

1990 Ford Probe GL

1990-92 AUTOMATIC TRANSMISSIONS Ford - 4EAT Overhaul

1990-92 AUTOMATIC TRANSMISSIONS

Ford - 4EAT Overhaul

APPLICATION

4EAT APPLICATION

Vehicle Application	Engine Displacement
1991-92 Capri	1.6L
1991-92 Escort	1.8 & 1.9L
1989-92 Probe	2.2L
1990-92 Probe	3.0L
1991-92 Tracer	1.8 & 1.9L

IDENTIFICATION

The 4EAT automatic transaxle is identified by vehicle certification label, attached to driver-side door jamb, below the latch striker. See [Fig. 1](#).

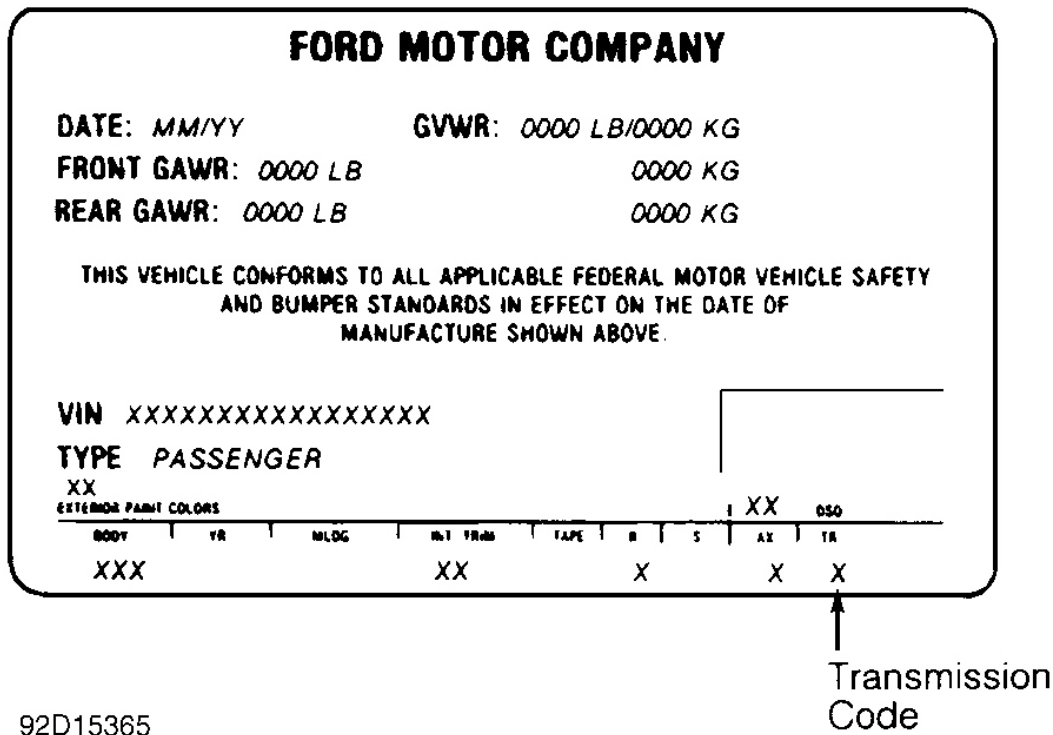


Fig. 1: Vehicle Certification Label (Capri Shown; Others Similar)

Courtesy of FORD MOTOR CO.

DESCRIPTION & OPERATION

The 4EAT is a 4-speed transaxle assembly. The 4EAT is controlled by both electronic and mechanical systems. Input signals from sensors are sent to 4EAT control module and computed to determine gear, shift patterns and lock-up timing. The 4EAT control module has built-in self-diagnosis, fail-safe mode and warning code display for the main input sensors and solenoid valves.

Four solenoid valves are located on the valve body. Solenoid valves actuate shifting and torque converter lock-up by switching oil flow through passages within the valve body.

When the lock-up solenoid is switched on, fluid pressure holding the lock-up control valve is drained, allowing valve to open. When valve opens, hydraulic pressure from the rear chamber causes the converter clutch to press tightly against the converter cover. Lock-up occurs and force is transmitted directly to the transaxle with no fluid slippage.

When the 4EAT control module switches lock-up solenoid off, hydraulic pressure in the front chamber becomes greater than pressure in the rear chamber. The converter clutch then moves away from the converter cover and lock-up is released.

The 4EAT transaxle can be operated in manual or automatic shift mode. When the vehicle is started, 4EAT will be in the automatic position. When the manual shift switch is pressed, 4EAT module will activate the manual shift mode. If the manual shift switch is pressed again or ignition is turned off, manual shift will cancel and automatic shift will be resumed.

Shift timing is also affected by the SHIFT MODE switch. When switch is in the NORM position, shift timing provides for maximum fuel efficiency. When switch is in the POWER position, shift timing provides for maximum acceleration.

LUBRICATION & ADJUSTMENTS

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

ON-VEHICLE SERVICE

DIFFERENTIAL OIL SEALS

Disassembly

1. Raise and support vehicle. Remove front wheels and splash shields. Drain transaxle fluid. Remove tie rod attaching hardware and tie rod. Remove stabilizer link.
2. Remove ball joint bolts and nuts. Pull lower control arms to separate from knuckles. Remove right joint shaft bracket.
3. Remove half-shafts by prying using a bar inserted between shaft and differential case. Support half-shafts

using wire. Using a flat-tip screwdriver, remove oil seals.

Reassembly

1. Using Seal Replacer (T87C-77000-H), tap in new differential oil seals. Replace circlip on end of half-shafts, and install half-shafts. Attach ball joints to knuckles. Install tie rod ends, and tighten nuts to 22-33 ft. lbs. (29-44 N.m).
2. Install ball joint bolts and nuts. Tighten to 32-40 ft. lbs. (43-54 N.m). Install stabilizer link assemblies. Turn nuts on each assembly until 1.00 (25.4 mm) of bolt thread can be measured from upper nut. See **Fig. 2**. Secure upper nut, and back off lower nut until torque of 12-17 ft. lbs. (16-23 N.m) is reached.
3. Install splash shields and front wheels. Refer to appropriate TRANSMISSION SERVICING - A/T article in AUTOMATIC TRANSMISSION SERVICING for specified transaxle fluid. Check for leaks.

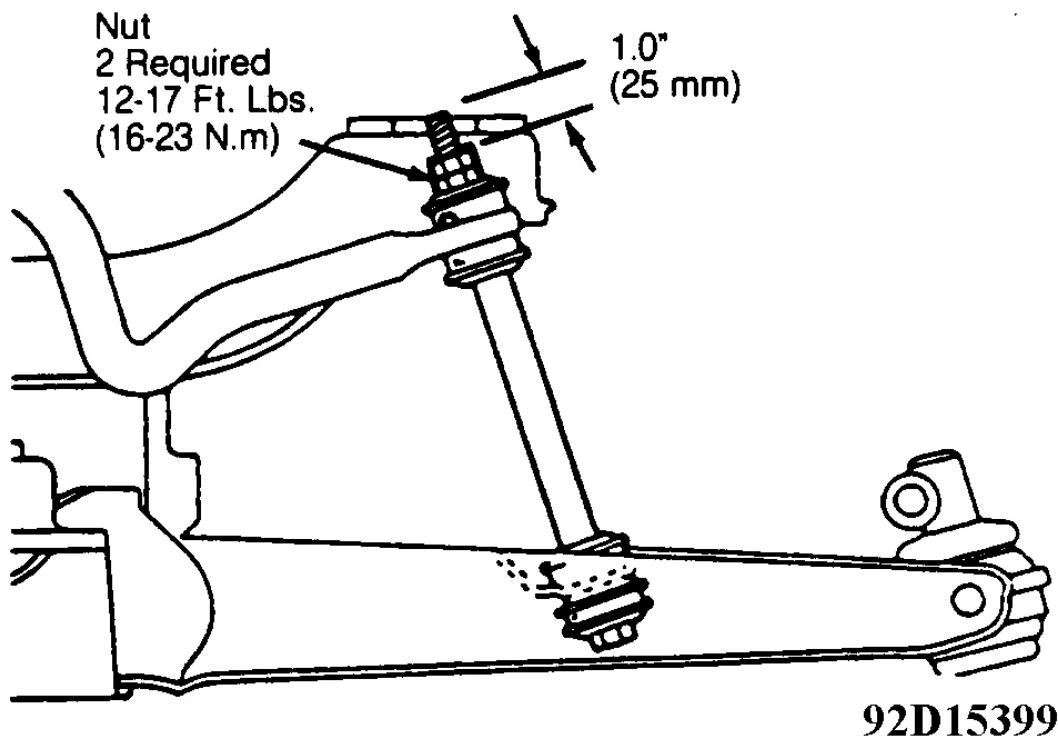


Fig. 2: Installing Stabilizer Link
Courtesy of FORD MOTOR CO.

LINE PRESSURE ADJUSTMENT

Probe

1. Place transaxle in Park. Remove left splash shield. Connect pressure gauge at line pressure inspection hole (square head plug "L"). See **Fig. 6**.

2. Start engine, and warm it to normal operating temperature. Loosen kickdown cable lock nut until line pressure exceeds 63 psi (434 kPa). Tighten kickdown cable lock nut. Ensure line pressure is 63-66 psi (434-455 kPa).

OIL COOLER

Removal & Installation

Disconnect oil hoses, and remove oil cooler. Straighten bent tins using a screwdriver. Install and connect oil cooler and hoses. Refer to appropriate TRANSMISSION SERVICING - A/T article in AUTOMATIC TRANSMISSION SERVICING for oil cooler draining and flushing.

VALVE BODY

Disassembly

1. Remove battery and battery carrier. Disconnect main fuse block, five 4EAT connectors and separate 4EAT harness from transaxle clips.
2. Raise and support vehicle. Drain transaxle fluid. Disconnect oil cooler outlet and inlet hoses. Remove valve body cover and gasket.
3. Remove kickdown cable from throttle cam. Pinch tangs of mating connector mounted on case to disconnect solenoid connector. Push connector inward, and remove connector. Remove valve body retaining bolts, and carefully remove body.

Reassembly

1. Shift transaxle into Reverse to place manual plate in correct position for reassembly. Install valve body using a mirror to align groove of manual valve with manual plate. Tighten retaining bolts to 95-130 INCH lbs. (11-15 N.m).
2. Insert solenoid connector into transaxle case hole. Attach mating connector.
3. Attach kickdown cable to throttle cam. Install valve body cover and new gasket. Tighten to 69-95 INCH-lbs. (8-11 N.m). **DO NOT** use gasket sealer on cover or gasket. Connect oil cooler hoses. Attach five 4EAT connectors, and support 4EAT harness on transaxle clips. Connect main fuse block. Install battery carrier and battery. Add specified transaxle fluid, and start engine. Test vehicle for proper operation, and ensure no leakage is present.

DRIVE AXLE SHAFTS

See appropriate AXLE SHAFT - FRONT article in DRIVE AXLES section.

TROUBLE SHOOTING

NOTE: Always check fluid levels/linkage. Ensure computer control systems are operating properly before diagnosing transaxle shifting problems. See **AUTO TRANS DIAGNOSIS - FORD 4EAT** article in AUTOMATIC TRANSMISSIONS. See **Fig. 3 -Fig. 4** for trouble shooting charts.

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CONDITION	POSSIBLE SOURCE	ACTION
● Engine Will Not Crank in Any Shift Lever Position	● Manual lever position switch stuck or failed. ● Manual lever position switch damaged or disconnected.	● INSPECT / SERVICE the manual lever position switch.
● Engine Does Not Crank in P	● Selector lever and linkage out of adjustment. ● Manual lever position switch not correctly aligned to transaxle.	● CONFIRM selector or linkage adjustment and operation. ● ADJUST manual lever position switch.
● Engine Starts in Shift Lever Positions Other Than P or N	● Shift linkage damaged or out of adjustment.	● CONFIRM selector linkage adjustment and operation.
● Vehicle Moves In P or Parking Gear not Disengaged When P is Disengaged	● Selector lever and linkage out of adjustment. ● Parking pawl.	● CONFIRM selector or linkage adjustment and operation. ● INSPECT parking pawl.
● Vehicle Moves In N	● Selector lever and linkage out of adjustment. ● Control valve damaged.	● CONFIRM selector or linkage adjustment and operation. ● INSPECT control valve, SERVICE or REPLACE as required.
● Vehicle Does Not Move In $\odot$, D, L, or R	● Control valves. ● Gear selector cable damaged. ● Improper fluid level. ● Oil pump dirty, broken, or bad seals. ● Torque converter damaged.	● INSPECT control valves. ● INSPECT gear selector cable. ● CHECK and FILL. ● INSPECT oil pump. ● INSPECT torque converter.
● Vehicle Does Not Move in Any Forward Shift Position. Reverse OK	● Control valves. ● Forward clutch worn or damaged. ● One way clutch no. 1 worn or damaged. ● Oil flow to forward clutch blocked.	● INSPECT control valves. ● INSPECT clutches.
● Vehicle Does Not Move in Reverse. Forward OK	● Reverse clutch worn or damaged. ● Low and reverse clutch slipping.	● INSPECT clutch. ● INSPECT clutch adjustment.
● Noise Severe Under Accel. or Decel. OK in Park or Neutral or Steady Speed	● Speedometer cable. ● Torque converter failure. ● Gear or clutch failure. ● Selector cable grounding out. ● Engine mounts grounding out.	● SERVICE or REPLACE. ● EXAMINE / SERVICE. ● EXAMINE / SERVICE. ● INSTALL and route cable as specified. ● NEUTRALIZE engine mounts.
● Noise in Park or Neutral - Does Not Stop in Drive at Stall	● Loose flywheel to converter bolts. ● Oil pump worn. ● Torque converter failure.	● TORQUE to specification. ● EXAMINE / SERVICE pump. ● EXAMINE / SERVICE converter.
● Noise in all Gears - Changes Power to Coast	● Final drive gearset worn. ● CV joints.	● EXAMINE / SERVICE final drive gearset. ● SERVICE as required.
● Noise in all Gears - Does Not Change Power to Coast	● Defective speedometer gears. ● Bearings worn or damaged. ● Planetary gearset noisy.	● EXAMINE / REPLACE speed drive or driven gear. ● EXAMINE / REPLACE. ● SERVICE planetary gearset.
● Harsh Shifts (any gears)	● Line pressure out of adjustment. ● Valve body. ● Sticking accumulators. ● CV joints. ● Engine mounts loose. ● Throttle modulator valve sticking. ● Pressure regulator valve sticking. ● Throttle valve sticking. ● Band adjustment. ● Band servo.	● ADJUST line pressure. ● INSPECT valve body. ● INSPECT accumulators. ● SERVICE as required. ● SERVICE as required. ● INSPECT throttle modulator valve. ● INSPECT pressure regulator valve. ● INSPECT throttle valve. ● CHECK band adjustment. ● INSPECT band servo.

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Fig. 3: 4EAT Trouble Shooting Chart (1 of 3)
Courtesy of FORD MOTOR CO.

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CONDITION	POSSIBLE SOURCE	ACTION
Soft Shifts (any gears)	- Line pressure. - Oil pump worn. - Internal ATF leakage. - Band adjustment. - Band servo. - Pressure regulator damaged. - ATF level. - Valve body. - Sticking accumulators. - Throttle valve sticking.	- ADJUST line pressure. - INSPECT oil pump. - INSPECT transaxle. - CHECK band adjustment. - INSPECT band servo. - INSPECT pressure regulator. - CHECK and FILL. - INSPECT valve body. - INSPECT accumulators. - INSPECT throttle valve.
Erratic Shifting, Incorrect Shift Points, Incorrect Shift Sequence	- Kickdown cable. - Control valves. - Band adjustment. - Clutches slipping. - Fluid level and quality.	- CHECK kickdown cable adjustment. - INSPECT control valves. - CHECK band adjustment. - INSPECT clutches. - CHECK and FILL.
Improper Lock-up	- Control valves. - Torque converter.	- INSPECT control valves. - INSPECT torque converter.
Skipping Gears (shift 1st to 3rd, or 2nd to Φ, for example)	- Control valves. - ATF temperature switch. - Valve body. 2-4 band.	- INSPECT control valves. - INSPECT ATF switch. - INSPECT valve body. - CHECK band adjustment.
Transaxle Overheating NOTE: Excessive overheating may cause damage to internal components. Always retest 4EAT for other symptoms after overheating problem is resolved and burned fluid is replaced.	- Improper fluid level. - Poor engine performance. - Worn clutch, incorrect band application, or poor oil pressure control. - Restriction in cooler lines. - Clogged cooler.	- CHECK fluid level. - ADJUST according to specifications. - CHECK cooler lines for kinks and damage. CLEAN, SERVICE or REPLACE cooler lines. - INSPECT cooler for plugging. SERVICE as required.
Drags in Reverse like Parking Brake is Applied	2-4 band. - Brakes.	INSPECT band adjustment.
Drags in Forward Gears	2-4 band. - Brakes.	INSPECT band adjustment.
Engine Runaway on Upshift	- Fluid level low. - Valve body. - Oil pump. - Damaged bypass valve. - Clutches slipping.	- CHECK fluid level. - INSPECT valve body, solenoid valves. - INSPECT oil pump. - INSPECT bypass valve. - INSPECT clutches.
Engine Runaway on Downshift	- Coasting bypass valve sticking. - Clutches slipping. - Fluid level. - Oil pump.	- INSPECT clutches. - CHECK fluid level. - INSPECT oil pump.
Manual Light Flashing	4EAT control module. - Sensors. - Circuit.	See 4EAT ELECTRONIC CONTROLS article
Mode will not Switch from Manual to Automatic or from Automatic to Manual	4EAT control module. - Mode switch. - Sensors. - Circuit.	See 4EAT ELECTRONIC CONTROLS article
Excessive Creep	- Torque converter. - Kickdown cable. - Ignition timing and idle speed.	- INSPECT torque converter. - INSPECT kickdown cable adjustment. - CORRECT or ADJUST.

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Fig. 4: 4EAT Trouble Shooting Chart (2 of 3)
 Courtesy of FORD MOTOR CO.

CONDITION	POSSIBLE SOURCE	ACTION
No Creep	- ATF level and condition. - Kickdown cable. - Selector lever. - Valve body. - Control valves. - Forward clutch. - Reverse clutch. - Oil pump.	- CHECK level and condition. - INSPECT kickdown cable adjustment. - CONFIRM selector linkage adjustment and operation. - INSPECT valve body. - INSPECT control valves. - INSPECT clutches. - INSPECT oil pump.
Engine Stalls When Put Into Gear	- Torque converter. - Valve body. - Control valves.	- INSPECT torque converter. - INSPECT valve body. - INSPECT control valves.

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Fig. 5: 4EAT Trouble Shooting Chart (3 of 3)

Courtesy of FORD MOTOR CO.

TESTING

INTRODUCTION

Perform Preliminary Inspection

Visually inspect for fluid leaks and loose engine or transmission mounts. Check CV joints for wear, damage and binding. Check for low tire pressure, blown fuses, poor wiring condition and loose connectors. Check accelerator and throttle valve linkage travel. Check shift linkage and selector lever for movement, binding and adjustment. Check oil cooler for air flow and leakage.

Review Symptoms

See **TROUBLE SHOOTING** .

Perform QUICK TEST

See **AUTO TRANS DIAGNOSIS - FORD 4EAT** article in AUTOMATIC TRANSMISSIONS. If vehicle passes QUICK TEST, go to STALL TEST.

STALL TEST

1. Engine coolant and transmission fluid must be at proper levels and operating temperatures. Connect tachometer to engine. Apply parking and service brakes firmly. Place selector in "R" position.
2. While observing tachometer, steadily increase engine RPM to maximum speed and release within 5 seconds. **DO NOT** exceed 5-second limit. Engine speed should be within specification. See **STALL SPEEDS** .
3. Run engine in Neutral for one minute to cool transmission. Repeat procedure in each gear. If not within specification, release accelerator immediately. See **STALL TEST RESULTS** . If engine speed is within specification, go to **HYDRAULIC CONTROL SYSTEM TIME LAG TESTING** .

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STALL SPEEDS

Application	Stall RPM
4EAT	2080-2420

STALL TEST RESULTS

High In All Ranges

Insufficient line pressure due to worn or leaking oil pump, control valve and/or case. Pressure regulator valve sticking.

High "OD" Only

One-way clutch No. 2 slipping.

High In Forward Ranges

Forward clutch slipping. One-way clutch No. 1 is slipping.

High In "D" & "L" (Manual)

Coasting clutch slipping.

High In "OD" (Manual)

2-4 band slipping.

High In "R", "L" & "N" (Manual)

Low and reverse clutch slipping.

High In "R"

Low and reverse clutch slipping. Reverse clutch slipping.

Low In All Ranges

Poor engine performance. One-way clutch slipping in torque converter.

HYDRAULIC CONTROL SYSTEM TIME LAG TESTING

1. Engine coolant and transmission fluid must be at proper levels and operating temperature. Apply parking and service brake firmly. Start engine, and idle it at 725-775 RPM.
2. Shift from "N" range to "OD" while measuring elapsed time until transaxle engages in gear. Run engine in Neutral for one minute to cool transmission. Repeat procedure shifting from "N" to "R".
3. Repeat 3 times, and average the results. Refer to the **HYDRAULIC CONTROL SYSTEM TIME LAG** . If transaxle engagement time is not within specification, go to **OIL PRESSURE & CONTROL**

TESTING . If transaxle engagement time is within specification, proceed to **HYDRAULIC CONTROL SYSTEM TIME LAG TEST RESULTS** .

HYDRAULIC CONTROL SYSTEM TIME LAG

Gear Selection	(1) Seconds
"N" To "OD"	0.5-1.0
"N" To "R"	0.5-1.0
(1) If transaxle engagement time lag is below specification, proceed to OIL PRESSURE & CONTROL TESTING .	

