

2010 Transmission

Automatic Transmission - 6T30/6T40/6T45 - Equinox & Terrain

REPAIR INSTRUCTIONS - ON VEHICLE

MANUAL SHIFT DETENT LEVER WITH SHAFT POSITION SWITCH ASSEMBLY REPLACEMENT

Special Tools

- **DT-48550** Detent Lever Pin Remover. See **Special Tools** .
- **J 41229** Manual Shaft Pin Installer. See **Special Tools** .

Removal Procedure

1. Remove the control valve body. Refer to **Control Valve Body Replacement**.

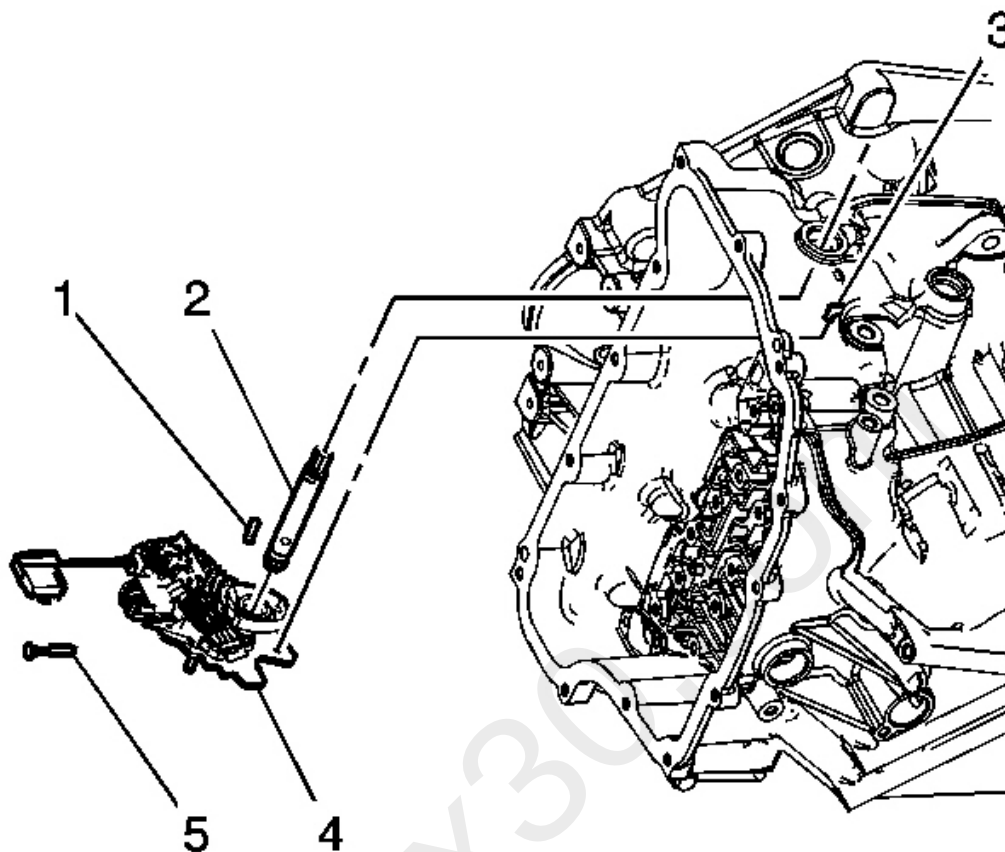


Fig. 1: View Of Manual Shift Detent Lever & Shaft Position Switch Assembly
Courtesy of GENERAL MOTORS CORP.

2. Remove the manual shaft detent lever hub pin (1) using **DT-48550** . See **Special Tools** .
3. Remove the manual shift shaft pin (5). Discard the pin.
4. Remove the manual shaft (2).

NOTE: **Disconnect the actuator rod (3) from the detent lever assembly. Do not remove the actuator rod from the transmission case.**

5. Remove the manual shaft detent (w/shift position switch) lever assembly (4).

Installation Procedure

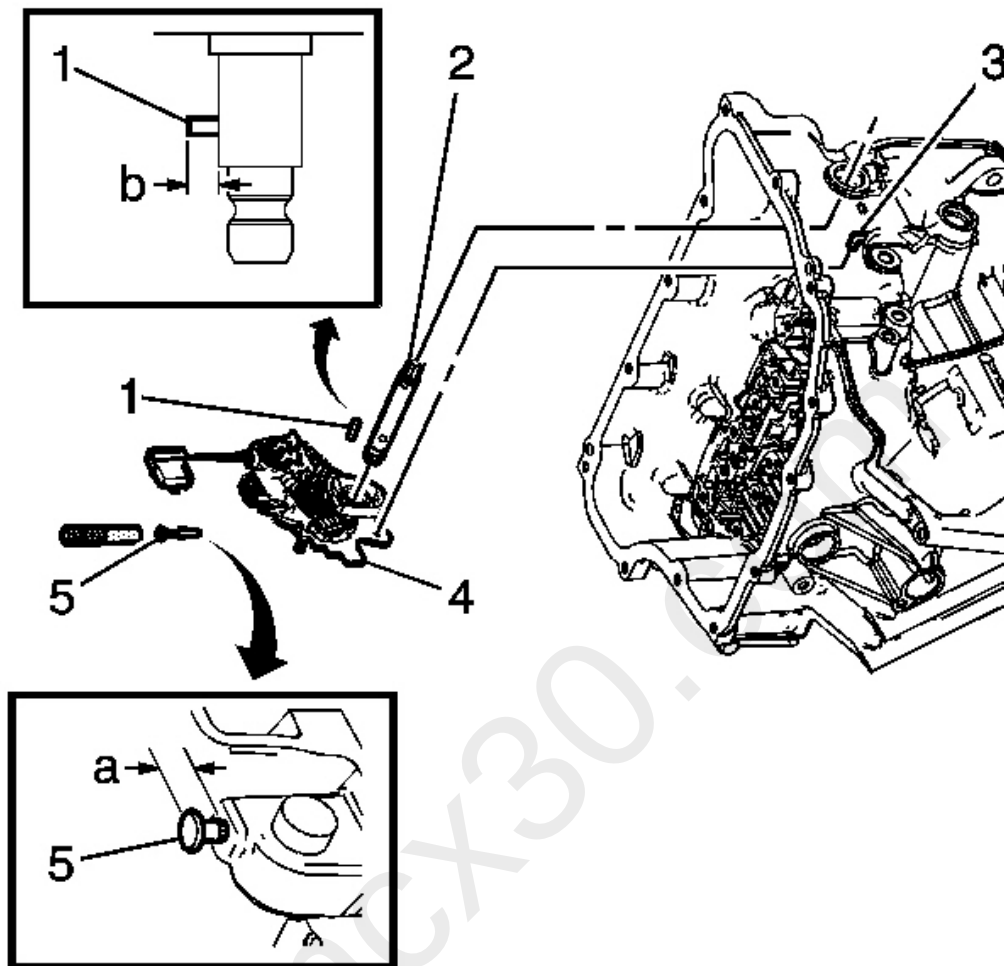


Fig. 2: Identifying Manual Shaft Detent (W/Shift Position Switch) Lever Assembly
 Courtesy of GENERAL MOTORS CORP.

NOTE: Connect the actuator rod (3) to the detent lever assembly.

1. Install the manual shaft detent (w/shift position switch) lever assembly (4).

NOTE: Lubricate the shaft with automatic transmission fluid to prevent damage to the manual shift shaft seal during installation.

2. Install the manual shaft (2).
3. Install the manual shaft detent lever hub pin (1) using **DT-48550** . See **Special Tools** .

Specification: Install the Manual Shaft Detent Lever Hub Pin to height of (b) 7.9 mm (0.38 in).

CAUTION: Use the manual shaft pin installer to install the pin at the correct height in order to properly secure the manual shaft. If you install the pin too deep, the case bore may crack.

4. Install the NEW manual shift shaft pin (5) using **J 41229** . See **Special Tools** . Use a NEW pin to ensure proper engagement with the case.

Specification: Inspect pin installed height is within (a) 7.2-8.2 mm (0.28-0.32 in).

5. Install the control valve body. Refer to **Control Valve Body Replacement**.
6. Perform the transmission adaptive values learn procedure. Refer to **Transmission Adaptive Values Learn** .

TRANSMISSION CONTROL LEVER KNOB REPLACEMENT

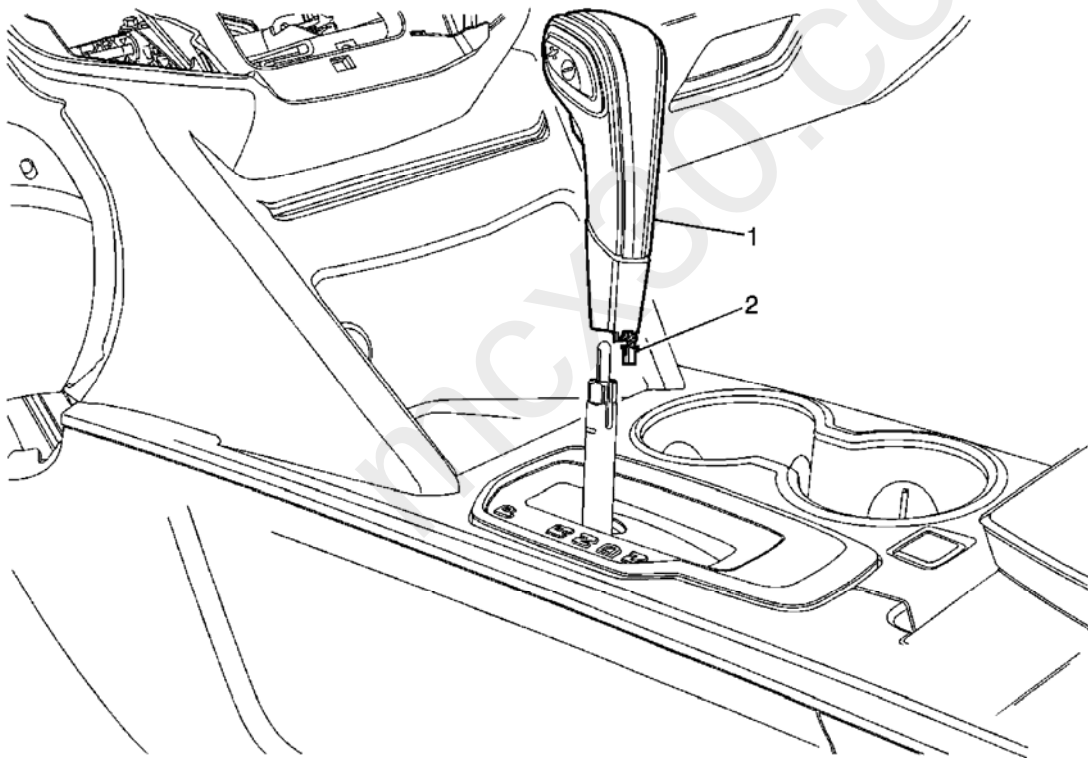


Fig. 3: Transmission Control Lever Knob
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Shift Control Knob Tip: Pull knob up off shift lever. Considerable effort may be required to remove knob from

	shift control lever. Place shift lever in the Neutral position.
2	Shift Control Connector Tip: To install, use a small flat tool to push connector into receiving connector.

TRANSMISSION CONTROL REPLACEMENT

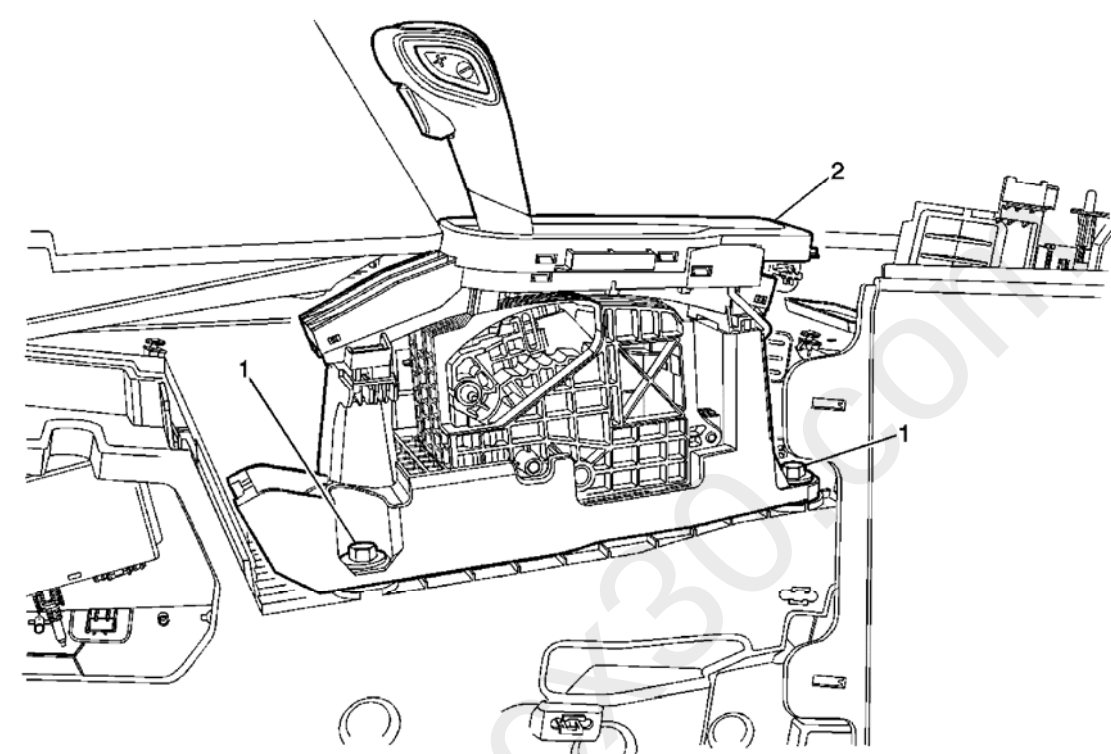


Fig. 4: Transmission Control
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the front floor console accessory trim plate. Refer to <u>Front Floor Console Accessory Trim Plate Replacement</u> . 2. Remove the left front lower console side finish cover. Refer to <u>Front Floor Lower Console Side Finish Cover Replacement - Left Side (Equinox)</u> or <u>Front Floor Lower Console Side Finish Cover Replacement - Left Side (Terrain)</u> . 3. Disconnect the range selector lever cable. Refer to <u>Range Selector Lever Cable Replacement</u>. 4. Disconnect the transmission control electrical connectors. 5. Remove the screws security upper control structures to lower console. Lift upon structure to allow shifter to clear.	
	Transmission Control Fasteners (Qty: 3)

1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 25 N.m (18 lb ft).
2	Transmission Control

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.

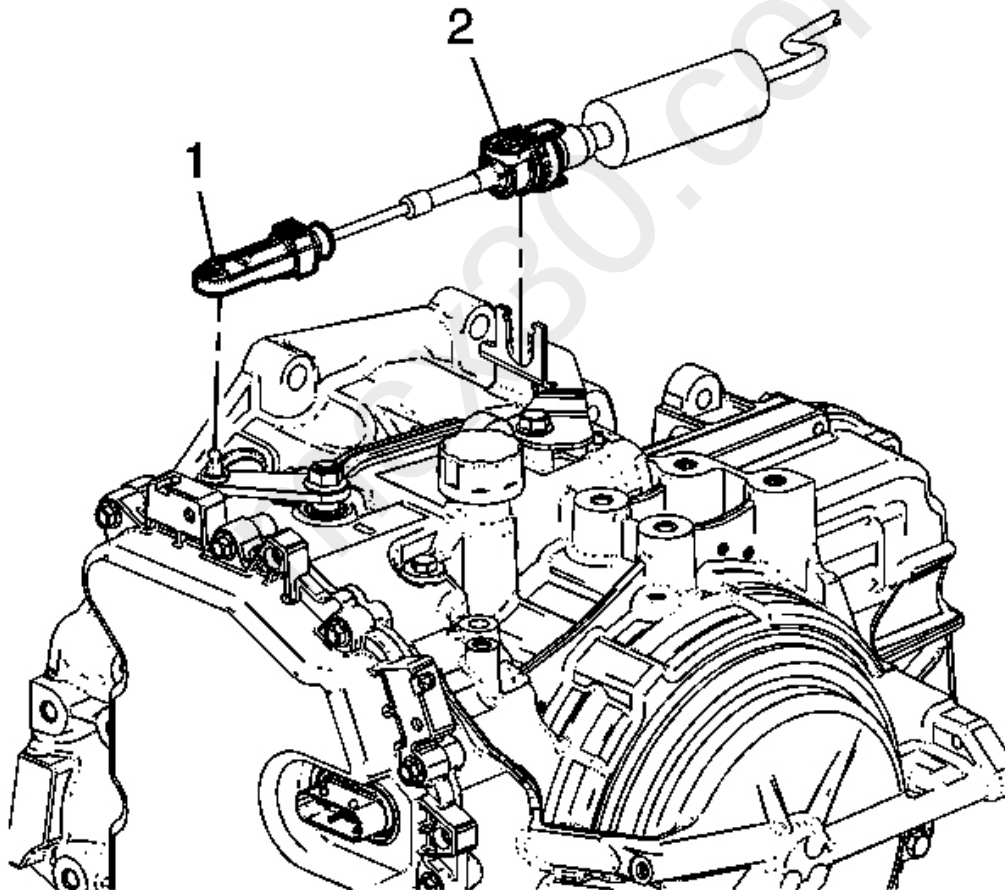


Fig. 5: View Of Transmission Range Selector Lever & Cable Connection
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the transmission range selector lever cable terminal (1) from the transmission manual shift lever pin.
3. Press the locking tabs inward in order to release the transmission range selector lever cable (2) from the cable bracket.

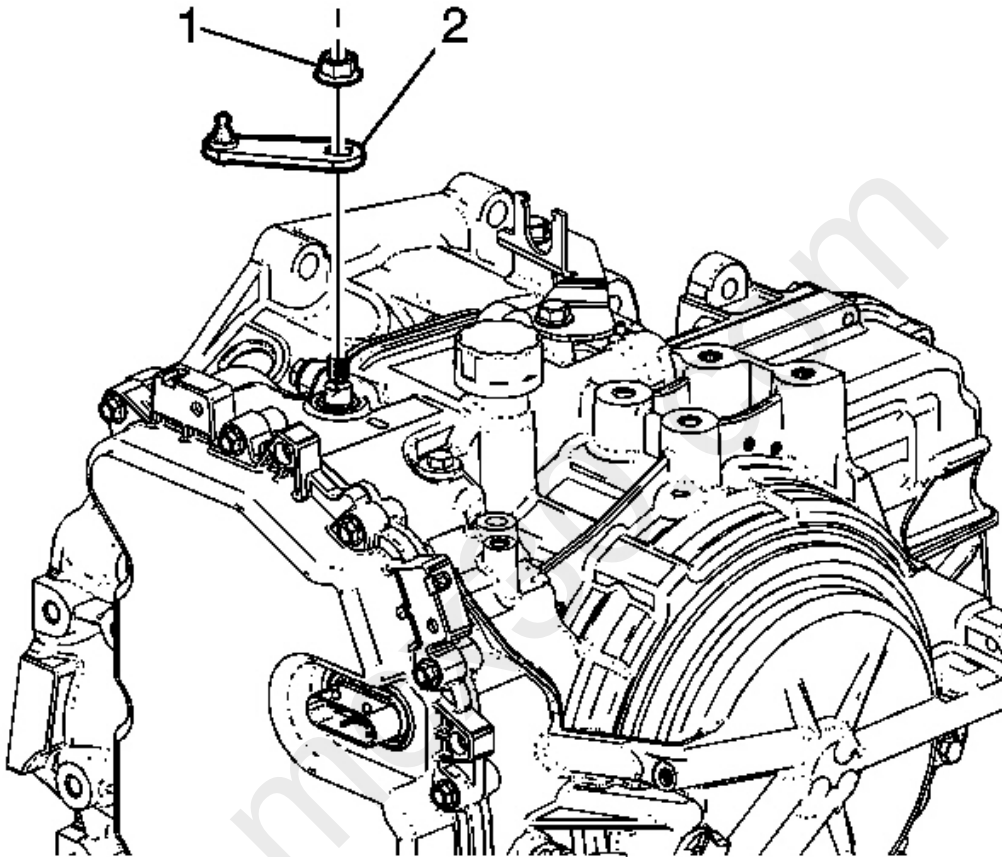


Fig. 6: View Of Transmission Range Selector Lever
Courtesy of GENERAL MOTORS CORP.

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.

4. Remove the transmission range selector lever nut (1).
5. Remove the transmission range selector lever (2).

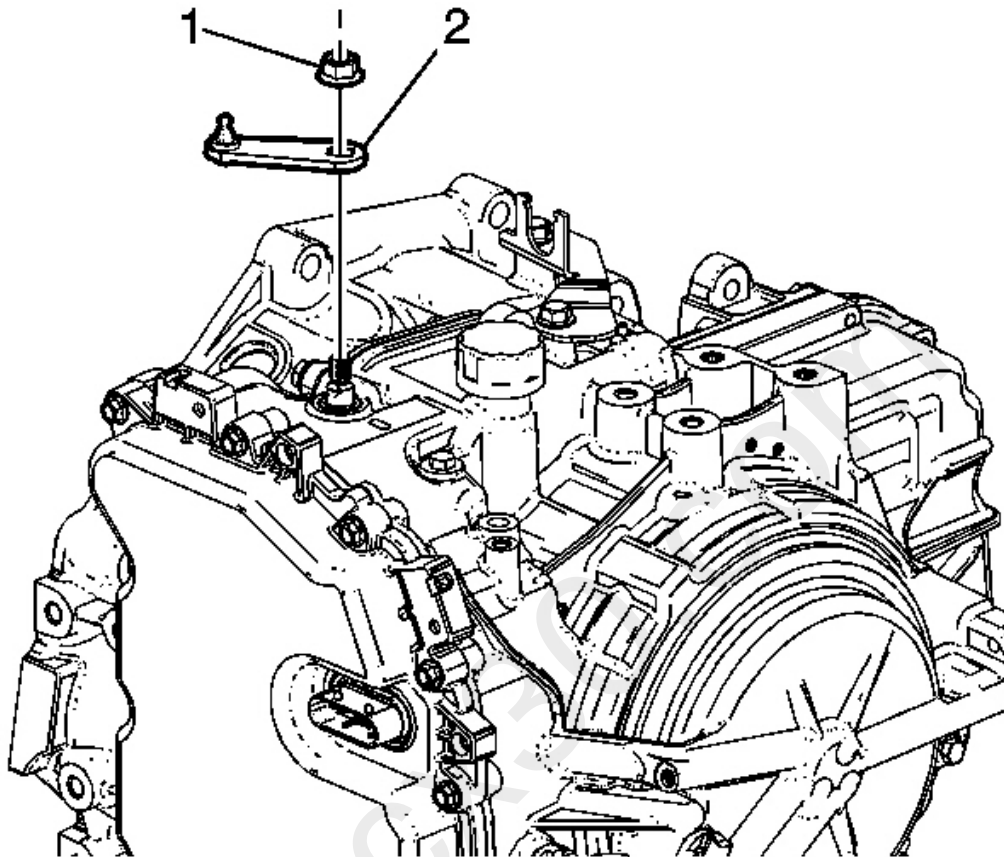


Fig. 7: View Of Transmission Range Selector Lever
Courtesy of GENERAL MOTORS CORP.

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.

1. Install the transmission range selector lever (2).

CAUTION: Refer to Fastener Caution .

2. Install the transmission range selector lever nut (1) and tighten to 30 N.m (22 lb ft).

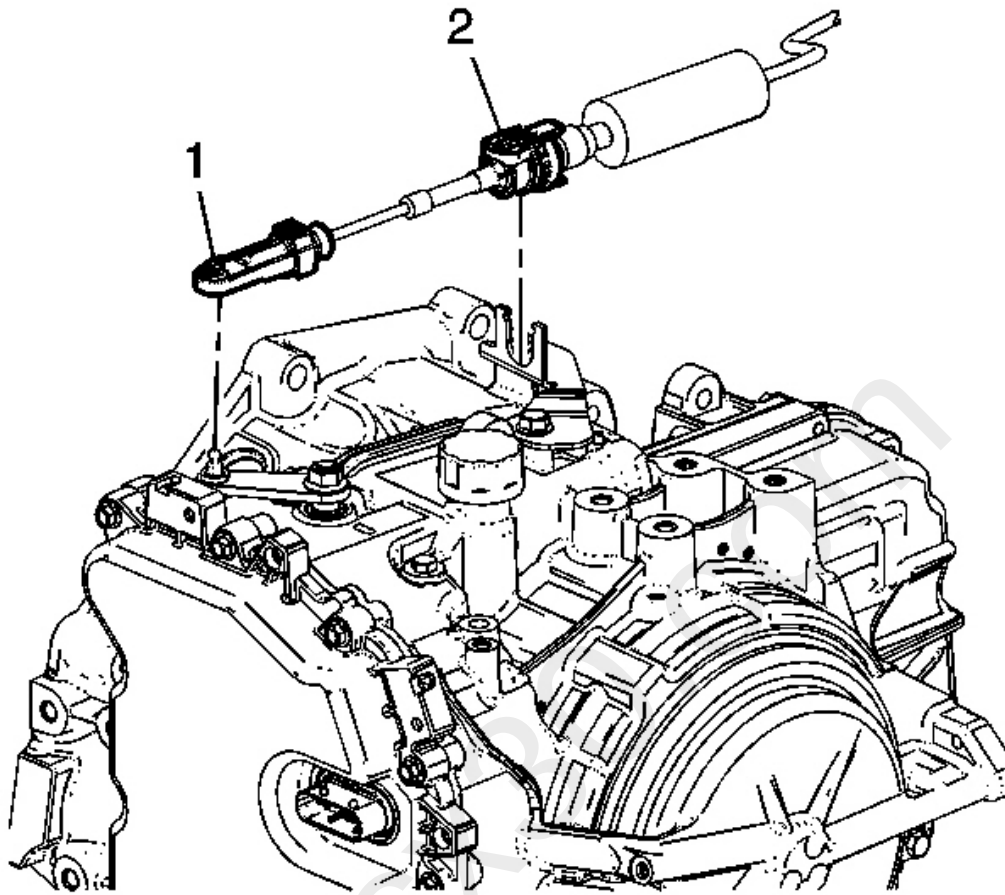


Fig. 8: View Of Transmission Range Selector Lever & Cable Connection
Courtesy of GENERAL MOTORS CORP.

3. Install the transmission range selector lever cable (2) to the cable bracket.
4. Connect the transmission range selector lever cable terminal (1) to the transmission manual shift lever pin.
5. Check the range selector cable adjustment. Refer to **Range Selector Lever Cable Adjustment**.

RANGE SELECTOR LEVER CABLE REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.

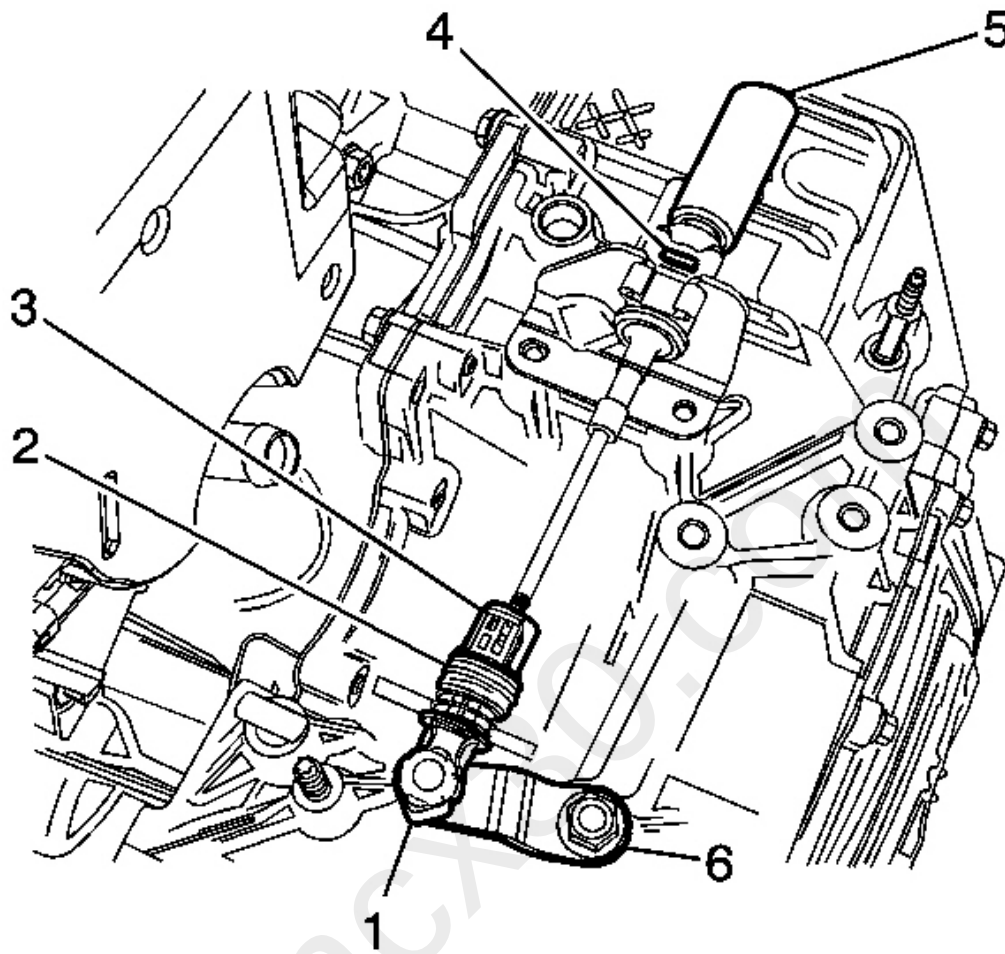


Fig. 9: Transmission Range Selector Lever Components
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the transmission range selector lever cable terminal (1) from the transmission manual shift lever pin (6).
3. Slide the retainer (4) rearward to release the transmission range selector lever cable from the bracket.
4. Remove the left front floor lower console extension. Refer to **Front Floor Lower Console Side Finish Cover Replacement - Left Side (Equinox)** or **Front Floor Lower Console Side Finish Cover Replacement - Left Side (Terrain)** .

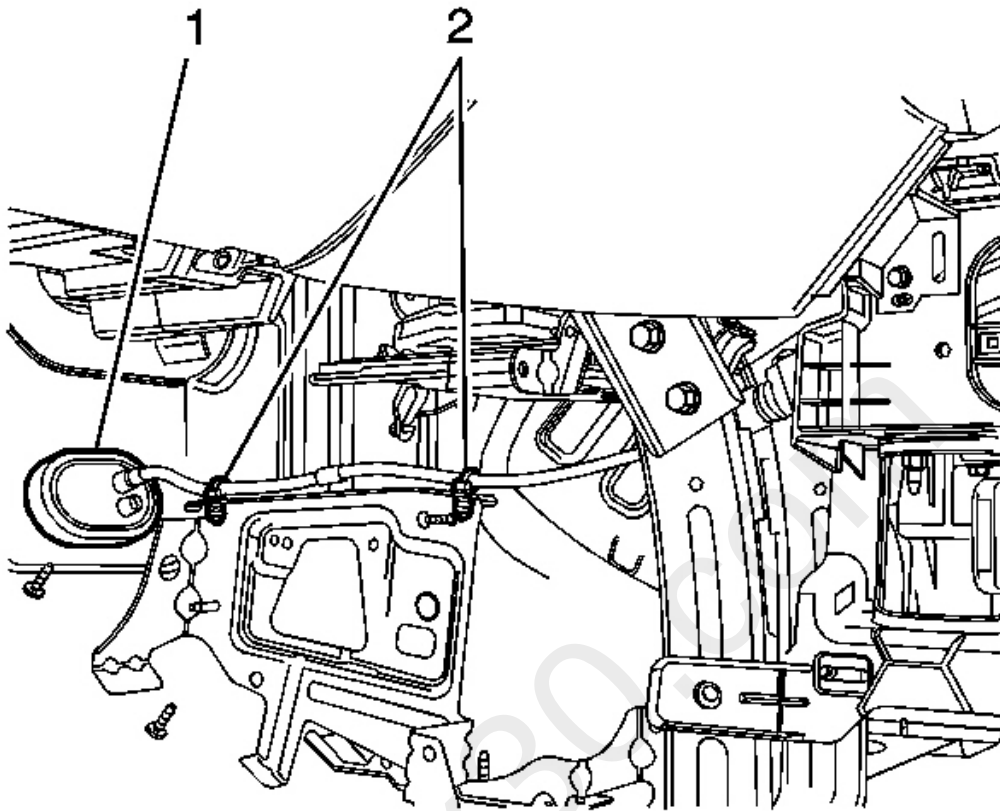


Fig. 10: Transmission Range Selector Lever Cable Retainers & Grommet
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the transmission range selector lever cable retainers (2) from the support bracket.
6. Remove the grommet (1) and cable assembly from the floor panel.

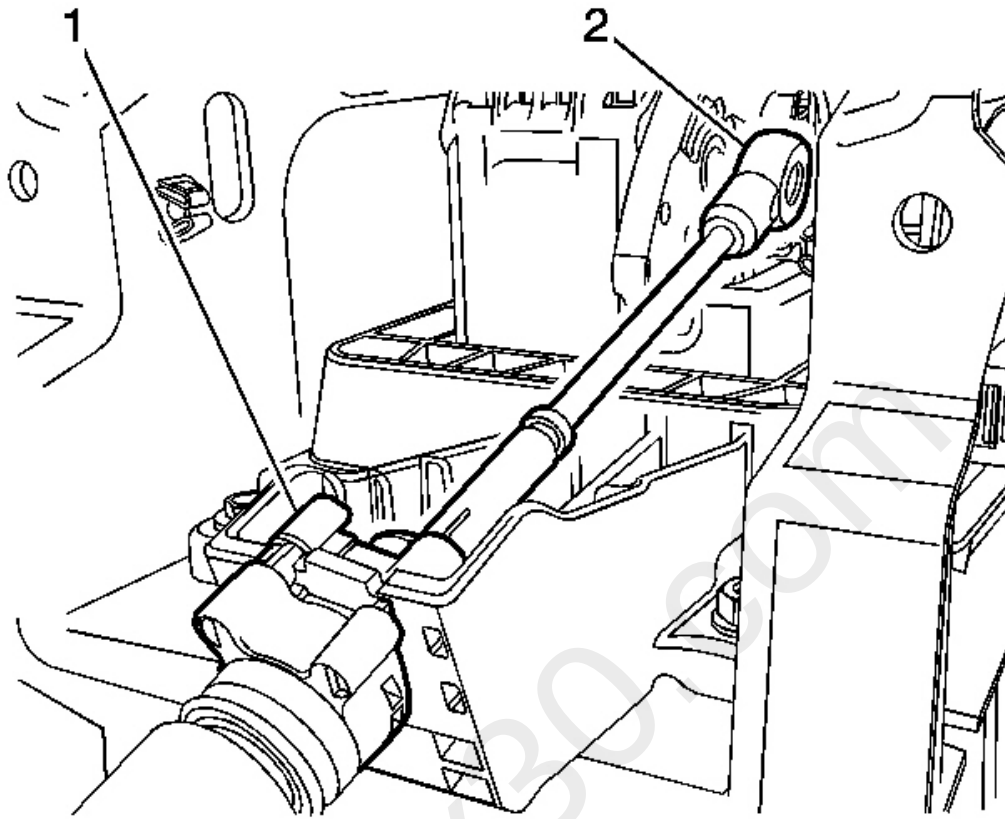


Fig. 11: Transmission Range Selector Lever Cable Retainer & Terminal
Courtesy of GENERAL MOTORS CORP.

