



# FORDAOD

## INDEX

|                              |    |
|------------------------------|----|
| INTRODUCTION.....            | 3  |
| SHIFT DIAGNOSIS.....         | 4  |
| LINKAGE-GENERAL.....         | 6  |
| UNIT REMOVAL.....            | 14 |
| UNIT INSTALLATION.....       | 21 |
| TEAR-DOWN.....               | 26 |
| ASSEMBLY .....               | 36 |
| COMPONENT REBUILD .....      | 52 |
| PUMP.....                    | 78 |
| VALVE BODY .....             | 84 |
| BEARING LOCATIONS.....       | 91 |
| SPECIFICATIONS.....          | 94 |
| PRESSURE SPECIFICATIONS..... | 96 |

# Technical Service Information

The Automatic Overdrive Transmission provides fully automatic operation in either the **Ⓧ** (OVERDRIVE) or **D** (3-OVERDRIVE LOCKOUT) positions.

**NOTE:** A 2 (SECOND) selector position replaces the 1 (LOW) selector position in vehicles equipped with the low gear lockout position.

**Ⓧ** (OVERDRIVE)—This is the normal driving position for an automatic overdrive transmission. In this position the transmission starts in first gear and as the vehicle accelerates, automatically upshifts to second, third and fourth gear. The transmission will automatically downshift as vehicle speed decreases.

**NOTE:** The transmission will not shift into or remain in overdrive gear when the accelerator is pushed to the floor.

The Automatic Overdrive Transmission differs from conventional 3-speed automatic transmissions in that the planetary gear set operates in 4th gear. Some audible perception of planetary action can exist as with any other mechanical device and should be accepted as being commercially quiet unless some abnormal noise is present.

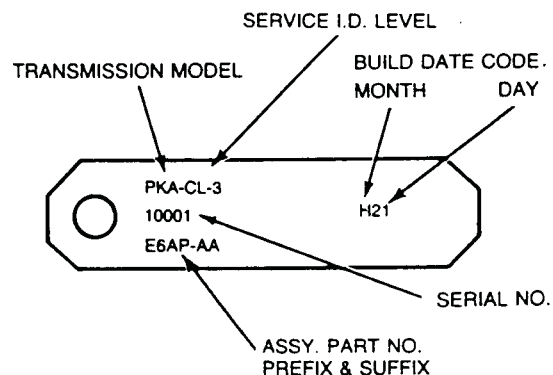
**D** (OVERDRIVE LOCKOUT)—In this position the transmission operates as in **Ⓧ** (OVERDRIVE) except there will be no shift into the overdrive gear. This position may be used when driving up or down mountainous roads to provide better performance and greater engine braking than the overdrive position. The transmission may be shifted from **Ⓧ** to **D** or **D** to **Ⓧ** at any vehicle speed.

**1** (LOW)—This position can be used when maximum engine braking is desired. To help brake the vehicle on hilly roads where **D** (OVERDRIVE LOCKOUT) does not provide enough braking, shift the selector lever to 1 (LOW). At vehicle speeds above approximately 40 km/h (25 mph), the transmission will shift to second gear, and remain in second gear. When vehicle speed drops below 40 km/h (25 mph), the transmission will downshift to first gear, and remain in first gear. Upshifts from 1 (LOW) can be made by manually shifting to **Ⓧ** (OVERDRIVE) or **D** (OVERDRIVE LOCKOUT). When 1 (LOW) is used for starting up, the transmission starts in first gear and stays in first gear.

**FORCED DOWNSHIFTS**—At vehicle speeds from 89-40 km/h (55-25 mph) in **Ⓧ** (OVERDRIVE) OR **D** (OVERDRIVE LOCKOUT), the transmission will downshift to second gear when the accelerator is pushed to the floor. At vehicle speeds below 40 km/h

(55 mph), the transmission will downshift to first gear when the accelerator is pushed to the floor. At most vehicle speeds in **Ⓧ** (OVERDRIVE), the transmission will downshift from fourth gear to third gear when the accelerator is pushed for moderate to heavy acceleration.

## AUTOMATIC OVERDRIVE TRANSMISSION MODEL TAG



ATTACHED TO UPPER  
RIGHT HAND EXTENSION  
HOUSING TO CASE BOLT.

## DIAGNOSIS AND TESTING

Refer to Section 17-01, for the complete Diagnosis and Testing procedures. The procedures in this Section apply only to transmission shift complaints that are attributed to a misadjusted or malfunctioning Throttle Valve Control System.

### Throttle Valve (TV) Control Systems

The AOD Transmission employs two Throttle Valve (TV) Control Systems.

A TV Control Rod Linkage System—used with all 3.8L and 5.8L engines.

A TV Cable Control System—used with all 5.0L and 5.0L HO engines.

TV Control hardware, adjustments, and diagnosis is different for each system. Before diagnosis or adjustment, verify which system is on the vehicle and follow the appropriate diagnosis and adjustment.

# Technical Service Information

Damage to friction elements in transmission may result due to excessive slipping since TV pressure will remain near zero. If it is necessary to drive vehicle before servicing or resetting cable, disconnect cable at the transmission lever. TV pressure will now be near maximum, allowing light throttle operation. However, shift will be delayed and harsh.

**Remedy:** Replace/reconnect cable and reset per procedure for the TV control cable system.

- B. **Symptoms:** Shift clunk when throttle is backed off after full or heavy throttle acceleration. Harsh coasting downshifts out of 4th gear (automatic 4-3 shifts in D range).

**Cause:** TV control cable is set too short.

**Remedy:** Reset cable per procedure for the TV control cable system.

**Cause:** TV control cable is not locked, locking key is in up position.

**Remedy:** Set cable per procedure for the TV control cable system.

**Cause:** Transmission lever does not return to idle (lever to rear as far as possible) although cable is correctly set.

**Remedy:** Check for binding due to misaligned or damaged cable brackets or damaged cable or return spring (in rubber boot). Check for binding at cable connections at throttle body or transmission. Pry off cable from the TV lever ball stud and check for free movement of the cable. Lubricate the ball stud with a small amount of Multi-Purpose Long-Life Lubricant, C1AZ-19590-B (ESA-M1C75-B) lubricant or equivalent and reattach the cable. Check for frozen moisture in cable due to damaged boot. Service or replace as necessary. Set cable per procedure for the TV control cable system.

**Cause:** Cable assembly not correctly attached to bracket at either throttle body or transmission.

**Remedy:** Determine reason for cable becoming detached. Replace if necessary. Set cable per procedure for the TV control cable system.

- C. **Symptoms:** Extremely delayed and harsh up-shift, especially at light to moderate acceleration and harsh idle engagement.

**Cause:** Cable disconnected at transmission (transmission TV pressure is at maximum).

**Remedy:** Determine cause for cable becoming disconnected. Service or replace as necessary. Set cable per procedure for the TV control cable system.

