

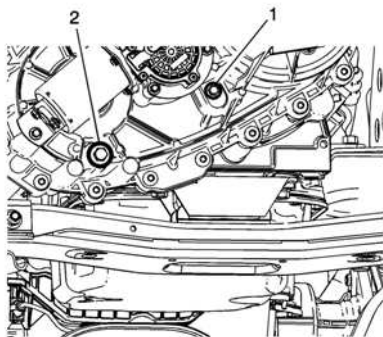
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

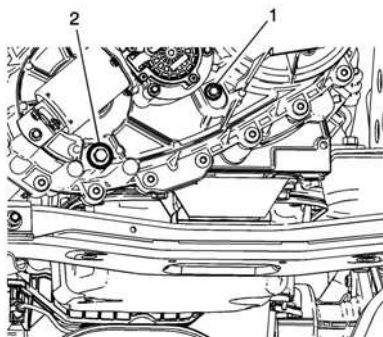
[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Remove the drain plug (2).

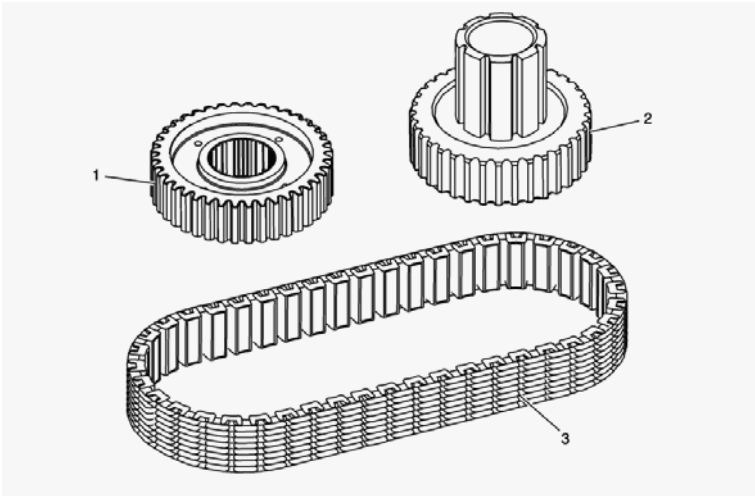
[Installation Procedure](#)



1. Install the drain plug (2).
2. Lower the vehicle.

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Drive Chain, Drive Sprocket, and Driven Sprocket Cleaning and Inspection

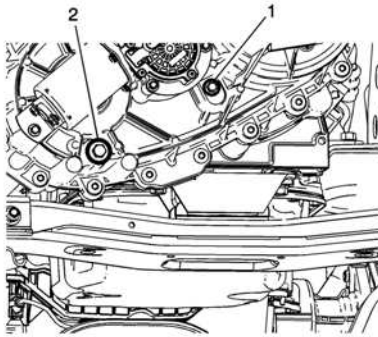
Callout	Component Name
Preliminary Procedure	
	• Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated. • Replace any components if damage is found in this procedure. The sprockets must be replaced as a pair. • Clean all components in cleaning solvent and air dry.
1	Transfer Case Front Output Shaft Driven Sprocket Note: • Inspect for chipped teeth, excessively worn gear surfaces, and debris embedded in the root of the teeth. • Witness marks at the location of the chain are to be considered normal.
2	Transfer Case Front Output Shaft Drive Sprocket Note: • Inspect for chipped teeth, excessively worn gear surfaces, and debris embedded in the root of the teeth. • Witness marks at the location of the chain are to be considered normal. • Inspect for wear to the drive sprocket bushings.
3	Transfer Case Front Output Shaft Drive Chain Assembly Note: Inspect for loose link pins, binding or stiff links, debris embedded in the links, or worn teeth surfaces.

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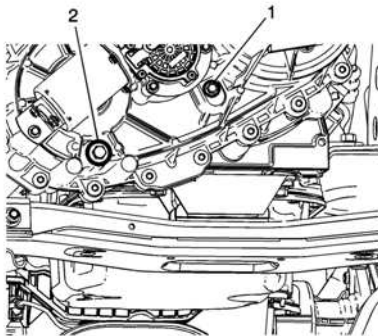
[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Remove the fill plug (1).

[Installation Procedure](#)

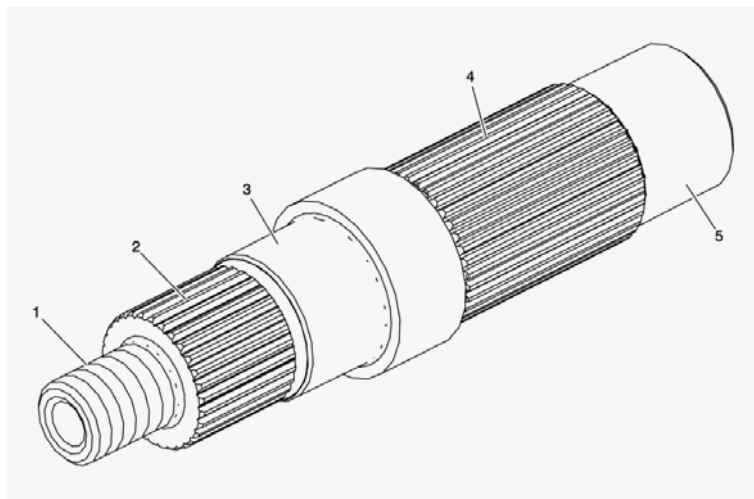


1. Install the fill plug (1).
2. Lower the vehicle.

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Front Output Shaft Cleaning and Inspection

cardiagn.com

Callout

Component Name

Preliminary Procedure

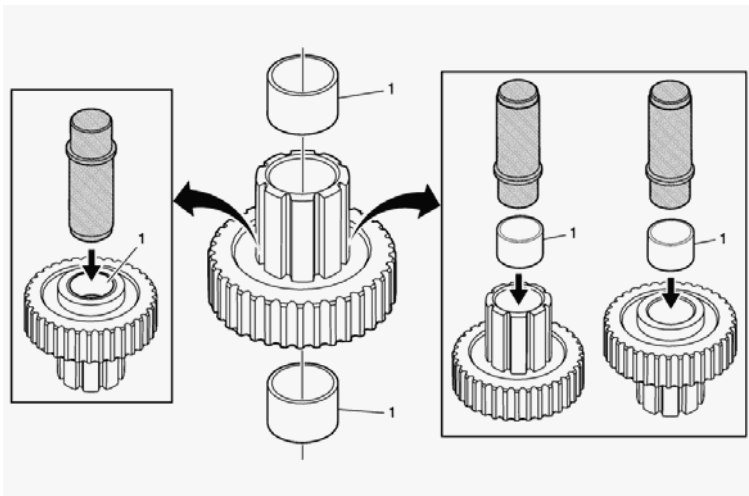
- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated.
- Clean all components in cleaning solvent and air dry.

- | | |
|---|--|
| 1 | Transfer Case Front Output Shaft Flange Nut Threads
Note: Inspect for excessive wear, or damage. |
| 2 | Transfer Case Front Output Shaft Flange Engagement Splines
Note: Witness marks at the location of the front output shaft flange is normal. |
| 3 | Transfer Case Front Output Shaft Front Bearing Surface
Note: Inspect for excessive wear, damage, or if the bearing has spun on the shaft. |
| 4 | Transfer Case Front Output Shaft Driven Sprocket Engagement Splines
Note: Witness marks at the location of the front output shaft driven sprocket is normal. |
| 5 | Transfer Case Front Output Shaft Rear Bearing Surface
Note: Inspect for excessive wear, damage, or if the bearing has spun on the shaft. |

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Front Output Shaft Drive Sprocket Bushing Replacement

Callout

Component Name

Preliminary Procedure

Ensure the bushings are installed squarely into the drive sprocket bore.

Front Output Shaft Drive Sprocket Bushing

Procedure

1

- Remove the bushings by pressing both out from the same side of the drive sprocket using the long end of the *DT 50316* bushing remover/installer.
- Install the bushings using the short end of the *DT 50316* bushing remover/installer.
- Press the bushings until the tool bottoms on the drive sprocket. The bushings are to be installed 0.04 in (1.0mm) below flush

Special Tools

DT 50316 Drive Sprocket Bushing Remover/Installer

For equivalent regional tools, refer to Special Tools.

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Removal Procedure

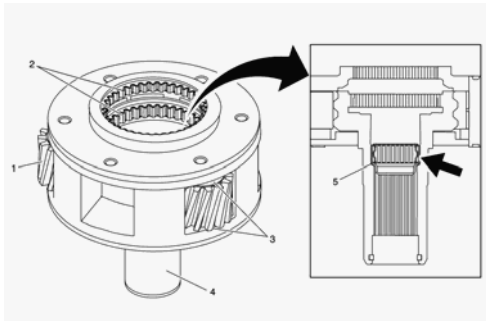
1. Remove the front propeller shaft. Refer to Front Propeller Shaft Replacement.
2. Remove the front output shaft flange. Refer to front output shaft flange removal in Transfer Case Disassemble.

Installation Procedure

1. Install the front output shaft flange. Refer to front output shaft flange installation in Transfer Case Assemble.
2. Install the front propeller shaft. Refer to Front Propeller Shaft Replacement.

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High/Low Planetary Carrier Cleaning and Inspection

Callout

Component Name

Preliminary Procedure

- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated.
- Clean all components in cleaning solvent and air dry. Do not spin the planetary gears with compressed air.
- The high/low planetary carrier is only serviced as an assembly.

Note: First design planetary carriers are a 6-pinion design. Second design planetary carriers are a 3-pinion design. When replacing a 6-pinion carrier with a 3-pinion design, the 3-pinion design planetary carrier internal gear must also be used. Refer to New Product Information.

Transfer Case High/Low Planetary Pinion Gear

Note:

1

- Inspect for broken, damaged, or debris embedded in the root of the teeth.
- Inspect for loose or binding gears with excessive end play.

2

Transfer Case Range Shift Sleeve Engagement Teeth

Note: Inspect the engagement teeth for chips or excessive wear.

3

Transfer Case High/Low Planetary Carrier Pinion Gear Thrust Washer

Note: Inspect for loose, binding gears or missing thrust washers which may create excessive end play.

4

Input Shaft Seal Surface

Note: Inspect for a worn, scored, or damaged surface.

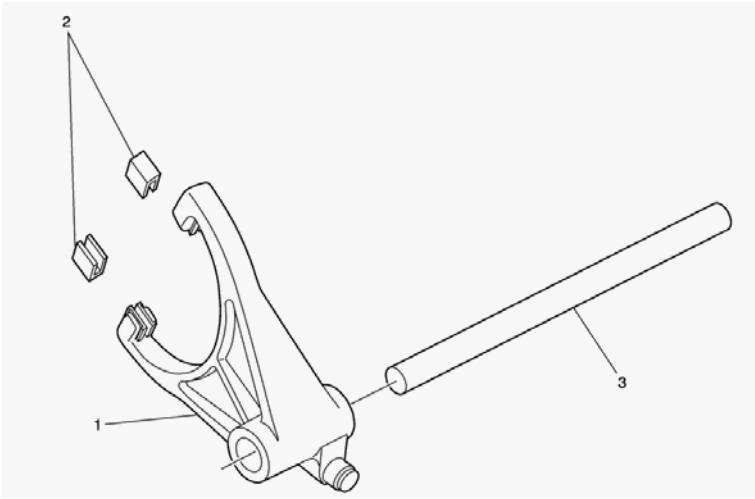
5

Pilot Bearing

Note: Inspect for a worn or missing bearings.

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Fuel Delivery: | Fuel:



High/Low Shift Components Cleaning and Inspection

Callout	Component Name
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Preliminary Procedure

- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated.
- Clean all components in cleaning solvent and air dry.

Transfer Case High/Low Shift Fork

Note:

- | | |
|---|--|
| 1 | <ul style="list-style-type: none">• Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found.• Inspect the shift roller for binding or looseness.• Inspect the fork bushings for wear.• Inspect for loose fit pin to the fork. The pin is press fit into the fork |
|---|--|

Transfer Case High/Low Shift Fork Pad

Note: Inspect the pads for wear or cracking.

- | | |
|---|--------------------------|
| 3 | Transfer Case Shift Rail |
|---|--------------------------|

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Removal Procedure

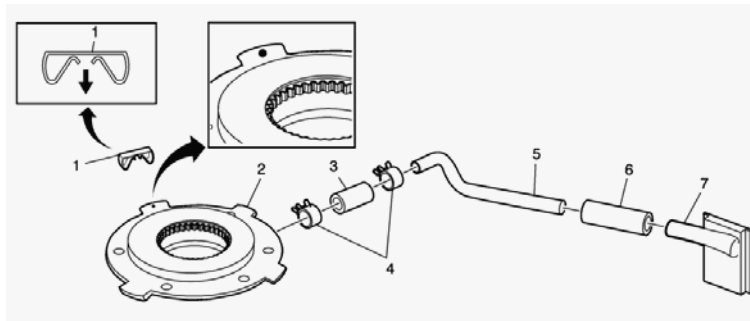
1. Remove the transfer case. Refer to Transfer Case Replacement.
2. Remove the input shaft seal from the transfer case. Refer to input shaft seal removal in Transfer Case Disassemble.

Installation Procedure

1. Install the input shaft seal. Refer to input shaft seal installation in Transfer Case Assemble.
2. Install the transfer case. Refer to Transfer Case Replacement.

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Oil Pump Cleaning and Inspection

Callout

Component Name

Preliminary Procedure

- Inspect the oil pump assembly.
- Clean all components in cleaning solvent and air dry.

Oil Pump Position Retainer

1

Note: Install the retainer onto the flange that has a dimple on the face. The raised area of the retainer is to locate into the recess of the flange.

Oil Pump Assembly

2

Note: Replace the oil pump assembly if there is any sign of binding. Do not disassemble the oil pump. The oil pump is serviced as an assembly.

Oil Pump Suction Hose

3

Oil Pump Suction Hose Clamp

4

Oil Pump Suction Tube

5

Oil Pump Suction Hose

6

Oil Pump Pickup Hose Screen

7

Note: Replace the oil pump pickup hose screen if the screen cannot be cleaned and is embedded with debris.

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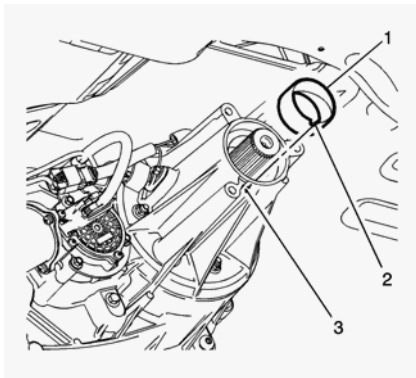
Special Tools

DT-50575 Transfer Case Rear Bushing Remover and Installer

For equivalent regional tools, refer to Special Tools.

[Removal Procedure](#)

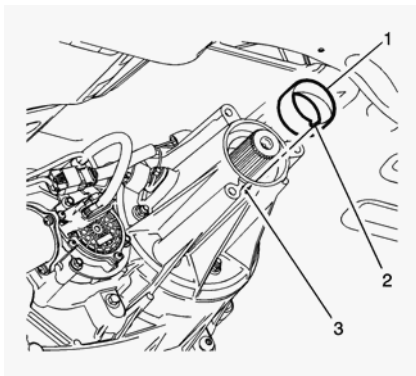
1. Remove the rear output shaft seal. Refer to Rear Output Shaft Seal Replacement.



Note: Only replace the rear output shaft bushing if it is worn or scored.

2. Install the finger section of DT-50575 remover and installer in front of the bushing (1).
3. Install the tube and forcing tube assembly into the finger section. Ensure the forcing screw is backed out.
4. Using a wrench on the forcing screw, remove the bushing.

[Installation Procedure](#)

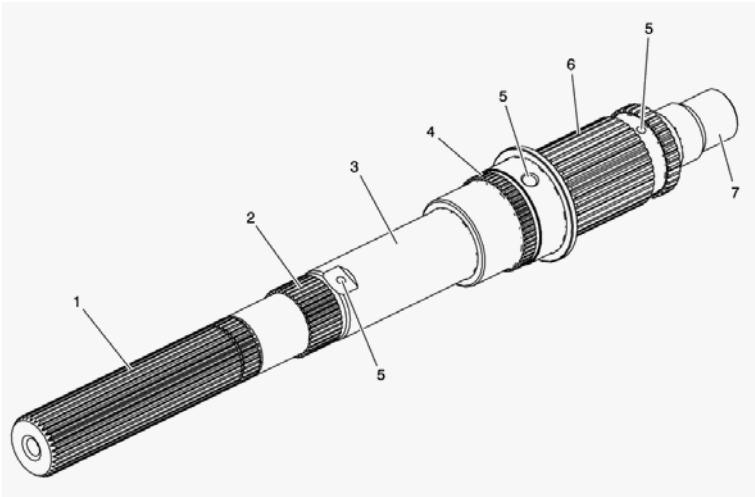


Note: The notched area of the bushing (2) should face the rear output shaft seal and be aligned with the rib of the transfer case.

1. Using DT-50575 remover and installer, install the bushing.
2. Install the rear output shaft seal. Refer to Rear Output Shaft Seal Replacement.

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Rear Output Shaft Cleaning and Inspection

Callout	Component Name
Preliminary Procedure	
- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated. - Clean all components in cleaning solvent and air dry.	
1	Transfer Case Rear Output Shaft Splines Note: Witness marks at the location of the yoke are normal.
2	Transfer Case Rear Output Shaft Speed Sensor Reluctor Wheel Engagement Splines Note: Witness marks at the location of speed sensor reluctor wheel is normal.
3	Transfer Case Front Output Shaft Drive Sprocket Bearing Surface Note: Inspect for scoring, brinelling, pitting, or excessive wear.
4	Transfer Case Oil Pump Assembly Engagement Splines Note: Witness marks at the location of the oil pump is normal.
5	Oil Galleries Note: Inspect for dirt, debris, or a restriction.
6	Transfer Case Range Shift Sleeve Engagement Splines Note: Witness marks at the location of the range shift sleeve is normal.
7	Transfer Case Input Shaft Pilot Bearing Surface Note: Inspect for scoring, brinelling, pitting, or excessive wear.

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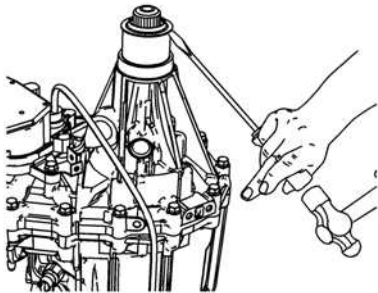
Special Tools

J-38869 Rear Extension Seal Installer

For equivalent regional tools, refer to Special Tools.

Removal Procedure

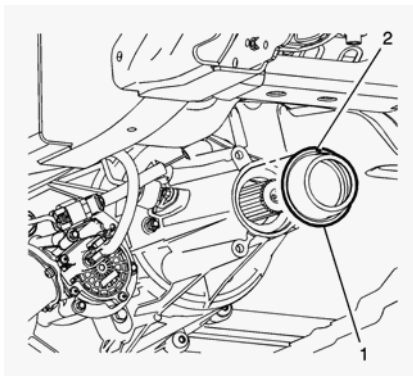
1. Remove the rear propeller shaft. Refer to One-Piece Propeller Shaft Replacement for one piece propeller shaft, or Two-Piece Rear Propeller Shaft Replacement for two piece propeller shaft.



Caution: Refer to Transfer Case Seal Removal Caution.

2. Using a suitable seal remover, remove the rear output shaft seal from the transfer case.

Installation Procedure



Note: The drain hole of the seal (1) should be aligned with the transfer case rib.

1. Using the J-38869 rear extension seal installer and a hammer, install the rear output shaft seal into the transfer case.
2. Inspect the transfer case fluid level.

Note: Ensure the seal surface of the propeller shaft yoke is clean and free from rust or scoring prior to installation.

3. Install the rear propeller shaft. Refer to One-Piece Propeller Shaft Replacement for one piece propeller shaft, or Two-Piece Rear Propeller Shaft Replacement for two piece propeller shaft.

