GROUP

TRANSAXLE, AUTOMATIC 17

(70000)

SECTION 17-01 Transaxle, Automatic—Service

VEHICLE APPLICATION

Capri.

DESCRIPTION

Transmission Identification

All vehicles are equipped with a Vehicle Identification Plate affixed to the RH side of the cowl panel.

Refer to the code in the space marked Trans below the windshield on the Vehicle Identification Plate for proper transmission identification. Code C is the designation for the 4EAT automatic transaxle.

For additional information such as: model, service ID level, or build date, refer to the transmission ID tag which is attached to the transmission case.

Transaxle, 4EAT

For information and service procedures on vehicles equipped with 4EAT transaxle, refer to Section 17-27.

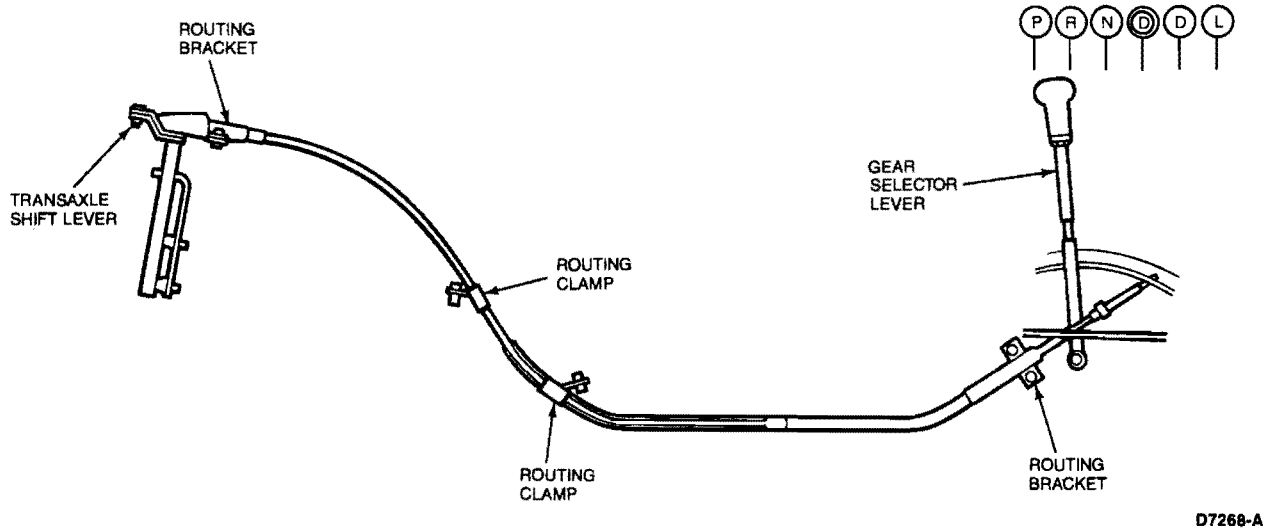
SECTION 17-02 Shift Control Linkage

VEHICLE APPLICATION

Capri.

DESCRIPTION

The external components required to shift the automatic transaxle are two levers interconnected by an encased cable. At the transaxle, a pin and spring clip attach the shift cable to an external shift lever. At the opposite end, two nuts and a T-joint attach the cable to the gear selector lever. Integral brackets anchor the ends of the protective casing to the transaxle case and to the gear selector housing. An additional routing clamp secures the cable and directs it out of the engine compartment toward the gear selector. Where the cable extends from the casing to one of the levers, protection is provided to prevent the entry of contaminants. At the transaxle a flexible, rubber boot encloses the cable and the end of the cable casing. The hole where the cable enters the gear selector housing is sealed by a rubber grommet installed on the end of the casing.



DESCRIPTION (Continued)

At the gear selector housing, the cable end and T-joint are connected to an intermediate link. The T-joint pin passes through the link and a roller / bushing that rides in a guide plate attached to the selector housing. From the cable connection and guide, the link extends to a pin attached to the gear selector lever.

In the gear selector housing, the gear selector lever is supported on bushings and a pivot pin that extends through the housing and bushings. A lock washer and nut hold the pivot pin in position. As the lever pivots on the pin, a spring and roller assembly detents each selector position.

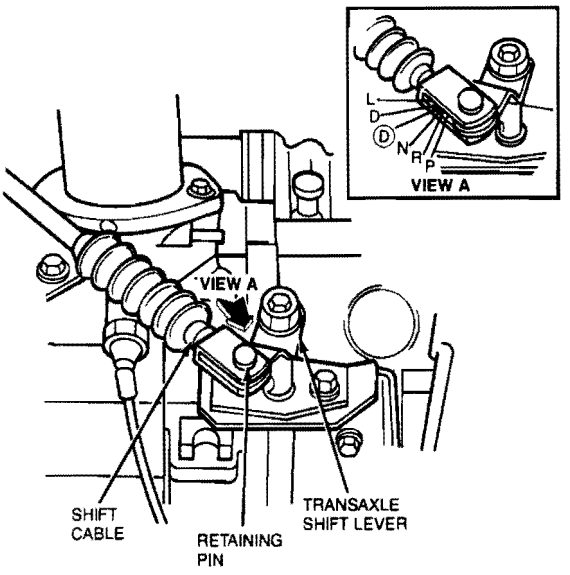
Free movement into and out of specific gear selector positions is prevented by a shift interlock. The shift lever cannot be moved from: P to R, ⓓ to D, D to L or N to R unless the button in the shift lever handle is pressed. When the button is pressed, a push rod extending through the gear selector lever pushes downward on the interlock pin. The downward movement of the pin allows it to clear the gates in the interlock plate. A spring, installed below the interlock pin returns the pin, push rod and button to the interlock position when the button is released.

The gear selector housing is installed through the bottom of the floorpan with four stud nuts holding it in position. After removal, the gear selector assembly can be disassembled for inspection and servicing of individual components. The shift cable, however, is serviced only as an assembly. Jam nuts installed on both sides of the cable T-joint allow cable length adjustments.

ADJUSTMENTS

Shift Control Cable

1. Position the gear selector lever in the NEUTRAL position.
2. Remove the spring clip and pin attaching the shift cable trunnion to the transaxle shift lever.
3. Rotate the transaxle shift lever fully counterclockwise. This is the park position.
4. Rotate the transaxle shift lever clockwise two detents. This is the neutral position. As the lever is rotated, position it between the ends of the shift cable trunnion.



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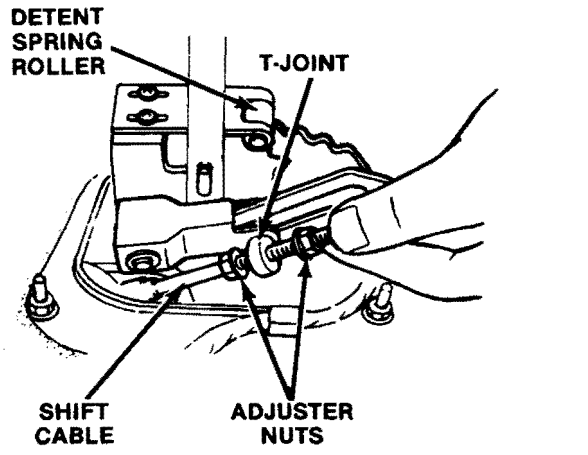
5. If the holes in the shift lever align with the holes in the trunnion, the cable is properly adjusted. If the holes do not align proceed to the next step.
6. Remove console shift quadrant. Refer to Section 45-31.
7. Loosen the adjuster nuts on the shift cable.



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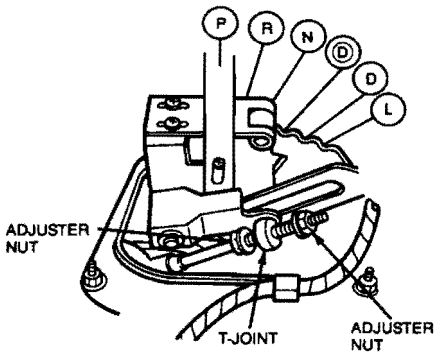
8. Position the gear selector lever in the PARK position and inspect the position of the detent spring roller.

   If the spring roller is centered in the park detent, proceed to Step 13.

   If the spring roller is not centered in the park detent, proceed to the next step.
9. Loosen the attaching screws and move the detent spring forward or backward to center it in the park detent.

ADJUSTMENTS (Continued)

10. Position the quadrant and install the attaching screws.
11. Position the selector lever in the NEUTRAL position.
12. Thread the adjuster nuts up or down the cable until the holes in the transaxle shift lever and the shift cable trunnion are aligned.



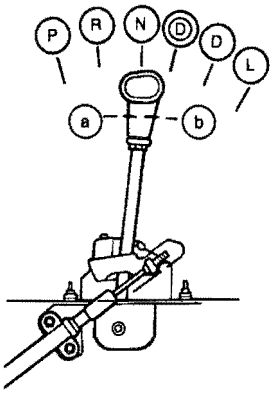
NOTE: SHIFT QUADRANT IS SHOWN REMOVED FOR CLARITY D7344-A

13. Tighten the adjuster nut to 8-11 N·m (69-95 lb-in).
14. Check the alignment of the holes in the transaxle shift lever and cable trunnion to make sure the adjustment was not disturbed while tightening the nuts.
15. Install the transaxle shift lever to shift cable attaching pin and retaining clip.
16. With the gear selector lever in the NEUTRAL position, press in on the shift interlock button and carefully push the lever forward while an assistant observes the transaxle shift lever. When the transaxle shift lever begins to move, note the amount the shift lever has moved.
17. With the gear selector lever in the NEUTRAL position, press in on the shift interlock button and carefully pull the lever rearward while an assistant observes the transaxle shift lever. When the transaxle lever begins to move, note the amount the shift lever has moved.
18. If the forward movement of the shift lever (a) and the rearward movement of the gear selector lever (b) are not equal, turn the adjuster nuts a slight amount until they become equal.

    If (a) is larger than (b), loosen locknut (B) and tighten locknut (A) so that (a) becomes smaller.

    If (b) is larger than (a), loosen locknut (A) and tighten locknut (B) so that (b) becomes smaller.
19. Tighten the adjuster nut to 8-11 N·m (69-95 lb-in).

    WARNING: Make sure the linkage adjustment has not affected operation of the neutral safety switch. With the parking brake and service brakes applied, try to start the engine in each gearshift position. The engine must crank only in the NEUTRAL and PARK positions. If the engine cranks in any of the other gear selector lever positions, check the linkage adjustment and neutral safety switch operation.
20. Position the console and install the attaching screws. Refer to Section 45-31.



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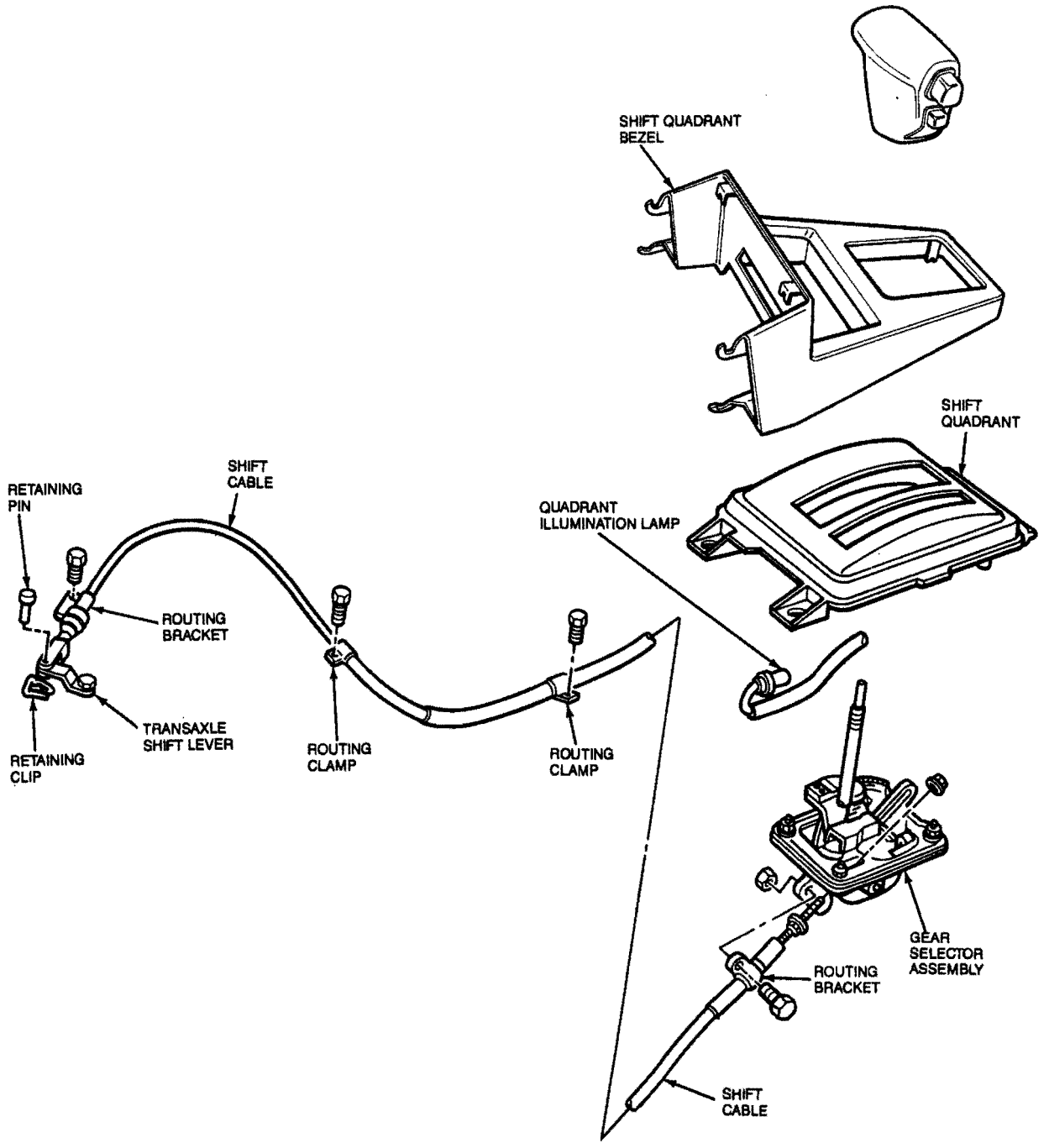
REMOVAL AND INSTALLATION

Shift Control Cable

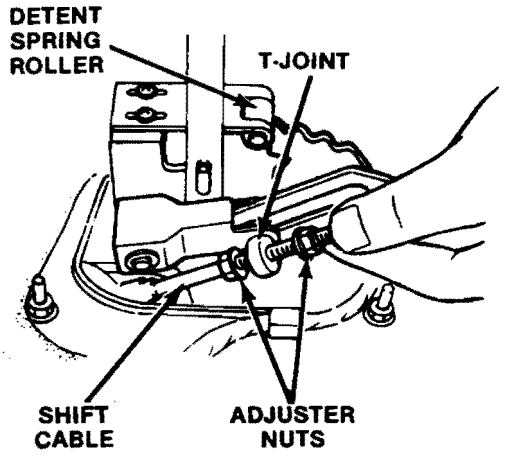


Removal

1. Remove the spring clip and pin attaching the transaxle shift cable to the transaxle shift lever.
2. Remove the bolts attaching the cable casing bracket to the transaxle case.

REMOVAL AND INSTALLATION (Continued)

3. Remove the shift cable routing clamp attaching bolts. One clamp is located below and to the right of the master cylinder. The other is attached to the sub-frame.
4. Remove the shift console and quadrant bezel. Refer to Section 45-31.
5. Remove the top adjuster nut from the shift cable.



6. Raise the vehicle on a hoist. Refer to Section 10-04.
7. Remove the screws attaching the cable casing bracket to the gear selector housing.
8. Pull the cable out of the gear selector housing and remove from the vehicle.

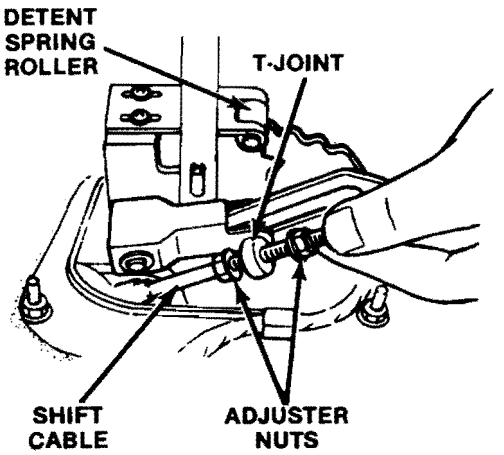
Installation

1. Insert the shift cable into the gear selector housing. Make sure the end of the cable passes through the T-joint as it enters the housing.
2. Install the cable casing bracket to gear selector housing attaching screws. Tighten the attaching screws securely.
3. Install routing clamp and bolt to sub-frame.
4. Lower the vehicle.
5. Install the cable casing bracket to transaxle case attaching bolts. Tighten the attaching bolt securely.
6. Position the cable and install the routing clamp attaching bolts. Tighten the attaching bolts securely.
7. Install the shift cable adjuster nut.
8. Adjust the shift cable, if necessary, as outlined.
9. Install shift console and quadrant bezel. Refer to Section 45-31.

Gear Selector Assembly

Removal

1. Loosen the shift handle and jam nut and remove.
2. Remove the shift interlock pin and push rod.
3. Remove the shift console and quadrant bezel. Refer to Section 45-31.
4. Twist the illumination lamp clockwise and pull it out of the lamp housing.
5. Disengage the lamp wiring from the routing clips on the shift quadrant.
6. Remove the top adjuster nut from the shift cable.



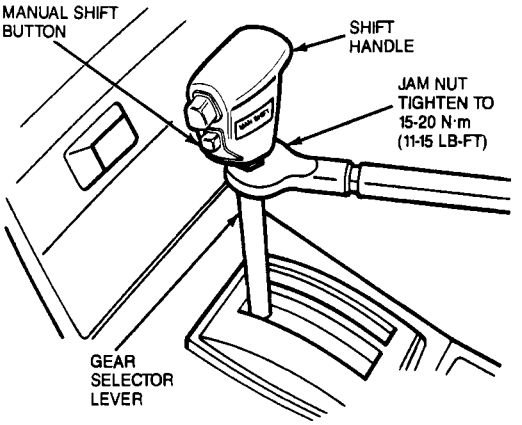
7. Remove the cable casing bracket to gear selector housing retaining screws.
8. Remove the gear selector retaining nuts and the quadrant / console mounting bracket.
9. Bend the gear selector retainer clips back just far enough to clear the floorpan.
10. Raise the vehicle on a hoist. Refer to Section 10-04.
11. Pull the gear selector downward and away from the floorpan. It may be necessary to pry downward slightly on the exhaust system to provide the necessary clearance.
12. Remove the screws attaching the cable casing bracket to the gear selector housing.
13. Pull the shift cable out of the gear selector housing and remove the gear selector.