HYDRAULIC CONTROL SYSTEM TIME LAG TEST RESULTS

"N" To "OD" High

Insufficient line pressure. Forward clutch or one-way clutch No. 1 & No. 2 slipping.

"N" To "OD" Selection High

N-D accumulator faulty. Excessive line pressure.

"N" To "OD" (Manual) Selection High

Insufficient line pressure. Forward clutch, 2-4 band or one-way clutch No. 1 slipping.

"N" To "OD" (Manual) Selection Low

1-2 accumulator faulty. Excessive line pressure.

"N" To "R" Selection High

Insufficient line pressure. Low and reverse clutch or reverse clutch slipping.

"N" To "R" Selection Low

N-R accumulator faulty. Excessive line pressure.

OIL PRESSURE & CONTROL TESTING

NOTE: This test checks oil pump line pressure, line pressure control, throttle control pressure and oil leakage.

1. Connect tachometer to engine. Connect pressure gauge at line pressure inspection hole (square head plug "L"), located next to oil pump. See **Fig. 6** .
2. With engine idling at 725-775 RPM in Park, shift to Drive and read line pressure at idle. Firmly apply brake pedal. Steadily increase engine RPM to maximum speed and, within 5 seconds, read line pressure (when engine speed stabilizes). Release accelerator. **DO NOT** exceed 5-second limit.

3. Check and record pressure. Repeat step 2) for each gear. Before shifting into each selector position, run engine in Neutral for one minute to cool transmission. If line pressure is within specification, proceed to **THROTTLE PRESSURE TESTING**. Refer to the **CONTROL PRESSURE SPECIFICATIONS**. If line pressure is not within specification, go to **OIL PRESSURE & CONTROL TEST RESULTS**.

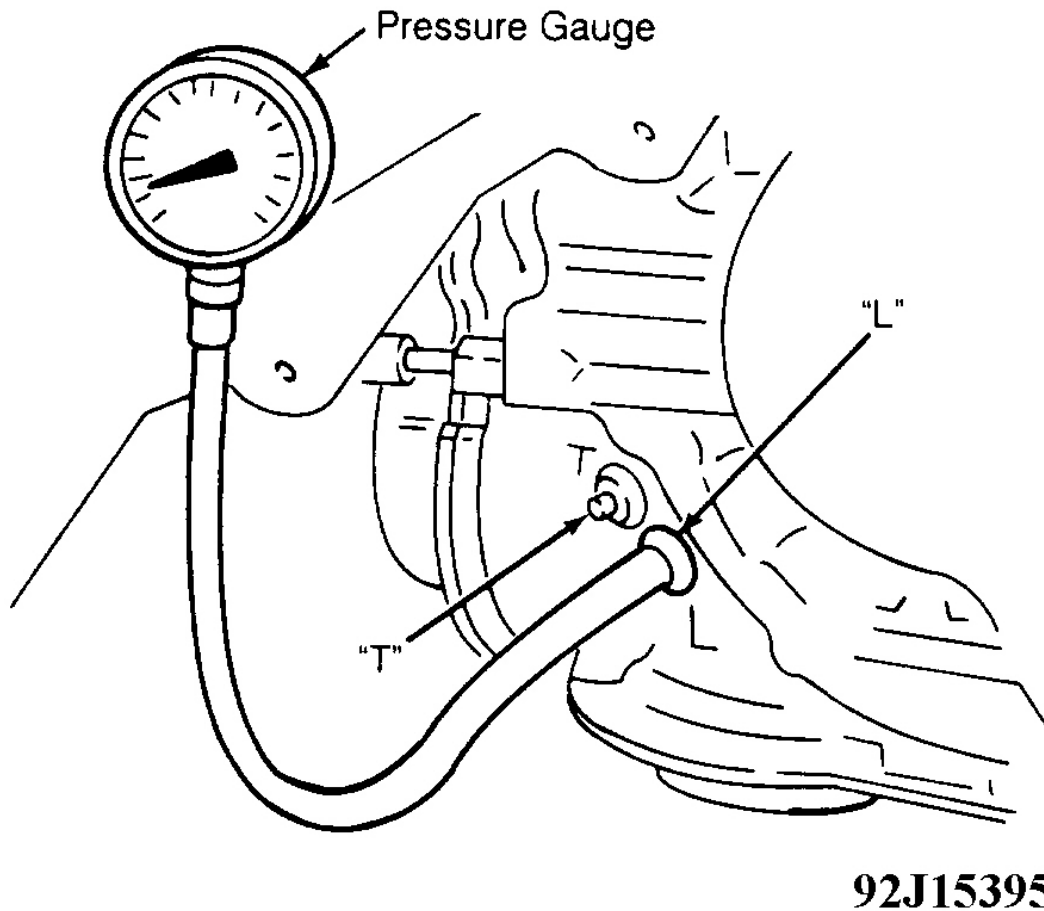


Fig. 6: Connecting Pressure Gauge
Courtesy of FORD MOTOR CO.

CONTROL PRESSURE SPECIFICATIONS

CONTROL PRESSURE SPECIFICATIONS

Drive Range	psi (kPa) @ Idle	psi (kPa) @ WOT Stall
O/D, D, L	63-66 (434-455)	127-151 (876-1041)
R	87-135 (600-931)	240-290 (1655-2000)

OIL PRESSURE & CONTROL TEST RESULTS

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Ensure line pressure is correctly adjusted. See **LINE PRESSURE ADJUSTMENT** under ON-VEHICLE SERVICE. If line pressure cannot be adjusted to specification, use following list to determine cause of trouble.

Low In All Ranges

Worn oil pump. Leaking oil pump or control valve body or case. Pressure regulator valve sticking.

Low In "OD" & "D"

Fluid leaking from reverse clutch.

Low In "R" Only

Fluid leaking from low and reverse band.

High In All Ranges

Throttle valve sticking. Throttle modulator valve sticking. Pressure regulator valve sticking.

THROTTLE PRESSURE TESTING

NOTE: Throttle pressure test checks line pressure for hydraulic components and improper throttle cable adjustments.

1. Connect tachometer to engine. Connect gauge and adapter to throttle inspection hole (square head plug "T"). See **Fig. 6**.
2. With engine idling at 725-775 RPM in Park, shift to Drive and read throttle pressure at idle. Firmly apply brake pedal. Steadily increase engine RPM to maximum speed and, within 5 seconds, read throttle pressure (when engine speed stabilizes). Release accelerator. **DO NOT** exceed 5-second limit.
3. Check and record pressure. Repeat step 2) for each gear. Before shifting into each selector position, run engine in Neutral for one minute to cool transmission. If throttle pressure is within specification, go to **ROAD TEST**. See **THROTTLE PRESSURE SPECIFICATIONS**. If not within specification, go to **THROTTLE PRESSURE TEST RESULTS**.

THROTTLE PRESSURE SPECIFICATIONS

THROTTLE PRESSURE SPECIFICATIONS

Drive Range	psi (kPa) @ Idle	psi (kPa) @ WOT Stall
O/D	6-13 (41-90)	64-83 (441-572)

THROTTLE PRESSURE TEST RESULTS

Too High Or Low

Throttle valve sticking. Improperly adjusted throttle cable.

ROAD TEST

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NOTE: Road test determines if shift control system is functioning properly.**"D" Range Shift Speed**

1. Warm engine to operating temperature. Place gear selector in "D". Turn SHIFT MODE switch to NORM position and cruise control off. Drive vehicle. Accelerate at 1/2 throttle followed by acceleration at full throttle.
2. Observe and record gear shift specifications. Refer to the **"D" RANGE SHIFT SPEED SPECIFICATIONS**. If transaxle gear shift is within specification, go to "L" RANGE SHIFT SPEED heading below. If transaxle gear shift is not within specification, go to appropriate shift symptom chart. See **Fig. 7 -Fig. 8**.

"D" RANGE SHIFT SPEED SPECIFICATIONS**"D" RANGE SHIFT SPEEDS (1.6L)**

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	5850-6450	37-40
.....	2-3	5400-5800	63-68
.....	3-2	3350-3600	58-63
.....	2-1	2800-3100	32-36
Half Throttle ⁽²⁾	1-2	3450-4050	22-25
(1) Full throttle TP sensor voltage is 4.0 volts.			
(2) Half throttle TP sensor voltage is 1.6-2.2 volts.			

"D" RANGE SHIFT SPEEDS (1.8)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	5900-6500	38-42
.....	2-3	5550-5950	66-71
.....	3-2	3350-3650	61-66
.....	2-1	2850-3200	34-38
Half Throttle ⁽²⁾	1-2	3300-3900	22-25
.....	2-3	3650-4300	43-51
(1) Full throttle TP sensor voltage is 4.0 volts.			
(2) Half throttle TP sensor voltage is 1.6-2.2 volts.			

"D" RANGE SHIFT SPEEDS (1.9L)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	4600-5150	30-34
.....	2-3	4850-5300	58-63
.....	3-2	2900-3200	54-59

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.....	2-1	1950-2250	24-27
Half Throttle ⁽²⁾	1-2	2600-3200	17-21
.....	2-3	2800-3400	33-41

(1) Full throttle TP sensor voltage is 4.0 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"D" RANGE SHIFT SPEEDS (2.2L NON-TURBO)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	5000-5500	33-37
.....	2-3	5300-5700	65-70
.....	4-3	3750-4000	102-109
.....	3-2	3050-3350	40-63
.....	2-1	2200-3200	26-30
Half Throttle ⁽²⁾	1-2	3500-4050	24-27
.....	2-3	3750-4250	47-53
.....	4-3	3750-4000	102-109
.....	3-2	1750-2350	33-33

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"D" RANGE SHIFT SPEEDS (2.2L TURBO)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	4900-5500	33-37
.....	2-3	5100-5500	62-67
.....	4-3	3850-4050	102-109
.....	3-2	3050-3350	57-62
.....	2-1	2200-2550	27-31
Half Throttle ⁽²⁾	1-2	3350-4150	24-27
.....	2-3	3850-4350	47-53
.....	4-3	4350-4600	102-109
.....	3-2	1700-2100	33-40

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"D" RANGE SHIFT SPEEDS (3.0L)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	(3)	33-37
.....	2-3	(3)	62-67

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.....	4-3	(3)	102-109
.....	3-2	(3)	57-62
.....	2-1	(3)	27-31
Half Throttle ⁽²⁾	1-2	(3)	24-27
.....	2-3	(3)	47-53
.....	4-3	(3)	102-109
.....	3-2	(3)	33-40

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

(3) Drum RPM information is not available from manufacturer.

"L" Range Shift Speed

1. Warm engine to operating temperature. Place gear selector in "L" position. Turn SHIFT MODE switch to NORM position and cruise control off. Drive vehicle. Accelerate at 1/2 throttle followed by acceleration at full throttle.
2. Observe and record gear shift specifications. Refer to the **"L" RANGE SHIFT SPEED SPECIFICATIONS**. If transaxle gear shift is within specification, go to "O/D" RANGE SHIFT SPEED heading below. If transaxle gear shift is not within specification, go to appropriate shift symptom chart. See **Fig. 7 -Fig. 8**.

"L" RANGE SHIFT SPEED SPECIFICATIONS**"L" RANGE SHIFT SPEED**

Throttle Position	Shift	Drum RPM	MPH
1.6L			
Full Throttle ⁽¹⁾	1-2	5850-6450	37-40
.....	2-1	2800-3100	32-36
Half Throttle ⁽²⁾	1-2	3450-4050	22-25
1.8L			
Full Throttle ⁽¹⁾	2-1	2250-2550	27-30
Half Throttle ⁽²⁾	1-2	4100-4650	27-30
1.9L			
Full Throttle ⁽¹⁾	2-1	2200-2500	27-30
Half Throttle ⁽²⁾	1-2	4050-4600	27-30
2.2L Non-Turbo			
Full Throttle ⁽¹⁾	1-2	5000-5500	33-35
.....	2-1	2200-2400	26-30
Half Throttle ⁽²⁾	1-2	3500-4050	24-27

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2.2L Turbo

Full Throttle ⁽¹⁾	1-2	4900-5500	33-37
.....	2-1	2200-2550	27-31
Half Throttle ⁽²⁾	1-2	3350-4150	24-27

3.0L

Full Throttle ⁽¹⁾	1-2	(3)	33-37
.....	2-1	(3)	27-30
Half Throttle ⁽²⁾	1-2	(3)	24-27

(1) Full throttle TP sensor voltage is 4.3 volts for all 2.2L and 3.0L models; 4.0 volts for all others.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts for all models.

(3) Information is not available from manufacturer.

"O/D" Range Shift Speed

1. Warm engine to operating temperature. Place gear selector in "OD". Turn SHIFT MODE switch to NORM position and cruise control off. Drive vehicle. Accelerate at 1/2 throttle followed by acceleration at full throttle. From cruise, accelerate at full throttle (kickdown).
2. Observe and record gear shift specifications. Refer to **"O/D" RANGE SHIFT SPEED SPECIFICATIONS**. If transaxle gear shift is within specification, go to SLIPPAGE CHECK. If transaxle gear shift is not within specification, go to appropriate shift symptom chart. See **Fig. 7 -Fig. 8**.

"O/D" RANGE SHIFT SPEED SPECIFICATIONS**"O/D" RANGE SHIFT SPEEDS (1.6L)**

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	5850-6450	37-40
.....	2-3	5350-5800	63-68
.....	3-O/D	5930-6300	104-110
Half Throttle ⁽²⁾	1-2	3450-4050	22-25
.....	2-3	3700-4350	43-51
.....	3-O/D	4200-4750	74-85
Kickdown ⁽¹⁾	O/D-3	3850-4100	96-102
.....	O/D-2	2300-2500	58-63
.....	3-2	3350-3600	58-63
.....	2-1	2750-3100	32-36

(1) Full throttle TP sensor voltage is 4.0 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"O/D" RANGE SHIFT SPEEDS (1.8L)

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Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	5900-6500	38-42
.....	2-3	5550-5950	66-71
Half Throttle ⁽²⁾	1-2	3300-3900	22-25
.....	2-3	3650-4300	43-51
.....	3-O/D	4050-4750	74-85
Kickdown ⁽¹⁾	O/D-3	3900-4100	100-107
.....	3-2	3400-3650	61-66
.....	2-1	2950-3200	34-38

(1) Full throttle TP sensor voltage is 4.0 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"O/D" RANGE SHIFT SPEEDS (1.9L)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	4600-5150	30-34
.....	2-3	4850-5300	58-63
.....	3-O/D	4450-4750	82-88
Half Throttle ⁽²⁾	1-2	2600-3200	17-21
.....	2-3	2800-3400	33-41
.....	3-O/D	2750-3300	51-61
Kickdown ⁽¹⁾	O/D-3	2950-3200	78-84
.....	3-2	2900-3200	78-84
.....	2-1	2000-2300	24-27

(1) Full throttle TP sensor voltage is 4.0 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"O/D" RANGE SHIFT SPEEDS (2.2L NON-TURBO)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	4900-5450	33-37
.....	2-3	5100-5500	63-68
.....	3-O/D	2900-3450	102-109
Half Throttle ⁽²⁾	1-2	2800-3350	19-23
.....	2-3	3000-3400	37-42
.....	3-O/D	2900-3450	55-66
.....	O/D-3	1600-1950	43-53
.....	3-2	1200-1550	24-30
Kickdown ⁽¹⁾	O/D-3	3500-3700	95-101
.....	O/D-2	2050-2250	56-61

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.....	O/D-1	950-1100	26-30
.....	3-2	2950-3200	56-61
.....	3-1	1350-1550	26-30
.....	2-1	2100-2400	26-30

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"O/D" RANGE SHIFT SPEEDS (2.2L TURBO)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	4750-5300	32-35
.....	2-3	4900-5300	60-64
.....	3-O/D	5450-5800	102-109
Half Throttle ⁽²⁾	1-2	3200-3850	19-23
.....	2-3	3450-3900	32-42
.....	3-O/D	3350-4000	55-66
.....	O/D-3	1400-1850	33-43
.....	3-2	1250-1550	21-26
Kickdown ⁽¹⁾	O/D-3	3550-3800	95-101
.....	O/D-2	2050-2250	55-60
.....	O/D-1	1000-1150	27-31
.....	3-2	2950-3200	55-60
.....	3-1	1450-1650	27-31
.....	2-1	2250-2550	27-31

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

"O/D" RANGE SHIFT SPEEDS (3.0L)

Throttle Position	Shift	Drum RPM	MPH
Full Throttle ⁽¹⁾	1-2	(3)	32-35
.....	2-3	(3)	60-64
.....	3-O/D	(3)	102-109
Half Throttle ⁽²⁾	1-2	(3)	19-23
.....	2-3	(3)	32-42
.....	3-O/D	(3)	55-66
.....	O/D-3	(3)	33-43
.....	3-2	(3)	21-26
Kickdown ⁽¹⁾	O/D-3	(3)	95-101
.....	O/D-2		55-60

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		(3)	
.....	O/D-1	(3)	27-31
.....	3-2	(3)	55-60
.....	3-1	(3)	27-31
.....	2-1	(3)	27-31

(1) Full throttle TP sensor voltage is 4.3 volts.

(2) Half throttle TP sensor voltage is 1.6-2.2 volts.

(3) Drum RPM information is not available from manufacturer.

Slippage Check

Connect a tachometer to vehicle. Drive the vehicle. Compare vehicle speed and engine speed to indicated drum speeds. Refer to **ENGINE & DRUM SPEED SLIPPAGE** charts. Inspect and repair transaxle as necessary.

ENGINE & DRUM SPEED SLIPPAGE**DRUM SPEED SLIPPAGE**

Gear	Conditions	Drum RPM 1000 with MPH@	Drum RPM 2000 with MPH@	Drum RPM 3000 with MPH@	Drum RPM 4000 with MPH@	Action To Take
1st	L Range, Manual Mode	7	11	20	27	Inspect low and reverse clutch.
1st	O/D Range, Normal Mode	7	11	20	27	Inspect one- way clutch.
2nd	D Range, Manual Mode	20	25	37	50	Inspect 2-4 band.
3rd	O/D Range, Manual Mode	19	38	57	76	Inspect coasting clutch.
O/D	O/D Range, Normal Mode	27	55	81	109	Inspect 3-4 clutch.

ENGINE SPEED SLIPPAGE

Gear	Conditions	Engine RPM	Engine RPM	Engine RPM	Engine RPM	Action To Take
O/D	O/D Range, Normal Mode, Lockup	1000	2000	3000	4000	Inspect torque converter.

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CONDITION	POSSIBLE SOURCE	ACTION
● Engine has Momentary Runaway During 3-2 Downshift	- Coasting bypass valve sticking or damaged. 2-4 band and servo.	- INSPECT, SERVICE or REPLACE. - INSPECT adjustment, SERVICE or REPLACE.
● Hesitation in 3-2 Shift	Valve body.	INSPECT the valve body and solenoid valves.
● No Engine Braking OVERDRIVE to DRIVE	- Fluid blockage to coasting clutch or failed coasting clutch. - Valve body.	- CHECK for blockage and coasting clutch condition. - INSPECT the valve body and solenoid valves.
● No Engine Braking DRIVE to LOW	- Fluid blockage to coasting clutch or failed coasting clutch. 2-4 band and servo. - Valve body. - Control valve.	- INSPECT coasting clutch for blockage or damage. - CHECK adjustment and INSPECT condition. - INSPECT the valve body and solenoid valves. - INSPECT, CLEAN or SERVICE.

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Fig. 7: 4EAT Downshift Symptom Chart
Courtesy of FORD MOTOR CO.

CONDITION	POSSIBLE SOURCE	ACTION
● No 2-3 Upshift	3-4 clutch spring. - Valve body.	- CHECK clutch adjustment and damage. - INSPECT the valve body and solenoid valves.
● No 2nd Gear (Transmission Shifts 1-3)	- Valve body. - Loose 2-4 band.	- INSPECT the valve body and solenoid valves. - ADJUST.
● No Lockup	- Lockup solenoid not functioning. - Torque converter.	- INSPECT the solenoid and related hydraulic circuit. - INSPECT the torque converter.
● Shift Points Incorrect	- Valve body. 2-4 band out of adjustment. - Damaged or worn forward clutch.	- INSPECT the valve body and solenoid valves. - CHECK 2-4 band adjustments. - INSPECT and SERVICE or REPLACE.
● Engine Runaway When Upshifting	- Neutral safety switch. - Valve body. - One way clutch # 1. 2-4 band and servo. 3-4 clutch. - Bypass valve sticking or damaged. - Forward clutch.	- CHECK the adjustment and condition. - CLEAN, SERVICE or REPLACE. - INSPECT, SERVICE or REPLACE. - CHECK the adjustment and condition. - CHECK the condition and SERVICE. - CLEAN, SERVICE or REPLACE. - INSPECT, SERVICE or REPLACE.
● No Upshift into OVERDRIVE	- One way clutch # 1. - Valve body. - Linkage.	- CHECK clutch # 1. - CHECK orifices, solenoid valves and valve body.
● Delayed 1-2 Shift	Valve body.	INSPECT valve body and solenoid valves.

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Fig. 8: 4EAT Upshift Symptom Chart
Courtesy of FORD MOTOR CO.

