

**1996 Ford Aerostar**

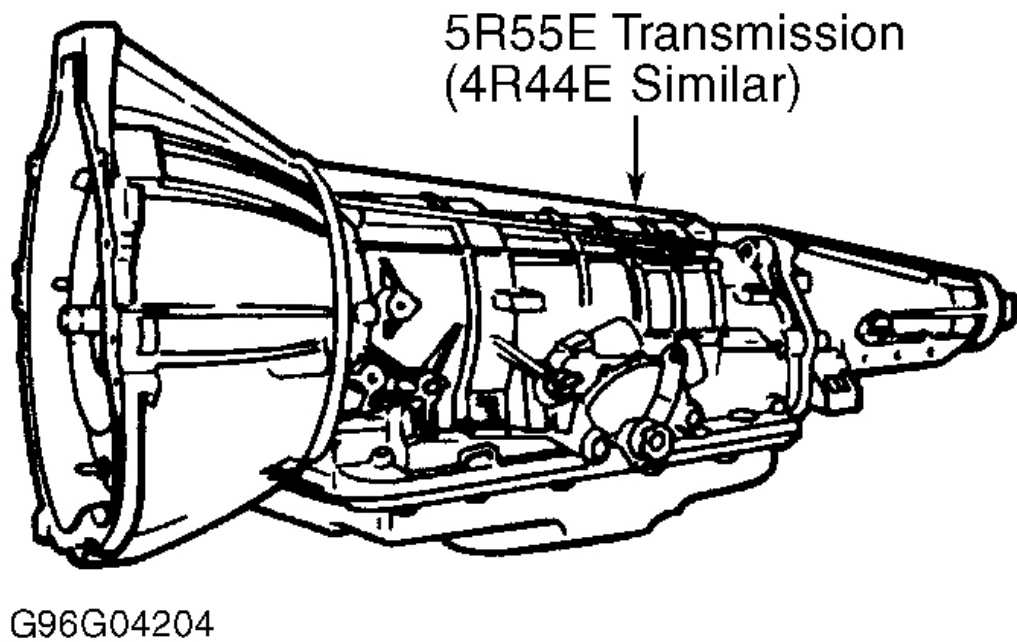
1995-96 AUTOMATIC TRANSMISSIONS Ford 4R44E &amp; 4R55E

**1995-96 AUTOMATIC TRANSMISSIONS****Ford 4R44E & 4R55E****APPLICATION****APPLICATION**

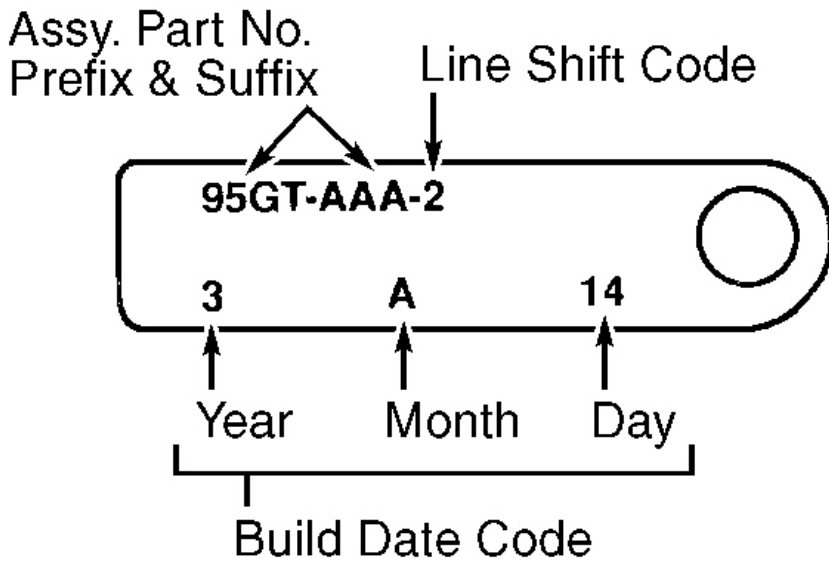
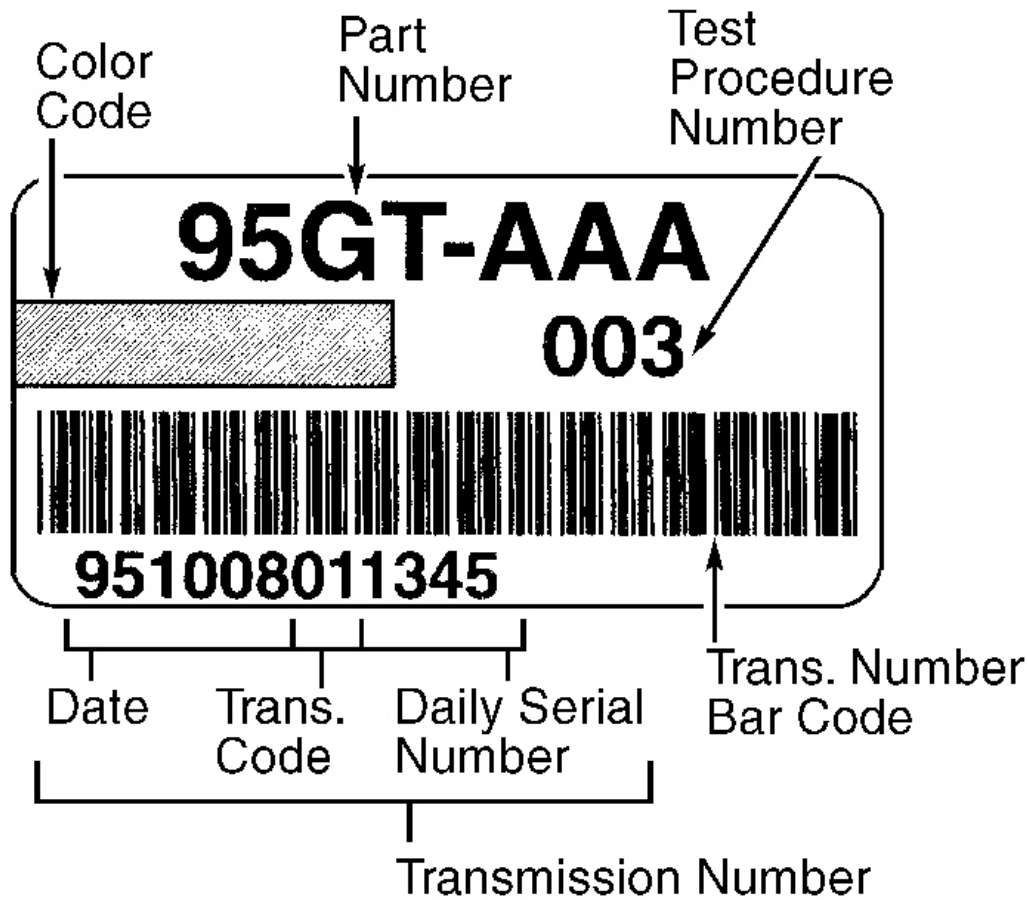
| Application        | Transmission |
|--------------------|--------------|
| Ford               |              |
| 1995               |              |
| Explorer 2WD, 4.0L | 4R55E        |
| Explorer 4WD, 4.0L | 4R55E        |
| Ranger 2WD, 2.3L   | 4R44E        |
| Ranger 2WD, 3.0L   | 4R44E        |
| Ranger 2WD, 4.0L   | 4R55E        |
| Ranger 4WD, 3.0L   | 4R44E        |
| Ranger 4WD, 4.0L   | 4R55E        |
| 1996               |              |
| Aerostar 2WD, 3.0L | 4R44E        |
| Aerostar 2WD, 4.0L | 4R55E        |
| Aerostar AWD, 4.0L | 4R55E        |
| Explorer 2WD, 4.0L | 4R55E        |
| Explorer 4WD, 4.0L | 4R55E        |
| Ranger 2WD, 2.3L   | 4R44E        |
| Ranger 2WD, 3.0L   | 4R44E        |
| Ranger 2WD, 4.0L   | 4R55E        |
| Ranger 4WD, 3.0L   | 4R44E        |
| Ranger 4WD, 4.0L   | 4R55E        |
| Mazda              |              |
| 1995               |              |
| B2300 2WD, 2.3L    | 4R44E        |
| B3000 2WD, 3.0L    | 4R44E        |
| B4000 2WD, 4.0L    | 4R55E        |
| B4000 4WD, 4.0L    | 4R55E        |
| 1996               |              |
| B2300 2WD, 2.3L    | 4R44E        |
| B3000 2WD, 3.0L    | 4R44E        |
| B3000 4WD, 3.0L    | 4R44E        |
| B4000 2WD, 4.0L    | 4R55E        |
| B4000 4WD, 4.0L    | 4R55E        |

**IDENTIFICATION**

The 4R44E/4R55E 4-speed automatic transmission can be identified by service identification tags affixed to unit. See **Fig. 1** and **Fig. 2** . Bar code identification label is located on fluid pan. Metal tag is attached to extension housing bolt. Top line of tag shows transmission model number and line shift code. Bottom line on tag shows build date code.



**Fig. 1: 4R44E/4R55E Transmission Assembly**  
Courtesy of FORD MOTOR CO.



G96J04205

**Fig. 2: 4R44E/4R55E Transmission Service Identification Tags**

Courtesy of FORD MOTOR CO.

**NOTE:** For 4R44E and 4R55E electronic testing and repair, see the **AUTO TRANS DIAGNOSIS - FORD 4R44E & 4R55E CONTROLS** article.

## DESCRIPTION

The 4R44E/4R55E is a 4-speed automatic overdrive transmission with lock-up type torque converter and electronic controls. The 4R44E is used with 2.3L and 3.0L engine applications. The 4R55E is used with 4.0L engine applications. Transmission consists of torque converter, 3 compound planetary gearsets, 3 multiple disc clutch packs, 3 bands and 2 one-way clutches.

Shift control solenoids control gear selection and are operated by the EEC-IV (1995) or EEC-V (1996) microprocessor. For additional information on the EEC-IV or EEC-V system, refer to appropriate TESTS W/CODES article in ENGINE PERFORMANCE section.

Input signals from sensors are sent to the Powertrain Control Module (PCM). The PCM can determine when the time and conditions are right for a shift or converter clutch application. The PCM can also determine line pressure needed to optimize shift feel.

Six electronic solenoids accomplish these functions as follows:

- 3 On/Off solenoids for shifting.
- One Pulse-Width Modulator (PWM) solenoid for Torque Converter Clutch (TCC) control.
- One Electronic Pressure Control (EPC) solenoid for line pressure control.
- One 3-2 timing/coast clutch solenoid to control release of coast clutch, coordinated release of the direct clutch, and apply of the low and intermediate band.

PCM has built-in self-diagnosis, fail-safe code and warning code display for the main input sensors and solenoid valves.

## LUBRICATION & ADJUSTMENTS

See appropriate TRANSMISSION SERVICING - A/T article in TRANSMISSION SERVICING.

## ON-VEHICLE SERVICE

### VALVE BODY

**NOTE:** Note length and position of valve body bolts for reassembly reference. See **Fig. 3** and **Fig. 4**.

### Removal

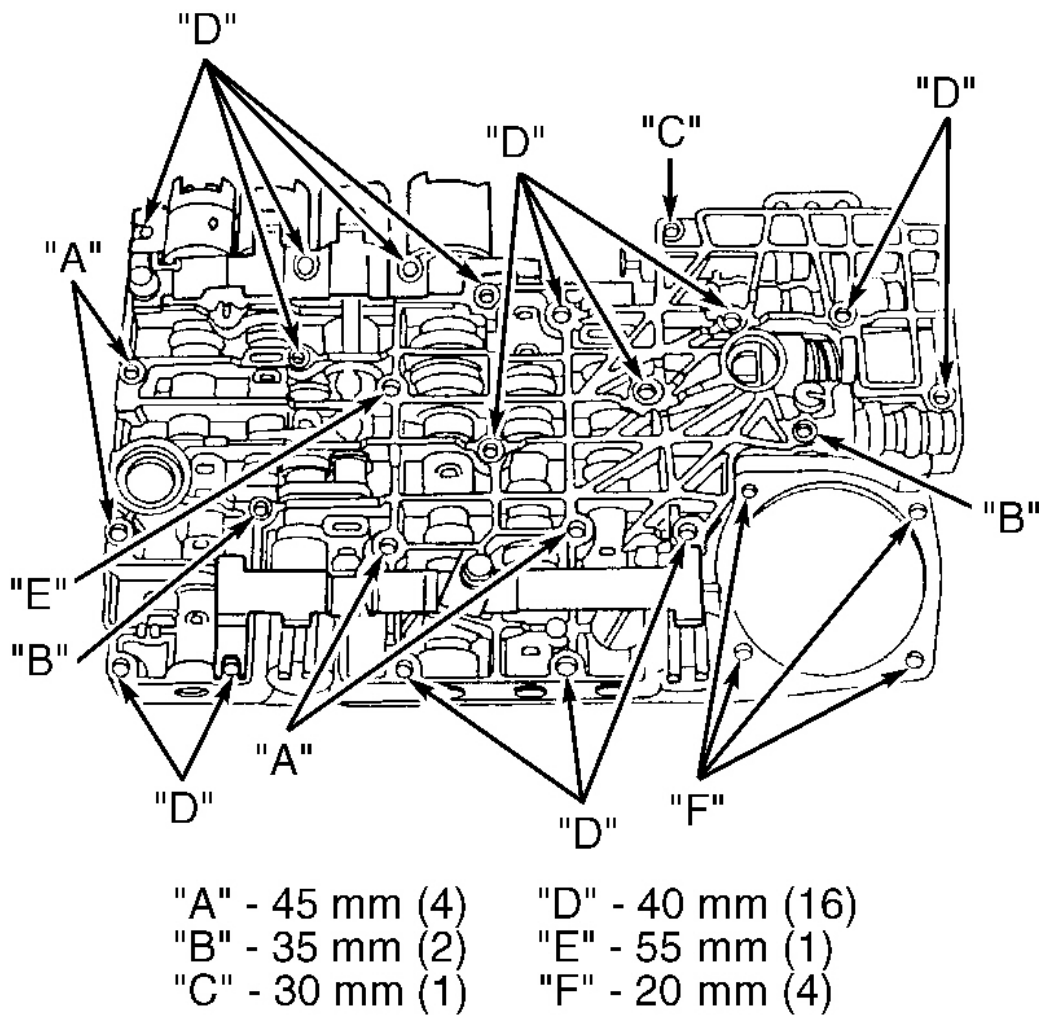
1. Raise and support vehicle. Loosen oil pan bolts and drain fluid. Remove oil pan, filter screen and "O" rings. Lift up wire loom guide and protector to disengage retaining pins from solenoid brackets. Disconnect 6 solenoid electrical connectors. Remove manual valve detent spring. See **Fig. 3** and **Fig. 4**.

**NOTE:**        **DO NOT remove center bolt from SS1 and SS3 solenoid bracket or forward bolt from TCC, CCS, SS2 and EPC solenoid bracket.**

2. Remove low-reverse servo bolts. Remove servo cover, gasket, piston and rod. Hold valve body in position and remove control valve body bolts. See **Fig. 3** and **Fig. 4**. Carefully ease valve body from case while detaching manual valve inner lever pin. Clean and inspect valve body thoroughly. See **CLEANING & INSPECTION**.

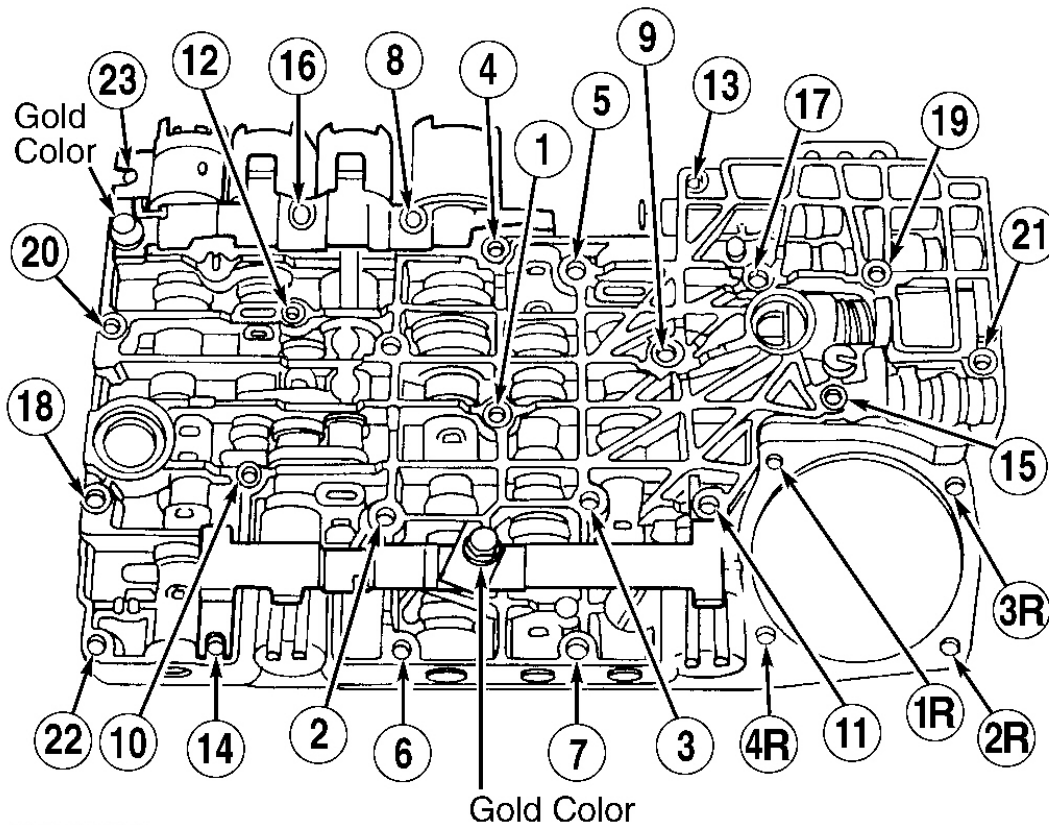
### Installation

1. Install Valve Body Alignment Pins (T95L-70010-B and T95L-70010-C) into case. See **Fig. 3** and **Fig. 4**. Ensure new separator gasket is properly aligned. Install valve body to case, align manual valve with lever pin with manual valve.
2. Install 4 bolts at location "A", 2 bolts at location "B" and one bolt at location "C" finger tight, to locate valve body into case. See **Fig. 3** and **Fig. 4**. Remove valve body alignment pins. Install remaining bolts finger tight, except filter screen bolt and 3-4 shift solenoid bolts.
3. Tighten valve body bolts, starting from center bolts and working to outer edges. See **TORQUE SPECIFICATIONS**. Install manual valve detent spring tighten bolt to specification.
4. Install low-reverse servo cover, piston, spring and gasket. Tighten bolts in crisscross pattern to specification. Connect solenoid wires. Install wire loom guide and protector.
5. Clean filter screen with solvent and install filter screen and "O" rings. Using a new gasket, install gasket and oil pan. Tighten oil pan bolts to specifications. Add 3 Qts. (2.8L) of Mercon ATF and start engine. Add fluid as necessary.



G96F04208

**Fig. 3: Control Valve Body Bolts Locations**  
 Courtesy of FORD MOTOR CO.



G96H04209

**Fig. 4: Control Valve Body Bolts Tightening Sequence**  
Courtesy of FORD MOTOR CO.

## LOW-REVERSE SERVO

### Removal & Installation

Remove transmission oil pan and filter screen with "O" rings. Remove low-reverse servo bolts. Remove servo cover, gasket, piston and rod. To install, reverse removal procedure. Tighten bolts in crisscross pattern to specification. See **TORQUE SPECIFICATIONS**.