7. Slide the transmission range selector lever cable retainer forward (1) and remove the transmission range selector cable from the transmission control base.
8. Disconnect the transmission range selector lever cable terminal (2) from the shift lever pin.
9. Remove the transmission range selector lever cable from the vehicle.

Installation Procedure

1. Install the transmission range selector lever cable in the vehicle.

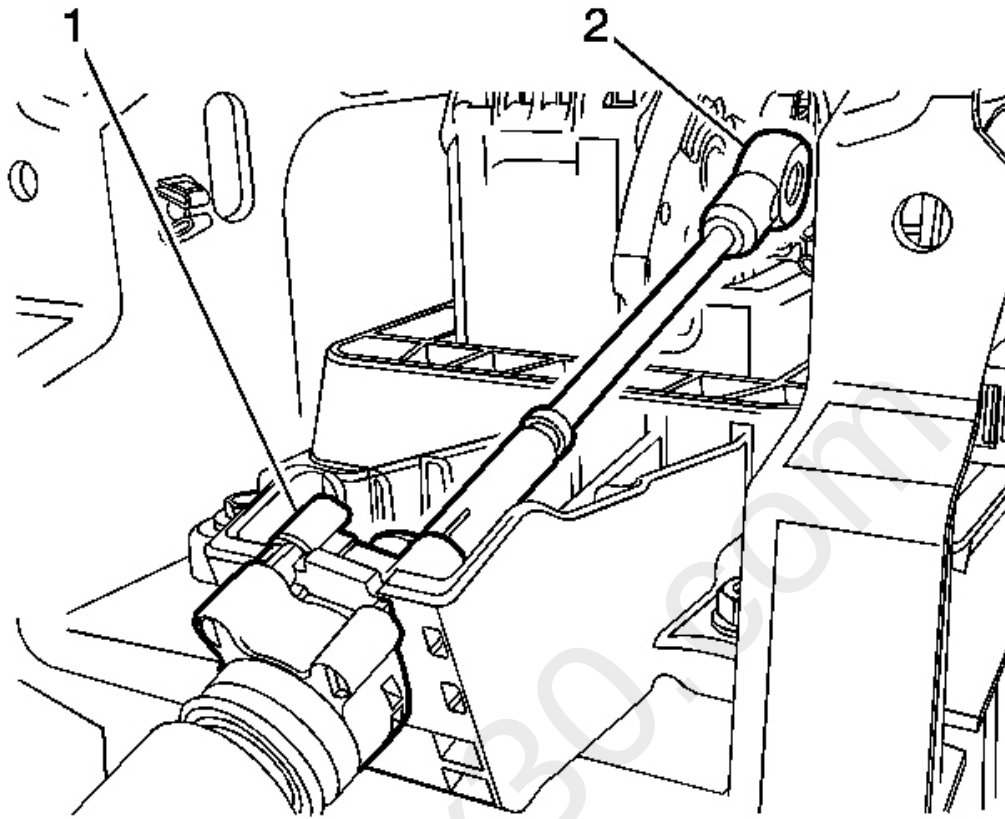


Fig. 12: Transmission Range Selector Lever Cable Retainer & Terminal
Courtesy of GENERAL MOTORS CORP.

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

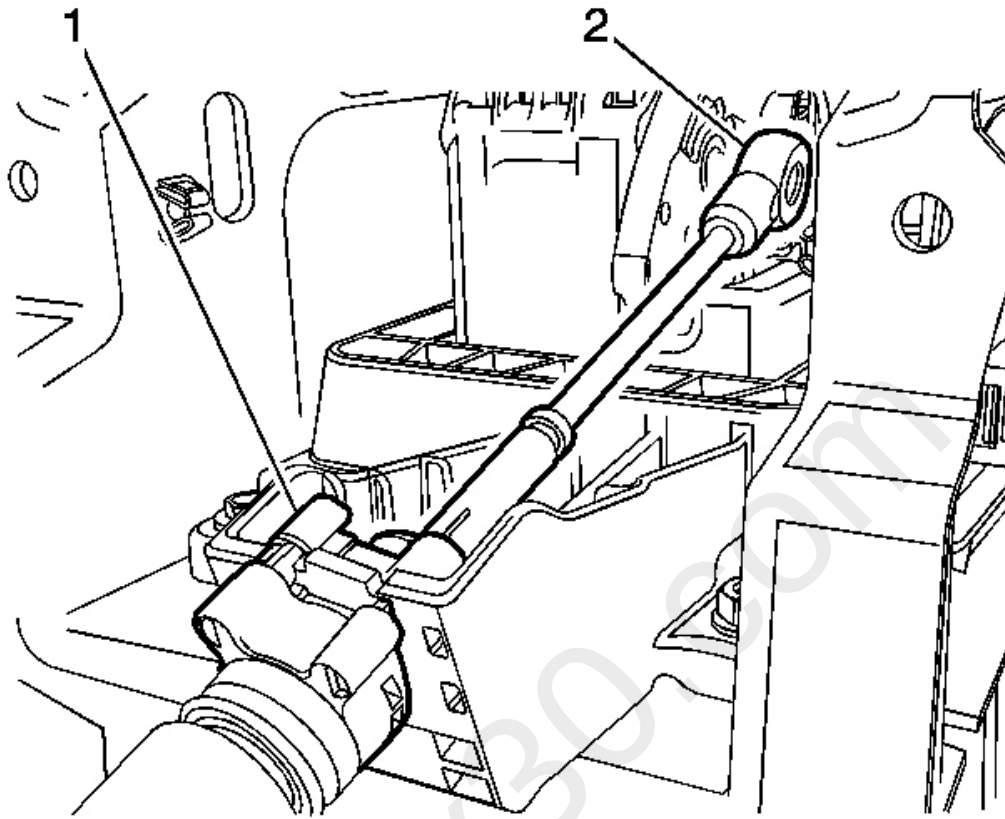


Fig. 13: Transmission Range Selector Lever Cable Retainer & Terminal
Courtesy of GENERAL MOTORS CORP.

3. Install the transmission range selector cable to the transmission control base, then slide the transmission range selector lever cable retainer rearward (1) to lock the cable in place.

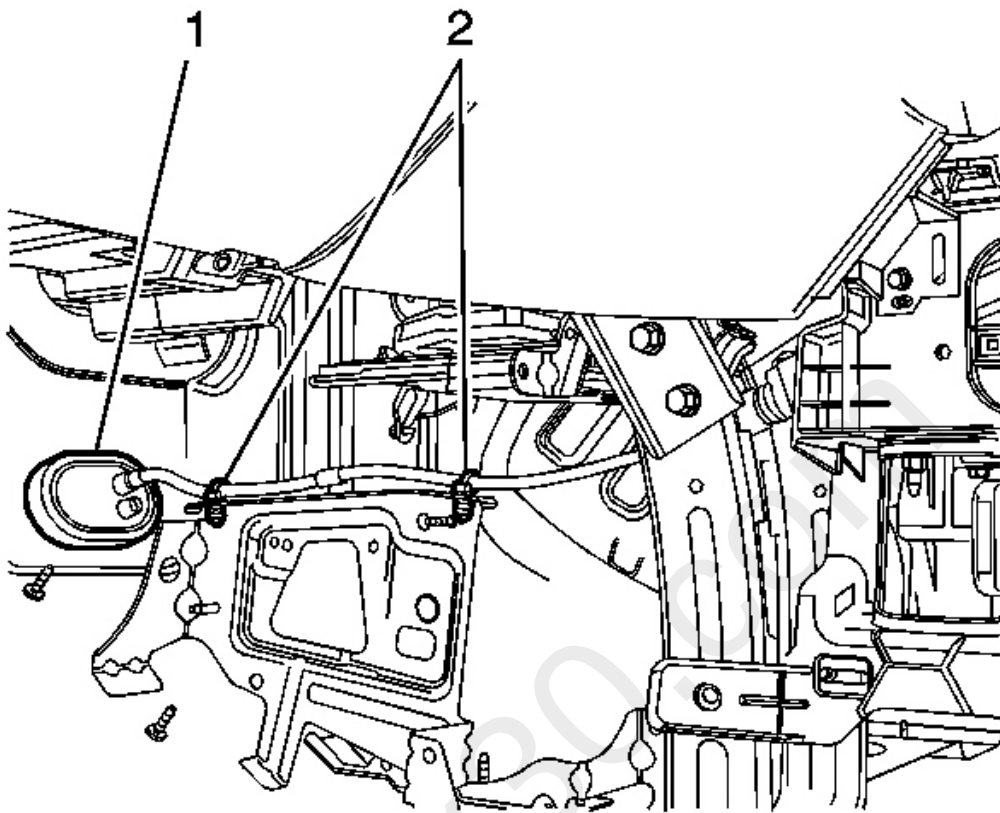


Fig. 14: Transmission Range Selector Lever Cable Retainers & Grommet
Courtesy of GENERAL MOTORS CORP.

4. Install the grommet (1) and cable assembly into the floor panel.
5. Connect the transmission range selector lever cable retainers (2) to the support bracket.
6. Install the front floor console extension. Refer to **Front Floor Lower Console Side Finish Cover Replacement - Left Side (Equinox)** or **Front Floor Lower Console Side Finish Cover Replacement - Left Side (Terrain)** .

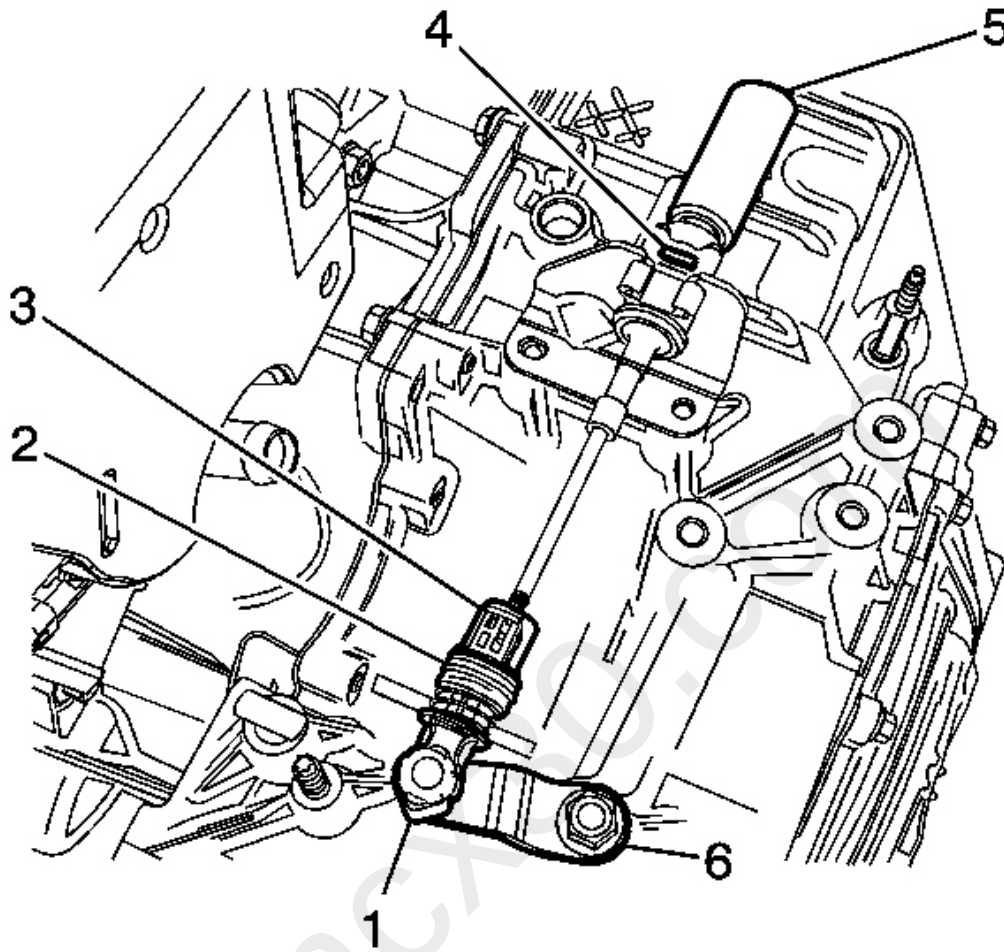


Fig. 15: Transmission Range Selector Lever Components
Courtesy of GENERAL MOTORS CORP.

7. Connect the transmission range selector lever cable terminal (1) to the transmission manual shift lever pin (6).
8. Install the cable in the bracket, then slide the retainer (4) forward to lock the transmission range selector lever cable in the bracket.
9. Adjust the cable. Refer to **Range Selector Lever Cable Adjustment**

RANGE SELECTOR LEVER CABLE ADJUSTMENT

NOTE: Adjust the automatic transmission range selector cable while the transmission and the gear selector are in the Park position only. Failure to

do so may cause mis-adjustment.

1. Set the park brake and chock the wheels.
2. Verify the transmission range select lever is in the park position.
3. Verify the transmission manual shift lever is in the park position.

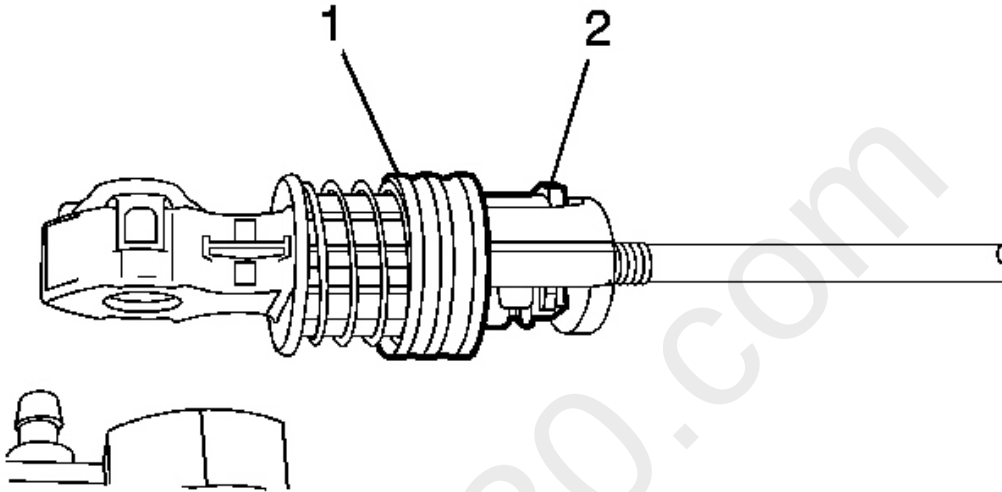


Fig. 16: Releasing Range Select Cable Adjuster Clip
Courtesy of GENERAL MOTORS CORP.

4. Pull the retaining collar (1) forward, then release the range select cable adjuster clip (2).

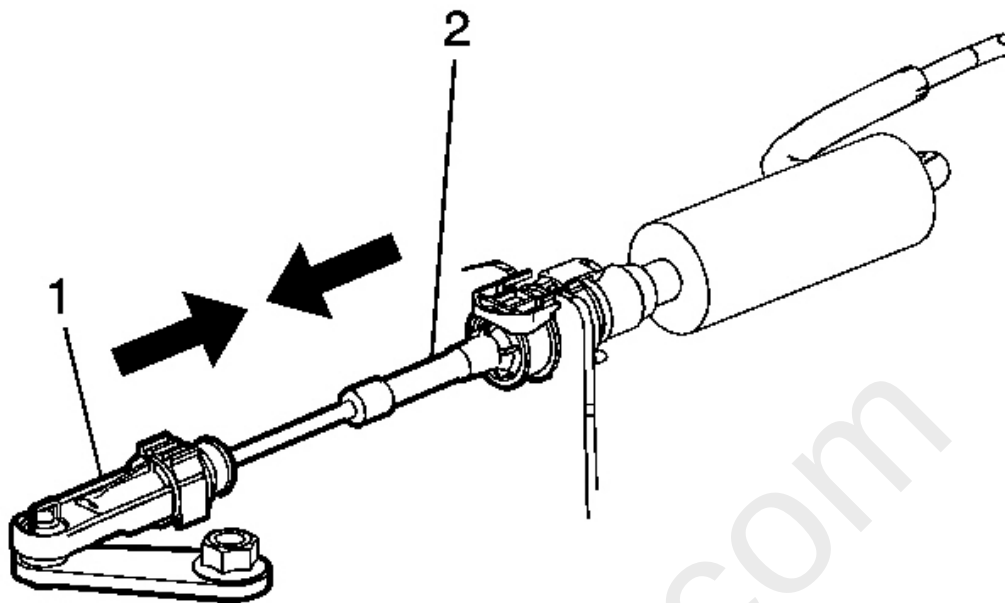


Fig. 17: Sliding Range Selector Halves Together
Courtesy of GENERAL MOTORS CORP.

5. Slide the two halves (1, 2) of the range select cable together until all free play is removed.

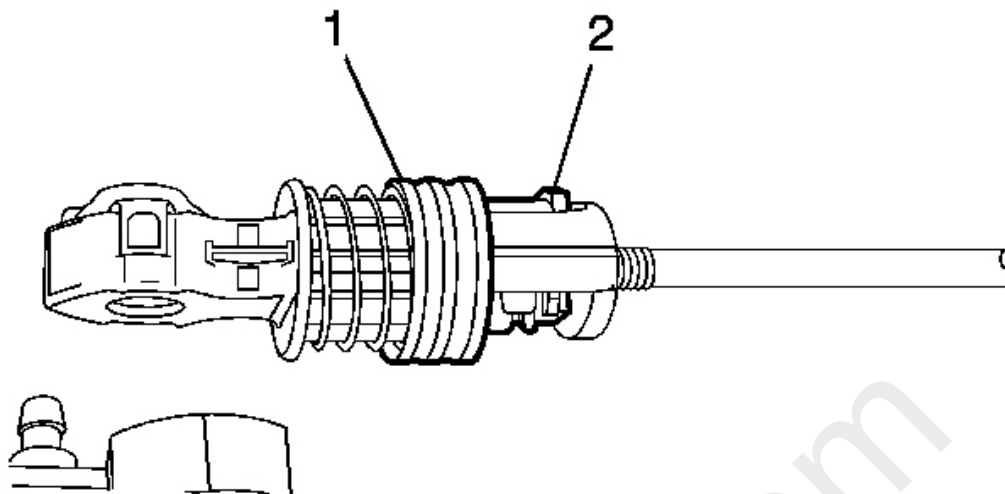


Fig. 18: Releasing Retaining Collar
Courtesy of GENERAL MOTORS CORP.

6. Depress the adjuster clip (1) locking the adjuster clip completely, then release the retaining collar.
7. Pull both halves of the range select cable in opposite directions to verify the cable adjuster is secured.
8. Check the transmission range select lever in all gear selections for proper operation.

RANGE SELECTOR LEVER CABLE BRACKET REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.

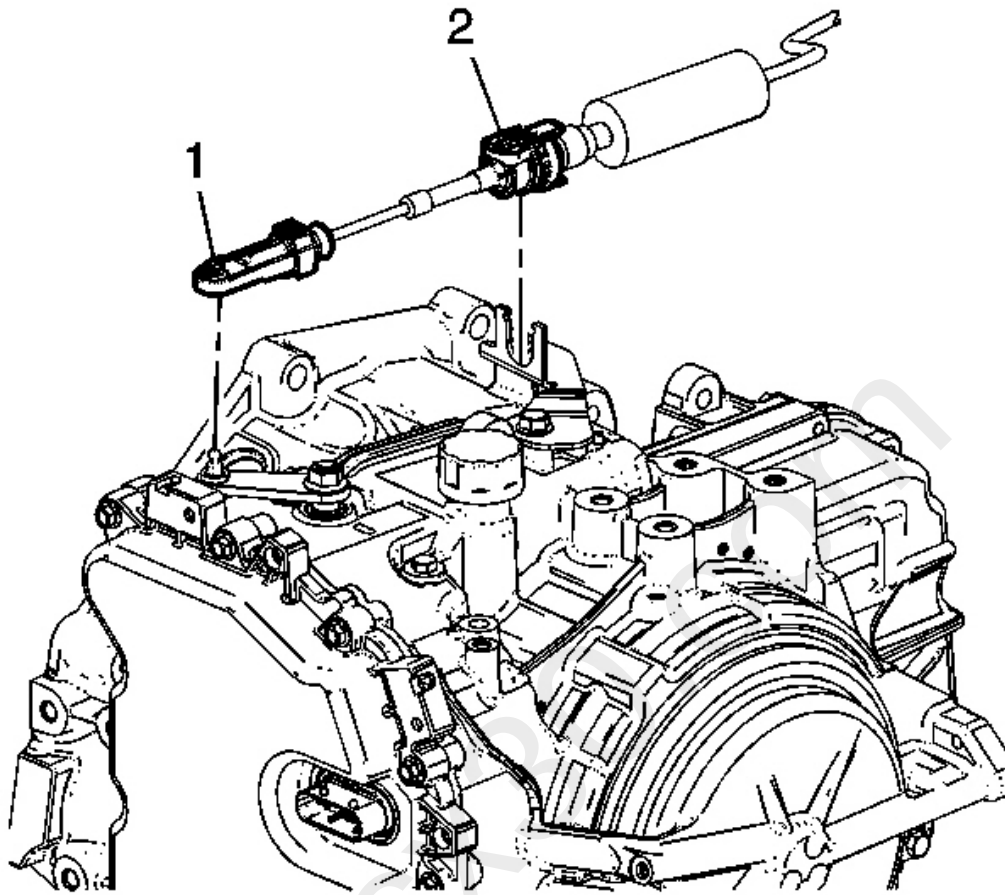


Fig. 19: View Of Transmission Range Selector Lever & Cable Connection
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the range selector cable end (1) from the range selector lever.
3. Disconnect the range selector cable (2) from the range selector cable bracket.

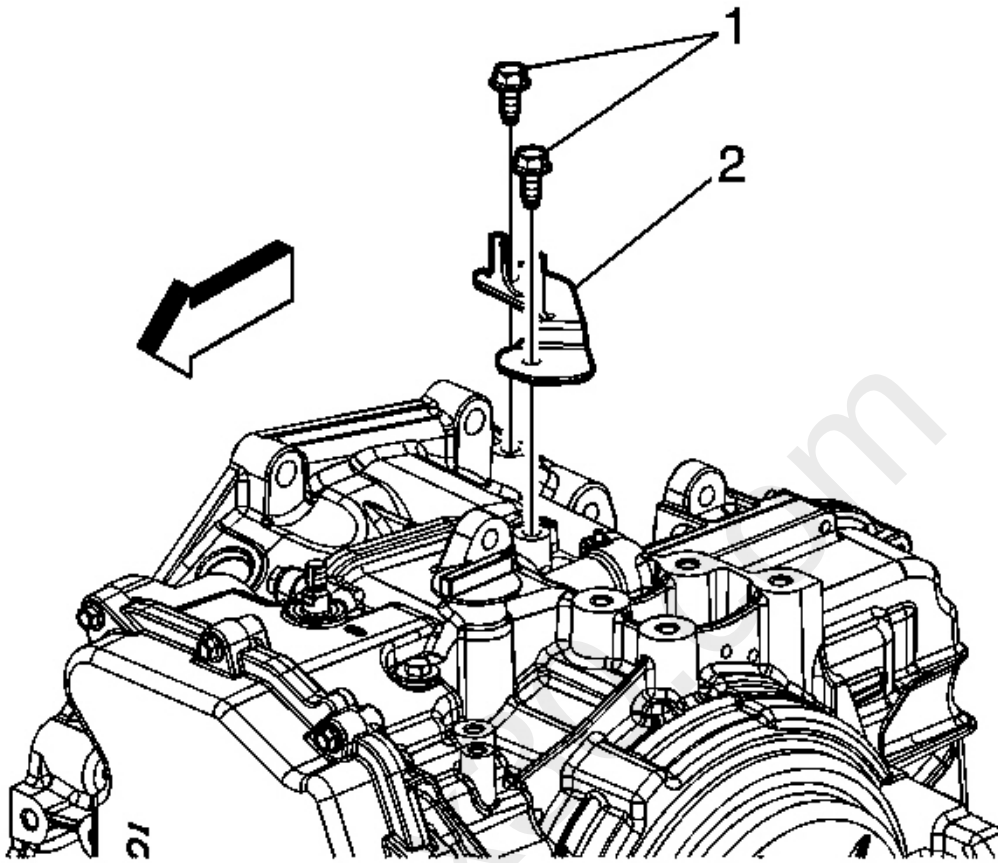


Fig. 20: Identifying Selector Cable Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

4. Remove the transmission range selector cable bracket bolts (1).
5. Remove the transmission range selector cable bracket (2).

Installation Procedure

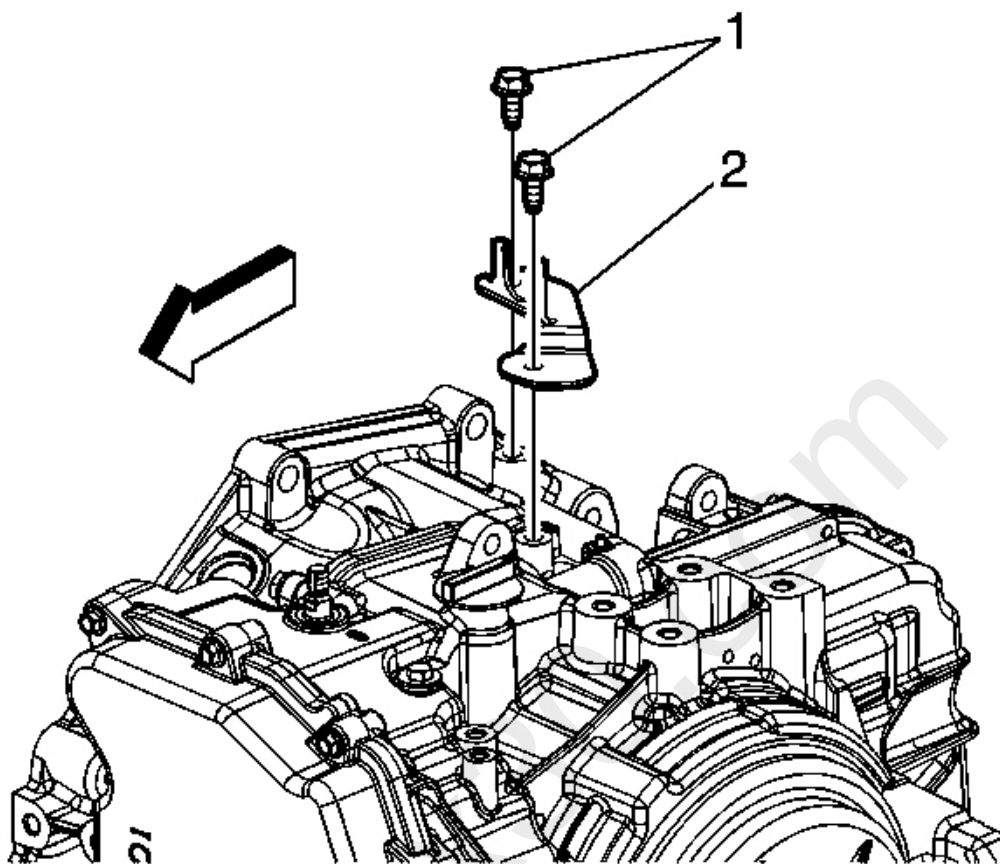


Fig. 21: Identifying Selector Cable Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the transmission range selector cable bracket (2).

CAUTION: Refer to Fastener Caution .

2. Install the transmission range selector cable bracket bolts (1) and tighten to 25 N.m (18 lb ft).

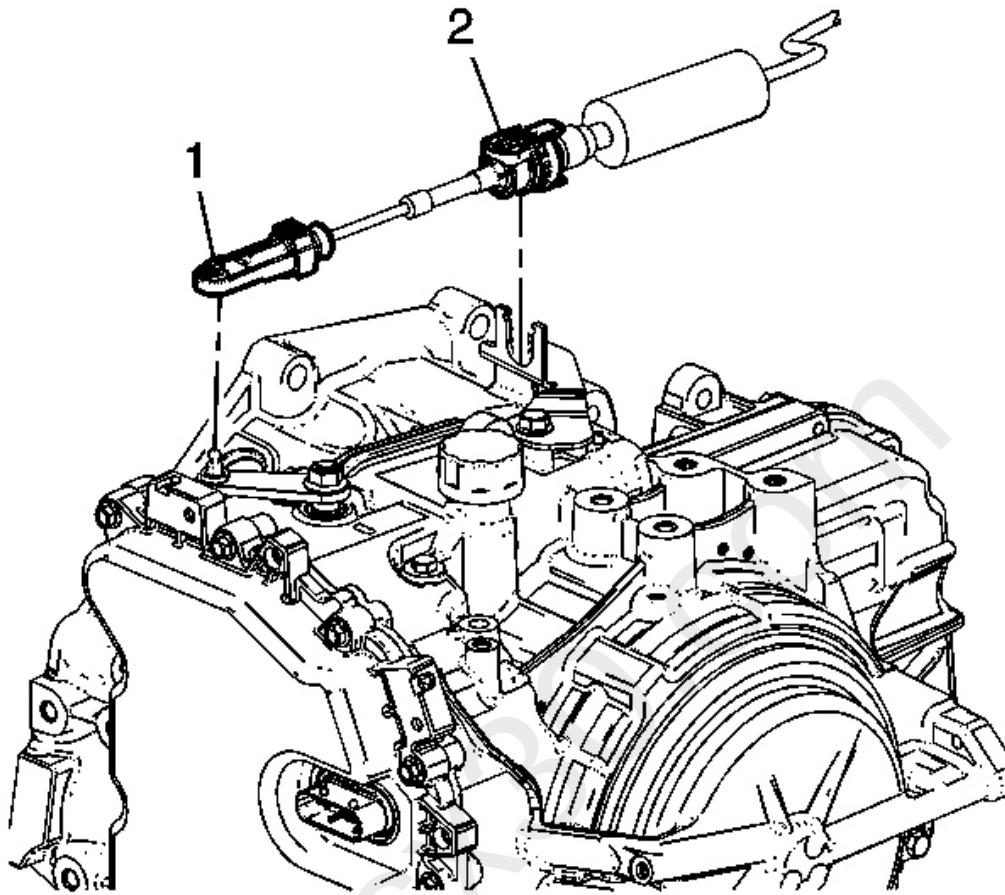


Fig. 22: View Of Transmission Range Selector Lever & Cable Connection
Courtesy of GENERAL MOTORS CORP.

3. Connect the range selector cable (2) to the range selector cable bracket.
4. Connect the range selector cable end (1) to the range selector lever.
5. Check the range selector cable adjustment. Refer to **Range Selector Lever Cable Adjustment**.

TRANSMISSION FLUID REPLACEMENT

Removal Procedure

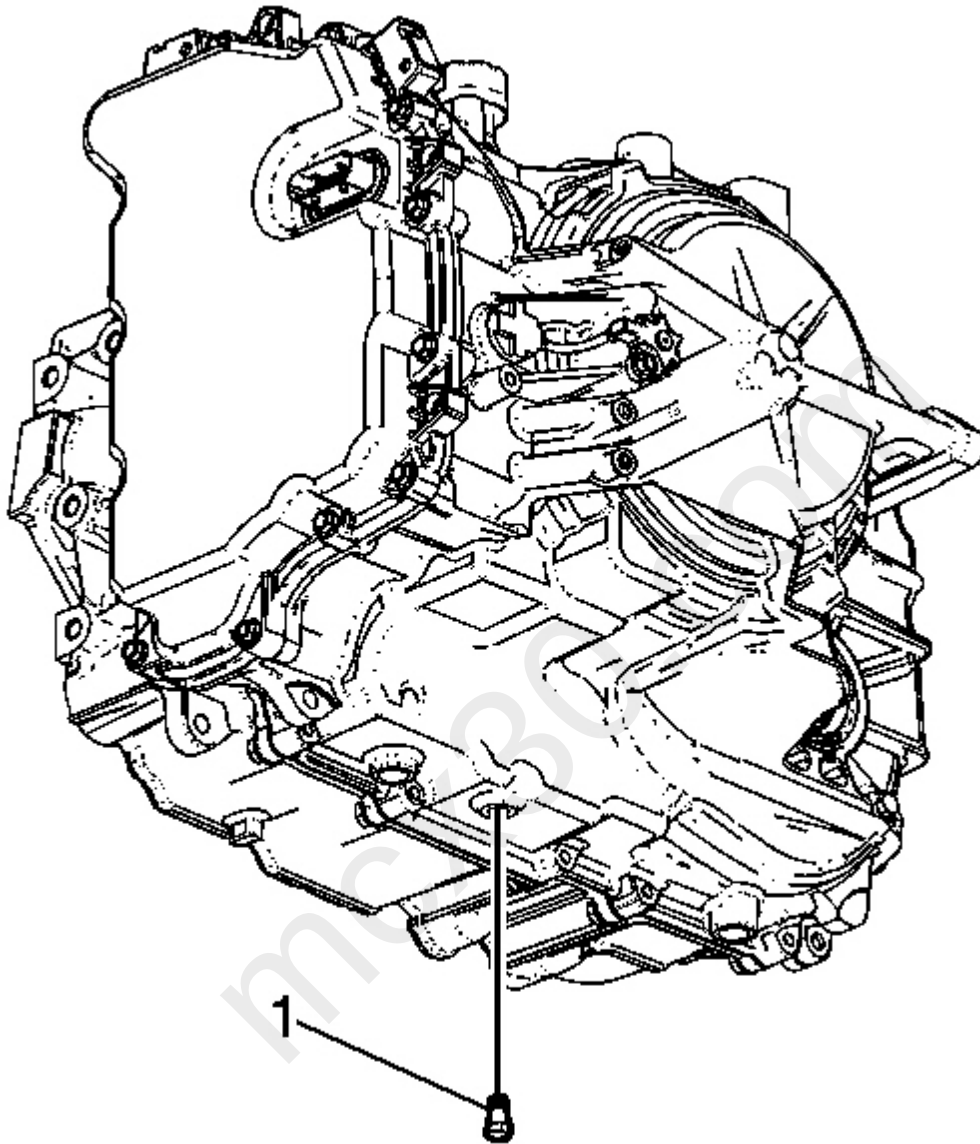


Fig. 23: Identifying Fluid Level Drain Plug
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the fluid drain plug (1).
3. Drain transmission fluid into a suitable container.

CAUTION: Refer to Component Fastener Tightening Caution .

