

2002 Chevrolet Corvette

2002 AUTOMATIC TRANSMISSIONS Servicing - Corvette

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Servicing - Corvette

APPLICATION

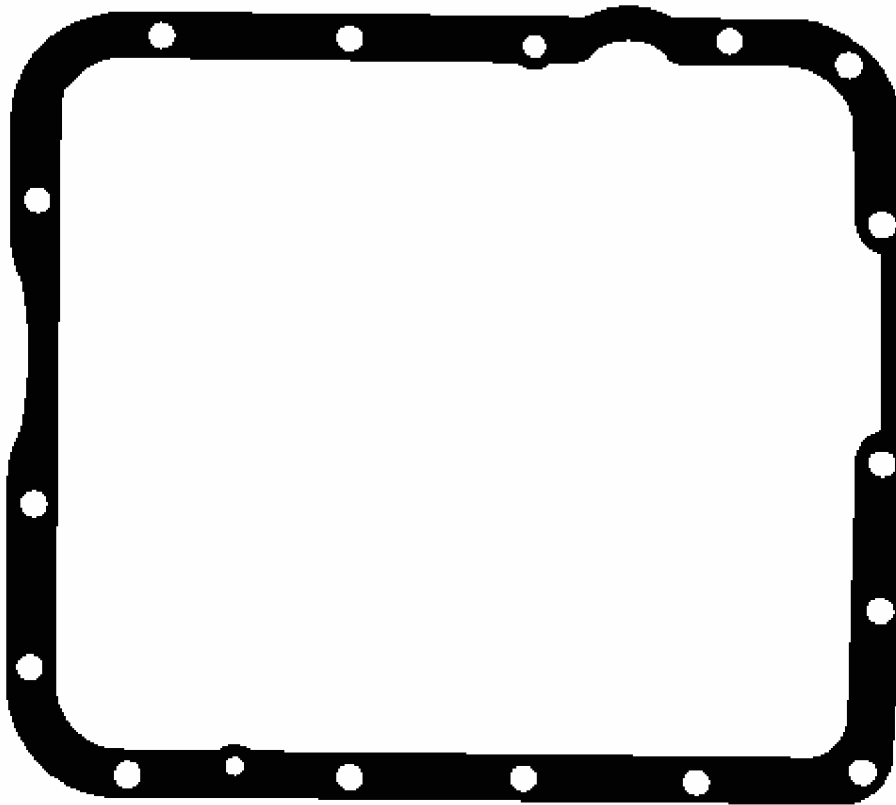
TRANSMISSION APPLICATION

Application	Transmission Model (RPO Code)
Corvette	4L60-E (M30)

IDENTIFICATION

OIL PAN GASKET

NOTE: Refer to illustration for oil pan gasket identification. See Fig. 1.



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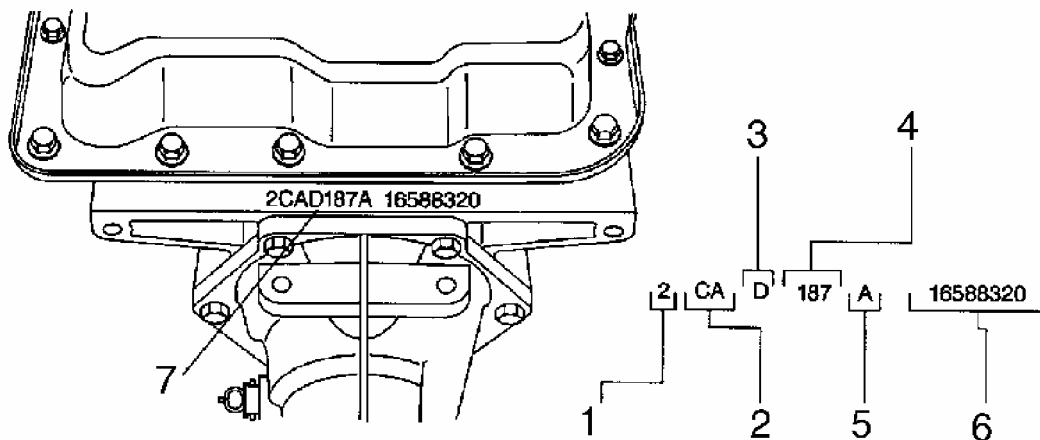
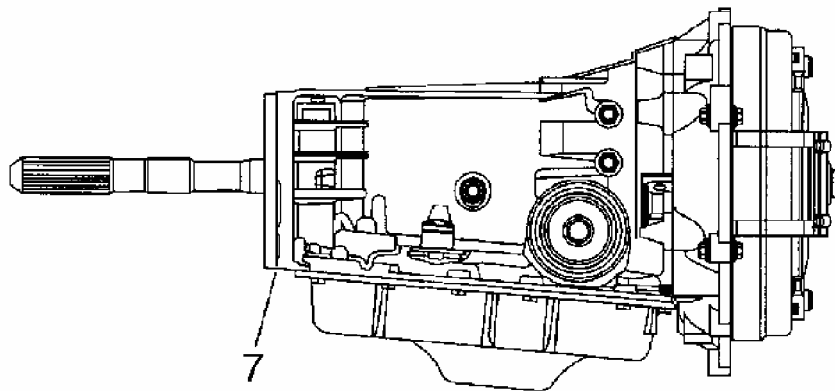
Fig. 1: Identifying Hydra-Matic 4L60-E Oil Pan Gasket
Courtesy of GENERAL MOTORS CORP.

TRANSMISSION

NOTE: For transmission identification, see **Fig. 2**.

2002 Chevrolet Corvette

2002 AUTOMATIC TRANSMISSIONS Servicing - Corvette



(1) 2 = 2002

(2) Model

(3) Hydra-Matic 4L60-E

(4) Julian Date or Day of the Year

(5) Shift Built, A, B, J = First Shift; C, H, W = Second Shift

(6) Serial No.

(7) Transmission ID Location

(7) Transmission ID Location

G00078165

Fig. 2: Identifying Transmission Identification Information
Courtesy of GENERAL MOTORS CORP.

LUBRICATION

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.

NOTE: The Corvette 4L60-E transmission is not equipped with a fluid dipstick.

SERVICE INTERVALS

Change the automatic transmission fluid and filter every 50,000 miles if the vehicle is mainly driven under one or more of these conditions:

- In heavy traffic where the outside temperature regularly reaches 32°C (90°F) or higher.
- In hilly or mountainous terrain.
- Uses such as high performance operation.

If the vehicle is not used under any of these conditions, change the fluid and filter every 100,000 miles.

CHECKING FLUID LEVELS

CAUTION: The engine must be running when the transmission fluid fill plug is removed, or excessive fluid loss will occur. Transmission fluid may be hot. Since the actual fluid level is unknown, stand clear when removing the fill plug. Have a container ready to capture any lost fluid. Do not turn the engine off with the fill plug removed, as you can be injured by hot transmission fluid being expelled out of the oil fill opening.

NOTE: The transmission fluid may darken with normal use and does not always indicate contamination or oxidation.

1. Start the engine and allow the engine to idle until the transmission fluid temperature has reached 30-50°C (86-122°F). Depress the brake pedal and move the shift lever through the gear ranges, pausing a few seconds in each range. Return the shift lever to

the Park range. Raise the vehicle on a hoist. The vehicle must be level with the engine running and the shift lever in the Park range. Remove the transmission plug. See **Fig. 3** . Check the fluid color. If necessary, use a small screwdriver as a dipstick. Is the fluid color clear red or light brown with no burnt odor? If so, go to step 4 . If not, go to next step.

2. Does the fluid have a burnt odor or a dark brown color? If so, go to step 8 . If not, go to next step.
3. Does the fluid have a cloudy or milky appearance? If so, go to step 7 . If not, go to step 8 .
4. Check the fluid level. The fluid level should be even with the bottom of the threaded plug hole. Is the fluid level low? If so, go to next step. If not, go to step 11 .
5. Add appropriate automatic transmission fluid in increments of 0.5L until the fluid drains from the plug hole. See **RECOMMENDED FLUIDS** . Did you add more than 1.5L to the transmission? If so, go to next step. If not, go to step 11 .
6. The transmission may have a leak. Inspect as necessary. Was a transmission fluid leak found? If so, go to step 9 . If not, go to step 11 .
7. The transmission fluid is contaminated with engine coolant. Repair or replace the transmission cooler in the radiator. Is the transmission cooler repair complete? If so, go to step 9 .

NOTE: **A very small amount of material in the bottom of the bottom pan is a normal condition.**

8. Drain the fluid by removing the bottom pan. Check the bottom pan for any excessive debris. Was excessive debris found? If so, go to next step. If not, go to step 10 .
9. Repair the transmission if required (in some cases, overhaul may be required). See appropriate OVERHAUL article in AUTOMATIC TRANSMISSIONS. Flush the transmission oil cooler and pipes and check flow. See **OIL COOLER FLUSHING** and **TRANSMISSION & OIL COOLER FLOW CHECK** . Add enough fluid to bring the fluid level to the bottom of the threaded plug hole. Start the engine and allow the engine to idle until the transmission fluid temperature has reached 30-50°C (86-122°F). Depress the brake pedal and move the shift lever through the gear ranges, pausing a few seconds in each range. Return the shift lever to the Park range. Raise the vehicle on a hoist. The vehicle must be level with the engine running and the shift lever in the Park range. Remove the transmission plug. If needed, add fluid in increments of 0.5L until the fluid drains from the threaded plug hole. Allow fluid to finish draining out of the plug hole. Install the plug and tighten to specification. See **TORQUE SPECIFICATIONS** . Wipe any excess fluid from the transmission with a rag or shop towel. Is repair complete? If so, road test vehicle. See PERFORMANCE TESTS in appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS.
10. Change the fluid and the fluid filter. See **DRAINING & REFILLING** . Start the engine and allow the engine to idle until the transmission fluid temperature has reached

30-50°C (86-122°F). Depress the brake pedal and move the shift lever through the gear ranges, pausing a few seconds in each range. Return the shift lever to the Park range. Raise the vehicle on a hoist. The vehicle must be level with the engine running and the shift lever in the Park range. Remove the transmission plug. If needed, add fluid in increments of 0.5L until the fluid drains from the threaded plug hole. Allow fluid to finish draining out of the plug hole. Install the plug and tighten to specification. See **TORQUE SPECIFICATIONS** . Wipe any excess fluid from the transmission with a rag or shop towel. Is repair complete? If so, road test vehicle. See PERFORMANCE TESTS in appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS.

11. Allow fluid to finish draining out of the plug hole. Install the plug and tighten to specification. See **TORQUE SPECIFICATIONS** . Wipe any excess fluid from the transmission with a rag or shop towel. Is repair complete? If so, road test vehicle. See PERFORMANCE TESTS in appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS.

RECOMMENDED FLUIDS

Manufacturer recommends Dexron-III automatic transmission fluid. Fill transmission with appropriate quantity. See **FLUID CAPACITIES** .

FLUID CAPACITIES

TRANSMISSION FLUID CAPACITIES ⁽¹⁾

Application	Drain & Refill ⁽²⁾ - Qts. (L)	Overhaul - Qts. (L)
4L60-E	5.0 (4.7)	10.8 (10.2)

(1) Fluid capacities listed are approximate. Always fill as specified in procedure. See **CHECKING FLUID LEVELS** .

(2) Drain and refill capacity does not include torque converter.

DRAINING & REFILLING

WARNING: When the transmission is at operating temperatures, take necessary precautions when removing the check/fill plug, to avoid being burned by draining fluid.

1. Raise and suitably support the vehicle. Place a drain pan under the transmission. Clean any dirt from around the transmission check/fill plug. Remove the transmission fluid check/fill plug and allow the fluid to drain. See [Fig. 3](#) .
2. Support the transmission oil pan. Remove the transmission oil pan bolts. Loosely reinstall the fluid check/fill plug. Lightly tap the oil pan with a rubber mallet or pry gently in order to loosen the pan. Remove the transmission oil pan. See [Fig. 4](#) . Drain

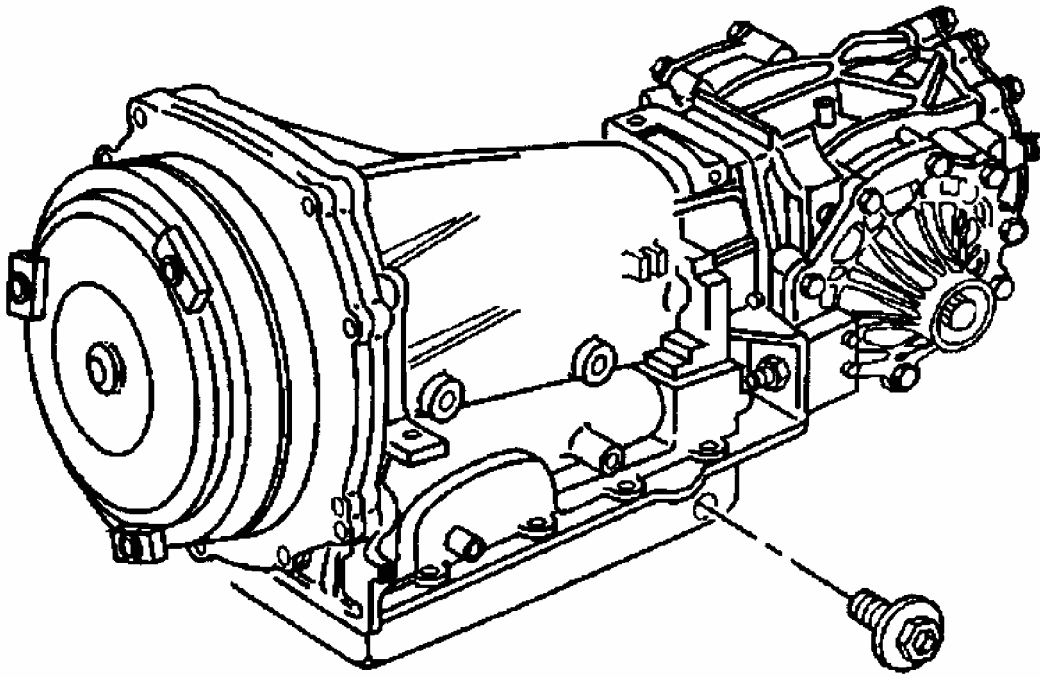
the remaining fluid from the oil pan.

NOTE: Observe position of the filter before removal to aid in installation.

3. Grasp firmly while pulling down with a twisting motion in order to remove the filter. Remove the filter seal. The filter seal may be stuck in the pump. If necessary, carefully use pliers or another suitable tool to remove the seal. Discard the seal. See **Fig. 5** and **Fig. 6** .
4. Inspect the transmission fluid. See **CHECKING FLUID LEVELS** . Inspect the transmission fluid filter. Pry the metal crimping away from the top of the filter and pull apart. The filter may contain evidence for root cause diagnosis:
 - Clutch material.
 - Bronze slivers indicating bushing wear.
 - Steel particles.

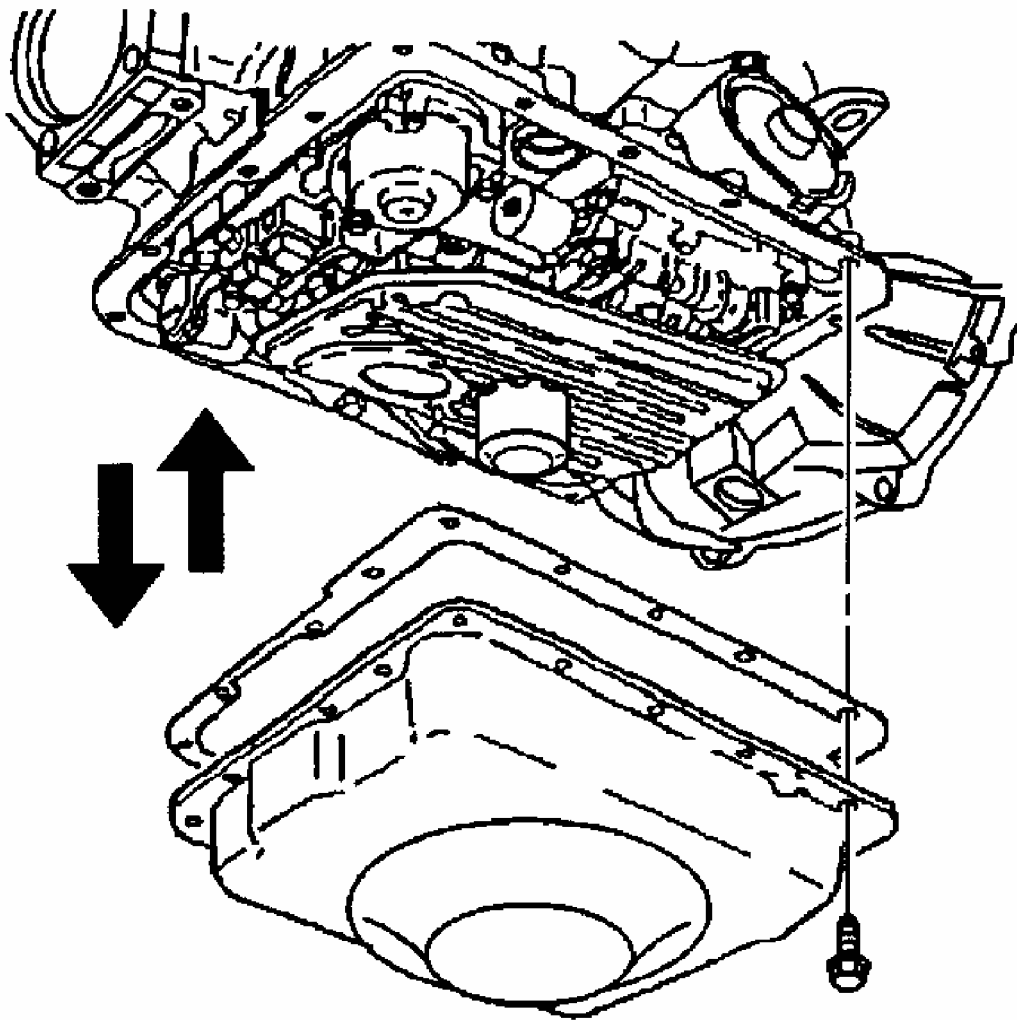
NOTE: Remove ALL traces of old gasket material from the transmission case and the oil pan gasket surfaces.

5. Clean the oil pan gasket mating surfaces, on both the transmission case and the transmission oil pan, with solvent and air dry. Coat the new filter seal with a small amount of Transjel(tm) (J 36850) or equivalent. Install the new filter seal into the transmission case. Gently tap the seal into place using a suitable size socket. See **Fig. 7** .
6. Install the new oil filter into position as noted during removal. Inspect the oil pan bolts and washers to determine if the conical washers are reversed. Reuse the oil pan bolts and washers if the conical washers are NOT reversed. Replace the oil pan bolts and washers if the conical washers are reversed. See **Fig. 8** .
7. Install the new oil pan gasket to the oil pan sealing surface. Position the oil pan to the transmission case and support the oil pan.
8. Install the oil pan bolts. Tighten the transmission oil pan bolts alternately and evenly to specification. See **TORQUE SPECIFICATIONS** . Remove the transmission fluid check/fill plug. Fill the transmission with appropriate fluid through the check/fill plug hole until fluid begins to pour out, then install the check/fill plug hand-tight. See **RECOMMENDED FLUIDS** .
9. Complete filling the transmission with fluid to the proper level. See **CHECKING FLUID LEVELS** . Tighten the transmission fluid check/fill plug to specification. See **TORQUE SPECIFICATIONS** . Inspect the oil pan gasket for leaks.



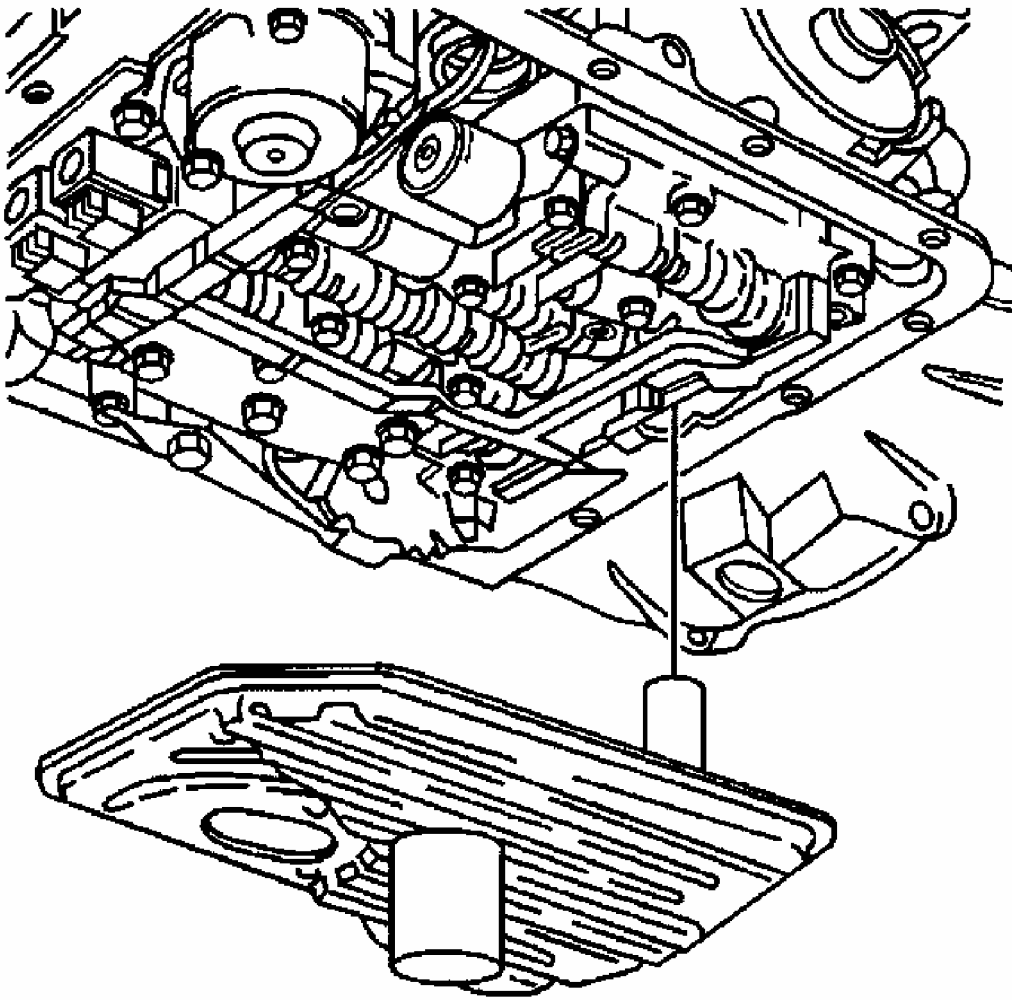
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Fig. 3: Locating Transmission Fluid Check/Fill Plug
Courtesy of GENERAL MOTORS CORP.



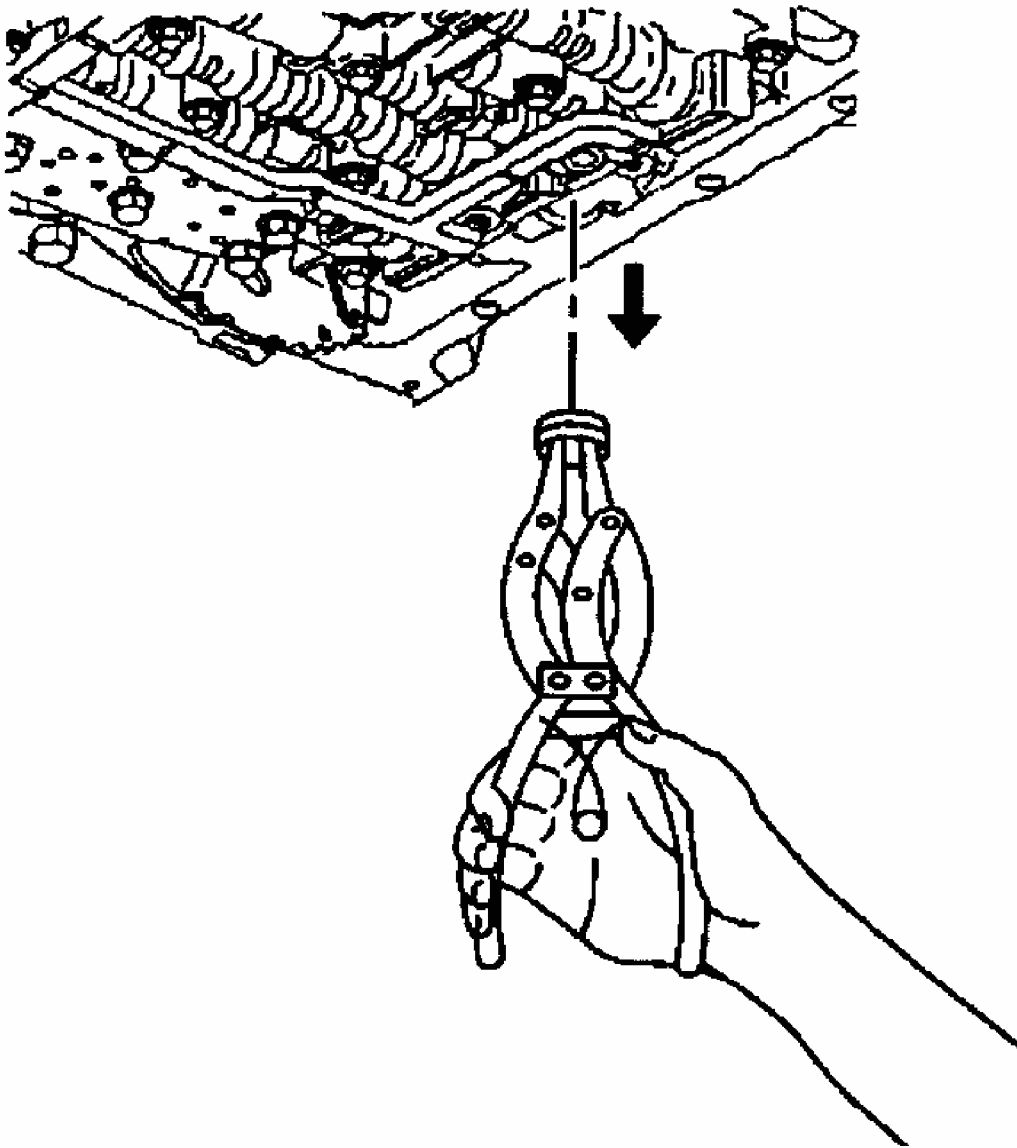
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Fig. 4: Removing/Installing Transmission Oil Pan
Courtesy of GENERAL MOTORS CORP.



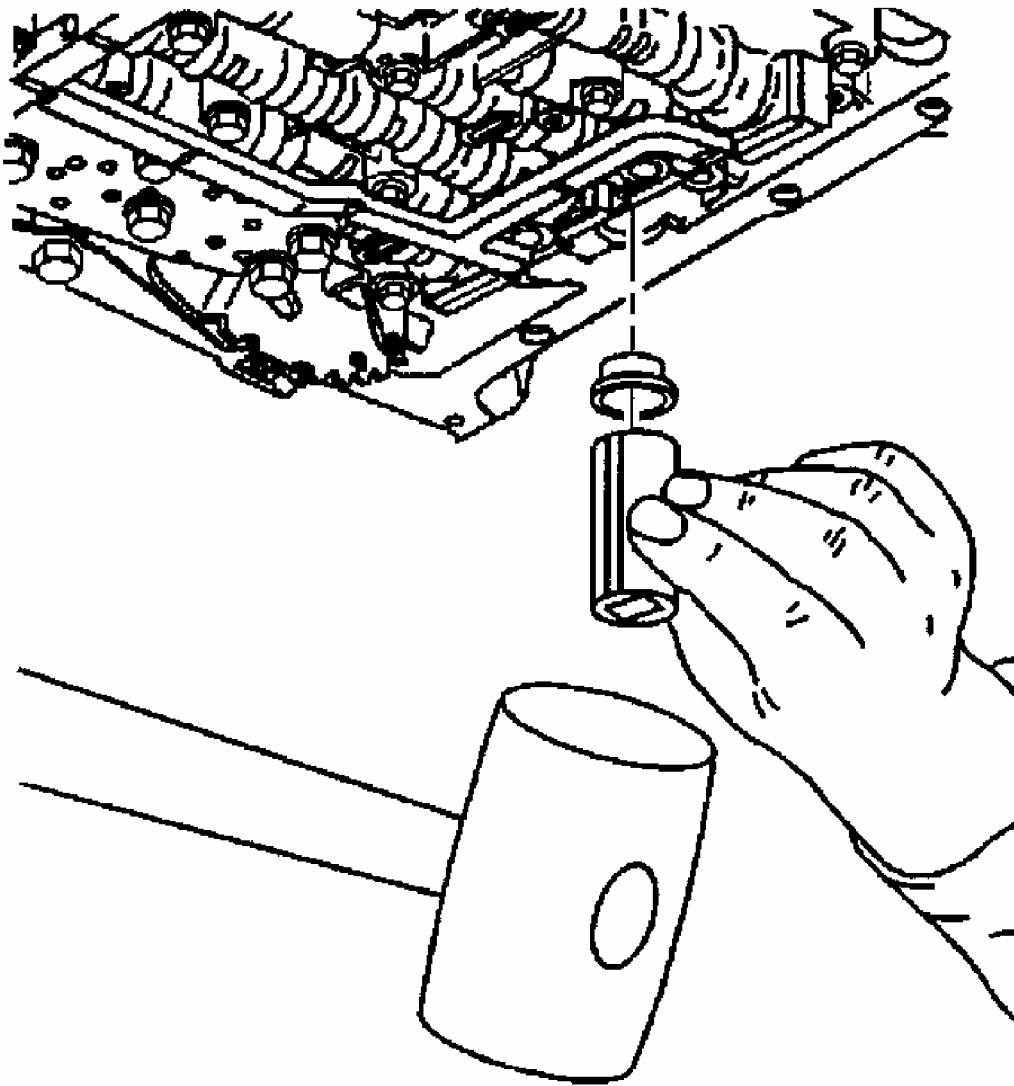
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Fig. 5: Removing/Installing Oil Filter
Courtesy of GENERAL MOTORS CORP.



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Fig. 6: Removing/Installing Oil Filter Seal
Courtesy of GENERAL MOTORS CORP.



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Fig. 7: Installing Oil Filter Seal
Courtesy of GENERAL MOTORS CORP.