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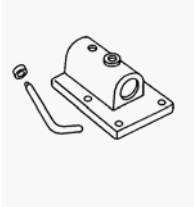
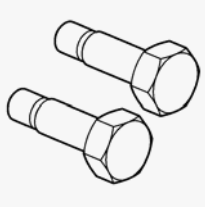
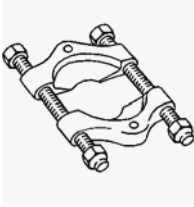
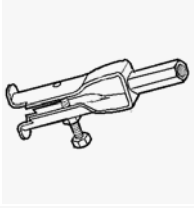
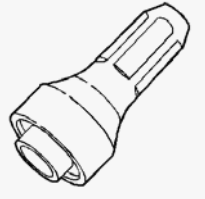
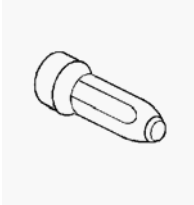
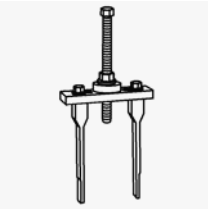
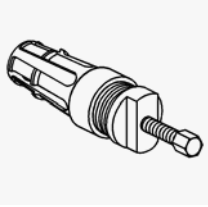
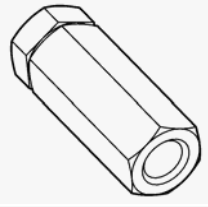
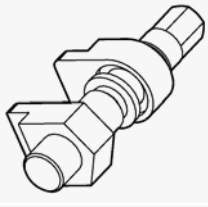
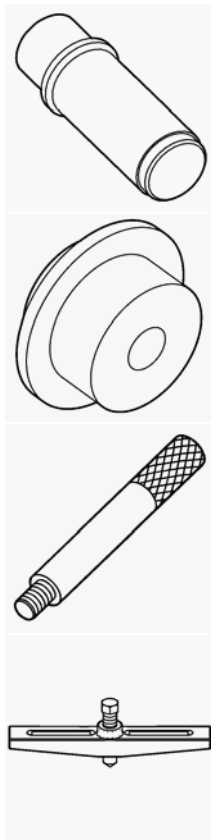
Illustration	Tool Number/Description
	DT 3289-20 J 3289-20 KM 113-2-A Holding Fixture
	DT 08614-A J 08614-A KM 210-3 7-0004805 Pinion Flange Holder and Remover
	DT 08614-20 J 08614-20 Flange Retaining Bolts
	DT 22912-B J 22912-B Split Plate Bearing Puller
	DT 29369-1 J 29369-1 Bushing and Bearing Remover
	DT 36842 J 36842 Transaxle Holding Fixture
	DT 38869 J 38869 Rear Extension Seal Installer

Illustration	Tool Number/Description
	DT 42738 J 42738 Seal Installer
	DT 45124 J 45124 Removal Bridge
	DT 45342-1 J 45342-1 Press Tube
	DT 45380 J 45380 Transfer Case Rear Bushing Remover and Installer
	DT 49308 Stud Remover and Installer
	DT 50228 Transfer Case Housing Separator
	DT 50314 Input Shaft Pilot Bearing and Actuator Shaft Seal Installer
	DT 50315 Puller Hardware Kit

Illustration



Tool Number/Description

DT 50316

Drive Sprocket Bushing Remover and Installer

DT 50633

Bearing Installer

GE 8092

J 8092

Driver Handle

GE 8433-1

J 8433-1

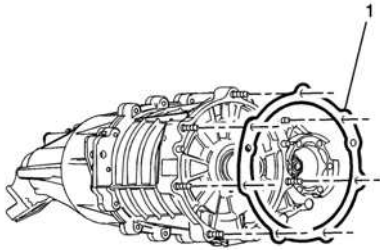
Puller Bar

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Removal Procedure

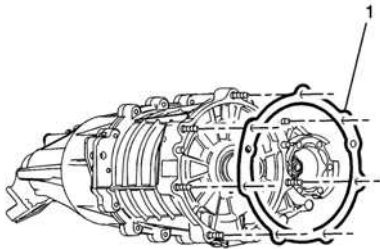
1. Remove the transfer case from the vehicle. Refer to Transfer Case Replacement.



2. Remove the transfer case extension housing gasket (1) from the transfer case.

Installation Procedure

1. Clean the gasket mating surfaces.



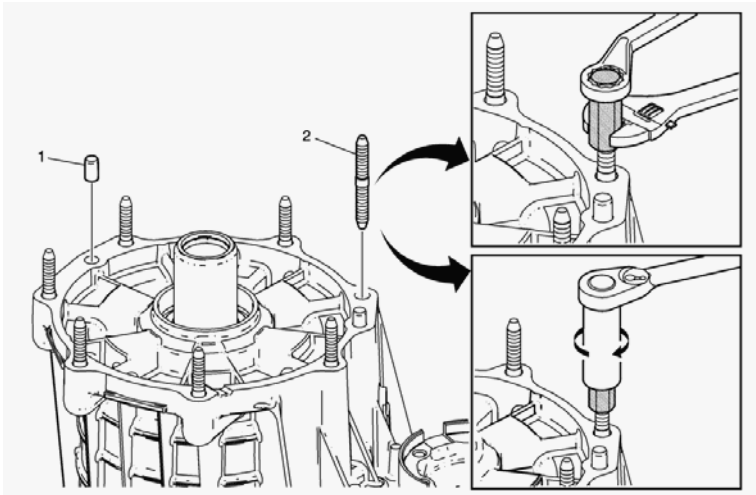
2. Install a New transfer case extension housing gasket (1) on the transfer case.
3. Install transfer case in the vehicle. Refer to Transfer Case Replacement.

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Table 1:	Transfer Case Stud Installation
Table 2:	Input Shaft Bearing and Front Output Shaft Front Bearing Installation
Table 3:	Front Output Shaft Flange Installation
Table 4:	High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Installation
Table 5:	Shift Cam Assembly Installation
Table 6:	High/Low Shift Fork, Oil Pump Assembly, and Rear Output Shaft Installation
Table 7:	Drive Chain and Sprockets Installation
Table 8:	Two/Four Wheel Drive Synchronizer Hub and Two/Four Shift Fork Installation
Table 9:	Rear Output Shaft Rear Bearing Installation
Table 10:	Front Output Shaft Rear Bearing Installation
Table 11:	Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Installation
Table 12:	Transfer Case Rear Half Installation
Table 13:	Rear Output Shaft Seal and Bushing Installation
Table 14:	Input Shaft Seal Installation
Table 15:	Oil Fill and Drain Plug, Vent Hose Connector, Two/Four Wheel Drive Actuator, and Speed Sensor Installation
Table 16:	Transfer Case Holding Fixture Removal
Table 17:	Transfer Case Vibration Dampener Installation
Table 18:	Transfer Case Shield Installation

Transfer Case Stud Installation



Transfer Case Stud Installation

Callout

1 Transfer Case Stud – Transmission Interface

Transfer Case Stud

Caution: Refer to Fastener Caution.

Note: Apply sealant P/N 12346004 (10953480 Canadian) to the stud threads before installation. Apply threadlock only to the threads on the end of the stud that will be installed into the transfer case front half.

Procedure

1. Install DT 49308 installer onto the stud.
2. Rotate the bolt until it contacts the top of the stud.
3. Install a deep socket over both the head of the bolt and the long nut and tighten the stud to specification.
4. Loosen the long nut and remove the tool from the stud.
5. Inspect the studs for the proper installation height. A properly installed stud should protrude from the face of the case 40 mm (1.58 in).

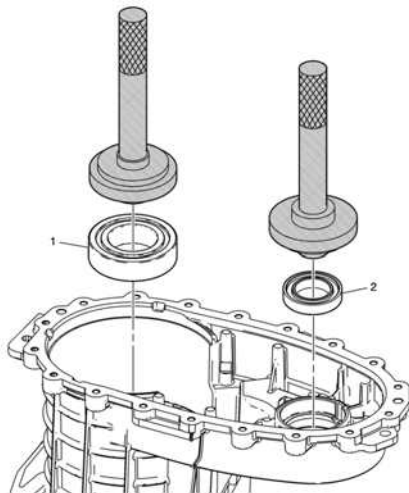
Tighten

12 Y (106 lb in)

Special Tools

DT 49308 Stud Installer

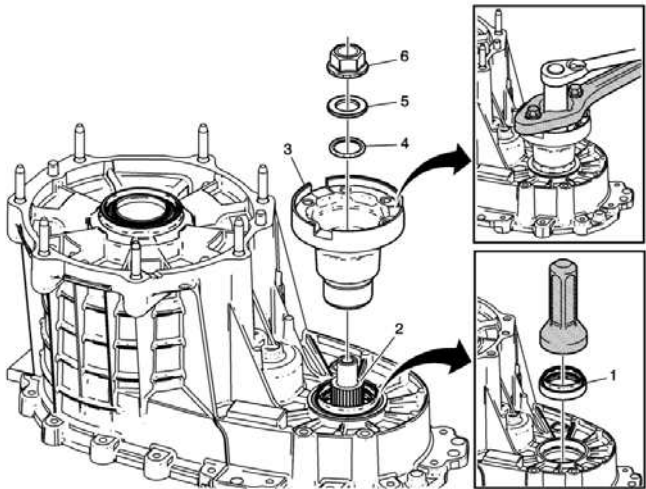
For equivalent regional tools, refer to Special Tools.



Input Shaft Bearing and Front Output Shaft Front Bearing Installation

Callout	Component Name
	Input Shaft Bearing
	Note: Use the large end of the tool to install the bearing.
	Special Tools
1	- DT 50633 Bearing Installer - GE 8092 Driver Handle For equivalent regional tools, refer to Special Tools.
	Front Output Shaft Front Bearing
	Note: Use the small end of the tool to install the bearing.
	Special Tools
2	- DT 50633 Bearing Installer - GE 8092 Driver Handle For equivalent regional tools, refer to Special Tools.

Front Output Shaft Flange Installation

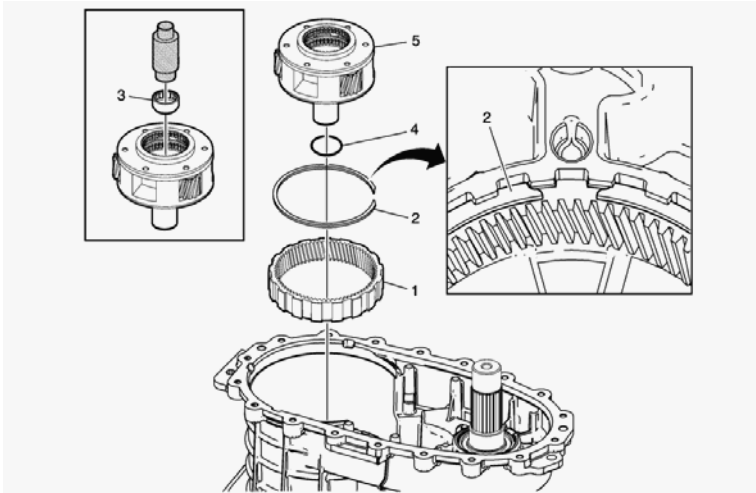


Front Output Shaft Flange Installation

Callout	Component Name
	Front Output Shaft Seal
	Special Tools
1	- J 42738 Seal Installer - DT 08814-20 Flange Retaining Bolt For equivalent regional tools, refer to Special Tools.

Callout	Component Name
2	Front Output Shaft
3	Front Output Shaft Flange
4	Front Output Shaft Flange Seal
5	Front Output Shaft Flange Washer
	Front Output Shaft Flange Nut
	Note:
	• Apply threadlock P/N 89021297 (Canadian 10953488) to the threads of the nut. • Use the J 08614-A holder and remover to hold the flange while tightening the nut.
6	Tighten
	145 Y (107 lb ft)
	Special Tools
	J 08614-A Pinion Flange Holder and Remover
	For equivalent regional tools, refer to Special Tools.

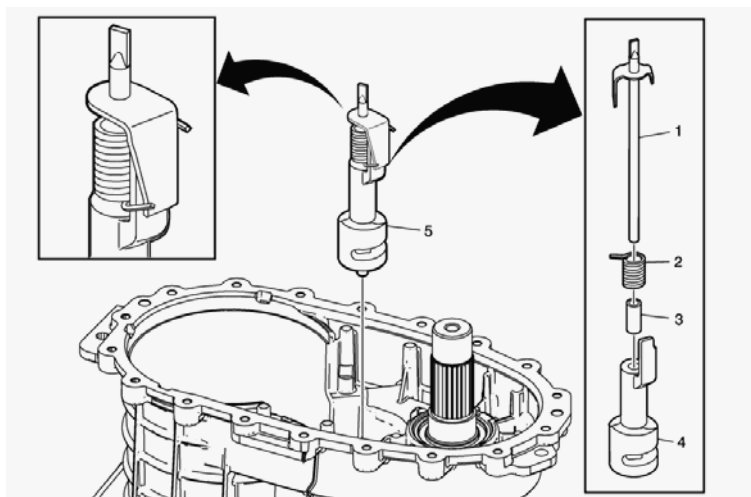
[High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Installation](#)



High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Installation

Callout	Component Name
	Planetary Carrier Internal Gear
1	Note: First design planetary carriers are a 6-pinion design. Second design planetary carriers are a 3-pinion design. When replacing a 6-pinion carrier with a 3-pinion design, the 3-pinion design planetary carrier internal gear must also be used. Refer to New Product Information.
	High/Low Internal Gear Retaining Ring
2	Note: Install the retaining ring so the ring ends are accessible for service.
	Input Shaft Pilot Bearing
	Note: Apply sealant P/N 89021297 (Canadian 10953588) to the outer diameter of the bearing.
3	Special Tools
	DT 50314 Input Shaft Pilot Bearing Remover/Installer
	For equivalent regional tools, refer to Special Tools.
4	Input Shaft O-ring Seal
	High/Low Planetary Carrier Assembly
5	Note: First design planetary carriers are a 6-pinion design. Second design planetary carriers are a 3-pinion design. When replacing a 6-pinion carrier with a 3-pinion design, the 3-pinion design planetary carrier internal gear must also be used. Refer to New Product Information.

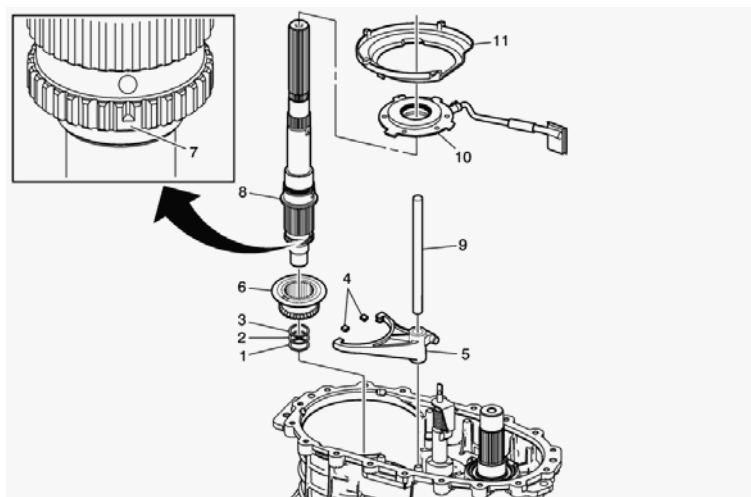
[Shift Cam Assembly Installation](#)



Shift Cam Assembly Installation

Callout	Component Name
1	Shift Detent Lever Shaft
2	High/Low Shift Fork Shaft Detent Spring Note: Ensure the spring tabs are installed in the correct orientation.
3	Shift Detent Lever Spacer
4	Shift Cam
5	Shift Cam Assembly

[High/Low Shift Fork, Oil Pump Assembly, and Rear Output Shaft Installation](#)

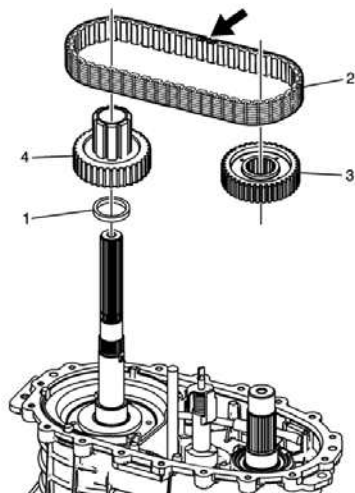


High/Low Shift Fork, Oil Pump Assembly, and Rear Output Shaft Installation

Callout	Component Name
1	Planetary Carrier Sun Gear Thrust Washer
2	Input Shaft Thrust Bearing Note: Apply lubricant to the bearing.
3	Planetary Carrier Sun Gear Thrust Washer
4	High/Low Shift Fork Pads
5	High/Low Shift Fork
6	Range Shift Sleeve Note: Assemble and install the range shift sleeve and high/low drive shift fork as an assembly.
7	Rear Output Shaft Spline Alignment

Callout	Component Name
	Rear Output Shaft
	Note:
8	- Note the orientation of the rear output shaft external splines to the range shift sleeve internal splines. - Use care when installing the rear output shaft to properly align the input end of the shaft through both the planetary carrier sun gear thrust washers and the input shaft thrust bearing.
9	Shift Rail
	Oil Pump Assembly
10	Note: Inspect for proper orientation of the oil pump retaining clip onto the oil pump. Refer to Oil Pump Cleaning and Inspection.
11	Support Bracket

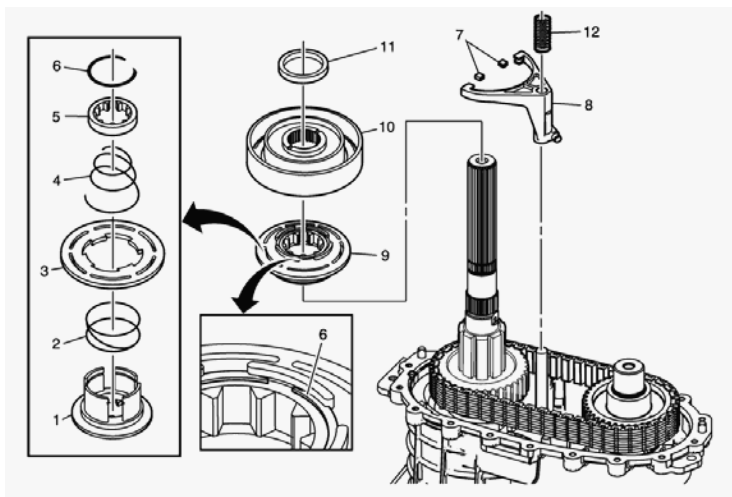
[Drive Chain and Sprockets Installation](#)



Drive Chain and Sprockets Installation

Callout	Component Name
1	Front Output Shaft Drive Sprocket Thrust Washer
	Front Output Shaft Drive Chain Assembly
	Procedure
2	1. Install the drive chain, driven sprocket, and drive sprocket as an assembly. 2. Note the orientation of the blue chain links to the sprockets. The blue chain links should be positioned facing upward and away from the case half.
3	Front Output Shaft Driven Sprocket
4	Front Output Shaft Drive Sprocket

[Two/Four Wheel Drive Synchronizer Hub and Two/Four Shift Fork Installation](#)



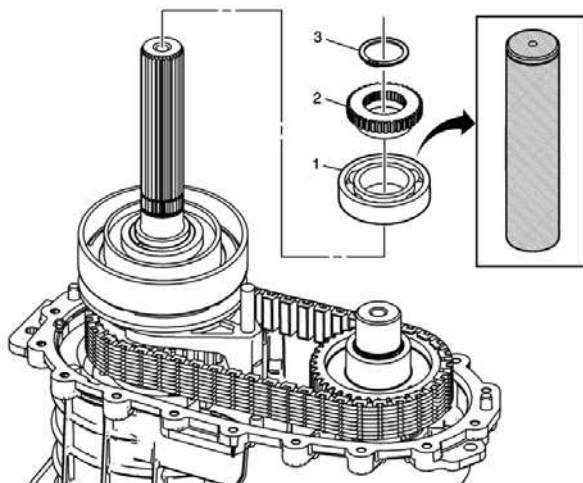
Two/Four Wheel Drive Synchronizer Hub and Two/Four Shift Fork Installation

