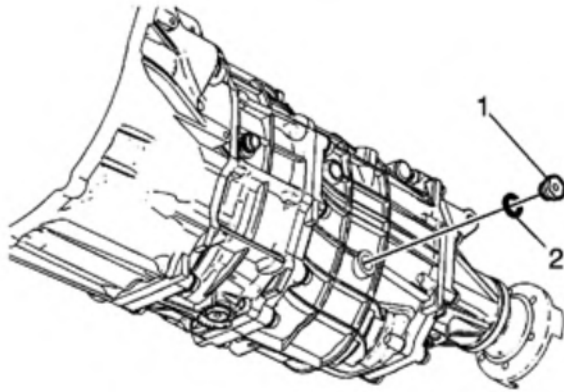
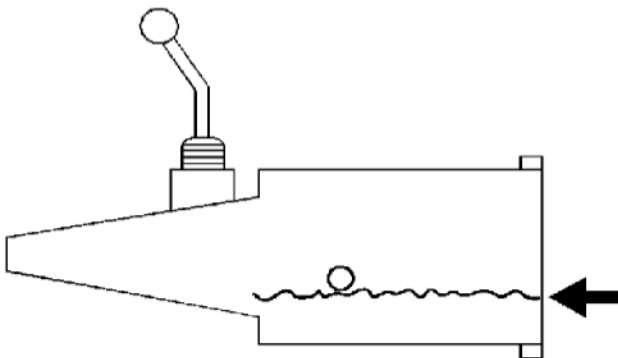


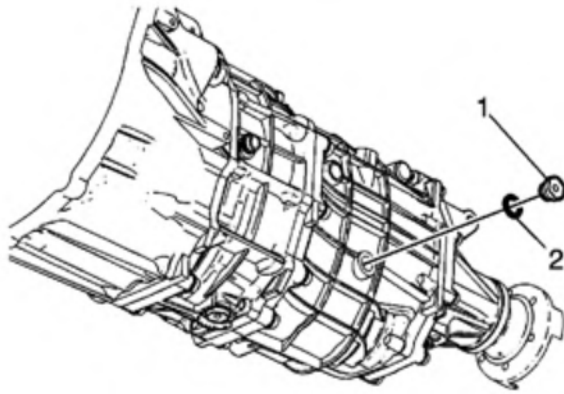
Transmission Fluid Level Inspection



1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Clean any dirt from around the fill plug (1).
3. Remove the transmission fill plug (1) and washer (2) from the transmission.



4. Check that the transmission fluid level is even with the bottom of the fill plug hole.
5. Add transmission fluid, if necessary.



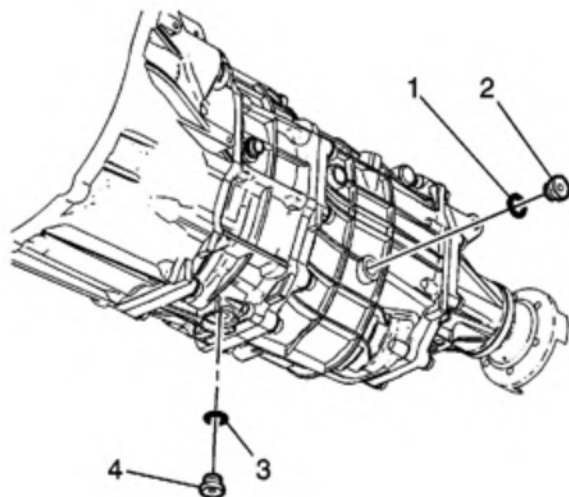
6. Inspect the fill plug washer (2) and replace if necessary.

Caution: Refer to [Component Fastener Tightening Caution](#) in the Preface section.

7. Install the transmission fill plug (1) and washer (2) then tighten to **37 N·m (27 lb ft)**.
8. Lower the vehicle.

Transmission Fluid Replacement

Draining Procedure

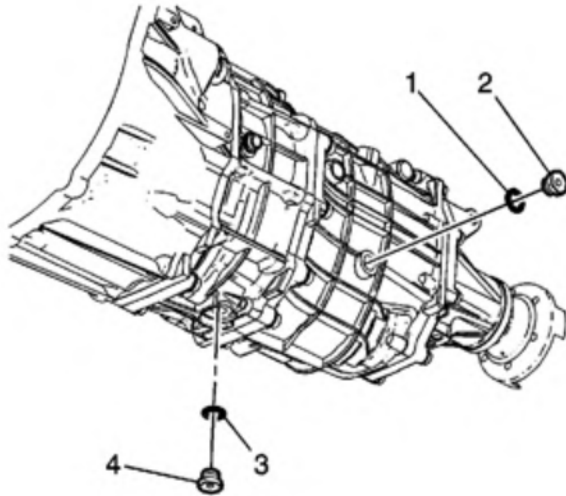


1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Clean away any dirt and debris from around the transmission fluid drain plug area.
3. Position an appropriate container below the transmission drain plug.
4. Remove the transmission fluid drain plug (4) and washer (3). Discard the washer.
5. Allow the transmission fluid to drain into the container.

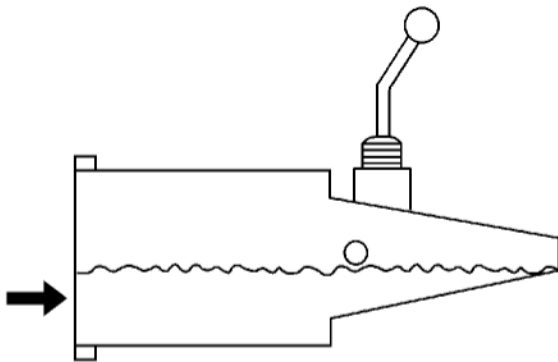
Caution: Refer to [Component Fastener Tightening Caution](#) in the Preface section.

6. Install the transmission fluid drain plug (4) and a NEW washer (3) then tighten to **37 N·m (27 lb ft)**.
7. Remove the container used to catch the used transmission fluid from under the vehicle.

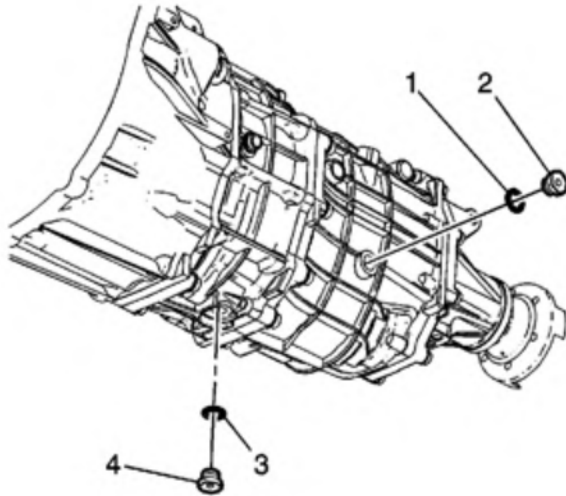
Filling Procedure



1. Clean away any dirt and debris from the transmission fluid fill plug area.
2. Remove the transmission fluid fill plug (2) and washer (1). Discard the washer.