Installation

1. Install the shift cable into the gear selector housing. Make sure the end of the cable passes through the T-joint as it enters the housing.
2. Install the adjuster nut on the end of the shift cable to prevent it from pulling out of the T-joint.

REMOVAL AND INSTALLATION (Continued)

3. Install the cable casing bracket to gear selector housing attaching screws. Tighten the attaching screws securely.
4. Bend the retainer tabs outward so that they will hook on the floorpan when the gear selector is installed.
5. Position the gear selector in the floorpan. If necessary pry downward on the exhaust system to provide the necessary clearance.
6. Lower the vehicle.
7. Position the quadrant / console mounting bracket and install the gear selector retaining nuts. Tighten the retaining nuts to 7-10 N·m (61-87 lb-in).
8. Route the lamp wiring through the shift quadrant routing clips. Install lamp housing and lock in position by turning counterclockwise.
9. Position the gear selector on the mounting bracket and install the retaining nuts.
10. Install shift console and quadrant bezel. Refer to Section 45-31.
11. Install the shift interlock pin.
12. Install push rod, jam nut and the shift handle to end of threads. Turn handle until it contacts jam nut. Position interlock button toward driver and tighten jam nut to 15-20 N·m (11-15 lb-ft). Check for proper operation. Adjust jam nut, if required.
13. Adjust the shift cable if necessary, as outlined.



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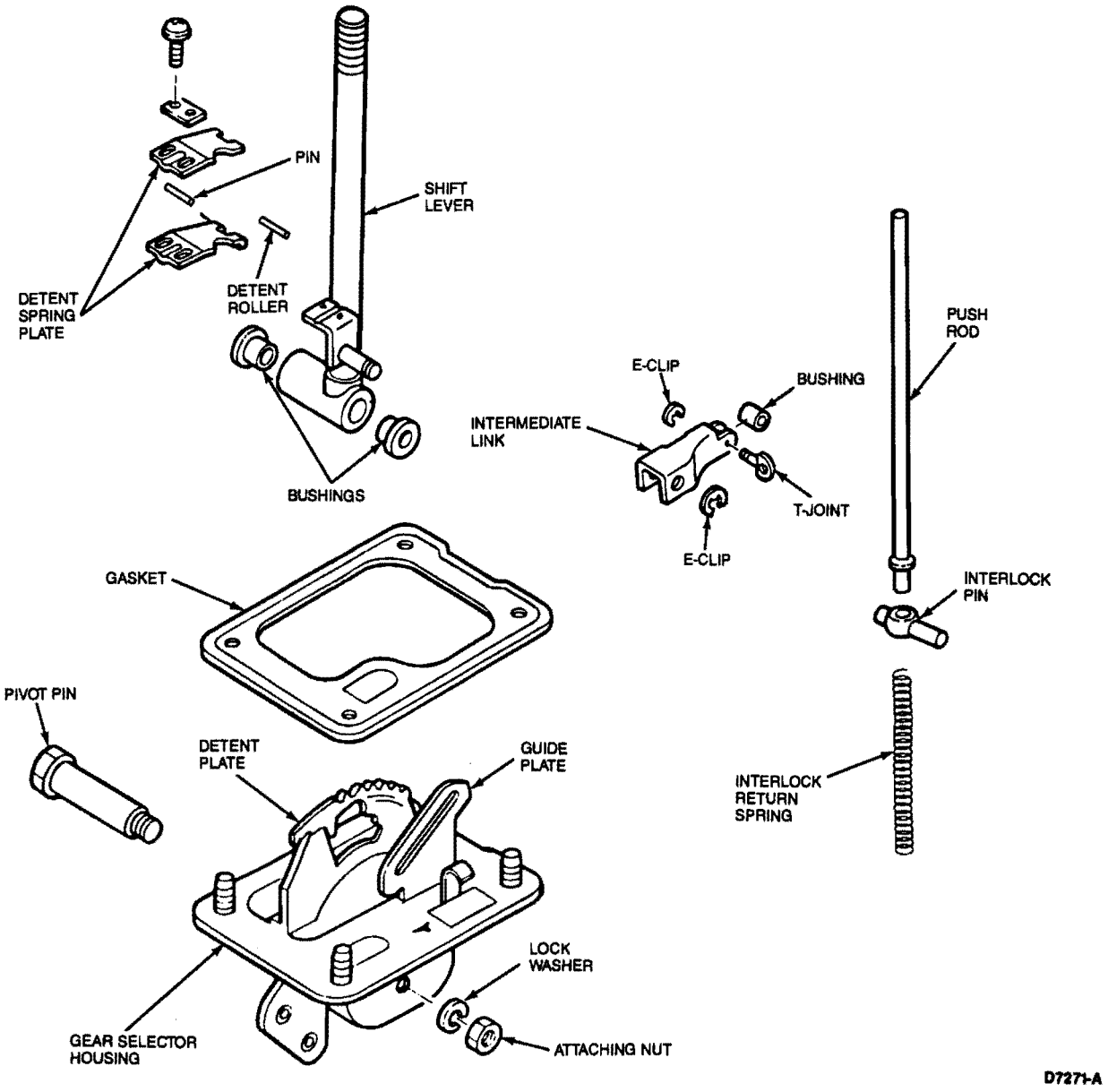
DISASSEMBLY AND ASSEMBLY

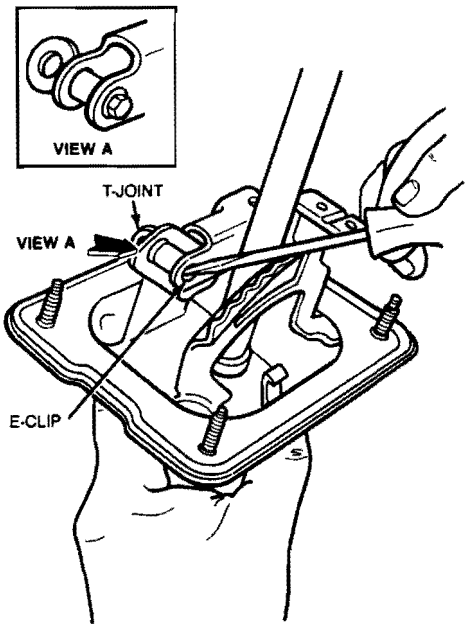
Gear Selector



DISASSEMBLY AND ASSEMBLY (Continued)

Disassembly

1. Remove the E-clip from the T-joint pin.



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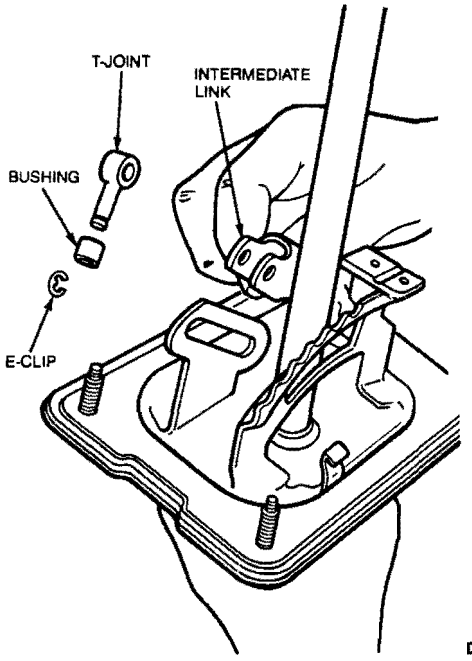
2. Remove the T-Joint and intermediate link bushing. Lift the intermediate link to remove the bushing.



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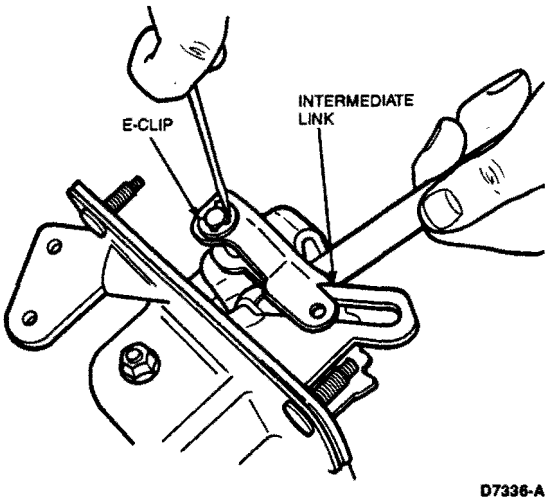
3. Remove the E-clip from the intermediate link pivot pin and remove the link.



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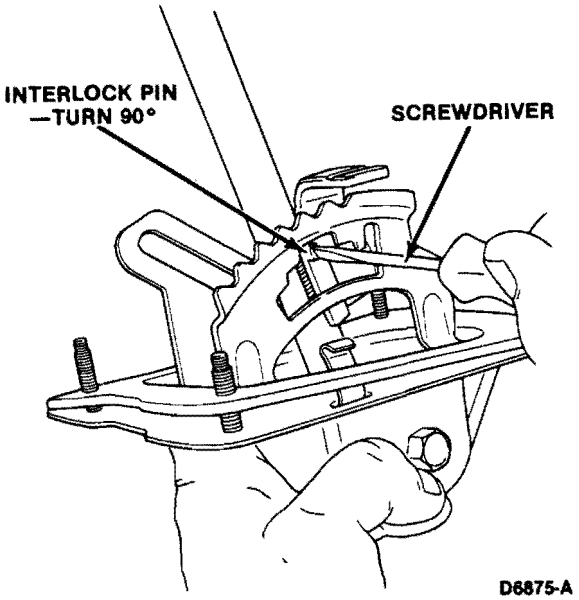
4. Using a small screwdriver turn the interlock pin 90 degrees. The screwdriver slot will move from the vertical position to the horizontal position.



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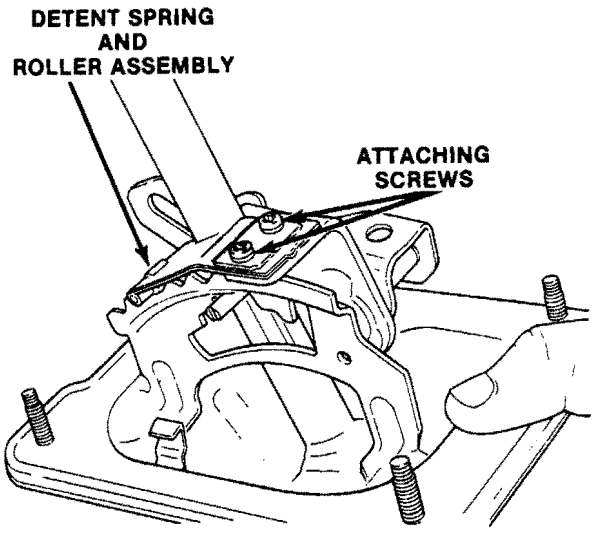
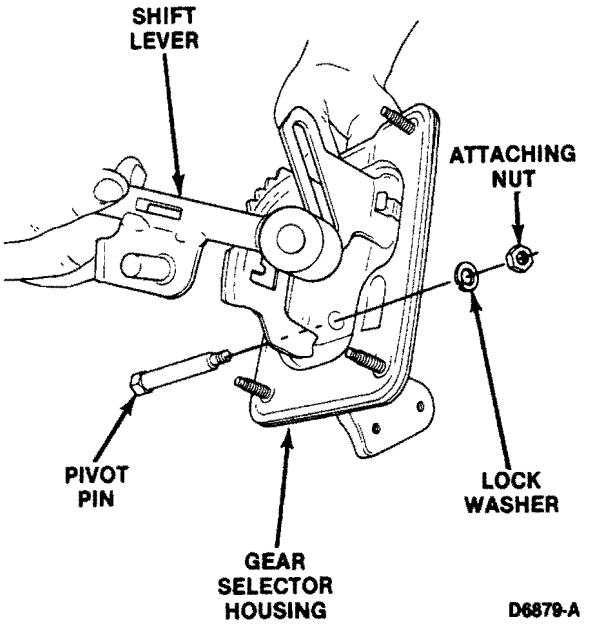
5. Press downward on the interlock pin with the interlock push rod and pull the pin out of the selector lever. The push rod must be used to hold the tensioned spring in position while the interlock pin is removed.
6. Remove the interlock push rod and return spring.

DISASSEMBLY AND ASSEMBLY (Continued)

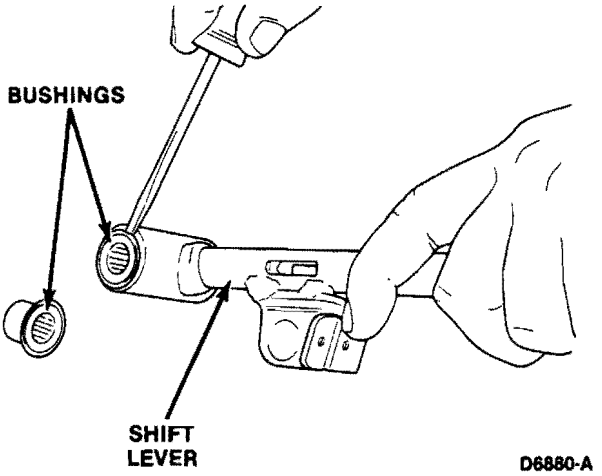
7. Remove the detent spring and roller assembly.



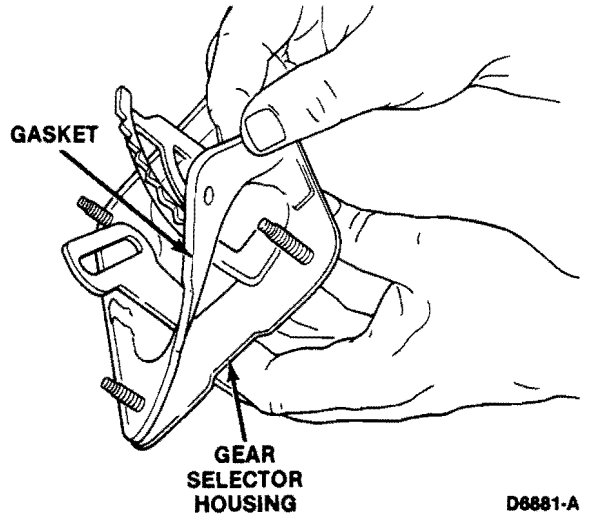
8. Remove the shift lever attaching nut, lock washer and pivot pin.



9. Remove the shift lever from the gear selector housing.
10. Remove the bushings from the shift lever.



11. Remove gasket from the gear selector housing.



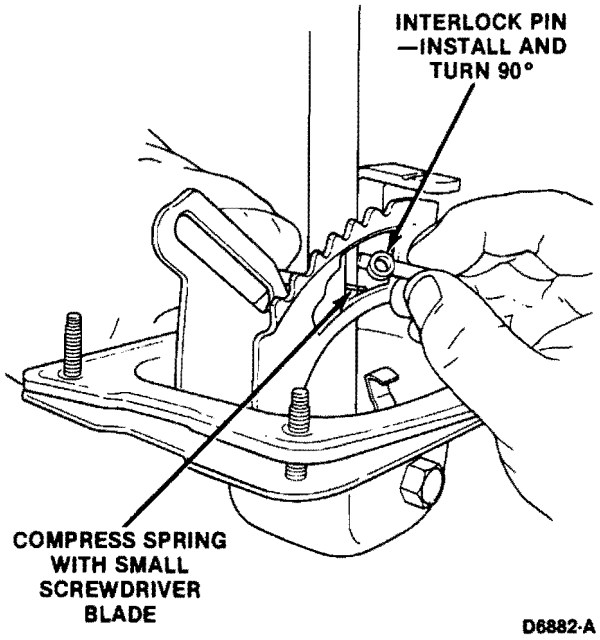
Assembly

1. Install the gear selector housing gasket.
2. Install the shift lever bushings.
3. Position the shift lever in the housing.
4. Install the shift lever pivot pin.
5. Install the pivot pin attaching lock washer and nut. Tighten the attaching nut to 12-17 N·m (104-148 lb-in).
6. Install the shift interlock return spring and push rod.
7. Compress the interlock return spring using a thin-bladed screwdriver. While holding the spring compressed, insert the interlock pin through the shift lever and turn 90 degrees. Make sure the slot in the pin is in the vertical position and remove the screwdriver.

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: When properly installed, the interlock pin should extend through the interlock plate and the interlock push rod should engage the hole in the pin.

8. Install the intermediate link on the pivot pin and install the E-clip.
9. Install the intermediate link bushing and T-joint.
10. Install the E-clip on the T-joint pin.
11. Install the detent spring. Position the shift lever in the park position, make sure the detent spring roller is centered in the park detent and tighten the attaching screws.



SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	Nem	Lb-Ft
Adjuster Nut	8-11	69-95 (lb-in)
Gear Selector Nuts	7-10	61-87 (lb-in)
Shift Handle Jam Nut	15-20	11-15
Selector Lever Pivot Pin Nut	12-17	104-148 (lb-in)

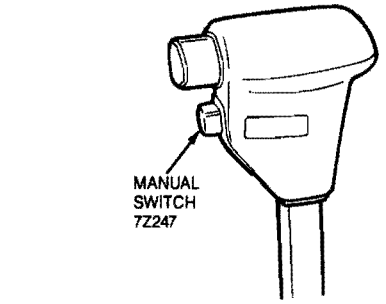
SECTION 17-27 Transaxle, Automatic—4EAT

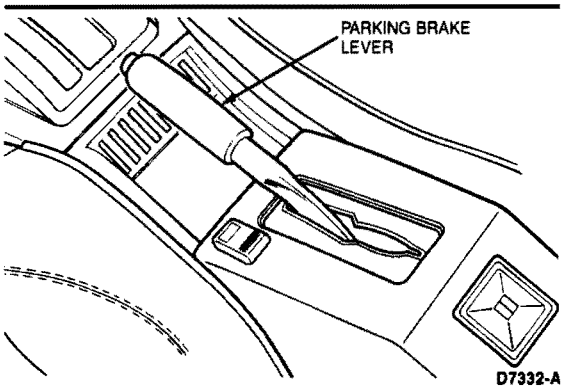
VEHICLE APPLICATION

Capri.