Callout

Component Name

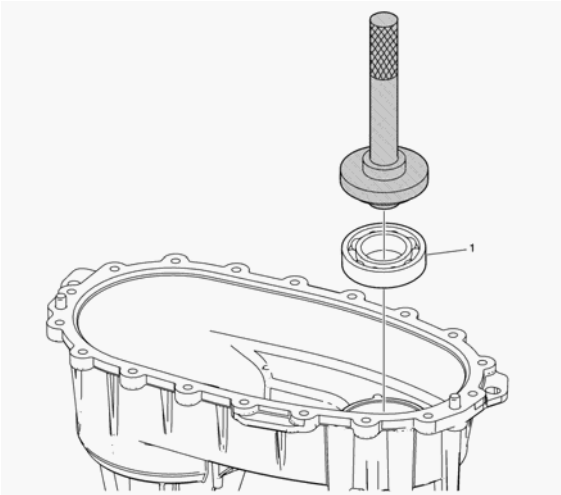
- | | |
|----|---|
| 1 | Two/Four Wheel Drive Clutch Coil Housing |
| 2 | Two/Four Wheel Drive Synchronizer Hub Outer Spring |
| 3 | Four Wheel Drive Armature Plate |
| 4 | Two/Four Wheel Drive Synchronizer Hub Inner Spring |
| 5 | Synchronizer Collar |
| 6 | Lockup Retaining Ring
Note: Ensure the ends of the retaining ring are to be positioned as indicated (6). The ends of the ring should NOT be positioned into an open area of the housing. |
| 7 | Two/Four Shift Fork Pads |
| 8 | Two/Four Shift Fork |
| 9 | Two/Four Wheel Drive Lockup Assembly
Note: Assemble the synchronizer/lockup assembly to the shift fork and install both components at the same time, positioning the lockup assembly onto the rear output shaft and the fork onto the shift rail. |
| 10 | Two/Four Wheel Drive Synchronizer Hub |
| 11 | Rear Output Shaft Bearing Spacer |
| 12 | Shift Fork Spring |

[Rear Output Shaft Rear Bearing Installation](#)



Callout	Component Name
	Rear Output Shaft Rear Bearing
	Special Tools
1	J 45342-1 Bearing Installer For equivalent regional tools, refer to Special Tools.
2	Rear Output Shaft Speed Sensor Reluctor Wheel Note: The raised area of the reluctor wheel should face the bearing.
3	Vehicle Speed Sensor Reluctor Wheel Retaining Ring

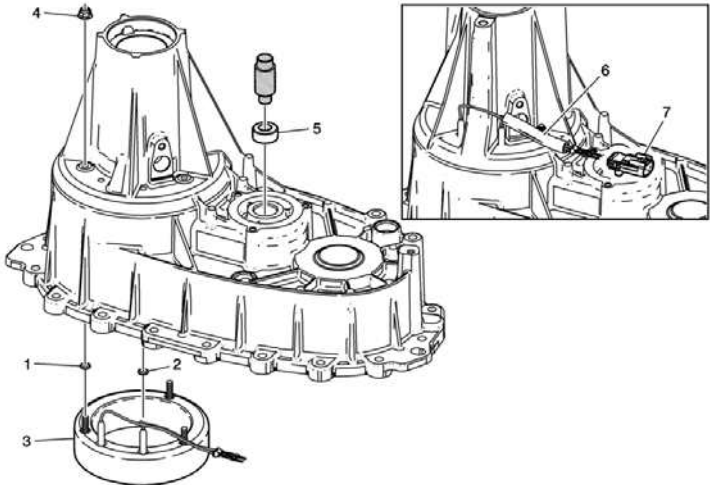
[Front Output Shaft Rear Bearing Installation](#)



Front Output Shaft Rear Bearing Installation

Callout	Component Name
	Front Output Shaft Rear Bearing
	Note: Use the small end of the tool to install the bearing.
	Special Tools
1	- DT 50633 Bearing Installer - GE 8092 Driver Handle For equivalent regional tools, refer to Special Tools.

[Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Installation](#)

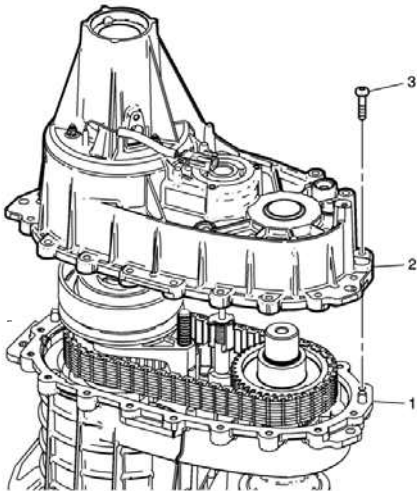


Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Installation

Callout	Component Name
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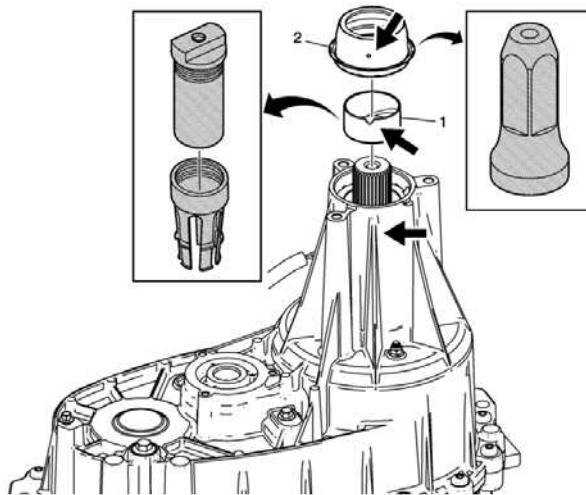
Callout	Component Name
1	Two/Four Wheel Drive Clutch Coil Stud O-ring Seal
2	Two/Four Wheel Drive Clutch Coil Wire O-ring Seal
3	Two/Four Wheel Drive Clutch Coil Assembly Note: Carefully slide the wires through the holes in the case to avoid damage to the wire coating.
4	Two/Four Wheel Drive Clutch Coil Nut Note: Tighten the nuts evenly to ensure the coil is installed and seated properly to the rear case. Tighten 12 Y (106 lb in) Cam Shaft Detent Lever Seal Note: The metal face of the seal should be positioned towards the installer tool.
5	Special Tools <i>DT 50314</i> Input Shaft Pilot Bearing Installer For equivalent regional tools, refer to Special Tools.
6	Synchronizer Coil Wiring Harness Conduit Note: Slide the conduit over the synchronizer coil wires to install it.
7	Synchronizer Coil Wiring Harness Connector Assembly Note: Insert the wires into the connector and install the connector wire retaining clip.

[Transfer Case Rear Half Installation](#)



Transfer Case Rear Half Installation

Callout	Component Name
	Transfer Case Front Half Caution: Apply the proper amount of sealant to the flange when assembling the transfer case. Excessive amounts of sealant can plug the oil pump screen, resulting in internal component failure.
1	Procedure • Ensure both sealing surfaces of the front and rear case halves are free of dirt, oil and cleaning solvent. • Apply a 3.5–4.0 mm (0.14–0.16 in) bead of sealant P/N 12346286 (Canadian 10953472) to the sealing service of the front case half.
2	Transfer Case Rear Half Transfer Case Half Bolt (Qty: 18)
3	Tighten 37 Y (27 lb ft)



Rear Output Shaft Seal and Bushing Installation

Callout

Component Name

Rear Output Shaft Bushing

Note: The notched area of the bushing should face the rear seal and be aligned with the rib of the case.

1

Special Tools

J 45380 Transfer Case Rear Bushing Remover and Installer

For equivalent regional tools, refer to Special Tools.

Rear Output Shaft Seal

Note: The drain hole of the seal should be aligned with the rib of the case.

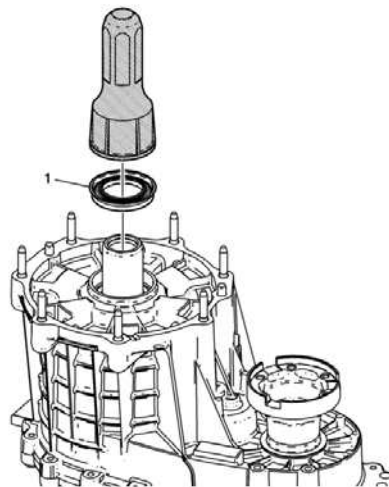
2

Special Tools

J 38869 Rear Extension Seal Installer

For equivalent regional tools, refer to Special Tools.

[Input Shaft Seal Installation](#)



Input Shaft Seal Installation

Callout

Component Name

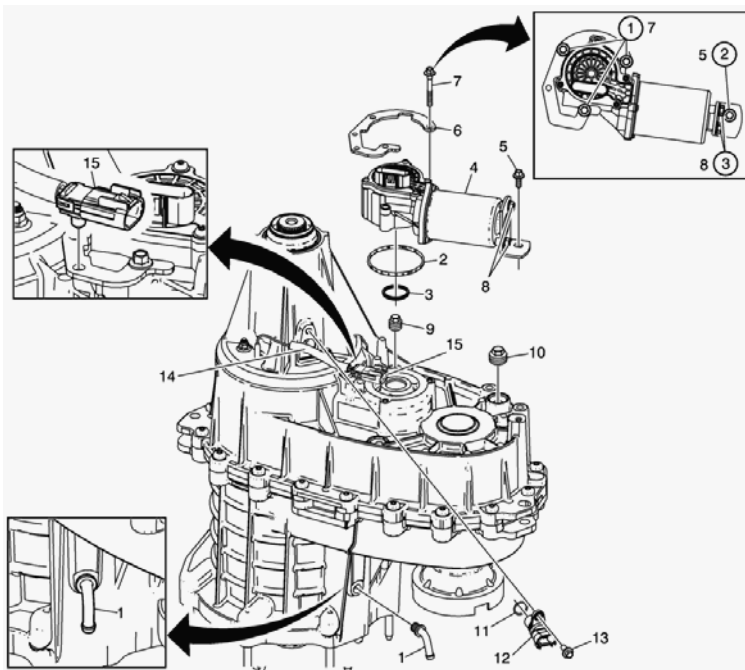
Input Shaft Seal

1

Special Tools

J 42738 Seal Installer

For equivalent regional tools, refer to Special Tools.



Oil Fill and Drain Plug, Vent Hose Connector, Two/Four Wheel Drive Actuator, and Speed Sensor Installation

Callout

Component Name

Vent Hose Connector

Note:

1

- Apply sealant P/N 12346004 (Canadian 10953480) to the hose connector before installation.
- Apply the sealant only to the end of the connector that installs into the case.

2

Two/Four Wheel Drive Actuator Outer O-ring Seal

3

Two/Four Wheel Drive Actuator Inner O-ring Seal

4

Two/Four Wheel Drive Actuator Assembly

Two/Four Wheel Drive Actuator Bolt

Procedure

Tighten in the sequence shown.

5

Note: Motor nuts and bolts have a specific tightening sequence, tighten bolts 7 before tightening bolt 5, then tighten the bracket nuts (8 Nm 70 lb in) last, as required

Tighten

12 Y (106 lb in)

6

Actuator Motor Bracket

Two/Four Wheel Drive Actuator Motor Bracket Bolt

7

Tighten

12 Y (106 lb in)

Bracket nuts

8

Tighten

8 Y (70 lb in)

Oil Fill Plug

Note:

9

- Apply sealant and install the fill plug ONLY after the correct type and quantity of fluid has been added to the assembly. Refer to Adhesives, Fluids, Lubricants, and Sealers.
- Apply sealant P/N 12346004 (Canadian 10953480) to the fill plug threads.

Tighten

15 Y (11 lb ft)

Oil Drain Plug

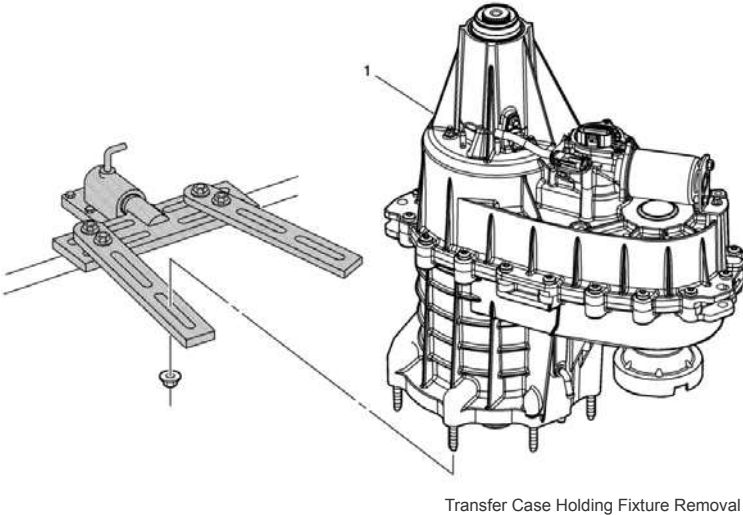
10

Note: Apply sealant PN 12346004 (Canadian 10953480) to the drain plug threads.

Tighten

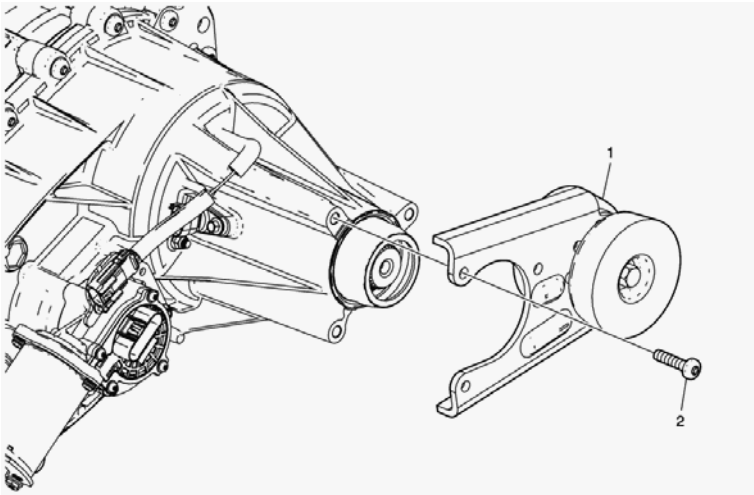
Callout	Component Name
	30 Y (22 lb ft)
11	Speed Sensor O-ring Seal Note: The speed sensor O-ring seal is reusable. Inspect the O-ring seal for damage and replace as required.
12	Rear Output Shaft Speed Sensor
13	Speed Sensor Bolt Tighten 12 Y (106 lb in)
14	Synchronizer Coil Wiring Harness Conduit Note: Slide the conduit over the synchronizer coil wires to install it.
15	Electrical Connector Note: Install the electrical retainer into the hole in the actuator motor bracket.

Transfer Case Holding Fixture Removal



Callout	Component Name
	Transfer Case
	Special Tools
1	- J 3289-20 Holding Fixture Base Assembly - J 36842 Case Holding Fixture For equivalent regional tools, refer to Special Tools.

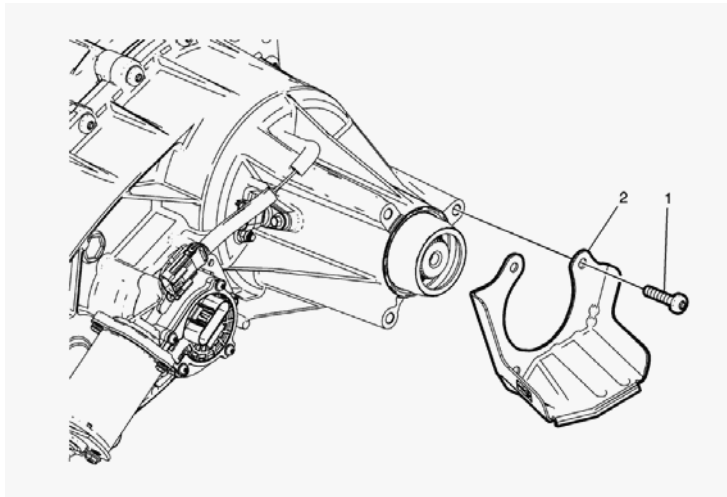
Transfer Case Vibration Dampener Installation



Transfer Case Vibration Dampener Installation

Callout	Component Name
1	Transfer Case Vibration Dampener - Model Dependent
	Transfer Case Vibration Dampener Bolt - Model Dependent
2	Tighten
	25 Y (18 lb ft)

[Transfer Case Shield Installation](#)



Transfer Case Shield Installation

Callout	Component Name
1	Transfer Case Shield - Model Dependent
	Transfer Case Shield Bolt - Model Dependent
2	Tighten
	25 Y (18 lb ft)

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

General Description

The American Axle Manufacturing (AAM) transfer cases, with broadcast codes – NQV is a 2-speed, part-time 4WD, electric-shift design. A 6-pinion or 3-pinion planetary carrier assembly provides high and low operating ranges. The planetary sun gear and annulus gear arrangement creates a 2.62-to-1 low-range gear reduction ratio. When in 4WD mode, torque is distributed front-to-rear based on vehicle conditions. Refer to New Product Information for additional information on the 6-pinion to 3-pinion planetary design change.

The case halves are a die-cast aluminum design. A double-row ball bearing supports the input shaft. Single row ball bearings support the front and rear output shafts. A needle roller bearing is located internal to the input shaft gear and supports the front of the rear output shaft. A gerotor type oil pump transfers fluid from the sump through the rear output shaft oil galleries to the gears and the bearings. The transfer case requires DEXRON®VI fluid, which is red in color. Refer to Adhesives, Fluids, Lubricants, and Sealers.

The transfer case features a 4 mode shift control rotary switch located on either the center floor shift console or instrument panel. When the ignition is in the RUN position, the transfer case shift control module monitors the transfer case shift control switch to determine if the driver desires a new mode/range position. At a turn of the transfer case shift control switch, the lamp of the new desired position will begin flashing to inform the driver that the transfer case shift control module has received the request for a new mode/range position. The lamp continues to flash until all shifting criteria has been met and the new mode/range position has been engaged. Once the new mode/range position is fully active, the switch indicator for the new position will remain ON constantly. In the event that the transfer case shift control module cannot or will not complete the shift, the indicator switch light flashes and returns the transfer case to the previously selected position.

The transfer case provides the driver with 4 manual mode/range positions:

- 2H - 2 Wheel Drive high range
- 4H - 4 Wheel Drive high range
- 4L - 4 Wheel Drive low range with a 2.62:1 gear ratio reduction
- NEUTRAL

2H to 4H

Turn the knob to the Four-Wheel High position. This can be done at any speed up to 120 km/h (75 mph), and the front axle will lock automatically. The transfer case will then change from 2H mode to 4H mode. The front and rear propeller shafts will then be mechanically coupled together and the front axle shafts coupled to the front propeller shaft.

2H or 4H to 4L

To shift from Two-Wheel High or Four-Wheel High to Four-Wheel Low, the vehicle must be stopped or moving less than 5 km/h (3 mph) with the transmission in N (Neutral) for an automatic transmission or the clutch pedal fully depressed for a manual transmission. The preferred method for shifting into Four-Wheel Low is to have your vehicle moving 1.6 to 3.2 km/h (1 to 2 mph). Rotate the shift control switch to the Four-Wheel Low position. You must wait for the Four-Wheel Low indicator light to stop flashing and stay on before shifting the transmission into gear or releasing the clutch pedal. If the Four-Wheel Low position is selected when the vehicle is in gear and/or moving faster than 5 km/h (3 mph), the Four-Wheel Low indicator light will flash for 30 seconds and will not complete the shift.

4H to 2H

Rotate the shift control switch to the Two-Wheel High position. This can be done at any speed up to 120 km/h (75 mph), and the front axle will unlock automatically. It is normal to hear and feel the vehicle's transfer case shift into Two-Wheel High. If you shift with the vehicle stopped, the indicator light may still flash. It may be necessary to shift the transmission momentarily into R (Reverse) and D (Drive), for an automatic transmission, or R (Reverse) and 1 (First) for a manual transmission to have the light stop flashing.

4L to 2H or 4H

To shift from Four-Wheel Low to Two-Wheel High or Four-Wheel High, the vehicle must be stopped or moving less than 5 km/h (3 mph) with the transmission in N (Neutral) for an automatic transmission or the clutch pedal pressed for a manual transmission. The preferred method for shifting out of Four-Wheel Low is to have your vehicle moving 1.6 to 3.2 km/h (1 to 2 mph). Rotate the shift control switch to the Two-Wheel High or Four-Wheel High position. You must wait for the Two-Wheel High or Four-Wheel High indicator light to stop flashing and stay on before shifting the transmission into gear or releasing the clutch pedal. If the Two-Wheel High or Four-Wheel High position is selected when the vehicle is in gear and/or moving faster than 5 km/h (3 mph), the Two-Wheel High or Four-Wheel High indicator light will flash for 30 seconds and will not complete the shift.