3. Fill the transmission to just below the bottom of the fill plug hole with the recommended fluid. Refer to [Lubrication Specifications](#).

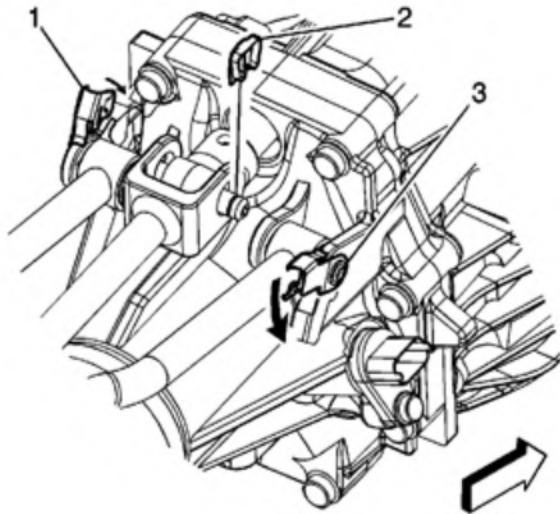


4. Install the transmission fluid fill plug (2) and a NEW washer (1) then tighten to **37 N·m (27 lb ft)**.
5. Lower the vehicle.

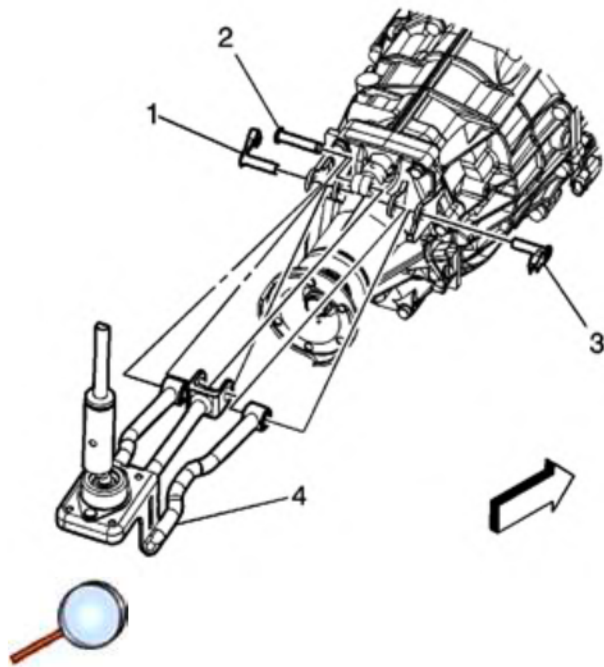
Transmission Control Replacement

Removal Procedure

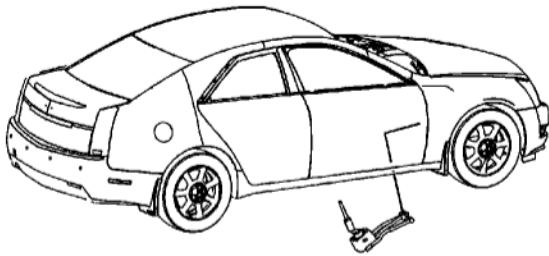
1. Remove the transmission control lever knob. Refer to [Transmission Control Lever Knob Replacement](#) .
2. Remove the front floor console. Refer to [Front Floor Console Replacement](#) .
3. Remove the manual transmission control mount plate assembly. Refer to [Transmission Control Mount Plate Replacement](#) .
4. Remove the exhaust system. Refer to [Exhaust System Replacement](#) .
5. Disconnect the front and rear propeller shafts (6) from the transmission and position out of the way. Refer to [Front Propeller Shaft Replacement](#) and [Rear Propeller Shaft Replacement](#) .
6. Support the transmission with a suitable jack.
7. Remove the transmission support. Refer to [Transmission Support Replacement](#) .
8. Lower the rear of the transmission in order to gain access to the top of the transmission.



9. Using a flat-blade tool, release the left and right side shift control rod pin retainers (1,3).
10. Using a flat-blade tool, release the center shift control rod pin retainer (2).