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CONDITION	POSSIBLE SOURCE	ACTION
Shift Shock in All Ranges	- Kickdown cable out of adjustment. - Throttle valve sticking or damaged. - Control valves. - Coasting clutch. - LOW and REVERSE brake. - Tire pressure. - Accumulators. 3-4 clutch. - CV joints or engine mounts. 2-4 band and servo. - Pressure regulator valve sticking or damaged.	- INSPECT the cable adjustment. - CLEAN, SERVICE or REPLACE. - CHECK for clogging blockage; SERVICE as required. - CHECK for wear; SERVICE or REPLACE. - CHECK for adjustment, wear, and damage; SERVICE as required. - INFLATE to the correct pressure. - CLEAN, SERVICE or REPLACE. - INSPECT, SERVICE or REPLACE. - SERVICE or REPLACE. - CHECK the adjustment. - CLEAN, SERVICE or REPLACE.
Harsh 1-2 Shift	Kickdown cable broken or out of adjustment.	CHECK the kickdown adjustment.
Harsh Engagement NEUTRAL-REVERSE	NEUTRAL-REVERSE accumulator sticking or damaged.	INSPECT, SERVICE or REPLACE.
Harsh Engagement NEUTRAL-OVERDRIVE	NEUTRAL-OVERDRIVE accumulator sticking or damaged.	INSPECT, SERVICE or REPLACE.
2-3 Shift Shock	2-3 accumulator sticking or damaged. 1-2 accumulator sticking or damaged.	- INSPECT and SERVICE or REPLACE. - INSPECT and SERVICE or REPLACE.
Erratic Shifts	- Kickdown cable broken or out of adjustment. - Pulse generator not functioning.	- INSPECT the cable adjustment. - INSPECT the pickup and torque converter.
Soft Shift in All Ranges	- Kickdown cable broken or out of adjustment. - Throttle valve sticking or damaged. - Tire pressure. - Pressure regulator valve sticking or damaged.	- INSPECT the cable adjustment. - CLEAN, SERVICE or REPLACE. - INFLATE to the correct pressure. - CLEAN, SERVICE or REPLACE.
1-2 Soft Shift	- Valve body. 2-4 band is too loose.	- INSPECT the valve body and solenoid valves. - INSPECT the adjustment.
2-3 Soft Shift	2-3 accumulator sticking or damaged. - Valve body.	- CLEAN, SERVICE or REPLACE. - INSPECT the valve body and solenoid valves.
NEUTRAL-REVERSE Soft Shift	NEUTRAL-REVERSE accumulator sticking or damaged.	CLEAN, SERVICE, or REPLACE.
No Lockup	Lockup valve sticking or damaged.	CLEAN, SERVICE or REPLACE.
Drags in Reverse Like Parking Brake is Applied	2-4 band is too tight.	CHECK adjustment.
Slow to Engage in Reverse	Reverse clutch.	INSPECT for damage or wear; SERVICE or REPLACE.

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Fig. 9: 4EAT Shift Quality Symptom Chart
Courtesy of FORD MOTOR CO.

REMOVAL & INSTALLATION

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

TORQUE CONVERTER

1. Torque converter is a sealed unit and cannot be disassembled for service. Replace torque converter if it is found to be defective. Remove any rust from pilot hub and boss of converter. Measure pilot bushing inner diameter. If measurement exceeds 2.090" (53.076 mm), replace torque converter.
2. Using Converter Cleaner (Rotunda 014-00028), flush torque converter. After converter is removed from cleaner, thoroughly drain solvent through hub. Add about .53 qt. (.5L) clean ATF to converter. Agitate fluid by hand. Thoroughly flush ATF from converter hub.

NOTE: **DO NOT clean torque converter by hand using solvent.**

TRANSAXLE DISASSEMBLY

1. Mount transaxle in a stand. Carefully remove torque converter from case. Remove oil pump drive shaft. Remove dipstick tube from case. Remove neutral safety switch, fluid temperature switch and pulse generator.
2. Disconnect solenoid connector. Remove 4EAT wiring harness and clip. Remove oil pipes, oil hoses and switch box as an assembly. Use a magnet to remove ball and spring from plug hole.
3. Remove oil pan and gasket. Remove oil strainer and "O" ring. Remove valve body cover and gasket. Remove kickdown cable and bracket. Remove throttle cam from cable. Pinch teeth of solenoid connector, and remove by pushing inward.
4. Remove retaining bolts from valve body, and carefully remove body. Remove oil pump and gasket. Remove piston stem from servo.
5. Remove turbine shaft retaining ring. Remove clutch assembly, 2-4 band, small sun gear and one-way clutch assembly. Secure 2-4 band using wire to prevent warping.
6. Pull anchor shaft while holding strut, and remove strut. Using a "C" clamp and socket to compress servo, remove retaining ring, servo and spring.
7. Remove one-way clutch retaining ring. Remove one-way clutch and carrier hub assembly. Remove wave washer. Remove low and reverse clutch retaining ring. Remove low and reverse clutch retaining plate and drive and driven plates.
8. Remove internal gear snap ring, and remove gear. Remove "O" ring located on converter housing side of turbine shaft. Pull out turbine shaft, and remove 3-4 clutch assembly.
9. Tap lightly using a plastic hammer to remove transaxle case retaining bolts and case from converter housing. Remove output shell from output gear.
10. Compress return spring and retainer using Spring Compressor (T88C-77000-AH) and Plate (T87C-77000-B). Remove retainer snap ring, return spring and retainer. Remove spring compressor tool. Apply compressed air through low and reverse clutch fluid passage to remove low and reverse clutch piston.
11. Remove plug, washer, spring, detent and bracket. Loosen manual shaft nut, and pull manual shaft out. Remove nut, washer, spacer and manual plate. Remove actuator support.
12. Remove parking assist lever retaining ring and lever. Remove parking pawl retaining ring. Pull out parking shaft, spring and parking pawl.
13. Remove differential and 2-3 accumulator. Remove bearing housing bolt to access roll pin. Remove roll pin using a pin punch. Tapping lightly using a plastic hammer, remove bearing housing. Use a socket to tap out idler and output gear assemblies from torque converter housing.
14. Using a Seal Remover (117-AC) and slide hammer, remove converter seal from bearing-stator support.

Remove converter housing from holding fixture. Remove bearing-stator support bolts. Press bearing-stator support out of torque converter housing using Step Plate (D80L30-10).

15. Use Bearing Puller (T86A-70043-A), Piston Remover (T73L2196-A) and a slide hammer to remove differential bearing cups. Remove adjustment shim(s). Remove differential oil seals using Bearing Cup Puller (T77F-I102-A) and a slide hammer.

COMPONENT DISASSEMBLY & REASSEMBLY

NOTE: For structural view of 4EAT transaxle, see Fig. 10.

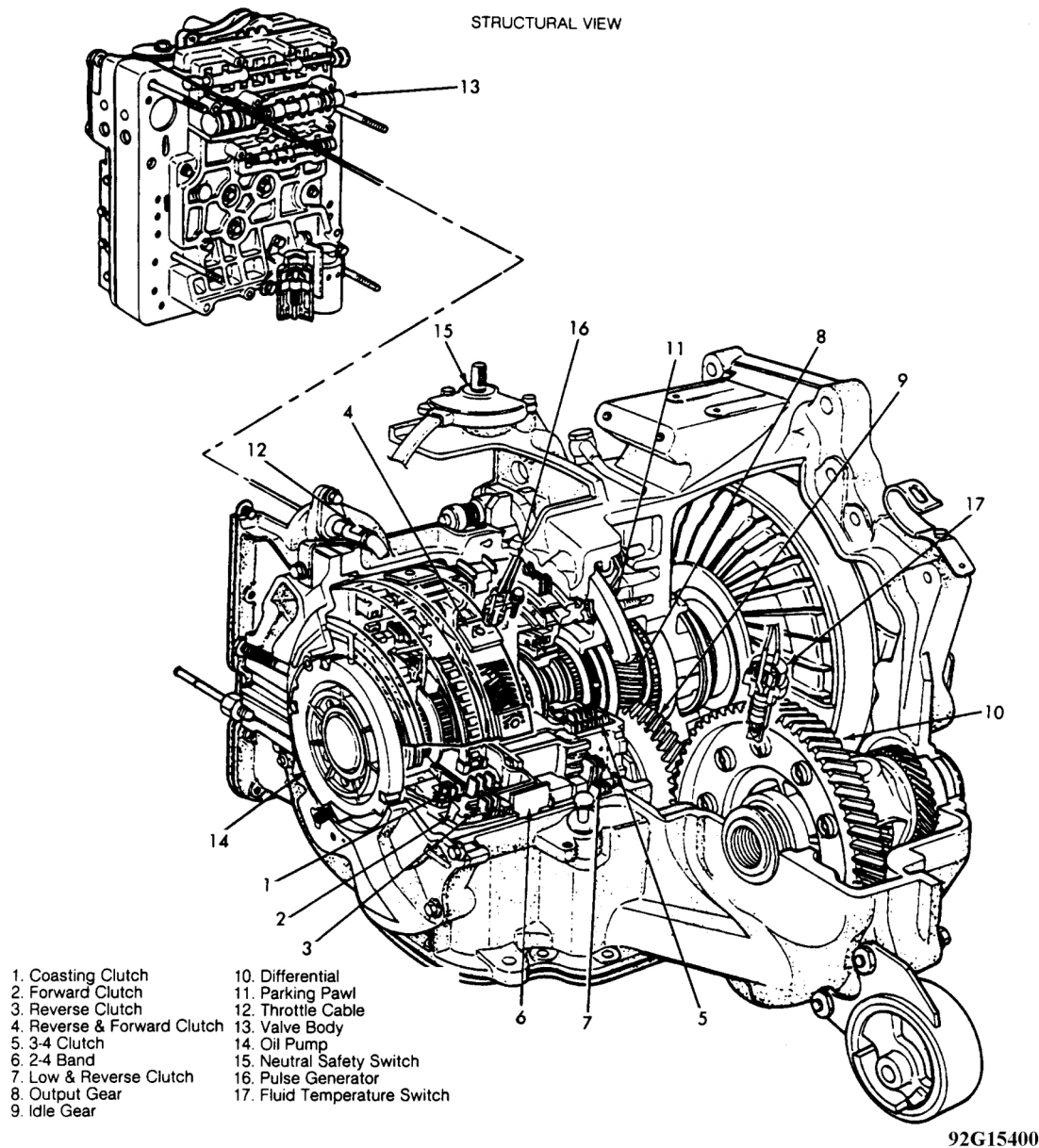


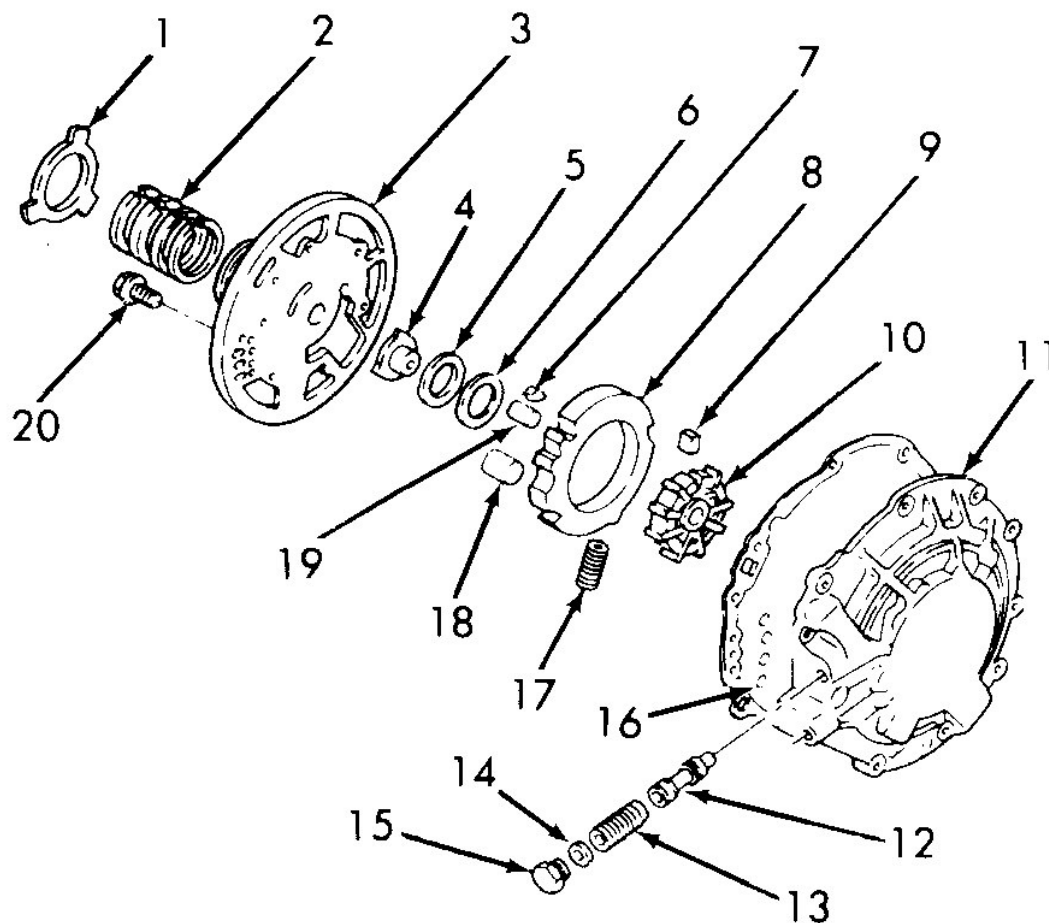
Fig. 10: View of 4EAT Transaxle

Courtesy of FORD MOTOR CO.

OIL PUMP

Disassembly

1. Remove oil pump cover, flange, spring and pivot roller. See **Fig. 11** . Remove guide ring and guide spring.
2. Remove vanes from rotor. Remove cam ring and rotor. Remove seal pin and spring. Remove plug, spring and valve. Remove thrust washer, "O" rings and seal rings from cover. See **Fig. 11** .



CAPRI

- | | |
|-------------------|---------------------|
| 1. Thrust Washer | 12. Valve |
| 2. Seal Ring | 13. Spring |
| 3. Cover | 14. Washer |
| 4. Flange | 15. Plug |
| 5. Guide Ring | 16. "O" Ring |
| 6. Guide Spring | 17. Spring |
| 7. Seal Spring | 18. Pivot Roller |
| 8. Cam Ring | 19. Seal Pin |
| 9. Vane | 20. Bolt |
| 10. Rotor | 21. Inner Pump Gear |
| 11. Oil Pump Body | 22. Outer Pump Gear |

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Fig. 11: Exploded View Of Oil Pump

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Courtesy of FORD MOTOR CO.**Inspection**

Check oil pump for broken or worn seal ring, weakened springs and damaged or worn sliding surfaces. Replace as required. Using Gauge Bar (T80L-77003-A) and a feeler gauge, measure clearances for parts listed in **OIL PUMP COMPONENTS CLEARANCES**. If clearances are not within specifications, replace oil pump.

Reassembly

1. Install valve and spring into oil pump body. Ensure valve moves freely. Install plug, and tighten to specification. Install cam ring, pivot roller and rotor. Install vanes into rotor with flat edges and notches facing upward.
2. Install guide spring and guide ring. Install flange with beveled edge down. Install spring and new "O" rings. Install seal pins with beveled edge down and springs facing toward cam ring.
3. Install oil pump cover to oil pump body. Tighten cover bolts to 71-97 INCH lbs. (8-11 N.m). Install oil pump shaft, and check for smooth operation. Install new seal rings. Apply petroleum jelly to thrust washer, and install washer on oil pump cover. Outer diameter of thrust washer should be 3.46" (88.0 mm).

OIL PUMP COMPONENTS CLEARANCES**OIL PUMP COMPONENTS CLEARANCES**

Application	Standard In. (mm)	Maximum: In. (mm)
Oil Pump Cover Seal Pin	.0002-.0008 (.005-.020)	.0020 (.060)
Oil Pump Cover Rotor	.0002-.0008 (.005-.020)	.0020 (.060)
Oil Pump Cover Cam Ring	.0002-.0008 (.005-.020)	.0020 (.060)
Oil Pump Cover Vane	.0006-.0020 (.015-.050)	.0030 (.080)
Rotor Groove Vane	.0004-.0018 (.010-.045)	.0026 (.065)

OIL PUMP COMPONENTS OUTER DIAMETER

Application	Standard In. (mm)	Minimum: In. (mm)
Oil Pump Body Sleeve	1.102 (28.00)	N/A
Guide Ring	.278 (57.85)	.272 (57.70)
Valve	.472 (12.00)	.467 (11.86)
Seal Pin	.236 (6.00)	.232 (5.90)

OIL PUMP COMPONENTS INNER DIAMETER

Application	Standard In. (mm)	Minimum: In. (mm)
Rotor Bushing	1.102 (28.00)	1.104 (28.05)

OUTPUT GEAR

NOTE: When transaxle is disassembled, output gear and differential bearing preload

are adjusted by selecting shims to insert under bearing cups. Use Shim Selector Sets (T87C-77000-J and T88C-77000-C).

Disassembly

1. Align bearing-stator support using Guide Pins (T80L-77100-A). Press support into converter housing using Step Plate (D80L-630-6). Remove bearing cup and adjustment shim(s) from bearing housing.
2. Insert output gear into converter housing. Place bearing cup over output gear bearing and 4 collars of Shim Selector Set (T87C-77000-J) on converter housing.
3. Install Shim Selector Gauge (T88C-77000-C1) on output gear. Turn two halves of gauge to eliminate any gap. Place bearing housing on collars. Install 4 screws using washer. Tighten to 14-19 ft. lbs. (19-26 N.m).
4. Install Preload Torque Adapter (T88C-77000-DH) on output gear. Using pins provided in Shim Selector Set (T87C-77000-J), loosen gauge halves until all free play is removed and bearing cup is seated. Thread gauge halves together. Measure drag on output gear bearing using an INCH-pound torque wrench. Read preload when output gear starts to turn. Turn gauge using pins until a reading of 4.3-7.8 INCH lbs. (0.5-0.9 N.m) is obtained.
5. Using a feeler gauge, measure gap between 2 halves in 4 spots at 90-degree intervals. See **Fig. 12**. Use largest measurement. Select no more than 7 shims to maintain clearance. Shims are available in .004-.020" (.10-.50 mm) thicknesses.

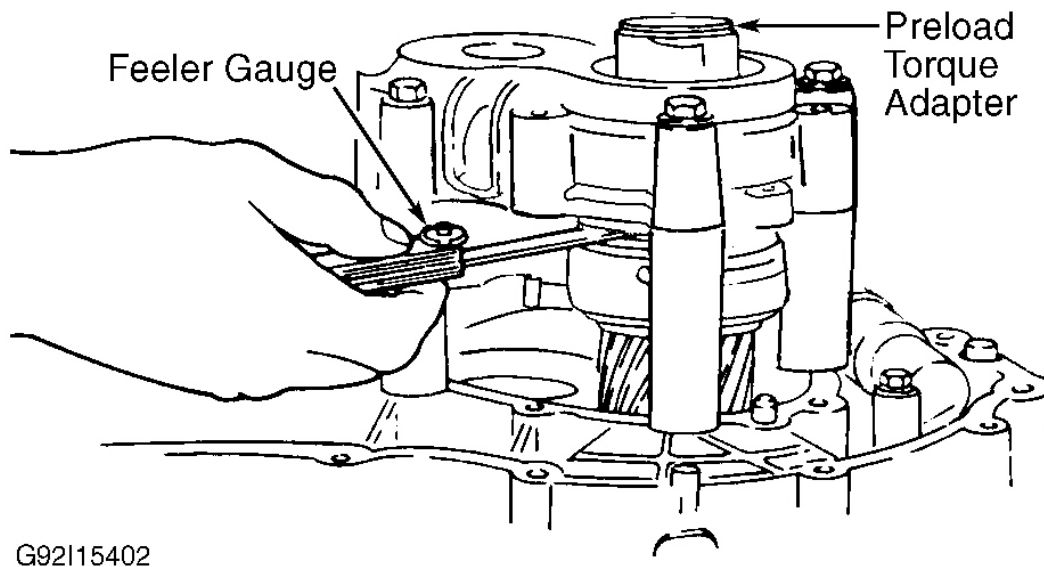


Fig. 12: Measuring Output Gear Preload
Courtesy of FORD MOTOR CO.

Reassembly

1. Remove screws, washers, bearing housing, gauge and bearing cup. Press selected shim(s) and bearing cup into bearing housing using Bearing Installer (T60K-4616-A).
2. Install bearing housing. Tighten retaining bolts to 14-19 ft. lbs. (19-26 N.m). Measure bearing preload. Preload should be .26-7.81 INCH lbs. (.03-.90 N.m). If preload is not within specification, repeat procedure. Remove bearing housing when proper preload specification is obtained.

DIFFERENTIAL

Disassembly

1. Remove rear bearing cup and shims from case; use Stator And Sprocket Bearing Remover (T86P-70043-A), Disc Brake Piston Remover (T73L-2196-A) and Slide Hammer (T50T-100-A). Install front bearing cup into converter housing using Driver Handle And Differential Bearing Cup Replacer (T88C-77000-FH).
2. Insert differential into converter housing. Place 6 collars of Shim Selector Set (T87C-77000-J) on converter housing. Install rear bearing cup over differential bearing. Using Shim Selection Gauge (T88C-77000-C1) on output gear, turn 2 halves of gauge to eliminate any gap.
3. Install transaxle case. Tighten to 27-38 ft. lbs. (36-52 N.m). Using shim selection kit pins, unthread gauge halves until all free play is removed and bearing is seated. Thread gauge halves back together.
4. Using a Differential Rotator (T88C-77000L) and INCH-pound torque wrench, measure drag on differential bearing. Read preload when differentials starts turning. Using pins of Shim Selector Set (T87C-77000-J), turn gauge until a reading of 4.3 INCH lbs. (.5 N.m) is obtained.
5. Using a feeler gauge, measure gap between 2 halves in 4 spots at 90-degree intervals. See **Fig. 13** . Use largest measurement, and add .008" (.20 mm). Select no more than 3 shims to maintain clearance. Shims are available in .004-.040" (.10-1.00 mm) thicknesses.

