

2010 TRANSMISSION

Automatic Transmission - 2ML70 - Escalade, Tahoe & Yukon

REPAIR INSTRUCTIONS - OFF VEHICLE

HOLDING FIXTURE INSTALLATION AND TORQUE DAMPENER REMOVAL

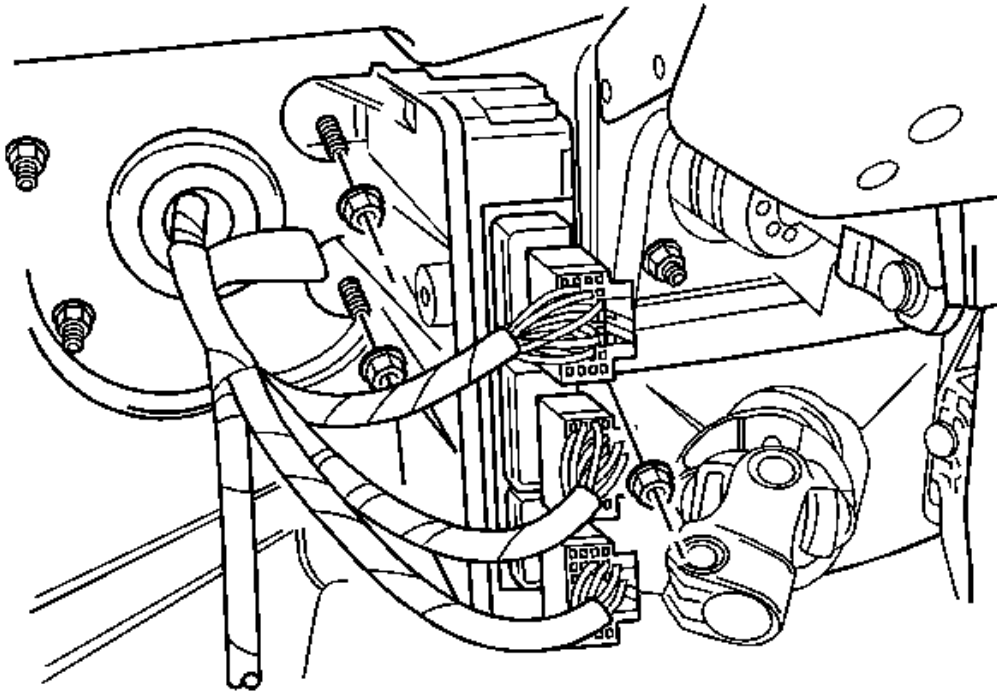


Fig. 1: Holding Fixture Removal/Installation and Torque Dampener
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Torque Dampener Assembly Special Tool: J 21366 Converter Holding Strap
	A/Trans Case Assembly Procedure 1. Rotate the transmission so that the dampener housing

2

is up and secure with locking pin.

2. Allow any remaining transmission fluid to drain from the case extension.

Special Tools

- **DT-48307** Holding Fixture. See **Special Tools** .
- **J 3289-20** Holding Fixture Base Assembly. See **Special Tools** .

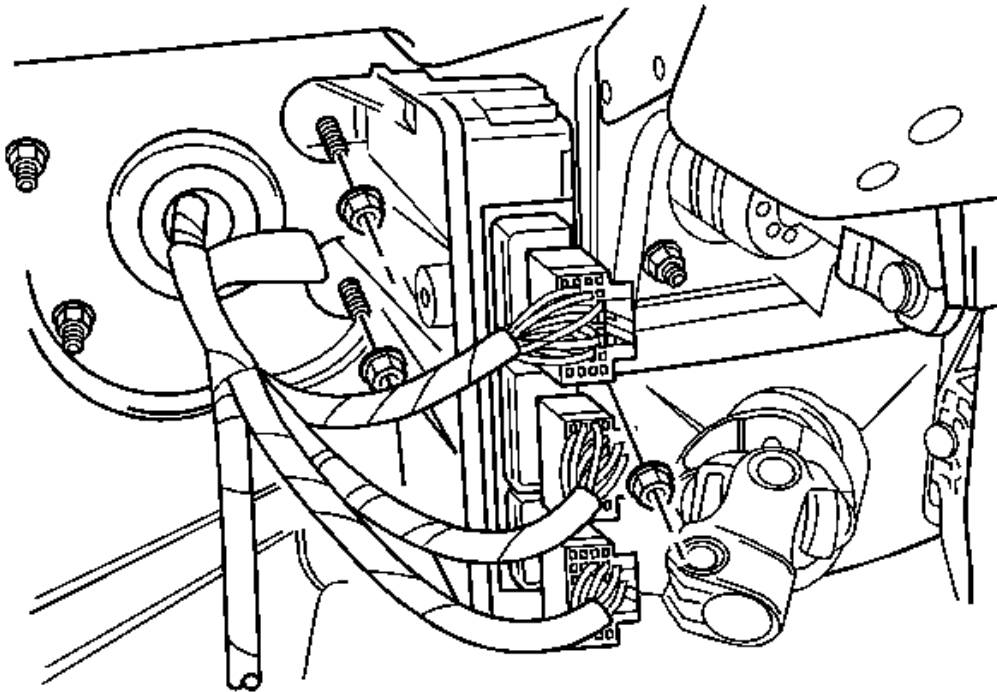
AUXILIARY FLUID PUMP REMOVAL

Fig. 2: Auxiliary Fluid Pump
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Auxiliary Fluid Pump Bolt M6 x 1.0 x 65 (Qty: 4)
	A/Trans Auxiliary Fluid Pump Assembly

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2	CAUTION: Do not damage the case sealing surface when removing or installing the pump and motor assembly.
3	A/Trans Auxiliary Fluid Pump Gasket CAUTION: The auxiliary fluid pump gasket is not re-usable. Use a NEW gasket when replacing or damage may occur.

TRANSMISSION FLUID PAN, FLUID FILTER, AND AUXILIARY FLUID PUMP FILTER REMOVAL

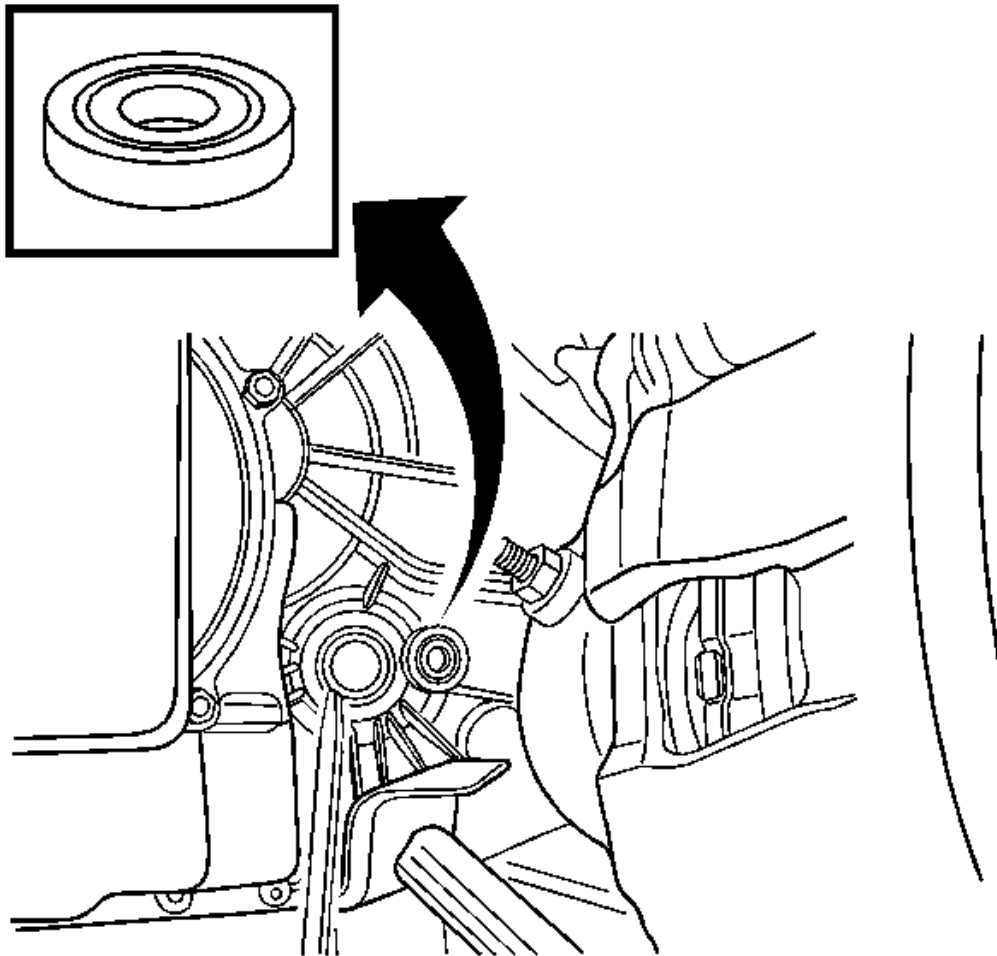


Fig. 3: Transmission Fluid Pan, Fluid Filter, and Auxiliary Fluid Pump Filter
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Fluid Pan Bolt M8 x 1.25 x 20 - External (Qty: 13)
2	A/Trans Fluid Pan Assembly
3	A/Trans Fluid Pan Gasket Tip: 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	A/Trans Fluid Filter Assembly CAUTION:

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	Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.
5	A/Trans Fluid Filter Seal Assembly CAUTION: Do not damage the case sealing surface when removing the filter seal assembly. Tip: Use a screwdriver or snap ring pliers.
6	A/Trans Auxiliary Fluid Pump Filter Assembly CAUTION: Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.
7	A/Trans Auxiliary Fluid Filter Seal
8	A/Trans Auxiliary Fluid Pump Outlet Pipe
9	A/Trans Auxiliary Fluid Filter Seal CAUTION: Do not damage the case sealing surface when removing the filter seal assembly. Tip: Use a screwdriver or snap ring pliers to remove.
10	Electrical Connector Slide Lock CAUTION: Pull up on the electrical connector slide lock to avoid damage to the connector.
11	Electrical Connector Passage Sleeve Special Tools • DT 47715 Electrical Connector Passage Sleeve Remover/Installer. See Special Tools . • J 42183 Driver Handle. See Special Tools .

CONTROL VALVE ASSEMBLY REMOVAL

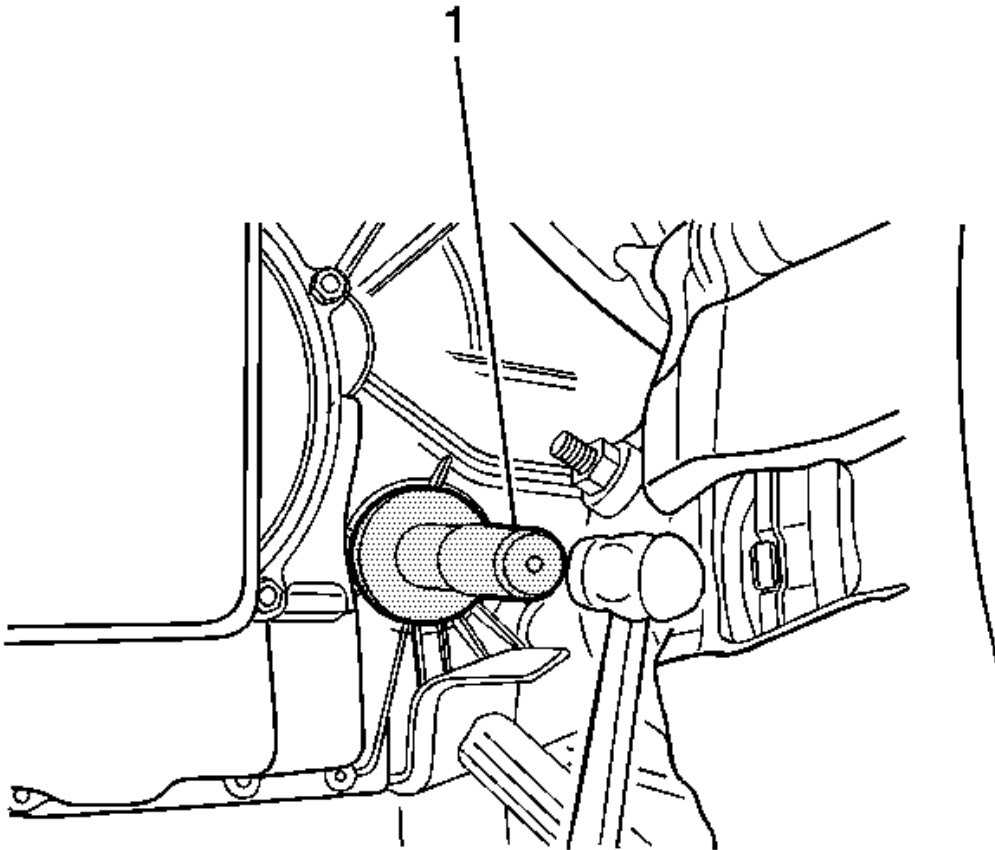


Fig. 4: Control Valve Assembly
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Control Solenoid (with Body and TCM) Valve Assembly Procedure: Disconnect the wiring harness.
2	Shift Shaft Position Switch Procedure: Disconnect the wiring harness.
3	A/Trans Wiring Harness Assembly Procedure: Disconnect the wiring harness.
	Control Valve Upper Body Bolt M6 x1.0 x 65 (Qty: 4)

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4	Tip: Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.
5	Internal Wire Harness Side Bracket
6	Control Valve Upper Body Bolt M6 x 1.0 x 80 (Qty: 2)
7	Control (with Body and Valve) 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.
8	A/Trans Fluid Pump Seal Assembly Tip: Do not reuse the seal assembly.
9	Hybrid Low, 1-2 Clutch Regulator Valve Seal (Qty: 6) Tip: Do not reuse the seal assembly.

TRANSMISSION CONTROL WIRING HARNESS EXTENSION HARNESS REMOVAL

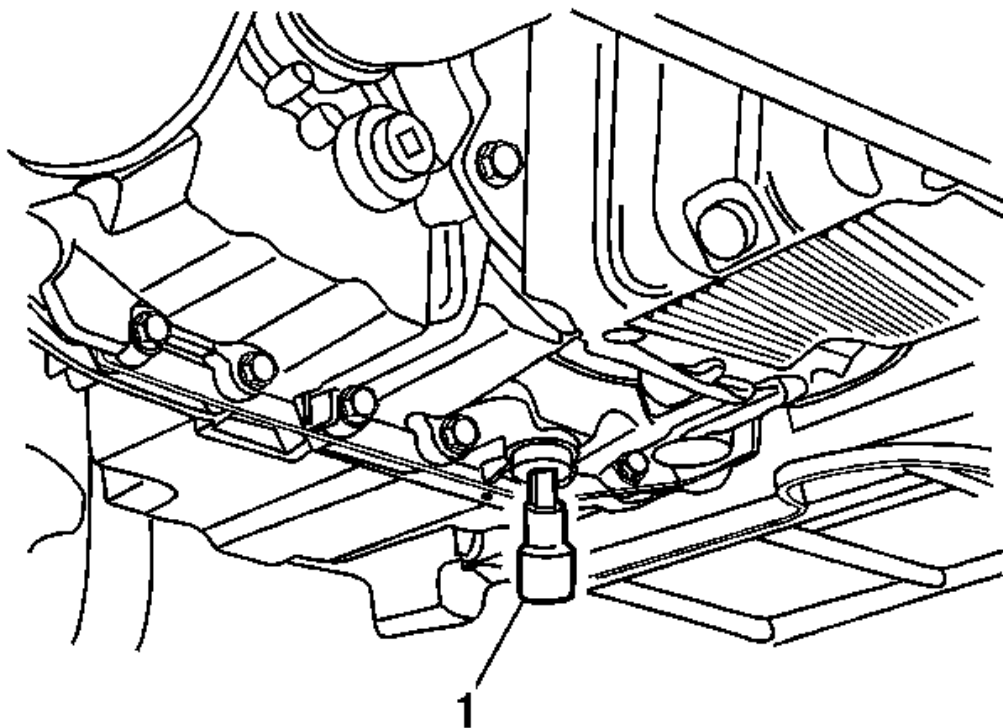


Fig. 5: Transmission Control Wiring Harness Extension Harness
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Control Wiring Harness Extension Harness Assembly CAUTION: Do not damage the connector ends or wires when removing the harness assembly.

TORQUE DAMPENER HOUSING REMOVAL

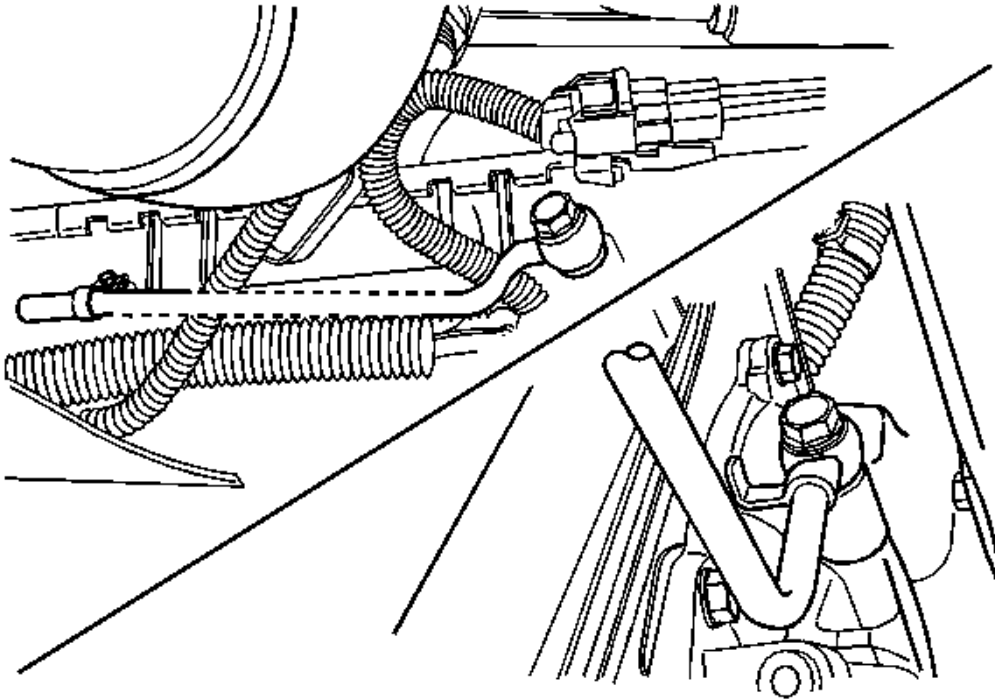


Fig. 6: Torque Dampener Housing Removal
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: The valve body assembly must be removed prior to removing the torque dampener (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.	
1	A/Trans Fluid Pump Cover Bolt M8 x 1.25 x 25 (Qty: 12)
2	A/Trans Torque Dampener (w/Fluid Pump) Housing Assembly
3	A/Trans Torque Dampener Housing Gasket

INPUT SHAFT, SUN GEAR CARRIER, AND SUN GEAR REMOVAL

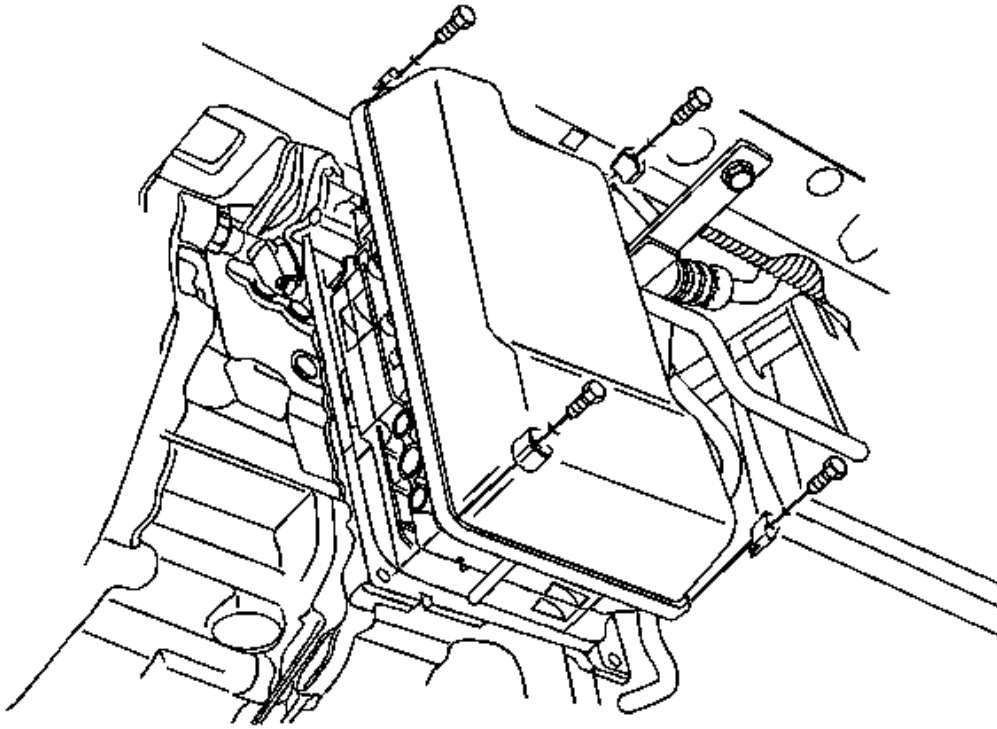


Fig. 7: Input Shaft, Sun Gear Carrier, and Sun Gear
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Input Shaft Thrust Bearing
2	Input Shaft Assembly
3	Sun Gear Carrier Thrust Bearing - 1st Position
4	Internal Gear Retaining Ring - 1st Position WARNING: Use care when removing or installing the retaining ring, or bodily injury may occur. Tip: Discard the retaining ring. It is not reusable.
5	Input Shaft Fluid Seal Ring Tip: Discard the seal ring. They are not reusable.
6	A/Trans Torque Dampener Clutch Fluid Seal Ring Tip: Discard the seal ring. They are not reusable.

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7	Input Shaft
8	Internal Gear
9	Sun Gear Carrier Assembly - 1st Position
10	Sun Gear Assembly - 1st Position

DRIVE MOTOR WITH GENERATOR ASSEMBLY REMOVAL - 1ST POSITION

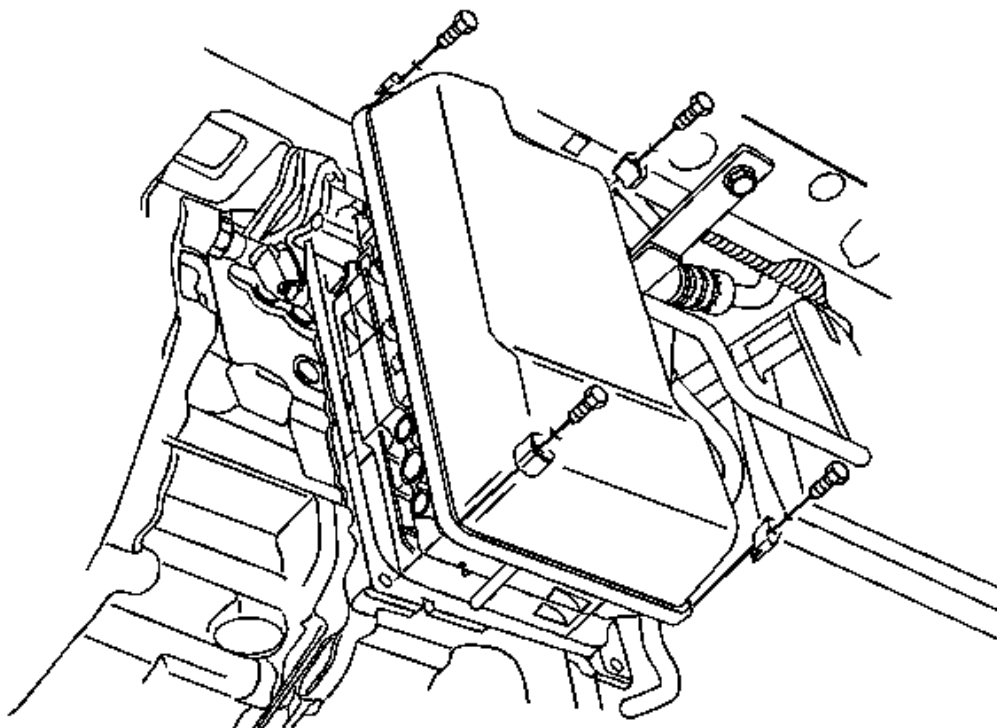


Fig. 8: Drive Motor with Generator Assembly Removal - 1st Position
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Generator Drive Motor Bolt M6 x 1.0 x 20.0 (Qty: 3) Tip: Remove only the three bolts on the motor that are indicated.
	Drive Motor (w/Generator) Assembly - 1st Position WARNING: The generator motor weighs approximately 36 kg (80

2

lbs). Personal injury may result if you lift the generator motor improperly.

CAUTION:

Set drive generator motor on its side to avoid damaging the electrical connectors.

Tip: Ensure the **DT-48473** is completely seated and locked on the motor assembly and ensure legs are bolted tight. See **Special Tools** . It will require the use of an overhead chain fall to remove. The O-Ring seals are not reusable.

Special Tool:

DT-48473 Motor Lift Plate. See **Special Tools** .