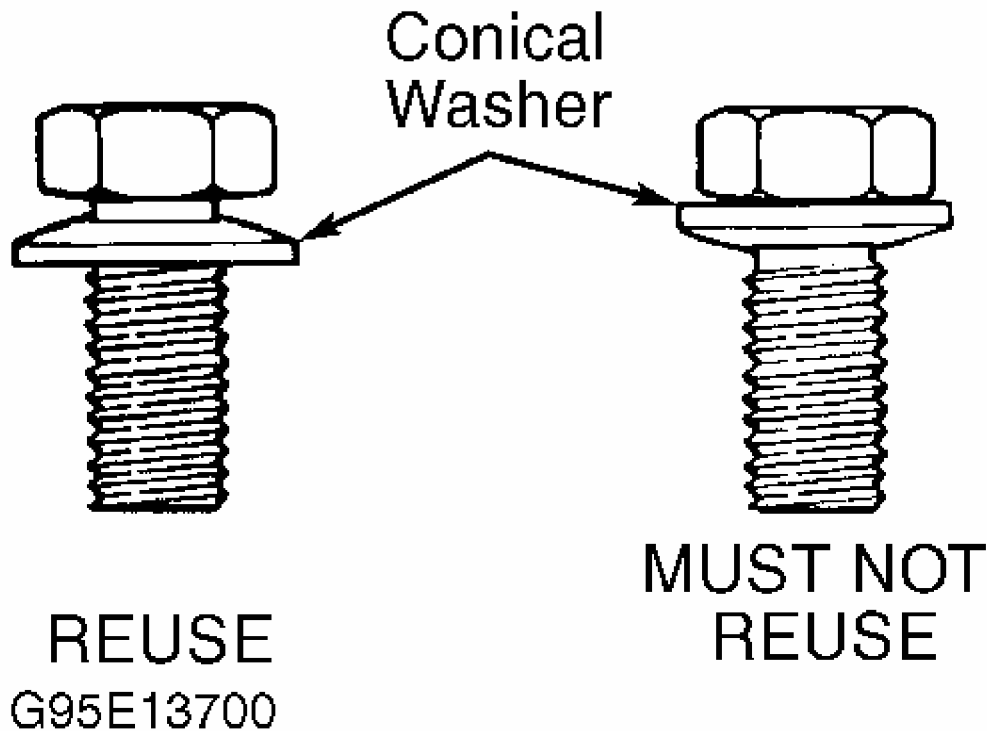


Fig. 8: Identifying Conical Washers
Courtesy of GENERAL MOTORS CORP.

OIL COOLER FLUSHING

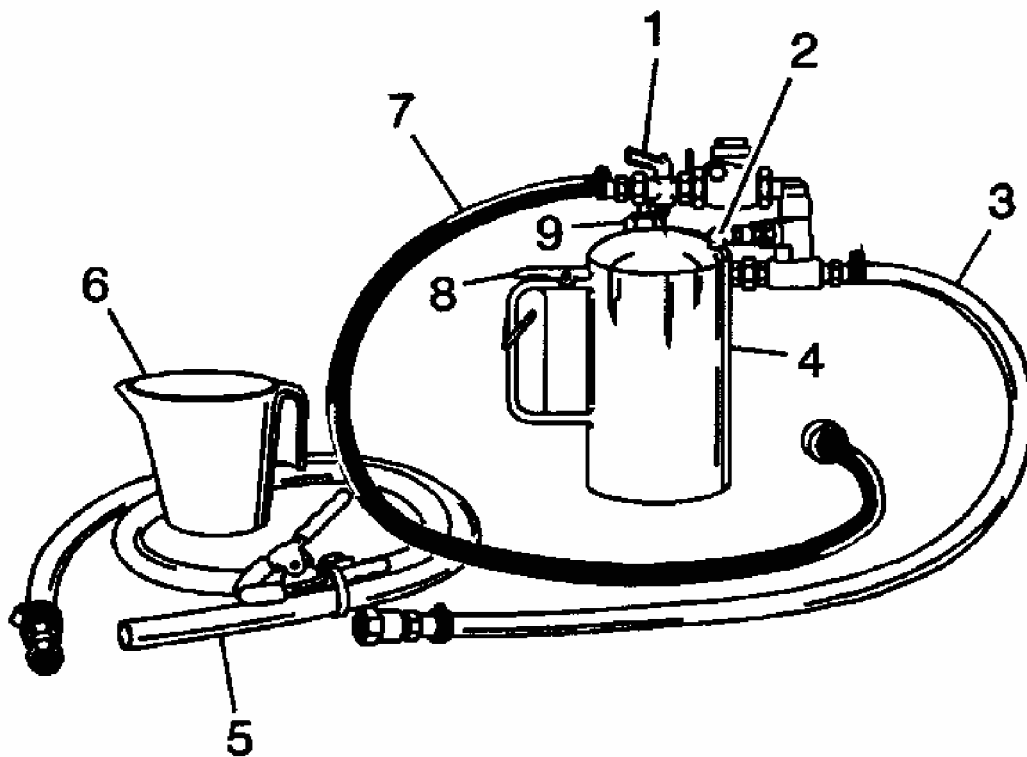
CAUTION: The flushing fluid (J 35944-22) is environmentally safe, yet powerful enough to cut through transmission fluid to dislodge any contaminants from the cooler. The safety precautions on the label regarding potential skin and eye irritations associated with prolonged exposure are typical precautions that apply to many similar cleaning solutions. It should be noted that according to General Motors, use of other non-approved fluids for cooler flushing can have an adverse reaction to the seals inside the transmission.

NOTE: Do not use solutions that contain alcohol or glycol. Use of solutions that contain alcohol or glycol may damage flushing equipment, oil cooler components and/or transmission components.

NOTE: GM studies indicate that plugged or restricted transmission oil coolers and pipes cause insufficient transmission lubrication and elevated operating temperatures which can lead to premature transmission wear-out. Many cases could have been prevented by following published procedures for transmission oil cooler flushing and flow checking. This procedure includes flushing and flow checking the auxiliary transmission oil cooler, if equipped. GM requires that transmission oil cooler flushing and flow checking be performed whenever a transmission is removed from the vehicle for service within warranty, including: Goodwin, SWAT, major overhaul, torque converter replacement and oil pump replacement.

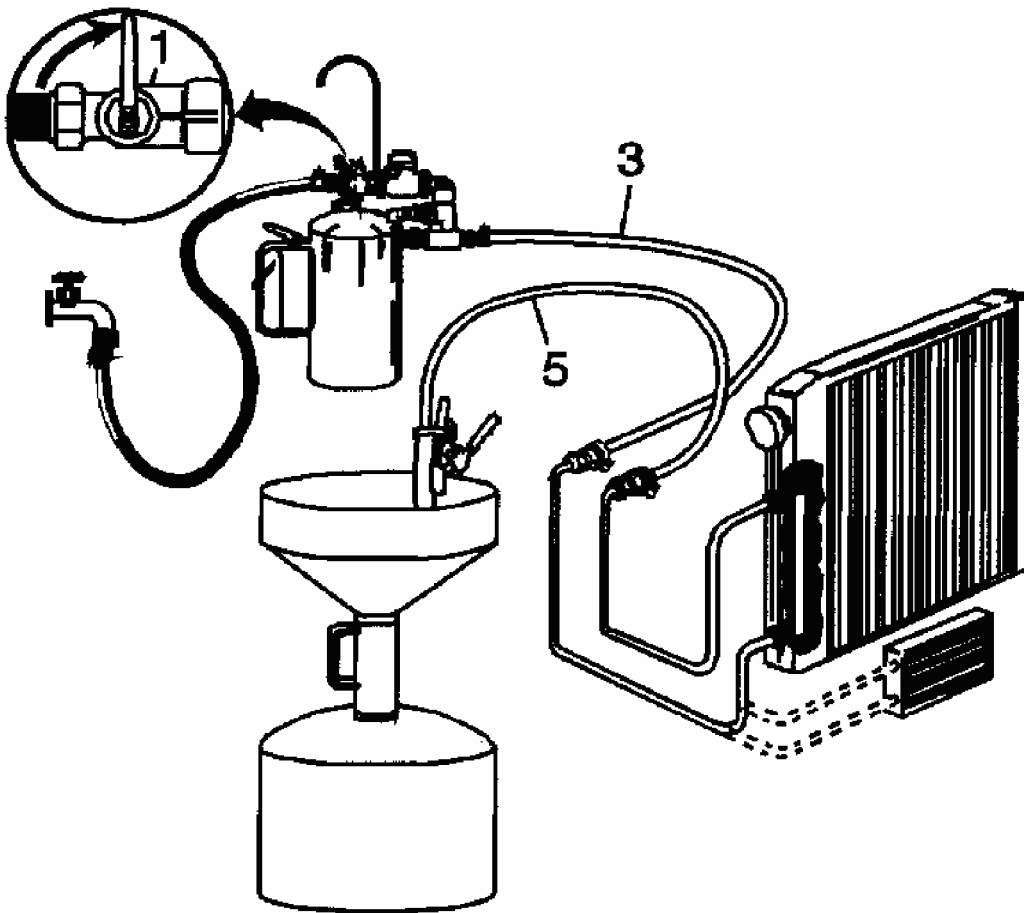
Preparation

1. After the repair or replacement transmission is installed in the vehicle, do not reconnect the oil cooler pipes.
2. Remove the fill cap (9) on the J 35944-A and fill the flusher tank (4) with 0.6L (20-21 oz.) of J 35944-22 flushing solution using the measuring cup (6). Do not overfill. Install the fill cap (9) on the J 35944-A and pressurize the flusher tank (4) to 550-700 kPa (80-100 psi), using the shop air supply at the tank air valve (9). See **Fig. 9**.
3. Connect the J 35944-A discharge hose (5) to the oil cooler return pipe (top connector) (may require J 35944-600). Clip the discharge hose (5) onto the oil drain container. Attach the J 35944-A to the undercarriage of the vehicle with the hook provided, and connect the flushing system feed supply hose (3) from the J 35944-A to the oil cooler feed pipe (bottom connector) (may require J 35944-600). See **Fig. 10**.
4. With the water supply valve (1) on the J 35944-A in the OFF position, connect the water supply hose (7) from the J 35944-A to the water supply at the faucet. See **Fig. 9** and **Fig. 10**. Turn ON the water supply at the faucet.



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Fig. 9: Identifying Flushing Equipment
Courtesy of GENERAL MOTORS CORP.



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Fig. 10: Connecting Flushing Equipment
Courtesy of GENERAL MOTORS CORP.

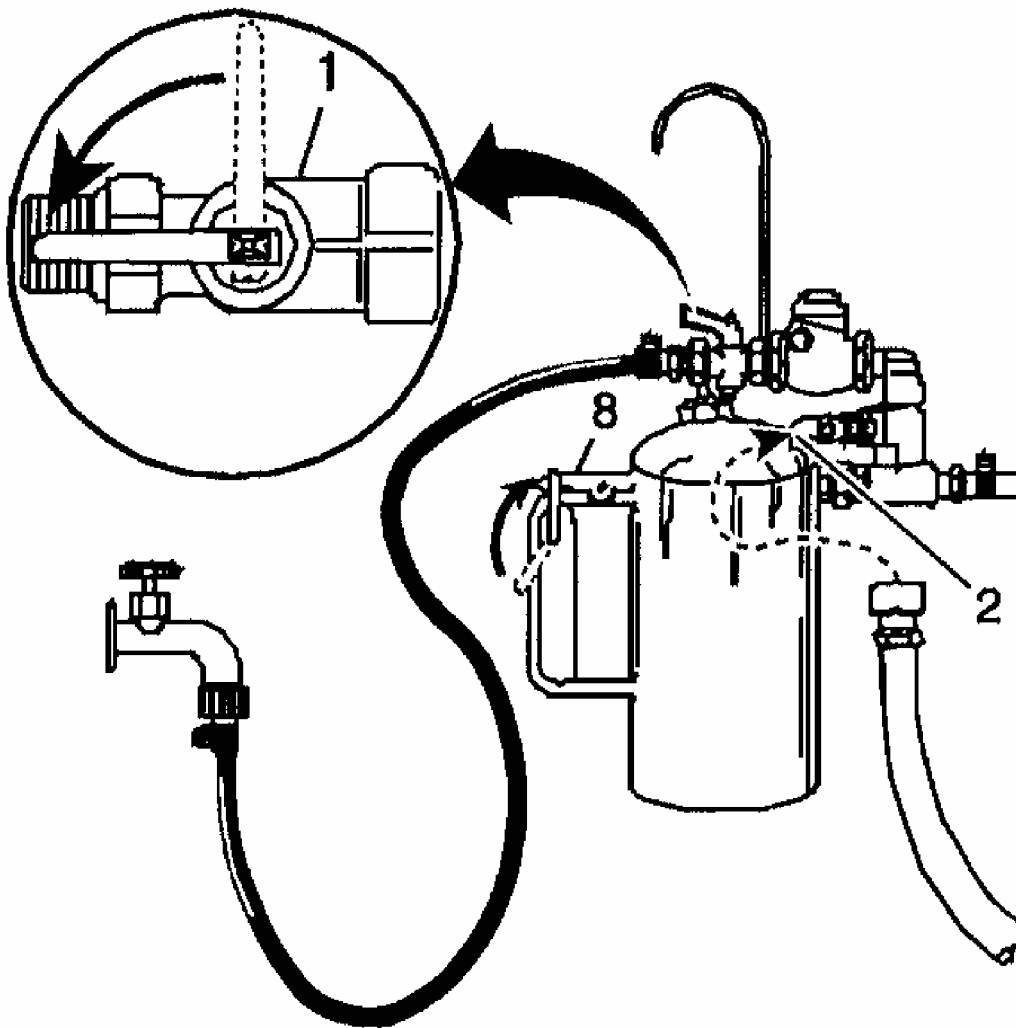
Initial Flush

1. Turn the (J 35944-A) water supply valve (1) to the ON position and allow water to flow through the oil cooler and pipes for 10 seconds to remove any remaining transmission fluid. See **Fig. 11** . If water does not flow through the oil cooler and pipes, the cause of the blockage must be diagnosed and the plugged component must be repaired or replaced. Continue with the cooler flushing and flow check procedure once the blockage is corrected.
2. Turn the (J 35944-A) water supply valve (1) to the OFF position and clip the discharge hose (5) onto a 5 gallon (19L) pail with a lid, to avoid splashback. See **Fig. 12** . Turn the (J 35944-A) water supply valve (1) to the ON position and depress the trigger (8) to mix cooler flushing solution into the water flow. See **Fig. 9** . Use the clip provided on the handle to hold the trigger (8) down. The discharge will foam vigorously when the

solution is introduced into the water stream.

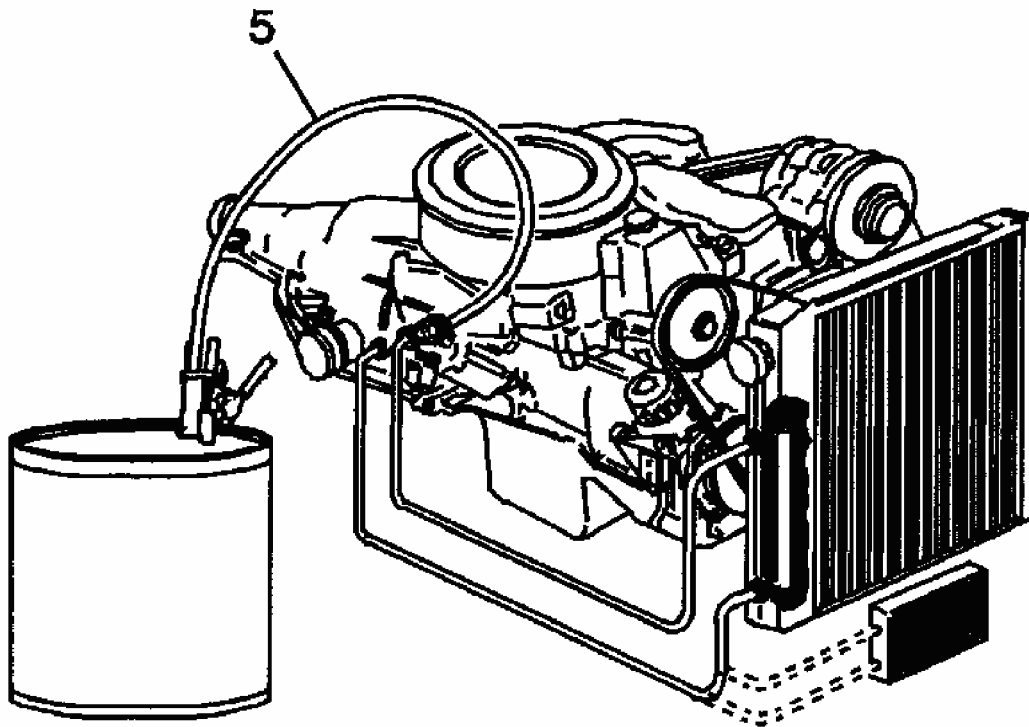
NOTE: Flushing for approximately 2 minutes in each cooler line direction will result in a total of about 8-10 gallons of waste fluid. This mixture of water and flushing fluid is to be captured in a five-gallon bucket or similar container.

3. Flush the oil cooler and pipes with water and solution for 2 minutes. During this flush, attach the shop air supply of 825 kPa (120 psi) to the flushing system feed air valve (2) located on the (J 35944-A) for 3-5 seconds at the end of every 15-20 second interval to create a surging action.
4. Release the trigger (8) and turn the (J 35944-A) water supply valve (1) to the OFF position.



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Fig. 11: Flushing Oil Cooling System
Courtesy of GENERAL MOTORS CORP.



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Fig. 12: Capturing Fluid Discharge
Courtesy of GENERAL MOTORS CORP.

Back Flush

1. Disconnect both hoses from the oil cooler pipes and then connect them to the opposite oil cooler pipe. This will allow the oil cooler and pipes to be back flushed. Repeat steps 2 and 3 of the INITIAL FLUSH procedure. Release the trigger (8) of the (J 35944-A) and allow water only to rinse the oil cooler and pipes for one minute.
2. Turn the (J 35944-A) water supply valve (1) to the OFF position and turn OFF the water supply at the faucet. Attach the shop air supply to the flushing system feed air valve (2) on the (J 35944-A), and blow out the water from the oil cooler and pipes. Continue until no water comes out of the discharge hose (5).

TRANSMISSION & OIL COOLER FLOW CHECK

1. Disconnect both hoses from the oil cooler pipes. Connect the oil cooler feed pipe (bottom connector) to the transmission and the return pipe (top connector) (may require J 35944-600) to the discharge hose (5). Clip the discharge hose (5) onto the empty oil drain container. See **Fig. 12**.
2. Confirm the transmission is filled with automatic transmission fluid. See **CHECKING**

FLUID LEVELS . Start the engine with the transmission in Park range and run for 30 seconds. A minimum of 2 qt (1.9L) must be discharged during this 30-second run time. If fluid flow is greater than 2 qts. (1.9L) in 30 seconds, go to next step. If fluid flow is less than 2 qts. (1.9L) in 30 seconds, perform the following diagnosis: Disconnect the oil cooler feed line at the radiator. Connect the discharge hose (5) to the cooler feed line. Clip the discharge hose (5) to the empty oil drain container. See **Fig. 12** . Start the engine with the transmission in Park range and run for 30 seconds. A minimum of 2 qts. (1.9L) must be discharged during this 30-second run time. Do the following according to the flow rate:

- A. Insufficient feed flow: inspect the transmission.
 - B. Sufficient feed flow: inspect the oil cooler return pipe and the oil cooler (and auxiliary cooler, if equipped).
3. Remove the discharge hose (5), reconnect the cooler feed and return pipes to the transmission and refill the unit to the proper fluid level. Inspect the transmission oil cooler pipe connections at the radiator, the auxiliary cooler (if equipped) and the transmission for leaks.

Clean-Up

Disconnect the water supply hose (7) from the (J 35944-A) and bleed any remaining air pressure from the flusher tank (4). See **Fig. 9** . Remove the fill cap (9) from the (J 35944-A) and return any unused flushing solution to its container. Rinse the (J 35944-A) with water. Do not store the (J 35944-A) with flushing solution in it. After every third use, clean the (J 35944-A) as described in the instructions included with the tool. Dispose of any waste water/solution and transmission fluid in accordance with local regulations.

ON-VEHICLE REPAIRS

Various components may be serviced without transmission removal. For servicing of these components, see appropriate component under **ADJUSTMENTS** and/or **REMOVAL & INSTALLATION** . For additional information on servicing electrical-type components, see appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS.

ADJUSTMENTS

WARNING: Vehicles are equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See **AIR BAG DEACTIVATION PROCEDURES** article in **GENERAL INFORMATION**.

PARK/NEUTRAL POSITION SWITCH

NOTE: Adjustment procedure is included with component removal and installation procedure. See **PARK/NEUTRAL POSITION SWITCH** under **REMOVAL & INSTALLATION**.

SHIFT CONTROL CABLE

Raise and suitably support the vehicle. Shift the transmission into Neutral. Using a flat bladed screwdriver, carefully pry to release the transmission shift control cable adjustment lock. See **Fig. 13** . Check to be sure that the transmission floor shift control is in the Neutral detent position. Check to be sure that the transmission is in the Neutral detent position. Press to secure the transmission shift control cable adjustment lock. Lower the vehicle.

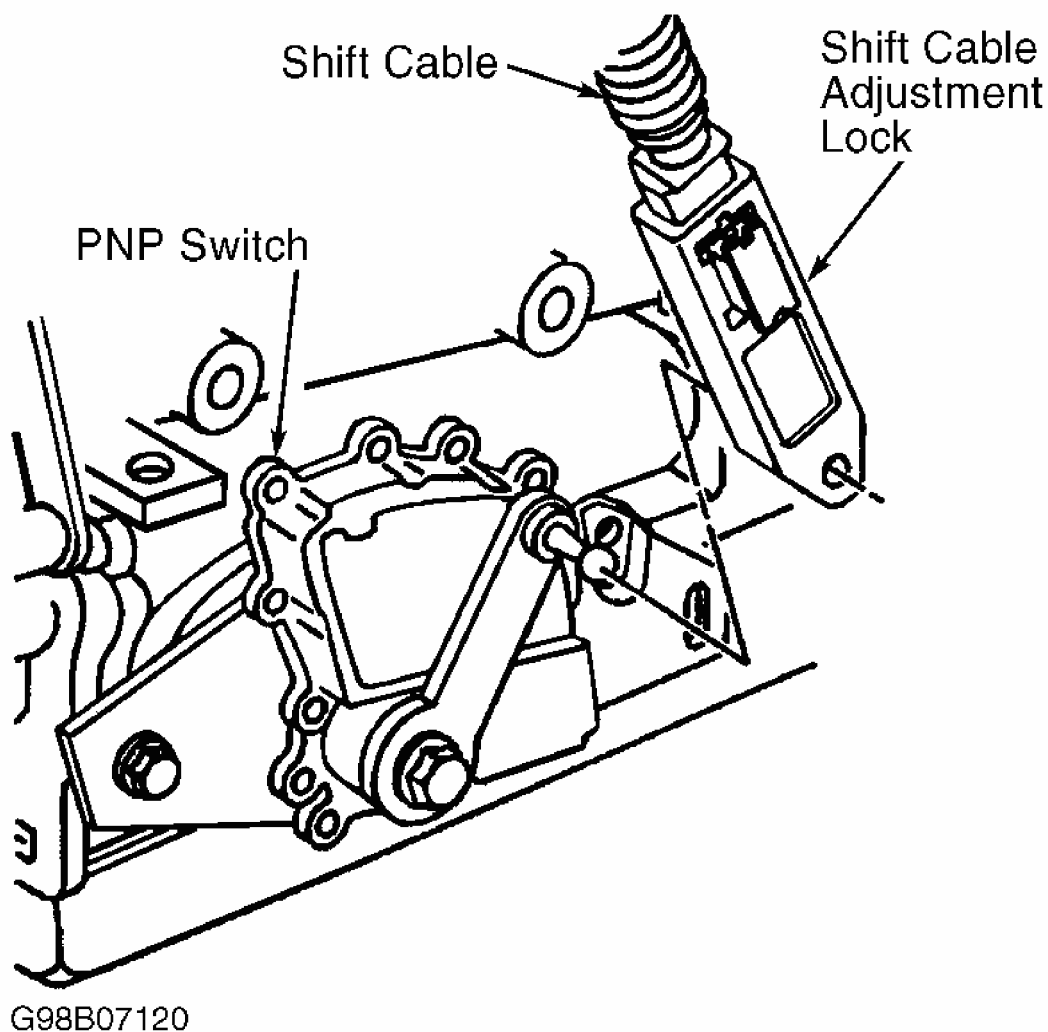


Fig. 13: Releasing/Engaging Shift Control Cable End

Courtesy of GENERAL MOTORS CORP.

REMOVAL & INSTALLATION

WARNING: Vehicles are equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See **AIR BAG DEACTIVATION PROCEDURES** article in **GENERAL INFORMATION**.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

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.

ACCUMULATOR ASSEMBLY, SPACER PLATE & GASKETS

Removal

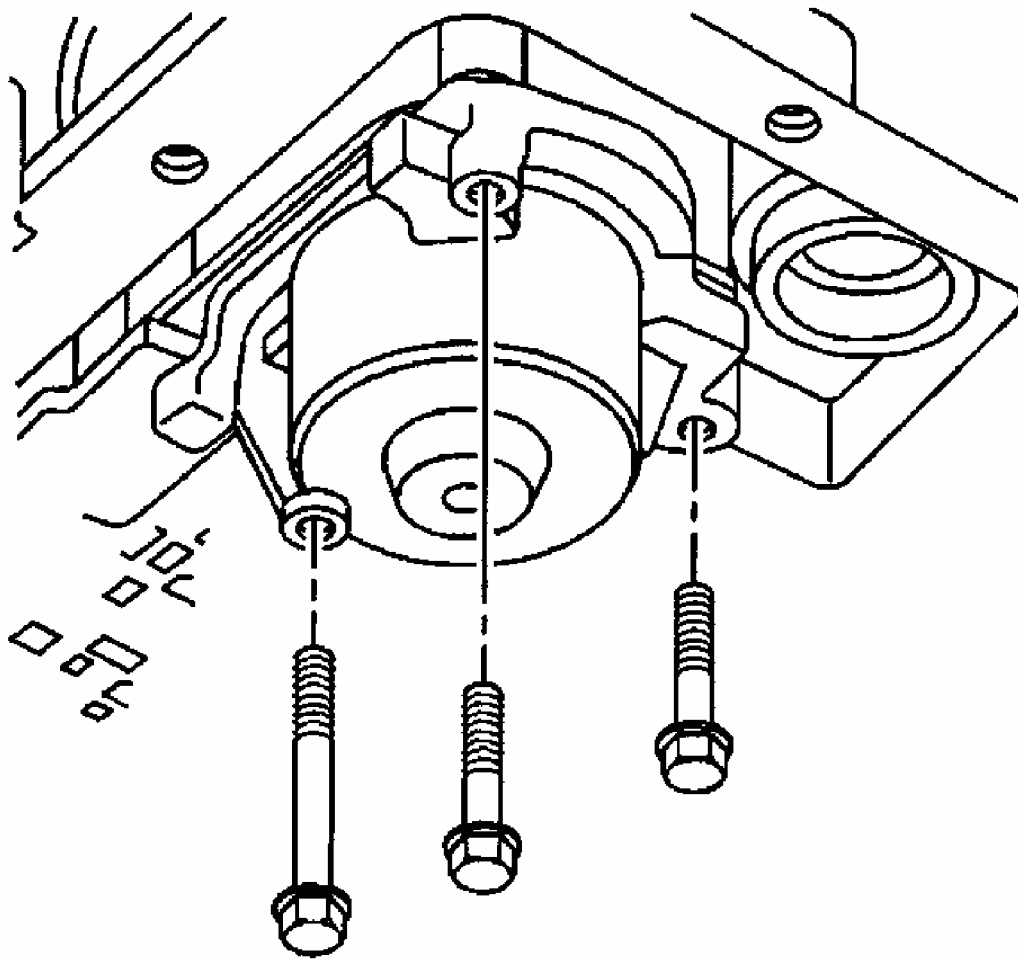
1. Raise and support the vehicle. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under **LUBRICATION**.

NOTE: The 1-2 accumulator can be removed without removing the control valve assembly.

2. Remove the control valve body. See **VALVE BODY & PRESSURE SWITCHES**.

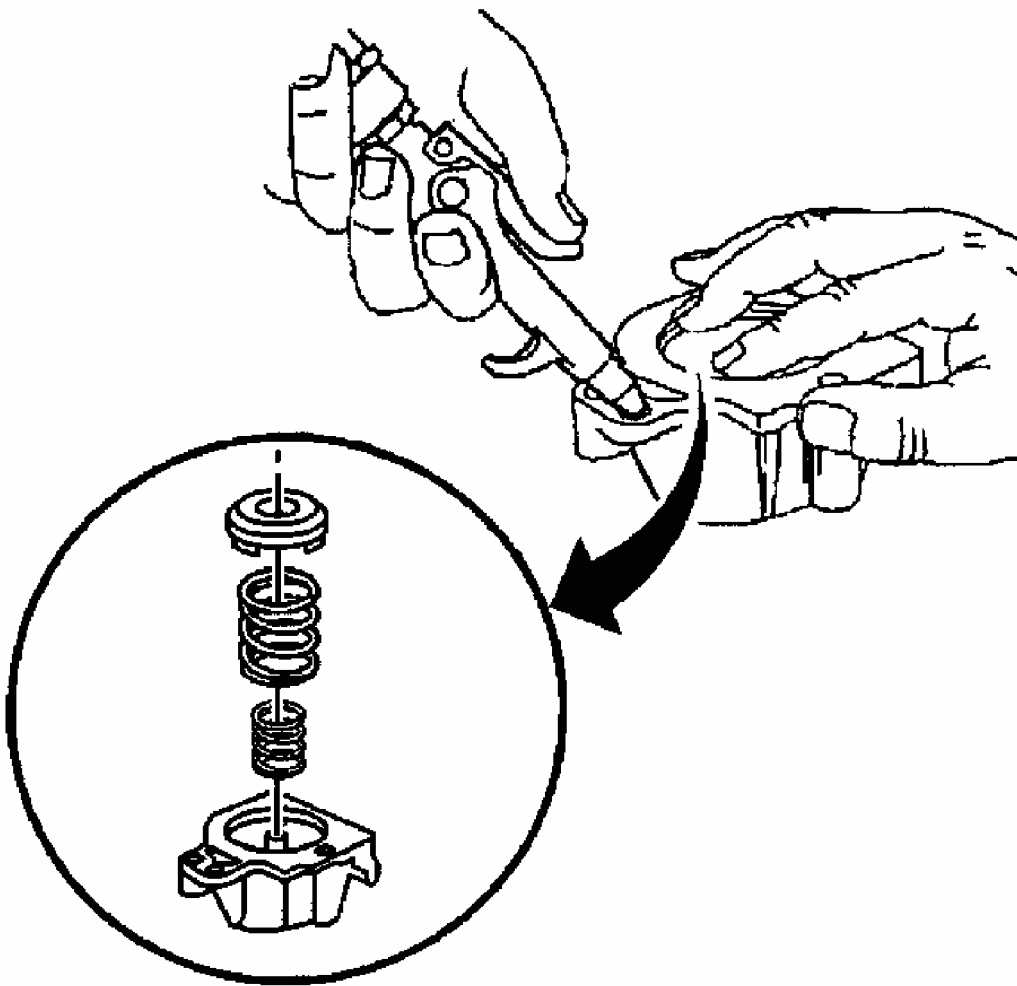
Remove the accumulator cover retaining bolts. Remove the 1-2 accumulator cover assembly. See **Fig. 14** . Disassemble the 1-2 accumulator. Blow compressed air into the 1-2 accumulator cover, as shown, to remove the 1-2 accumulator piston. See **Fig. 15** .

