

2014 GMC Acadia Denali

2014 TRANSMISSION Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

2014 TRANSMISSION

Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

REPAIR INSTRUCTIONS - OFF VEHICLE

LIFT PLATE AND HOLDING FIXTURE INSTALLATION

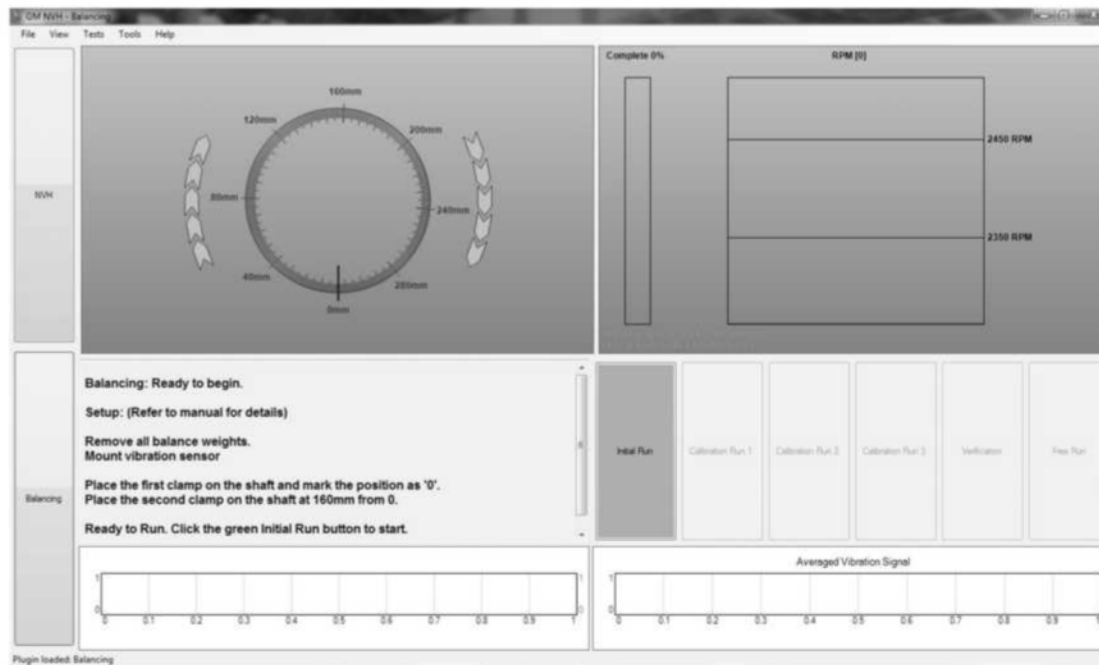


Fig. 1: Identifying Lift Plate & Holding Fixture
Courtesy of GENERAL MOTORS COMPANY

Lift Plate and Holding Fixture Installation

Callout	Component Name
1	DT-47811-A Transmission Lift Plate WARNING: Handle with care, the transmission assembly weighs over 90.7 kg (200 lbs). Bodily injury could occur if not handled properly. NOTE: After Installation of lift plate, raise the transmission with an overhead hoist.

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	Tighten 12 N.m (9 lb ft) Special Tools DT-47811-A Transmission Lift Plate For equivalent regional tools, refer to Special Tools .
2	DT-46625 Transmission Holding Fixture CAUTION: Refer to Fastener Caution . NOTE: Adjust mounting block on fixture to match bosses on case, then tighten bolts to: Tighten 13 N.m (10 lb ft) Special Tools DT-46625 Transmission Holding Fixture For equivalent regional tools, refer to Special Tools .

TORQUE CONVERTER REMOVAL

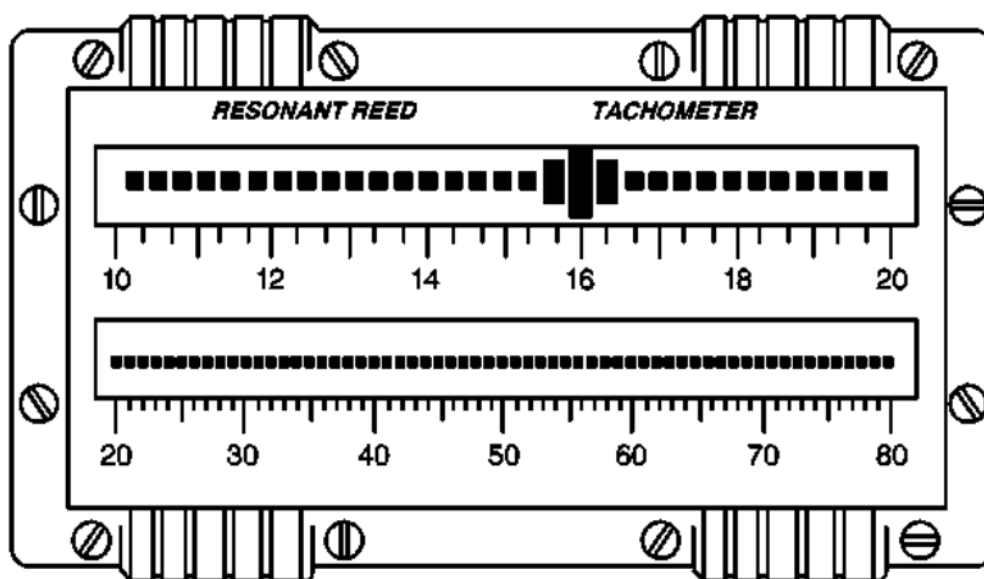


Fig. 2: View Of Torque Converter

Courtesy of GENERAL MOTORS COMPANY

Torque Converter Removal

Callout	Component Name
1	Lock Pin WARNING: Lock pin must be secured into the bench fixture to hold the transmission and prevent bodily injury. NOTE: Ensure the DT 3289-20 holding fixture is mounted to a bench that is properly supported and will support the weight of the transmission assembly without tipping. DT-39890 holding fixture adapter and an engine stand can be used as an alternative method for supporting the transmission assembly during repairs.

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	Special Tools • DT 3289-20 Holding Fixture • DT-39890 Transmission Holding Fixture Adapter For equivalent regional tools, refer to Special Tools .
2	DT 21366 Converter Holding Strap For equivalent regional tools, refer to Special Tools .
3	Dust Cover Bolts M10 x 25, model dependent (Qty: 2)
4	Dust Cover Push Pin, model dependent
5	Dust Cover, model dependent
6	Torque Converter Assembly CAUTION: Only install the lift assist handles until it stops. Do not tighten. Over tightening the lift assist handles can cause damage to the torque converter. NOTE: Failure to raise the torque converter straight up could damage the torque converter clutch lip seal inside the torque converter clutch assembly. Special Tools DT 46409 Torque Converter Lifting Handles For equivalent regional tools, refer to Special Tools .

CONTROL VALVE BODY ASSEMBLY REMOVAL

Control Valve Body Cover Removal

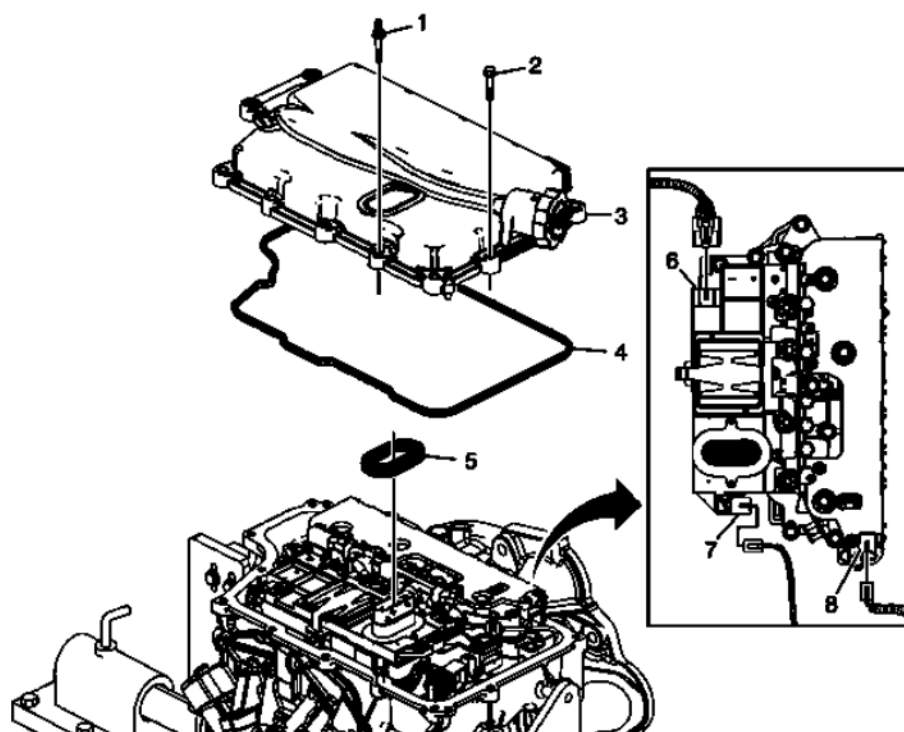


Fig. 3: Control Valve Body Assembly Components
Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Cover Removal

Callout	Component Name
1	Control Valve Body Cover Stud M6 x 30 (Qty: 3)
2	Control Valve Body Cover Bolt M6 x 30 (Qty: 11)
3	Control Valve Body Cover
4	Control Valve Body Cover Gasket NOTE: Do not re-use the valve body cover gasket.
5	Control Valve Body Cover Wiring Connector Hole Seal CAUTION: Support the control solenoid valve assembly around the connector when removing the seal. Excessive pulling force can damage the internal electrical connections.
6	Shift Position Switch Connector
7	Output Speed Sensor Connector
8	Input Speed Sensor Connector

Control Solenoid (W/ Body and TCM) Valve Assembly Removal

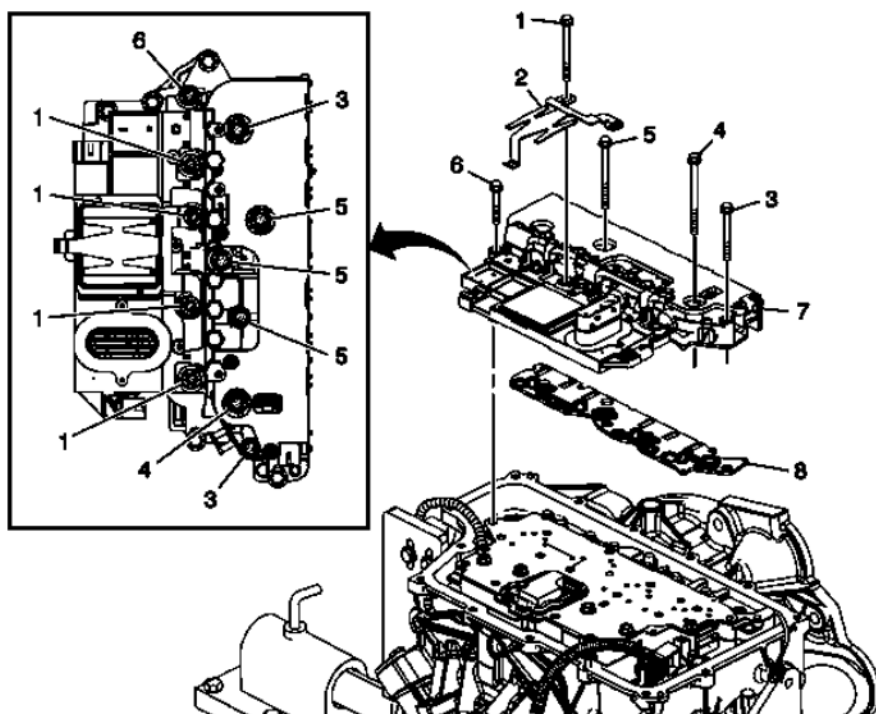


Fig. 4: Control Solenoid (W/ Body and TCM) Valve Assembly Components
Courtesy of GENERAL MOTORS COMPANY

Control Solenoid (w/Body and TCM) Valve Assembly Removal

Callout	Component Name
1	Control Valve Body Bolt M6 x 80 (Qty: 4)
2	Control Solenoid Valve Spring
3	Control Valve Body Bolt M6 x 65 (Qty: 2)
4	Control Valve Body Bolt M6 x 42 (Qty: 1)
5	Control Valve Body Bolt M6 x 95 (Qty: 3)
6	Control Valve Body Bolt M6 x 55 (Qty: 1)
7	Control Solenoid (w/ Body and TCM) Valve Assembly
8	Control Solenoid Valve Assembly Filter Plate
	CAUTION: Use care when removing or installing the filter plate assembly. A broken or missing retaining tab may not adequately secure the filter plate to the control solenoid valve assembly, resulting in possible damage or contamination. NOTE: Discard the filter plate, it is not reusable.

Control Valve Body Assembly and Output Speed Sensor Removal

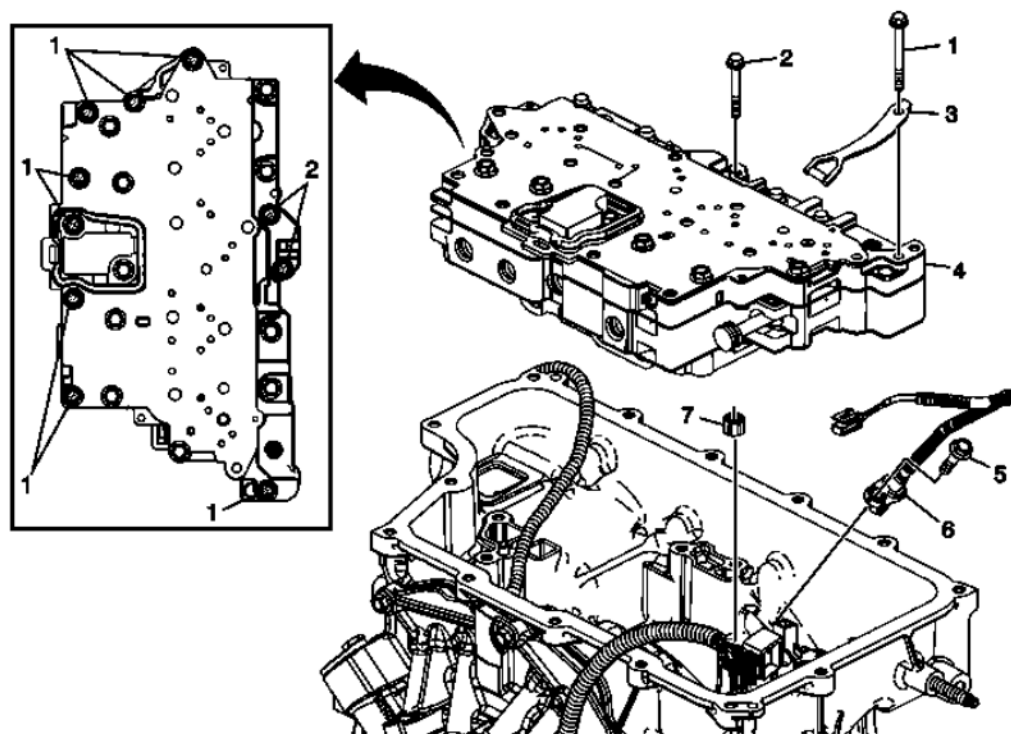


Fig. 5: Control Valve Body Assembly and Output Speed Sensor Components
Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Assembly and Output Speed Sensor Removal

Callout	Component Name
1	Control Valve Body Bolt M6 x 65 (Qty: 8)
2	Control Valve Body Bolt M6 x 55 (Qty: 2)
3	Manual Shaft Detent Assembly
4	Control Valve Body Assembly
5	A/Trans Output Speed Sensor Bolt M6 x 25
6	A/Trans Output Speed Sensor
7	1-2-3-4 Clutch Fluid Passage Seal NOTE: The seal is not reusable.

CASE COVER AND 3-5-REVERSE AND 4-5-6 CLUTCH HOUSING REMOVAL

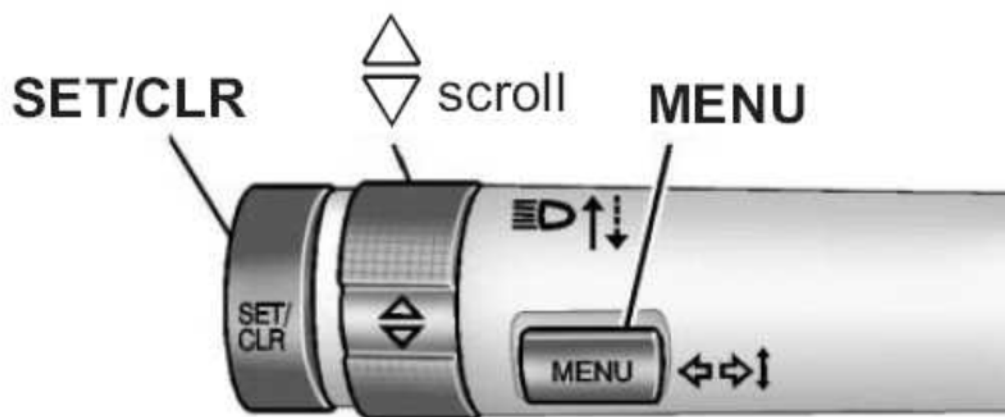


Fig. 6: Identifying Case Cover, 3-5-Reverse & 4-5-6 Clutch Housing
 Courtesy of GENERAL MOTORS COMPANY

Case Cover and 3-5-Reverse and 4-5-6 Clutch Housing Removal

Callout	Component Name
1	A/Trans Case Cover Assembly Bolt M6 x 30 (Qty: 10)
2	A/Trans Case Cover Assembly CAUTION: Use care when pulling the input speed sensor wire harness through the case to avoid damaging the harness.
3	A/Trans Case Cover Gasket NOTE: The gasket is not reusable.
4	Input Shaft Thrust Bearing Assembly NOTE: The bearing may be stuck to the case cover.
5	3-5 Rev/4-5-6 Clutch Housing Assembly

REACTION CARRIER HUB AND 2-6 CLUTCH PLATE REMOVAL

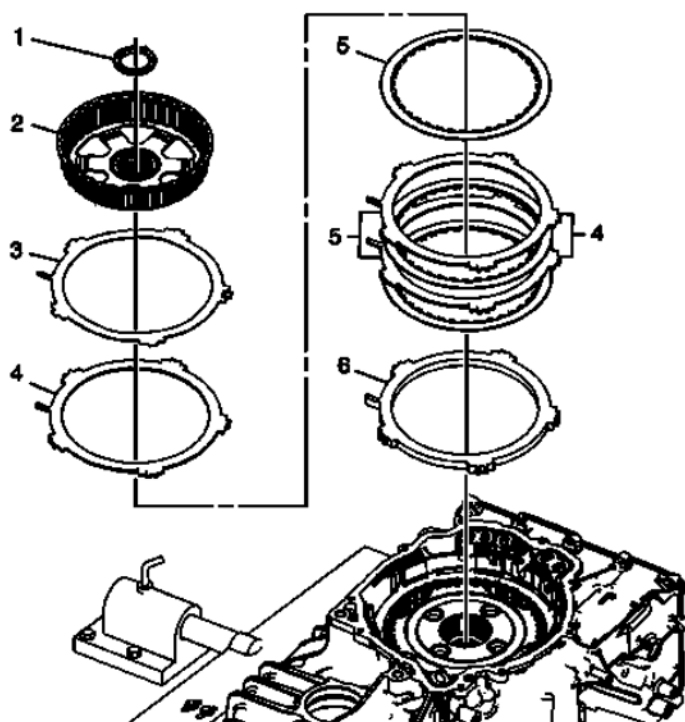


Fig. 7: Identifying Reaction Carrier Hub & 2-6 Clutch Plate
Courtesy of GENERAL MOTORS COMPANY

Reaction Carrier Hub and 2-6 Clutch Plate Removal

Callout	Component Name
1	2-6 Clutch Hub Thrust Bearing Assembly NOTE: The 2-6 clutch hub thrust bearing assembly may be stuck to the reaction carrier hub assembly.
2	Reaction Sun Gear Assembly
3	2-6 Clutch Cushion Spring
4	2-6 Clutch Plate (Qty: 3)
5	2-6 Clutch (w/ Friction Material) Plate Assembly (Qty: 3)
6	2-6 Clutch Backing Plate

LOW AND REVERSE CLUTCH PLATE REMOVAL

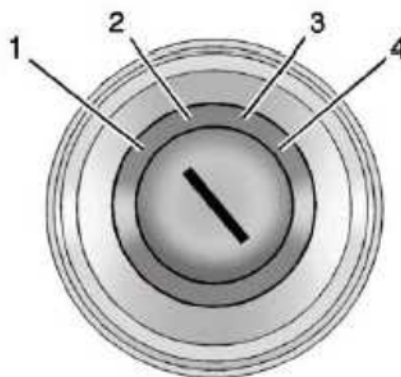
Ignition Positions

Keyless Access



Pressing the button cycles it through three modes: ACC/ACCESSORY, ON/RUN/START, and Stopping the Engine/OFF.

Key Access



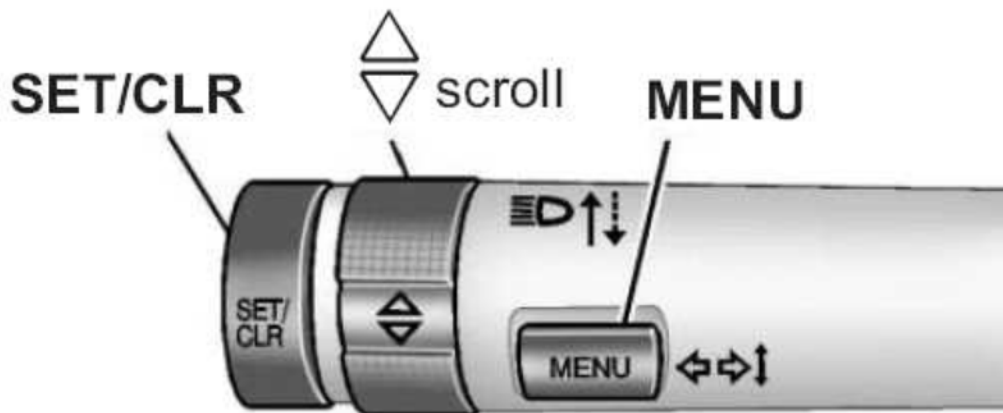
The ignition switch has four different positions.

Fig. 8: Identifying Low & Reverse Clutch Plate
Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Removal

Callout	Component Name
1	Low and Reverse Clutch Cushion (Waved) Spring
2	Low and Reverse Clutch Apply Plate
3	Low and Reverse Clutch (w/Friction Material) Plate Assembly (Qty: 4)
4	Low and Reverse Clutch Plate (Qty: 3)
5	Low and Reverse Clutch Backing Plate

LOW AND REVERSE CLUTCH AND 1-2-3-4 CLUTCH PLATE REMOVAL



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Fig. 9: Identifying Low, Reverse Clutch & 1-2-3-4 Clutch Plates

Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch and 1-2-3-4 Clutch Plate Removal

Callout	Component Name
1	Low and Reverse Clutch Retainer Ring
2	Low and Reverse Clutch Assembly
3	1-2-3-4 Clutch (w/ Friction Material) Plate Assembly (Qty: 2)
4	1-2-3-4 Clutch Plate (Qty: 2)
5	1-2-3-4 Clutch (Waved) Plate
6	1-2-3-4 Clutch Spring Retainer Ring
7	1-2-3-4 Clutch Spring
8	1-2-3-4 Clutch Piston NOTE: • Use pliers to remove the piston. • Inspect the piston seals for damage and/or wear. The piston is reusable.

TORQUE CONVERTER AND DIFFERENTIAL HOUSING, FRONT DIFFERENTIAL TRANSFER DRIVE GEAR AND FRONT DIFFERENTIAL CARRIER REMOVAL

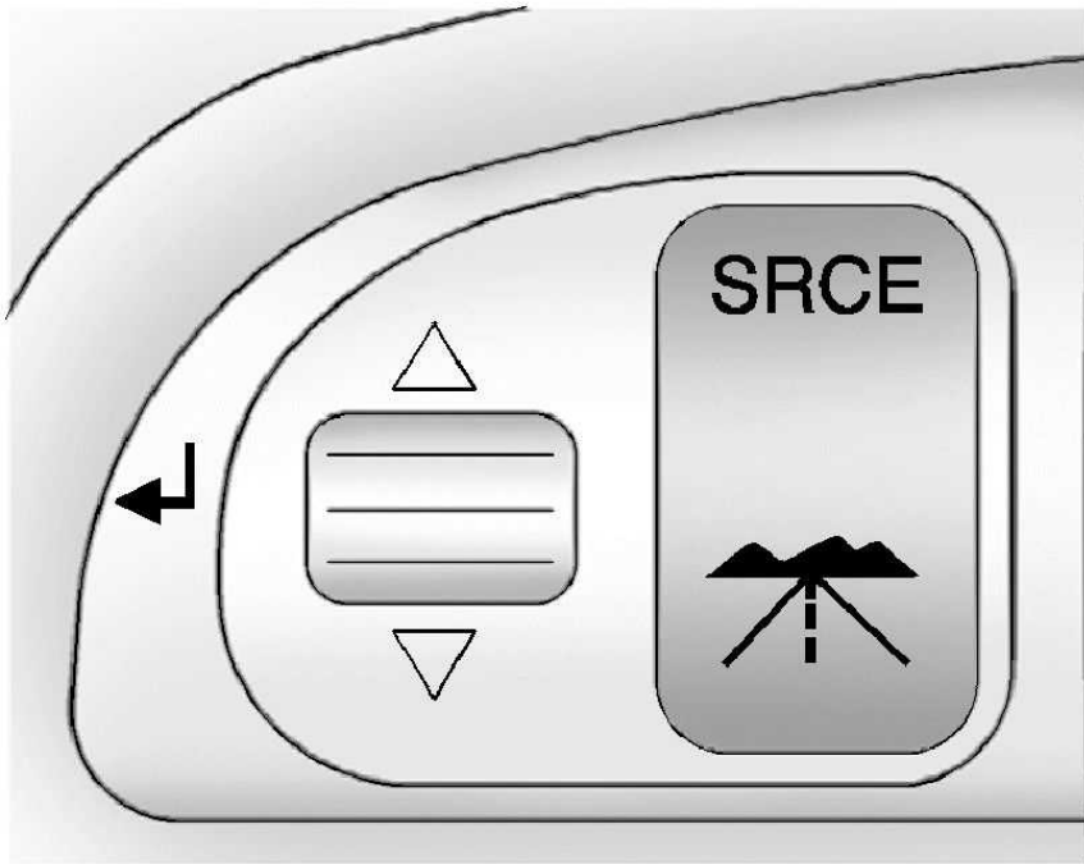


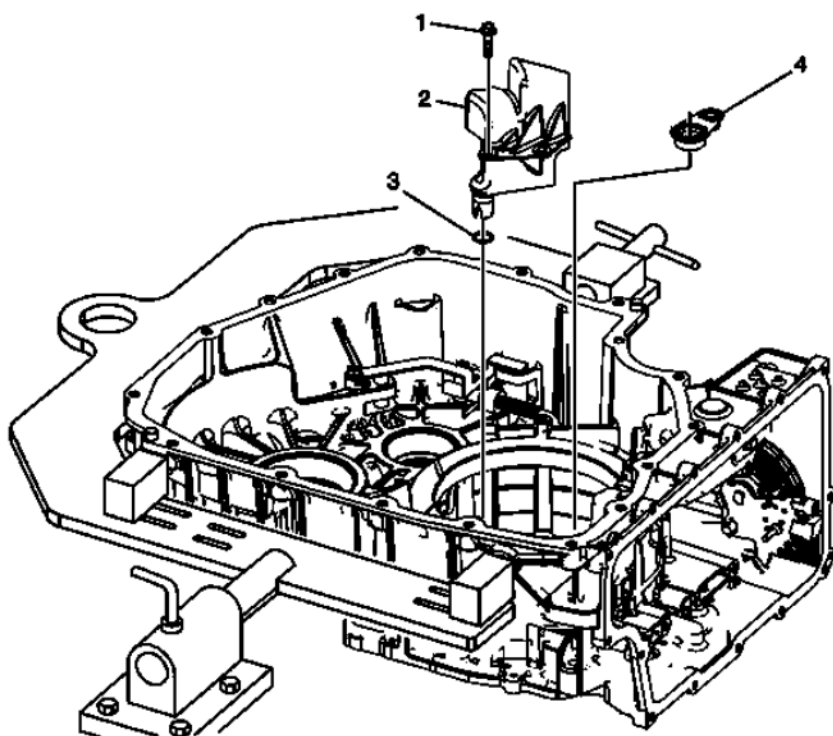
Fig. 10: Identifying Torque Converter, Differential Housing, Front Differential Transfer Drive Gear & Front Differential Carrier

Courtesy of GENERAL MOTORS COMPANY

Torque Converter and Differential Housing, Front Differential Transfer Drive Gear and Front Differential Carrier Removal

Callout	Component Name
1	Torque Converter and Differential Housing Bolt M8 x 35 (Qty: 17)
2	Torque Converter, Support and A/Trans Fluid Pump Housing Assembly
3	Torque Converter Housing Outer Seal NOTE: The seal is not reusable.
4	Front Differential Drive Pinion Gear Lube Tube
5	Front Differential Drive Pinion (w/ Transfer Gear) Gear Assembly
6	Front Differential Carrier Assembly

FLUID TROUGH REMOVAL

**Fig. 11: Identifying Fluid Trough**

Courtesy of GENERAL MOTORS COMPANY

Fluid Trough Removal

Callout	Component Name
1	A/Trans Fluid Trough Bolt M6 x 25 (Qty: 1)
2	A/Trans Fluid Trough
3	A/Trans Fluid Trough (O-Ring) Seal
4	A/Trans Fluid Pump Outlet Seal Assembly
	NOTE: The seal assembly is not reusable.

MANUAL SHIFT DETENT LEVER WITH SHAFT POSITION SWITCH ASSEMBLY AND PARK PAWL ACTUATOR REMOVAL

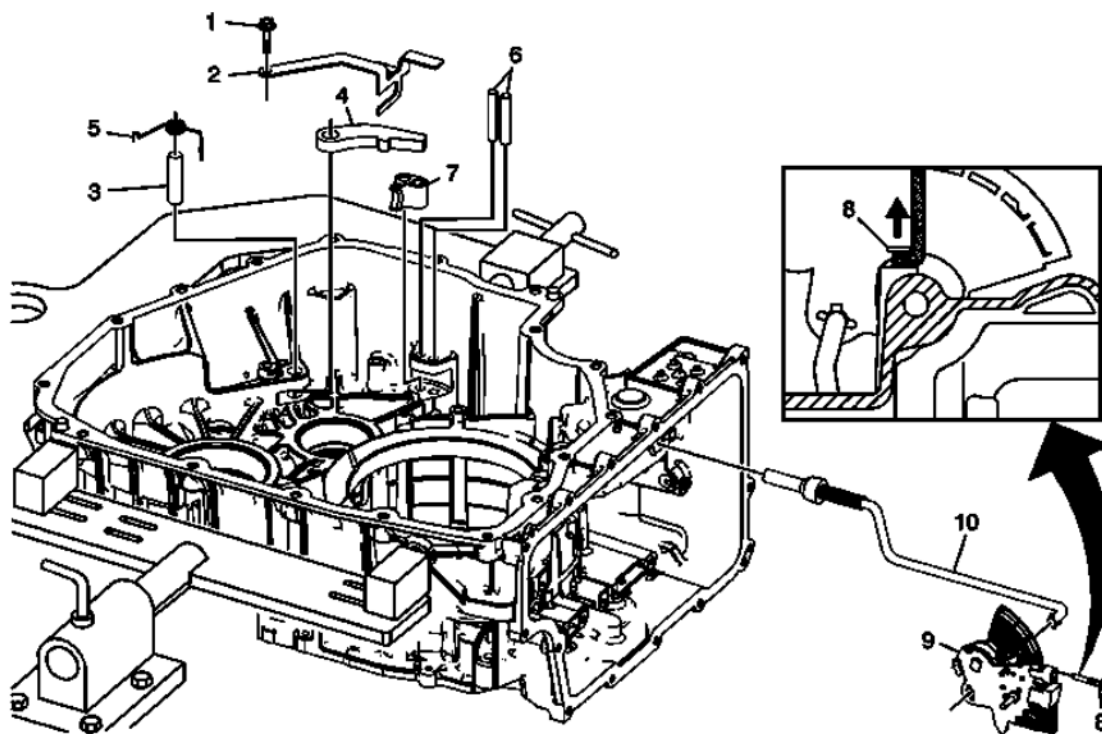


Fig. 12: Identifying Manual Shift Detent Lever With Shaft Position Switch Assembly & Park Pawl Actuator

Courtesy of GENERAL MOTORS COMPANY

Manual Shift Detent Lever with Shaft Position Switch Assembly and Park Pawl Actuator Removal

Callout	Component Name
1	Park Pawl Actuator Bracket Bolt M6 x 25 (Qty: 2)
2	Park Pawl Actuator Bracket
3	Park Pawl Shaft
4	Park Pawl
5	Park Pawl Spring
6	Park Pawl Actuator Guide Pin
7	Park Pawl Actuator Guide
8	Manual Shift Detent Lever Pin NOTE: • Use a small nail puller or other suitable tool. • Discard the pin. The pin is not reusable. Special Tools • DT 23129 Universal Seal Remover • GE 6125-1B Slide Hammer with Adapter

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	For equivalent regional tools, refer to Special Tools .
9	Manual Shaft Detent (w/Shift Position Switch) Lever Assembly NOTE: Rotate the assembly counterclockwise so the actuator rod will fit through the case opening.
10	Park Pawl Actuator Assembly

MANUAL SHIFT SHAFT SEAL REPLACEMENT

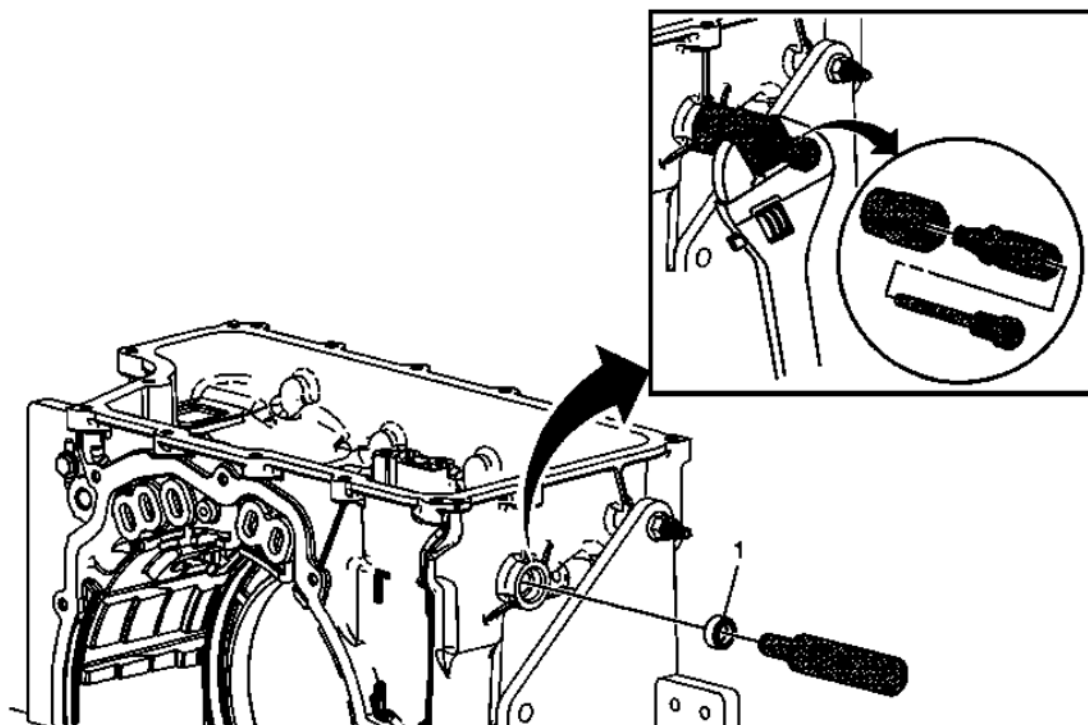


Fig. 13: Identifying Manual Shift Shaft Seal
Courtesy of GENERAL MOTORS COMPANY

Manual Shift Shaft Seal Replacement

Callout	Component Name
1	Manual Shift Shaft Seal Special Tools • DT 45201 Cooler Line Seal Remover • DT 46626 Seal Installer

For equivalent regional tools, refer to **Special Tools**.