## EXTENSION HOUSING

### Removal

1. Raise and support vehicle. Mark drive shaft(s) yoke and pinion flange for reassembly reference. Remove front (4WD) and rear drive shaft. Remove transfer case (if equipped). Disconnect speedometer cable from extension housing.
2. Support transmission with transmission jack. Remove rear support bolts. Raise transmission slightly and remove rear support from extension housing. Loosen extension housing bolts and allow transmission fluid

to drain.

3. Remove bolts and slide extension housing off output shaft. See appropriate component under **CLEANING & INSPECTION**.

#### **Installation**

1. Ensure parking pawl and spring are installed in housing correctly and are preloaded. Install new housing gasket and position extension housing on case.
2. Ensure parking pawl actuating rod is seated in extension housing guide cup bore. Install and tighten bolts. See **TORQUE SPECIFICATIONS**. To complete installation, reverse removal procedure.

### **EXTENSION HOUSING SEAL & BUSHING**

#### **Removal**

1. Raise and support vehicle. Mark drive shaft rear yoke and pinion flange for reassembly reference. Remove drive shaft.
2. Using Seal Remover (T74P-77248-A), remove the extension housing oil seal. Using Bushing Remover (T77L-7697-E), remove the extension housing bushing. See appropriate component under **CLEANING & INSPECTION**.

#### **Installation**

1. Using Bushing Installer (T77L-7697-F), install bushing with lube hole at 3 o'clock position. Ensure lube hole in bushing aligns with lube groove in extension housing. Using Seal Installer (T74P-77052-A), install seal with drain hole at 6 o'clock position.
2. Apply multipurpose long-life lubricant to seal lip and drive shaft yoke. Align index marks and install drive shaft. Add fluid as necessary

### **CCS, EPC, TCC, SS1, SS2 & SS3 SOLENOID**

**NOTE:**        **It is not necessary to remove valve body to replace solenoids**

#### **Removal & Installation**

1. Raise and support vehicle. Loosen oil pan bolts and drain fluid. Remove oil pan, filter screen and "O" rings. Lift up wire loom guide and protector to disengage retaining pins from solenoid brackets.
2. Disconnect appropriate solenoid electrical connector. Remove appropriate solenoid bracket bolts. Remove solenoid. SS1 and TCC solenoids may pop out of bore when bracket is removed. Converter modulator valve may come out when TCC solenoid is removed.
3. To install, reverse removal procedure. Ensure solenoid bracket engages TCC/EPC solenoid grooves and shift solenoid pockets. Clean filter screen with solvent and install filter screen and "O" rings. Using a new gasket, install gasket and oil pan. Tighten oil pan bolts to specifications. Add 3 Qts. (2.8L) of Mercon ATF and start engine. Add fluid as necessary.

### **TRANSMISSION RANGE (TR) SENSOR**



**Removal**

Disconnect shift linkage from transmission lever ball stud. Disconnect electrical connector. Remove manual control outer lever. Remove TR sensor.

**Installation**

1. Install TR sensor on manual lever. Install TR sensor bolts finger tight. Rotate manual lever to Neutral position (2 detents rearward). Install TR Sensor Alignment Tool (T93P-70010-A) into 3 slots on TR sensor. Tighten TR sensor bolts to specification. See **TORQUE SPECIFICATIONS** .
2. Install manual control outer lever, tighten nut to specification. Connect electrical connector. Install shift linkage and adjust if necessary.

**TROUBLE SHOOTING**

**NOTE:** After verifying driveability complaint, perform trouble shooting and testing procedures in this article. For electronic diagnostics and testing, see appropriate **AUTO TRANS DIAGNOSIS - FORD 4R44E & 4R55E CONTROLS** article. When trouble codes are retrieved, all engine related codes **MUST** be repaired first. For engine trouble code repair and diagnostic information, see appropriate **TESTS W/CODES** article in **ENGINE PERFORMANCE** section.

**PRELIMINARY CHECKS****Fluid Level**

1. Vehicle must be on level surface. Bring vehicle to normal operating temperature. Move shift selector through all positions, allowing enough time for each position to engage.
2. Securely engage shift lever in "P" position. Vehicles with 4WD must have 4WD selector in any position other than Neutral. Apply parking brake.
3. Check fluid with dipstick and add as necessary. If fluid is low , leakage is indicated. Locate and repair source of leak.

**Manual Shift Cable**

When column or console position is selected, ensure transmission detent position corresponds exactly. Adjust cable or indicator as necessary.

**ENGAGEMENT FAULTS****No Forward Engagement**

Fluid level, shift linkage, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body, pump assembly, center support assembly, forward clutch assembly and rear one-way clutch assembly.

**No Reverse Engagement**

Fluid level, shift linkage, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks), pump assembly, low-reverse clutch and low-reverse clutch band.

**Harsh Reverse Engagement**

Incorrect line pressure, valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks), and low-reverse clutch assembly .

**Harsh Forward Engagement**

Incorrect line pressure, valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks), and forward clutch assembly.

**Delayed/Soft Reverse Engagement**

Drive shaft (u-joints), engine mounts (loose or worn), fluid level and condition, shift linkage, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks), overdrive assembly, center support assembly, high-reverse clutch drum, and low-reverse clutch/band assembly.

**Delayed/Soft Forward Engagement**

Fluid level, shift linkage, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks), overdrive one-way clutch assembly, forward clutch and rear one-way clutch assembly.

**No Forward & No Reverse Engagement**

Fluid level, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body, pump assembly and overdrive one-way clutch assembly.

**No Forward In "D" & No Reverse Engagement**

Fluid level, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body, pump assembly, overdrive one-way clutch assembly and/or mechanical damage.

**Harsh Forward & Reverse Engagements**

Drive shaft (u-joints), engine mounts (loose or worn), idle speed, fluid level, high main control pressure and valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks).

**Delayed/Soft Forward & Reverse Engagement**

Fluid level and condition, low main control pressure, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks) and pump assembly.

**SHIFTING FAULTS**

**Some Or All Shifts Missing**

Fluid level and condition, shift linkage (misadjusted cable or kickdown system), incorrect line pressure, filter assembly (plugged), valve body (SS1, SS2, SS3, EPC solenoid), incorrectly tightened valve body bolts (cross-leaks), overdrive band, high-reverse clutch assembly, intermediate band, governor and transmission case (internal leaks).

**Early Or Late Shift Speeds**

Engine performance, tire size, axle ratio, speedometer gear (incorrect tooth count), incorrect line pressure and valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks).

**Erratic Or Hunting Shifting**

Fluid level and condition, filter assembly (plugged), valve body (sticking valves), incorrectly tightened valve body bolts (cross-leaks) and governor.

**Soft Or Slipping Shift Feel**

Fluid level and condition, filter assembly (plugged), incorrect line pressure, valve body (EPC solenoid), incorrectly tightened valve body bolts (cross-leaks), pump assembly, overdrive band and intermediate band.

**Harsh Shift Feel**

Fluid level, incorrect line pressure, valve body (EPC solenoid, separator plate), incorrectly tightened valve body bolts (cross-leaks), intermediate band and overdrive band.

**No Manual 1st Gear**

Incorrect line pressure, valve body (sticking valves), low-reverse band and low-reverse one-way clutch assembly.

**No Manual 2nd Gear**

Incorrect line pressure, valve body (sticking valves) and intermediate band.

**No Torque Converter Clutch (TCC) Application**

Valve body (TCC solenoid stuck open, TCC shuttle valve stuck in unlock position, TCC shift valve stuck in downshift position), torque converter and pump assembly.

**Torque Converter Clutch (TCC) Always Applied**

Valve body (TCC shuttle valve stuck in locked position) and torque converter.

**Torque Converter Clutch (TCC) Cycling**

Fluid contaminated, valve body (TCC solenoid, convertor clutch control valve) incorrectly tightened valve body bolts (cross-leaks) pump assembly and torque converter.

## MISCELLANEOUS FAULTS

### Transmission Overheating

Fluid level, incorrect line pressure, valve body (sticking valves), torque converter (seized one-way clutch) and cooler line restriction.

### No Engine Braking In Manual 2nd Gear

Incorrect line pressure, overdrive assembly and intermediate band.

### No Engine Braking In Manual 1st Gear

Fluid level, shift linkage, incorrect line pressure, coast clutch assembly, low-reverse clutch/band and low-reverse one-way clutch assembly.

### Vehicle Movement With Gear Selector In Neutral Position

Fluid level, shift linkage (adjustment), front one-way clutch assembly, forward clutch assembly and low-reverse one-way clutch.

### Slips & Chatters In Manual 1st Position

Incorrect line pressure, valve body (sticking valves), low-reverse band and low-reverse one-way clutch.

### Slips & Chatters In Manual 2nd Position

Incorrect line pressure, valve body (sticking valves), intermediate band and low-reverse one-way clutch.

## CLUTCH & BAND APPLICATION

### CLUTCH & BAND APPLICATION

| Selector Lever Position    | Elements In Use                                          |
|----------------------------|----------------------------------------------------------|
| "OD" (Overdrive)           |                                                          |
| 1st                        | Forward Clutch, Front 1-Way Clutch & Rear 1-Way Clutch   |
| 2nd                        | Forward Clutch, Front 1-Way Clutch & Intermediate Band   |
| 3rd                        | Forward Clutch, High/Reverse Clutch & Front 1-Way Clutch |
| 4th                        | Forward Clutch, High/Reverse Clutch & OD Band            |
| Reverse                    | Low/Reverse Band, Direct Clutch & OD 1-Way Clutch        |
| "D" (Drive) <sup>(1)</sup> |                                                          |
| 1st                        | Forward/Reverse Coast Clutch,                            |

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|                                                              |                                                                                                                 |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                                              | Forward Clutch, Front 1-Way Clutch<br>& Rear 1-Way Clutch                                                       |
| 2nd                                                          | Forward/Reverse Coast Clutch,<br>Forward Clutch, Front 1-Way Clutch<br>& Intermediate Band                      |
| 3rd                                                          | Forward Clutch, High/Reverse<br>Clutch, Front 1-Way Clutch &<br>Forward/Reverse Coast Clutch                    |
| Reverse                                                      | Coast Clutch, Low/Reverse Band,<br>Direct Clutch & Overdrive 1-Way<br>Clutch                                    |
| Manual                                                       |                                                                                                                 |
| 2nd                                                          | Forward/Reverse Coast Clutch,<br>Forward Clutch, Intermediate Band<br>& Front 1-Way Clutch                      |
| 1st                                                          | Forward/Reverse Coast Clutch,<br>Forward Clutch, Low/Reverse Band,<br>Front 1-Way Clutch & Rear 1-Way<br>Clutch |
| (1) Transmission Control Switch (TCS) on, overdrive canceled |                                                                                                                 |

## TESTING

After completing **PRELIMINARY CHECKS**, use initial road test to verify malfunction of transmission. Ensure engine is operating properly.

### SHIFT SPEED TEST

**NOTE:** Shift speeds into 4th gear are determined by engine calibration and are electronically controlled. Manufacturer does not supply wide-open throttle 3-4 or 4-3 shift speed information.

#### Road Test

This test will determine if shift control system is functioning properly.

1. Ensure engine and transmission is at normal operating temperature. Road test vehicle in "D" (overdrive on). Apply minimum throttle and observe speeds at which upshift occurs and torque converter engages. See **4R44E/4R55E SHIFT SPEEDS (2.3L 2WD)**, **4R44E/4R55E SHIFT SPEEDS (3.0L 2WD)**, **4R44E/4R55E SHIFT SPEEDS (3.0L 4WD)**, **4R44E/4R55E SHIFT SPEEDS (4.0L 2WD)** or **4R44E/4R55E SHIFT SPEEDS (4.0L 4WD)** table.
2. Stop vehicle. Press TCS switch, O/D OFF light will illuminate. repeat previous step. Transmission will make all upshifts except 3-4. Torque convertor lockup should occur above 27 MPH.
3. Press accelerator pedal to floor (WOT). Transmission should downshift from 3rd to 2nd or 3rd to 1st gear depending on vehicle speed. Torque convertor clutch should unlock.

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4. When traveling at approximately 30 MPH in "D" and transmission is manually shifted into 1st gear, transmission should shift into 2nd gear. When speed drops below 20 MPH, transmission will downshift into 1st gear.
5. If transmission fails to upshift/downshift or torque convertor clutch does not lock/unlock, see **TROUBLE SHOOTING**.

**4R44E/4R55E SHIFT SPEEDS (2.3L 2WD)**

| Operating Condition                                                      | Shift Speed MPH (3.73 Axle Ratio) |
|--------------------------------------------------------------------------|-----------------------------------|
| Minimum Throttle                                                         |                                   |
| 1-2                                                                      | 11-17                             |
| 2-3                                                                      | 20-27                             |
| 3-4                                                                      | 44-51                             |
| Partial Throttle                                                         |                                   |
| 1-2                                                                      | 23-29                             |
| 2-3                                                                      | 37-44                             |
| 3-4                                                                      | 60-67                             |
| 4-3                                                                      | 43-49                             |
| 3-2                                                                      | 25-31                             |
| WOT                                                                      |                                   |
| 1-2                                                                      | 37-43                             |
| 2-3                                                                      | 66-74                             |
| 3-2                                                                      | 61-69                             |
| 3-1/2-1                                                                  | 31-39                             |
| Coast <sup>(1)</sup>                                                     |                                   |
| 3-2                                                                      | 13-20                             |
| 2-1                                                                      | 6-11                              |
| Manual 2-1                                                               | 30-35                             |
| (1) Closed throttle, coasting condition. Downshift may be imperceptible. |                                   |

**4R44E/4R55E SHIFT SPEEDS (3.0L 2WD)**

| Operating Condition | Shift Speed MPH (3.45 Axle Ratio) | Shift Speed MPH (3.73 Axle Ratio) |
|---------------------|-----------------------------------|-----------------------------------|
| Minimum Throttle    |                                   |                                   |
| 1-2                 | 11-17                             | 10-16                             |
| 2-3                 | 20-25                             | 18-25                             |
| 3-4                 | 45-52                             | 42-49                             |
| Partial Throttle    |                                   |                                   |
| 1-2                 | 22-28                             | 20-26                             |
| 2-3                 | 35-42                             | 33-40                             |
| 3-4                 | 64-71                             | 58-67                             |

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|                                                                          |       |       |
|--------------------------------------------------------------------------|-------|-------|
| 4-3                                                                      | 54-61 | 50-57 |
| 3-2                                                                      | 32-38 | 30-36 |
| WOT                                                                      |       |       |
| 1-2                                                                      | 37-44 | 35-41 |
| 2-3                                                                      | 69-78 | 64-71 |
| 3-2                                                                      | 66-74 | 61-69 |
| 3-1/2-1                                                                  | 34-39 | 31-38 |
| Coast <sup>(1)</sup>                                                     |       |       |
| 3-2                                                                      | 15-20 | 13-20 |
| 2-1                                                                      | 9-14  | 9-14  |
| Manual 2-1                                                               | 33-38 | 33-38 |
| (1) Closed throttle, coasting condition. Downshift may be imperceptible. |       |       |

**4R44E/4R55E SHIFT SPEEDS (3.0L 4WD)**

| Operating Condition                                                      | Shift Speed MPH<br>(3.73 Axle Ratio) | Shift Speed MPH<br>(4.10 Axle Ratio) |
|--------------------------------------------------------------------------|--------------------------------------|--------------------------------------|
| Minimum Throttle                                                         |                                      |                                      |
| 1-2                                                                      | 12-17                                | 10-16                                |
| 2-3                                                                      | 20-26                                | 18-25                                |
| 3-4                                                                      | 45-53                                | 41-49                                |
| Partial Throttle                                                         |                                      |                                      |
| 1-2                                                                      | 22-29                                | 20-26                                |
| 2-3                                                                      | 36-43                                | 33-40                                |
| 3-4                                                                      | 64-72                                | 58-67                                |
| 4-3                                                                      | 54-62                                | 49-57                                |
| 3-2                                                                      | 30-37                                | 28-34                                |
| WOT                                                                      |                                      |                                      |
| 1-2                                                                      | 38-45                                | 34-41                                |
| 2-3                                                                      | 71-79                                | 64-73                                |
| 3-2                                                                      | 66-74                                | 60-69                                |
| 3-1/2-1                                                                  | 34-41                                | 31-38                                |
| Coast <sup>(1)</sup>                                                     |                                      |                                      |
| 3-2                                                                      | 14-19                                | 13-19                                |
| 2-1                                                                      | 9-14                                 | 8-14                                 |
| Manual 2-1                                                               | 25-30                                | 25-30                                |
| (1) Closed throttle, coasting condition. Downshift may be imperceptible. |                                      |                                      |

**4R44E/4R55E SHIFT SPEEDS (4.0L 2WD)**

| Operating Condition | Shift Speed MPH<br>(3.08 Axle Ratio) | Shift Speed MPH<br>(3.55 Axle Ratio) |
|---------------------|--------------------------------------|--------------------------------------|
|                     |                                      |                                      |

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**Minimum Throttle**

|     |       |       |
|-----|-------|-------|
| 1-2 | 14-20 | 12-18 |
| 2-3 | 23-30 | 20-27 |
| 3-4 | 46-53 | 39-46 |

**Partial Throttle**

|     |       |       |
|-----|-------|-------|
| 1-2 | 25-32 | 22-29 |
| 2-3 | 40-47 | 35-41 |
| 3-4 | 58-66 | 50-58 |
| 4-3 | 53-61 | 46-53 |
| 3-2 | 33-40 | 28-33 |

**WOT**

|         |       |       |
|---------|-------|-------|
| 1-2     | 39-46 | 34-39 |
| 2-3     | 70-79 | 61-69 |
| 3-2     | 65-73 | 56-64 |
| 3-1/2-1 | 34-40 | 29-36 |

**Coast <sup>(1)</sup>**

|            |       |       |
|------------|-------|-------|
| 3-2        | 12-22 | 9-15  |
| 2-1        | 10-16 | 14-20 |
| Manual 2-1 | 30-35 | 30-35 |

(1) Closed throttle, coasting condition. Downshift may be imperceptible.

**4R44E/4R55E SHIFT SPEEDS (4.0L 4WD)**

| <b>Operating Condition</b>  | <b>Shift Speed MPH<br/>(3.27 Axle Ratio)</b> | <b>Shift Speed MPH<br/>(3.73 Axle Ratio)</b> |
|-----------------------------|----------------------------------------------|----------------------------------------------|
| <b>Minimum Throttle</b>     |                                              |                                              |
| 1-2                         | 15-20                                        | 12-19                                        |
| 2-3                         | 19-30                                        | 20-28                                        |
| 3-4                         | 48-55                                        | 42-49                                        |
| <b>Partial Throttle</b>     |                                              |                                              |
| 1-2                         | 27-33                                        | 24-30                                        |
| 2-3                         | 42-49                                        | 37-44                                        |
| 3-4                         | 61-69                                        | 54-62                                        |
| 4-3                         | 54-62                                        | 47-55                                        |
| 3-2                         | 35-42                                        | 30-37                                        |
| <b>WOT</b>                  |                                              |                                              |
| 1-2                         | 41-48                                        | 36-43                                        |
| 2-3                         | 74-82                                        | 64-73                                        |
| 3-2                         | 68-77                                        | 59-68                                        |
| 3-1/2-1                     | 35-42                                        | 30-38                                        |
| <b>Coast <sup>(1)</sup></b> |                                              |                                              |
| 3-2                         | 17-23                                        | 15-21                                        |



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1995-96 AUTOMATIC TRANSMISSIONS Ford 4R44E & 4R55E

|                                                                          |       |       |
|--------------------------------------------------------------------------|-------|-------|
| 2-1                                                                      | 11-17 | 10-15 |
| Manual 2-1                                                               | 30-35 | 30-35 |
| (1) Closed throttle, coasting condition. Downshift may be imperceptible. |       |       |

### CONVERTER CLUTCH TEST

Connect tachometer to engine. Ensure engine and transmission is at normal operating temperature. Drive vehicle at approximately 50 MPH in "D" (overdrive on). Release throttle for about 2 seconds then reapply throttle to previous setting. Engine RPM should increase when throttle is released (clutch disengages). Engine RPM should decrease in about 5 seconds (clutch engages), after throttle is reapplied. If converter clutch does not engage or is engaged continuously, see appropriate **AUTO TRANS DIAGNOSIS - FORD 4R44E & 4R55E CONTROLS** article.