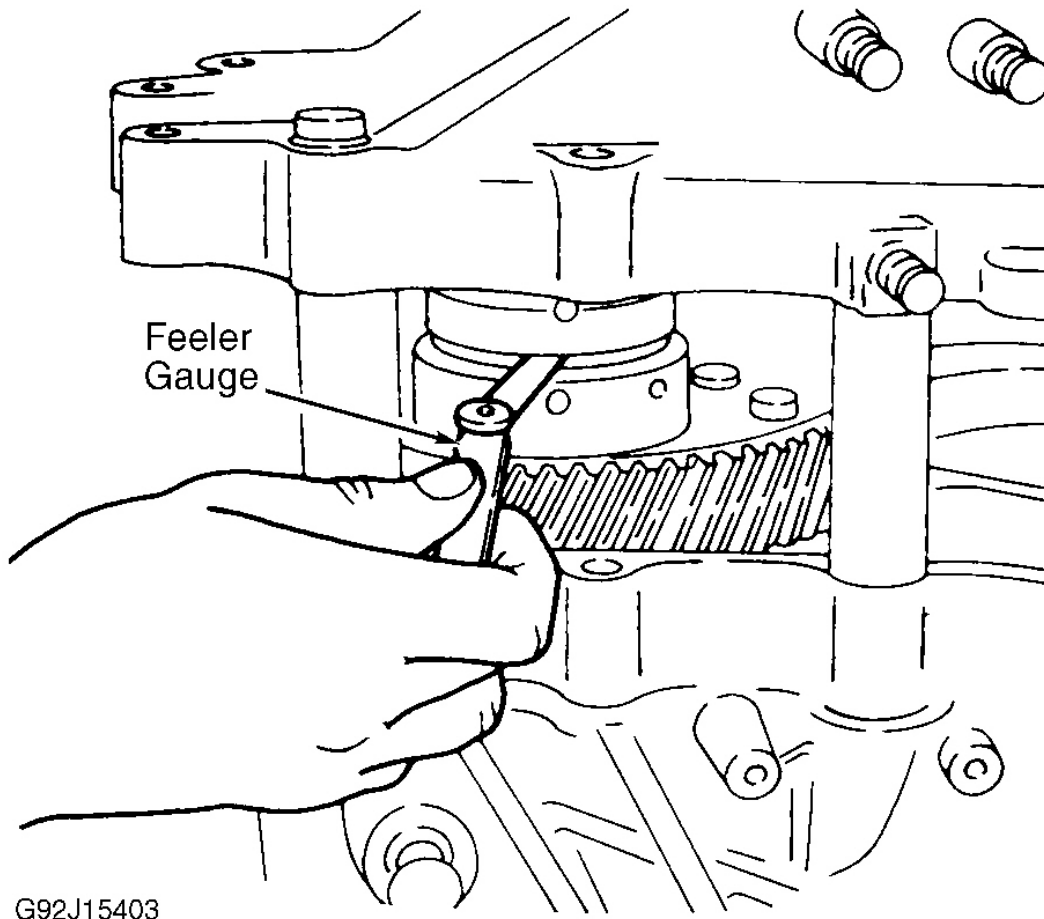


Fig. 13: Measuring Differential Preload
 Courtesy of FORD MOTOR CO.

Reassembly

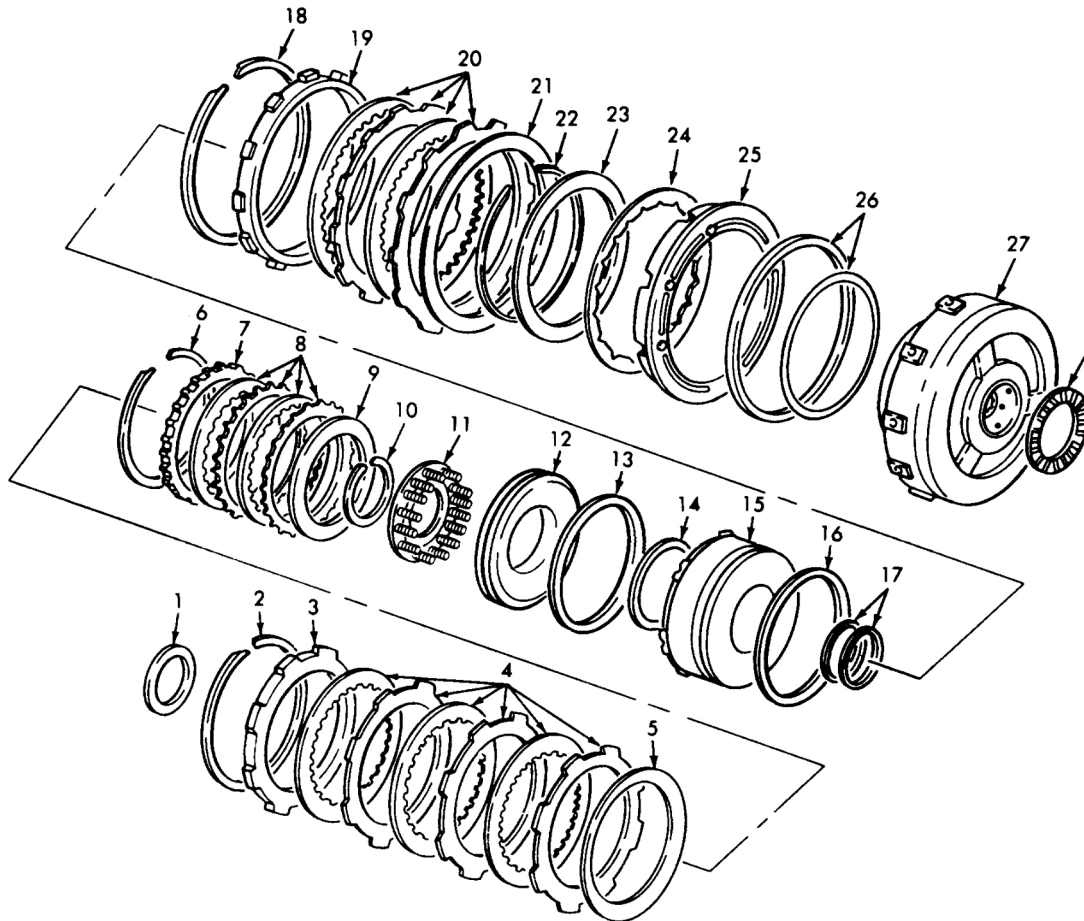
1. Remove screws, washers, case, gauge and bearing cup. Use Drive Handle (T80T-4000-W) and Bearing Cup Replacer (T88C-77000-FH) to install selected shim(s) and bearing cup into case.
2. Install transaxle case. Tighten retaining bolts to 27-38 ft. lbs. (36-52 N.m). Measure bearing preload. Preload should be 26-35 INCH lbs. (2.9-3.9 N.m). If preload is not within specification, repeat procedure. Remove transaxle case when proper preload specification is obtained.

FORWARD CLUTCH

NOTE: 2.2L EFI engine uses 3 drive plates and 3 driven plates. All other models utilize 4 of each plate.

Disassembly

Remove needle bearing, retaining ring and pressure plate. Remove forward clutch pack and dished plate. See **Fig. 14** and **Fig. 15**.



Forward Clutch

1. Needle Bearing
2. Snap Ring
3. Pressure Plate
4. Clutch Pack
5. Dished Plate

Coasting Clutch

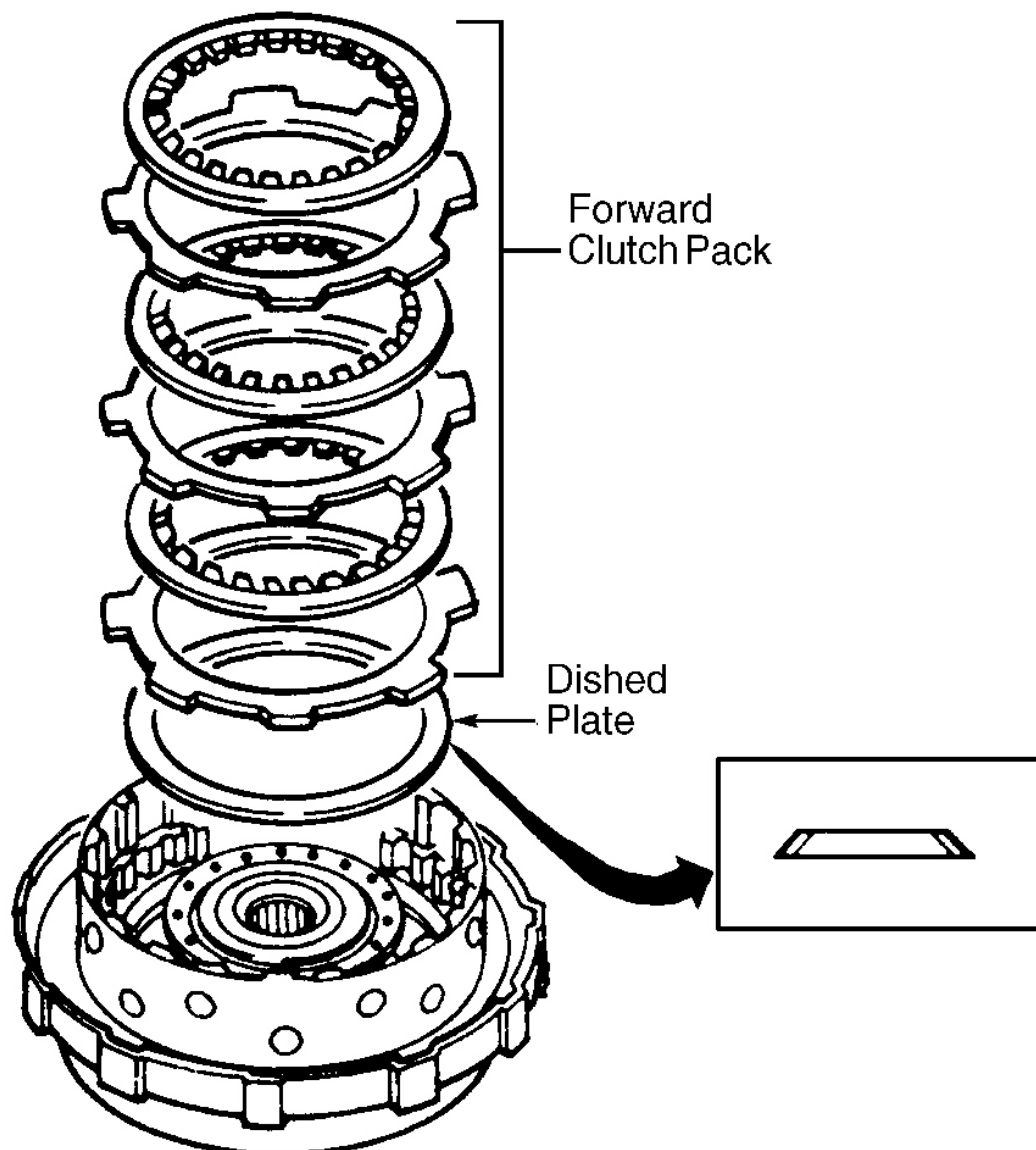
6. Snap Ring
7. Pressure Plate
8. Clutch Pack
9. Dished Plate
10. Snap Ring
11. Return Spring & Retainer
12. Coasting Piston
13. Outer Seal
14. Inner Seal
15. Coasting Clutch Drum
16. Outer Seal
17. Seal Rings

Reverse Clutch

18. Snap Ring
19. Pressure Plate
20. Clutch Pack
21. Dished Plate
22. Snap Ring
23. Return Spring Stopper
24. Piston Return Spring
25. Reverse Piston
26. Seal Rings
27. Reverse & Forward Drum

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Fig. 14: Exploded View Of Clutch Assemblies
Courtesy of FORD MOTOR CO.



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Fig. 15: Exploded View Of Forward Clutch
Courtesy of FORD MOTOR CO.

Inspection

Inspect all parts for wear, damage and effects of overheating. Check body thoroughly for wear and damage. Replace all parts as necessary.

Reassembly

1. Install dished plate with beveled side facing up. Install forward clutch pack. Install pressure plate and retaining ring.
2. Using a feeler gauge, check clearance between retaining ring and pressure plate. If clearance is not .040-.047" (1.0-1.2 mm), install a different pressure plate.
3. Pressure plates are available in following thicknesses: .232" (5.90 mm), .240" (6.10 mm), .248" (6.30 mm), .256" (6.50 mm), .264" (6.70 mm) and .350" (8.90 mm). Set forward and reverse drum on oil pump. Check clutch operation by applying air pressure through forward clutch, coasting clutch and reverse clutch fluid passages.
4. Clutch pack should compress and pressure should not exceed 57 psi (392 kPa). Pour specified transmission fluid until reverse piston, coasting clutch drum and coasting piston are submerged. Apply short burst of air through fluid passages. No bubbles should appear between piston and drum seal.
5. Pressure should not exceed 57 psi (392 kPa). Apply petroleum jelly to needle bearings, and install bearings on both sides of clutch assembly. Oil pump side outer diameter is 3.39" (86.0 mm) and one-way clutch side outer diameter is 2.21" (56.1 mm).

COASTING CLUTCH

NOTE: Coasting clutch pack consists of 2 drive plates and 2 driven plates.

Disassembly

1. Remove retaining ring, pressure plate, coasting clutch pack and dished plate. See **Fig. 14** and **Fig. 16**.
2. Install Spring Compressor (T65L-77515-A), and compress return spring and retainer. Remove retaining ring. Remove spring compressor. Remove return spring and retainer.
3. Remove coasting clutch drum from clutch assembly using compressed air. Remove coasting piston from drum.

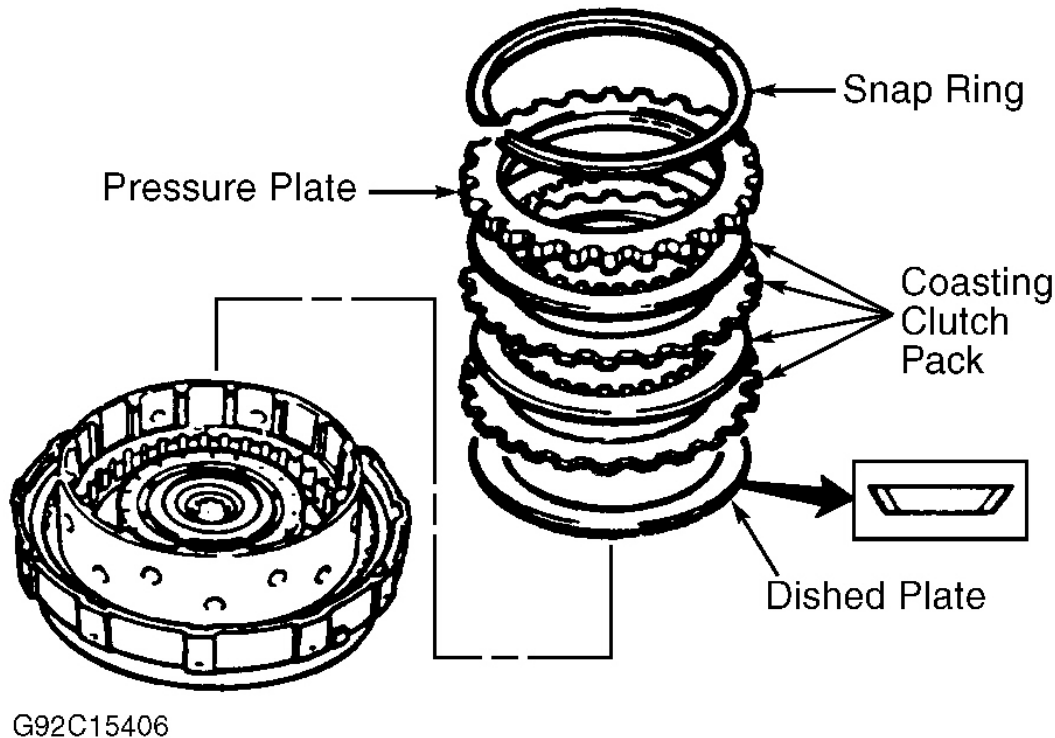


Fig. 16: Exploded View Of Coasting Clutch
 Courtesy of FORD MOTOR CO.

Inspection

Inspect all parts for wear, damage and effects of overheating. Inspect body for damage and wear. Replace as necessary.

Reassembly

1. Install new "O" rings on coasting piston. Apply transmission fluid to "O" rings, and install piston into coasting clutch drum. Roll outer "O" ring lip down to ease installation.
2. Install coasting clutch drum into reverse and forward drum. Install return spring and retainer. Use spring compressor to compress spring and retainer. Install snap ring.
3. Carefully remove spring compressor. Install dished plate with beveled side down. Install coasting clutch pack. Install pressure plate, and secure pack using snap ring.
4. Using a feeler gauge, check clearance between retaining ring and pressure plate. If clearance is not .040-.047" (1.00-1.20 mm), install a different pressure plate.
5. Pressure plates are available in following thicknesses: .232" (5.90 mm), .240" (6.10 mm), .248" (6.30 mm), .256" (6.50 mm), .264" (6.70 mm) and .350" (8.90 mm).

REVERSE CLUTCH

NOTE: Reverse clutch pack consists of 2 drive plates and 2 driven plates.

Disassembly

1. Remove snap ring, pressure plate, reverse clutch pack and dished plate. See **Fig. 14** and **Fig. 17**.
2. Using Spring Compressor (T88C-7700-AH), compress piston return spring. Remove one end of snap ring from groove using snap ring pliers. Once snap ring is started, remove it using a screwdriver.
3. Place clutch on oil pump. Apply compressed air to fluid passage, and remove reverse piston.

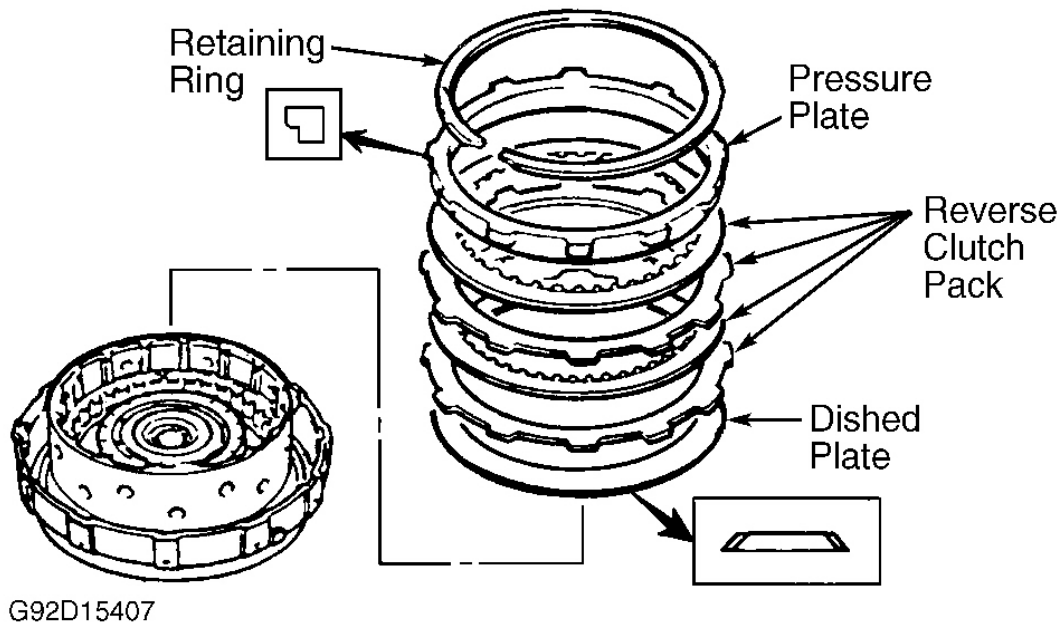


Fig. 17: Exploded View Of Reverse Clutch
Courtesy of FORD MOTOR CO.

Inspection

Inspect all parts for wear, damage and effects of overheating. Check body thoroughly for wear and damage. Replace all parts as necessary.

Reassembly

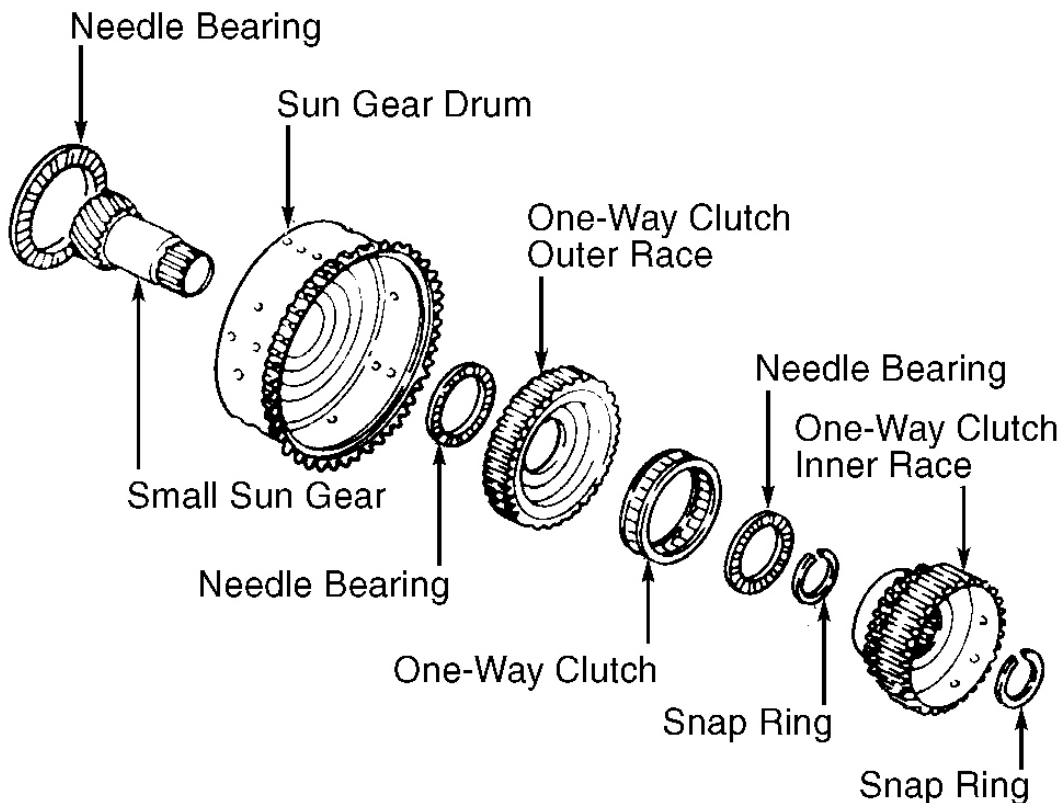
1. Install new "O" rings on reverse piston. Apply transmission fluid to "O" rings. Use Seal Protector (T88C-77000-GH) to install piston into reverse and forward drum. If necessary, use a screwdriver to seat piston.
2. Remove seal protector. Install piston return spring with tabs facing away from piston. Install return spring stopper with step facing upward. Install retaining ring half-way down reverse and forward drum.