2H, 4H, or 4L to Neutral

Use N (Neutral) when you plan to tow the vehicle. To shift the transfer case into N (Neutral) do the following:

1. Set the parking brake.
2. Start the vehicle.
3. Press the regular brake pedal and shift the transmission in N (Neutral), or press in the clutch pedal for vehicles with a manual transmission.
4. Shift the transfer case to Two-Wheel High.
5. Rotate the shift control switch clockwise past Four-Wheel Low to N (Neutral). Hold the switch in the neutral setting for at least 20 seconds or wait until the red neutral indicator light illuminates. The neutral red indicator light will come on when the transfer case shift to neutral is complete. Upon releasing the shift control switch from the neutral setting, the switch will rotate to the Four-Wheel Low setting. The transfer case will remain in neutral with the red neutral indicator light illuminated until a new setting is selected.
6. Press and hold the regular brake pedal and shift the transmission to R (Reverse) for one second, then shift the transmission to D (Drive) for one second, or 1 (First) for vehicles with manual transmission and let out the clutch to insure the transfer case is in Neutral. If the transfer case is not in Neutral, repeat this procedure starting at Step 3.
7. Turn the engine off by turning the key to ACC/ACCESSORY.
8. Place the transmission shift lever in P (Park), or 1 (First) for vehicles that have a manual transmission
9. Turn the ignition to LOCK/OFF.

Note: This neutral setting is a 2WD neutral, meaning the front and rear outputs of the transfer case are not engaged and should be treated as though in 2HI. With a disengaged front axle, there is no power flow to the front wheels, thus allowing towing with the front wheels off the ground or flat towing without driveline binding.

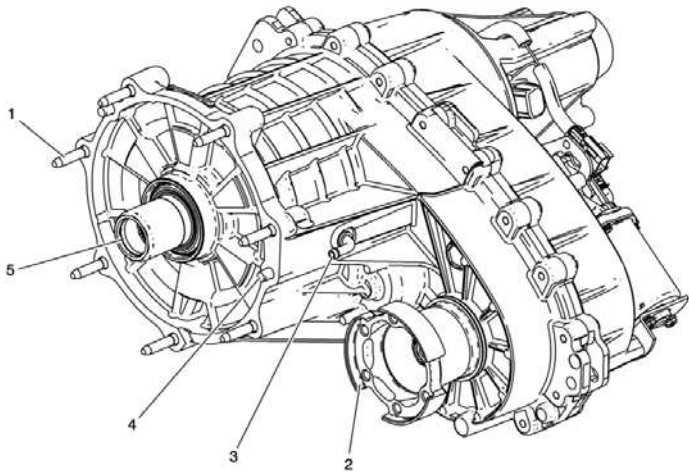
Once these conditions have been met, rotate the rotary switch clockwise past 4L to N (Neutral) and hold for 20 seconds. When the system completes the shift to neutral, the red neutral amp will illuminate. A shift to the neutral position allows the vehicle to be towed without rotating the transmission output shaft. In the neutral position, the rear propeller shaft rotates the transfer case rear output shaft, in turn rotating the oil pump, thus providing constant lubrication during towing. This

neutral position is a 2WD Neutral, meaning the front and rear outputs of the transfer case are not engaged as though in 2HI. With a disengaged front axle, there is no power flow to the front wheels, thus allowing towing with the front wheels off the ground or flat towing without driveline binding

Build Variations

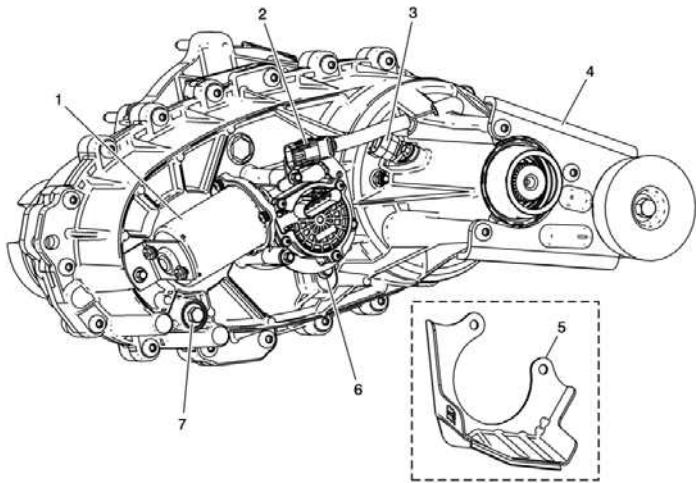
Broadcast Code	Other	Engine	Transmission	Axle Ratio
NQV	w/damper	LWH (2.8L Diesel)	MYB (6 speed AT)	3.42
NQV	—	LY7 (3.6L Gasoline)	MYB (6 speed AT)	3.42
NQV	w/damper	LWH (2.8L Diesel)	MYN (5 speed MT)	3.73
NQV	—	LY7 (3.6L Gasoline)	MYF (5 speed MT)	3.73
NQV	w/damper	LVN (2.5L Diesel)	MYL (5 speed MT)	4.10
NQV	w/rear shield	LE6 (2.4L Family II Gasoline)	MYG (5 speed MT)	4.56

External Components



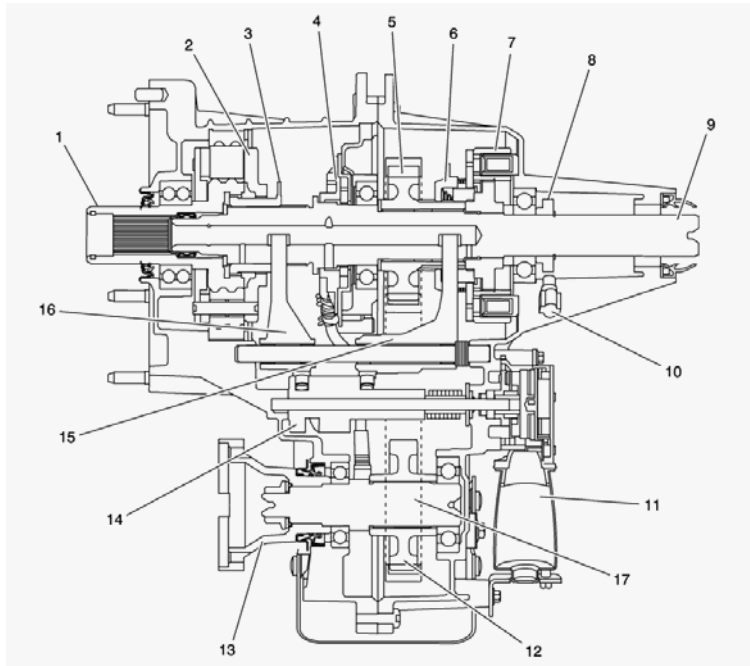
- (1) Transfer Case-to-Transmission Adapter Studs
- (2) Front Output Flange
- (3) Vent Hose Connector
- (4) Transfer Case-to-Adapter Locating Pins
- (5) Input shaft

External Components



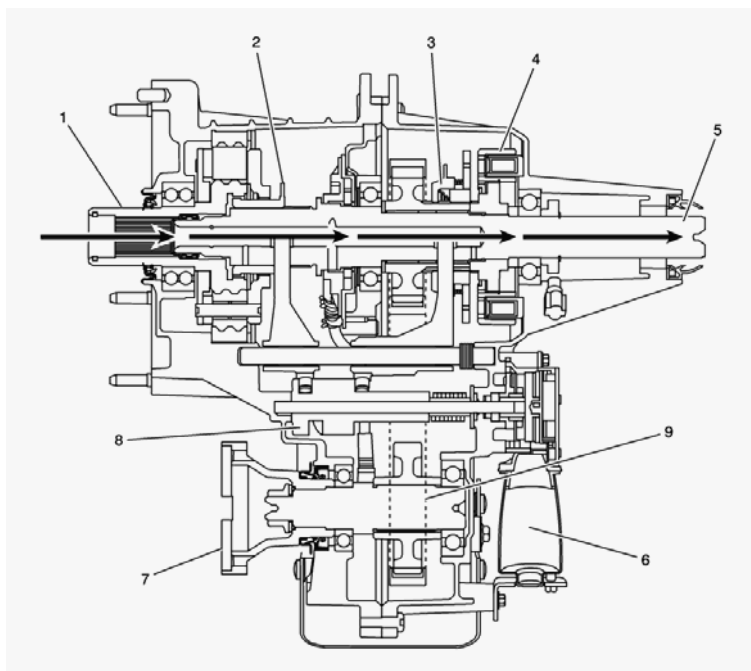
- (1) Actuator Motor
- (2) Synchronizer Coil Electrical Harness Connector
- (3) Vehicle Speed Sensor
- (4) Damper (LVN/LWH Diesel engines – MYB/MYL/MYN transmission applications)
- (5) Shield (LE6 engine – MYG transmission applications)
- (6) Oil Fill Plug
- (7) Transfer Case-to-Adapter Locating Pins

[Internal Components](#)



- (1) Input Shaft
- (2) Planetary Assembly
- (3) H/L Range Shift Sleeve
- (4) Oil Pump
- (5) Drive Sprocket
- (6) 2/4 Lock-up Collar Assembly
- (7) Synchronizer Coil
- (8) Reluctor Wheel
- (9) Rear Output Shaft
- (10) Vehicle Speed Sensor
- (11) Actuator Motor
- (12) Driven Sprocket
- (13) Front Output Flange
- (14) Shift Cam
- (15) 2/4 Shift Fork
- (16) H/L Shift Fork
- (17) Drive Chain

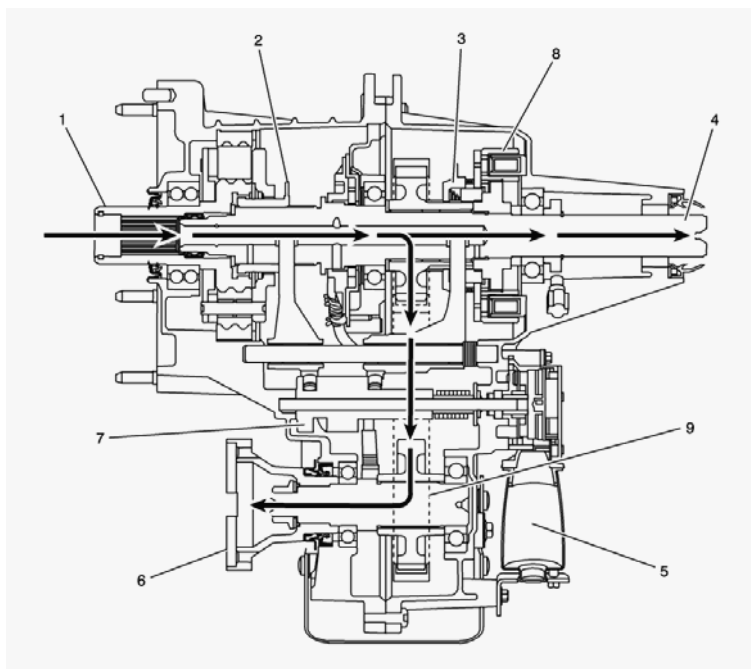
[2H Power Flow](#)



With the transfer case in the 2H mode:

- The input shaft (1) is rotating.
- The actuator motor (6) has rotated the shift cam (8) to the 2H position
- The H/L shift fork and range shift sleeve (2) are in the 2H position with the teeth of the range shift sleeve engaged into the teeth of the input shaft.
- The 2/4 shift fork and lockup collar assembly (3) are in the 2H position with the splines of the collar assembly engaged to the splines of the drive sprocket.
- The synchronizer coil (4) is not energized.
- The rear output shaft (5) is rotating.
- The front output shaft (7) and chain (9) are not rotating.

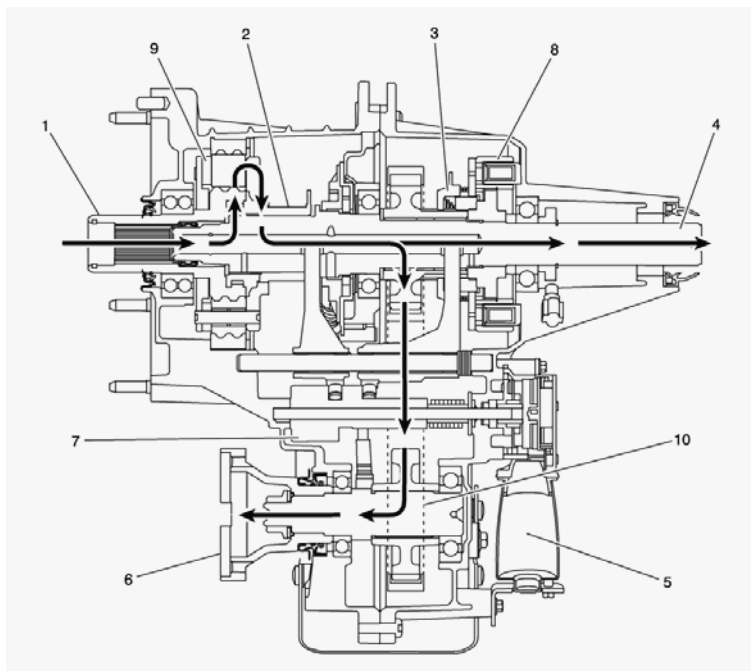
[4H Power Flow](#)



With the transfer case in the 4H mode:

- The input shaft (1) is rotating.
- The actuator motor (5) has rotated the shift cam (7) to the 4H position.
- The H/L shift fork and range shift sleeve (2) are in the 4H position with the teeth of the range shift sleeve engaged into the input shaft.
- The 2/4 shift fork and lockup collar assembly (3) are in the 4H position with the splines of the collar engaged to the splines of the lockup hub.
- The synchronizer coil (8) is energized only until the shift has been completed.
- The rear output shaft (4), chain (9), and front output shaft (6) are rotating.

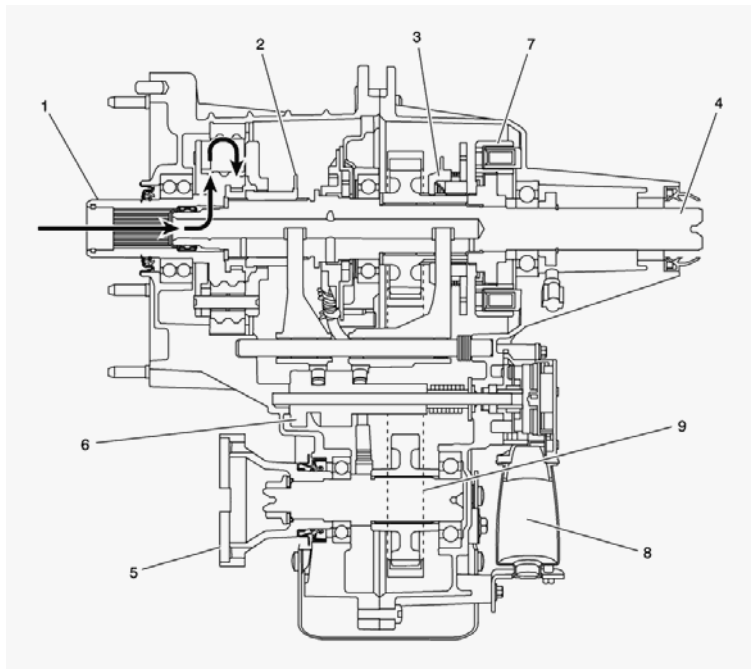
[4L Power Flow](#)



With the transfer case in the 4H mode:

- The input shaft (1) is rotating.
- The actuator motor (5) has rotated the shift cam (7) to the 4L position.
- The H/L shift fork and range shift sleeve (2) are in the 4L position with the teeth of the range shift sleeve engaged into the planetary assembly (9).
- The 2/4 shift fork and lockup collar assembly (3) are in the 2HI position with the splines of the collar engaged to the splines of the lockup hub.
- The synchronizer coil (8) is energized only until the shift has been completed.
- The rear output shaft (4), planetary (9), chain (10), and front output shaft (6) are rotating.

NEUTRAL Power Flow



With the transfer case in the Neutral mode:

- The input shaft (1) is rotating.
- The actuator motor (6) has rotated the shift cam (8) to the neutral position.
- The H/L shift fork and range shift sleeve (2) are in the neutral position with the teeth of the range shift sleeve not engaged into the planetary or to the input shaft.
- The 2/4 shift fork and lockup collar assembly (3) are in a 2HI position with the splines of the collar assembly engaged to the splines of the drive sprocket.
- The synchronizer coil (4) is not energized.
- The rear output shaft (5), chain (9) and front output shaft (7) are not rotating.

[Transfer Case 4WD System Components](#)

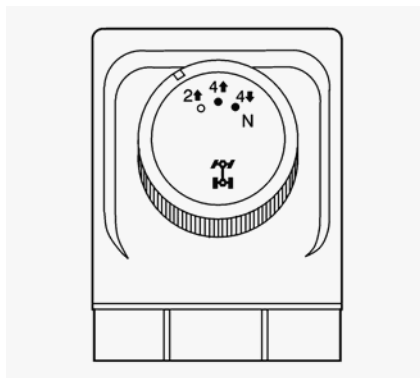
View the list of major electrical components that make up the four wheel drive (4WD) transfer case system below.

[Service 4WD Message](#)



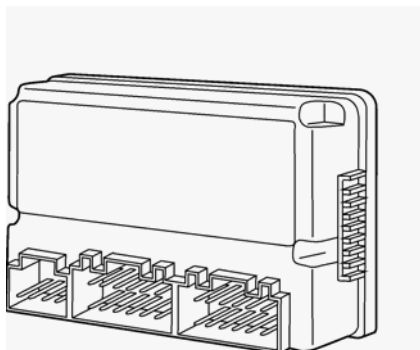
The Service 4WD message is a display within the drivers information center (DIC). This message is used to inform the driver that a transfer case system condition has occurred. The Service 4WD message is controlled by the transfer case shift control module via GM LAN.

[Transfer Case Shift Control Switch](#)



The 4WD system features a position shift control switch located on either the center floor shift console or instrument panel. When the ignition key is in the RUN position, the TCCM monitors the transfer case shift control switch to determine if the driver desires a new mode/range position. When either 2H, 4H, or 4L position is requested by rotating the switch, the corresponding LED of the new desired position will begin flashing to inform the driver that the TCCM has received a request for a new mode/range position. The LED continues to flash until all shifting criteria have been met and the new mode/range position is engaged. Once the new mode/range position is fully active, the switch indicator LED for the new position will remain ON constantly. To request the neutral position, the transfer case shift control switch is designed to be manually held in the neutral position for at least 10 seconds. If the switch is not manually held in the neutral position, the internal spring will return the switch to the 4L position when released. There is no flashing LED for the neutral position. When the criteria is met for a shift to neutral and the shift has been completed, the letter "N" will be illuminated red in color.

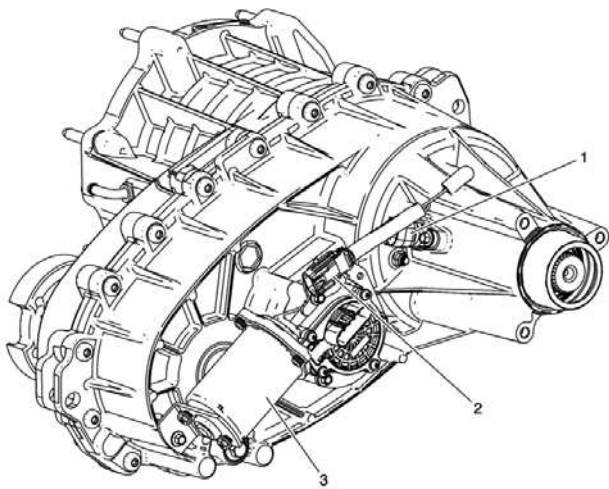
[Transfer Case Shift Control Module](#)



The transfer case is controlled by a GM LAN compliant transfer case control module (TCCM). The TCCM monitors various vehicle sensors and the driver's input, and controls the transfer case motor/actuator and front axle actuator accordingly. Refer to Control Module References and Transfer Case Shift Control Module Scan Tool Information

The vehicle speed sensor (VSS) is digital frequency voltage input to the Engine Control Module (ECM). The ECM sends this information to the transfer case control module (TCCM) via the GM LAN serial data bus. Refer to cell link TBD.