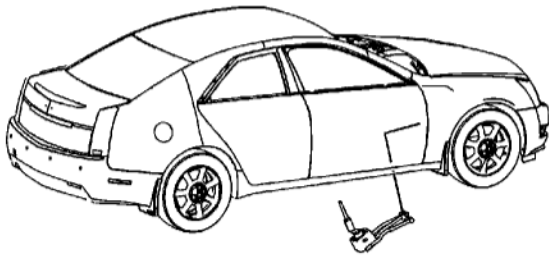


11. Remove the left and right side shift control rod pins (1, 3).
12. Remove the center shift control rod pin (2).

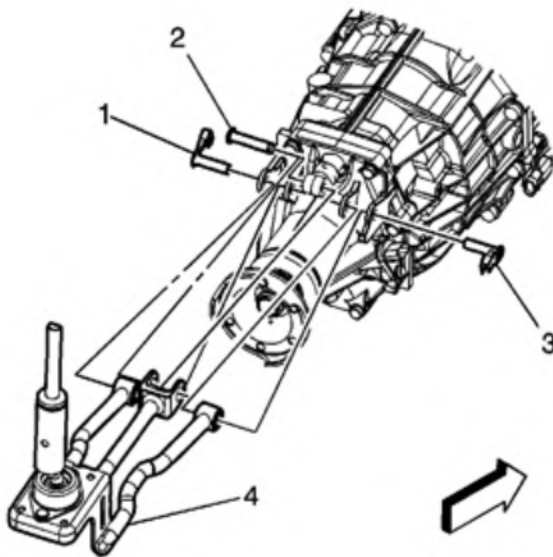


13. Remove the manual transmission control assembly from the vehicle.

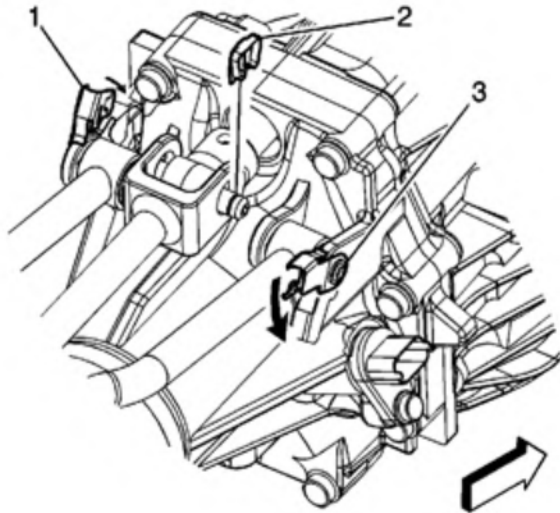
Installation Procedure



1. Position the manual transmission control assembly to the vehicle.

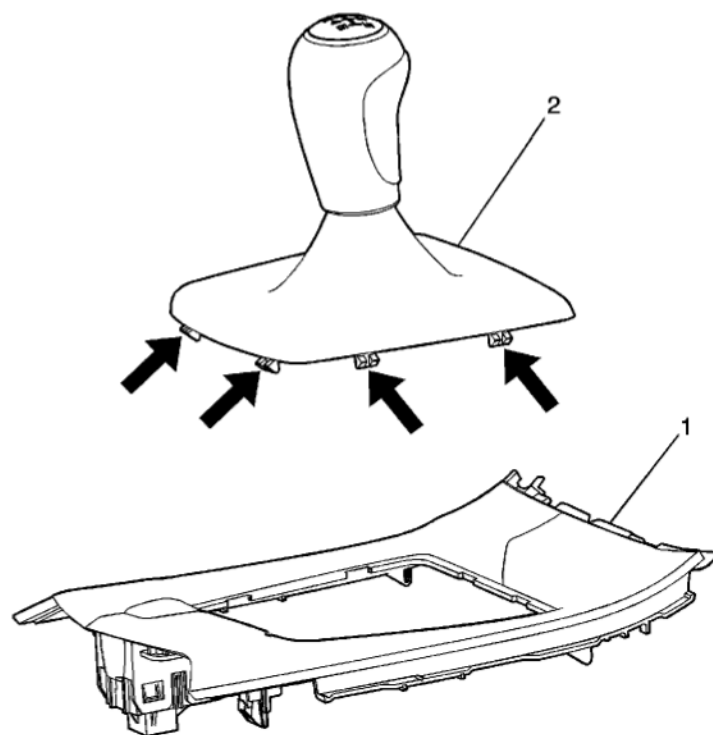


2. Install the center shift control rod pin (2).
3. Install the left and right side shift control rod pins (1,3).



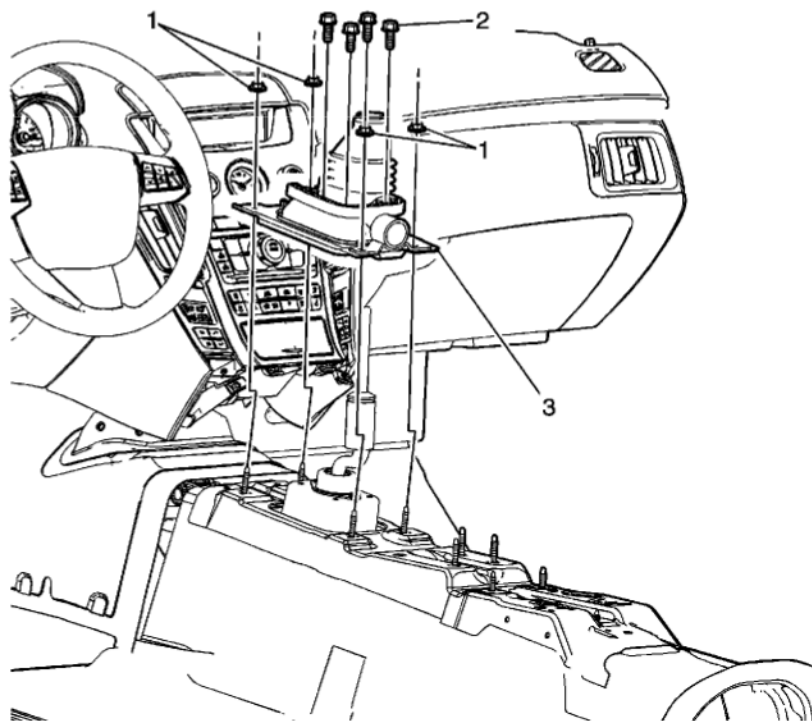
4. Install the center shift control rod pin retainer (2).
5. Rotate the left and right side shift control rod pins (1,2) in order to lock the retainers into place on the transmission.
6. Raise the transmission.
7. Install the transmission support. Refer to [Transmission Support Replacement](#) .
8. Remove the jack supporting the transmission.
9. Install the propeller shafts. Refer to [Front Propeller Shaft Replacement](#) and [Rear Propeller Shaft Replacement](#) .
10. Install the exhaust system. Refer to [Exhaust System Replacement](#) .
11. Lower the vehicle.
12. Install the manual transmission control mount plate assembly. Refer to [Transmission Control Mount Plate Replacement](#) .
13. Install the front floor console. Refer to [Front Floor Console Replacement](#) .
14. Install the transmission control lever knob. Refer to [Transmission Control Lever Knob Replacement](#) .

Transmission Control Lever Knob Replacement



Callout	Component Name
1	Front Floor Console Transmission Opening Trim Plate Refer to Front Floor Console Transmission Shift Opening Trim Plate Replacement .
2	Manual Transmission Control Lever Knob Assembly Procedure Release the (8) tabs securing the manual transmission control lever knob assembly to the front floor console transmission opening trim plate.

Transmission Control Mount Plate Replacement



Callout	Component Name
Preliminary Procedure	
1. Remove the front floor console transmission opening trim plate assembly. Refer to Front Floor Console Transmission Shift Opening Trim Plate Replacement .	
2. Remove the front floor console assembly. Refer to Front Floor Console Replacement .	
1	Manual Transmission Control Mount Plate Nut (Qty: 4) Caution: Refer to Fastener Caution in the Preface section. Tighten 9 N·m (80 lb in)
2	Manual Transmission Control Mount Plate Bolt (Qty: 4) Tighten 9 N·m (80 lb in)
3	Manual Transmission Control Mount Plate Assembly

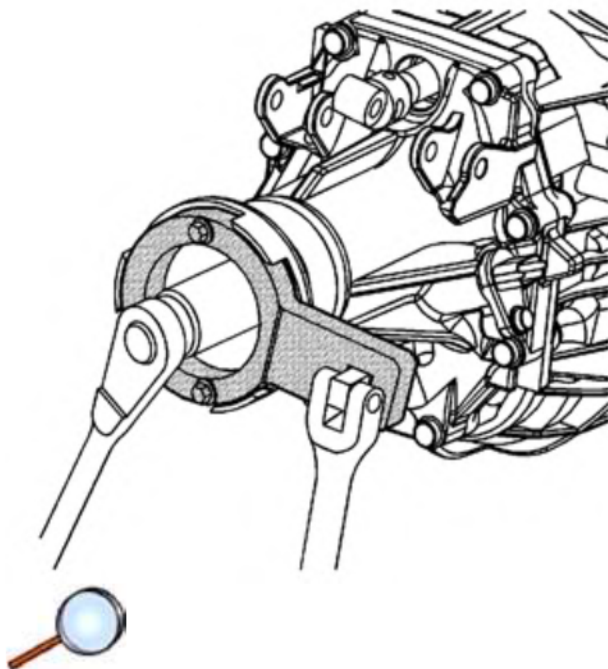
Mainshaft Rear Oil Seal Replacement

Special Tools

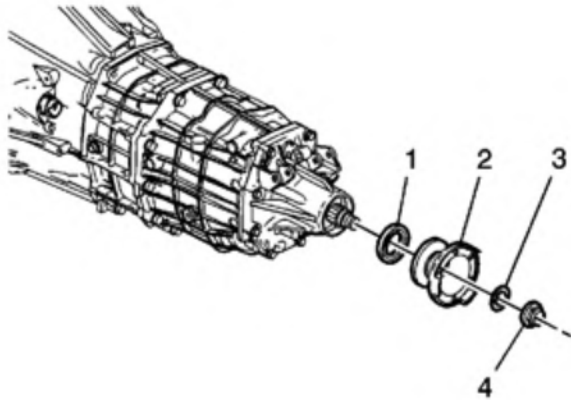
- [DT-48636](#) Flange Holder
- [J 6125-1B](#) Slide Hammer
- [J 23129](#) Universal Seal Remover
- [J 29873](#) Injector Nozzle Socket 30 mm
- [J 44765](#) Seal Installer
- [J 45019](#) Flange and Pinion Cage Remover

Removal Procedure

1. Place the transmission in neutral.
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the propeller shaft. Refer to [Rear Propeller Shaft Replacement](#).
4. Using a flat-bladed tool, disengage the staked portion of the drive flange nut.



