# SECTION 7

# AUTOMATIC/MANUAL TRANSMISSION GENERAL INFORMATION

## CONTENTS



## GENERAL DESCRIPTION

Section 7 contains information on where to locate on vehicle service, unit repair and diagnostic procedures for the automatic transmission assemblies, manual transmission assemblies and transfer case.

### SECTION 7A - AUTOMATIC TRANSMISSION ON-VEHICLE SERVICE

Refer to SECTION 7A in this manual for On-Vehicle-Service. This section contains information on transmission identification, fluid level checking procedures and specific information for servicing some components while the transmission is in the vehicle. This section also contains procedures for the removal and installation of the transmission from the vehicle.

### SECTION 7A-10A - (03-72LE 4-SPEED) or 7A-11A (3L30 3-SPEED) AUTOMATIC TRANSMISSION DIAGNOSIS

Refer to BOOK 2 for Automatic Transmission Diagnosis. These sections contain information to assist in diagnosing automatic transmission operating conditions when the unit is in the vehicle. The diagnosis covers: road test procedures, shift speed charts, pressure check procedures, diagnostic charts, electrical wiring diagrams, automatic transmission oil passage identification and torque converter clutch diagnosis.

For fluid flow diagrams and circuits descriptions, refer to the Transmission/Transaxle/Transfer Case Unit Repair Manual.

### SECTION 7A-10B - (03-72LE 4-Speed) AUTOMATIC TRANSMISSION UNIT REPAIR

Refer to SECTION 7A-10B in this manual for unit repair procedures. This section contains the disassembly, inspection, overhaul and assembly procedures for the mechanical components on the automatic transmission. It also includes information on gaging certain components, proper use of special tools, and torque specifications required for assembly.

### SECTION 7A-11B- (3L30 3-Speed) AUTOMATIC TRANSMISSION UNIT REPAIR

Refer to the Transmission/Transaxle/Transfer Case Unit Repair Manual. This manual contains the disassembly, inspection, overhaul and assembly procedures for the mechanical components in the transmission. Also included is the information on the gaging of certain components, proper use of special tools and torque specifications required for assembly.

### SECTION 7B - MANUAL TRANSMISSION ON-VEHICLE SERVICE

Refer to SECTION 7B in this manual for On-Vehicle Service. This section contains information on transmission identification, fluid level checking procedures and specific information for servicing some components while the transmission is in the vehicle. This section also contains procedures for the removal and installation of the transmission from the vehicle.

## SECTION 7B-4B - (2WD) or 7B-11(4WD) - MANUAL TRANSMISSION UNIT REPAIR

Refer to the Transmission/Transaxle/Transfer Case Unit Repair Manual. This manual contains the disassembly, inspection overhaul and assembly procedures for the mechanical components in the transmission. Also included is the information on the gaging of certain components, proper use of special tools and torque specifications required for assembly.

## SECTION 7C - CLUTCH

This section contains clutch assembly diagnosis, on-vehicle service of the flywheel, pressure plate/clutch disc removal and installation procedures, torque specification and special tools required.

## SECTION 7D - TRANSFER CASE

Refer to Section 7D in this manual for On-Vehicle Service. This section contains information to assist in diagnosing transfer case operating conditions when the unit is in the vehicle. Fluid level checking procedures and specific information for servicing some components while the transmission is in the vehicle. This section also contains procedures for the removal and installation of the transfer case from the vehicle.

## SECTION 7D - TRANSFER CASE UNIT REPAIR

Refer to the Transmission/Transaxle/Transfer Case Unit Repair Manual. This manual contains the disassembly, inspection overhaul and assembly procedures for the mechanical components in the transfer case. Also included is the information on the gaging of certain components, proper use of special tools and torque specifications required for assembly.

# SECTION 7A

# AUTOMATIC TRANSMISSION ON-VEHICLE SERVICE

**NOTICE:** Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. General Motors will call out those fasteners that require a replacement after removal. General Motors will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and joint clamping force, and may damage the fastener. When you install fasteners, use the correct sequence and tightening specifications. Following these instructions can help you avoid damage to parts and systems.

## CONTENTS

## GENERAL INFORMATION

The service procedures contained in this section are common to the Hydra-Matic 3L30, 3-speed automatic transmission and the Aisin 03-72LE, 4-speed electronic automatic transmission.

For complete electrical/hydraulic diagnosis of the 3L30, 3-speed automatic transmission, refer to SECTION 7A-11A. For complete electrical/hydraulic diagnosis of the 03-72LE, 4-speed electronic automatic transmission, refer to SECTION 7A-10A.

For complete 3L30, 3-speed automatic transmission unit repair procedures, refer to SECTION 7A-11B in the 1996 Transmission/Transaxle/Transfer Case Unit Repair Manual. For complete 03-72LE, 4-speed electronic automatic transmission unit repair procedures, refer to SECTION 7A-10B.

### TRANSMISSION IDENTIFICATION INFORMATION

#### *Figures 1 and 2*

The transmission identification plate, which contains the serial number, is located on the left side of the transmission case, just above the oil pan (Figure 1).

Additional transmission identification information can be found on the service parts identification label (Figure 2). This label contains information on regular production options (RPO) as well as standard and mandatory options. This label is affixed to the spare tire cover of each vehicle at the assembly plant. For additional information on the service parts identification label, refer to SECTION 0A.

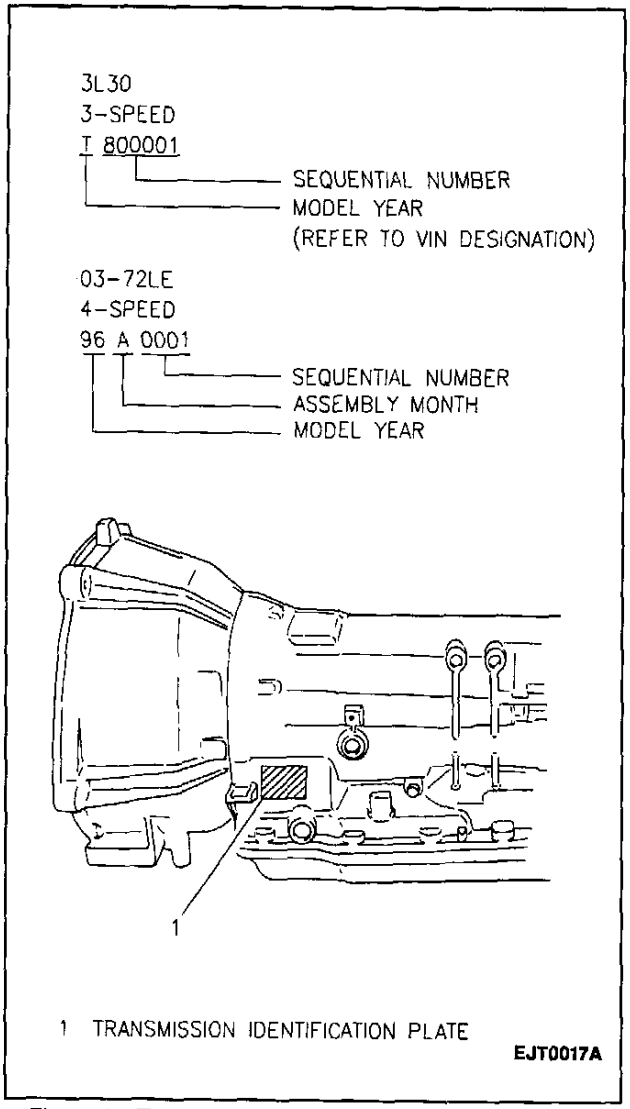



Figure 1—Transmission Identification Location (Typical)

## TRANSMISSION DEFINITIONS

The following definitions are being provided to establish a common language and assist the technician in describing automatic transmission related conditions. Some of these terms or conditions are used throughout the transmission sections of this manual.

### Throttle Positions

- **Minimum Throttle** - the least amount of throttle opening required for an upshift.
- **Light Throttle** - approximately 1/4 of accelerator pedal travel.
- **Medium Throttle** - approximately 1/2 of accelerator pedal travel.
- **Heavy Throttle** - approximately 3/4 of accelerator pedal travel.
- **Wide Open Throttle (WOT)** - full travel of the accelerator pedal.
- **Full Throttle Detent Downshift** - a quick application of the accelerator pedal to its full travel, forcing a downshift.
- **Zero Throttle Coastdown** - a full release of the accelerator pedal while the vehicle is in motion and in drive range.
- **Engine Braking** - a procedure where the engine is used to slow the vehicle by manually downshifting during a zero throttle coastdown.

### Shift Conditions

- **Bump** - a sudden and forceful application of a clutch or band.
- **Chuggle** - a bucking or jerking condition that may be engine related. May be most noticeable when the converter clutch is engaged. Similar to the feel of towing a trailer.
- **Delayed** - a condition where a shift is expected but does not occur for a period of time. Also defined as "Late" or "Extended."
- **Double Bump** (Double Feel) - two sudden applications of the clutch or band.
- **Early** - a condition where the shift occurs before the vehicle has reached a proper speed and tends to labor the engine after the upshift.
- **End Bump** - a firmer feel at the start of the shift as compared to the feel at the end of the shift. Also defined as "Feel" or "Slip Bump."
- **Firm** - a noticeably quick application of a clutch or band that is considered normal with a medium to heavy throttle shift.
- **Flare** - a quick release in engine rpm accompanied by a momentary loss of torque. This generally occurs during a shift and should not be confused with "Harsh." Also defined as "Slipping."

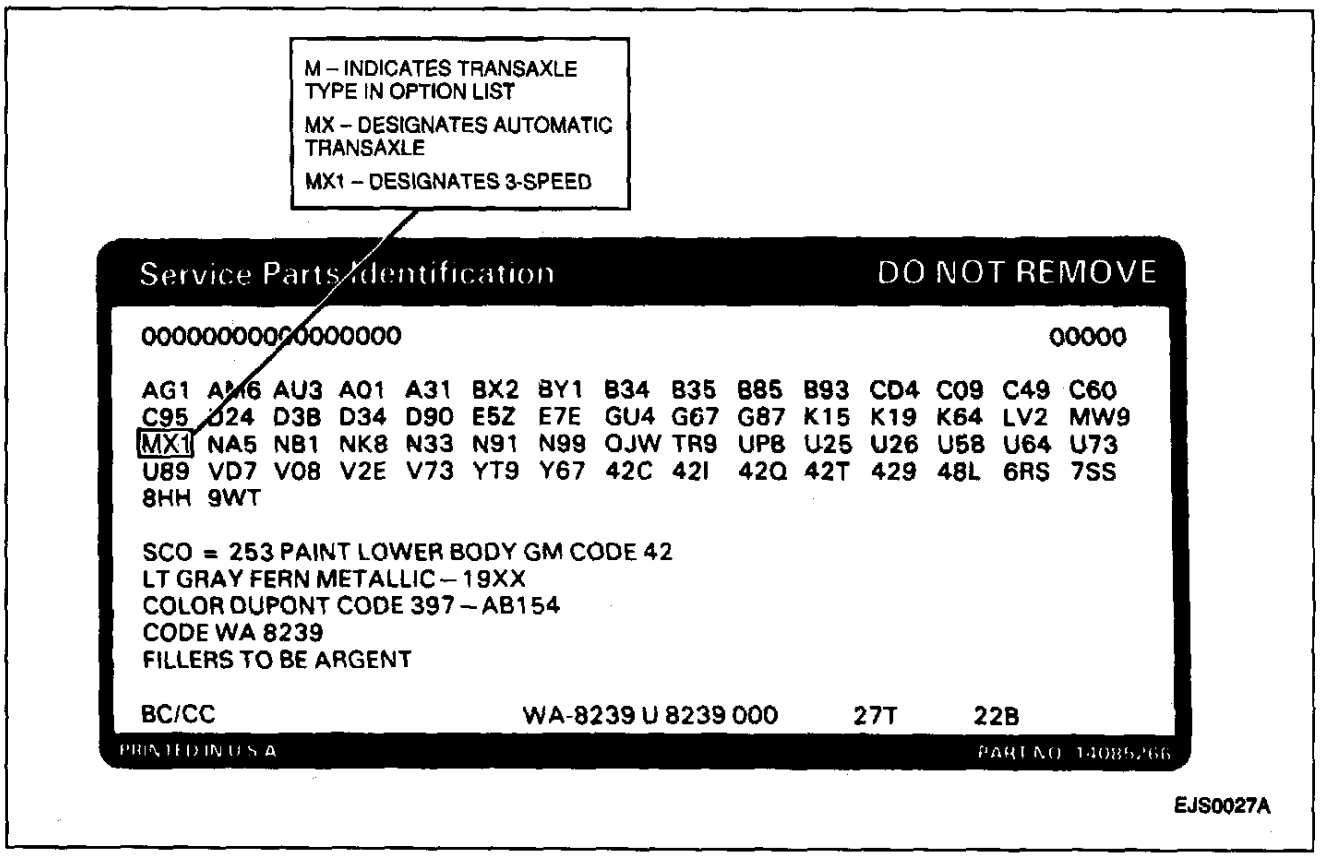



Figure 2—Service Parts Identification Label

- **Harsh** (Rough) - a more noticeable application of a clutch or band as compared to "Firm." This condition is considered undesirable at any throttle position.
- **Hunting** - a repeating quick series of upshifts and downshifts that causes a noticeable change in engine rpm. An example could be described as a 3-2-3-Shift pattern. Also defined as "Busyness."
- **Initial Feel** - a distinctly firmer feel at the start of a shift as compared to the finish of the shift.
- **Late** - a shift that occurs when the engine is at a higher than normal rpm for a given amount of throttle.
- **Shudder** - a repeated jerking sensation similar to "Chuggle" but more severe and rapid in nature. This condition may be most noticeable during certain ranges of vehicle speed. It may also be used to define the condition after converter clutch engagement.
- **Slipping** - a noticeable increase in engine rpm without a speed increase in the vehicle. A slip usually occurs during or after initial clutch or band engagement.
- **Soft** - a slow, almost unnoticeable clutch application with very little shift feel.
- **Surge** - a repeated engine related feeling of acceleration and deceleration that is less intense than "Chuggle."
- **Tie-Up** - a condition where two opposing clutches are attempting to engage at the same time causing the engine to labor with a noticeable loss of engine rpm.

### Noise Conditions

- **Drive Link Noise** - A whine or growl that increases and then fades with vehicle speed and is most noticeable under light throttle acceleration. It may also be noticeable in "P" (park) or "N" (neutral) operating ranges with the vehicle stationary.
- **Final Drive Noise** - A hum that is related to vehicle speed and is most noticed under light throttle acceleration.
- **Gear Noise** - A whine most noticeable in first gear and reverse, and is related to vehicle speed. A gear noise condition may become noticeable or go away after an upshift.
- **Pump Noise** - A high pitched whine that increases in intensity with engine rpm. This condition may also be noticeable in "P" (park) or "N" (neutral) operating ranges with the vehicle stationary.

## PRELIMINARY CHECKING PROCEDURES

The condition of an automatic transmission not operating properly may be influenced by one or a combination of the following items:

- Fluid level high or low. Refer to "Fluid Level Checking Procedures" later in this section.
- Engine performance. Refer to SECTION 6 or SECTION 6E.
- TV Cable adjustment. Refer to "TV Cable Adjustment " later in this section.
- Shift select cable adjustment. Refer to "Shift Select Cable" later in this section.
- Internal fluid leaks. Refer to SECTION 7A-10B for the 03-72LE, 4-speed electronic automatic transmission. For complete 3L30, 3-speed automatic transmission unit repair procedures, refer to SECTION 7A-11B in the 1996 Transmission/Transaxle/Transfer Case Unit Repair Manual.
- Electrical system. Refer to SECTION 7A-10A or SECTION 7A-11A and SECTION 8A.
- Transmission or other mechanical components. Refer to SECTION 7A-10B for the 03-72LE, 4-speed electronic automatic transmission. For complete 3L30, 3-speed automatic transmission unit repair procedures, refer to SECTION 7A-11B in the 1996 Transmission/Transaxle/Transfer Case Unit Repair Manual.

## NOISE AND VIBRATION ANALYSIS

A noise or vibration that is noticeable when the vehicle is in motion may not be the result of the transmission. If a noise or vibration is noticeable in "P" (park) or "N" (neutral) with the engine at idle, but is less noticeable as engine rpm increases, the cause may be from poor engine performance.

### Inspect

1. Tires for:
   - Uneven wear.
   - Imbalance.
   - Mixed sizes.
   - Mixed radial and bias ply. Refer to SECTION 3E.
2. Suspension components for:
   - Misalignment and wear.
   - Loose fasteners. Refer to SECTION 3C.
3. Engine/Transmission mounts for:
   - Excessive wear or damage.
   - Loose mounting bolts. Refer to SECTION 6A1, SECTION 7D, or "Transmission Assembly" later in this section.
4. Transmission case mounting holes for:
   - Missing bolts, nuts or studs.
   - Stripped threads.
   - Cracks.
5. Flywheel for:
   - Missing or loose bolts.
   - Cracks.
   - Imbalance. Refer to SECTION 6A1.
6. Torque converter for:
   - Missing or loose bolts or lugs.
   - Missing or loose balance weights.
   - Imbalance. Refer to SECTION 7A-10B for the 03-72LE, 4-speed electronic automatic transmission. For complete 3L30, 3-speed automatic transmission unit repair procedures, refer to SECTION 7A-11B in the 1996 Transmission/Transaxle/Transfer Case Unit Repair Manual.

## TRANSMISSION FLUID INFORMATION

### *Figures 3 and 4*

The automatic transmission fluid level can be checked by means of a fluid level indicator (dipstick), located in the rear of the engine compartment next to the bulkhead. By removing the fluid level indicator from the fluid filler tube, the amount of fluid can be gauged by the amount of fluid on the indicator. If the fluid level is found to be low, only Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, should be added. Use of any other type of transmission fluid could result in transmission or component failure. Checking fluid level, color and condition at regular intervals will provide early diagnosis information about the transmission (Figure 4). This information may be used to correct a condition that, if not detected early, could result in major transmission repairs. For more information refer to "Transmission Fluid Level Checking Procedures" later in this section.

**Important**

- When new automatic transmission fluid is red in color, it indicates that red dye was added to the fluid at the assembly plant to distinguish it from engine oil or engine coolant. This red dye is NOT an indication of fluid quality and is NOT permanent. As the vehicle is driven the fluid will become darker in color and may eventually appear light brown. However, if the fluid becomes extremely dark or loses viscosity, an internal transmission problem may exist.

## TRANSMISSION FLUID LEVEL CHECKING PROCEDURES

### Checking Fluid Level (Normal Operating Temperature)

### *Figures 3 and 4*

Be sure to check transmission fluid level at every engine oil change. Perform a fluid level check when transmission fluid is at normal temperature, 70 to 80° C (158 to 175° F). Driving the vehicle at 60 km/h (37 mph) in "D" range for 15 minutes will raise fluid temperature to the normal operating temperature. Fluid level check procedure is as follows:

1. Place vehicle on a level surface.
2. Apply parking brake and block vehicle wheels.
3. With selector lever in "P" position, start engine. DO NOT race engine.
4. Run engine at idle and move selector lever through each range, pausing for about three seconds in each range. Then return to the "P" position.

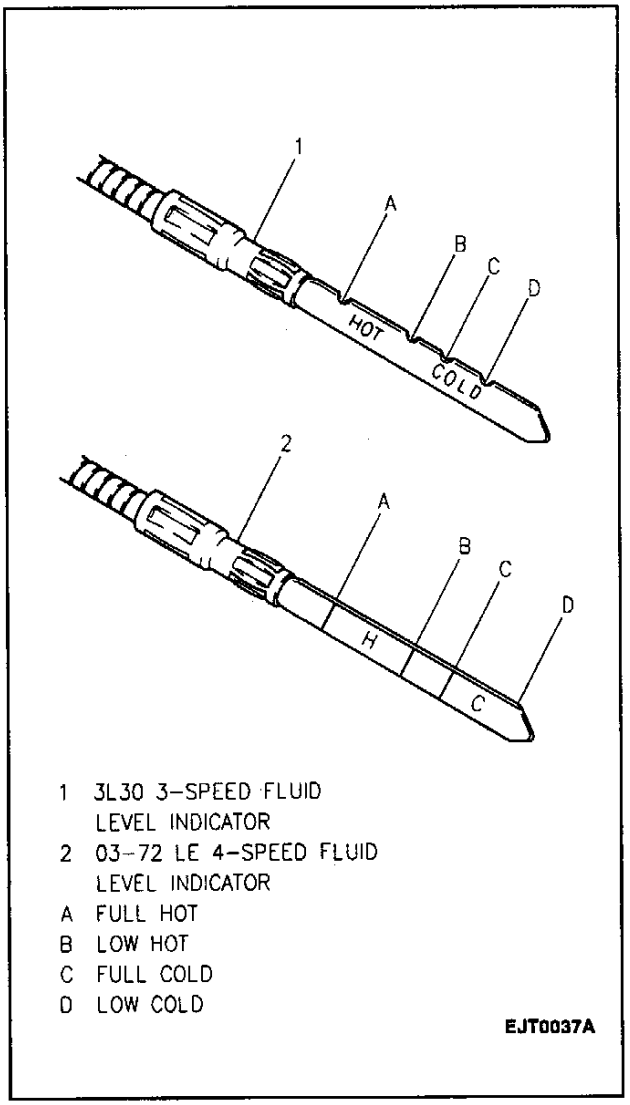



Figure 3—Fluid Level Indicator

5. Let engine idle for three minutes more.
6. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
7. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
8. Remove the indicator and check the fluid level (Figure 3). The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
9. If fluid was added, repeat steps 5 through 8.

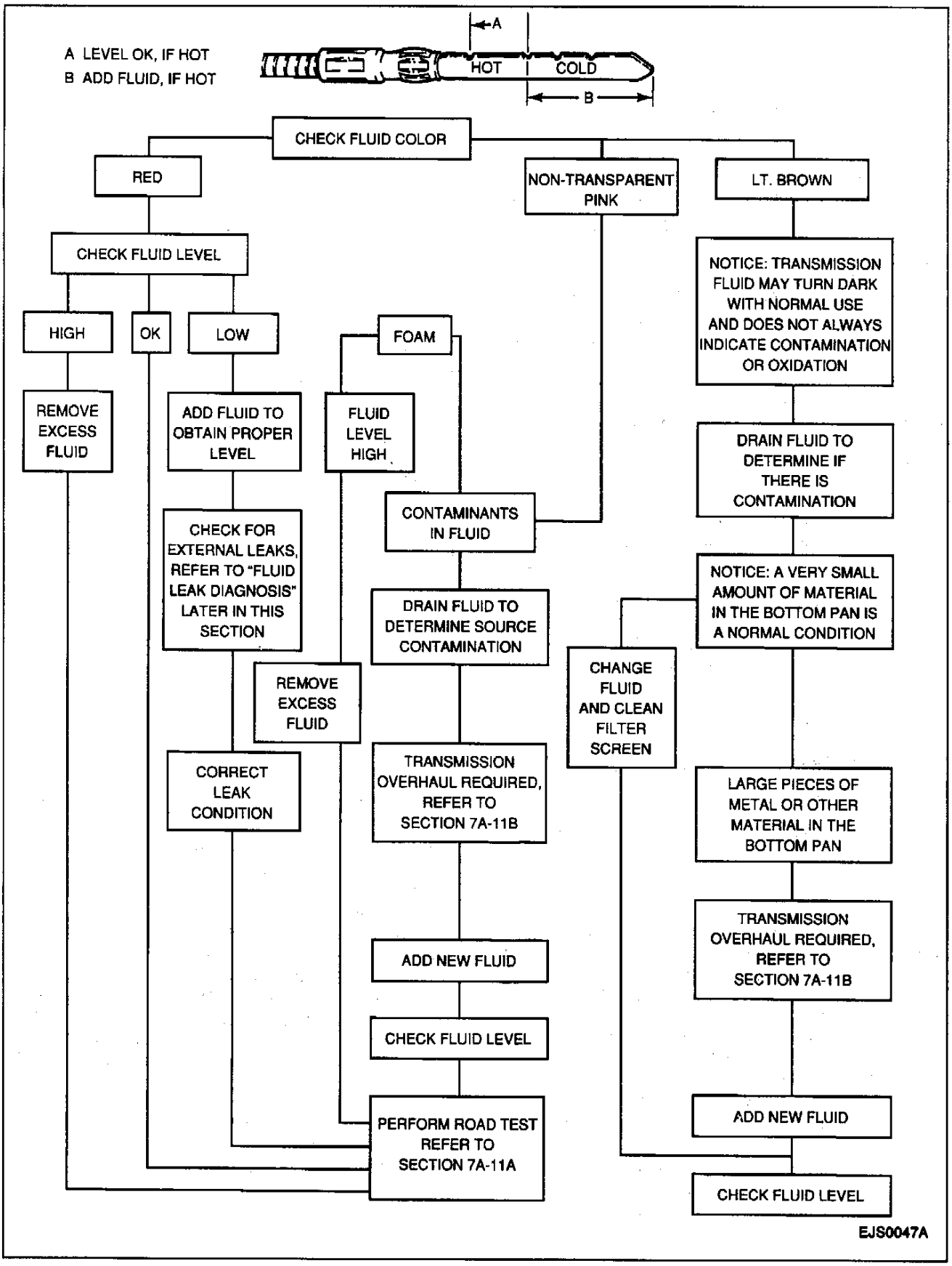



Figure 4—Checking Fluid Color and Condition (Typical)

### Checking Fluid Level (Room Temperature)

*Figures 3 and 4*

If the transmission has been overhauled or the fluid has been drained for oil pan and/or valve body service, refill the transmission after assembly and check its level according to the following procedures:

1. Place vehicle on level surface.
2. Apply parking brake and block vehicle wheels.
3. With selector lever in "P" position, start engine and run at idle for five minutes. DO NOT race engine.
4. With engine running at idle, check the level on the fluid level indicator (Figure 3). Fluid level should be between "FULL COLD" and "LOW COLD" marks. If fluid level is below the "LOW COLD" mark, add fluid to bring the level between the "LOW COLD" and "FULL COLD" marks. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent. DO NOT overfill.

**NOTICE:** DO NOT overfill automatic transmission. Overfilling may cause foaming and loss of fluid through the vent. Transmission slippage and mechanical failure may result.

## GENERAL SERVICE PROCEDURES

### PARTS CLEANING, INSPECTION and REPLACEMENT

Use appropriate safety equipment such as:

- Safety glasses.
- Safety shoes.
- Gloves.

**NOTICE:** The automatic transmission is an assembly that relies on hydraulic operation. This unit contains many seals, O-rings and gaskets that are set to very close tolerances. Any introduction of foreign matter can cause a hydraulic failure. Therefore, all facets of repair operations must be carried out in a clean work environment.

- Keep work areas and tools clean.
- Clean transmission exterior before removing parts.
- DO NOT use wipe cloths or rags.
- DO NOT use solvents on:
- Rubber seals.
- Plastic/Teflon® thrust washers or spacers.
- Blow out all fluid passages with compressed air.
- Clean out small passages with fine wire.
- Handle all parts carefully to prevent damage.

**NOTICE:** The assembly of some components will require the use of an assembly lube. It is recommended that J 36850 Transjel® transmission assembly lubricant be used during assembly. DO NOT use any type of grease to retain parts during assembly of this unit. Lubricants other than the recommended assembly lube may change transmission fluid characteristics, cause undesirable shift conditions and/or fluid pump intake clogging.

- When installing screws, bolts or studs into aluminum, always dip the threaded portion in J 36850.

**NOTICE:** DO NOT use air powered tools to disassemble or assemble transaxles. Improper bolt torques can contribute to transmission failure. This information, vital to diagnosis, can only be detected with hand tools.

- Observe and follow all torque specifications.
- Recondition stripped or damaged aluminum threads with thread inserts.
- Use only the gaskets or sealers discussed in this section.
- Replace Teflon® and rubber lip seals only when necessary and install using the appropriate seal installer.

#### Inspect

1. Manual linkages and cables for:
   - Bent or broken links and rods.
2. All seals, gaskets, O-ring seals and mating surfaces for:
   - Nicks.
   - Cuts.
   - Damage.
3. Snap rings for:
   - Expansion or compression.
   - Distortion.
   - Nicks.
   - Proper ring to groove fit.
4. Bearing and thrust surfaces for:
   - Wear.
   - Scoring.
   - Pitting.

### FLYWHEEL/TORQUE CONVERTER VIBRATION TEST PROCEDURE

#### Inspect

1. With manual selector in "P" (park) position, start engine.
2. With engine at idle, note any abnormal vibration.
3. Shift selector lever to "N" and note any abnormal vibration.
4. Return shift selector lever to "P" position and turn ignition switch off.

5. Raise and suitably support vehicle. Refer to SECTION 0A.
6. Remove three bolts and flywheel inspection cover (3L30, 3-Speed).
7. Remove two flywheel inspection cover bolts, one case left stiffener and flywheel inspection cover (03-72LE, 4-Speed).
8. Remove three flywheel-to-torque converter bolts.
9. Rotate torque converter 120 degrees (1/3 turn).
10. Install the three flywheel-to-torque converter bolts.

**Tighten**

- 3L30, 3-Speed:
  — Flywheel-to-torque converter bolts to 55 N.m (40 lb. ft.).
- 03-72LE, 4-Speed:
  — Flywheel-to-torque converter bolts to 60 - 70 N.m (44 - 52 lb. ft.).

11. Install flywheel inspection cover and secure with bolts.

**Tighten**

- Flywheel inspection cover bolts to 10 N.m (89 lb. in.).

12. Left case stiffener bolt (03-72LE, 4-Speed).

**Tighten**

- Case left stiffener bolt to 40 - 60 N.m (44 lb. ft.).

13. Install flywheel inspection plug (03-72LE, 4-Speed).
14. Lower vehicle.
15. With manual selector in "P" (park) position, start engine.
16. If any abnormal vibration still exists, repeat this procedure until the best possible balance is obtained. For more information on torque converter evaluation, refer to SECTIONS 7A-10A and 7A-11A.

## FLUID LEAK DIAGNOSIS

The cause of most external leaks can be located and repaired with the transmission in the vehicle. There are three methods for locating automatic transmission fluid leaks.

### General Method

1. Verify that the leak is transmission fluid.
2. Thoroughly clean the suspected leak area.
3. Drive the vehicle for 24 km (15 miles) or until normal operating temperatures are reached.
4. Park the vehicle over clean paper or cardboard.
5. Turn ignition switch off and wait approximately 30 minutes.
6. Inspect paper for spots in proportion to its position under the transmission assembly.
7. Make the necessary repairs.

### Powder Method

1. Thoroughly clean the suspected leak area with solvent.
2. Apply an aerosol powder or baby powder to the suspected leak area.
3. Drive the vehicle for 24 km (15 miles) or until normal operating temperatures are reached.
4. Turn ignition switch off.
5. Inspect the suspected leak area and trace the leak path through the powder to find the source.
6. Make the necessary repairs.

### Dye and Black Light Method

Tools Required:
J 28428-D High Intensity Black Light
J 28431-6 Fluorescent Oil Additive

1. Add 30 ml (1 oz.) of J 28431-6 into the automatic transmission fluid filler tube.
2. Drive vehicle for 24 km (15 miles) or until normal operating temperatures are reached.
3. Turn ignition switch off.
4. Using a J 28428-D, locate the source of the leak.
5. Make the necessary repairs.

## FLUID LEAK REPAIR

Once the leak has been pinpointed and traced back to its source, the cause of the leak must be determined for it to be properly repaired. For example, if a gasket is replaced but the sealing flange is bent, the new gasket will not repair the leak. The bent flange must also be repaired. Before attempting to repair a leak, certain conditions should be checked and corrected if necessary. The following conditions may cause a leak:

### Gasket Leakage

- Fluid level/pressure is too high.
- Plugged vent or drain-back holes.
- Improperly torqued fasteners, dirty or damaged threads.
- Warped flanges or sealing surfaces.
- Scratches, burrs or other damage to the sealing surfaces.
- Damaged or worn gasket.
- Cracking or porosity of the component.
- Improper sealant used, where applicable.
- Incorrect gasket.

### Seal Leakage

- Fluid level/pressure is too high.
- Plugged vent or drain-back holes.
- Damaged seal bore.
- Damaged or worn seal.
- Improper installation.
- Cracks in component.
- Scratched, nicked or damaged, manual or output shaft surfaces.
- Loose or worn bearing causing excess seal wear.

## Possible Points of Fluid Leaks

*Figures 5 and 6*

### Transmission Fluid Pan Leakage

**Inspect**

1. For incorrectly tightened attaching bolts.
2. For improperly installed or damaged gasket.
3. For damaged fluid pan.
4. For incorrect gasket.
5. For improperly installed or loose drain plug/gasket (03-72LE, 4-speed models only).

### Vent Leakage

**Inspect**

1. Fluid level indicator for overfilled system.
2. Fluid color for water or coolant in fluid. Fluid will appear milky.
3. For incorrect fluid level indicator.
4. For plugged or restricted vent.
5. For plugged or restricted drain-back holes.
6. For mispositioned fluid pump-to-case gasket.
7. For porous casting.

### Case Leakage

**Inspect**

1. For damaged or missing filler tube O-ring.
2. For incorrectly installed or missing filler tube bracket.
3. For missing, damaged, or improperly installed line pressure tap O-ring.
4. For missing, damaged, or improperly installed Vehicle Speed Sensor (VSS) O-ring seal (03-72LE, 4-speed models only).
5. For missing, damaged, or improperly installed solenoid wiring harness O-ring seal (03-72LE, 4-speed models only).
6. For missing, damaged or improperly installed TV cable seal.
7. For missing or incorrectly installed extension housing-to-transmission case gasket.
8. For loose or damaged fluid cooler pipe fittings.
9. For damaged speedometer driven gear seal (two-wheel drive models).
10. For manual shift shaft fluid seal(s).
11. For damaged, missing or improperly installed transmission case-to-converter housing gasket.
12. For worn or damaged extension housing seal.
13. For porous casting.

### Converter Side Leakage

1. Converter seal damaged:
   — Seal lip cut (Check converter hub for damage).
   — Garter spring missing from seal.
2. Converter leak in weld area (Replace torque converter).
3. Worn or damaged pump seal.
4. Porous casting (Case or pump).

### Fluid Out the Vent or Filler Tube

- Overfilled.
- Water or coolant in fluid (fluid will appear milky).
- Porous casting.
- Incorrect fluid level indicator.
- Plugged vent.
- Drain-back holes plugged.

### CASE POROSITY REPAIR

1. Clean the leak area with solvent and air dry.

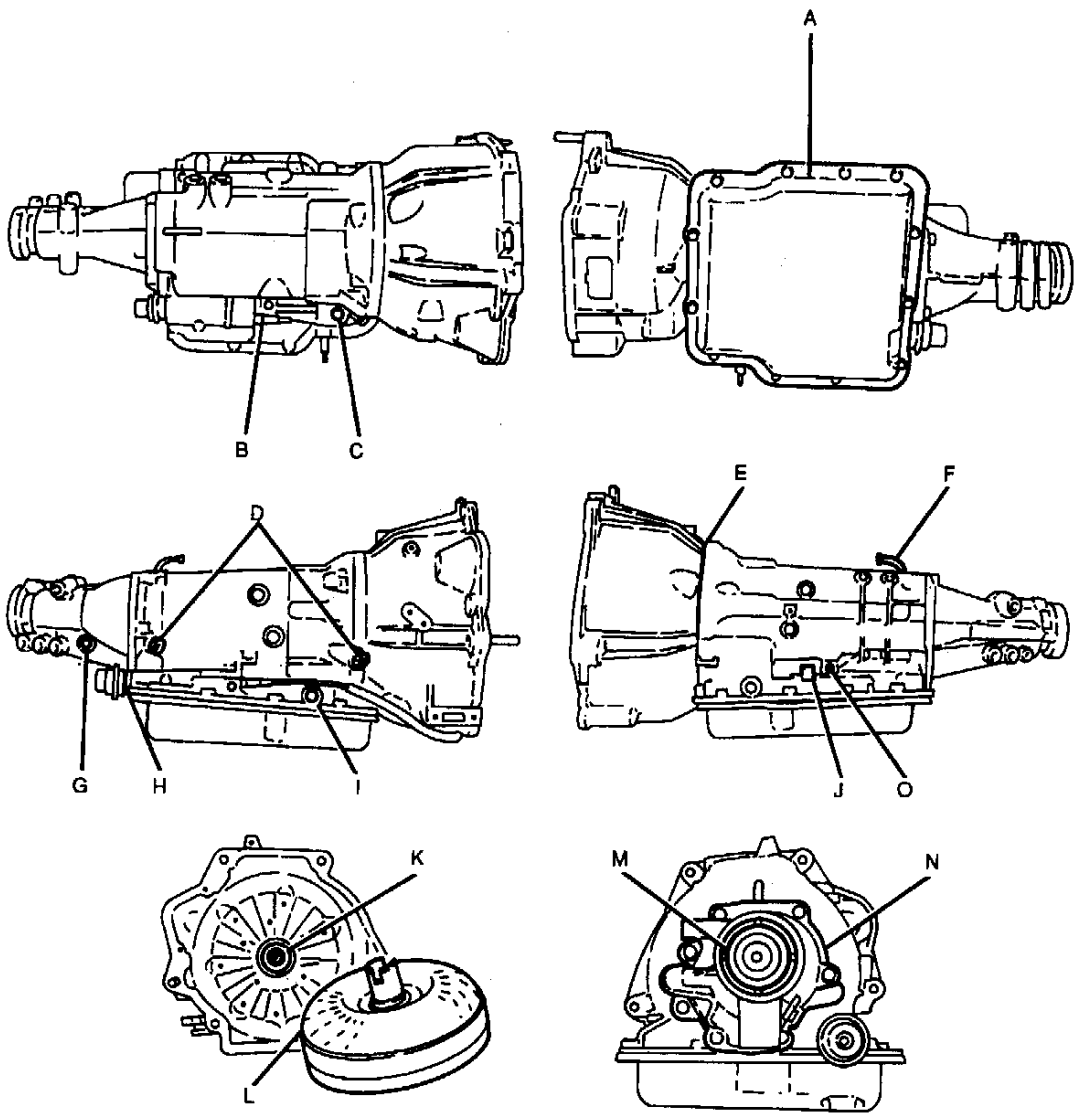
**CAUTION: Epoxy cement may cause skin irritation and eye damage. Read and follow all information on the container label as provided by the manufacturer.**

2. Mix a sufficient amount of epoxy cement GM P/N 1052533, or equivalent, following the manufacturer's recommendations.
3. While the transmission case is hot, apply epoxy cement with a clean, dry soldering acid brush.
4. Allow the epoxy cement to cure for three hours before starting the engine.
5. Repeat fluid leak diagnosis procedure to verify the repair.

## TORQUE CONVERTER CLUTCH (TCC) ELECTRICAL CONTROLS (3L30, 3-Speed)

The torque converter clutch (TCC) system uses controls that are internal as well as external to the transmission. Internal components of the TCC system include:

1. **TCC Solenoid Assembly** - Energizes to redirect transmission fluid to the converter clutch control valve in the fluid pump assembly.
2. **Fluid Pressure Switch** - Closes when the transmission is in third gear to complete the electrical circuit of the TCC solenoid to the engine control module.
3. **Fluid Pump Assembly** - Contains the TCC control valve. The TCC control valve determines the method of fluid feed to the torque converter assembly in order to enable or disable the clutch mechanism.