3. Remove the 1-2 accumulator inner and outer springs. Inspect the 1-2 accumulator inner and outer springs for cracks. Remove the 1-2 accumulator piston seal (1) from the 1-2 accumulator piston. See **Fig. 16** . Inspect the 1-2 accumulator piston and cover for porosity, cracks, scoring, and nicks and scratches.
4. Remove the spacer plate support retaining bolts. See **Fig. 17** . Use care not to drop the following items that will be removed along with the spacer plate: the number 1 check ball, the 3-4 accumulator spring and the 3-4 accumulator pin. Remove the spacer plate support.
5. Remove the spacer plate-to-valve body gasket, the spacer plate and the spacer plate-to-transmission case gasket. See **Fig. 18** . Remove the 3-4 accumulator piston (2). See **Fig. 19** . Inspect the 3-4 accumulator spring for cracks. Remove the 3-4 accumulator piston seal (1) from the 3-4 accumulator piston. See **Fig. 16** . Inspect the 3-4 accumulator piston for porosity, cracks, scoring, and nicks and scratches.



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Fig. 14: Removing/Installing 1-2 Accumulator Cover
Courtesy of GENERAL MOTORS CORP.



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Fig. 15: Removing/Installing 1-2 Accumulator Piston
Courtesy of GENERAL MOTORS CORP.

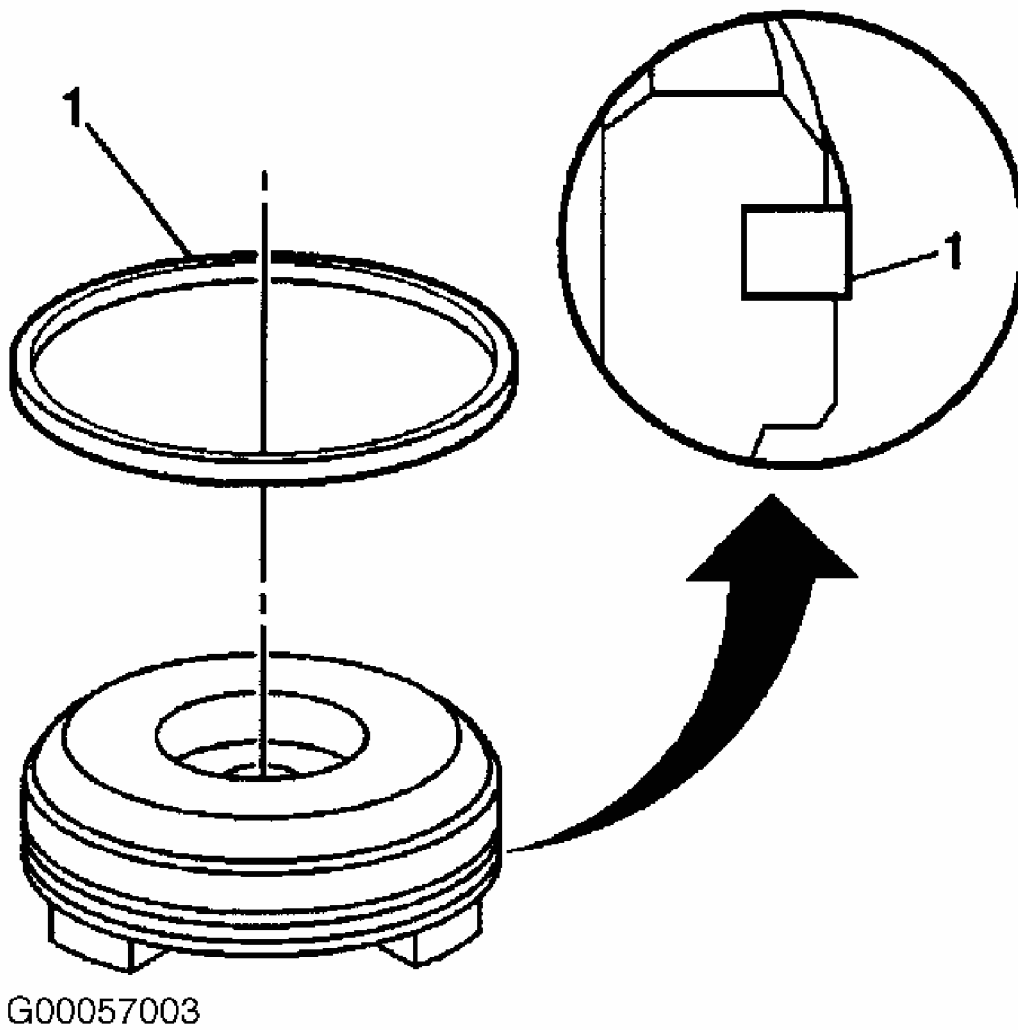
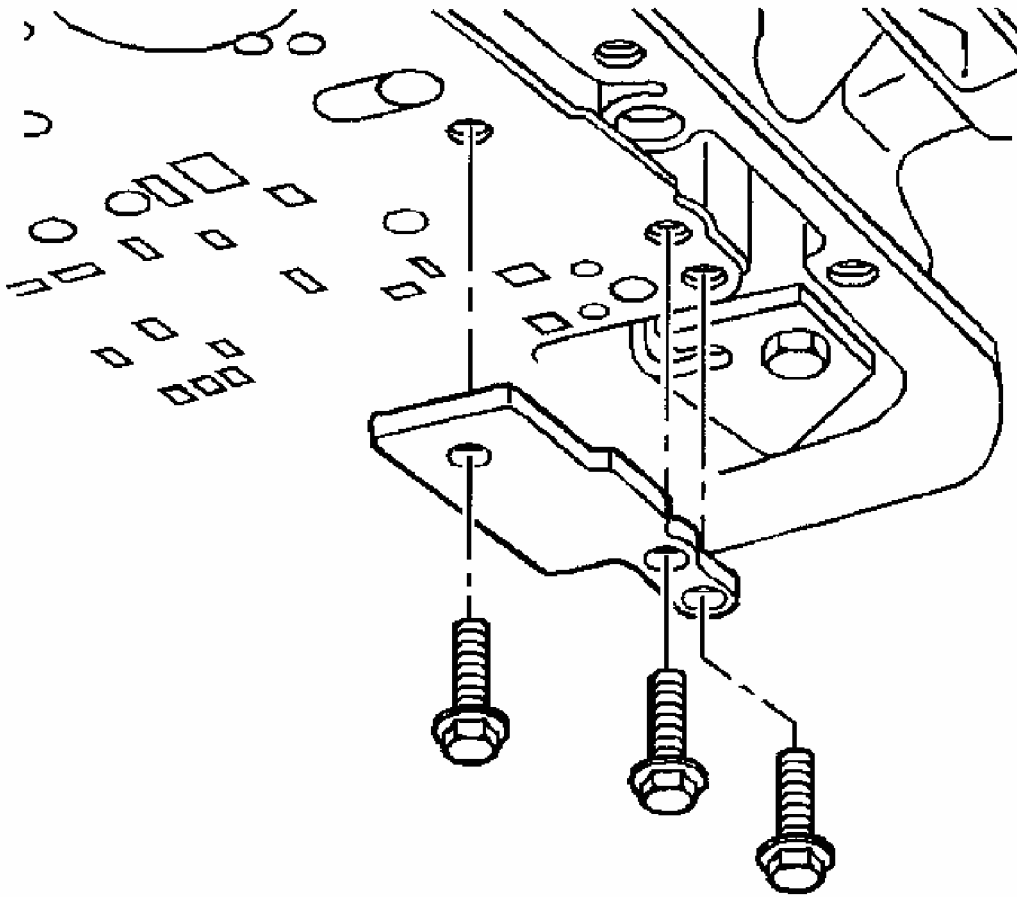
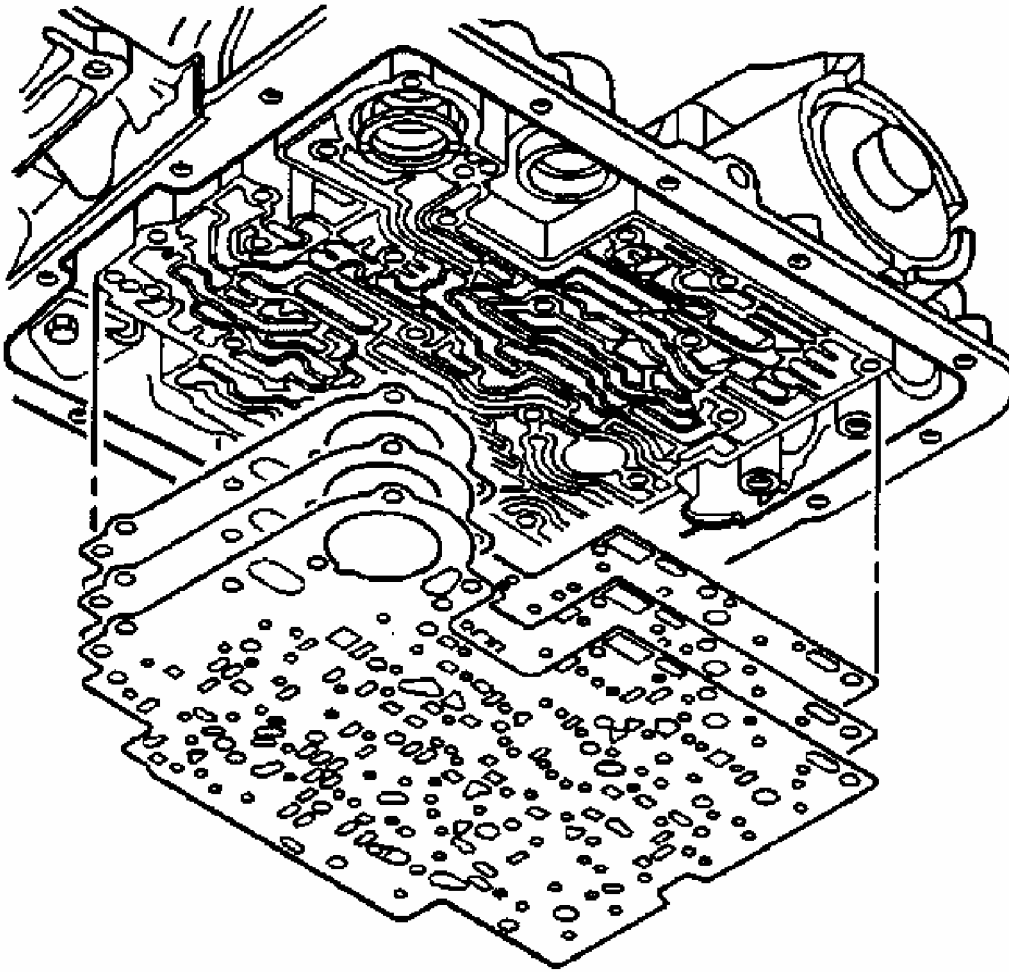


Fig. 16: Removing/Installing Piston Seal On Accumulator Piston
Courtesy of GENERAL MOTORS CORP.



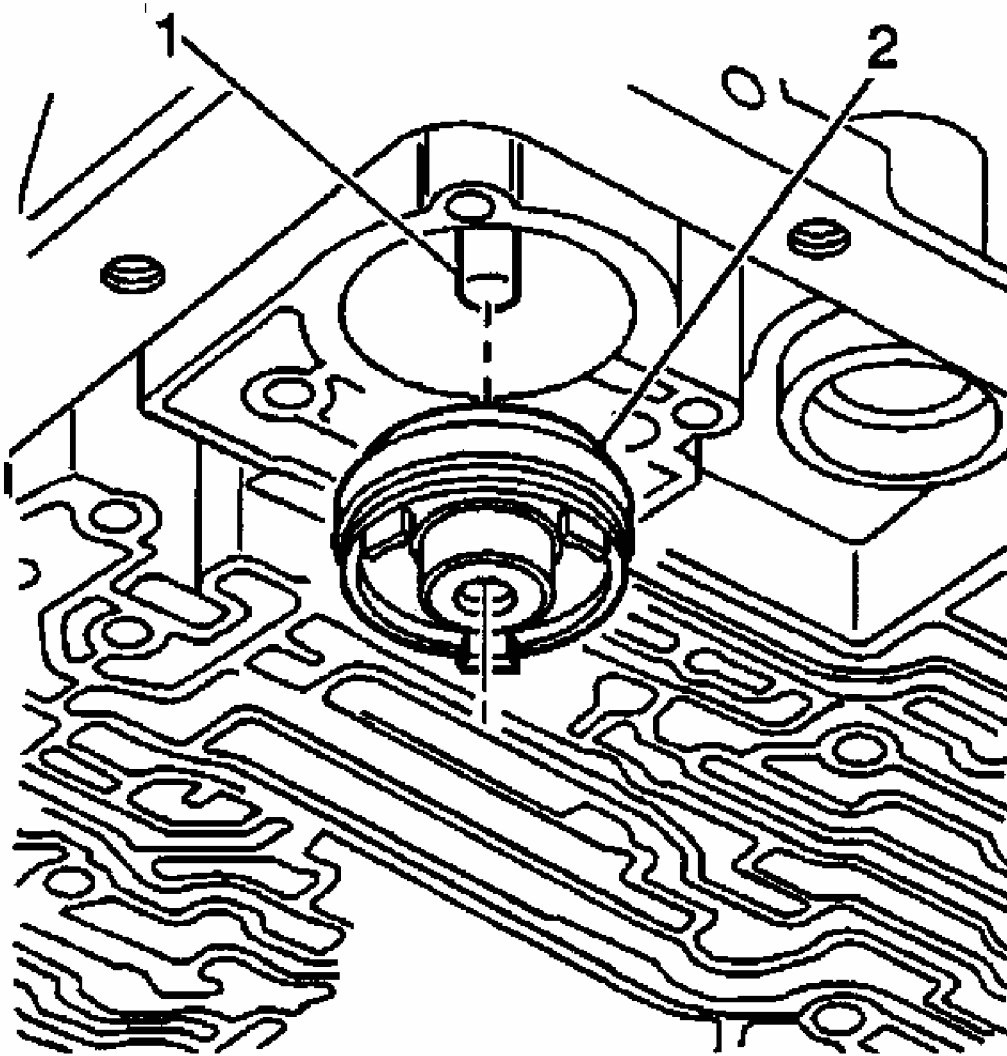
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Fig. 17: Removing/Installing Spacer Plate Support
Courtesy of GENERAL MOTORS CORP.



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Fig. 18: Removing/Installing Spacer Plates & Gaskets
Courtesy of GENERAL MOTORS CORP.



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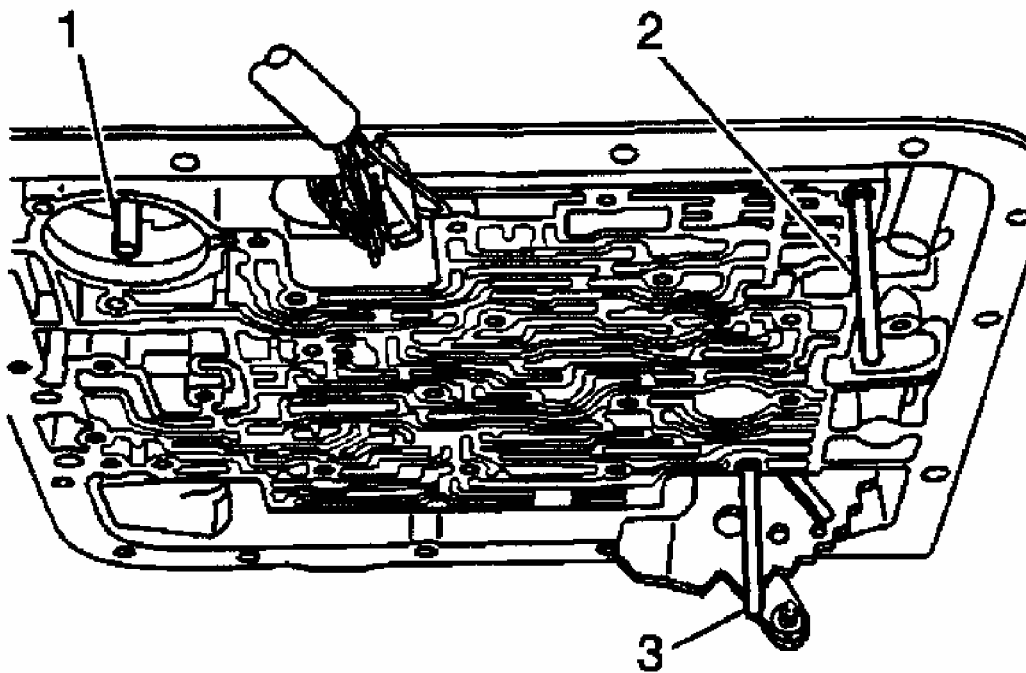
Fig. 19: Removing/Installing 3-4 Accumulator Piston
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install a new 3-4 accumulator piston seal (1) to the 3-4 accumulator piston. See **Fig. 16** . Install the 3-4 accumulator pin (1) into the transmission case and retain the pin with Transjel(tm) (J 36850). See **Fig. 19** . Install the 3-4 accumulator piston (2) onto the pin (1) in the transmission case. Ensure that the 3-4 accumulator piston legs face away from the transmission case.
2. Install the locating pins (J 25025-B) (2, 3) to the transmission case. See **Fig. 20** . Install

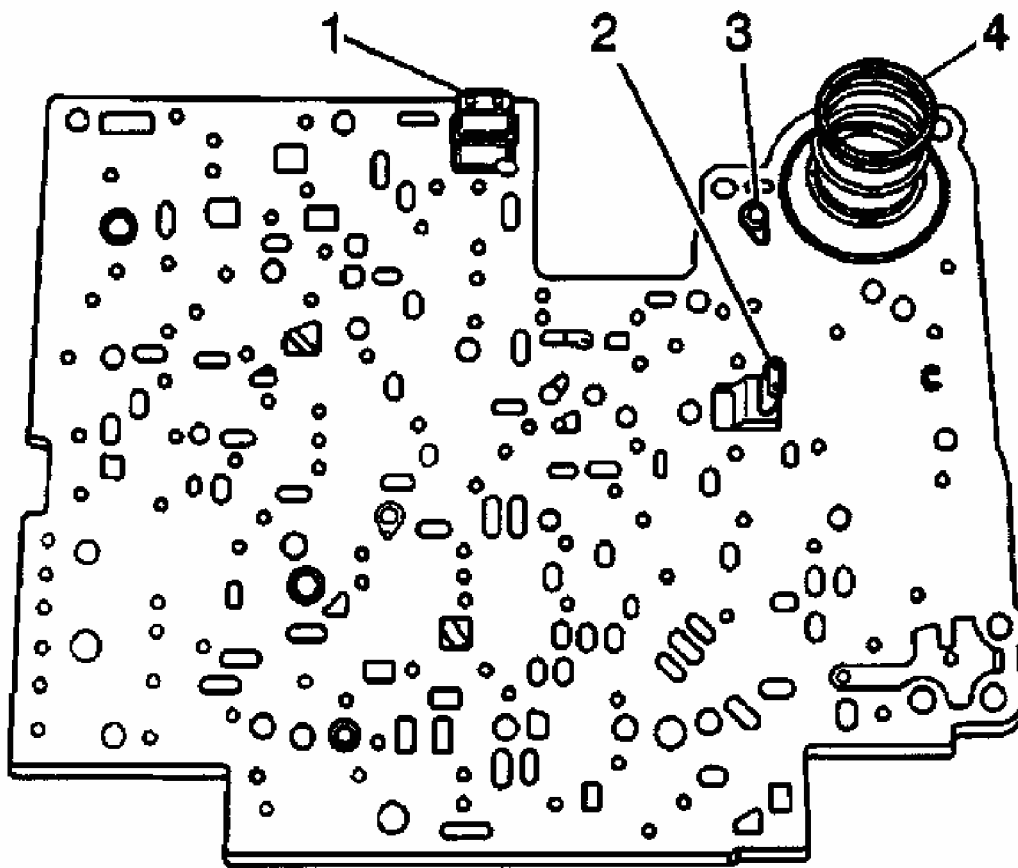
the spacer plate-to-transmission case gasket and the spacer plate-to-valve body gasket to the spacer plate; use Transjel(tm) (J 36850) in order to retain the gaskets to the spacer plate. See **Fig. 18** . The case gasket is identified by a "C". Be sure to place the case gasket on the transmission case side of the spacer plate.

3. The valve body gasket is identified by a "V". Be sure to place the valve body gasket on the valve body side of the spacer plate. Ensure that the solenoid screens (1, 2) are in place on the spacer plate. Place the check ball (3) on the spacer plate in the location shown. Place the 3-4 accumulator spring (4) on the spacer plate. See **Fig. 21** . Install the spacer plate and related components to the transmission.
4. Install the spacer plate support and the spacer plate support retaining bolts. See **Fig. 17** . Tighten the spacer plate support retaining bolts to specification. See **TORQUE SPECIFICATIONS** . After installing the spacer plate support (2), look through the hole in the spacer plate to ensure that the check ball (1) has remained in the proper location. See **Fig. 22** . Install a new 1-2 accumulator piston seal (1) to the 1-2 accumulator piston. See **Fig. 16** .
5. Install the 1-2 accumulator inner and outer springs to the 1-2 accumulator cover. Install the 1-2 accumulator piston onto the pin in the 1-2 accumulator cover. Ensure that the piston legs face the accumulator cover. See **Fig. 15** . Install the 1-2 accumulator cover and the accumulator cover retaining bolts. See **Fig. 14** . Tighten the accumulator cover retaining bolts to specification. See **TORQUE SPECIFICATIONS** . Remove the guide pins from the transmission case.
6. Install the control valve body. See **VALVE BODY & PRESSURE SWITCHES** . Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Lower the vehicle. Fill the transmission to the proper level with appropriate fluid. See **LUBRICATION** .



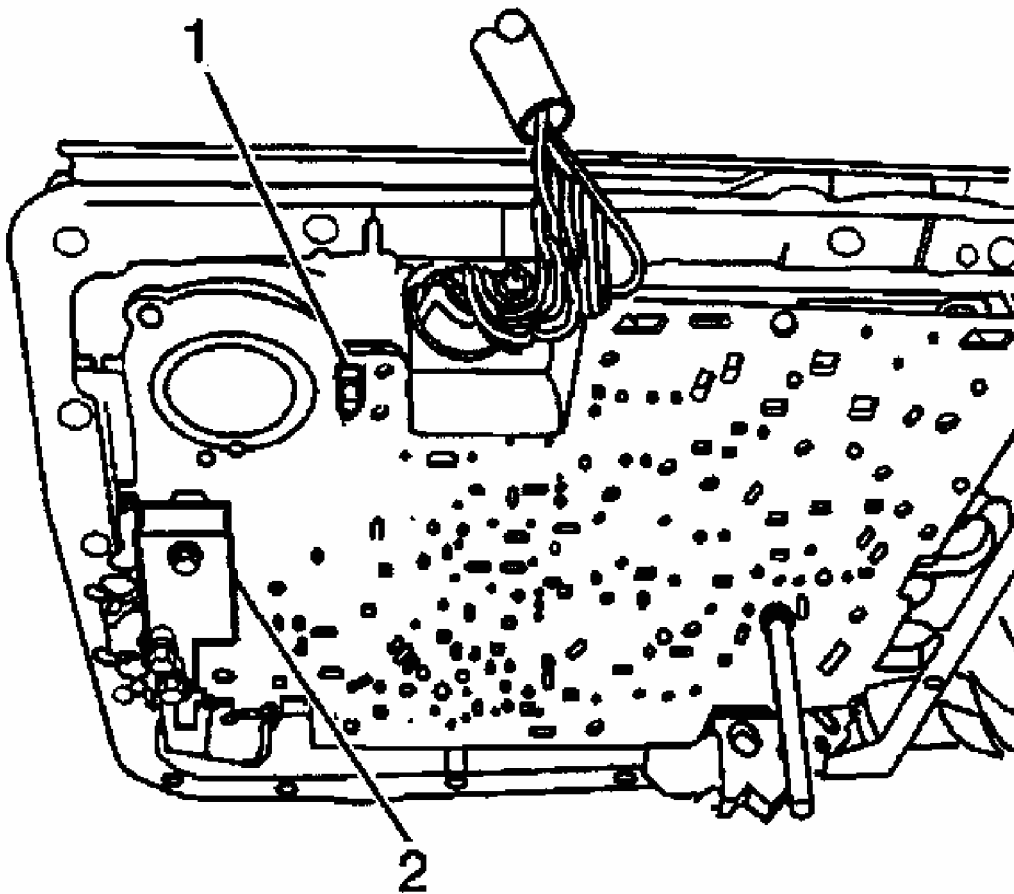
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Fig. 20: Removing/Installing Locating Pins
Courtesy of GENERAL MOTORS CORP.



G00057008

Fig. 21: Positioning Solenoid Screens, Check Ball & Accumulator Spring
Courtesy of GENERAL MOTORS CORP.



G00057009

Fig. 22: Verifying Check Ball Placement
Courtesy of GENERAL MOTORS CORP.

CONTROL & SHIFT SOLENOIDS

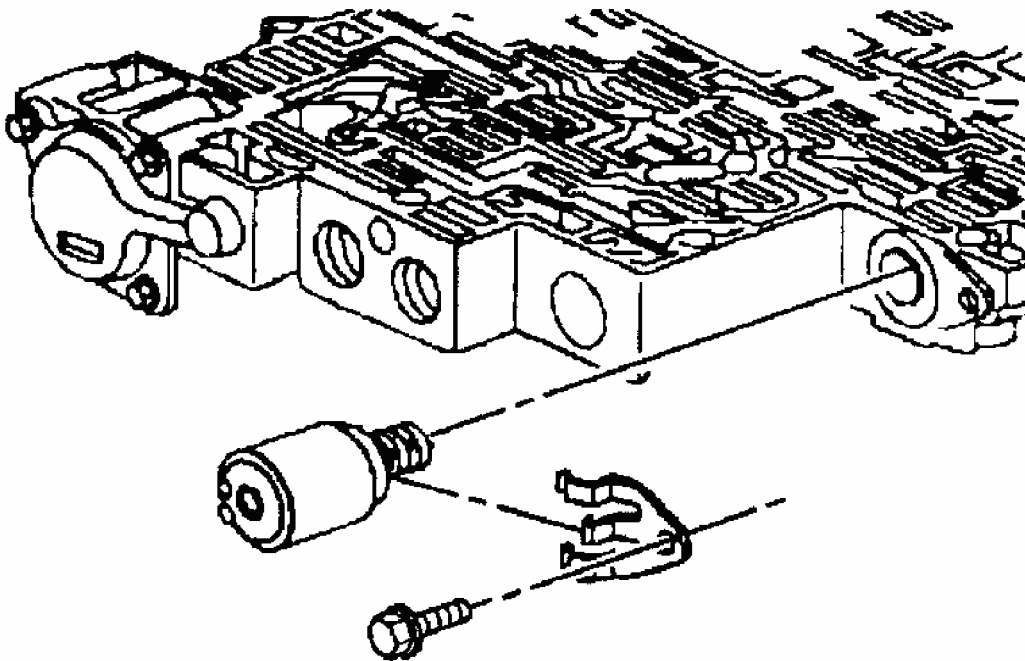
Removal

NOTE: Do not remove the valve body for the following procedures. Removal of the 1-2 accumulator is necessary only if servicing the pressure control solenoid.

1. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Remove the 1-2 accumulator if necessary. See **ACCUMULATOR ASSEMBLY, SPACER PLATE & GASKETS**.
2. Disconnect the internal wiring harness electrical connectors from the following components: transmission fluid pressure switch, 1-2 shift control solenoid, 2-3 shift

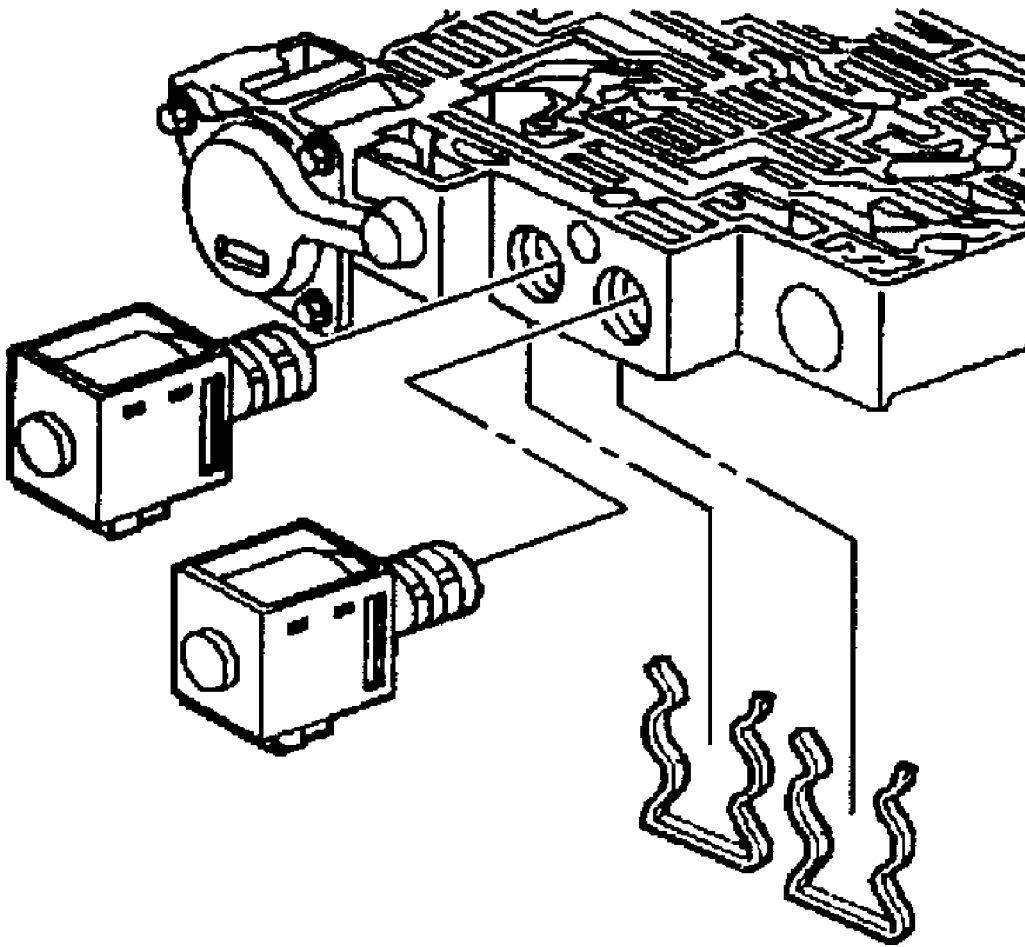
control solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 control solenoid. See **Fig. 53** .

3. Remove the pressure control solenoid retainer. Remove the pressure control solenoid. See **Fig. 23** . Remove the 1-2 and 2-3 shift solenoid retainers. Remove the 1-2 and 2-3 shift solenoids. See **Fig. 24** . Remove the 3-2 control solenoid retainer. Remove the 3-2 control solenoid. See **Fig. 25** .



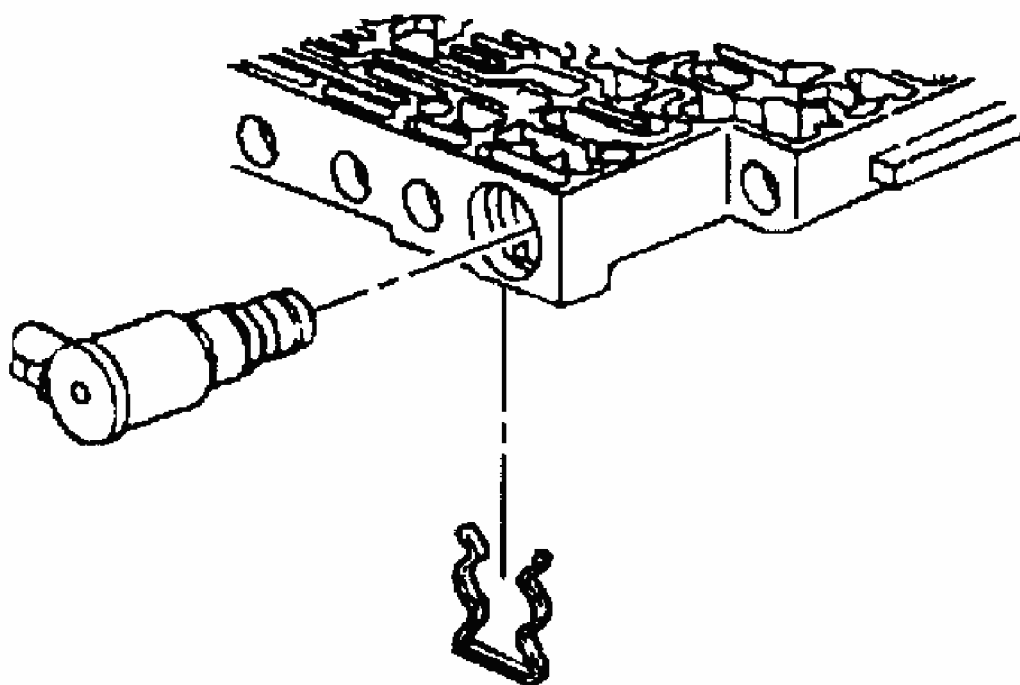
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Fig. 23: Removing/Installing Pressure Control Solenoid & Retainer
Courtesy of GENERAL MOTORS CORP.



G00056999

Fig. 24: Removing/Installing 1-2 & 2-3 Shift Solenoids & Retainers
Courtesy of GENERAL MOTORS CORP.



G00057000

Fig. 25: Removing/Installing 3-2 Control Solenoid & Retainer
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the 3-2 control solenoid. Install the 3-2 control solenoid retainer. See **Fig. 25** . Install the 1-2 and 2-3 shift solenoids. Install the 1-2 and 2-3 shift solenoid retainers. See **Fig. 24** . Install the pressure control solenoid. Ensure that the electrical tabs are facing outboard. Install the pressure control solenoid retainer and retaining bolt. See **Fig. 23** . Tighten the pressure control solenoid retaining bolt to specification. See **TORQUE SPECIFICATIONS** .
2. Connect the internal wiring harness electrical connectors to the following components: transmission fluid pressure switch, 1-2 shift control solenoid, 2-3 shift control solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 control solenoid. See **Fig. 53** . Install the 1-2 accumulator. See **ACCUMULATOR ASSEMBLY, SPACER PLATE & GASKETS** .
3. Install the transmission oil pan and filter. See **DRAINING & REFILLING** under **LUBRICATION**. Fill the transmission to the proper level with appropriate fluid. See **LUBRICATION** .

Removal

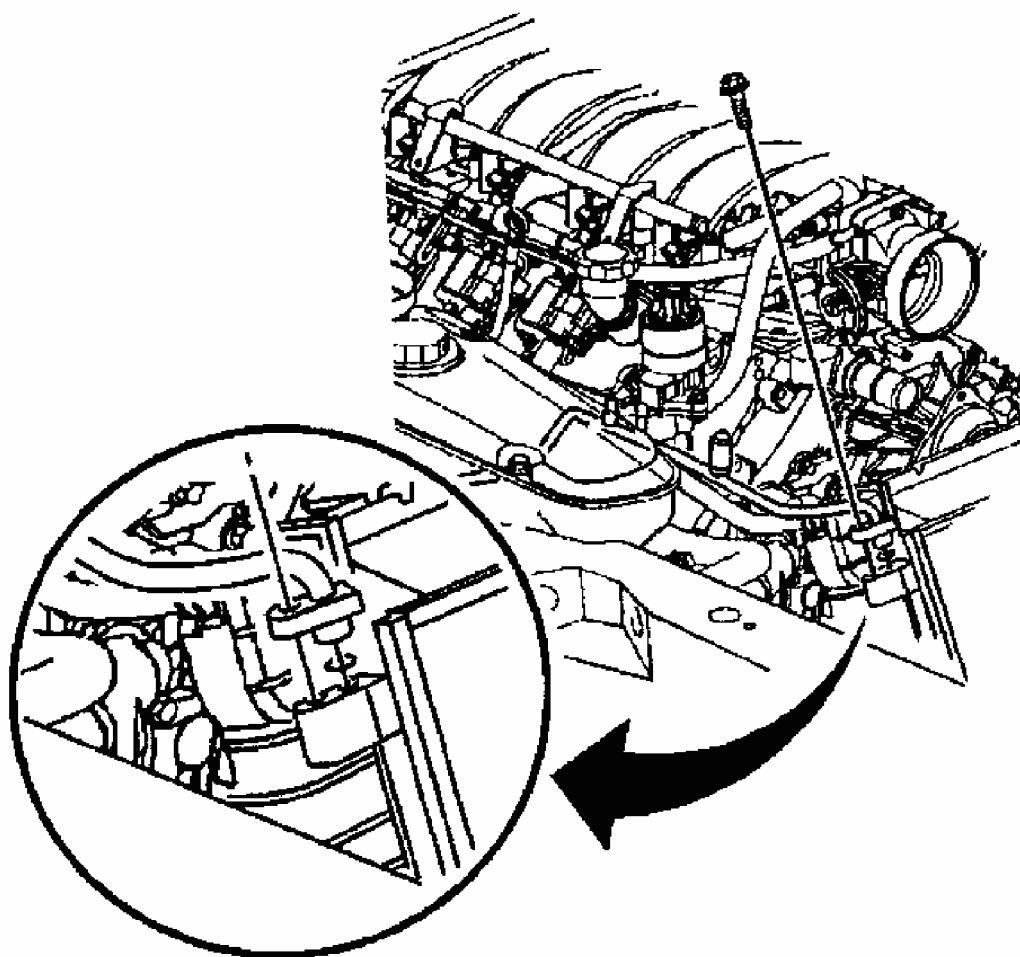
1. Position the front wheels straight ahead, and remove the ignition key to lock the steering column. Disconnect the negative battery cable. Drain the cooling system. Raise and suitably support the vehicle. Place a drain pan under the vehicle to catch any fluid.
2. Reposition the plastic retainer, in order to gain access to the lower Transmission Oil Cooler (TOC) connection. Using Transmission Cooler Quick Disconnect (J 44827), disconnect the lower TOC line from the oil cooler. Lower the vehicle; leave the vehicle on the hoist. Reposition the plastic retainer, in order to gain access to the upper TOC connection. Using Transmission Cooler Quick Disconnect (J 44827), disconnect the upper TOC line from the oil cooler. Remove the air cleaner assembly.

NOTE: Cap or tape the opening in the front evaporator tube and condenser immediately to prevent contamination.

3. Remove the upper and lower radiator support. Recover the refrigerant from the A/C system. See GENERAL SERVICING in HEATING & AIR CONDITIONING. Remove the front evaporator tube to condenser bolt. See **Fig. 26** . Disconnect the front evaporator tube from the condenser.
4. Using a back-up wrench on the condenser fitting (2), loosen the compressor hose fitting (1) from the condenser. See **Fig. 27** . Disconnect the compressor hose from the condenser. See **Fig. 28** . Discard the O-ring seal, and cap or tape the compressor hose and condenser openings. Using Spring Hose Clamp Pliers (J 38185), release and reposition the coolant surge tank upper hose clamp away from the radiator inlet. Separate the surge tank upper hose from the radiator inlet.
5. Using Spring Hose Clamp Pliers (J 38185), release and reposition the radiator inlet hose clamp away from the radiator inlet. Separate the radiator inlet hose from the radiator inlet. Using Spring Hose Clamp Pliers (J 38185), release and reposition the radiator outlet hose clamp away from the radiator outlet. Separate the radiator outlet hose from the radiator outlet. Carefully pivot the A/C condenser with the radiator forward, and tie off to support the assembly.
6. Remove the steering column intermediate shaft lower coupling shield. Match-mark the intermediate shaft lower coupling to the Power Steering (PS) gear to ensure correct orientation upon installation. Remove the intermediate shaft lower coupling bolt. Disconnect the intermediate shaft lower coupling from the PS gear. Slide the intermediate shaft lower coupling off of the PS gear steering shaft. See **Fig. 29** .
7. Remove the PS cooler retaining bolts. See **Fig. 30** . Remove the Brake Pressure Modulator Valve (BPMV) bracket. See appropriate ANTI-LOCK article in BRAKES. Remove the PS gear mounting bolts and nuts. Release the PS gear and cooler from the front suspension crossmember, then pull the gear and cooler forward. See **Fig. 31** .
8. Remove the A/C compressor bracket. Remove the generator. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS. Install the Engine Support Fixture (J 41803) and the Universal Engine Support Fixture

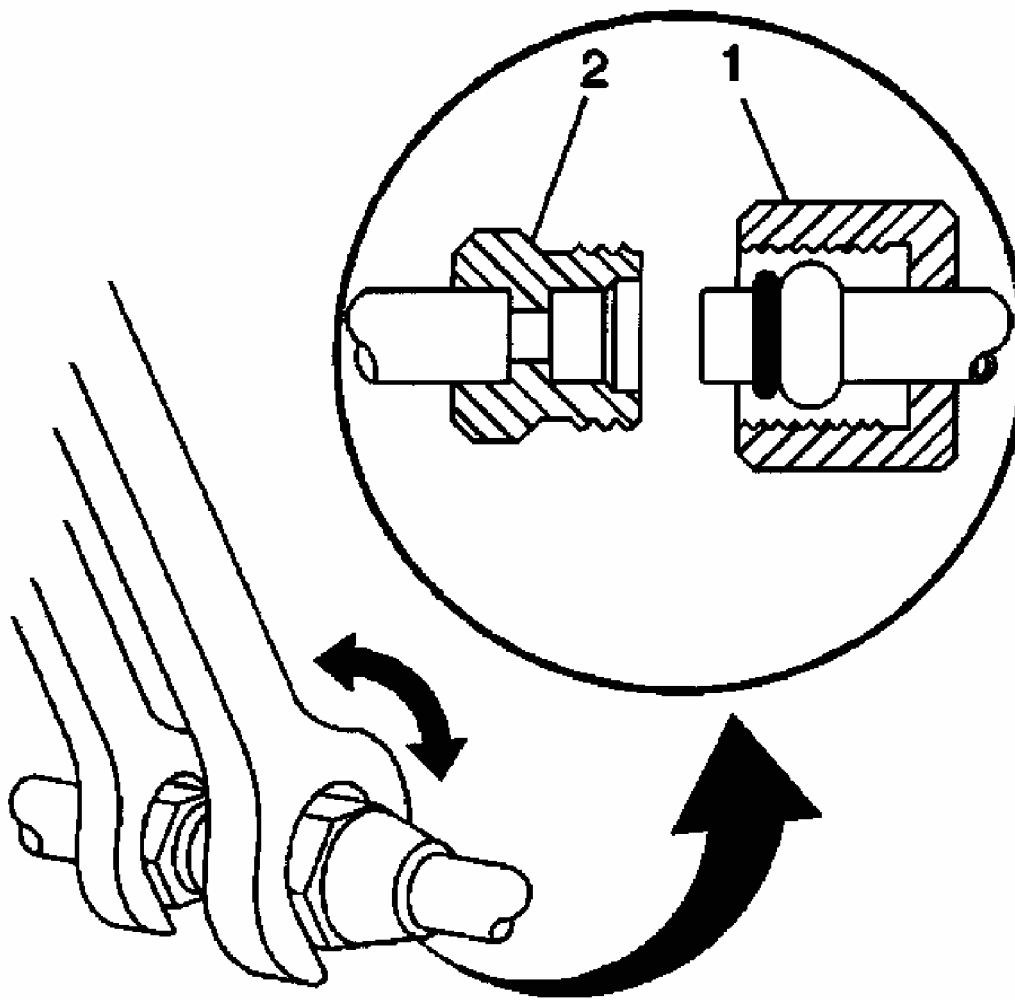
(J 28467-B) in order to support the engine. Remove the right hand engine mount (and bracket).

9. Remove the TOC front pipe front clip. See **Fig. 32** . Raise the vehicle. Remove the TOC front pipe front retaining clamp bolt and retaining clamp. See **Fig. 33** . Remove the TOC front pipe rear retaining clamp bolt and retaining clamp. See **Fig. 34** . Disconnect the TOC front pipe fittings from the junction fittings at the engine flywheel housing, then cap the pipe fittings and plug the junction fittings to prevent contamination. Lower the vehicle; leave the vehicle slightly above the ground. Finesse the TOC front pipes out of the vehicle (through the top).



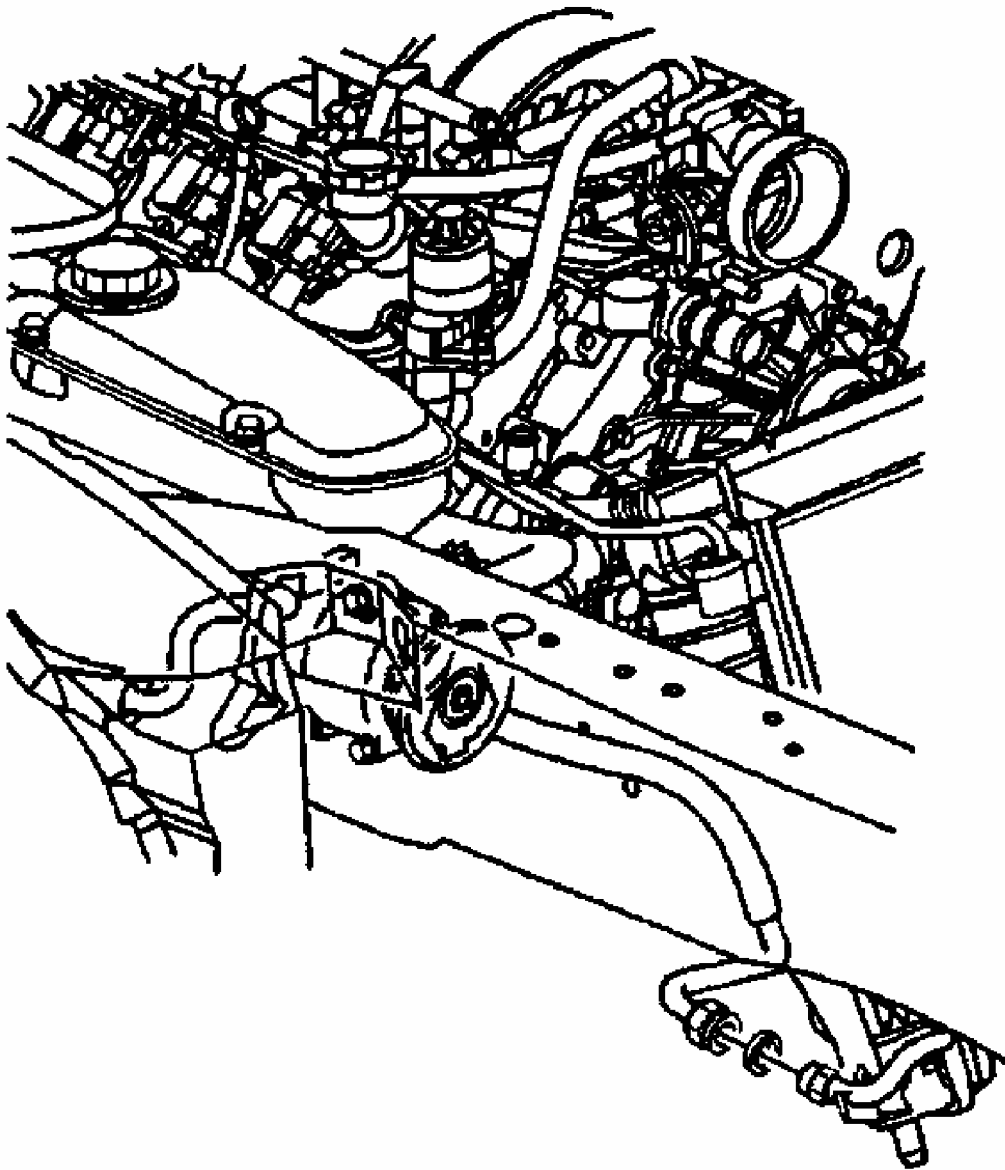
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Fig. 26: Disconnecting/Connecting Evaporator Tube At Condenser
Courtesy of GENERAL MOTORS CORP.



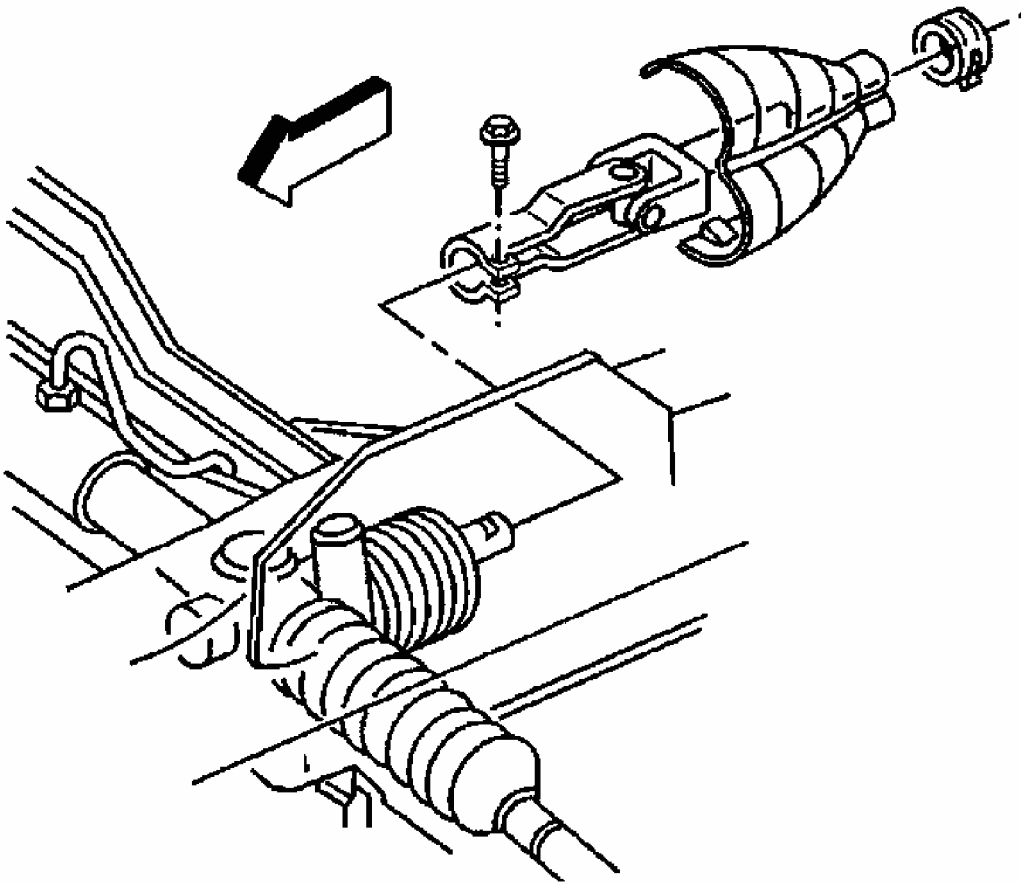
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Fig. 27: Loosening/Tightening Compressor Hose-To-Condenser Fitting
Courtesy of GENERAL MOTORS CORP.



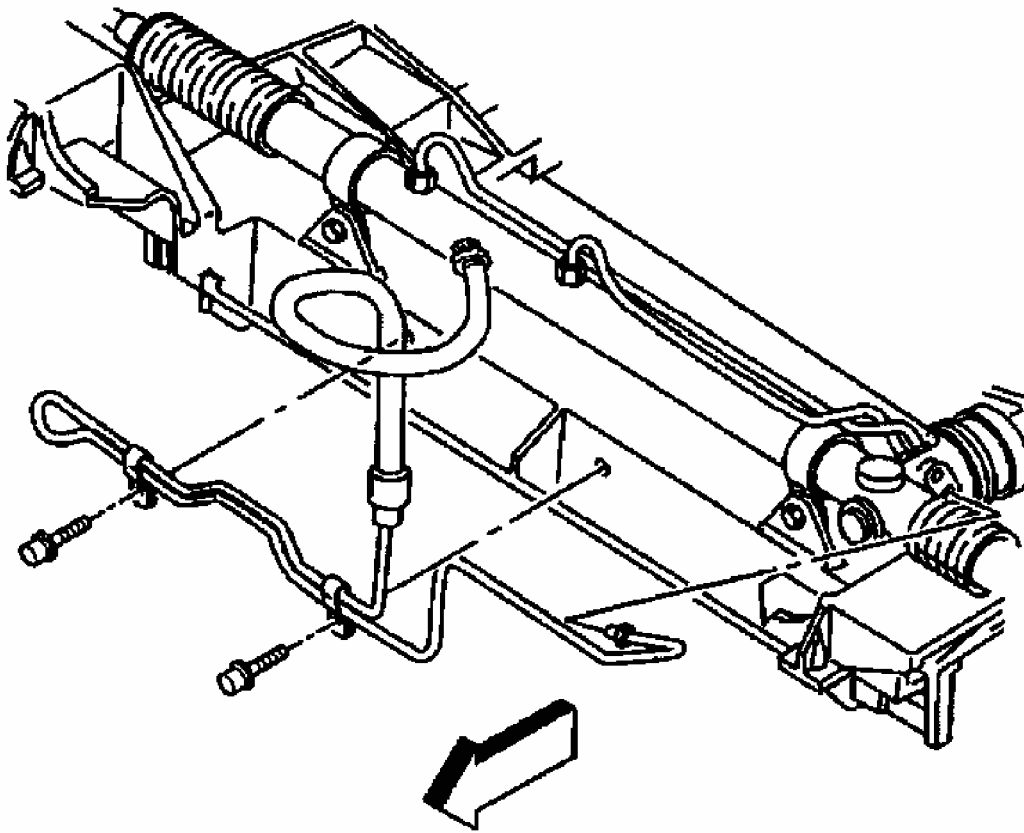
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Fig. 28: Disconnecting/Connecting Compressor Hose At Condenser
Courtesy of GENERAL MOTORS CORP.



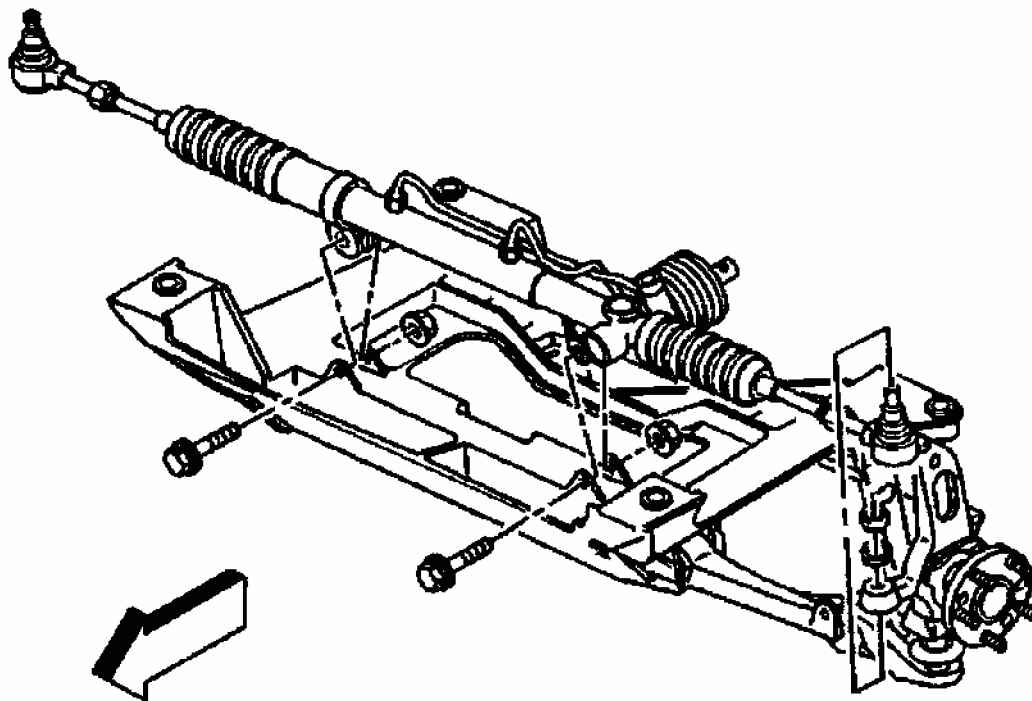
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Fig. 29: Disconnecting/Connecting Intermediate Shaft
Courtesy of GENERAL MOTORS CORP.



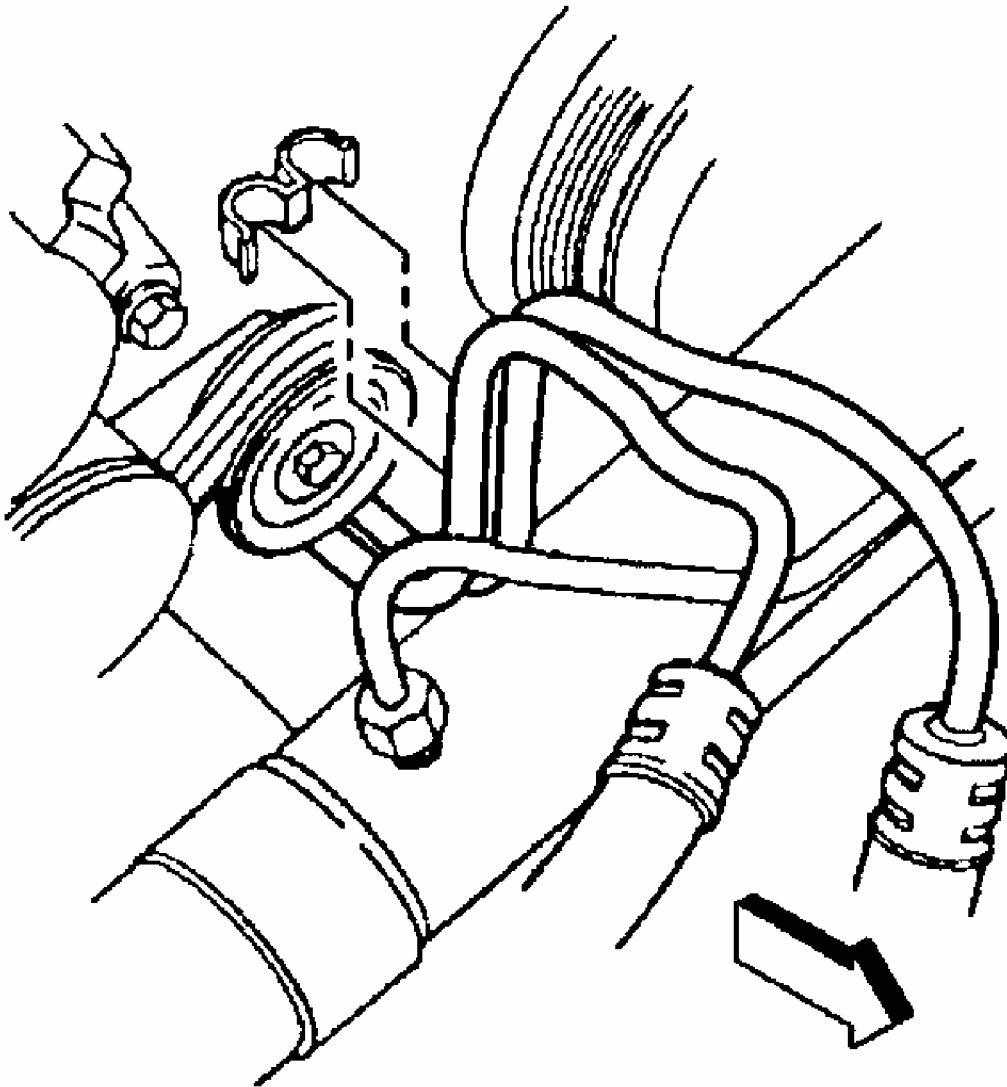
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Fig. 30: Removing/Installing Power Steering Cooler
Courtesy of GENERAL MOTORS CORP.



