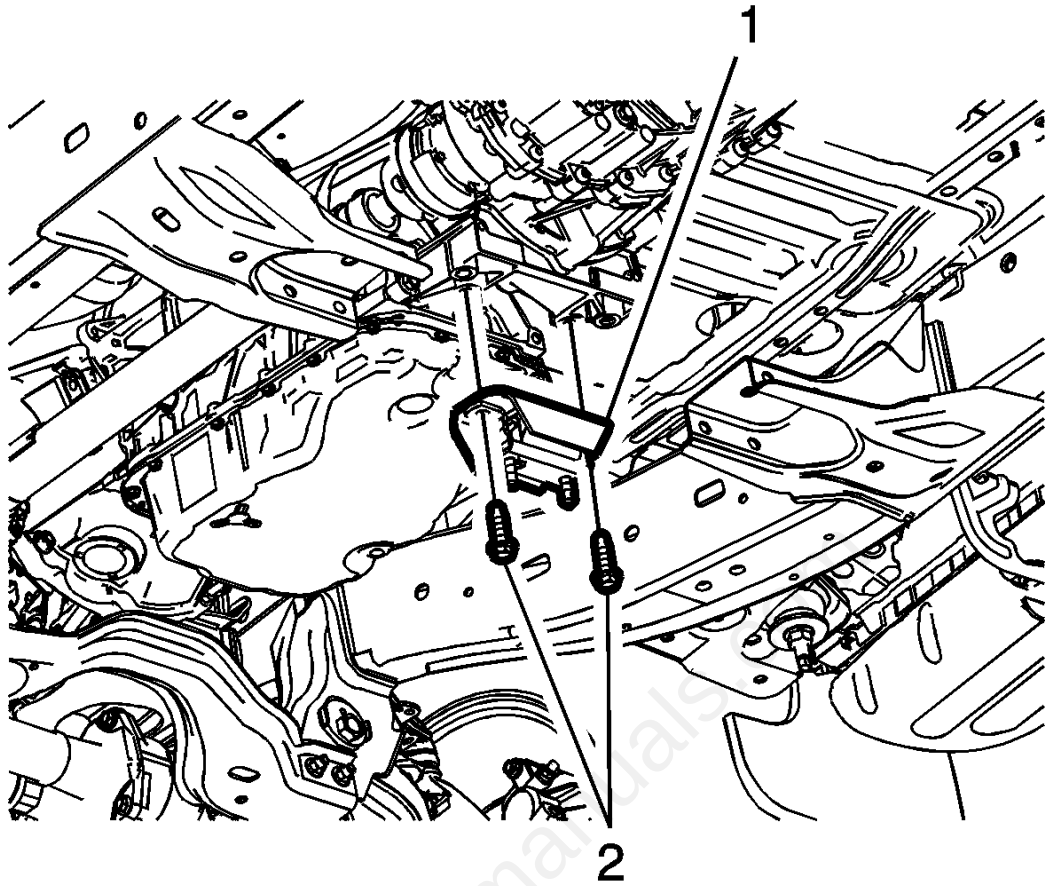


Fig. 97: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

13. Install the transmission mount (1). [Transmission Mount Replacement \(4WD\)](#)
14. Install the transmission crossmember. [Transmission Support Crossmember Replacement \(4WD\)](#)
15. Install the starter motor. [Starter Replacement \(LCV\)](#)

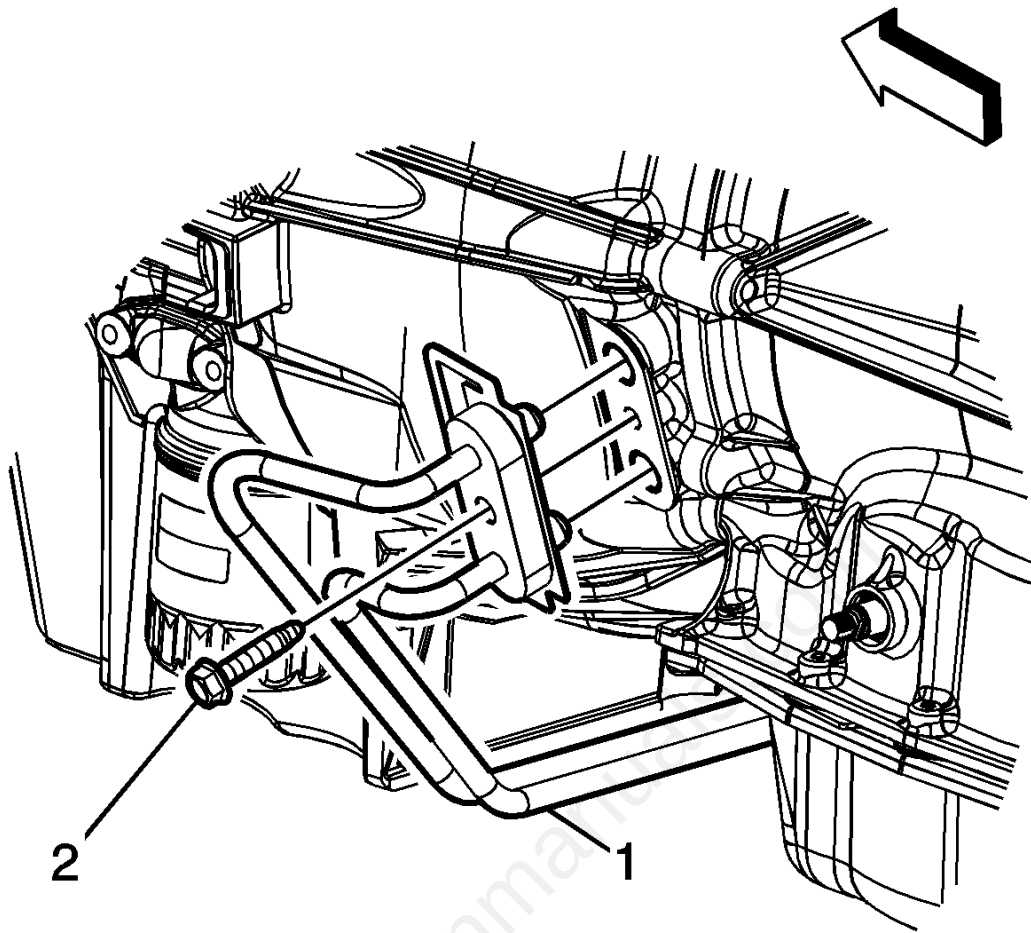
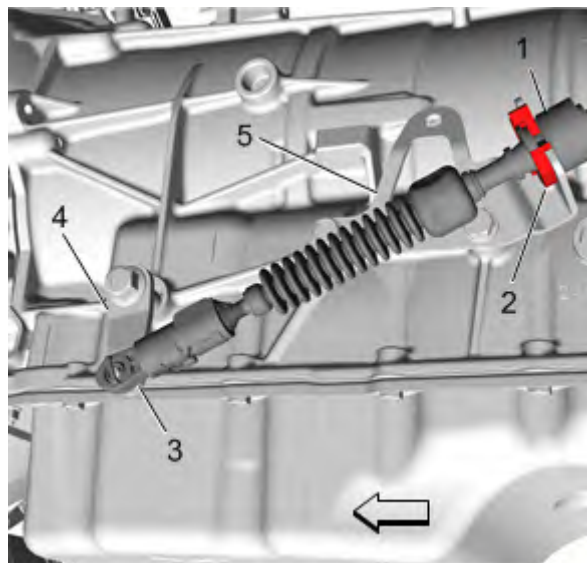


Fig. 98: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

16. Connect the transmission oil cooler lines (1) to the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LCV)**



Locking Retainer And Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

17. Install the range selector cable (1) to the transmission. [Range Selector Lever Cable Replacement](#)
18. Install the wire harness to the transmission.
19. Connect the transmission electrical connector to the transmission.

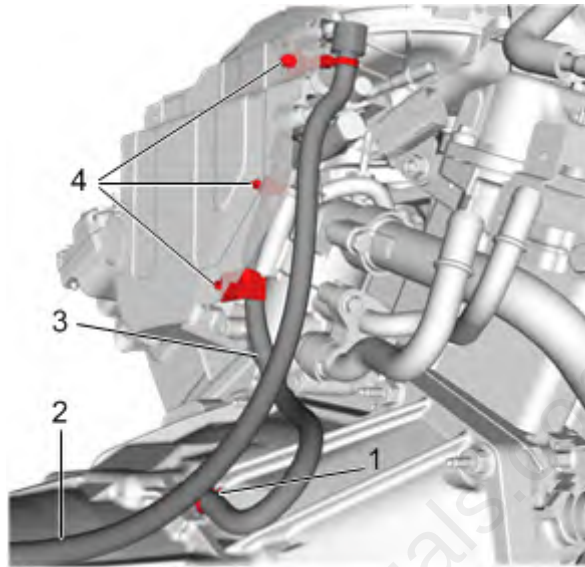


Fig. 100: Transmission Vent Hose

Courtesy of GENERAL MOTORS COMPANY

20. Connect the transmission vent hose (1) to the transmission.
21. Remove the transmission jack.
22. Install the transfer case. [Transfer Case Assembly Replacement](#)
23. Remove the exhaust pipe. [Exhaust Pipe Replacement \(LCV\)](#)
24. Lower the vehicle.
25. Connect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#) .
26. Fill the transmission to the proper level. [Transmission Fluid Level and Condition Check](#) .
27. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. [Service Programming System \(SPS\)](#) .

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

28. Perform the Reset Transmission Adapts. [Reset Transmission Adapts](#)

TRANSMISSION REPLACEMENT (LFX ENGINE WITH TWO WHEEL DRIVE)

dure

1. Disconnect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#)
2. Remove the starter motor. [Starter Replacement \(LFX\)](#)
3. Remove the exhaust pipe. [Exhaust Pipe Replacement](#)
4. Mark the position of the flywheel to the torque converter.
5. Remove the three flywheel to torque converter bolts.
6. Remove the rear propeller shaft. [Propeller Shaft Replacement \(with MYB\) Propeller Shaft Replacement \(with N8D\)](#)
7. Support the transmission with a transmission jack.
8. Remove the transmission crossmember. Refer to [Transmission Support Crossmember Replacement \(2WD\)](#)

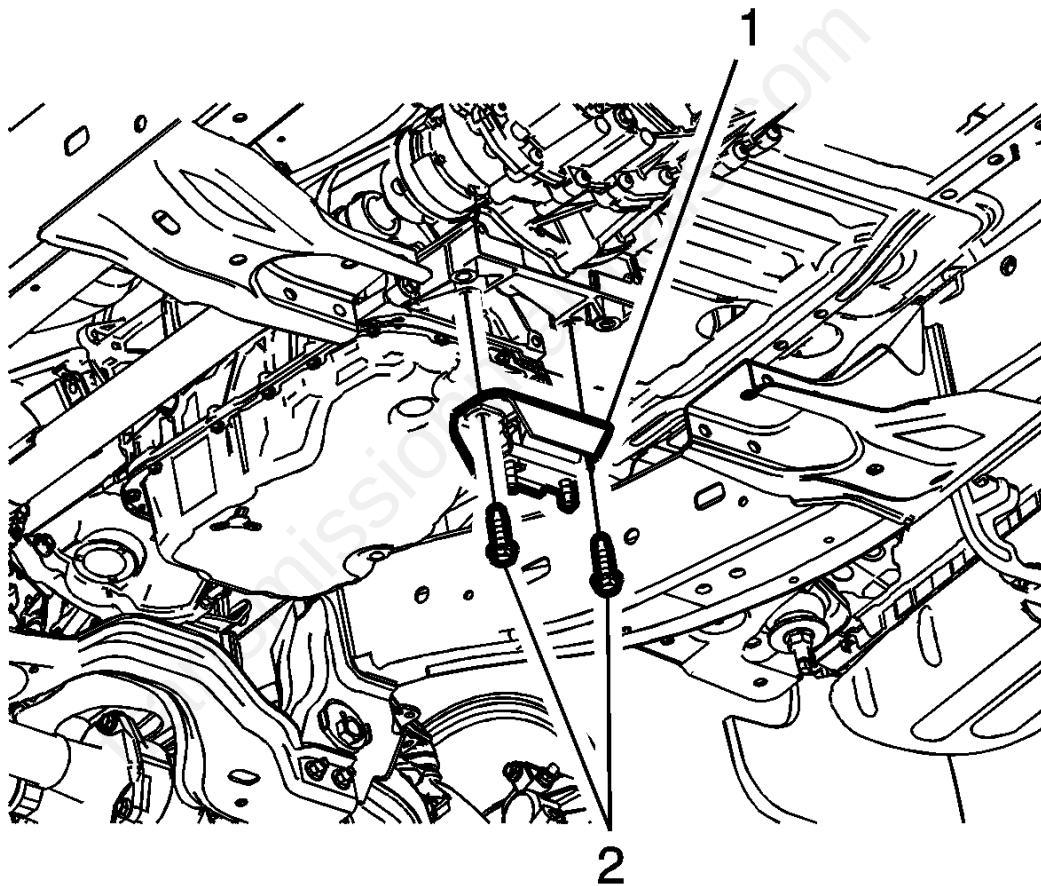


Fig. 101: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)