SUN GEAR SHAFT, SUN GEAR CARRIER, 1-3 CLUTCH HOUSING, AND MAIN SHAFT REMOVAL

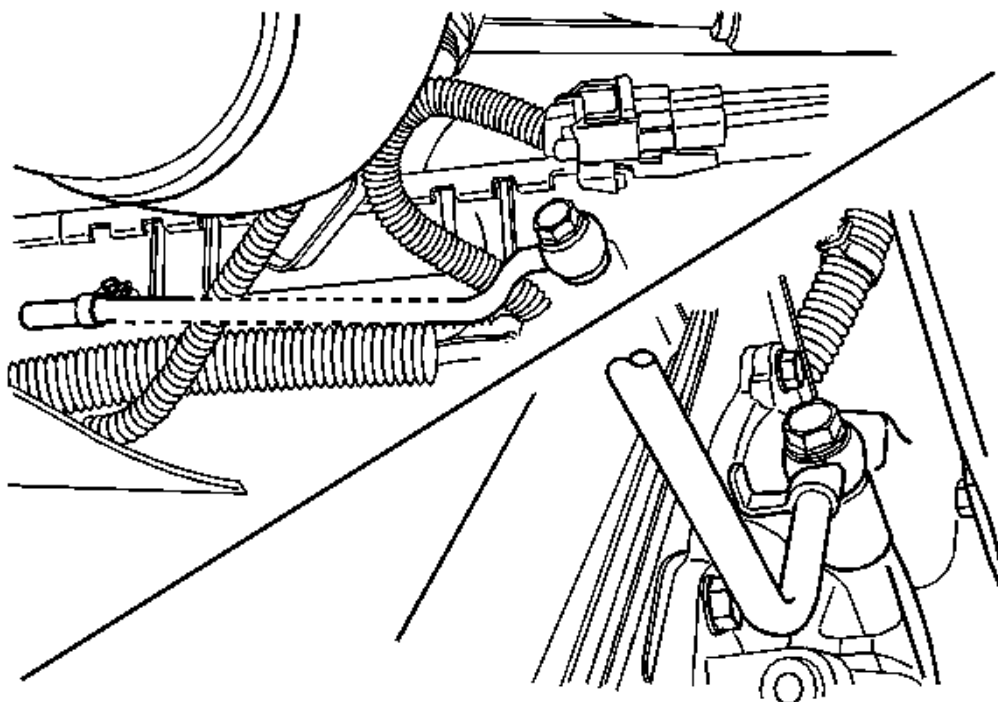


Fig. 9: Sun Gear Shaft, Sun Gear Carrier, 1-3 Clutch Housing, and Main Shaft

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Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Sun Gear Shaft Assembly - 1st Position
2	Internal Gear Thrust Bearing Assembly - 2nd Position
3	Main Shaft Assembly
4	Sun Gear Carrier Assembly - 2nd Position
5	Sun Gear Assembly - 2nd Position
6	1-3 Clutch Housing Assembly
7	Hybrid Direct, 2-3-4 Clutch Housing Thrust Bearing Assembly
8	Sun Gear Shaft Retaining Ring WARNING: Use care when removing or installing the retaining ring, or bodily injury may occur.
9	Sun Gear Shaft Assembly - 1st Position
10	Internal Gear - 2nd Position

4TH CLUTCH PISTON REMOVAL

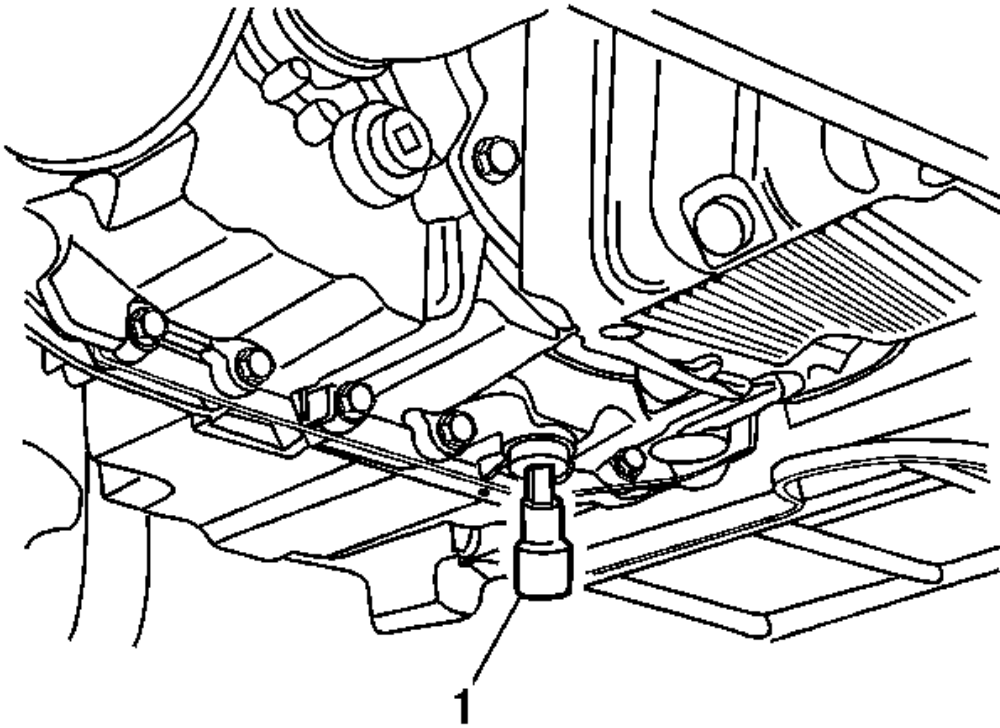
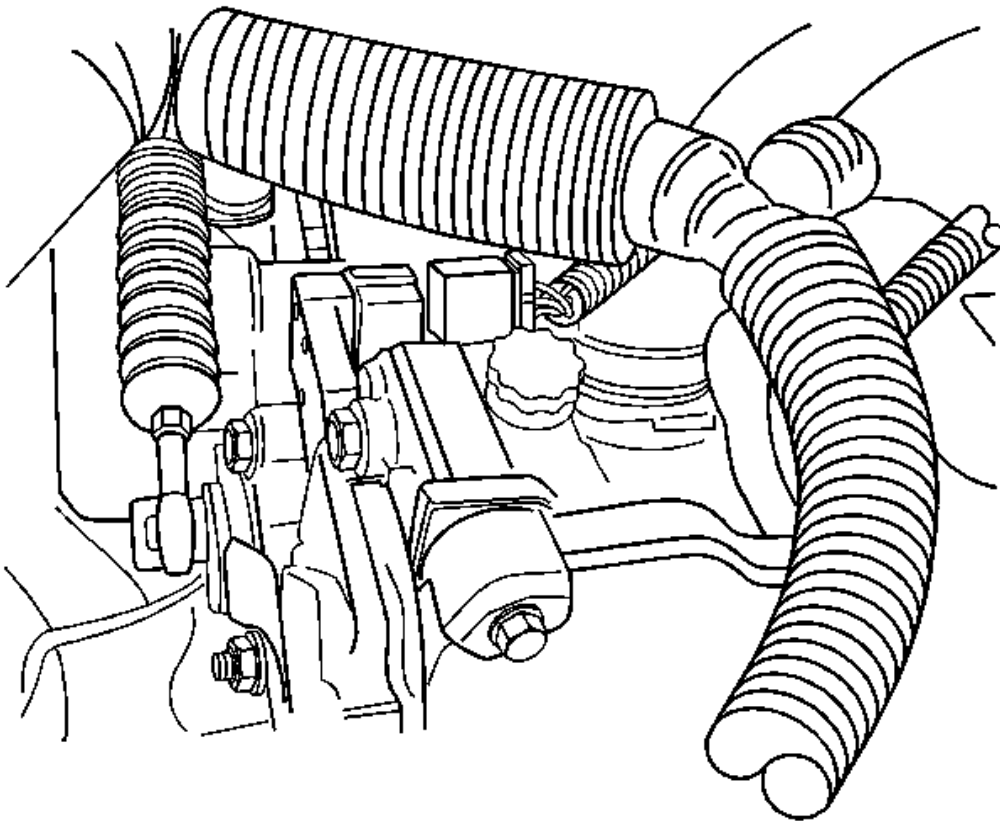


Fig. 10: 4th Clutch Piston
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	4th Clutch Piston Retaining Ring WARNING: Use care when removing or installing the retaining ring, or bodily injury may occur.
2	4th Clutch Backing Plate
3	4th Clutch Plate Assembly
4	4th Clutch Plate
5	4th Clutch Waved Plate
6	4th Clutch Piston Retaining Ring WARNING: Use care when removing or installing the retaining ring, or bodily injury may occur.
7	4th Clutch Piston Retaining Spring Assembly

REAR CASE REMOVAL**Fig. 11: Rear Case**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Rear Case Bolt M8 x 1.25 x 30 (Qty: 12)
2	A/Trans Rear Case Assembly Tip: During removal of the rear case, use care in order to retain the sun gear - 3rd position on the sun gear shaft assembly - 3rd position.
3	A/Trans Rear Case Gasket

SUN GEAR AND SUN GEAR SHAFT REMOVAL

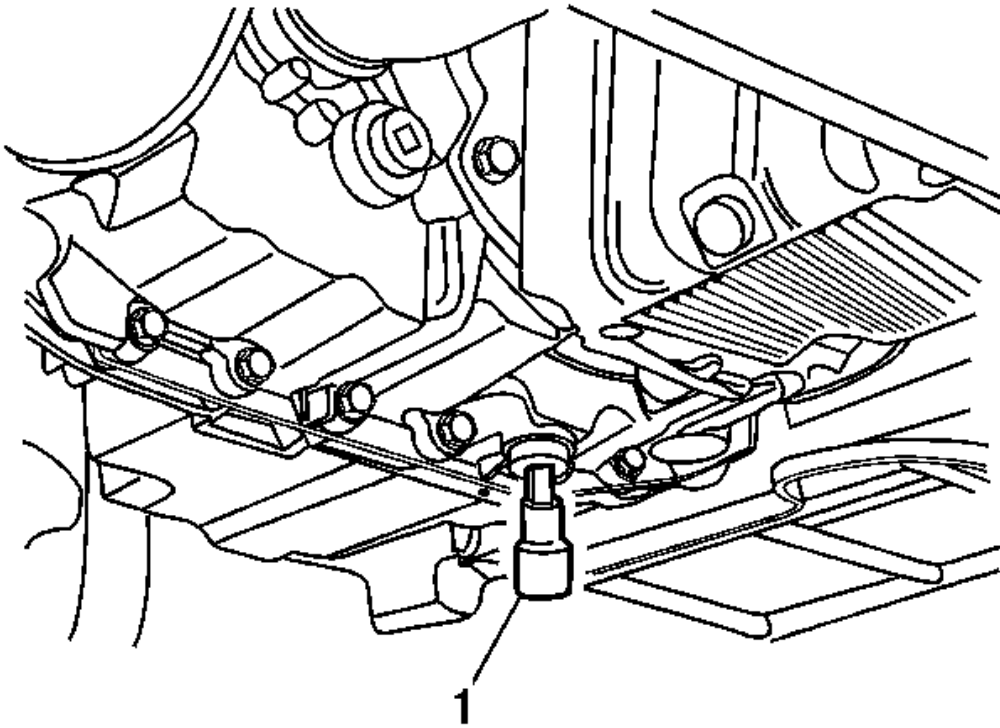


Fig. 12: Sun Gear and Sun Gear Shaft
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Sun Gear - 3rd Position Tip: This sun gear has no bushing inside and can only go with the sun gear shaft assembly.
2	Sun Gear Shaft Assembly - 3rd Position Tip: The sun gear shaft may be pressed into the motor on some models, and will not be serviced separately.

DRIVE MOTOR WITH GENERATOR ASSEMBLY REMOVAL - 2ND POSITION

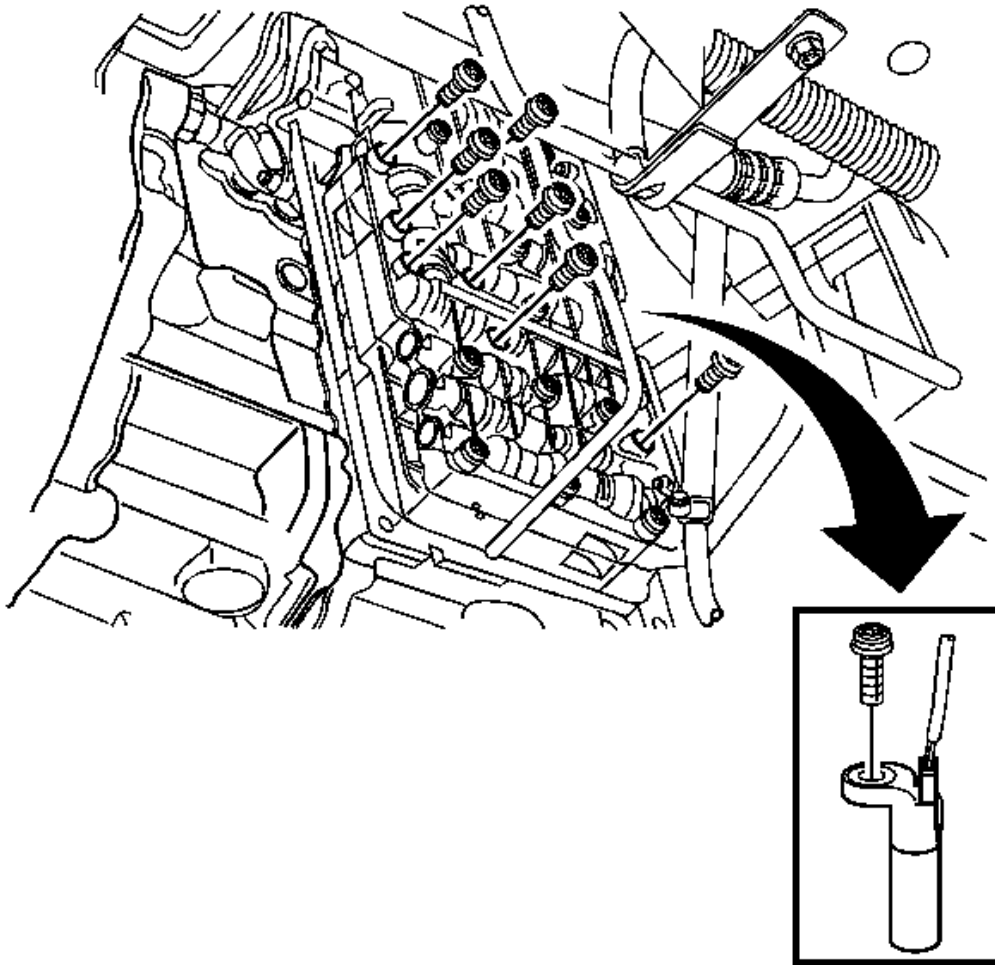


Fig. 13: Drive Motor with Generator Assembly - 2nd Position
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Generator Drive Motor Bolt M6 x 1.0 x 20.0 (Qty: 3) Tip: Remove only the three bolts on the motor that are indicated.
	Drive Motor (w/Generator) Assembly - 2nd Position WARNING: The generator motor weighs approximately 36 kg (80 lbs). Personal injury may result if you lift the generator motor improperly.

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CAUTION:

Set drive generator motor on its side to avoid damaging the electrical connectors.

Tip: Ensure the **DT-48473** is completely seated and locked on the motor assembly and ensure legs are bolted tight. See **Special Tools** . It will require the use of an overhead chain fall to remove. The O-Ring seals are not reusable.

Special Tool:

DT-48473 Motor Lift Plate. See **Special Tools** .

CENTER SUPPORT ASSEMBLY REMOVAL

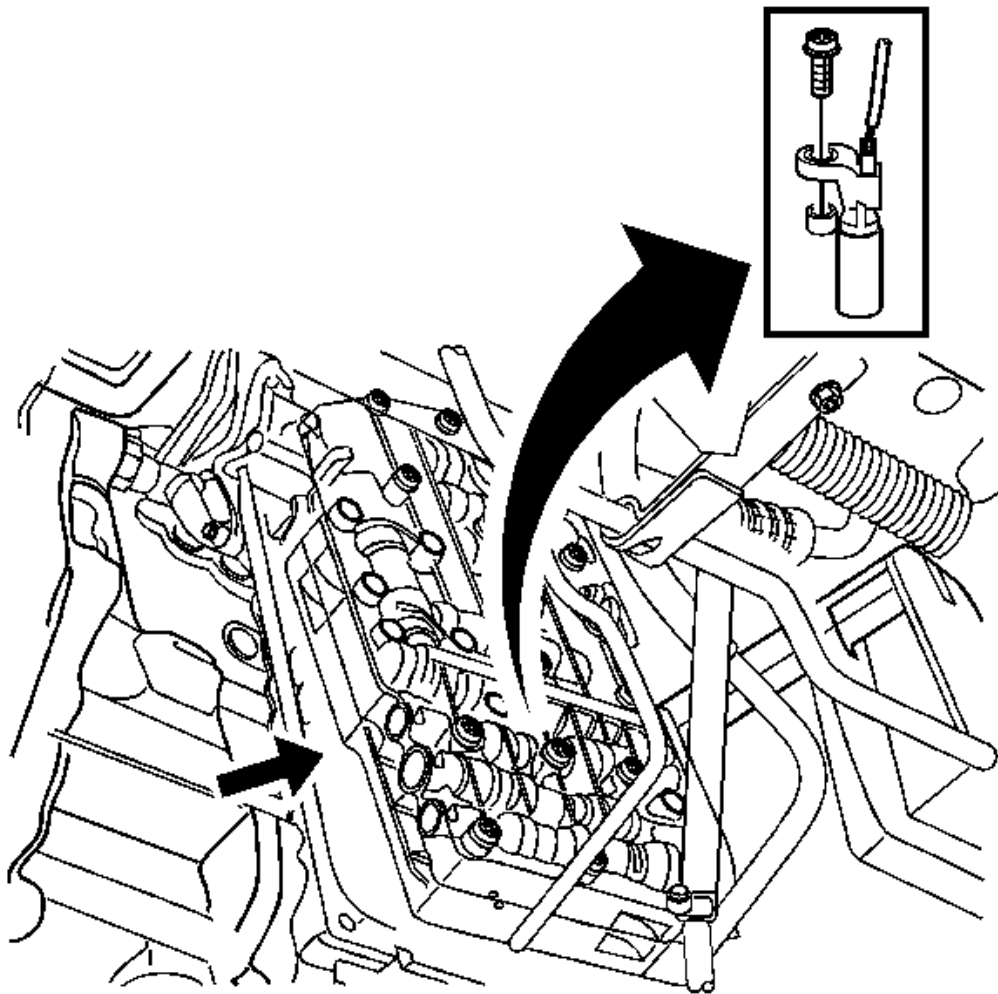


Fig. 14: Center Support Assembly
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Center Support Bolt M6 x 1.0 x 20.0 (Qty: 4)
2	Center Support Assembly

MANUAL SHIFT SHAFT POSITION SWITCH OVERHAUL

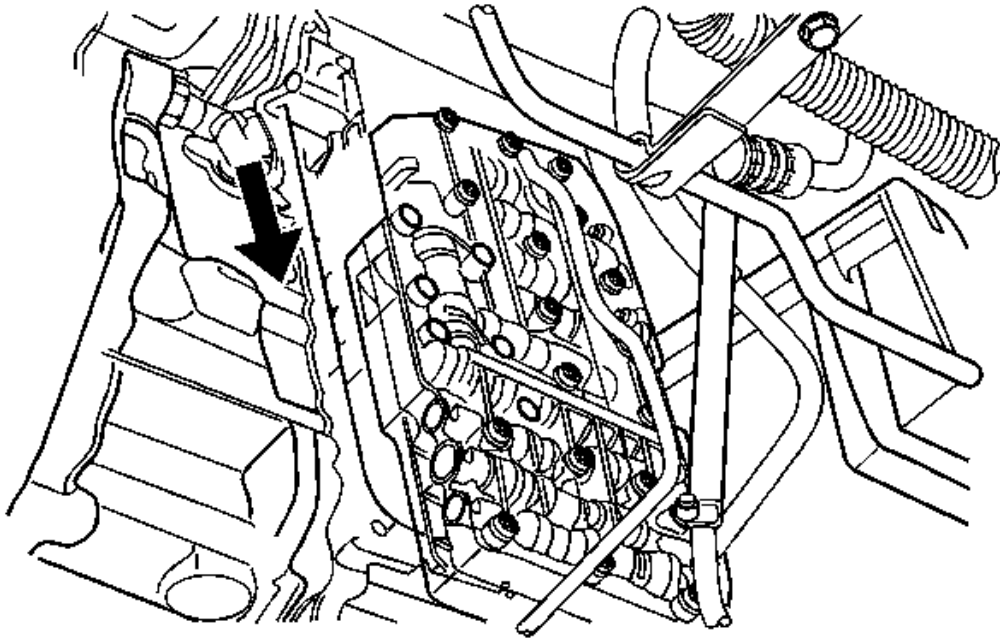


Fig. 15: Manual Shift Shaft Position Switch Overhaul
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Manual Shift Shaft Position Switch Bolt M5 x0.8 x 20 CAUTION: Refer to <u>Pin Reuse Caution</u> . CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 7-9 N.m (62-80 lb in)
2	Manual Shift Shaft Pin CAUTION: Refer to <u>Pin Reuse Caution</u> .
3	Manual Shift Shaft

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4	A/Trans Manual Shift Shaft Position Switch Assembly
5	Park Pawl Actuator Assembly

MANUAL SHIFT SHAFT SEAL REPLACEMENT

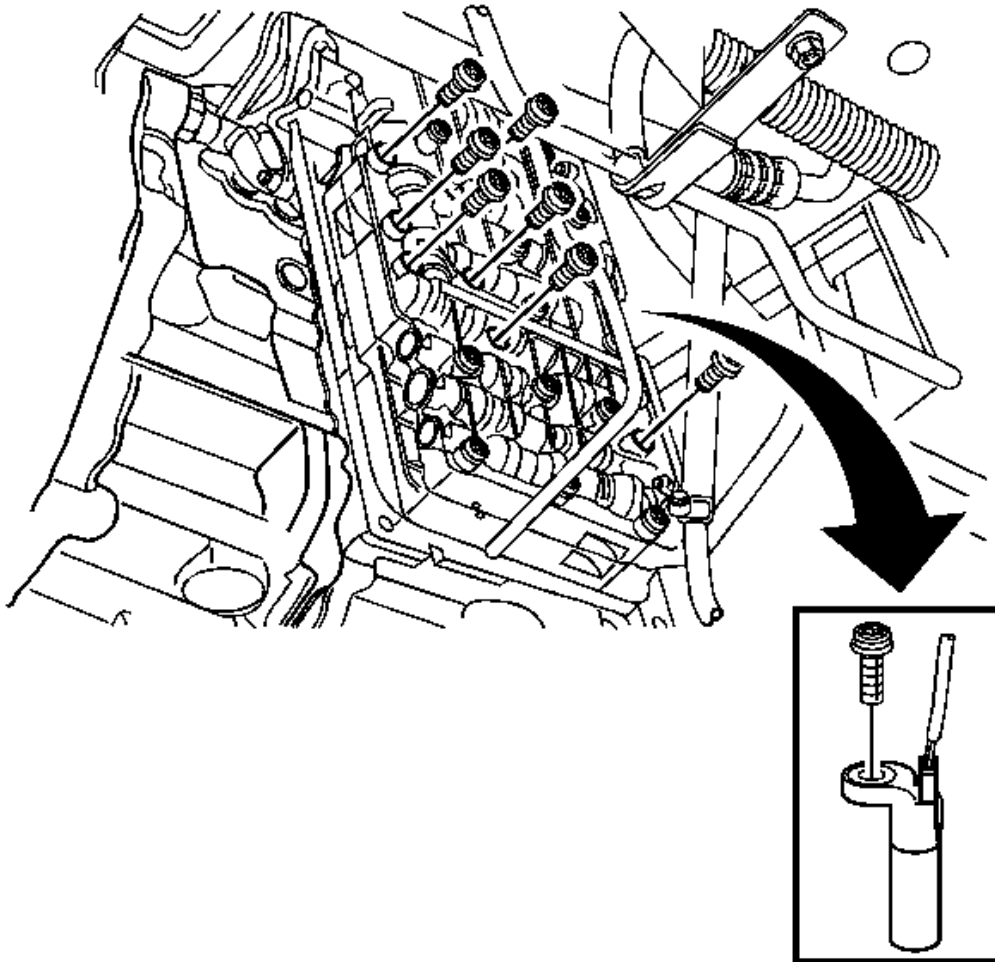


Fig. 16: Manual Shift Shaft Seal Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Manual Shift Shaft Seal

1

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.

Tip: Always install a NEW seal into the case.

Special Tools

- **DT 47770** Seal Installer. See **Special Tools** .
- **J 45201** Cooler Line Seal Remover. See **Special Tools** .

TRANSMISSION CASE CLEANING AND INSPECTION

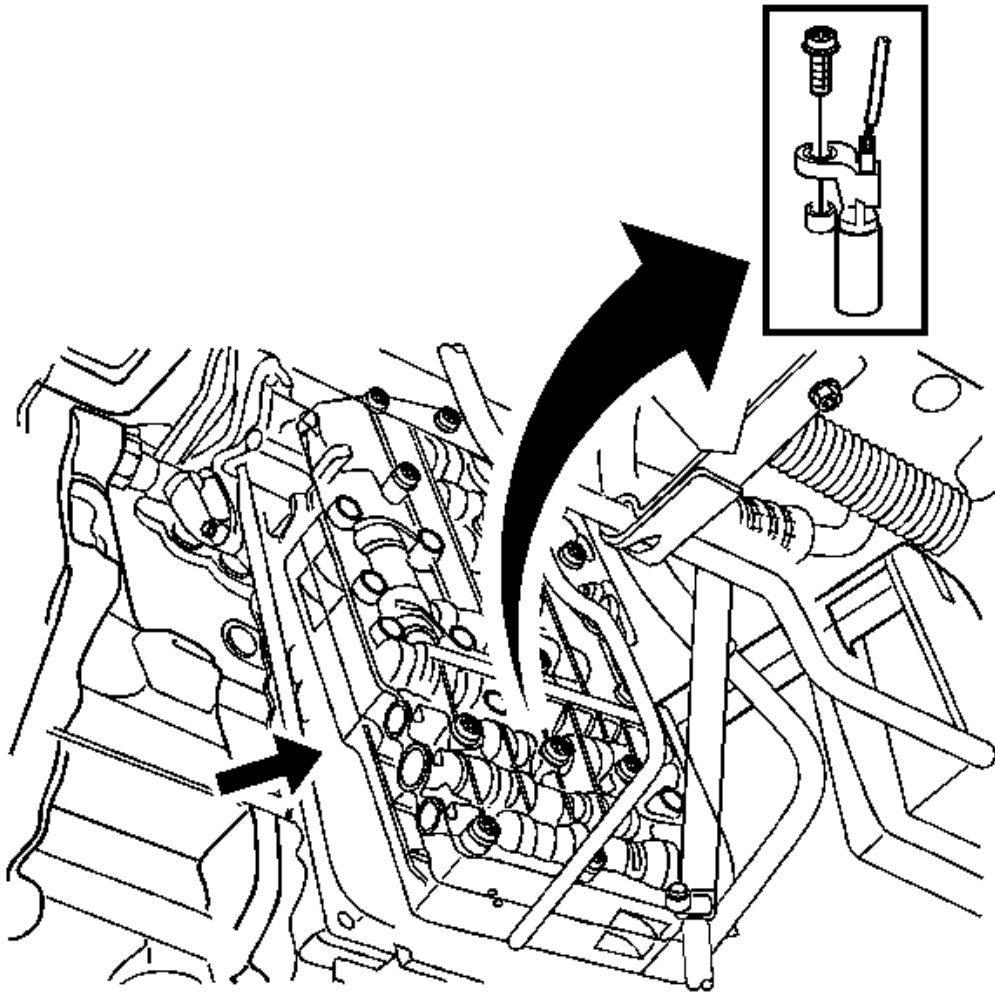


Fig. 17: Transmission Case Cleaning and Inspection
Courtesy of GENERAL MOTORS CORP.

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.	

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Preliminary Procedures

- Thoroughly clean the transmission case assembly, including case threads, with clean solvent.
- Clean gasket sealing surfaces. Remove all residual gasket material.
- Inspect all threaded holes. If necessary, repair any thread damage.

