

## 1994 Ford Taurus GL

1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

### 1993-94 AUTOMATIC TRANSMISSIONS

#### AX4S/AXOD-E Overhaul

## APPLICATION

**NOTE:** The AXOD-E transaxle is also known as AX4S.

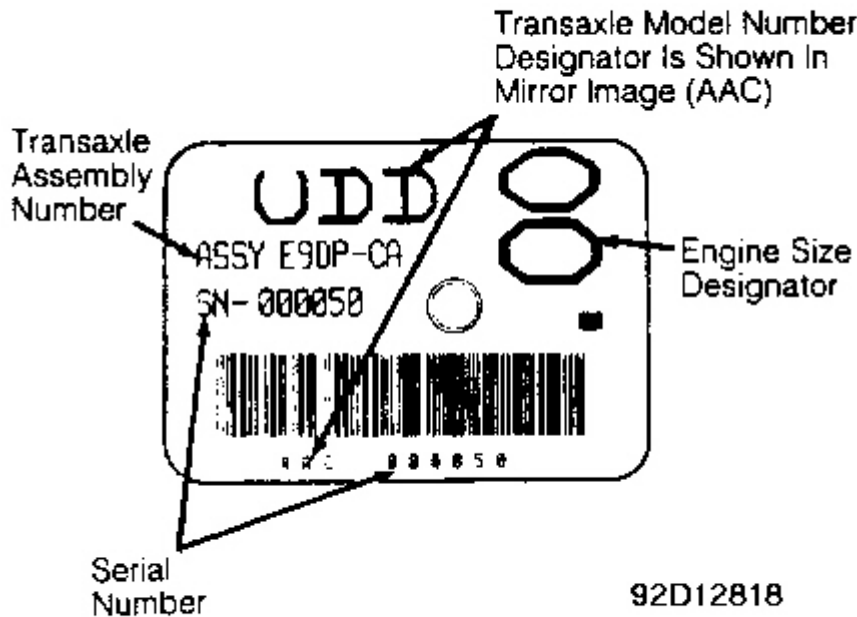
### TRANSAXLE APPLICATION

Application	Transaxle Model
Ford Taurus	AXOD-E/AX4S
Lincoln Continental	AXOD-E/AX4S
Mercury Sable	AXOD-E/AX4S

## IDENTIFICATION

The AXOD-E (Automatic Overdrive Transaxle-Electronic) is identified by the code letter "T", shown on the Vehicle Certification Label under "TR". The label is located on the driver's door lock panel or door pillar.

The transaxle also has an identification tag attached to the top of the converter housing. Use this information when servicing or ordering replacement parts. See **Fig. 1**.



**Fig. 1: Identification Tag**  
Courtesy of FORD MOTOR CO.

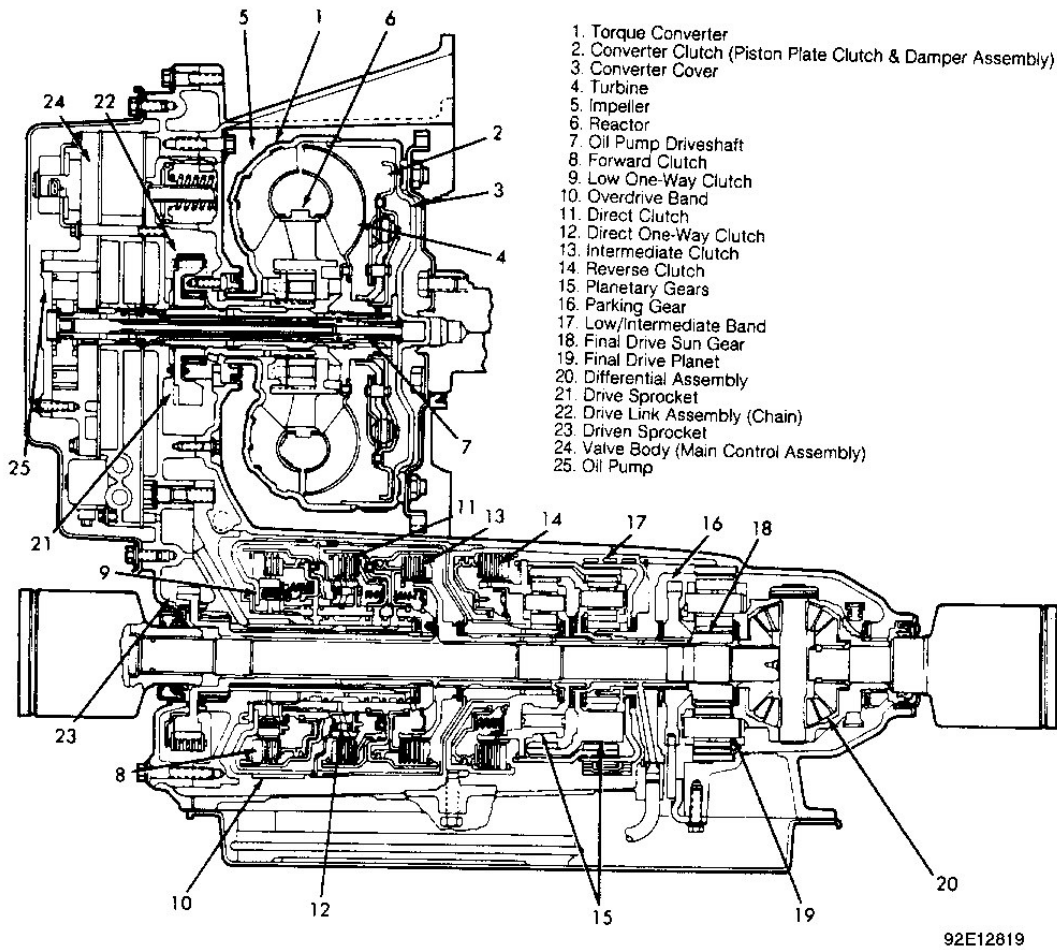
**NOTE:** For AXOD-E transaxle electronic testing and repair, see appropriate DIAGNOSIS article.

## DESCRIPTION

The AXOD-E combines an automatic transaxle and differential into a single unit designed for front wheel drive vehicles. The transaxle is an electronically controlled, fully automatic unit with 4 forward speeds, one Reverse, Neutral and Park. Shift control solenoids provide gear selection and are controlled by the EEC-IV microprocessor. For additional information on the EEC-IV system, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

The AXOD-E has 2 planetary gear sets and a combination planetary/differential gear set. Four multiple-plate clutches, 2 band assemblies, and 2 roller (one-way) clutches act as friction elements for operation of the planetary gear sets. See **Fig. 2**.

A lock-up torque converter couples the engine output to the planetary gears and overdrive unit. This is done by a chain which connects the drive and driven sprockets. The converter lock-up is controlled through the EEC-IV system. A piston plate clutch, inside converter, is activated by the computer and valve body.



**Fig. 2: Identifying Transmission Components**  
Courtesy of FORD MOTOR CO.

## LUBRICATION & ADJUSTMENTS

**NOTE:** For additional information, see appropriate **SERVICING** article in **AUTOMATIC TRANSMISSIONS**.

### FLUID LEVEL CHECK

**CAUTION:** Vehicle should not be driven if fluid level is lower than **DO NOT DRIVE** hole on transmission dipstick.

Before vehicle is driven, ensure fluid is above **DO NOT DRIVE** hole on dipstick. Drive vehicle 15-20 miles, until transmission is at operating temperature (dipstick is hot to touch). Vehicle must be at operating

temperature to ensure correct fluid level check.

Fluid level should be checked in Park position with engine at idle. Fluid level should be within cross-hatched area of dipstick. Ensure the following:

- Use only Mercon transmission fluid.
- If transmission fluid is excessively hot, allow vehicle to cool for 30 minutes prior to checking fluid level. Excessive heat build-up due to high speed operation, trailer towing, or operation in hot weather will effect fluid level.
- DO NOT overfill transmission. Fluid will foam and may cause transmission malfunction. Excessive fluid must be removed.
- If transmission is underfilled, slipping may occur.

## ON-VEHICLE SERVICE

### OIL COOLER FLUSHING

Contaminates **MUST** be removed from oil cooler before transmission is put back into service. Replace cooler supply tubes if leaking. Thoroughly flush oil cooler and lines if a major service or transaxle removal has occurred. It is recommended that a mechanically agitated cleaner such as Rotunda (014-00028) be used.

### OIL PUMP & VALVE BODY ASSEMBLY

#### Removal

1. Disconnect battery ground cable and electrical connectors from transaxle. Remove battery and battery tray. Remove and secure supply hoses, vacuum lines and wiring away from valve body cover, as necessary.
2. Disconnect shift lever and remove lever position sensor. Remove ABS cover and disconnect hoses, if equipped. Attach lifting equipment to support engine.
3. Remove left side transaxle mount. Remove side pan upper retaining bolts. Raise and support vehicle on hoist. Remove left wheel and inner fender splash shield. Remove transaxle-to-frame mount. Remove transaxle support bar.

**CAUTION: Do not remove 2 bolts holding oil pump and valve body together. Do not remove 6 oil pump cover bolts.**

4. Loosen valve body cover bolts and drain fluid. Remove cover and gasket. Using a screwdriver, position manual shift valve in Park position. Disconnect wiring to valve body. Remove valve body retaining bolts, disengage linkage and remove valve body. DO NOT remove 6 oil pump cover bolts. See **Fig. 3**.

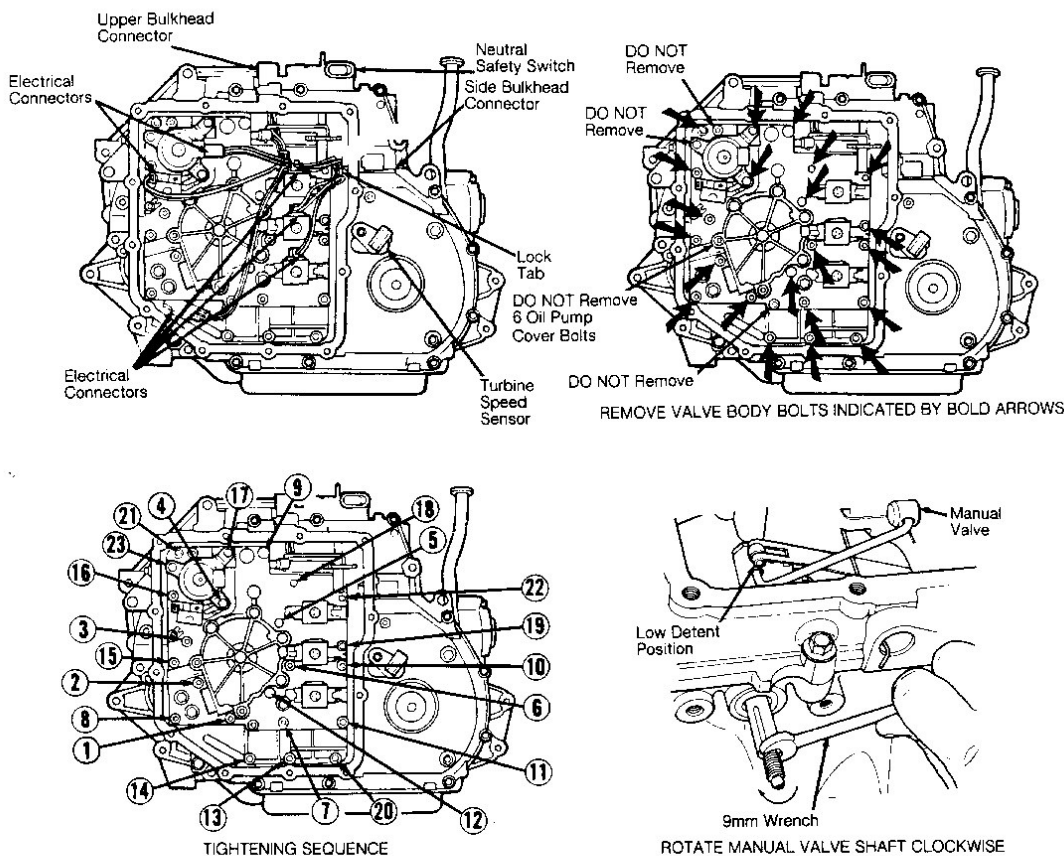
#### Installation

1. Install new valve body-to-chain cover gasket. Slide pump and valve body assembly onto oil pump shaft. Rotate pump and valve body assembly clockwise and connect manual valve link.

2. Slightly rotate or jiggle assembly to engage splines on oil pump shaft with splines in oil pump rotor. Valve body should slide flush onto chain cover without force. It may be necessary to rotate engine, using a 7/8" socket on crankshaft, to complete engagement of pump shaft to pump. If vehicle is equipped with ABS and valve body does not slide easily to flush position, go to next step.
3. If ABS-equipped, remove manual valve from valve body. Rotate valve body as necessary to allow full engagement. After engagement, return to installed position and install manual valve. Use Valve Body Alignment Pin (T86P-70100-C) to position valve body. Install bolts and tighten in sequence shown. See **Fig. 3**.

**CAUTION: DO NOT use bolts to draw pump and valve body into position.**

4. On all vehicles, install cover using a new gasket. To complete installation, reverse removal procedures. Refill transaxle and check for leaks.



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**Fig. 3: Removing & Installing Valve Body**  
Courtesy of FORD MOTOR CO.

## **TROUBLE SHOOTING**

### **PRELIMINARY INSPECTION**

1. Ensure vehicle is thoroughly road tested to verify driver's complaint. Determine if problem occurs during upshift, downshift, coasting or engagement. If noise is diagnosed, check if noise is affected by RPM, vehicle speed, gear selection or temperature. Ensure vehicle is at normal operating temperature when checking.
2. Inspect fluid level and condition. Visually inspect for vehicle modifications, electronic add-ons, fluid leaks and/or incorrect linkage adjustment. Check for trouble codes before any mechanical repair is performed. See **AXOD-E DIAGNOSIS** article for trouble code diagnosis and repair procedures. If no trouble codes are present, see applicable symptom diagnosis.
3. If the following symptoms are present, it is necessary to complete electronic diagnosis and repair before any mechanical diagnosis and repair is performed. See **AXOD-E DIAGNOSIS** article for trouble code diagnosis and repair procedures.
  - No Forward
  - No Reverse
  - Harsh Engagement
  - All Or Some Shifts Not Present
  - Early, Late, Erratic, Soft, Slipping And/Or Harsh Shifting
  - No First Gear (In "D" Position).
  - No Low Gear.
  - No 2nd Gear (SHO only).
  - No Torque Converter Clutch
  - Torque Converter Clutch Always Engaged
  - Torque Converter Cycling, Shudder Or Chatter
  - Poor Vehicle Performance
  - Transaxle Overheating
  - No Engine Braking In Low ("L")
  - No Engine Braking In 3rd (Overdrive Cancelled), (SHO only)

### **ENGAGEMENT FAULTS**

#### **No Forward Engagement, Reverse Okay**

Check fluid level, drive axles, shift linkage, low internal pressure, oil pump external or internal (support sealing rings) leakage, filter or filter seal, valve body malfunction (gasket cross-leak, stuck regulator valve, 3-4 shift valve, forward clutch control valve and 2-3 servo regulator valve), forward clutch assembly, overrunning clutch, support assembly (driven sprocket), low intermediate servo assembly and output shaft.

#### **No Reverse Engagement, Forward Okay**

Check fluid level, drive axles, external and internal shift linkage, low line pressure, valve body (bolt torque,

gasket cross-leak, forward clutch valve, manual control valve, main regulator valve and springs), oil pump assembly, support assembly (driven sprocket), forward clutch assembly, reverse clutch assembly, overrunning clutch assembly (planetary) and output shaft.

**Harsh Reverse Engagement**

Check fluid level, axle shafts and CV joints, engine/transaxle mounts, shift linkage, line pressure, restricted oil filter, valve body (improperly torqued bolts, gasket cross-leak, B1 check ball, pressure failsafe valve, manual control valve, main regulator valve), reverse clutch assembly and oil pump assembly.

**Harsh Forward Engagement**

Check fluid level, axle shafts and CV joints, engine/transaxle mounts, shift linkage, line pressure, valve body (improperly torqued bolts, gasket cross-leak, B2 or B3 check ball, pressure failsafe valve, main regulator valve, backout valve, EPC solenoid, 2-3 servo regulator valve, engagement valve), oil pump assembly, low and intermediate servo, drive shift accumulator, forward clutch assembly, and low and intermediate band/rear sun gear and drum.

**Delayed Or Soft Reverse Engagement**

Check fluid level, axle shafts and CV joints, engine/transaxle mounts, shift linkage, line pressure, restricted oil filter, valve body (improperly torqued bolts, gasket cross-leak, manual control valve, main regulator valve, B5 check ball, converter drain back valve, springs), oil pump assembly, support assembly (driven sprocket), neutral to drive accumulator, forward clutch assembly, reverse clutch assembly and drive shift accumulator.

**Delayed Or Soft Forward Engagement**

Check fluid level, axle shafts and CV joints, engine/transaxle mounts, shift linkage, line pressure, restricted oil filter, valve body (improperly torqued bolts, gasket cross-leak, manual control valve, main regulator valve, B5 check ball, 3-4 shift valve, backout valve, 2-3 servo regulator valve, engagement valve), oil pump assembly, low intermediate servo assembly, support assembly (driven sprocket), neutral to drive accumulator, forward clutch assembly, drive shift accumulator and low and intermediate band/rear sun gear and drum.

**SHIFTING MALFUNCTION****All Or Some Shifts Not Present**

Check fluid level, shift linkage, speedometer drive/driven gear, following symptoms.

**Early Or Late Shifting**

Check tire size, speedometer drive/driven gear and valve body.

**Erratic/Hunting Shift Timing**

Check fluid level, vehicle speed input, valve body and torque converter clutch (TCC).

**Soft/Slipping Shift Feel**

Check fluid condition and level, shift linkage, low line pressure and valve body (1-2 capacity modulator valve, accumulator/regulator valve, main regulator valve, 2-3 servo regulator valve, check balls, 3-2 shift timing valve, EPC solenoid, pressure failsafe valve and springs).

**Harsh Shift Feel**

Check fluid level and condition, axle shafts and CV joints, high line pressure, high EPC pressure and valve body (1-2 capacity modulator valve, accumulator/regulator valve, main regulator valve, 2-3 servo regulator valve, 3-2 timing valve, springs, check balls).

**No First Gear (In "D" Position)**

Check shift linkage, valve body (shift valves, intermediate clutch shuttle valve, forward clutch control valve, springs) and internal seal(s) leakage and bands or clutches.

**No Low Gear**

Check shift linkage, valve body (improperly torqued bolts, gasket cross-leak, manual low relief valve, springs), low direct clutch pressure, low line pressure, low EPC pressure, support assembly (driven sprocket) and direct clutch.

**No Manual 2nd Gear (3.2L SHO Only)**

Check shift linkage/cable/MLP sensor, valve body (improperly torqued bolts, gasket cross-leak, shift valves, forward clutch control valve, shift solenoids), clutch assembly, low intermediate servo, support assembly (drive sprocket), low one-way clutch assembly and low intermediate band.

**MISCELLANEOUS FAULTS****No Torque Converter Clutch**

Check low line pressure, low EPC pressure, valve body (improperly torqued bolts, gasket cross-leak, valve body pilot sleeve, manual shift valve, TCC control valve and/or plunger, converter regulator valve, springs, solenoid regulator valve), turbine shaft, oil pump shaft and torque converter.

**Torque Converter Clutch Always Engaged (Stalls Engine)**

Check valve body (improperly torque bolts, gasket cross-leak, TCC control valve or plunger) and torque converter.

**Torque Converter Clutch Cycling/Shudder/Chatter**

Check fluid condition, low line pressure, low EPC pressure, valve body (improperly torque bolts, gasket cross-leak, TCC control valve or plunger, valve body output sleeve, manual shift valve, converter regulator valve), TCC solenoid, turbine shaft, oil pump shaft and torque converter.

**No Engine Braking In 3rd Gear (OD Position) With OD Cancelled**



## 1994 Ford Taurus GL

1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

### (3.2L SHO Only)

Check shift linkage, forward clutch pressure, line pressure, valve body (improperly torqued bolts, gasket cross-leak, shift valves, forward clutch control valve), forward clutch assembly and low one-way clutch assembly.

### No Engine Braking In Manual Low Position

Check shift linkage, direct clutch pressure, valve body (improperly torqued bolts, gasket cross-leak, manual low relief valve, 1-2 shift valve, pull-in valve), direct clutch assembly and direct overrunning clutch assembly.

### Stiff Shift Lever Operation

Check shift interlock system, shift linkage and manual valve (valve body).

### Poor Vehicle Performance

Check correct shift linkage to shift lever indexing, torque converter (TCC applied and one-way clutch).

### Transaxle Overheating

Check fluid condition and level, cooler line restriction, auxiliary cooler, valve body (TCC control valve and plunger, converter regulator valve) and seized converter clutch.

## BAND & CLUTCH APPLICATION

### BAND & CLUTCH APPLICATION

Selector Position (Gear)	Bands & Clutches Applied
"L" (1st Gear)	Lo-Int Band, Forward Clutch, Direct Clutch, Low One-Way Clutch
"D" (1st Gear)	Lo-Int Band, Forward Clutch Low One-Way Clutch
"D" (2nd Gear)	Lo-Int Band, Forward Clutch, Intermediate Clutch Low One-Way Clutch (Overrunning)
"D" (3rd Gear)	Intermediate Clutch, Direct Clutch
"OD" (4th Gear)	OD Band, Intermediate Clutch, Direct Clutch Direct One-Way Clutch (Overrunning)
"R" (Reverse)	Forward Clutch, Reverse Clutch Low One-Way Clutch
"N" (Neutral)	Forward Clutch
"P" (Park)	Forward Clutch

## PERFORMANCE TESTS

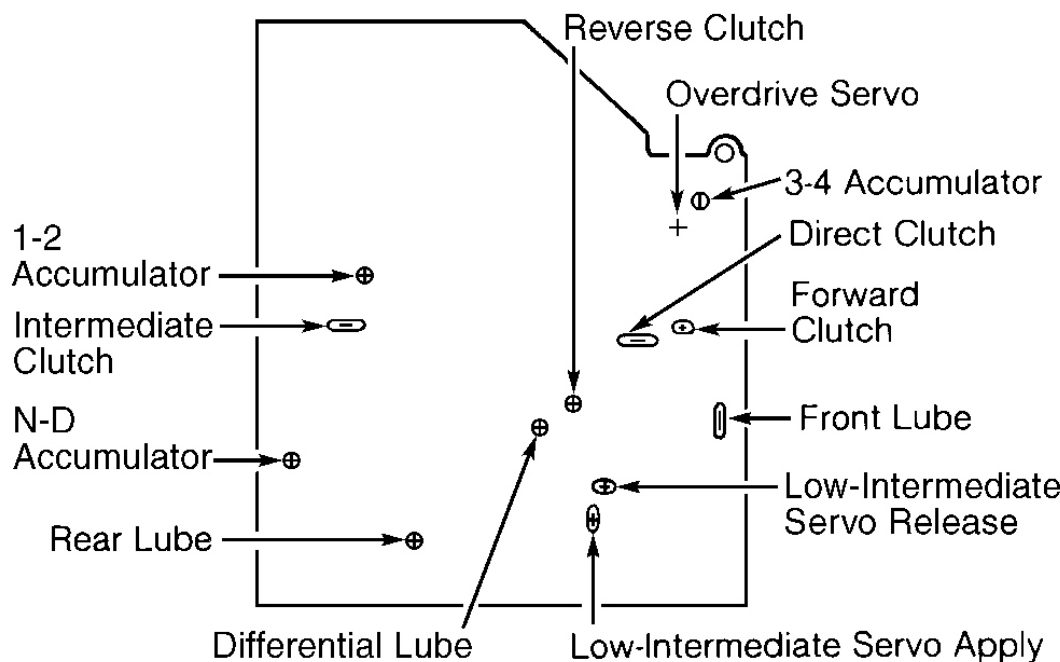
### AIR PRESSURE TEST

A NO DRIVE condition may exist even when line pressure is correct. This may be caused by an inoperative band or clutch. An erratic shift may be located by substituting air pressure for fluid pressure.