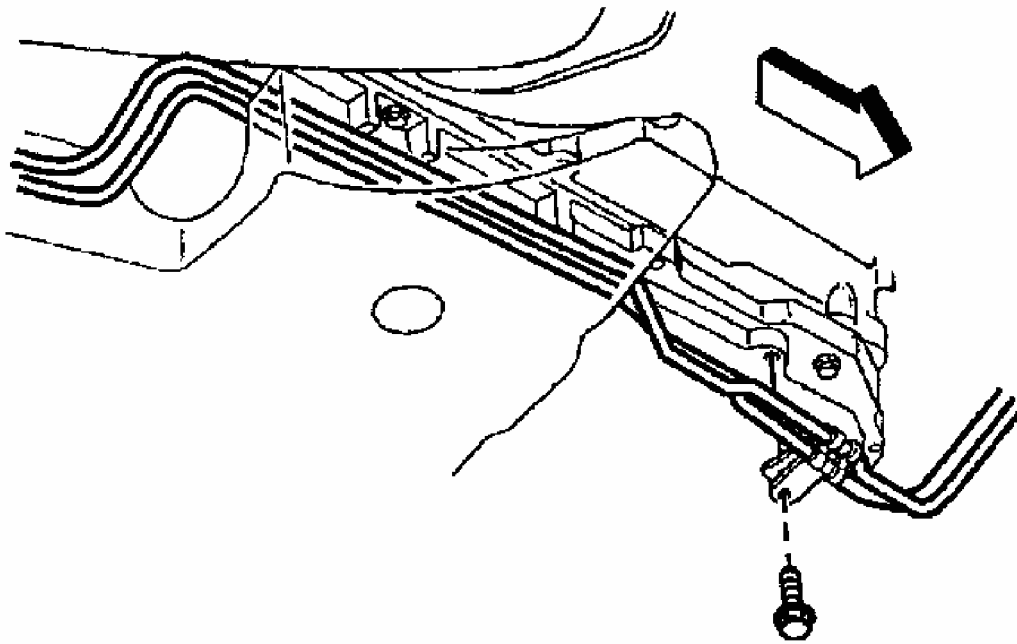
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Fig. 31: Removing/Installing Power Steering Gear
Courtesy of GENERAL MOTORS CORP.



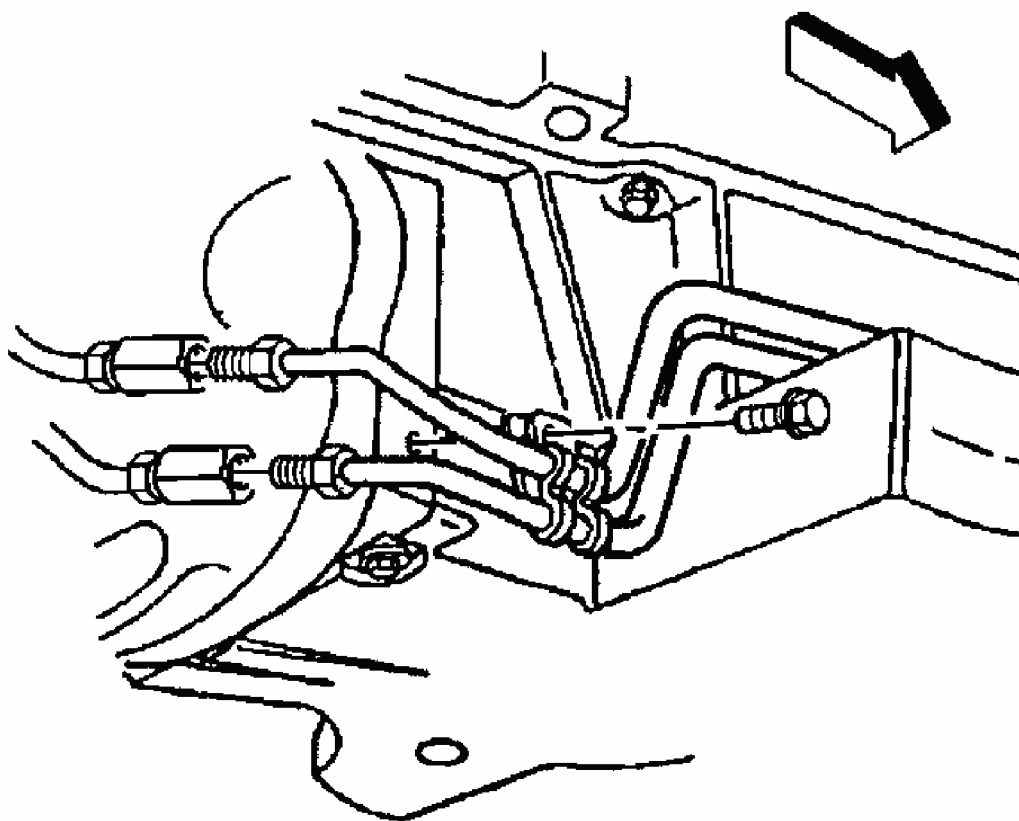
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Fig. 32: Removing/Installing Front Oil Cooler Pipe Front Clip
Courtesy of GENERAL MOTORS CORP.



G00074236

Fig. 33: Removing/Installing Front Oil Cooler Pipe Front Clamp Bolt
Courtesy of GENERAL MOTORS CORP.



G00074237

Fig. 34: Removing/Installing Front Oil Cooler Pipe Rear Clamp Bolt
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the TOC front pipes to the vehicle (through the top of the vehicle). Finesse the pipes into position. Raise the vehicle. Remove the caps from the rear of the TOC front pipes and remove the plugs from the junction fittings at the engine flywheel housing.
2. ALIGN and HAND-START, then tighten ONLY by hand to seat the TOC front upper and lower pipe fittings to the junction fittings at the engine flywheel housing. Tighten the transmission oil cooler front upper and lower pipe fittings to the junction at the engine flywheel housing to specification. See **TORQUE SPECIFICATIONS**.
3. Install the TOC front pipe rear retaining clamp and bolt. See **Fig. 34**. Tighten the transmission oil cooler front pipe rear retaining clamp bolt to specification. See **TORQUE SPECIFICATIONS**. Install the TOC front pipe front retaining clamp and bolt. See **Fig. 33**. Tighten the transmission oil cooler front pipe front retaining clamp bolt to specification.
4. Install the TOC front pipe front clip. See **Fig. 32**. Install the right hand engine mount

(and bracket). Lower the vehicle; leave the vehicle on the hoist. Remove the engine support fixtures.

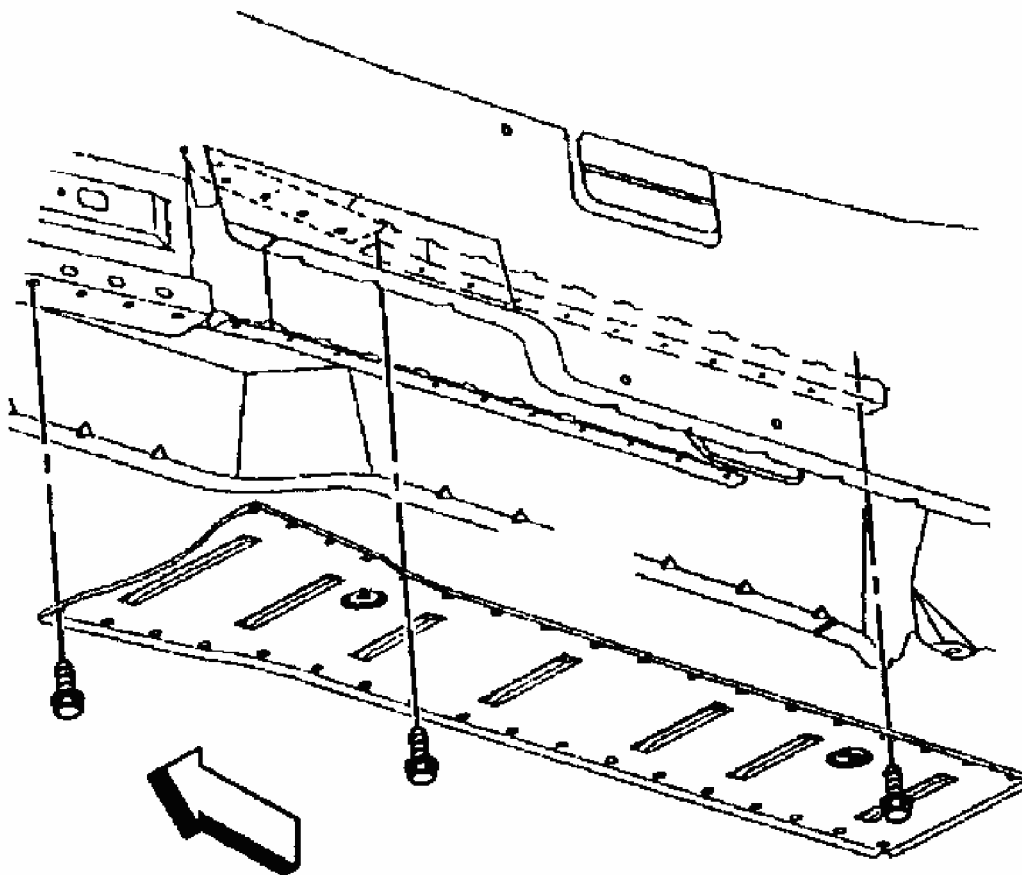
5. Install the generator. Install the A/C compressor bracket. Position the PS gear and cooler to the front suspension crossmember. See **Fig. 30** and **Fig. 31** . Install the BPMV bracket.
6. Install the PS gear mounting bolts and nuts. Tighten the power steering gear mounting nuts to specification. See **TORQUE SPECIFICATIONS** . Install the PS cooler retaining bolts. Tighten the power steering cooler retaining bolts to specification.
7. Connect the intermediate shaft lower coupling to the PS gear; be sure that the intermediate shaft and the PS gear steering shaft are orientated as marked prior to disconnecting them. Slide the intermediate shaft lower coupling onto the PS gear steering shaft. Install the intermediate shaft lower coupling bolt. See **Fig. 29** . Tighten the steering gear intermediate shaft lower coupling bolt to specification.
8. Install the intermediate shaft lower coupling shield. Lower the vehicle. Remove the tie-off retainer and carefully pivot the AC condenser and the radiator back into position. Install the radiator outlet hose to the radiator outlet. Position the radiator outlet hose clamp onto the radiator outlet.
9. Install the radiator inlet hose to the radiator inlet. Position the radiator inlet hose clamp onto the radiator inlet. Install the surge tank upper hose to the radiator inlet. Position the coolant surge tank upper hose clamp onto the radiator inlet.
10. Install the compressor hose to the condenser. See **Fig. 28** . Using a back-up wrench on the condenser fitting (2), tighten the compressor hose fitting (1) to the condenser. See **Fig. 27** . Tighten the fitting to specification. See **TORQUE SPECIFICATIONS** . Connect the front evaporator tube to the condenser. Install the front evaporator tube-to-condenser bolt. See **Fig. 26** . Tighten the fitting to specification.
11. Install the upper and lower radiator support. Install the air cleaner assembly. Connect the upper TOC line to the oil cooler using the following steps: Push the TOC pipe into the quick connect fitting, until a click is heard. Tug gently in the TOC line to ensure a proper connection. Position the plastic retainer over the connection.
12. Raise the vehicle. Connect the lower TOC line to the oil cooler using the following steps: Push the TOC pipe into the quick connect fitting, until a click is heard. Tug gently in the TOC line to ensure a proper connection. Position the plastic retainer over the connection.
13. Lower the vehicle. Connect the negative battery cable. Fill the cooling system. Recharge the A/C system. Check the transmission fluid level. See **CHECKING FLUID LEVELS** under LUBRICATION. Add if necessary.

OIL COOLER LINES (REAR)

Removal

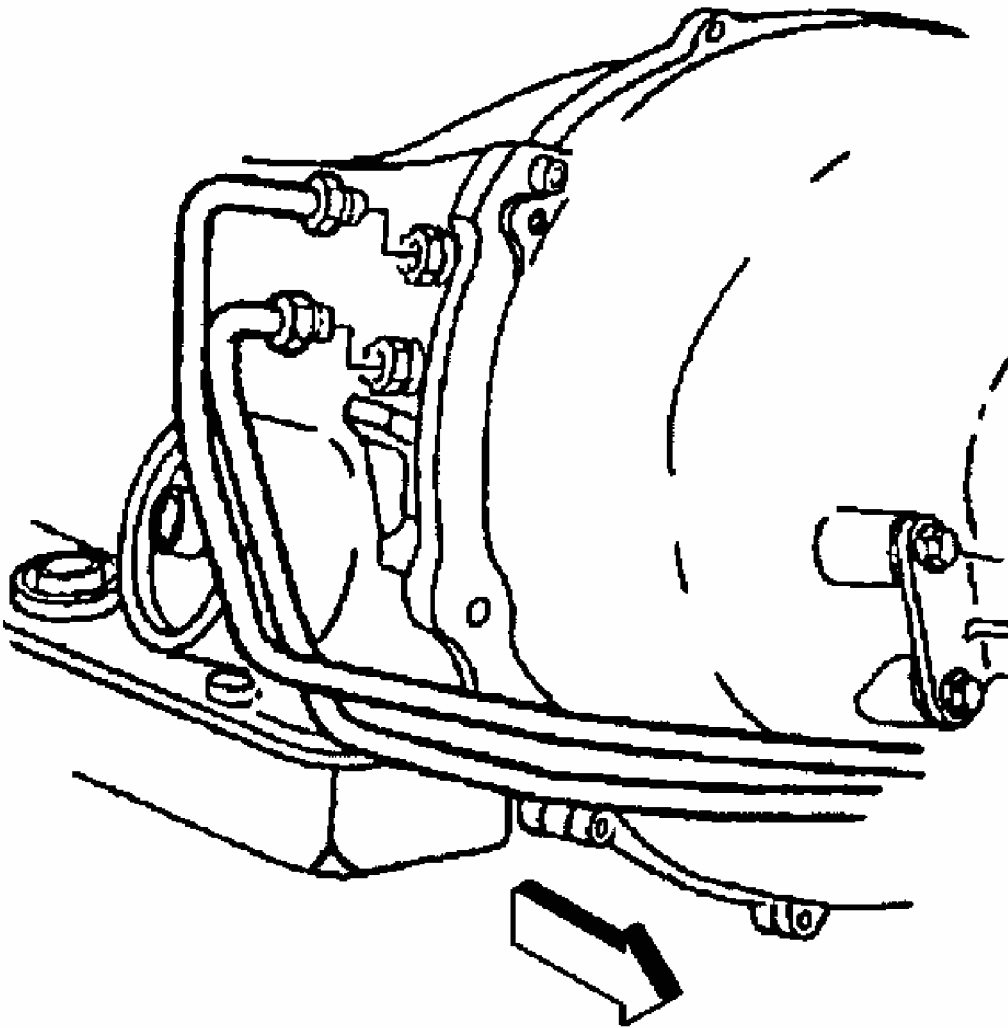
1. Raise and suitably support the vehicle. Remove the catalytic converter. Remove the right side muffler.

2. Remove the driveline tunnel closeout panel. See **Fig. 35** . Disconnect the transmission oil cooler (TOC) rear upper and lower pipe fittings from the junction fittings at the engine flywheel housing, then cap the pipes and plug the junction fittings to prevent contamination. See **Fig. 34** .
3. Disconnect the TOC rear upper and lower pipe fittings from the transmission fittings, then cap the pipes and plug the transmission fittings to prevent contamination. See **Fig. 36** . Remove the TOC rear pipe rear clip. See **Fig. 37** .
4. Remove the TOC rear pipe middle clip. Remove the TOC rear pipe front and rear clamp bolts and clamps. See **Fig. 38** . Remove the TOC rear pipes from the vehicle.



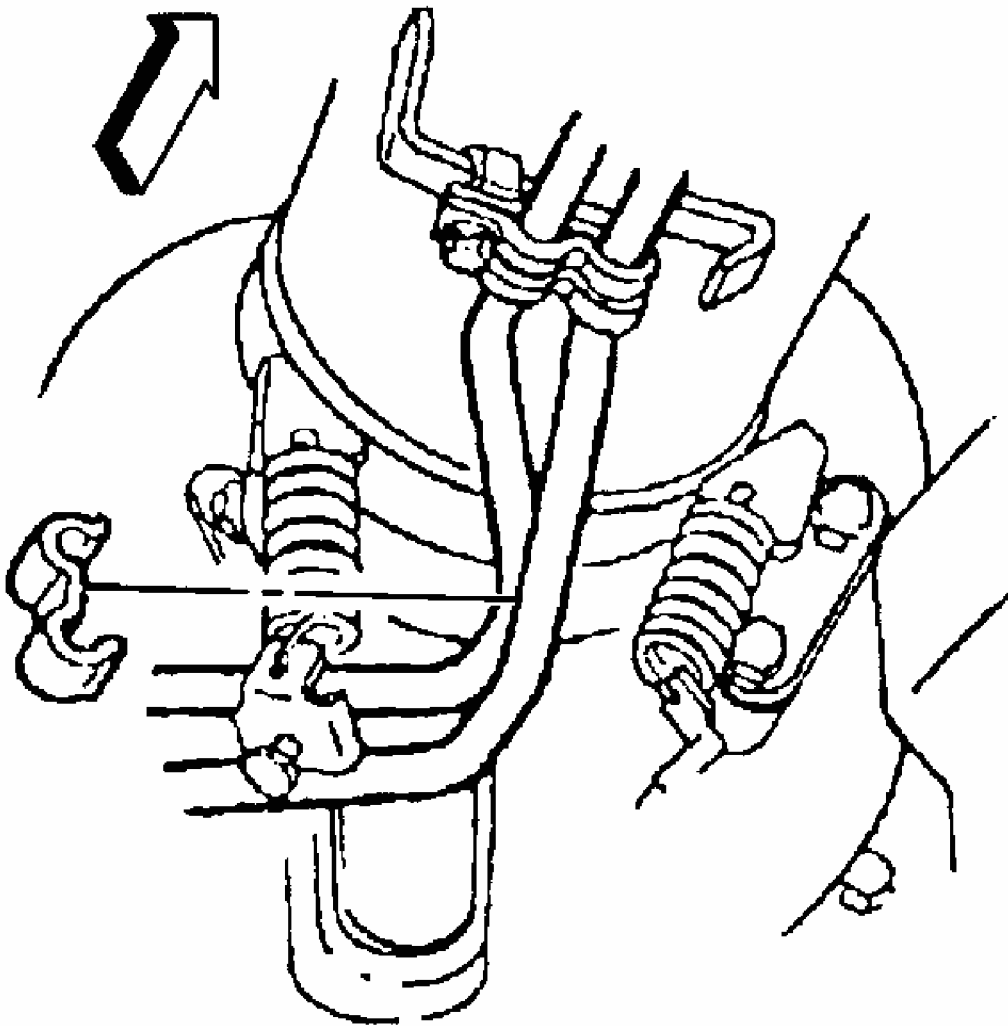
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Fig. 35: Removing/Installing Driveline Tunnel Closeout Panel
Courtesy of GENERAL MOTORS CORP.



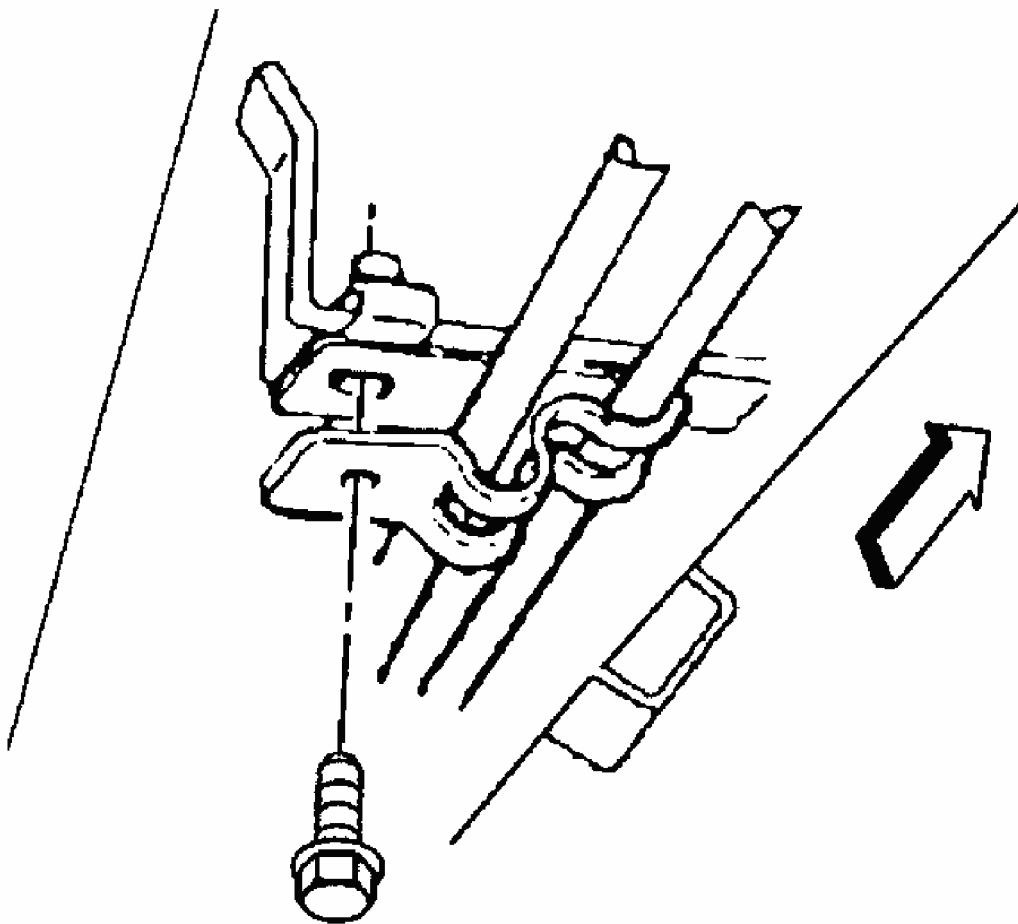
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Fig. 36: Removing/Installing Rear Oil Cooler Pipe At Transmission
Courtesy of GENERAL MOTORS CORP.



G00074241

Fig. 37: Removing/Installing Rear Oil Cooler Pipe Rear Clip
Courtesy of GENERAL MOTORS CORP.



G00074242

Fig. 38: Removing/Installing Rear Oil Cooler Pipe Front & Rear Clamp Bolts & Clamps

Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the transmission oil cooler (TOC) rear pipes into position. Install the TOC rear pipe front and rear retaining clamps and bolts. See **Fig. 38** . Tighten the transmission oil cooler rear pipe front and rear retaining clamp bolts to specification. See **TORQUE SPECIFICATIONS** . Install the TOC rear pipe middle clip.
2. Install the TOC rear pipe rear clip. See **Fig. 37** . Remove the caps from the rear of the TOC rear pipes and remove the plugs from the transmission fittings. ALIGN and HAND-START, then tighten ONLY by hand to seat the TOC rear upper and lower pipe fittings to the transmission fittings. See **Fig. 36** . Tighten the transmission oil cooler rear upper and lower pipe fittings to the transmission fittings to specification. See **TORQUE SPECIFICATIONS** .

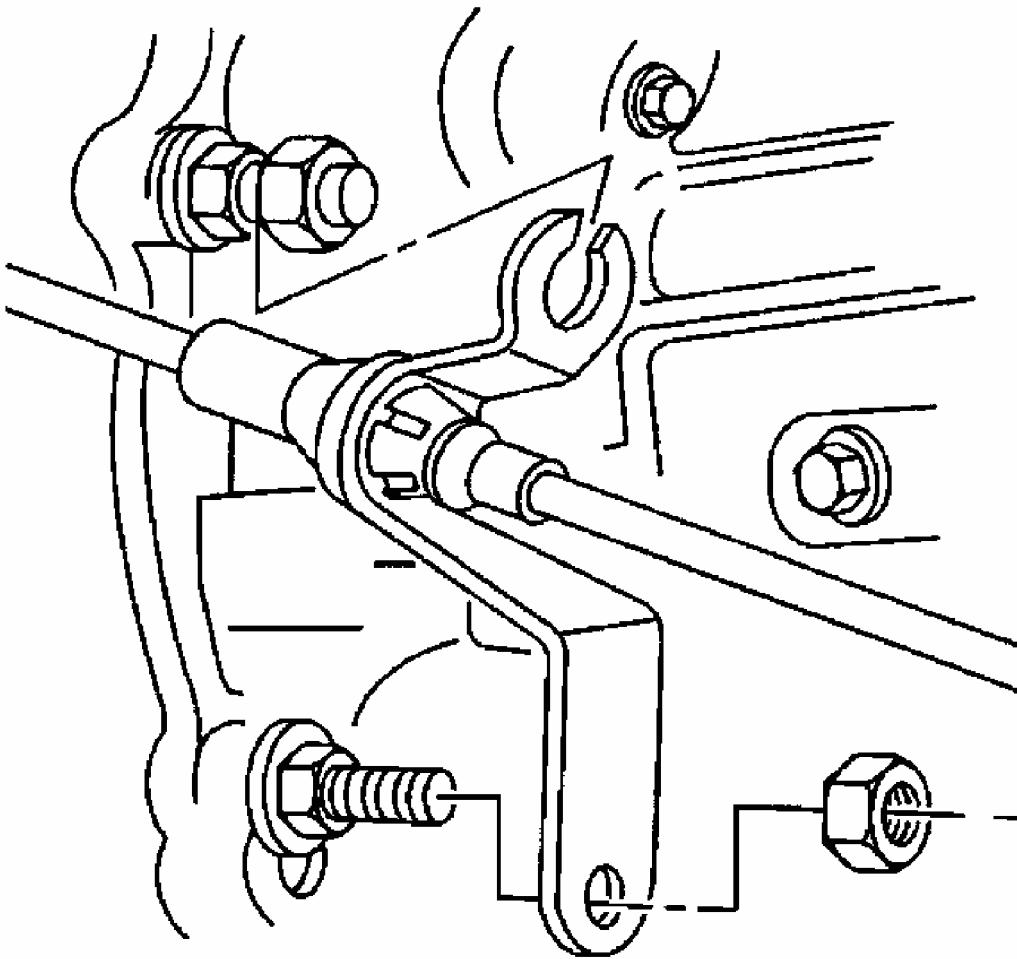
3. ALIGN and HAND-START, then tighten ONLY by hand to seat the TOC rear upper and lower pipe fittings to the junction fittings at the engine flywheel housing. See **Fig. 34** . Tighten the transmission oil cooler rear upper and lower pipe fittings to the junction fittings at the engine flywheel housing to specification. See **TORQUE SPECIFICATIONS** .
4. Install the driveline tunnel closeout panel. See **Fig. 35** . Install the right side muffler. Install the catalytic converter. Check the transmission fluid level. See **CHECKING FLUID LEVELS** under LUBRICATION. Add if necessary. Lower the vehicle.

PARK/NEUTRAL POSITION SWITCH

CAUTION: Use care to not suddenly jerk the shift control cable during disassembly, as the shift control cable rod end guide tubes are **EXTREMELY INFLEXIBLE** and capable of only a **SLIGHT** bend.

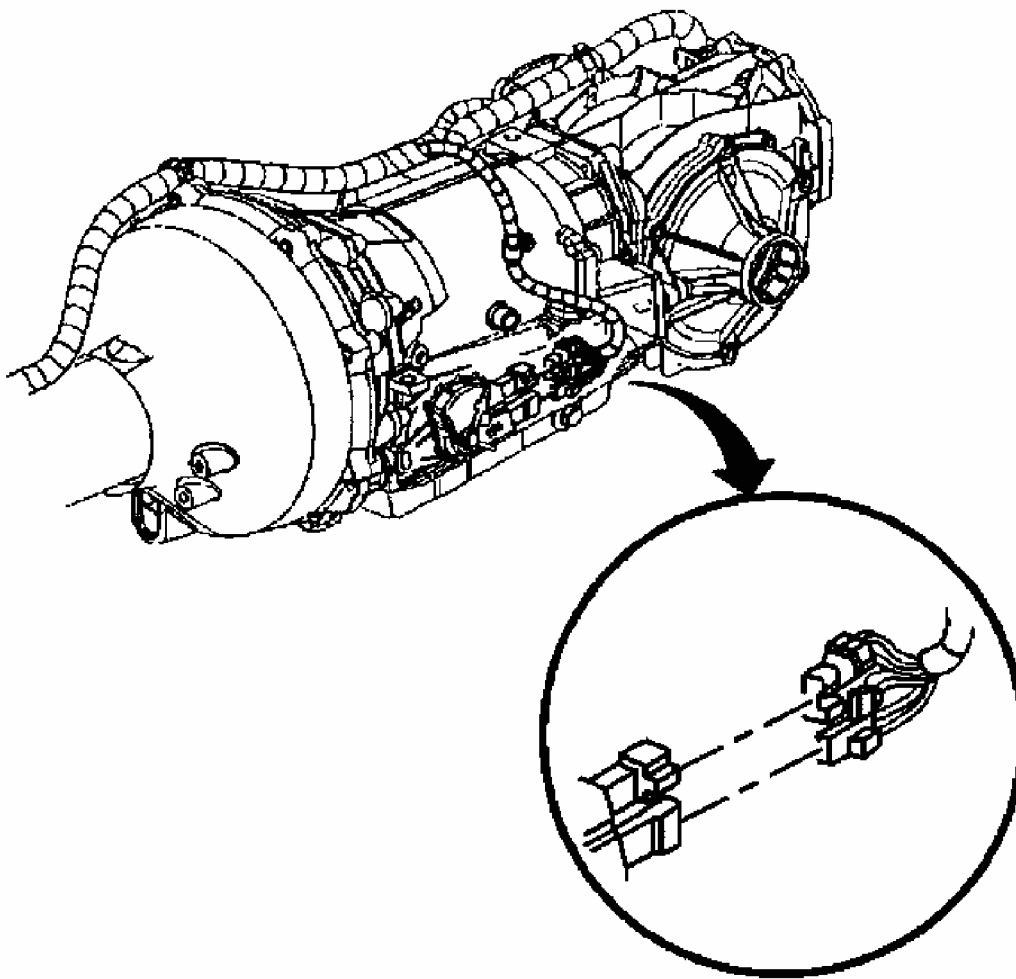
Removal

1. Raise and suitably support the vehicle. Remove the intermediate exhaust pipe and allow the LH muffler assembly to hang down out of the way. Shift the transmission into Neutral. Remove the nuts retaining the transmission shift control cable bracket to the transmission. See **Fig. 39** .
2. CAREFULLY release the shift control cable end clip from the transmission shift lever stud. See **Fig. 13** . Reposition the transmission shift cable and bracket. Disconnect the Park/Neutral position switch electrical connectors. See **Fig. 40** .
3. Using a wrench on the transmission manual shaft wrench flats (in order to keep the shaft from turning), remove the range selector (shift) lever retaining nut.
4. Remove the range selector (shift) lever. See **Fig. 41** . Check that the transmission is still in Neutral. Remove the Park/Neutral position switch mounting bolts. Slide the switch off of the manual shaft. See **Fig. 42** .