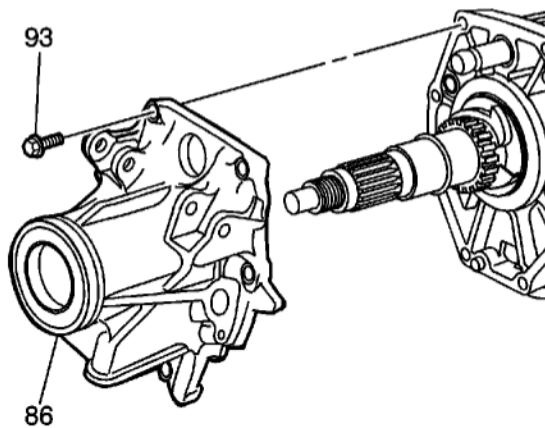
5. Install the [DT-48636](#) to the drive flange.
6. While holding [DT-48636](#) , loosen the flange nut using [J 29873](#) .
7. Remove the [DT-48636](#) .



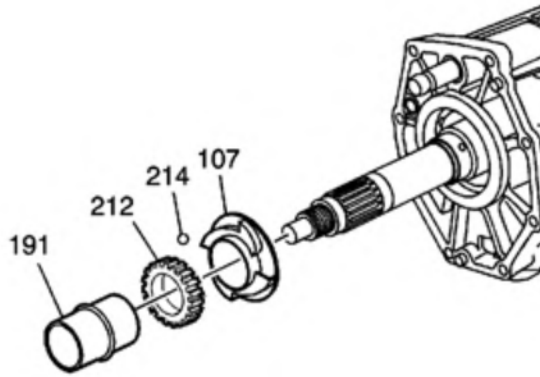
8. Remove and discard the drive flange nut (4).
9. Remove and discard the drive flange fluid seal (3).

Note: The rear output shaft rear bearing spacer must be replaced, and the bearing preload must be adjusted every time the rear drive flange is removed from the transmission.

10. Using [J 45019](#) , remove the drive flange (2).
11. Using [J 6125-1B](#) and [J 23129](#) remove the transmission case extension seal (1).

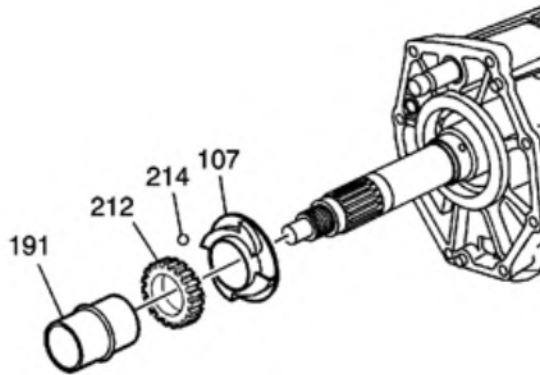


12. Remove the rear extension housing (86). Refer to [Transmission Disassemble](#).

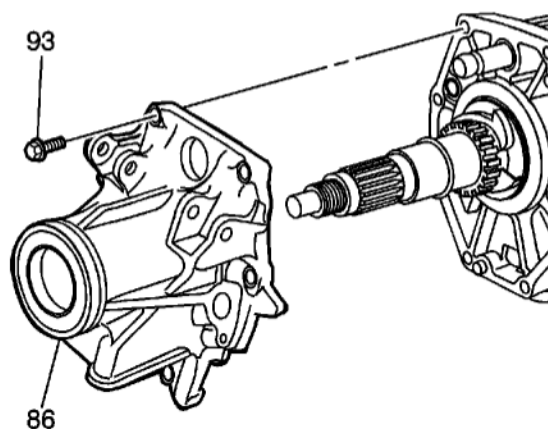


13. Remove and discard the rear output shaft rear bearing spacer (191).

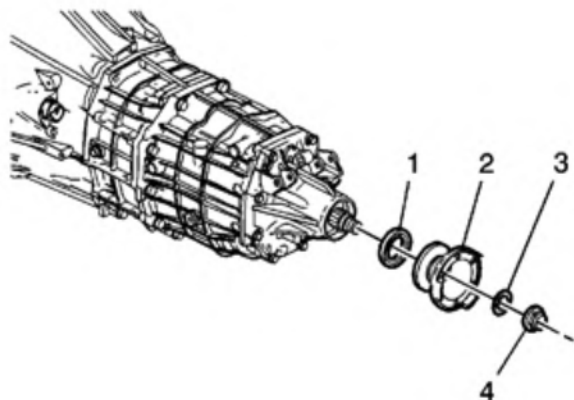
Installation Procedure



1. Install a NEW rear output shaft rear bearing spacer (191).



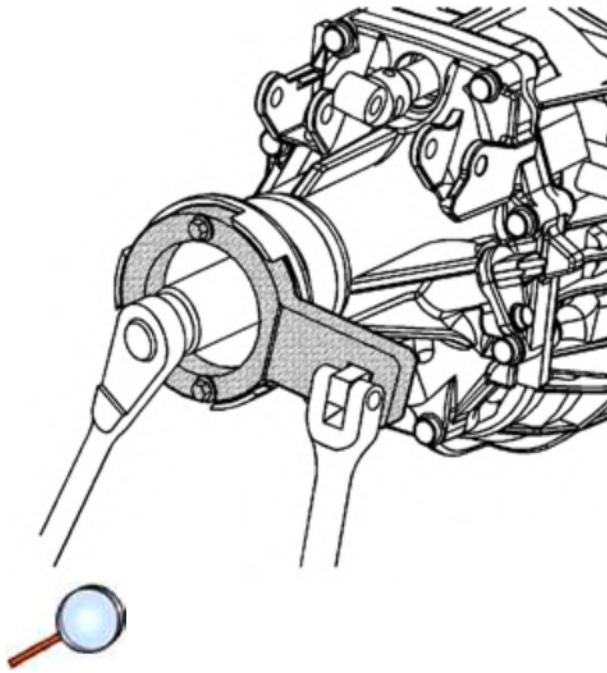
2. Install the rear extension housing (86). Refer to [Transmission Assemble](#).