3. Using spring compressor, compress spring. Install retaining ring using a screwdriver. Remove spring compressor. Install dished plate with beveled side facing upward. Install reverse clutch pack.
4. Install pressure plate with step facing down. Install snap ring. Using a feeler gauge, check clearance between retaining ring and pressure plate. If clearance is not .059-.071" (1.50-1.80 mm), install a different pressure plate.
5. Pressure plates are available in following thicknesses: .283" (7.20 mm), .291" (7.40 mm), .299" (7.60 mm), .301" (7.80 mm), .315" (8.00 mm) and .323" (8.20 mm).

SMALL SUN GEAR & ONE-WAY CLUTCH

Disassembly

1. Remove snap ring and one-way clutch inner and outer races. See **Fig. 18**.
2. Remove snap ring and small sun gear from drum. Separate one-way clutch inner race from outer race. Remove one-way clutch and needle bearing.



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Fig. 18: Exploded View Of Small Sun Gear & One-Way Clutch
Courtesy of FORD MOTOR CO.

Inspection

Thoroughly clean and inspect all components for damage, wear and effects of overheating. Replace as required.

Reassembly

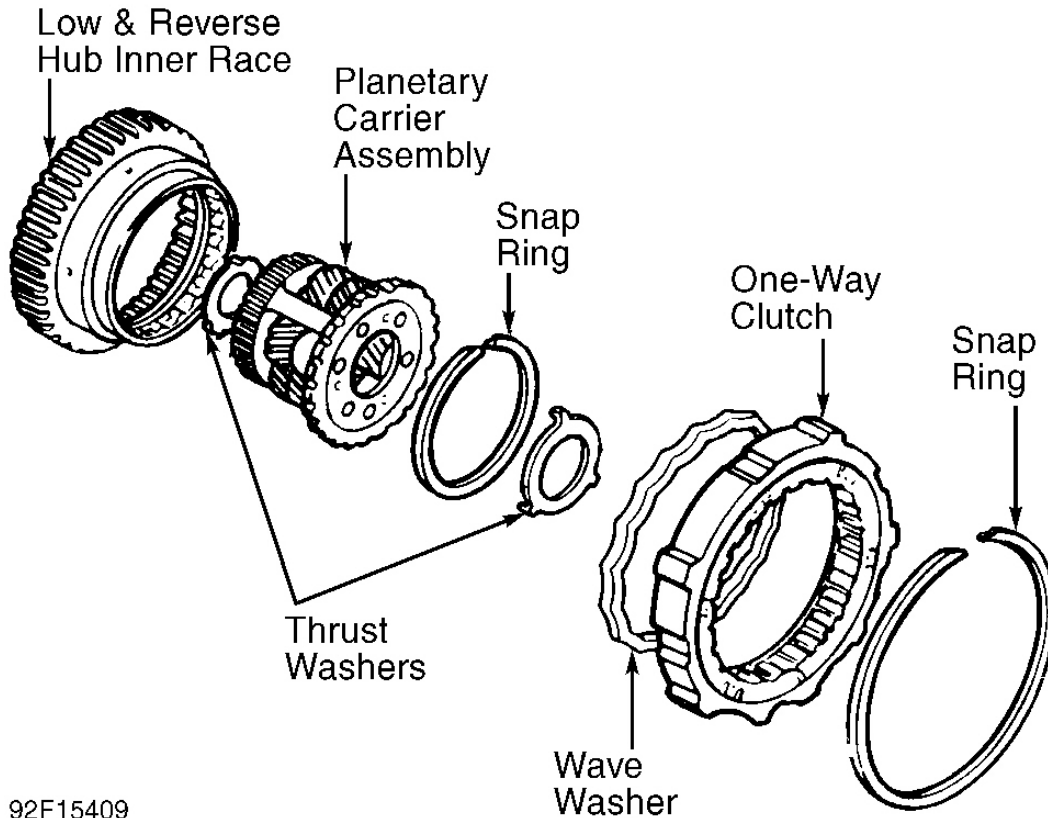
1. Apply petroleum jelly to needle bearing, and install bearing into one-way clutch inner race. Outer diameter is 2.44" (62.1 mm). Install one-way clutch into outer race. Ensure spring cage faces toward outer race.
2. Install one-way clutch inner race into outer race by turning inner race counterclockwise. Ensure inner race turns counterclockwise only.
3. Install small sun gear into drum, and install retaining ring. Install one-way clutch inner and outer races to sun gear drum. Ensure one-way clutch inner race and small sun gear clutch hub splines are aligned. Install snap ring.
4. Hold small sun gear, and ensure one-way clutch outer race turns smoothly and only clockwise. Apply petroleum jelly to needle bearing, and install bearing to sun gear drum. Outer diameter is 2.83" (72.0 mm).

ONE-WAY CLUTCH & PLANETARY CARRIER**Disassembly**

1. Remove one-way clutch, thrust washers and snap ring. See **Fig. 19**.
2. Remove planetary carrier assembly from inner race. Place one-way clutch on inner race, and ensure clutch rotates smoothly and clockwise only.

Reassembly

1. Assemble planetary gear to inner race. Install retaining ring.
2. Apply petroleum jelly to thrust washer, and install washer on clutch and planetary carrier assembly. Outer diameter should be 2.83" (72.0 mm) on sun gear drum side and 2.21" (57.0 mm) on 3-4 clutch side. Install one-way clutch.



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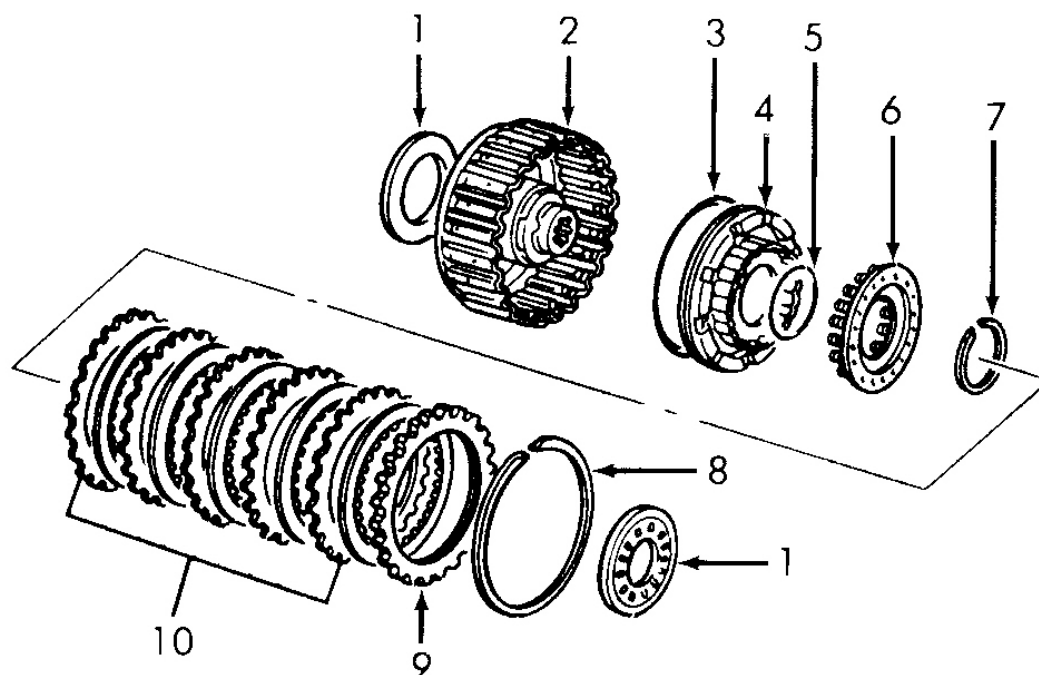
Fig. 19: Exploded View Of One-Way Clutch & Planetary Carrier
Courtesy of FORD MOTOR CO.

3-4 CLUTCH

NOTE: 3-4 clutch pack consists of 5 drive plates and 5 driven plates.

Disassembly

1. Remove needle bearings and snap ring. Remove pressure plate and clutch pack. See **Fig. 20**.
2. Using Spring Compressor (T65L-77515-A), compress return spring and retainer assembly and remove snap ring. Remove compressor.
3. Remove return spring and retainer. Using Leak Check Adapter (T88C-77000-JH), remove piston using compressed air. Remove inner and outer seals from piston.



1. Needle Bearing
2. 3-4 Clutch Drum
3. Outer Seal
4. 3-4 Clutch Piston
5. Inner Seal

6. Return Spring & Retainer
7. Snap Ring
8. Snap Ring
9. Pressure Plate
10. 3-4 Clutch Pack

92115410

Fig. 20: Exploded View Of 3-4 Clutch
 Courtesy of FORD MOTOR CO.

Inspection

Check drive and driven plates for damage and wear. Minimum thickness should be .055" (1.4 mm). Check for broken or worn springs. Free length of springs should be 1.307" (33.20 mm).

Reassembly

1. Install new "O" rings on 3-4 clutch piston. Apply transmission fluid. Using spring compressor, compress return spring and retainer assembly. Install retaining ring. Remove compressor.
2. Install 3-4 clutch pack. Install pressure plate with step facing upward. Install snap ring.
3. Using a feeler gauge, check clearance between snap ring and pressure plate. If clearance is not .051-.059" (1.30-1.50 mm), install a different pressure plate.
4. Pressure plates are available in following thicknesses: .157" (4.00 mm), .165" (4.20 mm), .173" (4.40 mm)

mm), 1.81" (4.60 mm) and .189" (4.80 mm).

5. Apply petroleum jelly to needle bearings, and install needle bearings on 3-4 clutch. Outer diameter is 2.21" (56.1 mm) for carrier side and 2.84" (72.1 mm) for output shell side. Install leak check adapter, and apply compressed air to check clutch operation. **DO NOT** apply over 57 psi (392 kPa) air pressure for more than 3 seconds.
6. Pour specified transmission fluid into clutch drum so 3-4 piston is fully submerged. Apply compressed air and ensure no bubbles come from clutch piston seal.

2-3 ACCUMULATOR

Disassembly

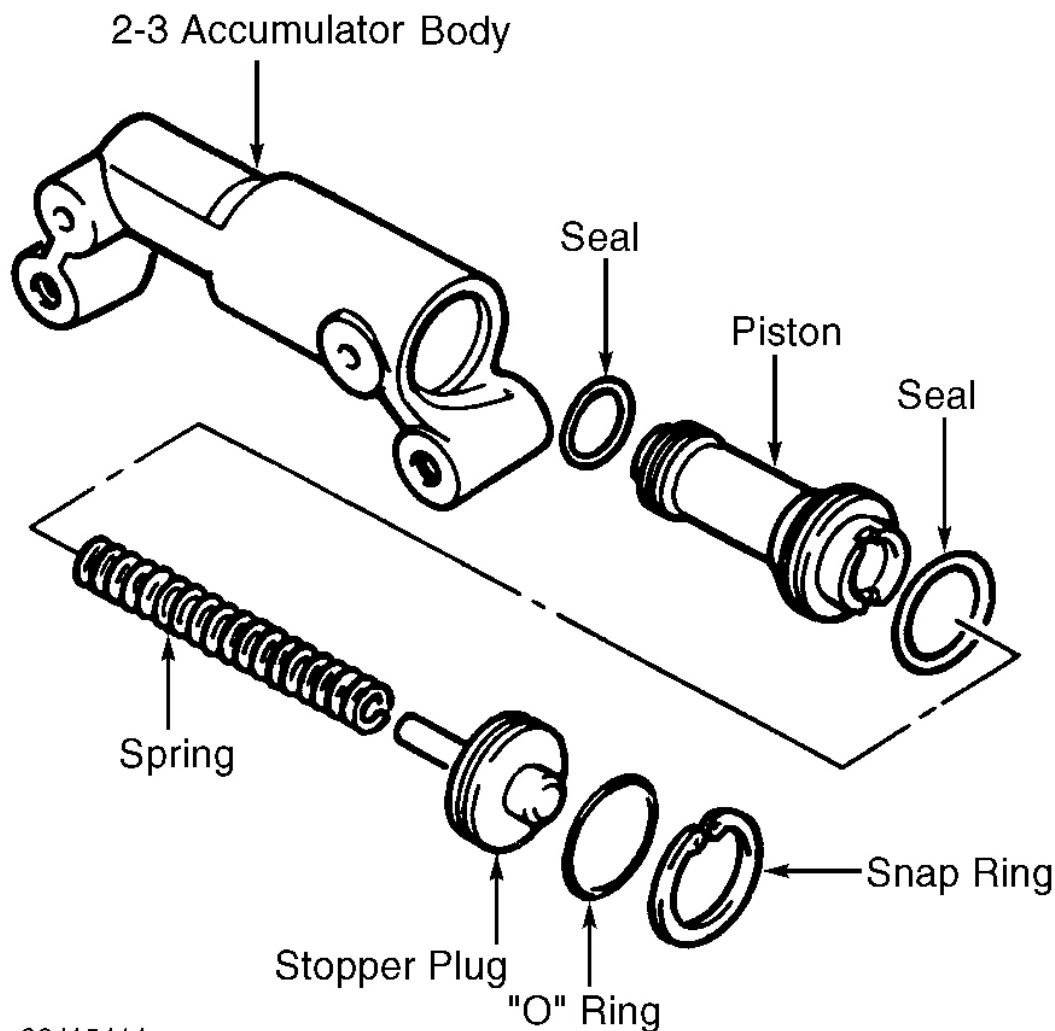
1. Remove snap ring while holding in stopper plug. Remove stopper plug. See **Fig. 21**.
2. Remove spring, piston, stopper plug "O" ring and seals from piston.

Inspection

Check for damaged or worn piston or stopper plug. Check for broken or worn spring. Free length should be 3.280" (83.30 mm) for non-turbo models and 2.968" (75.40 mm) for turbo models.

Reassembly

Reverse disassembly procedure.



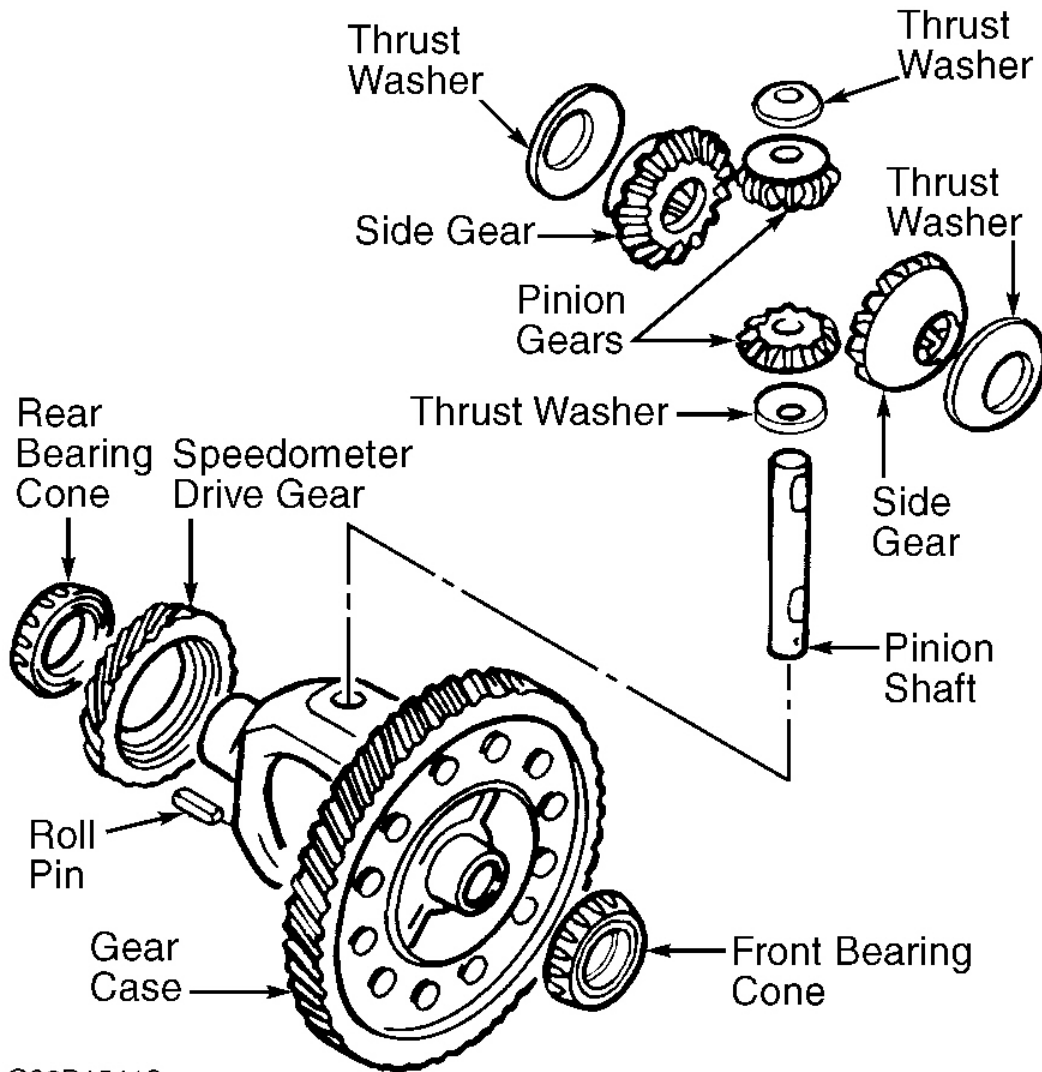
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Fig. 21: Exploded View Of 2-3 Accumulator
Courtesy of FORD MOTOR CO.

DIFFERENTIAL ASSEMBLY

Disassembly

1. Remove roll pin and pinion shaft. See **Fig. 22** . Remove pinions, and rotate thrust washers out of gear case.
2. Remove side gears and thrust washers. Using a bearing puller, remove speedometer drive gear and rear bearing cone. Remove speedometer drive gear.
3. Using a bearing puller, remove front bearing cone.



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Fig. 22: Exploded View Of Differential
 Courtesy of FORD MOTOR CO.

Side Gear & Pinion Backlash Check

Install left and right half-shafts into differential. Support half-shafts on "V" blocks. See **Fig. 23**. Using a dial indicator and Magnetic Base/Flex Arm (D78P-4201-C), measure backlash of both pinion gears. Backlash should be 0-.004" (0-.10 mm). Replace differential assembly if specification is exceeded.

Reassembly

1. Using either a driver handle or press and Bearing Cone Replacer (T88C-77000-EH), install speedometer drive gear and front and rear bearing cones.

2. Install thrust washers, pinion gears and pinion shaft. Install and crimp knock pin. Install thrust washers and side gears.

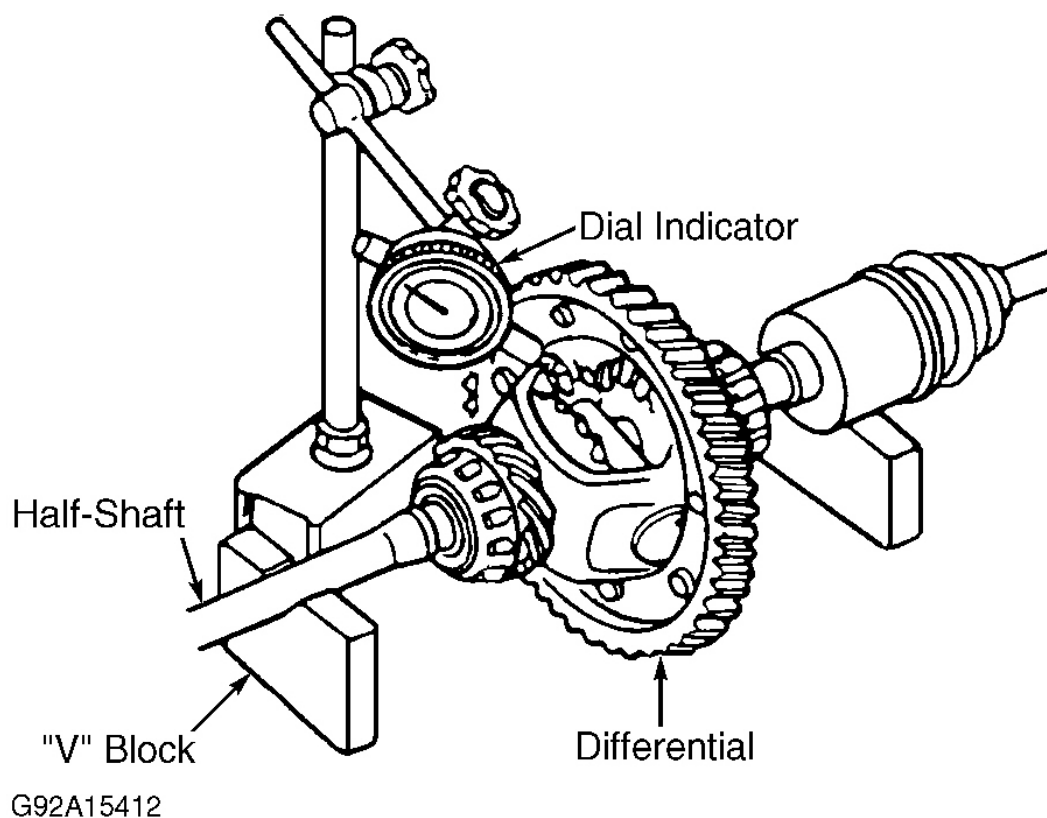


Fig. 23: Checking Side Gear & Pinion Backlash
Courtesy of FORD MOTOR CO.

