

2018 TRANSMISSION

Automatic Transmission - 9T45 (M3U) Or 9T50 (M3D M3H) - Repair Instructions - On Vehicle - Equinox & Terrain

REPAIR INSTRUCTIONS - ON VEHICLE

TRANSMISSION SERVICE FAST LEARN PROCEDURE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

Description

The learn procedure performs a series of individual clutch applications which allows the control module K71 to learn initial clutch apply pressures. The control module uses the learn values for clutch control and timing of shifts.

When to Perform the Procedure

NOTE: Failure to perform this procedure may result in poor system performance, DTCs being set, or customer dissatisfaction.

This procedure is required when the following component has been repaired, replaced, removed, or serviced:

- K71 Transmission Control Module
- T12 Automatic Transmission Assembly
- Any condition/repair related to the following: Shift Quality
- Calibration Update or Software Update
- Torque Converter Assembly
- Transmission - External/Internal Components

Conditions for Running the Procedure

Transmission Fluid Temperature = 75 to 85°C (167 to 185°F)

Reference Information

Scan Tool Reference

[Control Module References](#)

With Scan Tool

WARNING: Refer to [Parking Brake and Drive Wheels Warning](#)

1. Engine running.
2. Select: Module Diagnostics
3. Select: Transmission
4. Select: Configuration/Reset Functions
5. Select: Learn Functions
6. Select: Transmission Service Fast Learn
7. Follow the instructions on the scan tool.

Verify the scan tool procedure was successful.

- If the procedure was not successful

Refer to: Step 1

- Go to next step: If the procedure was successful

8. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#)

TRANSMISSION CONTROL LEVER KNOB REPLACEMENT

Removal Procedure

1. Set the parking brake.
2. Shift the transmission control into Reverse position.

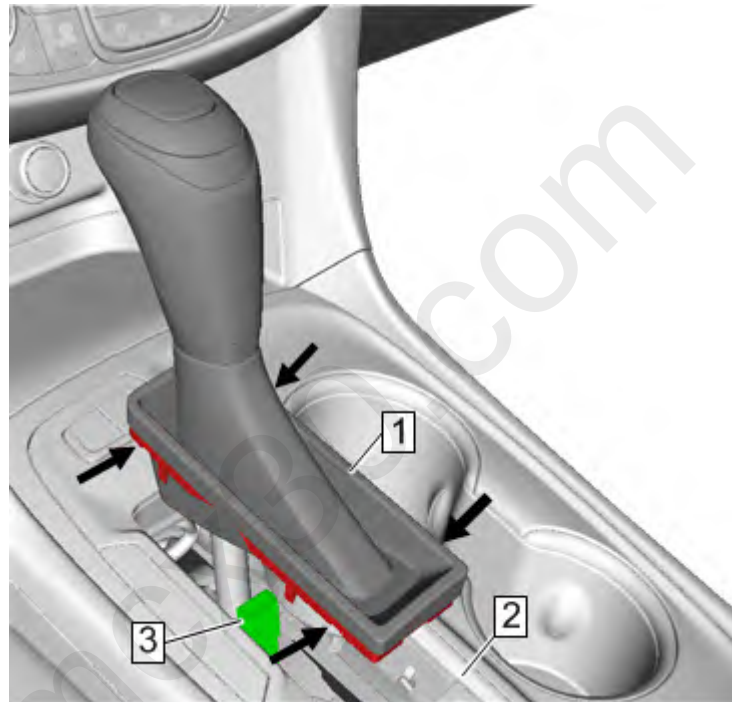


Fig. 1: Transmission Control Lever Boot, Lever Boot Bezel And Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

NOTE: The transmission control lever boot snaps to the lever boot bezel in four locations (arrows): two on the passenger side, one on the driver side, and one on the front side.

3. Unclip the transmission control lever boot (1) from the lever boot bezel (2), using a flat bladed tool.
4. Pull the lever boot up to gain access to the electrical connector (3).

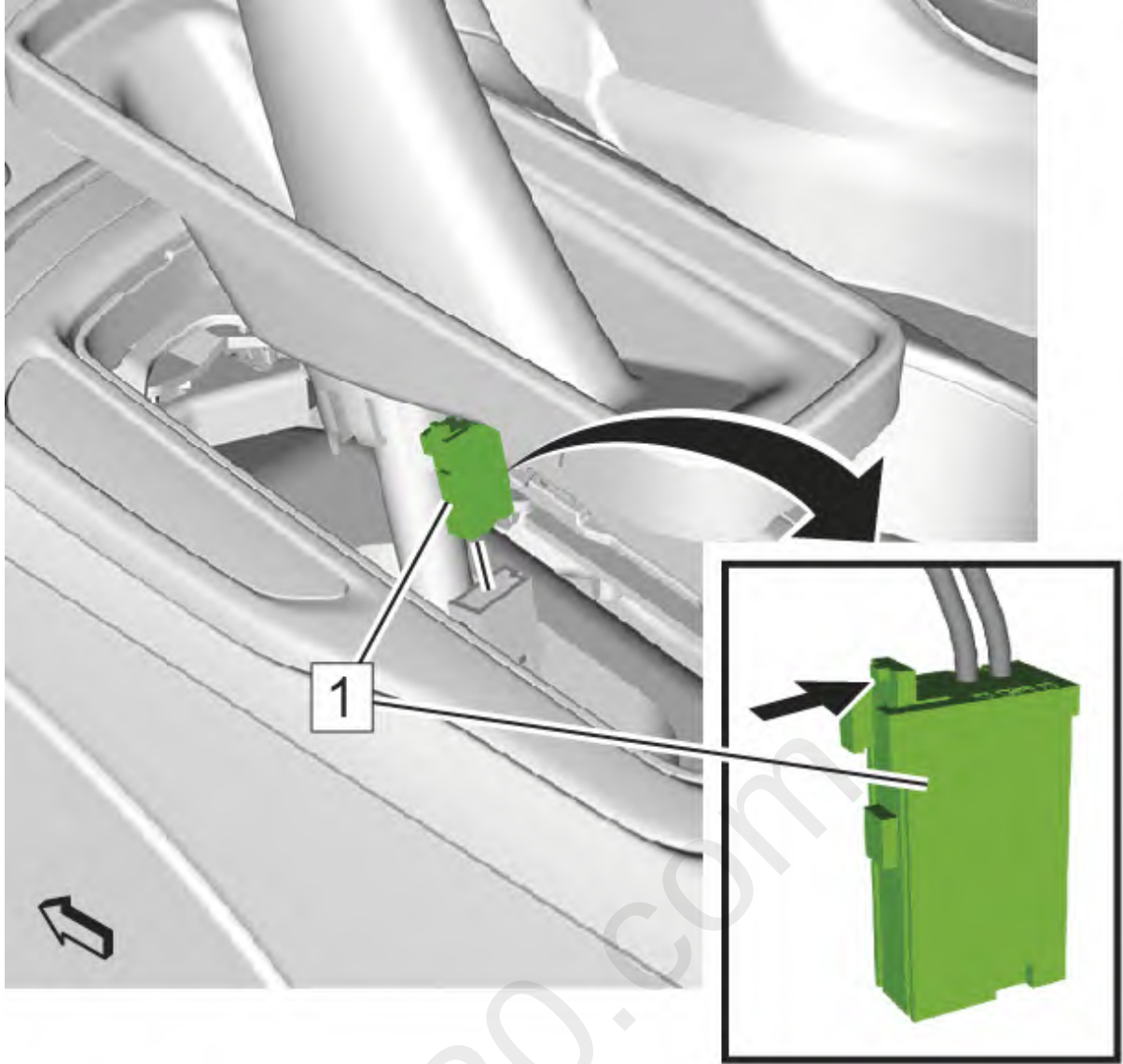


Fig. 2: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

5. Disconnect Electrical Connector (1)

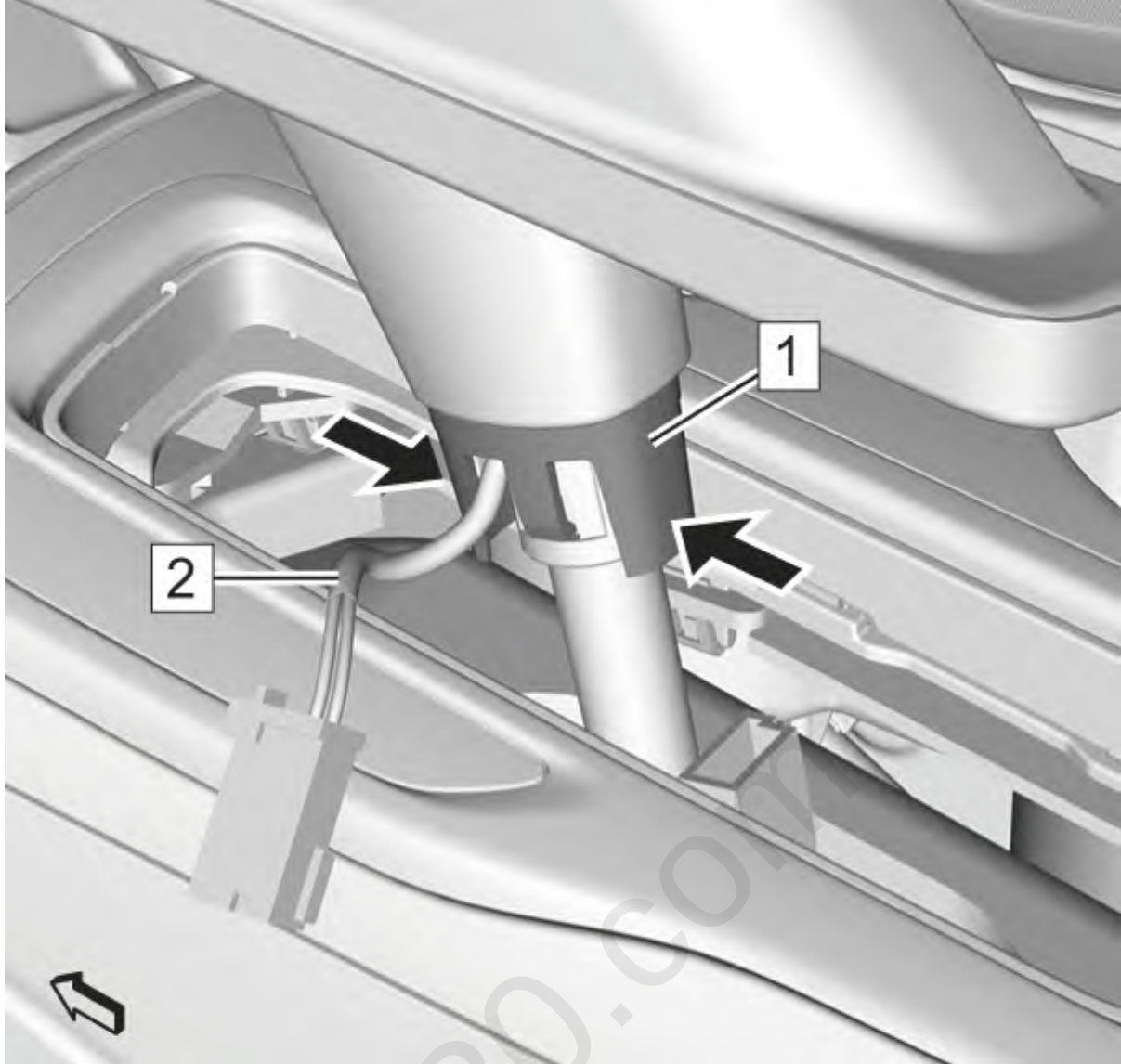


Fig.3: Upper Boot Ring And Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

6. Detach the transmission control lever boot from the transmission control lever knob.
 1. Pull the transmission control lever boot over the transmission control lever knob to gain access to the upper boot ring (1).
 2. Press the upper boot ring (arrows) to disengage the snaps.
 3. Push the upper boot ring along with the lever boot down.
 4. Guide the wiring harness (2) upwards out of the upper boot ring.

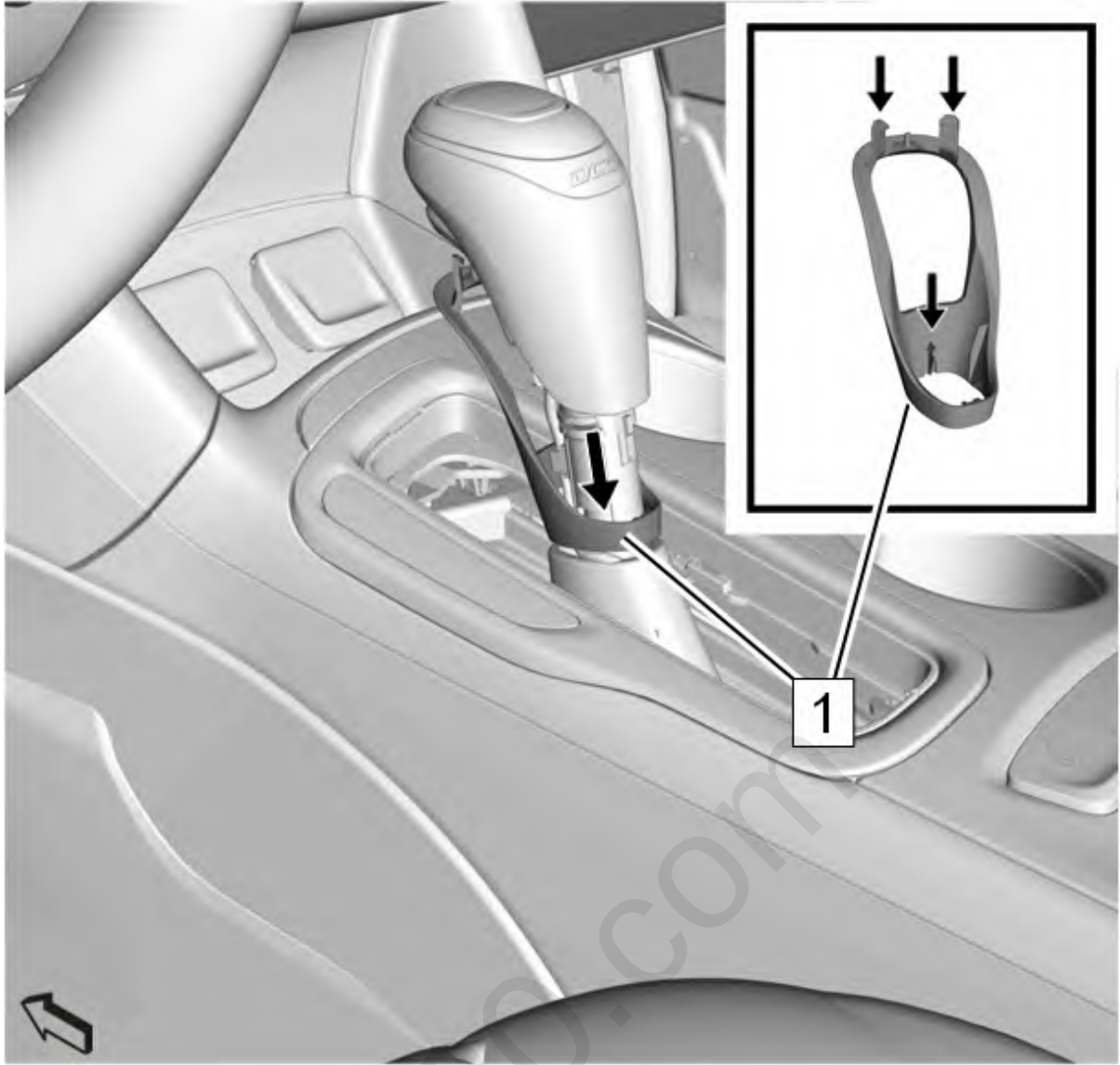


Fig. 4: Transmission Control Lever Knob Extension

Courtesy of GENERAL MOTORS COMPANY

NOTE: Press the button while sliding the lever knob extension downwards.

7. Detach the transmission control lever knob extension (1) from the lever knob with a flat bladed tool, then slide the lever knob extension downwards.

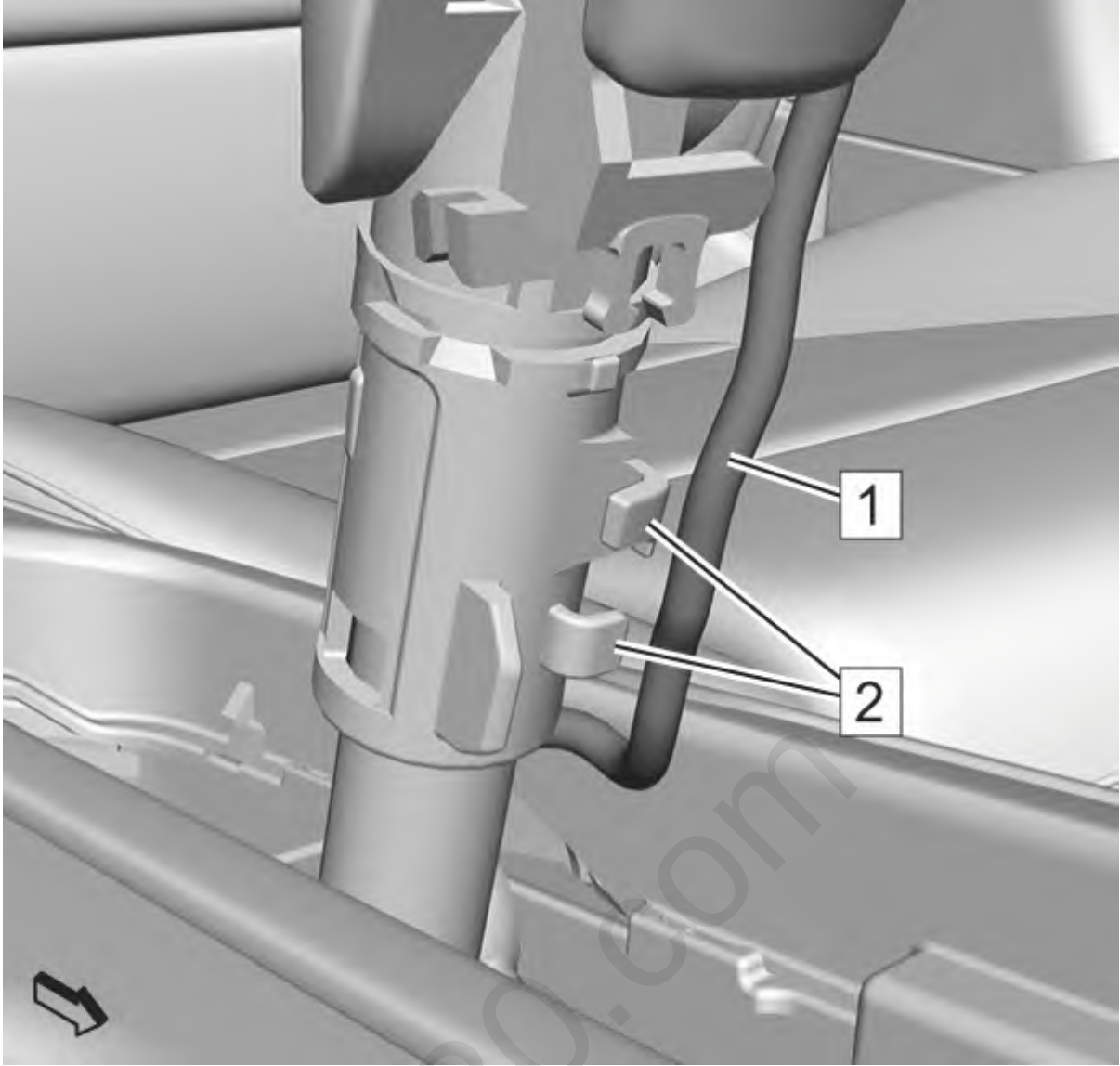


Fig.5: Wiring Harness And Holders

Courtesy of GENERAL MOTORS COMPANY

NOTE: The graphic is shown without the transmission control lever knob extension for clarity.

8. Position aside Wiring Harness (1)
 1. Detach the wiring harness from the 2 holders (2).
 2. Guide the wiring harness upwards out the bottom hole of the transmission control lever knob extension.

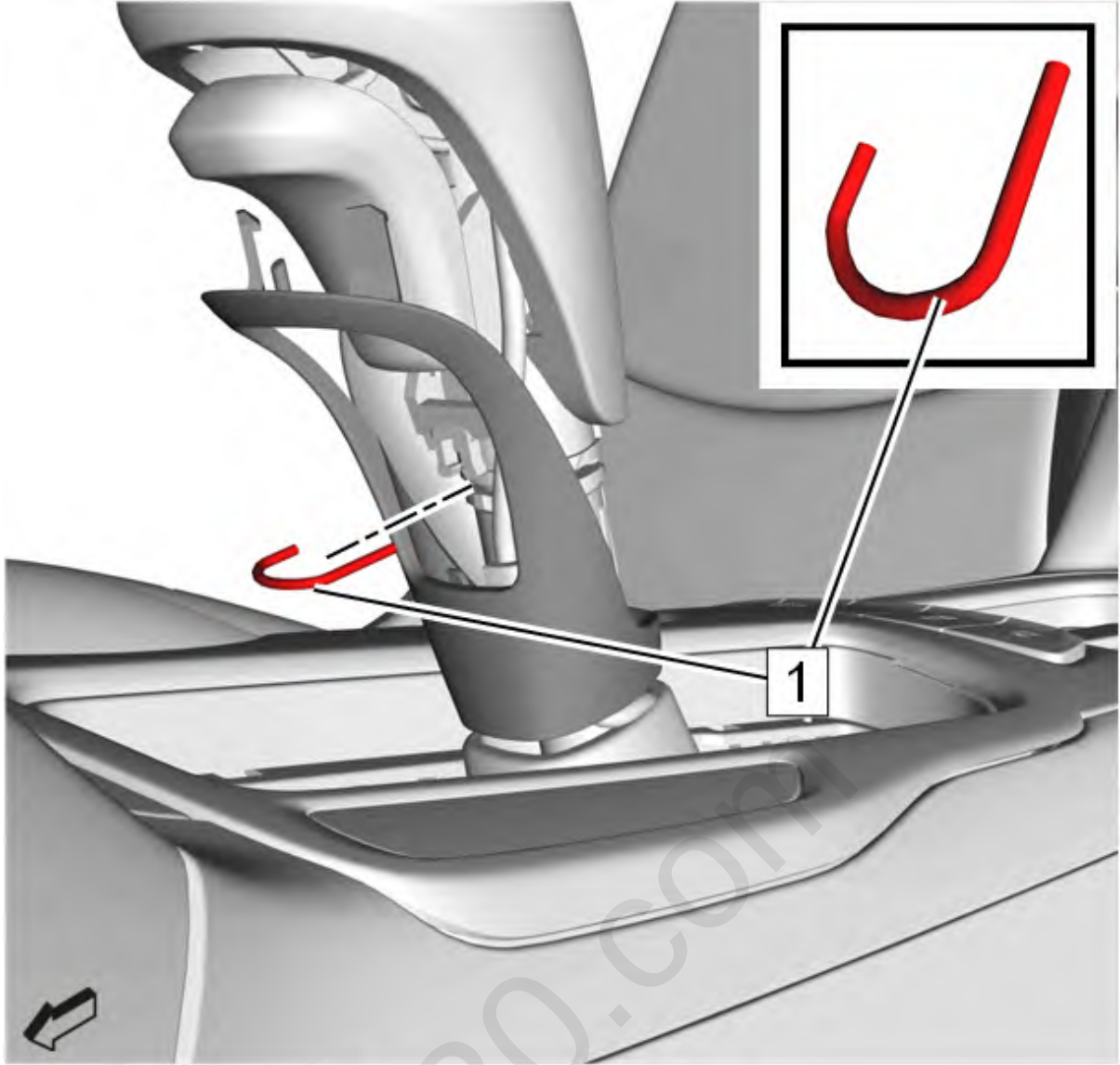


Fig. 6: Transmission Control Lever Knob Retainer
Courtesy of GENERAL MOTORS COMPANY

9. Remove the transmission control lever knob retainer (1).

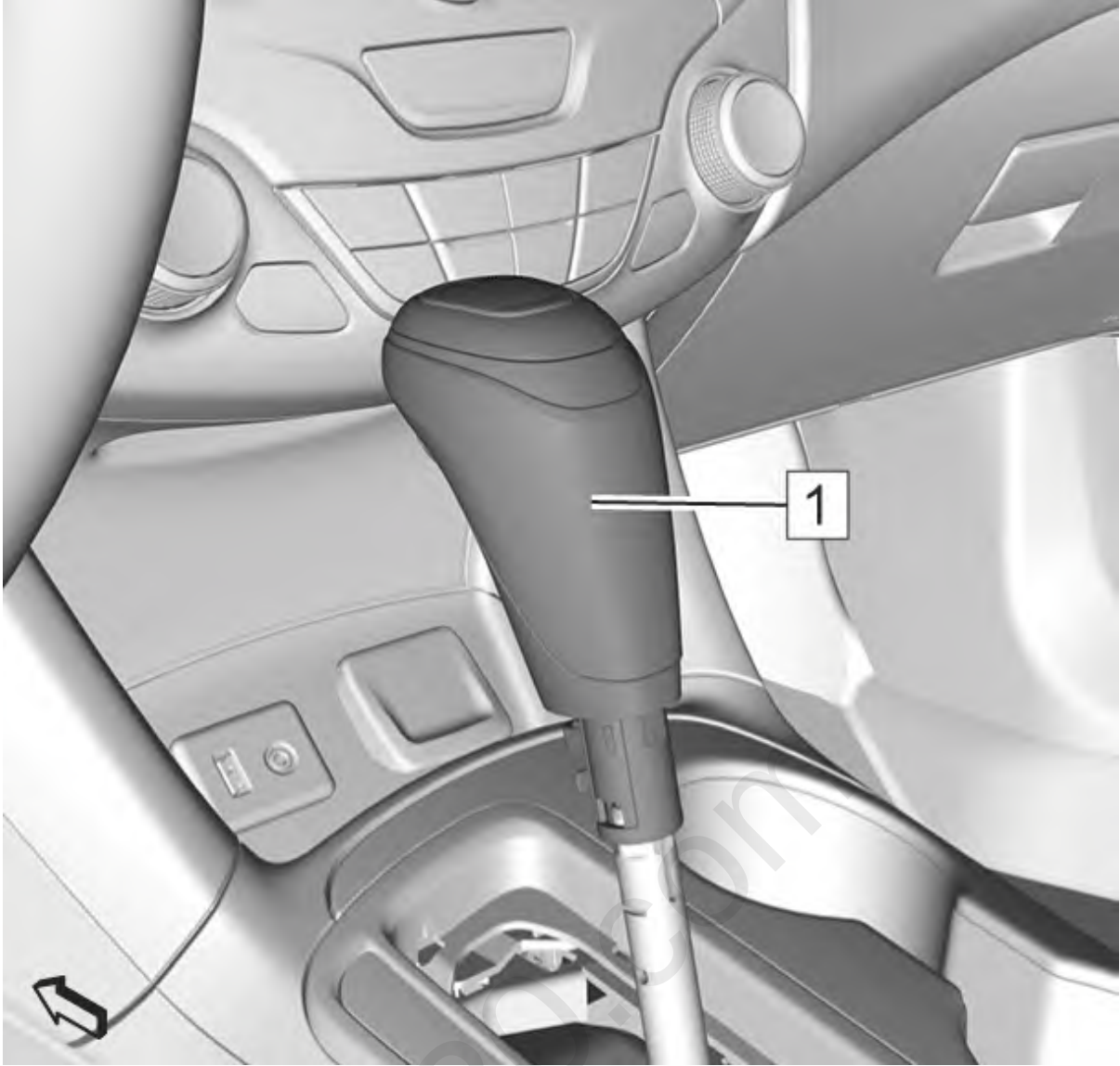


Fig. 7: Transmission Control Lever Knob

Courtesy of GENERAL MOTORS COMPANY

NOTE: This is a press fit and will require some force to pull the transmission control lever knob off. Before applying an upward force, ensure the wiring harness is free.

10. Remove Transmission Control Lever Knob (1) @ Transmission Control Lever

Installation Procedure

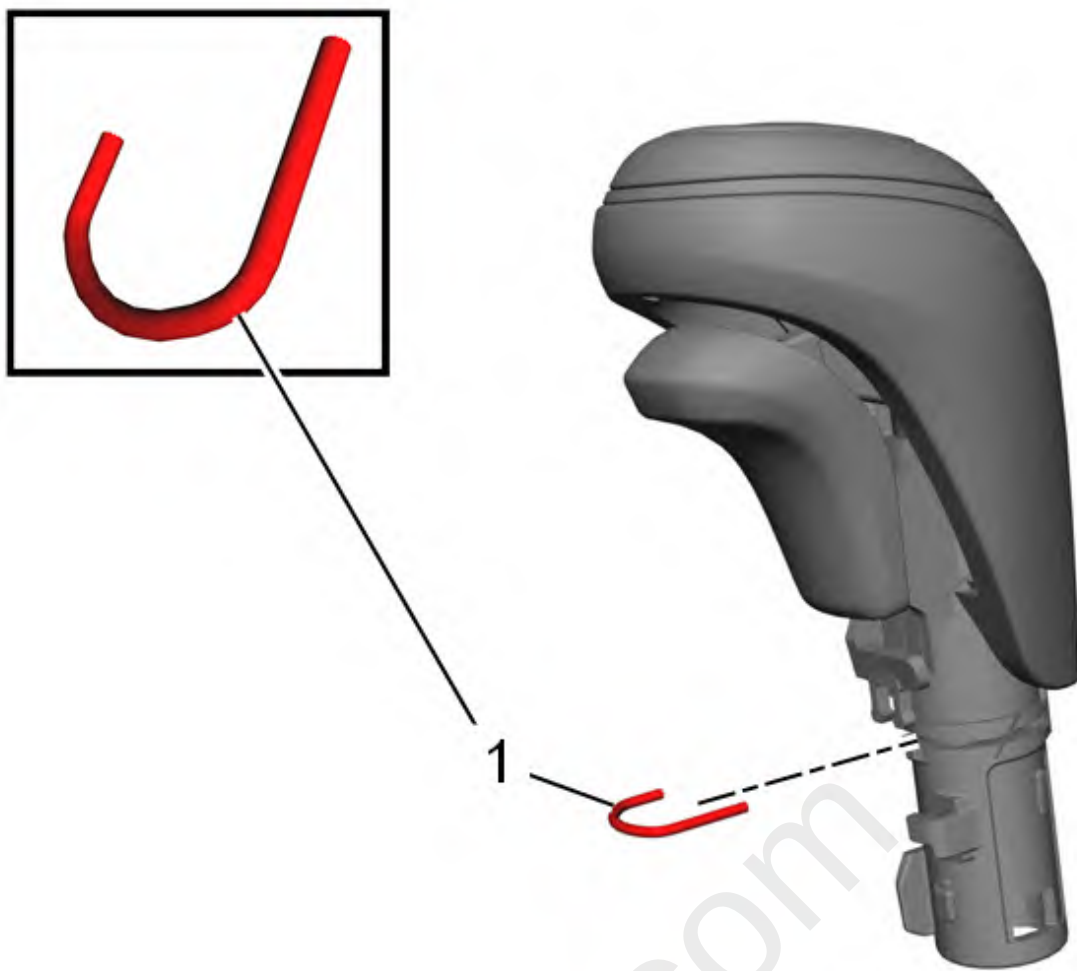


Fig. 8: Transmission Control Lever Knob Retainer
Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission control lever knob retainer (1).

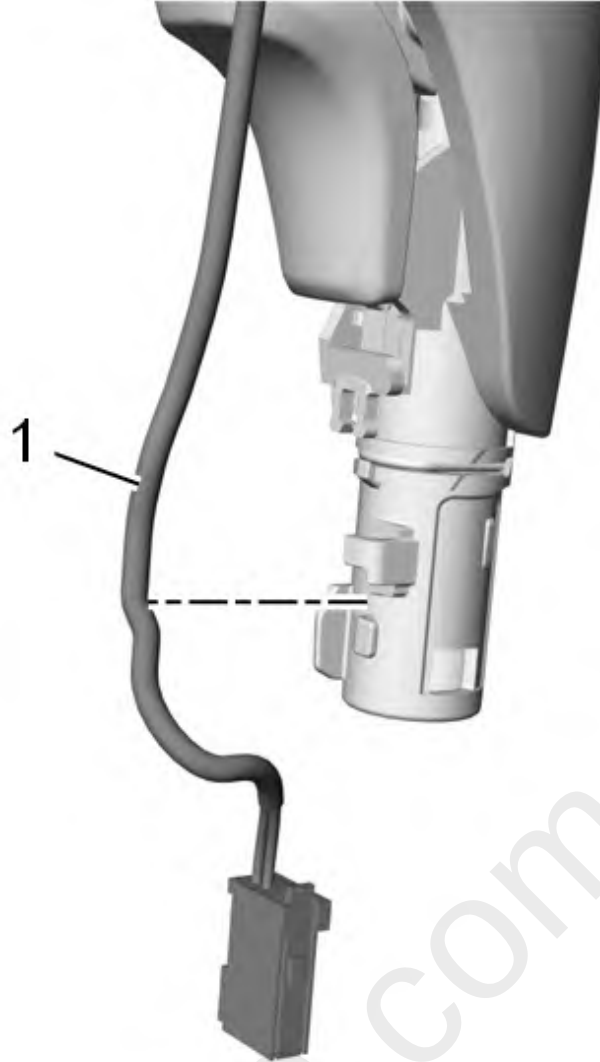


Fig.9: Wiring Harness

Courtesy of GENERAL MOTORS COMPANY

2. Reposition Wiring Harness (1)

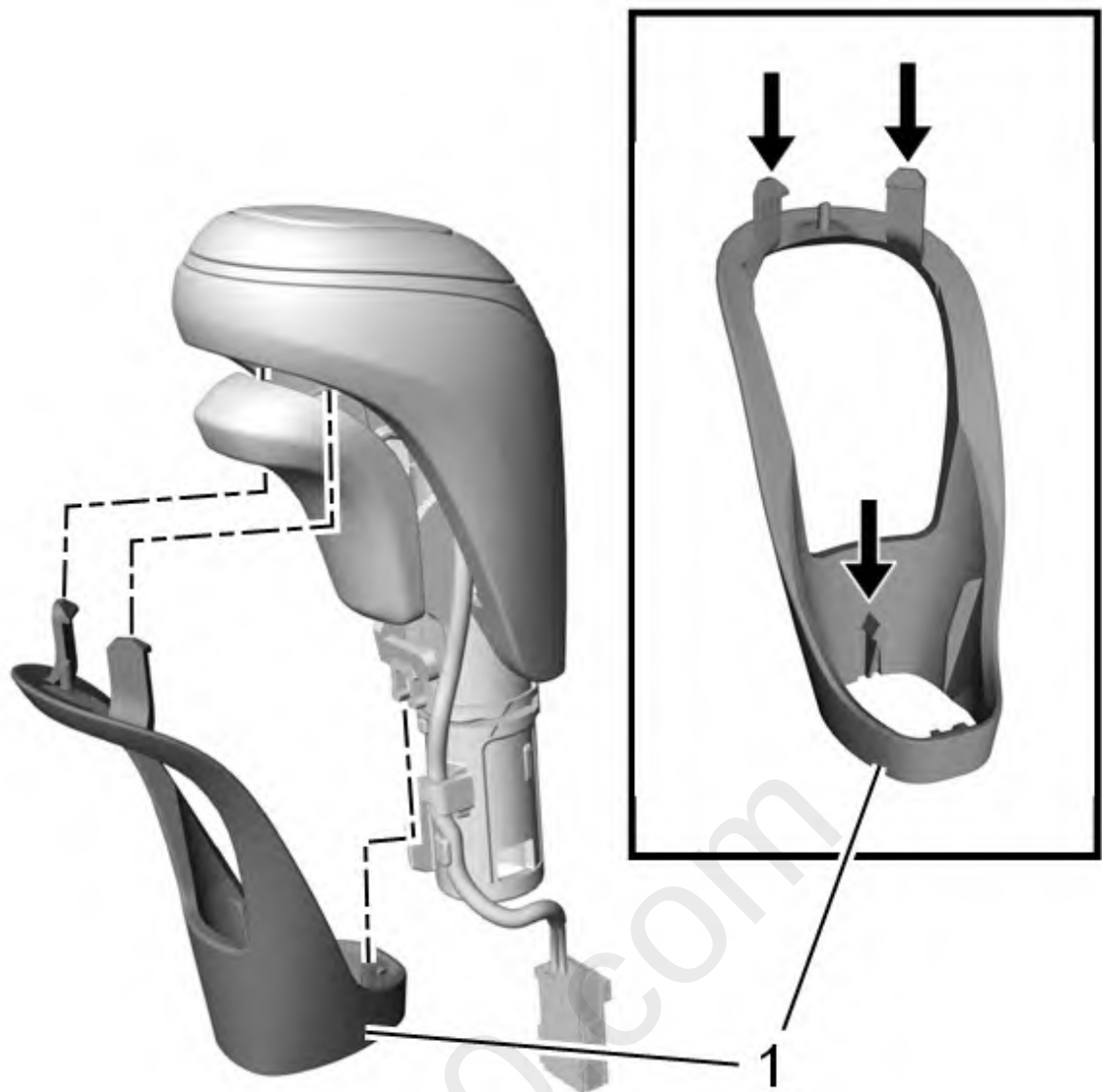


Fig. 10: Transmission Control Lever Knob Retainer
Courtesy of GENERAL MOTORS COMPANY

3. Guide the wiring harness through the transmission control lever knob retainer (1).
4. Attach the transmission control lever knob extension (1) to the lever knob.