FRONT WHEEL DRIVE SHAFT SEAL REPLACEMENT - CASE SIDE

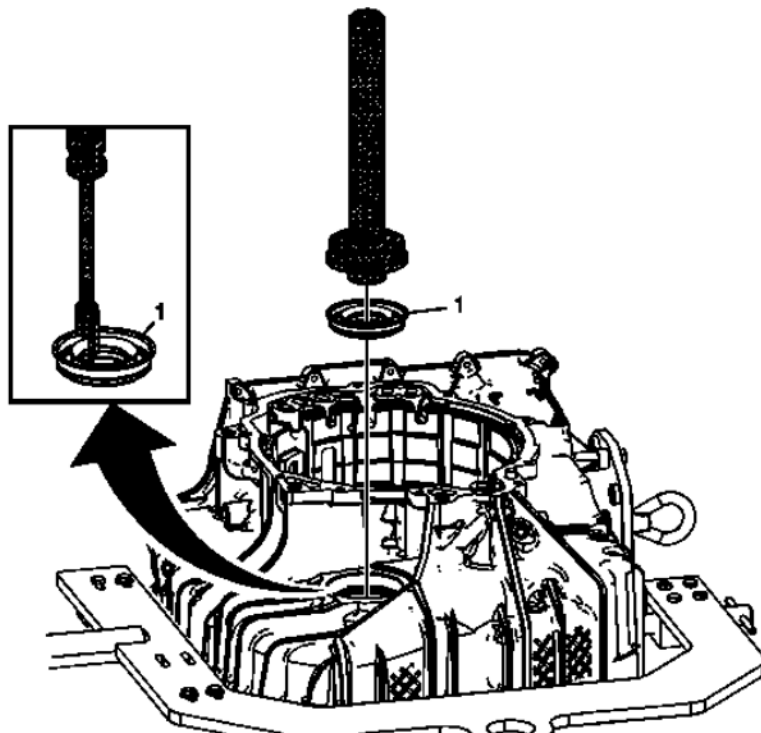


Fig. 14: Identifying Front Wheel Drive Shaft Oil Seal
Courtesy of GENERAL MOTORS COMPANY

Front Wheel Drive Shaft Seal Replacement - Case Side

Callout	Component Name
1	Front Wheel Drive Shaft Oil Seal Assemble NOTE: Use the flat side of J 46629-A seal installer to seat the seal to the case surface. Special Tools • DT 23129 Universal Seal Remover • DT 46629-A Seal Installer • GE 6125-1B Slide Hammer • GE 8092 Driver Handle For equivalent regional tools, refer to Special Tools.

FRONT DIFFERENTIAL CARRIER BEARING CUP REPLACEMENT - CASE SIDE

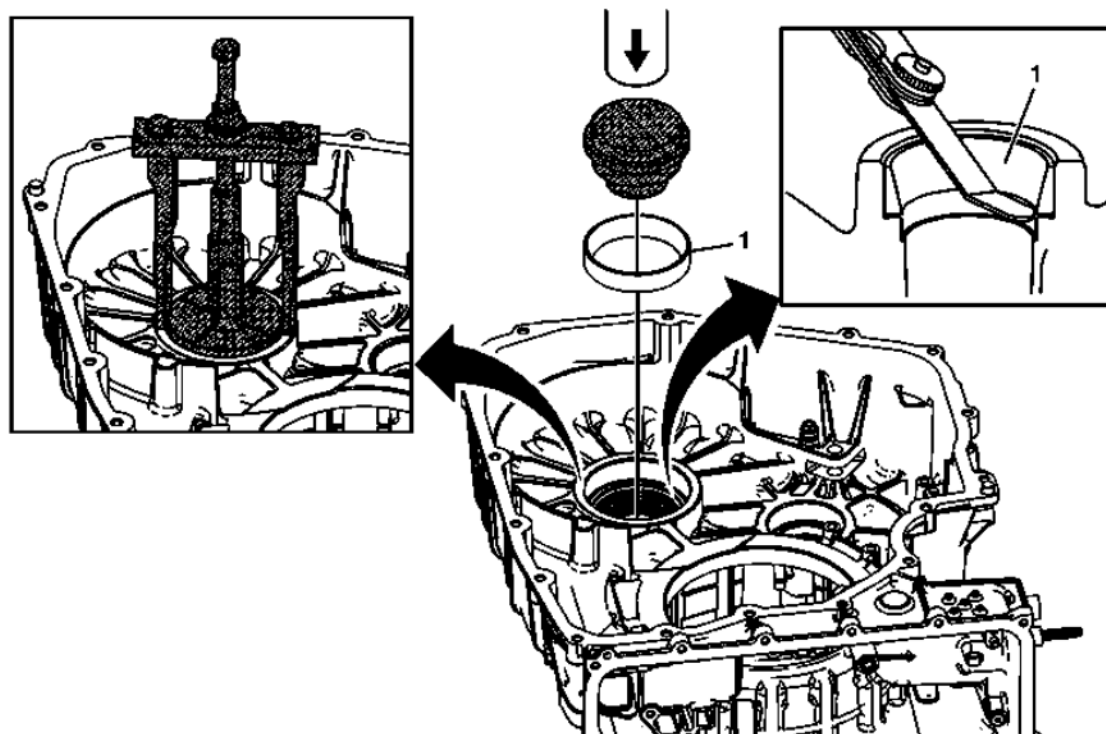


Fig. 15: Identifying Front Differential Carrier Bearing Cup
 Courtesy of GENERAL MOTORS COMPANY

Front Differential Carrier Bearing Cup Replacement - Case Side

Callout	Component Name
	Front Differential Bearing Cup CAUTION: Support the back side of the case before installing the bearing cup. Apply a light coating of transmission fluid to the bore before pressing the cup into position. Install the bearing cup until it stops moving. Applying excessive pressure to the bearing cup once it is seated could cause damage to the case casting. CAUTION: An unseated or improperly installed bearing cup will result in premature bearing failure. Visually inspect the bearing cup to insure there is "no gap" between the case, thrust washer and the bearing cup. Use of a feeler gauge may assist in identifying a bearing cup that is not fully seated. CAUTION: Failure to apply the lubricant will cause damage to the bolt and nut threads. CAUTION:

There are first and second design front differential bearing cups. First design bearing cups are manufactured by Timken. Second design bearing cups are manufactured by NSK. Second design bearing cups require DT-45087-A cup installer. If installing second design bearing cups, second design front differential carrier bearings must be used. All four parts must be kept as a set to prevent damage to the transmission.

NOTE:

- Tighten DT-47927-2 which is part of DT-47927 cup remover until it fits snugly on the bearing cup.
- Adjust DT 45124 removal bridge so it sits on the torque converter housing surface just beyond the bearing cup opening.
- Apply the extreme pressure lubricant DT 23444-A extreme press lubricant to the puller bolt threads to prevent damage to the bolt threads during bearing cup removal.
- Hold the puller bridge bolt and turn the nut to remove the bearing cup.

Special Tools

- DT 23444-A Extreme Press Lubricant - 1/4 Ounce Tube
- DT-45087 Bearing Cup Installer
- DT-45087-A Bearing Cup Installer
- DT 45124 Removal Bridge
- DT-47927 Bearing Cup Remover

For equivalent regional tools, refer to **Special Tools**.

FRONT DIFFERENTIAL DRIVE PINION GEAR BEARING CUP AND LUBRICANT DAM REPLACEMENT

Removal

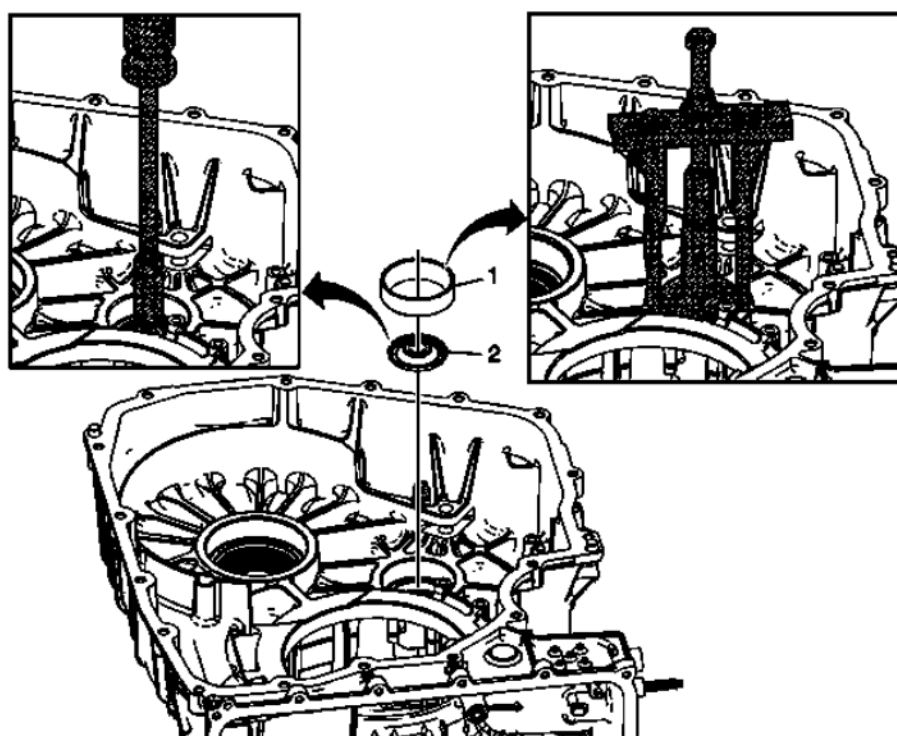


Fig. 16: Identifying Front Differential Drive Pinion Gear Bearing Cup & Lube Dam
Courtesy of GENERAL MOTORS COMPANY

Removal

Callout	Component Name
1	Front Differential Drive Pinion Gear Bearing Cup CAUTION: Failure to apply the lubricant will cause damage to the bolt and nut threads. NOTE: • Tighten DT-45094 cup remover until it fits snugly on the bearing cup. • Adjust DT 45124 removal bridge so it sits on the case surface just beyond the bearing cup opening. • Apply the extreme pressure lubricant DT 23444-A extreme press lubricant to the puller bolt threads to prevent damage to the bolt threads during bearing cup removal. • Hold the puller bridge nut and turn the bolt to remove the bearing cup. Special Tools • DT 23444-A Extreme Press Lubricant - 1/4 Ounce Tube • DT-45094 Bearing Cup Remover • DT 45124 Removal Bridge

	For equivalent regional tools, refer to Special Tools .
2	Front Differential Drive Pinion Gear Lube Dam Special Tools • DT-48055 Lube Dam Removal • GE 6125-1B Slide Hammer with Adapter For equivalent regional tools, refer to Special Tools .

Installation

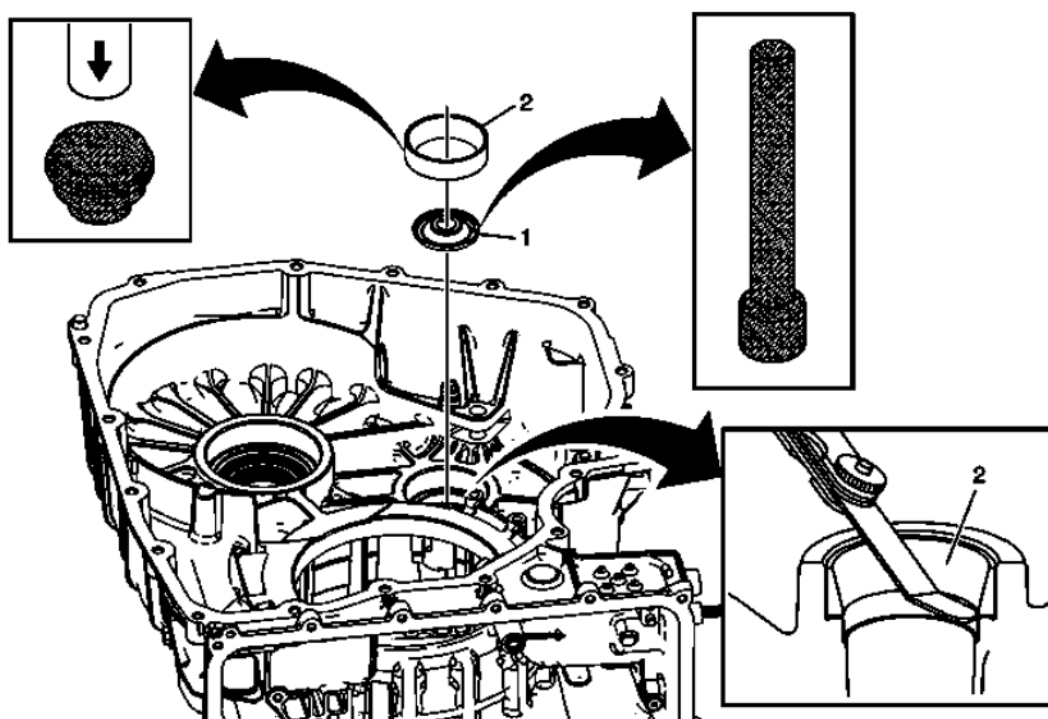


Fig. 17: View Of Front Differential Drive Pinion Gear Bearing Cup & Lube Dam
Courtesy of GENERAL MOTORS COMPANY

Installation

Callout	Component Name
1	Front Differential Drive Pinion Gear Lube Dam Special Tools • DT-46630 Lube Dam Installer

- GE 8092 Driver Handle

For equivalent regional tools, refer to **Special Tools**.

Front Differential Drive Pinion Gear Bearing Cup

CAUTION:

Support the back side of the case before installing the bearing cup. Apply a light coating of transmission fluid to the bore before pressing the cup into position. Install the bearing cup until it stops moving. Applying excessive pressure to the bearing cup once it is seated could cause damage to the case casting.

2

CAUTION:

An unseated or improperly installed bearing cup will result in premature bearing failure. Visually inspect the bearing cup to insure there is "no gap" between the case, thrust washer and the bearing cup. Use of a feeler gauge may assist in identifying a bearing cup that is not fully seated.

Special Tools

DT-45087 Bearing Cup Installer

For equivalent regional tools, refer to **Special Tools**.

TRANSMISSION CASE CLEANING AND INSPECTION

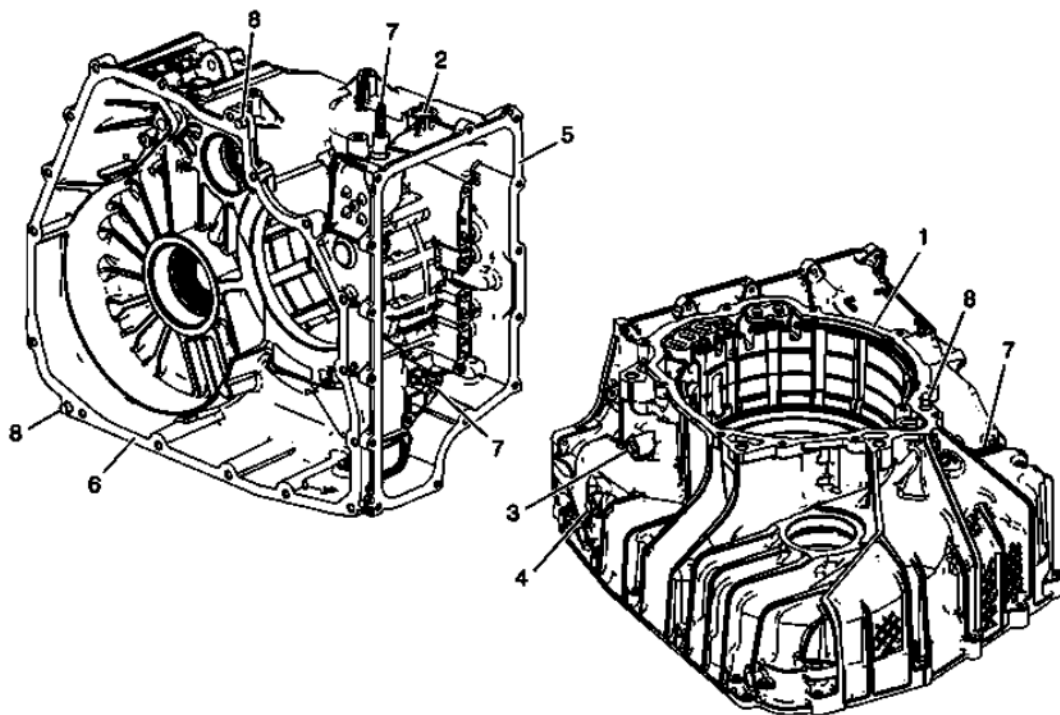


Fig. 18: Identifying Transmission Case Components
 Courtesy of GENERAL MOTORS COMPANY

Transmission Case Cleaning and Inspection

Callout	Component Name
CAUTION: Do not use abrasive pads or bristle devices to clean the sealing surfaces. Abrasive pads produce a fine grit that can effect transmission function. Abrasive pads can also remove enough metal to create oil leaks.	
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.	
Preliminary Procedures 1. Thoroughly clean the transmission case assembly, including case threads, with clean solvent. 2. Clean gasket sealing surfaces. Remove all residual gasket material. 3. Inspect all threaded holes. If necessary, repair any thread damage.	
1	Case Cover Sealing Surface
2	Manual Shift Shaft Seal Surface NOTE: Refer to <u>Manual Shift Shaft Seal Replacement</u>.
3	Fluid Pressure Test Plug
4	Fluid Drain Plug
5	Control Valve Body Cover Sealing Surface
6	Torque Converter Housing Sealing Surface
7	Transmission Fluid Cooler Pipe Stud M8 x 30.5 (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 12 N.m (106 lb in)
8	Transmission Case Cover Locator Pin Procedure Inspect the locating pins to be fully seated in case.

MANUAL SHIFT DETENT LEVER WITH SHAFT POSITION SWITCH ASSEMBLY AND PARK PAWL ACTUATOR INSTALLATION

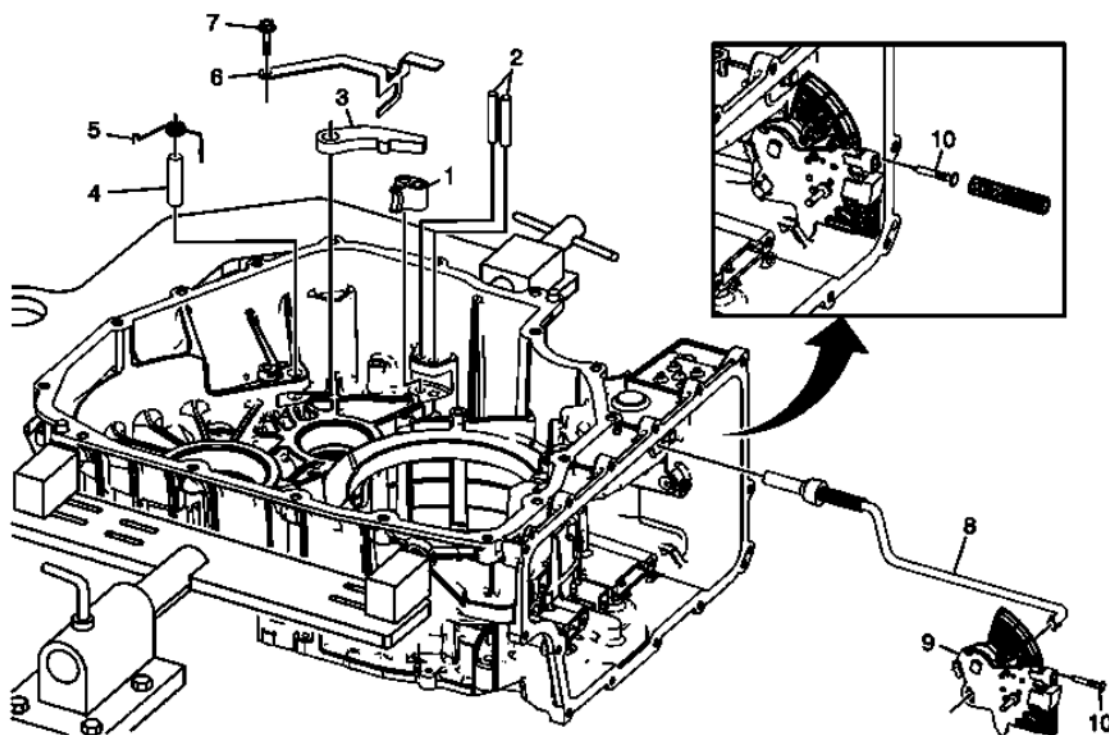


Fig. 19: Identifying Manual Shift Detent Lever With Shaft Position Switch Assembly & Park Pawl Actuator

Courtesy of GENERAL MOTORS COMPANY

Manual Shift Detent Lever with Shaft Position Switch Assembly and Park Pawl Actuator Installation

Callout	Component Name
1	Park Pawl Actuator Guide
2	Park Pawl Actuator Guide Pin
3	Park Pawl
4	Park Pawl Shaft
5	Park Pawl Spring
6	Park Pawl Actuator Bracket
7	Park Pawl Actuator Bracket Bolt M6 x 25 (Qty: 2)
	CAUTION: Refer to Fastener Caution . Tighten 12 N.m (106 lb in).
	Park Pawl Actuator Assembly

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8	NOTE: Install the park pawl actuator assembly onto the detent lever assembly.
9	Manual Shaft Detent (w/Shift Position Switch) Lever Assembly NOTE: • Rotate the assembly clockwise so the actuator rod will fit through the case opening. • Lubricate shaft with ATF to prevent damage to the manual shift shaft seal.
10	Manual Shift Shaft Pin CAUTION: Use J 41229 to install the manual shaft pin at the correct height in order to properly secure the manual shaft. If you install the pin too deep, the case bore may crack. Procedure 1. Use a NEW pin to ensure proper engagement to the case. 2. Inspect pin installed height is within 6.5-7.5 mm (0.25-0.30 in). Special Tools DT 41229 Manual Shaft Pin Installer For equivalent regional tools, refer to Special Tools .

FLUID TROUGH INSTALLATION

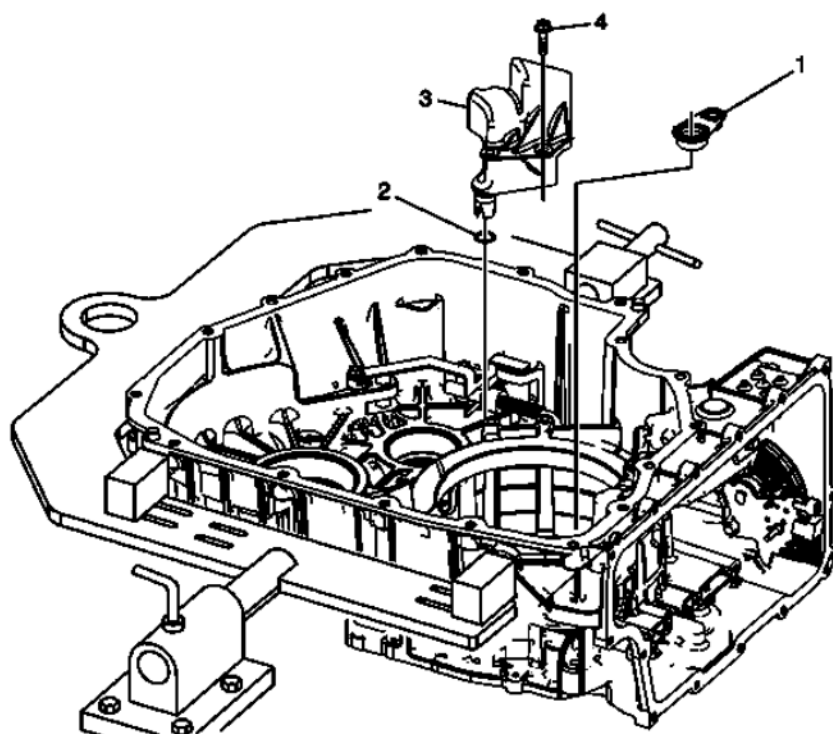


Fig. 20: Identifying Fluid Trough Components
 Courtesy of GENERAL MOTORS COMPANY

Fluid Trough Installation

Callout	Component Name
1	A/Trans Fluid Pump Outlet Seal Assembly
2	A/Trans Fluid Trough (O-ring) Seal
3	A/Trans Fluid Trough
4	A/Trans Fluid Trough Bolt M6 x 25 (Qty: 1) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 12 N.m (106 lb in).

TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY DISASSEMBLE

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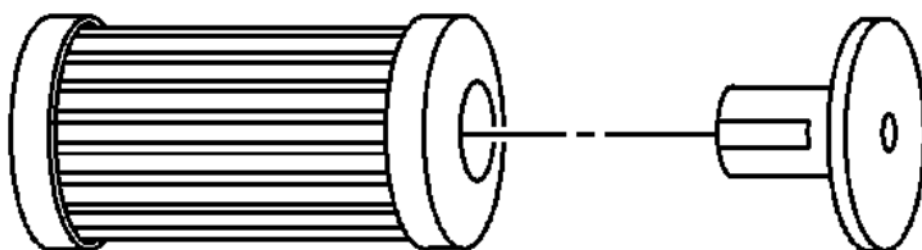


Fig. 21: Identifying Torque Converter & Differential Housing Assembly Components
Courtesy of GENERAL MOTORS COMPANY

Torque Converter and Differential Housing Assembly Disassemble

Callout	Component Name
1	Front Differential Carrier Baffle Bolt M6 x 25
2	Front Differential Carrier Baffle
3	Front Differential Transfer Drive Gear Support Bolt M8 x 25 (Qty: 9)
4	Front Differential Transfer Drive Gear Support Assembly
5	Drive Sprocket Thrust Washer
6	A/Trans Fluid Pump Bolt M6 x 25 (Qty: 3)
7	A/Trans Fluid Pump Assembly
8	Drive Link Assembly
	NOTE: Link and sprockets will be removed as an assembly.

9	Drive Sprocket Thrust Washer NOTE: Drive sprocket thrust washer may be stuck to the torque converter housing.
10	Driven Sprocket Thrust Washer

FRONT DIFFERENTIAL CARRIER BEARING CUP AND WASHER REPLACEMENT - TORQUE CONVERTER HOUSING SIDE

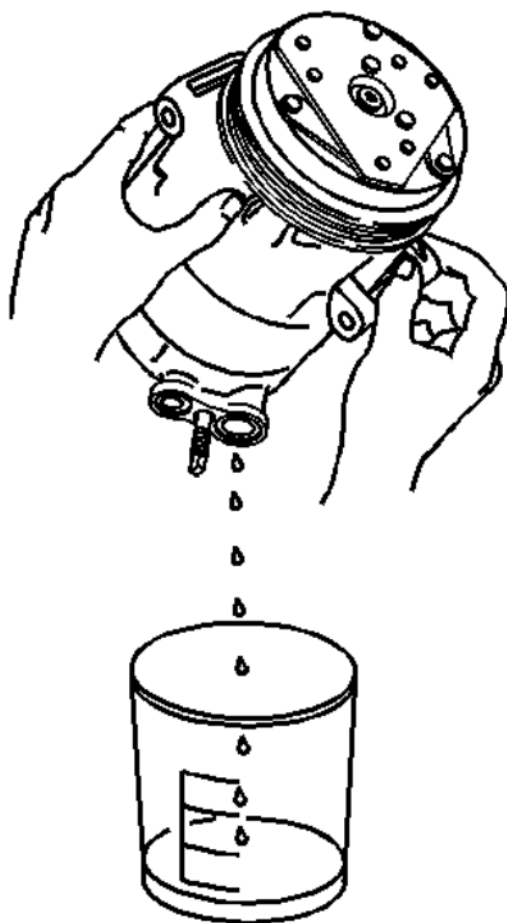


Fig. 22: Identifying Front Differential Carrier Bearing Cup & Washer
Courtesy of GENERAL MOTORS COMPANY

Front Differential Carrier Bearing Cup and Washer Replacement - Torque Converter Housing Side

Callout	Component Name
Preliminary Procedures	
Do not install the bearing cup until after the selective washer measurement has been performed.	

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- Install the correct differential bearing washer as determined by the thrust washer measurement procedure. Refer to **Front Differential Drive Pinion Gear Bearing Thrust Washer and Front Differential Bearing Washer Measurement**.

1 Front Differential Bearing Thrust Washer

Front Differential Carrier Bearing Cup

CAUTION:

Support the back side of the torque converter housing before installing the bearing cup. Apply a light coating of transmission fluid to the bore before pressing the cup into position. Install the bearing cup until it stops moving. Applying excessive pressure to the bearing cup once it is seated could cause damage to the torque converter housing casting.

CAUTION:

An unseated or improperly installed bearing cup will result in premature bearing failure. Visually inspect the bearing cup to insure there is "no gap" between the converter housing, thrust washer and the bearing cup. Use of a feeler gauge may assist in identifying a bearing cup that is not fully seated.

CAUTION:

Failure to apply the lubricant will cause damage to the bolt and nut threads.

CAUTION:

There are first and second design front differential bearing cups. First design bearing cups are manufactured by Timken. Second design bearing cups are manufactured by NSK. Second design bearing cups require DT-45087-A cup installer. If installing second design bearing cups, second design front differential carrier bearings must be used. All four parts must be kept as a set to prevent damage to the transmission.

2

Procedure

1. Tighten DT 47927-1 which is part of **DT-47927** bearing cup remover until it fits snugly on the bearing cup.
2. Adjust **DT 45124** remover bridge so it sits on the torque converter housing surface just beyond the bearing cup opening.
3. Apply the extreme pressure lubricant supplied with **DT 23444-A** extreme press lubricant to the puller bolt threads to prevent damage to the bolt threads during bearing cup removal.
4. Hold the puller bridge bolt and turn the nut to remove the bearing cup.

Special Tools

- **DT 23444-A** Extreme Press Lubricant - 1/4 Ounce Tube
- **DT-45087** Bearing Cup Installer
- **DT-45087-A** Bearing Cup Installer

- DT 45124 Remover Bridge
- DT-47927 Bearing Cup Remover

For equivalent regional tools, refer to **Special Tools** .

FRONT DIFFERENTIAL DRIVE PINION BEARING CUP, WASHER AND LUBRICANT DAM REPLACEMENT - TORQUE CONVERTER HOUSING SIDE

Bearing Cup, Washer and Lubricant Dam Removal

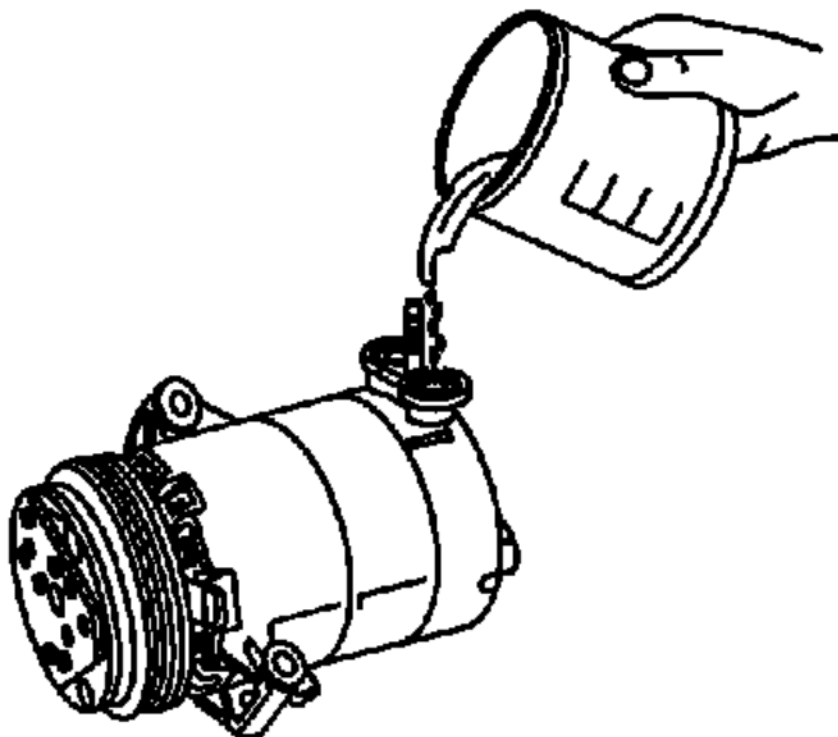


Fig. 23: View Of Front Differential Drive Pinion Bearing Cup, Washer & Lube Dam
Courtesy of GENERAL MOTORS COMPANY

Bearing Cup, Washer and Lubricant Dam Removal

Callout	Component Name
Preliminary Procedure	
Do not install the bearing cup until after the selective washer measurement has been performed.	
	Front Differential Drive Pinion Gear Bearing Cup

2014 GMC Acadia Denali

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1	CAUTION: Failure to apply the lubricant will cause damage to the bolt and nut threads. Procedure 1. Tighten DT-45094 bearing cup remover until it fits snugly on the bearing cup. 2. Adjust DT 45124 removal bridge so it sits on the torque converter housing surface just beyond the bearing cup opening. 3. Apply the extreme pressure lubricant DT 23444-A extreme press lubricant to the puller bolt threads to prevent damage to the bolt threads during bearing cup removal. 4. Hold the puller bridge bolt and turn the nut to removal the bearing cup. Special Tools • DT 23444-A Extreme Press Lubricant - 1/4 Ounce Tube • DT-45087 Transfer Shaft and Differential Bearing Cup Installer • DT-45094 Bearing Cup Remover • DT 45124 Removal Bridge • DT-47927 Bearing Cup Remover For equivalent regional tools, refer to Special Tools .
2	Front Differential Drive Pinion Gear Bearing Thrust Washer
3	Front Differential Drive Pinion Gear Lube Dam Special Tools • DT-48055 Lube Dam Remover • GE 6125-1B Slide Hammer with Adapter or equivalent For equivalent regional tools, refer to Special Tools .