OUTPUT GEAR

Disassembly & Reassembly

Remove seal rings. See **Fig. 24** . Using bearing puller, press off bearings. Reverse procedure to reassembly.

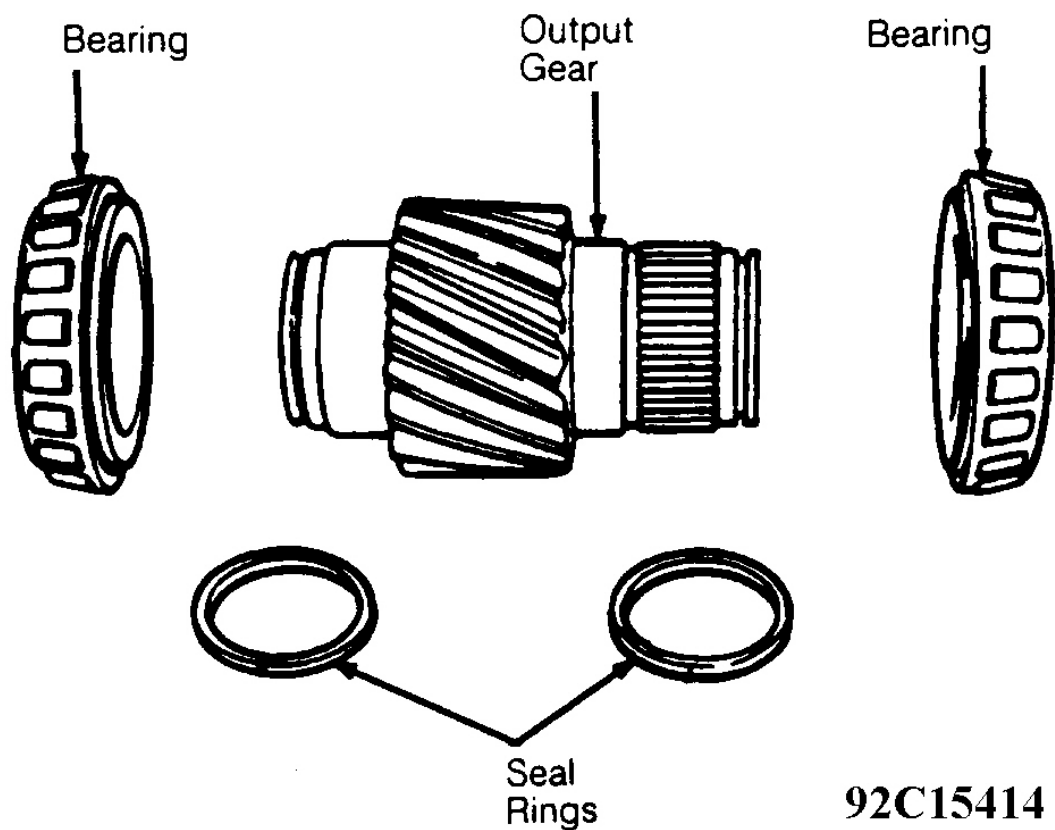


Fig. 24: Exploded View Of Output Gear
Courtesy of FORD MOTOR CO.

IDLER GEAR

Disassembly

1. Using Torque Adapter (T87C-77000-E), secure idler shaft in a vise. Using Mainshaft Lock Nut Wrench (T88T-7025-A) and a 1 5/8" socket, remove lock nut.
2. Remove bearing, spacer and idler gear from idler shaft. See **Fig. 25** . Remove adjustment shim and other bearing. Using puller and slide hammer, remove bearing cups.

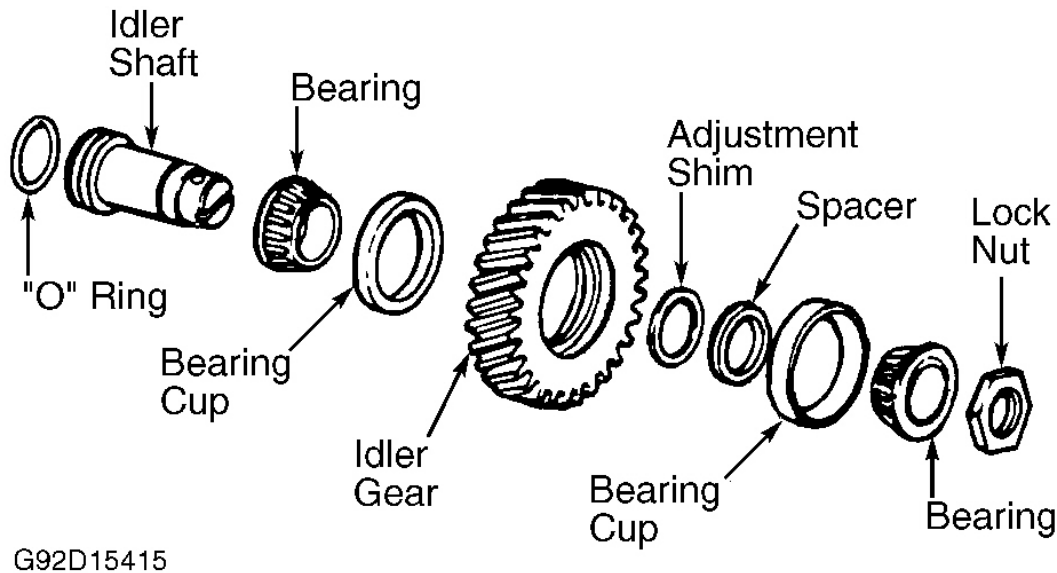


Fig. 25: Exploded View Of Idler Gear
 Courtesy of FORD MOTOR CO.

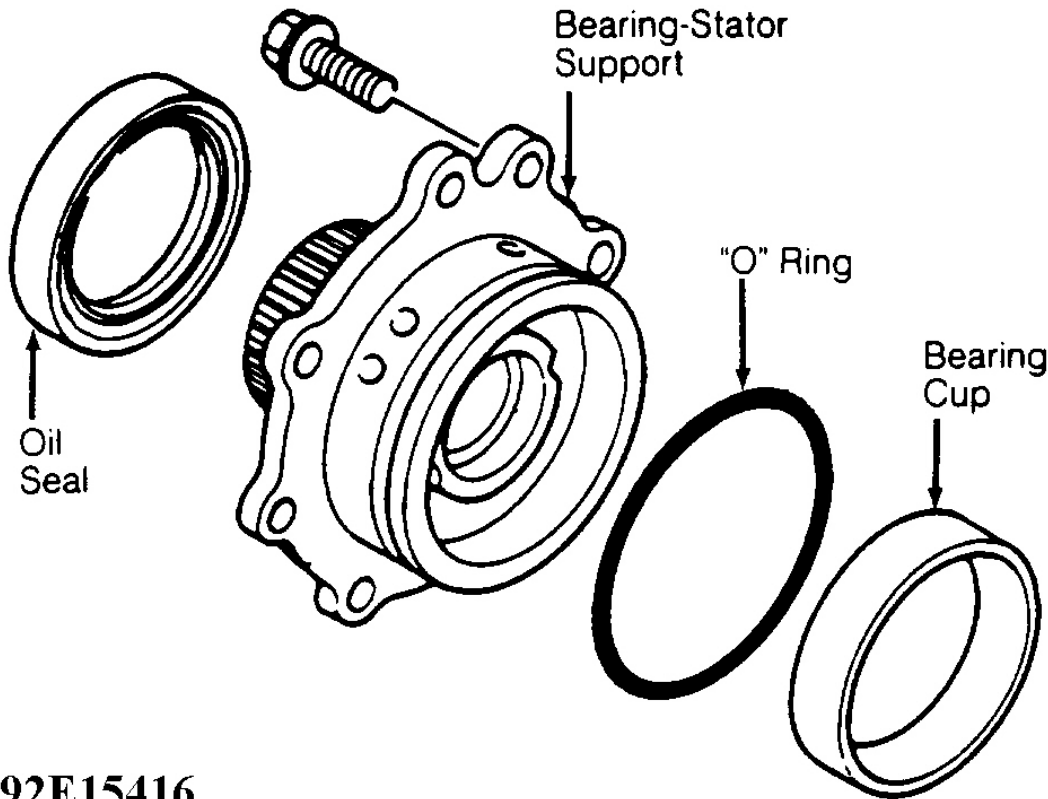
Reassembly

1. Press bearing cups into Idler gear. Install bearing on idler shaft. Install adjust shim, spacer and idler gear. Install other gear bearing.
2. Secure idler shaft in a vise using adapter. Use protective plates to prevent damage to adapter. Tighten lock nut to 94 ft. lbs. (128 N.m).
3. Turn idler gear and adapter over in vise. Measure preload while tightening lock nut to 94-130 ft. lbs. (128-177 N.m). Preload should be .26-.78 INCH lbs. (.03-.9 N.m). Read preload when idler shaft starts to turn.
4. If preload is not within specified range, adjustment shims are available in following thicknesses: .004" (.10 mm), .005" (.12 mm), .006" (.14 mm), .0063" (.16 mm), .007" (.18 mm), .008" (.20 mm) and .020" (.50 mm). **DO NOT** use more than 7 shims.

BEARING-STATOR SUPPORT

Disassembly & Reassembly

1. Remove bearing cup using pin punch. Remove "O" ring. See **Fig. 26**.
2. To reassemble, install "O" ring and press bearing cup into cover.



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Fig. 26: Exploded View Of Bearing-Stator Support
 Courtesy of FORD MOTOR CO.

VALVE BODY

NOTE: Each valve body bolt has a letter on bolt head which matches letter placed near bolt hole.

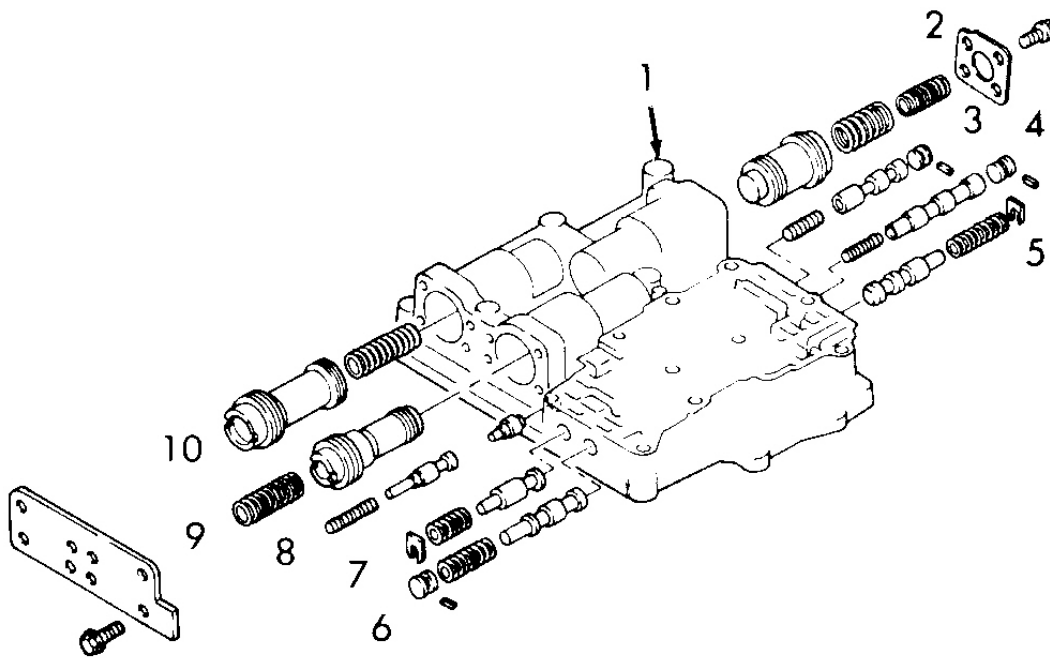
Disassembly

1. Remove 3-4 solenoid valve, lock-up solenoid, 1-2 solenoid valve and 2-3 solenoid valve. Remove wiring harness and brackets. Remove fluid strainers and "O" rings.
2. Remove front control body bolts. Remove front control body with pre-main separator as a unit. Remove pre-main separator and front gasket from front control body. Remove relief valve with .031" (.8 mm) orifice and spring from pre-main control body.
3. Remove pre-main control body retaining bolts. See **Fig. 27** . Remove pre-main control body and main separator as a unit. Remove pre-main rear gasket, main front gasket and main separator from pre-main control body. Remove relief valves with .079" (2.00 mm) and .098" (2.50 mm) orifices and springs from pre-main control body. Remove check ball and spring from pre-main control body. Remove relief valve with .035" (.90 mm) orifice and spring from main control body. See **Fig. 28** . Remove check ball and

spring from main control body.

4. Turn assembly over, and remove rear control body retaining bolts. Remove rear control body and rear separator as a unit. Remove main rear gasket and rear separator from rear control body. Remove relief valves with .039" (1.00 mm), .059" (1.50 mm) and .078" (2.00 mm) orifices and springs from rear control body. See **Fig. 29**.
5. Remove relief valve with .098" (2.50 mm) orifice and spring from main control body. Remove rubber ball from main control body.
6. Individual valves and springs are removed by removing retaining clips and bore plugs. Some valves are aluminum and cannot be removed using a magnet. Tap valve body on palm of hand to slide valve out of bore. If using a pick becomes necessary to remove valves and springs, use extreme caution to prevent damage to valves and bores.

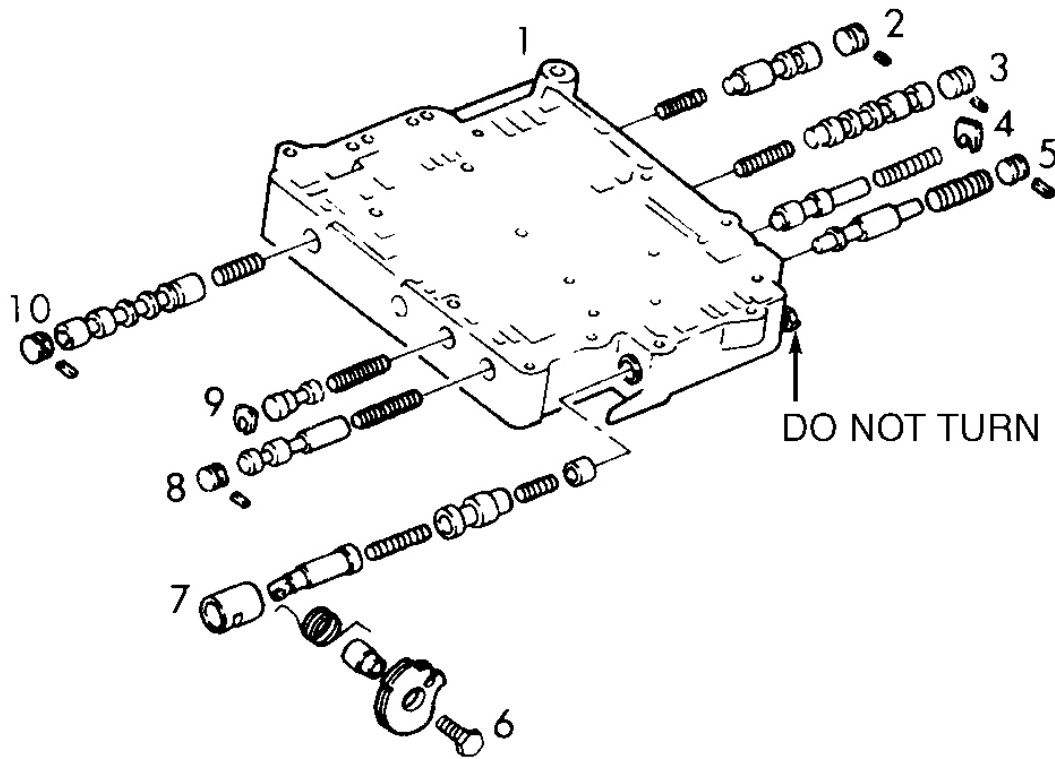
NOTE: **DO NOT** turn throttle valve adjusting screw on main control body. Adjusting screw is set during manufacturing and **MUST NOT** be altered.



- | | |
|--------------------------|---------------------------|
| 1. Pre-main Control Body | 6. 3-2 Capacity Valve |
| 2. 1-2 Accumulator | 7. 3-2 Timing Valve |
| 3. By-Pass Valve | 8. Coasting By-Pass Valve |
| 4. Servo Control Valve | 9. N-OD Accumulator |
| 5. 2-3 Timing Valve | 10. N-R Accumulator |

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Fig. 27: Exploded View Of Pre-Main Control Body
Courtesy of FORD MOTOR CO.



- | | |
|----------------------------|-----------------------------|
| 1. Main Control Body | 6. Throttle Cam Assembly |
| 2. 2-3 Shift Valve | 7. Throttle Valve Assembly |
| 3. 1-2 Shift Valve | 8. Throttle-Modulator Valve |
| 4. Low Reducing Valve | 9. Throttle Back-Up Valve |
| 5. Pressure-Modifier Valve | 10. 3-4 Shift Valve |

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Fig. 28: Exploded View Of Main Control Body
 Courtesy of FORD MOTOR CO.

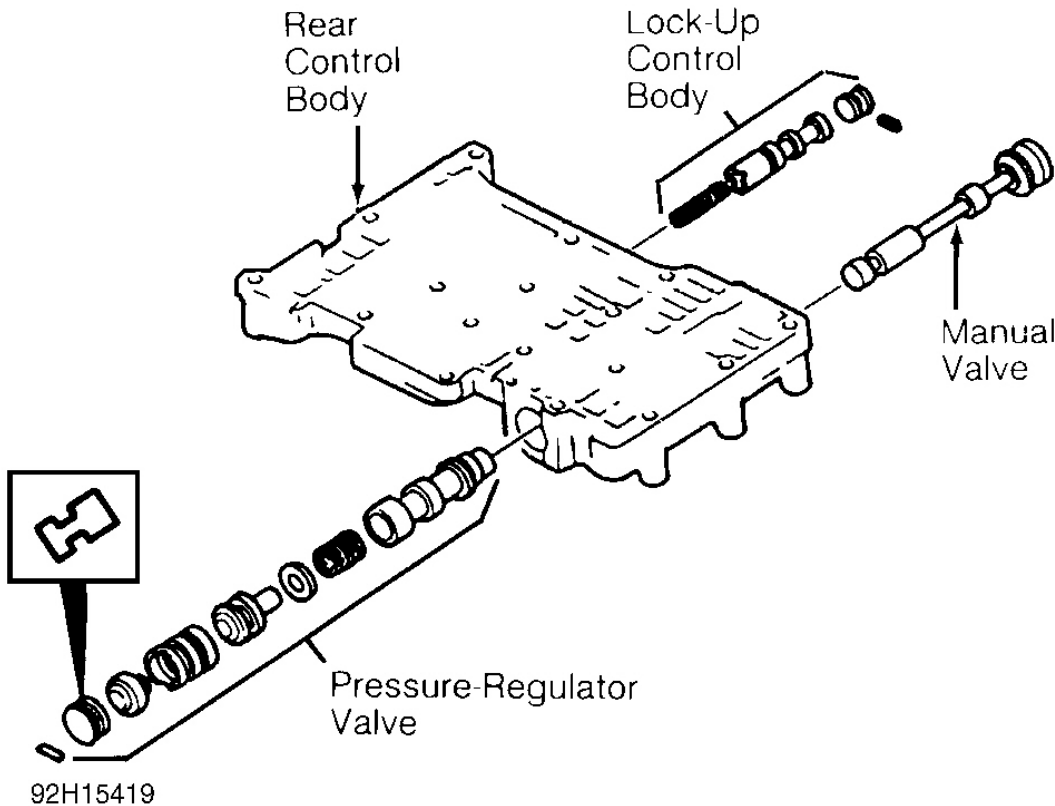


Fig. 29: Exploded View Of Rear Control Body
Courtesy of FORD MOTOR CO.

CAUTION: Avoid rounding off sharp edges of valves and plugs when using crocus cloth. These edges perform a cleaning action.

Cleaning & Inspection

1. Clean all parts thoroughly in clean solvent, and blow dry using moisture-free compressed air. Inspect all valves and plug bores for scores. Check all fluid passages for obstructions. Inspect all mating surfaces, plugs and valves for burrs and scores. If necessary, use crocus cloth to polish valves and plugs.
2. Inspect all springs for distortion. Check all valves and plugs for free movement in respective bores. Valves and plugs, when dry, must fall free from their own weight in respective bores.