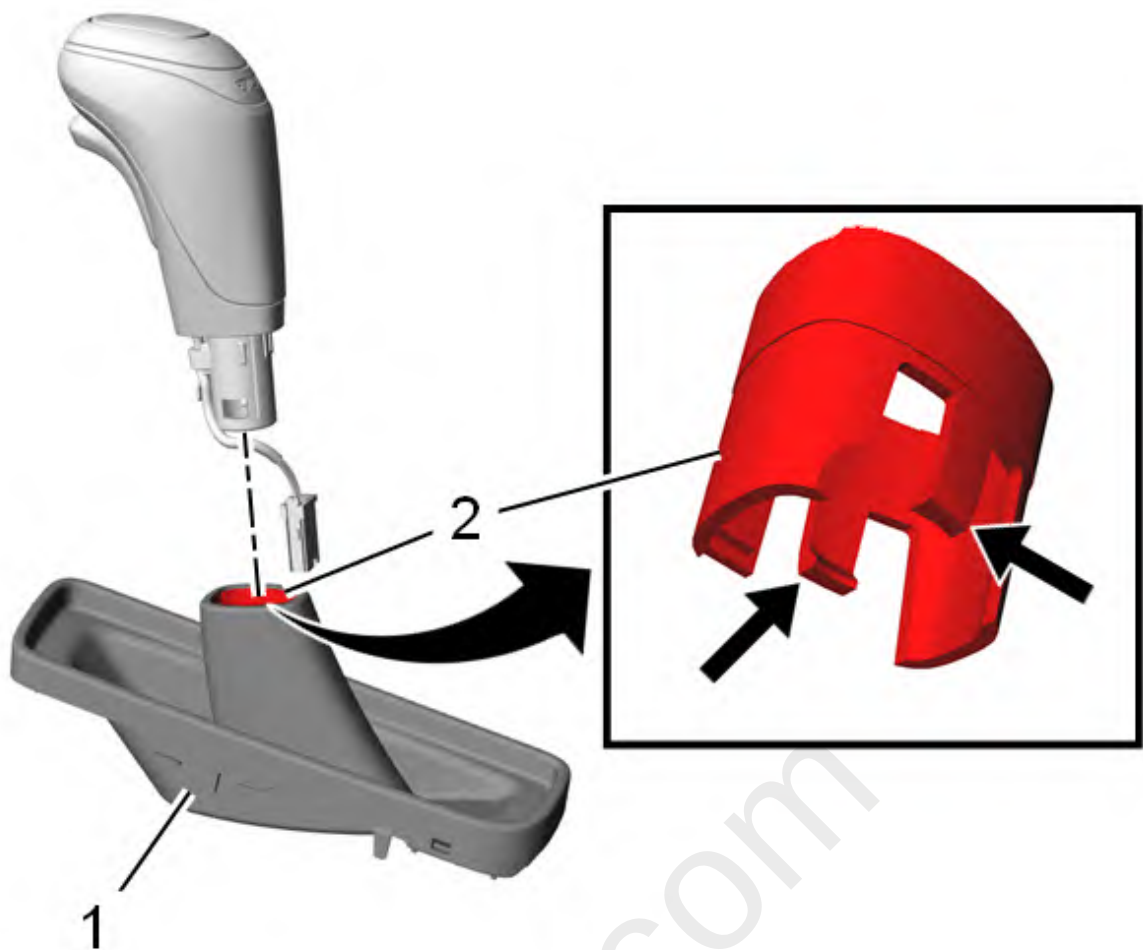
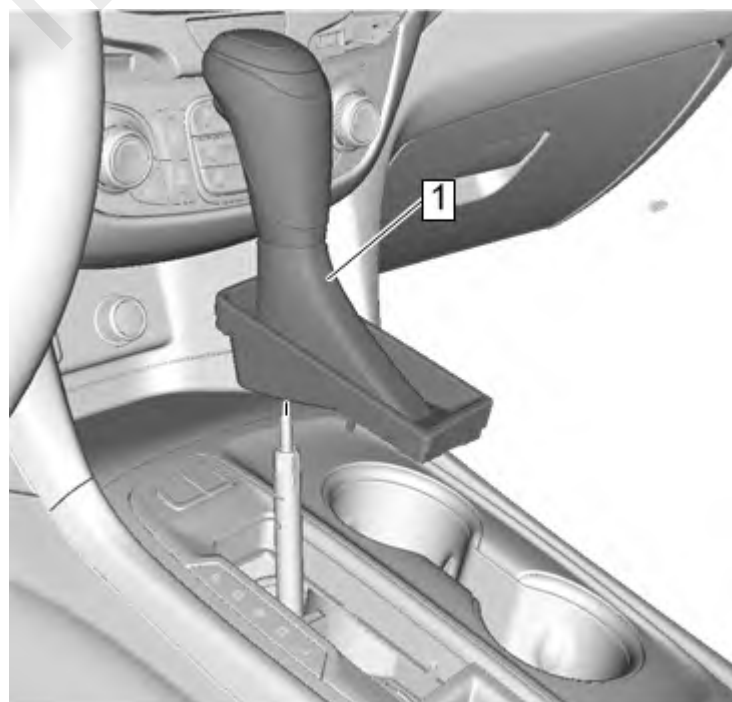


Fig. 11: Transmission Control Lever Boot And Upper Boot Ring
Courtesy of GENERAL MOTORS COMPANY

5. Attach the transmission control lever boot (1) to the transmission control lever knob.
 1. Guide the wiring harness through the transmission control lever boot (1).
 2. Clip the upper boot ring (2) into the bottom of the transmission control lever knob.



NOTE: When installing the transmission control lever knob, a defined snap noise should be audible and a snap effect should be felt. After installation, check the retention of the transmission control lever knob by pulling it upwards with two hands and significant force in an attempt to remove it.

6. Install Transmission Control Lever Knob (1) @ Transmission Control Lever
7. Shift the transmission control lever into "P" position

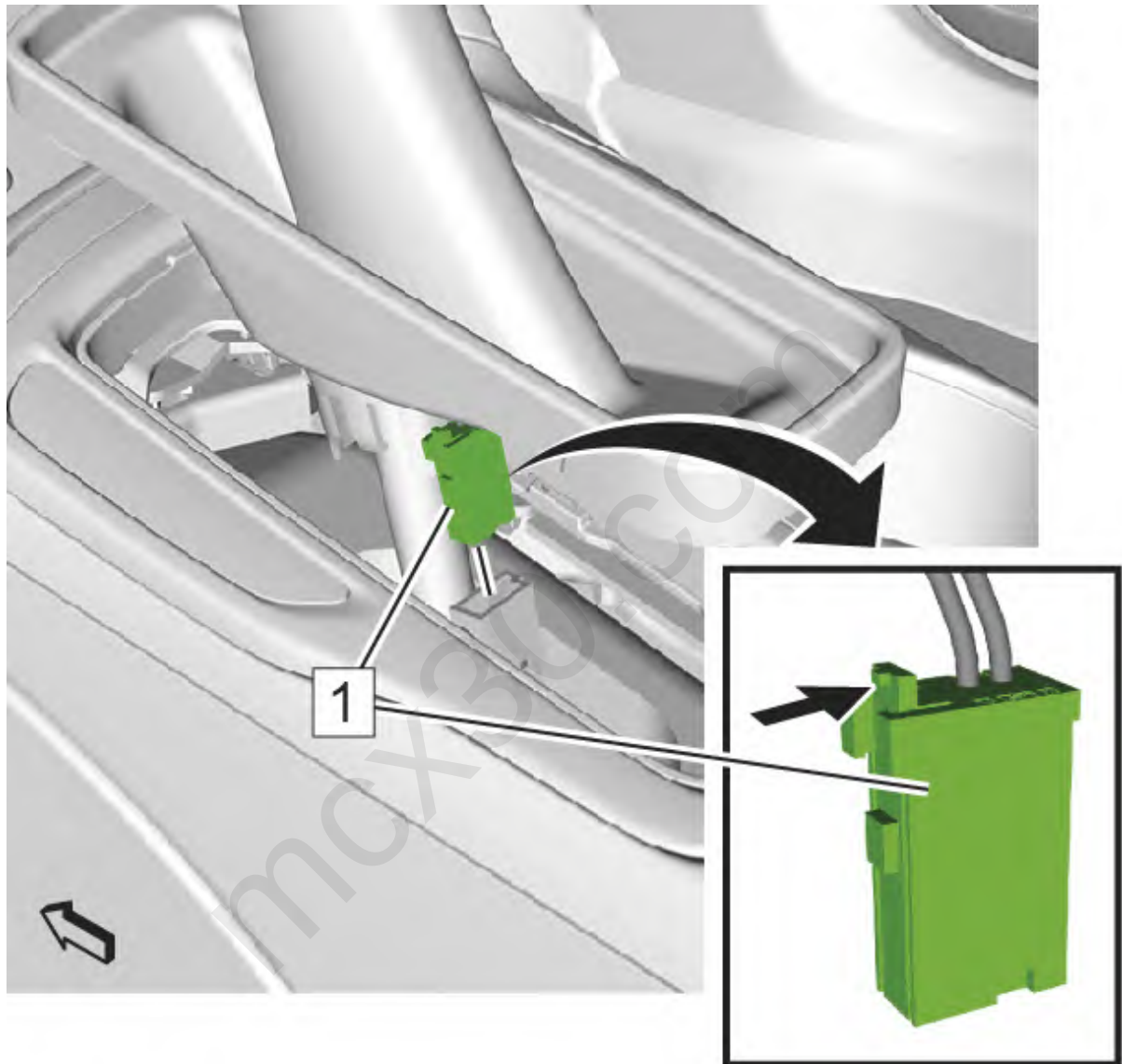


Fig. 13: Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

8. Connect Electrical Connector (1)

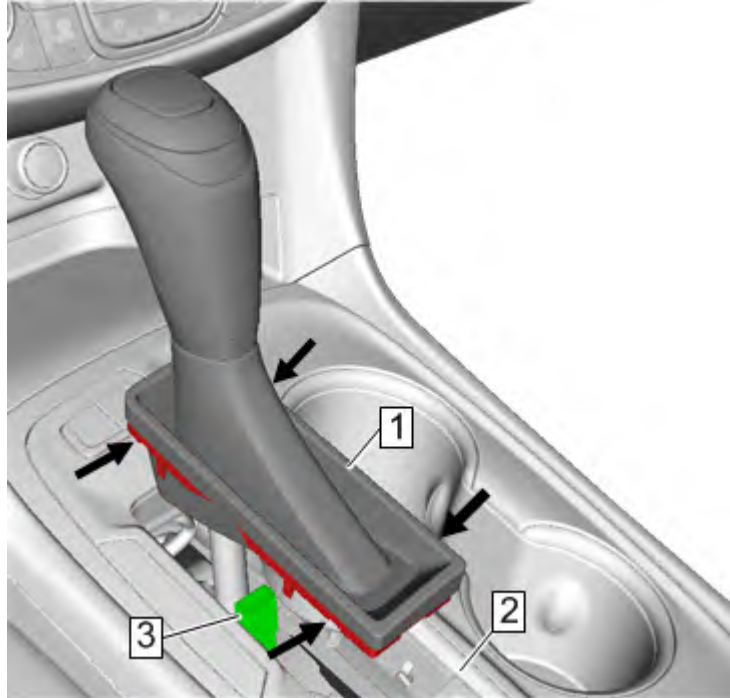


Fig. 14: Transmission Control Lever Boot, Lever Boot Bezel And Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

NOTE: The transmission control lever boot snaps to the lever boot bezel in four locations (arrows): two on the passenger side, one on the driver side, and one on the front side. Before pushing the transmission control lever boot into the lever boot bezel, ensure proper alignment along the edges to avoid visible gaps.

9. Clip the transmission control lever boot (1) into the lever boot bezel (2).
10. Release the parking brake.

ELECTRONIC TRANSMISSION SHIFT CONTROL PUSHBUTTON REPLACEMENT

Removal Procedure

1. Remove the front floor console transmission shift opening bezel. Refer to [Front Floor Console Transmission Shift Opening Bezel Replacement \(Terrain\)](#).

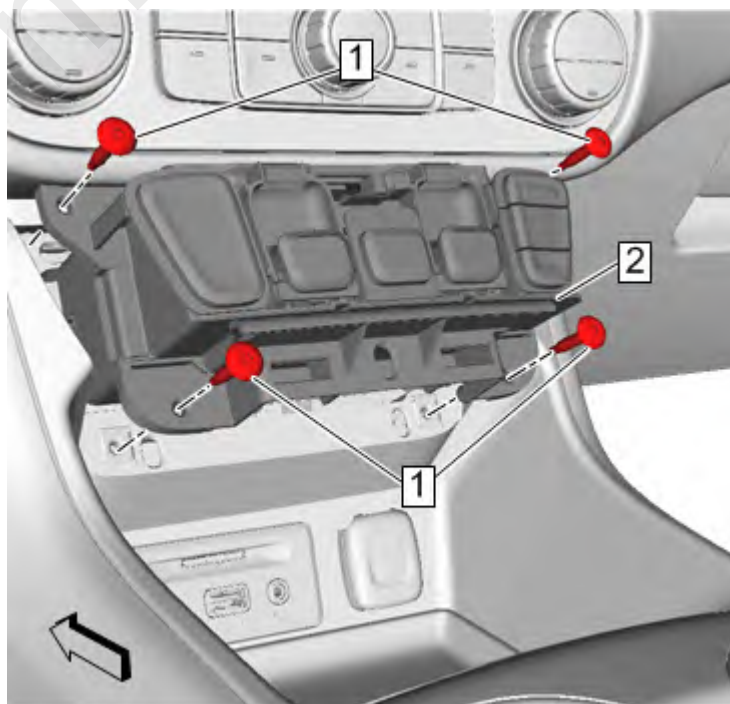


Fig. 15: Electronic Transmission Shift Control Pushbutton
Courtesy of GENERAL MOTORS COMPANY

2. Remove the screws (1)
3. Remove the electronic transmission shift control pushbutton assembly (2)
4. Disconnect the electrical connector.

Installation Procedure

1. Connect the electrical connector.

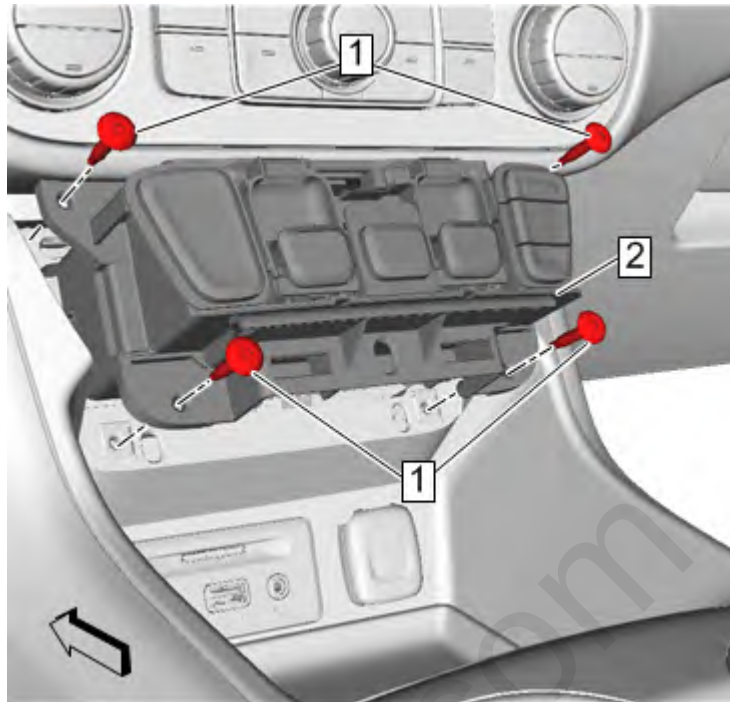


Fig. 16: Electronic Transmission Shift Control Pushbutton

Courtesy of GENERAL MOTORS COMPANY

2. Install the electronic transmission shift control pushbutton assembly (2)

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

3. Install the screws.
4. Install the front floor console transmission shift opening bezel. Refer to [Front Floor Console Transmission Shift Opening Bezel Replacement \(Terrain\)](#).

TRANSMISSION CONTROL MODULE REPLACEMENT

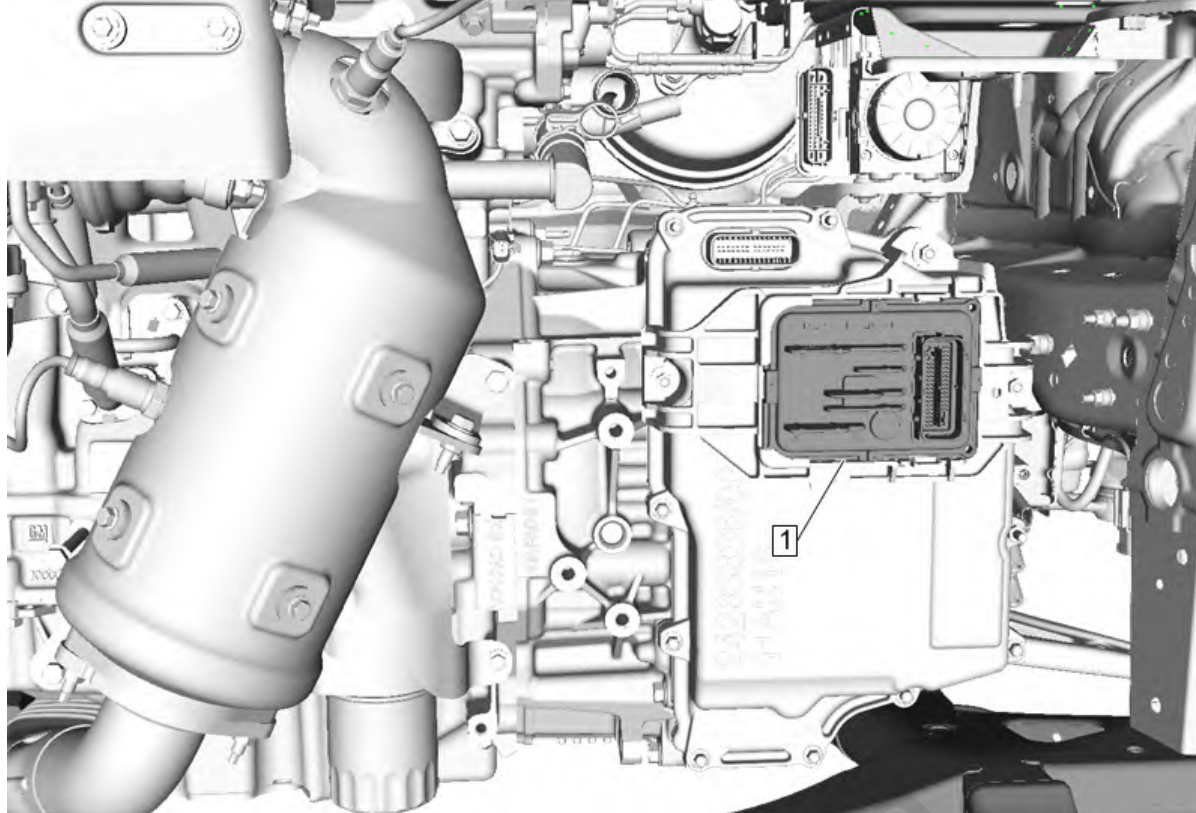


Fig. 17: Transmission Control Module
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Transmission Control Module Procedure 1. Disconnect the electrical connector. 2. Remove the module from the module bracket by releasing the retaining tabs. 3. Program the transmission control module, if replaced. Refer to Solenoid Valve Characterization Reprogramming NOTE: Radiator assembly removed for clarity.

TRANSMISSION CONTROL MODULE BRACKET REPLACEMENT

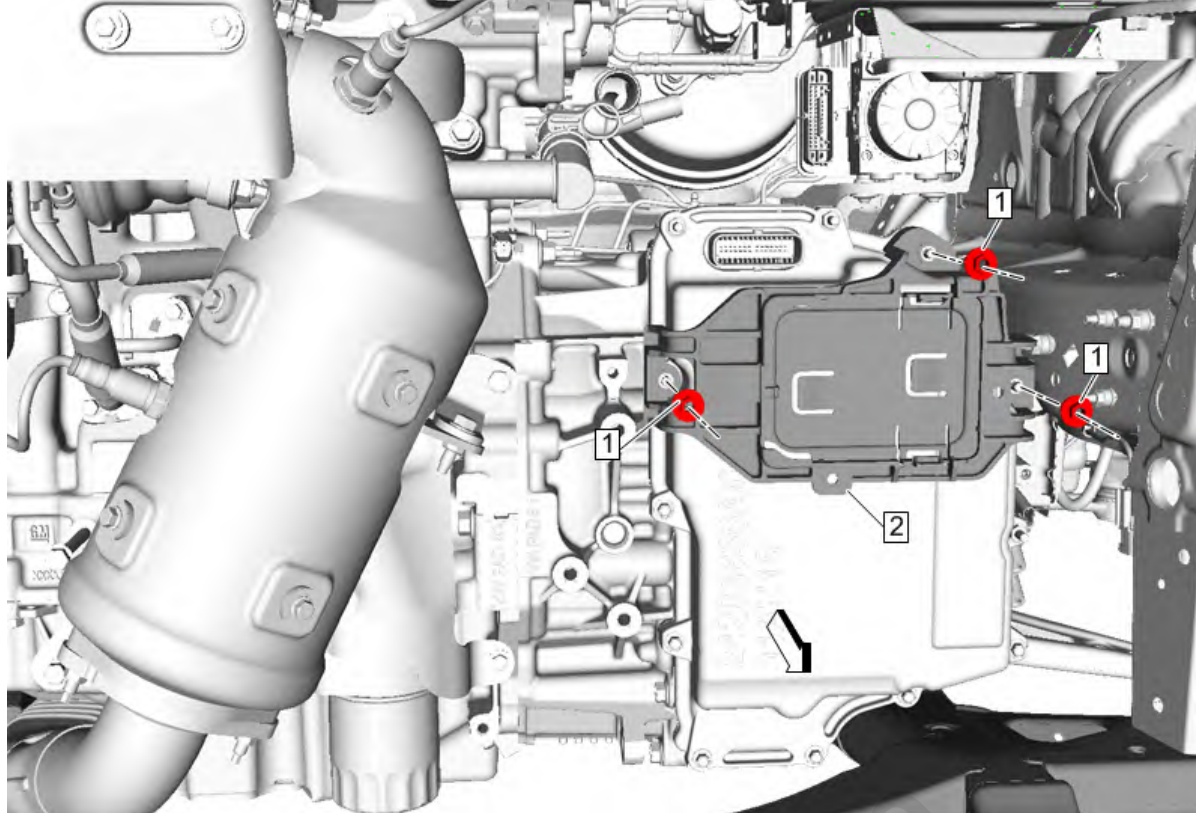


Fig. 18: Transmission Control Module Bracket
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Transmission Control Module. Refer to Transmission Control Module Replacement	
1	Transmission Control Module Bracket Nut (Qty: 3) NOTE: Radiator assembly removed for clarity. CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Transmission Control Module Bracket

TRANSMISSION CONTROL REPLACEMENT

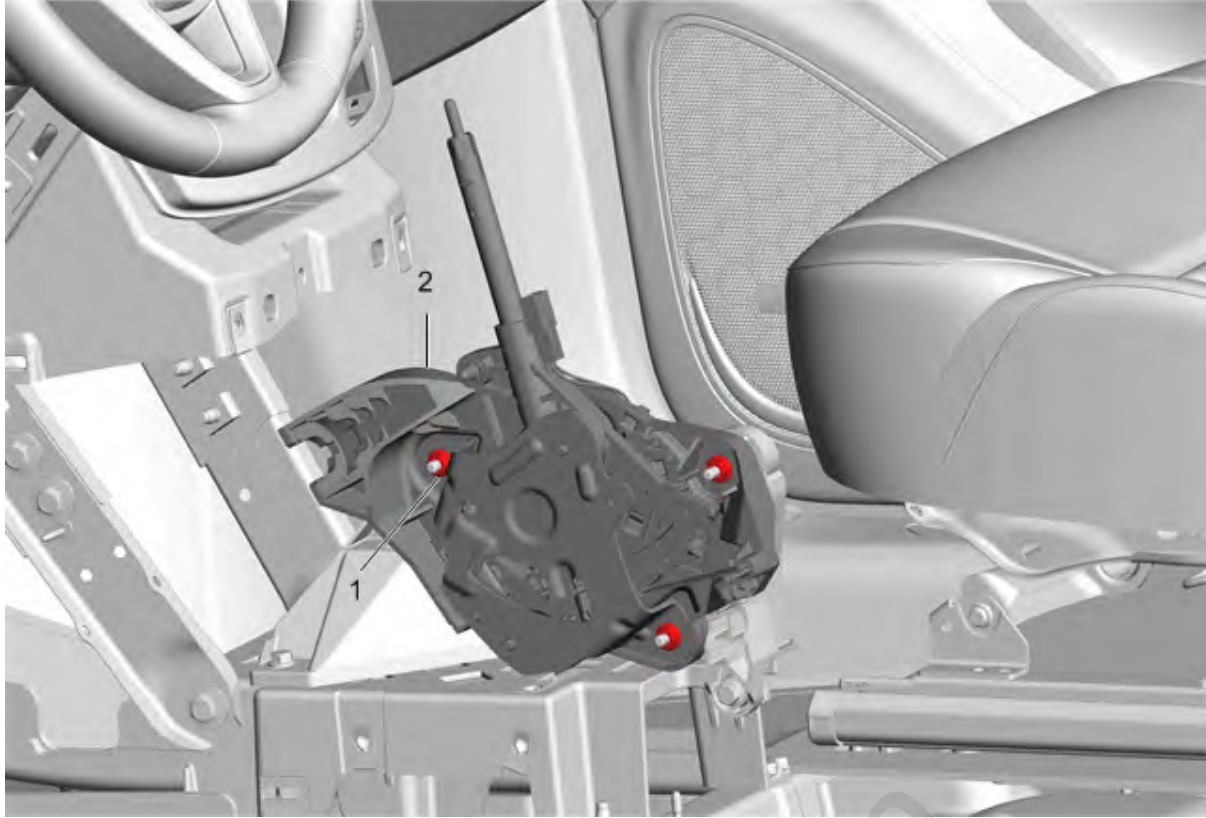


Fig. 19: Transmission Control

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front floor console. Refer to Front Floor Lower Console Replacement (Equinox). 2. Disconnect the shift control cable from the transmission control. Refer to Range Selector Lever Cable Replacement 3. Disconnect the electrical connector.	
1	Transmission Control Fastener (Qty: 3) CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Transmission Control

TRANSMISSION CONTROL BRACKET REPLACEMENT

Removal Procedure

1. Remove Transmission control. Refer to [Transmission Control Replacement](#)

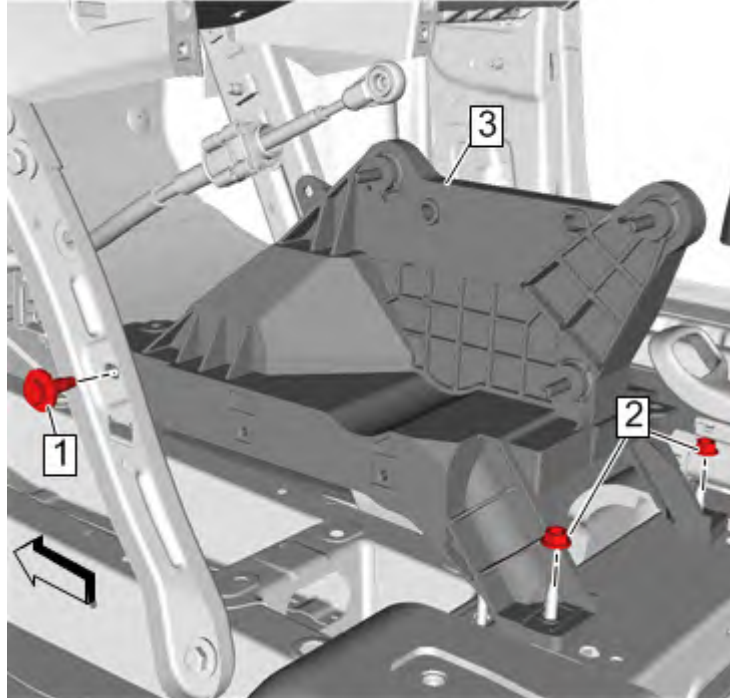


Fig. 20: Left I/P Center Support Bracket Bolt, Automatic Transmission Control Bracket And Nuts

Courtesy of GENERAL MOTORS COMPANY

2. Remove the left instrument panel center support bracket bolt (1).
3. Remove the automatic transmission control bracket nuts (2) from the automatic transmission control bracket (3).

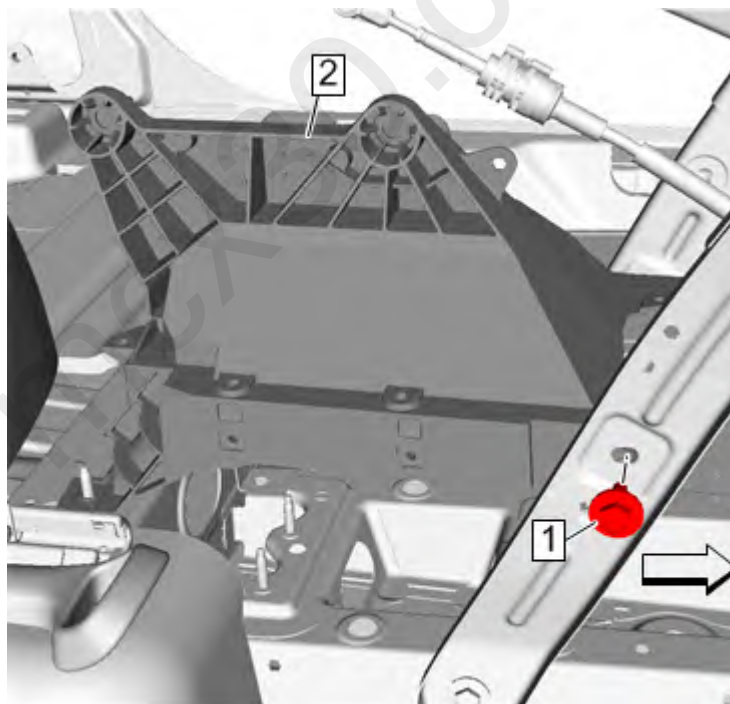


Fig. 21: Right I/P Center Support Bracket Bolt And Automatic Transmission Control Bracket

Courtesy of GENERAL MOTORS COMPANY

4. Remove the right instrument panel center support bracket bolt (1).
5. Remove the automatic transmission control bracket (2).

Installation Procedure

1. Position the transmission control bracket in the vehicle.

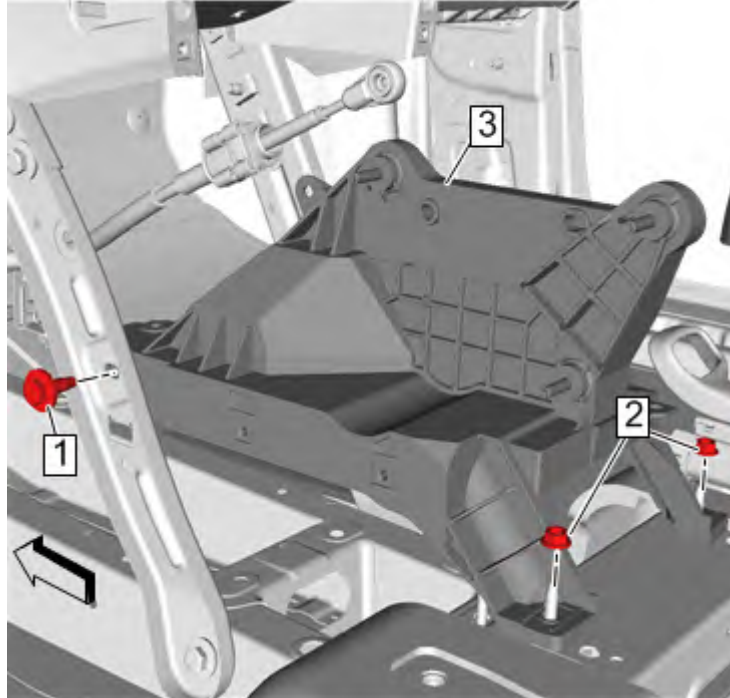


Fig. 22: Left I/P Center Support Bracket Bolt, Automatic Transmission Control Bracket And Nuts

Courtesy of GENERAL MOTORS COMPANY

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

2. Install the automatic transmission control nuts (2) to the automatic transmission control bracket (3) and tighten to 9 N.m (80 lb in).
3. Install the left instrument panel center support bracket bolt (1) and tighten to 22 N.m (16 lb ft).

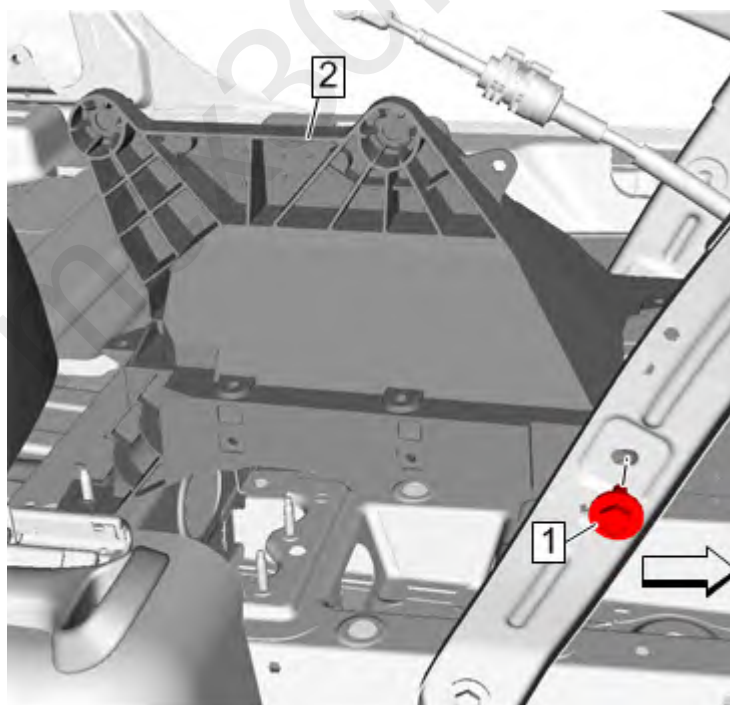


Fig. 23: Right I/P Center Support Bracket Bolt And Automatic Transmission Control Bracket

Courtesy of GENERAL MOTORS COMPANY

4. Install the right instrument panel center support bracket bolt (1) and tighten to 22 N.m (16 lb ft).
5. Install Transmission control. Refer to [Transmission Control Replacement](#)

ELECTRONIC TRANSMISSION RANGE SELECTOR MANUAL PARK RELEASE CABLE REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.

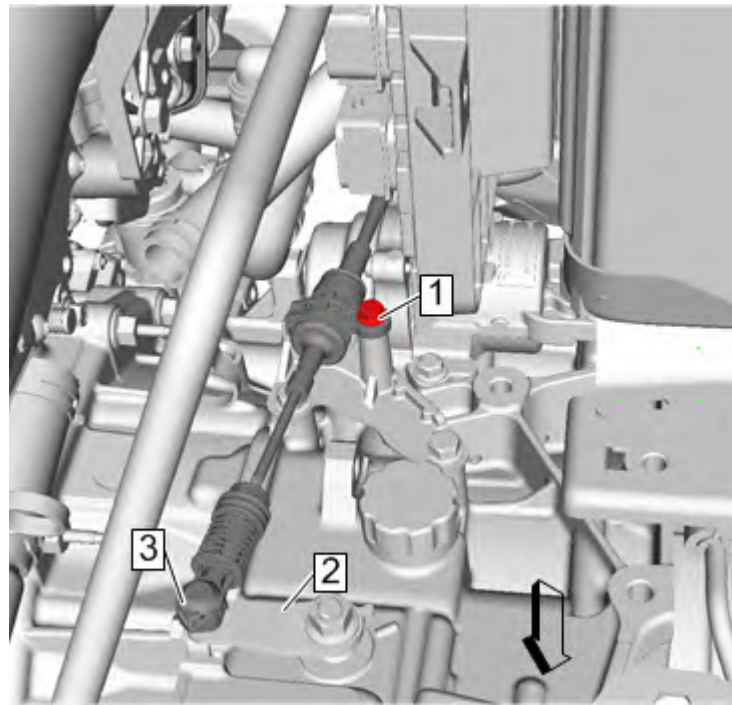


Fig. 24: Automatic Transmission Range Selector Lever Cable Terminal, Shift Lever And Clamp Bolt

Courtesy of GENERAL MOTORS COMPANY

2. Disconnect the electronic transmission range selector manual park release cable terminal (3) from the transmission manual shift lever (2).
3. Remove the bolt (1) retaining the electronic transmission range selector manual park release cable to the cable bracket.
4. Remove the electronic transmission range selector manual park release cable from the transmission.
5. Remove the front floor lower console. Refer to [Front Floor Lower Console Replacement \(Equinox\)](#).

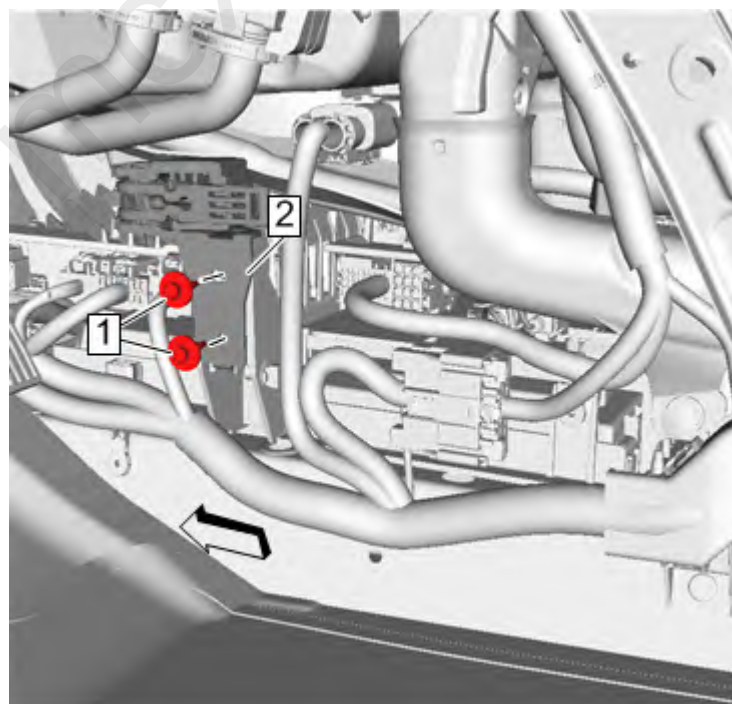


Fig. 25: Range Selector Manual Park Release Cable Handle And Retaining Bolts

Courtesy of GENERAL MOTORS COMPANY

6. Remove the electronic transmission range selector manual park release cable retaining bolts (1).
7. Reposition the front left carpet to access the shift cable grommet, if necessary.