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | TRANSMISSION FLUID PAN SEAL | F | VENT | K | INPUT SHAFT SEAL | | |
| B | TV CABLE SEAL | G | SPEEDOMETER DRIVEN GEAR SEAL | L | TORQUE CONVERTER | | |
| C | FLUID FILLER TUBE SEAL | | | M | EXTENSION HOUSING SEAL | | |
| D | TRANSMISSION COOLER PIPE FITTINGS | H | MODULATOR SEAL | N | EXTENSION HOUSING-TO-TRANSMISSION CASE SEAL | | |
| E | CONVERTER HOUSING SEAL | I | MANUAL SHIFT SHAFT SEAL | | | | |
| | | J | TCC CONNECTOR SEAL | O | LINE PRESSURE TAP | | |

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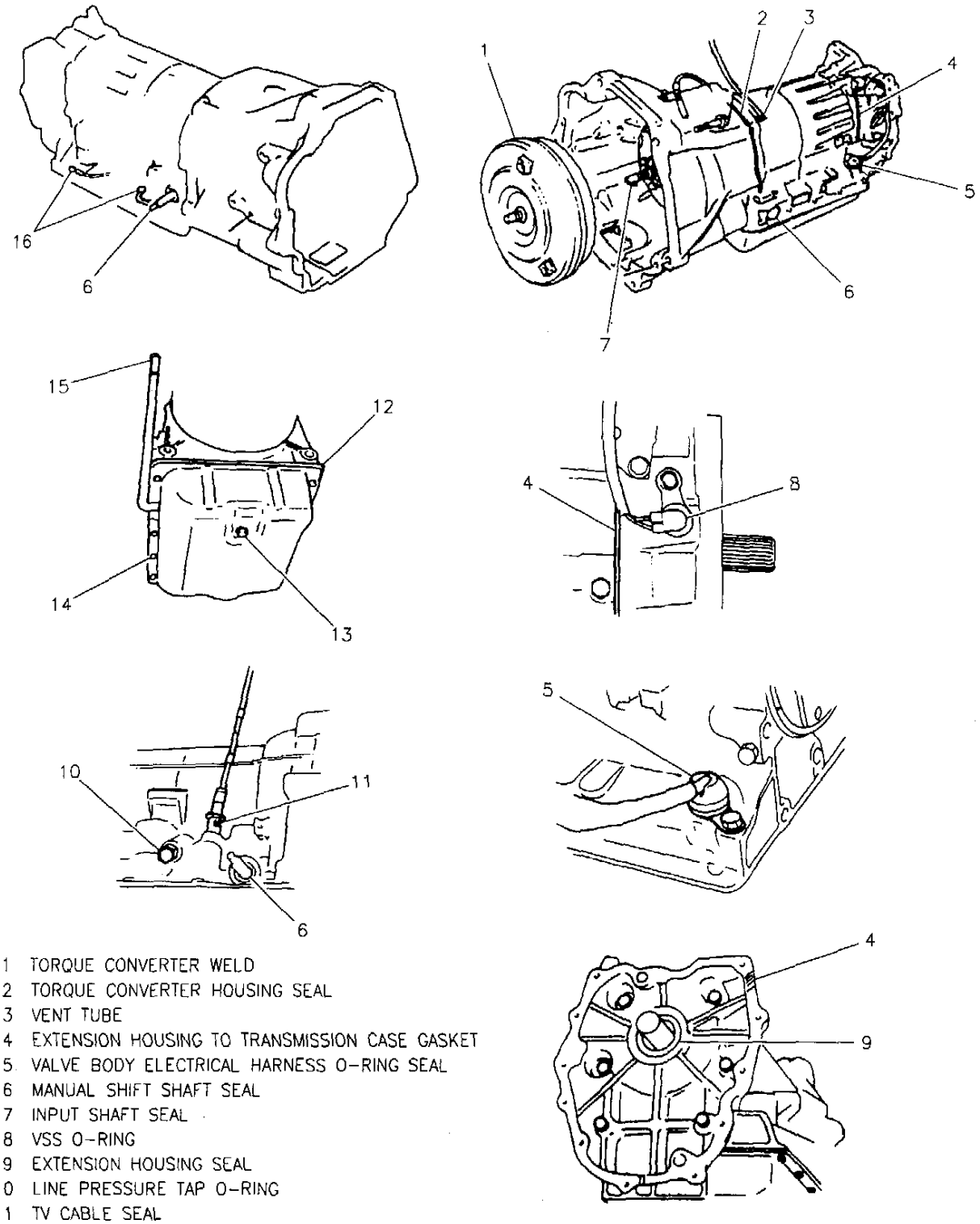
Figure 5—Possible Points of Fluid Leaks (3L30, 3-Speed)




1 TORQUE CONVERTER WELD
2 TORQUE CONVERTER HOUSING SEAL
3 VENT TUBE
4 EXTENSION HOUSING TO TRANSMISSION CASE GASKET
5 VALVE BODY ELECTRICAL HARNESS O-RING SEAL
6 MANUAL SHIFT SHAFT SEAL
7 INPUT SHAFT SEAL
8 VSS O-RING
9 EXTENSION HOUSING SEAL
10 LINE PRESSURE TAP O-RING
11 TV CABLE SEAL
12 TRANSMISSION FLUID PAN SEAL
13 DRAIN PLUG SEAL
14 TRANSMISSION FLUID PAN BOLTS
15 FLUID LEVEL TUBE SEAL
16 TRANSMISSION COOLER PIPE FITTINGS

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Figure 6—Possible Points of Fluid Leaks (03-72LE, 4-Speed)

The external control components of the TCC system include:

1. **Stoplamp Switch** - To avoid stalling the engine when braking, the converter clutch is released any time the brakes are applied.
2. **Engine Control Module** (ECM) - Receives input signals and grounds the TCC solenoid to apply the clutch mechanism when proper operating conditions are met.
3. **Throttle Position (TP) Sensor** - Sends throttle position information to the engine control module.
4. **Manifold Absolute Pressure (MAP) Sensor** - Sends engine vacuum (load) information to the engine control module.
5. **Vehicle Speed Sensor (VSS)** - Sends vehicle speed information to the engine control module.
6. **Engine Coolant Temperature (ECT) Sensor** - Sends engine coolant temperature information to the engine control module.

## TORQUE CONVERTER CLUTCH (TCC) ELECTRICAL CONTROLS (03-72LE, 4-Speed)

The torque converter clutch (TCC) system uses controls that are internal as well as external to the transmission. Internal components of the TCC system include:

1. **TCC Solenoid Assembly** - Energizes to redirect transmission fluid to the converter clutch control valve in the fluid pump assembly.
2. **Fluid Pump Assembly** - Contains the TCC control valve. The TCC control valve determines the method of fluid feed to the torque converter assembly in order to enable or disable the clutch mechanism.
3. **TCC Control Valve** - Houses the TCC solenoid assembly.

The external control components of the TCC system include:

1. **Stoplamp Switch** - To avoid stalling the engine when braking, the converter clutch is released any time the brakes are applied.
2. **Engine Control Module** (ECM) - Works hand in hand with the TCM to receive input signals and supplies them to the TCM.
3. **Transmission Control Module** (TCM) - Is an electronic component that controls gear shift and idle - up according to the signals from each sensor. It receives input signals and controls the operation of the solenoid valves that apply the clutch mechanism when proper operating conditions are met.
4. **Throttle Position (TP) Sensor** - Sends throttle position information to the transmission control module.
5. **Vehicle Speed Sensor (VSS)** - Sends vehicle speed information to the transmission control module.
6. **Engine Coolant Temperature (ECT) Sensor** - Sends engine coolant temperature information to the transmission control module.
7. **Cruise Control Module** (If equipped) - Sends cruise control information to the transmission control module.

## TORQUE CONVERTER CLUTCH (TCC) DIAGNOSIS

To properly diagnose the torque converter clutch (TCC) system, perform all electrical testing first. Refer to "Torque Converter Clutch" in SECTION 6E3 and SECTION 7A-11A (3L30, 3-speed automatic transmission) or SECTION 7A-10A (03-72LE, 4-speed electronic automatic transmission) for additional information. For an electrical schematic of the TCC system, refer to SECTION 8A.

# ON-VEHICLE SERVICE

## BRAKE TRANSMISSION SHIFT INTERLOCK (BTSI)

### Manual Selector

***Figures 7, 8 and 9***

**Remove or Disconnect**

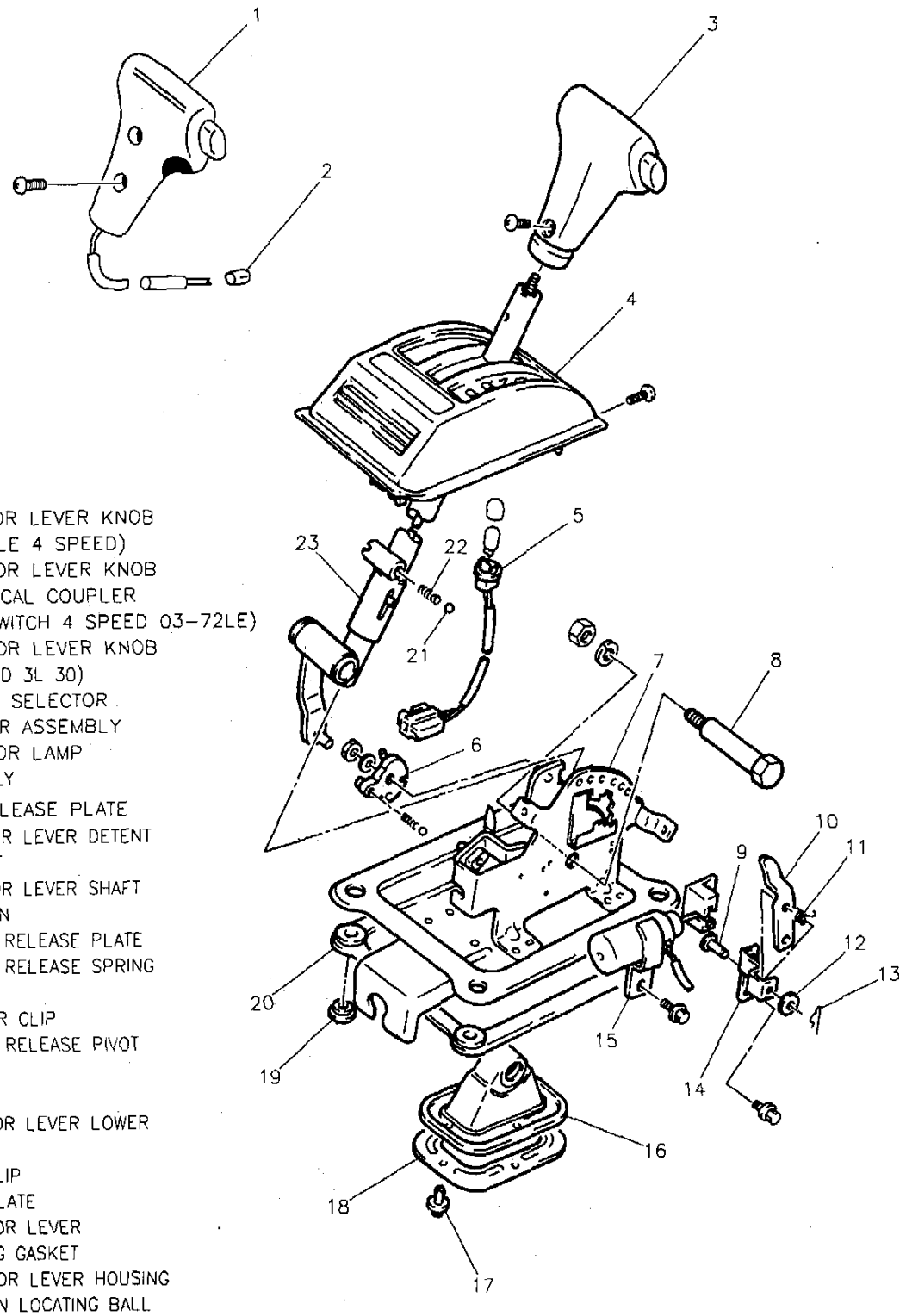
1. Negative (-) battery cable.
2. Two screws, two plastic retaining clips and console box from floor (Figure 7).
3. Shift lock solenoid electrical connector under carpet (Figure 8).
4. Shift indicator lamp electrical connector under carpet (Figure 8).
5. Two bolts and shift lock solenoid from selector lever detent bracket (Figure 7).
6. Two bolts and manual release pivot plate from selector lever detent bracket (Figure 7).

**Install or Connect**

1. Manual release pivot plate to manual selector detent bracket; secure with two bolts (Figure 7).
2. Shift lock solenoid to selector lever detent bracket; secure with two bolts (Figure 7).
3. Shift indicator lamp electrical connector under carpet (Figure 8).
4. Shift lock solenoid electrical connector under carpet (Figure 8).
5. Console box to floor; secure with two plastic retaining clips and two screws (Figure 7).
6. Negative (-) battery cable.

**Tighten**

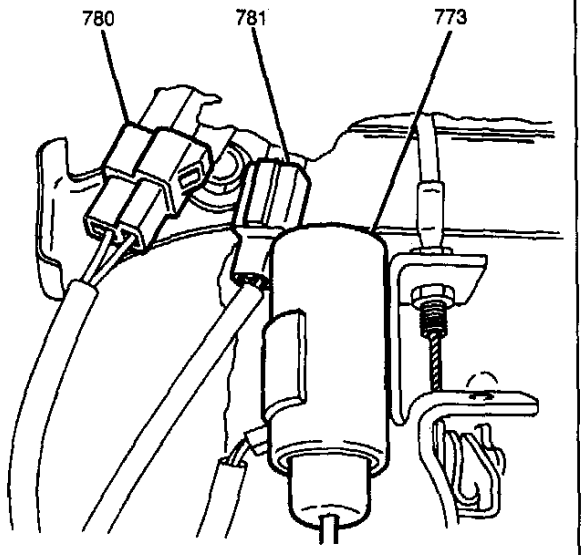
- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).




1 SELECTOR LEVER KNOB (03–72LE 4 SPEED)
2 SELECTOR LEVER KNOB ELECTRICAL COUPLER (O/D SWITCH 4 SPEED 03–72LE)
3 SELECTOR LEVER KNOB (3-SPEED 3L 30)
4 MANUAL SELECTOR INDICATOR ASSEMBLY
5 INDICATOR LAMP ASSEMBLY
6 KEY RELEASE PLATE
7 SELECTOR LEVER DETENT BRACKET
8 SELECTOR LEVER SHAFT
9 JOINT PIN
10 MANUAL RELEASE PLATE
11 MANUAL RELEASE SPRING
12 WASHER
13 RETAINER CLIP
14 MANUAL RELEASE PIVOT PLATE
15 BTSI
16 SELECTOR LEVER LOWER BOOT
17 BOOT CLIP
18 BOOT PLATE
19 SELECTOR LEVER HOUSING GASKET
20 SELECTOR LEVER HOUSING
21 POSITION LOCATING BALL
22 POSITION LOCATING SPRING
23 SELECTOR LEVER

EJT0067A

Figure 7—Manual Selector




773 SHIFT LOCK SOLENOID
780 SHIFT LOCK SOLENOID ELECTRICAL CONNECTOR
781 SHIFT INDICATOR LAMP ELECTRICAL CONNECTOR
EJS0077A

Figure 8—Shift Lock Solenoid and Shift Indicator Electrical Connections

## Shift Select Cable

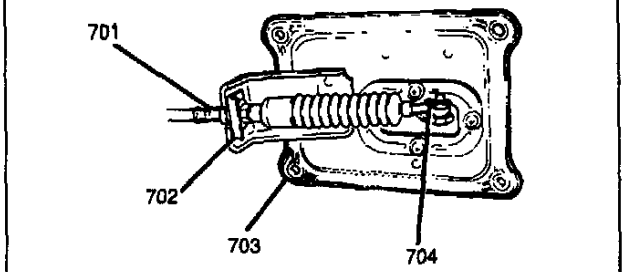
***Figures 7 through 12***

### Remove or Disconnect

1. Negative (-) battery cable.
2. Place manual selector in "N" (neutral) position.
3. Two screws, two plastic retaining clips and console box from floor (Figure 7).
4. Shift lock solenoid electrical connector under carpet (Figure 8).
5. Shift indicator lamp electrical connector under carpet (Figure 8).
6. Four bolts and manual selector from floor (Figure 7).
7. Retaining clip, washer, E-clip and shift select cable from selector lever (Figure 9).
8. Raise and suitably support vehicle. Refer to SECTION 0A.
9. Select cable locknut and shift select cable from manual shift lever (Figure 10).
10. E-clip from shift select cable bracket on transmission and shift select cable from vehicle (Figure 9).

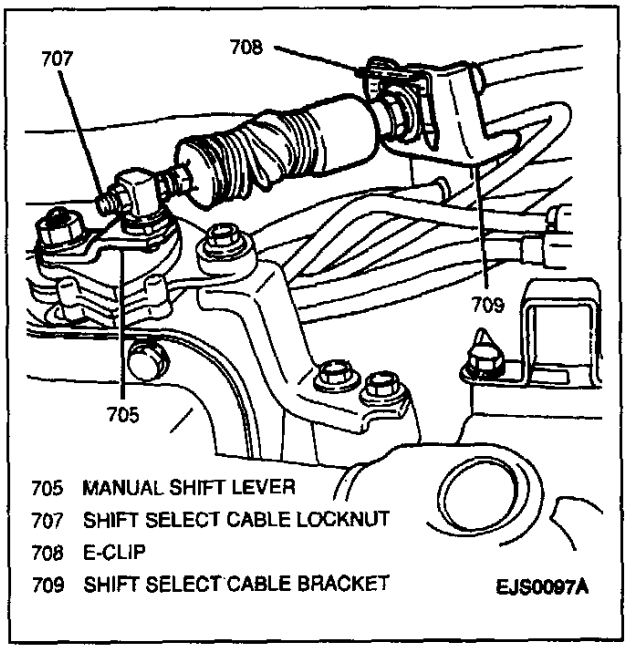
### Inspect

- Shift select cable for fraying or kinks. Replace as necessary.




701 SHIFT SELECT CABLE ASSEMBLY
702 E-CLIP
703 MANUAL SELECTOR
704 CABLE END CLIP
EJS0087A

Figure 9—Shift Select Cable at Manual Selector




705 MANUAL SHIFT LEVER
707 SHIFT SELECT CABLE LOCKNUT
708 E-CLIP
709 SHIFT SELECT CABLE BRACKET
EJS0097A

Figure 10—Shift Select Cable at Manual Shift Lever (Typical)

### Install or Connect

1. Place manual shift lever in "L" (low) position (Figure 11).
2. Shift select cable into shift select cable bracket at transmission; secure with E-clip.
3. Shift select cable into manual shift lever while moving manual shift lever back to the "N" (neutral) position; secure with select cable locknut. Do not tighten fully (Figure 12).
4. Lower vehicle to where access is possible to both the manual selector and the manual shift lever.
5. Shift select cable to selector lever; secure with E-clip, washer and retaining clip (Figure 9).

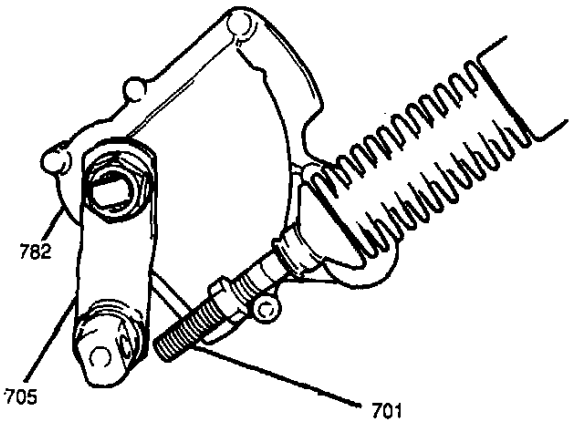
### Inspect

- Both ends of the shift select cable making sure no cable deflection exists.

### Tighten

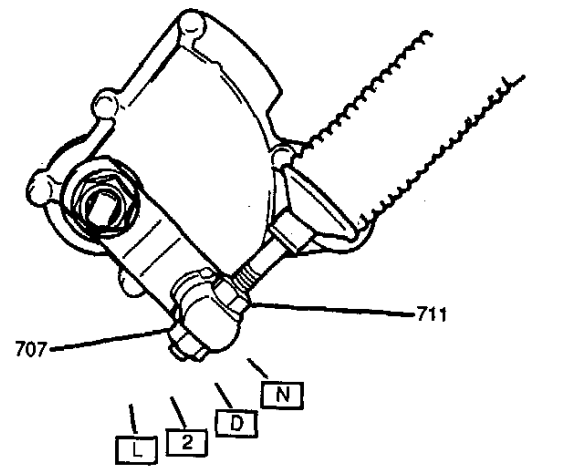
- Shift select cable locknut to 7 N.m (62 lb. in.).

6. Completely lower vehicle.
7. Manual selector to floor; secure with four bolts (Figure 7).




701 SHIFT SELECT CABLE
705 MANUAL SHIFT LEVER
782 PARK/NEUTRAL POSITION (PNP) SWITCH EJS0107A

Figure 11—Manual Shift Lever in "L" Position (Typical)




707 SHIFT SELECT CABLE LOCKNUT
711 SHIFT SELECT CABLE ADJUST NUT EJS0117A

Figure 12—Shift Select Cable Locknut Installation (Typical)

### Tighten

- Manual selector bolts to 18 N.m (13 lb. ft.).

8. Shift indicator lamp electrical connector under carpet (Figure 8).
9. Shift lock solenoid electrical connector under carpet (Figure 8).
10. Console box to floor; secure with two plastic retaining clips and two screws (Figure 7).
11. Place manual selector in "P" (park) position.
12. Negative (-) battery cable.

### Tighten

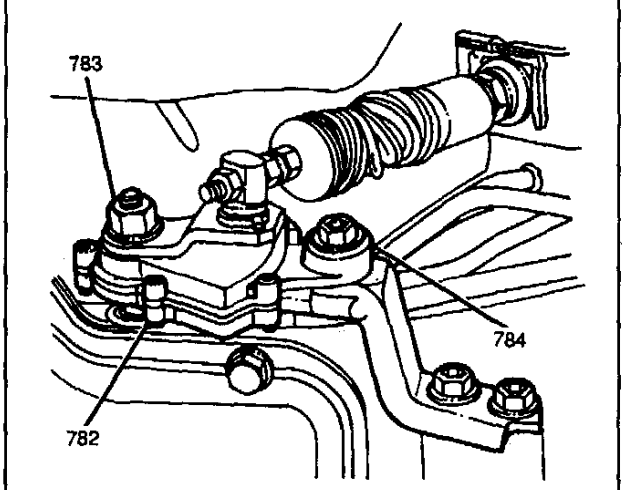
- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

## Park/Neutral Position (PNP) Switch (3L30, 3-Speed) or Transmission Range Switch (03-72LE, 4-SPEED)

*Figures 13 and 14*

### Remove or Disconnect

1. Negative (-) battery cable.
2. Place manual selector in "N" (neutral) position.
3. Raise and suitably support vehicle. Refer to SECTION 0A.
4. One nut, one washer and manual shift lever from manual shift shaft (Figure 13).
5. One bolt and PNP switch from manual shift shaft (Figure 13).
6. PNP switch electrical connectors under intake manifold and PNP switch from vehicle.




782 PARK/NEUTRAL POSITION (PNP) SWITCH
783 MANUAL SHIFT SHAFT NUT
784 PNP SWITCH BOLT EJS0127A

Figure 13—PNP Switch/Transmission Range Switch

### Install or Connect

1. PNP switch four terminal electrical C2 connectors under intake manifold, leaving the two terminal C1 connectors disconnected.
2. PNP switch onto manual shift shaft; secure with one bolt. Do not tighten fully.
3. Manual shift lever to manual shift shaft; secure with one washer and one nut. Do not tighten fully.

### Adjust

Tool Required:
J 39200 Digital Multimeter

- PNP switch by attaching the two probes of a J 39200 to either side of the two terminal C1 connectors (Figure 14).

A. Pivot the PNP switch as far clockwise (downward) as possible.
B. Slowly pivot the PNP switch counterclockwise (upward) until a click noise is heard and continuity is obtained on the J 39200.

### Tighten

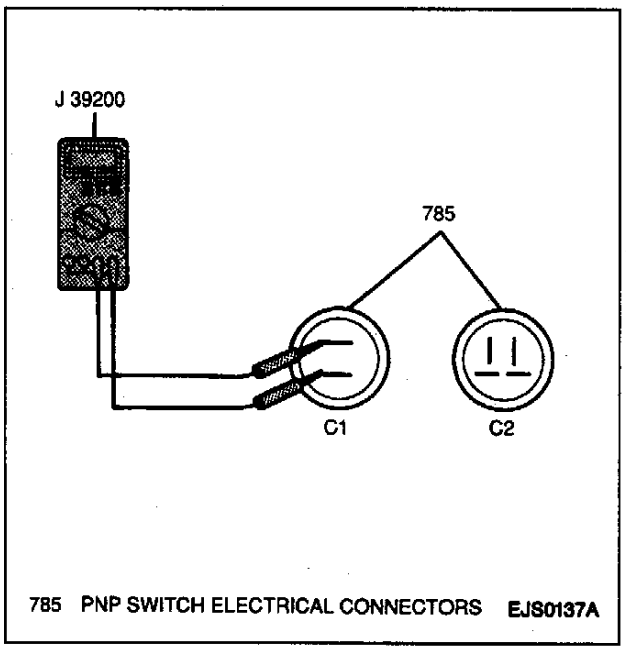
1. PNP switch bolt to 21 N.m (15 lb. ft.).
2. Manual select lever nut to 19 N.m (14 lb. ft.).

C. Connect the two terminal C1 PNP switch electrical connectors.

4. Lower vehicle.
5. Negative (-) battery cable.

### Tighten

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).




785 PNP SWITCH ELECTRICAL CONNECTORS EJS0137A

Figure 14—PNP Switch/Transmission Range Switch Electrical Connectors

### Important

- Upon completion of PNP switch installation, perform the following steps to ensure proper operation:

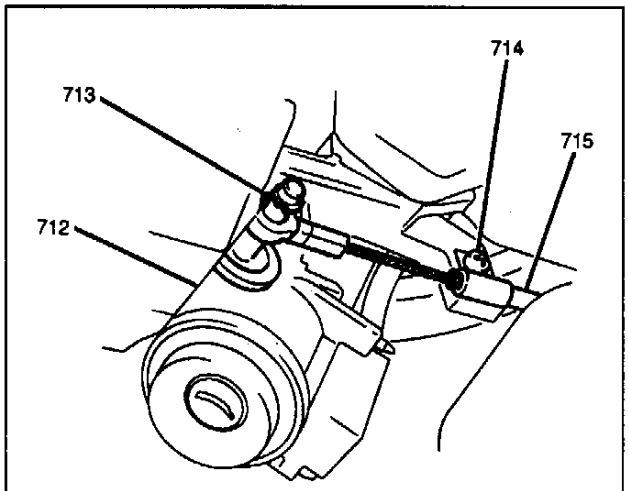
A. Apply parking brake and block vehicle wheels.
B. With the manual selector lever in "P" (park) position, turn ignition switch to "START" and verify that the starter motor operates.
C. Stop engine and return ignition switch to "ON" position.
D. Move shift selector lever from "P" to "N" (neutral) position, turn ignition switch to "START" position and verify that the starter motor operates.
E. Verify that the starter motor DOES NOT operate in "D," "2," "L," or "R" positions.

## Interlock Cable

***Figures 15, 16 and 17***

### Remove or Disconnect

1. Negative (-) battery cable.
2. Two screws, two plastic retaining clips and console box from floor.
3. Six screws and steering column upper and lower covers from steering column.
4. One C-clip, bracket retaining screw and interlock cable from ignition switch and out from under instrument panel (Figure 15).
5. Interlock cable nut (Figure 16).
6. Interlock cable end from key release plate at manual selector (Figure 16).
7. Interlock cable from interlock cable bracket at manual selector and remove interlock cable from under carpet.




712 IGNITION SWITCH
713 C-CLIP
714 BRACKET RETAINING SCREW
715 INTERLOCK CABLE EJS0147A

Figure 15—Interlock Cable at Ignition Switch

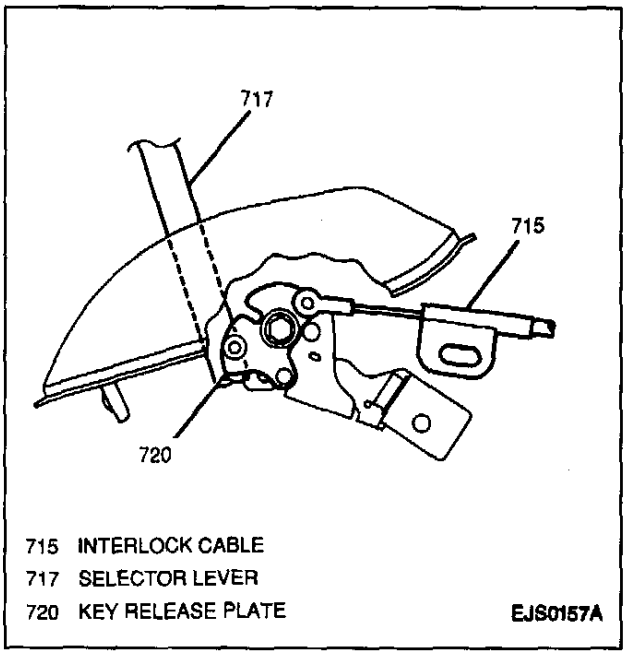



Figure 16—Interlock Cable at Manual Selector

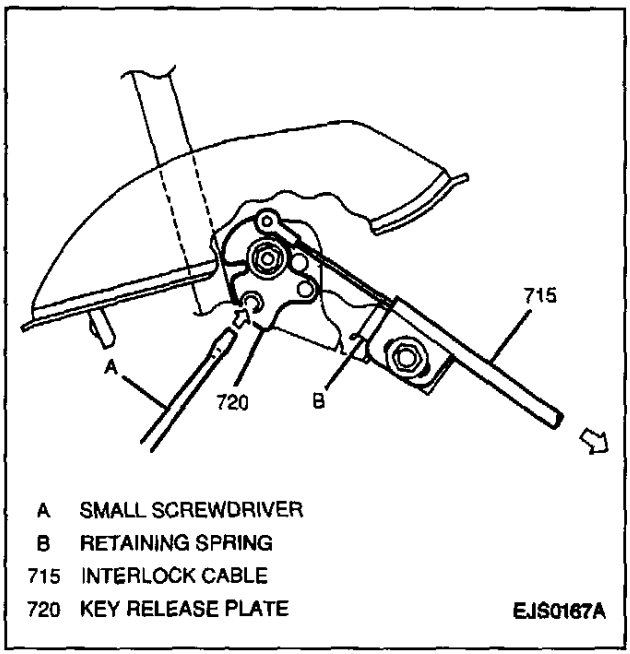



Figure 17—Adjusting Interlock Cable

**Inspect**

- Interlock cable for fraying or kinks. Replace as necessary.

**Install or Connect**

1. Route interlock cable under carpet to manual selector and under instrument panel to ignition switch.
2. Place manual selector lever in "N" and turn ignition switch to "ACC."
3. Interlock cable end to ignition switch; secure with bracket retaining screw and C-clip (Figure 15).
4. Steering column upper and lower coverts to steering column; secure with six screws.
5. Interlock cable end to key release plate (Figure 16); secure to manual selector with interlock cable nut. Do not tighten fully.

**Adjust**

- Rotate key release plate and insert a small screwdriver through the key release plate to hold it in position (Figure 17).
- Allow the retaining spring to position the interlock cable bracket (Figure 17).

**Tighten**

- Interlock cable nut to 13 N.m (115 lb. in.).

**Important**

- After tightening the interlock cable nut, make sure that with the manual selector lever shifted to the "P" position, the ignition switch can be turned from "ACC" to "LOCK" and the ignition key can be removed from the ignition switch. Verify also that with the manual selector lever in any position other than "P," the ignition switch CANNOT be turned from "ACC" to "LOCK."

6. Console box to floor; secure with two plastic retaining clips and two screws.
7. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

## Shift Lock Solenoid

***Figure 8***

**Remove or Disconnect**

1. Negative (-) battery cable.
2. Two screws, two plastic retaining clips and console box from floor.
3. Shift lock solenoid electrical connector under carpet (Figure 8).
4. One bolt and shift lock solenoid from manual selector.

**Inspect**

- For shift lock solenoid diagnosis and inspection procedures, refer to SECTION 8A.

### Install or Connect

1. Shift lock solenoid to manual selector; secure with one bolt.

#### Tighten

- Shift lock solenoid retaining bolt to 10 N·m (89 lb. in.).

2. Shift lock solenoid electrical connector under carpet.
3. Console box to floor; secure with two plastic retaining clips and two screws.
4. Negative (-) battery cable.

#### Tighten

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N·m (11 lb. ft.).

## Stoplamp Switch

***Figure 18***

### Remove or Disconnect

1. Negative (-) battery cable.
2. Stoplamp switch electrical connector from stoplamp switch.
3. Stoplamp switch adjustment nut from stoplamp switch.
4. Stoplamp switch from brake pedal bracket by unscrewing stoplamp switch out of brake pedal bracket.

### Install or Connect

1. Stoplamp switch into brake pedal bracket by screwing stoplamp switch into brake pedal bracket.
2. Stoplamp switch adjustment nut onto stoplamp switch. Do not tighten fully.

#### Adjust

- Stoplamp switch by pulling the brake pedal rearward (upward) away from floor. Adjust stoplamp switch until the distance between the threaded portion of the stoplamp switch and the brake pedal return cushion measures 0.5 to 1.0 mm (0.02 to 0.04-inch) (Figure 18).

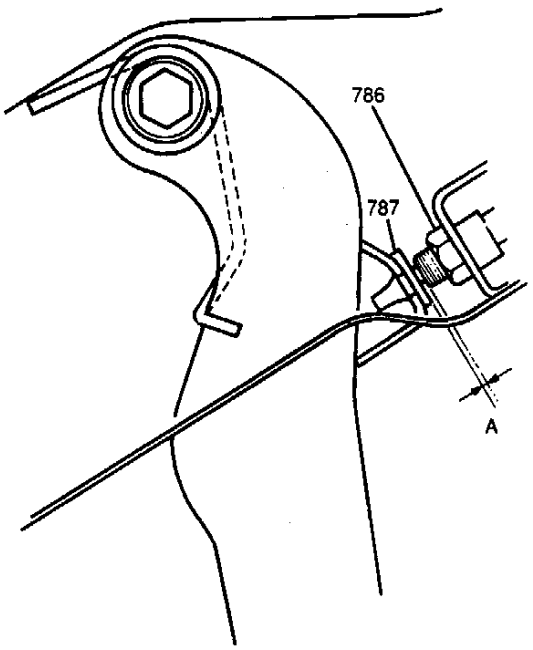
#### Tighten

- Stoplamp switch adjustment nut to 15 N·m (11 lb. ft.).

3. Stoplamp switch electrical connector to stoplamp switch.
4. Negative (-) battery cable.

#### Tighten

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N·m (11 lb. ft.).




A CLEARANCE BETWEEN END OF THREAD OF STOPLAMP SWITCH ASSEMBLY AND BRAKE PEDAL RETURN CUSHION IS WITHIN 0.5–1.0 mm (0.02–0.04")
786 STOPLAMP SWITCH ADJUSTMENT NUT
787 BRAKE PEDAL RETURN CUSHION EJS0177A

Figure 18—Stoplamp Switch Adjustment

## TV CABLE

***Figures 2 and 19 through 24***

### Remove or Disconnect

1. Loosen TV cable locknut and adjust nut (Figure 19).
2. TV cable from throttle body linkage (Figures 19 and 20).
3. TV cable casing from TV cable bracket at throttle body.
4. Negative (-) battery cable (03-72LE, 4-Speed).
5. Raise and suitably support vehicle. Refer to SECTION 0A.
6. One bolt and TV cable retaining bracket from transmission (3L30, 3-Speed) (Figure 21).
7. TV cable casing from transmission and TV cable end from throttle valve (Figure 22).

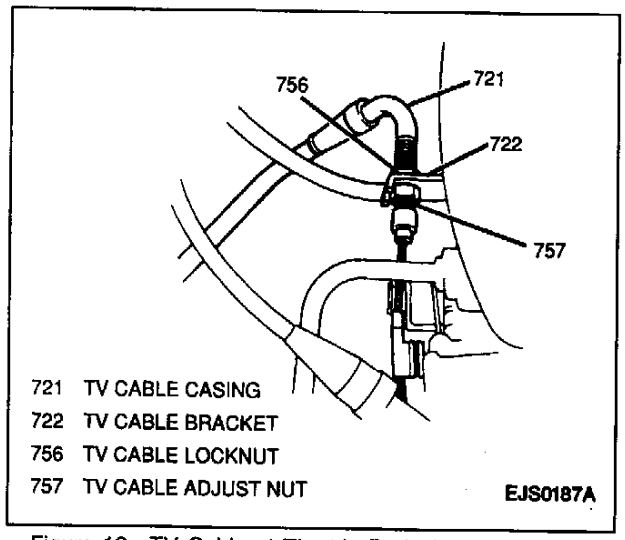



Figure 19—TV Cable at Throttle Body (3L30, 3-Speed)

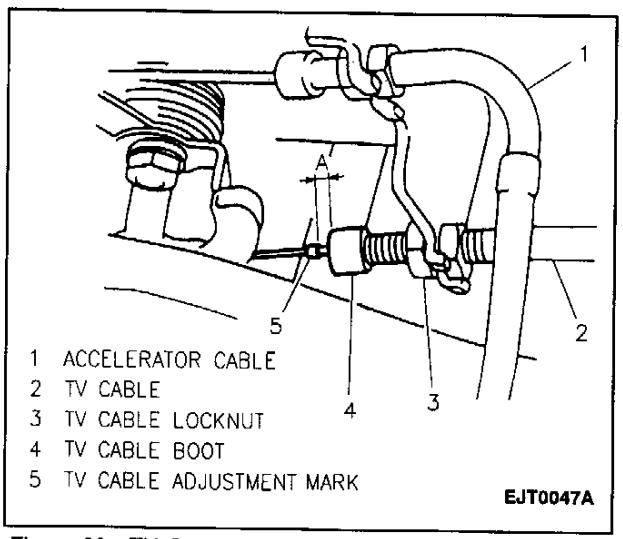



Figure 20—TV Cable at Throttle Body (03-72LE, 4-Speed)

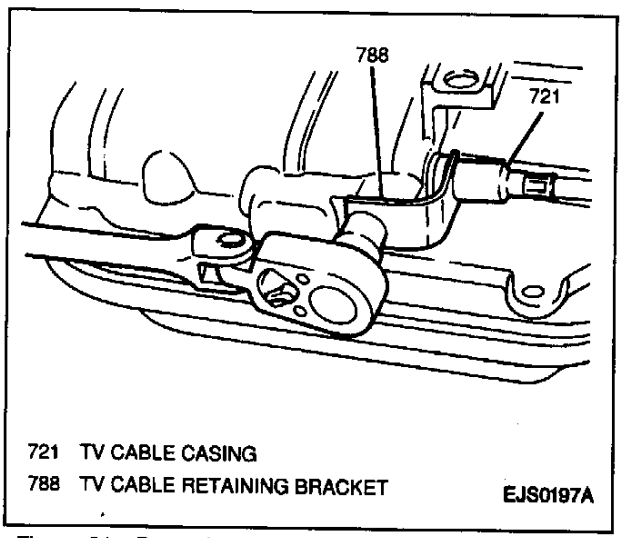



Figure 21—Removing TV Cable Retaining Bracket (3L30, 3-Speed)

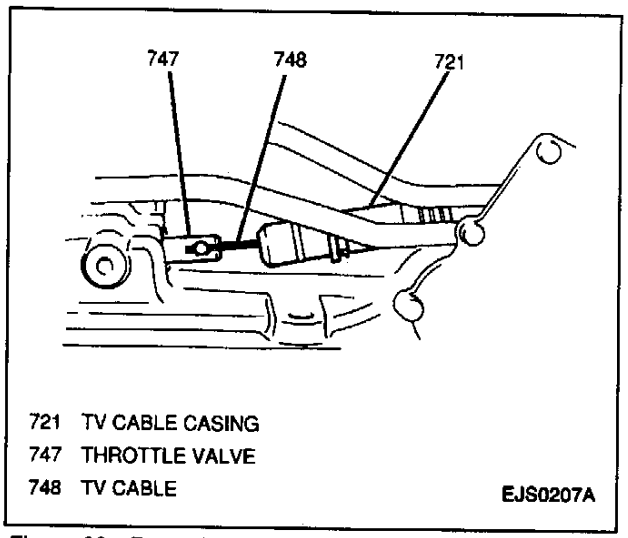



Figure 22—Removing TV Cable from Throttle Valve (3L30, 3-Speed)

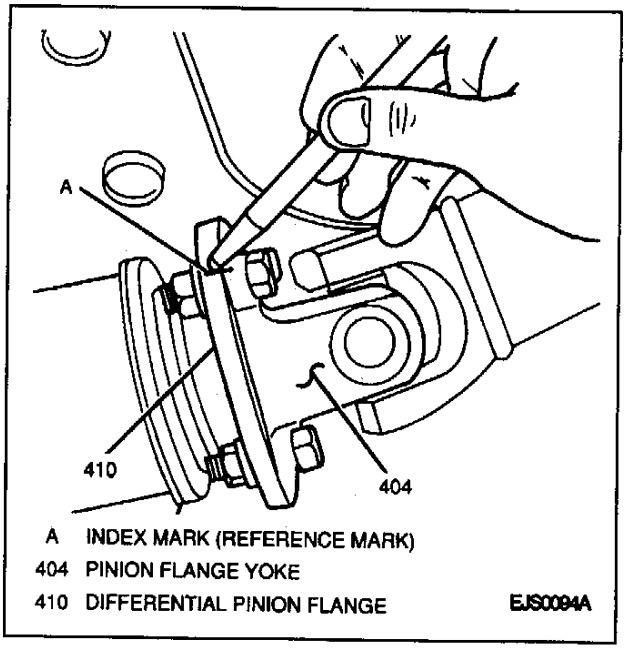



Figure 23—Placing Index Marks on Pinion Flange Yoke and Differential Pinion Flange

**Important**

- Perform steps 8 and 9 for four-wheel drive vehicles equipped with the 03-72LE, 4-speed automatic transmission.

