

Transmission

Automatic Transmission - 6L45 (MYA) or 6L90 (MYD) - Repair Instructions - Off Vehicle - CTS Coupe & Wagon

REPAIR INSTRUCTIONS - OFF VEHICLE

TORQUE CONVERTER REMOVAL AND HOLDING FIXTURE INSTALLATION (6L45)

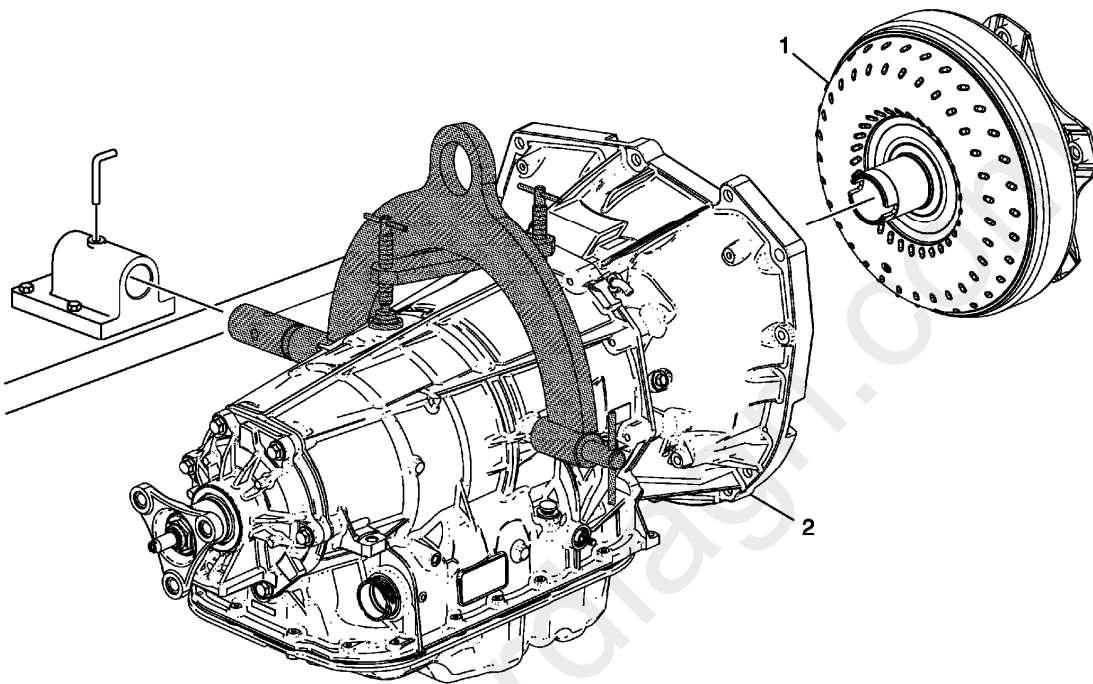


Fig. 1: Torque Converter & Transmission Case (6L45)
Courtesy of GENERAL MOTORS COMPANY

Torque Converter Removal and Holding Fixture Installation (6L45)

Callout	Component Name
1	Torque Converter Assembly
2	Transmission Case Assembly
	Procedure
	1. Rotate the transmission so that the converter housing is up and secure with locking pin. 2. Allow any remaining transmission fluid to drain from the case extension.
	Special Tools

- DT-48989 Holding Fixture
- J 3289-20 Holding Fixture Base Assembly

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

TORQUE CONVERTER REMOVAL AND HOLDING FIXTURE INSTALLATION (6L90)

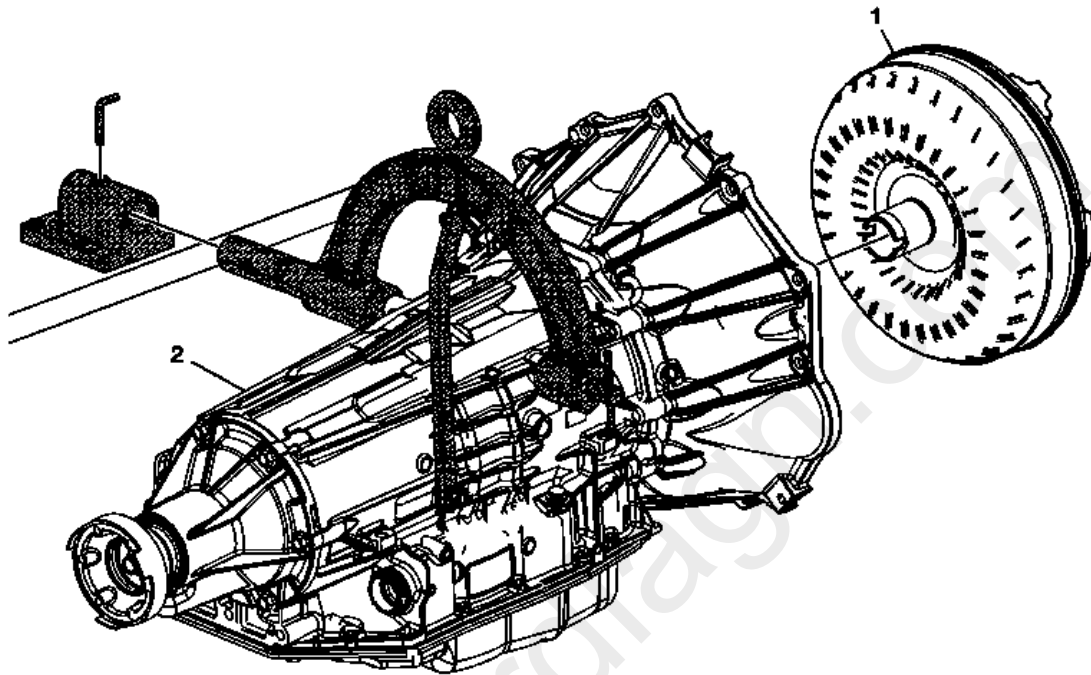


Fig. 2: Identifying Torque Converter & Holding Fixture (6L90)
Courtesy of GENERAL MOTORS COMPANY

Torque Converter Removal and Holding Fixture Installation (6L90)

Callout	Component Name
1	Torque Converter Assembly
2	Transmission Case Assembly
	Procedure 1. Rotate the transmission so that the converter housing is up and secure with locking pin. 2. Allow any remaining transmission fluid to drain from the case extension. Special Tools • DT 47605 Holding Fixture Adapter

- J 3289-20 Holding Fixture Base Assembly
- J 8763-B Holding Fixture

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

PROPELLER SHAFT TRANSMISSION FLANGE REMOVAL (6L45)

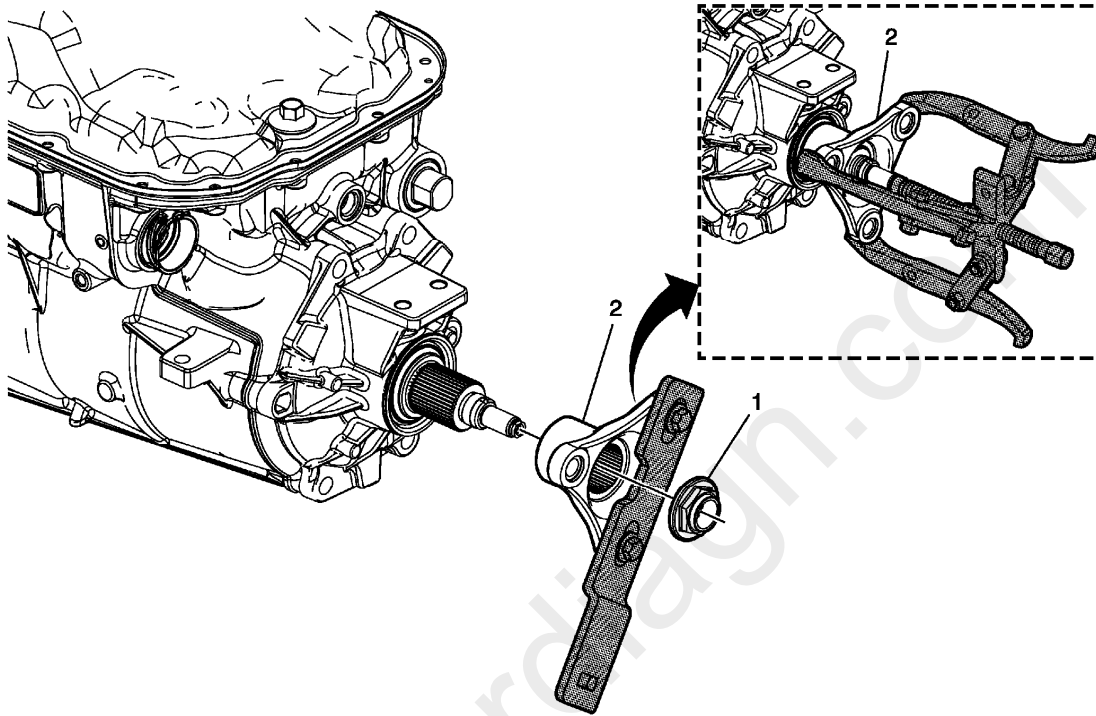


Fig. 3: Propeller Shaft Transmission Flange (6L45)
Courtesy of GENERAL MOTORS COMPANY

Propeller Shaft Transmission Flange Removal (6L45)

Callout	Component Name
1	Front Prop Shaft Flange Nut CAUTION: Do not reuse the flange nut. Reusing the flange nut may cause damage to the transmission. NOTE: If the prop shaft transmission flange is not easily removed with J 45012 holding fixture use DT 38416-B harmonic balancer remover to remove the flange. Special Tool

	• DT 38416-B Harmonic Balancer Remover • J 45012 Holding Fixture For equivalent regional tools, refer to Special Tools .
2	Prop Shaft Trans Flange

PROPELLER SHAFT TRANSMISSION FLANGE REMOVAL (6L90)

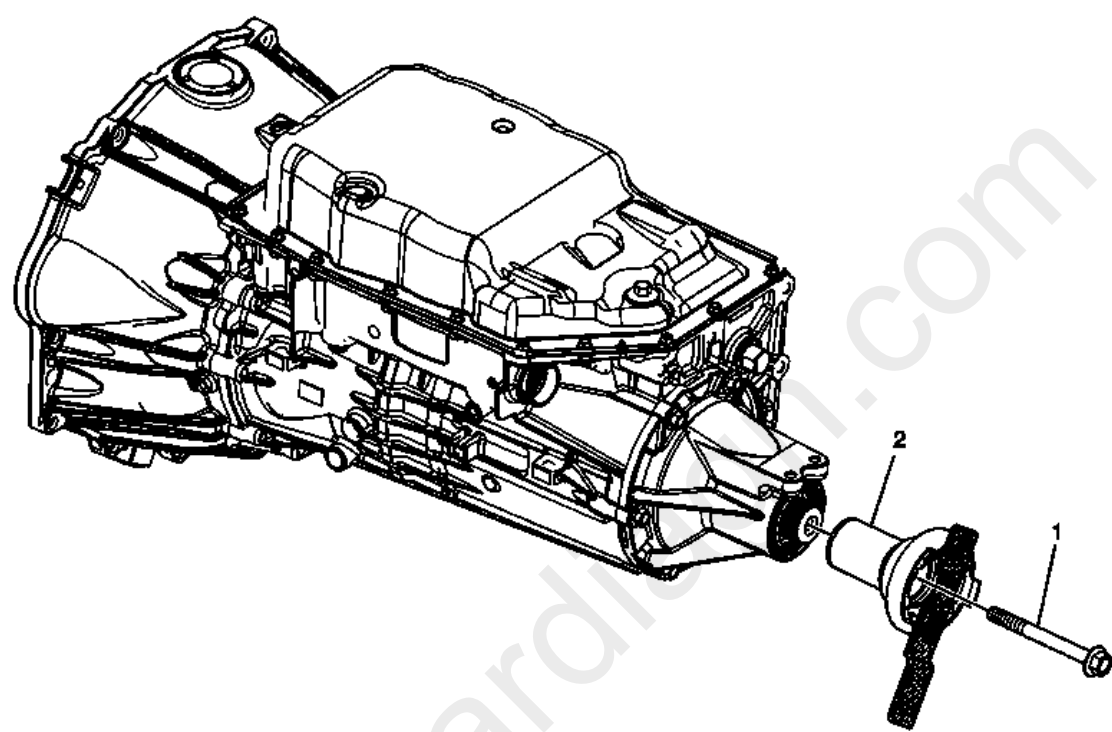


Fig. 4: Identifying Propeller Shaft Transmission Flange (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Propeller Shaft Transmission Flange Removal (6L90)

Callout	Component Name
1	Prop Shaft Bolt Special Tool J 45012 Holding Fixture For equivalent regional tools, refer to Special Tools .
2	Front Prop Shaft Flange

CASE EXTENSION ASSEMBLY REMOVAL (6L45)

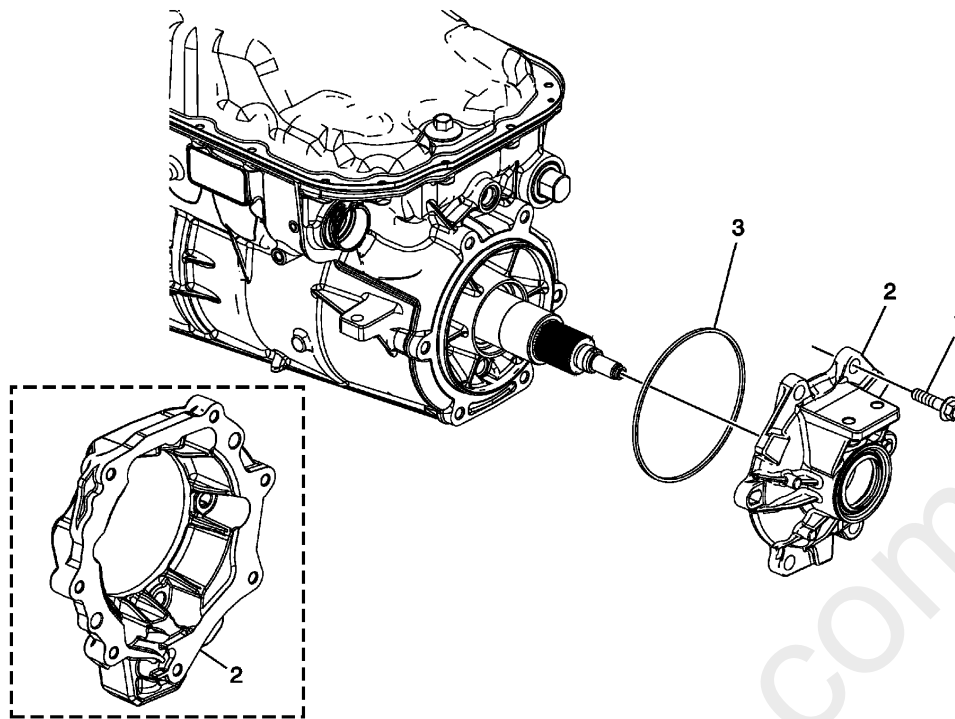


Fig. 5: Case Extension Assembly (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Case Extension Assembly Removal (6L45)

Callout	Component Name
1	Bolt M10 x 40 (Qty: 6)
2	Case Extension NOTE: Also available as AWD option.
3	Case Extension Seal

TRANSMISSION FLUID PAN, FILTER AND ELECTRICAL CONNECTOR PASSAGE SLEEVE REMOVAL (6L45)

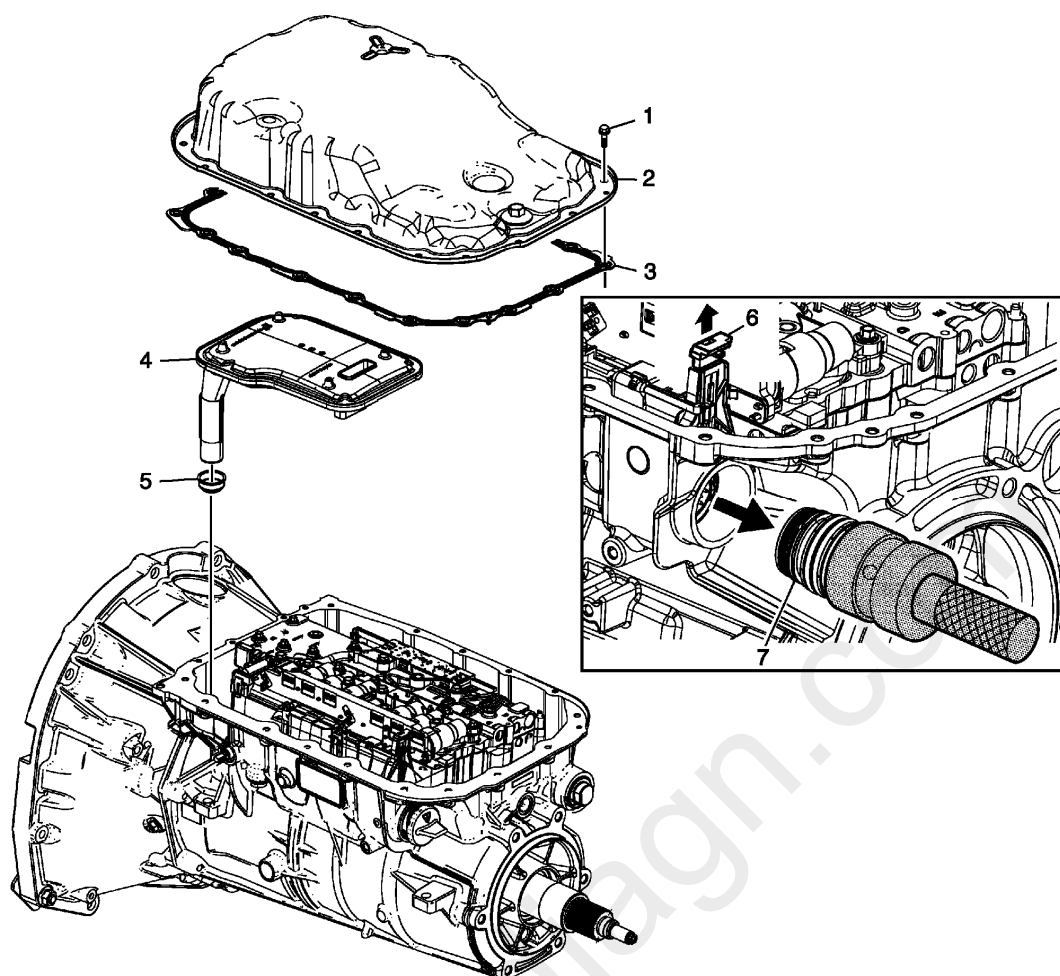


Fig. 6: Transmission Fluid Pan, Filter And Electrical Connector Passage Sleeve (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Pan, Filter and Electrical Connector Passage Sleeve Removal (6L45)

Callout	Component Name
1	Bolt M6 x 20 (Qty: 17)
2	Fluid Pan Assembly
3	Fluid Pan Gasket NOTE: The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.
4	Fluid Filter Assembly CAUTION: Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.
	Fluid Filter Seal Assembly

5	CAUTION: Do not damage the case sealing surface when removing the filter seal assembly. NOTE: Use a screwdriver or snap ring pliers.
6	Electrical Connector Slide Lock CAUTION: Pull up on the electrical connector slide lock to avoid damage to the connector.
7	Electrical Connector Passage Sleeve NOTE: Engage DT 47715 connector passage sleeve remover/installer on sleeve and pull straight out. Special Tools • DT 47715 Electrical Connector Passage Sleeve Remover/Installer • J 42183 Driver Handle For equivalent regional tools, refer to Special Tools .

TRANSMISSION FLUID PAN, FILTER AND ELECTRICAL CONNECTOR PASSAGE SLEEVE REMOVAL (6L90)

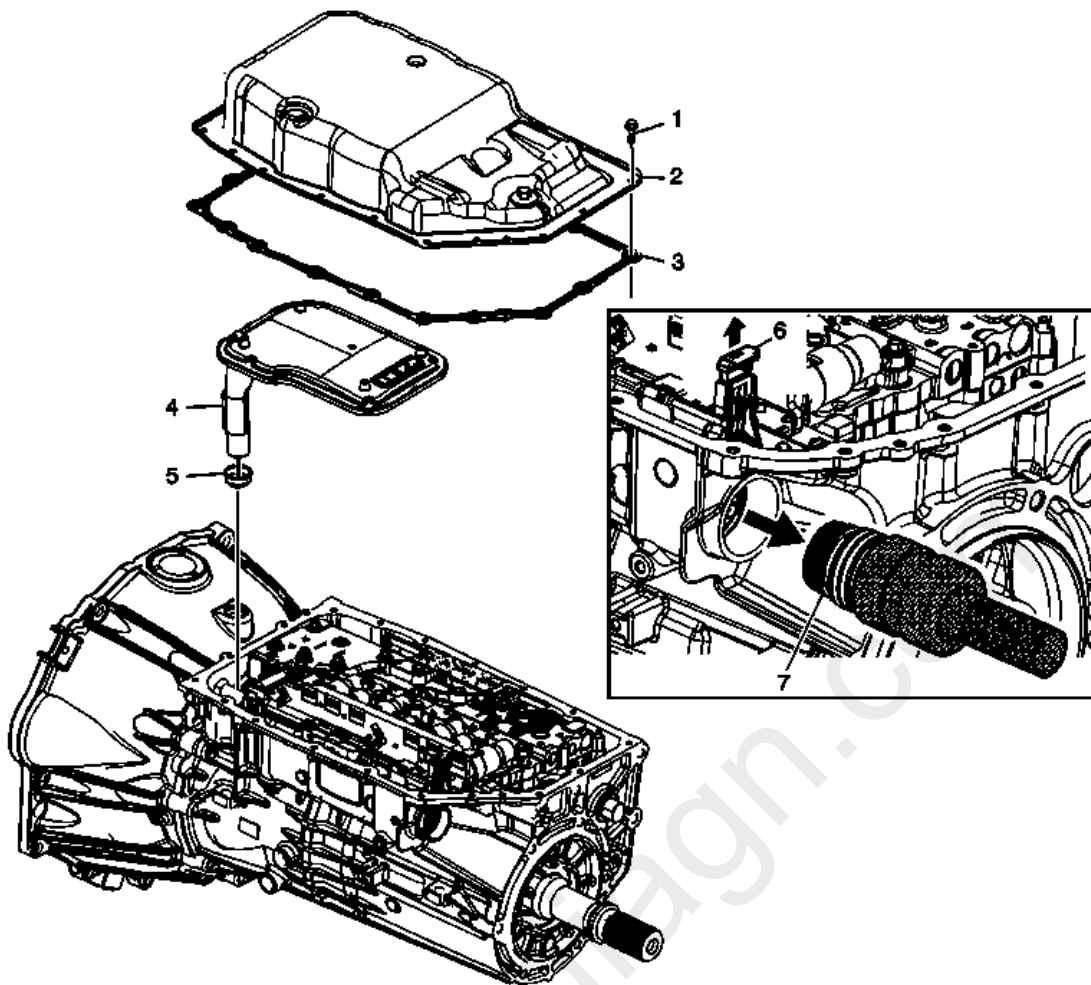


Fig. 7: Identifying Transmission Fluid Pan, Filter & Electrical Connector Passage Sleeve (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Pan, Filter and Electrical Connector Passage Sleeve Removal (6L90)

Callout	Component Name
1	Bolt M6 x 20 (Qty: 18)
2	Fluid Pan Assembly
3	Fluid Pan Gasket NOTE: The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.
4	Fluid Filter Assembly CAUTION: Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.
	Fluid Filter Seal Assembly

5	CAUTION: Do not damage the case sealing surface when removing the filter seal assembly. NOTE: Use a screwdriver or snap ring pliers.
6	Electrical Connector Slide Lock CAUTION: Pull up on the electrical connector slide lock to avoid damage to the connector.
7	Electrical Connector Passage Sleeve NOTE: Engage DT 47715 connector passage sleeve remover/installer on sleeve and pull straight out. Special Tools • DT 47715 Electrical Connector Passage Sleeve Remover/Installer • J 42183 Driver Handle For equivalent regional tools, refer to <u>Special Tools</u> .

CONTROL VALVE BODY ASSEMBLY REMOVAL

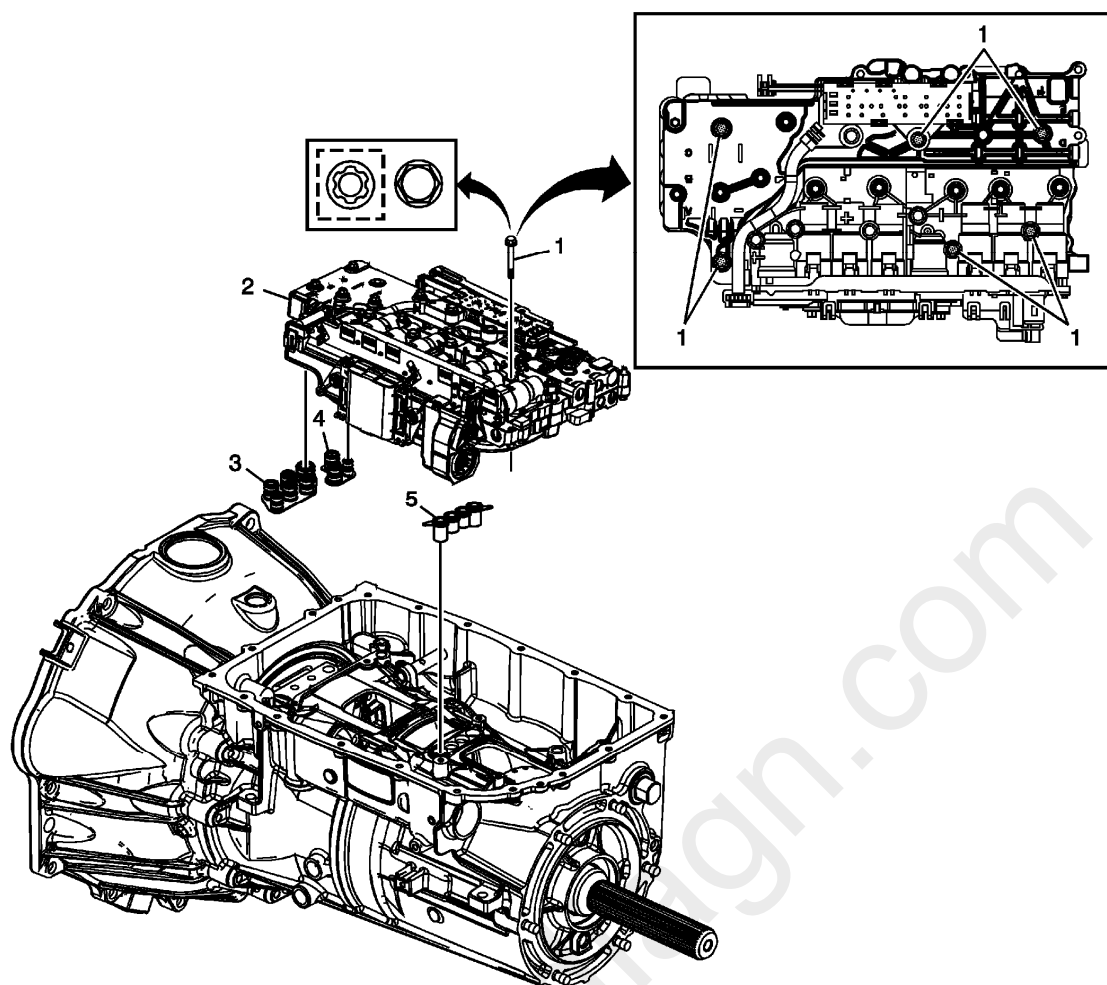


Fig. 8: Control Valve Body Assembly Component View
Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Assembly Removal

Callout	Component Name
1	Bolt M5 x 73 (Qty: 6) NOTE: Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated. Special Tool DT-48285 Valve Body Torx Plus Socket (if applicable) For equivalent regional tools, refer to Special Tools .
2	Control Valve Body Assembly CAUTION:

	Use care when handling the control valve body assembly. If dropped, damage to the internal components of the control solenoid valve assembly, including the transmission control module (TCM), may result.
3	Fluid Pump Seal Assembly CAUTION: Use care when removing the seal assemblies to avoid damaging the valve body seal bores. CAUTION: Refer to <u>Seal Reuse Caution</u> .
4	Fluid Pump Seal Assembly CAUTION: Use care when removing the seal assemblies to avoid damaging the valve body seal bores. CAUTION: Refer to <u>Seal Reuse Caution</u> .
5	Center Support Fluid Passage Seal Assembly CAUTION: Use care when removing the seal assemblies to avoid damaging the case seal bores. CAUTION: Refer to <u>Seal Reuse Caution</u> .

TORQUE CONVERTER HOUSING WITH FLUID PUMP REMOVAL (6L45)

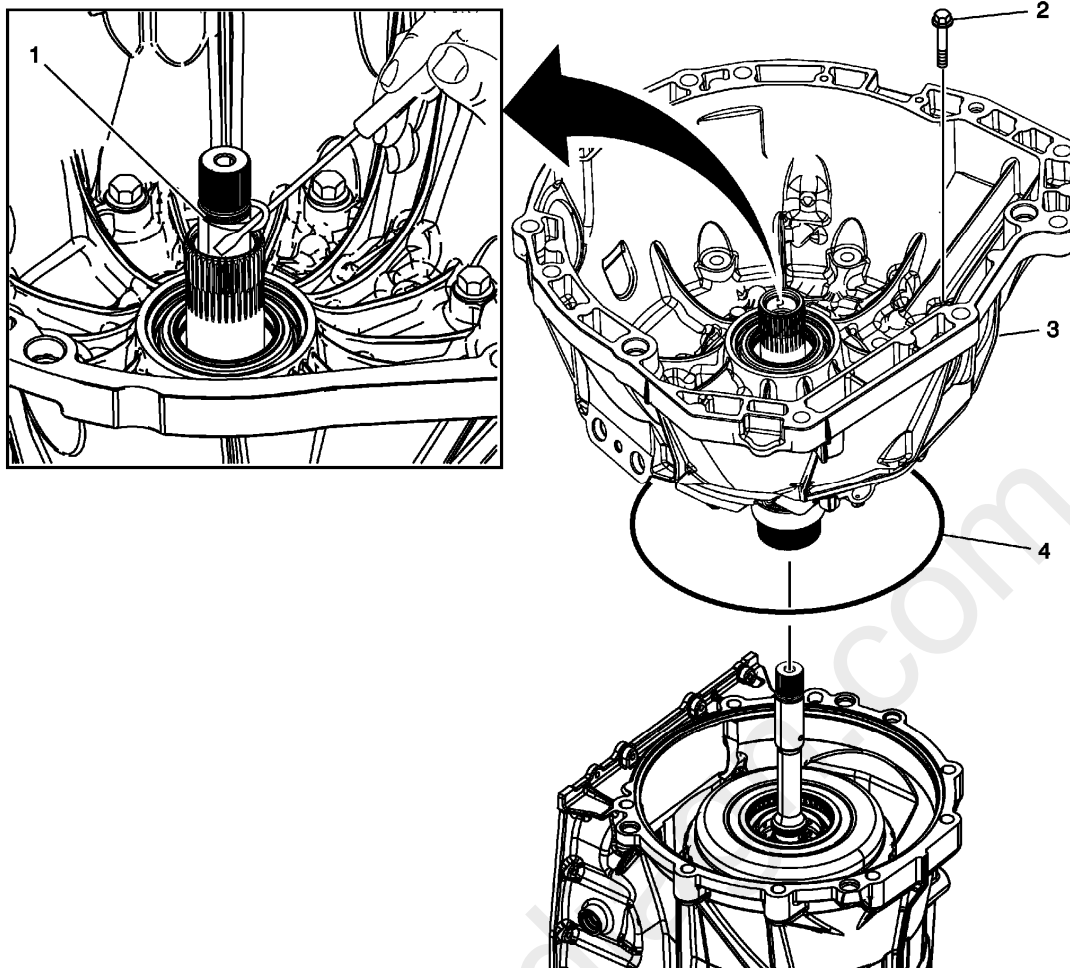


Fig. 9: Torque Converter Housing With Fluid Pump (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Removal (6L45)

Callout	Component Name
CAUTION: The valve body assembly must be removed prior to removing the torque converter (with fluid pump) housing assembly. Failure to ensure this will cause severe damage to both fluid pump seal assemblies. Also, the load of the valve body pushing on the seals, which in turn push on the pump, may prevent proper pump installation into the case. Refer to control valve body assembly removal.	
1	Turbine Shaft (O-ring) Seal
2	Bolt M8 x 1.25 x 50 (Qty: 8)
3	Torque Converter (With Fluid Pump) Housing Assembly
4	Fluid Pump Seal

TORQUE CONVERTER HOUSING WITH FLUID PUMP REMOVAL (6L90)

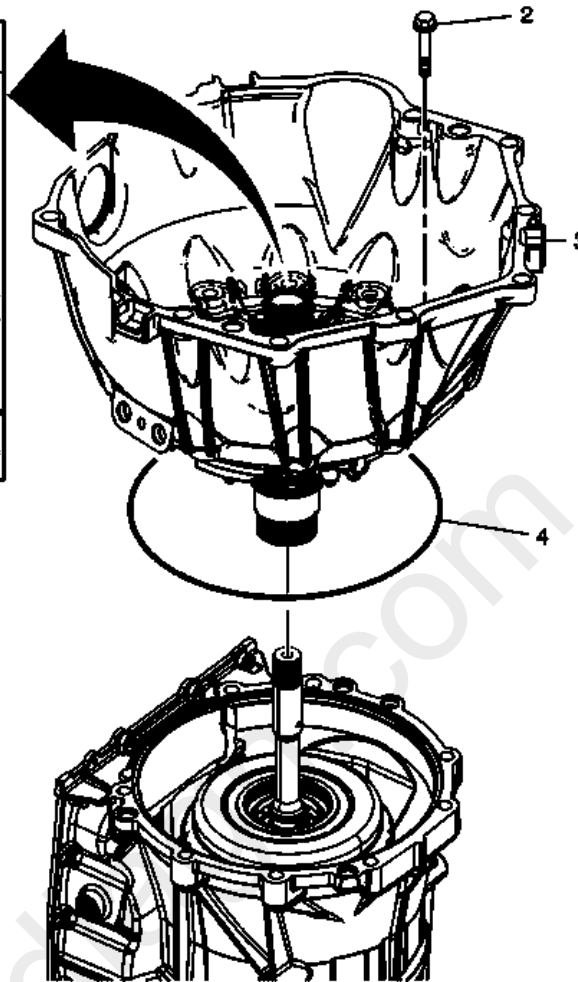
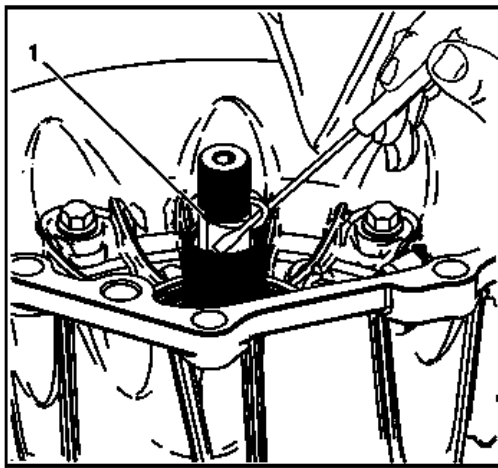


Fig. 10: Torque Converter Housing with Fluid Pump Component View
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Removal (6L90)

Callout	Component Name
CAUTION: The valve body assembly must be removed prior to removing the torque converter (with fluid pump) housing assembly. Failure to ensure this will cause severe damage to both fluid pump seal assemblies. Also, the load of the valve body pushing on the seals, which in turn push on the pump, may prevent proper pump installation into the case. Refer to control valve body assembly removal.	
1	Turbine Shaft (O-ring) Seal
2	Bolt M10 x 50 (Qty: 9)
3	Torque Converter (With Fluid Pump) Housing Assembly
4	Fluid Pump Seal

1-2-3-4 AND 3-5 REVERSE CLUTCH ASSEMBLY AND 4-5-6 CLUTCH ASSEMBLY REMOVAL (6L45)

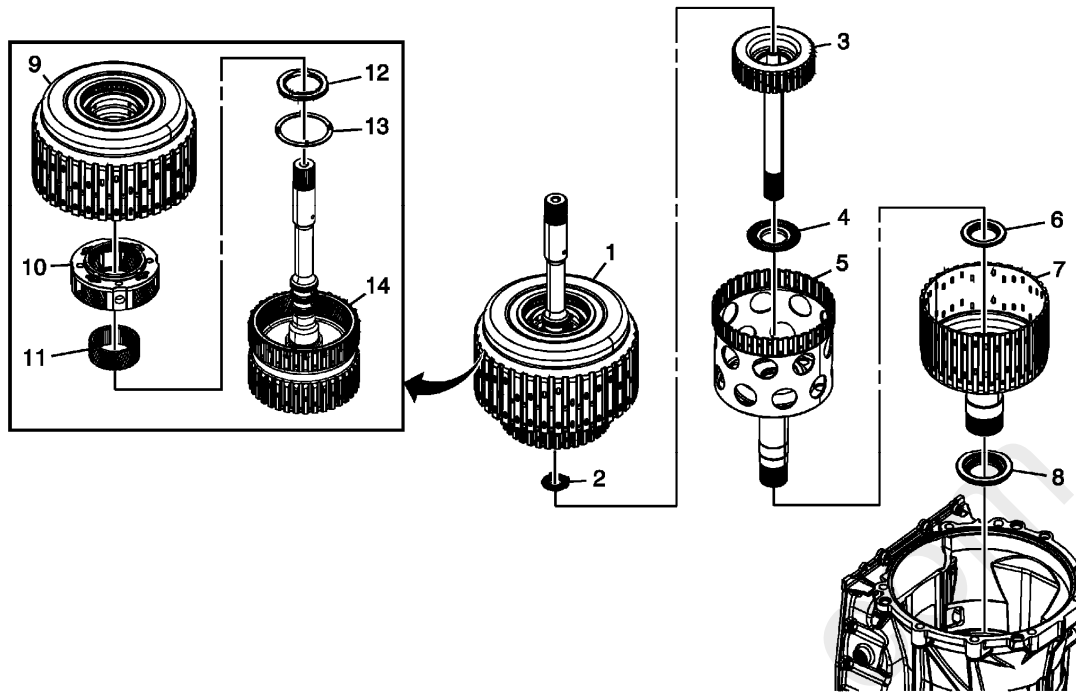


Fig. 11: 1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly
Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Removal (6L45)

Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 (With Turbine Shaft) Clutch Assembly
2	Turbine Shaft Thrust Bearing Assembly
3	4-5-6 Clutch (With Output Carrier Shaft) Hub Assembly
4	4-5-6 Clutch Hub Thrust Bearing Assembly
5	1-2-3-4 Clutch (With Output Carrier Inner Sun Gear Shaft) Hub Assembly
6	1-2-3-4 Clutch Hub Thrust Bearing Assembly
7	2-6 and 3-5 Reverse Clutch (With Output Carrier Outer Sun Gear Shaft) Hub Assembly
8	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
9	1-2-3-4 and 3-5 Reverse Clutch Assembly
10	Input Carrier Assembly
11	Input Sun Gear
12	Input Sun Gear Thrust Bearing
13	Input Sun Gear Thrust Washer
14	4-5-6 (With Turbine Shaft) Clutch Assembly

1-2-3-4 AND 3-5 REVERSE CLUTCH ASSEMBLY AND 4-5-6 CLUTCH ASSEMBLY REMOVAL (6L90)

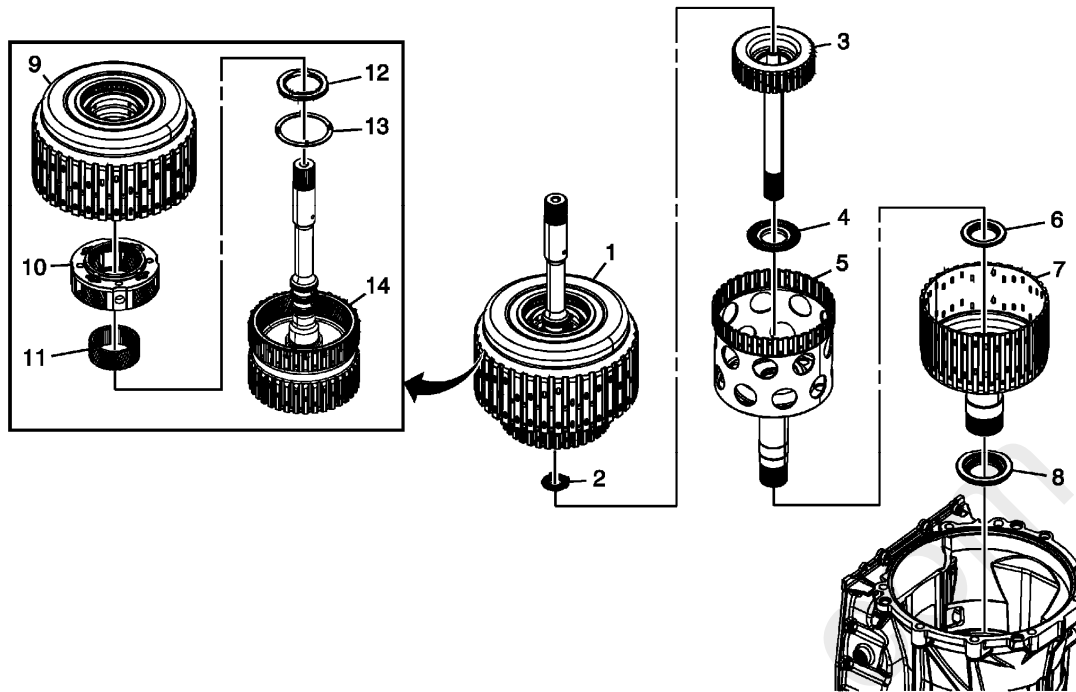


Fig. 12: 1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Removal (6L90)

Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 (With Turbine Shaft) Clutch Assembly
2	Turbine Shaft Thrust Bearing Assembly
3	4-5-6 Clutch (With Output Carrier Shaft and Dampener) Hub Assembly
4	4-5-6 Clutch Hub Thrust Bearing Assembly
5	1-2-3-4 Clutch (With Output Carrier Inner Sun Gear Shaft) Hub Assembly
6	1-2-3-4 Clutch Hub Thrust Bearing Assembly
7	2-6 and 3-5 Reverse Clutch (With Output Carrier Outer Sun Gear Shaft) Hub Assembly
8	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
9	1-2-3-4 and 3-5 Reverse Clutch Assembly
10	Input Carrier Assembly
11	Input Sun Gear
12	Input Sun Gear Thrust Bearing
13	Input Sun Gear Thrust Washer
14	4-5-6 (With Turbine Shaft) Clutch Assembly

CENTER SUPPORT, OUTPUT CARRIER AND OUTPUT SHAFT REMOVAL (6L45)

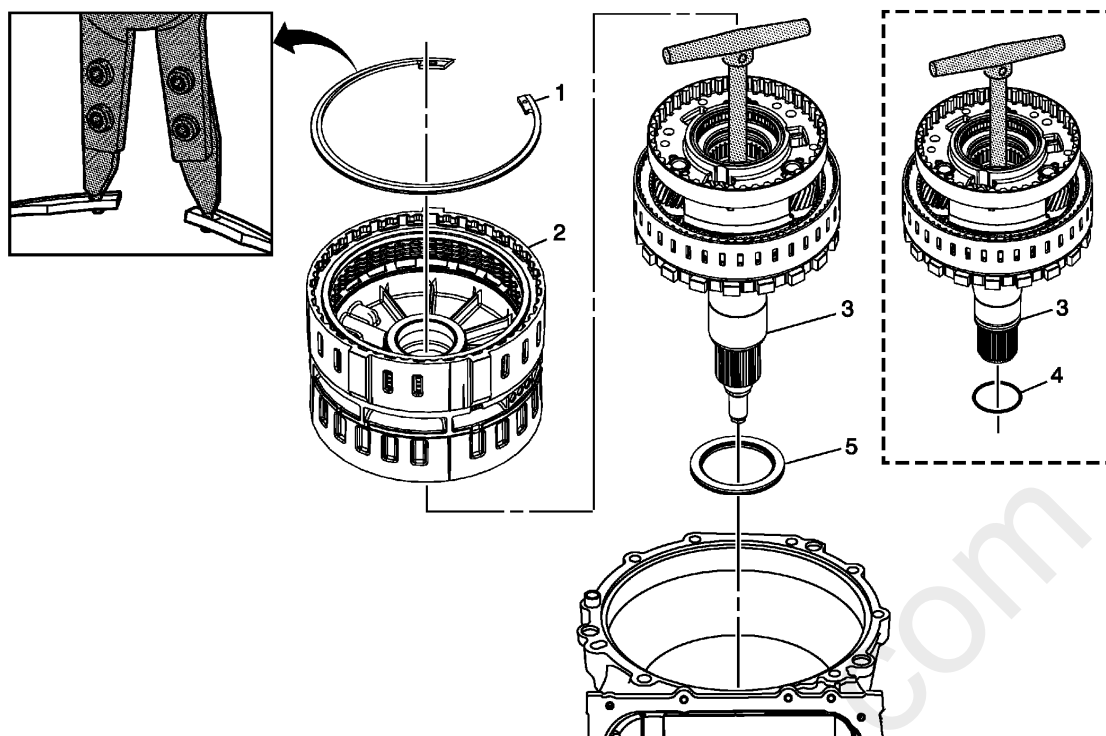


Fig. 13: Center Support, Output Carrier And Output Shaft (6L45)

Courtesy of GENERAL MOTORS COMPANY

Center Support, Output Carrier and Output Shaft Removal (6L45)

Callout	Component Name
1	Center Support Retaining Ring WARNING: Use care when removing or installing the retaining ring. Ensure the J 45126 is installed properly onto the retaining ring or bodily injury may occur. NOTE: After removing the retaining ring from the transmission, release the tension on it by placing it flat on the floor and stepping on it, then remove the tool. Special Tool J 45126 Snap Ring Pliers For equivalent regional tools, refer to Special Tools .
2	Center (with 2-6 Low and Reverse Clutch) Support Assembly
3	Output Carrier Assembly and Output Shaft Assembly CAUTION: Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage.