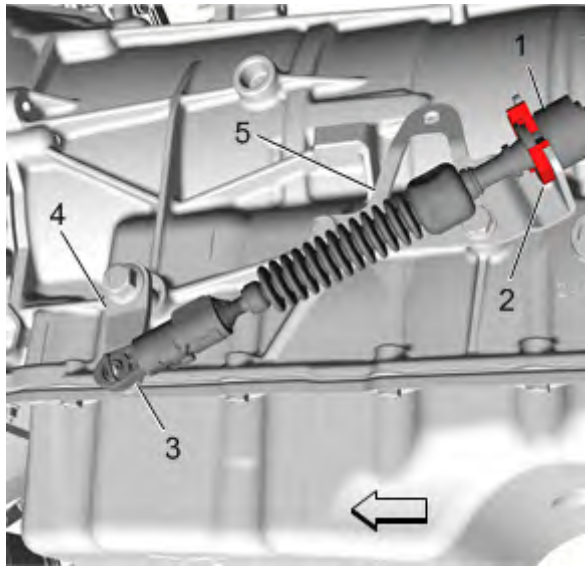


Fig. 102: Locking Retainer And Cable Bracket
 Courtesy of GENERAL MOTORS COMPANY

10. Remove the range selector cable (1) from the transmission. **Range Selector Lever Cable Replacement**

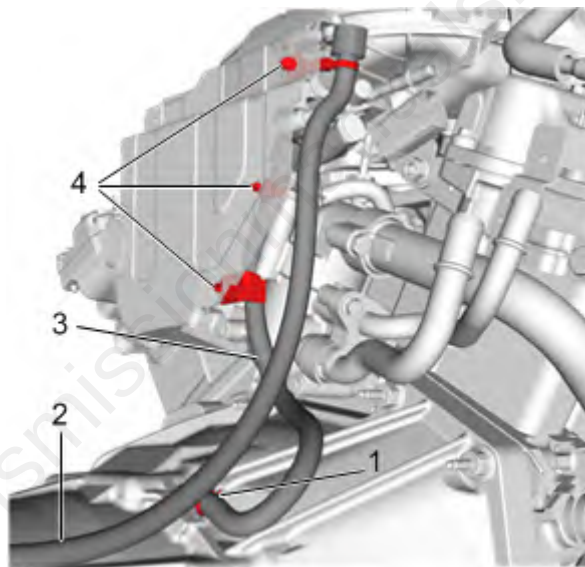


Fig. 103: Transmission Vent Hose
 Courtesy of GENERAL MOTORS COMPANY

11. Disconnect the transmission vent hose (1) from the transmission.
12. Disconnect the transmission electrical connector from the transmission.
13. Remove the wire harness from the transmission.

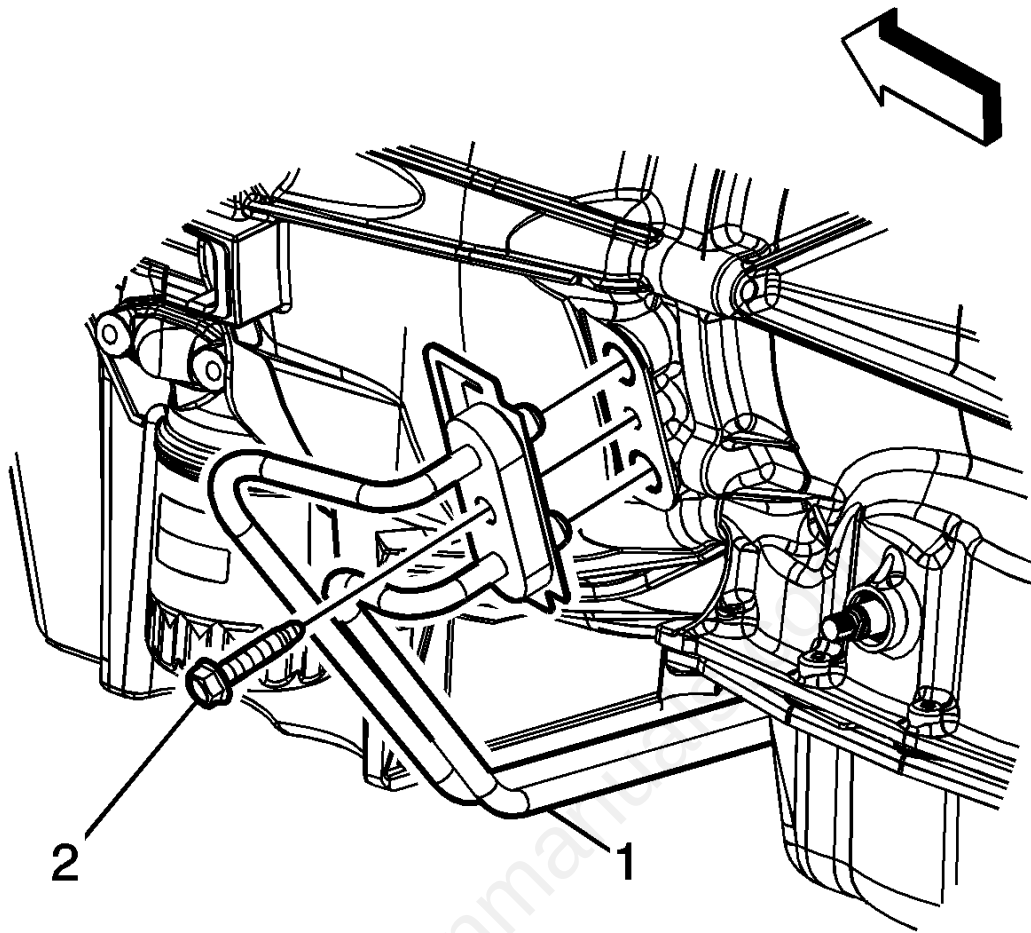


Fig. 104: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

14. Disconnect the transmission oil cooler lines (1) from the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LFX)**
15. Plug the transmission oil cooler line connections in the transmission case.
16. Lower the transmission to gain access to the top and sides of the transmission.

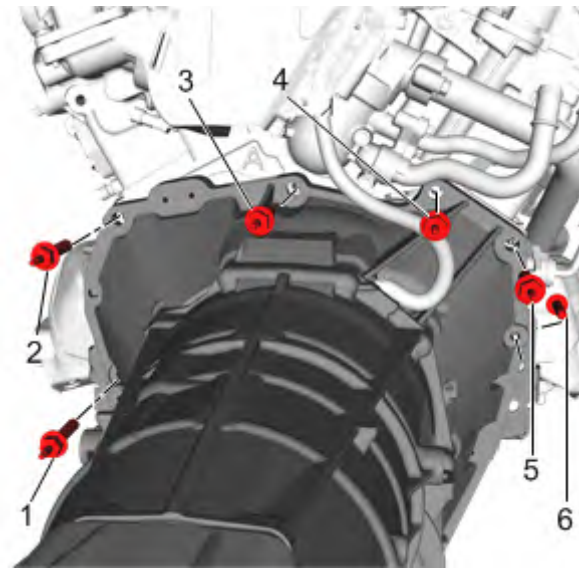


Fig. 105: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

17. Remove the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine.

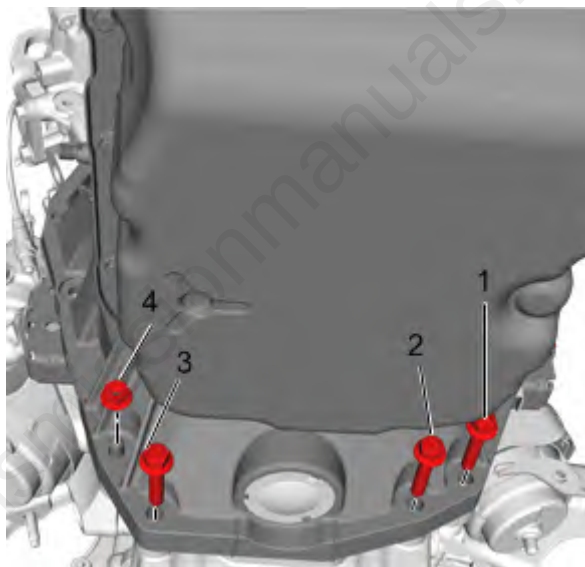


Fig. 106: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

18. Remove the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

19. Pull the transmission straight back.
20. Remove the transmission from the vehicle.
21. Transfer components as necessary.
22. Flush and flow test the transmission oil cooler and lines. [Transmission Fluid Cooler Flushing and Flow Test](#)

Installation Procedure

the transmission with a transmission jack.

2. Raise the transmission into place.
3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

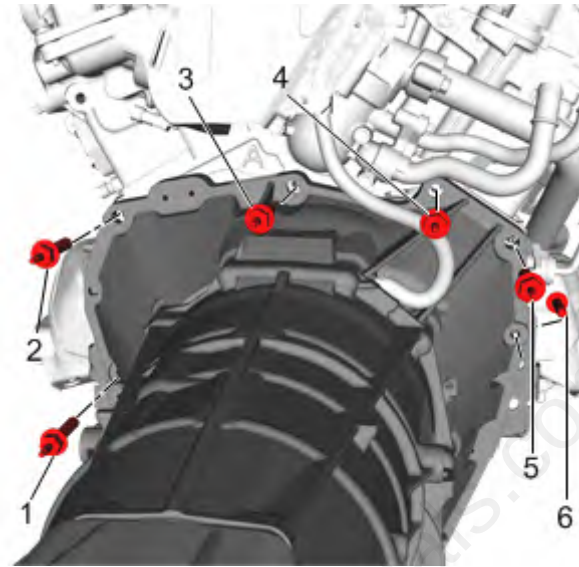


Fig. 107: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

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

4. Install the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

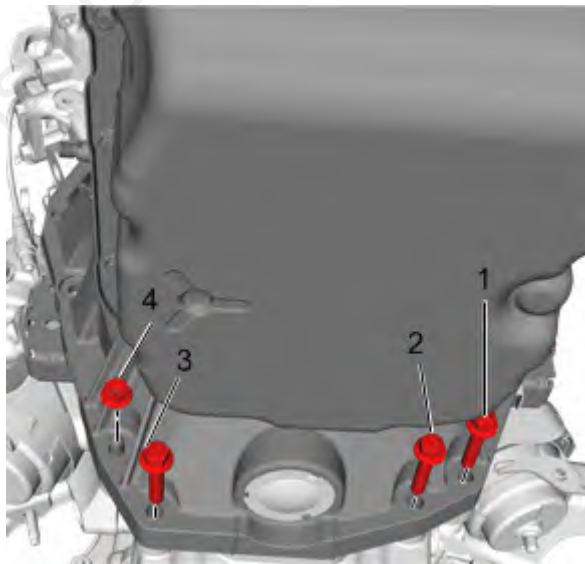


Fig. 108: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

5. Install the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

ig the torque converter bolts, clean the bolt threads and apply LOCTITE 242, or equivalent, to the threads prior to installation.

7. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).