8. Place index mark (reference mark) on the propeller shaft pinion flange and the front differential pinion flange of the transfer case to front differential propeller shaft (03-72LE, 4-Speed) (Figure 23).
9. Four bolts, four nuts and separate pinion flange yoke from front differential pinion flange (03-72LE, 4-Speed) (Figure 23).

- Position and support transfer case to front differential propeller shaft away from transmission fluid pan.

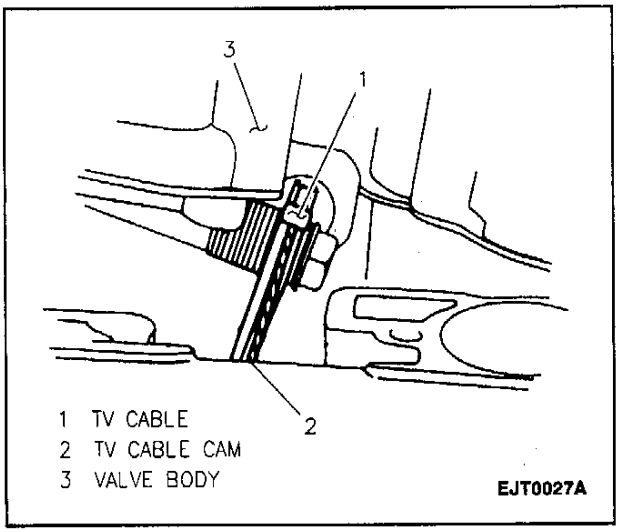



Figure 24—Removing TV Cable at TV Cable Cam (03-72LE, 4-Speed)

**Important**

- Removing propeller shaft from transfer case will result in fluid loss.

10. Transmission range switch electrical connector from transmission range switch (03-72LE, 4-Speed).
11. Transmission fluid pan and gasket from transmission. Refer to "Changing Fluid and Cleaning Filter Screen (03-72LE, 4-Speed)" later in this section.
12. Transmission valve body from transmission (03-72LE, 4-Speed). Refer to "Valve Body Removal (03-72LE, 4-Speed) " later in this section.
13. TV cable from TV cable cam (Figure 24) (03-72LE, 4-Speed).
14. TV cable case from transmission (Figure 2) (03-72LE, 4-Speed).

**Inspect**

- TV cable for fraying or kinks. Replace as necessary.
- TV cable O-ring for damage (03-72LE, 4-Speed). Replace as necessary.

**Install or Connect**

1. TV cable end into throttle valve and TV cable casing into transmission (3L30, 3-Speed) (Figure 22).
2. TV cable retaining bracket to transmission; secure with one bolt (3L30, 3-Speed) (Figure 21).

**Tighten**

- TV cable retaining bracket bolt (3L30, 3-Speed) to 10 N.m (89 lb. in.).

3. TV cable to transmission (03-72LE, 4-Speed) (Figure 24).
4. TV cable to TV cable cam (03-72LE, 4-Speed) (Figure 24).
5. Transmission valve body in transmission (03-72LE, 4-Speed). Refer to "Valve Body (03-72LE, 4-Speed) " earlier in this section.
6. Transmission range switch electrical connector to transmission range switch (03-72LE, 4-Speed).
7. Transmission fluid pan and gasket from transmission. Refer to "Changing Fluid and Cleaning Filter Screen (03-72LE, 4-Speed)" later in this section.

**Important**

- Perform step 8 for four-wheel drive vehicles equipped with the 03-72LE, 4-speed automatic transmission.

8. Pinion flange yoke to front differential pinion flange aligning index (reference marks) on the pinion flange; secure with four bolts and nuts (03-72LE, 4-Speed) (Figure 23).

**Tighten**

- Propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

9. TV cable casing into TV cable bracket at throttle body (Figures 19 and 20).
10. TV cable end to throttle body linkage (Figure 19).
11. Negative (-) battery cable (03-72LE, 4-Speed).

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

12. Adjust TV cable. Refer to "TV Cable Adjustment" later in this section.

## TV Cable Adjustment

***Figures 25 and 26***

**Inspect**

1. Accelerator cable for proper adjustment. Refer to SECTION 6C.
2. TV cable locknut and adjust nut making sure both nuts are loose and not in contact with the TV cable bracket at the throttle body.

**Adjust**

**3L30, 3-Speed**

- TV cable with the assistance of a second technician. Place the ignition switch in the "LOCK" position and fully depress and hold the accelerator pedal.

A. Pull the TV cable casing in direction "A" away from the throttle body until tight and no cable deflection exists (Figure 25).
B. With the TV cable pulled tight, tighten the TV cable locknut to within 1 mm (0.039-inch) of the TV cable bracket (Figure 25).

### Important

- Make sure the TV cable adjust nut is not in contact with the TV cable bracket at this point.

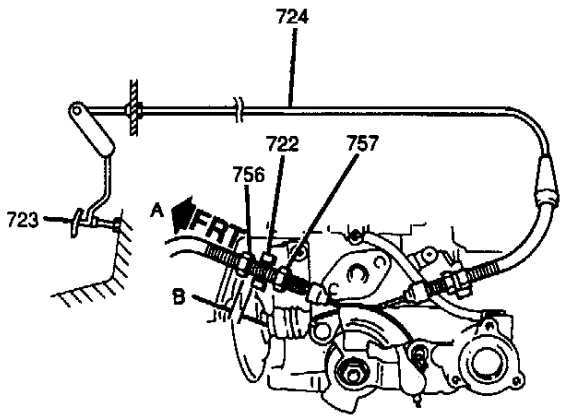
C. Release the accelerator pedal while keeping the TV cable locknut-to-TV cable bracket clearance at 1 mm (0.039-inch).
D. Tighten the TV cable adjust nut until it engages the TV cable bracket, fitting inside it.
E. Once the TV cable adjust nut is positioned flush with the TV cable bracket, tighten the TV cable locknut fully.

### Adjust

#### 03-72LE, 4-Speed

- TV cable with the assistance of a second technician. Place the ignition switch in the "LOCK" position and fully depress and hold the accelerator pedal.

A. Measure distance between tip end of TV cable adjustment mark and end of boot (indicates "A" in Figure 26). Distance of "A" must be 0.8-1.5mm (0.031-0.0-59 in.).
B. With the TV cable pulled tight, tighten the TV cable locknut (Figure 26).
C. After tightening TV cable locknut, measure distance between tip end of TV cable adjustment mark and end of boot again to ensure distance didn't change during tightening of locknut.




A PULL TO TIGHTEN CABLE
B LOCKNUT CLEARANCE 1 mm (0.039")
722 TV CABLE BRACKET
723 ACCELERATOR PEDAL
724 ACCELERATOR CABLE
756 TV CABLE LOCKNUT
757 TV CABLE ADJUST NUT
EJS0217A

Figure 25—TV Cable Adjustment (Typical)

## POWER/NORMAL (P/N) SWITCH (03-72LE, 4-SPEED)

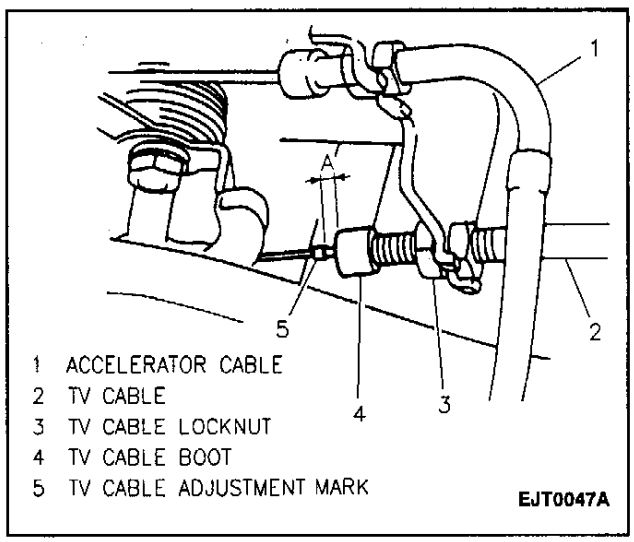
*Figure 27*

### Remove or Disconnect

1. Console. Refer to SECTION 8C.
2. Power/normal switch from console.

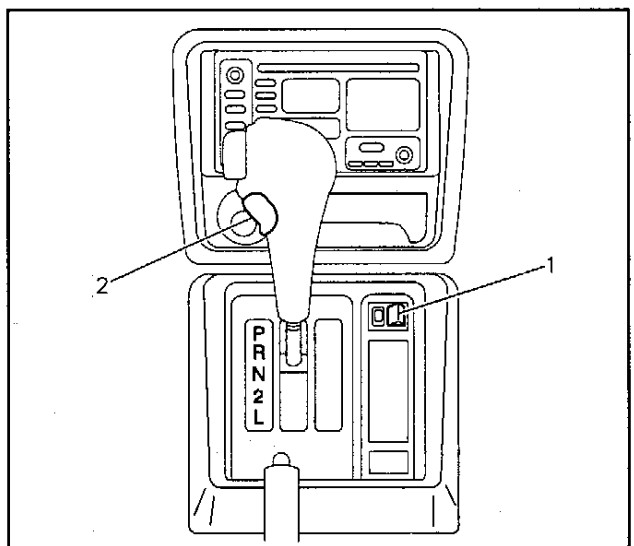
### Install or Connect

1. Power/normal switch into console.
2. Console. Refer to SECTION 8C.




1 ACCELERATOR CABLE
2 TV CABLE
3 TV CABLE LOCKNUT
4 TV CABLE BOOT
5 TV CABLE ADJUSTMENT MARK
EJT0047A

Figure 26—TV Cable Adjustment (03-72LE, 4-Speed)




1 POWER/NORMAL SWITCH
2 OD SWITCH
EJT013710A

Figure 27—Power/Normal (P/N) Switch (03-72LE, 4-Speed)

## O/D CUT SWITCH (03-72LE, 4-SPEED)

*Figure 7*

**Remove or Disconnect**

**Important**

- The O/D cut switch is part of the knob assembly. Therefore if switch is damaged the entire knob assembly must be replaced.

1. Console. Refer to SECTION 8C.
2. Back terminals out of O/D wire coupler (Figure 7).
3. O/D wire harness from O/D wire clamp (Figure 7).
4. Two screws securing knob assembly to select lever tube (Figure 7).
5. Gently pull knob assembly ensuring that O/D wire harness does not catch.

**Install or Connect**

1. Route O/D wire harness through select lever tube while ensuring that O/D wire harness tube is position correctly.
2. Ensure detent release guide taper is toward the rear of the vehicle (Figure 7).
3. Position knob assembly over selector lever tube; secure with two screws (Figure 7).
4. New O/D switch wire coupler (Figure 7).
5. O/D wire harness from O/D wire clamp.
6. Console. Refer to SECTION 8C.

## VEHICLE SPEED SENSOR (03-72LE, 4-SPEED)

*Figure 6*

**Remove or Disconnect**

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Vehicle speed sensor electrical connector (Figure 6).
4. One bolt and vehicle speed sensor from transmission (Figure 6).

**Install or Connect**

1. One bolt and vehicle speed sensor from transmission (Figure 6).
2. Vehicle speed sensor electrical connector (Figure 6).
3. Lower vehicle.
4. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

## TRANSMISSION CONTROL MODULE (TCM) (03-72LE, 4-SPEED)

*Figure 28*

**Remove or Disconnect**

1. Negative (-) battery cable.
2. TCM electrical connector (Figure 28).
3. Two bolts and TCM from bracket (Figure 28).

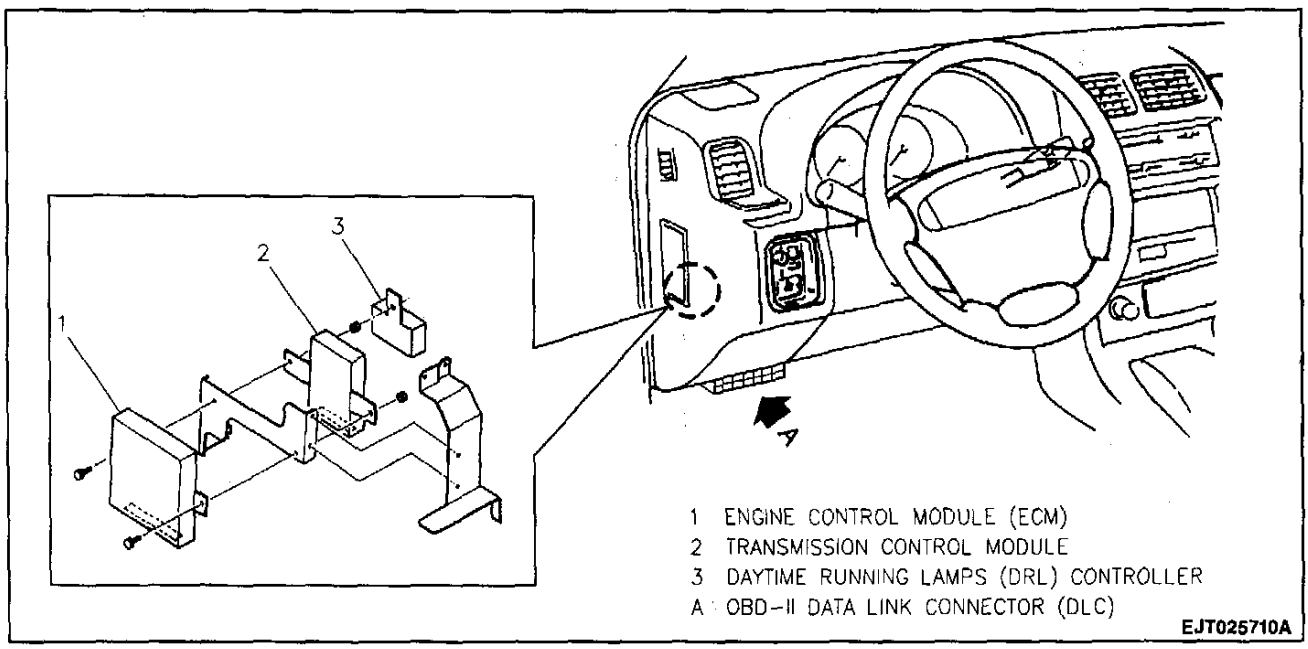



Figure 28—Transmission Control Module (03-72LE, 4-Speed)

### Install or Connect

1. TCM to bracket with two bolts (Figure 28).
2. TCM electrical connector (Figure 28).
3. Negative (-) battery cable.

### Tighten

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

## CHANGING FLUID AND CLEANING FILTER SCREEN (3L30, 3-SPEED)

***Figures 23, 29, 30 and 31***

### Remove or Disconnect

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Place index mark (reference mark) on the propeller shaft pinion flange and the front differential pinion flange of the transfer case to front differential propeller shaft (four-wheel drive models) (Figure 23).
3. Four bolts, four nuts and separate pinion flange yoke from front differential pinion flange (four-wheel drive models) (Figure 23).
   - Position and support transfer case to front differential propeller shaft away from transmission fluid pan.

### Important

- Removing propeller shaft from transfer case will result in fluid loss (four-wheel drive models).

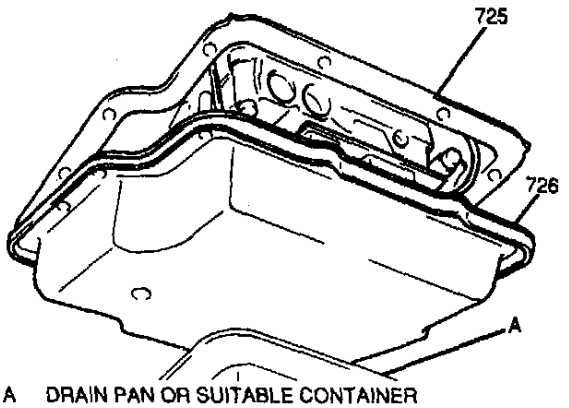



Figure 29—Removing Transmission Fluid Pan (3L30, 3-Speed)

**NOTICE:** This transmission is not equipped with a fluid pan drain plug. Transmission fluid will begin to drain out immediately after fluid pan seal is loosened. Make sure a drain pan or suitable container has been placed under the transmission fluid pan.

4. Place the drain pan or suitable container under the transmission fluid pan.
5. Nine transmission fluid pan bolts around the forward perimeter of the transmission fluid pan and loosen the three transmission fluid pan bolts in the rear of the transmission fluid pan allowing the transmission fluid pan to partially drain (Figure 29).

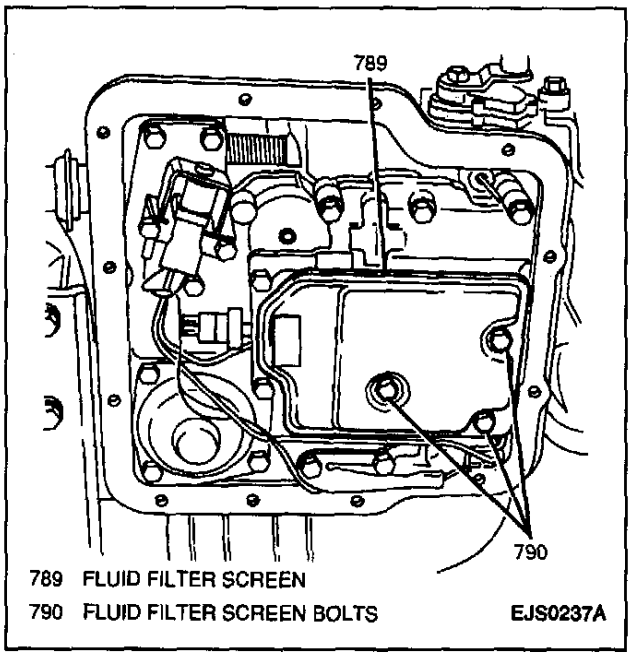



Figure 30—Fluid Filter Screen (3L30, 3-Speed)

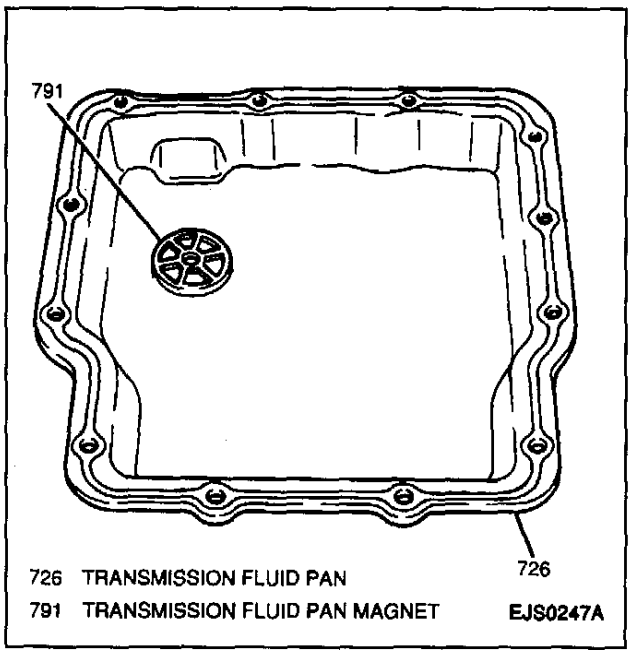



Figure 31—Transmission Fluid Pan and Magnet (3L30, 3-Speed Shown, 03-72LE, 4-Speed Similar)

6. Three remaining transmission fluid pan bolts, transmission fluid pan and gasket and drain remainder of transmission fluid pan into drain pan.
7. Three bolts, fluid filter screen and gasket from valve body (Figure 30).

**Important**

- A small amount of clutch material in the bottom of the transmission fluid pan is a normal condition and is consistent with normal transmission wear. The bottom of the fluid pan is equipped with a magnet that will collect minute metal filings (Figure 31). However, if large amounts of clutch material, metal shavings or other foreign matter are present, transmission disassembly and inspection is indicated.

**Clean**

1. Fluid filter screen with solvent and air dry.
2. Transmission fluid pan and fluid pan magnet with solvent and air dry (Figure 29).
3. Transmission fluid pan and fluid filter screen gasket mating surfaces.

**Inspect**

- Fluid filter screen for tears or other damage. Replace as necessary.

**Install or Connect**

1. New fluid filter screen gasket and fluid filter screen to valve body; secure with three bolts.

**Tighten**

- Fluid filter screen bolts to 19 N.m (14 lb. ft.).

2. New transmission fluid pan gasket and transmission fluid pan to transmission; secure with twelve bolts.

**Tighten**

- Transmission fluid pan bolts to 13 N.m (115 lb. in.).

3. Front propeller shaft into vehicle aligning index marks made during front propeller shaft removal; secure with four bolts and four nuts (four-wheel drive models).

**Tighten**

- Front propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

4. Lower vehicle.
5. Refill transmission as necessary:
   A. Place vehicle on a level surface.
   B. Remove fluid level indicator.
   C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
   D. Install fluid level indicator into fluid filler tube.
   E. Apply parking brake and block vehicle wheels.
   F. With selector lever in "P" position, start engine. DO NOT race engine.
   G. Run engine at idle and move selector lever through each range and return to the "P" position.
   H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
   I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
   J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
   K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## CHANGING FLUID AND CLEANING FILTER SCREEN (03-72LE, 4-SPEED)

***Figures 23, 31, 32 and 33***

**Remove or Disconnect**

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Place index mark (reference mark) on the propeller shaft pinion flange and the front differential pinion flange of the transfer case to front differential propeller shaft (four-wheel drive models) (Figure 23).
3. Four bolts, four nuts and separate pinion flange yoke from front differential pinion flange (four-wheel drive models) (Figure 23).

- Position and support transfer case to front differential propeller shaft away from transmission fluid pan.

**Important**

- Removing propeller shaft from transfer case will result in fluid loss (four-wheel drive models).

4. Place a drain pan or suitable container under transmission drain plug (Figure 32).

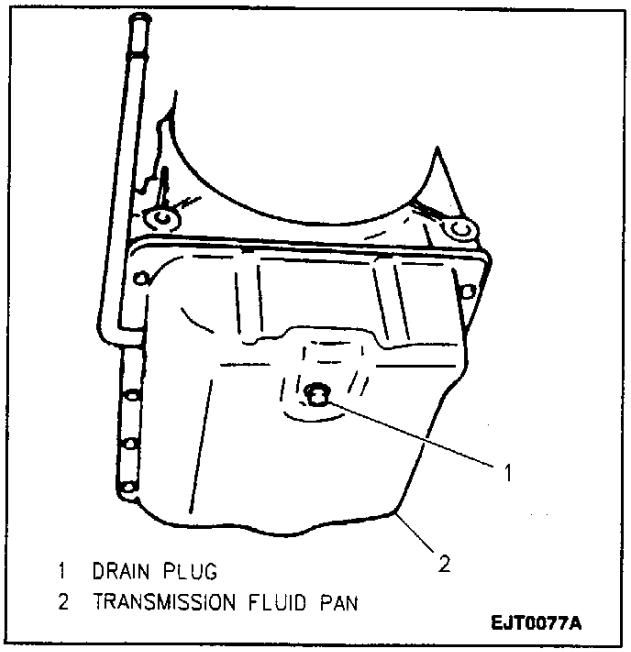



Figure 32—Drain Plug and Transmission Fluid Pan (03-72LE, 4-Speed)

5. Drain plug allowing the transmission fluid pan to drain (Figure 32).
6. Fourteen transmission fluid pan bolts and transmission fluid pan and gasket from transmission.
7. Four fluid pipes in the following order "A" through "D" (Figure 33).
8. Six bolts, fluid filter screen, fluid filter gasket, fluid filter spacer and fluid filter spacer gasket from valve body (Figure 33).

**Important**

- A small amount of clutch material in the bottom of the transmission fluid pan is a normal condition and is consistent with normal transmission wear. The bottom of the fluid pan is equipped with a magnet that will collect minute metal filings (Figure 31). However, if large amounts of clutch material, metal shavings or other foreign matter are present, transmission disassembly and inspection is indicated.

**Clean**

1. Fluid filter screen with solvent and air dry.
2. Transmission fluid pan and fluid pan magnets with solvent and air dry (Figure 31).
3. Transmission fluid pan and fluid filter screen gasket mating surfaces.

**Inspect**

- Fluid filter screen for tears or other damage. Replace as necessary.

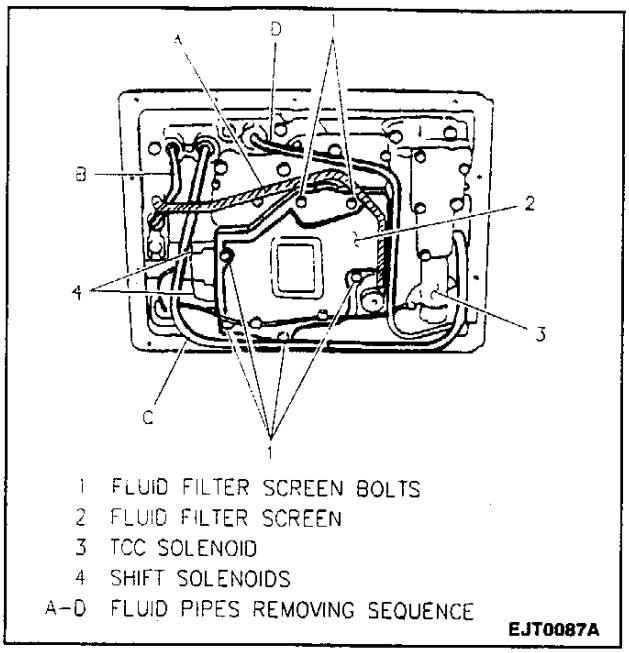



Figure 33—Fluid Pipes and Filter Screen (03-72LE, 4-Speed)

**Install or Connect**

1. New fluid filter screen gasket and fluid filter screen to valve body; secure with six bolts (Figure 33).

**Tighten**

- Fluid filter screen bolts to 5 - 6 N.m (44 - 53 lb. in.).

2. Four fluid pipes in the following order "D", "C", "B" and then "A" (Figure 33).
3. New transmission fluid pan gasket and transmission fluid pan to transmission; secure with fourteen bolts.

**Important**

- When installing transmission pan, ensure filler tube connects properly.

**Tighten**

- Transmission fluid pan bolts to 4 - 5 N.m (35 - 44 lb. in.).

4. Transmission drain plug into transmission (Figure 32).

**Tighten**

- Transmission drain plug to 15 - 18 N.m (11 - 13 lb. ft.).

5. Front propeller shaft into vehicle aligning index marks made during front propeller shaft removal; secure with four bolts and four nuts (four-wheel drive models).

**Tighten**

- Front propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

6. Lower vehicle.
7. Refill transmission as necessary:
   A. Place vehicle on a level surface.
   B. Remove fluid level indicator.
   C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
   D. Install fluid level indicator into fluid filler tube.
   E. Apply parking brake and block vehicle wheels.
   F. With selector lever in "P" position, start engine. DO NOT race engine.
   G. Run engine at idle and move selector lever through each range and return to the "P" position.
   H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
   I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
   J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
   K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## TRANSMISSION COOLER FLUSHING

***Figure 34***

In a major transmission failure where particles of metal or engine coolant has been carried with the fluid throughout the transmission and its fluid cooling system, it will be necessary to flush out the fluid cooler and its connecting hoses. To flush out the fluid cooler and hoses use the following procedure:

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Disconnect both cooler hoses at their clamps on the right side of the transmission (Figure 34).
3. Place a hose over the end of the fluid cooler inlet hose (from the left side of the transmission fluid cooler) and insert the hose into an empty container.
4. Using a fluid suction gun, flush clean solvent, or equivalent, through the return hose (from the right side of the transmission fluid cooler) until clean solvent comes through the hose attached to the inlet hose. This process will "back flush" the transmission fluid cooler.
5. Remove the hose from the cooler inlet hose and place it on the return hose.
6. Using the same process as described in Step 3, flush clean solvent or equivalent through the inlet hose until clean solvent comes out the return hose.
7. Remove the remaining solvent from the fluid cooler using compressed air applied to the return hose and flush with transmission fluid.
8. Reconnect fluid cooler hoses to cooler lines at right side of transmission.

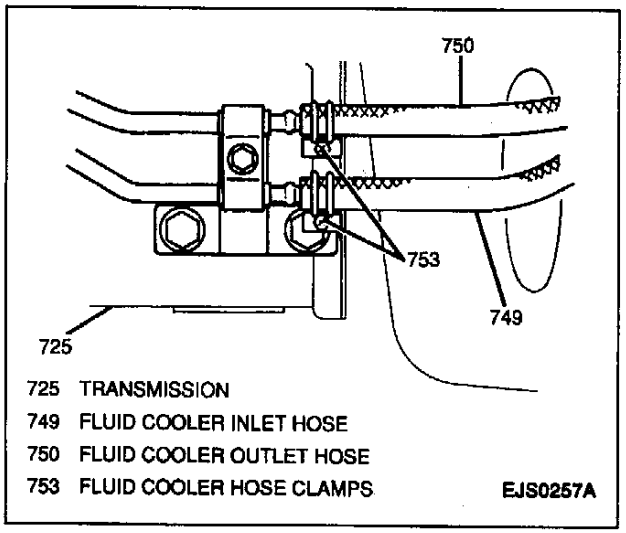



Figure 34—Transmission Fluid Cooler Inlet/Outlet Hoses

# SERVICEABLE COMPONENTS

## VACUUM MODULATOR (3L30, 3-SPEED)

***Figures 35 and 36***

**Remove or Disconnect**

Tool Required:
J 23100 Vacuum Modulator Wrench

1. Raise and suitably support vehicle. Refer to SECTION 0A.

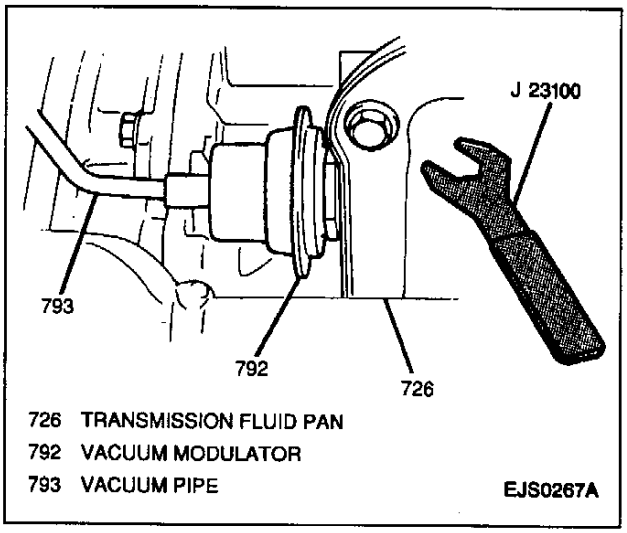



Figure 35—Removing Vacuum Modulator (3L30, 3-Speed)

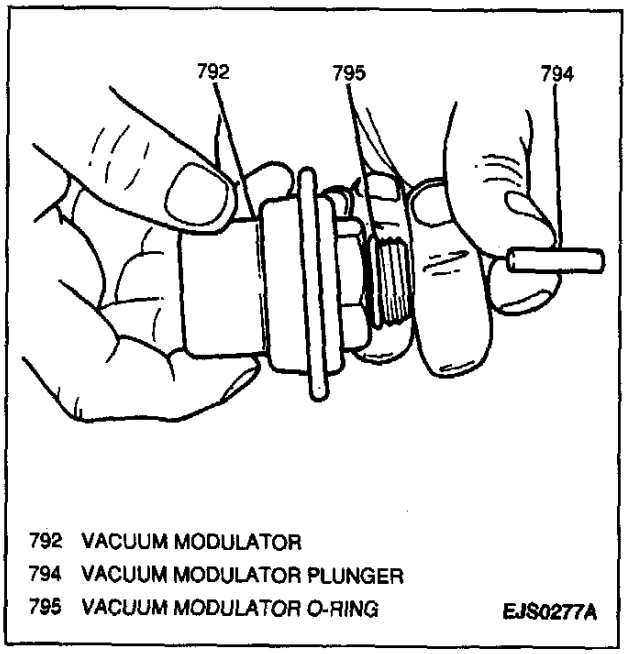



Figure 36—Inspecting Vacuum Modulator (3L30, 3-Speed)

2. Vacuum hose and pipe from vacuum modulator (Figure 35).
3. Vacuum modulator and plunger from transmission using a J 23100 (Figure 36).

### Inspect

Tool Required:
J 23738-A Hand Operated Vacuum Pump

1. Vacuum modulator for leakage by removing the vacuum modulator plunger from the vacuum modulator and observing any transmission fluid that drains out of the vacuum modulator. If transmission fluid is present in the vacuum modulator, replace the vacuum modulator (Figure 36).
2. Vacuum modulator for leakage using a J 23738-A. Attach the J 23738-A to the vacuum fitting on the rear of the vacuum modulator. Apply 67 kPa (20 in. Hg) of vacuum to the vacuum modulator and observe the gage at the top of the J 23738-A. If the J 23738-A indicates a vacuum loss, replace the vacuum modulator.
3. Vacuum modulator O-ring for cuts or other damage. Replace as necessary.

### Install or Connect

Tools Required:
J 36850 Transjel® Transmission Assembly Lubricant
J 23100 Vacuum Modulator Wrench

1. Apply J 36850 to the vacuum modulator O-ring.
2. Vacuum modulator and modulator plunger into transmission using a J 23100 (Figure 36).

### Tighten

- Vacuum modulator to 52 N.m (38 lb. ft.).

3. Vacuum hose and pipe to vacuum modulator (Figure 35).
4. Lower vehicle.

## LOW SERVO (3L30, 3-SPEED)

***Figures 37 through 47***

### Remove or Disconnect

Tool Required:
J 23075 Servo and Third Clutch Piston Spring Compressor

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Transmission fluid pan and gasket from transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
4. Three bolts and fluid filter screen and gasket from valve body.
5. Two TCC solenoid pipes from TCC solenoid, fluid pump and valve body (Figure 37).
6. Electrical connector from TCC solenoid (Figure 37).
7. Electrical connectors from fluid pressure switch (Figure 37).
8. Two bolts and TCC solenoid from reinforcement plate.
9. Six bolts and reinforcement plate from transmission (Figure 38).
10. Four bolts, servo piston cover and gasket from transmission (Figure 38).

**NOTICE:** Disconnect the manual valve link from the parking lock and range selector lever while lowering the valve body. Use caution not to lose the check ball in the transmission case passage when removing valve body. The check ball should drop out of the case passage onto the top of the valve body upon valve body removal.

11. Nine valve body bolts, manual detent roller, valve body, transfer plate, transfer plate gaskets and one check ball from transmission case (Figure 38).
12. Install a J 23075 to the transmission with the offset of the tool facing toward the corner of the transmission case (Figure 39).
13. Tighten the J 23075 until the servo piston retaining ring can be removed.
14. Servo piston retaining ring from servo piston bore in transmission case (Figure 39).
15. Loosen the J 23075 until the J 23075 can be removed from the transmission case.
16. The J 23075 from the transmission case.
17. Servo piston, return spring and servo apply rod from servo bore in transmission case (Figure 40).

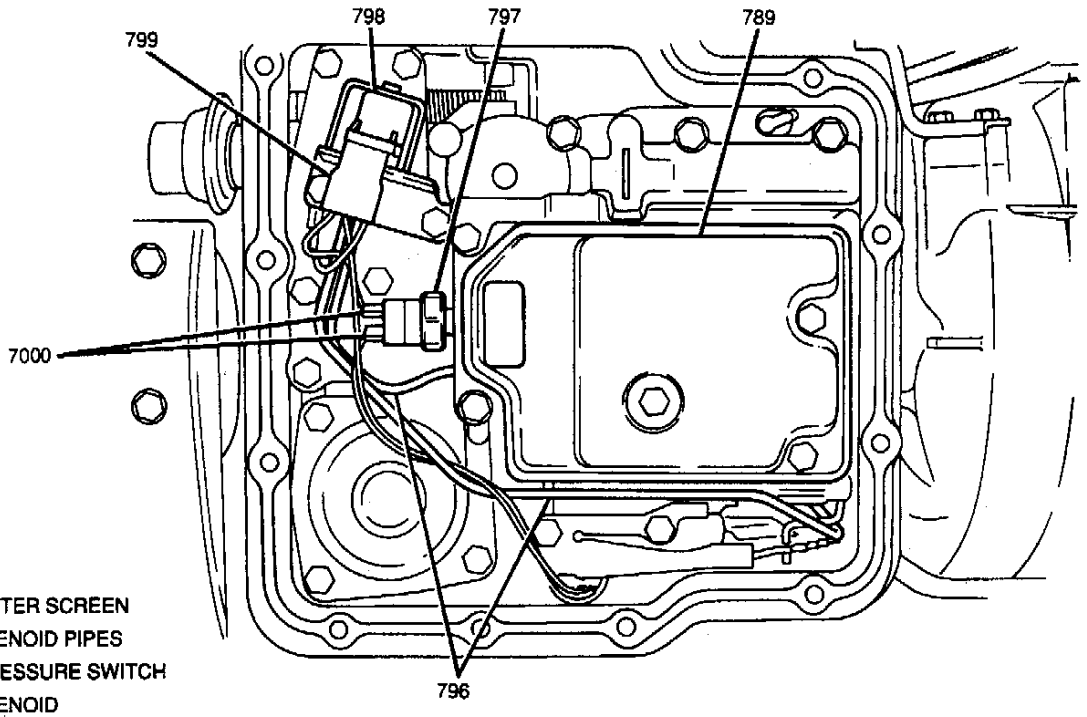



Figure 37—TCC Solenoid, Fluid Pipes and Fluid Pressure Switch (3L30, 3-Speed)

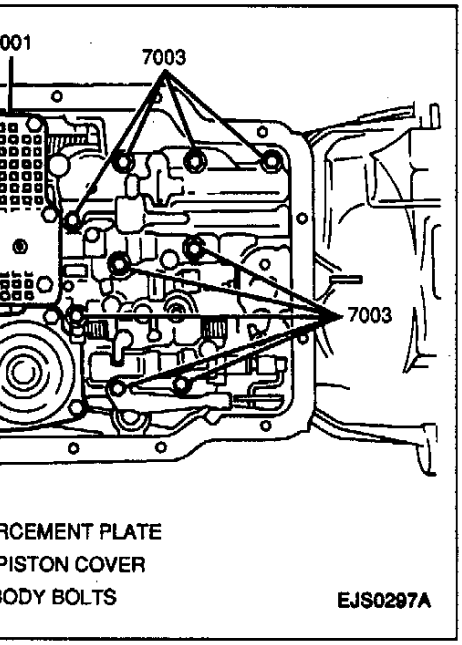



Figure 38—Reinforcement Plate, Servo Piston Cover and Valve Body Bolts (3L30, 3-Speed)

18. Locknut from servo piston adjusting screw.
19. Place the servo piston in a hydraulic press and compress the servo piston cushion spring using the J 23075 until the servo piston cushion spring retainer clip can be removed (Figure 41).