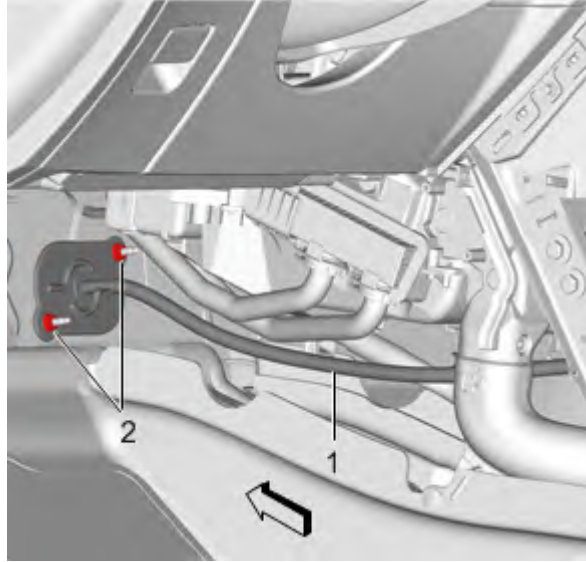


Fig. 26: Range Selector Manual Park Release Cable And Cable Grommet Fasteners
Courtesy of GENERAL MOTORS COMPANY

8. Remove the electronic transmission range selector manual park release cable grommet fasteners (2).
9. Remove the electronic transmission range selector manual park release cable (1) from the vehicle.

Installation Procedure

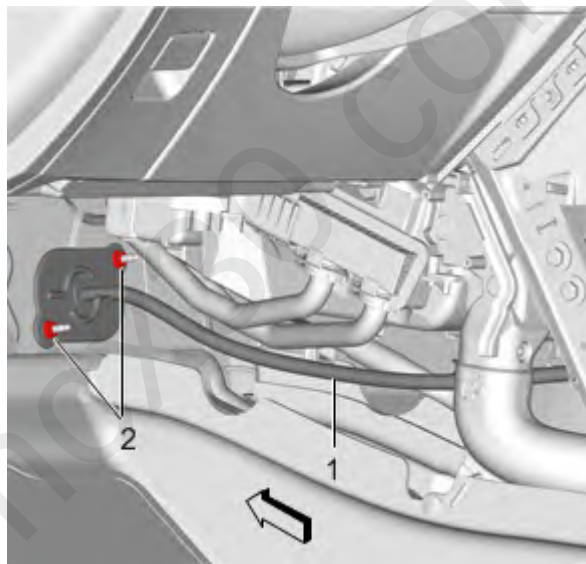


Fig. 27: Range Selector Manual Park Release Cable And Cable Grommet Fasteners
Courtesy of GENERAL MOTORS COMPANY

1. Install the electronic transmission range selector manual park release cable (1) through the cowl panel.

CAUTION: Refer to **Fastener Caution** .

2. Install the electronic transmission range selector manual park release cable grommet fasteners (2) and tighten to 6 N.m (53 lb in).

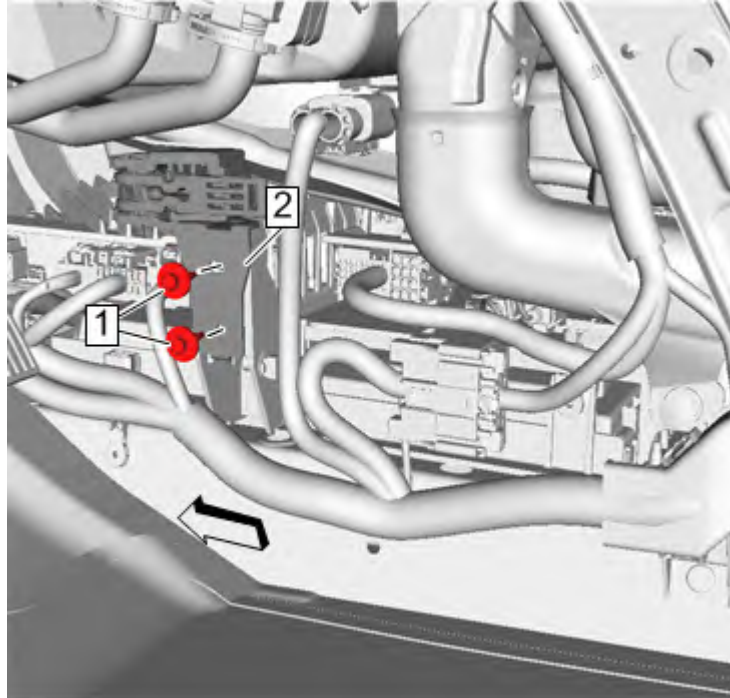


Fig. 28: Range Selector Manual Park Release Cable Handle And Retaining Bolts
 Courtesy of GENERAL MOTORS COMPANY

3. Position the electronic transmission range selector manual park release cable handle (2) to the bracket.
4. Install the electronic transmission range selector manual park release cable handle fasteners (1) and tighten to 2.5 N.m (22 lb in).
5. Install the front floor lower console. Refer to [Front Floor Lower Console Replacement \(Equinox\)](#).
6. Position the front left carpet, if necessary.
7. Install the electronic transmission range selector manual park release cable to the cable bracket on the transmission.

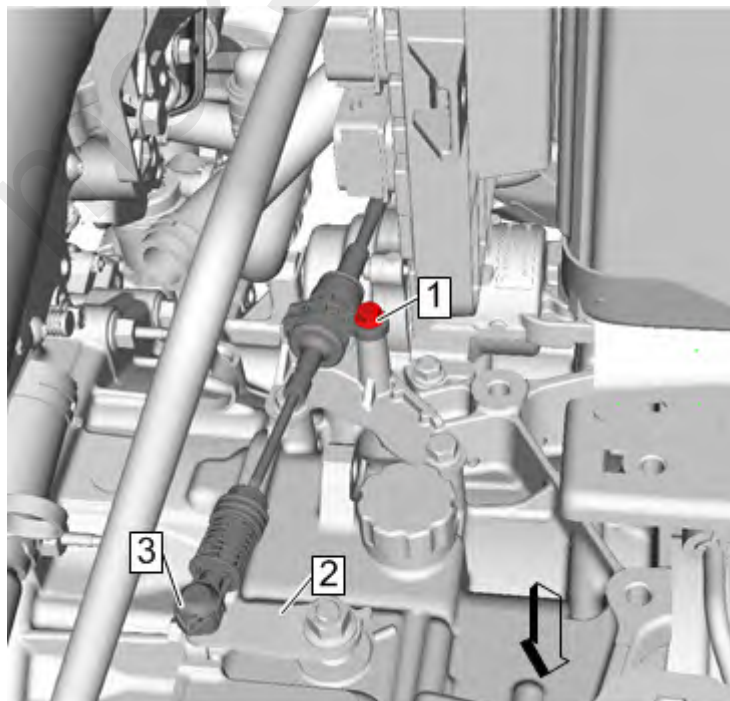


Fig. 29: Automatic Transmission Range Selector Lever Cable Terminal, Shift Lever And Clamp Bolt
 Courtesy of GENERAL MOTORS COMPANY

8.

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.

9. Connect the electronic transmission range selector manual park release cable terminal (3) to the transmission manual shift lever (2).
10. Install the electronic transmission range selector manual park release cable bolt (1) and tighten to 9 N.m (80 lb in).

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER CABLE BRACKET REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.
2. Disconnect the range selector lever cable from the range selector lever cable bracket. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#)

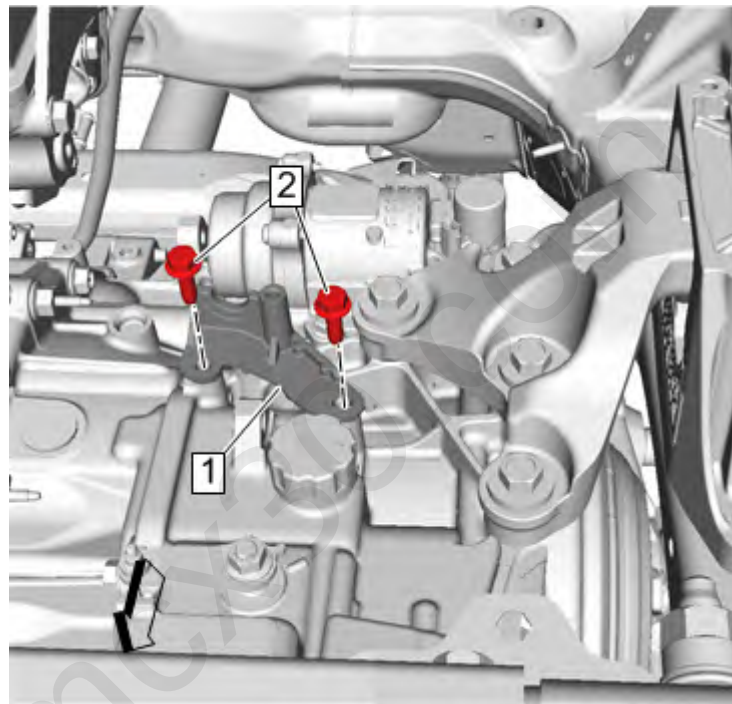


Fig. 30: Transmission Range Selector Cable Bracket And Bolts
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

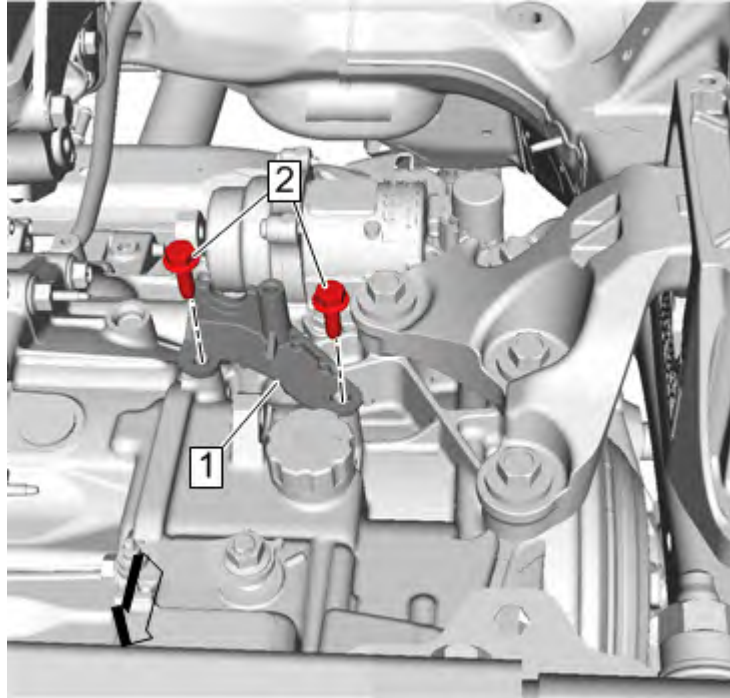


Fig. 31: Transmission Range Selector Cable Bracket And Bolts

Courtesy of GENERAL MOTORS COMPANY

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

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

2. Install the transmission range selector lever cable bracket bolts (2) and tighten to 22 N.m (16 lb ft).
3. Connect the range selector lever cable to the range selector lever cable bracket. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#)
4. Check the range selector cable adjustment. Refer to [Range Selector Lever Cable Adjustment](#)

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER CABLE REPLACEMENT

Removal Procedure

1. Set the park brake and chock the wheels.

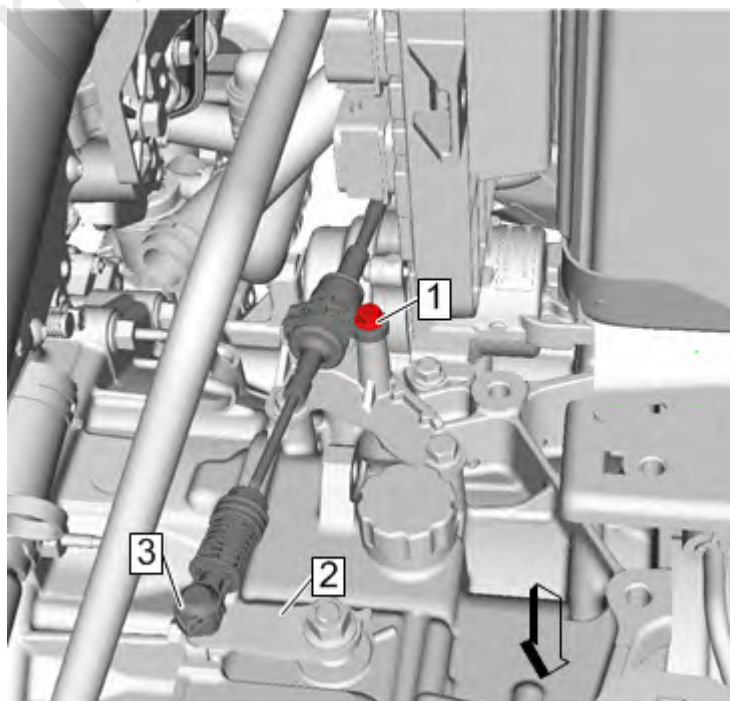


Fig. 32: Automatic Transmission Range Selector Lever Cable Terminal, Shift Lever And Clamp Bolt

2. Disconnect the range selector lever cable terminal (3) from the transmission manual shift lever (2).
3. Remove the bolt (1) retaining the automatic transmission range selector lever cable to the cable bracket.
4. Remove the range selector lever cable from the transmission.
5. Remove the front floor lower console. Refer to [Front Floor Lower Console Replacement \(Equinox\)](#).

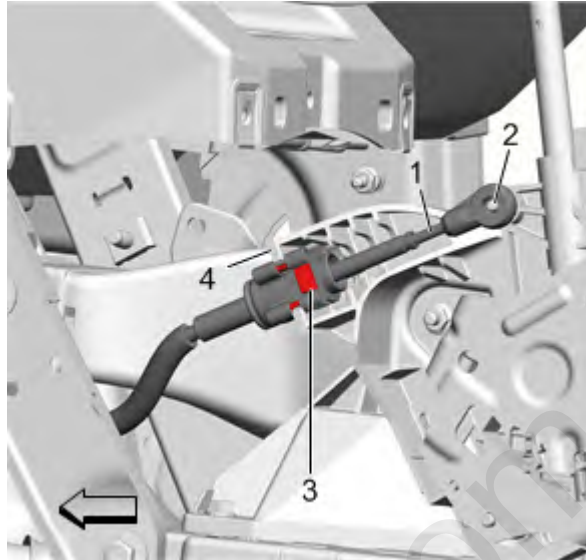


Fig. 33: Range Selector Lever Cable Components

Courtesy of GENERAL MOTORS COMPANY

6. Disconnect the range selector lever cable terminal (1) from the transmission control shift lever pin (2).
7. Push the locking tab (3) rearward in order to release the range selector lever cable (1) from the transmission control assembly (4).
8. Reposition the front left carpet to access the shift cable grommet, if necessary.

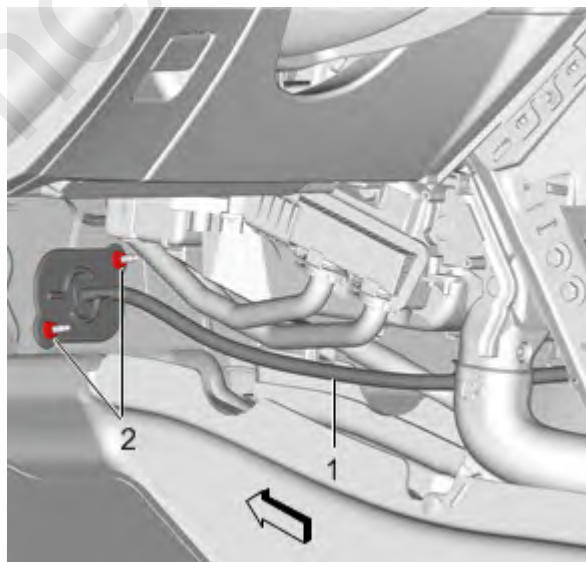


Fig. 34: Range Selector Manual Park Release Cable And Cable Grommet Fasteners

Courtesy of GENERAL MOTORS COMPANY

9. Remove the range selector lever cable grommet fasteners (2).
10. Remove the range selector lever cable (1) from the vehicle.

Installation Procedure

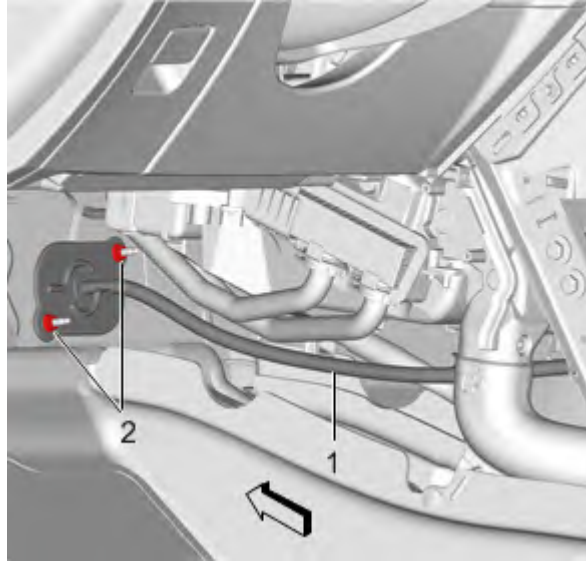


Fig. 35: Range Selector Manual Park Release Cable And Cable Grommet Fasteners
 Courtesy of GENERAL MOTORS COMPANY

1. Install the range selector lever cable (1) through the cowl panel.

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

2. Install the range selector lever cable grommet fasteners (2) and tighten to 6 N.m (53 lb in).

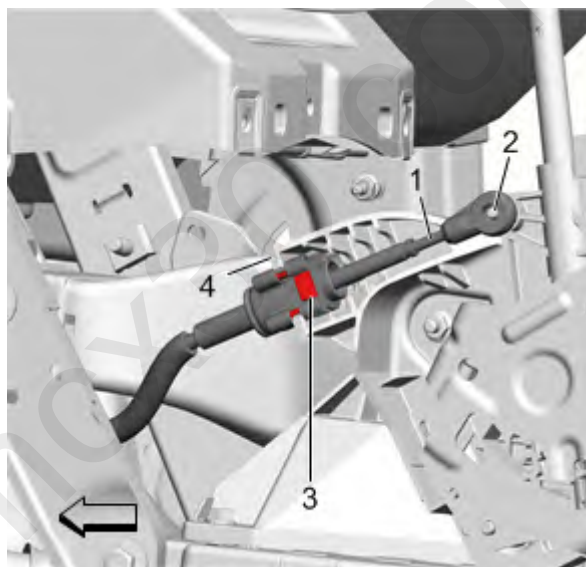


Fig. 36: Range Selector Lever Cable Components
 Courtesy of GENERAL MOTORS COMPANY

3. Install the cable (1) to transmission control assembly (4).
4. Push the locking tab (3) forward in order to lock the range selector lever cable (1) to the transmission control assembly (4).

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.

5. Connect the transmission range selector lever cable terminal to the transmission control shift lever pin (2).
6. Install the front floor lower console. Refer to [Front Floor Lower Console Replacement \(Equinox\)](#).
7. Position the front left carpet, if necessary.
8. Install the transmission range selector lever cable to the cable bracket on the transmission.

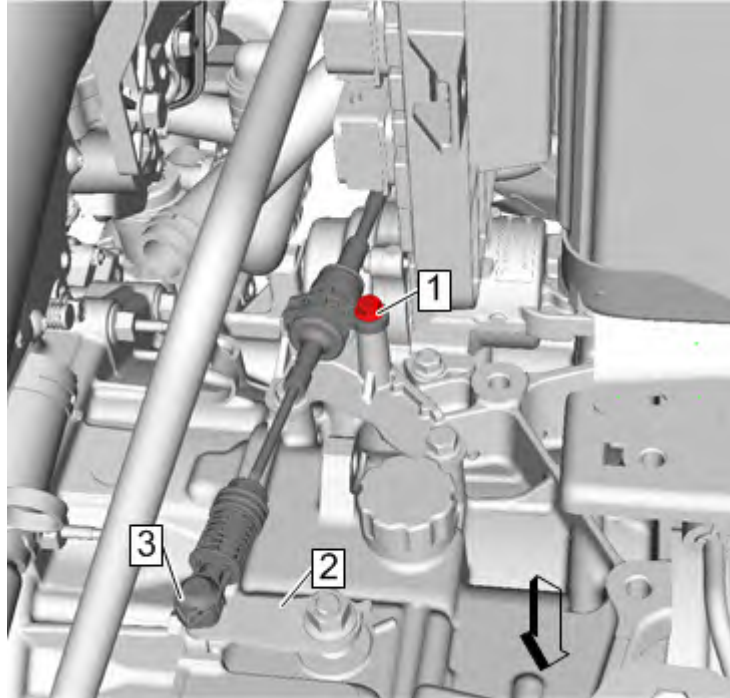


Fig. 37: Automatic Transmission Range Selector Lever Cable Terminal, Shift Lever And Clamp Bolt

Courtesy of GENERAL MOTORS COMPANY

- 9.
10. Connect the transmission range selector lever cable terminal (3) to the transmission manual shift lever (2).
11. Install the automatic transmission range selector lever bolt (1) and tighten to 9 N.m (80 lb in).
12. Adjust the range selector lever cable. Refer to [Range Selector Lever Cable Adjustment](#)

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER CABLE LEVER REPLACEMENT

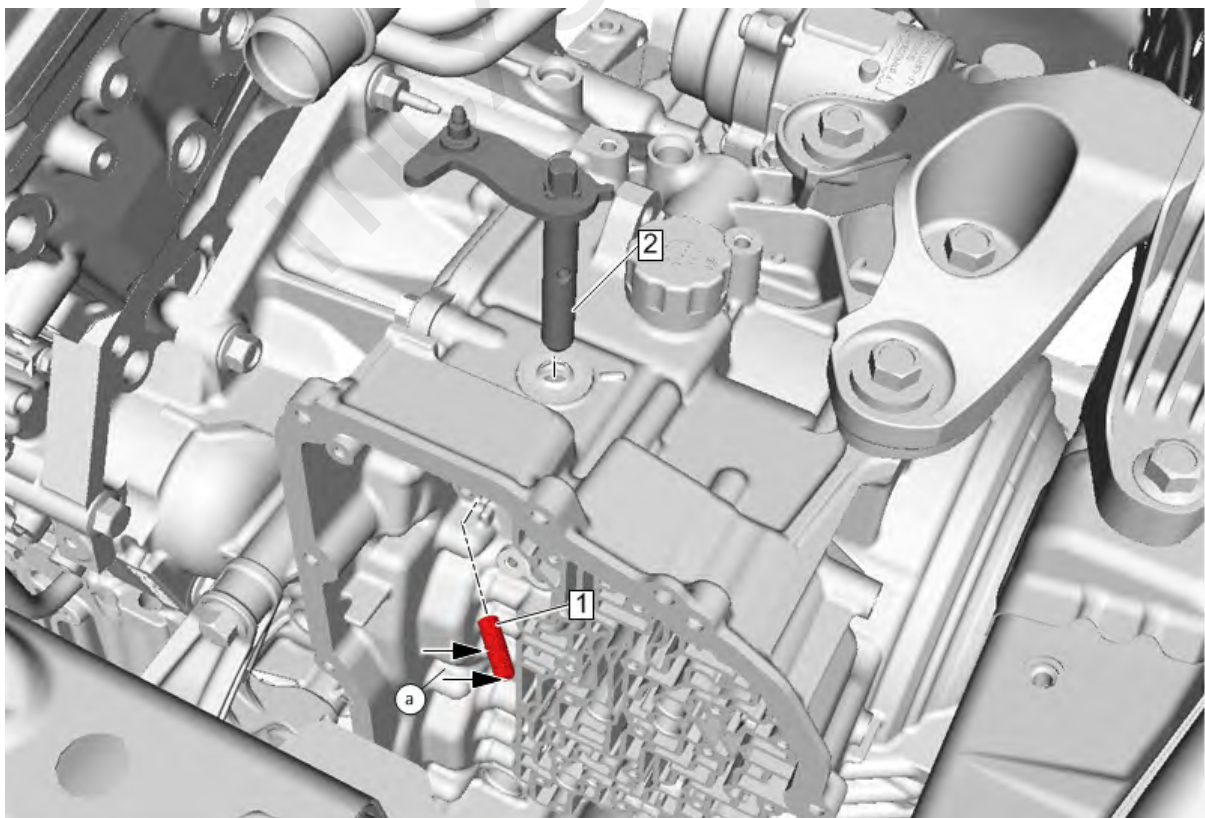


Fig. 38: Automatic Transmission Range Selector Lever Cable Lever

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedures 1. Disconnect the electronic transmission range selector manual park release cable from the automatic transmission range selector lever cable lever, then position out of the way. <u>Electronic Transmission Range Selector Manual Park Release Cable Replacement</u> 2. Remove Control Valve Body. Refer to <u>Control Valve Body Replacement</u>	
	Manual Shaft Detent Lever Hub Pin CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1 Install the manual shaft detent lever hub pin to correct height. NOTE: Install a NEW manual shaft detent lever hub pin. Specification 7.9 mm (0.38 in) (a)
2	Manual Shaft NOTE: Lubricate the shaft with ATF to prevent damage to the manual shift shaft seal during installation.
3	Manual Shaft Detent Lever Assembly
4	Park Pawl Actuator

RANGE SELECTOR LEVER CABLE ADJUSTMENT

1. Remove the engine control module bracket. Refer to [Engine Control Module Bracket Replacement](#)

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.

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

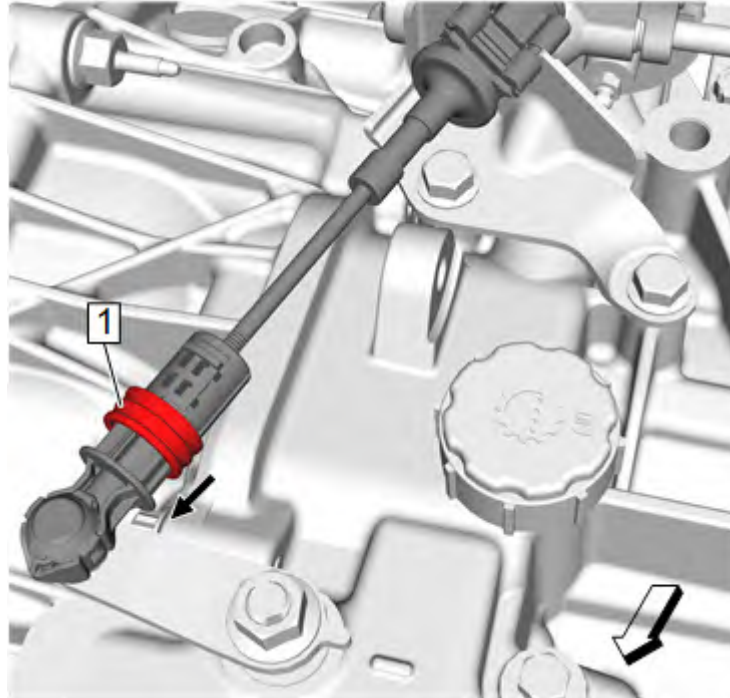


Fig. 39: Retaining Collar

Courtesy of GENERAL MOTORS COMPANY

5. Pull the retaining collar (1) forward.

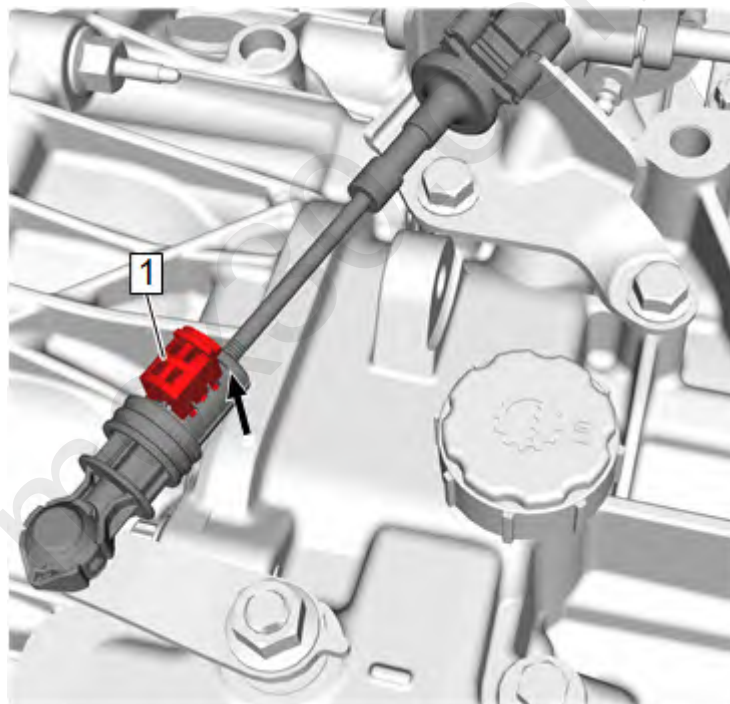


Fig. 40: Range Select Cable Adjusting Retainer

Courtesy of GENERAL MOTORS COMPANY

6. Release the range select cable adjusting retainer by pushing it upward (1).

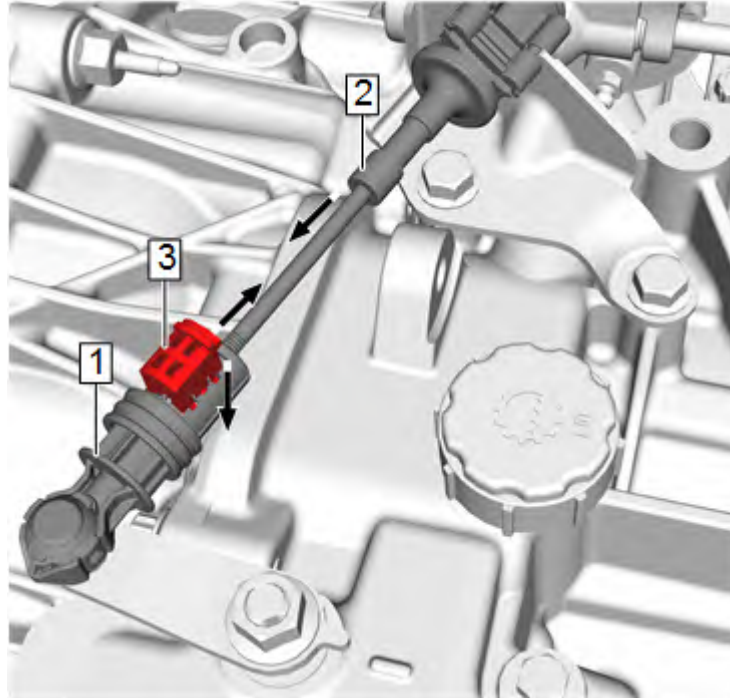


Fig. 41: Range Select Cable Halves And Adjuster Retainer
 Courtesy of GENERAL MOTORS COMPANY

7. Slide the two halves (1, 2) of the range select cable together until all free play is removed.
8. Depress the adjuster retainer (3) locking the adjuster retainer completely.

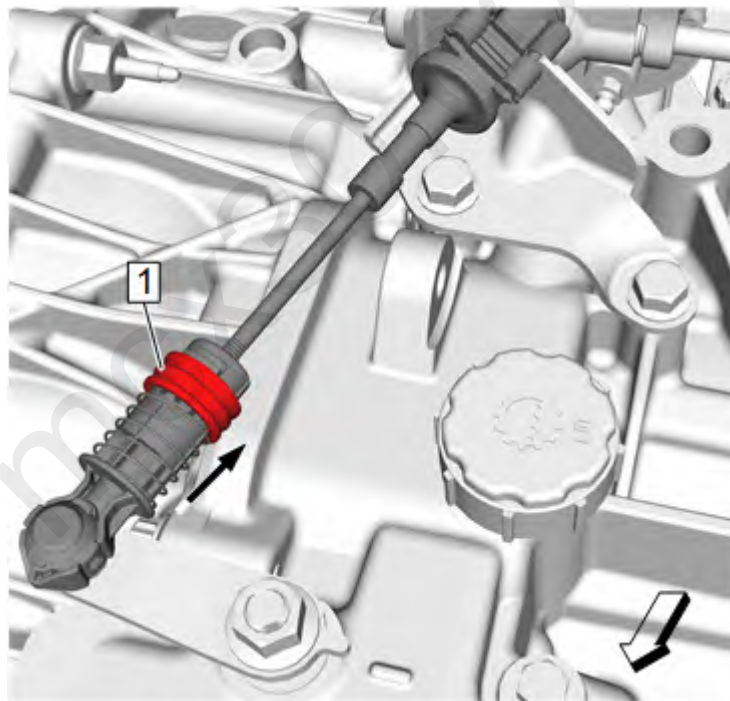


Fig. 42: Retaining Collar
 Courtesy of GENERAL MOTORS COMPANY

9. Release the retaining collar (1).

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.

10. Pull both halves of the range select cable in opposite directions to verify the cable adjuster is secured.
11. Check the transmission range select lever in all gear selections for proper operation.