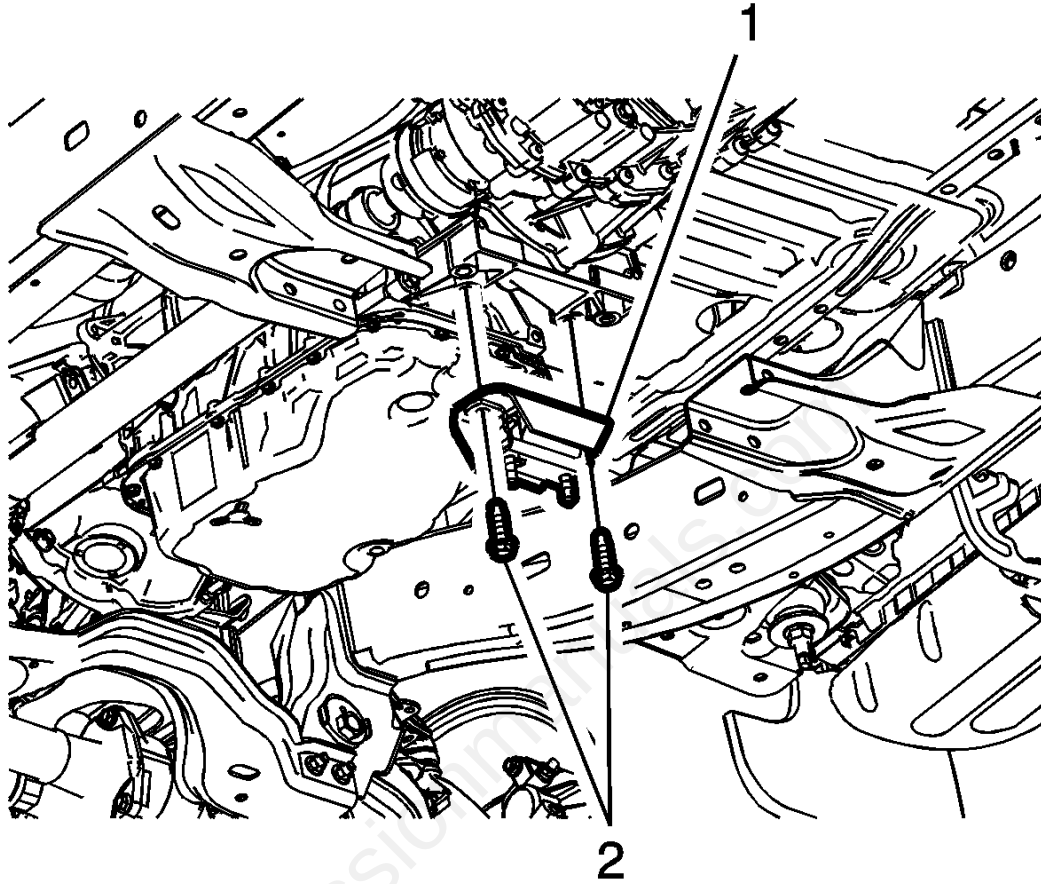


Fig. 109: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

8. Install the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)
9. Install the transmission crossmember. [Transmission Support Crossmember Replacement \(2WD\)](#)
10. Install the starter motor. [Starter Replacement \(LFX\)](#)

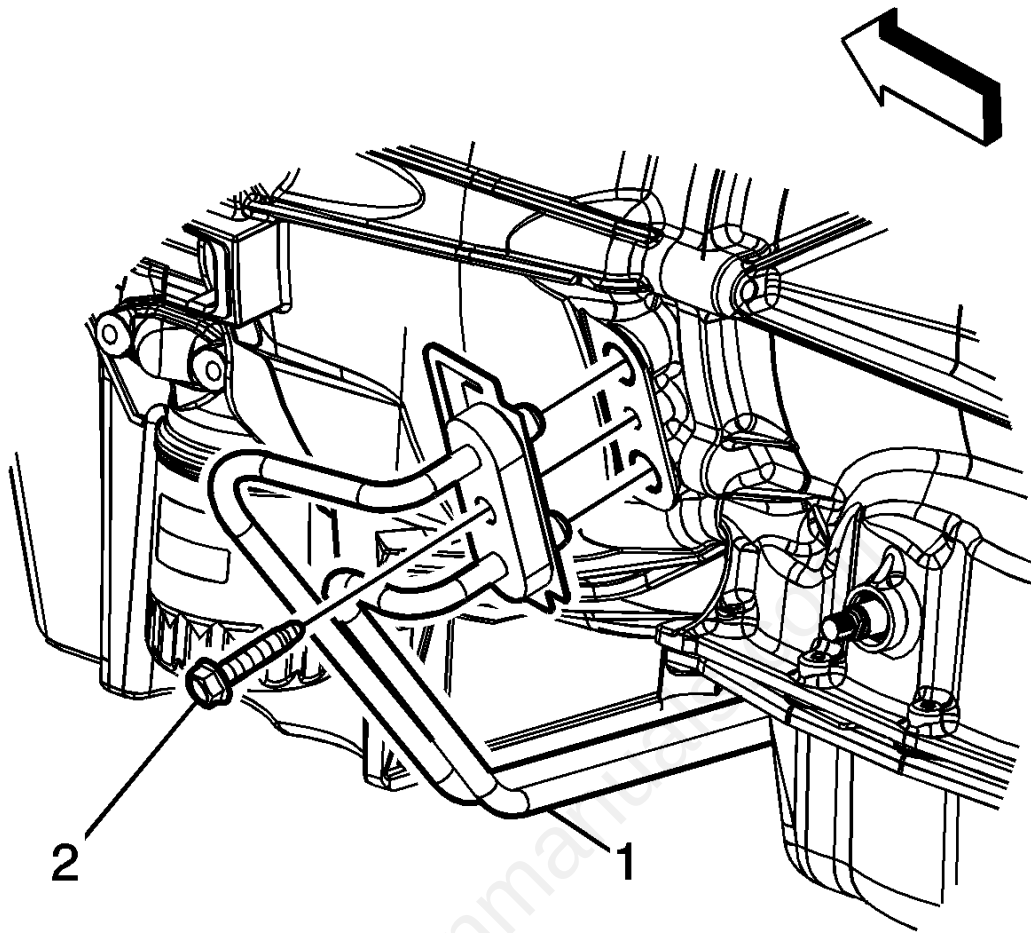
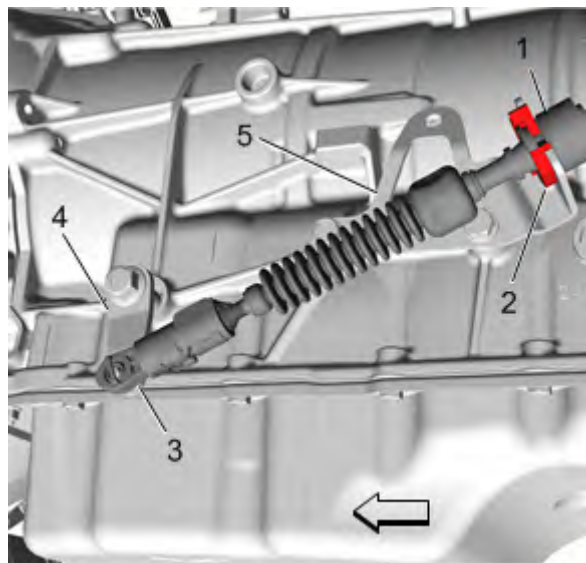


Fig. 110: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

11. Connect the transmission oil cooler lines (1) to the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LFX)**



: Locking Retainer And Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

12. Install the range selector cable (1) to the transmission. [Range Selector Lever Cable Replacement](#)
13. Install the wire harness to the transmission.
14. Connect the transmission electrical connector to the transmission.

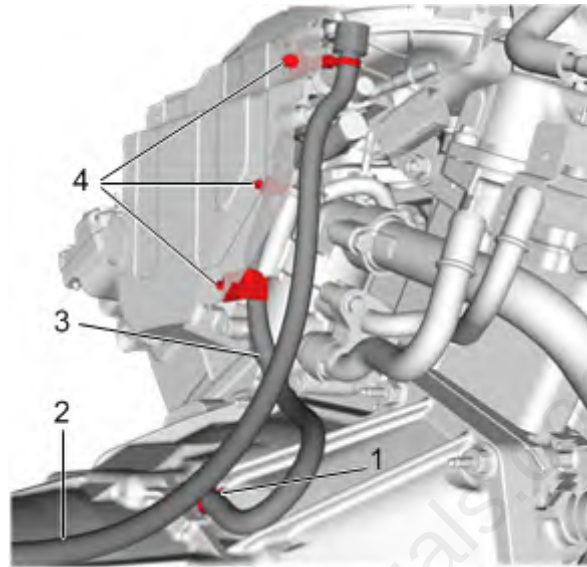


Fig. 112: Transmission Vent Hose

Courtesy of GENERAL MOTORS COMPANY

15. Connect the transmission vent hose (1) to the transmission.
16. Remove the transmission jack.
17. Install the rear propeller shaft. [Propeller Shaft Replacement \(with MYB\) Propeller Shaft Replacement \(with N8D\)](#)
18. Remove the exhaust pipe. [Exhaust Pipe Replacement](#)
19. Lower the vehicle.
20. Connect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#) .
21. Fill the transmission to the proper level. [Transmission Fluid Level and Condition Check](#) .
22. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. [Service Programming System \(SPS\)](#) .

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

23. Perform the Reset Transmission Adapts. [Reset Transmission Adapts](#)

ION REPLACEMENT (LWN DIESEL ENGINE WITH FOUR WHEEL DRIVE)

Removal Procedure

1. Disconnect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#) .
2. Remove the starter motor. [Starter Replacement \(LWN\)](#)
3. Remove the catalytic converter. [Catalytic Converter Replacement \(LWN\)](#)
4. Remove the flywheel inspection cover.
5. Mark the position of the flywheel to the torque converter.
6. Rotate the engine through the inspection cover opening using an appropriate tool.
7. Remove the six flywheel to torque converter bolts.
8. Remove the transfer case. [Transfer Case Assembly Replacement](#)
9. Support the transmission with a transmission jack.
10. Remove the transmission cross member. [Transmission Support Crossmember Replacement \(4WD\)](#)
11. Lower rear of transmission to access the radiator surge tank outlet pipe nuts.

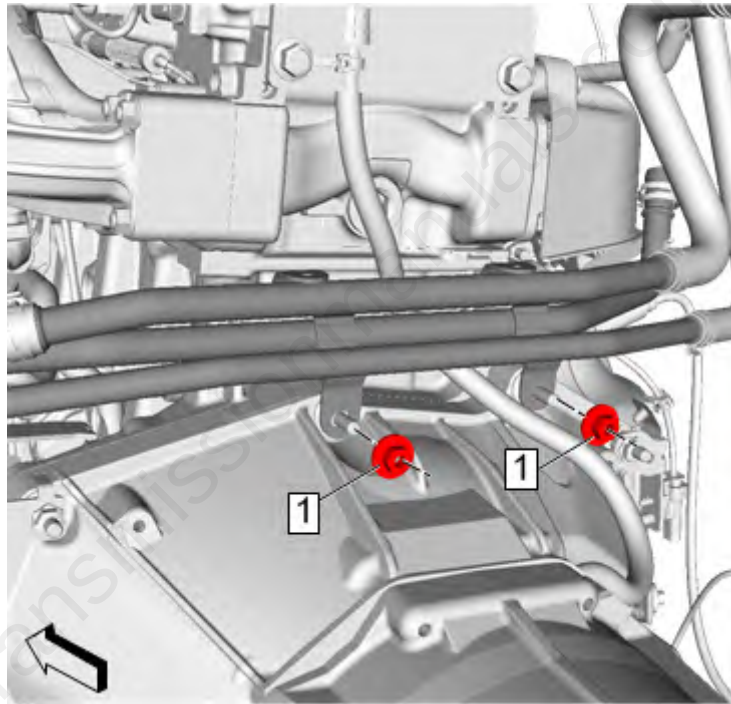


Fig. 113: Radiator Surge Tank Pipe Nuts

Courtesy of GENERAL MOTORS COMPANY

12. Remove the radiator surge tank outlet pipe nuts (1).
13. Raise rear of transmission and install transmission cross member to support transmission.
14. Lower the vehicle.