1	A/Trans Vent Pipe
2	A/Trans Case Assembly
3	High Voltage Electrical Box
4	Manual Shift Shaft Seal Refer to <u>Manual Shift Shaft Seal Replacement</u> .
5	Torque Dampener Housing Sealing Surface
6	Generator Assembly Sealing Surface
7	A/Trans Fluid Pan Gasket Sealing Surface
8	Rear Case Gasket Surface
9	Generator Assembly Sealing Surface
10	Wiring Harness Passage Sleeve Bore

CENTER SUPPORT CLEANING AND INSPECTION

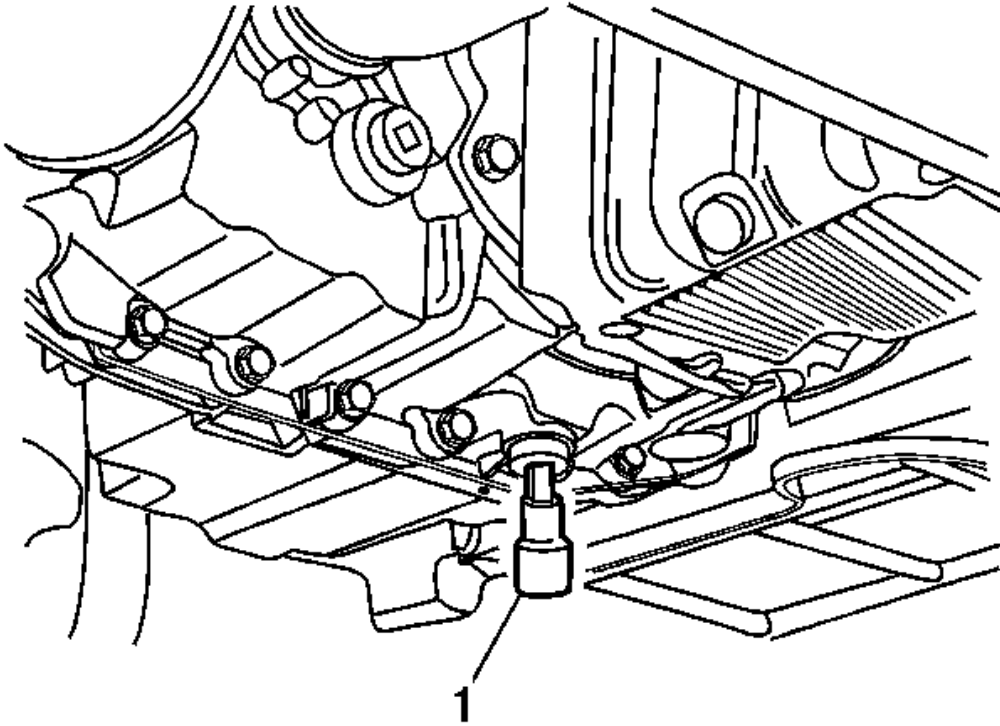


Fig. 18: Center Support Cleaning and Inspection
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	1-3 Clutch Housing Fluid Seal Ring Tip: Install a NEW seal. Discard the old seal, it is not reusable.
2	Alignment Hole
3	Seal Ring Grooves
4	Center Support Assembly

CENTER SUPPORT ASSEMBLY INSTALLATION

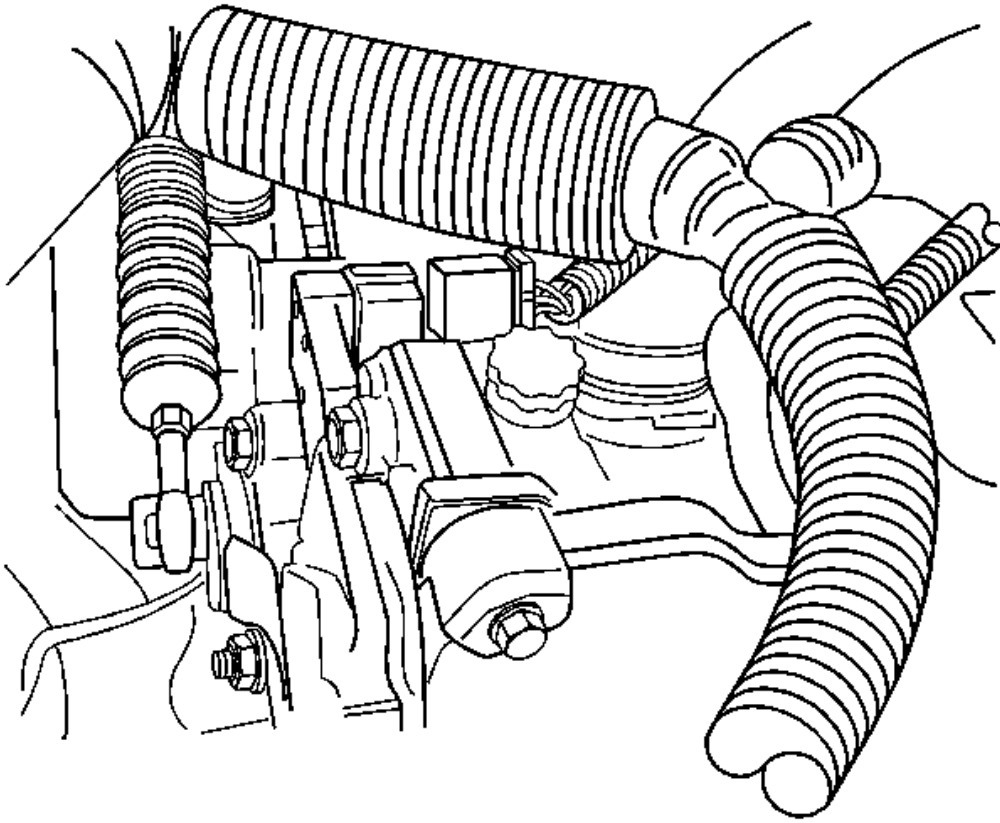


Fig. 19: Center Support Assembly
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Center Support Assembly
2	Center Support Bolt M6 x 1.0 x 20 (Qty: 4)
	CAUTION: Refer to <u>Fastener Caution</u> .
	Tighten: 9-13 N.m (80-115 lb in)

DRIVE MOTOR WITH GENERATOR ASSEMBLY CLEANING AND INSPECTION - 2ND POSITION

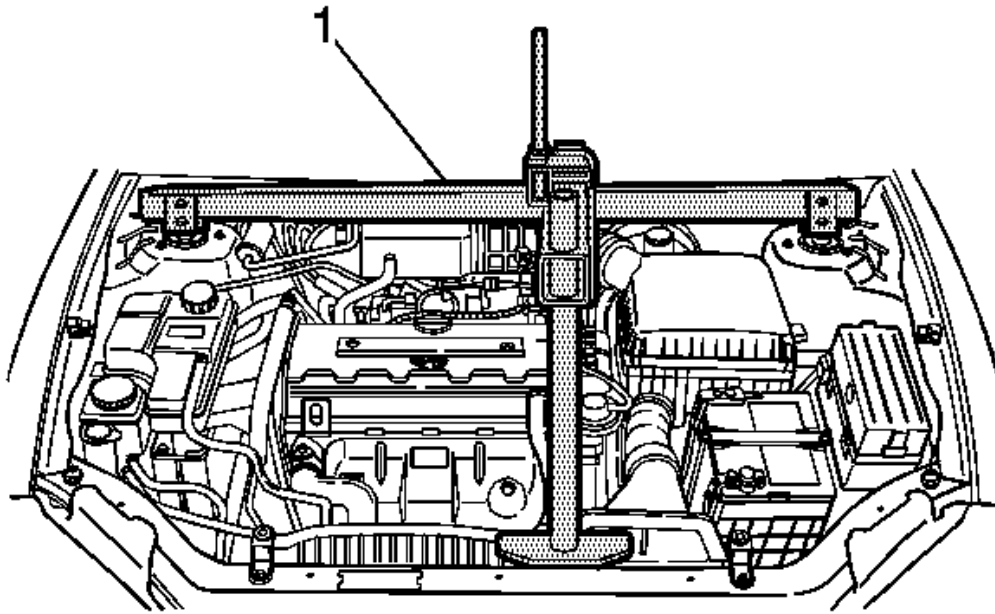


Fig. 20: Drive Motor with Generator Assembly Cleaning and Inspection - 2nd Position
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: Do not use any type of solvent or cleaning agents in or on motor. Solvents or cleaning agents may damage the motor. Wipe with a clean towel that is lint free.	
1	Generator Drive Motor Housing Seal Tip: Dex VI will continue to drain from the motor which is normal.
2	Resolver and Temp Sensor Connector Tip: - This is a critical connection, care must be taken. - Inspect for bent or broken pins.
3	Generator Motor Bearing
4	Generator Motor High Voltage Connections Tip: Inspect for arcing, broken plastic, or loose terminals.
5	Sun Gear Shaft Assembly - Third Postion Tip: The sun gear shaft may be pressed into the motor on

some models and will not be serviced separately.

- Inspect the splines on both ends of the shaft.

DRIVE MOTOR WITH GENERATOR ASSEMBLY INSTALLATION - 2ND POSITION

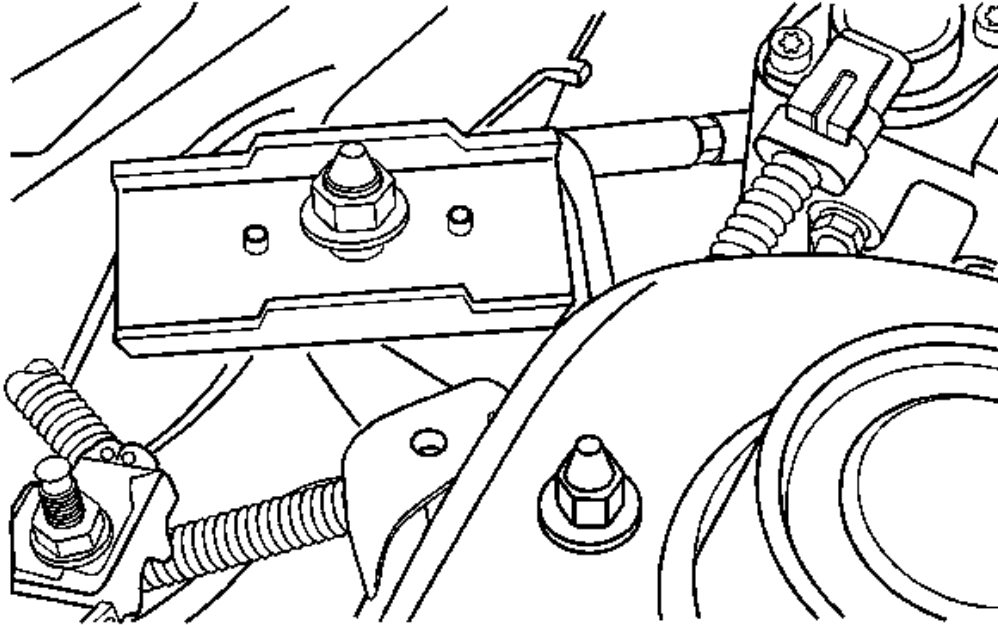


Fig. 21: Drive Motor with Generator Assembly - 2nd Position
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Drive Motor (w/Generator) Assembly - 2nd Position WARNING: The generator motor weighs approximately 36 kg (80 lbs). Personal injury may result if you lift the generator motor improperly. CAUTION: Carefully feed temp sensor and resolver connector thru case opening or damage may occur.

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	Tip: Install NEW O-Rings on motor while using holding fixture.
2	Generator Drive Motor Bolt M6 x 1.0 x 20 (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tip: Use Dexron VI to aid with installation on O-Rings for motor. Tighten: 9-13 N.m (80-115 lb in) Special Tool: DT-48473 Motor Lift Plate. See <u>Special Tools</u> .

SUN GEAR AND SUN GEAR SHAFT INSTALLATION

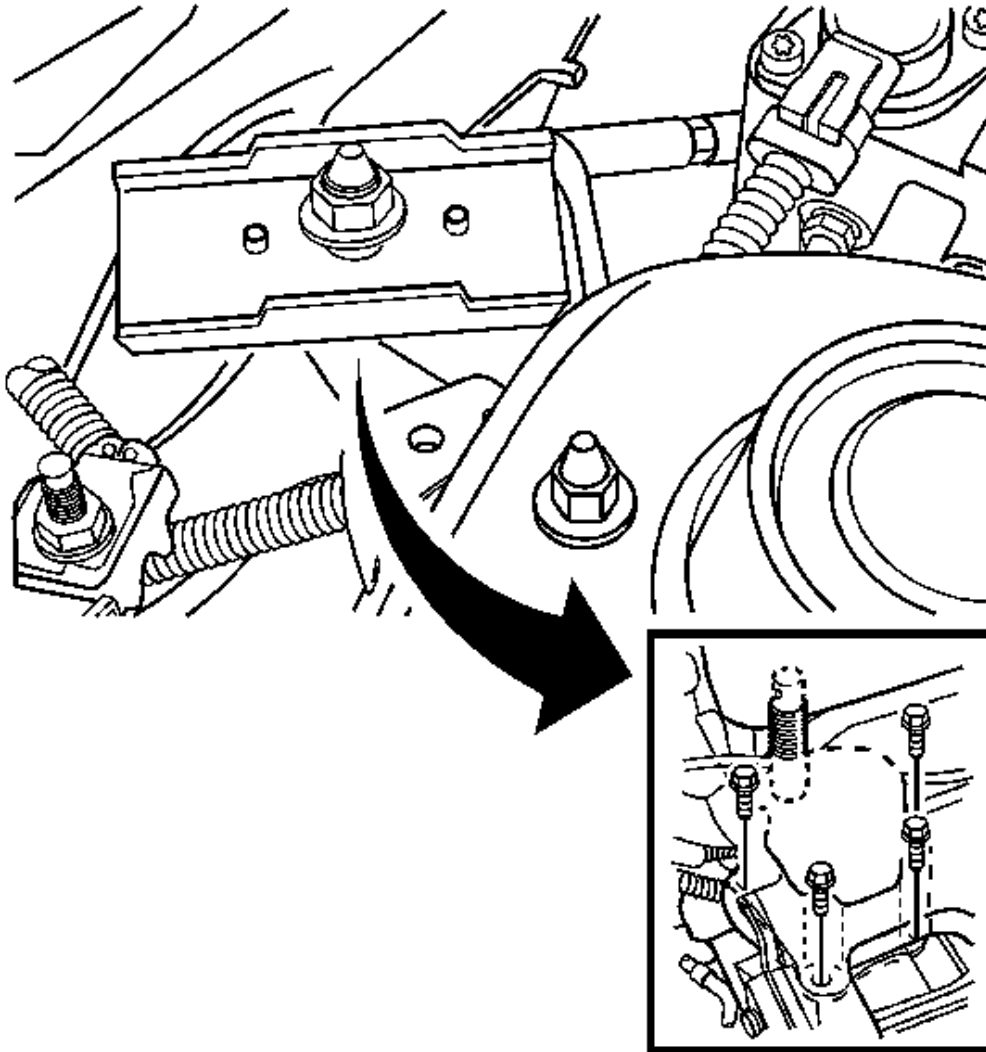


Fig. 22: Sun Gear and Sun Gear Shaft
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Sun Gear Shaft Assembly - 3rd Position Tip: - You might have to rotate the shaft to align the splines. - The sun gear shaft may be pressed into the motor

	on some models and will not be serviced separately.
2	Sun Gear - 3rd Position

OUTPUT SPEED SENSOR AND CASE EXTENSION REMOVAL

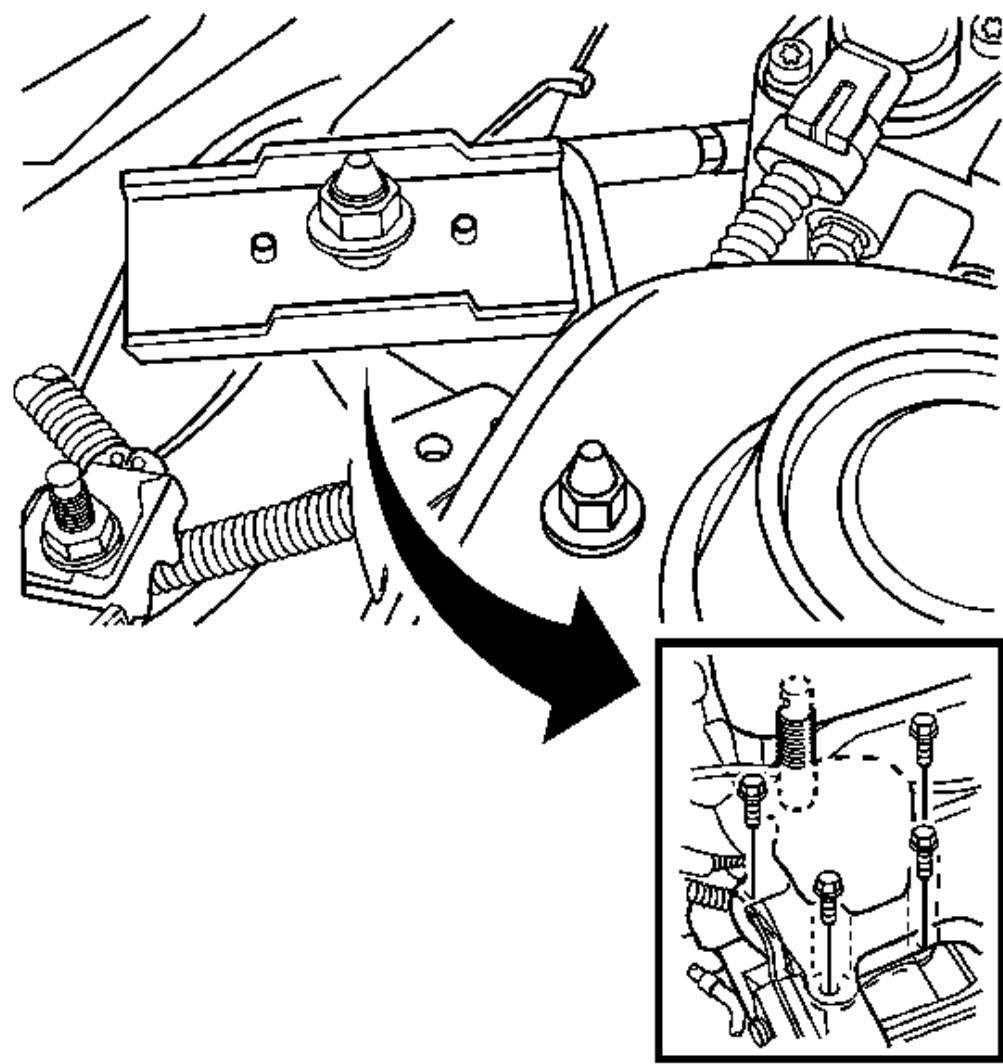


Fig. 23: Output Speed Sensor and Case Extension
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

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1	A/Trans Rear Case Bolt M10 x 1.5 x 45 (Qty: 6)
2	2WD Output Housing Extension Assembly Tip: There is also a 4WD option with bolts and torque sequence the same as the 2WD.
3	Gasket (2WD Outlet Only)
4	Vehicle Speed Sensor Bolt
5	A/Trans Output Speed Sensor Assembly
6	A/Trans Output Speed Sensor O-Ring Seal

HYBRID LOW, 1-2 CLUTCH PISTON REMOVAL

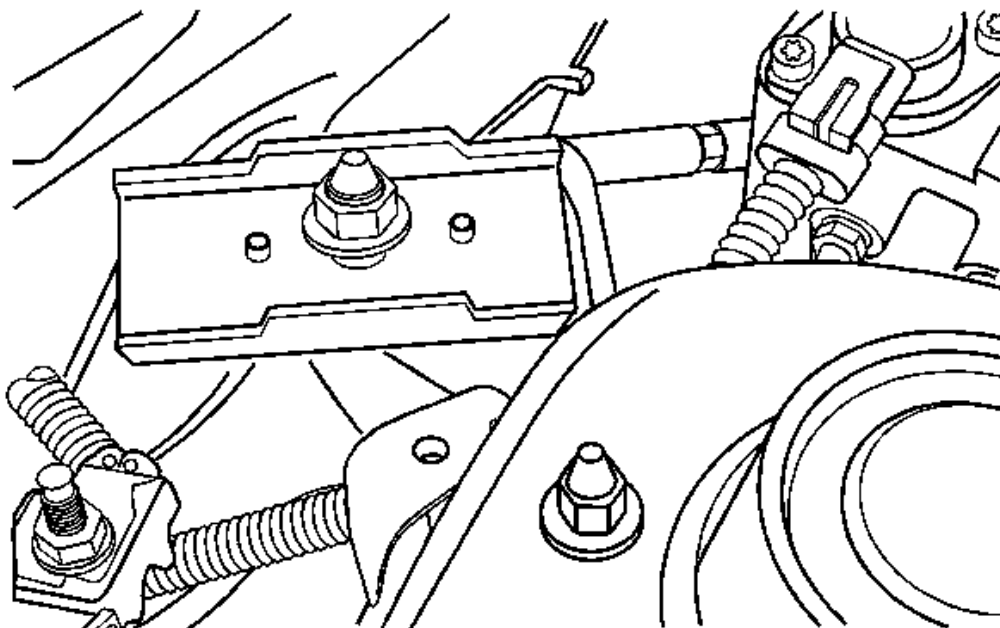


Fig. 24: Hybrid Low, 1-2 Clutch Piston
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Hybrid Low, 1-2 Clutch Piston Retaining Ring Tip: Do not reuse the retaining ring.
2	Hybrid Low, 1-2 Clutch Backing Plate Assembly
3	Hybrid Low, 1-2 Clutch Plate Assembly
4	Hybrid Low, 1-2 Clutch Plate
5	Hybrid Low, 1-2 Clutch Plate - Waved

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6	Hybrid Low, 1-2 Clutch Return Spring Assembly
7	Hybrid Low, 1-2 Clutch Piston

SUN GEAR CARRIER AND HYBRID DIRECT, 2-3-4 CLUTCH HOUSING REMOVAL

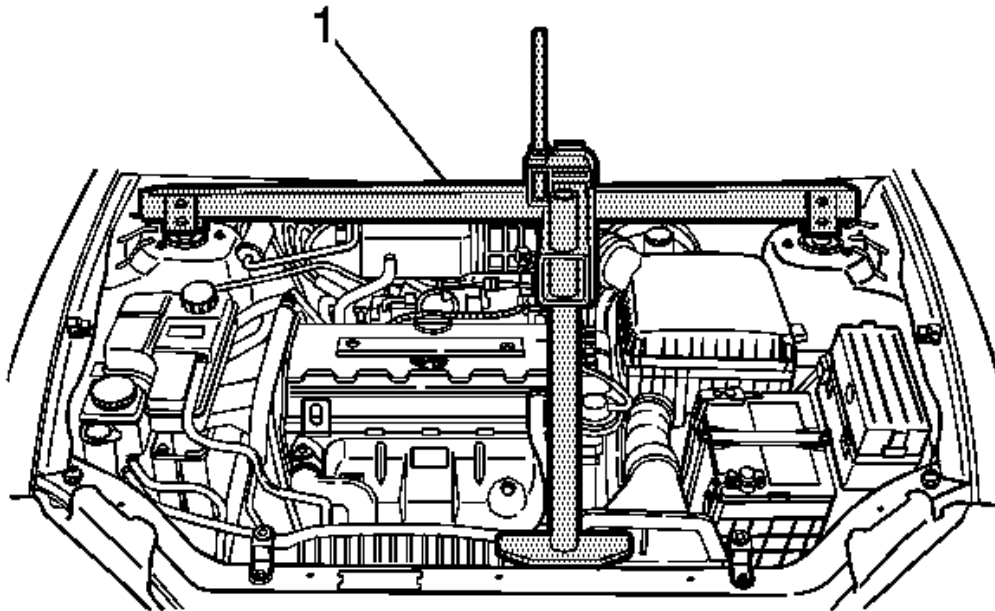


Fig. 25: Sun Gear Carrier and Hybrid Direct, 2-3-4 Clutch Housing
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Internal Gear - 3rd Position
2	Internal Gear Thrust Washer - Plastic - 3rd Position
3	Internal Gear Thrust Washer - Steel - 3rd Position Tip: Some scoring of this thrust washer is normal due to wear, if scoring is found it is not necessary to replace to the washer.
4	Sun Gear Carrier Assembly - 3rd Position
5	Internal Gear Thrust Bearing Assembly - 2nd Position
6	Hybrid Direct, 2-3-4 Clutch Hub
7	Output Shaft Thrust Bearing Assembly

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8	Output Shaft Assembly Tip: There is also a 4WD optional output shaft assembly.
9	Hybrid Direct, 2-3-4 Clutch Housing Assembly
10	Hybrid Direct, 2-3-4 Clutch Housing Thrust Bearing Assembly

HYBRID DIRECT, 2-3-4 CLUTCH SUPPORT REMOVAL

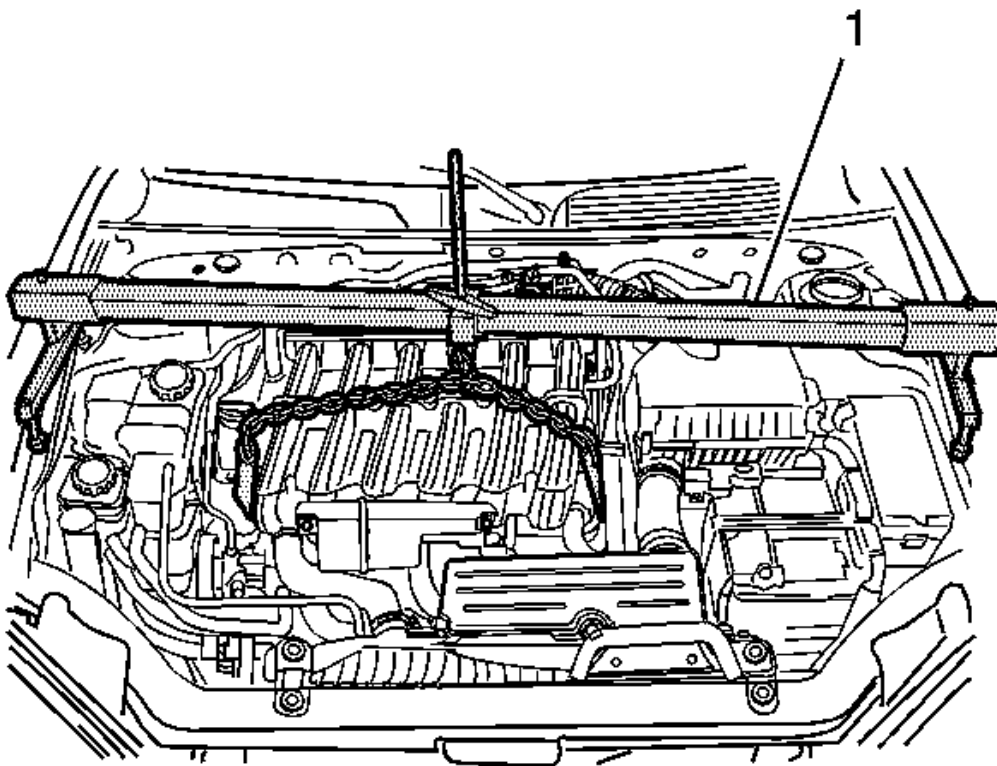


Fig. 26: Hybrid Direct, 2-3-4 Clutch Support
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Housing Seal Ring
2	Hybrid Direct, 2-3-4 Clutch Support Bolt M6 x 1.0 x 20 (Qty: 9) Special Tools: DT-48784: E8 Modified Torx Socket

	For equivalent regional tools refer to Special Tools .
3	Hybrid Direct, 2-3-4 Clutch Support Assembly
4	Hybrid Direct, 2-3-4 Clutch Support Gasket

PARK PAWL REPLACEMENT

Removal

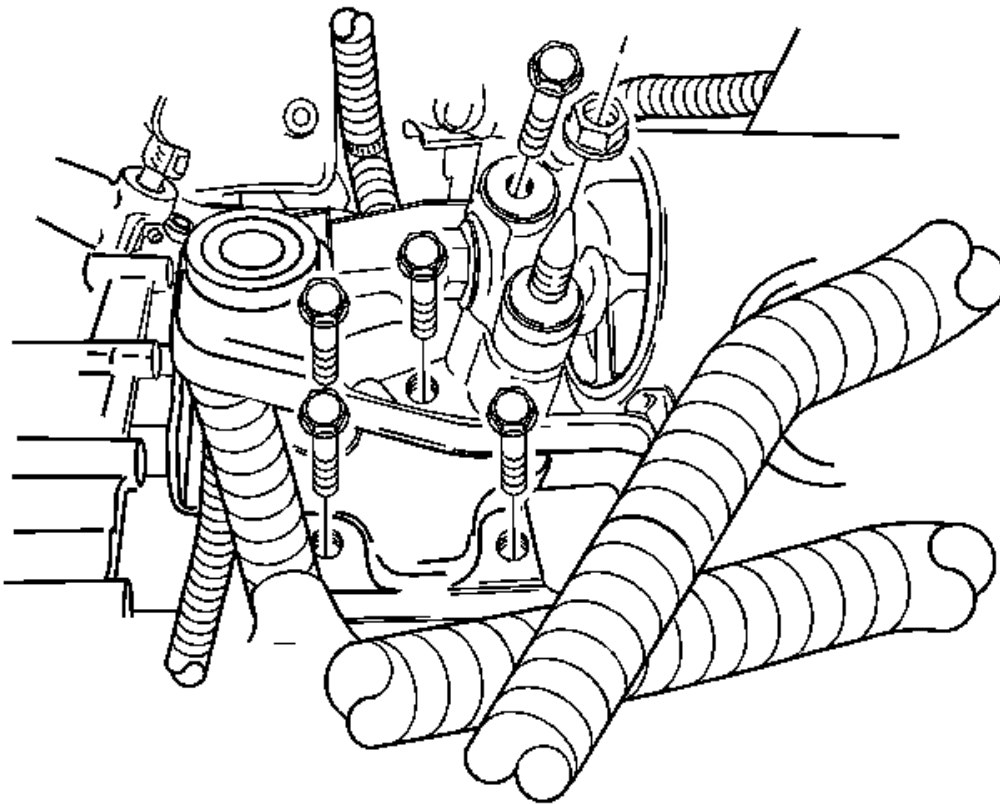


Fig. 27: Park Pawl Replacement
Courtesy of GENERAL MOTORS CORP.

Removal

Callout	Component Name
1	Park Pawl Cover Bolt M6 x 1.0 x 20 (Qty: 5)
2	Park Pawl Cover
3	Park Pawl Cover Gasket

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4	Park Pawl Actuator Guide Pin
5	Park Pawl Actuator Guide Tip: Push the park pawl into housing in order to remove the park pawl actuator guide.
6	Park Pawl Shaft Hole Plug
7	Park Pawl Shaft
8	Park Pawl
9	Park Pawl Spring

Installation

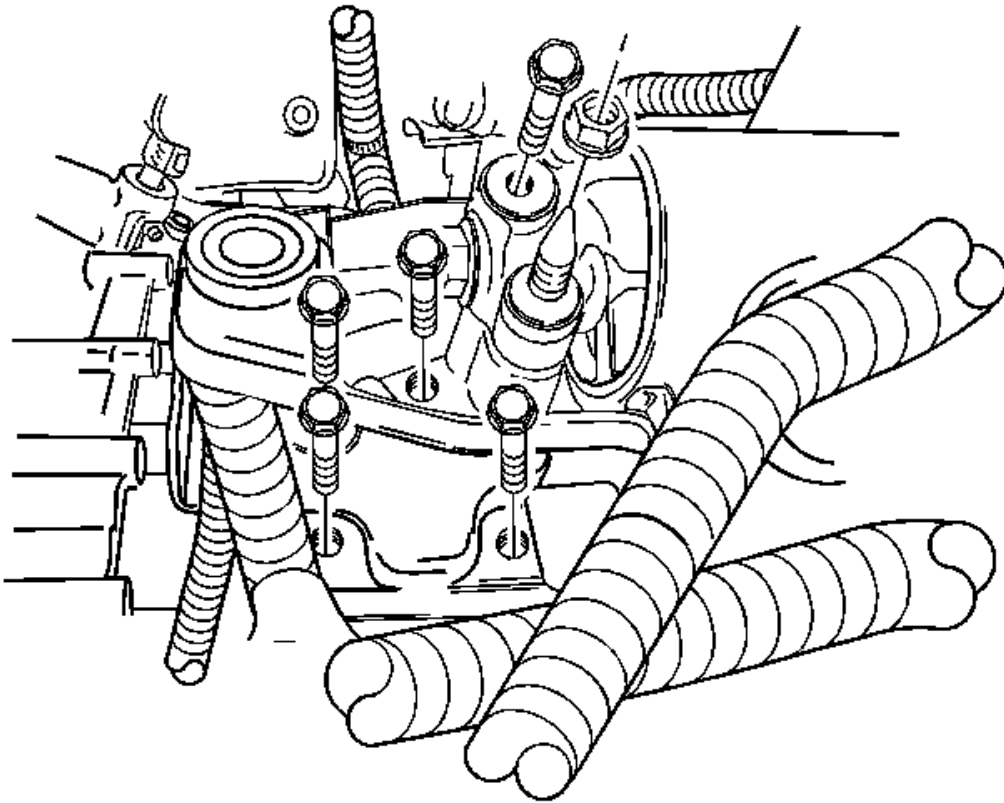


Fig. 28: Park Pawl Replacement
Courtesy of GENERAL MOTORS CORP.