**CAUTION: Perform line pressure test before performing stall speed test. If line pressure is low at stall, DO NOT perform stall speed test or transmission damage will occur. DO NOT maintain Wide Open Throttle (WOT) in any gear for more than 5 seconds.**

### LINE PRESSURE TEST

#### Test Procedure

Connect pressure gauge to line pressure test port. See **Fig. 5** . Start engine. Apply service and parking brakes. Check pressure in all gears. See **LINE PRESSURE SPECIFICATIONS (PSI) TABLE** . If line pressure is not within specification, perform appropriate electronic test. See appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS. If no electronic faults are present, perform air pressure test. See **AIR PRESSURE TEST** . Service valve body or pump as required. See **LINE PRESSURE DIAGNOSIS** .

### LINE PRESSURE DIAGNOSIS

Compare recorded control pressures to control pressures listed in table. See **LINE PRESSURE SPECIFICATIONS (PSI) TABLE** . If control pressures are outside of specified ranges, use symptoms to determine cause of trouble.

#### High At Idle In All Ranges

Wiring harness, EPC boost valve, EPC solenoid, or main regulator valve.

#### Low At Idle In All Ranges

Low fluid level, restricted intake screen or filter, loose valve body bolts, pump leakage, case leakage, faulty valve body or separator plate.

#### Low In All Forward Ranges

Forward clutch, valve body or overdrive servo.

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**Low In "P"**

Valve body.

**Low In "R"**

Separator plate, rear servo, low-reverse clutch, overdrive servo, valve body or forward clutch.

**Low In "N"**

Valve body or overdrive servo.

**Low In "O/D"**

Forward clutch, overdrive servo or valve body.

**Low In "D"**

Forward clutch, overdrive servo or valve body.

**Low In "1st"**

Forward clutch or valve body.

**Low In "2nd"**

Intermediate servo, overdrive servo or forward clutch.

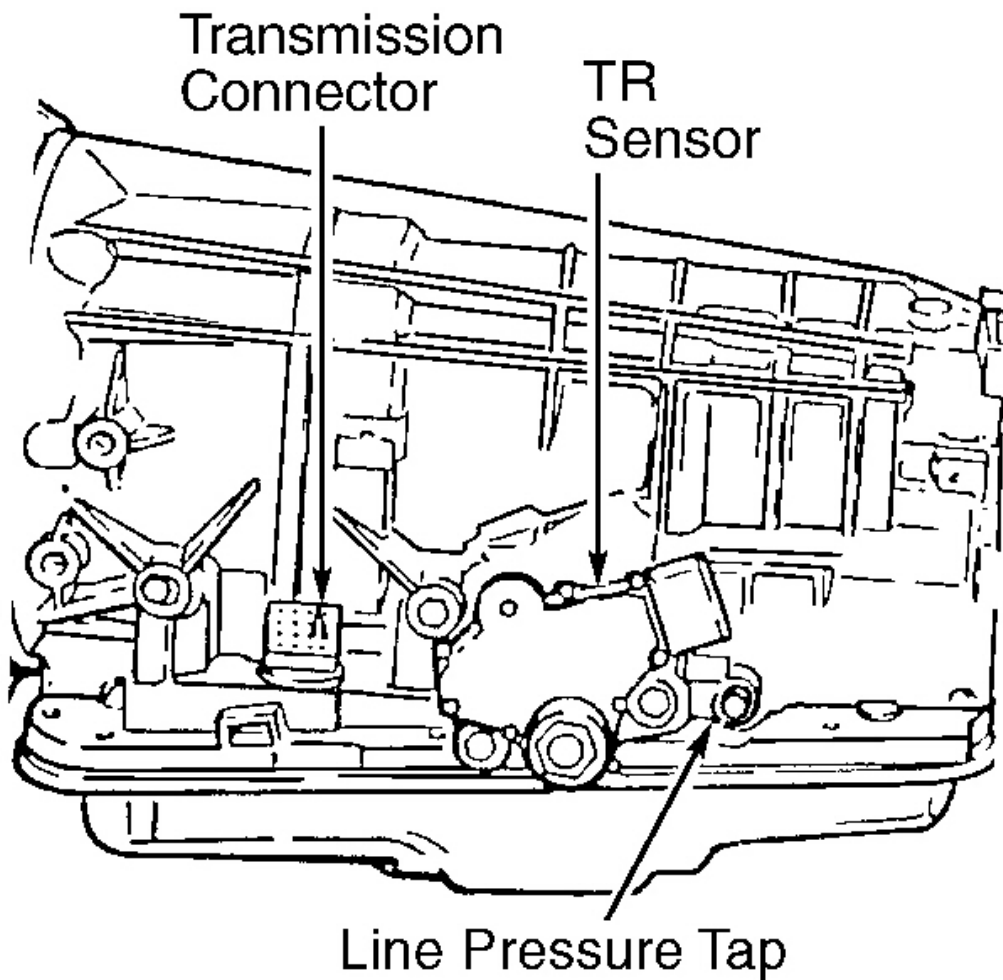
**LINE PRESSURE SPECIFICATIONS (PSI)**

| Selector Position                        | @ Idle RPM | @ WOT Stall RPM |
|------------------------------------------|------------|-----------------|
| Ford                                     |            |                 |
| Aerostar 3.0L (4R44E)                    |            |                 |
| "P" & "N"                                | 79-93      | N/A             |
| "R"                                      | 79-136     | 291-331         |
| "D", "2" & "1"                           | 69-79      | 193-227         |
| Aerostar, Explorer & Ranger 4.0L (4R55E) |            |                 |
| "P" & "N"                                | 90-103     | N/A             |
| "R"                                      | 95-162     | 299-346         |
| "D", "2" & "1"                           | 87-98      | 207-241         |
| Ranger 2.3L (4R44E)                      |            |                 |
| "P" & "N"                                | 79-93      | N/A             |
| "R"                                      | 79-136     | 291-331         |
| "D", "2" & "1"                           | 69-79      | 193-227         |
| Ranger 3.0L (4R44E)                      |            |                 |
| "P" & "N"                                | 85-103     | N/A             |
|                                          |            |                 |

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|                |         |         |
|----------------|---------|---------|
| "R"            | 107-162 | 237-283 |
| "D", "2" & "1" | 98-111  | 164-190 |
| Mazda          |         |         |
| 2.3L (4R44E)   |         |         |
| "P" & "N"      | 79-93   | N/A     |
| "R"            | 79-136  | 291-331 |
| "D", "2" & "1" | 69-79   | 193-227 |
| 3.0L (4R44E)   |         |         |
| "P" & "N"      | 85-103  | N/A     |
| "R"            | 107-162 | 237-283 |
| "D", "2" & "1" | 98-111  | 164-190 |
| 4.0L (4R55E)   |         |         |
| "P" & "N"      | 90-103  | N/A     |
| "R"            | 95-162  | 299-346 |
| "D", "2" & "1" | 87-98   | 207-241 |



G96B04206

**Fig. 5: Identifying Line Pressure Test Port**  
Courtesy of FORD MOTOR CO.

## STALL SPEED TEST

### Testing Precautions

1. Engine coolant and transmission fluid must be at proper levels and operating temperatures. Linkages must be adjusted properly. Hold accelerator down just long enough to get a stable tachometer reading. **DO NOT** floor accelerator for more than 5 seconds.
2. **DO NOT** exceed maximum specified RPM for vehicle. Before shifting into each selector position, run engine in Neutral at 1000 RPM for 2 minutes to cool transmission. If engine speed exceeds specification,

## 1996 Ford Aerostar

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release accelerator immediately, as this is an indication of clutch or band slippage.

### Testing Procedure

Connect tachometer to engine. Apply parking and service brakes firmly. Place selector lever in each gear. Press accelerator completely to floor and record tachometer reading in each gear. **DO NOT** exceed 5 second limit. Engine speed should be within specifications. See **STALL SPEEDS SPECIFICATIONS TABLE** .

### STALL SPEEDS SPECIFICATIONS

| Application        | Stall Speed RPM |
|--------------------|-----------------|
| 2.3L & 3.0L Engine | 2720-3165       |
| 4.0L Engine        | 2550-2950       |

### STALL TEST RESULTS

#### Low In All Ranges

Poor engine performance. Faulty torque converter stator one-way clutch.

#### High In "O/D", "D" & "1"

Overdrive one-way clutch or rear one-way clutch faulty.

#### High In "D", "2" & "1"

Forward clutch or overdrive one-way clutch faulty.

#### High In "O/D" Only

Forward clutch or overdrive one-way clutch faulty.

#### High In All Ranges

General transmission problems are indicated. Perform control pressure tests.

#### High In "R" Only

Overdrive clutch, overdrive one-way clutch, low-reverse and high clutch, low-reverse band or servo faulty.

#### High In "2" Only

Intermediate band or servo faulty.

#### High In "1" Only

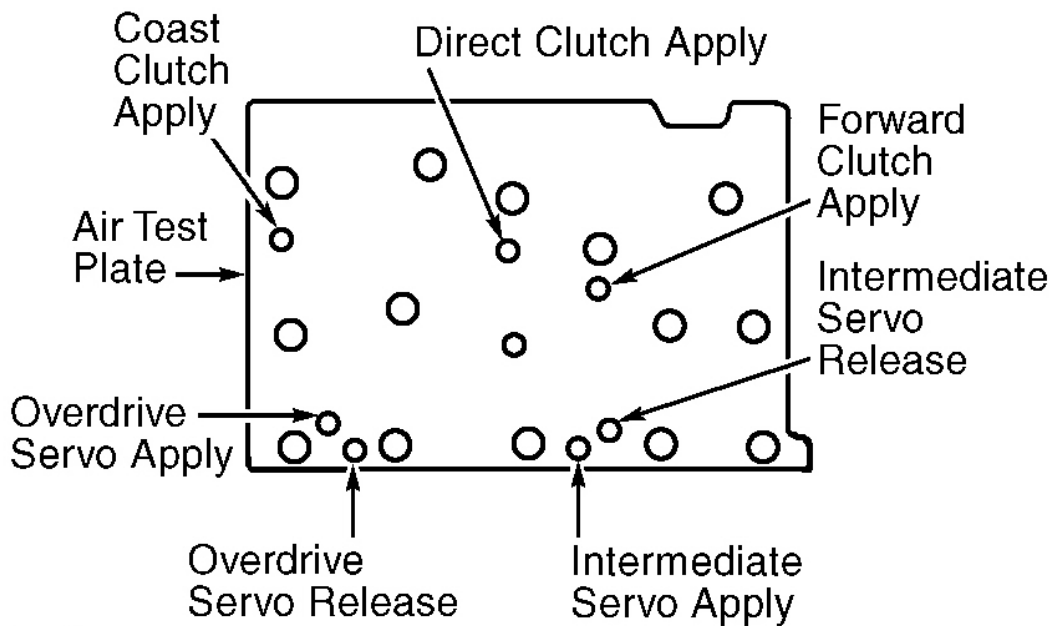
Low-reverse band or servo faulty.

### AIR PRESSURE TESTS

A "No Drive" condition can exist, even with correct transmission fluid pressure, due to inoperative clutches or bands. Inoperative units can be located through a series of checks by substituting air pressure for fluid pressure to determine location of malfunction.

To check unit, drain transmission fluid. Remove oil pan, gasket and control valve body. See **VALVE BODY** removal procedure under ON-VEHICLE SERVICE. Install Transmission Test Plate (T95L-77000-AH) and Test Plate Gasket (T95L-7006-A). Using shop air (40 psi maximum), apply air to indicated points. See **Fig. 6**.

**NOTE:** Cover vent in test plate with shop towel to prevent fluid spray. **DO NOT** plug or apply air pressure to test plate vent.



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**Fig. 6: Air Pressure Test Points**  
Courtesy of FORD MOTOR CO.

A dull thud can be heard or movement felt when clutch or band is applied. If clutch seals or check balls are leaking a hissing sound may be heard. If air pressure applied to a clutch passage fails to operate clutch or operates clutches simultaneously, check fluid passages in case and oil pump. Use air pressure to detect obstructions.

#### TRANSMISSION FLUID COOLER FLOW CHECK

**NOTE:** Before performing TRANSMISSION FLUID COOLER FLOW CHECK, ensure shift cables and linkages are properly adjusted. Ensure fluid level is correct and line pressures are within specifications. See **LINE PRESSURE TEST**.

1. Remove transmission dipstick from filler tube. Install a funnel into filler tube. Raise and support vehicle. Disconnect transmission cooler return line (upper line) from transmission case fitting.
2. Connect one end of a hose to transmission cooler return line. Install other end of hose into filler tube funnel. Start engine and run at idle with transmission in Neutral position.
3. Note fluid flow at funnel. Wait until flow is constant. This indicates air bleeding has been completed. Fluid flow should be free and heavy. If flow is intermittent or light, check flow from transmission fluid output line to determine source of restriction.
4. If transmission output line flow is good, restriction is in cooler. Repair as necessary. If output line flow is poor, check for main oil circuit leakage, oil pump defect or a stuck converter charge relief valve.

## **TORQUE CONVERTER FLUSHING**

Whenever transmission has been disassembled to replace worn or damaged parts or because valve body sticks due to foreign material, converter must be cleaned using a mechanically agitated cleaner, such as Rotunda (014-00028). Under no conditions should converter be cleaned by hand agitation using solvent.

After removing torque converter from cleaning equipment, thoroughly drain remaining solvent from converter hub. Add 2 Qts. (1.9L) of clean transmission fluid to converter and agitate by hand. Thoroughly drain converter hub.

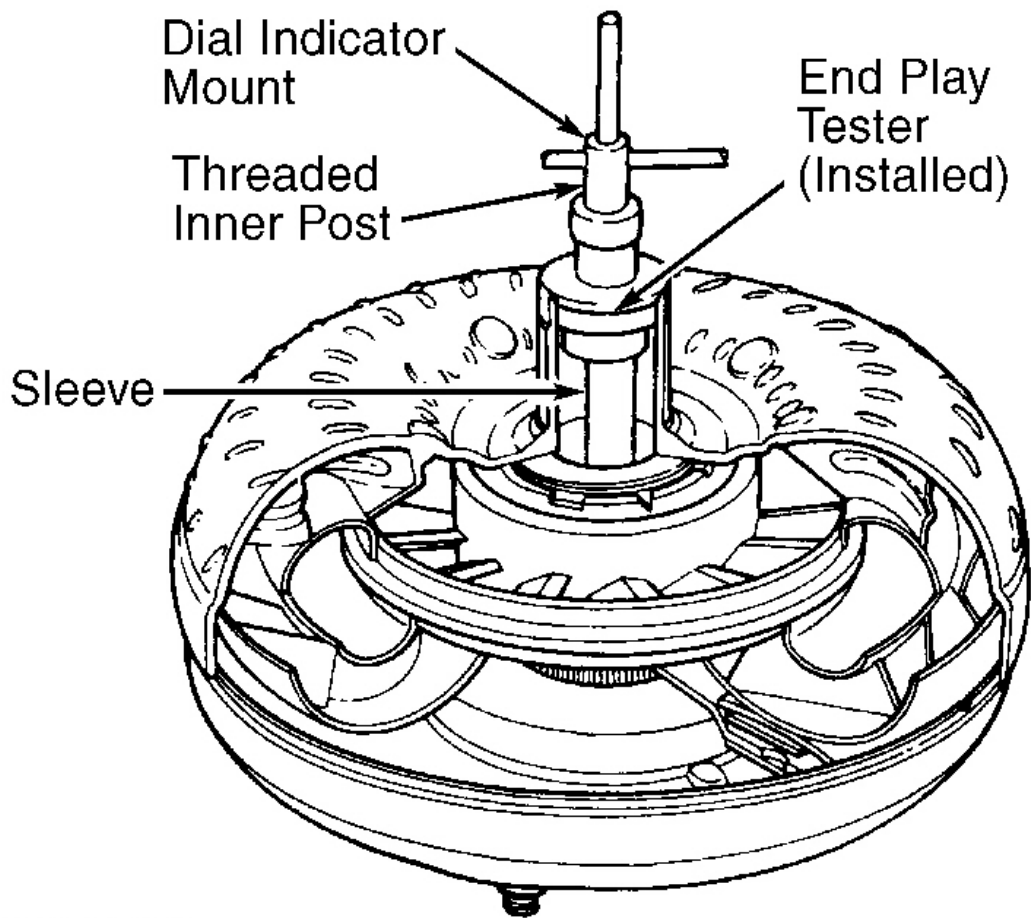
**NOTE:**        **Torque converter is a sealed unit and cannot be disassembled for service. Replace if found to be defective. Perform the following tests to ensure converter is defective before replacing unit.**

## **TORQUE CONVERTER LEAK TEST**

If torque converter welds indicate leakage, attach Torque Converter Leak Detector (Rotunda 021-00054) to converter and follow detector kit instructions.

## **TORQUE CONVERTER TURBINE & STATOR END PLAY CHECK**

1. Insert Torque Converter End Play Tester (T80L-7902-A) into converter pump drive hub until it bottoms. Expand sleeve in turbine spline by tightening threaded inner post of tester until it is securely locked into spline. See [Fig. 7](#).
2. Attach dial indicator to tester with dial indicator tip on converter housing. Zero dial face. Lift tester upward as far as it will go and note dial indicator reading.
3. Reading is total end play of turbine and stator. If end play exceeds .023" (.58 mm) on new or rebuilt converter, or .050" (1.27 mm) on used converter, replace torque converter assembly.



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**Fig. 7: Installing Torque Converter End Play Tester**  
Courtesy of FORD MOTOR CO.

## TORQUE CONVERTER STATOR INTERFERENCE CHECK

### Stator-To-Impeller Interference Check

1. Position front pump assembly on bench with spline end of stator shaft pointing upward. Mount converter on pump so splines of one-way clutch inner race engage splines of stator support and impeller hub engages pump drive gear.
2. While holding pump stationary, rotate converter in both directions (clockwise and counterclockwise). Converter should rotate freely without interference. If an interference or scraping condition exists, replace torque converter unit.

## REMOVAL & INSTALLATION



See appropriate TRANSMISSION REMOVAL & INSTALLATION - A/T article in TRANSMISSION SERVICING section.

## TRANSMISSION DISASSEMBLY

**NOTE:** See Fig. 25 , Fig. 26 , Fig. 27 and Fig. 28 for exploded view of internal parts, thrust washer and needle bearing locations.