[Transfer Case Two/Four Wheel Drive Actuator Motor](#)

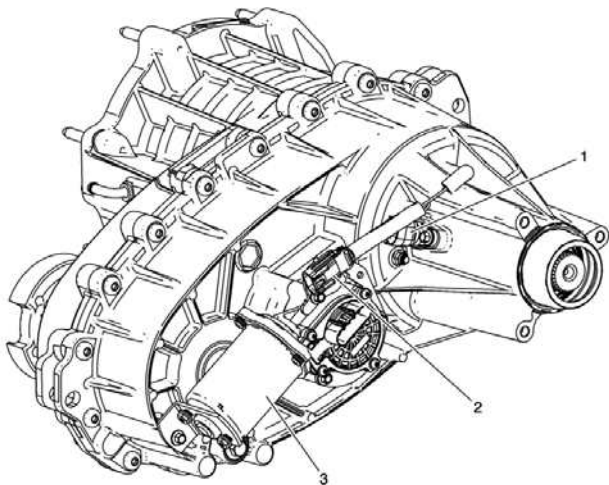


The transfer case two/four wheel drive actuator motor (3) is a bi-directional, permanent magnet, DC motor. The motor is commanded when either control motor circuit A or control motor circuit B is energized. The circuit ground is provided through the transfer case control module (TCCM) via the opposing control motor circuit. The actuator motor, through a series of gears, rotates the transfer case shift detent lever shaft, which moves the transfer case shift cam and transfer case high/low shift forks to shift the transfer case to the following modes or ranges:

- 2H
- 4H
- 4L
- Neutral

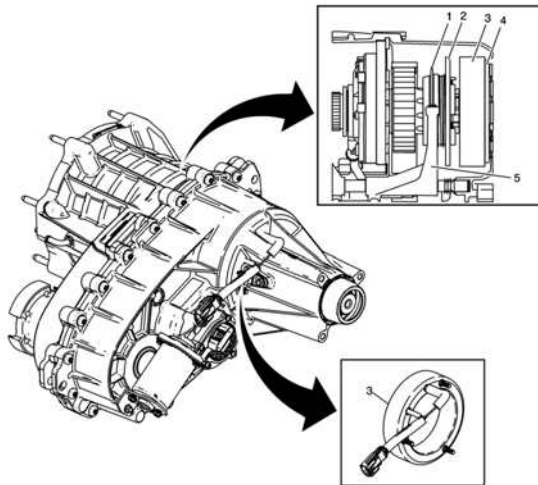
The actuator motor incremental sensor is a voltage input to the TCCM. The incremental sensor is an integral part of the transfer case actuator motor and cannot be replaced independently.

[Vehicle Speed Sensor](#)



There is a Vehicle Speed Sensor (VSS) (1) mounted to the transfer case on the rear output shaft. The VSS is a pulse modulated (PM) generator. The PM generator produces a digital voltage between 0-5 volts. The digital voltage signal frequency increases as vehicle speed increases. The VSS is an input to the Engine Control Module (ECM). The ECM sends this information to the TCCM via the GM LAN serial data bus. The VSS is external to the transfer case and can be serviced separately.

[Synchronizer Coil](#)



When either 4HI or 4LO mode is requested, the TCCM sends a 12-volt signal to the two/four wheel drive clutch coil (4) via the clutch coil control circuit. The clutch coil is energized creating a magnetic field. The electro-magnetic field causes the armature plate (2) of the two/four wheel drive lockup assembly (1) to be drawn towards the two/four wheel drive synchronizer hub (3). As the two parts move closer to each another, the lockup assembly (1) begins to rotate. Once the rotational speeds of the lockup assembly and the synchronizer hub are equal, the two/four wheel drive shift fork (5) continues to move until the components are mechanically coupled in 4WD. When the coupling of the lockup assembly and synchronizer hub are complete, the TCCM will then command the front axle actuator to engage. With the vehicle in either the 4HI or 4LO mode, the front axle actuator remains in 4WD position until a new range is selected. At that point, the 12 volt signal to the two/four wheel drive clutch coil is turned off. The clutch coil circuit is controlled by the TCCM high and low side drivers. Both circuits must be activated to engage the system.

Front Drive Axle

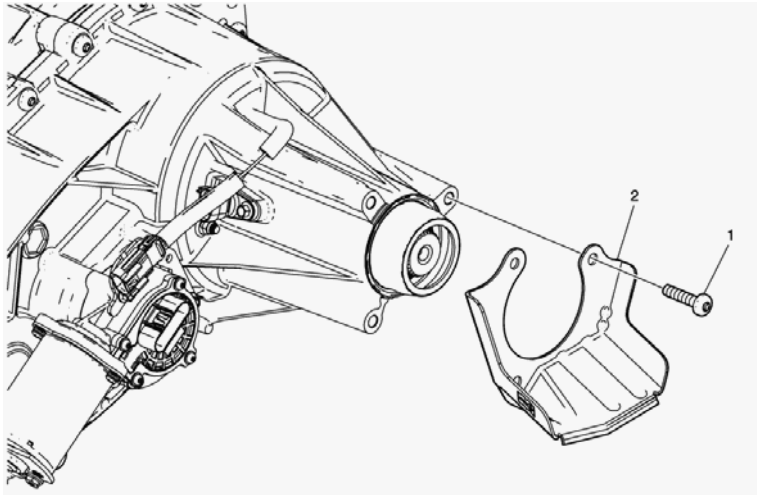
The front axle actuator is commanded by the TCCM to engage (4WD) or disengage (2WD) the front axle. With the vehicle in 4HI or 4LO mode, the front axle actuator remains in the 4WD position until a new range is selected. Refer to Transfer Case Control Schematics and Front Drive Axle Description and Operation.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

- Table 1: [Transfer Case Shield Removal](#)
- Table 2: [Transfer Case Vibration Dampener Removal](#)
- Table 3: [Transfer Case Holding Fixture Installation](#)
- Table 4: [Oil Fill and Drain Plug, Vent Hose Connector, Two/Four Wheel Drive Actuator, and Speed Sensor Removal](#)
- Table 5: [Input Shaft Seal Removal](#)
- Table 6: [Rear Output Shaft Seal and Bushing Removal](#)
- Table 7: [Transfer Case Rear Half Removal](#)
- Table 8: [Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Removal](#)
- Table 9: [Front Output Shaft Rear Bearing Removal](#)
- Table 10: [Shift Cam Assembly Removal](#)
- Table 11: [Rear Output Shaft Rear Bearing Removal](#)
- Table 12: [Two/Four Wheel Drive Synchronizer Hub and High/Low Shift Fork Removal](#)
- Table 13: [Drive Chain and Sprockets, Oil Pump Assembly, and Rear Output Shaft Removal](#)
- Table 14: [High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Removal](#)
- Table 15: [Front Output Shaft Flange Removal](#)
- Table 16: [Input Shaft Bearing and Front Output Shaft Front Bearing Removal](#)
- Table 17: [Transfer Case Stud Removal](#)

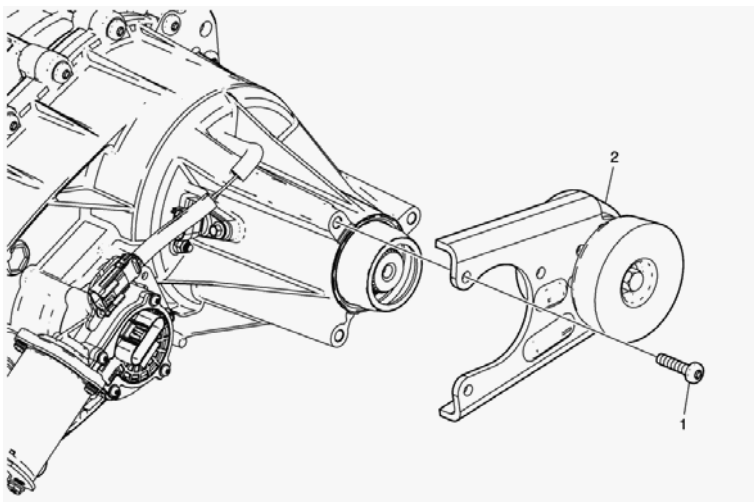
Transfer Case Shield Removal



Transfer Case Shield Removal

Callout	Component Name
1	Transfer Case Shield Bolt - Model Dependent
2	Transfer Case Shield - Model Dependent

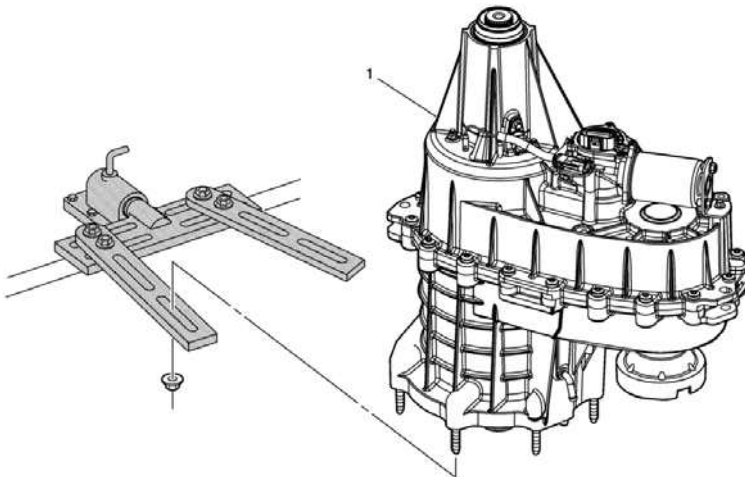
Transfer Case Vibration Dampener Removal



Transfer Case Vibration Dampener Removal

Callout	Component Name
1	Transfer Case Vibration Dampener Bolt - Model Dependent
2	Transfer Case Vibration Dampener - Model Dependent.

[Transfer Case Holding Fixture Installation](#)



Transfer Case Holding Fixture Installation

Callout	Component Name
1	Transfer Case

Procedure

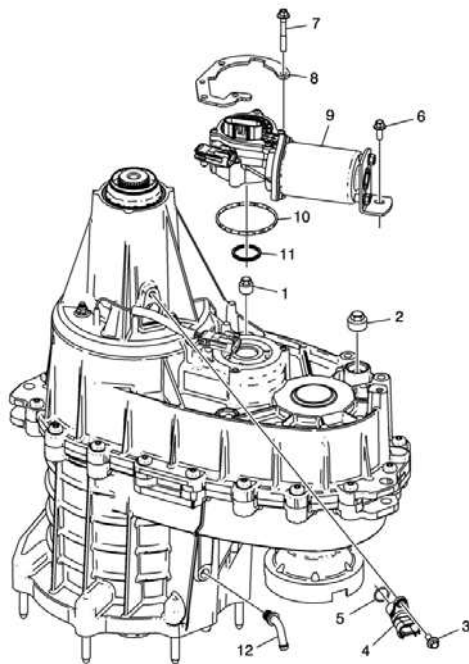
1. Always secure with the pivot pin after rotating.
2. The transfer case can be rotated 360 degrees to facilitate repair.
3. Use four M10 x 1.5 mm nuts to retain the assembly to the fixture.

Special Tools

- J 3289-20 Holding Fixture Base Assembly
- J 36842 Case Holding Fixture

For equivalent regional tools, refer to Special Tools.

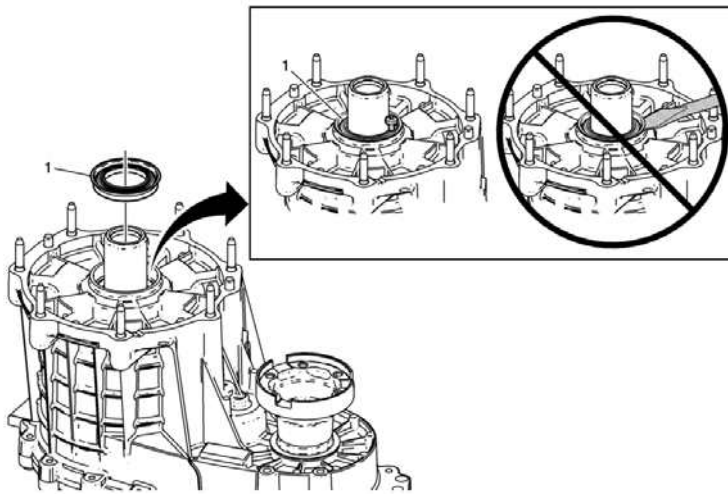
[Oil Fill and Drain Plug, Vent Hose Connector, Two/Four Wheel Drive Actuator, and Speed Sensor Removal](#)



Oil Fill and Drain Plug, Vent Hose Connector, Two/Four Wheel Drive Actuator, and Speed Sensor Removal

Callout	Component Name
1	Oil Fill Plug
2	Oil Drain Plug
3	Speed Sensor Bolt
4	Rear Output Shaft Speed Sensor
5	Speed Sensor O-ring Seal
	Note: The speed sensor O-ring seal is reusable. Inspect the O-ring seal for damage and replace as required.
6	Two/Four Wheel Drive Actuator Bolt
7	Two/Four Wheel Drive Actuator Motor Bracket Bolt
8	Actuator Motor Bracket
9	Two/Four Wheel Drive Actuator Assembly
10	Two/Four Wheel Drive Actuator Outer O-ring Seal
11	Two/Four Wheel Drive Actuator Inner O-ring Seal
	Vent Hose Connector
12	Note: Remove ONLY if vent hose connector replacement is required.

[Input Shaft Seal Removal](#)



Input Shaft Seal Removal

Callout

Component Name

Input Shaft Seal

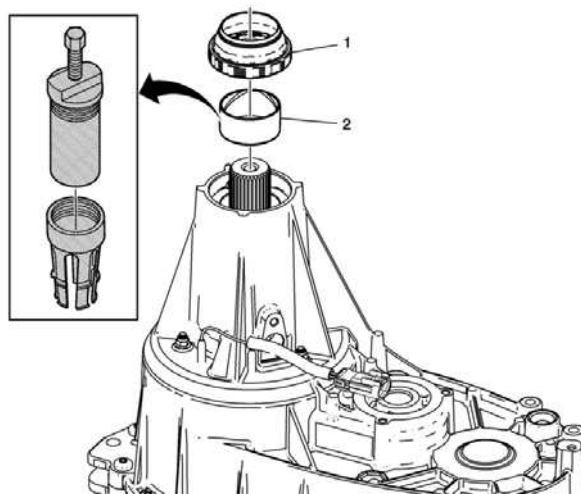
Caution: Refer to Machined Surface Damage Caution.

1

Procedure

1. Drill a pilot hole, as required, and insert a self-tapping screw into the body of the seal.
2. Use pliers or a slide hammer type tool to remove the seal from the bore.

[Rear Output Shaft Seal and Bushing Removal](#)



Rear Output Shaft Seal and Bushing Removal

Callout

Component Name

Rear Output Shaft Seal

1

Caution: Refer to Transfer Case Seal Removal Caution.

Rear Output Shaft Bushing

Procedure

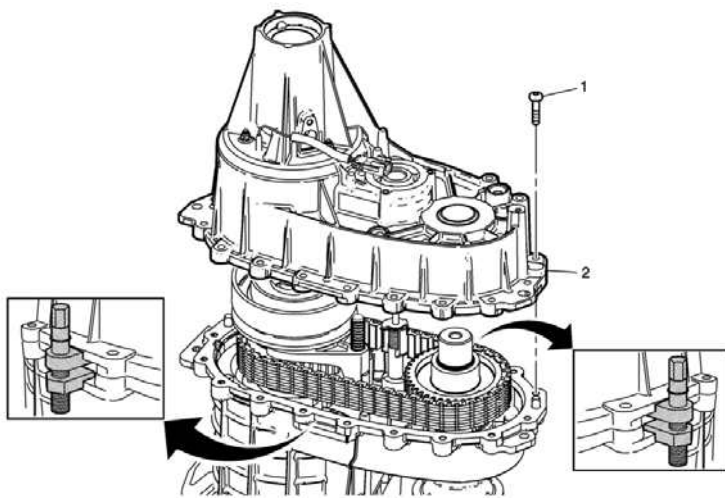
1. Only remove the bushing if faulty. Refer to Transfer Case Rear Half Cleaning and Inspection.
2. Install the finger section of the *J 45380* remover/installer into the bushing.
2. Install the forcing tube assembly into the finger section. Ensure the forcing screw is backed out.
4. Using a wrench on the forcing screw, remove the bushing.

Special Tools

J 45380 Transfer Case Rear Bushing Remover and Installer

For equivalent regional tools, refer to Special Tools.

[Transfer Case Rear Half Removal](#)



Transfer Case Rear Half Removal

Callout

Component Name

1 Transfer Case Half Bolt (Qty: 18)

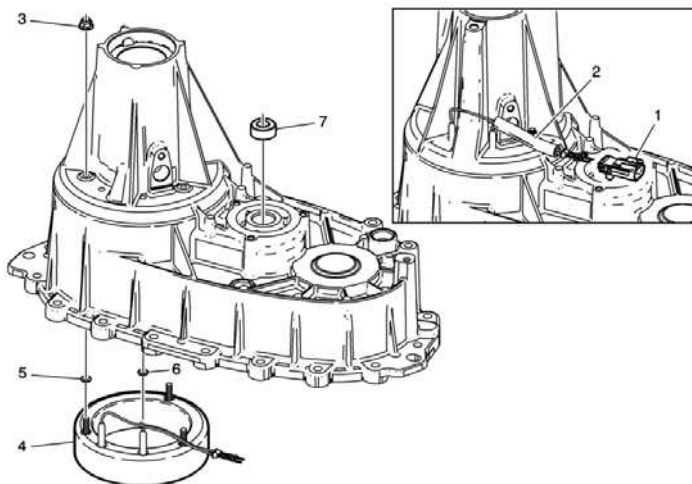
Transfer Case Rear Half

Special Tools

2 DT 50228 Case Splitter

For equivalent regional tools, refer to Special Tools.

Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Removal



Two/Four Wheel Drive Clutch Coil and Cam Shaft Detent Lever Seal Removal

Callout

Component Name

1 Synchronizer Coil Wiring Harness Connector Assembly

Note: Remove the connector wire retaining clip and separate the wires from the connector.

2 Synchronizer Coil Wiring Harness Conduit

Note: Slide the conduit over the synchronizer coil wires to remove it.

3 Two/Four Wheel Drive Clutch Coil Nut

4 Two/Four Wheel Drive Clutch Coil Assembly

Note: Carefully slide the wires through the holes in the case to avoid damage to the wire coating.

5 Two/Four Wheel Drive Clutch Coil Stud O-ring Seals.

Note: Replace as required.

6 Two/Four Wheel Drive Clutch Coil Stud Wire O-ring Seals.

Note: Replace as required.

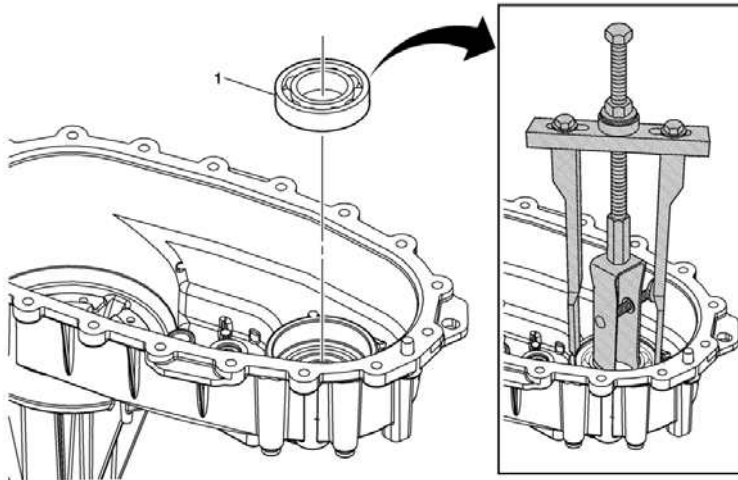
Callout

Component Name

7

Cam Shaft Detent Lever Seal

Front Output Shaft Rear Bearing Removal



Front Output Shaft Rear Bearing Removal

Callout

Component Name

Front Output Shaft Rear Bearing

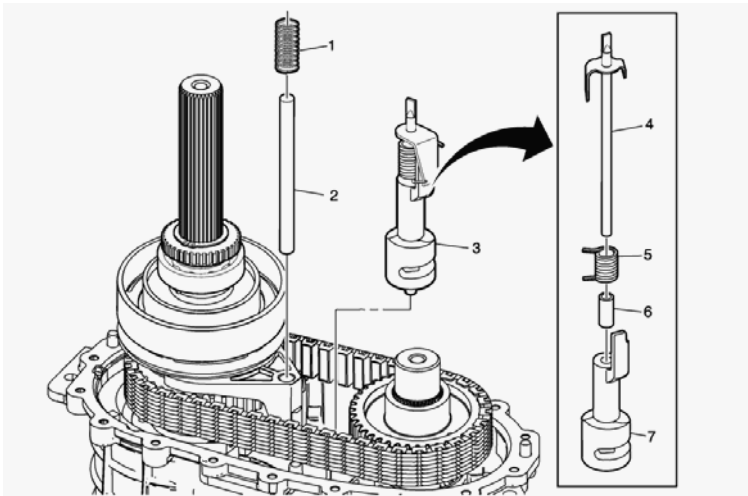
Special Tools

1

- J 29369-1 Bushing and Bearing Remover
- J 45124 Removal Bridge

For equivalent regional tools, refer to Special Tools.