4. Install the fluid drain plug (1) and tighten to 12 N.m (106 lb in).

Installation Procedure

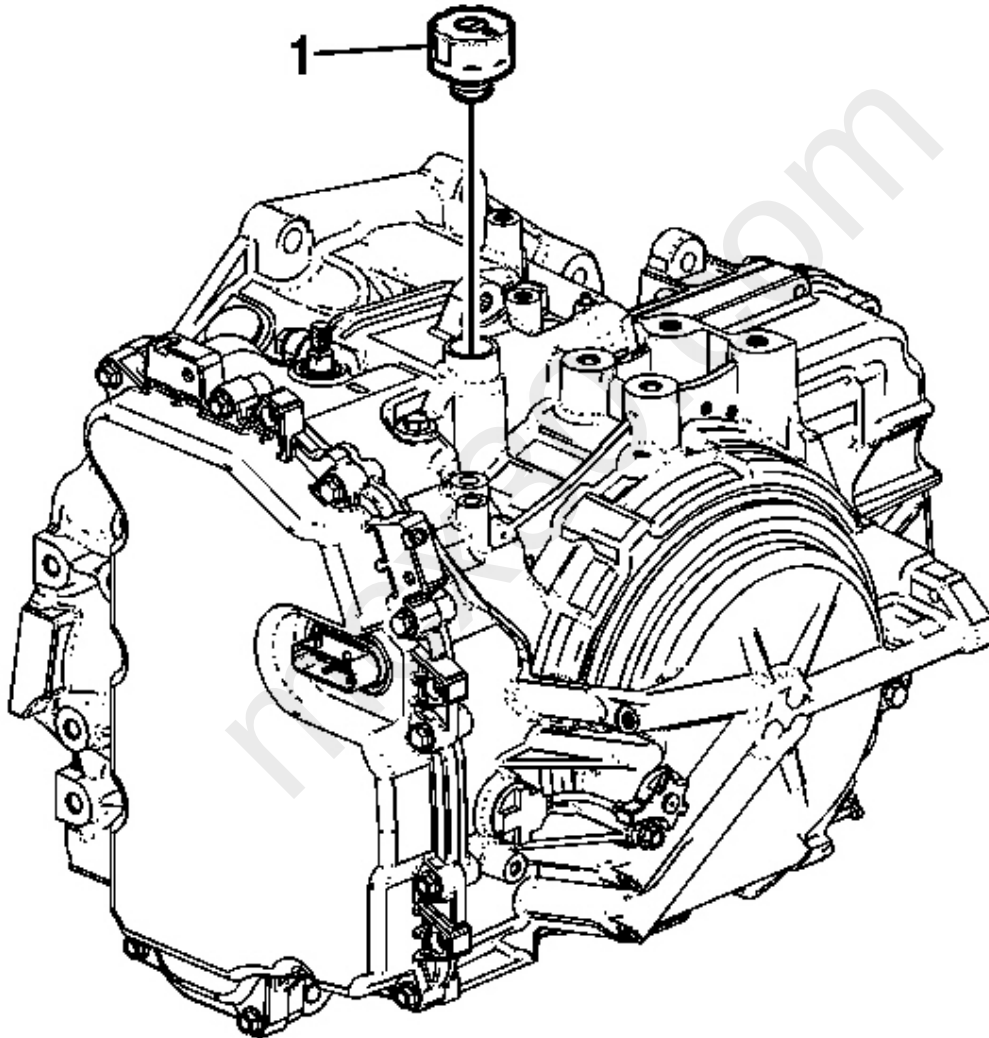


Fig. 24: Identifying Fluid Fill Cap
Courtesy of GENERAL MOTORS CORP.

1. Lower the vehicle.
2. Remove the fluid fill cap (1).
3. Fill the transmission to the proper level with the correct fluid. Refer to **Transmission Fluid Level and Condition Check** and **Fluid Capacity Specifications (6T40/45/50)** .
4. Install the fluid fill cap (1).

TRANSMISSION FLUID COOLER PIPE CONNECTOR REPLACEMENT - RADIATOR

Removal Procedure

1. Drain the cooling system. Refer to **Cooling System Draining and Filling (Static)** or **Cooling System Draining and Filling (GE 47716)** .
2. Remove the transaxle oil cooler hoses from the oil cooler fittings on the radiator. Refer to **Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection** .

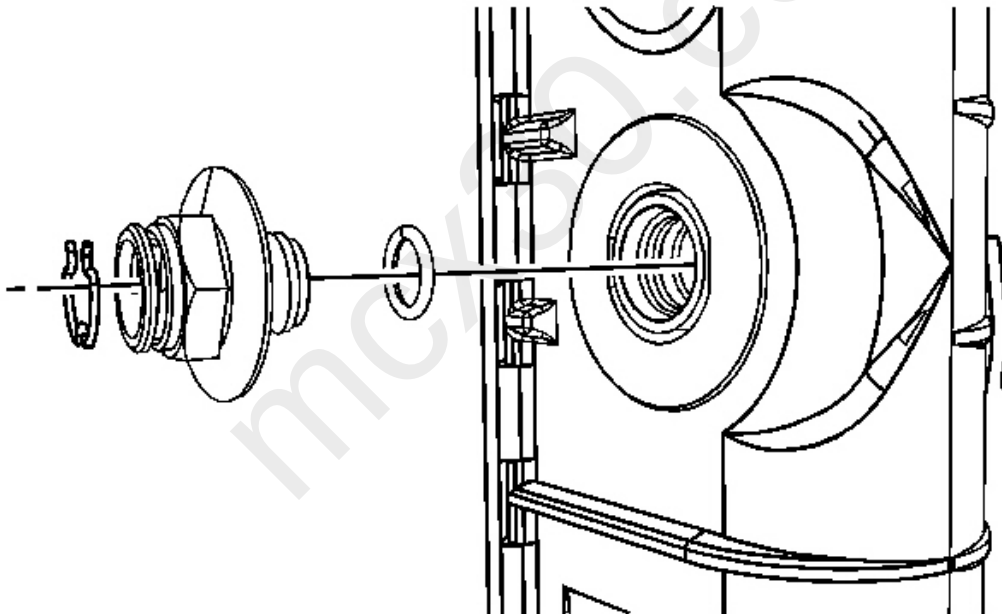


Fig. 25: View Of Oil Cooler Fitting At Radiator
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not remove the upper and lower transaxle oil cooler fittings from the radiator at the same time other wise the transaxle oil cooler will fall inside the radiator end tank.

3. Remove the oil cooler fitting from the radiator.

Installation Procedure

1. Inspect the new O-ring seals for cracks, cuts or damage. Replace if necessary.

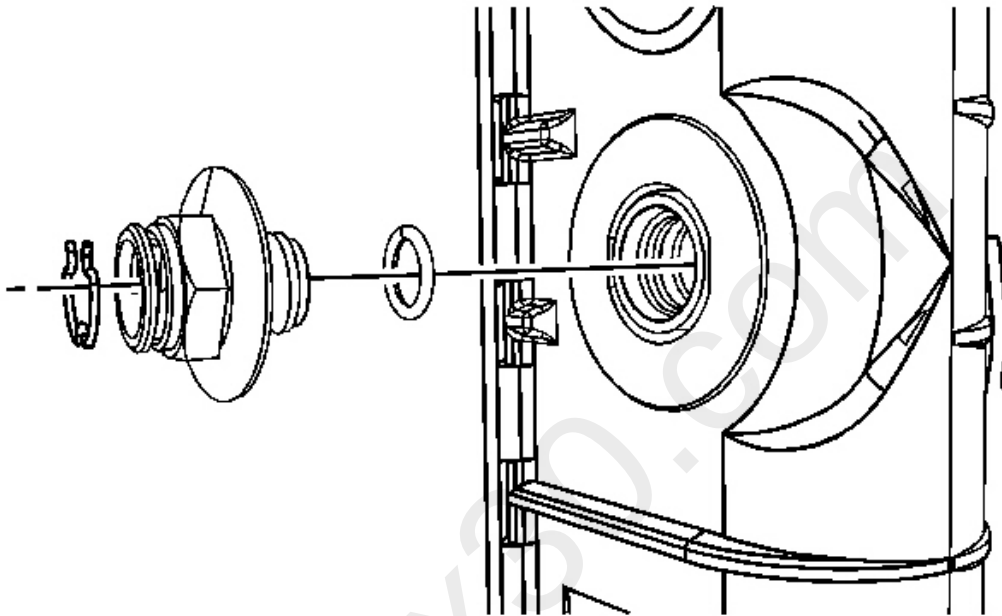


Fig. 26: View Of Oil Cooler Fitting At Radiator
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fastener Caution .

NOTE: **The correct thread engagement is critical. Cross-threaded fittings can achieve proper tightness and still leak.**

2. Install the oil cooler fitting to the radiator and tighten to 38 N.m (28 lb ft).
3. Install the transaxle oil cooler hoses to the oil cooler fittings on the radiator. Refer to Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection .
4. Fill the cooling system. Refer to Cooling System Draining and Filling (Static) or Cooling System Draining and Filling (GE 47716) .
5. Adjust the transmission fluid level.

6. Inspect for fluid leaks.

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

Removal Procedure

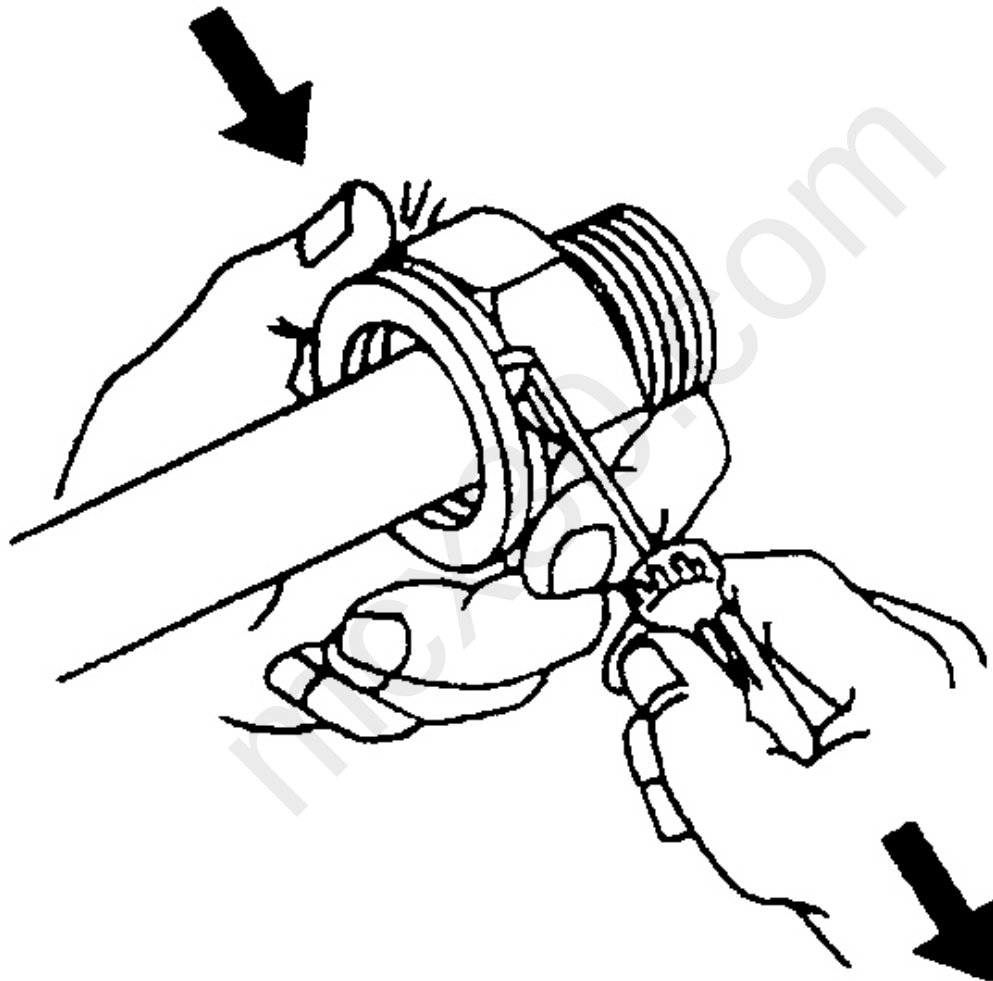


Fig. 27: Removing Retaining Ring For Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

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

the transmission.

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

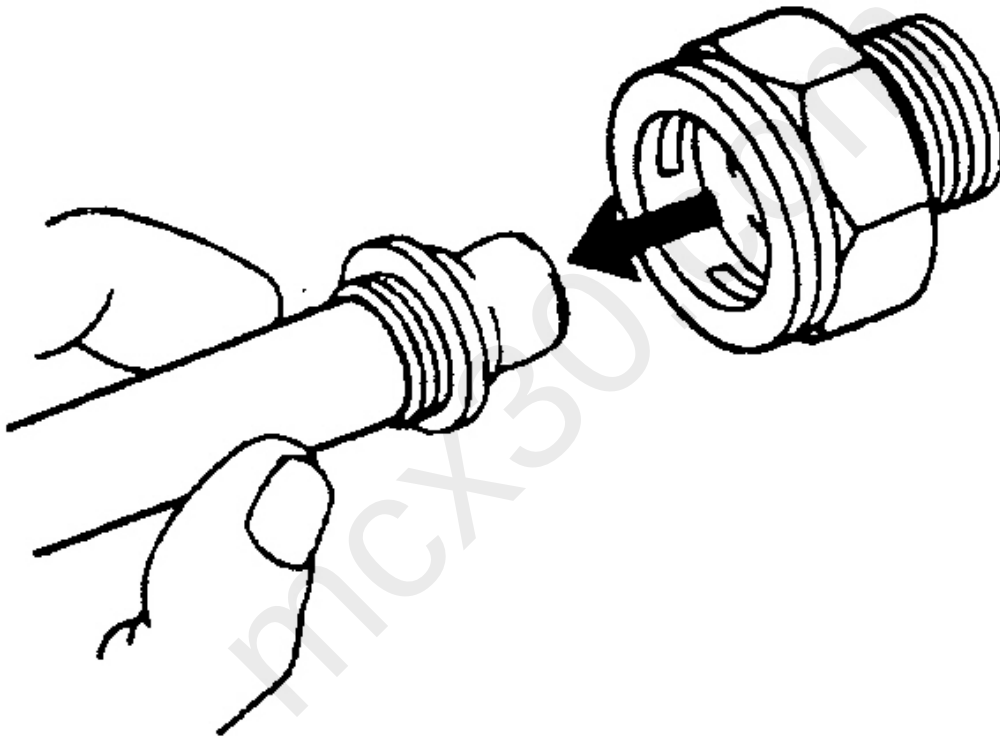


Fig. 28: Cooler Line & Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

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

Installation Procedure

IMPORTANT:

- Do not reuse any of the existing oil lines or oil line fittings if there is excessive corrosion.

- Do not reuse any of the existing retaining rings that were removed from the existing quick connect fittings. Install new retaining rings.
- Ensure the following procedures are performed when installing the new retaining rings onto the fittings.

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

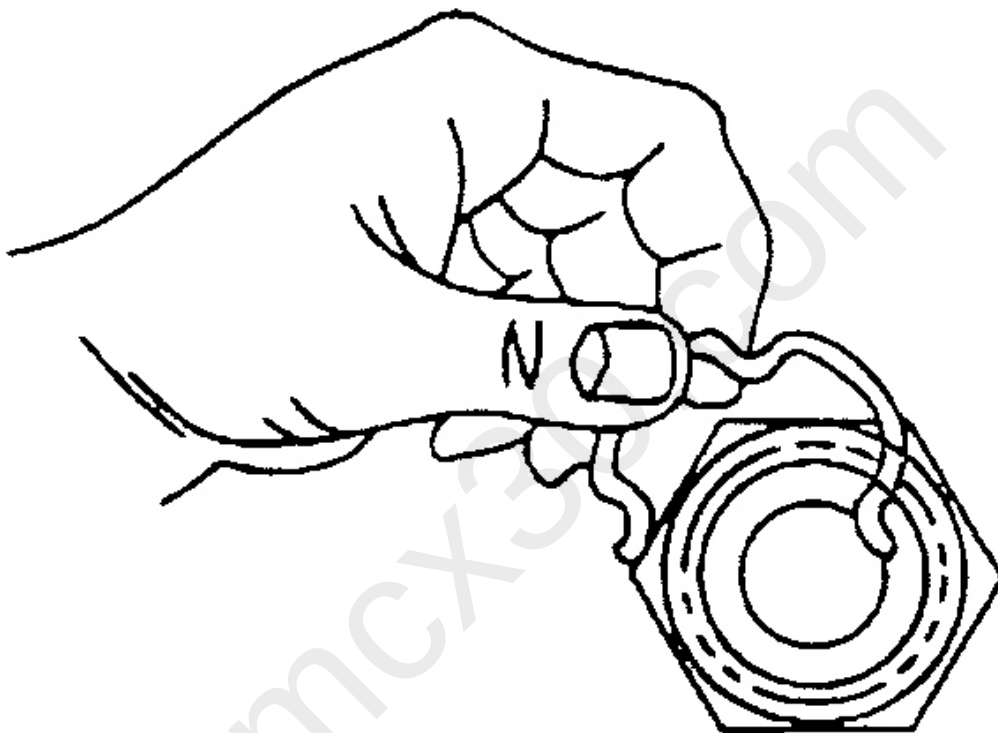


Fig. 29: Hooking Retaining Ring Into Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

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

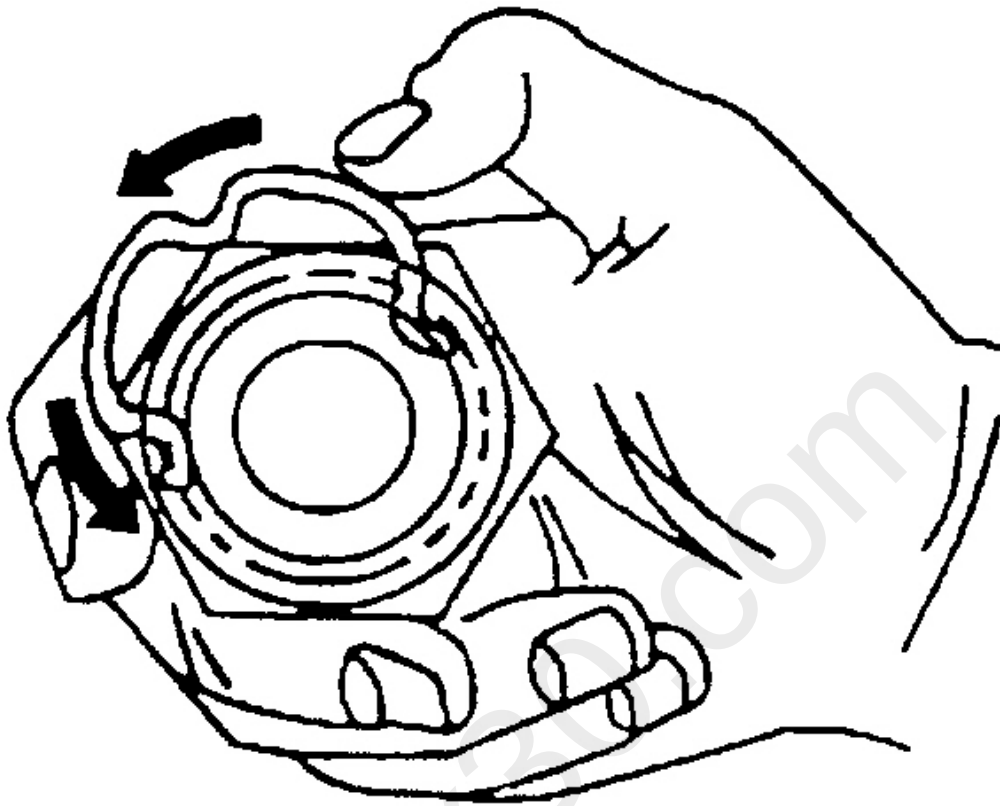


Fig. 30: Rotating Retaining Ring Around Fitting
Courtesy of GENERAL MOTORS CORP.

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

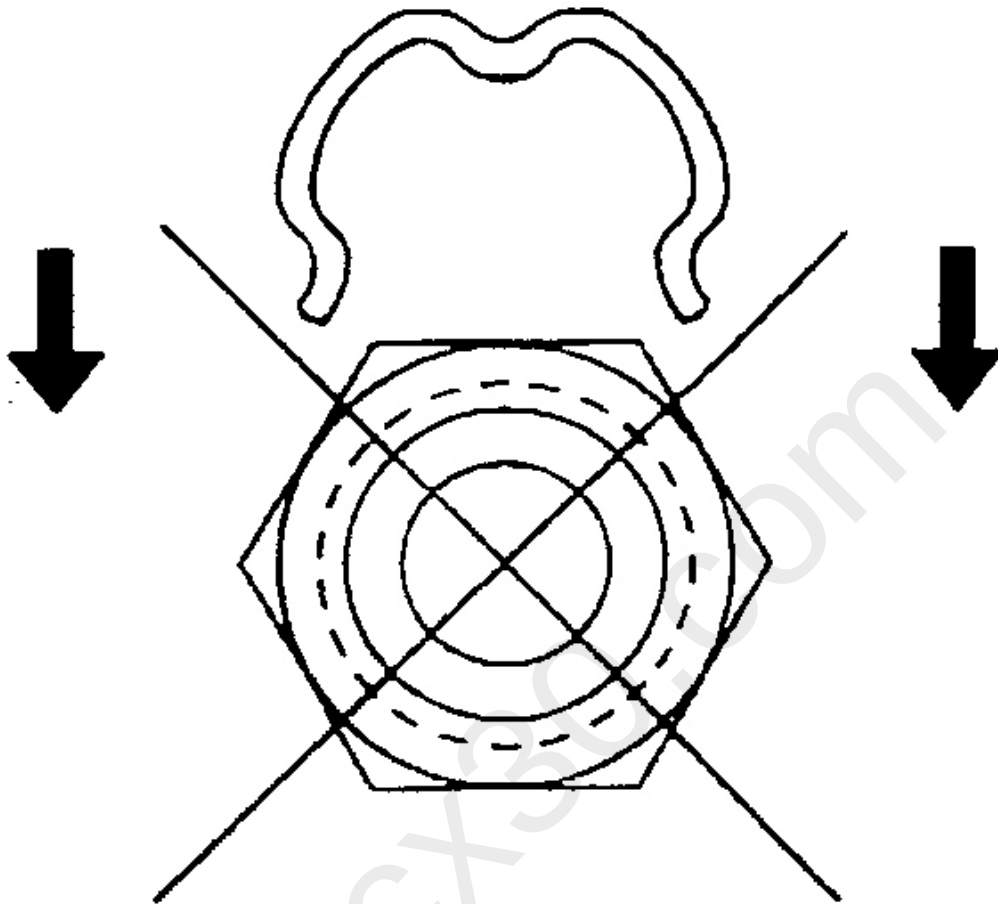


Fig. 31: Identifying Improper Engine Oil Cooler Hose/Pipe Retaining Ring Installation
Courtesy of GENERAL MOTORS CORP.

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

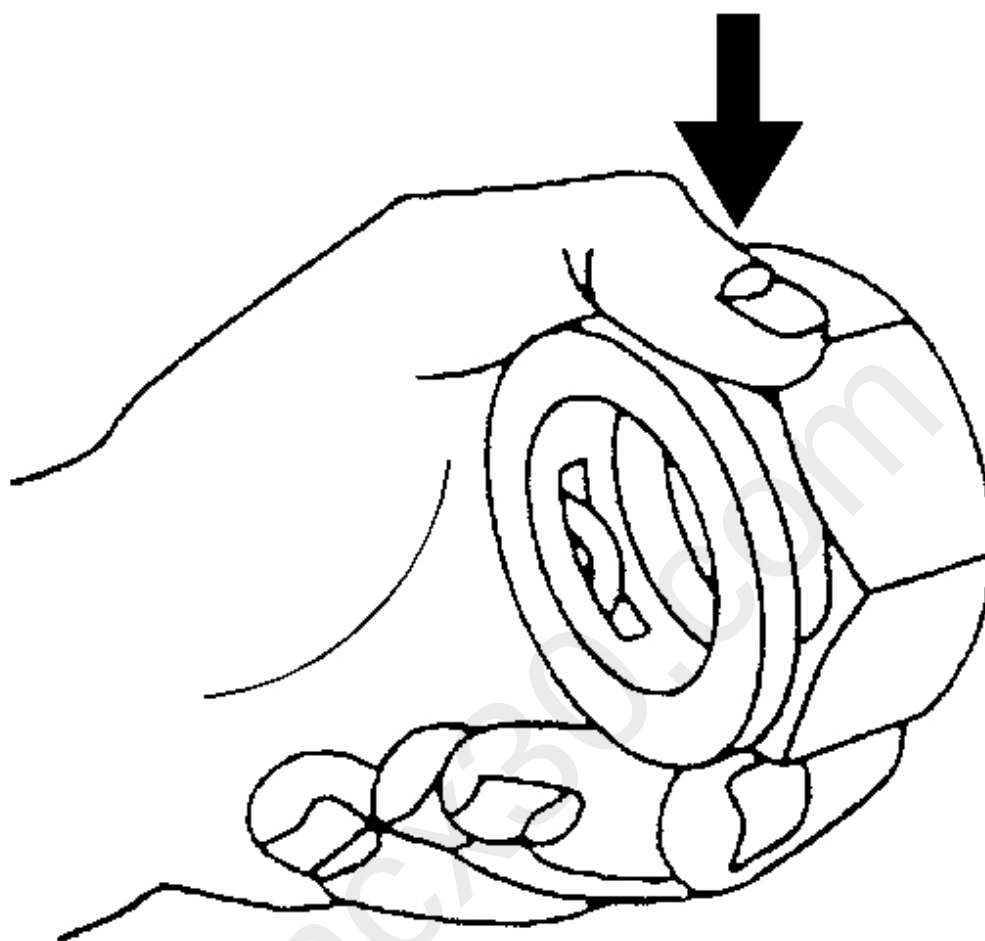


Fig. 32: Ensuring Retaining Ring Is Seated Correctly
Courtesy of GENERAL MOTORS CORP.

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

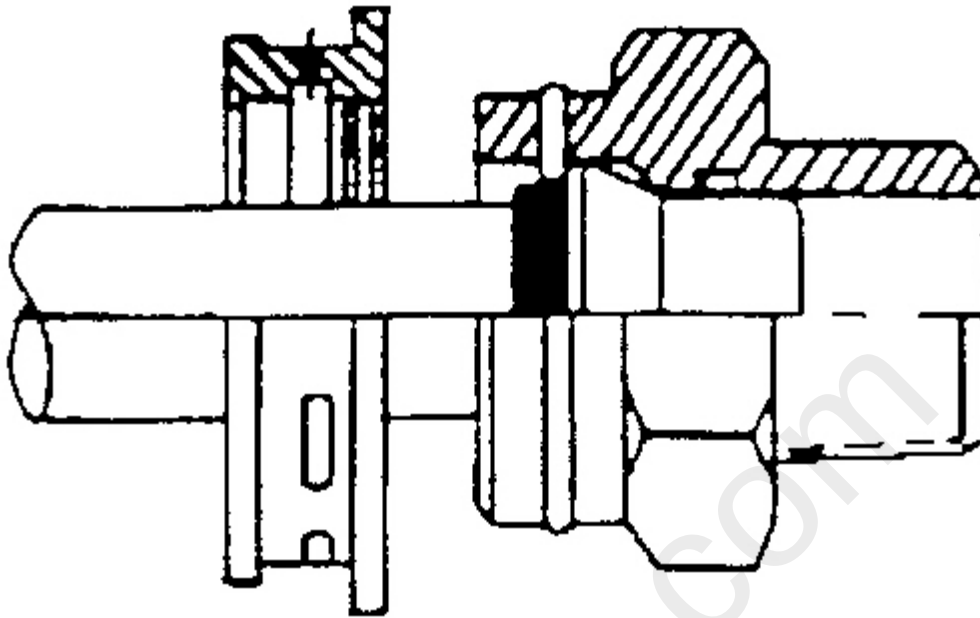


Fig. 33: View Of Cooler Line Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

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

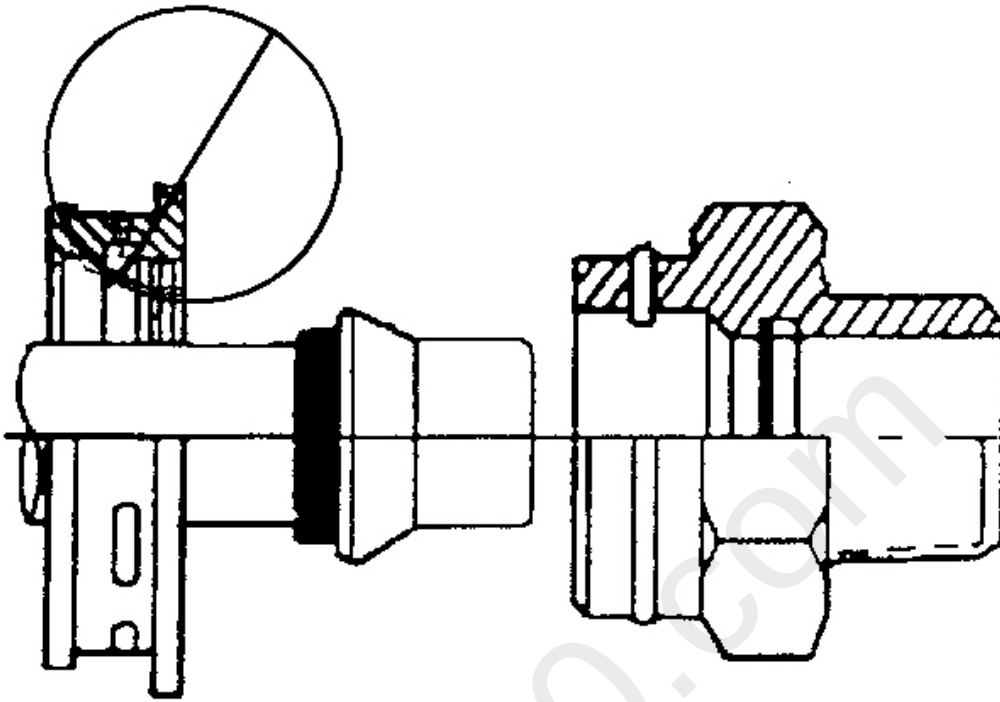


Fig. 34: Identifying Plastic Cap
Courtesy of GENERAL MOTORS CORP.

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

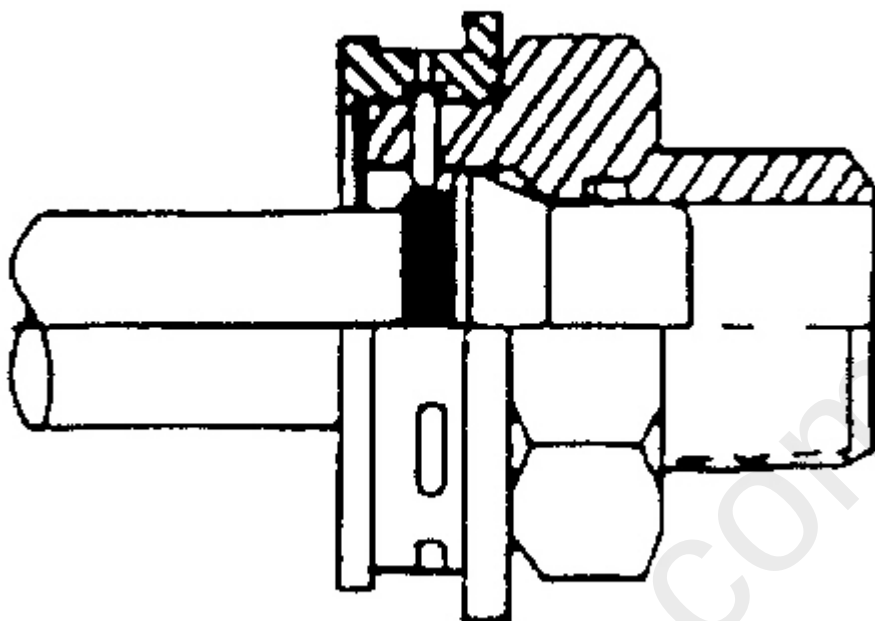


Fig. 35: View Of Cooler Line & Plastic Cap
Courtesy of GENERAL MOTORS CORP.

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

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

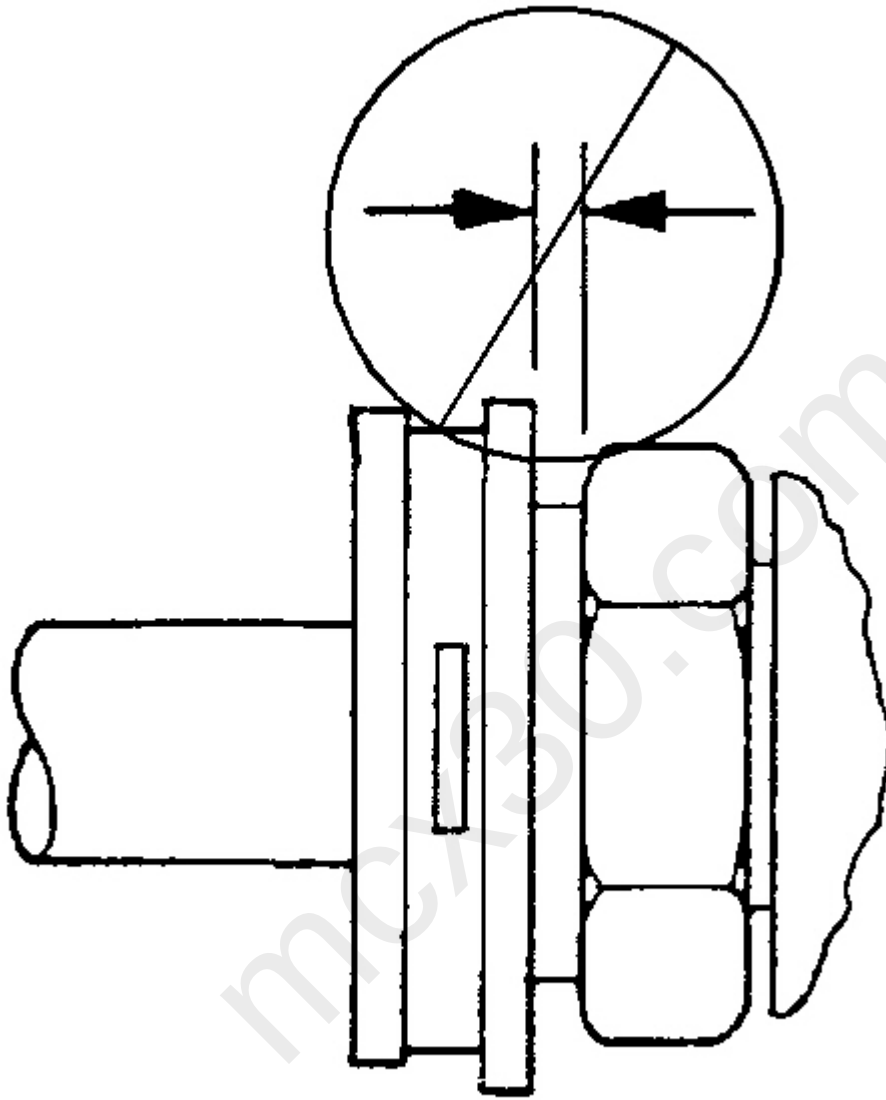


Fig. 36: Checking For Gap Between Cap & Fitting
Courtesy of GENERAL MOTORS CORP.

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

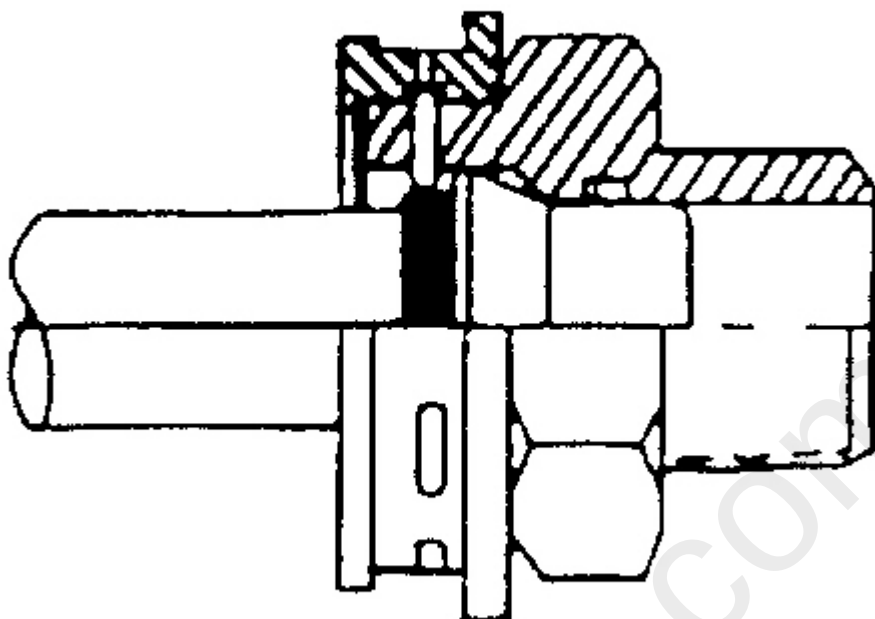


Fig. 37: View Of Cooler Line & Plastic Cap
Courtesy of GENERAL MOTORS CORP.