1. Remove transfer case, if equipped. Remove torque converter and input shaft. Splined input shaft ends are different. Note direction of installation for reassembly reference. Remove extension housing oil seal. Using Bushing Remover (T77L-7697-E), remove extension housing bushing (if necessary).
2. Remove extension housing. Remove parking pawl, return spring and shaft. Remove heat shield (if equipped). Remove manual control outer lever. Remove TR sensor. Remove oil pan and filter screen. Lift up wire loom guide and protector to disengage retaining pins from solenoid brackets. Disconnect 6 solenoid electrical connectors. Remove manual valve detent spring. Remove low-reverse servo bolts. Remove servo cover, gasket, piston and rod.

**NOTE:** DO NOT remove center bolt from SS1 and SS3 solenoid bracket or forward bolt from TCC, CCS, SS2 and EPC solenoid bracket. See Fig. 3 and Fig. 4 .

3. Remove valve body bolts. Remove valve body and gasket from case. Using Servo Cover Compressor (T95L-77028-A), remove intermediate servo cover snap ring. Remove and mark intermediate servo cover, piston and spring. Using servo cover compressor, remove overdrive servo cover snap ring. Remove and mark overdrive cover, piston and spring.

**NOTE:** Servo covers are under spring pressure. Use care during snap ring removal. If covers stick, lightly tap cover or side of case. Air pressure may be used, but DO NOT exceed 20 psi (1.4 kg/cm<sup>2</sup> ). See Fig. 6 .

4. Remove and discard overdrive and intermediate band lock nuts and back off adjusting screws. Remove and discard converter housing-to-case bolts. Remove converter housing and pump as an assembly. Use a twisting motion to keep clutches in place. Remove gasket and No. 1 thrust washer. Compress overdrive band and remove anchor strut and adjusting screw.
5. Remove overdrive band. Tag band as overdrive. Tag anchor or apply end of band for reassembly reference. Lift out overdrive brake and coast clutch drum. Remove overdrive band apply strut and actuating lever shaft. Lift out overdrive planetary gear carrier assembly with No. 2 and No. 12 thrust bearings. Remove servo band lever and overdrive control bracket.

**NOTE:** Mark actuating lever and shaft for reassembly to overdrive assembly. Overdrive actuating lever shaft is longer than the intermediate actuating lever shaft.

6. Lift out overdrive ring gear, one-way clutch and center shaft assembly. Remove No. 3 thrust bearing. Remove 5 mm Allen head bolt retaining center support. Remove lock nut from center support. Disconnect Turbine Shaft Speed Sensor (TSS) connector from 16-pin case connector. Remove TSS.

7. Remove case connector retaining ring. Depress tab on back side of case connector while pushing down on connector. Remove connector and harness through bottom of case. Remove center support snap ring from case. Remove center support by pulling upward, carefully and evenly. Remove No. 4 thrust bearing behind center support.
8. Remove intermediate band anchor strut through bottom of case. Remove intermediate band adjusting screw. Remove intermediate band. Tag band as intermediate. Tag anchor or apply end of band for reassembly reference. Remove intermediate band actuating lever and shaft. Remove intermediate band servo lever. Tag for reassembly reference.

**NOTE:**        **Mark actuating lever and shaft for reassembly to intermediate assembly. Intermediate actuating lever shaft is shorter than the overdrive actuating lever shaft.**

9. Remove intermediate brake and direct clutch drum, No. 5 thrust washer, forward clutch cylinder and forward ring gear and hub. Remove No. 7 thrust bearing. Remove forward planetary gear set. Remove input shell with forward sun gear. Remove large snap ring from reverse planet gear carrier (except 4.0L models). On all models, remove reverse planet carrier and No. 8 and No. 9 thrust washers.
10. On models with 4.0L engine, remove output shaft sleeve. On all models, remove and discard small output shaft snap ring. Remove output shaft ring gear and hub. Remove No. 10 thrust washer. Remove low-reverse drum and one-way clutch assembly. Inner race of rear one-way clutch is not removable. Remove low-reverse band. Remove output shaft. Remove park gear. Remove No. 11 thrust washer.
11. Remove manual valve inner lever nut. Remove manual valve inner lever and parking pawl actuating rod. To loosen manual control lever shaft retaining pin, tap lightly on each side pin, using small hammer and drift. Remove retaining pin, manual control lever shaft and seal.

## **COMPONENT DISASSEMBLY & REASSEMBLY**

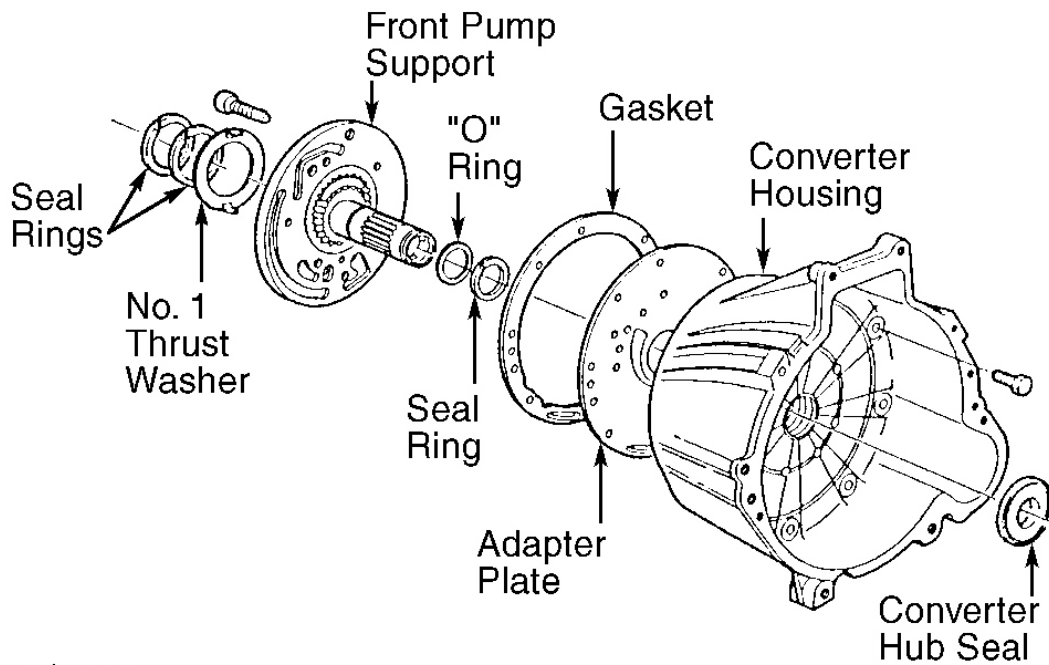
### **CONVERTOR HOUSING & PUMP**

#### **Disassembly**

Remove front pump gasket, square cut seal ring, 2 overdrive brake drum seal rings and front pump support seal ring. See **Fig. 8** . Remove front pump-to-convertor housing bolts. Remove front pump support, gear and adapter plate. Remove pump gears. Remove metal displaced by prior staking. Remove front pump seal. See related components under **CLEANING & INSPECTION** .

#### **Reassembly**

To reassemble, reverse disassembly procedure. Install new convertor hub-to-convertor housing seal and stake in place using Front Pump Staking Tool (T87L-77248-A). Protect oil passages on rear of convertor housing while staking.



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**Fig. 8: Exploded View Of Converter Housing & Pump**  
Courtesy of FORD MOTOR CO.

## COAST CLUTCH

### Disassembly

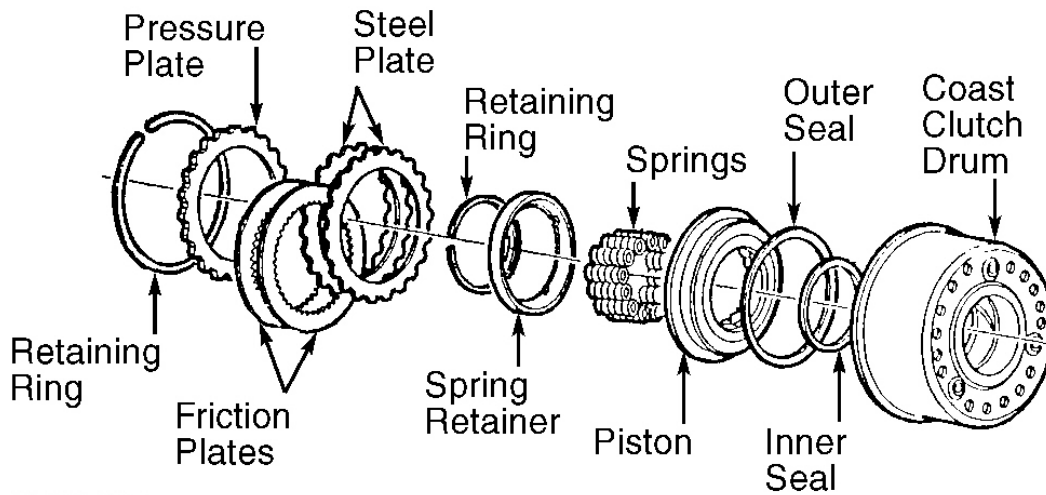
1. Remove pressure plate retaining snap ring. Remove pressure plate and clutch pack. Using appropriate spring compressor, compress clutch springs and remove retaining ring. Carefully release pressure on springs.
2. Remove spring compressor, spring retainer and clutch springs. Turn clutch body over and carefully force piston out with compressed air. **DO NOT** exceed 20 psi (1.4 kg/cm<sup>2</sup>). Hold finger over opposite hole. Remove "O" rings from piston and clutch body. See related components under **CLEANING & INSPECTION**.

### Reassembly

1. Install inner and outer piston seals. Ensure seal lips face bottom of cylinder. Apply transmission fluid to seals and install clutch piston into Coast Clutch Outer Seal Sizing Tool (T95L-70010-D). If installing new clutch plates, soak in transmission fluid for at least 30 minutes. Ensure coast clutch drum check ball is free in cage.
2. Remove clutch piston from sizing tool and install into coast clutch drum. Install piston springs and spring retainer. Compress springs and install retaining snap ring. Carefully remove spring compressor. Install 2 steel plates and 2 friction plates in alternating order, starting with steel plate first. See **Fig. 9**. Install

pressure plate and secure pack with retaining snap ring.

3. While pushing down on clutch pack, use a feeler gauge to check clearance between retaining snap ring and pressure plate. If clearance is not .051-.079" (1.3-2.0 mm), install correct thickness retaining snap ring.
4. Retaining snap rings are available in the following thicknesses: .054" (1.37 mm), .068" (1.73 mm), .082" (2.08 mm) and .096" (2.44 mm). Once correct retaining snap ring is installed, recheck clearance.
5. Apply air pressure to hole on back side of clutch assembly. Block opposite hole with finger. Piston must apply under pressure and release when air is removed.



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**Fig. 9: Exploded View Of Coast Clutch**  
Courtesy of FORD MOTOR CO.

## DIRECT CLUTCH

### Disassembly

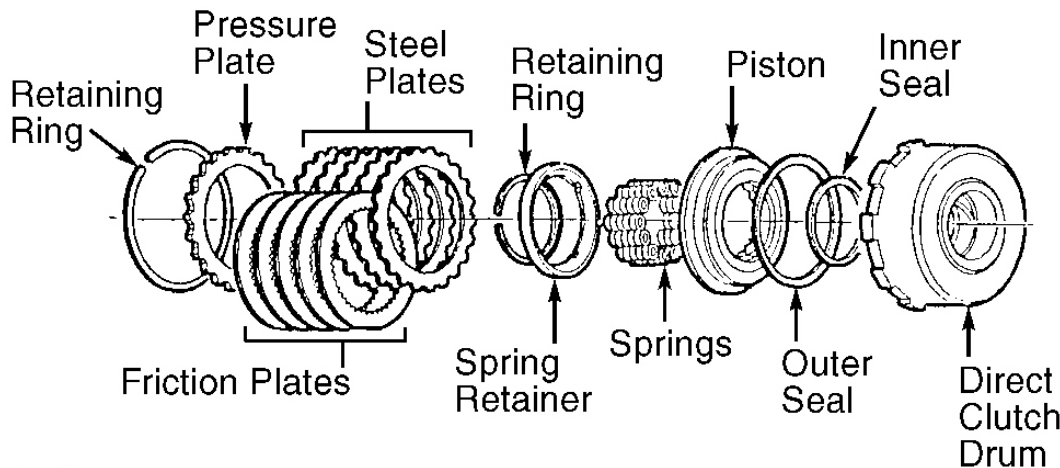
1. Remove pressure plate retaining snap ring. Remove pressure plate and clutch pack. Using appropriate spring compressor, compress clutch springs and remove retaining ring. Carefully release pressure on springs.
2. Remove spring compressor, spring retainer and clutch springs. Turn clutch body over and carefully force piston out with compressed air. **DO NOT** exceed 20 psi (1.4 kg/cm<sup>2</sup>). Hold finger over opposite hole. Remove "O" rings from piston and clutch body. See related components under **CLEANING & INSPECTION**.

### Reassembly

1. Install inner and outer piston seals. Ensure seal lips face bottom of cylinder. Apply transmission fluid to seals and install clutch piston into Direct Clutch Outer Seal Sizing Tool (T95L-70010-E). If installing

new clutch plates, soak in transmission fluid for at least 30 minutes. Ensure coast clutch drum check ball is free in cage. Remove clutch piston from sizing tool and install into direct clutch drum.

2. Install piston springs and spring retainer. Compress springs and install retaining snap ring. Carefully remove spring compressor. Install a steel plate and then a friction plate. Alternately install remaining discs in clutch pack. Number of clutch discs varies with engine size. Install same number of discs as removed. See **Fig. 10** . Install pressure plate and secure pack with retaining snap ring.
3. While pushing down on clutch pack, use a feeler gauge to check clearance between retaining snap ring and pressure plate. If clearance is not .051-.079" (1.3-2.0 mm), install correct thickness retaining snap ring.
4. Retaining snap rings are available in the following thicknesses: .054" (1.37 mm), .068" (1.73 mm), .082" (2.08 mm) and .096" (2.44 mm). Once correct retaining snap ring is installed, recheck clearance.
5. Apply air pressure to hole on back side of clutch assembly. Block opposite hole with finger. Piston must apply under pressure and release when air is removed.



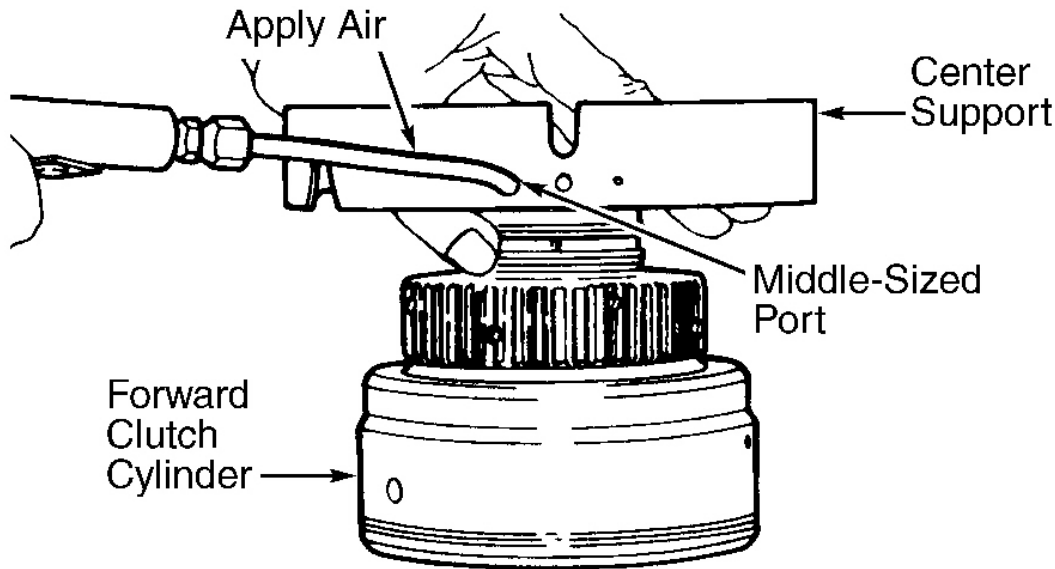
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**Fig. 10: Exploded View Of Direct Clutch**  
Courtesy of FORD MOTOR CO.

## FORWARD CLUTCH

### Disassembly

1. Remove pressure plate retaining snap ring. Remove pressure plate and clutch pack. Using appropriate spring compressor, compress clutch springs and remove retaining ring. Carefully release pressure on springs.
2. Remove spring compressor, spring retainer, clutch springs and cushion spring. Install center support on forward clutch cylinder. Apply air pressure to left side (middle-sized) port. Piston will be forced out. See **Fig. 11** . Remove "O" rings from piston and clutch body. See related components under **CLEANING & INSPECTION** .

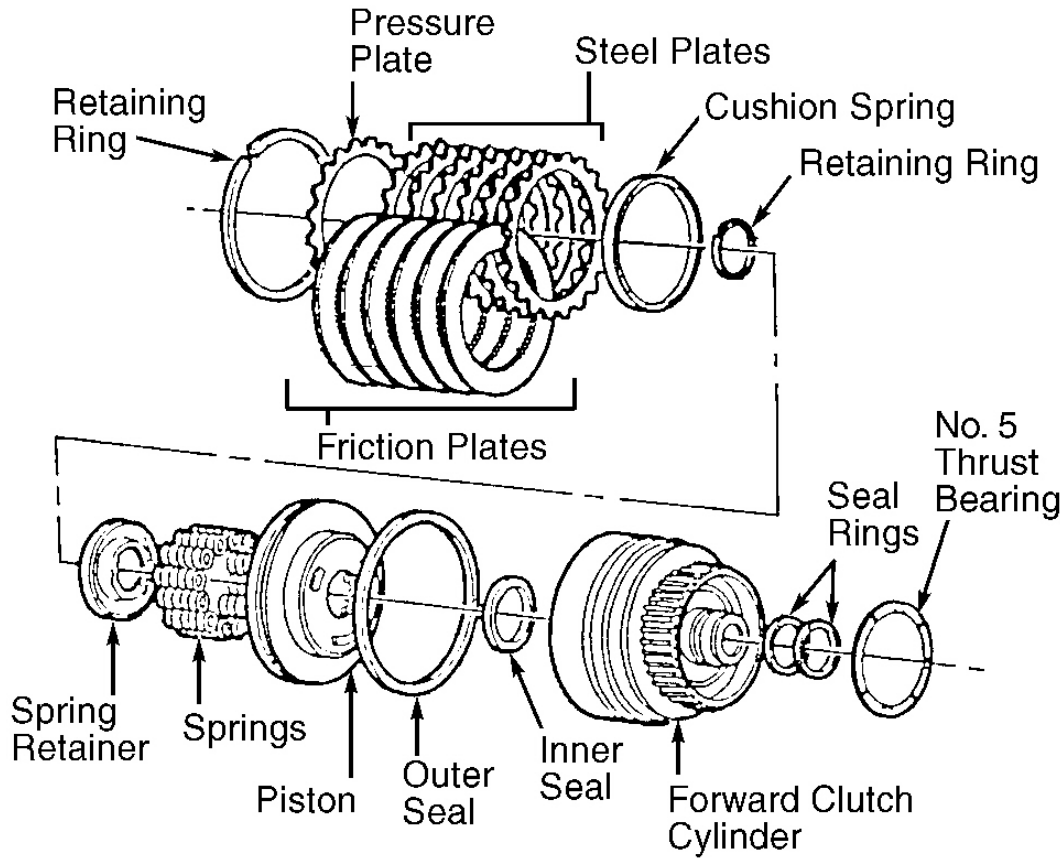


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**Fig. 11: Removing Forward Clutch Piston**  
 Courtesy of FORD MOTOR CO.