	Special Tool DT 47786 Output Carrier/Shaft Lifting Tool For equivalent regional tools, refer to Special Tools .
4	A/Trans Case O-Ring Seal - AWD Models if equipped
5	Output Shaft Thrust Bearing Assembly

CENTER SUPPORT, OUTPUT CARRIER AND OUTPUT SHAFT REMOVAL (6L90)

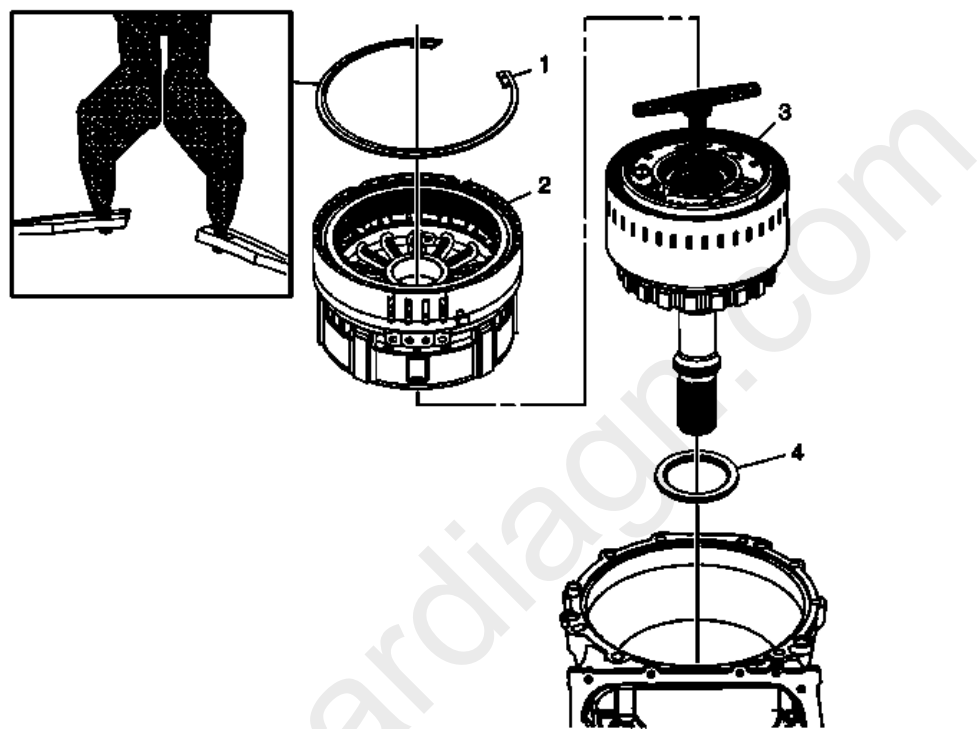


Fig. 14: Identifying Center Support, Output Carrier & Output Shaft (6L90)
Courtesy of GENERAL MOTORS COMPANY

Center Support, Output Carrier and Output Shaft Removal (6L90)

Callout	Component Name
1	Center Support Retaining Ring WARNING: Use care when removing or installing the retaining ring. Ensure the J 45126 and DT 47773 are installed properly onto the retaining ring or bodily injury may occur. NOTE: To release tension on the retaining ring, place the retaining ring flat on the floor and step on it, then remove the tool.

	Special Tools • DT 47773 Snap Ring Pliers Adapter Set • J 45126 Snap Ring Pliers For equivalent regional tools, refer to <u>Special Tools</u> .
2	Center (with 2-6 Low and Reverse Clutch) Support Assembly
3	Output Carrier Assembly and Output Shaft Assembly CAUTION: Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage. Special Tool DT 47786 Output Carrier/Shaft Lifting Tool For equivalent regional tools, refer to <u>Special Tools</u> .
4	Output Shaft Thrust Bearing Assembly

MANUAL SHIFT SHAFT AND PARKING SYSTEM COMPONENTS OVERHAUL (6L45)

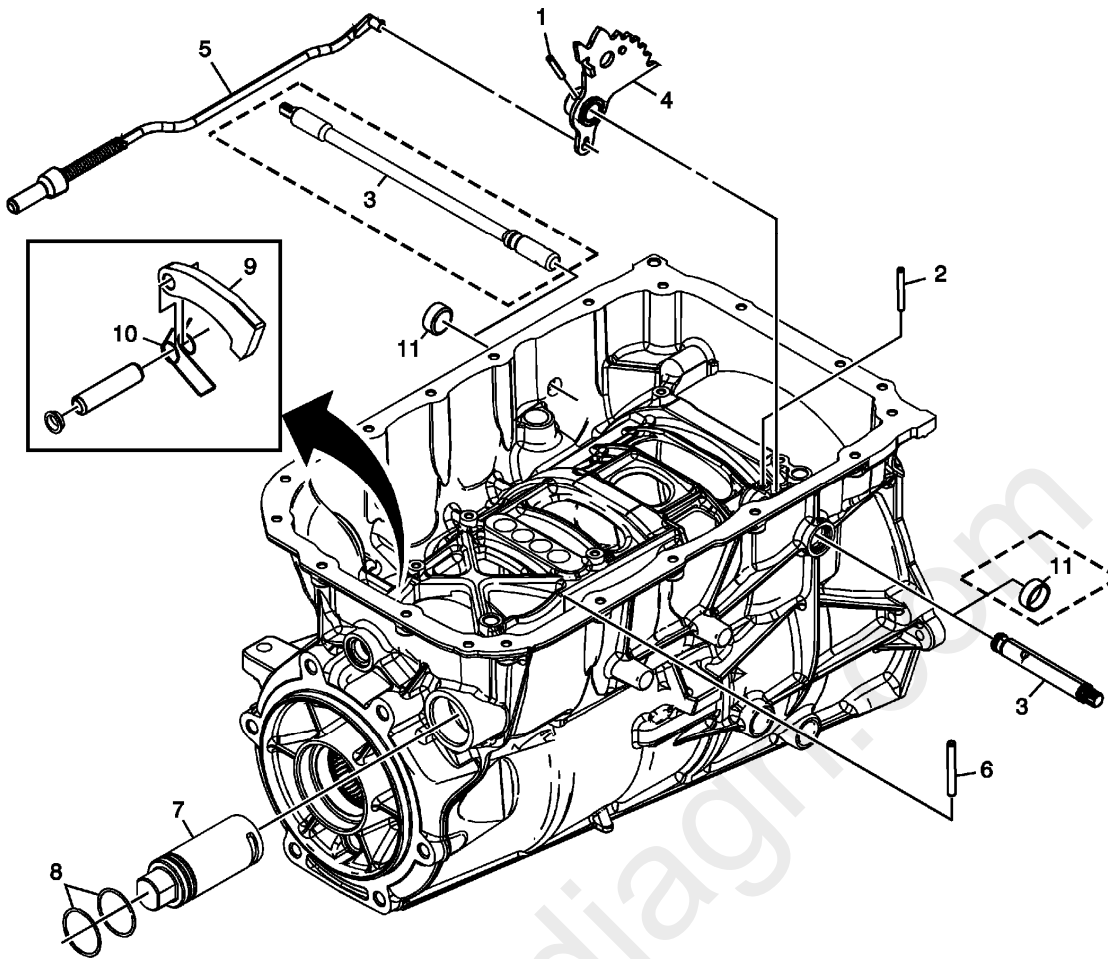


Fig. 15: Manual Shift Shaft and Parking System Component View
 Courtesy of GENERAL MOTORS COMPANY

Manual Shift Shaft and Parking System Components Overhaul (6L45)

Callout	Component Name
1	Manual Shaft Detent Lever Hub Pin CAUTION: Refer to <u>Pin Reuse Caution</u> .
2	Manual Shift Shaft Pin CAUTION: Refer to <u>Pin Reuse Caution</u> .
3	Manual Shift Shaft CAUTION: Ensure the manual shift shaft seal is replaced before installing the shaft. Installing the seal after the shaft may cause damage to the seal, resulting in fluid leaks and

	transmission damage. NOTE: Refer to <u>Manual Shift Shaft Seal Replacement</u>.
4	Manual Shaft Detent Lever Assembly
5	Park Pawl Actuator Assembly
6	Park Pawl Actuator Guide Pin CAUTION: Refer to <u>Pin Reuse Caution</u> . NOTE: Use a large pair of side cutters to "walk" the pin out.
7	Park Pawl Actuator Guide
8	Park Pawl Actuator Guide (O-ring) Seals CAUTION: Refer to <u>Seal Reuse Caution</u> .
9	Park Pawl NOTE: Inspect for damage only. Do not remove. The park pawl is not a serviceable component.
10	Park Pawl Spring NOTE: Inspect for damage only. Do not remove. The park pawl spring is not a serviceable component.
11	Manual Shift Shaft Hole Plug NOTE: Press plug to seat. Ensure plug is installed evenly.

MANUAL SHIFT SHAFT AND PARKING SYSTEM COMPONENTS OVERHAUL (6L90)

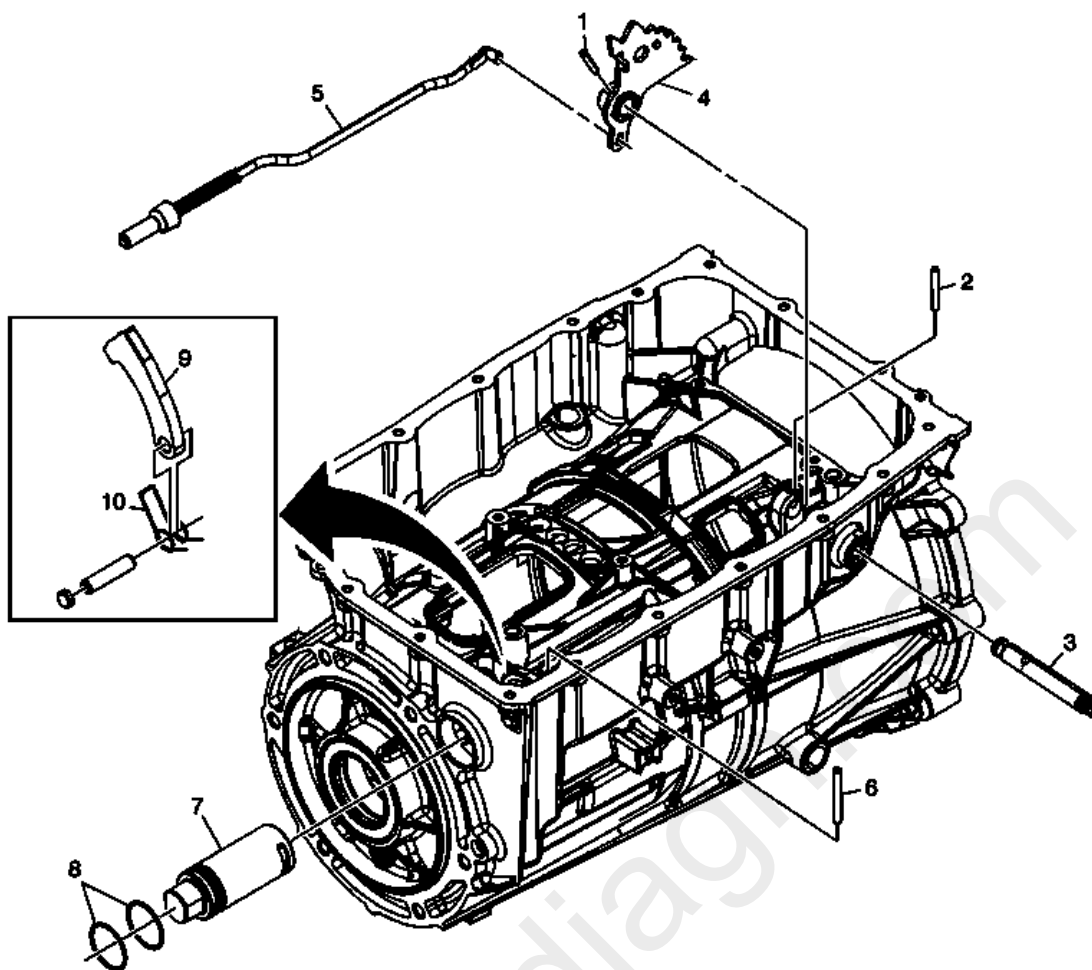


Fig. 16: Overhauling Manual Shift Shaft and Parking System Components
 Courtesy of GENERAL MOTORS COMPANY

Manual Shift Shaft and Parking System Components Overhaul (6L90)

Callout	Component Name
1	Manual Shaft Detent Lever Hub Pin CAUTION: Refer to <u>Pin Reuse Caution</u> .
2	Manual Shift Shaft Pin CAUTION: Refer to <u>Pin Reuse Caution</u> .
3	Manual Shift Shaft CAUTION: Ensure the manual shift shaft seal is replaced before installing the shaft. Installing the seal after the shaft may cause damage to the seal, resulting in fluid leaks and

	transmission damage. NOTE: Refer to <u>Manual Shift Shaft Seal Replacement</u>.
4	Manual Shaft Detent Lever Assembly
5	Park Pawl Actuator Assembly
6	Park Pawl Actuator Guide Pin CAUTION: Refer to <u>Pin Reuse Caution</u> . NOTE: Use a large pair of side cutters to "walk" the pin out.
7	Park Pawl Actuator Guide
8	Park Pawl Actuator Guide (O-ring) Seals CAUTION: Refer to <u>Seal Reuse Caution</u> .
9	Park Pawl NOTE: Inspect for damage only. Do not remove. The park pawl is not a serviceable component.
10	Park Pawl Spring NOTE: Inspect for damage only. Do not remove. The park pawl spring is not a serviceable component.

MANUAL SHIFT SHAFT SEAL REPLACEMENT

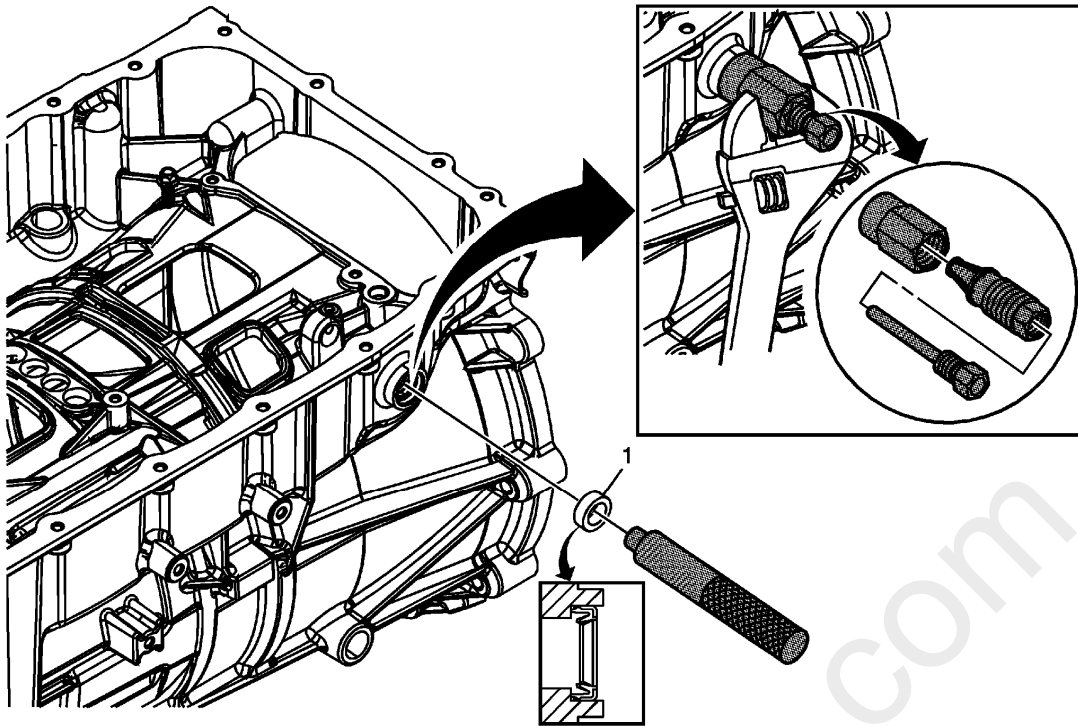


Fig. 17: Manual Shift Shaft Seal
 Courtesy of GENERAL MOTORS COMPANY

Manual Shift Shaft Seal Replacement

Callout	Component Procedure
1	Manual Shift Shaft Seal CAUTION: Do not damage the case bore during removal of the manual shift shaft seal. CAUTION: When installing the seal, ensure the seal lip is firmly seated against the case bore surface. Do not allow the seal lip to be crushed, or a leak may result. CAUTION: Refer to <u>Seal Reuse Caution</u> . Special Tools • DT 47770 Seal Installer • DT 45201 Cooler Line Seal Remover For equivalent regional tools, refer to <u>Special Tools</u> .

OUTPUT SHAFT SEAL REPLACEMENT (AWD MODELS ONLY)

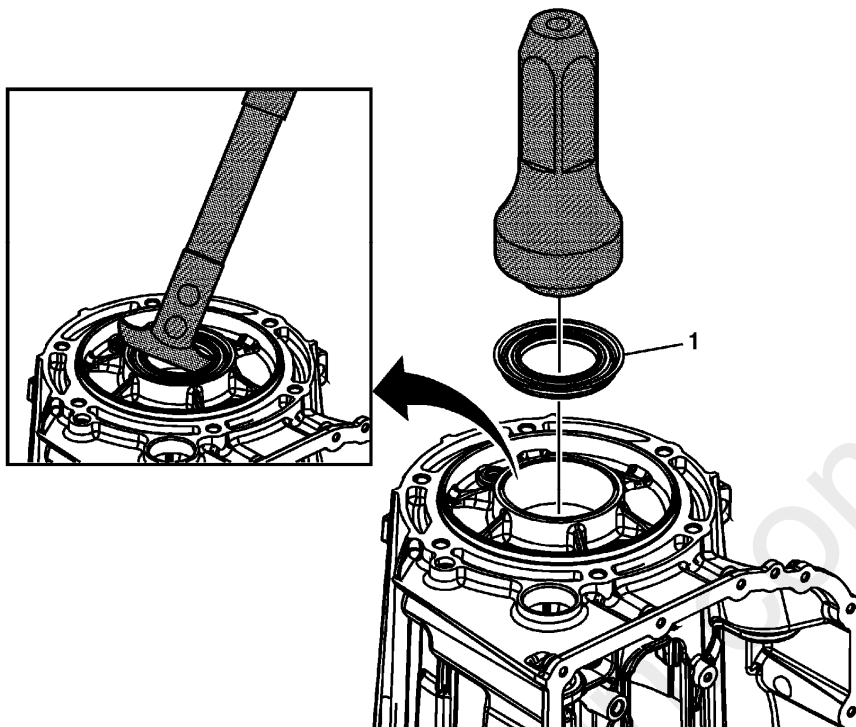


Fig. 18: Output Shaft Seal

Courtesy of GENERAL MOTORS COMPANY

Output Shaft Seal Replacement (AWD Models Only)

Callout	Component Name
1	Output Shaft Seal Assembly CAUTION: Refer to <u>Seal Reuse Caution</u> . Special Tool • EN 37212 Front Output Shaft Seal Installer (6L45) • DT 38693 Seal Installer (6L80) • EN 45000 Seal Remover For equivalent regional tools, refer to <u>Special Tools</u> .

OUTPUT SHAFT BEARING REPLACEMENT - CASE (6L45)

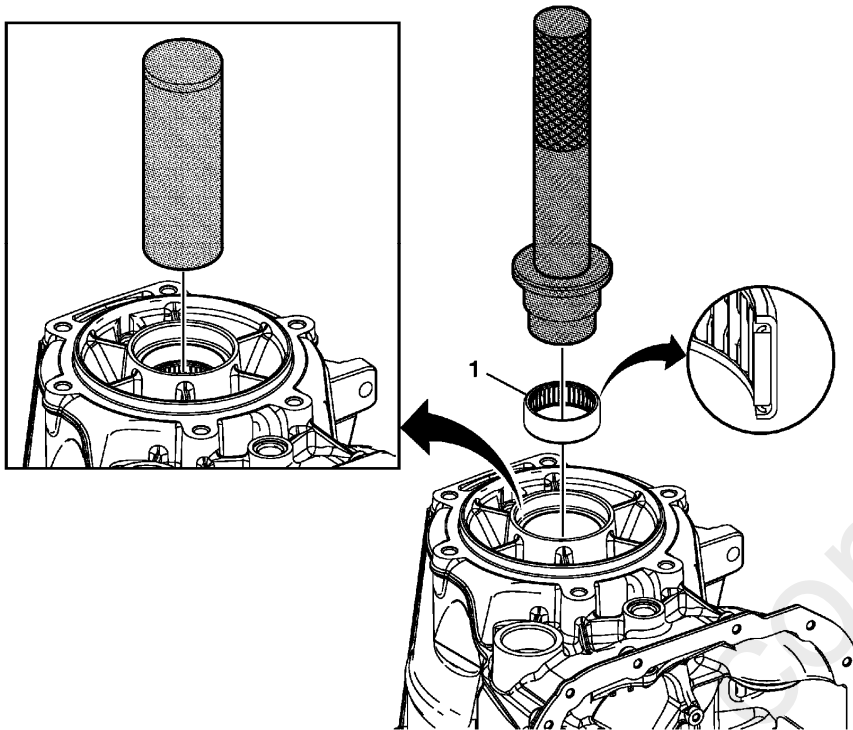


Fig. 19: Output Shaft Bearing - Case (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Output Shaft Bearing Replacement - Case (6L45)

Callout	Component Name
1	Output Shaft Bearing Assembly NOTE: Use J 35512 bearing installer to remove the bearing and DT 49784 bearing installer and J 8092 driver handle to install the bearing. Special Tools • DT 49784 Bearing Installer • J 8092 Driver Handle • J 35512 Inner Pinion Bearing Installer For equivalent regional tools, refer to Special Tools .

CASE INSPECTION

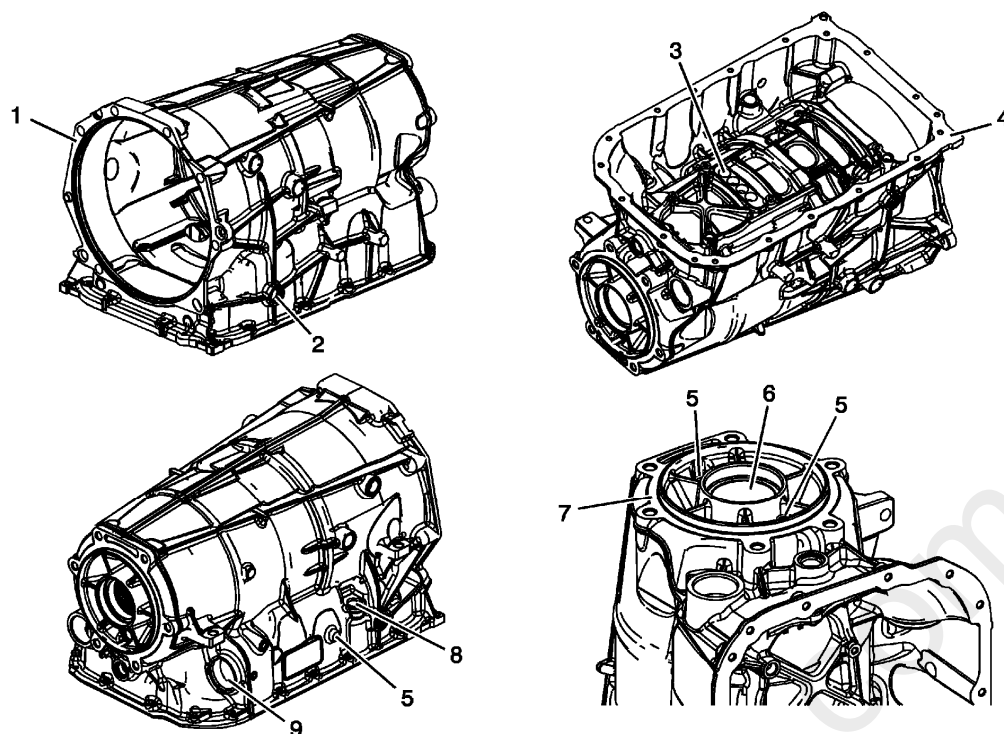


Fig. 20: View Of Case Components
Courtesy of GENERAL MOTORS COMPANY

Case 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.	
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	Front Case Sealing Surface
2	Manual Shift Shaft Seal
	NOTE: Refer to <u>Manual Shift Shaft Seal Replacement</u> .
3	Center Support Fluid Passage Seal Bores

4	Fluid Pan Sealing Surface
5	Case Plugs
6	Output Shaft Bearing Assembly
7	Rear Case Sealing Surface
8	Fill Tube Bore
9	Electrical Connector Passage Sleeve Bore

OUTPUT SHAFT DISASSEMBLE (6L45)

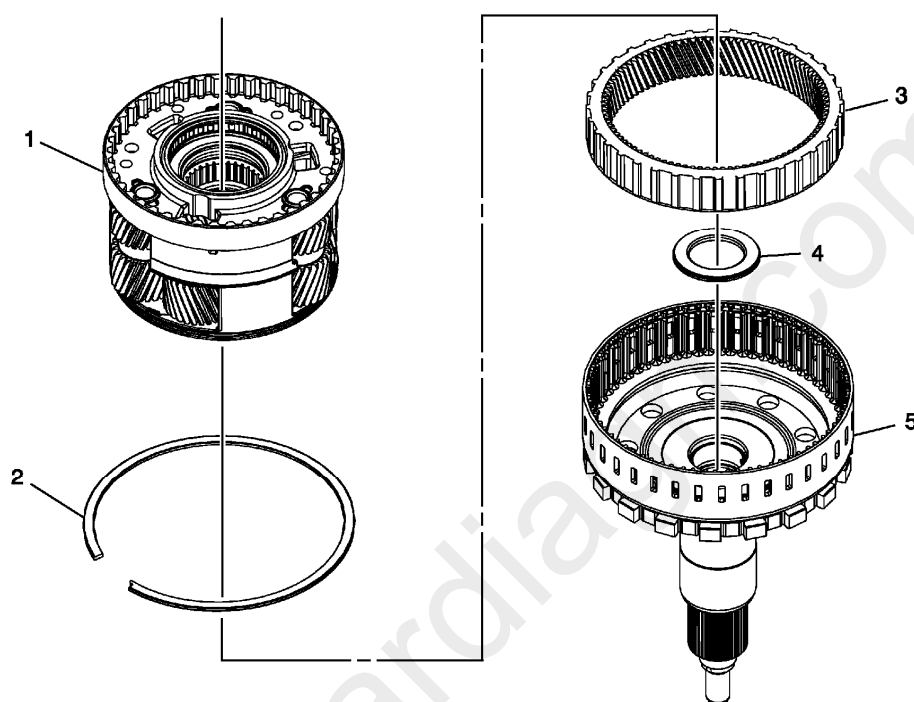


Fig. 21: Output Shaft Components (6L45)
Courtesy of GENERAL MOTORS COMPANY

Output Shaft Disassemble (6L45)

Callout	Component Name
Preliminary Procedure	
Inspect each component and replace as necessary.	
1	Output Carrier Assembly
2	Output Carrier Internal Gear Retaining Ring
3	Output Carrier Internal Rear Gear
4	Output Carrier Thrust Bearing Assembly
5	Output Shaft Assembly

OUTPUT INTERNAL GEAR DISASSEMBLE (6L90)

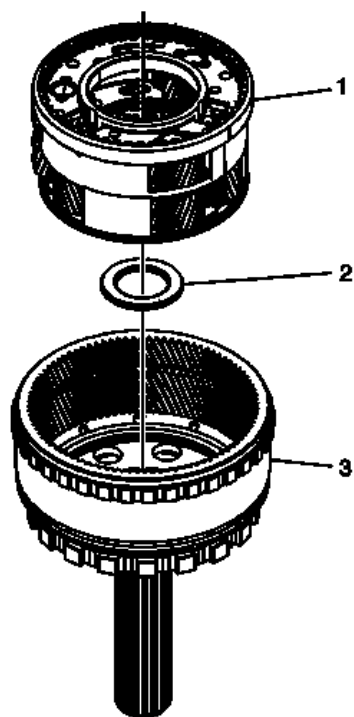


Fig. 22: Output Internal Gear And Carrier (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Output Internal Gear Disassemble (6L90)

Callout	Component Name
NOTE: Inspect each component and replace as necessary.	
1	Output Carrier Assembly
2	Output Carrier Thrust Bearing Assembly
3	Output Internal Gear Assembly

OUTPUT SHAFT ASSEMBLE (6L45)

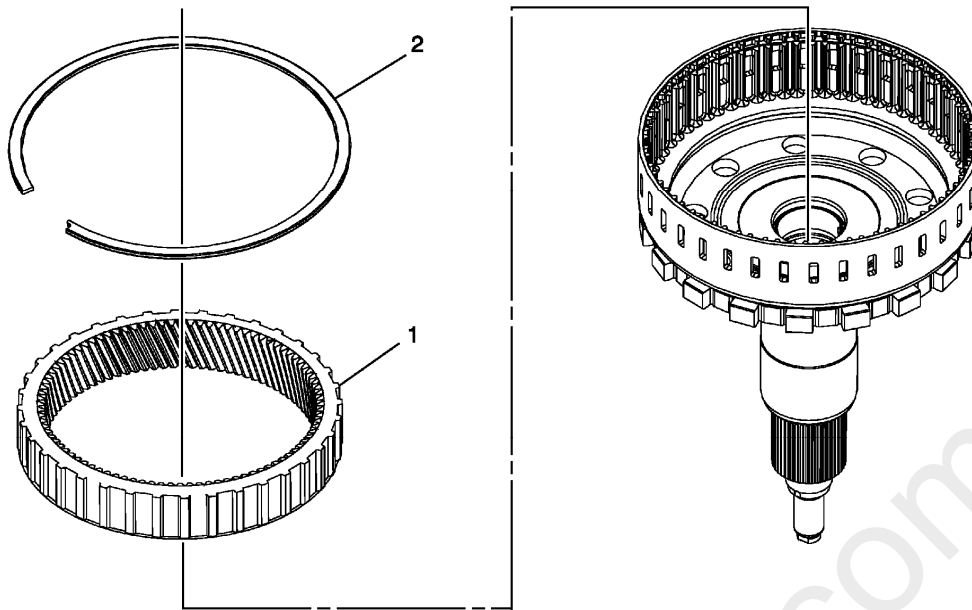


Fig. 23: Output Shaft Components (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Output Shaft Assemble (6L45)

Callout	Component Name
1	Output Carrier Internal Rear Gear CAUTION: Install the gear chamfer side down. Failure to install the gear chamfer side down may result in transmission damage.
2	Output Carrier Internal Gear Retaining Ring

OUTPUT CARRIER ASSEMBLY OVERHAUL (6L45)

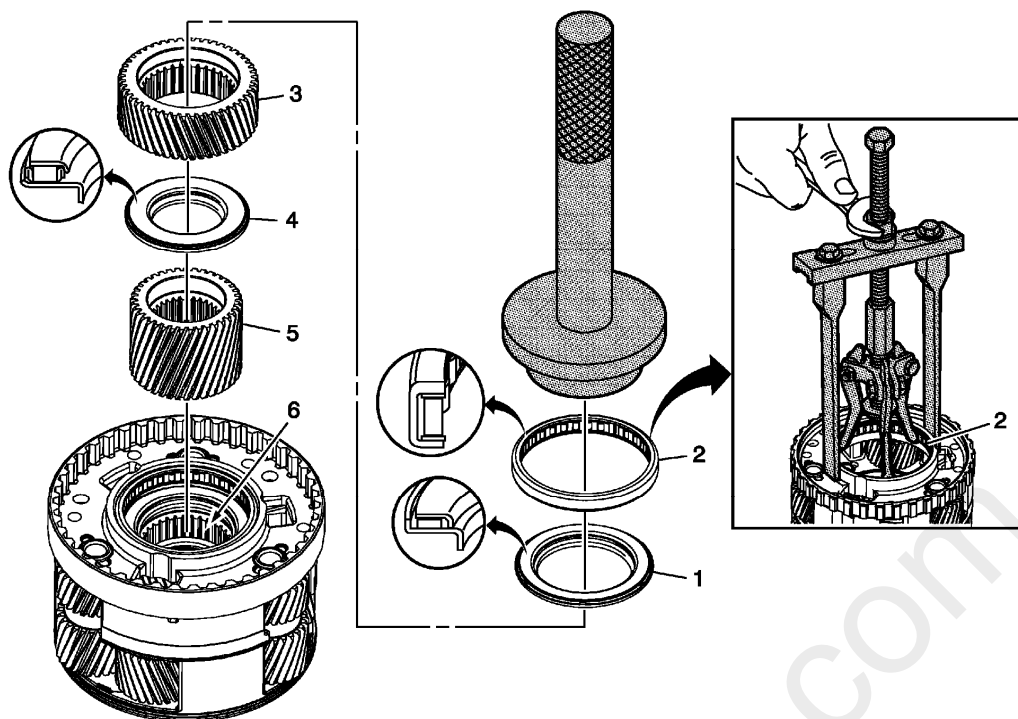


Fig. 24: Output Carrier Assembly (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Output Carrier Assembly Overhaul (6L45)

Callout	Component Name
1	Output Carrier Front Sun Gear Thrust Bearing Assembly
2	Center Support Roller Bearing
	CAUTION: Do not reuse the center support roller bearing. Install a NEW center support roller bearing. Reusing an old bearing may result in damage to the output carrier. NOTE: The thick side of the bearing shell faces up. Special Tools • DT 49789 Bearing Installer • DT 47865 Bearing Remover • J 8092 Driver Handle • J 45124 Removal Bridge For equivalent regional tools, refer to Special Tools.
	Output Carrier Front Sun Gear

3	CAUTION: Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
4	Output Carrier Front Sun Gear Rear Thrust Bearing Assembly
5	Output Carrier Rear Sun Gear
6	CAUTION: Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
	Output Carrier Rear Sun Gear Bearing Assembly
6	NOTE: Inspect for damage only. Do not remove. The bearing assembly is not a serviceable component.

OUTPUT CARRIER ASSEMBLY OVERHAUL (6L90)

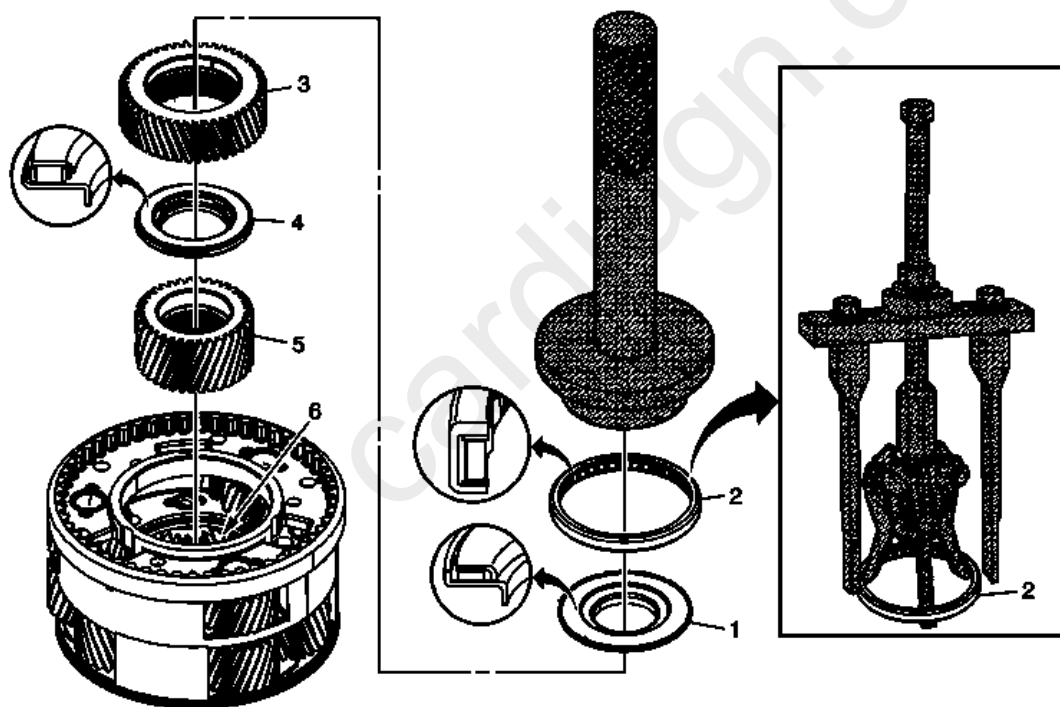


Fig. 25: Output Carrier Assembly Overhaul (6L90)
Courtesy of GENERAL MOTORS COMPANY

Output Carrier Assembly Overhaul (6L90)

Callout	Component Name
1	Output Carrier Front Sun Gear Thrust Bearing Assembly
	Center Support Roller Bearing

2	CAUTION: Do not reuse the center support roller bearing. Install a NEW center support roller bearing. Reusing an old bearing may result in damage to the output carrier. NOTE: The thick side of the bearing shell faces up. Special Tools • DT 47857 Bearing Installer • J 8092 Driver Handle • J 45124 Removal Bridge • DT 47865 Bearing Remover For equivalent regional tools, refer to Special Tools .
3	Output Carrier Front Sun Gear CAUTION: Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
4	Output Carrier Front Sun Gear Rear Thrust Bearing Assembly
5	Output Carrier Rear Sun Gear CAUTION: Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
6	Output Carrier Rear Sun Gear Bearing Assembly NOTE: Inspect for damage only. Do not remove. The bearing assembly is not a serviceable component.

OUTPUT CARRIER TO OUTPUT SHAFT ASSEMBLY (6L45)

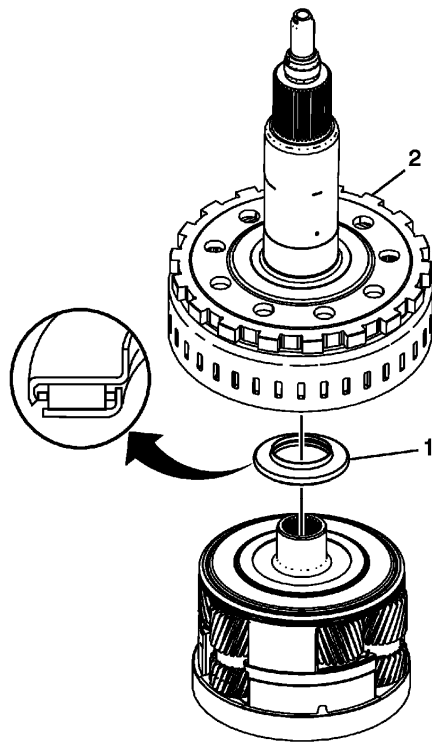


Fig. 26: Output Carrier To Output Shaft (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Output Carrier to Output Shaft Assemble (6L45)

Callout	Component Name
1	Output Carrier Thrust Bearing Assembly
2	Output Shaft Assembly

OUTPUT CARRIER TO OUTPUT SHAFT ASSEMBLY (6L90)

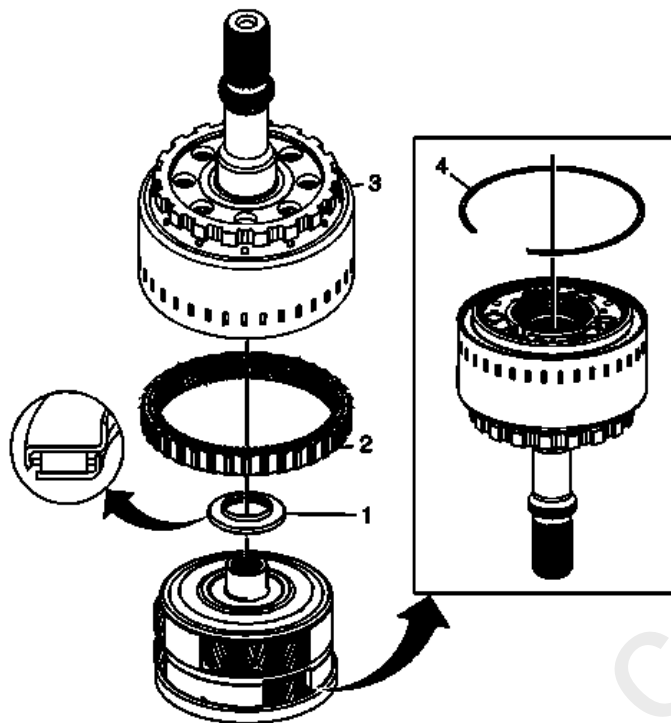


Fig. 27: Identifying Output Carrier To Output Shaft Components (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Output Carrier to Output Shaft Assemble (6L90)

Callout	Component Name
1	Output Carrier Thrust Bearing Assembly
2	Output Carrier Internal Front Gear CAUTION: Install the gear flat side down. Failure to install the gear flat side down may result in transmission damage.
3	Output Shaft Assembly
4	Output Carrier Internal Gear Retaining Ring NOTE: Grasp the output shaft and carrier with both hands to turn over.

OUTPUT CARRIER TO OUTPUT INTERNAL GEAR ASSEMBLE (6L90)

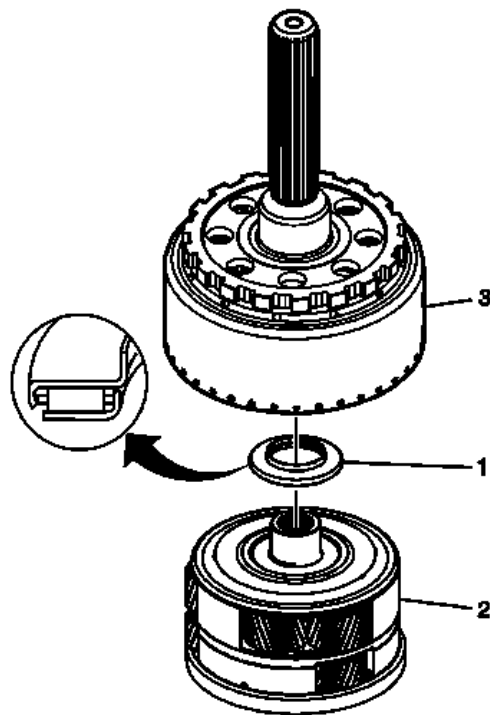


Fig. 28: Output Carrier Components & Internal Gear Assembly (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Output Carrier to Output Internal Gear Assemble (6L90)

Callout	Component Name
1	Output Carrier Thrust Bearing Assembly
2	Output Carrier Assembly
3	Output Internal Gear Assembly
	NOTE: Grasp the output shaft and carrier with both hands to turn over.

2-6 CLUTCH OVERHAUL (6L45)

2-6 Clutch Plates Removal

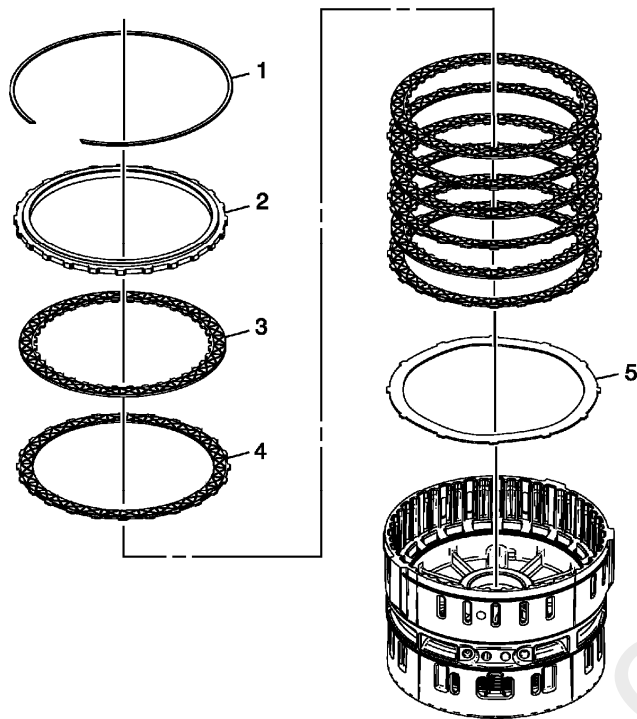


Fig. 29: 2-6 Clutch Plates (6L45)
 Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Plates Removal

Callout	Component Name
1	2-6 Clutch Backing Plate Retaining Ring
2	2-6 Clutch Backing Plate
3	2-6 Clutch Plate Assembly (Qty: 4)
4	2-6 Clutch Plate (Qty: 4)
5	2-6 Clutch (Waved) Plate

2-6 Clutch Piston Replacement

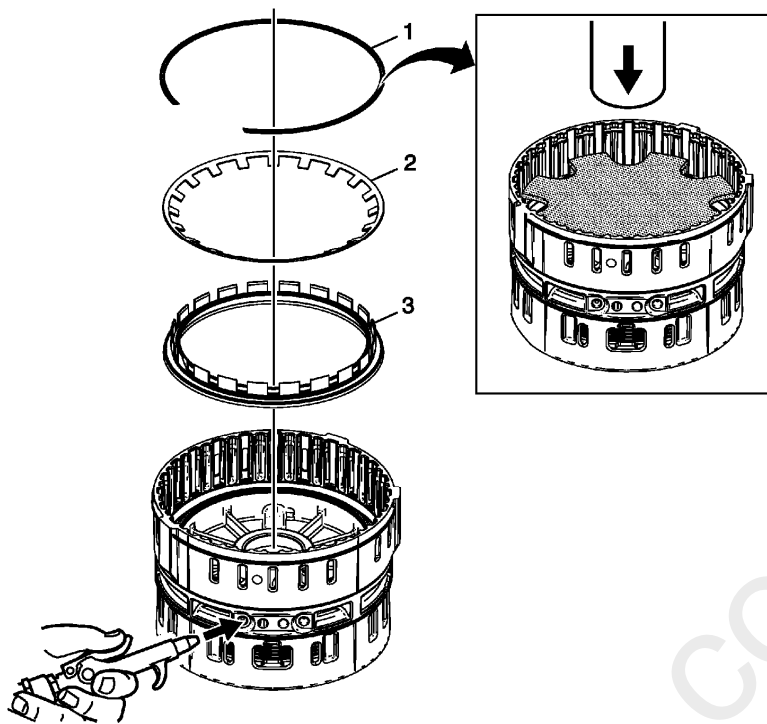


Fig. 30: 2-6 Clutch Piston (6L45)
Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Piston Replacement

Callout	Component Name
1	2-6 Clutch Spring Retaining Ring NOTE: Ensure the DT-48065 spring compressor is centered over the clutch spring. Special Tool DT-48065 Clutch Spring Compressor For equivalent regional tools, refer to Special Tools .
2	2-6 Clutch Spring CAUTION: Ensure the spring tabs are facing down during installation and that the tabs fit between the teeth on the piston. Failure to do so may cause damage to the clutch assembly.
3	2-6 Clutch Piston Assembly NOTE: It may be necessary to apply air to the apply passage in order to unseat the piston.