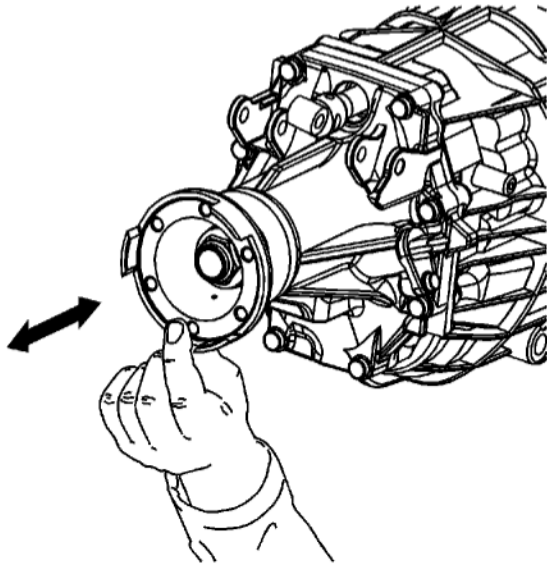
Note: Install the seal onto the tool before installing into the case to prevent damage to the seal.

3. Using [J 44765](#) install the new transmission case extension seal (1).
4. Install the drive flange (2) to the transmission output shaft.
5. Install a NEW drive flange fluid seal (3).
6. Install a NEW drive flange nut (4) until finger tight.

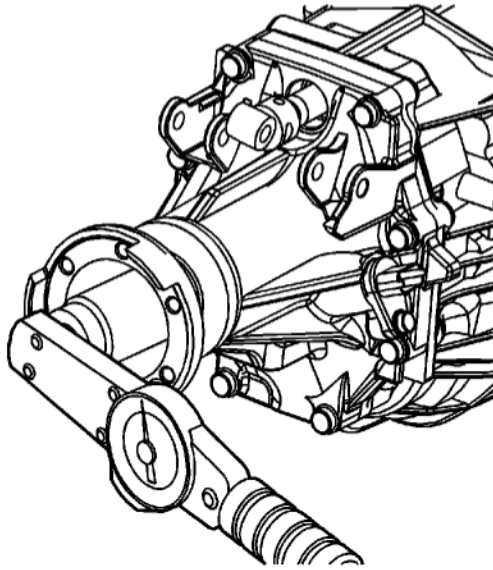
Preload Adjustment Procedure



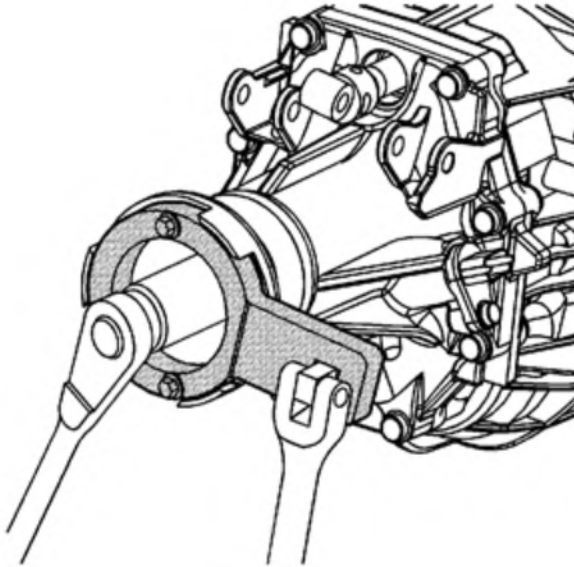
1. Shift the transmission into any gear.
2. Attach [DT-48636](#) to the output flange.
3. Hold [DT-48636](#) in order to prevent the output flange from rotating. Using [J 29873](#) tighten the output flange nut. Tighten until the looseness is minimal.



4. Verify looseness by shaking the output shaft longitudinally.



5. Remove [DT-48636](#) from the output flange.
6. Shift the transmission into NEUTRAL.
7. Rotate the output flange several times in order to seat the bearings.
8. Measure the rotational torque/drag torque of the output flange by using a suitable tool. Record this initial rotational torque measurement as value A.



9. Attach [DT-48636](#) to the output flange.
10. Shift the transmission into any gear.

Caution: Refer to [Fastener Caution](#) in the Preface section.

11. Tighten the nut to 220-565 N·m (162-417 lb ft).
12. Remove the [DT-48636](#) from the output flange.
13. Shift the transmission into NEUTRAL.

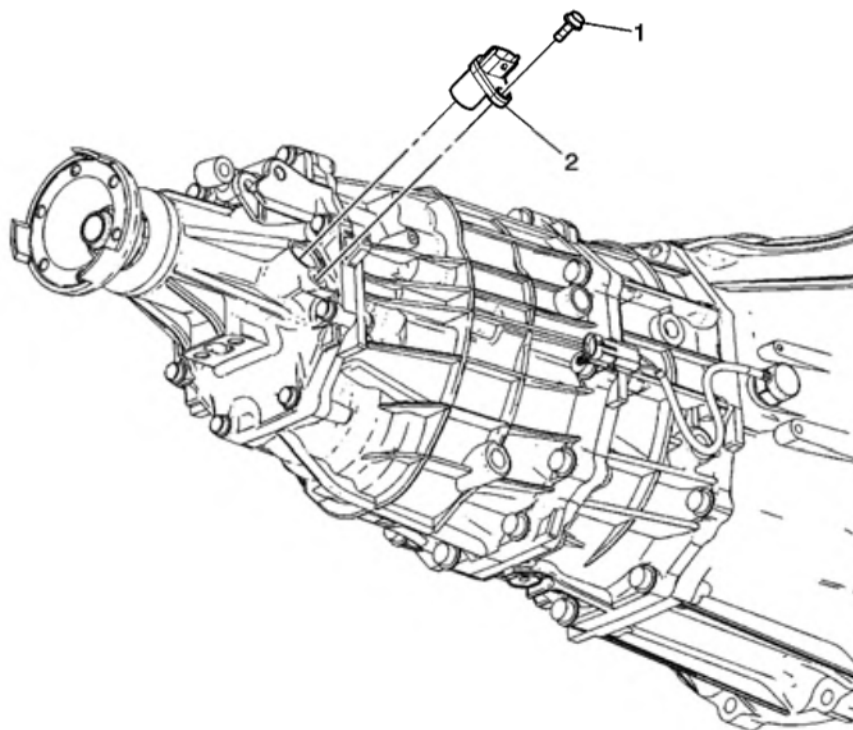
14. Rotate the output flange several times in order to seat the bearings.
15. Measure the rotational torque/drag torque of the output flange by using a suitable tool. Record this rotational torque measurement as value B.
16. Subtract value A from value B. Verify that the resulting measurement is within the specified range.

Specification

The rotational torque specification is 0.45-1.35 N·m (4-12 lb in).