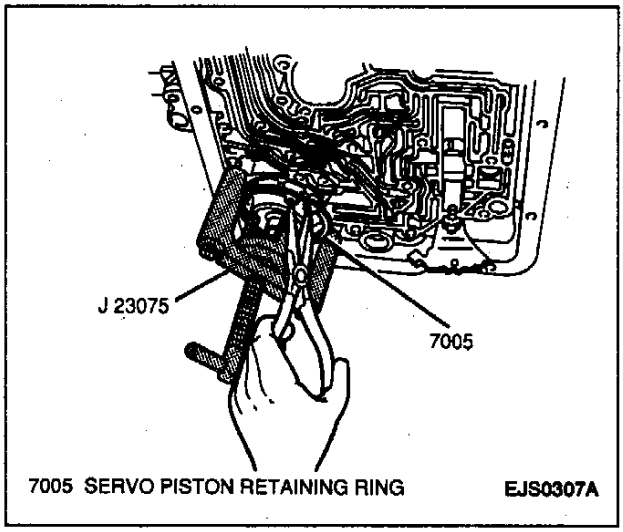



Figure 39—Removing Servo Piston Retaining Ring (3L30, 3-Speed)

20. Servo piston cushion spring retainer clip from servo piston adjusting screw (Figure 41).
21. Servo piston from hydraulic press and servo piston adjusting sleeve, cushion spring seat, cushion spring and adjusting screw from servo piston (Figure 42).

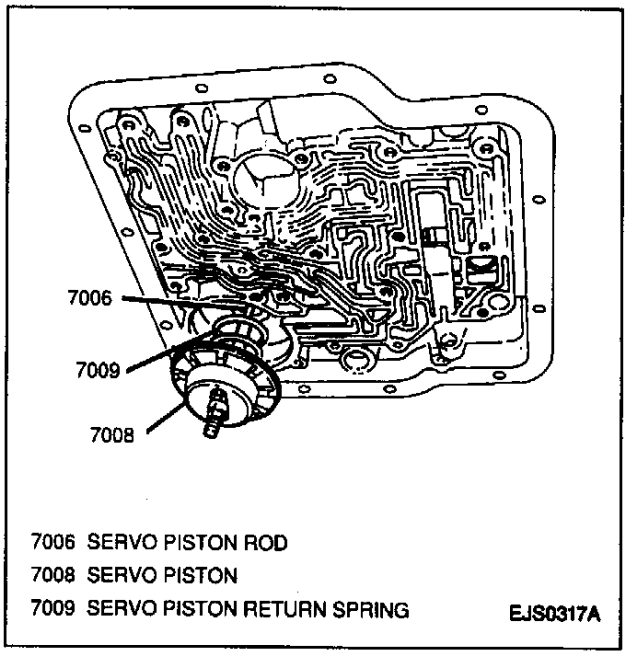



Figure 40—Removing Servo Piston, Return Spring and Apply Rod (3L30, 3-Speed)

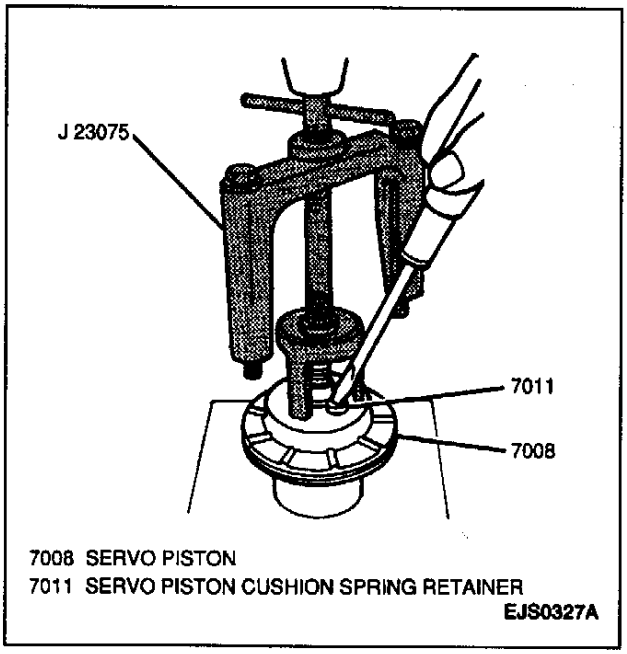



Figure 41—Removing Servo Piston Cushion Retainer Spring (3L30, 3-Speed)

## Inspect

1. Servo piston bore for nicks, burrs or side damage. Replace as necessary.
2. Servo piston adjusting sleeve for nicks or burrs. Replace as necessary.
3. Servo piston apply rod for nicks, burrs or scoring. Replace as necessary.

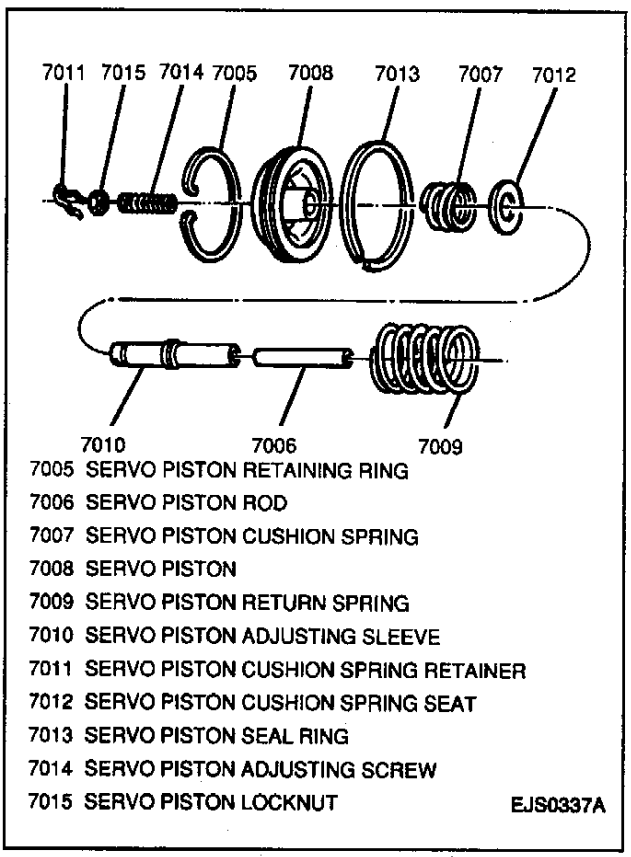



Figure 42—Disassembling Servo Piston (3L30, 3-Speed)

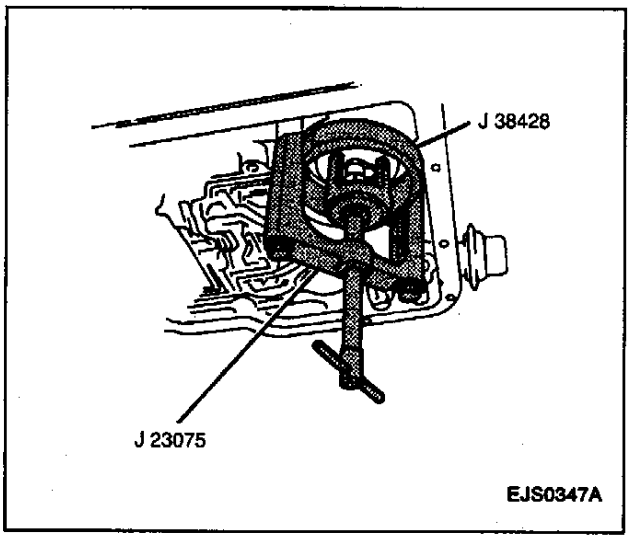



Figure 43—Installing Servo Piston Retaining Ring (3L30, 3-Speed)

## Install or Connect

Tools Required:
- J 23075 Servo and Third Clutch Piston Spring Compressor
- J 38428 Servo Piston Ring Installer
- J 36850 Transjel® Transmission Assembly Lubricant
- J 3387-2 Converter Housing Guide Pin

1. Apply a thin coat of J 36850 to all servo components prior to assembly.

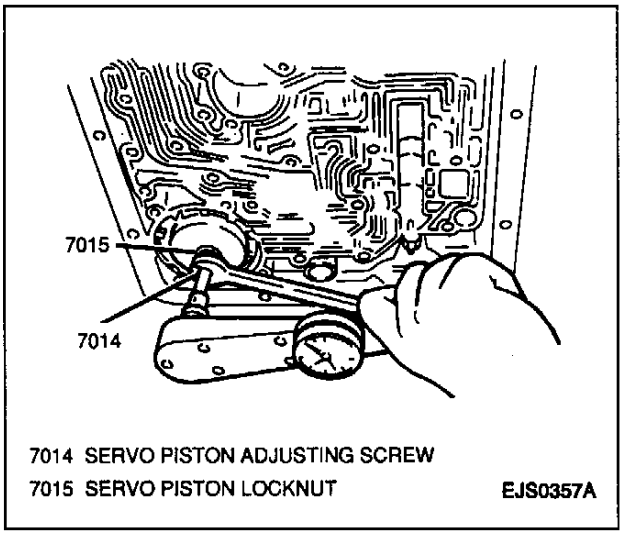



Figure 44—Adjusting Low Servo (3L30, 3-Speed)

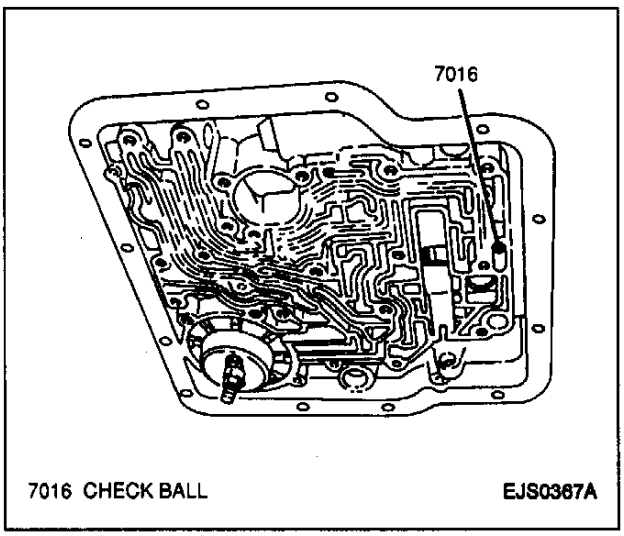



Figure 45—Check Ball Location (3L30, 3-Speed)

2. Servo piston adjusting screw, cushion spring, cushion spring seat, and servo piston adjusting sleeve, cushion spring seat, cushion spring and adjusting screw onto servo piston (Figure 42).
3. Place the servo piston in a hydraulic press and using the J 23075, compress the servo piston cushion spring until the servo piston cushion spring retainer clip can be installed (Figure 41).
4. Servo piston cushion spring retainer clip onto the servo piston adjusting screw (Figure 41).
5. Locknut onto servo piston adjusting screw.
6. Servo piston, return spring and servo apply rod into servo bore in transmission case.
7. The J 23075 in conjunction with a J 38428 onto the transmission case with the offset of the J 23075 facing toward the corner of the transmission (Figure 43).

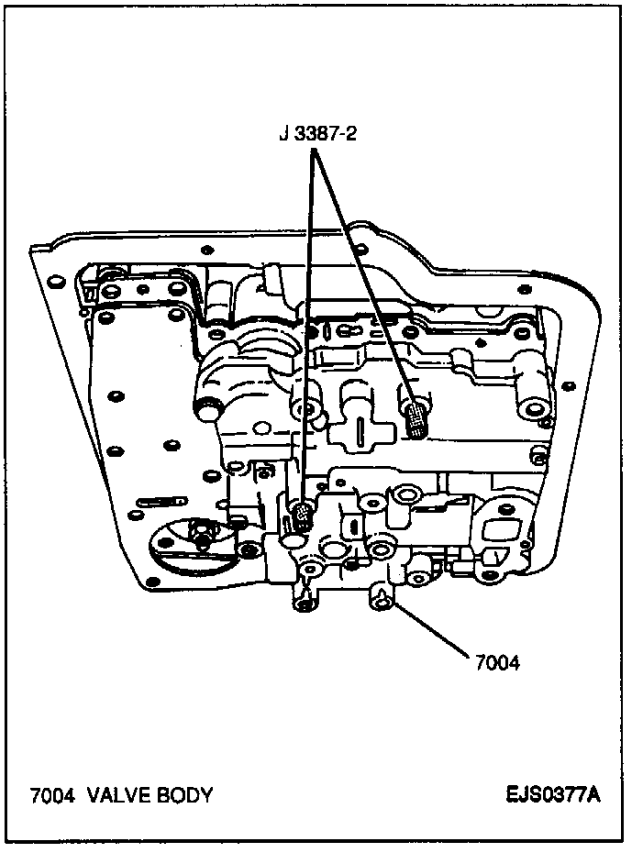



Figure 46—Installing Valve Body (3L30, 3-Speed)

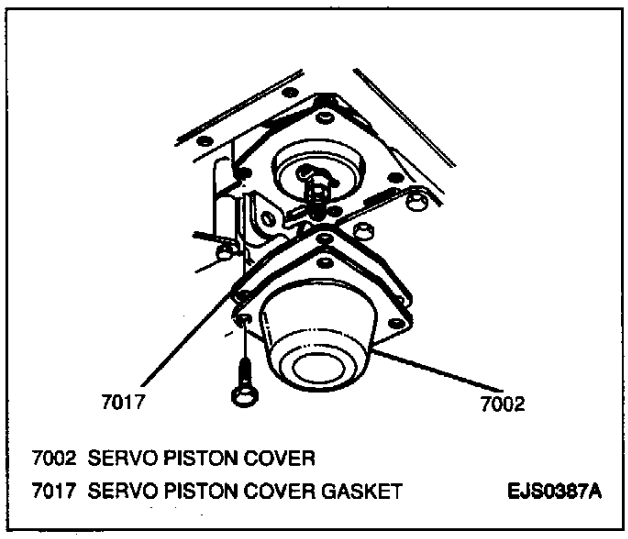



Figure 47—Installing Servo Piston Cover and Gasket (3L30, 3-Speed)

8. Tighten the J 23075 until the servo piston retaining ring can be installed (Figure 43).
9. Servo piston retaining ring into servo piston bore in transmission case.
10. Loosen the J 23075 until the J 23075 and the J 38428 can be removed from the transmission case.

**Adjust**

- Low servo by holding the servo piston adjusting sleeve with a standard open end wrench (Figure 44).

A. Loosen the locknut on the servo piston adjusting sleeve.
B. Tighten the servo piston adjusting screw to 24 N.m (18 lb. ft.) using a torque wrench with a 5 mm (3/16-inch) hex head socket making sure the locknut remains loose (Figure 44).
C. Back off the servo piston adjusting screw exactly five revolutions.
D. Tighten the locknut to 19 N.m (14 lb. ft.) while holding the servo piston adjusting screw and sleeve firmly.

**NOTICE:** Make sure to install the check ball in the transmission case passage when installing valve body (Figure 45). Use a small amount of J 36850 to retain the check ball in place during valve body installation. Failure to install check ball in its correct position may result in transmission shift failure.

11. Check ball, transfer plate gaskets, transfer plate, valve body and manual detent roller onto transmission case aligning valve body with transmission case using the J 3387-2; secure with nine bolts (Figure 46).

**Tighten**

- Valve body bolts to 19 N.m (14 lb. ft.).

12. New servo piston cover gasket and servo piston cover onto transmission case; secure with four bolts (Figure 47).

**Tighten**

- Servo piston cover bolts to 25 N.m (18 lb. ft.).

13. Reinforcement plate onto transmission case; secure with six bolts (Figure 38).

**Tighten**

- Reinforcement plate bolts to 19 N.m (14 lb. ft.).

14. TCC solenoid onto reinforcement plate; secure with two bolts.

**Tighten**

- TCC solenoid retaining bolts to 19 N.m (14 lb. ft.).

15. Electrical connectors to fluid pressure switch (Figure 37).
16. Electrical connector to TCC solenoid (Figure 37).

**Inspect**

- TCC solenoid pipe O-rings for cuts or other damage. Replace as necessary.

17. Apply a thin coat of J 36850 to the TCC solenoid pipe O-rings.
18. Two TCC solenoid pipes into TCC solenoid, fluid pump and valve body (Figure 37).

**Clean**

A. Transmission fluid pan and magnet using solvent and air dry.
B. Transmission fluid filter screen with solvent and air dry.

19. New fluid filter screen gasket and fluid filter screen onto valve body; secure with three bolts (Figure 37).

**Tighten**

- Fluid filter screen bolts to 19 N.m (14 lb. ft.).

20. New transmission fluid pan gasket and fluid pan onto transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
21. Lower vehicle.
22. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

23. Refill transmission as necessary:

A. Place vehicle on a level surface.
B. Remove fluid level indicator.
C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
D. Install fluid level indicator into fluid filler tube.
E. Apply parking brake and block vehicle wheels.
F. With selector lever in "P" position, start engine. DO NOT race engine.
G. Run engine at idle and move selector lever through each range and return to the "P" position.
H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## SPEEDOMETER DRIVEN GEAR (TWO-WHEEL DRIVE MODELS) (3L30, 3-SPEED)

***Figures 48 and 49***

### Remove or Disconnect

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Speedometer cable from speedometer driven gear case (Figure 48).
3. One bolt and speedometer guide bracket from extension housing (Figure 48).
4. Speedometer driven gear case from extension housing.
5. Speedometer driven gear from speedometer driven gear case (Figure 49).
6. Speedometer driven gear case lip seal from speedometer driven gear case.

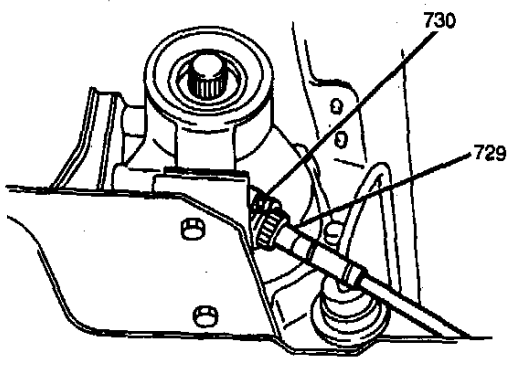
### Inspect

- Speedometer driven gear for excessive wear. Replace as necessary.
- Speedometer driven gear case O-ring for cuts or other damage. Replace as necessary.

### Install or Connect

Tool Required:
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply a thin coat of J 36850 to all speedometer driven gear components prior to assembly.
2. New speedometer driven gear case lip seal into speedometer driven gear case.
3. Speedometer driven gear into speedometer driven gear case.
4. Speedometer driven gear case into extension housing.
5. One bolt and speedometer guide bracket to extension housing (Figure 48).




729 SPEEDOMETER CABLE
730 SPEEDOMETER GUIDE BRACKET BOLT EJS0397A

Figure 48—Speedometer Cable and Guide Bracket Bolt (3L30, 3-Speed)

### Tighten

- Speedometer guide bracket bolt to 9 N·m (80 lb. in.).

6. Speedometer cable to speedometer driven gear case (Figure 49).
7. Lower vehicle.

## SPEEDOMETER CABLE

For speedometer cable service procedures, refer to SECTION 8C.

## SPEEDOMETER DRIVEN GEAR (FOUR-WHEEL DRIVE MODELS)

Refer to SECTION 7D for service on the speedometer driven gear.

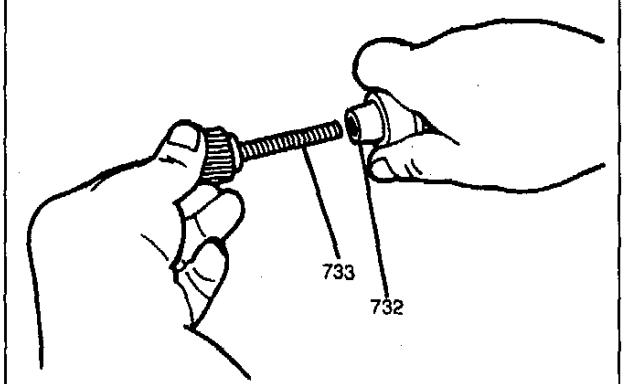
## EXTENSION HOUSING SEAL (TWO-WHEEL DRIVE MODELS) (3L30, 3-SPEED)

***Figures 50 and 51***

### Remove or Disconnect

Tools Required:
J 6125-B Slide Hammer
J 23129 Converter Housing Seal and Extension Housing Oil Seal Remover

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Place an index mark (reference mark) on the pinion flange yoke of the rear propeller shaft and the differential pinion flange to ensure correct rear propeller shaft installation.
3. Four bolts, four nuts and rear propeller shaft from vehicle.
4. Extension housing seal from extension housing using a J 23129 with a J 6125-B (Figure 50).
5. Extension housing seal surface for cracks or other damage. Replace as necessary.




732 SPEEDOMETER DRIVEN GEAR CASE
733 SPEEDOMETER DRIVEN GEAR EJS0407A

Figure 49—Removing Speedometer Driven Gear from Speedometer Driven Gear Case (3L30, 3-Speed)

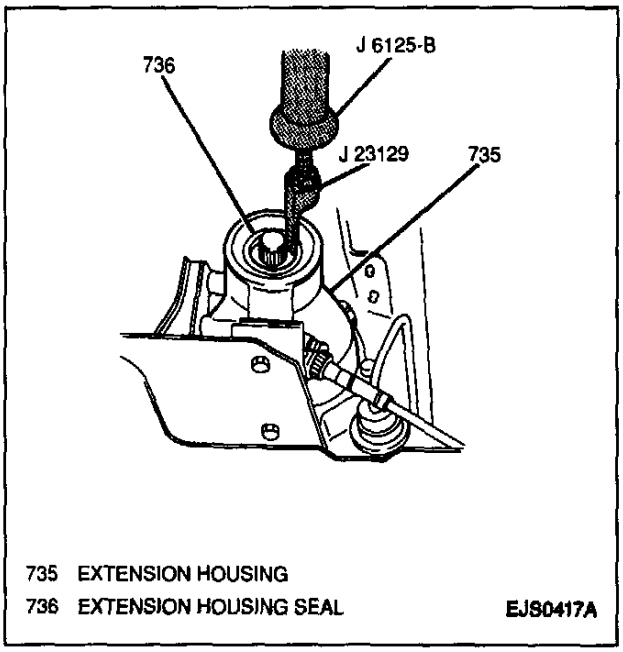



Figure 50—Removing Extension Housing Seal (3L30, 3-Speed)

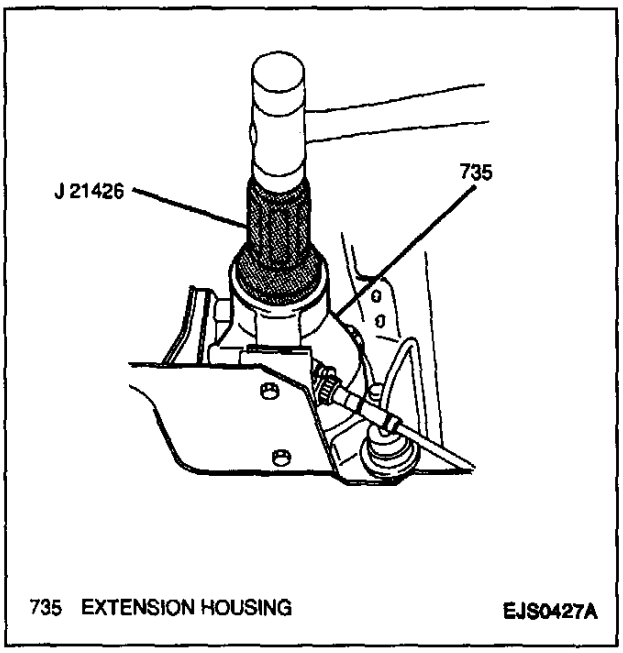



Figure 51—Installing Extension Housing Seal (3L30, 3-Speed)

### Install or Connect

Tools Required:
J 21426 Extension Housing Seal Installer
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply a thin coat of J 36850 to the extension housing seal surface.
2. New extension housing seal using a J 21426 (Figure 51).
3. Apply J 36850 to the new extension housing seal lip.

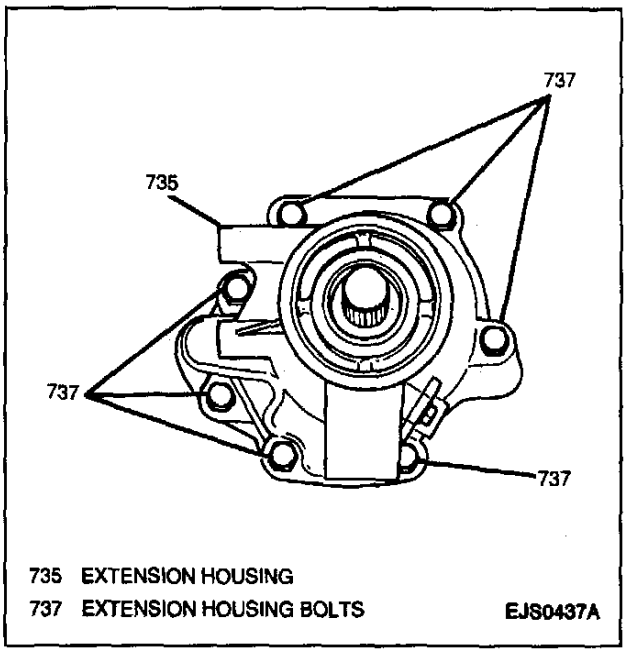



Figure 52—Extension Housing Bolts (3L30, 3-Speed)

4. Rear propeller shaft into vehicle aligning index marks made during rear propeller shaft removal; secure with four bolts and four nuts.

### Tighten

- Rear propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

5. Lower vehicle.

## EXTENSION HOUSING (TWO-WHEEL DRIVE MODELS) (3L30, 3-SPEED)

***Figures 48 and 52 through 57***

### Remove or Disconnect

Tools Required:
J 23062-14 Extension Housing Bushing Remover and Installer
J 8092 Drive Handle

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Place an index mark (reference mark) on the pinion flange yoke of the rear propeller shaft and the differential pinion flange to ensure correct rear propeller shaft installation.
3. Four bolts, four nuts and rear propeller shaft from vehicle.
4. Drain transmission fluid. Refer to "Changing Fluid and Cleaning Filter Screen (03-72L, 4-Speed)" earlier in this section.
5. Transmission fluid pan and gasket and drain transmission fluid. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
6. Install transmission fluid pan and new gasket onto transmission to support transmission assembly on hydraulic jack; secure with twelve bolts (3L30, 3-Speed).

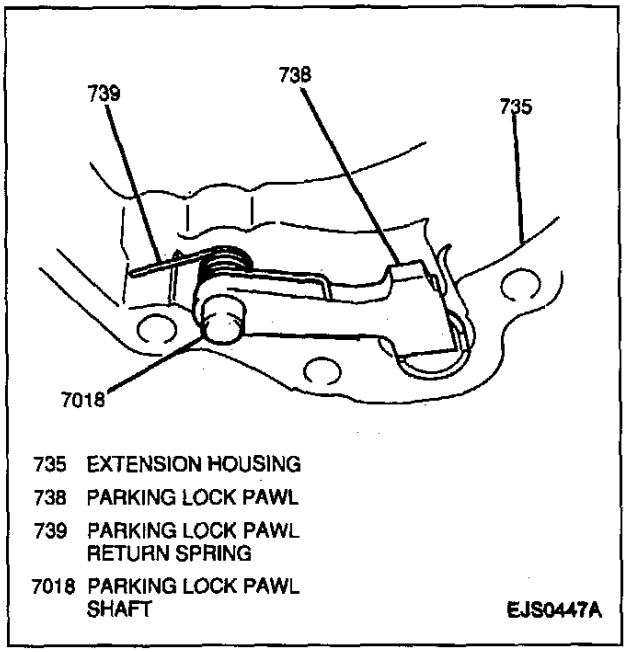



Figure 53—Parking Lock Pawl, Parking Lock Pawl Shaft and Return Spring (3L30, 3-Speed)

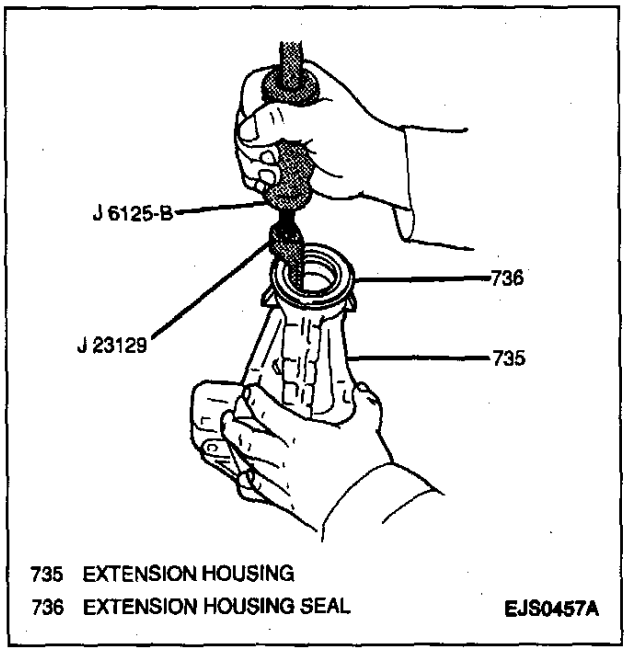



Figure 54—Removing Extension Housing Seal (3L30, 3-Speed)

**Tighten**

- Transmission fluid pan bolts to 13 N·m (115 lb. in.).

7. Speedometer cable from speedometer driven gear case (Figure 48).
8. One bolt and speedometer guide bracket from transmission (Figure 48).
9. Speedometer driven gear case from transmission extension housing.
10. Two bolts, two nuts and exhaust pipe bracket from extension housing and catalytic converter.

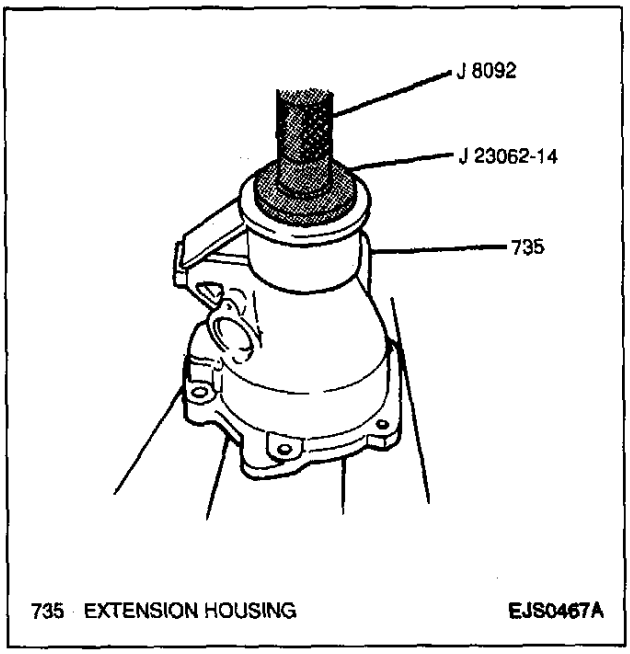



Figure 55—Removing Extension Bearing (3L30, 3-Speed)

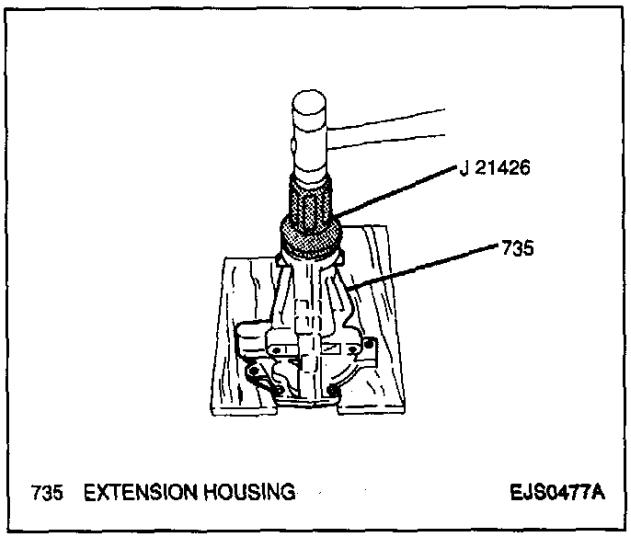



Figure 56—Installing Extension Housing Seal (3L30, 3-Speed)

11. Support transmission with a suitable hydraulic jack.
12. Two bolts from rear transmission mount.
13. Four bolts and rear transmission crossmember from vehicle.
14. Seven bolts, extension housing and gasket from transmission case (Figure 52).
15. Parking lock pawl, parking lock pawl shaft and parking lock pawl return spring from extension housing (Figure 53).
16. Extension housing seal from extension housing using a J 23129 in conjunction with a J 6125-B (Figure 54).
17. Extension bearing from extension housing using a J 23062-14 with a J 8092 (Figure 55).

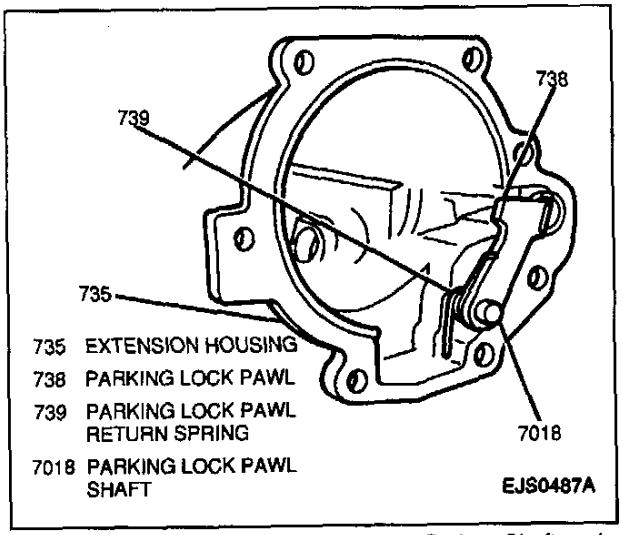



Figure 57—Parking Lock Pawl Return Spring, Shaft and Installation (3L30, 3-Speed)

### Clean

- Extension housing and transmission case mating surfaces.

### Inspect

- Extension housing for cracks or other damage. Replace as necessary.

### Install or Connect

Tools Required:
- J 21426 Extension Housing Seal Installer
- J 36850 Transjel® Transmission Assembly Lubricant
- J 23062-14 Extension Housing Bushing Remover and Installer
- J 8092 Driver Handle

1. Extension bearing into extension housing using a J 23062-14 with a J 8092.
2. Extension housing seal into extension housing using a J 21426 (Figure 56).
3. Parking lock pawl return spring, parking lock pawl shaft and parking lock pawl into extension housing (Figure 57).
4. New extension housing gasket and extension housing to transmission case; secure with seven bolts (Figure 52).

### Tighten

- Extension housing bolts to 31 N.m (23 lb. ft.).

5. Rear transmission crossmember to undercarriage; secure with four bolts.

### Tighten

- Rear transmission crossmember bolts to 60 N.m (44 lb. ft.).

6. Two bolts to rear transmission mount.

### Tighten

- Rear transmission mount bolts to 60 N.m (44 lb. ft.).

7. Remove hydraulic jack from under transmission.
8. Exhaust pipe bracket to extension housing and catalytic converter; secure with two bolts and two nuts.

### Tighten

- Exhaust pipe bracket bolts and nuts to 23 N.m (17 lb. ft.).

9. Apply J 36850 to the speedometer driven gear case O-ring.
10. Speedometer driven gear case into extension housing.
11. One bolt and speedometer guide bracket to extension housing (Figure 48).

### Tighten

- Speedometer guide bracket bolt to 9 N.m (80 lb. in.).

12. Speedometer cable to speedometer driven gear case (Figure 48).
13. New transmission fluid pan gasket and fluid pan onto transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
14. New transmission fluid plug gasket and fluid pan plug into transmission. Refer to "Changing Fluid and Cleaning Filter Screen (03-72LE, 4-Speed)" earlier in this section.
15. Rear propeller shaft into vehicle aligning index marks made during rear propeller shaft removal; secure with four bolts and four nuts.

### Tighten

- Rear propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

16. Lower vehicle.
17. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.

J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.

K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## TRANSFER ADAPTER CASE SEAL (FOUR-WHEEL DRIVE MODELS)

***Figures 58 and 61***

### Remove or Disconnect

Tools Required:
J 6125-B Slide Hammer
J 23129 Converter Housing Seal and Extension Housing Oil Seal Remover

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Support transmission with a suitable hydraulic jack.
3. Transfer case from vehicle. Refer to SECTION 7D.
4. Transfer adapter case seal from transfer adapter case using a J 23129 with a J 6125-B (Figure 58).

### Inspect

- Transfer adapter case for cracks and other damage. Replace as necessary.