12. Install the engine control module bracket. Refer to [Engine Control Module Bracket Replacement](#)

AUTOMATIC TRANSMISSION FLUID PRESSURE TEST HOLE PLUG REPLACEMENT

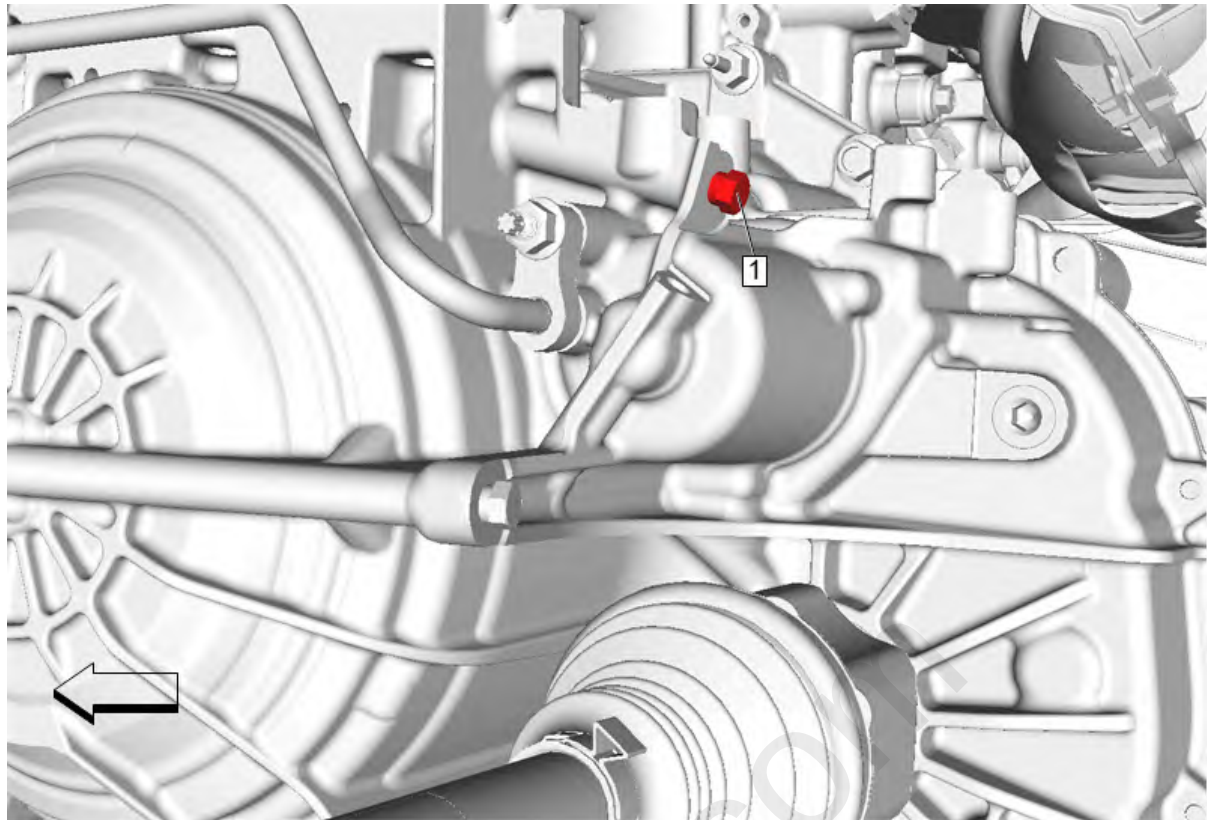


Fig. 43: Automatic Transmission Fluid Pressure Test Hole Plug
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Automatic Transmission Fluid Pressure Test Hole Plug CAUTION: Refer to Component Fastener Tightening Caution . Tighten 12 N.m (106 lb in)

TRANSMISSION FLUID FILLER CAP REPLACEMENT

Removal Procedure

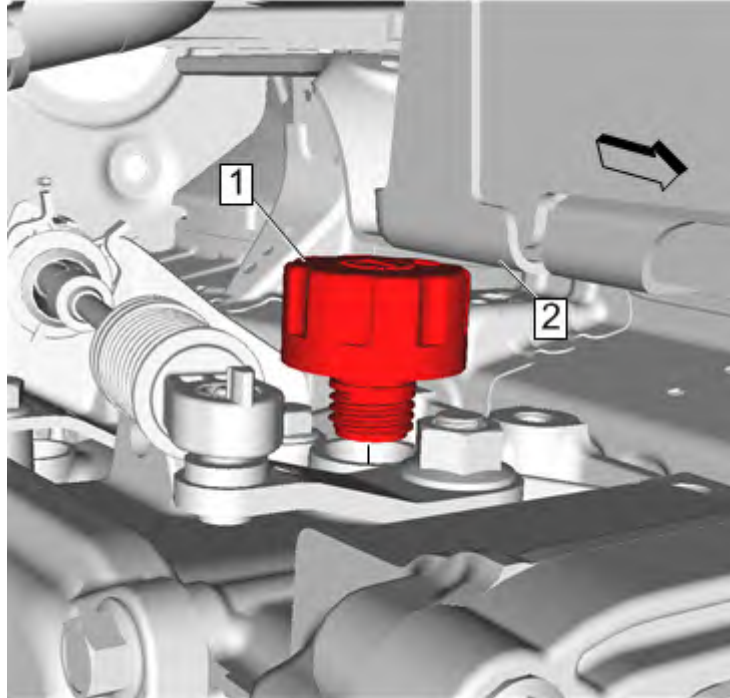


Fig. 44: Fluid Fill Cap

Courtesy of GENERAL MOTORS COMPANY

1. Remove the transmission fluid filler cap (1).

Installation Procedure

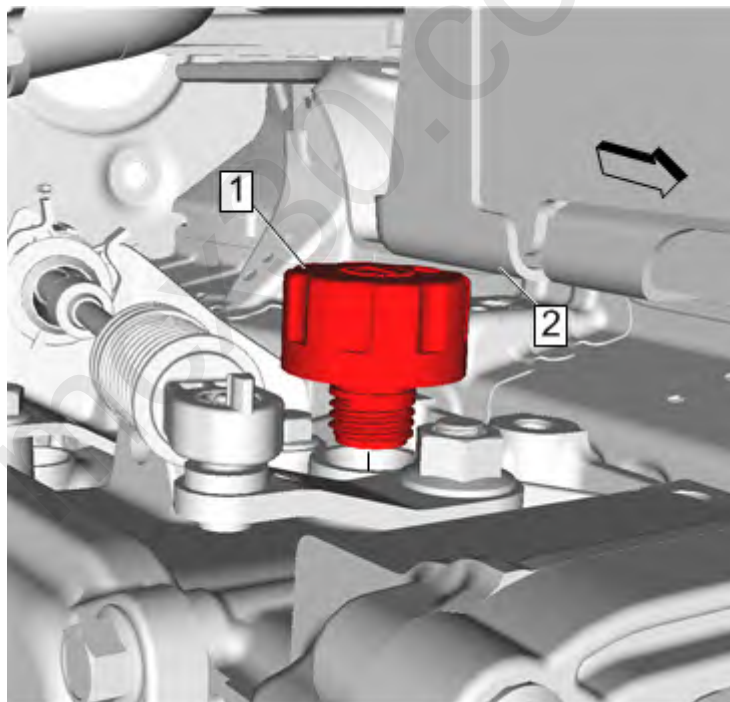


Fig. 45: Fluid Fill Cap

Courtesy of GENERAL MOTORS COMPANY

1. Install the transmission fluid filler cap (1).

TRANSMISSION FLUID FILLER TUBE PLUG REPLACEMENT

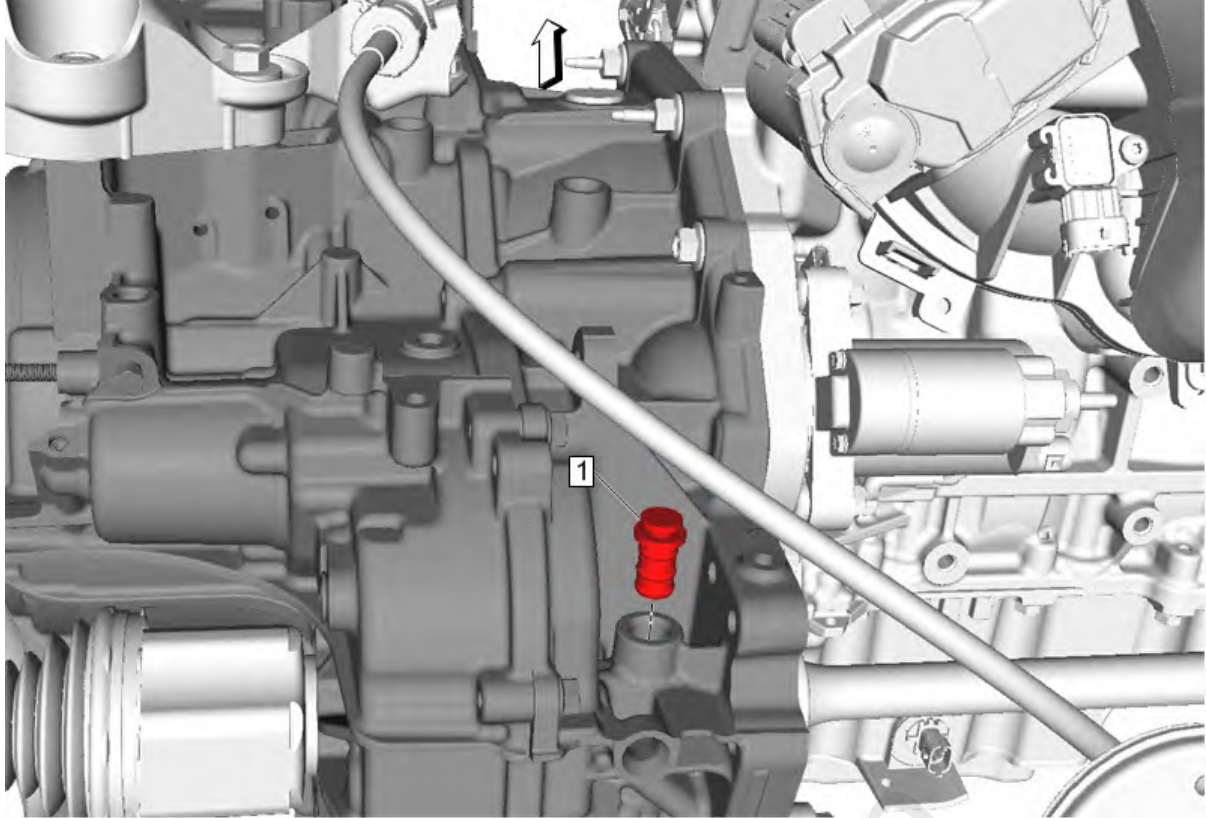


Fig. 46: Transmission Fluid Filler Tube Plug
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Fluid Pressure Test Plug

AUTOMATIC TRANSMISSION FLUID PAN DRAIN PLUG REPLACEMENT

Removal Procedure

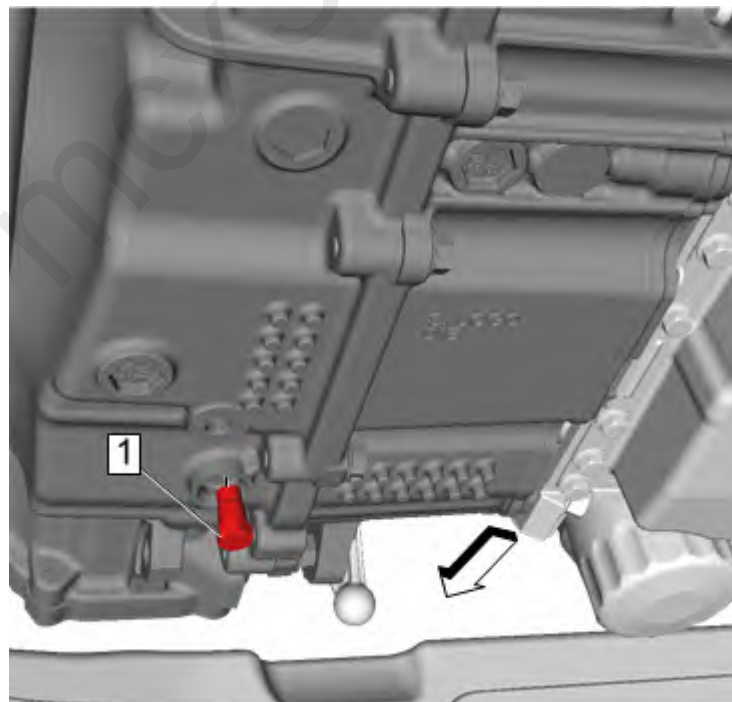


Fig. 47: Fluid Drain Plug
 Courtesy of GENERAL MOTORS COMPANY

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

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

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

Installation Procedure

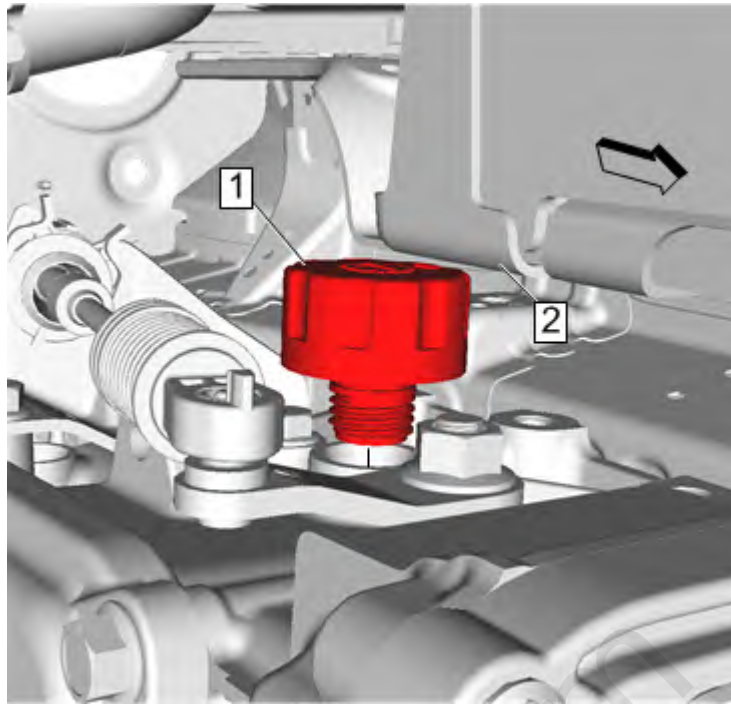


Fig. 48: Fluid Fill Cap

Courtesy of GENERAL MOTORS COMPANY

1. Lower the vehicle.

NOTE: If the transmission fluid filler cap cannot be accessed, proceed to the next step in this procedure.

2. Remove the fluid fill cap (1), if accessible.
3. Remove the left front wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation](#)

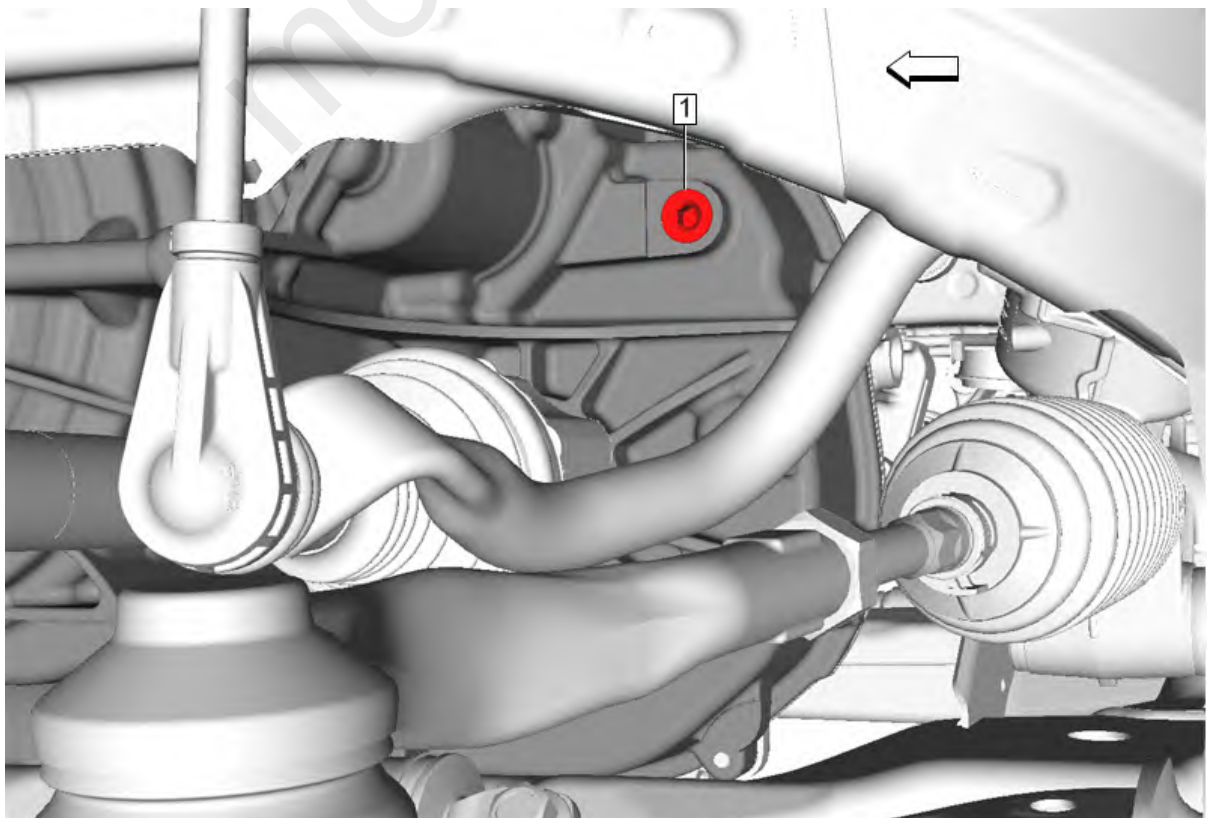


Fig. 49: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

4. Remove the fluid filler plug (1) from the transmission.
5. Fill the transmission to the proper level with the correct fluid. Refer to [Transmission Fluid Level and Condition Check](#) , and [Adhesives, Fluids, Lubricants, and Sealers](#) .
6. Install the fluid fill cap (1), if accessible.

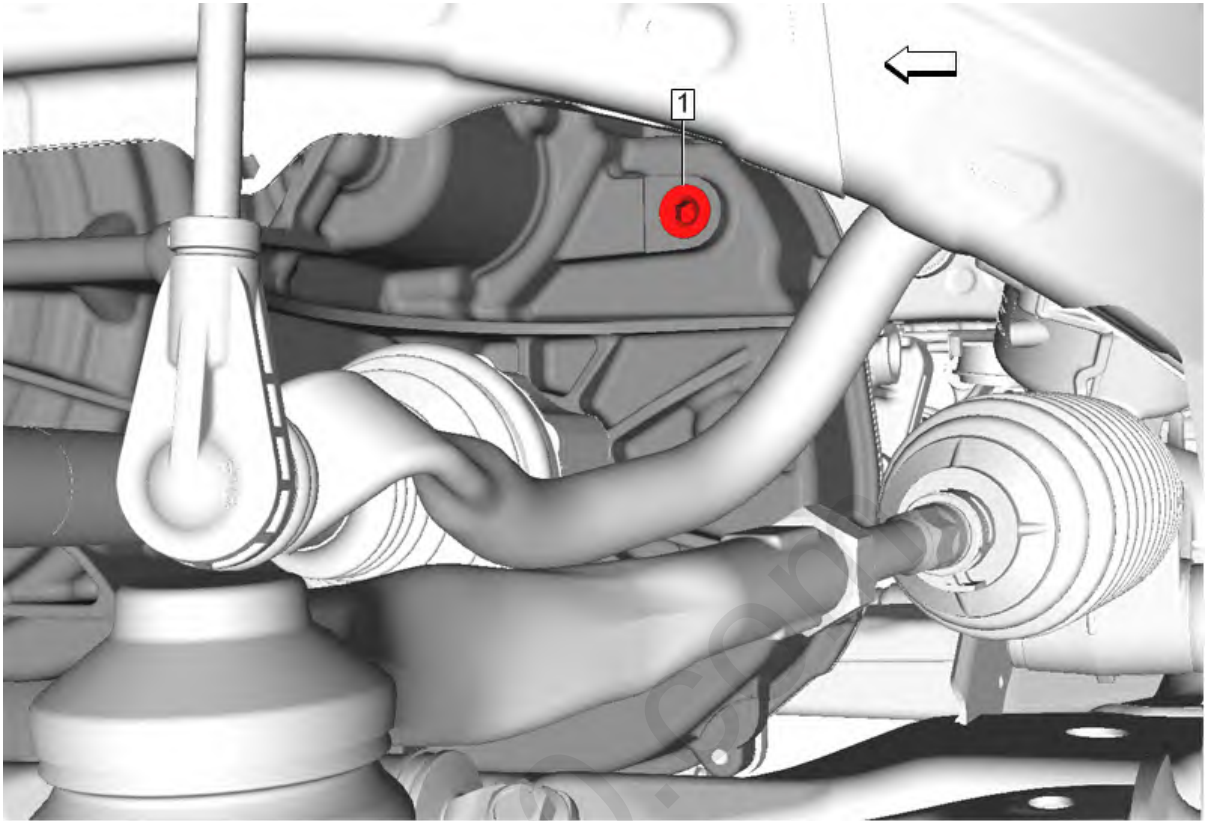


Fig. 50: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

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

7. Install the fluid filler plug (1) to the transmission and tighten to 40 N.m (30 lb ft).
8. Install the left front wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation](#)

AUTOMATIC TRANSMISSION FLUID LEVEL HOLE PLUG REPLACEMENT

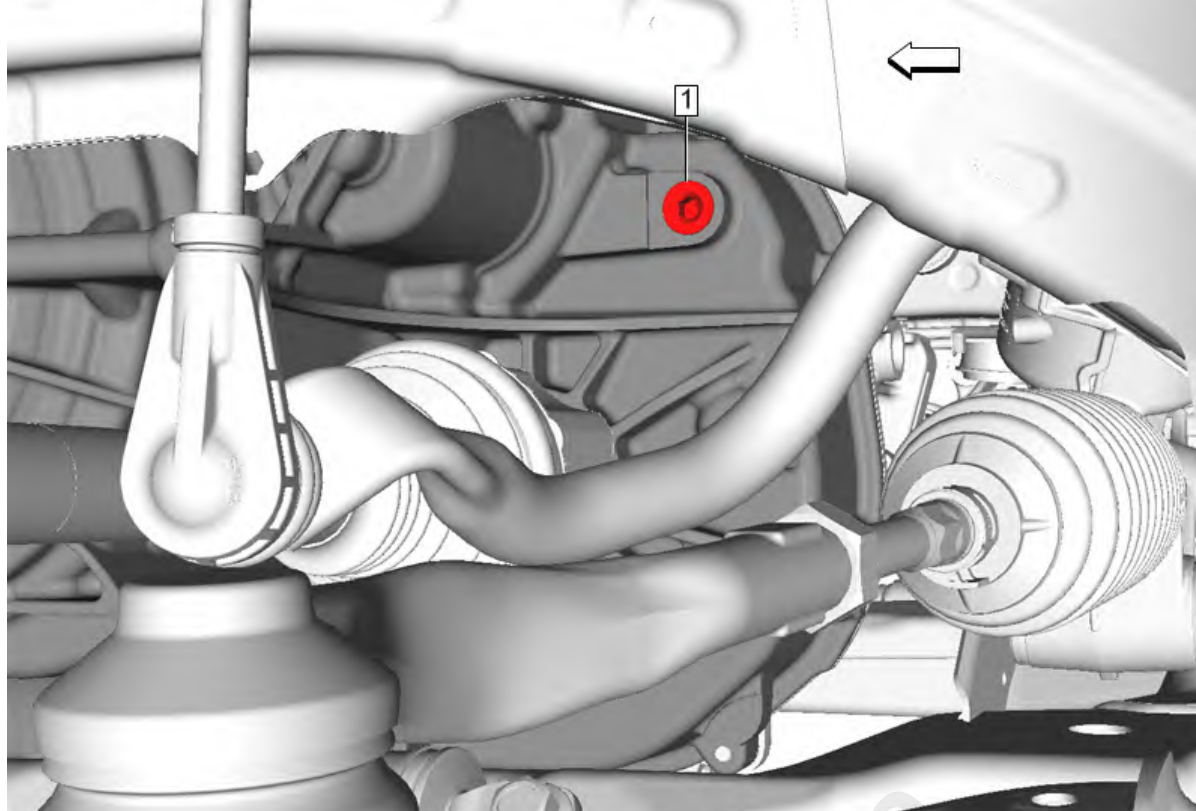


Fig. 51: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Fluid Filler Plug CAUTION: Refer to Component Fastener Tightening Caution . Tighten 40 N.m (30 lb ft)

AUTOMATIC TRANSMISSION CASE HOLE PLUG REPLACEMENT (CASE HOLE PLUG)

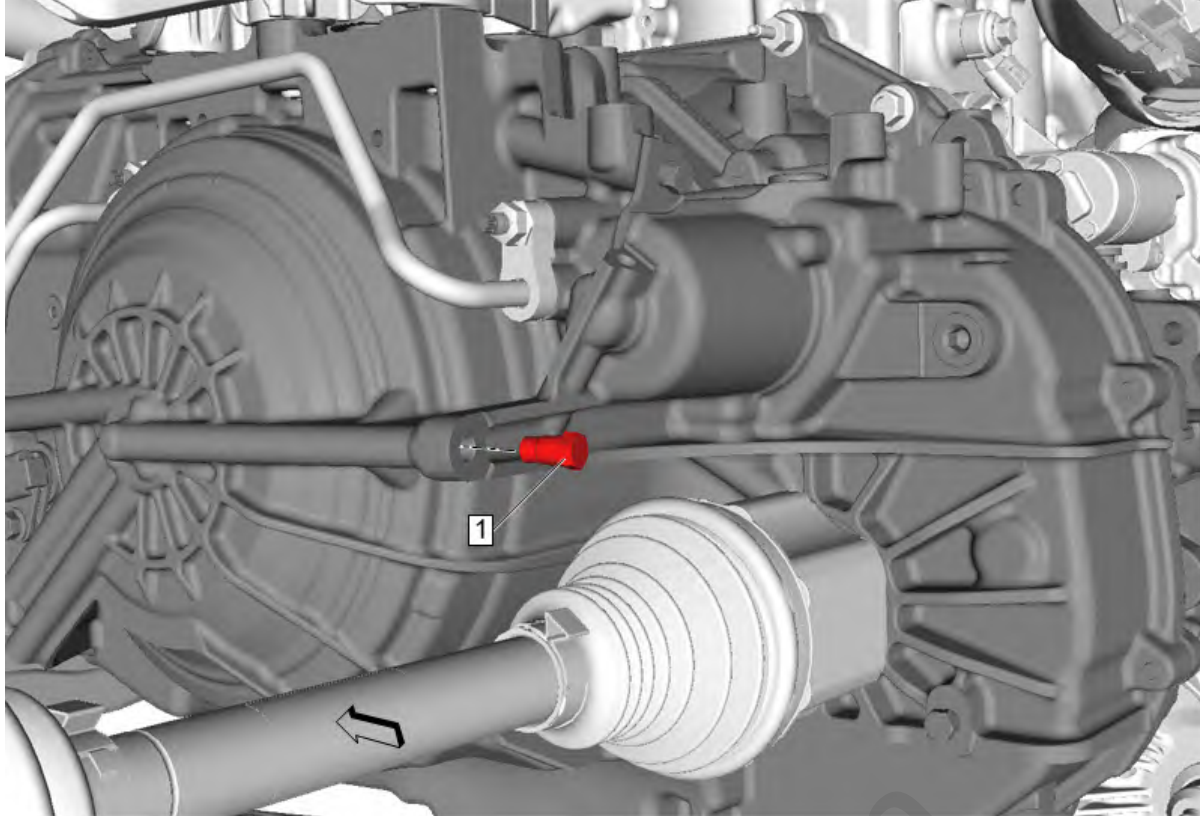


Fig. 52: Automatic Transmission Case Hole Plug_(Case Hole Plug).

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Automatic Transmission Case Hole Plug CAUTION: Refer to Component Fastener Tightening Caution . Tighten 12 N.m (106 lb in)

AUTOMATIC TRANSMISSION CASE HOLE PLUG REPLACEMENT (AUXILIARY FLUID FILL PLUG)

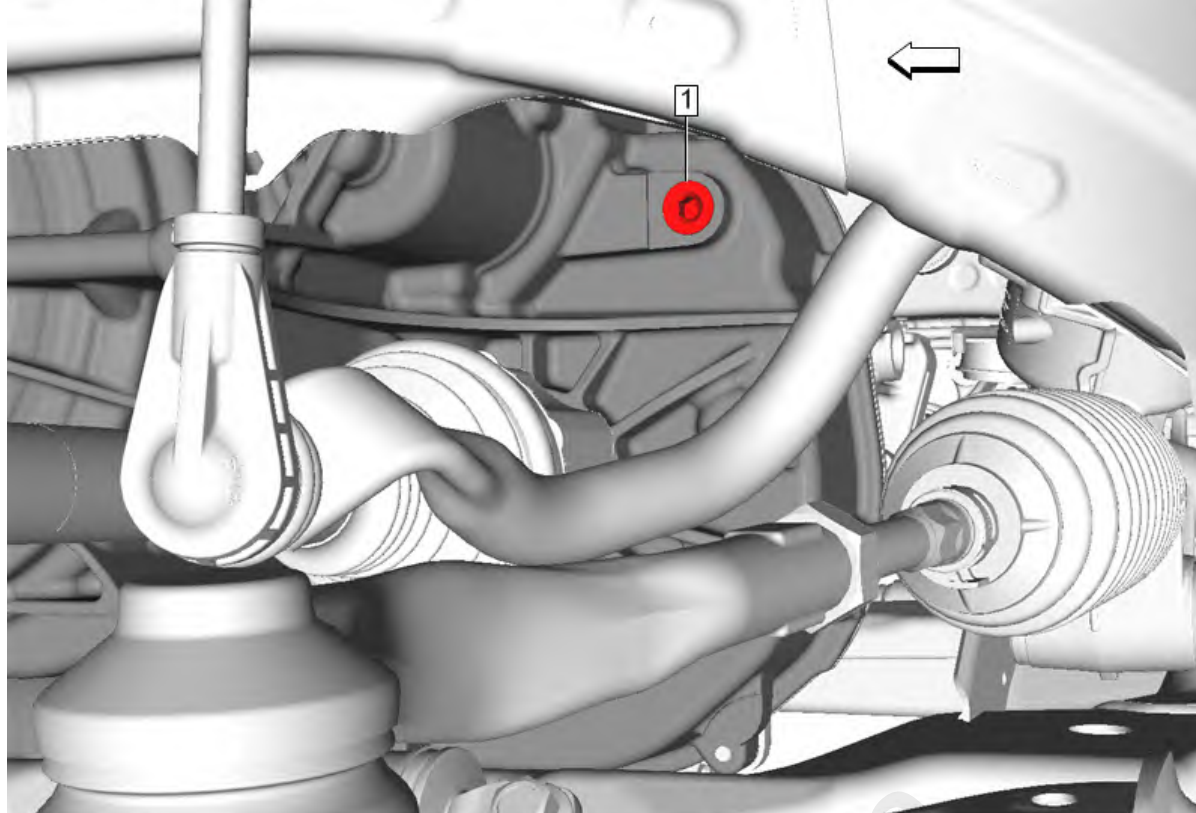


Fig. 53: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Fluid Filler Plug CAUTION: Refer to Component Fastener Tightening Caution . Tighten 40 N.m (30 lb ft)

MANUAL SHIFT DETENT LEVER SHAFT REPLACEMENT

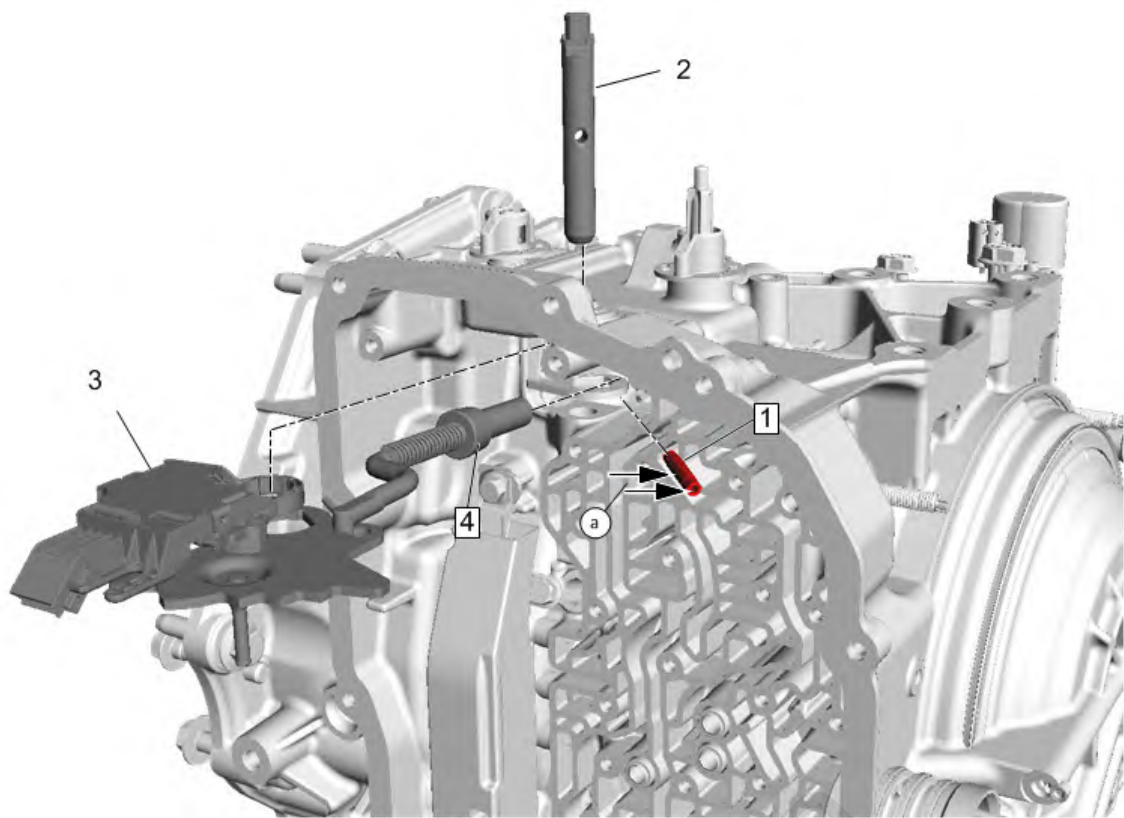


Fig. 54: Manual Shift Detent Lever Shaft
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove Automatic Transmission Range Selector Lever Cable. Refer to Automatic Transmission Range Selector Lever Cable Replacement 2. Remove Control Valve Body. Refer to Control Valve Body Replacement	
1	Manual Shaft Detent Lever Hub Pin CAUTION: Refer to Fastener Caution . Procedure Install the manual shaft detent lever hub pin to correct height. NOTE: Install a NEW manual shaft detent lever hub pin. Specification 7.9 mm (0.38 in) (a)
2	Manual Shaft NOTE: Lubricate the shaft with ATF to prevent damage to the manual shift shaft seal during installation.
3	Manual Shaft Detent Lever Assembly
4	Park Pawl Actuator

MANUAL SHIFT SHAFT SEAL REPLACEMENT

Special Tools

- **DT-45201** Cooler Line Seal Remover
- **DT-49101** Seal Installer

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

Removal Procedure

1. Remove the manual shift detent lever shaft assembly. Refer to [Manual Shift Detent Lever Shaft Replacement](#)

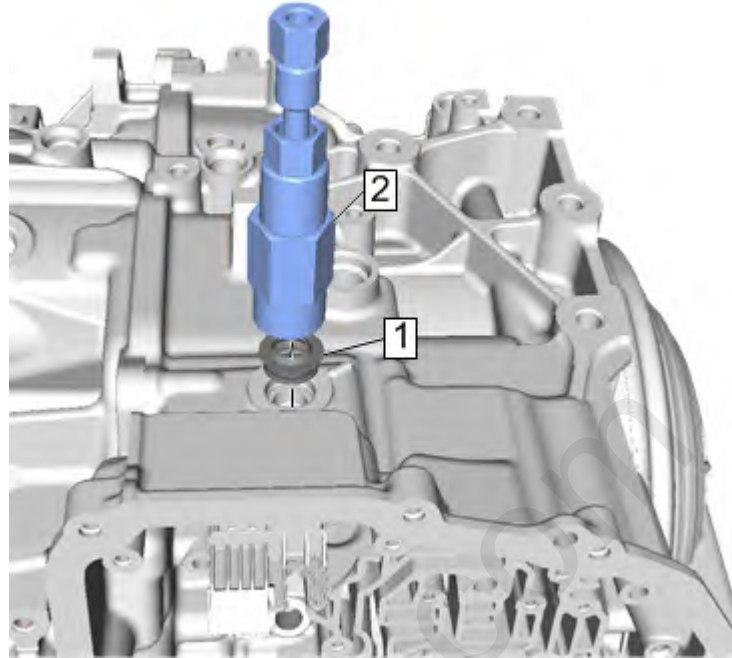


Fig. 55: Manual Shaft Seal And Special Tool
Courtesy of GENERAL MOTORS COMPANY

2. Remove the manual shaft seal (1) using **DT-45201** remover.

Installation Procedure

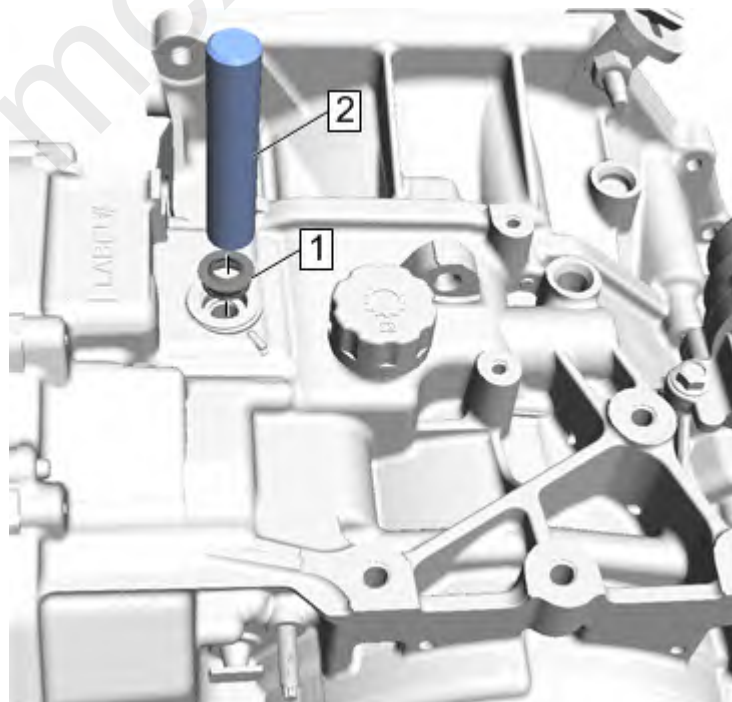


Fig. 56: Manual Shaft Seal And Special Tool
Courtesy of GENERAL MOTORS COMPANY

1. Install the manual shaft seal (1) using **DT-49101** seal installer.

2. Install the manual shift detent lever shaft assembly. Refer to [Manual Shift Detent Lever Shaft Replacement](#)

FRONT WHEEL DRIVE SHAFT OIL SEAL REPLACEMENT (LEFT SIDE)

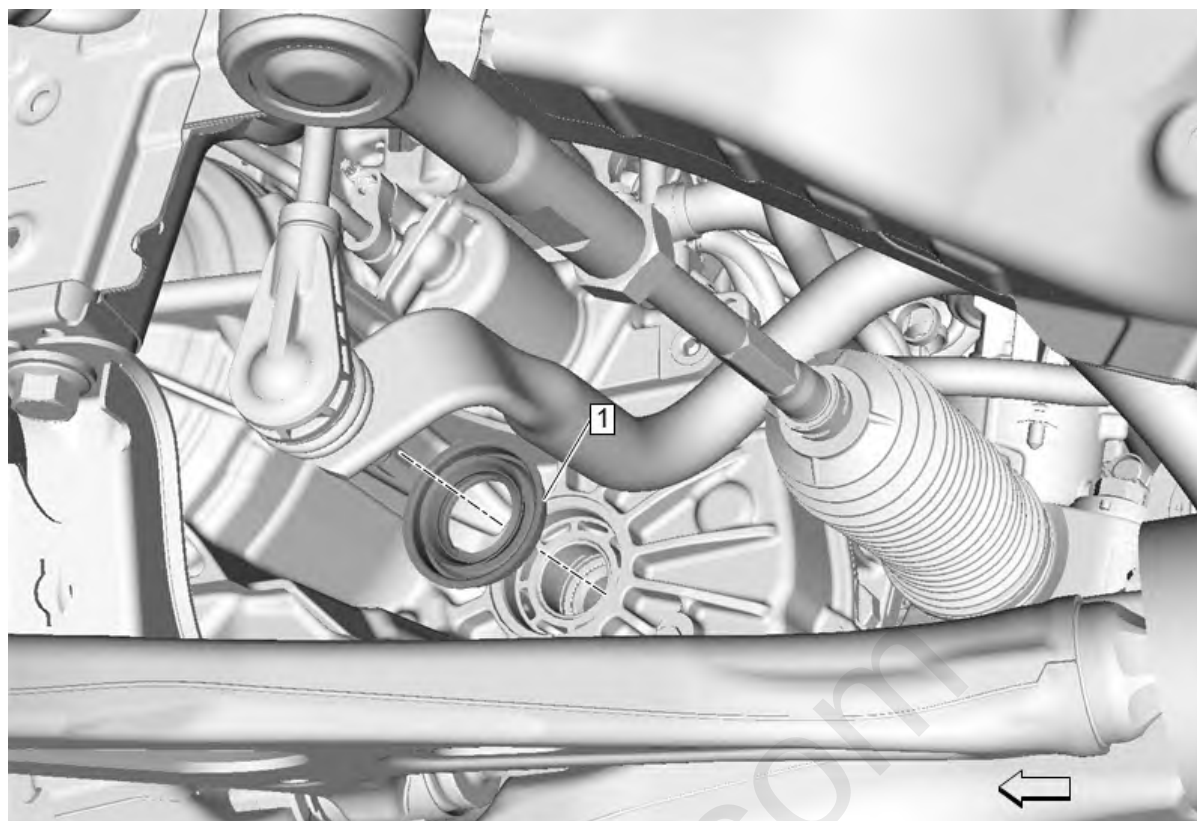


Fig. 57: Front Wheel Drive Shaft Oil Seal (Left Side).