**Cause:** Transmission lever stays at WOT or part throttle although cable is correctly set.

**Remedy:** Check for binding conditions as detailed in Step B. Service or replace as necessary. Set cable per procedure for the TV control cable system.

## TV Linkage Diagnostic Check

With selector lever in N, carburetor de-cammed, there should be no gap at TV linkage. If gap exists, check for binding grommets and TV return spring not returning TV lever at carburetor. Check linkage adjustment at carburetor, if necessary.

## ADJUSTMENTS

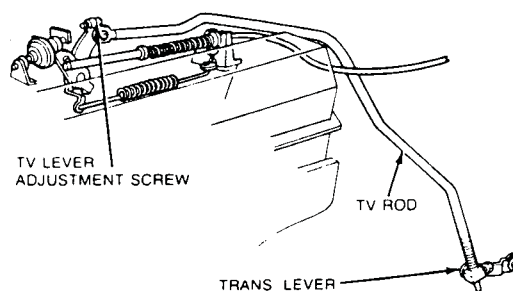
### Throttle Valve (TV) Control Linkage System

#### 3.8L and 5.8L Engines

#### Service Adjustment Procedure

The Throttle Valve (TV) Control Linkage System consists of the linkage lever on the carburetor, the transmission control rod assembly, and the external TV control lever on the transmission.

TYPICAL TV ROD CONTROL SYSTEM



## Technical Service Information

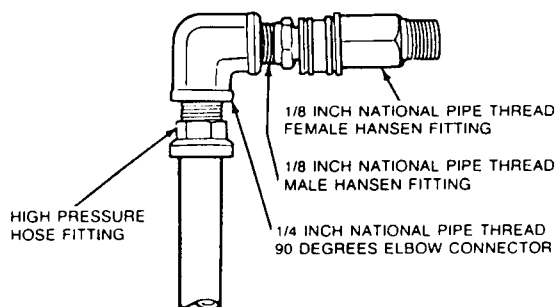
The following procedure may be used to check and/or adjust the throttle valve (TV) control linkage using the TV control pressure.

1. Check/adjust the engine curb idle speed to specification required. Refer to the Engine/Emissions Diagnosis\* manual for appropriate procedure. Make sure the curb idle speed is set to specification with and without the throttle solenoid positioner (anti-diesel solenoid) energized, if so equipped.
2. Attach TV Pressure Gauge (0-60 psi) with Hose T86L-70002-A or equivalent, to the TV port on the transmission.

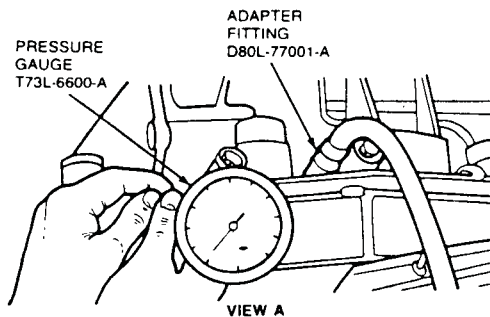
**NOTE:** If the service tool is not available, in order to avoid the exhaust system, obtain the following locally available material and assemble as shown:

- One 1/8-inch NPT Female Hansen Fitting.
- One 1/8-inch NPT Male Hansen Fitting.
- One 1/4-inch NPT 90 degree elbow connector.
- One high-pressure hose fitting.

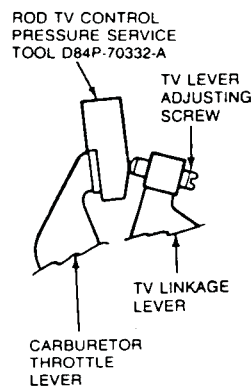
The pressure gauge should have 200mm (8 feet) of flexible hose to make the gauge accessible while operating the engine.



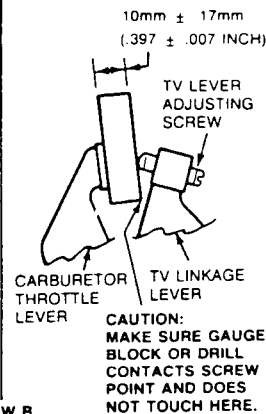
3. Obtain Rod TV Control Pressure Gauge Block D84P-70332-A, or fabricate a block 10mm  $\pm$  0.17mm (0.397  $\pm$  0.007 inch) thick. The following drill bit shanks may also be used in order of preference: Letter X (.397 inch), 10mm (.3937 inch) or 25/64 (.3906 inch).



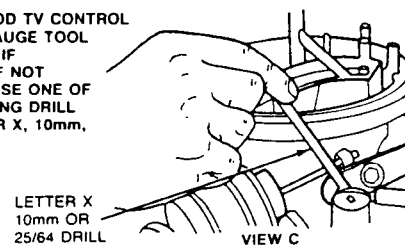
### SERVICE TOOL USAGE



### SHOP MADE GAUGE BLOCK OR DRILL SHANK



**NOTE:** USE ROD TV CONTROL PRESSURE GAUGE TOOL D84P-70332-A IF AVAILABLE. IF NOT AVAILABLE, USE ONE OF THE FOLLOWING DRILL SIZES (LETTER X, 10mm, OR 25/64).



4. Operate the engine until normal operating temperature is reached and the throttle lever is off fast idle or the idle speed control plunger (if equipped) is at its normal idle position. The transmission fluid temperature should be approximately 38°-72°C (100°-150°F). Do not make pressure check if transmission fluid is cold or too hot to touch.

## Technical Service Information

10. Clean and inspect the valve body. Refer to Section 17-01.
11. Position a new separator plate gasket to the separator plate.
12. Using Valve Body Guide Pins T80L-77100-A or equivalent, position the valve body to the case, making sure that the inner manual lever and inner TV lever are engaged.
13. Install and tighten the 24 attaching bolts to 9-11 N·m (80-100 lb-in).
14. Install the detent spring and attaching bolt.
15. Remove the Valve Body Guide Pins T80L-77100-A or equivalent and install and tighten the remaining two valve body-to-case bolts.
16. Position the TV lever torsion spring against the separator plate.
17. Using three filter attaching bolts install the filter and gasket to the valve body and tighten attaching bolts to 9-11 N·m (80-100 lb-in).
18. Clean the transmission oil pan and gasket surfaces thoroughly.
19. Using a new oil pan gasket, secure the pan to the transmission case. Tighten the attaching bolts to 16-22 N·m (12-16 lb-ft).
20. Install any exhaust system hardware that might have been removed.
21. Lower the vehicle and fill the transmission to the correct level with the specified fluid. Start the engine and shift the transmission to all ranges, then recheck the fluid level. Refer to Section 17-01 for the Transmission Fluid Level Check procedure.
22. Adjust TV linkage rod or cable system as outlined under linkage adjustment.

### Low-Reverse Servo Assembly

#### Removal

1. Raise the vehicle on a hoist so the transmission fluid pan is accessible.  
  
NOTE: Some vehicles may require removal of interfering exhaust system components.
2. Starting at the rear and working toward the front, loosen the oil pan attaching bolts and drain the fluid from the transmission. It may be

necessary to use a 3/8-inch or 1/4-inch drive ratchet with a 10mm universal socket to remove the oil pan bolts. If the same fluid is to be used again, filter the fluid through a 100 mesh screen. Reuse the fluid only if the fluid is in good condition.