DESCRIPTION

The Electronically Controlled Automatic Transmission (4EAT) System is a Mazda type G automatic transaxle. This automatic transaxle features a combination of electronic and mechanical systems for controlling forward gear shifting, torque converter lockup for quietness and economy, and self-diagnosis capability for simplifying troubleshooting procedures. A Manual switch is provided for slow driving on steep, slippery, or dangerous roads.





Unique mechanical features of the 4EAT include a single compact combination-type planetary gear (4-speed capability) instead of the usual two planetary gears used in previous 3-speed transaxles, making a reduction in overall size possible. Also a new variable-capacity oil pump is used which provides a constant oil quantity at and above a medium speed, and reduces the power losses resulting from pumping more oil than necessary at higher speeds.

The electronic system controls the transmission shifting in forward speeds and torque converter lockup by means of solenoid operated valves. These solenoid valves when energized (ON) actuate friction elements (clutches and bands) to control shifting in the planetary gear. The shift timing and lock up events are regulated by the control unit in programmed logic and in response to input sensors and switches in order to produce optimum driveability.

4EAT diagnostic procedure, following a preliminary inspection for obvious defects and a Quick Test for Service Codes (seven total), consists of conducting either Pinpoint Tests or Operational Tests or both in logical sequence as directed, followed by Post Operational Tests if required.

Problems with components of this system that involve electronic control are diagnosed in Section 16 of Engine / Emissions.

4EAT SYSTEM ELECTRONIC COMPONENTS

Components	4EAT Control Unit Input/Output
4EAT Control Unit	—
Vehicle Speed Sensor	Input
Pulse Generator	Input
Throttle Position Sensor	Input
Idle Switch	Input
Coolant Temperature Switch	Input
Fluid Temperature Switch (ATF)	Input
Brakelamp Switch	Input
Neutral Safety Switch	Input
Manual Switch	Input
Solenoid Valve 1-2 Shift	Output
Solenoid Valve 2-3 Shift	Output
Solenoid Valve 3-4 Shift	Output
Solenoid Valve Lockup	Output

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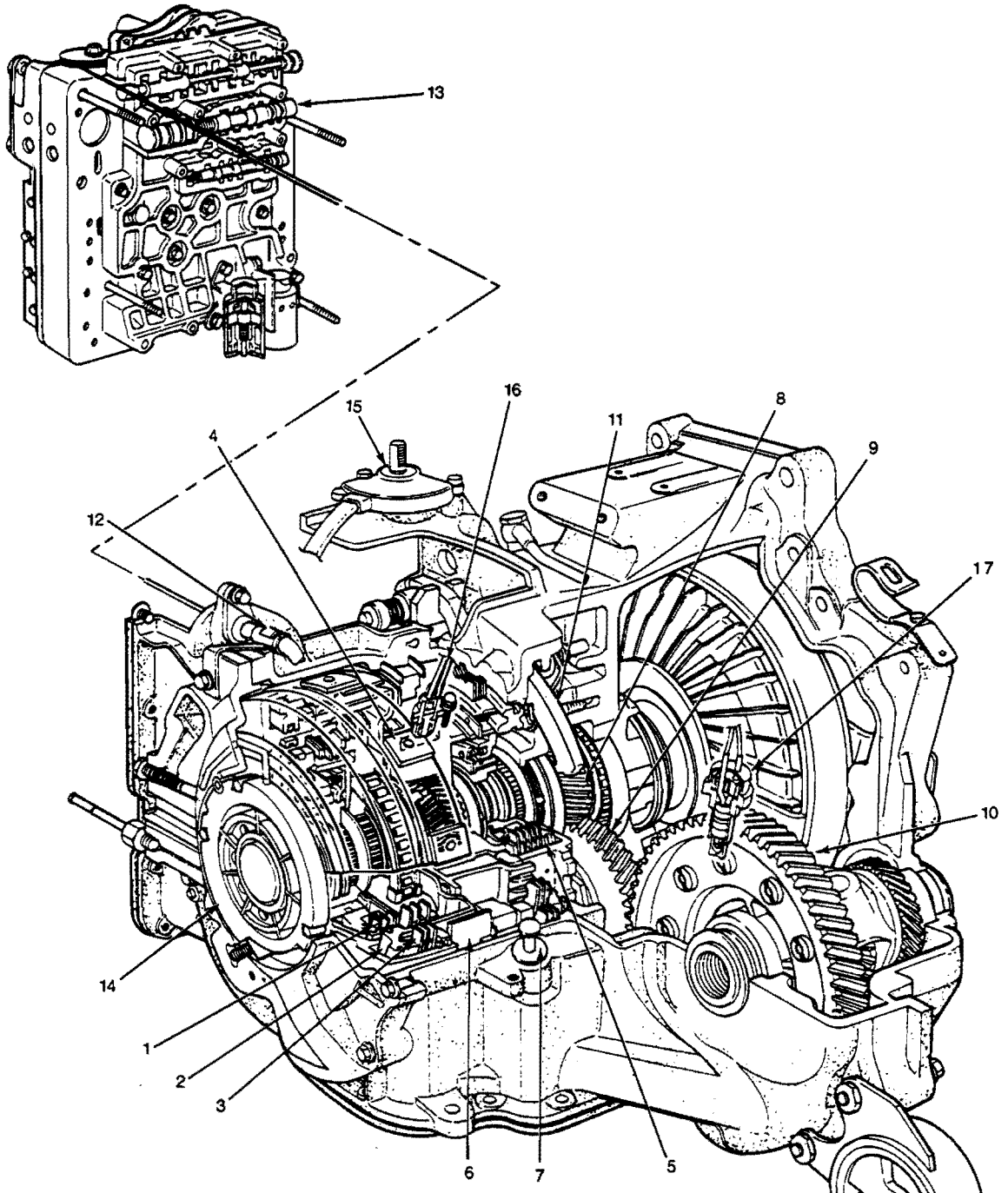
DESCRIPTION (Continued)

STRUCTURAL VIEW



1. COASTING CLUTCH
2. FORWARD CLUTCH
3. REVERSE CLUTCH
4. REVERSE AND FORWARD DRUM
5. 3-4 CLUTCH
6. 2-4 BAND
7. LOW AND REVERSE
8. OUTPUT GEAR
9. IDLE GEAR
10. DIFFERENTIAL
11. PARKING PAWL
12. THROTTLE CABLE
13. CONTROL BODY
14. OIL PUMP
15. NEUTRAL SAFETY SWITCH
16. PULSE GENERATOR
17. FLUID TEMPERATURE SWITCH

D8577-B

DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the 4EAT Transaxle from above and below the vehicle and check for:

Mechanical

a. Fluid leaks.
b. Loose engine or transaxle mounts.
c. CV joints and halfshafts loose, worn or damaged.
d. Shift linkage binding or damaged.
e. Front brakes excessively worn or damaged.
f. Incorrect tire pressure.

Electrical

a. Blown fuses.
b. Stretched, open or damaged wiring.
c. Corroded or loose connectors.

2. Check accelerator linkage and throttle valve linkage for freedom of travel.
3. Activate the emergency override button and then shift the selector lever manually through all ranges to check for ease of movement, obvious binding or bad adjustment.
4. Check the oil cooler (mounted in front of the radiator) for free air flow and leakage.
5. If fault is not visually evident, refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• Engine Will Not Crank in Any Shift Lever Position	• Neutral start switch does not operate or is disconnected. • 4EAT control module.	• Go to switch monitor test **SM1.**
• Engine Does Not Crank in P	• Selector lever and linkage out of adjustment. • Neutral start switch not correctly aligned to transaxle.	• Confirm selector or linkage adjustment and operation. • Adjust neutral start switch.
• Engine Starts in Shift Lever Positions Other Than P or N	• Shift linkage damaged or out of adjustment. • Neutral start switch is shorted. • 4EAT control module.	• Confirm selector linkage adjustment and operation. • Go to switch monitor test **SM1.**
• Vehicle Moves in P or Parking Gear Not Disengaged When P is Disengaged	• Selector lever and linkage out of adjustment. • Parking pawl is damaged.	• 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 linkage and operation. • Inspect control valve. Service or replace as required.
• Vehicle Does Not Move in Ⓓ, D, L and R	• Control valves. • Improper fluid level. • Oil pump dirty, broken or damaged seals. • Torque converter damaged.	• Go to switch monitor test **SM1.** • Check and fill to proper level. • 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.	• Go to switch monitor test **SM1.** • Inspect clutches. • Go to operational tests.
• Vehicle Does Not Move in Reverse	• Reverse clutch worn or damaged. • Low and reverse clutch slipping.	• Go to operational tests. • Inspect clutch. • Inspect clutch adjustment.
• Noise Severe Under Acceleration or Deceleration. 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.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Noise in Park or Neutral-Does Not Stop in Drive	• Loose flywheel to converter bolts. • Oil pump worn. • Torque converter failure.	• Tighten to specification. • Examine / service pump. • Examine / service converter. • Go to operational test **OP1.**
• Noise in All Gears-Changes Power to Coast	• Final drive gear set worn. • CV joints.	• Examine / service final drive gear set. • Service as required.
• Noise in All Gears-Does Not Change Power to Coast	• Damaged speedometer gears. • Bearings worn or damaged. • Planetary gear set noisy.	• Examine / replace speed drive or driven gear. • Examine / replace. • Service planetary gear set.
• Harsh Shifts (Any Gears)	• Kickdown cable out of adjustment. • Valve body. • Sticking accumulators. • CV joints. • Tire over-inflated. • Engine mounts loose. • Throttle valve sticking. • Band adjustment. • Band servo.	• Check kickdown cable adjustment. • Inspect valve body. • Inspect accumulators. • Service as required. • Inflate to proper level. • Secure engine mounts. • Inspect throttle valve. • Check band adjustment. • Inspect band servo.
• Soft Shifts (Any Gears)	• Kickdown cable out of adjustment. • Band adjustment. • Band servo. • Pressure regulator damaged. • ATF level. • Valve body. • Tire under-inflated. • Sticking accumulators. • Throttle valve sticking.	• Check kickdown cable adjustment. • Check band adjustment. • Inspect band servo. • Inspect pressure regulator. • Check and fill. • Inspect valve body. • Inflate to proper level. • Inspect accumulators. • Inspect throttle valve.
• Erratic Shifting, Incorrect Shift Points, Incorrect Shift Sequence	• Kickdown cable out of adjustment. • Control valves. • Band adjustment. • Clutches slipping. • Fluid level and quality.	• Check kickdown cable adjustment. • Go to switch monitor test **SM1.** • Check band adjustment. • Inspect clutches. • Check and fill.
• Improper Lockup	• Control valves. • Torque converter.	• Go to switch monitor test **SM1.** • Inspect torque converter.
• Skipping Gears (Shift 1st to 3rd or 2nd to OD, For Example)	• Valve body. • Control valves. • 2-4 band adjustment.	• Inspect valve body. • Go to Switch Monitor Test **SM1.** • Check band adjustment.
• Transaxle Overheating	• 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. • Go to operational test **OP1.** • Check cooler lines for kinks and damage. Clean, service or replace cooler lines. • Inspect cooler for plugging. Service as required. 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.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Drags in Reverse Like Parking Brake is Applied	• 2-4 band adjustment. • Brakes.	• Inspect band adjustment. • Refer to Section 12-01.
• Drags in Forward Gears Like Parking Brake is Applied	• Band adjustment. • Brakes.	• Inspect band adjustment. • Go to Section 12-01.
• Engine Runaway on Upshift	• Fluid level low. • Valve body. • 2-4 band adjustment. • Oil pump. • Damaged bypass valve. • Clutches slipping.	• Check fluid level. • Inspect valve body, solenoid valves. • Inspect band adjustment. • Inspect oil pump. • Inspect bypass valve. • Inspect clutches.
• Engine Runaway on Downshift	• Coasting bypass valve sticking. • Clutches slipping. • Fluid level. • Oil pump.	• Go to operational test **OP1.** • Inspect clutches. • Check fluid level. • Inspect oil pump.
• Excessive Creep	• Torque converter. • Kickdown cable out of adjustment. • Ignition timing and idle speed.	• Inspect torque converter. • Inspect kickdown cable adjustment. • Check and adjust as necessary.
• No Creep	• ATF level and condition. • Kickdown cable out of adjustment. • Selector level. • 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.

Preliminary Inspection

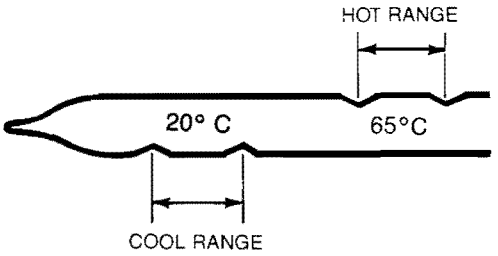
To help locate problems with the transaxle, the following sequence should be followed, except when directed otherwise by the symptom menu:

1. **Perform Preliminary Inspection.** This step will help find possible problems that are obvious, easy to check and easy to repair.
2. **Review Condition Chart.** This step provides basic direction or test procedures. The condition chart only covers problems that are easy to relate to a customer complaint. More detailed symptoms are covered in the operational and the road test sections of the diagnostics to isolate problems found while driving, or for problems that need specific analysis. Follow the direction given in the "Action to Take" column. Directions are given in a recommended order of testing.
3. **Perform Switch Monitor Test.** This test step checks input signals from the individual input switches to the 4EAT control module.
4. **Perform Operational Tests.** This step determines the causes of most basic problems that may exist. Follow directions given to repair any faults. When directed to perform operational tests and road tests for the same condition, always perform operational tests first; this action will prevent causing possible damage to the transaxle during driving.
5. **Perform Road Test.** The road test is an evaluation of the 4EAT while driving; service or inspection of the transaxle during this test may involve major disassembly, therefore road test should always be done last. The powertrain may also show problems during the road test that can cause transaxle malfunction, or be confused with transaxle problems. If no problems are found during road test, it is likely that the problem is intermittent. Since the problem may not re-occur, the symptom should be evaluated with the customer present.

   NOTE: After any repair is made, retest the transaxle to verify if condition is still present. If the condition re-occurs, further testing must be performed to isolate the problem. Any time fluid is drained from the transaxle, be certain the proper type and amount of fluid is replaced.

DIAGNOSIS AND TESTING (Continued)

Engine problems or driveline problems can affect transaxle performance; therefore other systems may have to be serviced before the transaxle, such as the engine, or halfshafts.

TEST STEP	RESULT	ACTION TO TAKE
PI1 ATF LEVEL AND CONDITION		
• Park vehicle on level surface. • Warm engine at idle. • Selector lever in P position. • Apply brakes and shift selector through entire range twice. • Remove dipstick, wipe it clean and replace (make certain dipstick is completely sealed in tube). • Remove dipstick again and inspect level. • Is fluid level between F and L marks on proper scale?  	Yes ▶ No ▶	GO to **PI2.** ADD ATF as required. NOTE: If particles are evident in ATF or there is other contamination (water, dirt, foam, etc.) the transaxle oil pan must be removed for further inspection. If contamination is present, the transaxle must be disassembled, flushed and cleaned.
PI2 ATF CONDITION CHECK		

• Park vehicle on level surface.
• Selector level in P position.
• Warm engine at idle.
• Remove dipstick.
• Inspect ATF for:
  • Burnt ATF
  • Unusual smell
  • Discoloration
  • Contamination (improper type of fluid, etc.)
• Are any concerns evident?
	Yes ▶
	No ▶
	Burnt ATF
		DRAIN and REPLACE ATF.
		GO to **PI3.**
		REFER to condition chart.

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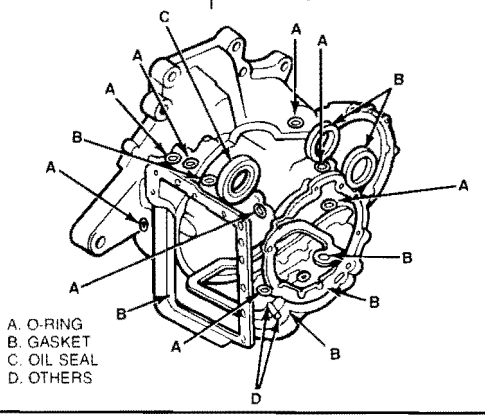
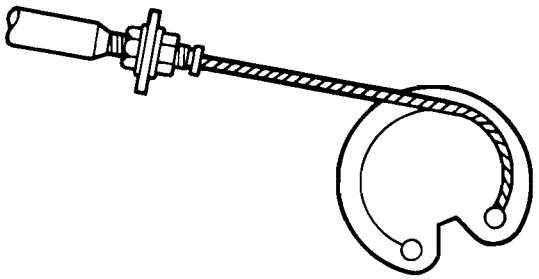
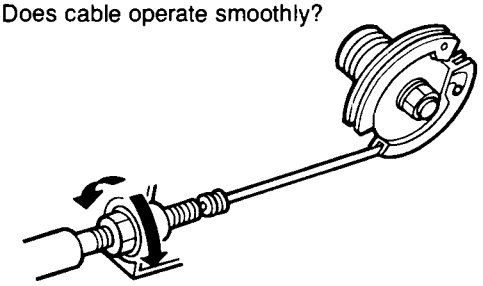
DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
PI3 IDLE SPEED INSPECTION		
• Warm engine. • Transaxle in P range. • Ground the STI connector. • With a tachometer, check the vehicle's idle speed. The idle speed should be 800-900 rpm in neutral. • If the idle speed is not within specification, adjust the idle speed by turning the idle speed adjusting screw until the idle speed is within specification. • Is the idle speed within specification?	Yes ▶ No ▶	GO to **PI4.** ADJUST idle speed as required.
PI4 SELECTOR LEVER INSPECTION		
• Move the selector lever through every range. • Turn ignition switch to ON and apply brake pedal. • Check the button. It must be pushed to engage step R, step P ranges but not N, or (D) range. • Check that lever position matches indicator. • Check for good operation of the button (smooth operation and clicks in each position). • Does the selector lever operate properly?	Yes ▶ No ▶	GO to **PI5.** ADJUST or SERVICE the selector lever as required. 
PI5 TRANSAXLE FLUID LEAKAGE CHECKS		
• Vehicle parked on level surface. • Check speedometer cable connection at the transaxle. • Leakage at the oil pan gasket often can be stopped by tightening the attaching bolts to specification. • Check the fluid filler tube connection at the transaxle case. • Check the fluid lines and fittings between the transaxle and the cooler for looseness, wear or damage. • Oil soluble aniline or fluorescent dyes premixed at the rate of 2.5 ml (1/2 teaspoon) of dye powder to 0.23L (1/2 pint) of transaxle fluid, have proven helpful in locating the source of fluid leakage. • Check the power steering gear system. The power steering gear system is positioned over the transaxle and is filled with transmission fluid. Leaks from the power steering gear may pool on the transaxle before dripping onto the ground, thus giving the appearance of a transaxle fluid leak. • Are any concerns evident?	Yes ▶ No ▶	SERVICE or REPLACE leaking gasket or component. GO to **PI6.** NOTE: Do not try to stop an oil leak by increasing any bolt or fitting torque beyond specification. This may cause damage to the transaxle case threads. 