2-6 Clutch Plates Installation

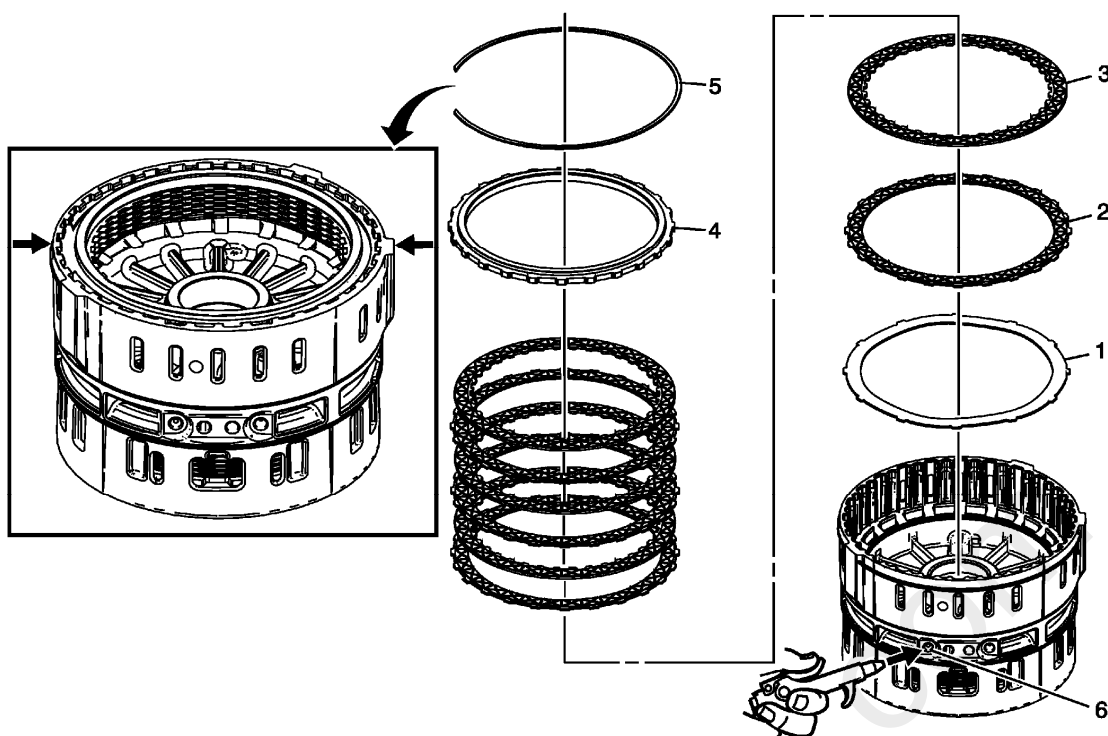


Fig. 31: 2-6 Clutch Plates (6L45)

Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Plates Installation

Callout	Component Name
1	2-6 Clutch (Waved) Plate
2	2-6 Clutch Plates (Qty: 4) NOTE: Alternate between steel and fiber clutch plates.
3	2-6 Clutch Plate Assembly (Qty: 4) NOTE: Alternate between steel and fiber clutch plates.
4	2-6 Clutch Backing Plate
5	2-6 Clutch Backing Plate Retaining Ring CAUTION: When installed, the open end of the snap ring must orient away from the slotted and scalloped areas of the center support assembly. Ideal orientation location should be at the 3 o'clock or 9 o'clock position of the center support, when facing the pan side of the case. Orienting the snap ring opening with either the scalloped or slotted areas of the center support may cause transmission damage.

	Procedure Be sure to install the retaining ring gap at the 9 o'clock or 3 o'clock position, as indicated by the arrows.
6	2-6 Clutch Apply Passage NOTE: Apply air to verify proper installation of all 2-6 clutch components.

2-6 CLUTCH OVERHAUL (6L90)

2-6 Clutch Plates Removal

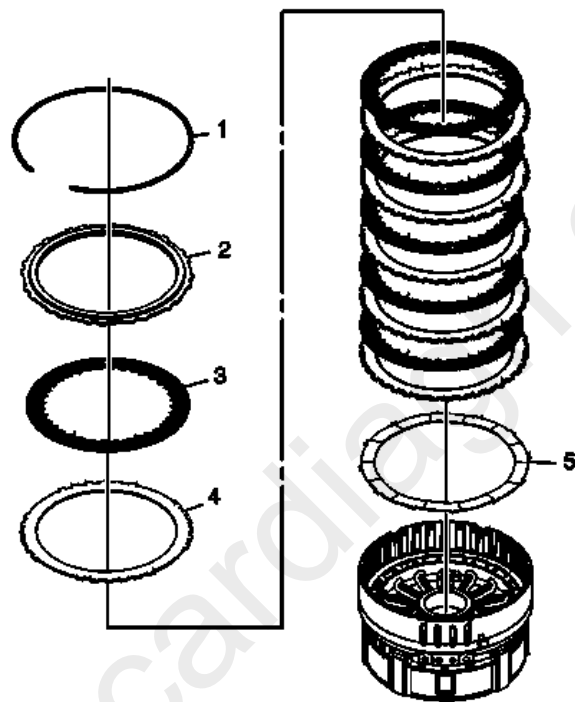


Fig. 32: 2-6 Clutch Plates Removal
 Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Plates Removal

Callout	Component Name
1	2-6 Clutch Backing Plate Retaining Ring
2	2-6 Clutch Backing Plate
3	2-6 Clutch Plate Assembly (Qty: 6)
4	2-6 Clutch Plate (Qty: 6)
5	2-6 Clutch (Waved) Plate

2-6 Clutch Piston Replacement

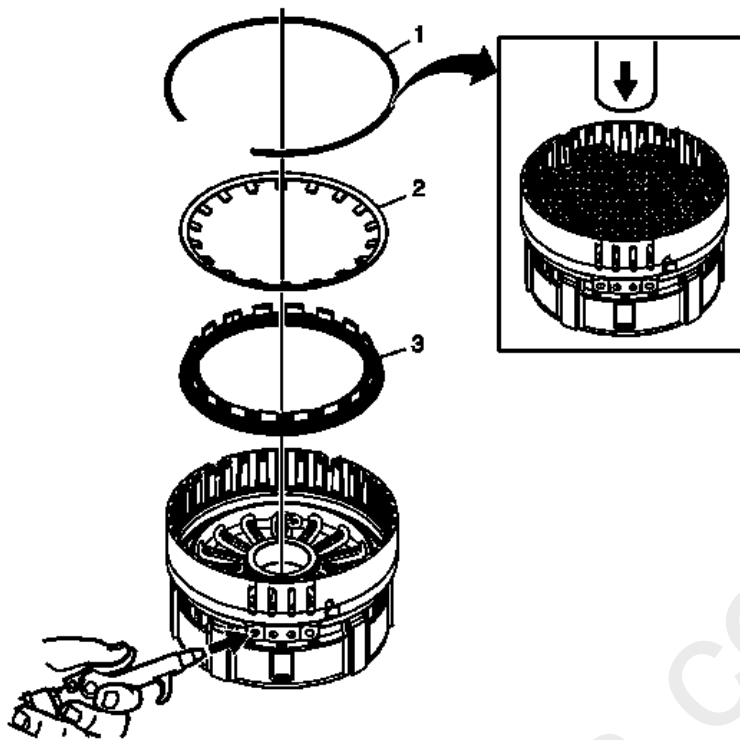


Fig. 33: 2-6 Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Piston Replacement

Callout	Component Name
1	2-6 Clutch Spring Retaining Ring NOTE: Ensure the DT 47761 spring compressor is centered over the clutch spring. Special Tool DT 47761 Clutch Spring Compressor For equivalent regional tools, refer to Special Tools .
2	2-6 Clutch Spring CAUTION: Ensure the spring tabs are facing down during installation and that the tabs fit between the teeth on the piston. Failure to do so may cause damage to the clutch assembly.
3	2-6 Clutch Piston Assembly NOTE: It may be necessary to apply air to the apply passage in order to unseat the piston.

2-6 Clutch Plates Installation

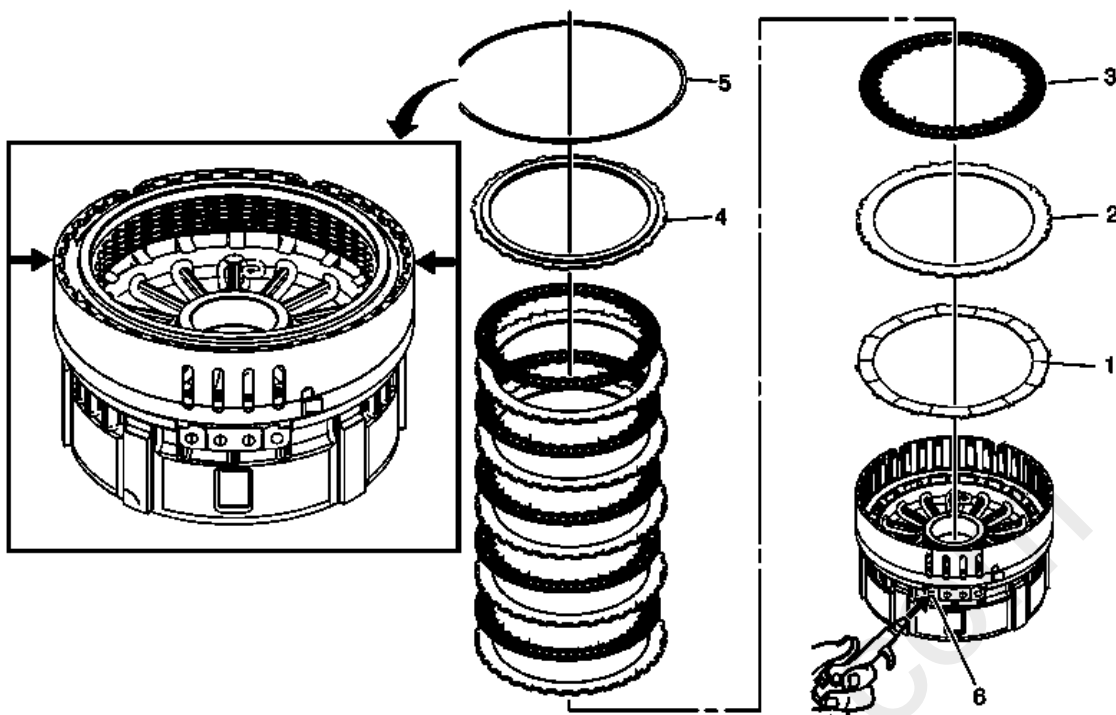


Fig. 34: 2-6 Clutch Plates Installation
 Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Plates Installation

Callout	Component Name
1	2-6 Clutch (Waved) Plate
2	2-6 Clutch Plates (Qty: 6) NOTE: Alternate between steel and fiber clutch plates.
3	2-6 Clutch Plate Assembly (Qty: 6) NOTE: Alternate between steel and fiber clutch plates.
4	2-6 Clutch Backing Plate
5	2-6 Clutch Backing Plate Retaining Ring CAUTION: When installed, the open end of the snap ring must orient away from the slotted and scalloped areas of the center support assembly. Ideal orientation location should be at the 3 o'clock or 9 o'clock position of the center support, when facing the pan side of the case. Orienting the snap ring opening with either the scalloped or slotted areas of the center support may cause transmission damage.

	Procedure Be sure to install the retaining ring gap at the 9 o'clock or 3 o'clock position, as indicated by the arrows.
6	2-6 Clutch Apply Passage NOTE: Apply air to verify proper installation of all 2-6 clutch components.

2-6 CLUTCH BACKING PLATE RETAINING RING MEASUREMENT (6L45)

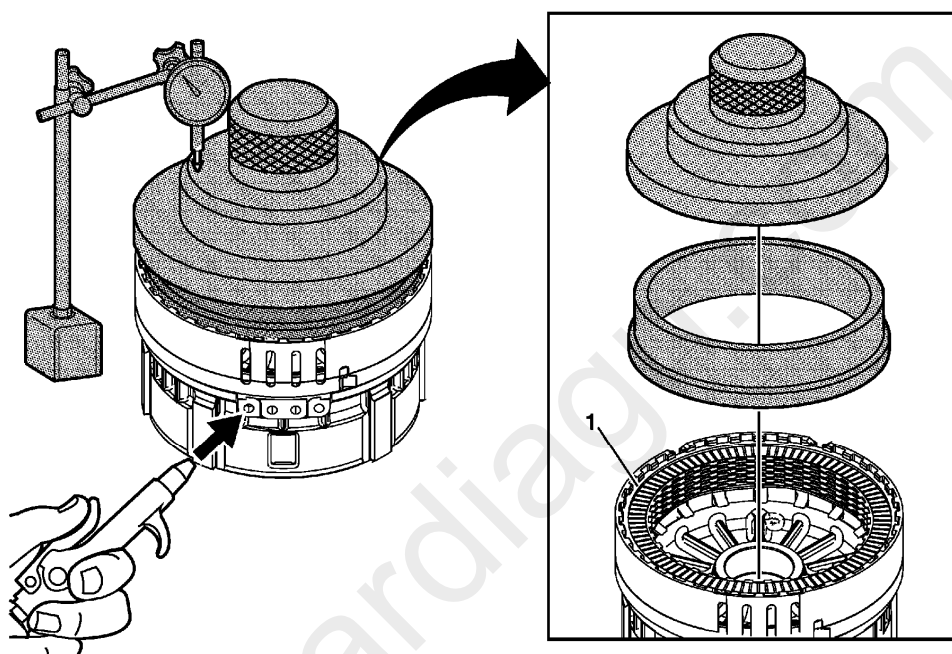


Fig. 35: 2-6 Clutch Backing Plate Retaining Ring Measurement (6L45)
 Courtesy of GENERAL MOTORS COMPANY

2-6 Clutch Backing Plate Retaining Ring Measurement (6L45)

Callout	Component Name
Preliminary Procedures 1. Install DT 47868-1 clutch pack travel weight and DT-47868-4 travel weight adapter onto the 2-6 clutch backing plate. 2. Attach the J 8001 dial indicator set to the J 26900-13 magnetic base and zero out the dial indicator on the DT 47868-1 clutch pack travel weight.	
Special Tools • DT 47868-1 Clutch Pack Travel Weight	

- **DT-47868-4** Clutch Travel Weight Adapter
- **J 8001** Dial Indicator Set
- **J 26900-13** Magnetic Base

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

1	2-6 Clutch Apply Passage NOTE: Apply compressed air to the apply passage hole, at least 3 times and observe the dial indicator measurement each time. This action "fluffs" the clutch plates to ensure an accurate measurement. Refer to <u>Clutch Backing Plate Retaining Ring Specifications (6L45)</u> .
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LOW AND REVERSE CLUTCH OVERHAUL (6L45)

Low and Reverse Clutch Plate Removal

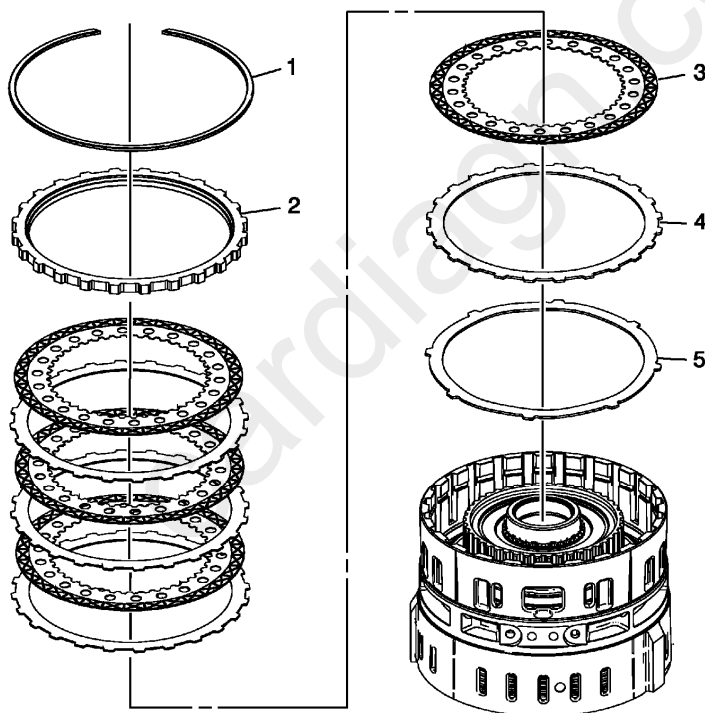


Fig. 36: Low And Reverse Clutch Plate (6L45)
Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Removal

Callout	Component Name
1	Low and Reverse Clutch Backing Plate Retaining Ring
2	Low and Reverse Clutch Backing Plate
3	Low and Reverse Clutch Plate Assembly (Qty: 4)

4	Low and Reverse Clutch Plate (Qty: 4)
5	Low and Reverse Clutch (Waved) Plate

Low and Reverse Clutch Piston Removal

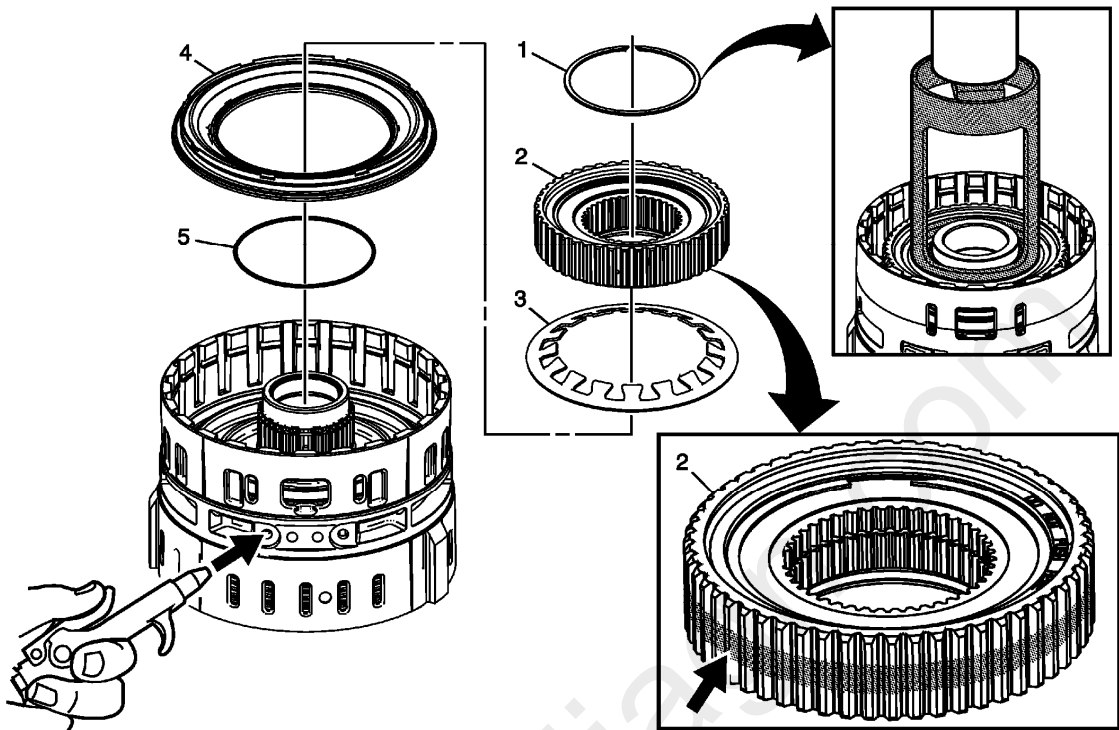


Fig. 37: Low And Reverse Clutch Piston (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Removal

Callout	Component Name
1	Low and Reverse Clutch Spring Retaining Ring Special Tool DT-48903 Clutch Spring Compressor For equivalent regional tools, refer to Special Tools .
2	Low Clutch Sprag Assembly NOTE: A blue colored ring may be present on the outer splines of the low clutch sprag assembly. This is a normal condition caused by heat treating during manufacturing and does not indicate need for replacement.
3	Low and Reverse Clutch Spring
4	Low and Reverse Clutch Piston Assembly NOTE: It may be necessary to apply air to the apply passage in order to unseat the piston.

5

Low Clutch Sprag Seal

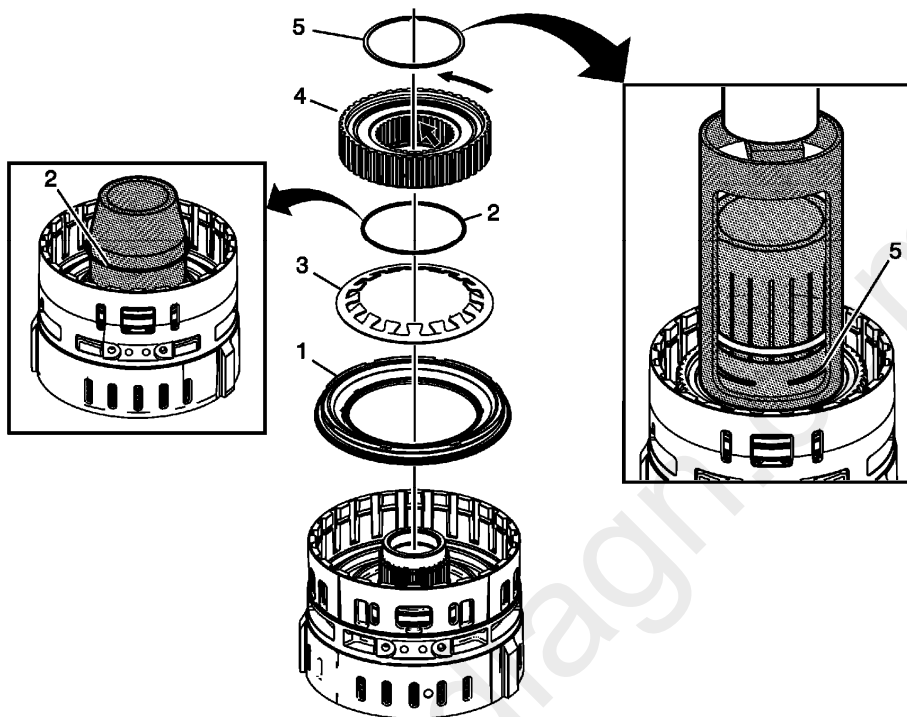
CAUTION:Refer to Seal Reuse Caution .**Low and Reverse Clutch Piston Installation**

Fig. 38: Low And Reverse Clutch Piston (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Installation

Callout	Component Name
1	Low and Reverse Clutch Piston Assembly NOTE: Lubricate the inner and outer sealing surfaces of the piston assembly with automatic transmission fluid (ATF) in order to ease installation into the center support assembly.
2	Low Clutch Sprag Seal CAUTION: Refer to <u>Seal Reuse Caution</u> . NOTE: Apply ATF to the DT-49297 low clutch sprag seal cone to ease seal installation.

	Special Tool DT-49297 Low Clutch Sprag Seal Cone For equivalent regional tools, refer to <u>Special Tools</u> .
3	Low and Reverse Clutch Spring CAUTION: Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
4	Low Clutch Sprag Assembly NOTE: • Verify that the low clutch sprag is operating correctly. Refer to the illustration for proper freewheel direction. • Ensure the missing spline on the sprag assembly is aligned with the missing spline on the center support hub. This is the oil passage location.
5	Low and Reverse Clutch Spring Retaining Ring CAUTION: The retaining ring gap must be aligned with the missing spline on the center support hub. Failure to do so may cause damage to the clutch assembly. Special Tools • DT-48903 Clutch Spring Compressor • DT-49296-1 Low Clutch Sprag Retaining Ring Cone • DT-49296-2 Low Clutch Sprag Retaining Ring Pusher For equivalent regional tools, refer to <u>Special Tools</u> .

Low and Reverse Clutch Plate Installation

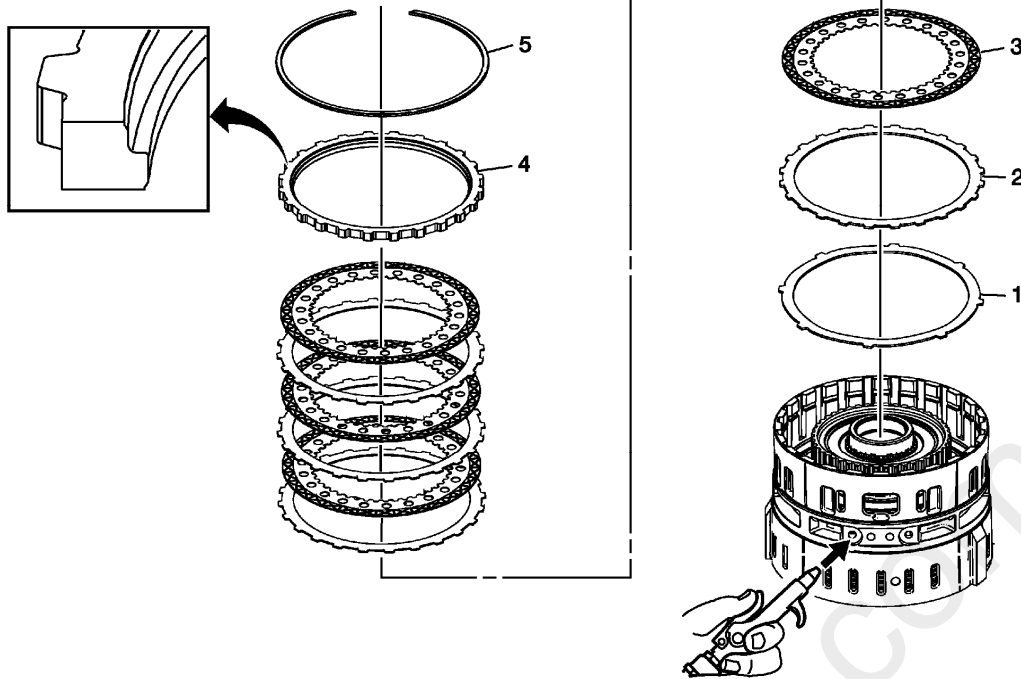


Fig. 39: Low And Reverse Clutch Plate (6L45)
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Installation

Callout	Component Name
1	Low and Reverse Clutch (Waved) Plate
2	Low and Reverse Clutch Plate (Qty: 4)
3	Low and Reverse Clutch Plate Assembly (Qty: 4)
4	Low and Reverse Clutch Backing Plate NOTE: Install the backing plate with the inner step side up.
5	Low and Reverse Clutch Backing Plate Retaining Ring NOTE: Apply air to verify proper installation of all low and reverse clutch components.

LOW AND REVERSE CLUTCH OVERHAUL (6L90)

Low and Reverse Clutch Plate Removal

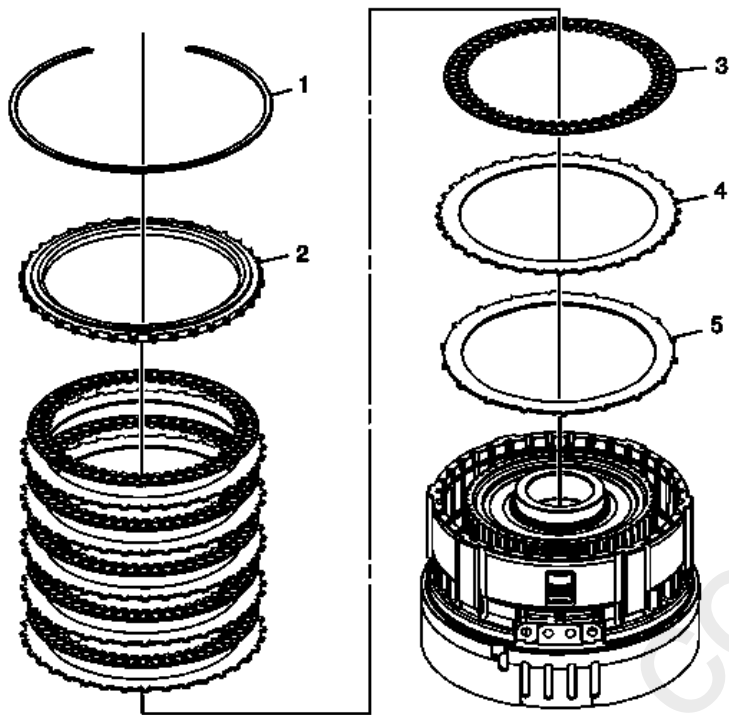


Fig. 40: Low and Reverse Clutch Plate Removal
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Removal

Callout	Component Name
1	Low and Reverse Clutch Backing Plate Retaining Ring
2	Low and Reverse Clutch Backing Plate
3	Low and Reverse Clutch Plate Assembly (Qty: 6)
4	Low and Reverse Clutch Plate (Qty: 6)
5	Low and Reverse Clutch (Waved) Plate

Low and Reverse Clutch Piston Removal

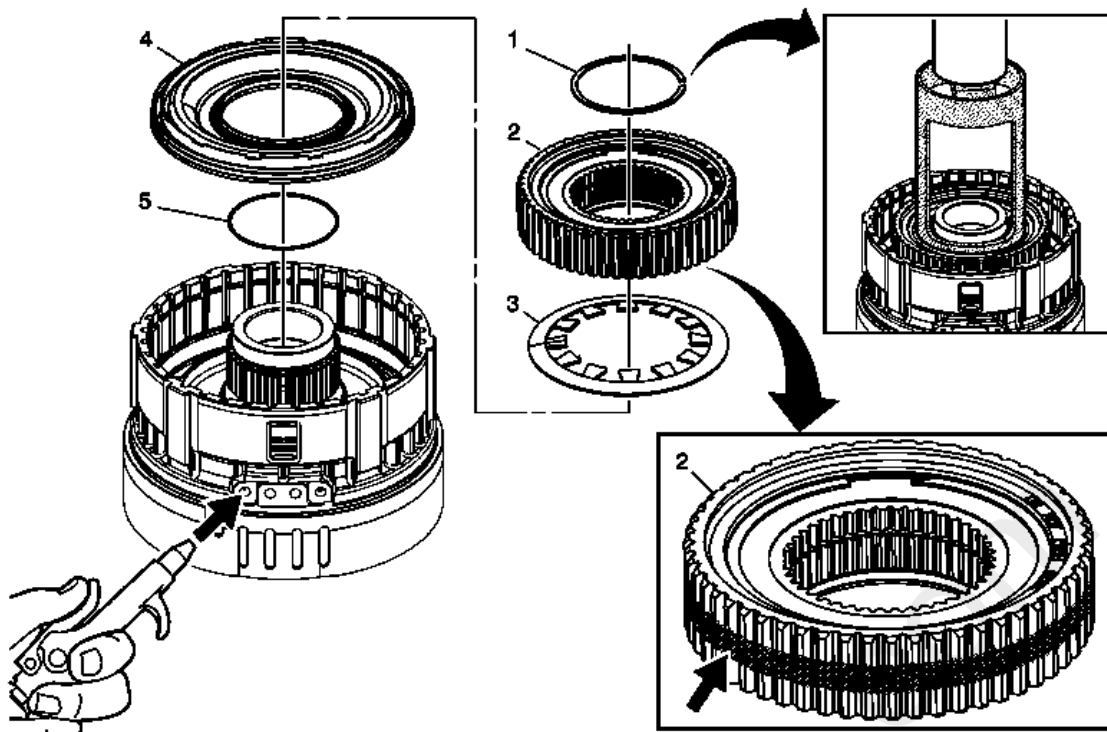


Fig. 41: Removing Low And Reverse Clutch Piston
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Removal

Callout	Component Name
1	Low and Reverse Clutch Spring Retaining Ring CAUTION: Ensure the DT 47779 contacts the sprag assembly and not the sprag retaining ring. Damage to the sprag may result. Special Tool DT 47779 Clutch Spring Compressor For equivalent regional tools, refer to Special Tools .
2	Low Clutch Sprag Assembly NOTE: A blue colored ring may be present on the outer splines of the low clutch sprag assembly. This is a normal condition caused by heat treating during manufacturing and does not indicate need for replacement.
3	Low and Reverse Clutch Spring
4	Low and Reverse Clutch Piston Assembly NOTE:

	It may be necessary to apply air to the apply passage in order to unseat the piston.
5	Low Clutch Sprag Seal CAUTION: Refer to <u>Seal Reuse Caution</u> .

Low and Reverse Clutch Piston Installation

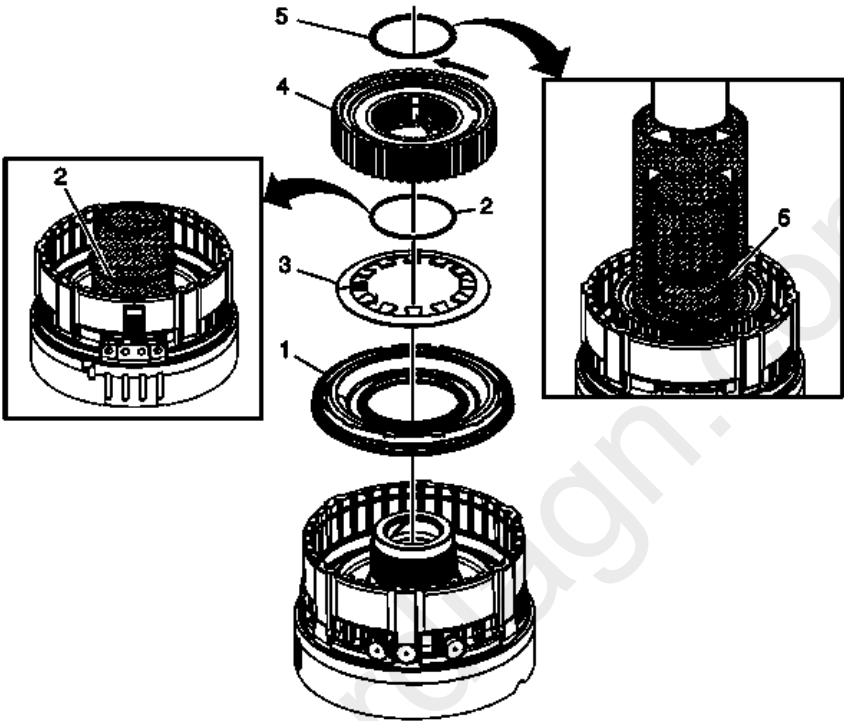


Fig. 42: Low And Reverse Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Piston Installation

Callout	Component Name
1	Low and Reverse Clutch Piston Assembly NOTE: Lubricate the inner and outer sealing surfaces of the piston assembly with automatic transmission fluid (ATF) in order to ease installation into the center support assembly.
2	Low Clutch Sprag Seal CAUTION: Refer to <u>Seal Reuse Caution</u> . NOTE:

	Apply ATF to the DT 47780 low clutch sprag seal cone to ease seal installation. Special Tool DT 47780 Low Clutch Sprag Seal Cone For equivalent regional tools, refer to <u>Special Tools</u> .
3	Low and Reverse Clutch Spring CAUTION: Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
4	Low Clutch Sprag Assembly NOTE: • Verify that the low clutch sprag is operating correctly. Refer to the illustration for proper freewheel direction. • Ensure the missing splines on the sprag assembly are aligned with the missing splines on the center support hub.
5	Low and Reverse Clutch Spring Retaining Ring CAUTION: Ensure the DT 47779 contacts the sprag assembly and not the sprag retaining ring. Damage to the sprag may result. CAUTION: The retaining ring gap must be aligned with the 3 missing splines on the center support hub. Failure to do so may cause damage to the clutch assembly. Special Tools • DT 47778-1 Low Clutch Sprag Retaining Ring Cone • DT 47778-2 Low Clutch Sprag Retaining Ring Pusher • DT 47779 Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .

Low and Reverse Clutch Plate Installation

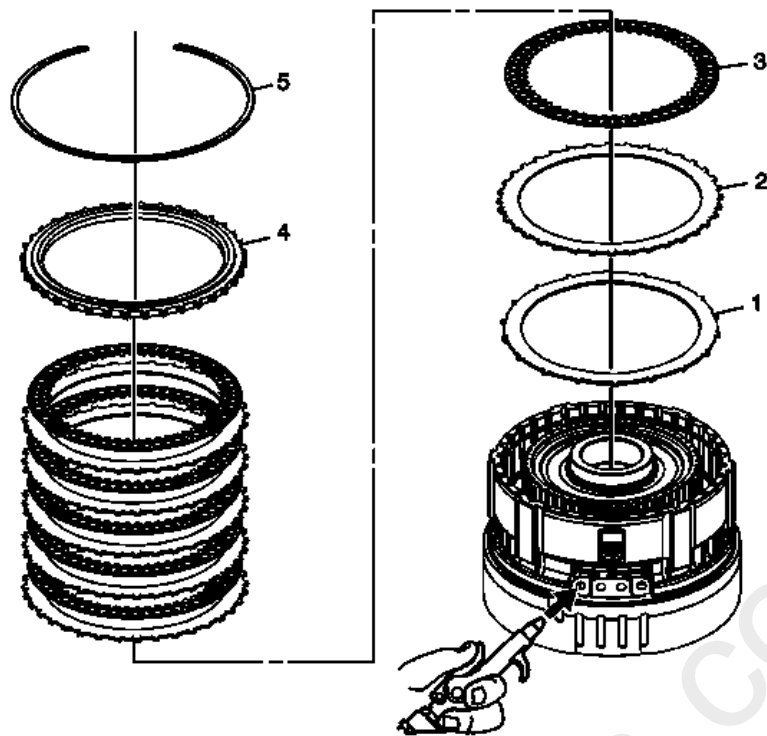


Fig. 43: Low and Reverse Clutch Plate
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Plate Installation

Callout	Component Name
1	Low and Reverse Clutch (Waved) Plate
2	Low and Reverse Clutch Plate (Qty: 6)
3	Low and Reverse Clutch Plate Assembly (Qty: 6)
4	Low and Reverse Clutch Backing Plate
5	Low and Reverse Clutch Backing Plate Retaining Ring
	NOTE: Apply air to verify proper installation of all low and reverse clutch components.

LOW AND REVERSE CLUTCH BACKING PLATE RETAINING RING MEASUREMENT

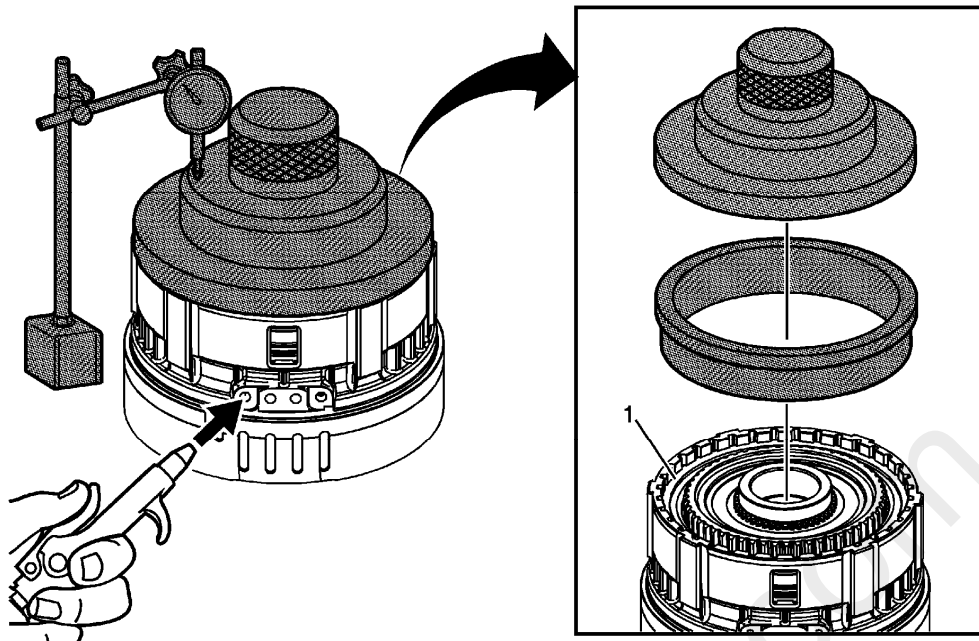


Fig. 44: View Of Low & Reverse Clutch Backing Plate Retaining Ring
 Courtesy of GENERAL MOTORS COMPANY

Low and Reverse Clutch Backing Plate Retaining Ring Measurement

Callout	Component Name
Preliminary Procedures	
1. Install DT-47868-1 pack travel weight and DT-47868-4 travel weight adapter onto the low and reverse clutch backing plate. 2. Attach the GE 8001 dial indicator set to the GE 26900-13 magnetic base and zero out the dial indicator on the DT-47868-1 pack travel weight.	
Special Tools	
• DT-47868-1 Pack Travel Weight • DT-47868-4 Clutch Travel Weight Adapter • GE 8001 Dial Indicator Set • GE 26900-13 Magnetic Base	
For equivalent regional tools, refer to Special Tools .	
1	Low and Reverse Backing Plate Retaining Ring NOTE: Apply compressed air to the apply passage hole, at least 3 times and observe the dial indicator measurement each time. This action "fluffs" the clutch plates to ensure an

accurate measurement. Refer to Clutch Backing Plate Retaining Ring Specifications (6L90) , Clutch Backing Plate Retaining Ring Specifications (6L45) .

4-5-6 CLUTCH DAMPENER OVERHAUL (6L45/6L90)

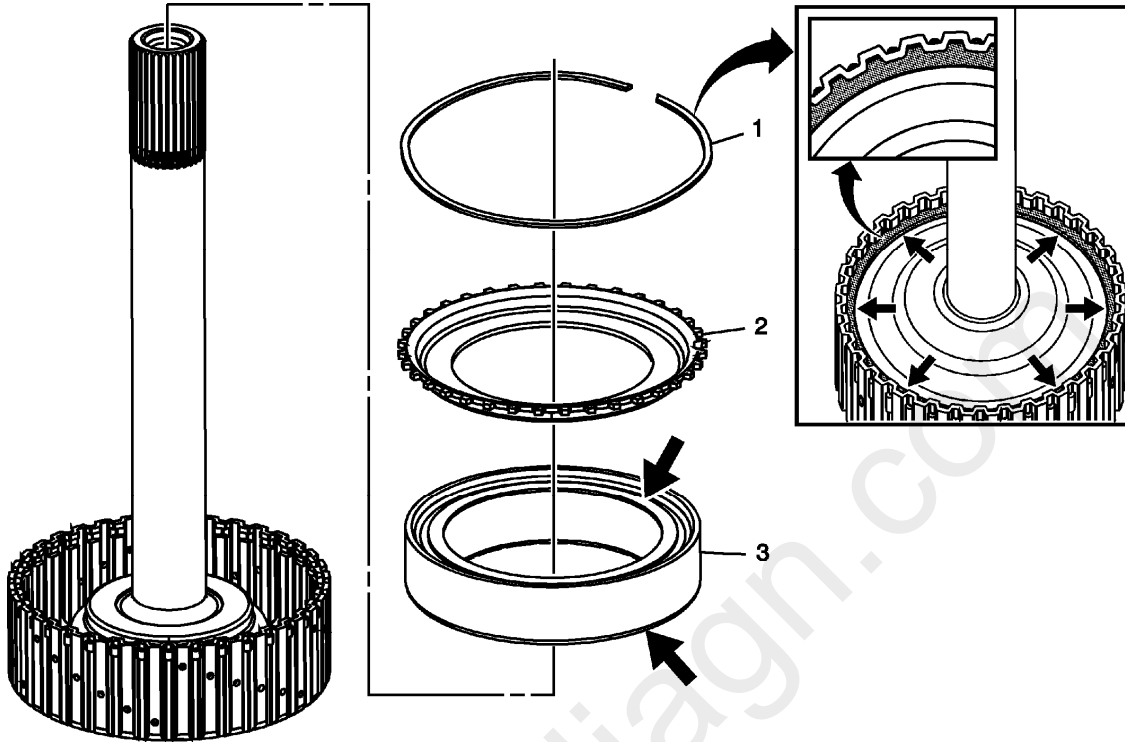


Fig. 45: Overhauling 4-5-6 Clutch Damper
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Damper Overhaul (6L45/6L90)

Callout	Component Name
1	4-5-6 Clutch Damper Retaining Ring CAUTION: Ensure the retaining ring is fully seated when installed. Using a screwdriver, fully seat the retaining ring into the groove by pushing on the inside diameter around the whole circumference. If the retaining ring is not fully seated, transmission damage will result.
2	4-5-6 Clutch Damper Apply Plate
3	4-5-6 Clutch Damper NOTE: Dry and inspect the clutch damper for the following conditions: • Pitting • Flaking • Delamination

- Wear
- Glazing
- Cracking

If any of these conditions are found, replace the dampener.

4-5-6 CLUTCH OVERHAUL (6L45)

4-5-6 Clutch Plates Removal

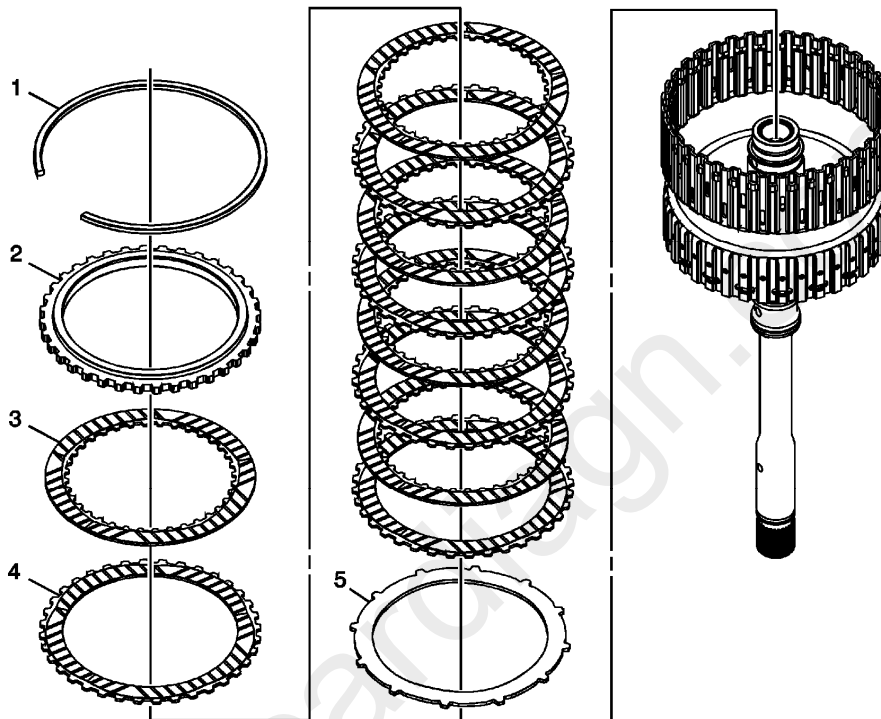


Fig. 46: 4-5-6 Clutch Plates Component View
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Plates Removal

Callout	Component Name
1	4-5-6 Clutch Backing Plate Retaining Ring
2	4-5-6 Clutch Backing Plate
3	4-5-6 Clutch Plate Assembly (Qty: 5)
4	4-5-6 Clutch Plate (Qty: 5)
5	4-5-6 Clutch (Waved) Plate

4-5-6 Clutch Piston Removal

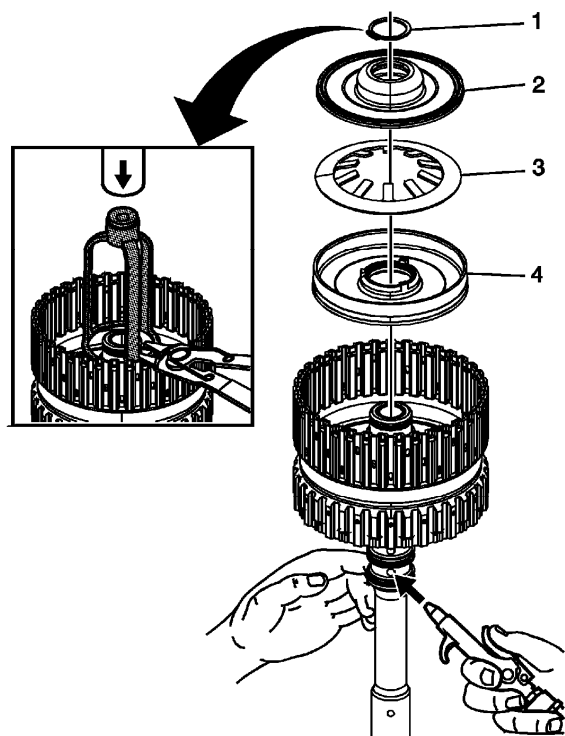


Fig. 47: 4-5-6 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Removal

Callout	Component Name
1	4-5-6 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool DT 43074 Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .
2	4-5-6 Clutch Piston Dam Assembly NOTE: It may be necessary to apply air pressure to remove the dam and piston.
3	4-5-6 Clutch Spring
	4-5-6 Clutch Piston Assembly

NOTE:

It may be necessary to apply air pressure to remove the piston.