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

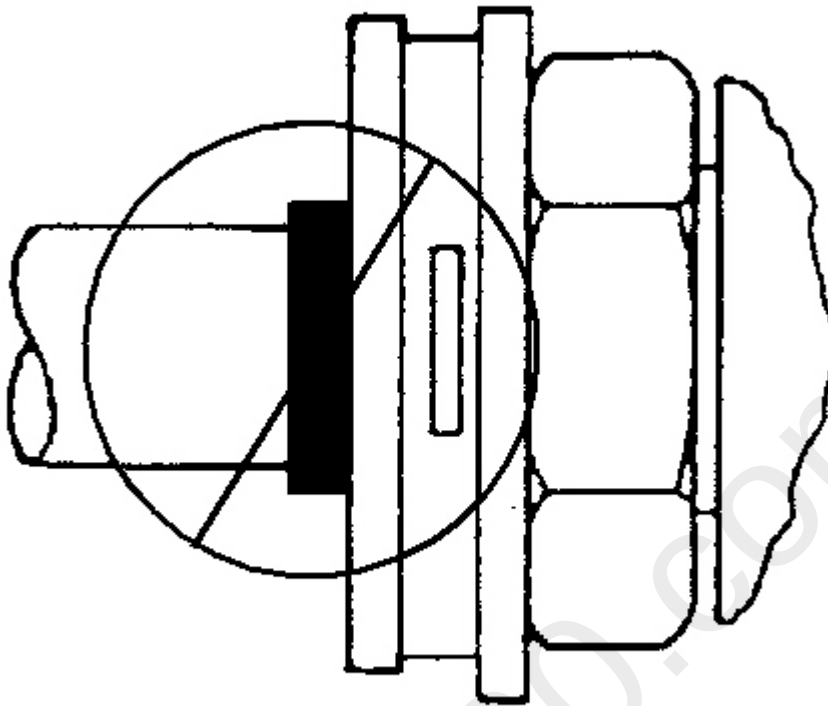


Fig. 38: Identifying Improper Joint Seating
Courtesy of GENERAL MOTORS CORP.

14. A hidden yellow identification band indicates proper joint seating.
15. Fill the transmission to the proper level with DEXRON® VI transmission fluid. Refer to **Transmission Fluid Level and Condition Check** .

TRANSMISSION FLUID COOLER OUTLET PIPE REPLACEMENT

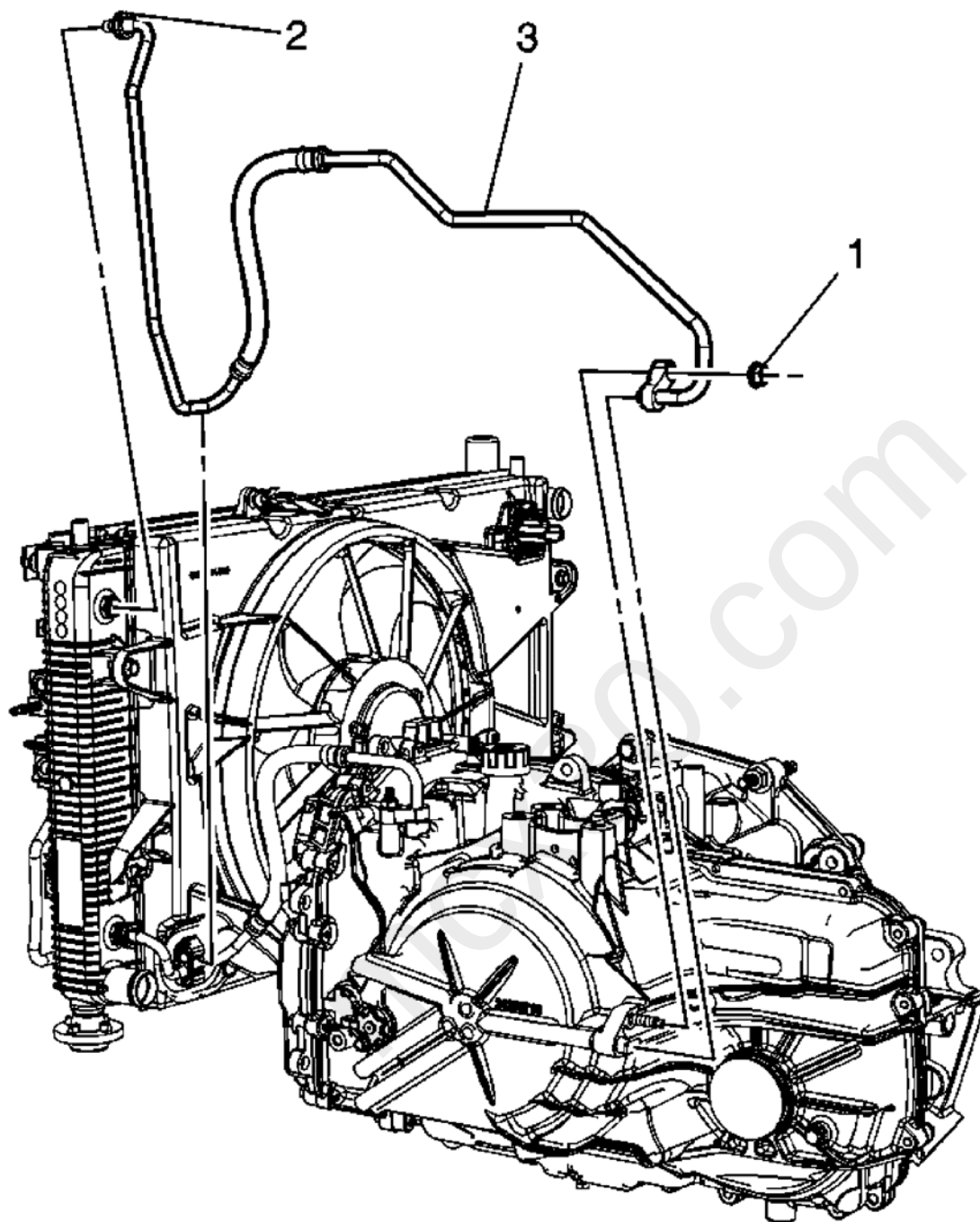


Fig. 39: Transmission Fluid Cooler Outlet Pipe
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Raise the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> .	
	Transmission Fluid Cooler Outlet Pipe Nut

1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 22 N.m (16 lb ft)
2	Front Transmission Fluid Cooler Outlet Pipe Quick Disconnect Preliminary Procedure: Disconnect the transmission line from the radiator. Refer to <u>Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection</u> .
3	Front Transmission Fluid Cooler Outlet Pipe Procedure 1. Install new sealing washers. 2. Note the routing of the transmission line to ensure proper installation. 3. Remove the transmission line from the clips securing the line to the transmission and fan shroud. 4. Inspect the transmission fluid level. Refer to <u>Transmission Fluid Level and Condition Check</u> .

TRANSMISSION FLUID COOLER INLET PIPE REPLACEMENT

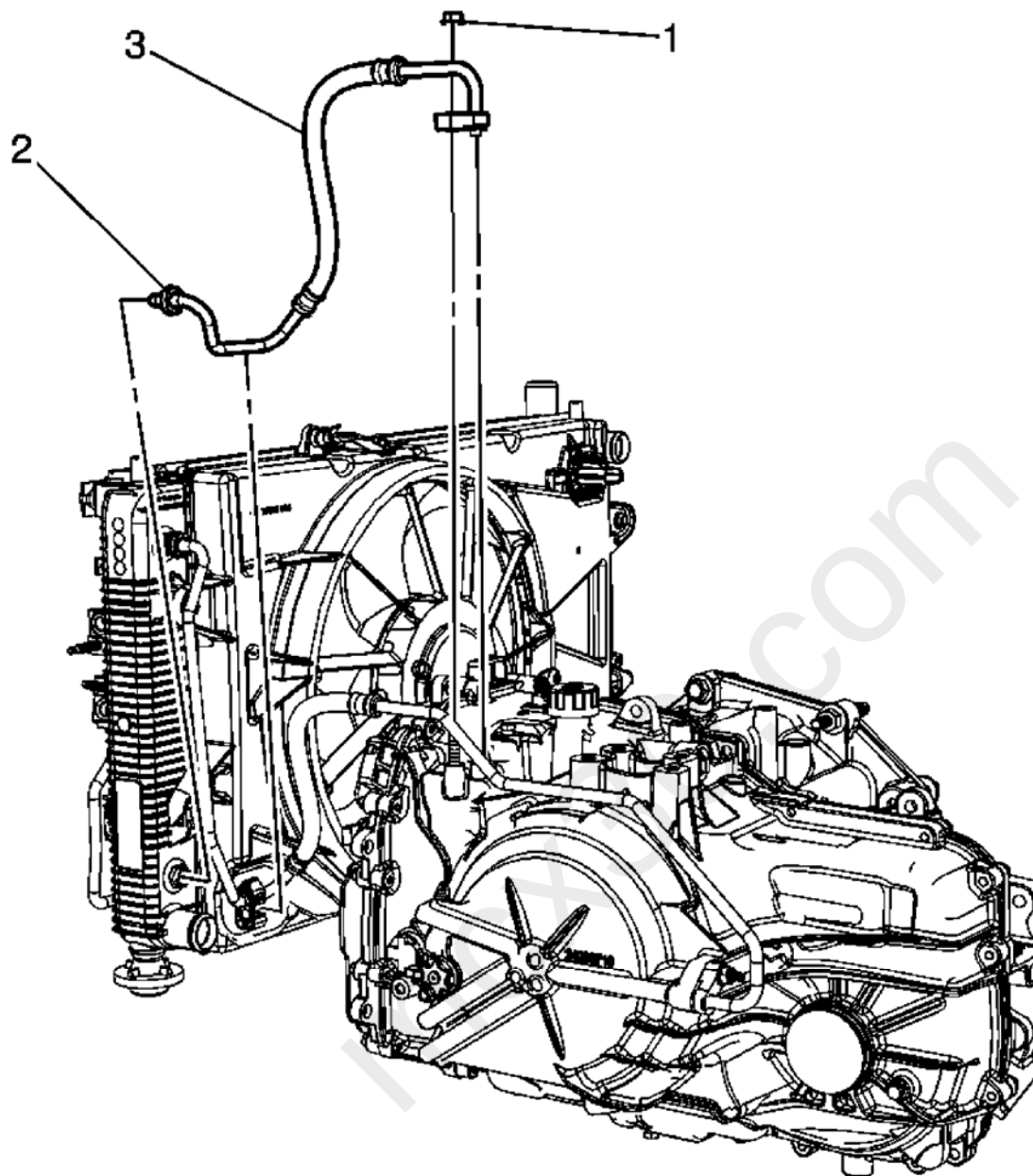


Fig. 40: Transmission Fluid Cooler Inlet Pipe
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Raise the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> .	
1	Transmission Fluid Cooler Inlet Pipe Nut CAUTION: Refer to <u>Fastener Caution</u> .

	Tighten: 22 N.m (16 lb ft)
2	Front Transmission Fluid Cooler Inlet Pipe Quick Disconnect Preliminary Procedure: Disconnect the transmission line from the radiator. Refer to <u>Transmission Fluid Cooler Hose/Pipe Quick-Connect Fitting Disconnection and Connection</u> .
3	Front Transmission Fluid Cooler Inlet Pipe Procedure 1. Install new sealing washers. 2. Note the routing of the transmission line to ensure proper installation. 3. Remove the transmission line from the clips securing the line to the transmission and fan shroud. 4. Inspect the transmission fluid level. Refer to <u>Transmission Fluid Level and Condition Check</u> .

AUTOMATIC TRANSMISSION FLUID PRESSURE TEST HOLE PLUG REPLACEMENT

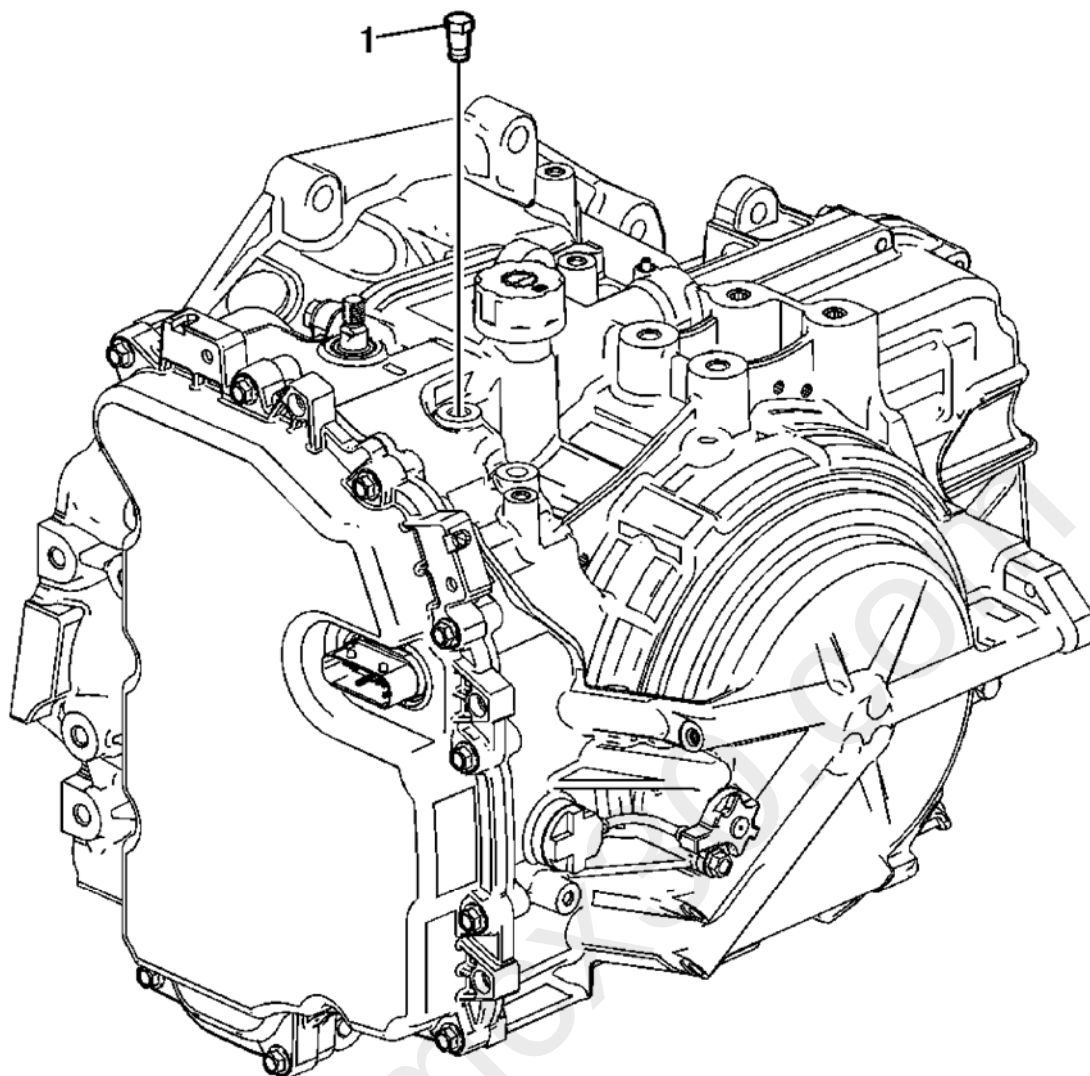


Fig. 41: Automatic Transmission Fluid Pressure Test Hole Plug
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Fluid Pressure Test Plug CAUTION: Refer to <u>Component Fastener Tightening Caution</u> . Tighten: 12 N.m (106 lb in)

FRONT WHEEL DRIVE SHAFT SEAL REPLACEMENT - LEFT SIDE

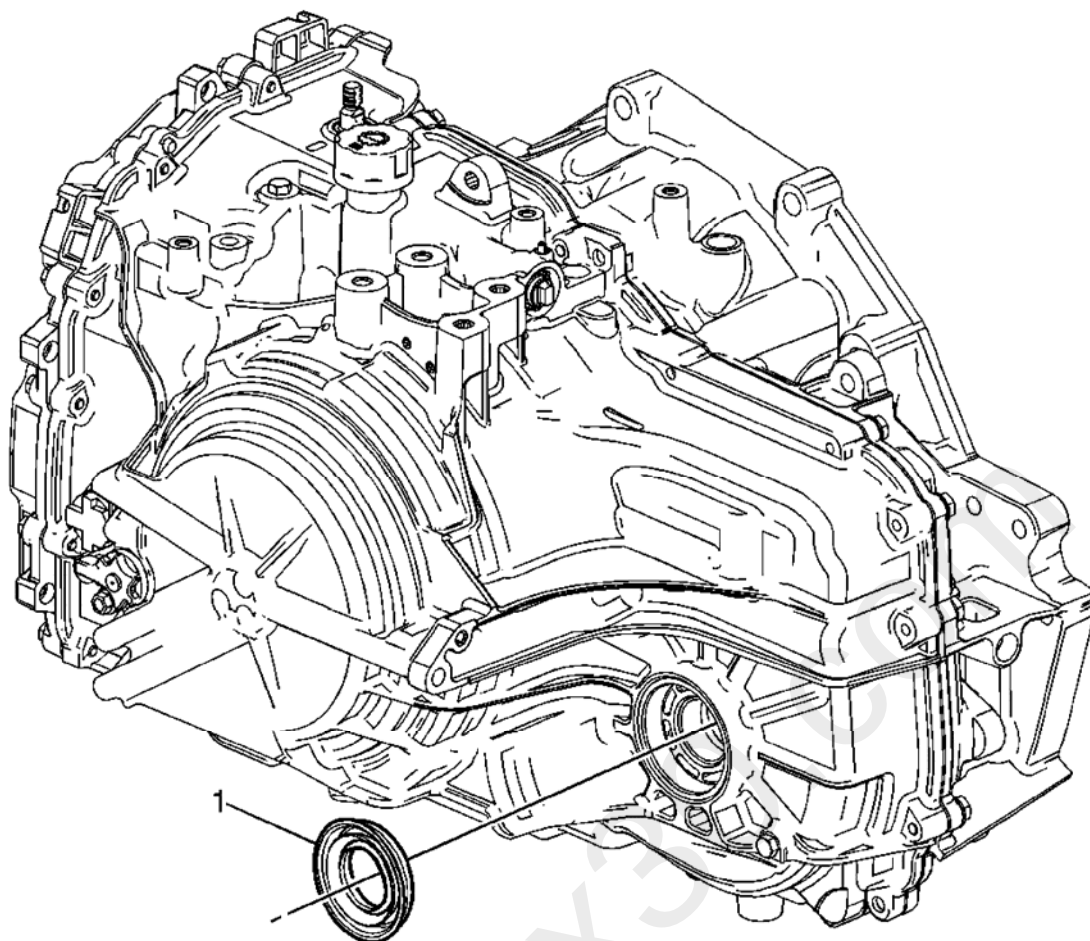


Fig. 42: Front Wheel Drive Shaft Seal - Left Side
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Raise the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 2. Remove the left wheel drive shaft. Refer to <u>Front Wheel Drive Shaft Replacement</u> .	
1	Left Front Wheel Drive Shaft Oil Seal Tip: - For seal removal use J 6125-B Slide Hammer with J 23129 Universal Seal Remover. See <u>Special Tools</u> . - For seal installation use J 8092 Driver Handle with DT-47790 Seal Installer. See <u>Special Tools</u> . Special Tools

- **DT-47790** Seal Installer. See **Special Tools** .
- **J 6125-B** Slide Hammer. See **Special Tools** .
- **J 8092** Driver Handle
- **J 23129** Universal Seal Remover. See **Special Tools** .

FRONT WHEEL DRIVE SHAFT SEAL REPLACEMENT - RIGHT SIDE

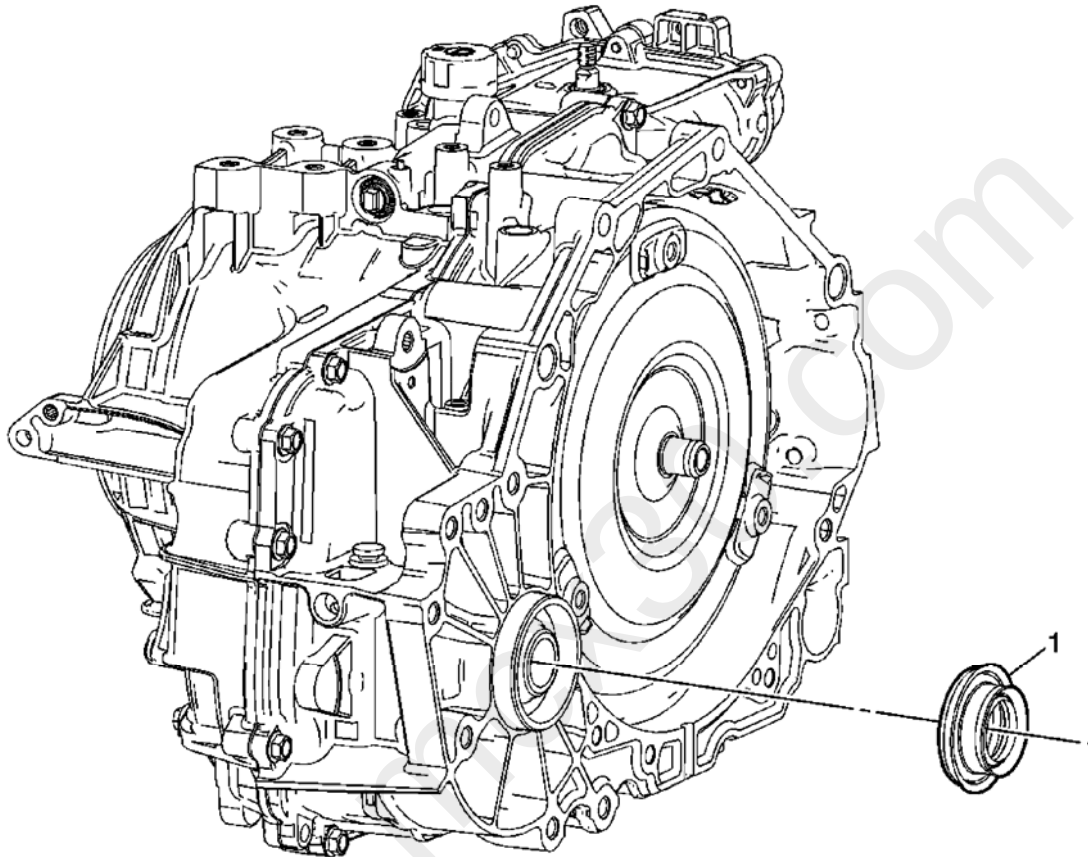


Fig. 43: Front Wheel Drive Shaft Seal - Right Side
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Raise the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the intermediate drive shaft. Refer to Front Wheel Drive Intermediate Shaft Replacement .	
	Right Front Wheel Drive Shaft Oil Seal Tip:

1	• For seal removal use J 6125-B Slide Hammer with J 23129 Universal Seal Remover. See <u>Special Tools</u> . • For seal installation use J 8092 Driver Handle with DT-47790 Seal Installer. See <u>Special Tools</u> . Special Tools • DT-47790 Seal Installer. See <u>Special Tools</u> . • J 6125-B Slide Hammer. See <u>Special Tools</u> . • J 8092 Driver Handle • J 23129 Universal Seal Remover. See <u>Special Tools</u> .
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MANUAL SHIFT SHAFT AND SEAL REPLACEMENT

Special Tools

- **J 45201** Cooler Line Seal Remover. See **Special Tools** .
- **J-46626** Seal Installer

Removal Procedure

1. Remove the battery tray. Refer to **Battery Tray Replacement** .
2. Remove the manual shaft and position switch assembly. Refer to **Manual Shift Detent Lever with Shaft Position Switch Assembly Replacement**.

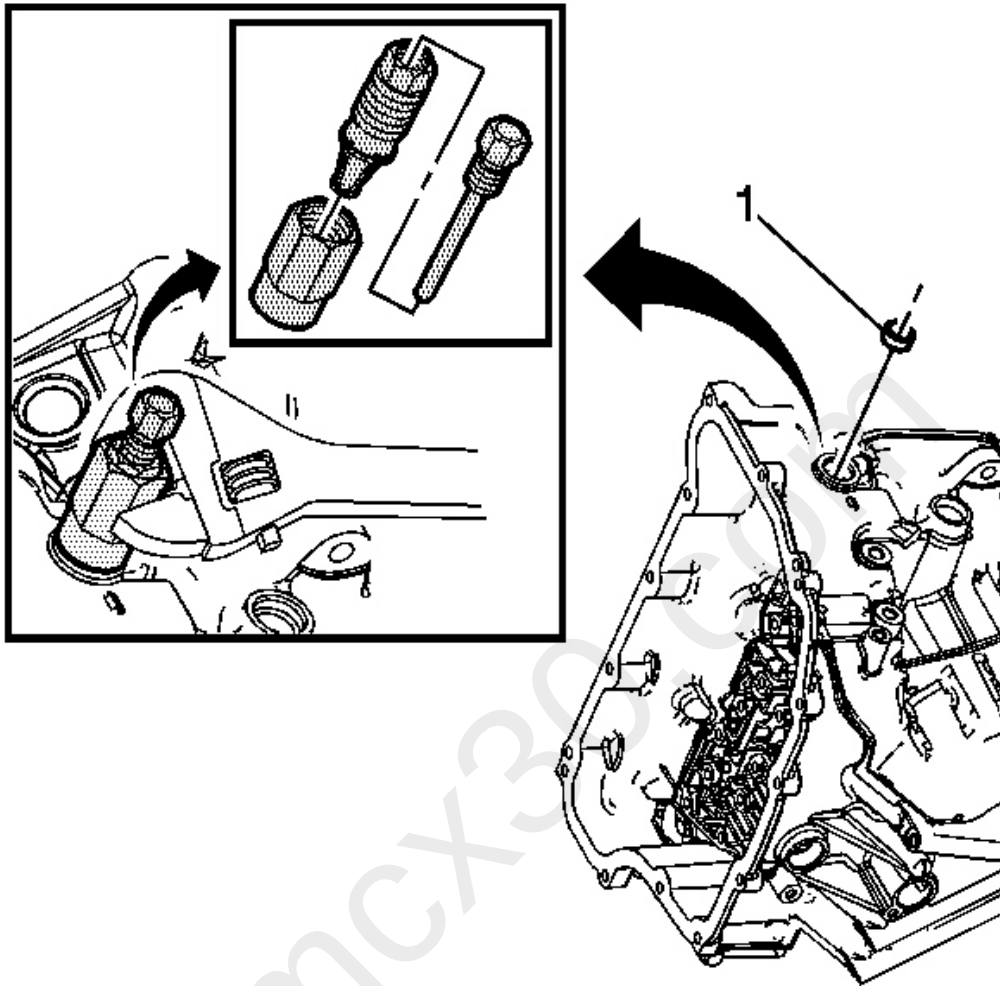


Fig. 44: Removing Manual Shaft Seal
Courtesy of GENERAL MOTORS CORP.

3. Remove the manual shaft seal (1) using **J 45201** . See **Special Tools** .

Installation Procedure

1. Install the manual shaft and position switch assembly. Refer to **Manual Shift Detent Lever with Shaft Position Switch Assembly Replacement**.

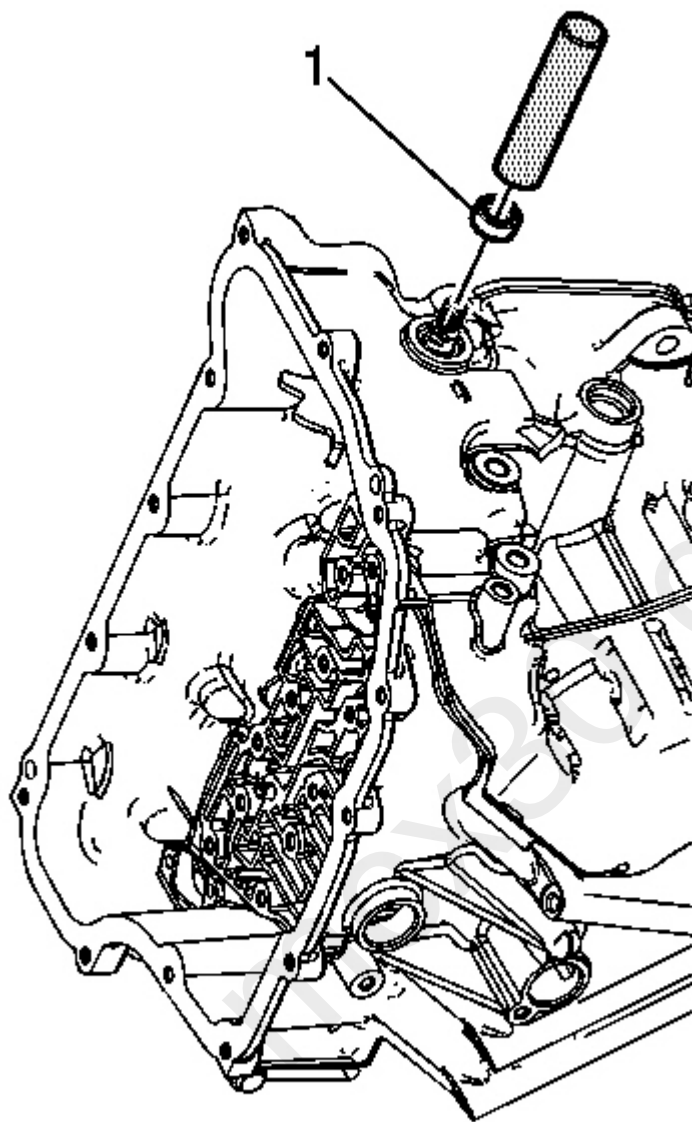


Fig. 45: Installing Manual Shaft Seal
Courtesy of GENERAL MOTORS CORP.

2. Install the manual shaft seal (1) using J-46626 .
3. Install the battery tray. Refer to **Battery Tray Replacement** .

CONTROL SOLENOID VALVE AND TRANSMISSION CONTROL MODULE ASSEMBLY REPLACEMENT

Removal Procedure

1. Remove the transmission control valve body cover. Refer to Control Valve Body Cover Replacement.

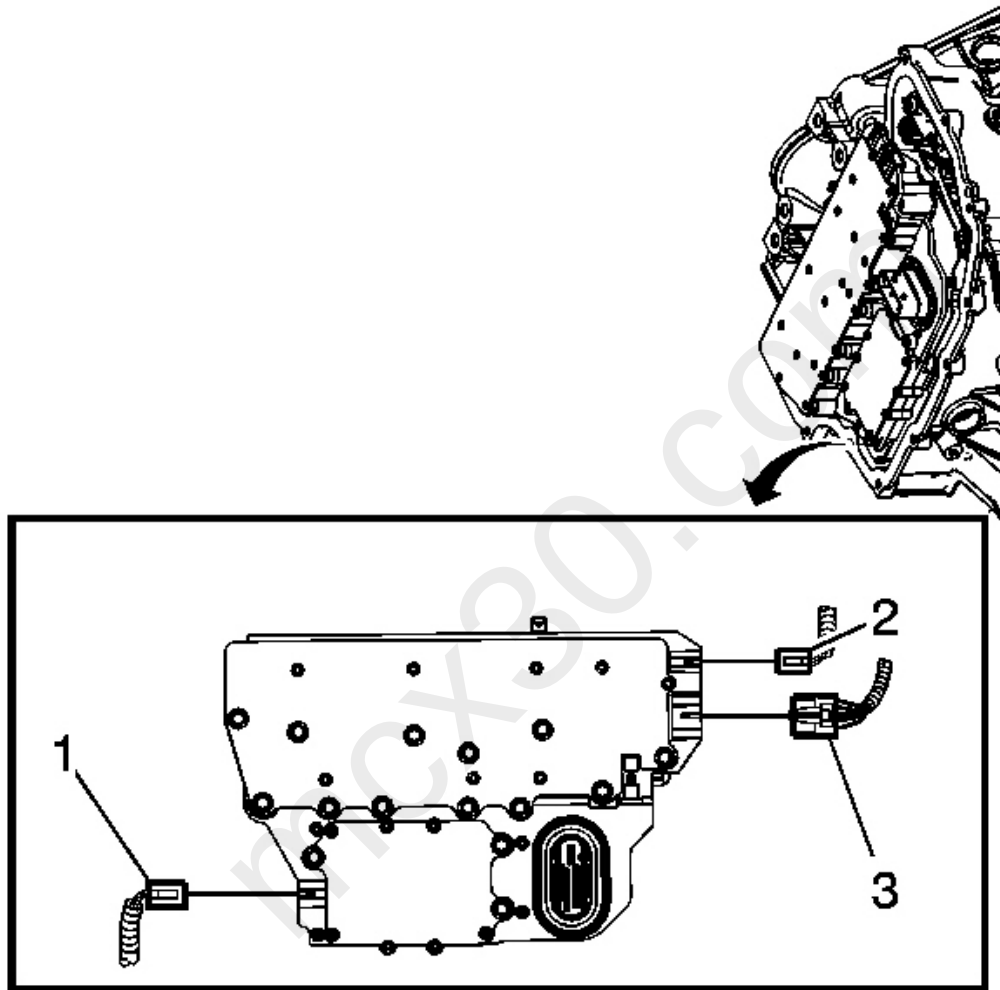


Fig. 46: Identifying Speed Sensor & Shift Position Switch Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the input speed sensor electrical connector (1).
3. Disconnect the output speed sensor electrical connector (2).
4. Disconnect the shift position switch electrical connector (3).

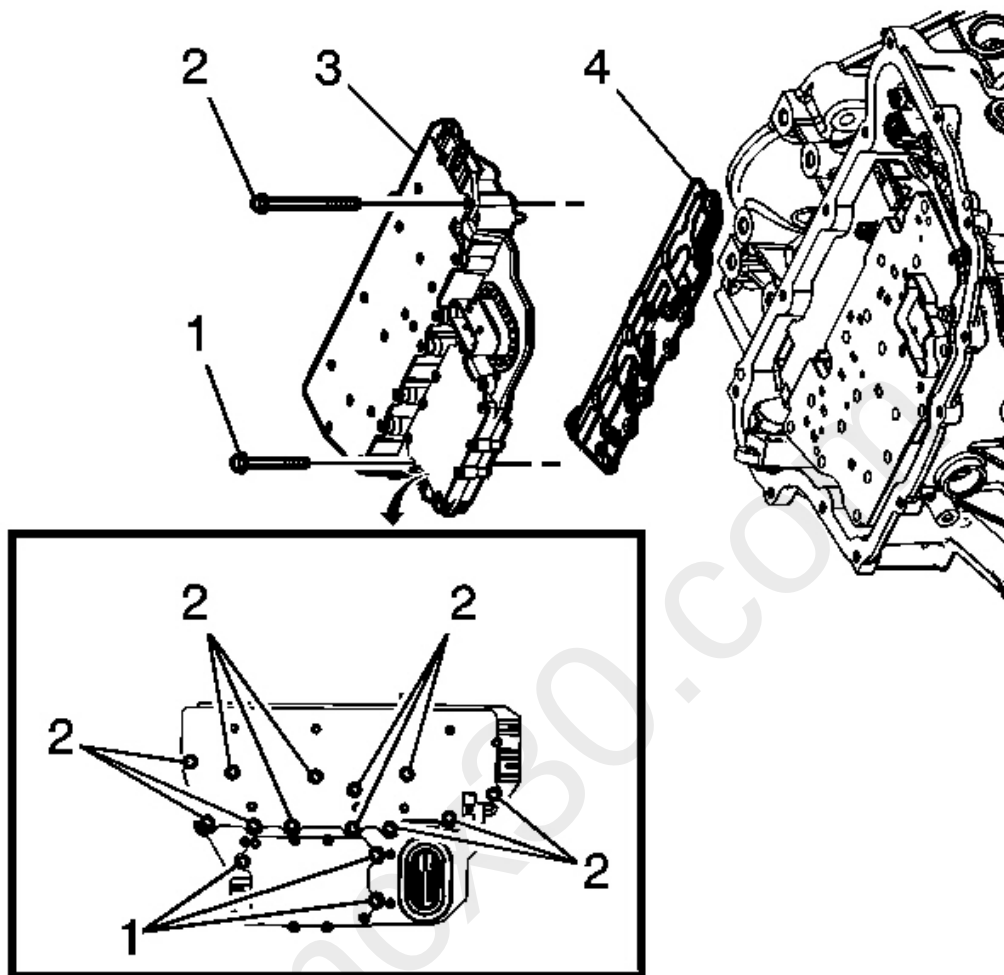


Fig. 47: Locating Control Valve Body & Bolts
 Courtesy of GENERAL MOTORS CORP.