With gear selector lever in a forward gear position, a NO DRIVE condition may be caused by an inoperative forward clutch, low-intermediate one-way clutch or low-intermediate band.

A NO COAST condition in manual low (1st gear), could be caused by a faulty direct clutch or direct one-way clutch. Reverse failure may be caused by a malfunctioning reverse clutch, forward clutch or low-intermediate one-way clutch. Use the following procedure to perform air pressure tests:

1. Drain transaxle fluid and remove oil pan. Remove valve body cover, oil pump and valve body assembly. See **OIL PUMP & VALVE BODY ASSEMBLY** under ON-VEHICLE SERVICE. Install Air Pressure Test Plate (T91P-7006-A) with valve body assembly-to-chain cover gasket.
2. Faulty clutches and bands may be located by applying air pressure to the indicated test ports. See **Fig. 4**. Refer to appropriate test procedure for listed components.



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**Fig. 4: Identifying Air Pressure Test Plate**  
Courtesy of FORD MOTOR CO.

#### Forward Clutch

Apply air pressure to forward clutch test port. A dull thud can be heard, or movement of piston felt when clutch piston is applied. If clutch seal(s) are leaking, a hissing sound will be heard.

#### Overdrive Servo

Apply air pressure to overdrive servo test port. Operation of servo is indicated by tightening of overdrive band

around overdrive drum. Due to cushioning effect of servo release spring, this may not be heard or felt. Servo should hold air pressure and a dull thud should be heard when air pressure is released.

#### **Direct Clutch**

Apply air pressure to direct clutch test port. A dull thud can be heard, or movement of piston felt on case as piston is applied. A hissing sound indicates a leaking clutch seal.

#### **Intermediate Clutch**

Apply air pressure to intermediate clutch test port. A dull thud can be heard, or movement of piston felt on transmission case as piston is applied. If clutch seal(s) are leaking, a hissing sound will be heard.

**NOTE:**      **If air pressure fails to operate a clutch, or operates clutches simultaneously, remove and, using air pressure, check fluid passages in the clutches, chain cover and driven sprocket support.**

#### **Low-Intermediate Servo**

1. Apply air pressure to low-intermediate servo apply test port. Low-intermediate band should tighten around sun gear of rear planetary gear set. Due to cushioning effect of the servo release spring, band application may not be heard or felt. Servo should hold air pressure and a dull thud should be heard when air pressure is released.
2. Apply air pressure to low-intermediate servo release test port while continuing to pressurize apply port. Servo piston should return to release position. Low-intermediate band should loosen and a dull thud should be heard. Release air pressure from apply test port. The release test port should hold air pressure. Any leakage or failure of piston movement requires servo servicing.

#### **Lube & Rear Lube Passages**

Apply air pressure to lube and rear lube test ports to check for blockage. If either passage holds air pressure, remove test plate and check for an obstruction or damage.

**NOTE:**      **If air pressure applied to the accumulator passages fails to operate an accumulator, remove and check fluid passages in the accumulator and chain cover.**

#### **1-2, 3-4 & N-D Accumulators**

Apply air pressure to each accumulator test port. Accumulator should apply. Due to cushioning effect of release spring, application may not be heard or felt. Accumulator should hold air pressure without leaking and a dull thud should be heard when air pressure is released.

#### **LINE PRESSURE TEST**

1. Connect a pressure gauge to line pressure test port. See **Fig. 5**. Start engine. Apply service and parking brakes. Check pressure in all gears. See **TRANSAXLE PRESSURE SPECIFICATIONS (PSI)** table.

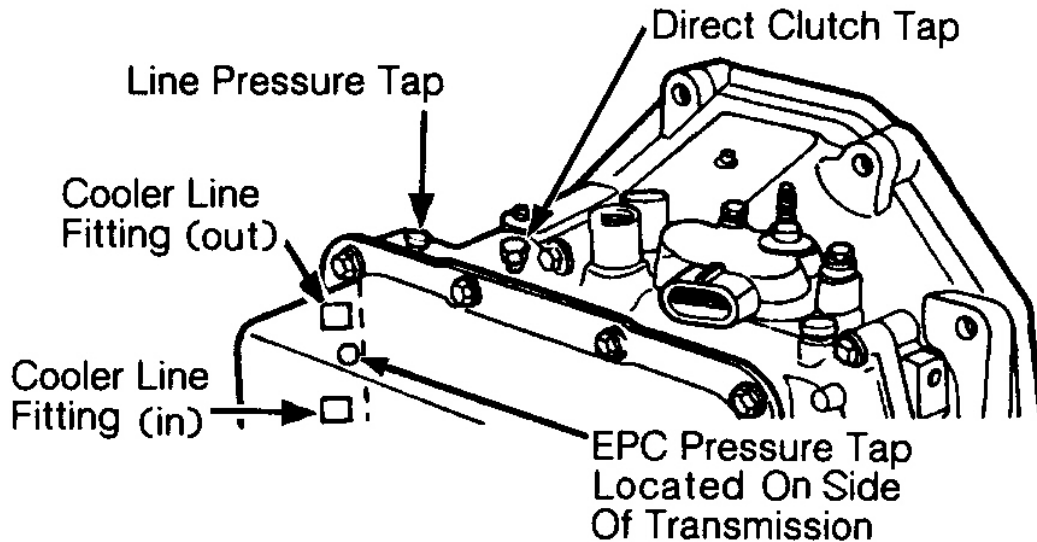
**1994 Ford Taurus GL**

1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

2. If pressure is not within specification, perform QUICK TEST and PINPOINT TEST E. See **AXOD-E DIAGNOSIS** article. Also perform air pressure checks and service valve body. See **AIR PRESSURE TEST**.
3. If line pressure is not within specification after servicing valve body and there are no fault codes present during EEC-IV Quick Test procedure, Electronic Pressure Control (EPC) solenoid may have a mechanical fault. Connect pressure gauge to EPC port. Start engine and check pressure at idle and at Wide Open Throttle (WOT). If pressure is not within specification, replace EPC solenoid.

**TRANSAXLE PRESSURE SPECIFICATIONS (PSI)**

Selector Position	@ Idle RPM	@ WOT Stall RPM
Line Pressure		
"P" & "N"	48-77	NA
"R"	61-99	252-316
"OD" & "D"	48-77	168-217
"L"	48-77	168-217
Direct Clutch <sup>(1)</sup>		
"L"	40-60	40-60
EPC		
"P" & "N"	10-20	NA
"R"	10-20	70-90
"OD" & "D"	10-20	70-90
"L"	10-20	70-90
(1) Pressure is measured only in manual low position.		



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

### STALL SPEED TEST

**NOTE:** After each test, shift transaxle into Neutral and run engine for at least 2 minutes to cool torque converter and transmission fluid.

**CAUTION:** Do not maintain Wide Open Throttle (WOT) in any gear for more than 5 seconds. If engine RPM exceeds maximum specified stall speed, release accelerator immediately. Clutch or band slippage is indicated.

The stall speed test checks the operation of the following items:

- Converter One-Way Clutch
- Forward Clutch
- Low One-Way Clutch
- Reverse Clutch
- Low-Intermediate Band
- Engine Performance

1. Apply service and parking brakes. Connect tachometer to engine, and record RPM reached in each gear selector range (except Neutral) at WOT. Stall speed should be as indicated in **STALL SPEED SPECIFICATIONS** table.

**STALL SPEED SPECIFICATIONS**

<b>Application</b>	<b>Stall RPM</b>
3.0L V6	1881-2211
3.2L V6	2849-3252
3.8L V6	1791-2097

2. If stall speeds exceed specification, ensure engine is mechanically okay and tuned to specification. If engine is okay, remove torque converter and check torque converter one-way clutch for slippage.
3. If stall speed is too high in "OD", "D", "1", the following components may be faulty:
  - Forward Clutch
  - Low-Intermediate One-Way Clutch
  - Low-Intermediate Band or Servo
4. If stall speed is too high in "R", the following components may be faulty:
  - Forward Clutch
  - Low-Intermediate One-Way Clutch
  - Reverse Clutch

**SHIFT POINT ROAD TEST**

Use the following road test procedure to verify shift control valves are operating correctly:

1. Drive vehicle to bring engine and transaxle to operating temperature. Operate vehicle with gear selector in "OD" position.
2. Apply MINIMUM throttle and observe and record upshift speeds. Observe and record speed at which converter clutch applies.
3. Stop vehicle and move gear selector to "D" position. Repeat step 2). Transaxle should make all upshifts except 3rd-to-4th. Torque converter lock-up should occur above 27 MPH (43 km/h).
4. Depress throttle pedal to Wide Open Throttle (WOT) position. Converter clutch should release and transaxle should downshift to next lower gear.
5. With vehicle speed greater than 30 MPH (48 km/h), move gear selector from "D" to "1" position and release accelerator pedal. Transaxle should immediately downshift to 2nd gear. When vehicle speed drops to less than 20 MPH (32 km/h), transaxle should downshift into 1st gear.
6. If transaxle fails to shift as described above, perform EEC-IV QUICK TEST procedure. See appropriate DIAGNOSIS article.

**TORQUE CONVERTER**

Torque converter is a sealed unit and cannot be disassembled. Replace converter assembly if defective. Perform the following procedures to ensure converter is defective before replacing unit.

**LEAK TEST**

If torque converter welds indicate leakage, attach Torque Converter Leak Test Kit (021-00054) to converter and

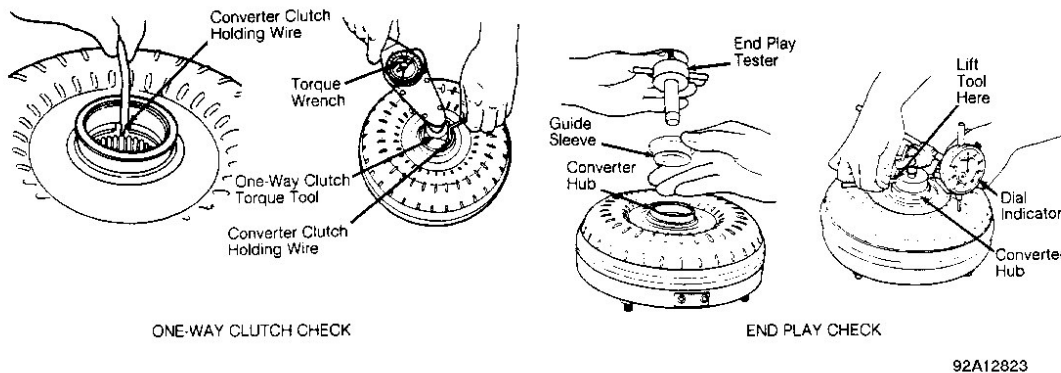
follow directions supplied with kit.

### TORQUE CONVERTER REACTOR ONE-WAY CLUTCH CHECK

Position Holding Wire (T77L-7902-R), into thrust washer slot. While holding wire in position, install One-Way Clutch Torque Tool (T81P-7902-B) in reactor spline. Turn socket counterclockwise with a torque wrench. If socket begins to turn before torque wrench reads 10 ft. lbs. (14 N.m), replace converter. See **Fig. 6**.

### TORQUE CONVERTER END PLAY CHECK

Position End Play Tester (T80L-7902-A) and Guide Sleeve (T86P-7902-A) in torque converter hub. Tighten tester nut. Mount a dial indicator on tester with stylus contacting converter shell. Zero indicator and lift on tester handles. If reading is above .05" (1.3 mm), replace converter.



**Fig. 6: Checking Torque Converter**  
Courtesy of FORD MOTOR CO.

## REMOVAL & INSTALLATION

**NOTE:** See appropriate REMOVAL & INSTALLATION article in AUTOMATIC TRANSMISSIONS.

## TRANSAXLE DISASSEMBLY

**NOTE:** For exploded view of transaxle, see **Fig. 7 -Fig. 10**.

1. Remove torque converter. Mount transaxle in a appropriate holding fixture. Place in vertical position and drain fluid.
2. Place in horizontal position. Remove 2 (8 mm) speedometer cover bolts, cover and seal. Discard seal. Lift speedometer drive gear assembly and bearing from case. Bearing sits on top of speedometer drive gear.
3. Remove 3 (8 mm) bolts from overdrive servo cover. Servo cover is under pressure and must be retained

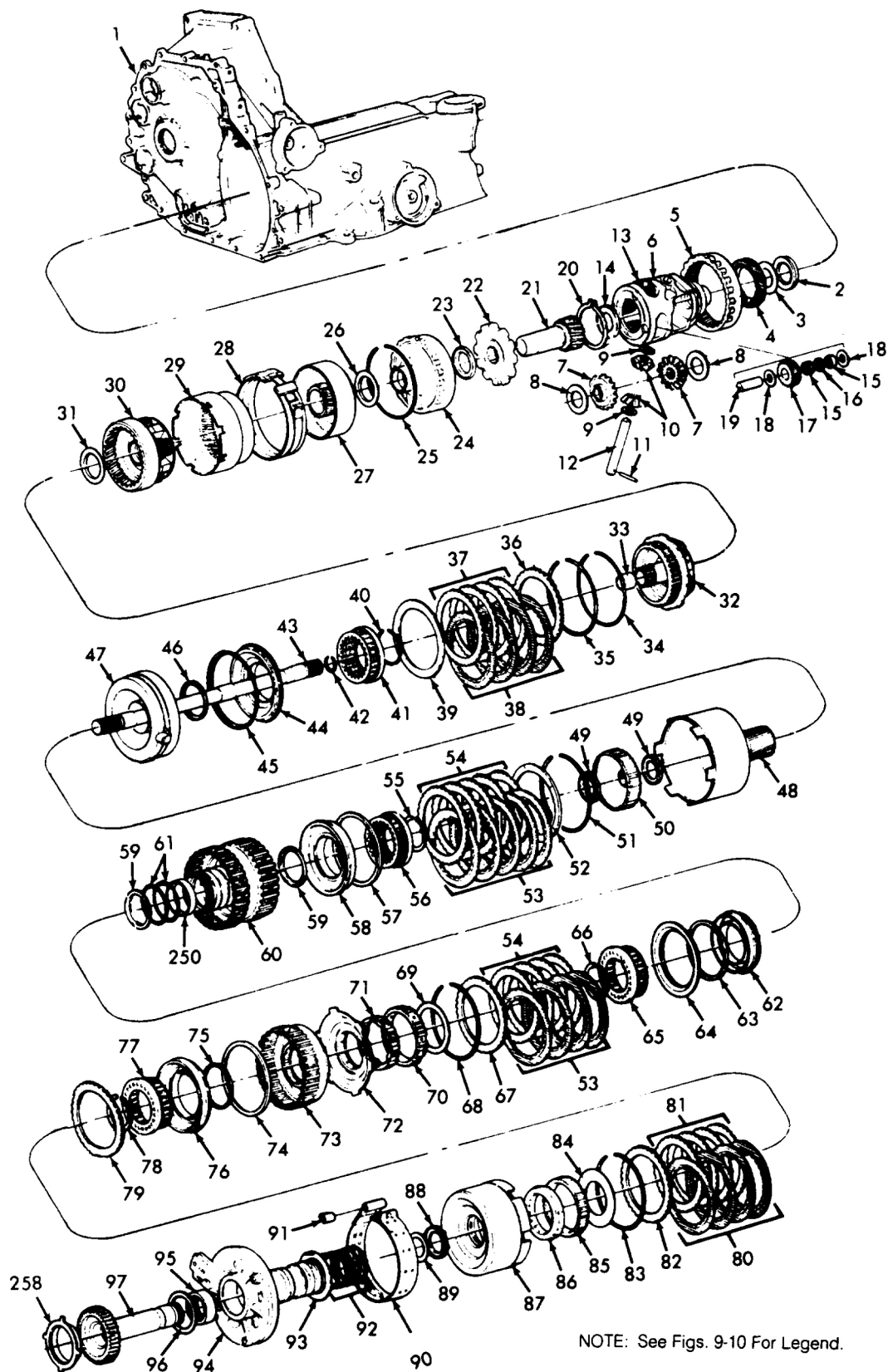
when removing bolts. Mark and remove cover, piston assembly and spring. Discard "O" ring from cover. Remove 3 low-intermediate servo cover bolts. Mark and remove cover, piston assembly and spring. Remove and discard gasket.

4. Install Step Plate Adapter (D80L-630-3) into right-hand output shaft opening; hold adapter in position with grease. Screw output shaft Seal Remover (T74P-6700-A) into metal seal and protector. Tighten screw on end of seal remover until metal seal protector is removed. Reinstall remover and repeat procedure to remove seal.



# 1994 Ford Taurus GL

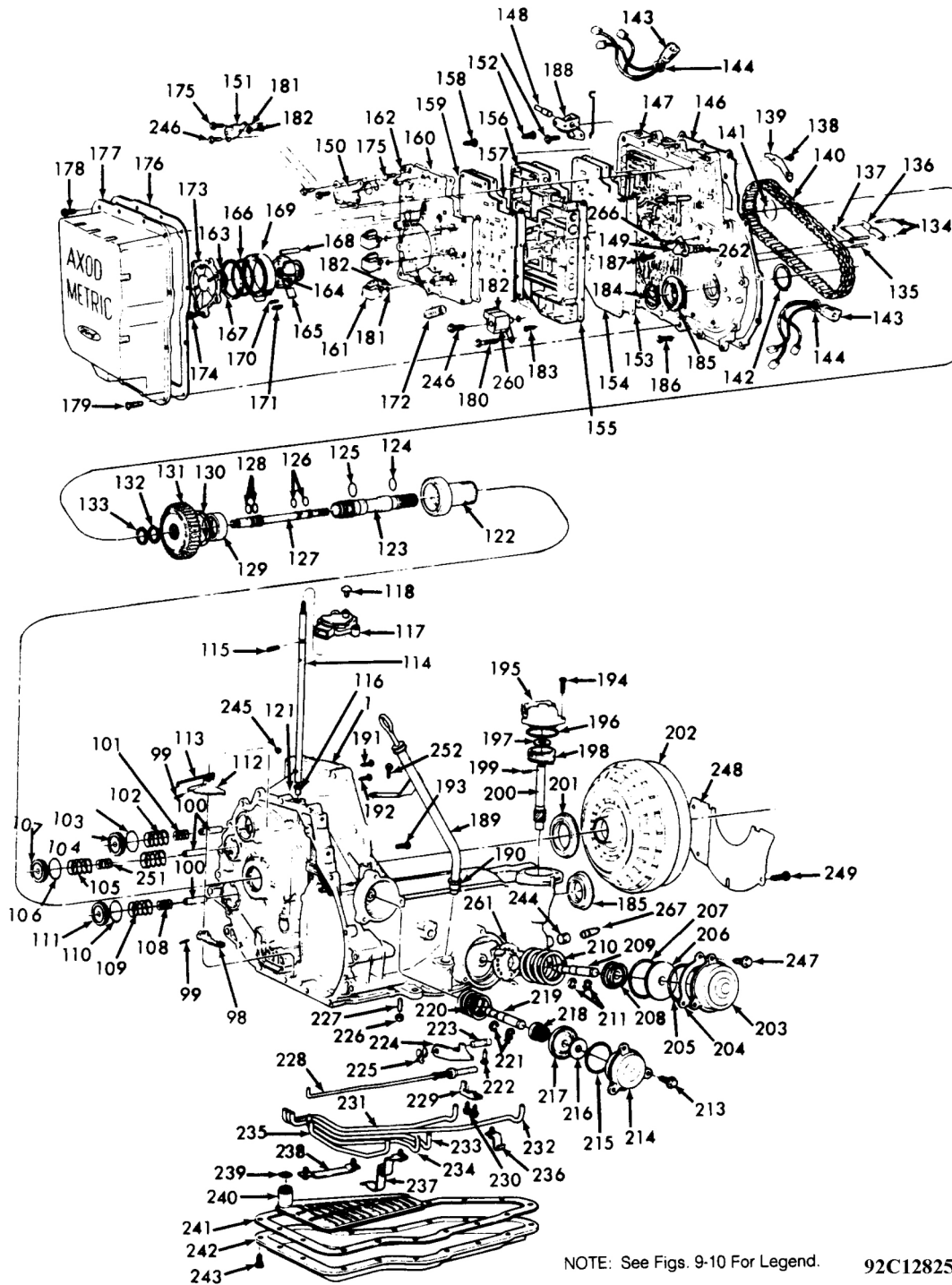
## 1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul



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**Fig. 7: Exploded View Of AXOD-E Transaxle (1 of 4)**

Courtesy of FORD MOTOR CO.



**Fig. 8: Exploded View Of AXOD-E Transaxle (2 of 4)**

Courtesy of FORD MOTOR CO.