Turbine Shaft Fluid Seal Ring Replacement

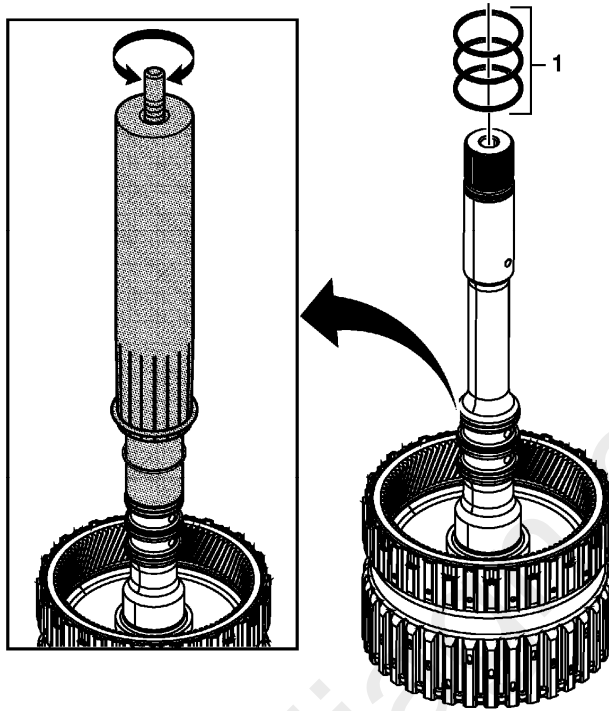


Fig. 48: Turbine Shaft Fluid Seal Rings (6L45)

Courtesy of GENERAL MOTORS COMPANY

Turbine Shaft Fluid Seal Ring Replacement

Callout	Component Name
Preliminary Procedures	
1. Inspect the turbine shaft fluid passages and splines. 2. Clean any plugged passages.	
	Turbine Shaft Fluid Seal Ring (Qty: 3) CAUTION: Do not use old seal rings. Install NEW seal rings. Reusing old seal rings may cause internal transmission leaks and transmission damage. Procedure 1. Apply DT 36850 transjel lubricant to the seals. 2. Adjust the turn screw on DT-48066-3 seal protector and install the bottom seal ring first using DT-48066-2 seal pusher to push into place.

3. Seals must be sized before torque converter housing and fluid pump assembly installation, refer to 1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Installation (6L45).

NOTE:

Place your thumb at the bottom of each groove during seal installation to protect the seal from over-travel.

1

Special Tools

- DT 36850 Transjel Lubricant
- DT-48066-2 Seal Pusher
- DT-48066-3 Seal Protector

For equivalent regional tools, refer to Special Tools .

4-5-6 Clutch Piston Installation

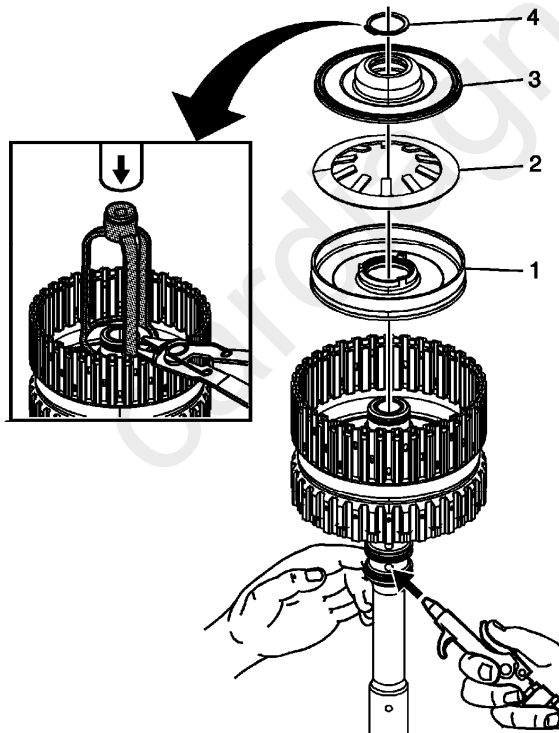


Fig. 49: 4-5-6 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Installation

Callout	Component Name
1	4-5-6 Clutch Piston Assembly

2	4-5-6 Clutch Spring CAUTION: Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
3	4-5-6 Clutch Piston Dam Assembly NOTE: Lubricate the inner and outer sealing surfaces of the dam assembly with automatic transmission fluid (ATF) in order to ease installation into the piston.
4	4-5-6 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . NOTE: Apply air to verify proper installation of all 4-5-6 clutch components. Piston should apply and release smoothly. Special Tool DT 43074 Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .

4-5-6 Clutch Plates Installation

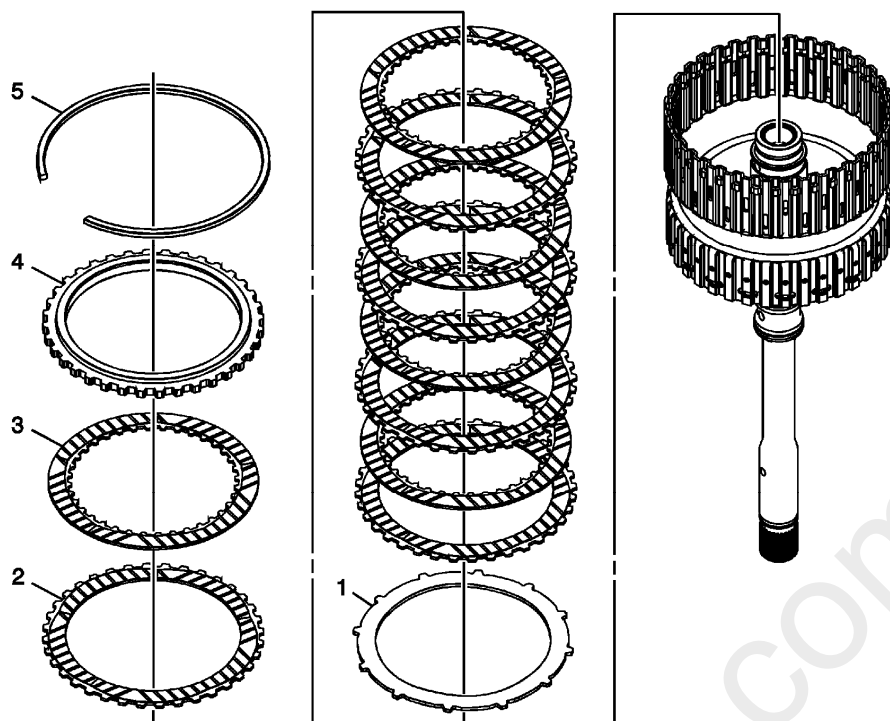


Fig. 50: 4-5-6 Clutch Plates Component View
 Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Plates Installation

Callout	Component Name
1	4-5-6 Clutch (Waved) Plate
2	4-5-6 Clutch Plate (Qty: 5)
3	4-5-6 Clutch Plate Assembly (Qty: 5)
4	4-5-6 Clutch Backing Plate
5	4-5-6 Clutch Backing Plate Retaining Ring
	NOTE: After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to <u>4-5-6 Clutch Backing Plate Retaining Ring Measurement</u> .

4-5-6 CLUTCH OVERHAUL (6L90)

4-5-6 Clutch Plates Removal

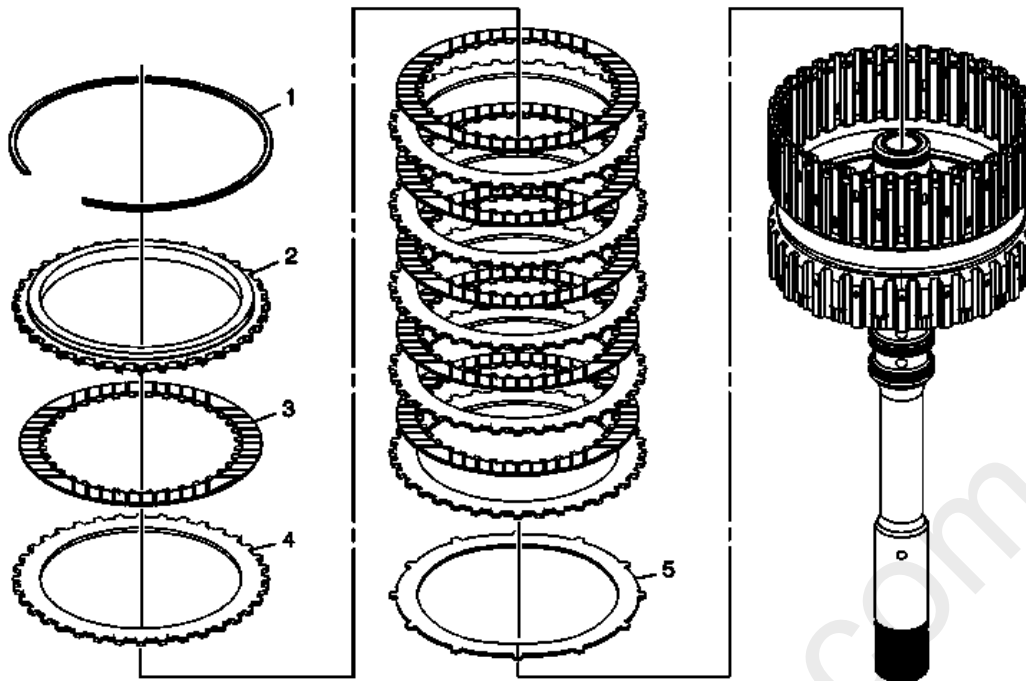


Fig. 51: Removing 4-5-6 Clutch Plates
 Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Plates Removal

Callout	Component Name
1	4-5-6 Clutch Backing Plate Retaining Ring
2	4-5-6 Clutch Backing Plate
3	4-5-6 Clutch Plate Assembly • 6L80 - Qty: 6 • 6L90 - Qty: 7
4	4-5-6 Clutch Plate • 6L80 - Qty: 6 • 6L90 - Qty: 7
5	4-5-6 Clutch (Waved) Plate

4-5-6 Clutch Piston Removal

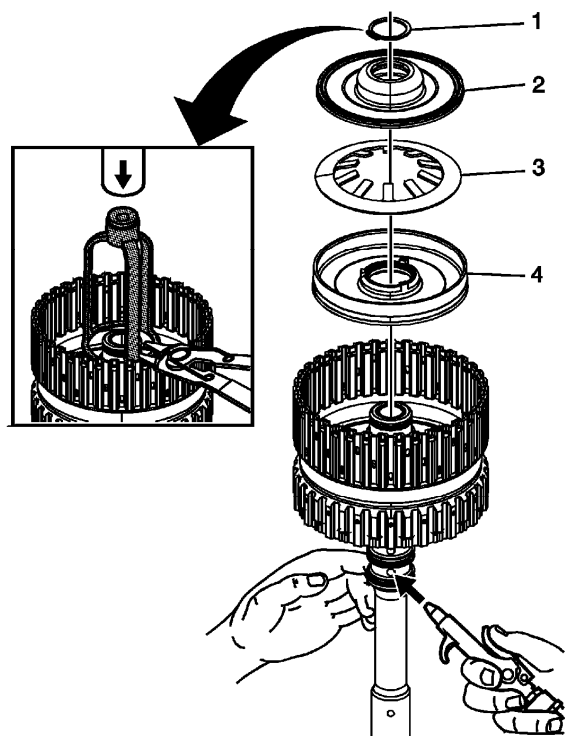


Fig. 52: 4-5-6 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Removal

Callout	Component Name
1	4-5-6 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool J 43074 Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .
2	4-5-6 Clutch Piston Dam Assembly NOTE: It may be necessary to apply air pressure to remove the dam and piston.
3	4-5-6 Clutch Spring
	4-5-6 Clutch Piston Assembly

NOTE:

It may be necessary to apply air pressure to remove the piston.

Turbine Shaft Fluid Seal Ring Replacement

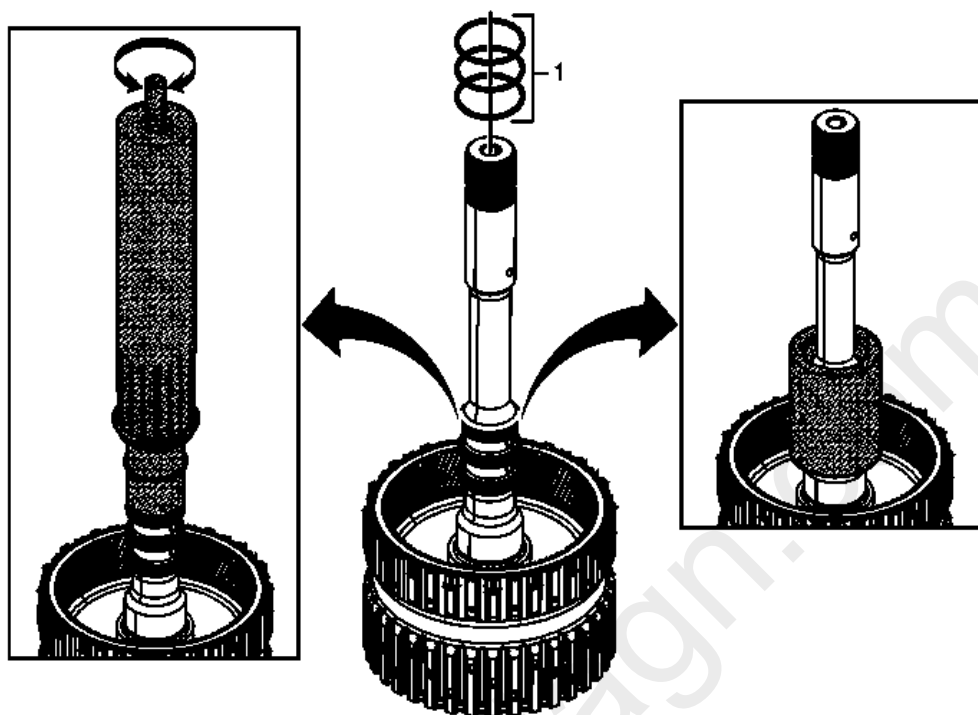


Fig. 53: Turbine Shaft Fluid Seal Ring
Courtesy of GENERAL MOTORS COMPANY

Turbine Shaft Fluid Seal Ring Replacement

Callout	Component Name
Preliminary Procedures	
- Inspect the turbine shaft fluid passages and splines. - Clean any plugged passages.	
1	Turbine Shaft Fluid Seal Ring (Qty: 3) CAUTION: Do not use old seal rings. Install NEW seal rings. Reusing old seal rings may cause internal transmission leaks and transmission damage. CAUTION: Size the fluid seal rings for at least 5 minutes after installation to obtain proper seal ring size. Failure to do so may cause internal transmission leaks and transmission damage. NOTE:

Adjust the turn screw on DT 47768-1 Seal Protector and install the bottom seal ring first.

Special Tools

- DT 47768-1 Seal Protector
- DT 47768-2 Seal Pusher
- DT 47768-3 Seal Sizer

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

4-5-6 Clutch Piston Installation

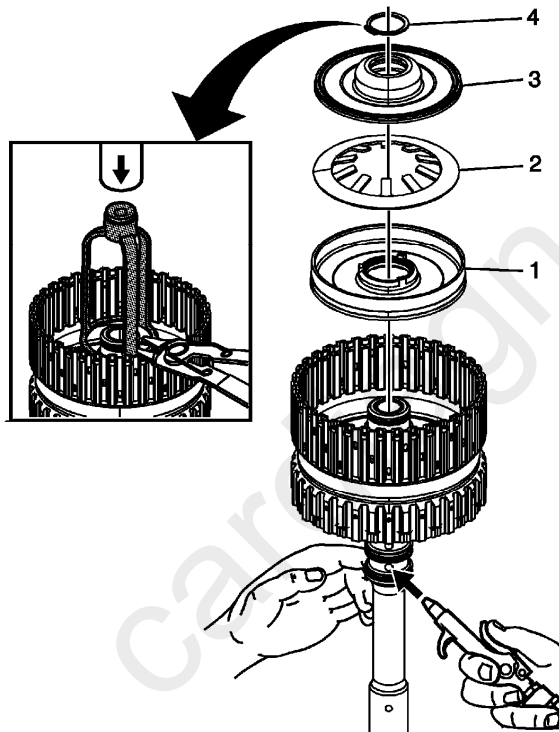


Fig. 54: 4-5-6 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Piston Installation

Callout	Component Name
1	4-5-6 Clutch Piston Assembly
2	4-5-6 Clutch Spring CAUTION: Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
	4-5-6 Clutch Piston Dam Assembly

3	NOTE: Lubricate the inner and outer sealing surfaces of the dam assembly with automatic transmission fluid (ATF) in order to ease installation into the piston.
4	4-5-6 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . NOTE: Apply air to verify proper installation of all 4-5-6 clutch components. The piston should apply and release smoothly. Special Tool J 43074 Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .

4-5-6 Clutch Plates Installation

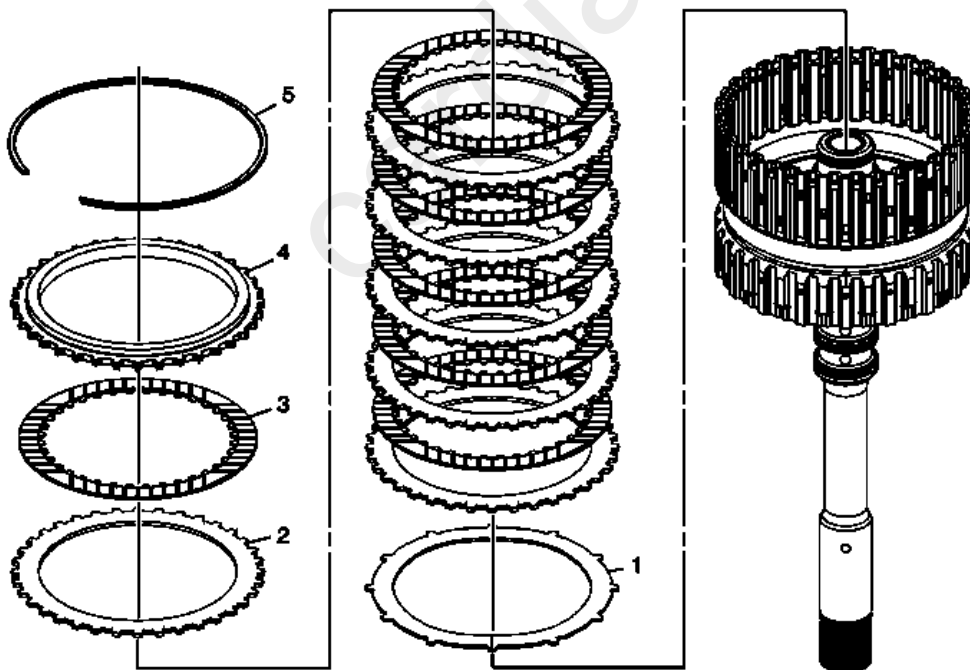


Fig. 55: 4-5-6 Clutch Plates

Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Plates Installation

Callout	Component Name
1	4-5-6 Clutch (Waved) Plate
2	4-5-6 Clutch Plate • 6L80 - Qty: 6 • 6L90 - Qty: 7
3	4-5-6 Clutch Plate Assembly • 6L80 - Qty: 6 • 6L90 - Qty: 7
4	4-5-6 Clutch Backing Plate
5	4-5-6 Clutch Backing Plate Retaining Ring NOTE: After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to <u>4-5-6 Clutch Backing Plate Retaining Ring Measurement</u>.

4-5-6 CLUTCH BACKING PLATE RETAINING RING MEASUREMENT

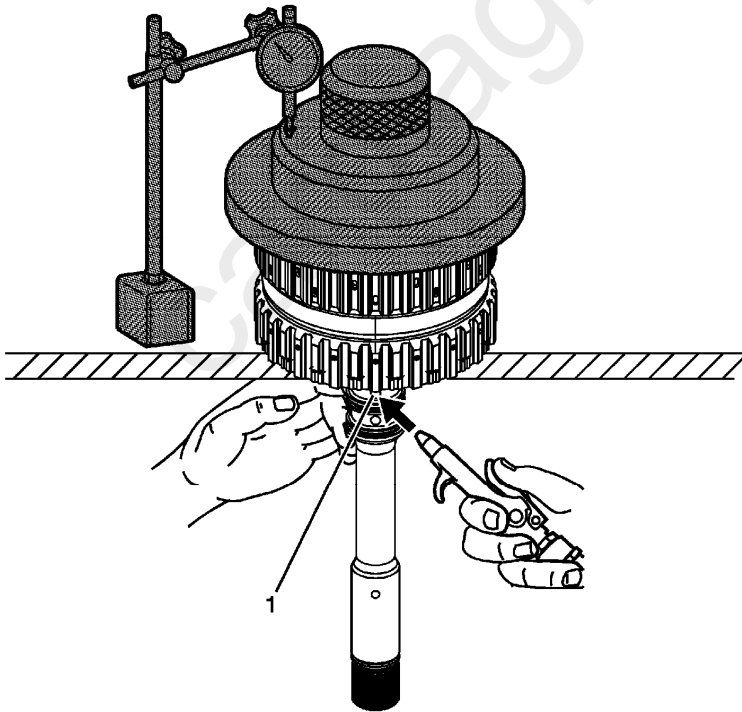


Fig. 56: Measuring 4-5-6 Clutch Backing Plate Retaining Ring
Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Backing Plate Retaining Ring Measurement

Callout	Component Name
Preliminary Procedures 1. Install the clutch assembly into a hole in the workbench 2. Zero out the dial indicator on the DT 47868-1 pack travel weight.	
Special Tools • DT 47868-1 Pack Travel Weight • GE 8001 Dial Indicator Set • GE 26900-13 Magnetic Base	
For equivalent regional tools, refer to Special Tools .	
1	4-5-6 Clutch Apply Passage NOTE: While using one finger to block the top passage hole on the turbine shaft, apply compressed air to the opposite top passage hole, and observe the dial indicator measurement. Refer to <u>Clutch Backing Plate Retaining Ring Specifications (6L90)</u> , <u>Clutch Backing Plate Retaining Ring Specifications (6L45)</u> to determine the correct retainer.

1-2-3-4 AND 3-5 REVERSE CLUTCH OVERHAUL (6L45)

1-2-3-4 and 3-5 Reverse Clutch Plates Removal

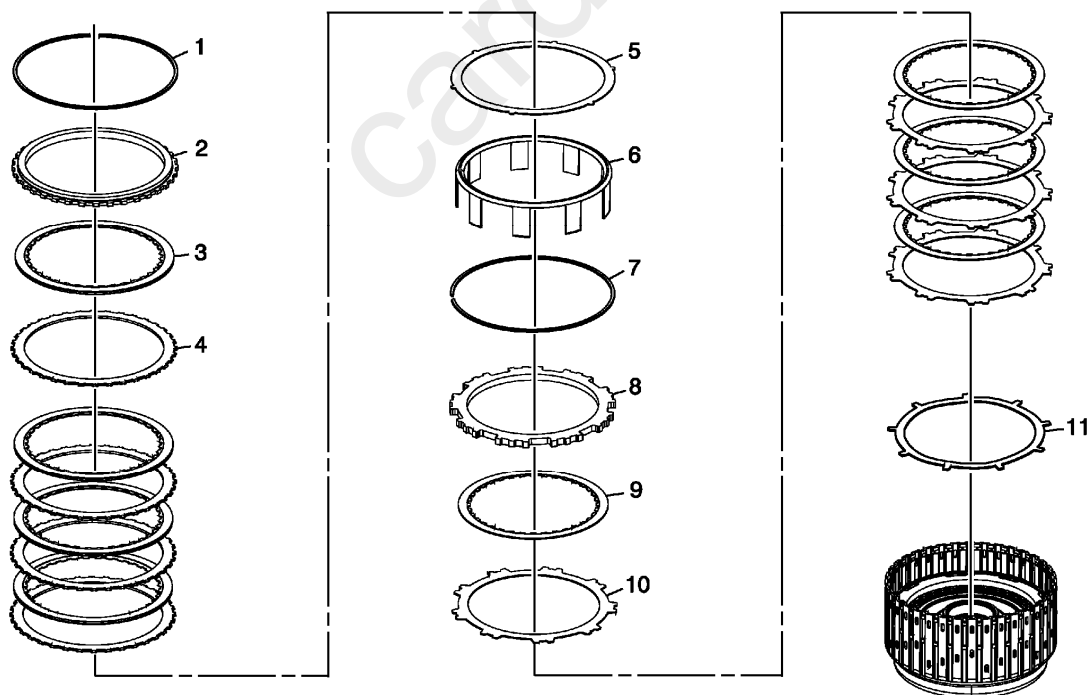


Fig. 57: 1-2-3-4 And 3-5 Reverse Clutch Plates (6L45)

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Plates 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 Plate Assembly (Qty: 4)
4	3-5 Reverse Clutch Plate (Qty: 4)
5	3-5 Reverse Clutch (Waved) Plate
6	3-5 Reverse Clutch Apply Ring
7	1-2-3-4 Clutch Backing Plate Retaining Ring
8	1-2-3-4 Clutch Backing Plate
9	1-2-3-4 Clutch Plate Assembly (Qty: 4)
10	1-2-3-4 Clutch Plate (Qty: 4)
11	1-2-3-4 Clutch (Waved) Plate

1-2-3-4 Clutch Piston Removal

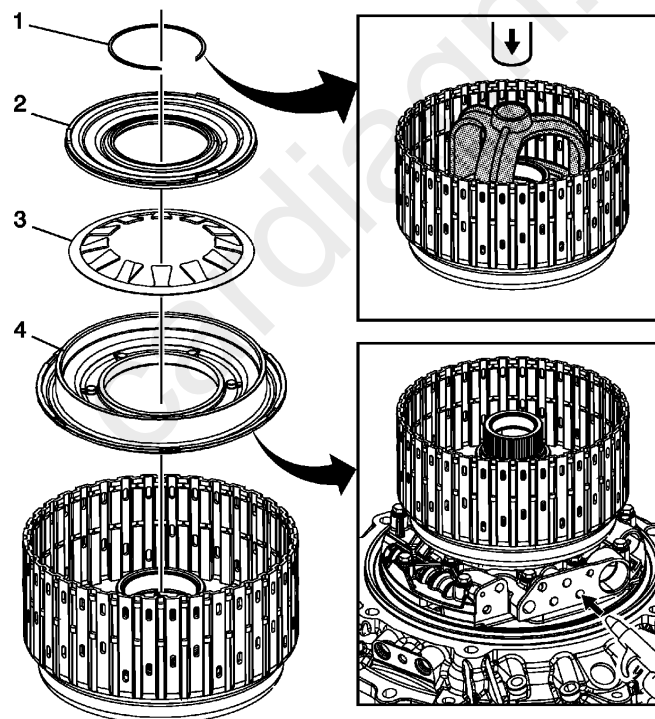


Fig. 58: 1-2-3-4 Clutch Piston (6L45)

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Piston Removal

Callout	Component Name

1	1-2-3-4 Clutch Piston Dam Retaining Ring. CAUTION: Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool J 38734 Intermediate Spring Compressor Adapter For equivalent regional tools, refer to Special Tools .
2	1-2-3-4 Clutch Piston Dam Assembly
3	1-2-3-4 Clutch Spring
4	1-2-3-4 Clutch Piston NOTE: • It may be necessary to apply air to the apply passage in order to remove the piston. Install the 1-2-3-4 and 3-5 reverse clutch housing assembly onto the torque converter (with fluid pump) housing assembly in order to apply air. • After air is applied, it may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

3-5 Reverse Clutch Piston Removal

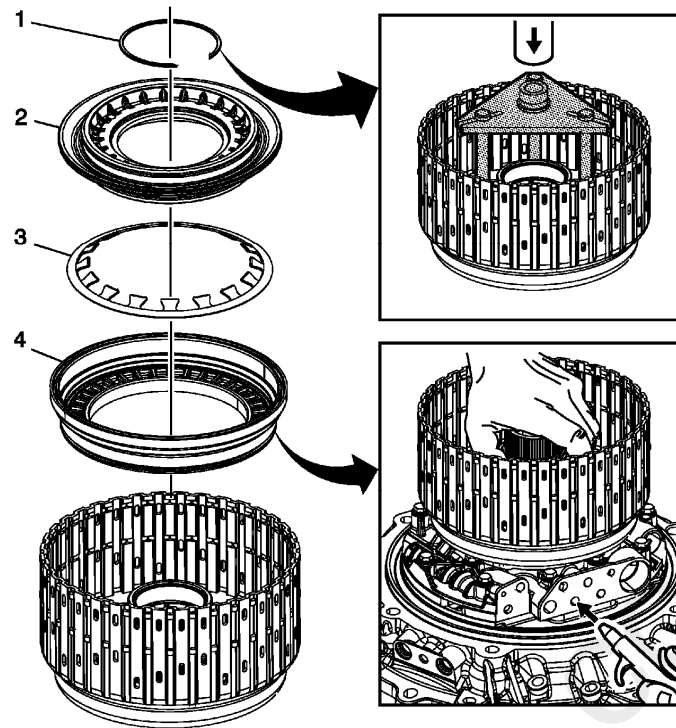


Fig. 59: 3-5 Reverse Clutch Piston (6L45)
 Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Piston Removal

Callout	Component Name
1	1-2-3-4 Clutch Piston Housing Retaining Ring CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool DT 47867 Adjustable Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .
2	1-2-3-4 Clutch Piston Housing
3	3-5 Reverse Clutch Spring
4	3-5 Reverse Clutch Piston Procedure 1. It may be necessary to apply air to the apply passage in order to remove the piston. 2. Install the 1-2-3-4 and 3-5 reverse clutch housing assembly onto the torque converter (with fluid pump) housing assembly in order to apply air. 3. Apply hand pressure on the 1-2-3-4 clutch piston housing while applying compressed air to the apply passage in order to unseat the 3-5 reverse clutch piston.

NOTE:

After air is applied, it may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

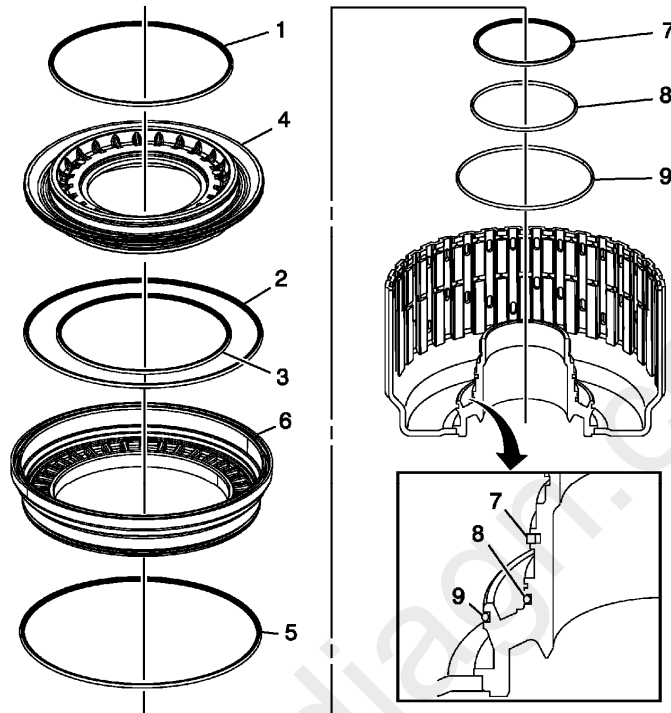


Fig. 60: 1-2-3-4 And 3-5 Reverse Clutch Piston Seals (6L45)

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

Callout	Component Name
CAUTION: Refer to <u>Seal Reuse Caution</u> .	
Preliminary Procedure Lubricate all seals with automatic transmission fluid (ATF) prior to installation.	
1	1-2-3-4 Clutch Piston Seal
2	3-5 Reverse Clutch Piston Dam (O-Ring) Seal
3	3-5 Reverse Clutch Piston Inner Seal
4	1-2-3-4 Clutch Piston Housing
5	3-5 Reverse Clutch Piston Outer Seal
6	3-5 Reverse Clutch Piston
	1-2-3-4 Clutch Piston Inner Seal
CAUTION:	

7	Do not install a NEW 1-2-3-4 clutch piston inner seal yet. A special tool used to install the 1-2-3-4 clutch piston housing retaining ring may damage the seal if the seal is installed prior to installing the retaining ring. Refer to 3-5 Reverse Clutch Piston Installation.
8	1-2-3-4 Clutch Piston Housing Seal
9	1-2-3-4 Clutch Piston Housing Seal

3-5 Reverse Clutch Piston Installation

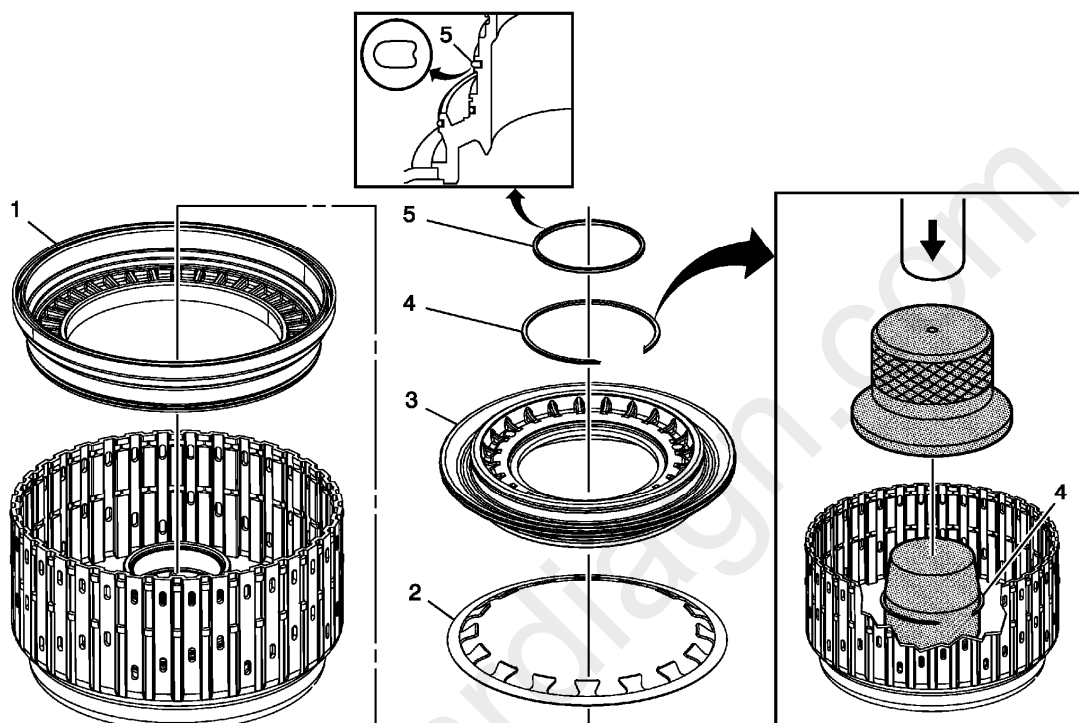


Fig. 61: 3-5 Reverse Clutch Piston (6L45)
Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Piston Installation

Callout	Component Name
1	3-5 Reverse Clutch Piston
2	3-5 Reverse Clutch Spring CAUTION: Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Piston Housing
	1-2-3-4 Clutch Piston Housing Retaining Ring CAUTION: Before using the DT 47782-2, push the retaining ring over the DT 47782-1 by hand so

4	that the ring is positioned below the tapered area of the DT 47782-1. If the ring is positioned above the tapered area when it is being installed, the ring will become lodged between both tools and damage to the tools, retaining ring, and piston housing will result. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . CAUTION: Push the retaining ring down over the cone until the ring seats firmly in the retaining ring groove. The retaining ring will make a distinctive click sound when it seats. Failure to properly seat the retaining ring may cause damage to the 3-5 reverse clutch assembly. NOTE: Use a screwdriver in order to verify the retaining ring is fully seated into the groove. It may appear as though the retaining ring is not fully seated, since the groove is shallow by design. However, this shallow interface is normal. Special Tools • DT 47782-1 Retaining Ring Cone • DT 47782-2 Retaining Ring Installer For equivalent regional tools, refer to <u>Special Tools</u> .
5	1-2-3-4 Clutch Piston Inner Seal CAUTION: Install a NEW seal and orientate as shown. Failure to do so may cause internal transmission leaks and damage to the transmission.

1-2-3-4 Clutch Piston Installation

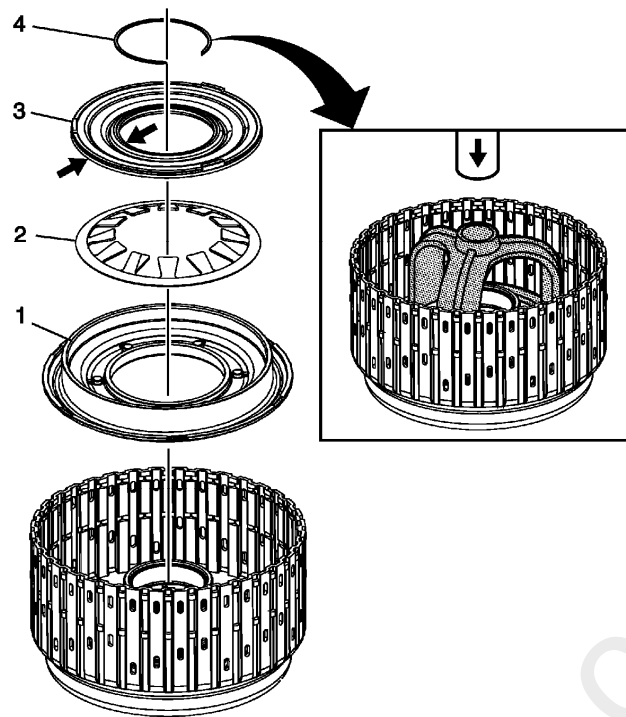


Fig. 62: 1-2-3-4 Clutch Piston (6L45)
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Piston Installation

Callout	Component Name
1	1-2-3-4 Clutch Piston
2	1-2-3-4 Clutch Spring CAUTION: Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Piston Dam Assembly NOTE: Lubricate the inner and outer surfaces of the dam assembly with ATF in order to ease installation into the piston. Install the tabs facing up.
4	1-2-3-4 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> .

Special Tool

J 38734 Intermediate Spring Compressor Adapter

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

1-2-3-4 Clutch Plate Installation

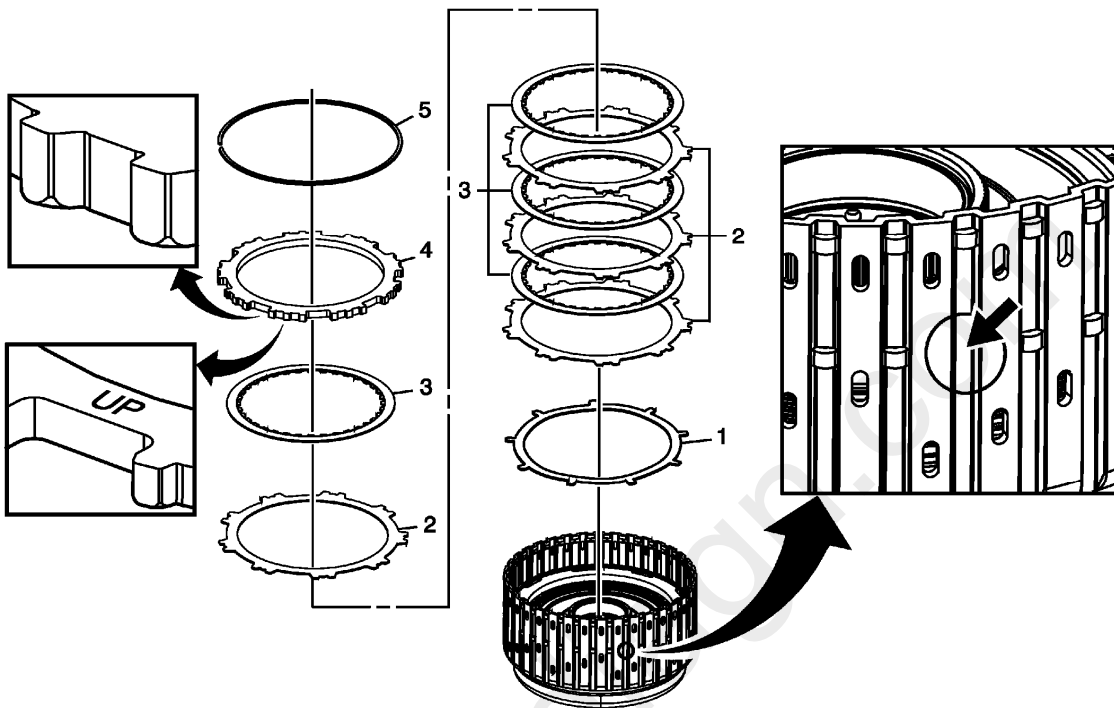


Fig. 63: 1-2-3-4 Clutch Plate (6L45)

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Plate Installation

Callout	Component Name
1	1-2-3-4 Clutch (Waved) Plate 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.
2	1-2-3-4 Clutch Plate (Qty: 4) CAUTION: Ensure all clutch plates are centered in the housing. When installing the first steel clutch plate, ensure an opening between the external splines is centered over the missing snap ring groove punch in the housing. Align the external splines of each remaining steel clutch plate with the first steel clutch plate. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Plate Assembly (Qty: 4)

4	1-2-3-4 Clutch Backing Plate CAUTION: Align the external splines of the backing plate with the external splines of the steel clutch plates. Failure to do so may cause damage to the clutch assembly. CAUTION: Ensure the 1-2-3-4 Clutch Backing Plate is installed correctly to prevent mechanical damage.
5	1-2-3-4 Clutch Backing Plate Retaining Ring CAUTION: Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly. NOTE: After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to <u>1-2-3-4 Clutch Backing Plate Retaining Ring Measurement</u>.

3-5 and Reverse Clutch Plate Installation

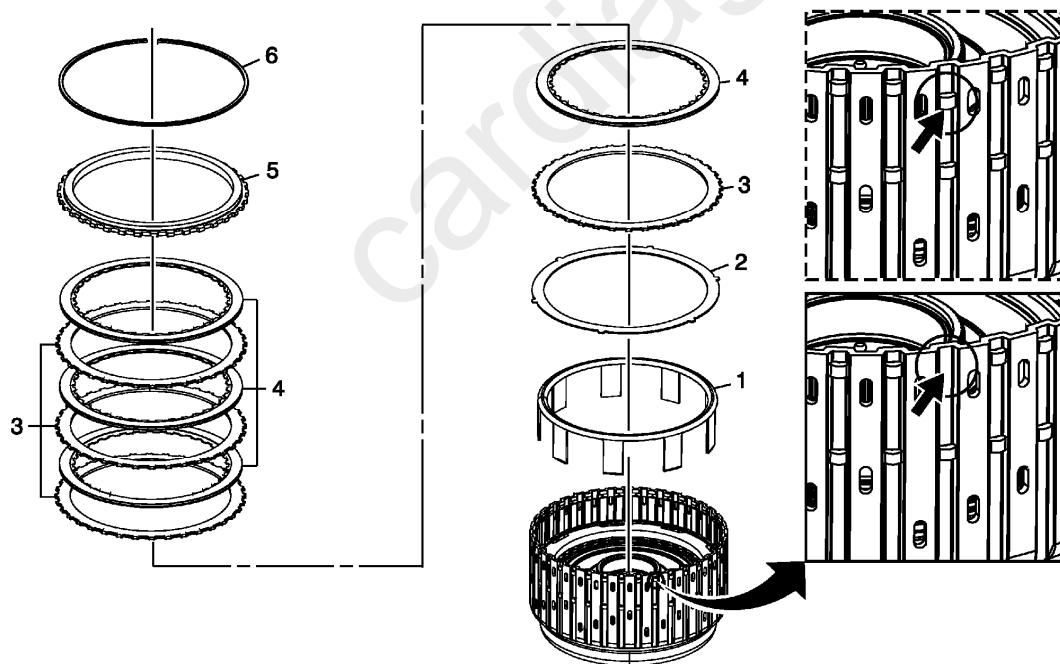


Fig. 64: 3-5 And Reverse Clutch Plate (6L45)
Courtesy of GENERAL MOTORS COMPANY

3-5 and Reverse Clutch Plate Installation

Callout	Component Name
1	3-5 Reverse Clutch Apply Ring CAUTION: Ensure apply ring legs are positioned into the 3-5 reverse clutch piston. Failure to do so may cause damage to the 3-5 reverse clutch assembly.
2	3-5 Reverse Clutch (Waved) Plate
3	3-5 Reverse Clutch Plate (Qty: 4)
4	3-5 Reverse Clutch Plate Assembly (Qty: 4)
5	3-5 Reverse Clutch Backing Plate
6	3-5 Reverse Clutch Backing Plate Retaining Ring CAUTION: Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly. NOTE: After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to <u>3-5 Reverse Clutch Backing Plate Retaining Ring Measurement (6L45)</u> .

1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

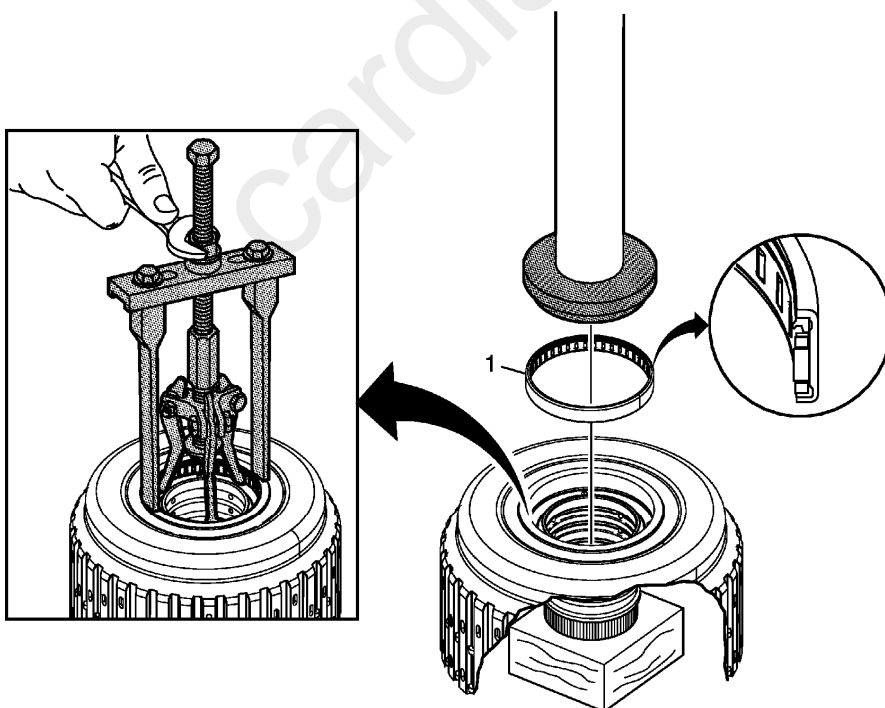


Fig. 65: 1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

Callout	Component Name
1	3-5 Reverse Clutch Bearing CAUTION: Install the NEW bearing assembly with the seal side up. Improper installation of the bearing may cause damage to the transmission. CAUTION: Do not use a hammer or other striking tool that may cause damage to the bearing and housing. Use care to ensure the bearing is installed slowly and evenly using an arbor press supporting the inner hub. Do not support by the housing or fracture will result. CAUTION: Do not reuse the bearing. Install a NEW bearing. Reusing an old bearing may cause damage to the transmission. Procedure Install the bearing flush to 0.3 mm below the thrust surface. Special Tools • DT 47865 Bearing Remover • DT 47866 Bearing Installer • J 45124 Removal Bridge For equivalent regional tools, refer to <u>Special Tools</u> .