Bearing Cup, Washer and Lubricant Dam Installation

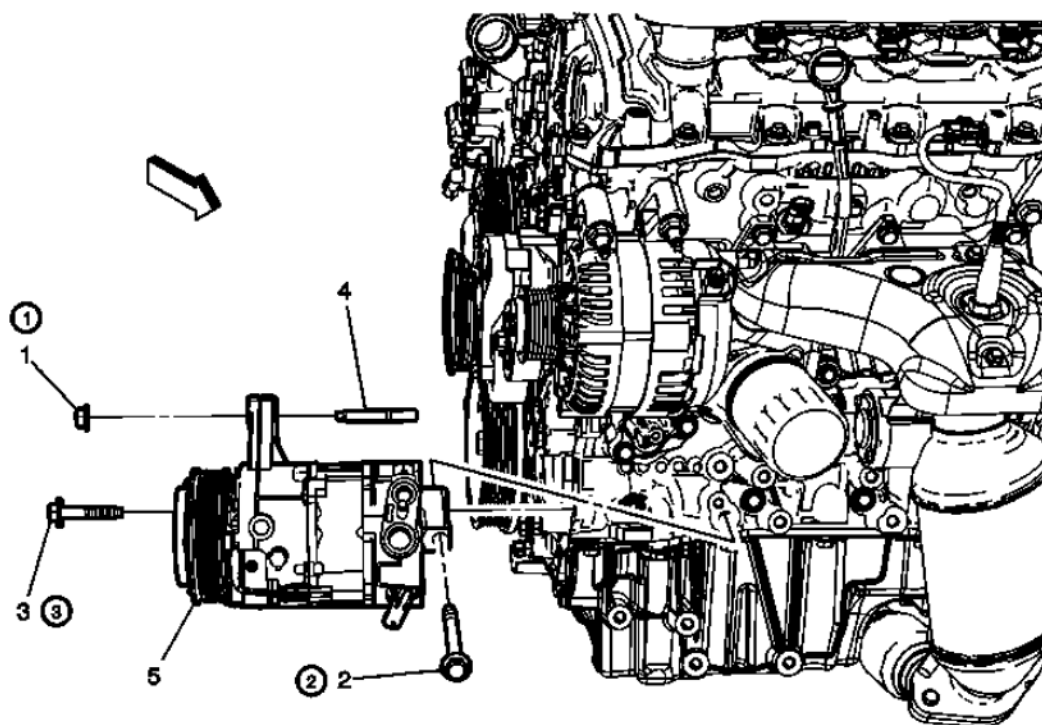


Fig. 24: Identifying Front Differential Drive Pinion Bearing Cup, Washer & Lube Dam
Courtesy of GENERAL MOTORS COMPANY

Bearing Cup, Washer and Lubricant Dam Installation

Callout	Component Name
Preliminary Procedure Do not install the bearing cup until after the selective washer measurement has been performed.	
1	Front Differential Drive Pinion Gear Lube Dam Special Tools • DT-46630 Lube Dam Installer • GE 8092 Driver Handle For equivalent regional tools, refer to Special Tools .
2	Front Differential Drive Pinion Gear Bearing Thrust Washer NOTE: Install the correct drive pinion gear bearing thrust washer as determined by the thrust washer measurement procedure. Refer to Front Differential Drive Pinion Gear Bearing Thrust Washer and Front Differential Bearing Washer Measurement .
	Front Differential Drive Pinion Gear Bearing Cup

CAUTION:

Support the back side of the torque converter housing before installing the bearing cup. Apply a light coating of transmission fluid to the bore before pressing the cup into position. Install the bearing cup until it stops moving. Applying excessive pressure to the bearing cup once it is seated could cause damage to the torque converter housing casting.

CAUTION:

3 An unseated or improperly installed bearing cup will result in premature bearing failure. Visually inspect the bearing cup to insure there is "no gap" between the converter housing, thrust washer and the bearing cup. Use of a feeler gauge may assist in identifying a bearing cup that is not fully seated.

Special Tools

DT-45087 Bearing Cup Installer

For equivalent regional tools, refer to **Special Tools**.

FRONT WHEEL DRIVE SHAFT SEAL REPLACEMENT - TORQUE CONVERTER HOUSING SIDE

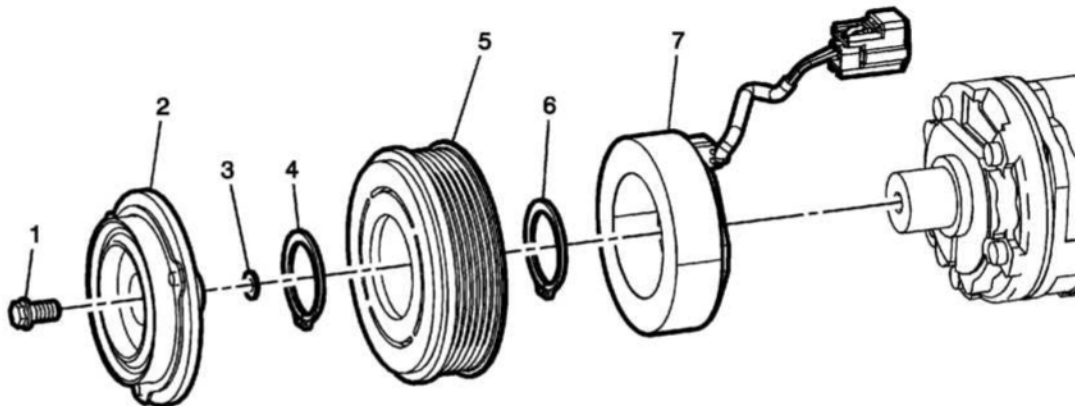


Fig. 25: Identifying Front Wheel Drive Shaft Oil Seal
Courtesy of GENERAL MOTORS COMPANY

Front Wheel Drive Shaft Seal Replacement - Torque Converter Housing Side

Callout	Component Name

2014 GMC Acadia Denali

2014 TRANSMISSION Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

Torque Converter - Front Wheel Drive Shaft Oil Seal Assembly

NOTE:

Use the open side of DT 46629-A seal installer to avoid seal lip damage and to install the seal to the proper depth.

Special Tools

1

- **DT 23129** Universal Seal Remover
- **DT 46629-A** Seal Installer
- **GE 6125-1B** Slide Hammer with Adapter
- **GE 8092** Driver Handle

For equivalent regional tools, refer to **Special Tools** .

TORQUE CONVERTER HOUSING CLEANING AND INSPECTION

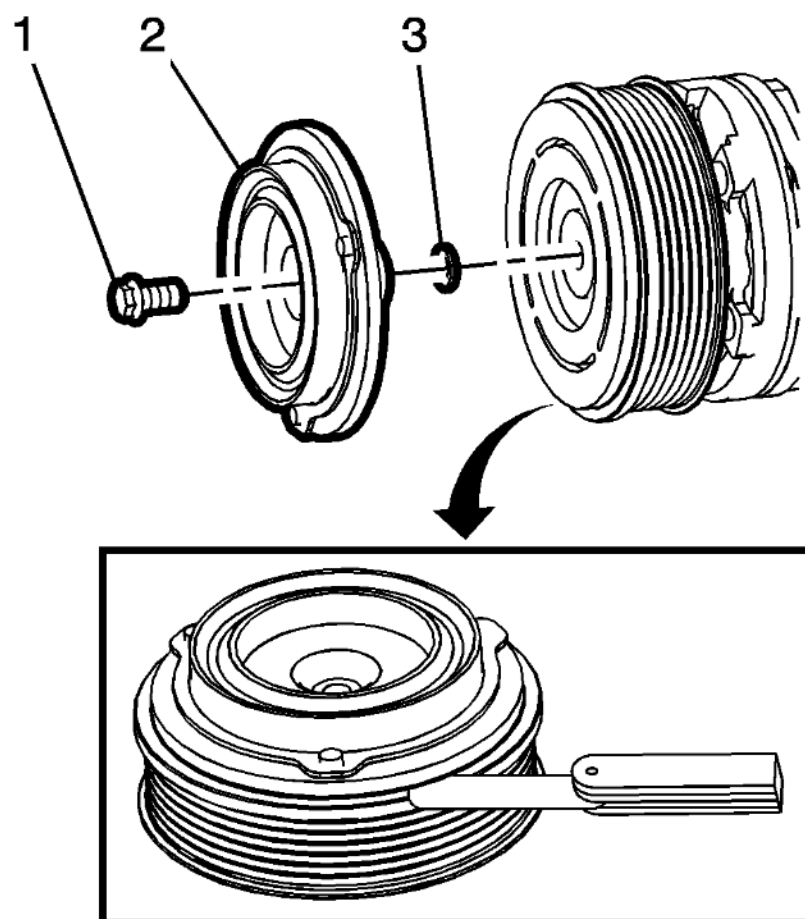


Fig. 26: Identifying Torque Converter Housing
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing Cleaning and Inspection

Callout	Component Name
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure. CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component. CAUTION: Do not use abrasive pads or bristle devices to clean the sealing surfaces. Abrasive pads produce a fine grit that can effect transmission function. Abrasive pads can also remove enough metal to create oil leaks.	

Preliminary Procedure Thoroughly clean the torque converter and differential housing, including threads, with clean solvent.

1	Threaded Holes
2	Gasket Sealing Surfaces

TORQUE CONVERTER FLUID SEAL REPLACEMENT

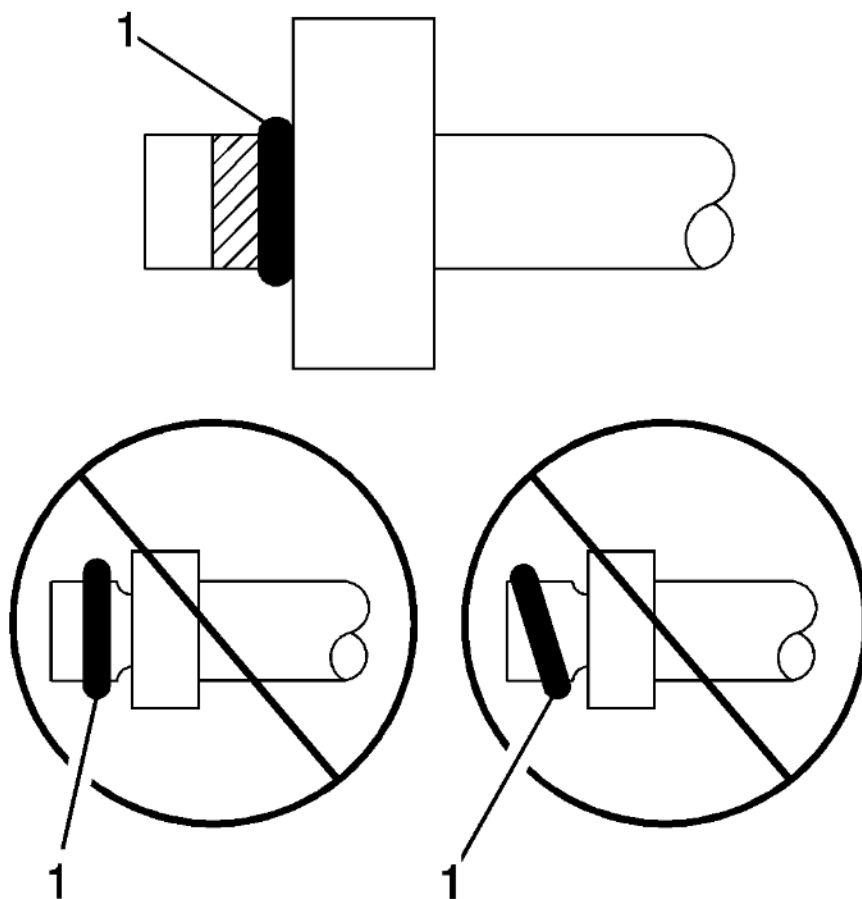


Fig. 27: Identifying Torque Converter Fluid Seal
Courtesy of GENERAL MOTORS COMPANY

Torque Converter Fluid Seal Replacement

Callout	Component Name
	Torque Converter Fluid Seal
	CAUTION: Support the back side of the torque converter housing while installing the seal. Install the seal until it stops moving. Applying excessive pressure to the seal once it is seated

could cause damage to the torque converter housing casting.

Special Tools

1

- **DT 23129** Universal Seal Remover
- **DT 49861** Seal Installer
- **GE 6125-1B** Slide Hammer with Adapter or equivalent

For equivalent regional tools, refer to **Special Tools** .

FRONT DIFFERENTIAL TRANSFER DRIVE GEAR SUPPORT ASSEMBLY DISASSEMBLE

Seal Removal

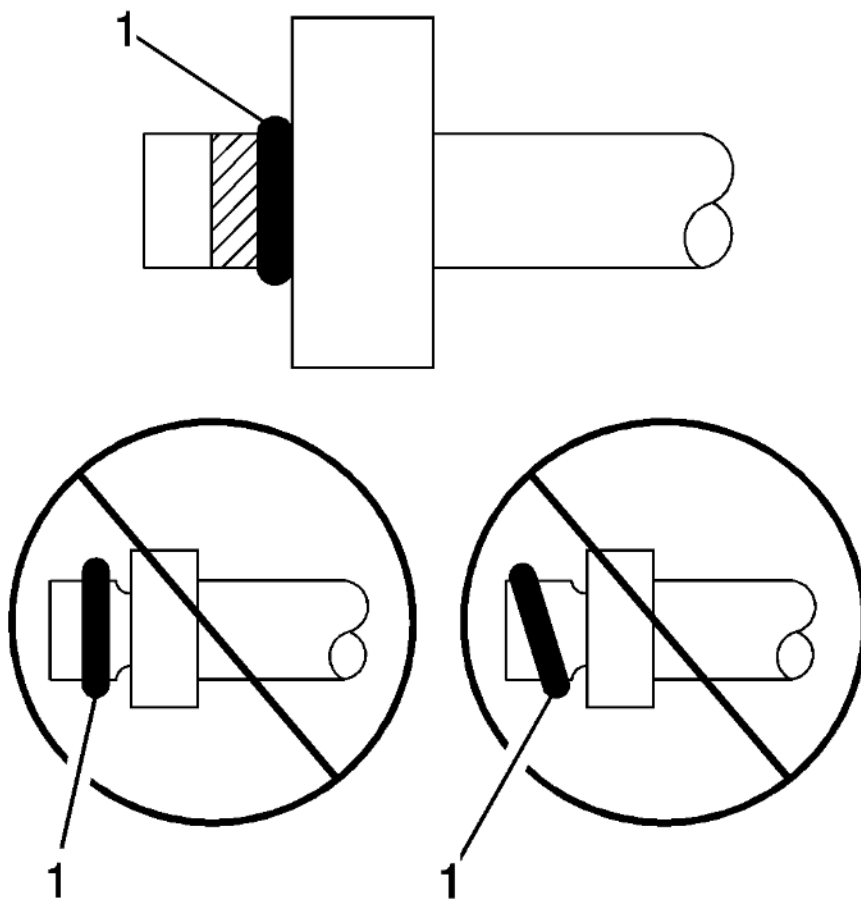


Fig. 28: Identifying Front Differential Transfer Drive Gear Support Seal
Courtesy of GENERAL MOTORS COMPANY

2014 GMC Acadia Denali

2014 TRANSMISSION Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

Seal Removal

Callout	Component Name
CAUTION: Do not remove the transfer drive gear bearing retaining nut. The drive gear and bearing are not serviceable. Removing the retaining nut will damage the support.	
Preliminary Procedure - Inspect the support assembly for damage or wear to the splines, bushings, machined surfaces and threaded holes. - Inspect the transfer drive gear for damage or wear. - Inspect the transfer drive gear bearing assembly for proper operation. - The bearing should roll smoothly and quietly.	
1	Front Differential Transfer Drive Gear Support Seal
	Special Tools DT 23129 Universal Seal Remover GE 6125-1B Slide Hammer with Adapter or equivalent
	For equivalent regional tools, refer to Special Tools .
2	Front Differential Transfer Drive Gear Support Torque Converter Fluid Seal Assembly

Fluid Passage Tube Removal

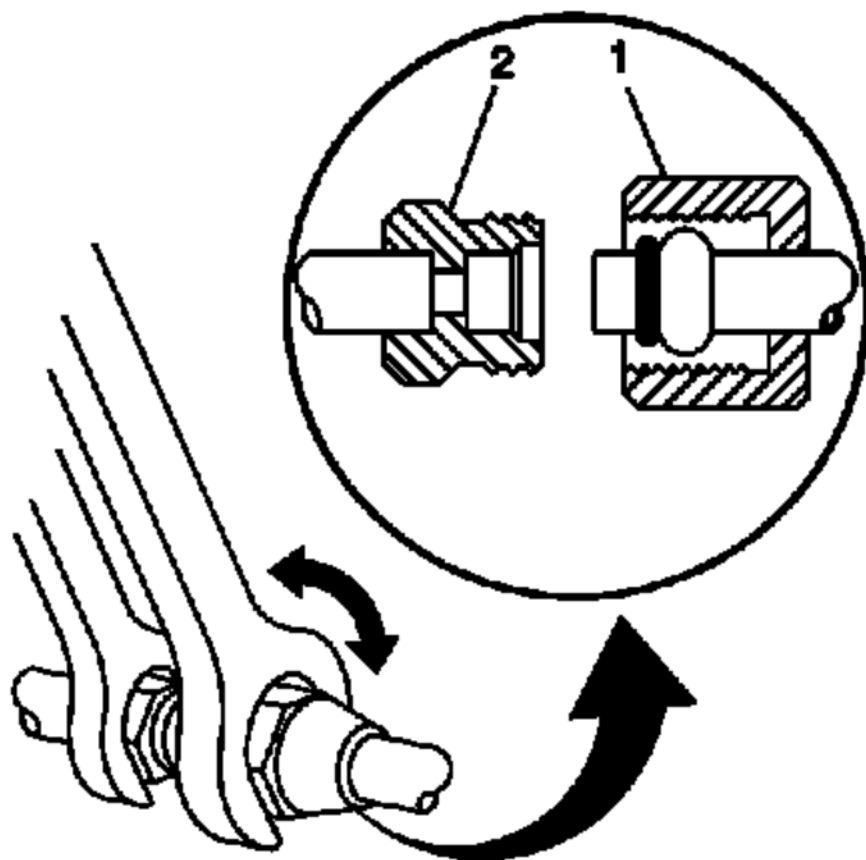


Fig. 29: Identifying Fluid Passage Tube Assembly
 Courtesy of GENERAL MOTORS COMPANY

Fluid Passage Tube Removal

Callout	Component Name
CAUTION: Do not remove the transfer drive gear bearing retaining nut. The drive gear and bearing are not serviceable. Removing the retaining nut will damage the support.	
Preliminary Procedures - Inspect the support assembly for damage or wear to the splines, bushings, machined surfaces and threaded holes. - Inspect the transfer drive gear for damage or wear. - Inspect the transfer drive gear bearing assembly for proper operation. - The bearing should roll smoothly and quietly.	
1	Front Differential Transfer Drive Gear Fluid Passage Tube Bolt M6 x 15 (Qty: 2)
2	Front Differential Transfer Drive Gear Fluid Passage Tube Bolt M5 x 12 (Qty: 2)

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3	Fluid Passage Tube Assembly NOTE: Inspect the tubes for damage, wear or cracked welds.
4	Front Differential Transfer Drive Gear Support Fluid Passage Tube Gasket
5	Front Differential Transfer Drive Gear Support Seal

FRONT DIFFERENTIAL TRANSFER DRIVE GEAR SUPPORT ASSEMBLY ASSEMBLE

Drive Support Seal Installation

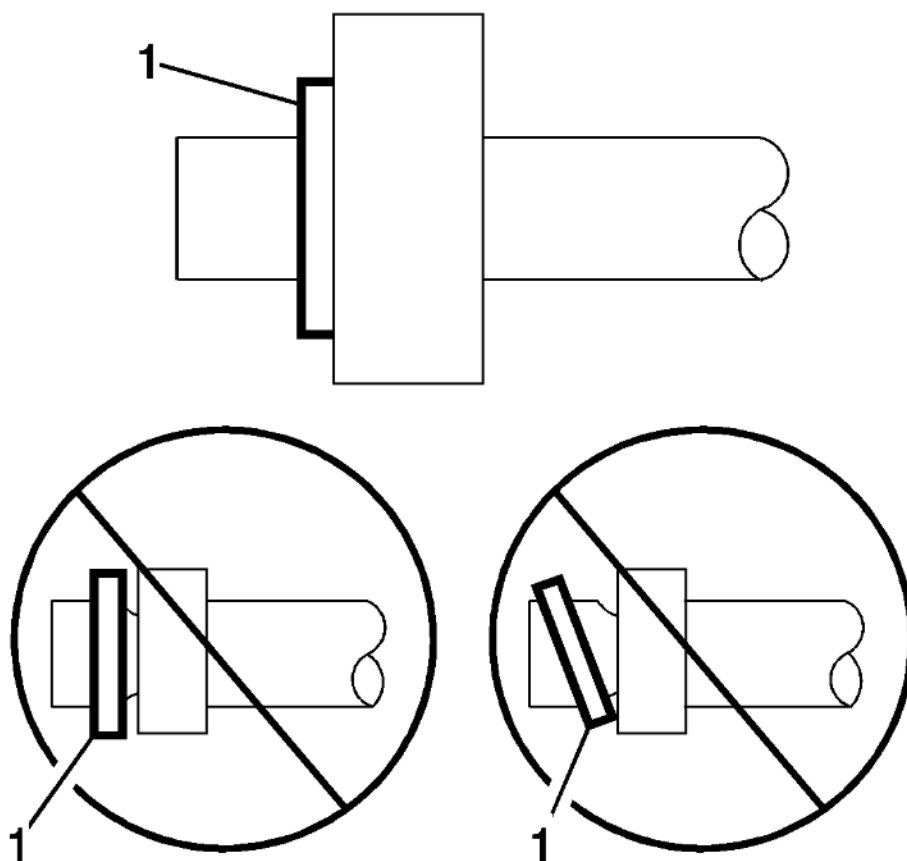


Fig. 30: Identifying Front Differential Transfer Drive Gear Support Seal
Courtesy of GENERAL MOTORS COMPANY

Drive Support Seal Installation

Callout	Component Name
	Front Differential Transfer Drive Gear Support Seal

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2014 TRANSMISSION Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

1	NOTE: A NEW seal must be installed. Special Tools DT-46624 Support Seal Installer For equivalent regional tools, refer to Special Tools .
2	Small Chamfer Faces Up CAUTION: To avoid damaging the seal, first place DT 46624-1 with the small chamfer end facing up and leave in place for at least 60 seconds.
3	Large Chamfer Faces Up NOTE: Turn DT 46624-1 which is part of DT-46624 seal installer, over with the large chamfer end facing up for 60 seconds to ensure that the seal has been properly sized.

Fluid Passage Tube Installation

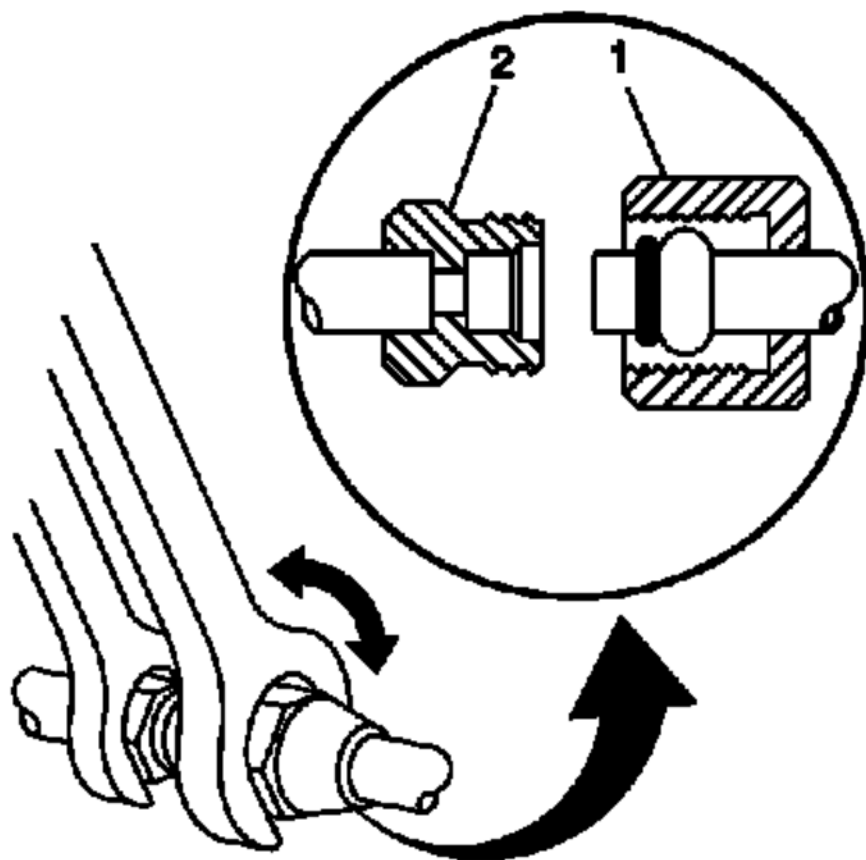


Fig. 31: Identifying Front Differential Transfer Drive Gear Support Fluid Passage Tube
 Courtesy of GENERAL MOTORS COMPANY

Fluid Passage Tube Installation

Callout	Component Name
1	Front Differential Transfer Drive Gear Support Fluid Passage Tube Gasket
2	Fluid Passage Tube Assembly
3	Front Differential Transfer Drive Gear Fluid Passage Tube Bolt M6 x 15 (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 12 N.m (106 lb in)
4	Front Differential Transfer Drive Gear Fluid Passage Tube Bolt M5 x 12 (Qty: 2) Tighten 7 N.m (62 lb in)

Seal Installation

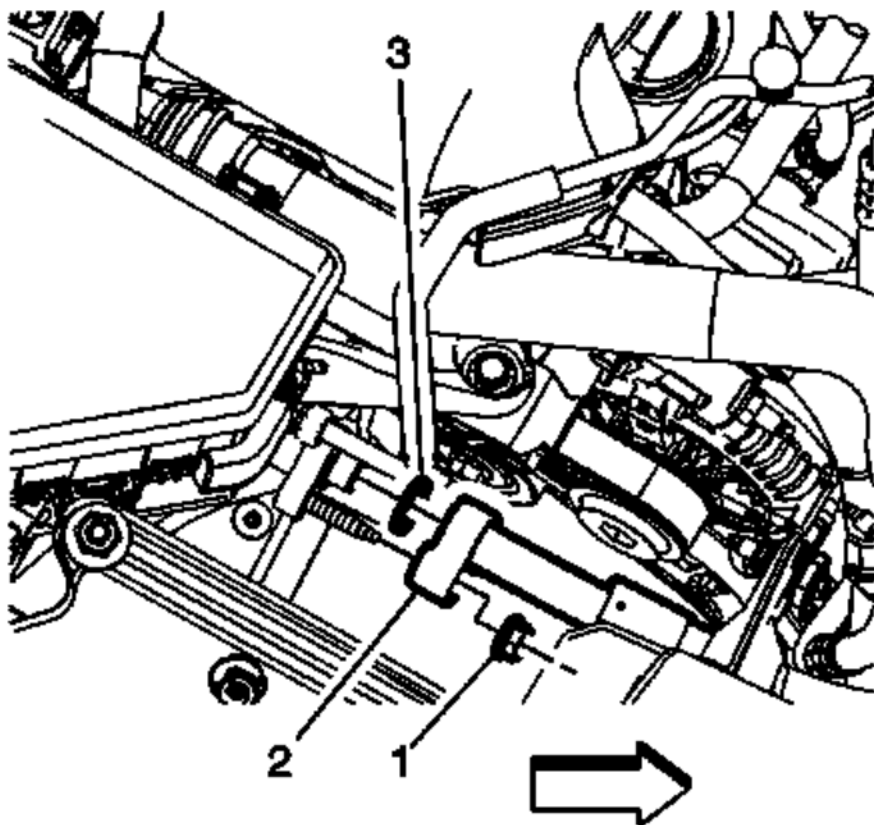


Fig. 32: View Of Front Differential Transfer Drive Gear Support Seal
 Courtesy of GENERAL MOTORS COMPANY

Seal Installation

Callout	Component Name
1	Front Differential Transfer Drive Gear Support Seal CAUTION: • Ensure staking does not line up with lubrication holes or the holes may be damaged. • Stop driving the seal once it bottoms out to avoid seal damage. NOTE: The fluid seal assembly must be staked in place using DT-49131 seal staking tool to ensure proper seal retention. Special Tools

- DT-46627-A Seal Installer
- DT-49131 Seal Staking Tool

For equivalent regional tools, refer to **Special Tools** .

2 Front Differential Transfer Drive Gear Support Torque Converter Fluid Seal Assembly

TRANSMISSION FLUID PUMP CLEANING AND INSPECTION

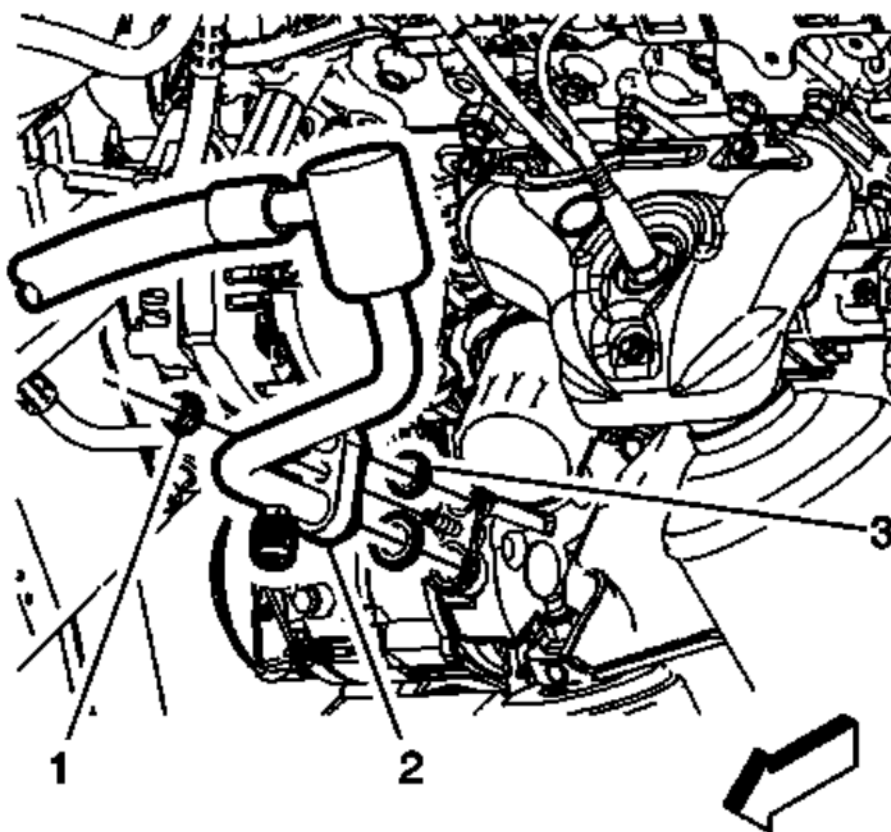


Fig. 33: Identifying Fluid Pump Components
Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Pump Cleaning and Inspection

Callout	Component Name
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION:	

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Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.

Preliminary Procedure The fluid pump assembly is not serviceable.

1	Filter Neck Seal NOTE: Install a NEW filter neck seal. Special Tools 28585 Snap ring Remover or equivalent For equivalent regional tools, refer to Special Tools .
2	A/Trans Fluid Filter Assembly NOTE: Install a NEW fluid filter assembly.
3	Fluid Pump Drive Shaft NOTE: • Inspect the fluid pump drive shaft splines for damage or wear. • Rotate the fluid pump drive shaft for free operation.

FRONT DIFFERENTIAL DRIVE PINION GEAR BEARING THRUST WASHER AND FRONT DIFFERENTIAL BEARING WASHER MEASUREMENT

Differential Thrust Washer Gauge Installation

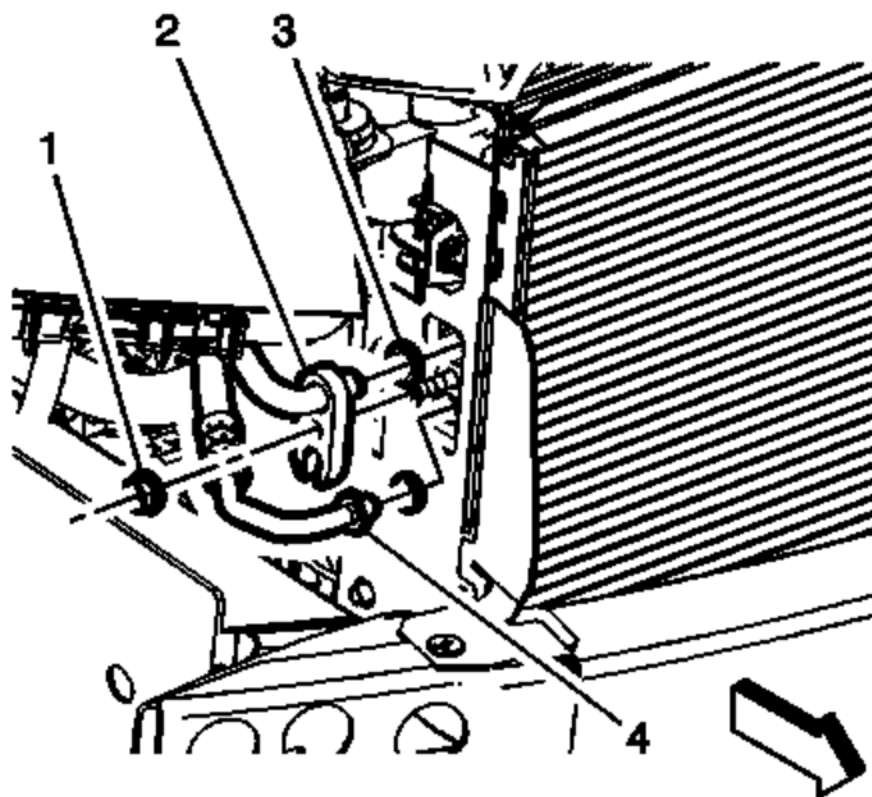


Fig. 34: Identifying Differential Thrust Washer Gauge
 Courtesy of GENERAL MOTORS COMPANY

Differential Thrust Washer Gauge Installation

Callout	Component Name
1	Front Differential Carrier Assembly NOTE: Install the differential assembly and the pinion gear assembly together to avoid interference with the gears during installation.
2	Front Differential Drive Pinion (w/Transfer Gear) Gear Assembly NOTE: Install the differential assembly and the pinion gear assembly together to avoid interference with the gears during installation.
	Front Differential Drive Pinion Gear Bearing Cup NOTE: After placing the bearing cup on the gear, place DT 47800-2 which is part of DT-47800 selection gauge kit, onto the bearing cup.