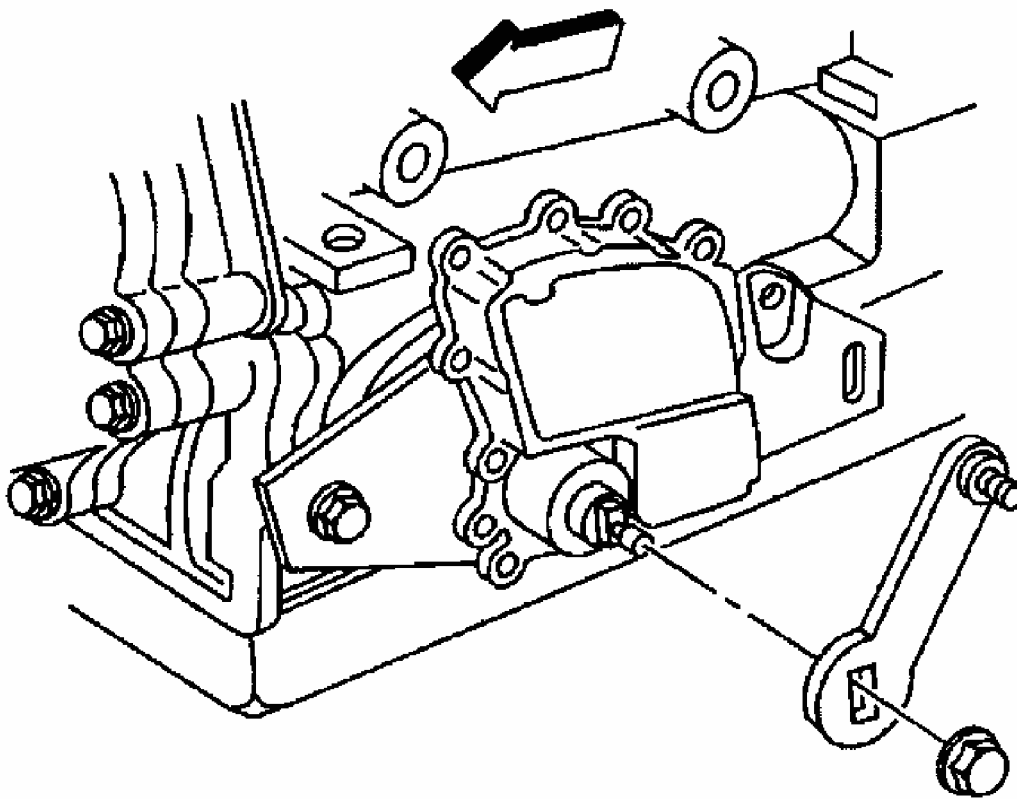
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Fig. 39: Removing/Installing Shift Control Cable Bracket
Courtesy of GENERAL MOTORS CORP.



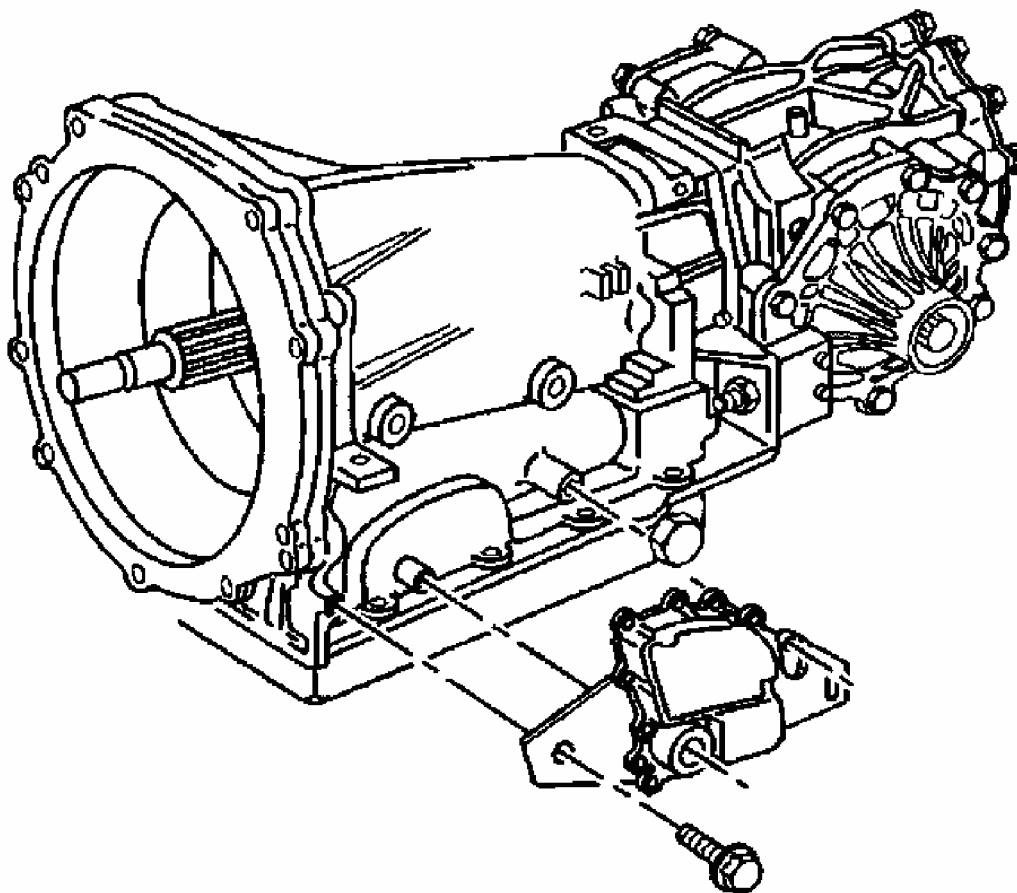
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Fig. 40: Locating Park/Neutral Position Switch Harness Connector
Courtesy of GENERAL MOTORS CORP.



G00056964

Fig. 41: Removing/Installing Range (Shift) Selector Lever
Courtesy of GENERAL MOTORS CORP.



G00056965

Fig. 42: Removing/Installing Park/Neutral Position Switch
Courtesy of GENERAL MOTORS CORP.

Installation

NOTE: Do not remove the Park/Neutral Position Switch Aligner (J 41364-A) from the Park/Neutral position switch until instructed.

1. Install the Park/Neutral Position Switch Aligner (J 41364-A) to the Park/Neutral position switch. Align the two lower slots on the switch with the two lower tabs on the aligner tool. See **Fig. 43** .
2. Rotate the aligner tool until the upper pin on the aligner tool is lined up with the notch on the top of the switch. See **Fig. 43** . Check that the transmission is still in Neutral.
3. Install the Park/Neutral position switch to the transmission manual shaft. Align the flats in the switch hub with the flats on the manual shaft. Slide the switch onto the transmission manual shaft until the switch mounting bracket contacts the mounting

bosses on the transmission case.

4. Install the Park/Neutral position switch mounting bolts. Tighten the Park/Neutral position switch mounting bolts to specification. See **TORQUE SPECIFICATIONS** . Remove the aligner tool from the switch. Install the transmission range selector (shift) lever onto the transmission manual shaft. Be sure to install the shift lever in an upright orientation.
5. Using a wrench on the transmission manual shaft wrench flats (in order to keep the shaft from turning), install the range selector (shift) lever retaining nut. Tighten the transmission range selector lever nut to specification. See **TORQUE SPECIFICATIONS** . Connect the Park/Neutral position switch electrical connectors.
6. Install the transmission shift control cable and bracket into position. Align the shift control cable end to the transmission shift lever stud. CAREFULLY secure the shift control cable end clip to the transmission shift lever stud.
7. Install the nuts retaining the transmission shift control cable bracket to the transmission. Tighten the transmission shift control cable bracket retaining nuts to specification. See **TORQUE SPECIFICATIONS** . Install the intermediate exhaust pipe. Shift the transmission into Park. Lower the vehicle.

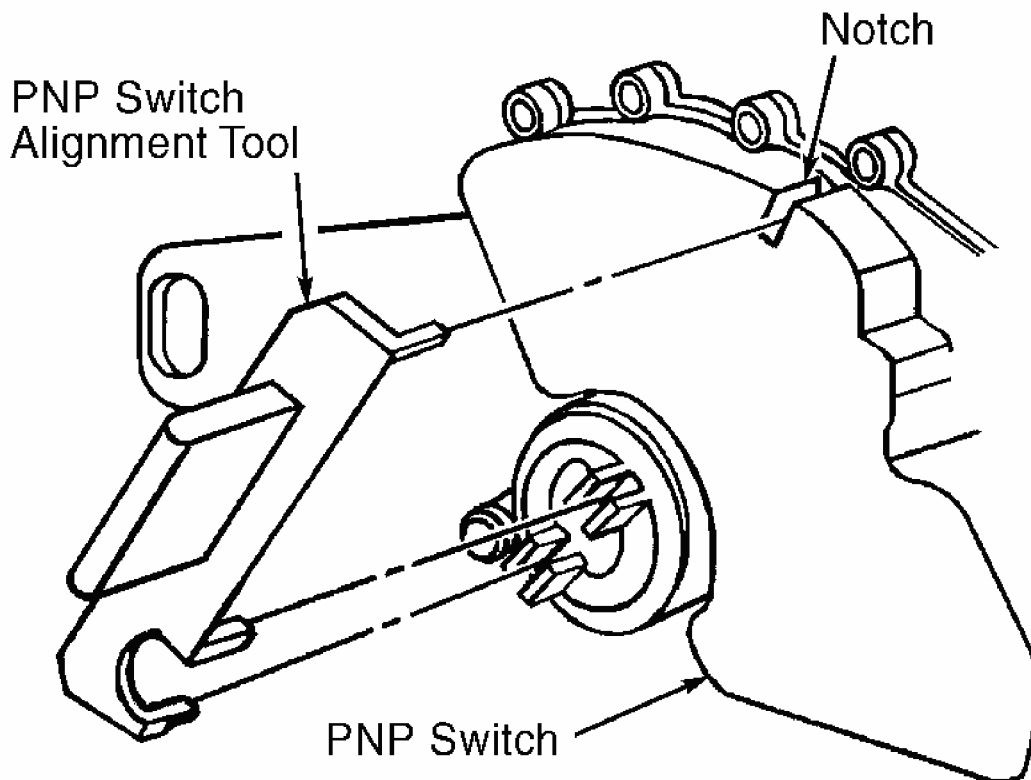
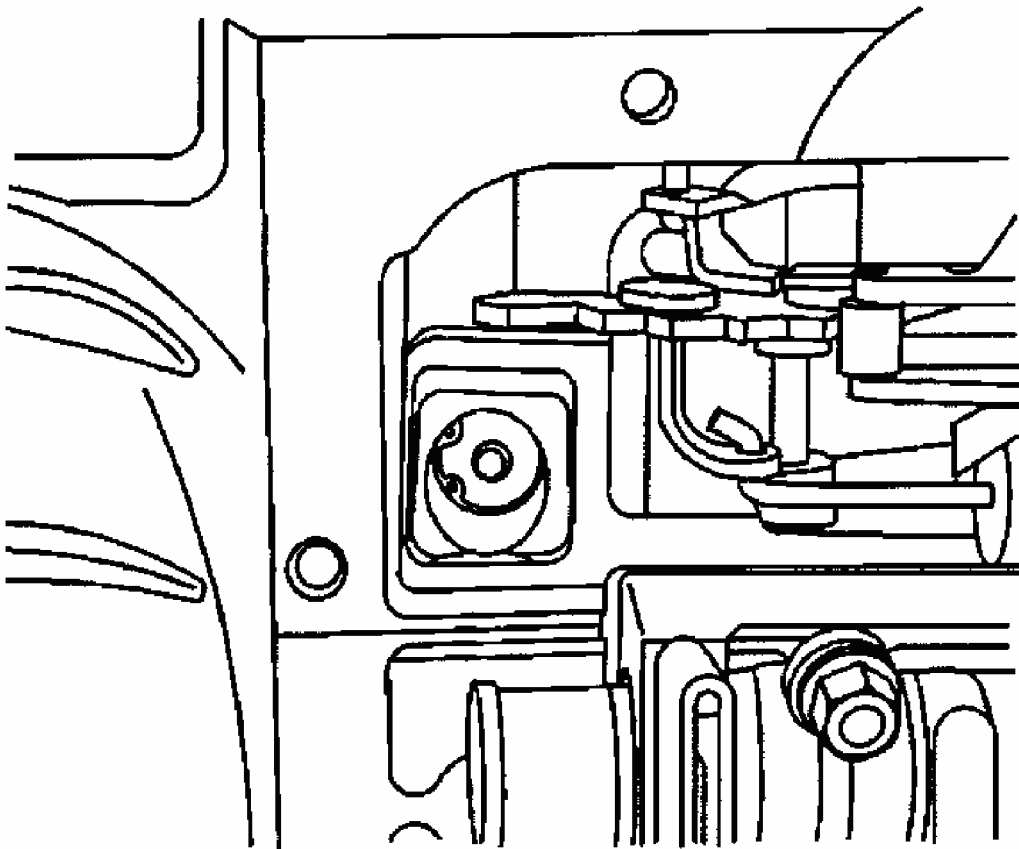


Fig. 43: Aligning Park/Neutral Position Switch
Courtesy of GENERAL MOTORS CORP.

PRESSURE REGULATOR

Removal

1. Raise and support the vehicle. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Compress the reverse boost valve sleeve into the bore of the oil pump to release tension on the reverse boost valve retaining ring. See **Fig. 44** . Remove the reverse boost valve retaining ring, then slowly release tension on the reverse boost valve sleeve.
2. Remove the reverse boost valve sleeve (5) and the reverse boost valve (4). See **Fig. 45** . Remove the pressure regulator isolator spring (3) and the pressure regulator valve spring (2). Remove the pressure regulator valve (1).



G00056996

Fig. 44: Locating Reverse Boost Valve & Retaining Ring
Courtesy of GENERAL MOTORS CORP.

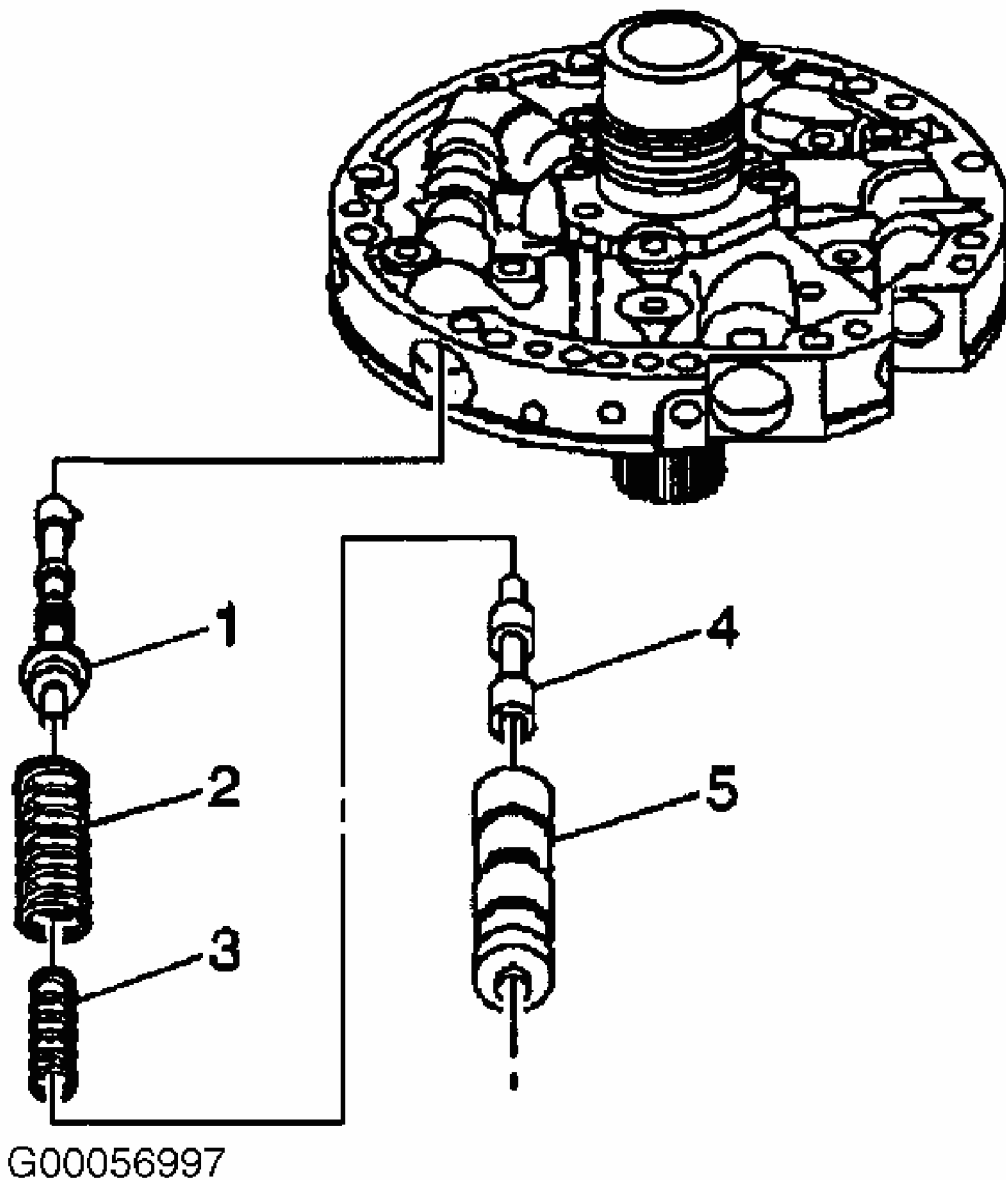


Fig. 45: Identifying Reverse Boost & Pressure Regulator Valve Components
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the pressure regulator valve (1). Install the pressure regulator isolator spring (3) and the pressure regulator valve spring (2). Install the reverse boost valve (4) in the reverse boost valve sleeve (5). Install the reverse boost valve (4) and sleeve (5) in the oil pump cover. See **Fig. 45**.
2. Compress the reverse boost valve sleeve into the bore of the oil pump to expose the

retaining ring slot. Install the reverse boost valve retaining ring, then slowly release tension on the reverse boost valve sleeve. See [Fig. 44](#) . Install the transmission oil filter and pan. See **DRAINING & REFILLING** under LUBRICATION.

3. Lower the vehicle. Fill the transmission to the proper level with appropriate fluid. See **LUBRICATION** .

SHIFT CONTROL CABLE

Removal

1. Raise and suitably support the vehicle. Shift the floor shift control to Neutral. If replacing a damaged cable, be sure that BOTH the floor shift control and the transmission are in Neutral. Remove the catalytic converter assembly. Remove the driveline tunnel closeout panel.

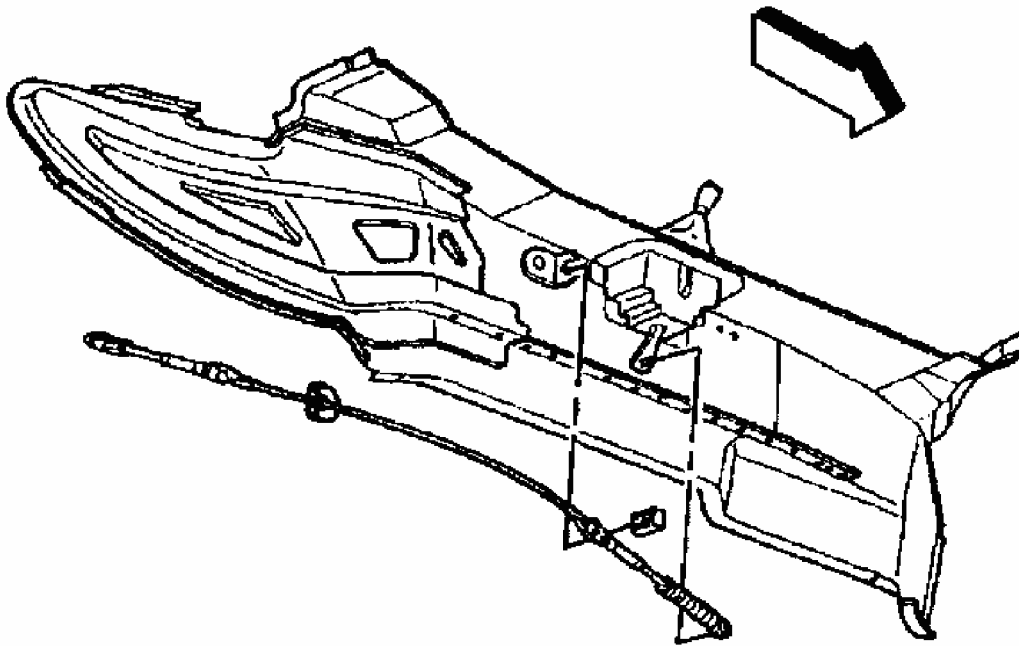
CAUTION: Use care to not suddenly jerk the shift control cable during disassembly, as the shift control cable rod end guide tubes are EXTREMELY INFLEXIBLE and capable of only a SLIGHT bend.

2. Using a large flat-blade screwdriver, CAREFULLY release the shift control cable end clip from the floor shift control arm stud. See [Fig. 46](#) .
3. Remove the shift control cable from the driveline tunnel bracket as follows:
 - A. Using a flat-blade screwdriver, pry the cable retaining staple clip from the cable.
 - B. Depress the cable retaining tabs.
 - C. While depressing the tabs, push the tabs through the hole in the driveline tunnel bracket.
 - D. Slide the cable out of the bracket slot.

CAUTION: Use care to not suddenly jerk the shift control cable during disassembly, as the shift control cable is EXTREMELY INFLEXIBLE.

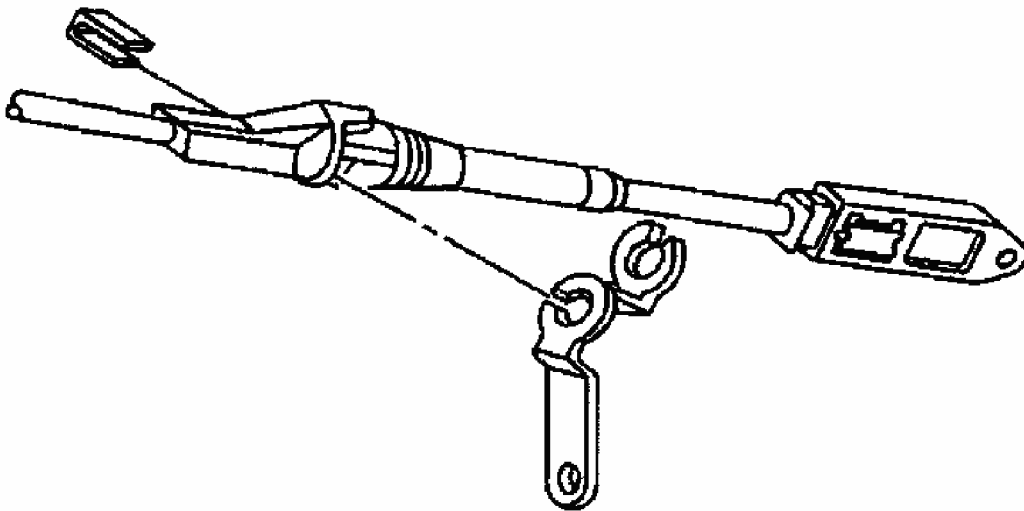
4. Remove the nuts retaining the shift control cable bracket to the transmission. See [Fig. 39](#) . Reposition the cable and cable bracket away from the studs. CAREFULLY release the shift control cable end clip from the transmission shift lever stud. See [Fig. 13](#) . Remove the shift control cable and bracket.
5. Remove the shift control cable bracket from the shift control cable (if necessary) as follows:
 - A. Using a flat-blade screwdriver, pry the shift cable retaining staple clip from the cable.
 - B. Depress the shift cable retaining tabs.

- C. While depressing the tabs, push the tabs through the hole in the shift cable bracket.
- D. Slide the cable out of the bracket slot. See **Fig. 47** .



G00056974

Fig. 46: Disconnecting/Connecting Shift Control Cable From Floor Shift Control
Courtesy of GENERAL MOTORS CORP.



G00056975

Fig. 47: Removing/Installing Shift Control Cable From Support Bracket
Courtesy of GENERAL MOTORS CORP.

Installation

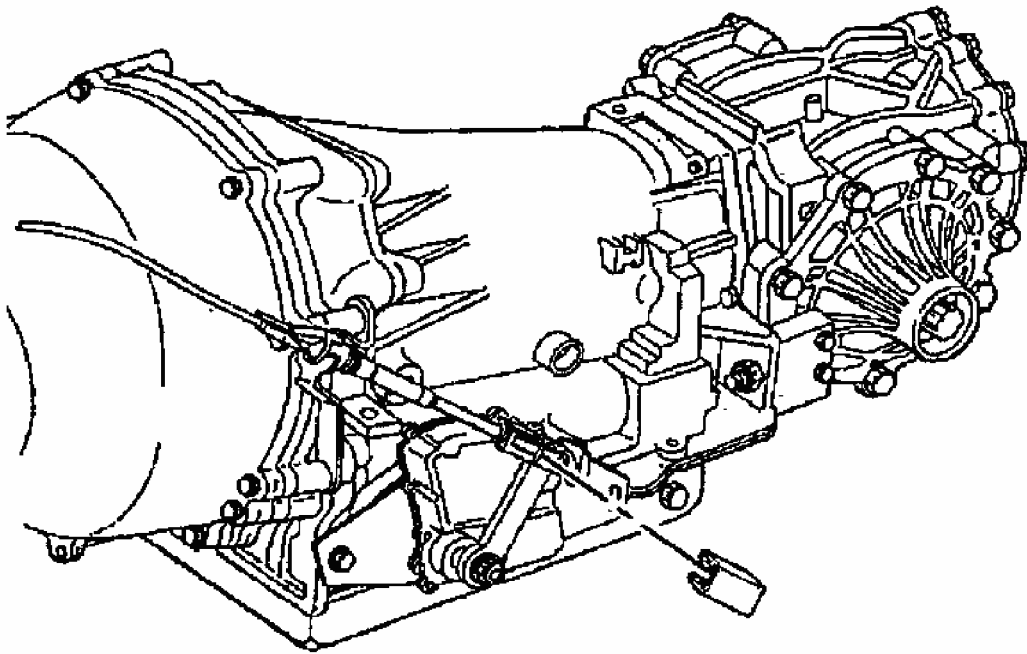
1. Install the shift control cable bracket to the shift control cable (if removed) as follows:
 - A. Slide the smaller diameter portion of the cable into the slot in the shift cable bracket.
 - B. Push the tabs through the hole in the bracket to lock the cable in place.
 - C. Insert the shift cable retaining staple clip between the shift cable retaining tabs. Press the staple clip firmly to secure.
2. Position and install the shift control cable to the driveline tunnel bracket as follows:
 - A. Slide the smaller diameter portion of the shift cable into the slot in the driveline tunnel bracket.
 - B. Push the shift cable retaining tabs through the hole in the bracket to lock the cable in place.
 - C. Insert the shift cable retaining staple clip between the shift cable retaining tabs. Press the staple clip firmly to secure.
3. Align the shift control cable end to the floor shift control arm stud.

CAUTION: Use care to not suddenly jerk the shift control cable during assembly, as the shift control cable rod end guide tubes are **EXTREMELY INFLEXIBLE** and capable of only a **SLIGHT** bend.

4. CAREFULLY secure the shift control cable end clip to the floor shift control arm stud. Install the shift control cable bracket to the transmission studs.
5. Install the nuts retaining the shift control cable bracket to the transmission. Tighten the transmission shift control cable bracket retaining nuts to specification. See **TORQUE SPECIFICATIONS** . Check to be sure that BOTH the floor shift control and the transmission are in Neutral. Align the shift control cable end to the transmission shift lever stud.

CAUTION: Use care to not suddenly jerk the shift control cable during assembly, as the shift control cable is EXTREMELY INFLEXIBLE.

6. CAREFULLY secure the shift control cable end clip to the transmission shift lever stud. If installing a NEW transmission shift control cable, remove the shipping guard from the adjuster lock. See **Fig. 48** .
7. If installing a NEW transmission shift control cable, depress the shift control cable adjuster lock. Lower the vehicle; leave the vehicle on the hoist. Verify that the shift control cable is operating smoothly as follows:
 - A. Firmly apply the parking brake.
 - B. Turn the ignition switch to ON; DO NOT start the engine.
 - C. Apply the regular brakes.
 - D. Shift from Neutral to 1st, then shift from 1st to 2nd, then Drive and so on; pause for one second in each detent position. Take note of an audible sound from the transmission shift lever each time a shift detent is selected.
 - E. Shift from Park directly to 1st.
 - F. Repeat steps "D" and "E" an additional 2 times.
 - G. If any binding is felt during this check, or if no audible sound was produced from the transmission shift lever, inspect the shift control cable for damage (at either end of the cable).
 - H. Shift the floor shift control into Park.
 - I. Release the regular brakes.
 - J. Turn the ignition switch OFF.
 - K. Release the parking brake.
8. Raise and support the vehicle. Install the driveline tunnel closeout panel. Install the catalytic converter assembly. Test drive the vehicle in an area with little traffic; ensure that the transmission will shift smoothly into and maintain each detent position.