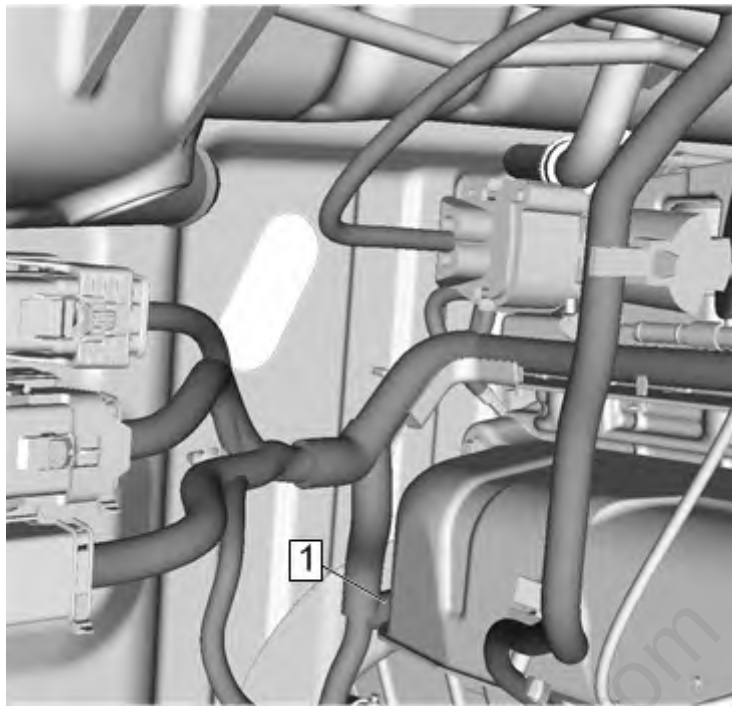


Fig. 114: Reposition Wiring Harness Outboard Away From Radiator Surge Tank Pipe Assembly
 Courtesy of GENERAL MOTORS COMPANY

15. From passenger side of vehicle, reposition wiring harness outboard away from radiator surge tank pipe assembly.
16. Rotate radiator surge tank outlet pipe assembly to remove from transmission studs.
17. Raise the vehicle
18. Remove the driver side wheel liner. **Front Wheelhouse Liner Replacement**
19. Pull the surge tank pipe assembly towards driver side until pipe brackets are out of the way of the Studs and support the assembly.
20. Using a suitable jack, support the transmission and remove transmission cross member.

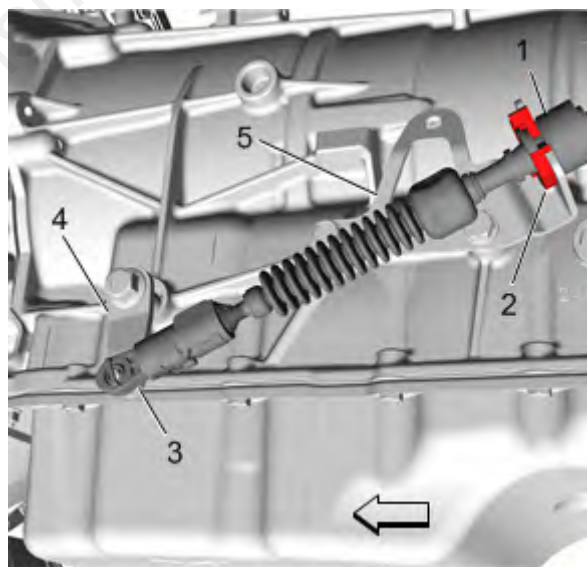


Fig. 115: Locking Retainer And Cable Bracket
 Courtesy of GENERAL MOTORS COMPANY

21. Remove the range selector cable (1) from the transmission. **Range Selector Lever Cable Replacement**

- ect the transmission vent hose from the transmission.
23. Disconnect the transfer case vent hose from the transfer case.
 24. Disconnect the transmission electrical connector from the transmission.
 25. Remove the wire harness from the transmission.

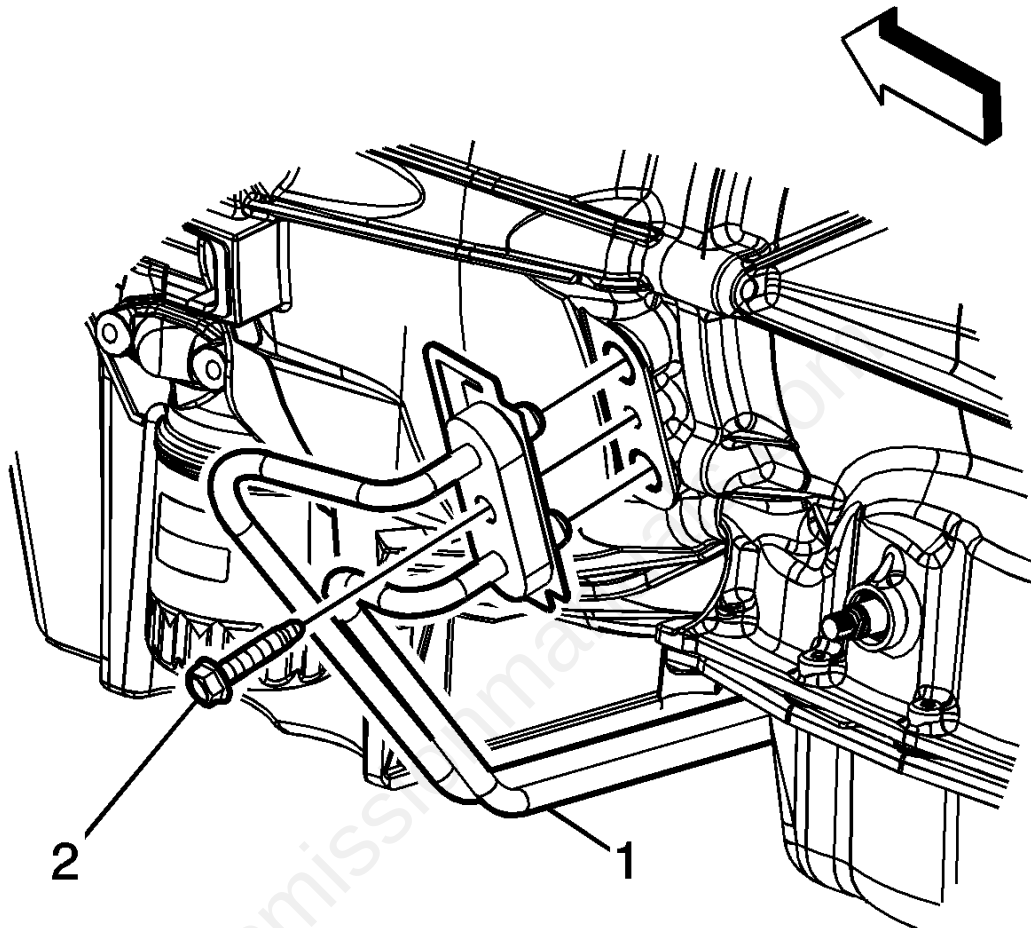


Fig. 116: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

26. Disconnect the transmission oil cooler lines (1) from the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LWN)**
27. Plug the transmission oil cooler line connections in the transmission case.
28. Remove the nuts retaining the upper and lower fuel line brackets to the transmission studs and reposition the lines.

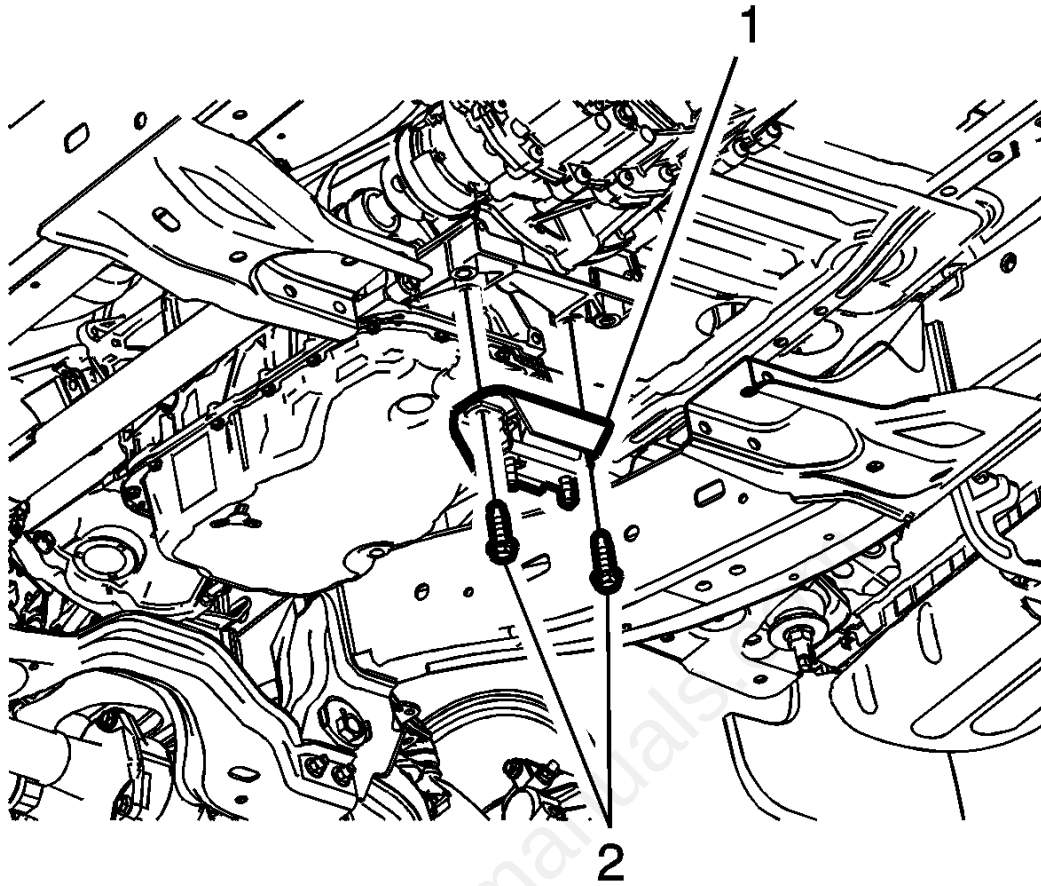
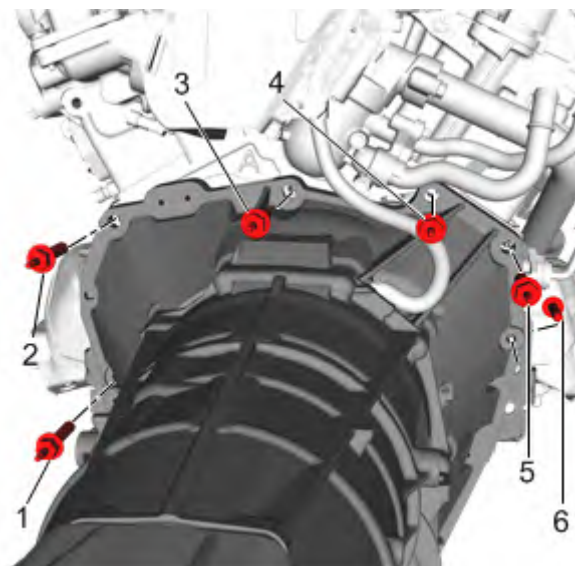


Fig. 117: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

29. Remove the transmission mount (1). [Transmission Mount Replacement \(4WD\)](#)
30. Lower the transmission to gain access to the top and sides of the transmission.