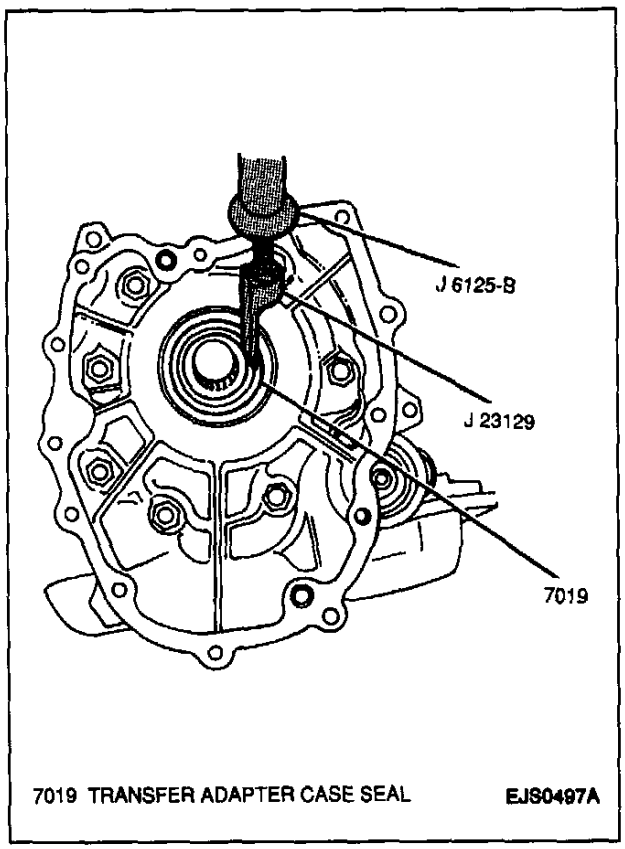



Figure 58—Removing Transfer Adaptor Case Seal

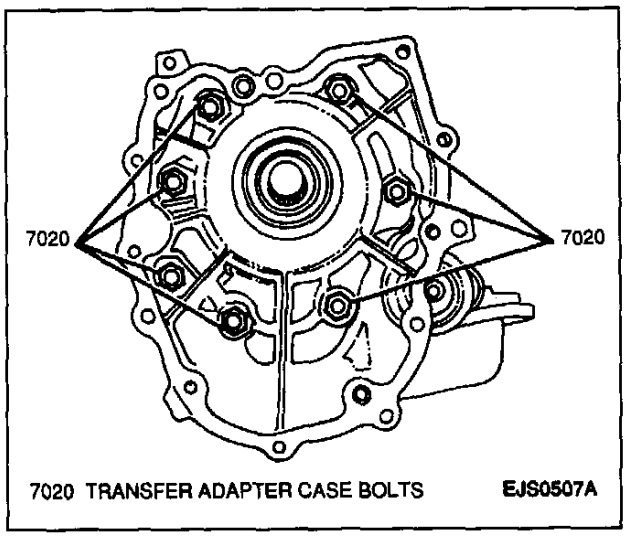



Figure 59—Transfer Adaptor Case Bolts

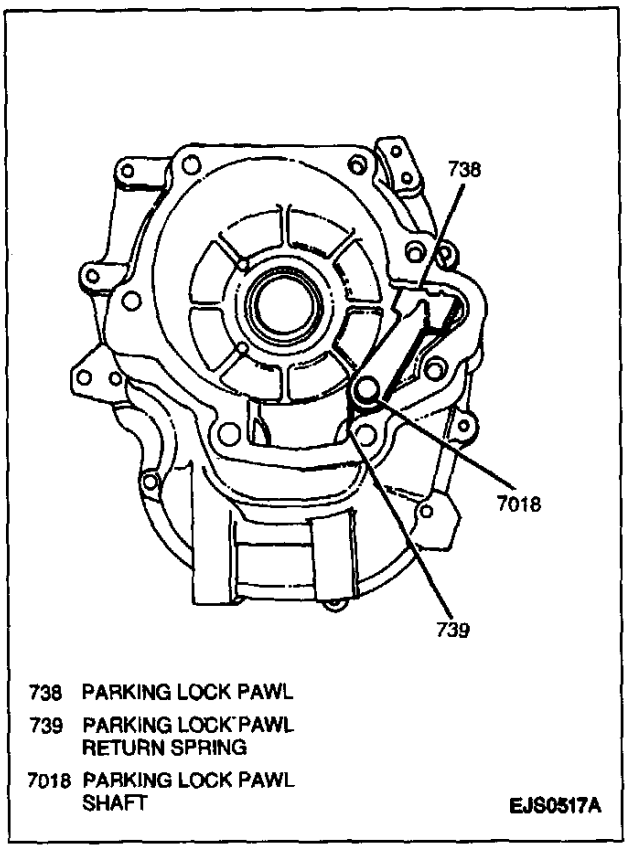



Figure 60—Parking Lock Pawl, Parking Lock Pawl Shaft and Parking Lock Pawl Return Spring

### Install or Connect

Tools Required:
J 35538 Axle Shaft Seal Installer
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply a thin coat of J 63850 to the transfer adapter case seal surface.
2. New transfer adapter case seal into the transfer adapter case using a J 35538 (Figure 61).
3. Apply J 36850 to the new transfer adapter case seal lip.
4. Transfer case into vehicle. Refer to SECTION 7D.
5. Remove hydraulic jack from under transmission.
6. Lower vehicle.

## TRANSFER ADAPTER CASE (FOUR-WHEEL DRIVE MODELS)

***Figures 58 through 61***

### Remove or Disconnect

Tools Required:
J 6125-B Slide Hammer
J 23129 Converter Housing Seal and Extension Housing Oil Seal Remover

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Place a drain pan or suitable container under transmission fluid pan.
3. Transmission fluid pan and gasket and drain transmission fluid. Refer to appropriate "Changing Fluid and Cleaning Filter Screen" earlier in this section.
4. Install transmission fluid pan and new gasket onto transmission to support transmission assembly on hydraulic jack; secure with twelve bolts (3L30, 3-Speed).

### Tighten

- Transmission fluid pan bolts to 13 N·m (115 lb. in.).

5. Remove drain pan from under transmission fluid pan.
6. Support transmission with a suitable hydraulic jack.
7. Transfer case from vehicle. Refer to SECTION 7D.
8. Two bolts, two nuts and exhaust pipe bracket from transfer adapter case and catalytic converter.
9. Seven bolts, transfer adapter case and gasket from transmission case (Figure 59).
10. Parking lock pawl, parking lock pawl shaft and parking lock pawl return spring from transfer adapter case (Figure 60).
11. Transfer adapter case seal from transfer adapter case using a J 6125-B with a J 23129 (Figure 58).

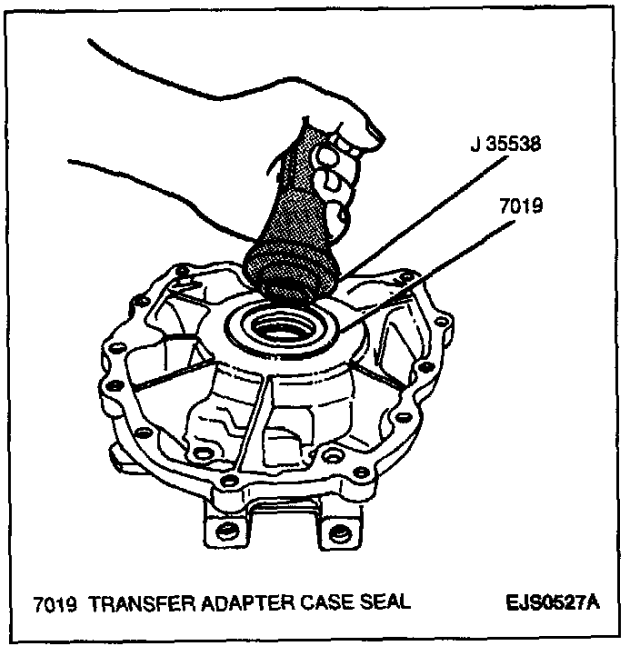



Figure 61—Installing New Transfer Adaptor Case Seal

### Clean

- Transfer adapter case and transmission case mating surfaces.

### Inspect

- Transfer adapter case for cracks or other damage. Replace as necessary.

### Install or Connect

Tools Required:
J 35538 Axle Shaft Seal Installer
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply a thin coat of J 63850 to the transfer adapter case seal surface.
2. New transfer adapter case seal into the transfer adapter case using a J 35538 (Figure 61).
3. Apply J 36850 to the new transfer adapter case seal lip.
4. Parking lock pawl return spring, parking lock pawl shaft and parking lock pawl into transfer adapter case (Figure 60).
5. New transfer adapter case gasket and transfer adapter case to transmission case; secure with seven bolts (Figure 59).

### Tighten

- Transfer adapter case bolts to 31 N·m (23 lb. ft.).

6. Exhaust pipe bracket to transfer adapter case and catalytic converter; secure with two bolts and two nuts.

### Tighten

- Exhaust pipe bracket bolts and nuts to 23 N.m (17 lb. ft.).

7. Transfer case into vehicle. Refer to SECTION 7D.
8. Remove hydraulic jack from under transmission.
9. Lower vehicle.
10. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## SPEEDOMETER DRIVE GEAR (TWO-WHEEL DRIVE MODELS) (3L30, 3-SPEED)

***Figure 62***

### Remove or Disconnect

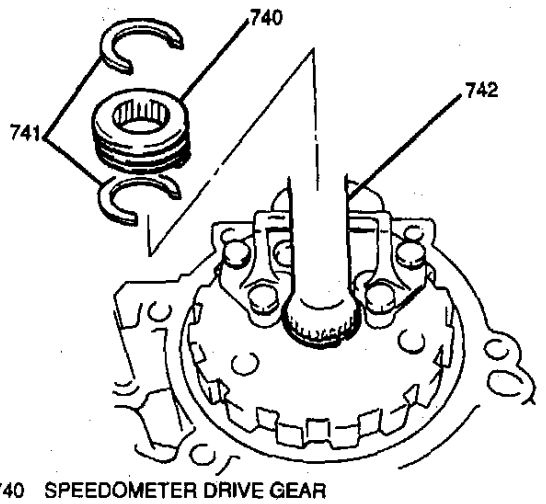
1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Extension housing from transmission case. Refer to "Extension Housing" earlier in this section.
3. Two speedometer drive gear retaining rings and speedometer drive gear from transmission output shaft (Figure 62).

### Inspect

- Speedometer drive gear for abnormal wear or damage. Replace as necessary.

### Install or Connect

1. Speedometer drive gear onto transmission output shaft; secure with two speedometer drive gear retaining rings (Figure 62).
2. Extension housing to transmission case. Refer to "Extension Housing" earlier in this section.
3. Lower vehicle.
4. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.




740 SPEEDOMETER DRIVE GEAR
741 SPEEDOMETER DRIVE GEAR RETAINING RING
742 OUTPUT SHAFT
EJS0537A

Figure 62—Speedometer Drive Gear Removal (3L30, 3-Speed)

K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## GOVERNOR ASSEMBLY (3L30, 3-SPEED)

***Figures 62 through 65***

### Remove or Disconnect

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Extension housing from transmission case (two-wheel drive models). Refer to "Extension Housing" earlier in this section.
3. Transfer adapter case from transmission case (four-wheel drive models). Refer to "Transfer Adapter Case" earlier in this section.
4. Two speedometer drive gear retaining rings and speedometer drive gear from transmission output shaft (Figure 62).
5. Governor ring and governor hub from transmission output shaft (Figure 63)
6. Four bolts, governor assembly and gasket from governor hub.
7. Governor fluid screen from governor hub (Figure 64).
8. Secondary valve retainer, secondary spring, secondary valve and primary valve from governor body (Figure 65).

### Clean

- All governor components with solvent and air dry.

### Inspect

1. Governor hub seal rings for cuts or other damage. Replace as necessary (Figure 65).

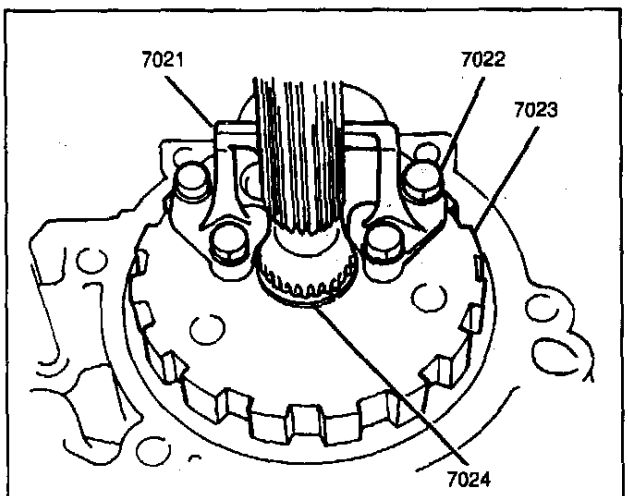



Figure 63—Governor Hub and Governor Ring

2. Primary and secondary valves for nicks or burrs. Replace governor assembly as necessary.
3. Fluid passages and valve bores in governor body for nicks, burrs or varnish. Replace governor assembly as necessary.

### Install or Connect

Tool Required:
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply a thin coat of J 36850 to the primary and secondary valves.
2. Primary valve, secondary valve, secondary spring and secondary valve retainer into governor body.
3. Governor fluid screen into governor hub.
4. New governor assembly gasket and governor assembly onto governor hub; secure with four bolts.

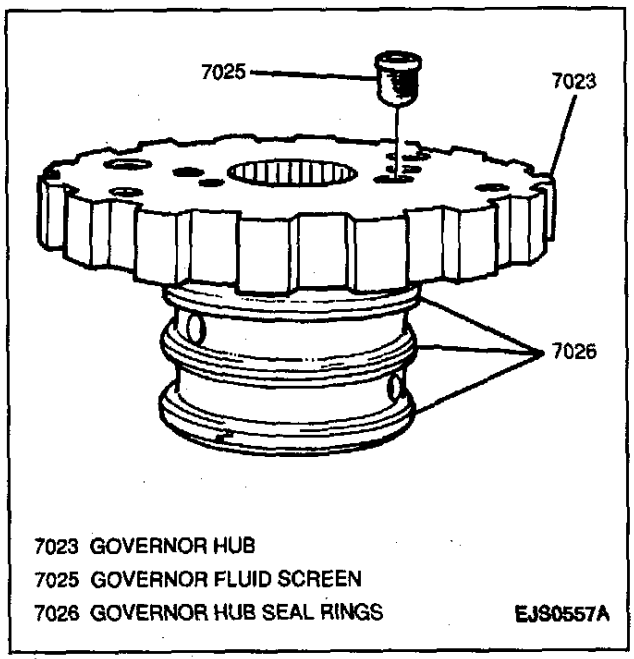



Figure 64—Removing Governor Fluid Screen

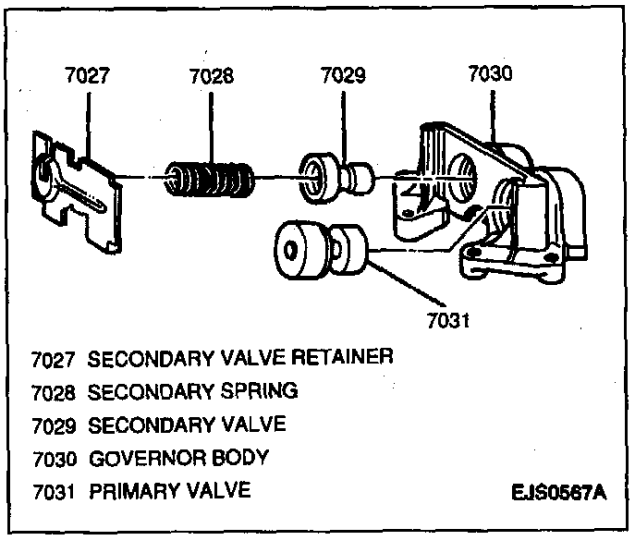



Figure 65—Disassembling Governor Assembly

**Tighten**

- Governor assembly bolts to 9 N.m (80 lb. in.).

5. Apply J 36850 to the governor seal rings on the governor hub.
6. Governor hub onto transmission output shaft; secure with governor ring (Figure 63).
7. Speedometer drive gear onto transmission output shaft; secure with two speedometer drive gear retaining rings (Figure 62).
8. Transfer adapter case to transmission case (four-wheel drive models). Refer to "Transfer Adapter Case" earlier in this section.
9. Extension housing to transmission case (two-wheel drive models). Refer to "Extension Housing" earlier in this section.
10. Lower vehicle.
11. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## FLUID FILLER TUBE

**Remove or Disconnect**

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. One bolt and fluid filler tube from transmission case.

**Inspect**

- Fluid filler tube O-ring for cuts or other damage. Replace as necessary.

**Install or Connect**

Tool Required:
J 36850 Transjel® Transmission Assembly Lubricant

1. Apply J 36850 to the fluid filler tube O-ring.
2. Fluid filler tube into transmission case; secure with one bolt.

**Tighten**

- Fluid filler tube bracket bolt to 23 N.m (17 lb. ft.).

3. Lower vehicle.

## VALVE BODY REMOVAL (3L30, 3-SPEED)

***Figures 37 and 38***

**Remove or Disconnect**

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Transmission fluid pan and gasket from transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
4. Three bolts, fluid filter screen and gasket from valve body (Figure 37).
5. Two TCC solenoid pipes from TCC solenoid, fluid pump and valve body (Figure 37).
6. Electrical connector from TCC solenoid (Figure 37).
7. Electrical connectors from fluid pressure switch (Figure 37).
8. Two bolts and TCC solenoid from reinforcement plate.
9. Fluid pressure switch from valve body by turning counterclockwise (Figure 37).
10. Six bolts and reinforcement plate from transmission case (Figure 38).
11. Four bolts, servo piston cover and gasket from transmission case (Figure 38).

**NOTICE:** Disconnect the manual valve link from the parking lock and range selector lever while lowering the valve body. Use caution not to lose the check ball in the transmission case passage when removing valve body. The check ball should drop out of the case passage onto the top of the valve body upon valve body removal.

12. Nine bolts, manual detent roller, valve body, transfer plate, transfer plate gaskets and one check ball from transmission case (Figure 38).

## Valve Body Disassembly (3L30, 3-SPEED)

***Figures 66, 67 and 68***

### Remove or Disconnect

1. Manual valve and manual valve link from valve body (Figure 66).
2. Two bolts, transfer plate and transfer plate gaskets from valve body (Figure 67).
3. Retaining pin, 1-2 accumulator valve plug, 1-2 accumulator valve and 1-2 accumulator valve spring from valve body (Figure 66).
4. Retaining pin, high speed downshift timing valve spring, downshift timing valve, retaining pin, timing and control valve plug, low speed downshift timing valve and downshift timing valve spring from valve body (Figure 66).
5. Retaining pin, manual low control valve spring, manual low control valve and reverse control valve from valve body (Figure 66).
6. Retaining pin, detent pressure regulator valve spring and detent pressure regulator valve from valve body (Figure 66).
7. Retaining pin, 3-2 control valve plug, 3-2 control valve spring and 3-2 control valve from valve body (Figure 66).
8. Retaining pin, 2-3-Shift control valve sleeve, 2-3-Shift control valve, 2-3 control valve spring, 2-3 control valve spring seat and 2-3-Shift valve from valve body (Figure 66).
9. Retaining pin, 1-2 shift control valve sleeve, 1-2 shift control valve primary spring, 1-2 shift control valve, 1-2 shift control valve secondary spring and 1-2 shift valve from valve body (Figure 66).

### Clean

1. All valve body components thoroughly with solvent and air dry.
2. 1-2 accumulator piston assembly by pouring solvent into the 1-2 accumulator passage in the valve body and repeatedly compressing and decompressing the 1-2 accumulator piston. This will flush out any dirt or foreign material in the 1-2 accumulator piston chamber. Make sure all solvent is drained out of the 1-2 accumulator piston chamber after cleaning (Figure 68).

### Inspect

Tool Required:
J 38549 Transmission Valve Lapping Compound

1. Valve body for:

- Distorted or damaged valve bores.
- Blocked fluid passages.

2. All valves, springs and attaching parts for unusual wear or damage. Replace as necessary.
3. All valves for fit in their respective bores. If valves stick or do not move back and forth smoothly in their bores, apply J 38549 to any sticking valve twisting the valve back and forth in its bore until valve operates smoothly.

**NOTICE:** The use of a honing stone, fine sandpaper or crocus cloth is not recommended for servicing stuck valves. All valve lands have sharply machined corners that are necessary to "cleaning" the bore. If these corners are rounded, foreign material could wedge between the valve and the bore causing the valve to stick. If it is necessary to clean a valve, J 38549 should be used. After a valve has been cleaned, make sure all traces of J 38549 have been removed before valve body assembly.

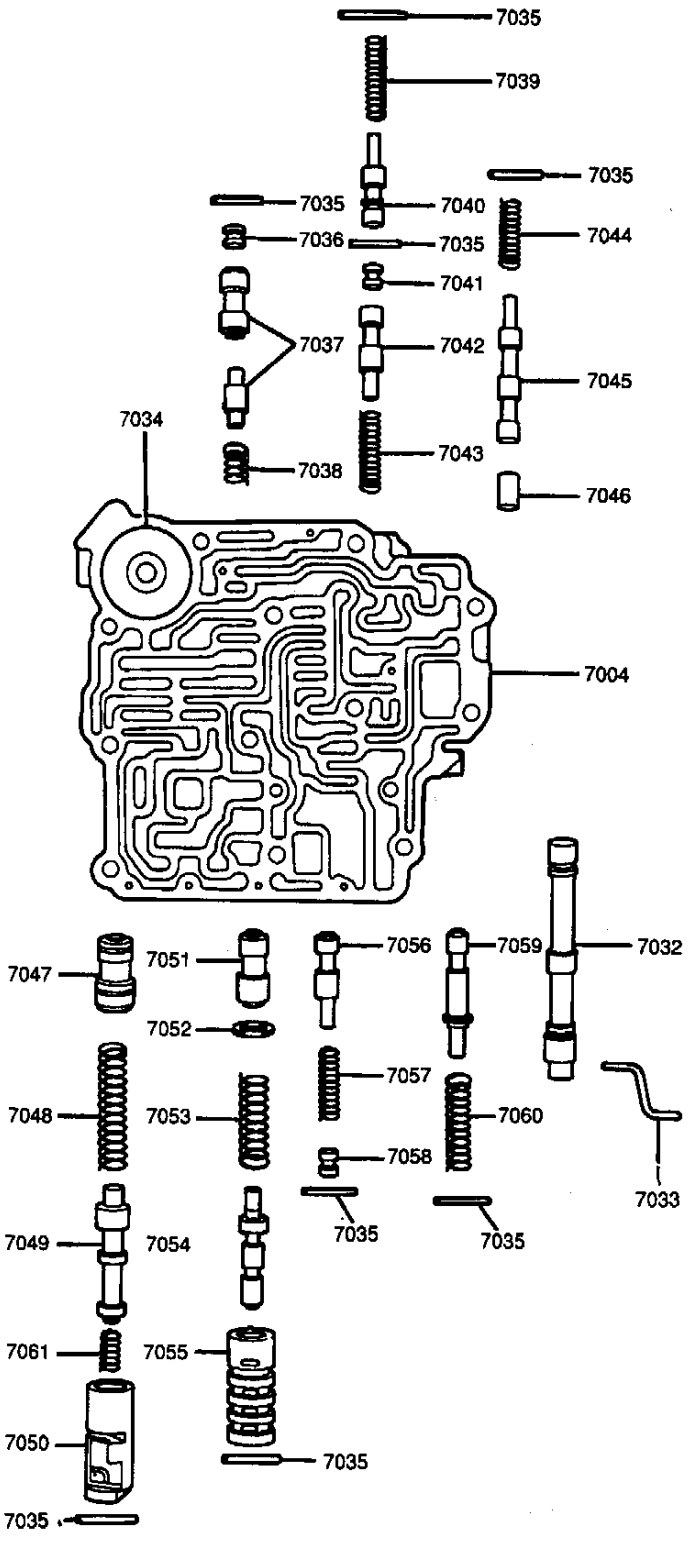
## Valve Body Assembly (3L30, 3-SPEED)

***Figures 66 and 67***

### Install or Connect

Tools Required:
J 36850 Transjel® Transmission Assembly Lubricant
J 3387-2 Converter Housing Guide Pin

1. Apply a thin coat of J 36850 to all valve body components prior to assembly.
2. 1-2 shift valve, 1-2 shift control valve secondary spring, 1-2 shift control valve, 1-2 shift control valve primary spring and 1-2 shift control valve sleeve into valve body; secure with retaining pin (Figure 65).
3. 2-3-Shift valve, 2-3 control valve spring seat, 2-3 control valve spring, 2-3-Shift control valve and 2-3-Shift control sleeve into valve body; secure with retaining pin (Figure 66).
4. 3-2 control valve, 3-2 control valve spring and 3-2 control valve plug into valve body; secure with retaining pin (Figure 66).
5. Detent pressure regulator valve and detent pressure regulator valve spring into valve body; secure with retaining pin (Figure 66).
6. Reverse control valve, manual low control valve and manual low control valve spring into valve body; secure with retaining pin (Figure 66).
7. Downshift timing valve spring, low speed downshift timing valve, timing and control valve plug, retaining pin, high speed downshift timing valve and downshift timing valve spring into valve body; secure with retaining pin (Figure 66).
8. 1-2 accumulator valve spring, 1-2 accumulator valve and 1-2 accumulator valve plug into valve body; secure with retaining pin (Figure 66).
9. New transfer plate gaskets and transfer plate onto valve body using the J 3387-2 to align the transfer plate and gaskets; secure with two bolts (Figure 67).




7004 VALVE BODY
7032 MANUAL VALVE
7033 MANUAL VALVE LINK
7034 1–2 ACCUMULATOR PISTON ASSEMBLY
7035 RETAINING PIN
7036 1–2 ACCUMULATOR PLUG
7037 1–2 ACCUMULATOR VALVE
7038 1–2 ACCUMULATOR VALVE SPRING
7039 HIGH SPEED DOWNSHIFT TIMING VALVE SPRING
7040 HIGH SPEED DOWNSHIFT TIMING VALVE
7041 TIMING AND CONTROL VALVE PLUG
7042 LOW SPEED DOWNSHIFT TIMING VALVE
7043 LOW SPEED DOWNSHIFT TIMING VALVE SPRING
7044 MANUAL LOW CONTROL VALVE SPRING
7045 MANUAL LOW CONTROL VALVE
7046 REVERSE CONTROL VALVE
7047 1–2 SHIFT VALVE
7048 1–2 SHIFT CONTROL VALVE SECONDARY SPRING
7049 1–2 SHIFT CONTROL VALVE
7050 1–2 SHIFT CONTROL VALVE SLEEVE
7051 2–3 SHIFT VALVE
7052 2–3 SHIFT CONTROL VALVE SPRING SEAT
7053 2–3 SHIFT CONTROL VALVE SPRING
7054 2–3 SHIFT CONTROL VALVE
7055 2–3 SHIFT CONTROL VALVE SLEEVE
7056 3–2 CONTROL VALVE
7057 3–2 CONTROL VALVE SPRING
7058 3–2 CONTROL VALVE PLUG
7059 DETENT PRESSURE REGULATOR VALVE
7060 DETENT PRESSURE REGULATOR VALVE SPRING
7061 1–2 SHIFT CONTROL VALVE PRIMARY SPRING

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Figure 66—Valve Body Components (3L30, 3-Speed)

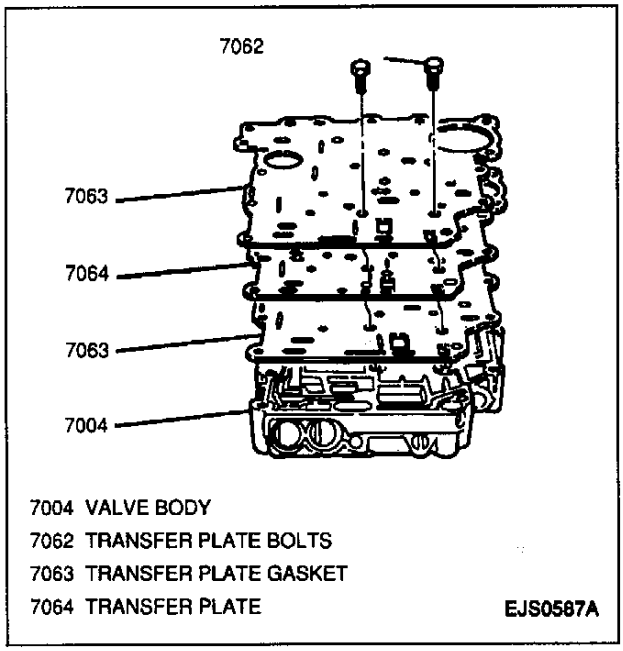



Figure 67—Removing Transfer Plate Retaining Bolts (3L30, 3-Speed)

**Tighten**

- Transfer plate-to-valve body bolts to 9 N.m (80 lb. in.).

10. Manual valve and manual valve link into valve body.

## VALVE BODY INSTALLATION (3L30, 3-SPEED)

***Figures 37, 38, 46 and 47***

**Install or Connect**

Tools Required:
J 3387-2 Converter Housing Guide Pin
J 36850 Transjel® Transmission Assembly Lubricant

**NOTICE:** Make sure to install the check ball in the transmission case passage when installing valve body. Use a small amount of J 36850 to retain the check ball in place during valve body installation. Failure to install check ball in its correct position may result in transmission shift failure.

1. Check ball, transfer plate gaskets, transfer plate, valve body and manual detent roller onto transmission case aligning valve body with transmission case using the J 3387-2; secure with nine bolts (Figure 46).

**Tighten**

- Valve body bolts to 19 N.m (14 lb. ft.).

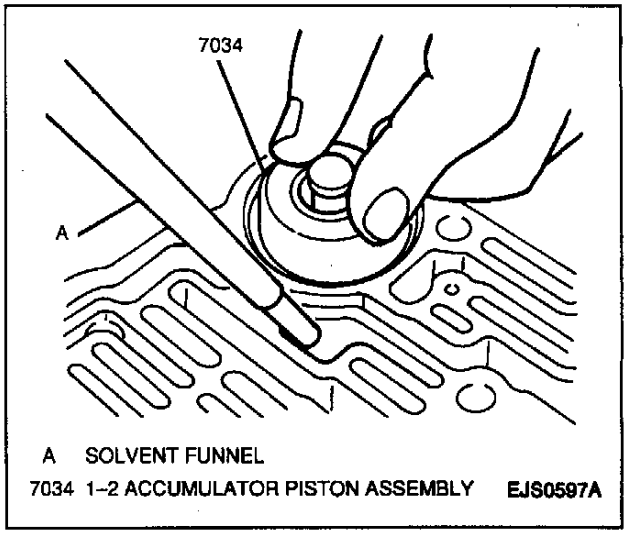



Figure 68—Cleaning 1-2 Accumulator Piston (3L30, 3-Speed)

2. New servo piston cover gasket and servo piston cover onto transmission case; secure with four bolts (Figure 47).

**Tighten**

- Servo piston cover bolts to 25 N.m (18 lb. ft.).

3. Reinforcement plate onto transmission case; secure with six bolts (Figure 38).

**Tighten**

- Reinforcement plate bolts to 19 N.m (14 lb. ft.).

4. Fluid pressure switch into valve body by turning clockwise (Figure 37).

**Tighten**

- Fluid pressure switch to 10 N.m (89 lb. in.).

5. TCC solenoid onto reinforcement plate; secure with two bolts.

**Tighten**

- TCC solenoid retaining bolts to 19 N.m (14 lb. ft.).

6. Electrical connectors to fluid pressure switch (Figure 37).
7. Electrical connector to TCC solenoid (Figure 37).

**Inspect**

- TCC solenoid pipe O-rings for cuts or other damage. Replace as necessary.

8. Apply a thin coat of J 36850 to the TCC solenoid pipe O-rings.
9. Two TCC solenoid pipes into TCC solenoid, fluid pump and valve body (Figure 37).
10. New fluid filter screen gasket and fluid filter screen onto valve body; secure with three bolts.

**Tighten**

- Fluid filter screen bolts to 19 N.m (14 lb. ft.).

11. New transmission fluid pan gasket and transmission fluid pan onto transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
12. Remove drain pan from under transmission fluid pan.
13. Lower vehicle.
14. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

15. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 (1.6 qts.) liters of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## VALVE BODY AND ACCUMULATOR PISTONS REMOVAL (03-72LE, 4-SPEED)

***Figures 69 through 71***

**Remove or Disconnect**

1. Electrical connectors from torque convertor (TCC) solenoid and shift solenoid assembly.
2. Fifteen bolts retaining valve body and valve body from transmission case by (Figure 69):
   - Lift valve body slowly and disconnect TV cable from TV cable cam and remove valve body from transmission case (Figure 70).

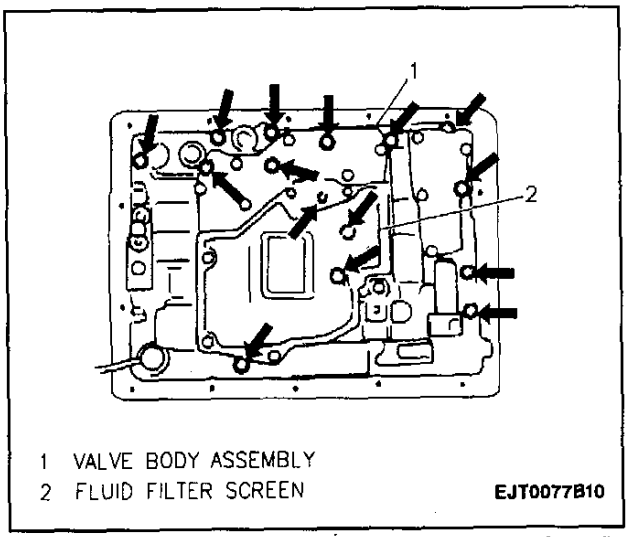



Figure 69—Valve Body Bolt Location (03-72LE, 4-Speed)

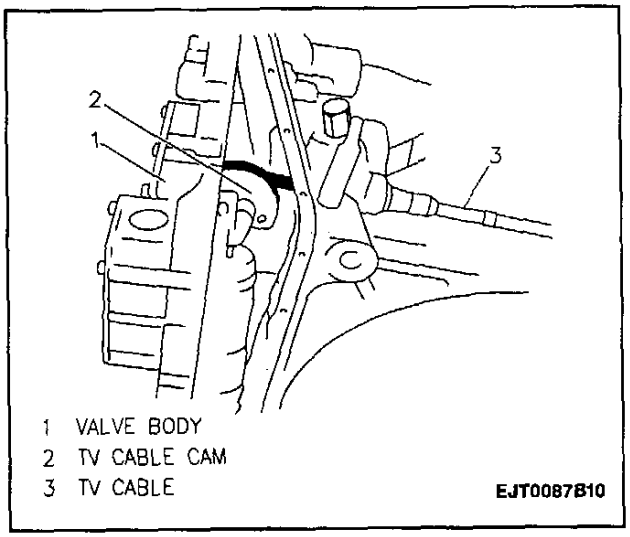



Figure 70—TV Cable Cam (03-72LE, 4-Speed)

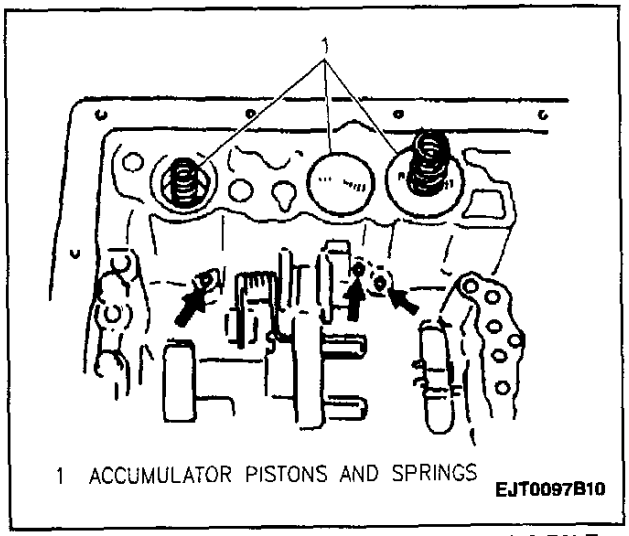



Figure 71—Accumulator Pistons and Springs (03-72LE, 4-Speed)

3. One bolt and solenoid wiring harness from transmission case.
4. Cover accumulators with a clean cloth and apply low compressed air slowly to the fluid passages shown in Figure 71 until the air pressure forces the second brake, direct clutch and forward clutch accumulators from out of there respective case bores.

**Inspect**

- Accumulator pistons for cracks, scarring or damage.
- Accumulator springs for weakness, cracks or damage.
- Piston seals for cuts or damage.
- Accumulator case bores for scars, nicks or pitting.

## Valve Body Disassembly (03-72LE, 4-SPEED)

***Figures 72 through 79***

**Remove or Disconnect**

1. One bolt and detent spring, plate and manual valve from valve body (Figure 73).
2. Nine bolts from upper valve body side (Figure 74).
3. Six bolts from lower valve body side (Figure 75).
4. Separate upper valve body from lower body while pressing separator plate and gasket against lower valve body to prevent check balls and springs from falling out of lower valve body (Figure 76).

**Inspect**

1. Front upper valve body that valves and check balls are in the proper location (Figure 77).
2. Rear upper valve body that check balls are in proper location (Figure 78).
3. Lower valve body that bypass valve, check balls and primary regulator valve sleeve retainer are in proper location (Figure 79).

## Front Upper Valve Body Disassembly (03-72LE, 4-SPEED)

***Figures 80 through 86***

**Remove or Disconnect**

**NOTICE:** When disassembling the front upper valve body, keep all valve springs, spring seats and plugs with their respective valves. Most valve springs are of different sizes and CANNOT be interchanged. Make sure all parts are clean and dry before assembly.

1. Throttle valve keep plate from valve body (Figure 81).
2. Using flat bladed screwdriver, hold cut back valve plug and remove cut back retainer with a magnet then remove cut back plug, cut back valve and cut back valve spring (Figure 82).
3. One bolt on front valve body end cover and loosen the other to move cover (Figure 83).
4. Secondary regulator valve subassembly and regulator valve spring (Figure 83).
5. One remaining cover bolt and end cover from valve body.
6. Cam bolt, TV cable cam, cam return spring and cam spacer (Figure 84).

**Important**

- Note the number of throttle valve compensating rings prior to removal. Line pressure is determined by the number of adjusting rings. The same number of compensating rings that were removed must be installed to ensure proper transmission line pressure. Some valve bodies do not require adjusting rings.

7. Push throttle valve slightly in and remove locating pin with magnet from down shift plug (Figure 85).
8. Down shift plug, throttle valve primary spring, throttle valve, secondary valve spring and throttle valve compensating ring(s) from valve body (Figure 86).

**Clean**

- All upper valve body components and dry thoroughly.

