



**FORDAOD**

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## **INTRODUCTION FORD AOD**

The Ford AOD transmission was the first domestic produced Automatic Overdrive Transmission. This book contains the general description of the transmission, adjustment procedures, diagnosis, removal and installation in the vehicle and dis-assembly and assembly of the unit.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee their accuracy.

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*WE WISH TO THANK  
FORD MOTOR COMPANY  
FOR THE INFORMATION AND  
ILLUSTRATIONS THAT MADE  
THIS BOOKLET POSSIBLE*

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# 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.

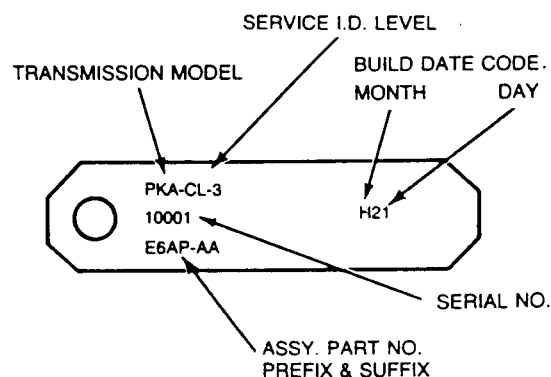
**D** (OVERDRIVE LOCKOUT)—In this position the transmission operates as in **Ⓢ** (OVERDRIVE) except there will be no shift into the overdrive gear. This position may be used when driving up or down mountainous roads to provide better performance and greater engine braking than the overdrive position.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

## Shift Trouble Diagnosis

### TV Rod Linkage System

#### 3.8L and 5.8L Engines.

- A. **Symptoms:** Excessively early and/or soft upshifts with or without slip-bump feel. Slip-bump feel on light throttle shift into and out of ④ (3-4 and/or 4-3 shifts). No forced downshift (kickdown) function at appropriate speeds.

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

**Remedy:** Adjust linkage using procedure in Linkage Adjustment at Carburetor. Since linkage is short, initial gap should exist between throttle lever and linkage lever adjusting screw or a gap should develop after backing out screw no more than one turn. If this is not the case, short linkage diagnosis is incorrect.

If the adjusting screw has insufficient travel to be turned in at least one turn after closing the gap between the screw and throttle lever, it will be necessary to adjust as described in Linkage Adjustment at Transmission.

If the adjusting screw was initially backed out all the way and the linkage lever is in contact with the throttle lever, turn in screw at least two turns but no more than four turns. If problem is not corrected, readjust linkage as described in Linkage Adjustment at Transmission.

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

**Cause:** TV Control Linkage is set too long.

**Remedy:** Follow linkage adjustment procedure using Linkage Adjustment at Carburetor.

Since linkage is long, it should be necessary to backout linkage lever adjustment screw at least five turns before a gap develops between screw and throttle lever. If this is not the case, long linkage diagnosis is incorrect.

If the adjusting screw has insufficient travel to develop a gap between screw and throttle lever as described above, return screw to original position and then backout screw at least two turns but no more than four turns. If screw has insufficient travel to be backed out a minimum of two turns or if the problem is not corrected, readjust linkage as described in Linkage Adjustment at Transmission.

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

**Cause:** Interference prevents return of TV control rod.

**Remedy:** Correct interference area.

**Cause:** Excess friction due to binding of grommets prevents return of TV control linkage.

**Remedy:** Check for bent or twisted rod or levers causing misalignment of grommets. Service or replace defective components. Replace grommets if damaged. Reset TV control linkage using procedure in this Section.

**Cause:** TV control rod disconnected. (Transmission is at maximum TV pressure).

**Remedy:** Reconnect TV control rod. Replace grommet(s) if rod disconnect was due to damaged grommet(s).

**Cause:** Clamping bolt on trunnion at lower end of TV control rod is loose.

**Remedy:** Reset TV control linkage using procedure in this Section.

**Cause:** Linkage lever return spring broken or disconnected. (Transmission is at maximum TV pressure).

**Remedy:** Reconnect or replace spring.

- D. **Symptoms:** Harsh coasting downshifts, harsh 3-4 upshifts when backing off throttle, and possible harsh idle engagement.

**Cause:** TV lever spring at carburetor not returning TV lever completely, or TV linkage grommets binding.

**Remedy:** Replace TV lever spring at carburetor. Check for binding grommets. Clean and lubricate with dry lubricant. Replace, if necessary.

### TV Control Cable System

#### 5.0L and 5.0L HO Engines

- A. **Symptoms:** Excessively early and/or soft upshifts with or without slip-bump feel. Slip-bump feel on light throttle shift into and out of 4th gear (3-4 and/or 4-3 shifts). No forced downshift (kickdown) function at appropriate speeds.

**Cause:** TV control cable set too long.

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

**CAUTION:** Do not drive vehicle if cable is broken or disconnected at throttle body lever.

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

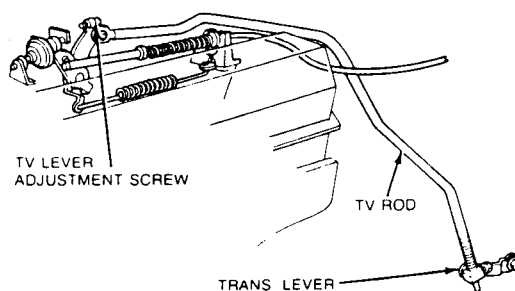
### Throttle Valve (TV) Control Linkage System

#### 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





The linkage lever follows the motion of the carburetor throttle lever and has an adjustment screw for limited linkage adjustment capability. The TV control rod transmits motion between the linkage lever on the carburetor and the TV control lever on the transmission and is adjusted to proper length during initial assembly. The external TV control lever actuates the internal TV control mechanism which regulates the TV control pressure. The external TV control lever motion is controlled by stops internal to the transmission at idle and wide open throttle (WOT).

The TV control linkage is set to its proper length during initial assembly using the sliding trunnion block at the transmission end of the TV control rod assembly. Under normal circumstances, it should not be necessary to alter this adjustment. Any required adjustment of the TV control linkage can normally be accomplished using the adjustment screw on the linkage lever at the carburetor. Major linkage adjustment (sliding trunnion on rod) may only be required after maintenance involving the removal and/or replacement of the carburetor, TV control rod assembly, or the transmission. Minor linkage adjustment (adjustment screw on linkage lever) may be required after installing a new main control assembly, or after idle speed adjustments greater than 50 rpm, and to correct complaints of poor transmission shift quality as outlined in following parts.

## Minimum Idle Stop

When the linkage is correctly adjusted, the TV control lever on the transmission will be at its internal idle stop position (lever up as far as it will travel) when the carburetor throttle lever is at its minimum idle stop. There will be a light contact force between the throttle lever and end of the linkage lever adjustment screw. Due to flexibility in the linkage system, the linkage lever adjustment screw would have to be backed out approximately three turns before a gap between the screw and throttle lever could be detected.

At wide open throttle (WOT), the TV Control Lever on the transmission **may** or **may not** be at its wide open stop. The wide open throttle position **must not** be used as the reference point in adjusting linkage.

## Linkage Adjustment—General Instructions

Before any engine TV linkage adjustment can be done, the throttle lever at the carburetor (or fuel charging assembly on EFI vehicles) must be positioned at its minimum idle stop.

## Without DC Motor Idle Speed Control (ISC)

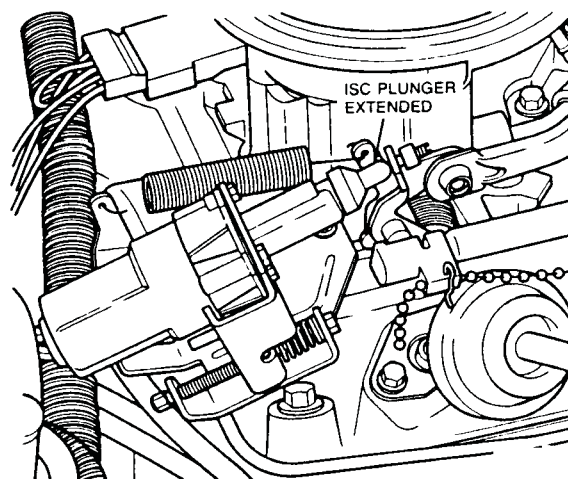
### 5.8L Engine

1. Check/adjust the engine curb idle speed to specification. Refer to the Engine/Emissions Diagnosis\* manual for procedures to adjust throttle solenoid applications. Make sure the curb idle speed is set to specification with and without the throttle solenoid positioner (anti-dieseling solenoid energized, if so equipped).
2. Shut engine off. Remove air cleaner.
3. De-cam the fast idle cam on the carburetor so that the throttle lever is against the idle stop or throttle solenoid positioner stop.

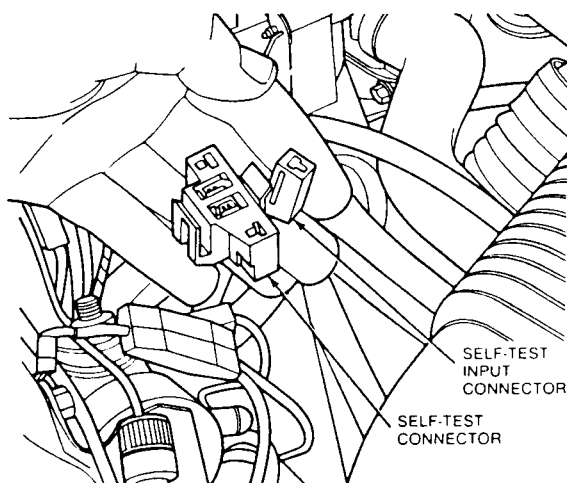
## With DC Motor Idle Speed Control (ISC)

### 3.8L Engine

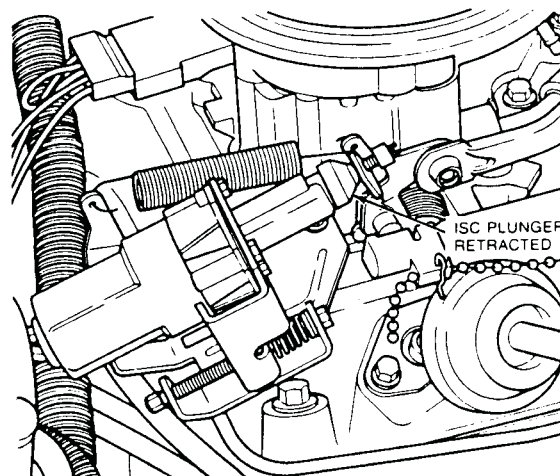
NOTE: When engine is shut off, the ISC plunger automatically extends and moves the throttle lever to fast idle in preparation for the next time the engine is started. The TV linkage cannot be correctly adjusted in this position. The ISC plunger will retract only if the procedure is followed in the exact sequence.



1. Locate the Self Test Connector and Self Test Input Connector in the engine compartment. Typically in the area of the RH (passenger side) fender apron. These two connectors are located next to each other.

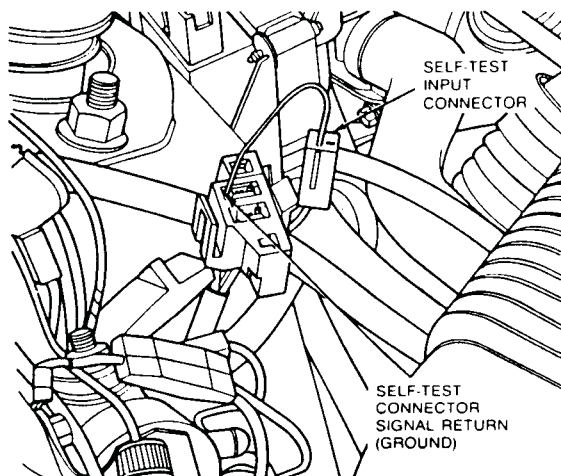


3. Turn the ignition key to the RUN position. Do not start engine. The ISC plunger will retract. Wait until the plunger is fully retracted, about 10 seconds.



4. Shut off key and remove jumper wire and air cleaner.

2. Connect a jumper wire between the STI Connector and the Signal Return Ground on the Self Test Connector.



## Linkage Adjustment at Carburetor

The TV control linkage may be adjusted at the carburetor using the following procedure:

1. Set carburetor at minimum idle stop as described in Linkage Adjustment General Instructions. Place shift lever in NEUTRAL and set parking brake.

**IMPORTANT:** The transmission selector lever must be in NEUTRAL.

2. Backout (CCW) linkage lever adjusting screw all the way (screw end is flush with lever face).
3. Turn in (CW) adjusting screw until a thin shim of .127mm (0.005 inch) maximum, or piece of writing paper fits snug between end of screw and throttle lever. **To eliminate effect of friction, push linkage lever forward (tending to close gap) and release before checking clearance between end of screw and throttle lever.**

**Do not apply any load on levers with tools or hands while checking gap.**



## Technical Service Information

4. Turn in (CW) adjusting screw an additional three turns. (Three turns are preferred. One turn minimum is permissible if screw travel is limited).
5. If it is not possible to turn in adjusting screw at least one additional turn or if there was insufficient screw adjusting capacity to obtain an initial gap in Step 2, refer to Linkage Adjustment at Transmission.

### Idle Speed Adjustment

Whenever it is required to adjust idle speed by more than 50 rpm, the adjustment screw on the linkage lever at the carburetor should also be readjusted as shown:

Idle Speed Change	Linkage Adjustment at Carburetor
50 rpm or more decrease	Check TV Lever adjustment at carburetor
Less than 50 rpm	No change Required
50 rpm or more increase	Check TV lever adjustment at carburetor

After making any idle speed adjustments, always verify that the linkage lever and throttle lever are in contact with the throttle lever at its idle stop (or throttle solenoid positioner) and the shift lever is in N (NEUTRAL). If this is not the case refer to paragraphs A and C in Shift Trouble Diagnosis.

On vehicles equipped with DC motor idle speed control, idle speed adjustment is automatic and TV linkage adjustment will normally not be required. In some cases, a new low mileage engine may cause the transmission to exhibit moderate symptoms of a long TV rod (refer to Shift Trouble Diagnosis). These symptoms will correct themselves as the engine is broken in and the ISC adjusts the idle speed.

### Linkage Adjustment at Transmission

The linkage lever adjustment screw has limited adjustment capability. If it is not possible to adjust the TV linkage using this screw, the length of the TV control rod assembly must be readjusted using the following procedure. This procedure must also be followed whenever a new TV control rod assembly is installed.

This procedure requires placing the vehicle on a hoist to give access to the linkage components at the transmission TV control lever.

1. Set carburetor at its minimum idle stop as described in Linkage Adjustment General Instructions. Place shift lever in NEUTRAL and set parking brake. Engine off.

NOTE: Transmission selector must be in NEUTRAL.

2. Set the linkage lever adjustment screw at approximately mid-range.
3. If a new TV control rod assembly is being installed, connect the rod to the linkage lever at the carburetor.

**CAUTION: The following steps involve working in proximity to the exhaust system. Allow the exhaust system to cool before proceeding.**

4. Raise the vehicle on the hoist. Refer to the Pre-Delivery manual, Section 50-04.
5. Loosen the bolt on the sliding trunnion block on the TV control rod assembly. Remove any corrosion from the control rod and free-up the trunnion block so that it slides freely on the control rod.
6. Push up on the lower end of the control rod to ensure that the linkage lever at carburetor is firmly against the throttle lever. Release force on rod. Rod must stay up.
7. Push the TV control lever on the transmission up against its internal stop with a firm force, approximately 22 N (5 lb), and tighten the bolt on the trunnion block. Do not relax force on lever until bolt is tightened.
8. Lower the vehicle and verify that the throttle lever is still against the minimum idle stop or throttle solenoid positioner stop. If not, repeat Steps 2 through 8.

### Linkage Adjustment Using TV Control Pressure

NOTE: This procedure requires the use of TV Pressure Gauge with Hose (0-60 psi) T86L-70002-A or equivalent. The results of the adjustment procedure depends on the accuracy of the pressure gauge.

A pressure gauge should be checked periodically (approximately once a year) or when the following occurs:

1. The needle will not return to 0 kPa (0 psi) under no pressure.
2. The needle goes past 0 kPa (0 psi) (negative side) under no pressure.
3. Bumping or dropping a pressure gauge.



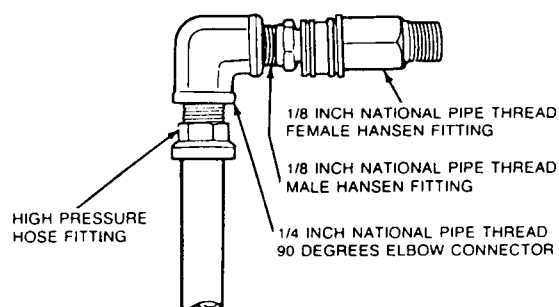
The following procedure may be used to check and/or adjust the throttle valve (TV) control linkage using the TV control pressure.

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.

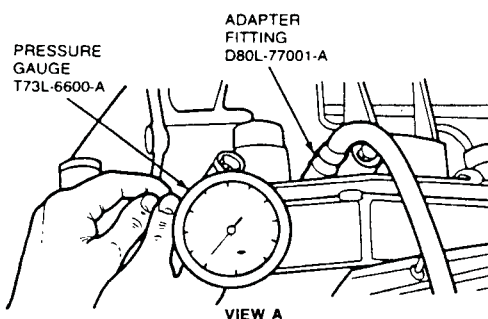
NOTE: If the service tool is not available, in order to avoid the exhaust system, obtain the following locally available material and assemble as shown:

- 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.

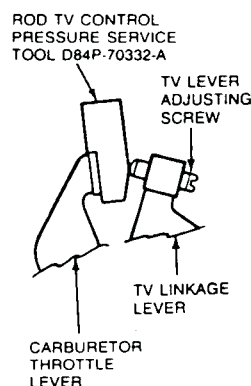
The pressure gauge should have 200mm (8 feet) of flexible hose to make the gauge accessible while operating the engine.



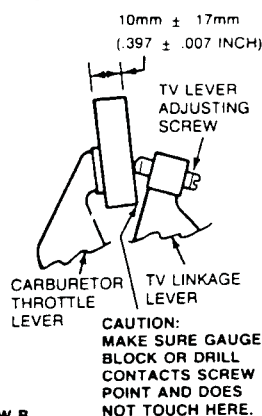
3. Obtain Rod TV Control Pressure Gauge Block D84P-70332-A, or fabricate a block 10mm  $\pm$  0.17mm (0.397  $\pm$  0.007 inch) thick. The following drill bit shanks may also be used in order of preference: Letter X (.397 inch), 10mm (.3937 inch) or 25/64 (.3906 inch).



## SERVICE TOOL USAGE

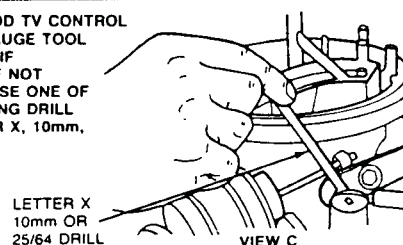


## SHOP MADE GAUGE BLOCK OR DRILL SHANK



CAUTION: MAKE SURE GAUGE BLOCK OR DRILL CONTACTS SCREW POINT AND DOES NOT TOUCH HERE.

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.

5. Set parking brake, place shift selector in N (NEUTRAL), remove air cleaner, shut off air conditioner. If equipped with a vacuum operated throttle modulator, disconnect and plug the vacuum line to this unit. If equipped with a throttle solenoid positioner or an idle speed control, do not disconnect either of these components.

NOTE: The following pressure check must be made with the engine idling at normal curb idle in NEUTRAL, parking brake set, with no accessory load on engine. Do not make pressure check in PARK.

6. With engine idling in NEUTRAL insert gauge block (or drill shank) between the carburetor throttle lever and adjust screw on the transmission linkage lever. The TV pressure should be  $241 \pm 34$  kPa ( $35 \pm 5$  psi). For best transmis-

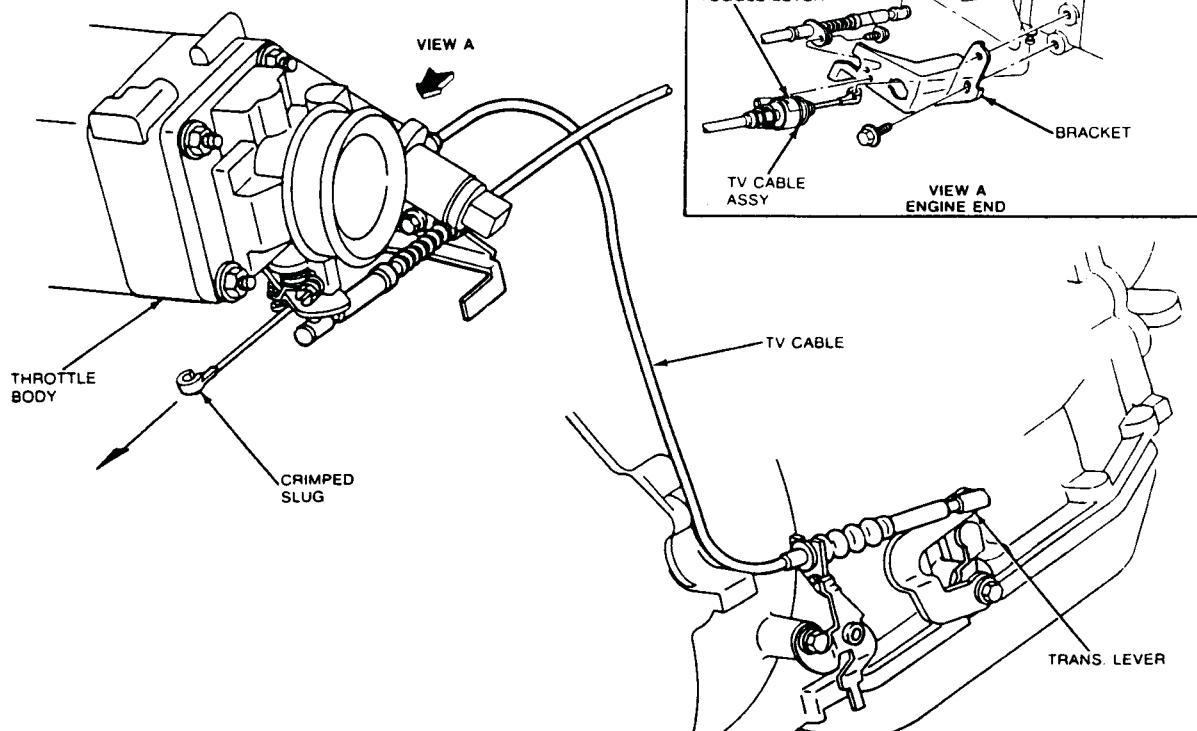
sion function, use the adjusting screw to set the pressure as close as possible to 241 kPa (35 psi). Turning the screw in will raise the pressure 10.3 kPa (1.5 psi) per turn. Backing out the screw will lower the pressure. If equipped with idle speed control, some "hunting" may occur and an average pressure reading will have to be determined. If the adjusting screw does not have enough adjustment range to bring TV pressure within specification, first adjust rod at the transmission.

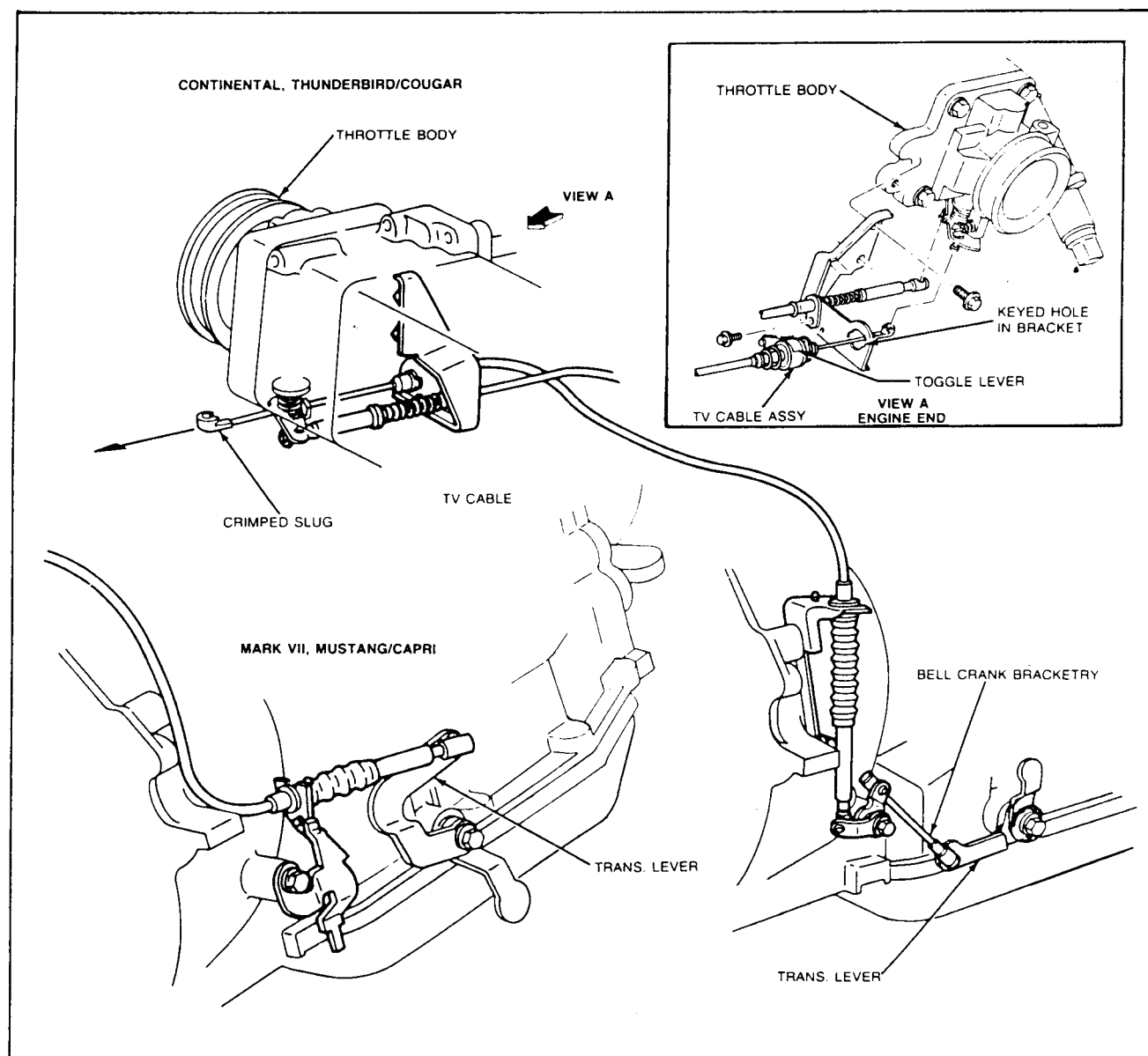
7. Remove gauge block, allowing TV lever to return to idle. With engine still idling in NEUTRAL, TV pressure must be less than 34 kPa (5 psi). If not, back out adjusting screw until TV pressure is less than 34 kPa (5 psi). Reinstall gauge block and check that TV pressure is still  $241 \pm 34$  kPa ( $35 \pm 5$  psi).

## Throttle Valve (TV) Control Cable System

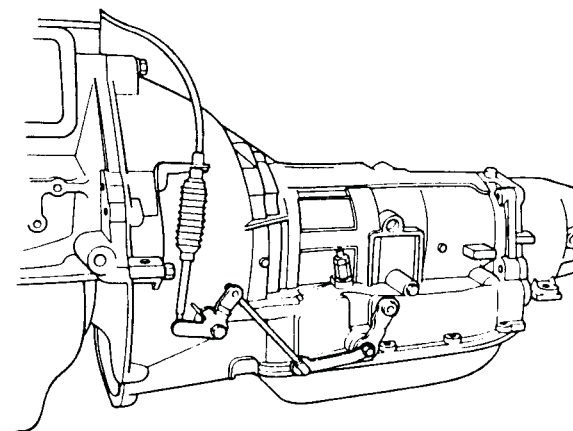
### 5.0L and 5.0L HO Engines

The throttle valve (TV) control cable system consists of a cable attaching stud on the throttle body throttle lever, the TV control cable assembly, the external TV control lever on the transmission, and the cable mounting brackets at the throttle body and transmission.





On Continental and Thunderbird/Cougar vehicles, there is also a bellcrank assembly mounted on the transmission bell housing in the area of the TV lever and bracketry holding the cable in the upper bell housing area.



As the throttle is moved from idle to wide open throttle (WOT), the TV control cable pulls the transmission TV control lever from idle to WOT. Return of the cable and transmission lever toward idle is accomplished by the return spring on the transmission end of the cable assembly. This spring and the end of the cable assembly is protected by a flexible rubber boot. The transmission external TV control lever actuates the internal TV control mechanism which regulates the TV control pressure. The travel of this lever is controlled by stops internal to the transmission.

The TV control cable is set and locked to its proper length during initial assembly by pushing down on the locking lever at the throttle body end of the cable assembly. When the lever is unlocked, the cable is released for adjustment. The take-up spring at this end of the cable automatically tensions the cable when released. With the slack taken up and the locking lever pushed, the take-up spring plays no part in the operation of the system.

Under normal circumstances, it should not be necessary to alter or readjust the initial setting of the TV control cable. Situations requiring readjustment of the TV control cable include maintenance involving the removal and/or replacement of the throttle body, transmission, TV cable assembly or installing a new main control assembly. Readjustment of the TV control cable would also be necessary to correct complaints of poor transmission shift quality that would have been caused by a misadjustment of the TV control cable.

When the TV control cable is properly set, the transmission TV control lever will be at its internal idle stop (lever to rear as far as it will travel) when the throttle lever is at its idle stop.

## Idle Speed Affect on TV Control Cable

The 5.0L and 5.0L HO (302 CID) SEFI (Sequential Electronic Fuel Injection) engine uses an Air Bypass (ISC) that does not affect throttle position. Therefore, idle automatic setting does not affect TV cable adjustment.

## Linkage Adjustment Using Throttle Valve TV Control Pressure (TV Cable System)

**NOTE:** This procedure requires the use of TV Pressure Gauge with Hose (0-60 psi) T86L-70002-A or equivalent. The results of the adjustment procedure depends on the accuracy of the pressure gauge.

A pressure gauge should be checked periodically (approximately once a year) or when the following occurs:

1. The needle will not return to 0 kPa (0 psi) under no pressure.
2. The needle goes past 0 kPa (0 psi) (negative side) under no pressure.
3. Bumping or dropping a pressure gauge.

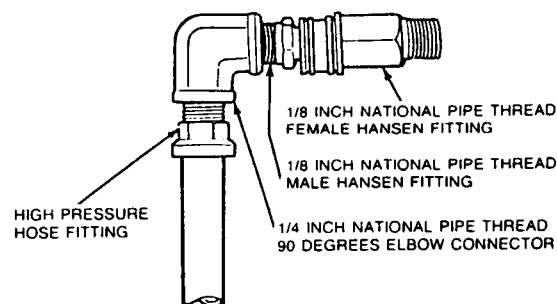
## Adjustment and/or Check

1. Attach TV Pressure Gauge with Hose (0-60 psi) T86L-70002-A or equivalent, to the TV port on the transmission.

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

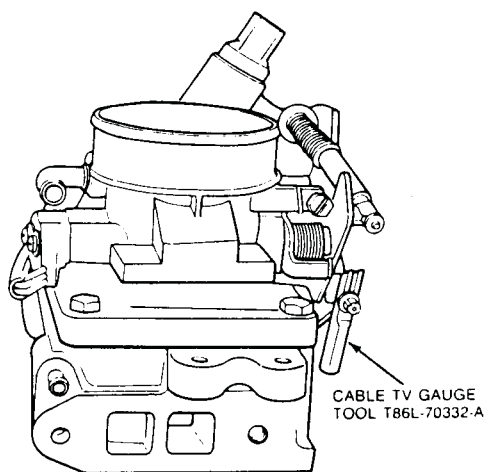
- One 1/8-inch NPT Female Hansen Fitting.
- One 1/8-NPT Male Hansen Fitting.
- One 1/4-inch NPT 90 degree elbow connector.
- One high-pressure hose fitting.

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



2. On Lincoln Town Car or Ford Crown Victoria/Mercury Grand Marquis only, remove the air cleaner cover and inlet tube from the throttle body inlet for easier access to throttle lever.
3. Insert tapered end of the tool between the crimped slug on the end of cable and plastic cable fitting that attaches to the throttle lever. Push in Cable TV Gauge Tool T86L-70332-A, or equivalent forcing the crimped slug away from the plastic fitting. Make sure gauge block is pushed in as far as it will go.

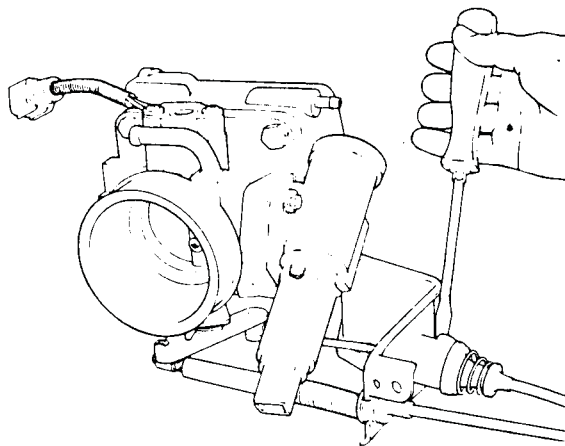
**WARNING: THIS PROCEDURE REQUIRES WORKING IN CLOSE PROXIMITY TO THE EGR SPACER ASSEMBLY WHICH MAY BE HOT.**



4. Operate engine until normal operating temperature is reached. 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.
5. Set parking brake and place shift selector in NEUTRAL. With gauge tool in place and engine idling in NEUTRAL, the TV pressure should be  $241 \pm 34$  kPa ( $35 \pm 5$  psi). For best transmission function, set the TV pressure as close as possible to 241 kPa (35 psi) using the following procedure.

**NOTE:** Do not check or set TV pressure in PARK.

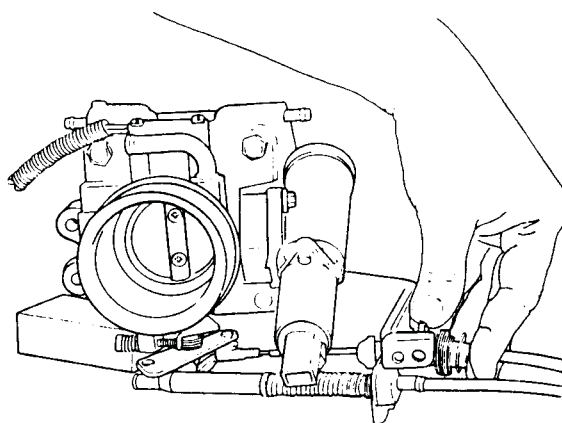
6. Using a screwdriver or pointed tool, pry up white toggle lever on cable adjuster located immediately behind the throttle body cable mounting bracket.



The adjuster preload spring should cause the adjusting slider to move away from the throttle body and TV pressure should increase.

**NOTE:** Toggle lever must be completely up to allow slider to move freely.

7. Push on the slider from behind bracket until TV pressure is 241 kPa (35 psi). While still holding slider, push down on toggle lever as far as it will go, locking slider in position.





**NOTE:** Toggle lever must be completely down (lying flat in cable adjuster assembly) to lock properly.

8. Remove gauge tool, allowing cable to return to its normal idle position. With engine still idling in NEUTRAL, TV pressure must be at or near 0 (less than 241 kPa (5 psi)). If not, reinstall gauge block, taking care to avoid the hot EGR spacer. Repeat Steps 6 and 7 but set TV pressure to a pressure less than 241 kPa (35 psi) but not less than 207 kPa (30 psi). Remove gauge block and recheck TV pressure to determine if it is at or near 0.

## REMOVAL AND INSTALLATION

**NOTE:** If the transmission is being removed for a 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.

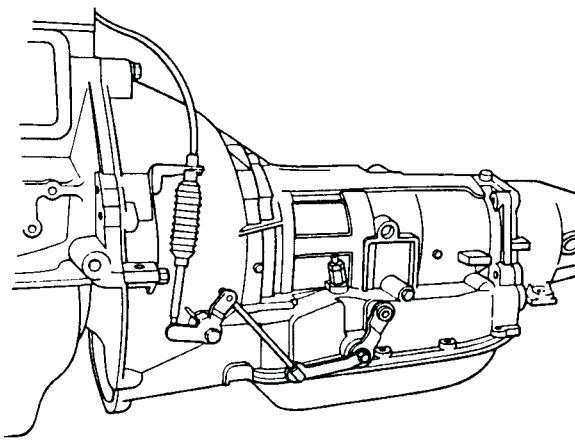
Cleaning and flushing procedures for transmission components, including the direct clutch check ball, can be found in Section 17-01. Cleaning and Inspection.

### Transmission

#### Removal

1. Raise the vehicle on a hoist or stands. Refer to Pre-Delivery manual Section 50-04.
2. Place the drain pan under the transmission fluid pan. Starting at the rear of the pan and working toward the front, loosen the attaching bolts and allow the fluid to drain. Finally remove all of the pan attaching bolts except two at the front, to allow the fluid to further drain. With fluid drained, install two bolts on the rear side of the pan to temporarily hold it in place.
3. Remove the converter drain plug access cover from the lower end of the converter housing.

4. Remove the converter-to-flywheel attaching nuts. Place a wrench on the crankshaft pulley attaching bolt to turn the converter to gain access to the nuts.
5. Place a drain pan under the converter to catch the fluid. With the wrench on the crankshaft pulley attaching bolt, turn the converter to gain access to the converter drain plug and remove the plug. After the fluid has been drained, reinstall the plug.
6. Disconnect the driveshaft from the rear axle and slide shaft rearward from the transmission. To maintain driveshaft balance, mark the rear driveshaft yoke and axle companion flange so the driveshaft can be installed in its original position. Refer to Section 15-60 or 15-66. Install a seal installation tool in the extension housing to prevent fluid leakage.
7. Disconnect the cable from the terminal on the starter motor. Remove the three attaching bolts and remove the starter motor. Disconnect the neutral start switch wires at the plug connector.
8. Remove the rear mount-to-crossmember attaching bolts and the two crossmember-to-frame attaching bolts.
9. Remove the two engine rear support-to-extension housing attaching bolts.
10. Disconnect TV linkage rod or cable from transmission TV lever ball stud. On Continental and Thunderbird/Cougar vehicles, disconnect cable from bellcrank lever stud and remove self-tapping bolt from bell housing bracketry.



11. Carefully disconnect manual rod from transmission manual lever at transmission using Shift Linkage Grommet Removal Tool T84P-7341-A or equivalent. For tool usage instructions, refer to Section 17-02.



12. Remove the two bolts securing the bellcrank bracket to the converter housing.

13. Raise the transmission with a transmission jack to provide clearance to remove the crossmember. Remove the rear mount from the crossmember and remove the crossmember from the side supports.

NOTE: Disconnect and remove any interfering exhaust system hardware.

14. Lower the transmission to gain access to the oil cooler lines.

15. Disconnect cooler oil line from the fittings on the transmission using Cooler Line Disconnect Tool T82L-9500-AH or equivalent.

16. Disconnect the speedometer cable from the extension housing.

17. Remove the bolt that secures the transmission fluid filler tube to the cylinder block. Lift the filler tube and the dipstick from the transmission.

18. Secure the transmission to the jack with the chain.

19. Remove the converter housing-to-cylinder block attaching bolts.

20. Carefully move the transmission and converter assembly away from the engine and, at the same time, lower the jack to clear the underside of the vehicle.

21. Remove the converter and mount the transmission in a holding fixture.

### Installation

1. Tighten converter drain plug to 11-38 N·m (8-28 lb-ft).

2. Position the converter on the transmission, making sure the converter drive flats are fully engaged in the pump gear by rotating the converter.

**IMPORTANT: Lubricate pilot with chassis grease.**

3. With the converter properly installed, place the transmission on the jack. Secure the transmission to the jack with a chain.

4. Rotate the converter until the studs and drain plug are in alignment with the holes in the flywheel.

5. Align the orange balancing marks on converter stud and flywheel bolt hole if balancing marks are present.

6. Move the converter and transmission assembly forward into position, using care not to damage the flywheel and the converter pilot. The converter face must rest squarely against the flywheel. This indicates that the converter pilot is not binding in the engine crankshaft.

NOTE: Before installing the torque converter to the flywheel attaching nut, a check should be made to ensure that the converter is properly seated. The converter should move freely with respect to the flywheel. Grasp the stud. Movement back and forth should result in a metallic clank noise if the converter is properly seated. If the converter will not move, the transmission must be removed and the converter repositioned so that the impeller hub is properly engaged in the pump gear.

7. Install and tighten the transmission housing-to-engine attaching bolts to 55-68 N·m (40-50 lb-ft).

8. Remove the safety chain from around the transmission.

9. Install a new O-ring on the lower end of the transmission filler tube. Insert the tube in the transmission case and secure the tube to the engine with the attaching bolt.

10. Connect the speedometer cable to the extension housing.

11. Connect the oil cooler lines to the right side of transmission case. Tighten lines to 24-31 N·m (18-23 lb-ft).

12. Position the crossmember on the side supports. Position the rear mount on the crossmember and install the attaching bolt and nut.

13. Secure the engine rear support to the extension housing and tighten the bolts to specification. Refer to Group 21 for specifications.

14. If removed, install any exhaust system hardware.

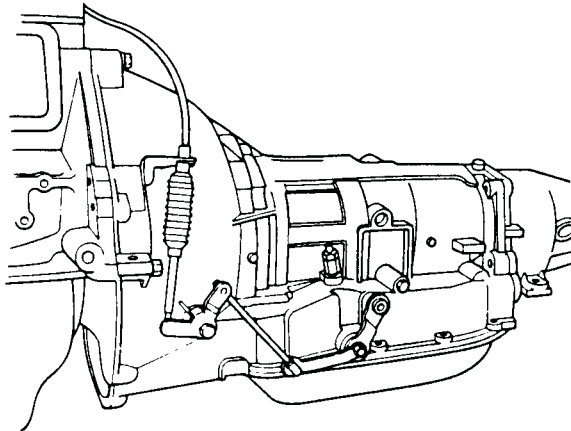
15. Lower the transmission and remove the jack.

16. Secure the crossmember to the side supports with the attaching bolts and tighten them to specifications.

17. Position the bellcrank to the converter housing and install the two attaching bolts. Tighten to specification.

18. Connect the TV linkage rod to the transmission TV lever. Connect the manual linkage rod to the manual lever at the transmission.