Installation

Callout	Component Name
1	Park Pawl Spring

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2	Park Pawl
3	Park Pawl Shaft
4	Park Pawl Shaft Hole Plug
5	Park Pawl Actuator Guide
6	Park Pawl Actuator Guide
7	Park Pawl Cover Gasket
8	Park Pawl Cover
	Park Pawl Cover Bolt M6 x 1.0 x 20 (Qty: 5)
9	CAUTION: Refer to Fastener Caution . Tighten: 9-13 N.m (80-115 lb in)

HYBRID DIRECT, 2-3-4 CLUTCH SUPPORT INSTALLATION

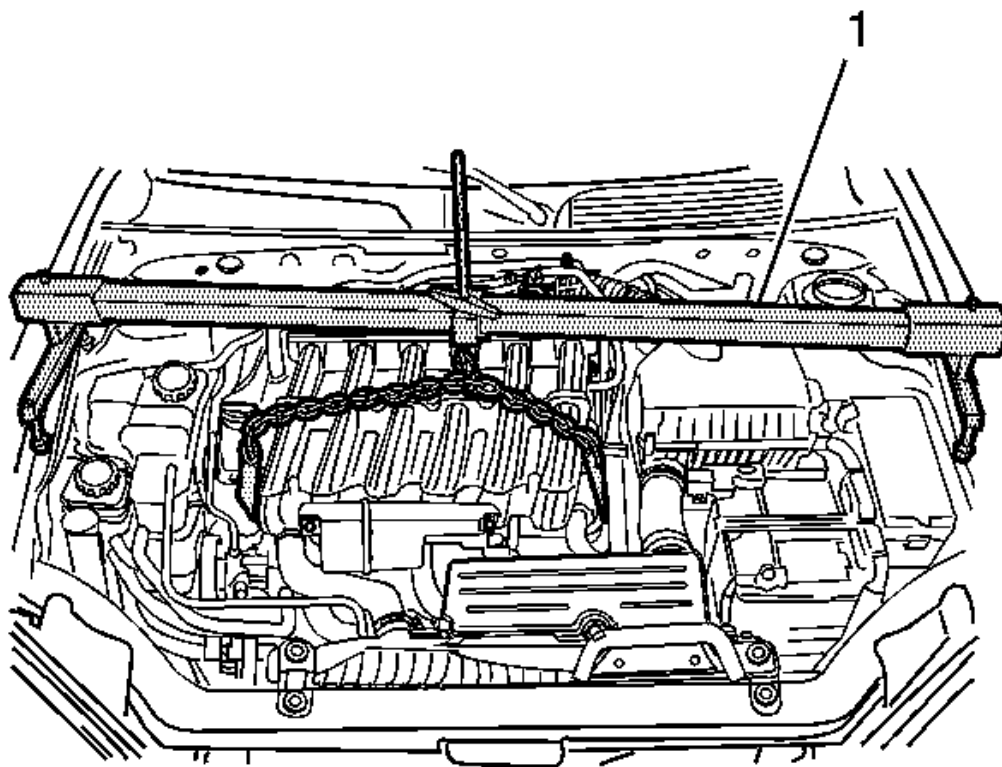


Fig. 29: Hybrid Direct, 2-3-4 Clutch Support

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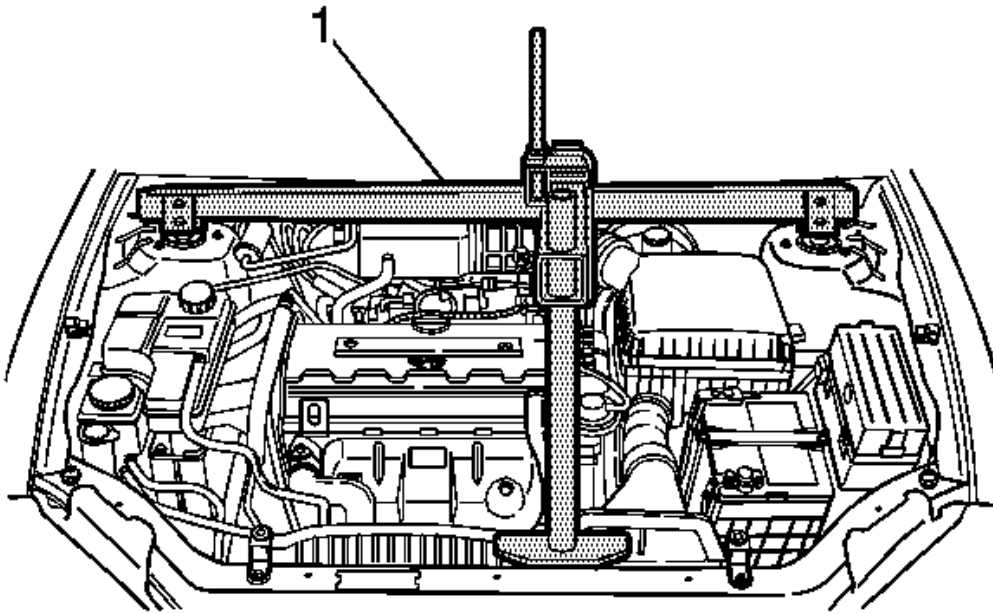
2010 TRANSMISSION Automatic Transmission - 2ML70 - Escalade, Tahoe & Yukon

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Support Gasket
2	Hybrid Direct, 2-3-4 Clutch Support Assembly
3	Hybrid Direct, 2-3-4 Clutch Support Bolt M6 x 1.0 x 20 (Qty: 9) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 9-13 N.m (80-115 lb in) Special Tools: DT-48784: E8 Modified Torx Socket For equivalent regional tools refer to <u>Special Tools</u> .
4	Hybrid Direct, 2-3-4 Clutch Housing Seal Ring

HYBRID DIRECT, 2-3-4 CLUTCH HOUSING OVERHAUL

2-3-4 Clutch Plates Disassemble

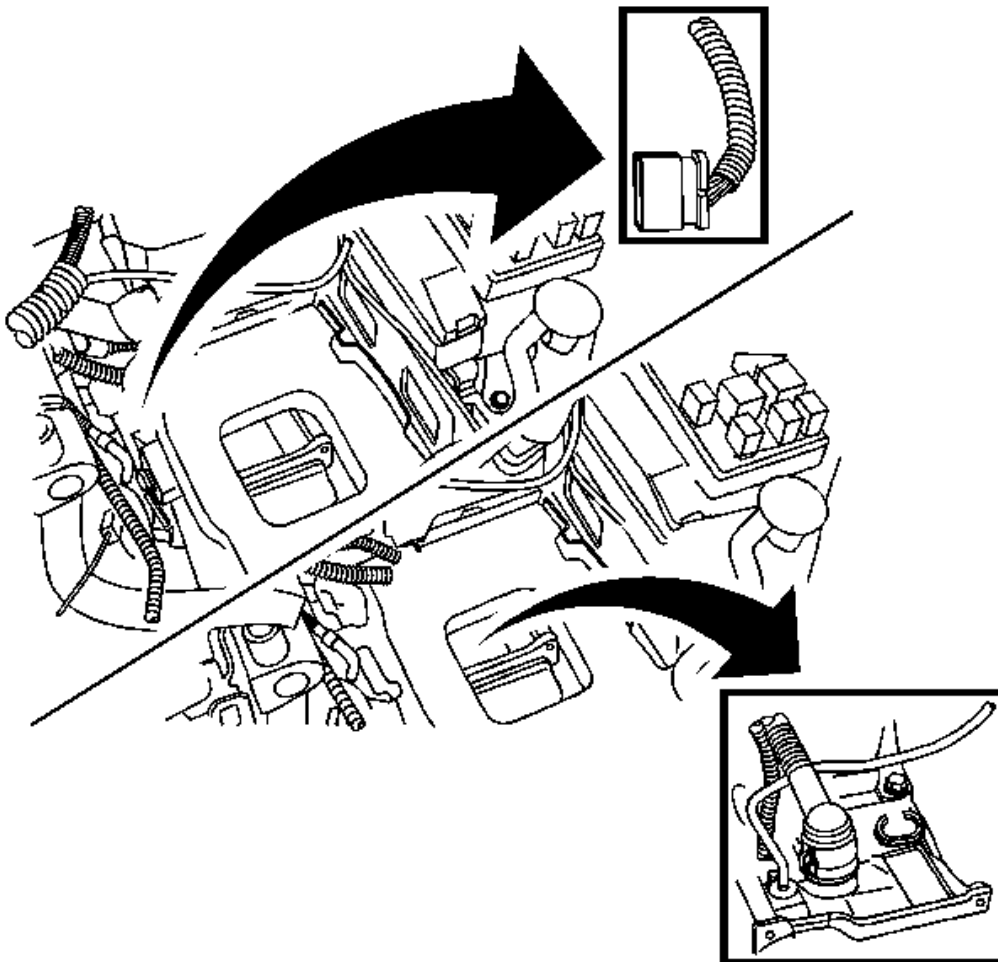
**Fig. 30: 2-3-4 Clutch Plates**

Courtesy of GENERAL MOTORS CORP.

2-3-4 Clutch Plates Disassemble

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Plate Retaining Ring Tip: Discard the retaining ring. It is not reusable.
2	Hybrid Direct, 2-3-4 Clutch Backing Plate
3	Hybrid Direct, 2-3-4 Clutch Plate Assembly
4	Hybrid Direct, 2-3-4 Clutch Plate
5	Hybrid Direct, 2-3-4 Clutch Plate - Waved

2-3-4 Clutch Disassemble

**Fig. 31: 2-3-4 Clutch**

Courtesy of GENERAL MOTORS CORP.

2-3-4 Clutch Disassemble

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Piston Ring Tip: • Use DT 47867 and press to remove the 2-3-4 piston and spring. See Special Tools . • Discard the retaining ring. It is not reusable.

	Special Tool: DT 47867 Adjustable Clutch Spring Compressor. See Special Tools .
2	Hybrid Direct, 2-3-4 Clutch Piston Dam
3	Hybrid Direct, 2-3-4 Clutch Piston Return Spring Tip: Use DT 47867 and press to remove the 2-3-4 piston and spring. See Special Tools .
4	Hybrid Direct, 2-3-4 Clutch Piston Outer Seal
5	Hybrid Direct, 2-3-4 Clutch Piston
6	Hybrid Direct, 2-3-4 Clutch Piston Inner Seal

2-3-4 Clutch Assemble

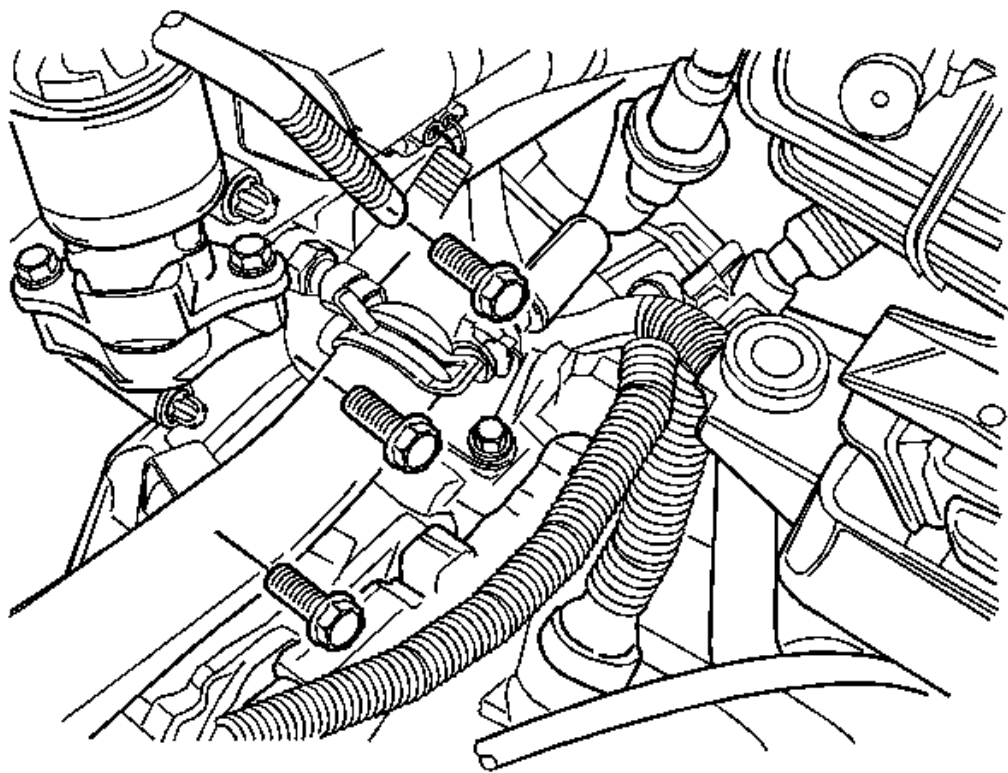


Fig. 32: 2-3-4 Clutch
 Courtesy of GENERAL MOTORS CORP.

2-3-4 Clutch Assemble

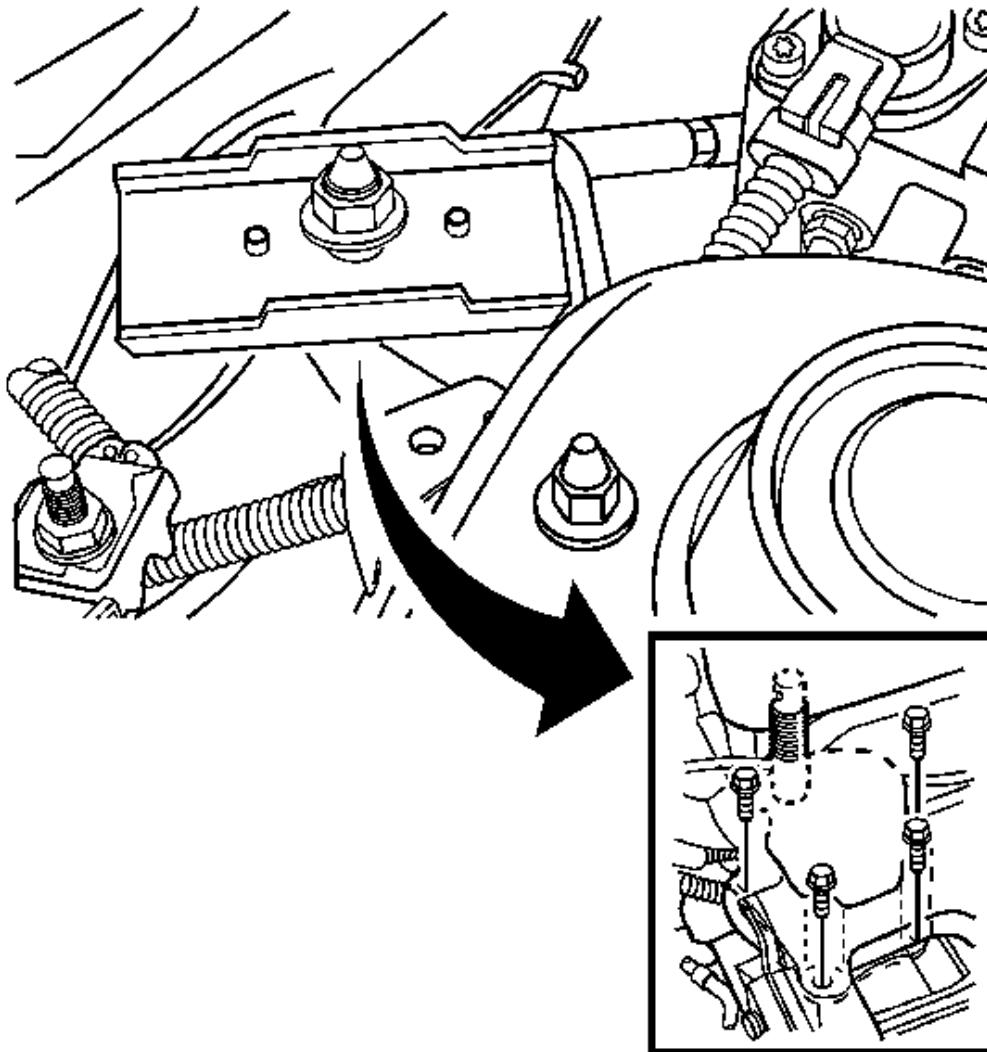
Callout	Component Name
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1	Hybrid Direct, 2-3-4 Clutch Piston Inner Seal
2	Hybrid Direct, 2-3-4 Clutch Piston
3	Hybrid Direct, 2-3-4 Clutch Piston Outer Seal
4	Hybrid Direct, 2-3-4 Clutch Piston Return Spring
5	Hybrid Direct, 2-3-4 Clutch Piston Dam
6	Hybrid Direct, 2-3-4 Clutch Piston Ring Tip: • Use a NEW retaining ring. Do not reuse the retaining ring, it is not reusable. • Use DT 47867 to install the 2-3-4 ring. See <u>Special Tools</u> . Special Tool: DT 47867 Adjustable Clutch Spring Compressor. See <u>Special Tools</u> .

2-3-4 Clutch Plates Assemble

**Fig. 33: 2-3-4 Clutch Plates**

Courtesy of GENERAL MOTORS CORP.

2-3-4 Clutch Plates Assemble

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Plate - Waved Tip: Make sure you install the wave plate first, then the clutch pack, then the hybrid direct, 2-3-4 clutch backing plate.
2	Hybrid Direct, 2-3-4 Clutch Plate

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3	Hybrid Direct, 2-3-4 Clutch Plate Assembly
4	Hybrid Direct, 2-3-4 Clutch Backing Plate Tip: Make sure to install with lip facing up, see orientation.
5	Hybrid Direct, 2-3-4 Clutch Plate Retaining Ring Tip: Use a NEW retaining ring.

SUN GEAR CARRIER AND HYBRID DIRECT, 2-3-4 CLUTCH HOUSING INSTALLATION

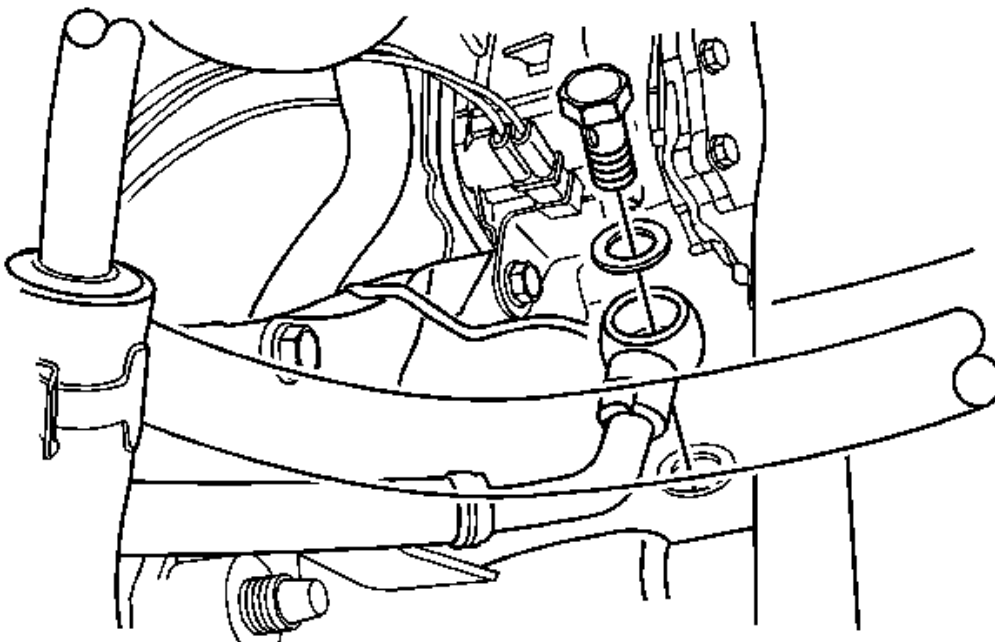


Fig. 34: Sun Gear Carrier and Hybrid Direct, 2-3-4 Clutch Housing
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Hybrid Direct, 2-3-4 Clutch Housing Thrust Bearing Assembly
2	Hybrid Direct, 2-3-4 Clutch Housing Assembly
3	Output Shaft Assembly
4	Output Shaft Retaining Ring Tip: Inspect the retainer ring and ensure it is seated properly. It is not necessary to remove the retainer ring unless it is damaged, in which case it

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	will need to be replaced.
5	Output Shaft Thrust Bearing Assembly
6	Hybrid Direct, 2-3-4 Clutch Hub
7	Internal Gear Thrust Bearing Assembly - 2nd Position
8	Sun Gear Carrier Assembly - 3rd Position
9	Internal Gear Thrust Washer - Steel - 3rd Position
10	Internal Gear Thrust Washer - Plastic - 3rd Position
11	Internal Gear - 3rd Position

HYBRID LOW, 1-2 CLUTCH PISTON INSTALLATION

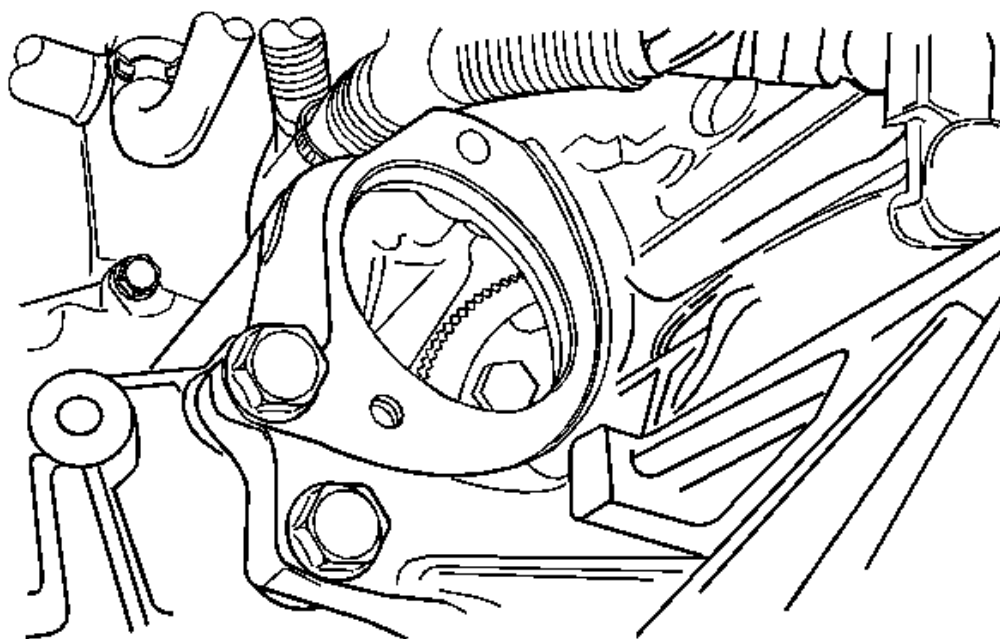


Fig. 35: Hybrid Low, 1-2 Clutch Piston
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Hybrid Low, 1-2 Clutch Piston
2	Hybrid Low, 1-2 Clutch Return Spring Assembly
3	Hybrid Low, 1-2 Clutch Plate - Waved

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4	Hybrid Low, 1-2 Clutch Plate
5	Hybrid Low, 1-2 Clutch Plate Assembly
6	Hybrid Low, 1-2 Clutch Backing Plate Assembly Tip: Make sure to install with lip facing up, see orientation.
7	Hybrid Low, 1-2 Clutch Piston Retaining Ring Tip: • Install a NEW retaining ring. Do not reuse the old retaining ring. • Start retaining ring at one end, work around to the other end. Special Tool: J-46632 Spring Compressor. See Special Tools .

PROPELLER SHAFT FRONT SLIP YOKE OIL SEAL REPLACEMENT

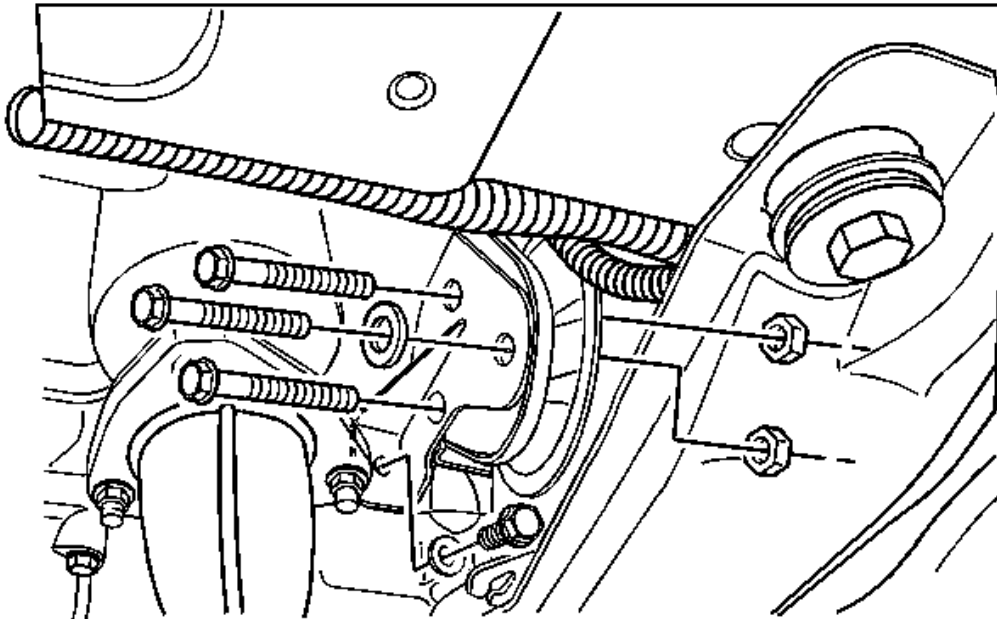


Fig. 36: Propeller Shaft Front Slip Yoke Oil Seal Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Output Seal (2WD Only) Tip: Use J 38869 to install. See Special Tools . Special Tool: J 38869 Rear Extension Seal Installer. See Special Tools .

OUTPUT SPEED SENSOR AND CASE EXTENSION INSTALLATION

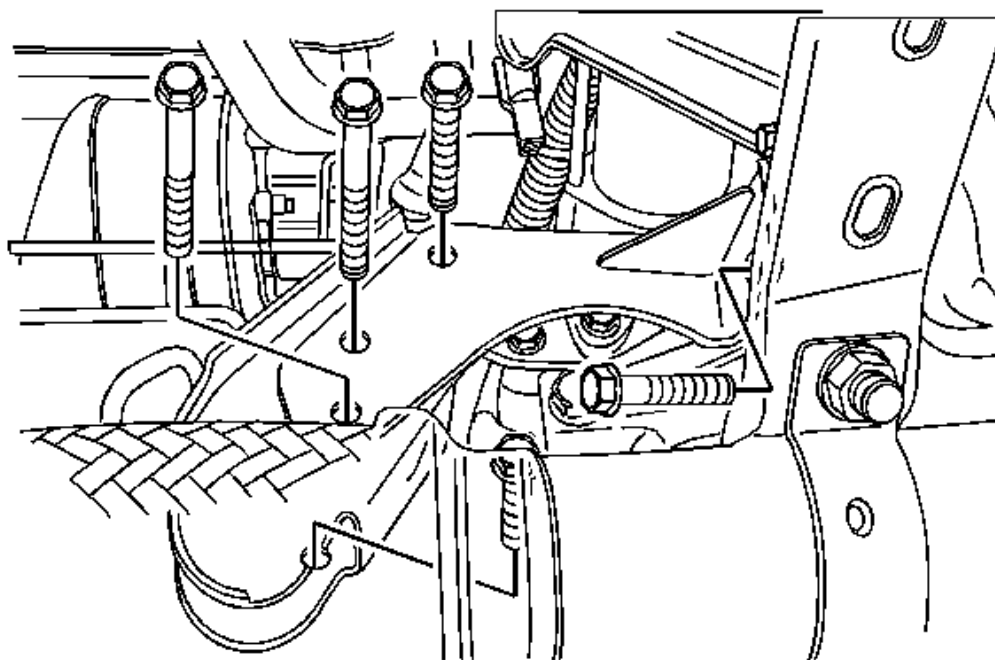


Fig. 37: Output Speed Sensor and Case Extension
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Gasket (2WD Output Only)
2	2WD Output Housing Extension Assembly
3	A/Trans Rear Case Bolt M10 x 1.5 x 45 (Qty: 6) CAUTION: Refer to <u>Fastener Caution</u> .