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
PI6 KICKDOWN CABLE INSPECTION		
• Engine OFF. • Transaxle in P range. • Check for smooth operation of kickdown cable from idle to WOT. • Does cable operate smoothly? 	Yes ▶ No ▶	GO to **PI7.** SERVICE or REPLACE kickdown cable as required.
PI7 THROTTLE CABLE INSPECTION		
• Engine OFF. • Transaxle in P range. • Check for smooth operation of throttle cable from idle to WOT. • Does cable operate smoothly? 	Yes ▶ No ▶	GO to **PI8.** ADJUST or REPLACE as required.
PI8 TIRE PRESSURE CHECK		
• Engine OFF. • Transaxle in P range. • Check tire pressures. • Are all tires inflated to proper pressure?	Yes ▶ No ▶	REFER to condition chart. INFLATE tire(s) to proper level.

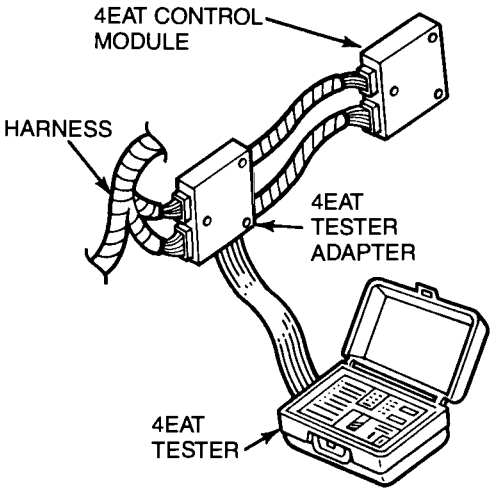
CD8029-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
SM1 SWITCH MONITOR TEST A		

• Connect 4EAT tester.
• Key OFF.
• Check that the following 4EAT tester LEDs are illuminated:
  • 20 Memory Power
  • 1C Malfunction Code
  • 1E Check Connect
NOTE: Other LEDs may also be illuminated if an input is under the right condition. For example, if the gear selector lever is in P or N, the P/N LED will be illuminated.
• Are the LEDs illuminated as indicated?
	Yes ▶
	No ▶
		GO to **SM2.**
		REFER to Quick Test, Section 15 in Emissions.

SM2 SWITCH MONITOR TEST B		
• 4EAT tester connected. • Key ON, engine OFF. • Check each switch under the conditions specified in Chart A. • Check each switch with the engine ON. • Are the switches OK?	Yes ▶ No ▶	GO to **SM3.** REFER to Quick Test, Section 15 in Emissions.



CD8030-A

DIAGNOSIS AND TESTING (Continued)

CHART A

SWITCH	LED or VOM	CONDITION
Brakelamp	ON OFF	Above 10V Below 1.5V	Brake pedal depressed Brake pedal released
Idle	ON OFF	Above 10V Below 1.5V	Accelerator pedal depressed Accelerator pedal released
L	ON OFF	Above 10V Below 1.5V	In L range Other ranges
Ⓓ	ON OFF	Above 10V Below 1.5V	In Ⓓ range Other ranges
D	ON OFF	Above 10V Below 1.5V	In D range Other ranges
N or P	ON OFF	Below 1.5V Above 10V	In N or P range Other ranges
Manual	ON OFF	Above 10V Below 1.5V	Manual switch depressed Manual switch released
Manual Ind.	ON OFF	Below 1.5V Above 10V	Manual shift ON Manual shift OFF
Throttle Position Sensor	— — —	4.0-4.5V 0.5V Changes 0.5V	Accelerator pedal fully depressed and held Accelerator pedal released Every 1/8 position change

CD8031-A

TEST STEP	RESULT ▶	ACTION TO TAKE
SM3 SWITCH MONITOR TEST C		
• 4EAT tester connected. • Engine ON. • Check that the following switches under the conditions listed in the chart below:	Yes ▶ No ▶	GO to **OP1.** REFER to Quick Test, Section 15 in Emissions.

SWITCH	LED or VOM	CONDITION
Coolant Temp.	ON OFF	Above 10V Below 1.5V	Above 72°C (162°F) Below 65°C (149°F)
ATF Temp.	ON OFF	Below 1.5V Above 10V	ATF temp. above 143°C (289°F) ATF temp. below 150°C (302°F)

• Are the switches OK?

CD8032-A

DIAGNOSIS AND TESTING (Continued)

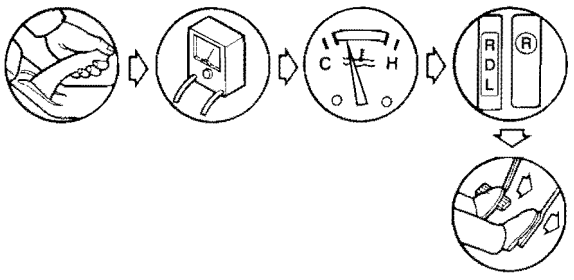
Operational Tests

Description

Operational test procedures are provided to service as pre-road test checks. The procedures are conducted with engine operating in the service facility using a minimum of time and with less effort than the road test requires. These procedures are used to determine the causes of (and provide the corrective actions for) transaxle malfunctions most likely to occur. These include the torque converter, the powertrain, the friction elements (clutches and bands), the hydraulic system and the associated regulating valves and controls.

Preparation

1. Check the following items.
   a. Coolant level and condition.
   b. ATF level and condition.
   c. Idle speed.
2. Preparation of the vehicle.
   a. Block the wheels.
   b. Apply the parking brake.
   c. Warm the engine to 50-80°C (122-176°F).
   d. Place the selector lever firmly in the P position.
3. Perform the operational tests.

TEST STEP	RESULT ▶	ACTION TO TAKE
OP1 POWERTRAIN FUNCTION CHECK (STALL TEST)		
• Check for slippage of the clutches and band brakes and the torque converter capacity as follows: 1. Stall Test Procedure: With the selector lever set to R, and the foot brake firmly applied, steadily increase engine speed to its maximum, quickly read and note the highest rpm. Release the accelerator. **CAUTION: This procedure must be completed within 5 seconds, followed by cooling the ATF in N range idling for at least one minute.** 2. Repeat the test, followed by the cooling step for each of the selector lever ranges (D), D, and L. 3. Use the following Stall Test Evaluation chart to verify the test results, and the corresponding Action to Take. 	▶	REFER to Stall Test Evaluation chart.

CD8033-A

DIAGNOSIS AND TESTING (Continued)

STALL TEST EVALUATION CHART

TEST RESULT	RANGE	POSSIBLE SOURCE	ACTION TO TAKE
Above Specification*	In all ranges	Worn oil pump	REPLACE.
		Oil leakage from oil pump control valve, and/or transmission case.	DISASSEMBLE INSPECT, and SERVICE or REPLACE as required.
		Insufficient line pressure	
		Stuck pressure regulator valve	
	In Ⓓ range	One-Way clutch No. 2 slipping	
	In forward ranges	Forward clutch slipping One-Way clutch No. 1 slipping	DISASSEMBLE, INSPECT, and SERVICE or REPLACE as required.
	In D and L ranges	Coasting clutch slipping	
	In Ⓓ and D ranges	2-4 band slipping	ADJUST and RETEST.
	In R, L and L ranges	Low and reverse brake slipping	DISASSEMBLE, INSPECT, SERVICE/REPLACE as required.

*Specification — Stall Speed
Ⓓ, D, L, R ranges
1.6L — 2200-2500 rpm

CD8034-A

DIAGNOSIS AND TESTING (Continued)

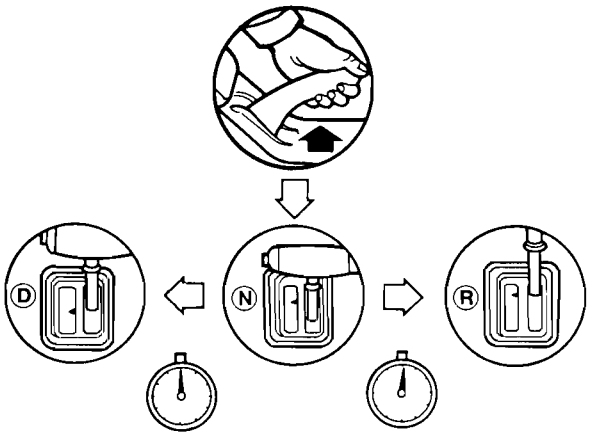
STALL TEST EVALUATION CHART

TEST RESULT	RANGE	POSSIBLE SOURCE	ACTION TO TAKE
Above Specification	In R range	Low and reverse brake slipping. Reverse clutch slipping.	PERFORM road test to determine whether problem is low and reverse band or reverse clutch. a) Engine brake applied in 1st... Reverse Clutch. b) Engine brake not applied in 1st...Low and reverse band. SERVICE or REPLACE as required.
Within Specification*		All shift control elements within transmission are functioning normally.	GO to **OP2.**
		Engine out of tune.	Tune engine before running Stall Test.
Below Specification*		One-Way clutch slipping within torque converter.	DISASSEMBLE, INSPECT, SERVICE, or REPLACE as required.

*Specification — Stall Speed
Ⓓ, D, L, ranges
1.6L — 2200-2500 rpm

CD8035-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT ▶	ACTION TO TAKE
OP2 HYDRAULIC CONTROL SYSTEM TIME LAG CHECK		
• Check the time lag between selector lever positions using a stopwatch. • Time Lag Test Procedure: 1. Warm the engine to bring the transaxle to operating temperature 60-70°C (140-158°F). 2. With the engine idling at 850 ± 50 RPM, in P range, lift from N range to D range and measure the elapsed time until engagement is felt, using the stopwatch. 3. Idle the engine in N range for one minute minimum to cool the ATF. 4. Repeat step 1 procedure for N to D range and N to R range. 5. Repeat step 1 through 3, three times and average the results. 6. Use the following Time Lag Evaluation Chart to verify the corresponding Action to Take. 	▶	REFER to Time Lag Evaluation chart.

CD8036-A

DIAGNOSIS AND TESTING (Continued)

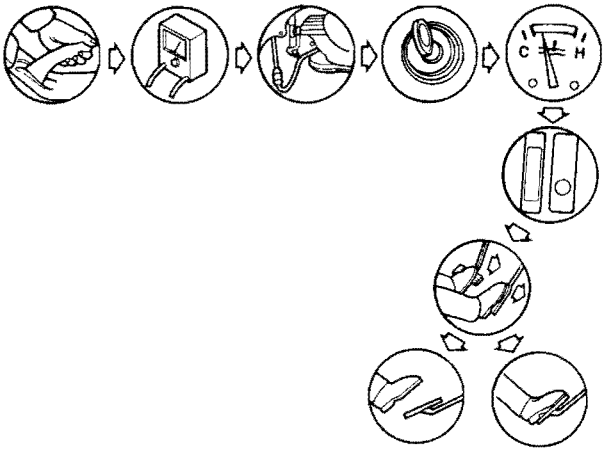
TIME LAG EVALUATION CHART

SHIFT	RESULT	POSSIBLE SOURCE	ACTION TO TAKE
	More than Specification*	Insufficient line pressure	GO to **OP3.**
N — Ⓓ		Forward clutch slipping One-way clutch #1 slipping One-way clutch #2 slipping	DISASSEMBLE, INSPECT and SERVICE, or REPLACE as required.
		N — D accumulator not operating properly.	
	Less than Specification*	Excessive line pressure.	GO to **OP3.**
	More than Specification*	Insufficient line pressure.	GO to **OP3.**
N — R		Low and reverse brake slipping. Reverse clutch slipping.	DISASSEMBLE, INSPECT, and SERVICE or REPLACE as required.
	Less than Specification*	N — R accumulator not operating properly.	
		Excessive line pressure.	GO to **OP3.**

*Specification Time Lag:
N — Ⓓ range .5 — .6 second
N to R range .6 — .7 second

CD8037-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT ▶	ACTION TO TAKE
OP3 OIL PRESSURE CONTROL CHECK		
• Check the oil pump line pressure, line pressure control, throttle control pressure, and oil pressure leakage as follows: • Connect a tachometer to the engine. • Connect a pressure tester at the line pressure inspection hole square head plug L. • Procedure: 1. With the engine idling at 850 ± 50 RPM in P range, shift the Selector Lever to the Ⓓ range, then read the line pressure at idle, with the foot brake firmly applied, steadily increase the engine rpm to its maximum, quickly read and note line pressure. Release the accelerator. **CAUTION: Step 1 must be completed within five seconds, followed by cooling the ATF in N range idling for at least one minute.** 2. Repeat Step 1 for each range, making certain to cool the transaxle in between tests.  3. Specifications — Line Pressure **Range** / Ⓓ, D, L / R Idle: 363-415 (3.7-4.6, 53-65) / 588-735 (6.0-7.5, 85-107) Stall Speed: 932-1069 (9.5-10.9, 136-155) / 1520-1746 (15.5-17.8, 220-253)	▶	REFER to Line Pressure Evaluation chart.

CD8038-A

DIAGNOSIS AND TESTING (Continued)

LINE PRESSURE EVALUATION CHART

PRESSURE TEST RESULT	RANGE	POSSIBLE SOURCE	ACTION TO TAKE
Low	All	Worn oil pump, fluid leaking from oil pump, control valve body or transaxle case. Pressure regulator valve sticking. Throttle Valve sticking. Throttle Modulator Valve sticking. Throttle Cable out of adjustment.	DISASSEMBLE, INSPECT, SERVICE or REPLACE as required, the complete pump or valve assembly or components.
Low	Ⓓ, D	Fluid pressure leak-down from hydraulic circuit of forward clutch.	DISASSEMBLE, INSPECT, SERVICE or REPLACE components as required.
Low	R	Fluid pressure leak-down from hydraulic circuit of low and reverse brake or reverse clutch.	DISASSEMBLE, INSPECT, SERVICE or REPLACE components as required.
High	All	Throttle valve sticking. Throttle modulator valve sticking. Pressure regulator valve sticking. Throttle cable out of adjustment.	DISASSEMBLE, INSPECT, SERVICE or REPLACE components as required.
Within Specified Limits	All	—	GO to **OP4.**

CD8039-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
OP4	THROTTLE PRESSURE TEST		
	• Check the line pressure for checking the hydraulic components and for improper throttle cable adjustments as follows: • Connect the pressure tester at the throttle pressure inspection hole (square head plug T). • Procedure: 1. With the engine idling at 850 ± 50 RPM in P range, shift the selector lever to the (D) range, then read the throttle pressure at idle, with the foot brake firmly applied, steadily increase the engine rpm to its maximum, quickly read and note the throttle pressure. Release the accelerator. **CAUTION: Step 1 must be completed within five seconds, followed by cooling the ATF in N range idling for at least one minute.** 2. Specification — Throttle Pressure Throttle Pressure kPa (Kg/cm2 PSI) **D Range** Idle 32-101 (.33-1.03, 5-15) Stall Speed 543-660 (5.53-6.73, 78-96)	▶	REFER to Throttle Pressure Test Evaluation chart.

CD8040-A

DIAGNOSIS AND TESTING (Continued)

THROTTLE PRESSURE TEST EVALUATION CHART

PRESSURE TEST RESULT	POSSIBLE LOCATION OF PROBLEM	ACTION TO TAKE
Not within specified limits	Throttle valve sticking. Pressure regulator valve sticking.	DISASSEMBLE, INSPECT, SERVICE, CLEAN or REPLACE the valve(s) as required.
	Improper adjustment of throttle cable.	REMOVE, INSPECT for damage and freedom of movement, REPLACE and adjust as required.
Within specified limits	—	REFER to Road Test.

CD8045-A

Road Test

Description

The road test is an evaluation of the 4EAT performance. The road test should only be performed when the 4EAT symptom menu directs you here. The road test involves a driving evaluation of the transaxle shifting quality, ability and timing. Shift problems will be directed to a list of symptoms for appropriate actions to take. These symptom menus are given: Upshift, Downshift, and Shift feel for various symptoms encountered.

1. Drive the vehicle and attempt to recreate the condition.
2. **Safety.** It is important that the road test is performed with safety issues in mind. Use the provided safety belts and operate the vehicle in a safe manner.
3. Two persons should participate in the road test, one to drive the vehicle and another to observe conditions and symptoms.
4. **Alternatives.** In some cases it may not be necessary or desirable to perform an actual road test. The condition may occur at starting, idle or high rpm idle conditions. If this situation applies, proceed with the road test procedure by using the operating condition that applies to your situation.
5. If several conditions are found, service them in the order that they occur.
6. Begin road test with step SP1.

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
SP1	SHIFT POINT CHECK		
• Connect 4EAT Tester.		Yes ▶	GO to **SP2.**
• Warm engine to operating temperature (above 185°F).		No (problem on up-shift)	REFER to upshift symptom menu.
• Cruise control off.		No (problem on down-shift)	REFER to downshift symptom menu.
• Selector lever in Ⓓ range.			
• Drive vehicle: Accelerate at 1/2 throttle. Accelerate at full throttle.			
• Compare shift point with chart.			

1.6L ENGINE

Throttle Position (Throttle Position Sensor Voltage)	Shifting (Gears)		Drum Speed (RPM)	Vehicle Speed (MPH)
Fully Opened (4.0V)	1	2	5850-6450	37-40
	2	3	5400-5800	63-68
	3	2	3350-3600	58-63
	2	1	2750-3100	32-36
Half Throttle (1.6-2.2V)	1	2	3450-4050	22-25
	2	3	3700-4350	43-51

• Is shift point correct?

CD8041-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
SP2	SHIFT POINT CHECK		
• 4EAT Tester connected. • Warm engine to operating temperature (above 185°F). • Cruise control off. • Selector lever in L range. • Drive vehicle: Accelerate at 1/2 throttle. Accelerate at full throttle. • Compare shift point with chart.		Yes ▶ No (problem on up-shift) No (problem on down-shift)	GO to **SP3.** REFER to upshift symptom menu. REFER to downshift symptom menu.