19. Connect TV linkage rod or cable to transmission TV lever ball stud. On Continental and Thunderbird/Cougar vehicles, attach cable to bell housing bracketry by installing self-tapping bolt. Also, connect cable to bell crank lever stud.



20. Connect manual linkage rod to manual lever at transmission using the Shift Linkage Grommet Installation Tool T84P-7341-B or equivalent. For tool usage instructions, refer to Section 17-02.
21. Secure the converter-to-flywheel attaching nuts and tighten them to 27-46 N·m (20-34 lb-ft).
22. Install the converter housing access cover and secure it with the attaching bolts. Tighten to 16-22 N·m (12-16 lb-ft).
23. Secure the starter motor in place with the attaching bolts. Connect the cable to the terminal on the starter. Connect the neutral start switch harness at the transmission.
24. Connect the driveshaft to the rear axle. Install the driveshaft so the index marks, made during removal, are correctly aligned.  
  
NOTE: Lubricate the yoke splines with Multi-Purpose Long Life Lubricant C1AZ-19590-B or equivalent. Refer to Sections 15-60 and 15-66.
25. Lower the vehicle.
26. Lower 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 Transmission Fluid Level Check procedure.

27. Adjust the manual shift linkage as required. Refer to Section 17-02.
28. Adjust TV linkage as outlined in this Section.

## Main Control Valve Body

### Removal

1. Raise the vehicle on a hoist so the transmission fluid pan is accessible. Refer to Pre-Delivery manual, Section 50-04.  
  
NOTE: Some vehicles may require the 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 and 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 the filter).
5. Remove the detent spring attaching bolt and spring.
6. Remove the 24 valve body-to-case attaching bolts. Remove the valve body. Discard valve body-to-case gasket.

### Installation

1. Clean and inspect the valve body. Refer to Section 17-01.
2. 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 levers are engaged.
3. Install and tighten the 24 valve body-to-case attaching bolts to 9-11 N·m (80-100 lb-in).
4. Install and tighten the detent spring and attaching bolts to 9-11 N·m (80-100 lb-in).



## Technical Service Information

5. Remove the guide pins and install and tighten the remaining two attaching bolts.
6. Load TV lever torsion spring against the separator plate.
7. 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).
8. Clean the transmission oil pan and gasket surfaces thoroughly.
9. Using a new oil pan gasket, secure the pan to the transmission case. It may be necessary to use a 3/8 inch or 1/4 inch drive ratchet with a 10mm socket to install the oil pan bolts. Tighten the attaching bolts to 16-22 N·m (12-16 lb-ft).
10. 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.
11. Adjust the linkage rod or cable system as outlined under the linkage adjustment.

### Overdrive Servo Assembly

#### Removal

1. Raise the vehicle on a hoist so the transmission oil pan is accessible. Refer to Pre-Delivery manual, Section 50-04.  
  
NOTE: Some vehicles may require the 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 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 fluid 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 the filter.)
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 overdrive servo piston cover with a hammer handle and remove the retaining snap ring.
8. Using Servo Piston Remover T80L-77030-B or equivalent, apply air pressure to the servo piston release passage in order to remove the overdrive servo piston cover and spring. Remove the piston from the cover.
9. Remove the rubber seals from the piston and the cover.

#### Installation

1. Clean and inspect the servo piston and cover for nicks and/or burrs. Clean and inspect the servo piston pocket in the case for nicks and burrs also.
2. Install new servo piston and cover seals on the piston and cover, respectively.
3. Lubricate the piston seals with either clean transmission fluid or a petroleum jelly.
4. Install the servo piston into the cover, lubricate the cover seals and the overdrive servo pocket in the case.
5. Assemble the return spring to the servo piston.
6. Install the overdrive piston cover and spring into the overdrive servo pocket in the case. Make sure the servo rod contacts the overdrive band apply pocket. Failure to do so will result in a no 3-4 shift condition.
7. Using the handle of a hammer, depress the overdrive servo sufficiently to gain clear access to the retaining snap ring groove in the case. Install the snap ring.
8. Inspect the outer edge of the overdrive servo pocket for possible nicks and burrs which might have been raised during the removal or installation of the retaining snap ring.
9. Remove nicks and burrs with a fine honing stone and clean the effected areas thoroughly. Failure to do so may cause improper seating of the valve body separator plate to the hydraulic passages in the case, and subsequent cross leakage.



## 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.



6. Inspect the outer edge of reverse servo pocket for nicks or burrs which might have been raised during the removal or installation of the retaining snap ring.
7. Remove nicks or burrs with a "fine" honing stone and clean the effected surfaces thoroughly. Failure to do so may cause improper seating of the valve body separator plate to the hydraulic passages in the case and subsequent cross leakage.
8. Clean and inspect the valve body. Refer to Section 17-01.
9. Position a new valve body gasket to the separator plate.
10. Install Valve Body Guide Pins T80L-77100-A or equivalent to the case. Position a new separator plate gasket to the valve body and case, making sure that the inner manual lever and inner TV lever are engaged.
11. Install and tighten 24 attaching bolts to 9-11 N·m (80-100 lb-in).
12. Install and tighten the detent spring and attaching bolt to 9-11 N·m (80-100 lb-in).
13. Position the TV lever torsion spring against the separator plate.
14. Remove the Valve Body Guide Pins T80L-77100-A or equivalent and install and tighten the remaining two valve body attaching bolts.
15. Using three filter attaching bolts install the filter and gasket to the valve body and tighten the attaching bolts to 9-11 N·m (80-100 lb-in).
16. Clean the transmission oil pan and gasket surfaces thoroughly.
17. 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). It may be necessary to use a 3/8-inch or 1/4-inch drive ratchet with a 10mm universal socket to install the oil pan bolts.
18. Install any exhaust system components that might have been removed.
19. 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. Refer to Section 17-01 for the Transmission Fluid Level Check procedure.
20. Adjust the TV linkage rod or cable system as outlined under cable adjustment.

### 3-4 Accumulator Piston

#### Removal

1. Raise the vehicle on a hoist so the transmission oil pan is accessible.  
  
NOTE: Some vehicles may require the 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 and 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 the filter-to-valve body attaching bolts and remove the filter, grommet and gasket. Discard gasket. If the fluid was contaminated, discard the filter.
5. Remove the detent spring and attaching bolts.
6. Remove the 24 valve body-to-case attaching bolts. Remove the valve body. Discard valve body-to-case gasket.
7. To remove the 3-4 accumulator piston, depress the cover and remove the retaining snap ring.
8. Slowly release the tension on the 3-4 accumulator cover, allowing the removal of the piston cover, return spring and piston. (Some models may not use a spring).
9. If necessary, apply air pressure to the hydraulic apply passage using Servo Piston Remover T80L-77030-B or equivalent.
10. Remove the seals from the 3-4 accumulator cover and piston. Inspect seals for possible nicks, cuts or irregular wear patterns. If damaged, discard the seals.

#### Installation

1. Thoroughly clean and inspect the 3-4 accumulator piston and cover.
2. Install new seals on the 3-4 accumulator piston and cover.
3. Thoroughly clean and inspect the accumulator pocket in the case.

4. Lubricate the rubber cover seal and the cover pocket of case with either clean transmission fluid or a petroleum jelly.
5. Reinstall the 3-4 accumulator piston (and return spring) into the case. Install the cover.
6. Depress the cover into piston pocket sufficiently to allow clear access to the snap ring groove in the ID of the pocket.
7. Install the retaining snap ring. **IMPORTANT: Cover must then be reseated snug against retaining ring.** Inspect the outer edge of the 3-4 accumulator piston pocket for nicks or burrs which might have been raised during the removal or installation of the retaining snap ring. Remove nicks or burrs with a fine honing stone and clean the effected surfaces thoroughly. Failure to do so may cause improper seating of the valve body separator plate to the hydraulic passages in the case and subsequent cross leakage.
8. Clean and inspect the valve body if necessary. Refer to Section 17-01.
9. Position a new valve body gasket to the separator plate.
10. 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.
11. Install and tighten 24 valve body-to-case attaching bolts to 9-11 N·m (80-100 lb-in).
12. Install and tighten the detent spring and attaching bolt to 9-11 N·m (80-100 lb-in).
13. Remove the Valve Body Guide Pins T80L-77100-A or equivalent and install the two remaining valve body attaching bolts.
14. Position the TV lever torsion spring against the separator plate.
15. Using three filter attaching bolts install the filter and gasket to the valve body and tighten the attaching bolts to 9-11 N·m (80-100 lb-in).
16. Clean the transmission oil pan and gasket surfaces thoroughly.
17. Using a new oil pan gasket, secure the pan to the transmission case. It may be necessary to use a 3/8-inch drive ratchet with a 10mm universal socket to install the oil pan bolts. Tighten the attaching bolts to 16-22 N·m (12-16 lb-ft).
18. Install any exhaust system components that might have been removed.

19. Lower the vehicle and fill the transmission to the proper 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.
20. Adjust TV linkage rod or cable system as outlined under linkage adjustment.

### 2-3 Accumulator Piston

#### Removal

1. Raise the vehicle on a hoist so the transmission oil pan is accessible. Refer to Pre-Delivery manual, Section 50-04.  
  
NOTE: Some vehicles may require the removal of interfering hardware.
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 the 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 the filter).
5. Remove the detent spring and attaching bolt.
6. Remove the 24 valve body-to-case attaching bolts. Remove the valve body. Discard the valve body-to-case gasket.
7. Depress the 2-3 accumulator piston cover. Remove the retaining snap ring, cover the spring.
8. Remove the 2-3 accumulator piston.
9. Remove the seals from the 2-3 accumulator piston and discard.



## Technical Service Information

### Installation

1. Clean and inspect the 2-3 accumulator piston. Replace piston if damaged.
2. Clean and inspect the 2-3 accumulator pocket in the case for nicks, burrs or porosity.
3. Install new seals on the 2-3 accumulator piston.
4. Install the 2-3 accumulator piston into the case.
5. Install the return spring and cover.
6. Install the retaining snap ring.
7. Inspect the outer edge of 2-3 accumulator piston pocket for nicks or burrs which might have been raised during the removal or installation of the retaining snap ring.
8. Remove nicks or burrs with a fine honing stone and clean the effected surfaces thoroughly. Failure to do so may cause improper seating of the valve body separator plate to the hydraulic passages in the case and subsequent cross leakage.
9. Clean and inspect the valve body. Refer to Section 17-01.
10. Position a new valve body-to-case gasket to the separator plate.
11. 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. Install and tighten 24 valve body-to-case attaching bolts to 9-11 N·m (80-100 lb-in).
12. Install and tighten the detent spring and attaching bolt to 9-11 N·m (80-100 lb-in).
13. Remove the Valve Body Guide Pins T80L-77100-A or equivalent and install and tighten the two remaining valve body attaching bolts.
14. Position the TV lever torsion spring against the separator plate.
15. Using three filter attaching bolts, install the filter and gasket to the valve body and tighten the attaching bolts to 9-11 N·m (80-100 lb-in).
16. Clean the transmission oil pan and gasket surfaces thoroughly.
17. Using a new oil pan gasket, secure the pan to the transmission case. It may be necessary to use a 3/8-inch or 1/4-inch drive ratchet with a 10mm universal socket to install the oil pan bolts. Tighten the attaching bolts to 16-22 N·m (12-16 lb-ft).

18. Install any exhaust system components that might have been removed.
19. Lower the vehicle and fill the transmission to the proper 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.
20. Adjust TV linkage rod or cable system as outlined under linkage adjustment.

### Extension Housing Bushing and Rear Seal

#### Removal

1. Raise the vehicle and disconnect the driveshaft at the transmission. To maintain driveline balance, mark the rear driveshaft yoke and axle companion flange so the driveshaft can be installed in its original position. Refer to Section 15-60 or 15-66.
2. When only the rear seal needs replacing, carefully remove it with Extension Housing Seal Remover T74P-77248-A or equivalent.
3. Remove the bushing. Use the Extension Housing Bushing Remover T77L-7697-A or equivalent carefully so that the output shaft spline is not damaged.

#### Installation

1. When installing a new bushing use Extension Housing Bushing Replacer T80L-77034-A or equivalent.
2. Before installing a new seal, inspect the sealing surface of the universal joint yoke for scores. If scores are found, replace the yoke.
3. Inspect the counterbore of the housing for burrs. Remove burrs with crocus cloth.
4. Install the seal into the housing with Extension Housing Seal Replacer T61L-7657-A or equivalent. The seal should be firmly seated in the bore. Coat the inside diameter of the rubber portion of the seal with Multi Purpose Long-Life Lubricant C1AZ-19590-B or equivalent.
5. Install the driveshaft so that the index marks, made during removal, are correctly aligned. Refer to Section 15-60 or 15-66.

NOTE: Lubricant yoke splines with Multi-Purpose Long Life Lubricant C1AZ-19590-B or equivalent.

**Extension Housing****Removal**

1. Raise the vehicle on a hoist or stands. Refer to Pre-Delivery manual, Section 50-04.

NOTE: Remove any interfering exhaust system components.

2. Disconnect the parking brake cable from the equalizer, if so equipped.
3. Disconnect the driveshaft from the rear axle flange and remove it from the transmission. To maintain driveline balance, mark the rear driveshaft yoke and axle companion flange so the driveshaft can be installed in its original position.
4. Disconnect the speedometer cable from the extension housing.
5. Remove the engine rear support-to-extension housing attaching bolts.
6. Place a jack under the transmission and raise it just enough to remove the weight from the engine rear support.
7. Remove the bolt that secures the engine rear support to the crossmember and remove the support.
8. Place a drain pan under the rear of the transmission case.
9. Lower the transmission and remove the extension housing attaching bolts. Slide the extension housing off the output shaft and allow the fluid to drain.

NOTE: The lower three extension housing bolts have been coated with a sealant. More break torque may be required to remove these bolts.

10. Remove and discard extension housing gasket.

**Installation**

1. Clean the mounting surface on the transmission and on the extension housing. Remove any sealant from the bolts and the case bolt holes. Position a new gasket on the transmission. Coat the lower three bolts with Ford Threadlock and Sealant EOAZ-19544-A or Ford Pipe Sealant D8AZ-19554-A Teflon® Tape or equivalent.
2. Hold the extension housing in place and secure it with the attaching bolts. Tighten to 22-27 N·m (16-20 lb-ft).

3. Raise the transmission high enough to position the engine rear support on the crossmember.
4. Secure the support to the crossmember with the attaching bolt and nut. Tighten the bolt to specification. Refer to Group 21 for specifications.
5. Lower the transmission and remove the jack. Install engine rear support-to-extension housing attaching bolts. Tighten the bolts to specification. Refer to Group 21 for specifications.
6. Secure the speedometer cable to the extension housing with the attaching bolt.
7. If so equipped, connect the parking brake cable to the equalizer.
8. Install the driveshaft in the transmission and connect shaft to rear axle flange. Install driveshaft so that index marks, made during removal, are correctly aligned. Refer to Section 15-60 or 15-66.

NOTE: Lubricate yoke splines with Multi-Purpose Long Life Lubricant C1AZ-19590-B or equivalent.

9. Install any exhaust system components that might have been removed.
10. Lower the vehicle. Fill the transmission to the proper level with the specified fluid. Start the engine and shift the transmission through all ranges, then recheck the fluid level. Refer to Section 17-01 for the Transmission Fluid Level Check procedure.

**Governor****Removal**

1. Remove the extension housing as outlined.  
  
NOTE: If the governor body only is to be removed, skip Steps 2 and 3.
2. Remove the governor-to-output shaft retaining snap ring.
3. Using a soft-faced hammer, tap the governor assembly off the output shaft. Remove the governor driveball.
4. Remove the governor-to-counterweight attaching screws. Lift the governor from the counterweight.

**Installation**

1. Lubricate the governor valve parts with clean transmission fluid. Make certain that the valve moves freely in the valve body bore.
2. Position the governor valve body on the counterweight with the cover facing toward the front of the vehicle. Install the two attaching screws, and tighten to 6-7 N·m (50-60 lb-in).
3. Position the governor drive ball into the pocket of the output shaft.
4. Align the keyway in the counterweight to the governor drive ball. Slide governor assembly onto the output shaft. If necessary, gently tap governor into position with a soft-faced hammer.
5. Reinstall the governor to output shaft retaining snap ring. Clean the mounting surface on the transmission and on the extension housing. Position a new gasket on the transmission.
6. Install the extension housing as outlined.

**Internal and External Shift Linkage****Removal**

1. It may be necessary to remove the fan shroud bolts and move the shroud away from the fan on models that require lowering the transmission for access to the manual lever.
2. Raise vehicle on a hoist so that transmission oil pan is accessible. Refer to Pre-Delivery manual, Section 50-04.
3. Remove any interfering exhaust system components.
4. On vehicles that require additional clearance to remove the manual lever, lower the transmission.
5. Apply penetrating oil to the outer throttle lever attaching nut to prevent breaking the inner throttle lever.
6. Grasp the outer throttle lever and hold firmly. Then, remove the outer throttle lever attaching nut and lockwasher. Swing lever and TV rod or cable assembly out of the way for clearance.
7. Carefully disconnect the manual rod from the transmission manual lever at the transmission using the Shift Linkage Grommet Removal Tool T84P-7341-A or equivalent. For tool usage instructions, refer to Section 17-02.

8. Place a drain pan under the transmission oil pan. Starting at the rear of the pan and working toward the front, loosen the attaching bolts and allow the fluid to drain. Remove all of the attaching bolts except two at the front to allow the fluid to further drain. 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. After all fluid has drained, remove the two remaining bolts and the oil pan and gasket. Discard the gasket. If the same fluid is to be used again, filter the fluid through a 100 mesh screen. Reuse the fluid only if it is in good condition.
9. Remove the transmission oil filter grommet and gasket. Discard the gasket. If the fluid is contaminated, discard the filter. (Do not clean the filter).
10. Remove the manual lever detent spring and roller assembly.
11. Remove the manual lever retaining pin by prying with a narrow sharp screwdriver. Use care when removing the pin.
12. Note assembled position of the TV lever torsion spring, then remove spring.
13. Slide a 5/8-inch box end wrench over the inner manual lever close to the bottom of the lever. Do not allow the wrench to contact the "rooster comb" area. Using a 21mm wrench, remove the manual lever attaching nut. Securely hold the inner manual lever with the box end wrench while applying break torque to the manual lever attaching nut.
14. Remove the outer manual lever from the case.
15. Remove inner throttle lever and shaft assembly.
16. Remove the inner manual lever and park pawl actuating rod assembly.
17. Disconnect the park pawl actuating rod from the inner manual lever.
18. Remove the manual lever oil seal with a screwdriver or Shift Shaft Seal Remover T58L-101-A and Slide Hammer T50T-100-A or equivalent. Discard the seal.

**Installation**

1. Install a new manual lever seal into the case using Shift Shaft Seal Replacer T74P-77498-A or equivalent.
2. Check the manual lever, shaft and threads for damage.



3. With the manual lever attaching nut on the inner throttle lever and shaft assembly, slide the inner throttle lever through the inner manual lever.
4. Slide the outer manual lever in the case. Make sure the lever is properly positioned either up or down depending on application.
5. Allow the inner throttle lever and shaft assembly to slide through the ID bore of the outer manual lever.
6. Snug up the manual lever attaching nut against the inner manual lever making sure the flats are properly aligned. First tighten the nut to remove free play, then tighten the nut to specification. The torque can be approximated by tightening the nut to remove free play, then turning the nut an additional 30 degrees. This is equivalent to rotating one point of the nut 1/4 turn.
7. Position TV lever torsion spring on the inner throttle valve shaft and align into notch.
8. Push manual lever all the way into the case. Make sure inner manual lever pin is engaged in manual valve detent slot and inner throttle lever is acting on the TV valve. Neutral start switch plunger must also be riding on cam surface of inner manual lever.
9. Install new manual lever retaining pin in case. Pin must be flush or slightly below pan surface.
10. Install a new throttle lever seal.
11. Install detent spring. Make sure detent spring roller is centered on "rooster comb" area. Tighten to 9-11 N·m (80-100 lb-in).
12. Install the throttle valve outer lever. Do not push inner throttle valve lever past throttle valve.
13. Install throttle lever lockwasher and attaching nut. Tighten nut to 16.5-21.5 N·m (12-16 lb-ft).
14. Check PARK function and operation of TV lever and manual lever before further assembly.
15. Connect the manual linkage rod to the manual lever at the transmission using the Shift Linkage Grommet Installation Tool T84P-7341-B or equivalent. For tool usage instructions, refer to Section 17-02.
16. Install the oil filter gasket and oil filter. Tighten to 9-11 N·m (80-100 lb-in).
17. Install oil pan with a new gasket and tighten bolts to 16.5-21.5 N·m (12-16 lb-ft). It might be necessary to use a 3/8-inch or 1/4-inch drive ratchet with a 10mm universal socket to install the

oil pan bolts. On some vehicles it is easier to install the oil pan after the crossmember is installed.

18. Install exhaust system components and crossmember as appropriate. Install the fan shroud bolts (if removed).
19. Lower vehicle and add three quarts of specified transmission fluid.
20. Start vehicle in PARK and with brake pedal depressed, cycle gear selector several times. Recheck oil level. Refer to Section 17-01. Check for leaks.
21. Check and adjust manual linkage. Refer to Section 17-02.
22. Check/adjust the TV linkage at the carburetor.

### Neutral Start Switch

Lincoln Town Car, Ford Crown Victoria/Mercury Grand Marquis

#### Removal

1. Set parking brake.
2. Place the selector lever in the manual low position.
3. Open hood and remove the air cleaner assembly.
4. Disconnect the negative battery ground cable.
5. Disconnect the neutral start switch electrical harness from the neutral switch by lifting the harness straight up off the switch without side-to-side motion.
6. Remove the neutral switch and O-ring seal using a 24-inch extension, universal adapter and the Neutral Start Switch Socket T74P-77247-A or equivalent (access path is the area by the left side dash panel).

NOTE: Use the Neutral Start Switch Socket T74P-77247-A or equivalent for both removing and installing the switch. Other tools could crush or puncture the walls of the switch.



## Technical Service Information

### Installation

1. Install the neutral start switch and O-ring.

**CAUTION: Exercise care not to damage the switch terminals. Tighten to 11-15 N·m (8-11 lb-ft) using a clicker type torque wrench, a 24-inch extension, a universal adapter, and the neutral start switch socket tool.**

2. Connect the neutral start switch electrical harness to the neutral start switch.
3. Connect the negative battery ground cable.
4. Check the operation of the neutral start switch in each position with the parking brake engaged.
5. Install the air cleaner and close the hood.

5. Remove the neutral start switch and O-ring using Neutral Start Switch Socket T74P-77247-A or equivalent, assembled to a ratchet 24cm (9½-inch) in length. Once the socket and ratchet are on the switch, sufficient clearance for tool movement can be gained by reaching from the rear of the transmission over the extension housing area while standing on a stool.

**NOTE: Use the Neutral Start Switch Socket T74P-77247-A or equivalent for both removing and installing the switch. Other tools could crush or puncture the walls of the switch.**

### Mark VII/Continental, Thunderbird/Cougar, LTD/Marquis, Mustang/Capri

#### Removal

1. Place the selector lever in the manual LOW position.
2. Disconnect the negative battery ground cable.
3. Raise the vehicle on a hoist. Refer to Pre-Delivery manual, Section 50-04.
4. Disconnect the neutral start switch electrical harness from the neutral start switch by pushing the harness straight up off the switch using a long blade screwdriver underneath the rubber plug section of the harness.

### Installation

1. Install the neutral start switch and O-ring.

**CAUTION: Exercise care not to damage the switch terminals. Tighten to 11-15 N·m (8-11 lb-ft) using a clicker type torque wrench, the neutral start switch socket tool and by following the method in Step 4 of the removal procedure for tool clearance.**

2. Connect the neutral start switch electrical harness to the neutral start switch.
3. Lower the vehicle from the hoist.
4. Connect the negative battery ground cable.
5. Check the operation of the neutral start switch in each position with the parking brake engaged.

CLUTCH AND BAND APPLICATION

	Interm. Friction Clutch	Interm. One-Way Clutch	Overdrive Band	Reverse Clutch	Forward Clutch	Planetary One-Way Clutch	Low-Reverse Band	Direct Clutch
1st Gear Manual Low					Applied	Holding	Applied	
2nd Gear Manual Low	Applied	Holding	Applied		Applied			
1st Gear — ⓐ(OVERDRIVE) or D(3)					Applied	Holding		
2nd Gear — ⓐ(OVERDRIVE) or D(3)	Applied	Holding			Applied			
3rd Gear — ⓐ(OVERDRIVE) or D(3)	Applied				Applied			Applied
4th Gear — ⓐ(OVERDRIVE)	Applied		Applied					Applied
Reverse (R)				Applied			Applied	



# 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.

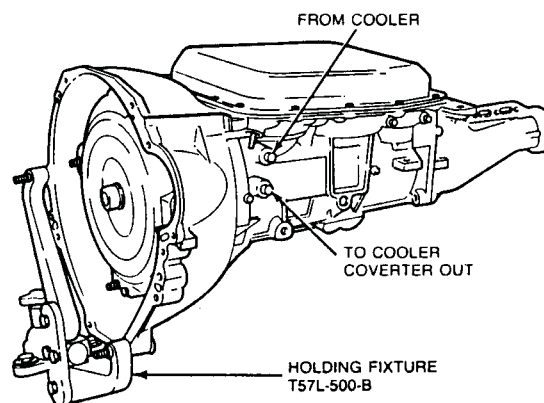
- Refer to Section 17-01 for procedures detailing the cleaning and inspection of individual components.
- Thorough cleaning of the transmission exterior will reduce the possibility that damaging contaminants might enter the subassemblies during disassembly and assembly.
- All fasteners must be tightened 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

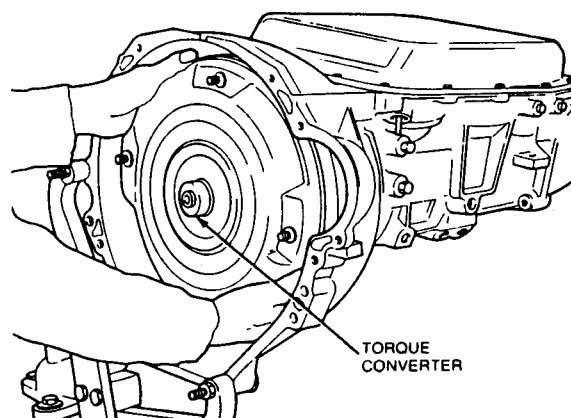
### Disassembly

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



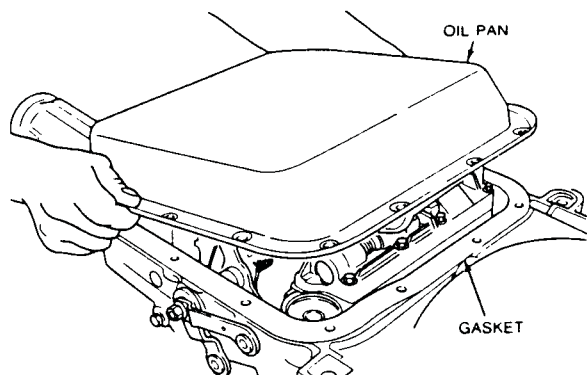
2. Grasp the torque converter firmly and pull straight out of the transmission.

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



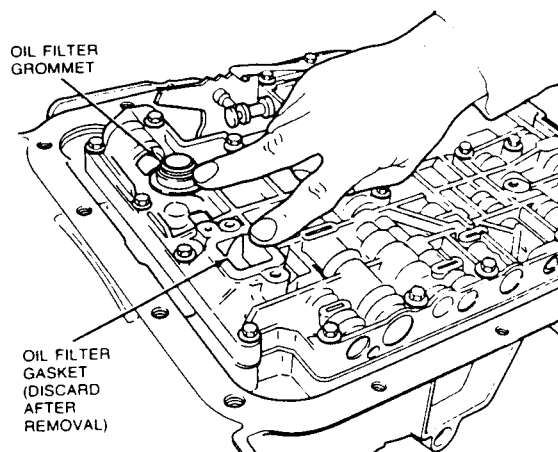
3. Remove the 14 oil pan attaching bolts, the oil pan and the pan gasket.

Discard the gasket.

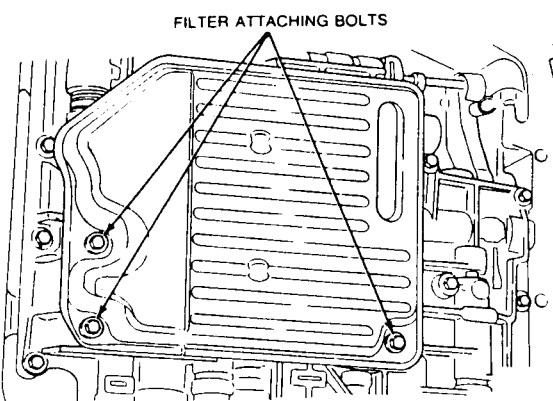


Remove the filter, grommet and gasket and discard.

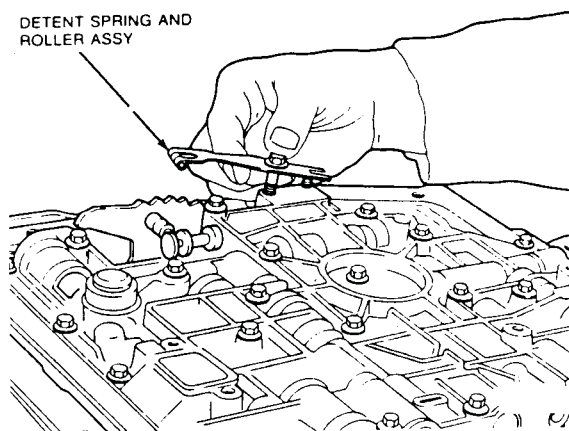
NOTE: If fluid was contaminated be sure to use a new filter. Never attempt to clean or reuse a dirty filter.



4. Remove the three oil filter attaching bolts.

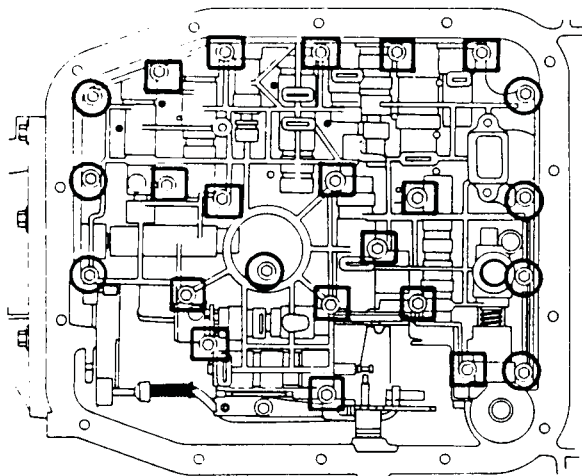


5. Remove the manual lever detent spring and roller assembly.



6. Remove the remaining 24 valve body-to-case attaching bolts, the valve body assembly and the valve body gasket.

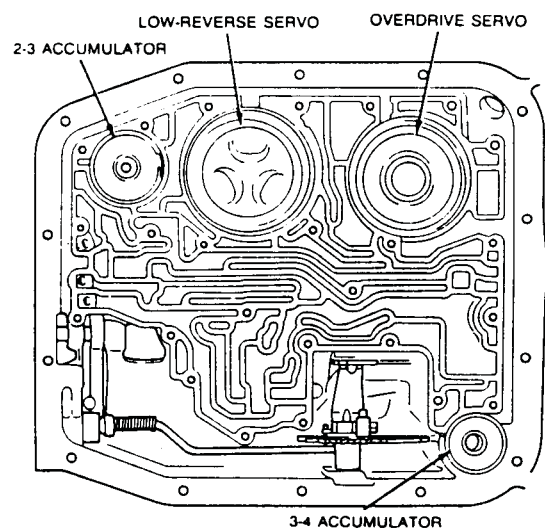
NOTE: The four front, one center and three rear attaching bolts are shorter than the others.



- INDICATES A LONGER BOLT  
□ INDICATES A SHORT BOLT

7. This illustration shows the position of the 3-4 accumulator, the overdrive servo, the low reverse servo, and the 2-3 accumulator.

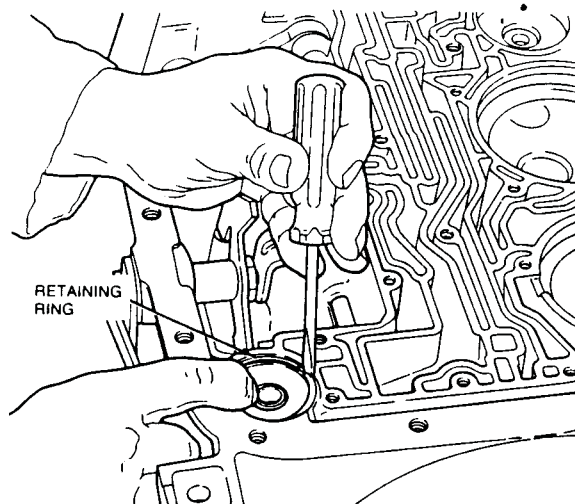
Remove these components from the transmission using the following procedures.



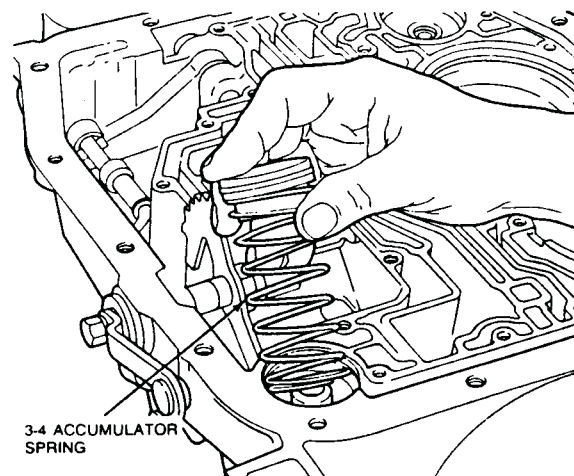
## 3-4 Accumulator

### Removal

8. Push down on the accumulator cover and remove the retaining ring using a thin-bladed screwdriver.

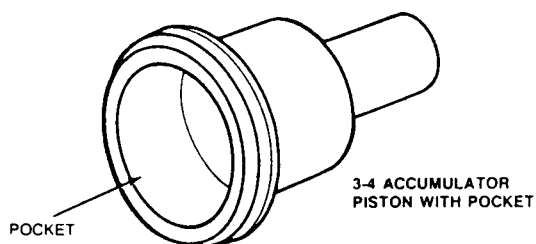


9. Remove the accumulator cover and, if so equipped, the piston return spring.





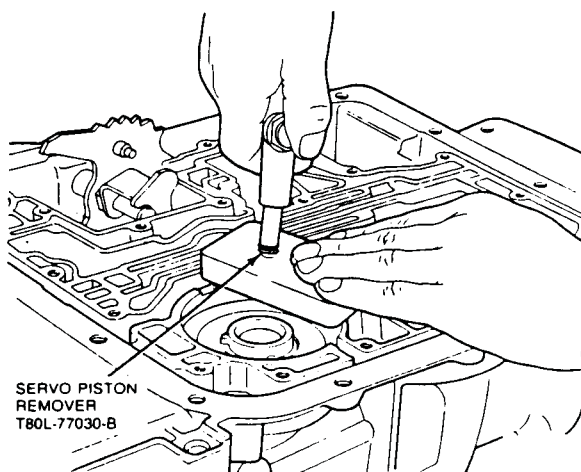
Some AOD applications will have an inverted 3-4 accumulator piston design. The inverted piston has a pocket in the piston.



**NOTE:** Depending on model application, one of three accumulator designs will be present: there will be a spring between the cover and piston as shown, there will be a spring beneath the piston, or there will be no spring. The appearance of the piston and spring will also vary from model to model.

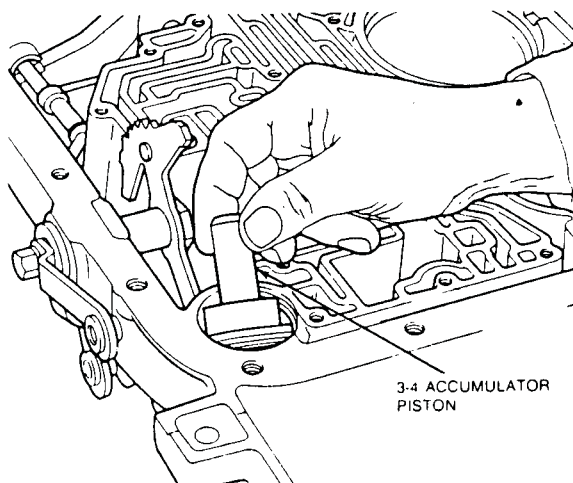
If the cover sticks in the bore use Servo Piston Remover T80L-77030-B or equivalent and air pressure to aid removal.

**CAUTION:** Make certain a portion of the Servo Piston Remover T80L-77030-B or equivalent extends over the bore to prevent the cover from flying out of the bore.



10. Remove the accumulator piston.

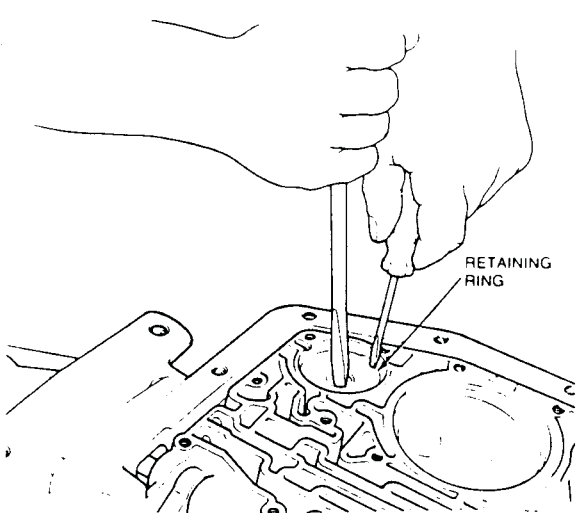
The piston uses a scarf-cut Teflon® seal and comes out with very little resistance.



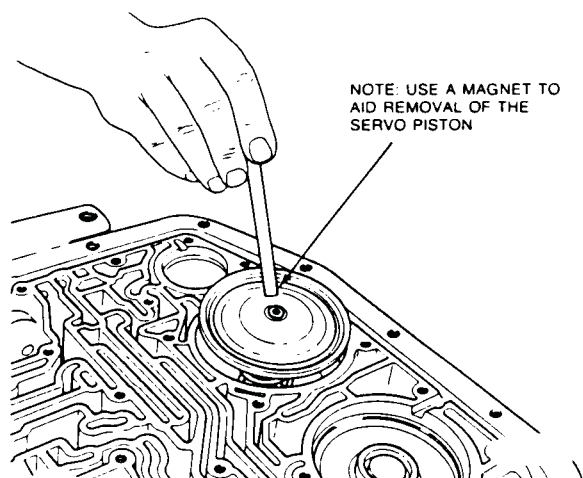
## 2-3 Accumulator

### Removal

11. Using a wide-bladed screwdriver or wooden dowel, push down on the accumulator cover and remove the retaining ring.



NOTE: If necessary, a magnet can be used to lift the piston from the bore.

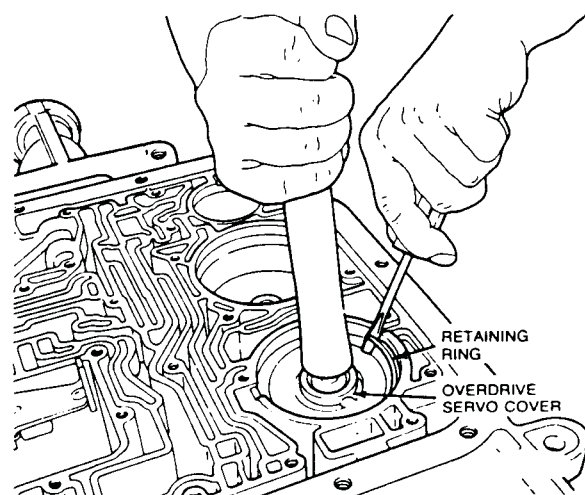


NOTE: The length of the rod attached to the piston may vary in length from transmission to transmission. Three possible lengths may be encountered. A single groove cut into the piston rod indicates the shortest possible length while two and three groove piston rods indicate successively longer rods. For assembly purposes, it is important to determine which length piston rod was used in the manufacture of the transmission.

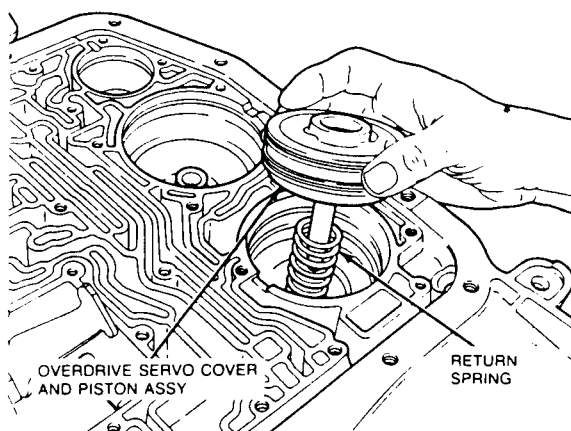
## Overdrive Servo

### Removal

16. Using a hammer handle or wooden dowel, push down on the servo cover and remove the retaining ring.



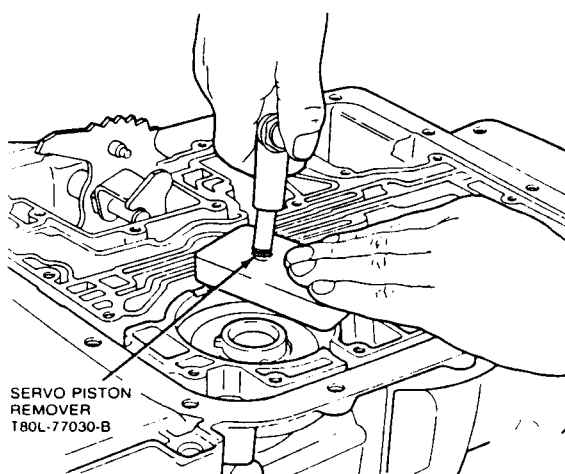
17. Remove the cover and piston as a unit.