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Front Wheel Drive Half Shaft - Left Side. Refer to Front Wheel Drive Half Shaft Replacement - Left Side	
1	Left Front Wheel Drive Shaft Oil Seal Procedure 1. For seal removal use GE-6125-1B slide hammer with DT-23129 universal seal remover. 2. For seal installation use GE-8092 driver handle with DT-47790 seal installer. Special Tools • DT-23129 Universal Seal Remover • DT-47790 Seal Installer • GE-6125-1B Slide Hammer • GE-8092 Driver Handle For equivalent regional tools, Special Tools

FRONT WHEEL DRIVE SHAFT OIL SEAL REPLACEMENT (RIGHT SIDE)

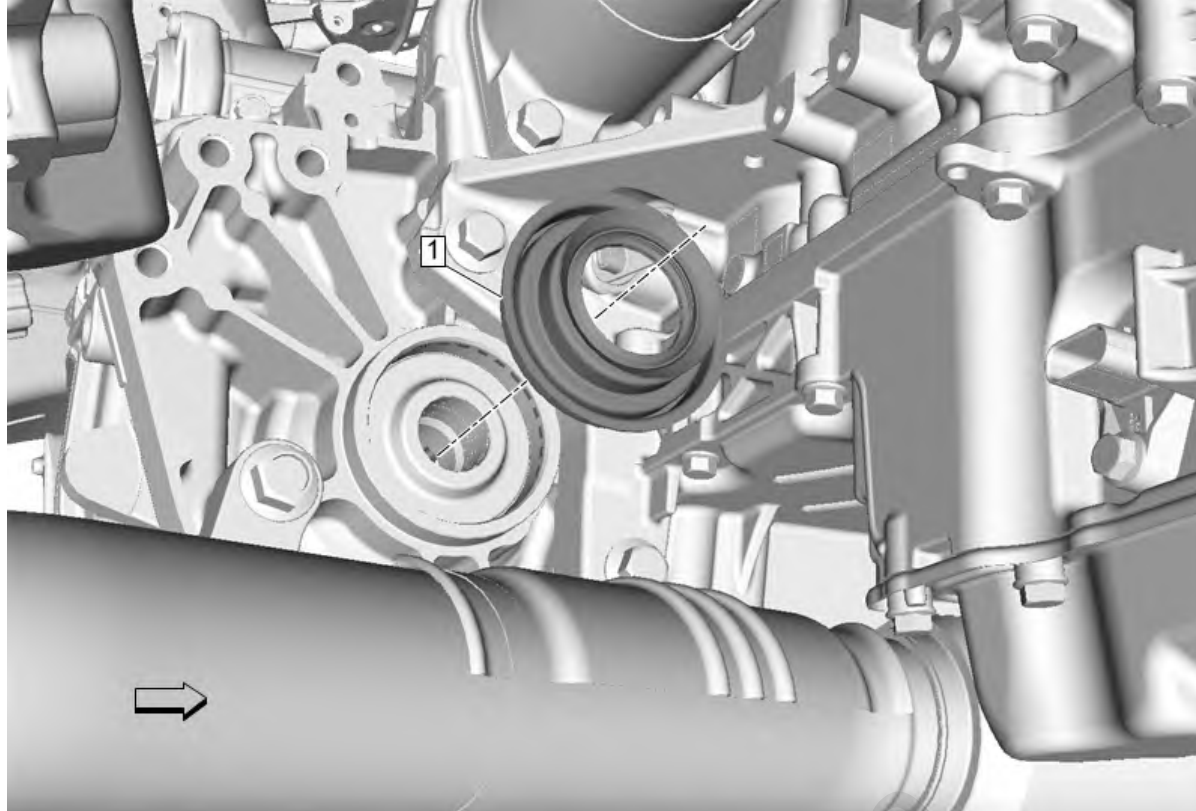


Fig. 58: Front Wheel Drive Shaft Oil Seal (Right Side)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Front Wheel Drive Half Shaft - Right Side. Refer to Front Wheel Drive Half Shaft Replacement - Right Side (AWD) , Front Wheel Drive Half Shaft Replacement - Right Side (M3U, MHG, MNH, MNK with FWD) , Front Wheel Drive Half Shaft Replacement - Right Side (M3D, M3H with FWD) .	
1	Right Front Wheel Drive Shaft Oil Seal Procedure 1. For seal removal use GE-6125-1B slide hammer with DT-23129 universal seal remover. 2. For seal installation use GE-8092 driver handle with DT-47790 seal installer. Special Tools • DT-23129 Universal Seal Remover • DT-47790 Seal Installer • GE-6125-1B Slide Hammer • GE-8092 Driver Handle For equivalent regional tools, Special Tools .

CONTROL VALVE BODY COVER REPLACEMENT

Removal Procedure

1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection \(KL9\)](#) .
2. Remove the charge air cooler outlet air tube. Refer to [Charge Air Cooler Outlet Air Tube Replacement](#) .
3. Remove the transmission control module bracket. Refer to [Transmission Control Module Bracket Replacement](#)

4. Drain the transmission fluid. Refer to [Transmission Fluid Drain and Fill](#)

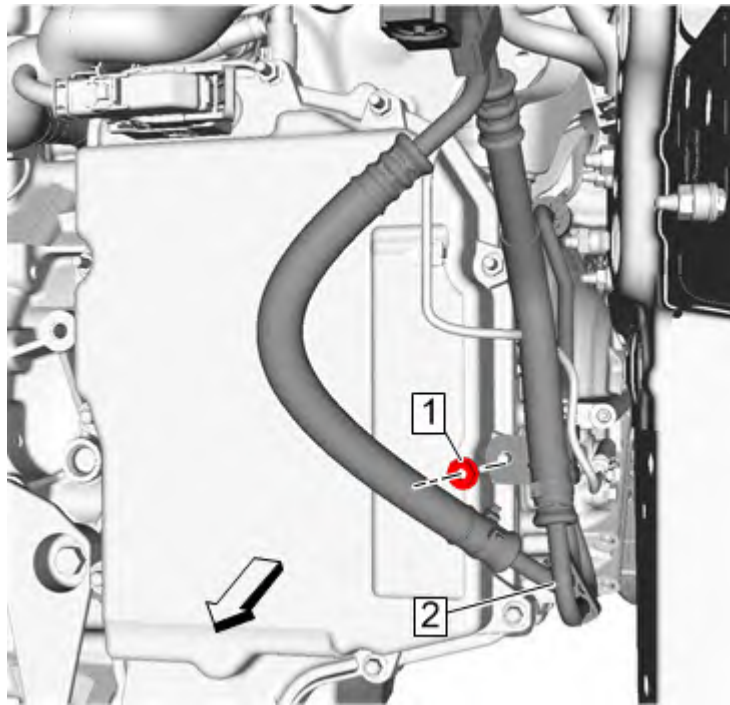


Fig. 59: Transmission Fluid Cooler Pipes And Nut

Courtesy of GENERAL MOTORS COMPANY

5. Remove the transmission fluid cooler pipe nut (1) from the transmission.
6. Reposition the transmission fluid cooler pipes (2) out of the way.

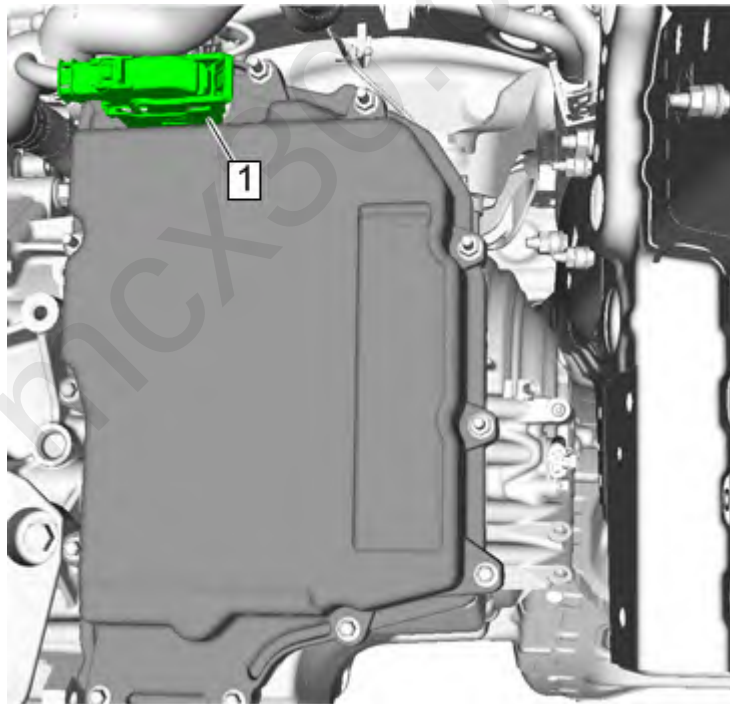


Fig. 60: Control Valve Body Transmission Control Module Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

7. Disconnect the control valve body transmission control module electrical connector (1), then unclip the wiring harness from the cover.
8. Remove the body ground cable and wiring harness assembly mounting bolt at front of transmission and position ground cable and harness out of the way.

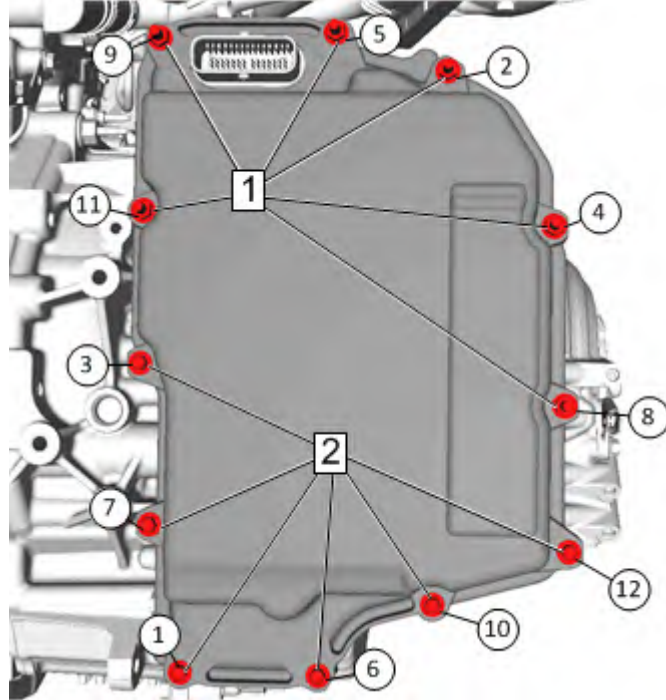


Fig. 61: Control Valve Body Cover Bolt Tightening Sequence
 Courtesy of GENERAL MOTORS COMPANY

9. Remove the control valve body cover bolts (1, 2).

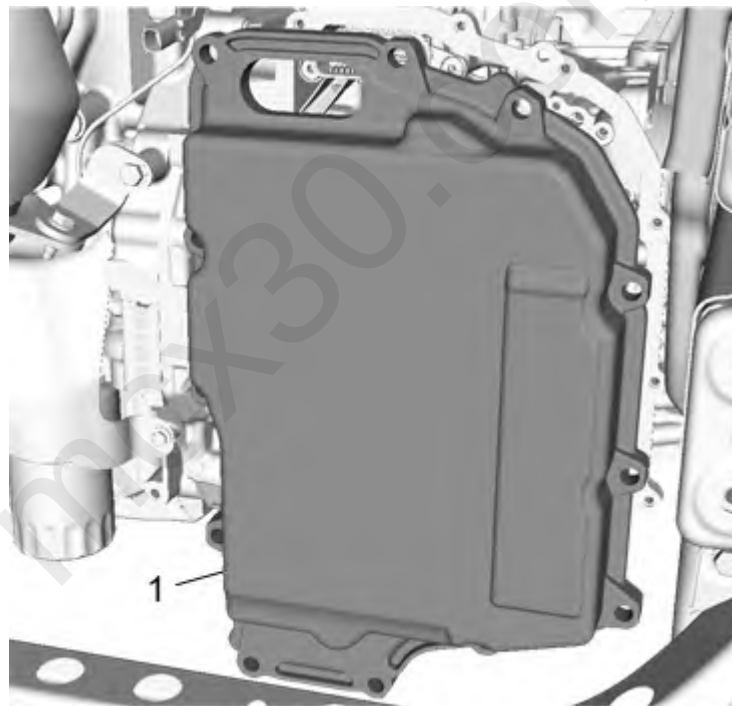


Fig. 62: Control Valve Body Cover
 Courtesy of GENERAL MOTORS COMPANY

10. Remove the control valve body cover (1).
11. Clean the transmission case and control valve body cover gasket surfaces. Inspect and replace the gasket as necessary.

Installation Procedure

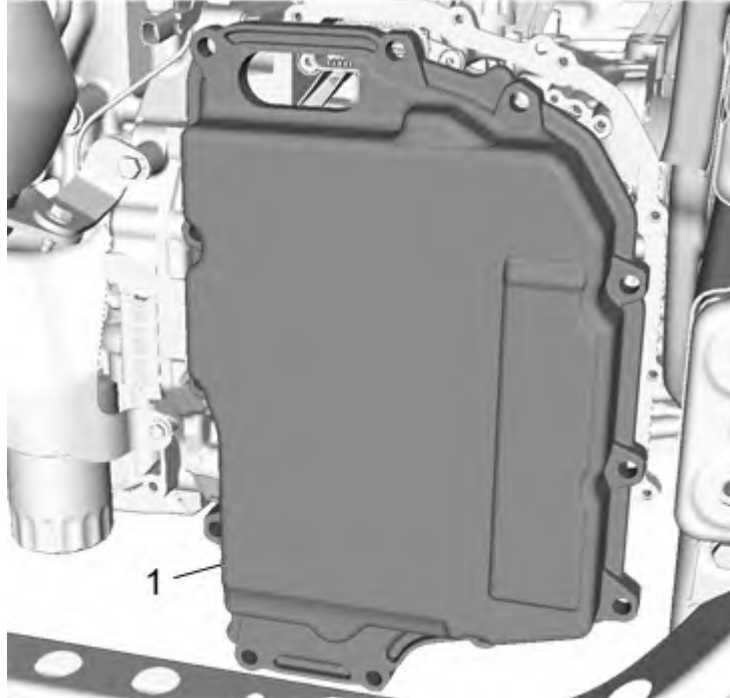


Fig. 63: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

1. Install the control valve body cover (1).

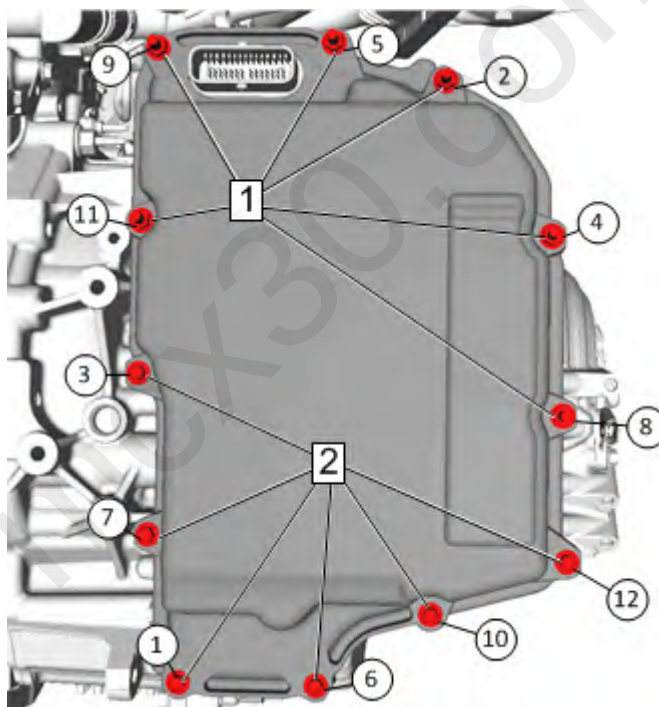


Fig. 64: Control Valve Body Cover Bolt Tightening Sequence

Courtesy of GENERAL MOTORS COMPANY

NOTE: The number (1) bolts are stud bolts.

2. Hand start the control valve body cover bolts (1, 2).

CAUTION: Refer to **Fastener Caution** .

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

3. Install the control valve body cover bolts. Tighten the bolts in sequence to 9 N.m (80 lb in).
4. Install the body ground cable and wiring harness assembly to the front of transmission.

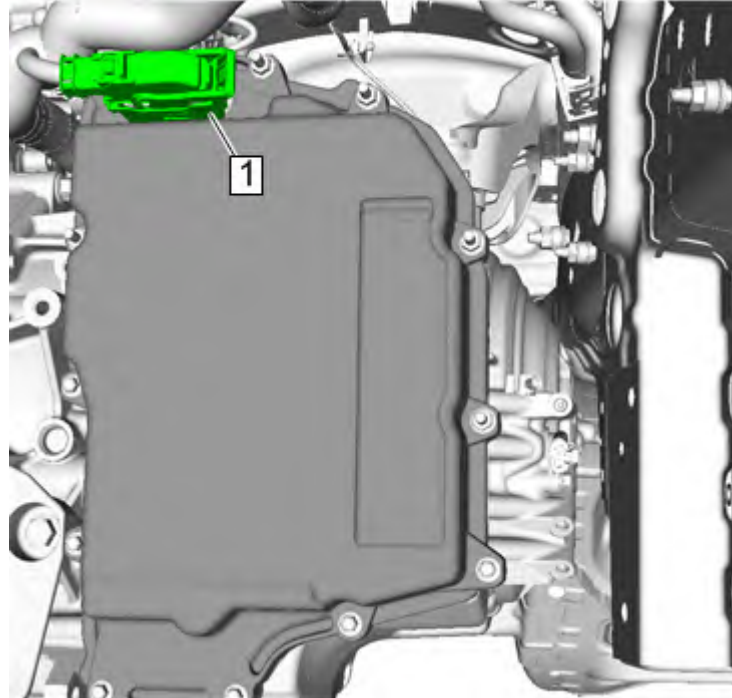


Fig. 65: Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

5. Connect the control valve body transmission control module electrical connector (1), then clip the wiring harness to the cover.

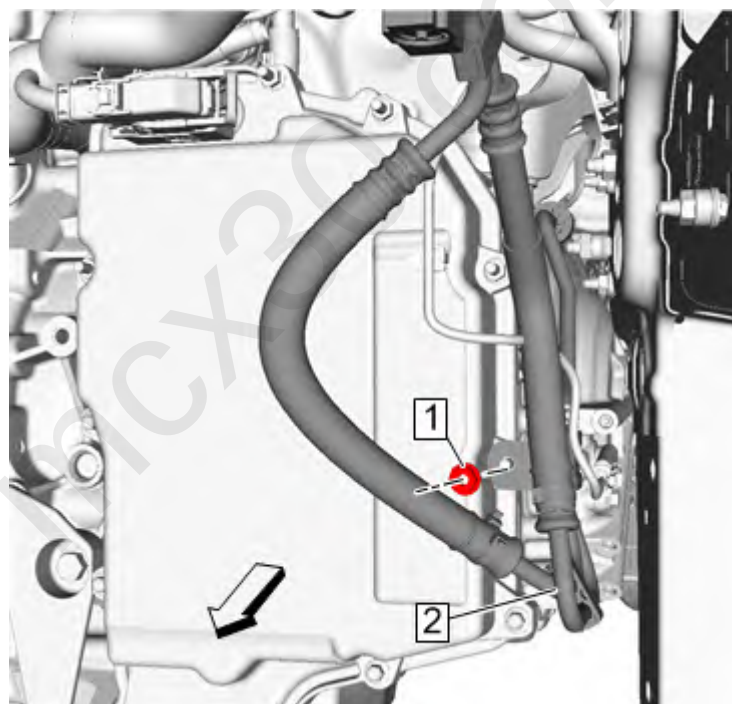


Fig. 66: Transmission Fluid Cooler Pipes And Nut
Courtesy of GENERAL MOTORS COMPANY

6. Reposition the transmission fluid cooler outlet pipes (2) to the transmission
7. Install the transmission fluid cooler inlet pipe nut (1) to the transmission and tighten to 9 N.m (80 lb in).
8. Fill the transmission with correct fluid. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#)
9. Check transmission fluid level. Refer to [Transmission Fluid Level and Condition Check](#) .
10. Install the transmission control module bracket. Refer to [Transmission Control Module Bracket Replacement](#)
11. Install the charge air cooler outlet air tube. Refer to [Charge Air Cooler Outlet Air Tube Replacement](#) .
12. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection \(KL9\)](#) .

13. Check for leaks.

CONTROL VALVE BODY REPLACEMENT

Removal Procedure

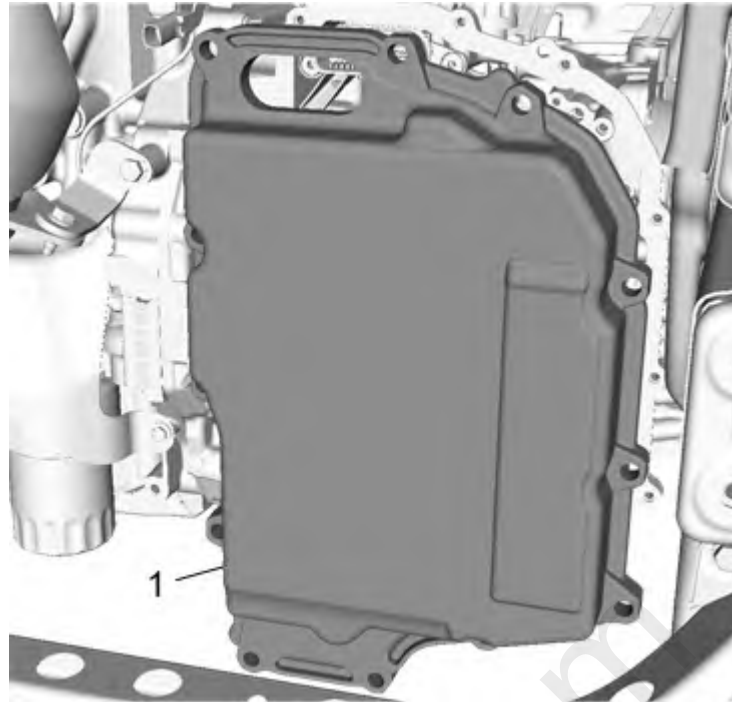


Fig. 67: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

1. Remove the control valve body cover (1) from the transmission. Refer to [Control Valve Body Cover Replacement](#)

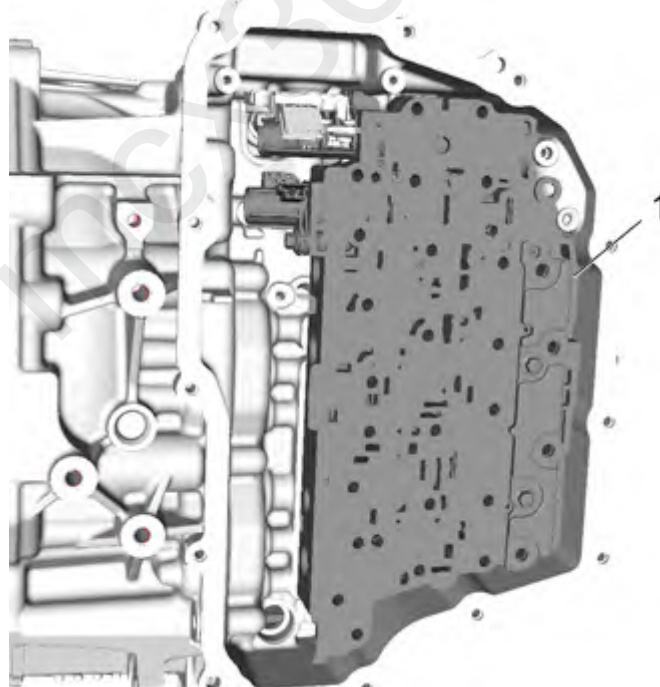


Fig. 68: Control Valve Body

Courtesy of GENERAL MOTORS COMPANY

2. Remove the control valve body (1) from the transmission. Refer to [Control Valve Body Assembly Removal \(without ETRS\)](#), [Control Valve Body Assembly Removal \(with ETRS\)](#)

Installation Procedure

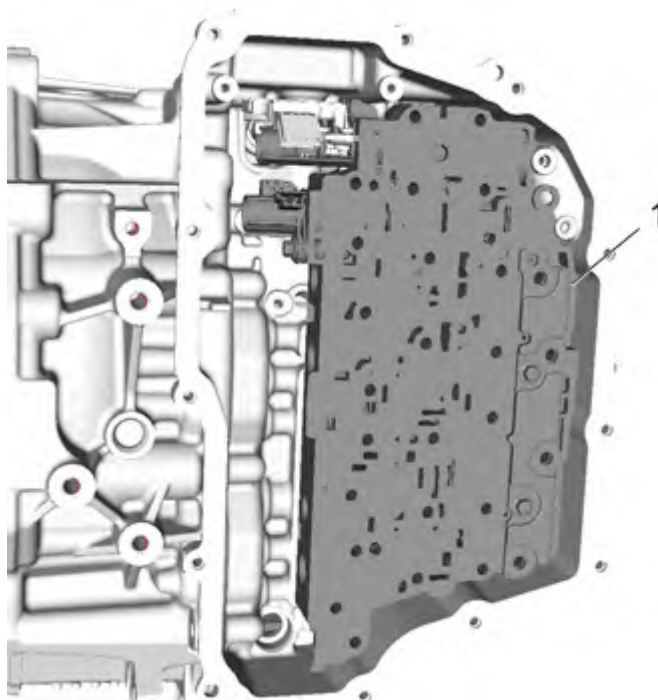


Fig. 69: Control Valve Body

Courtesy of GENERAL MOTORS COMPANY

1. Install the control valve body (1) to the transmission. Refer to [Control Valve Body Assembly Installation \(without ETRS\)](#), [Control Valve Body Assembly Installation \(with ETRS\)](#).

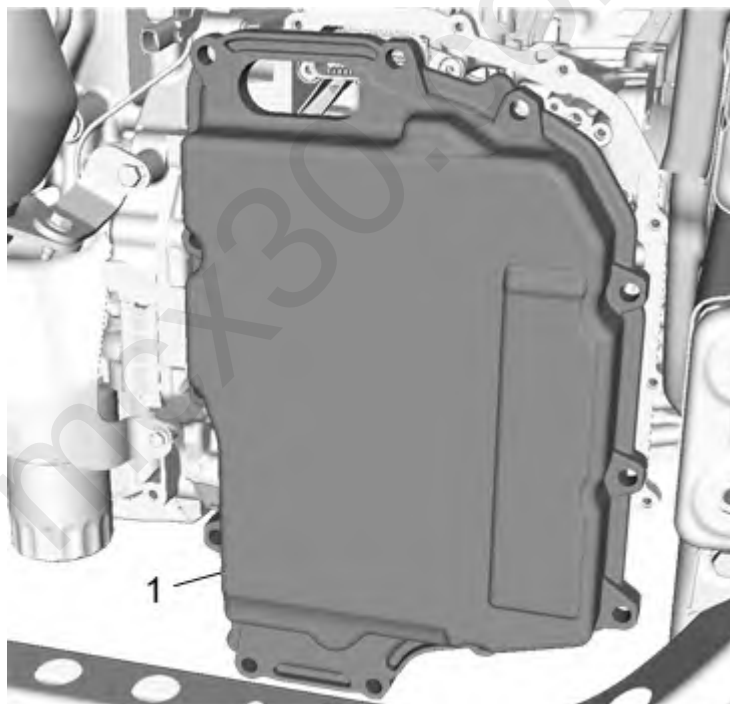


Fig. 70: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

2. Install the control valve body cover (1) to the transmission. Refer to [Control Valve Body Cover Replacement](#)
3. Reprogram the transmission. Refer to [Solenoid Valve Characterization Reprogramming](#)

CONTROL VALVE SOLENOID BODY REPLACEMENT

Removal Procedure

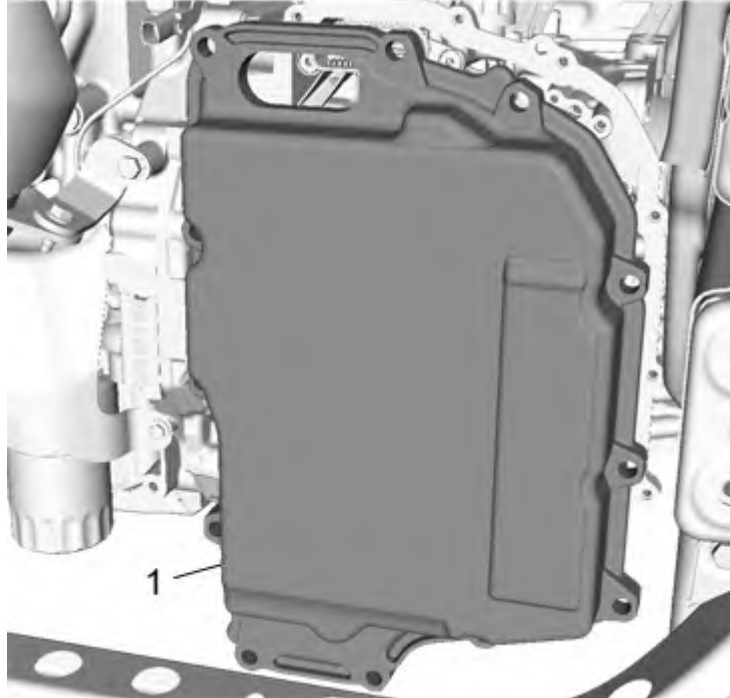


Fig. 71: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

1. Remove the control valve body cover (1) from the transmission. Refer to [Control Valve Body Cover Replacement](#)

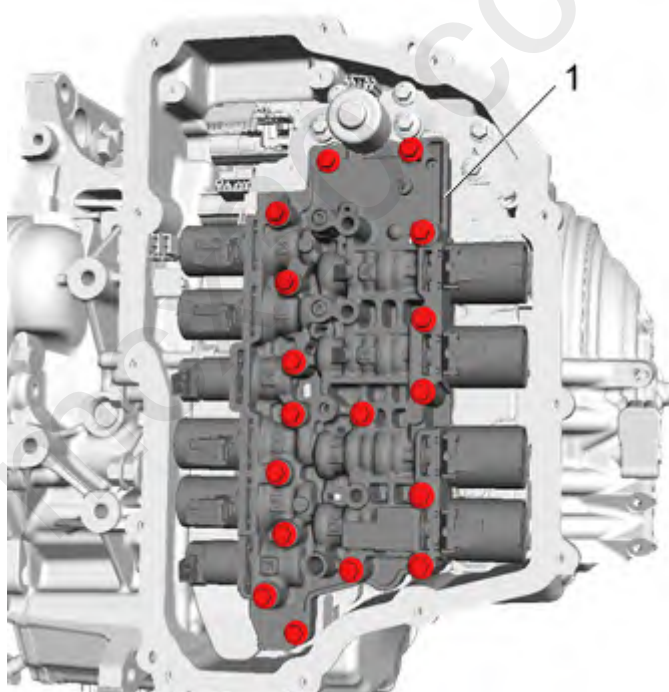


Fig. 72: Control Valve Solenoid Body

Courtesy of GENERAL MOTORS COMPANY

2. Remove the control valve solenoid body (1) from the transmission. Refer to [Control Valve Body Assembly Removal \(without ETRS\)](#), [Control Valve Body Assembly Removal \(with ETRS\)](#)

Installation Procedure

1. Document the new Transmission Unique Number (TUN) or Part Unique Number (PUN) as required.

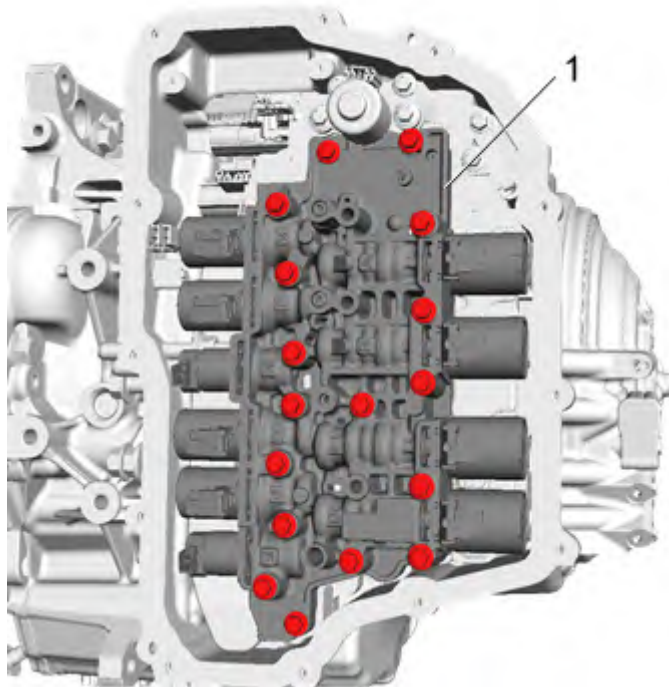


Fig. 73: Control Valve Solenoid Body

Courtesy of GENERAL MOTORS COMPANY

2. Install the control valve solenoid body (1) to the transmission. Refer to [Control Valve Body Assembly Installation \(without ETRS\)](#), [Control Valve Body Assembly Installation \(with ETRS\)](#).

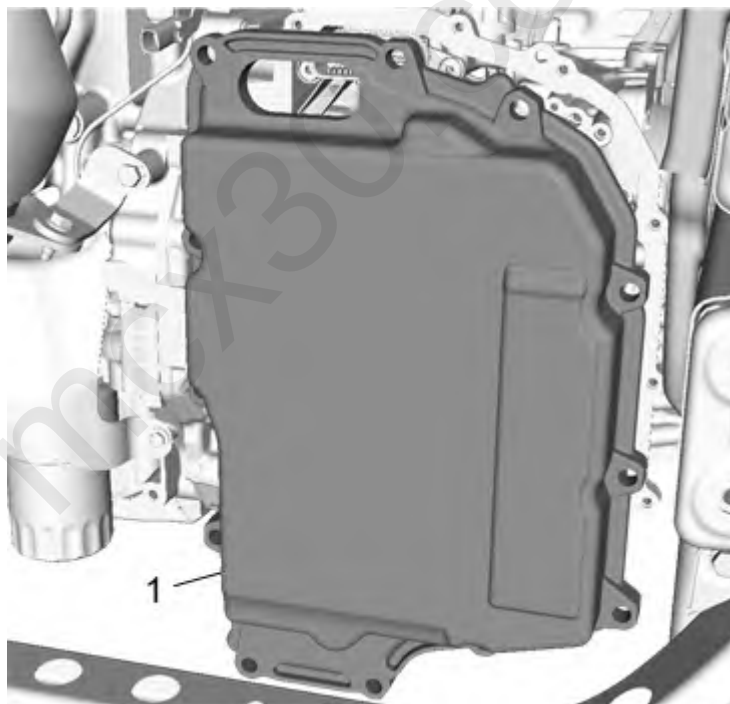


Fig. 74: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

3. Install the control valve body cover (1) to the transmission. Refer to [Control Valve Body Cover Replacement](#)
4. Reprogram the transmission. Refer to [Solenoid Valve Characterization Reprogramming](#)

AUTOMATIC TRANSMISSION INPUT SPEED SENSOR REPLACEMENT

Removal Procedure

1. Remove the left front wheel house liner. Refer to [Front Wheelhouse Liner Replacement - Left Side \(Equinox\)](#), [Front Wheelhouse Liner Replacement - Left Side \(Terrain\)](#).

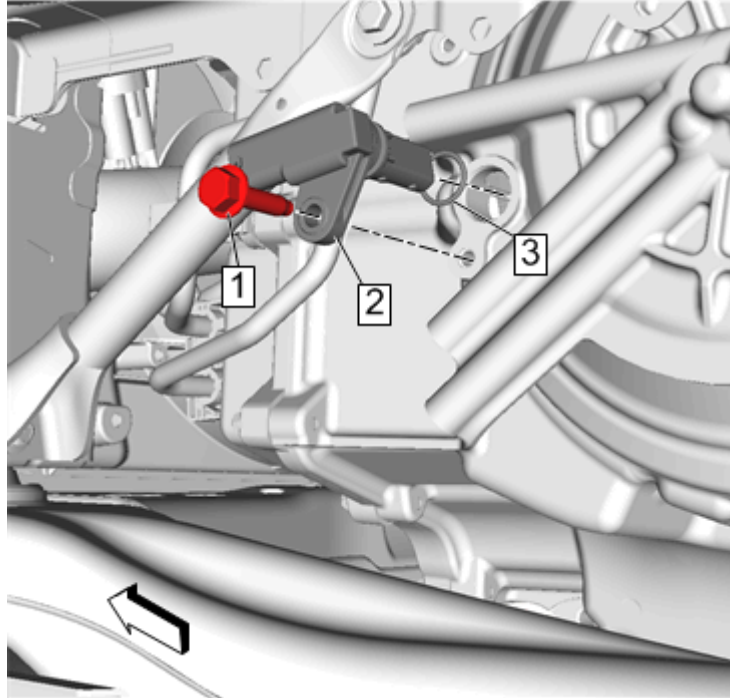


Fig. 75: Input Speed Sensor, Bolt And Seal
 Courtesy of GENERAL MOTORS COMPANY

2. Remove the input speed sensor bolt (1).
3. Remove the input speed sensor (2).
4. Remove the input speed sensor seal (3).