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Fig. 48: Removing Adjuster Lock Shipping Guard
Courtesy of GENERAL MOTORS CORP.

TCC SOLENOID, TCC PWM SOLENOID & WIRING HARNESS

Removal

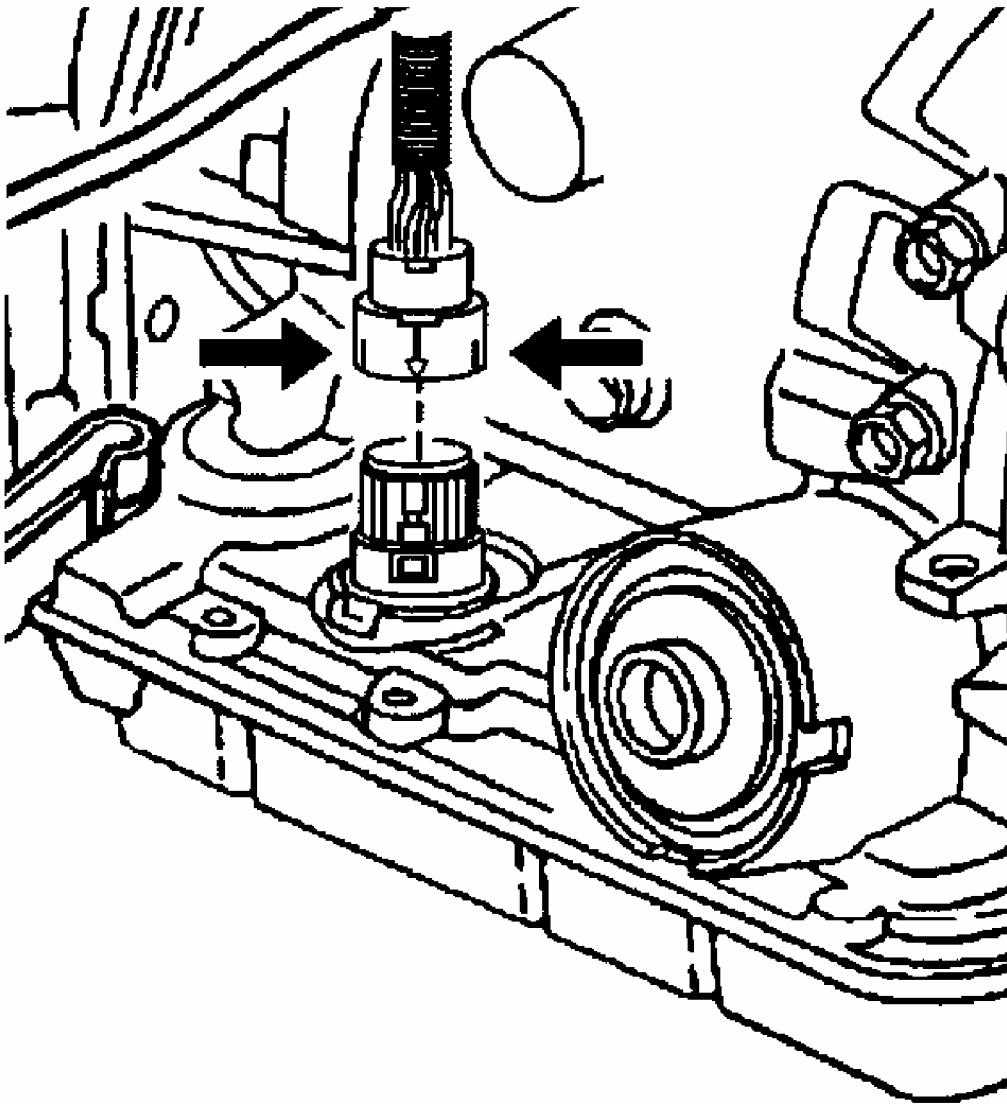
1. Raise and support the vehicle. Remove the transmission oil pan and the filter. See **DRAINING & REFILLING** under LUBRICATION. Disconnect the transmission harness 20-way connector from the transmission internal harness pass-through connector. See **Fig. 49** . Depress both tabs on the connector and pull straight up; do not pry the connector.

NOTE: **Removal of the valve body is not necessary for the following procedure.**

2. Remove the 1-2 accumulator assembly. Do not remove the spacer plate. See **ACCUMULATOR ASSEMBLY, SPACER PLATE & GASKETS** . Disconnect the internal wiring harness electrical connectors from the following components: transmission fluid pressure switch, 1-2 shift control solenoid, 2-3 shift control solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 control solenoid. See **Fig. 53** .
3. Remove the TCC PWM solenoid retainer. Remove the TCC PWM solenoid in order to access one of the TCC solenoid retaining bolts. See **Fig. 55** . Remove the pressure

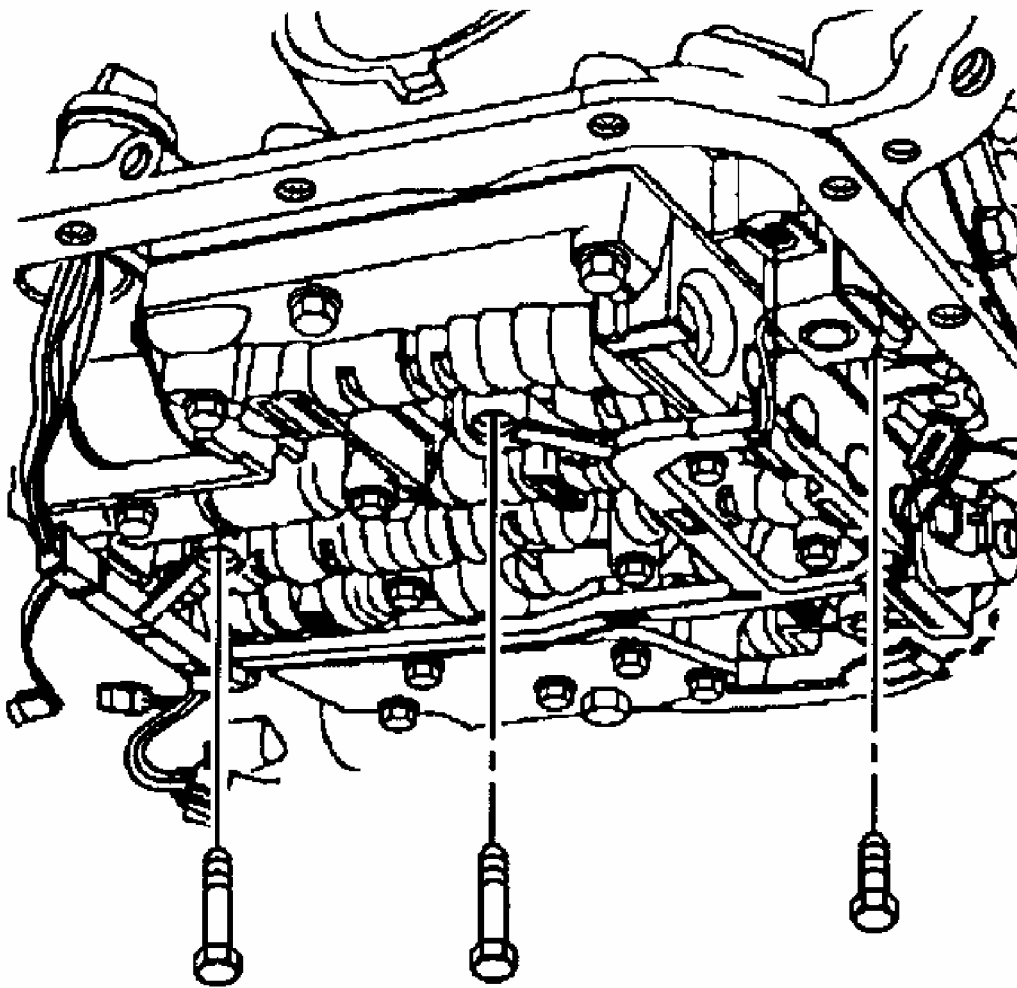
control solenoid retainer. Remove the pressure control solenoid. See **Fig. 23** .

4. Remove the TCC solenoid retaining bolts and the valve body bolts which retain the internal wiring harness. See **Fig. 50** . Using Seal Protector Retainer Installer (J 28458), release the pass-through electrical connector from the transmission case. Use the small end of the tool over the top of the connector. Twist in order to release the 4 tabs retaining the connector. Pull the harness connector down through the transmission case. Remove the TCC solenoid (with O-ring seal) and wiring harness assembly from the transmission case. See **Fig. 51** and **Fig. 57** .
5. Inspect the TCC solenoid and wiring harness assembly for damage, cracked connectors, exposed wires and loose pins.



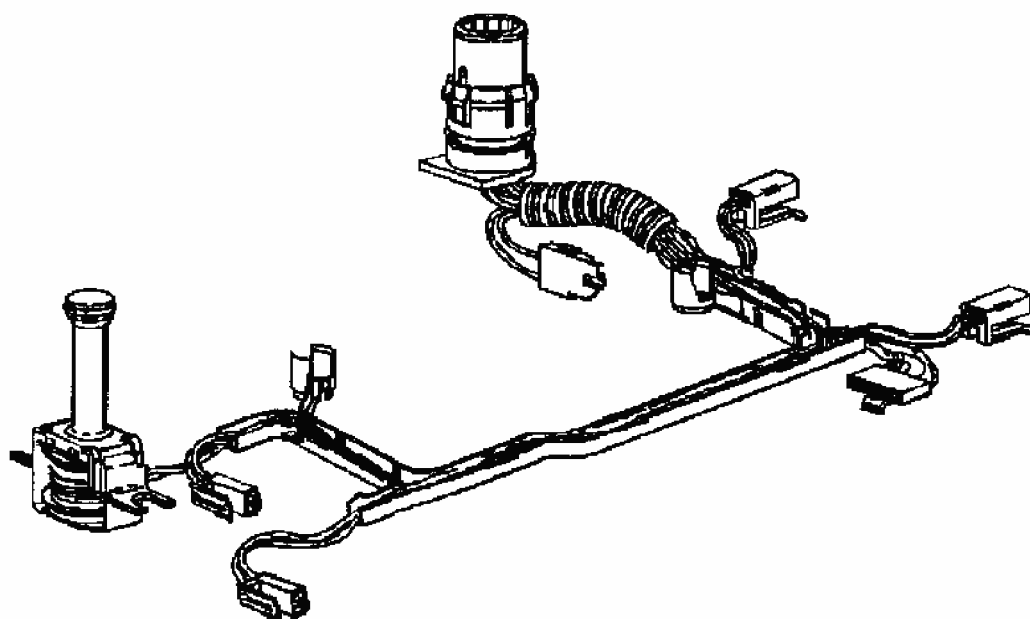
G00057010

Fig. 49: Disconnecting/Connecting 20-Way Transmission Wire Harness Connector
Courtesy of GENERAL MOTORS CORP.



G00057011

Fig. 50: Removing/Installing Internal Transmission Wire Harness Retaining Bolts
Courtesy of GENERAL MOTORS CORP.



G00057012

Fig. 51: Identifying Internal Transmission Wire Harness
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the wiring harness and TCC solenoid assembly with a new O-ring seal to the transmission. Install the pass-through electrical connector to the transmission case. Install the valve body bolts which retain the internal wiring harness and install the TCC solenoid retaining bolts. Tighten the control valve body retaining bolts to specification. See **TORQUE SPECIFICATIONS** . Tighten the TCC solenoid retaining bolts to specification.
2. Install the pressure control solenoid. Ensure that the electrical tabs are facing outboard. Install the pressure control solenoid retainer and retaining bolt. See **Fig. 23** . Tighten the pressure control solenoid retaining bolt to specification. See **TORQUE SPECIFICATIONS** . Install the TCC PWM solenoid to the control valve body. Install the TCC PWM solenoid retainer. See **Fig. 55** .
3. Connect the internal wiring harness electrical connectors to the following components: transmission fluid pressure switch, 1-2 shift control solenoid, 2-3 shift control solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 control solenoid. See **Fig. 53** . Install the 1-2 accumulator. See **ACCUMULATOR ASSEMBLY, SPACER PLATE & GASKETS** .
4. Connect the transmission harness 20-way connector to the transmission pass-through connector. Align the arrows on each half of the connector and insert straight down. See

Fig. 49 . Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Lower the vehicle. Fill the transmission to the proper level with appropriate fluid. See **LUBRICATION** .

VALVE BODY & PRESSURE SWITCHES

Removal

1. Ensure that removal of the valve body is necessary before proceeding. The following components can be serviced without removing the valve body from the transmission:
 - A. The torque converter clutch solenoid (1).
 - B. The pressure control solenoid (2).
 - C. The internal wiring harness (3).
 - D. The 2-3 shift solenoid (4).
 - E. The 1-2 shift solenoid (5).
 - F. The transmission fluid pressure manual valve position switch (6).
 - G. The 3-2 shift solenoid (7).
 - H. The torque converter clutch pulse width modulation (TCC PWM) solenoid (8).

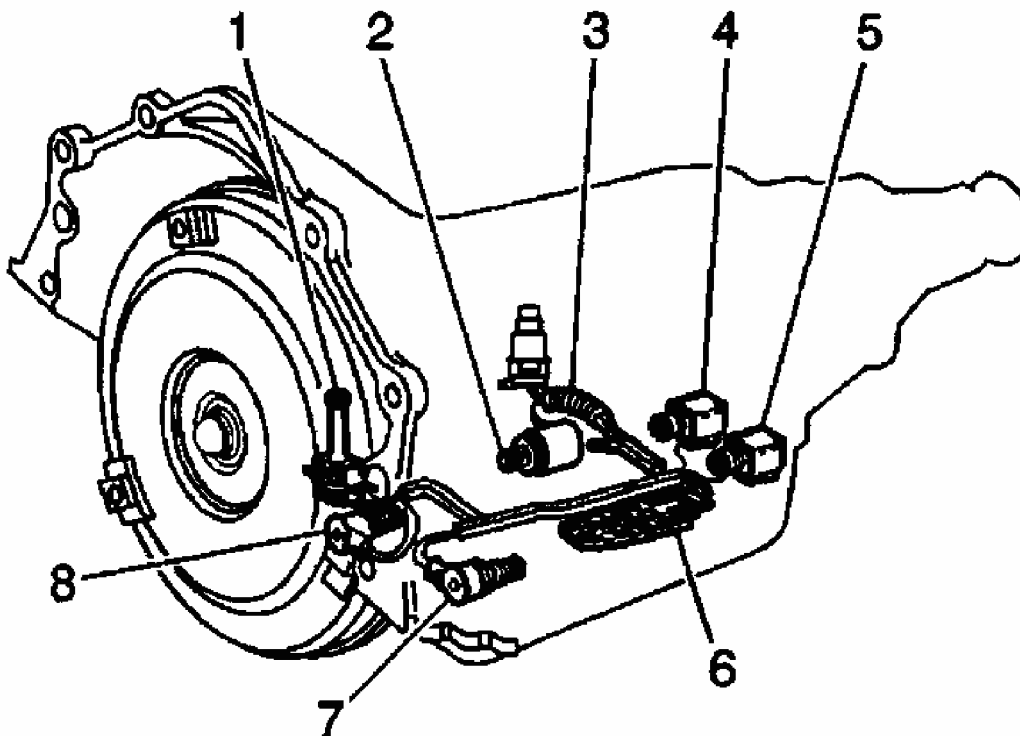
Refer to illustration for component identification. See **Fig. 52** .

2. Remove the fluid level indicator. Raise and support the vehicle. Remove the oil pan, gasket and filter. See **DRAINING & REFILLING** under LUBRICATION.
3. Disconnect the internal wiring harness electrical connectors from the following components: transmission fluid pressure manual valve position switch, 1-2 shift solenoid, 2-3 shift solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 shift solenoid. See **Fig. 53** .
4. Remove the fluid indicator stop bracket bolt (2). Remove the fluid indicator bracket (1). See **Fig. 54** . Remove the TCC PWM solenoid retainer (2) with a small screwdriver. Rotate the solenoid (1) in the bore, if necessary, until the flat part of the retainer (2) is visible. See **Fig. 55** . Remove the TCC PWM solenoid (1) in order to access the TCC solenoid retaining bolts.
5. Remove the TCC solenoid retaining bolts. Remove the TCC solenoid (with O-ring seal) and wiring harness from the control valve body. See **Fig. 56** and **Fig. 57** . Reposition the harness to the side of the transmission case.
6. Remove the control valve body bolts which retain the transmission fluid pressure switch to the control valve body. Remove the transmission fluid pressure switch. Inspect the transmission fluid pressure switch for damage or debris. See **Fig. 58** .
7. Remove the manual detent spring retaining bolt. Remove the manual detent spring. Inspect the manual detent spring for cracks or damage.

CAUTION: Keep the control valve body level when lowering it from

the vehicle. This will prevent the loss of check balls located in the control valve body passages.

8. Remove the remaining control valve body bolts. Carefully begin to lower the control valve body down from the transmission case while simultaneously disconnecting the manual valve link. See **Fig. 59** . If disassembly, cleaning, inspection and assembly of the control valve body is necessary, see appropriate OVERHAUL article in AUTOMATIC TRANSMISSIONS.



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Fig. 52: Identifying Serviceable Components
Courtesy of GENERAL MOTORS CORP.

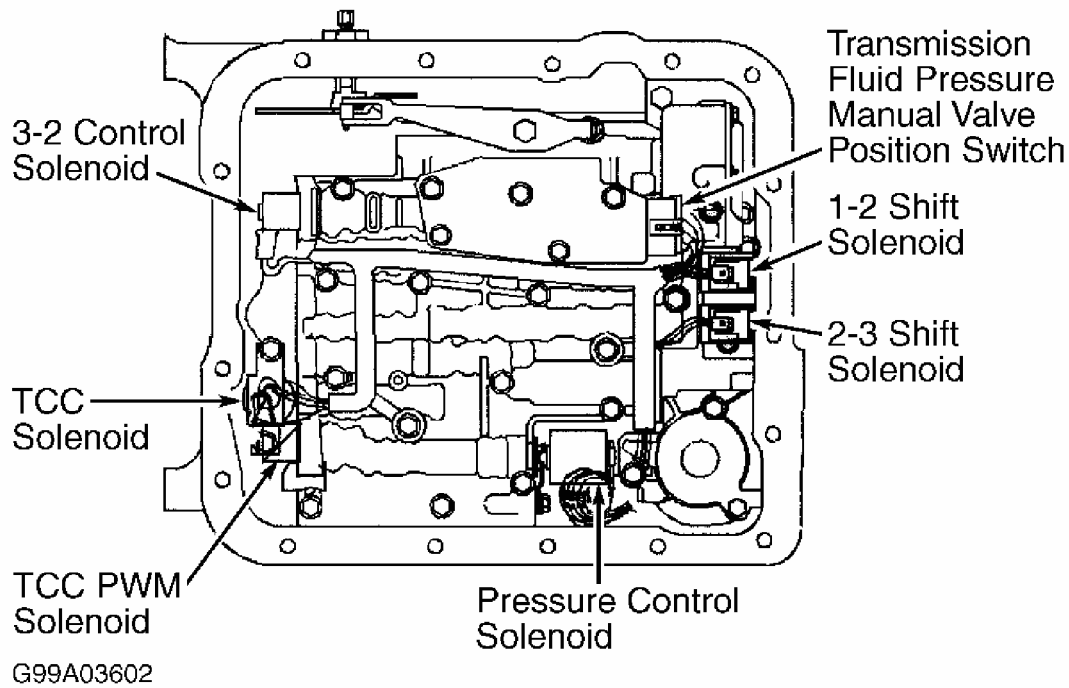
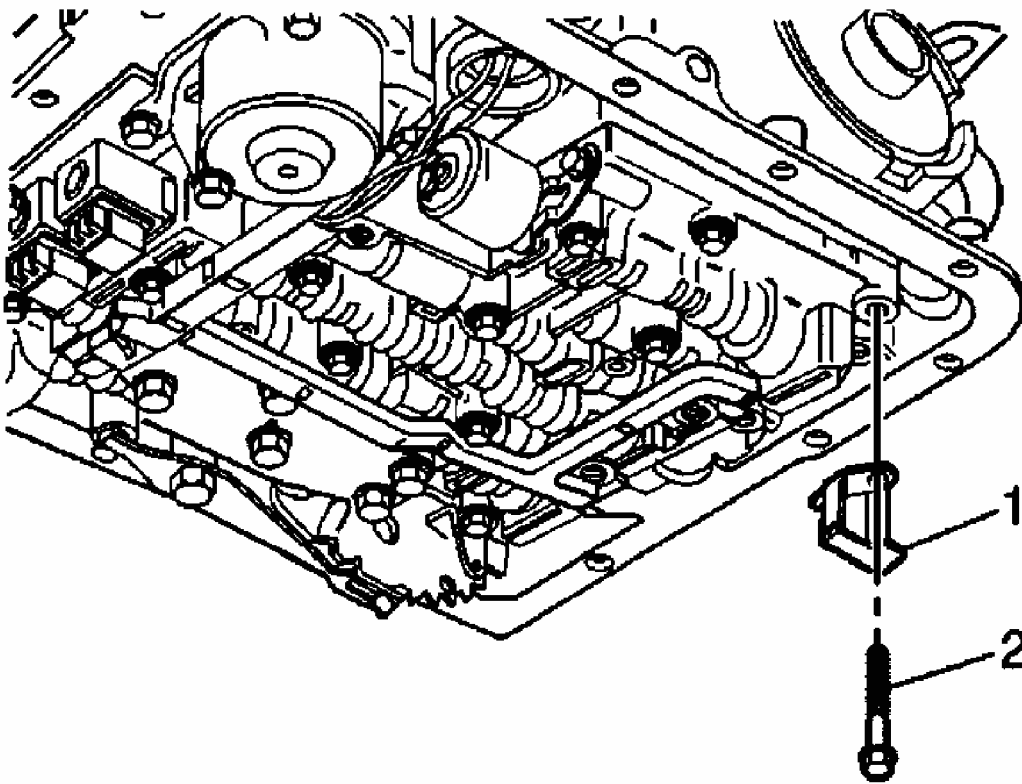
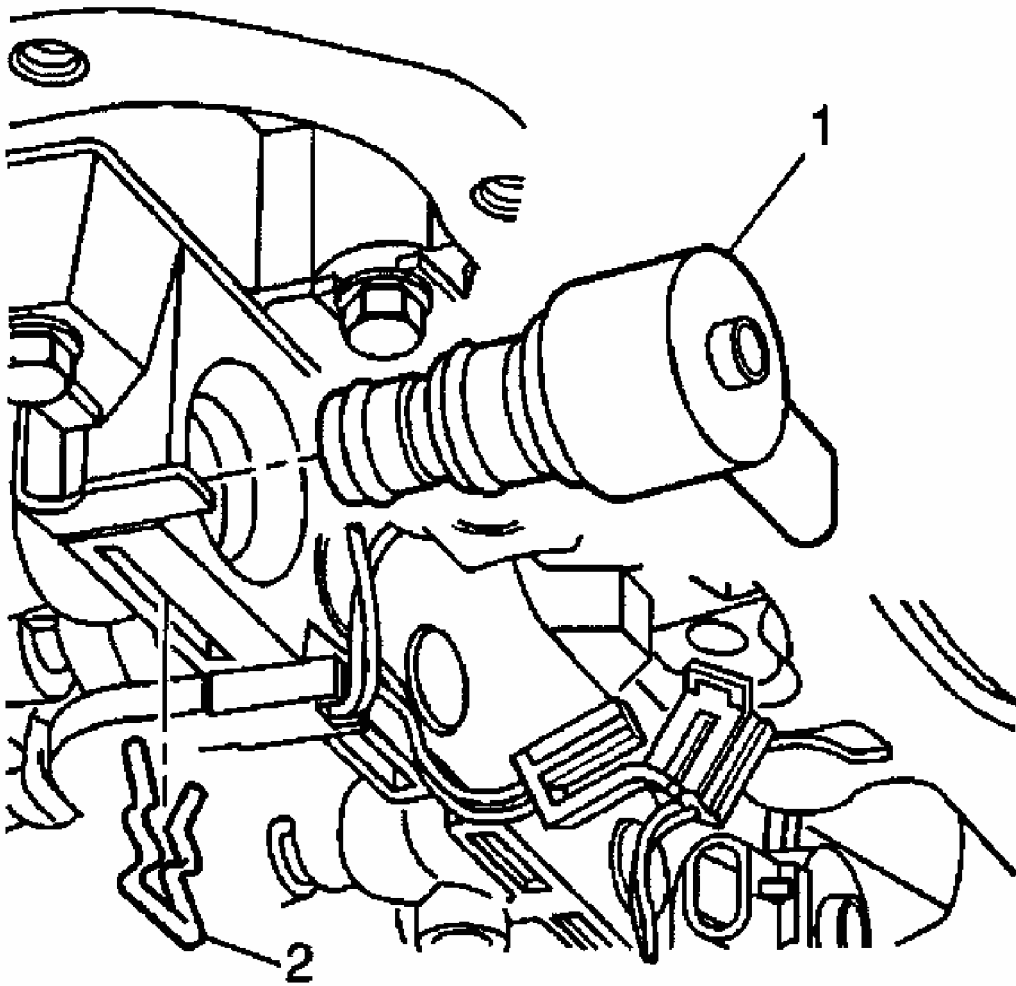


Fig. 53: Locating Valve Body Solenoids
Courtesy of GENERAL MOTORS CORP.



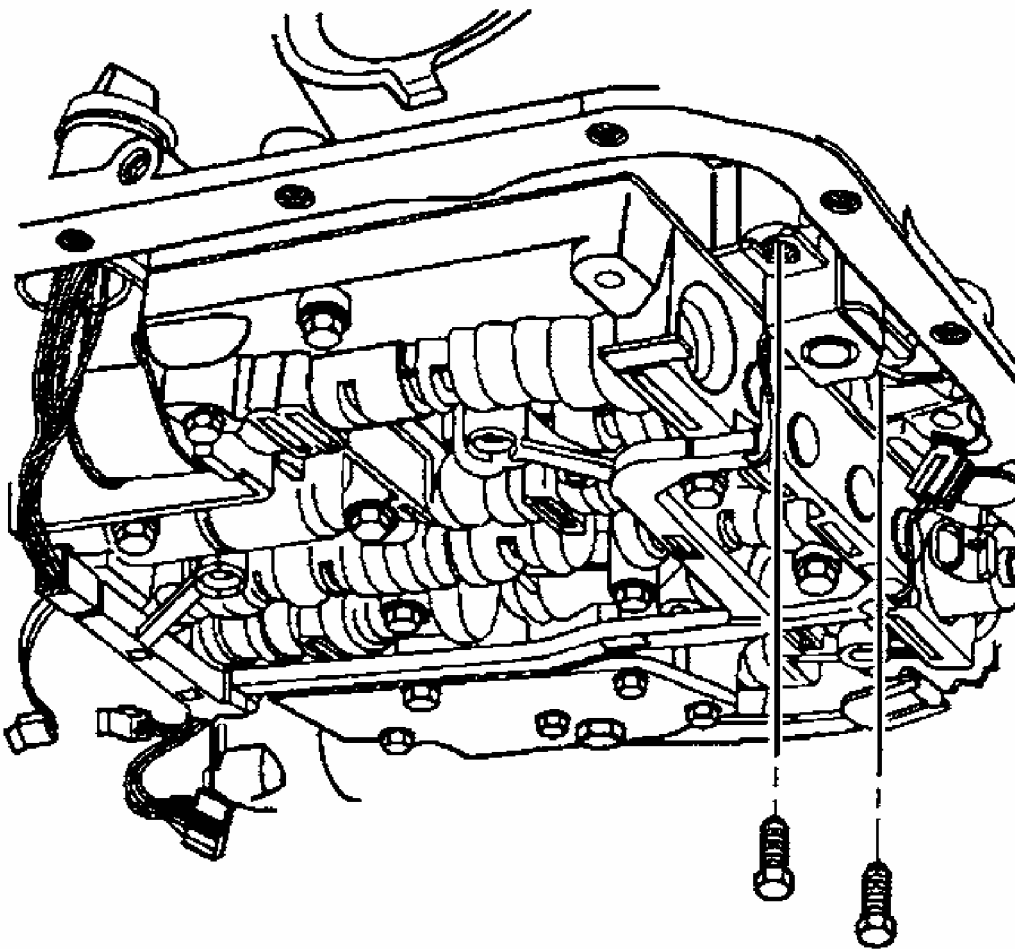
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Fig. 54: Removing/Installing Fluid Indicator Stop Bracket
Courtesy of GENERAL MOTORS CORP.



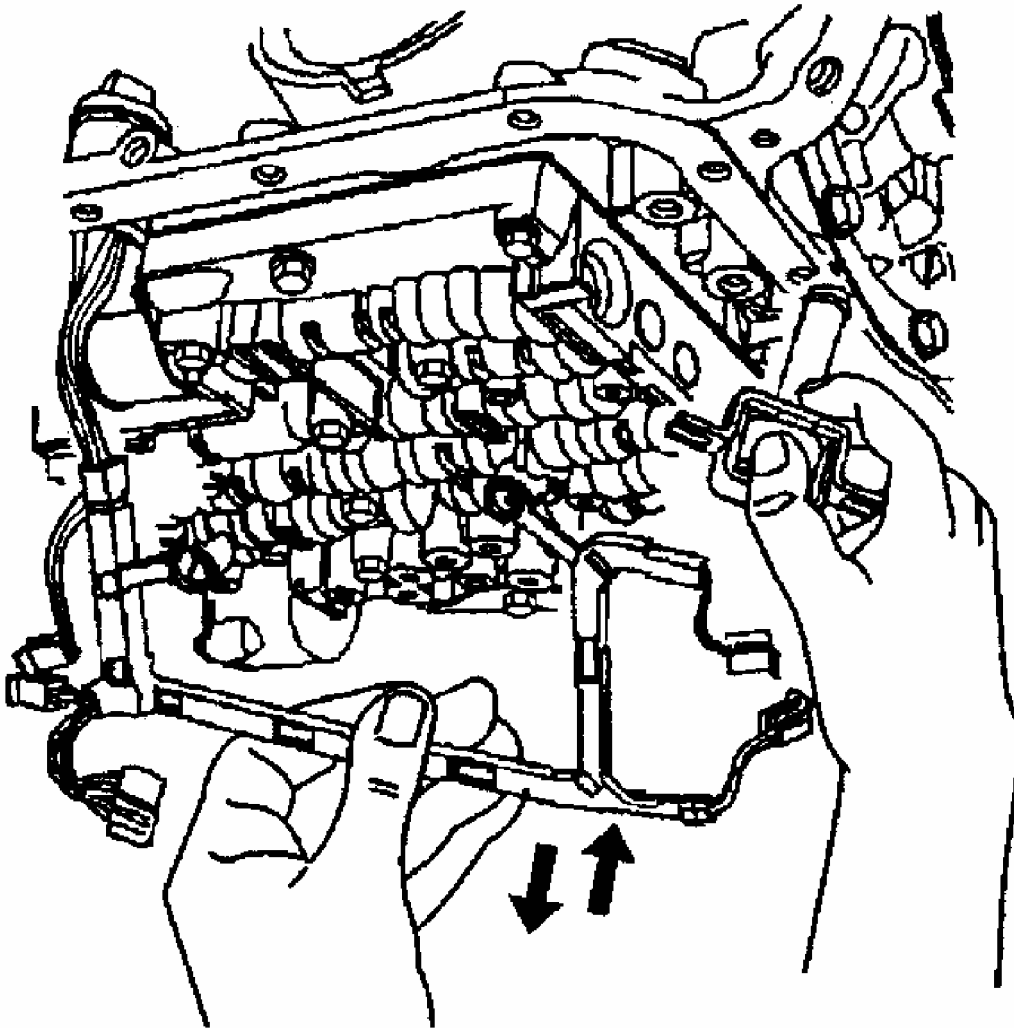
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Fig. 55: Removing/Installing TCC PWM Solenoid
Courtesy of GENERAL MOTORS CORP.