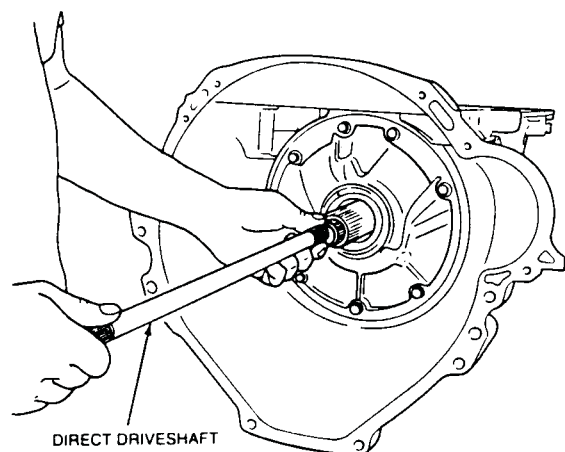
If the cover sticks in the bore, use Servo Piston Remover T80L-77030-B or equivalent and air pressure to aid removal.

**CAUTION:** Make certain a portion of the Servo Piston Remover T80L-77030-B or equivalent extends over the bore to prevent the cover from flying out of the bore.

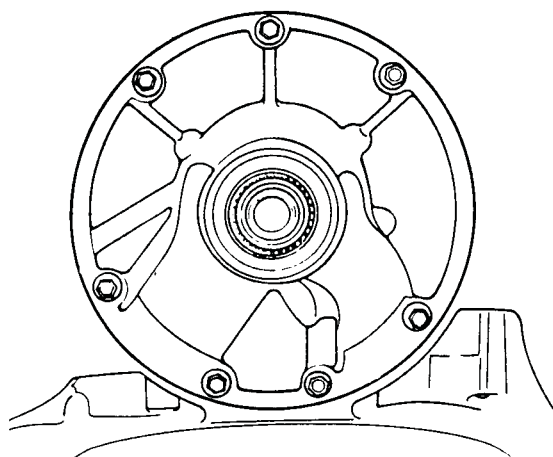
Remove spring.



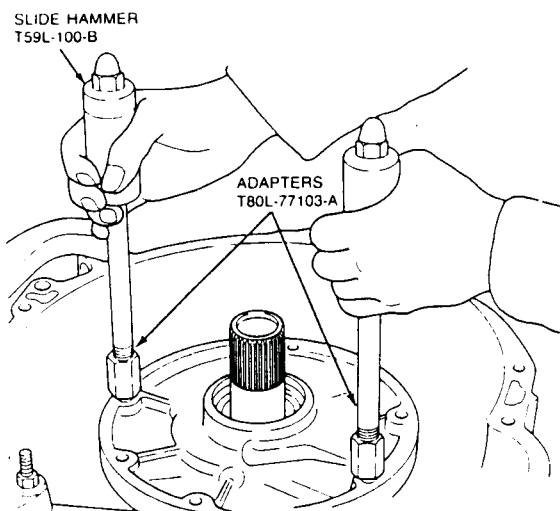
18. Remove the direct driveshaft.



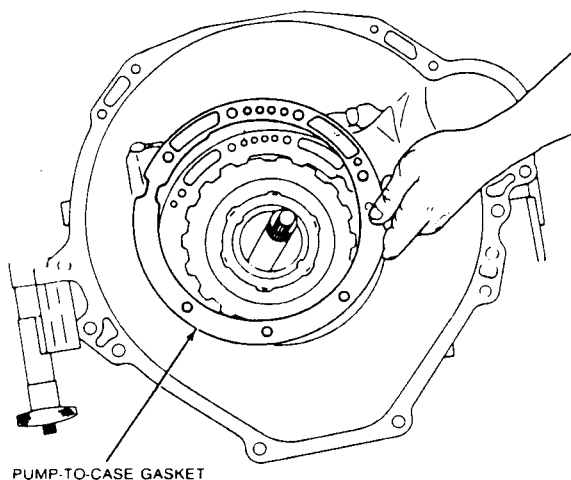
19. Remove the seven 10mm pump body attaching bolts. All bolts have been coated with a sealant. More break torque might be required to remove the bolts. Before installation, clean bolts and bolt holes in case and pump. Coat bolts with Threadlock and Sealer EOAZ-19554-A or Pipe Sealant with Teflon® D8AZ-19554-A or equivalent.



20. Remove the pump assembly using Impact Slide Hammer T59L-100-B and Front Pump Remover Adapters T80L-77103-A, or equivalent.



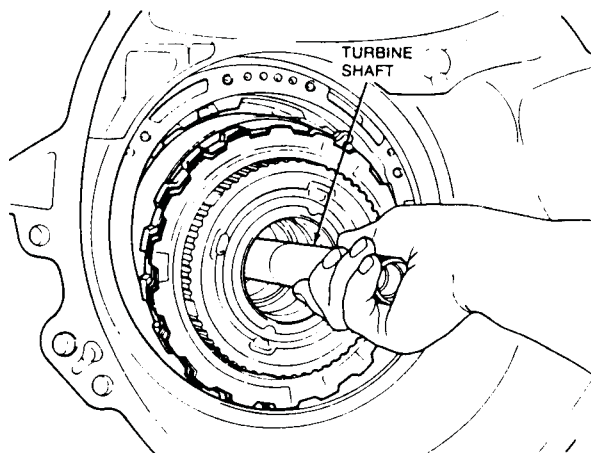
21. Remove the pump-to-case gasket.



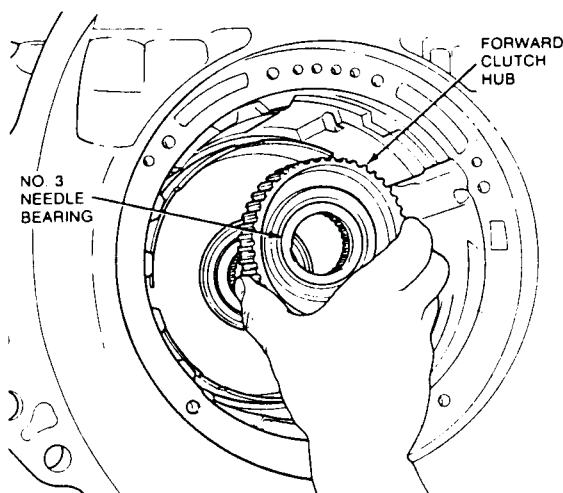
22. Grasp the turbine shaft firmly and pull these components out of the case as an assembly:

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

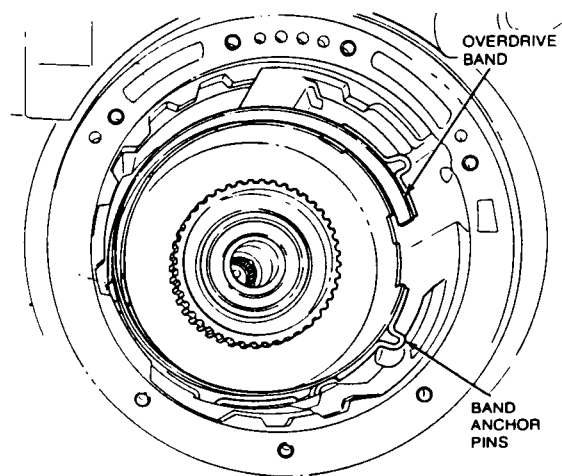
NOTE: Remove the assembly carefully to prevent damage to the overdrive band friction material by the reverse clutch drive lugs.



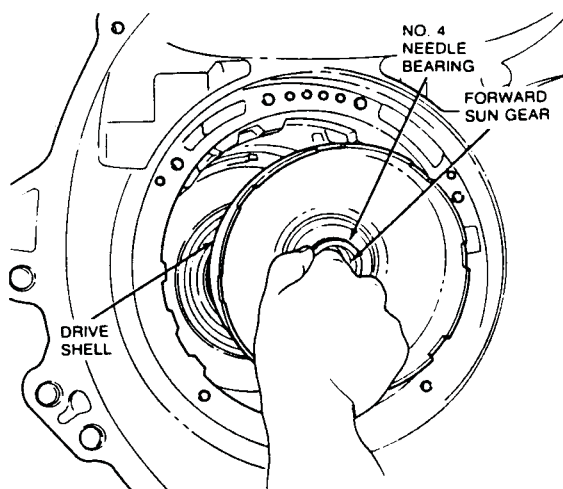
24. Remove the forward clutch hub and the No. 3 needle bearing as an assembly.



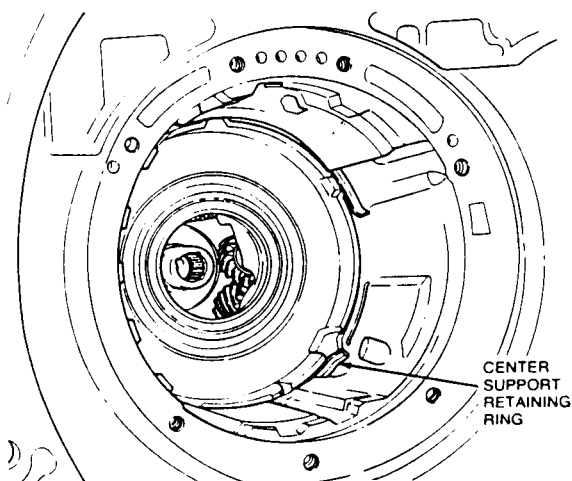
23. Disengage the overdrive band from the anchor pins and remove from the case.



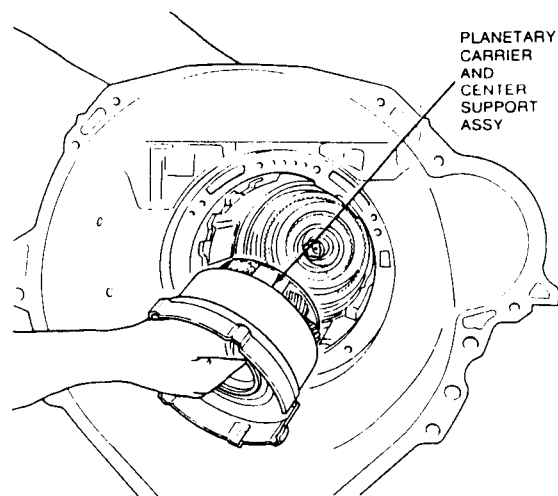
25. Remove the forward sun gear, the No. 5 needle bearing, the reverse sun gear and drive shell and the No. 4 needle bearing as an assembly.



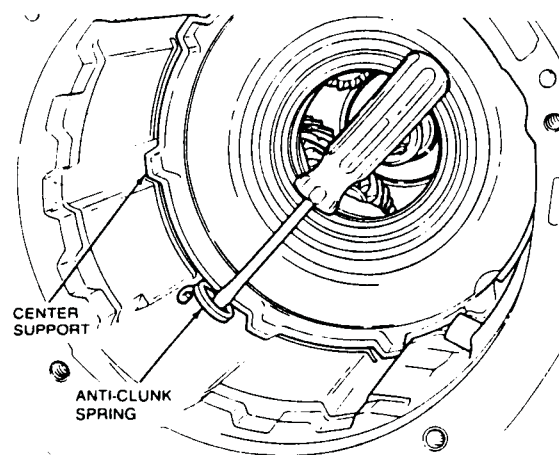
26. Remove the center support retaining ring.  
Note position of tabs for assembly.



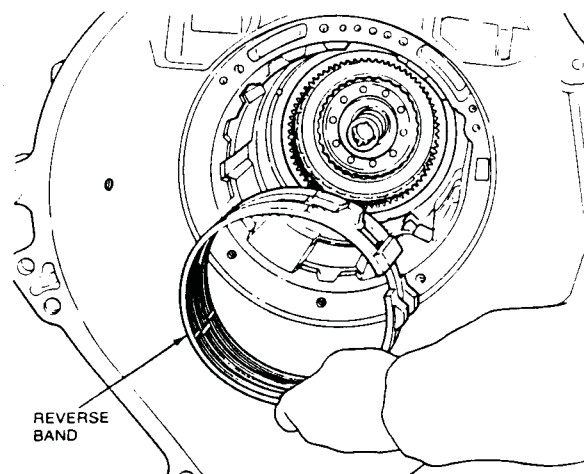
28. Remove the center support and planetary carrier as an assembly.



27. Using a screwdriver, pry the anti-clunk spring out from between the center support and the case.  
Note the location for assembly.

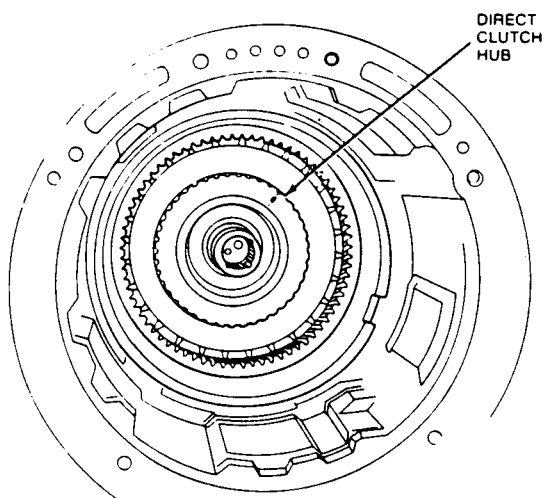


29. Remove the reverse band.





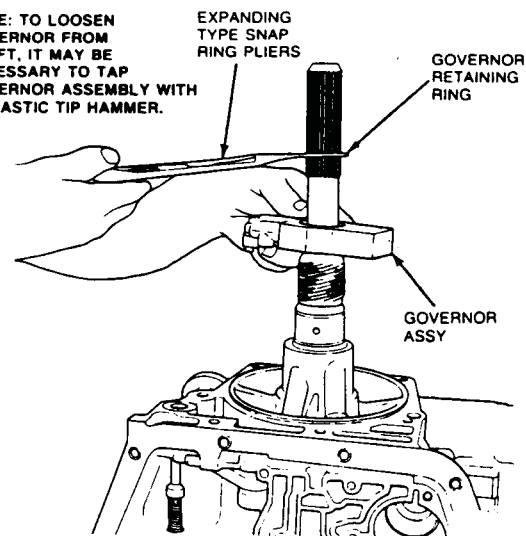
30. If the direct clutch hub did not come out with the planetary carrier, reach in and lift it out of the direct clutch.



32. Remove the retaining ring and governor assembly.

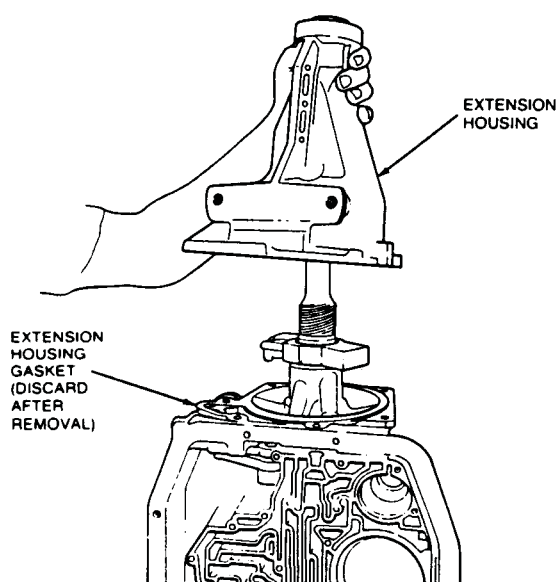
NOTE: If the transmission is positioned with the output shaft pointing up, do not allow the shaft assembly to fall through the case when the governor is removed.

NOTE: TO LOOSEN GOVERNOR FROM SHAFT, IT MAY BE NECESSARY TO TAP GOVERNOR ASSEMBLY WITH A PLASTIC TIP HAMMER.

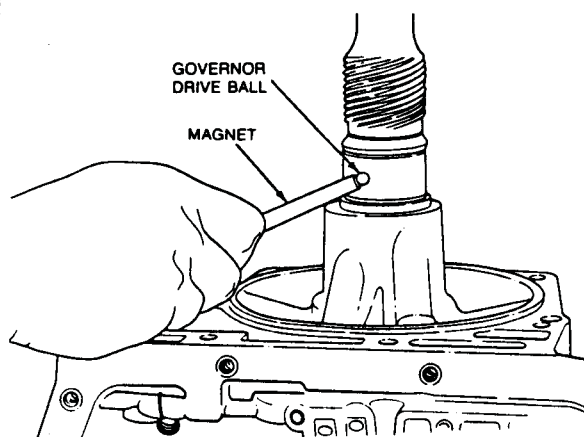


31. Remove the six extension housing attaching bolts and the extension housing.

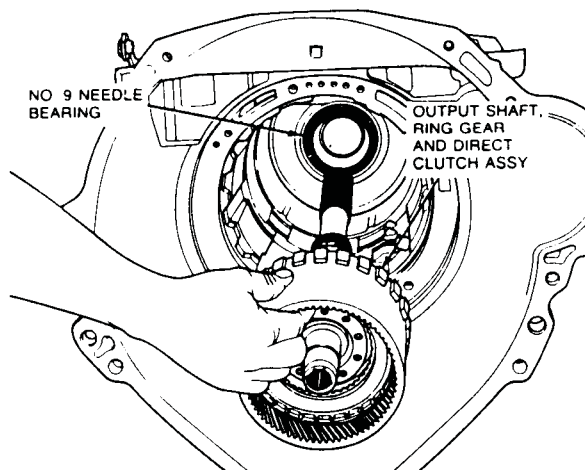
Remove and discard the extension housing gasket.



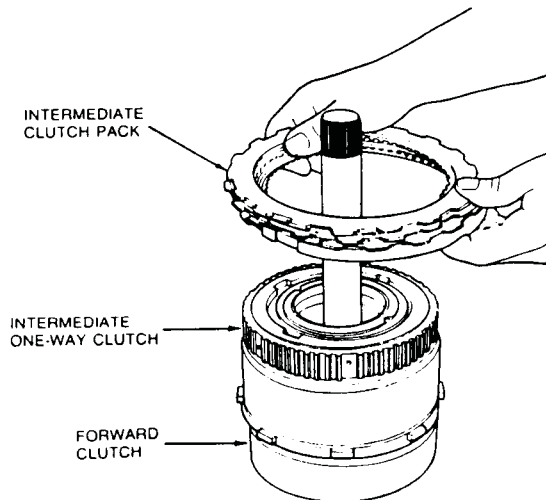
33. Remove the governor drive ball from the output shaft. A magnet may be used to aid removal.



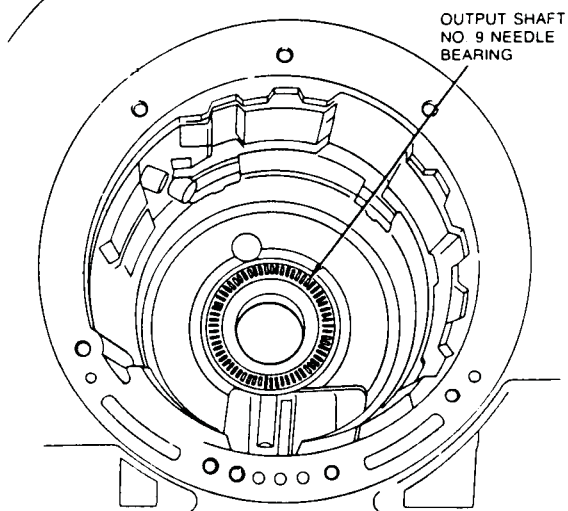
34. Remove the output shaft, the ring gear and the direct clutch as an assembly, through the front of the case.



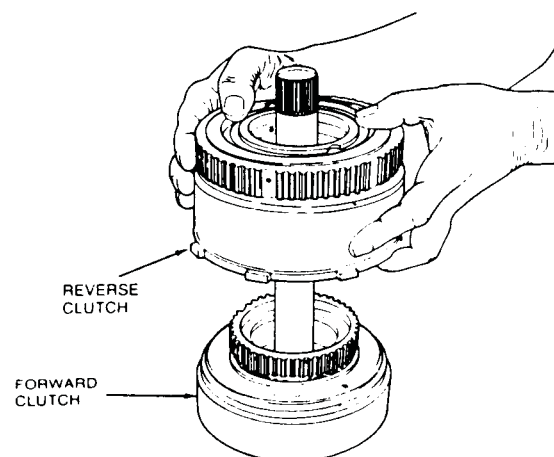
36. Remove the intermediate clutch pack from the intermediate one-way clutch.



35. Remove the output shaft No. 9 needle bearing from the rear of the case.



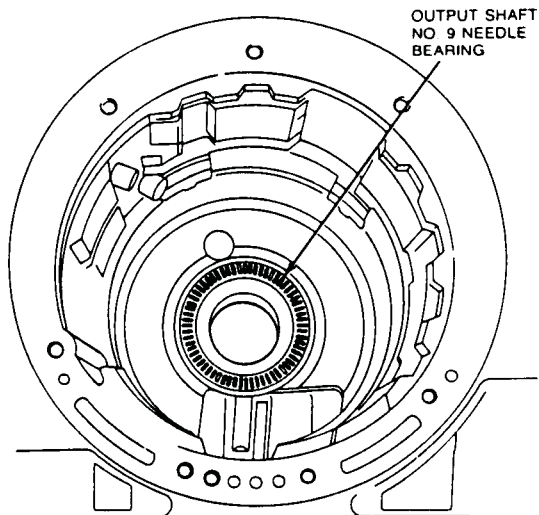
37. Remove the reverse clutch assembly from the forward clutch assembly.



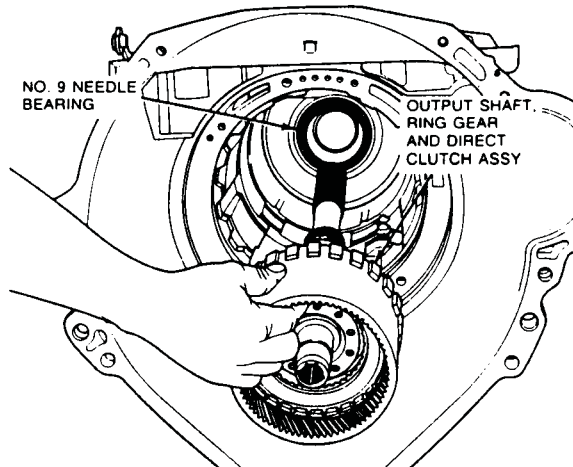
## Transmission

### Assembly

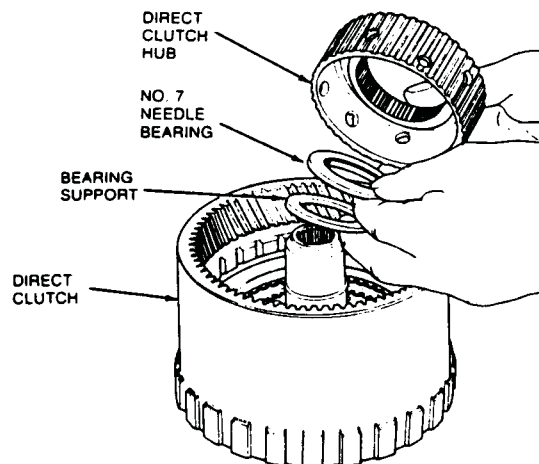
1. Install the output shaft needle bearing No. 9 in the transmission case.



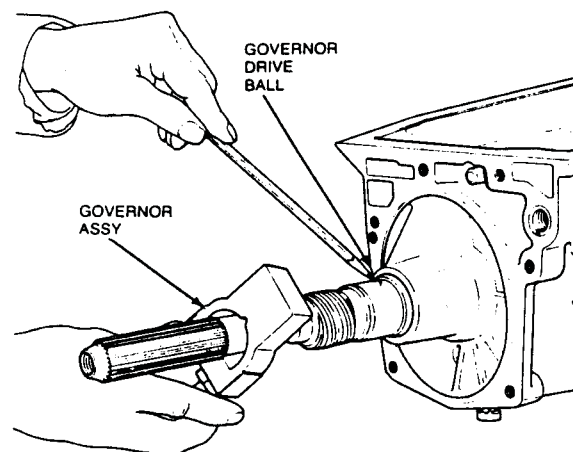
3. Install the output shaft, the ring gear and the direct clutch as an assembly.



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

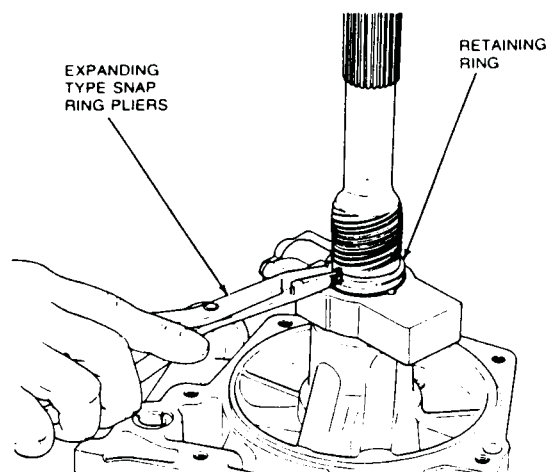


4. Install the governor drive ball and the governor assembly.

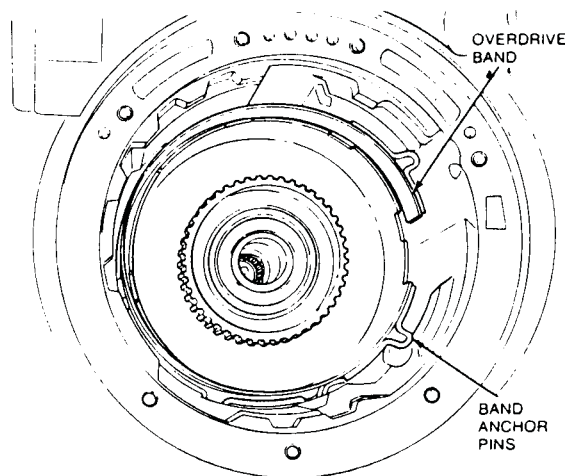


Install the governor retaining ring.

Make sure that the face of the governor body is about flush with the counterweight. The cover and attaching screws must face toward the case (forward).

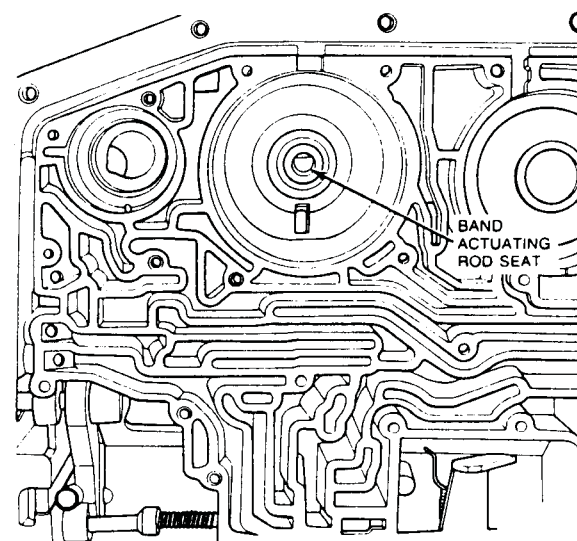
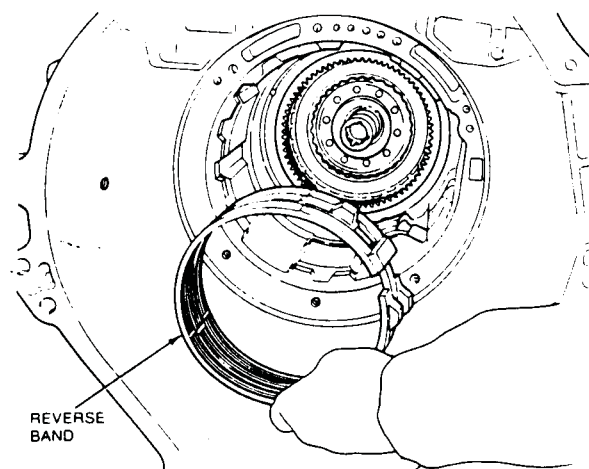


Make sure the band is seated on the anchor pins.

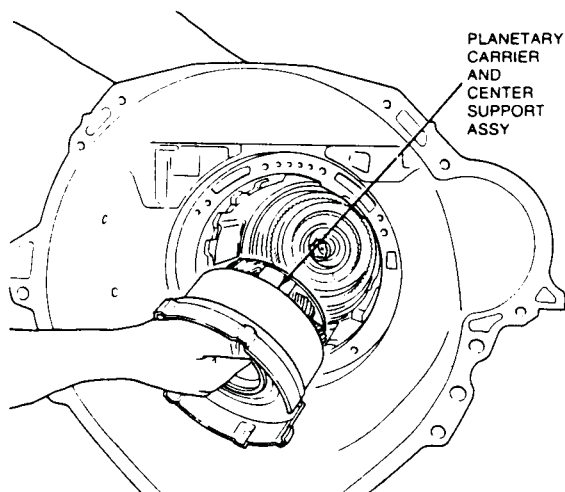


NOTE: When properly installed, the center of the band actuating rod seat can be seen through the servo piston bore.

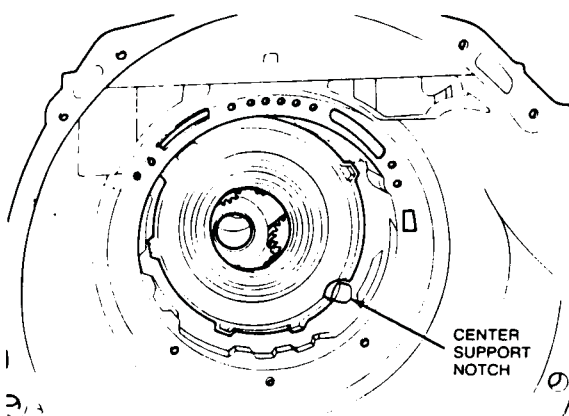
5. Install the low-reverse band.



6. Install the center support and planetary assembly. Rotate the output shaft, if necessary, to align the planet carrier splines with the direct clutch hub splines.

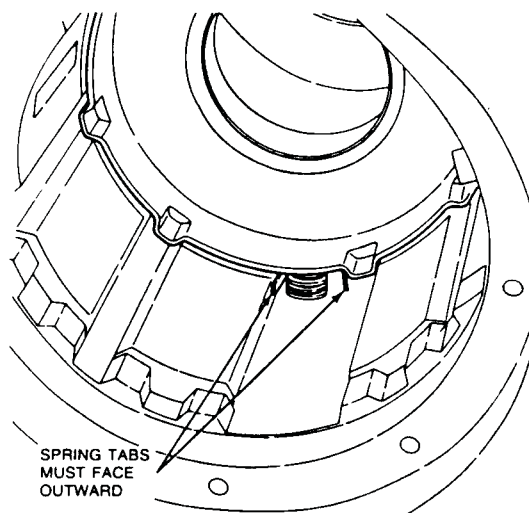


NOTE: The planet carrier and center support assembly cannot be installed unless the notch cut in the center support is aligned with the overdrive band anchor pin.

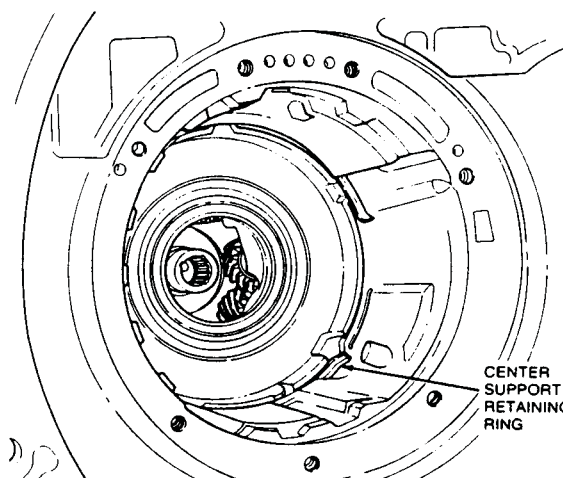


7. Install the center support anti-clunk spring using a hammer handle or wooden dowel.

NOTE: Spring tabs must face outward.



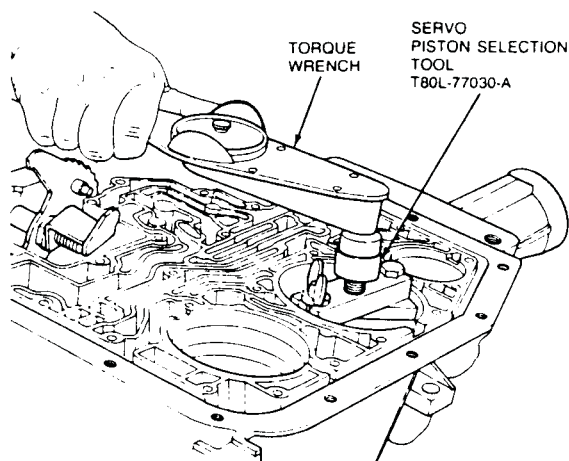
8. Install the center support retaining ring.



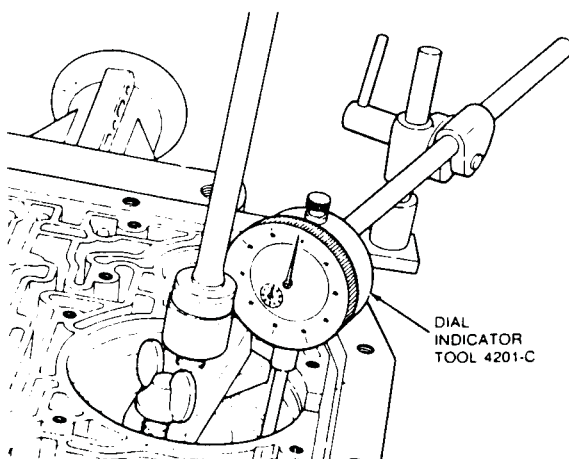


9. To determine the correct length of the low-reverse servo piston, proceed as follows:

- a. Lubricate the low-reverse piston seal to facilitate assembly and to prevent damage to the seal.
- b. Install the low-reverse servo piston and return spring. Do not install the piston cover or retaining ring.
- c. Install Servo Piston Selection Tool T80L-77030-A or equivalent, and tighten the band apply bolt on Servo Piston Selection Tool T80L-77030-A or equivalent to 5.6 N·m (50 lb-in).



- d. Attach Dial Indicator TOOL-4201-C or equivalent and position the indicator stem on the flat portion of the piston. Zero the dial indicator.



- e. Thread the bolt out of the selector tool until the piston stops against the bottom of the tool.

- f. Read the amount of piston travel on the dial indicator.

- If the travel is 2.845-6.020mm (0.112-0.237 inch), the piston length is within specification.
- If the travel is not within specification, selective pistons are available in the following lengths:

ID

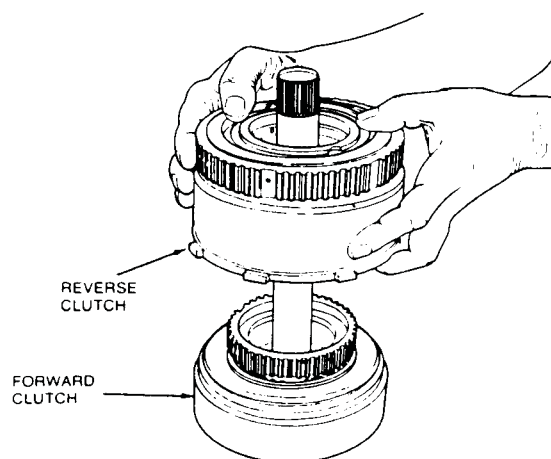
2.936 1 groove  
2.989 2 grooves  
3.043 3 grooves

Length of rod measured from piston surface to end of rod.

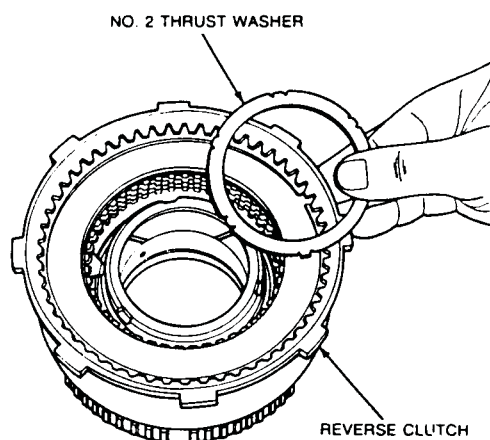
Select the proper rod to bring the servo piston travel within specification.

- g. Lubricate the cover seal to facilitate assembly and to prevent damage to the seal.
- h. Remove the servo selection tool and dial indicator.
- i. Install the servo cover and retaining ring.

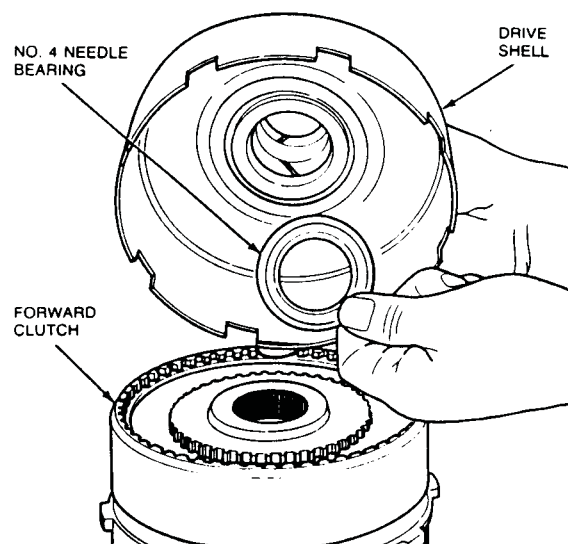
10. Install the reverse clutch on the forward clutch.



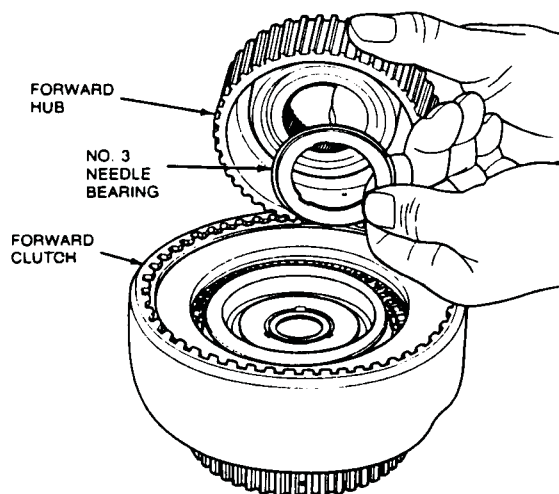
NOTE: Make sure the No. 2 thrust washer is in position.



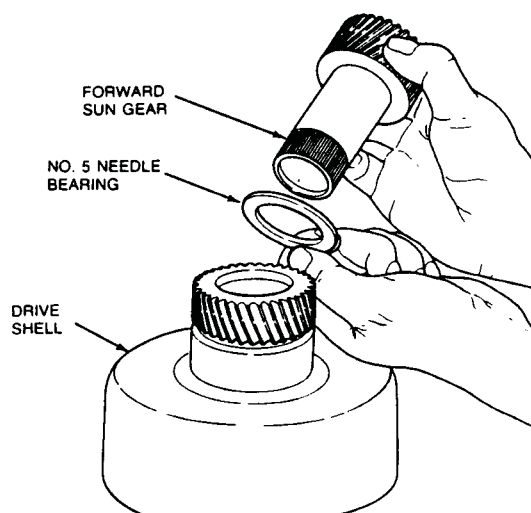
12. Position the No. 4 needle bearing on the forward clutch hub and install the drive shell.



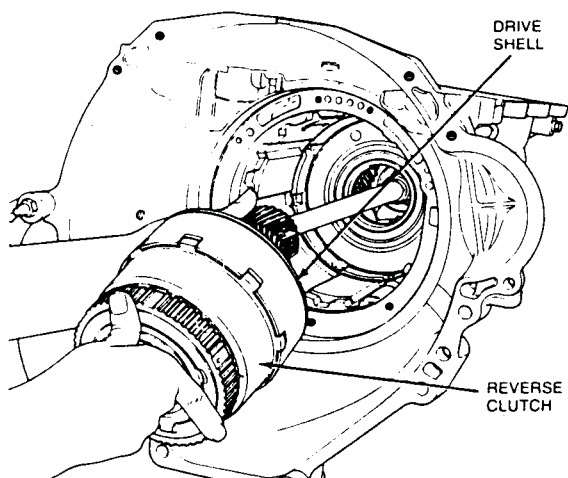
11. Install the No. 3 needle bearing and forward clutch hub in the forward clutch.



13. Install the No. 5 needle bearing and forward sun gear on the drive shell.

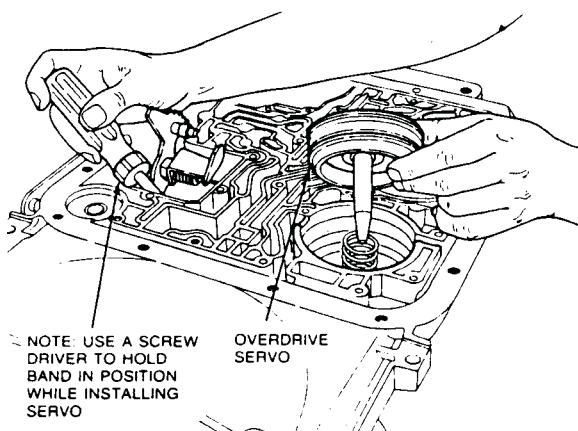


14. Install the drive shell, forward clutch and reverse clutch as an assembly. Rotate the output shaft, as necessary, to aid the engagement of the sun gear with the planetary gears.

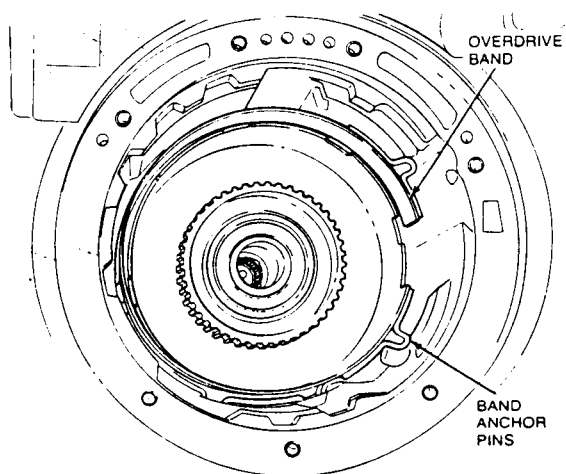


16. Lubricate the overdrive servo cover seals to facilitate assembly and to prevent damage to the seal.

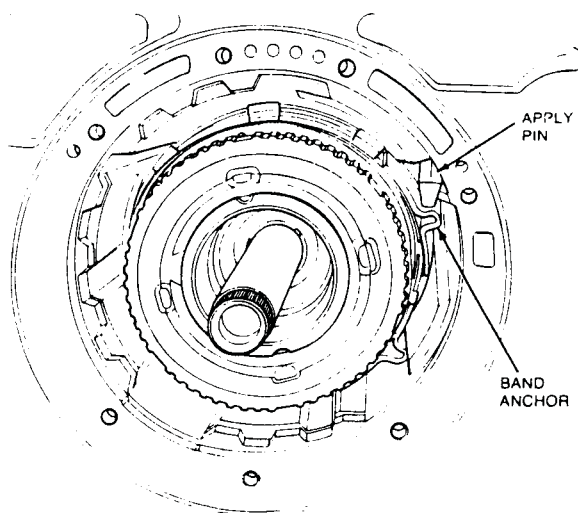
Install the overdrive servo.