3. Remove the transmission oil pan attaching bolts, pan and gasket. Discard gasket.
4. Remove three filter-to-valve body attaching bolts and remove the filter, grommet and gasket. Discard gasket. If the fluid is contaminated, discard the filter (do not clean).
5. Remove the detent spring and attaching bolt.
6. Remove the 24 valve body-to-case attaching bolts. Remove the valve body. Discard valve body-to-case gasket.
7. Depress the reverse servo piston cover with a hammer handle as shown. Remove the retaining snap ring and piston cover.

NOTE: Care must be taken to prevent reverse servo piston from springing free from case when cover is removed.

8. To remove the reverse servo piston and spring, apply air pressure to the servo piston release passage using Servo Piston Remover T80L-77030-B or equivalent. Cover the servo piston pocket to prevent the piston from falling out from the case when air is applied and becoming damaged.

#### Installation

1. Clean and inspect the servo pocket in the case.
2. Clean the reverse servo piston, cover and return spring. Inspect the piston and cover sealing edges for cuts, burrs or irregular wear pattern. Replace if necessary.
3. Assemble the return spring to the servo piston.
4. Install the reverse servo piston and spring, and the servo cover into the case reverse servo pocket.

NOTE: Make sure that the servo piston is reinstalled with the same rod length as the one which was removed.

5. Using the handle of a hammer, depress the reverse servo piston and cover sufficiently to gain clear access to the retaining snap ring groove in the case. Install the snap ring.



# Technical Service Information

**NOTE:** Before beginning the transmission overhaul, review the following guidelines. These general rules are provided to emphasize the need for attention to detail and care when servicing an automatic transmission.

- If the transmission is being removed for major overhaul, it is important to completely clean all transmission components, including converter, cooler, cooler lines, main control valve body, governor, all clutches and all check balls after any transmission servicing that generates contamination. These contaminants are a major cause for recurring transmission troubles and must be removed from the system before the transmission is put back into service.

The cleaning of debris from the direct clutch check ball is often omitted. This omission can lead to a repeat servicing of the transmission.

Cleaning and flushing procedures for transmission components, including the direct clutch check ball, can be found under Cleaning and Inspection, Section 17-01.

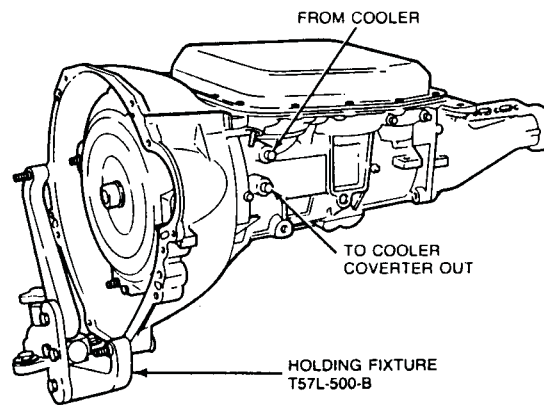
- Refer to Section 17-01 for procedures detailing the cleaning and inspection of individual components.
- Thorough cleaning of the transmission exterior will reduce the possibility that damaging contaminants might enter the subassemblies during disassembly and assembly.
- All fasteners must be tightened to the torque indicated in the text. In addition to appearing in the text, the necessary torques can be found in Specifications.
- When building-up subassemblies, each component part should be lubricated with clean transmission fluid. It is also good practice to lubricate the subassemblies as they are installed in the case.
- Needle bearings, thrust washers and seals should be lightly coated with petroleum jelly during subassembly buildup or transmission assembly.
- Many components and surfaces in the transmission are precision machined. Careful handling during disassembly, cleaning inspection and assembly can prevent unnecessary damage to machined surfaces.
- When building-up subassemblies or assembling the transmission, always use new gaskets and seals.
- The transmission service area should be kept clean, well organized and supplied with clean lint-free shop cloths.

- Whenever a seal is removed from a piston, shaft or servo, note the type of seal and when applicable, the direction of the sealing lip.
- Always use the specified transmission fluid when lubricating seals or other components prior to assembly (refer to Specifications for the proper oil).

## Transmission

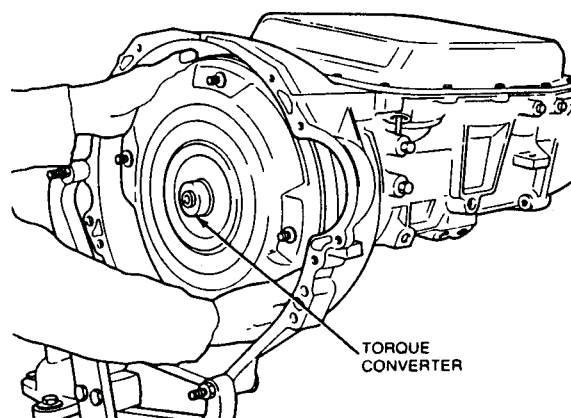
### Disassembly

1. Mount the transmission in Bench Holding Fixture T57L-500-B or equivalent.



2. Grasp the torque converter firmly and pull straight out of the transmission.

**NOTE:** The torque converter is relatively heavy. Be prepared to handle the weight.

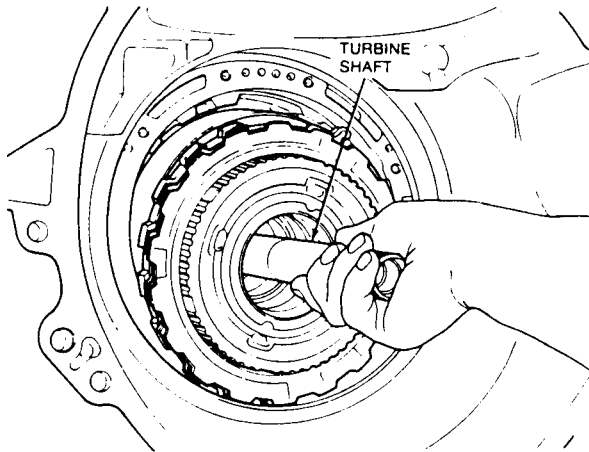


## Technical Service Information

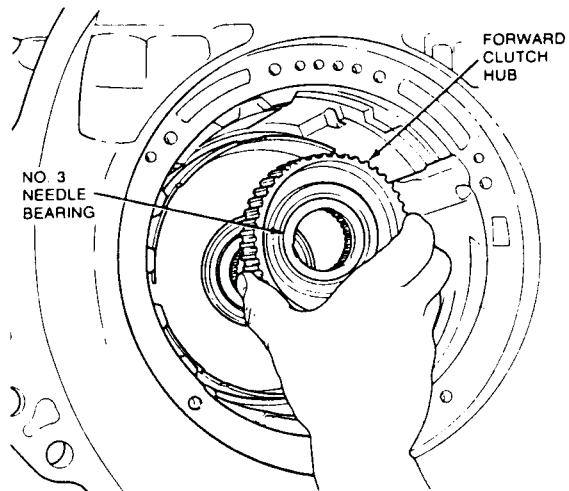
22. Grasp the turbine shaft firmly and pull these components out of the case as an assembly:

- a. Intermediate clutch pack
- b. Intermediate one-way clutch
- c. Reverse clutch
- d. Forward clutch

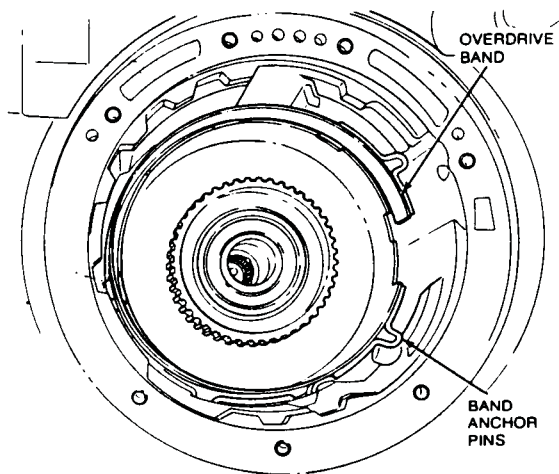
NOTE: Remove the assembly carefully to prevent damage to the overdrive band friction material by the reverse clutch drive lugs.



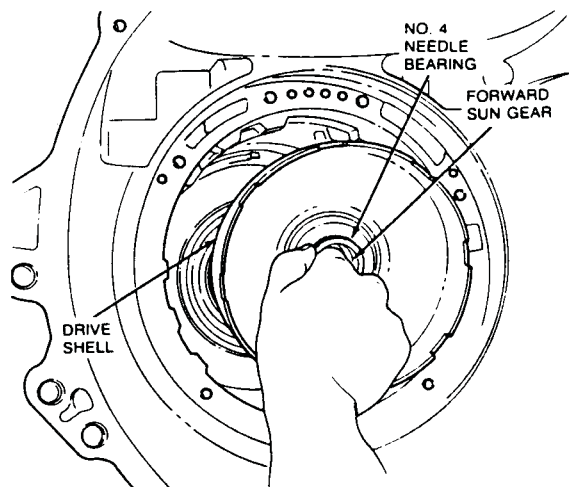
24. Remove the forward clutch hub and the No. 3 needle bearing as an assembly.



23. Disengage the overdrive band from the anchor pins and remove from the case.



25. Remove the forward sun gear, the No. 5 needle bearing, the reverse sun gear and drive shell and the No. 4 needle bearing as an assembly.

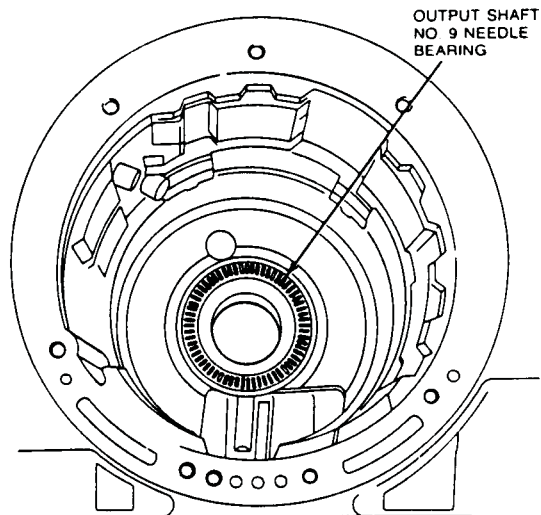


# Technical Service Information

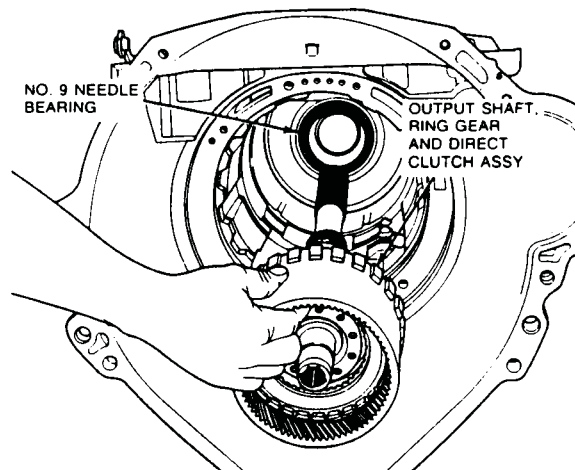
## Transmission

### Assembly

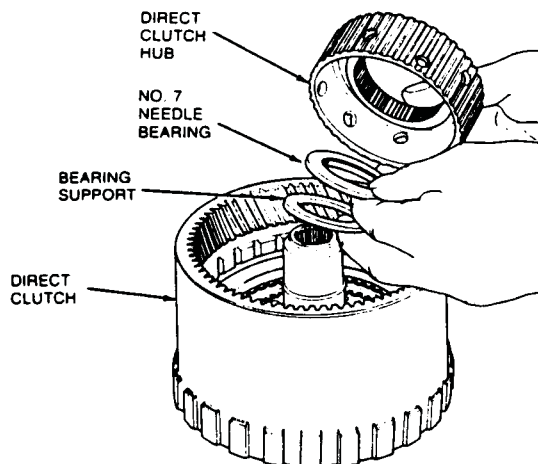
1. Install the output shaft needle bearing No. 9 in the transmission case.



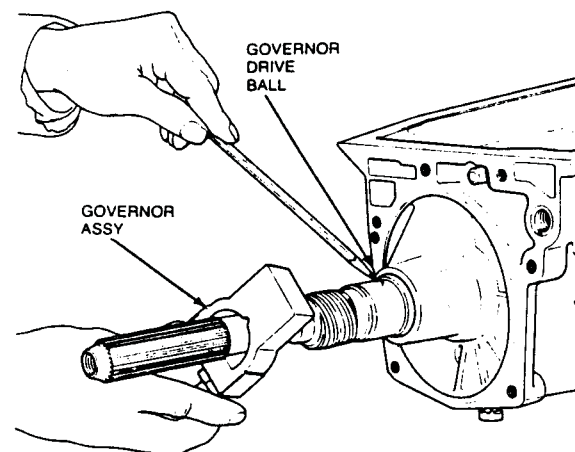
3. Install the output shaft, the ring gear and the direct clutch as an assembly.