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3	Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools .
4	Front Differential Carrier Bearing Cup NOTE: After placing the bearing cup on the gear, place DT 47800-1 which is part of DT-47800 selection gauge kit, onto the bearing cup. Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools .
5	Torque Converter Housing Outer Seal
6	Torque Converter and Support and A/Trans Fluid Pump Housing Assembly NOTE: • Install 2 DT 47800-6 which is part of DT-47800 selection gauge kit, into a case threaded hole at approximately 180° apart. • Some alignment of DT 47800-1 and 2 which is part of DT-47800 selection gauge kit, may be required while lowering the TC housing onto the case. • Install DT 47800-3 which is part of DT-47800 selection gauge kit, spacer over DT 47800-6. Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools .

Torque Sequence

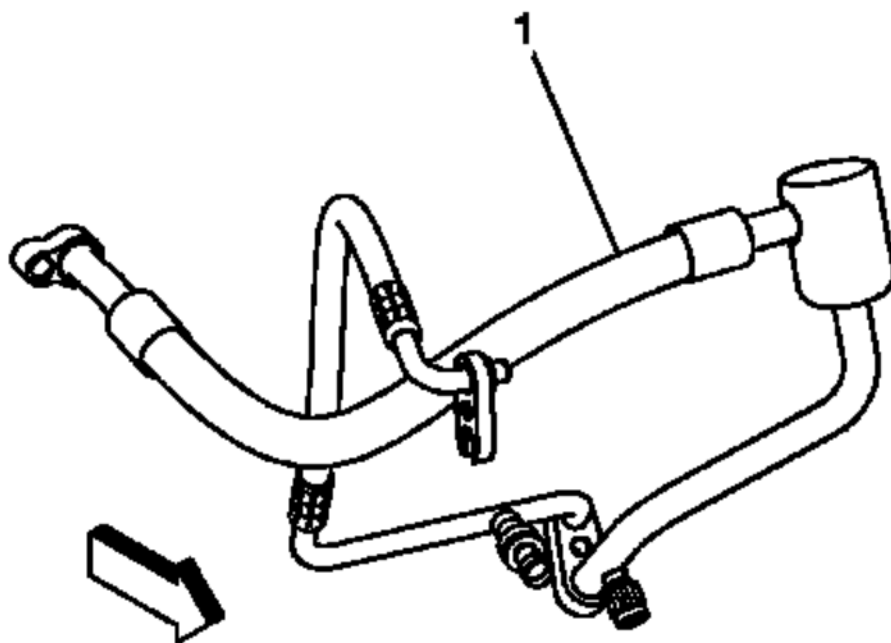


Fig. 35: Identifying Front Differential Carrier Assembly Torque Sequence
 Courtesy of GENERAL MOTORS COMPANY

Torque Sequence

Callout	Component Name
1	Spacer Bolt M8 x 127 (Qty: 8) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Install the remaining spacers evenly at every other bolt hole. 2. Remove the DT 47800-6 which is part of DT-47800 selection gauge kit, guide pins and install spacer bolts in all bolt holes at spacer locations. 3. Tighten the bolts in sequence. Tighten 30 N.m (22 lb ft)

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	Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools.
2	Front Differential Carrier Assembly CAUTION: If the bearings are not properly seated into the bearing cups, the washer selection will be inaccurate and the bearing pre-load will be set too low. Low bearing pre-load will cause premature failure of the front differential drive pinion gear. Procedure Rotate the differential assembly 10 revolutions to allow the bearings to seat into the cups. NOTE: Differential rotating tool DT-47793 differential rotating tool can be used to rotate the differential from the case side. Special Tools DT-47793 Differential Rotating Tool For equivalent regional tools, refer to Special Tools.

Differential Thrust Washer Selection

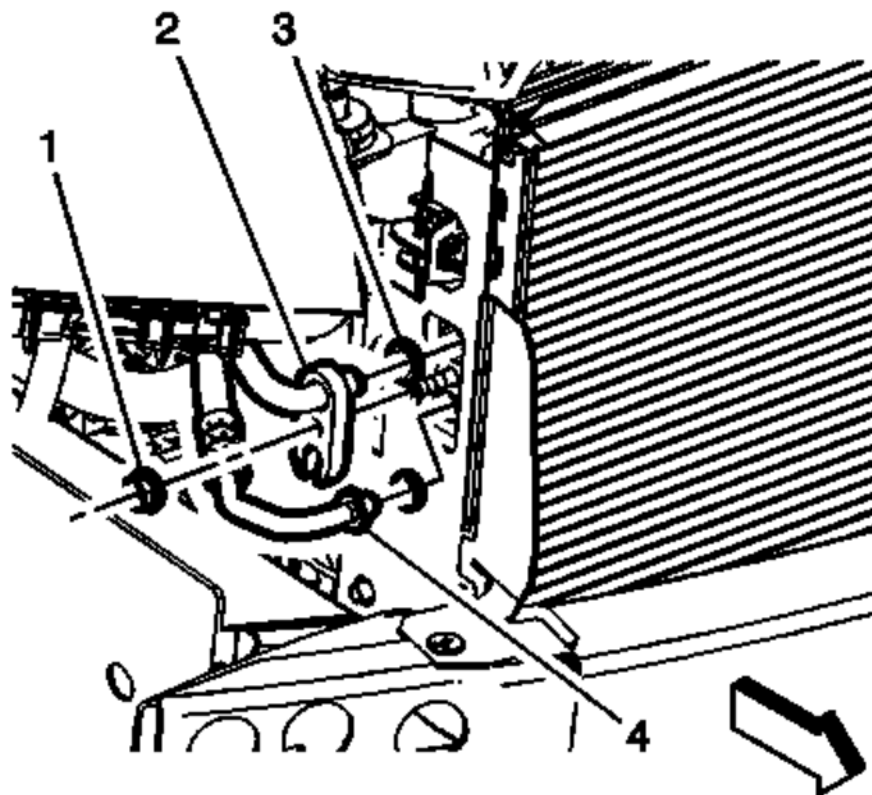


Fig. 36: Identifying Differential Thrust Washer Selection
 Courtesy of GENERAL MOTORS COMPANY

Differential Thrust Washer Selection

Callout	Component Name
CAUTION: Improper thrust washer selection can cause insufficient taper bearing pre-load which will cause premature failure of the front differential drive pinion gear.	
1	Front Differential Bearing Washer Procedure Place DT 47800-7 in the gap in DT 47800-2 which are both part of DT-47800 selection gauge kit, to determine the proper thrust washer. Choose the correct thrust washer. Refer to <u>Taper Bearing Preload Selective Specifications</u> . NOTE: - Continue trying different sizes of DT 47800-7 which is part of DT-47800 selection gauge kit, until the gauge will no longer fit into the gap. The correct thrust washer size is equal to the largest blade gauge that fits into the gap. - Match the size of the correct DT 47800-7 blade which is part of DT-47800 selection gauge kit, to the color code in the thrust washer specification chart.

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	The washer color coding is on the outside diameter of the washer. - The gap in DT 47800-2 which are both part of DT-47800 selection gauge kit may not be even. Hold the top of the gauge and rotate the bottom of the gauge to even out the gap. Take two gap measurements 180 degrees apart. Average the two measurements and select the thrust washer that is closest to the average. - The washer color coding is on the outside diameter of the washer. Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools .
2	Front Differential Drive Pinion Gear Bearing Thrust Washer Procedure Place DT 47800-7 in the gap in DT 47800-1 which are both part of DT-47800 selection gauge kit, to determine the proper thrust washer. Choose the correct thrust washer. Refer to Taper Bearing Preload Selective Specifications . NOTE: - Continue trying different sizes of DT 47800-7 which is part of DT-47800 selection gauge kit, until the gauge will no longer fit into the gap. The correct thrust washer size is equal to the largest gauge that fits into the gauge. - Match the size of the correct DT 47800-7 blade which is part of DT-47800 selection gauge kit to the color code in the thrust washer selection chart. - The gap in DT 47800-1 which is part of DT-47800 selection gauge kit may not be even. Hold the top of the gauge and rotate the bottom of the gauge to even out the gap. Take two gap measurements 180 degrees apart. Average the two measurements and select the thrust washer that is closest to the average. - The washer color coding is on the outside diameter of the washer. Special Tools DT-47800 Thrust Washer Selection Gauge Kit For equivalent regional tools, refer to Special Tools .
	Torque Converter and Support and A/Trans Fluid Pump Housing Assembly Procedure - Remove DT 47800-3 which are both part of DT-47800 selection gauge kit, bolts and spacers. - Remove the torque converter housing. - Remove DT 47800-1 and DT 47800-2 which are both part of DT-47800 selection gauge kit. - Remove the torque converter housing seal. - Remove the pinion gear and differential bearing cups. - Install the bearing cups and thrust washers into the torque converter housing per the

replacement procedures. Refer to Front Differential Carrier Bearing Cup and Washer Replacement - Torque Converter Housing Side and Front Differential Drive Pinion Bearing Cup, Washer and Lubricant Dam Replacement - Torque Converter Housing Side.

3

NOTE:

DT 47800-1 and DT 47800-2 which are both part of DT-47800 selection gauge kit, may stick in the torque converter housing. Be careful not to drop the gauges.

Special Tools

DT-47800 Thrust Washer Selection Gauge Kit

For equivalent regional tools, refer to Special Tools .

TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY ASSEMBLE

Pump Assembly Installation

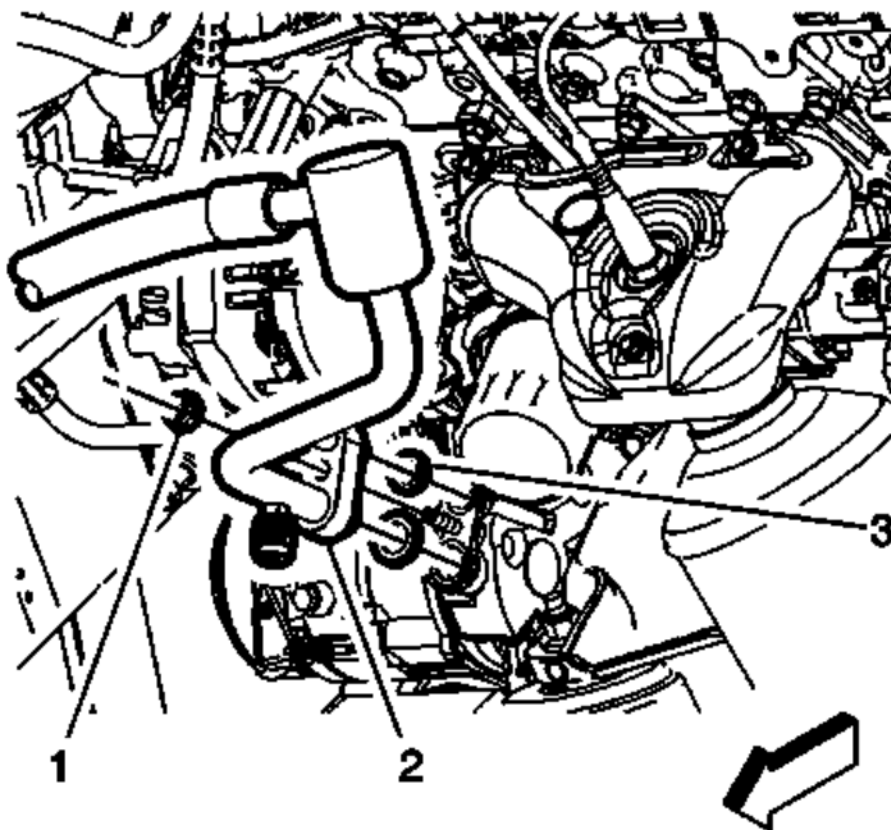


Fig. 37: View Of Pump Assembly

Courtesy of GENERAL MOTORS COMPANY

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Pump Assembly Installation

Callout	Component Name
1	Driven Sprocket Thrust Washer
2	Drive Sprocket Thrust Washer
3	Install Drive Link Assembly NOTE: Install as an assembly.
4	A/Trans Fluid Pump Assembly NOTE: Rotating the drive sprocket and link assembly while installing the oil pump will aid in aligning the driven sprocket and oil pump drive shaft splines.
5	A/Trans Fluid Pump Bolt M6 x 25 (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten in sequence shown. Tighten 12 N.m (106 lb in).

Transfer Drive Gear Assembly Installation

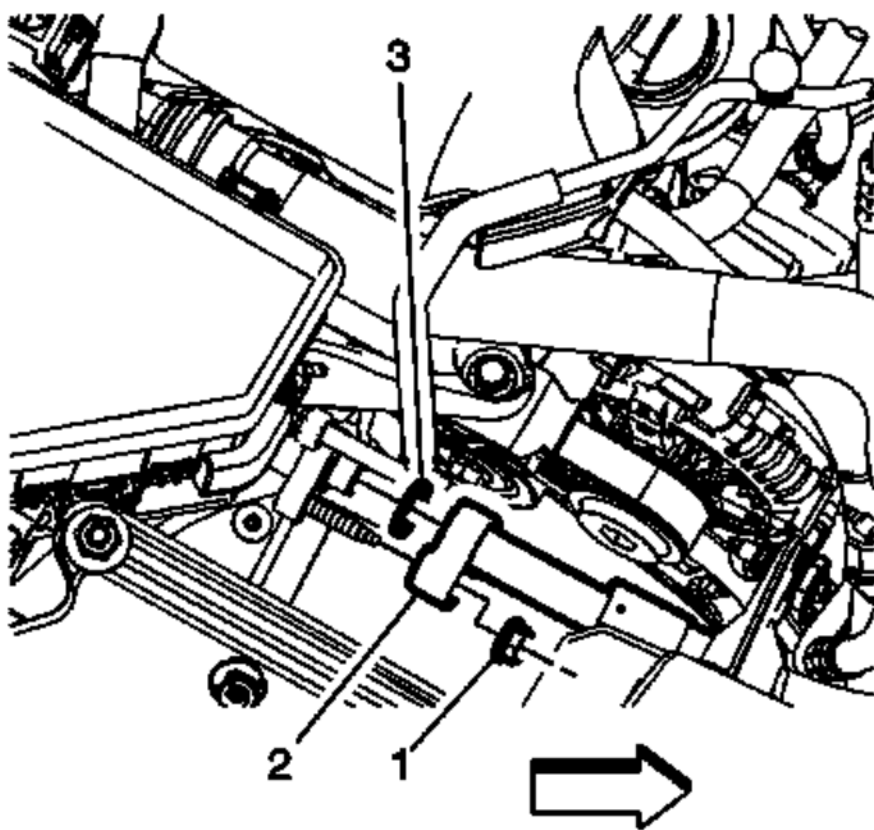


Fig. 38: View of Transfer Drive Gear Assembly
 Courtesy of GENERAL MOTORS COMPANY

Transfer Drive Gear Assembly Installation

Callout	Component Name
1	Drive Sprocket Thrust Washer
2	Front Differential Transfer Drive Gear Support Assembly
3	Front Differential Transfer Drive Gear Support Bolt M8 x 25 (Qty: 9) CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tighten in sequence shown. Tighten 10 N.m (89 lb in) plus $50^{\circ} \pm 4^{\circ}$. Special Tools: EN 45059 Angle Meter For equivalent regional tools, refer to <u>Special Tools</u> .

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4	Front Differential Carrier Baffle
5	Front Differential Carrier Baffle Bolt M6 x 25 Tighten 12 N.m (106 lb in).

FRONT DIFFERENTIAL DRIVE PINION GEAR BEARING REPLACEMENT

Removal

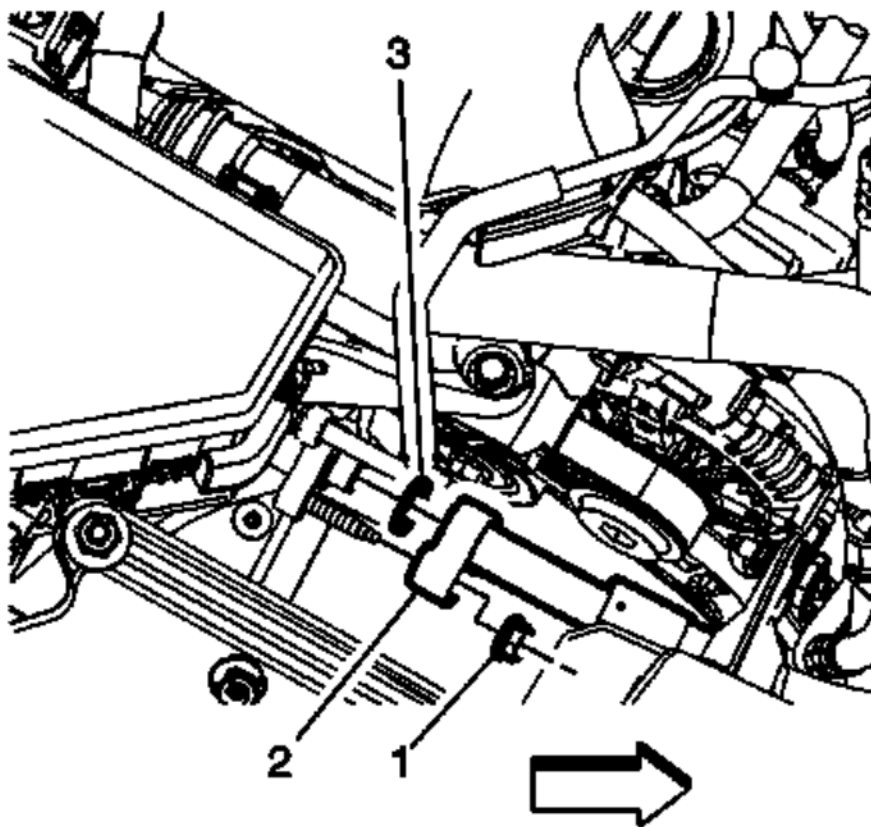


Fig. 39: View Of Front Differential Drive Pinion Gear Bearing
Courtesy of GENERAL MOTORS COMPANY

Removal

Callout	Component Name
	Front Differential Drive Pinion Gear Bearing
	NOTE: • When removing the front differential drive pinion gear bearing use DT 41816-2 step plate. • Use DT 8433-1 puller bar or equivalent with bolts 2-3/8 x 3 x 24.

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Special Tools

1

- DT 8433-1 Puller Bar or equivalent
- DT 22912-B Split Plate Bearing Remover or equivalent
- DT 41816-2 Step Plate

For equivalent regional tools, refer to **Special Tools** .

Installation

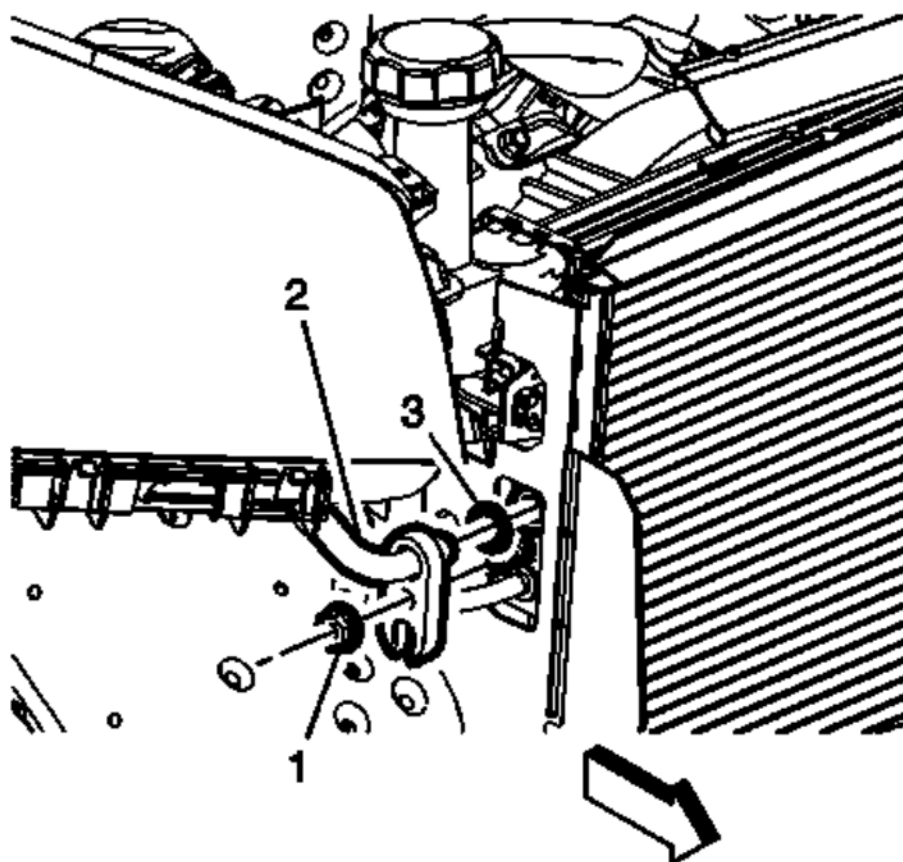


Fig. 40: Identifying Front Differential Drive Pinion Gear Bearing
Courtesy of GENERAL MOTORS COMPANY

Installation

Callout	Component Name
	Front Differential Drive Pinion Gear Bearing
	CAUTION:

Pressing against the bearing assembly can damage the bearing and cause premature bearing failure.

1

Special Tools

DT-47928 Bearing Installer

For equivalent regional tools, refer to **Special Tools** .

FRONT DIFFERENTIAL CARRIER BEARING REPLACEMENT

Removal

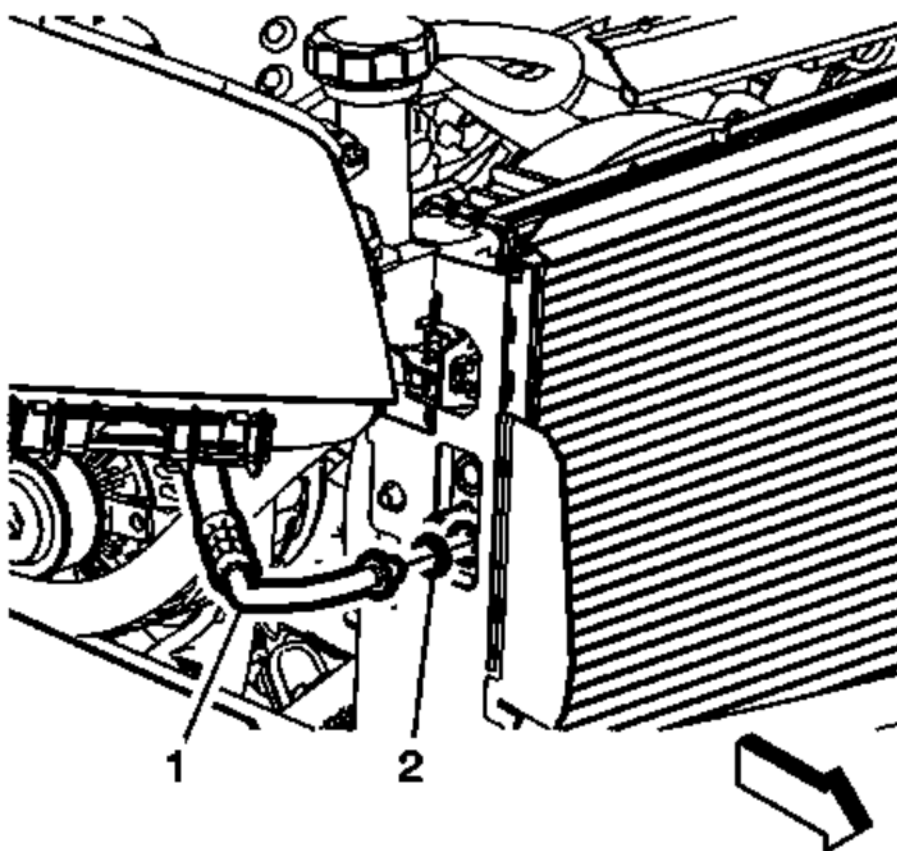


Fig. 41: Identifying Front Differential Carrier Bearing
Courtesy of GENERAL MOTORS COMPANY

Removal

Callout	Component Name
	Front Differential Carrier Bearing Assembly
	Special Tools

2014 GMC Acadia Denali

2014 TRANSMISSION Automatic Transmission - 6T75 (M7V M7X) - Repair Instructions - Off Vehicle - Acadia, Enclave And Traverse

1	• DT-41816 Three Legged Puller • DT 41816-2 Step Plate For equivalent regional tools, refer to Special Tools .
2	Inner Race NOTE: Ensure all 3 legs of the puller make contact with the inner race of the bearing.
3	Front Differential Carrier Bearing Assembly NOTE: • AWD differential may need longer bolts, 2-3/8 x 5 x 24 thread bolts. • When removing the front differential carrier bearing assembly use DT 41816-2 step plate. Special Tools • DT 8433-1 Puller Bar or equivalent • DT 22912-B Split Plate Bearing Remover or equivalent • DT 41816-2 Step Plate For equivalent regional tools, refer to Special Tools .

Installation

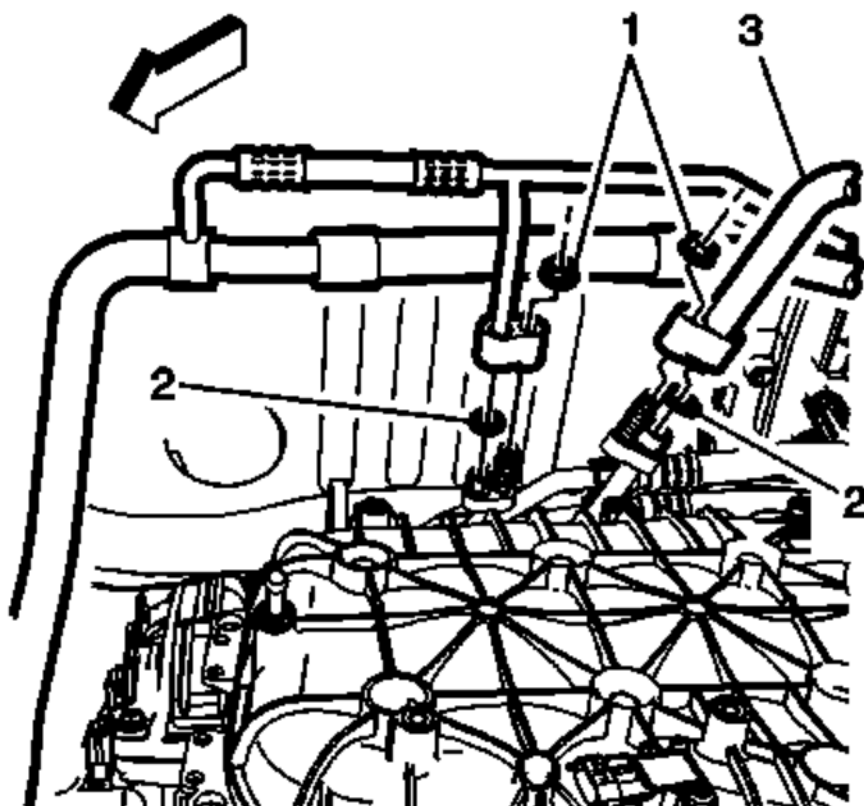


Fig. 42: View Of Front Differential Carrier Bearing
 Courtesy of GENERAL MOTORS COMPANY

Installation

Callout	Component Name
1	Front Differential Carrier Bearing Assembly CAUTION: Pressing against the bearing assembly can damage the bearing and cause premature bearing failure. CAUTION: There are first and second design front differential carrier bearings. First design bearings have twenty eight rollers and are manufactured by Timken. Second design bearings have 30 rollers and are manufactured by NSK. If installing second design bearings, second design front differential carrier bearing cups must be used. All four parts must be kept as a set to prevent damage to the transmission. Special Tools DT-47928 Bearing Installer

For equivalent regional tools, refer to **Special Tools** .

Front Differential Carrier Bearing Assembly

CAUTION:

Pressing against the bearing assembly can damage the bearing and cause premature bearing failure.

CAUTION:

There are first and second design front differential carrier bearings. First design bearings have twenty eight rollers and are manufactured by Timken. Second design bearings have 30 rollers and are manufactured by NSK. If installing second design bearings, second design front differential carrier bearing cups must be used. All four parts must be kept as a set to prevent damage to the transmission.

Special Tools

DT-47928 Bearing Installer

For equivalent regional tools, refer to **Special Tools** .

FRONT DIFFERENTIAL CARRIER CLEANING AND INSPECTION

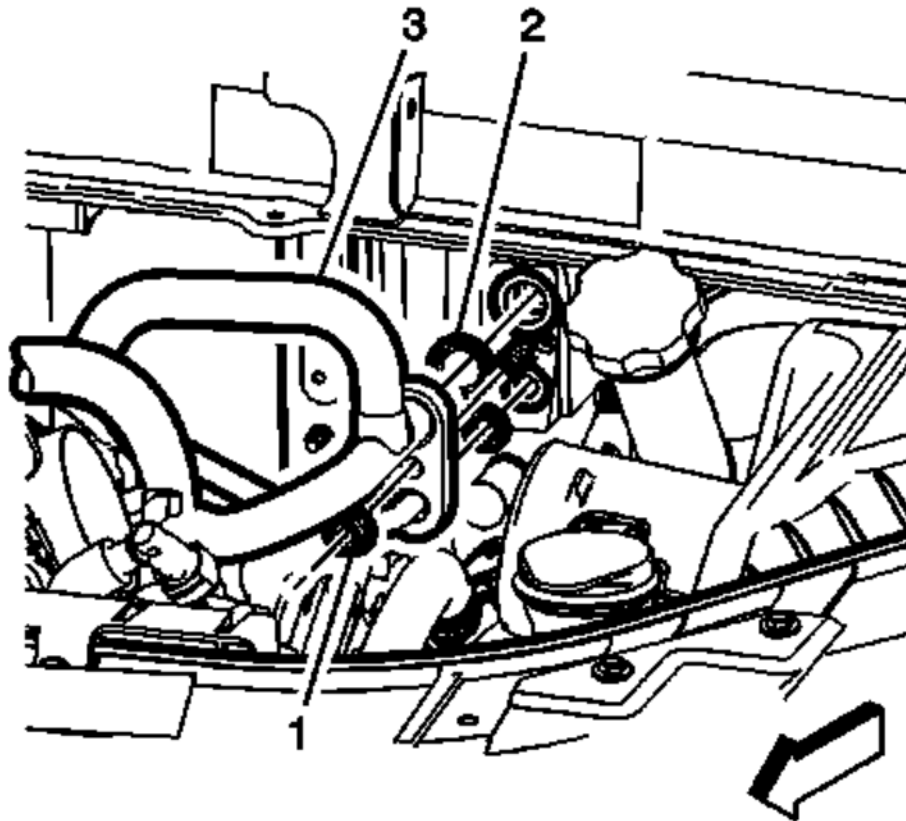


Fig. 43: Identifying Front Differential Carrier Components
 Courtesy of GENERAL MOTORS COMPANY

Front Differential Carrier Cleaning and Inspection

Callout	Component Name
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.	
CAUTION: Keep the thrust washers with gear it was matched to. The thrust washers are selective sizes and it is difficult to identify the proper washer thickness. Improper assembly can cause premature failure of the differential assembly.	
Preliminary Procedure Clean and inspect the differential assembly, pinion gears and thrust washers for scoring, wear or damage. The differential assembly is only serviced as an assembly.	
1	Front Differential Pinion Gear Shaft Retainer NOTE: Discard and use a new retainer. Special Tools 3/16 in (5 mm) 7 in Punch or equivalent For equivalent regional tools, refer to Special Tools .
2	Front Differential Pinion Gear Shaft
3	Front Differential Pinion Gears
4	Front Differential Carrier Thrust Washers
5	Front Differential Pinion Side Gears
6	Front Differential Side Gear Thrust Washer

FRONT DIFFERENTIAL DRIVE PINION GEAR AND CARRIER INSTALLATION

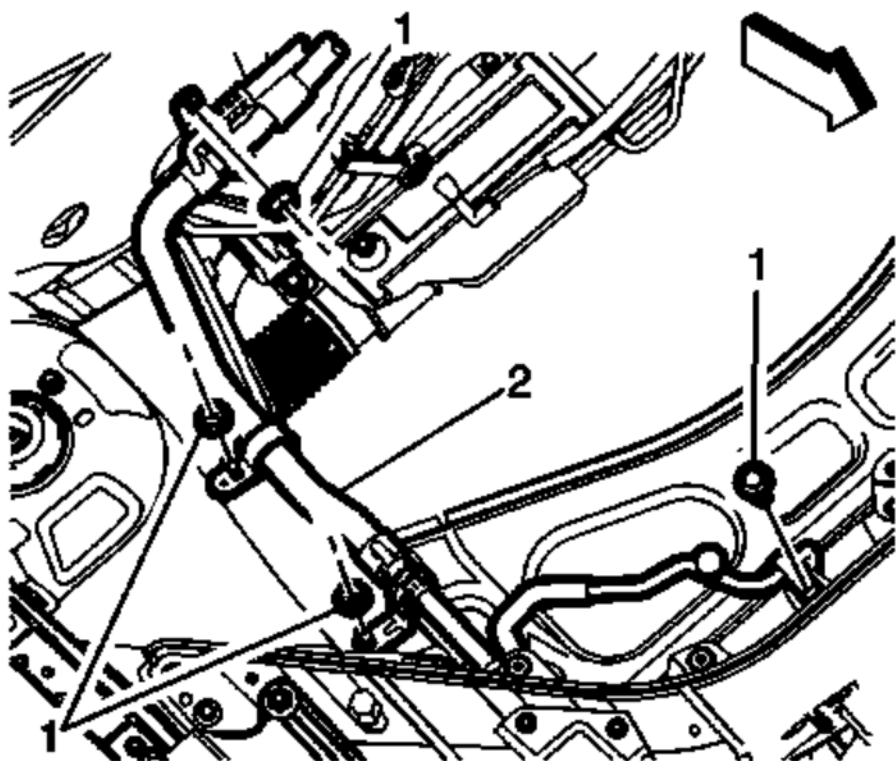


Fig. 44: Identifying Front Differential Carrier Assembly
 Courtesy of GENERAL MOTORS COMPANY

Front Differential Drive Pinion Gear and Carrier Installation

Callout	Component Name
1	Front Differential Carrier Assembly NOTE: Install the differential assembly and the pinion gear assembly together to avoid interference with the gears during installation.
2	Front Differential Drive Pinion (w/Transfer Gear) Gear Assembly
3	Front Differential Drive Pinion Gear Lube Tube

TORQUE CONVERTER AND DIFFERENTIAL HOUSING INSTALLATION

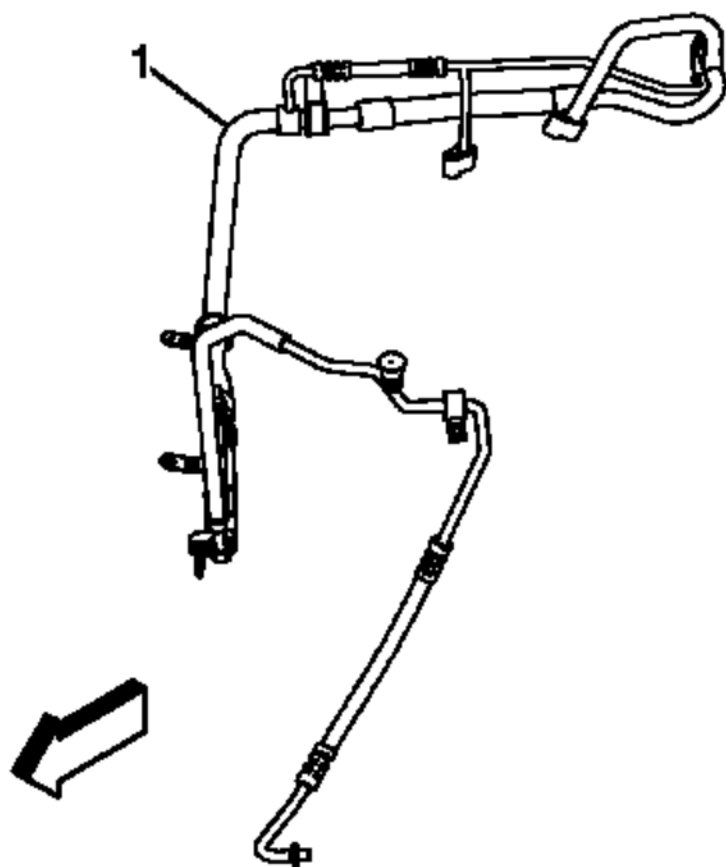


Fig. 45: Identifying Torque Converter & Differential Housing
Courtesy of GENERAL MOTORS COMPANY

Torque Converter and Differential Housing Installation

Callout	Component Name
1	Torque Converter Housing Outer Seal
2	Torque Converter and Support and A/Trans Fluid Pump Housing Assembly
3	Torque Converter and Differential Housing Bolts M8 x 35 (Qty: 17) CAUTION: Some bolt torques specifications are different. Over tightening the bolts at the 12, 15 and 17 positions in the sequence could cause damage to the case threads. CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten in sequence shown. Tighten

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- Bolts 1-11, 13-14 and 16 to 36Y (27 lb ft)
- Bolts 12, 15 and 17 to 30 N.m (22 lb ft)

FRONT DIFFERENTIAL CARRIER PRELIMINARY ROTATIONAL TORQUE MEASUREMENT

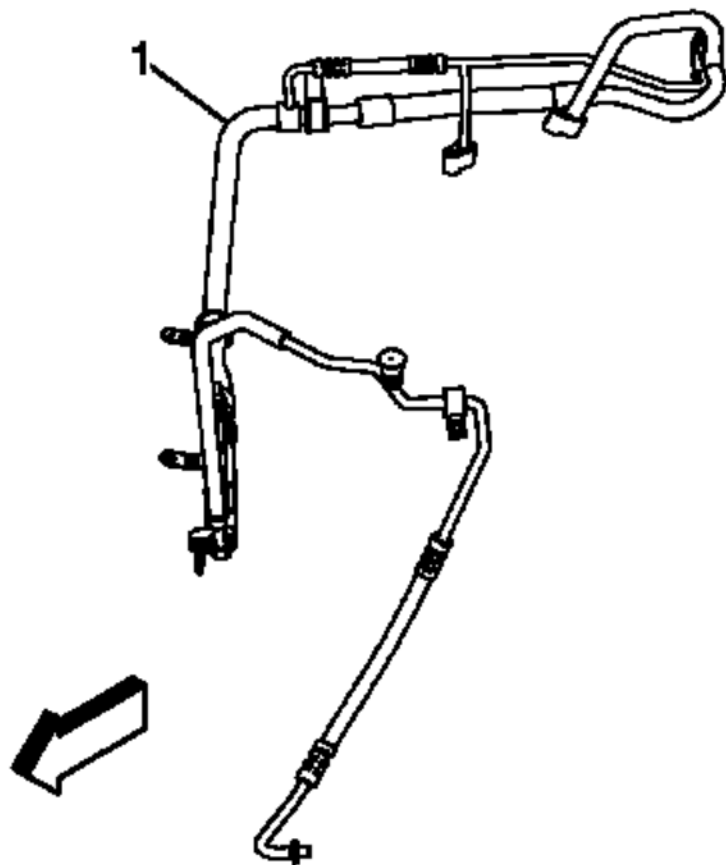


Fig. 46: Identifying Special Tool - DT-47793
Courtesy of GENERAL MOTORS COMPANY

Front Differential Carrier Preliminary Rotational Torque Measurement

Callout	Component Name
	Front Differential Carrier Assembly CAUTION: Low bearing pre-load will cause premature failure of the front differential drive pinion gear. CAUTION: Refer to <u>Fastener Caution</u> .