## 1994 Ford Taurus GL

### 1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

1. Case Assembly
2. Differential Carrier Thrust Bearing & Race Assembly
3. Differential Carrier Thrust Washer
4. Governor Drive Gear
5. Final Drive Ring Gear
6. Transaxle Differential Gear Case
7. Differential Side Gear
8. Differential Side Gear Thrust Washer
9. RR Axle Differential Pinion Thrust Washer
10. Rear Axle Differential Pinion
11. Coiled Spring Pin (Retains Differential Pinion Shaft)
12. Differential Pinion Shaft
13. Gear & Differential Case Assembly
14. Final Drive Carrier Bearing & Race Assembly
15. Final Drive Planet Gear Needle Bearing
16. Final Drive Planetary Gear Spacer
17. Final Drive Planetary Gear
18. Final Drive Planetary Gear Thrust Washer
19. Final Drive Pinion Shaft
20. Retaining Ring (Retains Pinion Shaft Into Carrier)
21. Final Drive Sun Gear Assembly
22. Parking Gear
23. Final Drive Gear Thrust Bearing & Race Assembly
24. Planet Gear Support Assembly
25. Retaining Ring
26. Sun Gear Bearing & Race Assembly
27. Sun Gear & Drum Assembly
28. Low & Intermediate Band Assembly
29. Ring Gear
30. Rear Planetary Gear Assembly
31. Planetary Thrust Bearing & Race Assembly
32. Front Planetary Assembly
33. Front Planetary Carrier Bearing
34. Rear Clutch Plate Retainer
35. Retaining Ring
36. Reverse Clutch Pressure Plate
37. Friction Clutch Plates (4)
38. Steel Clutch Plates (4)
39. Clutch Cushion Spring Plate
40. Retaining Ring
41. Reverse Clutch Support & Spring Assembly
42. Retaining Ring
43. Differential Output Shaft
44. Reverse Clutch Piston
45. Reverse Clutch Piston Outer Seal
46. Reverse Clutch Piston Inner Seal
47. Reverse Clutch Cylinder
48. Front Sun Gear & Shell Assembly
49. Front Sun Gear Bearing & Race Assembly
50. Intermediate Clutch Hub
51. Intermediate Clutch Plate Ring
52. Intermediate Clutch Pressure Plate
53. Internal Splined Clutch Plate Assembly
54. External Splined Clutch Plate Assembly
55. Retaining Ring
56. Intermediate Clutch Support & Spring Assembly
57. Intermediate Clutch Outer Seal
58. Intermediate Clutch Piston
59. Intermediate/Direct Clutch Inner Seal
60. Intermediate/Direct Clutch Cylinder Assembly
61. Intermediate/Direct Clutch Hub Seal
62. Direct Clutch Piston Assembly
63. Direct Clutch Outer Seal
64. Direct Clutch Piston Ring
65. Direct Clutch Support & Spring Assembly
66. Retaining Ring
67. Direct Clutch Pressure Plate
68. Direct Clutch Plate Ring
69. Direct Clutch Thrust Washer
70. Direct One-Way Clutch Outer Race
71. Direct One-Way Clutch Assembly
72. Direct One-Way Clutch Inner Race & Bushing Assembly
73. Forward Clutch Cylinder Valve Assembly
74. Forward Clutch Outer Seal
75. Forward Clutch Inner Seal
76. Forward Clutch Piston
77. Forward Clutch Support & Spring Assembly
78. Retaining Ring
79. Forward Clutch Wave Spring
80. Forward Clutch Internal Spline Friction Plate
81. Forward Clutch External Spline Steel Plate
82. Forward Clutch Pressure Plate
83. Retaining Ring
84. Forward Clutch Thrust Washer
85. Low One-Way Clutch Outer Race
86. Low One-Way Clutch Assembly
87. Overdrive Drum Assembly
88. Direct Clutch Hub Bearing & Race Assembly
89. Driven Sprocket Support Thrust Washer
90. Overdrive Band Assembly
91. Overdrive Band Retainer
92. Forward Clutch Cylinder Seal
93. Front Support Thrust Washer (No. 5)
94. Driven Sprocket Support Assembly
95. Driven Sprocket Bearing Assembly
96. Driven Sprocket Thrust Washer (#4)
97. Driven Sprocket Assembly
98. Manual Control Lever Assembly
99. Manual Control Shaft Spring Pin (4mm x 28mm)
100. Accumulator Piston Shaft
101. 1-2 Shift Accumulator Inner Shift Spring
102. 1-2 Shift Accumulator Outer Shift Spring
103. 1-2 Shift Accumulator Piston Seal
104. 1-2 Shift Accumulator Piston
105. 3-4 Shift Accumulator Spring
106. 3-4 Shift Accumulator Piston Seal
107. 3-4 Shift Accumulator Piston
108. Drive Shift Accumulator Inner Spring
109. Drive Shift Accumulator Outer Spring
110. Drive Shift Accumulator Piston Seal
111. Drive Shift Accumulator Piston
112. Manual Detent Lever Assembly
113. Manual Control Valve Actuator Rod
114. Manual Control Shaft
115. Shaft Retaining Pin
116. Manual Control Shaft Seal Assembly
117. Main Lever Position Sensor Assembly
118. Bolt (Neutral Start Switch-to-Case)
119. Bolt (Chain Cover-to-Case)
120. Hex Head Plug
121. Identification Tag
122. Stator Support Assembly
123. Turbine Shaft
124. "O" Ring Seal
125. Turbine Shaft Rear Seal
126. Pump Shaft Rear Seal
127. Oil Pump Drive Shaft Assembly
128. Front Pump Shaft Seal
129. Drive Sprocket Bearing Assembly
130. Drive Sprocket Thrust Washer (No. 2)
131. Drive Sprocket Assembly
132. Retaining Ring (Turbo Shaft-To-Drive Sprocket)
133. Turbine Shaft Front Seal (Metal)
134. Oil Level Thermal Retaining Collar
135. Spring Pin (4mm x 22mm)
136. Oil Level Thermostatic Element
137. Oil Level Thermostat Plate Valve
138. Bolt (Detent Spring Assembly-To-Chain Cover)
139. Manual Valve Detent Spring Assembly
140. Drive Chain
141. Drive Sprocket Thrust Washer (No. 1)
142. Chain Cover Thrust Washer (No. 3)
143. Bulkhead Assembly Wiring Connector
144. "O" Ring Seal (Wire Harness-To-Case)
145. Case Vent Assembly
146. Chain Cover Gasket
147. Chain Cover Assembly
148. Connector Assembly
149. Turbine Speed Sensor
150. Pressure Regulator Solenoid Assembly
151. By-Pass Clutch Control Solenoid Assembly
152. Screw
153. Control Assembly Gasket
154. Valve Body Separator Plate
155. Control Valve Body Separator Plate Gasket
156. Main Control Assembly
157. Pump Assembly Gasket
158. Screw
159. Oil Pump Body Separator Plate
160. Oil Pump Body Separator Plate Gasket

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**Fig. 9: Legend For Exploded View of AXOD-E Transaxle (3 of 4)**

**Courtesy of FORD MOTOR CO.**

161. Switch Control Solenoid Assembly	215. O/D Band Servo Cover Seal
162. Oil Pump Bearing & Seal Assembly	216. O/D Servo Piston Retainer
163. Oil Pump Vane Support Ring	217. O/D Servo Piston & Seal Assembly
164. Oil Pump Rotor	218. O/D Servo Retainer & Cushion Spring Assembly
165. Oil Pump Vane	219. O/D Servo Piston Rod
166. Oil Pump Bore Ring Side Seal	220. O/D Servo Return Spring
167. Oil Pump Bore Ring Side Seal Support	221. O/D Servo Retaining Ring
168. Pin (8mm x 37.7mm)	222. Shaft Retainer Pin
169. Oil Pump Body Ring	223. Parking Pawl Shaft
170. Oil Pump Bore Ring Radial Seal Support	224. Parking Pawl
171. Oil Pump Bore Ring Radial Seal	225. Parking Pawl Return Spring
172. Oil Pump Bore Ring Spring	226. Screw
173. Oil Pump Cover & Sleeve Assembly	227. Nut
174. Bolt (Pump Cover-To-Pump Body)	228. Park Pawl Actuating Rod Assembly
175. Bolt (Pump Body & Main Control-To-Chain Cover)	229. Park Pawl Actuating Abutment
176. Main Control Cover Gasket	230. Bolt (Abutment Assembly-To-Case)
177. Main Control Cover	231. Rear Lube Oil Transfer Tube
178. Bolt (Chain Cover-To-Case)	232. Governor Oil Transfer Tube
179. Bolt (Main Control Cover-To-Chain Cover)	233. Servo Apply Oil Transfer Tube
180. Bolt (Valve Body-To-Chain Cover & Solenoid Assembly)	234. Servo Release Oil Transfer Tube
181. "O" Ring Seal	235. Reverse Clutch Apply Oil Transfer Tube
182. "O" Ring Seal	236. Governor Feed Tube Support Bracket Assembly
183. Bypass Clutch Solenoid Screen Assembly	237. Reverse Clutch Tube Support Bracket Assembly
184. Output Shaft Retainer Circle Clip (Retains CV Joint)	238. Tube Support Main Bracket Assembly
185. Differential Seal Assembly	239. Oil Filter Seal
186. Bolt (Valve Body-To-Chain Cover & Solenoid Assembly)	240. Oil Filter Assembly
187. Bolt (Chain Cover-To-Driven Support)	241. Oil Pan Gasket
188. Oil Level Indicator Assembly	242. Oil Pan
189. Oil Filler Tube Assembly	243. Bolt (Oil Pan-To-Case)
190. Oil Filler Grommet	244. Cup Plug
191. Bolt (Chain Cover-To-Driven Support)	245. 1/4" Spring Nut (Retain I.D. Tag)
192. Bolt (Case-To-Chain Cover)	246. Bolt (Solenoid Assembly-To-Valve Body)
193. Screw (Case-To-Stator Support)	247. Bolt (Servo Cover-To-Case)
194. Bolt (Governor/Speedo Drive Cover-To-Case)	248. Converter Housing Lower Cover
195. Governor/Speedo Drive Cover	249. Bolt (Converter Housing Cover-To-Case)
196. "O" Ring (Governor/Speedo Drive Cover Seal)	250. Direct/Intermediate Clutch Cylinder Bushing
197. Thrust Bearing & Race Assembly	251. 3-4 Shift Accumulator Inner Spring
198. Speedo Drive Gear	252. Bolt (Filler Tube-To-Case)
199. Spring Pin (Speedo Drive Drive Pin)	253. Bolt (Oil Pump Assembly-To-Main Control)
200. Gear & Shaft Assembly	254. Hex Head Shoulder Stud
201. Torque Converter Hub Seal	255. Forward Clutch Wave Spring (3.8L only)
202. Torque Converter (10 1/4")	256. Ceramic Magnet Case
203. Low/Intermediate Band Servo Cover	257. 1-2 Shift Accumulator Center Spring (3.8L only)
204. Low/Intermediate Band Servo Gasket	258. Driven Sprocket Speed Sensor Wheel
205. Low/Intermediate Servo Piston Cover Seal	259. Intermediate Circuit Case Screen
206. Low/Intermediate Band Servo Piston	260. Oil Temperature Sensor
207. Low/Intermediate Band Servo Piston Seal	261. Low/Intermediate Servo Return Spring Retainer
208. Low/Intermediate Servo Spring & Retainer Assembly	262. "O" Ring Seal (14.0mm x 1.78mm)
209. Low/Intermediate Servo Piston Rod	263. "O" Ring Seal (25.12mm x 1.78mm)
210. Low/Intermediate Servo Piston Spring	264. "O" Ring Seal (12.42mm x 1.78mm)
211. Low/Intermediate Servo Piston Ring	265. Trans Cooler Tube Retaining Clip
212. Transfer Tube Seal Assembly	266. Bolt
213. Bolt (O/D Servo Cover-To-Case)	267. Stud
214. O/D Band Servo Cover	268. Exciter Ring

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**Fig. 10: Legend For Exploded View of AXOD-E Transaxle (4 of 4)**  
**Courtesy of FORD MOTOR CO.**

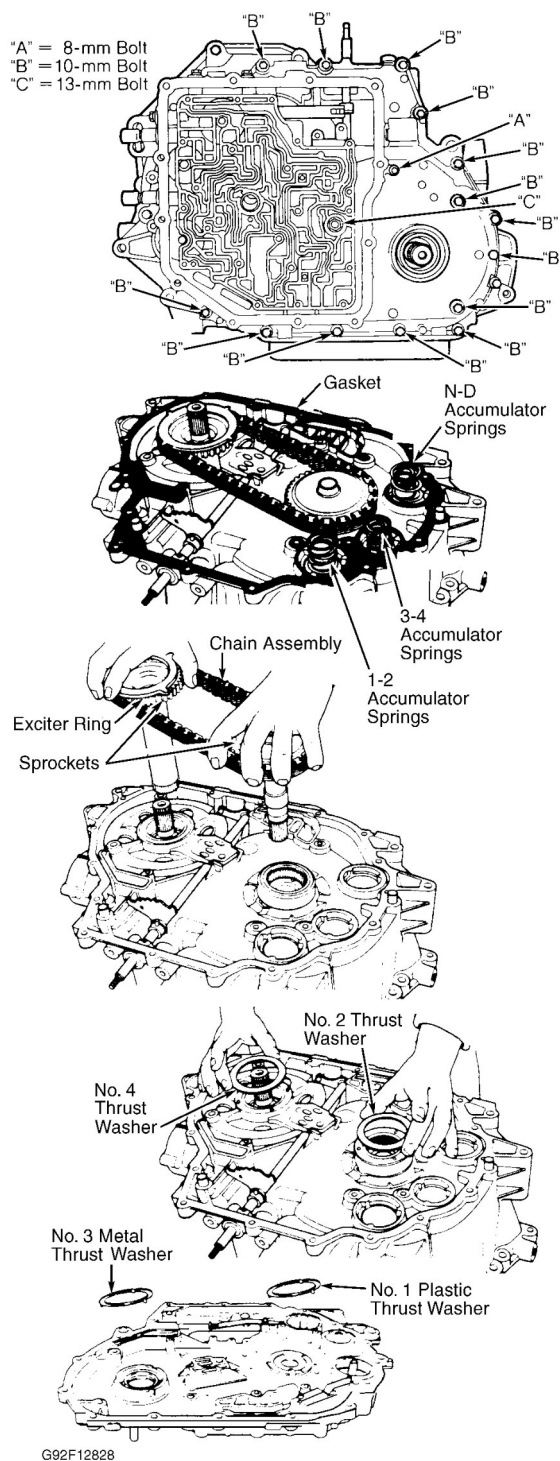
- Remove 2 (8 mm) bolts from Manual Lever Position Sensor (MLPS) and remove sensor. Remove dipstick tube and dipstick from case. Remove 9 chain cover bolts from inside torque converter housing.
- Using a slide hammer and Seal Puller (1175-AC), remove converter oil seal from input shaft. Rotate transaxle to vertical position. Remove 12 valve body cover bolts. Remove cover and discard gasket.
- Disconnect electrical connectors from pressure switches and solenoid. Use both hands. DO NOT pull on wires. Compress tabs on both sides of bulkhead connector from inside of chain cover and remove connector and wiring. See [Fig. 3](#).
- Using a 9 mm wrench on flats of manual shaft, rotate shaft clockwise to position manual linkage in low detent (manual valve all the way in). Mark and remove 22 oil pump and valve body bolts, noting length and location. See [Fig. 3](#).

**CAUTION: Do not remove 2 bolts holding oil pump and valve body together. Do not remove 6 oil pump cover bolts.**

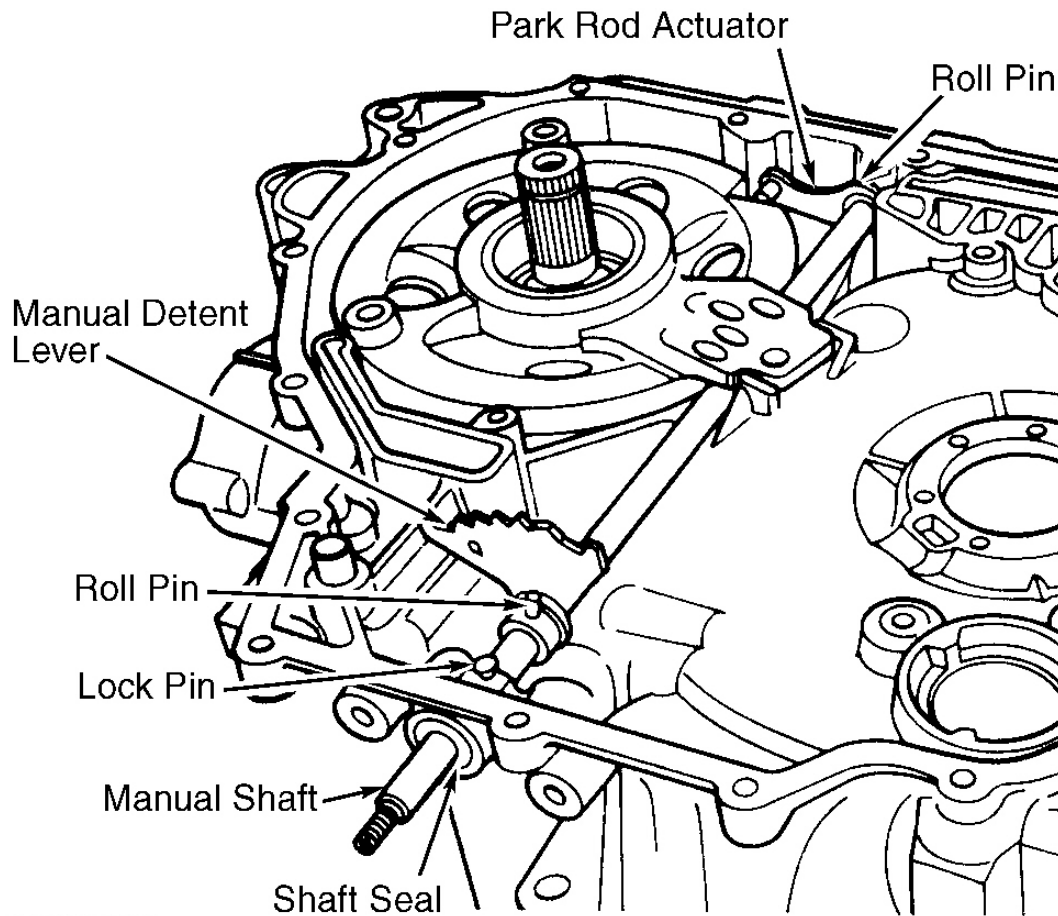
9. Rotate valve body clockwise and remove manual valve link from manual valve. Disconnect manual valve link from detent lever. Remove pump and valve body assembly.
10. Pull oil pump drive shaft out of case and remove 4 Teflon seals from shaft. Discard seals.
11. Place transaxle in vertical position. Remove and discard left output shaft circlip. Screw Seal Remover (T74P-6700-A) into metal seal protector. Tighten screw of seal remover until metal seal protector is removed. Repeat procedure to remove seal.
12. Remove Turbine Speed Sensor (TSS) from chain cover. Mark and remove 16 chain cover bolts. Note length and location of bolts. Chain cover is under spring pressure; remove carefully. See **Fig. 11** . Note location of accumulator springs and tag to ensure reassembly to original location. Mark and remove No. 1 (plastic) thrust washer from chain cover. Mark and remove No. 3 (metal) thrust washer from chain cover.

**NOTE: Measure chain stretch at mid-point between sprockets before disassembly. If stretch exceeds 7/8", replace chain.**

13. Simultaneously lift both sprockets out with chain assembly. Remove cast iron sealing ring from input shaft. Mark and remove No. 2 and No. 4 thrust washers from drive and driven sprocket supports. Inspect drive sprocket support bearing to determine if it needs replacing. If bearing is okay, remove 6 Torx (T30) bolts attaching support to case.
14. Using Pin Remover (D81P-3504-N), remove lockpin and 2 roll pins from manual shaft. Be careful not to damage machined surfaces. Slide shaft out and pry seal from case. See **Fig. 12** .



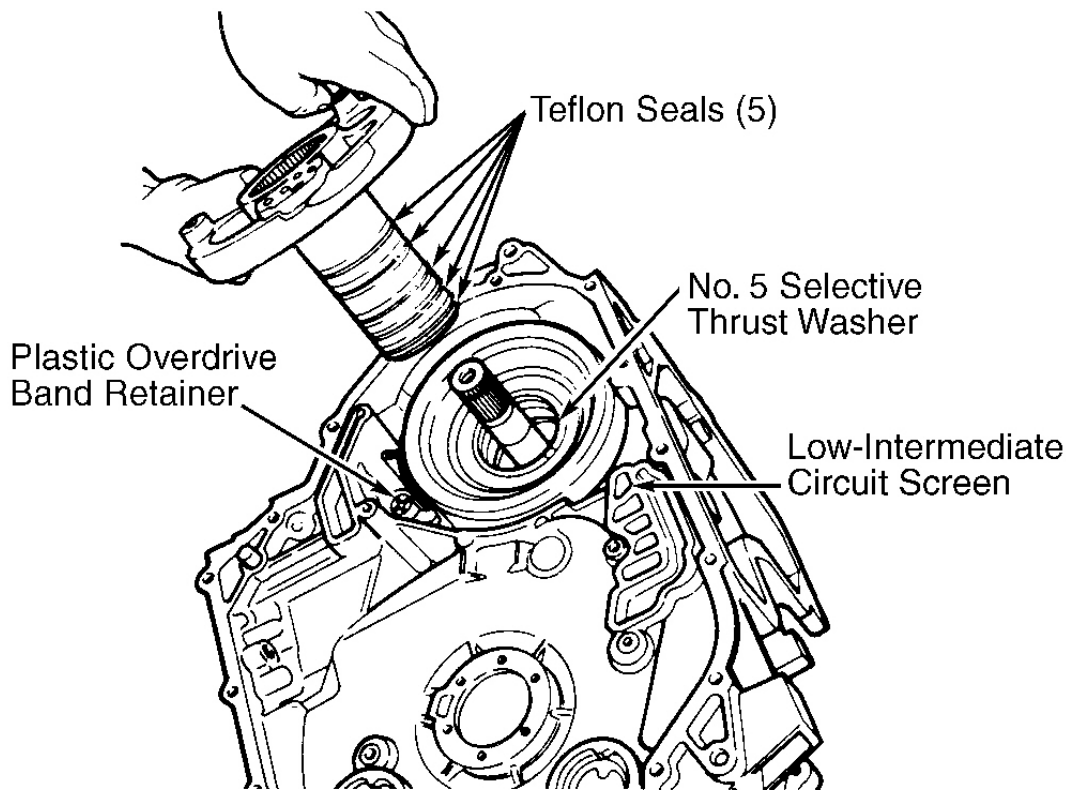
**Fig. 11: Removing Chain Cover**  
 Courtesy of FORD MOTOR CO.



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**Fig. 12: Removing Manual Shaft & Seal**  
 Courtesy of FORD MOTOR CO.

15. Using a straightedge, note whether driven sprocket support machined bolt hole surface is above or below the case machined surface. Note for reassembly reference. Remove driven sprocket support assembly.
16. Remove 5 Teflon seals from support assembly. Mark and remove No. 5 selective thrust washer. Washer may stay on support assembly during removal. Using a wire hook, if necessary, remove No. 8 selective thrust washer and No. 9 needle bearing. Remove plastic overdrive band retainer and overdrive band. See **Fig. 13** . Remove filter screen. Clean filter with compressed air. Replace filter tube lip seal.
17. Position transaxle with oil pan up. Remove 17 oil pan cover bolts. Remove cover and discard gasket. Remove reverse apply tube/oil filter bolt and bracket. Remove oil filter screen and discard lip seal.