#### Reassembly

1. Install inner and outer piston seals and cushion spring. Coat piston components and seal with petroleum jelly. Using inner and outer Seal Lip Protectors (T74P-77548-A and T74P-77548-B) install clutch piston into body. Remove seal lip protectors. Install compression springs and spring retainer. Compress springs and install retaining snap ring. Carefully remove spring compressor.
2. Ensure cushion is installed between steel clutch plate and piston. See [Fig. 12](#) . Install a steel plate and then a friction plate. Alternately install remaining discs in clutch pack. Number of clutch discs varies with engine size. Install same number of discs as removed. Install pressure plate and secure pack with retaining snap ring.
3. While pushing down on clutch pack, use a feeler gauge to check clearance between retaining snap ring and pressure plate. If clearance is not .055-.083" (1.4-2.1 mm), install correct thickness retaining snap ring.
4. Retaining snap rings are available in the following thicknesses: .054" (1.37 mm), .068" (1.73 mm), .082" (2.08 mm) and .096" (2.44 mm). Once correct retaining snap ring is installed, recheck clearance.
5. Install forward clutch cylinder seal rings, ensure seal rings are interlocked and ring gaps 180 degrees apart. Install center support on forward clutch cylinder. Apply air pressure to left side (middle-sized) port. See [Fig. 11](#) . Piston must apply under pressure and release when air is removed.



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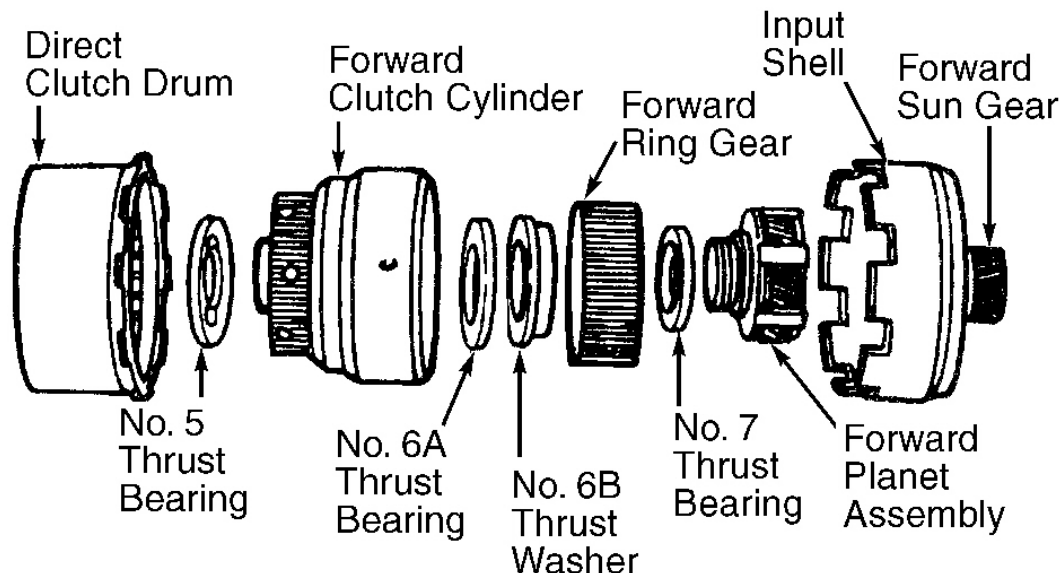
**Fig. 12: Exploded View Of Forward Clutch Assembly**  
Courtesy of FORD MOTOR CO.

## FORWARD GEAR TRAIN ASSEMBLY

**NOTE:** Forward gear train assembly consists of direct clutch assembly, forward clutch assembly and forward planetary gear set.

### Assembly

1. Install No. 5 thrust washer on direct clutch drum, ensure tabs are properly aligned. Install forward clutch assembly into direct clutch drum. Install No. 6A thrust bearing into clutch cylinder. Install No. 6B thrust washer into ring gear hub. Install ring gear and hub into clutch cylinder. See **Fig. 13**.
2. Install No. 7 thrust bearing into ring gear. Install forward planet assembly into ring gear. Install input shell and forward sun gear assembly, ensure sun gear aligns with planet assembly and input shell aligns with direct clutch drum.



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**Fig. 13: Exploded View Of Forward Gear Train Assembly**  
 Courtesy of FORD MOTOR CO.

## OVERDRIVE ONE-WAY CLUTCH

**CAUTION:** Overdrive one-way clutch is serviced with overdrive center shaft. Damage to clutch may occur if removed.

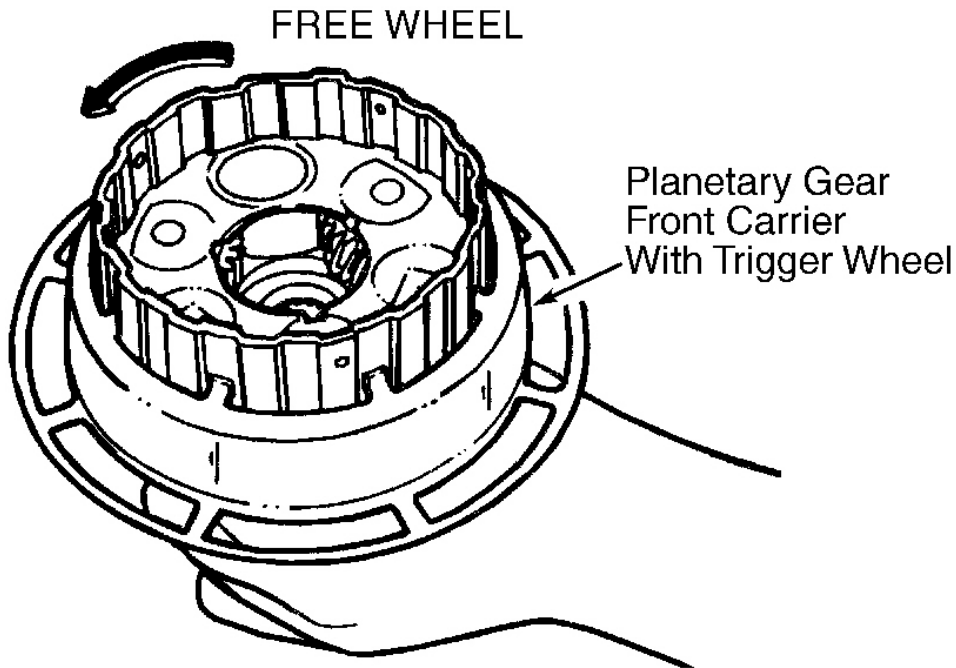
### Disassembly

Remove overdrive center shaft retaining ring. Remove overdrive center shaft from ring gear. Temporarily insert planet gear overdrive carrier into one-way clutch rollers. Planet assembly should only rotate in counterclockwise direction. Remove planet gear carrier assembly. See **Fig. 14**.

### Reassembly

1. Install overdrive center shaft and overdrive one-way clutch into overdrive ring gear. Install center shaft retaining ring. Install No. 2 thrust bearing between overdrive center shaft face and planetary gear overdrive carrier. Install overdrive carrier into overdrive center shaft and overdrive ring gear.
2. Ensure No. 12 thrust bearing race is centered and lip faces toward sun gear. Install overdrive sun gear into overdrive carrier. Install coast clutch adapter on overdrive sun gear. See **Fig. 15**.

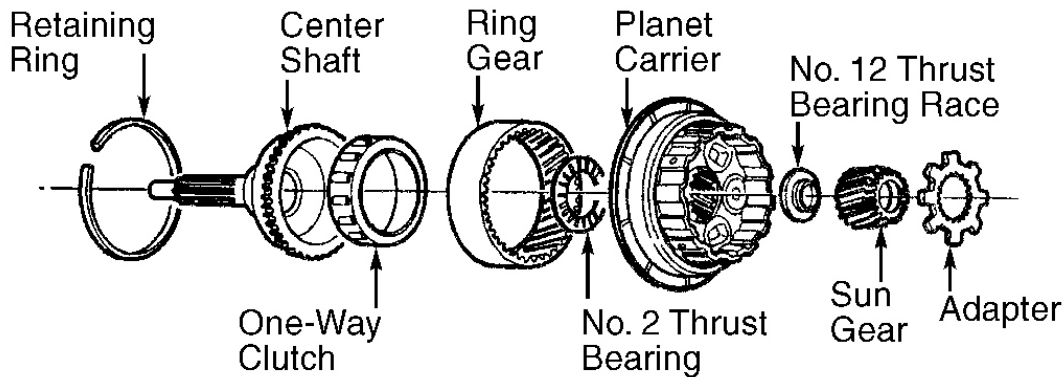




NOTE: Hold center shaft and insert front carrier assembly into one-way clutch. Carrier assembly should rotate in counterclockwise direction and lock in clockwise direction.

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**Fig. 14: Overdrive One-Way Clutch Rotation**  
Courtesy of FORD MOTOR CO.



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**Fig. 15: Exploded View Of Overdrive One-Way Clutch**  
Courtesy of FORD MOTOR CO.

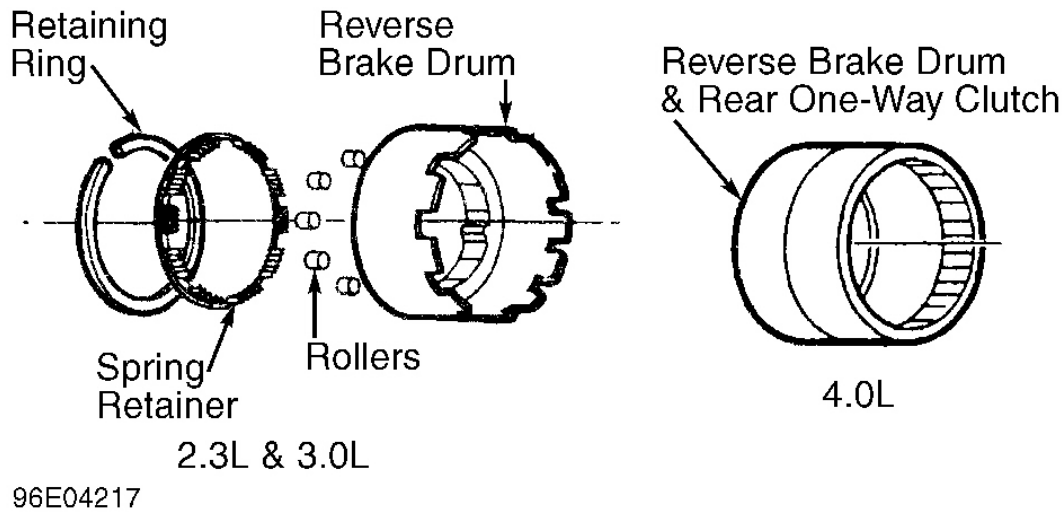
## REVERSE BRAKE DRUM

### Disassembly

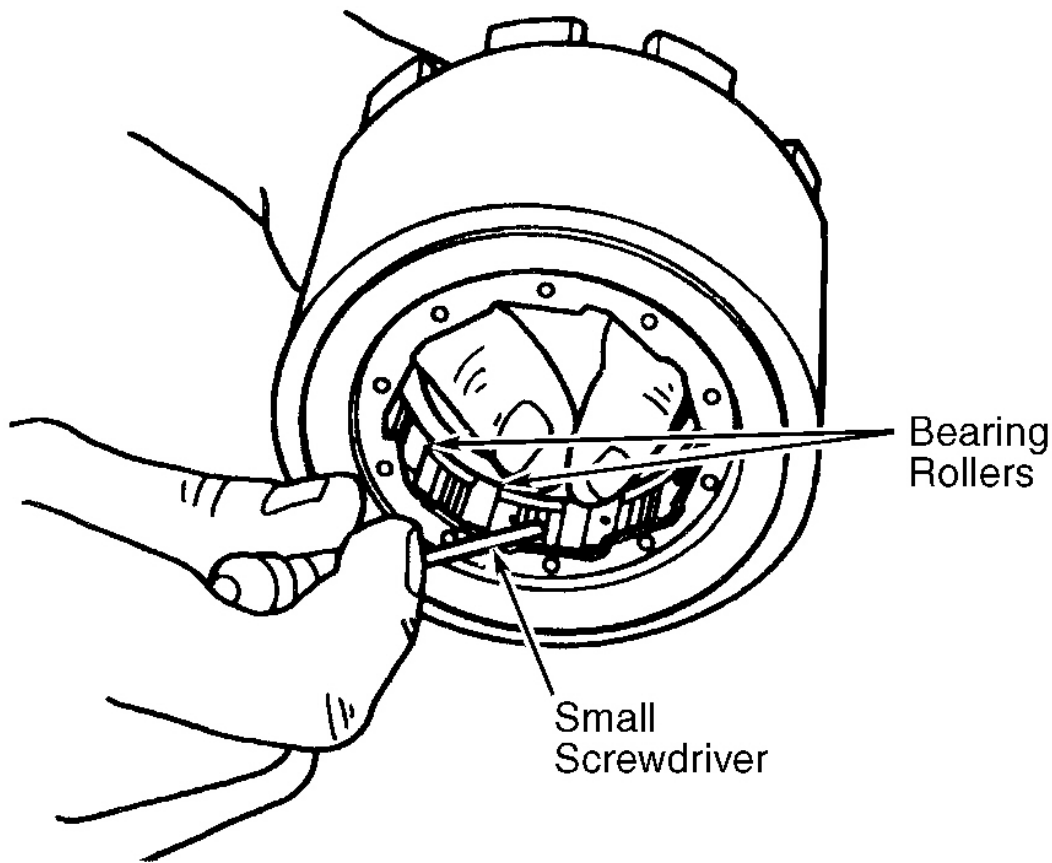
On all models except 4.0L, remove retaining ring. Lift out cage with springs and bearings. See **Fig. 16** . On 4.0L models, there is no retaining ring. One-way clutch is serviced as part of reverse brake drum. Ensure thrust rails are properly installed.

### Reassembly

Install one-way clutch with springs into reverse brake drum. Compress springs and install bearing rollers. See **Fig. 17** . After installing last roller, install Overrunning Clutch Replacing Guide (T74P-77193-A).



**Fig. 16: Exploded View Of Reverse Brake Drum**  
Courtesy of FORD MOTOR CO.



96G04218

**Fig. 17: Installing Low One-Way Clutch Rollers**  
Courtesy of FORD MOTOR CO.

## VALVE BODY

**NOTE:** During disassembly, place individual parts in order and in relative position for reassembly reference. Tag all springs as they are removed for reassembly reference.

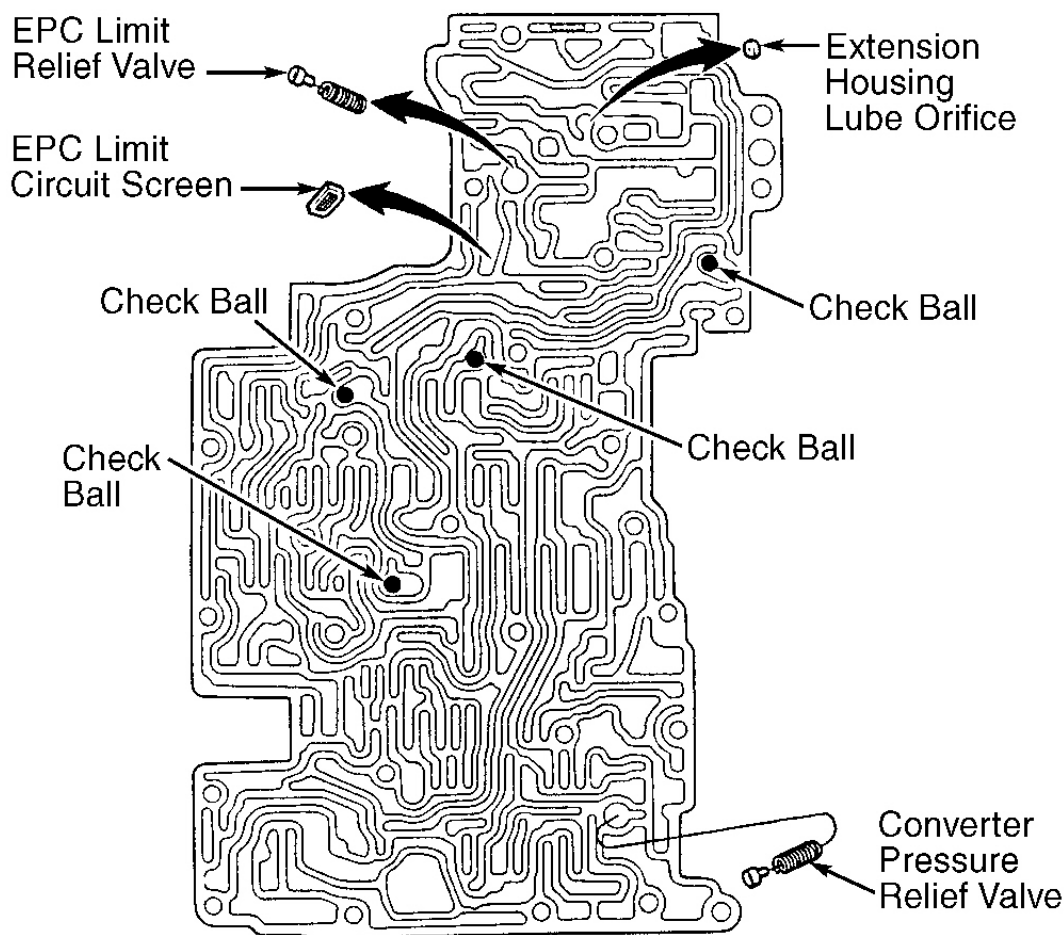
### Disassembly

1. Remove solenoid bracket bolts and solenoids. SS1 and TCC solenoids may pop out of bore when bracket is removed. Converter modulator valve may come out when TCC solenoid is removed. Remove 3 Torx bolts, separator plate and gasket.
2. Note location and remove check balls, extension housing lube orifice, relief valves with springs, and EPC limit circuit screen. See **Fig. 18**. Remove retaining plates, dowels, plugs and valves with springs from

valve body. See **Fig. 19** . See related components under **CLEANING & INSPECTION** .