Installation Procedure

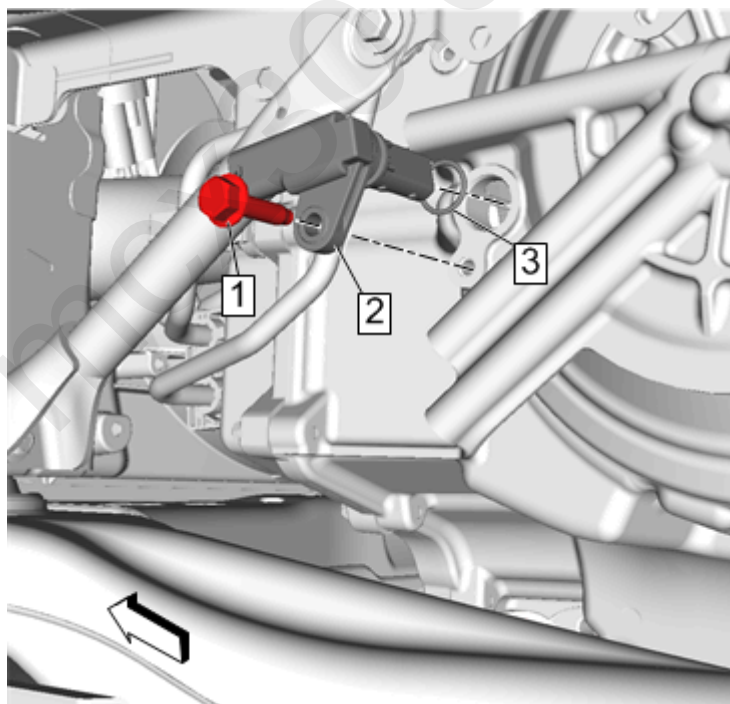


Fig. 76: Input Speed Sensor, Bolt And Seal
 Courtesy of GENERAL MOTORS COMPANY

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

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

3. Install the input speed sensor bolt (1) and tighten to 9 N.m (80 lb in).
4. Install the left front wheel house liner. Refer to [Front Wheelhouse Liner Replacement - Left Side \(Equinox\)](#) [Front Wheelhouse Liner Replacement - Left Side \(Terrain\)](#) .

AUTOMATIC TRANSMISSION OUTPUT SPEED SENSOR REPLACEMENT

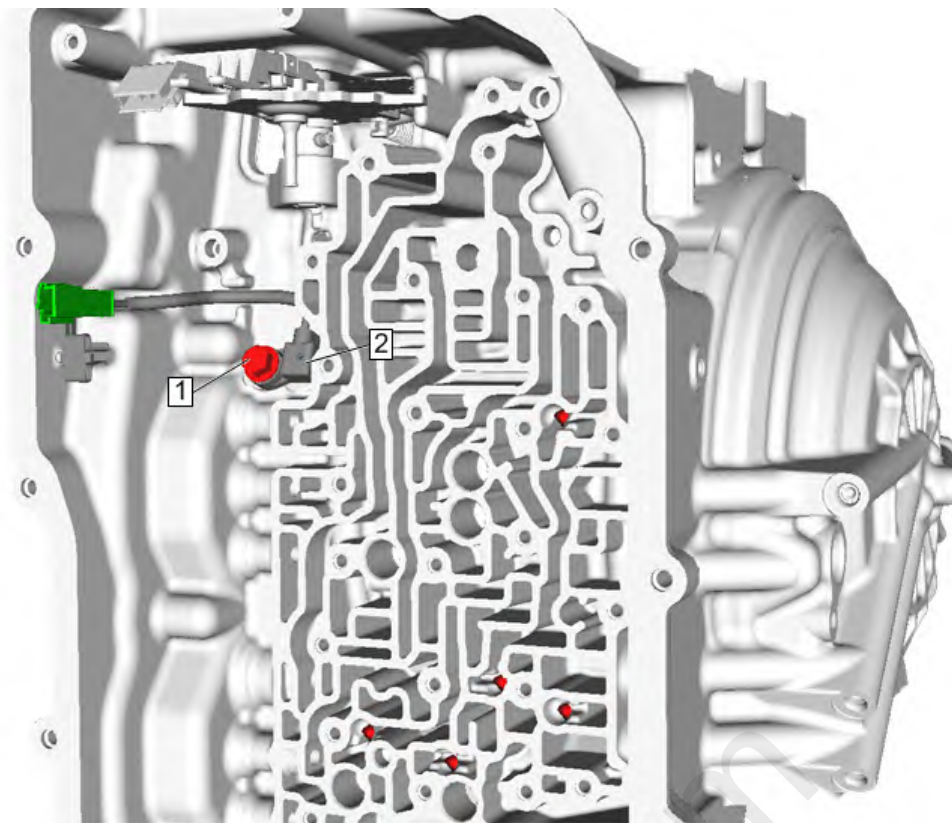


Fig. 77: Automatic Transmission Output Speed Sensor

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the control valve body. Refer to Control Valve Body Replacement	
1	Output Speed Sensor Bolt CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Output Speed Sensor Procedure Perform the transmission service fast learn procedure. Refer to Transmission Service Fast Learn Procedure .

TRANSMISSION MOUNT REPLACEMENT (LEFT SIDE M3U)

Special Tools

EN-45059 Angle Meter

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Remove the battery tray. Refer to [Battery Tray Replacement](#)
2. Support the transmission using a suitable jack.



Fig. 78: Left Transmission Mount And Bolts
 Courtesy of GENERAL MOTORS COMPANY

3. Remove the left transmission mount to body bolts (5).
4. Remove and DISCARD the left transmission mount to transmission bolts (1, 2, 3).
5. Remove the transmission mount (4) from the vehicle.

Installation Procedure



Fig. 79: Left Transmission Mount And Bolts
 Courtesy of GENERAL MOTORS COMPANY

1. Install the left transmission mount (4) to the vehicle.

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

2. Install the transmission mount to body bolts (5) and tighten to 100 N.m (74 lb ft).

CAUTION: Refer to [Torque-to-Yield Fastener Warning](#) .

3. Install the NEW left transmission mount to transmission bolt (1) and initially tighten to 35 N.m (26 lb ft).
4. Install the NEW left transmission mount to transmission bolt (2) and initially tighten to 35 N.m (26 lb ft).
5. Install the NEW left transmission mount to transmission bolt (3) and initially tighten to 35 N.m (26 lb ft).
6. Tighten left transmission mount to transmission bolts (1-3) to 100 N.m (74 lb ft) plus 60 - 75 degrees, using the **EN-45059** meter.
7. Remove the transmission jack.
8. Install the battery tray. Refer to [Battery Tray Replacement](#) .

TRANSMISSION MOUNT REPLACEMENT (LEFT SIDE M3D/M3H)

Special Tools

EN-45059 Angle Meter

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Remove the battery tray. Refer to [Battery Tray Replacement](#)
2. Support the transmission using a suitable jack.

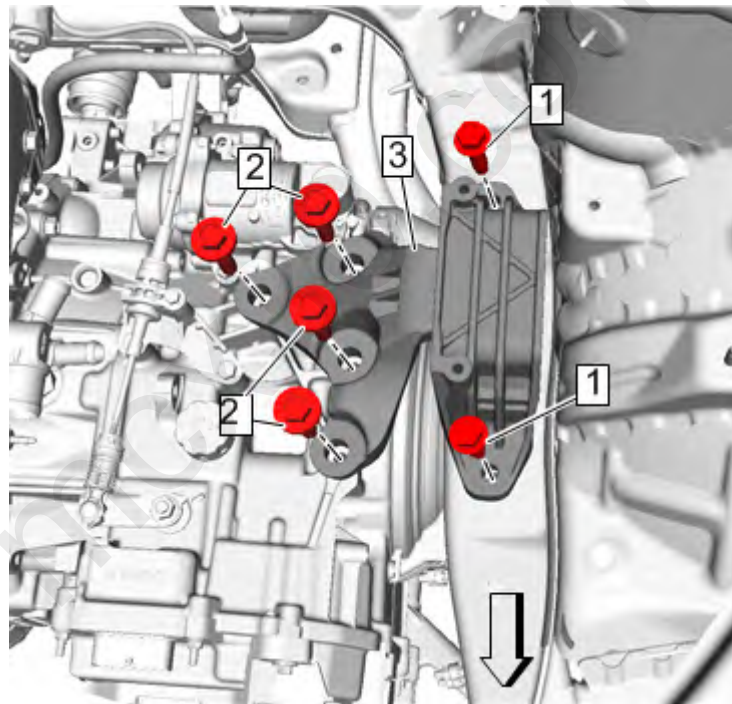


Fig. 80: Left Transmission Mount And Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Remove and DISCARD the left transmission mount to transmission bolts (2).
4. Remove the left transmission mount to body bolts (1).
5. Remove the transmission mount (3) from the vehicle.

Installation Procedure



Fig. 81: Left Transmission Mount And Bolts
 Courtesy of GENERAL MOTORS COMPANY

1. Install the left transmission mount (3) to the vehicle.

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

2. Install the transmission mount to body bolts (1) and tighten to 100 N.m (74 lb ft).

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

3. Install the NEW left transmission mount to transmission bolts (2) and tighten to 100 N.m (74 lb ft) plus 60 - 75 degrees, using the EN-45059 meter.
4. Remove the transmission jack.
5. Install the battery tray. Refer to [Battery Tray Replacement](#) .

TRANSMISSION MOUNT STRUT REPLACEMENT (ALL WHEEL DRIVE)

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Prior to removing the transmission rear strut, mark the transmission rear strut fasteners to transmission rear strut to sub frame interfaces using spray paint or a marker for correct positioning during installation.
3. Remove the two piece propeller shaft. Refer to [Two-Piece Propeller Shaft Replacement](#)
4. Using a suitable jack stand, support the rear of the powertrain.

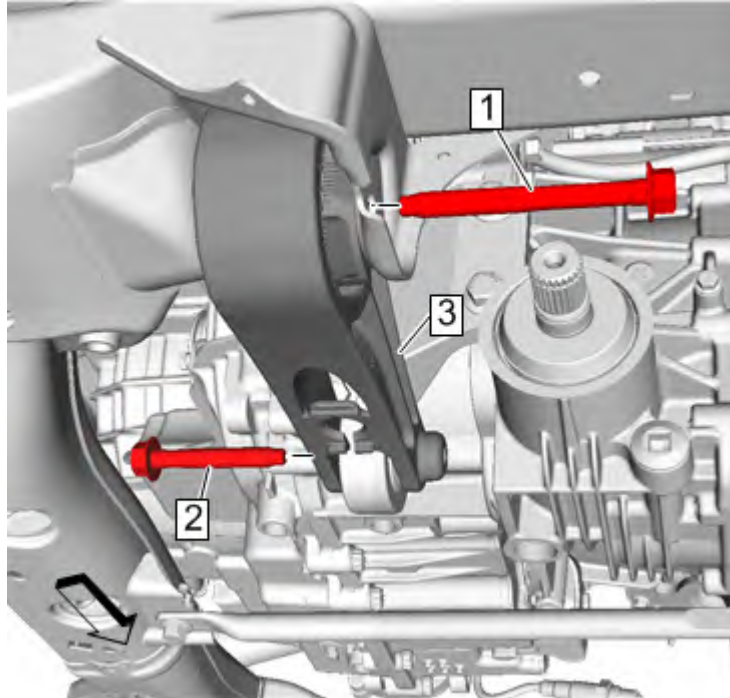


Fig. 82: Transmission Rear Strut And Bolts

Courtesy of GENERAL MOTORS COMPANY

5. Remove and DISCARD the transmission rear strut through bolt (2).
6. Remove and DISCARD the transmission rear strut to drivetrain and front suspension cradle bolt (1).
7. Remove the transmission rear strut (3).

Installation Procedure

1. Using the outline made by the spray paint or marker, position the transmission rear strut to the drivetrain and front suspension cradle.

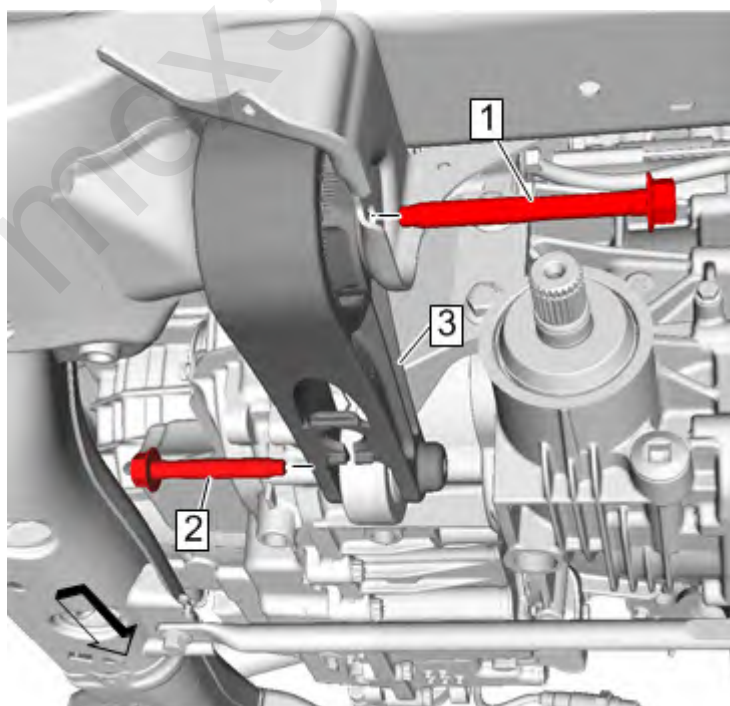


Fig. 83: Transmission Rear Strut And Bolts

Courtesy of GENERAL MOTORS COMPANY

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

2. Install the NEW transmission rear strut bolt (2) and tighten the bolt to 80 N.m (59 lb ft) plus 45 to 60 degrees.

3. Install the NEW transmission rear strut to bracket through bolt (1) and tighten to 100 N.m (74 lb ft) plus 120 to 135 degrees.
4. Install the two piece propeller shaft. Refer to [Two-Piece Propeller Shaft Replacement](#)
5. Remove the jack stand.
6. Lower the vehicle. Refer to [Lifting and Jacking the Vehicle](#)

TRANSMISSION MOUNT STRUT REPLACEMENT (FRONT WHEEL DRIVE)

Removal Procedure

1. Remove the transmission mount strut bracket. Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#)
2. Prior to removing the transmission strut, mark the transmission strut fasteners to transmission strut to sub frame interfaces using spray paint or a marker for correct positioning during installation.
3. Using a suitable jack stand, support the rear of the powertrain.

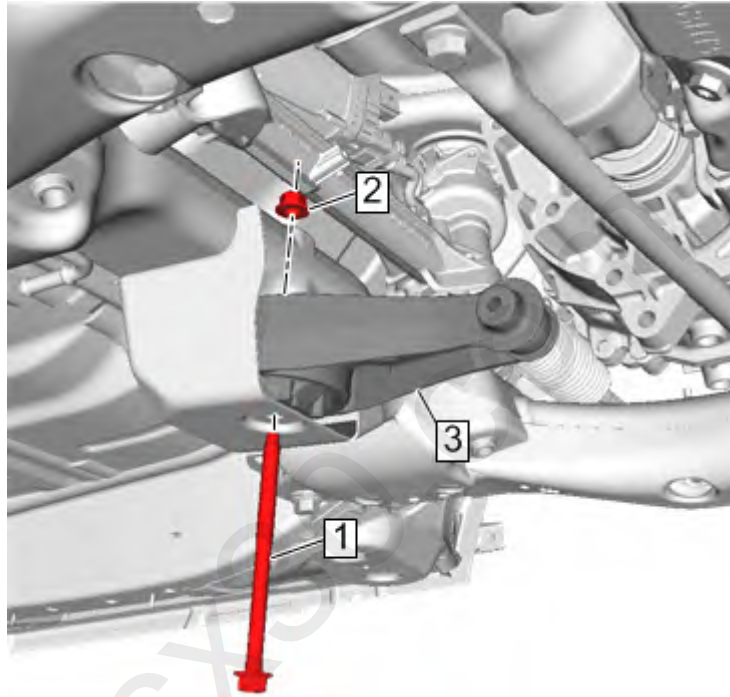


Fig. 84: Transmission Strut, Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Remove the strut through bolt retaining nut (2).
5. Remove and DISCARD the transmission strut through bolt (1).
6. Remove the transmission strut (3).

Installation Procedure

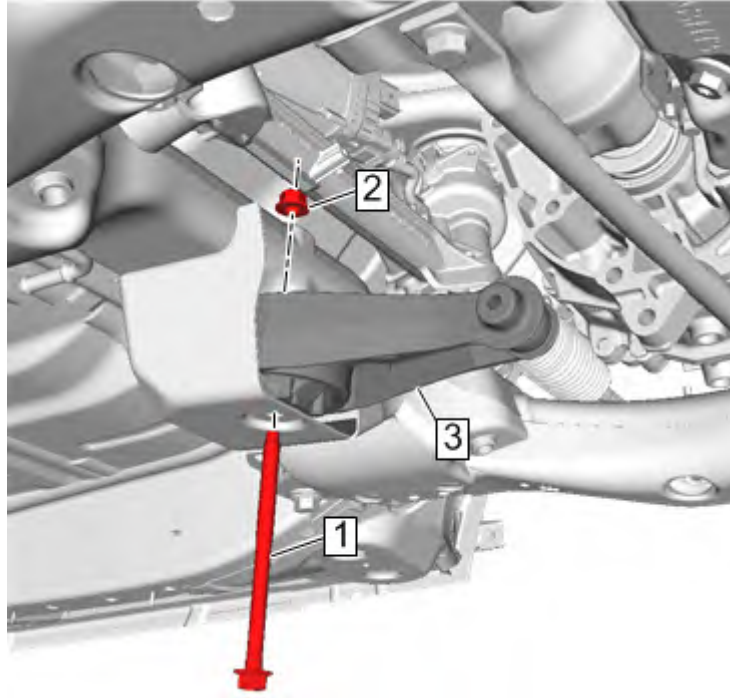


Fig. 85: Transmission Strut, Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Using the outline made by the spray paint or marker, position the transmission strut (3) to the drivetrain and front suspension cradle.

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

2. Install the NEW transmission strut to bracket through bolt (1) and nut (2) then tighten to 100 N.m (74 lb ft) plus 120 to 135 degrees.
3. Perform the Powertrain Mount Balancing - Lower procedure. Refer to the appropriate engine section.
4. Remove the jack stand.
5. Install the transmission mount strut bracket. Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#).

TRANSMISSION MOUNT STRUT BRACKET REPLACEMENT (ALL WHEEL DRIVE)

Removal Procedure

1. Remove the transmission mount strut. Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

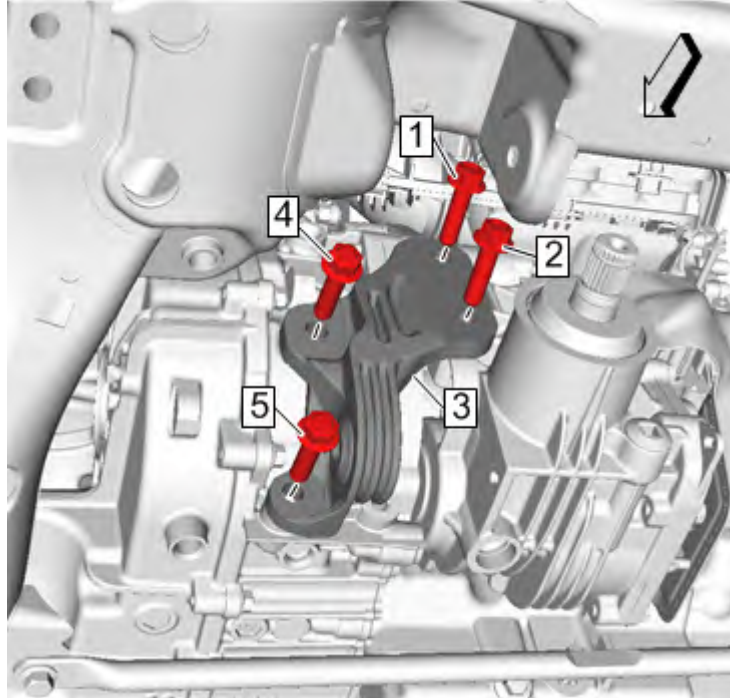


Fig. 86: Transmission Rear Mount Strut Bracket And Bolts
 Courtesy of GENERAL MOTORS COMPANY

2. Remove and DISCARD the 2 transmission rear mount strut bracket to power transfer unit bolts (1, 2).
3. Remove and DISCARD the 2 transmission rear mount strut bracket to transmission bolts (4, 5).
4. Remove the transmission rear mount strut bracket (3) from the transmission.

Installation Procedure

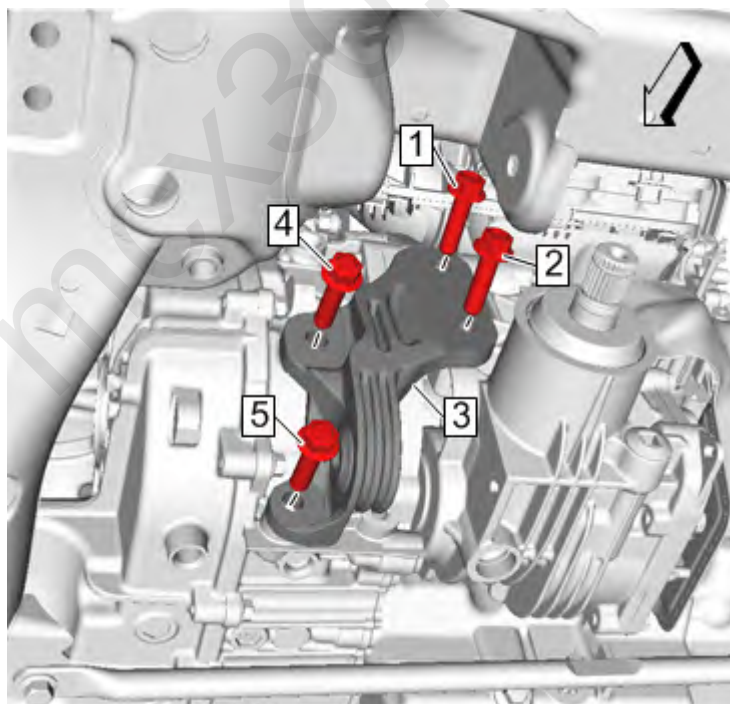


Fig. 87: Transmission Rear Mount Strut Bracket And Bolts
 Courtesy of GENERAL MOTORS COMPANY

1. Position the transmission rear mount strut bracket (3) to the transmission.

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

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

2. Install the 2 NEW transmission rear mount strut bracket to power transfer unit bolts (1, 2) first and tighten to 100 N.m (74 lb ft) plus 60 - 75 degrees.

3. Install the 2 NEW transmission rear mount strut bracket to transmission bolts (4, 5) and tighten to 100 N.m (74 lb ft) plus 60 - 75 degrees.
4. Install the transmission mount strut. Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

TRANSMISSION MOUNT STRUT BRACKET REPLACEMENT (FRONT WHEEL DRIVE)

Removal Procedure

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

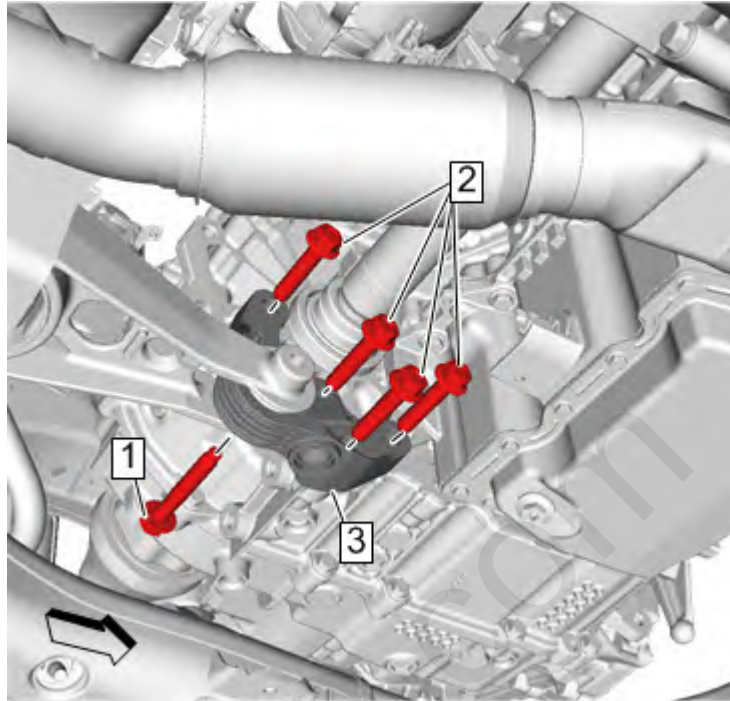


Fig. 88: Transmission Mount Strut Bracket And Bolts
Courtesy of GENERAL MOTORS COMPANY

2. Remove the transmission mount strut bracket to transmission mount strut bolt (1).
3. Remove and DISCARD the transmission mount strut bracket bolt (2).
4. Remove the transmission mount strut bracket (3) from the transmission.

Installation Procedure

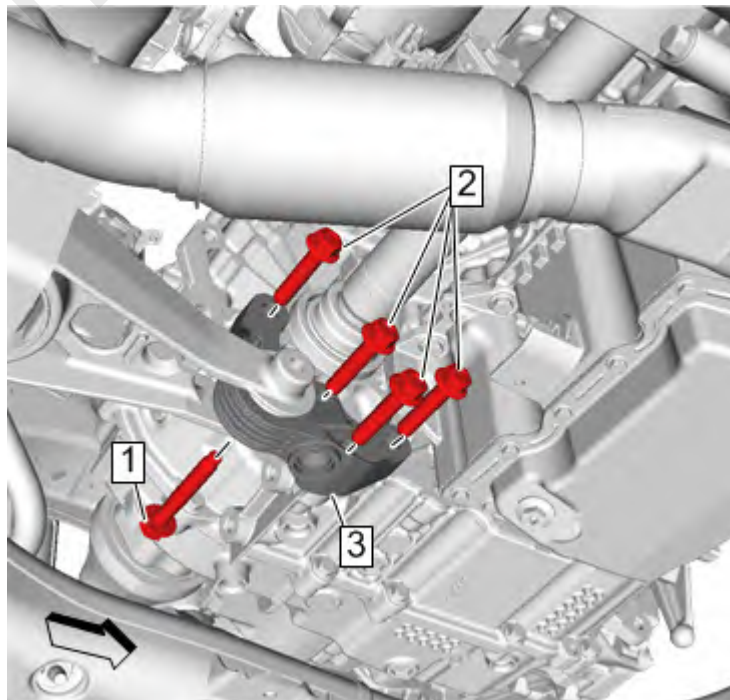


Fig. 89: Transmission Mount Strut Bracket And Bolts
Courtesy of GENERAL MOTORS COMPANY

1. Position the transmission mount strut bracket (3) to the transmission.

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

2. Install the four NEW transmission mount strut bracket to transmission bolts (2) and tighten to 100 N.m (74 lb ft) plus 60 to 75 degrees.
3. Install the transmission mount strut bracket to transmission mount strut bolt (1) and tighten to 80 N.m (59 lb ft) plus 45 to 60 degrees.
4. Lower the vehicle. Refer to [Lifting and Jacking the Vehicle](#)

FLUID TRANSFER PIPE REPLACEMENT

Removal Procedure

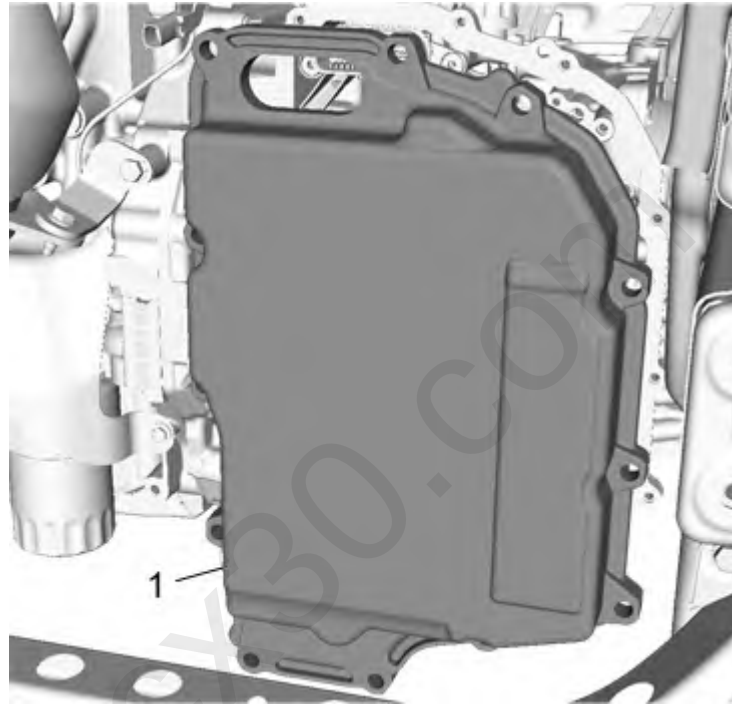


Fig. 90: Control Valve Body Cover
Courtesy of GENERAL MOTORS COMPANY

1. Remove the control valve body cover (1) from the transmission. Refer to [Control Valve Body Cover Replacement](#)

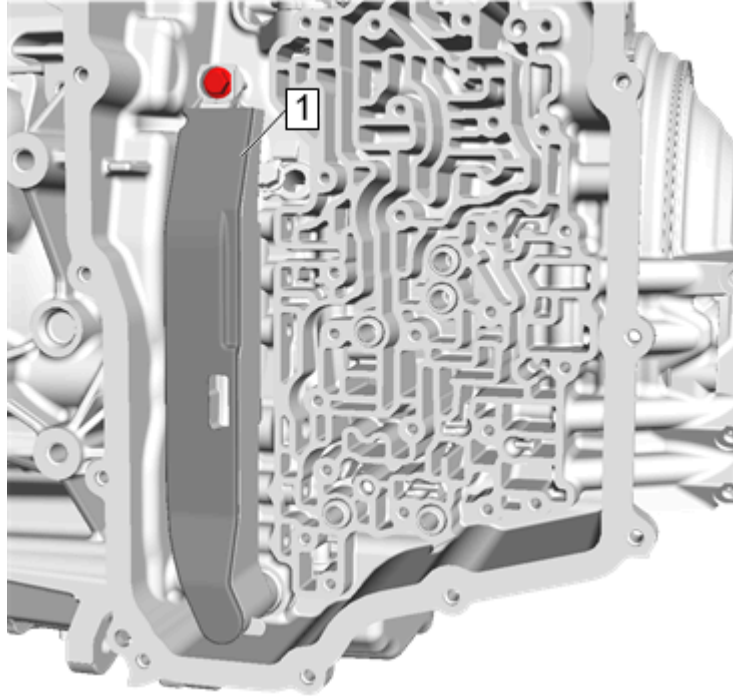


Fig. 91: Fluid Transfer Pipe

Courtesy of GENERAL MOTORS COMPANY

2. Remove the fluid transfer pipe (1) from the transmission. Refer to [Control Valve Body Assembly Removal \(without ETRS\)](#), [Control Valve Body Assembly Removal \(with ETRS\)](#).

Installation Procedure

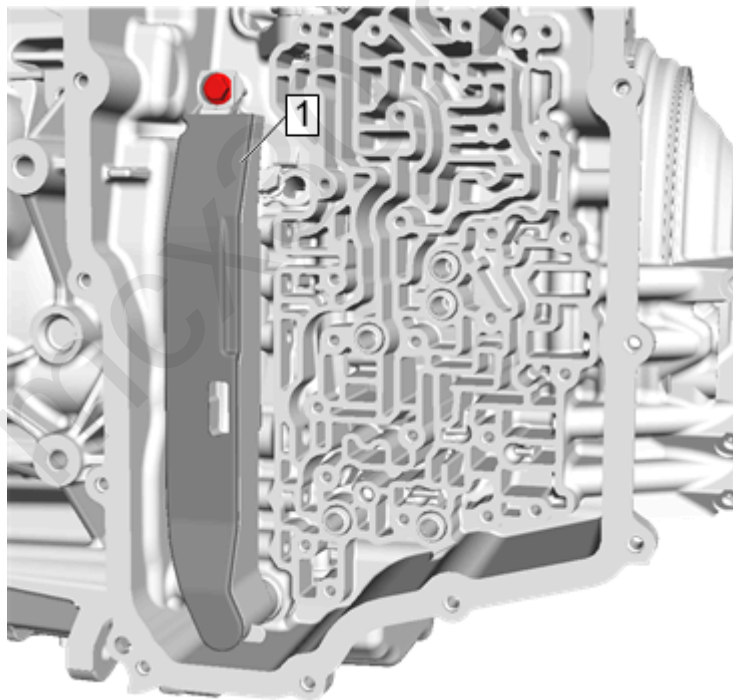


Fig. 92: Fluid Transfer Pipe

Courtesy of GENERAL MOTORS COMPANY

1. Install the fluid transfer pipe (1) to the transmission. Refer to [Control Valve Body Assembly Installation \(without ETRS\)](#), [Control Valve Body Assembly Installation \(with ETRS\)](#).

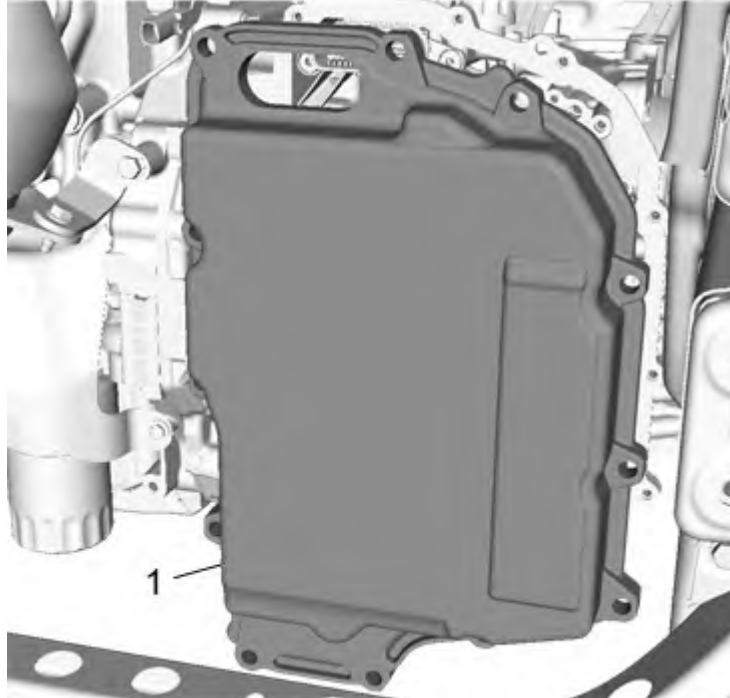


Fig. 93: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

2. Install the control valve body cover (1) to the transmission. Refer to [Control Valve Body Cover Replacement](#)

TORQUE CONVERTER REPLACEMENT

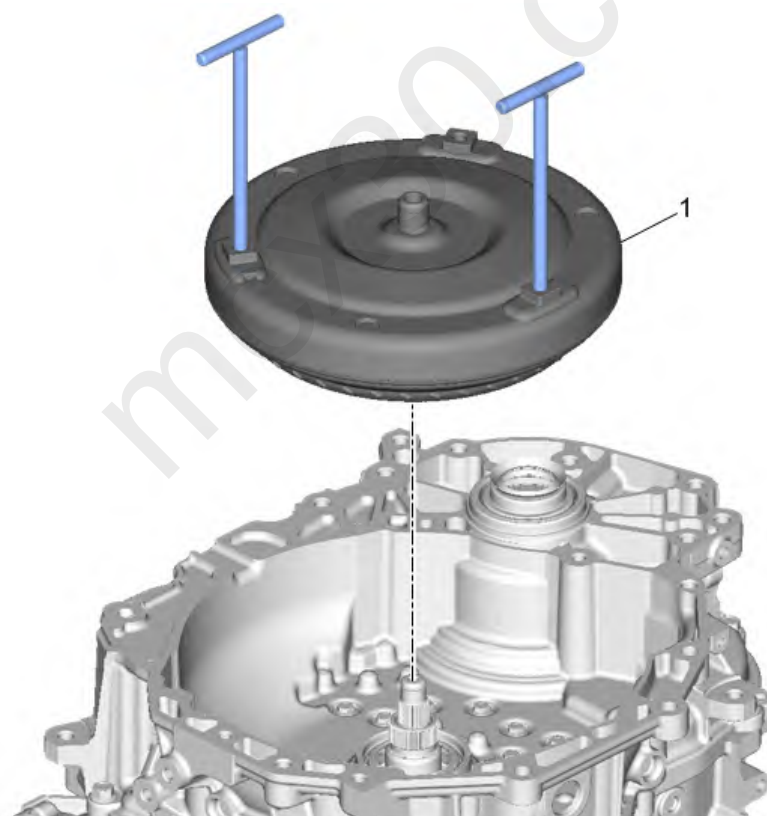


Fig. 94: Torque Converter

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Remove Transmission. Refer to Transmission Replacement (Front Wheel Drive)Transmission Replacement (All Wheel Drive). 2. Position the transmission assembly so the torque converter is facing up.	

Callout	Component Name
1	Torque Converter Assembly CAUTION: Only install the lift assist handles until it stops. Do not tighten. Over tightening the lift assist handles can cause damage to the torque converter. CAUTION: Lower the torque converter straight down. Failure to lower the torque converter straight down could damage the torque converter clutch lip seal inside the torque converter clutch assembly. CAUTION: Failure to raise the torque dampener assembly straight up could damage the torque dampener clutch lip seal inside the torque dampener clutch assembly. Special Tools DT-46409 Torque Converter Lifting Handles For equivalent regional tools, refer to Special Tools.