1.6L ENGINE

Throttle Position (Throttle Position Sensor Voltage)	Shifting (Gears)		Drum Speed (RPM)	Vehicle Speed (MPH)
Fully Opened (4.0V)	1	2	5850-6450	37-40
	2	1	2800-3100	32-36
Half Throttle (1.6-2.2V)	1	2	3450-4050	22-25

• Is shift point correct?

CD8042-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
SP3	SHIFT POINT CHECK		
• 4EAT Tester connected.		Yes ▶	GO to **SP4.**
• Warm engine to operating temperature (above 185°F).		No (problem on up-shift)	REFER to upshift symptom menu.
• Selector lever in (D) range.		No (problem on down-shift)	REFER to downshift symptom menu.
• Cruise control off.			
• Drive vehicle: Accelerate at 1/2 throttle. Accelerate at full throttle. Operate kickdown (sudden acceleration).			
• Compare shift point with chart.			

1.6L ENGINE

Throttle Position (Throttle Position Sensor Voltage)	Shifting (Gears)	Drum Speed (RPM)	Vehicle Speed (MPH)
Fully Opened (4.0V)	1 2	5850-6450	37-40
	2 3	5350-5800	63-68
	3 OD	5950-6300	104-110
Half Throttle (1.6-2.2V)	1 2	3450-4050	22-25
	2 3	3700-4350	43-51
	3 OD	4200-4750	74-85
	Lock Up On (OD)	2950-3400	74-85
	Lock Up Off (OD)	2400-2600	60-65
Kickdown	OD 3	3850-4100	96-102
	OD 2	2300-2500	58-63
	OD 1	1250-1400	32-36
	3 2	3350-3600	58-63
	3 1	1850-2050	32-36
	2 1	2750-3100	32-36

• Is shift point correct?

CD8043-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
SP4 CHECK SLIPPAGE		
• 4EAT Tester connected. • Warm engine to operating temperature (above 185°F). • Connect tachometer. • Drive vehicle: • Compare vehicle speed (and engine speed) to four indicated drum speeds. • Is vehicle speed (or engine speed) above or below indicated speed?	Yes ▶ Yes (All speeds are incorrect) ▶ No ▶	Follow direction given in chart. INSPECT forward clutch. GO to **OD1**..

1.6L ENGINE

Driving Conditions		Vehicle Speed (RPM) 1000 2000 3000 4000	
Gear	**Other Conditions**	**Vehicle Speed (MPH)**	**Action to Take**
1st	L Range	6 12 19 25	Inspect Low and Reverse Brake
1st	D Range	6 12 19 25	Inspect One-Way Clutch
2nd	D Range	11 22 34 45	Inspect 2-4 Brake Band
3rd	D Range	17 35 52 69	Inspect Coasting Clutch
OD	D Range	25 50 74 99	Inspect 3-4 Clutch

Engine Speed (RPM)

Gear	Other Conditions	Engine Speed (RPM)	Action to Take
OD	D Range (Lock-up)	1000 2000 3000 4000	Inspect Torque Converter

CD8044-A

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
OD1	SHIFT FEEL CHECK		
	• Warm engine to operating temperature (above 185°F).	Yes ▶	REFER to shift feel symptom menu.
	• Selector lever in Ⓓ range.	No ▶	GO to **OD2.**
	• Cruise control off.		
	• Drive vehicle from closed throttle to wide open throttle.		
	• Does shift feel excessively harsh or slushy?		
OD2	ENGINE BRAKING CHECK		
	• Warm engine to operating temperature (above 185°F).	Yes ▶	GO to **D1.**
	• Selector lever in Ⓓ range.	No ▶	REFER to downshift symptom menu.
	• Cruise control off.		
	• Drive vehicle until Ⓓ gear is obtained.		
	• Shift selector lever into D range.		
	• Is engine braking felt (in D range only) immediately?		

	TEST STEP	RESULT ▶	ACTION TO TAKE
D1	ENGINE BRAKING CHECK		
	• Warm engine to operating temperature (above 185°F).	Yes ▶	GO to **P1.**
	• Cruise control off.	No ▶	REFER to downshift symptom menu.
	• Selector lever in D range.		
	• Drive vehicle until 3rd gear is obtained.		
	• Shift selector lever into L range.		
	• Is engine braking felt immediately?		

	TEST STEP	RESULT ▶	ACTION TO TAKE
P1	VEHICLE STOPPING TEST		
	• Drive vehicle on level surface.	Yes ▶	REFER to shift feel symptom menu.
	• Warm engine to operating temperature (above 185°F).	No ▶	PERFORM parking pawl inspection.
	• Maximum speed of 2 mph.		
	• Shift selector lever into P range.		
	• Does vehicle stop?		

DIAGNOSIS AND TESTING (Continued)

SHIFT FEEL SYMPTOM MENU

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 band. • Tire pressure. • Accumulators. • 3-4 clutch. • CV joints or engine mounts. • 2-4 band and servo. • Pressure regulator valve sticking or damaged.	• Inspect cable adjustment. • Clean, service or replace. • Check for clogging or blockage, service as required. • Check for wear, service or replace. • Check for adjustment, wear and damage, service as required. • Inflate to proper pressure. • Clean, service or replace. • Inspect, service or replace. • Service or replace. • Check adjustment. • Clean, service or replace.
• Harsh 1-2 Shift	• Kickdown cable broken or out of adjustment.	• Check kickdown adjustment.
• Harsh Engagement N-R	• N-R accumulator sticking or damaged.	• Inspect and service or replace.
• Harsh Engagement N-D	• N-R accumulator sticking or damaged.	• Inspect and service or replace.
• 2-3 Shift Shock	• 2-3 accumulator sticking or damaged. • 1-2 accumulator sticking or damaged. • Pulse generator not functioning.	• Inspect and service or replace. • Inspect and service or replace. • Check pickup and torque converter for damage.
• Erratic Shifts	• Kickdown cable broken or out of adjustment. • Pulse generator not functioning.	• Inspect cable adjustment. • Inspect 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 cable adjustment. • Clean, service or replace. • Inflate to proper pressure. • Clean, service or replace.
• 1-2 Soft Shift	• Valve body. • 2-4 brake band is too loose.	• Inspect valve body, solenoid valves. • Inspect adjustment.
• 2-3 Soft Shift	• 2-3 accumulator sticking or damaged. • Valve body.	• Clean, service or replace. • Inspect valve body, solenoid valves.
• N-R Soft Shift	• N-R 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 brake band is too tight.	• Check adjustment.
• Slow to Engage in Reverse	• Reverse clutch.	• Inspect for damage or wear; service or replace.

DOWNSHIFT SYMPTOM MENU

CONDITION	POSSIBLE SOURCE	ACTION
• Engine Has Momentary Runaway During 3-2 Downshift	• Coasting bypass valve sticking or damaged. • 2-4 brake band and servo.	• Inspect, service or replace. • Inspect adjustment, service or replace.
• Hesitation in 3-2 Shift	• Valve body.	• Inspect valve body, solenoid valves.

DIAGNOSIS AND TESTING (Continued)

DOWNSHIFT SYMPTOM MENU (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• No Engine Braking Ⓓ to D	• Fluid blockage to coasting clutch to failed coasting clutch. • Valve body.	• Check for blockage and coasting clutch condition. • Inspect valve body, solenoid valves.
• No Engine Braking D to L	• Fluid blockage to coasting clutch to 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 valve body, solenoid valves. • Inspect, clean or service.

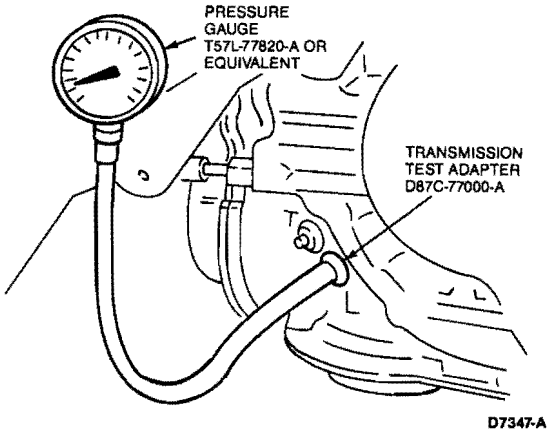
UPSHIFT SYMPTOM MENU

CONDITION	POSSIBLE SOURCE	ACTION
• No 2-3 Upshift	• 3-4 clutch spring. • Valve body.	• Check clutch adjustment, damage. • Inspect valve body, solenoid valves.
• No 2nd Gear (Transaxle Shifts 1-3)	• Valve body. • Loose 2-4 band.	• Inspect valve body, solenoid valves. • Adjust.
• No Lockup	• Lockup solenoid not functioning. • Torque converter.	• Inspect solenoid and related hydraulic circuit. • Inspect torque converter.
• Shift Points Incorrect	• Valve body. • 2-4 band out of adjustment. • Damaged or worn forward clutch.	• Inspect valve body, 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 adjustment and condition. • Clean, service or replace. • Inspect, service or replace. • Check adjustment and condition. • Check condition, 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, valve body.
• Delayed 1-2 Shift	• Valve body.	• Inspect valve body, solenoid valves.

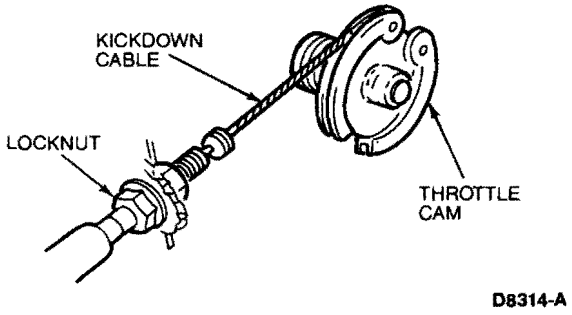
ADJUSTMENTS

Kickdown Cable

1. Remove the splash shield next to the left front tire.
2. Remove the square head plug (marked "L") and install Transmission Test Adapter D87C-77000-A and Pressure Gauge T57L-77820-A or equivalent.

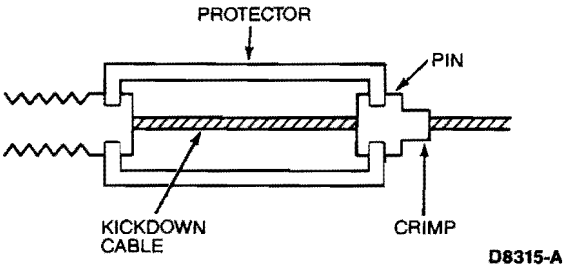


3. Turn the kickdown cable locknuts to the furthest point from the throttle cam (loosen the cable all the way).



4. Shift the transaxle into PARK and warm up the engine.

   NOTE: The idle speed should be 700-800 RPM.
5. Turn the locknuts toward the throttle cam until the line pressure begins to exceed 450 kPa (63-66 psi).
6. Turn the locknuts away from the throttle cam until a line pressure of 432-450 kPa (63-66 psi) is reached.
7. Tighten the locknuts.
8. Turn off the engine.
9. Install the square head plug and tighten to 5-10 N·m (43-87 lb-in).
10. When installing a new kickdown cable, fully open the throttle valve, then crimp the pin with the protector installed as shown. Remove the protector.



MAJOR SERVICE OPERATIONS

Transaxle Fluid Level Check

Use the following procedure to check the transaxle fluid level:

1. Apply the parking brake and block the drive wheels.
2. Run the engine to warm up the transaxle fluid.
3. While the engine is idling, shift the selector lever from PARK to LOW, then shift back to PARK.
4. Pull out the dipstick and be sure that the transaxle level is between the LOW and FULL marks. Use the low temperature scale when the fluid temperature is 20°C (68°F). Use the high temperature scale when the fluid temperature is 65°C (149°F). If necessary, add Motorcraft MERCON® transaxle fluid or equivalent.

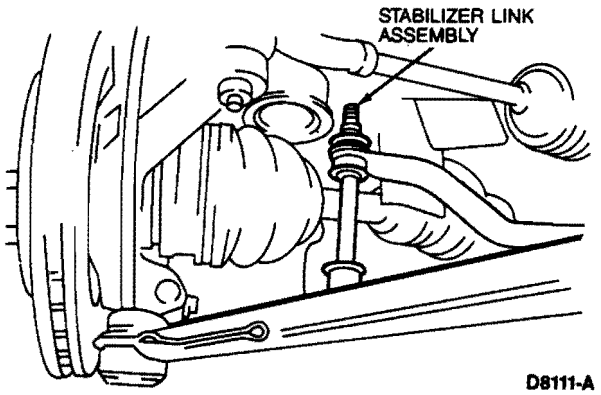
Differential Oil Seals

Removal

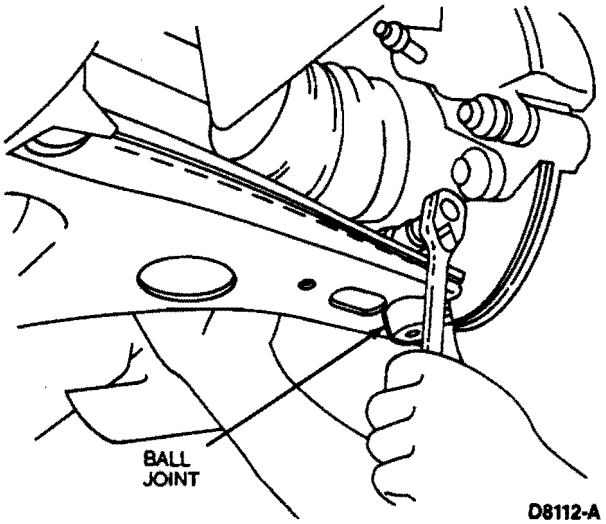
1. Raise and support the vehicle. Refer to Section 10-04.
2. Remove the front wheels.
3. Remove the splash shields.
4. Drain the transaxle fluid.
5. Remove the tie rod nuts and cotter pins and disconnect the tie rod ends.

MAJOR SERVICE OPERATIONS (Continued)

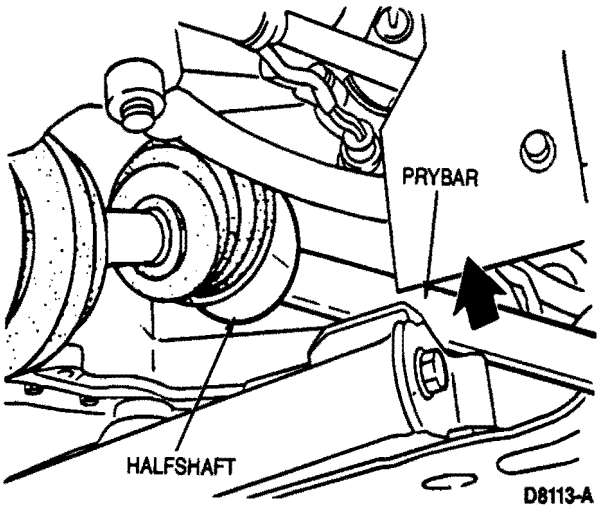
6. Remove the stabilizer link assemblies.



7. Remove the bolts and nuts from the lower arm ball joints.



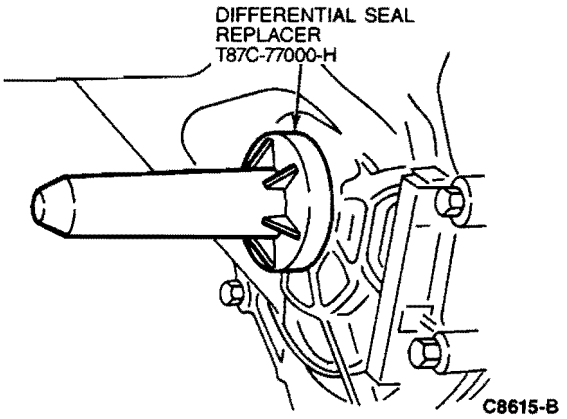
8. Pull the lower arms to separate them from the knuckles.
9. Remove the RH joint shaft bracket.
10. Remove the halfshafts from the transaxle by prying with a bar inserted between the shaft and transaxle case. Support the halfshafts with wire.



11. Remove the differential oil seals with a flat-tip screwdriver.

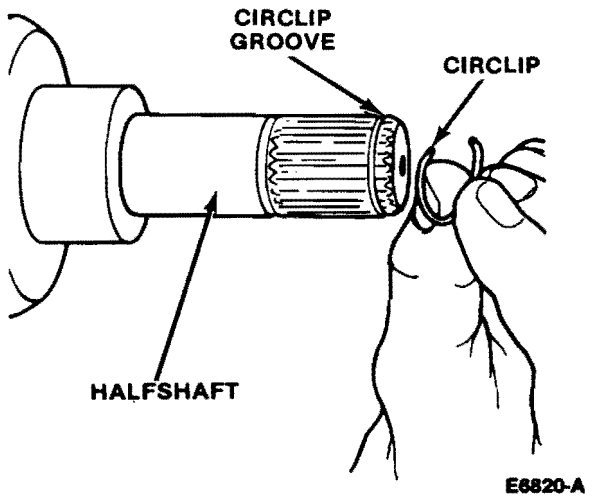
Installation

1. Tap in new differential oil seals using Differential Seal Replacer T87C-77000-H or equivalent.

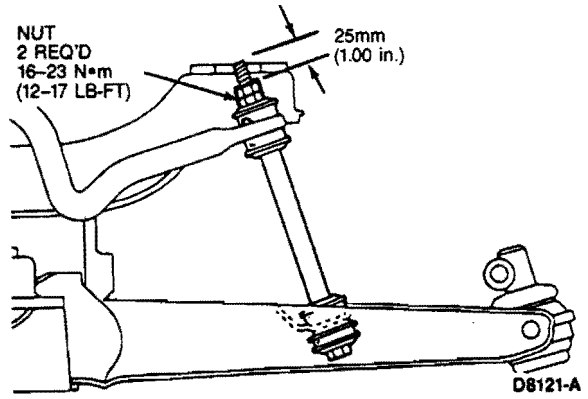


MAJOR SERVICE OPERATIONS (Continued)

2. Replace the circlip located on the end of each halfshaft.



3. Install the halfshafts. Refer to Section 15-22.
4. Attach the lower arm ball joints to the knuckles.
5. Install the tie rod ends and tighten the nuts to 29-44 N·m (22-33 lb-ft). Install new cotter pins.
6. Install the bolts and nuts to the lower arm ball joints. Tighten to 43-54 N·m (32-40 lb-ft).
7. Install the stabilizer link assemblies. Turn the nuts on each assembly until 25.4mm (1 inch) of bolt thread can be measured from the upper nut. When this length is reached, secure the upper nut and back off the lower nut until a torque of 16-23 N·m (12-17 lb-ft) is reached.