15. Install the overdrive band. Make sure the band anchor is properly positioned on the anchor pin.

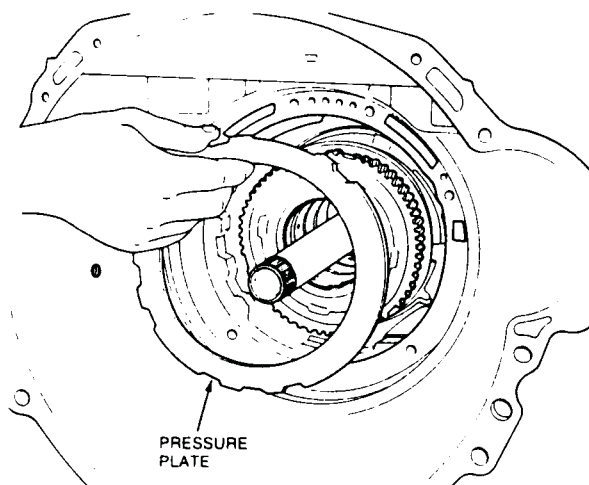


17. With the overdrive servo installed, inspect the apply pin and band for proper position and engagement. If the band anchor and apply pin are not properly engaged, remove the servo and reposition the band as necessary.

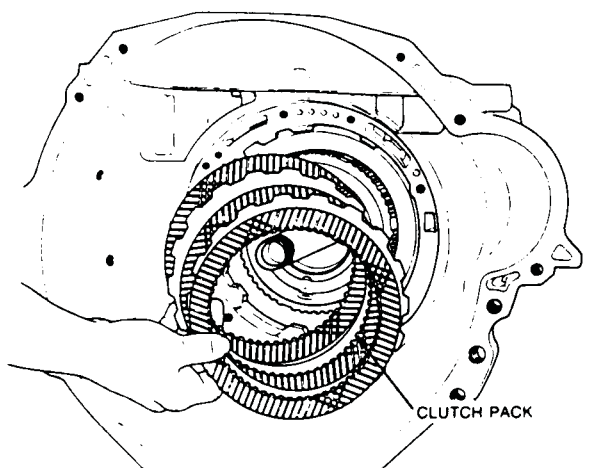


18. Install the intermediate clutch pack components in the following order:

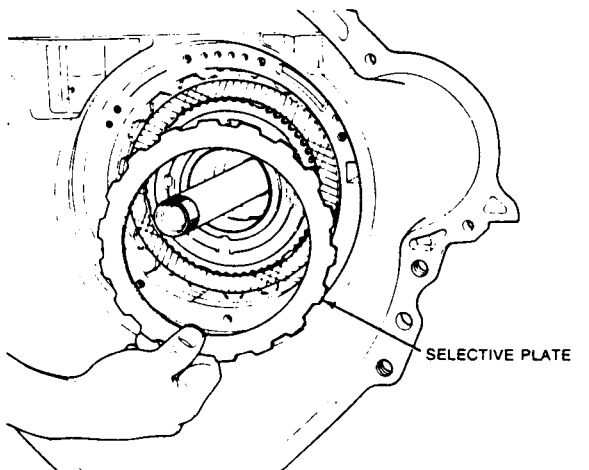
a. Pressure plate



b. Clutch pack



c. Selective steel plate



19. Measure the intermediate clutch clearance using a Depth Micrometer D80P-4201-A and End Play Gauge Bar T80L-77003-A or equivalent. Set the end play tool across the pump case mounting. Locate the micrometer end play gauge bar and read the depth. The depth at the intermediate clutch separator plate is:

5.8L (351 CID), 5.0L (302 CID)

41.5-41.8mm (1.634-1.636 inch)

3.8L (232 CID)

41.4-41.7mm (1.629-1.640 inch)

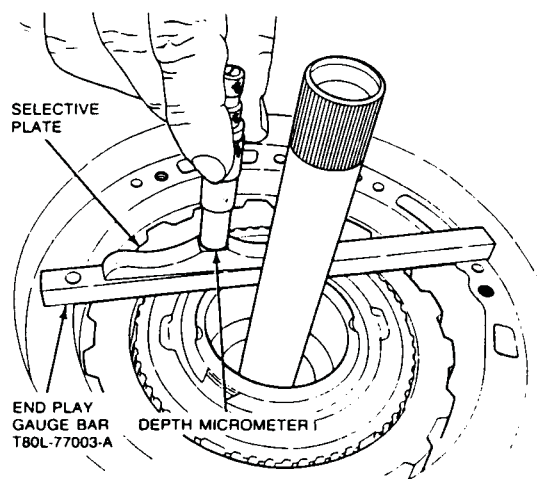
Check the clearance again 180 degrees opposite to assure the average depth is within tolerance.

NOTE: Maintain a downward pressure on the clutch pack while measuring depth.

If the depth is not within tolerance, the following size selective steel separator plates are available:

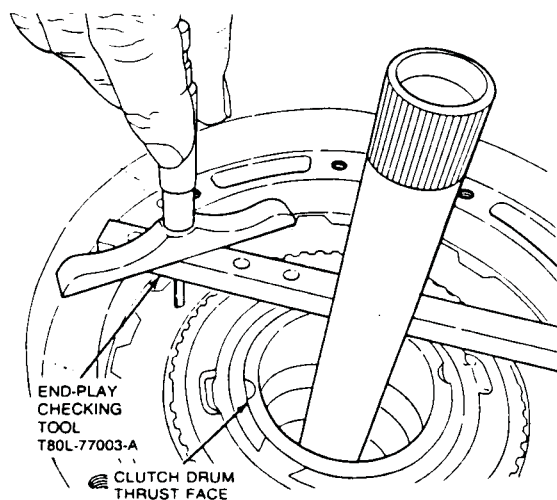
- 0.071-0.067 inch
- 0.081-0.077 inch
- 0.091-0.087 inch
- 0.101-0.097 inch

Install the correct plate and recheck the clearance.

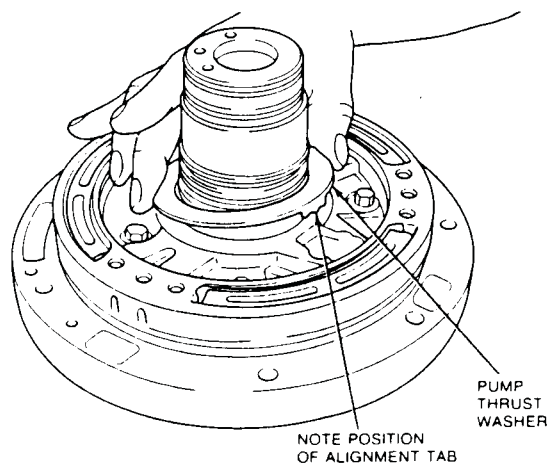


20. Position the Depth Micrometer D80P-4201-A on End Play Bar T80L-77003-A or equivalent so that the depth is measured at the reverse clutch drum thrust face. Check the end play 180 degrees opposite to determine the average depth. The following chart shows the proper selective thrust washer for various depth measurements.

Depth	Washer No.	Washer Size	Washer Color
37.668-38.113mm (1.483-1.500 inch)	1	0.050-0.054 inch	Green
38.114-38.540mm (1.501-1.517 inch)	2	0.068-0.072 inch	Yellow
38.541-38.970mm (1.518-1.534 inch)	3	0.085-0.089 inch	Natural
38.971-39.408mm (1.535-1.551 inch)	4	0.102-0.106 inch	Red
39.409-39.827mm (1.552-1.568 inch)	5	0.119-0.123 inch	Blue

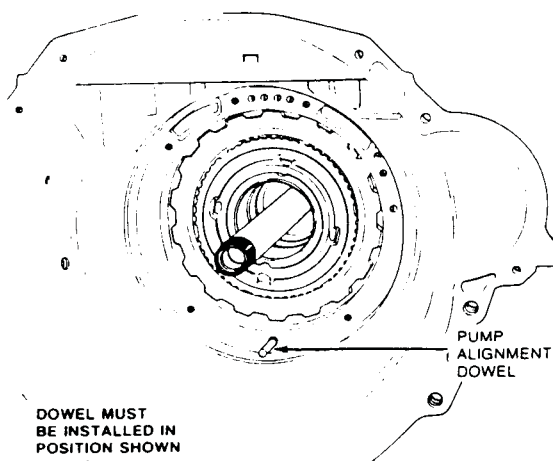


21. Install the selective washer determined in Step 20 on the pump. Use petroleum jelly to hold it in place.



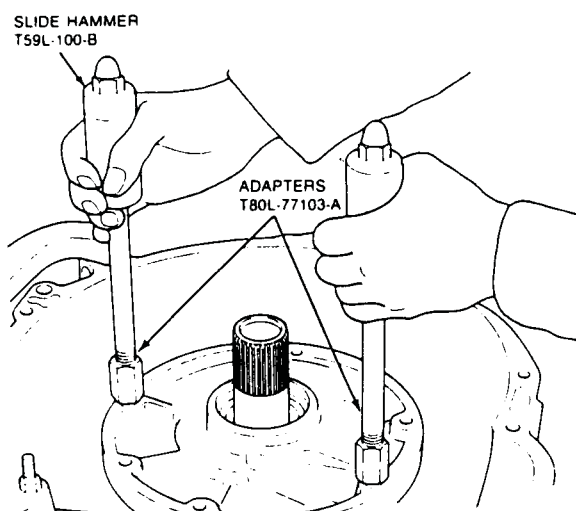
22. Install pump alignment dowel. The alignment dowel can be fabricated by removing the head from a M8-1.25 bolt. Install the dowel only a few threads in the position shown.

23. Install a new pump gasket.

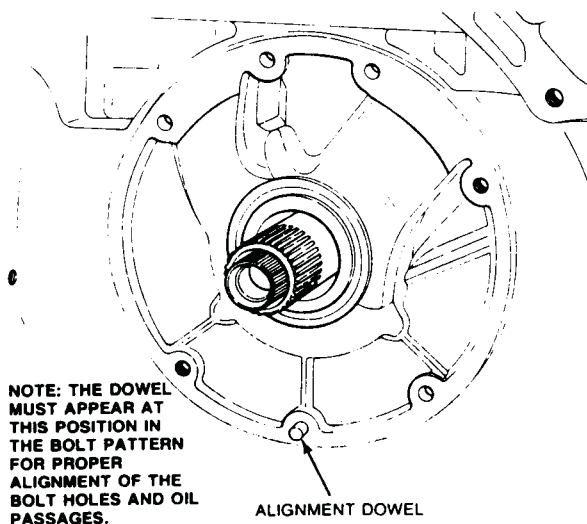




24. Using Impact Slide Hammer T59L-100-B and Front Pump Remover Adapters T80L-77103-A or equivalent, lower the pump assembly into the case.

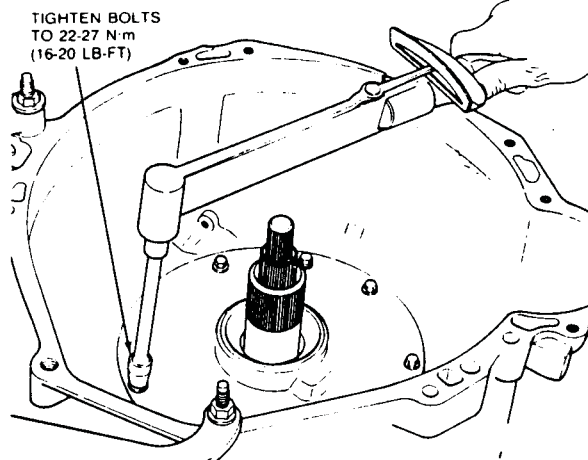


**NOTE:** The dowel must appear at this position in the bolt pattern for proper alignment of the bolt holes and oil passages.



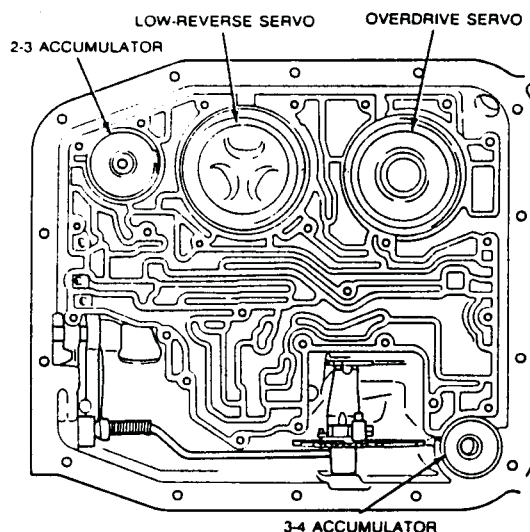
25. Remove the alignment dowel and install the seven pump attaching bolts. Alternately tighten the bolts a few turns at a time to draw the pump into the case. Tighten the attaching bolts to 22-27 N·m (16-20 lb-ft).

**NOTE:** Clean attaching bolts with a wire brush to remove loose particles. Apply a coating of Threadlock and Sealer EDAZ-19554-A or equivalent, to bolt threads before installation.

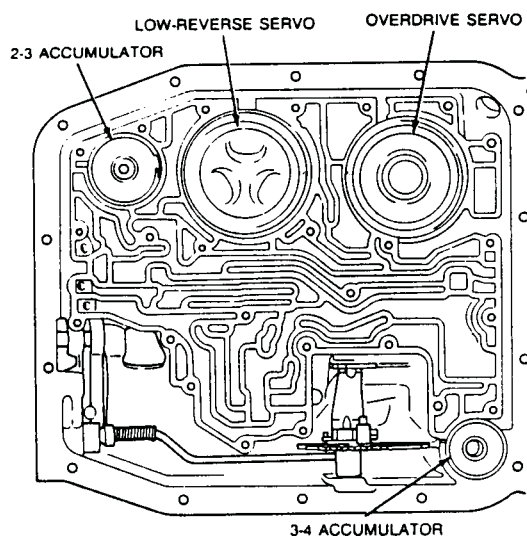


26. Assemble the 3-4 accumulator. Install the piston (and spring, if so equipped). Lubricate the rubber seal on the cover and the top of the bore to help cover installation. Install cover.

**IMPORTANT NOTE:** After assembly, the cover must be fully up and seated against retaining ring to avoid exposing a pressure passage. Use air pressure if necessary to seat cover up against retaining ring.

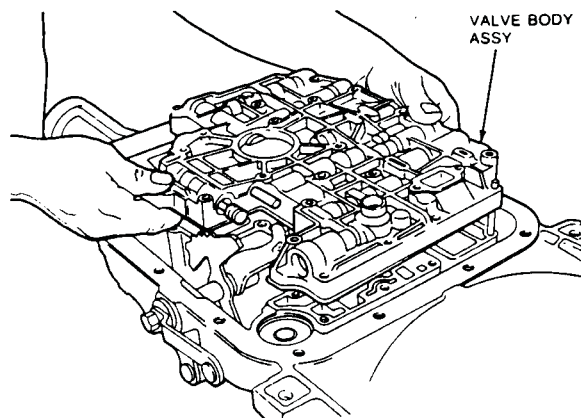


27. Assemble the 2-3 accumulator.

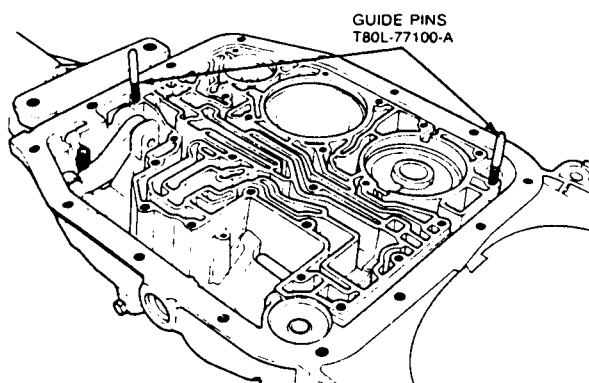


29. Install the valve body gasket and the valve body assembly over the pins.

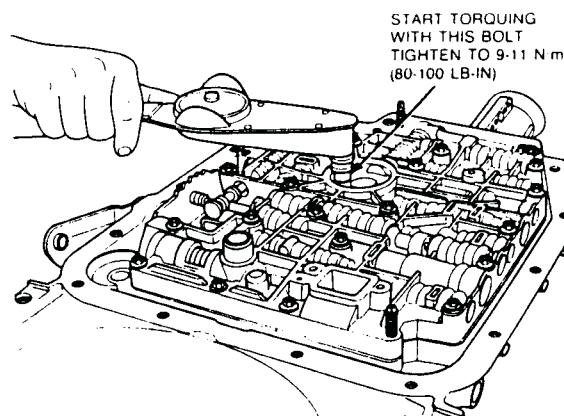
NOTE: Make sure the manual and throttle levers are properly positioned before installing the valve body attaching bolts.



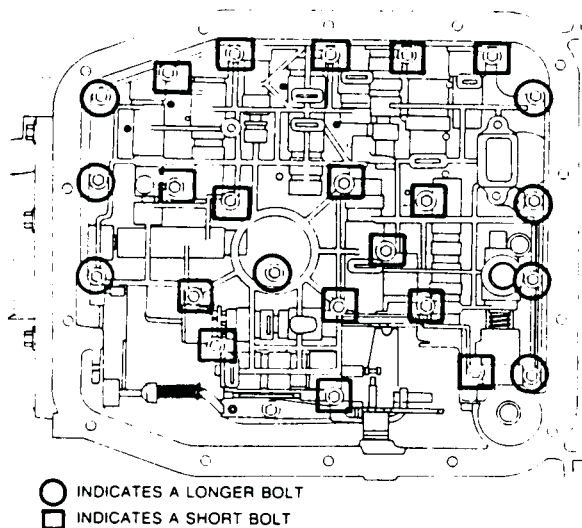
28. Install Valve Body Guide Pins T80L-77100-A or equivalent in the positions shown.



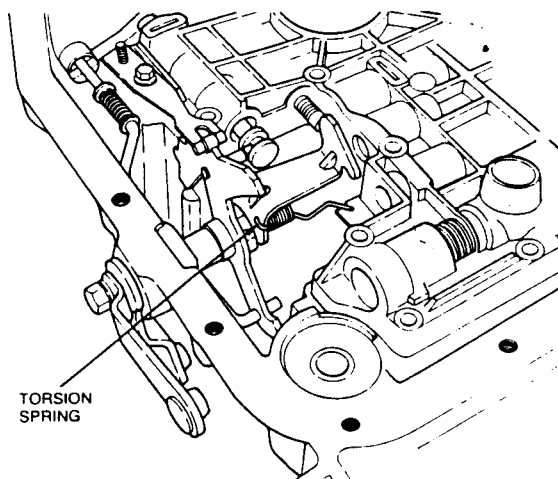
30. Loosely install 22 valve body attaching bolts using an 8mm socket. Starting at the center and working outward, tighten the bolts to 9-11 N·m (80-100 lb-in.)



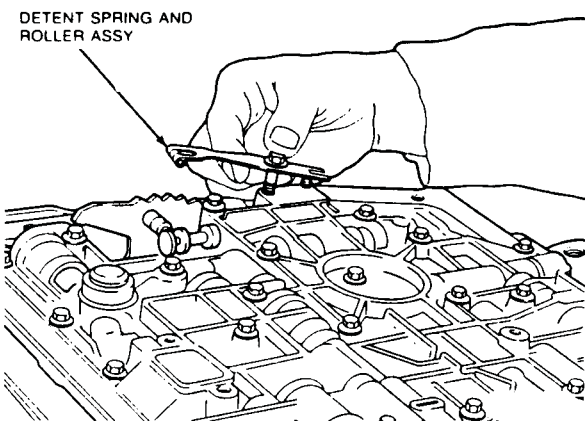
NOTE: Two different length bolts are used. The shorter bolts are used at the four front, one center and three rear locations. Refer to the illustration.



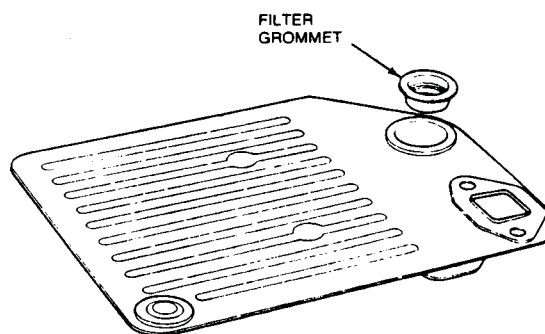
32. Position the TV lever torsion spring against the separator plate V-notch. This spring pushes the throttle lever in the direction of wide open throttle.



31. Remove the alignment pins and install bolts (short). Install the detent spring and roller assembly (long bolt). Tighten the bolts to 9-11 N·m (80-100 lb-in).

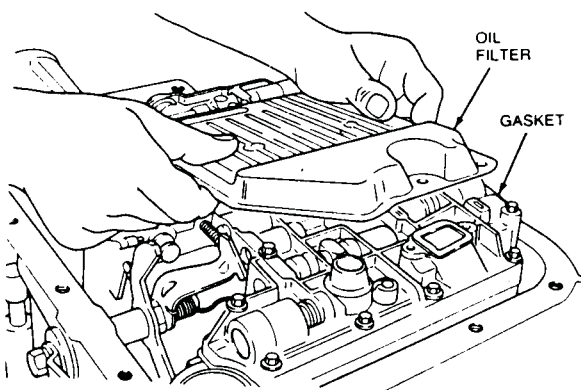


33. Install the filter grommet.



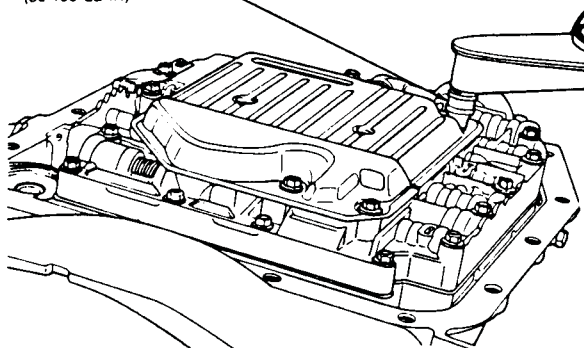
34. Install a new filter gasket and the filter on the valve body.

NOTE: If the fluid was contaminated, be sure to use a new filter. Never attempt to clean or reuse a dirty filter.

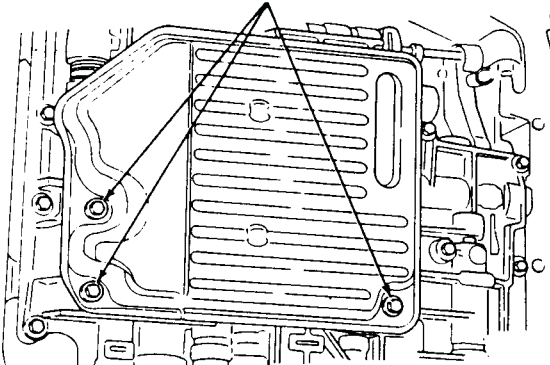


35. Install the filter attaching bolts. Tighten the attaching bolts to 9-11 N·m (80-100 lb-in).

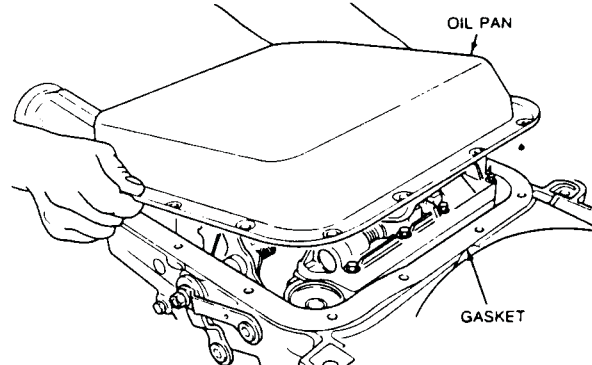
TIGHTEN ATTACHING BOLTS TO 9-11 N·m (80-100 LB-IN)



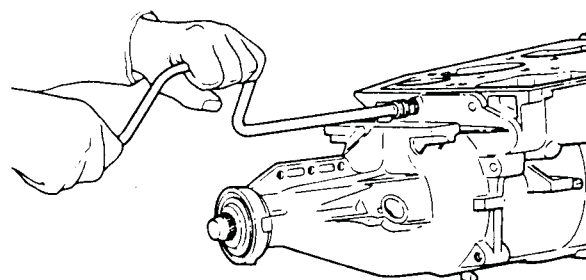
FILTER ATTACHING BOLTS



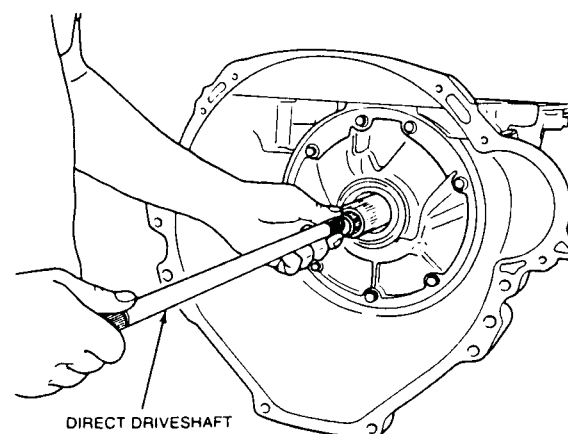
36. Position a new pan gasket and install the oil pan (10mm socket). Tighten the attaching bolts to 8-13.5 N·m (6-10 lb-ft).



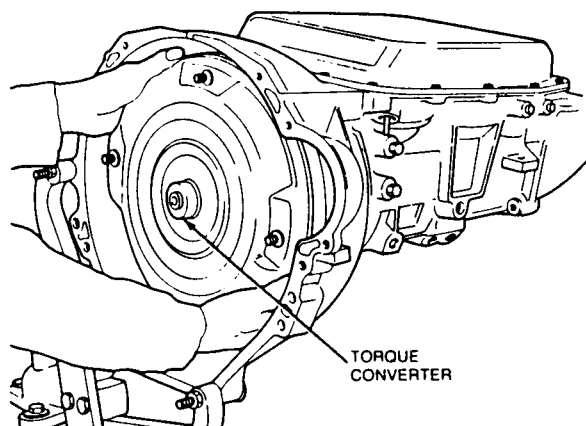
37. Position a new gasket and install the extension housing. Tighten the attaching bolts to 22-27 N·m (16-20 lb-ft).



38. Install the direct driveshaft.

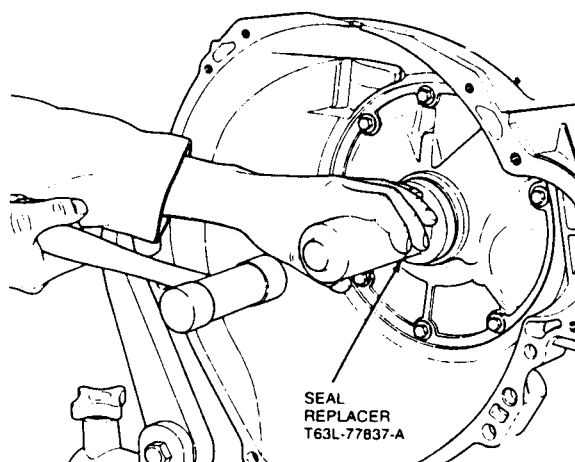


39. Install the torque converter. Make sure the converter is fully seated in the pump.



## Installation

Install the seal using Front Pump Seal Replacer T63L-77838-A or equivalent.

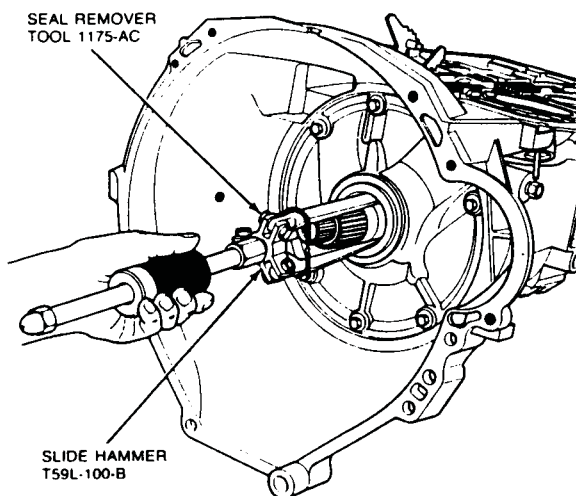


## Sub Assemblies

### Pump Seal

#### Removal

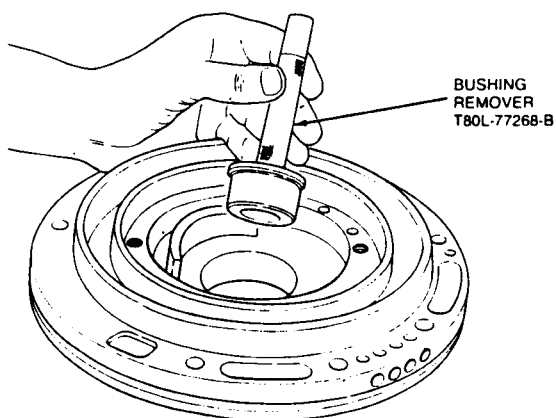
Remove the pump seal using Front Pump Seal Remover TOOL-1175-AC and Impact Slide Hammer T59L-100-B or equivalent.



## Pump Bushing

#### Removal

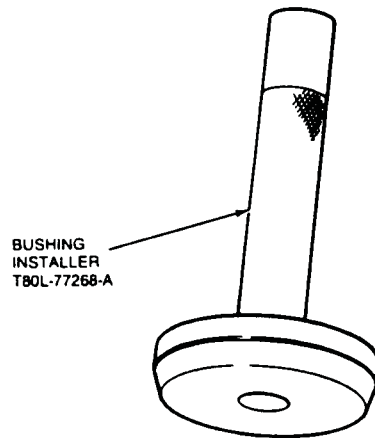
Remove the bushing using Bushing Remover T80L-77268-B or equivalent.





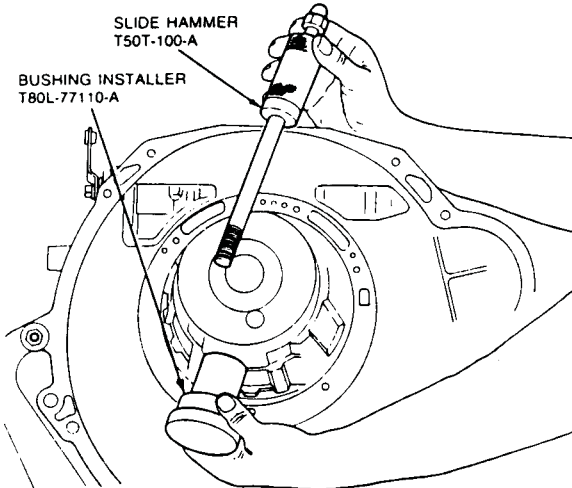
## Installation

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



## Installation

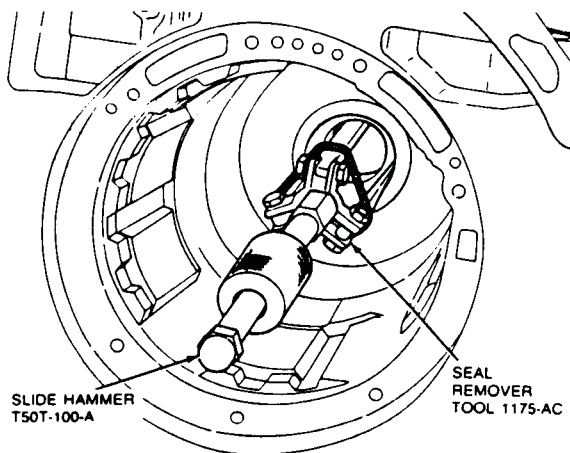
1. Position the replacement bushing on Bushing Installer T80L-77110-A or equivalent and install in the bushing bore through the front of the case.
2. Thread Impact Slide Hammer T50T-100-A or equivalent into the bushing installer through the back of the case and install the bushing.



## Case Bushing

### Removal

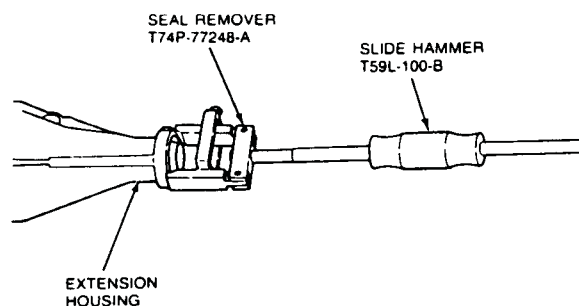
To remove the transmission case bushing use Impact Slide Hammer T50T-100-A and Seal Remover TOOL-1175-AC or equivalent.



## 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.



## Assembly

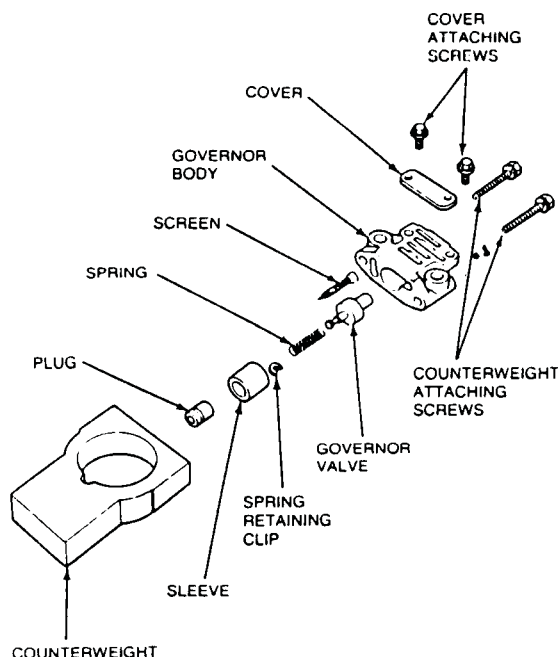
1. If removed, install the clip and spring on the governor valve.
2. Install the governor valve in the governor body.
3. Install the sleeve in the governor body with the points outward.
4. Install the plug in the sleeve with the knurled face inward.
5. Position the cover and install the attaching screws.

Tighten the attaching screws to 2.3-2.4 N·m (20-30 lb-in).

6. Install the screen in the body. NOTE: The steel band (brass colored) goes inward and the top of the screen faces outward.
7. Position the governor body on the counterweight and install the attaching screws.

Tighten the attaching screws to 6-7 N·m (50-60 lb-in).

NOTE: The finished face of the body should be flush with the face of the counterweight. (If it is not, the body is installed backwards).

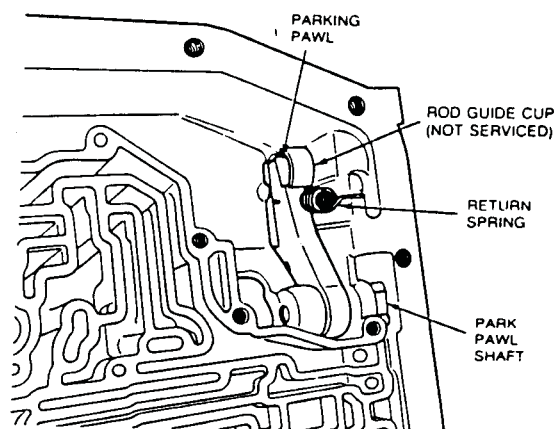


## Governor

### Disassembly

1. Remove the screws attaching the counterweight to the governor body.
2. Remove the cover screws and cover.
3. Remove the plug, the sleeve, and the governor valve from the governor body.
4. Remove the screen from the governor body.

NOTE: Externally, the AOD governor is very similar in appearance to the FMX governor. However, the internal components are not the same. The AOD governor can be distinguished from the FMX by examining the governor valve. The AOD governor valve has a circular shoulder on the end of the valve.



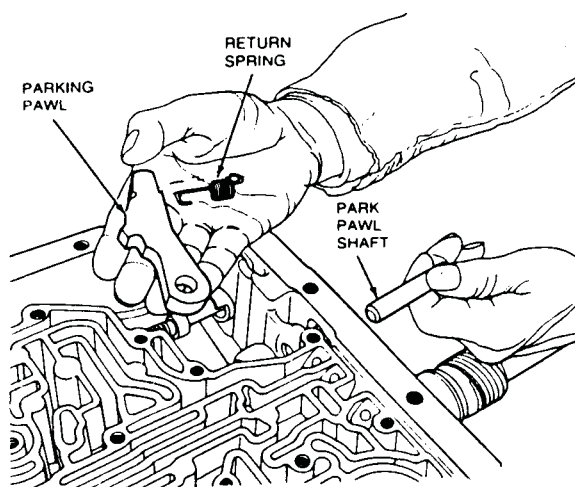
### Parking Pawl

#### Removal

1. Slide the park pawl shaft out the rear of the case and remove the parking pawl.
2. Remove the return spring.

## Installation

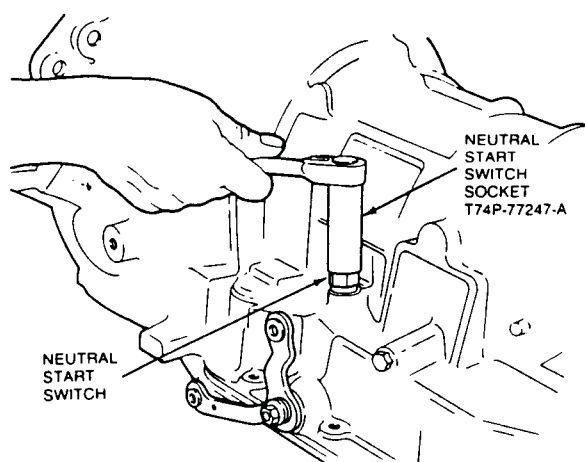
1. Hook the squared end of the spring into the notch on the park pawl.
2. Hold pawl and spring in place and hook curved end of spring into the recess in the case.
3. Install the park pawl shaft.



## Neutral Start Switch

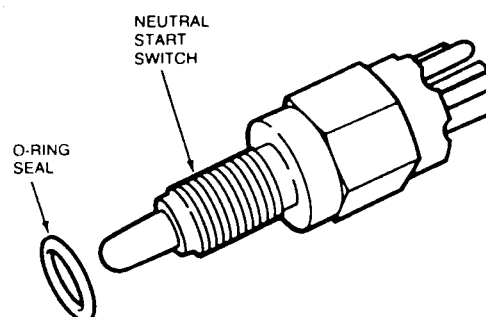
### Removal

1. Using the Neutral Start Switch Socket T74P-77247-A or equivalent, remove the switch from the case.
2. Remove the O-ring seal and discard.

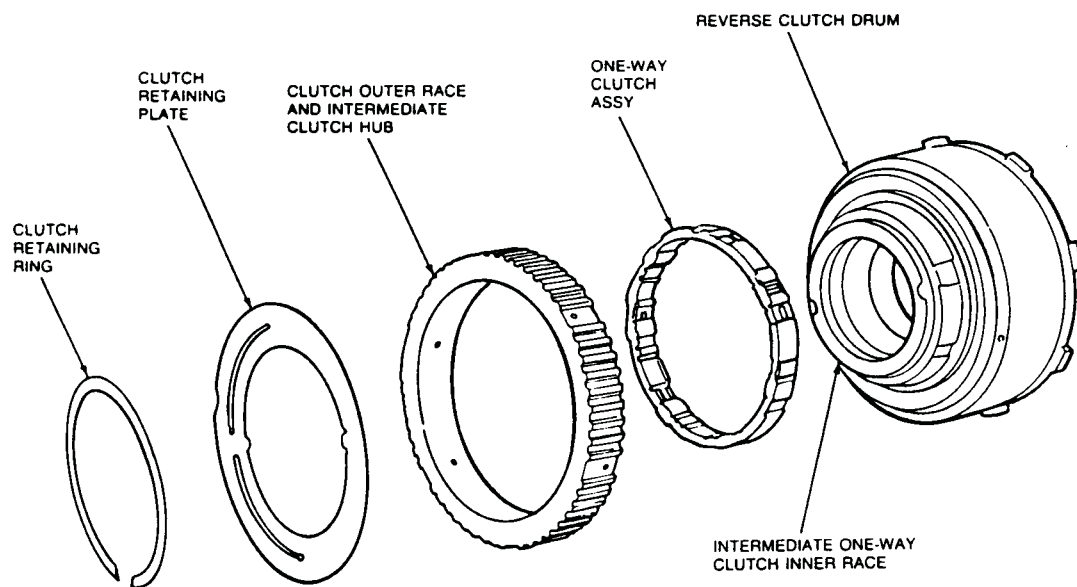


### Installation

1. Install a new seal on the neutral start switch.
2. Install the switch in the case using the Neutral Start Switch Socket T74P-77247-A or equivalent. Tighten to 11-14 N·m (8-11 lb-ft).