Reassembly

1. Install all valve trains into respective bores using illustrations as assembly guides. See **Fig. 27 -Fig. 31** .

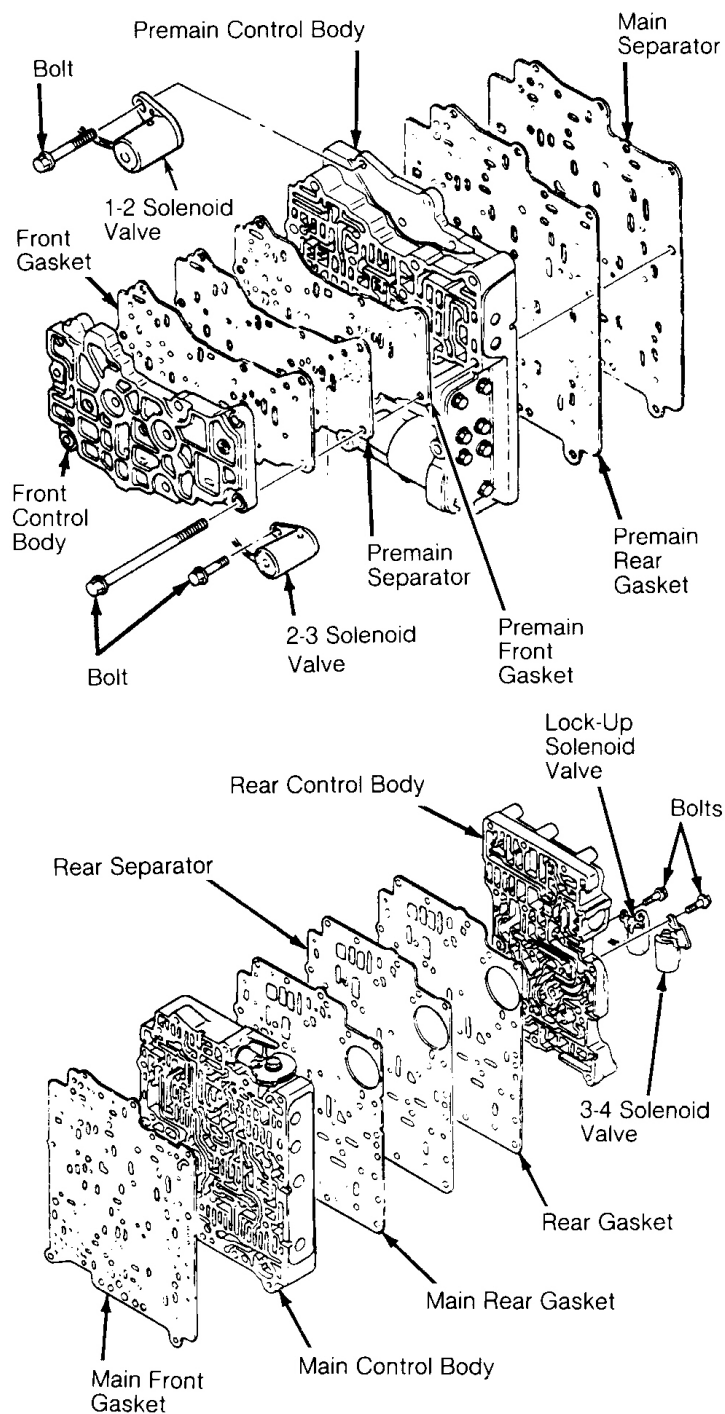
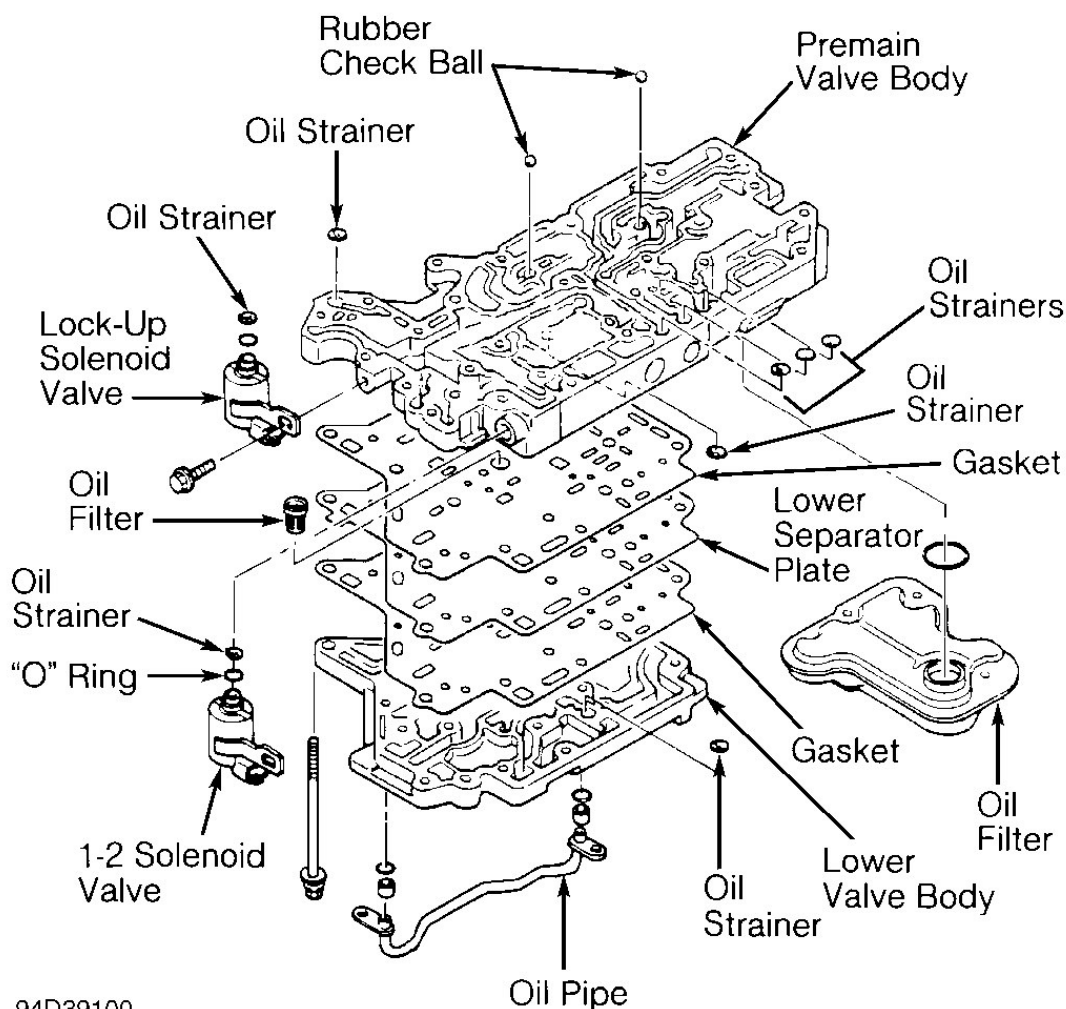


Fig. 30: Exploded View Of Valve Body Assembly (Probe)
 Courtesy of FORD MOTOR CO.



94D39100

Fig. 31: Pre-main & Lower Valve Body (Capri, Escort & Tracer)

Courtesy of FORD MOTOR CO.

- When installing throttle valve assembly into main control body, ensure groove is aligned with bolt hole. Install throttle return spring on throttle cam. Tighten retaining bolts to 69-95 INCH lbs. (8-11 N.m).
- Install neutral-reverse/neutral-overdrive accumulator plate on pre-main control body. Tighten retaining bolts to 57-69 INCH lbs. (6-8 N.m). Install 1-2 accumulator plate. Tighten retaining bolts to 57-69 INCH lbs. (6-8 N.m). **DO NOT** install harness bracket bolt yet.

NOTE: Match bolt head letter with corresponding letter on valve body. **DO NOT** mix gaskets during assembly.

- Install relief valves with .039" (1.00 mm), .059" (1.50 mm) and .078" (2.00 mm) orifices and springs in rear control body. Install new gaskets on both sides of rear separator. Rear gasket and main rear gasket are not interchangeable. Install rear separator on rear control body.

5. Install relief valve with .098" (2.50 mm) orifice and spring in main control body. Install rubber ball in main control body. See **Fig. 32**.
6. Install rear control body to main control body. Loosely tighten rear control body retaining bolts. On all models except Capri, turn assembly over and install relief valve with .035" (.90 mm) orifice and spring in main control body. On Capri, turn assembly over and install relief valve with .031" (.80 mm) orifice and spring in main control body. On all models, install check ball and spring in main control body. See **Fig. 33**.
7. On all models except 2.2L turbo, install relief valves with .079" (2.00 mm) orifice and springs into pre-main control body. On 2.2L turbo, install relief valves with .098" (2.50 mm) orifice and springs into pre-main control body. On all models, install check ball and spring in pre-main control body. See **Fig. 34**.

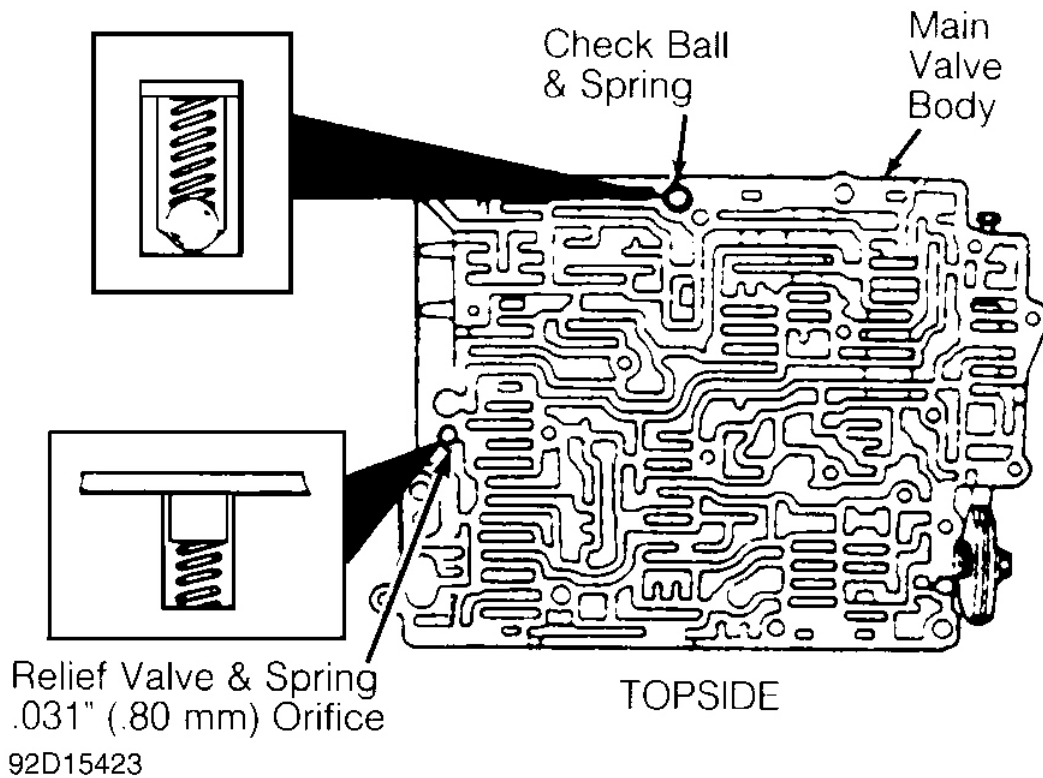


Fig. 32: Locating Rubber Ball In Main Control Body
Courtesy of FORD MOTOR CO.

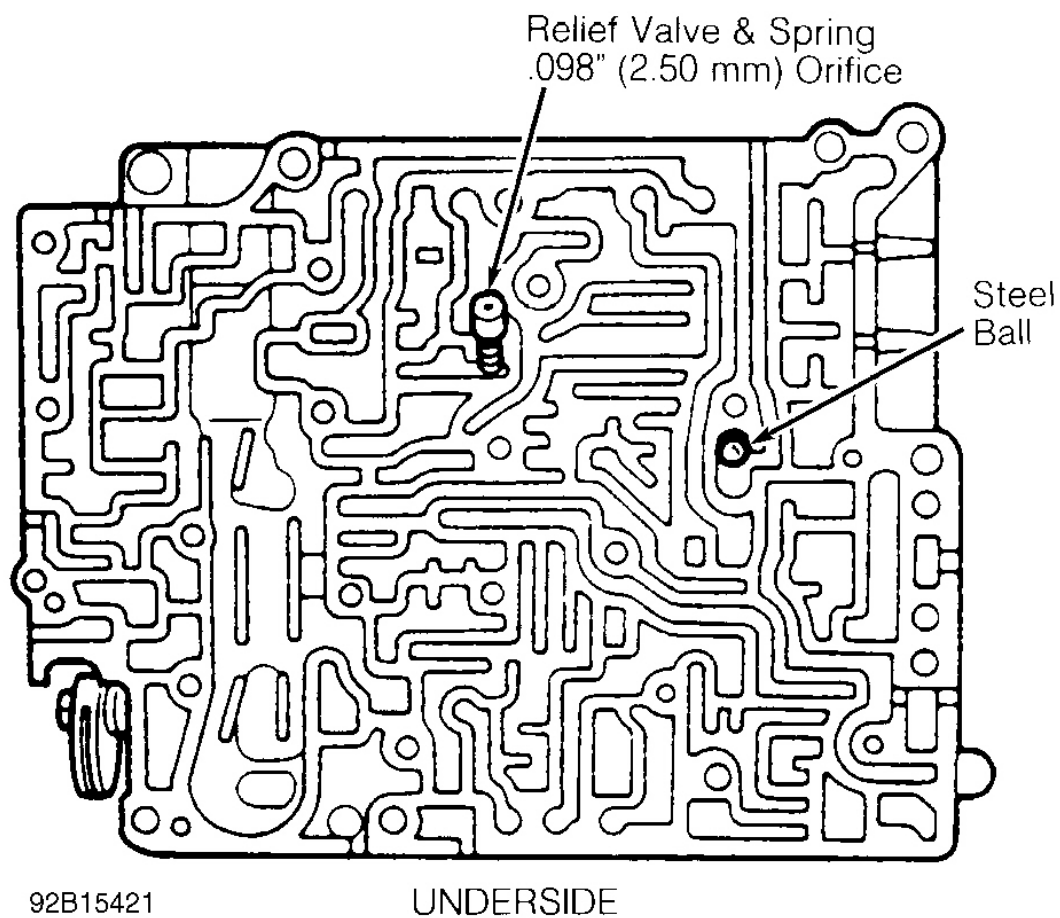


Fig. 33: Locating Check Ball In Main Control Body
Courtesy of FORD MOTOR CO.

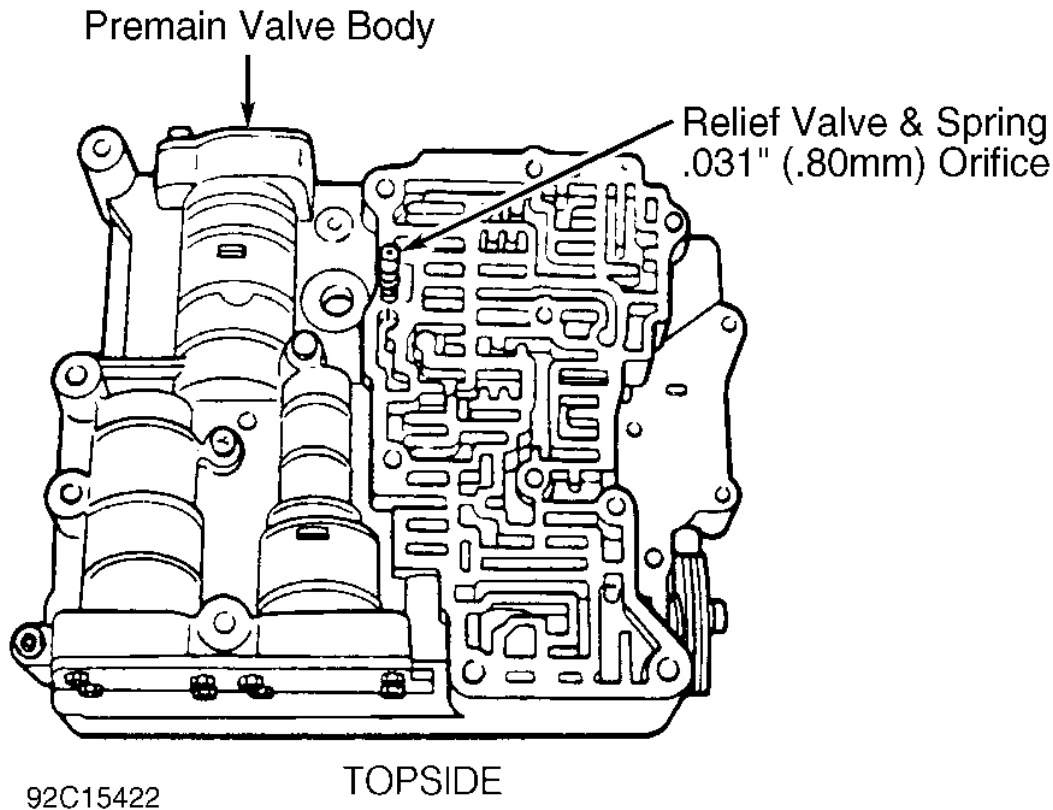


Fig. 34: Locating Check Ball In Pre-Main Control Body
Courtesy of FORD MOTOR CO.

8. Install new gaskets both sides of main separator. See **Fig. 30** or **Fig. 31**. Pre-main rear gasket and main front gasket are not interchangeable. Install main separator on pre-main control body. Set pre-main control body on main control body. Loosely tighten pre-main control retaining bolts, including hexagonal head bolt. Install relief valve with .031"(.80 mm) orifice and spring into pre-main control body.
9. Install new gaskets on both sides of pre-main separator. Front gasket and pre-main front gasket are not interchangeable. Install front control body on pre-main control body. Loosely tighten front control body retaining bolts. Install 2 valve body mounting bolts to use for alignment.
10. Tighten retaining bolts on front and rear faces of valve body 57-69 INCH lbs. (6-8 N.m). Install new fluid strainers. Install new "O" rings on solenoid valves. Install 3-4 and lock-up solenoid valve. Tighten retaining bolts to 57-69 INCH lbs. (6-8 N.m). Install 1-2 solenoid valve and 2-3 solenoid valve. Tighten retaining bolts to 57-69 INCH lbs. (6-8 N.m). Install wiring harness and brackets.

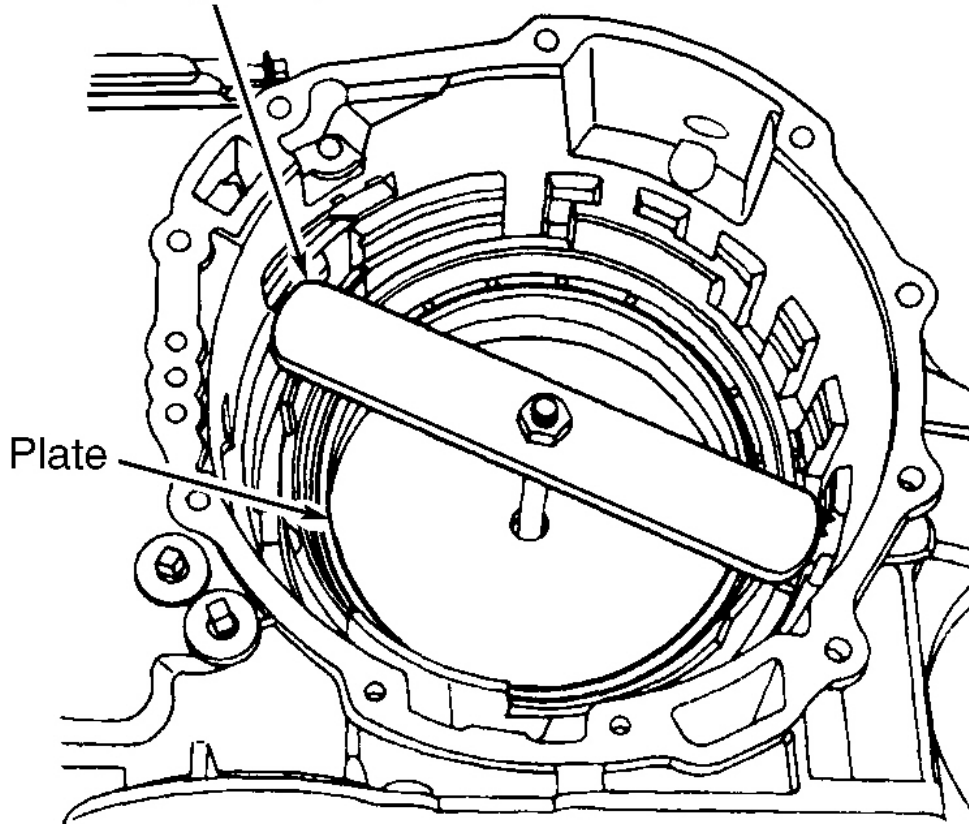
TRANSAXLE REASSEMBLY

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 in place. Use all new gaskets and seals. Tighten bolts evenly.

1. Using a plastic hammer, tap output and idler gear into converter housing. Install bearing housing, and tighten to 14-19 ft. lbs. (19-26 N.m). Align groove on idle shaft with mark on bearing housing, and tap in roll pin.
2. Install 2-3 accumulator, and tighten retaining bolts to 69-95 INCH lbs. (8-11 N.m). Install parking pawl and shaft. Install spring and retaining ring. Move shaft to check for proper parking pawl operation. Install parking assist lever and retaining ring. Install actuator support, and tighten retaining bolts to 95-120 INCH lbs. (11-14 N.m).
3. Install manual shaft, spacer, manual plate, washer and nut, and tighten to 30-41 ft. lbs. (41-55 N.m). Install bracket and retaining bolt. Tighten bolt to 69-95 INCH lbs. (8-11 N.m). Install detent ball, spring, washer and plug. Tighten plug to 9-13 ft. lbs. (12-18 N.m).
4. Using Seal Protector (T88C-77000-GH), carefully install low and reverse clutch piston by pushing evenly around circumference. **DO NOT** damage outer seal. Remove protector.
5. Install return spring and retainer. Compress return spring and retainer using Spring Compressor (T88C-77000-AH) and Plate (T87C-77000-B). See **Fig. 35** . Install snap ring. Remove spring compressor.