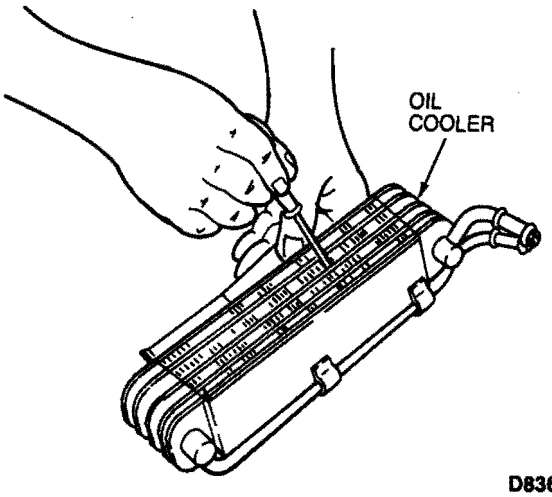


8. Install the splash shields.
9. Install the front wheels and tighten the lug nuts to 88-118 N·m (65-87 lb-in).
10. Add the specified transaxle fluid and check for leaks.

Oil Cooler

Removal

1. Remove front bumper. Refer to Section 47-02.
2. Disconnect the oil hoses.
3. Remove the oil cooler.
4. Straighten bent fins with a screwdriver.



Installation

1. Install the oil cooler.
2. Connect the oil hoses.
3. Install front bumper.

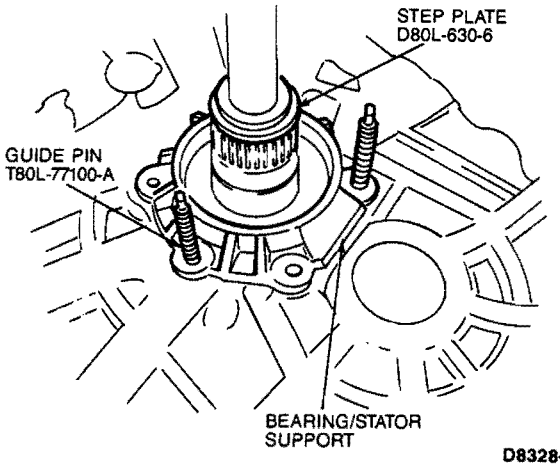
Bearing Preload and Shim Selection

NOTE: Whenever the transaxle is disassembled, the bearing preload must be adjusted. The output gear and differential bearing preload are adjusted by selecting shim(s) to insert under the bearing cups. To determine the correct thickness shim(s), use Shim Selection Kit T87C-77000-J and T88C-77000-C or equivalent along with the following procedure.

MAJOR SERVICE OPERATIONS (Continued)

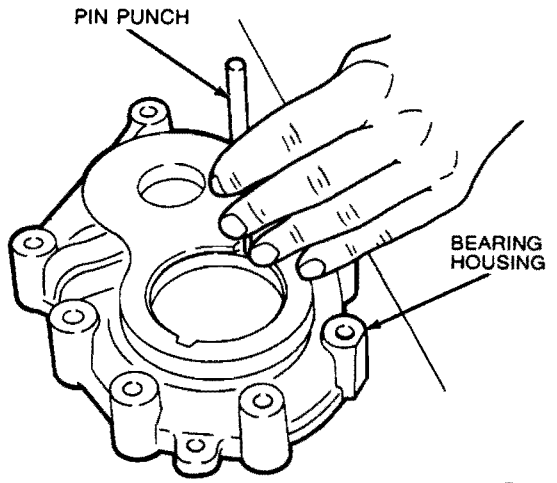
Output Gear

1. Align the bearing / stator support using Guide Pins T80L-77100-A or equivalent then press the support into the converter housing using Step Plate D80L-630-6 or equivalent.



D8328-A

2. Remove the bearing cup and adjustment shim(s) from the bearing housing.

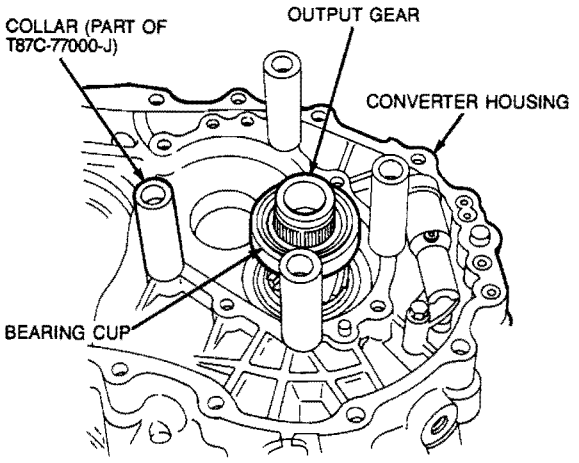


D8329-A

3. Place the output gear into the converter housing.

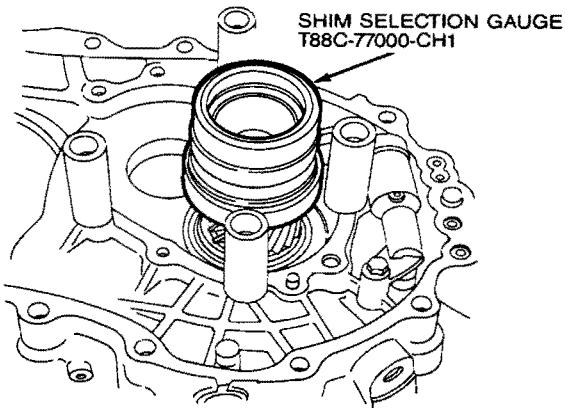
4. Place the bearing cup over the output gear bearing.

5. Place four collars (part of T87C-77000-J) on the converter housing at the positions shown.



D8330-A

6. Place Shim Selection Gauge T88C-77000-CH1 or equivalent on the output gear. Turn the two halves of the gauge to eliminate any gap between them.

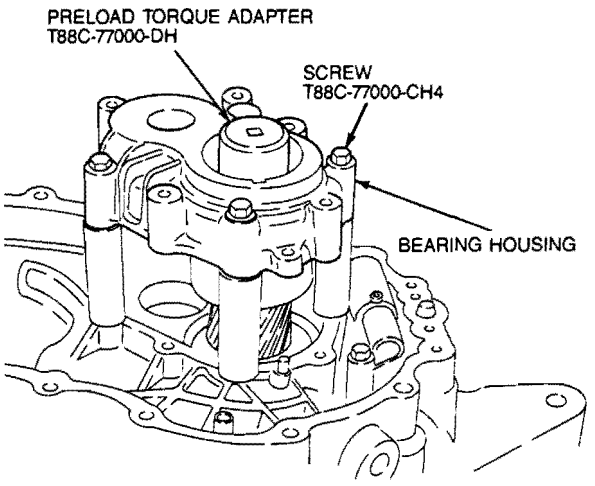


D8331-B

7. Place the bearing housing on the collars, then install four bolts T88C-77000-CH4 or equivalent with washers. Tighten to 19-26 N·m (14-19 lb-ft).

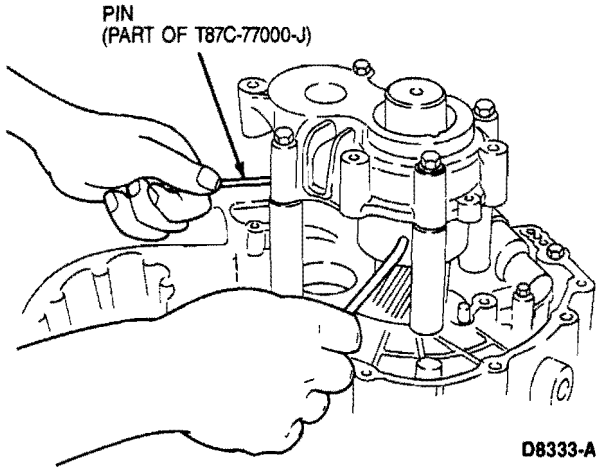
MAJOR SERVICE OPERATIONS (Continued)

8. Place Preload Torque Adapter T88C-77000-DH or equivalent on the output gear.



D8332-B

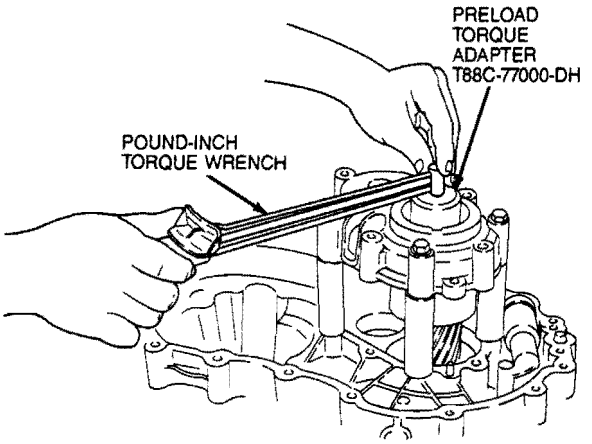
9. Using the pins provided in T87C-77000-J or equivalent loosen the gauge halves until all of the free play is removed and the bearing cup is seated. Then thread the gauge halves back together.



D8333-A

10. Attach a pound-inch torque wrench to the torque adapter. Measure the drag on the output gear bearing.

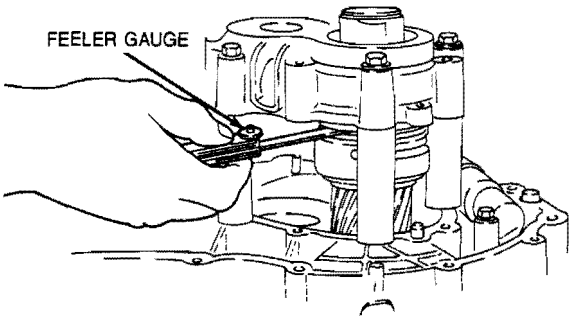
    NOTE: Read the preload when the output gear starts to turn.



D8334-A

11. Turn the gauge using the pins (part of T87C-77000-J) until a reading of 0.5-0.9 N·m (4.3-7.8 lb-in) is obtained on the torque wrench.

12. Use a feeler gauge to measure the gap between the two halves of the gauge. Measure the gap at four spots, at 90 degree intervals. Use the largest measurement.



D8335-A

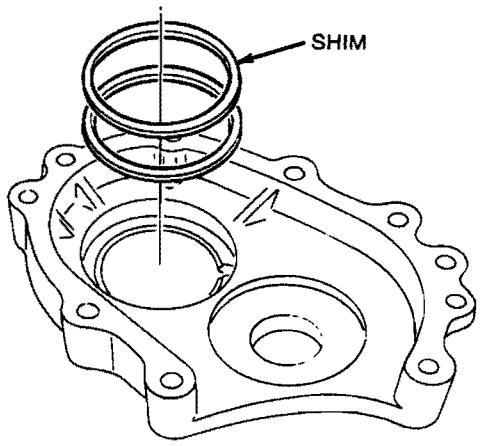
13. Using the following chart select the shim(s) that is closest (or slightly larger) to the measured value of the gauge gap.

Part Number	Shim Thickness
E92Z-7F405-B	0.10mm (0.004 inch)
E92Z-7F405-C	0.12mm (0.005 inch)
E92Z-7F405-D	0.14mm (0.006 inch)
E92Z-7F405-E	0.16mm (0.0063 inch)
E92Z-7F405-F	0.18mm (0.007 inch)
E92Z-7F405-G	0.20mm (0.008 inch)
E92Z-7F405-A	0.50mm (0.020 inch)

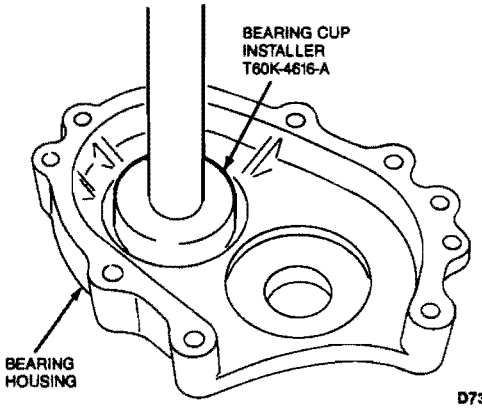
CD8373-B

MAJOR SERVICE OPERATIONS (Continued)

NOTE: Do not use more than seven shims.



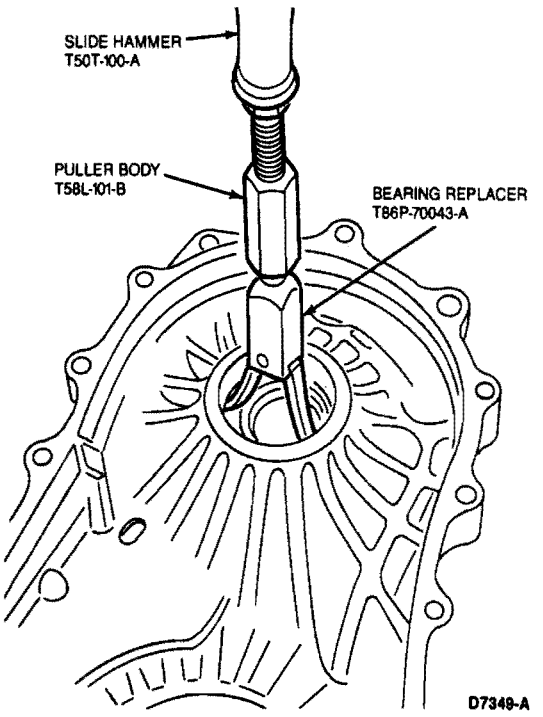
14. Remove the screws, washers, bearing housing, gauge, and bearing cup.
15. Press the selected shim(s) and bearing cup into the bearing housing using Bearing Cup Installer T60K-4616-A or equivalent.



16. Install the bearing housing. Tighten the retaining bolts to 19-26 N·m (14-19 lb-ft).
17. Measure the bearing preload. The preload should be 0.03-0.9 N·m (0.26-7.81 lb-in). Repeat the gauging process if the preload measurement is not within specification.
18. When the proper preload specification has been obtained, remove the bearing housing.

Differential

1. Remove the rear bearing cup and shims from the transaxle case using Bearing Replacer T86P-70043-A, Puller T58L-101-B, and Slide Hammer T50T-100-A or equivalent.



2. Install the front bearing cup into the converter housing using Driver Handle T80T-4000-W and Differential Bearing Cup Replacer T77F-1217-B or equivalent.

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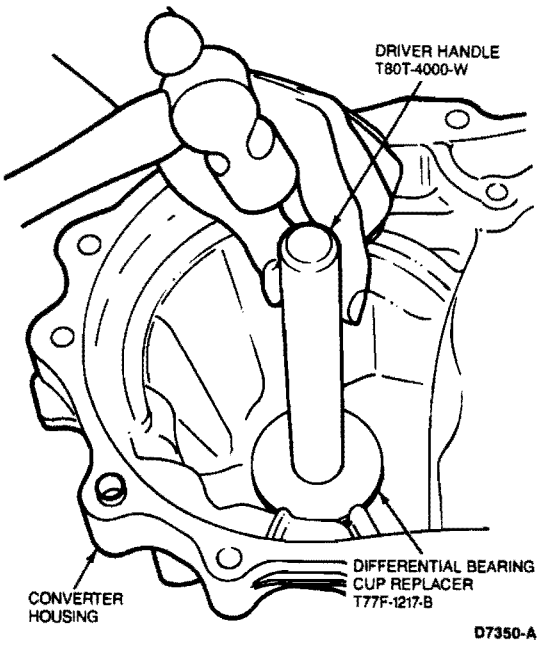
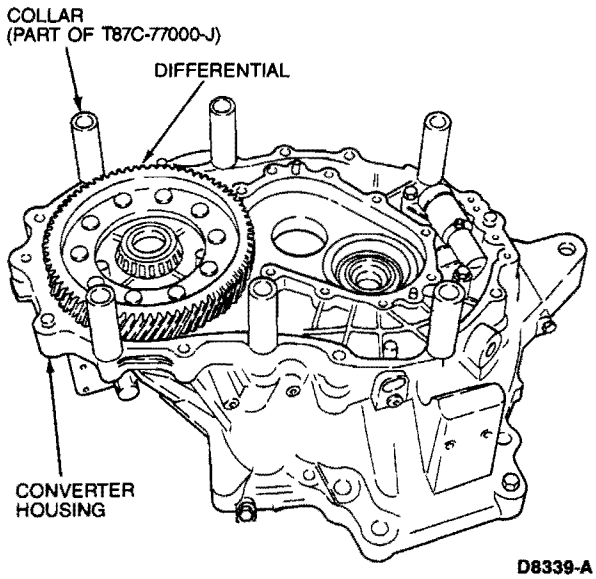


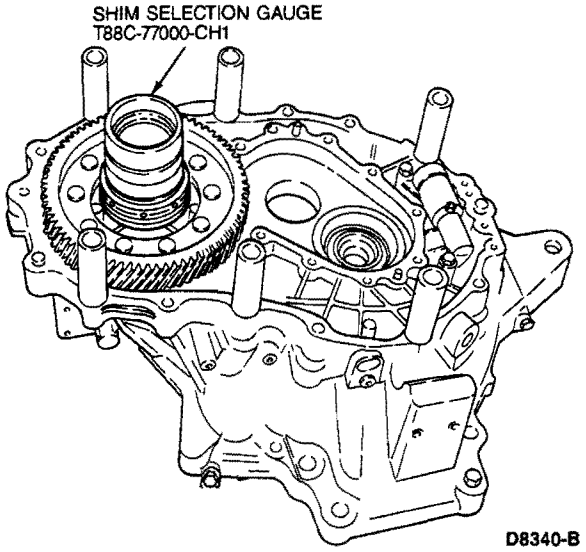
3. Place the differential into the converter housing.

MAJOR SERVICE OPERATIONS (Continued)

4. Place six collars (part of T87C-77000-J) on the converter housing at the positions shown.

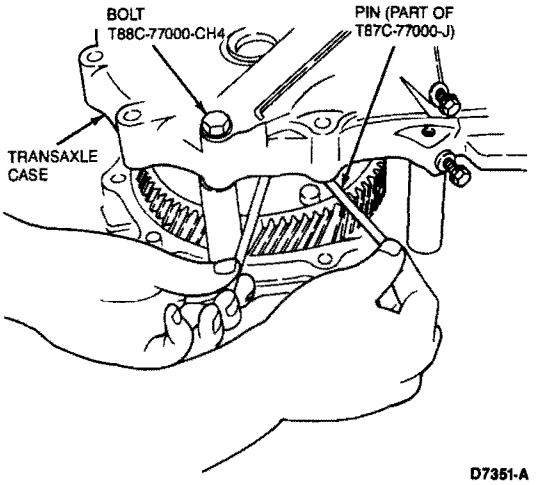


5. Place the rear bearing cup over the differential bearing.
6. Place Shim Selection Gauge T88C-77000-CH1 or equivalent on the output gear. Turn the two halves of the gauge to eliminate any gap between them.