TORQUE CONVERTER FLUID SEAL REPLACEMENT

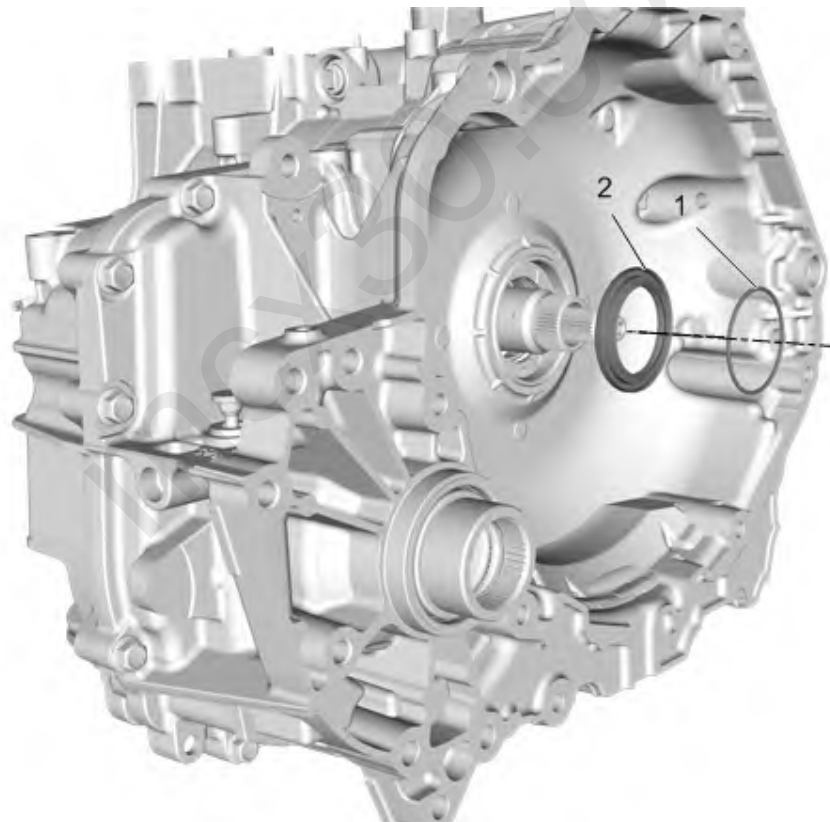


Fig. 95: Torque Converter Fluid Seal

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Torque Converter. Refer to Torque Converter Replacement .	
1	Torque Converter Fluid Seal Retainer

Callout	Component Name
2	Torque Converter Fluid Seal Special Tools • DT-6125-1B Slide Hammer • J-29162 Seal Installer • EN-23129 Universal Seal Remover For equivalent regional tools, refer to Special Tools .

AUTOMATIC TRANSMISSION WIRING HARNESS REPLACEMENT

Removal Procedure

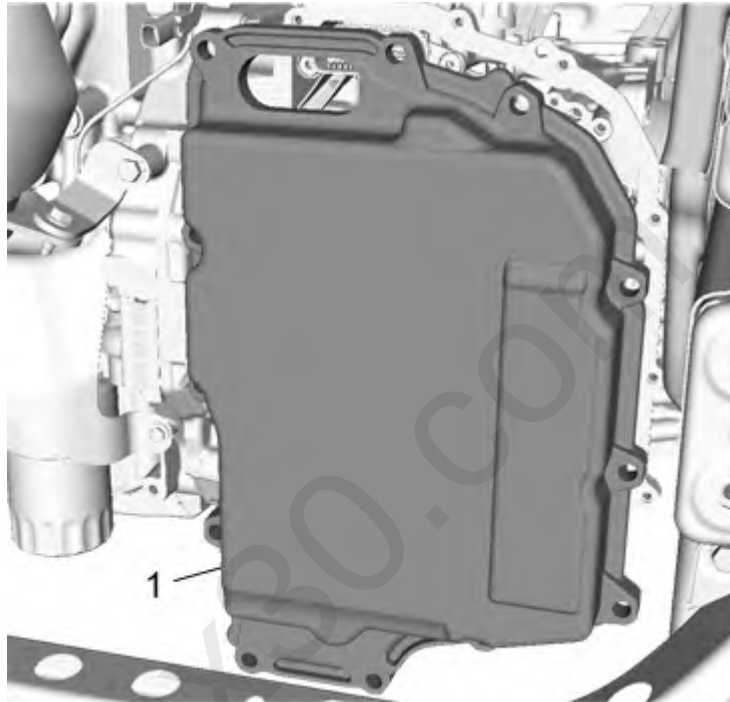


Fig. 96: Control Valve Body Cover

Courtesy of GENERAL MOTORS COMPANY

1. Remove the control valve body cover (1) from the transmission. Refer to [Control Valve Body Cover Replacement](#)

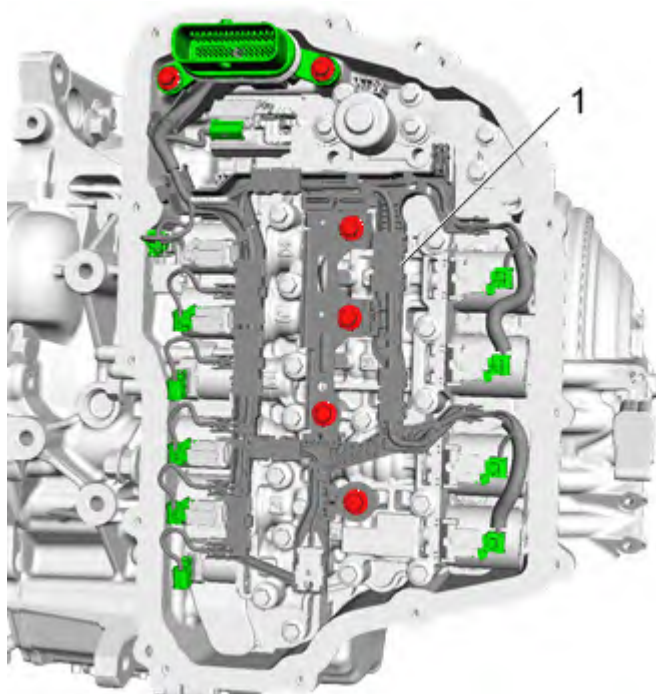


Fig. 97: Automatic Transmission Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

2. Remove the automatic transmission wiring harness (1) from the transmission. Refer to [Control Valve Body Assembly Removal \(without ETRS\)](#), [Control Valve Body Assembly Removal \(with ETRS\)](#).

Installation Procedure

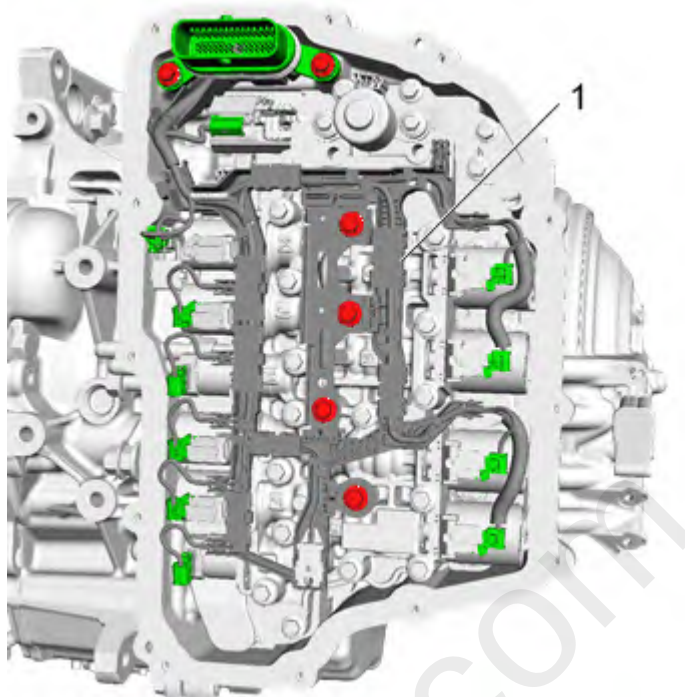


Fig. 98: Automatic Transmission Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

1. Install the automatic transmission wiring harness (1) to the transmission. Refer to [Control Valve Body Assembly Installation \(without ETRS\)](#), [Control Valve Body Assembly Installation \(with ETRS\)](#).

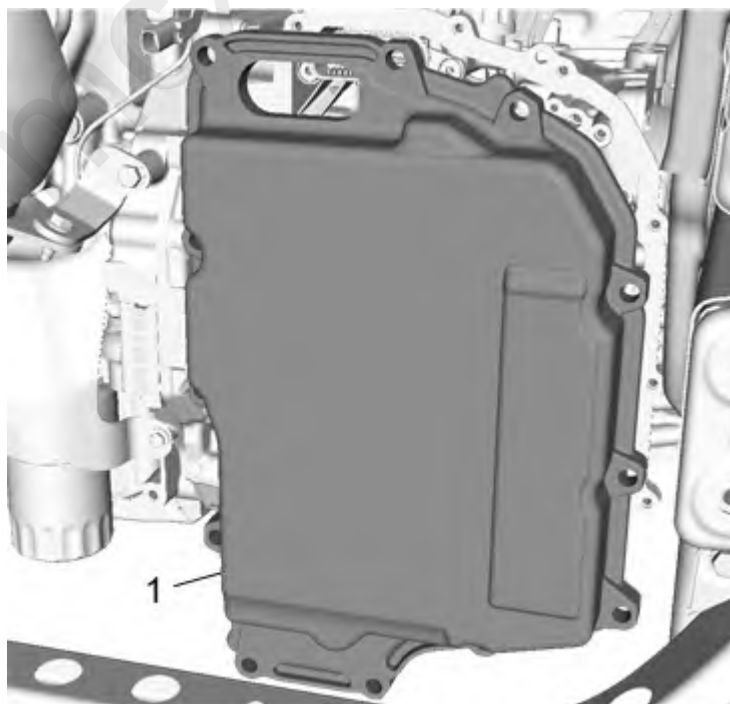


Fig. 99: Control Valve Body Cover
Courtesy of GENERAL MOTORS COMPANY

2. Install the control valve body cover (1) to the transmission. Refer to [Control Valve Body Cover Replacement](#).

Removal Procedure

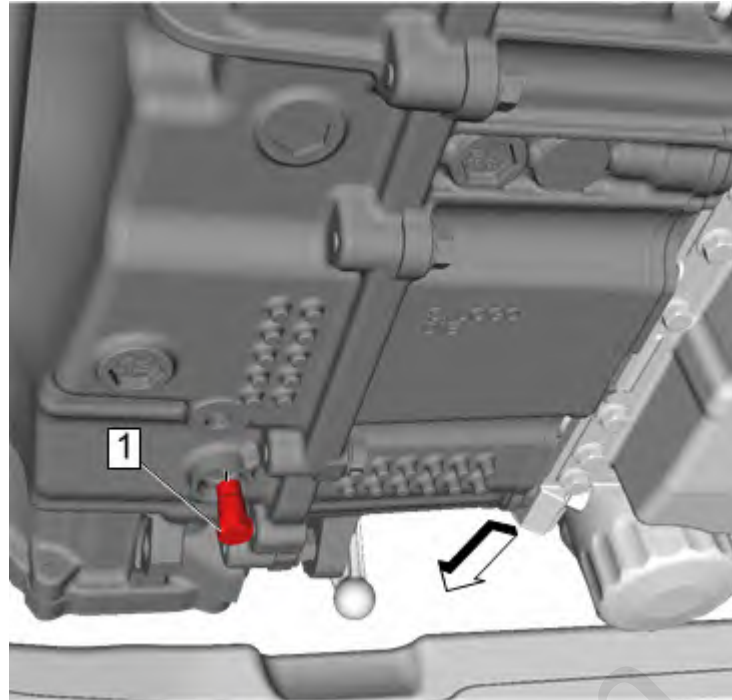


Fig. 100: Fluid Drain Plug

Courtesy of GENERAL MOTORS COMPANY

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

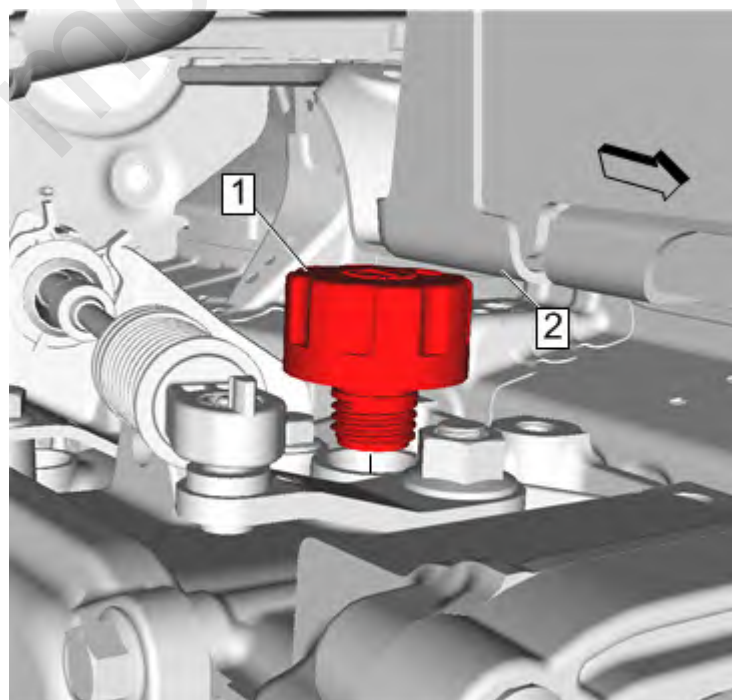


Fig. 101: Fluid Fill Cap

Courtesy of GENERAL MOTORS COMPANY

1. Lower the vehicle.

NOTE:

If the transmission fluid filler cap cannot be accessed, proceed to the next step in this procedure.

2. Remove the fluid fill cap (1), if accessible.
3. Remove the left front wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation](#)

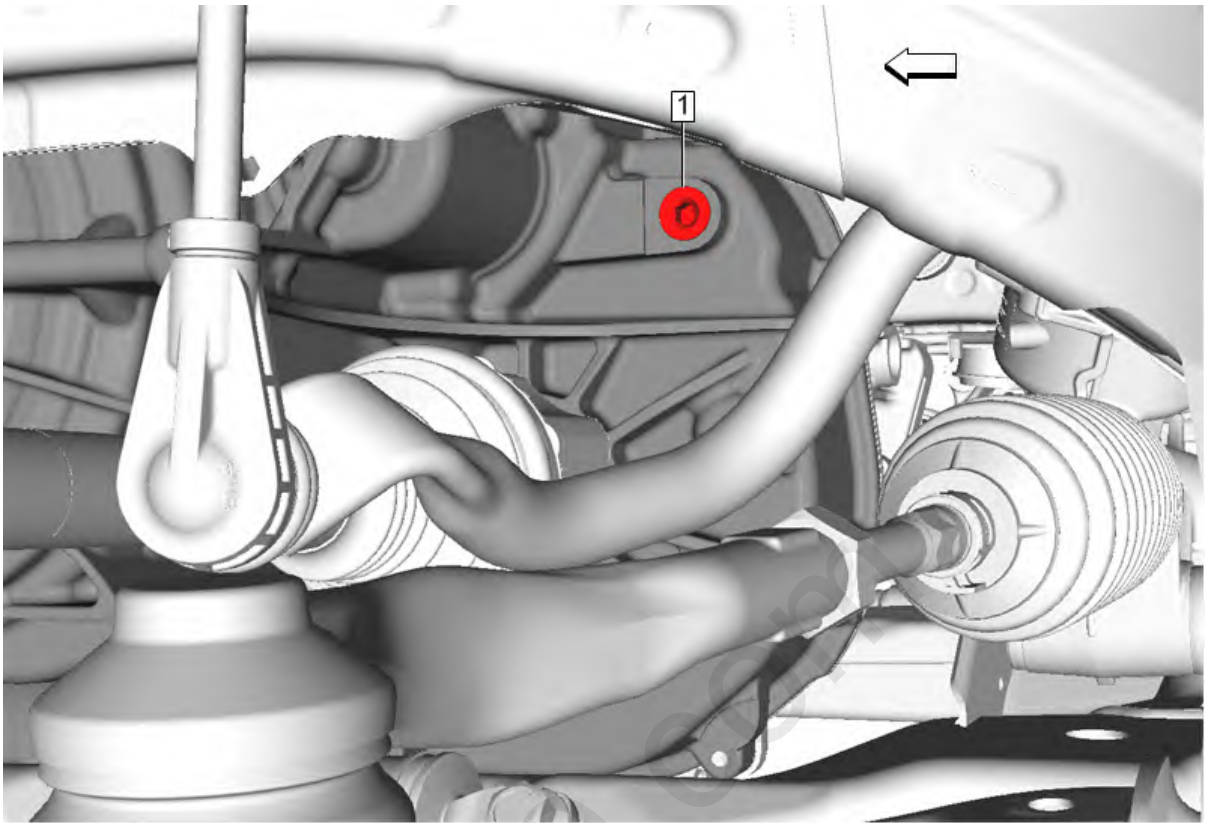


Fig. 102: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

4. Remove the fluid filler plug (1) from the transmission.
5. Fill the transmission to the proper level with the correct fluid. Refer to [Transmission Fluid Level and Condition Check](#) , and [Adhesives, Fluids, Lubricants, and Sealers](#) .

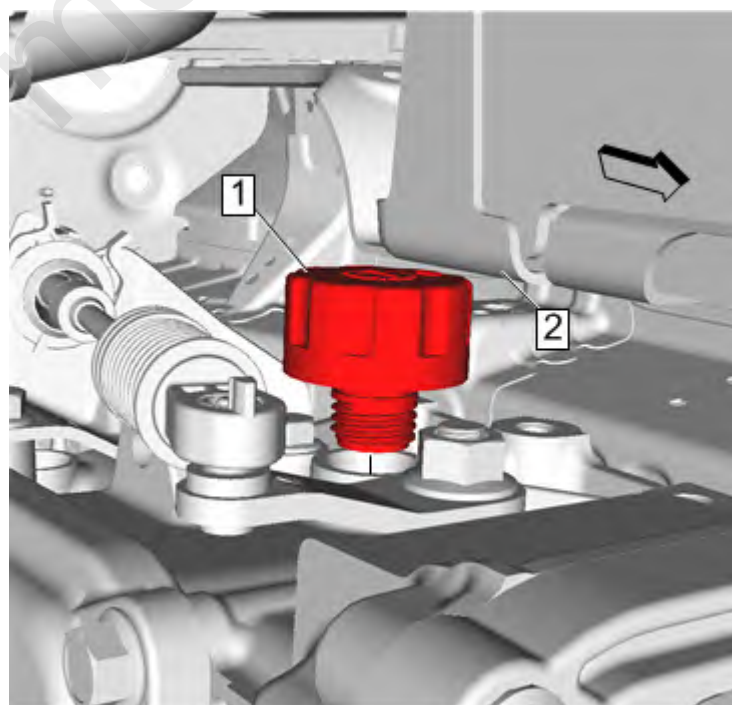


Fig. 103: Fluid Fill Cap

Courtesy of GENERAL MOTORS COMPANY

6. Install the fluid fill cap (1), if accessible.

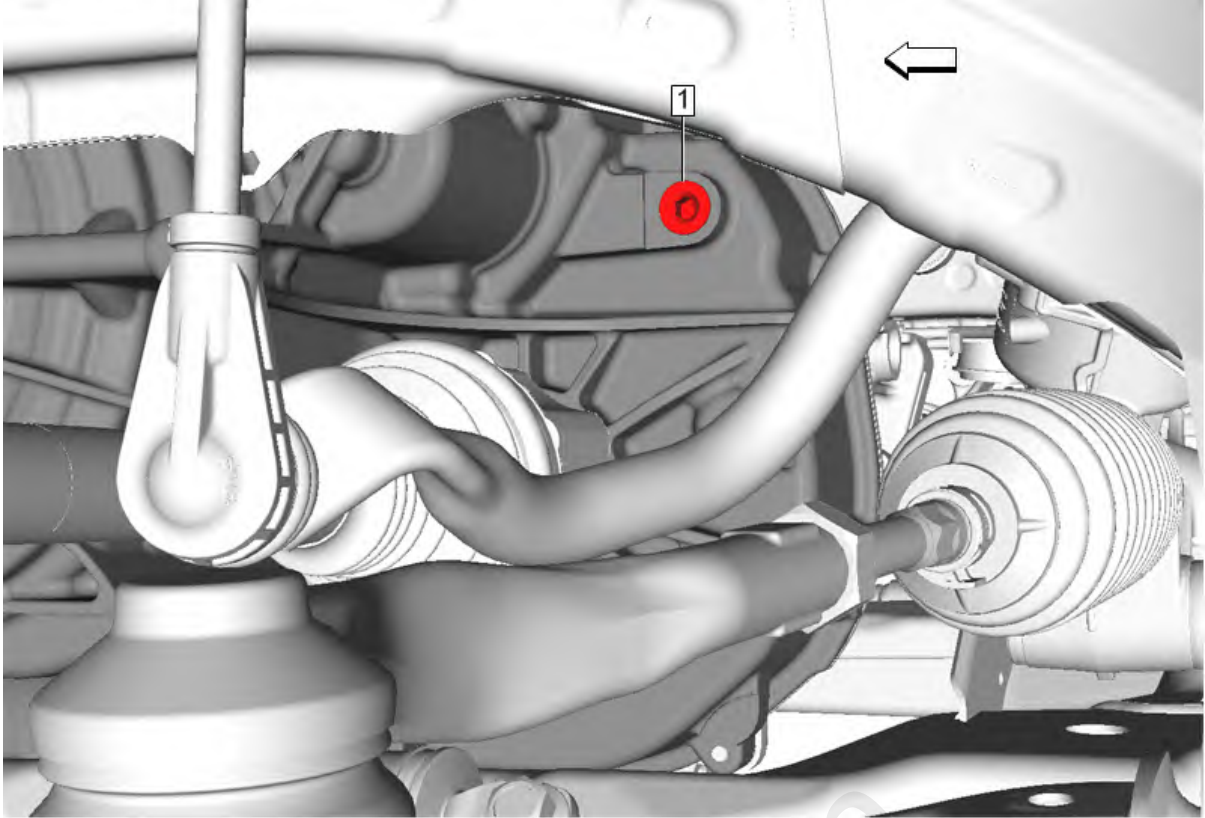


Fig. 104: Fluid Filler Plug

Courtesy of GENERAL MOTORS COMPANY

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

7. Install the fluid filler plug (1) to the transmission and tighten to 40 N.m (30 lb ft).
8. Install the left front wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation](#)

TRANSMISSION REPLACEMENT (FRONT WHEEL DRIVE)

Removal Procedure

1. Disconnect the transmission range select lever cable from the transmission. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#)
2. Drain the transmission fluid. Refer to [Transmission Fluid Drain and Fill](#)

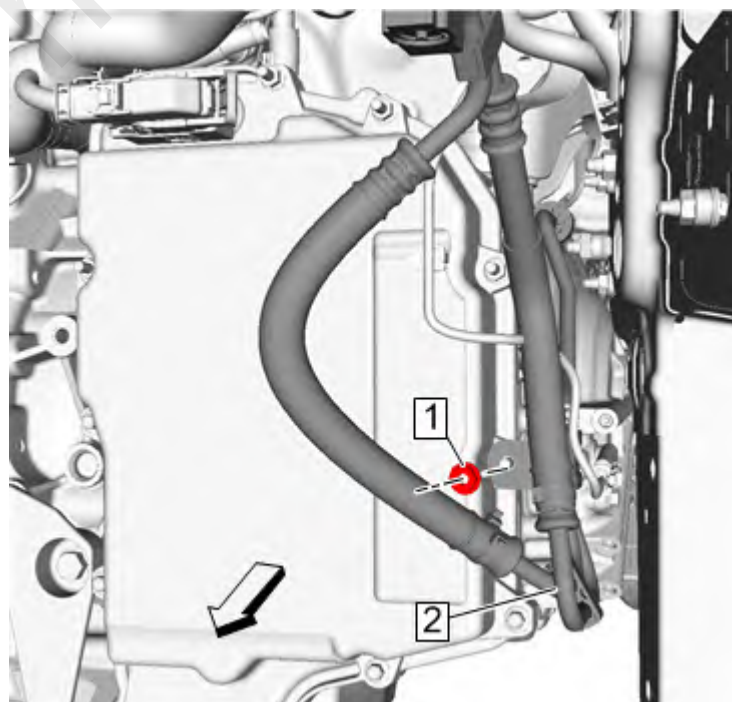


Fig. 105: Transmission Fluid Cooler Pipes And Nut

Courtesy of GENERAL MOTORS COMPANY

3. Remove the transmission fluid cooler pipe nut (1) from the transmission.
4. Remove the transmission fluid cooler pipes (2). Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(MNH, MHG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(M3D, M3H, M3U\)](#).

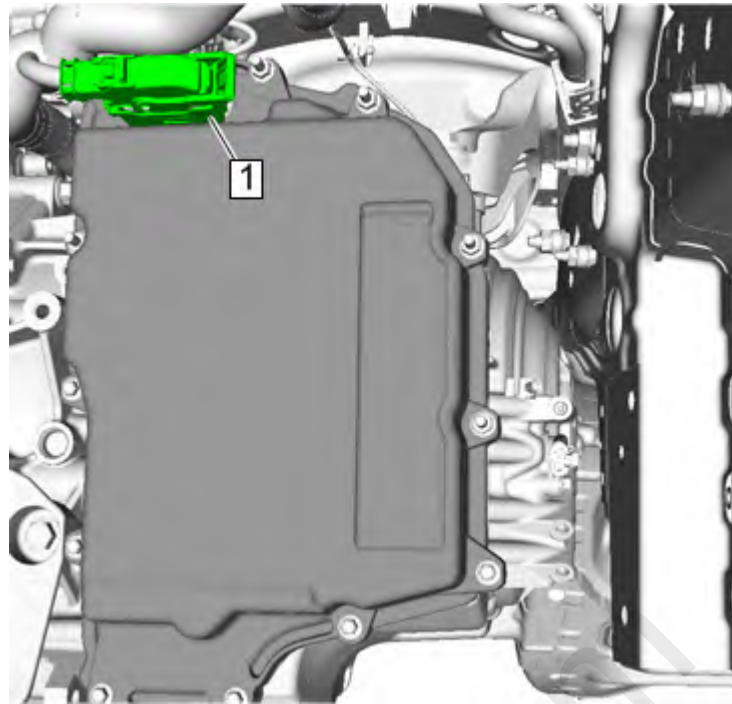


Fig. 106: Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

5. Disconnect the control valve body transmission control module electrical connector (1), then unclip the wiring harness from the cover.
6. Remove the body ground cable and wiring harness assembly mounting bolt at front of transmission and position ground cable and harness out of the way.
7. Plug and/or cap the pipes and the transmission to prevent contamination.

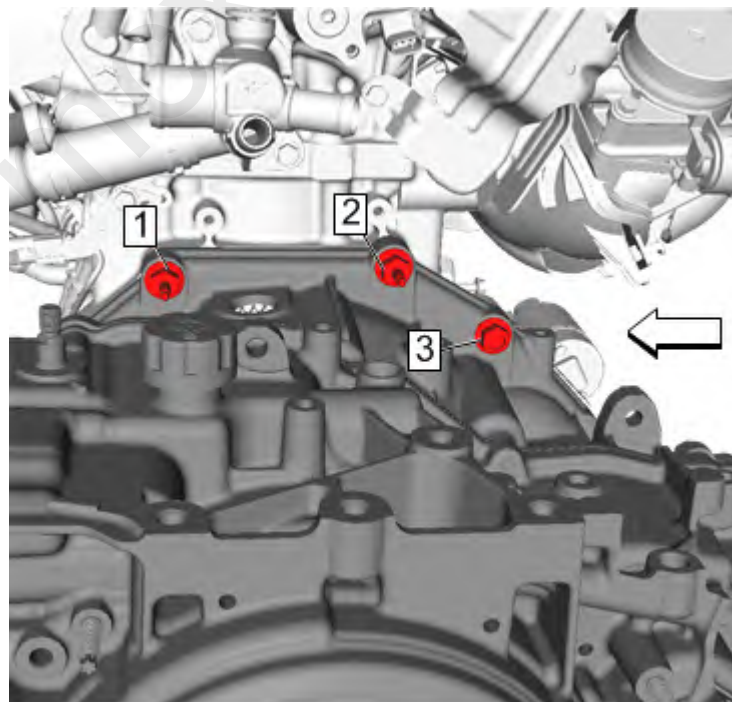


Fig. 107: Upper Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove the upper transmission to engine bolts (1, 2, 3).
9. Remove the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).

10. Disconnect the wheel drive shafts from the transmission. Refer to [Front Wheel Drive Half Shaft Replacement - Left Side](#) , and [Front Wheel Drive Half Shaft Replacement - Right Side \(M3U, MHG, MNH, MNK with FWD\)](#). [Front Wheel Drive Half Shaft Replacement - Right Side \(M3D, M3H with FWD\)](#).
11. Remove the transmission mount strut and transmission mount strut bracket from the transmission. Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#).
12. Remove the starter. Refer to [Starter Replacement \(LYX - Front Wheel Drive\)](#). [Starter Replacement \(LTG - Front Wheel Drive\)](#). [Starter Replacement \(LH7 - Front Wheel Drive\)](#).
13. Mark the relationship of the flywheel to the torque converter for reassembly.

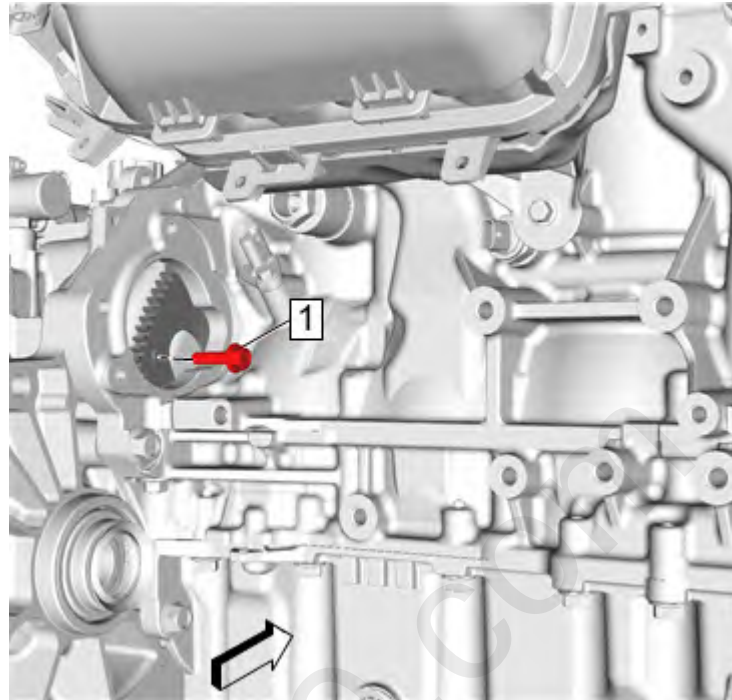


Fig. 108: Torque Converter To Flywheel Bolts
Courtesy of GENERAL MOTORS COMPANY

14. Remove the torque converter to flywheel bolts (1).
15. Remove the auxiliary water pump and bracket from the transmission. Refer to [Auxiliary Water Pump Replacement \(LYX with KL9\)](#). [Auxiliary Water Pump Replacement \(LH7 Equinox\)](#). [Auxiliary Water Pump Replacement \(LTG with KL9\)](#). [Auxiliary Water Pump Replacement \(LH7 Terrain\)](#).
16. Lower the vehicle.
17. Install the engine support fixture. Refer to [Engine Support Fixture](#)
18. Remove the left transmission mount to transmission bolts. Refer to [Transmission Mount Replacement \(Left Side M3U\)](#). [Transmission Mount Replacement \(Left Side M3D/M3H\)](#).
19. Lower the transmission side with the support fixture to allow clearance for removal.
20. Unclip the engine wiring harness from the transmission.
21. Raise the vehicle.
22. Use a transmission jack in order to support the transmission.
23. Remove the oil pump flow control valve heat shield, if equipped. Refer to [Oil Pump Flow Control Valve Heat Shield Replacement](#)
24. Remove the three way catalytic converter. Refer to [Warm Up Three-Way Catalytic Converter Replacement \(LYX\)](#). [Warm Up Three-Way Catalytic Converter Replacement \(LTG\)](#).

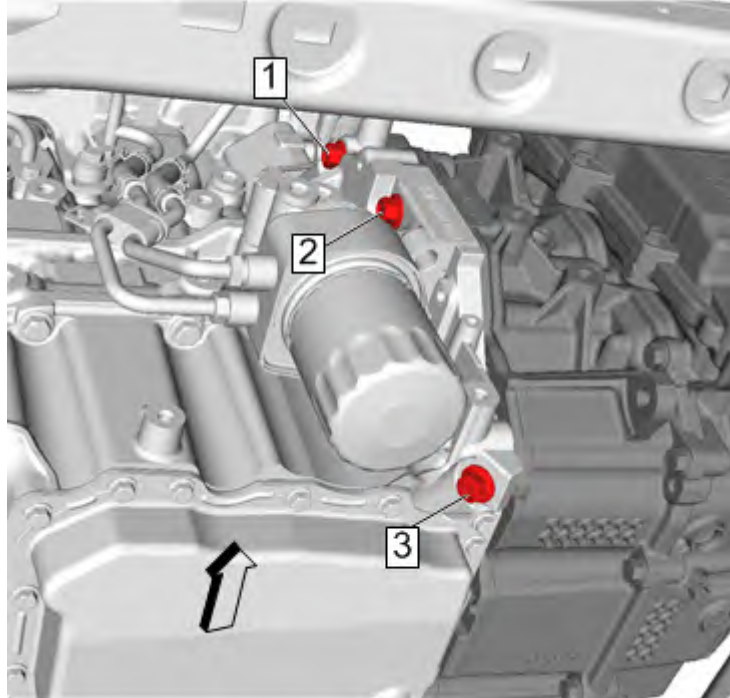


Fig. 109: Front Transmission To Engine Bolts
 Courtesy of GENERAL MOTORS COMPANY

25. Remove the front transmission to engine bolts (1, 2, 3).

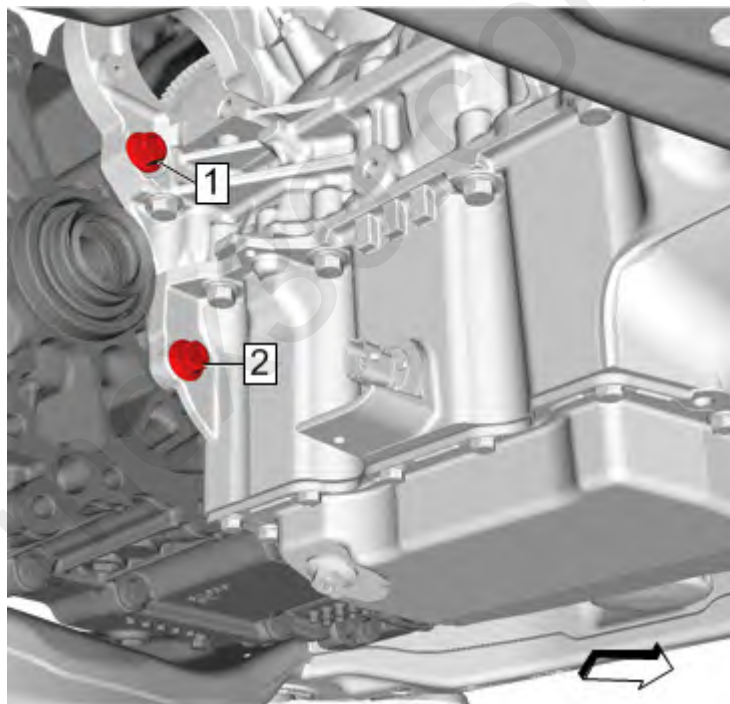


Fig. 110: Lower Transmission Fasteners
 Courtesy of GENERAL MOTORS COMPANY

26. Remove the lower transmission fasteners (1, 2).

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

27. Separate the transmission from the engine.
 28. Lower the transmission with the transmission jack far enough to remove the transmission.
 29. Transfer components as necessary.
 30. Flush and flow test the transmission oil cooler and lines. Refer to [Transmission Fluid Cooler Flow Test and Flushing](#)

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

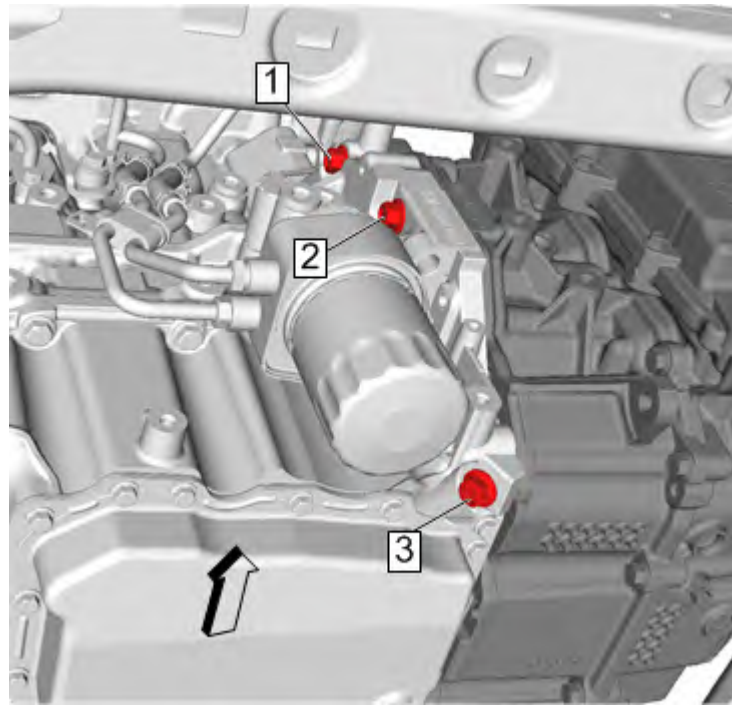


Fig. 111: Front Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

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

2. Install the transmission bolts (1, 2, 3) and tighten to 58 N.m (43 lb ft).

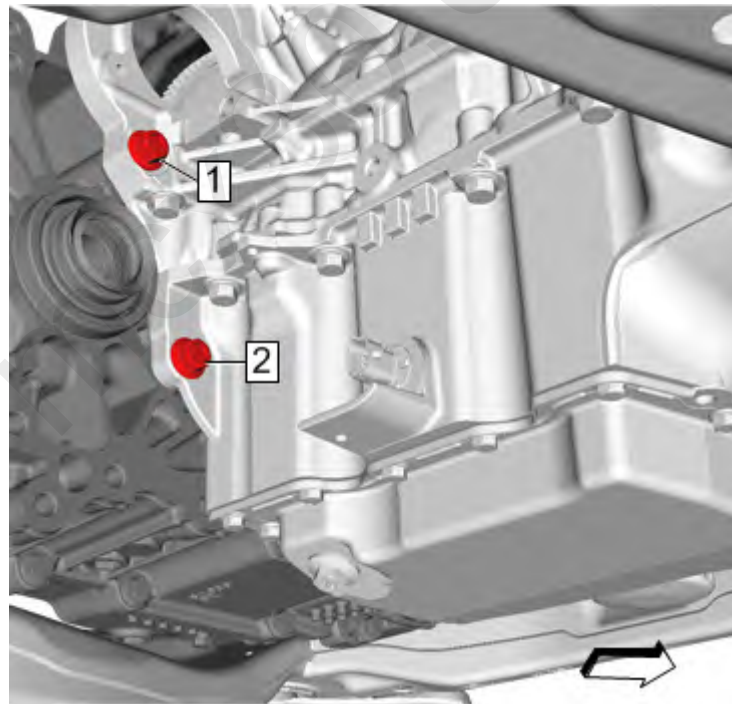


Fig. 112: Lower Transmission Fasteners
Courtesy of GENERAL MOTORS COMPANY

3. Install the front transmission to engine bolt (1, 2) and tighten to 58 N.m (43 lb ft).
4. Install the oil pump flow control valve heat shield, if equipped. Refer to [Oil Pump Flow Control Valve Heat Shield Replacement](#)
5. Remove the transmission jack.
6. Align the mark of the flywheel to the mark on the torque converter for reassembly.