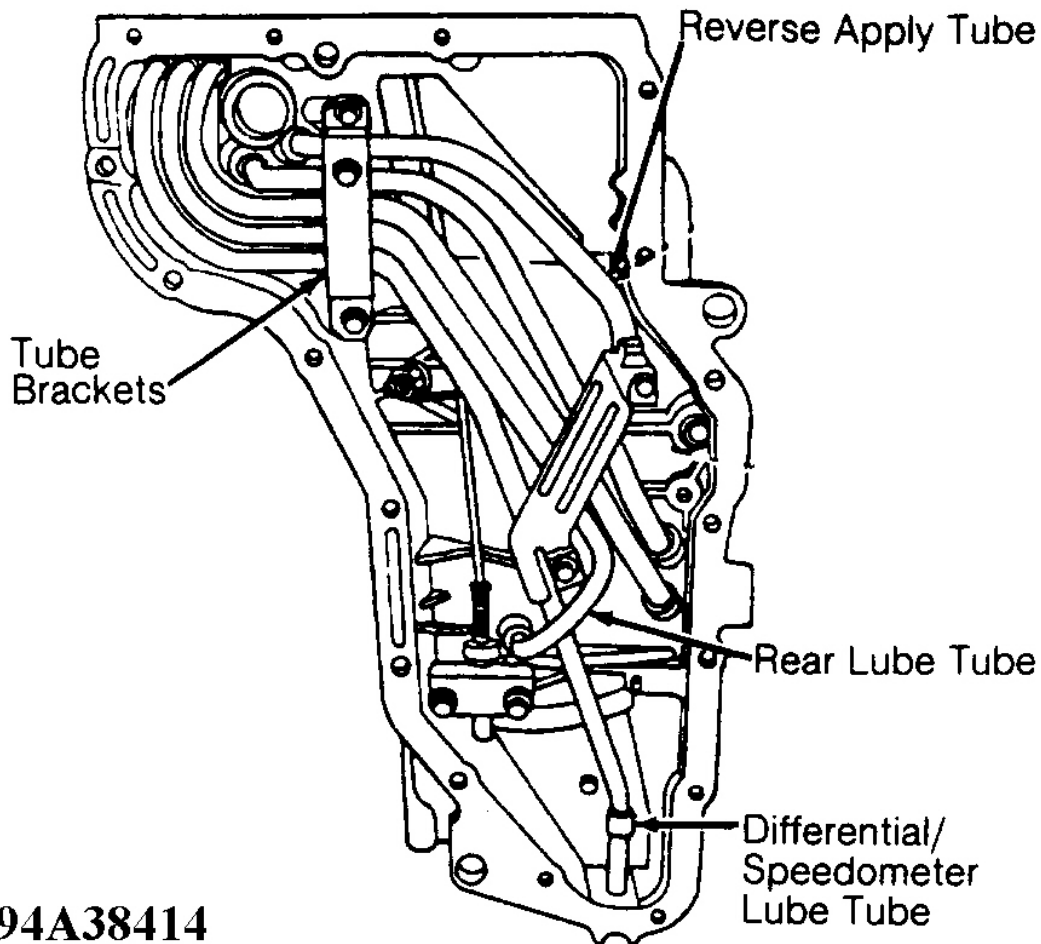


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**Fig. 13: Removing Driven Sprocket Support**  
Courtesy of FORD MOTOR CO.

18. Remove tube retaining bracket bolts and brackets. If necessary, use Tube Remover (T86P-70001-A) and a slide hammer to remove lube tubes. Tubes are retained with Loctite. See **Fig. 14** .





**Fig. 14: Oil Tube Locations**  
Courtesy of FORD MOTOR CO.

**NOTE:** For complete transaxle disassembly, reverse apply tube **MUST** be removed prior to removing the reverse clutch or differential.

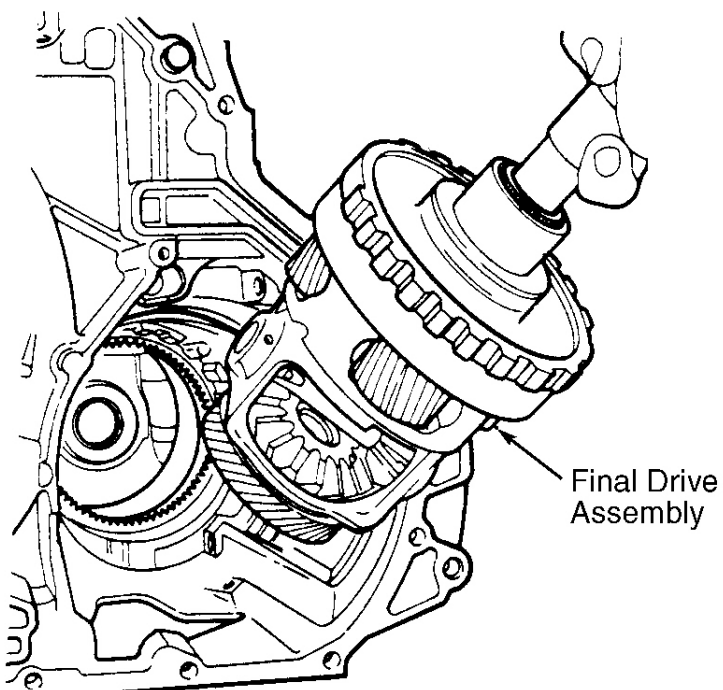
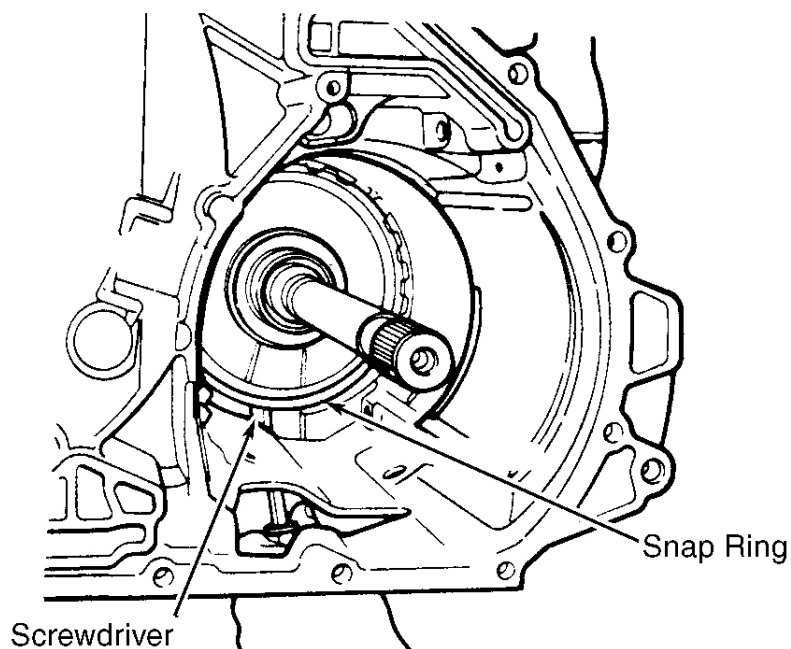
19. Remove 2 parking rod abutment bolts. Remove parking rod by lifting to clear abutment and lower from case. Remove parking pawl shaft roll pin. Use magnet to remove parking pawl shaft. Remove parking pawl and return spring. Loosen 19 mm reverse clutch anchor pin nut and remove 6 mm Allen head bolt.

**NOTE:** It is necessary to modify Front Clutch Loading Tool (T86P-70389-A) for use on 3.2L transaxle. Remove .02" (.5 mm) of material from hook end of tool.

20. Place transaxle in horizontal position. Install Front Clutch Loading Tool (T86P-70389-A). Lift front sun gear and shell assembly out of case. Install hook portion of Front Clutch Loading Tool (T86P-70389-A) on inner diameter of reverse clutch cylinder. Grasp outer diameter with fingertips and slide clutch

assembly out of case.

21. Rotate transaxle to vertical position. Grasp front planetary shaft and lift out both front and rear planetary assemblies. Lift out low-intermediate drum and sun gear assembly. Remove low-intermediate band.
22. Remove final drive assembly snap ring from case using a screwdriver inserted through side of case. Lift out final drive assembly using output shaft. See **Fig. 15** .
23. Remove and discard rear lube tube seal using a 3/8" rod or drift. Remove final drive ring gear from case. Remove No. 18 thrust washer and No. 19 needle bearing. Thrust washer may remain on final drive next to speedometer gear. Tap seal towards inside of case. If case replacement is necessary, remove Torx bolts and converter support from old case at this time.



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**Fig. 15: Removing Final Drive Assembly**  
Courtesy of FORD MOTOR CO.

## COMPONENT DISASSEMBLY & REASSEMBLY

**NOTE:** When reassembling clutch packs, always soak clutch discs in ATF for 15 minutes before assembling.

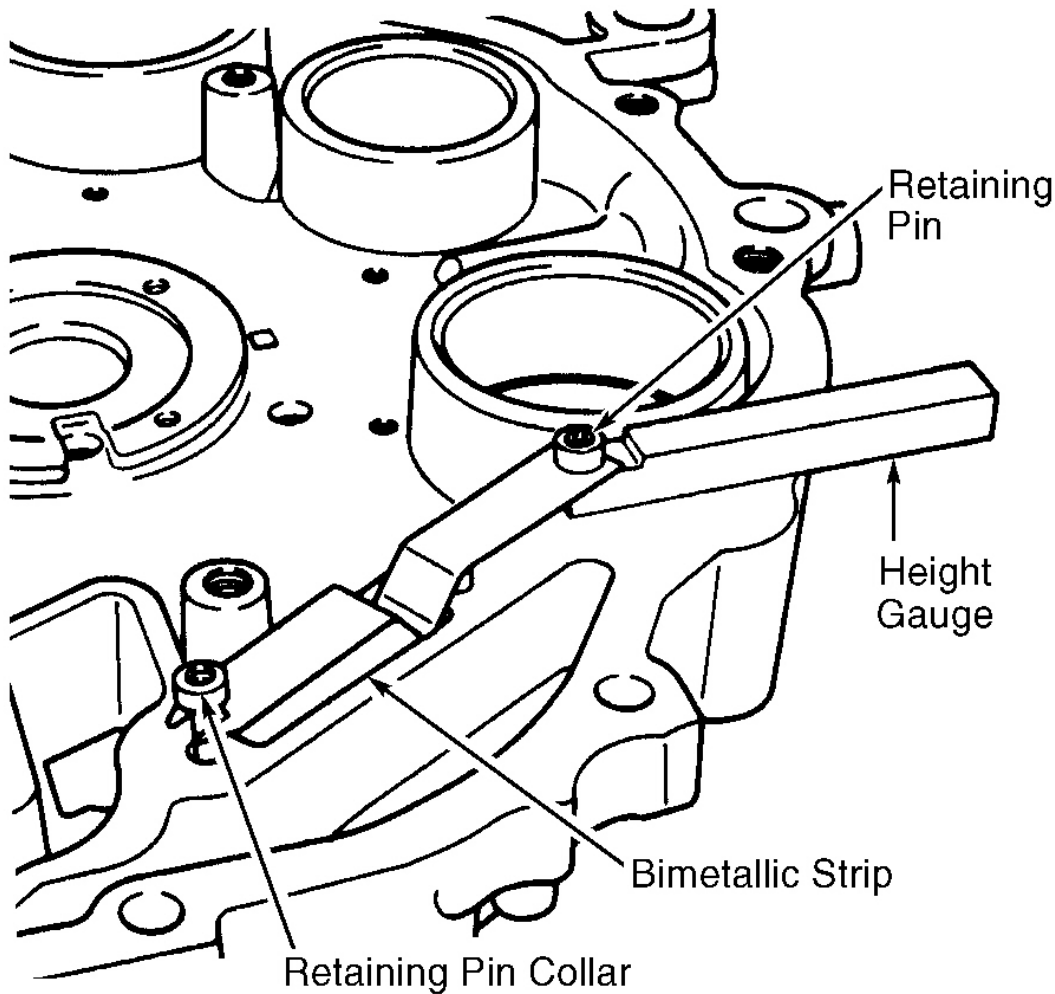
## CHAIN COVER

### Disassembly

1. If replacing wiring or chain cover, break off locating tab on bulkhead connectors and remove connectors from cover. DO NOT pull on wiring or connector. Only remove wiring if cover replacement is necessary. Mark and remove 3 accumulator piston shafts. Using flat-nose pliers, remove 3 accumulator pistons. Use care to avoid damaging piston bores.
2. Using side cutters, carefully remove retaining pin collars. See **Fig. 16** . Remove bimetallic strip and plate. Pull retaining pins from cover. Use care not to damage bimetallic strip or machined case surface.
3. Remove manual valve detent spring bolt and spring. Remove quick-disconnect oil cooler fittings from cover.

### Reassembly

1. Use a sealant on threads and install quick-disconnect fittings. Install manual valve detent spring and position tab in hole. Tighten bolt to 84-108 INCH lbs. (9-12 N.m). Start bimetallic strip retaining pins in cover. Gently tap center pin to bottom of hole. Center pin must not extend from case more than .26" (6.6 mm).
2. Position end of bimetallic strip with hole over front retaining pin. Install retaining collars. Place Height Gauge (T86P-70422-A) against pin between bimetallic strip and case. Gently tap collar onto pin until it seats against bimetallic strip. See **Fig. 16** .
3. Engage slotted end of bimetallic strip under rear retaining pin. Use gauge and gently tap collar onto pin. Remove slotted end of bimetallic strip from pin. Position retaining plate onto rear and middle retaining pins. Place slotted end bimetallic strip under retaining collar.
4. Install new "O" rings and seals on accumulator pistons; lubricate with petroleum jelly. The N-D accumulator piston is fitted with an "O" ring. The 3-4 accumulator and 1-2 accumulator are fitted with square-cut seals. Install accumulator pistons; ensure pistons are inserted straight into bores. Install 3 accumulator piston shafts.
5. Install new "O" ring on electrical connectors. Connectors should "click" when they are installed. Black connector goes into top bore and White connector goes into side.



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**Fig. 16: Setting Bimetallic Strip Height**  
Courtesy of FORD MOTOR CO.

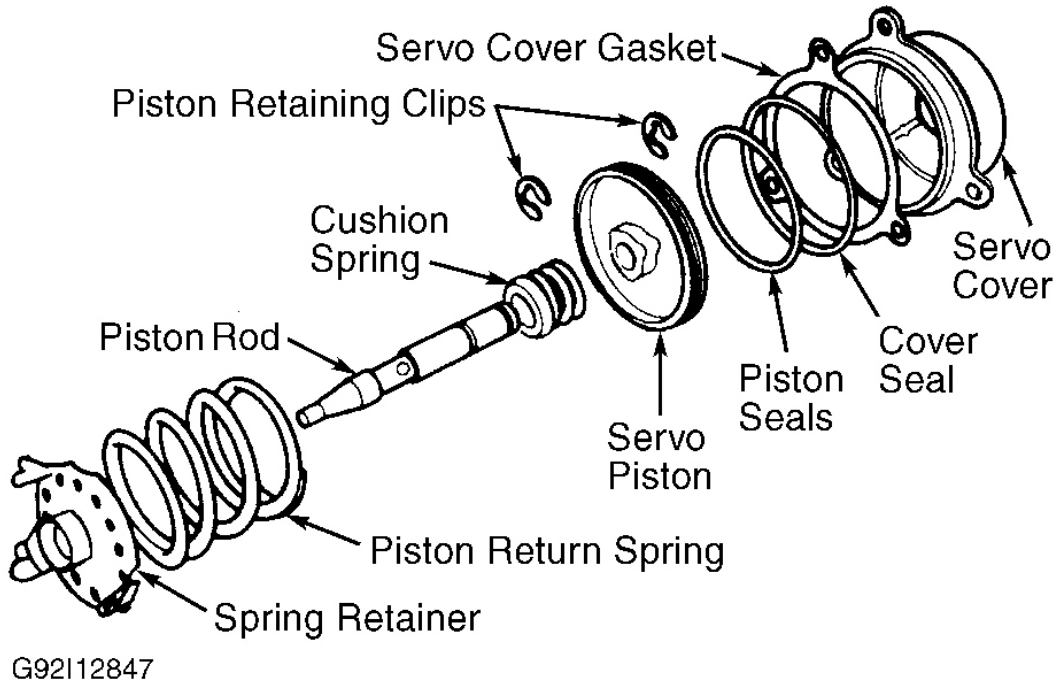
## DIFFERENTIAL & GEAR SET

### Disassembly

1. Remove rear planetary support, needle bearings (No. 15 and 16), and park wheel from output shaft. Ensure bushing lubrication hole is aligned with lube hole in rear planetary support. Replace bushing if necessary.
2. Remove planetary pinion shaft retaining snap ring. Using a magnet, work pinion shafts out of differential case housing. Slide out pinion gears and thrust washers. Inspect needle bearings and pinion shafts. Replace as necessary. Remove speedometer drive gear by gently prying off with screwdriver, if necessary.



petroleum jelly. To reassemble, reverse disassembly procedure.

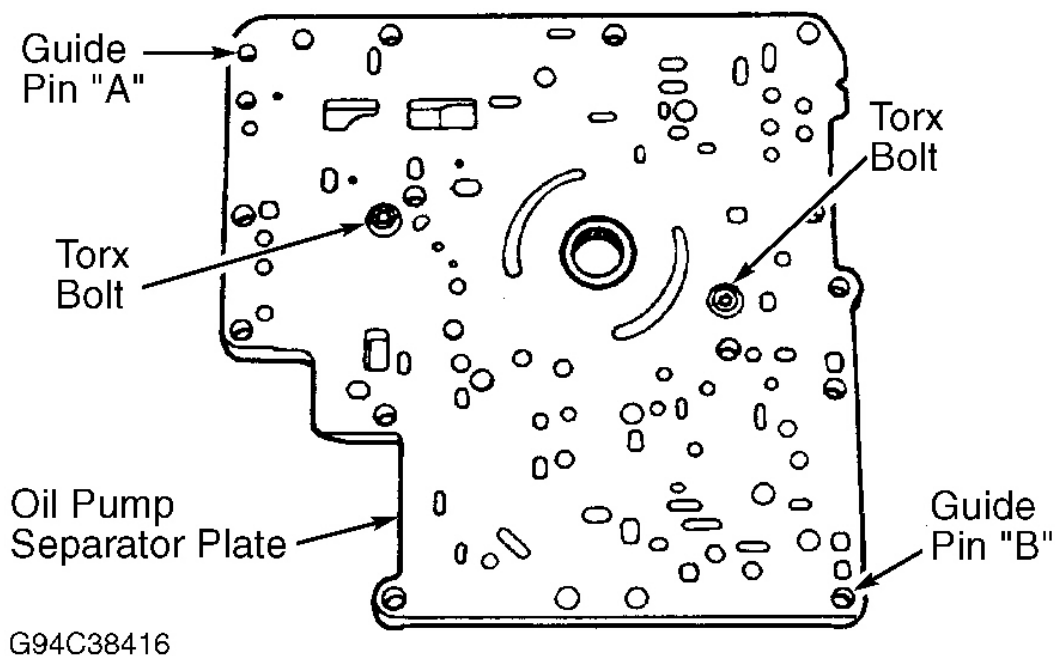


**Fig. 18: Exploded View Of Low-Intermediate Servo**  
Courtesy of FORD MOTOR CO.

## OIL PUMP

### Removal & Installation

1. To separate oil pump housing from valve body, remove Torx bolts retaining oil pump housing to valve body. See **Fig. 19** . Separate valve body from oil pump. Remove and discard gasket. Clean gasket surface thoroughly.
2. Prior to installing oil pump housing to valve body, ensure check balls and relief valves are in correct position in pump housing. Position a new gasket and separator plate on oil pump housing.
3. Insert valve body Guide Pin Set (T86P-70100 "A" and "B") in valve body. See **Fig. 19** . Install 2 Torx bolts retaining separator plate to oil pump housing. Install pump housing on valve body.

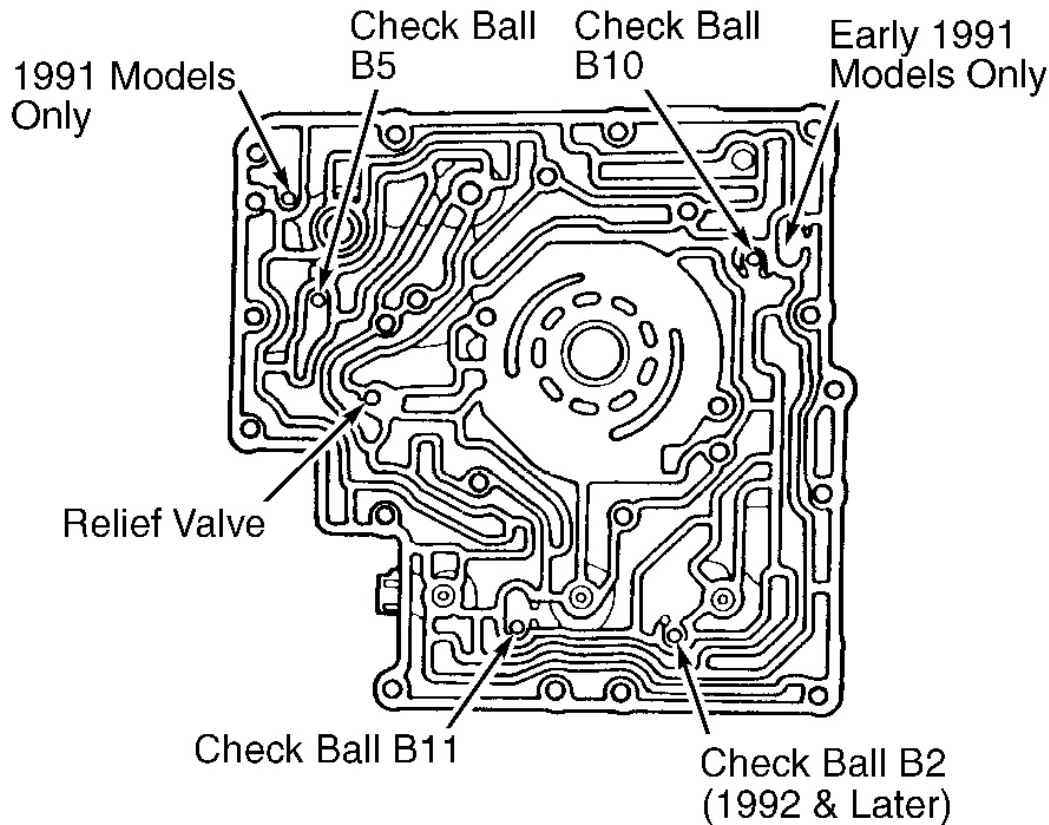


**Fig. 19: Identifying Oil Pump Separator Plate**  
Courtesy of FORD MOTOR CO.

#### Disassembly

1. Remove Torx bolts holding separator plate to oil pump housing. Remove separator plate and gasket. Remove 4 check balls and one relief valve. See **Fig. 20** .