: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

31. Remove the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine.

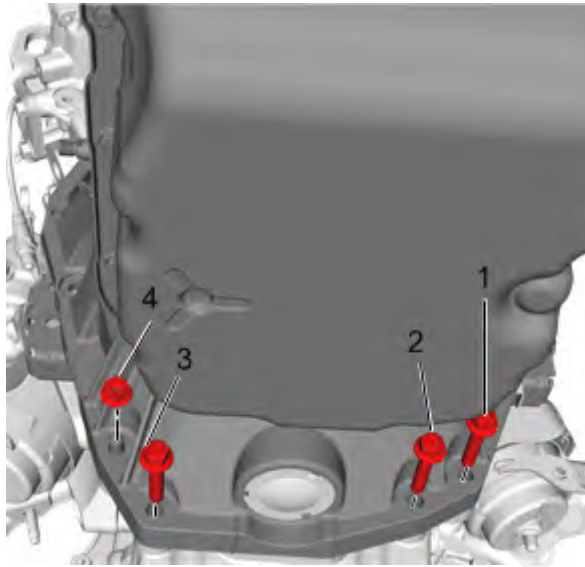


Fig. 119: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

32. Remove the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

33. Pull the transmission straight back.

34. Remove the transmission from the vehicle.

35. Transfer components as necessary.

36. Flush and flow test the transmission oil cooler and lines. **Transmission Fluid Cooler Flushing and Flow Test**

Installation Procedure

1. Support the transmission with a transmission jack.

2. Raise the transmission into place.

3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

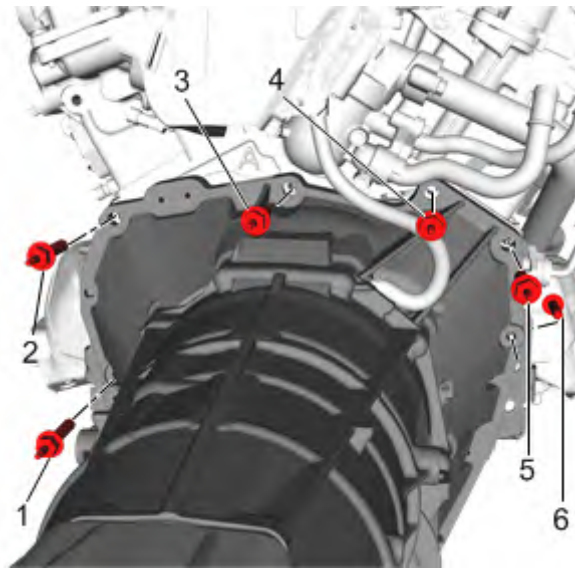


Fig. 120: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Fastener Caution .

4. Install the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

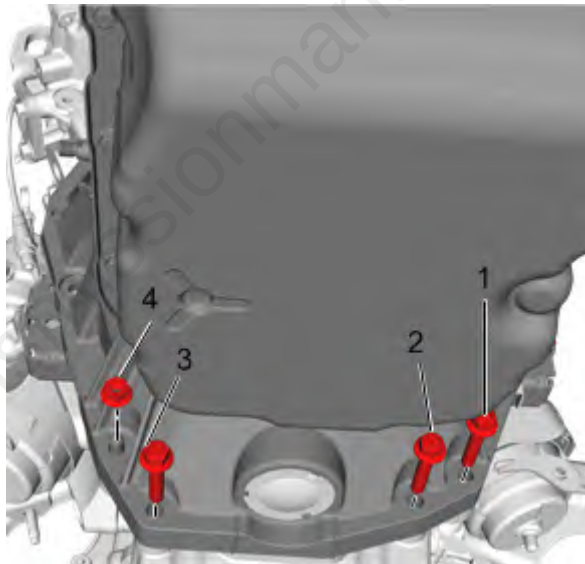


Fig. 121: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

5. Install the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).
6. If reusing the torque converter bolts, clean the bolt threads and apply thread locker or an equivalent, to the threads prior to installation. Adhesives, Fluids, Lubricants, and Sealers
7. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).
8. Install the flywheel inspection cover.
9. Support transmission and install transmission cross member.
10. Remove radiator surge tank pipe assembly support and position back onto the studs.

the driver side wheel liner. [Front Wheelhouse Liner Replacement](#)

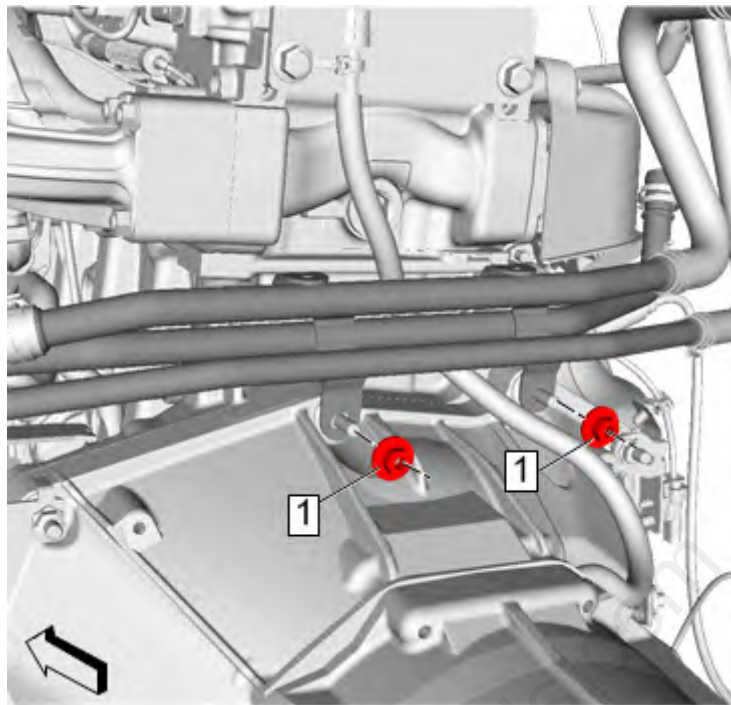


Fig. 122: Radiator Surge Tank Pipe Nuts

Courtesy of GENERAL MOTORS COMPANY

12. Lower rear of transmission and install radiator surge tank pipe nuts and tighten to 22 N.m (16 lb ft).

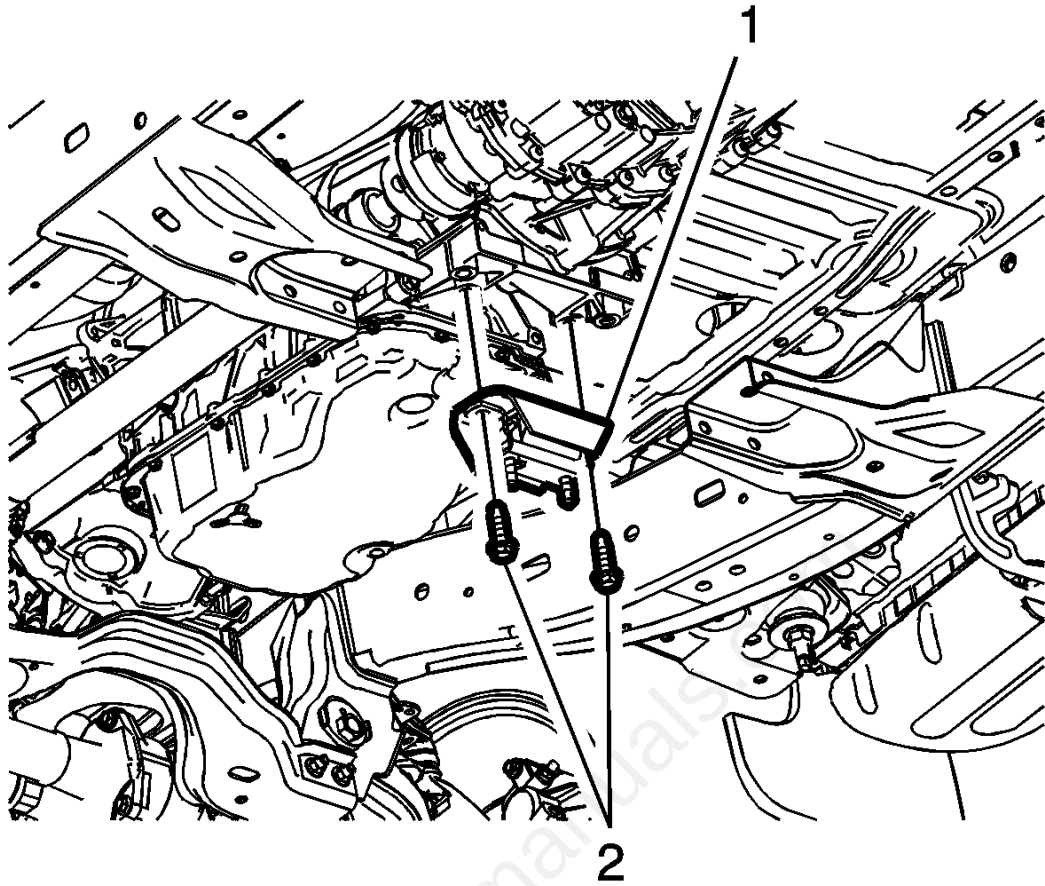


Fig. 123: Transmission Mount Bolts

Courtesy of GENERAL MOTORS COMPANY

13. Install the transmission mount (1). [Transmission Mount Replacement \(4WD\)](#)
14. Install the transmission cross member. [Transmission Support Crossmember Replacement \(4WD\)](#)
15. Install the starter motor. [Starter Replacement \(LWN\)](#)

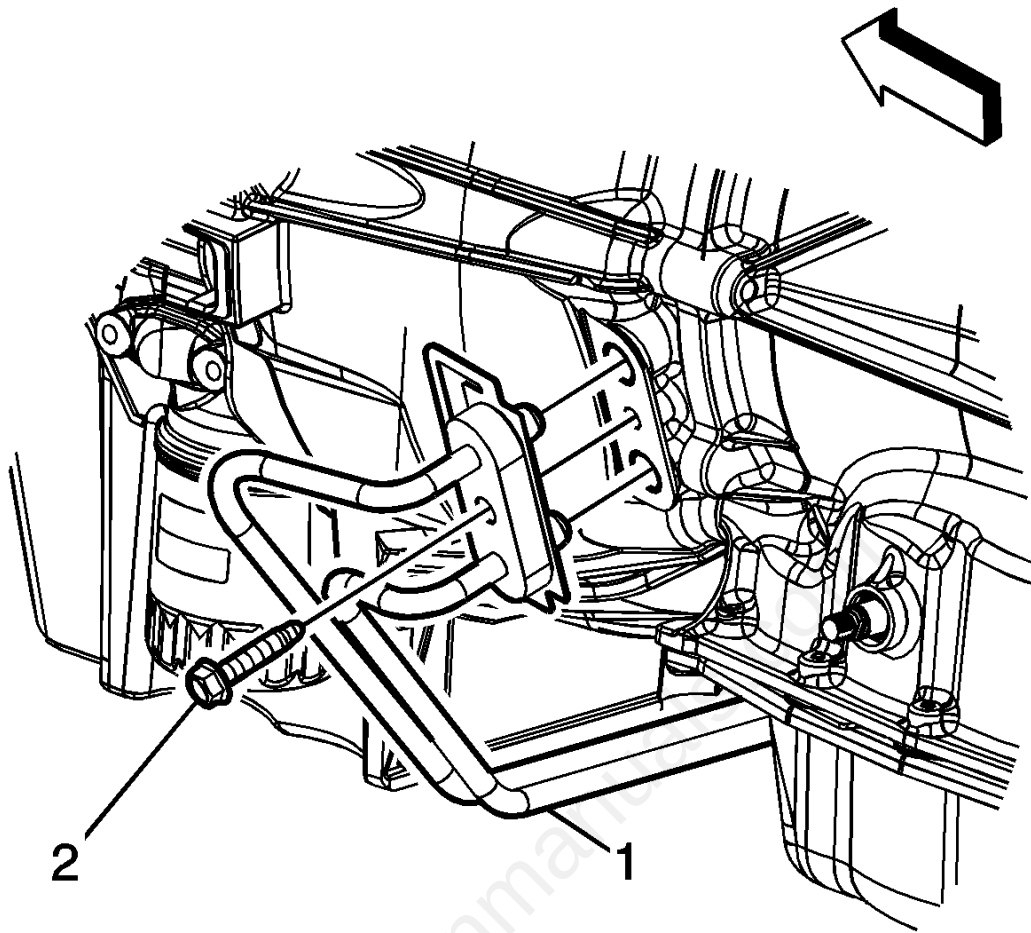
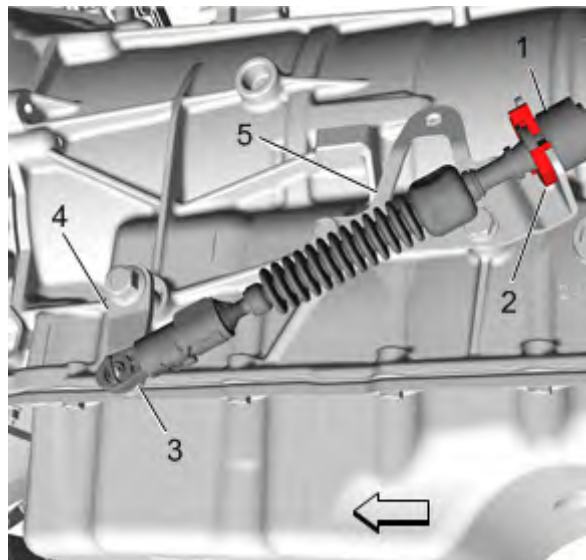


Fig. 124: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

16. Connect the transmission oil cooler lines (1) to the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LWN)**
17. Install the nuts retaining the upper and lower fuel line brackets to the transmission studs.