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	Tighten: Tighten bolt to 51-61 N.m (38-45 lb ft).
4	A/Trans Output Speed Sensor O-Ring Seal
5	A/Trans Output Speed Sensor Assembly
6	Vehicle Speed Sensor Bolt M6 x 1.0 x 20
	Tighten: Tighten bolt to 9-13 N.m (80-115 lb in).

REAR CASE INSTALLATION

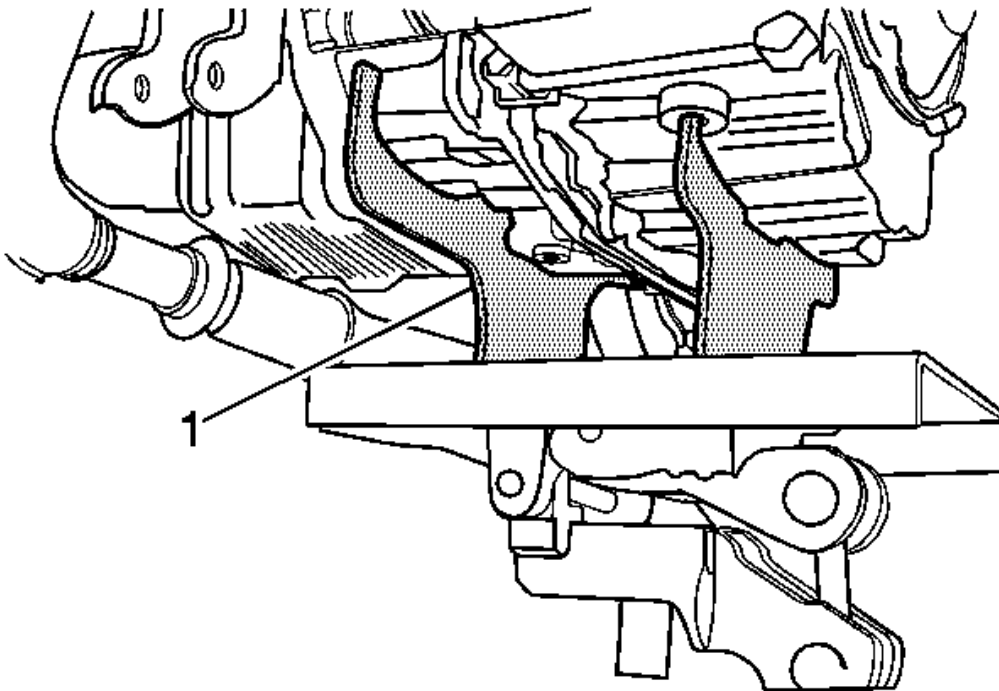


Fig. 38: Rear Case
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Rear Case Gasket Tip: Verify that the sun gear - 3rd position is on the sun gear shaft assembly - 3rd position.
2	A/Trans Rear Case Assembly Tip: Be cautious of the park pawl rod, making sure it is lined up accurately thru the rear case assembly.

3	A/Trans Rear Case Bolt M8 x 1.25 x 30 (Qty: 12) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: Tighten bolt to 24-29 N.m (18-21 lb ft).
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4TH CLUTCH PISTON INSTALLATION

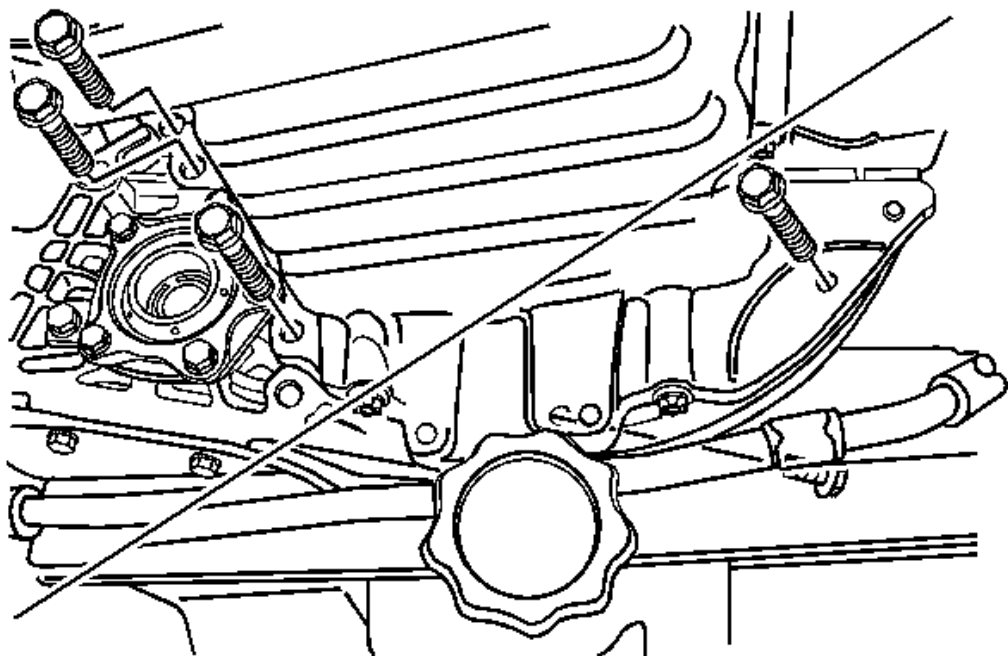


Fig. 39: 4th Clutch Piston
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	4th Clutch Piston Tip: Use a 2 inch spacer between DT-48056 and DT-47694 . See <u>Special Tools</u> . Special Tools • DT-47694 Piston Spring Compressor. See <u>Special Tools</u> .

	• DT-48056 Spring Compressor Bridge. See Special Tools .
2	4th Clutch Piston Retaining Spring Assembly
3	4th Clutch Piston Retaining Ring Tip: Do not reuse the retaining ring.
4	4th Clutch Waved Plate
5	4th Clutch Plate Tip: Alternate between steel and fiber clutch plates.
6	4th Clutch Plate Assembly Tip: Alternate between steel and fiber clutch plates.
7	4th Clutch Backing Plate
8	4th Clutch Piston Retaining Ring Tip: Do not reuse the retaining ring.

1-3 CLUTCH HOUSING OVERHAUL

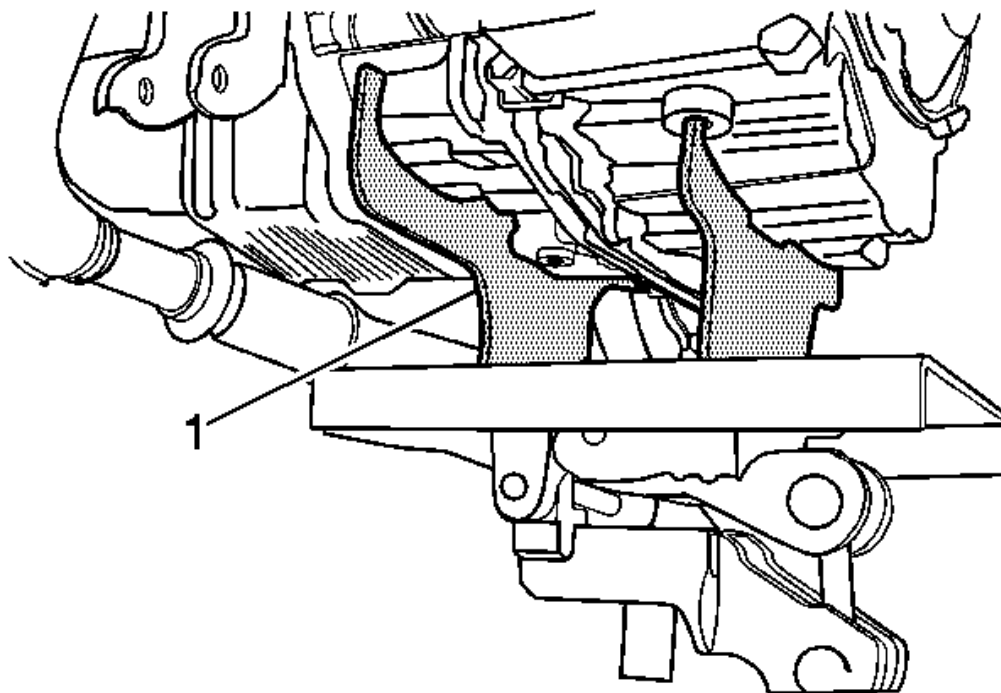


Fig. 40: 1-3 Clutch Housing Overhaul
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
1	1-3 Clutch Retaining Ring Tip: Do not reuse the retaining ring.
2	1-3 Clutch Backing Plate
3	1-3 Clutch Plate Assembly
4	1-3 Clutch Plate
5	1-3 Clutch Plate - Waved

1-3 Piston Removal

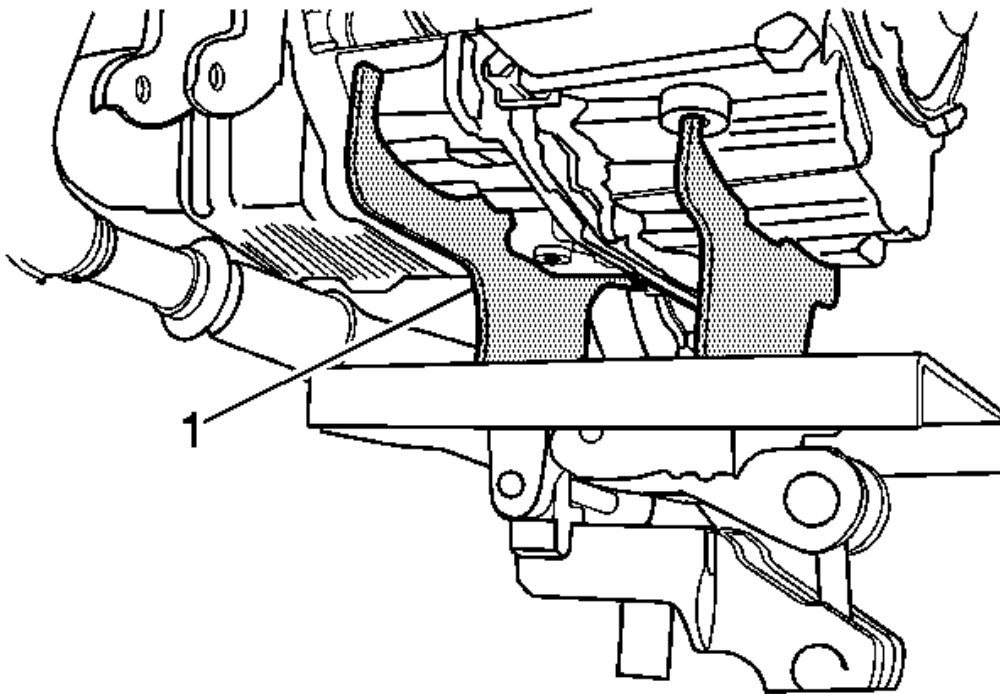


Fig. 41: 1-3 Piston

Courtesy of GENERAL MOTORS CORP.

1-3 Piston Removal

Callout	Component Name
1	1-3 Clutch Piston Retaining Ring Tip: Discard retaining ring. It is not reusable. Special Tool: DT 47867 Adjustable Clutch Spring Compressor. See Special Tools .

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2	1-3 Clutch Piston Dam
3	1-3 Clutch Retaining Spring
4	1-3 Clutch Piston
5	1-3 Clutch Housing Assembly

1-3 Piston Installation

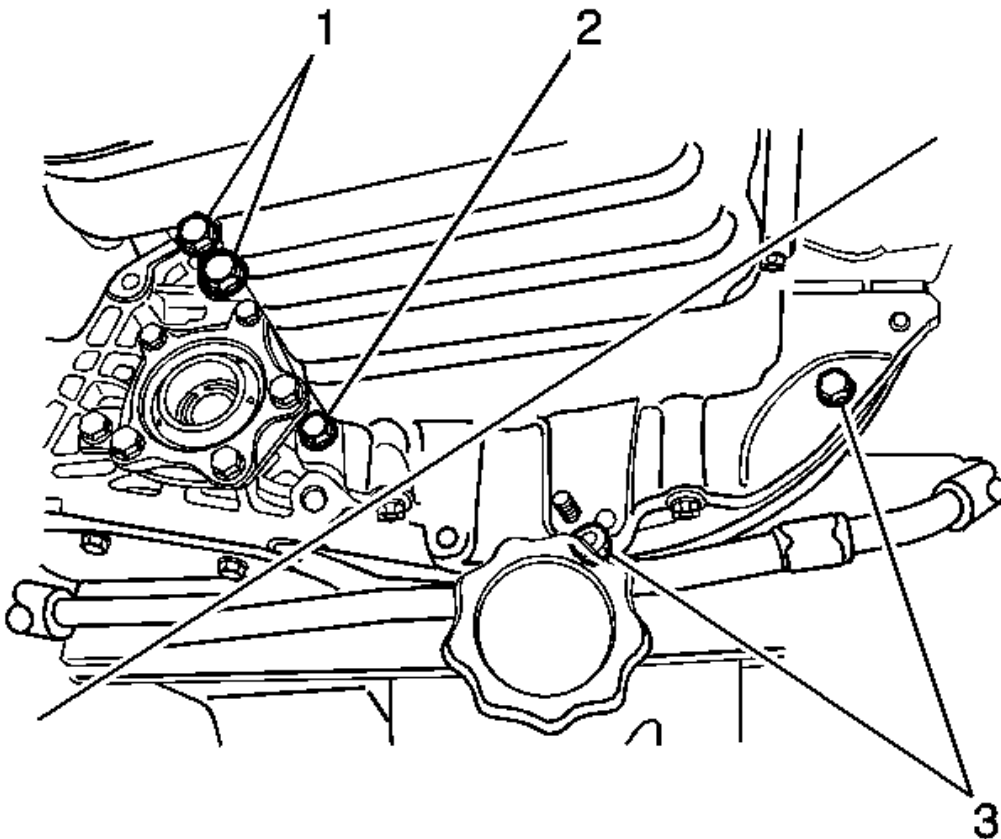


Fig. 42: Identifying 1-3 Piston Components
Courtesy of GENERAL MOTORS CORP.

1-3 Piston Installation

Callout	Component Name
1	1-3 Clutch Housing Assembly
2	1-3 Clutch Piston Special Tool: DT-47821 Seal Protector. See Special Tools .

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3	1-3 Clutch Retaining Spring
4	1-3 Clutch Piston Dam Special Tool: DT-47820 Seal Protector. See Special Tools .
5	1-3 Clutch Piston Retaining Ring Tip: Use a NEW retaining ring. The old retaining ring is not reusable. Special Tool: DT 47867 Adjustable Clutch Spring Compressor. See Special Tools .

1-3 Clutch Plate Installation

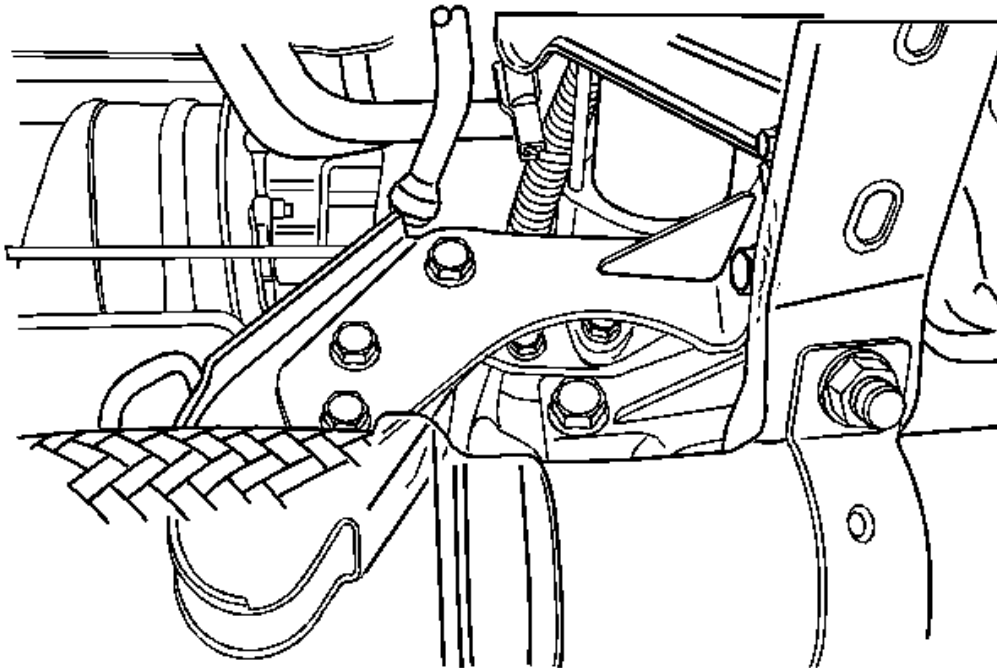


Fig. 43: 1-3 Clutch Plate

Courtesy of GENERAL MOTORS CORP.

1-3 Clutch Plate Installation

Callout	Component Name
1	1-3 Clutch Plate - Waved
2	1-3 Clutch Plate Tip: Alternate between steel and fiber clutch

	plates.
3	1-3 Clutch Plate Assembly Tip: Alternate between steel and fiber clutch plates.
4	1-3 Clutch Backing Plate Tip: Make sure to install with lip facing up. See orientation.
5	1-3 Clutch Retaining Ring Tip: Do not reuse the retaining ring.

1-3 CLUTCH HOUSING, SUN GEAR CARRIER, AND SUN GEAR INSTALLATION

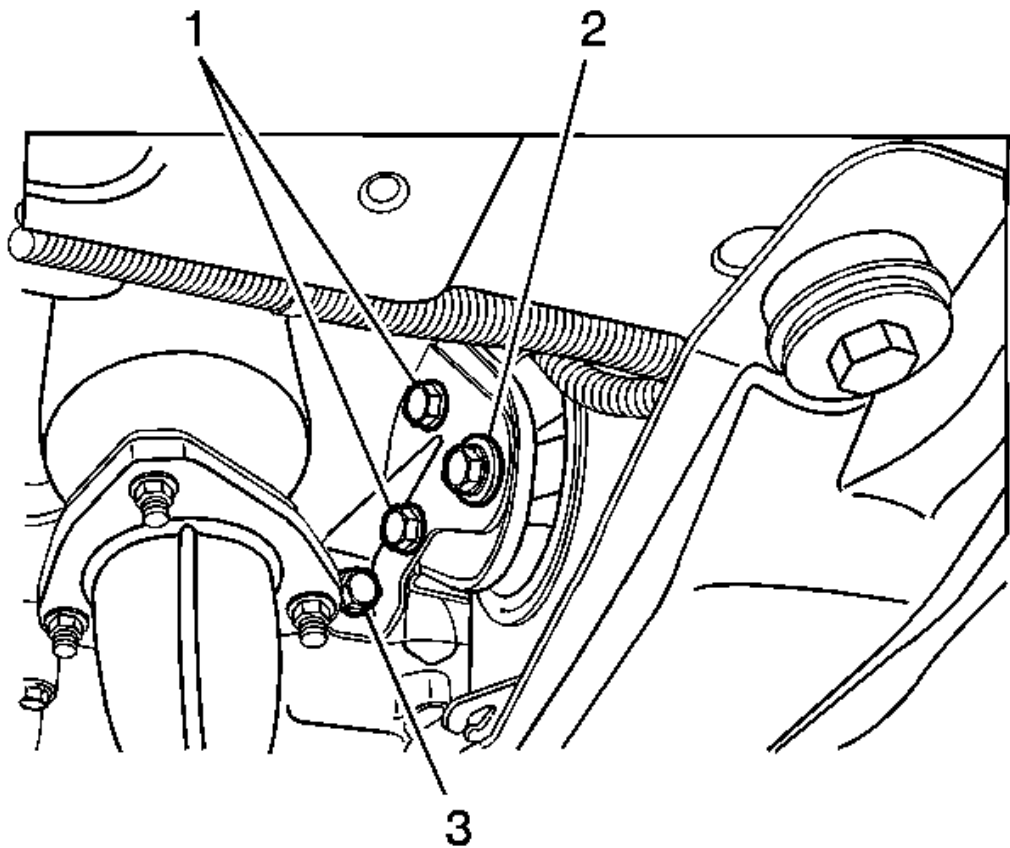


Fig. 44: 1-3 Clutch Housing, Sun Gear Carrier, and Sun Gear
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
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1	Hybrid Direct, 2-3-4 Clutch Housing Thrust Bearing Assembly
2	1-3 Clutch Housing Assembly Procedure 1. Align the internal teeth of the 4th clutch plates to aid in installation. 2. To ensure the clutch housing is fully seated measure from the case surface to the clutch housing hub, dimension (a). Specification: Dimension (a) 253 mm (9.96 in)
3	Sun Gear Assembly - 2nd Position
4	Sun Gear Carrier Assembly - 2nd Position

MAIN SHAFT INSTALLATION

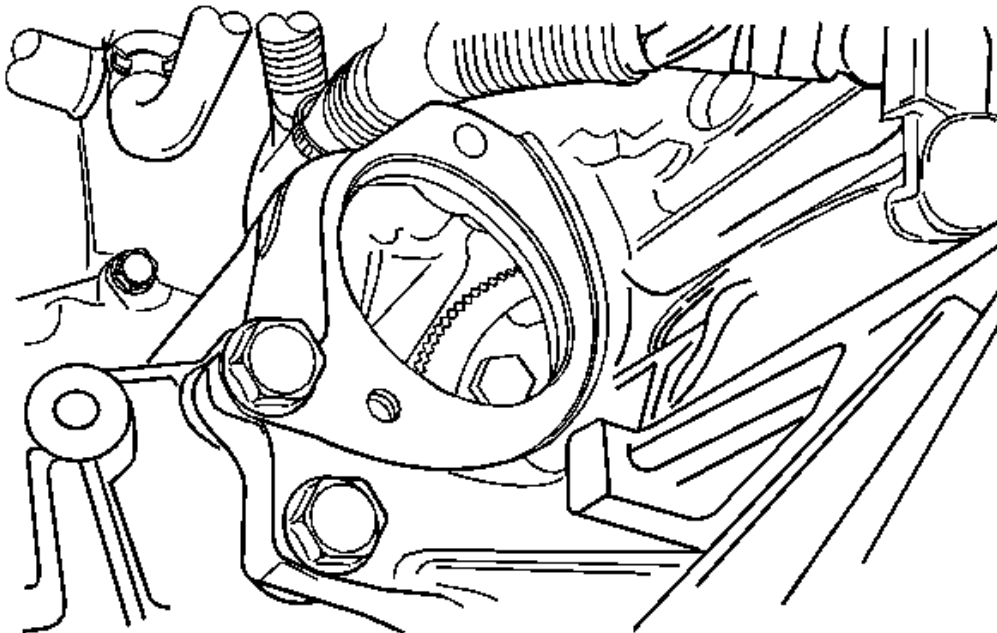


Fig. 45: Main Shaft
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
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1	Main Shaft Assembly
2	Internal Gear Thrust Bearing Assembly - 2nd Position

SUN GEAR SHAFT INSTALLATION

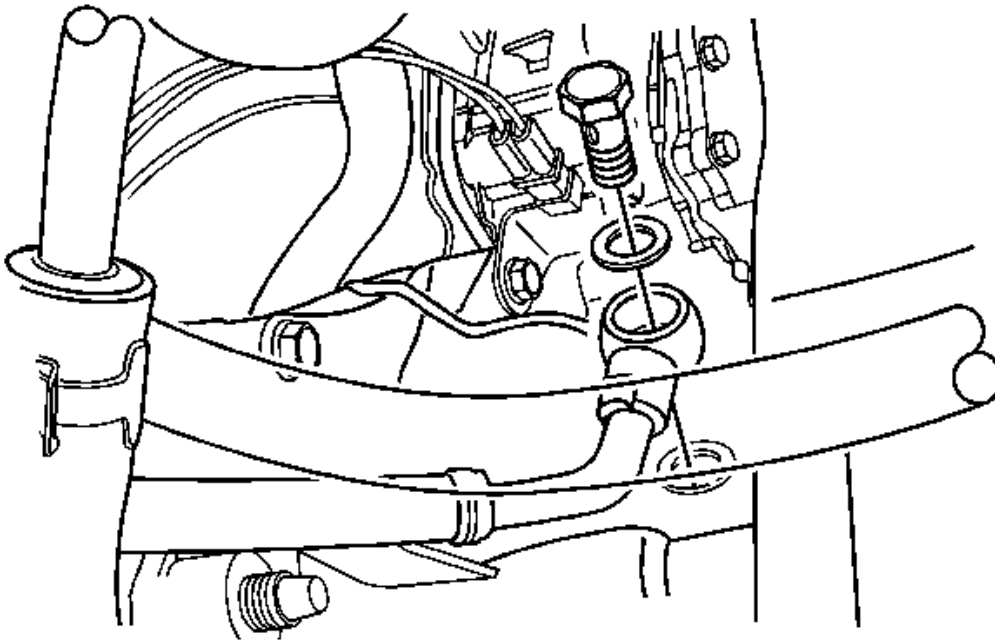


Fig. 46: Sun Gear Shaft
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Internal Gear - 2nd Position
2	Sun Gear Shaft Assembly - 1st Position
3	Sun Gear Shaft Retaining Ring Tip: Do not reuse the retaining ring.
4	Sun Gear Shaft Assembly Tip: When fully seated the sun gear shaft assembly will be dimension (a) below the mainshaft. Specification: Dimension (a) 33 mm (1.30 in)

DRIVE MOTOR WITH GENERATOR ASSEMBLY CLEANING AND INSPECTION - 1ST

POSITION

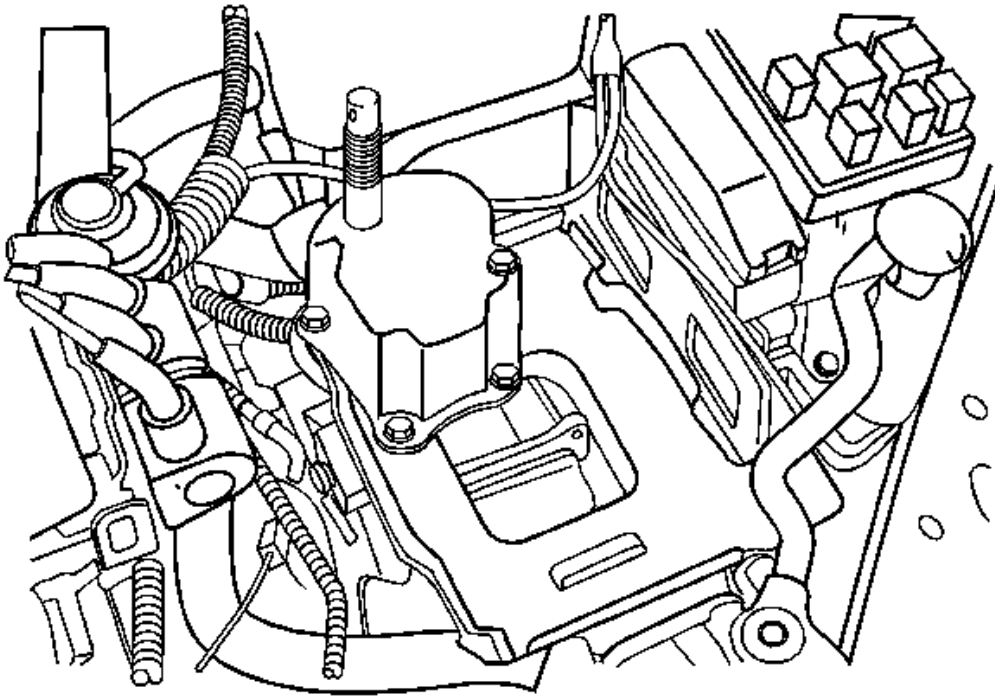


Fig. 47: Drive Motor with Generator Assembly Cleaning and Inspection - 1st Position
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: Do not use any type of solvent or cleaning agents in or on motor. Solvents or cleaning agents may damage the motor. Wipe with a clean towel that is lint free.	
1	Generator Drive Motor Housing Seal Tip: Dex VI will continue to drain from the motor which is normal.
2	Generator Assembly Bearing
3	Generator Motor High Voltage Connections Tip: Inspect for arcing, broken plastic, or loose terminals.