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**Fig. 20: Identifying Oil Pump Check Balls & Relief Valve (Valve Body View)**  
 Courtesy of FORD MOTOR CO.

2. Remove 6 bolts retaining cover to housing and remove. Remove bore spring by prying out of housing using a screwdriver. Place shop rag under screwdriver to prevent damage to housing surface.

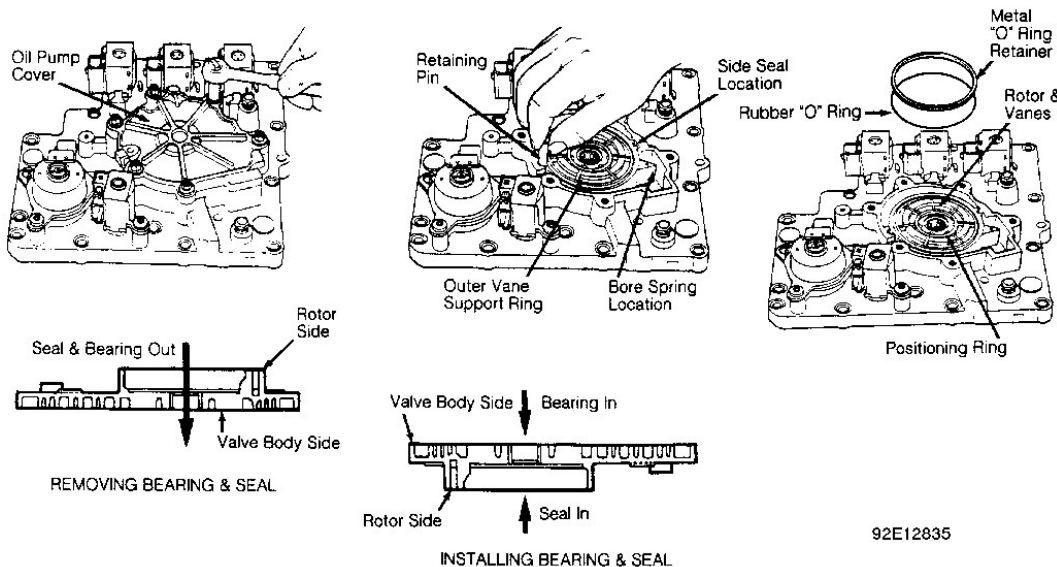
**CAUTION: Use extreme caution when removing bore spring to prevent injury.**

3. Remove outside vane support retaining pin. Remove metal "O" ring retainer and "O" ring from outer vane support. Discard "O" ring.
4. Remove and discard side seal. Remove side seal support, top vane positioning ring and outer vane support. Remove 7 vanes from rotor. Remove inner vane support and bottom vane positioning ring. See **Fig. 21**.
5. Remove bolts retaining EPC and lock-up solenoids. Remove solenoids. Depress tabs and twist shift solenoids counterclockwise to remove. Use a socket on the rotor side of housing to press bearing and seal assembly out of valve body side of pump.

**NOTE:** The only serviceable parts in oil pump are seals. If any other parts are damaged or worn, replace entire assembly.

### Reassembly

1. To reassemble, reverse disassembly procedure. To install bearing and seal, use Output Shaft Seal Installation Tool (T89P-1177-AH). Install bearing from separator plate side of pump body. Bearing must be pressed in flush with pump body. Install seal from rotor side of pump body. See **Fig. 21**.
2. Install bottom vane positioning ring. Install inner vane support with small inside diameter counter bore facing up. Shiny portion of the 7 vane blades is installed toward outer vane support. Install outer vane support. Install top vane positioning ring. Install new side seal between outer vane support and housing. Install outer vane support retaining pin.
3. Install bore spring. Install "O" ring and metal retainer in outer vane support. Install oil pump cover while aligning pump gears with drive shaft. Install oil pump cover and tighten 6 retaining bolts to 84-108 INCH lbs. (9-12 N.m).
4. Install check balls and relief valve. Install separator plate and new gasket. Use valve body Guide Pins (T86P-70100-A or B) to align separator plate and pump housing. Install Torx bolts and tighten to 84-108 INCH lbs. (9-12 N.m). Remove guide pins.



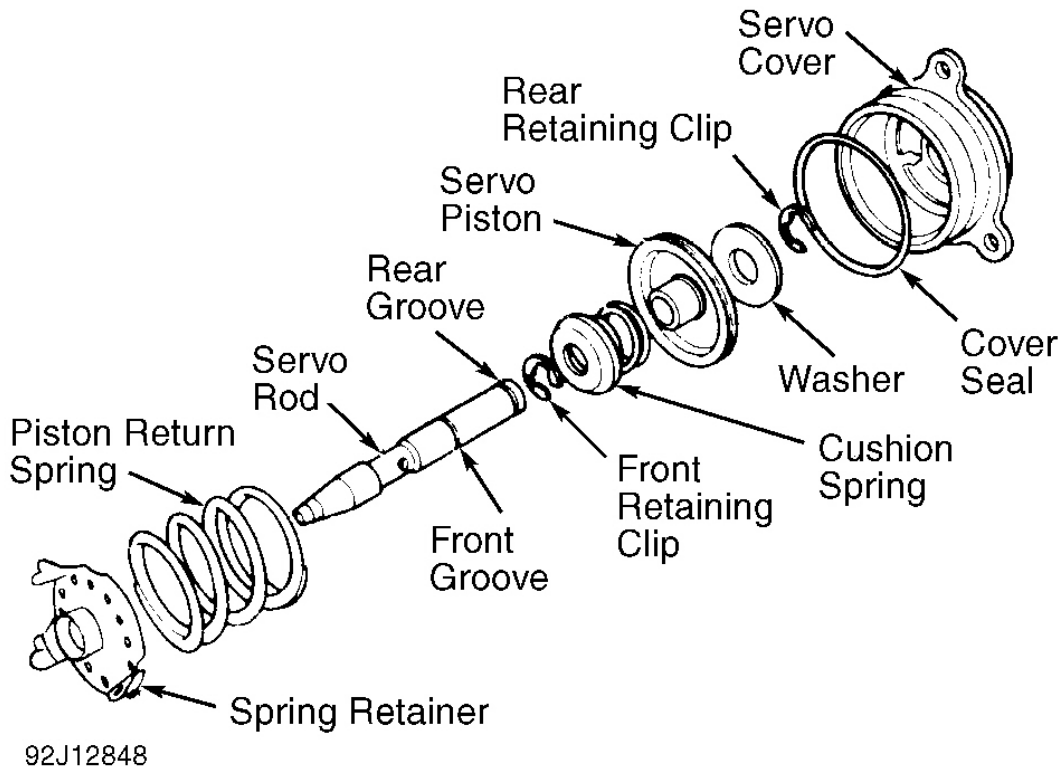
**Fig. 21: Identifying Oil Pump Components**  
Courtesy of FORD MOTOR CO.

### OVERDRIVE SERVO

#### Disassembly & Reassembly

Remove 3 cover bolts, cover, return spring and rod. See **Fig. 22**. Remove piston from cover. Place piston

assembly in a soft-jawed vise. Remove rear piston rod retaining clip and washer. Remove piston, seal and cushion spring. Piston and seal are an assembly and piston must be replaced if seal is damaged. Remove front rod clip, if necessary. Lubricate seals with petroleum jelly. To reassemble, reverse disassembly procedure. Ensure springs are correctly positioned in case.



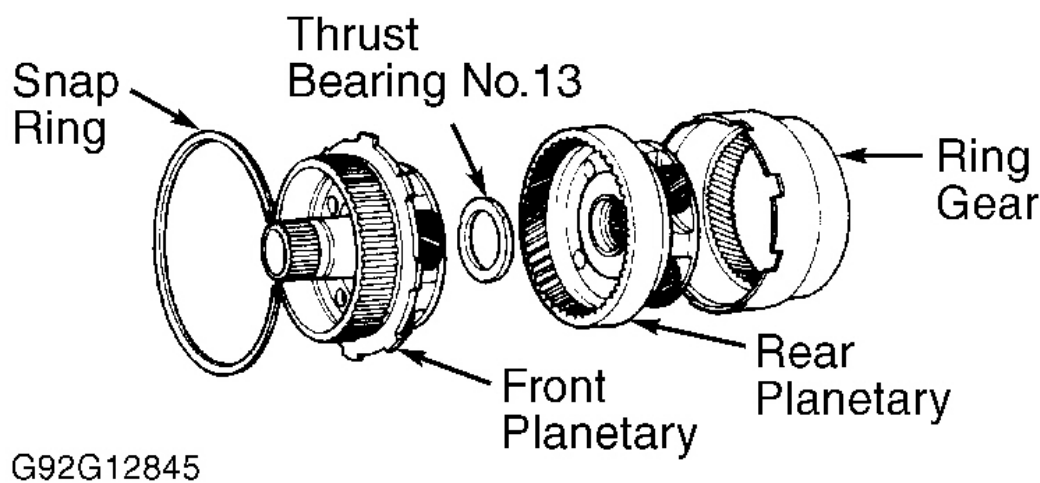
**Fig. 22: Exploded View Of Overdrive Servo**  
Courtesy of FORD MOTOR CO.

## PLANETARY ASSEMBLY

**NOTE:** Except for differential components, individual components of the planetary carrier are not serviceable.

### Disassembly & Reassembly

Remove snap ring. Remove front planetary and No. 13 needle bearing from rear planetary. Remove rear planetary from shell and ring gear assembly. To reassemble, reverse disassembly procedure. See **Fig. 23**.



**Fig. 23: Identifying Planetary Assembly Components**  
 Courtesy of FORD MOTOR CO.

## **SHELL ASSEMBLY (FORWARD, DIRECT & INTERMEDIATE CLUTCHES)**

### **Disassembly**

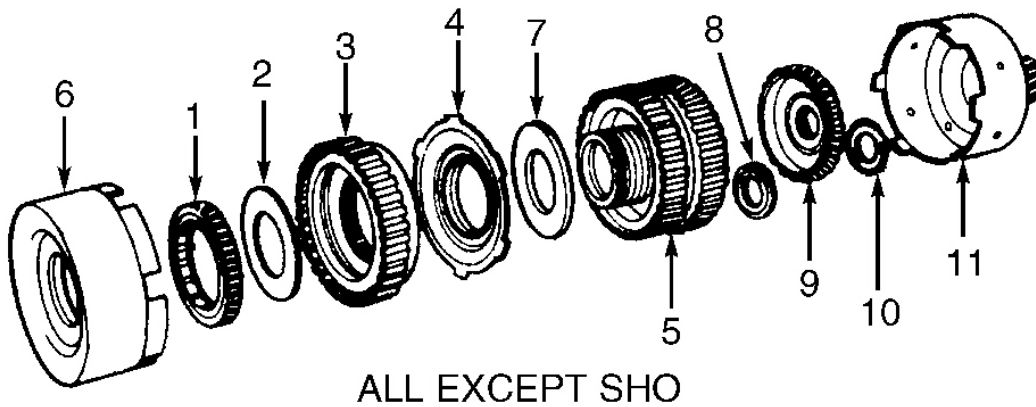
1. Set assembly on overdrive drum and remove sun gear and shell assembly. Remove No. 11 needle bearing, intermediate clutch hub and No. 10 needle bearing. See **Fig. 24** or **Fig. 25**.
2. Turn assembly onto intermediate cylinder hub and remove overdrive drum and one-way clutch assembly. Remove No. 6 thrust washer. Remove forward clutch assembly by prying up on each side with 2 screwdrivers.
3. Direct clutch hub "O" rings retain forward clutch on hub. Pry evenly and do not locate screwdriver ends on or near forward clutch check ball. Remove direct one-way clutch and No. 7 thrust washer. Remove direct one-way clutch outer race and one-way clutch.

### **Reassembly**

1. Ensure all clutch assemblies have been checked and overhauled as necessary before reassembling shell assembly. Position shell with intermediate clutch facing down. Ensure No. 7 thrust washer tabs are aligned with slots in direct clutch.
2. Install one-way clutch on direct clutch, with clutch lip facing down and lip on outer race facing up. Outer race should turn clockwise and lock counterclockwise when direct clutch is facing up. Install one-way clutch and align onto clutch pack splines. Install "O" rings on hub.
3. Install forward clutch assembly, being careful not to damage "O" rings. Install No. 6 thrust washer on forward clutch assembly. Ensure one-way clutch is positioned in overdrive drum. One-way clutch should turn counterclockwise. Position overdrive drum over forward clutch. See **Fig. 26**.
4. Turn assembly over and set on overdrive drum. Install No. 10 needle bearing onto intermediate clutch

hub. Use petroleum jelly to hold bearing in position.

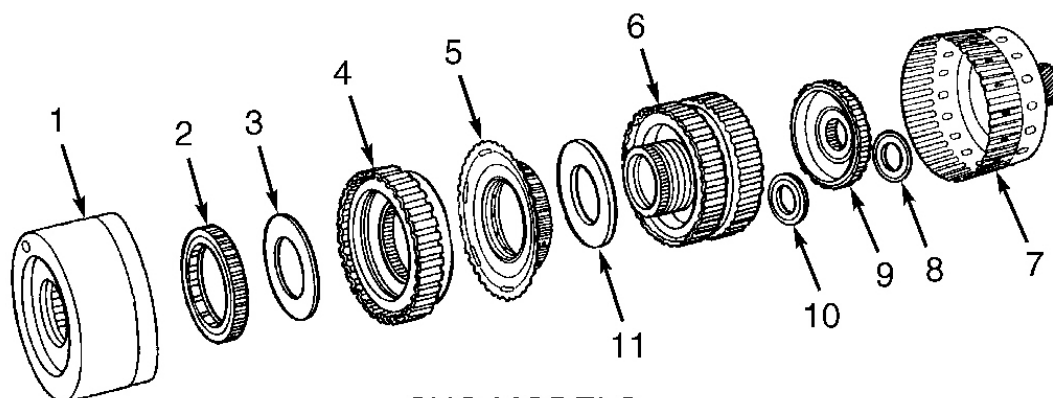
5. Install intermediate clutch hub into forward clutch. Install No. 11 needle bearing on intermediate clutch hub with outer lip facing down. Install sun gear and shell assembly over forward clutch. Ensure tabs of sun gear shell and overdrive drum align.



- |                                    |                            |
|------------------------------------|----------------------------|
| 1. Low One-Way Clutch              | 7. No. 7 Thrust Washer     |
| 2. No. 6 Thrust Washer             | 8. No. 10 Needle Bearing   |
| 3. Forward Clutch                  | 9. Intermediate Clutch Hub |
| 4. Direct One-Way Clutch           | 10. No. 11 Needle Bearing  |
| 5. Direct & Intermediate Clutch    | 11. Sun Gear & Shell       |
| 6. Overdrive Drum & One-Way Clutch |                            |

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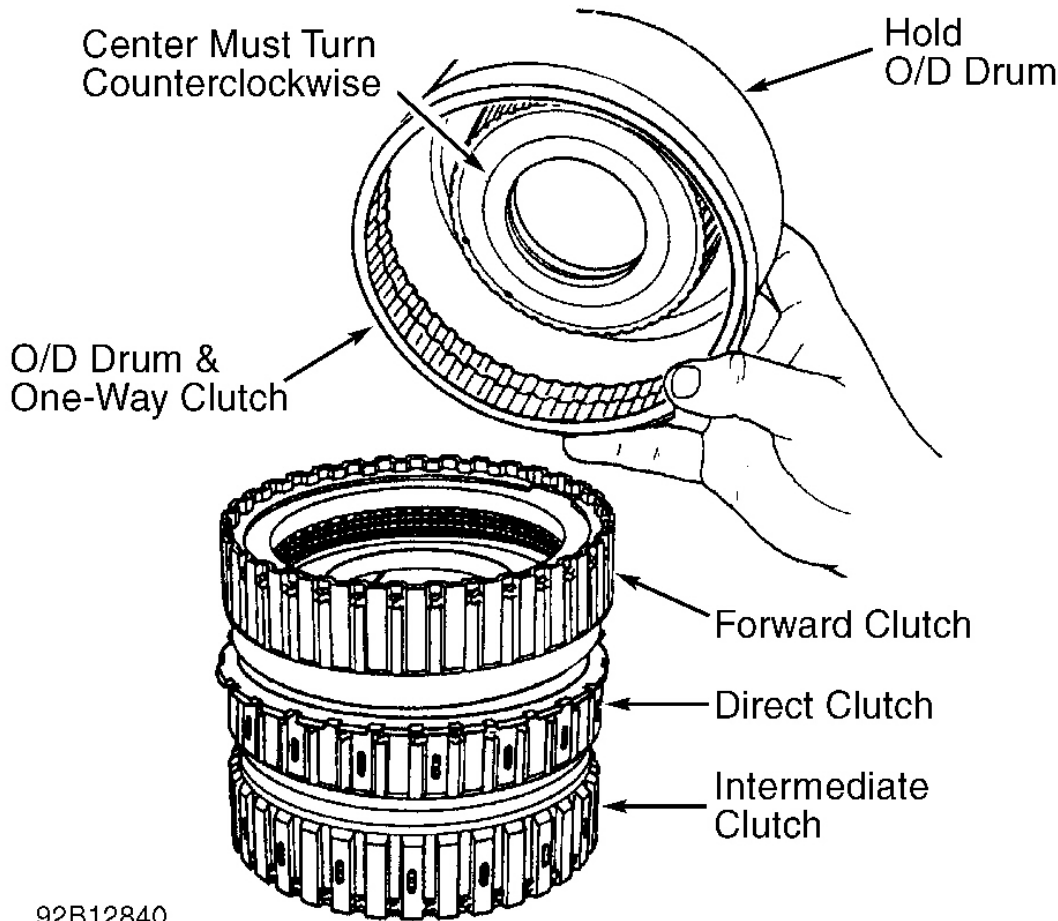
**Fig. 24: Exploded View Of Shell Assembly (Except SHO)**  
 Courtesy of FORD MOTOR CO.

**SHO MODELS**

- |                               |                            |
|-------------------------------|----------------------------|
| 1. Overdrive Drum             | 7. Front Sun Shell         |
| 2. One-Way Clutch Race        | 8. No. 11 Needle Bearing   |
| 3. Thrust Washer No. 6        | 9. Intermediate Clutch Hub |
| 4. Forward Clutch             | 10. No. 10 Thrust Bearing  |
| 5. One-Way Clutch             | 11. Thrust Washer No. 7    |
| 6. Direct/Intermediate Clutch |                            |

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**Fig. 25: Exploded View Of Shell Assembly (SHO)****Courtesy of FORD MOTOR CO.**



**Fig. 26: One-Way Clutch Rotation**  
 Courtesy of FORD MOTOR CO.

## DIRECT CLUTCH

### Disassembly

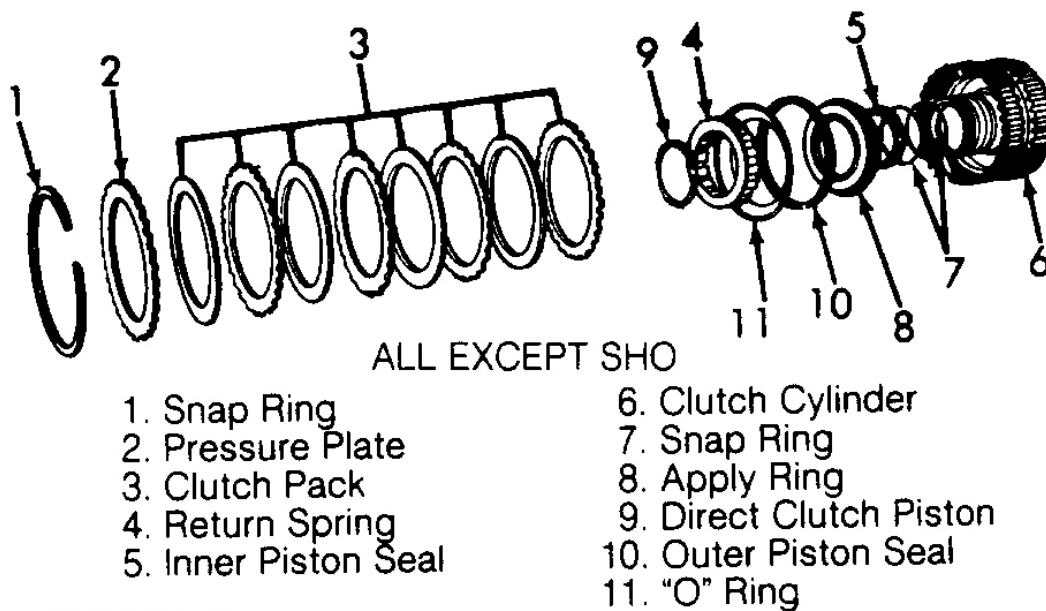
1. Remove "O" ring seals. Remove snap ring, pressure plate and clutch pack. If bushing replacement is necessary, remove direct-intermediate clutch bushing using slide hammer and Sprocket Bearing Remover (T86P-70043-A). See [Fig. 27](#) or [Fig. 28](#).
2. Remove snap ring and return spring using appropriate spring compressor. Remove and disassemble 2-piece piston assembly. Remove inner and outer piston seals.

### Reassembly

1. Install inner and outer piston seals. Ensure seal lip faces bottom of cylinder. Using Seal Lip Protector (T86P-70234-A), install piston into hub. Ensure check ball moves freely. Install piston apply ring and

return spring in cylinder. See **Fig. 27** or **Fig. 28**.

2. Align notch in return spring assembly with check ball. Use spring compressor and install snap ring. Install clutch pack, pressure plate and snap ring into cylinder. Install direct clutch bushing, if necessary.
3. Using dial indicator, check clutch pack clearance. Push down firmly on clutch pack with about 30 lbs. of force. Release pressure and zero dial indicator. Lift pressure plate to bottom of snap ring and note dial indicator reading. Take 2 readings 180 degrees apart and note average. Clearance should be .031-.051" (.78-1.29 mm).
4. If clearance is not within specification, replace selective snap ring. Snap rings are available in the following thicknesses; .049-.053" (1.24-1.34), .065-.069" (1.65-1.75), .082-.086" (2.08-2.18), .98-.102" (2.50-2.60) and .115-.119" (2.92-3.02). Recheck clearance with new snap ring installed and adjust as necessary.