5. Remove the 3 control valve body bolts (1) M5 x 40.5.
6. Remove the 12 control valve body bolts (2) M6 x 97.
7. Remove the control solenoid valve assembly (3) with transmission control module.

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.

8. Remove the control solenoid valve assembly filter plate (4). Discard the filter plate. It is not reusable.
9. Inspect the channel plate bolt pass through holes for damage or brinelling. Any damage will cause incorrect pressure switch operation. Replace as necessary.

Installation Procedure

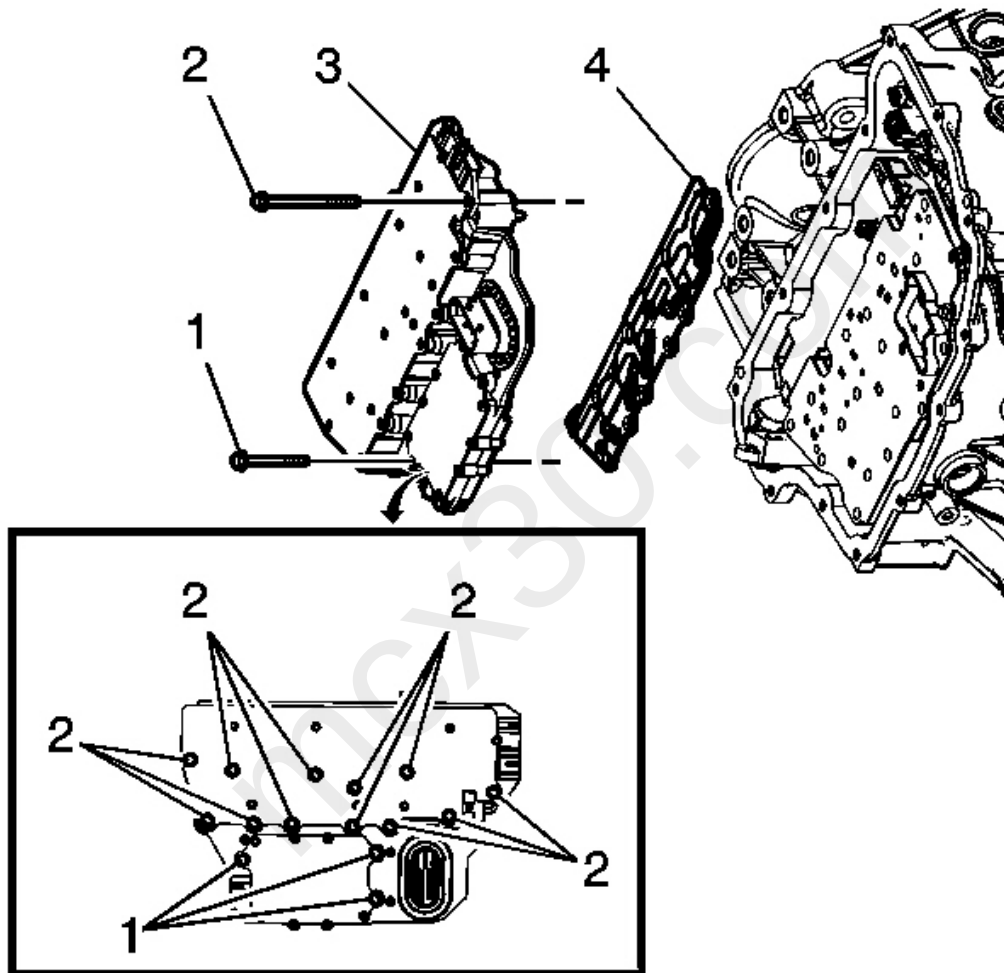


Fig. 48: Locating Control Valve Body & Bolts
Courtesy of GENERAL MOTORS CORP.

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.

1. Install a NEW control solenoid valve assembly filter plate (4) to prevent fluid leaks past the fluid seals.
2. Install the control solenoid valve assembly (3) with transmission control module.
3. Hand start the control valve body bolts (1, 2).

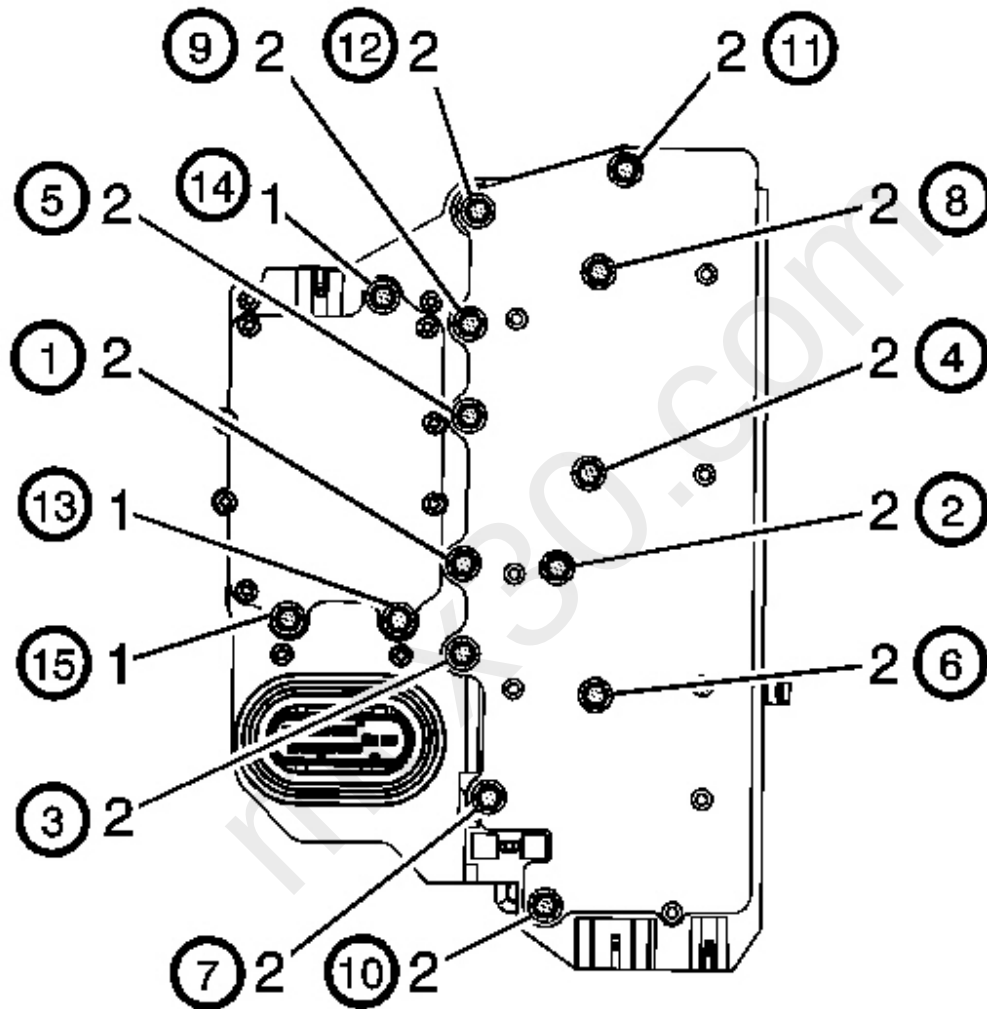


Fig. 49: Identifying Control Valve Body Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fastener Caution .

4. Secure the 12 control valve body bolts (2) M6 x 97 and tighten in sequence to 10 N.m (89 lb in).
5. Secure the 3 control valve body bolts (1) M5 x 40.5 and tighten in sequence to 8 N.m (71 lb in).

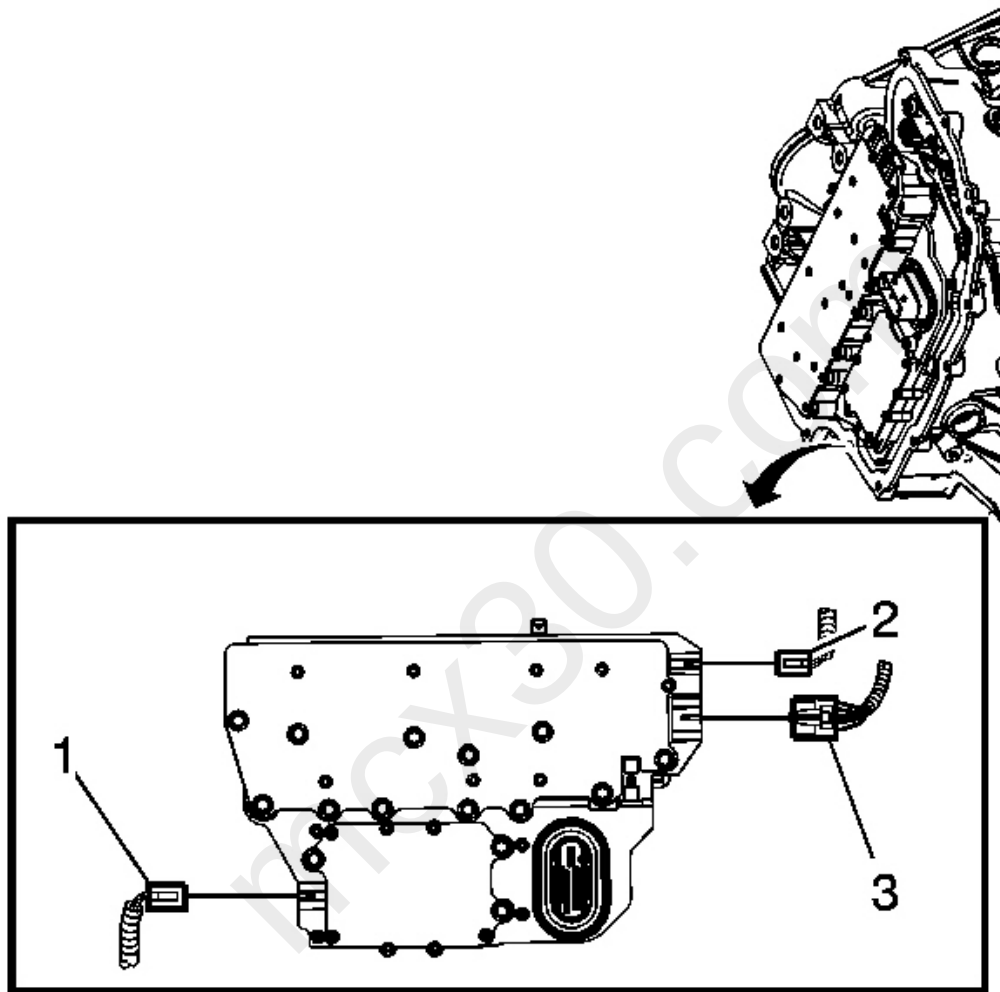


Fig. 50: Identifying Speed Sensor & Shift Position Switch Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

6. Connect the input speed sensor electrical connector (1).
7. Connect the output speed sensor electrical connector (2).
8. Connect the shift position switch electrical connector (3).
9. Install the transmission control valve body cover. Refer to **Control Valve Body Cover Replacement**.

CONTROL VALVE BODY COVER REPLACEMENT

Removal Procedure

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
2. Disconnect the radiator outlet hose from the radiator. Refer to Radiator Outlet Hose Replacement (LAF) or Radiator Outlet Hose Replacement (LF1) .

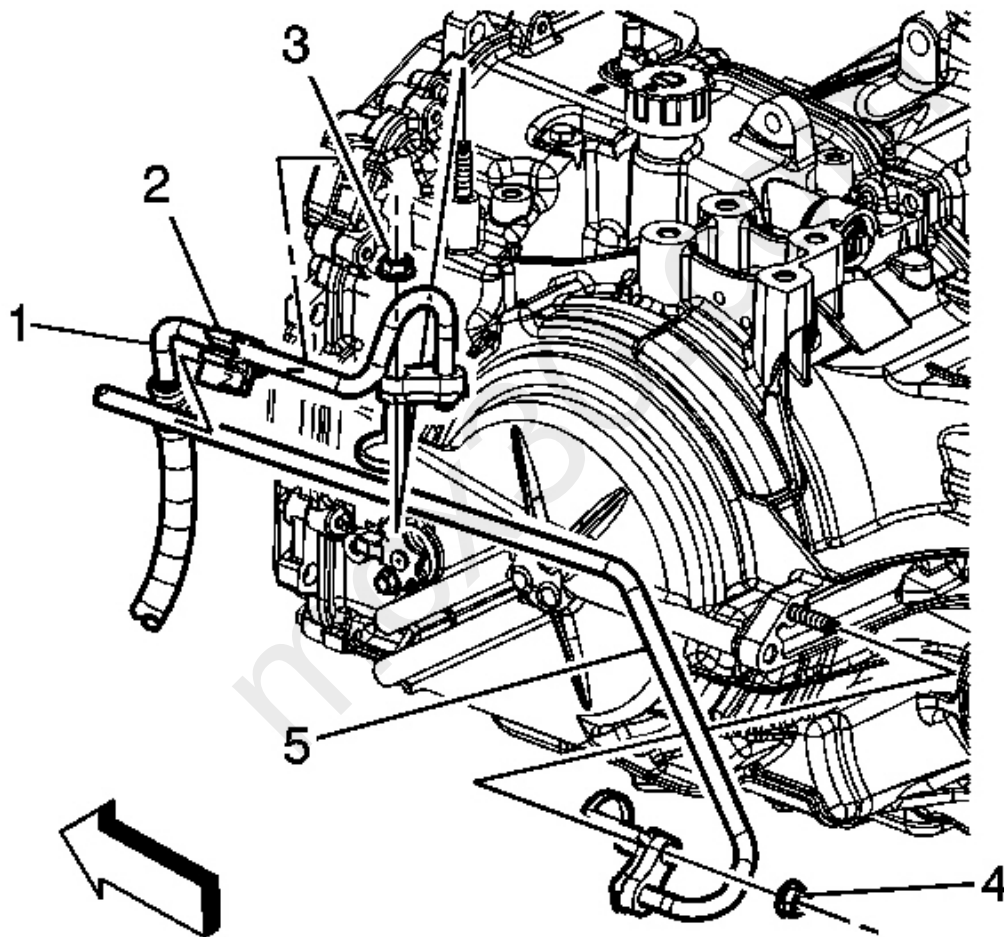


Fig. 51: Identifying Cooler Inlet & Outlet Hoses
Courtesy of GENERAL MOTORS CORP.

3. Remove the oil cooler inlet (1) and outlet (2) hoses from the retainer (2) on the control valve body cover.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .

5. Remove the front transmission mount. Refer to **Transmission Front Mount Replacement**.
6. Drain the transmission. Refer to **Transmission Fluid Replacement**.

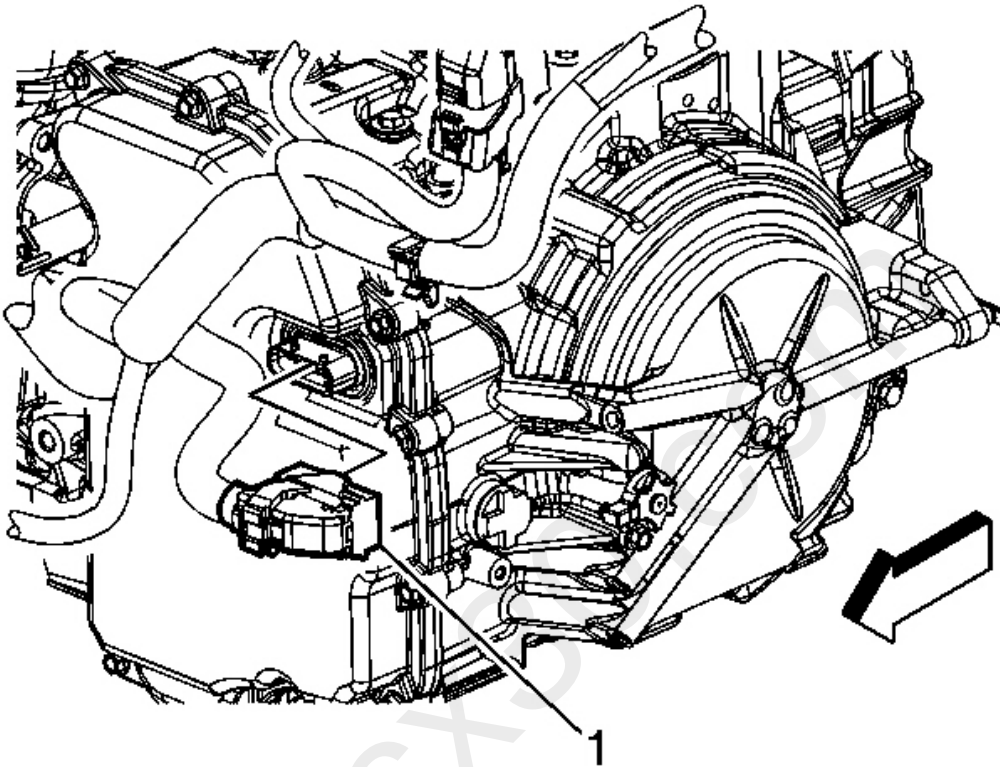


Fig. 52: Identifying Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

7. Disconnect the control valve body transmission control module (TCM) electrical connector (1), then the wiring harness from the cover.

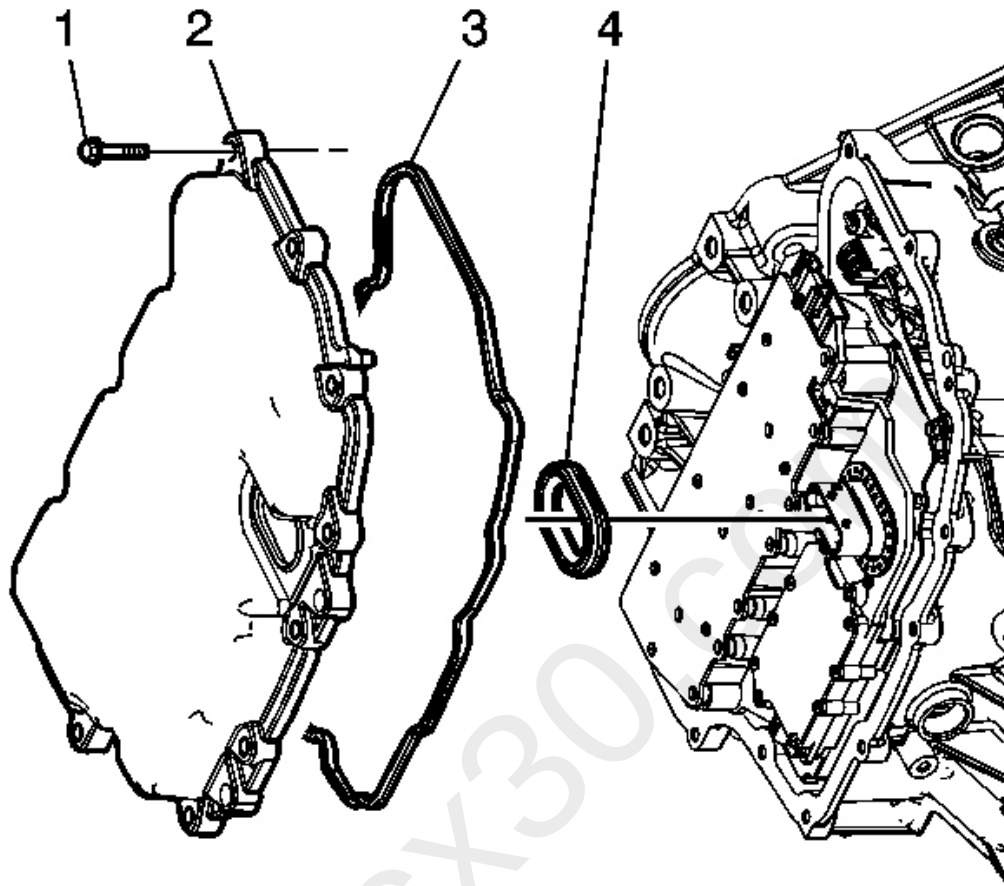


Fig. 53: View Of Control Valve Body
Courtesy of GENERAL MOTORS CORP.

8. Remove the control valve body cover bolts (1).
9. Support the transmission with a transmission jack.
10. Using the transmission jack raise the transmission to gain clearance for removal of the control valve body cover.
11. Remove the control valve body cover.
12. Remove the control valve body cover gasket.

CAUTION: Support the control solenoid valve assembly around the connector when removing the seal. Excessive pulling force can damage the internal electrical connections.

13. Remove the control valve body cover wiring connector hole seal.
14. Remove all traces of the old gasket material. Clean the transmission case and control valve body cover gasket surfaces.

Installation Procedure

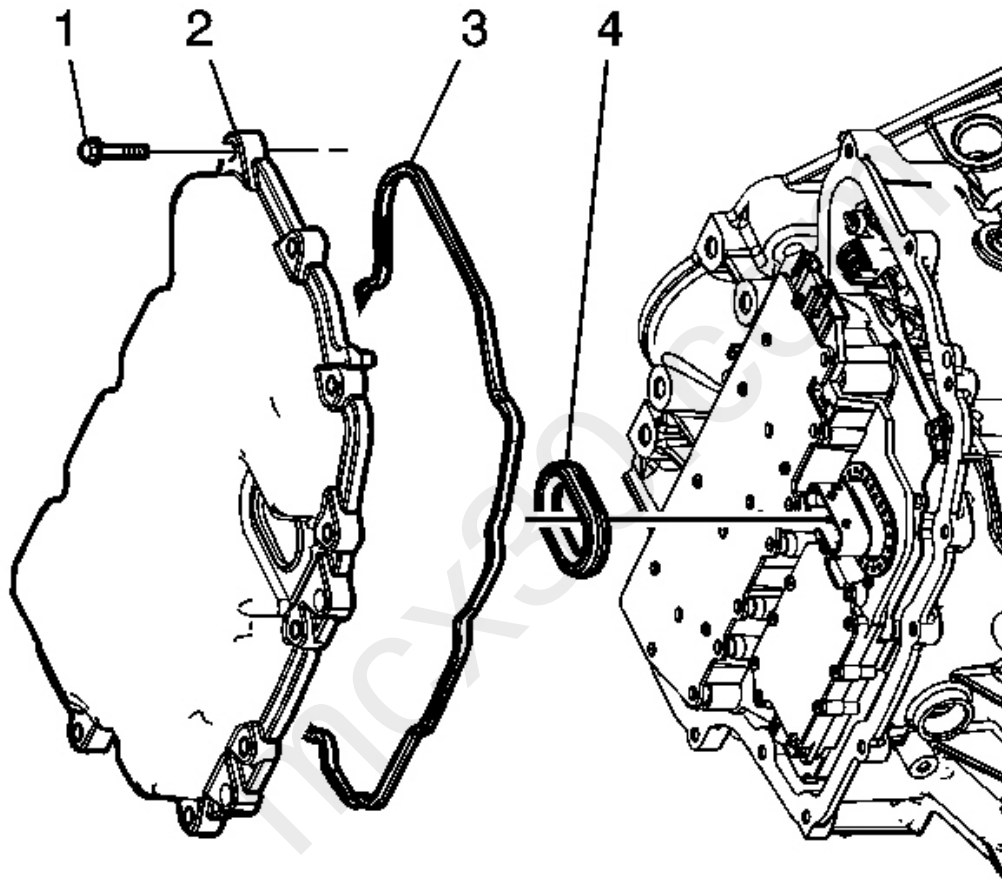


Fig. 54: View Of Control Valve Body
Courtesy of GENERAL MOTORS CORP.

1. Install the control valve body cover wiring connector hole seal (4).
2. Install the control valve body cover gasket (3) to the control valve body cover.
3. Install the control valve body cover (2).
4. Lower the transmission and remove the transmission jack.
5. Hand start the control valve body cover bolts (1).

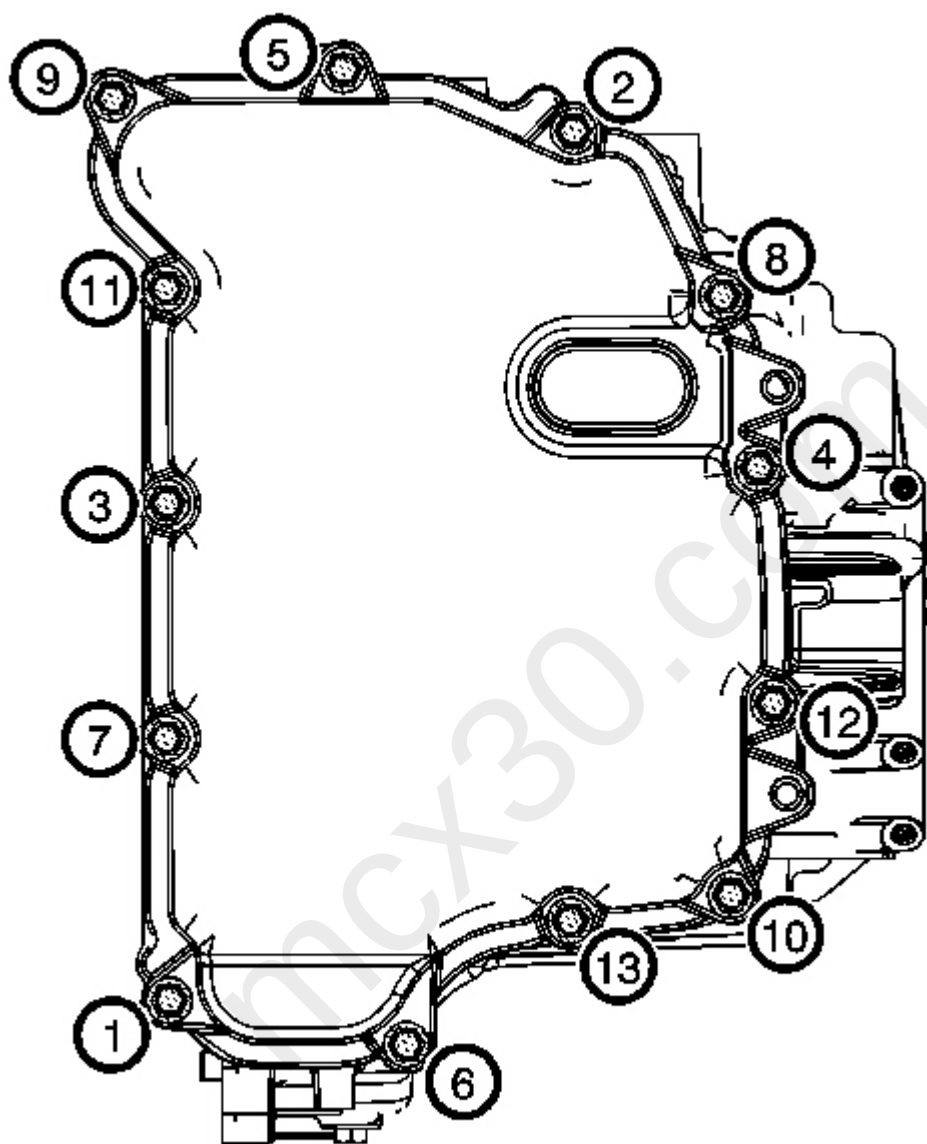


Fig. 55: Identifying Valve Body Cover Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fastener Caution .

NOTE: Install all control valve body cover bolts and studs by hand then torque all bolts and studs in sequence.

6. Install the control valve body cover bolts. Tighten the bolts in sequence to 12 N.m (106 lb in).

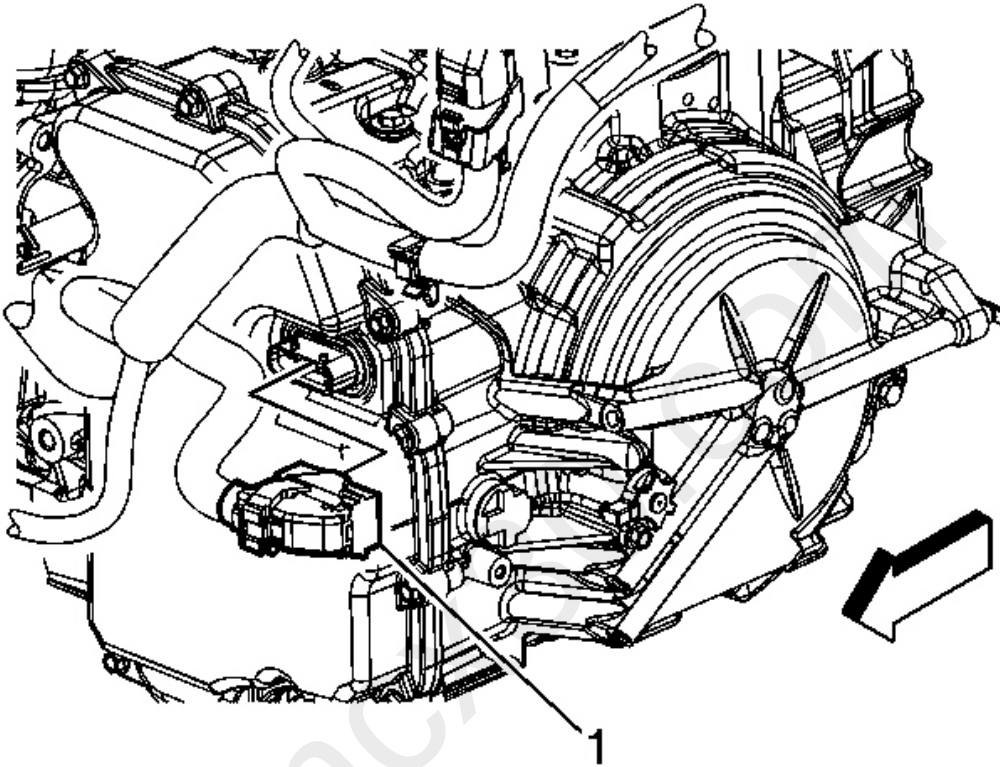


Fig. 56: Identifying Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

7. Connect the control valve body TCM electrical connector (1), then clip the wiring harness to the cover.
8. Install the front transmission mount. Refer to **Transmission Front Mount Replacement**.
9. Lower the vehicle.

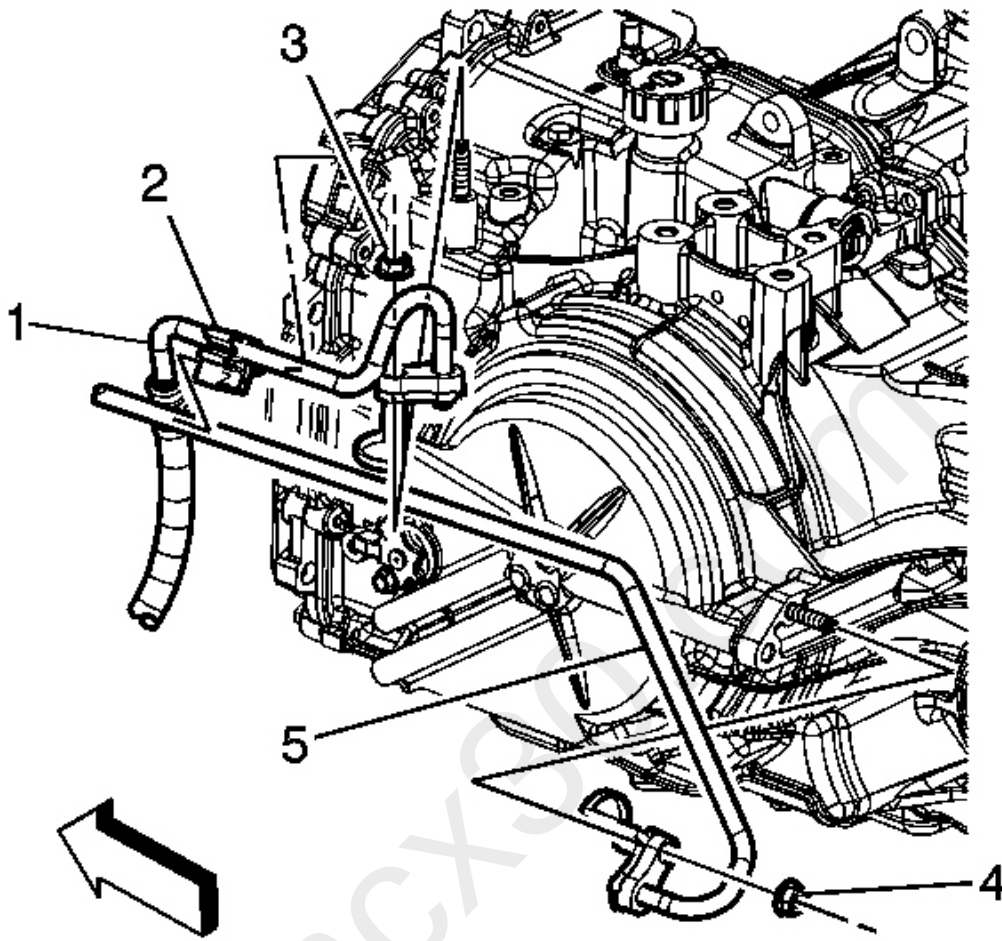


Fig. 57: Identifying Cooler Inlet & Outlet Hoses
Courtesy of GENERAL MOTORS CORP.

10. Install the oil cooler inlet (1) and outlet (5) hoses to the retainer (2) on the control valve body cover.
11. Connect the radiator outlet hose to the radiator. Refer to **Radiator Outlet Hose Replacement (LAF)** or **Radiator Outlet Hose Replacement (LF1)**.
12. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**.
13. Fill the transmission. Refer to **Transmission Fluid Replacement**.
14. Check for leaks.