[: Locking Retainer And Cable Bracket](#)

Courtesy of GENERAL MOTORS COMPANY

18. Install the range selector cable (1) to the transmission. [Range Selector Lever Cable Replacement](#)
19. Install the wire harness to the transmission.
20. Connect the transmission electrical connector to the transmission.
21. Connect the transmission vent hose to the transmission.
22. Connect the transfer case vent hose to the transfer case.
23. Remove the transmission jack.
24. Install the transfer case. [Transfer Case Assembly Replacement](#)
25. Install the catalytic converter. [Catalytic Converter Replacement \(LWN\)](#)
26. Lower the vehicle.

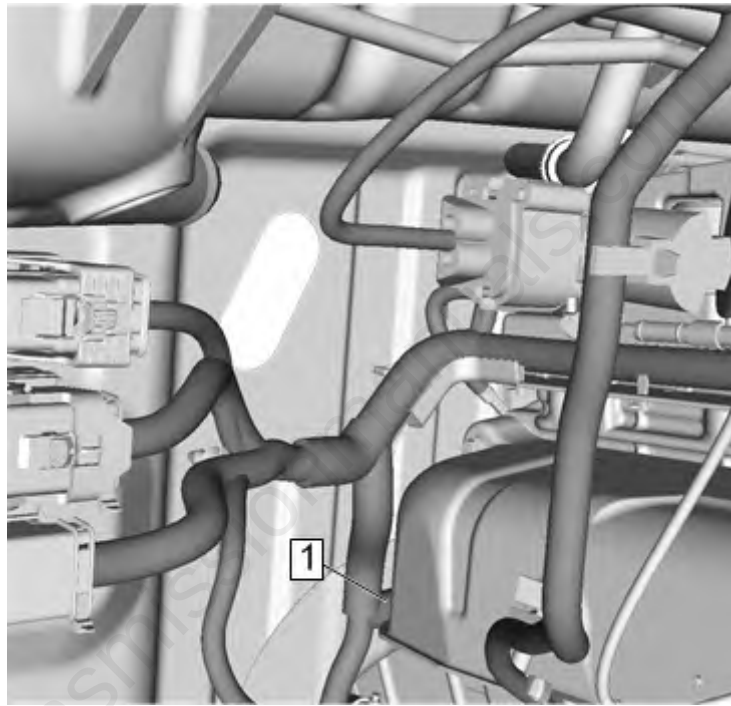


Fig. 126: Reposition Wiring Harness Outboard Away From Radiator Surge Tank Pipe Assembly
Courtesy of GENERAL MOTORS COMPANY

27. From passenger side of vehicle, reposition wiring harness outboard to the surge tank pipe assembly.
28. Connect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#)
29. Fill the transmission to the proper level. [Transmission Fluid Level and Condition Check](#) .
30. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. [Service Programming System \(SPS\)](#)

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement

- TCM software/calibration update
- Any service in response to a shift quality concern

31. Perform the Reset Transmission Adapts. [Reset Transmission Adapts](#) .

TRANSMISSION REPLACEMENT (LWN DIESEL ENGINE WITH TWO WHEEL DRIVE)

Removal Procedure

1. Remove the starter motor. [Starter Replacement \(LWN\)](#)
2. Remove the catalytic converter. [Catalytic Converter Replacement \(LWN\)](#)
3. Remove the flywheel inspection cover.
4. Mark the position of the flywheel to the torque converter.
5. Rotate the engine through the inspection cover opening using an appropriate tool.
6. Remove the six flywheel to torque converter bolts.
7. Remove the propeller shaft. [Propeller Shaft Replacement \(with MYB\) Propeller Shaft Replacement \(with N8D\)](#)
8. Support the transmission with a transmission jack.
9. Remove the transmission cross member. [Transmission Support Crossmember Replacement \(2WD\)](#)
10. Lower rear of transmission to access the radiator surge tank outlet pipe nuts.

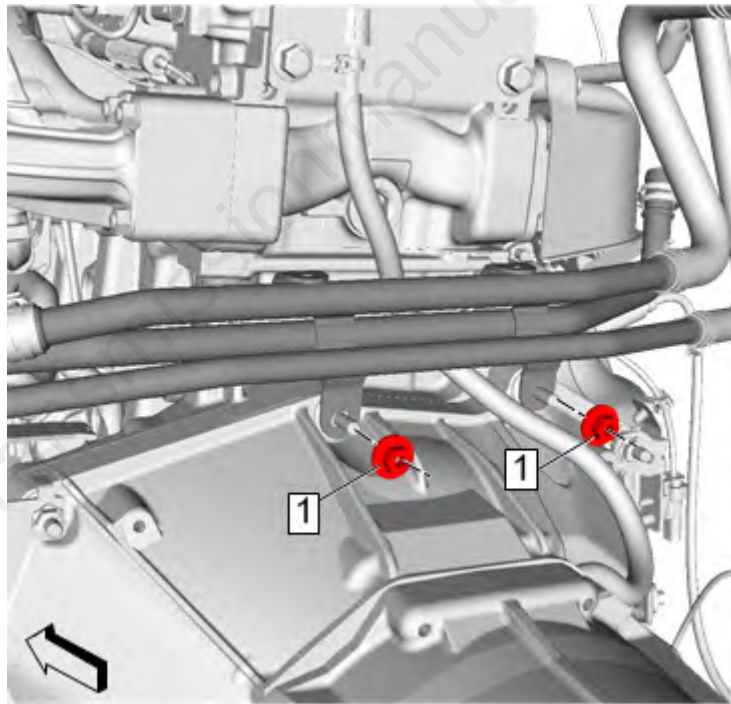


Fig. 127: Radiator Surge Tank Pipe Nuts

Courtesy of GENERAL MOTORS COMPANY

11. Remove the radiator surge tank outlet pipe nuts (1).
12. Raise rear of transmission and install transmission cross member to support transmission.
13. Lower the vehicle.

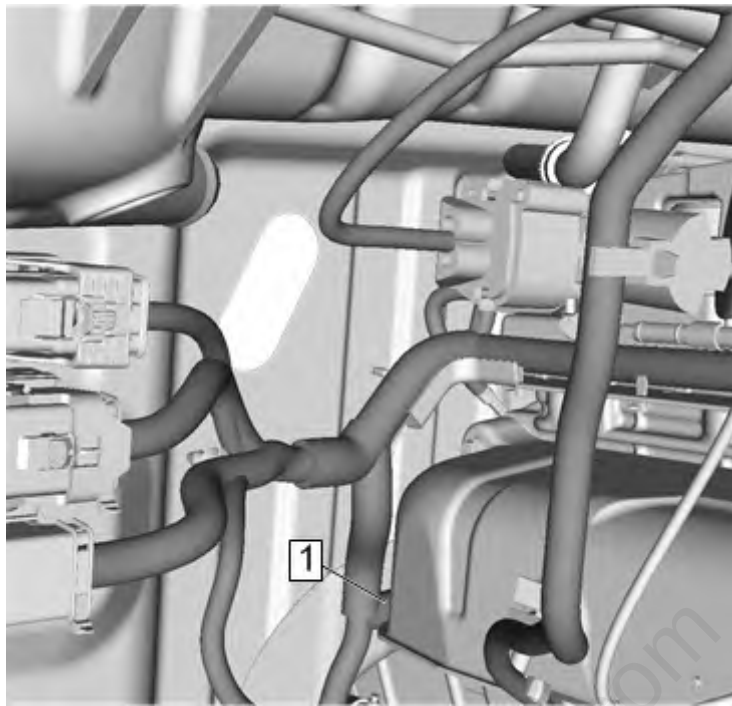


Fig. 128: Reposition Wiring Harness Outboard Away From Radiator Surge Tank Pipe Assembly
 Courtesy of GENERAL MOTORS COMPANY

14. From passenger side of vehicle, reposition wiring harness outboard away from radiator surge tank pipe assembly.
15. Rotate radiator surge tank outlet pipe assembly to remove from transmission studs.
16. Raise the vehicle
17. Remove the driver side wheel liner. **Front Wheelhouse Liner Replacement**
18. Pull the surge tank pipe assembly towards driver side until pipe brackets are out of the way of the Studs and support the assembly.
19. Using a suitable jack, support the transmission and remove transmission cross member.

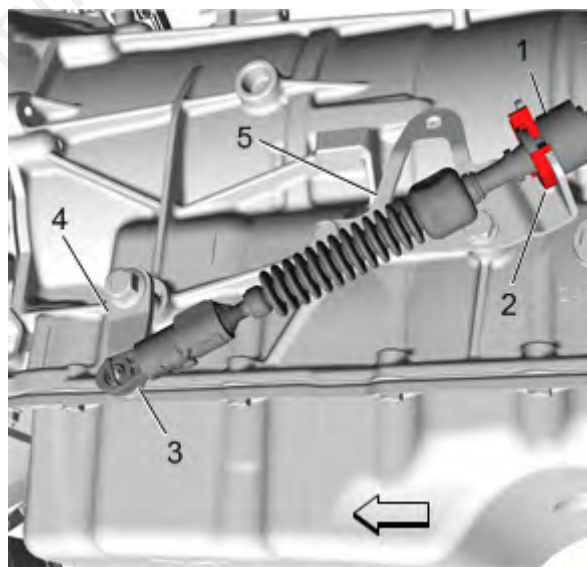


Fig. 129: Locking Retainer And Cable Bracket
 Courtesy of GENERAL MOTORS COMPANY

20. Remove the range selector cable (1) from the transmission. **Range Selector Lever Cable Replacement**

- ect the transmission vent hose from the transmission.
22. Disconnect the transfer case vent hose from the transfer case.
 23. Disconnect the transmission electrical connector from the transmission.
 24. Remove the wire harness from the transmission.