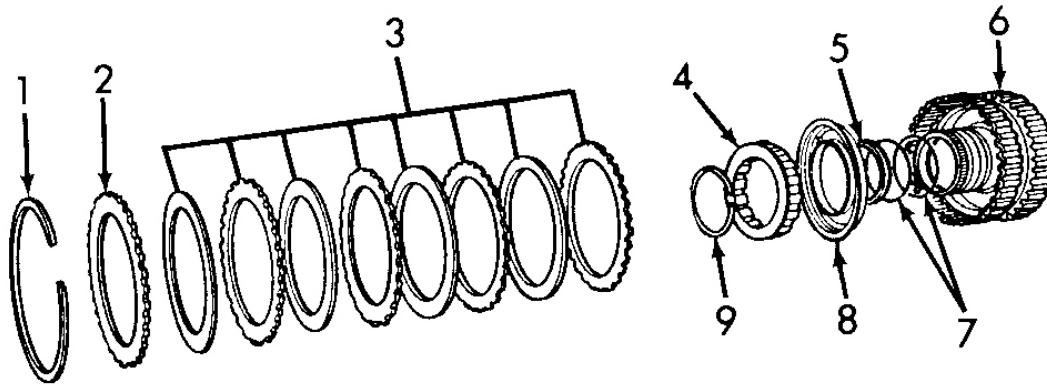


**92D12842**

**Fig. 27: Exploded View Of Direct Clutch Assembly (Except SHO)**

Courtesy of FORD MOTOR CO.





1. Snap Ring
2. Pressure Plate
3. Clutch Pack
4. Return Spring
5. Inner Piston Seal

6. Clutch Cylinder
7. Snap Ring
8. Apply Ring
9. Direct Clutch Piston

94C38424

**Fig. 28: Exploded View Of Direct Clutch Assembly (SHO)**

Courtesy of FORD MOTOR CO.

**FORWARD CLUTCH**

**NOTE:** The number of plates and discs in the forward clutch and direct clutch assembly may vary with application.

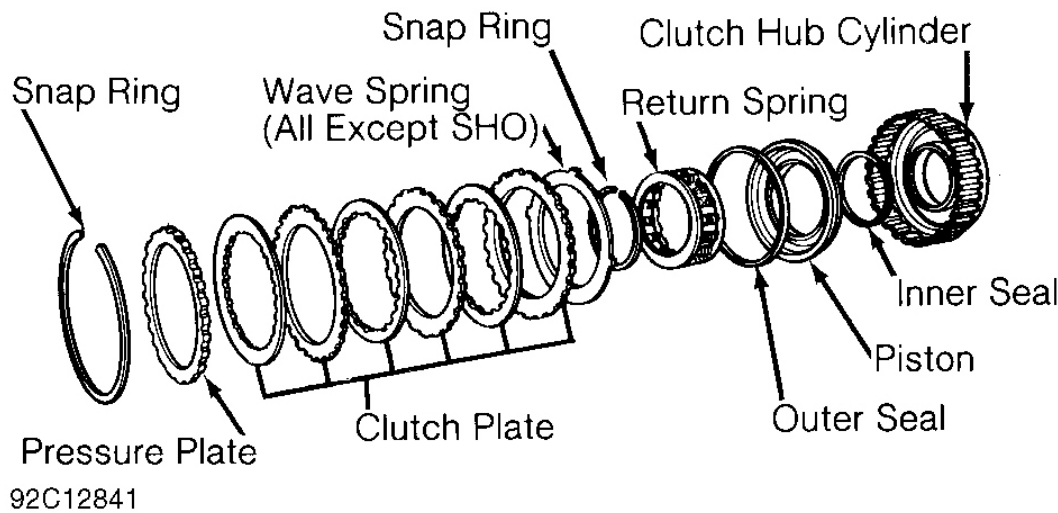
**Disassembly**

Remove snap ring, pressure plate, clutch pack and wave spring. See **Fig. 29** . Using appropriate spring compressor to compress return spring, remove snap ring and return spring. Remove piston assembly from hub. Remove inner and outer piston seals.

**Reassembly**

1. Install inner and outer piston seals. Ensure seal lips face bottom of cylinder. Using Seal Lip Protector (T86P-70548-A), install piston assembly. Using compressor, install return spring and snap ring. Install wave spring, clutch pack, pressure plate and snap ring. See **Fig. 29** .
2. Check clutch pack clearance using a dial indicator. Push down firmly on clutch pack with about 30 lbs. of force. Release pressure and zero dial indicator. Lift pressure plate to bottom of snap ring and note dial indicator reading. Take 2 readings 180 degrees apart and note average. Clearance should be .054-.072" (1.37-1.82 mm).
3. If clearance is not within specification, replace selective snap ring. Snap rings are available in the

following thicknesses; .049-.053" (1.24-1.34), .063-.067" (1.60-1.70), .077-.081" (1.95-2.05), .091-.094" (2.31-2.38) and .104-.108" (2.65-2.75). Recheck clearance with new snap ring installed and adjust as necessary.



**Fig. 29: Exploded View of Forward Clutch Assembly**  
Courtesy of FORD MOTOR CO.

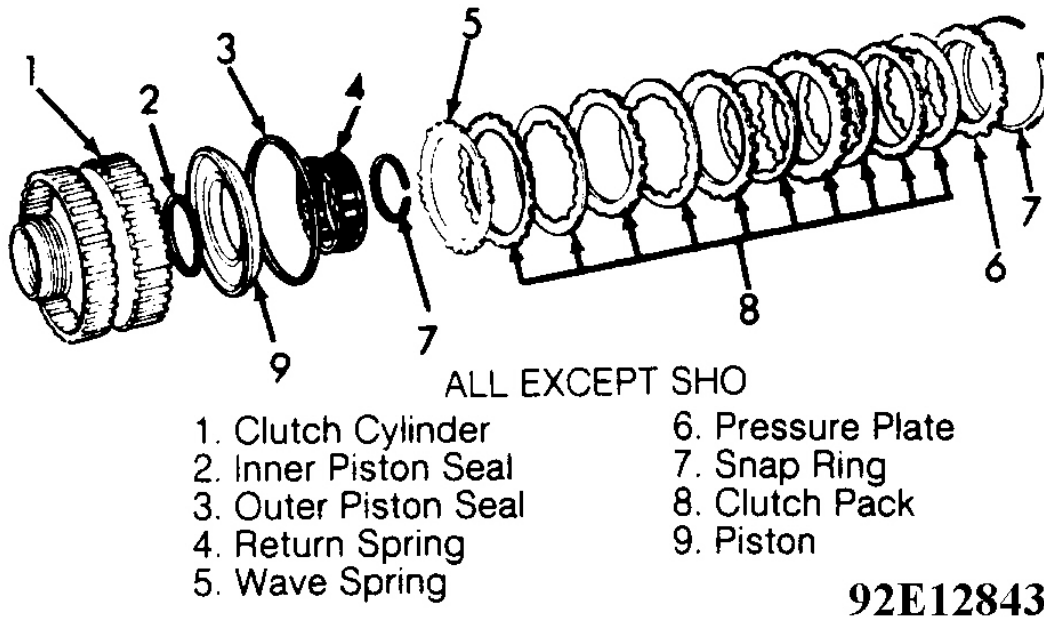
## INTERMEDIATE CLUTCH

### Disassembly

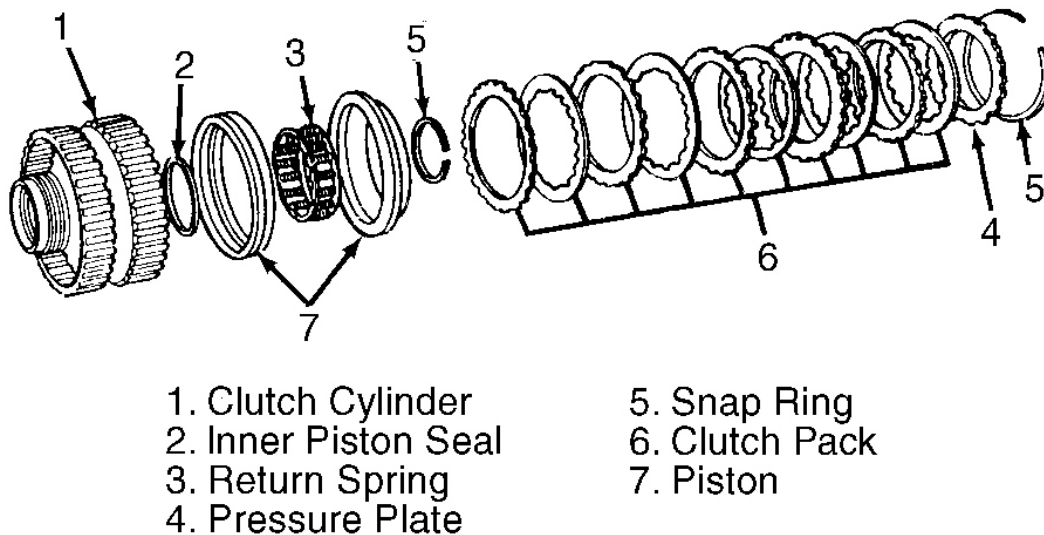
Remove snap ring, pressure plate and clutch pack assembly. Using appropriate spring compressor, remove snap ring and return spring. Remove piston assembly and inner and outer seals. See **Fig. 30** or **Fig. 31**.

### Reassembly

1. Ensure check ball moves freely. Using Seal Lip Protector (T86P-70548-A), install inner and outer seals (lip facing bottom of cylinder). Install piston.
2. Using spring compressor, install return spring and snap ring. Install clutch pack, pressure plate and snap ring. See **Fig. 30** or **Fig. 31**. Ensure step on pressure plate snap ring.
3. Check clutch pack clearance using a dial indicator. Push down firmly on clutch pack with about 30 lbs. of force. Release pressure and zero dial indicator. Lift pressure plate to bottom of snap ring and note dial indicator reading. Take 2 readings 180 degrees apart and note average. Clearance should be .040-.059" (1.02-1.50 mm). If clearance is not within specifications, replace selective snap ring. Snap rings are available in the following thicknesses; .047-.051" (1.20-1.30), .066-.070" (1.67-1.77), .084-.088" (2.14-2.24), .103-.107" (2.61-2.71) and .120-.124" (3.04-3.14). Recheck clearance with new snap ring installed and adjust as necessary.



**Fig. 30: Exploded View Of Intermediate Clutch Assembly (Except SHO)**  
Courtesy of FORD MOTOR CO.



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**Fig. 31: Exploded View Of Intermediate Clutch Assembly (SHO)**

Courtesy of FORD MOTOR CO.

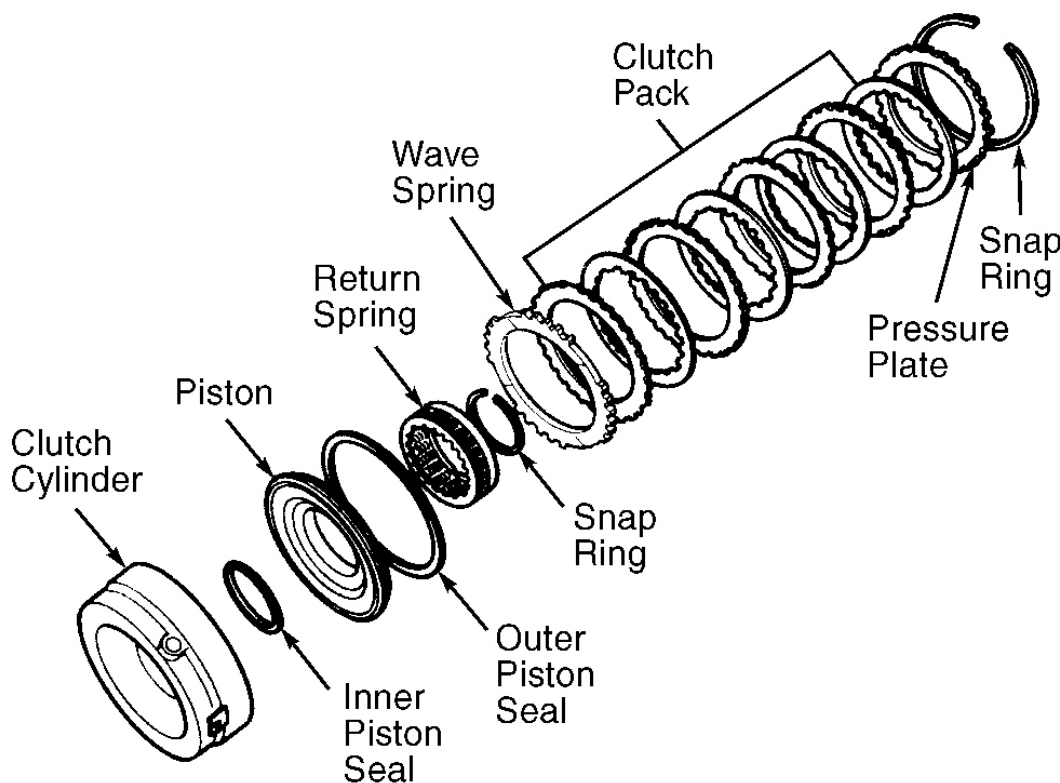
## REVERSE CLUTCH

### Disassembly

Remove snap ring, pressure plate, clutch pack and wave spring from clutch cylinder. Remove inner snap ring and return spring using appropriate spring compressor. Lift out piston and remove inner and outer seals. See **Fig. 32**.

### Reassembly

1. Install inner and outer piston seals (seal lip faces down) and install piston using Seal Protector (T86P-70403-A). Using spring compressor, install snap ring and return spring. Install wave spring, clutch pack, pressure plate and snap ring. See **Fig. 32**.
2. Check clutch pack clearance using a dial indicator. Push down firmly on clutch pack with about 30 lbs. of force. Release pressure and zero dial indicator. Lift pressure plate to bottom of snap ring and note dial indicator reading. Take 2 readings 180 degrees apart and note average. Clutch clearance should be .038-.064" (.97-1.63 mm). Snap rings are available in the following thicknesses; .059-.064" (1.52-1.62 mm), .078-.081" (1.98-2.08 mm), .096-.100" (2.45-2.55 mm) and .115-.119" (2.92-3.02 mm)



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**Fig. 32: Exploded View Of Reverse Clutch Assembly**  
Courtesy of FORD MOTOR CO.

## VALVE BODY

### Disassembly

1. Place valve body on bench with separator plate up. Remove 2 Torx bolts retaining separator plate and valve body. Remove separator plate and gasket.
2. Remove 6 check balls, 2 relief valves and 2 filter screens. Clean solenoid filters. See **Fig. 34** .

**CAUTION: As most valves are aluminum, remove by tapping valve body on palm of hand to slide valves from bores. If a hook or pick is used to remove valve, ensure valve or valve bore is not damaged.**

3. Disassemble valves and springs by removing retaining clips and bore plugs for each valve. See **Fig. 33** . Retain valve and related components for each bore, for reassembly reference.

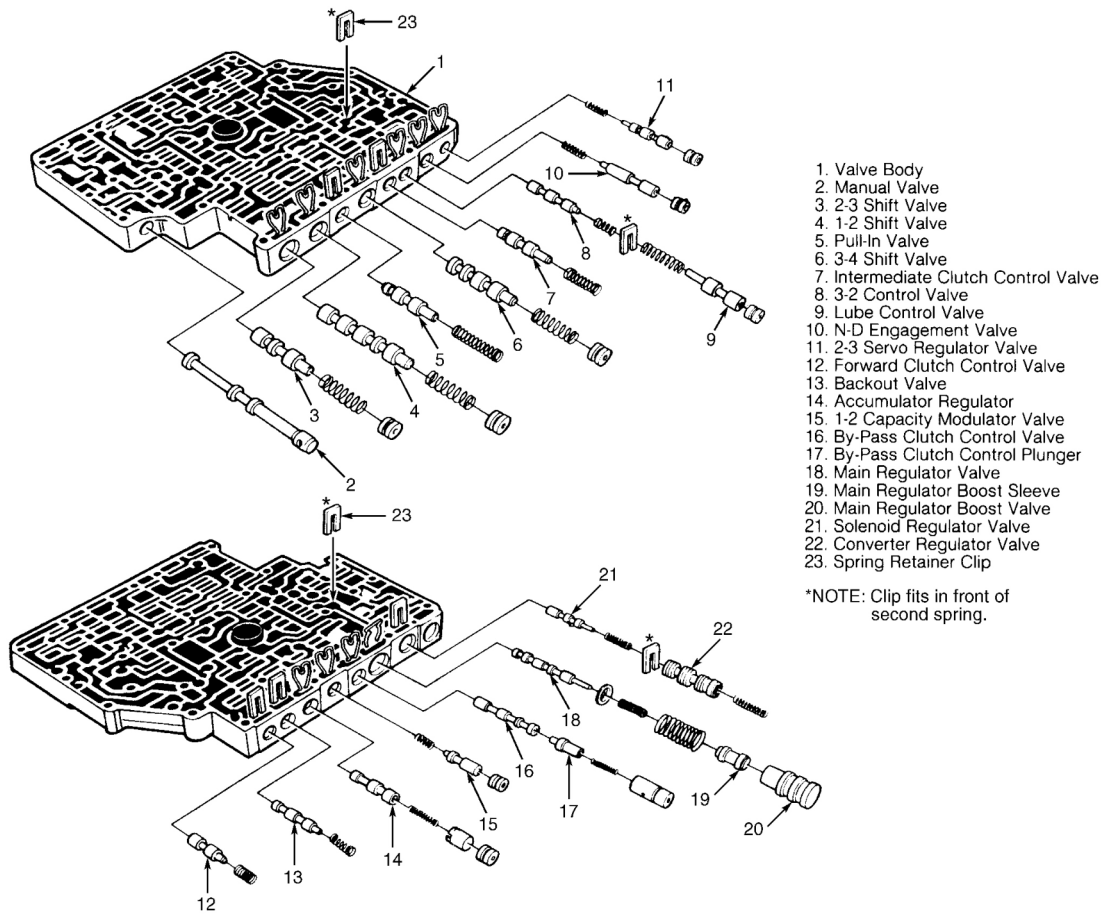
### Inspection

Inspect all valves, plugs and bores for scores or burrs. Valves and plugs, when dry, must fall from their respective bores by their own weight. Roll manual valve on a flat surface to check for bends. Inspect all springs for any defect and replace as necessary.

**NOTE: Polish valves and plugs with crocus cloth if necessary. Avoid rounding sharp edges. Always use NEW retaining clips.**

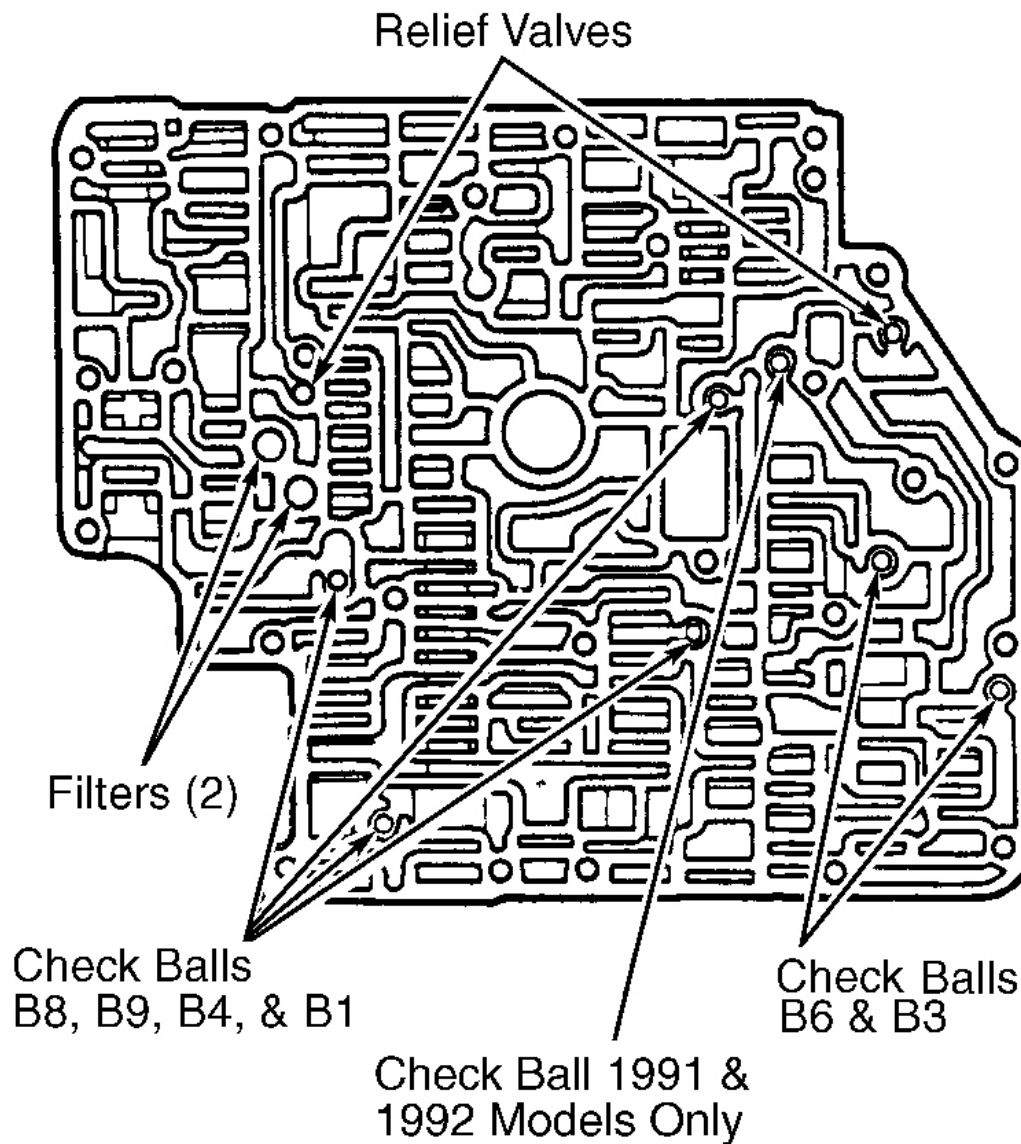
### Reassembly

To reassemble, reverse disassembly procedure. Install 6 check balls, 2 relief valves and 2 filters. Use a new valve body gasket. Use guide pins to align separator plate with valve body. Install Torx bolts and tighten to 84-108 INCH lbs. (9-12 N.m).



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**Fig. 33: Exploded View of Valve Body Components**  
 Courtesy of FORD MOTOR CO.



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**Fig. 34: Valve Body Check Balls & Relief Valves**  
Courtesy of FORD MOTOR CO.