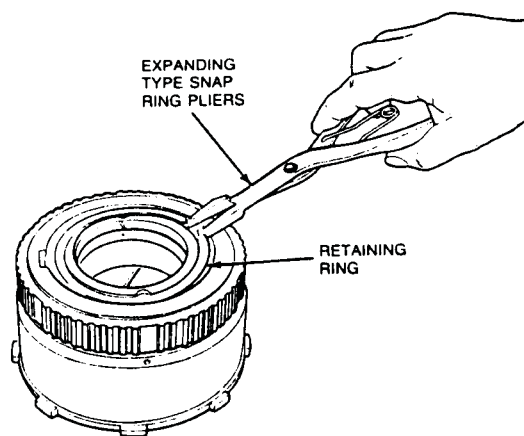


## Intermediate One-Way Clutch

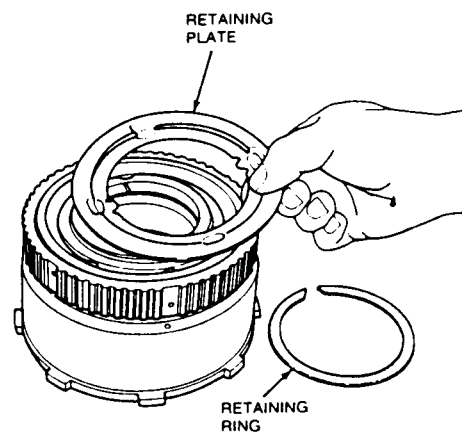


## Disassembly and Assembly

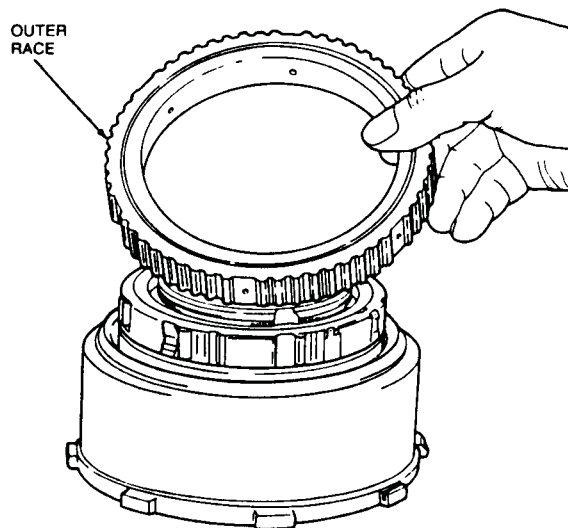
1. Using snap ring pliers, remove the clutch retaining ring.



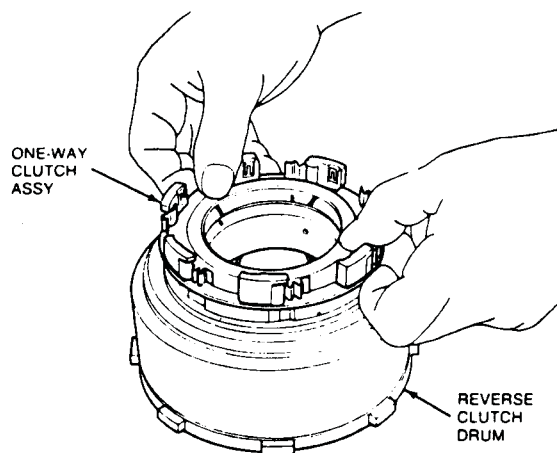
2. Remove the clutch retaining plate.



3. Remove the clutch outer race by lifting on the race while turning counterclockwise.



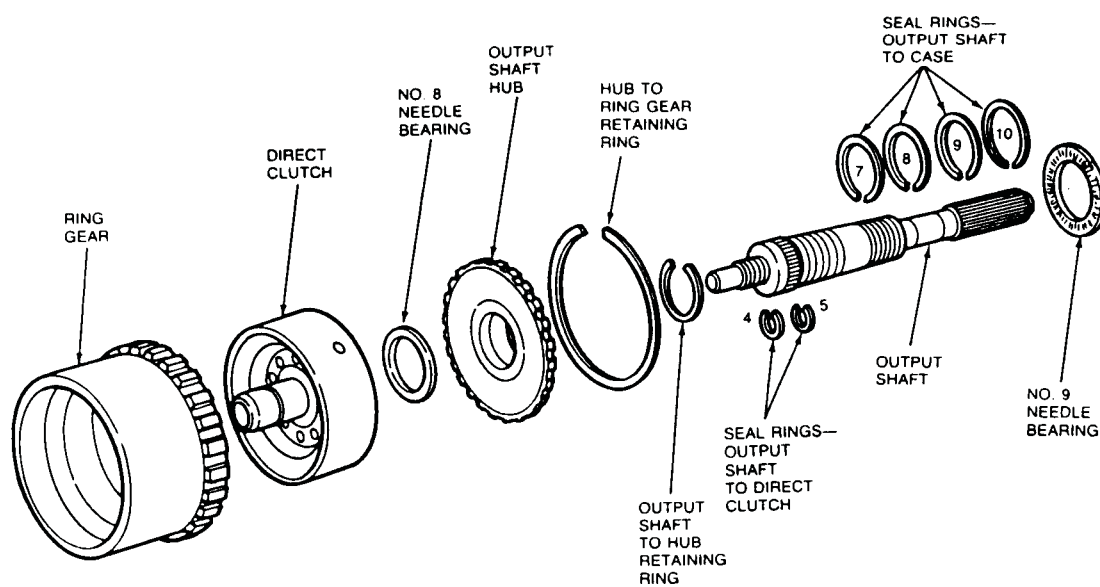
4. Carefully lift the one-way clutch from the inner race.



5. To assemble the intermediate one-way clutch, reverse Steps 1 through 4.

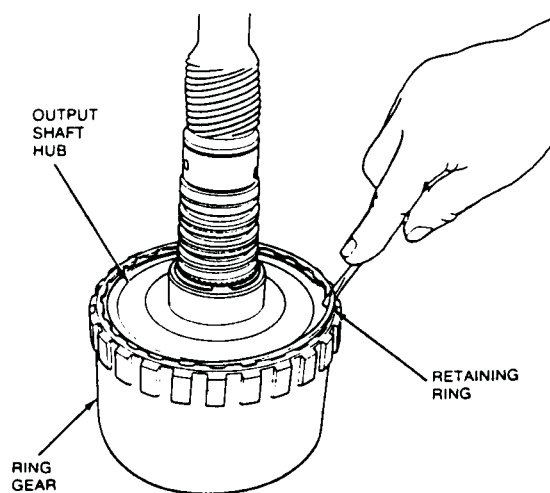


## Output Shaft

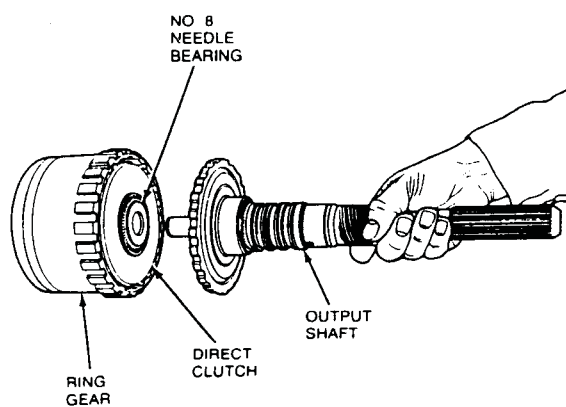


## Disassembly and Assembly

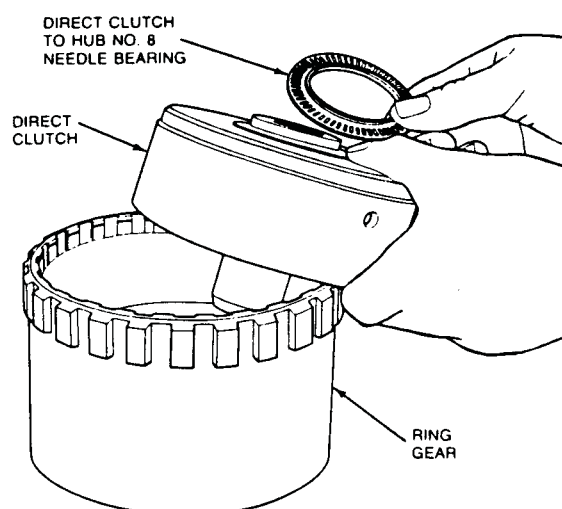
1. Remove the ring retaining the output shaft hub to the ring gear.



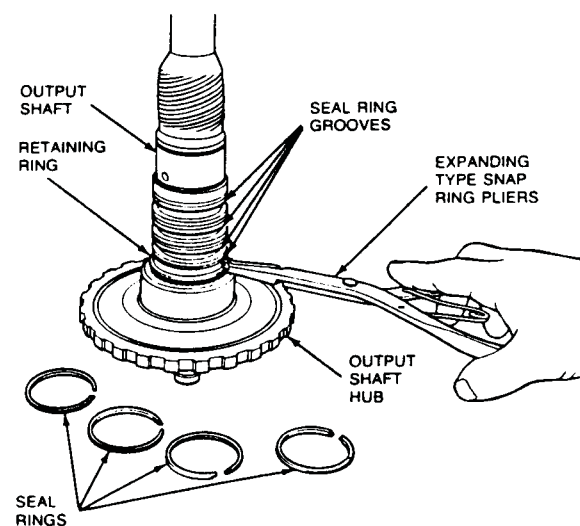
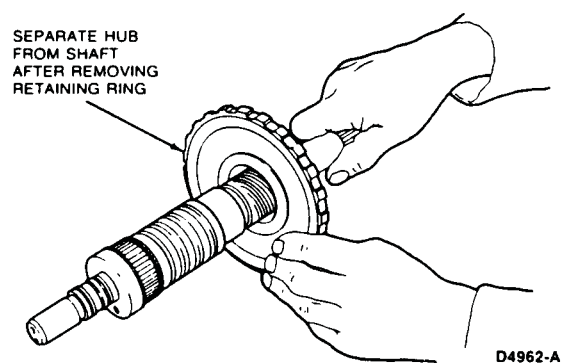
2. Separate the output shaft and hub assembly from the ring gear.



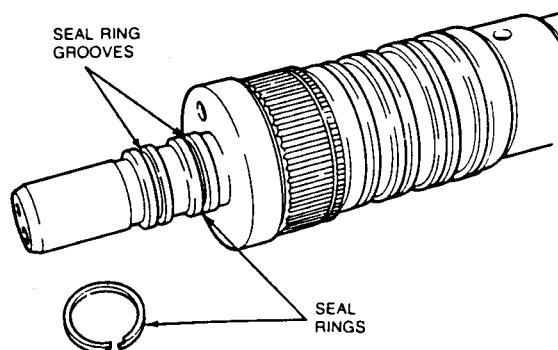
3. Remove the direct clutch from the ring gear and the No. 8 needle bearing from the back of the direct clutch.



4. Remove the four output shaft seal rings (7, 8, 9 and 10) and the hub-to-output shaft retaining ring. Separate the hub from the output shaft.



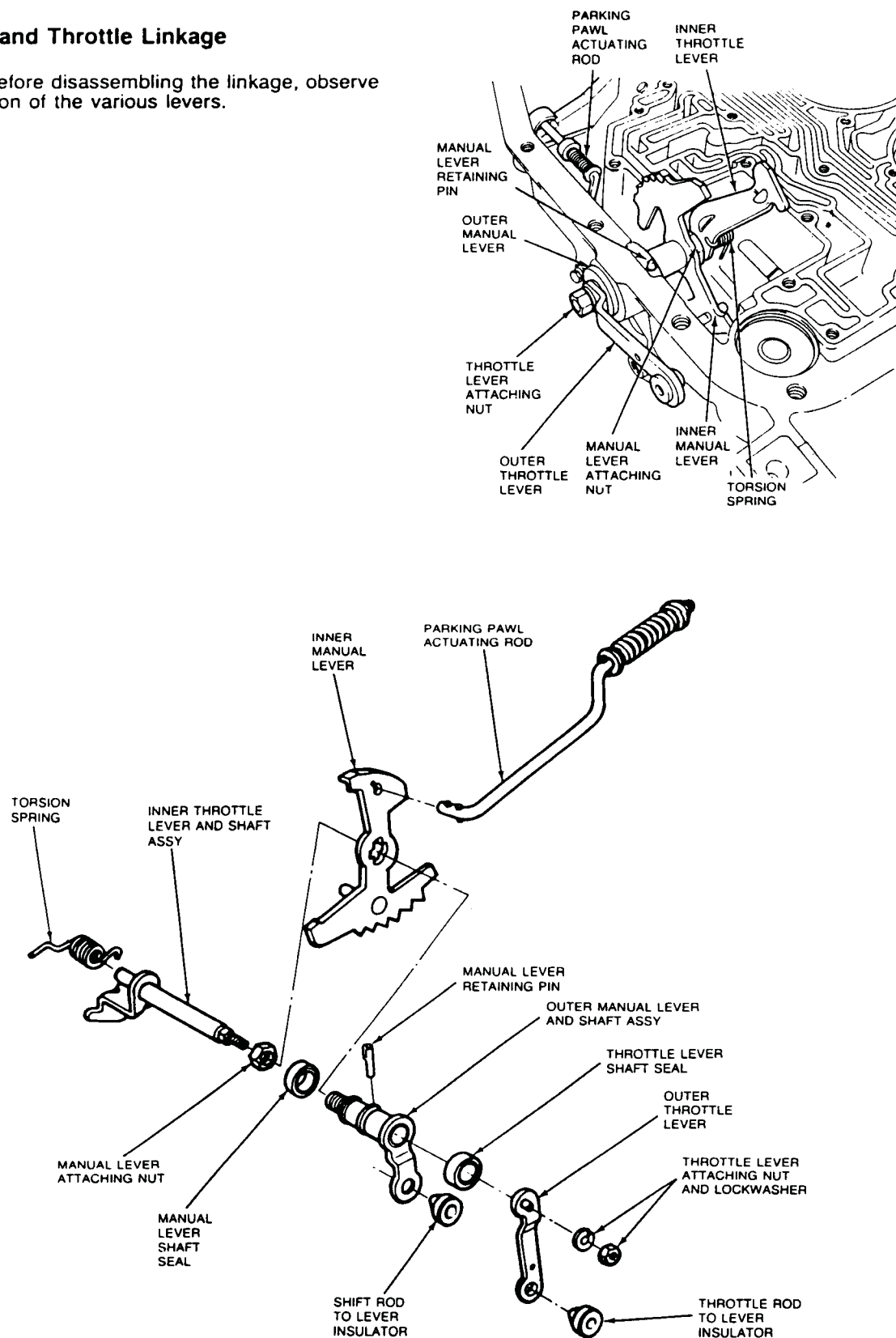
5. Remove the two direct clutch seal rings (5 and 6) from the output shaft.



6. To assemble the output shaft, reverse Steps 1 through 5.

## Manual and Throttle Linkage

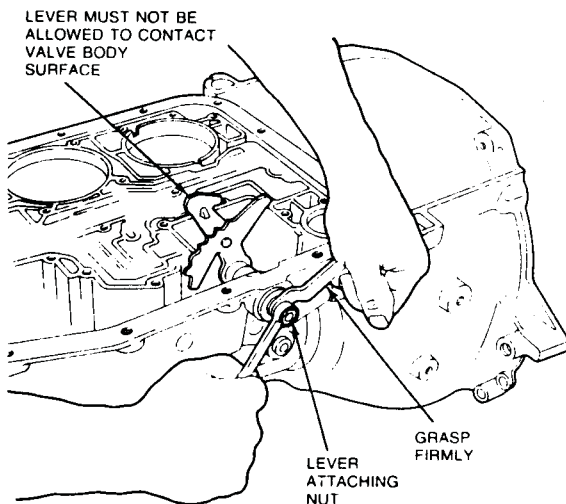
NOTE: Before disassembling the linkage, observe the location of the various levers.



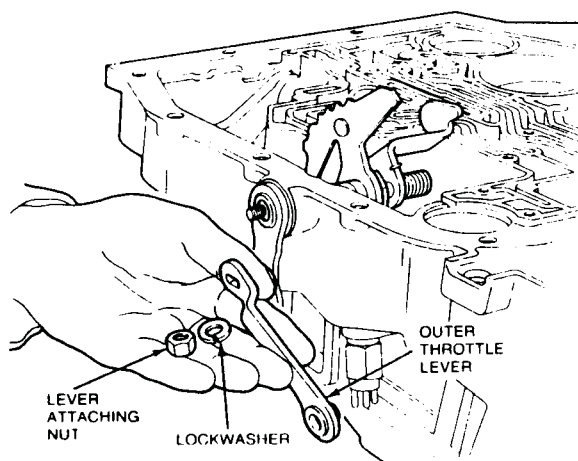
## Disassembly

1. Grasp the outer throttle lever firmly and loosen the lever attaching nut.

**NOTE:** The outer throttle lever must be held in the position shown to prevent the inner throttle lever from rotating against the machined valve body surface. Failure to observe this precaution could result in damage to the valve body surface.

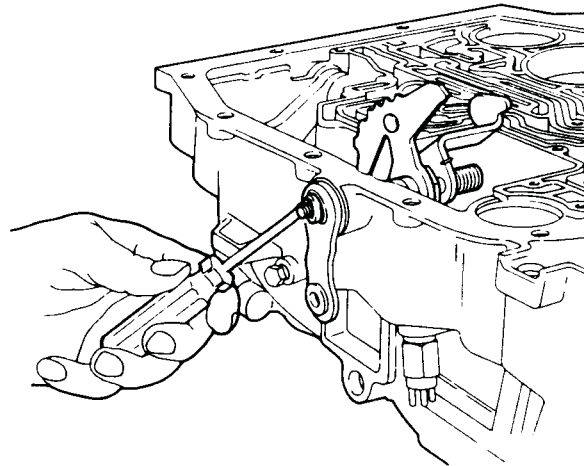


Remove the attaching nut, the lockwasher, and throttle lever.

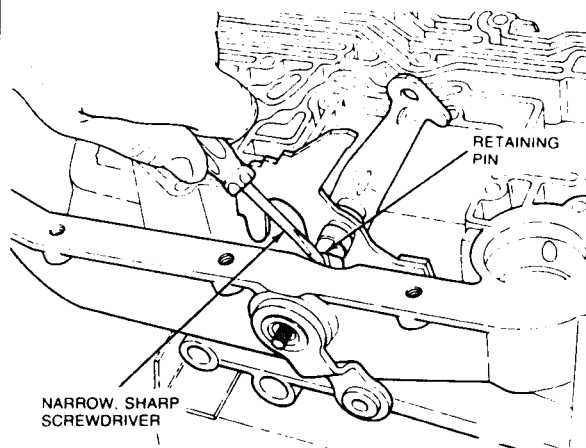


2. Using a small screwdriver or awl, remove the seal from the outer manual lever counterbore.

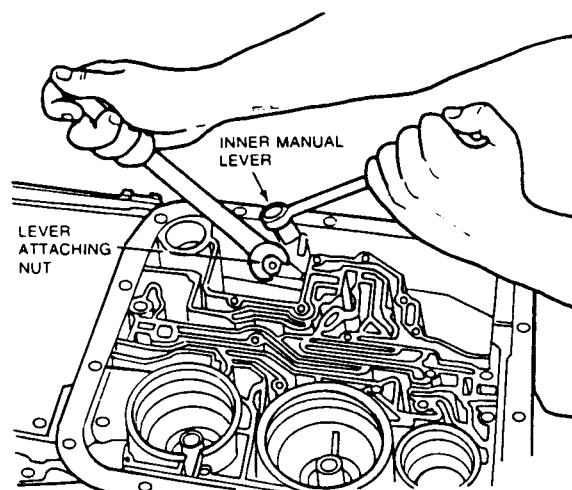
Discard seal.



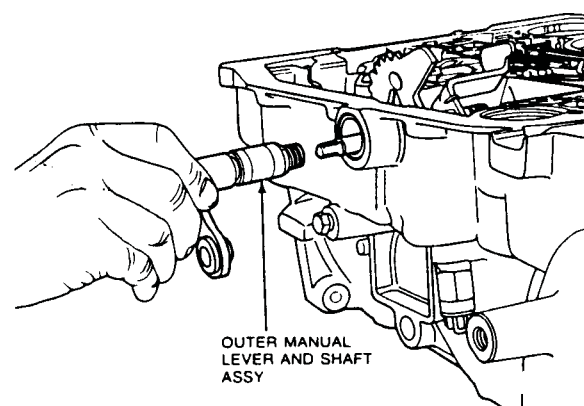
3. Using a narrow, sharp screwdriver, carefully remove the manual shaft retaining pin from the case.



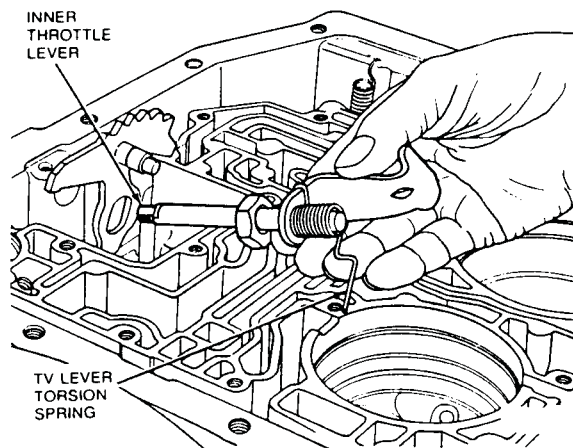
4. Slide a 5/8-inch box end wrench over the inner manual lever, close to the bottom of the lever. Do not allow the wrench to contact the "rooster comb" area. Using a 21mm wrench, remove the manual lever attaching nut while securely holding the inner manual lever.



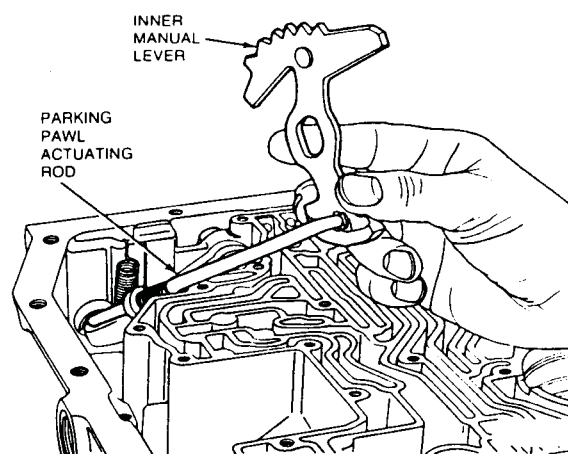
Thread the nut off the shaft and remove the lever.



5. Remove the inner throttle lever and TV lever torsion spring.



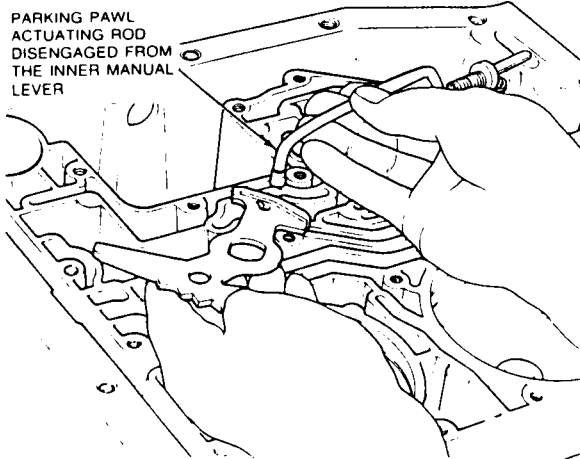
6. Remove the inner manual lever and parking pawl actuating rod as an assembly.





After removal, the rod may be disengaged from the lever.

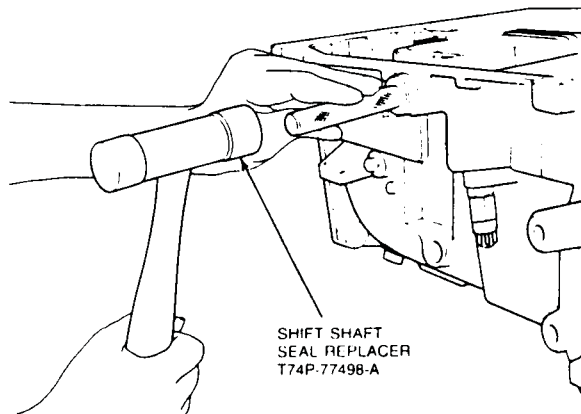
PARKING PAWL  
ACTUATING ROD  
DISENGAGED FROM  
THE INNER MANUAL  
LEVER



## Assembly

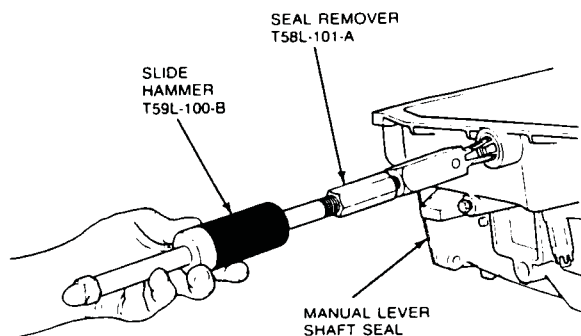
To assemble the manual throttle linkages, reverse the disassembly except for the following:

1. Install a new manual lever seal using Shift Shaft Seal Replacer T74P-77498-A or equivalent.



7. Remove the manual lever shaft seal from the case using Shift Shaft Seal Remover T58L-101-A and Impact Slide Hammer T59L-100-B or equivalent.

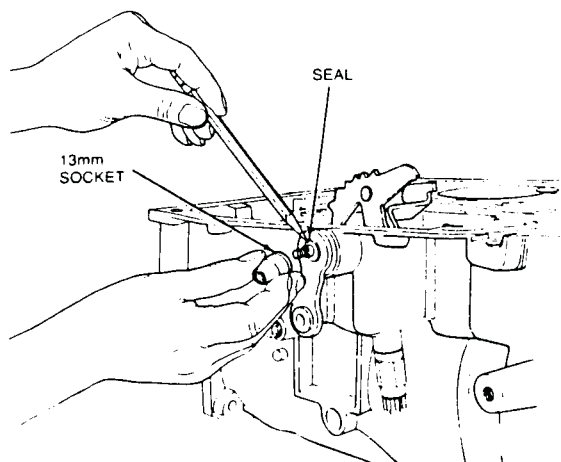
Discard seal.



2. Before installing the outer throttle lever, install a new seal in the outer manual lever. To seat the seal, a 13mm thin wall socket may be used.

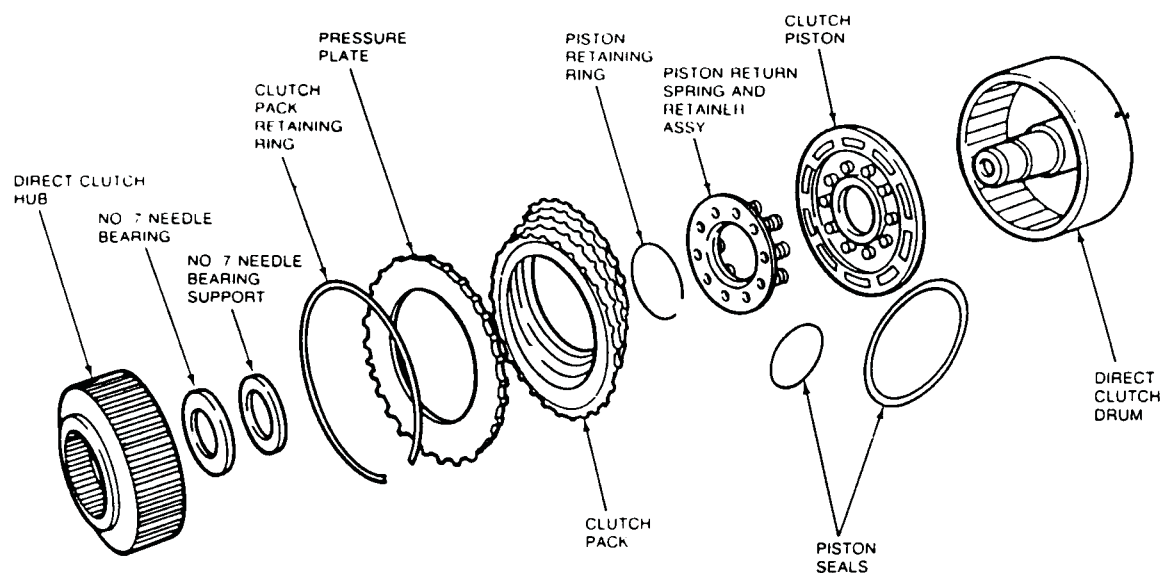
Position the ratchet end of the socket against the seal.

NOTE: The seal identification number must face outward.



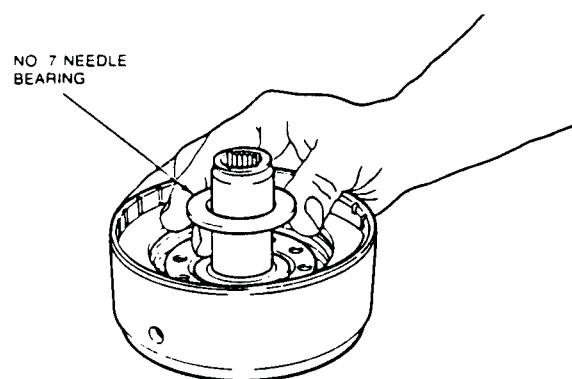


## Direct Clutch

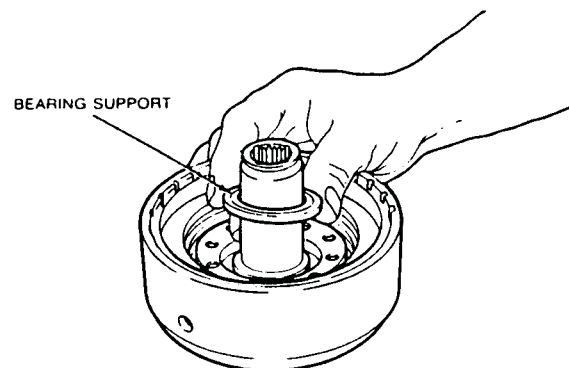


## Disassembly

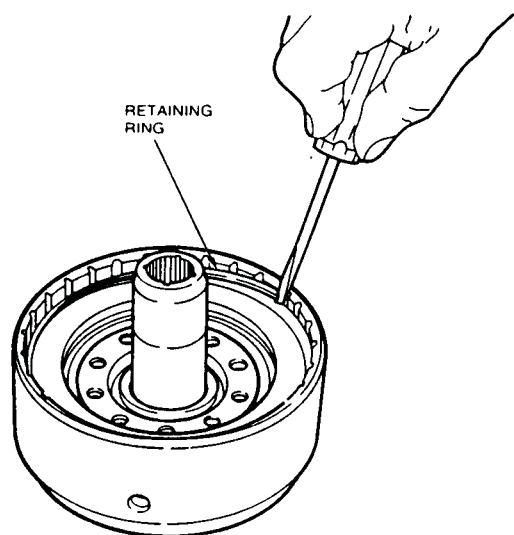
1. Remove the No. 7 direct clutch hub inner needle bearing.



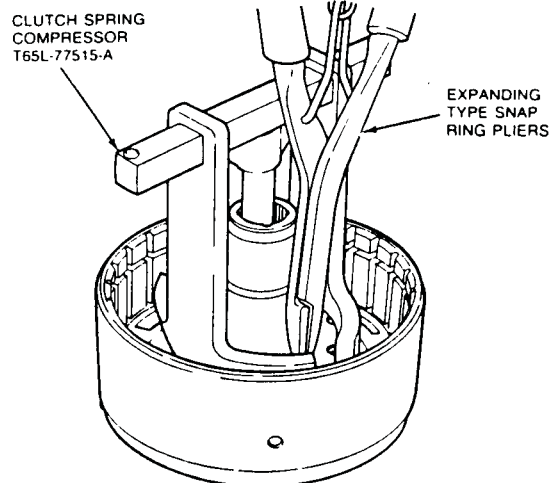
2. Remove bearing support.



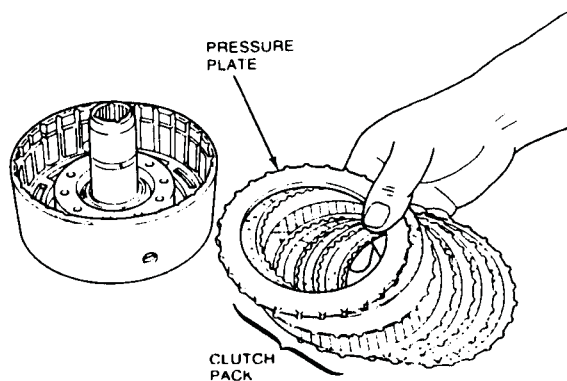
3. Remove the clutch pack selective retaining snap ring.



5. Using Clutch Spring Compressor T65L-77515-A or equivalent, compress the piston return springs. Remove the piston retaining ring using expanding type snap ring pliers.

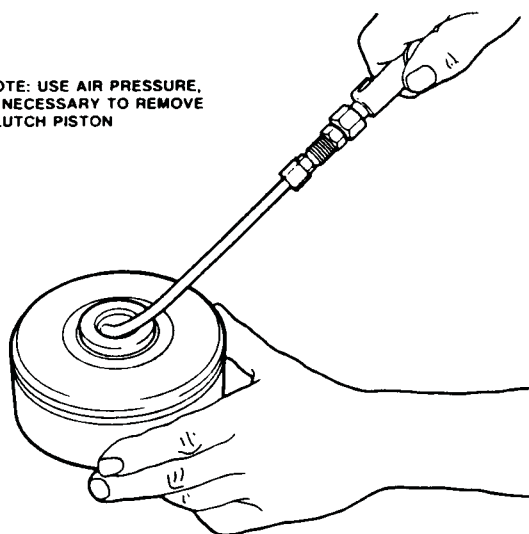


4. Remove the clutch pack from the drum.

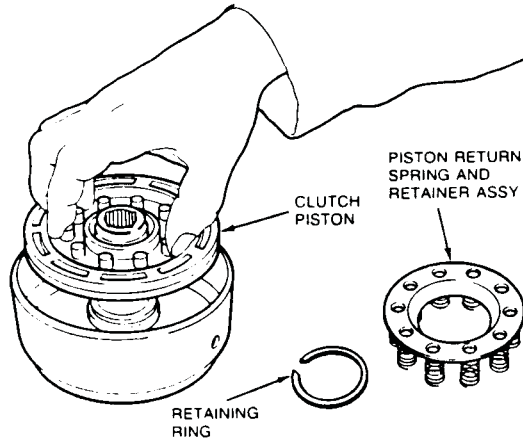


6. Remove the spring retainer assembly and piston from the drum.

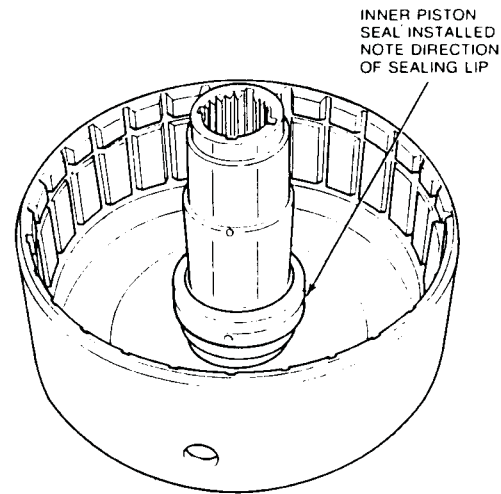
NOTE: USE AIR PRESSURE, IF NECESSARY TO REMOVE CLUTCH PISTON



Note the position and direction of the lip seals and then remove.

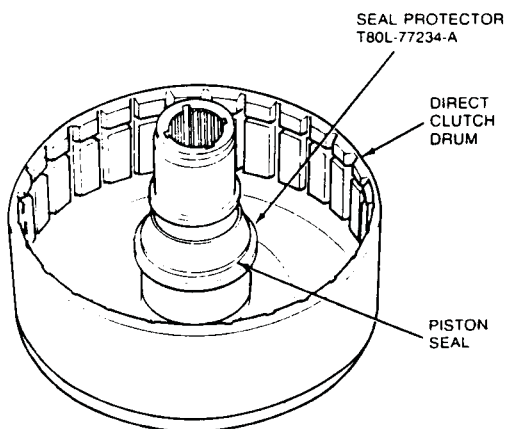


- d. Push the seal down until it snaps off the end of the protector onto the clutch hub.
- e. Remove the seal protector from the clutch hub.
- f. Slide the seal up until it seats in the seal groove.

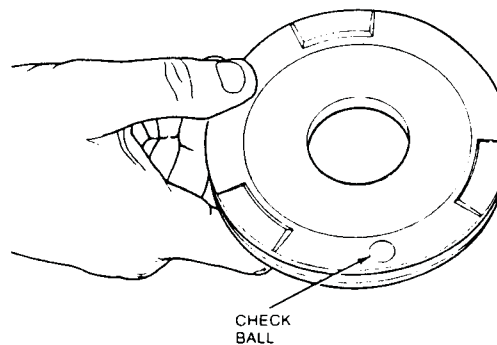


## Assembly

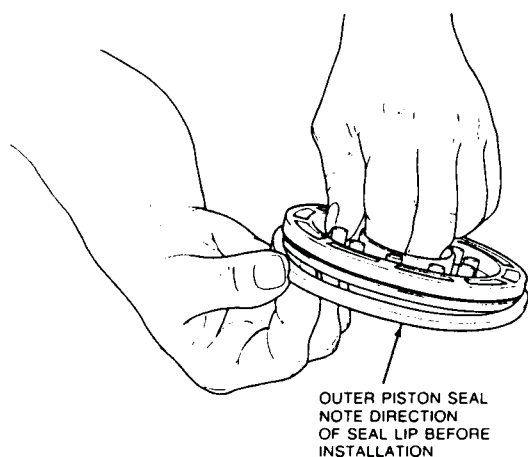
1. Install the inner piston seal on the clutch drum hub as follows:
  - a. Position Direct Clutch Lip Seal Protector T80L-77234-A or equivalent over the clutch drum hub.
  - b. Lubricate the seal and the seal protector with petroleum jelly.
  - c. Position the seal over the installer tool with the sealing lip facing down.



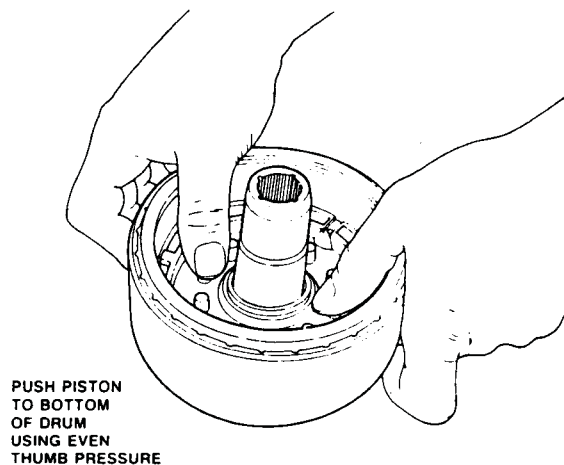
2. Inspect the piston check ball. Make sure the ball is present and moves freely. Check for leakage by performing the direct clutch piston check ball leakage procedure as outlined in Section 17-01.



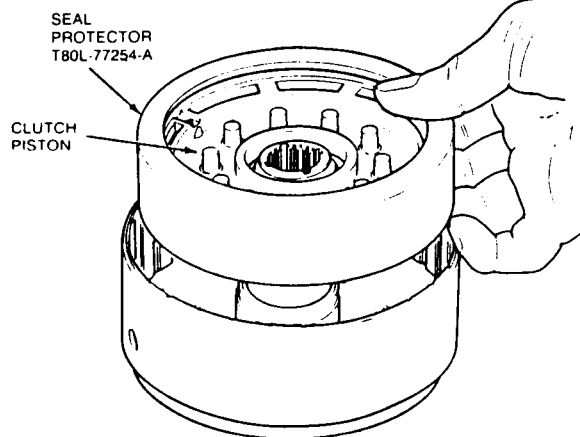
3. Install the outer clutch piston seal. Note the direction of the sealing lip before installation. The lip points away from the spring posts.



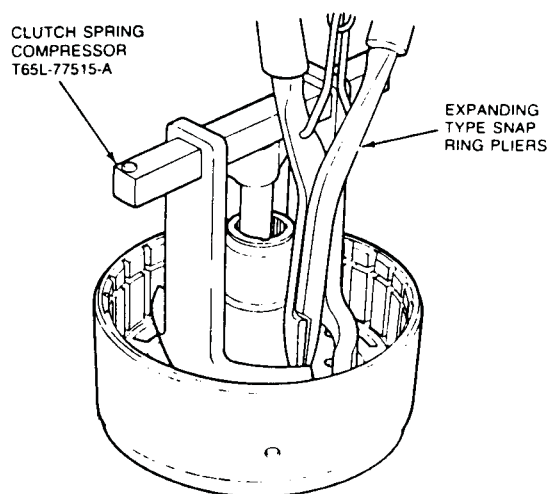
- c. Position the tool in the clutch drum and push the piston to the bottom of the drum using even thumb pressure.



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

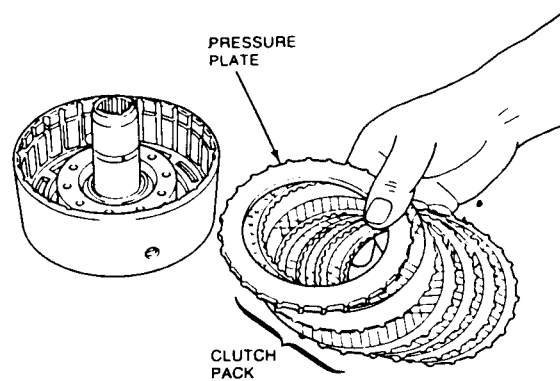


5. Install the piston spring and retainer assembly and retaining ring using Clutch Spring Compressor T65L-77515-A or equivalent.



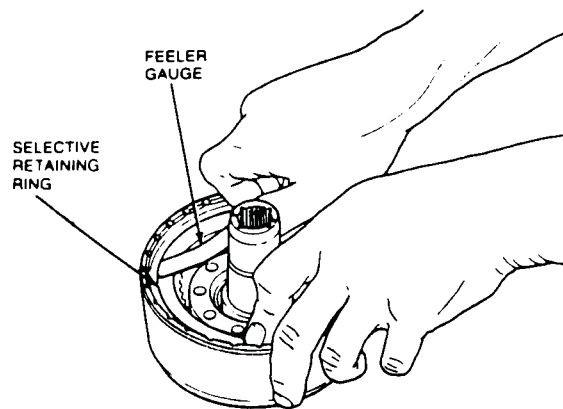


## 6. Install the clutch pack.



## 7. Install the clutch pack selective 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:

5.0L HO, 5.0L SEFI, 5.8L

1.3-1.77mm (0.050-0.067 inch).

3.8L

1.0-1.44mm (0.040-0.057 inch).