CONTROL VALVE BODY REPLACEMENT

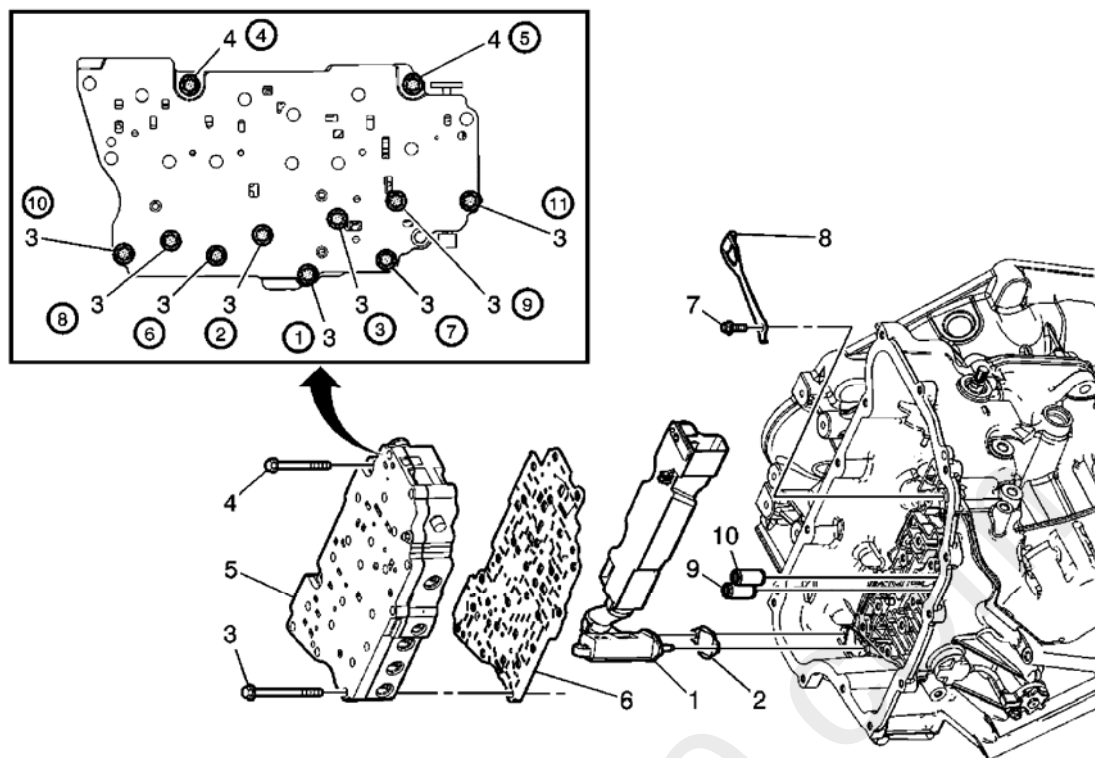


Fig. 58: Control Valve Body

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the control solenoid valve and transmission control module assembly. Refer to <u>Control Solenoid Valve and Transmission Control Module Assembly Replacement</u> .	
1	Fluid Level Control Valve
2	Fluid Level Control Valve Gasket
3	Control Valve Body Bolt M6 x 60 (Qty: 9) CAUTION: Refer to <u>Fastener Caution</u> . Tip: Tighten in specified sequence. Tighten: 12 N.m (106 lb in)
4	Control Valve Body Bolt M6 x 53 (Qty: 2) Tip: Tighten in specified sequence. Tighten: 12 N.m (106 lb in)
5	Control Valve Body Assembly

6	Control Valve Body Spacer Plate Assembly
7	Manual Shaft Detent Spring Bolt M6 x 16 (Qty: 1) Tip: Tighten in specified sequence. Tighten: 12 N.m (106 lb in)
8	Manual Shaft Detent Lever Spring Assembly
9	1-2-3-4 Clutch Fluid Passage Seal Tip: Discard the seal. It is not reusable.
10	Low/Reverse Clutch Fluid Passage Seal Tip: Discard the seal. It is not reusable.

OUTPUT SPEED SENSOR REPLACEMENT

mcx30.com

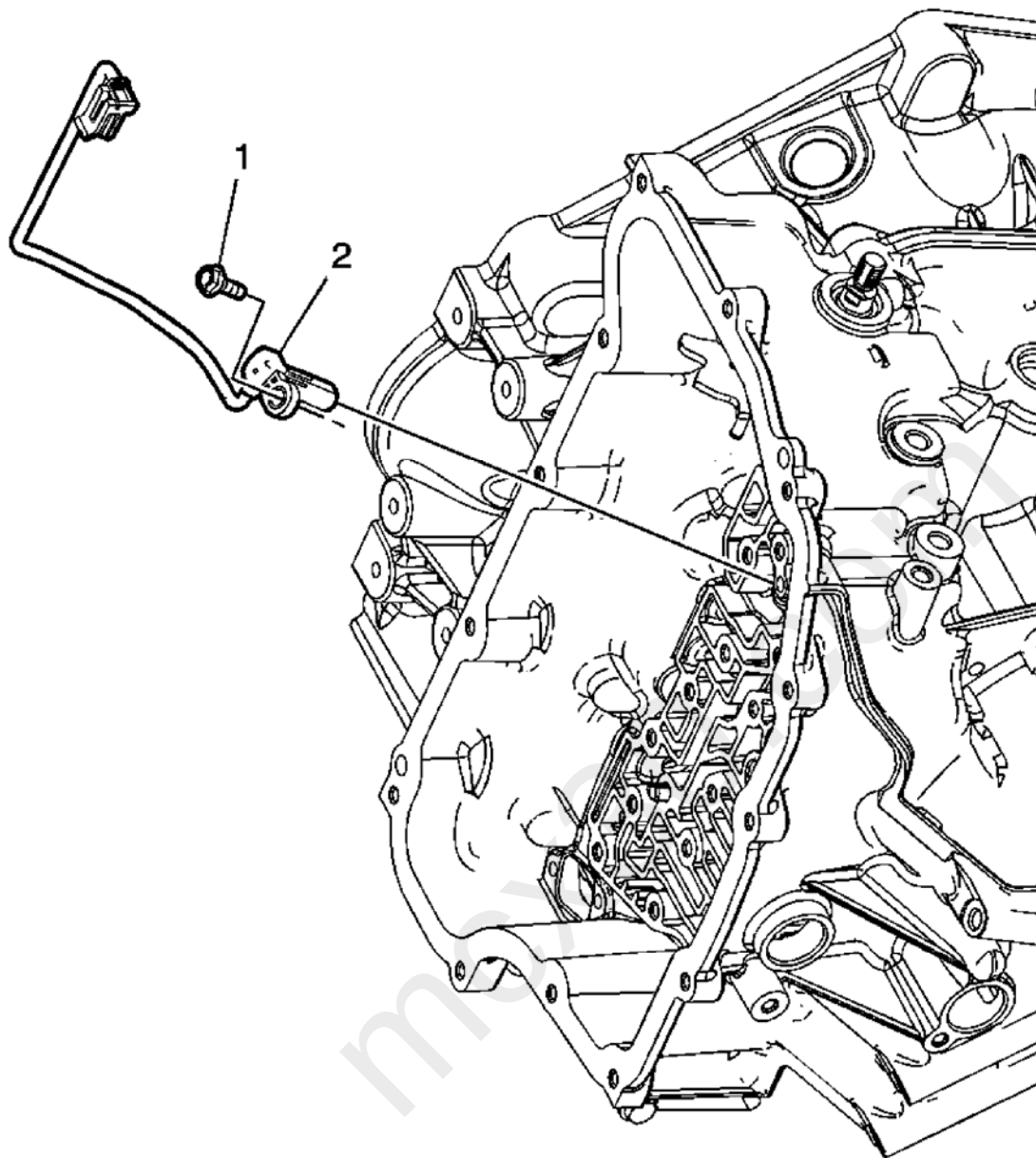


Fig. 59: Output Speed Sensor
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the control solenoid valve and transmission control module assembly. Refer to <u>Control Valve Body Replacement</u>. 2. Perform the transmission adaptive values learn procedure. Refer to <u>Transmission Adaptive Values Learn</u>.	
	Output Speed Sensor Bolt M6 x 18

1	CAUTION: Refer to <u>Fastener Caution</u> . Tip: Tighten in specified sequence. Tighten: 12 N.m (106 lb in)
2	Output Speed Sensor

INPUT SPEED SENSOR REPLACEMENT

Removal Procedure

1. Remove the transmission control valve body cover. Refer to **Control Valve Body Cover Replacement**.

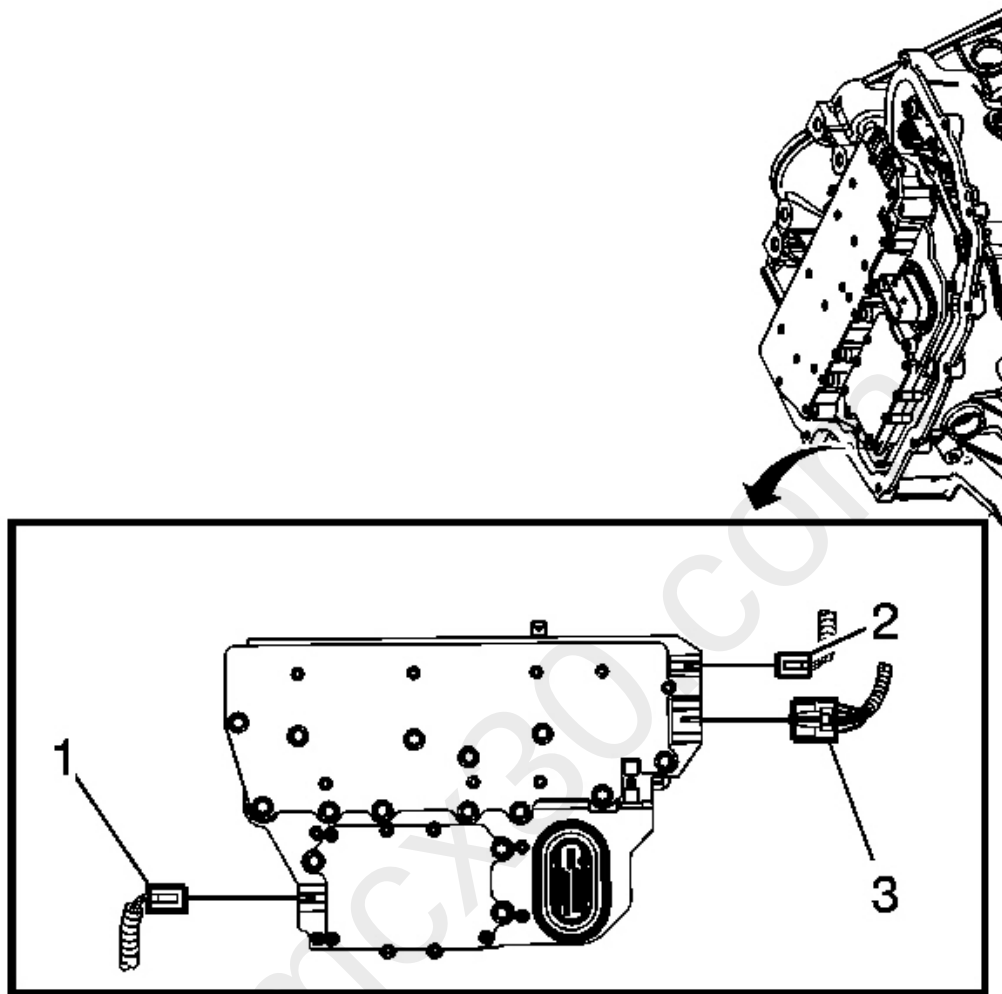


Fig. 60: Identifying Speed Sensor & Shift Position Switch Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the input speed sensor electrical connector (1).

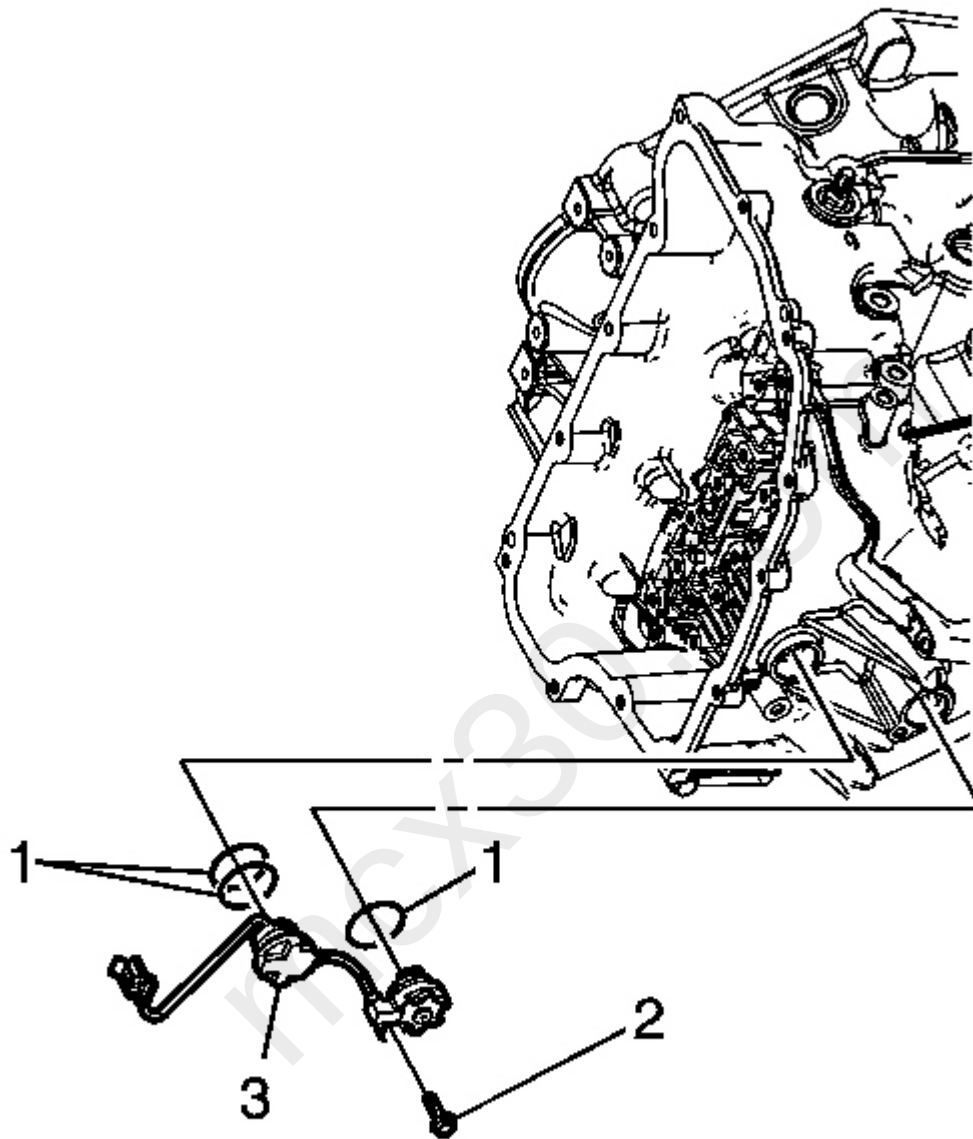


Fig. 61: Identifying Input Speed Sensor Components
Courtesy of GENERAL MOTORS CORP.

3. Remove the input speed sensor bolt (2) M6 x 23.
4. Remove the input speed sensor (3).
5. Remove the 3 input speed sensor seals (1).

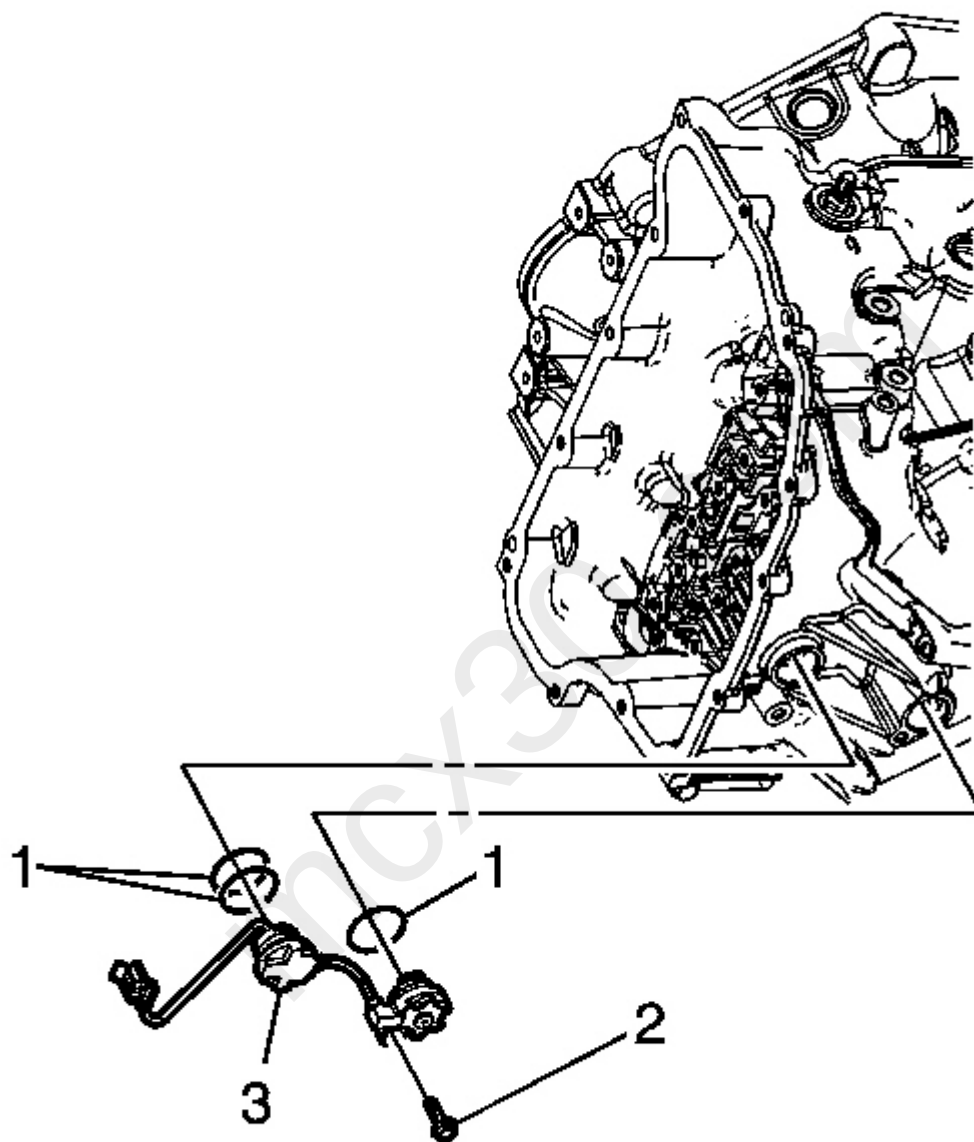


Fig. 62: Identifying Input Speed Sensor Components
Courtesy of GENERAL MOTORS CORP.

1. Install the 3 input speed sensor seals (1).
2. Install the input speed sensor (3).

CAUTION: Refer to Fastener Caution .

3. Install the input speed sensor bolt (2) M6 x 23 and tighten to 12 N.m (106 lb in).

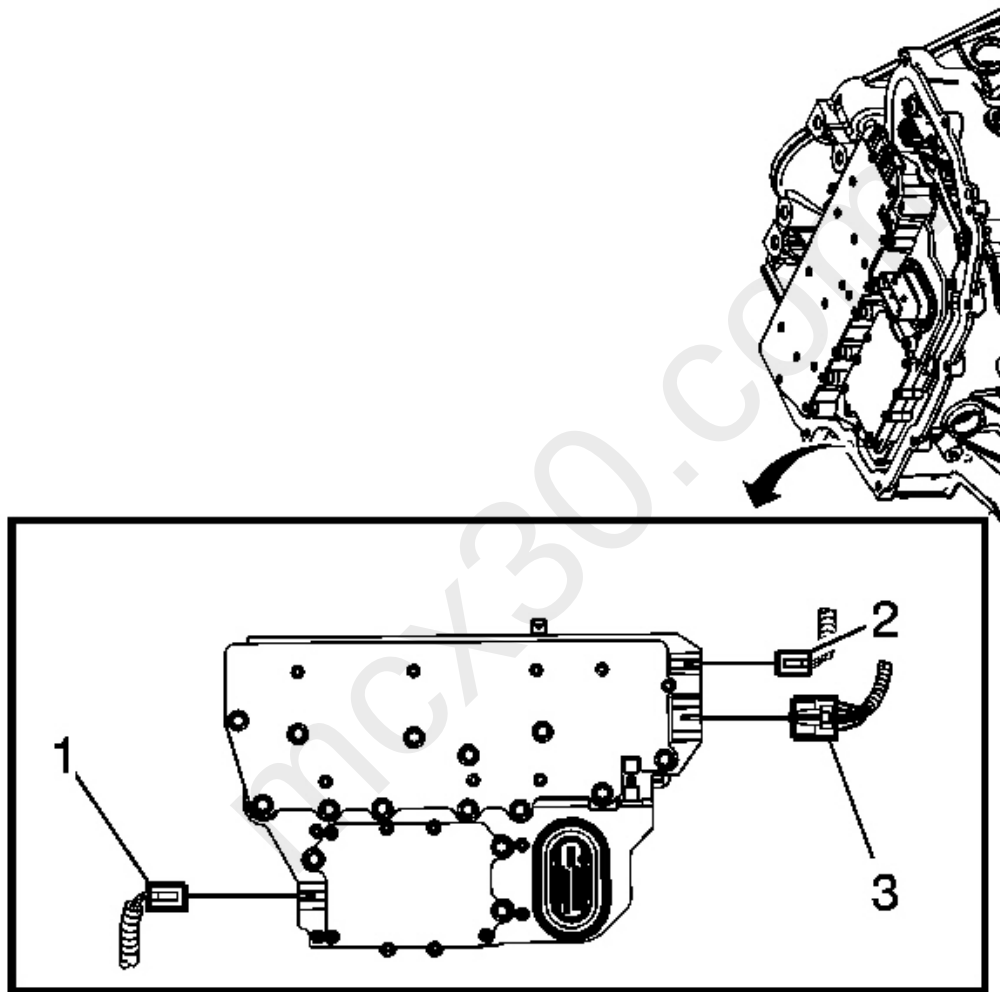


Fig. 63: Identifying Speed Sensor & Shift Position Switch Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

4. Connect the input speed sensor electrical connector (1).
5. Install the transmission control valve body cover. Refer to Control Valve Body Cover Replacement.
6. Perform the transmission adaptive values learn procedure. Refer to Transmission Adaptive Values

Learn .

TRANSMISSION MOUNT REPLACEMENT - LEFT SIDE

Removal Procedure

1. Remove the battery tray. Refer to Battery Tray Replacement .
2. Remove the underhood electrical center.
3. Support the engine and transmission.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .

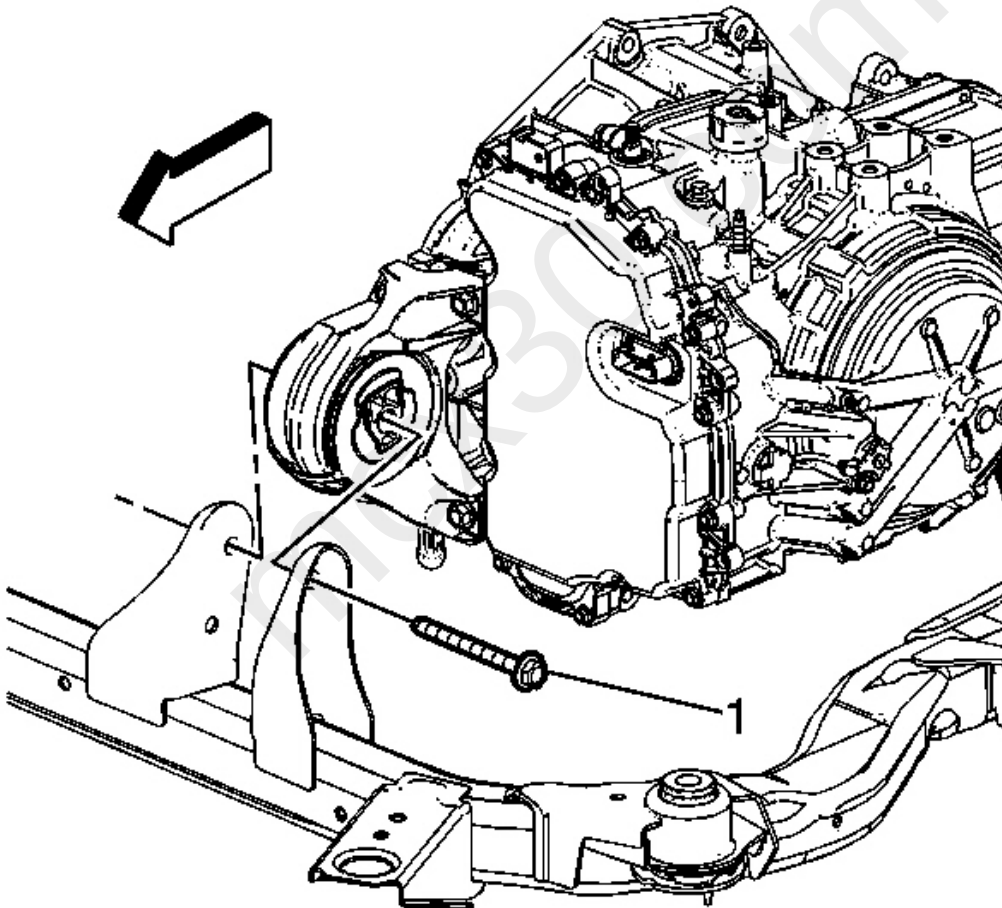


Fig. 64: Front Transmission Mount To Frame Bolt
Courtesy of GENERAL MOTORS CORP.

5. Remove the front transmission mount to frame bolt (1).

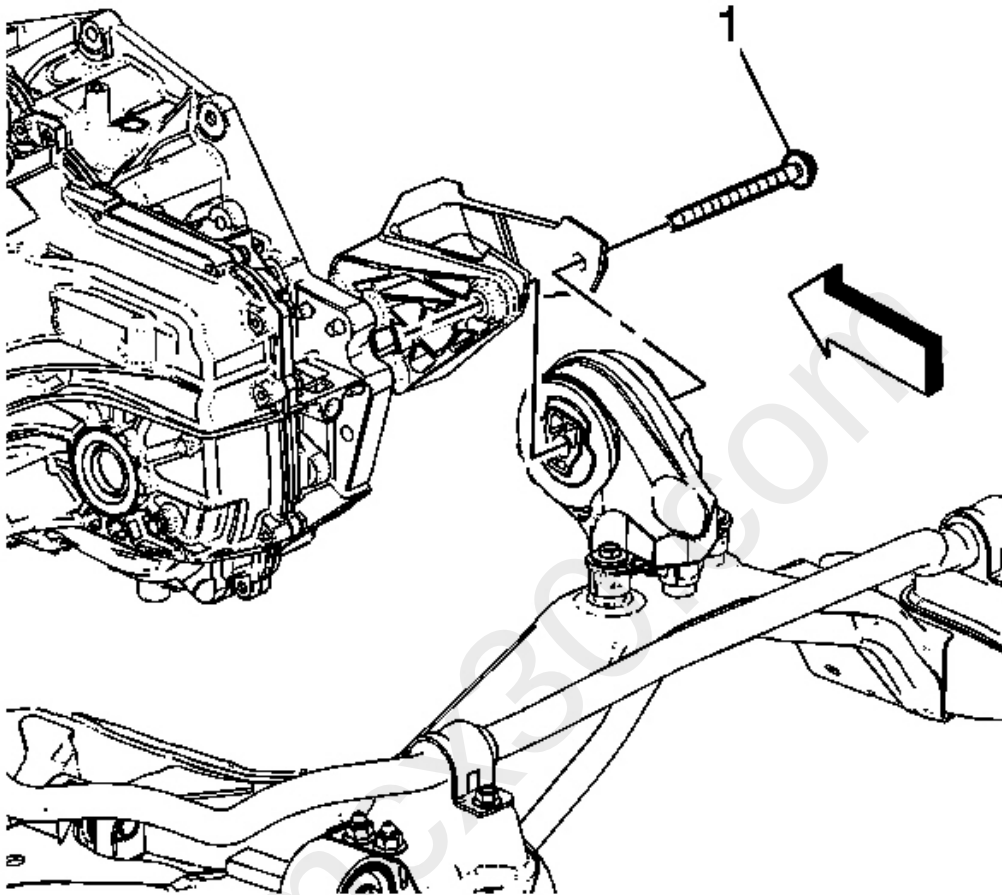


Fig. 65: Rear Transmission Mount To Rear Transmission Mount Bracket Bolt
Courtesy of GENERAL MOTORS CORP.

6. Remove the rear transmission mount to rear transmission mount bracket bolt (1).
7. Lower the vehicle.

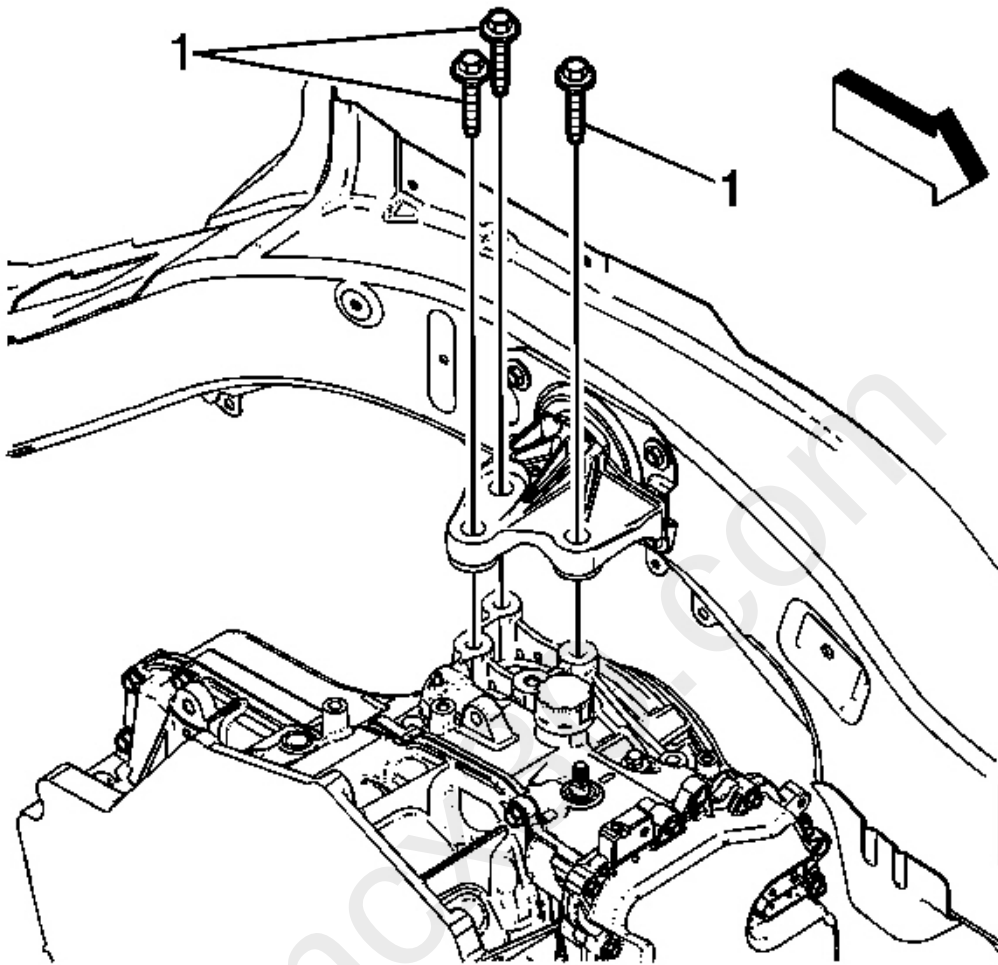


Fig. 66: Left Transmission Mount To Transmission Bolts
Courtesy of GENERAL MOTORS CORP.

8. Remove the left transmission mount to transmission bolts (1).

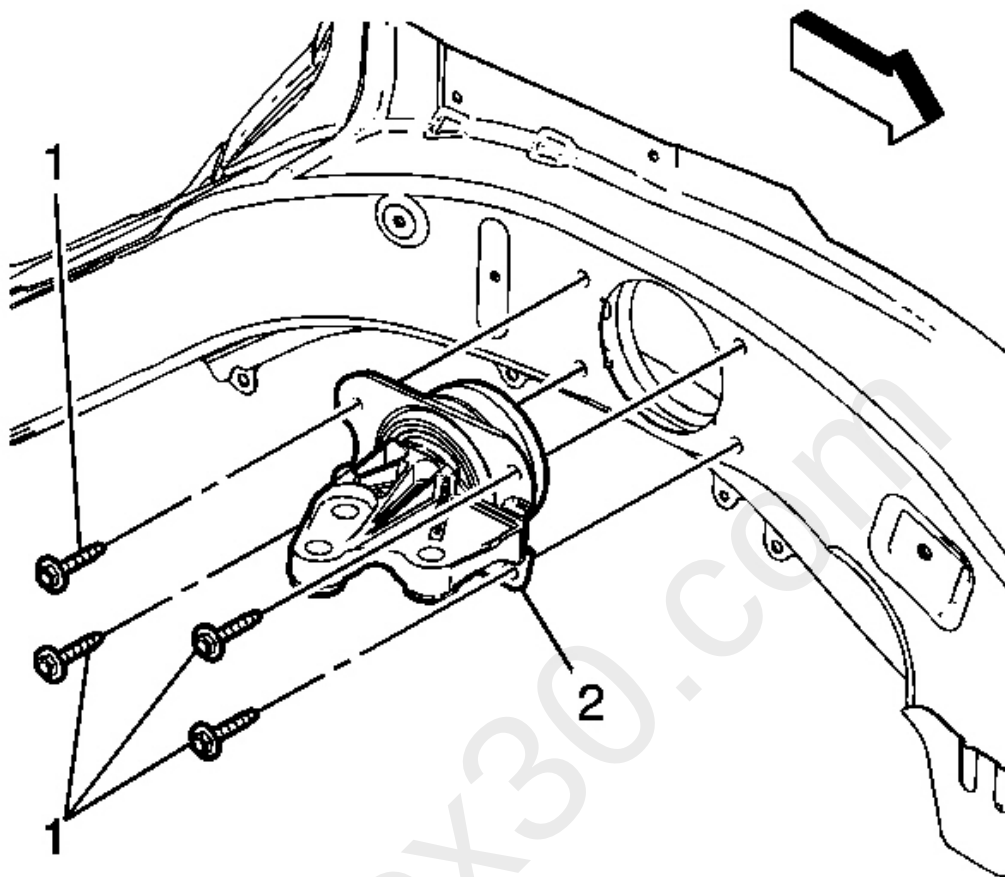


Fig. 67: Left Transmission Mount To Frame Rail Bolts
Courtesy of GENERAL MOTORS CORP.

9. Remove the left transmission mount to frame rail bolts (1).
10. Lower the transmission enough to provide clearance for the left transmission mount.
11. Remove the left transmission mount (2).

Installation Procedure

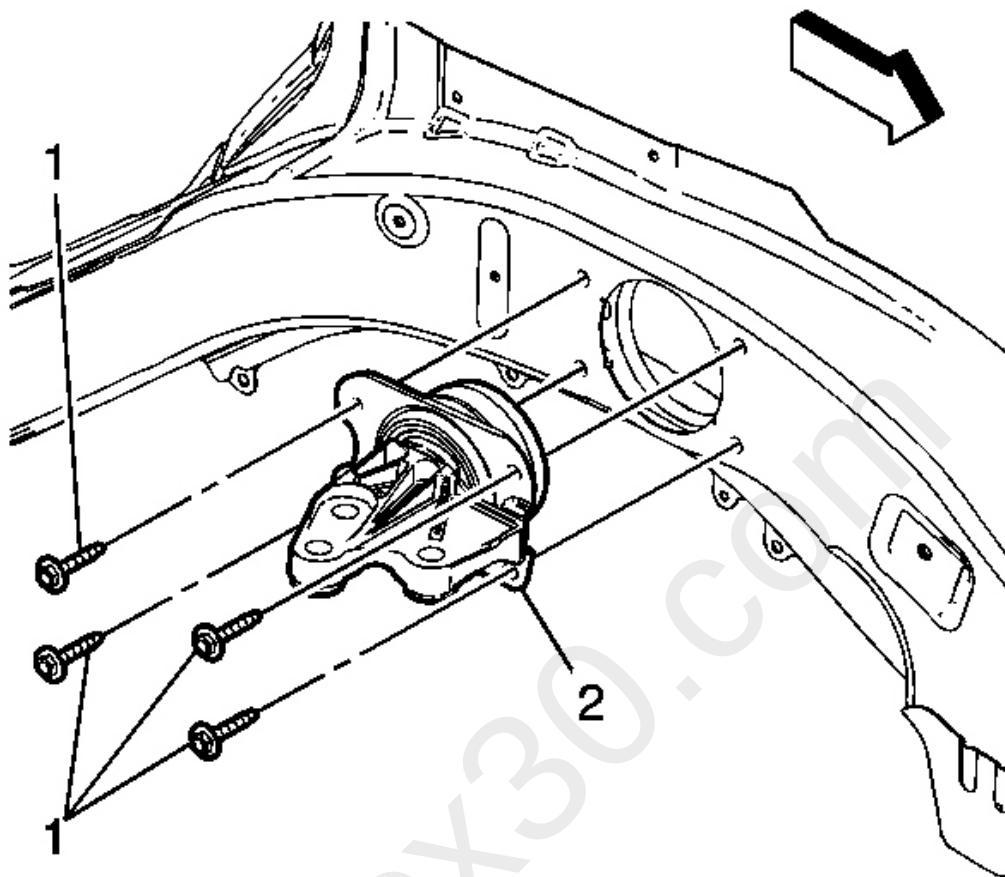


Fig. 68: Left Transmission Mount To Frame Rail Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the left transmission mount (2).