## TRANSAXLE CASE

### Inspection

Inspect case for cracks and stripped threads. Inspect gasket surfaces and mating surfaces for burrs. Check vent for obstructions, and check all fluid passages for obstructions and leakage. Inspect case bushing for scores.

Check all parking linkage parts for wear or damage.

## TRANSAXLE REASSEMBLY

**NOTE:** Handle all parts carefully to avoid damaging bearings and mating surfaces. Lubricate all parts with clean ATF. Use petroleum jelly on gaskets, thrust washers and needle bearings to retain them in place. Use all new gaskets and seals, and tighten bolts evenly.

**NOTE:** For identification and position of thrust bearings and washers, see [Fig. 43](#).

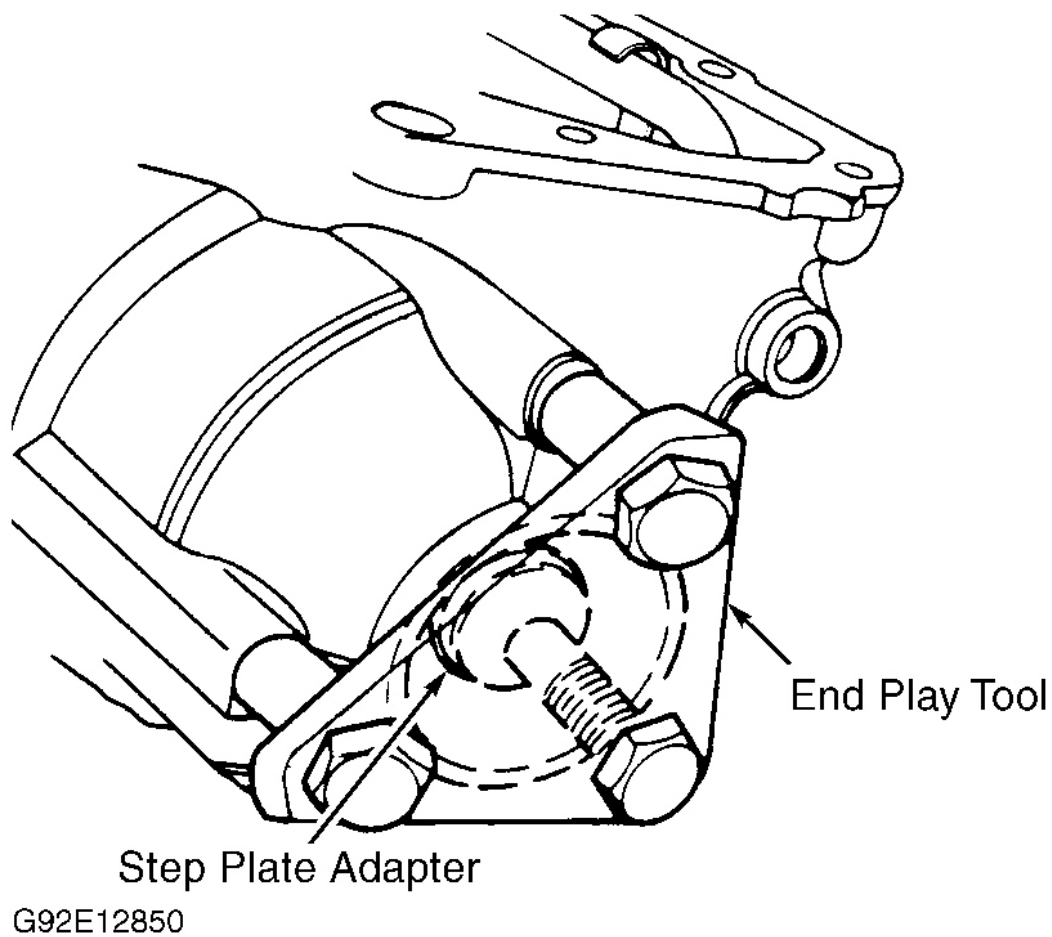
1. Place case in horizontal position. Install drive sprocket support bearing, if necessary. Install drive sprocket support. Drive sprocket support bolt holes are offset. Sprocket support can only be aligned one way. Install and tighten 6 Torx (T-30) bolts to specification. See TORQUE SPECIFICATIONS.
2. Install converter oil seal using appropriate seal driver. Install right-hand output shaft seal using seal driver. After installation, ensure garter springs are present on seals.
3. Install AXOD End Play Tool (T87P-70014-AH) and Step Plate Adapter (D80L-630-3) over right-hand output shaft opening. See [Fig. 35](#). This tool will be used to select thrust washers.
4. Position transaxle case in vertical position. Install No. 19 needle bearing over case boss with flat side facing up and outer lip facing down. Install final drive ring with external splines up. Lightly tap ring gear to fully seat in case splines.
5. Install speedometer drive gear, differential assembly, final drive sun gear, parking gear, No. 16 needle bearing, rear planet support, No. 15 needle bearing and No. 18 thrust washer. See [Fig. 36](#).
6. Lower final drive assembly into case. Install snap ring and align end of snap ring with low-intermediate band anchor pin. Check end clearance at output shaft to select No. 18 thrust washer. Mount a dial indicator to end of output shaft. Back out screw on tool installed in step 3), until it no longer touches shaft. Zero dial indicator. Tighten screw to 35-44 INCH lbs. (4-5 N.m). Observe dial indicator. End clearance should be .004-.025" (.10-.63 mm). See [Fig. 37](#).
7. If not within specification, replace No. 18 selective thrust washer. See NO. 18 THRUST WASHER SELECTION table.

### NO. 18 THRUST WASHER SELECTION

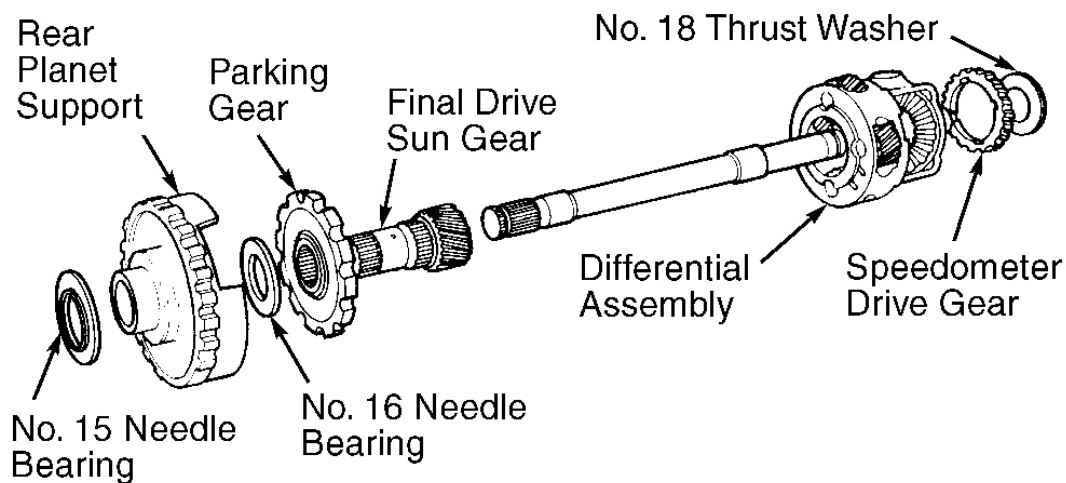
Thickness/In. (mm)	Color Code
.048-.052 (1.20-1.28)	Red
.052-.054 (1.30-1.38)	Green
.056-.058 (1.40-1.48)	Blue
.060-.062 (1.50-1.58)	Black
.064-.066 (1.60-1.68)	White
.068-.070 (1.70-1.78)	Brown
.072-.074 (1.80-1.88)	Gold

8. After installing correct thrust washer, recheck clearance. If end clearance is within specifications, back off screw on tool and leave in position for No. 5 and No. 8 selective thrust washer clearance check.



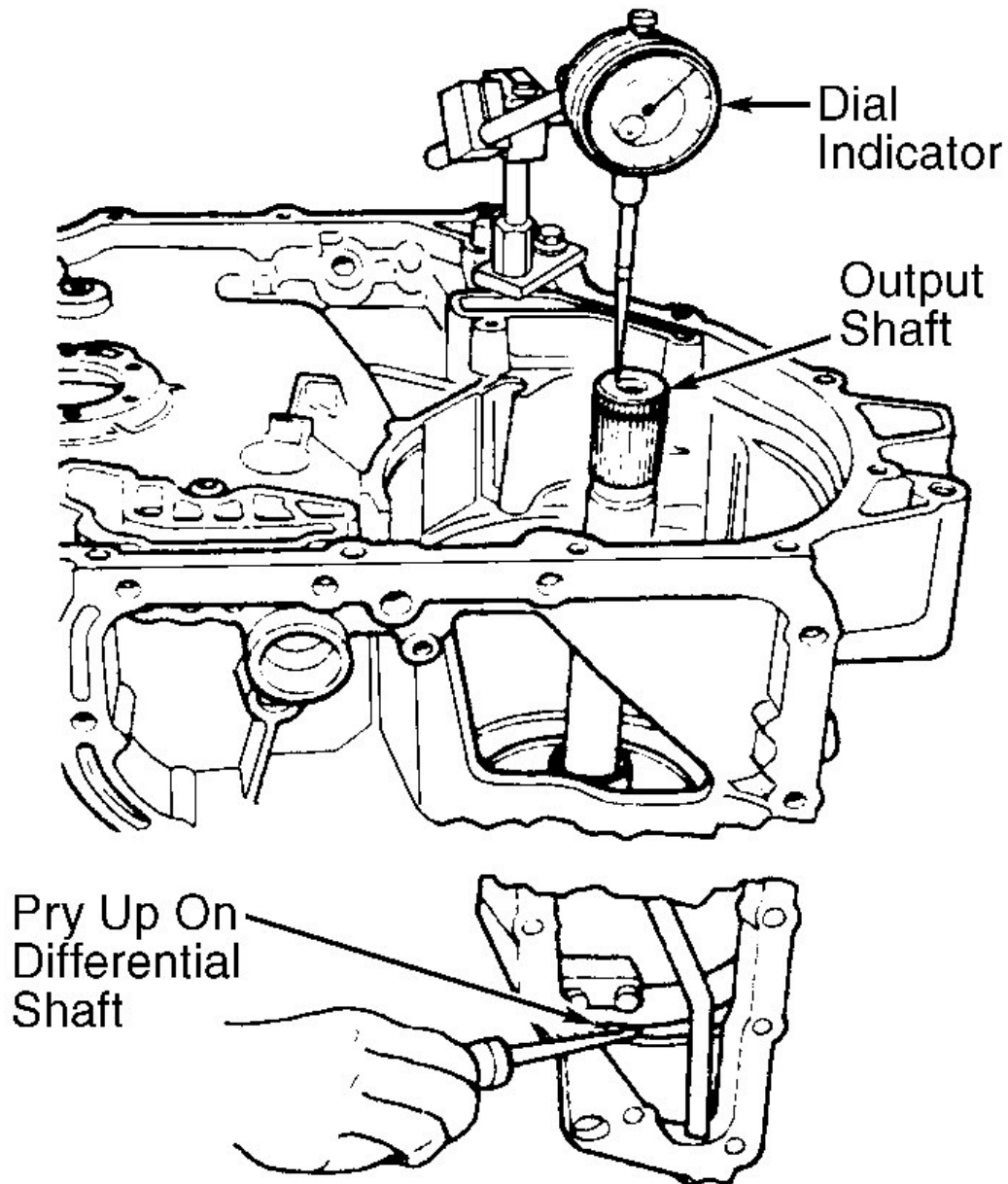


**Fig. 35: Installing End Play Tool**  
Courtesy of FORD MOTOR CO.



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**Fig. 36: Assembling Final Drive Components**  
Courtesy of FORD MOTOR CO.



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**Fig. 37: Checking Output Shaft End Play**  
Courtesy of FORD MOTOR CO.

9. Install low-intermediate band and align anchor pin pocket with anchor pin. Install low-intermediate drum and sun gear assembly.
10. Reassemble ring gear and shell assembly, rear planetary, No. 13 needle bearing, front planetary and snap

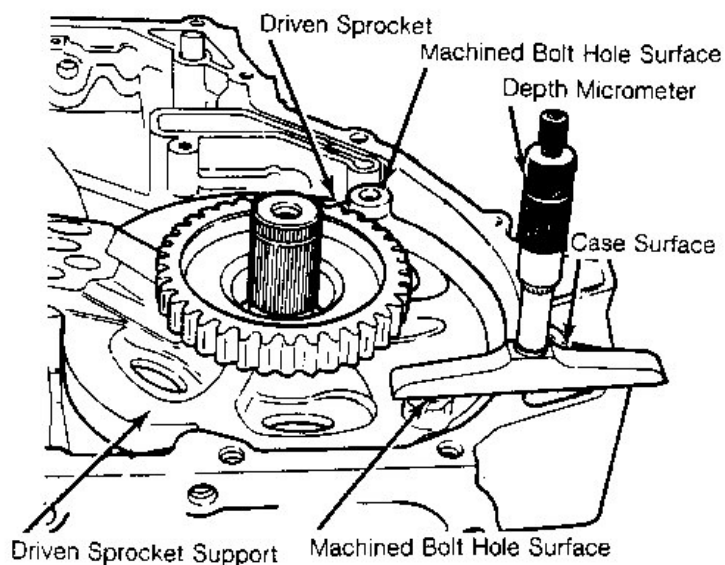
ring. See **Fig. 23** . Carefully slide planetary assembly over output shaft.

11. Lower reverse clutch into case and ensure clutch plates engage (intermediate clutch hub may be used as a tool to turn splines, if necessary). Align clutch cylinder anchor pin pocket with anchor pin case hole.
12. Start reverse anchor pin bolt, but do not tighten. Reassemble forward, direct and intermediate clutch assembly. Using Front Clutch Loading Tool (T86P-70389-A), lower assembly into case. Align shell and sun gear splines into forward planetary. Ensure assembly is fully seated before removing tool.
13. Install overdrive band into case. Install plastic retainer with crosshairs facing up. Check end clearance for No. 5 and No. 8 thrust washer.
14. Tighten screw on End Play Tool (T87P-7001-AH) to 35-44 INCH lbs. (4-5 N.m). Ensure all 5 Teflon seals and No. 5 thrust washer are removed from driven sprocket support. Install No. 9 needle bearing over output shaft, with outer lip facing up. Install No. 8 selective thrust washer. Install driven sprocket support and driven sprocket. Remove No. 5 thrust washer from sprocket support, if attached.
15. To measure No. 8 thrust washer clearance, it must first be determined if machined bolt hole surfaces on driven sprocket support are ABOVE or BELOW case machined surface. See **Fig. 38** .
16. If bolt hole surfaces are ABOVE the case machined surface, place depth micrometer on machined bolt hole surface and measure distance to case machined surface. Check both bolt hole surfaces and determine average of both readings. If measurement exceeds .008" (.21 mm), measure existing No. 8 thrust washer and select a washer that will ensure a measurement of .000-.008" (.00-.21 mm). See **NO. 8 THRUST WASHER SELECTION** table. Select washer and repeat measurement procedure; record reading of this measurement for use in a later step.
17. If machined bolt hole surfaces are BELOW case machined surface, place depth micrometer on case machined surface and measure distance to machined bolt hole surface. See **Fig. 38** . Measure both bolt hole surfaces and determine average of both readings. If average reading exceeds .018" (.46 mm), measure existing No. 8 thrust washer and select a washer that will bring measurement to less than .018" (.46 mm). See **NO. 8 THRUST WASHER SELECTION** table. Recheck measurement and record reading.

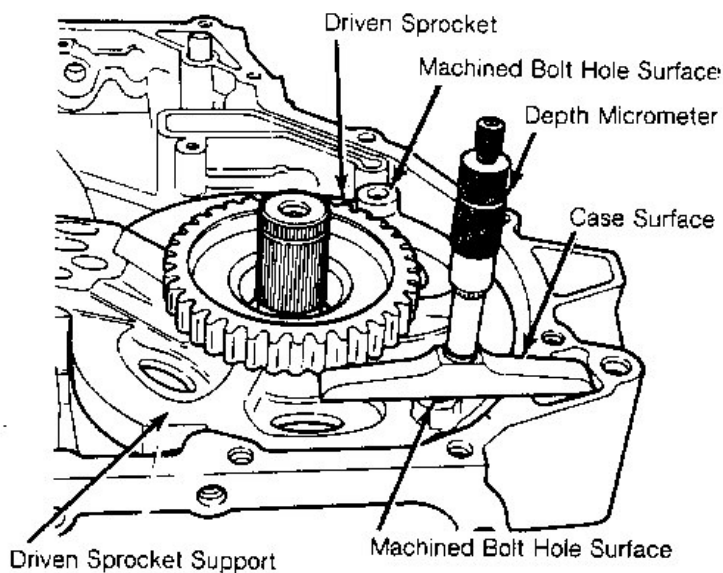
#### NO. 8 THRUST WASHER SELECTION

Thickness/Inch (mm)	Color
.056-.060 (1.43-1.53)	Natural
.066-.070 (1.68-1.78)	Dark Green
.075-.079 (1.92-2.02)	Light Blue
.085-.089 (2.17-2.27)	Red

18. With correct No. 8 thrust washer selected, check end play and No. 5 thrust washer installation. Remove driven sprocket support, No. 8 thrust washer and No. 9 needle bearing. Apply petroleum jelly to No. 5 thrust washer and install on driven sprocket support. Align washer tab with mating slot in support. Install driven sprocket support. DO NOT install No. 8 thrust washer or No. 9 needle bearing at this time.
19. Determine if machined bolt hole surfaces of sprocket support are now ABOVE or BELOW machined case surface. If machined bolt hole surfaces are ABOVE case surface, add the distance of the final measurement taken in step 17) to the distance above the case. This distance should be .000-.033" (.00-.85 mm). If measurement exceeds specification, replace No. 5 thrust washer and recheck. See **NO. 5 THRUST WASHER SELECTION** table.



BOLT HOLE SURFACE ABOVE CASE SURFACE



BOLT HOLE SURFACE BELOW CASE SURFACE

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**Fig. 38: Measuring Thrust Washer Clearance**  
Courtesy of FORD MOTOR CO.

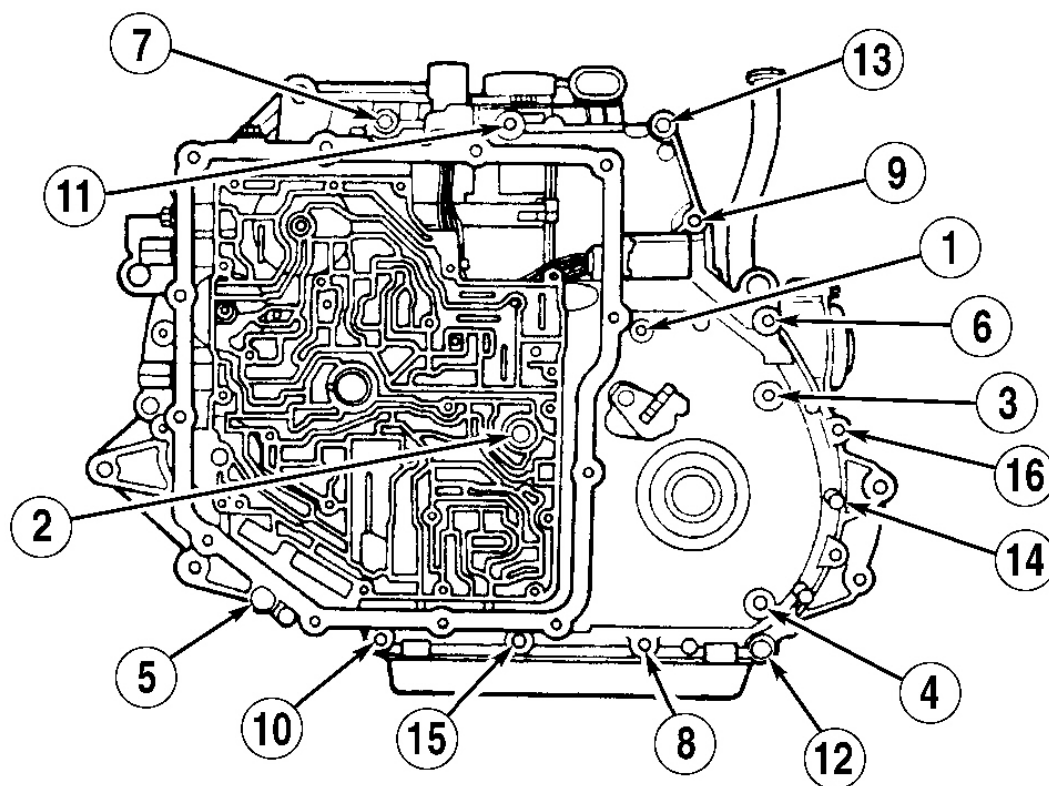
20. If machined bolt hole surfaces are BELOW the case surface, record this measurement and the final measurement from step 17). Subtract the thickness of No. 8 thrust washer from No. 5 thrust washer.

Result must be .000-.033" (.00-.84 mm). If measurement is not within specification, replace No. 5 thrust washer and recheck. See **NO. 5 THRUST WASHER SELECTION** table.

### NO. 5 THRUST WASHER SELECTION

Thickness	Color
.086-.090" (2.18-2.28 mm)	Green
.095-.099" (2.43-2.53 mm)	Black
.105-.109" (2.67-2.77 mm)	Natural
.115-.118" (2.92-3.02 mm)	Red

21. Remove tool from bottom of case. Remove dial indicator set-up. Remove driven sprocket support and install No. 9 needle bearing and correct No. 8 thrust washer. Install 5 Teflon seals on driven sprocket support. Install correct No. 5 thrust washer. Install driven sprocket support.
22. If manual shaft components have not been installed, tap manual shaft seal into case. Start manual shaft through seal, and slide manual detent lever onto shaft. Slide shaft through park rod actuating lever and tap into case hole. Install new lock pin through case hole, aligning with groove in shaft. Install new roll pins.
23. Install parking pawl, return spring, parking pawl shaft and locator pin. Ensure parking pawl engages park gear and returns freely. Install park rod actuating lever and park rod in case. Install park rod abutment and start abutment bolts. Push in parking pawl and locate rod between pawl and abutment.
24. Tighten reverse drum Allen head (6 mm) bolts to 89-106 INCH lbs. (10-12 N.m) and 19 mm lock nut to 26-35 ft. lbs. (35-47 N.m). Tighten park rod abutment bolts, reverse anchor pin bolt and lock nut to specification. Clean and lightly tap oil tubes into position until fully seated. Apply Threadlock (262) around tube-to-case surface. Install tube retaining brackets.
25. Install seal and oil filter into case. Install reverse apply tube/oil filter bracket and bolt. Install oil pan with new gasket. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** . Position transaxle with input shaft and overdrive band facing up.
26. Align tabs of No. 2 and No. 4 thrust washers and install on drive and driven sprocket supports. Lubricate and install cast iron sealing ring on input shaft. Install chain on drive and driven sprockets. Lower assembly into sprocket supports, rotating to ensure components are fully seated.
27. Install No. 1 (plastic) and No. 3 (metal) thrust washers on chain cover, aligning tabs with slots in chain cover. Install new chain cover gasket. Install marked accumulator springs to correct position. Carefully align chain cover input shaft bore with input shaft. Ensure cast iron sealing ring is not damaged. Gently apply downward pressure, to overcome accumulator spring pressure, and start 2 chain cover bolts 180 degrees apart.
28. Install remaining chain cover bolts and tighten to specification in sequence. See **Fig. 39** . Input shaft should have end play and rotate freely. If it does not rotate freely, remove chain cover and check for damaged cast iron seal.