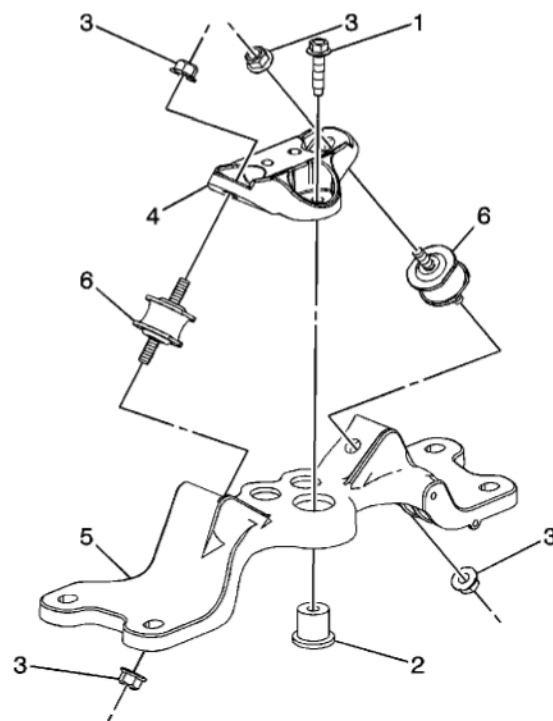
17. Repeat the previous steps until you have confirmed that the rotational torque specification is reached, then stake the nut in place. If the rotational torque requirement has been exceeded, replace the spacer and repeat the steps above.
18. At the correct location, stake the drive flange nut.
19. Install the propeller shaft. Refer to [Rear Propeller Shaft Replacement](#).
20. Lower the vehicle.

Vehicle Speed Sensor Replacement



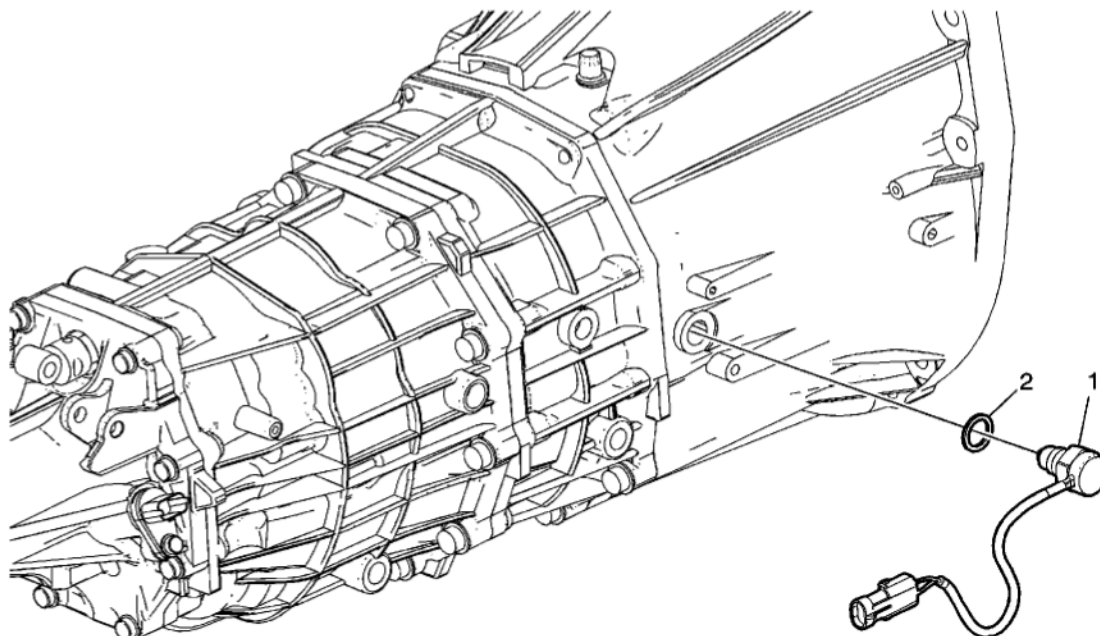
Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle. 2. Remove the transmission support. Refer to Transmission Support Replacement. 3. Lower the rear of the transmission.	
1	Vehicle Speed Sensor Bolt Caution: Refer to Fastener Caution in the Preface section. Tighten 8 N·m (71 lb in)
2	Vehicle Speed Sensor Procedure Disconnect the electrical wire harness from the vehicle speed sensor.

Transmission Mount Replacement (Except CTS-V)



Callout	Component Name
Preliminary Procedures	
Remove the transmission support. Refer to Transmission Support Replacement .	
1	Transmission Mount Travel Restrictor Bolt Caution: Refer to Fastener Caution in the Preface section. Tighten 90 N·m (66 lb ft)
2	Transmission Mount Travel Restrictor
3	Transmission Mount Nut (Qty: 4) Tighten 58 N·m (43 lb ft)
4	Transmission Mount Adaptor
5	Transmission Support
6	Transmission Mount (Qty: 2)

Backup Lamp Switch Replacement



Callout	Component Name
Preliminary Procedures	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .	
1	Backup Lamp Switch Caution: Refer to Component Fastener Tightening Caution in the Preface section. Procedure Disconnect the electrical wire harness from the backup lamp switch. Tighten 44 N·m (32 lb ft)
2	Backup Lamp Switch Washer Tip Use a NEW backup lamp switch washer.

Transmission Mount Inspection

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

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

Note: Before replacing any transmission mount due to suspected fluid loss, verify that the source of the fluid is the transmission mount, not the engine, transmission or accessories.

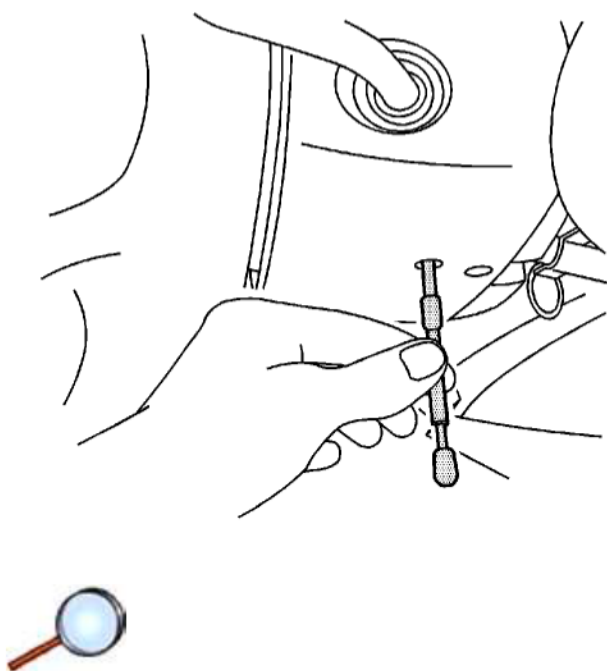
2. Raise the transmission in order to remove the weight from the transmission mount and create slight tension in the rubber.
3. Observe the transmission mount while raising the transmission. Replace the transmission mount if the transmission mount exhibits any of the following conditions:
 - The hard rubber surface is covered with heat check cracks.
 - The rubber is separated from the metal plate of the transmission mount.
 - The rubber is split through the center of the transmission mount.
4. If there is movement between the metal plate of the transmission mount and its attaching points, lower the transmission on the transmission mount. Tighten the bolts or nuts attaching the transmission mount to the frame or transmission mount bracket. Refer to [Transmission Mount Replacement](#).
5. Lower the vehicle.