NOTE:

- If the turning torque is not within specifications, the transfer gear assembly and differential bearing thrust washer is incorrect and must be corrected. Refer to Front Differential Drive Pinion Gear Bearing Thrust Washer and Front Differential Bearing Washer Measurement.
- Use a dial or beam torque wrench with DT-47793 differential rotating tool to measure turning torque.

1

Tighten

4-12 N.m (35-106 lb in)

Special Tools

DT-47793 Differential Rotating Tool

For equivalent regional tools, refer to Special Tools.

1-2-3-4 CLUTCH PLATE AND LOW AND REVERSE CLUTCH INSTALLATION

Piston and Spring Installation

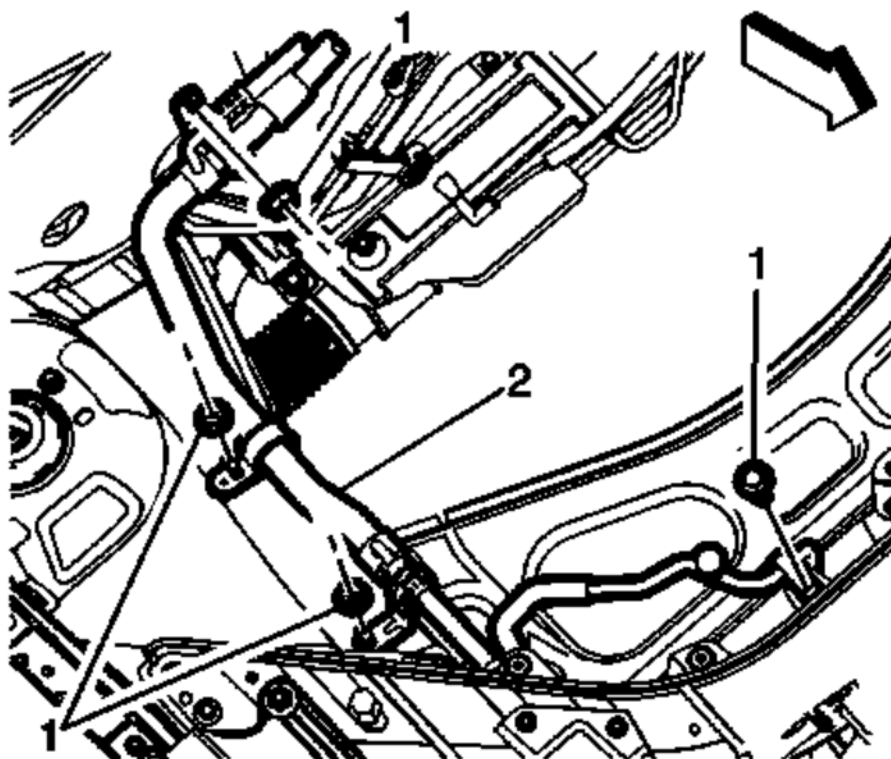


Fig. 47: Identifying 1-2-3-4 Clutch Components

Courtesy of GENERAL MOTORS COMPANY

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Piston and Spring Installation

Callout	Component Name
1	1-2-3-4 Clutch Piston NOTE: DT-46623 seal protector prevents the piston seal lip from damage during installation. Apply a thin coat of ATF to the I.D. of DT-46623 seal protector to ease the installation of the piston. Special Tools DT-46623 Piston Seal Protector For equivalent regional tools, refer to Special Tools .
2	1-2-3-4 Clutch Spring
3	1-2-3-4 Clutch Spring Retainer Ring CAUTION: Refer to Fastener Caution . Procedure: 1. The retainer opening should be supported by a spline tooth of the case. 2. Install DT-46632 spring compressor and DT-48056 spring compressor bridge and retain to the case using 2 case cover assembly bolts. 3. Turn the DT-48056 spring compressor bridge compressor bolt to compress the 1-2-3-4 Clutch Spring until the retaining ring groove is exposed. 4. Push retainer ring into the groove. 5. Remove DT-48056 spring compressor bridge and DT-46632 spring compressor. 6. Air check the piston operation by applying air to the 1-2-3-4 clutch feed passage in the case. 7. Excessive air leaks indicate damage to the clutch piston seal. Tighten 12 N.m (9 lb ft). Special Tools • DT-48056 Spring Compressor Bridge • DT-46632 Piston Spring Compressor For equivalent regional tools, refer to Special Tools .

1-2-3-4 Clutch Plates and Low Reverse Clutch Installation

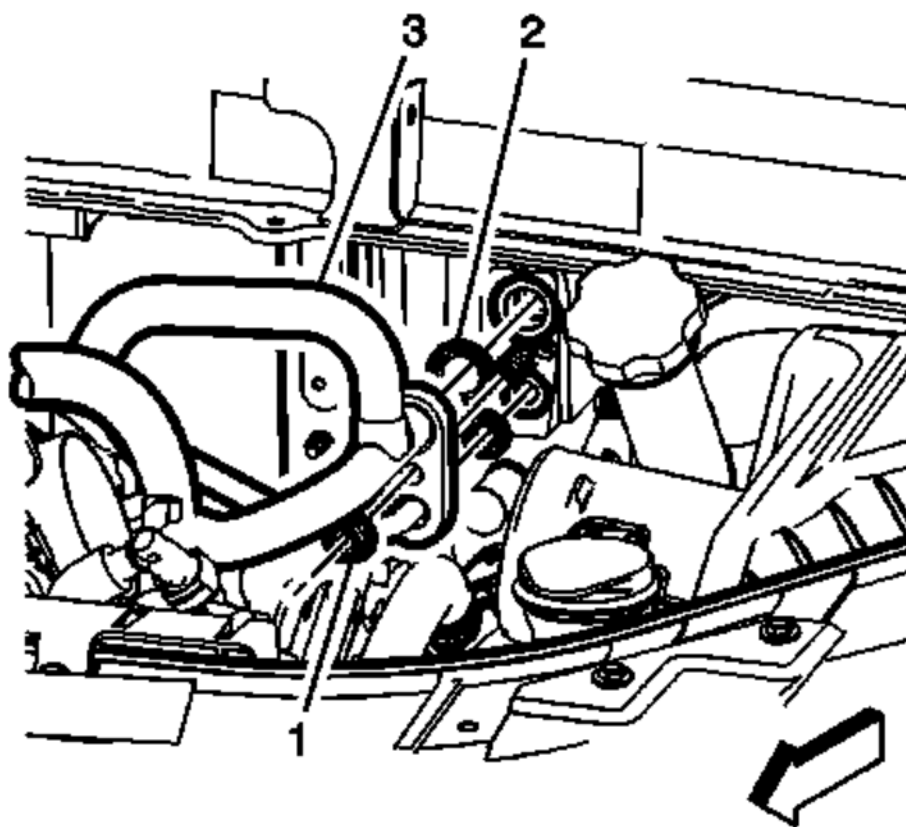


Fig. 48: Identifying 1-2-3-4 Clutch Plates & Low Reverse Clutch Installation Order
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Plates and Low Reverse Clutch Installation

Callout	Component Name
1	1-2-3-4 Clutch (Waved) Plate NOTE: The tab on the clutch plate faces the bottom of the case.
2	1-2-3-4 Clutch Plate (Qty: 2) NOTE: The tab on the clutch plate faces the bottom of the case.
3	1-2-3-4 Clutch (w/Friction Material) Plate Assembly (Qty: 2)
4	Low and Reverse Clutch Assembly
	Low and Reverse Clutch Retaining Ring

5

NOTE:

The tab needs to go in groove at about 2 o'clock and snap ring opening needs to face 3 o'clock.

Low and Reverse Clutch Plate Installation

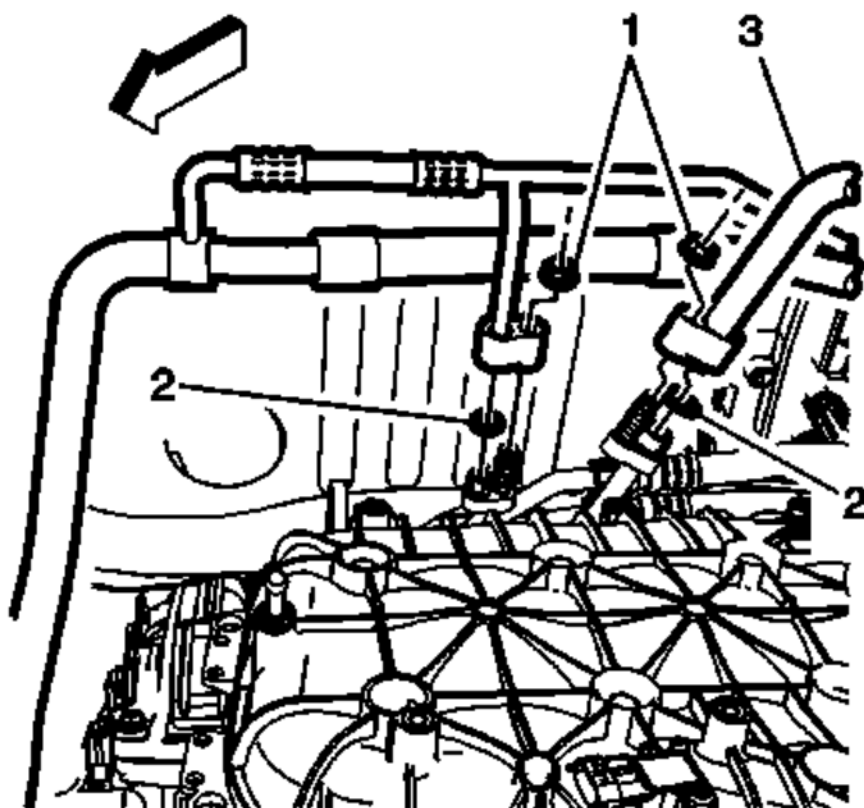


Fig. 49: Identifying Low & Reverse Clutch Plate
Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Installation

Callout	Component Name
1	Low and Reverse Clutch Backing Plate NOTE: The tab on the clutch plate faces the bottom of the case.
2	Low and Reverse Clutch (w/Friction Material) Plate Assembly (Qty: 4)
3	Low and Reverse Clutch Plate (Qty: 3) NOTE:

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	The tab on the clutch plate faces the bottom of the case.
4	Low and Reverse Clutch Apply Plate NOTE: The tab on the clutch plate faces the bottom of the case.
5	Low and Reverse Clutch Cushion (Waved) Spring NOTE: The tab on the clutch plate faces the bottom of the case.

REACTION CARRIER CLEANING AND INSPECTION

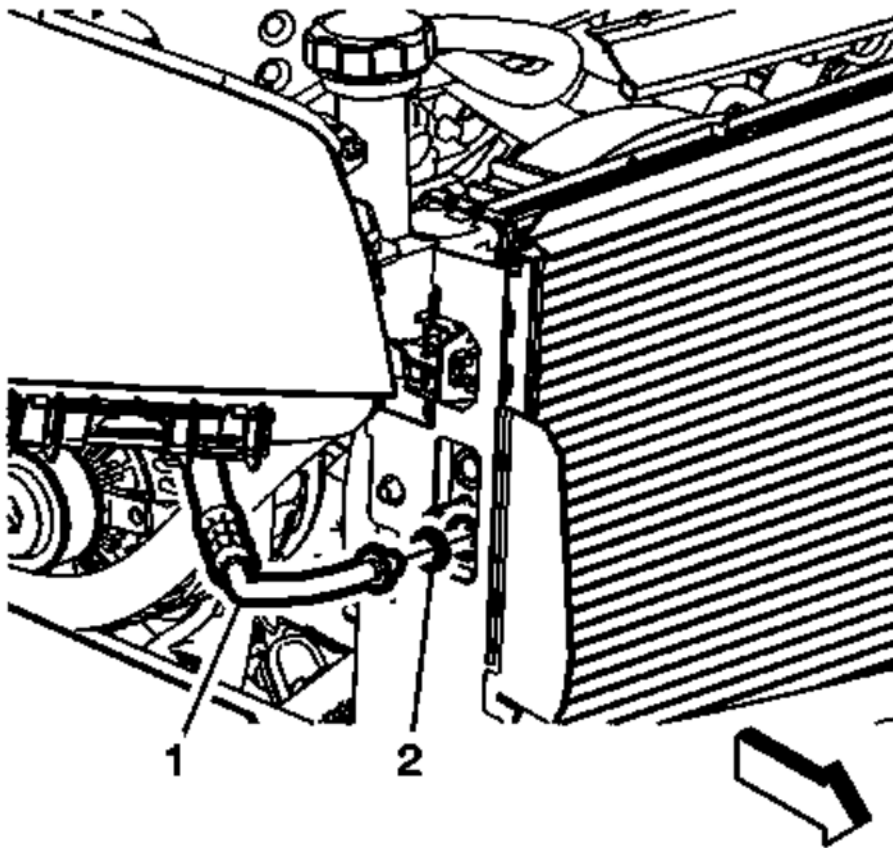


Fig. 50: View Of Reaction Carrier Assembly & Components
Courtesy of GENERAL MOTORS COMPANY

Reaction Carrier Cleaning and Inspection

Callout	Component Name
Preliminary Procedures Clean and Inspect the carrier as an assembly. If wear or damage is found disassemble to replace the	

affected component.

1	Input Internal Gear Retaining Ring
2	Input Internal Gear
3	Reaction Carrier Assembly

OUTPUT CARRIER CLEANING AND INSPECTION

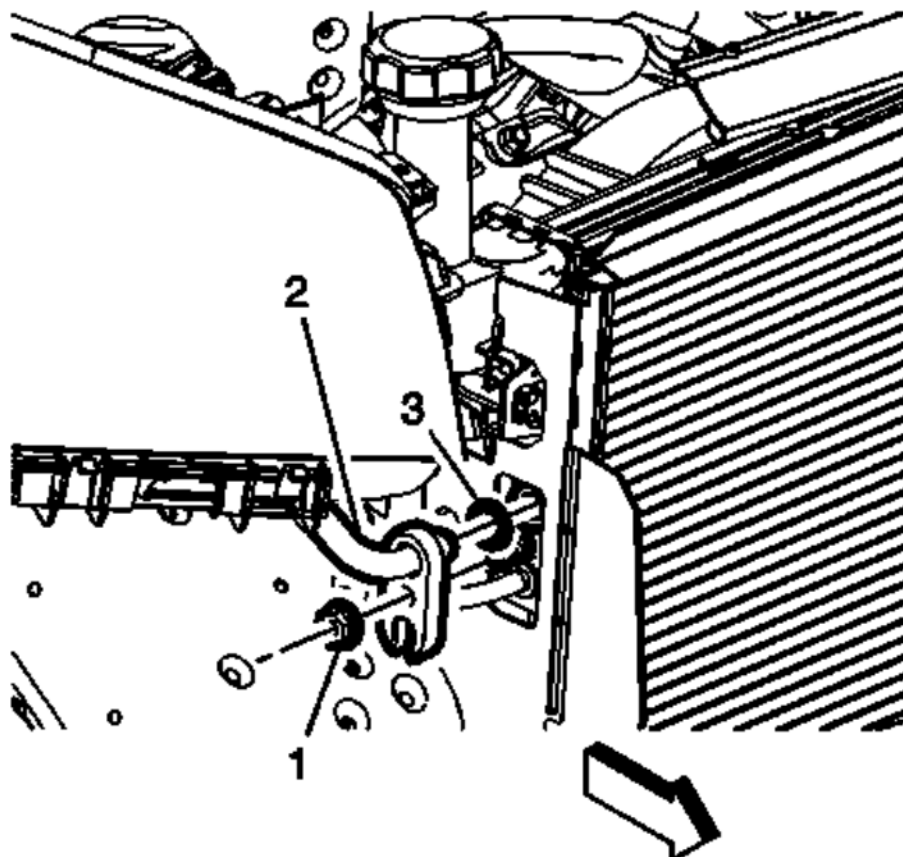


Fig. 51: View Of Output Carrier Components
Courtesy of GENERAL MOTORS COMPANY

Output Carrier Cleaning and Inspection

Callout	Component Name
Preliminary Procedures	
Clean and Inspect the carrier as an assembly. If wear or damage is found disassemble to replace the affected component.	
1	Reaction Internal Gear Retaining Ring
2	Reaction Carrier Internal Gear
3	Output Carrier Assembly

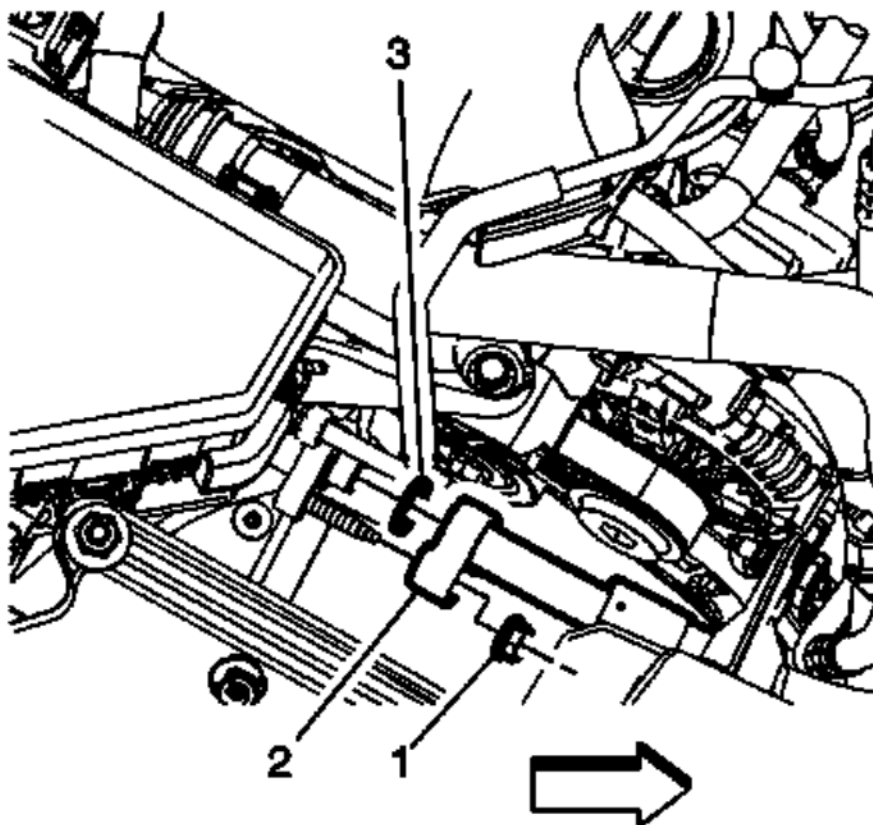
INPUT, REACTION AND OUTPUT CARRIER INSTALLATION

Fig. 52: Identifying Input, Reaction & Output Carrier
 Courtesy of GENERAL MOTORS COMPANY

Input, Reaction and Output Carrier Installation

Callout	Component Name
Preliminary Procedure	
Note location of the orientation lip on bearings. All thrust bearings can only be assembled one way.	
1	Input Shaft Thrust Bearing Assembly
2	Output Carrier Transfer Drive Gear Hub Assembly
3	Front Differential Transfer Drive Gear Input Hub Bearing Assembly
4	Output Sun Gear Assembly
5	Output Carrier Assembly
6	Output Carrier Thrust Bearing Assembly
7	Output Carrier Thrust Bearing Assembly
8	Input (w/ Output Internal Gear) Carrier Assembly
9	Input Sun Gear
10	Input Sun Gear Thrust Bearing Assembly

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11	Input Carrier Thrust Bearing Assembly
12	Reaction (w/ Input Internal Gear) Carrier Assembly

2-6 CLUTCH PLATE INSTALLATION

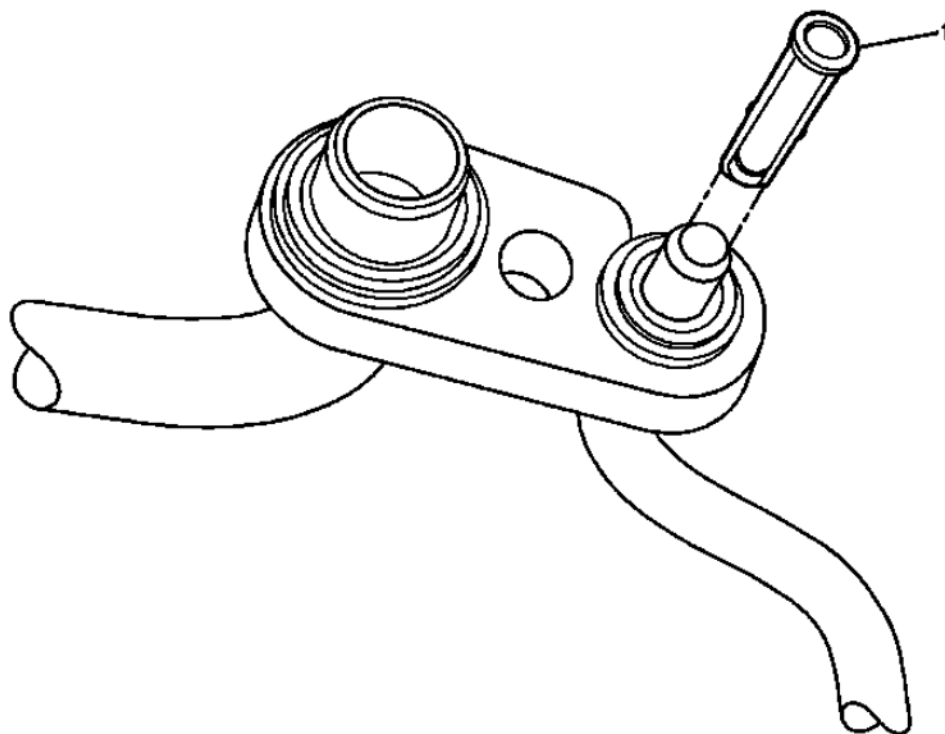


Fig. 53: Identifying 2-6 Clutch Plate
Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Plate Installation

Callout	Component Name
1	2-6 Clutch Backing Plate NOTE: The tab on the clutch plate faces the bottom of the case.
2	2-6 Clutch (w/ Friction Material) Plate Assembly (Qty: 3)
3	2-6 Clutch Plate (Qty: 3) NOTE: The tab on the clutch plate faces the bottom of the case.
4	2-6 Clutch Cushion Spring
5	Reaction Sun Gear Assembly
	2-6 Clutch Hub Thrust Bearing Assembly

6

NOTE:

Note location of the orientation lip on bearing. All thrust bearings can only be assembled one way.

3-5-REVERSE AND 4-5-6 CLUTCH HOUSING DISASSEMBLE

Reluctor Wheel and Piston Removal

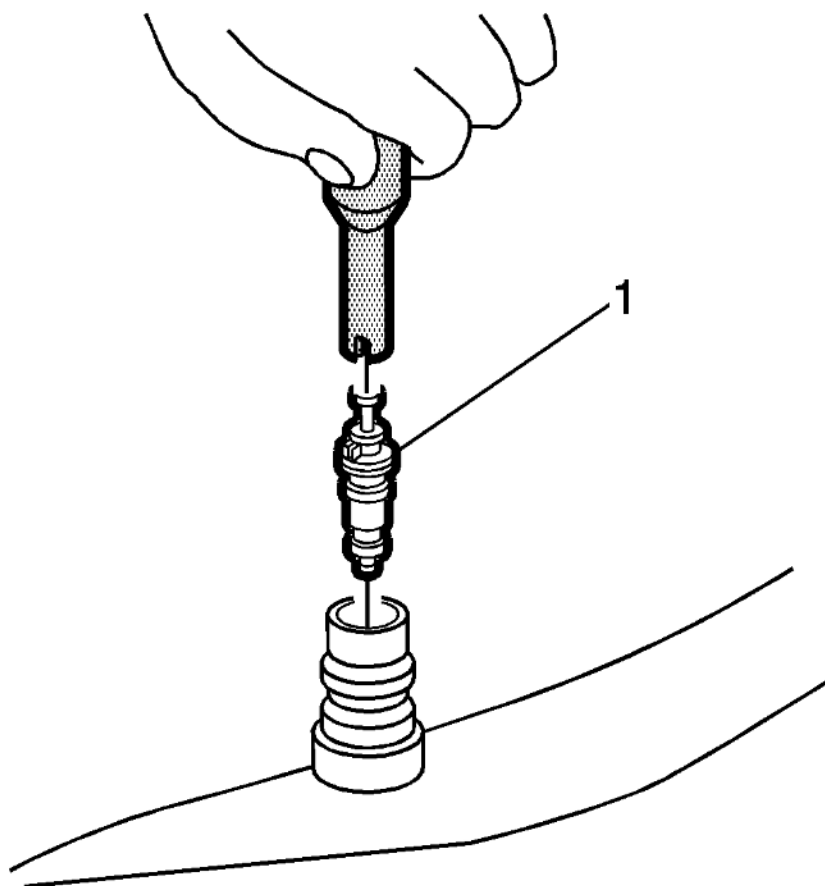


Fig. 54: View Of Input Shaft Speed Sensor Reluctor Wheel Piston & 3-5 Reverse Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

Reluctor Wheel and Piston Removal

Callout	Component Name
	A/Trans Input Shaft Speed Sensor Reluctor Ring Retaining Ring
	CAUTION: Compress the reluctor wheel just enough to clear the retainer. Over compressing the

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	reluctor wheel will break the alignment tab and the clutch housing.
1	Special Tools DT-47694 Piston Spring Compressor For equivalent regional tools, refer to Special Tools .
2	A/Trans Input Shaft Speed Sensor Reluctor Wheel
3	3-5 Reverse Clutch Piston NOTE: Inspect piston seals for damage and/or wear. Piston is reusable.
4	3-5 Reverse Clutch Spring Assembly
5	3-5 Reverse Clutch Piston Inner Seal (Orange)
6	3-5 Reverse Clutch Piston Inner Seal (Black)
7	3-5 Reverse Clutch Piston Dam Seal

Clutch Plate Removal

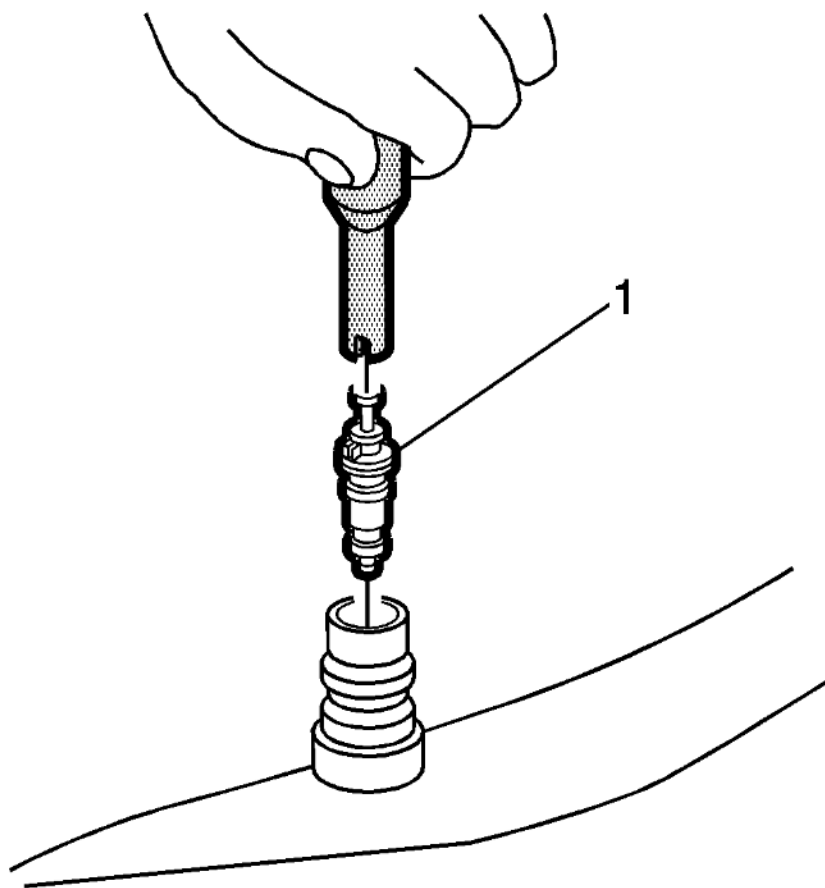


Fig. 55: View Of 3-5 Reverse Clutch Plates
Courtesy of GENERAL MOTORS COMPANY

Clutch Plate Removal

Callout	Component Name
1	3-5 Reverse Clutch Backing Plate Retaining Ring
2	3-5 Reverse Clutch Backing Plate
3	3-5 Reverse Clutch (w/ Friction Material) Plate Assembly (Qty: 4)
4	3-5 Reverse Clutch Plate (Qty: 4)
5	3-5 Reverse Clutch (Waved) Plate

4-5-6 Clutch Hub Removal

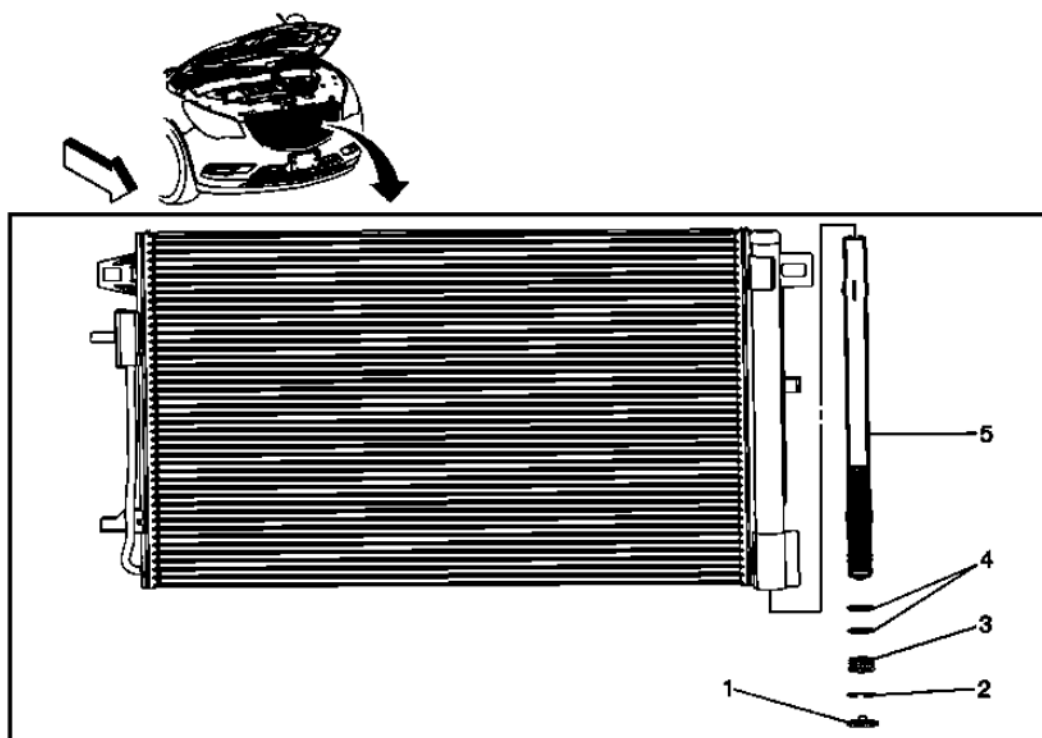


Fig. 56: View Of Reaction Carrier Hub Assembly
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Hub Removal

Callout	Component Name
1	4-5-6 Backing Plate Retaining Ring NOTE: Gently push down on the backing plate to get enough clearance between the backing plate and retainer.
2	Reaction Carrier Hub Assembly NOTE: The clutch plates will come out of the housing with the hub assembly.
3	4-5-6 Clutch Backing Plate
4	4-5-6 Clutch Plate (Qty: 6)
5	4-5-6 Clutch (w/ Friction Material) Plate Assembly (Qty: 6)
6	4-5-6 Clutch Hub Thrust Bearing Assembly NOTE: The bearing may stick to the reaction carrier hub.