#### TORQUE SPECIFICATIONS

Bolt No. 1: 7-9 Ft. Lbs. (9-12 N.m)

Bolt No. 2: 25-35 Ft. Lbs. (34-48 N.m)

All Others: 20-26 Ft. Lbs. (20-26 N.m)

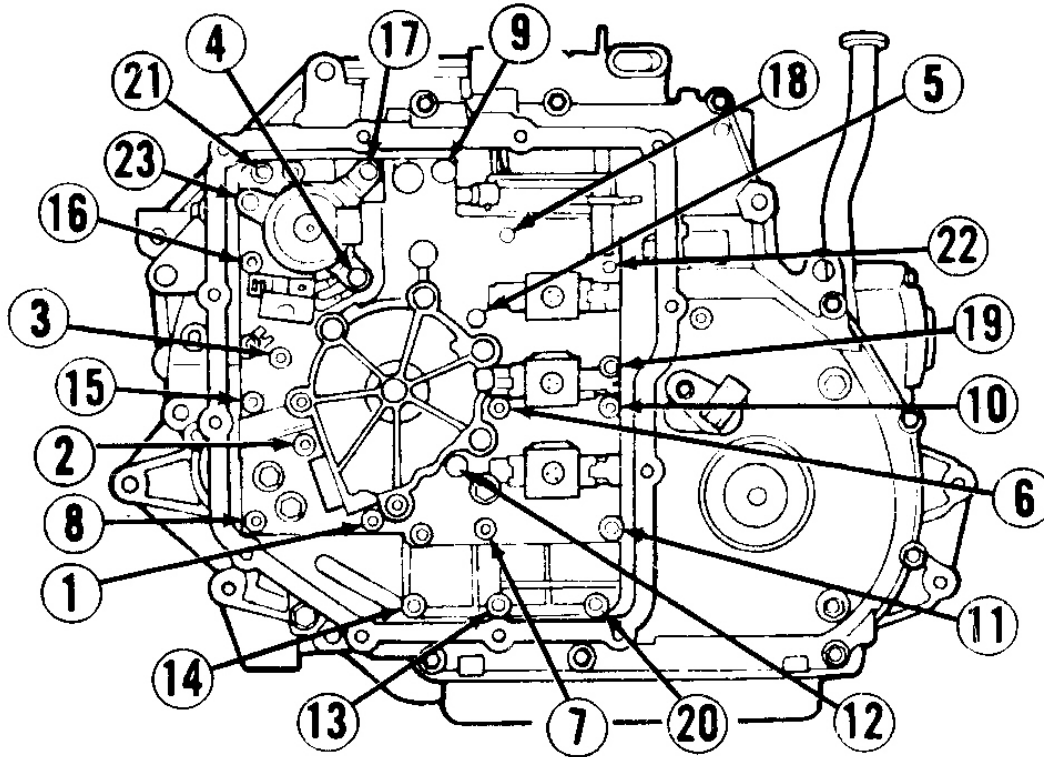
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**Fig. 39: Chain Cover Tightening Sequence**  
Courtesy of FORD MOTOR CO.

29. Install turbine speed sensor. Install output shaft seal and circlip. Perform air pressure test. See **AIR PRESSURE TEST** under PERFORMANCE TESTS. Install new Teflon seals on pump driveshaft. Install shaft and connect manual valve link to detent lever.
30. Start oil pump and valve body assembly over pump shaft and connect manual valve link to manual valve. Push valve body down until seated. Install valve body bolts and tighten in sequence to 80-106 INCH lbs. (9-12 N.m). Ensure 3 short bolts are located in correct position. See **Fig. 40**.
31. Install bulkhead connector and electrical connectors. Ensure connectors "click" to lock position as they are installed. Place gear selector in Neutral position. Install Manual Lever Position Sensor (MLPS) and lightly tighten bolts. Align slots of MLPS using Gear Position Sensor Adjuster (T91P-70010-A). Tighten bolts to 80-106 INCH lbs. (9-12 N.m).
32. Install valve body cover with new self-adhesive gasket. Tighten bolts to specification. Install dipstick tube

grommet and dipstick tube in case. Install speedometer driven gear and drive gear shaft. Install thrust bearing and race with black side of race facing upward. Install speedometer cover with new seal. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** . Place transaxle in horizontal position. Install remaining chain cover bolts in bellhousing. Proceed to **SERVO PISTON TRAVEL CHECK** if any of the following components are being replaced:

- Transaxle Case Assembly
- Band Assembly
- Drum/Sun Gear Assembly
- Servo Piston Rod
- Servo Piston



NOTE: Bolts No. 13, 14 & 20 Are Shorter Length.

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**Fig. 40: Identifying Valve Body Tightening Sequence**

Courtesy of FORD MOTOR CO.

**NOTE:** Servo piston travel check of both the overdrive and low-intermediate servos should only be performed if either the transaxle case, band assembly, drum and sun gear assembly, servo piston rod or servo piston were replaced.



**NOTE:** If test springs from servo tool kits are used in test procedure, ensure they are not interchanged with operational springs. Test springs are weaker and may be shorter or have smaller wire diameter. Spring color may be identical.

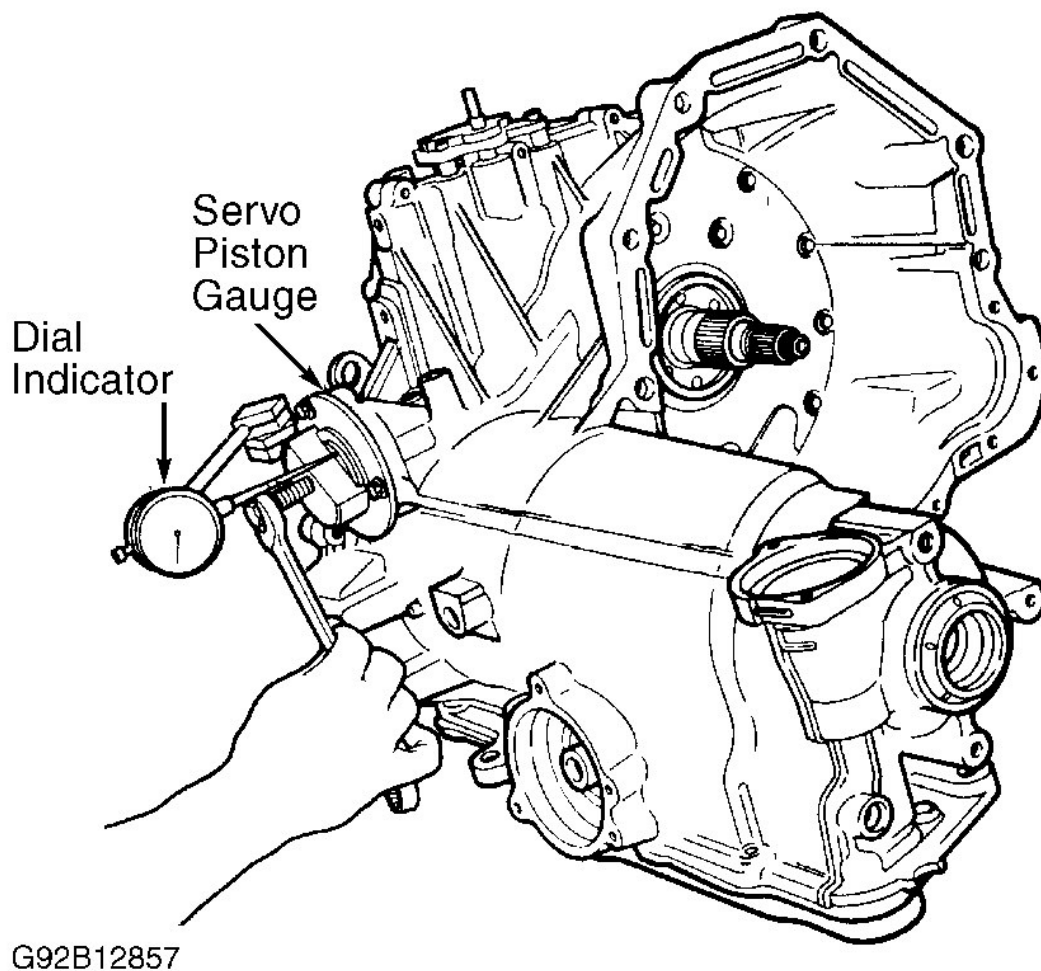
## SERVO PISTON TRAVEL CHECK

### Overdrive Servo

1. Install spring from Overdrive Servo Rod Kit (T86P-70023-B) in case. Install servo piston and rod in case. Install servo piston gauge from kit and secure in case using servo cover bolts. Tighten bolts to 90 INCH lbs. (10 N.m). Tighten gauge center screw to 10 INCH lbs (1.13 N.m). See **Fig. 41** .
2. Attach a dial indicator and position stylus through hole in gauge. Ensure stylus contacts piston on a flat surface. DO NOT contact step on piston. Zero dial indicator.
3. Back off gauge center screw until piston movement stops and read piston travel on dial indicator. Piston travel is determined by servo rod length. Piston travel should be .070-.149" (1.8-3.8 mm).
4. If piston travel is not within specification, change piston rod and recheck. Piston rod is identified by number of grooves located on tip of rod. See **OVERDRIVE SERVO ROD SELECTION** table. Install overdrive servo assembly. Install new seals, cover and bolts. Tighten bolts to 84-108 INCH lbs. (10-12 N.m).

### OVERDRIVE SERVO ROD SELECTION

Number Of Grooves In Rod Tip	Rod Length Inch (mm)
0 (No Grooves)	3.911 (99.33)
1	3.860 (98.05)
2	3.810 (96.78)



**Fig. 41: Overdrive Servo Check**  
Courtesy of FORD MOTOR CO.

#### Low-Intermediate Servo

1. Install spring from Low-Intermediate Servo Kit (T86P-70023-A). Install servo piston (without seal) and rod in case. Install servo piston gauge from kit and secure in case using servo cover bolts. Tighten bolts to 90 INCH lbs. (10 N.m). Tighten gauge screw to 30 INCH lbs. (3.4 N.m). See **Fig. 42**.
2. Attach a dial indicator and position stylus through hole in gauge. Ensure stylus has contacted piston on a flat surface and not on step of piston. Zero dial indicator.
3. Back off gauge center screw until piston movement stops and read dial indicator. Piston travel is determined by servo rod length. Piston travel should be .217-.256" (5.5-6.5 mm) if a used low-intermediate band is installed. If low-intermediate band is new, reading should be .197-.236" (5.0-6.0 mm).
4. If piston travel is not within specification, change piston rod and recheck. Piston rod is identified by

**1994 Ford Taurus GL**

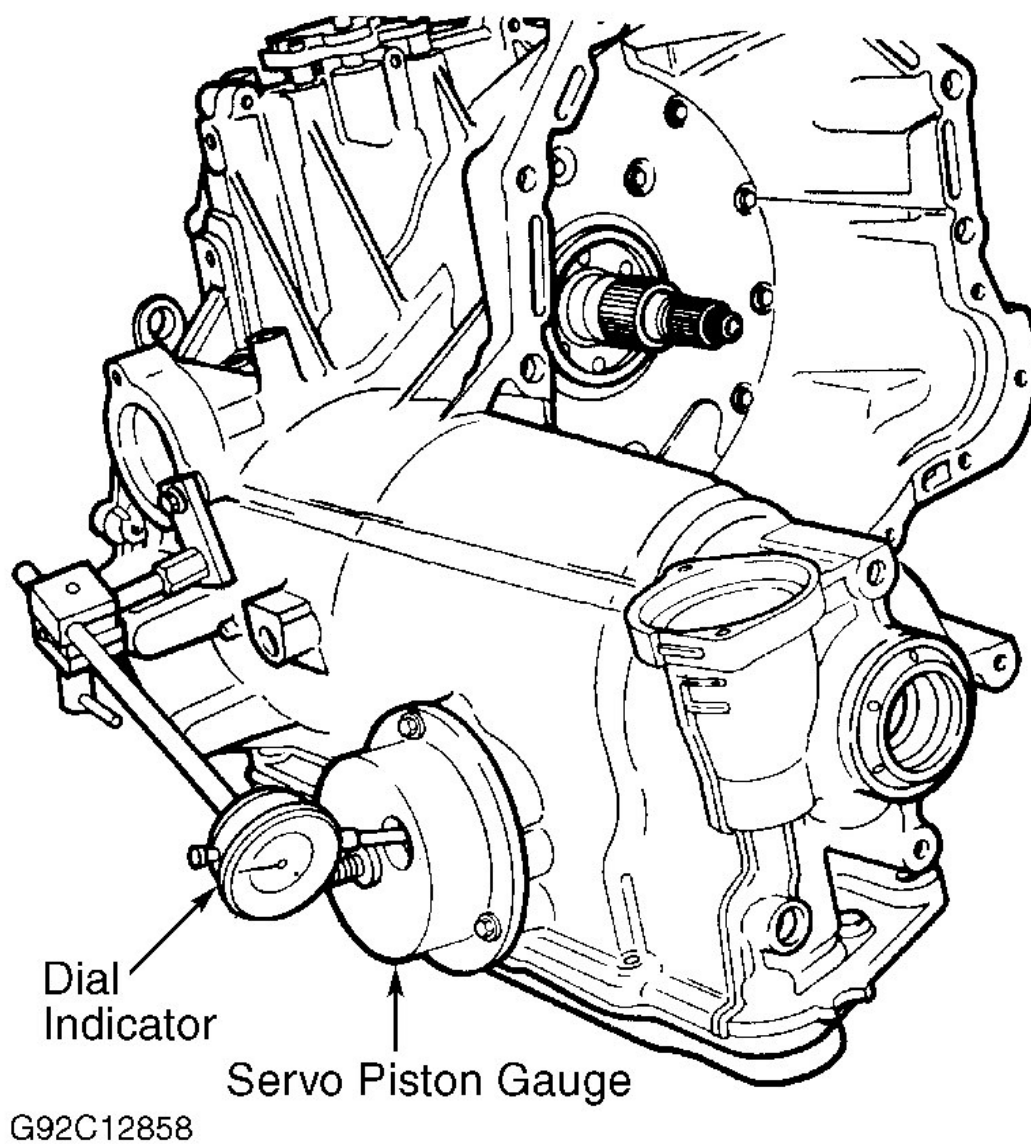
1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

number of grooves located on tip of rod. See **LOW-INTERMEDIATE SERVO ROD SELECTION** table. Install servo assembly. Install new seals, cover and bolts. Tighten bolts to specification.

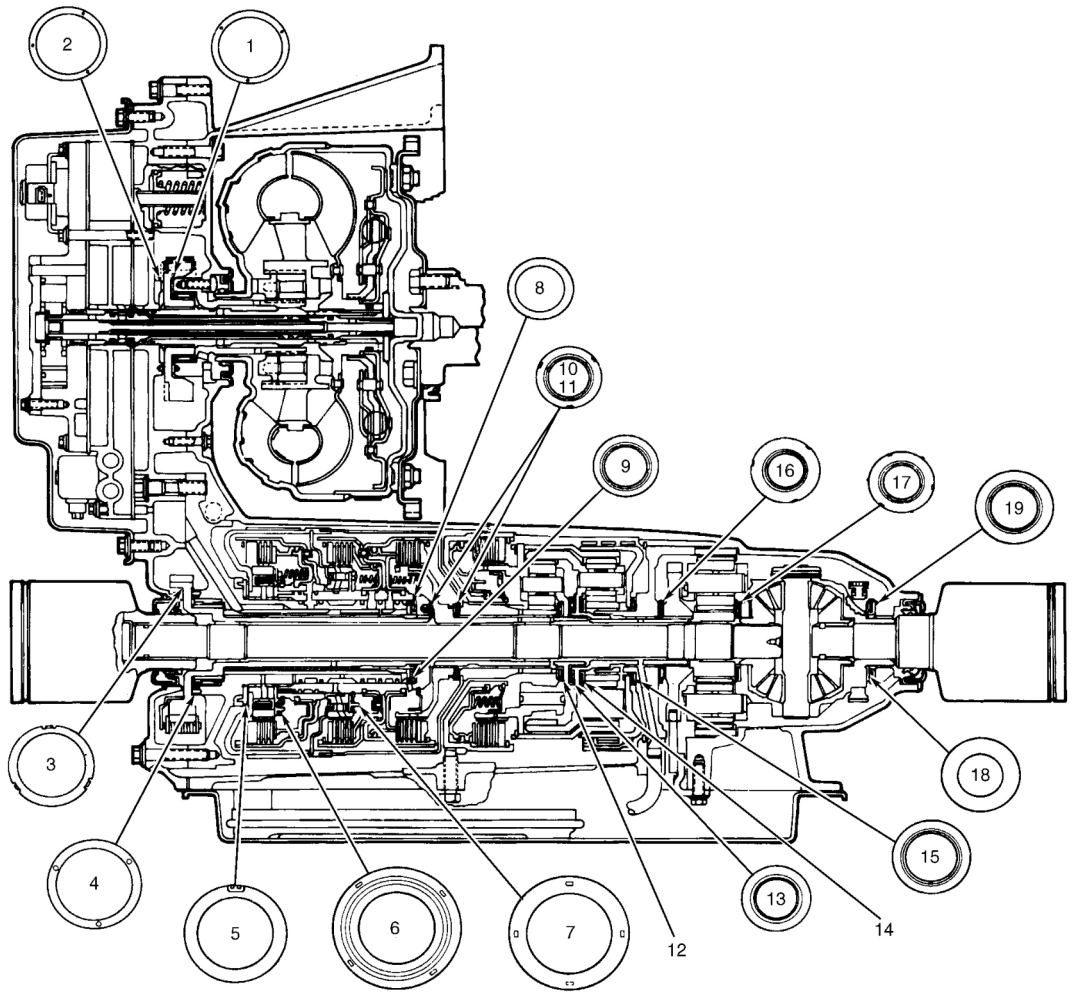
**LOW-INTERMEDIATE SERVO ROD SELECTION**

<b>Number Of Grooves In Rod Tip</b>	<b>Rod Length Inch (mm)</b>
0 (No Grooves)	4.498 (114.26)
1	4.477 (113.72)
2	4.456 (113.18)
3	4.435 (112.64)
4	4.413 (112.10)

**NOTE:** Ensure tab on low-intermediate servo cover is aligned with port on case.



**Fig. 42: Low-Intermediate Servo Check**  
Courtesy of FORD MOTOR CO.



- |   |   |   |
|---|---|---|
| 1. Drive Sprocket/Stator Support Thrust Washer      | 7. Direct Clutch/Direct One-Way Clutch Race Thrust Washer | 13. Planetary Center Thrust Bearing       |
| 2. Drive Sprocket/Stator Support Thrust Washer      | 8. Driven Sprocket Support Thrust Washer                  | 14. Not Serviceable                       |
| 3. Case Cover/Driven Sprocket Thrust Washer         | 9. Direct Clutch Hub Thrust Bearing                       | 15. Rear Sun Gear Thrust Bearing          |
| 4. Driven Sprocket Thrust Washer                    | 10. Front Sun Gear Thrust Bearing                         | 16. Final Drive Gear Front Thrust Bearing |
| 5. Support/Forward Clutch Thrust Washer             | 11. Front Sun Gear Thrust Bearing                         | 17. Final Drive Gear Front Thrust Bearing |
| 6. Forward Clutch One-Way Clutch Race Thrust Washer | 12. Not Serviceable                                       | 18. Differential Carrier Thrust Washer    |
|   |   | 19. Differential Carrier Thrust Bearing   |

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**Fig. 43: Identifying Thrust Washers & Needle Bearings**  
 Courtesy of FORD MOTOR CO.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS

Application	Ft Lbs. (N.m)
Anchor Bolt Lock Nut	25-35 (33-47)
Chain Cover Bolt-To-Case (13 mm)	20-22 (27-30)
Converter-To-Flywheel Bolts	23-39 (31-53)
Oil Pan-To-Case Bolts	10-12 (14-16)
Park Rod Abutment Bolts-To-Case	20-22 (27-30)

**1994 Ford Taurus GL**

1993-94 AUTOMATIC TRANSMISSIONS AX4S/AXOD-E Overhaul

	<b>INCH Lbs. (N.m)</b>
Anchor Bolt (6 mm Allen)	84-108 (10-12)
Case-To-Reverse Clutch Screw	84-108 (10-12)
Case-To-Stator Support	84-108 (10-12)
Chain Cover Bolt-To-Case (8 mm)	84-108 (10-12)
Chain Cover Bolts-To-Case (10 mm)	84-108 (10-12)
Detent Spring-To-Chain Cover	84-108 (10-12)
Drive Sprocket Support-To-Case (Torx)	84-108 (10-12)
Governor & Servo Covers-To-Case	84-108 (10-12)
Low-Intermediate Servo Cover-To-Case	84-108 (10-12)
Manual Valve Detent Spring Bolt	84-108 (10-12)
Neutral Start Switch Bolt	84-108 (10-12)
Oil Pump-To-Valve Body	84-108 (10-12)
Oil Pump Cover-To-Oil Pump	84-108 (10-12)
Separator Plate-To-Oil Pump	84-108 (10-12)
Separator Plate-To-Valve Body	84-108 (10-12)
Solenoid-To-Valve Body	84-108 (10-12)
T.V. Bracket-To-Case	84-108 (10-12)
Valve Body-To-Case	84-108 (10-12)
Valve Body Cover-To-Case	84-108 (10-12)
Valve Body Solenoid-To-Chain Cover	84-108 (10-12)

**TRANSAXLE SPECIFICATIONS****TRANSAXLE SPECIFICATIONS**

<b>Application</b>	<b>In. (mm)</b>
Direct Clutch Pack Clearance	.031-.051 (.78-1.29)
Forward Clutch Pack Clearance	.054-.072 (1.37-1.82)
Intermediate Clutch Pack Clearance	.040-.059 (1.02-1.50)
Reverse Clutch Pack Clearance	.038-.064 (.97-1.63)