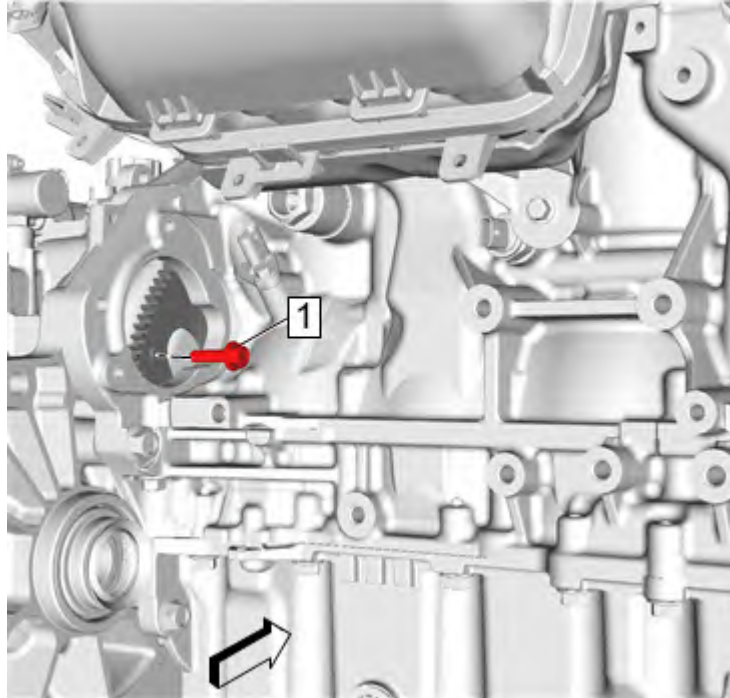


Fig. 113: Torque Converter To Flywheel Bolts
 Courtesy of GENERAL MOTORS COMPANY

NOTE: If reusing the torque converter bolts, clean the threads and apply threadlocker to the threads prior to installation. Adhesives, Fluids, Lubricants, and Sealers

7. Install the torque converter to flywheel bolts (1) and tighten to 60 N.m (44 lb ft).
8. Install the auxiliary water pump and bracket to the transmission. Refer to Auxiliary Water Pump Replacement (LYX with KL9), Auxiliary Water Pump Replacement (LH7 Equinox), Auxiliary Water Pump Replacement (LTG with KL9), Auxiliary Water Pump Replacement (LH7 Terrain).
9. Install the three way catalytic converter. Refer to Warm Up Three-Way Catalytic Converter Replacement (LYX), Warm Up Three-Way Catalytic Converter Replacement (LTG).
10. Install the starter. Refer to Starter Replacement (LYX - Front Wheel Drive), Starter Replacement (LTG - Front Wheel Drive), Starter Replacement (LH7 - Front Wheel Drive).
11. Install the left transmission mount to the transmission. Transmission Mount Replacement (Left Side M3U), Transmission Mount Replacement (Left Side M3D/M3H).
12. Install the wheel drive shafts to the transmission. Refer to Front Wheel Drive Half Shaft Replacement - Left Side, and Front Wheel Drive Half Shaft Replacement - Right Side (M3U, MHG, MNH, MNK with FWD), Front Wheel Drive Half Shaft Replacement - Right Side (M3D, M3H with FWD).
13. Install the drivetrain and front suspension cradle. Refer to Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive).
14. Install the transmission mount strut bracket to the transmission. Refer to Transmission Mount Strut Bracket Replacement (Front Wheel Drive).
15. Remove the engine support fixture. Refer to Engine Support Fixture

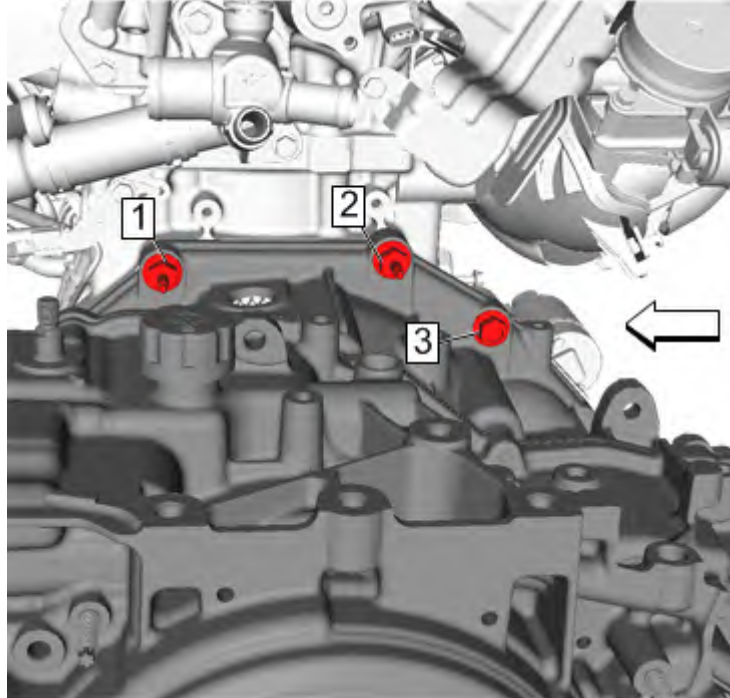


Fig. 114: Upper Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

16. Install the upper transmission to engine bolts (1, 2, 3) and tighten to 58 N.m (43 lb ft).

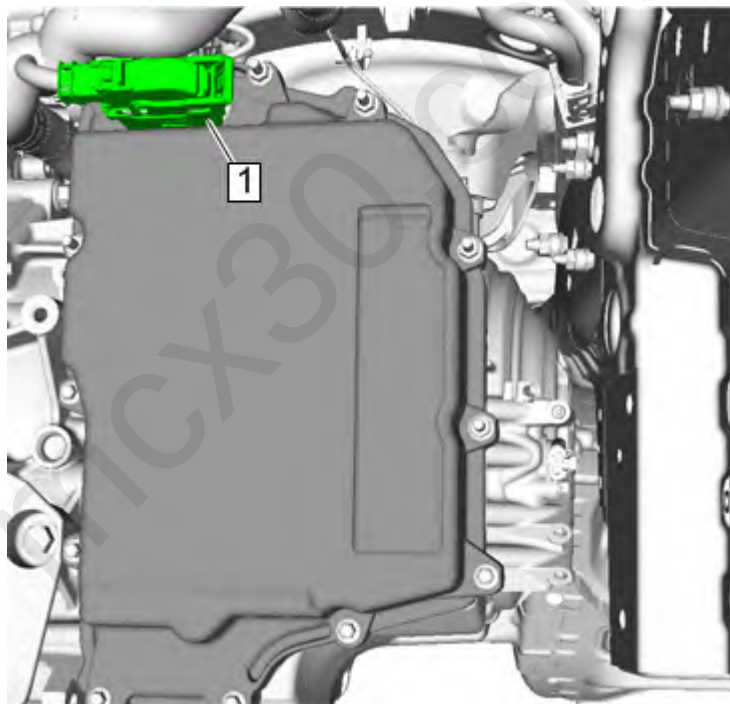


Fig. 115: Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

17. Connect the control valve body transmission control module electrical connector (1), then clip the wiring harness to the cover.

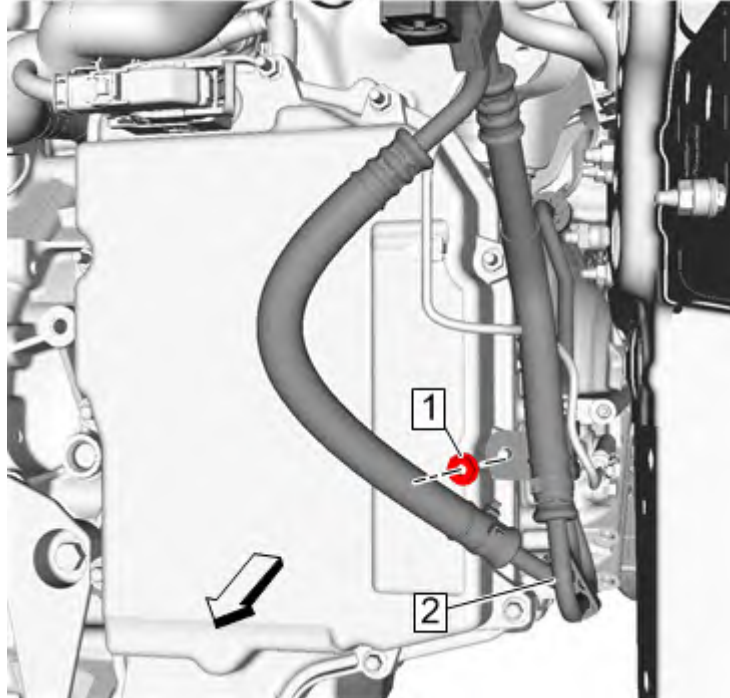


Fig. 116: Transmission Fluid Cooler Pipes And Nut
Courtesy of GENERAL MOTORS COMPANY

18. Install the transmission fluid cooler outlet pipes (2) to the transmission. Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(MNH, MHG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(M3D, M3H, M3U\)](#).
19. Install the transmission fluid cooler inlet pipe nut (1) to the transmission and tighten to 9 N.m (80 lb in).
20. Clip the engine wiring harness to the transmission.
21. Install the transmission range select lever cable to the transmission. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#).
22. Adjust the automatic transmission range selector lever cable. Refer to [Range Selector Lever Cable Adjustment](#).
23. Fill the transmission with fluid. Refer to [Transmission Fluid Drain and Fill](#).
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 Transmission Adaptive Values Learn 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 Transmission Service Fast Learn procedure. Refer to [Transmission Service Fast Learn Procedure](#).
26. Reprogram the transmission. Refer to [Solenoid Valve Characterization Reprogramming](#).
27. Road test the vehicle.

TRANSMISSION REPLACEMENT (ALL WHEEL DRIVE)

Removal Procedure

1. Disconnect the transmission range select lever cable from the transmission. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#)
2. Drain the transmission fluid. Refer to [Transmission Fluid Drain and Fill](#)

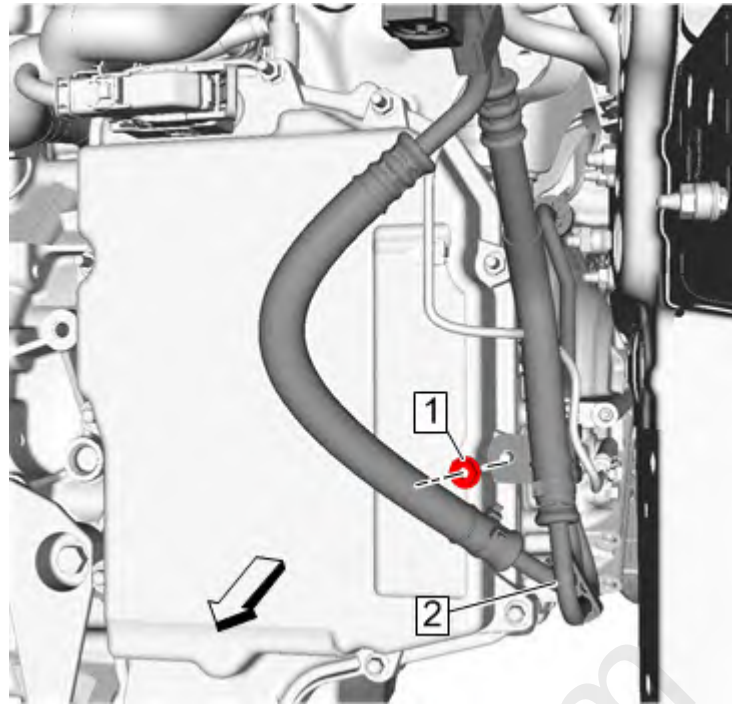


Fig. 117: Transmission Fluid Cooler Pipes And Nut
Courtesy of GENERAL MOTORS COMPANY

3. Remove the transmission fluid cooler pipe nut (1) from the transmission.
4. Remove the transmission fluid cooler pipes (2). Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(MNH, MHG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(M3D, M3H, M3U\)](#).

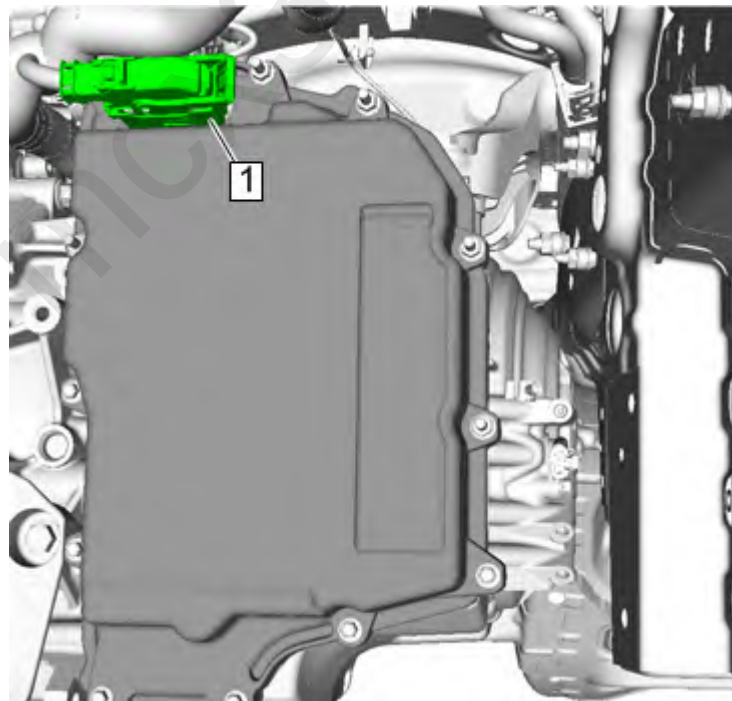


Fig. 118: Control Valve Body Transmission Control Module Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

5. Disconnect the control valve body transmission control module electrical connector (1), then unclip the wiring harness from the cover.
6. Remove the body ground cable and wiring harness assembly mounting bolt at front of transmission and position ground cable and harness out of the way.
7. Plug and/or cap the pipes and the transmission to prevent contamination.

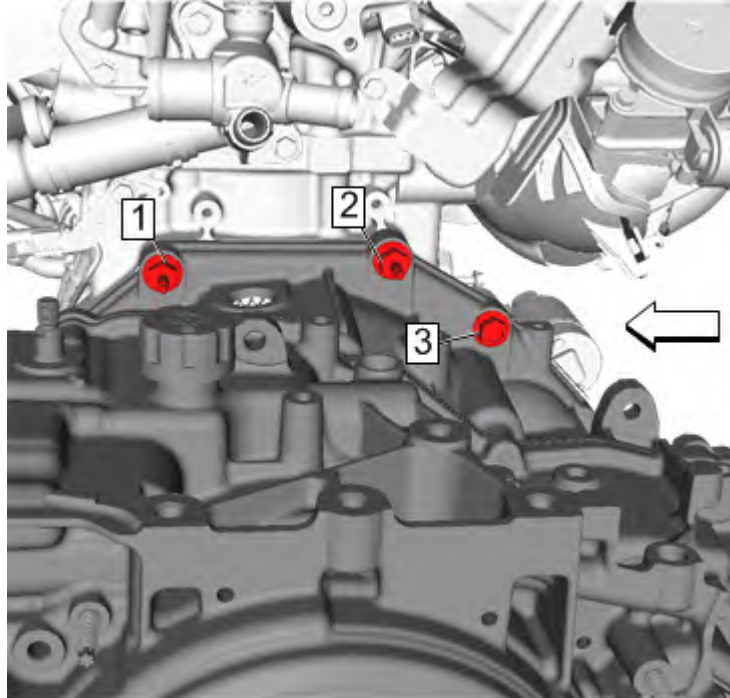


Fig. 119: Upper Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove the upper transmission to engine bolts (1, 2, 3).
9. Remove the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#)
10. Disconnect the wheel drive shafts from the transmission. Refer to [Front Wheel Drive Half Shaft Replacement - Left Side](#) , and [Front Wheel Drive Half Shaft Replacement - Right Side \(AWD\)](#).
11. Remove the power transfer unit case. Refer to [Power Transfer Unit Case Replacement \(MNH Transmission with LYX Engine\)](#), [Power Transfer Unit Case Replacement \(M3D Transmission with LTG Engine\)](#), [Power Transfer Unit Case Replacement \(MHG Transmission with LH7 Engine\)](#).
12. Remove the transmission mount strut bracket from the transmission. Refer to [Transmission Mount Strut Bracket Replacement \(All Wheel Drive\)](#).
13. Remove the starter. Refer to [Starter Replacement \(LYX - All Wheel Drive\)](#), [Starter Replacement \(LTG - All Wheel Drive\)](#), [Starter Replacement \(LH7 - All Wheel Drive\)](#).
14. Mark the relationship of the flywheel to the torque converter for reassembly.

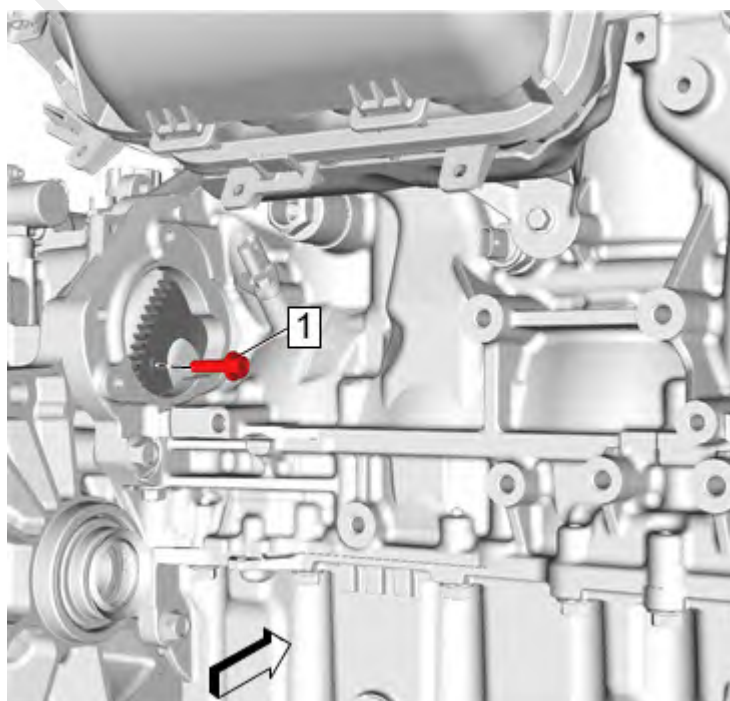


Fig. 120: Torque Converter To Flywheel Bolts
Courtesy of GENERAL MOTORS COMPANY

15. Remove the torque converter to flywheel bolts (1).
16. Lower the vehicle.
17. Install the engine support fixture. Refer to [Engine Support Fixture](#)
18. Remove the left transmission mount to transmission bolts. Refer to [Transmission Mount Replacement \(Left Side M3U\)](#)[Transmission Mount Replacement \(Left Side M3D/M3H\)](#).
19. Lower the transmission side with the support fixture to allow clearance for removal.
20. Unclip the engine wiring harness from the transmission.
21. Raise the vehicle.
22. Use a transmission jack in order to support the transmission.
23. Remove the oil pump flow control valve heat shield. Refer to [Oil Pump Flow Control Valve Heat Shield Replacement](#)

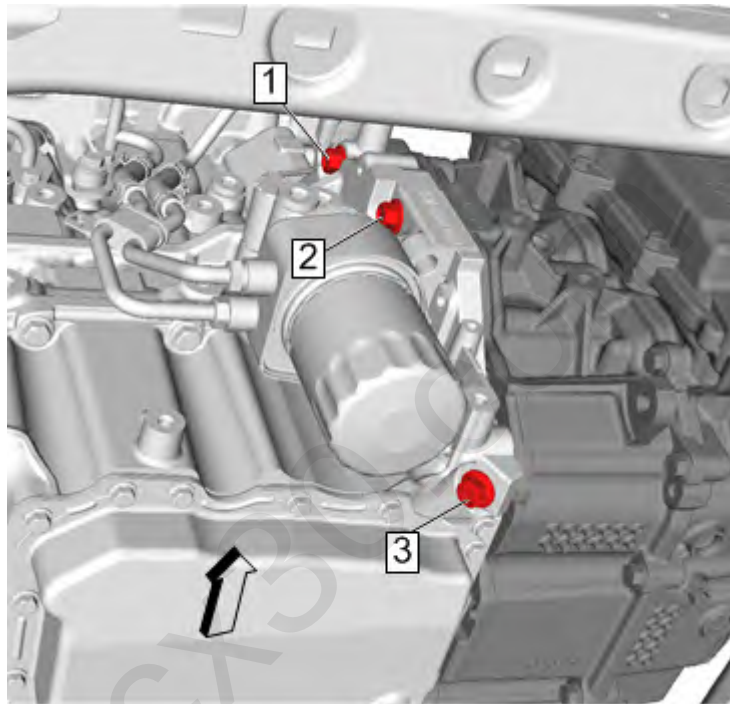
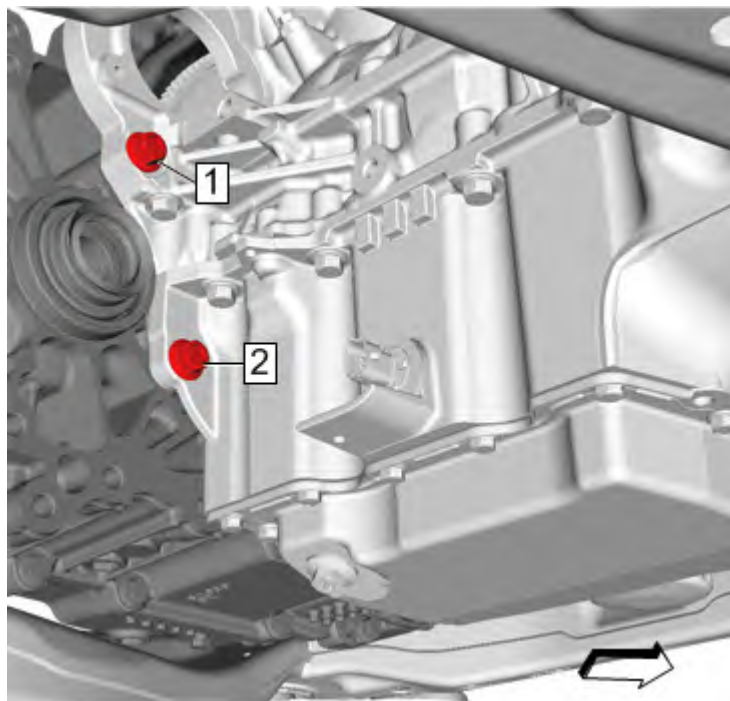


Fig. 121: Front Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

24. Remove the front transmission to engine bolts (1, 2, 3).



25. Remove the lower transmission fasteners (1, 2).

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

26. Separate the transmission from the engine.

27. Lower the transmission with the transmission jack far enough to remove the transmission.

28. Transfer components as necessary.

29. Flush and flow test the transmission oil cooler and lines. Refer to [Transmission Fluid Cooler Flow Test and Flushing](#)

Installation Procedure

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

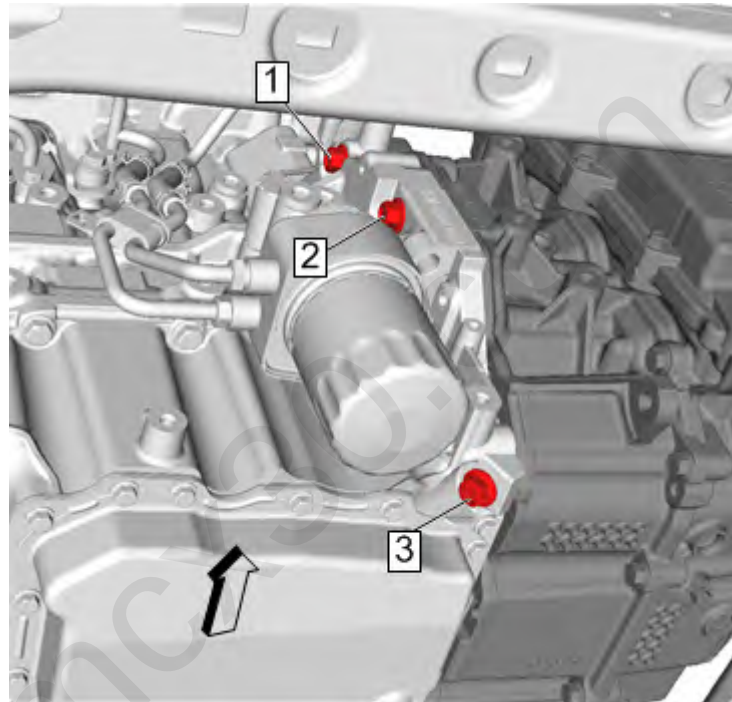


Fig. 123: Front Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

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

2. Install the transmission bolts (1, 2, 3) and tighten to 58 N.m (43 lb ft).

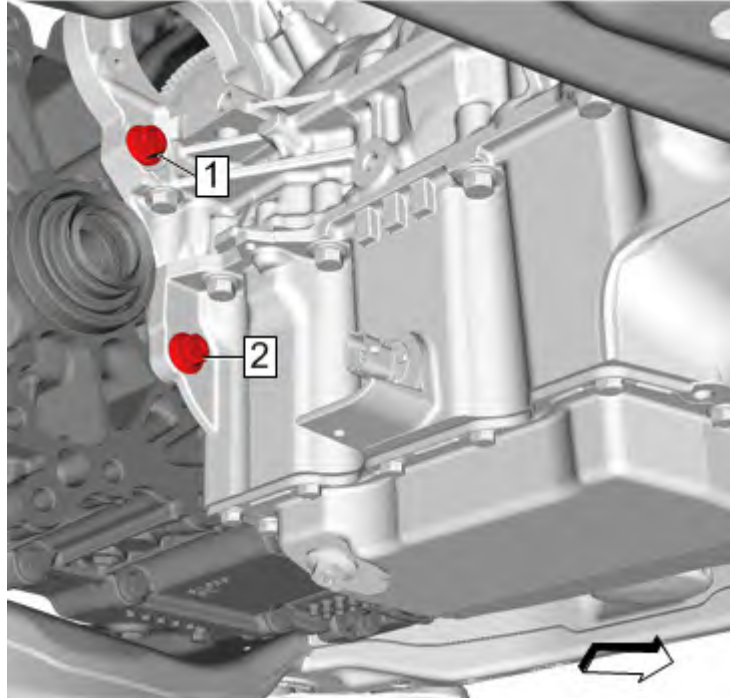


Fig. 124: Lower Transmission Fasteners

Courtesy of GENERAL MOTORS COMPANY

3. Install the front transmission to engine bolt (1, 2) and tighten to 58 N.m (43 lb ft).
4. Install the oil pump flow control valve heat shield. Refer to [Oil Pump Flow Control Valve Heat Shield Replacement](#)
5. Remove the transmission jack.
6. Align the mark of the flywheel to the mark on the torque converter for reassembly.

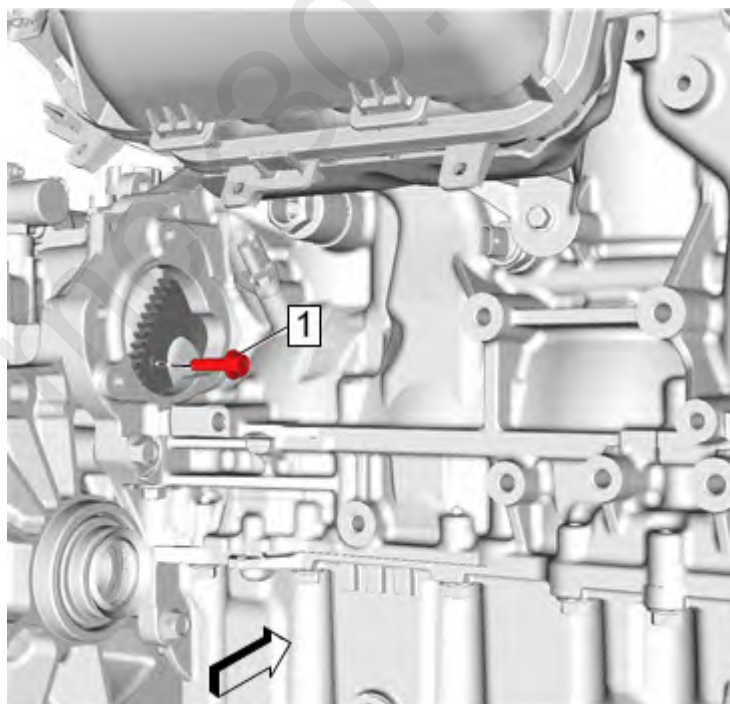


Fig. 125: Torque Converter To Flywheel Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: If reusing the torque converter bolts, clean the threads and apply threadlocker to the threads prior to installation. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#)

7. Install the torque converter to flywheel bolts (1) and tighten to 60 N.m (44 lb ft).
8. Install the starter. Refer to [Starter Replacement \(LYX - All Wheel Drive\)](#), [Starter Replacement \(LTG - All Wheel Drive\)](#), [Starter Replacement \(LH7 - All Wheel Drive\)](#)

9. Install the left transmission mount to the transmission. Refer to [Transmission Mount Replacement \(Left Side M3U\)](#)[Transmission Mount Replacement \(Left Side M3D/M3H\)](#).
10. Install the wheel drive shafts to the transmission. Refer to [Front Wheel Drive Half Shaft Replacement - Left Side](#) , and [Front Wheel Drive Half Shaft Replacement - Right Side \(AWD\)](#).
11. Install the power transfer unit case. Refer to [Power Transfer Unit Case Replacement \(MNH Transmission with LYX Engine\)](#) [Power Transfer Unit Case Replacement \(M3D Transmission with LTG Engine\)](#) [Power Transfer Unit Case Replacement \(MHG Transmission with LH7 Engine\)](#).
12. Install the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
13. Install the transmission mount strut bracket to the transmission. Refer to [Transmission Mount Strut Bracket Replacement \(All Wheel Drive\)](#).
14. Remove the engine support fixture. Refer to [Engine Support Fixture](#)

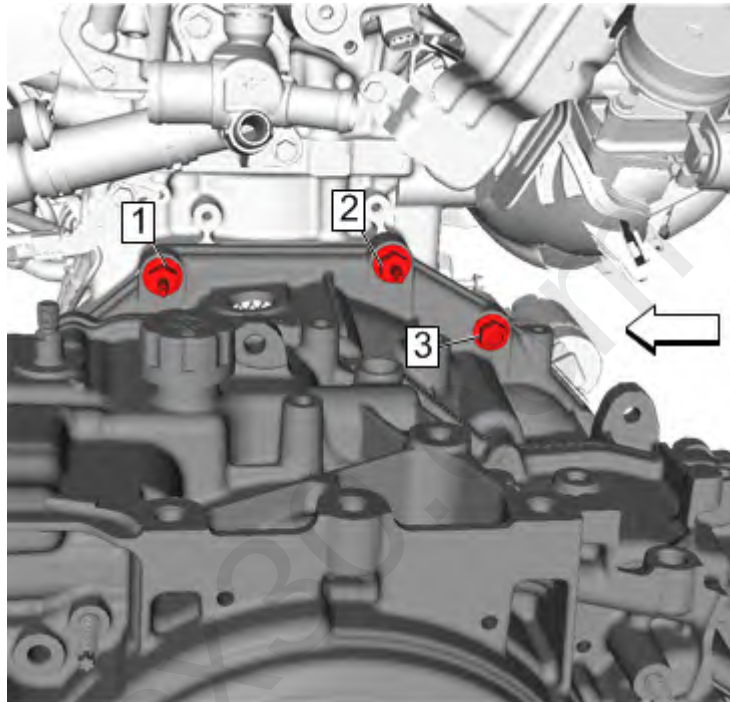
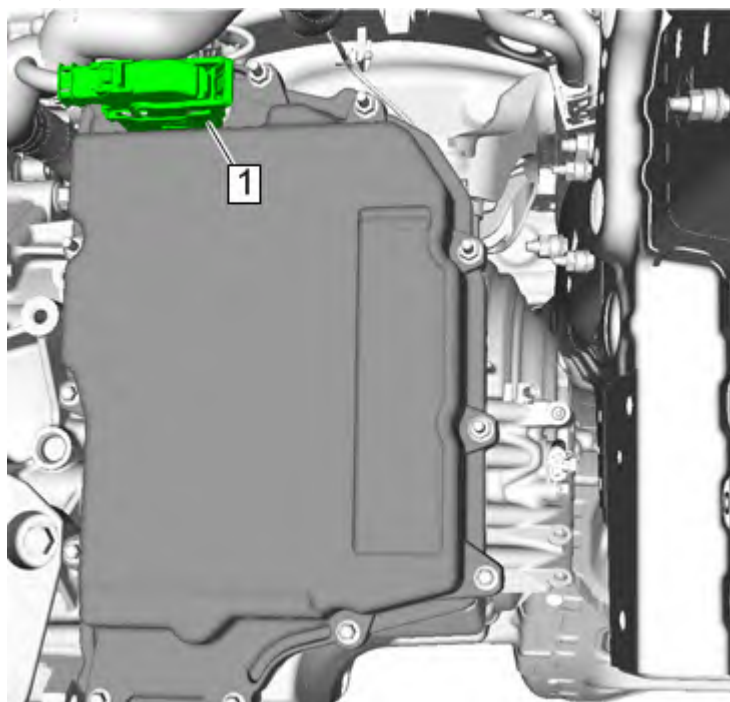


Fig. 126: Upper Transmission To Engine Bolts
Courtesy of GENERAL MOTORS COMPANY

15. Install the upper transmission to engine bolts (1, 2, 3) and tighten to 58 N.m (43 lb ft).



16. Connect the control valve body transmission control module electrical connector (1), then clip the wiring harness to the cover.

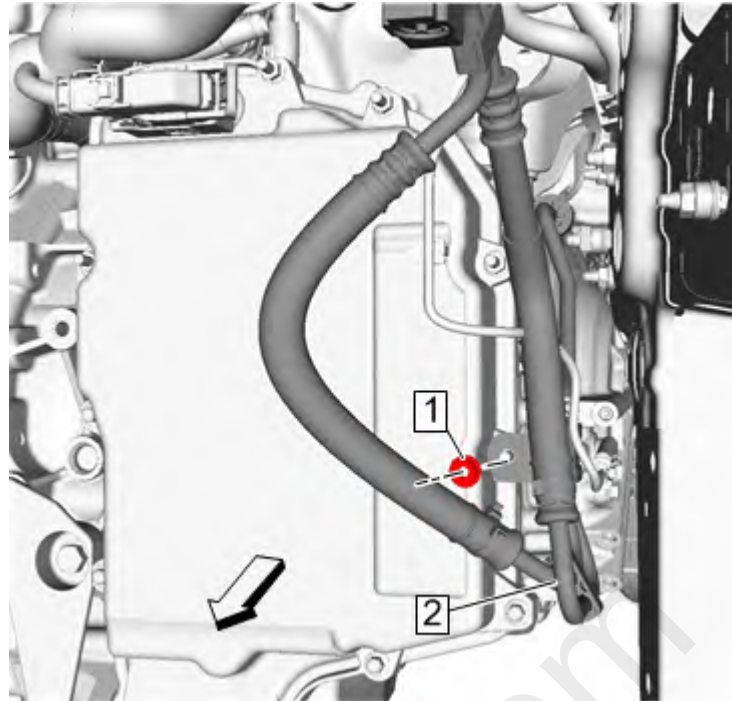


Fig. 128: Transmission Fluid Cooler Pipes And Nut
Courtesy of GENERAL MOTORS COMPANY

17. Install the transmission fluid cooler outlet pipes (2) to the transmission. Refer to [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(MNH, MHG\)](#), [Transmission Fluid Cooler Inlet and Outlet Pipe Replacement \(M3D, M3H, M3U\)](#).
18. Install the transmission fluid cooler inlet pipe nut (1) to the transmission and tighten to 9 N.m (80 lb in).
19. Clip the engine wiring harness to the transmission.
20. Install the transmission range select lever cable to the transmission. Refer to [Automatic Transmission Range Selector Lever Cable Replacement](#).
21. Adjust the automatic transmission range selector lever cable. Refer to [Transmission Fluid Drain and Fill](#).
22. Fill the transmission with fluid. Refer to [Transmission Fluid Drain and Fill](#).
23. 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 Transmission Adaptive Values Learn 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

24. Perform the Transmission Service Fast Learn procedure. Refer to [Transmission Service Fast Learn Procedure](#).
25. Reprogram the transmission. Refer to [Solenoid Valve Characterization Reprogramming](#).

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