4-5-6 Clutch Piston Removal

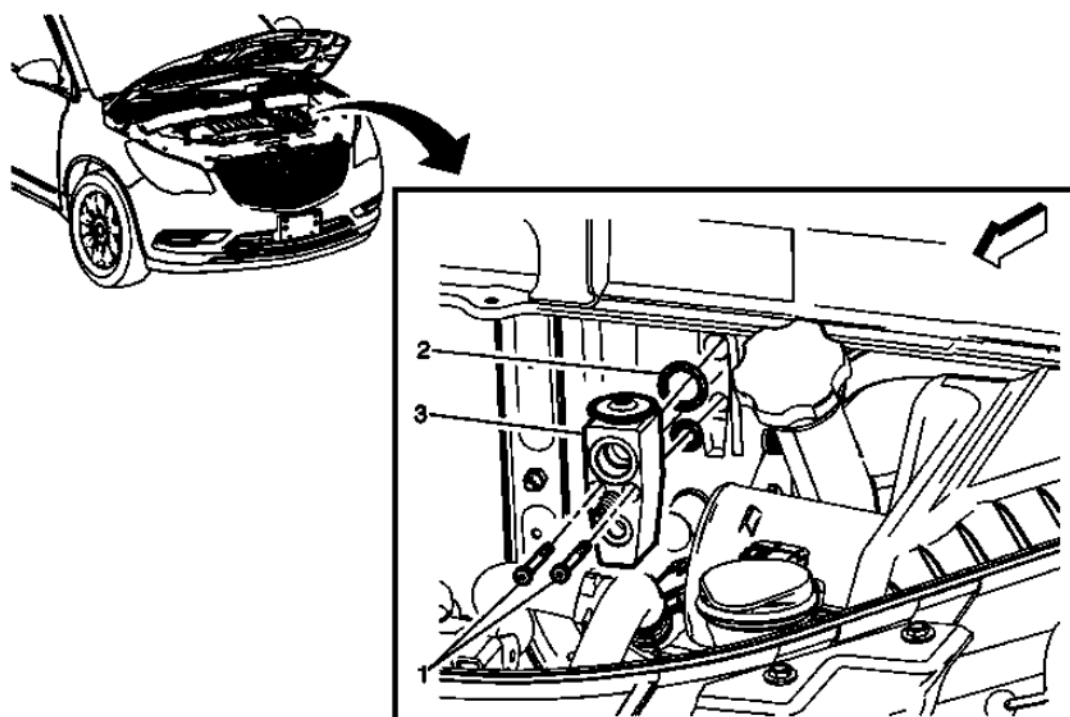


Fig. 57: 4-5-6 Clutch Spring Assembly
 Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Removal

Callout	Component Name
1	4-5-6 Clutch Dam Retaining Ring
	Special Tools • DT-47693 Dam Protector • GE 8059 Snap Ring Pliers-Parallel Jaw or equivalent For equivalent regional tools, refer to Special Tools.
2	4-5-6 Clutch Piston Fluid Dam
	Procedure: 1. Place the 3-5-R and 4-5-6 clutch housing onto the case cover assembly. 2. Apply shop air to the 4-5-6 clutch feed hole using a rubber tipped air gun to dislodge the dam piston and the 4-5-6 clutch piston from the clutch housing.
3	4-5-6 Clutch Spring Assembly
4	4-5-6 Clutch Piston
5	4-5-6 Clutch Piston Outer Seal (Stepped)

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6	4-5-6 Clutch Piston Outer Seal (Rounded)
7	4-5-6 Clutch Piston Inner Seal

3-5-REVERSE AND 4-5-6 CLUTCH HOUSING ASSEMBLE

4-5-6 Clutch Piston Installation

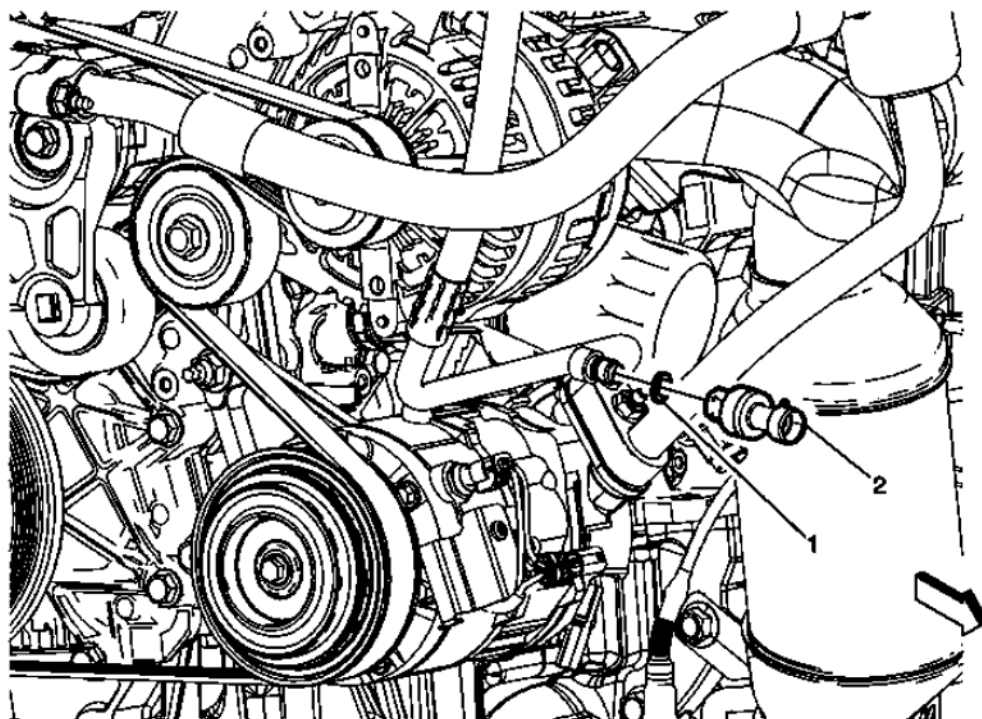


Fig. 58: Identifying 4-5-6 Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Installation

Callout	Component Name
1	4-5-6 Clutch Piston Inner Seal
2	4-5-6 Clutch Piston Outer Seal (Rounded)
3	4-5-6 Clutch Piston Outer Seal (Stepped) (Orange)
4	4-5-6 Clutch Piston NOTE: DT-47859 outer seal protector prevents the piston seal lip from damage during installation. Apply a thin coat of ATF to the I.D. of DT-47859 outer seal protector to ease the installation of the piston. Special Tools

DT-47859 Piston Outer Seal Protector

For equivalent regional tools, refer to **Special Tools** .

4-5-6 Clutch Dam Installation

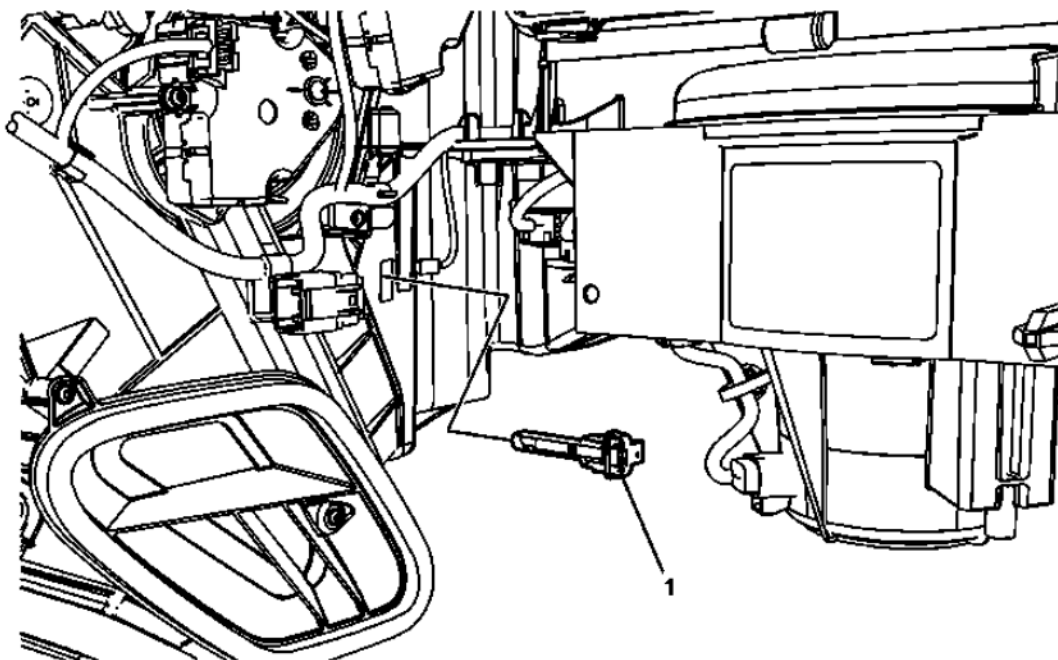


Fig. 59: View Of 4-5-6 Clutch Dam

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Dam Installation

Callout	Component Name
1	4-5-6 Clutch Spring
2	4-5-6 Clutch Piston Fluid Dam NOTE: DT 47693-1 which is part of DT-47693 dam protector prevents the dam seal lip from damage during installation. Apply a thin coat of ATF to the I.D. of DT 47693-1 which is part of DT-47693 dam protector to ease the installation of the dam. Special Tools DT-47693 Dam Protector For equivalent regional tools, refer to Special Tools .
	4-5-6 Clutch Dam Retaining Ring

Special Tools

3

- DT 47693-2 Clutch Spring Compressor which is part of **DT-47693** Dam Protector
- **GE 8059** Snap Ring Pliers-Parallel Jaw or equivalent

For equivalent regional tools, refer to **Special Tools** .

4-5-6 Clutch Plates Installation

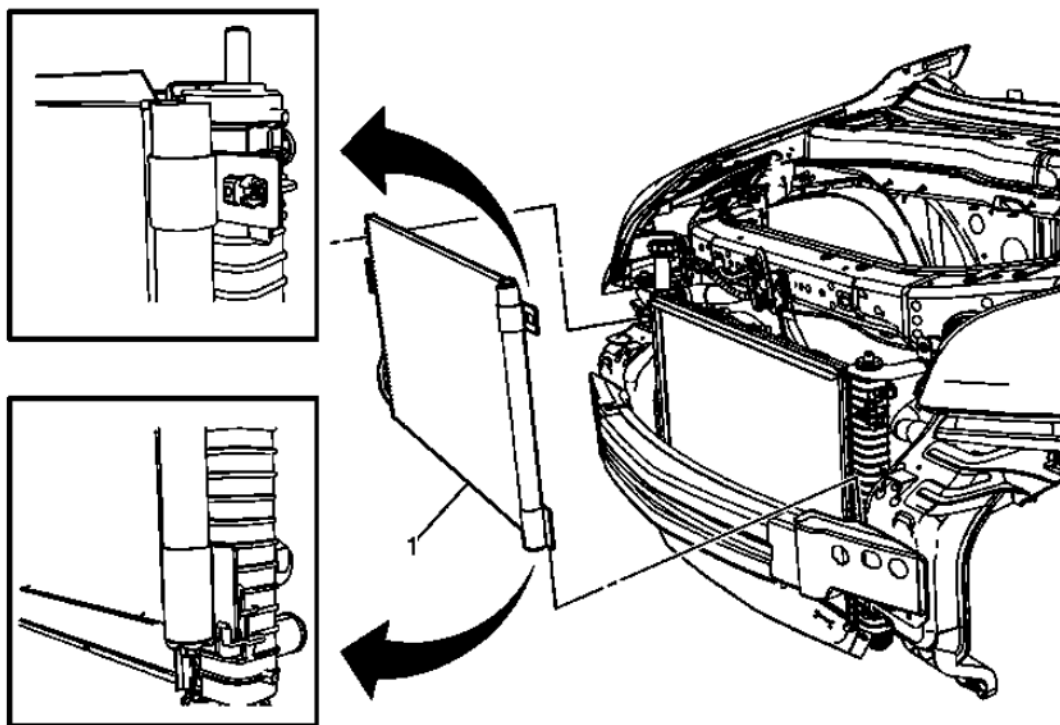


Fig. 60: Locating 4-5-6 Clutch Plates
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Plates Installation

Callout	Component Name
1	4-5-6 Clutch Hub Thrust Bearing NOTE: Note location of the orientation lip on bearing. All thrust bearings can only be assembled one way.
	Reaction Carrier Hub Assembly CAUTION: Failure to use DT 48551 could cause damage to the hub assembly bushings which

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	could cause premature transmission failure.
2	Special Tools DT-48551 Reaction Hub Bushing Protector For equivalent regional tools, refer to Special Tools .
3	4-5-6 Clutch Plate (Qty: 6)
4	4-5-6 Clutch (w/ Friction Material) Plate Assembly (Qty: 6)
5	4-5-6 Clutch Backing Plate
	4-5-6 Clutch Backing Plate Retaining Ring
6	NOTE: Gently push down on the backing plate to get enough clearance between the backing plate and retainer.

3-5 Reverse Clutch Plates Installation

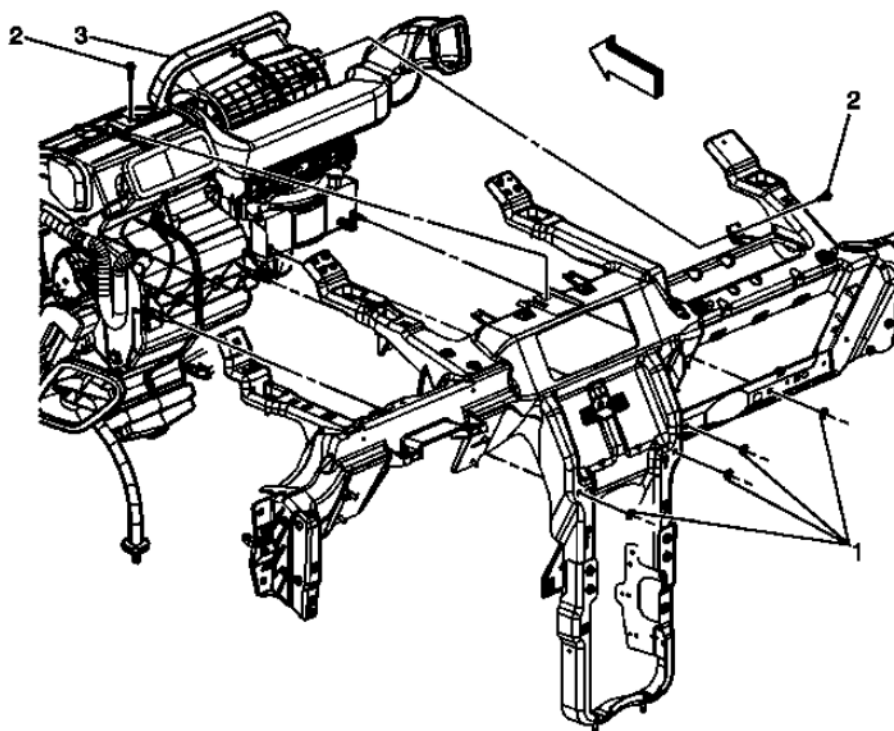


Fig. 61: Identifying 3-5 Reverse Clutch Plates
Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Plates Installation

Callout	Component Name
1	3-5 Reverse Clutch (Waved) Plate
2	3-5 Reverse Clutch Plate (Qty: 4)

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3	3-5 Reverse Clutch (w/ Friction Material) Plate Assembly (Qty: 4)
4	3-5 Reverse Clutch Backing Plate
5	3-5 Reverse Clutch Backing Plate Retaining Ring

Piston and Reluctor Wheel Installation

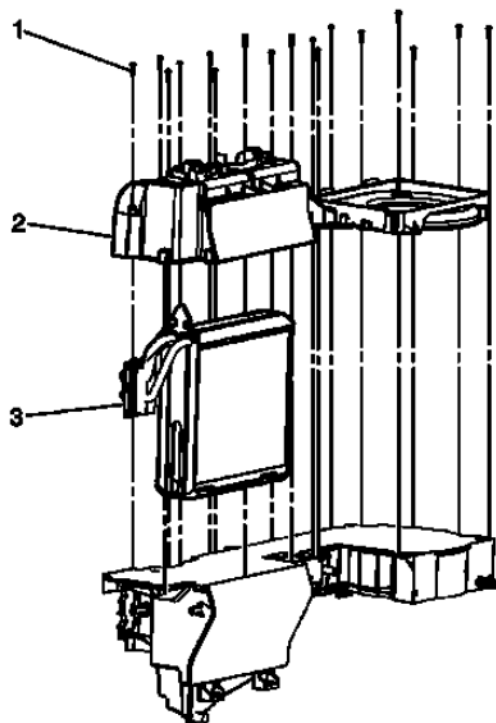


Fig. 62: View Of Piston & Reluctor Wheel
Courtesy of GENERAL MOTORS COMPANY

Piston and Reluctor Wheel Installation

Callout	Component Name
1	3-5 Reverse Clutch Piston Dam Seal
2	3-5 Reverse Clutch Piston Inner Seal (Black) NOTE: Apply a thin coat of ATF to the seal to ease the installation of the piston.
3	3-5 Reverse Clutch Piston Inner Seal (Orange) NOTE: Apply a thin coat of ATF to the seal to ease the installation of the piston.
4	3-5 Reverse Clutch Spring Assembly
	3-5 Reverse Clutch Piston

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5	NOTE: • DT-46622 seal protector prevents the piston seal lip from damage during installation. Apply a thin coat of ATF to the I.D. of DT-46622 seal protector to ease the installation of the piston. • Install DT-46622 seal protector onto the speed sensor reluctor wheel. Push the 3-5 Reverse Clutch piston into the reluctor wheel until it stops against J-46622 seal protector. Remove DT-46622 seal protector by separating it at the opening. Special Tools DT-46622 Piston Seal Protector For equivalent regional tools, refer to Special Tools .
6	A/Trans Input Shaft Speed Sensor Reluctor Wheel
7	A/Trans Input Shaft Speed Sensor Reluctor Wheel Retaining Ring CAUTION: Compress the reluctor wheel just enough to clear the retainer ring groove. Over compressing the reluctor wheel will break the alignment tab and the clutch housing. Special Tools DT-47694 Piston Spring Compressor For equivalent regional tools, refer to Special Tools .

3-5-R and 4-5-6 Clutch Piston Air Check

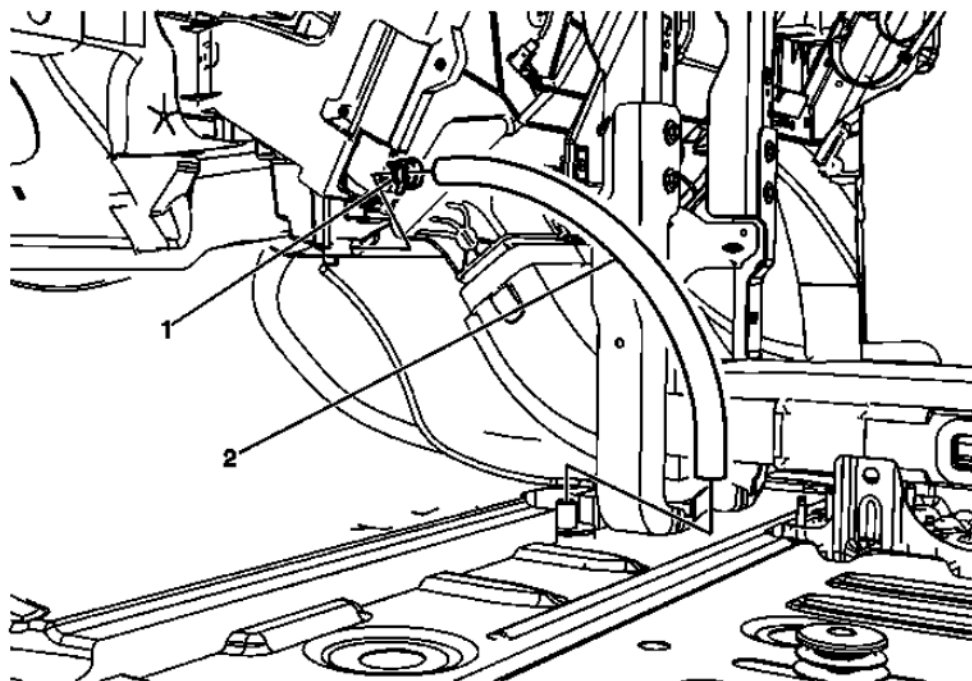


Fig. 63: View Of 35R And 4-5-6 Clutch Piston Air Check
 Courtesy of GENERAL MOTORS COMPANY

3-5-R and 4-5-6 Clutch Piston Air Check

Callout	Component Name
1	Case Cover Assembly NOTE: The fluid seal rings should be in place and not damaged.
2	4-5-6 Clutch Feed Fluid Passage CAUTION: Regulate the air pressure to 40 psi maximum. High pressure could cause the piston to over travel and damage the piston seals. Procedure 1. Apply shop air to the 4-5-6 clutch feed passage. 2. Observe the 4-5-6 piston movement. NOTE: Minimal piston movement and excessive air leaking could indicate damage to the 4-5-6 piston seals or improper assembly.
	3-5 Rev Clutch Feed Fluid Passage

CAUTION:

Regulate the air pressure to 40 psi maximum. High pressure could cause the piston to over travel and damage the piston seals.

Procedure

3

1. Apply shop air to the 3-5-Rev clutch feed passage.
2. Observe the 3-5-Rev piston movement.

NOTE:

Minimal piston movement and excessive air leaking could indicate damage to the 3-5-Rev piston seals or improper assembly.

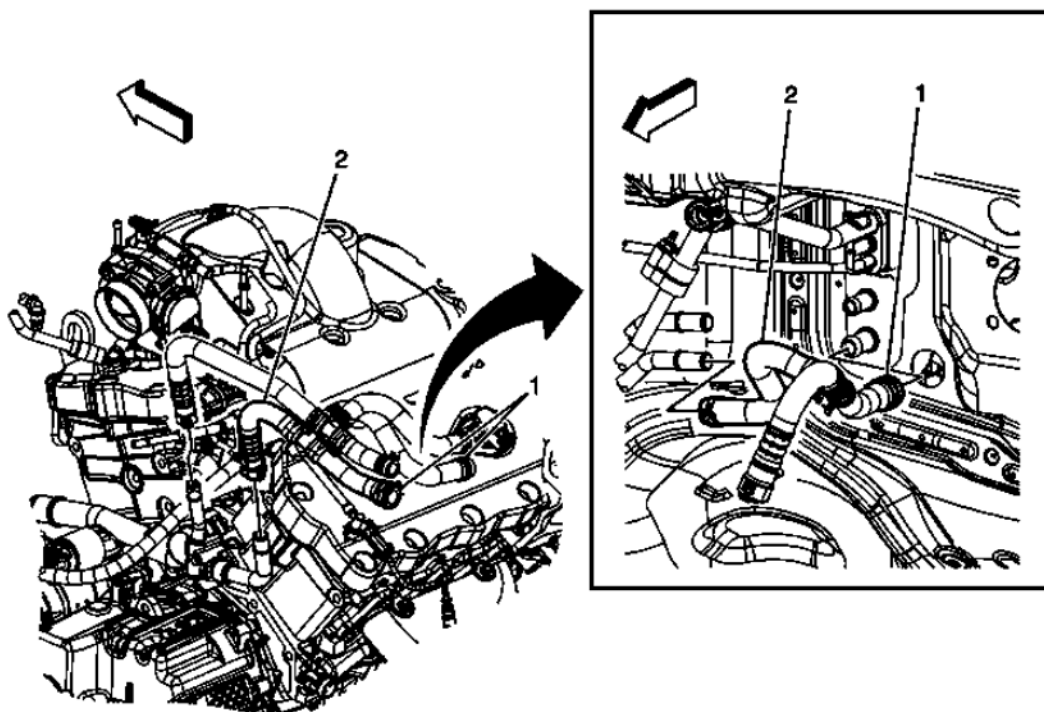
3-5-REVERSE AND 4-5-6 CLUTCH HOUSING INSTALLATION

Fig. 64: Identifying 3-5 Reverse & 4-5-6 Clutch Housing
Courtesy of GENERAL MOTORS COMPANY

3-5-Reverse and 4-5-6 Clutch Housing Installation

Callout	Component Name
1	3-5 Reverse and 4-5-6 Clutch Assembly
	NOTE:

Rotate the assembly back and forth to align the 3-5 reverse clutch plates with the reaction sun gear housing.

CASE COVER ASSEMBLY DISASSEMBLE

ISS Removal

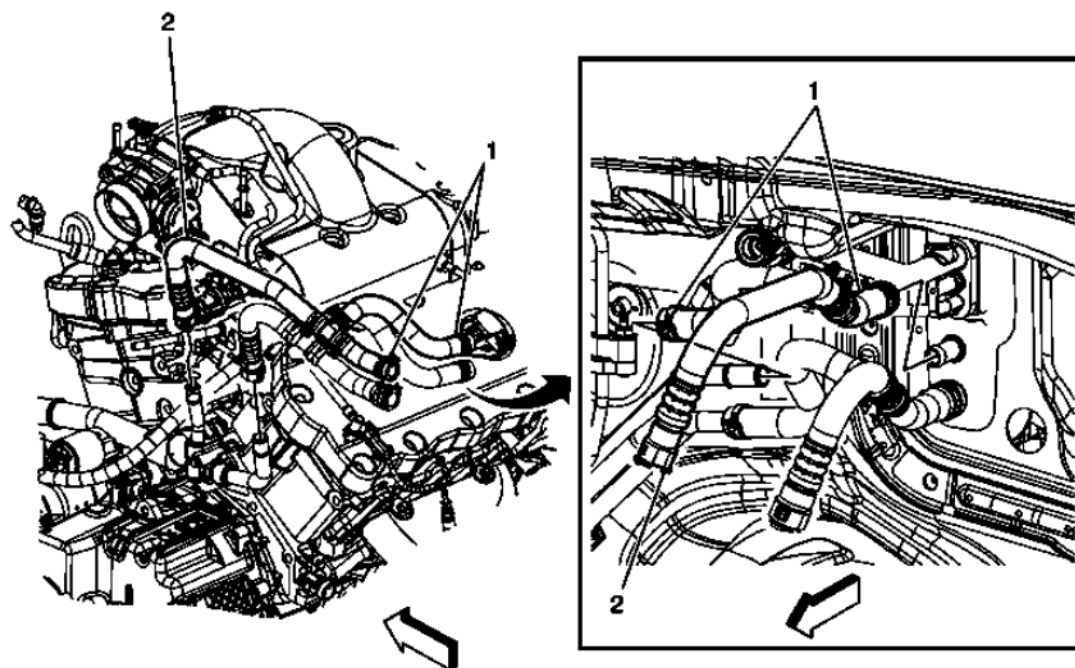


Fig. 65: View Of 3-5 Reverse & 4-5-6 Clutch Fluid Seal Ring

Courtesy of GENERAL MOTORS COMPANY

ISS Removal

Callout	Component Name
1	A/Trans Input Speed Sensor Bolt M6 x 25
2	A/Trans Input Speed Sensor
3	A/Trans Input Speed Sensor Seal NOTE: Discard the seal.
4	3-5 Reverse and 4-5-6 Clutch Fluid Seal Ring NOTE: Discard the seals.

Low and Reverse Clutch Piston Removal

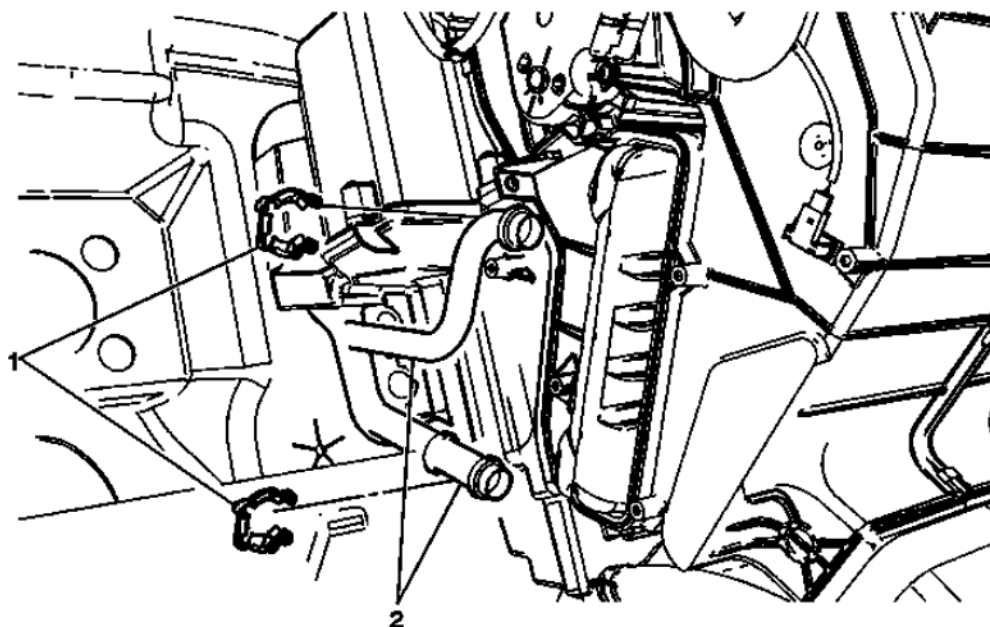


Fig. 66: Identifying Low & Reverse Clutch Piston
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Removal

Callout	Component Name
1	Low and Reverse Clutch Spring Retaining Ring
2	Low and Reverse Clutch Spring
3	Low and Reverse Clutch Piston Assembly
	NOTE: Inspect piston seals for damage and/or wear. Piston is reusable.

2-6 Clutch Piston Removal

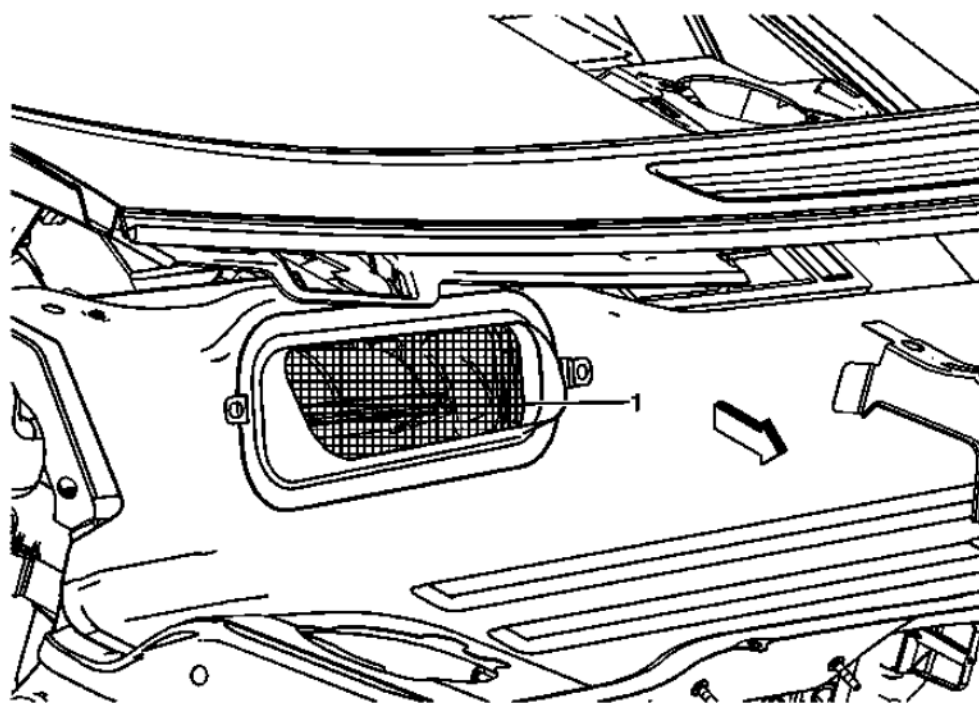


Fig. 67: View Of 2-6 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Piston Removal

Callout	Component Name
1	2-6 Clutch Spring Retaining Ring Special Tools DT-46632 Spring Compressor For equivalent regional tools, refer to Special Tools .
2	2-6 Clutch Spring Assembly
3	2-6 Clutch Piston NOTE: Inspect piston seals for damage and/or wear. Piston is reusable.