DRIVE MOTOR WITH GENERATOR ASSEMBLY INSTALLATION - 1ST POSITION

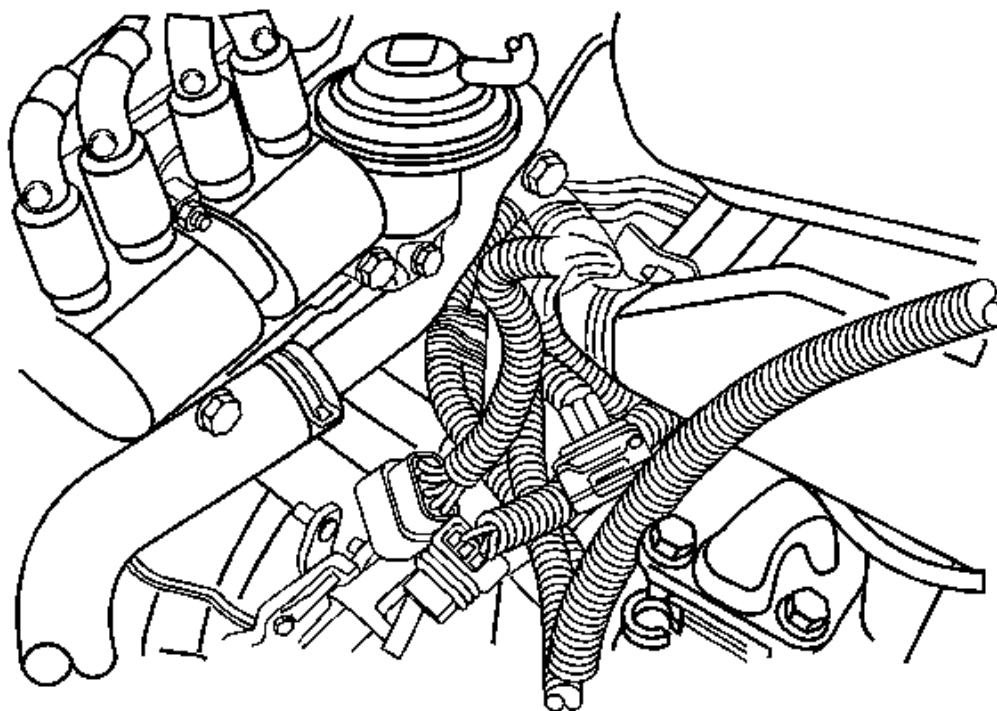


Fig. 48: Drive Motor with Generator Assembly - 1st Position

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Drive Motor (w/Generator) Assembly - 1st Position WARNING: The generator motor weighs approximately 36 kg (80 lbs). Personal injury may result if you lift the generator motor improperly. CAUTION: Carefully feed temp sensor and resolver connector thru case opening or damage may occur. Tip: Replace with NEW seals while motor is on holding fixture.
	Generator Drive Motor Bolt M6 x 1.0 x 20 (Qty: 3)

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2

CAUTION:

Refer to **Fastener Caution** .

Tip: Use Dexron VI to aid installation on O-rings for motor.

Tighten: Tighten bolt to 9-13 N.m (80-115 lb in).

Special Tool:

DT-48473 Motor Lift Plate. See **Special Tools** .

SUN GEAR CARRIER AND SUN GEAR INSTALLATION

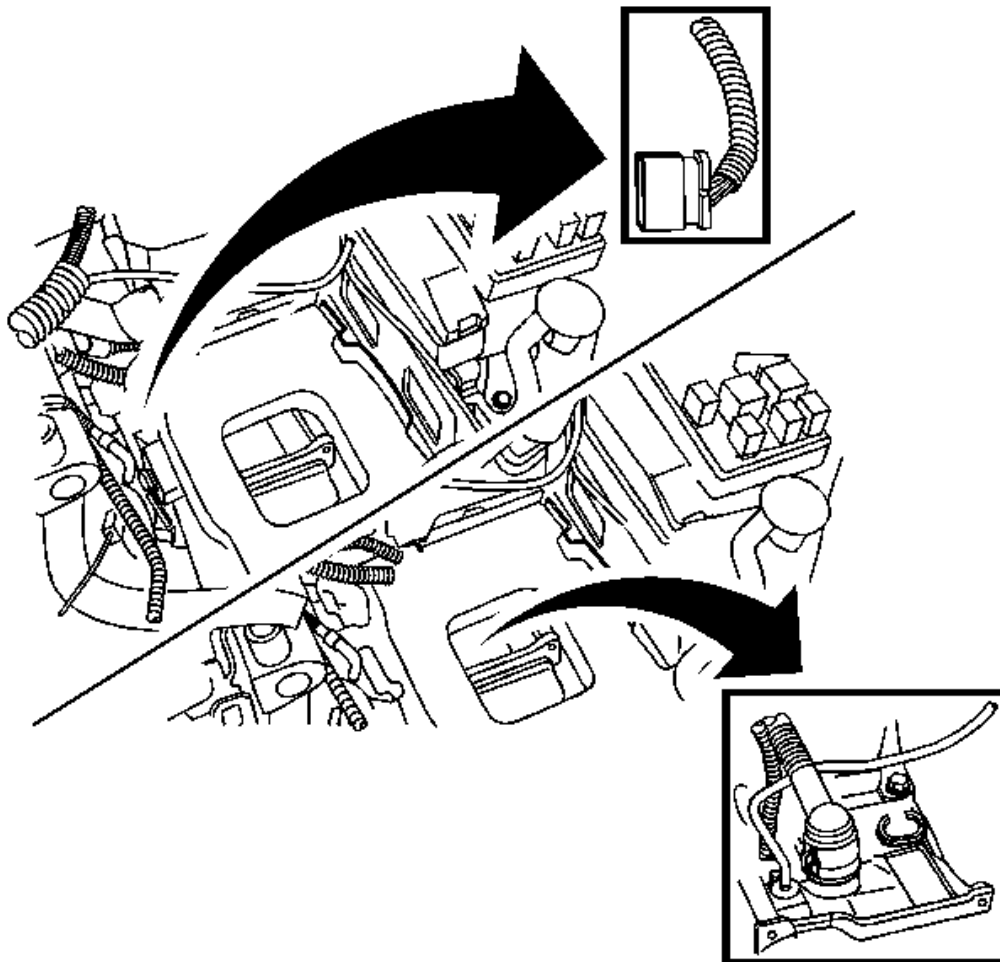
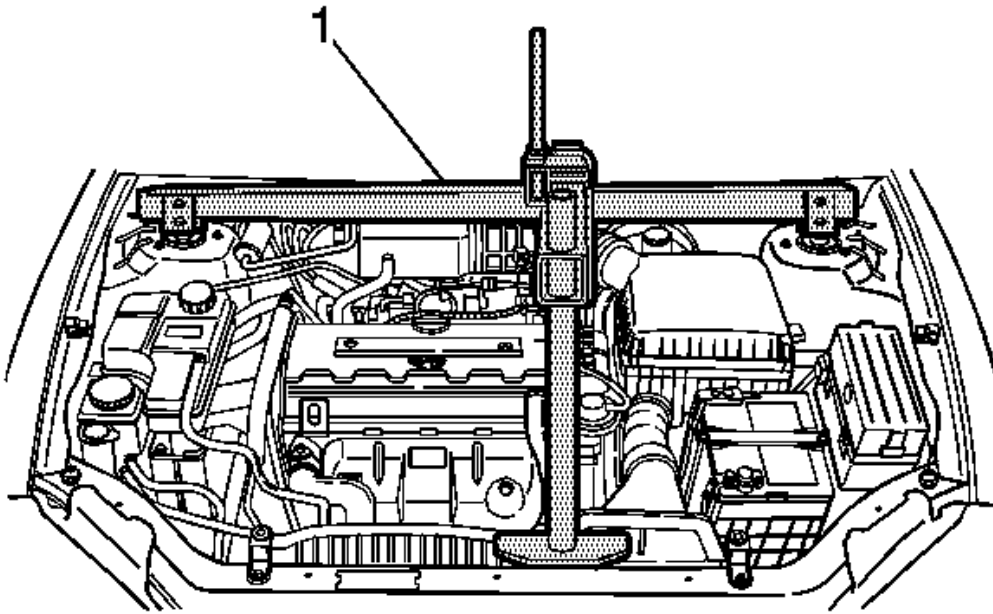


Fig. 49: Sun Gear Carrier and Sun Gear
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Sun Gear Assembly - 1st Position
2	Sun Gear Carrier Assembly - 1st Position
3	Sun Gear Carrier Thrust Bearing - 1st Position

INPUT SHAFT INSTALLATION

**Fig. 50: Input Shaft**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Internal Gear Retaining Ring - 1st Position Tip: Use a NEW retaining ring. Do not reuse the old retaining ring.
2	Input Shaft
3	Internal Gear - 1st Position
4	Input Shaft Assembly
5	A/Trans Torque Dampener Clutch Fluid Seal Ring Tip: Use a NEW seal ring. Do not reuse the old seal ring.
6	Input Shaft Fluid Seal Ring Tip: Use a NEW seal ring. Do not reuse the old seal ring.
7	Input Shaft Thrust Bearing

TORQUE DAMPENER HOUSING AND FLUID PUMP COVER DISASSEMBLE

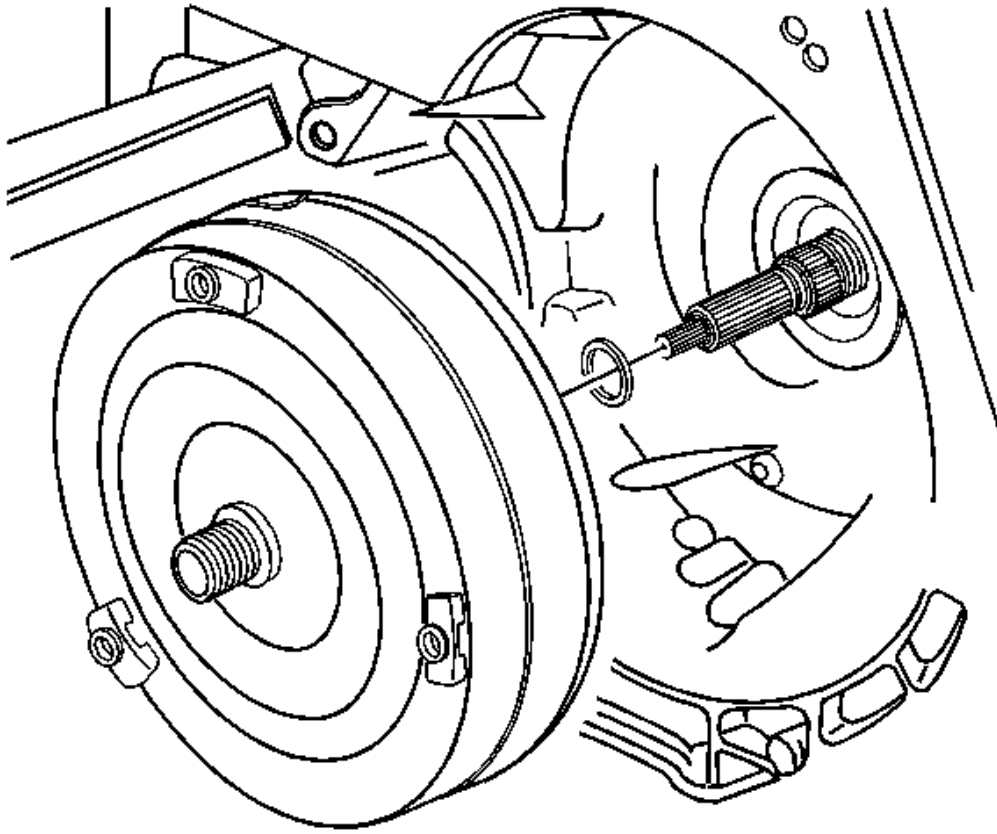


Fig. 51: Torque Dampener Housing and Fluid Pump Cover Disassemble
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Fluid Pump Cover Bolt M6 x 1.0 x 45 (Qty: 18)
2	A/Trans Fluid Pump Cover Assembly
3	A/Trans Fluid Pump Slide O-Ring Seal
4	A/Trans Fluid Pump Rotor
5	A/Trans Fluid Pump Vane
6	A/Trans Fluid Pump Rotor Guide
7	A/Trans Fluid Pump Vane Ring
8	A/Trans Fluid Pump Slide Outer Spring
9	A/Trans Fluid Pump Slide
10	A/Trans Fluid Pump Slide O-Ring Seal

11	Pump Slide Fluid Seal Ring
12	A/Trans Fluid Pump Slide Seal
13	A/Trans Fluid Pump Slide Support
14	A/Trans Fluid Pump Slide Pivot Pin

FLUID PUMP COVER CLEANING AND INSPECTION

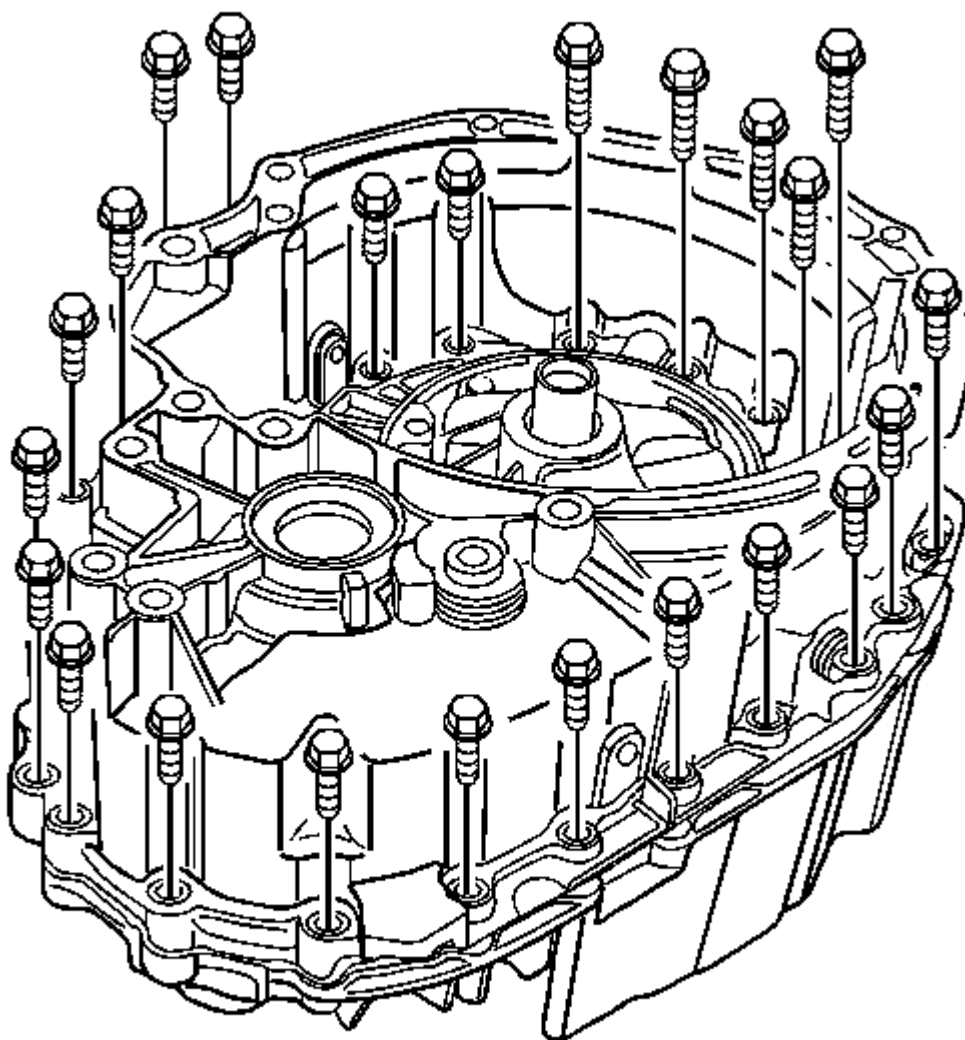


Fig. 52: Fluid Pump Cover Cleaning and Inspection
Courtesy of GENERAL MOTORS CORP.

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	A/Trans Fluid Cooler Bypass Valve Train
2	Pressure Regulator Valve Train
3	Transmission Lube Fluid Pressure Regulator Valve Train
4	A/Trans Fluid Pump and Auxiliary Fluid Pump Valve Train
5	Pressure Relief Ball Valve and Spring

TORQUE DAMPENER HOUSING CLEANING AND INSPECTION

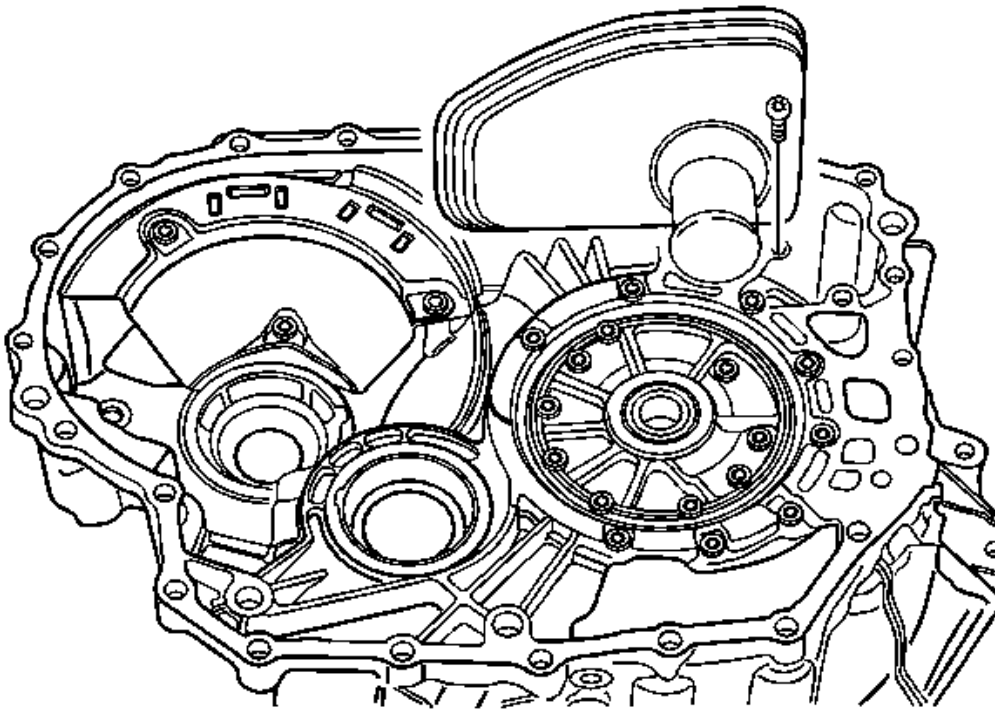


Fig. 53: Torque Dampener Housing Cleaning and Inspection
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	

1. Thoroughly clean the torque dampener housing assembly, including threads, with clean solvent.
2. Clean sealing surfaces.
3. Inspect all threaded holes. If necessary, repair any thread damage.

1	Input Shaft Bushing
2	Trans Fluid Cooler Pipe Fitting Seals (Qty: 2) CAUTION: Refer to <u>Seal Reuse Caution</u> . Tip: Refer to <u>Transmission Fluid Cooler Pipe Fitting Seal Replacement</u> .
3	Auxiliary Fluid Pump Sealing Surface Tip: Clean any gasket material.

TRANSMISSION FLUID PUMP SEAL REPLACEMENT

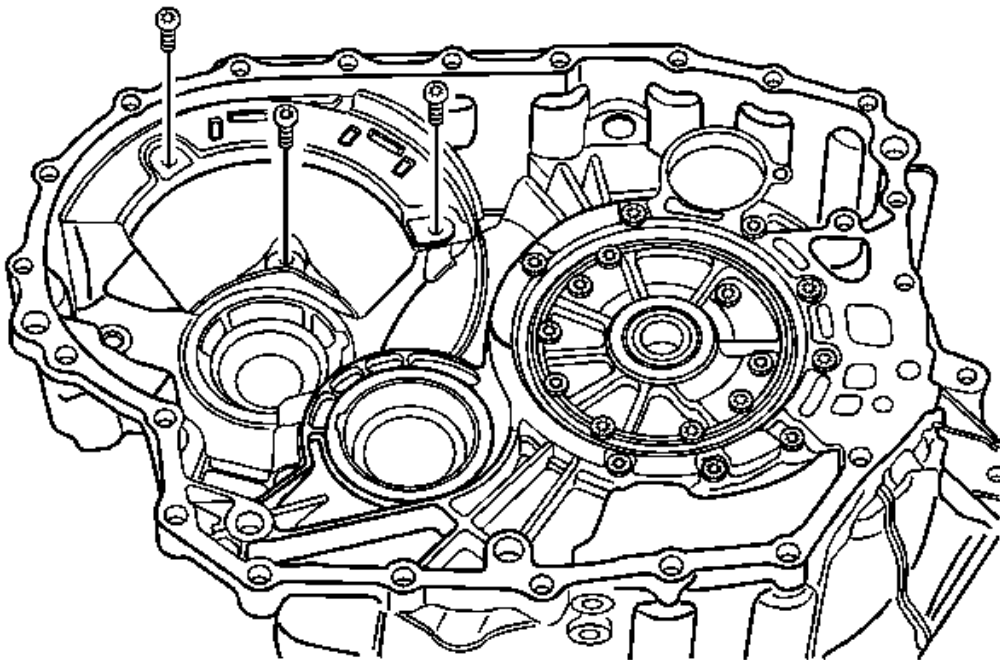


Fig. 54: Transmission Fluid Pump Seal Replacement
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
1	A/Trans Torque Dampener Fluid Seal Retaining Ring
2	A/Trans Fluid Pump Seal Special Tool: J 45000 Seal Remover. See Special Tools .

TRANSMISSION FLUID COOLER PIPE FITTING SEAL REPLACEMENT

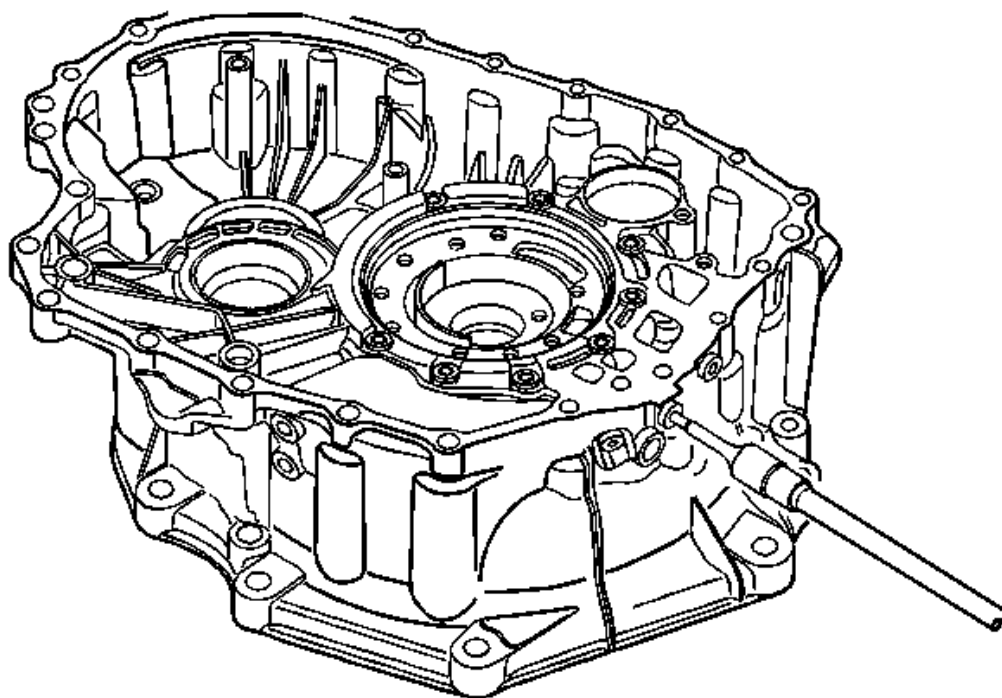


Fig. 55: Transmission Fluid Cooler Pipe Fitting Seal Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Trans Fluid Cooler Pipe Fitting Seals (Qty: 2) Special Tools • DT 47770 Seal Installer. See Special Tools . • J 45201 Cooler Line Seal Remover. See Special Tools .

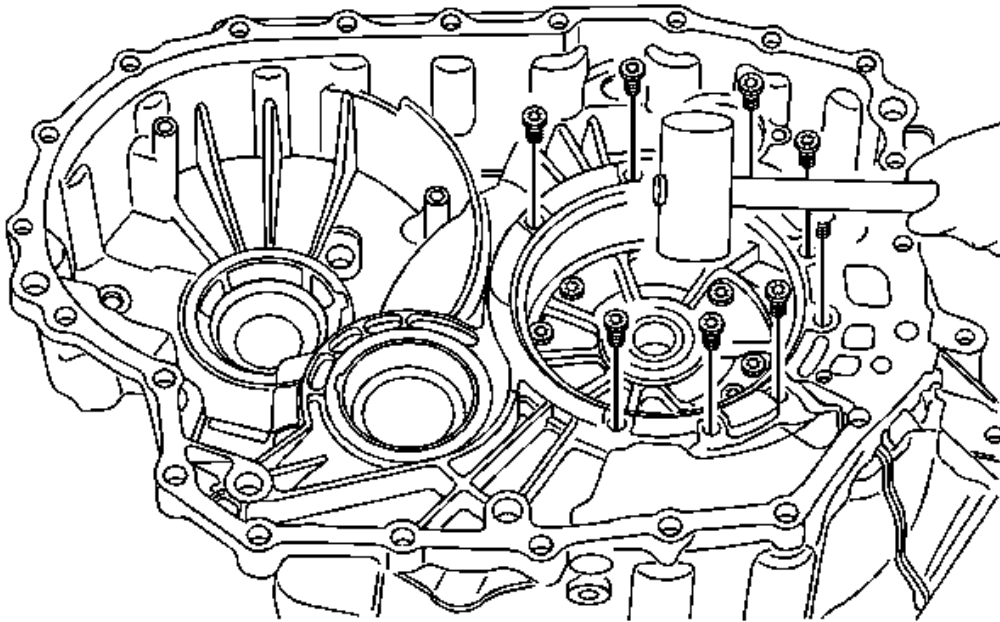
FLUID PUMP SELECTIVE MEASUREMENT

Fig. 56: Fluid Pump Selective Measurement
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Pump Rotor Cavity Tip: Measure the distance from the bottom of the gauge bar to the bottom of the pump rotor cavity. Refer to <u>Fluid Pump Selective Specifications</u> .
2	A/Trans Fluid Pump Rotor Tip: Refer to <u>Fluid Pump Selective Specifications</u> to select the correct rotor.
3	A/Trans Fluid Pump Slide Tip: Refer to <u>Fluid Pump Selective Specifications</u> to select the correct slide.

TORQUE DAMPENER HOUSING AND FLUID PUMP COVER ASSEMBLE

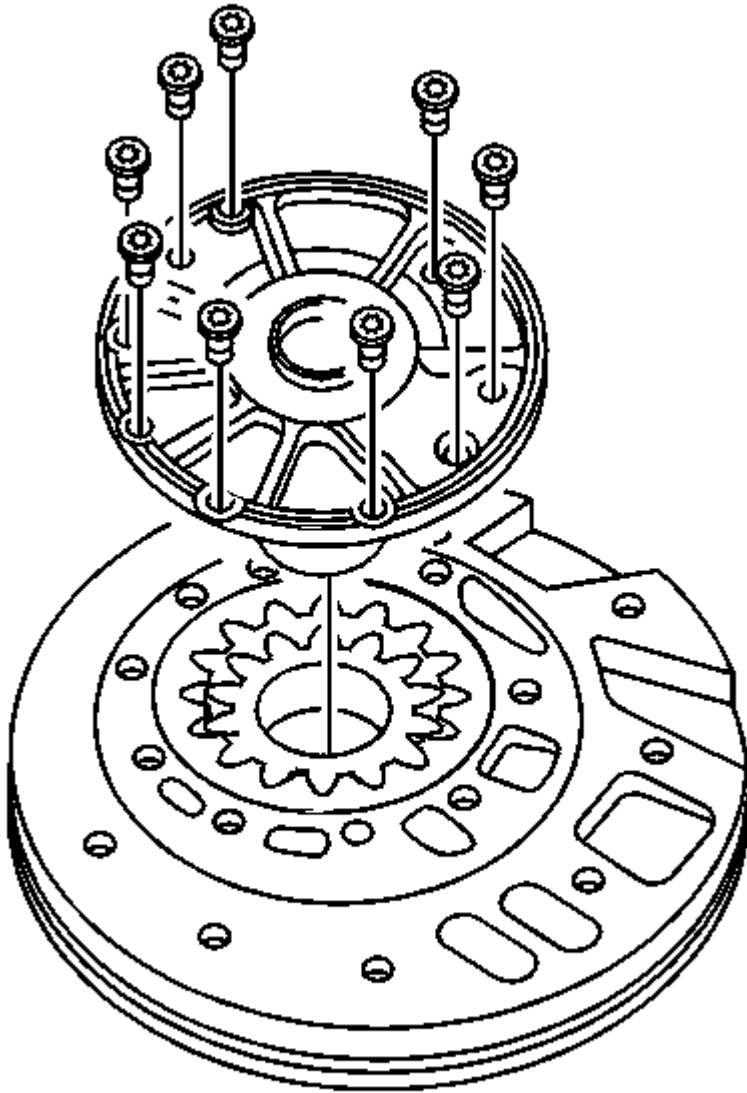


Fig. 57: Torque Dampener Housing and Fluid Pump Cover Assemble
Courtesy of GENERAL MOTORS CORP.