1-2-3-4 AND 3-5 REVERSE CLUTCH OVERHAUL (6L45/6L90)

1-2-3-4 and 3-5 Reverse Clutch Plates Removal

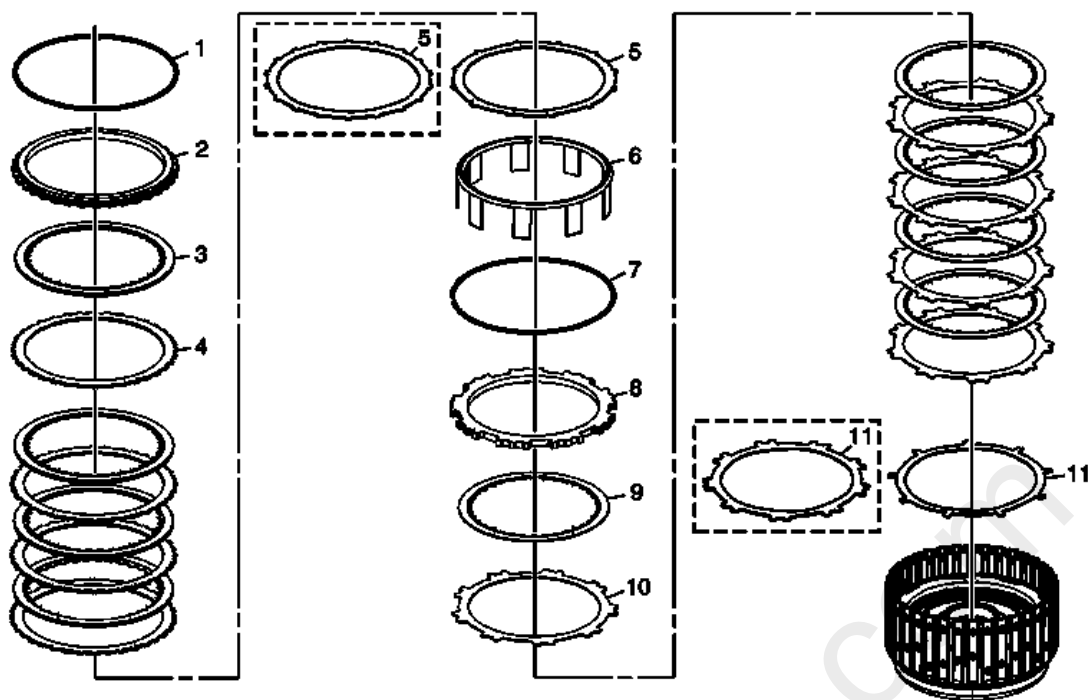


Fig. 66: Removing 1-2-3-4 and 3-5 Reverse Clutch Plates
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Plates 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 Plate Assembly Procedure - Remove Qty: 4 plates - 6L45/6L80 - Remove Qty: 4 or 5 plates - Model Dependent - 6L90
4	3-5 Reverse Clutch Plate Procedure - Remove Qty: 4 plates - 6L45/6L80 - Remove Qty: 4 or 5 plates - Model Dependent - 6L90
5	3-5 Reverse Clutch (Waved) Plate
6	3-5 Reverse Clutch Apply Ring
7	1-2-3-4 Clutch Backing Plate Retaining Ring
8	1-2-3-4 Clutch Backing Plate
	1-2-3-4 Clutch Plate Assembly

9	Procedure - Remove Qty: 5 plates - 6L45/6L80 - Remove Qty: 5 or 6 plates - Model Dependent - 6L90
10	1-2-3-4 Clutch Plate Procedure - Remove Qty: 5 plates - 6L45/6L80 - Remove Qty: 5 or 6 plates - Model Dependent - 6L90
11	1-2-3-4 Clutch (Waved) Plate

1-2-3-4 Clutch Piston Removal

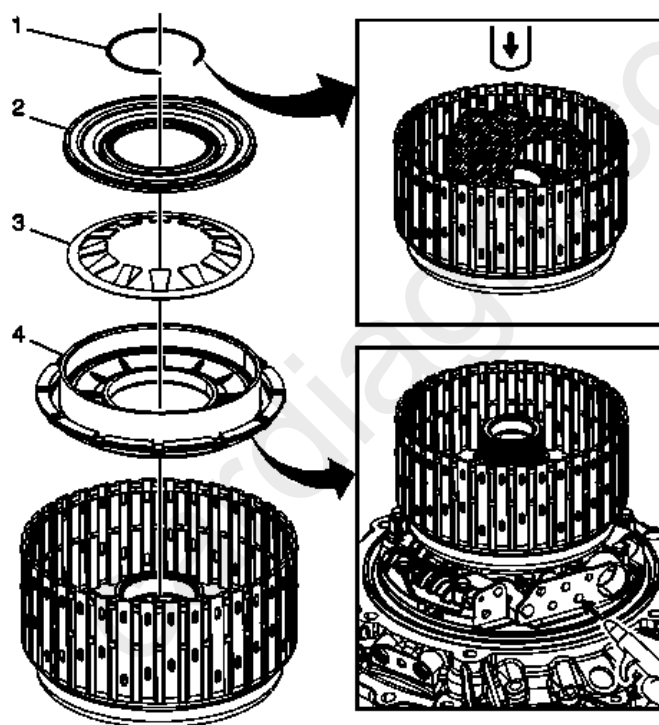


Fig. 67: Removing 1-2-3-4 Clutch Piston
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Piston Removal

Callout	Component Name
	1-2-3-4 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it.

1	CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool DT 38734 Intermediate Spring Compressor Adapter For equivalent regional tools, refer to Special Tools .
2	1-2-3-4 Clutch Piston Dam Assembly
3	1-2-3-4 Clutch Spring
4	1-2-3-4 Clutch Piston NOTE: • It may be necessary to apply air to the apply passage in order to remove the piston. Install the 1-2-3-4 clutch housing onto the torque converter (with fluid pump) housing assembly in order to apply air. • After air is applied, it may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

3-5 Reverse Clutch Piston Removal

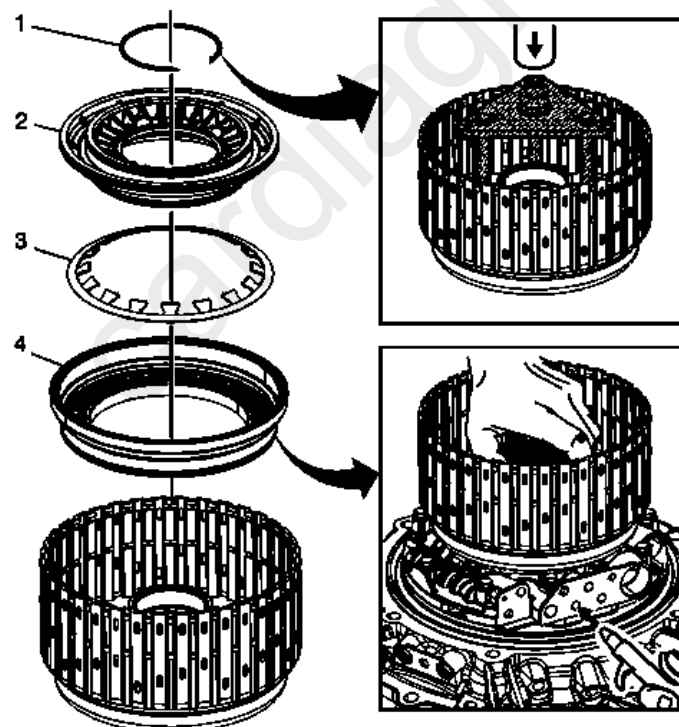


Fig. 68: Removing 3-5 Reverse Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Piston Removal

Callout	Component Name
Preliminary Procedures 1. Install the 1-2-3-4 and 3-5 reverse clutch housing assembly onto the torque converter (with fluid pump) housing assembly. 2. Apply hand pressure on the 1-2-3-4 clutch piston housing while applying compressed air to the apply passage in order to unseat the 3-5 reverse clutch piston.	
1	1-2-3-4 Clutch Piston Housing Retaining Ring CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool DT 47867 Adjustable Clutch Spring Compressor For equivalent regional tools, refer to <u>Special Tools</u> .
2	1-2-3-4 Clutch Piston Housing
3	3-5 Reverse Clutch Spring
4	3-5 Reverse Clutch Piston NOTE: It may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

3-5 Reverse Clutch Air Bleed Inspection (6L90)

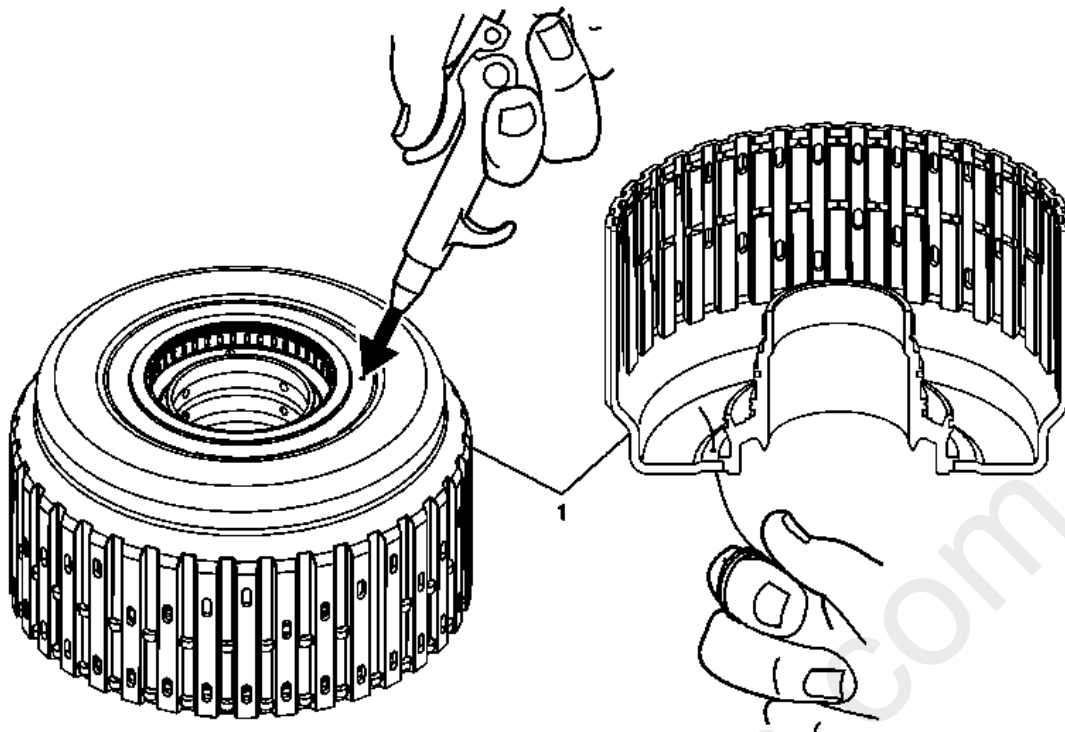


Fig. 69: Using Compressed Air To Ensure Unblocked Bleed Passage
 Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Air Bleed Inspection (6L90)

Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Housing Assembly Procedure Ensure the air bleed passage is clear and free from obstructions by using a fine wire and also compressed air.

3-5 Reverse Clutch Housing Inspection Disassembled

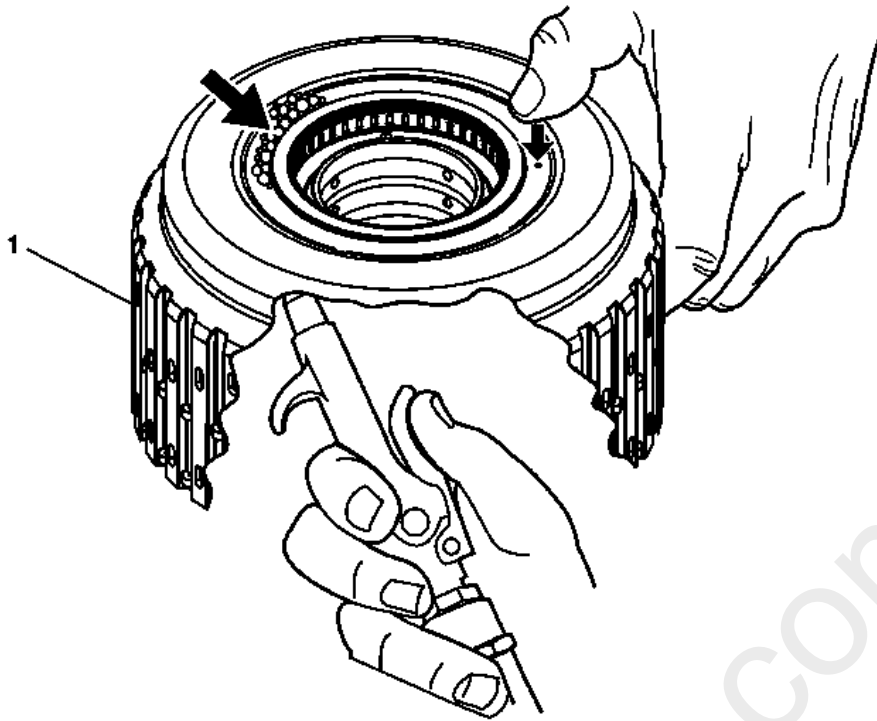


Fig. 70: Inspecting 3-5 Reverse Clutch Housing (6L45/6L90)
 Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Housing Inspection Disassembled

Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Housing Assembly Procedure 1. Apply soap compound to weld area of housing. 2. Hold thumb over the air bleed passage. 3. For disassembled 1-2-3-4 and 3-5 reverse clutch housing spray compressed air onto the housing / hub joint and inspect weld area for bubbles. 4. If bubbles are detected a new housing is required.

3-5 Reverse Clutch Housing Inspection Assembled

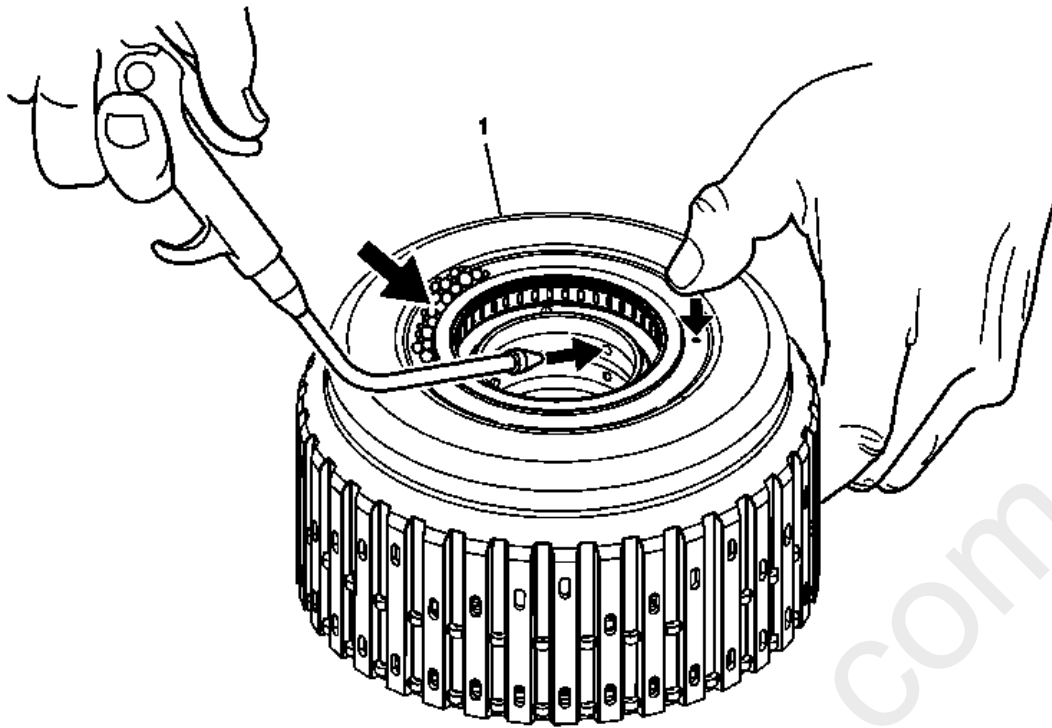


Fig. 71: Inspecting 3-5 Reverse Clutch Housing (6L45/6L90)
 Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Housing Inspection Assembled

Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Housing Assembly Procedure 1. Apply soap compound to weld area of housing. 2. Hold thumb over the air bleed passage. 3. For fully assembled 1-2-3-4 and 3-5 reverse clutch housing spray compressed air into the 3-5R clutch feed hole and inspect weld area for bubbles. 4. If bubbles are detected a new housing is required.

1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

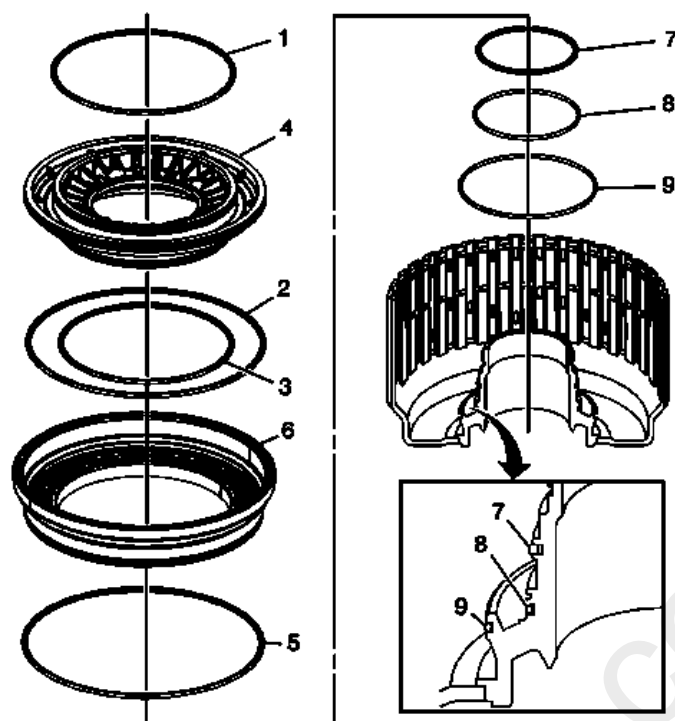


Fig. 72: 1-2-3-4 and 3-5 Reverse Clutch Piston Seals
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

Callout	Component Name
CAUTION: Refer to <u>Seal Reuse Caution</u> .	
Preliminary Procedure Lubricate all seals with automatic transmission fluid (ATF) prior to installation.	
1	1-2-3-4 Clutch Piston Seal
2	3-5 Reverse Clutch Piston Dam (O-Ring) Seal
3	3-5 Reverse Clutch Piston Inner Seal
4	1-2-3-4 Clutch Piston Housing
5	3-5 Reverse Clutch Piston Outer Seal
6	3-5 Reverse Clutch Piston
7	1-2-3-4 Clutch Piston Inner Seal CAUTION: Do not install a NEW 1-2-3-4 clutch piston inner seal yet. A special tool used to install the 1-2-3-4 clutch piston housing retaining ring may damage the seal if the seal is installed prior to installing the retaining ring. Refer to 3-5 Reverse Clutch Piston Installation.
8	1-2-3-4 Clutch Piston Housing Seal
9	1-2-3-4 Clutch Piston Housing Seal

3-5 Reverse Clutch Piston Installation

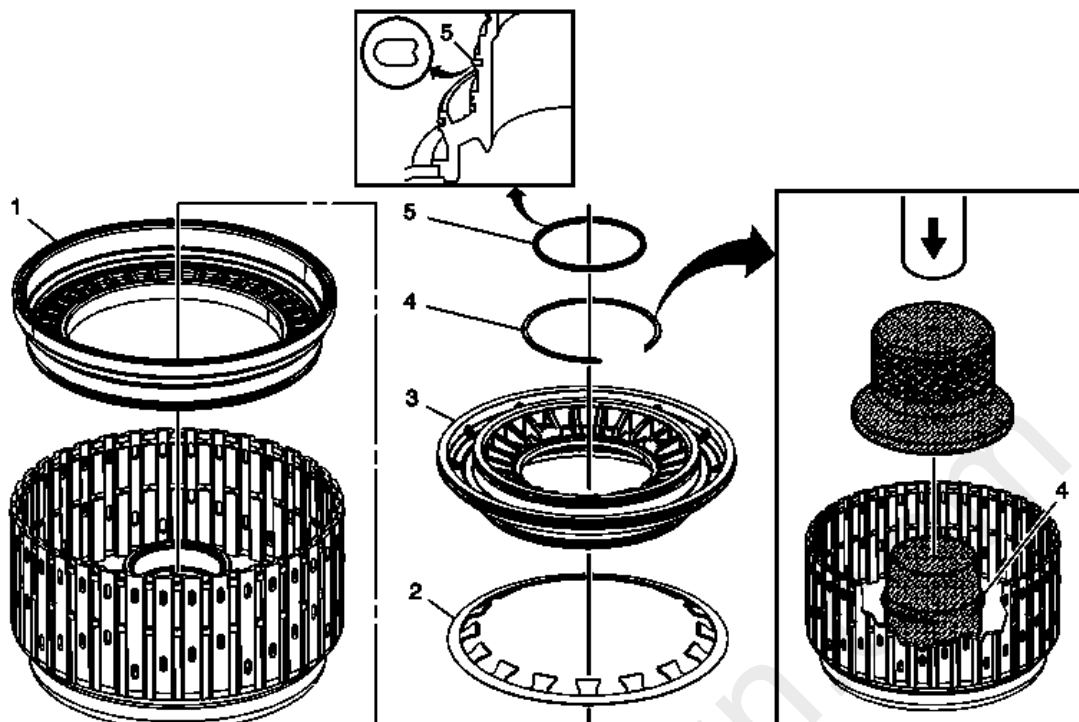


Fig. 73: 3-5 Reverse Clutch Piston
Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Piston Installation

Callout	Component Name
1	3-5 Reverse Clutch Piston
2	3-5 Reverse Clutch Spring CAUTION: Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Piston Housing
	1-2-3-4 Clutch Piston Housing Retaining Ring CAUTION: Before using the DT 47782-2, push the retaining ring over the DT 47782-1 by hand so that the ring is positioned below the tapered area of the DT 47782-1. If the ring is positioned above the tapered area when it is being installed, the ring will become lodged between both tools and damage to the tools, retaining ring, and piston housing will result. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> .

4	CAUTION: Push the retaining ring down over the cone until the ring seats firmly in the retaining ring groove. The retaining ring will make a distinctive click sound when it seats. Failure to properly seat the retaining ring may cause damage to the 3-5 reverse clutch assembly. NOTE: Use a screwdriver in order to verify the retaining ring is fully seated into the groove. It may appear as though the retaining ring is not fully seated, since the groove is shallow by design. However, this shallow interface is normal. Special Tools • DT 47782-1 Retaining Ring Cone • DT 47782-2 Retaining Ring Installer For equivalent regional tools, refer to Special Tools .
5	1-2-3-4 Clutch Piston Inner Seal CAUTION: Install a NEW seal and orientate as shown. Failure to do so may cause internal transmission leaks and damage to the transmission.

1-2-3-4 Clutch Piston Installation

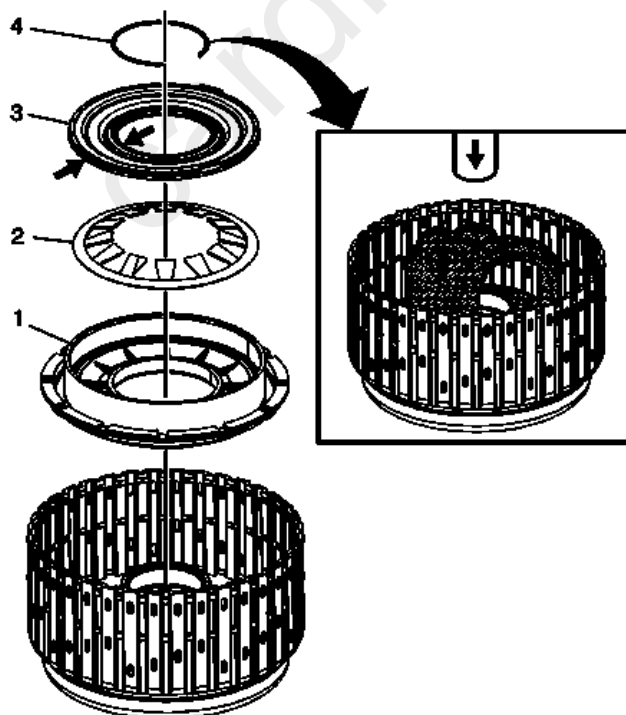


Fig. 74: 1-2-3-4 Clutch Piston

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Piston Installation

Callout	Component Name
1	1-2-3-4 Clutch Piston
2	1-2-3-4 Clutch Spring CAUTION: Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Piston Dam Assembly NOTE: Lubricate the inner and outer surfaces of the dam assembly with ATF in order to ease installation into the piston. Install the tabs facing up.
4	1-2-3-4 Clutch Piston Dam Retaining Ring CAUTION: Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it. CAUTION: Refer to <u>Retaining Ring Reuse Caution</u> . Special Tool DT 38734 Intermediate Spring Compressor Adapter For equivalent regional tools, refer to <u>Special Tools</u> .

1-2-3-4 Clutch Plate Installation

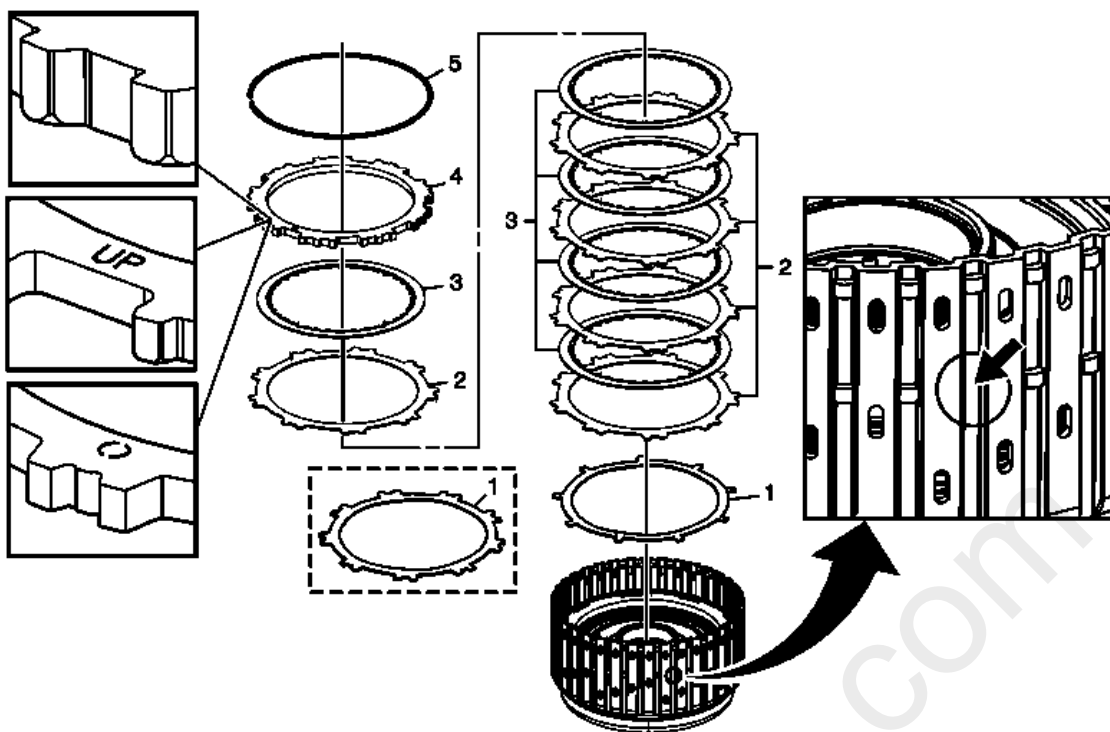


Fig. 75: 1-2-3-4 Clutch Plate
Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 Clutch Plate Installation

Callout	Component Name
1	1-2-3-4 Clutch (Waved) Plate CAUTION: Ensure an opening between the external splines of the waved plate is centered over the missing snap ring groove punch in the housing. Failure to do so may cause damage to the clutch assembly.
2	1-2-3-4 Clutch Plate CAUTION: Ensure all clutch plates are centered in the housing. When installing the first steel clutch plate, ensure an opening between the external splines is centered over the missing snap ring groove punch in the housing. Align the external splines of each remaining steel clutch plate with the first steel clutch plate. Failure to do so may cause damage to the clutch assembly. Procedure • Install Qty: 5 plates - 6L45/6L80 • Install Qty: 5 or 6 plates - Model Dependent - 6L90
	1-2-3-4 Clutch Plate Assembly

3	Procedure • Install Qty: 5 plates - 6L45/6L80 • Install Qty: 5 or 6 plates - Model Dependent - 6L90
4	1-2-3-4 Clutch Backing Plate CAUTION: Align the external splines of the backing plate with the external splines of the steel clutch plates. Failure to do so may cause damage to the clutch assembly. CAUTION: Ensure the 1-2-3-4 Clutch Backing Plate is installed correctly to prevent mechanical damage. Procedure If the plate has UP stamped on it, install that side up. If the plate has 3 circle marks spaced 120 degrees apart stamped on it, install that side up. If no identification marks are present, install sharp edge up, chamfer side down.
5	1-2-3-4 Clutch Backing Plate Retaining Ring CAUTION: Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly. NOTE: After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to <u>1-2-3-4 Clutch Backing Plate Retaining Ring Measurement</u>.

3-5 and Reverse Clutch Plate Installation

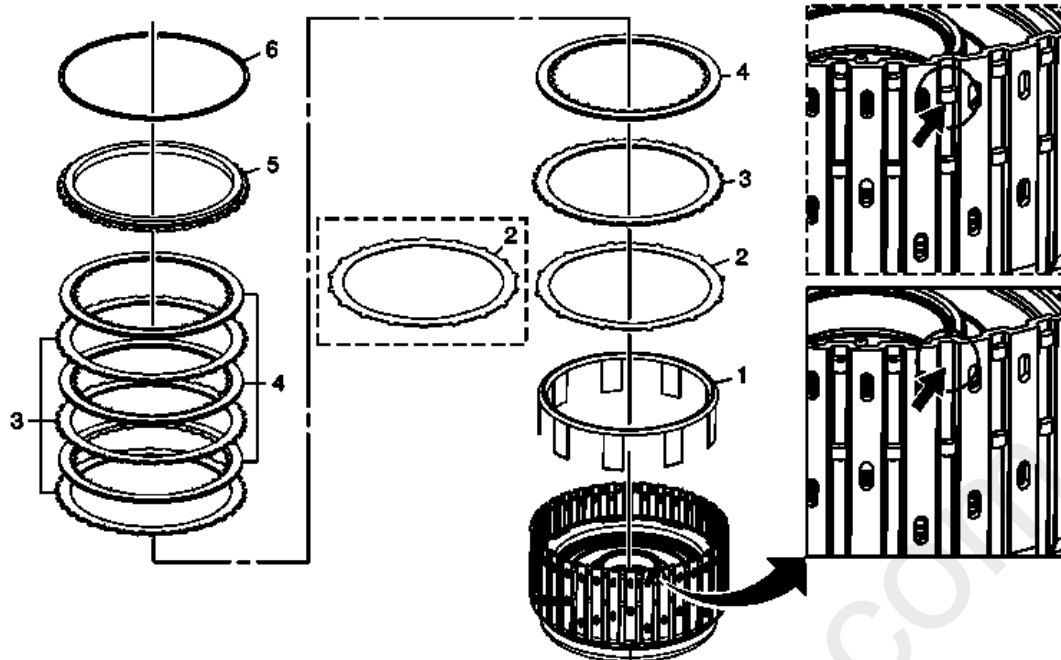


Fig. 76: 3-5 and Reverse Clutch Plate
 Courtesy of GENERAL MOTORS COMPANY

3-5 and Reverse Clutch Plate Installation

Callout	Component Name
1	3-5 Reverse Clutch Apply Ring CAUTION: Ensure apply ring legs are positioned into the 3-5 reverse clutch piston. Failure to do so may cause damage to the 3-5 reverse clutch assembly.
2	3-5 Reverse Clutch (Waved) Plate
3	3-5 Reverse Clutch Plate Procedure • Install Qty: 4 plates - 6L45/6L80 • Install Qty: 4 or 5 plates - Model Dependent - 6L90
4	3-5 Reverse Clutch Plate Assembly Procedure • Install Qty: 4 plates - 6L45/6L80 • Install Qty: 4 or 5 plates - Model Dependent - 6L90
5	3-5 Reverse Clutch Backing Plate
	3-5 Reverse Clutch Backing Plate Retaining Ring

CAUTION:

Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly.

NOTE:

6

- After retaining ring is installed check 1-2-3-4 and 3-5 reverse clutch housing for weld leak. Refer to 3-5 Reverse Clutch Housing Inspection Assembled earlier in this procedure.
- After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to 3-5 Reverse Clutch Backing Plate Retaining Ring Measurement (6L90), 3-5 Reverse Clutch Backing Plate Retaining Ring Measurement (6L45).

1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

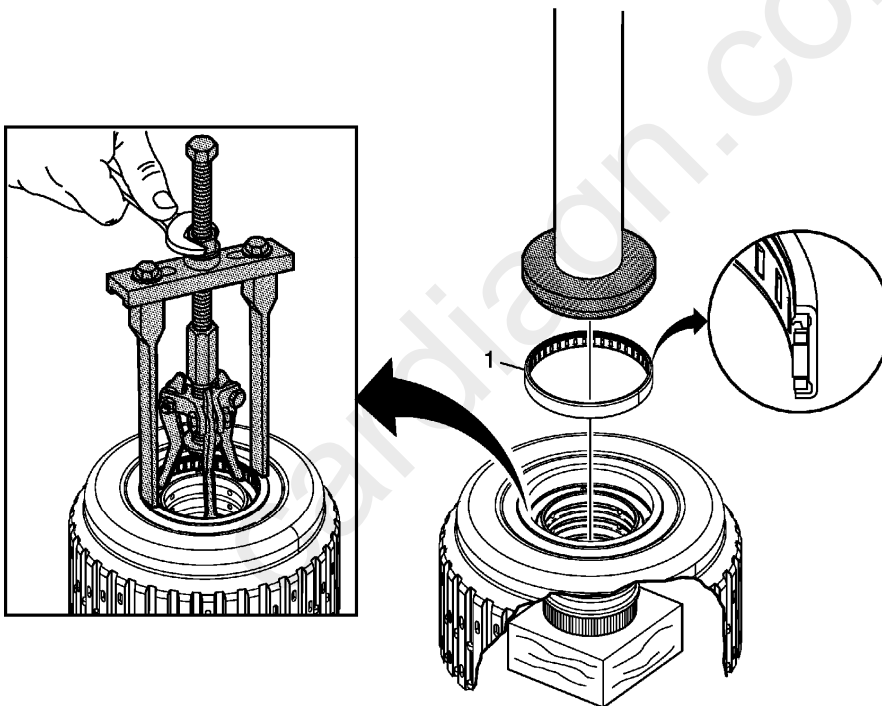


Fig. 77: 1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly
Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

Callout	Component Name
	3-5 Reverse Clutch Bearing
	CAUTION:

Install the NEW bearing assembly with the seal side up. Improper installation of the bearing may cause damage to the transmission.

CAUTION:

Do not use a hammer or other striking tool that may cause damage to the bearing and housing. Use care to ensure the bearing is installed slowly and evenly using an arbor press supporting the inner hub. Do not support by the housing or fracture will result.

CAUTION:

Do not reuse the bearing. Install a NEW bearing. Reusing an old bearing may cause damage to the transmission.

1

Procedure

Install the bearing flush to 0.3 mm (0.012 in) below the thrust surface.

Special Tools

- DT 47865 Bearing Remover
- DT 47866 Bearing Installer
- DT 45124 Removal Bridge

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

1-2-3-4 CLUTCH BACKING PLATE RETAINING RING MEASUREMENT

Fluid Passage Plug Kit Installation

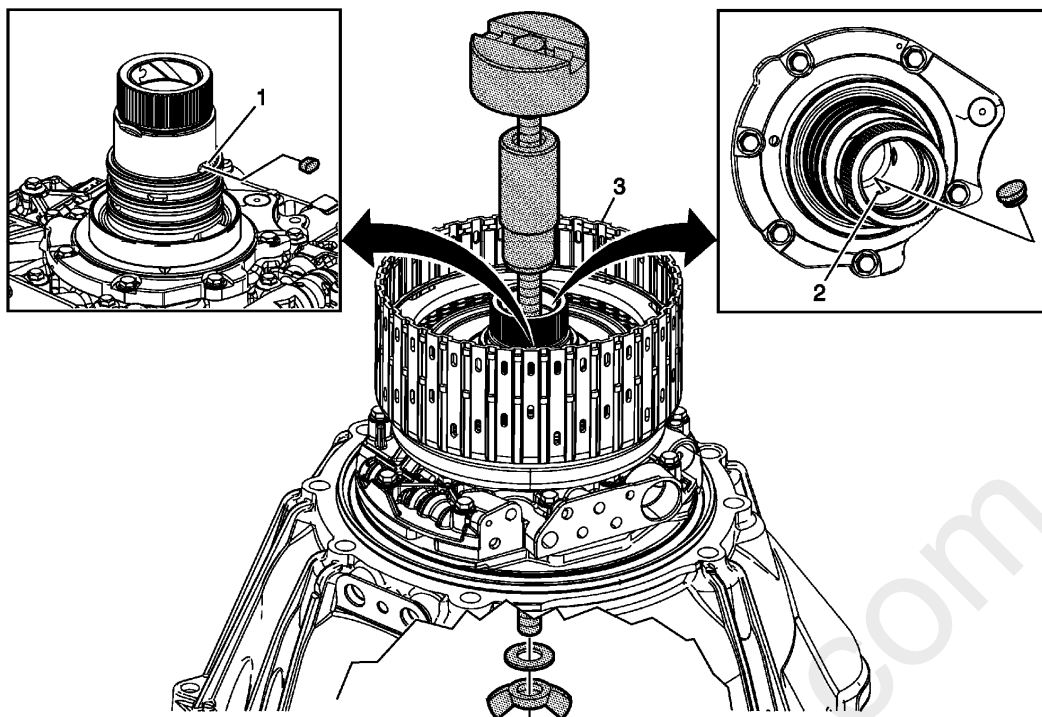


Fig. 78: View Of Fluid Passage Plug Kit Components
 Courtesy of GENERAL MOTORS COMPANY

Fluid Passage Plug Kit Installation

Callout	Component Name
Special Tools	
DT-49291 Clutch Travel Air Passage Plug Kit	
1	Compensator Feed Fluid Passage - Outer Procedure Install the tapered oval fluid passage plug DT-49291-4 which is part of DT-49291 clutch travel air passage plug kit , into the compensator feed fluid passage hole on the 1-2-3-4 and 3-5 reverse clutch support assembly. NOTE: The compensator feed fluid passage hole is the top outer hole on the 1-2-3-4 and 3-5 reverse clutch support assembly.
2	Compensator Feed Fluid Passage - Inner Procedure Install the round fluid passage plug DT-49291-5 which is part of DT-49291 clutch travel air passage plug kit , into the compensator feed fluid passage hole inside the 1-2-3-4 and 3-5 reverse clutch support assembly. NOTE: The compensator feed fluid passage hole is the middle inner hole in the 1-2-3-4 and 3-5 reverse clutch support assembly.
	1-2-3-4 and 3-5 Reverse Clutch Housing Assembly

Procedure

- 3
1. Ensure that the 1-2-3-4 clutch plates, backing plate and retaining ring are installed.
 2. Install the 1-2-3-4 and 3-5 reverse clutch housing onto the torque converter (with fluid pump) housing assembly.
 3. Install the applicable plug kit sleeve DT-49291-2 (6L90) or DT-49291-3 (6L45), cap DT-49291-1, bolt, washer and nut which are all part of **DT-49291** clutch travel air passage plug kit.

Apply Compressed Air and Measurement

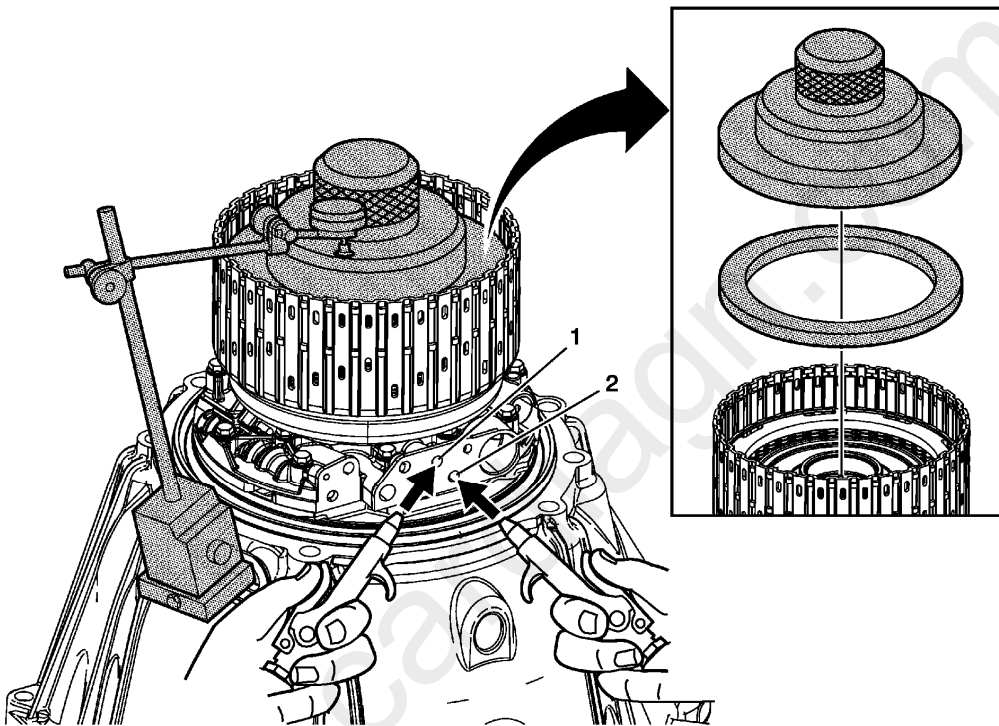


Fig. 79: 1-2-3-4 Clutch Backing Plate Retaining Ring Component View
Courtesy of GENERAL MOTORS COMPANY

Apply Compressed Air and Measurement

Callout	Component Name
Preliminary Procedures	
1.	Install the DT 47868-2 base adapter onto the torque converter housing.
2.	Install DT 47868-1 travel weight and DT-47868-3 travel weight adapter onto the 1-2-3-4 clutch backing plate.
3.	Install the GE 26900-13 magnetic base onto DT 47868-2 base adapter.
4.	Attach the GE 8001 dial indicator set to the GE 26900-13 magnetic base.

Special Tools

- DT 47868-1 Clutch Pack Travel Weight
- DT 47868-2 Magnetic Base Adapter
- DT-47868-3 Clutch Travel Weight Adapter
- GE 8001 Dial Indicator Set
- GE 26900-13 Magnetic Base

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

1	Compensator Feed Fluid Passage Procedure 1. Apply compressed air to the compensator feed fluid passage. 2. Zero out the dial indicator J 8001 dial indicator set.
2	1-2-3-4 Clutch Apply Passage Procedure While Applying compressed air to the compensator feed fluid passage, simultaneously apply compressed air to the 1-2-3-4 clutch apply passage. Do this at least 3 times and observe the dial indicator measurement each time. Refer to Clutch Backing Plate Retaining Ring Specifications (6L90) , Clutch Backing Plate Retaining Ring Specifications (6L45) .

3-5 REVERSE CLUTCH BACKING PLATE RETAINING RING MEASUREMENT (6L45)

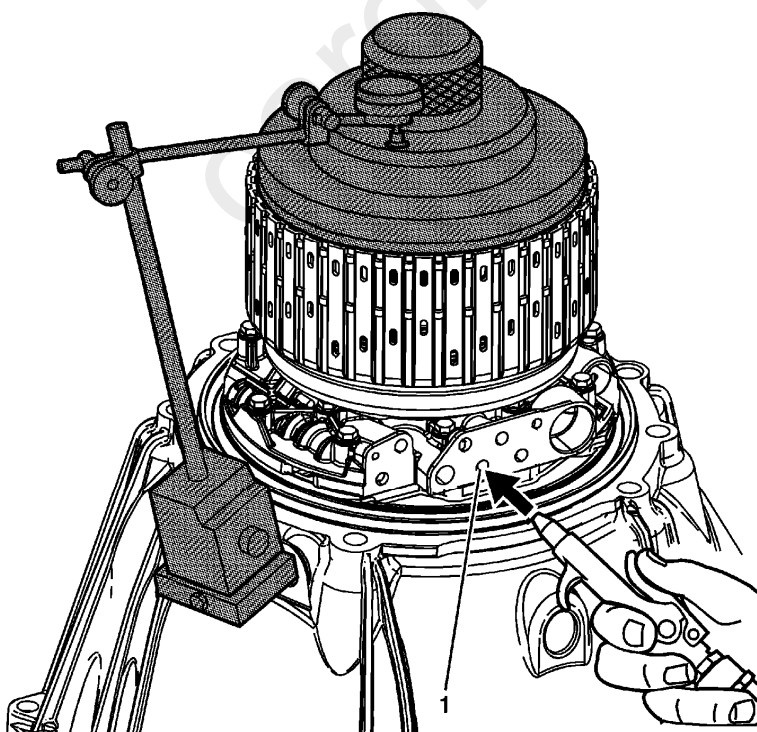


Fig. 80: 3-5 Reverse Clutch Backing Plate Retaining Ring Component View
 Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Backing Plate Retaining Ring Measurement (6L45)

Callout	Component Name
Preliminary Procedures 1. Install the 1-2-3-4 and 3-5 reverse clutch housing with the 1-2-3-4 and 3-5 reverse clutch plates installed, onto the torque converter housing. 2. Install the DT 47868-2 magnetic base adapter onto the torque converter housing. 3. Install DT 47868-1 clutch pack travel weight and DT 47868-3 clutch travel weight adapter (6L45 applications only) onto the 3-5 reverse clutch backing plate. 4. Install the J 26900-13 magnetic base onto DT 47868-2 magnetic base adapter. 5. Attach the J 8001 dial indicator set to the J 26900-13 magnetic base and zero out the dial indicator on the DT 47868-1 clutch pack travel weight.	
Special Tools • DT 47868-1 Clutch Pack Travel Weight • DT 47868-2 Magnetic Base Adapter • DT 47868-3 Clutch Travel Weight Adapter (6L45 applications only) • J 8001 Dial Indicator Set • J 26900-13 Magnetic Base	
For equivalent regional tools, refer to Special Tools .	
1	3-5 Reverse Clutch Apply Passage NOTE: Apply compressed air to the apply passage hole, and observe the dial indicator measurement. Refer to Clutch Backing Plate Retaining Ring Specifications (6L45) .