Transmission Replacement

Special Tools

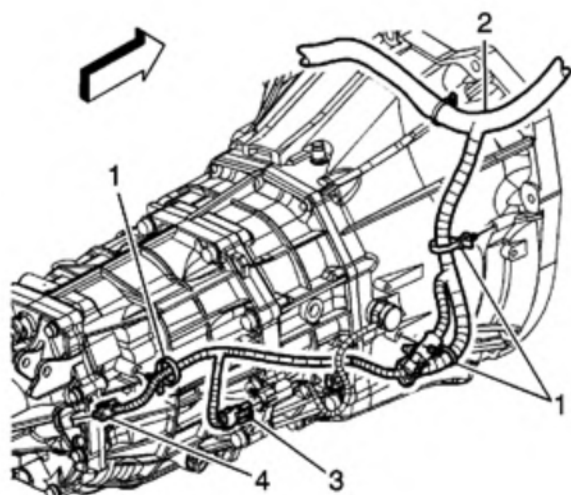
[J 42640](#) Steering Column Anti-Rotation Pin

Removal Procedure

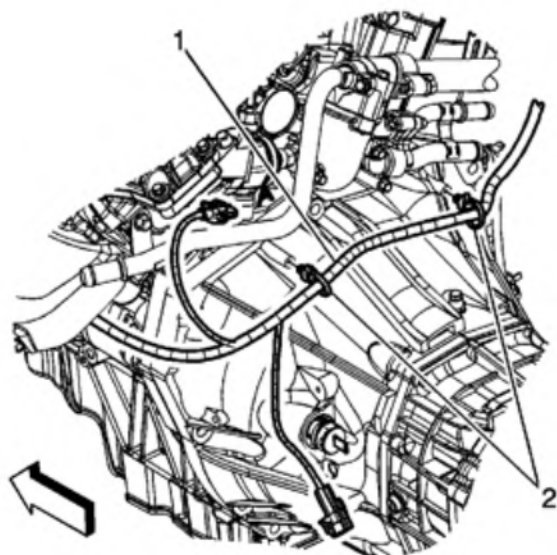


Caution: The front wheels of the vehicle must be maintained in the straight ahead position and the steering column must be in the LOCK position before disconnecting the steering column or intermediate shaft. Failure to follow these procedures will cause improper alignment of some components during installation and result in damage to the SIR coil assembly.

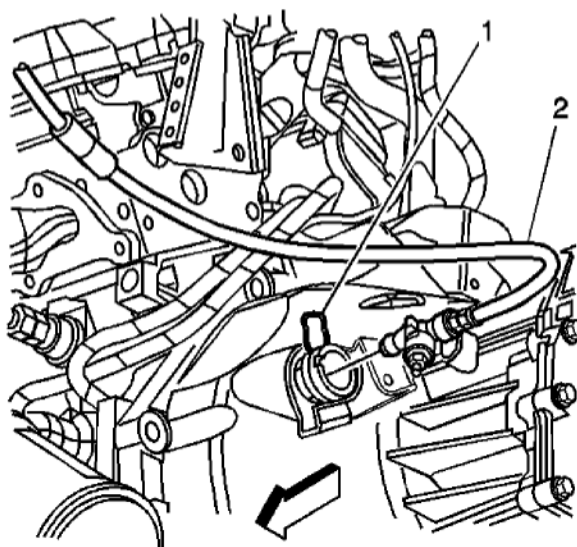
1. Turn the steering wheel so that the front wheels are pointing straight ahead.
2. Turn the ignition lock cylinder to the lock position and remove the key.
3. Lock the steering column through the access hole in the lower steering column trim cover using [J 42640](#).
4. Remove the transmission control lever knob. Refer to [Transmission Control Lever Knob Replacement](#).
5. Remove the manual transmission control mount plate assembly. Refer to [Transmission Control Mount Plate Replacement](#).
6. Remove the exhaust system. Refer to [Exhaust System Replacement](#).
7. Remove the catalytic converters. Refer to [Catalytic Converter Replacement - Left Side](#) and [Catalytic Converter Replacement - Right Side](#).
8. Remove the propeller shaft. Refer to [Rear Propeller Shaft Replacement](#).



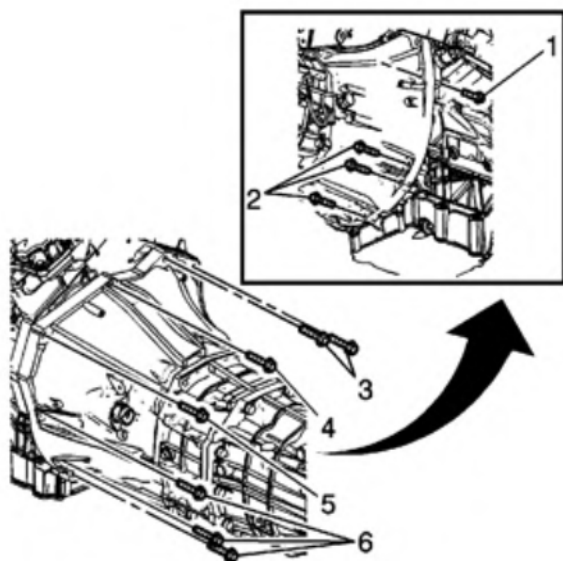
9. Disconnect the electrical connector (5) from the vehicle speed sensor.
10. Disconnect the electrical connector (4) from the backup lamp switch.
11. Remove the electrical harness retainers (1) from the transmission.
12. Position the electrical harness (2) out of the way.



13. Remove the electrical harness retainers (2) from the transmission.
14. Position the electrical harness (1) out of the way.
15. Support and secure the transmission with a suitable transmission jack.
16. Remove the transmission support. Refer to [Transmission Support Replacement](#).
17. Remove the transmission control. Refer to [Transmission Control Replacement](#).



18. Remove the clutch hydraulic hose retaining clip (1) from the clutch slave cylinder.
19. Disconnect the clutch hydraulic hose (2) from the clutch slave cylinder. It is not necessary to plug the lower hose end or slave cylinder fitting as they are equipped with check valves. Only minimal fluid loss may be experienced.



20. Remove the transmission bolts (1-6).
21. Pull the transmission free from the engine dowels.

Note: Ensure clearance is maintained between the transmission and the following:

- The clutch assembly
- The input shaft
- The catalytic converters
- The wiring harnesses

- The propeller shaft

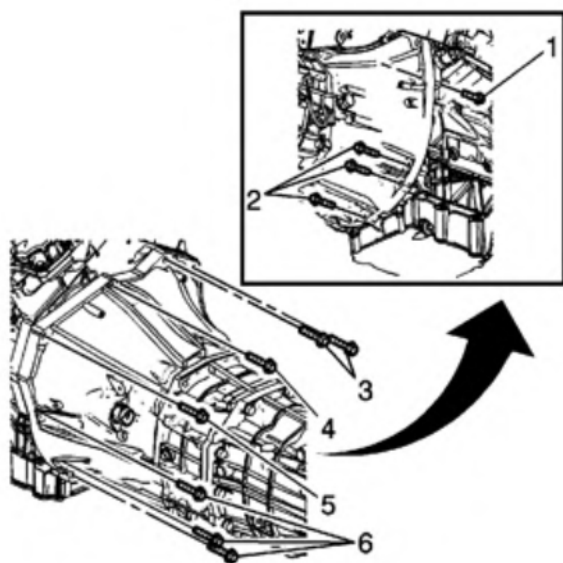
22. Using the transmission jack, carefully lower the transmission from the vehicle.