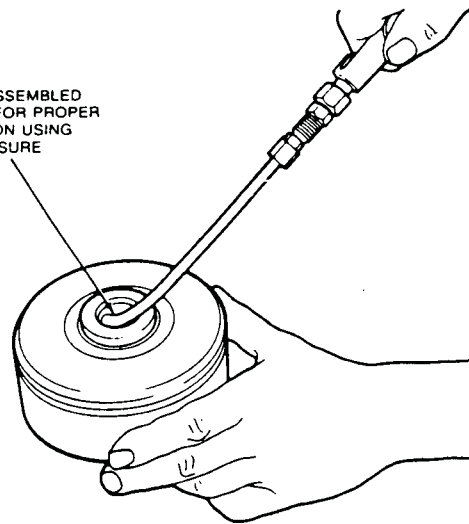
If the clearance is not within limits, selective snap rings are available in the following thicknesses:

- 0.050-0.054 inch
- 0.064-0.068 inch
- 0.078-0.082 inch
- 0.092-0.096 inch

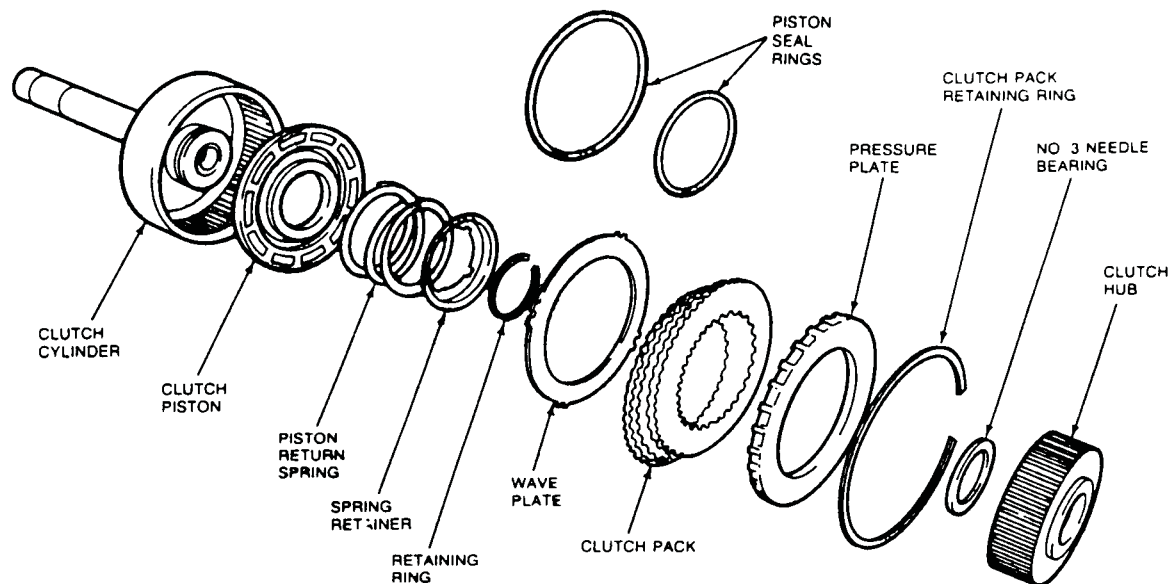
Install the correct size snap ring and recheck the clearance.

8. Check the clutch for proper operation using air pressure. The clutch should be heard and felt to apply smoothly and without leakage.

CHECK ASSEMBLED  
CLUTCH FOR PROPER  
OPERATION USING  
AIR PRESSURE

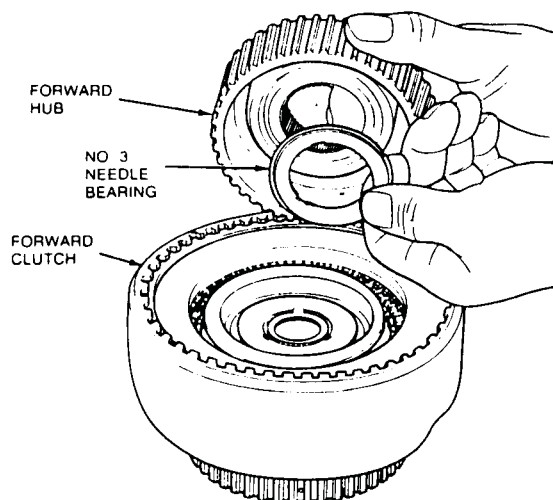


## Forward Clutch



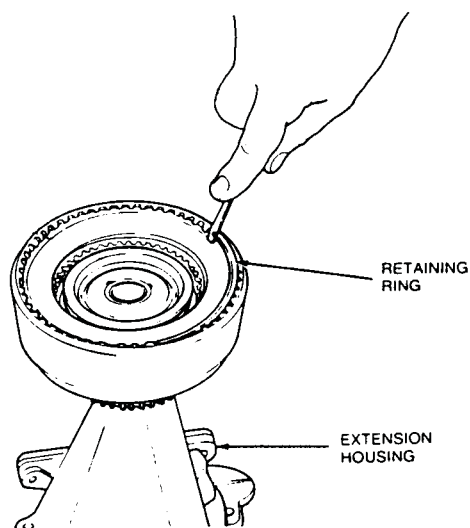
## Disassembly

1. Remove the clutch hub and No. 3 needle bearing, if not already removed.

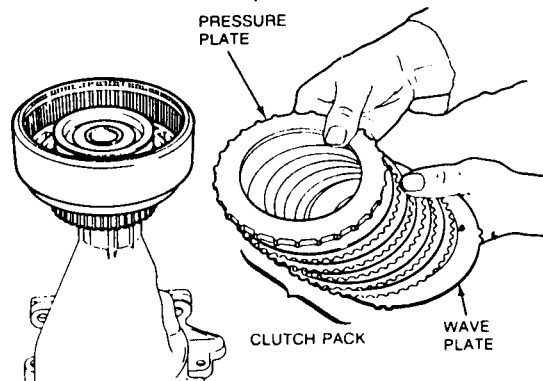


2. Remove the clutch pack selective retaining ring.

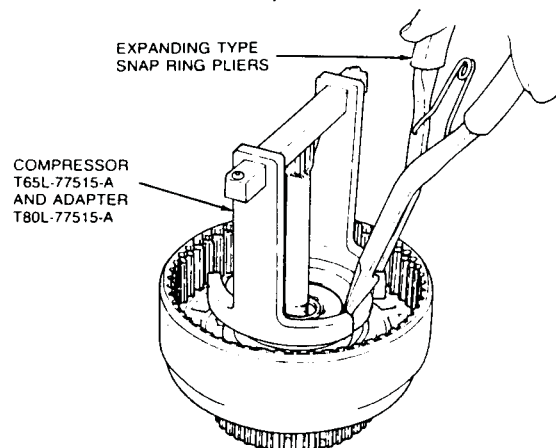
NOTE: To aid handling, the clutch may set in the extension housing or a 51mm (2-inch) diameter hole may be cut in the work bench.



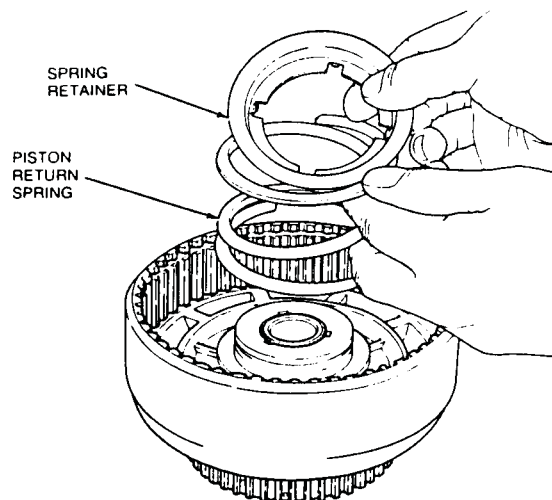
3. Remove the clutch pack.



4. Compress the piston return spring using Clutch Spring Compressor T65L-77515-A, and Forward Clutch Spring Compressor Adapter T80L-77515-A or equivalent.

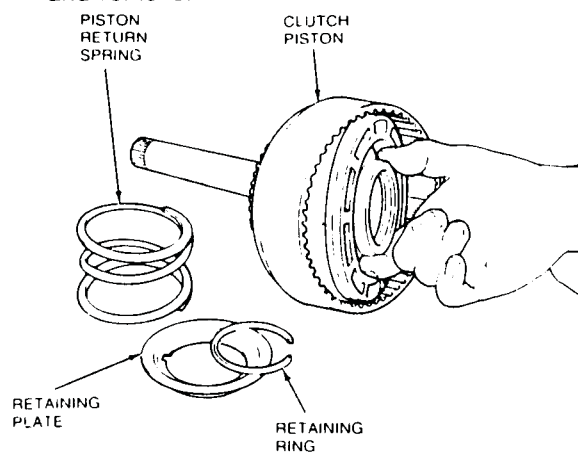


Remove the retaining ring and spring retainer.

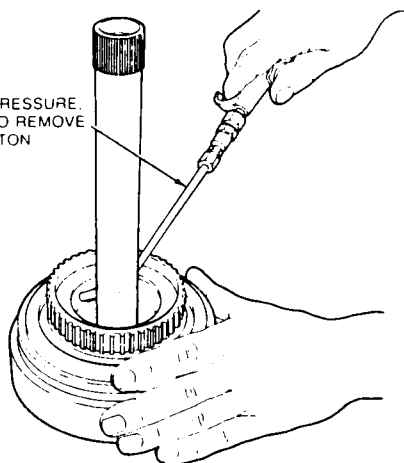


## 5. Remove the clutch piston.

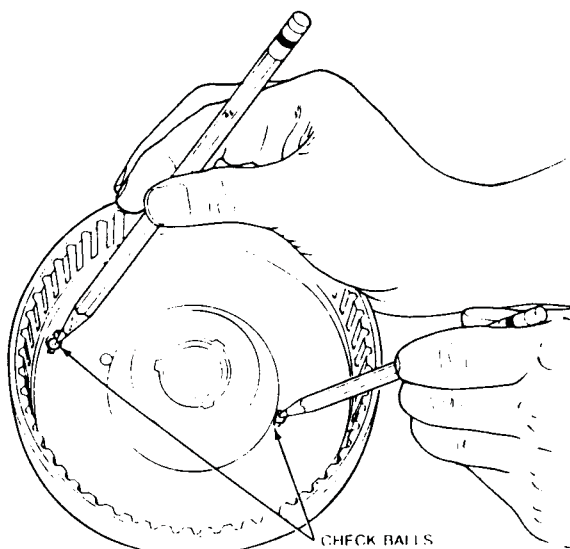
Note the position and direction of the lip seals and remove.



NOTE: USE AIR PRESSURE, IF NECESSARY TO REMOVE THE CLUTCH PISTON

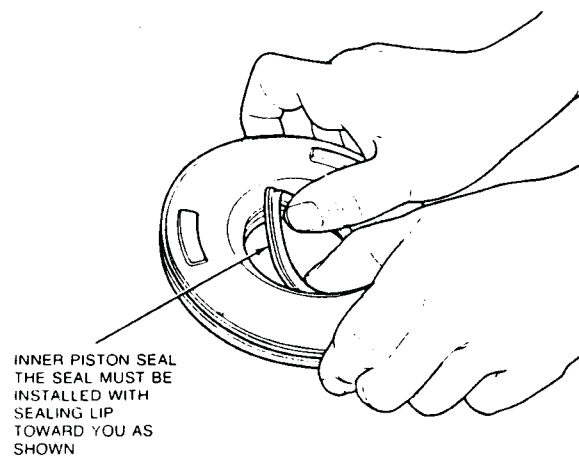
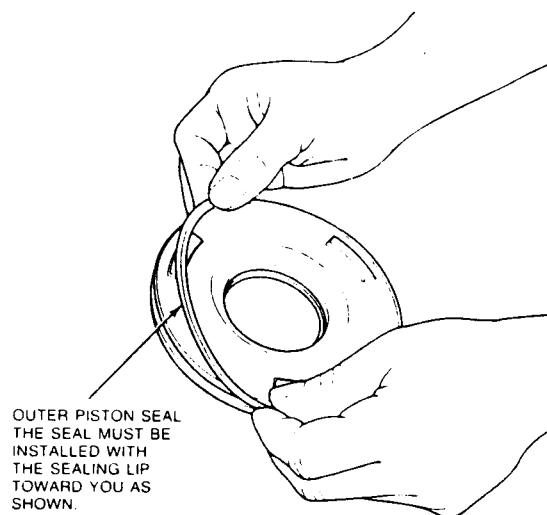


NOTE: Make sure check balls in clutch piston are free.



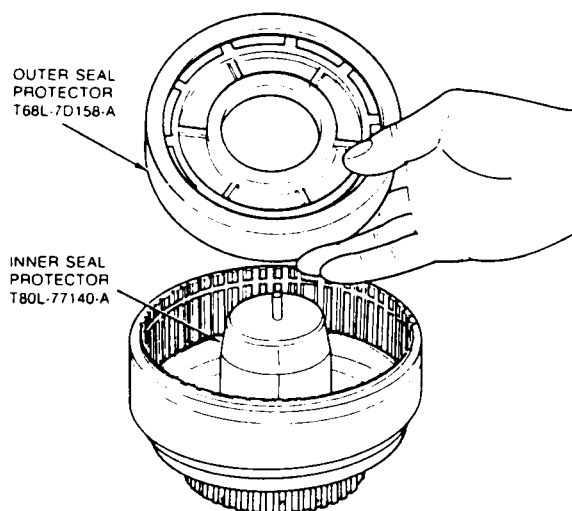
## Assembly

1. Install new seals on the clutch piston. Note the direction of the sealing lip before installation.

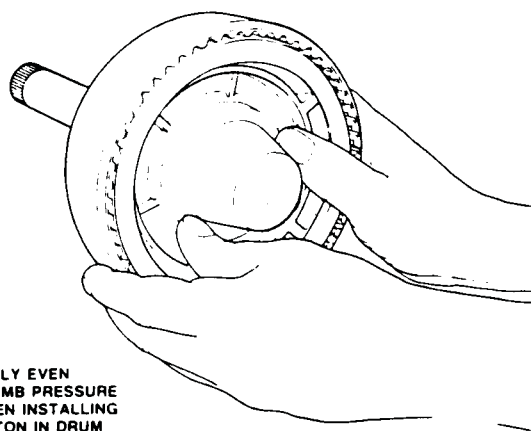


## 2. Install the clutch piston as follows:

- a. Coat the piston seals and the clutch drum sealing area with petroleum jelly.
- b. Install the Forward Clutch Lip Seal Protect or (inner), T80L-77140-A or equivalent, over the clutch cylinder hub.

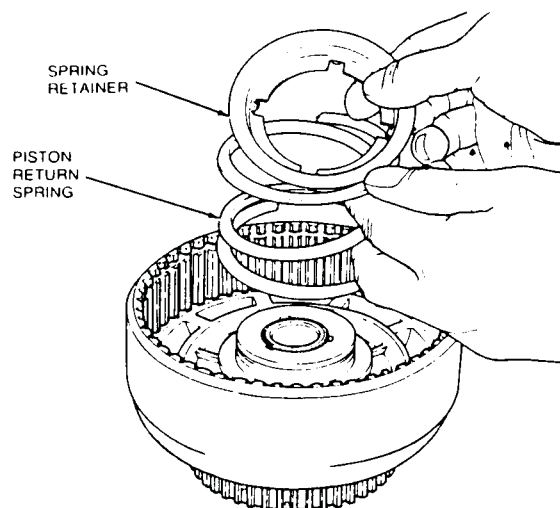


- c. Install the piston in the Forward Clutch Lip Seal Protector (outer), T68P-7D158-A or equivalent.
- d. Position the seal protector and piston in the clutch drum. Push the piston to the bottom of the drum using even thumb pressure.

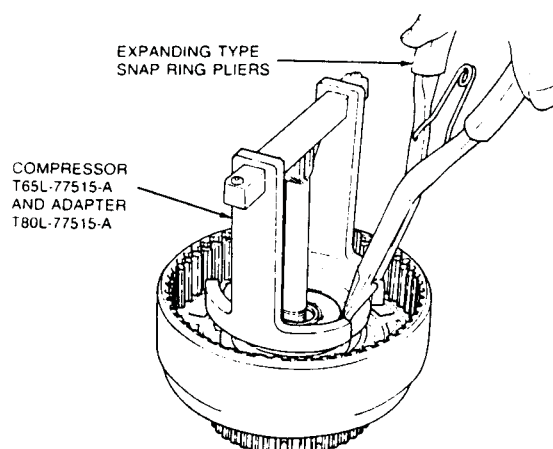


APPLY EVEN  
THUMB PRESSURE  
WHEN INSTALLING  
PISTON IN DRUM

## 3. Install the piston return spring, the spring retainer and the retaining ring.

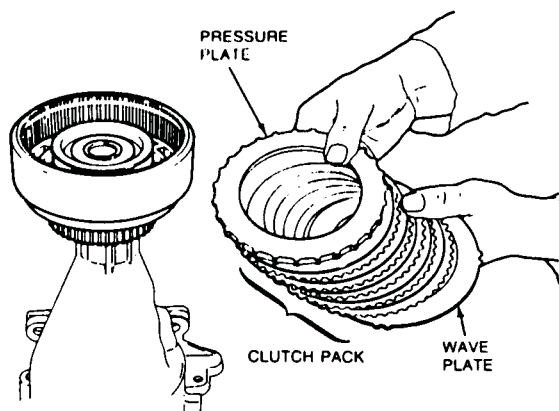


Compress the piston return spring using Clutch Spring Compressor T65L-77515-A and Forward Clutch Spring Compressor Adapter T80L-77515-A or equivalent.

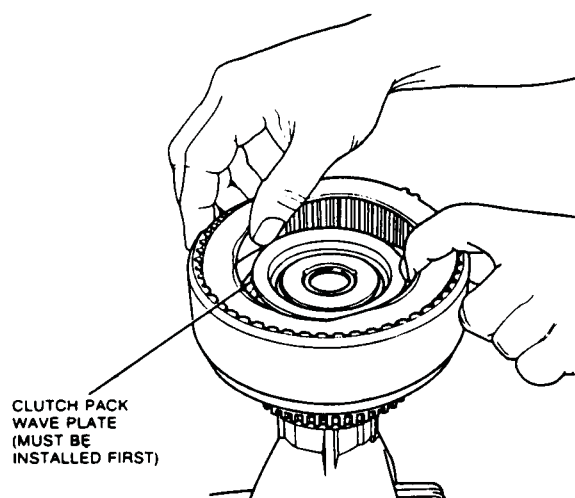




4. Install the clutch pack.

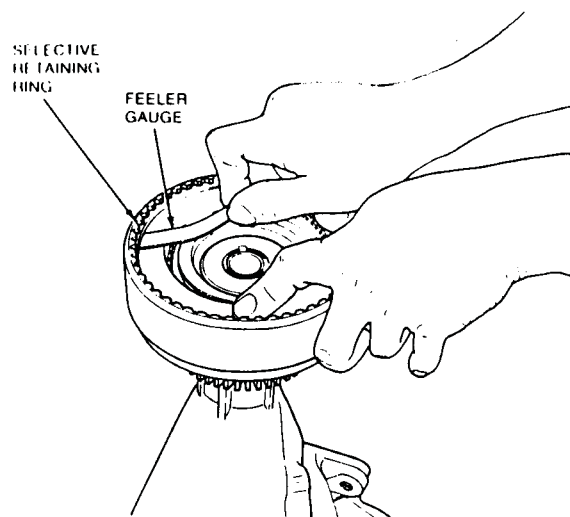


NOTE: The wave plate must be installed first.



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)

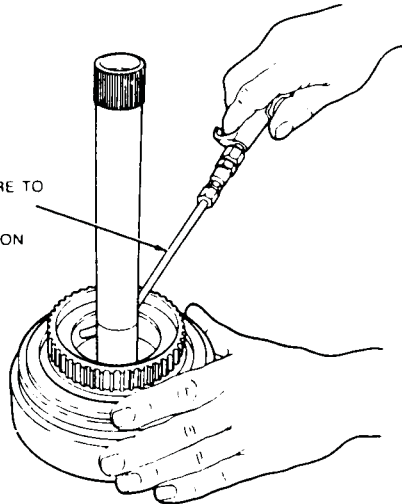
If the clearance is not within specification, selective snap rings are available in the following thicknesses:

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

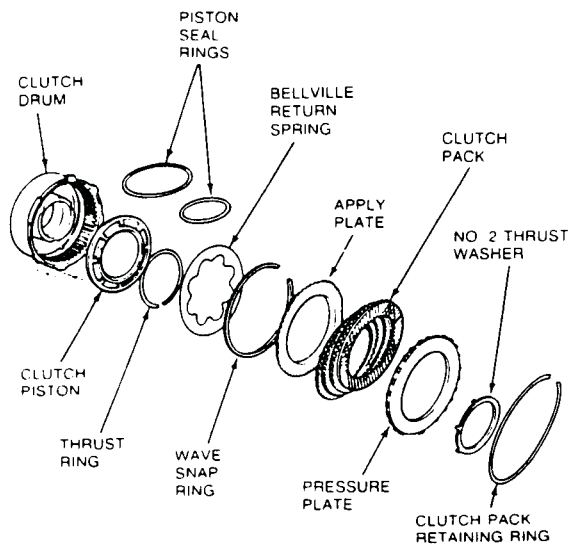
Install the correct size snap ring and recheck the clearance.

6. Check the clutch for proper operation using air pressure. The clutch should be heard and felt to apply smoothly and without leakage.

USE AIR PRESSURE TO CHECK CLUTCH ASSEMBLY FOR PROPER OPERATION

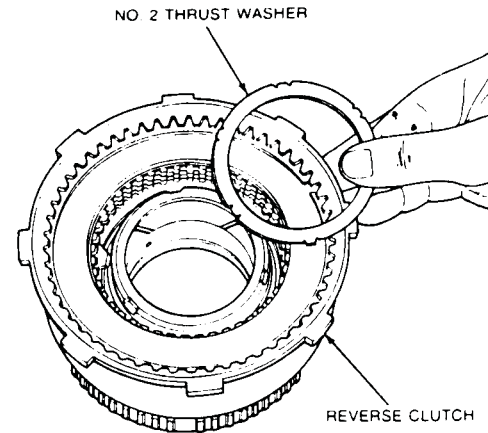


## Reverse Clutch

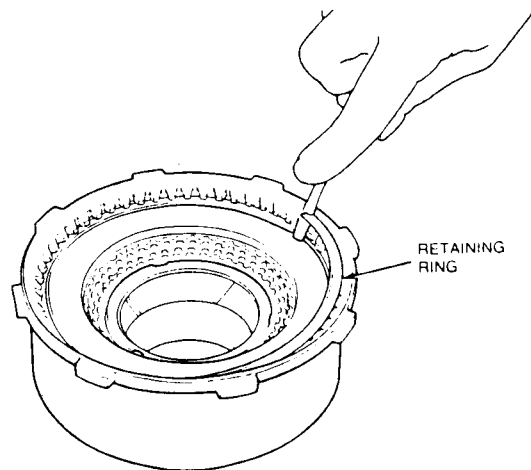


## Disassembly

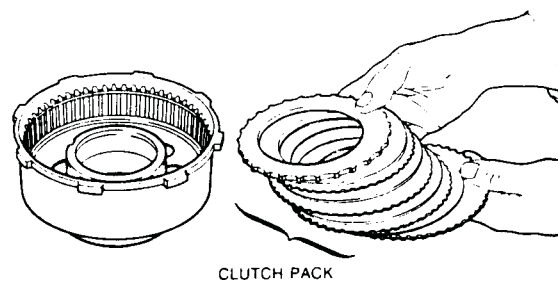
1. Remove the No. 2 thrust washer.



2. Remove the clutch pack retaining ring.

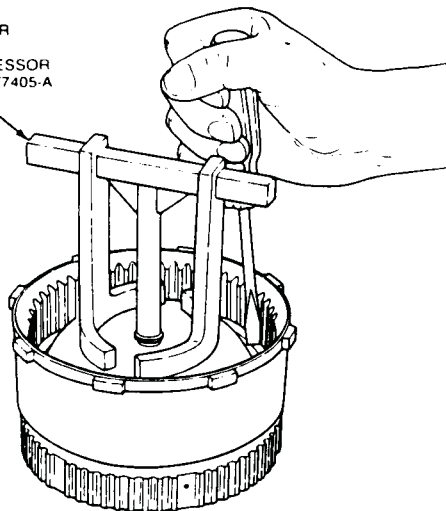


3. Remove the clutch pack.

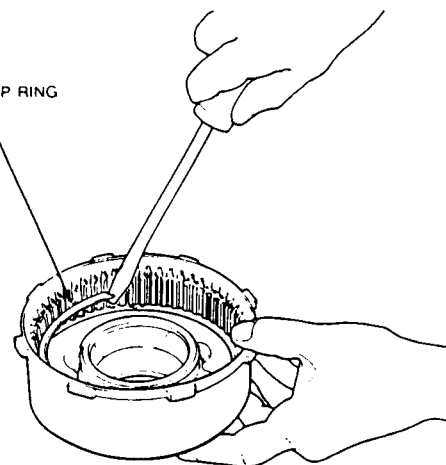


4. Remove the wave snap ring using Clutch Spring Compressor T65L-77515-A and Reverse Clutch Spring Compressor Plate T80L-77405, or equivalent.

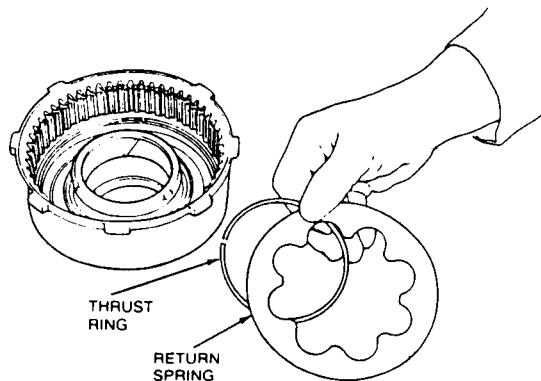
COMPRESSOR  
T65L-77515-A  
AND COMPRESSOR  
PLATE T80L-77405-A



WAVE SNAP RING

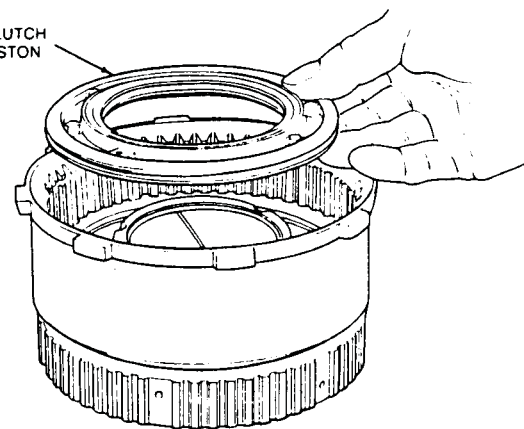


5. Remove the piston return spring and the thrust ring.



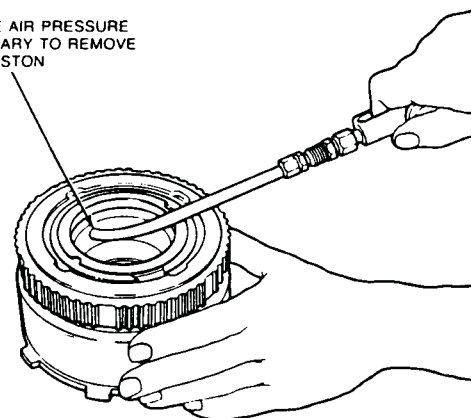
6. Remove the clutch piston.

CLUTCH  
PISTON



NOTE: To aid removal, it may be necessary to apply air pressure to the drum. Block the opposite hole with a finger.

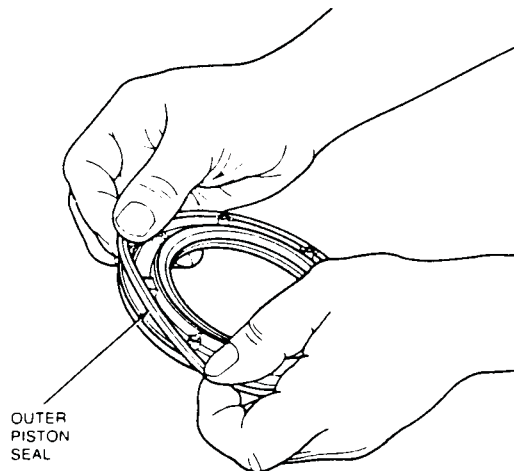
NOTE: USE AIR PRESSURE  
IF NECESSARY TO REMOVE  
CLUTCH PISTON



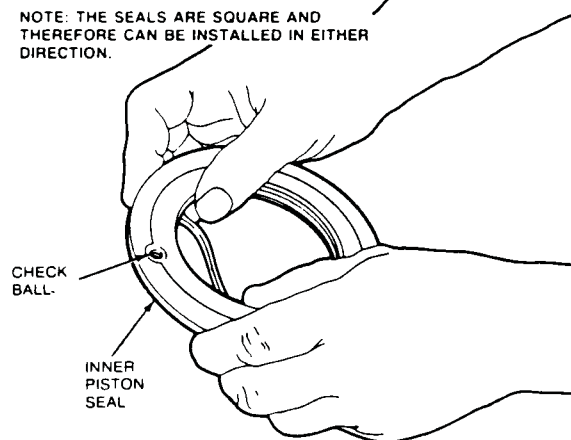
## Assembly

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.

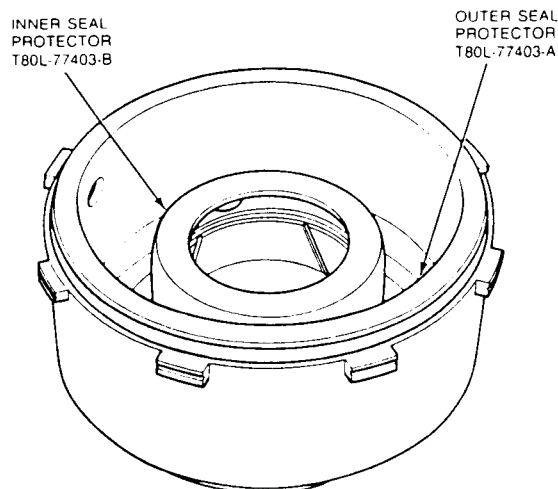


NOTE: THE SEALS ARE SQUARE AND THEREFORE CAN BE INSTALLED IN EITHER DIRECTION.

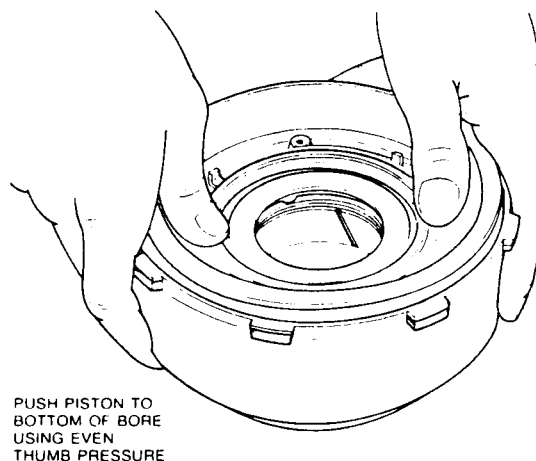


2. Install the clutch piston as follows:

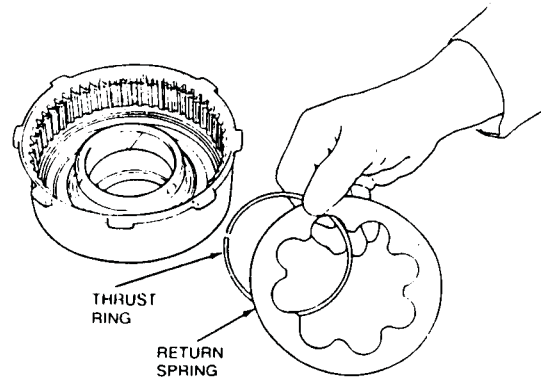
- a. Coat the piston seals and clutch drum seating area with petroleum jelly.
- b. Install Reverse Clutch Seal Protector (inner) T80L-77403-B and Reverse Clutch Seal Protector (outer) T80L-77403-A or equivalent in the clutch drum.



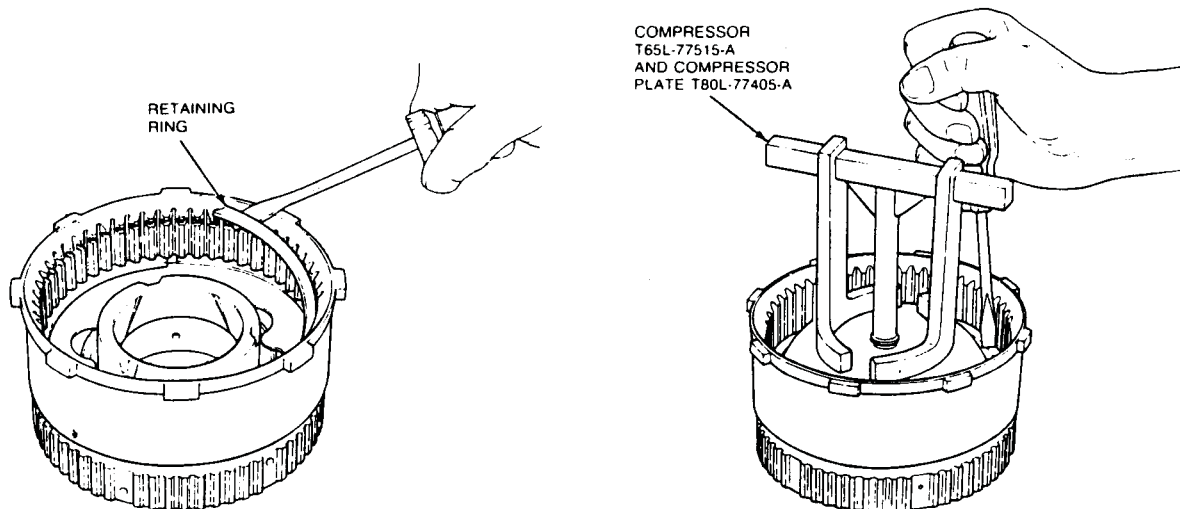
- c. Coat the piston seals, the clutch drum sealing area and the seal protector with petroleum jelly.
- d. Position the piston and push it to the bottom of the drum using even thumb pressure.



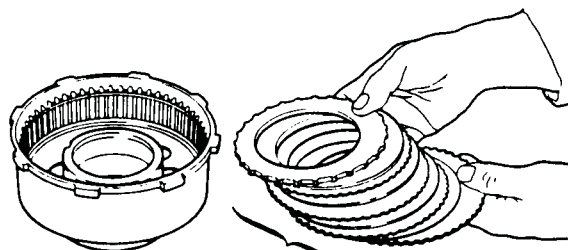
3. Install the piston thrust ring and the piston return spring.



4. Install the wave snap ring (with points down) using Clutch Spring Compressor T65L-77515-A and Reverse Clutch Spring Compressor Plate T80L-77405-A or equivalent.

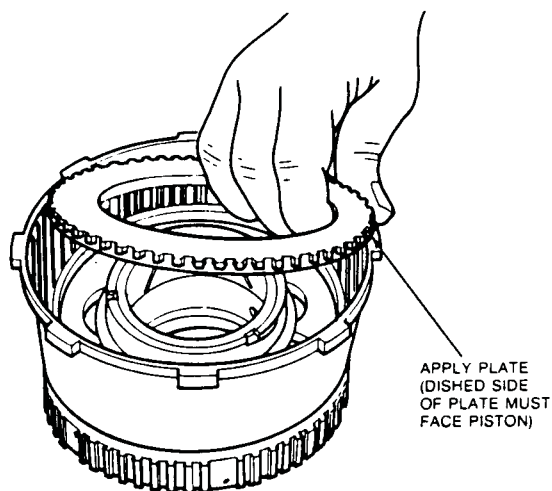


5. Install the clutch pack.



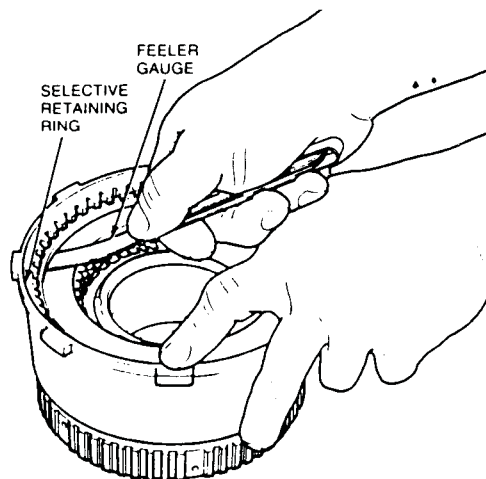
CLUTCH PACK

NOTE: The apply plate must be installed first. Note that the dished side of the plate must face the piston.



APPLY PLATE  
(DISHED SIDE  
OF PLATE MUST  
FACE PISTON)

6. 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:

5.0L (302 CID), 3.8L (232 CID)

.76-1.42mm (0.030-0.056 inch)

5.8L (351 CID)

1.02-1.91mm (0.040-0.075 inch)

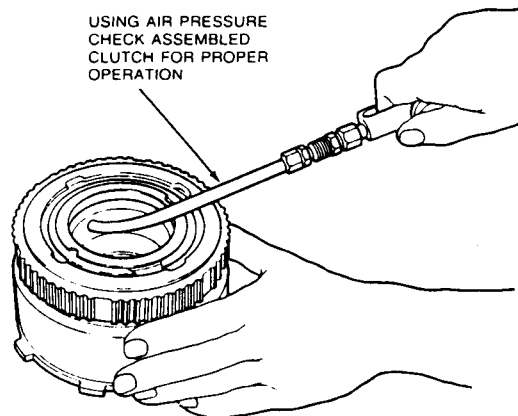
If the clearance is not within specification, selective snap rings are available in the following thicknesses:

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

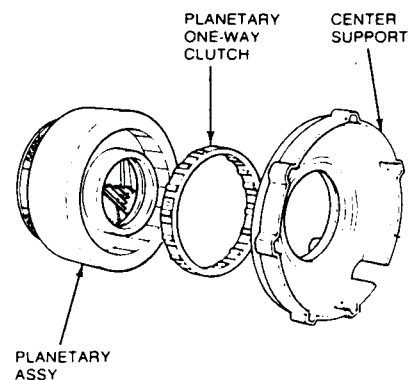
Install the correct size snap ring and recheck the clearance.



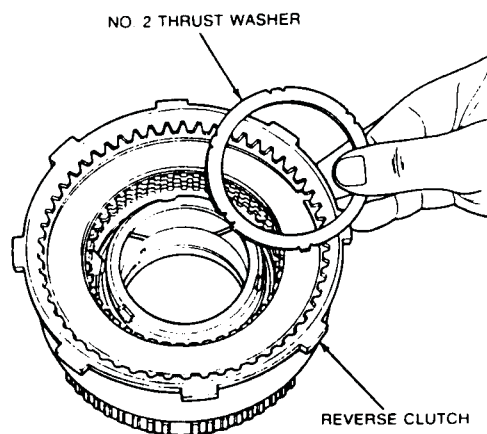
7. Check the clutch for proper operation using air pressure. The clutch should be heard and felt to apply smoothly and without leakage.



## Center Support and Planetary One-Way Clutch

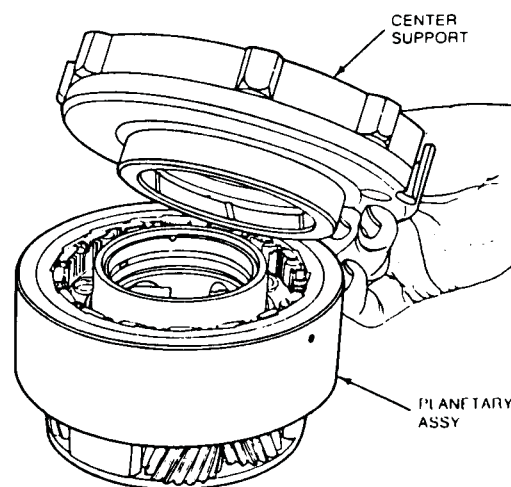


8. Install the No. 2 thrust washer.

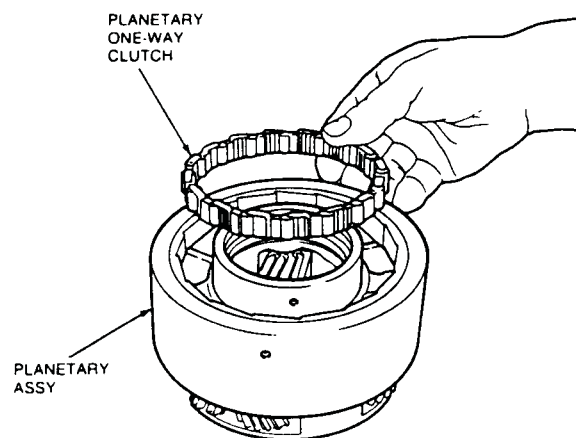


## Disassembly

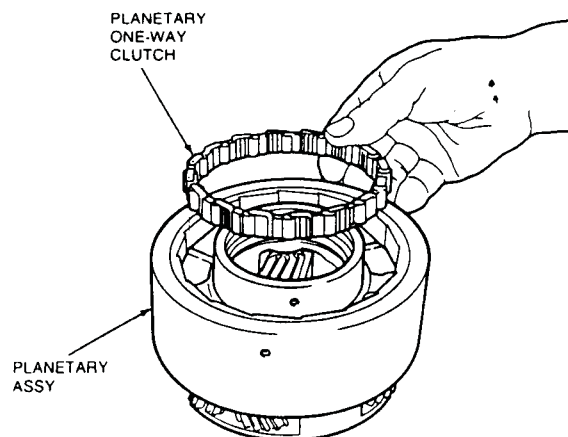
1. Remove the center support from the planetary carrier. Rotate the center support counterclockwise and lift.