2. Install the bearing support, No. 7 needle bearing and direct clutch hub in the direct clutch.



4. Install the governor drive ball and the governor assembly.

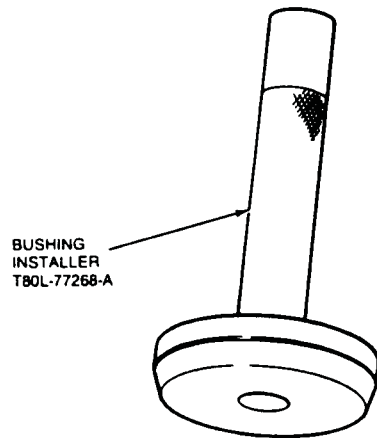




# Technical Service Information

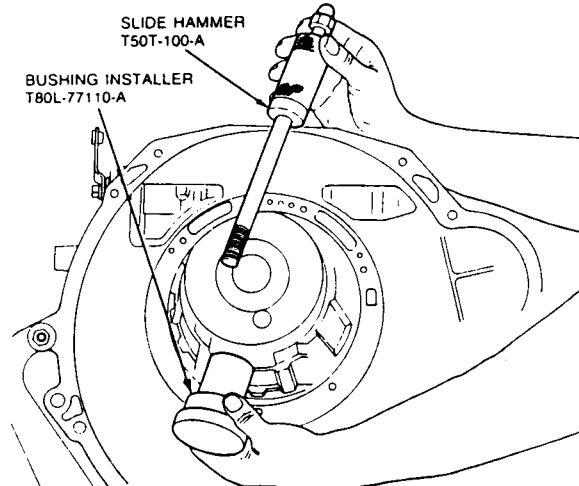
## Installation

Install the bushing using Bushing Installer T80L-77268-A or equivalent.



## Installation

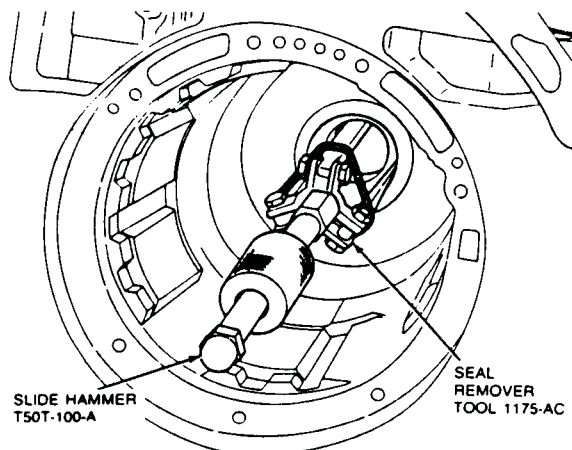
1. Position the replacement bushing on Bushing Installer T80L-77110-A or equivalent and install in the bushing bore through the front of the case.
2. Thread Impact Slide Hammer T50T-100-A or equivalent into the bushing installer through the back of the case and install the bushing.



## Case Bushing

### Removal

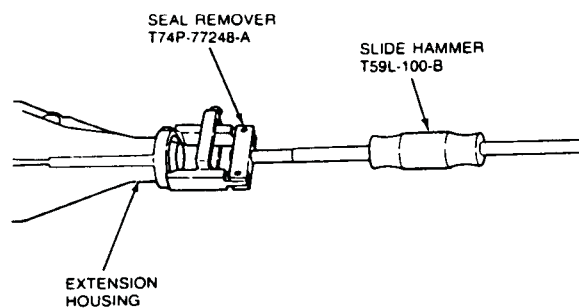
To remove the transmission case bushing use Impact Slide Hammer T50T-100-A and Seal Remover TOOL-1175-AC or equivalent.



## Extension Housing Seal

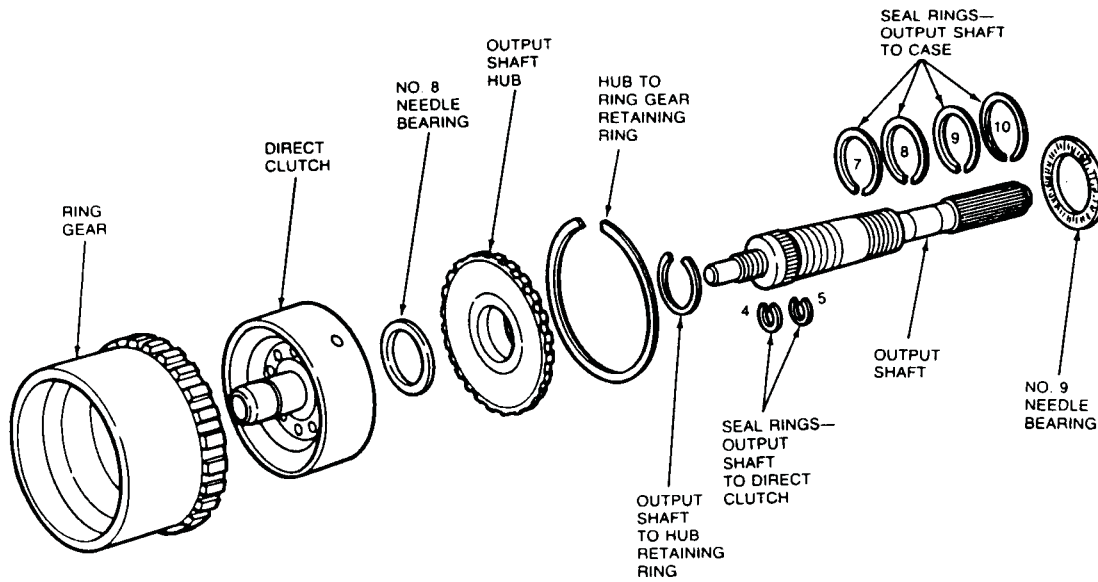
### Removal

Remove the extension housing seal using Impact Slide Hammer T59L-100-B and Extension Housing Seal Remover T74P-77248-A or equivalent.