Shift Cam Assembly Removal



Shift Cam Assembly Removal

Callout

Component Name

1

Shift Fork Spring

2

Shift Rail

3

Shift Cam Assembly

4

Shift Detent Lever Shaft

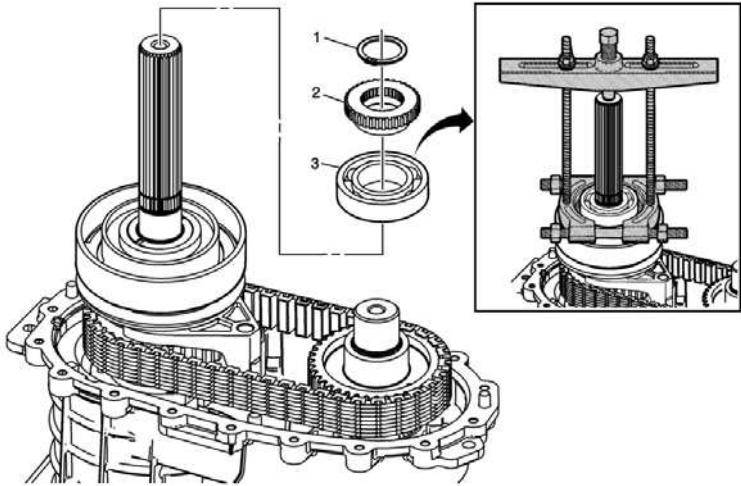
5

High/Low Shift Fork Shaft Detent Spring

Note: Orientation of the spring tabs for reassembly.

Callout	Component Name
6	Shift Detent Lever Spacer
7	Shift Cam

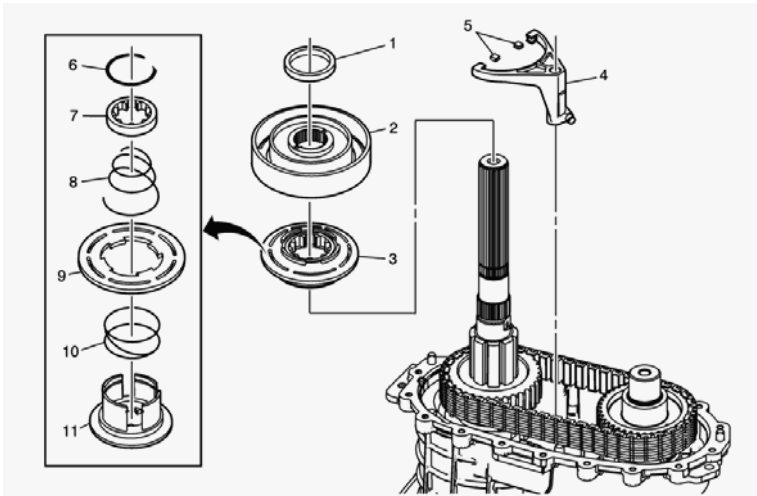
Rear Output Shaft Rear Bearing Removal



Rear Output Shaft Rear Bearing Removal

Callout	Component Name
1	Speed Sensor Reluctor Wheel Retaining Ring
2	Speed Sensor Reluctor Wheel
	Rear Output Shaft Rear Bearing
Special Tools	
3	- J 8433 Two Jaw Puller - J 22912 Split Plate Bearing Puller - DT 50315 Puller Hardware Kit
For equivalent regional tools, refer to Special Tools.	

Two/Four Wheel Drive Synchronizer Hub and High/Low Shift Fork Removal

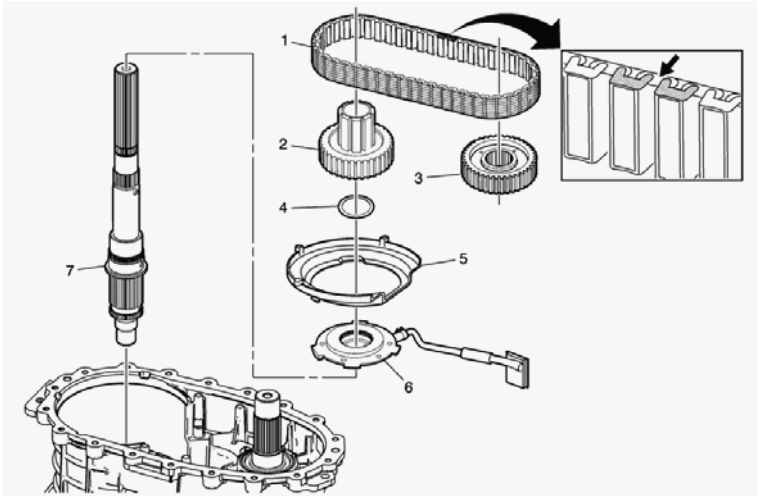


Two/Four Wheel Drive Synchronizer Hub and High/Low Shift Fork Removal

Callout	Component Name
1	Rear Output Shaft Bearing Spacer
2	Two/Four Wheel Drive Synchronizer Hub

Callout	Component Name
3	Two/Four Wheel Drive Lockup Assembly Note: Remove the two/four shift fork and the two/four wheel drive lockup from the shift rail as an assembly.
4	Two/Four Shift Fork
5	Two/Four Shift Fork Pads
6	Lockup Retaining Ring
7	Synchronizer Collar
8	Two/Four Wheel Drive Synchronizer Hub Inner Spring
9	Four Wheel Drive Armature Plate
10	Two/Four Wheel Drive Synchronizer Hub Outer Spring
11	Two/Four Wheel Drive Clutch Coil Housing

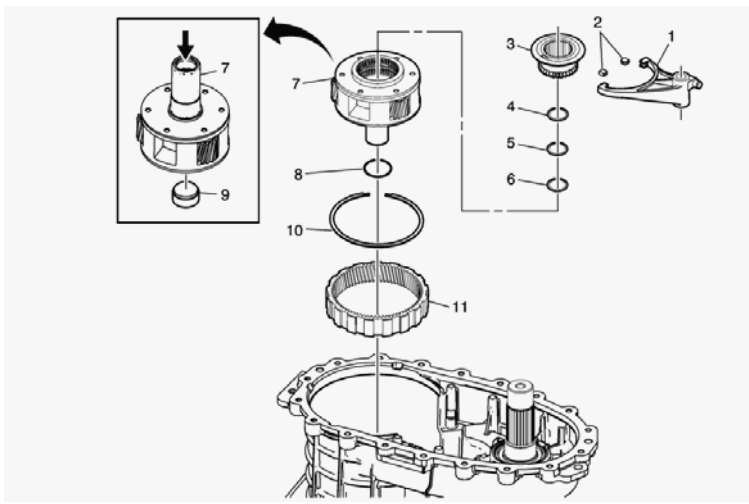
[Drive Chain and Sprockets, Oil Pump Assembly, and Rear Output Shaft Removal](#)



Drive Chain and Sprockets, Oil Pump Assembly, and Rear Output Shaft Removal

Callout	Component Name
1	Front Output Shaft Drive Chain Assembly Note: Note the orientation of the blue links to the sprockets for reassembly.
2	Front Output Shaft Drive Sprocket
3	Front Output Shaft Driven Sprocket
4	Front Output Shaft Drive Sprocket Thrust Washer
5	Support Bracket
6	Oil Pump Assembly
7	Rear Output Shaft Note: Note the orientation of the rear output shaft to the range shift sleeve to aid in reassembly.

[High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Removal](#)



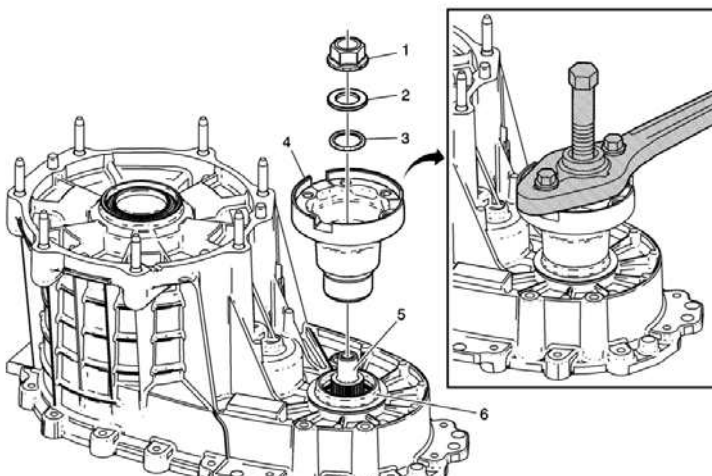
High/Low Planetary Carrier Assembly, Front Output Shaft, and Planetary Carrier Internal Gear Removal

Callout

Component Name

- | | |
|----|---|
| 1 | High/Low Wheel Drive Shift Fork
Note: Remove the shift fork and range shift sleeve as an assembly. |
| 2 | High/Low Drive Shift Fork Pads |
| 3 | Range Shift Sleeve |
| 4 | Planetary Carrier Sun Gear Thrust Washer |
| 5 | Input Shaft Thrust Bearing |
| 6 | Planetary Carrier Sun Gear Thrust Washer |
| | High/Low Planetary Carrier Assembly |
| 7 | Note: First design planetary carriers are a 6-pin design. Second design planetary carriers are a 3-pin design. When replacing a 6-pin carrier with a 3-pin design, the 3-pin design planetary carrier internal gear must also be used. Refer to New Product Information. |
| 8 | Input Shaft O-ring Seal |
| 9 | Input Shaft Pilot Bearing |
| 10 | High/Low Internal Gear Retaining Ring |
| | Planetary Carrier Internal Gear |
| 11 | Note: First design planetary carriers are a 6-pin design. Second design planetary carriers are a 3-pin design. When replacing a 6-pin carrier with a 3-pin design, the 3-pin design planetary carrier internal gear must also be used. Refer to New Product Information. |

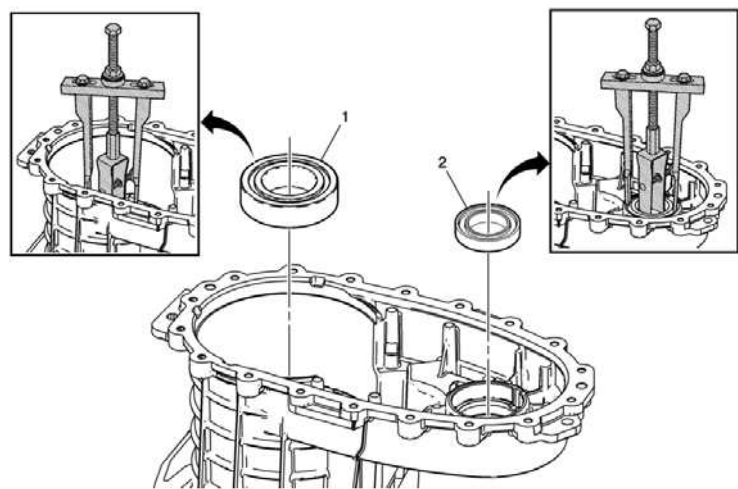
Front Output Shaft Flange Removal



Front Output Shaft Flange Removal

Callout	Component Name
1	Front Output Shaft Flange Nut
2	Front Output Shaft Flange Washer
3	Front Output Shaft O-ring Seal
	Front Output Shaft Flange
Special Tools	
4	• J 08614-A Pinion Flange Holder and Remover • DT 08614-20 Flange Retaining Bolts For equivalent regional tools, refer to Special Tools.
5	Front Output Shaft
6	Front Output Shaft Seal

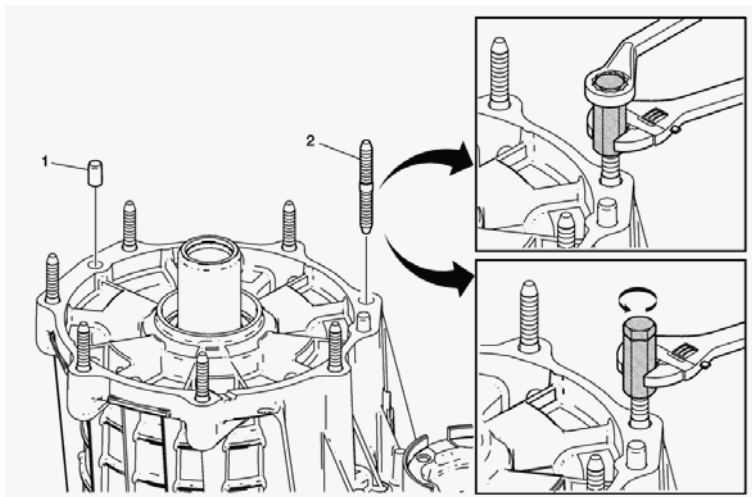
Input Shaft Bearing and Front Output Shaft Front Bearing Removal



Input Shaft Bearing and Front Output Shaft Front Bearing Removal

Callout	Component Name
	Input Shaft Bearing
Special Tools	
1	• J 29369-1 Bushing and Bearing Remover • J 45124 Removal Bridge For equivalent regional tools, refer to Special Tools.
	Front Output Shaft Front Bearing
Special Tools	
2	• J 29369-1 Bushing and Bearing Remover • J 45124 Removal Bridge For equivalent regional tools, refer to Special Tools.

Transfer Case Stud Removal



Transfer Case Stud Removal

Callout

Component Name

- | | |
|---|---|
| 1 | <p>Transfer Case Stud – Transmission Interface</p> <p>Note: Remove the studs as required.</p> |
| 2 | <p>Transfer Case Stud</p> <p>Special Tools</p> <p><i>DT 49308</i> Stud Installer</p> <p>For equivalent regional tools, refer to Special Tools.</p> |

2013 Chevrolet Colorado

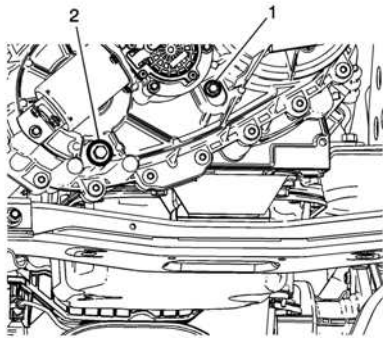
Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

[Removal Procedure](#)

Note: When performing the following service procedures, use only hand tools to remove and install the fill or drain plugs.

1. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.

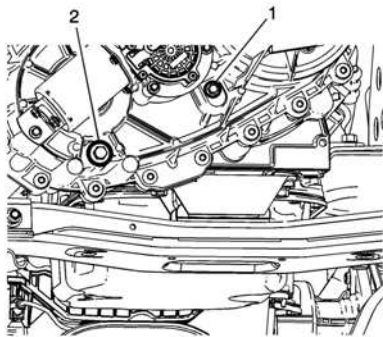


2. Remove the fill plug (1) from the transfer case.

Note: When draining the transfer case, make sure that an approved drain pan is used.

3. Remove the drain plug (2) from the transfer case.

[Installation Procedure](#)

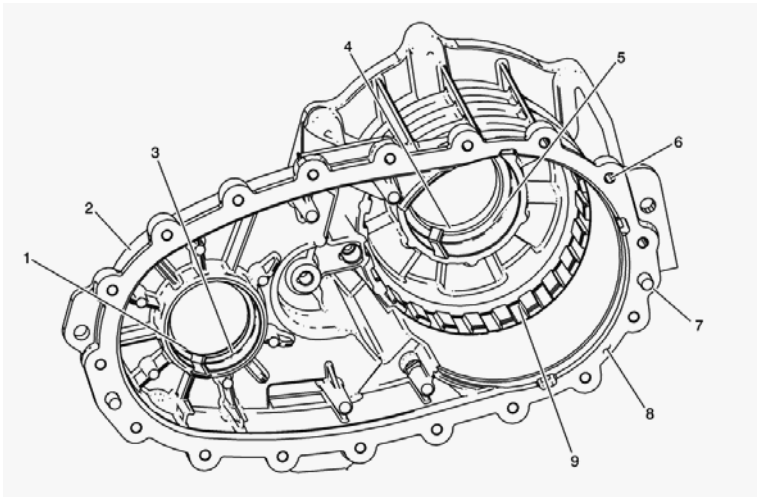


Caution: Refer to Fastener Caution.

1. Apply pipe sealant to the threads on the drain plug (2).
2. Install the drain plug in the transfer case and tighten the drain plug to **30 Y (22 lb ft)**.
3. Fill the transfer case to the bottom of the fill hole with the proper fluid. Refer to Adhesives, Fluids, Lubricants, and Sealers.
4. Apply pipe sealant to the threads on the fill plug (1).
5. Install the fill plug and tighten to **12 Y (106 lb in)**.
6. Lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Transfer Case Front Half Cleaning and Inspection

Callout	Component Name
Preliminary Procedure	
- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated. - Clean the front case half in cleaning solvent and air dry. - Remove any sealant from the sealing surface.	
1	Front output shaft seal bore for damage Note: Inspect for cracks, broken areas, or other damage.
2	Transfer Case Front Half Note: Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found.
3	Transfer Case Front Output Shaft Front Bearing Bore Note: Replace the front case half assembly if a bearing has spun or if cracks or other damage are detected.
4	Transfer Case Input Shaft Seal Bore Note: Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found.
5	Transfer Case Input Shaft Bearing Bore Note: Replace the front case half assembly if a bearing has spun or if cracks or other damage are detected.
6	Transfer Case Threaded Bolt Holes Note: Repair any damaged threads.
7	Transfer Case Locating pins (Qty: 2) Note: Repair or replace loose, missing, or damaged locating pins.
8	Case Sealing Surface Note: Repair small scratches or nicks with a soft stone.
9	Planetary Carrier Internal Gear Teeth Note: Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found.

2013 Chevrolet Colorado

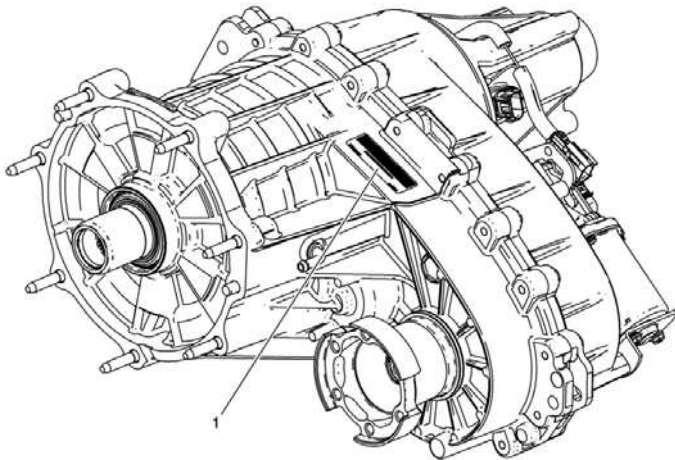
Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

Using a Scan Tool

1. Ignition ON, engine OFF.
2. On the scan tool, under Transfer Case Control Module, select Configuration/Reset Functions.
3. Select the Range Actuator Learn procedure.
4. When the Range Actuator Learn procedure is initiated you should hear the motor engage, indicating a successful learn procedure.

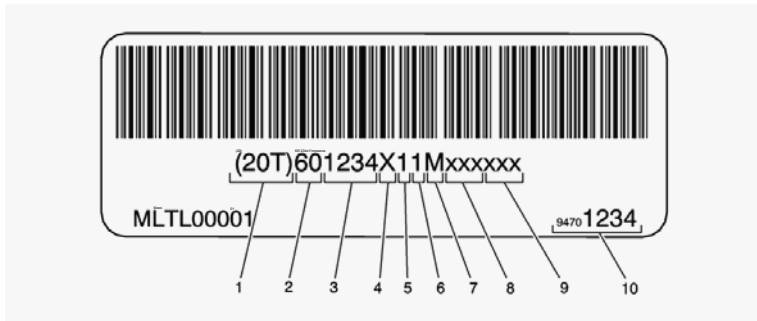
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



The transfer case identification label (1) is located on the top of the front case half.