Clean and Inspect

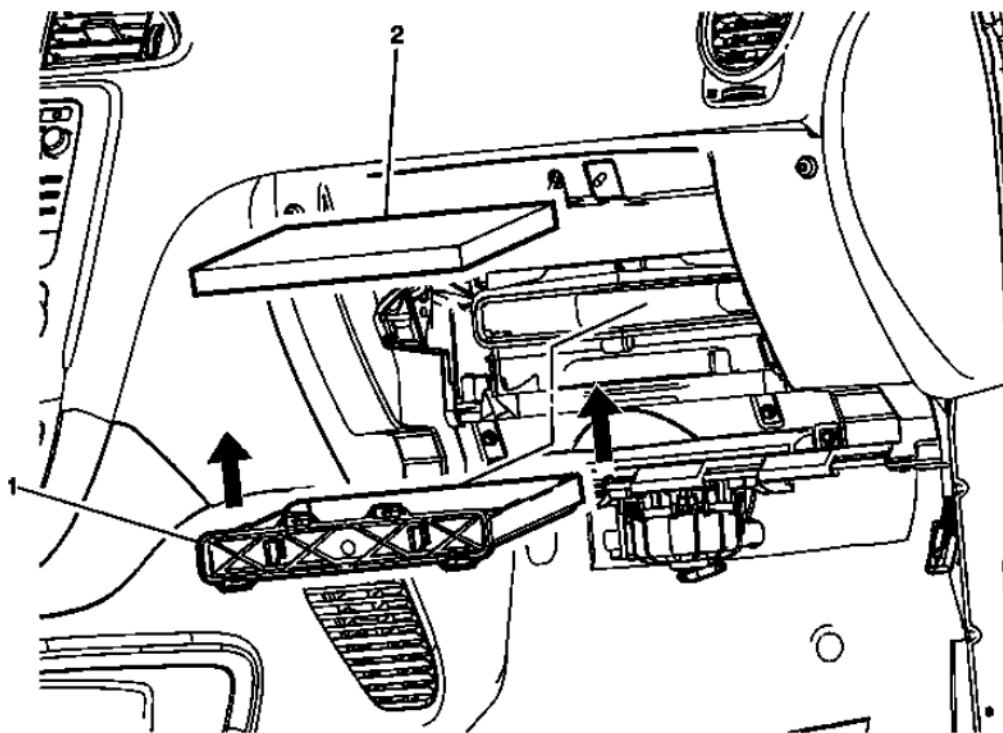


Fig. 68: Identifying Case Cover Assembly Components
 Courtesy of GENERAL MOTORS COMPANY

Clean and Inspect

Callout	Component Name
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.	
Preliminary Procedures	
1. Thoroughly clean the case cover assembly, including threads, with clean solvent.	
2. Clean gasket sealing surfaces. Remove all residual gasket material.	
3. Inspect all threaded holes. If necessary, repair any thread damage.	
1	Gasket Sealing Surface
2	Fluid Passages
3	Piston Bores
4	Cover to Case Passages
5	A/Trans Input Speed Sensor Assembly Bore

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6	Cover Casting
7	Passage Cup Plugs
8	Input Shaft Support Bolts CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tightened bolts in sequence. Tighten 12 N.m (106 lb in).

CASE COVER ASSEMBLY ASSEMBLE

Fluid Seal Ring Installation

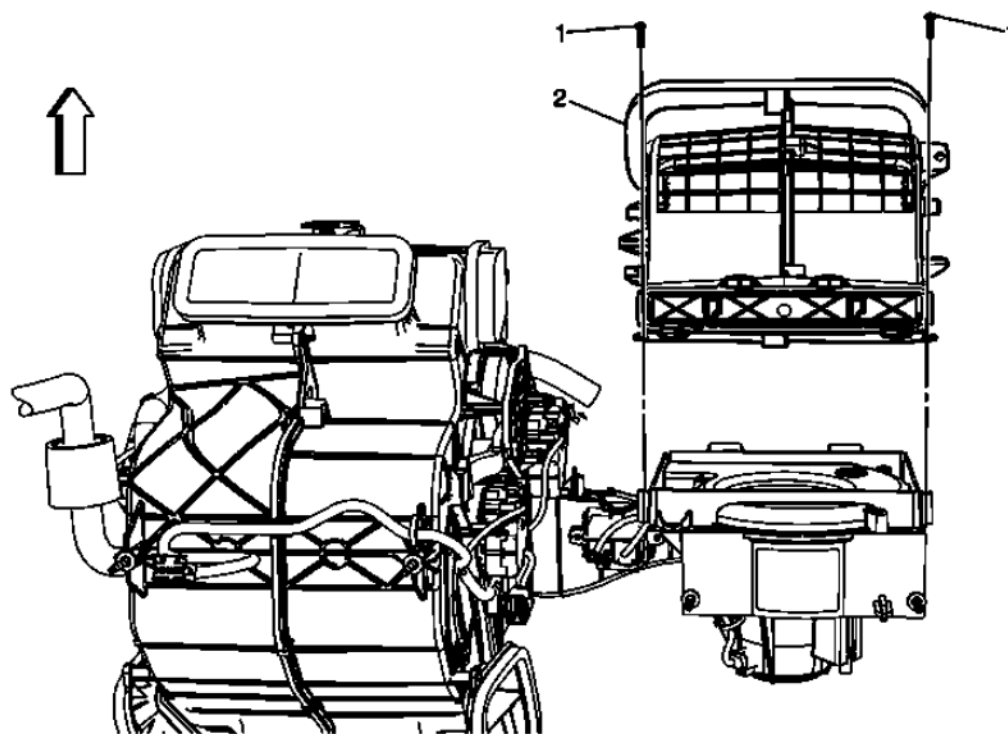


Fig. 69: Identifying Fluid Seal Ring
Courtesy of GENERAL MOTORS COMPANY

Fluid Seal Ring Installation

Callout	Component Name
	3-5 Reverse and 4-5-6 Clutch Fluid Seal Ring

1	Procedure 1. Place DT 46620-3 which is part of DT-46620 seal installer over the case cover hub and adjust it so that only the bottom seal ring is exposed. 2. Place a NEW fluid seal ring onto DT 46620-3 which is part of DT-46620 seal installer. 3. Use DT 46620-2 which is part of DT-46620 seal installer to push the fluid seal ring down over DT 46620-3 which is part of DT-46620 seal installer into the hub ring groove. 4. Repeat the above steps to install all 4 seal rings, adjusting DT 46620-3 which is part of DT-46620 seal installer to the appropriate ring groove. Special Tools DT-46620 Seal Installer For equivalent regional tools, refer to Special Tools .
2	Small Chamfer Up CAUTION: Do not force the seal installer down over the seals as this will roll and damage the seals. The large chamfer is designed to fit over the over stretched seal. Use a hand to help shrink the seal if the seal installer is difficult to install over the seal rings. Procedure Install DT 46620-1 which is part of DT-46620 seal installer with the large chamfer end down over the fluid seal rings and leave DT 46620-1 which is part of DT-46620 seal installer on the seals for at least 60 seconds.
3	Large Chamfer Up Procedure 1. Install DT 46620-1 which is part of DT-46620 seal installer with the small chamfer end facing down for at least 60 seconds. This will properly size the bottom seal ring. 2. Leaving DT 46620-1 which is part of DT-46620 seal installer on the fluid seal rings for an extended period of time could cause a fluid leak on the initial clutch piston circuit until the seal rings warm up and expand to the proper dimension.

2-6 Clutch Piston Installation

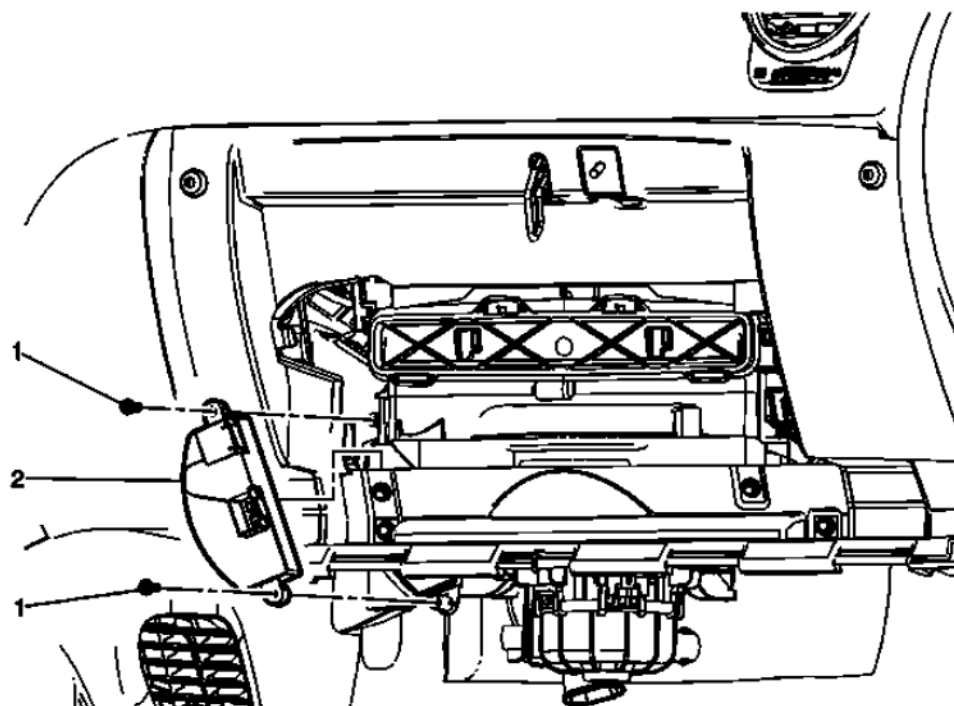


Fig. 70: View Of 2-6 Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Piston Installation

Callout	Component Name
1	2-6 Clutch Piston Procedure DT-46621 seal protector prevents the piston seal lip from damage over the retaining ring groove during installation. Apply a thin coat of ATF to the O.D. of DT-46621 seal protector to ease the installation of the piston. Special Tools DT-46621 Seal Protector For equivalent regional tools, refer to Special Tools .
2	2-6 Clutch Spring Assembly
3	2-6 Clutch Spring Assembly Procedure 1. Install the retaining ring with the opening positioned to the top of the case cover. 2. Place the retainer ring inside DT-46632 spring compressor prior to placing DT-46632 spring compressor onto the spring. Special Tools

DT-46632 Spring Compressor

For equivalent regional tools, refer to **Special Tools** .

Low and Reverse Clutch Piston Installation

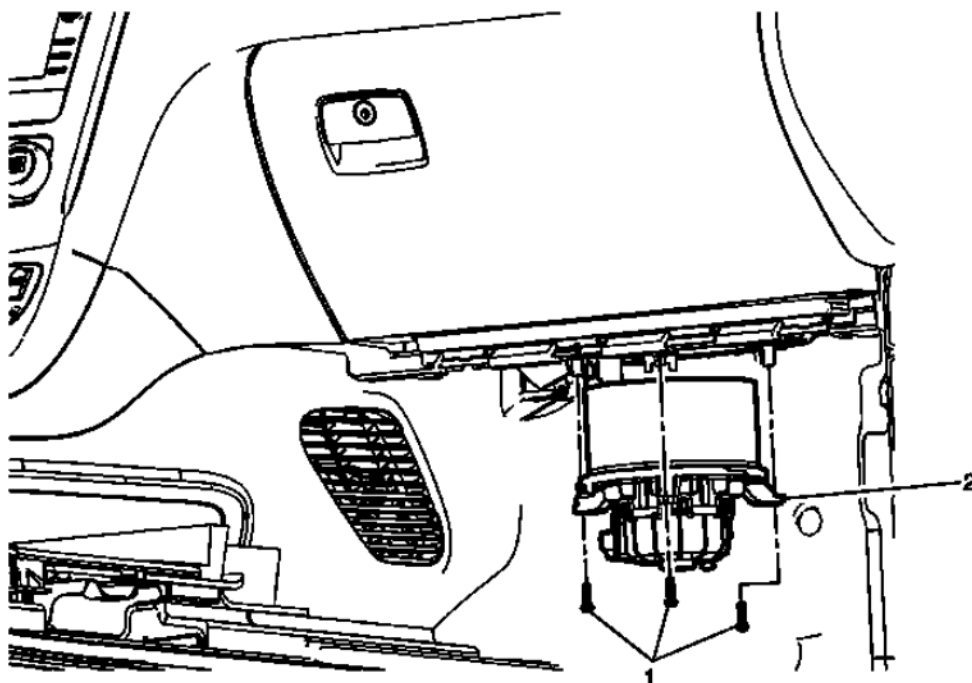


Fig. 71: Identifying Low & Reverse Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Installation

Callout	Component Name
1	Low and Reverse Clutch Piston Assembly Procedure 1. Install the L/R piston with the air bleed positioned at the alignment feature on the cover, using DT-46628-1 seal protector. This will orient the piston fingers with the openings in the case. 2. DT-46628-1 seal protector prevents the piston seal lip from damage during installation. Apply a thin coat of ATF to the I.D. of DT-46628-1 seal protector to ease the installation of the piston. Special Tools DT-46628-1 Piston Seal Protector

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	For equivalent regional tools, refer to Special Tools .
2	Low and Reverse Clutch Spring
3	Low and Reverse Clutch Spring Retaining Ring NOTE: Do not align the retainer opening with other retaining ring openings. Special Tools DT-46628-2 Spring Compressor For equivalent regional tools, refer to Special Tools .

2-6 and Low-Reverse Piston Function Inspection

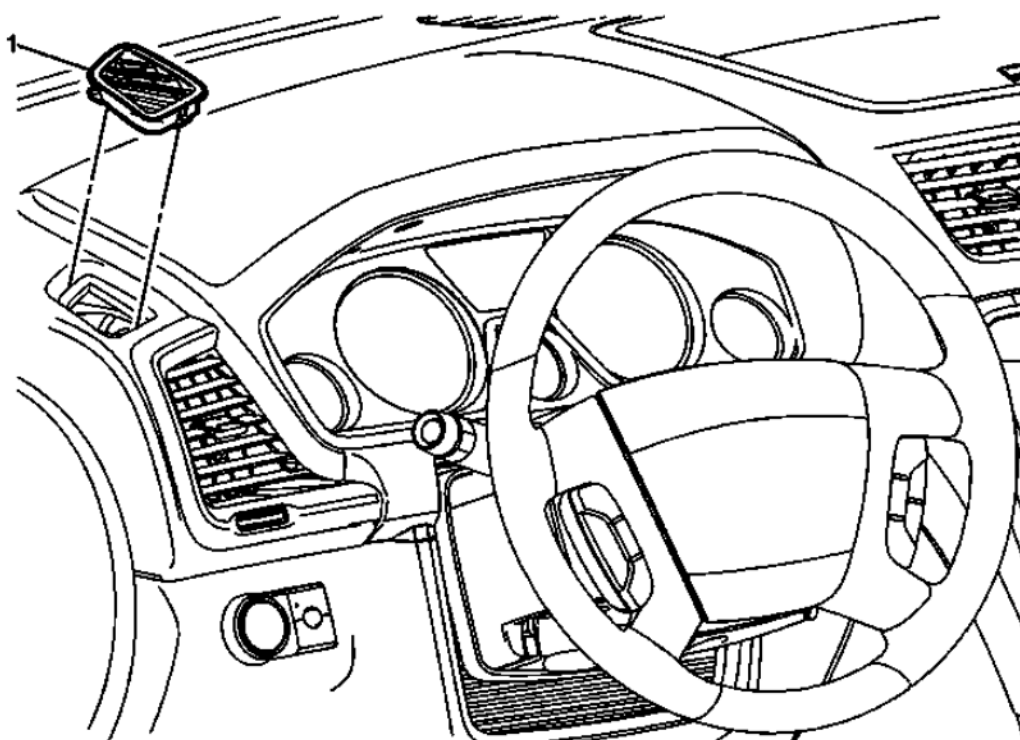


Fig. 72: 2-6 and Low-Reverse Piston Function Inspection
Courtesy of GENERAL MOTORS COMPANY

2-6 and Low-Reverse Piston Function Inspection

Callout	Component Name
1	Case Cover Assembly NOTE: The fluid seal rings should be in place and not damaged.
	2-6 Clutch Feed Passage

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2	CAUTION: Regulate the air pressure to 40 psi maximum. High pressure could cause the piston to over travel and damage the piston seals. Procedure Apply shop air to the 2-6 clutch feed. Observe the 2-6 piston movement. NOTE: Minimal piston movement and excessive air leaking could indicate damage to the 2-6 piston seals or improper assembly.
3	Low and Reverse Clutch Feed Passage CAUTION: Regulate the air pressure to 40 psi maximum. High pressure could cause the piston to over travel and damage the piston seals. Procedure Apply shop air to the Low and Reverse clutch feed. Observe the Low and Reverse piston movement. NOTE: Minimal piston movement and excessive air leaking could indicate damage to the Low and Reverse piston seals or improper assembly.

Input Speed Sensor Installation

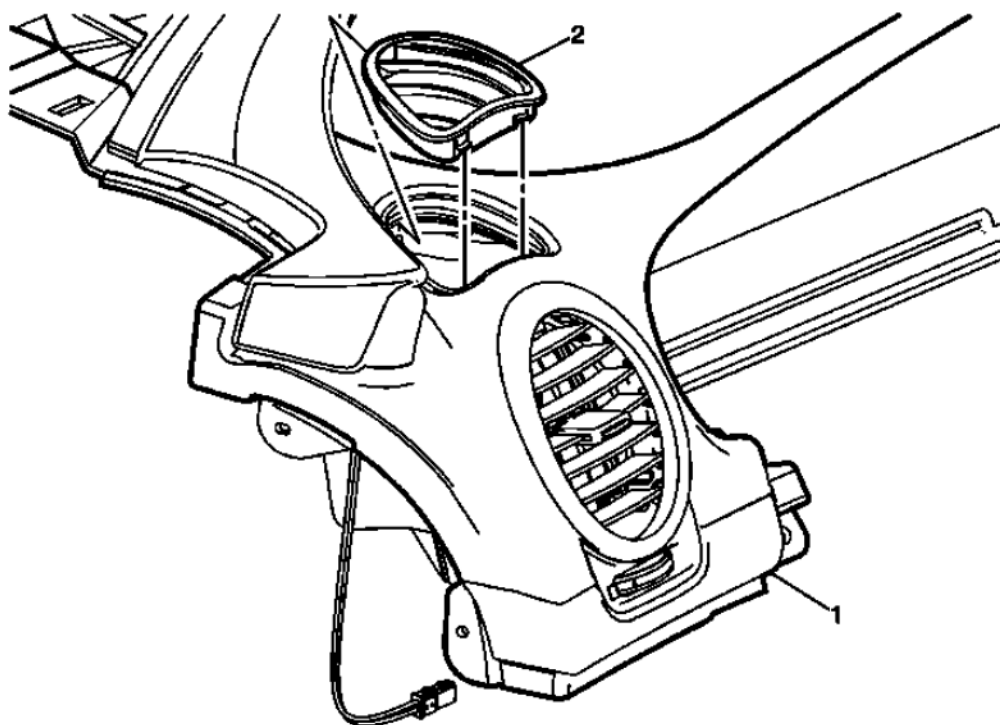


Fig. 73: View Of Input Speed Sensor
 Courtesy of GENERAL MOTORS COMPANY

Input Speed Sensor Installation

Callout	Component Name
1	Input Speed Sensor Seal
2	A/Trans Input Speed Sensor Assembly
3	A/Trans Input Speed Sensor Bolt M6 x 25 CAUTION: Refer to <u>Fastener Caution</u> . Procedure Apply threadlocker or equivalent to the input speed sensor bolt. Refer to <u>Adhesives, Fluids, Lubricants and Sealers</u> . NOTE: The seal is coated with a dry lubricant. If the coating is missing, lubricate the seal with automatic transmission fluid prior to installation. Tighten 9 N.m (7 lb ft)

CASE COVER ASSEMBLY INSTALLATION

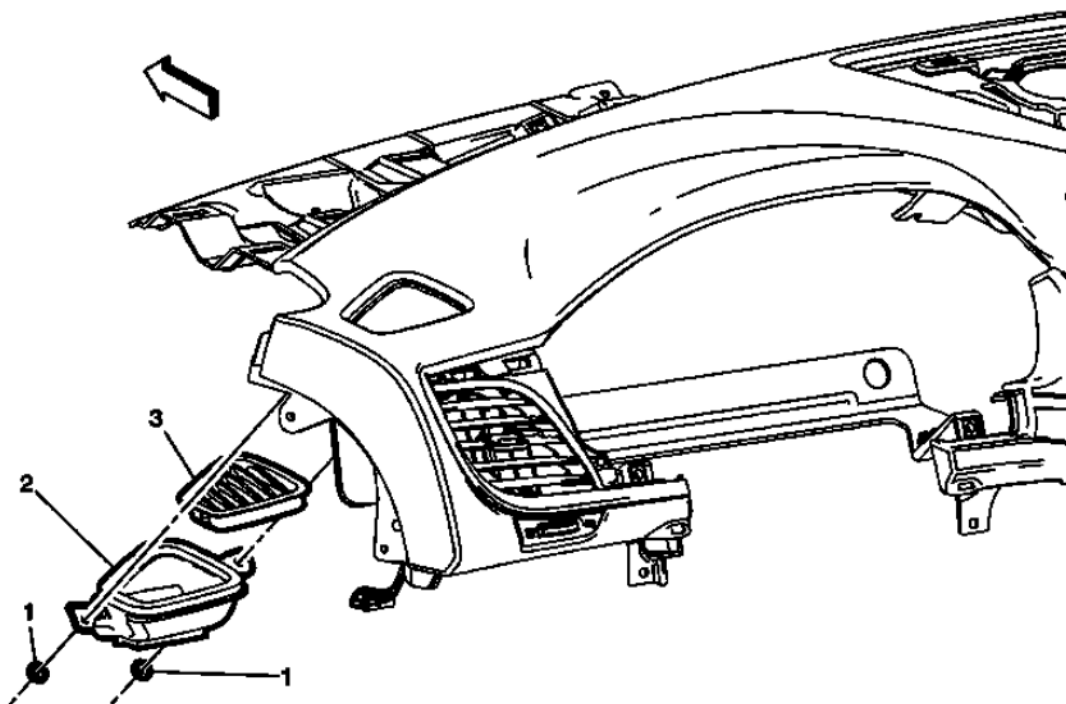


Fig. 74: Identifying Case Cover Assembly Components
 Courtesy of GENERAL MOTORS COMPANY

Case Cover Assembly Installation

Callout	Component Name
1	Input Shaft Thrust Bearing NOTE: Note location of the orientation lip on bearing. All thrust bearings can only be assembled one way.
2	A/Trans Case Cover Gasket
3	Input Speed Sensor Wire Harness NOTE: Route the input speed sensor wire harness through the case passage.
4	A/Trans Case Cover Assembly Procedure 1. Use guide pins to install the case cover assembly to prevent damage to the input shaft thrust bearing. 2. Pull the input speed sensor wire harness through the case passage while lowering the

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cover assembly onto the case.

Special Tools

39068 Guide Pins

For equivalent regional tools, refer to **Special Tools**.

A/Trans Case Cover Assembly Bolt M6 x 30 (Qty: 10)

CAUTION:

Refer to **Fastener Caution**.

5

Procedure

Tighten in sequence shown.

Tighten

12 N.m (106 lb in)

FRONT DIFFERENTIAL CARRIER FINAL ROTATIONAL TORQUE MEASUREMENT

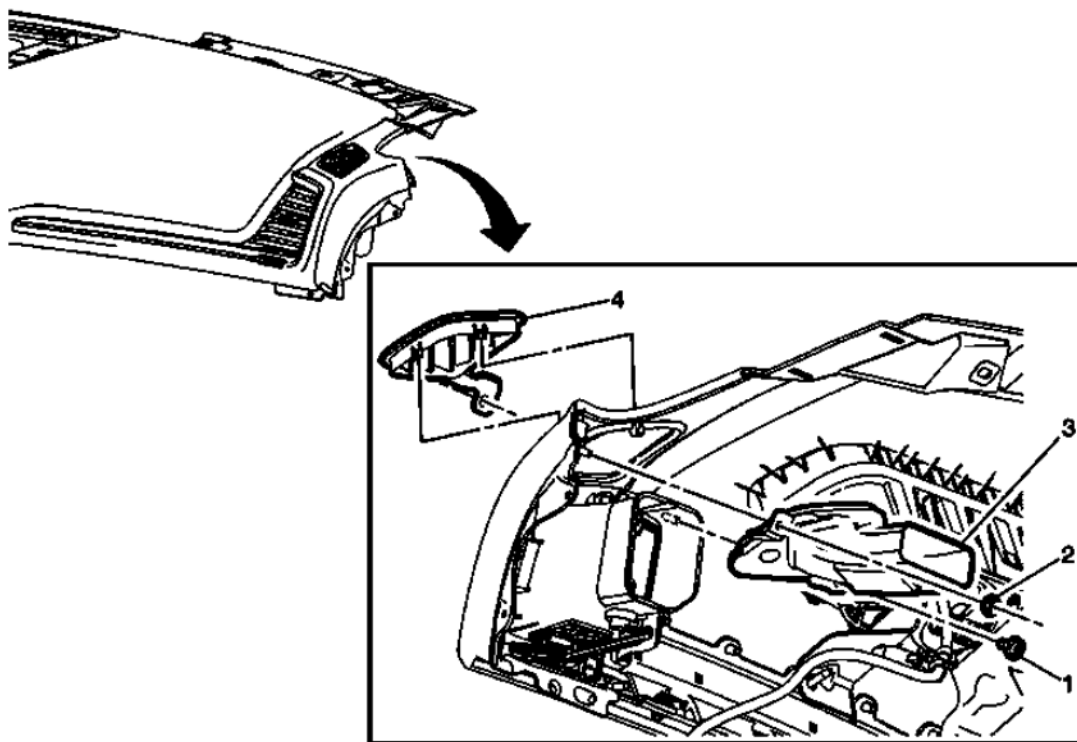


Fig. 75: Identifying Special Tool - DT-47793

Courtesy of GENERAL MOTORS COMPANY

Front Differential Carrier Final Rotational Torque Measurement

Callout	Component Name

Front Differential Carrier Assembly

CAUTION:

Low bearing pre-load will cause premature failure of the front differential drive pinion gear.

CAUTION:

Refer to Fastener Caution .

NOTE:

1

- If the turning torque is not within specifications, the transfer gear assembly and differential bearing thrust washer is incorrect and must be corrected. Refer to Front Differential Drive Pinion Gear Bearing Thrust Washer and Front Differential Bearing Washer Measurement.
- Use a dial or beam torque wrench with DT-47793 differential rotating tool to measure turning torque.

Tighten

14-22 (10-16 lb ft)

Special Tools

DT-47793 Differential Rotating Tool

For equivalent regional tools, refer to Special Tools .

CONTROL VALVE BODY ASSEMBLY DISASSEMBLE

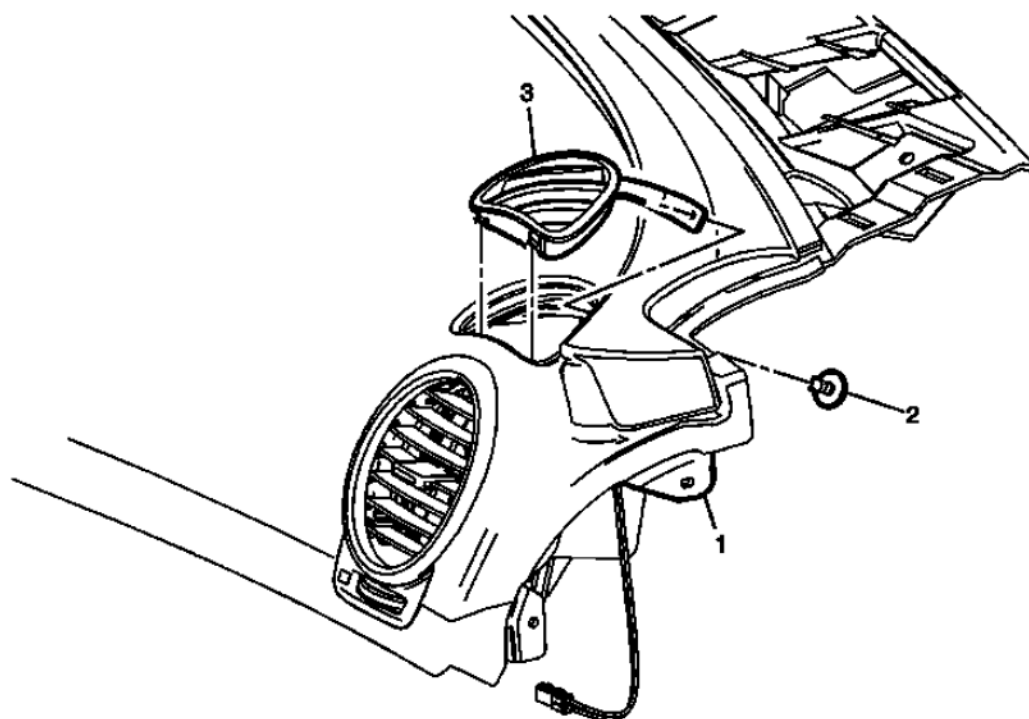


Fig. 76: Control Valve Body Assembly Components
Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Assembly Disassemble

Callout	Component Name
1	Control Valve Body Bolt M6 x 65 (Qty: 5)
2	Control Valve Body Bolt M6 x 35 (Qty: 3)
3	Control Valve Channel Upper Plate Assembly NOTE: - Inspect the upper channel plate bolt pass through holes for damage or brinelling. Any damage near the PCS feed hole will cause incorrect pressure switch operation. Replace as necessary. - The TCU pin gasket is not serviceable. If the gasket is damaged, the control valve channel upper plate assembly must be replaced.
4	Control Valve Body Bolt M6 x 55 (Qty: 2)
5	Control Valve Body Bolt M6 x 55 (Qty: 1)
6	Control Valve Channel Plate Assembly
7	Control Valve Body Ball Check Valve (Qty: 10)
8	Control Valve Upper Body Assembly
9	Control Valve Lower Body Spacer Plate Assembly NOTE:

	Discard the spacer plate assembly.
10	Control Valve Lower Body Assembly

CONTROL VALVE LOWER BODY ASSEMBLY CLEANING AND INSPECTION

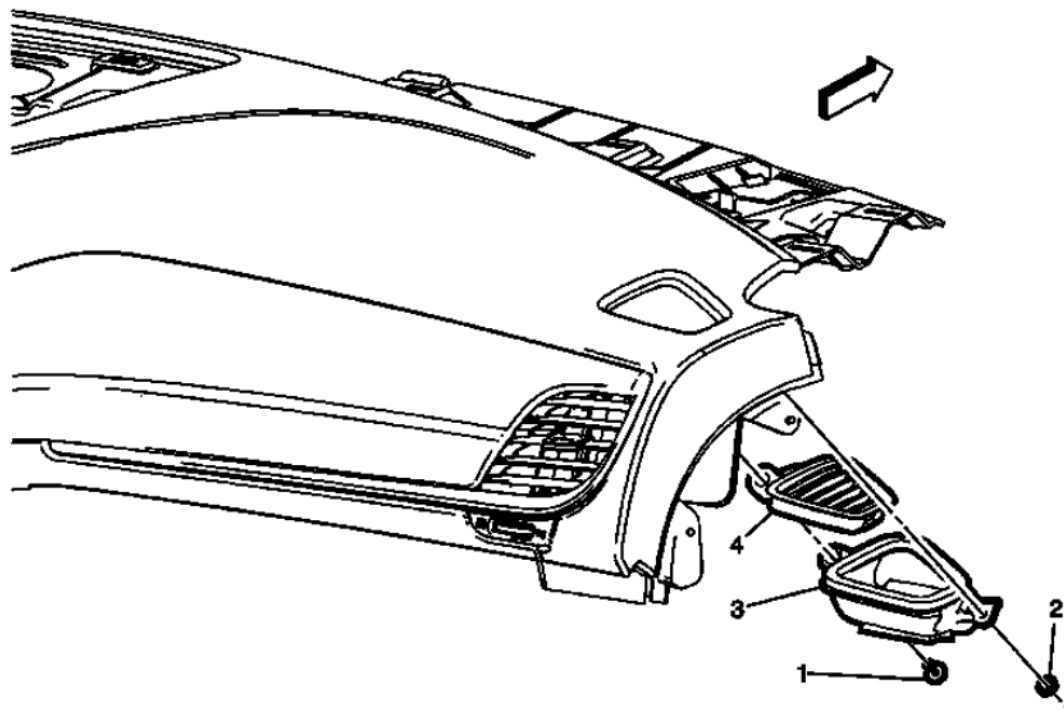


Fig. 77: Control Valve Lower Body Assembly Cleaning and Inspection
Courtesy of GENERAL MOTORS COMPANY

Control Valve Lower Body Assembly Cleaning and Inspection

Callout	Component Name
WARNING: Valve springs can be tightly compressed. Use care when removing retainers and plugs. Personal injury could result.	
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.	
Preliminary Procedure Clean and inspect all valve components and the valve body. The control valve lower body is replaceable only as an assembly.	

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1	3-5 Reverse Clutch Boost Valve Train
2	Accumulator Feed Limit Valve Train
3	4-5-6 Clutch Boost Valve Train
4	4-5-6 Clutch Accumulator Piston Assembly
5	1-2-3-4 Clutch Boost Valve Train
6	1-2-3-4 Clutch Regulator Valve Train
7	Control Valve Body Locating Pins (Qty: 2) NOTE: Inspect Valve Body locating pins for proper installed height of 4.25 mm (0.17 in).

CONTROL VALVE UPPER BODY ASSEMBLY CLEANING AND INSPECTION

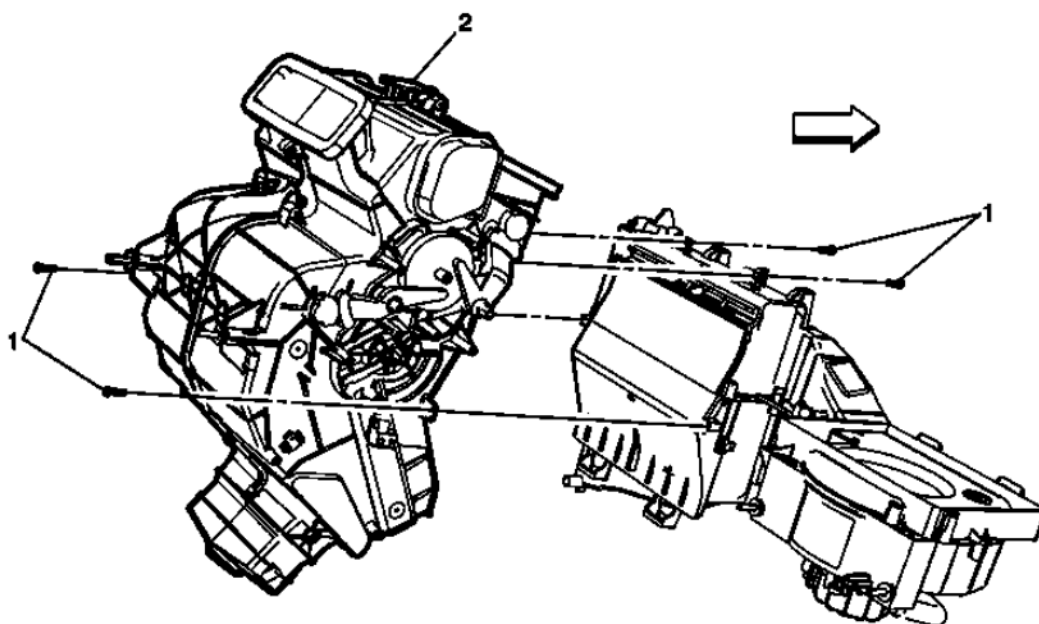


Fig. 78: Control Valve Upper Body Assembly Cleaning and Inspection Components
Courtesy of GENERAL MOTORS COMPANY

Control Valve Upper Body Assembly Cleaning and Inspection

Callout	Component Name
WARNING: Valve springs can be tightly compressed. Use care when removing retainers and plugs. Personal injury could result.	
CAUTION:	

After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.