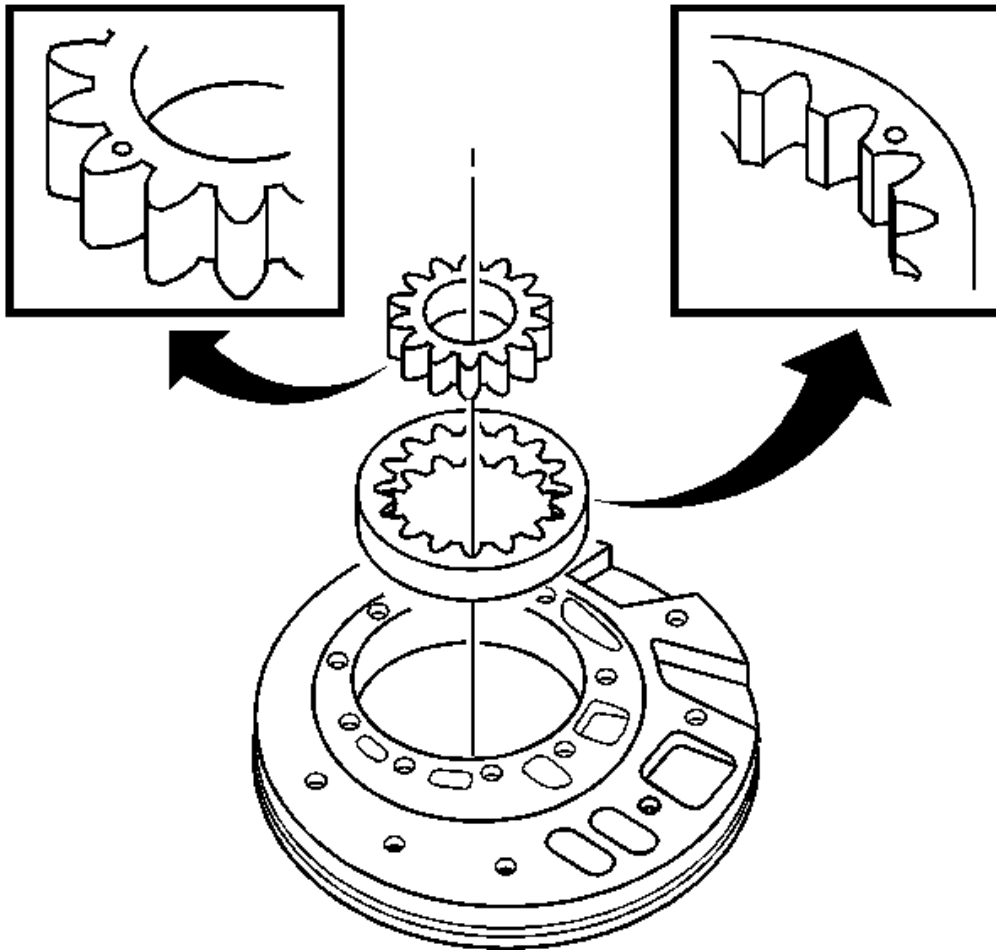
Callout	Component Name
Preliminary Procedure: If installing a NEW pump rotor and slide into the torque dampener housing, ensure to properly select the correct rotor and slide before performing this procedure. Refer to <u>Fluid Pump Selective Measurement</u> and <u>Fluid Pump Selective Specifications</u> .	

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1	Pump Slide Fluid Seal Ring
2	A/Trans Fluid Pump Slide O-Ring Seal
3	A/Trans Fluid Pump Slide Pivot Pin
4	A/Trans Fluid Pump Slide Seal Support Tip: The seal support is circular. The seal is rectangular.
5	A/Trans Fluid Pump Slide Seal
6	A/Trans Fluid Pump Slide
7	A/Trans Fluid Pump Slide Outer Spring
8	A/Trans Fluid Pump Vane Ring
9	A/Trans 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	A/Trans Fluid Pump Rotor
11	A/Trans Fluid Pump Vanes (Qty: 13)
12	A/Trans Fluid Pump Slide O-Ring Seal

FLUID PUMP COVER INSTALLATION

**Fig. 58: Fluid Pump Cover**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Fluid Pump Cover Assembly Tip: Align pump with guide pins on the torque dampener housing.
2	A/Trans Fluid Pump Cover Bolts M6 x1.0 x 45 (Qty: 18) CAUTION: Refer to <u>Fastener Caution</u> .

Procedure::

Tighten in sequence shown.

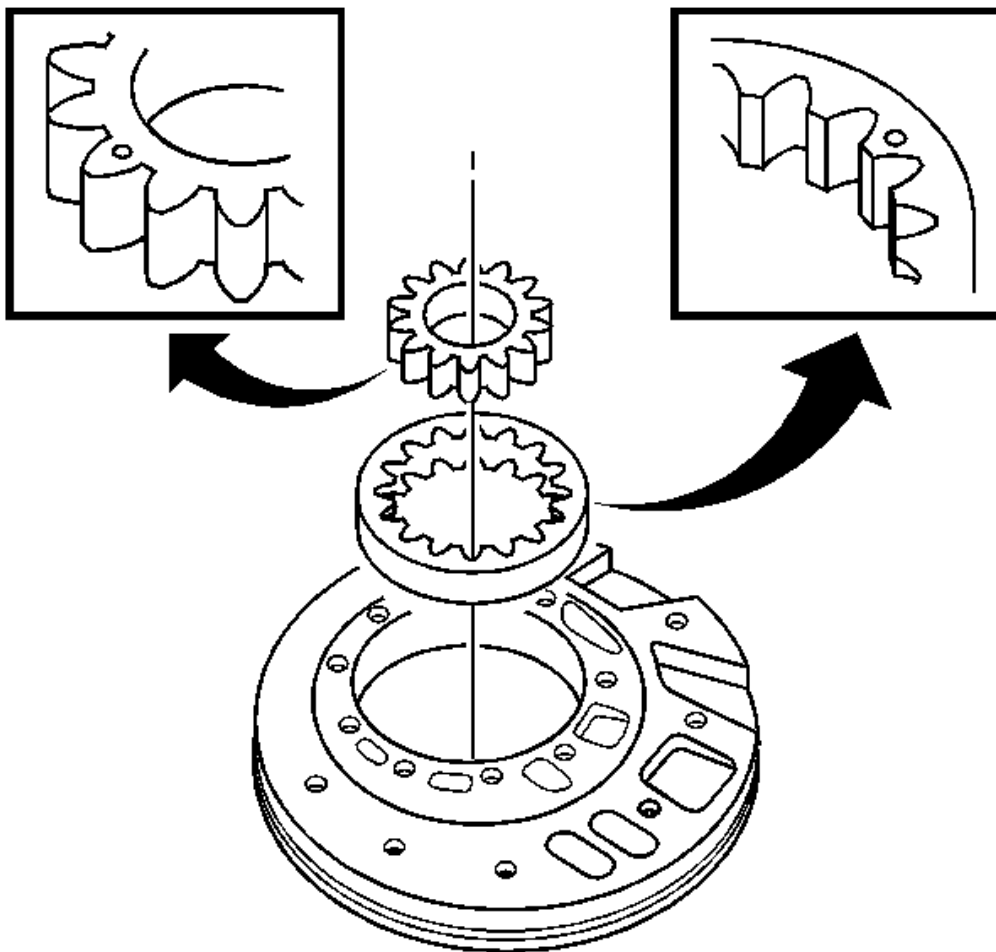
Tighten: 9-13 N.m (80-115 lb in)**TORQUE DAMPENER HOUSING AND FLUID PUMP COVER INSTALLATION**

Fig. 59: Torque Damper Housing and Fluid Pump Cover
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	A/Trans Torque Damper Housing Gasket

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1	Tip: Do not reuse the gasket. Replace with a NEW gasket.
2	A/Trans Torque Dampener (w/Fluid Pump) Housing Assembly
3	A/Trans Fluid Pump Cover Bolt M8 x 1.25 x 25 (Qty: 12) CAUTION: Refer to <u>Fastener Caution</u> . Procedure:: Tighten in the sequence shown. Tighten: 24-29 N.m (17.70-21.38 lb ft)

TRANSMISSION CONTROL WIRING HARNESS EXTENSION HARNESS INSTALLATION

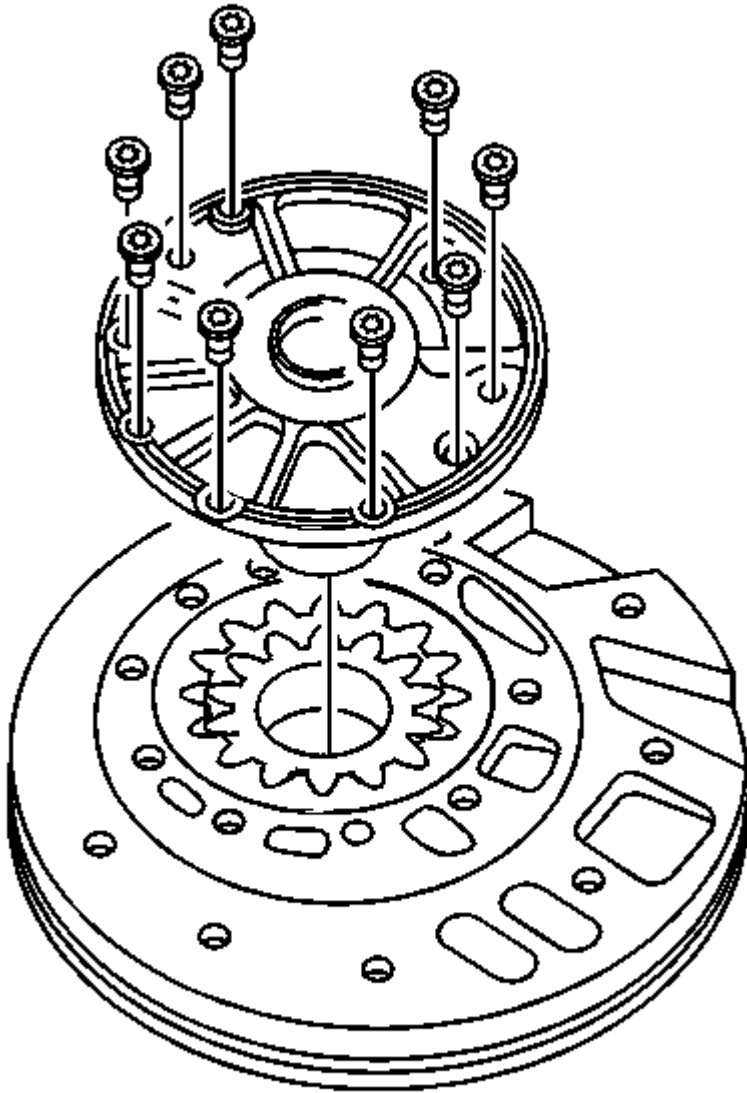


Fig. 60: Transmission Control Wiring Harness Extension Harness
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Control Wiring Harness Extension Harness O-Ring Seal Tip: Use only a NEW Seal.
2	A/Trans Control Wiring Harness Extension

Harness Assembly

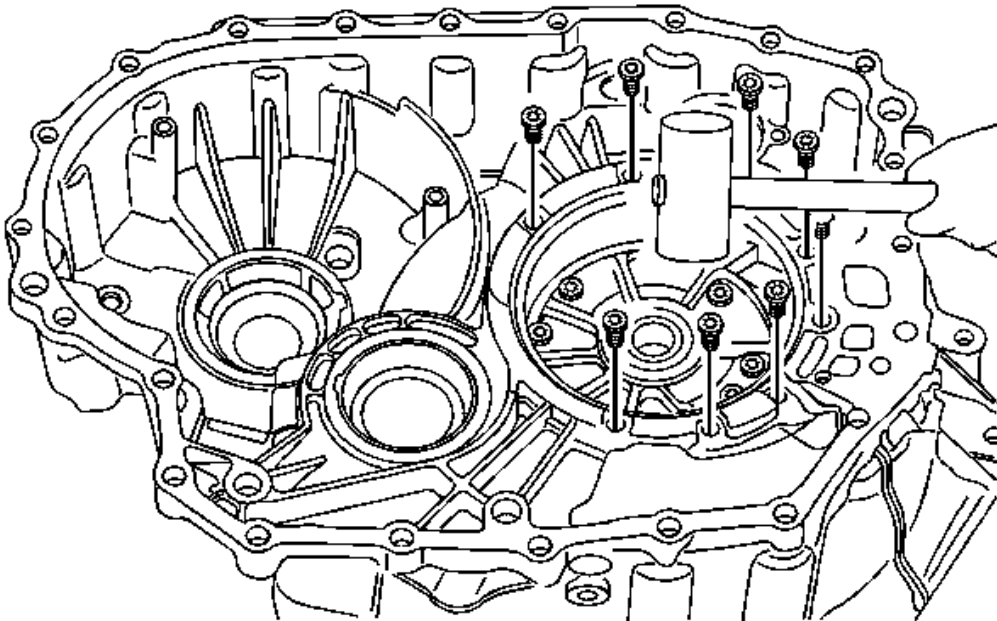
CONTROL VALVE ASSEMBLY DISASSEMBLE**Manual Shaft Detent Assembly Removal**

Fig. 61: Manual Shaft Detent Assembly
Courtesy of GENERAL MOTORS CORP.

Manual Shaft Detent Assembly Removal

Callout	Component Name
1	Manual Shift Detent Spring Bolt
2	Manual Shift Detent Assembly
3	Control Valve Channel Plate Bolt M6 x 1.0 x 35 (Qty: 2)
4	A/Trans Manual Shift Shaft Position Switch Assembly Bracket

Control Solenoid Valve and Valve Body Assembly Disassemble

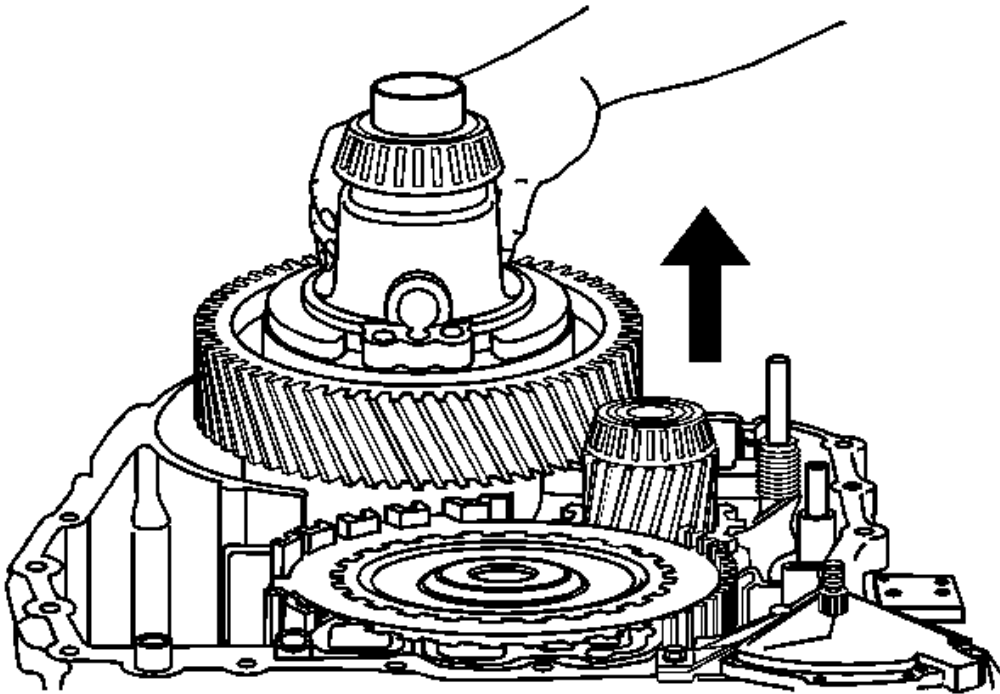


Fig. 62: Control Solenoid Valve and Valve Body Assembly Disassemble
 Courtesy of GENERAL MOTORS CORP.

Control Solenoid Valve and Valve Body Assembly Disassemble

Callout	Component Name
1	Control Solenoid Valve Heat Sink (w/Body and TCM) Bolt M5 x .8 x 53 (Qty: 2)
2	Control Valve Lower Body Bolt M6 x 1.0 x 55 (Qty: 9)
3	Control Solenoid (w/Body and TCM) Valve Assembly
4	Control Valve Channel Plate Spacer Plate Gasket 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.

5

A/Trans Wiring Harness Assembly

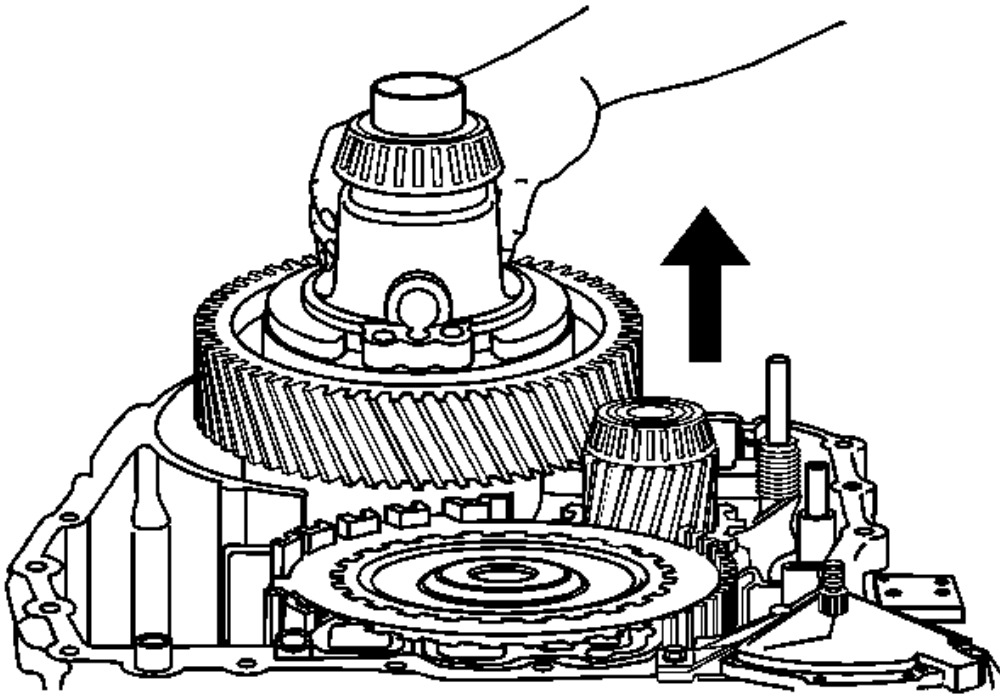
Valve Assembly and Transfer Plate Disassemble

Fig. 63: Valve Assembly and Transfer Plate
Courtesy of GENERAL MOTORS CORP.

Valve Assembly and Transfer Plate Disassemble

Callout	Component Name
1	Control Valve Channel Plate Bolt M6 x1.0 x 35 (Qty: 3)
2	Control Valve Channel Plate Bolt M6 x 1.0 x 35.0 (Qty: 17)
3	Control Valve Channel Plate Tip: Separate the upper and lower valve bodies by carefully prying at the point indicated.
	Control Valve Body Spacer (w/Gasket) Plate Assembly

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4	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.
5	A/Trans Fluid Pump Ball Check Valve Tip: • Remove only 1 ball check valve. • There are 2 incapsulated ball check valves. Do not remove. • Note the position of the ball check valves.
6	Control Valve Upper Body Assembly

Valve Assembly Overhaul

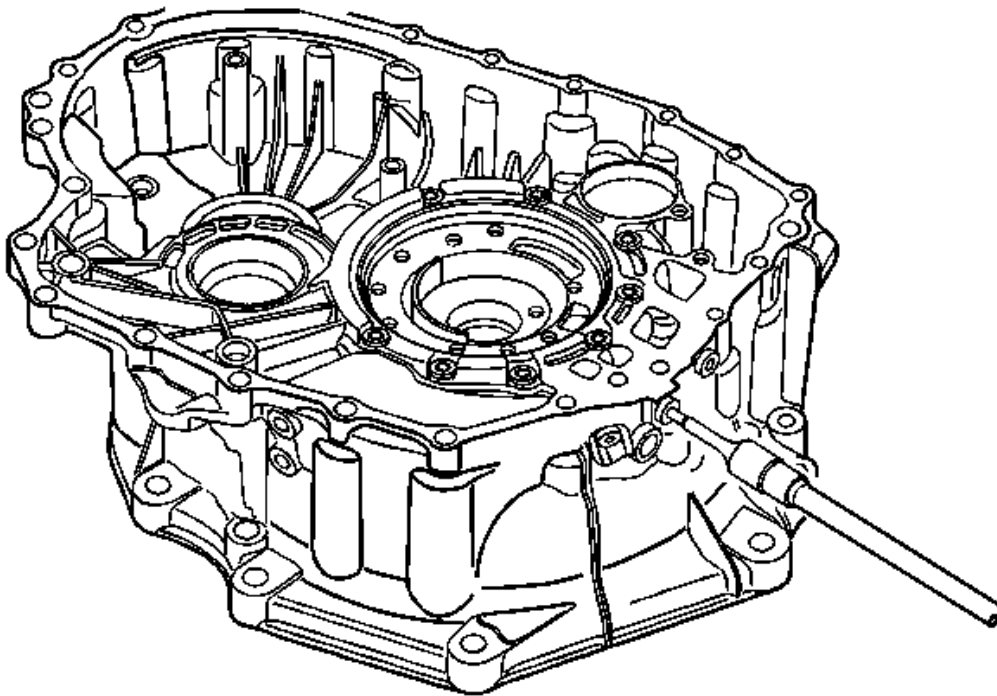


Fig. 64: Valve Assembly Overhaul
Courtesy of GENERAL MOTORS CORP.

Valve Assembly Overhaul

Callout	Component Name
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WARNING:

Valve springs can be tightly compressed. Use care when removing retainers and plugs. Personal injury could result.

Preliminary Procedures

1. Clean and inspect all valve components and the valve body. The control valve lower body is replaceable only as an assembly.
2. Clean and inspect the 2 incapsulated ball check valves but do not remove.

1	Auxiliary Line Boost Valve Train
2	1-3 Clutch Regulator Valve Train
3	Hybrid Direct, 2-3-4 Clutch Regulator Valve Train
4	Shift Solenoid Valve Train - Mode A
5	Shift Solenoid Valve Train - Mode B
6	Actuator Feed Limit Valve Train
7	Hybrid Low, 1-2 Clutch Regulator Valve
8	Hybrid Low, 1-2 Clutch Boost Valve Train
9	Clutch Piston Exhaust Blowoff Ball Valve Train

CONTROL VALVE ASSEMBLY ASSEMBLE

Valve Assembly to Transfer Plate Assemble

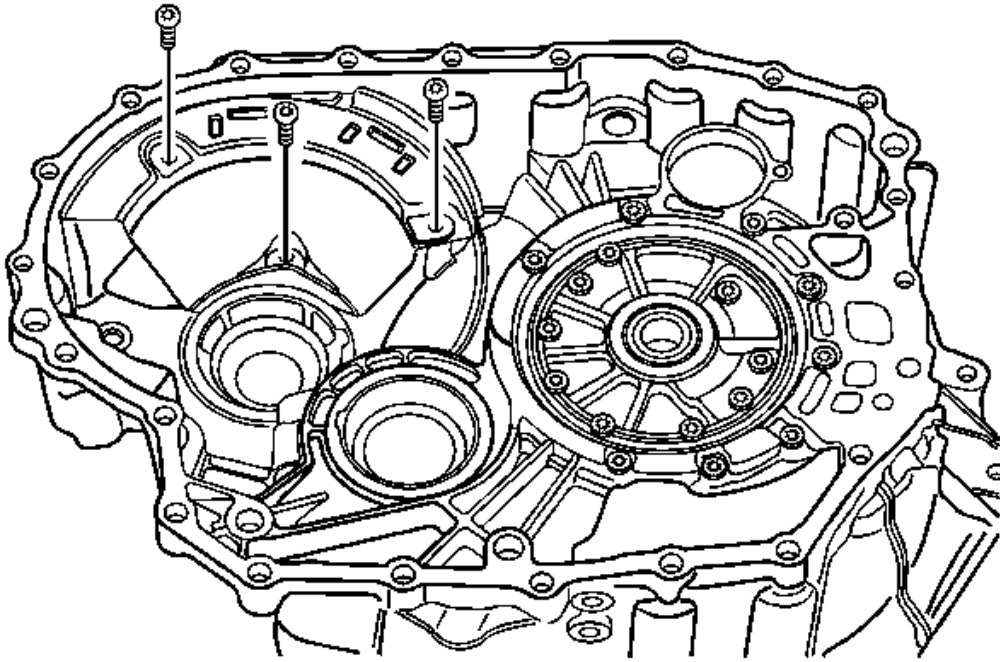


Fig. 65: Valve Assembly to Transfer Plate
 Courtesy of GENERAL MOTORS CORP.

Valve Assembly to Transfer Plate Assemble

Callout	Component Name
1	A/Trans Fluid Pump Ball Check Valve Tip: Clean and inspect the ball check valve and install. 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 Channel Plate Tip: Turn the valve body assembly over after installing to the upper body.
4	Control Valve Channel Plate Bolt M6 x1.0 x 35 (Qty: 3)

Tip: Hand tighten only.

Filter Plate Installation

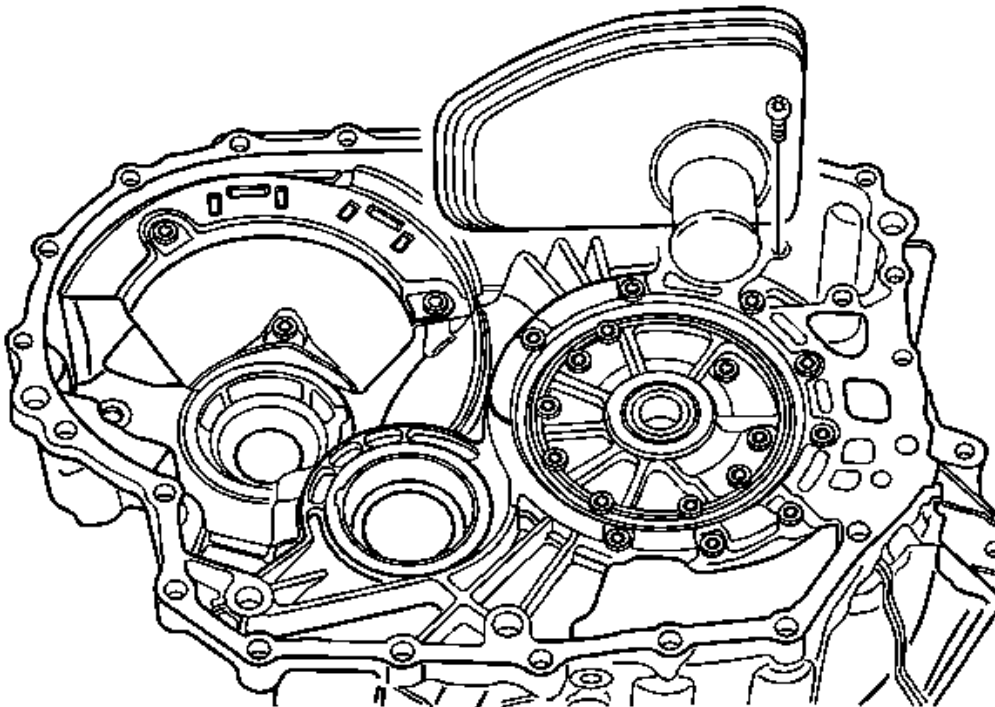


Fig. 66: Filter Plate

Courtesy of GENERAL MOTORS CORP.

Filter Plate Installation

Callout	Component Name
1	Control Valve Channel Plate Spacer Plate Gasket 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: Carefully feed temp sensor and resolver connector

thru case opening or damage may occur.

Tip: Use care when removing or installing the channel plate assembly. However, if a retaining tab is broken or missing, DO NOT replace the control solenoid valve assembly. The channel plate assembly can still be adequately aligned.