3-5 REVERSE CLUTCH BACKING PLATE RETAINING RING MEASUREMENT (6L90)

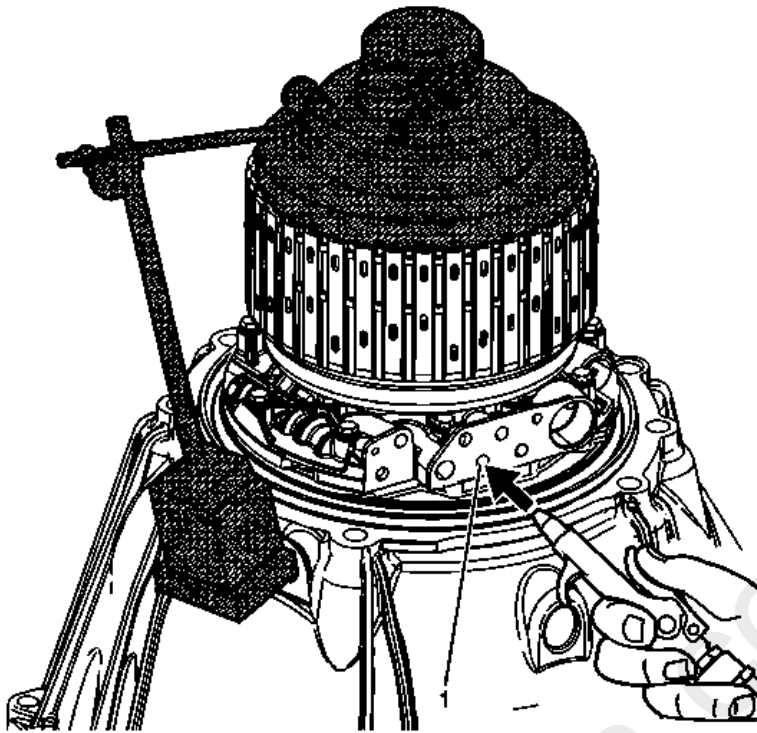


Fig. 81: View Of Backing Plate Retaining Ring
Courtesy of GENERAL MOTORS COMPANY

3-5 Reverse Clutch Backing Plate Retaining Ring Measurement (6L90)

Callout	Component Name
Preliminary Procedures	
1. Install the 1-2-3-4 and 3-5 reverse clutch housing with the 1-2-3-4 and 3-5 reverse clutch plates installed, onto the torque converter housing. 2. Install the DT 47868-2 magnetic base adapter onto the torque converter housing. 3. Install DT 47868-1 clutch pack travel weight onto the 3-5 reverse clutch backing plate. 4. Install the J 26900-13 magnetic base onto DT 47868-2 magnetic base adapter. 5. Attach the J 8001 dial indicator set to the J 26900-13 magnetic base and zero out the dial indicator on the DT 47868-1 clutch pack travel weight.	
Special Tools	
• DT 47868-1 Clutch Pack Travel Weight • DT 47868-2 Magnetic Base Adapter • J 8001 Dial Indicator Set • J 26900-13 Magnetic Base	
For equivalent regional tools, refer to Special Tools .	
	3-5 Reverse Clutch Apply Passage

1

NOTE:

Apply compressed air to the apply passage hole, and observe the dial indicator measurement. Refer to Clutch Backing Plate Retaining Ring Specifications (6L90) .

TORQUE CONVERTER HOUSING WITH FLUID PUMP DISASSEMBLE

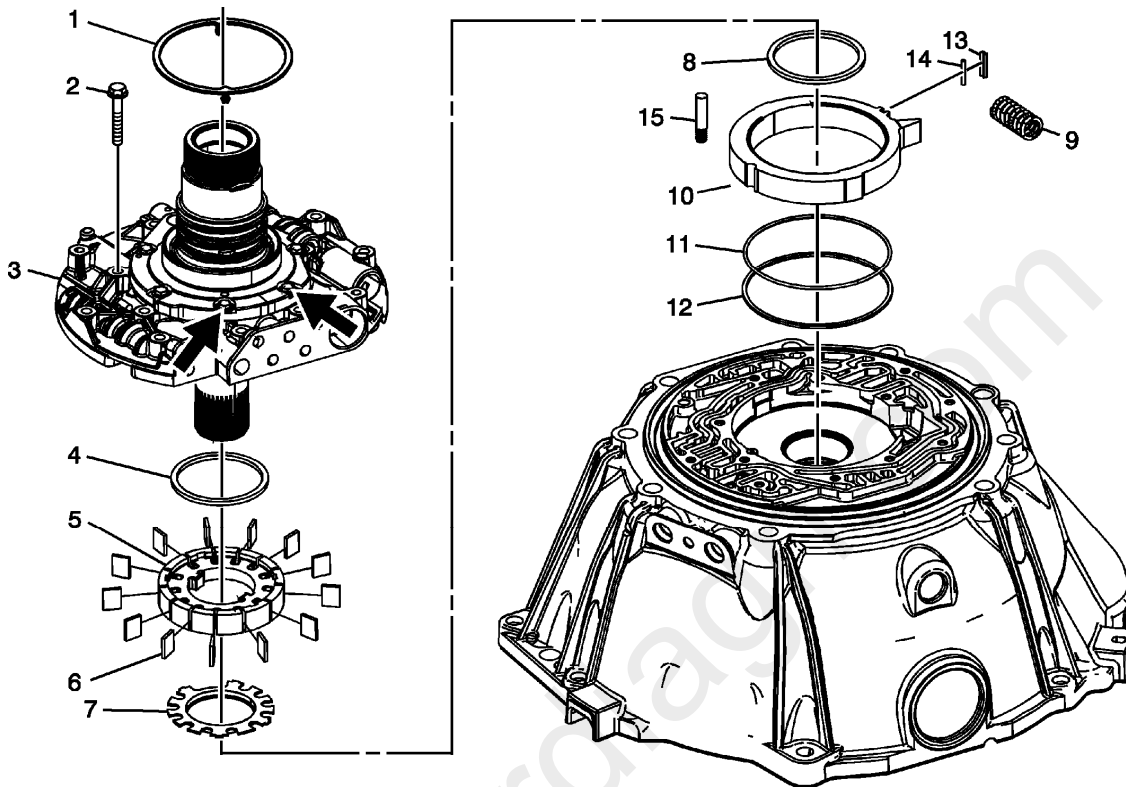


Fig. 82: Torque Converter Housing with Fluid Pump Component View
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Disassemble

Callout	Component Name
CAUTION: Do not loosen or remove the 6 bolts securing the clutch support to the pump cover assembly. These bolts have been installed and torqued only after specific clutch support rotational requirements have been met. If the clutch support is not installed properly, damage to the transmission will occur.	
1	1-2-3-4 and 3-5 Reverse Clutch Housing Thrust Washer
2	Bolt M6 x 40 (Qty: 13)
3	Fluid Pump Cover Assembly
4	Fluid Pump Vane Ring
5	Fluid Pump Rotor
6	Fluid Pump Vanes (Qty: 13)
7	Fluid Pump Rotor Guide
8	Fluid Pump Vane Ring

9	Fluid Pump Slide Outer Spring
10	Fluid Pump Slide
11	Fluid Pump Slide (O-Ring) Seal
12	Fluid Pump Slide Fluid Seal Ring
13	Fluid Pump Slide Seal
14	Fluid Pump Slide Seal Support
15	Fluid Pump Slide Pivot Pin

FLUID PUMP COVER CLEANING AND INSPECTION

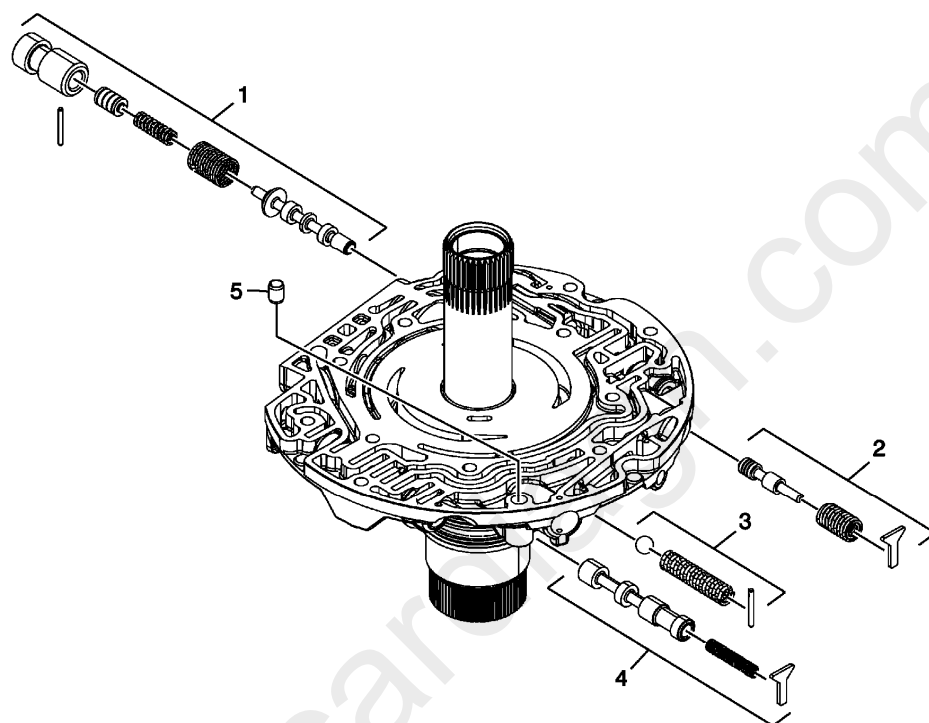


Fig. 83: View Of Fluid Pump Cover Components
Courtesy of GENERAL MOTORS COMPANY

Fluid Pump Cover Cleaning and Inspection

Callout	Component Name
WARNING: Valve springs can be tightly compressed. Use care when removing retainers and plugs. Personal injury could result.	
Preliminary Procedure Clean and inspect all components and machined surfaces.	
1	Pressure Regulator Valve Train
2	Converter Feed Limit Valve Train
3	Pressure Relief Ball Valve and Spring
4	TCC Control Valve and Spring

1-2-3-4 AND 3-5 REVERSE CLUTCH FLUID SEAL RING INSTALLATION (6L45)

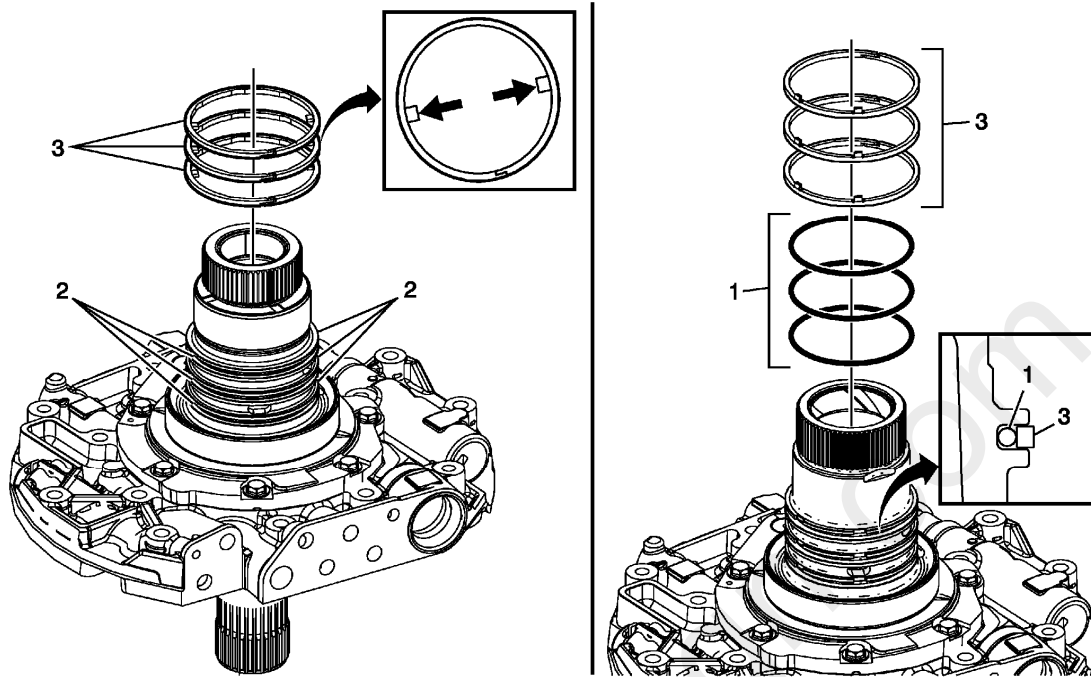


Fig. 84: 1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings (6L45)

Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Ring Installation (6L45)

Callout	Component Name
CAUTION: Do not use old seal rings. Install NEW seal rings. Reusing old seal rings may cause internal transmission leaks and transmission damage.	
1	1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings - Inner O-ring (Qty: 3) - Model Dependent
2	1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings Anti-rotation Slots
3	1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings (Qty: 3) NOTE: Ensure anti-rotation tabs on seal rings align with anti-rotation slots.

1-2-3-4 AND 3-5 REVERSE CLUTCH FLUID SEAL RING INSTALLATION (6L90)

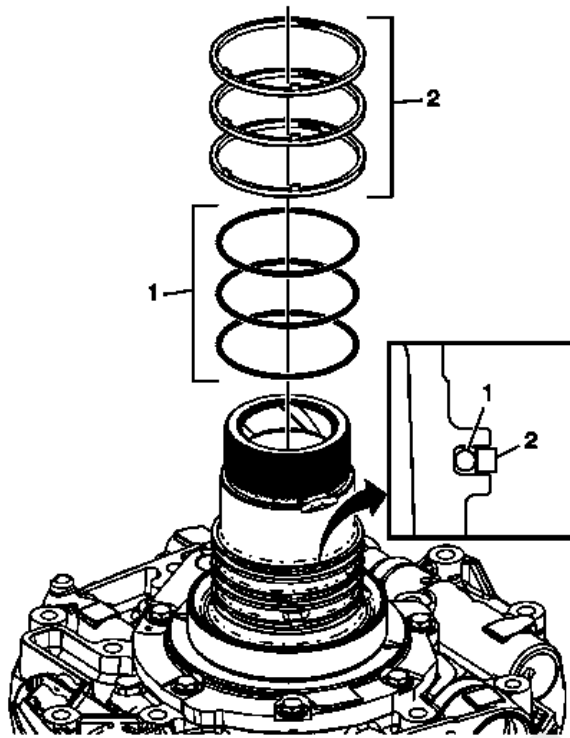


Fig. 85: 1-2-3-4 And 3-5 Reverse Clutch Fluid Seal Ring (6L90)
 Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Ring Installation (6L90)

Callout	Component Name
CAUTION: Do not use old seal rings. Install NEW seal rings. Reusing old seal rings may cause internal transmission leaks and transmission damage.	
1	1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings - Inner O-ring (Qty: 3)
2	1-2-3-4 and 3-5 Reverse Clutch Fluid Seal Rings - Outer (Qty: 3)

TORQUE CONVERTER HOUSING CLEANING AND INSPECTION

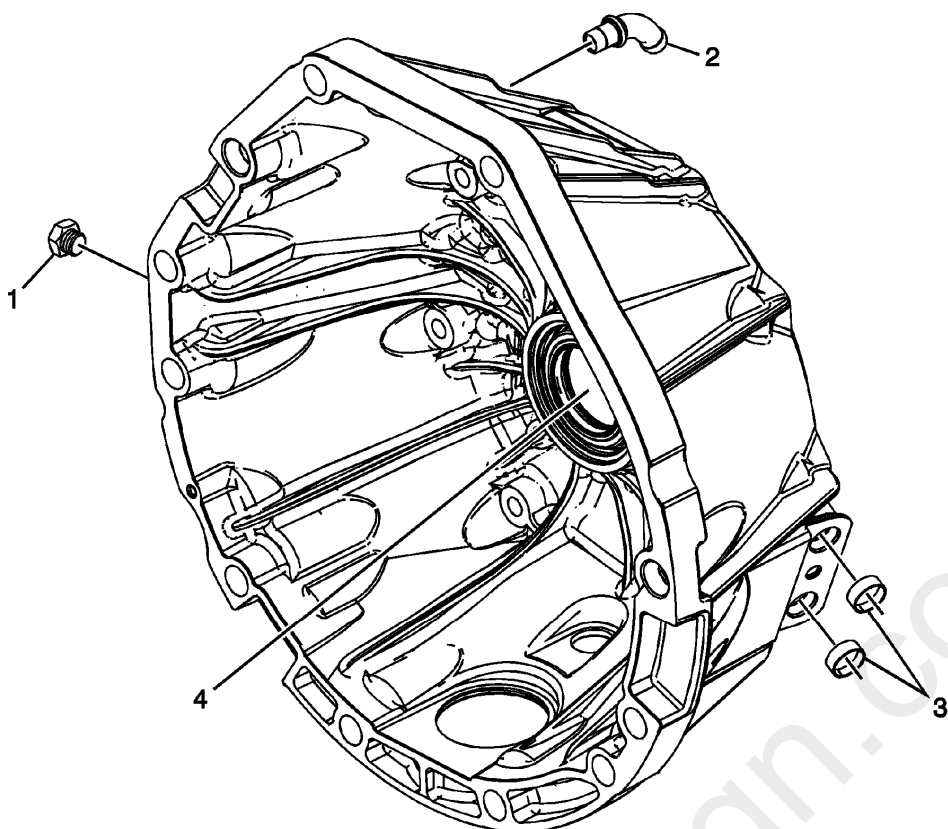


Fig. 86: Torque Converter Housing Component View
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing Cleaning and Inspection

Callout	Component Name
Preliminary Procedures 1. Thoroughly clean the torque converter housing assembly, including threads, with clean solvent. 2. Clean sealing surfaces. 3. Inspect all threaded holes. If necessary, repair any thread damage.	
1	Line Pressure Test Hole Plug CAUTION: Use care when tightening the line pressure test hole plug. Do not use a socket extension, which could cause side-loading and potentially crack the transmission case assembly. Specification 11 N.m (97 lb in)
2	A/Trans Vent Pipe
	Trans Fluid Cooler Pipe Fitting Seals (Qty: 2)

3	CAUTION: Refer to <u>Seal Reuse Caution</u> . NOTE: Refer to <u>Transmission Fluid Cooler Pipe Seal Replacement</u> .
4	Torque Converter Bushing

TORQUE CONVERTER FLUID SEAL REPLACEMENT

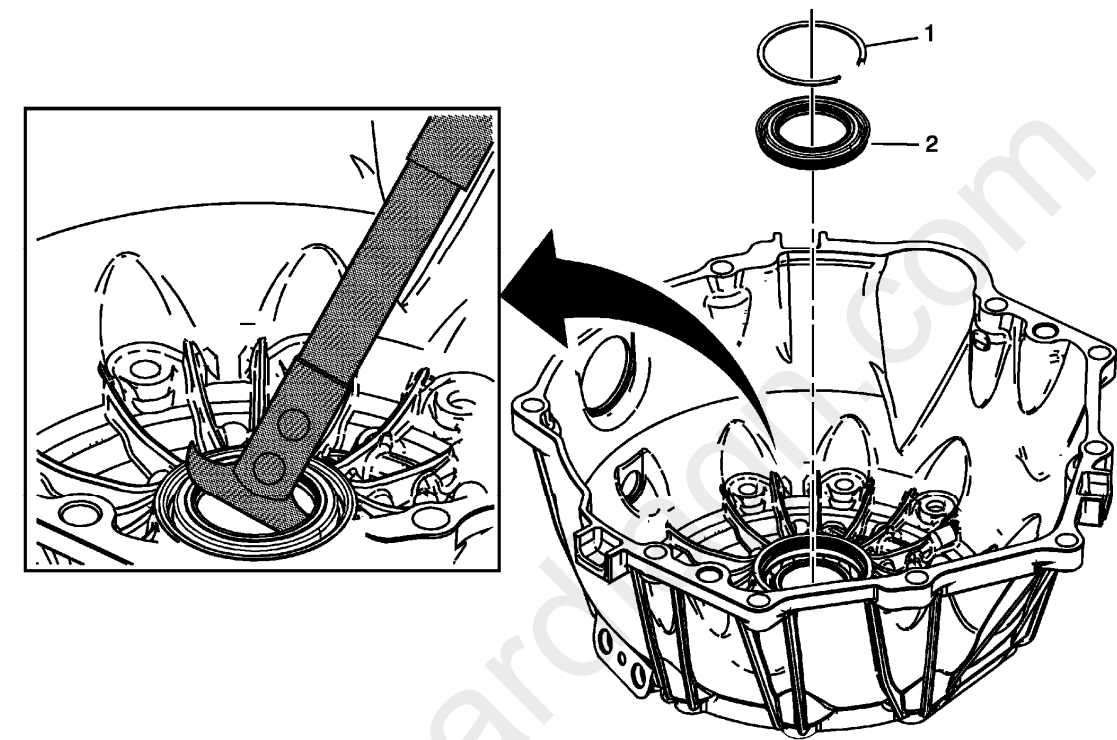


Fig. 87: Torque Converter Fluid Seal Component View
Courtesy of GENERAL MOTORS COMPANY

Torque Converter Fluid Seal Replacement

Callout	Component Name
1	Torque Converter Fluid Seal Retaining Ring
2	Torque Converter Fluid Seal Assembly NOTE: The seal can be installed by hand. Special Tool EN 45000 Seal Remover For equivalent regional tools, refer to <u>Special Tools</u> .

TRANSMISSION FLUID COOLER PIPE SEAL REPLACEMENT

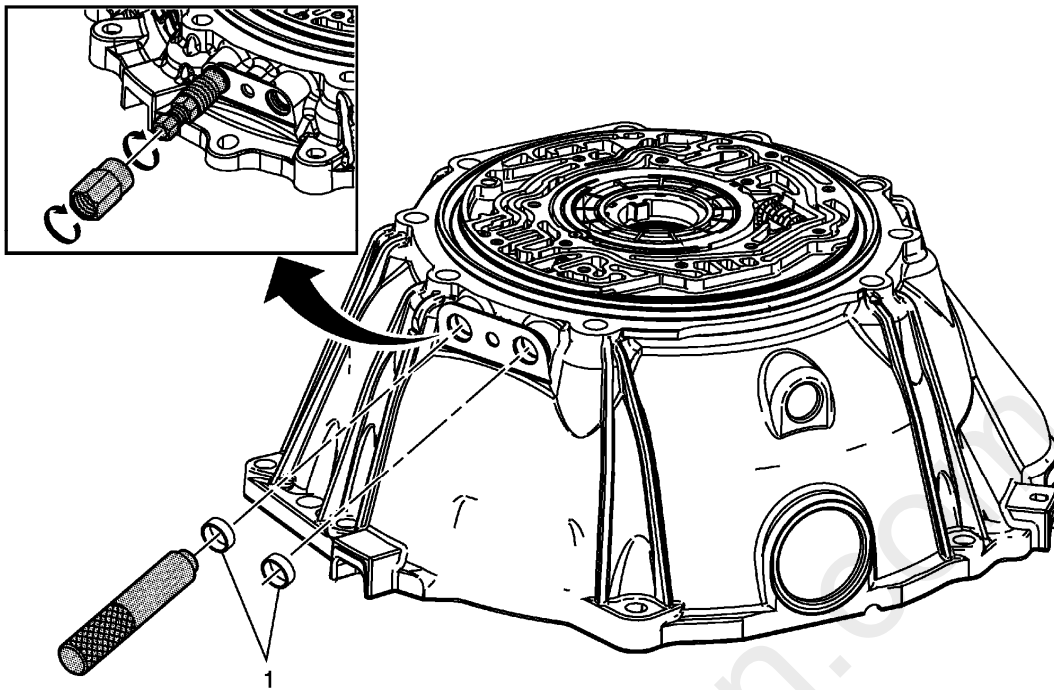


Fig. 88: Fluid Cooler Pipe Seal Component View
Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Cooler Pipe Seal Replacement

Callout	Component Name
1	Trans Fluid Cooler Pipe Fitting Seals (Qty: 2) Special Tools • DT 47770 Seal Installer • DT 45201 Cooler Line Seal Remover For equivalent regional tools, refer to Special Tools .

FLUID PUMP SELECTIVE MEASUREMENT

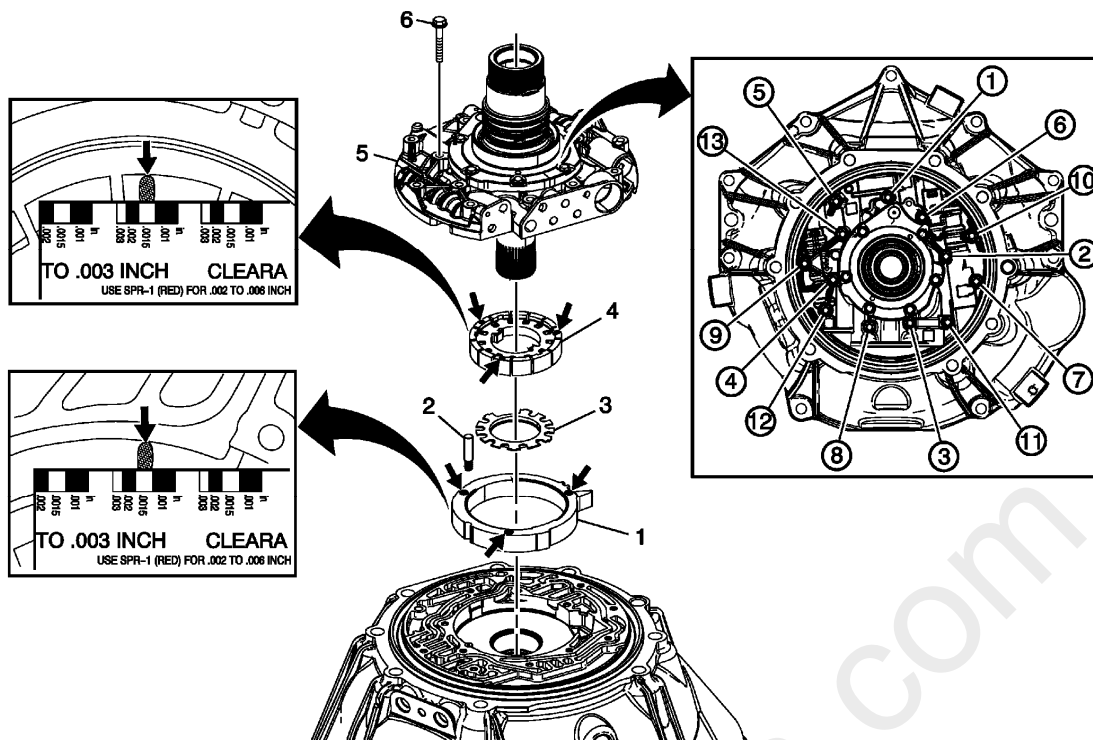


Fig. 89: Identifying Fluid Pump Components & Bolt Tightening Sequence
 Courtesy of GENERAL MOTORS COMPANY

Fluid Pump Selective Measurement

Callout	Component Name
Preliminary Procedures	
1. Clean and inspect all components and machined surfaces. 2. After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components.	
1	Fluid Pump Slide Procedure 1. Install an existing and/or undamaged pump slide. 2. Place gauging plastic in three locations on the pump slide surface facing the pump cover, up.
2	Fluid Pump Slide Pivot Pin
3	Fluid Pump Rotor Guide NOTE: Align the rotor guide tabs to the notches on the bottom of the rotor.
	Fluid Pump Rotor Procedure

4	1. Install an existing and/or undamaged pump rotor. 2. Place gauging plastic in three locations on the pump rotor surface facing the pump cover, up.
5	Fluid Pump Cover Assembly
6	Fluid Pump Cover Bolts M6 x 40 (Qty: 13) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Hand tighten the bolts. 2. Tighten the fluid pump cover bolts in the sequence shown. 3. Remove the pump cover bolts and the pump cover. 4. Using the measuring device provided with the gauging plastic kit, measure the gauging plastic on the rotor and the slide, see inset drawings. Choose the correct selective rotor and or slide, based on the slide and rotor to fluid pump body end play specifications. Refer to <u>Fluid Pump Selective Specifications</u> . 5. Remove the gauging plastic and clean the rotor and slide surfaces. Tighten 11 N.m (97 lb in)

TORQUE CONVERTER HOUSING WITH FLUID PUMP ASSEMBLE

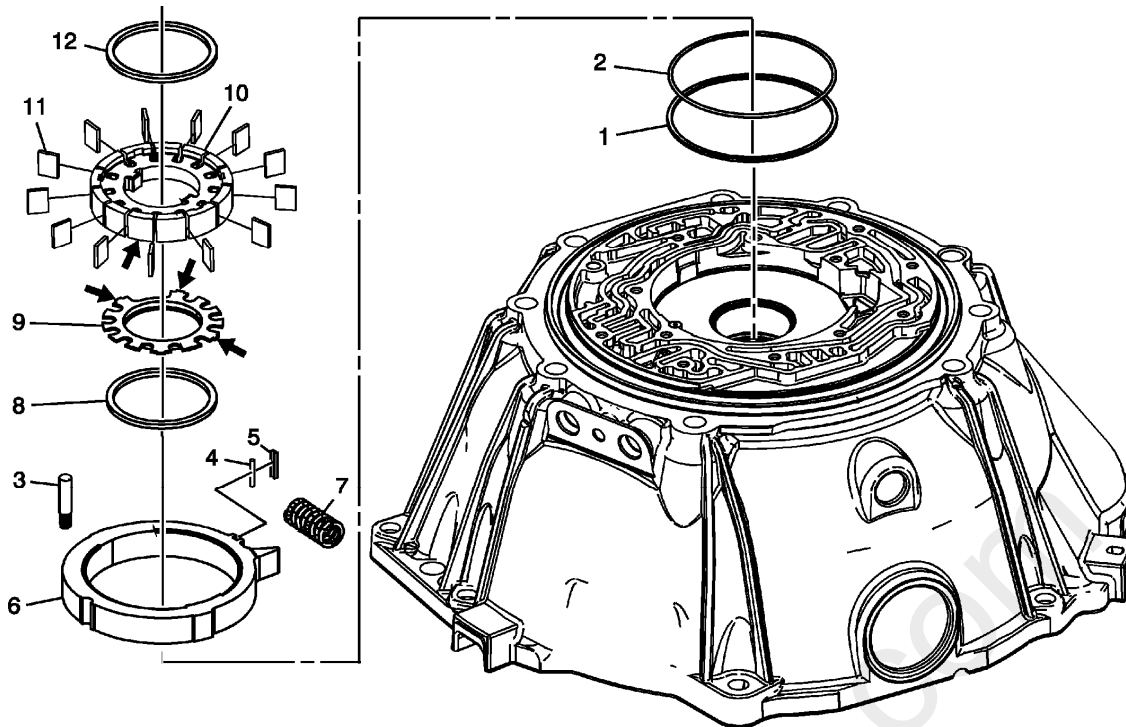


Fig. 90: Torque Converter Housing with Fluid Pump Component View
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Assemble

Callout	Component Name
1	Fluid Pump Slide Fluid Seal Ring
2	Fluid Pump Slide (O-Ring) Seal
3	Fluid Pump Slide Pivot Pin
4	Fluid Pump Slide Seal Support NOTE: The seal support is circular. The seal is rectangular.
5	Slide Seal
6	Fluid Pump Slide NOTE: If installing a NEW pump slide into the torque converter housing, ensure to properly select the correct rotor and slide before performing this procedure. Refer to <u>Fluid Pump Selective Measurement</u> , and <u>Fluid Pump Selective Specifications</u> .
7	Fluid Pump Slide Outer Spring
8	Fluid Pump Vane Ring
9	Fluid Pump Rotor Guide CAUTION: Align the rotor guide tabs to the notches on the bottom of the rotor. Failure to do so

	may cause transmission damage.
10	Fluid Pump Rotor NOTE: If installing a NEW pump rotor into the torque converter housing, ensure to properly select the correct rotor and slide before performing this procedure. Refer to <u>Fluid Pump Selective Measurement</u> , and <u>Fluid Pump Selective Specifications</u> .
11	Fluid Pump Vanes (Qty: 13)
12	Fluid Pump Vane Ring

FLUID PUMP COVER INSTALLATION

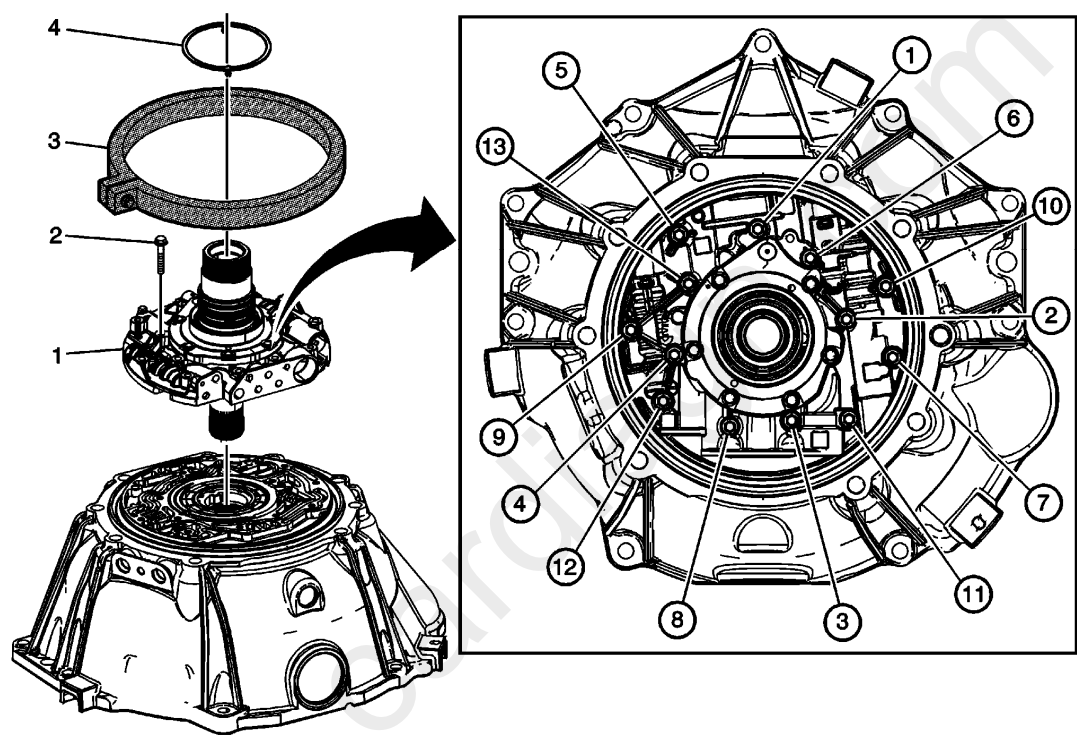


Fig. 91: Fluid Pump Cover Component View
 Courtesy of GENERAL MOTORS COMPANY

Fluid Pump Cover Installation

Callout	Component Name
1	Fluid Pump Cover Assembly
2	Fluid Pump Cover Bolts M6 x 40 (Qty: 13) NOTE: Hand tighten only.
	Alignment Tool and Bolt

CAUTION:
Refer to Fastener Caution .

Procedure

3

1. Center the **DT 46664** pump cover alignment tool around the fluid pump cover assembly in the 9 o'clock position and tighten the alignment bolt.
2. Tighten the fluid pump cover bolts in the sequence shown.

Tighten

11 N.m (97 lb in)

Special Tools

DT 46664 Pump Cover Alignment Tool

For equivalent regional tools, refer to Special Tools .

4

NEW 1-2-3-4 and 3-5 Reverse Clutch Housing Thrust Washer

CONTROL VALVE BODY ASSEMBLY DISASSEMBLE

Input and Output Speed Sensor Assembly Removal

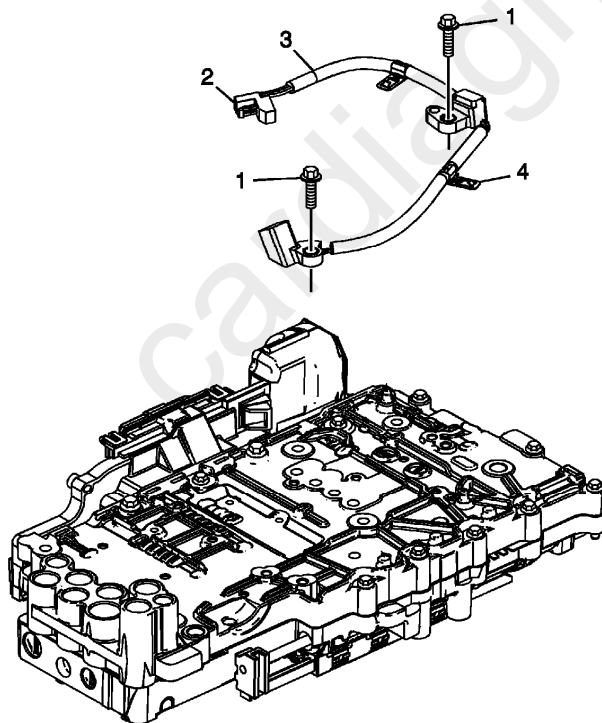


Fig. 92: Removing Input and Output Speed Sensor Assembly
Courtesy of GENERAL MOTORS COMPANY

Input and Output Speed Sensor Assembly Removal

Callout	Component Name
1	Bolt M6 x 20 (Qty: 2)
2	Speed Sensor Electrical Connector NOTE: Release the connector lock before disconnecting.
3	A/Trans Input and Output Speed Sensor Assembly
4	A/Trans Input and Output Speed Sensor Wiring Harness Clip (Qty: 2) NOTE: Inspect the clips and replace if damaged.

Manual Shaft Detent Assembly and Manual Shift Shaft Position Switch Removal

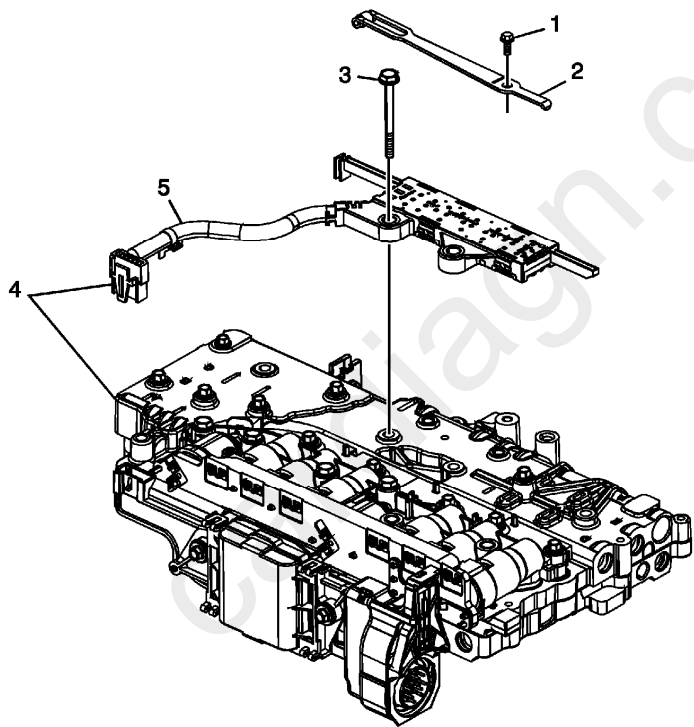


Fig. 93: Removing Manual Shaft Detent Assembly and Manual Shift Shaft Position Switch
 Courtesy of GENERAL MOTORS COMPANY

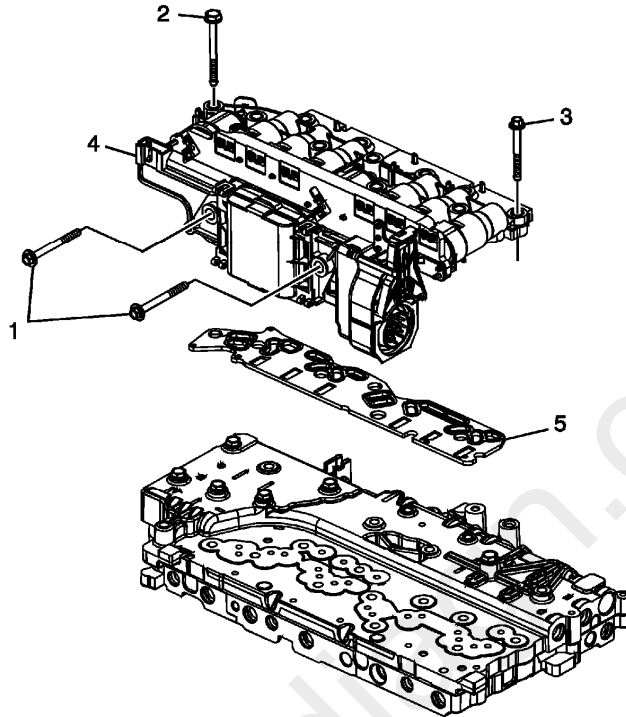
Manual Shaft Detent Assembly and Manual Shift Shaft Position Switch Removal

Callout	Component Name
1	Bolt M6 x 14.5
2	Manual Shaft Detent Assembly
3	Bolt M5 x 55
4	A/Trans Manual Shift Shaft Position Switch Assembly Electrical Connector

NOTE:**Release the connector lock before disconnecting.**

5

A/Trans Manual Shift Shaft Position Switch Assembly

Control Solenoid Valve Assembly Removal**Fig. 94: Removing Control Solenoid Valve Assembly**

Courtesy of GENERAL MOTORS COMPANY

Control Solenoid Valve Assembly Removal

Callout	Component Name
1	Bolt M5 x 53 (Qty: 2)
2	Bolt M5 x 55 (Qty: 4)
3	Bolt M5 x 45 (Qty: 5)
4	Control Solenoid (w/Body and TCM) Valve Assembly CAUTION: Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components, including the transmission control module (TCM), may result.
	Filter Plate Assembly 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

5

assembly, resulting in possible damage or contamination.

CAUTION:

Discard the filter plate. Replace with a NEW filter plate. Reusing an old filter plate may cause damage to the control solenoid valve assembly.

Upper and Lower Valve Bodies Disassemble

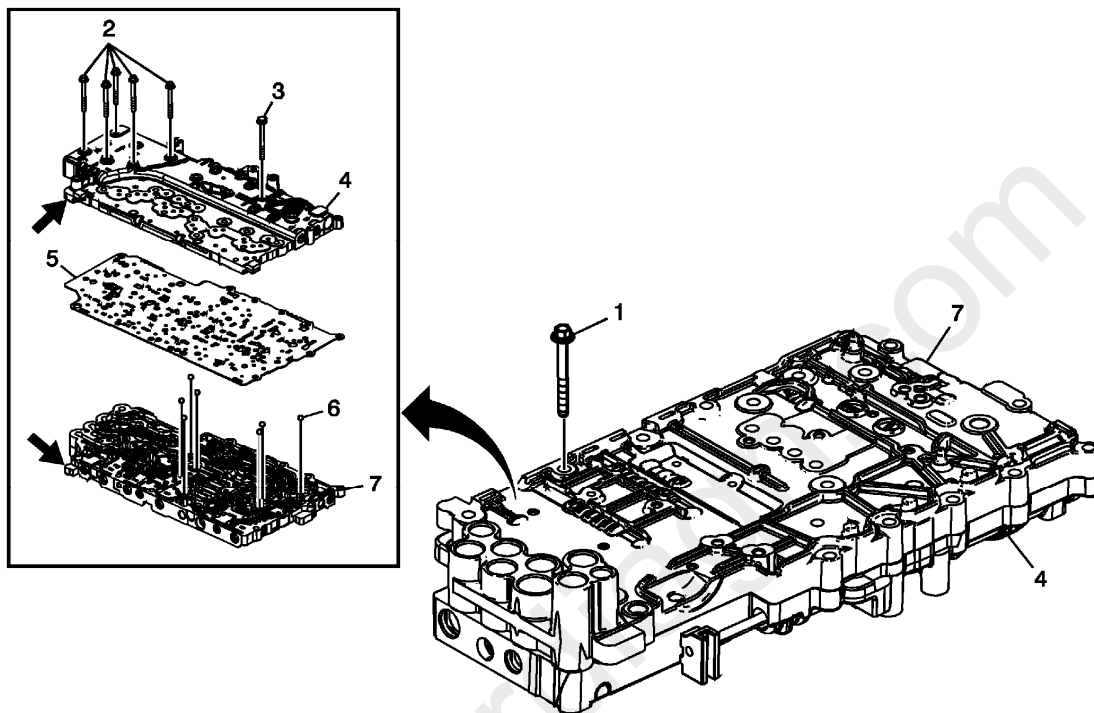


Fig. 95: Disassembling Upper and Lower Valve Bodies
Courtesy of GENERAL MOTORS COMPANY

Upper and Lower Valve Bodies Disassemble

Callout	Component Name
1	Bolt M5 x 36 (Qty: 12)
2	Bolt M5 x 45 (Qty: 5)
3	Bolt M5 x 55
4	Control Valve Lower Body Assembly NOTE: - Separate the upper and lower valve bodies by carefully prying at the point indicated. - Refer to <u>Control Valve Lower Body Assembly Cleaning and Inspection</u>.
	Control Valve Body Spacer (w/Gasket) Plate Assembly

5	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.
6	Control Valve Body Ball Check Valve (Qty: 7) NOTE: Note the position of the ball check valves.
7	Control Valve Upper Body Assembly NOTE: Refer to <u>Control Valve Upper Body Assembly Cleaning and Inspection</u> .

CONTROL VALVE LOWER BODY ASSEMBLY CLEANING AND INSPECTION

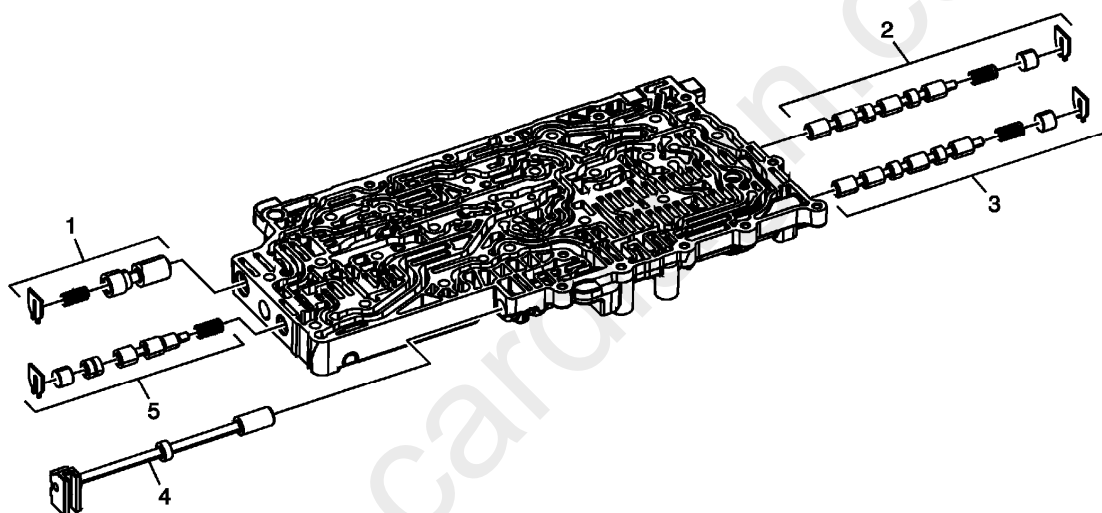


Fig. 96: Cleaning Control Valve Lower Body Assembly
Courtesy of GENERAL MOTORS COMPANY

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.