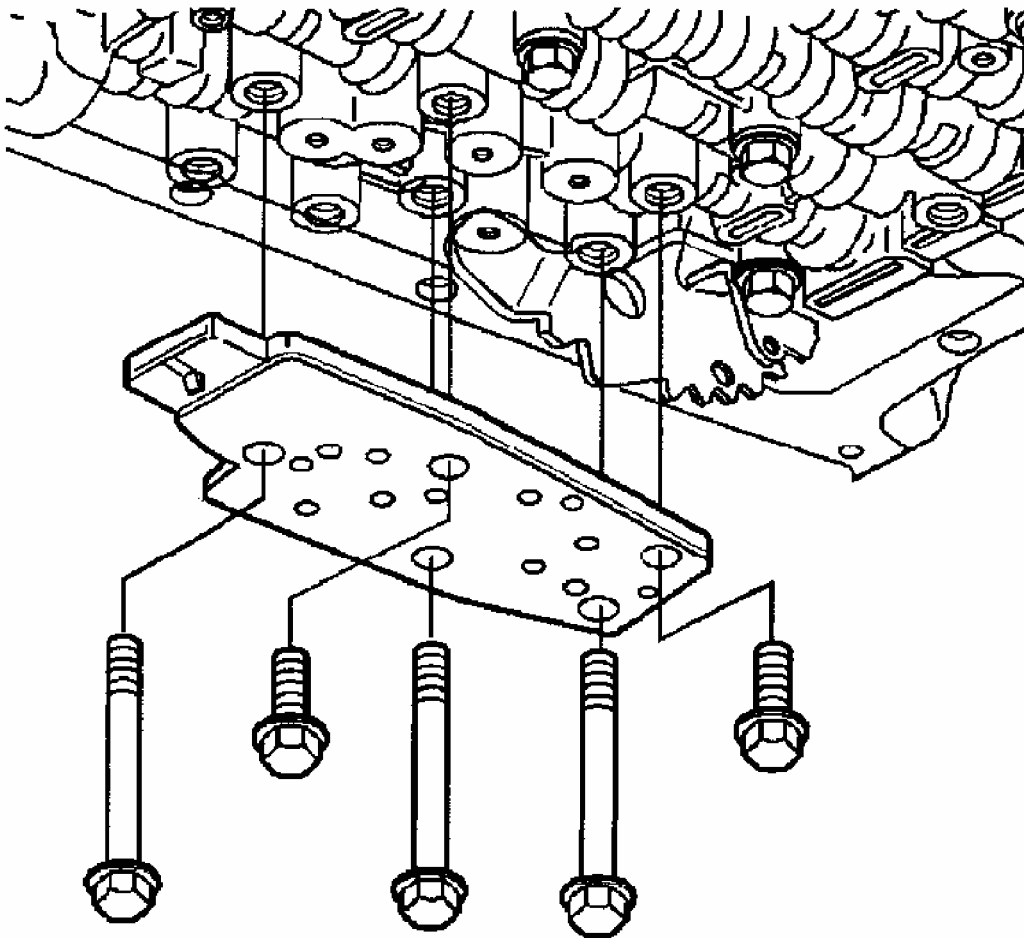
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Fig. 56: Removing/Installing TCC Solenoid
Courtesy of GENERAL MOTORS CORP.



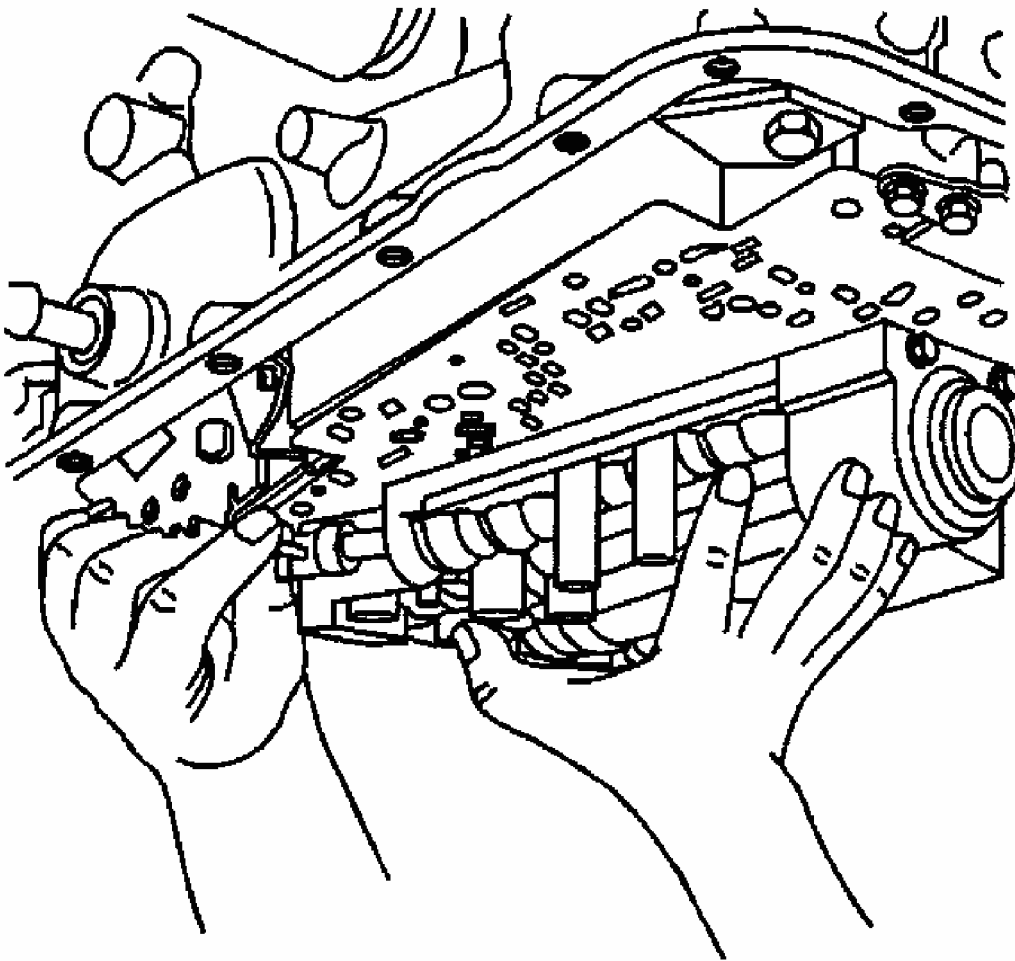
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Fig. 57: Removing/Installing Valve Body Wire Harness
Courtesy of GENERAL MOTORS CORP.



G00056991

Fig. 58: Removing/Installing Transmission Fluid Pressure Switch
Courtesy of GENERAL MOTORS CORP.



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Fig. 59: Removing/Installing Valve Body Assembly
Courtesy of GENERAL MOTORS CORP.

Installation

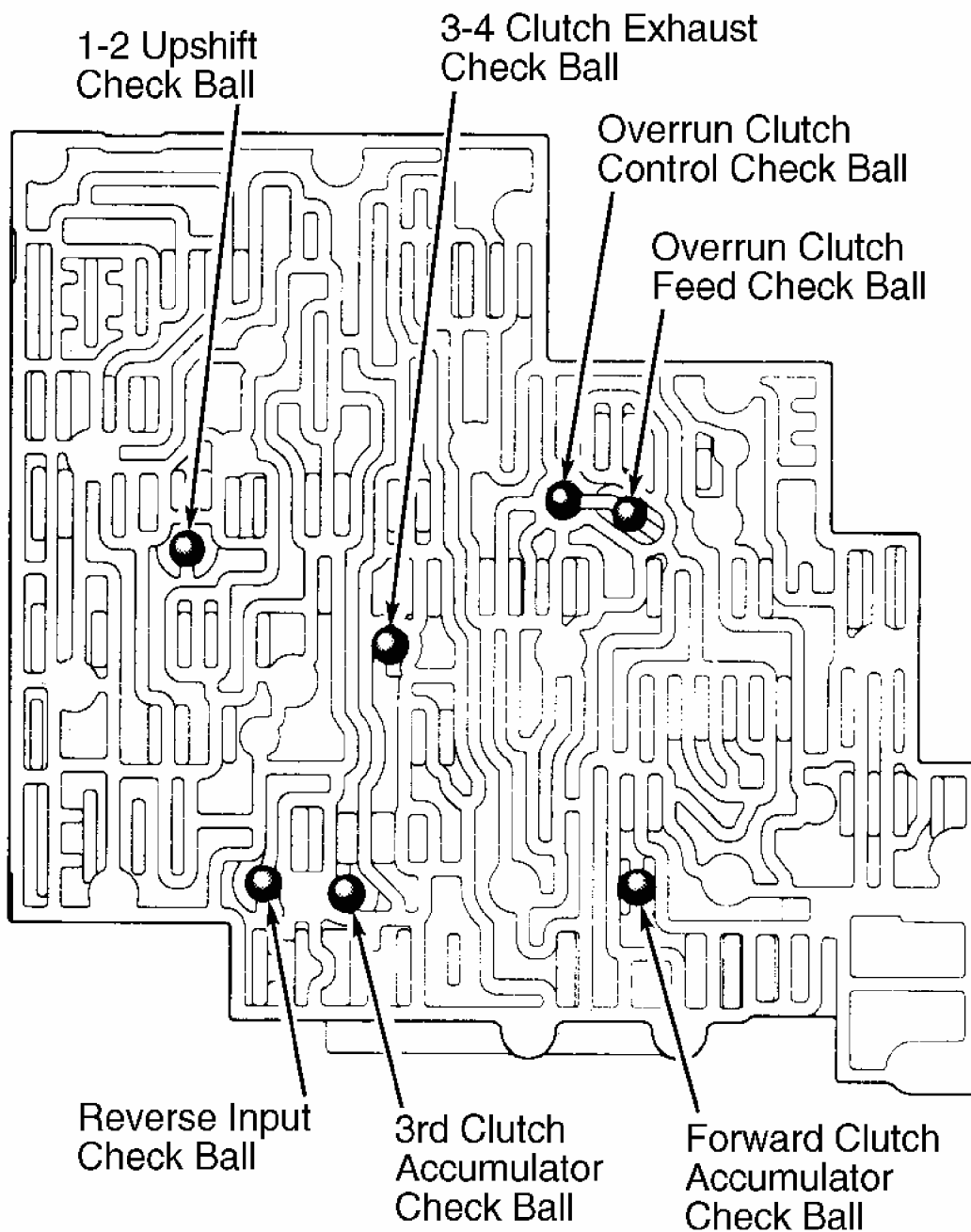
1. Install the check balls in the valve body. See **Fig. 60** . Install the control valve body to the transmission case while simultaneously connecting the manual valve link to the manual valve. See **Fig. 59** . Verify that the manual valve link is installed properly to the inside detent lever and the manual valve. See **Fig. 61** . Install one bolt (M6 X 1.0 X 47.5) hand-tight in the center of the valve body to hold it in place.

NOTE: When installing bolts throughout this procedure, be sure to use the correct bolt size and length in the correct location as specified.

2. Do not install the transmission fluid indicator stop bracket and bolt at this time. Install, but do not tighten, the control valve body bolts which retain only the valve body directly. Each numbered bolt location corresponds to a specific bolt size and length, as indicated by the illustration. See **Fig. 62** .
3. Install the manual detent spring. Install, but do not tighten, the manual detent spring retaining bolt. Install the transmission fluid pressure switch. Install, but do not tighten, the control valve body bolts which retain the transmission fluid pressure switch to the control valve body.

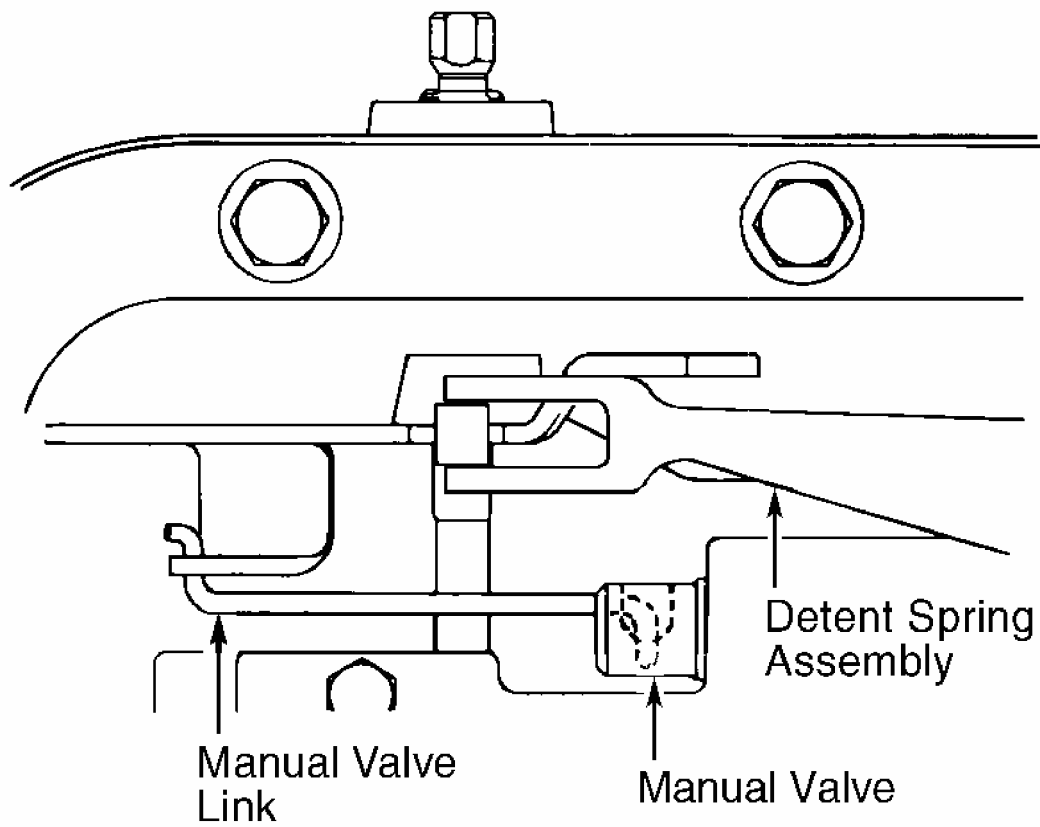
CAUTION: Tighten valve body bolts in a spiral pattern starting from the center. If the bolts are torqued at random, valve bores may be distorted and inhibit valve operation.

4. Tighten the control valve body bolts in a spiral pattern starting from the center, as indicated by the arrows. See **Fig. 62** . Tighten the control valve body bolts (in sequence) to specification. See **TORQUE SPECIFICATIONS** . Ensure that the manual detent spring is aligned properly with the detent lever. Tighten the manual detent spring bolt to specification.
5. Install the TCC solenoid with a new O-ring seal to the valve body. Install the TCC solenoid bolts. Tighten the TCC solenoid retaining bolts to specification. See **TORQUE SPECIFICATIONS** . Install the internal wiring harness to the valve body. See **Fig. 57** . The internal wiring harness has a tab (1) on the edge of the conduit. See **Fig. 63** .
6. Place the tab between the valve body and the pressure switch in the location shown (2). See **Fig. 64** . Press the harness into position on the valve body bolt bosses (1, 3).
7. Install the TCC PWM solenoid (1) to the control valve body. Install the TCC PWM solenoid retainer (2). See **Fig. 55** . Install the transmission fluid indicator stop bracket (1) and bolt (2). See **Fig. 54** . Tighten the transmission fluid indicator stop bracket bolt to specification. See **TORQUE SPECIFICATIONS** .
8. Connect the internal wiring harness electrical connectors to the following components: transmission fluid pressure manual valve position switch, 1-2 shift solenoid, 2-3 shift solenoid, pressure control solenoid, TCC PWM solenoid and 3-2 shift solenoid. See **Fig. 53** .
9. Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Lower the vehicle. Add transmission fluid to obtain the proper fluid level.



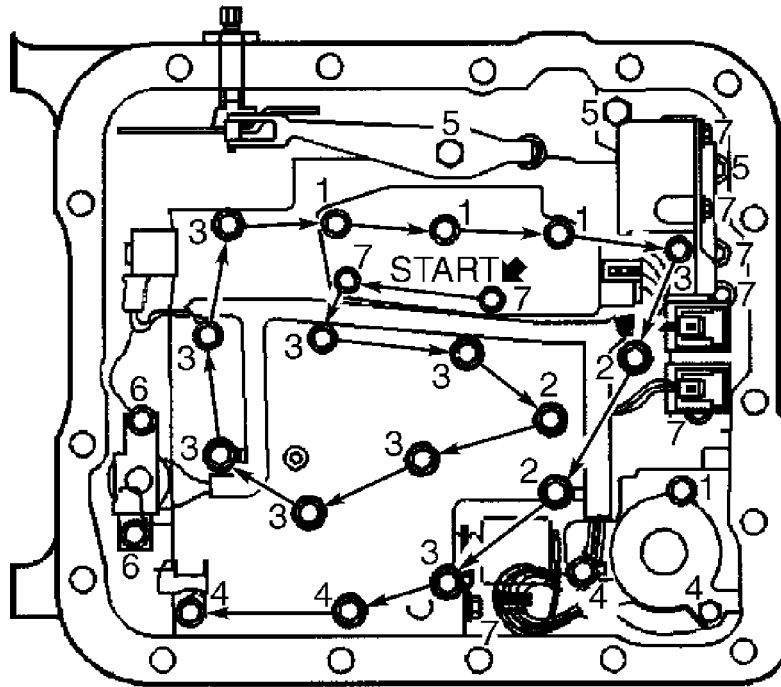
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Fig. 60: Locating Valve Body Check Balls
Courtesy of GENERAL MOTORS CORP.



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Fig. 61: Installing Manual Valve Link
Courtesy of GENERAL MOTORS CORP.



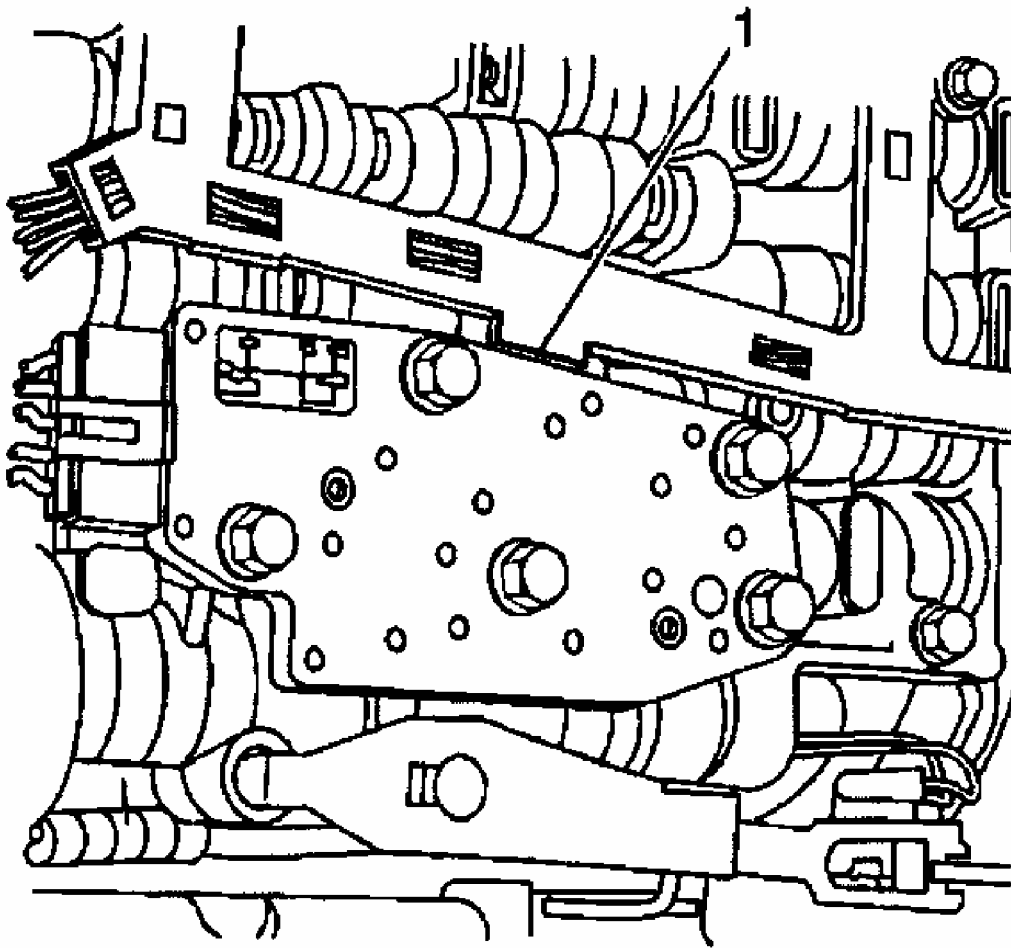
NOTE: Numbers identify bolt length.
Arrows identify tightening sequence.

VALVE BODY BOLT IDENTIFICATION

Bolt No.	Length In. (mm)
1	2.56 (65)
2	2.14 (54.4)
3	1.87 (47.5)
4	1.38 (35)
579 (20)
647 (12)
771 (18)

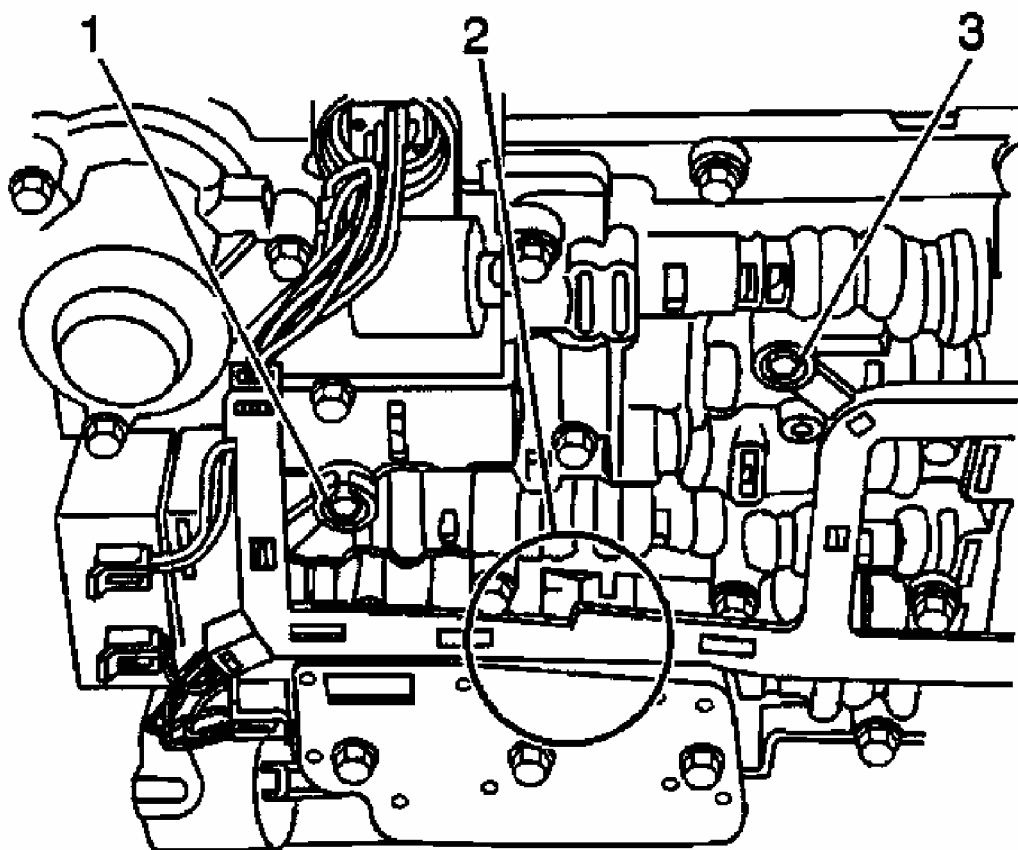
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Fig. 62: Identifying Valve Body Bolt Location
Courtesy of GENERAL MOTORS CORP.



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Fig. 63: Identifying Internal Wiring Harness Tab
Courtesy of GENERAL MOTORS CORP.



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Fig. 64: Positioning Internal Wiring Harness
Courtesy of GENERAL MOTORS CORP.

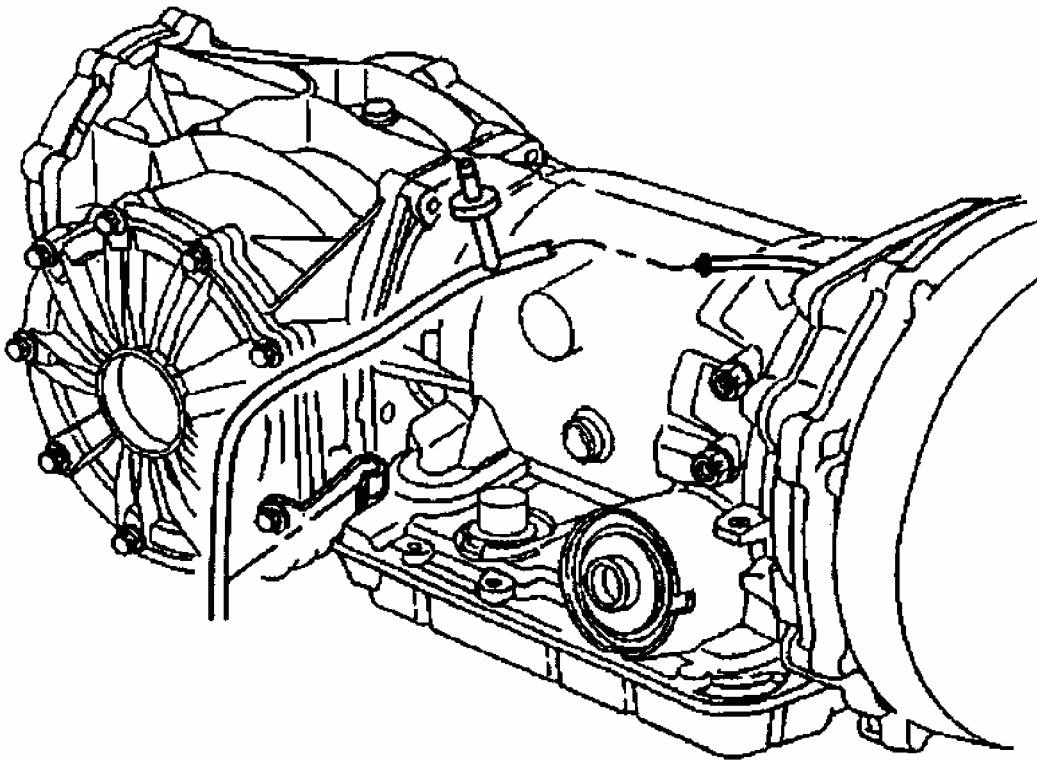
VENT HOSE

Removal & Installation

1. Raise and suitably support the vehicle. Release the transmission vent hose from the lower retaining clip. See **Fig. 65** .

NOTE: **Observe the orientation of the transmission vent hose check valve prior to removal of the hose.**

2. Remove the transmission vent hose from the transmission vent tube.
3. To install, connect the transmission vent hose to the transmission vent tube. Orient the transmission vent hose check valve as noted prior to removal. Secure the transmission vent hose to the lower retaining clip. Lower the vehicle.



G00056995

Fig. 65: Removing/Installing Transmission Vent Hose
 Courtesy of GENERAL MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Compressor Hose-To-Condenser Fitting	17 (24)
Front Evaporator Tube-To-Condenser Bolt	20 (27)
Oil Check/Fill Plug	22 (30)
Oil Cooler Line-To-Flywheel Housing Fitting	20 (27)
Oil Cooler Line-To-Transmission Fitting	26 (35)
PNP Switch Mounting Bolt	20 (27)
Power Steering Gear Mounting Nut	74 (100)
Shift Control Cable Bracket Retaining Nut	15 (20)
Steering Gear Intermediate Shaft Coupling Bolt	25 (34)
Transmission Range Selector Lever Nut	15 (20)
	INCH Lbs. (N.m)

2002 Chevrolet Corvette

2002 AUTOMATIC TRANSMISSIONS Servicing - Corvette

Accumulator Cover Retaining Bolt	97 (11)
Front Oil Cooler Line Front Clamp Bolt	106 (12)
Front Oil Cooler Line Rear Clamp Bolt	19 (2.2)
Manual Detent Spring Bolt	97 (11)
Oil Pan Bolt	97 (11)
Power Steering Cooler Bolt	97 (11)
Pressure Control Solenoid Retaining Bolt	97 (11)
Rear Oil Cooler Line Front & Rear Clamp Bolts	106 (12)
Spacer Plate Support Retaining Bolt	97 (11)
TCC Solenoid Retaining Bolt	97 (11)
Transmission Fluid Indicator Stop Bracket Bolt	97 (11)
Valve Body-To-Transmission Bolt	97 (11)