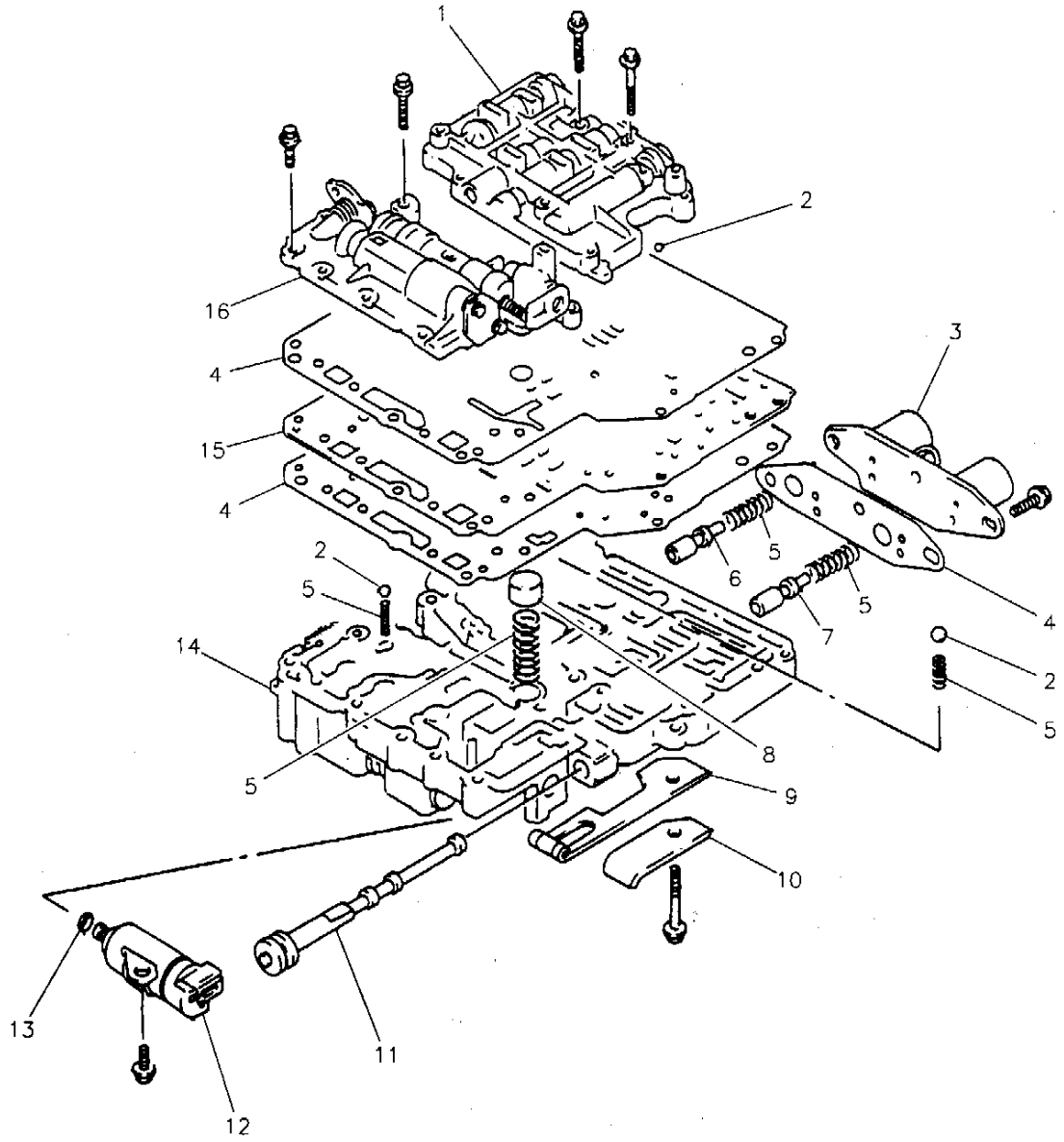
**Inspect**

1. All valves for cracks, scoring or other damage. Replace as necessary.
2. All valve springs for damage or distortion. Replace as necessary.
3. Front upper valve body valve bores for scoring or cracks. Replace as necessary.

**Measure**

Tool Required:
J 26900-5 Vernier Caliper

1. Free length and outer coil diameter of all front upper valve body valve springs using a J 26900-5. If spring free length is not as specified in the front upper valve body spring chart, replace as necessary.




1 REAR UPPER VALVE BODY
2 BALL
3 SHIFT SOLENOID ASSEMBLY
4 GASKET
5 SPRING
6 INTERMEDIATE COAST MODULATOR VALVE
7 LOW COAST MODULATOR VALVE
8 BY-PASS VALVE
9 DETENT SPRING
10 PLATE
11 MANUAL VALVE
12 TORQUE CONVERTER CLUTCH SOLENOID
13 O-RING
14 LOWER VALVE BODY ASSEMBLY
15 PLATE
16 FRONT UPPER VALVE BODY

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Figure 72—Valve Body Assembly Components (03-72LE, 4-Speed)

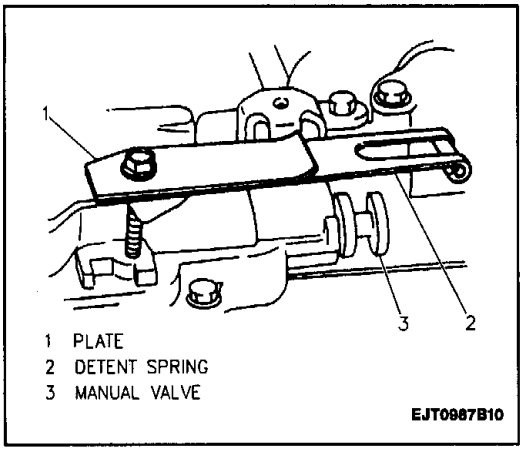



Figure 73—Detent Spring and Manual Valve (03-72LE, 4-Speed)

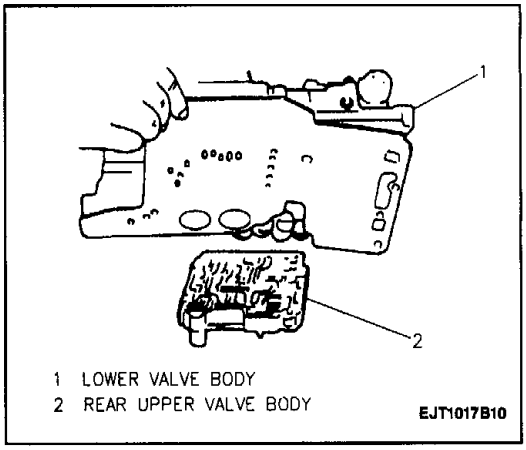



Figure 76—Removing Lower Valve from Upper Valve Body (03-72LE, 4-Speed)

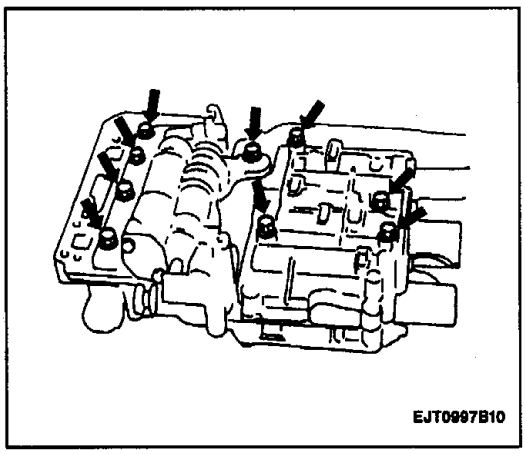



Figure 74—Upper Valve Body Bolt Location (03-72LE, 4-Speed)

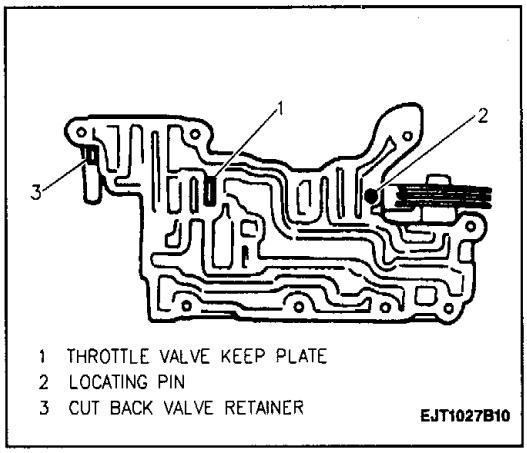



Figure 77—Inspecting Front Upper Valve Body Assembly (03-72LE, 4-Speed)

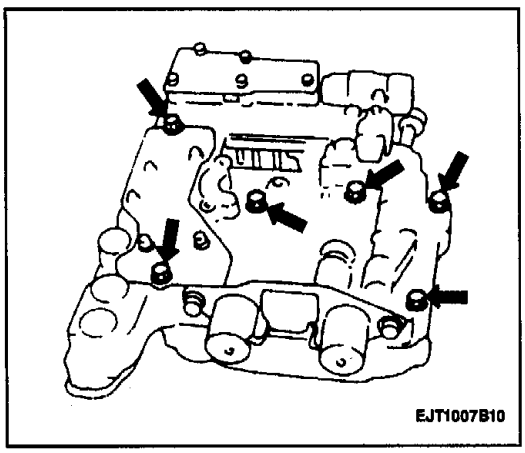



Figure 75—Lower Valve Body Bolt Location (03-72LE, 4-Speed)

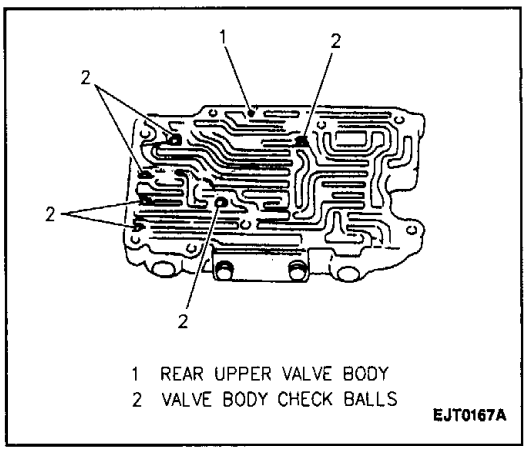



Figure 78—Inspecting Rear Upper Valve Body Assembly (03-72LE, 4-Speed)

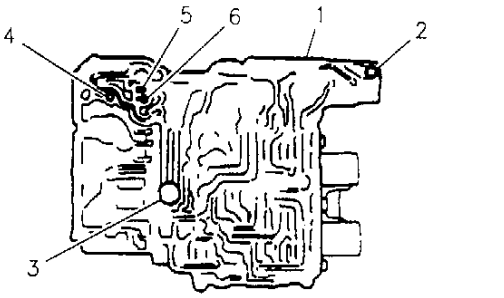



Figure 79—Inspecting Lower Valve Body Assembly (03-72LE, 4-Speed)

## Front Upper Valve Body Assembly (03-72LE, 4-SPEED)

***Figures 80 and 87***

### Install or Connect

1. Secondary valve spring, throttle valve compensating ring(s), throttle valve primary spring and down shift plug to valve body; secure with one locating pin.
2. Cam return spring, cam spacer and TV cam to valve body; secure with one bolt.

### Tighten

- TV cable cam bolt to 8 N.m (71 lb. in.).

3. Front valve end cover to valve body; secure with one bolt. Do Not tighten bolt fully.
4. Secondary valve spring, secondary regulator valve to valve body. Rotate end cover over valve; secure with one remaining bolt (Figure 87).

### Tighten

- Pressure relief valve bolts to 5 N.m (44 lb. in.).

5. Cut back valve spring, cut back valve and cut back plug to valve body; secure with one valve retainer.
6. Throttle valve keep plate to valve body.

## Rear Upper Valve Body Disassembly (03-72LE, 4-SPEED)

***Figures 88 through 93***

### Remove or Disconnect

**NOTICE:** When disassembling the rear upper valve body, keep all valve springs, spring seats and plugs with their respective valves. Most valve springs are of different sizes and CANNOT be interchanged. Make sure all parts are clean and dry before assembly.

1. Six valve body balls from valve body (Figure 89).
2. Depress 3-2 kickdown control valve plug and remove needle roller with magnet from valve body.
3. 3-2 kickdown control valve plug, clutch sequence valve and reverse brake sequence valve spring from valve body (Figure 90).
4. Depress shift valve plug, and remove shift valve retainer with magnet from valve body (Figure 91).
5. Shift valve plug and 3-4 shift valve spring from valve body.
6. Two plate bolts securing rear upper valve body plate and gasket to valve body (Figure 92).
7. 1-2 shift valve and shift valve spring from valve body.
8. Depress shift valve plug and remove valve retainer with magnet from valve body (Figure 93).
9. Shift valve plug, 2-3 shift valve and shift valve spring from valve body.

### Clean

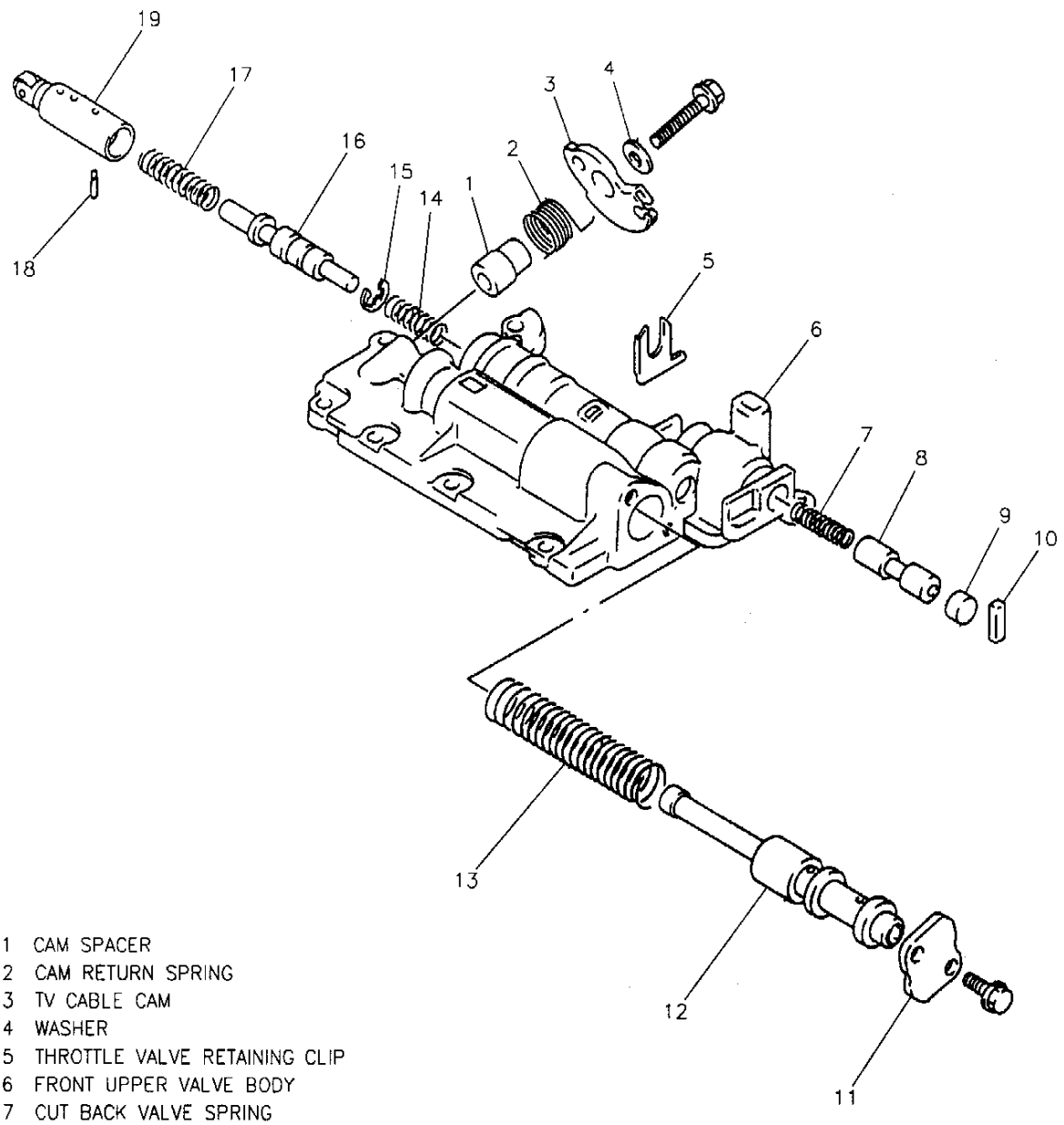
- All upper valve body components and dry thoroughly.

### Inspect

1. All valves for cracks, scoring or other damage. Replace as necessary.
2. All valve springs for damage or distortion. Replace as necessary.
3. Rear upper valve body valve bores for scoring or cracks. Replace as necessary.

**FRONT UPPER VALVE BODY SPRING CHART (03-72LE, 4-SPEED)**

| VALVE SPRING | SPRING OUTER DIAMETER | FREE LENGTH |
|---|---|---|
| Secondary Regulator Valve Spring | 17.43 mm (0.681 in.) | 71.23 mm (2.804 in.) |
| Cut Back Valve Spring | 6.85 mm (0.269 in.) | 23.00 mm (0.905 in.) |
| Secondary Valve Spring | 8.58 mm (0.337 in.) | 19.24 mm (0.757 in.) |
| Throttle Valve Primary Spring | 10.90 mm (0.429 in.) | 39.55 mm (1.557 in.) |




1 CAM SPACER
2 CAM RETURN SPRING
3 TV CABLE CAM
4 WASHER
5 THROTTLE VALVE RETAINING CLIP
6 FRONT UPPER VALVE BODY
7 CUT BACK VALVE SPRING
8 CUT BACK VALVE
9 CUT BACK PLUG
10 CUT BACK VALVE RETAINER
11 SECONDARY REGULATOR VALVE COVER
12 SECONDARY REGULATOR VALVE
13 SECONDARY REGULATOR SPRING
14 SECONDARY KICK DOWN SPRING
15 KICK DOWN RETAINING CLIP
16 KICK DOWN VALVE
17 PRIMARY KICK DOWN SPRING
18 LOCATING PIN
19 KICK DOWN PLUG

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Figure 80—Front Upper Valve Body Components (03-72LE, 4-Speed)

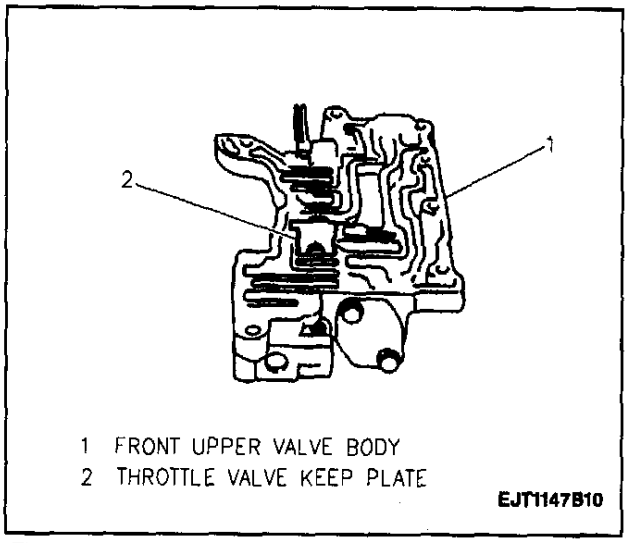



Figure 81—Removing Throttle Valve Keep Plate (03-72LE, 4-Speed)

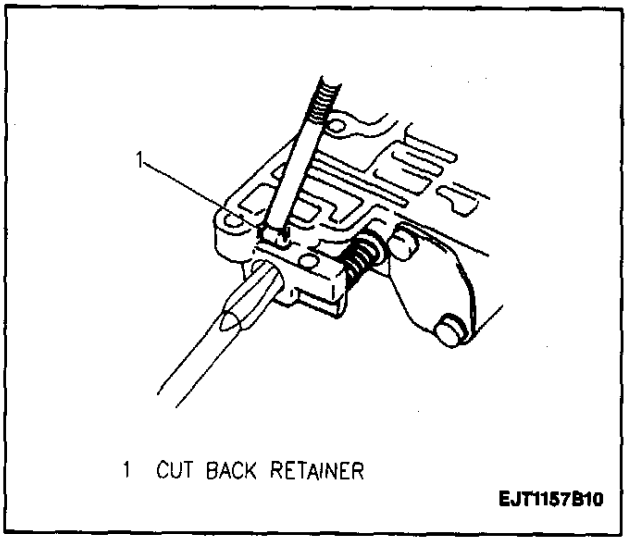



Figure 82—Removing Cut Back Valve (03-72LE, 4-Speed)

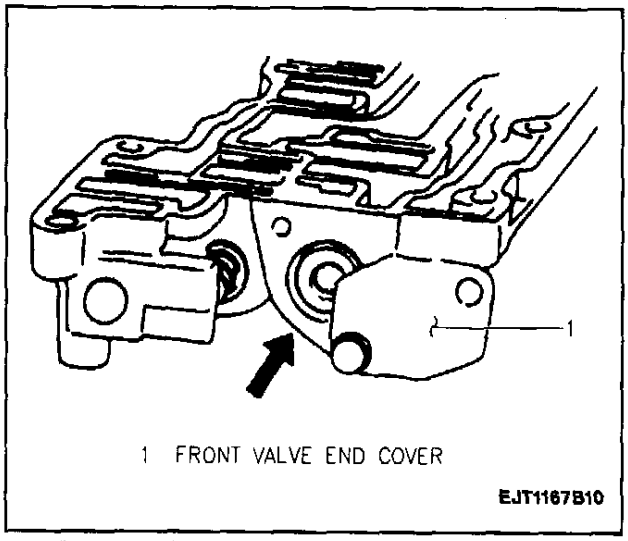



Figure 83—Removing Front Valve Body End Cover (03-72LE, 4-Speed)

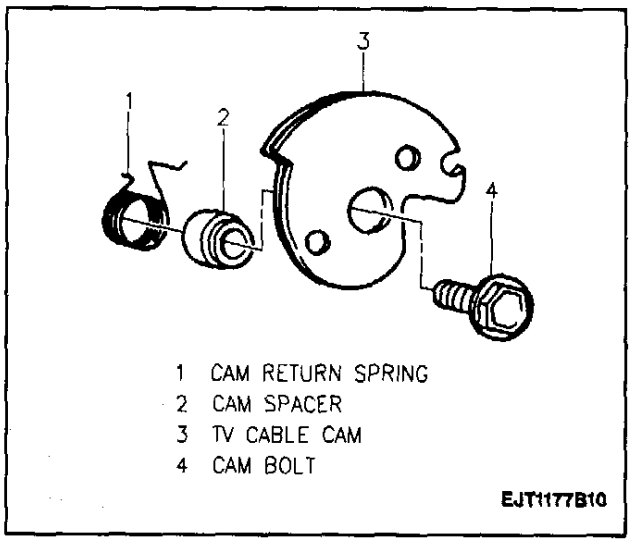



Figure 84—TV Cable Cam Components (03-72LE, 4-Speed)

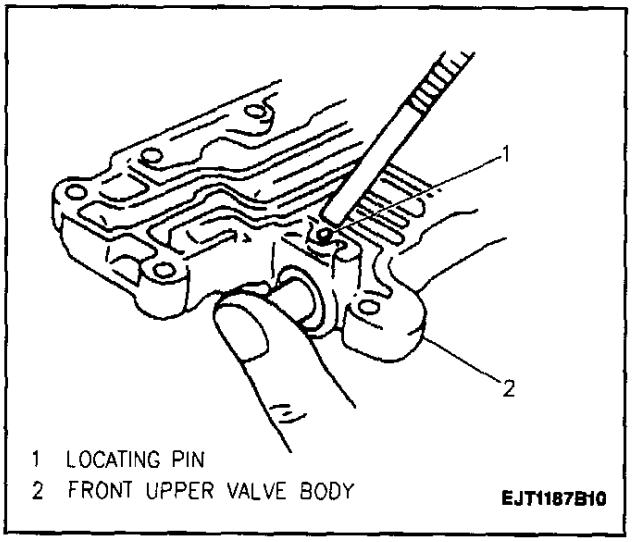



Figure 85—Removing Throttle Valve Locating Pin (03-72LE, 4-Speed)

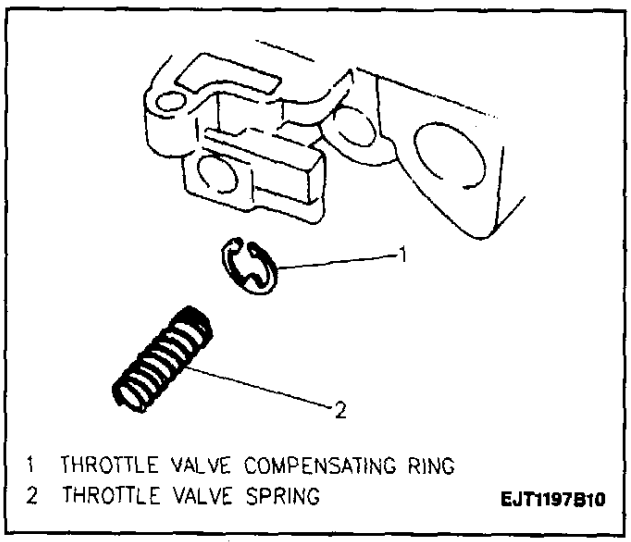



Figure 86—Removing Throttle Valve Spring and Comensating Ring(s) (03-72LE, 4-Speed)

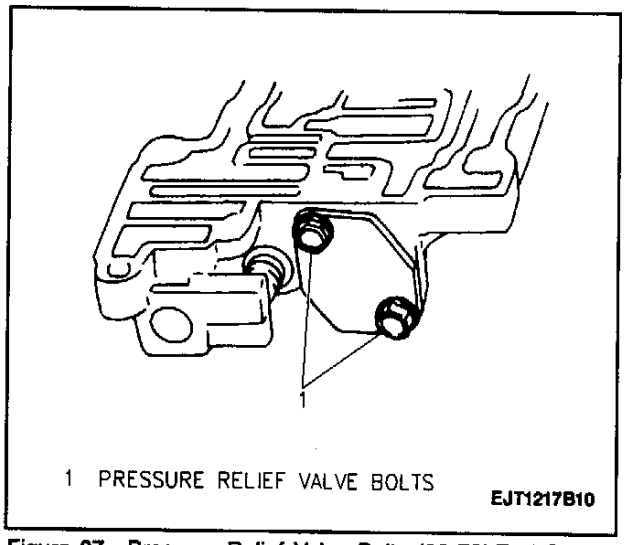



Figure 87—Pressure Relief Valve Bolts (03-72LE, 4-Speed)

### Measure

Tool Required:
J 26900-5 Vernier Caliper

1. Free length and outer coil diameter of all rear upper valve body valve springs using a J 26900-5. If spring free length is not as specified in the rear upper valve body spring chart, replace as necessary.

## Rear Upper Valve Body Assembly (03-72LE, 4-SPEED)

***Figures 88 and 89***

### Install or Connect

1. 2-3 shift valve spring, shift valve and shift valve plug to valve body; secure with one retainer.
2. 1-2 shift valve spring, shift valve, rear valve body plate gasket and rear valve body plate to valve body plate; secure with two bolts.

### Tighten

- Rear valve body plate bolts to 5 N.m (44 lb. in.)

3. 3-4 shift valve spring, shift valve, and shift valve plug to valve body; secure with one retainer.
4. Reverse brake sequence valve spring, clutch sequence valve and 3-2 kickdown control valve plug to valve body; secure with one needle roller pin.
5. Six valve body balls to valve body (Figure 89).

## Lower Valve Body Disassembly (03-72LE, 4-SPEED)

***Figures 94 through 102***

### Remove or Disconnect

**NOTICE:** When disassembling the rear upper valve body, keep all valve springs, spring seats and plugs with their respective valves. Most valve springs are of different sizes and CANNOT be interchanged. Make sure all parts are clean and dry before assembly.

1. Bypass valve, bypass valve spring, check ball, valve damping spring, valve body ball and ball valve spring from valve body (Figure 95).
2. Lower valve body plate and gasket from valve body (Figure 96).
3. TCC (lock-up) control valve plate and gasket from valve body (Figure 96).
4. Depressed pressure relief valve retainer, remove pressure relief valve bolt, pressure relief valve retainer, pressure relief valve spring and pressure relief valve ball (Figure 97).
5. One Bolt, TCC (lock-up) solenoid and O-ring from TCC solenoid (Figure 98).
6. Two bolts shift solenoid assembly, gasket, low coast modulator valve spring, intercoast modulator valve spring and 2 intermediate coast modulator valves from valve body (Figure 99).
7. Depressing TCC (lock-up) control sleeve. Using a magnet, remove locating pin and then remove TCC (lock-up) control valve spring (Figure 100).

### Important

- There are four step positions on the primary regulator valve sleeve. Note the position of the primary regulator valve sleeve for reassembly (Figure 101).

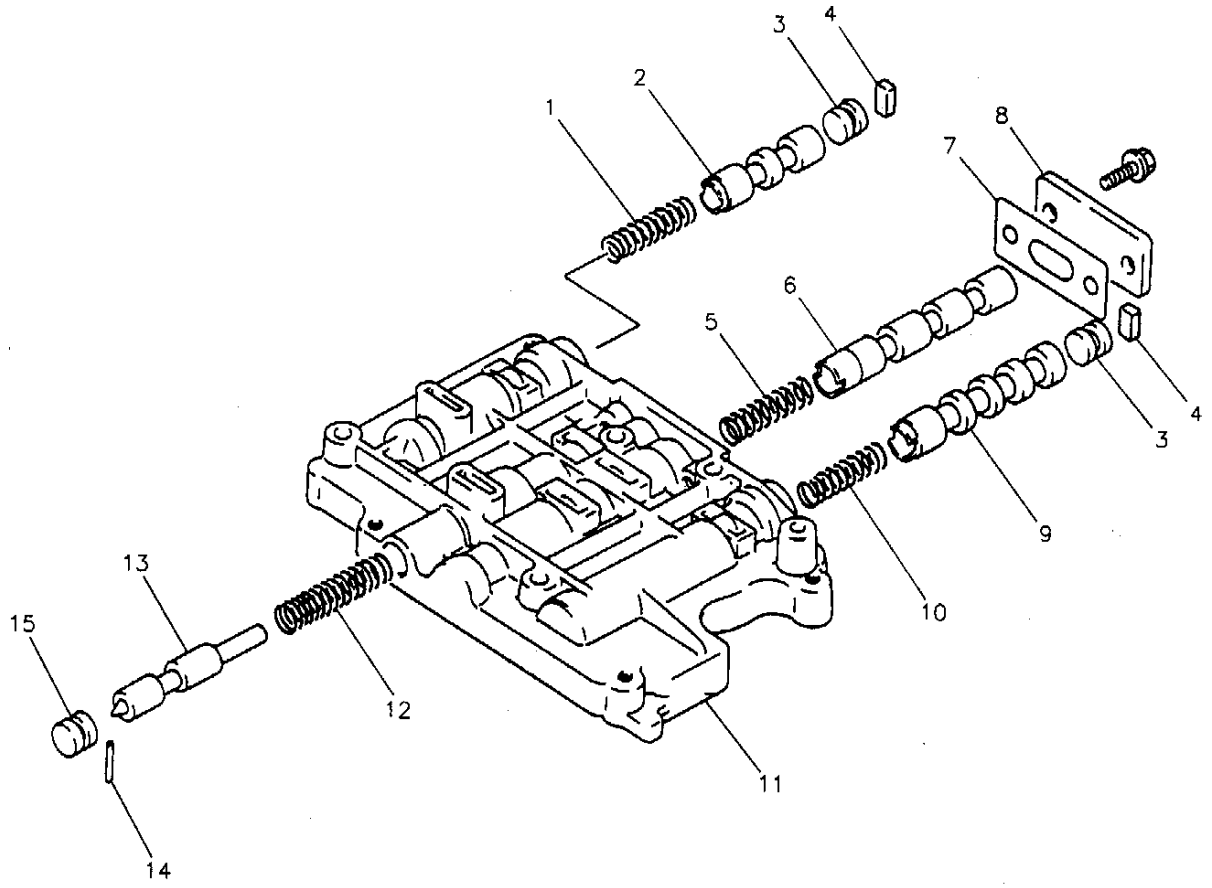
8. Depress primary regulator valve sleeve. Using a magnet, remove primary regulator valve sleeve retainer, primary regulator valve sleeve, primary regulator valve plunger, primary regulator valve spring and primary regulator valve (Figure 102).

### Clean

- All upper valve body components and dry thoroughly.

**REAR UPPER VALVE BODY SPRING CHART (03-72LE, 4 SPEED)**

| VALVE SPRING | SPRING OUTER DIAMETER | FREE LENGTH |
|---|---|---|
| Reverse Brake Sequence Valve Spring | 9.20 mm (0.362 in.) | 37.55 mm (1.478 in.) |
| 1-2 Shift Valve Spring | 8.90 mm (0.350 in.) | 29.15 mm (1.147 in.) |
| 2-3 Shift Valve Spring | 8.90 mm (0.350 in.) | 29.15 mm (1.147 in.) |
| 3-4 Shift Valve Spring | 8.90 mm (0.350 in.) | 29.15 mm (1.147 in.) |




1 SHIFT VALVE SPRING
2 3-4 SHIFT VALVE
3 SHIFT VALVE PLUG
4 SHIFT VALVE RETAINING PIN
5 SHIFT VALVE SPRING
6 1-2 SHIFT VALVE
7 GASKET
8 RETAINER PLATE
9 2-3 SHIFT VALVE
10 SHIFT VALVE SPRING
11 REAR UPPER VALVE BODY
12 REVERSE BRAKE SEQUENCE VALVE SPRING
13 CLUTCH SEQUENCE SPRING
14 RETAINING PIN
15 3-2 KICK DOWN CONTROL VALVE PLUG

EJT0147A

Figure 88—Rear Upper Valve Body Components (03-72LE, 4-Speed)

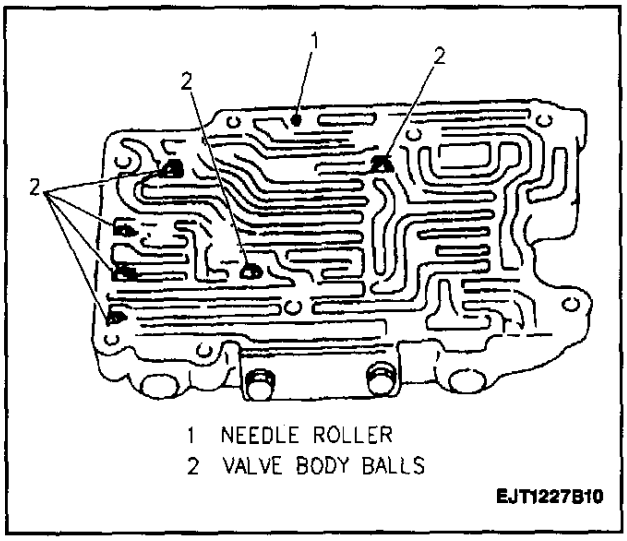



Figure 89—Valve Body Ball Location (03-72LE, 4-Speed)

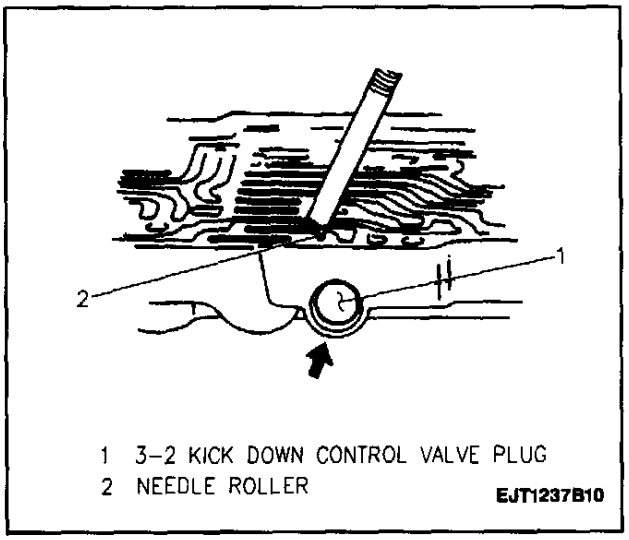



Figure 90—Removing 3-2 Kick Down Control Valve Plug (03-72LE, 4-Speed)

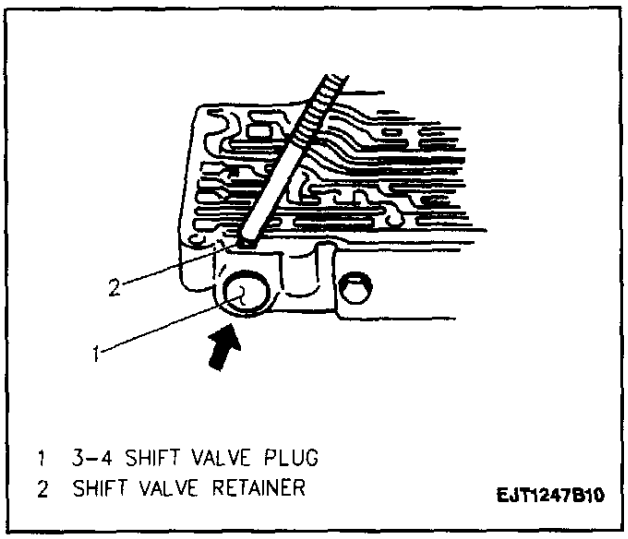



Figure 91—Removing 3-4 Shift Valve Plug (03-72LE, 4-Speed)

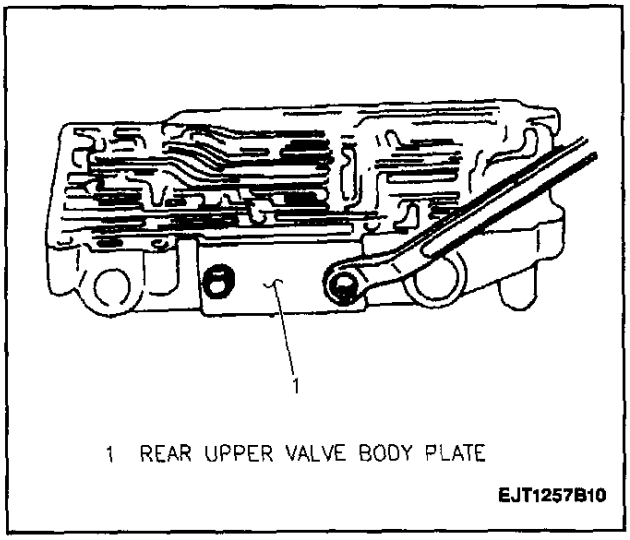



Figure 92—Removing Rear Upper Valve Body Plate (03-72LE, 4-Speed)

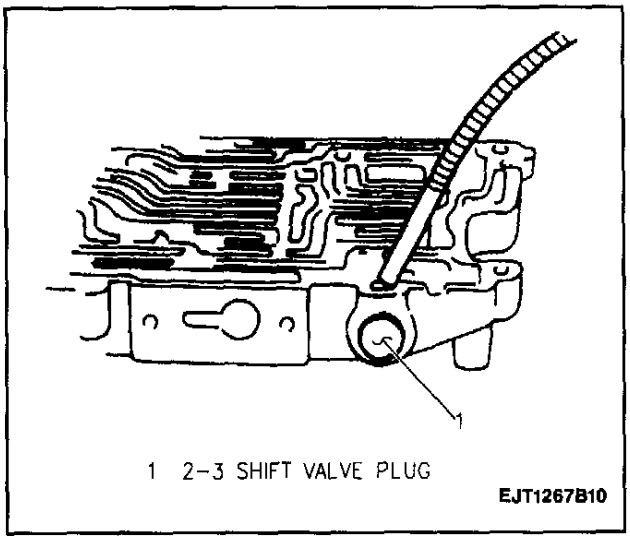



Figure 93—Removing 2-3 Shift Valve Plug (03-72LE, 4-Speed)

## Inspect

1. All valves for cracks, scoring or other damage. Replace as necessary.
2. All valve springs for damage or distortion. Replace as necessary.
3. Lower valve body valve bores for scoring or cracks. Replace as necessary.

## Measure

Tool Required:
J 26900-5 Vernier Caliper

1. Free length and outer coil diameter of all lower valve body valve springs using a J 26900-5. If spring free length is not as specified in the lower valve body spring chart, replace as necessary.