1	Clutch Piston Dam Feed Regulator Valve Train
2	Clutch Select Solenoid Valve 3 Train
3	Clutch Select Solenoid Valve 2 Train
4	Manual Valve
5	TCC Regulator Apply Valve Train

CONTROL VALVE UPPER BODY ASSEMBLY CLEANING AND INSPECTION

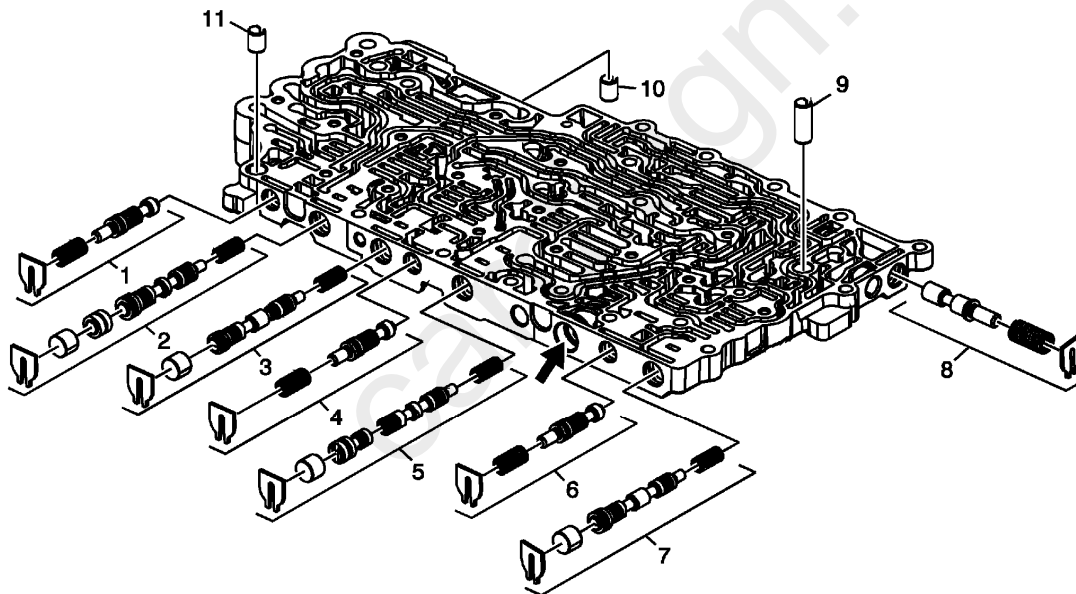


Fig. 97: Cleaning Control Valve Upper Body Assembly
Courtesy of GENERAL MOTORS COMPANY

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:

Do not remove the exhaust backfill pressure relief retainer, spring, or ball valve (refer to arrow in above illustration for location). The retainer is set to a precise depth. Replacement of this retainer could cause internal transmission damage.

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, locating pins, and the valve body. The control valve upper body is replaceable only as an assembly.

1	Clutch Boost Valve Train
2	1-2-3-4 Clutch Regulator Valve Train
3	3-5 Reverse Clutch Regulator Valve Train
4	Clutch Boost Valve Train
5	2-6 Clutch Regulator Valve Train
6	Clutch Boost Valve Train
7	CBR1/4-5-6 Clutch Regulator Valve Train
8	Actuator Feed Limit Valve Train
9	Control Valve Body Locator Pin
10	Control Valve Body Locator Pin
11	Control Valve Body Locator Pin

CONTROL VALVE BODY ASSEMBLY ASSEMBLE

Upper to Lower Control Valve Body Assembly Assemble

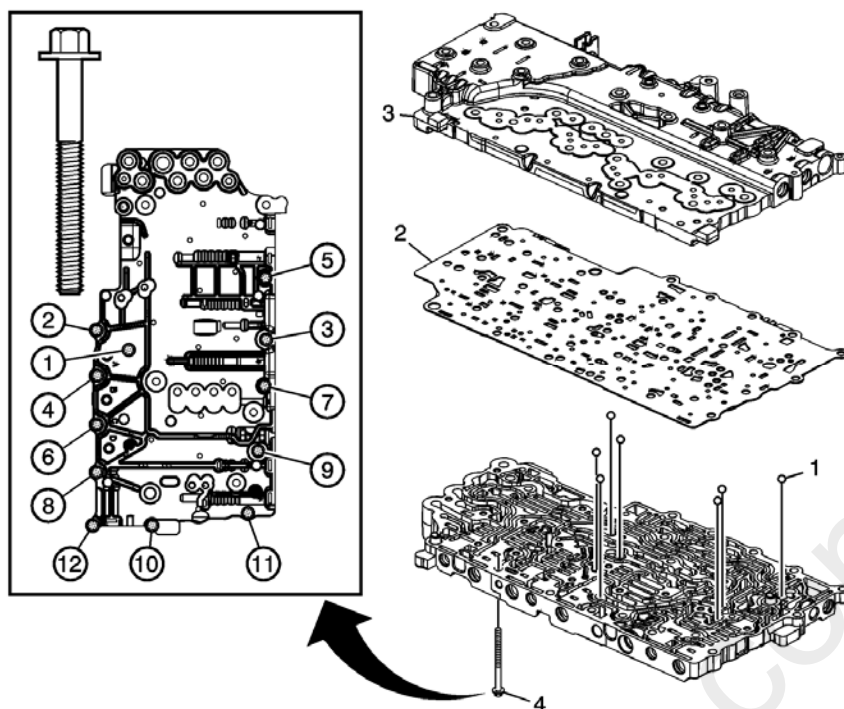


Fig. 98: Assembling Control Valve Body Assembly
 Courtesy of GENERAL MOTORS COMPANY

Upper to Lower Control Valve Body Assembly Assemble

Callout	Component Name
1	Control Valve Body Ball Check Valve (Qty: 7) 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. NOTE: Refer to <u>Ball Check Valve Locations</u> .
2	Control Valve Body Spacer (w/Gasket) 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.
3	Control Valve Lower Body Assembly NOTE: Turn the valve body assembly over after installing to upper body.
	Bolt M5 x 36 (Qty: 12)

4

CAUTION:
Refer to Fastener Caution .

Procedure

Tighten the bolts in the sequence shown.

Tighten

8 N.m (71 lb in).

Filter Plate Installation

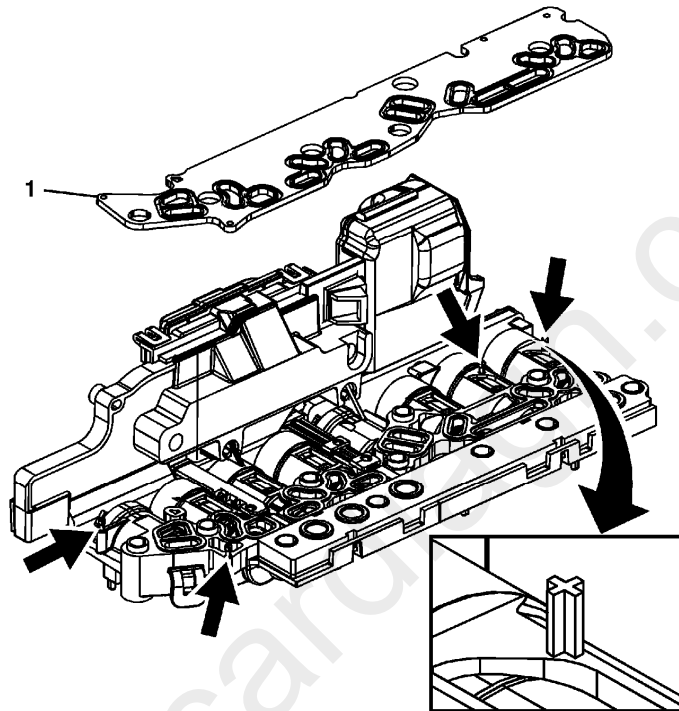


Fig. 99: Filter Plate

Courtesy of GENERAL MOTORS COMPANY

Filter Plate Installation

Callout	Component Name
1	Filter Plate Assembly CAUTION: Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components, including the transmission control module (TCM), may result. CAUTION: Discard the filter plate. Replace with a NEW filter plate. Reusing an old filter plate may

cause damage to the control solenoid valve assembly.

NOTE:

Use care when removing or installing the filter plate assembly. However, if a retaining tab is broken or missing, do not replace the control solenoid valve assembly. The filter plate assembly can still be adequately aligned.

Control Solenoid Valve Assembly Installation

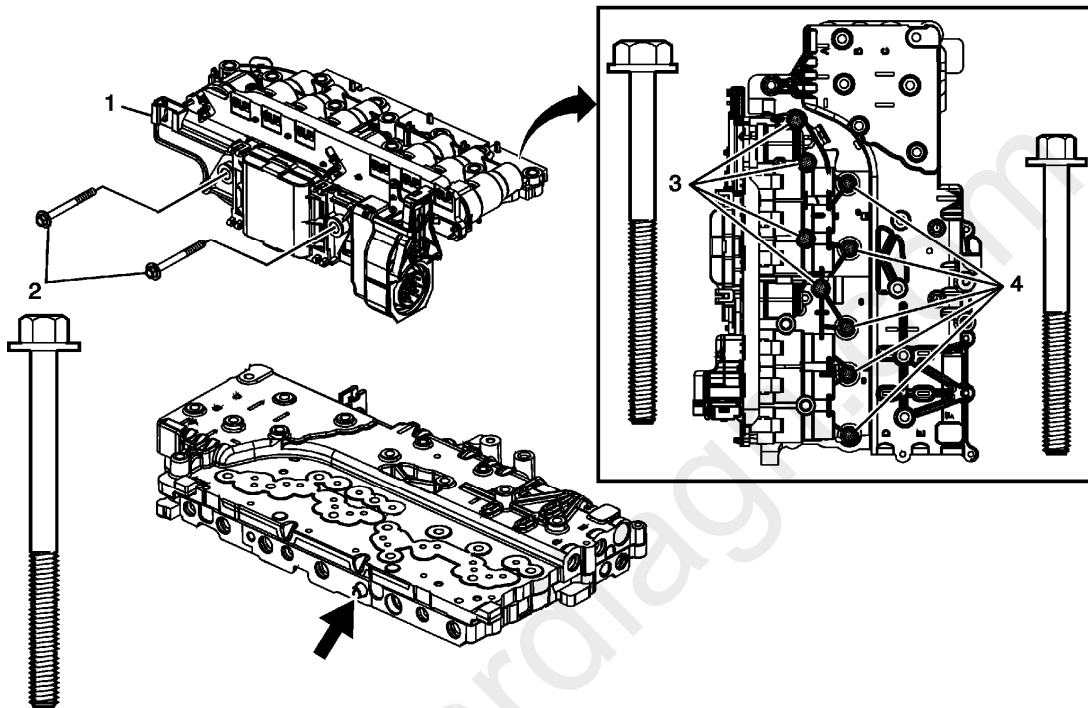


Fig. 100: Control Solenoid Valve Assembly
Courtesy of GENERAL MOTORS COMPANY

Control Solenoid Valve Assembly Installation

Callout	Component Name
1	Control Solenoid (w/Body and TCM) Valve Assembly NOTE: Note the locator pin on the control valve lower body assembly while aligning the control solenoid valve assembly.
2	Bolt M5 x 53 (Qty: 2) NOTE: Hand tighten only.
	Bolt M5 x 55 (Qty: 4)

3	NOTE: Hand tighten only.
4	Bolt M5 x 45 (Qty: 5) NOTE: Hand tighten only.

Manual Shift Shaft Position Switch Installation

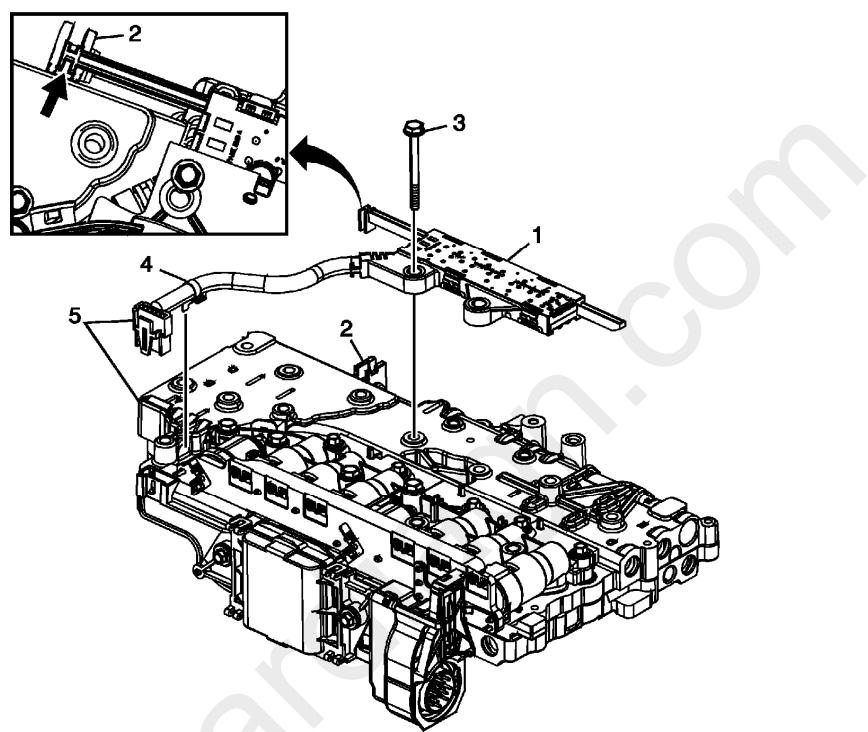


Fig. 101: Manual Shift Shaft Position Switch
 Courtesy of GENERAL MOTORS COMPANY

Manual Shift Shaft Position Switch Installation

Callout	Component Name
1	A/Trans Manual Shift Shaft Position Switch Assembly
2	Manual Valve Link NOTE: Align the switch activator slide with the manual valve link.
3	Bolt M5 x 55 NOTE: Hand tighten only.
	A/Trans Manual Shift Shaft Position Switch Harness Clip

4	NOTE: The wiring harness clip on the manual shift shaft position switch does not need to be replaced if damaged or missing. The clip functions only as a manufacturing assembly aid to keep the harness clear during an automated bolt installation process. If the clip is damaged, simply remove and discard.
5	A/Trans Manual Shift Shaft Position Switch Electrical Connector NOTE: Connect and lock the manual shift shaft position switch electrical connector to the control solenoid valve assembly.

Valve Body, Control Solenoid Torque Sequence

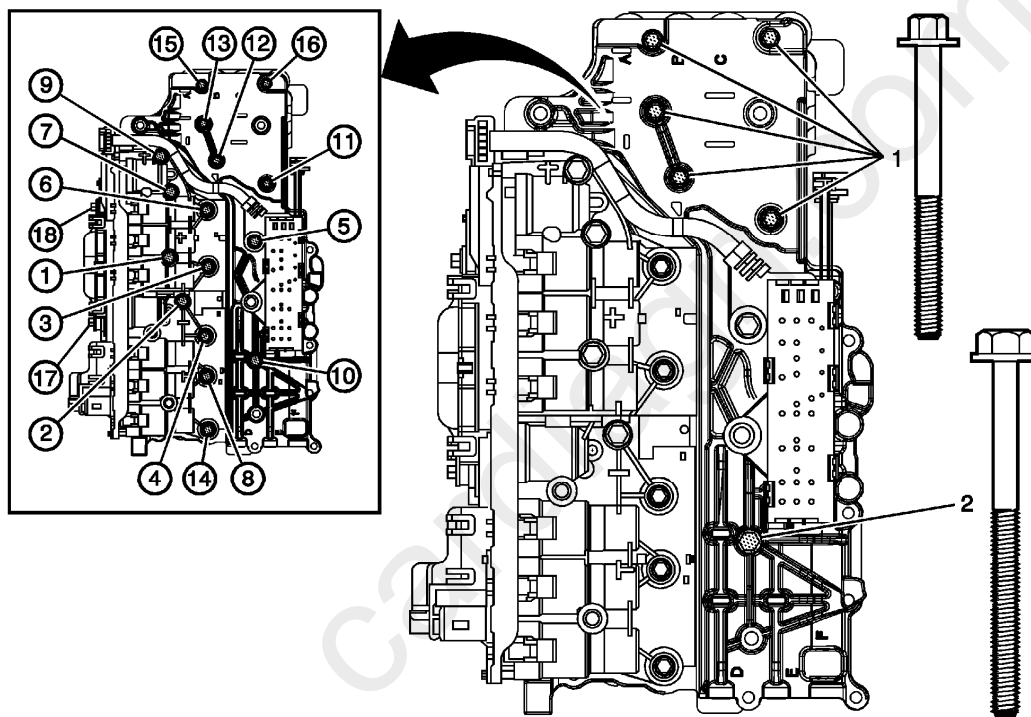


Fig. 102: Control Solenoid Torque Sequence
Courtesy of GENERAL MOTORS COMPANY

Valve Body, Control Solenoid Torque Sequence

Callout	Component Name
CAUTION: Bolt torque sequencing is critical to the proper function of the control solenoid valve assembly. Failure to follow the required sequencing may result in transmission malfunction.	
Preliminary Procedure	
1. Hand tighten the last 6 bolts before final torque sequence.	

2. The 2 "heat sink" bolts must be tightened last.	
1	Bolts M5 x 45 (Qty: 5)
2	Bolt M5 x 55
	CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tighten all 18 bolts in the sequence shown. Tighten 8 N.m (71 lb in).

Control Solenoid Valve Assembly Contact Gap Inspection

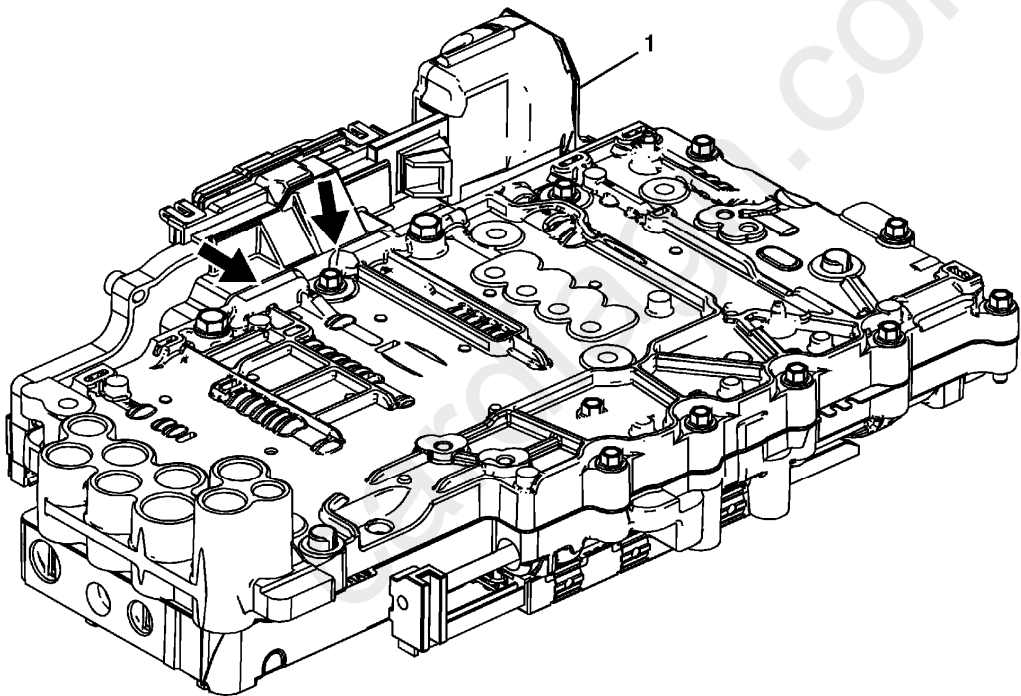


Fig. 103: Inspecting Control Solenoid Valve Assembly Contact Gap
Courtesy of GENERAL MOTORS COMPANY

Control Solenoid Valve Assembly Contact Gap Inspection

Callout	Component Name
1	Control Solenoid (w/Body and TCM) Valve Assembly NOTE: Inspect the contact area between the "heat sink" area of the control solenoid valve assembly and the valve body. There should be no visible gap. If a gap exists, loosen all

18 bolts and retighten in the required sequence.

Input and Output Speed Sensor Assembly Installation

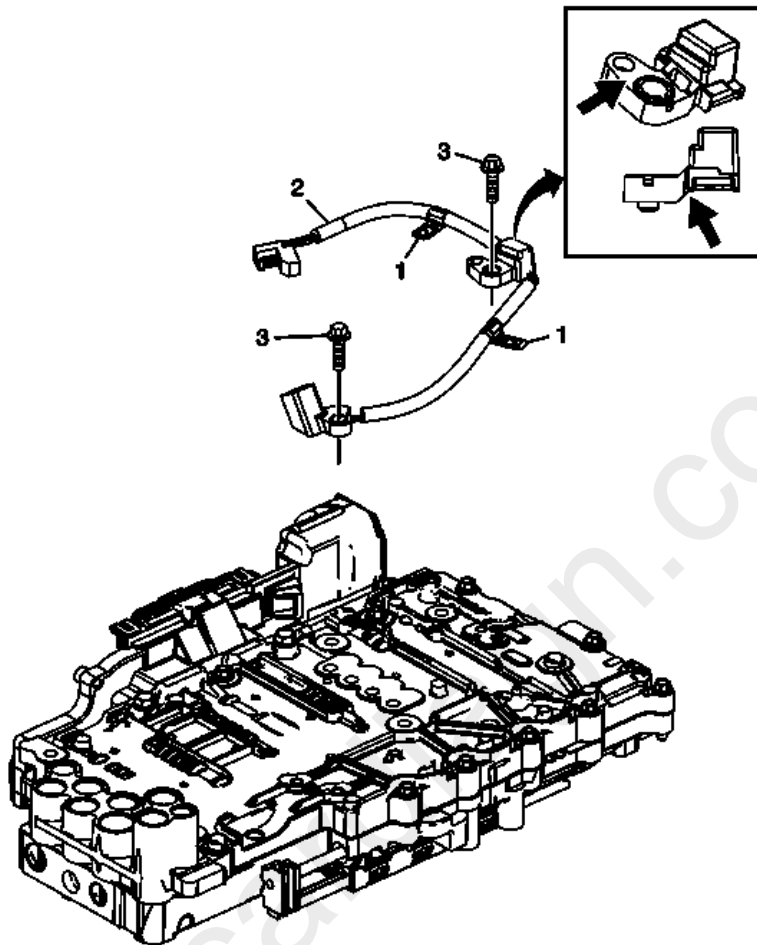


Fig. 104: Input and Output Speed Sensor Assembly
Courtesy of GENERAL MOTORS COMPANY

Input and Output Speed Sensor Assembly Installation

Callout	Component Name
1	A/Trans Input and Output Speed Sensor Wiring Harness Clip (Qty: 2)
2	A/Trans Input and Output Speed Sensor Assembly
3	Bolt M6 x 20 (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten

12 N.m (106 lb in)

CENTER SUPPORT, OUTPUT CARRIER AND OUTPUT SHAFT INSTALLATION (6L45)

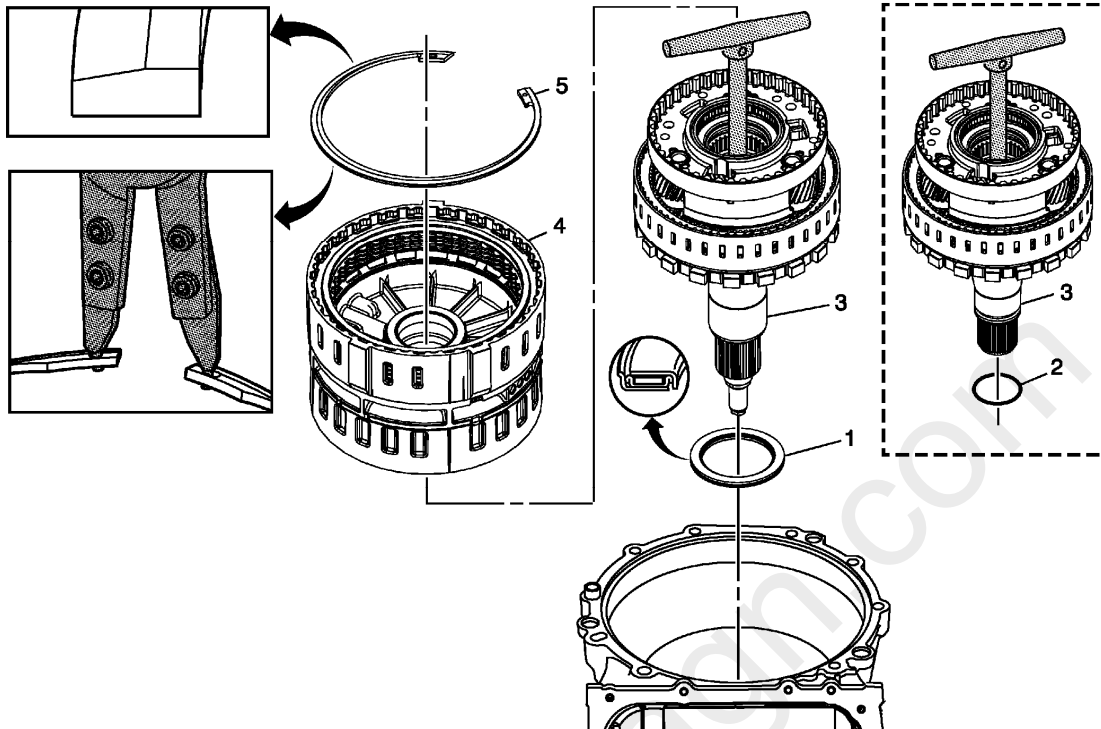


Fig. 105: Center Support, Output Carrier And Output Shaft (6L45)
Courtesy of GENERAL MOTORS COMPANY

Center Support, Output Carrier and Output Shaft Installation (6L45)

Callout	Component Name
1	Output Shaft Thrust Bearing Assembly
2	A/Trans Case O-Ring Seal - AWD Models if equipped
3	Output Carrier Assembly and Output Shaft Assembly CAUTION: Apply automatic transmission fluid (ATF) to the inside diameter of the output shaft seal before installing the output shaft assembly into the case. Failure to lube the seal may cause the seal to roll during output shaft installation, which will result in transmission damage. CAUTION: Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage. Special Tool

	DT 47786 Output Carrier/Shaft Lifting Tool For equivalent regional tools, refer to Special Tools .
4	Center Support Assembly NOTE: • When the center support assembly is properly installed, the fluid passages should align with the fluid passage seal bores in the case assembly. • It may be necessary to rotate the output shaft by hand in order to fully install the center support assembly.
5	Center Support Retaining Ring WARNING: Use care when removing or installing the retaining ring. Ensure the J 45126 is installed properly onto the retaining ring or bodily injury may occur. CAUTION: Ensure the retaining ring is installed with the tapered side up, and in the 9 o'clock position from the pan side of the case. Failure to properly install the retaining ring will cause transmission damage. Special Tool J 45126 Snap Ring Pliers For equivalent regional tools, refer to Special Tools .

CENTER SUPPORT, OUTPUT CARRIER AND OUTPUT SHAFT INSTALLATION (6L90)

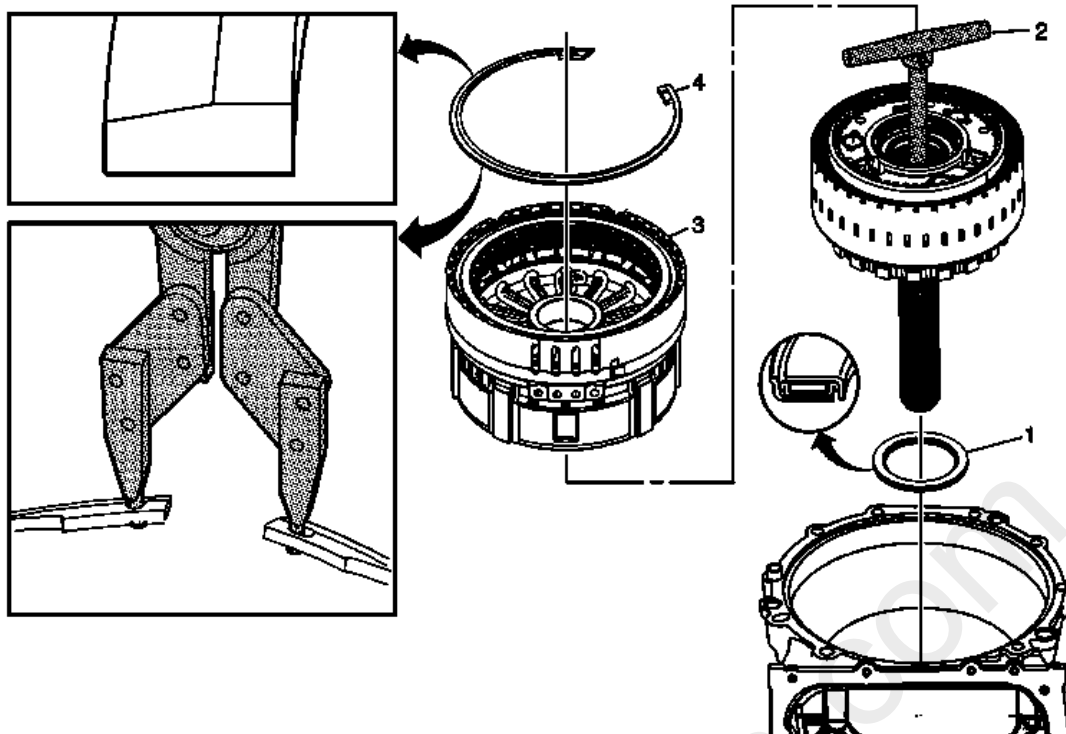


Fig. 106: Center Support, Output Carrier and Output Shaft Component View
 Courtesy of GENERAL MOTORS COMPANY

Center Support, Output Carrier and Output Shaft Installation (6L90)

Callout	Component Name
1	Output Shaft Thrust Bearing Assembly
2	Output Carrier Assembly and Output Shaft Assembly CAUTION: Apply automatic transmission fluid (ATF) to the inside diameter of the output shaft seal before installing the output shaft assembly into the case. Failure to lube the seal may cause the seal to roll during output shaft installation, which will result in transmission damage. CAUTION: Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage. Special Tools DT 47786 Output Carrier/Shaft Lifting Tool
3	Center Support Assembly NOTE:

	• When the center support assembly is properly installed, the fluid passages should align with the fluid passage seal bores in the case assembly. • It may be necessary to rotate the output shaft by hand in order to fully install the center support assembly.
4	Center Support Retaining Ring WARNING: Use care when removing or installing the retaining ring. Ensure the J 45126 and DT 47773 are installed properly onto the retaining ring or bodily injury may occur. CAUTION: Ensure the retaining ring is installed with the tapered side up, and in the 9 o'clock position from the pan side of the case. Failure to properly install the retaining ring will cause transmission damage. Special Tools • DT 47773 Snap Ring Pliers Adapter Set • J 45126 Snap Ring Pliers

1-2-3-4 AND 3-5 REVERSE CLUTCH ASSEMBLY AND 4-5-6 CLUTCH ASSEMBLY INSTALLATION (6L45)

2-6 and 3-5 Reverse Clutch Hub, 1-2-3-4 Clutch Hub and 4-5-6 Clutch Hub Installation

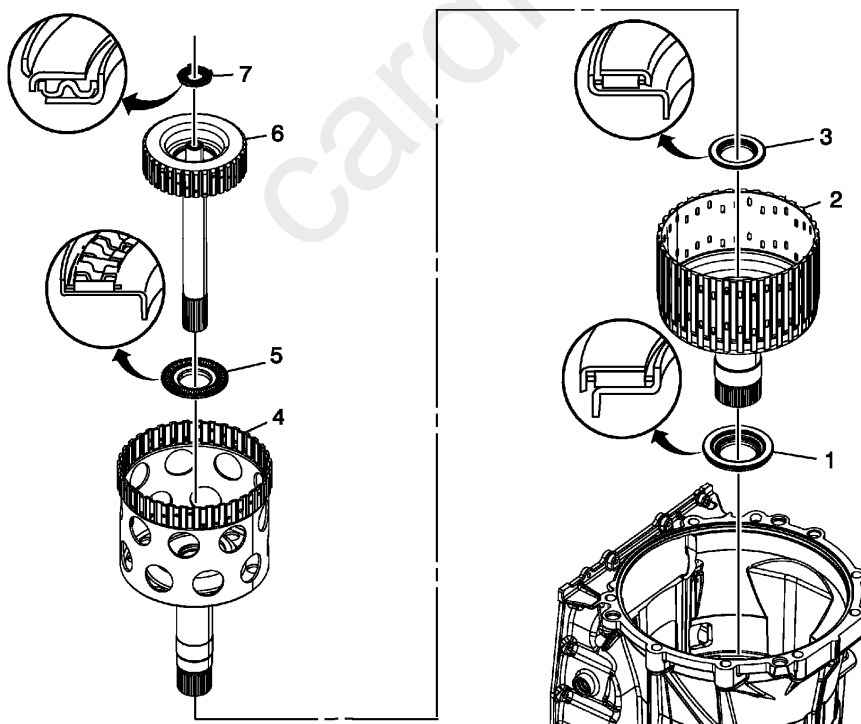


Fig. 107: 1-2-3-4, 3-5 Reverse Clutch Assembly & 4-5-6 Clutch Assembly Components (6L45)
 Courtesy of GENERAL MOTORS COMPANY

2-6 and 3-5 Reverse Clutch Hub, 1-2-3-4 Clutch Hub and 4-5-6 Clutch Hub Installation

Callout	Component Name
1	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
2	2-6 and 3-5 Reverse Clutch (with Output Carrier Outer Sun Gear Shaft) Hub Assembly
3	1-2-3-4 Clutch Hub Thrust Bearing Assembly
4	1-2-3-4 Clutch (with Output Carrier Inner Sun Gear Shaft) Hub Assembly
5	4-5-6 Clutch Hub Thrust Bearing Assembly
6	4-5-6 Clutch (with Output Carrier Shaft) Hub Assembly NOTE: Refer to 4-5-6 Clutch Dampener Overhaul (6L45) for complete inspection - (6L45 Only).
7	Turbine Shaft Thrust Bearing Assembly

4-5-6 Clutch Assembly, Input Carrier and Input Sun Gear and 1-2-3-4 and 3-5 Reverse Clutch Installation

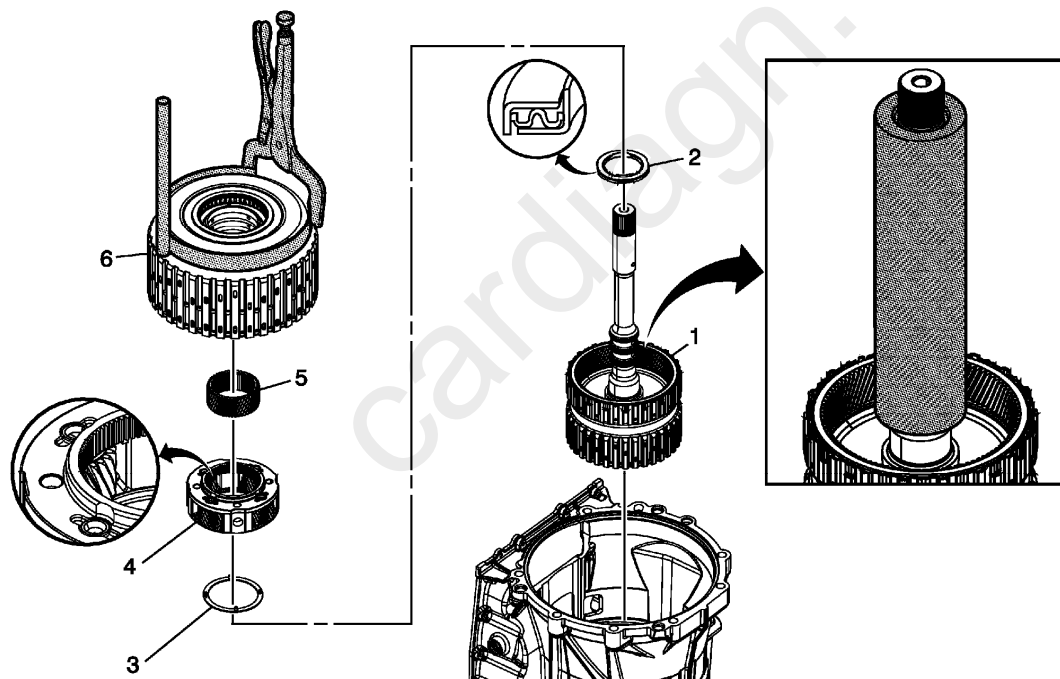


Fig. 108: 1-2-3-4, 3-5 Reverse Clutch Assembly & 4-5-6 Clutch Assembly Components
 Courtesy of GENERAL MOTORS COMPANY

4-5-6 Clutch Assembly, Input Carrier and Input Sun Gear and 1-2-3-4 and 3-5 Reverse Clutch Installation

Callout	Component Name
	4-5-6 (with Turbine Shaft) Clutch Assembly

1	CAUTION: The new turbine shaft fluid seal rings must be sized prior to torque converter housing assembly, or damage to the seals will result. Procedure Apply DT 36850 Transjel Lubricant to inner bore of DT 48066-1A Seal Sizer and install the sizer over the turbine shaft fluid seals. Size the seals for 5 minutes before installing the Torque Converter (with Fluid Pump) Housing Assembly. Special Tools • DT 36850 Transjel Lubricant • DT 48066-1A Seal Sizer For equivalent regional tools, refer to <u>Special Tools</u> .
2	Input Sun Gear Thrust Bearing NOTE: Thrust bearing snaps onto input carrier assembly.
3	Input Sun Gear Thrust Washer
4	Input Carrier Assembly NOTE: The spline on the input carrier installs up into the 1-2-3-4 and 3-5 reverse clutch housing.
5	Input Sun Gear
6	1-2-3-4 and 3-5 Reverse Clutch Assembly NOTE: Wiggle the DT 47781 clutch assembly installer in order to align the 1-2-3-4 and 3-5 reverse clutch plates with the external splines of the 4-5-6 clutch assembly. To verify that the 1-2-3-4 and 3-5 reverse clutch assembly is fully installed, lift up on the turbine shaft. There should not be any noticeable slack. Special Tool DT 47781 C1234 35R Clutch Assembly Installer For equivalent regional tools, refer to <u>Special Tools</u> .

1-2-3-4 AND 3-5 REVERSE CLUTCH ASSEMBLY AND 4-5-6 CLUTCH ASSEMBLY INSTALLATION (6L90)

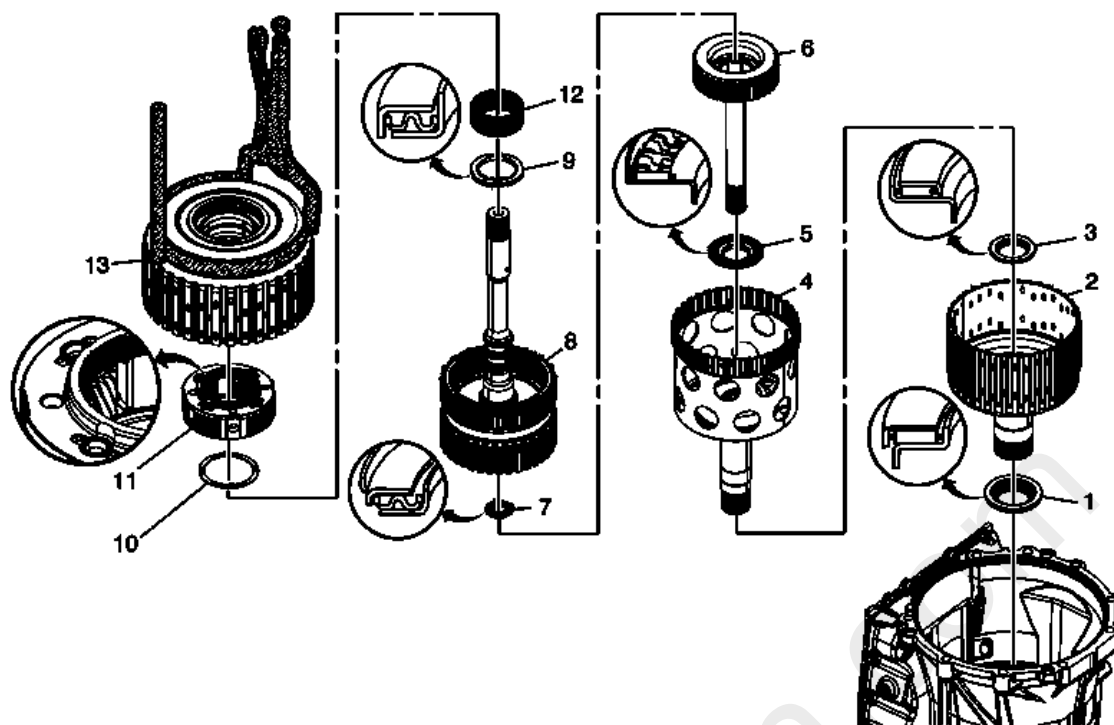


Fig. 109: 1-2-3-4 And 3-5 Reverse Clutch Assembly And 4-5-6 Clutch Assembly
Courtesy of GENERAL MOTORS COMPANY

1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Installation (6L90)

Callout	Component Name
1	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
2	2-6 and 3-5 Reverse Clutch (with Output Carrier Outer Sun Gear Shaft) Hub Assembly
3	1-2-3-4 Clutch Hub Thrust Bearing Assembly
4	1-2-3-4 Clutch (with Output Carrier Inner Sun Gear Shaft) Hub Assembly
5	4-5-6 Clutch Hub Thrust Bearing Assembly
6	4-5-6 Clutch (with Output Carrier Shaft and Dampener) Hub Assembly NOTE: Refer to <u>4-5-6 Clutch Dampener Overhaul (6L90)</u> for complete inspection.
7	Turbine Shaft Thrust Bearing Assembly
8	4-5-6 (with Turbine Shaft) Clutch Assembly
9	Input Sun Gear Thrust Bearing NOTE: Thrust bearing snaps onto input carrier assembly.
10	Input Sun Gear Thrust Washer
	Input Carrier Assembly

11	NOTE: The spline on the input carrier installs up into the 1-2-3-4 and 3-5 reverse clutch housing.
12	Input Sun Gear
13	1-2-3-4 and 3-5 Reverse Clutch Assembly NOTE: Wiggle the DT 47781 clutch assembly installer in order to align the 1-2-3-4 and 3-5 reverse clutch plates with the external splines of the 4-5-6 clutch assembly. To verify that the 1-2-3-4 and 3-5 reverse clutch assembly is fully installed, lift up on the turbine shaft. There should not be any noticeable slack. Special Tool DT 47781 C1234 35R Clutch Assembly Installer For equivalent regional tools, refer to Special Tools .