2. Carefully remove the planetary one-way clutch from the planetary assembly.

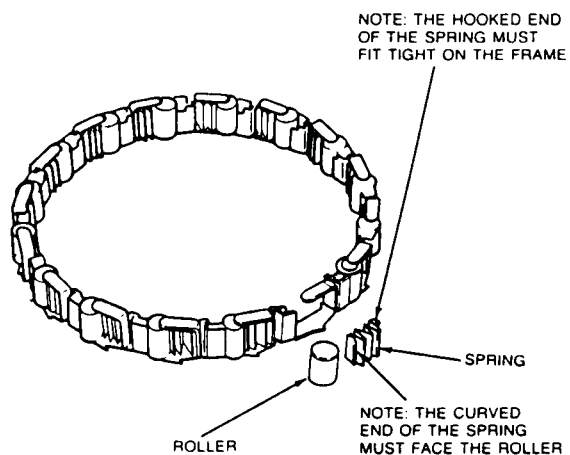


2. Install the one-way clutch in the planetary carrier.



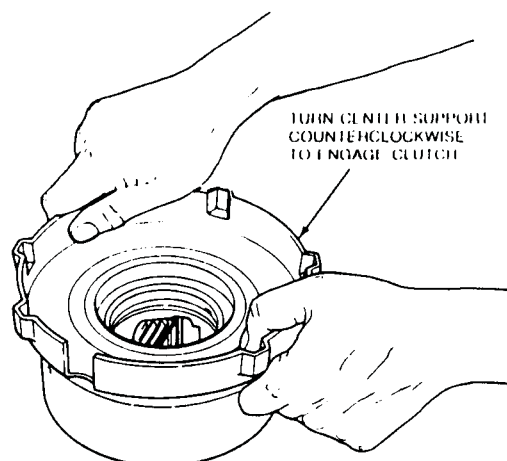
## Assembly

1. If necessary, assemble the one-way clutch.

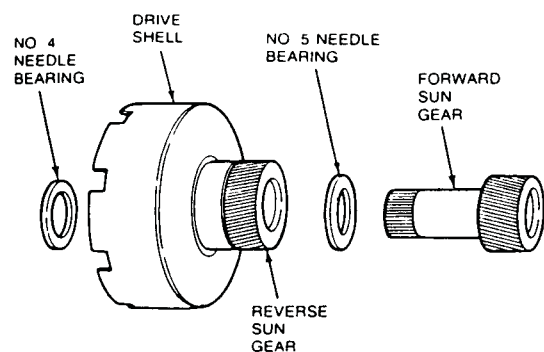


3. Install the center support into the one-way clutch by rotating the center support counterclockwise.

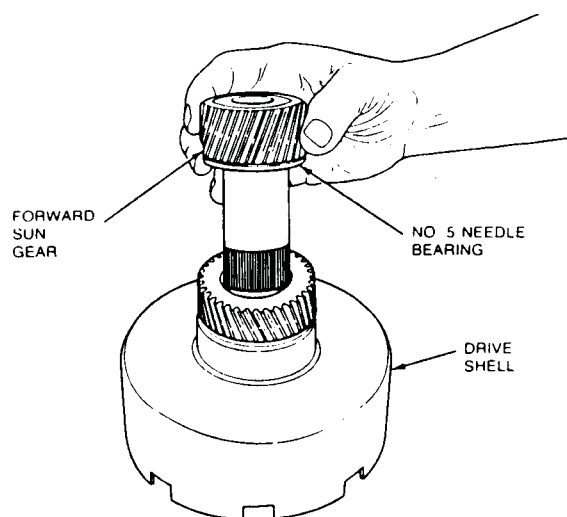
Lubricate the clutch races and the clutch assembly with petroleum jelly to aid in assembly.



## Sun Gear and Drive Shell

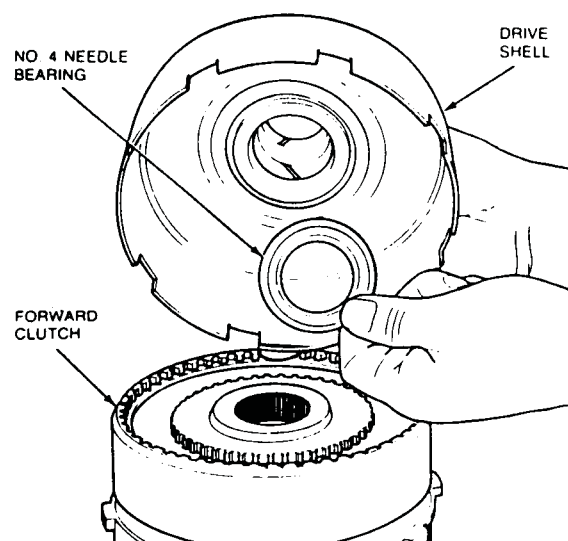


2. Remove the forward sun gear and No. 5 needle bearing from the drive shell.

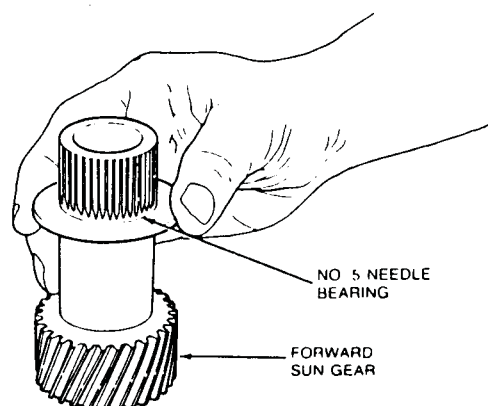


## Disassembly

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



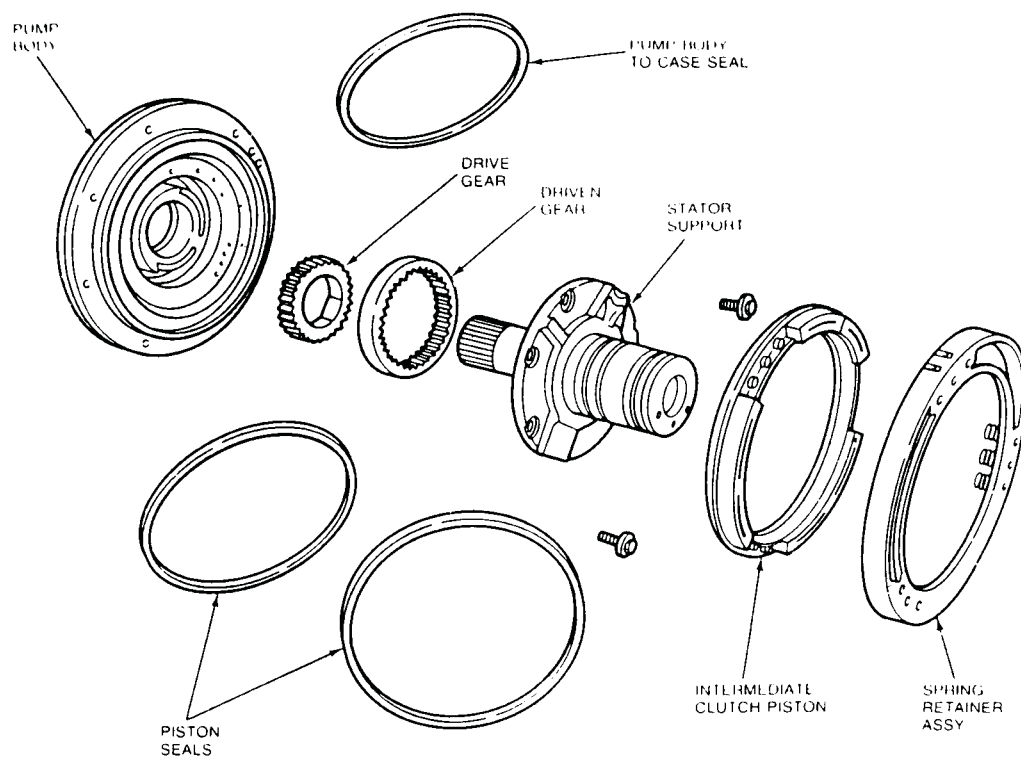
3. Remove the No. 5 needle bearing from the forward sun gear.



## Assembly

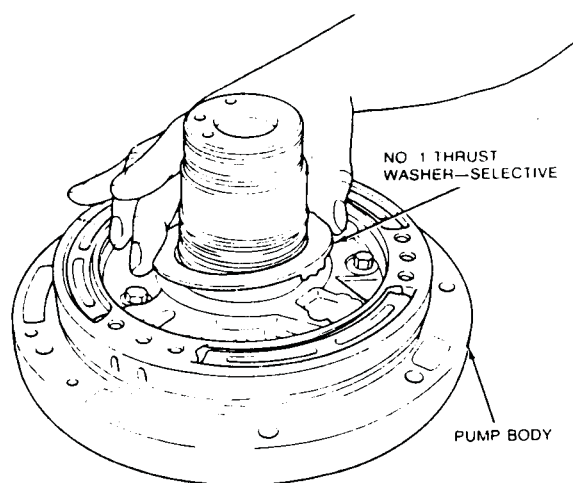
The sun gear and drive shell is assembled as part of the transmission assembly procedure.

## Pump and Intermediate Clutch Piston



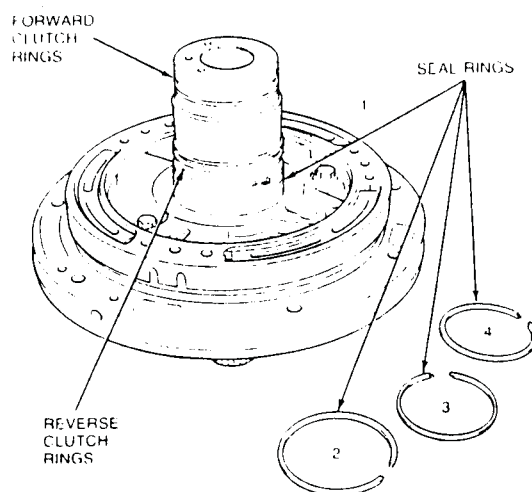
### Disassembly

1. Remove the No. 1 thrust washer.

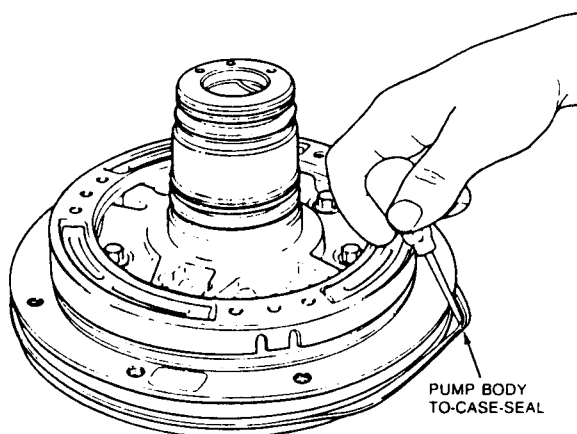


2. Remove the four pump seal rings (1, 2, 3 and 4).

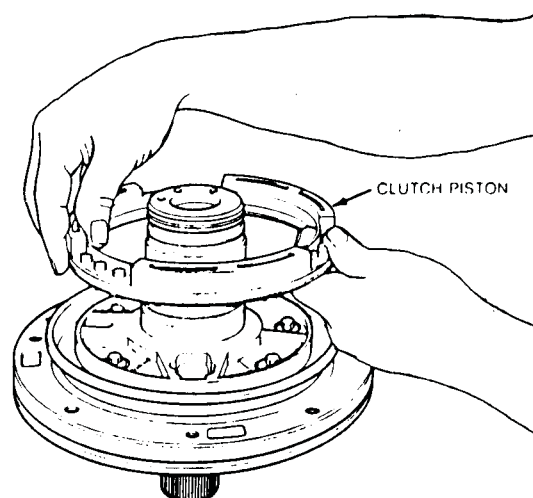
The reverse clutch rings (1 and 2) are larger than the forward clutch rings (3 and 4).



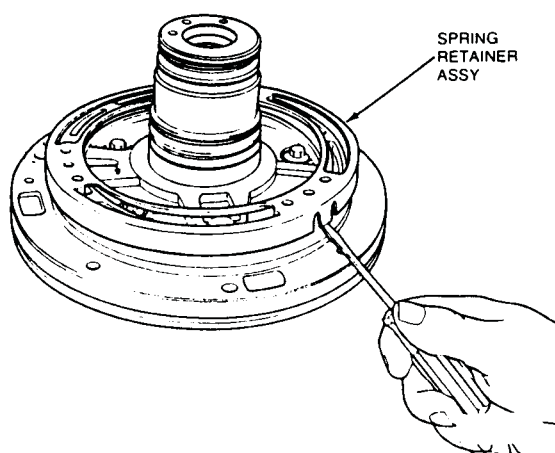
3. Remove the pump body-to-case seal and discard.



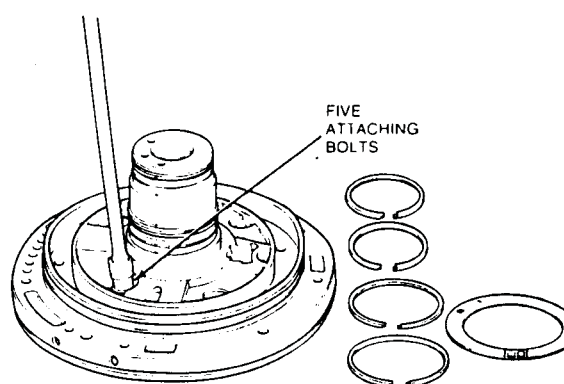
5. Remove the clutch piston.



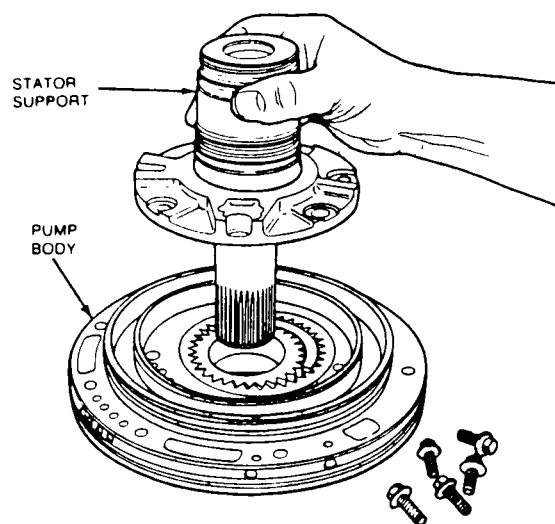
4. Remove the spring retainer assembly by carefully dislodging the tabs.



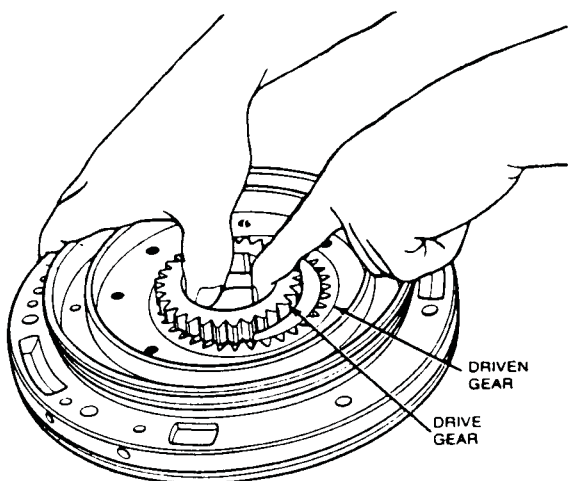
6. Remove the five 10mm stator support bolts.



7. Remove the stator support.

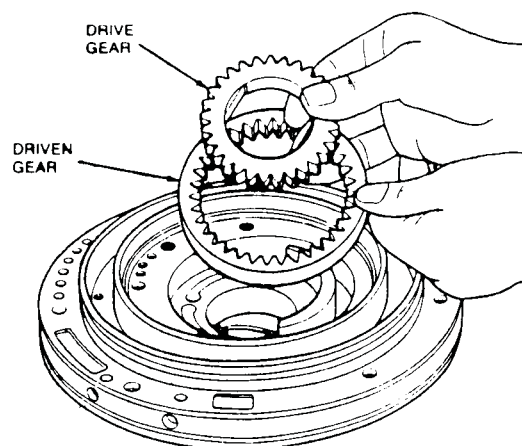


8. Remove the drive and driven pump gears from the pump body.

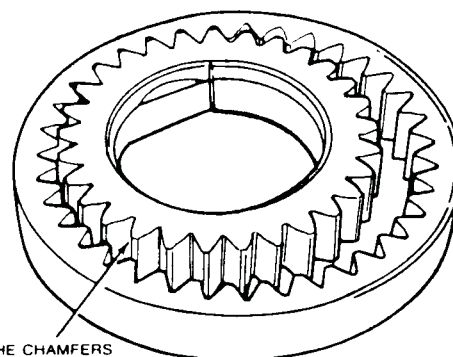


## Assembly

1. Install the drive and driven pump gears in the pump body.



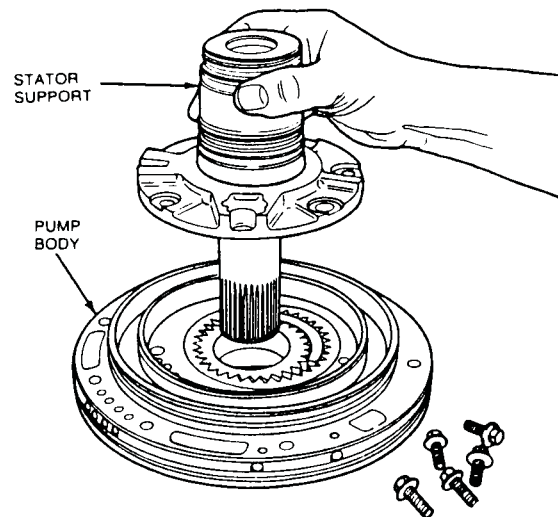
NOTE: Chamfers on both gears face into the pump body.



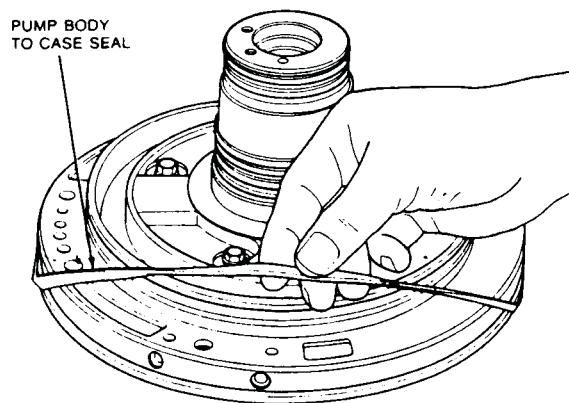
THE CHAMFERS ON BOTH GEARS MUST BE FACE DOWN AFTER INSTALLATION



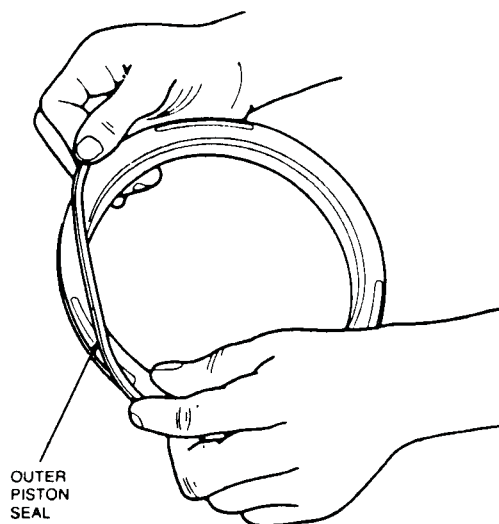
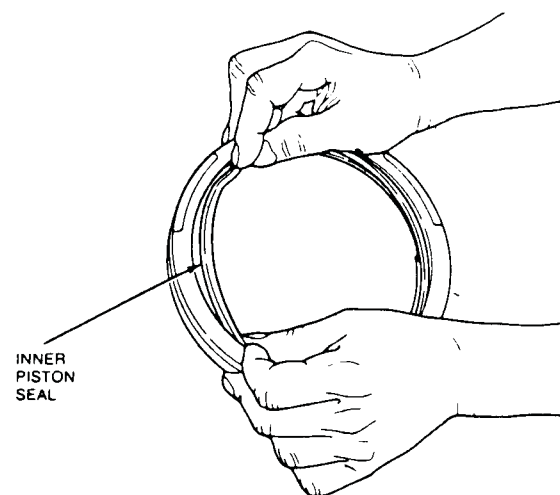
2. Position the stator support to the pump body and install the bolts. Tighten to 16-22 N·m (12-16 lb-ft).



3. Install new pump-to-case seal.

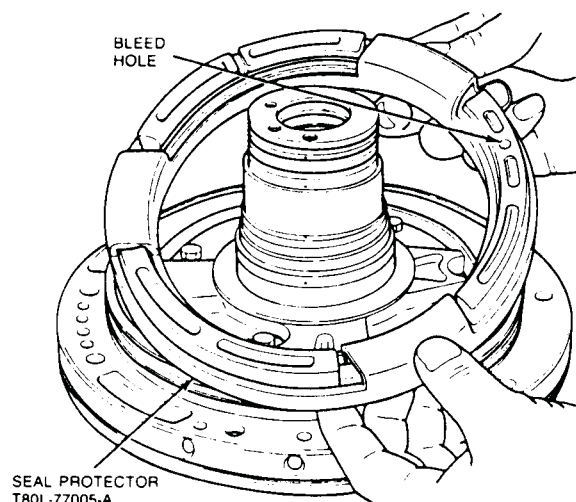


4. Install new seals on the clutch piston. Note the direction of the sealing lip before installation. The lips point away from the spring posts.



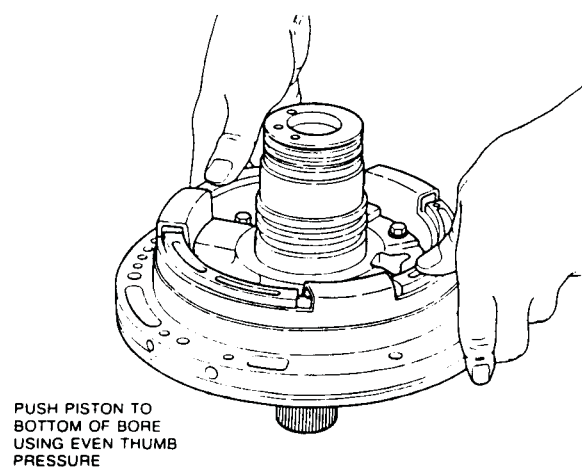
5. Install the clutch piston as follows:

- a. Coat the piston seals and the pump body sealing area with petroleum jelly.
- b. Install the piston in seal protector T80L-77005-A or equivalent.



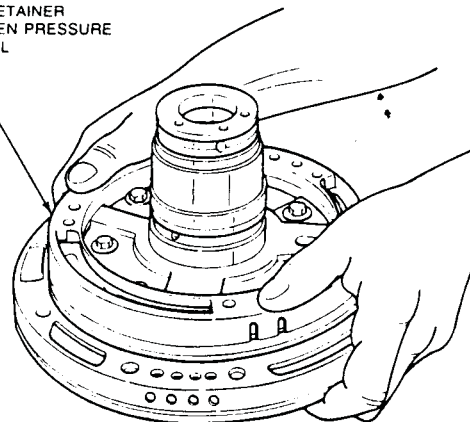
- c. Install the piston in the pump body and push to the bottom of the bore by exerting even thumb pressure on the piston.

**IMPORTANT NOTE:** The piston bleed must be located at 12:00 o'clock position (toward top of transmission.)



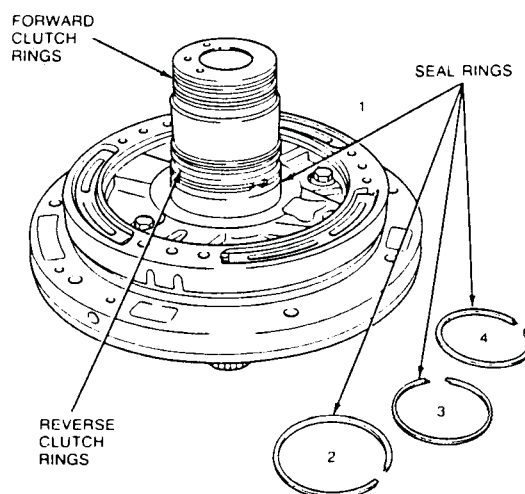
6. Snap the spring retainer assembly into place on the pump body. Use even pressure.

SPRING RETAINER  
APPLY EVEN PRESSURE  
TO INSTALL



7. Install the pump seal rings.

**NOTE:** Stator support seal rings (1 and 2) are the largest rings and are for the reverse clutch. These rings are closest to the pump. Stator support seal rings (3 and 4) are for the forward clutch. These rings are furthest from the pump body.



## Accumulators and Servos

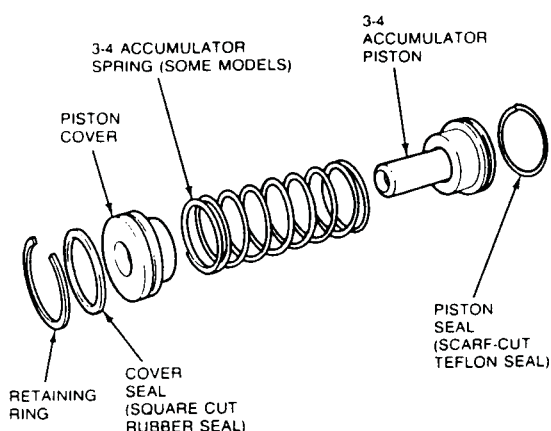
### Disassembly and Assembly

#### 3-4 Accumulator

Install new seals on the accumulator piston and the piston cover.

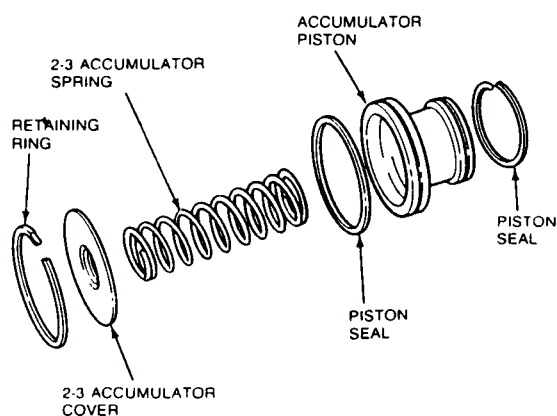
NOTE: Be sure the diagonal cuts on the piston seal are aligned properly.

NOTE: Some transmissions may be built with a spring. Depending on model application the spring may or may not be present. The appearance of the piston and spring may also vary from model to model.



#### 2-3 Accumulator

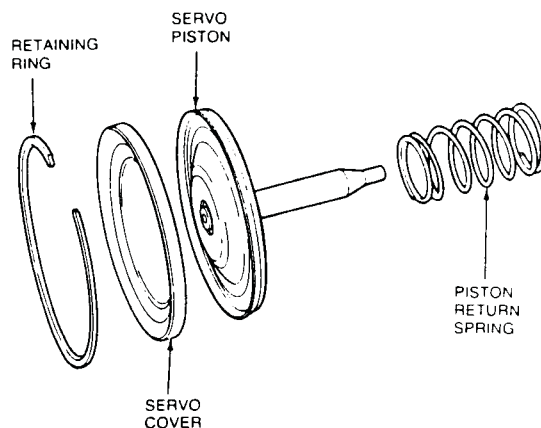
Install new seals on the accumulator piston. Be sure the diagonal cuts are properly aligned.



#### Low Reverse Servo

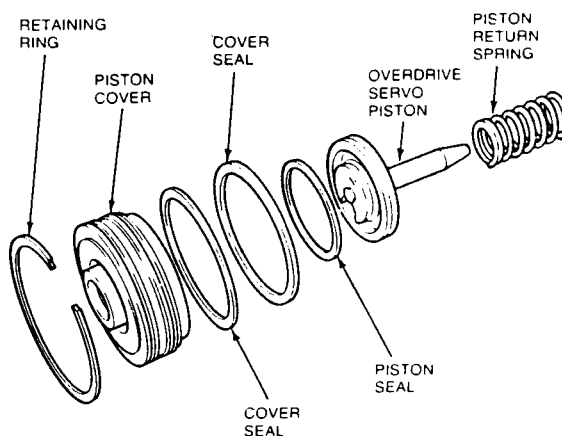
Inspect the sealing edge on both the servo cover and the apply piston. Replace the cover or piston, if necessary.

NOTE: The length of the rod attached to the piston may vary in length from transmission to transmission. Three possible lengths may be encountered. A single groove rod indicates the shortest possible length, while two and three groove piston rods indicate successively longer rods. For assembly purposes, it is important to determine which length piston rod was used in the manufacture of the transmission.



#### Overdrive Servo

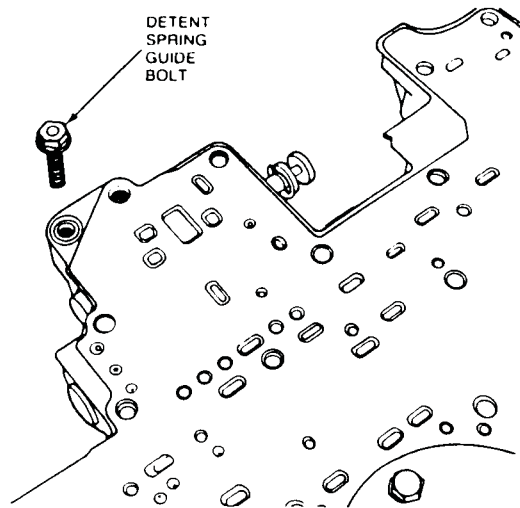
1. Pull the overdrive servo piston out of the piston cover.
2. Install new seals on the piston and cover.
3. Lubricate the piston seal to prevent damage and to facilitate assembly.
4. Install the piston in the cover.



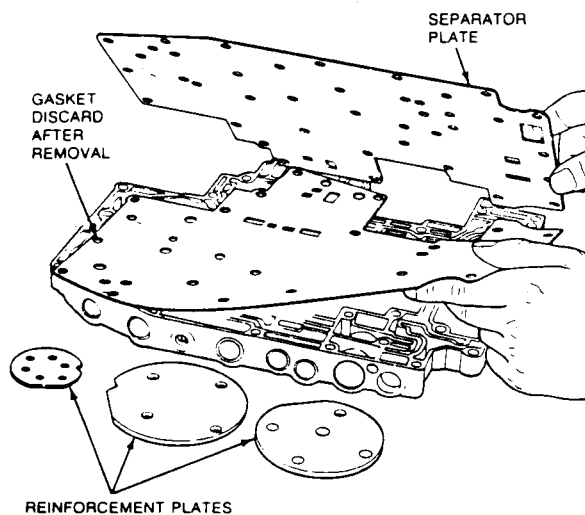
## Valve Body

### Disassembly

1. Remove and discard valve body gasket. Loosen and remove 11 bolts from reinforcement plates and detent spring guide bolt from the separator plate using a 10mm socket.



2. Remove separator plate, reinforcement plates and separator plate gasket. Discard gasket.

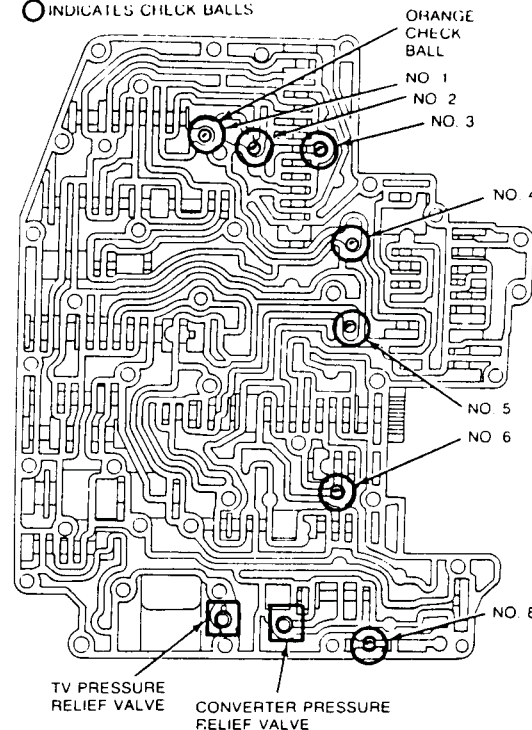


3. Remove the two relief valves and seven check balls from the valve body. Note the location of the orange ball. It is not interchangeable with the six black balls.

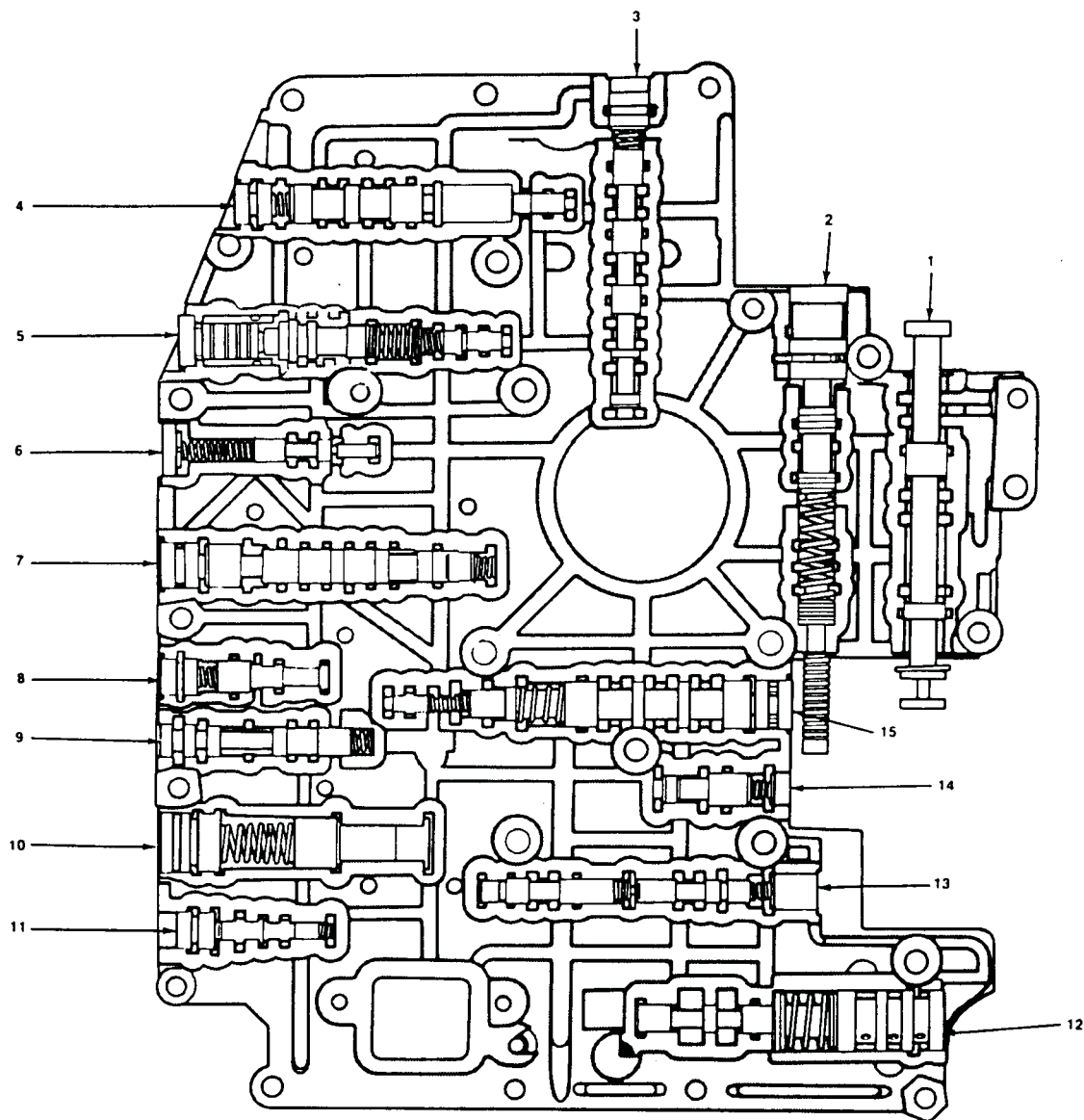
NOTE: The check balls are numbered one through eight. Check ball number seven was eliminated in a previous production year. There are a total of seven check balls.

□ INDICATES RELIEF VALVE

○ INDICATES CHECK BALLS



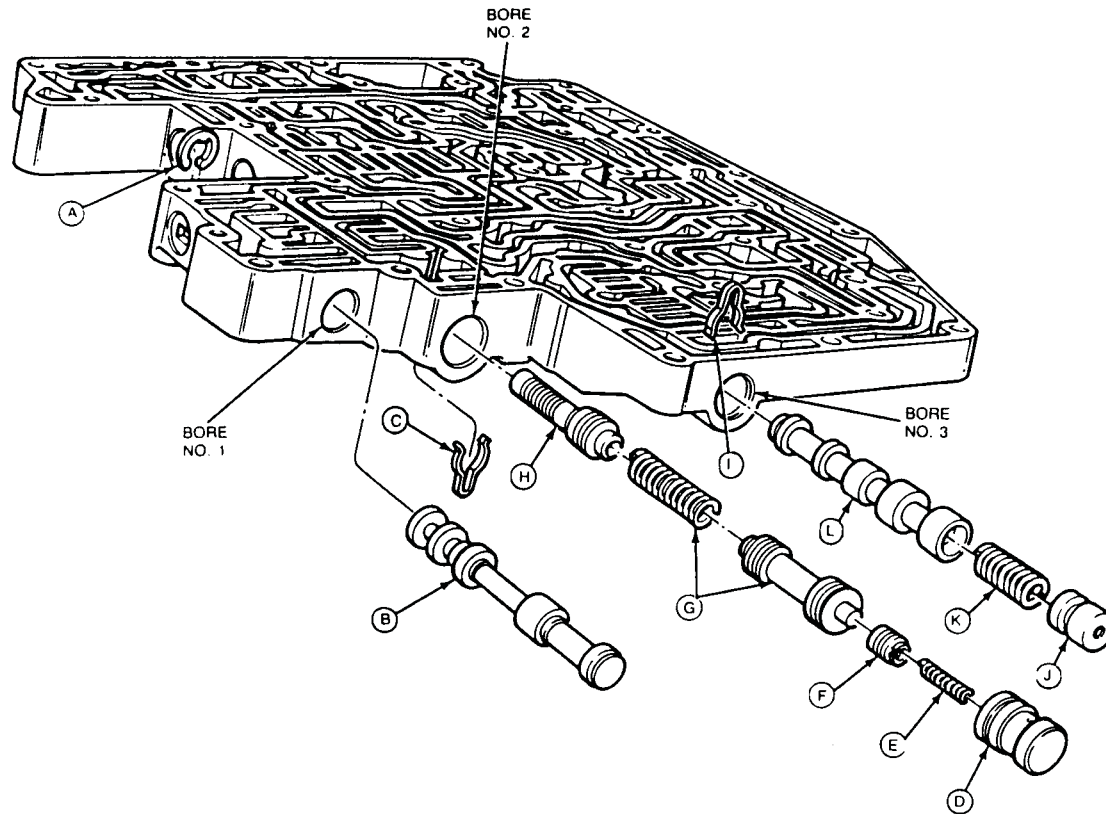
4. The following procedural steps detail the removal and installation of the individual valves. Each valve body bore has been assigned a reference number on the assembled view. The illustrations have been assigned a corresponding reference number. Each set of illustrations contains the views necessary to remove and install the components contained in a particular valve body bore.



## 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

VALVE BODY — REAR OF VEHICLE SIDE  
BORES 1, 2 AND 3



BORE NO. 1	BORE NO. 2	BORE NO. 3
(A) Clip	(C) Clip	(I) Clip
(B) Manual Valve	(D) Throttle Sleeve	(J) Bore Plug
	(E) Preload Spring	(K) Spring
	(F) Throttle Plug ①	(L) 2-3 Backout Valve
	(G) Throttle Control Valve and Spring ②	
	(H) Throttle Plunger	

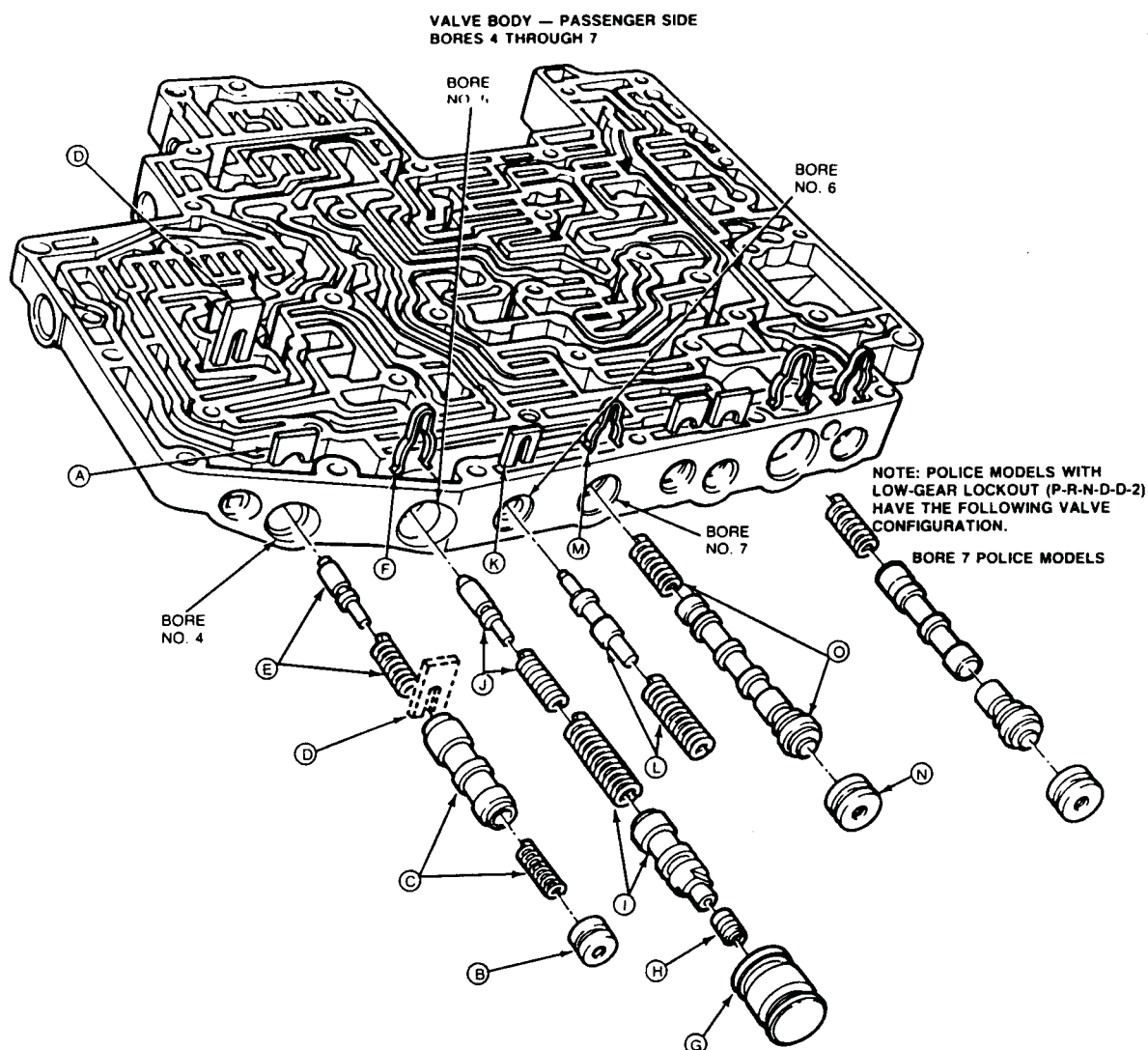
**NOTES:**

Some Bore Plugs have a tapped hole in the center. use a M4 metric screw in tapped hole for easier plug removal. These plugs must be installed with the tap hole facing outward.