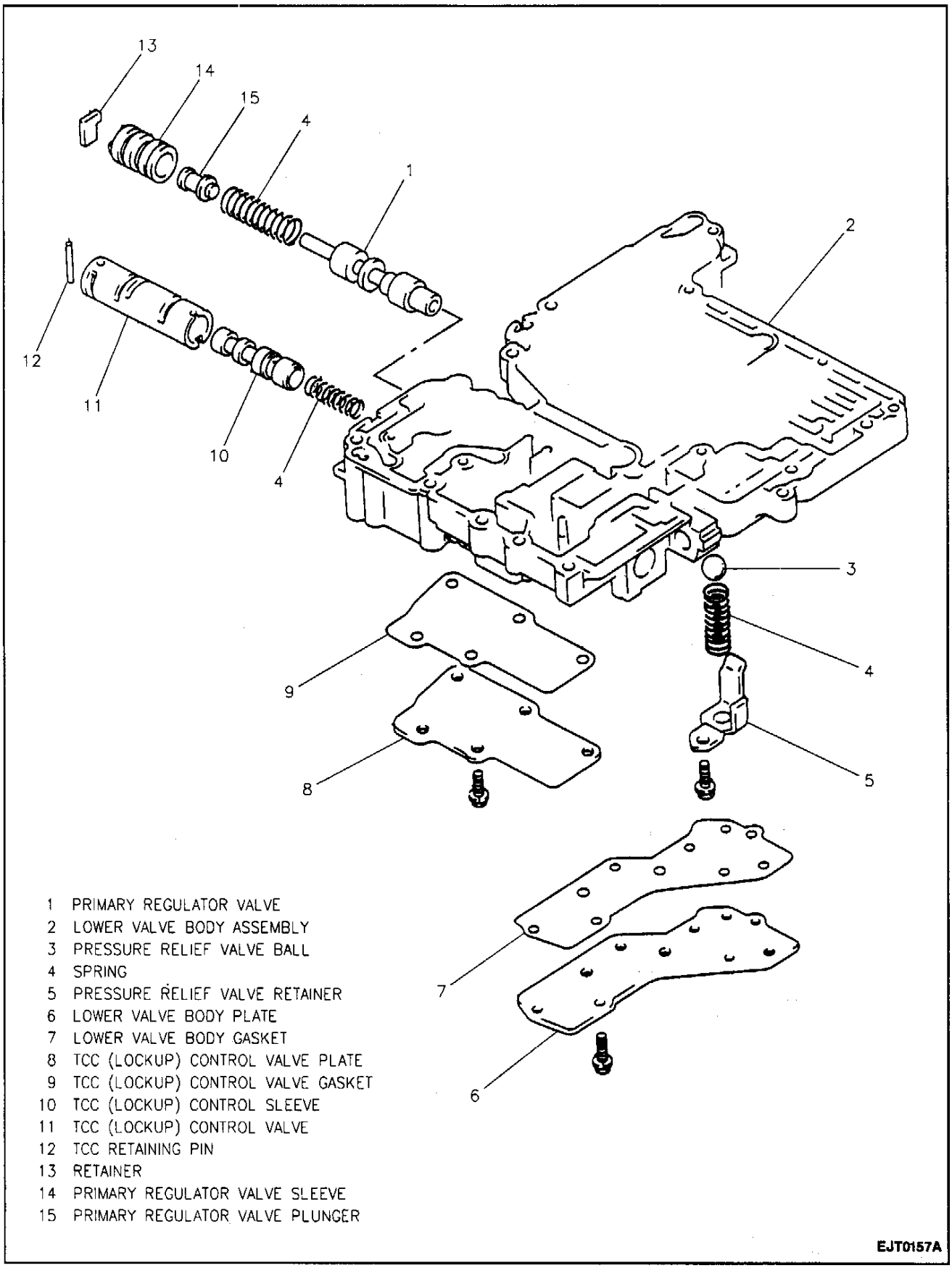
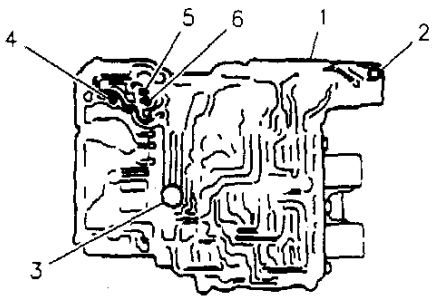


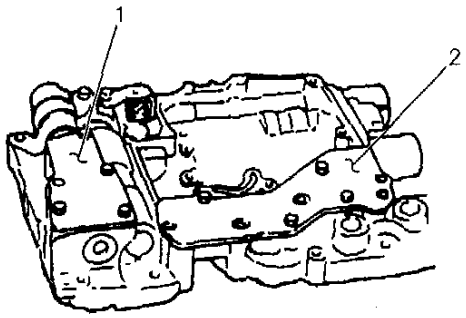

Figure 94—Lower Valve Body Components (03-72LE, 4-Speed)




1 LOWER VALVE BODY
2 VALVE BODY BALL
3 BY PASS VALVE
4 LOCATING PIN
5 PRIMARY REGULATOR VALVE SLEEVE RETAINER
6 CHECK BALL

EJT0227A

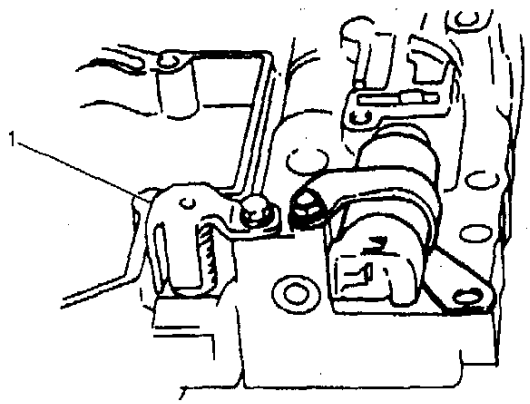
Figure 95—Bypass Valve, Valve Spring, Check Ball, Valve Damping Spring, Valve Body Ball and Ball Valve Spring Location (03-72LE, 4-Speed)




1 LOWER VALVE BODY PLATE
2 TCC (LOCK-UP) CONTROL VALVE PLATE

EJT1287B10

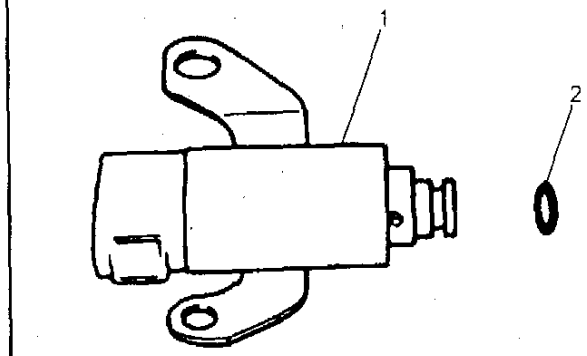
Figure 96—Lower Valve Body Plate And TCC (Lock Up) Control Valve Plate (03-72LE, 4-Speed)




1 PRESSURE RELIEF VALVE RETAINER

EJT1297B10

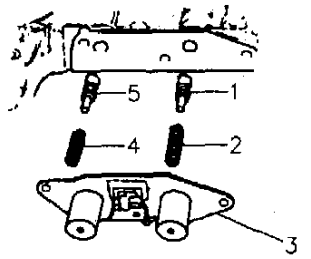
Figure 97—Pressure Relief Valve Retainer (03-72LE, 4-Speed)




1 TORQUE CONVERTER CLUTCH SOLENOID
2 O-RING

EJT1307B10

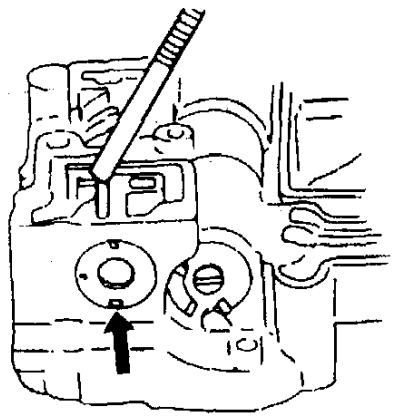
Figure 98—Torque Convertor Clutch Solenoid (03-72LE, 4-Speed)




1 LOW COAST MODULATOR VALVE
2 INTERMEDIATE COAST MODULATOR VALVE SPRING
3 SHIFT SOLENOID ASSEMBLY
4 LOW COAST MODULATOR VALVE SPRING
5 INTERMEDIATE COAST MODULATOR VALVE

EJT1317B10

Figure 99—Shift Solenoid Assembly Components (03-72LE, 4-Speed)



EJT1327B10

Figure 100—TCC (Lock Up) Control Valve (03-72LE, 4-Speed)

**LOWER VALVE BODY SPRING CHART (03-72LE, 4-SPEED)**

| VALVE SPRING | SPRING OUTER DIAMETER | FREE LENGTH |
|---|---|---|
| Pressure Relief Valve Spring | 13.14 mm (0.517 in.) | 38.14 mm (1.501 in.) |
| TCC (Lock-Up) Control Valve Spring | 11.30 mm (0.445 in.) | 34.60 mm (1.362 in.) |
| Valve Damping Spring | 4.95 mm (0.195 in.) | 20.00 mm (0.787 in.) |
| Low Coast Modulator Valve Spring | 10.00 mm (0.394 in.) | 42.35 mm (1.667 in.) |
| Inter Coast Modulator Valve Spring | 10.00 mm (0.394 in.) | 35.43 mm (1.395 in.) |
| Ball Valve Spring | 11.11 mm (0.437 in.) | 32.14 mm (1.265 in.) |
| Bypass Valve Spring | 13.82 mm (0.544 in.) | 33.32 mm (1.312 in.) |
| Primary Regulator Valve Spring | 17.20 mm (0.677 in.) | 56.30 mm (2.216 in.) |

## Lower Valve Body Assembly (03-72LE, 4-SPEED)

***Figures 95 and 102***

### Install or Connect

1. Primary regulator valve, primary regulator valve spring, primary regulator valve plunger, primary regulator valve sleeve and primary regulator valve sleeve retainer into valve body.
2. TCC (lock-up) control valve spring, TCC (lock-up) control sleeve and locating pin into valve body.
3. 2 intermediate coast modulator valves, intercoast modulator valve spring, low coast modulator valve spring, gasket, and shift solenoid assembly; secure with two bolts.

### Tighten

- Shift solenoid assembly bolts to 10 N.m (89 lb. in.).

4. New O-ring to TCC solenoid. Lubricate with automatic transmission Fluid.
5. TCC (lock-up) solenoid to valve body; secure with one bolt.
6. Pressure relief valve ball, pressure relief valve spring, pressure relief valve retainer secure; with one bolt.

### Tighten

- TCC solenoid retaining bolt to 5 N.m (44 lb. in.).

7. TCC (lock-up) control valve gasket and plate to valve body; secure with six bolts.

### Tighten

- TCC control valve plate bolts to 5 N.m (44 lb. in.).

8. Lower valve body gasket and plate to valve body; secure with four bolts.

### Tighten

- Lower valve body plate bolts to 5 N.m (44 lb. in.).

9. Ball valve spring, valve body ball, valve damping spring, check ball, bypass valve spring and bypass valve to valve body (Figure 95).

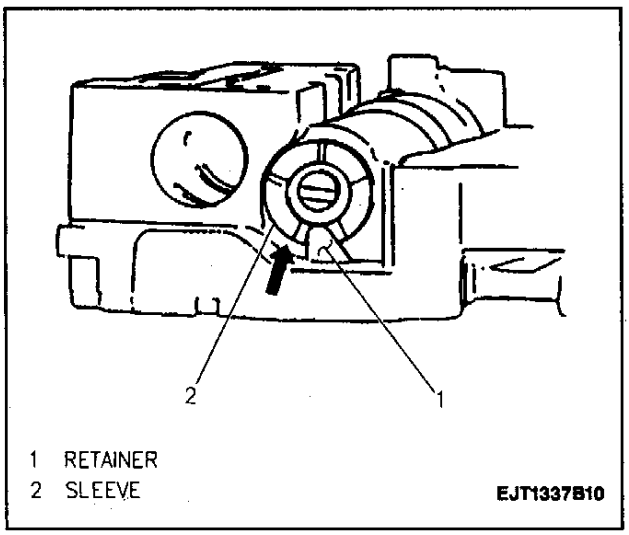



Figure 101—Primary Regulator Valve Retainer and Sleeve (03-72LE, 4-Speed)

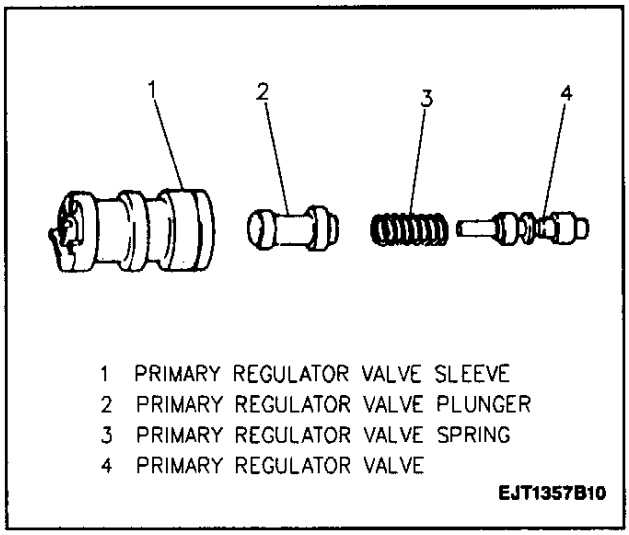



Figure 102—Primary Regulator Valve Components (03-72LE, 4-Speed)

## Valve Body Assembly (03-72LE, 4-SPEED)

***Figures 103 through 112***

### Install or Connect

**NOTICE:** Torque sequence and specification *is very important to valve body operation. If* bolts are torqued at random, valve bores may become distorted and inhibit valve operation. DO NOT use air powered tools when assembling the valve bodies.

1. Place separator plate and new gasket to lower valve body, temporarily install to bolts (Figure 103).
2. New upper valve body gasket to lower valve body assembly (Figure 104).
3. While holding upper valve body gasket and lower valve body together, install assembly to rear upper valve body assembly.
4. Three bolts to lower valve body (Figure 105).

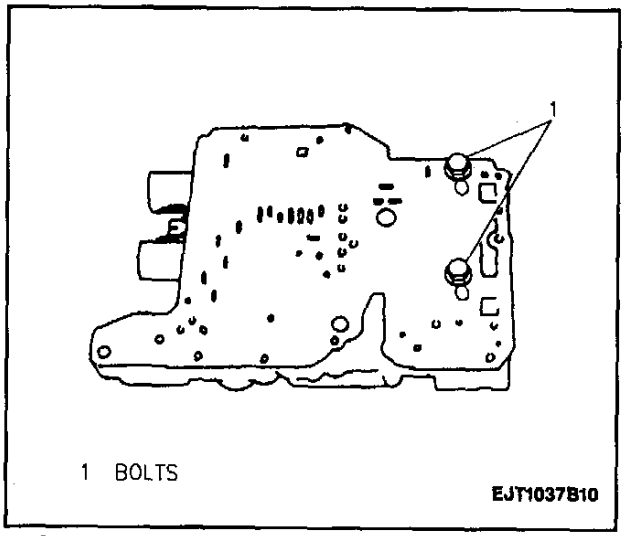



Figure 103—Installing Separator Plate and Gasket to Lower Valve Body (03-72LE, 4-Speed)

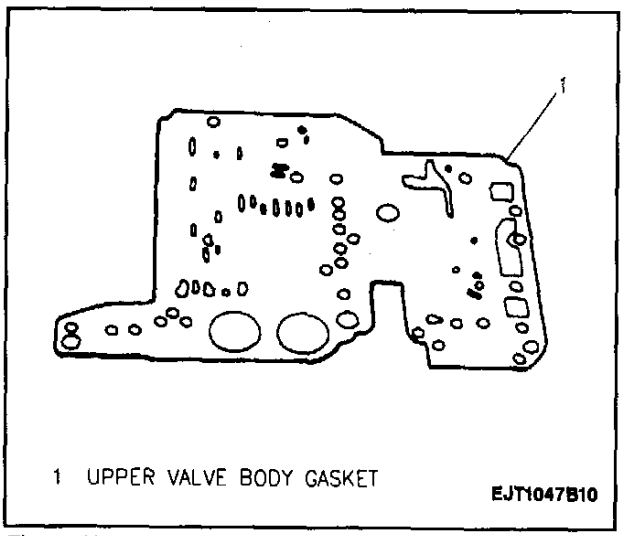



Figure 104—Upper Valve Body Gasket (03-72LE, 4-Speed)

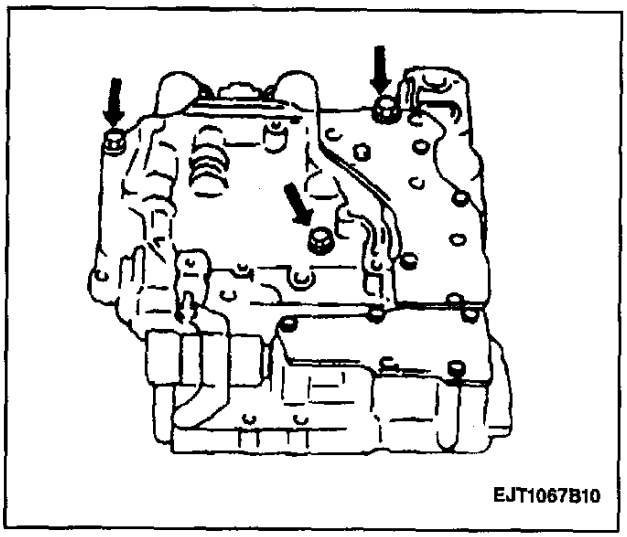



Figure 105—Lower Valve Body Bolt Location (03-72LE, 4-Speed)

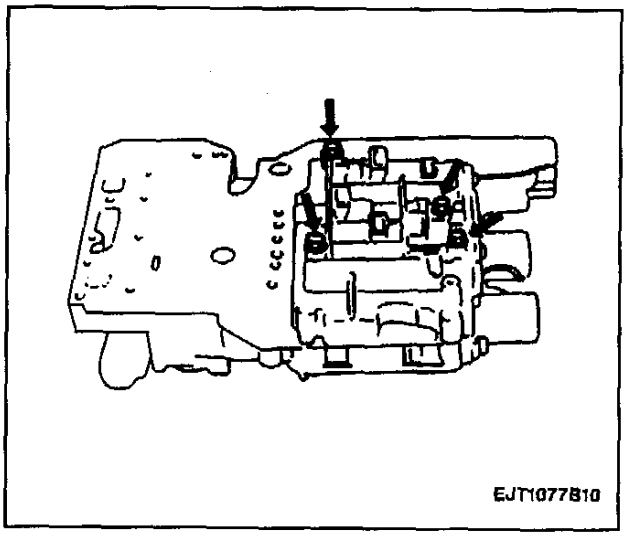



Figure 106—Upper Valve Body Bolt Location (03-72LE, 4-Speed)

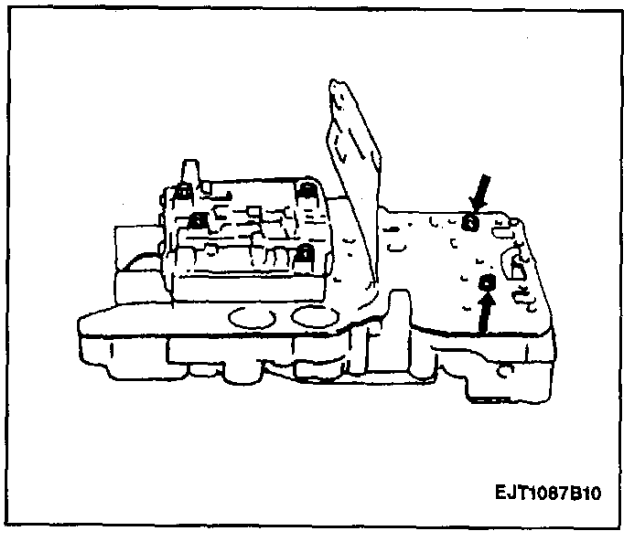



Figure 107—Removing Temporarily Installed Bolts (03-72LE, 4-Speed)

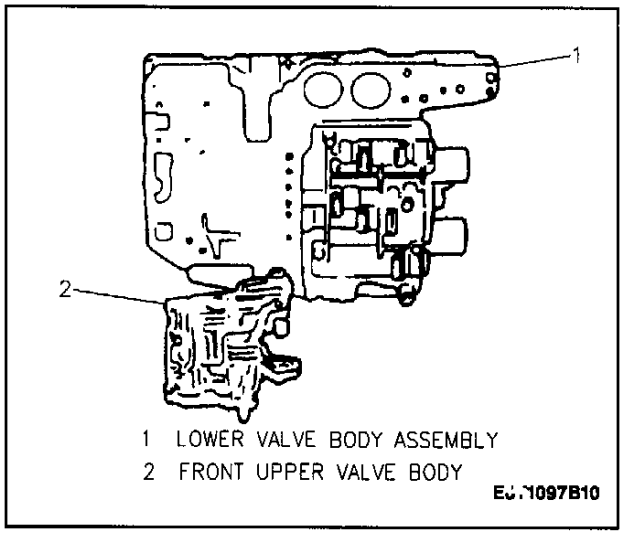



Figure 108—Installing Lower Valve Body to Front Upper Valve Body (03-72LE, 4-Speed)

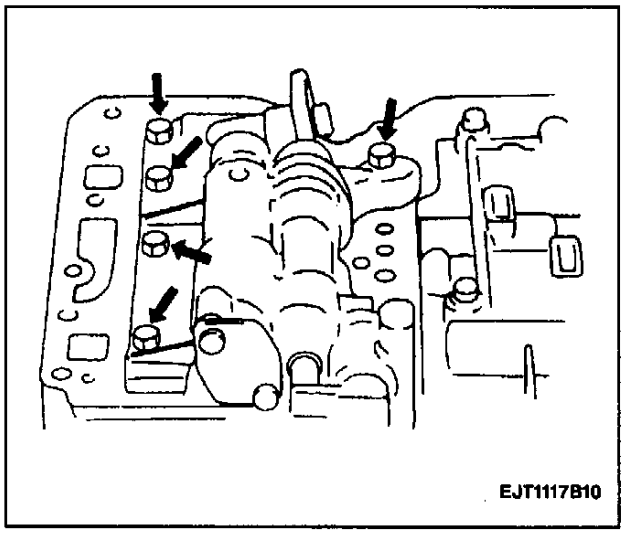



Figure 110—Installing Front Upper Valve Body Bolts (03-72LE, 4-Speed)

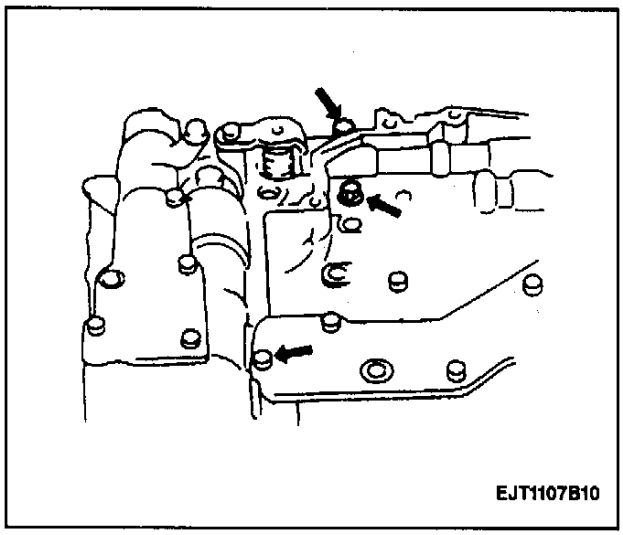



Figure 109—Installing Three Bolts to Lower Valve Body (03-72LE, 4-Speed)

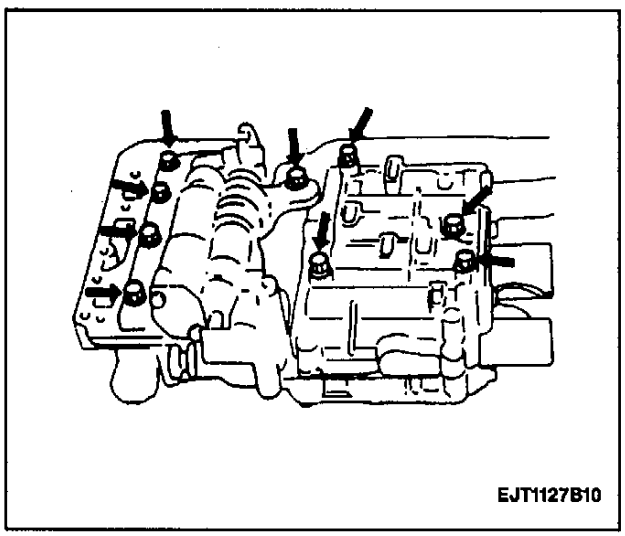



Figure 111—Upper Valve Body Bolt Location (03-72LE, 4-Speed)

5. Turn lower valve body assembly over and install four bolts to upper valve body side (Figure 106).
6. Remove two bolts temporally install in step 1 (Figure 107).
7. Lower valve body assembly to front upper valve body (Figure 108).
8. Three bolts to lower valve body side (Figure 109).
9. Turn valve body assembly over and install five bolts to front upper valve body (Figure 110).
10. Tighten upper valve body side bolts (Figure 111).

**Tighten**

- Upper valve body side bolts to 5 N·m (44 lb. in.).

11. Tighten lower valve body side bolts (Figure 112).

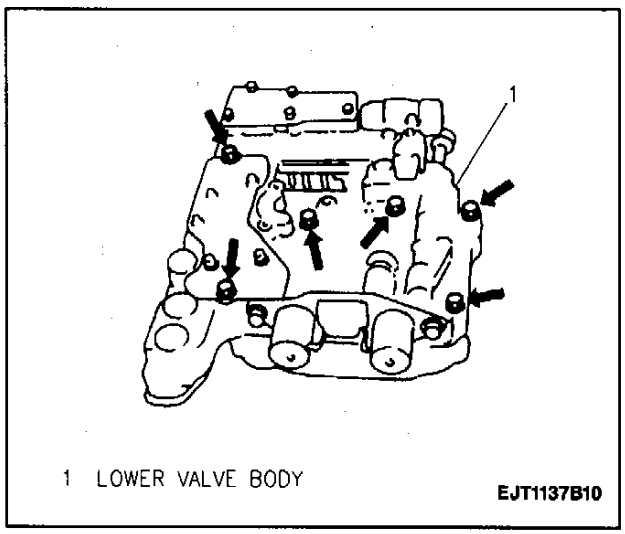



Figure 112—Lower Valve Body Bolt Location (03-72LE, 4-Speed)

**ACCUMULATOR PISTON AND SPRING CHART**

| PISTON OR SPRING | PISTON OUTER DIAMETER | SPRING FREE LENGTH |
|---|---|---|
| Direct Clutch Accumlator | 31.80-31.85 mm (1.252-1.254 in.) | — |
| Direct Clutch Accumlator Spring | — | 55.18 mm (2.172 in.) |
| Forward Clutch Accumlator | 31.80-31.85 mm (1.252-1.254 in.) | — |
| Forward Clutch Accumlator Upper Spring | — | 57.18 mm (2.251 in.) |
| Forward Clutch Accumlator Lower Spring | — | 29.50 mm (1.161 in.) |
| Second Brake Accumulator | 34.80-34.85 mm (1.370-1.372 in.) | — |
| Second Brake Accumulator Upper Spring | — | 55.18 mm (2.172 in.) |
| Second Brake Accumulator Lower Spring | — | 35.13 mm (1.383 in.) |

**Tighten**

- Lower valve body side bolts to 5 N.m (44 lb. in.).

12. Manual valve, detent spring plate to valve body assembly; secure with one bolt.

**Tighten**

- Detent spring bolt to 5 N.m (44 lb. in.).

## VALVE BODY AND ACCUMULATOR PISTONS INSTALLATION (03-72LE, 4-SPEED)

***Figures 113 through 117***

**Install or Connect**

1. Apply automatic transmission fluid to new TV cable O-ring and O-ring to TV cable.
2. TV cable to transmission case (Figure 113).
3. Apply to automatic transmission fluid to new O-rings, springs and install them to accumulator pistons (Figure 114) and Accumulator Piston and Spring Chart.

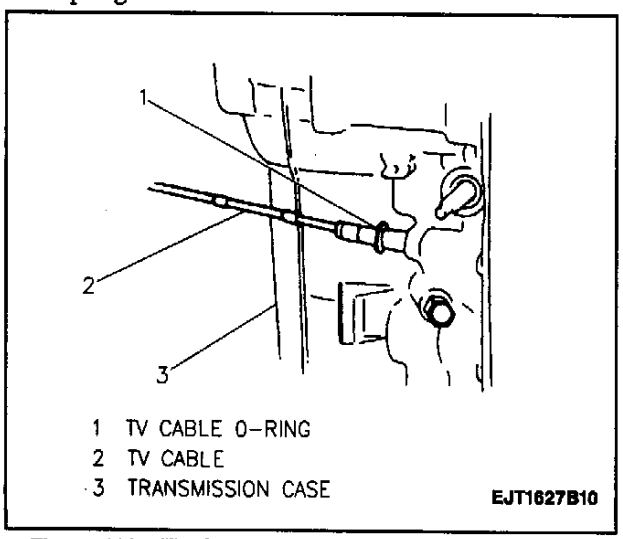



Figure 113—TV Cable and O-Ring (03-72LE, 4-Speed)

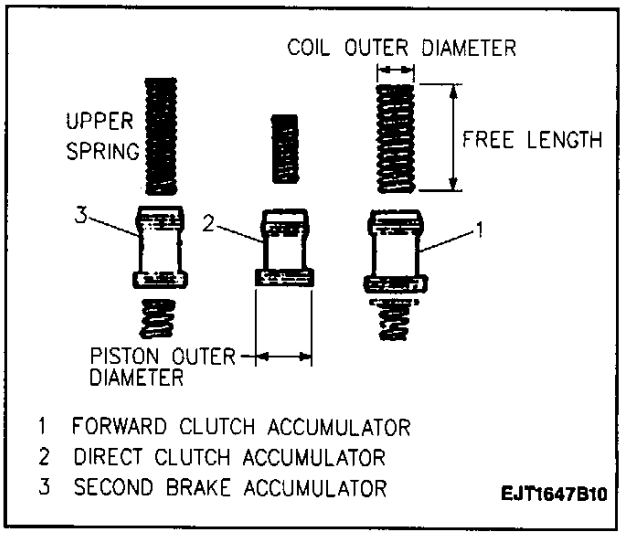



Figure 114—Accumulator Pistons and Springs (03-72LE, 4-Speed)

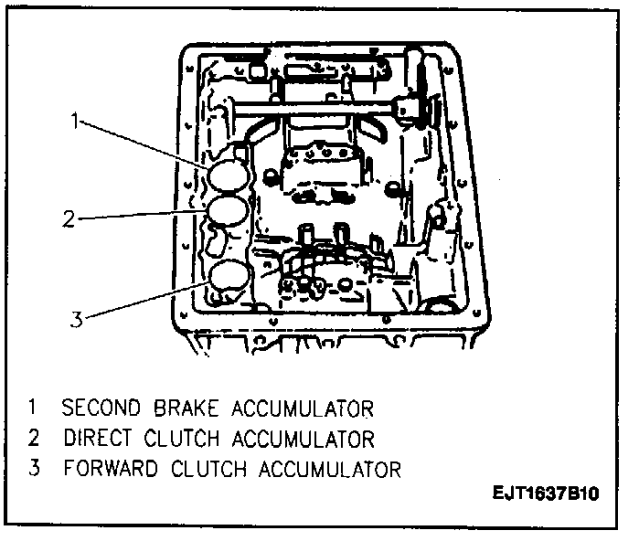



Figure 115—Accumulator Piston Locations (03-72LE, 4-Speed)

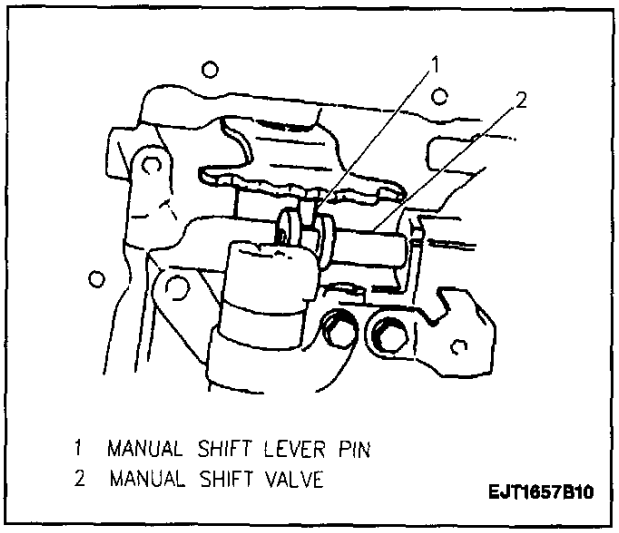



Figure 116—Aligning Manual Shift Lever Pin with Manual Shift Valve (03-72LE, 4-Speed)

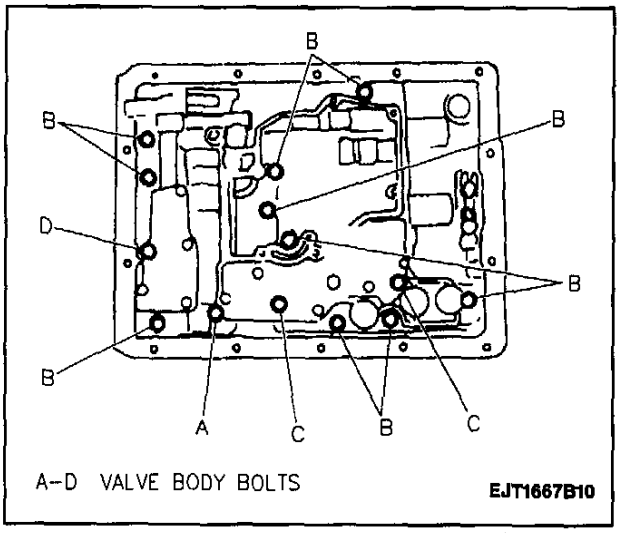



Figure 117—Valve Body Bolt Location (03-72LE, 4-Speed)

4. Accumulator pistons to transmission case (Figure 115).
5. Valve body to transmission case.
6. Lift valve body slowly and install TV cable to TV cable cam of the valve body.
7. After confirming that accumulator pistons are pushed all the way down, match pin of manual shift lever with groove in manual valve (Figure 116).
8. Fifteen valve body-to-case bolts according to length (Figure 117).

### Measure

- Valve body bolt lengths:
  - A. 25 mm (0.98 in)
  - B. 30 mm (1.18 in)
  - C. 47 mm (1.85 in)
  - D. 60 mm (2.36 in)

### Tighten

- Valve body bolt to 10 N.m (89 lb. in.).

9. Lubricate new O-ring with A/T fluid and install to grommet of solenoid wiring harness.
10. Solenoid wiring harness to transmission case; secure with one bolt.

## TORQUE CONVERTER CLUTCH (TCC) SOLENOID AND FLUID PRESSURE SWITCH (3L30, 3-SPEED)

***Figure 37***

### Remove or Disconnect

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Transmission fluid pan and gasket from transmission. Refer to "Changing Fluid and Cleaning Filter Screen" earlier in this section.
4. Two TCC solenoid pipes from TCC solenoid, fluid pump and valve body (Figure 37).
5. Electrical connector from TCC solenoid (Figure 37).
6. Electrical connectors from fluid pressure switch (Figure 37).
7. Two bolts and TCC solenoid from reinforcement plate.
8. Fluid pressure switch from valve body by turning counterclockwise (Figure 37).

### Inspect

1. TCC solenoid pipe O-rings for cuts or other damage. Replace as necessary.
2. For TCC solenoid and fluid pressure switch inspection and diagnosis procedures, refer to SECTION 7A-11A and SECTION 6E3. For a complete schematic of the TCC system, refer to SECTION 8A.

### Install or Connect

1. Fluid pressure switch into valve body by turning clockwise (Figure 37).

### Tighten

- Fluid pressure switch to 10 N.m (89 lb. in.).

2. TCC solenoid onto reinforcement plate; secure with two bolts.

### Tighten

- TCC solenoid retaining bolts to 19 N.m (14 lb. ft.).

3. Electrical connectors to fluid pressure switch (Figure 37).
4. Electrical connector to TCC solenoid (Figure 37).
5. Apply a thin coat of J 36850 to the TCC solenoid pipe O-rings.

6. Two TCC solenoid pipes into TCC solenoid, fluid pump and valve body (Figure 37).
7. New transmission fluid pan gasket and transmission fluid pan onto transmission. Refer to "Changing Fluid and Cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
8. Lower vehicle.
9. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

10. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## TORQUE CONVERTER CLUTCH (TCC) SOLENOID (03-72LE, 4-SPEED)

***Figure 23, 32, 33, 97 and 98***

**Remove or Disconnect**

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Place index mark (reference mark) on the propeller shaft pinion flange and the front differential pinion flange of the transfer case to front differential propeller shaft (four-wheel drive models) (Figure 23).
4. Four bolts, four nuts and separate pinion flange yoke from front differential pinion flange (four-wheel drive models) (Figure 23).
    - Position and support transfer case to front differential propeller shaft away from transmission fluid pan.

**Important**

- Removing propeller shaft from transfer case will result in fluid loss (four-wheel drive models).

5. Place a drain pan or suitable container under transmission drain plug (Figure 32).
6. Drain plug allowing the transmission fluid pan to drain (Figure 32).
7. Fourteen transmission fluid pan bolts and transmission fluid pan and gasket from transmission.
8. Three fluid pipes in the following order "A", "C" and "D" (Figure 33).
9. Electrical connector from TCC solenoid.
10. Two bolts and TCC solenoid from lower valve body (Figure 97).

**Inspect**

1. TCC solenoid pipe O-ring for cuts and other damage. Replace as necessary (Figure 98).
2. For TCC solenoid inspection and diagnosis procedures, refer to SECTION 7A-10A and SECTION 6E3. For a complete schematic of the TCC system, refer to SECTION 8A.

**Install or Connect**

1. New TCC solenoid gasket and TCC solenoid onto lower valve body; secure with two bolts.

**Tighten**

- TCC solenoid bolts to 5 N.m (44 lb. in.).

2. Electrical connector to TCC solenoid.
3. Apply a thin coat of automatic transmission fluid to the fluid pipe O-rings.
4. Four fluid pipes in the following order "D", "C" and then "A" (Figure 33).
5. New transmission fluid pan gasket and transmission fluid pan to transmission; secure with fourteen bolts.

**Important**

- When installing transmission pan, ensure filler tube connects properly.

**Tighten**

- Transmission fluid pan bolts to 4 - 5 N.m (35 - 44 lb. in.).

6. Transmission drain plug into transmission (Figure 32).

**Tighten**

- Transmission drain plug to 15 - 18 N.m (11 - 13 lb. ft.).

7. Front propeller shaft into vehicle aligning index marks made during front propeller shaft removal; secure with four bolts and four nuts (four-wheel drive models).

**Tighten**

- Front propeller shaft bolts and nuts to 50 N.m (37 lb. ft.).

8. Lower vehicle.
9. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

10. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## SHIFT SOLENOID ASSEMBLY (03-72LE, 4-SPEED)

***Figure 23, 32, 33 and 99***

**Remove or Disconnect**

1. Negative (-) battery cable.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Place index mark (reference mark) on the propeller shaft pinion flange and the front differential pinion flange of the transfer case to front differential propeller shaft (four-wheel drive models) (Figure 23).
4. Four bolts, four nuts and separate pinion flange yoke from front differential pinion flange (four-wheel drive models) (Figure 23).
    - Position and support transfer case to front differential propeller shaft away from transmission fluid pan.

**Important**

- Removing propeller shaft from transfer case will result in fluid loss (four-wheel drive models).

5. Place a drain pan or suitable container under transmission drain plug (Figure 32).
6. Drain plug allowing the transmission fluid pan to drain (Figure 32).
7. Fourteen transmission fluid pan bolts and transmission fluid pan and gasket from transmission.
8. Three fluid pipes in the following order "A", "C" and "D" (Figure 33).
9. Electrical connector from shift solenoid assembly.
10. Two bolts and brake applying cover and brake applying cover gasket from transmission body.
11. Three bolts, shift solenoid assembly and shift solenoid assembly gasket from lower valve body (Figure 99).

**Inspect**

- For shift solenoid assembly inspection and diagnosis procedures, refer to SECTION 7A-10A and SECTION 6E3. For a complete schematic of the shift solenoid assembly system, refer to SECTION 8A.