TORQUE CONVERTER HOUSING WITH FLUID PUMP INSTALLATION (6L45)

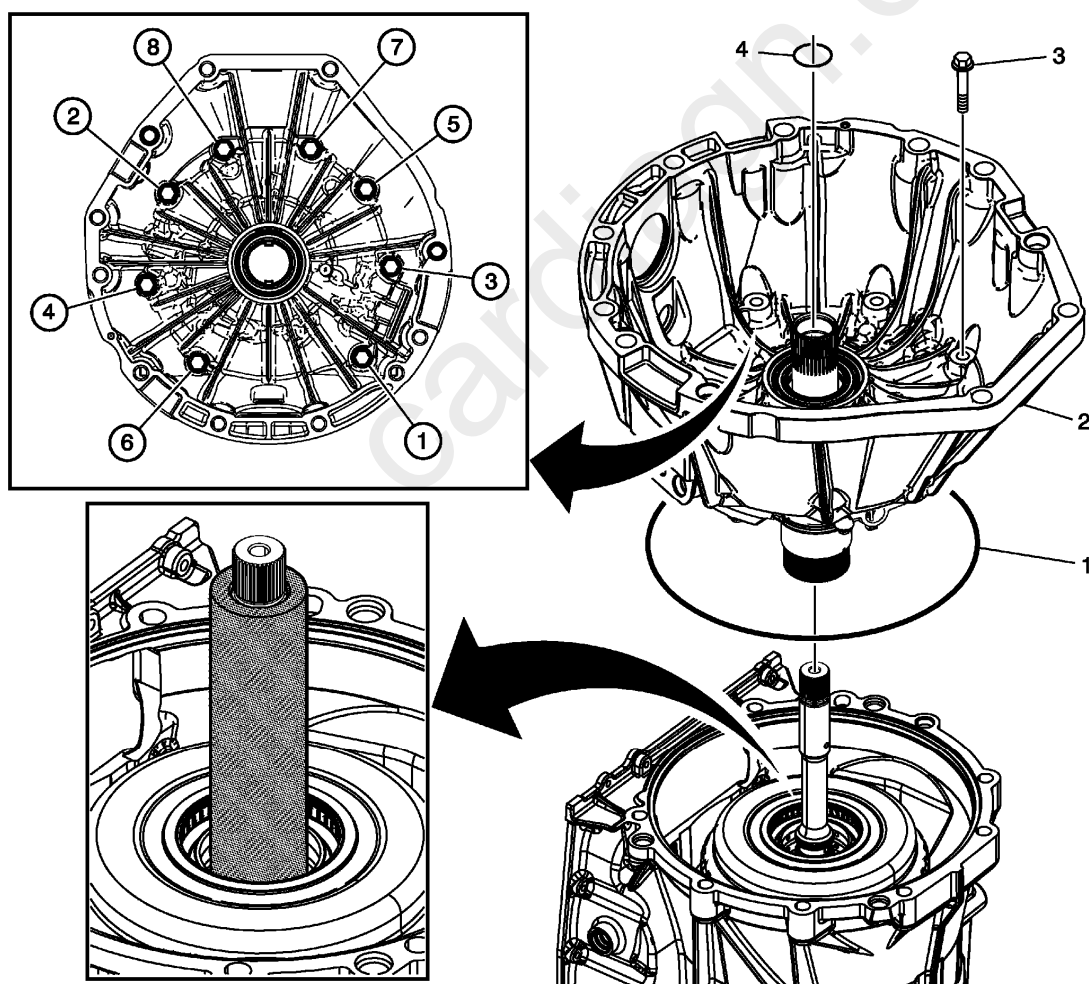


Fig. 110: Torque Converter Housing with Fluid Pump (6L45)

Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Installation (6L45)

Callout	Component Name
CAUTION: The new turbine shaft fluid seal rings must be sized prior to torque converter housing assembly, or damage to the seals will result.	
Procedure If the turbine shaft fluid seals have not been sized prior to torque converter housing installation refer to <u>1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Installation (6L45).</u>	
1	NEW Fluid Pump Seal
2	Torque Converter (with Fluid Pump) Housing Assembly - Model Dependent CAUTION: Ensure the turbine shaft (O-ring) seal is not installed prior to installing the torque converter housing assembly. The seal may become cut or damaged during installation of the torque converter housing assembly. Procedure Remove the DT 48066-1A seal sizer prior to torque converter housing installation. Special Tools DT 48066-1A Seal Sizer For equivalent regional tools, refer to <u>Special Tools</u> .
3	Bolts M8 x 1.25 x 50 (Qty: 8) CAUTION: Refer to <u>Fastener Caution</u> . Procedure Tighten in sequence shown. Tighten 31 N.m (23 lb ft)
4	NEW Turbine Shaft (O-Ring) Seal

TORQUE CONVERTER HOUSING WITH FLUID PUMP INSTALLATION (6L90)

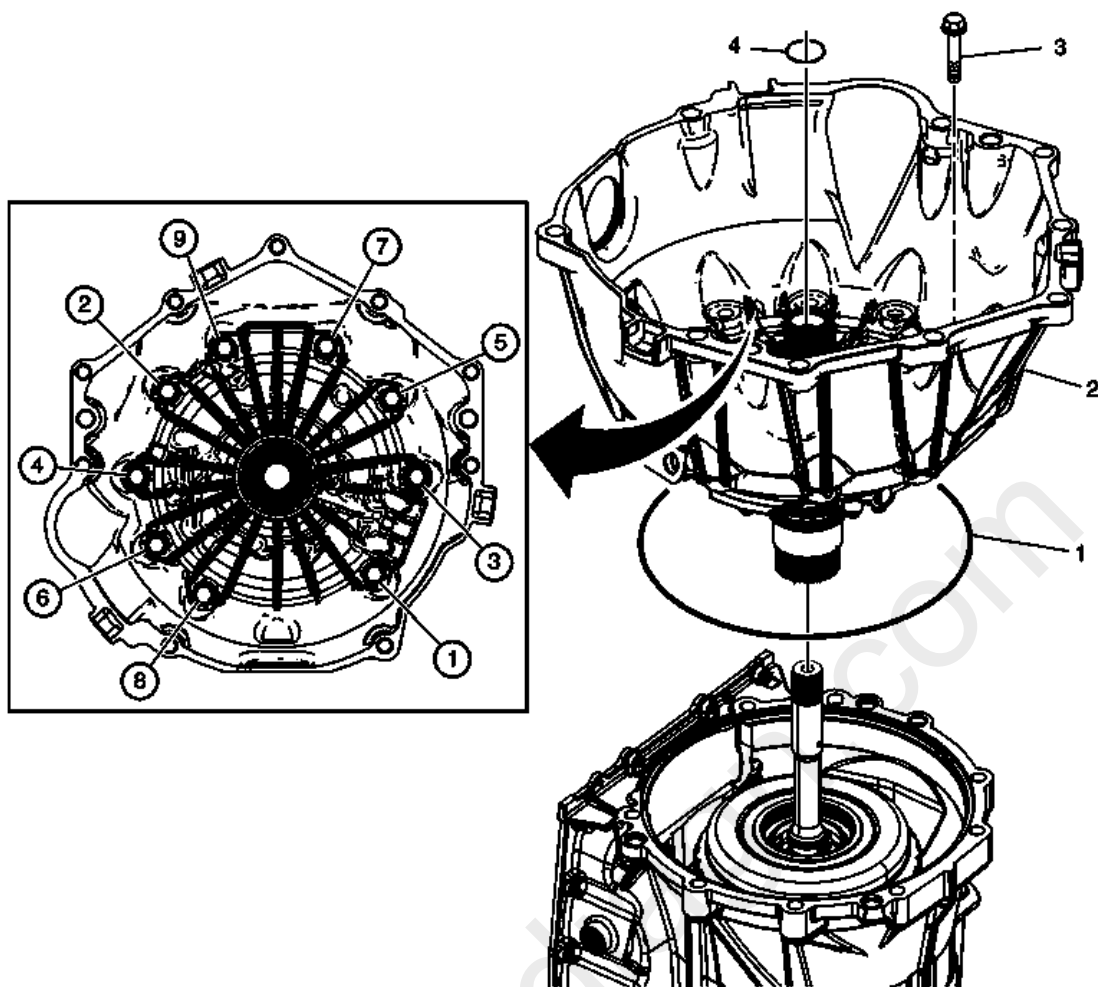


Fig. 111: View Of Torque Converter Housing & Fluid Pump Components
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Housing with Fluid Pump Installation (6L90)

Callout	Component Name
1	NEW Fluid Pump Seal
2	Torque Converter (with Fluid Pump) Housing Assembly CAUTION: Ensure the turbine shaft (O-ring) seal is not installed prior to installing the torque converter housing assembly. The seal may become cut or damaged during installation of the torque converter housing assembly.
3	Bolts M10 x 50 (Qty: 9) CAUTION: Refer to <u>Fastener Caution</u> .

Procedure Tighten in the sequence shown. Tighten 72 N.m (53 lb ft)	
4	NEW Turbine Shaft (O-Ring) Seal

OUTPUT SHAFT SEAL REPLACEMENT (6L45)

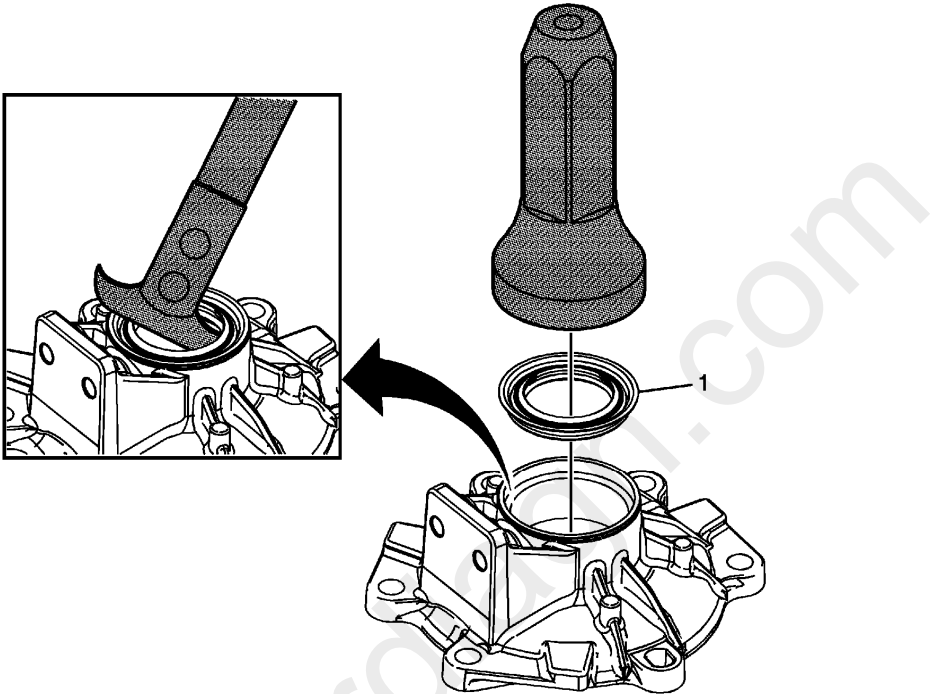


Fig. 112: Case Extension Seal Component View
 Courtesy of GENERAL MOTORS COMPANY

Output Shaft Seal Replacement (6L45)

Callout	Component Name
1	Output Shaft Seal Assembly Special Tools • J 37212 Front Output Shaft Seal Installer • J 45000 Seal Remover For equivalent regional tools, refer to Special Tools .

OUTPUT SHAFT SEAL REPLACEMENT (6L90)

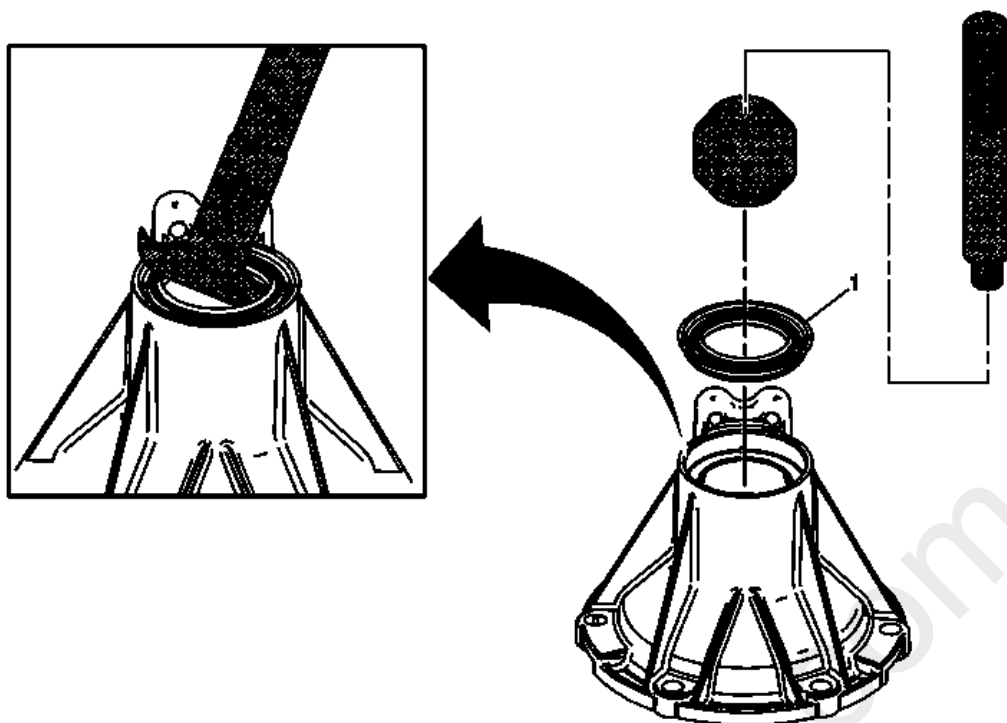


Fig. 113: Identifying Output Shaft Seal (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Output Shaft Seal Replacement (6L90)

Callout	Component Name
1	Prop Shaft Front Slip Yoke Oil Seal Special Tools • DT-48021 Seal Installer • J 8092 Driver Handle • J 45000 Seal Remover For equivalent regional tools, refer to Special Tools .

OUTPUT SHAFT BEARING REPLACEMENT - CASE EXTENSION (6L45)

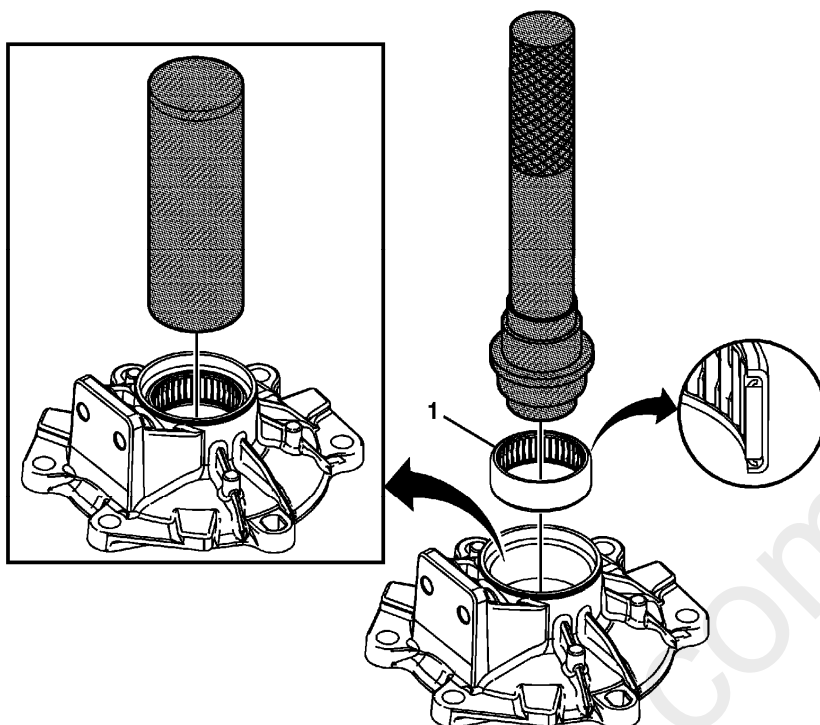


Fig. 114: Output Shaft Bearing Component View
 Courtesy of GENERAL MOTORS COMPANY

Output Shaft Bearing Replacement - Case Extension (6L45)

Callout	Component Name
1	Output Shaft Bearing Assembly NOTE: Use J 35512 bearing installer to remove the bearing and the large diameter end of DT 48222 bearing installer and J 8092 driver handle to install the bearing. The thick side of the bearing shell faces up. Special Tools • DT 48222 Bearing Installer • J 8092 Driver Handle • J 35512 Inner Pinion Bearing Installer For equivalent regional tools, refer to Special Tools .

CONTROL VALVE BODY ASSEMBLY INSTALLATION

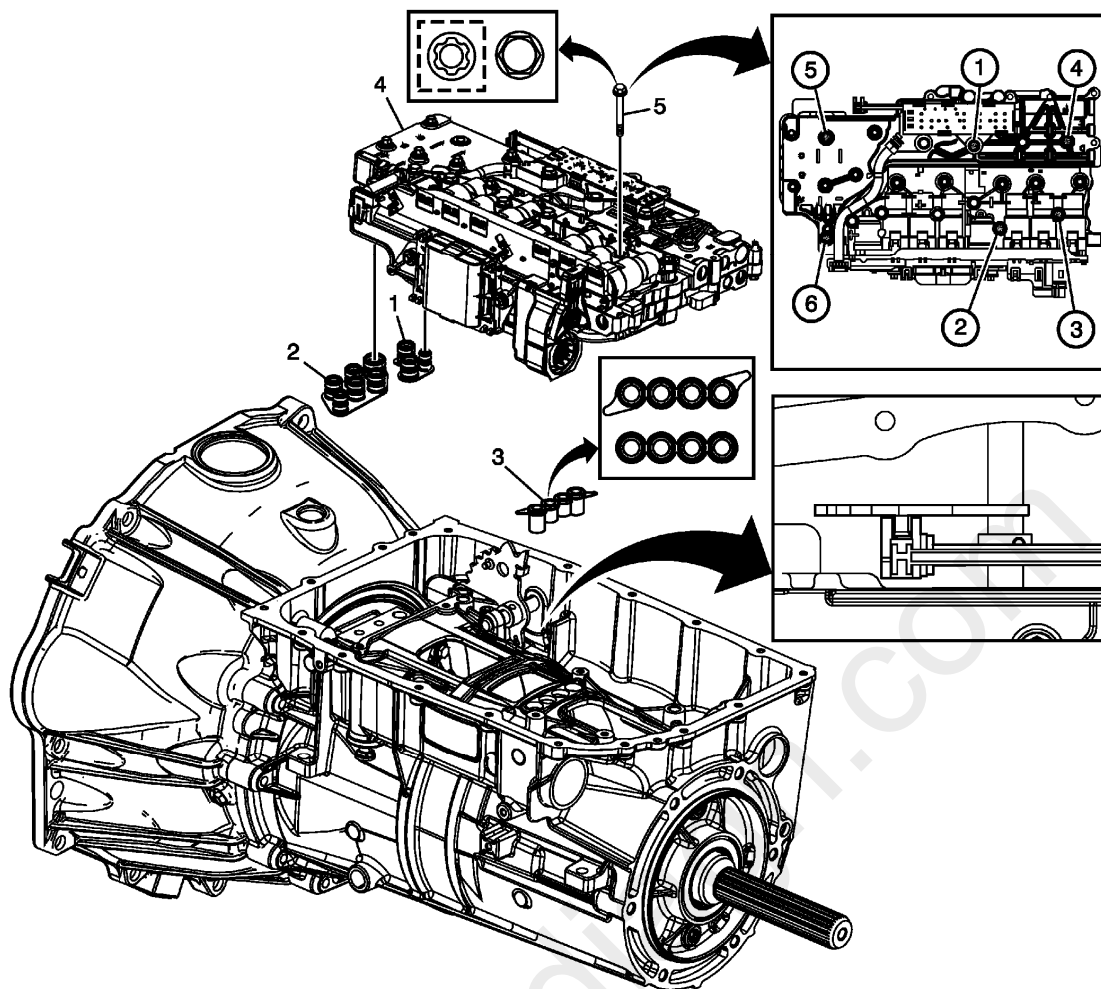


Fig. 115: Control Valve Body Assembly Component View
 Courtesy of GENERAL MOTORS COMPANY

Control Valve Body Assembly Installation

Callout	Component Name
1	NEW Fluid Pump Seal Assembly
2	NEW Fluid Pump Seal Assembly
3	NEW Center Support Fluid Passage Seal Assembly NOTE: There are two different designs for the Center Support Fluid Passage Seal. The design for 6L45 (MYA/MYB) models utilizes tabs. The design for 6L90 (MYC/MYD) models does not have tabs.
4	Control Valve Body Assembly CAUTION: The control valve body assembly needs to be lowered into place vertically, with no lateral movement. Lateral movement can damage the pass through connector pins

and/or the oil transfer seals.

NOTE:

Align the manual shift shaft position switch activator slide with the detent lever guide pin.

Bolts M5 x 73 (Qty: 6)

CAUTION:

Refer to Fastener Caution .

5

Procedure

Tighten in the sequence shown.

Tighten

8 N.m (71 lb in).

Special Tool

DT-48285 Valve Body Torx Plus Socket (if applicable)

For equivalent regional tools, refer to Special Tools .

AUTOMATIC TRANSMISSION ELECTRICAL CONNECTOR PASSAGE SLEEVE INSTALLATION

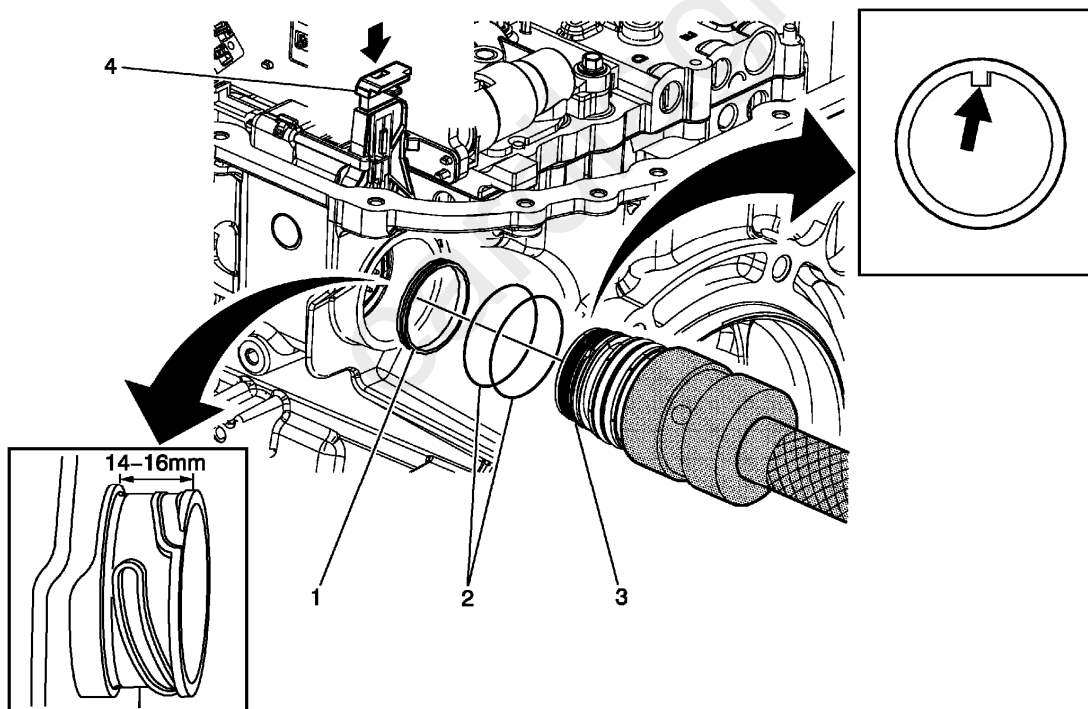


Fig. 116: Automatic Transmission Electrical Connector Passage Sleeve

Courtesy of GENERAL MOTORS COMPANY

Automatic Transmission Electrical Connector Passage Sleeve Installation

Callout	Component Name
1	NEW Lip Seal
2	NEW O-Ring Seals (Qty: 2)
3	Electrical Connector Passage Sleeve CAUTION: Orientate the alignment tab inside the passage sleeve with the slot in the electrical connector of the control solenoid valve assembly. Push the sleeve straight into the case bore and connector. Do NOT rotate the sleeve at any time. Ensure the sleeve is fully seated into the case. When the sleeve is properly installed, the distance from the case surface to the end of the sleeve should be 14-16 mm. Even though the correct electrical connections may still be maintained, failure to ensure proper installation of the sleeve may result in a fluid leak around the sleeve lip seal and into the sleeve cavity. Specification 14-16 mm Special Tools • DT 47715 Electrical Connector Passage Sleeve Remover/Installer • EN 42183 Driver Handle For equivalent regional tools, refer to Special Tools .
4	Electrical Connector Slide Lock NOTE: Push down on the electrical connector slide lock to ensure proper installation.

FLUID FILTER AND MANUAL SHIFT DETENT ASSEMBLY INSTALLATION

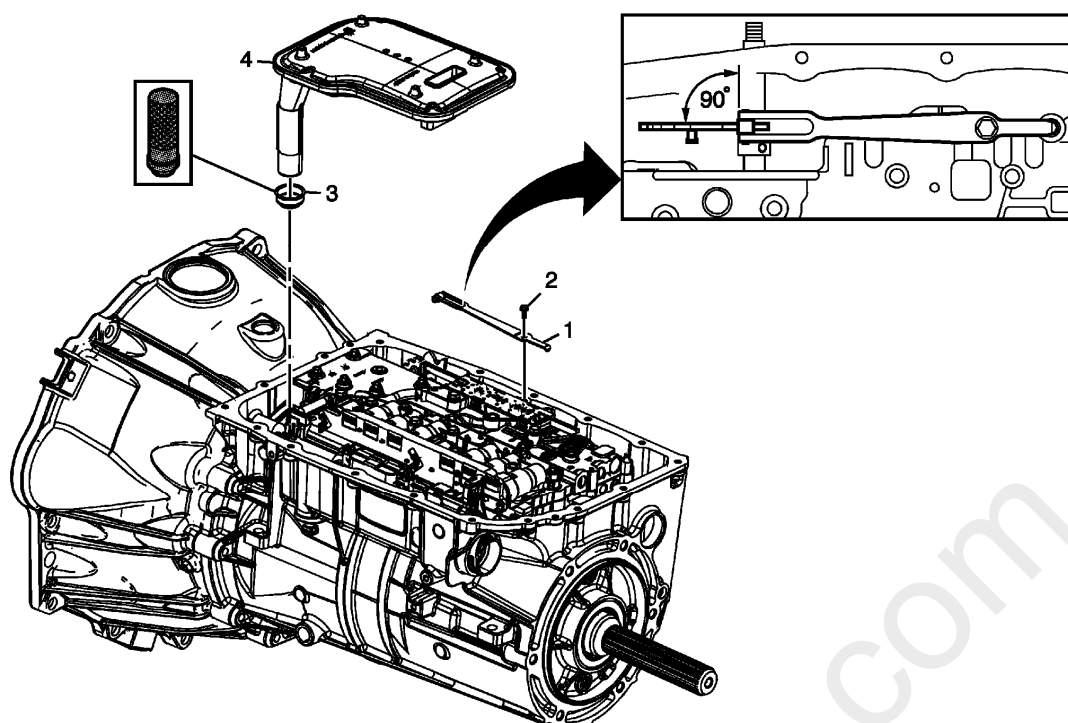


Fig. 117: Fluid Filter And Manual Shift Detent Assembly Component View
 Courtesy of GENERAL MOTORS COMPANY

Fluid Filter and Manual Shift Detent Assembly Installation

Callout	Component Name
1	Manual Shaft Detent Assembly CAUTION: Ensure the manual shaft detent assembly roller is centered over the manual shaft detent lever assembly. Failure to center the roller may cause hard or no shift lever operation.
2	Bolt M6 x 14.5 CAUTION: Refer to <u>Fastener Caution</u> . Tighten 12 N.m (106 lb in).
3	NEW Fluid Filter Seal Assembly Special Tools • DT 47848 Seal Installer • EN 42183 Driver Handle

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

4 NEW Fluid Filter Assembly

TRANSMISSION FLUID PAN INSTALLATION (6L90)

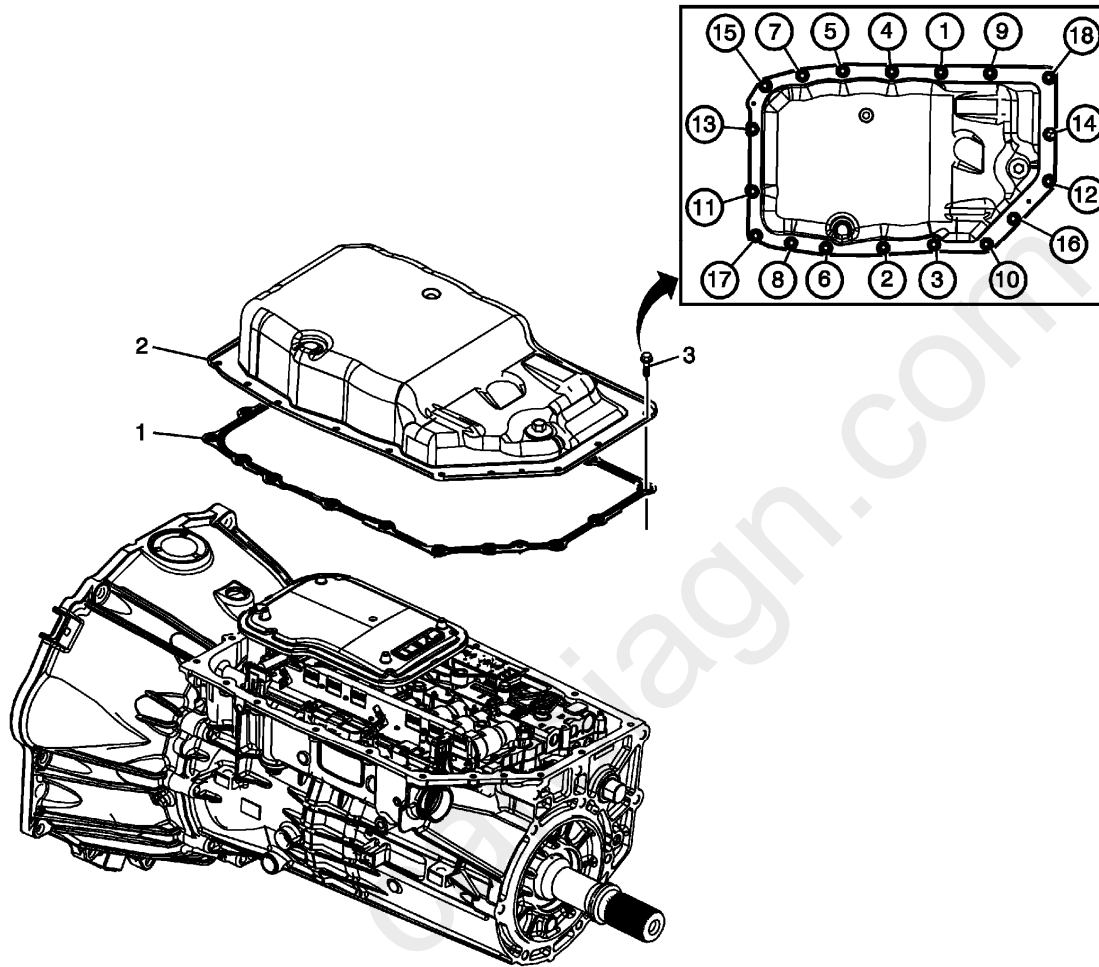


Fig. 118: Identifying Transmission Fluid Pan Components (6L90)

Courtesy of GENERAL MOTORS COMPANY

Transmission Fluid Pan Installation (6L90)

Callout	Component Name
1	Fluid Pan Gasket NOTE: The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.
2	Fluid Pan Assembly
	Fluid Pan Bolts M6 x 20 (Qty: 18)

3

CAUTION:

Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

Procedure

Tighten in sequence shown.

Tighten

9 N.m (80 lb in)

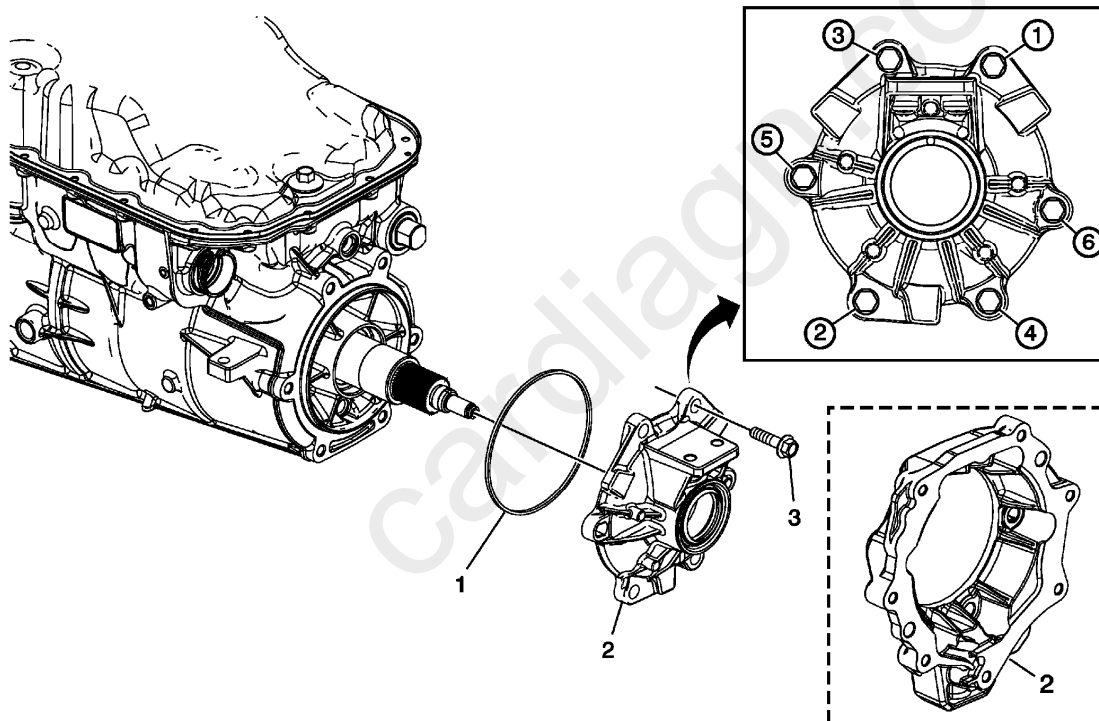
CASE EXTENSION ASSEMBLY INSTALLATION (6L45)

Fig. 119: Case Extension Assembly (6L45)

Courtesy of GENERAL MOTORS COMPANY

Case Extension Assembly Installation (6L45)

Callout	Component Name
1	NEW Case Extension Seal
2	Case Extension
	NOTE:

	Optional AWD version uses same bolts and torque sequence.
3	Bolts M10 x 40 (Qty: 6) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten in sequence shown. Tighten 55 N.m (41 lb ft)

CASE EXTENSION ASSEMBLY INSTALLATION (6L90)

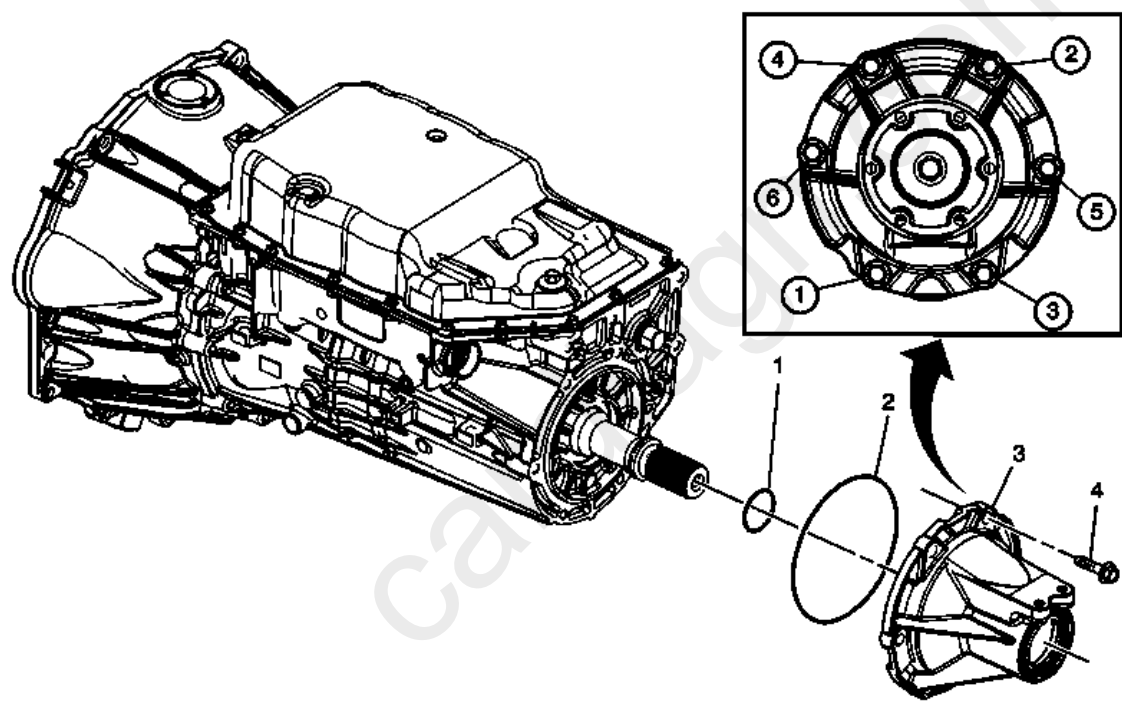


Fig. 120: Identifying Case Extension Assembly Components (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Case Extension Assembly Installation (6L90)

Callout	Component Name
1	NEW Prop Shaft Trans Flange Seal
2	NEW Case Extension Seal
3	Case Extension
	Bolts M10 x 40 (Qty: 6)
	CAUTION:

Refer to **Fastener Caution** .

4

Procedure

Tighten in sequence shown.

Tighten

55 N.m (41 lb ft)

PROPELLER SHAFT TRANSMISSION FLANGE INSTALLATION (6L45)

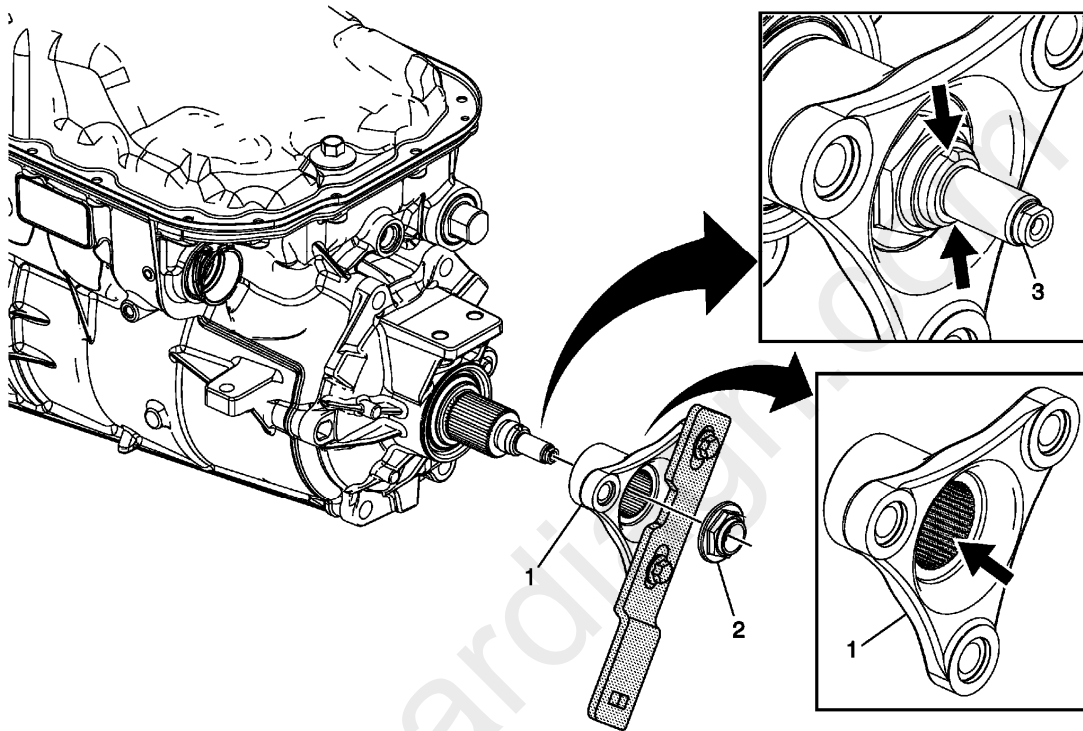


Fig. 121: Propeller Shaft Transmission Flange (6L45)

Courtesy of GENERAL MOTORS COMPANY

Propeller Shaft Transmission Flange Installation (6L45)

Callout	Component Name
	Prop Shaft Trans Flange
	Procedure
1	1. The output shaft splines must be thoroughly clean and dry before installing the flange. 2. Apply GM P/N 89021297 (Canadian P/N 10953488) across the width of the flange splines, install. However, if the replacement flange contains a pre-applied adhesive patch, then liquid adhesive is not required and the 24 hour cure time is not necessary. 3. Sufficient application of adhesive to every tooth on the flange will leave excess adhesive on the output shaft after installation. If no excess is observed, reapply

	adhesive. NOTE: • When repairing low speed and garage shift clunk - except for moving the vehicle from the hoist, do not operate the vehicle above 5 mph at light throttle for 24 hours to allow the adhesive to cure. • If the replacement flange contains a pre-applied adhesive patch, then liquid adhesive is not required and the 24 hour cure time is not necessary.
2	NEW Front Prop Shaft Flange Nut CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. The output shaft nut threads must be thoroughly clean and dry before installing the nut. 2. Apply GM P/N 89021297 (Canadian P/N 10953488) across the width of the nut threads, prior to tightening and staking. However, if the replacement nut contains a pre-applied adhesive patch, then liquid adhesive is not required. Tighten 55 (41 lb ft) Special Tool J 45012 Holding Fixture For equivalent regional tools, refer to <u>Special Tools</u> .
3	Output Shaft CAUTION: Stake the flange nut onto the output shaft. Use the two staking grooves on the shaft to locate the staking points. Failure to stake the flange nut may result in damage to the transmission.

PROPELLER SHAFT TRANSMISSION FLANGE INSTALLATION (6L90)

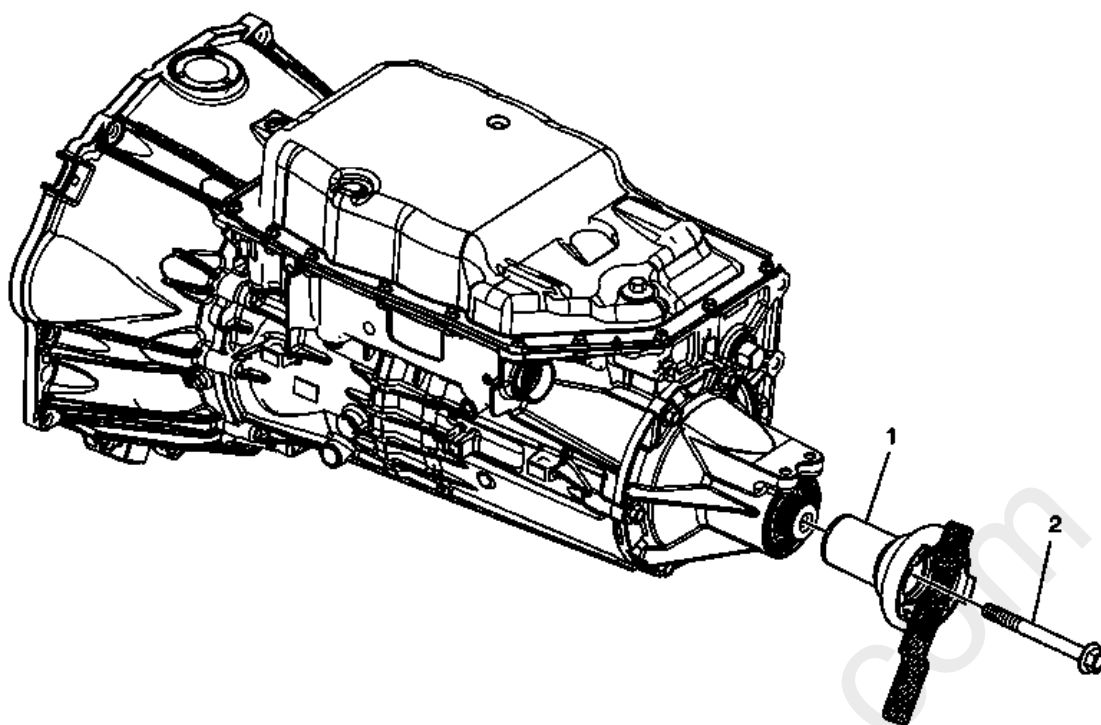


Fig. 122: Identifying Propeller Shaft Transmission Flange Components (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Propeller Shaft Transmission Flange Installation (6L90)

Callout	Component Name
1	Front Prop Shaft Flange
2	Prop Shaft Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 105 N.m (77 lb ft). Special Tool J 45012 Holding Fixture For equivalent regional tools, refer to <u>Special Tools</u> .

TORQUE CONVERTER INSTALLATION AND HOLDING FIXTURE REMOVAL (6L45)

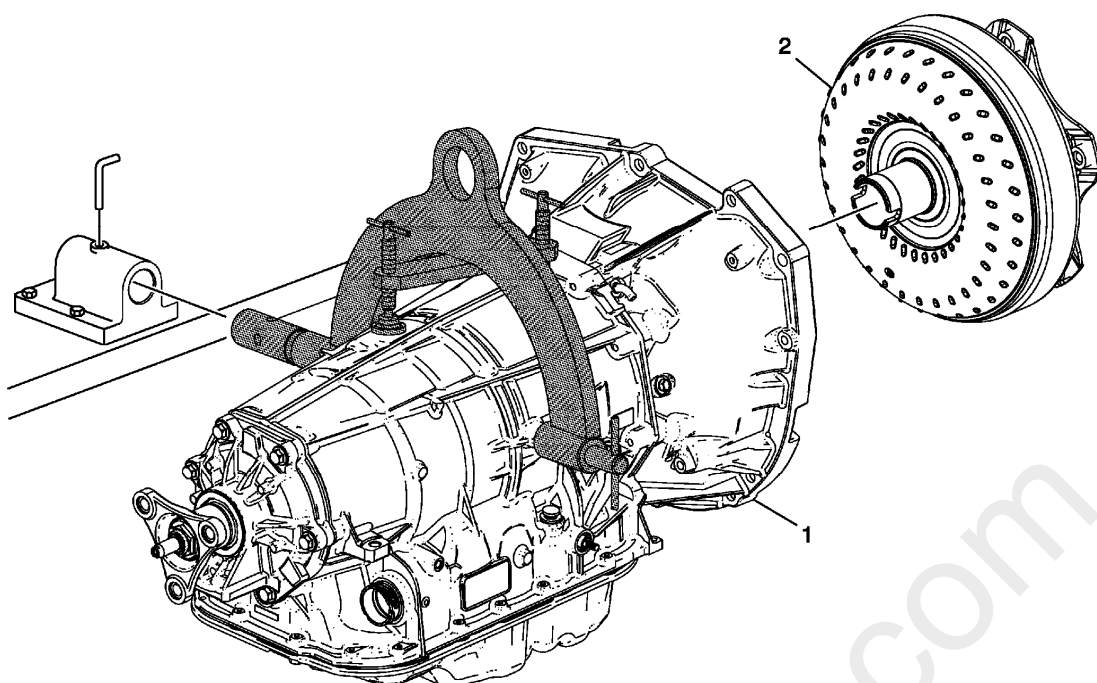


Fig. 123: Torque Converter And Holding Fixture (6L45)

Courtesy of GENERAL MOTORS COMPANY

Torque Converter Installation and Holding Fixture Removal (6L45)

Callout	Procedure
NOTE: Rotate the transmission so that the fluid pan assembly is down.	
1	Transmission Case Assembly Special Tools • DT 48067 Holding Fixture Adapter • DT-48989 Holding Fixture • J 3289-20 Holding Fixture Base Assembly • J 8763-B Holding Fixture For equivalent regional tools, refer to Special Tools .
2	Torque Converter Assembly

TORQUE CONVERTER INSTALLATION AND HOLDING FIXTURE REMOVAL (6L90)

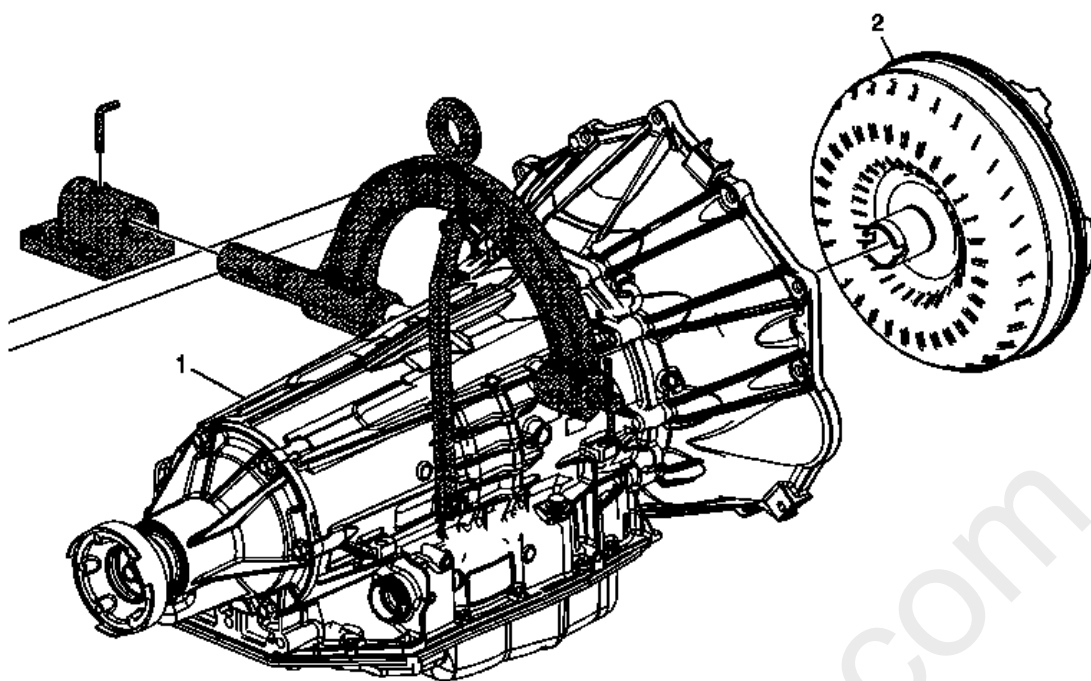


Fig. 124: Identifying Torque Converter & Holding Fixture Components (6L90)
 Courtesy of GENERAL MOTORS COMPANY

Torque Converter Installation and Holding Fixture Removal (6L90)

Callout	Procedure
Preliminary Procedure Rotate the transmission so that the fluid pan assembly is down.	
1	Transmission Case Assembly Special Tools • DT 47605 Holding Fixture Adapter • J 3289-20 Holding Fixture Base Assembly • J 8763-B Holding Fixture For equivalent regional tools, refer to Special Tools .
2	Torque Converter Assembly