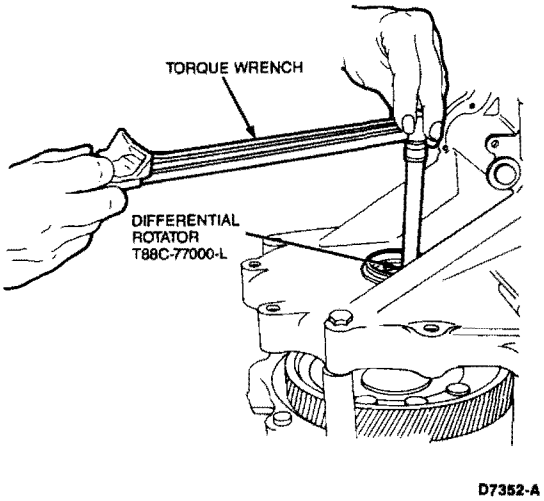
7. Place the transaxle case on the collars, then install six bolts T88C-77000-CH4 or equivalent with washers. Tighten to 36-52 N·m (27-38 lb-ft).

8. Using the pins provided in T87C-77000-J or equivalent, unthread the gauge halves until all the free play is removed and the bearing cup is seated. Then thread the gauge halves back together.



9. Engage Differential Rotator T88C-77000-L or equivalent and attach a pound-inch torque wrench to the adapter. Measure the drag on the differential bearing.

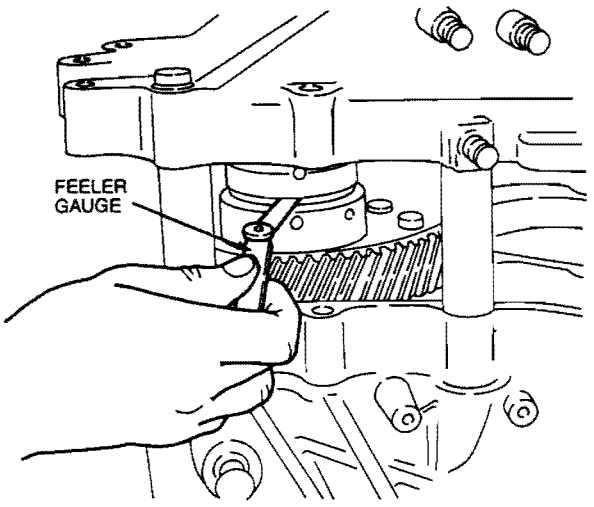
   NOTE: Read the preload when the differential starts to turn.



10. Turn the gauge using the pins (part of T87C-77000-J) until a reading of 0.5 N·m (4.3 lb-in) is obtained on the torque wrench.

MAJOR SERVICE OPERATIONS (Continued)

11. Use a feeler gauge to measure the gap between the two halves of the gauge. Measure the gap at four spots, at 90 degree intervals. Use the largest measurement.



D8343-A

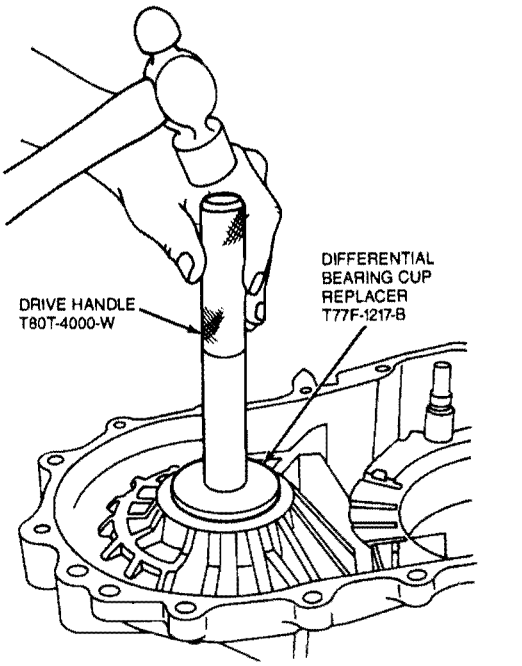
12. Add 0.2mm (0.0079 inch) to the largest measurement. Using the following chart, select the shim(s) closest (or slightly larger) to this final value.

    NOTE: Do not use more than three shims.

Part Number	Shim Thickness
E92Z-4067-A	0.10mm (0.004 in.)
E92Z-4067-B	0.12mm (0.005 in.)
E92Z-4067-C	0.14mm (0.006 in.)
E92Z-4067-D	0.16mm (0.0063 in.)
E92Z-4067-E	0.18mm (0.007 in.)
E92Z-4067-F	0.20mm (0.008 in.)
E92Z-4067-G	0.25mm (0.010 in.)
E92Z-4067-H	0.30mm (0.012 in.)
E92Z-4067-J	0.35mm (0.014 in.)
E92Z-4067-K	0.40mm (0.016 in.)
E92Z-4067-L	0.45mm (0.018 in.)
E92Z-4067-N	0.50mm (0.020 in.)
E92Z-4067-P	0.55mm (0.022 in.)
E92Z-4067-Q	0.60mm (0.024 in.)
E92Z-4067-R	0.65mm (0.026 in.)
E92Z-4067-S	0.70mm (0.028 in.)
E92Z-4067-T	0.75mm (0.030 in.)
E92Z-4067-U	0.80mm (0.032 in.)
E92Z-4067-V	0.85mm (0.034 in.)
E92Z-4067-W	0.90mm (0.036 in.)
E92Z-4067-X	0.95mm (0.038 in.)
E92Z-4067-Y	1.00mm (0.040 in.)
E92Z-4067-Z	1.05mm (0.042 in.)
E92Z-4067-AA	1.10mm (0.044 in.)
E92Z-4067-AB	1.15mm (0.046 in.)
E92Z-4067-AC	1.20mm (0.048 in.)

CC8428-A

13. Remove the screws, washers, transaxle case, gauge, and bearing cup.
14. Install the selected shim(s) and bearing cup into the transaxle case using Drive Handle T80T-4000-W and Differential Bearing Cup Replacer T77F-1217-B or equivalent.



D7353-A

15. Install the transaxle case. Tighten the retaining bolts to 37-52 N·m (27-38 lb-ft).
16. Measure the bearing preload. The preload should be 2.9-3.9 N·m (26-35 lb-in). Repeat the gauging process if the preload measurement is not within specification.
17. When the proper preload specification has been obtained, remove the transaxle case.

REMOVAL AND INSTALLATION

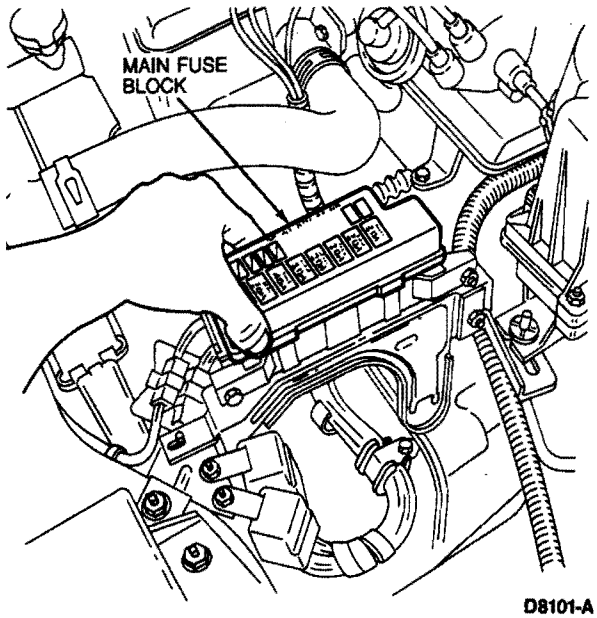
Valve Body

Removal

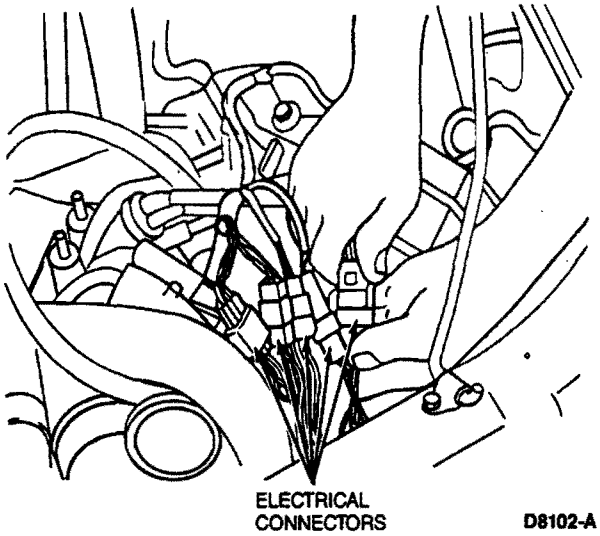
1. Remove air cleaner assembly. Refer to Section 24-41.

REMOVAL AND INSTALLATION (Continued)

2. Disconnect the main fuse block.

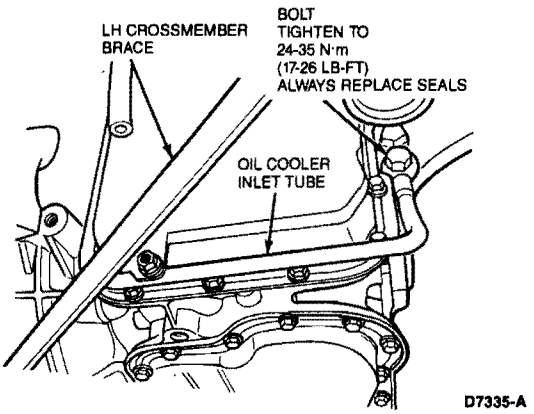


3. Disconnect the five 4EAT connectors and separate the 4EAT harness from the transaxle clips.

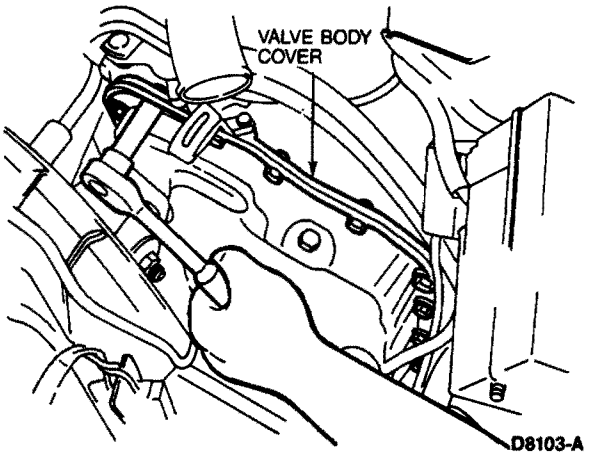


4. Raise and support the vehicle. Refer to Section 10-04.
5. Drain the transaxle fluid.

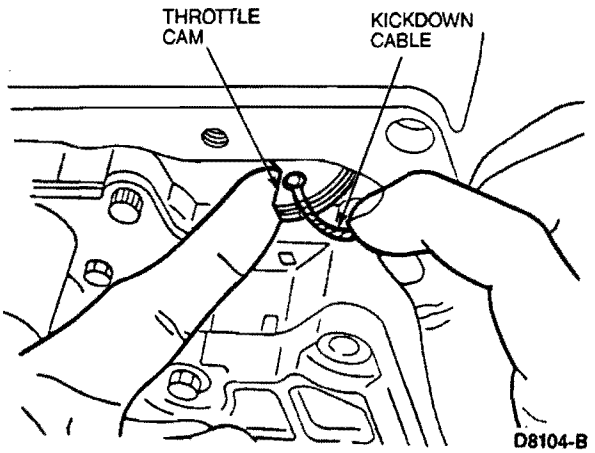
   WARNING: AVOID SPILLING TRANSAXLE FLUID; THE FLUID MAY BE HOT.
6. Disconnect the oil cooler outlet and inlet hoses.
7. Remove oil cooler inlet tube from transaxle.



8. Remove the valve body cover and gasket.

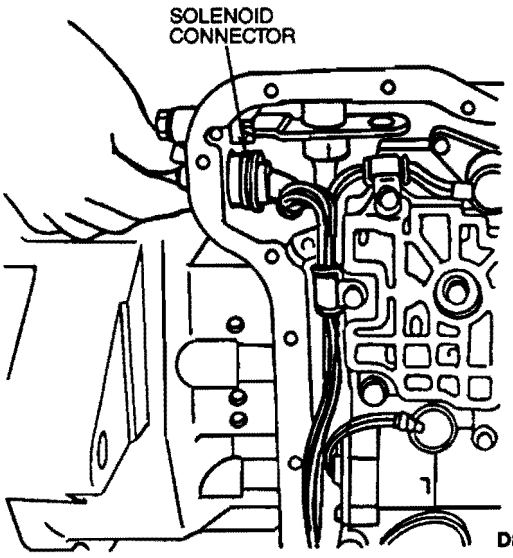


9. Remove the kickdown cable from the throttle cam.

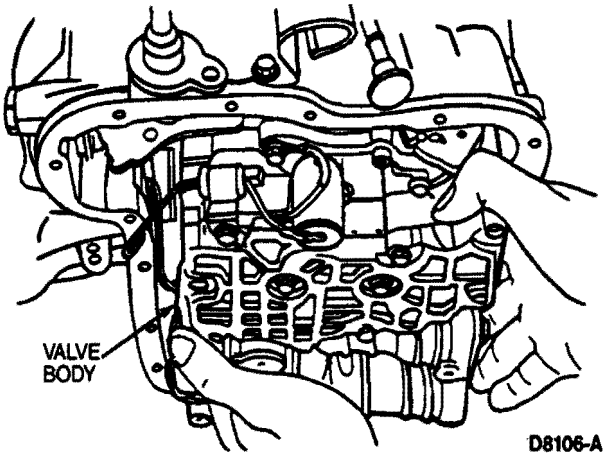


REMOVAL AND INSTALLATION (Continued)

10. Disconnect the solenoid connector, then pinch the tangs of the mating connector mounted on the transaxle case. Remove it by pushing inward.



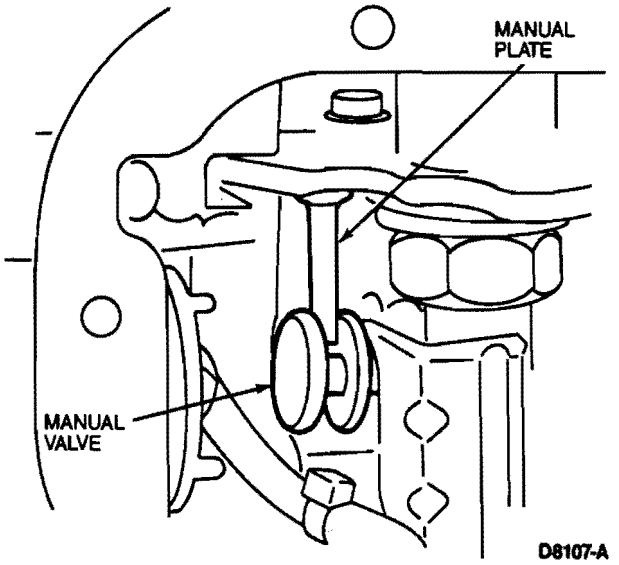
11. Remove the attaching bolts from the valve body and carefully remove the valve body.



Installation

NOTE: Shift transaxle into REVERSE to place the manual plate in the correct position for installation.

1. Install the valve body, using a mirror to align the groove of the manual valve with the manual plate.



2. Tighten the valve body mounting bolts to 11-15 N·m (95-130 lb-in).
3. Insert the solenoid connector into the transaxle case hole. Attach the mating connector.
4. Attach the kickdown cable to the throttle cam.
5. Install the valve body cover and a new gasket. Tighten to 8-11 N·m (69-95 lb-in).
6. Install oil cooler inlet tube to transaxle. Tighten bolt to 16-24 N·m (11-17 lb-ft).

   NOTE: Do not use gasket sealer, RTV, etc., on the valve cover or gasket.
7. Connect the oil cooler hoses.
8. Attach the five 4EAT connectors and support the 4EAT harness on the transaxle clips.
9. Connect the main fuse block.
10. Install the air cleaner assembly. Refer to Section 24-41.
11. Add the specified transaxle fluid and check for fluid leaks.

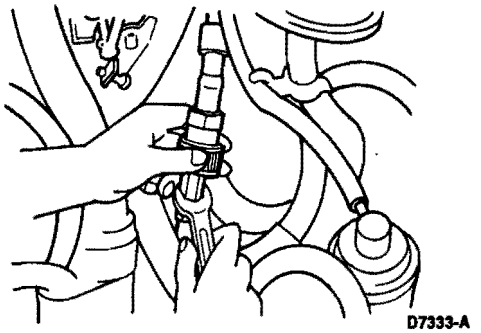
Transaxle

Removal

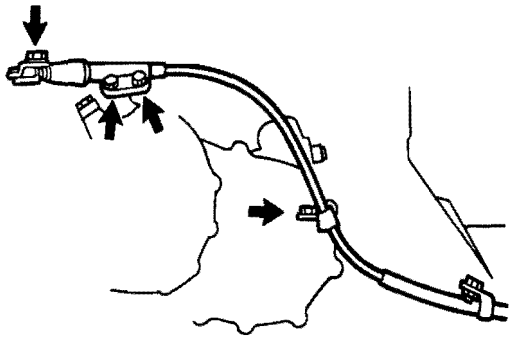
1. Disconnect and remove battery.
2. Remove air cleaner assembly. Refer to Section 24-41.

REMOVAL AND INSTALLATION (Continued)

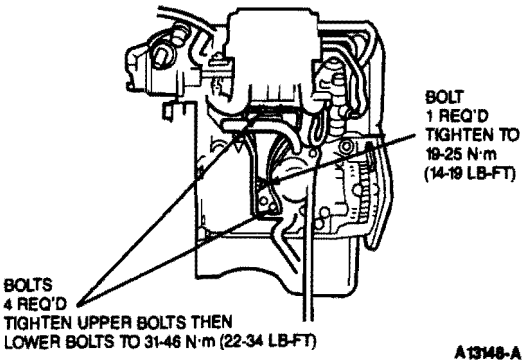
3. Disconnect speedometer cable at cable connector.