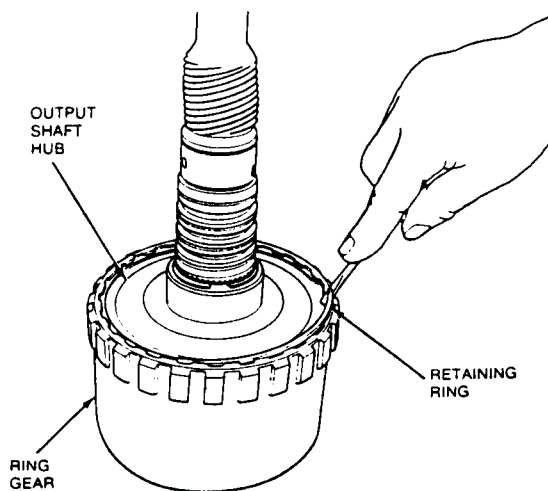
# Technical Service Information

## Output Shaft

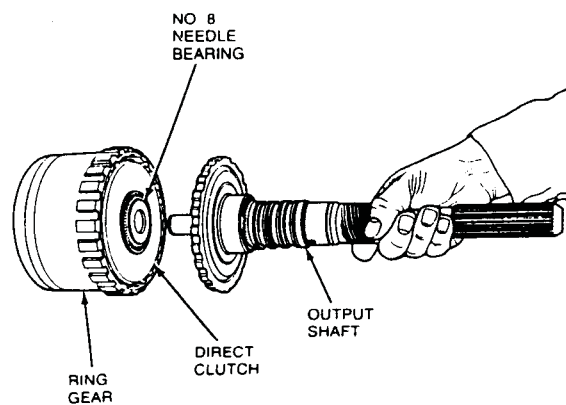


## Disassembly and Assembly

1. Remove the ring retaining the output shaft hub to the ring gear.

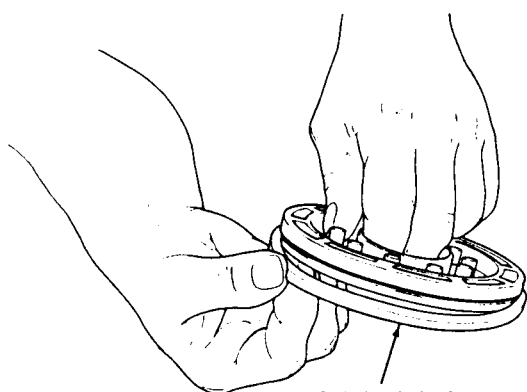


2. Separate the output shaft and hub assembly from the ring gear.



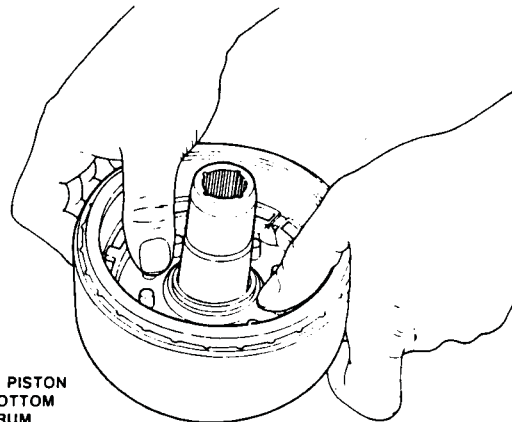
## Technical Service Information

3. Install the outer clutch piston seal. Note the direction of the sealing lip before installation. The lip points away from the spring posts.



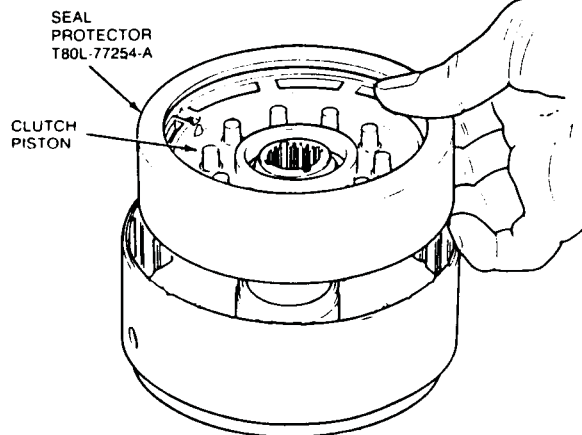
OUTER PISTON SEAL  
NOTE DIRECTION  
OF SEAL LIP BEFORE  
INSTALLATION

- c. Position the tool in the clutch drum and push the piston to the bottom of the drum using even thumb pressure.

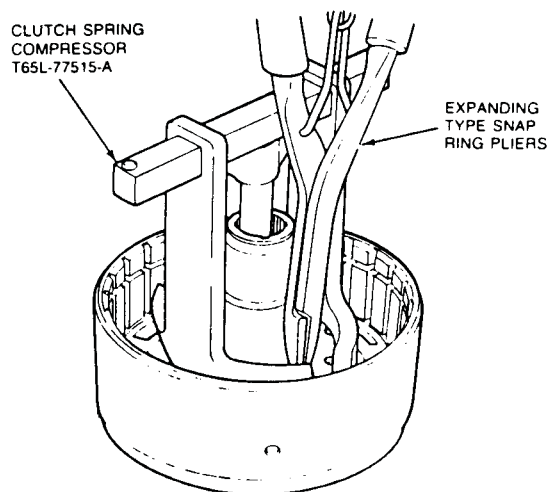


PUSH PISTON  
TO BOTTOM  
OF DRUM  
USING EVEN  
THUMB PRESSURE

4. Install the clutch apply piston as follows:
- Coat the piston seals, the clutch drum sealing area, and the piston inner seal area with petroleum jelly.
  - Install the piston in the Lip Seal Protector T80L-77254-A or equivalent.

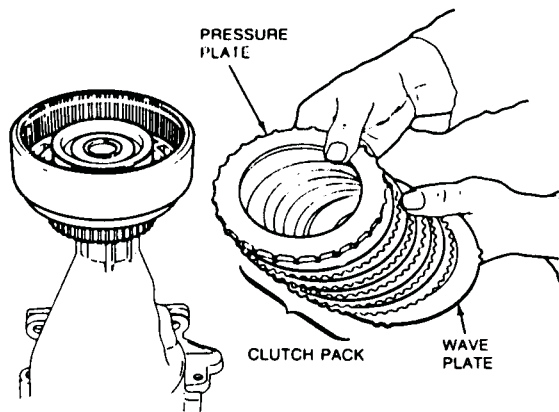


5. Install the piston spring and retainer assembly and retaining ring using Clutch Spring Compressor T65L-77515-A or equivalent.

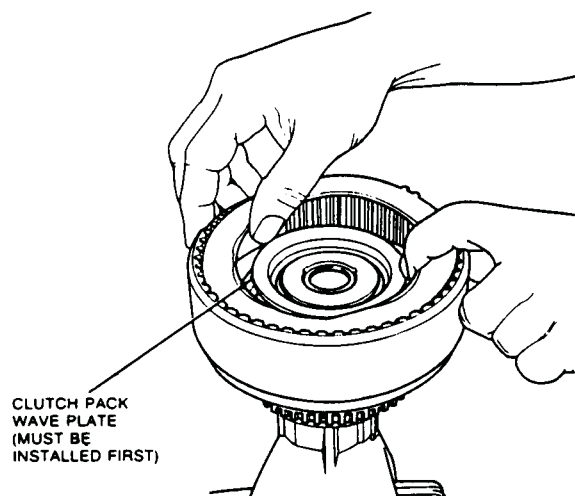


## Technical Service Information

### 4. Install the clutch pack.

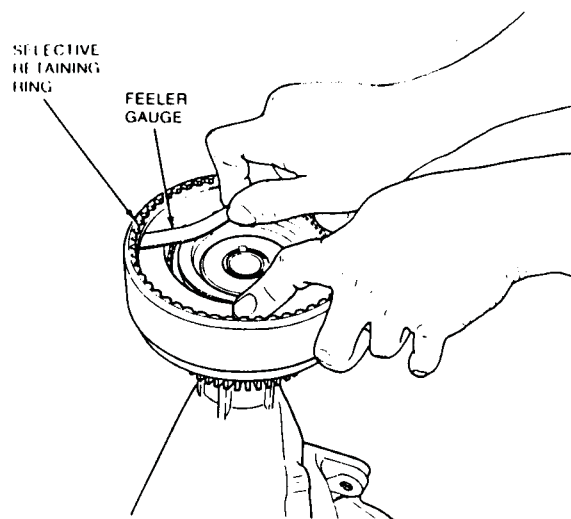


NOTE: The wave plate must be installed first.