Installation Procedure

Note: Ensure clearance is maintained between the transmission and the following:

- The clutch assembly
- The input shaft
- The catalytic converters
- The wiring harnesses
- The propeller shaft

1. Using the transmission jack, carefully raise the transmission to the vehicle.



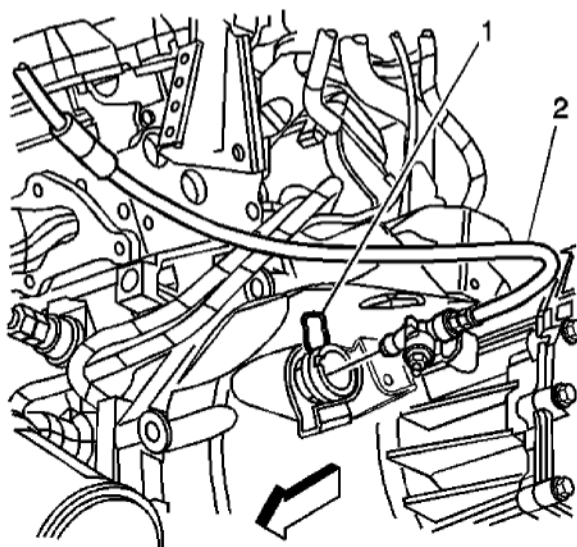
2. Align the transmission with the engine dowels.

Caution: Refer to [Fastener Caution](#) in the Preface section.

3. Install the transmission bolts (1-6).

Tighten

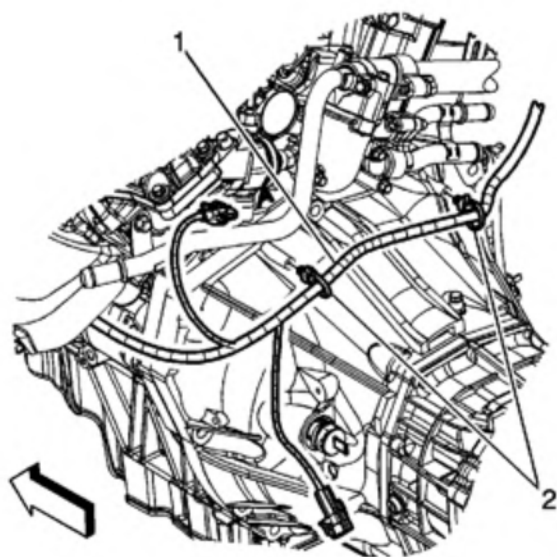
Tighten the bolts to 50 N·m (37 lb ft).



4. Install the clutch hydraulic hose retaining clip (1) to the clutch slave cylinder.

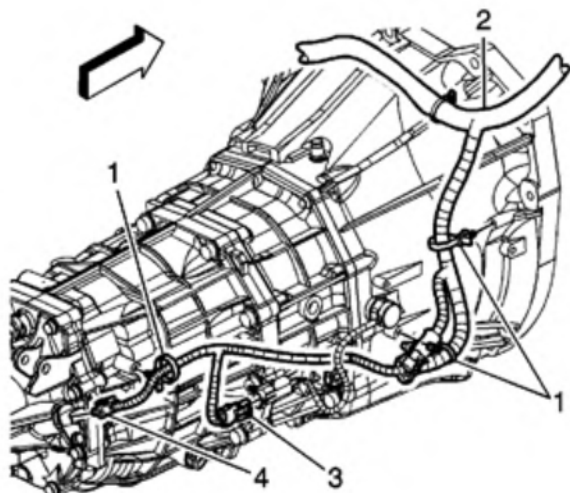
Note: Ensure the clutch hydraulic hose is routed in an upward direction above the clutch slave cylinder with no sharp bends, kinks, or downward loops. Ensure the clutch hydraulic hose does not come in contact with any sharp or potentially hot surfaces.

5. Install the clutch hydraulic hose to the vehicle.
6. Align the clutch hydraulic hose locating tab with the notch in the slave cylinder hose fitting.
7. Push the clutch hydraulic hose (2) into the clutch slave cylinder until a "click" is heard.
8. Tug gently on the clutch hydraulic hose (2) to ensure proper retention to the clutch slave cylinder.
9. Install the transmission control. Refer to [Transmission Control Replacement](#).
10. Remove the transmission jack.
11. Install the transmission support. Refer to [Transmission Support Replacement](#).

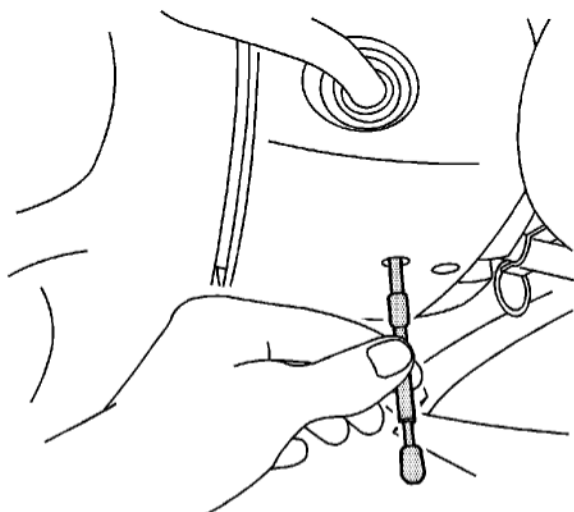




12. Install the electrical harness retainers (2) to the transmission.



13. Install the electrical harness retainers (1) to the transmission.
14. Connect the electrical connector (4) to the backup lamp switch.
15. Connect the electrical connector (5) to the vehicle speed sensor.
16. Install the propeller shaft. Refer to [Rear Propeller Shaft Replacement](#).
17. Install the catalytic converters. Refer to [Catalytic Converter Replacement - Left Side](#) and [Catalytic Converter Replacement - Right Side](#).
18. Install the exhaust system. Refer to [Exhaust System Replacement](#).
19. Inspect the transmission fluid level. Refer to [Transmission Fluid Level Inspection](#).
20. Lower the vehicle.
21. Install the manual transmission control mount plate assembly. Refer to [Transmission Control Mount Plate Replacement](#).
22. Install the transmission control lever knob. Refer to [Transmission Control Lever Knob Replacement](#).





23. Unlock the steering column by removing the [J 42640](#) from the steering column lower trim cover access hole.
24. Bleed the clutch hydraulic system. Refer to [Hydraulic Clutch Bleeding](#).

Transmission Final Test and Inspection

Complete the following procedure after the transmission is installed in the vehicle:

1. With the ignition OFF or disconnected and clutch pedal depressed, crank the engine several times. Listen for any unusual noises or evidence that any parts are binding.
2. Place transmission in neutral, start the engine and listen for any unusual noises or evidence that any parts are binding.
3. While the engine continues to idle raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
4. Perform a final inspection for the proper fluid level. Refer to [Transmission Fluid Level Inspection](#).
5. Lower the vehicle.
6. Road test the vehicle.