CAUTION: Refer to Fastener Caution .

2. Install the left transmission mount to frame rail bolts (1) and tighten to 27 N.m (20 lb ft).
3. Raise the transmission until the transmission contacts the left transmission mount.

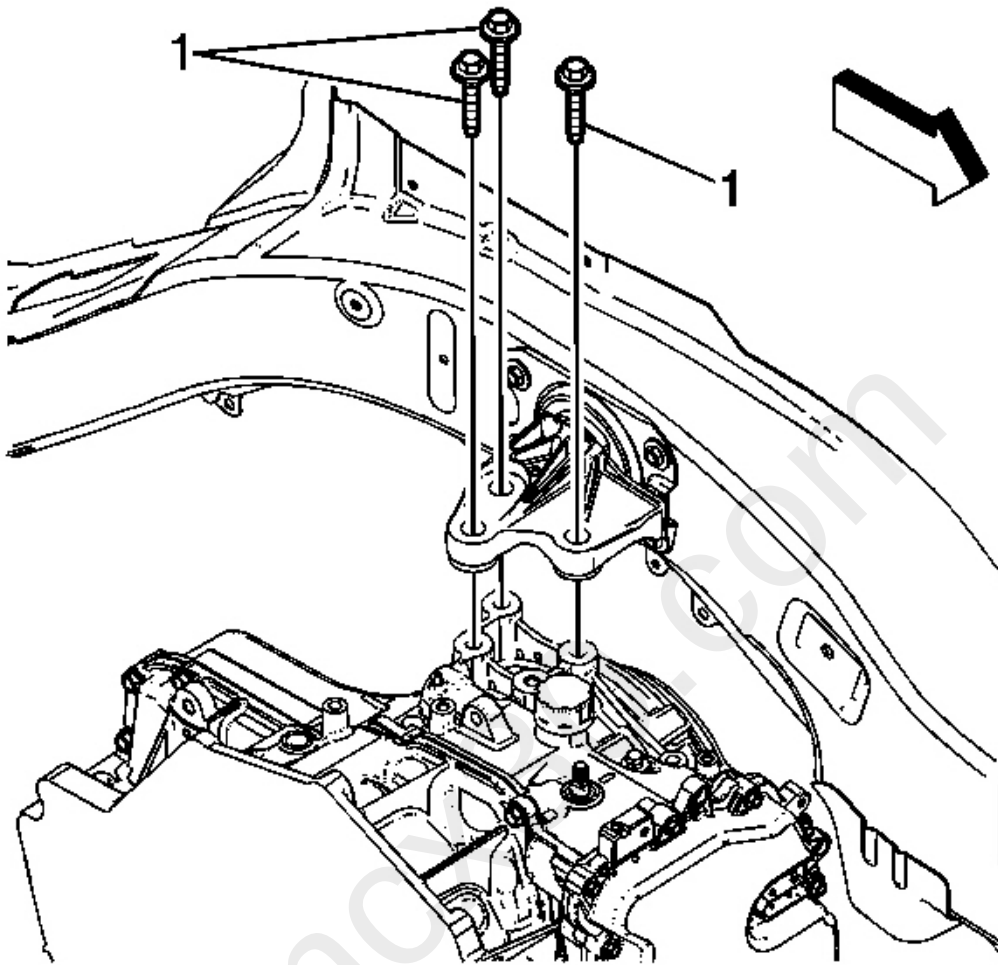


Fig. 69: Left Transmission Mount To Transmission Bolts
Courtesy of GENERAL MOTORS CORP.

4. Install the left transmission mount to transmission bolts (1) and tighten to 50 N.m (37 lb ft).
5. Raise the vehicle.

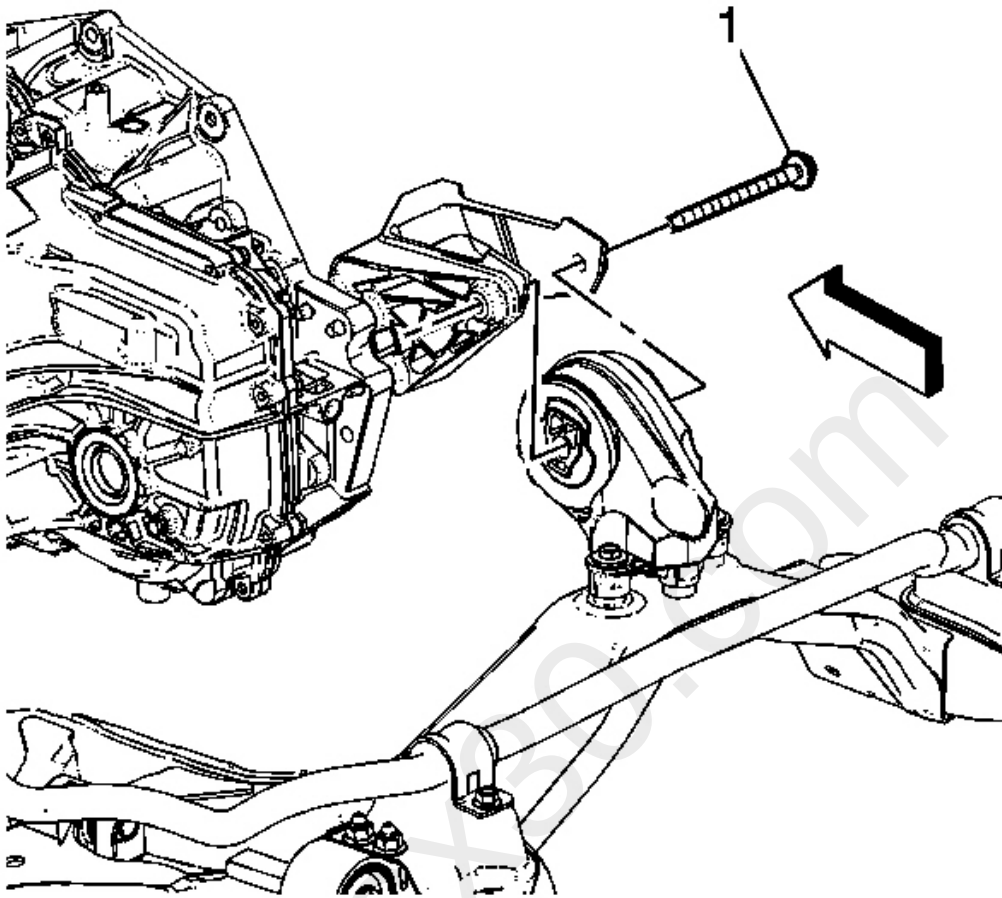


Fig. 70: Rear Transmission Mount To Rear Transmission Mount Bracket Bolt
Courtesy of GENERAL MOTORS CORP.

6. Install the rear transmission mount to rear transmission mount bracket bolt (1) and tighten to 110 N.m (81 lb ft).

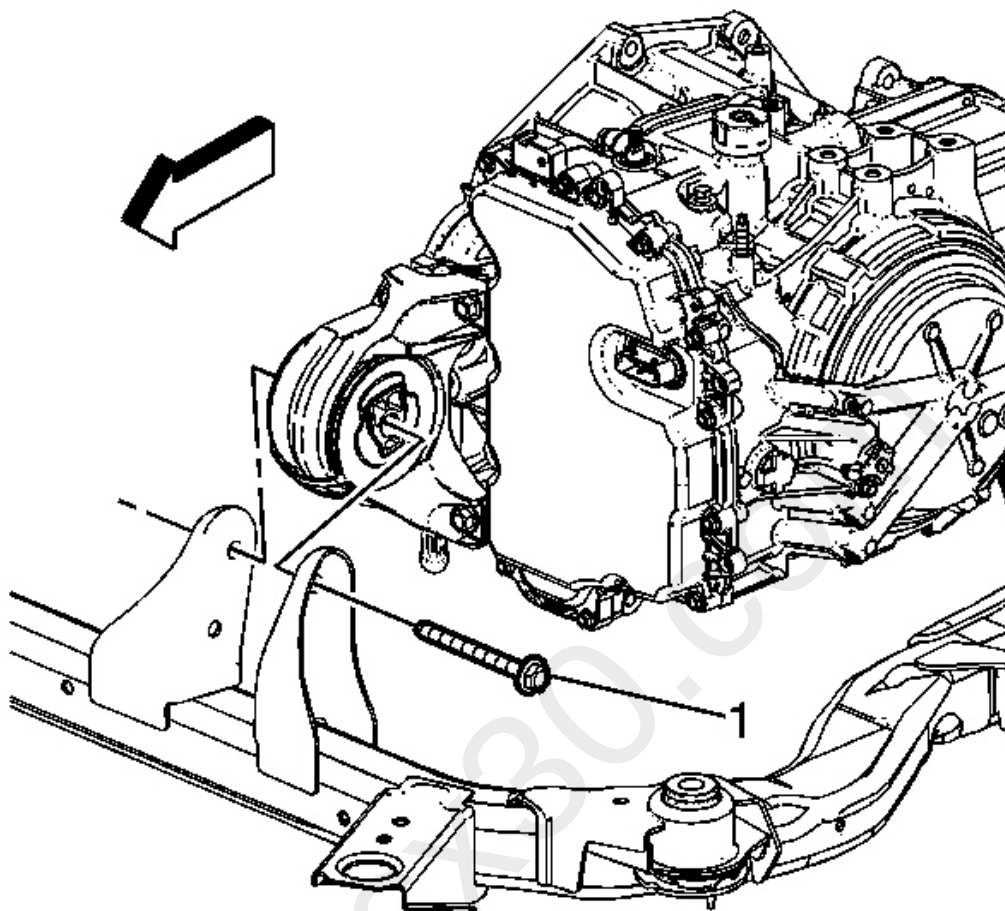


Fig. 71: Front Transmission Mount To Frame Bolt
Courtesy of GENERAL MOTORS CORP.

7. Install the front transmission mount to frame bolt (1) and tighten to 110 N.m (81 lb ft).
8. Lower the vehicle.
9. Remove the engine and transmission support.
10. Install the battery tray. Refer to **Battery Tray Replacement** .
11. Install the underhood electrical center.

TRANSMISSION FRONT MOUNT REPLACEMENT

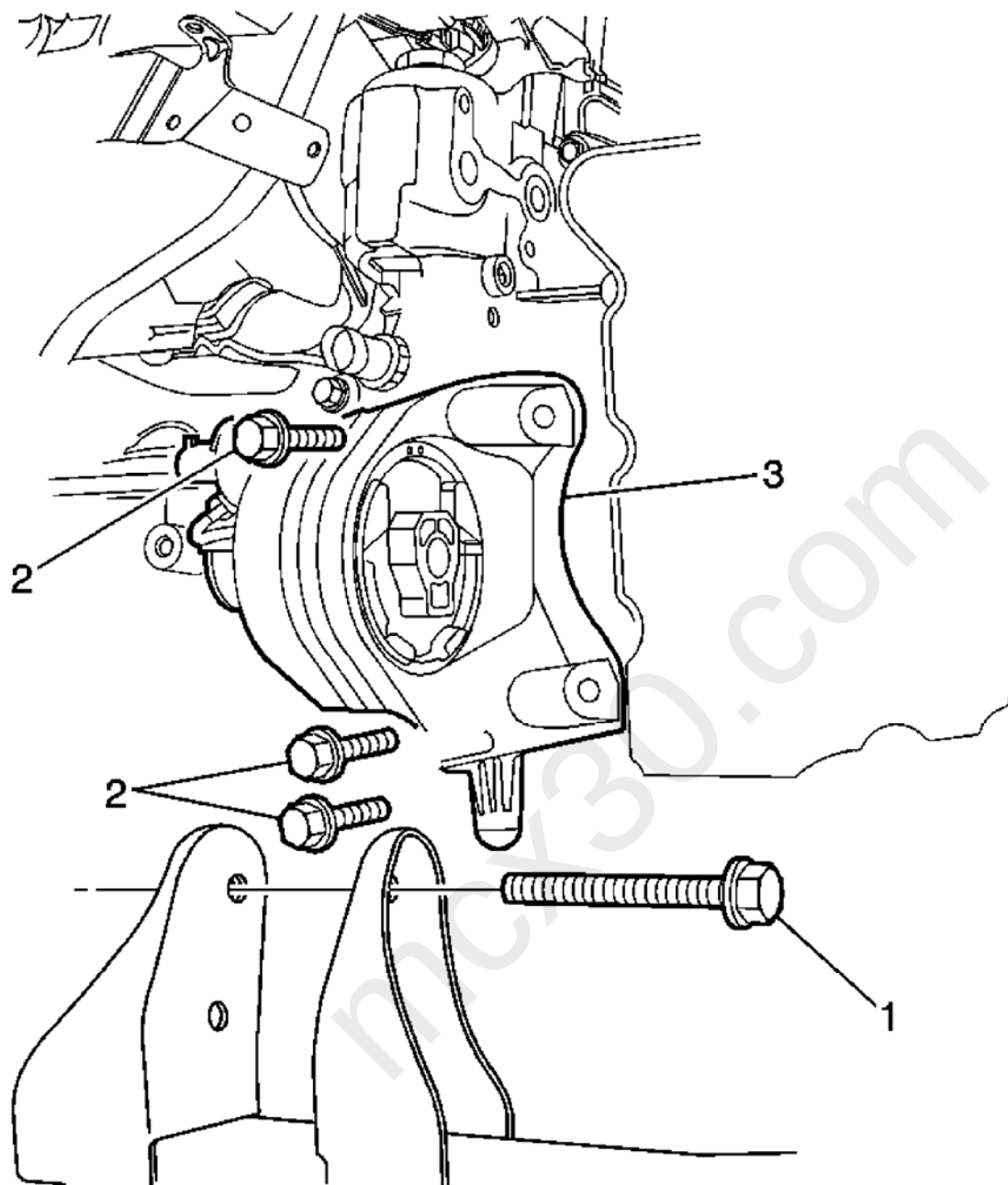


Fig. 72: Transmission Front Mount
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1.	Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> .
2.	Support the transmission with a transmission jack.

1	Front Transmission Mount Thru Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 110 N.m (81 lb ft)
2	Front Transmission Mount Bolt (Qty: 3) Tighten: 50 N.m (37 lb ft)
3	Front Transmission Mount

TRANSMISSION REAR MOUNT BRACKET REPLACEMENT (AWD)

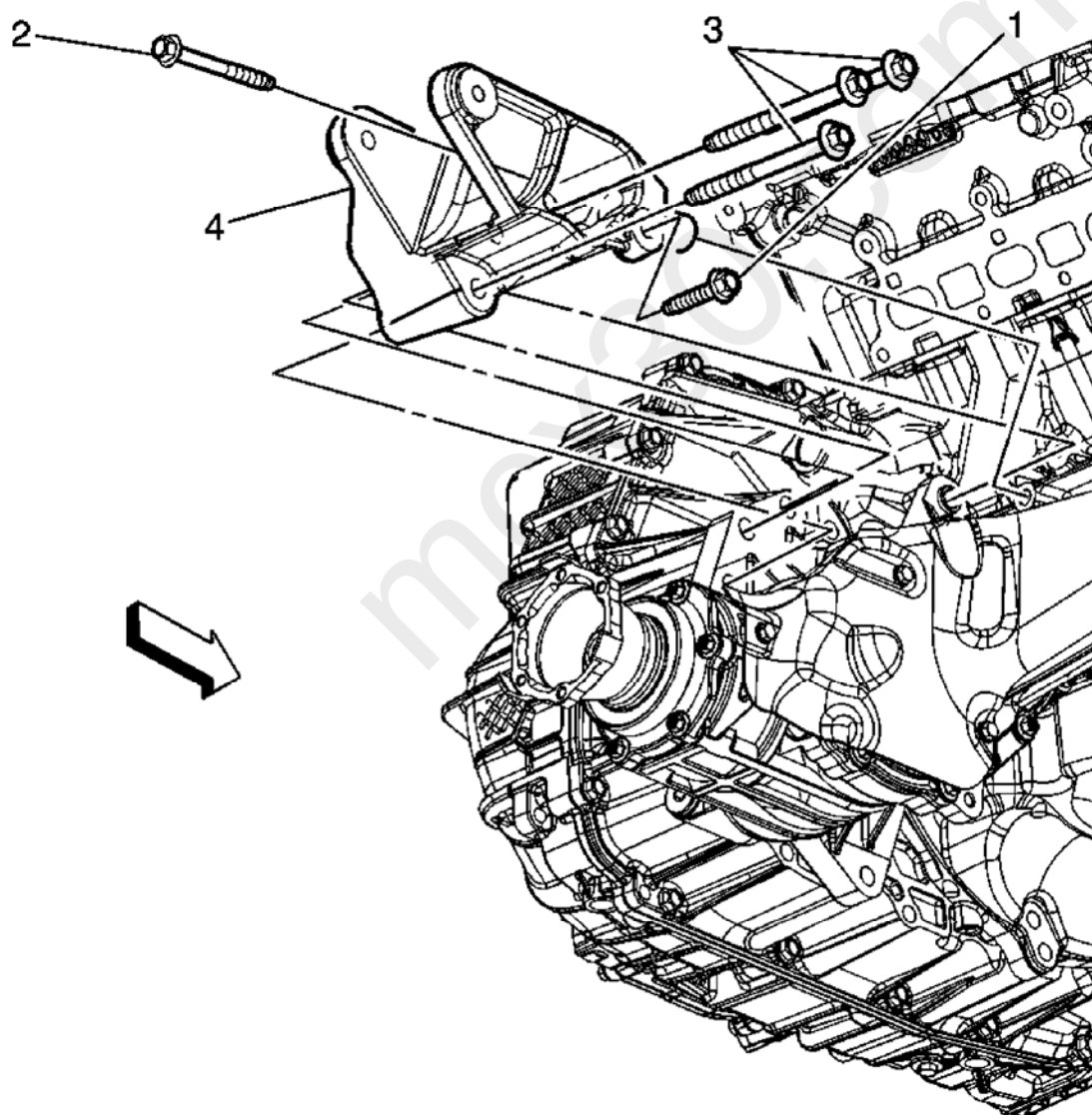


Fig. 73: Transmission Rear Mount Bracket (AWD)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the rear transmission mount. Refer to <u>Transmission Rear Mount Replacement</u> .	
1	Rear Transmission Mount Bracket Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 50 N.m (37 lb ft)
2	Rear Transmission Mount Bracket Bolt Tighten: 50 N.m (37 lb ft)
3	Rear Transmission Mount Bracket Bolt (Qty: 3) Tighten: 110 N.m (81 lb ft)
4	Rear Transmission Mount Bracket

TRANSMISSION REAR MOUNT BRACKET REPLACEMENT (FWD)

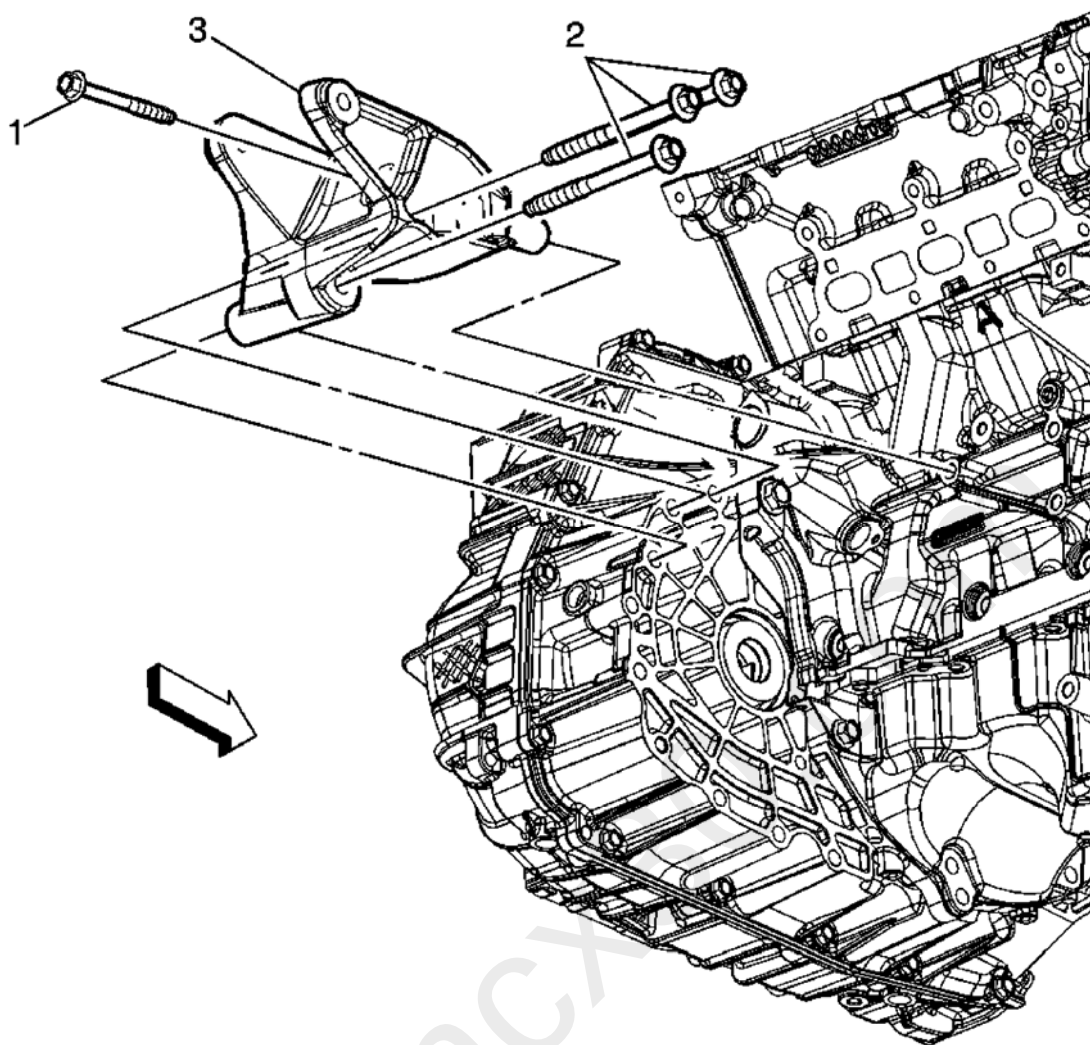
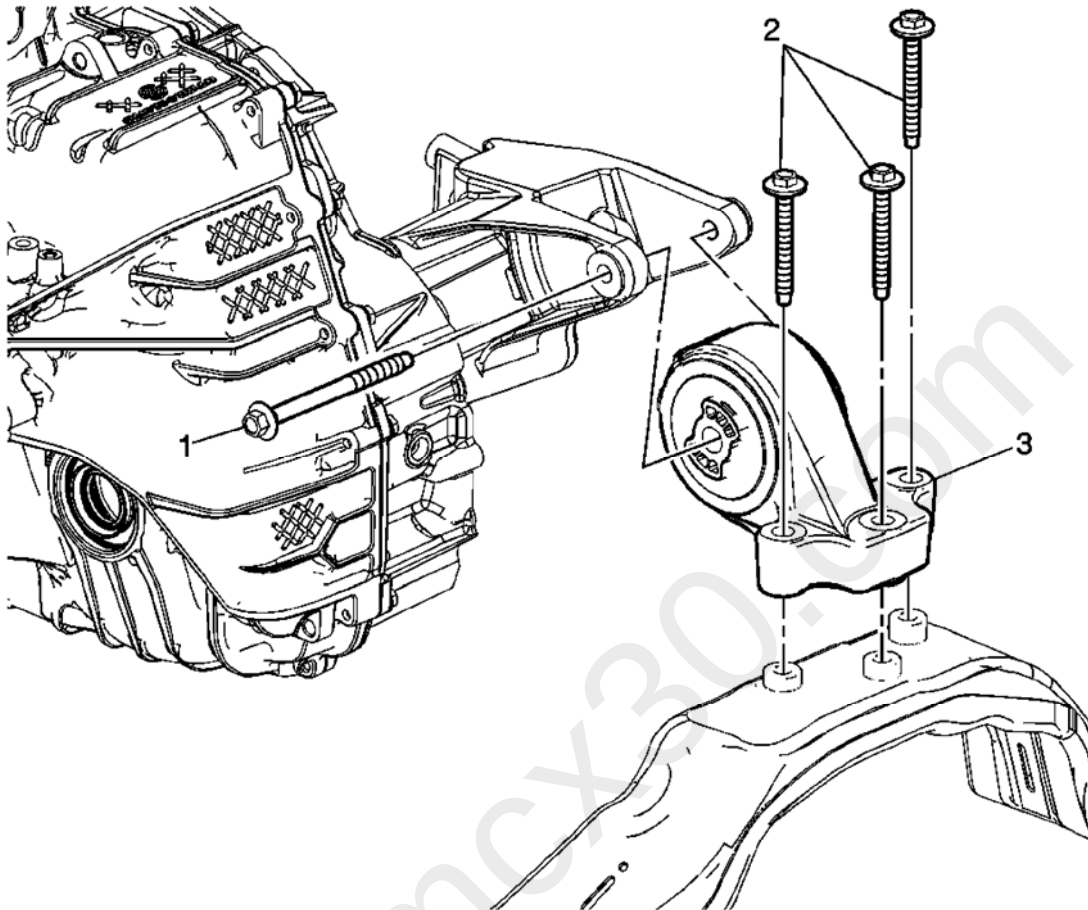


Fig. 74: Transmission Rear Mount Bracket (FWD)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the rear transmission mount. Refer to <u>Transmission Rear Mount Replacement</u> .	
1	Rear Transmission Mount Bracket Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 50 N.m (37 lb ft)
2	Rear Transmission Mount Bracket Bolt (Qty: 3) Tighten: 110 N.m (81 lb ft)

TRANSMISSION REAR MOUNT REPLACEMENT (FWD)**Fig. 75: Transmission Rear Mount (FWD)**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the right front tire and wheel. Refer to <u>Tire and Wheel Removal and Installation</u> .	
2. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> .	
3. Support the transmission with a transmission jack.	
1	Rear Transmission Mount Thru Bolt CAUTION: Refer to <u>Fastener Caution</u> .

	Tighten: 110 N.m (81 lb ft)
2	Rear Transmission Mount Bolt (Qty: 3) Tighten: 50 N.m (37 lb ft)
3	Rear Transmission Mount

TRANSMISSION REAR MOUNT REPLACEMENT (AWD)

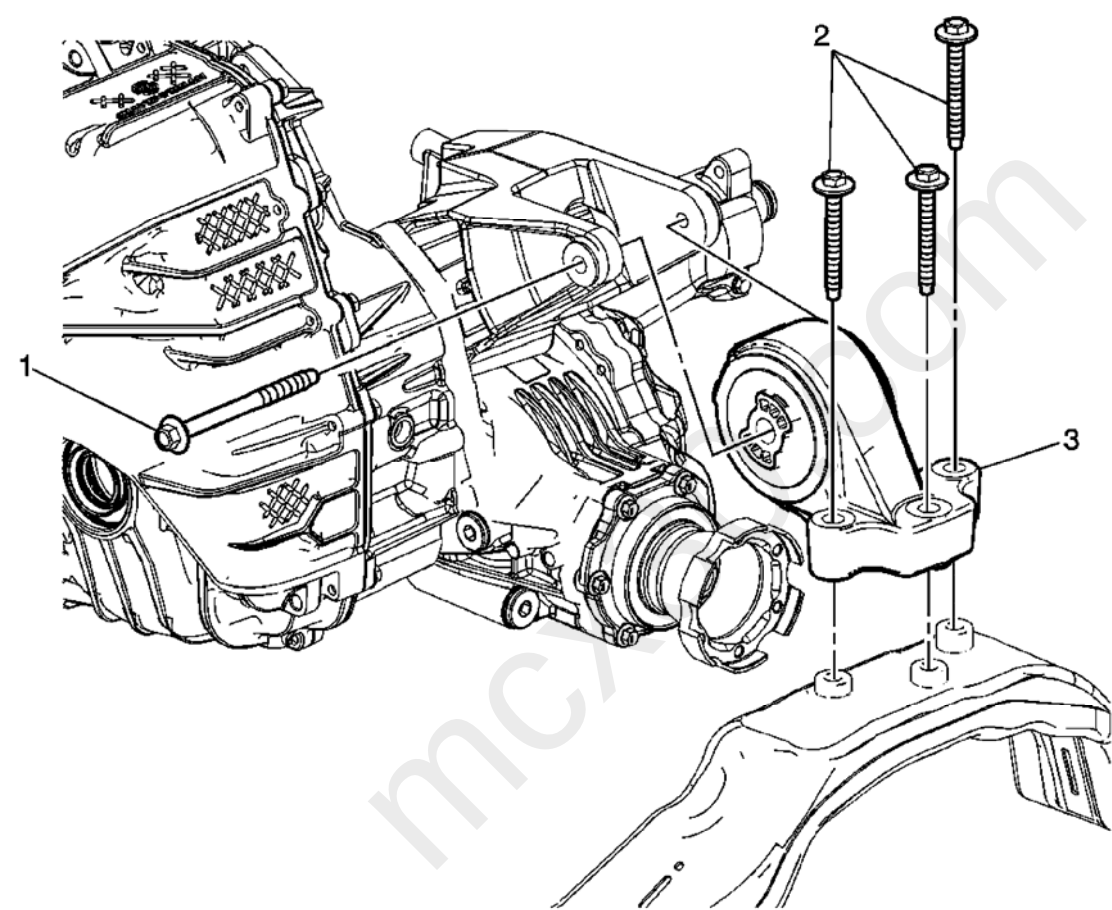


Fig. 76: Transmission Rear Mount (AWD)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the right front tire and wheel. Refer to <u>Tire and Wheel Removal and Installation</u> .	
2. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> .	
3. Support the transmission with a transmission jack.	
	Rear Transmission Mount Thru Bolt

1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 110 N.m (81 lb ft)
2	Rear Transmission Mount Bolt Tighten: 50 N.m (37 lb ft)
3	Rear Transmission Mount

TRANSMISSION REPLACEMENT

Removal Procedure

1. Remove the battery tray. Refer to **Battery Tray Replacement** .
2. Remove the transmission range select lever cable and bracket. Refer to **Range Selector Lever Cable Bracket Replacement**.

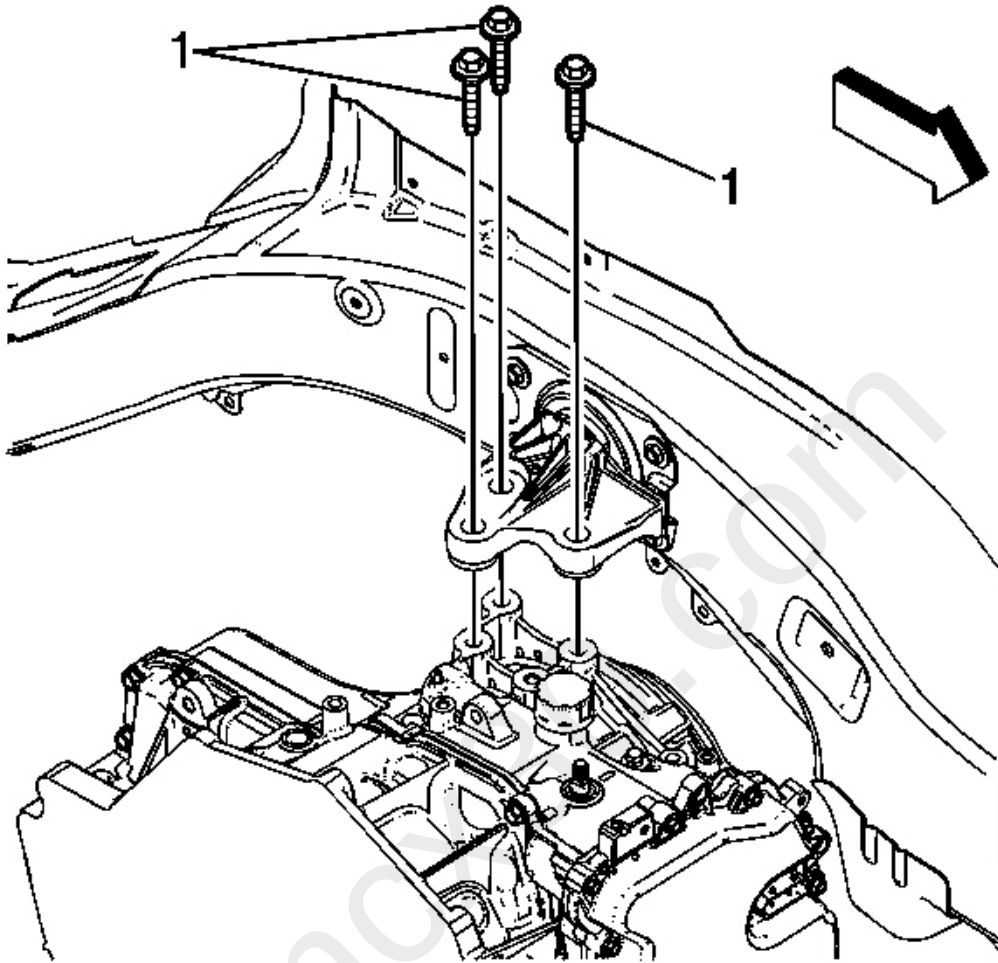


Fig. 77: Left Transmission Mount To Transmission Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the left transmission mount bolts (1) from the transmission.
4. Drain the transmission fluid. Refer to **Transmission Fluid Replacement**.

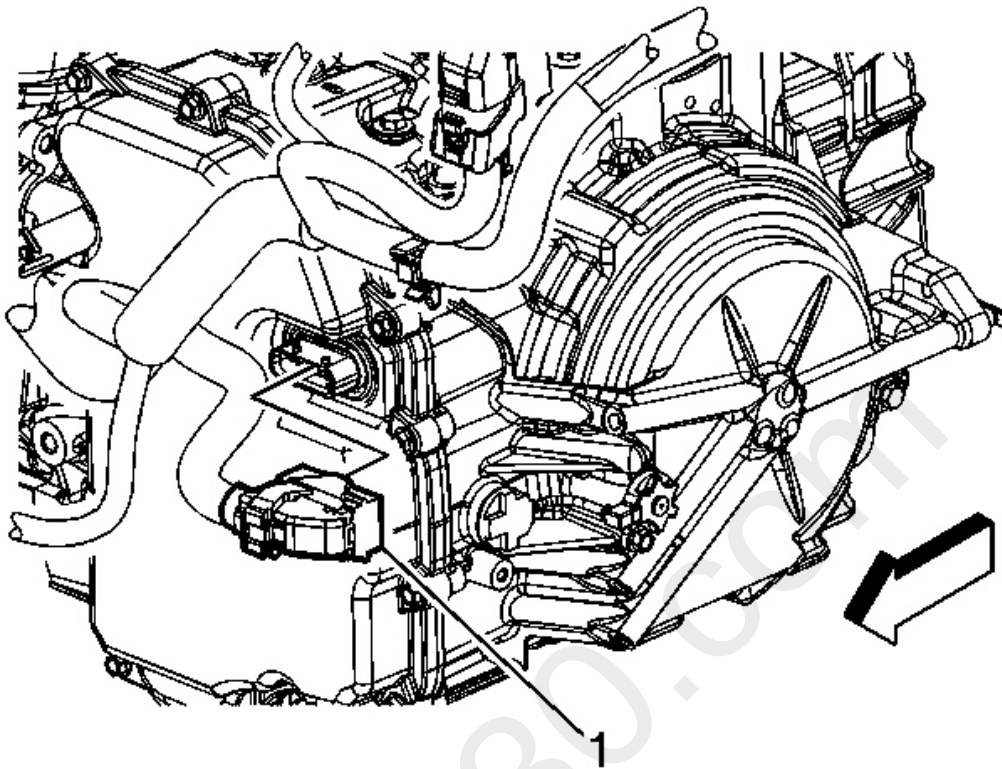


Fig. 78: Identifying Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the control valve body transmission control module (TCM) electrical connector (1).