2

A/Trans Wiring Harness Assembly

Control Solenoid (w/Body and TCM) Valve Installation

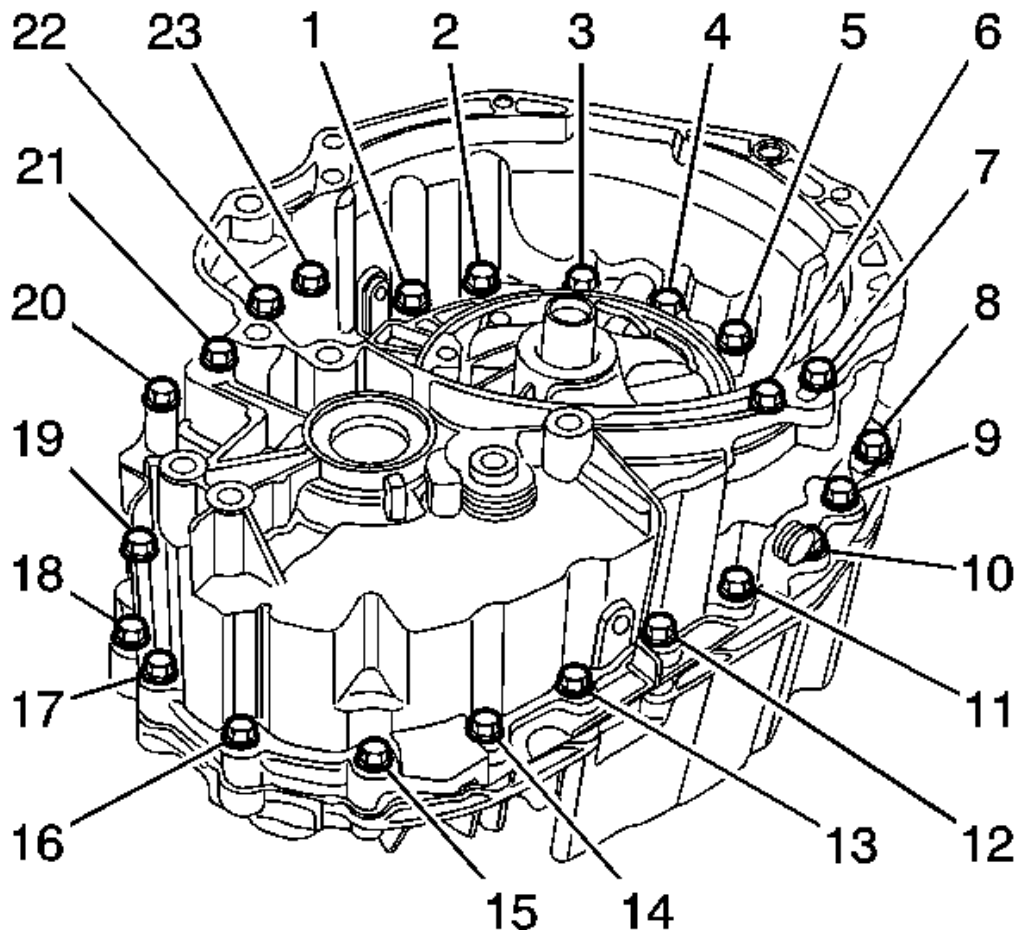


Fig. 67: Control Solenoid (w/Body and TCM) Valve
Courtesy of GENERAL MOTORS CORP.

Control Solenoid (w/Body and TCM) Valve Installation

Callout	Component Name
1	Control Solenoid (w/Body and TCM) Valve Assembly Tip: Note the locator pin on the control valve lower body assembly while aligning the control solenoid valve assembly.
2	Control Solenoid Valve Heat Sink (w/Body and TCM) Bolt M5 x.8 x 53 (Qty: 2) Tip: Hand tighten only.
3	Control Valve Lower Body Bolt M6 x1.0 x 55 (Qty: 9) Tip: Hand tighten only.

Control Valve Body, Upper and Lower Assembly

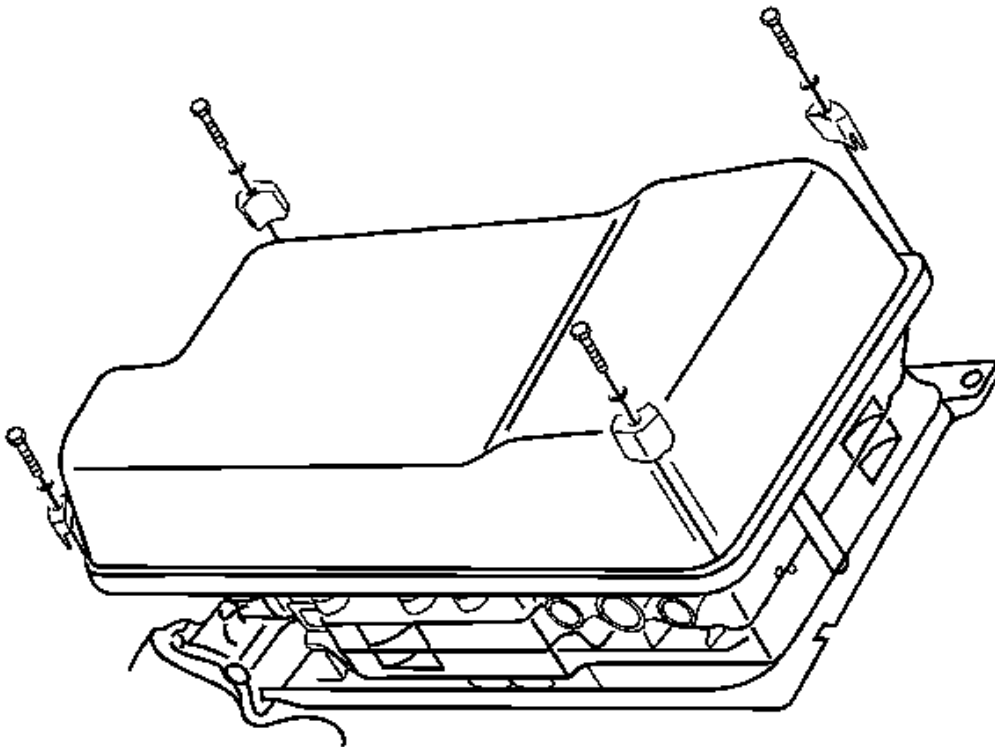


Fig. 68: Control Valve Body, Upper and Lower Assembly
Courtesy of GENERAL MOTORS CORP.

Control Valve Body, Upper and Lower Assembly

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.	
1	A/Trans Manual Shift Shaft Position Switch Assembly Bracket
2	Control Valve Channel Plate Bolts M6 x1.0 x 35 (Qty: 19) Tip: Hand tighten only.

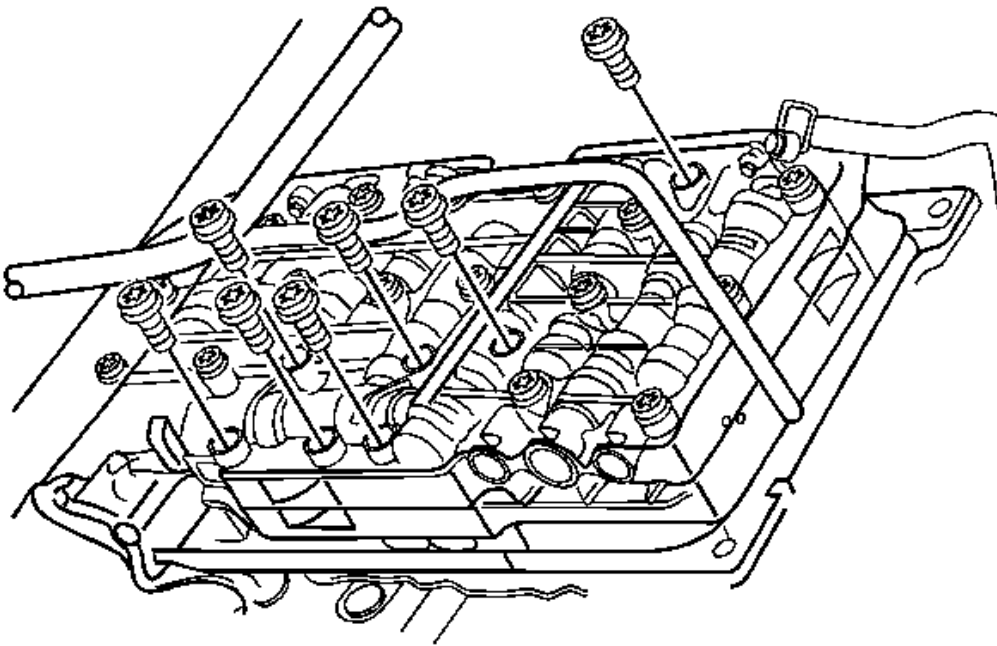
Valve Body, Control Solenoid Torque Sequence

Fig. 69: Valve Body, Control Solenoid Tightening Sequence
 Courtesy of GENERAL MOTORS CORP.

Valve Body, Control Solenoid

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.	

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Preliminary Procedure: The 2 heat sink bolts must be tightened last.

1	Control Valve Body Bolts M6 x1.0 x 55 (Qty: 31) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten all 31 bolts in the sequence shown. Tighten: 11 N.m (97 lb in)
2	Control Solenoid Valve Heat Sink (w/Body and TCM) Bolt M5 x.8 x 53 (Qty: 2). Tip: To ensure valve body to control solenoid assembly are properly aligned, inspect contact gap, see the following procedure. Tighten: 7 N.m (62 lb in)

Control Bodies Contact Gap Inspection

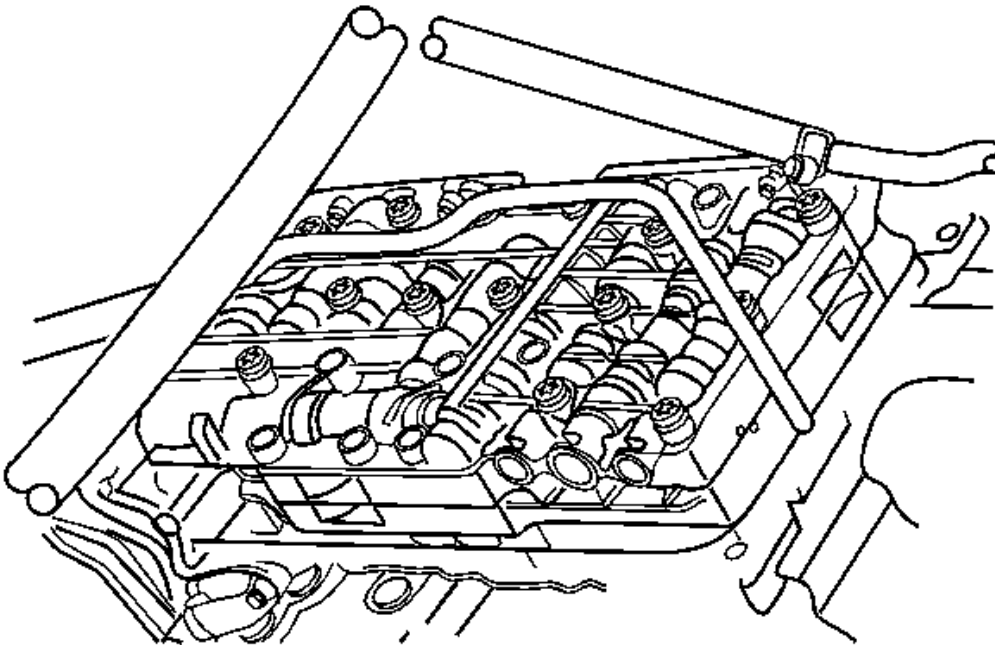


Fig. 70: Control Bodies Contact Gap Inspection
Courtesy of GENERAL MOTORS CORP.

Control Bodies Contact Gap Inspection

Callout	Component Name
1	Control Solenoid (w/Body and TCM) Valve Assembly Tip: 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.

CONTROL VALVE ASSEMBLY INSTALLATION

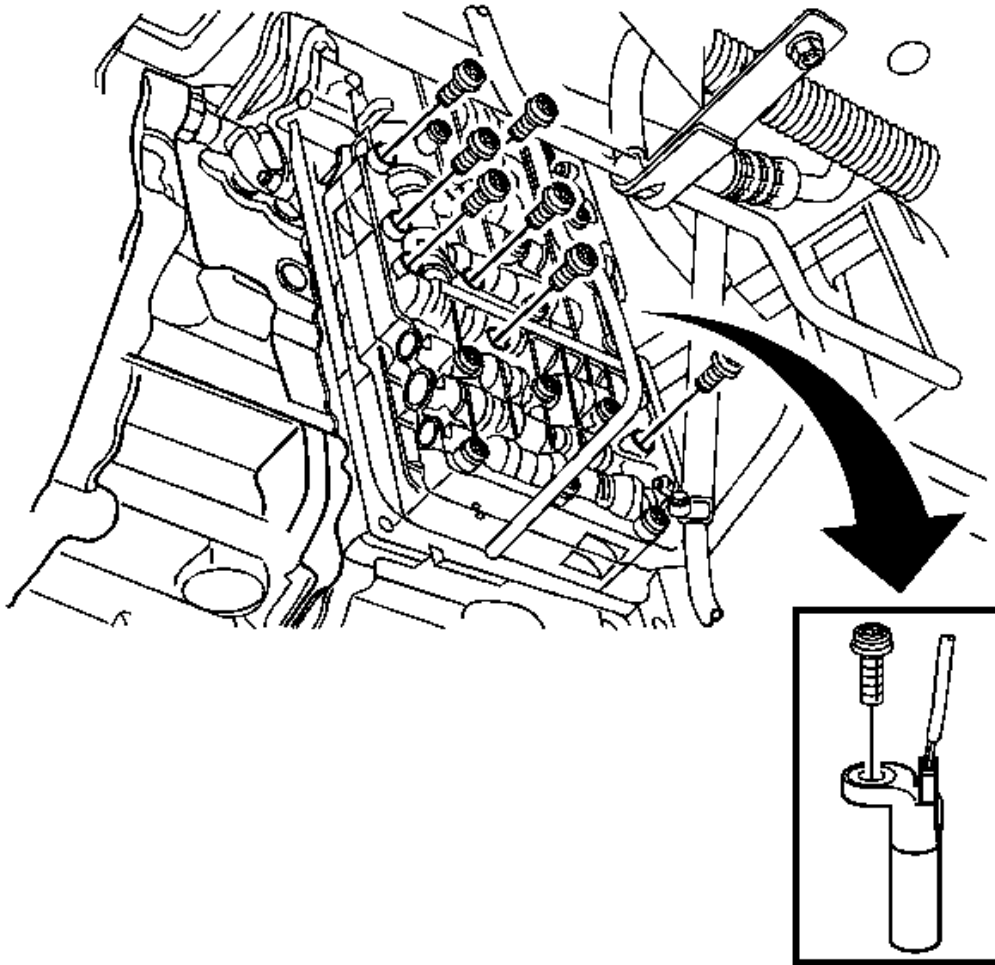


Fig. 71: Control Valve Assembly
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Control Valve Upper Body Seal (Qty: 6) Tip: Install a NEW seal.
2	A/Trans Fluid Pump Seal Assembly Tip: Install a NEW seal assembly.
3	Control (with Body and Valve) Valve Assembly Tip: Align the manual shift shaft position switch activator slide with the detent lever guide pin.
4	Internal Wire Harness Side Bracket

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5	Control Valve Upper Body Bolt M6 x1.0 x 65 (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten in the sequence shown. Tighten: 9-13 N.m (80-115 lb in)
6	Control Valve Upper Body Bolt M6 x 1.0 x 80 (Qty: 2)
7	Manual Shift Detent Assembly
8	Manual Shift Detent Spring Bolt M6 x 1.0 x 16 Tighten: 9-13 N.m (80-115 lb in)
9	Control Solenoid (with Body and TCM) Valve Assembly Procedure: Connect the wiring harness.
10	Shift Shaft Position Switch Procedure: Connect the wiring harness.
11	A/Trans Wiring Harness Assembly Procedure: Connect the wiring harness to the ground spade on the internal wire harness side bracket.

AUTOMATIC TRANSMISSION ELECTRICAL CONNECTOR PASSAGE SLEEVE INSTALLATION

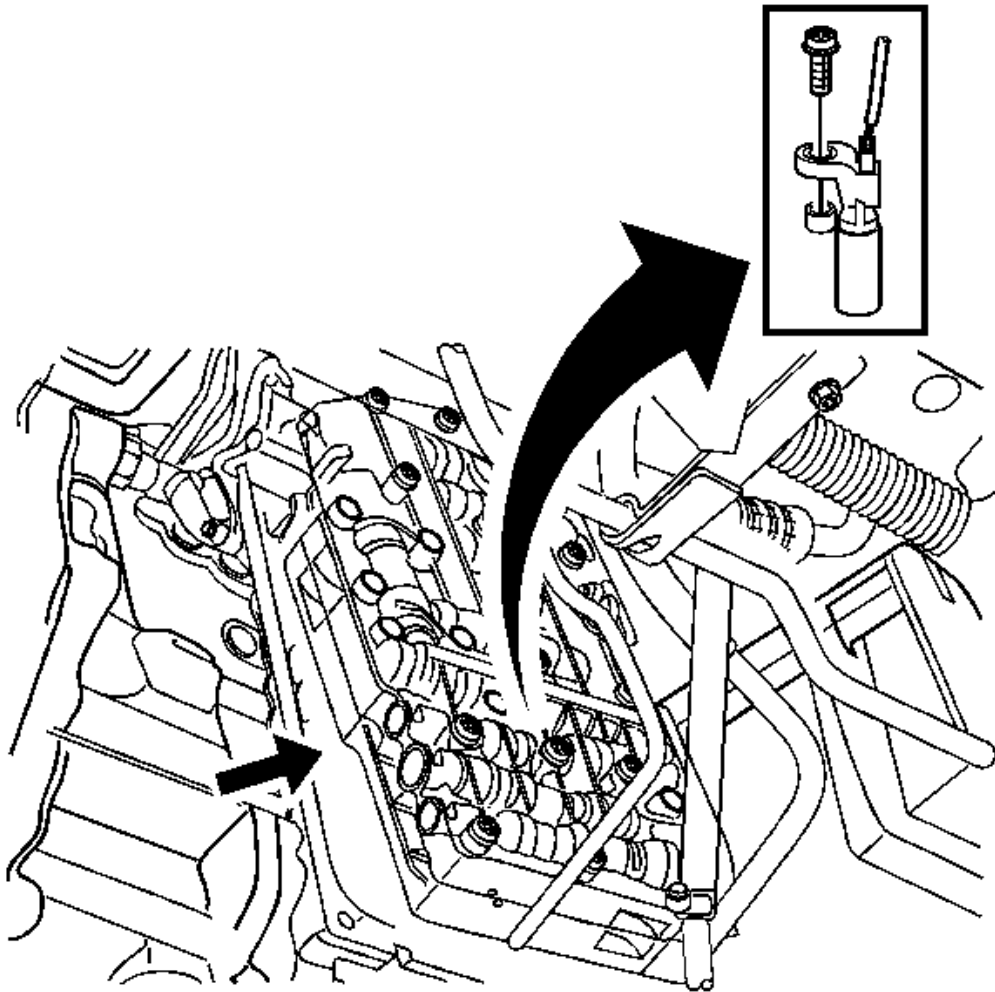


Fig. 72: Automatic Transmission Electrical Connector Passage Sleeve
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Electrical Connector Passage Lip Seal Tip: Inspect the lip seal for damage.
2	A/Trans Electrical Connector Passage O-Ring Seal Tip: Inspect the O-Ring seals for damage.
	A/Trans Electrical Connector Passage Sleeve CAUTION: Orientate the alignment tab inside the passage sleeve with the

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3	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. See Special Tools . • J 42183 Driver Handle. See Special Tools .
4	Electrical Connector Slide Lock Tip: Push down on the electrical connector slide lock to ensure proper installation.

TRANSMISSION FLUID PAN, FLUID FILTER, AND AUXILIARY FLUID PUMP FILTER INSTALLATION

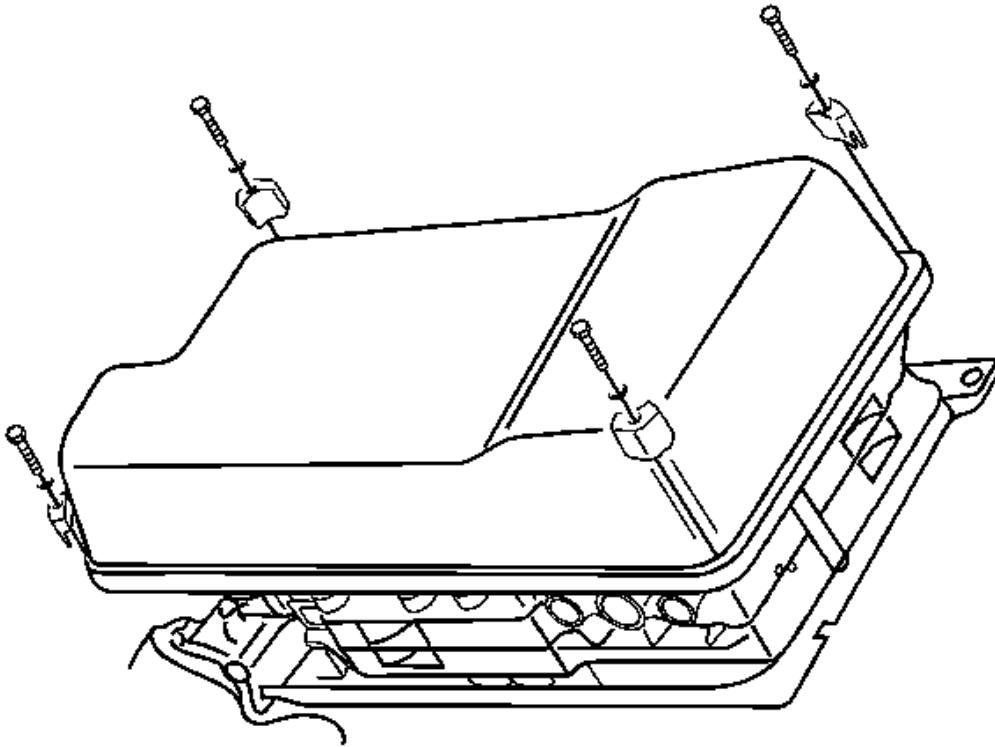


Fig. 73: Transmission Fluid Pan, Fluid Filter, and Auxiliary Fluid Pump Filter
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Fluid Filter Seal Assembly Tip: Install a NEW seal assembly. Special Tools • DT 47848 Water Pump Pulley Holding Tool. See Special Tools . • J 42183 Driver Handle. See Special Tools .
2	A/Trans Fluid Filter Assembly Tip: Install a NEW filter assembly.
3	A/Trans Auxiliary Fluid Filter Seal Tip: Install a NEW seal.
4	A/Trans Auxiliary Fluid Pump Outlet Pipe
5	A/Trans Auxiliary Fluid Filter Seal

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	Tip: Install a NEW seal.
6	A/Trans Auxiliary Fluid Pump Filter Assembly Tip: Install a NEW fluid pump filter assembly.
7	A/Trans Fluid Pan Gasket Tip: 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.
8	A/Trans Fluid Pan Assembly
9	A/Trans Fluid Pan Bolts M8 x1.25 x 20 (Qty: 13) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Tighten in the sequence shown. Tighten: 24-29 N.m (18-21 lb ft)

AUXILIARY FLUID PUMP INSTALLATION

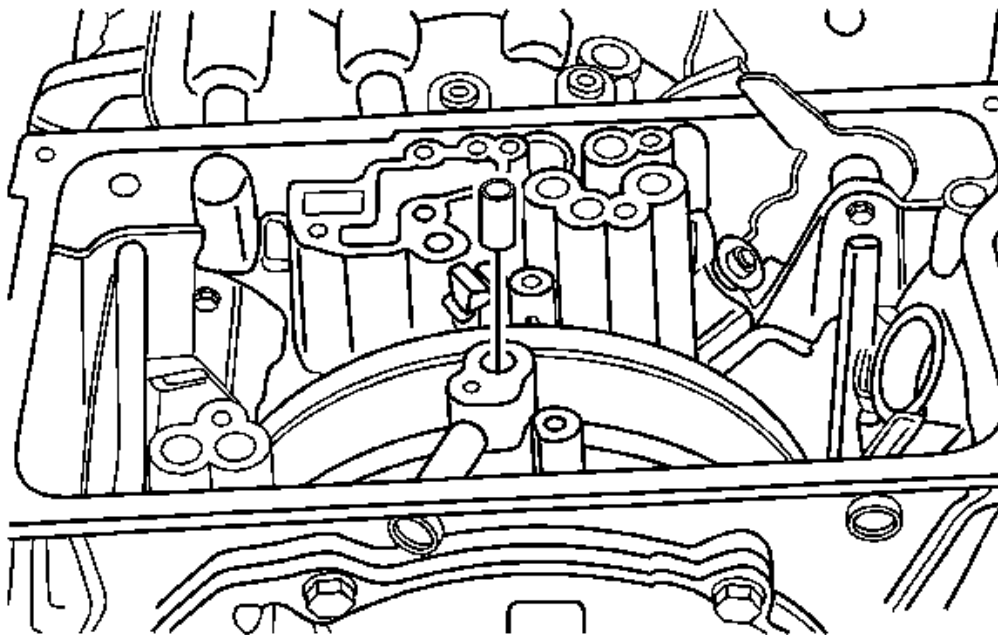


Fig. 74: Auxiliary Fluid Pump

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Auxiliary Fluid Pump Gasket CAUTION: The auxiliary fluid pump gasket is not re-usable. Use a NEW gasket when replacing or damage may occur.
2	A/Trans Auxiliary Fluid Pump Assembly CAUTION: Do not damage the case sealing surface when removing or installing the pump and motor assembly.
3	A/Trans Auxiliary Fluid Pump Bolt M6 x 1.0 x 65 (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: Tighten to 9-13 N.m (80-115 lb in).

HOLDING FIXTURE REMOVAL AND TORQUE DAMPENER INSTALLATION

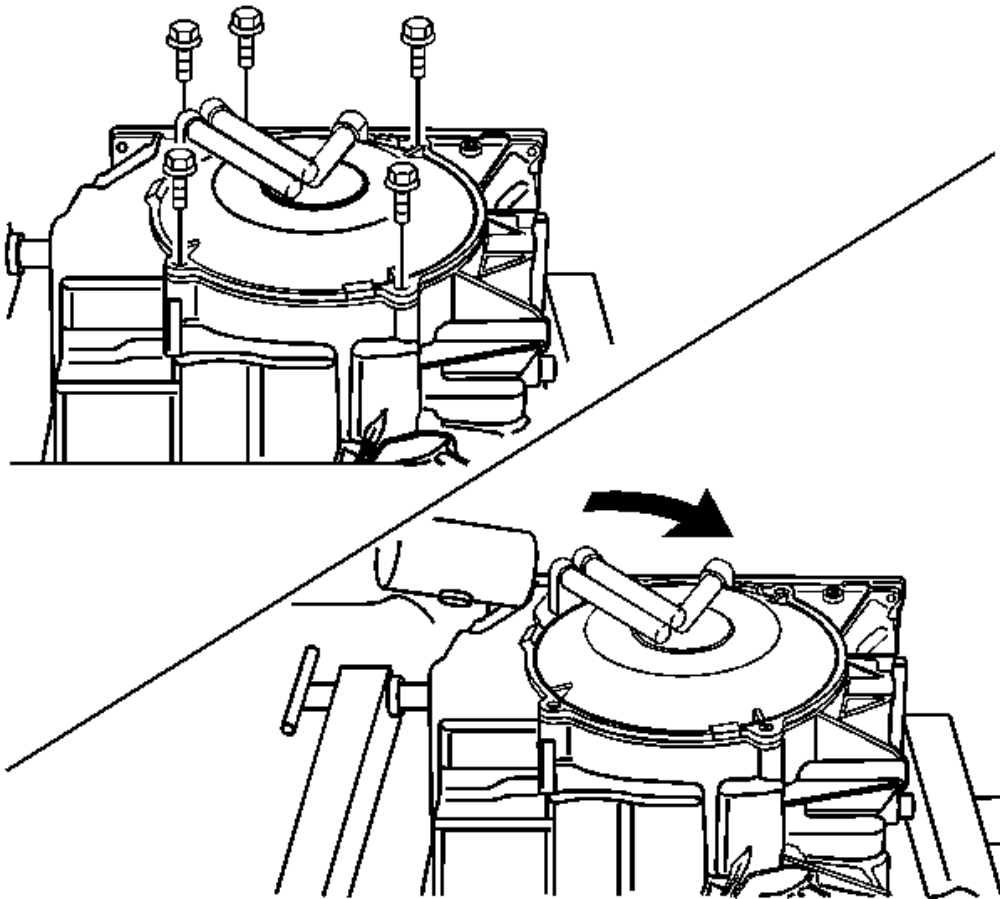


Fig. 75: Holding Fixture Removal/Installation and Torque Damper
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	A/Trans Torque Damper Assembly Special Tool: J 21366 Converter Holding Strap
2	A/Trans Case Assembly Special Tools • DT-48307 Holding Fixture. See Special Tools . • J 3289-20 Holding Fixture Base Assembly. See Special Tools .