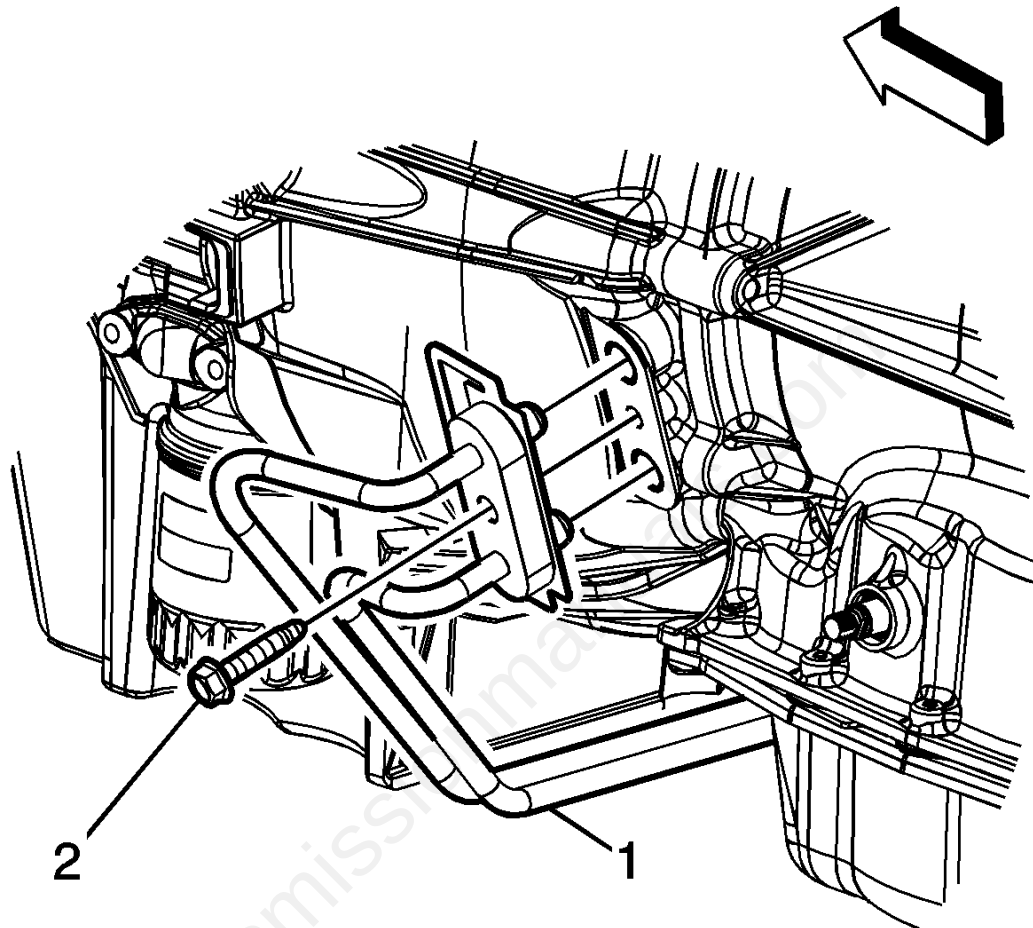


Fig. 130: View Of Oil Cooling Lines & Bolt
Courtesy of GENERAL MOTORS COMPANY

25. Disconnect the transmission oil cooler lines (1) from the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LWN)**
26. Plug the transmission oil cooler line connections in the transmission case.
27. Remove the nuts retaining the upper and lower fuel line brackets to the transmission studs and reposition the lines.

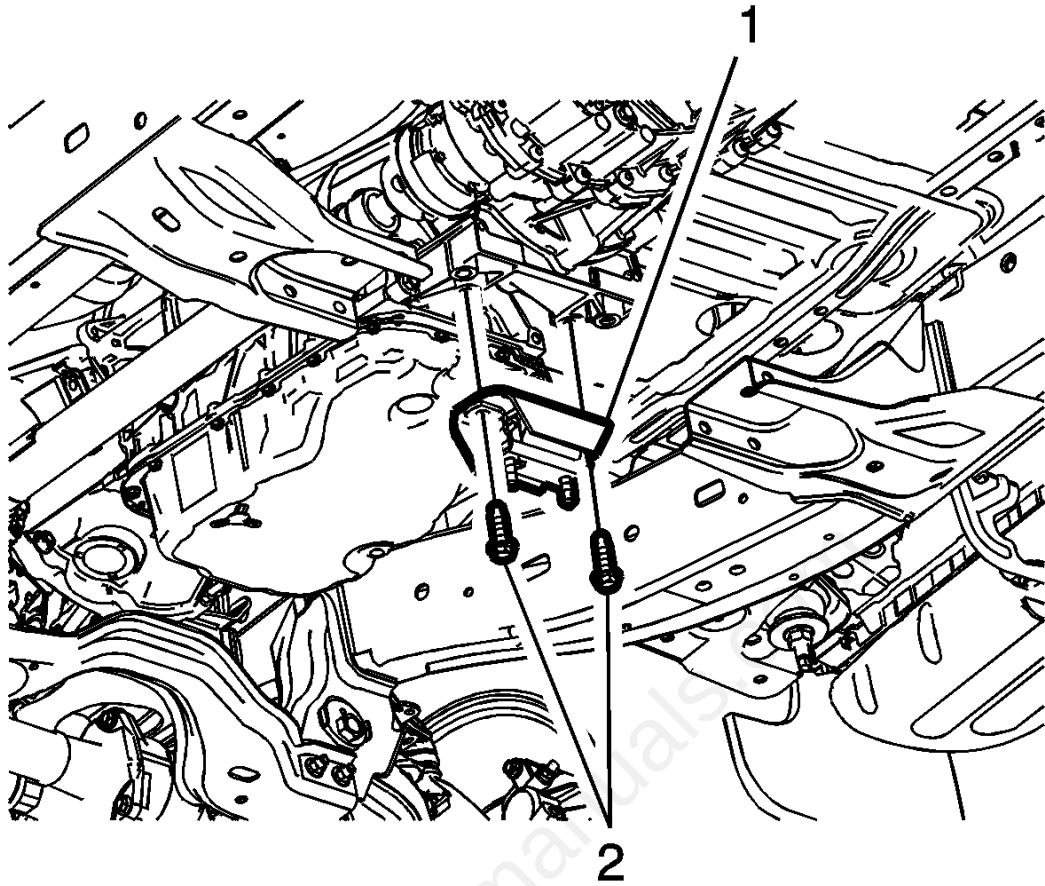
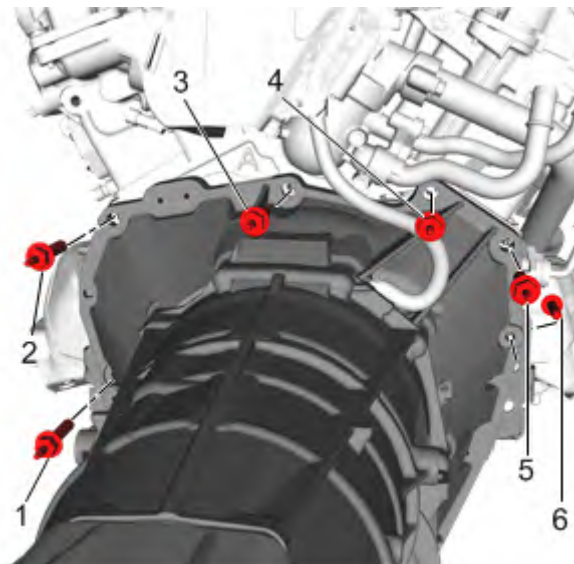


Fig. 131: Transmission Mount Bolts
 Courtesy of GENERAL MOTORS COMPANY

28. Remove the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)
29. Lower the transmission to gain access to the top and sides of the transmission.



: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

30. Remove the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine.

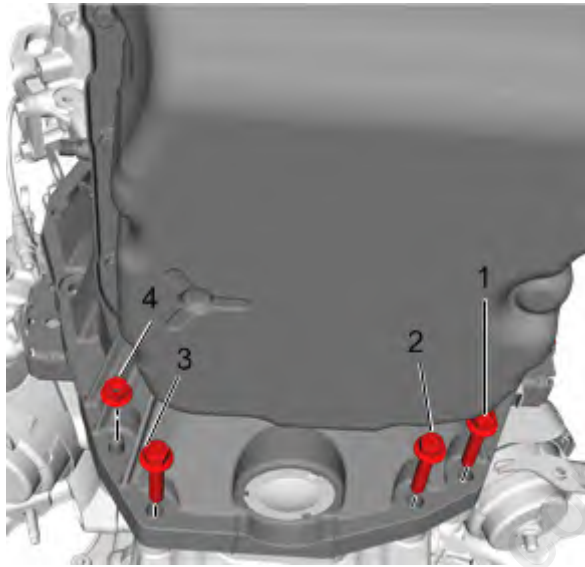


Fig. 133: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
Courtesy of GENERAL MOTORS COMPANY

31. Remove the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine.

NOTE: Ensure that the torque converter stays seated in the transmission when pulling the transmission out.

32. Pull the transmission straight back.

33. Remove the transmission from the vehicle.

34. Transfer components as necessary.

35. Flush and flow test the transmission oil cooler and lines. **Transmission Fluid Cooler Flushing and Flow Test**

Installation Procedure

1. Support the transmission with a transmission jack.

2. Raise the transmission into place.

3. Slide the transmission straight onto the locating pins while lining up the marks on the flywheel and the torque converter.

The torque converter must rotate freely by hand.

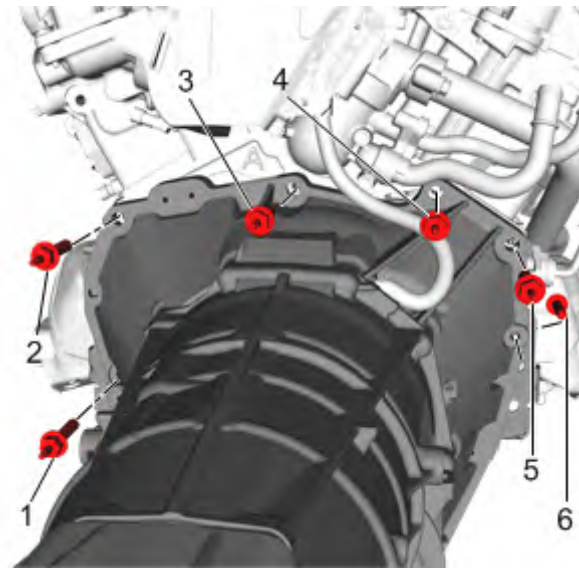


Fig. 134: 6 Upper Fasteners (1, 2, 3, 4, 5, 6) securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: [Fastener Caution](#) .

4. Install the 6 upper fasteners (1, 2, 3, 4, 5, 6) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).

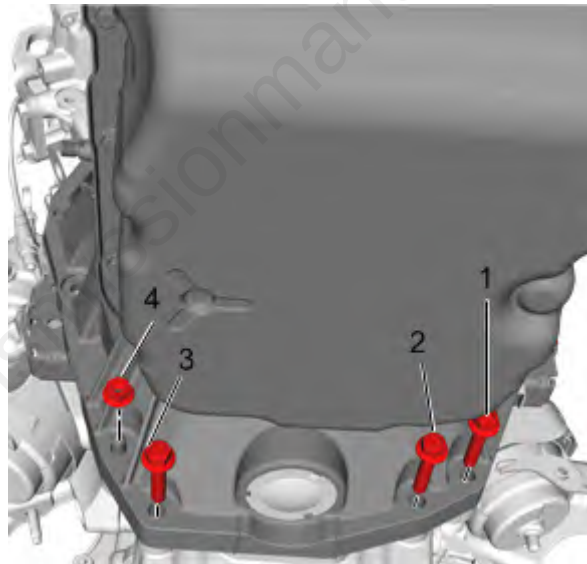


Fig. 135: 4 Lower Fasteners (1, 2, 3, 4) Securing Transmission To Engine
 Courtesy of GENERAL MOTORS COMPANY

5. Install the 4 lower fasteners (1, 2, 3, 4) securing the transmission to the engine and tighten to 50 N.m (37 lb ft).
6. If reusing the torque converter bolts, clean the bolt threads and apply thread locker or an equivalent, to the threads prior to installation. [Adhesives, Fluids, Lubricants, and Sealers](#)
7. Install the flywheel to torque converter bolts and tighten to 63 N.m (46 lb ft).
8. Install the flywheel inspection cover.
9. Support transmission and install transmission cross member.
10. Remove radiator surge tank pipe assembly support and position back onto the studs.