### 5. Install the clutch pack retaining ring and check the clearance between the ring and the pressure plate using a feeler gauge.

The pressure plate should be held downward as the clearance is checked.



The clearance should be:

3.8L (232 CID)

1.02-1.80mm (0.040-0.071 inch)

5.0L HO (302 CID), 5.0L SEFI (302 CID),

5.8L (351 CID)

1.27-2.26mm (0.050-0.089 inch)

If the clearance is not within specification, selective snap rings are available in the following thicknesses:

- 0.060-0.064 inch
- 0.074-0.078 inch
- 0.088-0.092 inch
- 0.102-0.106 inch

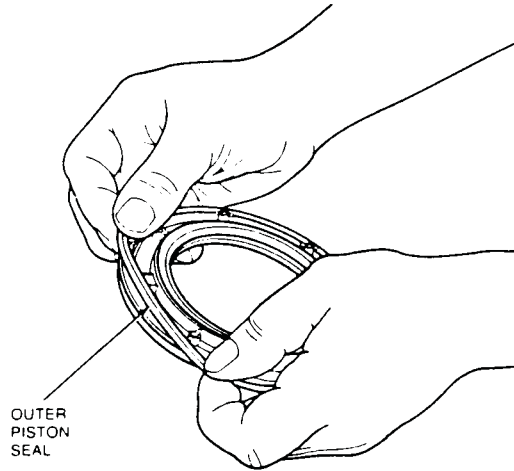
Install the correct size snap ring and recheck the clearance.

# Technical Service Information

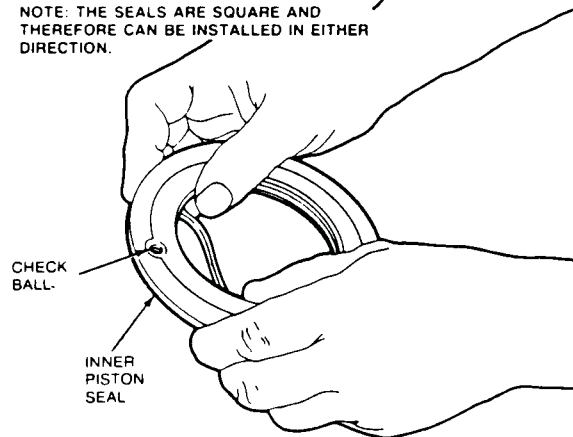
## Assembly

1. Install new seals on the clutch piston. Because the seals are square cut, the direction of installation is not important.

NOTE: The piston check ball must be present and moving freely.

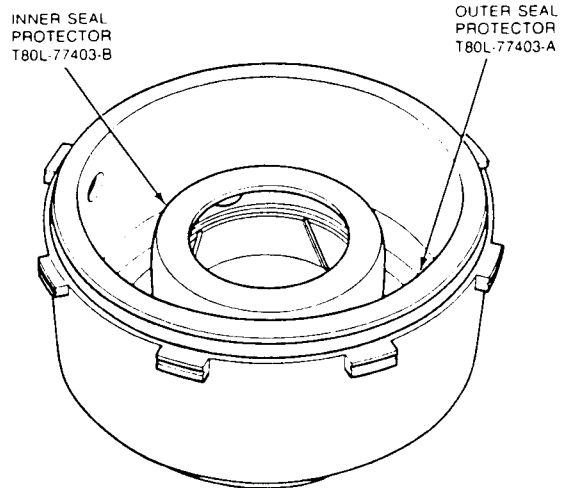


NOTE: THE SEALS ARE SQUARE AND THEREFORE CAN BE INSTALLED IN EITHER DIRECTION.

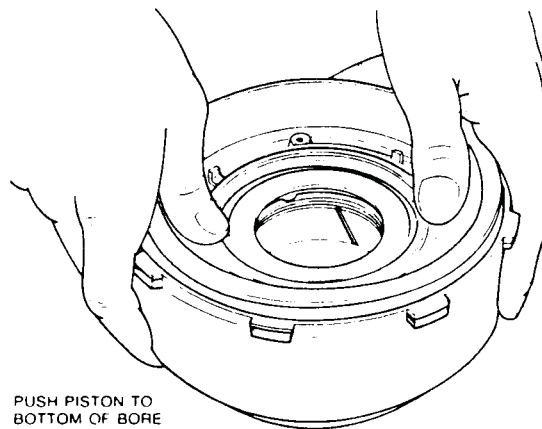


2. Install the clutch piston as follows:

- a. Coat the piston seals and clutch drum seating area with petroleum jelly.
- b. Install Reverse Clutch Seal Protector (inner) T80L-77403-B and Reverse Clutch Seal Protector (outer) T80L-77403-A or equivalent in the clutch drum.

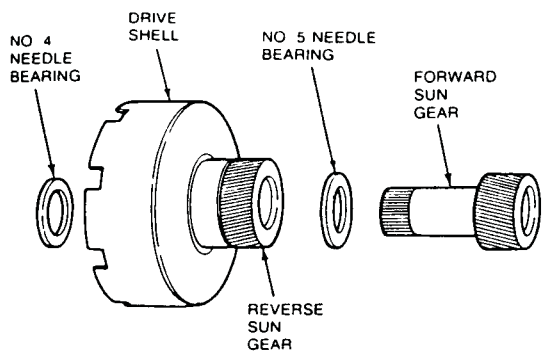


- c. Coat the piston seals, the clutch drum sealing area and the seal protector with petroleum jelly.
- d. Position the piston and push it to the bottom of the drum using even thumb pressure.