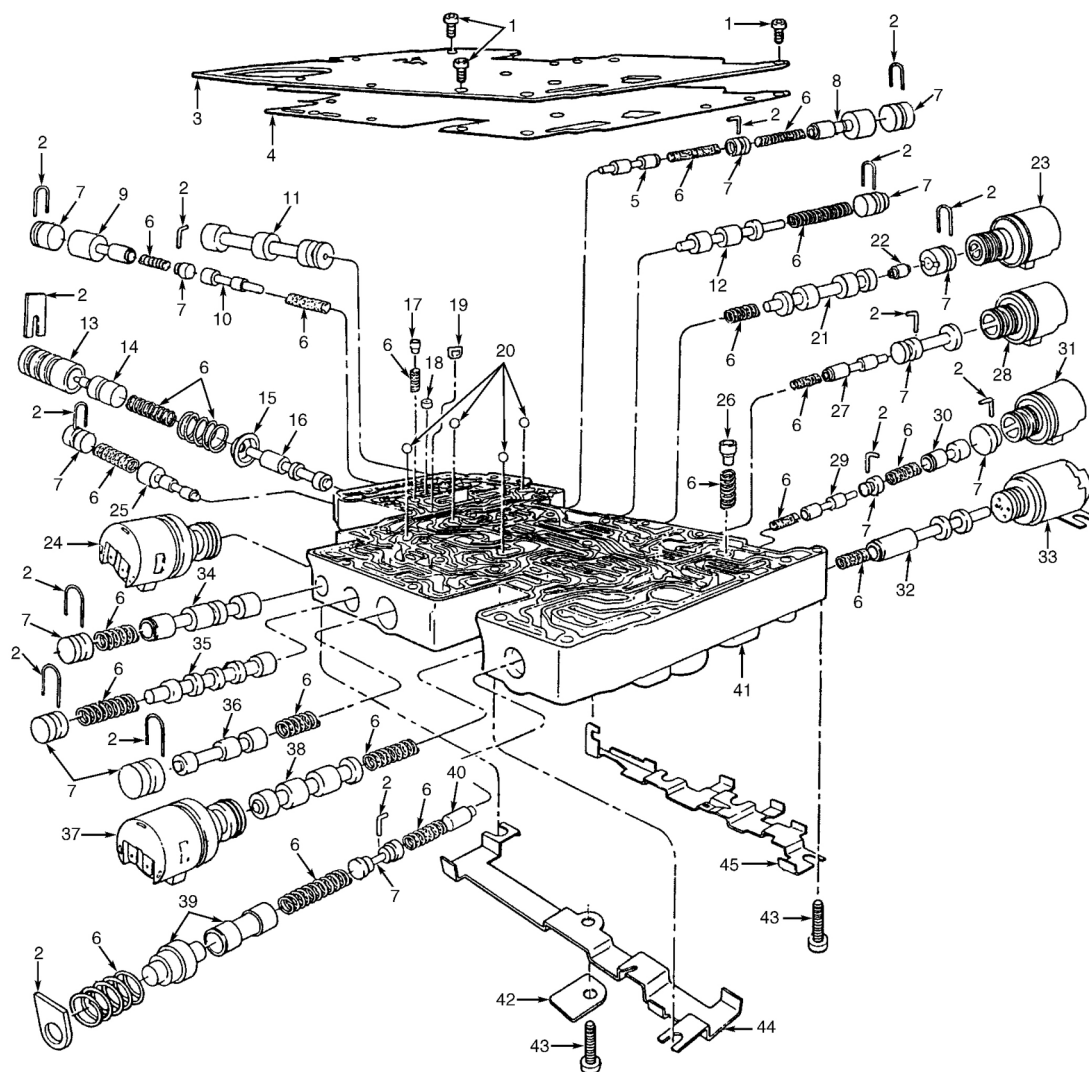
### Reassembly

1. Lubricate all parts with transmission fluid. Install valves, springs, plugs, and pins. See **Fig. 19** . Ensure check balls are installed in proper locations. See **Fig. 18** . Install relief valves and springs, extension housing lube orifice, and EPC limit circuit screen. Relief valves and springs are interchangeable.
2. Using new gasket, apply petroleum jelly to keep gasket in place during separator plate reassembly. Install separator plate. Install solenoids and brackets. SS1, SS2, SS3, and CCS solenoids are interchangeable.



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**Fig. 18: Location Of Check Balls & Relief Valves**  
Courtesy of FORD MOTOR CO.



1. Torx Bolt
2. Plug Retainer
3. Separator Plate
4. Separator Gasket
5. Reverse Modulation Valve
6. Spring
7. Plug
8. Reverse Modulation Valve
9. Forward Modulator Valve
10. EPC Boost Valve
11. Manual Valve
12. 2-3 Shift Valve
13. Pressure Boost Valve Sleeve
14. Pressure Boost Valve
15. Spring Retainer
16. Pressure Regulator Valve

17. EPC Relief Valve
18. Extension Housing Lube Orifice
19. EPC Limit Circuit Screen
20. Check Ball
21. 1-2 Shift Valve
22. 1-2 Shift Valve
23. EPC Solenoid
24. Shift Solenoid No. 1
25. Forward Engagement Control Valve
26. Converter Pressure Relief Valve
27. Solenoid Regulator Valve
28. Shift Solenoid No. 2
29. Coast Clutch Valve

30. Solenoid Regulator Valve
31. Coast Clutch Solenoid
32. Converter Clutch Valve
33. TCC Solenoid
34. 3-2 Valve
35. Manual Low Valve
36. 3-2 Valve
37. Shift Solenoid No. 3
38. 3-4 Shift Valve
39. Thermostat By-Pass Valve
40. Cooler Limit Valve
41. Main Control Valve Body
42. Identification Plate
43. Solenoid Bracket Bolt
44. SS1 & SS3 Solenoid Bracket
45. EPC, SS2, CCS & TCS Solenoid Bracket

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**Fig. 19: Exploded View Of Valve Body Assembly**  
Courtesy of FORD MOTOR CO.

## CLEANING & INSPECTION

### CLEANING

Wash all parts in cleaning solvent, except composition clutch plates, bands and synthetic seals. Use scraper or brush for heavy deposits. Rotate bearings by hand in cleaning solvent.

Dry all parts and blow out fluid passages with moisture-free compressed air. Hold bearings while drying to prevent bearing from spinning. **DO NOT** spin dry bearings.

Lubricate clean bearings with transmission fluid and wrap in lint-free cloth until ready to install. Soak new clutch plates and bands in transmission fluid for at least 30 minutes prior to installation.

## **INSPECTION**

### **Case**

Inspect case for cracks and stripped threads. Inspect gasket surfaces for flatness and damage. Check vent and all fluid passages for obstruction or leakage. Inspect case bushing for scoring. Inspect parking linkage for wear or damage.

**NOTE:**        **All main control assembly valves are anodized aluminum. Valves cannot be sanded, filed or dressed in any way. If valves have scratches, nicks or burrs that prevent free movement, main control assembly must be replaced.**

### **Control Valve Body**

Inspect all springs for distortion. Roll manual valve on flat surface to check for bent condition. Clean and inspect all fluid passages, especially at check balls, valves and other areas where dirt and debris accumulate. Inspect all valve and plug bores for scores or obstructions. Inspect valves and plugs for burrs or scoring. All valves and plugs should move freely in bores. Valves and plugs should fall of their own weight into bores.

### **Extension Housing**

Inspect housing for cracks or damage. Inspect bushing and seal bore for scoring and burrs. Using crocus cloth, remove burrs. Inspect drive shaft yoke for scoring and replace it if scoring is found.

### **Forward Clutch Assembly**

Inspect clutch cylinder thrust surfaces, piston, bore and clutch plates for scores or burrs. Minor burrs and scoring may be polished with crocus cloth. Inspect piston check ball for proper seating. Check clutch springs for distortion or cracks. Check clutch plates for flatness and free movement on clutch hub. Check clutch hub thrust surfaces and splines for wear or scoring. Inspect input shaft for damaged or worn splines.

### **Governor**

Inspect spring for distortion. Inspect fluid passages for obstruction. Inspect valve and bore for burrs or scoring. Polish with crocus cloth, if necessary. **DO NOT** round edges of valve. Valves should move freely in bore. Valve should fall of its own weight into bore.

### **Pinion Carrier**

Inspect pins and shafts in planet assemblies for loose fit or complete disengagement. Ensure proper staking of shaft retaining pins before installation of planet assembly. Pins should be no more than .040" (1.0 mm) below surface of carrier. Inspect pinion gears for worn or damaged teeth. Check for free rotation of pinion gears.

### **Pump**

Inspect fluid passages. Inspect mating surfaces of pump body and case for burrs. Inspect gear teeth for burrs. Inspect gear bearing surfaces and pump bushing for scoring. Minor burrs and scoring may be polished with crocus cloth.

### **One-Way Clutches**

Inspect outer and inner races for scoring or damage. Inspect rollers and springs for damage. Inspect roller cage for damaged spring retainers.

### **Reverse-High & Overdrive Clutches**

Inspect drum band surface, bushing and thrust surfaces for scoring. Minor burrs and scoring may be polished with crocus cloth. Inspect clutch piston, bore and inner and outer bearing surfaces for scoring. Inspect clutch plates for flatness and free movement on clutch hub. Check clutch plates for scoring or burrs. Check clutch springs for distortion. Replace as necessary. Inspect clutch cylinder check balls for proper seating.

### **Servos**

Inspect band lining for excessive wear and proper bonding to metal band. Inspect fluid passages for obstructions. Inspect servo and piston bore for cracks, scoring or other damage. Inspect seals and sealing surfaces. Repair or replace as necessary.

### **Stator Support**

Inspect stator support splines for burrs and wear. Inspect oil ring grooves in stator support for nicks or damaged edges. Check front pump support seal and seal rings for damage.

## **TRANSMISSION REASSEMBLY**

**NOTE:** Lubricate all parts with transmission fluid during reassembly. Thrust washers and gaskets should be held in place with petroleum jelly. See Fig. 27 and Fig. 28 for location of thrust washers & bearings.

1. Before installing center support into case, install new seals on support hub. It is necessary to size these seals. Apply liberal amount of petroleum jelly to center support hub and seals.

**NOTE:** If sizing is not done, the seals may be cut or rolled over when entering intermediate brake drum cavity.

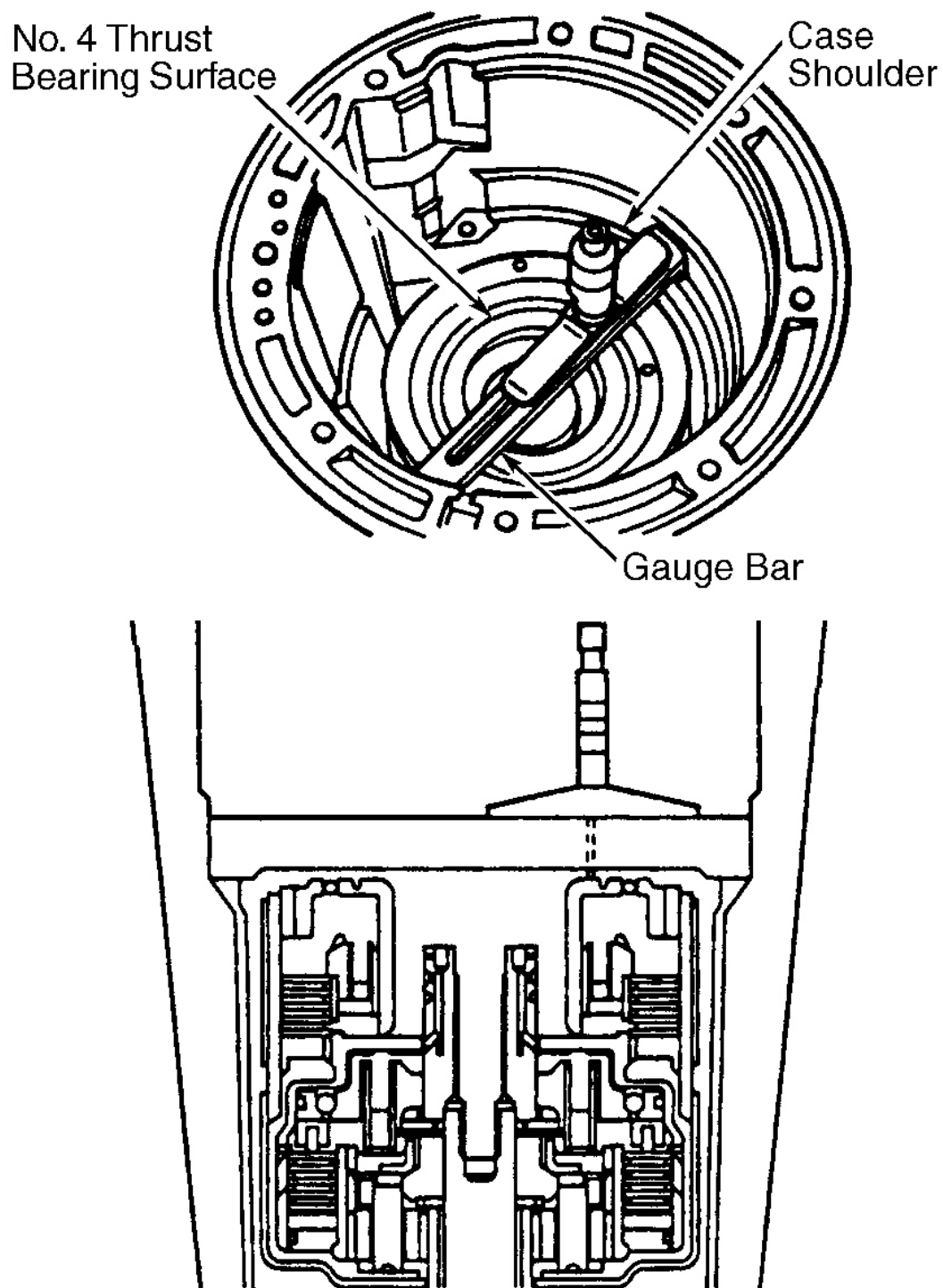
2. Use overdrive brake drum for sizing. Carefully rotate center support while inserting it into drum housing. Observe seals as they enter cavity to ensure that they do not roll over or get cut.



3. Ensure center support is seated fully into overdrive drum. Allow assembly to stand for several minutes for seals to seat in grooves. Set aside until required for reassembly.

**NOTE:**        **If new output shaft is being installed, ensure correct shaft is used. The shaft for the 4.0L model does not have a lubrication hole.**

4. Install manual control lever shaft seal. Install control lever shaft and retaining pin. Assemble manual valve inner lever and parking pawl actuating rod. Install manual valve inner lever and nut. Tighten nut to specification. See **TORQUE SPECIFICATIONS** .
5. Position No. 11 thrust washer in rear of case. Install park gear. Using Clutch Replacement Guide (T74P-77193-A), install low-reverse brake drum (guide not required on 4.0L models). Install No. 10 thrust washer with tabs facing one-way clutch. Install output shaft. Install output shaft ring gear and hub. Install new snap ring. On 4.0L models, install output shaft sleeve with cone facing up.
6. On all models, install No. 9 thrust washer, reverse planet assembly and No. 8 thrust washer. Tabs on thrust washers face into planet assembly. On all models except 4.0L, install snap ring in drum to hold planet assembly. On all models, install low-reverse band as marked at disassembly. Replace piston "O" ring and install low-reverse servo piston assembly to hold band in position.
7. Install previously assembled forward geartrain assembly. Check transmission rear end play to determine amount of space between thrust washer surface of overdrive center support and intermediate brake drum. The No. 4 selective thrust washer is used to obtain end play of .004-.022" (.10-.55 mm). See **Fig. 27** or **Fig. 28** .
8. Temporarily install low-reverse band servo piston and rod to hold band in position. Install forward gear train assembly. Turn transmission so output shaft points downward. Place Gauge Bar (T93L-77003-AH) on case shoulder. See **Fig. 20** .

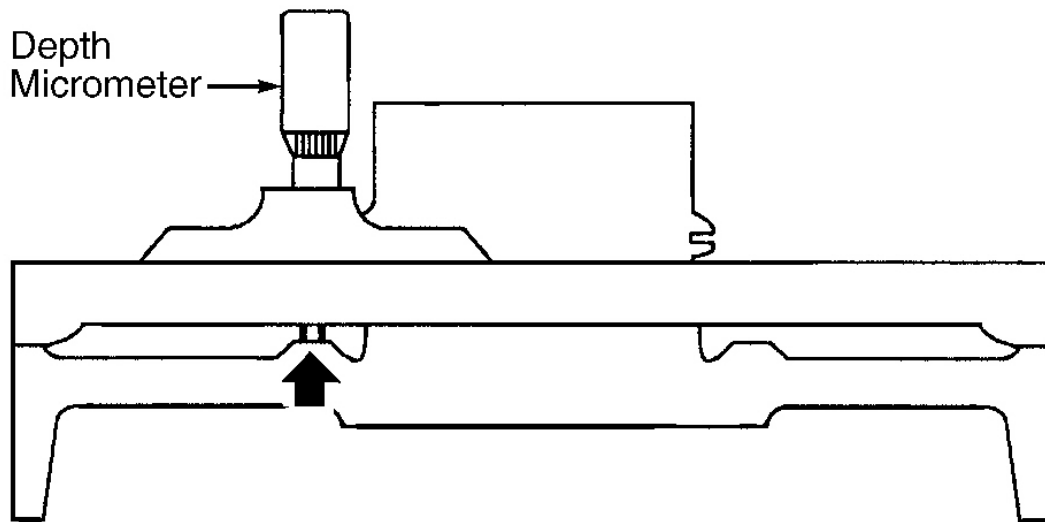


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**Fig. 20: Measuring No. 4 Thrust Washer Clearance**

## Courtesy of FORD MOTOR CO.

9. Using depth micrometer, measure between gauge bar and intermediate brake drum No. 4 thrust bearing mating surface at 2 locations, 180 degrees apart. Use the following formula to determine clearance:  $"T" = ((\text{"A"} + \text{"B"}) / 2) - \text{"C"}$  Record reading.
- "A" = Depth measurement to one side thrust bearing mating surface.
  - "B" = Depth measurement of opposite thrust bearing mating surface.
  - "C" = Gauge bar thickness.
  - "T" = Thrust bearing clearance.
10. Place gauge bar across center support. Using depth micrometer, measure between gauge bar and center support No. 4 thrust bearing mating surface at 2 locations, 180 degrees apart. See **Fig. 21** . Use the following formula to determine clearance:  $\text{"E"} = ((\text{"D"} + \text{"F"}) / 2) - \text{"C"}$  . Record reading.
- "D" = Depth measurement to one side thrust bearing mating surface.
  - "F" = Depth measurement of opposite thrust bearing mating surface.
  - "C" = Gauge bar thickness.
  - "E" = Thrust bearing clearance.