CAUTION:

Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.

Preliminary Procedure Clean and inspect all valve components and the valve body. The control valve upper body is replaceable only as an assembly.

1	1st Reverse and 4-5-6 Clutch Regulator Valve Train
2	TCC Regulator Apply Valve Train
3	2-6 Clutch Regulator Valve Train
4	3-5 Reverse Clutch Regulator Valve Train
5	Pressure Regulator Valve Train
6	Isolator Valve Train
7	TCC Control Valve Train
8	Clutch Select Solenoid #3 Valve Train
9	Clutch Select Solenoid #2 Valve Train
10	Manual Valve

CONTROL VALVE CHANNEL PLATE CLEANING AND INSPECTION

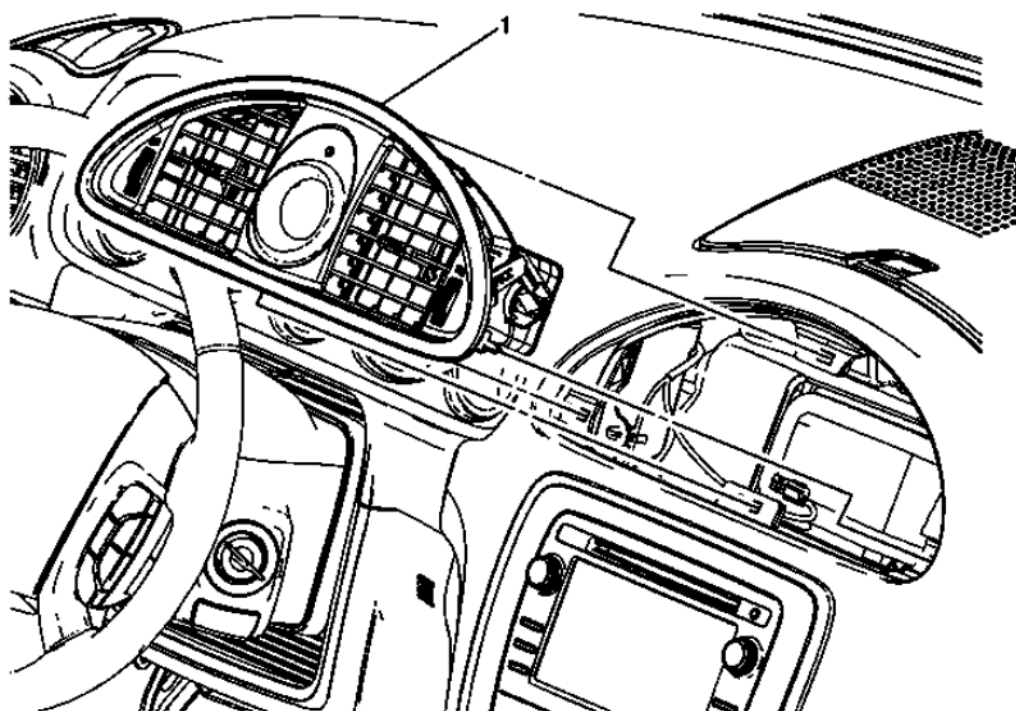


Fig. 79: Control Valve Channel Plate Cleaning and Inspection

Courtesy of GENERAL MOTORS COMPANY

Control Valve Channel Plate Cleaning and Inspection

Callout	Component Name
CAUTION: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure.	
CAUTION: Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component.	
1	Control Valve Body Spacer Plate Retainer (Qty: 2)
2	Control Valve Upper Body Spacer Plate Assembly
3	Actuator Feed Accumulator Spring (Qty: 3)
4	Actuator Feed Accumulator Piston (Qty: 3)
5	Control Valve Body Locating Pin (Qty: 2)
	NOTE: Inspect locating pins for proper installed height of 4.25 mm (0.17 in).

CONTROL VALVE BODY ASSEMBLY ASSEMBLE

Lower and Upper Body Assemble

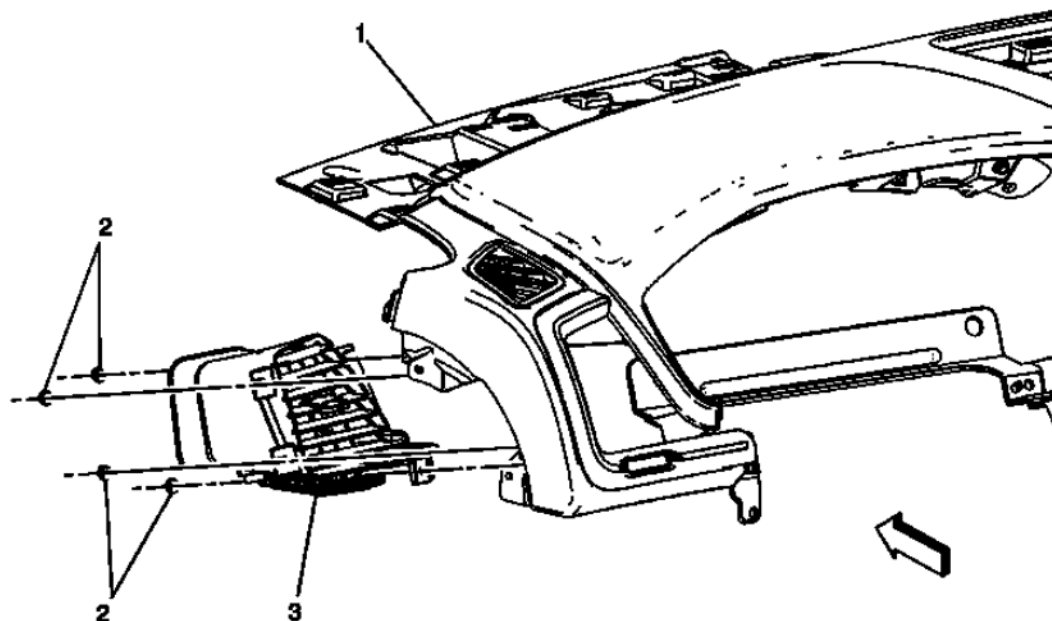


Fig. 80: Control Valve Body Assembly Components

Courtesy of GENERAL MOTORS COMPANY

Lower and Upper Body Assemble

Callout	Component Name
1	Control Valve Lower Body Spacer Plate Assembly CAUTION: Do not use the old spacer plate. Install a NEW spacer plate. Reusing an old spacer plate may cause internal transmission leaks and transmission damage. NOTE: Inspect the upper channel plate bolt through holes for damage or brinelling. Any damage around the PCS switch feed holes could cause leakage around the PCS switch seals. Replace as necessary.
2	Control Valve Upper Body Assembly
3	Control Valve Body Ball Check Valve (Qty: 10) CAUTION: Do not use any type of grease or other material to hold the check ball valves in place during assembly. Grease will cause the valves to not operate properly, resulting in damage to the transmission.
4	Control Valve Channel Plate Assembly
5	Control Valve Body Bolt 6 x 55 (Qty: 1) CAUTION: Refer to Fastener Caution . Tighten 12 N.m (9 lb ft)

Channel Plate and Upper Channel Plate Assemble

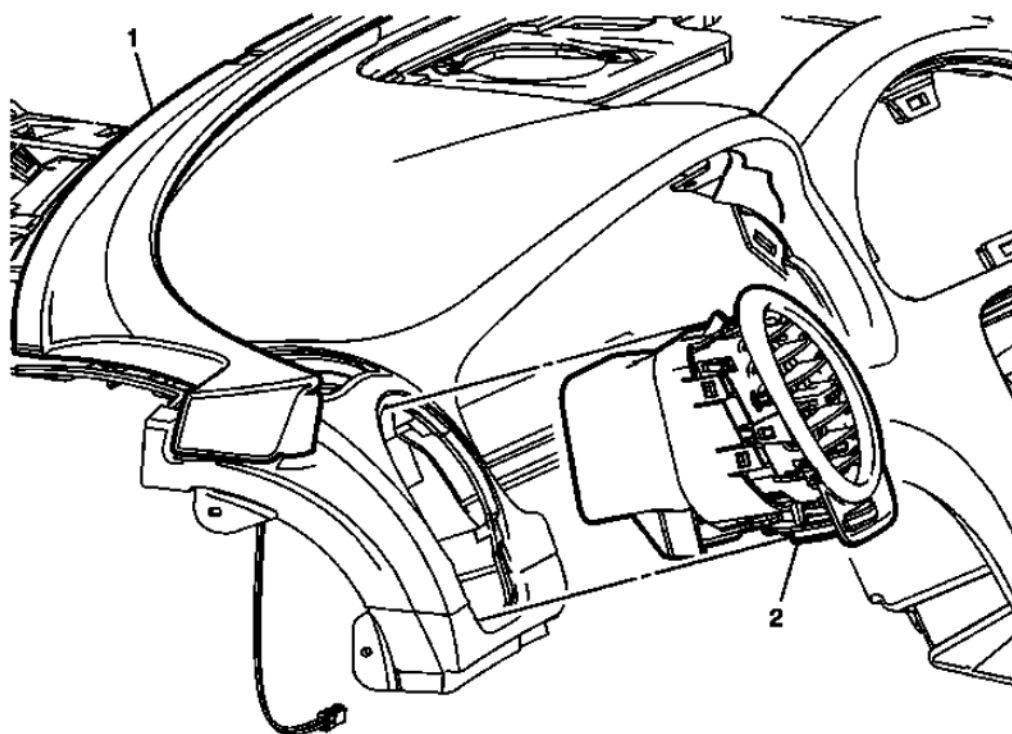


Fig. 81: Channel Plate and Upper Channel Plate Components
 Courtesy of GENERAL MOTORS COMPANY

Channel Plate and Upper Channel Plate Assemble

Callout	Component Name
1	Control Valve Channel Upper Plate Assembly NOTE: - Inspect the upper channel plate bolt pass through holes for damage or burnelling. Any damage near the PCS feed holes could cause leaking around the PCS switch seal. Replace as necessary. - The TCU pin gasket is not serviceable. If the gasket is damaged, the control valve channel upper plate assembly must be replaced.
2	Control Valve Body Bolt M6 x 35 (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Procedure Hand tighten for alignment, then tighten in sequence, after all bolts are installed. Tighten 12 N.m (9 lb ft)
	Control Valve Body Bolt M6 x 65 (Qty: 5)

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3	Procedure Tighten in sequence. Tighten 12 N.m (9 lb ft)
4	Control Valve Body Bolt M6 x 55 (Qty: 2) Procedure Tighten in sequence. Tighten 12 N.m (9 lb ft)

CONTROL VALVE BODY ASSEMBLY INSTALLATION

Output Speed Sensor and Valve Body Installation

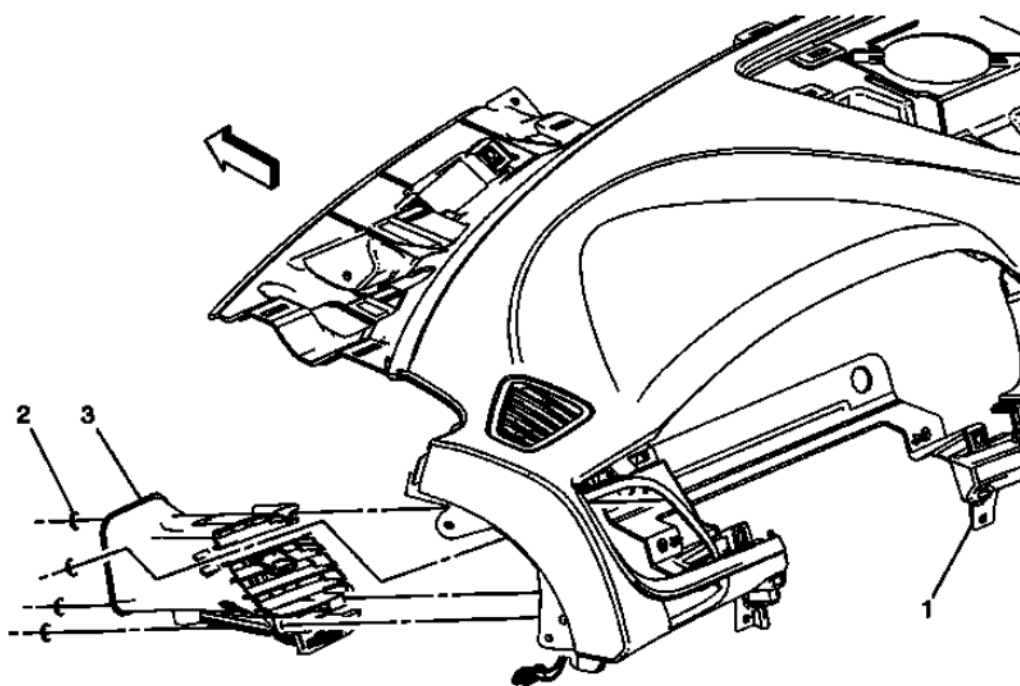


Fig. 82: Output Speed Sensor And Control Valve Body Assembly
Courtesy of GENERAL MOTORS COMPANY

Output Speed Sensor and Valve Body Installation

Callout	Component Name
1	1-2-3-4 Clutch Fluid Passage Seal
2	A/Trans Output Speed Sensor Assembly
	A/Trans Output Speed Sensor Assembly Bolt M6 x 25
	CAUTION:

3	Refer to <u>Fastener Caution</u> .
	Tighten 12 N.m (9 lb ft)
4	Control Valve Body Assembly
	Manual Valve
5	NOTE: - Align the manual valve to the detent lever assembly. - Removing the manual shaft assembly pin will aid in aligning the manual valve to the detent lever. Install the manual shaft pin after the valve body assembly is installed using DT 41229 pin installer, if it was not installed previously. Refer to <u>Manual Shift Detent Lever with Shaft Position Switch Assembly and Park Pawl Actuator Removal</u>. Special Tools DT 41229 Manual Shaft Pin Installer For equivalent regional tools, refer to <u>Special Tools</u> .

Control Valve Body Bolts Installation

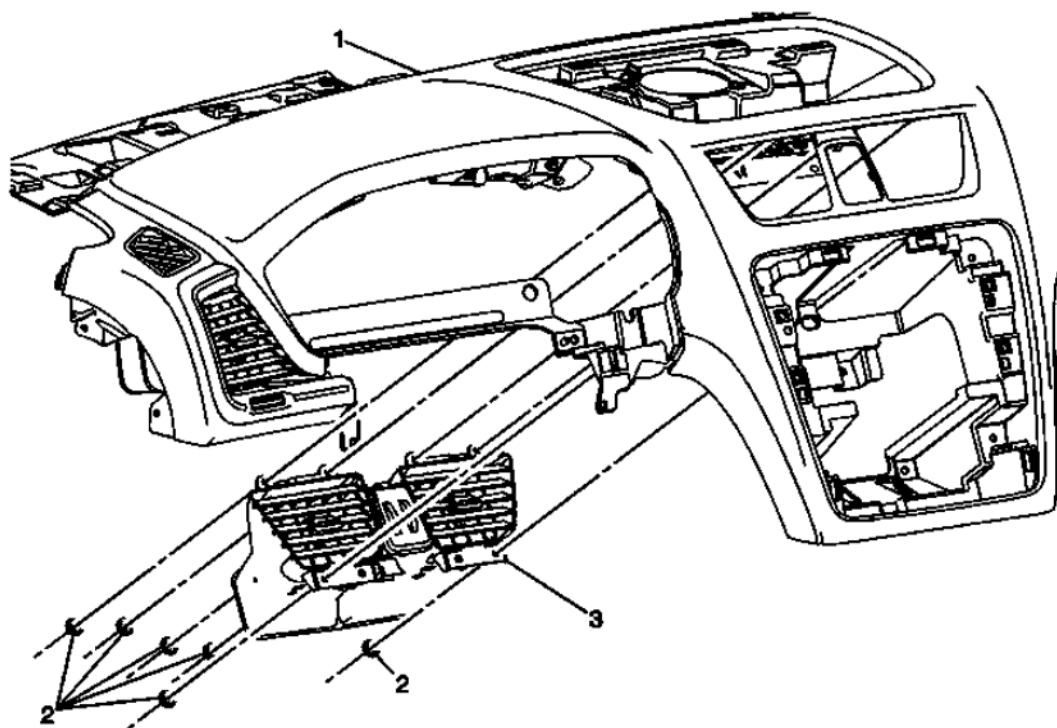


Fig. 83: Control Valve Body Bolts

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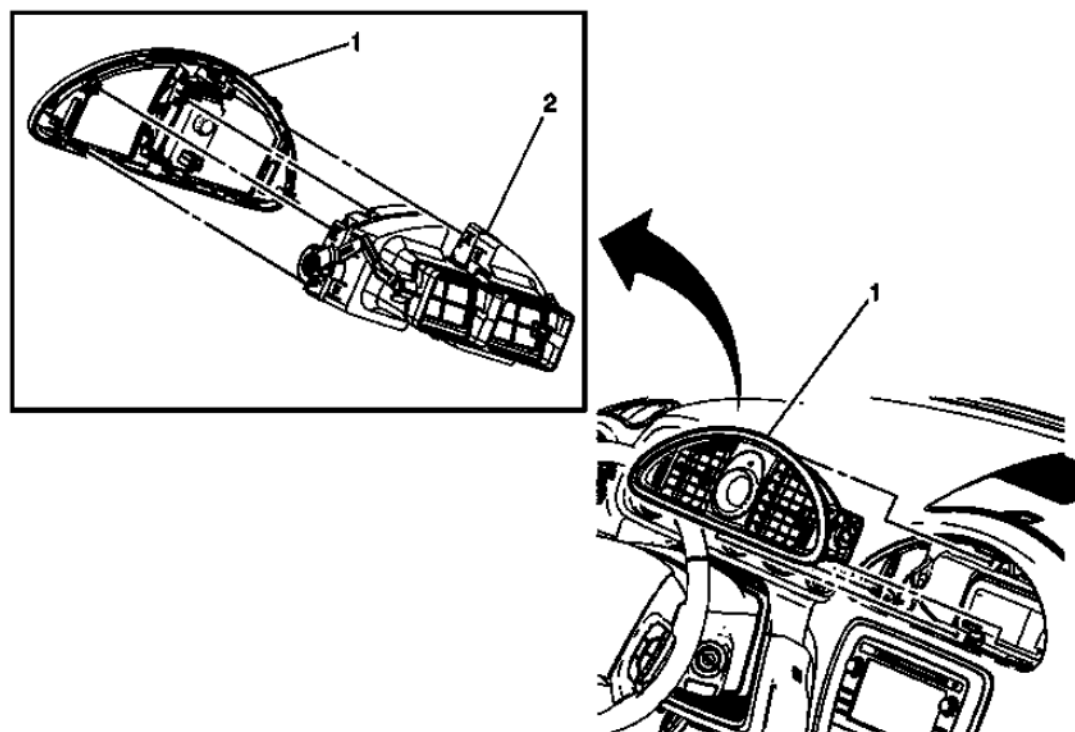
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Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Bolts Installation

Callout	Component Name
1	Manual Shaft Detent Assembly NOTE: Ensure proper alignment of the detent assembly to the detent lever assembly with position switch while tightening the bolt. The detent assembly can move and hit the valve body assembly that could cause improper engagement with the detent lever assembly.
2	Control Valve Body Bolt M6 x 65 (Qty: 8) CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tighten in sequence. Tighten 12 N.m (9 lb ft).
3	Control Valve Body Bolt M6 x 55 (Qty: 2) Procedure Tighten in sequence. Tighten 12 N.m (9 lb ft).

Filter Plate Installation

**Fig. 84: Filter Plate Installation**

Courtesy of GENERAL MOTORS COMPANY

Filter Plate Installation

Callout	Component Name
1	Control Solenoid Valve Assembly Filter Plate CAUTION: Use care when removing or installing the filter plate assembly. A broken or missing retaining tab may not adequately secure the filter plate to the control solenoid valve assembly, resulting in possible damage or contamination. NOTE: Install a NEW filter plate to prevent fluid leaks past the oil seals.

Control Solenoid (W/ Body and TCM) Valve Assembly Installation

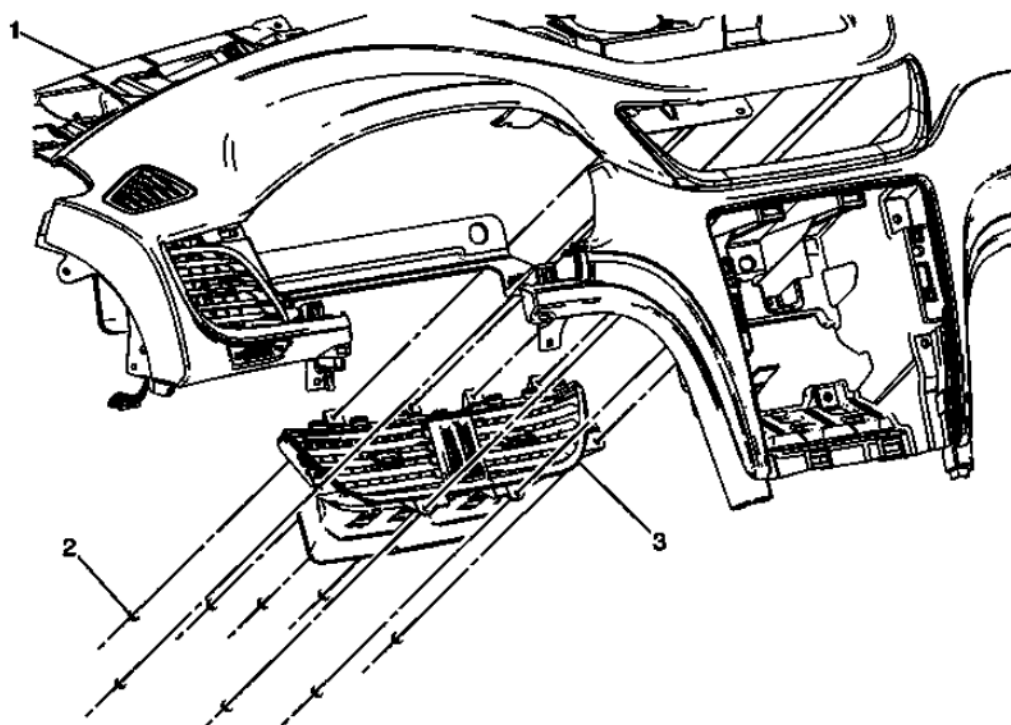


Fig. 85: Control Solenoid (W/ Body and TCM) Valve Assembly Components
 Courtesy of GENERAL MOTORS COMPANY

Control Solenoid (w/Body and TCM) Valve Assembly Installation

Callout	Component Name
CAUTION: Refer to <u>Fastener Caution</u> .	
Preliminary Procedure Install all bolts before tightening, then tighten in sequence to 12 N.m (9 lb ft).	
1	Control Solenoid (w/Body and TCM) Valve Assembly CAUTION: Do not drop the control solenoid with body and transmission control module (TCM) valve assembly. Internal damage can occur if the control solenoid with body and TCM valve assembly is dropped. DO NOT reuse the control solenoid with body and TCM valve assembly if it is dropped.
2	Control Solenoid Valve Spring NOTE: - If the control solenoid spring is missing or improperly installed, the TCM may overheat causing the TCM to shut down. The transmission will default to 3rd or 5th gear. - Insert tab of spring into slot on spacer plate, then rotate into position.
3	Control Valve Body Bolt M6 x 80 (Qty: 4)

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4	Control Valve Body Bolt M6 x 55 (Qty: 1)
5	Control Valve Body Bolt M6 x 95 (Qty: 3)
6	Control Valve Body Bolt M6 x 42 (Qty: 1)
7	Control Valve Body Bolt M6 x 65 (Qty: 2)

Wire Routing and Connector Locations

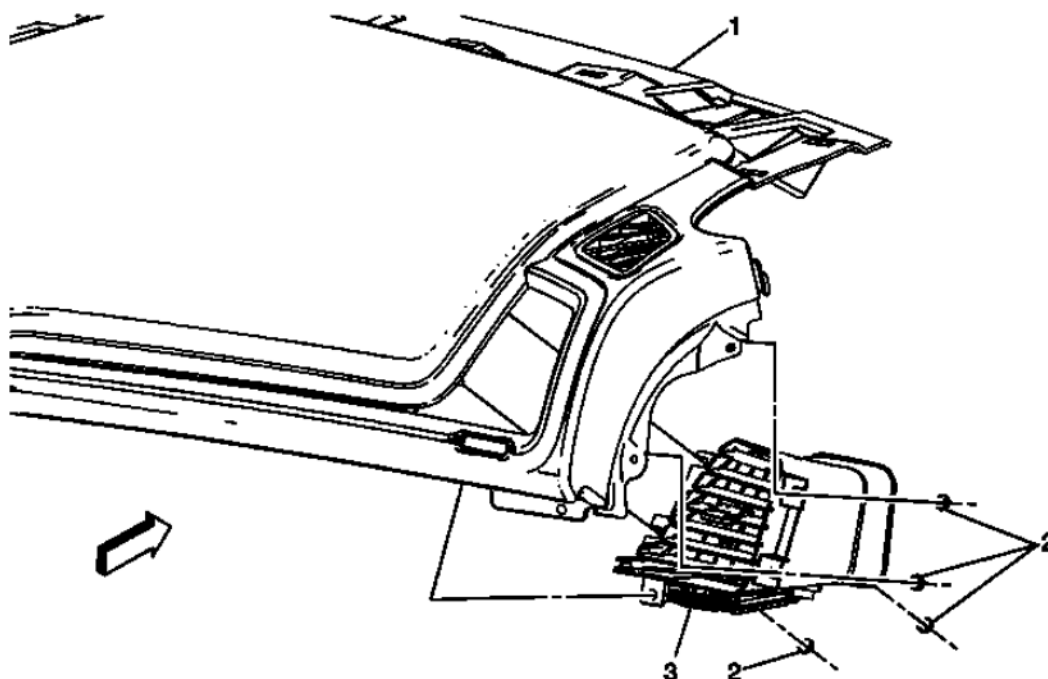


Fig. 86: Identifying Wire Routing & Connector Locations
Courtesy of GENERAL MOTORS COMPANY

Wire Routing and Connector Locations

Callout	Component Name
Preliminary Procedure Route all wires as shown.	
1	Shift Position Switch Connector
2	Output Speed Sensor Connector
3	Input Speed Sensor Connector

Control Valve Body Cover Installation

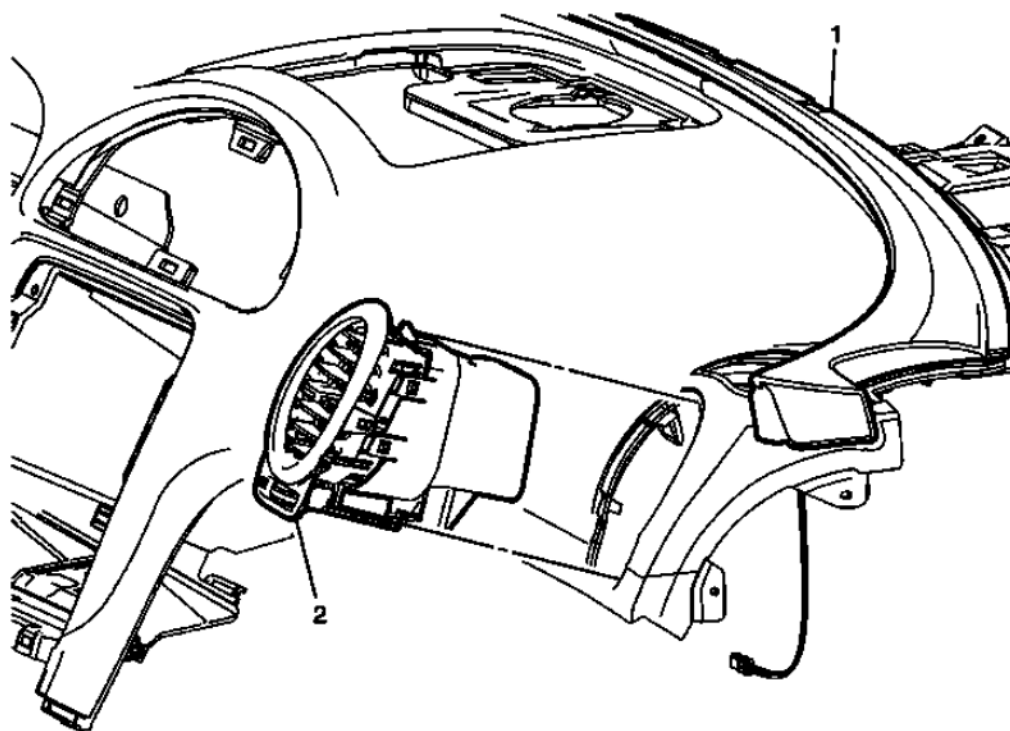


Fig. 87: Control Valve Body Cover Assembly Bolt Tightening Sequence
 Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Cover Installation

Callout	Component Name
1	Control Valve Body Cover Wiring Connector Hole Seal NOTE: Holes in the seal must face down.
2	Control Valve Body Cover Assembly Gasket
3	Control Valve Body Cover Assembly
4	Control Valve Body Cover Bolt M6 x 30 (Qty: 11) CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tighten in sequence. Tighten 12 N.m (9 lb ft).
5	Control Valve Body Cover Stud M6 x 30 (Qty: 3) Procedure Tighten in sequence.

Tighten
12 N.m (9 lb ft).

TORQUE CONVERTER INSTALLATION

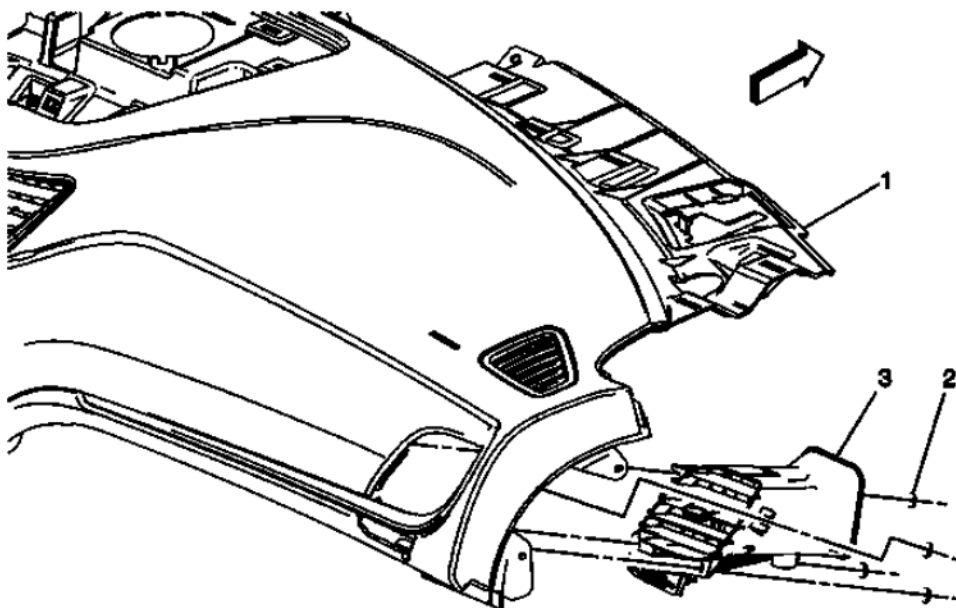


Fig. 88: View Of Torque Converter
Courtesy of GENERAL MOTORS COMPANY

Torque Converter Installation

Callout	Component Name
1	Torque Converter Assembly CAUTION: Lower the torque converter straight down. Failure to lower the torque converter straight down could damage the torque converter clutch lip seal inside the torque converter clutch assembly. Special Tools DT 46409 Torque Converter Lifting Handles For equivalent regional tools, refer to Special Tools.
	DT 21366 Converter Holding Strap WARNING:

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2	The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump or may fall completely out of the transmission causing personal injury and/or property damage.
3	Dust Cover - Model Dependant
4	Dust Cover Push Pin - Model Dependant (Qty: 2)
5	Dust Cover Bolt - Model Dependant CAUTION: Refer to <u>Fastener Caution</u> . Tighten 75 N.m (37 lb ft)

LIFT PLATE AND HOLDING FIXTURE REMOVAL

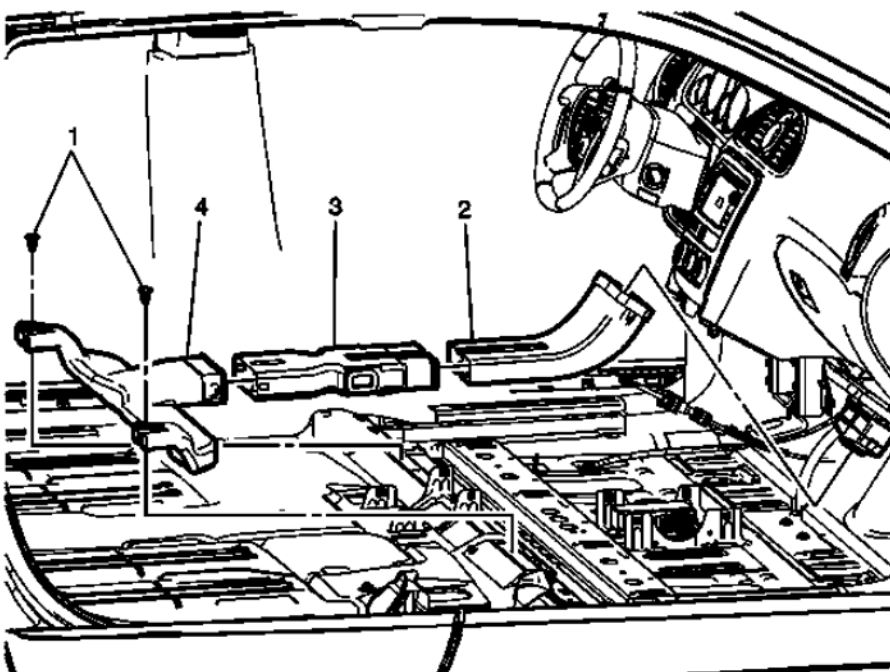


Fig. 89: Identifying Lift Plate & Holding Fixture
Courtesy of GENERAL MOTORS COMPANY

Lift Plate and Holding Fixture Removal

Callout	Component Name
	DT 46625 Transmission Holding Fixture

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1	NOTE: Raise the transmission in order to remove the holding fixture. For equivalent regional tools, refer to Special Tools .
2	DT-47811-A Lift Plate NOTE: Lower the transmission assembly onto the transmission jack in order to remove the lift plate. For equivalent regional tools, refer to Special Tools .