the driver side wheel liner. **Front Wheelhouse Liner Replacement**

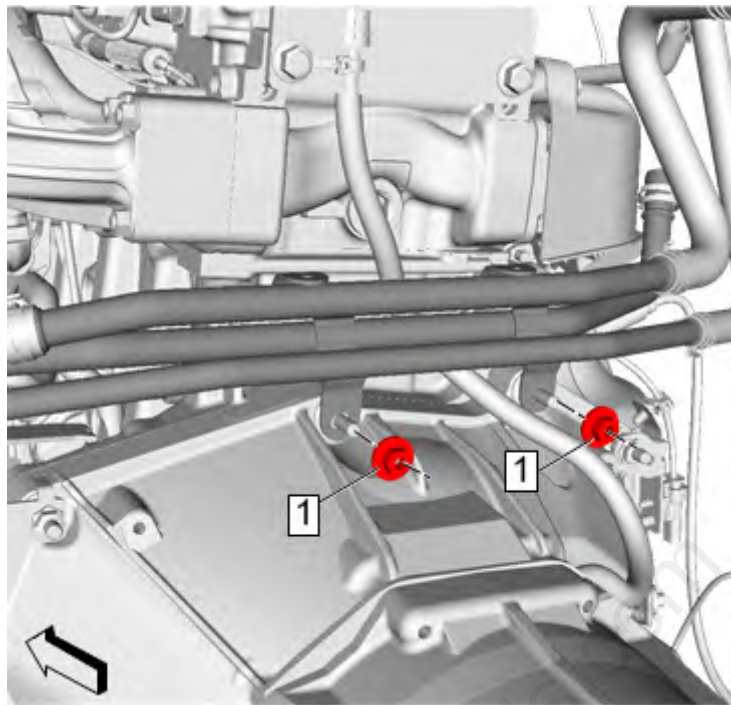


Fig. 136: Radiator Surge Tank Pipe Nuts

Courtesy of GENERAL MOTORS COMPANY

12. Lower rear of transmission and install radiator surge tank pipe nuts and tighten to 22 N.m (16 lb ft).

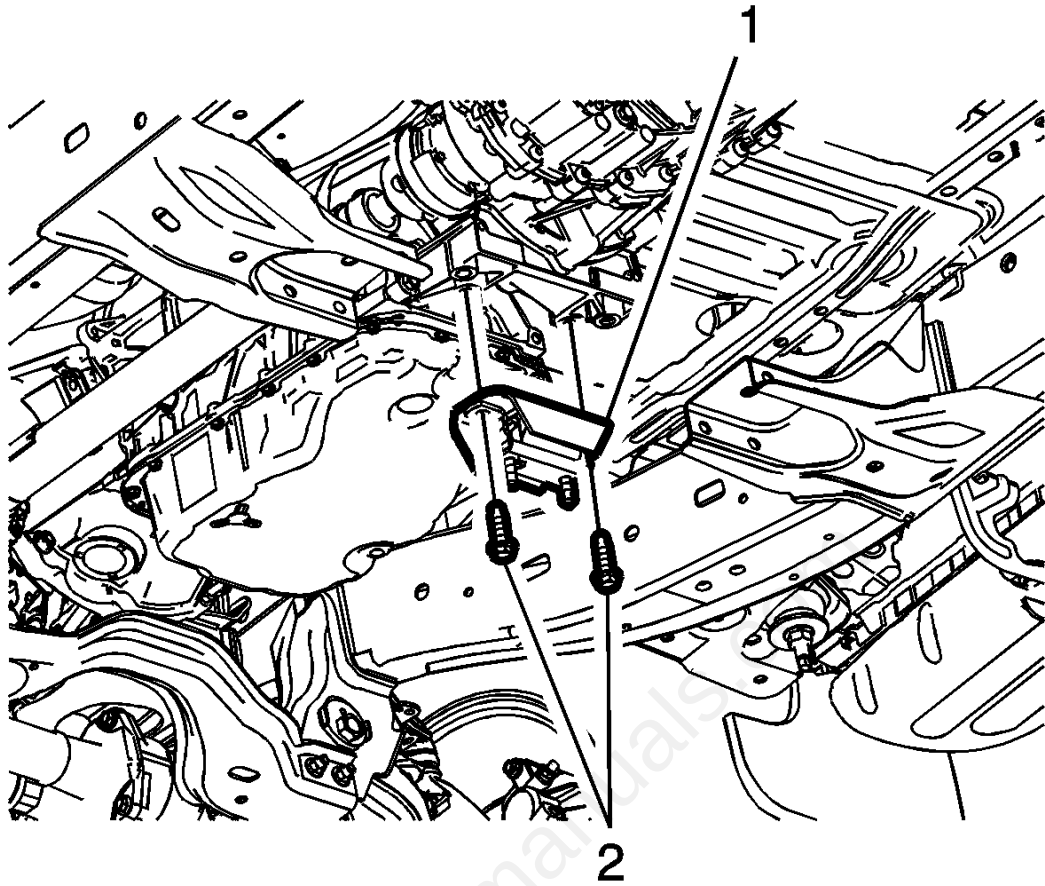


Fig. 137: Transmission Mount Bolts
Courtesy of GENERAL MOTORS COMPANY

13. Install the transmission mount (1). [Transmission Mount Replacement \(2WD\)](#)
14. Install the transmission cross member. [Transmission Support Crossmember Replacement \(2WD\)](#)
15. Install the starter motor. [Starter Replacement \(LWN\)](#)

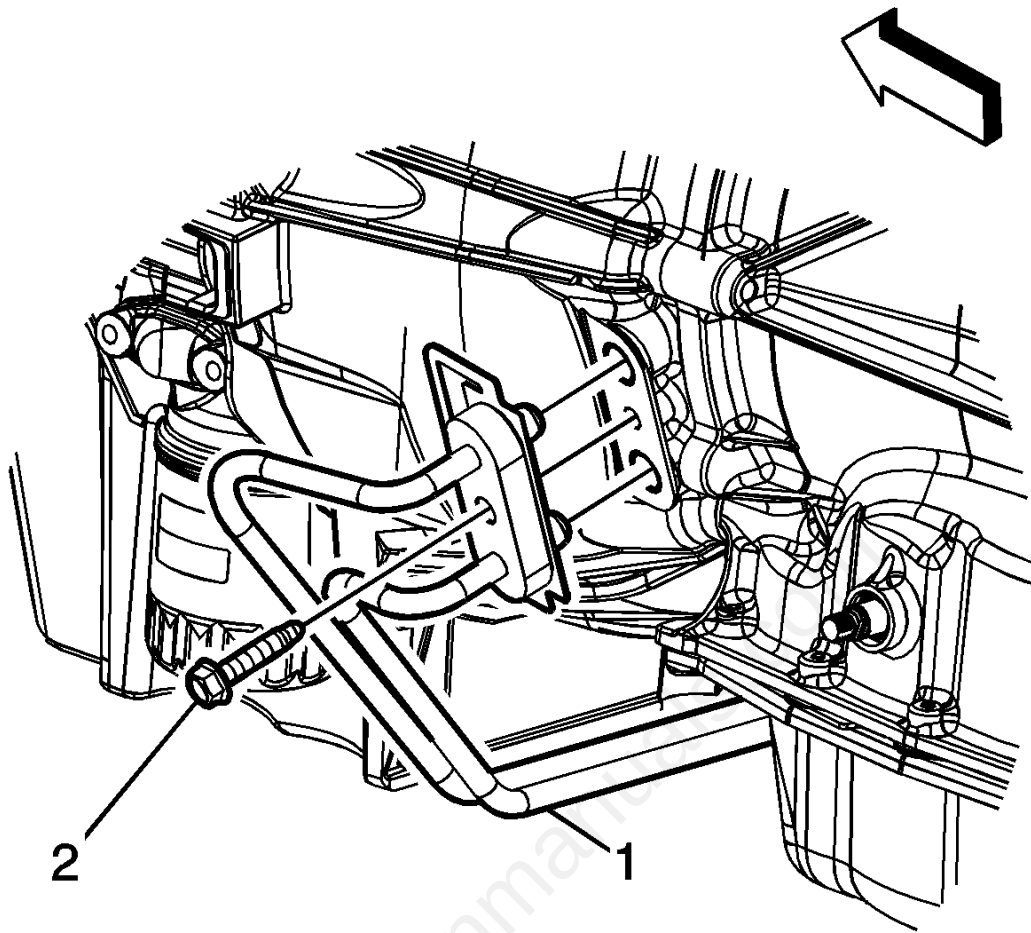
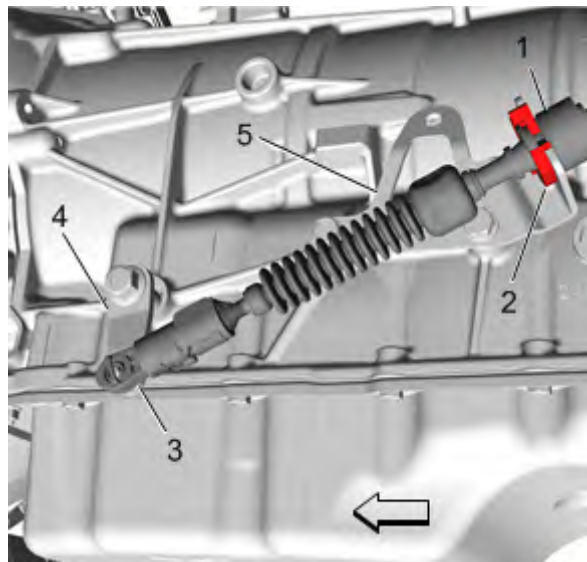


Fig. 138: View Of Oil Cooling Lines & Bolt
 Courtesy of GENERAL MOTORS COMPANY

16. Connect the transmission oil cooler lines (1) to the transmission. **Transmission Fluid Cooler Inlet and Outlet Pipe Replacement (LWN)**
17. Install the nuts retaining the upper and lower fuel line brackets to the transmission studs.



!: Locking Retainer And Cable Bracket

Courtesy of GENERAL MOTORS COMPANY

18. Install the range selector cable (1) to the transmission. [Range Selector Lever Cable Replacement](#)
19. Install the wire harness to the transmission.
20. Connect the transmission electrical connector to the transmission.
21. Connect the transmission vent hose to the transmission.
22. Connect the transfer case vent hose to the transfer case.
23. Remove the transmission jack.
24. Install the propeller shaft. [Propeller Shaft Replacement \(with MYB\)](#) [Propeller Shaft Replacement \(with N8D\)](#)
25. Install the catalytic converter. [Catalytic Converter Replacement \(LWN\)](#)
26. Lower the vehicle.

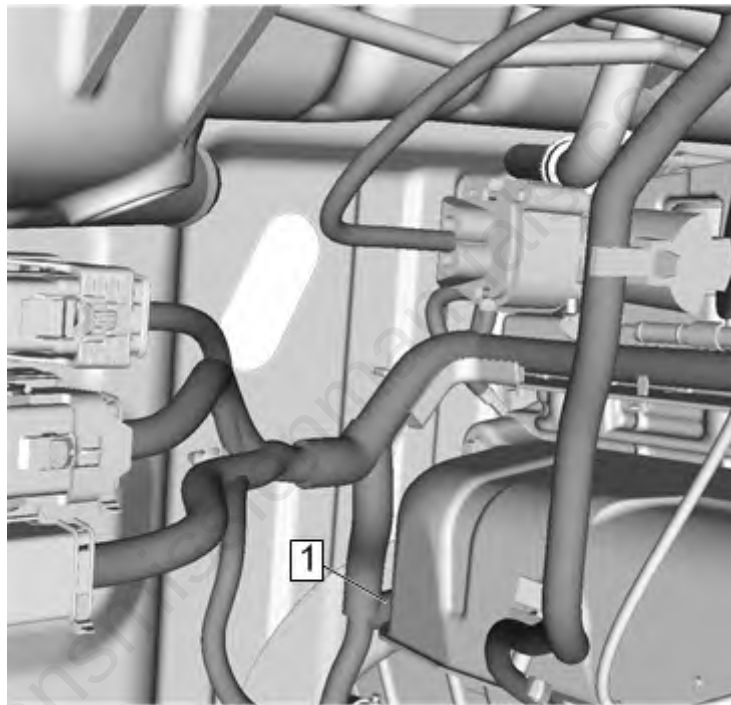


Fig. 140: Reposition Wiring Harness Outboard Away From Radiator Surge Tank Pipe Assembly

Courtesy of GENERAL MOTORS COMPANY

27. From passenger side of vehicle, reposition wiring harness outboard to the surge tank pipe assembly.
28. Connect the negative battery cable. [Battery Negative Cable Disconnection and Connection](#)
29. Fill the transmission to the proper level. [Transmission Fluid Level and Condition Check](#) .
30. If a NEW TCM has been installed into the vehicle, the NEW module needs to be reprogrammed. [Service Programming System \(SPS\)](#)

NOTE:

The Service Fast Learn Adapts procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:

- Transmission internal service/overhaul
- Valve body repair or replacement

- **Control solenoid valve assembly replacement**
- **TCM software/calibration update**
- **Any service in response to a shift quality concern**

31. Perform the Reset Transmission Adapts. [Reset Transmission Adapts](#) .

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