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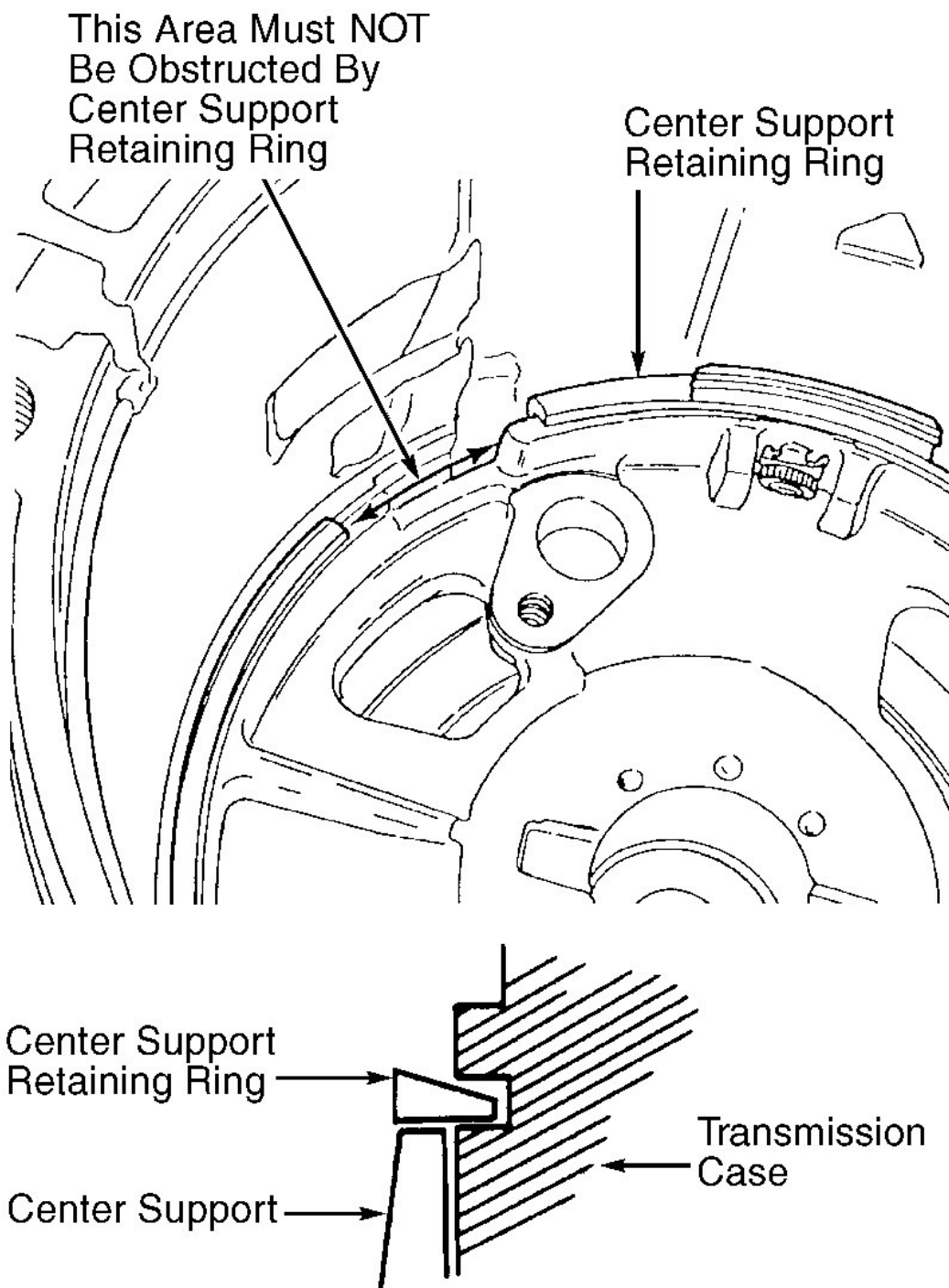
**Fig. 21: Measuring Center Support No. 4 Thrust Bearing Clearance**  
Courtesy of FORD MOTOR CO.

11. Add readings "T" and "E". Total equals No. 4 thrust bearing clearance between intermediate brake drum and center support. Select and install No. 4 thrust bearing onto center support. See **SELECTIVE THRUST WASHER NO. 4** table.

**SELECTIVE THRUST WASHER NO. 4**

| Average Reading In. (mm) | Thrust Washer Thickness<br>In. (mm) |
|--------------------------|-------------------------------------|
| .070-.075 (1.79-1.90)    | .104-.110 (2.65-2.80)               |
| .075-.083 (1.91-2.10)    | .110-.116 (2.80-2.95)               |
| .083-.090 (2.11-2.30)    | .118-.124 (3.00-3.15)               |
| .091-.095 (2.31-2.43)    | .126-.132 (3.20-3.35)               |

12. Install intermediate servo apply lever and shaft into case. Install intermediate band apply strut. Install intermediate band, anchor strut, and adjusting screw. Install selected No. 4 thrust washer on center support and retain with petroleum jelly.
13. Temporarily insert input shaft (short splines down), through intermediate brake drum and into splines of forward clutch cylinder. Carefully place center support into case. **DO NOT** seat it into intermediate brake drum. Ensure it is square with case and 5 mm Allen bolt retainer nut aligns with hole in case.
14. **DO NOT** apply pressure to center support. Gently wiggle input shaft, allowing center support to slide into intermediate brake drum of its own weight. Perform this operation until support is fully seated. Remove input shaft.
15. Install snap ring to retain center support. Snap ring taper should face front of transmission. Ends of snap ring should be positioned in wide shallow cavity located in the 5 o'clock position. Install 5 mm Allen head bolt that retains center support to case. See **Fig. 22** .



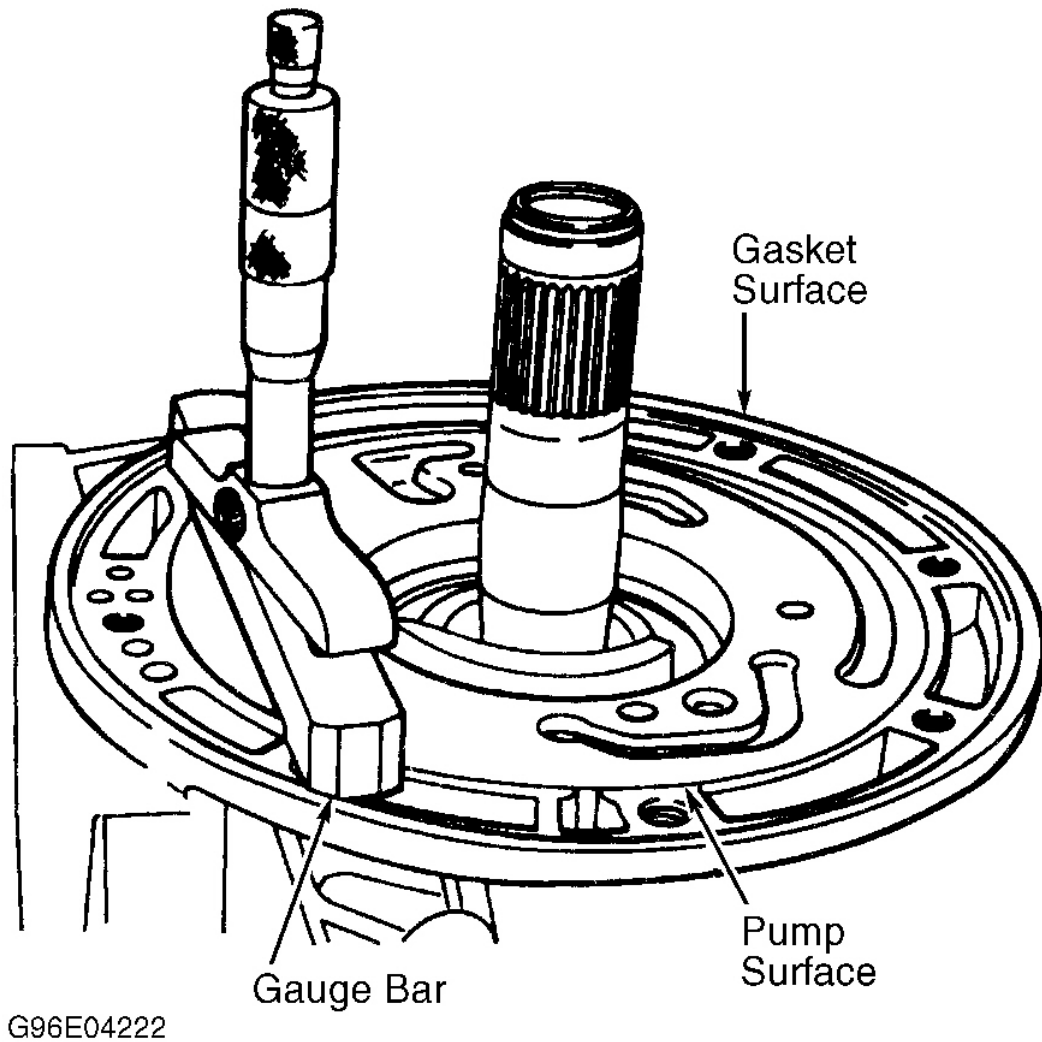
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**Fig. 22: Installing Center Support Retaining Ring**  
Courtesy of FORD MOTOR CO.

16. Install turbine shaft speed sensor. Position No. 3 thrust washer on top of center support. Carefully install overdrive planet, one-way clutch, and overdrive center shaft assembly into case. **DO NOT** bend TSS exciter wheel.
17. Place thin blade of TSS Gauge (T95L-70010-F) over speed sensor. Rotate exciter wheel, exciter wheel triggering window should pass over gauge. Place thick blade of gauge over speed sensor. Rotate exciter wheel, exciter wheel triggering window should not pass over gauge. Repeat for remaining exciter wheel triggering windows.
18. If TSS air gap clearance is not as specified, replace planet gear overdrive carrier and exciter wheel. Align clutch plates and overdrive adapter gear. Install overdrive brake and coast clutch drum assembly. Install overdrive bracket, apply lever and shaft. Install overdrive band (tagged at disassembly), and apply strut. Install anchor strut and adjusting screw.
19. Using petroleum jelly, place No. 1 selective washer on rear of pump with tabs into pump face. Temporarily install pump assembly (without gasket) into case. Ensure pump assembly is fully seated in case and pump body is below level of case gasket surface.

**NOTE:**        **Check for damaged or missing front pump support seal. Replace if necessary.**

20. Place appropriate gauge bar on case shoulder. See **Fig. 23** . Using depth micrometer, measure between gauge bar and pump surface at 2 locations, 180 degrees apart. Average measurements and subtract thickness of gauge bar to select correct thickness thrust washer.



**Fig. 23: Checking End Play**  
Courtesy of FORD MOTOR CO.

21. End play range is .007-.025" (.18-.64 mm). If end play is above specification, use thicker No. 1 selective thrust washer. If end play is below specification, use thinner No. 1 selective thrust washer. See **NO. 1 SELECTIVE THRUST WASHER**.

#### NO. 1 SELECTIVE THRUST WASHER

| Identification Number | Thickness: In. (mm)   |
|-----------------------|-----------------------|
| 1                     | .053-.055 (1.35-1.40) |
| 2                     | .061-.063 (1.55-1.60) |
| 3                     | .065-.067 (1.65-1.70) |
| 4                     | .069-.071 (1.75-1.80) |

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|   |                       |
|---|-----------------------|
| 5 | .073-.075 (1.85-1.90) |
| 6 | .077-.079 (1.95-2.00) |
| 7 | .081-.083 (2.05-2.10) |

22. After end play check has been completed, remove oil pump and install correct No. 1 selective thrust washer. Install new drive gear "O" ring. Lubricate Front Pump Seal Sizing Tool (T95L-70010-G) and place into drive gear to seat "O ring".
23. Remove front pump seal sizing tool. Place pump gears into pump housing. The inside edge of small gear has a chamfer on one side. This chamfer must face toward front of transmission. The larger gear has a dimple on one side which must face toward rear of transmission.
24. Install pump adaptor plate. Position pump housing and adaptor plate onto converter housing. Notch on outside of adaptor plate will be at 9 o'clock position relative to converter housing. Install bolts finger tight.
25. To prevent seal leakage, pump gear breakage or bushing failure, align pump in converter housing with Pump Alignment Set (T74P-77103-X). Select smallest I.D. sleeve which will fit completely over pump shaft. Outside diameter of sleeve will center pump in converter housing.
26. Install 6 new Allen bolts. Tighten to specification. See **TORQUE SPECIFICATIONS** . Remove alignment tool. Install overdrive brake drum seal rings. Ensure seal ring ends are properly overlapped and ring gaps are placed 180 degrees apart. Coat converter housing gasket with petroleum jelly and position on converter housing.
27. Install seal ring on converter housing. Position No. 1 selected thrust washer on rear of pump. Turn converter housing over and install front pump support seal ring. Install input shaft and converter guide pins. Align converter housing and pump to transmission case. Remove alignment pins. Install 8 new bolts with "O" rings and tighten to specification.
28. Replace piston "O" ring and install intermediate servo piston assembly. Install piston cover and snap ring. Replace piston "O" ring and install overdrive servo piston assembly. Install piston cover and snap ring. **DO NOT** press servo cover and "O" ring past relief hole in case. "O" ring damage may occur.
29. Install new lock nut on overdrive band adjusting screw. Apply petroleum jelly to lock nut seal. Tighten adjusting screw to 120 INCH lbs. (14 N.m) and back off exactly 2 turns. Hold adjusting screw and tighten lock nut to 35-45 ft. lbs. (47-61 N.m). Repeat procedure for intermediate band. Air pressure tests may be performed to ensure proper transmission operation. See **AIR PRESSURE TESTS** under TESTING.
30. Lubricate and install 16-pin connector. Ensure tab locks in place. Install case connector retaining ring. Install TSS connector into 16-pin case connector.
31. Align valve body to separator plate and gasket using tapered punches. Use a small amount of petroleum jelly to hold gasket in place. Install alignment pins into case. Install valve body onto case while aligning manual valve with manual valve inner lever pin.

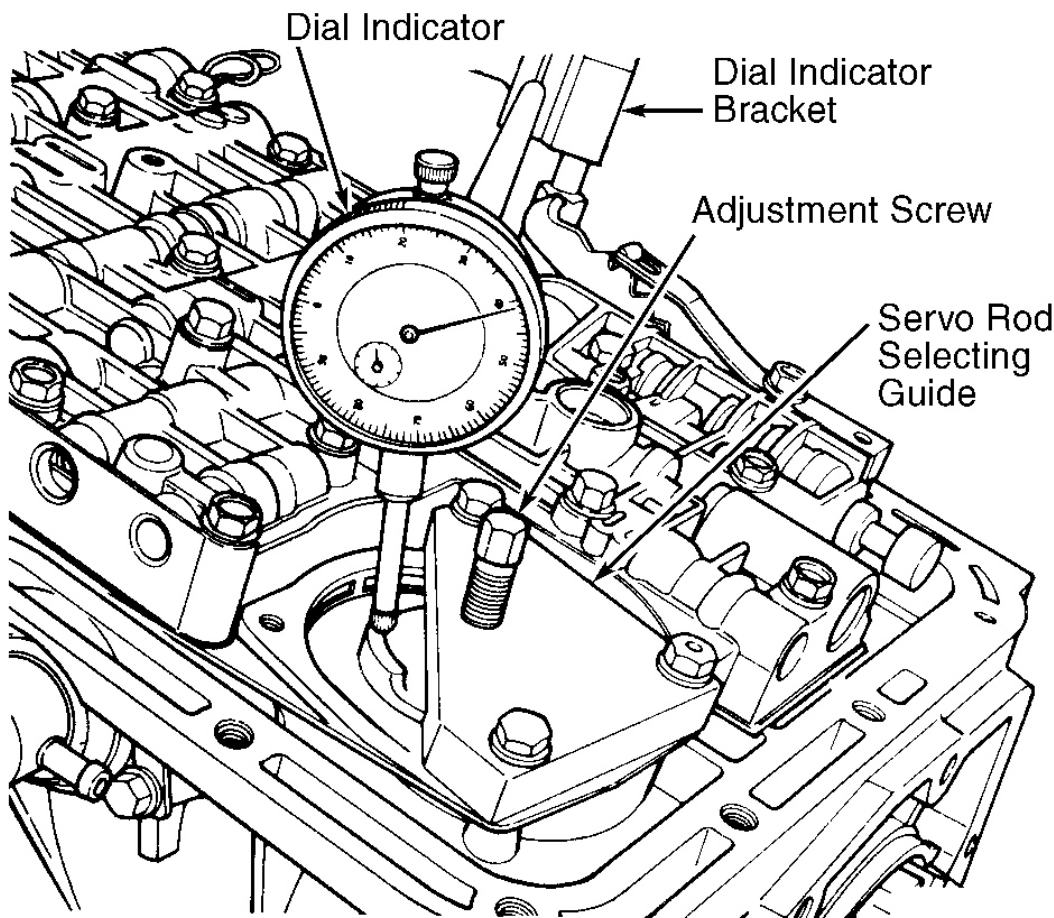
**NOTE:**      **Valve body bolts are of different lengths. Ensure each bolt is installed in its correct location.**

32. Install and finger tighten bolts "A", "B", and "C". See **Fig. 3** and **Fig. 4** . Remove valve body alignment pins. Install and finger tighten remaining bolts. **DO NOT** install filter screen bolt at this time. Tighten all bolts to specification in sequence. See **Fig. 3** and **Fig. 4** . Install manual lever detent spring.



**NOTE:** If low-reverse servo piston rod is to be checked, perform steps 31) through 35). Ensure A4LD Servo Check Spring (D4ZZ-7D031-A) is removed after checking piston rod travel.

33. Remove low-reverse servo piston assembly. Install low-reverse servo piston assembly into bore along with A4LD Servo Check Spring (D4ZZ-7D031-A). Ensure piston rod is seated correctly in low-reverse band apply end. Install Servo Rod Selecting Gauge (T74P-77190-A) with new servo cover gasket. See **Fig. 24**.



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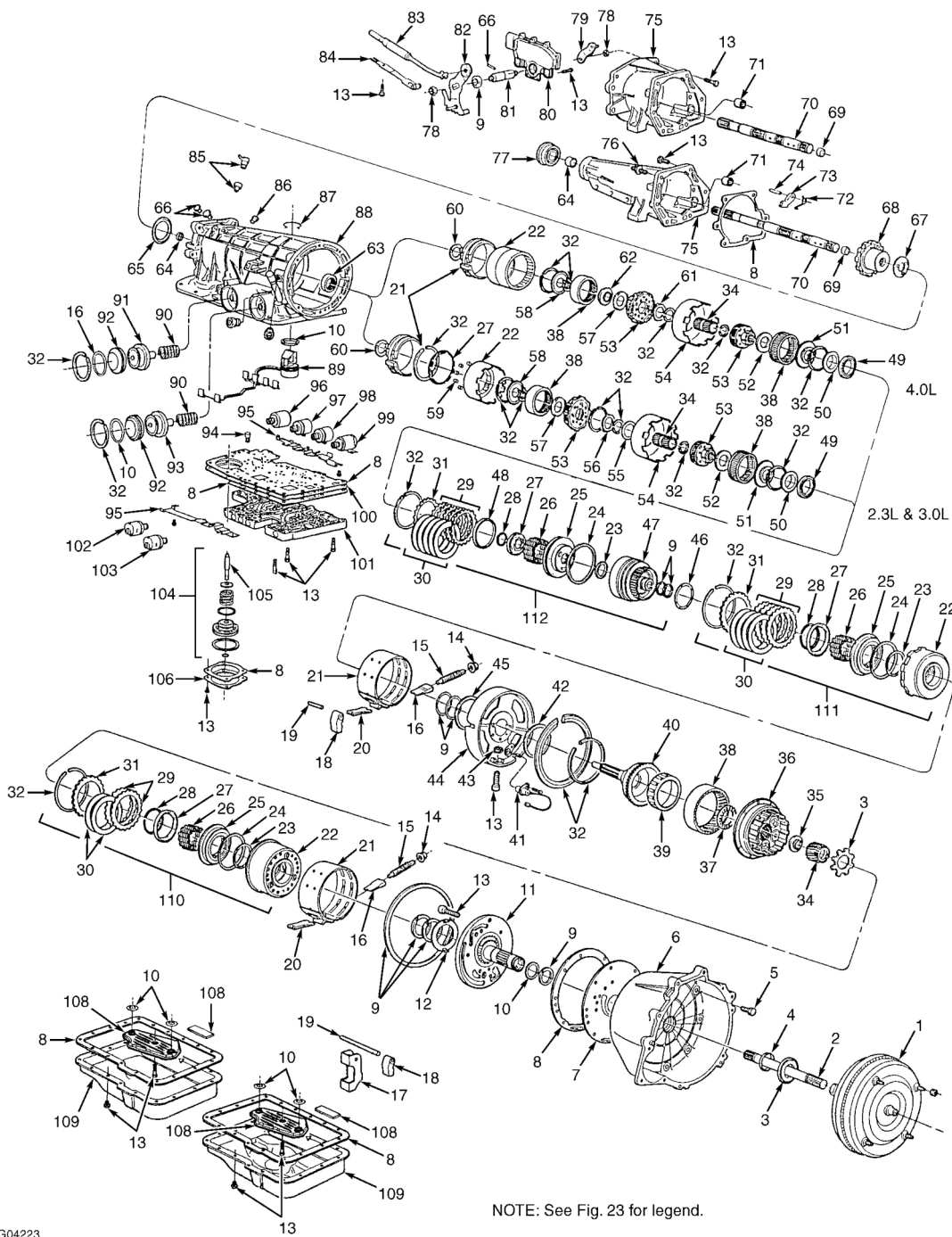
**Fig. 24: Selecting Servo Piston & Rod**  
Courtesy of FORD MOTOR CO.