[Bar Code](#)



- (1) Data Identifier
- (2) Component Identifier
- (3) Last 4 digits of GM Part Number
- (4) Supplier Identifier
- (5) Line ID
- (6) Shift
- (7) Year or Production
- (8) Julian Date
- (9) Serial Number
- (10) GM Part Number

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

Special Tools

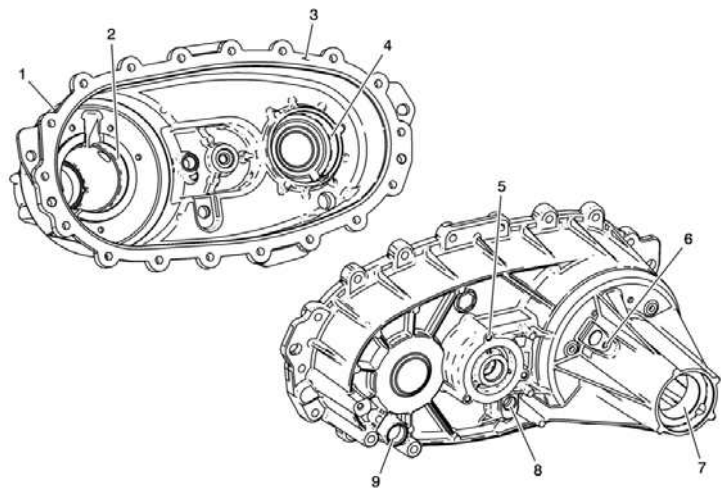
GE-7872 Magnetic Base Dial Indicator Set , or equivalent

Note: This measurement procedure is intended to measure transmission or transfer case output flange runout for systems with a constant velocity (CV) joint, rubber coupling or bolt-on U-joint yoke at the transmission or transfer case.

1. Place the transmission in NEUTRAL.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. If equipped with a CV joint, measure the transmission or transfer case output flange radial runout on the machined surface of the prop shaft front CV joint housing, as close to the flange as possible:
 1. Clean the surface of the prop shaft front CV joint housing just rear of the transmission or transfer case output flange.
 2. Mount a dial indicator set, GE-7872 Magnetic Base Dial Indicator Set , or equivalent, and position the dial indicator to contact the prop shaft front CV joint housing as close to the transfer case output flange as possible.
4. If equipped with a rubber coupling or bolt-on U-joint yoke, measure the transfer case output flange radial runout on the machined surface of the flange pilot area:
 1. Mark the position of the prop shaft to the transmission or transfer case output flange.
 2. Separate the propshaft from the transmission or transfer case output flange.
 3. Clean the surface of the flange pilot area.
 4. Mount a dial indicator set, GE-7872 Magnetic Base Dial Indicator Set , or equivalent, and position the dial indicator to contact the pilot area as close to the end of the pilot as possible.
5. Rotate the transmission or transfer case output flange by hand to locate the low spot.
6. Set the dial indicator to zero on the low spot.
7. Rotate the flange or shaft by hand and record the amount of radial runout.
8. Compare the runout of the flange or shaft to the runout tolerance specifications guideline.
9. If the transmission or transfer case output flange runout exceeds the specification, the flange or shaft requires replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Transfer Case Rear Half Cleaning and Inspection

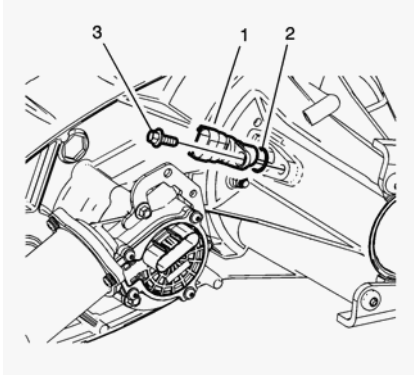
Callout	Component Name
Preliminary Procedure	
- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated. - Clean the rear case half in cleaning solvent and air dry. - Remove any sealant from the sealing surface.	
1	Transfer Case Rear Case Half Assembly Note: Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found.
2	Transfer Case Rear Output Shaft Rear Bearing Bore Note: Replace the rear case half assembly if a bearing has spun or if cracks or other damage are detected.
3	Case Sealing Surface Note: Repair small scratches or nicks with a soft stone.
4	Transfer Case Front Output Shaft Rear Bearing Bore Note: Replace the rear case half assembly if a bearing has spun or if cracks or other damage are detected.
5	Actuator Motor Bolt Hole Threads
6	Vehicle Speed Sensor Bolt Hole Threads Note: Repair or replace the rear case half assembly if the speed sensor bolt hole threads are damaged.
7	Transfer Case Rear Output Shaft Rear Bushing Note: Replace the bushing if worn or scored.
8	Oil Fill Plug Threads
9	Oil Drain Plug Threads

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

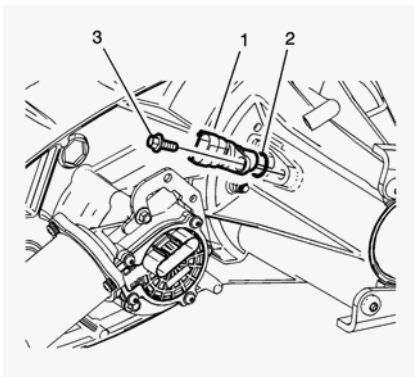
[Removal Procedure](#)

1. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the electrical connector from the speed sensor.



3. Remove the speed sensor (1) and the O-ring (2) from the transfer case.

[Installation Procedure](#)



Caution: Refer to Fastener Caution.

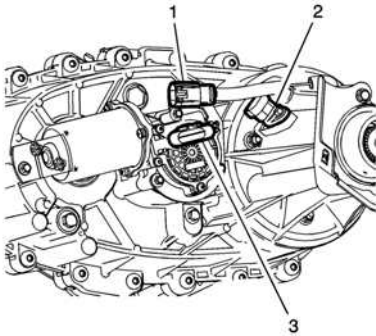
1. Install the new speed sensor (1) into the transfer case with a new O-ring seal (2). Tighten the speed sensor to **12 Y (106 lb in)**.
2. Install the electrical connector to the speed sensor.
3. Lower the vehicle. Refer to Lifting and Jacking the Vehicle.

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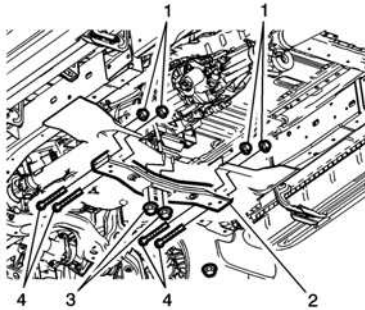
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

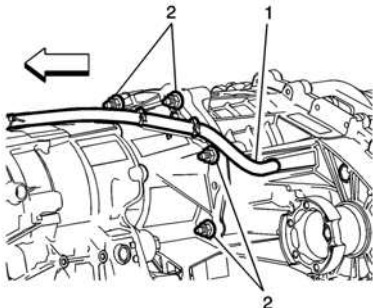
1. Remove the rear propeller shaft. Refer to One-Piece Propeller Shaft Replacement for one piece propeller shaft, or Two-Piece Rear Propeller Shaft Replacement for two piece propeller shaft.
2. Remove the front propeller shaft. Refer to Front Propeller Shaft Replacement.



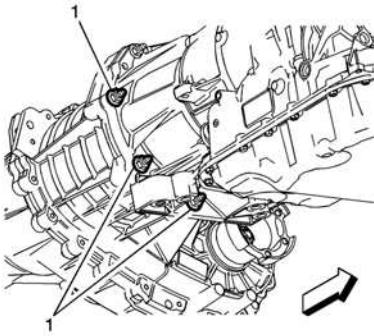
3. Disconnect the engine wiring harness electrical connectors from the following:
 - The clutch coil assembly (1)
 - The rear output shaft speed sensor (2)
 - The actuator motor (3)
- Position the Transmission wiring harness aside.



- Remove the transmission support crossmember (2). Refer to Transmission Support Crossmember Replacement.
- Remove the transmission mount. Refer to Transmission Mount Replacement for the 6L45/6L50/6L80/6L90 transmission or Transmission Rear Mount Replacement for the Eaton 5-speed transmission.
- Using a suitable transmission jack, support the transfer case.

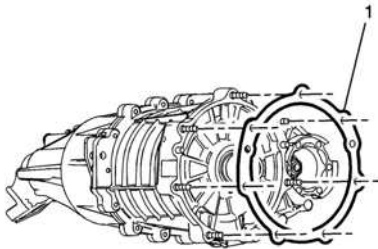


- Disconnect the vent hose (1) from the transfer case.
- Lower the transfer case to gain access to the top fasteners and remove the four left upper transfer case fasteners (2) from the transmission extension housing.

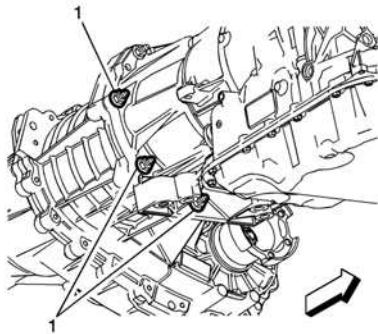


- Remove the three lower right side fasteners (1) from the transmission extension housing.
- Install the transmission mount. Refer to Transmission Mount Replacement for the 6L45/6L50/6L80/6L90 transmission or Transmission Rear Mount Replacement for the Eaton 5-speed transmission.
- To support the transmission assembly, install the transmission support crossmember. Refer to Transmission Support Crossmember Replacement.
- With the aid of an assistant, carefully lower the transfer case from the vehicle.

[Installation Procedure](#)

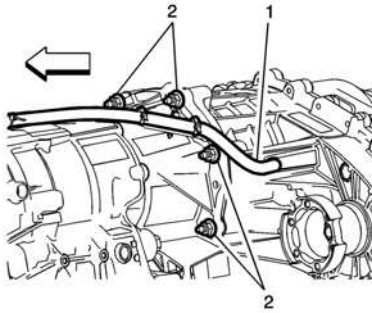


1. Install a New transfer case extension housing gasket (1) on the transfer case.
2. With the aid of an assistant, carefully raise the transfer case to the transfer case extension housing, aligning the splines.
3. Install the 7 nuts on the transmission extension housing hand tight.
4. Remove the transmission support crossmember. Refer to Transmission Support Crossmember Replacement.
5. To gain access to the lower fastener, remove the transmission mount. Refer to Transmission Mount Replacement for the 6L45/6L50/6L80/6L90 transmission or Transmission Rear Mount Replacement for the Eaton 5-speed transmission.

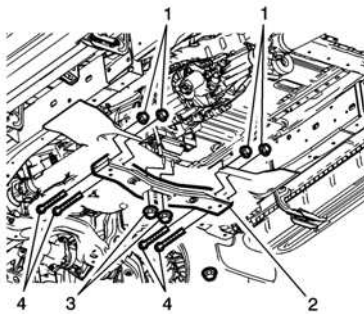


Caution: Refer to Fastener Caution.

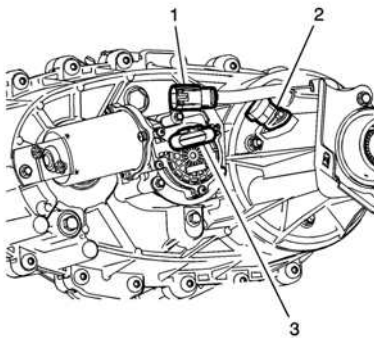
6. Install the three lower right side fasteners (1) on the transmission extension housing and tighten to **50 Y (37 lb ft)**.



7. Install the four left upper transfer case fasteners (2) on the transmission extension housing and tighten to **50 Y (37 lb ft)**.
8. Connect the vent hose (1) from the transfer case.



9. Install the transmission mount. Refer to Transmission Mount Replacement for the 6L45/6L50/6L80/6L90 transmission or Transmission Rear Mount Replacement for the Eaton 5-speed transmission.
10. Install the transmission support crossmember (2). Refer to Transmission Support Crossmember Replacement.
11. Position the transmission wiring harness (3) to the transfer case assembly.



12. Connect the engine wiring harness electrical connectors to the following:
 - The clutch coil assembly (1)
 - The rear output shaft speed sensor (2)
 - The actuator motor (3)
 - Install the front propeller shaft. Refer to Front Propeller Shaft Replacement.
 - Install the rear propeller shaft. Refer to One-Piece Propeller Shaft Replacement for one piece propeller shaft, or Two-Piece Rear Propeller Shaft Replacement for two piece propeller shaft.
 - Fill the transfer case with fluid, if previously drained or lost from component replacement. Refer to Approximate Fluid Capacities.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

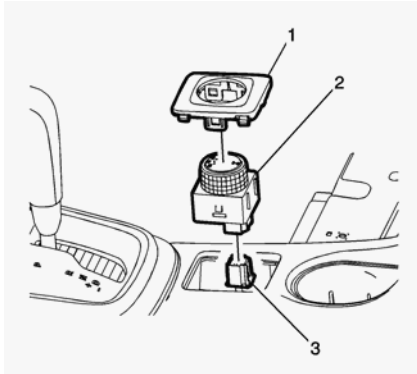
Caution: Do not damage the sealing surfaces of the transfer cases or the shafts when prying the seals for removal. Damaging the sealing surface may cause leakage or require replacement of the damaged component.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

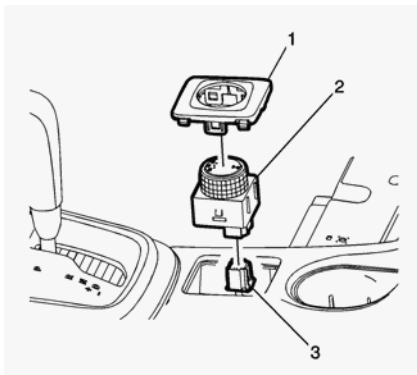
Fuel Delivery: | Fuel:

[Removal Procedure](#)



1. Using a flat bladed trim tool, remove the transfer case selector switch trim bezel (1) and switch assembly.
2. Disconnect the electrical connector (3) from the transfer case selector switch (2).
3. Remove the transfer case selector switch (2) from the transfer case selector switch trim bezel (1).

[Installation Procedure](#)

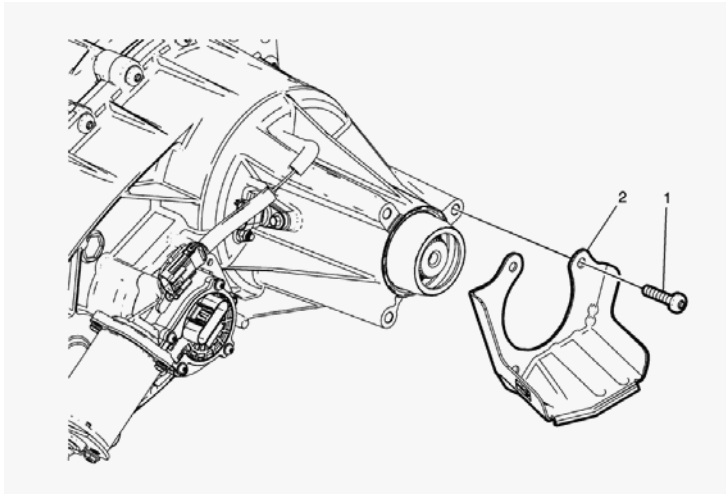


1. Install the transfer case selector switch (2) to the transfer case selector switch trim bezel (1).
2. Connect the electrical connector (3) from the transfer case selector switch (2).
3. Install the transfer case selector switch and transfer case selector switch trim bezel into the floor console.
4. Verify correct operation of the transfer case selector switch.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Transfer Case Shield Replacement

Callout

Component Name

Preliminary Procedure

Remove the two-piece rear propeller shaft, if necessary. Refer to Two-Piece Rear Propeller Shaft Replacement.

Transfer Case Shield Bolt – Model Dependent

Caution: Refer to Fastener Caution.

1

Tighten

25 Y (18 lb ft)

2

Transfer Case Shield – Model Dependent

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

The following service procedures require either a programming or a setup event performed for a complete repair.

Transfer Case Shift Control Module Replacement

If the transfer case shift control module is replaced, the transfer case shift control module reprogramming procedure and the Transfer Case High/Low Clutch Reset procedures must be performed. Refer to Service Programming System (SPS)

Transfer Case Shift Control Module Reprogramming

If the transfer case shift control module needs to be reprogrammed, refer to Service Programming System (SPS).

Ensure that the following conditions exist in order to prepare for transfer case shift control module programming or reprogramming:

- The battery is fully charged.
- The ignition switch is in the RUN position.
- The Techline equipment cable connection at the data link connector (DLC) is secure.

Program the transfer case shift control module using the latest software matching the vehicle. Refer to up-to-date Techline equipment user instructions.

If the transfer case shift control module fails to program, proceed as follows:

- Ensure that the transfer case shift control module connection is OK.
- Inspect the Techline equipment for the latest software version.
- Attempt to program the transfer case shift control module. If the transfer case shift control module still cannot be programmed properly, replace the transfer case shift control module.

Transfer Case Shift Control Module Setup

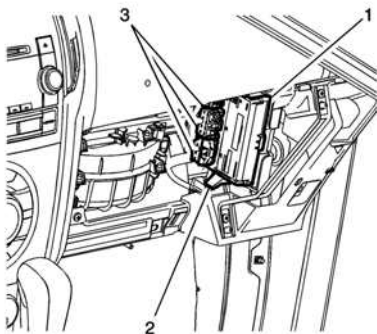
Perform the Transfer Case High/Low Clutch Retest (Motor Learn Procedure). Refer to Transfer Case High/Low Clutch Reset for NQV.

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Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

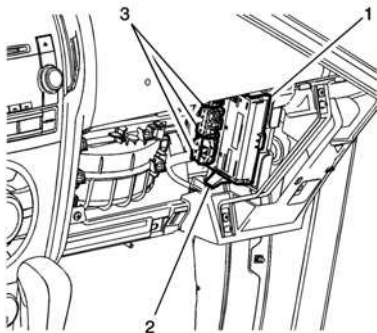
Removal Procedure

1. Remove the instrument lower panel.



2. Disconnect the electrical connectors (3) from the transfer case control module (TCCM).
3. Press the retaining tab (2) downward to release the TCCM.
4. Remove the TCCM from the vehicle.

Installation Procedure



1. Press the retaining tab (2) downward, then install the TCCM.
2. Connect the electrical connectors (3) to the TCCM.
3. Install the instrument lower panel.
4. Reprogram the TCCM. Refer to Control Module References.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

Table 1: [Scan Tool Data Parameters](#)

Table 2: [Scan Tool Output Controls](#)

The Transmission Control Module Scan Tool Data List contains all transfer case related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists, and in some cases may appear more than once, or in more than one data list in order to group certain related parameters together.

The values below represent a typical display recorded from a properly functioning system.

Only the parameters listed below are used/referenced in this manual for diagnosis. If a scan tool displays other parameters, those values are not recommended by General Motors for use in diagnosis.

If all values are within the expected value described below, refer to Symptoms - Transfer Case for diagnosis.

The scan tool values from a properly functioning transfer case may be used for comparison with the transfer case you are diagnosing. The values below represent a typical display recorded from a properly functioning system.

Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
<i>Operating Conditions:</i> Ignition ON, engine OFF, Park or Neutral and transfer case in 2WD, unless otherwise noted.			
2WD High Range Indicator Command	ON or OFF	ON	This parameter displays ON when the transfer case shift control module commands the 2WD High indicator light ON.
2WD/4WD Synchronizer Clutch Command	0 to 100%	0%	This parameter displays the pulse width modulated voltage signal being supplied by the transfer case shift control module to the 2WD/4WD synchronizer clutch on the low reference circuit. This parameter will display 0% after a range shift.
2WD/4WD Synchronizer Clutch Current	0.00 to 5.00 A	0.00 A	This parameter displays the current drawn by the 2WD/4WD synchronizer clutch from the transfer case shift control module. This parameter will display 0.00 A after shifting ranges.
2WD/4WD Synchronizer Clutch High Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. A short to battery on the 2WD/4WD synchronizer clutch high control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch High Control Circuit High Voltage Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch Low Control Circuit High Voltage Test Status parameter.
2WD/4WD Synchronizer Clutch Low Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. A short to ground on the 2WD/4WD synchronizer clutch high control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch High Control Circuit Low Voltage Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch Low Control Circuit Low Voltage Test Status parameter.
2WD/4WD Synchronizer Clutch High Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch

Parameter	System State	Expected Value	Description
2WD/4WD Synchronizer Clutch Low Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	channel 2 encoder signal circuit and the low reference circuit. An open/high resistance condition on the 2WD/4WD synchronizer clutch high control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch High Control Circuit Open Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch Low Control Circuit Open Test Status parameter. This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. A short to battery on the 2WD/4WD synchronizer clutch low control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch Low Control Circuit High Voltage Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch High Control Circuit High Voltage Test Status parameter.
2WD/4WD Synchronizer Clutch Low Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. A short to ground on the 2WD/4WD synchronizer clutch low control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch Low Control Circuit Low Voltage Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch High Control Circuit Low Voltage Test Status parameter.
2WD/4WD Synchronizer Clutch Low Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD/4WD synchronizer clutch control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. An open/high resistance condition on the 2WD/4WD synchronizer clutch low control circuit will cause this parameter to display Malfunction. When Malfunction is set on the 2WD/4WD Synchronizer Clutch Low Control Circuit Open Test Status parameter it also sets on the 2WD/4WD Synchronizer Clutch High Control Circuit Open Test Status parameter.
2WD/4WD Synchronizer Clutch Low Control Command	ON or OFF	OFF	This parameter displays the status of the 2WD/4WD synchronizer clutch high control circuit. The 2WD/4WD synchronizer clutch control circuit is made up of the transfer case position switch channel 2 encoder signal circuit and the low reference circuit. This parameter displays OFF after a Range Shift.
4WD High Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case shift control module commands the 4WD High indicator light ON.
4WD Low Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case shift control module commands the 4WD Low indicator light ON.
Control Module Voltage Signal	0.0 to 25.5 V	Battery Voltage	This parameter displays the voltage measured by the transfer case shift control module at the battery positive voltage circuit.
Display Dimming	0 to 100%	Varies	This parameter displays the current being supplied by the transfer case shift control module to the transfer case 2WD/4WD indicator switch.

Parameter	System State	Expected Value	Description
Front Axle Engagement Actuator Command	Engaged or Disengaged	Disengaged	This parameter displays either Engaged or Disengaged. Engaged when the body control module is commanding Auto 4WD, 4WD, or 4WD Low ranges, and Disengaged when the body control module is commanding Neutral, or 2WD ranges.
Front Axle Engagement Actuator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. A short to battery on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Engagement Actuator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. A short to ground on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Engagement Actuator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. An open/high resistance condition on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Feedback Switch	Engaged or Disengaged	Disengaged	This parameter displays the actual status of the front axle.
Ignition 1 Signal	ON or OFF	ON	This parameter displays the status of the run/crank ignition 1 voltage circuit to the transfer case shift control module. The scan tool displays OFF at ignition OFF.
Ignition Accessory Signal	ON or OFF	ON	This parameter displays the status of the ignition accessory signal circuit to the transfer case shift control module. The scan tool displays OFF when interior lights turn OFF.
Non-Driven Wheel Speed	Varies	km/h/MPH	This parameter displays the non-drive wheel speed in kilometers or miles per hour.
Range Actuator Command	-100 to +100%	0%	This parameter displays the pulse width modulated voltage signal being supplied by the transfer case shift control module to the transfer case encoder motor on circuit A or circuit B. The scan tool displays negative values when turning counterclockwise or positive values when turning clockwise. This parameter will display 0% after a range shift.
Range Actuator Control Circuit A Command	OFF, High or Low	OFF	This parameter displays the direction of the voltage flow of the range actuator control circuit. The scan tool displays Low-High-Off when turning counterclockwise or High-Low-Off when turning clockwise while shifting. This parameter will display OFF after shifting ranges. Opposite of Range Actuator Control Circuit B.
Range Actuator Control Circuit B Command	OFF, High or Low	OFF	This parameter displays the direction of the voltage flow of the range actuator control circuit. The scan tool displays High-Low-Off when turning clockwise or Low-High-Off when turning counterclockwise while shifting ranges. This parameter will display OFF after shifting ranges. Opposite of Range Actuator Control Circuit A.
Range Actuator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. A short to battery on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B.

Parameter	System State	Expected Value	Description
Range Actuator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	A short to ground on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction. This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. An open on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Control Circuit Shorted Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. A short to ground, short to battery or short together on the range actuator control circuit A and/or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Current	-15.0 to +36.0 A	0.0 A	This parameter displays the current drawn by the range actuator from the transfer case shift control module on either the range actuator control circuit A or the range actuator control circuit B. Typical values display 0.0 to 12.0 A. This parameter will display 0.0 A after shifting ranges.
Range Actuator Direction Command	Stationary, Clockwise or Counterclockwise	Stationary	This parameter displays what direction the transfer case shift control module is commanding the range actuator to turn. This parameter will display Stationary after a range change.
Range Actuator Position	2WD, 4WD High-2WD 4WD High/Locked, 4WD High-Neutral, Neutral, Neutral-4WD Low, or 4WD Low	2WD	This parameter displays the actual position of the transfer case according to the range actuator position sensor.
Range Actuator Position Sensor	0 to 360°	99°	This parameter displays the position of the range actuator position sensor in degrees. Typical scan tool displays: • 2WD = 85-115° • 4WD High/Locked = 5-35° • 4WD Low = 315-345° • Neutral = 190-200°
Range Actuator Position Sensor	190 to 210 Hz	199 Hz	This parameter displays the frequency of the current being supplied to the range actuator position sensor.
Range Actuator Position Sensor	0 to 100%	24% (±5%)	This parameter displays the position of the range actuator position sensor in percent. Typical scan tool values: • 2WD = 24% • 4WD High = 5% • 4WD Low = 95% • Neutral = 5%
Range Actuator Position Sensor Supply Voltage	4.8 to 5.2 V	5.0 V	This parameter displays the voltage being supplied by the transfer case shift control module to the range actuator position sensor.
Service 4WD Indicator Command	ON or OFF	OFF	This parameter displays ON anytime a DTC sets.
Transfer Case Commanded Position	2WD, 4WD High/Locked, 4WD Low, Neutral or None	2WD	This parameter displays the current range commanded by the driver.
Transfer Case Neutral Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case shift control module commands the Neutral indicator light ON.

Parameter	System State	Expected Value	Description
Transfer Case Output Shafts Slip Speed	Varies	RPM	This parameter displays the difference between the rotational speeds of the transfer case output shafts.
Transfer Case Range Selection Switch	0.0 to 7.5 V	2.0 V (±0.2 V)	This parameter displays the voltage being returned from the transfer case range selection switch. Typical scan tool displays: • 2WD = 2.0 V • 4WD High/Locked = 3.0 V • 4WD Low = 1.5 V • Neutral = 2.5 V
Transfer Case Range Selection Switch Reference	0.0 to 7.5 V	5.0 V	This parameter displays the voltage being supplied by the transfer case shift control module to the transfer case range selection switch.
Transfer Case Range Selection Switch State	2WD, 4WD High/Locked, 4WD Low, Neutral or None	2WD	This parameter displays the current range commanded by the transfer case range selection switch.
Transmission Fluid Temperature	Varies	°C (°F)	This parameter displays the transmission fluid temperature in degrees Celsius or Fahrenheit. This parameter displays the current gear the transmission is in.
Transmission Gear	Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6	Park or Neutral	The scan tool displays Park, Reverse and Neutral when ignition ON and engine OFF. The scan tool displays Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6 when engine ON.
Transmission OSS	Varies	RPM	This parameter displays transmission output shaft speed in revolutions per minute. This parameter displays the current gear the transmission is in.
Transmission Range	Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6	Park or Neutral	The scan tool displays Park, Reverse and Neutral when ignition ON and engine OFF. The scan tool displays Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6 when engine ON.
Vehicle Speed	Varies	km/h/MPH	This parameter displays vehicle speed in kilometers or miles per hour.

Scan Tool Output Controls

Output Control	Description
Note: Refer to the scan tool manual for complete scan tool operating instructions.	
2WD High Range Indicator	This function allows the technician to command the 2WD High indicator light, within the transfer case shift control switch, ON or OFF.
2WD/4WD Synchronizer Clutch	This function allows the technician to increase the current supplied to the 2WD/4WD synchronizer clutch from 0% to 100% in 10% increments. Current will be held until released.
2WD/4WD Synchronizer Clutch Test	Note: Transmission must be in transmission Neutral for this output control to operate. This function allows the technician to command full current to the 2WD/4WD synchronizer clutch. Current will be held for 2–3 seconds.
4WD High Range Indicator	This function allows the technician to command the 4WD High indicator light, within the transfer case shift control switch, ON or OFF.
4WD Low Range Indicator	This function allows the technician to command the 4WD Low indicator light, within the transfer case shift control switch, ON or OFF.
Front Axle Engagement Actuator	Note: Transmission must be in transmission Neutral for this output control to operate. This function allows the technician to command the front axle to engage.
Range Actuator Learn	This function allows the technician to command the transfer case shift control module to relearn the range actuator position sensor after the encoder motor, module, or transfer case is replaced.
Transfer Case Neutral Range Indicator	This function allows the technician to command the Neutral indicator light, within the transfer case shift control switch, ON or OFF.

Output Control

Description

Transfer Case Range

Note: Transmission must be in transmission Neutral for this output control to operate.

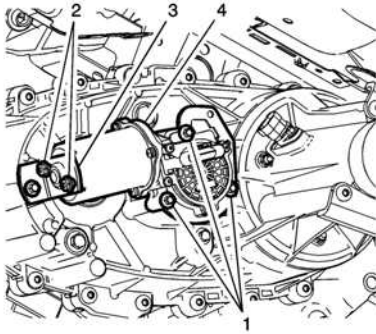
This function allows the technician to command range changes.

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Submodel: | Engine Type: | Liters:
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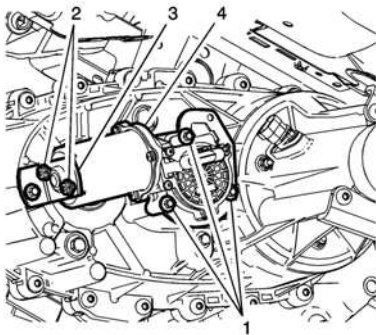
[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Disconnect the electrical connector from the actuator motor.



3. Remove the four actuator motor fasteners (1).
4. Remove the actuator motor (4) from the transfer case.
5. Remove the actuator motor bracket fasteners (2).
6. Remove the bracket (3) from the actuator motor (4).

[Installation Procedure](#)



1. Position the bracket (3) on the actuator motor (4).

Caution: Refer to Fastener Caution.

2. Install the bracket fasteners (2) and tighten to **8 Y (70 lb in)**.
3. Install the actuator motor (4) on the transfer case.
4. Install the actuator motor fasteners (1) and tighten to **12 Y (106 lb in)**.
5. Connect the electrical connector to the actuator motor.
6. Lower the vehicle.
7. Verify correct operation of the actuator motor.
8. Reprogram the transfer case control module. Refer to Control Module References.

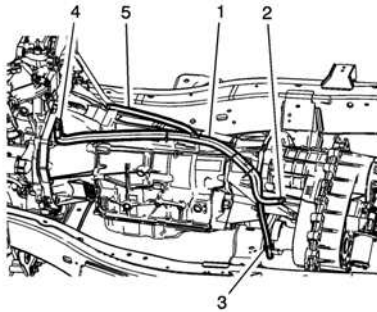
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

[Removal Procedure](#)

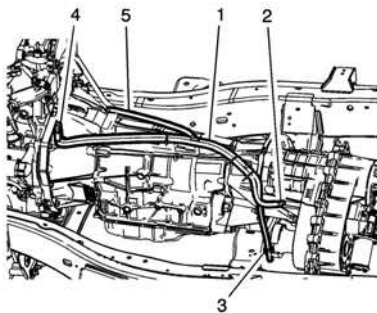
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Disconnect the transfer case vent hose assembly (1) from the following:

- The transfer case vent pipe (2)
- The transmission crossmember (3)
- The engine compartment bracket (4)
- The transmission vent pipe (5)
- Remove the wire ties and separate the transfer case vent hose from the transmission vent hose.

[Installation Procedure](#)



Important: Ensure the vent hoses are free of kinks and routed clear of sharp objects.

1. Install the wire ties to attach the transfer case vent hose to the transmission vent hose.
2. Connect the transfer case vent hose assembly (1) to the following:

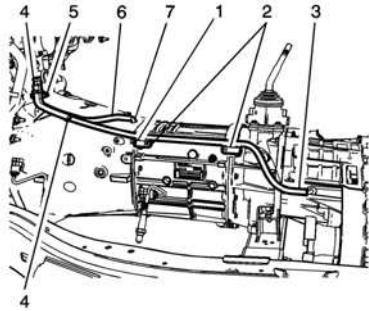
- The transfer case vent pipe (2)
- The transmission crossmember (3)
- The engine compartment bracket (4)
- The transmission vent pipe (5)
- Lower the vehicle.

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Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

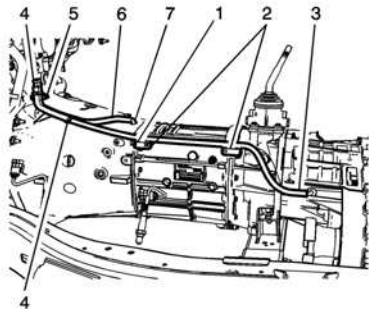
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Disconnect the transfer case vent hose assembly (1) from the following:

- The transmission retainers (2)
- The transfer case vent pipe (3)
- The engine compartment bracket (5)
- Cut the wire ties (4).
- Remove the transfer case vent hose (1) from the vehicle.

[Installation Procedure](#)



Important: Ensure the vent hoses are free of kinks and routed clear of sharp objects.

1. Install the wire ties (4) to attach the transfer case vent hose (1) to the transmission vent hose (6).
2. Connect the transfer case vent hose assembly (1) to the following:

- The transmission retainers (2)
- The transfer case vent pipe (3)
- The engine compartment bracket (5)
- Lower the vehicle.

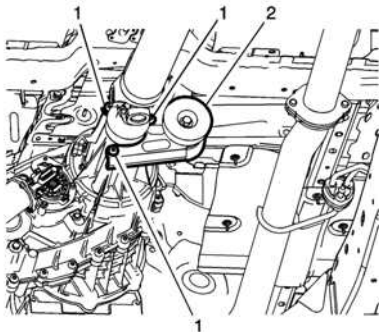
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

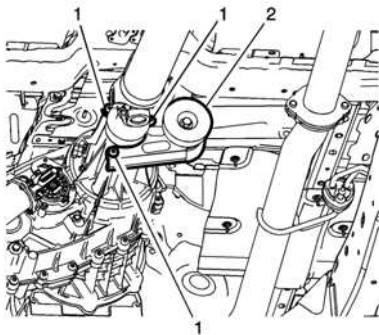
[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Remove the vibration dampener fasteners (1).
3. Remove the vibration dampener (2) from the transfer case.

[Installation Procedure](#)



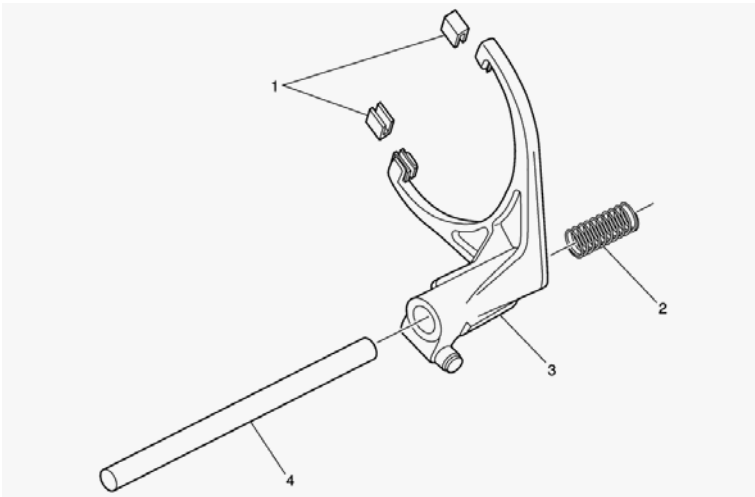
1. Position the vibration dampener (2) on the transfer case.

Caution: Refer to Fastener Caution.

2. Install the vibration dampener fasteners (1) and tighten to **25 Y (18 lb ft)**.
3. Lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Two/Four Wheel Drive Shift Components Cleaning and Inspection

cardiagn.com

Callout

Component Name

Preliminary Procedure

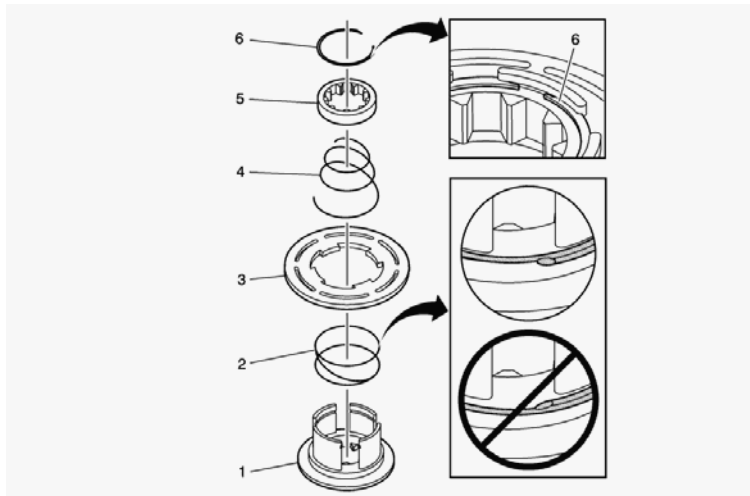
- Inspect all components or sub-components and perform any repair procedure necessary to fix the damage. If the damage cannot be repaired, replace the component or sub-component as indicated.
- Clean all components in cleaning solvent and air dry.

1	Transfer Case Two/Four Shift Fork Pad Note: Inspect the pads for wear or cracking.
2	Shift Fork Spring Transfer Case Two/Four Shift Fork Note:
3	• Inspect for cracks, broken areas, or other damage. The component must be replaced if damage is found. • Inspect the shift roller for binding or looseness. • Inspect the fork bushing for wear • Inspect for loose fit pin to the fork. The pin is press fit into the fork
4	Transfer Case Shift Rail

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Two/Four Wheel Drive Synchronizer Hub Assemble

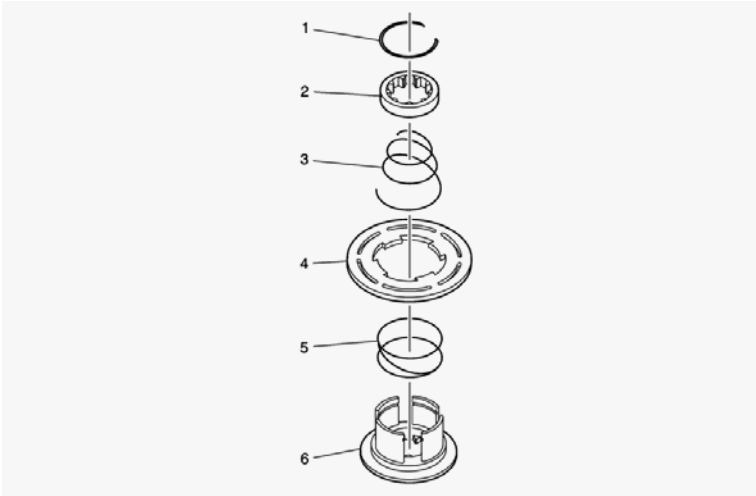
Callout

Component Name

- | | |
|---|---|
| 1 | Two/Four Wheel Drive Clutch Coil Housing |
| 2 | Two/Four Wheel Drive Synchronizer Hub Outer Spring |
| 3 | Four Wheel Drive Armature Plate |
| 4 | Two/Four Wheel Drive Synchronizer Hub Inner Spring |
| 5 | Synchronizer Collar |
| | Lockup Retaining Ring |
| 6 | Note: Ensure the ends of the retaining ring are to be positioned as indicated (6). The ends of the ring should NOT be positioned into an open area of the housing. |

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Two/Four Wheel Drive Synchronizer Hub Disassemble

Callout	Component Name
1	Lockup Retaining Ring
2	Synchronizer Collar
3	Two/Four Wheel Drive Synchronizer Hub Inner Spring
4	Four Wheel Drive Armature Plate
5	Two/Four Wheel Drive Synchronizer Hub Outer Spring
6	Two/Four Wheel Drive Clutch Coil Housing