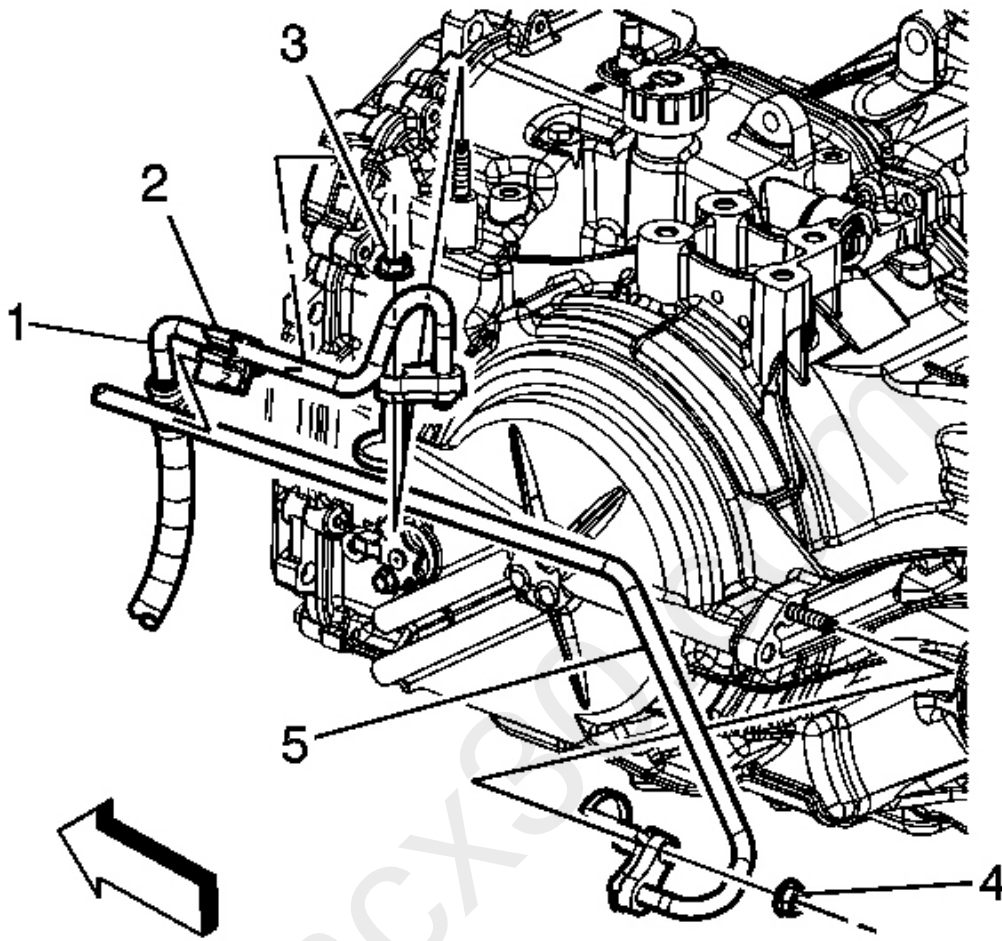


Fig. 79: Identifying Cooler Inlet & Outlet Hoses
Courtesy of GENERAL MOTORS CORP.

6. Remove the oil cooler inlet (1) and outlet (5) hoses from the retainer (2) on the control valve body cover.
7. Remove the transmission fluid cooler inlet hose nut (3) from the transmission.
8. Remove the transmission fluid cooler inlet hose (1) from the transmission.
9. Remove the transmission fluid cooler outlet hose nut (4) from the transmission.
10. Remove the transmission fluid cooler outlet hose (5) from the transmission.
11. Plug and/or cap the hose and transmission to prevent contamination.

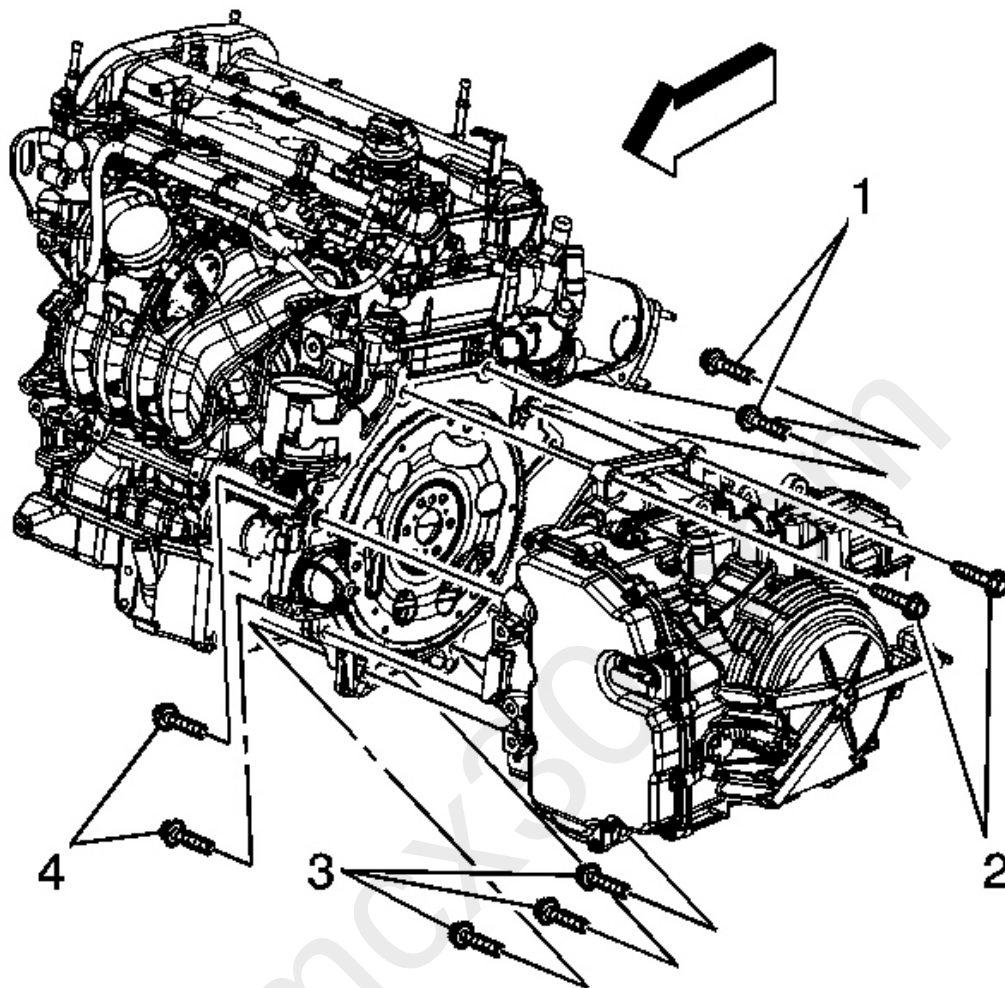


Fig. 80: Identifying Transmission-To-Engine Bolts
Courtesy of GENERAL MOTORS CORP.

12. Remove the upper transmission to engine bolts (2).
13. Remove the frame. Refer to **Drivetrain and Front Suspension Frame Replacement** .
14. Disconnect the wheel drive shafts and intermediate shaft from the transmission. Refer to **Front Wheel Drive Shaft Replacement** .
15. On AWD equipped vehicles, remove the transfer case. Refer to **Transfer Case Assembly Replacement**
16. Remove the rear transmission mount bracket from the transmission. Refer to **Transmission Rear Mount Bracket Replacement (AWD)** or **Transmission Rear Mount Bracket Replacement (FWD)**.
17. Remove the front transmission mount from the transmission. Refer to **Transmission Front Mount Replacement**.

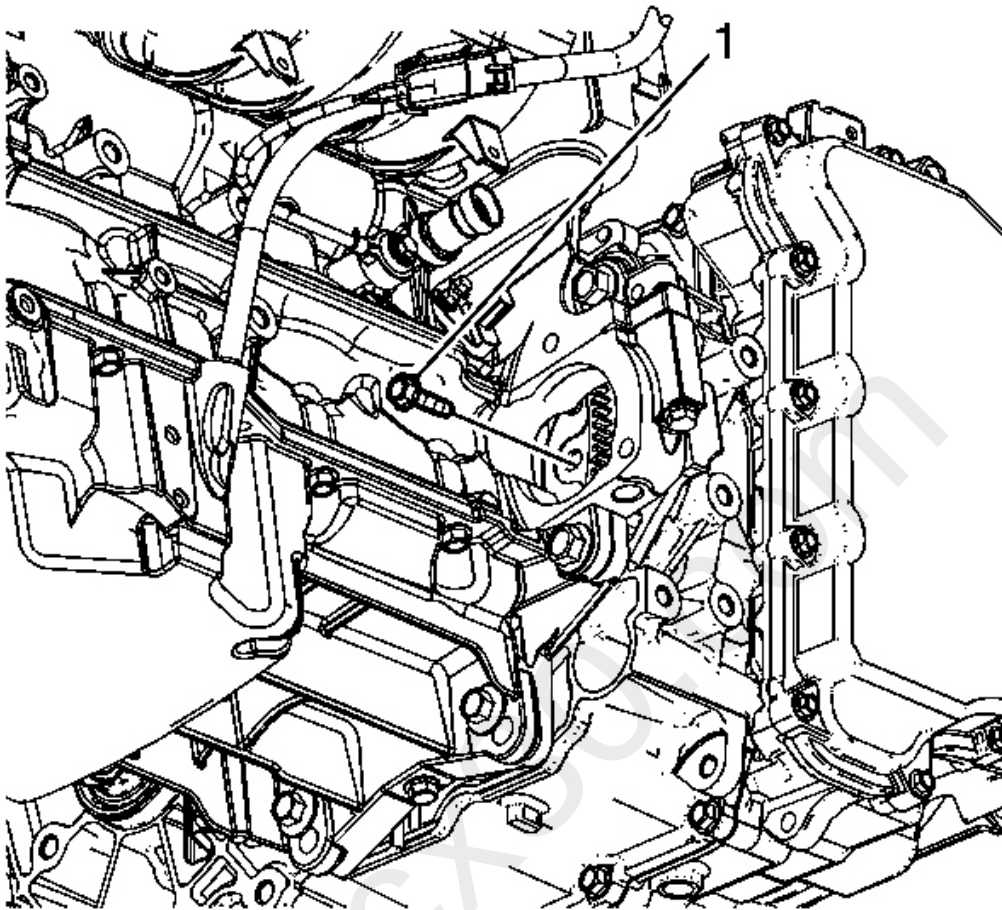


Fig. 81: Identifying Starter Bolts
Courtesy of GENERAL MOTORS CORP.

18. Remove the starter. Refer to **Starter Replacement (LAF)** or **Starter Replacement (LF1)** .
19. Mark the relationship of the flywheel to the torque converter for reassembly.
20. Remove the torque converter to flywheel bolts (1).
21. Use a transmission jack in order to support the transmission.

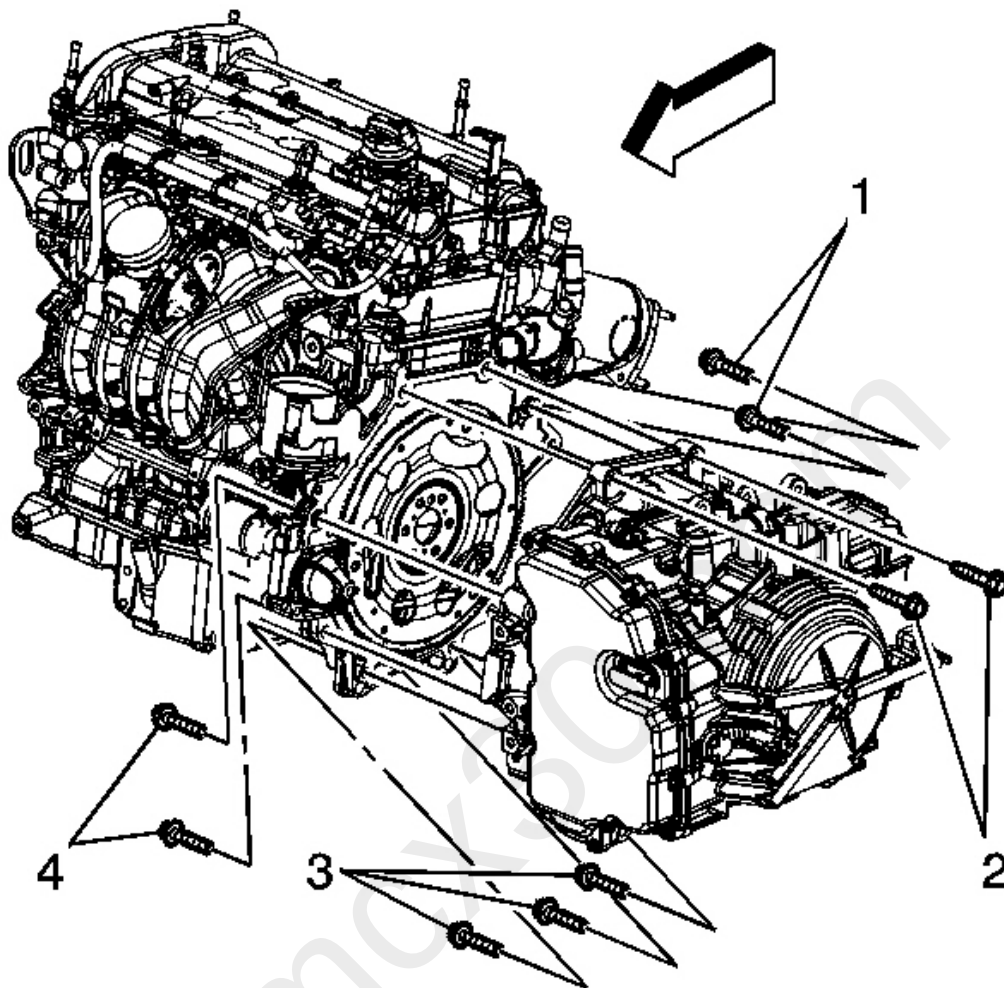


Fig. 82: Identifying Transmission-To-Engine Bolts
Courtesy of GENERAL MOTORS CORP.

22. Remove the remaining transmission bolts (1, 3, 4).

NOTE: Insure the torque converter remains securely in place on the transmission input shaft while separating and removing the transmission.

23. Separate the transmission from the engine.
24. Lower the transmission with the transmission jack far enough to remove the transmission.

Installation Procedure

1. Raise the transmission with the transmission jack and position the transmission to the engine.

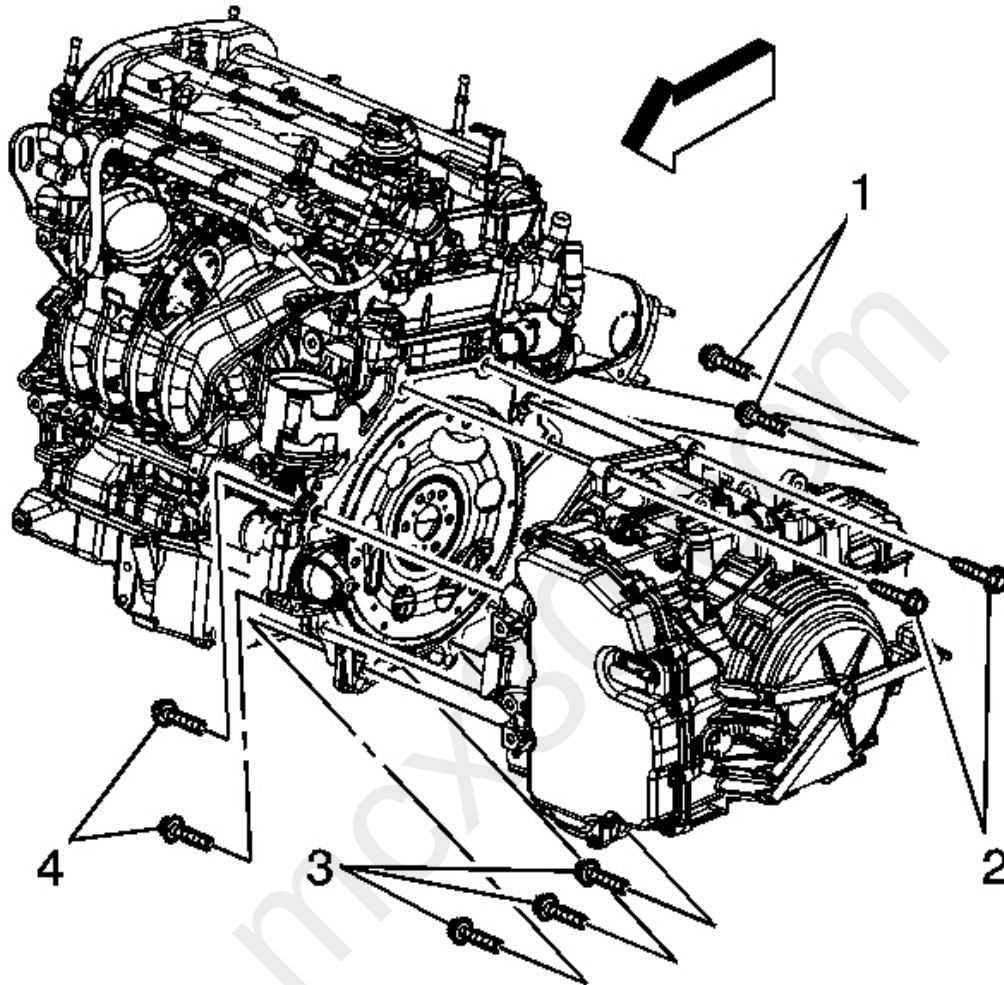


Fig. 83: Identifying Transmission-To-Engine Bolts
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Fastener Caution .

2. Install the transmission bolts (1, 3, 4) and tighten to 75 N.m (55 lb ft).
3. Remove the transmission jack.

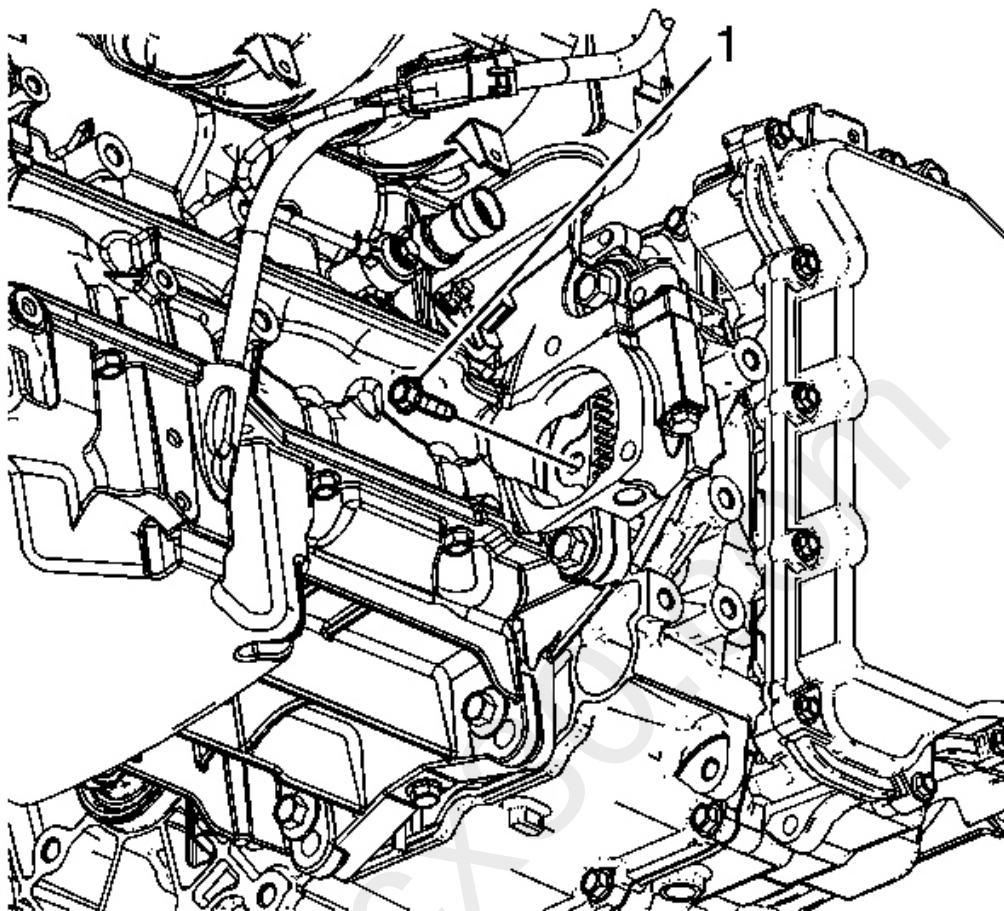


Fig. 84: Identifying Starter Bolts
 Courtesy of GENERAL MOTORS CORP.

4. Install the torque converter to flywheel bolts (1) and tighten to 62 N.m (46 lb ft).
5. Install the starter. Refer to **Starter Replacement (LAF)** or **Starter Replacement (LF1)** .
6. Install the front transmission mount to the transmission. Refer to **Transmission Front Mount Replacement**.
7. On AWD equipped vehicles, install the transfer case. Refer to **Transfer Case Assembly Replacement** .
8. Install the rear transmission mount bracket to the transmission. Refer to **Transmission Rear Mount Bracket Replacement (AWD)** or **Transmission Rear Mount Bracket Replacement (FWD)**.
9. Install the intermediate drive shaft and wheel drive shafts to the transmission. Refer to **Front Wheel Drive Shaft Replacement** .
10. Install the frame. Refer to **Drivetrain and Front Suspension Frame Replacement** .

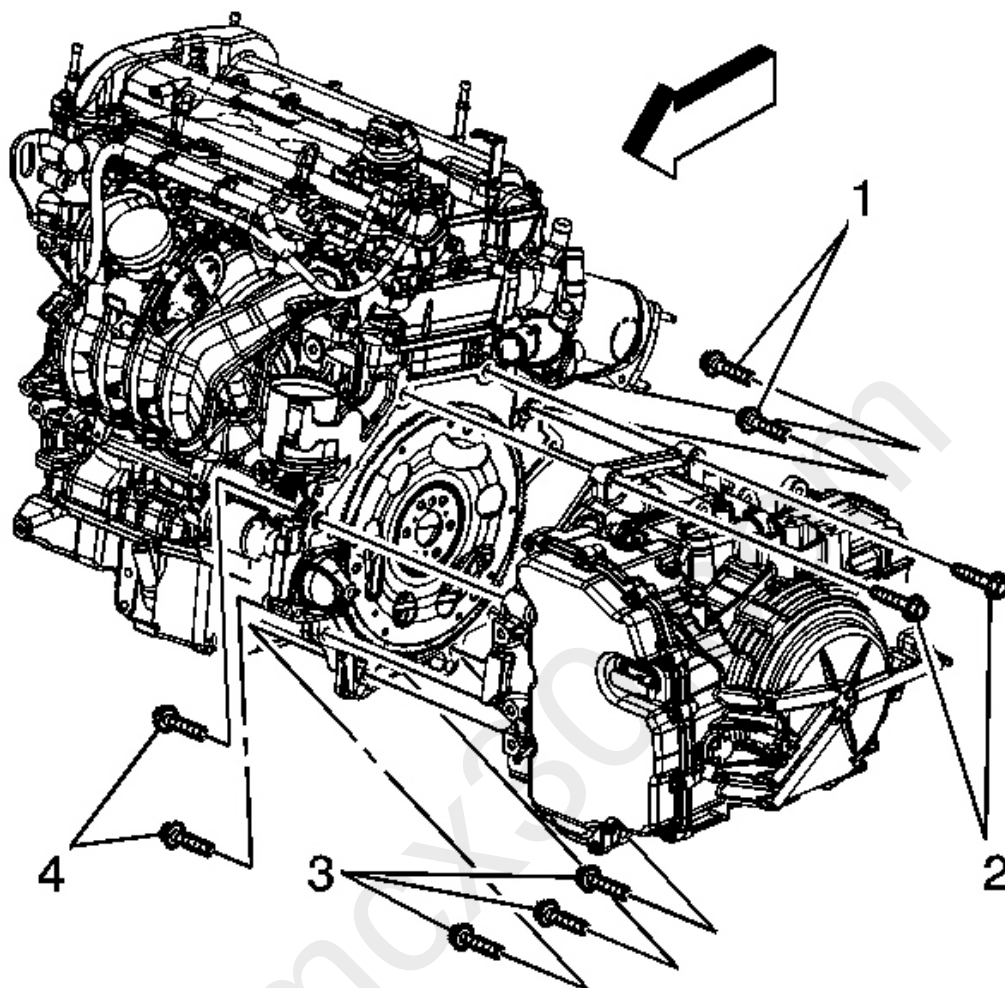


Fig. 85: Identifying Transmission-To-Engine Bolts
Courtesy of GENERAL MOTORS CORP.

11. Install the upper transmission to engine bolts (2) and tighten to 75 N.m (55 lb ft).

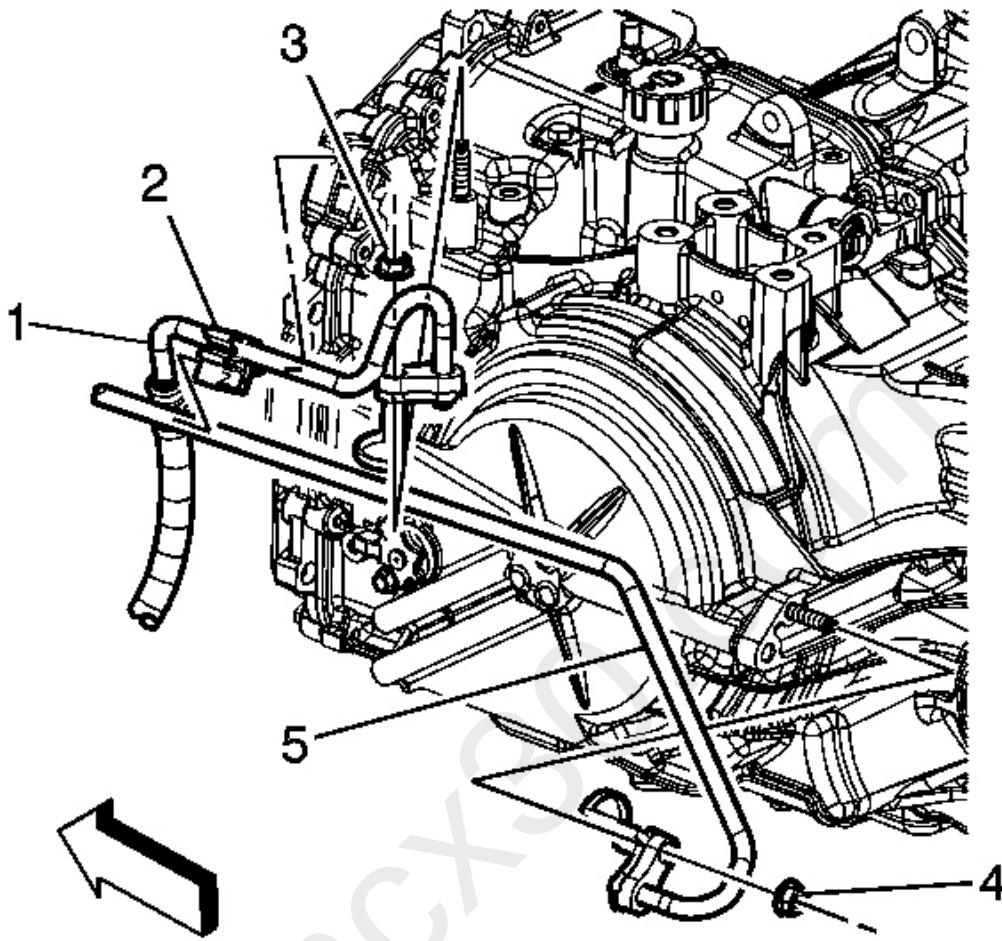


Fig. 86: Identifying Cooler Inlet & Outlet Hoses
Courtesy of GENERAL MOTORS CORP.

12. Install the transmission fluid cooler outlet hose (5) to the transmission.
13. Install the transmission fluid cooler outlet hose retainer nut (4) and tighten to 22 N.m (16 lb ft).
14. Install the transmission fluid cooler inlet hose (1) to the transmission.
15. Install the transmission fluid cooler inlet hose retainer nut (3).
16. Install the oil cooler inlet (1) and outlet (5) hoses to the retainer (2) on the control valve body cover.

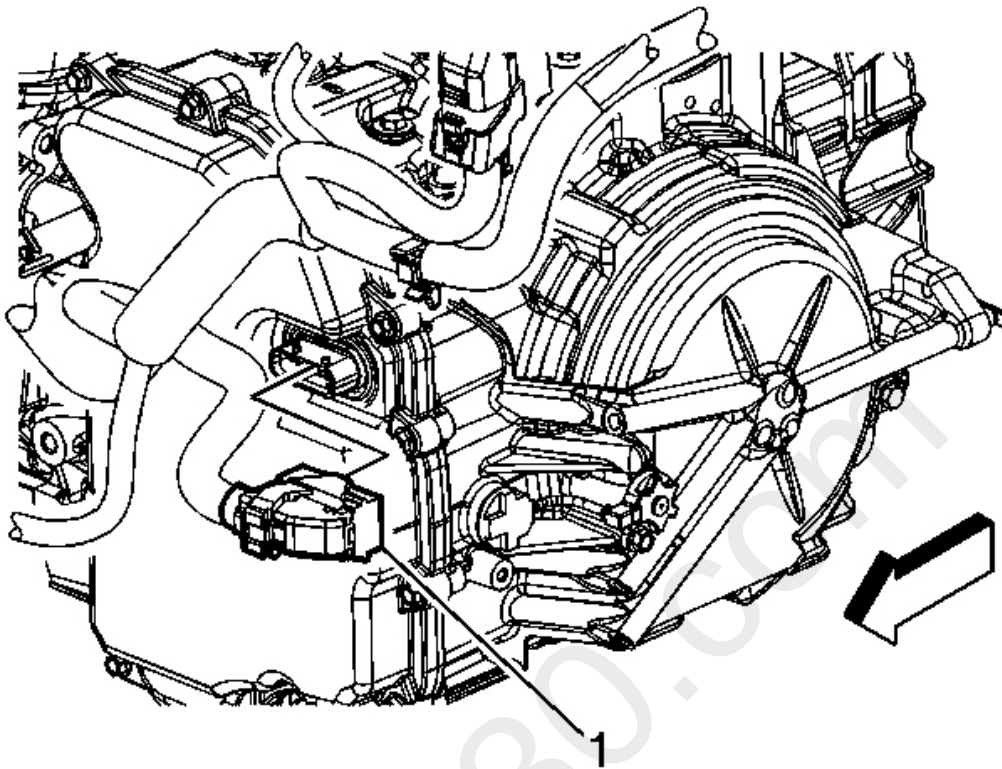


Fig. 87: Identifying Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS CORP.

17. Connect the control valve body TCM electrical connector (1).
18. Install the transmission range select lever cable and bracket. Refer to **Range Selector Lever Cable Bracket Replacement**.
19. Install the battery tray. Refer to **Battery Tray Replacement**.
20. Adjust the automatic transmission range selector lever cable. Refer to **Range Selector Lever Cable Adjustment**.
21. Fill the transmission with fluid. Refer to **Transmission Fluid Replacement**.

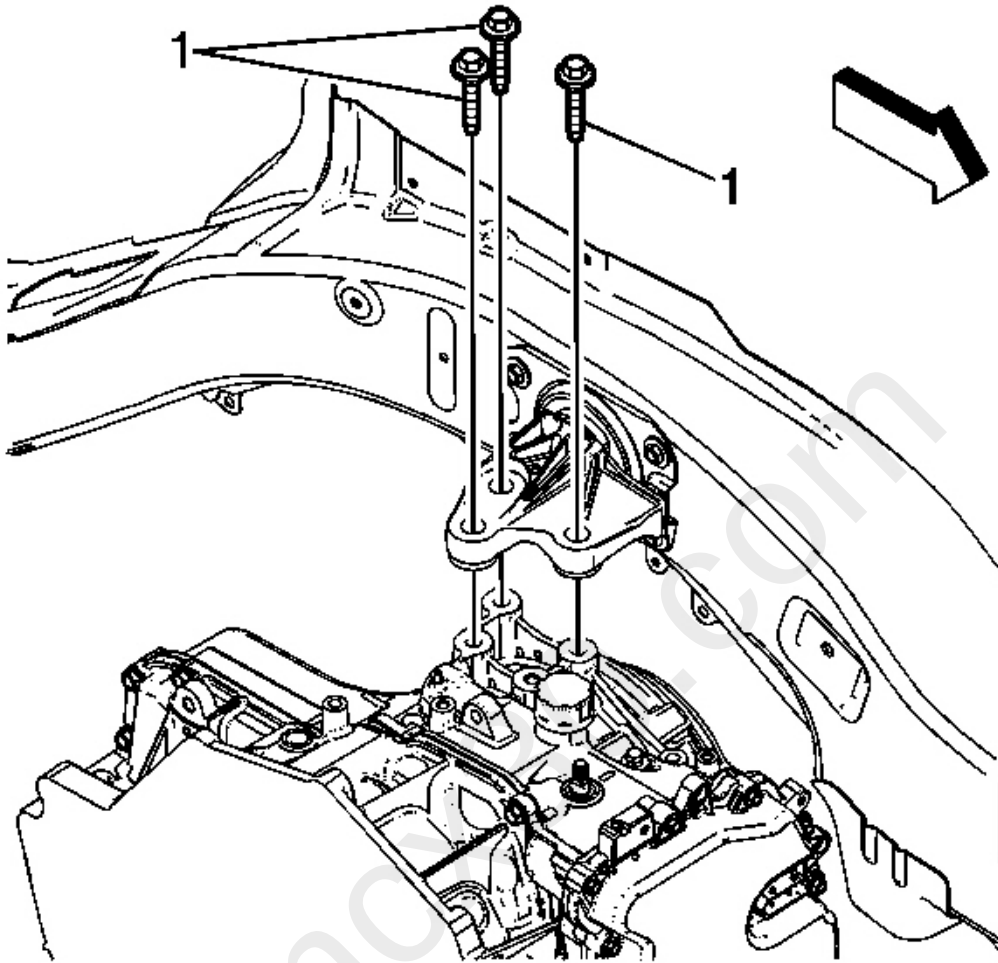


Fig. 88: Left Transmission Mount To Transmission Bolts
Courtesy of GENERAL MOTORS CORP.

22. Install the left transmission mount bolts (1) to the transmission and tighten to 50 N.m (37 lb ft).
23. For transmission control module programming and setup, refer to **Control Module References** .

NOTE: **After an internal transmission repair or internal part replacement the service fast learn adapt procedure should be performed.**

24. Perform the transmission adaptive values learn procedure. Refer to **Transmission Adaptive Values Learn** .
25. Road test the vehicle.