34. Tighten select gauge adjusting screw to 35 INCH lbs. (4 N.m). Install dial indicator onto case. Position indicator tip on one of 3 servo piston pads accessible through cut-out of guide. Zero dial indicator.
35. Back out adjusting screw until servo piston bottoms out on guide. Record distance servo piston moved. Servo piston travel should be .120-.220" (3.05-5.59 mm).

36. If piston travel is greater than specification, use next longest piston and rod. If less than specification, use next shorter piston and rod. Rods are identified by their number of grooves. Rods with 2 grooves are shortest in length; rods with no grooves are medium in length; rods with one groove are longest.
37. Install selected piston and rod. Recheck piston travel. If correct, remove guide and test spring. Reinstall servo assembly, accumulator spring, gasket and cover. Install servo cover bolts and tighten to specification. Install solenoid connectors. Install wiring protector and guide.
38. Install new "O" rings on filter screen and lube with petroleum jelly. Install filter screen and bolt. Connect Transmission Tester (007-0085C) to 16-pin case connector. Perform solenoid static function check. See appropriate DIAGNOSIS article AUTOMATIC TRANSMISSIONS. Install oil pan with new gasket. Tighten pan bolts to specification in 2 steps. See **TORQUE SPECIFICATIONS** . Install heat shield (if equipped).
39. Install parking pawl and return spring in extension housing and preload. Using new gasket, install extension housing. Ensure operating parking rod is correctly seated in extension guide cup. Install and tighten bolts. Install extension housing bushing (if removed). Ensure lube hole in bushing is aligned with slot in extension housing. Install rear seal.
40. Install transmission range sensor on manual lever. Install sensor bolts finger tight. Rotate manual lever to neutral position (2 detents rearward). Install TR Sensor Alignment Tool (T93P-70010-A) into 3 slots on sensor. Tighten TR sensor bolts to specification and remove alignment tool. Install manual control outer lever. Tighten nut to specification.
41. Install input shaft and torque converter. Ensure torque converter is properly installed. When installation is correct, measurement between torque converter pilot nose and front face of housing will be .40-.57" (10.23-14.43 mm).

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**Fig. 25: Exploded View Of 4R44E/4R55E Transmission (1 Of 2)**  
Courtesy of FORD MOTOR CO.

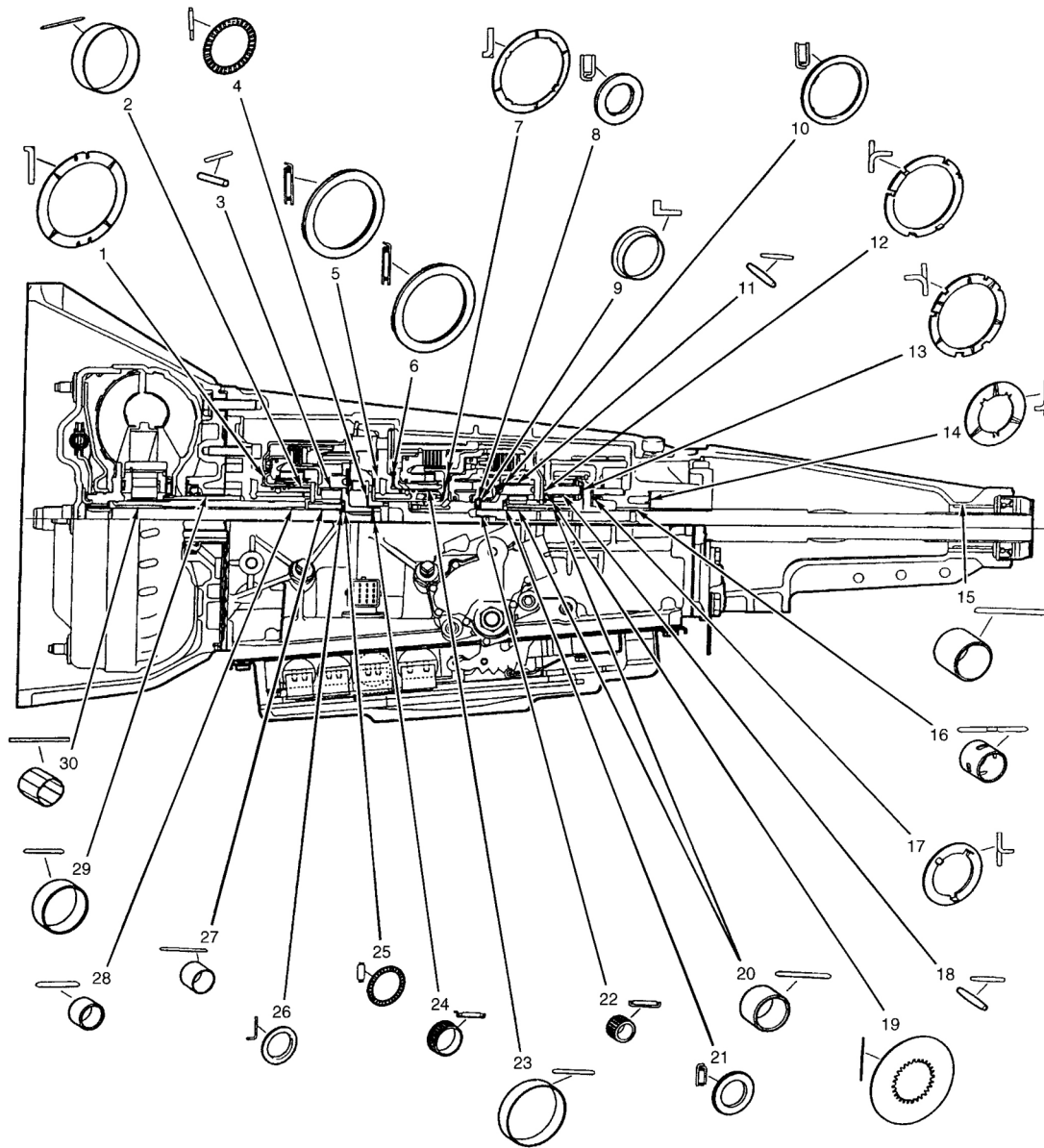
## 1996 Ford Aerostar

### 1995-96 AUTOMATIC TRANSMISSIONS Ford 4R44E & 4R55E

- |                              |                           |                                |                           |
|------------------------------|---------------------------|--------------------------------|---------------------------|
| 1. Torque Converter          | 29. Steel Plate           | 56. No. 8 Thrust Washer        | 84. Detent Spring         |
| 2. Input Shaft               | 30. Friction Plate        | 57. No. 9 Thrust Washer        | 85. Case Vent             |
| 3. Torque Converter Hub Seal | 31. Pressure Plate        | 58. Output Shaft Hub           | 86. Line Pressure Plug    |
| 4. Oil Pump Bushing          | 32. Retaining Ring        | 59. One-Way Clutch Roller      | 87. Retaining Clip        |
| 5. Bolt & Seal Assembly      | 33. Adapter               | (2.3L & 3.0L)                  | 88. Case Assembly         |
| 6. Converter Housing Cover   | 34. Sun Gear              | 60. No. 10 Thrust Washer       | 89. 16-Pin Connector      |
| 7. Oil Pump Plate            | 35. Bearing Rear Race     | 61. No. 8 Thrust Washer (4.0L) | 90. Spring                |
| 8. Gasket                    | 36. Carrier Assembly      | 62. Output Shaft Sleeve (4.0L) | 91. Intermediate Servo    |
| 9. Seal                      | 37. No. 2 Thrust Bearing  | 63. One-Way Clutch Inner Race  | 92. Cover & Seal Assembly |
| 10. "O" Ring                 | 38. Ring Gear             | 64. Bushing                    | 93. Overdrive Servo       |
| 11. Oil Pump Assembly        | 39. One-Way Clutch        | 65. Splash Oil Retainer        | 94. Torx Bolt             |
| 12. No. 1 Thrust Washer      | 40. Center Shaft          | 66. Pin                        | 95. Solenoid Bracket      |
| 13. Bolt                     | 41. Speed Sensor          | 67. No. 11 Thrust Washer       | 96. EPC Solenoid          |
| 14. Lock Nut                 | 42. No. 3 Thrust Bearing  | 68. Park Gear                  | 97. Shift Solenoid No. 2  |
| 15. Adjusting Screw          | 43. Nut & Cage            | 69. Bearing                    | 98. Coast Clutch Solenoid |
| 16. Anchor Strut             | 44. Center Support        | 70. Output Shaft               | 99. TCC Solenoid          |
| 17. Overdrive Lever Bracket  | 45. No. 4 Thrust Bearing  | 71. Park Rod Cup Guide         | 100. Separator Plate      |
| 18. Servo Lever              | 46. No. 5 Thrust Washer   | 72. Park Pawl Return Spring    | 101. Valve Body           |
| 19. Lever Shaft              | 47. Cylinder Assembly     | 73. Park Pawl                  | 102. Shift Solenoid No. 1 |
| 20. Apply Strut              | 48. Cushion Spring        | 74. Park Pawl Shaft            | 103. Shift Solenoid No. 3 |
| 21. Band Assembly            | 49. No. 6A Thrust Bearing | 75. Extension Housing          | 104. Reverse Servo        |
| 22. Drum Assembly            | 50. No. 6B Thrust Washer  | 76. Stud                       | 105. Reverse Servo Rod    |
| 23. Inner Seal               | 51. Ring Gear Hub         | 77. Rear Seal                  | 106. Reverse Servo Cover  |
| 24. Outer Seal               | 52. No. 7 Thrust Bearing  | 78. Nut                        | 107. Filter               |
| 25. Piston                   | 53. Planet Assembly       | 79. Manual Valve Lever (Outer) | 108. Magnet               |
| 26. Piston Springs           | 54. Input Shell           | 80. Transmission Range Sensor  | 109. Oil Pan              |
| 27. Spring Retainer          | 55. No. 14 Thrust Washer  | 81. Manual Valve Shaft         | 110. Coast Clutch         |
| 28. Piston Retainer          | (2.3L & 3.0L)             | 82. Manual Valve Lever (Inner) | 111. Direct Clutch        |
|                              |                           | 83. Parking Pawl Rod           | 112. Forward Clutch       |

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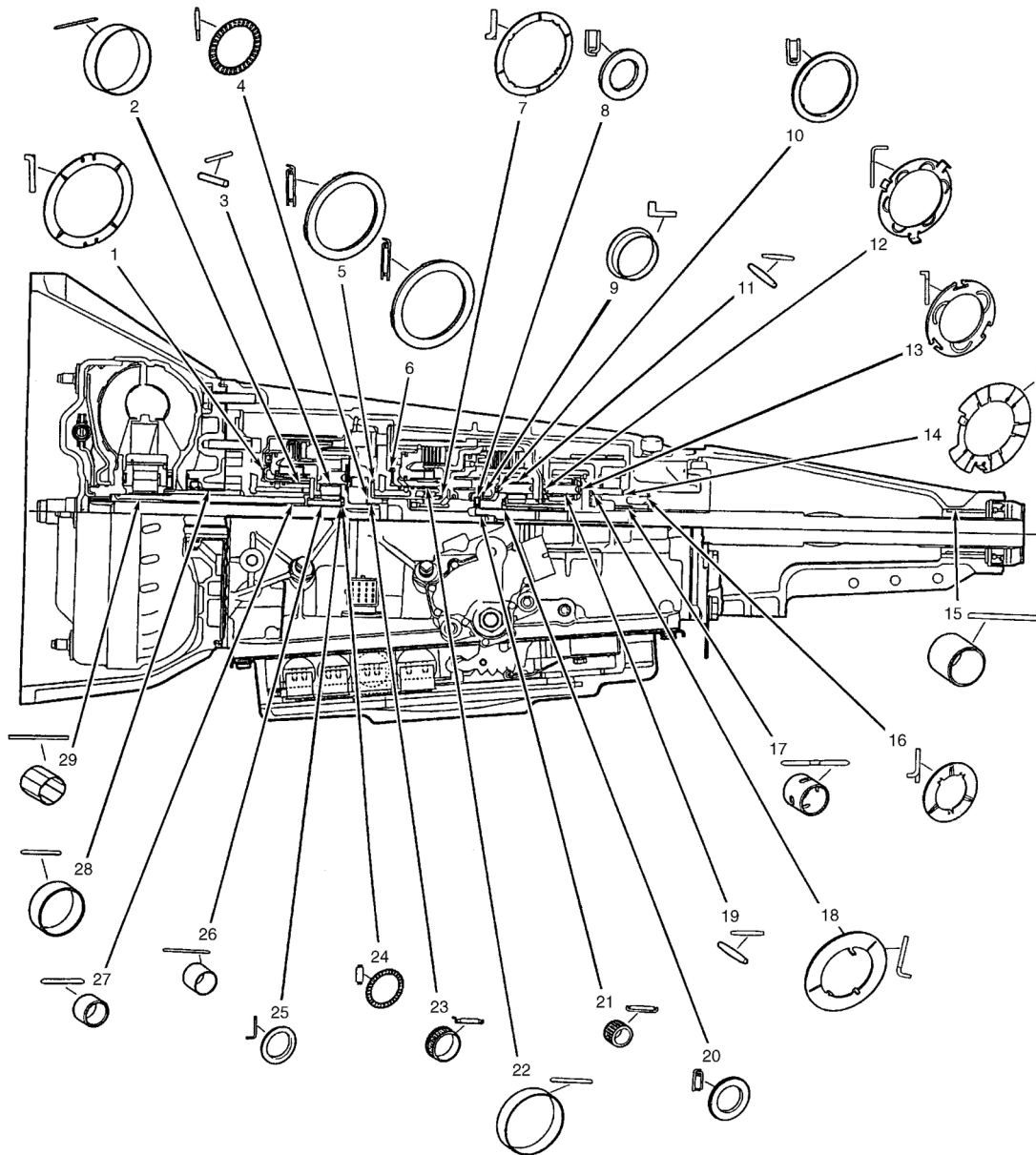
**Fig. 26: Legend For View Of 4R44E/4R55E Transmission (2 Of 2)**  
**Courtesy of FORD MOTOR CO.**



- |                          |                          |                          |                         |
|--------------------------|--------------------------|--------------------------|-------------------------|
| 1. Thrust Washer No. 1   | 9. Thrust Washer No. 6B  | 17. Thrust Washer No. 10 | 24. Needle Bearing      |
| 2. Bushing               | 10. Thrust Bearing No. 7 | 18. Needle Bearing       | 25. Needle Bearing      |
| 3. Needle Bearing        | 11. Needle Bearing       | 19. Thrust Washer No. 14 | 26. Thrust Bearing Race |
| 4. Thrust Bearing No. 2  | 12. Thrust Washer No. 8  | 20. Bushing              | 27. Bushing             |
| 5. Thrust Bearing No. 3  | 13. Thrust Washer No. 9  | 21. Needle Bearing       | 28. Bushing             |
| 6. Thrust Bearing No. 4  | 14. Thrust Washer No. 11 | 22. Needle Bearing       | 29. Bushing             |
| 7. Thrust Washer No. 5   | 15. Bushing              | 23. Bushing              | 30. Bushing             |
| 8. Thrust Bearing No. 6A | 16. Bushing              |                          |                         |

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**Fig. 27: Thrust Bearing & Washer Locations (2.3L & 3.0L - 4R44E)**  
 Courtesy of FORD MOTOR CO.



- |                         |                          |                          |                         |
|-------------------------|--------------------------|--------------------------|-------------------------|
| 1. Thrust Washer No. 1  | 8. Thrust Bearing No. 6A | 16. Thrust Washer No. 11 | 23. Needle Bearing      |
| 2. Bushing              | 9. Thrust Washer No. 6B  | 17. Bushing              | 24. Needle Bearing      |
| 3. Needle Bearing       | 10. Thrust Bearing No. 7 | 18. Thrust Washer No. 10 | 25. Thrust Bearing Race |
| 4. Thrust Bearing No. 2 | 11. Needle Bearing       | 19. Needle Bearing       | 26. Bushing             |
| 5. Thrust Bearing No. 3 | 12. Thrust Washer No. 8  | 20. Needle Bearing       | 27. Bushing             |
| 6. Thrust Bearing No. 4 | 13. Thrust Washer No. 9  | 21. Needle Bearing       | 28. Bushing             |
| 7. Thrust Washer No. 5  | 14. Washer               | 22. Bushing              | 29. Bushing             |
|                         | 15. Bushing              |                          |                         |

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**Fig. 28: Thrust Bearing & Washer Locations (4.0L - 4R55E)**  
Courtesy of FORD MOTOR CO.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS

**1996 Ford Aerostar**

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| <b>Application</b>                    | <b>Ft. Lbs. (N.m)</b>  |
|---------------------------------------|------------------------|
| Band Adjuster Lock Nut                | 35-45 (47-61)          |
| Converter Housing Cover (Except 2.3L) | 12-16 (16-22)          |
| Converter Housing-To-Case             | 27-39 (37-53)          |
| Converter-To-Flywheel                 | 20-34 (27-46)          |
| Extension Housing-To-Case             | 27-39 (37-53)          |
| Manual Lever Inner Nut                | 30-40 (41-54)          |
| Manual Lever Outer Nut                | 30-40 (41-54)          |
| Oil Cooler Line-To-Connector          |                        |
| Nut                                   | 18-23 (24-31)          |
| 5/16" Tube Nut                        | 12-18 (16-24)          |
| Oil Pump-To-Converter Housing         | 16-21 (22-28)          |
| Transmission-To-Engine                |                        |
| Except 3.0L Engine                    | 28-38 (38-52)          |
| 3.0L Engine                           | 33-44 (45-60)          |
|                                       | <b>INCH Lbs. (N.m)</b> |
| Center Support-to-Case Bolt           | 80-115 (9-13)          |
| Converter Housing Cover Bolt (2.3L)   | 27 (3)                 |
| Governor-To-Collector Body Bolt       | 89-115 (10-13)         |
| Low-Reverse Servo Cover Bolt          | 80-115 (9-13)          |
| Manual Lever Outer Nut                | 89-133 (10-15)         |
| Separator Plate Bolt                  | 71-98 (8-11)           |
| Transmission Oil Pan Bolt             | 98-115 (11-13)         |
| TR Sensor                             | 71-98 (8-11)           |
| Vacuum Diaphragm Clip Bolt            | 89-106 (10-12)         |
| Valve Body-to-Case Bolt               | 71-98 (8-11)           |

**TRANSMISSION SPECIFICATIONS****TRANSMISSION SPECIFICATIONS**

| <b>Application</b>                   | <b>In. (mm)</b>       |
|--------------------------------------|-----------------------|
| Converter End Play (Max.)            |                       |
| New Or Rebuilt Convertor             | .023 (.58)            |
| Used Convertor                       | .050 (1.27)           |
| Coast Clutch Pack Clearance          | .055-.083 (1.40-2.10) |
| Direct/Reverse Clutch Pack Clearance | .051-.079 (1.30-2.00) |
| Forward Clutch Pack Clearance        | .055-.083 (1.40-2.10) |