**Install or Connect**

1. New shift solenoid assembly gasket and shift solenoid assembly to lower valve body; secure with three bolts (Figure 99).

**Tighten**

- Shift solenoid assembly bolts to 10 N.m (89 lb. in.).

2. Electrical connector to shift solenoid assembly.
3. New brake applying cover gasket and brake applying cover onto transmission body; secure with two bolts.

**Tighten**

- Brake applying cover bolts to 10 N.m (89 lb. in.).

4. Apply a thin coat of automatic transmission fluid to the fluid pipe O-rings.
5. Four fluid pipes in the following order "D", "C" and then "A" (Figure 33).

6. New transmission fluid pan gasket and transmission fluid pan to transmission; secure with fourteen bolts.

**Important**

- When installing transmission pan, ensure filler tube connects properly.

**Tighten**

- Transmission fluid pan bolts to 4 - 5 N·m (35 - 44 lb. in.).

7. Transmission drain plug into transmission (Figure 32).

**Tighten**

- Transmission drain plug to 15 - 18 N·m (11 - 13 lb. ft.).

8. Front propeller shaft into vehicle aligning index marks made during front propeller shaft removal; secure with four bolts and four nuts (four-wheel drive models).

**Tighten**

- Front propeller shaft bolts and nuts to 50 N·m (37 lb. ft.).

9. Lower vehicle.
10. Negative (-) battery cable.

**Tighten**

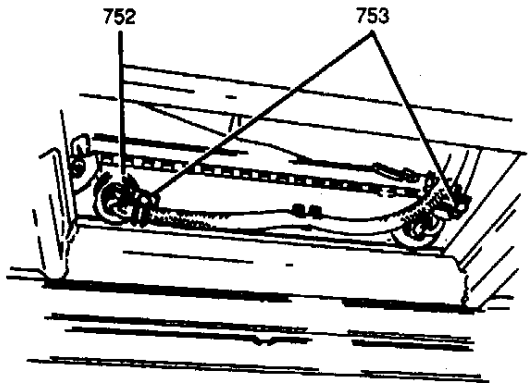
- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N·m (11 lb. ft.).

11. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent, into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.3 qts.) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

## TRANSMISSION COOLER PIPES AND HOSES

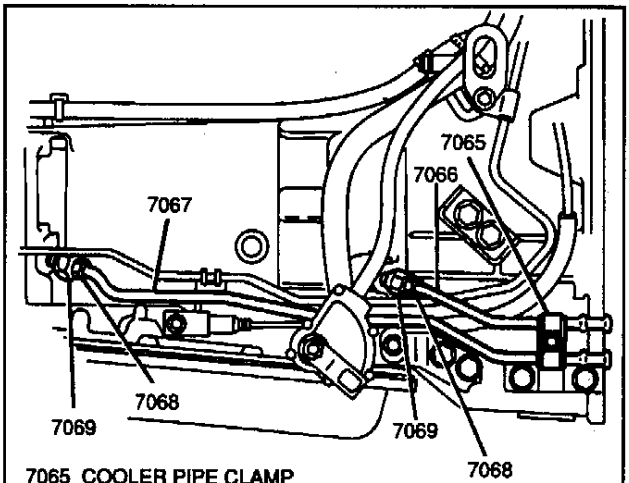
### *Figures 34, 118, 119 and 120*

1. Raise and suitably support vehicle. Refer to Section 0A.
2. Four bolts and front skid plate (if equipped).




752 TRANSMISSION COOLER
753 FLUID COOLER HOSE CLAMPS EJS0607A

Figure 118—Cooler Hoses at Transmission Cooler




7065 COOLER PIPE CLAMP
7066 OUTLET COOLER PIPE
7067 INLET COOLER PIPE
7068 COOLER PIPE FLARE NUT
7069 COOLER PIPE FITTING EJS0617A

Figure 119—Transmission Cooler Pipes (3L30, 3-Speed)

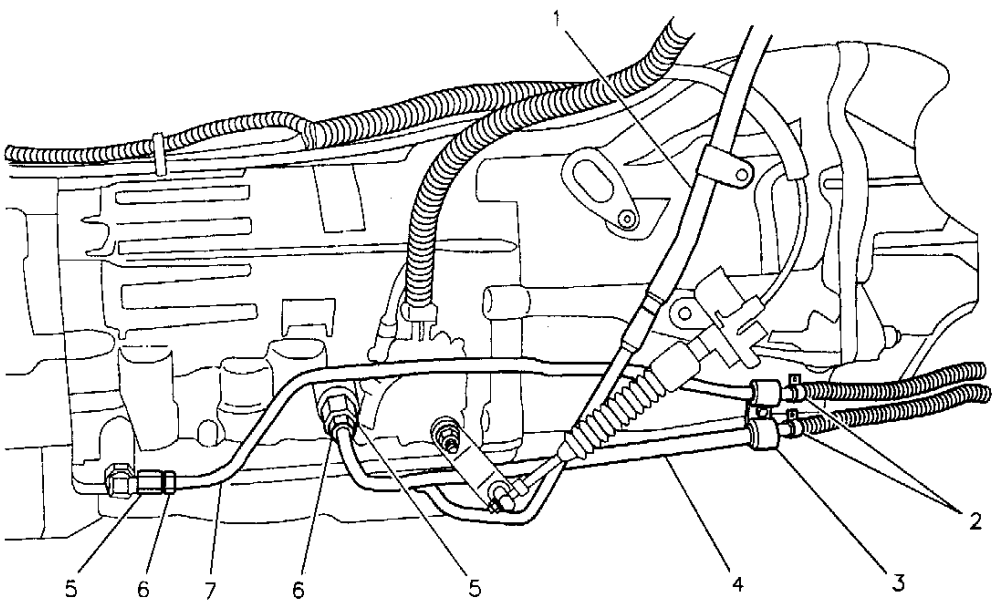



Figure 120—Transmission Cooler Pipes (03-72LE, 4-Speed))

3. Place a drain pan or suitable container under transmission cooler hoses.
4. Two screws and cooler hoses from cooler hose retainer clamps.
5. Two inlet and outlet hose clamps and transmission cooler hoses from transmission cooler (Figure 118).
6. Two inlet and outlet hose clamps and transmission cooler hoses from inlet and outlet cooler pipes at transmission (Figure 34).
7. Place a drain pan or suitable container under transmission cooler pipes.
8. One bolt and cooler pipe clamp from transmission (Figure 119).
9. Inlet and outlet transmission cooler pipes from transmission by loosening both flare nuts at cooler pipe fittings (Figures 119 and 120).
10. Remove drain pan from under vehicle.

### Inspect

1. Transmission cooler pipes for kinks or other damage. Replace as necessary.
2. Transmission cooler hoses for leaks or damage. Replace as necessary.
3. Transmission cooler pipe flare nuts for damage. Replace as necessary.

### Install or Connect

1. Inlet and outlet transmission cooler pipes to transmission by threading both flare nuts into cooler pipe fittings (Figures 119 and 120).

**Tighten**

- Cooler pipe flare nuts to 25 N.m (18 lb. ft.).

2. Cooler pipe clamp from transmission cooler pipe bracket; secure with one bolt (Figure 118).

**Tighten**

- Cooler pipe clamp bolt to 23 N.m (17 lb. ft.).

3. Transmission cooler hoses to inlet and outlet cooler pipes at transmission; secure with two inlet and outlet hose clamps (Figures 119 and 120).
4. Transmission cooler hoses to transmission cooler; secure with two inlet and outlet hose clamps (Figure 118).
5. Transmission cooler hoses to cooler hose retainer clamps; secure with two screws.
6. Front skid plate to vehicle; secure with four bolts (if equipped).

**Tighten**

- Front skid plate bolts to 54 N.m (40 lb. ft.).

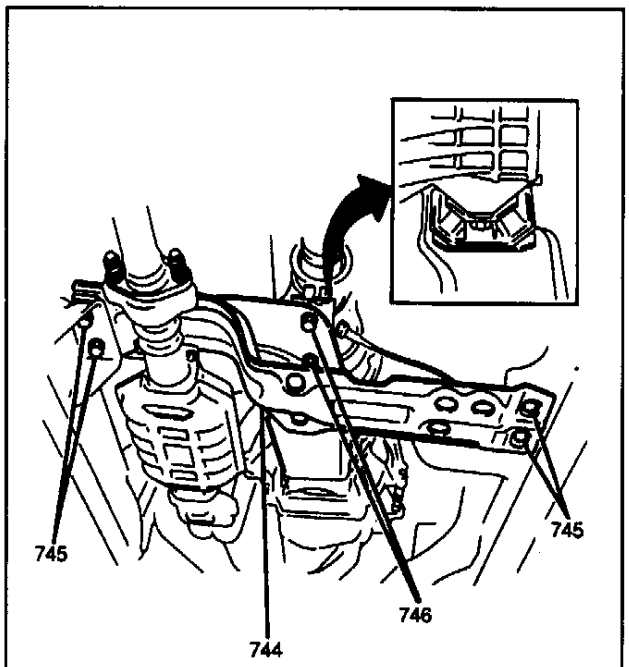
7. Lower vehicle.

## TRANSMISSION ASSEMBLY

***Figures 119 through 126***

### Remove or Disconnect

1. Negative (-) battery cable.
2. Fluid level indicator from fluid filler tube.
3. Vacuum modulator hose at intake manifold (3L30, 3-speed models only).
4. Transmission position switch electrical connectors under intake manifold (3L30, 3-speed models only).
5. TV cable from throttle body (03-72LE, 4-speed models only). Refer to "TV Cable" earlier in this section.
6. Console. Refer to SECTION 8C.
7. Four bolts from shift lever and position shift lever away from transmission assembly.
8. One screw and transfer case shift lever knob (four-wheel drive models).
9. Six screws and transfer case shift lever boot, plate, bracket and case cover boot (four-wheel drive models).
10. Four-wheel drive switch electrical connectors from transfer case (four-wheel drive models).
11. Raise and suitably support vehicle. Refer to SECTION 0A.
12. Front pipe/catalytic converter. Refer to SECTION 6F.




744 REAR TRANSMISSION CROSSMEMBER
745 REAR TRANSMISSION CROSSMEMBER BOLTS
746 REAR TRANSMISSION MOUNT BOLTS EJS0627A

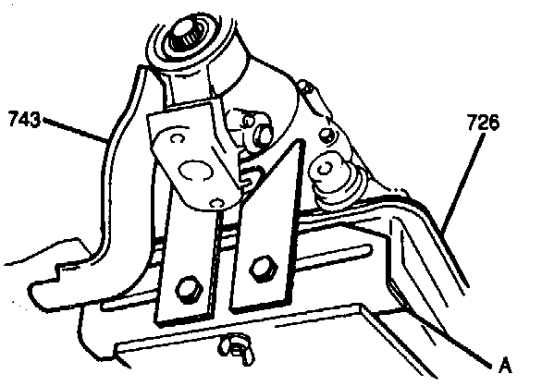
Figure 121—Rear Transmission Crossmember and Mount Bolts

13. Transfer case from vehicle (four-wheel drive models). Refer to SECTION 7D.
14. Vehicle speed sensor electrical connector.
15. Park/Neutral position (PNP) switch (3L30, 3-Speed) or transmission range switch (03-72LE, 4-Speed) electrical connector (Figures 119 and 120).
16. TCC/shift solenoid assembly electrical connector (03-72LE, 4-speed models only).
17. TV cable from valve body (3L30, 3-speed models only). Refer to "TV Cable" earlier in this section.
18. Starter motor electrical connections from starter motor.
19. Two bolts and starter motor from transmission.
20. Two upper transmission retaining bolts from transmission.
21. Shift select cable from transmission. Refer to "Shift Select Cable" earlier in this section.
22. Two bolts and shift select cable bracket from transmission (Figure 126).
23. Transmission fluid pan and gasket and drain transmission fluid (3L30, 3-speed models only). Refer to "Changing Fluid and cleaning Filter Screen (3L30, 3-Speed)" earlier in this section.
24. Install transmission fluid pan and gasket onto transmission to support transmission assembly on hydraulic jack; secure with twelve bolts (3L30, 3-speed models only).

### Tighten

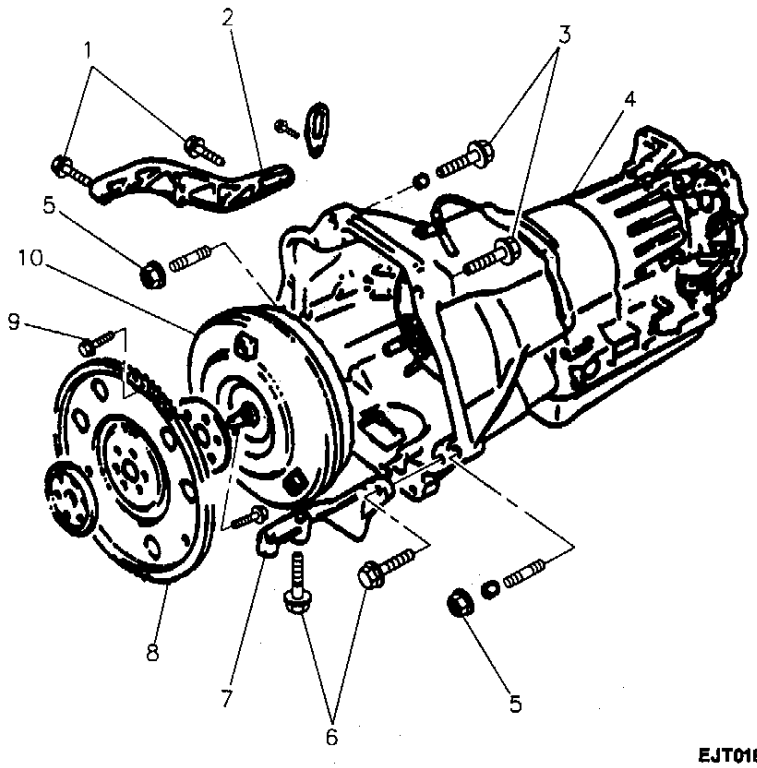
- Transmission fluid pan bolts to 13 N·m (115 lb. in.).

25. Transmission fluid pan drain plug and drain transmission fluid (03-72LE, 4-speed models only).
26. Install transmission fluid pan drain plug (03-72LE, 4-speed models only).



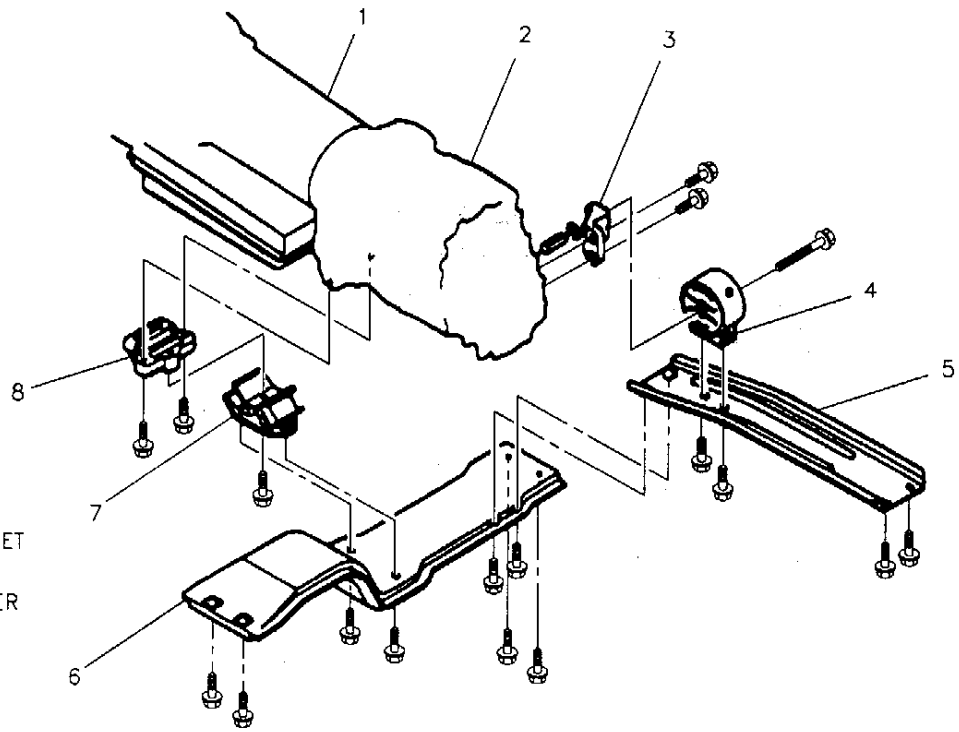

A TRANSMISSION JACK
726 TRANSMISSION FLUID PAN
743 EXHAUST PIPE BRACKET EJS0637A

Figure 122—Exhaust Pipe Bracket—Typical



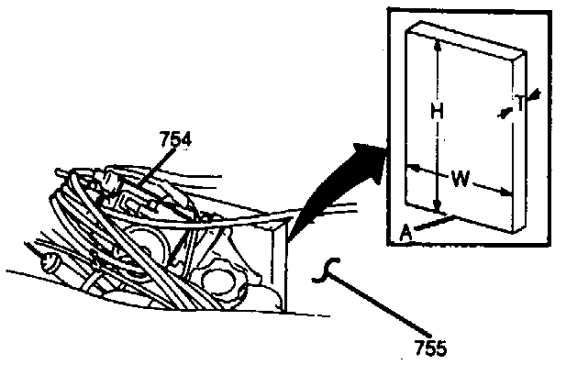

1 CASE RIGHT STIFFENER RETAINING BOLTS
2 CASE RIGHT STIFFENER
3 UPPER TRANSMISSION RETAINING BOLTS
4 AUTOMATIC TRANSMISSION
5 LOWER TRANSMISSION RETAINING NUTS
6 CASE LEFT STIFFENER RETAINING BOLTS
7 CASE LEFT STIFFENER
8 DRIVE PLATE
9 TORQUE CONVERTER RETAINING BOLT
10 TORQUE CONVERTER

Figure 123—Transmission Attaching Components (03-72LE, 4-Speed)




1 AUTOMATIC TRANSMISSION
2 TRANSFER
3 TORQUE STOPPER BRACKET
4 TORQUE STOPPER BUSH
5 TORQUE STOPPER MEMBER
6 ENGINE REAR MOUNTING MEMBER
7 ENGINE REAR MOUNTING
8 ENGINE REAR MOUNTING BRACKET

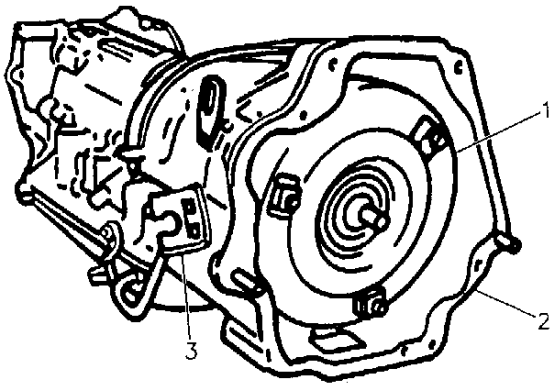
Figure 124—Transmission Rear Mounting Hardware (03-72LE, 4-Speed)




A WOOD BLOCK
H 200 mm (8.0")
T 45 mm (1.8")
W 100-150 mm (4.0-6.0")
754 DISTRIBUTOR CAP
755 BULKHEAD
EJS0647A

Figure 125—Wood Block Support Installation

27. Support transmission with a suitable hydraulic jack.
28. Two bolts from rear transmission mount (two-wheel drive models) (Figure 121).
29. Four bolts and rear transmission crossmember from vehicle (two-wheel drive models) (Figure 121).
30. Two bolts from engine rear mounting (four-wheel drive models) (Figure 124).
31. Two bolts from engine rear mounting member and torque stopper member securing torque stopper bushing to torque stopper bushing member (four-wheel drive models) (Figure 124).
32. Four bolts and engine rear mounting member from undercarriage (four-wheel drive models) (Figure 124).
33. One bolt and fluid filler tube from transmission.
34. Speedometer cable from speedometer driven gear case (two-wheel drive models). Refer to "Speedometer Driven Gear" earlier in this section.
35. Four bolts and case right stiffener from engine and transmission (03-72LE, 4-speed models only) (Figure 123).
36. Four bolts and case left stiffener from engine and transmission (03-72LE, 4-speed models only) (Figure 123).
37. Two clamps and fluid cooler hoses from fluid cooler pipes at transmission (Figures 119 and 120).
38. Flywheel inspection cover from converter housing.
39. Two bolts and flywheel inspection plug from converter housing.
40. Three flywheel-to-torque converter bolts.




1 TORQUE CONVERTER
2 CONVERTER HOUSING
3 SHIFT SELECTOR CABLE BRACKET
EJT0207A

Figure 126—Shift Selector Cable Bracket

41. Four bolts and front skid plate from vehicle (if equipped).
42. Two bolts, two nuts and exhaust pipe bracket from extension housing (two-wheel drive models) (Figure 122).
43. Place a wood block with the dimensions shown in Figure 124 between the distributor gear housing and the bulkhead to prevent the distributor and other components from being damaged when the transmission is lowered.
44. Lower transmission slowly until engine contacts its support point on the wood block (Figure 125).
45. Vent hose from vent tube at top of transmission (3L30, 3-speed models only).
46. Two lower transmission retaining nuts.

**CAUTION: When removing transmission assembly, be sure to keep the transmission assembly horizontal as so not to let torque converter slide out. Tilting the transmission front forward can cause torque converter to fall out, whereby an injury may result.**

47. Slowly lower transmission making sure no obstructions exist and remove transmission from vehicle.

## Inspect

- For inspection and overhaul procedures, refer to SECTION 7A-10B (03-72LE, 4-Speed) and for complete 3L30, 3-speed automatic transmission unit repair procedures, refer to SECTION 7A-11B in the 1996 Transmission/Transaxle/Transfer Case Unit Repair Manual.

**Install or Connect**

**CAUTION: When installing transmission assembly with torque converter installed in it, be sure to keep the transmission assembly horizontal as so not to let torque converter slide out. Tilting the transmission front forward can cause torque converter to fall out, whereby an injury may result.**

1. Slowly raise transmission into vehicle making sure no obstructions exist.
   - On vehicles equipped with a 03-72LE, 4-speed transmission, it is important to route the TV cable while raising transmission into place.
2. Two lower transmission retaining nuts.

**Tighten**

   - Lower transmission retaining nuts to 85 N.m (62 lb. ft.).
3. Vent hose to vent tube at top of transmission (3L30, 3-speed models only).
4. Raise transmission slowly until engine is no longer in contact with the wood block between the bulkhead and the distributor gear housing.
5. Remove wood block.
6. Exhaust pipe bracket to extension housing and catalytic converter; secure with two bolts and two nuts (two-wheel drive models) (Figure 122).

**Tighten**

   - Exhaust pipe bracket bolts and nuts to 23 N.m (17 lb. ft.).
7. Three flywheel-to-torque converter bolts.

**Tighten**

   - Flywheel-to-torque converter bolts to 55 N.m (40 lb. ft.) (3L30, 3-speed models only).
   - Flywheel-to-torque converter bolts to 60 - 70 N.m (44 - 52 lb. ft.) (03-72LE, 4-speed models only).
8. Flywheel inspection cover to converter housing; secure with two bolts.

**Tighten**

   - Flywheel inspection cover bolts to 10 N.m (89 lb. in.).
9. Flywheel inspection plug to converter housing.
10. Two fluid cooler hoses to fluid cooler pipes; secure with two clamps (Figures 119 and 120).

**Tighten**

   - Fluid cooler hose clamps to 1.5 N.m (12 lb. in.).
11. Left and right case stiffeners to transmission to engine, secure with four bolts each (03-72LE, 4-Speed) (Figure 123).

**Tighten**

   - Case left and right stiffener bolts 40 to 60 N.m (29 to 44 lb. ft.) (03-72LE, 4-Speed).
12. Front skid plate to vehicle (if equipped); secure with four bolts.

**Tighten**

   - Front skid plate bolts to 54 N.m (40 lb. ft.).
13. Speedometer cable to speedometer driven gear case. Refer to "Speedometer Driven Gear" earlier in this section.
14. Fluid filler tube into transmission; secure with one bolt.

**Tighten**

   - Fluid filler tube bracket bolt to 23 N.m (17 lb. ft.).
15. Engine rear mounting member to undercarriage (four-wheel drive models); secure with four bolts (Figure 124).

**Tighten**

   - Engine rear mounting member bolts to 40 - 60 N.m (30 - 44 lb. ft.).
16. Torque stopper bushing to torque stopper member (four-wheel drive models); secure with two bolts (Figure 124).

**Tighten**

   - Torque stopper bushing bolts to 40 - 60 N.m (30 - 44 lb. ft.).
17. Two bolts securing engine rear mounting to engine rear mounting member (four-wheel drive models); secure with four bolts (Figure 124).
   - Engine rear mounting bolts to 40 - 60 N.m (30 - 44 lb. ft.).
18. Rear transmission crossmember to undercarriage (two-wheel drive models); secure with four bolts (Figure 121).

**Tighten**

   - Rear transmission crossmember bolts to 60 N.m (44 lb. ft.).
19. Two bolts to rear transmission mount (two-wheel drive models) (Figure 121).

**Tighten**

   - Rear transmission mount bolts to 60 N.m (44 lb. ft.).
20. TV cable to valve body (3L30, 3-speed models only). Refer to "TV Cable" earlier in this section.
21. Shift select cable bracket to transmission with two bolts.
22. Shift select cable to transmission. Refer to "Shift Select Cable" earlier in this section.
23. Rear and front (if equipped) propeller shafts into vehicle. Refer to SECTION 4A.

24. Two upper transmission retaining bolts to transmission.

**Tighten**

- Upper transmission retaining bolts to 85 N.m (62 lb. ft.).

25. Remove hydraulic jack from under transmission.
26. Starter motor to transmission converter housing; secure with two bolts.

**Tighten**

- Starter motor bolts to 30 N.m (22 lb. ft.).

27. Starter motor electrical connections to starter motor.
28. TCC electrical connector (03-72LE, 4-speed models only).
29. Park/Neutral position (PNP) switch (3L30, 3-Speed) or transmission range switch (03-72LE, 4-Speed) electrical connector.
30. Vehicle speed sensor electrical connector.
31. Transfer case into vehicle (four-wheel drive models). Refer to SECTION 7D.
32. Front pipe/catalytic converter. Refer to SECTION 6F.

**Important**

- Perform steps 33 and 34 if needed.

33. New transmission pan gasket and transmission pan to transmission (3L30, 3-speed models only); secure with twelve bolts.

**Tighten**

- Transmission fluid pan bolts to 13 N.m (115 lb. in.).

34. New transmission fluid pan drain plug gasket and transmission fluid pan plug to transmission pan (03-72LE, 4-speed models only).

**Tighten**

- Transmission fluid pan drain plug to 15 - 18 N.m (11 - 13 lb. ft.).

35. Lower vehicle.
36. Four-wheel drive switch electrical connectors to transfer case (four-wheel drive models).
37. Case cover boot, bracket, plate, and shift lever boot to transfer case shift lever (four-wheel drive models); secure with six screws.
38. Transfer case shift lever knob to transfer case shift lever; secure with one screw.
39. Shift selector to floor with four bolts.
40. Console. Refer to SECTION 8C.
41. Transmission position switch electrical connectors under intake manifold (3L30, 3-Speed).
42. Fluid level indicator into fluid filler tube.
43. Vacuum modulator hose to intake manifold (3L30, 3-Speed).
44. TV cable to throttle body (03-72LE, 4-Speed). Refer to "TV Cable" earlier in this section.
45. Negative (-) battery cable.

**Tighten**

- Negative (-) battery cable-to-negative (-) battery terminal retainer to 15 N.m (11 lb. ft.).

46. Refill transmission as necessary:
    A. Place vehicle on a level surface.
    B. Remove fluid level indicator.
    C. Add approximately 1.5 liters (1.6 qts.) of Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent into fluid filler tube.
    D. Install fluid level indicator into fluid filler tube.
    E. Apply parking brake and block vehicle wheels.
    F. With selector lever in "P" position, start engine. DO NOT race engine.
    G. Run engine at idle and move selector lever through each range and return to the "P" position.
    H. With engine running at idle, remove fluid level indicator from filler tube and wipe indicator off.
    I. Reinsert fluid level indicator into filler tube making sure it is seated in its original position.
    J. Remove the indicator and check the fluid level. The level should be between the "FULL HOT" and "LOW HOT" marks. If the level is below the "LOW HOT" mark, add fluid to bring the level to the "FULL HOT" mark. Bringing the fluid level from the "LOW HOT" mark to the "FULL HOT" mark requires 0.3 liters (0.70 pints) of fluid. Use Dexron®-III automatic transmission fluid GM P/N 12346143, or equivalent.
    K. Conduct a road test and check transmission level. Refer to "Checking Fluid Level (Normal Operating Temperature)" earlier in this section.

# SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

| | |
|---|---|
| Flywheel-to-Torque Converter Bolts (3L30, 3-Speed) | 55 N.m (40 lb. ft.) |
| Flywheel-to-Torque Converter Bolts (03-72LE, 4-Speed) | 60 - 70 N.m (44 to 52 lb. ft.) |
| Flywheel Inspection Cover Bolts | 10 N.m (89 lb. in.) |
| Left Case Stiffener Bolt (03-72LE, 4-Speed) | 40 - 60 N.m (44 lb. ft.) |
| Negative (-) Battery Cable-To-Negative (-) Battery Terminal Retainer | 15 N.m (11 lb. ft.) |
| Shift Select Cable Locknut | 7 N.m (62 lb. in.) |
| Manual Selector Bolts | 18 N.m (13 lb. ft.) |
| Left and Right Case Stiffener Bolts (03-72LE, 4-Speed) | 40 - 60 N.m (29 to 44 lb. ft.) |
| Park/Neutral Position Switch Bolt | 21 N.m (15 lb. ft.) |
| Manual Select Lever Nut | 19 nm (14 lb. ft.) |
| Interlock Cable Nut | 13 N.m (115 lb. in.) |
| Shift Lock Solenoid Retaining Bolt | 10 N.m (89 lb. in.) |
| Stoplamp Switch Adjustment Nut | 15 N.m (11 lb. ft.) |
| TV Cable Retaining Bracket Bolt (3L30, 3-Speed) | 10 N.m (89 lb. in.) |
| Front Propeller Shaft Bolts and Nuts (Four-wheel Drive Models) | 50 N.m (37 lb. ft.) |
| Fluid Filter Screen Bolts (3L30, 3-Speed) | 19 N.m (14 lb. ft.) |
| Transmission Fluid Pan Bolts (3L30, 3-Speed) | 13 N.m (115 lb. in.) |
| Fluid Filter Screen Bolts (03-72LE, 4-Speed) | 5 - 6 N.m (44 - 53 lb. in.) |
| Transmission Fluid Pan Bolts (03-72LE, 4-Speed) | 4 - 5 N.m (35 - 44 lb. in.) |
| Transmission Fluid Drain Plug (03-72LE, 4-Speed) | 15 - 18 N.m (11 - 13 lb. ft.) |
| Rear Propeller Shaft Bolts and Nuts | 50 N.m (37 lb. ft.) |
| Vacuum Modulator (3L30, 3-Speed) | 52 N.m (38 lb. ft.) |
| Valve Body Bolts (3L30, 3-Speed) | 19 N.m (14 lb. ft.) |
| Servo Piston Cover Bolts (3L30, 3-Speed) | 25 N.m (18 lb. ft.) |
| Reinforcement Plate Bolts (3L30, 3-Speed) | 19 N.m (14 lb. ft.) |
| TCC Solenoid Retaining Bolts (3L30, 3-Speed) | 19 N.m (14 lb. ft.) |
| Speedometer Guide Bracket Bolt | 9 N.m (80 lb. in.) |
| Rear Propeller Shaft Bolts and Nuts | 50 N.m (37 lb. ft.) |
| Extension Housing Bolts (3L30, 3-Speed) | 31 N.m (23 lb. ft.) |
| Rear Transmission Crossmember Bolts (Two-wheel Drive Models) | 60 N.m (44 lb. ft.) |
| Rear Transmission Mount Bolts (Two-wheel Drive Models) | 60 N.m (44 lb. ft.) |
| Exhaust Pipe Bracket Bolts and Nuts (3L30, 3-Speed) | 23 N.m (17 lb. ft.) |
| Engine Rear Mounting Member Bolts (Four-wheel Drive Models) | 40 - 60 N.m (30-44 lb. ft.) |
| Engine Rear Mounting Bolts (Four-wheel Drive Models) | 40 - 60 N.m (30-44 lb. ft.) |
| Transfer Adapter Case Bolts | 31 N.m (23 lb. ft.) |
| Governor Assembly Bolts (3L30, 3-Speed) | 9 N.m (80 lb. in.) |
| Fluid Filler Tube Bracket Bolt | 23 N.m (17 lb. ft.) |
| Transfer Plate-to-Valve Body Bolts | 9 N.m (80 lb. in.) |
| Fluid Pressure Switch | 10 N.m (89 lb. in.) |
| TV Cable Cam Bolt (03-72LE, 4-Speed) | 8 N.m (71 lb. in.) |
| Pressure Relief Valve Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Rear Valve Body Plate Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Shift Solenoid Assembly Bolts (03-72LE, 4-Speed) | 10 N.m (89 lb. in.) |
| TCC Solenoid Retaining Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| TCC Control Valve Plate Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Lower Valve Body Plate Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Upper Valve Body Side Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Lower Valve Body Side Bolts (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Detent Spring Bolt (03-72LE, 4-Speed) | 5 N.m (44 lb. in.) |
| Valve Body Bolts (03-72LE, 4-Speed) | 10 N.m (89 lb. in.) |

| | |
|---|---|
| Brake Applying Cover Bolts (03-72LE, 4-Speed) | 10 N.m (89 lb. in.) |
| Cooler Pipe Flare Nuts | 25 N.m (18 lb. ft.) |
| Cooler Pipe Clamp Bolt | 23 N.m (17 lb. ft.) |
| Front Skid Plate Bolts | 54 N.m (40 lb. ft.) |
| Fluid Cooler Hose Clamps | 1.5 N.m (12 lb. in.) |
| Lower Transmission Retaining Nuts | 85 N.m (62 lb. ft.) |
| Right and Left Case Stiffener Bolts (03-72LE, 4-Speed) | 40 - 60 N.m (44 lb. ft.) |
| Torque Stopper Bushing Bolts (Four-wheel Drive Models) | 40 - 60 N.m (30 - 44 lb. ft.) |
| Upper Transmission Retaining Bolts | 85 N.m (62 lb. ft.) |
| Starter Motor Bolts | 30 N.m (22 lb. ft.) |

## FLUID CAPACITIES (APPROXIMATE)

| | |
|---|---|
| Pan Removal | 1.5 liters (1.6 qts.) |
| Overhaul Less Torque Converter | 3.5 liters (3.7 qts.) |
| Overhaul With New Torque Converter | 4.9 liters (5.1 qts.) |
| Fluid Recommended | Dexron®-III Automatic Transmission Fluid GM P/N 12346143, or equivalent |

## SPECIAL TOOLS

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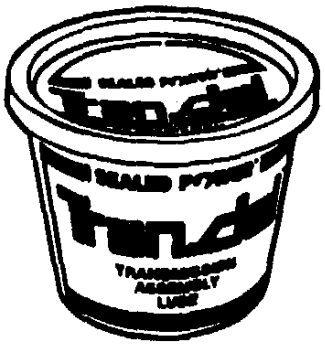
J 36850



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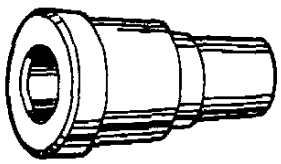

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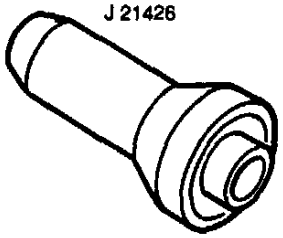

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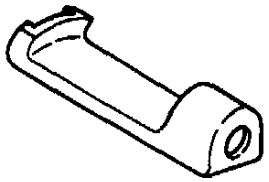

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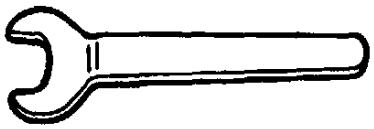

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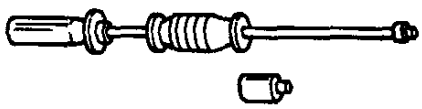

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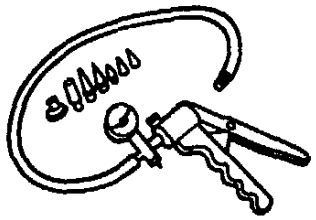

1 TRANSJEL® TRANSMISSION ASSEMBLY LUBRICANT
2 CONVERTER HOUSING SEAL AND EXTENSION HOUSING OIL SEAL REMOVER
3 DRIVER HANDLE
4 SLIDE HAMMER
5 EXTENSION HOUSING BUSHING REMOVER AND INSTALLER
6 EXTENSION HOUSING SEAL INSTALLER
7 VACUUM MODULATOR WRENCH
8 AXLE SHAFT SEAL INSTALLER
9 HAND OPERATED VACUUM PUMP

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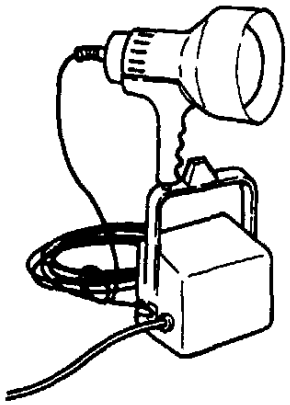

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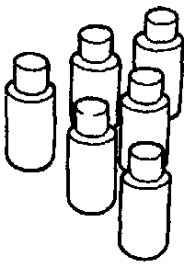

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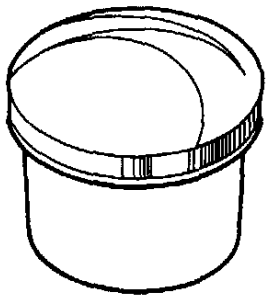

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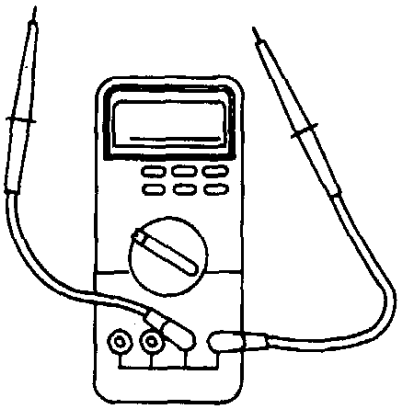

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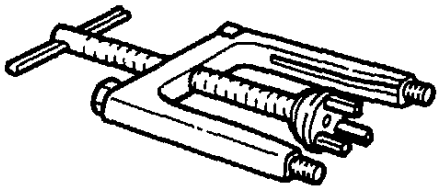

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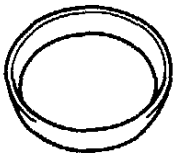

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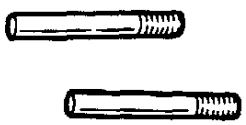

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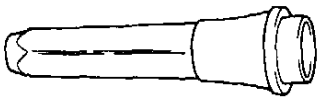

10 HIGH INTENSITY BLACK LIGHT
11 FLUORESCENT OIL ADDITIVE
12 TRANSMISSION VALVE LAPPING COMPOUND
13 DIGITAL MULTIMETER
14 SERVO AND THIRD CLUTCH PISTON COMPRESSOR
15 SERVO PISTON RING INSTALLER
16 CONVERTER HOUSING GUIDE PIN
17 FRONT PUMP SEAL INSTALLER

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