① The notch in the throttle plug faces the bottom of the throttle sleeve bore

② The chamfered stem of the throttle control valve faces the throttle plunger





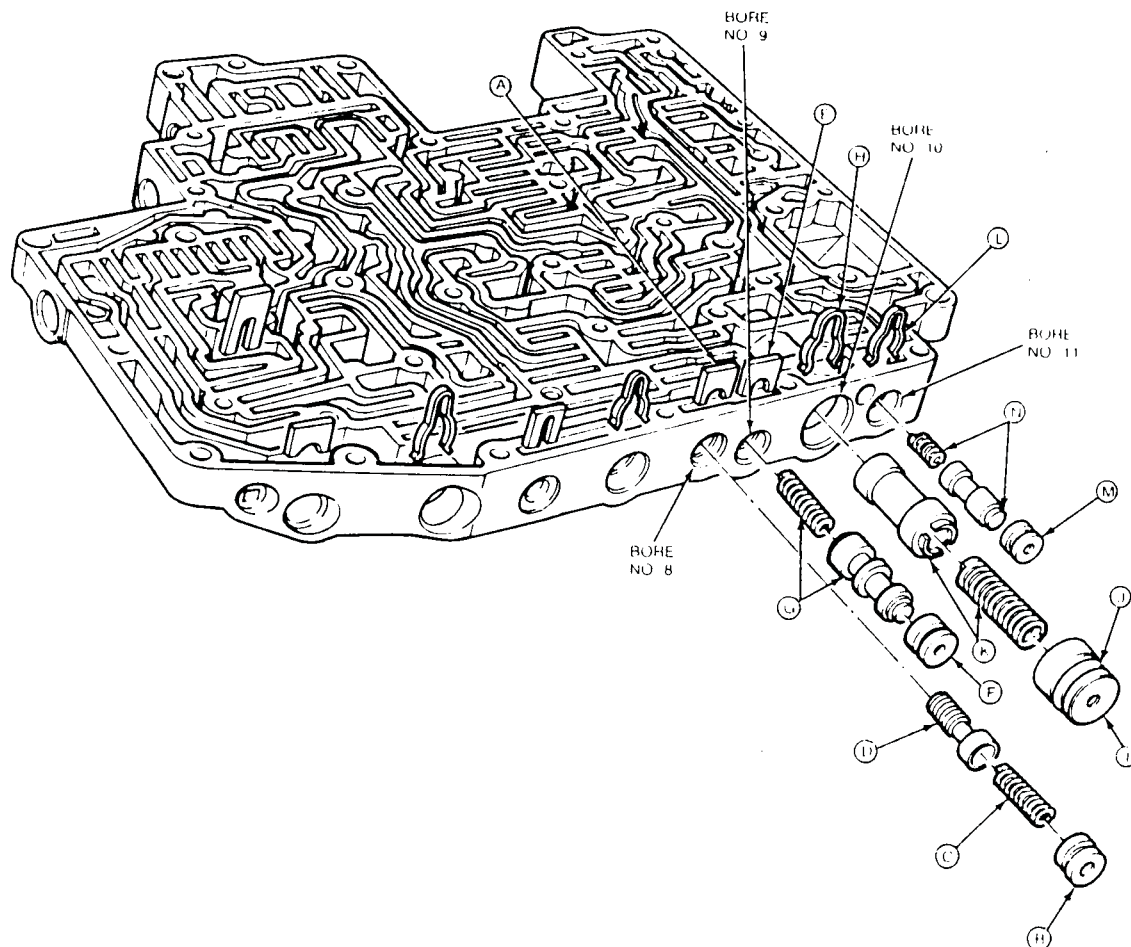
BORE NO. 4	BORE NO. 5	BORE NO. 6	BORE NO. 7
(A) Spring Retainer Plate	(F) Clip	(K) Retainer Plate	(M) Clip
(B) Bore Plug 1	(G) Sleeve	(L) TV Limit Valve and Spring	(N) Bore Plug
(C) Orifice Control Valve and Spring	(H) Plug 2		(O) 1-2 Shift Valve and Spring
(D) Spring Retainer Plate 1	(I) 3-4 Shift Valve and Spring		
(E) 2-3 Capacity Modulator Valve and Spring	(J) 3-4 TV Modulator Valve and Spring		

**NOTES:**

Some Bore Plugs have a tapped hole in the center, use a M4 metric screw in tapped hole for easier plug removal. These plugs must be installed with the tap hole facing outward.

- 1 The 2-3 Capacity Modulator Valve Retainer Plate is thicker and longer than the other plates. It must be installed in this slot.
- 2 The notch in the plug faces the bottom of the sleeve bore.

## VALVE BODY — PASSENGER SIDE BORES 8 THROUGH 11

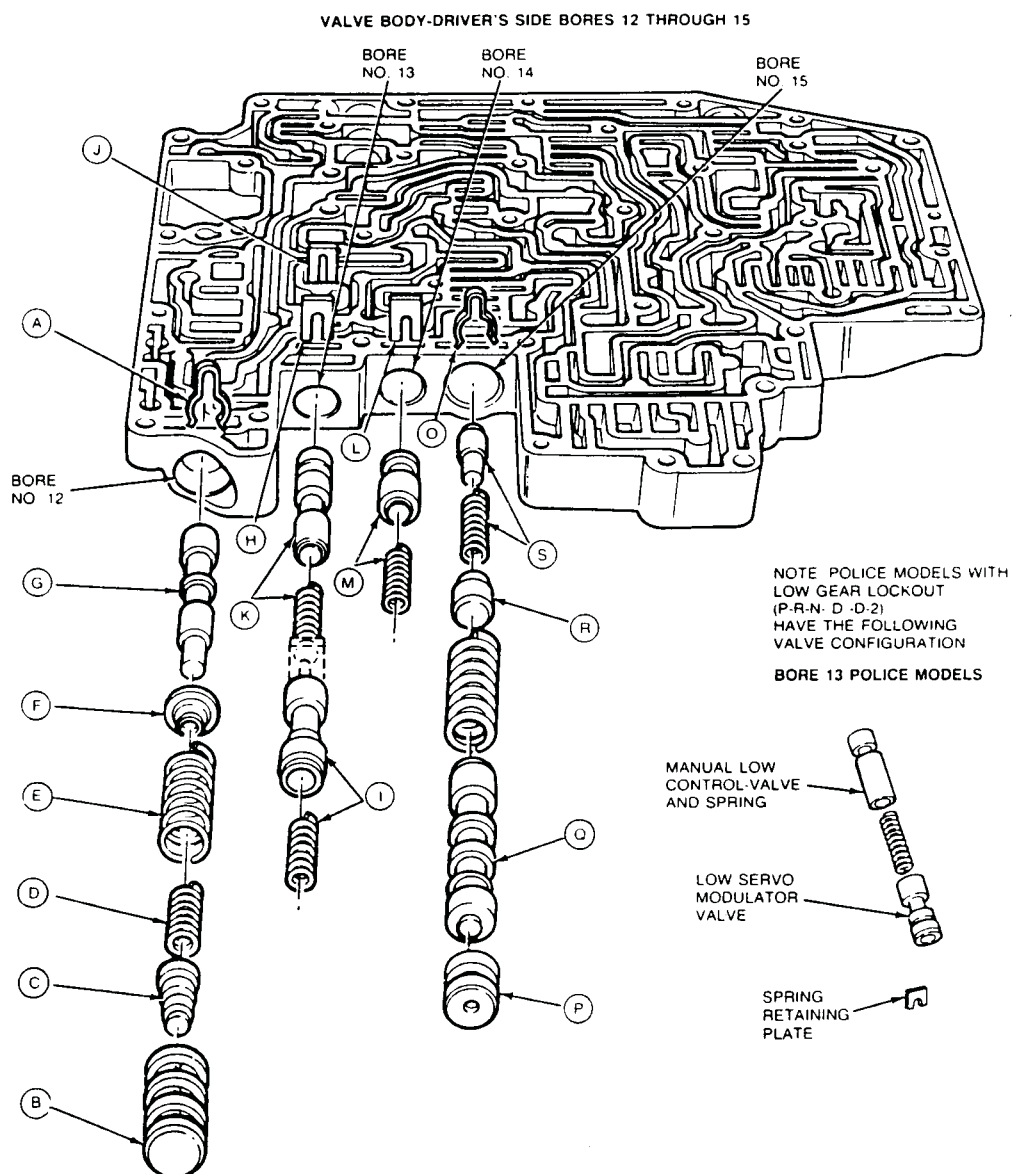


BORE NO. 8	BORE NO. 9	BORE NO. 10	BORE NO. 11
(A) Spring Retainer Plate	(E) Spring Retainer Plate	(H) Clip	(L) Clip
(B) Bore Plug 1	(F) Bore Plug	(I) Bore Plug	(M) Bore Plug
(C) Spring	(G) 3-4 Shuttle Valve and Spring	(J) O-ring Seal 2	(N) 1-2 Capacity Modulator Valve and Spring
(D) O/D Servo Regulator Valve		(K) 1-2 Accumulator Valve and Spring 3	

### NOTES:

Some Bore Plugs have a tapped hole in the center; use a M4 metric screw in tapped hole for easier plug removal. These plugs must be installed with the tap hole facing outward.

- (1) To install the O/D Servo Regulator Valve Bore Plug turn the retainer plate into the plug slot.
- (2) When installing the 1-2 Accumulator Valve Bore Plug into the bore, the O-ring seal must face outside of the valve body.
- (3) The 1-2 Accumulator Valve and valve body diameter are not the same for all models.



BORE NO. 12	BORE NO. 13	BORE NO. 14	BORE NO. 15
(A) Clip	(H) Spring Retainer Plate	(L) Spring Retainer Plate	(O) Clip
(B) Boost Sleeve	(I) Low Servo Modulator Valve and Spring	(M) 3-4 Back Out Valve and Spring	(P) Bore Plug
(C) Boost Valve	(J) Spring Retainer Plate		(Q) 2-3 Shift Valve and Spring
(D) Main Regulator Valve Spring	(K) 2-1 Scheduling Valve and Spring		(R) 3-2 Control Valve
(E) Boost Valve Spring			(S) 2-3 Modulator Valve and Spring
(F) Spring Seat			
(G) Main Pressure Regulator Valve			

**NOTES:**

Some Bore Plugs have a tapped hole in the center, use a M4 metric screw in tapped hole for easier plug removal. These plugs must be installed with the tap hole facing outward.

## Assembly

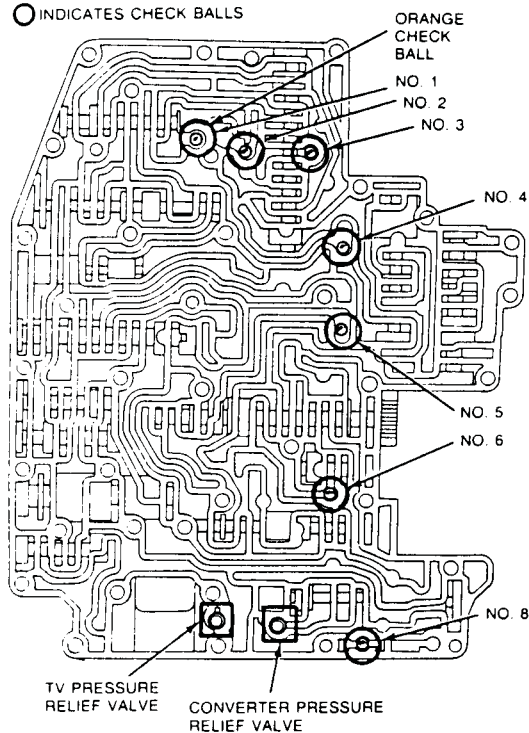
1. Install the seven body check balls.

Note the location of the orange ball. This ball is larger than the others and must be positioned as shown.

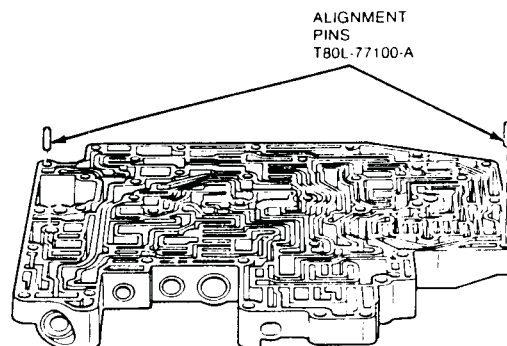
NOTE: The check balls are labelled one through eight. Check ball seven was eliminated in a previous production year. There are a total of seven check balls.

□ INDICATES RELIEF VALVE

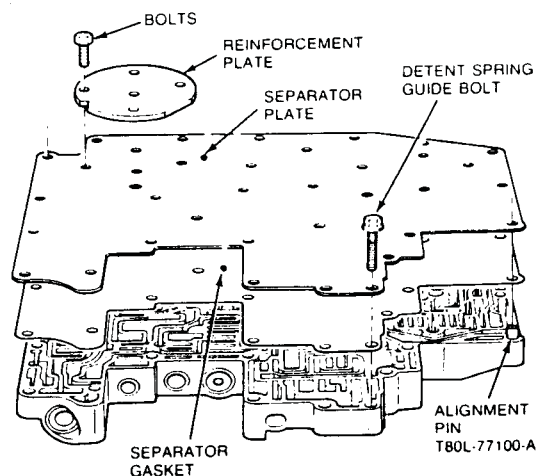
○ INDICATES CHECK BALLS



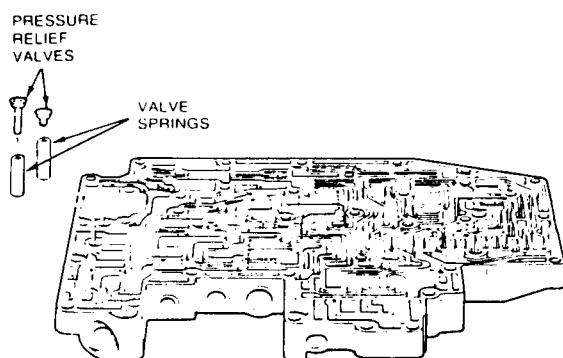
3. Install Alignment Pins T80L-77100-A or equivalent. Note the location of the pins. These two holes are smaller than the other bolt holes to assure proper alignment of the gasket and separator plate with valve body. These two holes also align the valve body gasket and valve body assembly with the case.



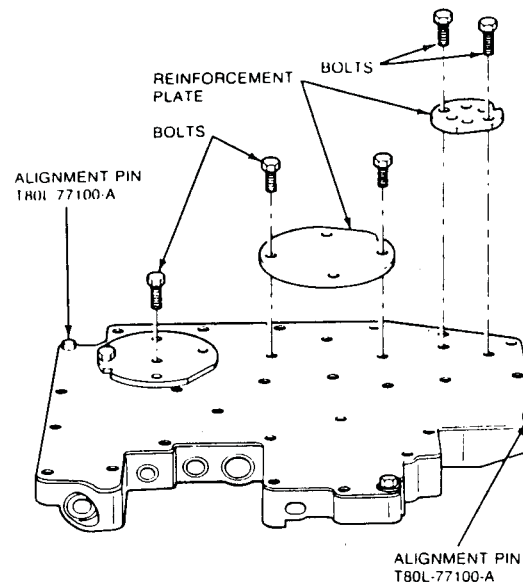
4. Use a new separator plate gasket. Slide the gasket and the separator plate over the two alignment pins. Position the three reinforcement plates and loosely install the 11 bolts. Loosely install the detent spring guide bolt. (This bolt is the same as the short valve body assembly-to-case attaching bolts).



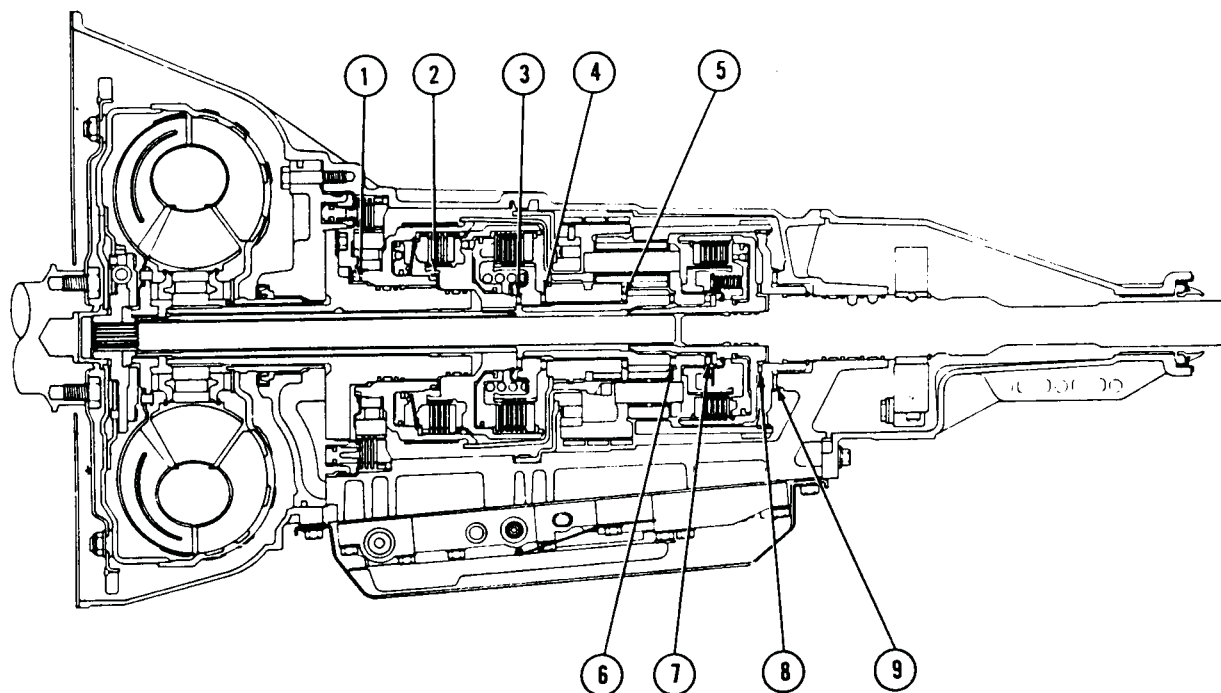
2. Install the pressure relief valves.

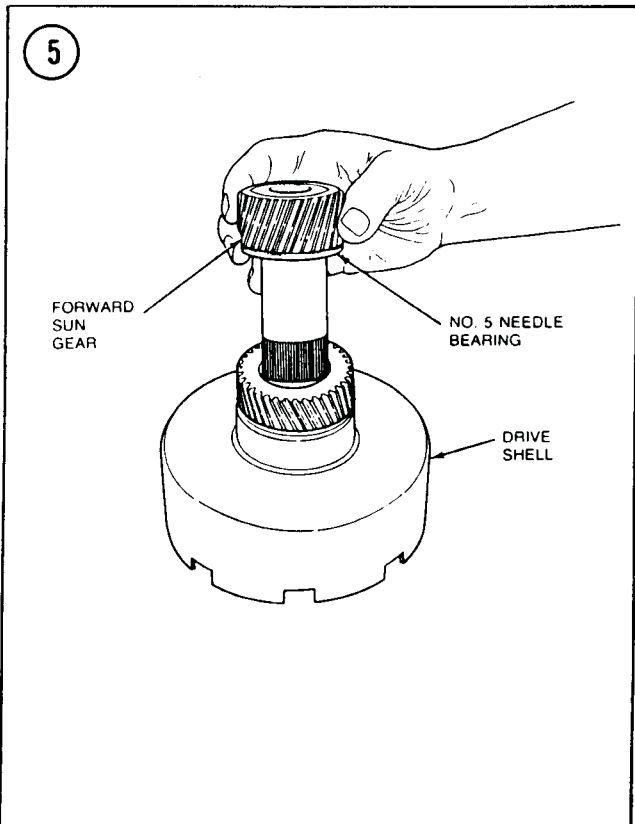
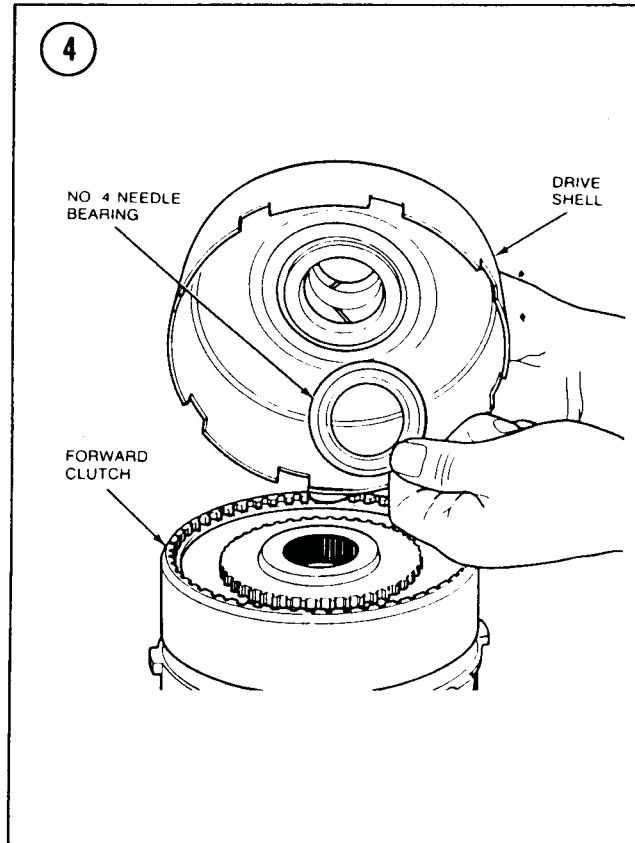
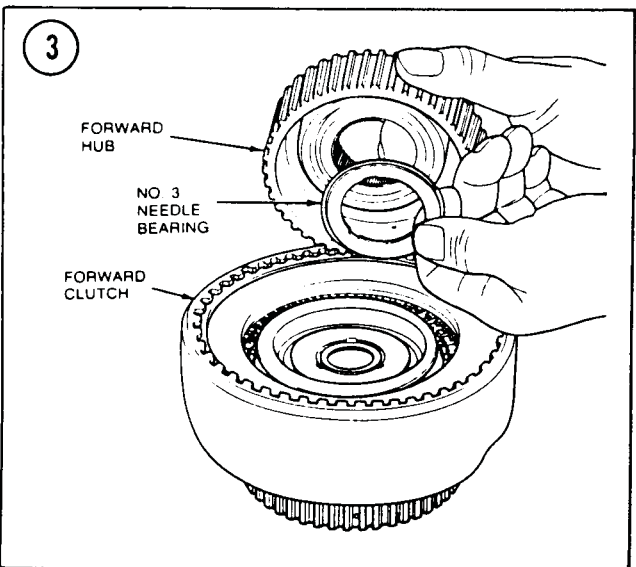
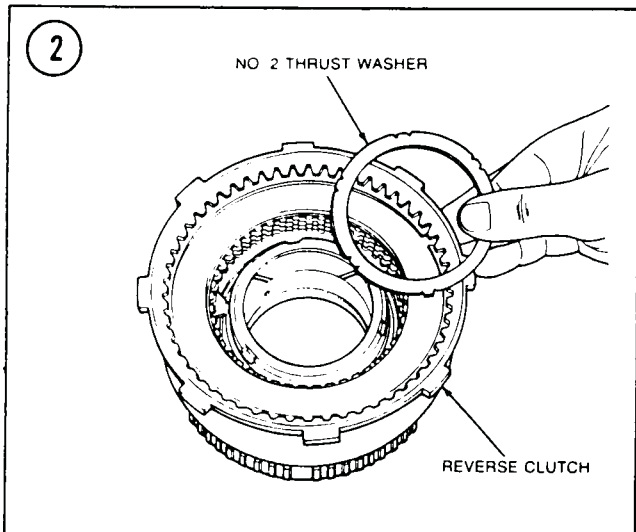
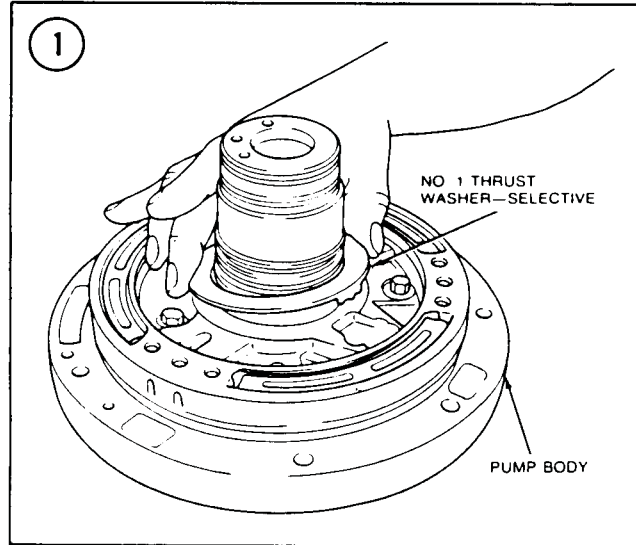


5. Starting at the center (large) reinforcement plate and working outward, tighten the 11 attaching bolts to 9-11 N·m (80-100 lb-in). Tighten the detent spring guide bolt to 9-11 N·m (80-100 lb-in). Remove the alignment pins.

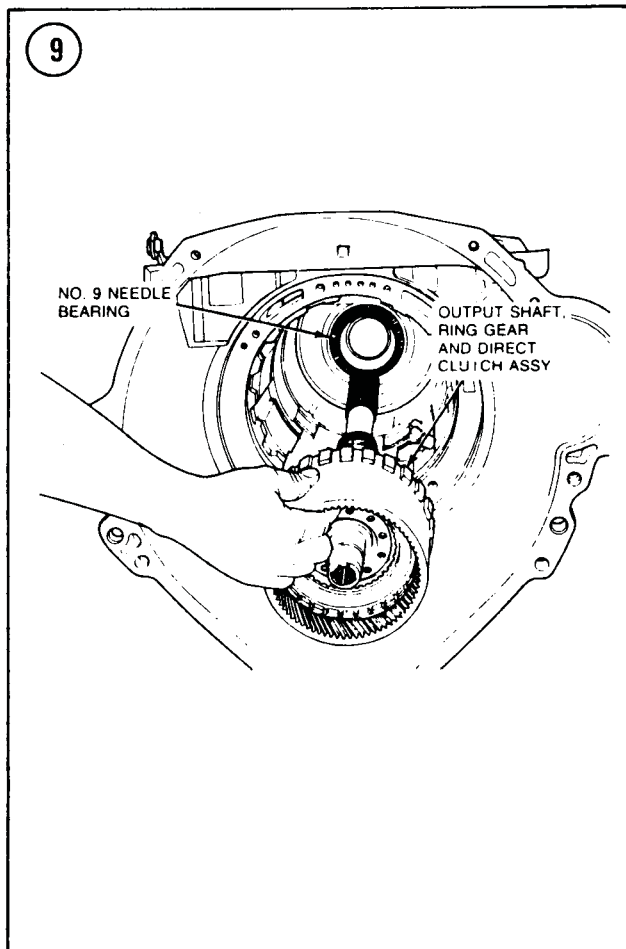
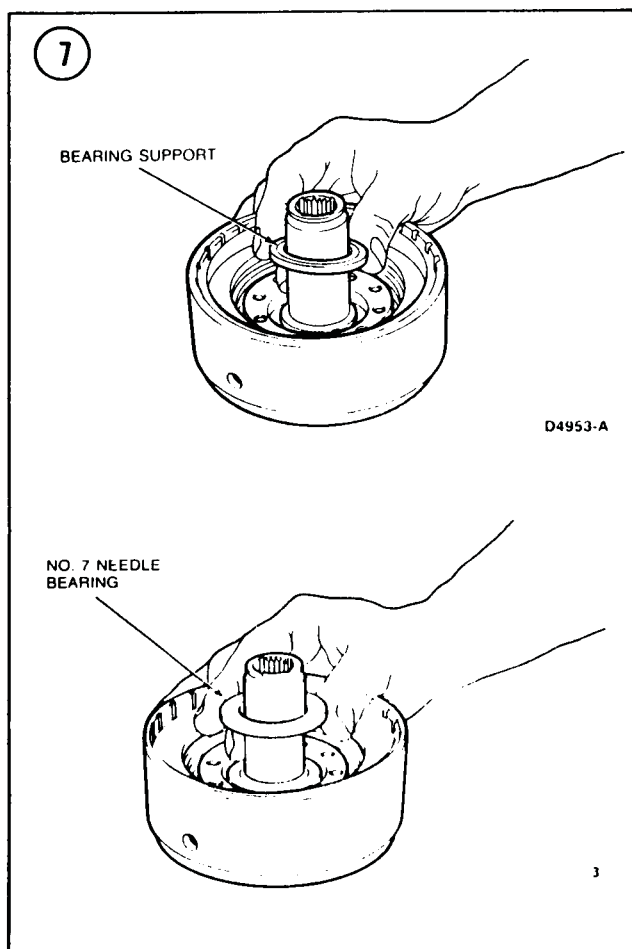
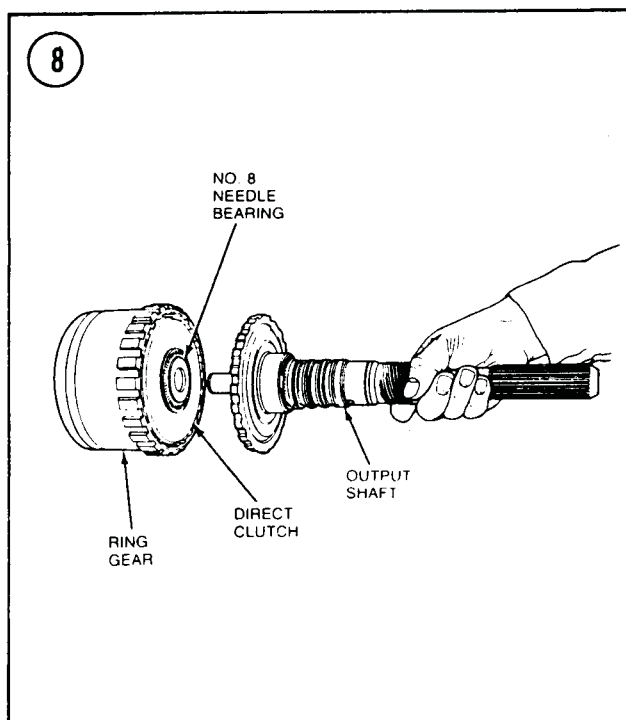
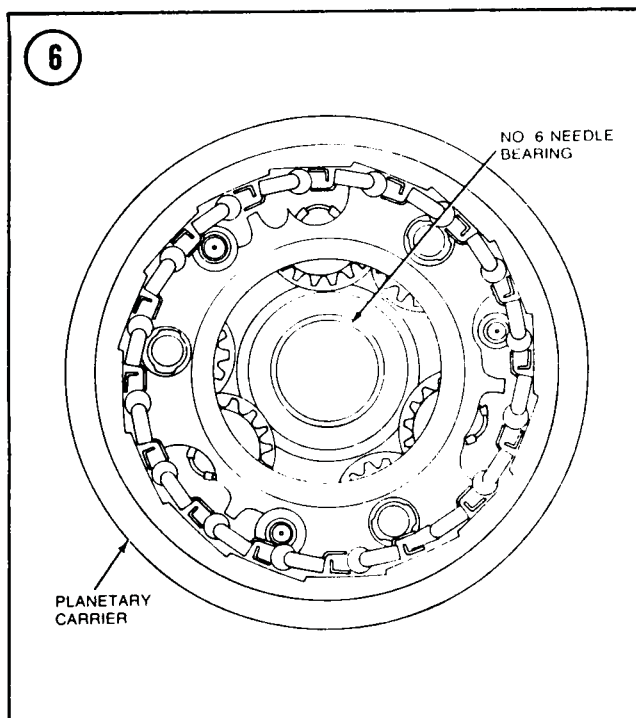


## Thrust Bearing Locator











# Technical Service Information

## SPECIFICATIONS

### FORWARD CLUTCH

Transmission Model	Steel	Friction	Clearance	Selective Snap Rings-Thickness
Models with 3.8L (232 CID)	4*	4	1.02-1.80mm (0.040-0.071 inch)	0.060-0.064 0.074-0.078 0.088-0.092 0.102-0.106
Models with 5.0L HO, 5.0L S.E.F.I. or 5.8L (302 or 351 CID)	5*	5	1.27-2.26mm (0.050-0.089 inch)	

\*Plus a waved plate (installed next to piston).

### REVERSE CLUTCH

Transmission Model	Steel	Friction	Clearance	Selective Snap Rings-Thickness
Models with 3.8L (232 CID)	2	3	0.76-1.42mm (0.030-0.056 inch)	0.060-0.064 0.074-0.078 0.088-0.092 0.102-0.106
Models with 5.0L HO, 5.0L S.E.F.I. or 5.8L (351 CID)	3	4	1.02-1.91mm (0.040-0.075 inch)	

### DIRECT CLUTCH

Transmission Model	Steel	Friction	Clearance	Selective Snap Rings-Thickness
Models with 5.0L HO, 5.0L S.E.F.I. or 5.8L	5	5	1.3-1.77mm (0.050-0.067 inch)	0.050-0.054 0.064-0.068 0.078-0.082 0.092-0.096
Models with 3.8L (232 CID)	4	4	1.02-1.44mm (0.040-0.057 inch)	

### INTERMEDIATE CLUTCH

Transmission Model	Steel	Friction	Gauge Dim.	Selective Steel Plates-Thickness
Models with 5.8L or 5.0L (351 or 302 CID)	3	3	41.504-41.808mm (1.634-1.646 inch)	0.067-0.071 0.077-0.081 0.087-0.091 0.097-0.101
Models with 3.8L (232 CID)	2	2	41.4-41.7mm (1.628-1.640 inch)	

LOW-REVERSE SERVO PISTON TRAVEL — 2.845-6.020mm (0.112-0.237 inch)

Note: Piston travel can be adjusted using one of the selective servo pistons available for service.

### SELECTIVE SERVO PISTONS — ALL MODELS

Rod Length*	I.D.	Rod Length*	I.D.	Rod Length*	I.D.
2.936	1 Groove	2.989	2 Groove	3.043	3 Groove

\*Measured from the piston surface to the end of the rod.

### FLUID CAPACITY

Liters	Imperial Quarts	Quarts
11.6	10.2	12.3

### SELECTIVE THRUST WASHER\* — ALL MODELS

Depth	Thickness	Color Code	Depth	Thickness	Color Code
37.668-38.113mm (1.483-1.500 inch)	0.050-0.054	Green	38.971-39.408mm (1.535-1.551 inch)	.102-.106	Red
38.114-38.540mm (1.501-1.517 inch)	0.068-0.072	Yellow	39.409-39.827mm (1.552-1.568 inch)	.119-.123	Blue
38.541-38.970mm (1.518-1.534 inch)	0.085-0.089	Natural			

\*The thrust washer is located on the stator support which is attached to the back of the pump housing.

### TORQUE SPECIFICATIONS

Description	N·m	Lb·Ft	Description	N·m	Lb·Ft
Stator Support to Pump Body	16-22	12-16	Converter to Flywheel	27-46	20-34
Front Pump to Case	22-27	16-20	Converter Housing Access Cover to Converter Housing	16-22	12-16
Reinforcing Plate to Valve Body	9-14	80-120 lb-in	Detent Spring Attaching Bolt	9-14	80-120 lb-in
Separator Plate to Valve Body	9-11	80-100 lb-in	Inner Manual Lever to Shaft	26-37	19-27
Valve Body to Case	9-11	80-100 lb-in	Outer Throttle Lever to Shaft	16-22	12-16
Filter to Valve Body	9-14	80-120 lb-in	Push Connect Fitting to Case	24-31	18-23
Oil Pan to Case	8-13.5	6-10	Converter Plug to Converter	11-38	8-28
Extension to Case	22-27	16-20	Neutral Start Switch to Case	11-15	8-11
Governor Body to Counterweight	6-7	50-60	Pressure Plug to Case	8-16	6-12
Governor Body Cover to Governor Body	2.3-3.4	20-30	Transmission to Engine	55-68	40-50



## TRANSMISSION — AUTOMATIC — AOD — DESCRIPTION OF CHANGES

### FORD

1986 FORD, THUNDERBIRD, MUSTANG

### LINCOLN-MERCURY

1986 MERCURY, COUGAR, CAPRI, LINCOLN,  
CONTINENTAL, MARK VII

### LIGHT TRUCK

1986 E & F-SERIES, BRONCO

Twenty-four transmission calibrations are currently released for the 1986 Automatic Overdrive Transmission (AOD) program: Eighteen for passenger car and six for truck.

New to AOD will be the release of the 5.0L SEFI (sequential electronic fuel injection) engine for all 5.0L and 5.0L HO passenger cars. Fourteen of the twenty-four calibrations are new and have been programmed for 5.0L SEFI passenger car application.

The 5.0L Econoline application will be released with the 5.0L EFI engine. The AOD transmission calibration will be combined with the F-Series 5.0L EFI calibration. There will be no more 5.0L-2V carbureted engine applications with the AOD transmission.

### Major Design Changes Affecting Serviceability for All Passenger Car and Truck Applications

- Lube hole added to the reverse sun gear to improve planetary lubrication (incorporated mid-1985).
- Transmission fluid changed to H Fluid (Ford Specification ESP-M2C166-H); was Dexron®II.
- New manual lever retaining pin.
- Galvanized oil pan to improve corrosion protection (incorporated mid-1985).
- 1.5mm longer passenger car cooler line quick connect fittings to insure full seating of the cooler line metal tube wall.

### Major Design Changes Affecting Serviceability for the 5.0L SEFI and the 5.0L HO SEFI Passenger Car Applications

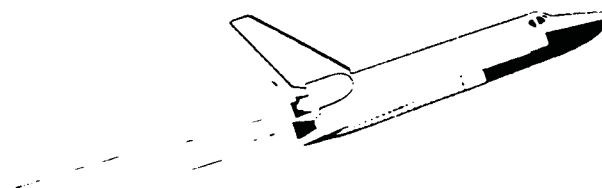
- Forward clutch pack plate count increased by one friction plate and one steel plate (was four friction, four steel; now five friction, five steel).

- Reverse clutch pack plate count increased by one friction plate and one steel plate (was three friction, 2 steel; now four friction, three steel).
- Cable TV control system released on all vehicles. Installation in engine compartment varies among car lines.
- TV cable adjustment toggle lever at throttle body lever on driver side of engine compartment for Lincoln Town Car, Crown Victoria, and Grand Marquis vehicles.
- TV cable adjustment toggle lever at throttle body lever on passenger side of engine compartment for Mark VII, Continental, Mustang, Capri, Thunderbird, and Cougar vehicles.
- New cable TV adjustment procedure using TV control pressure and a special service tool.
- For Continental, Thunderbird, and Cougar vehicles, there is also a bellcrank assembly mounted on the transmission bell housing in the area of the TV lever and bracketry holding the cable in the upper bell housing area.
- New TV outer control lever at the transmission.
- New main control valve bodies not compatible for past model service.

### Major Design Changes Affecting Serviceability for the New 5.0L EFI Econoline Application

- Forward clutch pack plate count increased to five friction, five steel (was four friction, four steel).
- Reverse clutch pack plate count increased to four friction, three steel (was three friction, two steel).
- Cable TV system released. Adjustment procedure similar to 5.0L EFI truck application.
- New filler tube and dipstick.

All F-Series, Econoline, and Bronco applications will have new TV control outer levels.





## Technical Service Information

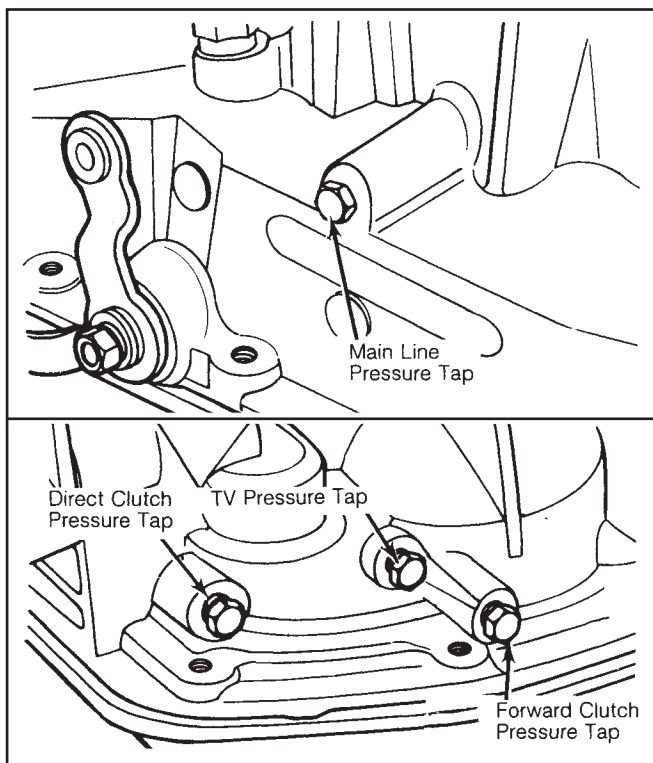
### PRESSURE SPECIFICATIONS

Tap	Range	Idle Pressure	WOT Pressure
<i>Main line</i>	<i>Reverse</i>	<i>75-90 psi.</i>	<i>241-290 psi.</i>
<i>Forward Clutch</i>	<i>Drive</i>	<i>55-65 psi.</i>	<i>176-215 psi.</i>
<i>TV pressure</i>	<i>Drive</i>	<i>0-3 psi. *</i>	<i>70-91 psi.</i>

*\* = Idle pressure with no gage block*

**NOTE:** *Connect pressure gage to desired pressure port shown below.  
Pressure should indicate readings shown above.  
Pressure should be within 10-15 psi of Main line pressure  
when checking the Direct or Forward Clutch.*

#### Pressure Port Locations



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