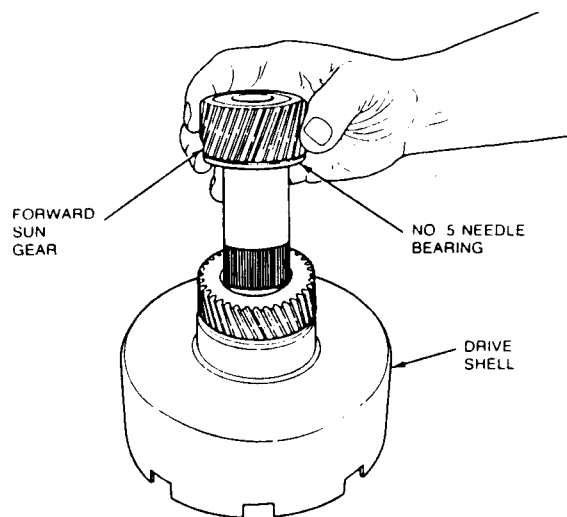


# Technical Service Information

## Sun Gear and Drive Shell

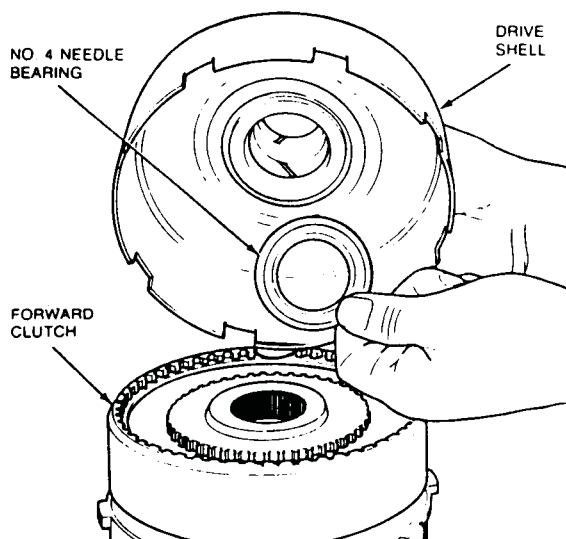


2. Remove the forward sun gear and No. 5 needle bearing from the drive shell.

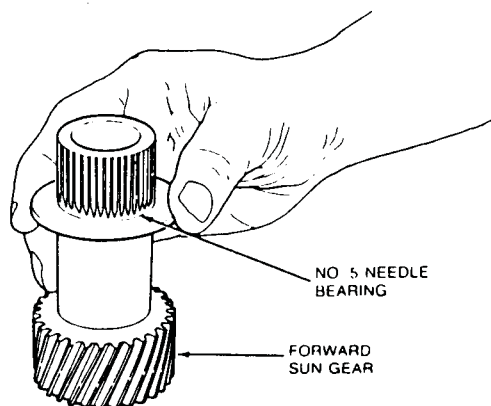


## Disassembly

1. Remove the No. 4 needle bearing from the drive shell.



3. Remove the No. 5 needle bearing from the forward sun gear.

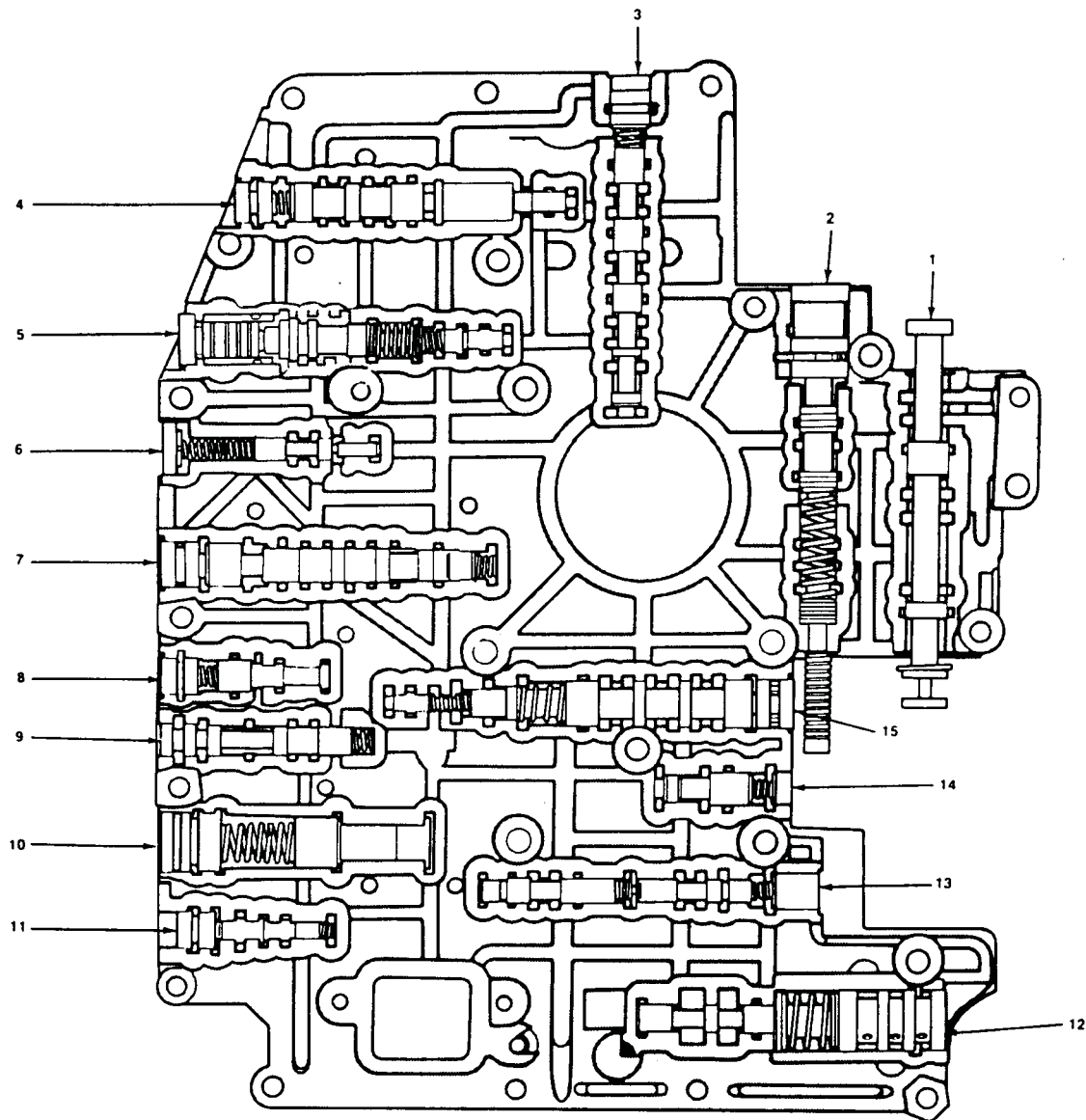


## Assembly

The sun gear and drive shell is assembled as part of the transmission assembly procedure.



# Technical Service Information



**LEGEND:**

1. MANUAL VALVE
2. THROTTLE SYSTEM VALVES
3. 2-3 BACKOUT VALVE
4. ORIFICE CONTROL VALVE/2-3 CAPACITY MODULATOR VALVE (FUNCTIONS ARE SEPARATED BY A SPRING RETAINING PLATE)
5. 3-4 SHIFT AND 3-4 MODULATOR VALVES
6. TV LIMIT VALVE
7. 1-2 SHIFT VALVE
8. OD SERVO REGULATOR VALVE
9. 3-4 SHUTTLE VALVE
10. 1-2 ACCUMULATOR VALVE
11. 1-2 CAPACITY MODULATOR VALVE
12. MAIN REGULATOR AND PRESSURE BOOST VALVES
13. 2-1 SCHEDULING VALVE/LOW SERVO MODULATOR VALVE (FUNCTIONS ARE SEPARATED BY A SPRING RETAINING PLATE)
14. 3-4 BACKOUT VALVE
15. 2-3 SHIFT, 3-2 CONTROL AND 2-3 TV MODULATOR VALVES