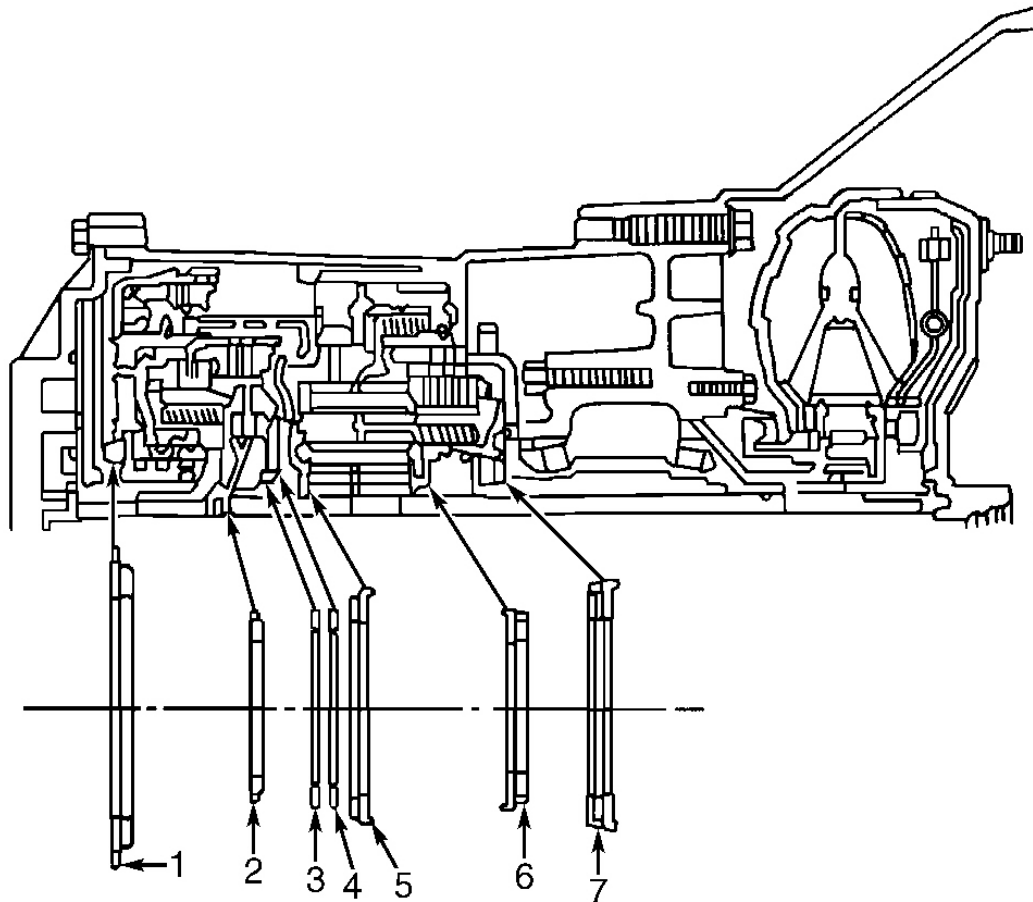
Return Spring Compressor



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Fig. 35: Installing Return Spring
Courtesy of FORD MOTOR CO.

6. Submerge reverse clutch piston in transaxle fluid. Apply maximum of 57 psi (392 kPa) compressed air for no more than 3 seconds through fluid passage. No bubbles should appear between piston and seals. Install output shell to output gear and 2.83" (72.0 mm) thrust washer on output shell.
7. Apply thin coat of silicone sealant to contact surfaces of converter housing and transaxle case. Install new "O" rings. Install case to converter housing, and tighten retaining bolts to specification.
8. Install Transaxle Plugs (T88C-7025-AH) to differential side gears. Failure to install plugs may allow differential side gears to become mispositioned.
9. With thrust washer and needle bearing correctly positioned, install 3-4 clutch and turbine shaft assembly into case. See **Fig. 36** . Install internal gear and snap ring.



- | | |
|-------------------------------|------------------------------------|
| 1. Oil Pump & Clutch Assembly | 5. Small Sun Gear & One-Way Clutch |
| 2. Clutch Assembly | 6. Planetary Carrier Assembly |
| 3. One-Way Clutch Inner Race | 7. 3-4 Clutch Assembly |
| 4. One-Way Clutch Outer Race | |

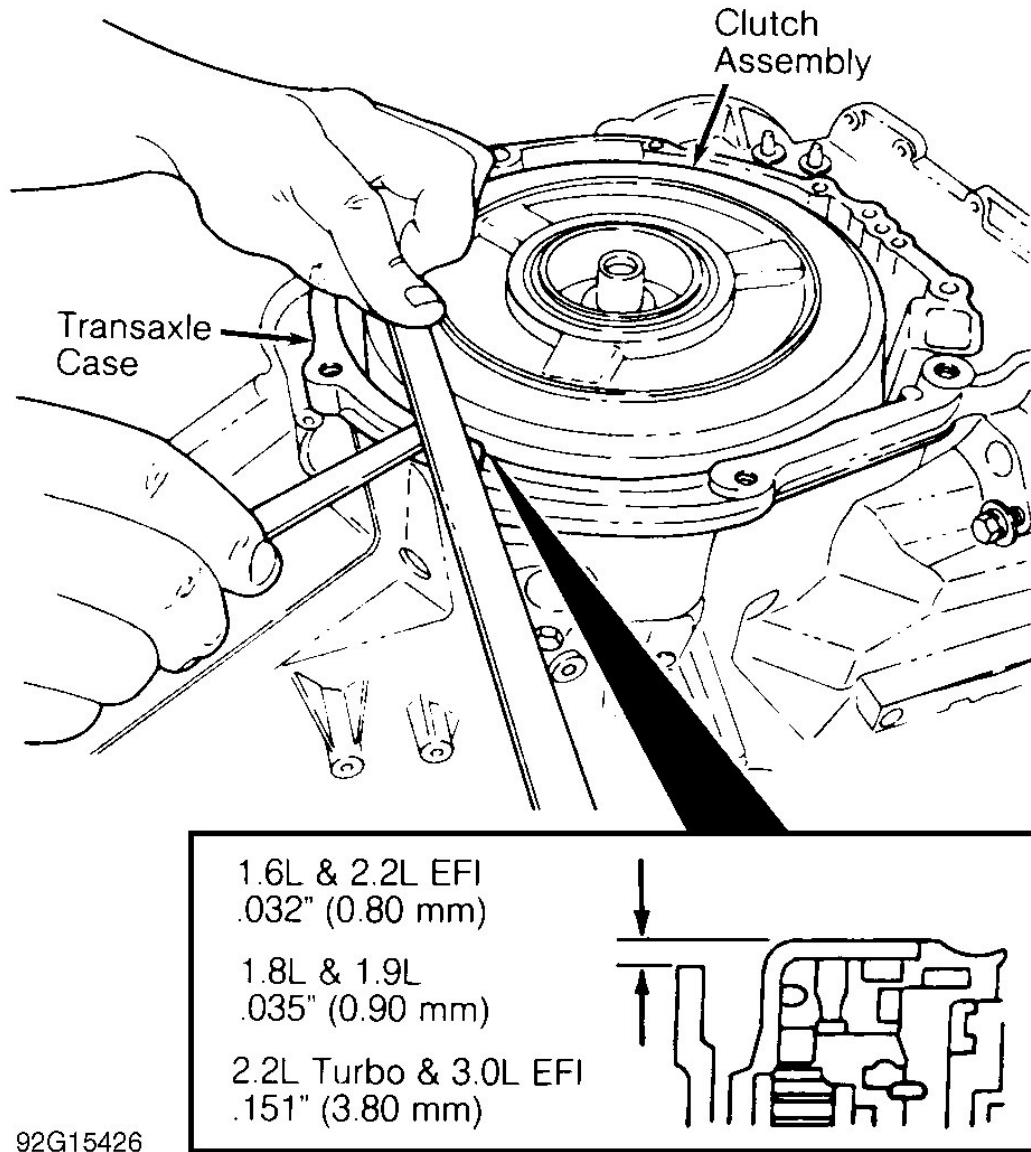
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Fig. 36: Locating Thrust Washers & Needle Bearings
 Courtesy of FORD MOTOR CO.

10. With thrust washer and needle bearing correctly positioned, install carrier hub assembly.
11. Install low and reverse clutch pack, retaining plate and snap ring. Using a feeler gauge, check clearance between retaining ring and retaining plate. If clearance is not .083-.094" (2.10-2.40 mm), install a different retaining plate. Retaining plates are available in following thicknesses: .268" (6.80 mm), .276" (7.00 mm), .283" (7.20 mm), .291" (7.40 mm), .299" (7.60 mm) and .307" (7.80 mm).

NOTE: 2.2L EFI engine uses 4 drive plates and 4 driven plates. All other models use 5 of each plate.

12. Install wave washer. Turn carrier hub assembly counterclockwise, and carefully install one-way clutch. Install snap ring.
13. Install servo spring and servo. Compress servo using a "C" clamp and install retaining ring. Remove "C" clamp. Install piston stem.
14. Install anchor strut. Install 2-4 band in case fully expanded. Interlock 2-4 band and anchor strut. With thrust washer and needle bearing correctly positioned, install small sun gear and one-way clutch by rotating.
15. Pull 2-4 band using pliers, and install piston stem in correct position. Loosely tighten piston stem by hand. Ensure needle bearing is correctly positioned.
16. Install clutch assembly by rotating. Measure height difference between reverse and forward drum and case. Height difference should be .032" (.80 mm) for 1.6L and 2.2L EFI models, .035" (.90 mm) for 1.8L & 1.9L models and .151" (3.80 mm) for 2.2L turbo and 3.0L EFI models. See **Fig. 37** .



92G15426

Fig. 37: Measuring Height Difference Of Case & Clutch
 Courtesy of FORD MOTOR CO.

17. Place needle bearing on clutch assembly. To adjust total end play, remove previous thrust washer and gasket from oil pump. Place a .087" (2.20 mm) thrust washer on oil pump. Set oil pump on clutch assembly.
18. Using a feeler gauge, measure clearance between transaxle case and oil pump. See **Fig. 38** . Select correct end play thrust washer to install. See **END PLAY THRUST WASHER SELECTION CHART** .

END PLAY THRUST WASHER SELECTION CHART

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Measured Clearance: In. (mm)	Thrust Washer Thickness: In. (mm)	Part Number
.000-.004 (0.00-0.11)	.087 (2.20)	E92Z-7D014-D
.004-.011 (0.11-0.30)	.078 (2.00)	E92Z-7D014-C
.012-.019 (0.31-0.50)	.071 (1.80)	E92Z-7D014-B
.020-.027 (0.51-0.70)	.063 (1.60)	E92Z-7D014-A
.028-.035 (0.71-0.90)	.055 (1.40)	E92Z-7D014-F
.036-.043 (0.91-1.10)	.047 (1.20)	E92Z-7D014-E

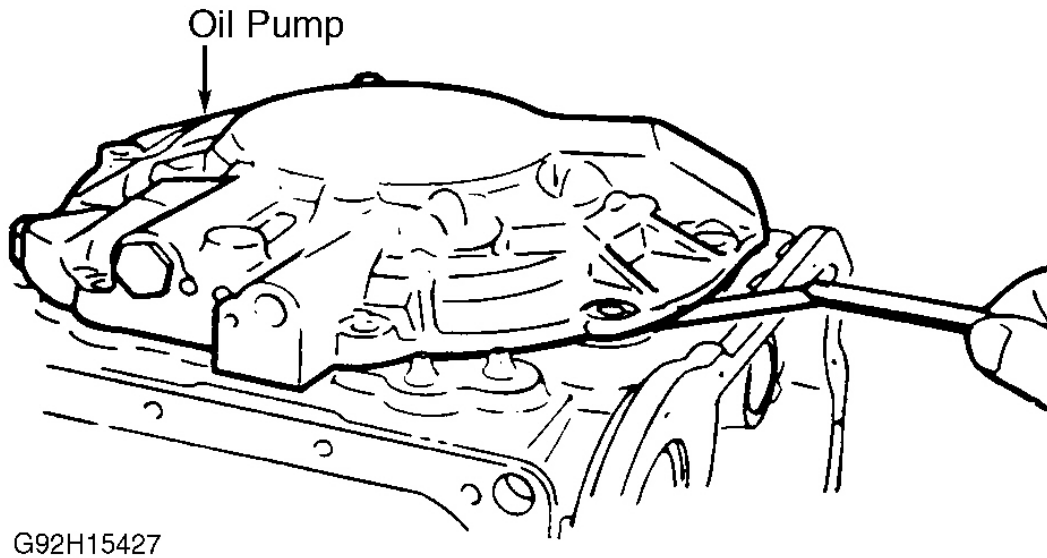
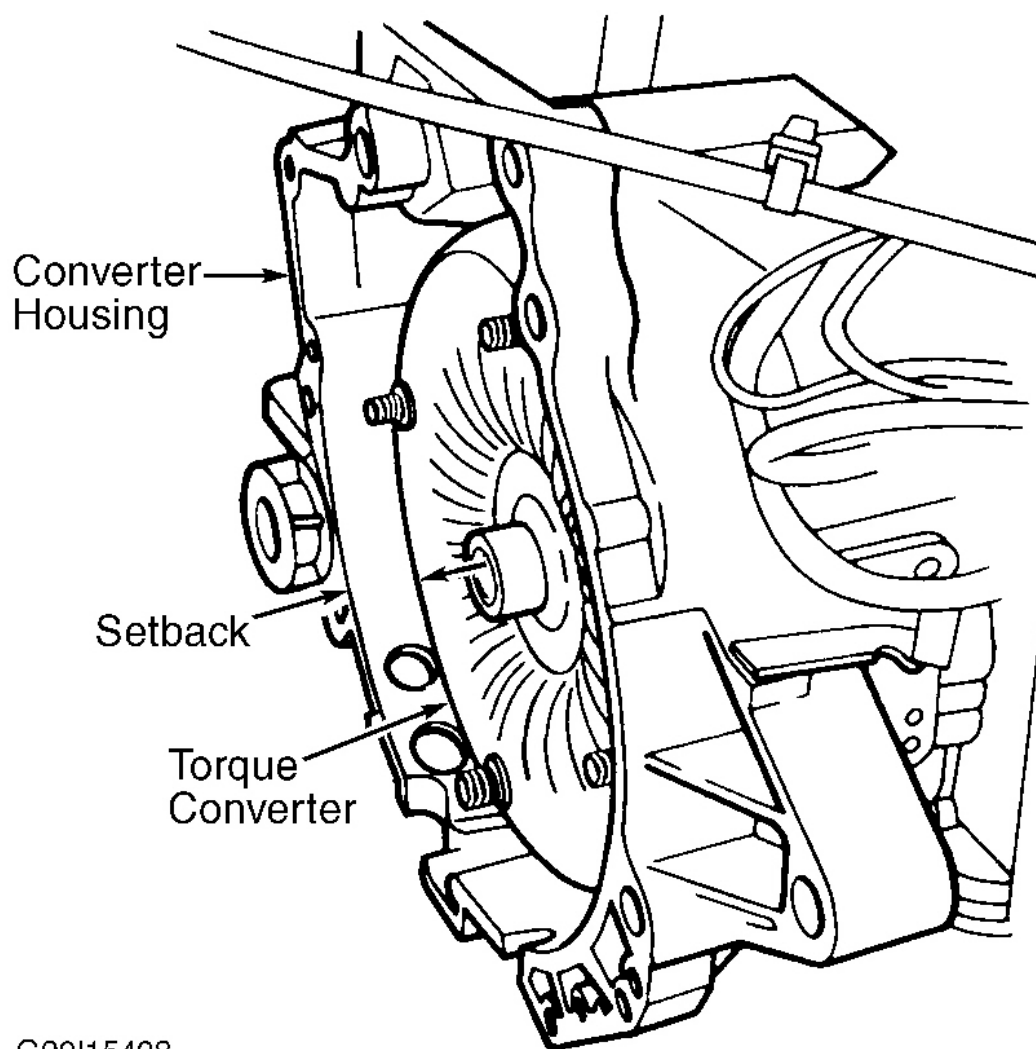


Fig. 38: Measuring Oil Pump-To-Case Clearance
Courtesy of FORD MOTOR CO.

19. Remove oil pump. Place selected thrust washer and new gasket on oil pump. Install oil pump on clutch assembly, and tighten retaining bolts to 14-19 ft. lbs. (19-26 N.m) Loosen lock nut, and tighten piston stem to 78-95 INCH lbs (9-11 N.m). Loosen piston stem 2 turns. Tighten lock nut to 18-29 ft. lbs. (25-39 N.m).
20. Install oil strainer using new "O" ring. Tighten retaining bolts to 69-95 INCH lbs. (8-11 N.m). Ensure magnets are correctly positioned in oil pan. Install oil pan and new gasket. Tighten retaining bolts to 69-95 INCH lbs. (8-11 N.m).

21. Align manual valve with pin on manual plate, and install valve into case. Tighten retaining bolts to 95-130 INCH lbs. (11-15 N.m). Install solenoid connector using a new "O" ring in case.
22. Install new "O" ring on kickdown cable bracket. Feed cable through case, and connect cable to throttle cam. Install kickdown cable attaching bolt and bracket. Tighten attaching bolt to 69-95 INCH lbs. (8-11 N.m) and bracket bolt to 14-19 ft. lbs. (19-26 N.m).
23. Install valve body cover using a new gasket. Tighten to 69-95 INCH lbs. (8-11 N.m). Install oil pipes, oil hoses and switch box as an assembly. Tighten switch box retaining bolts to 12-17 ft. lbs. (16-24 N.m). Install ball, spring, new washers and plug. Install harness clip, and tighten to 69-95 INCH lbs. (8-11 N.m). Tighten plug to 23-35 ft. lbs. (31-47 N.m).
24. Install solenoid connector. Install pulse generator and fluid temperature switch. Tighten pulse generator bolts to 69-95 INCH lbs. (8-11 N.m) and tighten fluid temperature switch bolts to 22-29 ft. lbs. (29-39 N.m).
25. Install dipstick tube using a new "O" ring. Tighten retaining bolts to 61-87 INCH lbs. (7-10 N.m).
26. Turn manual shaft to neutral position. Install neutral safety switch to loosely tighten retaining bolts. Remove screw, and insert a .079" (2.00 mm) pin. Move neutral safety switch until pin engages switch alignment hole.
27. Tighten switch retaining bolts to 69-95 INCH lbs. (8-11 N.m). Remove pin, and install screw. Install harness using remaining clip, and tighten to 69-95 INCH lbs. (8-11 N.m).
28. Remove transaxle from holding fixture. Using Converter Seal Replacer (T88C-77000-BH), install converter seal.
29. Install new "O" ring on turbine shaft. Install oil pump shaft.
30. Fill torque converter with specified transaxle fluid. Carefully install torque converter in converter housing while rotating to align splines.
31. Measure distance between torque converter and end of converter housing. Distance should be .98" (25.0 mm). See **Fig. 39** .
32. Install right transaxle mount, and tighten retaining bolts to 43-49 ft. lbs. (58-67 N.m). Using Differential Seal Replacer (T87C-77000-H), install differential oil seals. To complete reassembly of transaxle, reverse disassembly procedure.



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Fig. 39: Measuring Converter Housing Clearance
 Courtesy of FORD MOTOR CO.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bearing Housing Bolts	14-19 (19-26)
Center Transaxle Mount Bolt	27-40 (37-54)
Center Transaxle Mount Nuts	47-66 (64-89)
Crossmember Bolts	27-40 (37-54)

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Crossmember Nut	55-69 (75-94)
Drain Plug	29-43 (39-58)
Fluid Temperature Switch Bolts	22-29 (29-39)
Gusset Plate-To-Transaxle Bolts	27-38 (37-52)
Left Mount-To-Bracket Bolt And Nut	49-69 (66-94)
Manual Plate Nut	30-41 (41-56)
Oil Line Plug	23-35 (31-47)
Oil Pump Bolts	14-19 (19-26)
Range Selector-To-Transaxle Bolts	22-29 (29-39)
Right Transaxle Mount Bolts	43-49 (58-66)
Switch Box Bolts	12-17 (16-23)
Throttle Converter	14-19 (19-26)
Torque Cable Bracket Bolt	32-45 (43-61)
Torque Converter Nuts	32-45 (43-61)
Transaxle Case-To-Converter Housing	27-38 (37-52)
Transaxle-To-Engine Bolts	66-86 (89-117)
Transaxle-To-Left Mount Bolts	63-86 (85-117)
INCH Lbs. (N.m)	
Actuator Support Bolts	95-120 (11-14)
Converter Cover Bolts	69-95 (8-11)
Dipstick Tube Bolt	61-87 (7-10)
Front Face & Rear Face Valve Body Bolts	57-69 (6-8)
Line Pressure Plug	43-87 (5-10)
N-R/N-OD Accumulator Plate Bolts	57-69 (6-8)
Neutral Safety Switch Bolts	69-95 (8-11)
Oil Pan Bolts	69-95 (8-11)
Oil Pump Cover Bolts	69-95 (8-11)
Pulse Generator Bolt	69-95 (8-11)
Solenoid Valve Bolts	57-69 (6-8)
Throttle Cam Bolts	69-95 (8-11)
Valve Body Bolts	95-130 (11-15)
1-2 Accumulator Plate Bolts	57-69 (6-8)
2-3 Accumulator Bolts	69-95 (8-11)