D7333-A

4. Ensure transmission is in the PARK position. Remove shift cable retaining nut from neutral safety switch.
5. Remove shift cable retaining bolts.


D7334-A

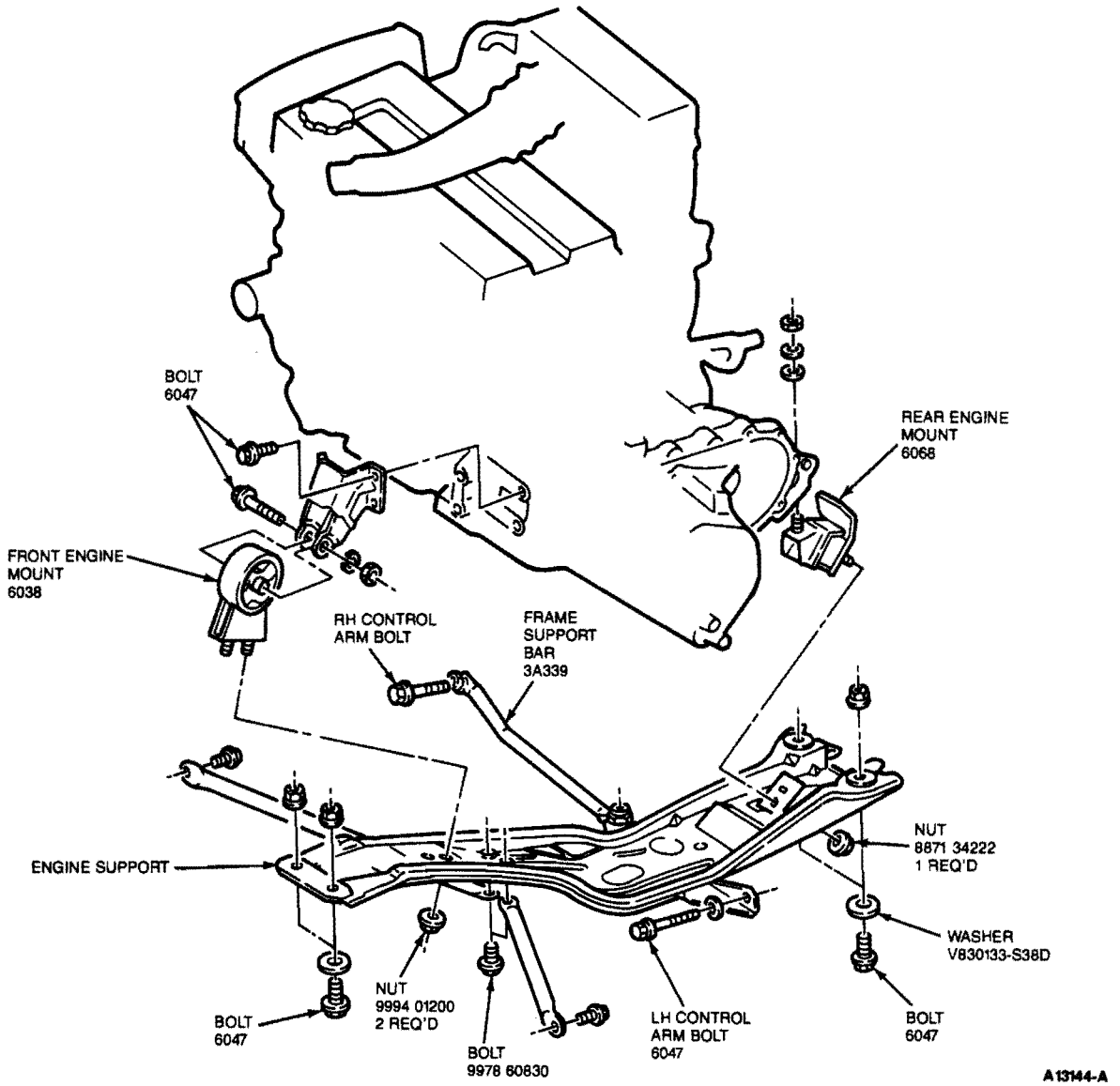
6. Disconnect kickdown cable from throttle body housing. Route cable out of the straps for removal with transmission.
7. Disconnect electrical connectors from transmission.
8. Remove dipstick tube bracket retaining bolt and ground wire.
9. Remove starter upper retaining bolts.
10. Remove upper intake manifold support retaining bolts.



A13148-A

11. Remove heater bypass tube bracket.
12. Remove transaxle to engine upper retaining bolts.
13. Install Engine Support Bar D88L-6000-A or equivalent.
14. Raise vehicle with a hoist. Refer to Section 10-04.
15. Drain transaxle fluid.
16. Remove intake manifold support lower retaining bolts. Refer to the illustration following Step 10.
17. Disconnect starter motor electrical connectors and remove starter.
18. Remove front wheel and tire assemblies. Refer to Section 11-01.
19. Remove front caliper brake hose retaining clips from strut bracket.
20. Remove ball joint pinch bolts. Separate ball joints from control arms.
21. Remove splash shields.
22. Remove LH control arm front retaining bolt.
23. Loosen RH control arm front retaining bolt.
24. Remove frame brace to crossmember retaining bolt.
25. Remove front and rear transaxle mount to crossmember retaining nuts.
26. Remove crossmember braces.

REMOVAL AND INSTALLATION (Continued)



27. Remove shift cable retaining screw from crossmember.
28. Remove crossmember.
29. Remove LH axle shaft.
30. Disconnect RH axle shaft from transaxle. Install Differential Plugs T88C-7025-AH or equivalent.

    CAUTION: Failure to install Differential Plugs may result in misalignment of differential side gears.
31. Remove gusset plate retaining bolts from transaxle. Loosen gusset plate retaining bolts on engine.
32. Remove torque converter cover plate.
33. Remove exhaust manifold support bracket.
34. Remove front and rear transaxle mounts.
35. Lower vehicle.
36. Lower but do not remove engine transaxle assembly with support bar.
37. Raise vehicle.
38. Remove torque converter to drive plate retaining nuts.
39. Position transaxle jack under transaxle and secure with safety chains.
40. Remove transaxle to engine lower retaining bolts.
41. Remove transaxle from vehicle.

REMOVAL AND INSTALLATION (Continued)

Installation

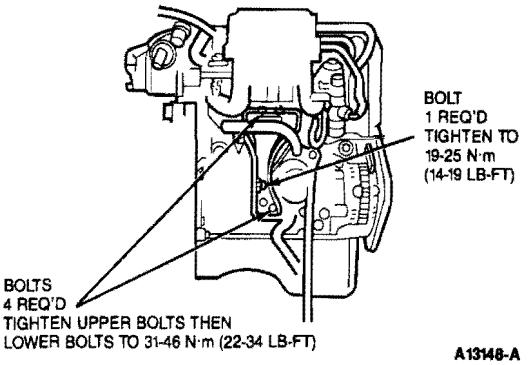
NOTE: Install new circlips to inner CV joint shafts.

1. Raise transaxle and position to engine.

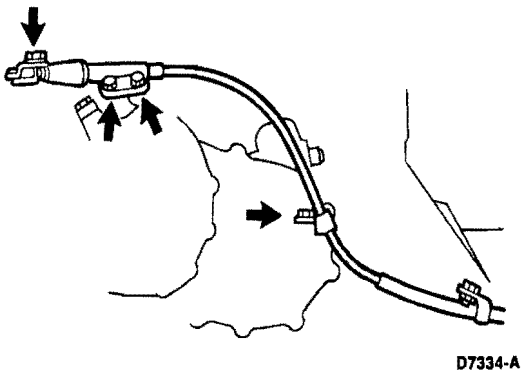
   CAUTION: Raise transaxle slowly and ensure dipstick tube clears battery tray.

   CAUTION: Align torque converter studs to drive plate.
2. Install transaxle to engine lower retaining bolts. Tighten to 55-80 N·m (41-59 lb-ft).
3. Install torque converter-to-drive plate retaining nuts. Tighten to 39-49 N·m (25-36 lb-ft).
4. Remove transaxle jack.
5. Lower vehicle.
6. Raise engine / transaxle assembly into position with support fixture.

   CAUTION: Use care in raising engine transaxle so as not to damage A/C if equipped, or other engine compartment components.
7. Raise vehicle.
8. Install front and rear mounts to transaxle. Tighten retaining bolts to 37-52 N·m (27-38 lb-ft).
9. Install exhaust manifold support. Tighten transaxle mount bolt to 67-91 N·m (49-67 lb-ft). Tighten manifold nut to 31-46 N·m (23-34 lb-ft).
10. Install torque converter cover plate. Tighten retaining bolts to 37-52 N·m (27-38 lb-ft).
11. Align gusset plates and install retaining bolts. Tighten to 55-80 N·m (41-59 lb-ft). Tighten remaining gusset plate retaining bolts to 43-61 N·m (32-45 lb-ft).
12. Position crossmember to transaxle mounts. Align rear transaxle mount stud first. Loosely install retaining nut. Align front transaxle mount studs. Loosely install retaining nuts.
13. Install crossmember retaining bolts. Tighten to 64-89 N·m (47-66 lb-ft).
14. Tighten front and rear transaxle mount retaining nuts to 28-46 N·m (20-34 lb-ft).
15. Install axle shafts and new retaining nuts. Tighten new LH axle stub shaft nuts to 157-235 N·m (116-174 lb-ft). Ensure axles are fully seated by grasping the shafts and pulling outward.
16. Position shift cable and install shift cable lower retaining bolt. Tighten to 8-11 N·m (69-95 lb-in).
17. Install crossmember braces. Tighten retaining bolts to 18-26 N·m (13-20 lb-ft).
18. Install frame brace. Tighten crossmember bolt to 31-46 N·m (23-34 lb-ft).
19. Install control arm front retaining bolt(s). Tighten bolts to 93-117 N·m (69-86 lb-ft).
20. Install ball joint pinch bolts. Tighten to 43-54 N·m (32-40 lb-ft).
21. Install brake hose retaining clips.
22. Install splash shields.
23. Install starter motor and lower retaining bolts. Connect starter electrical connectors.
24. Install intake manifold support bracket. Loosely install lower retaining bolts.
25. Install tire and wheel assemblies.
26. Lower vehicle.
27. Install transaxle to engine upper retaining bolts. Tighten to 55-80 N·m (41-59 lb-ft).
28. Remove engine support fixture.
29. Install heater bypass tube bracket.
30. Install intake manifold support upper bolts. Tighten all retaining bolts to 31-46 N·m (22-34 lb-ft).

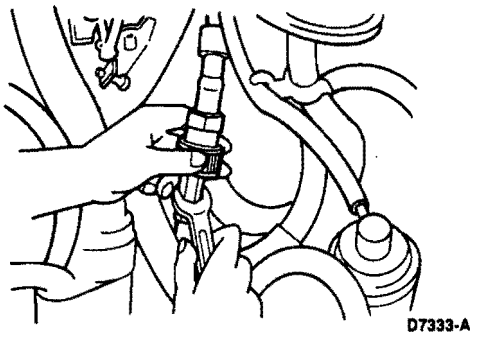


31. Install starter motor upper retaining bolts. Tighten to 31-46 N·m (22-34 lb-ft).
32. Position ground wire and install dipstick tube retaining bolt. Tighten to 8-11 N·m (69-95 lb-in).
33. Route shift cable and connect to neutral safety switch. Tighten cable retaining bolts to 8-11 N·m (69-95 lb-in). Tighten safety switch nut to 44-64 N·m (33-47 lb-ft).



REMOVAL AND INSTALLATION (Continued)

34. Route and install kickdown cable to throttle housing.
35. Connect transaxle electrical connectors.
36. Connect speedometer cable.


D7333-A

37. Install air cleaner assembly. Refer to Section 24-41.
38. Install battery and connect terminals.
39. Fill transaxle with fluid according to specifications.
40. Start engine, check transaxle for proper operation.

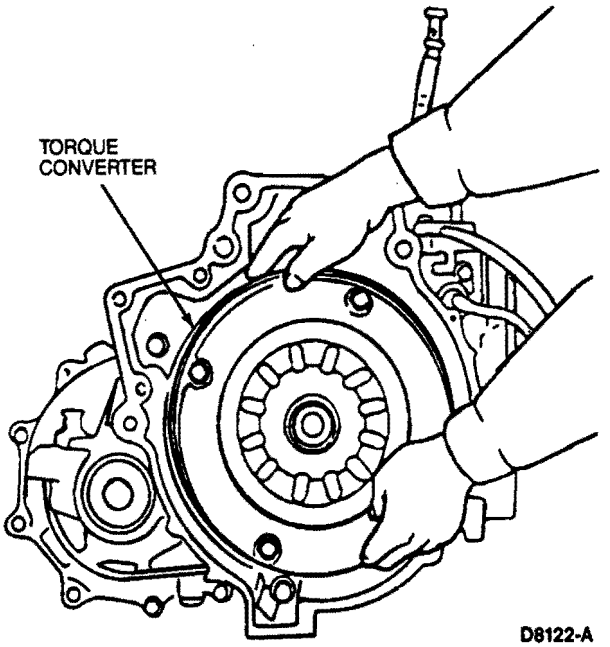
DISASSEMBLY AND ASSEMBLY

Transaxle

Disassembly

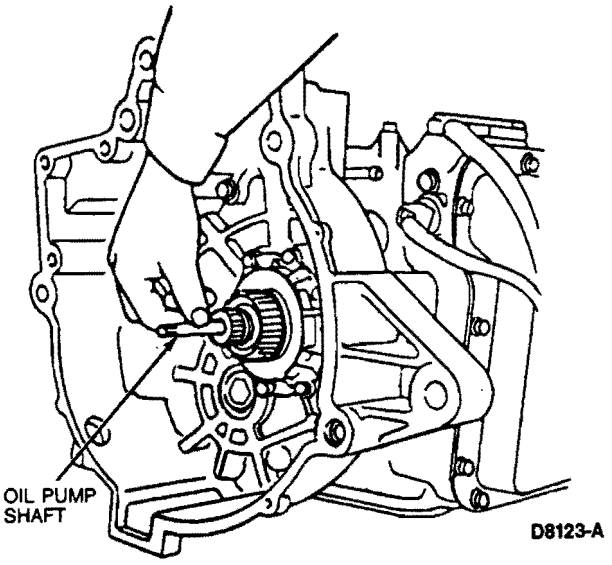
1. Remove the torque converter.

   CAUTION: The torque converter is heavy. Be careful not to drop it.



D8122-A

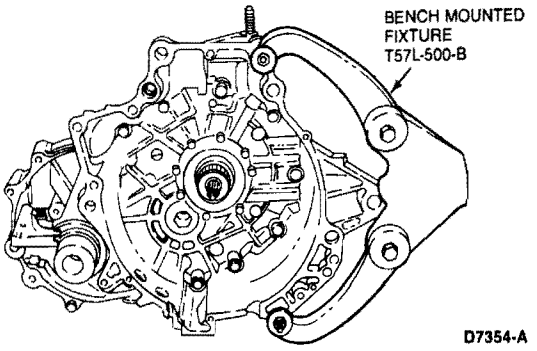
2. Remove the oil pump shaft.



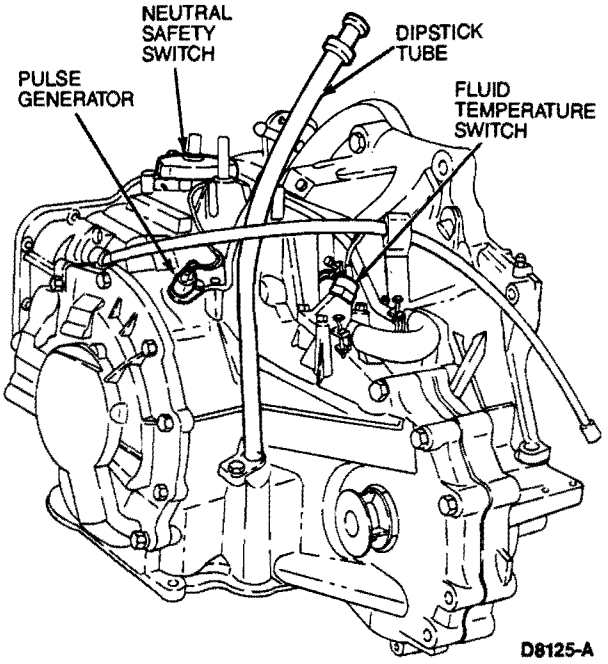
D8123-A

DISASSEMBLY AND ASSEMBLY (Continued)

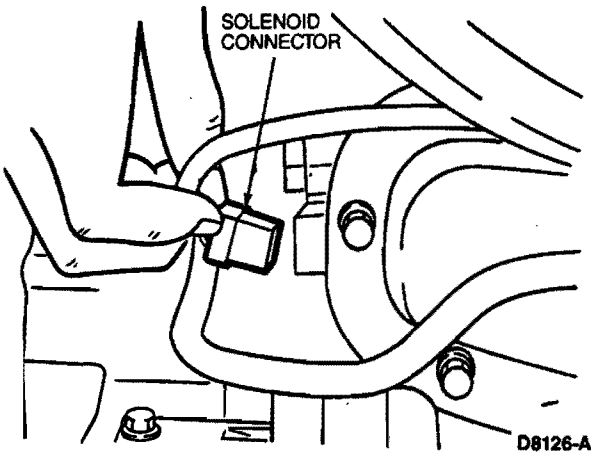
3. Mount the transaxle on Bench Mounted Fixture T57L-500-B or equivalent.



4. Remove the dipstick tube retaining bolts and pull the tube from its slot.
5. Remove the neutral safety switch.
6. Remove the fluid temperature switch.
7. Remove the pulse generator.

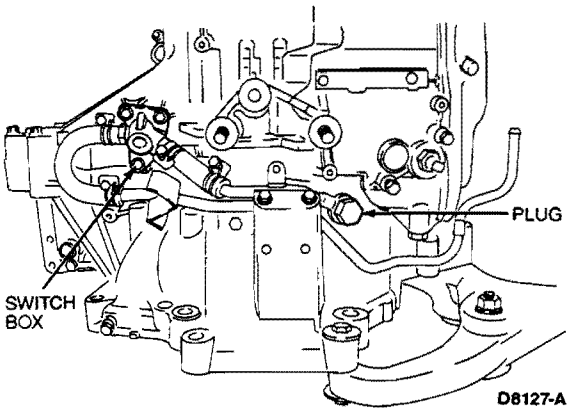


8. Disconnect the solenoid connector.



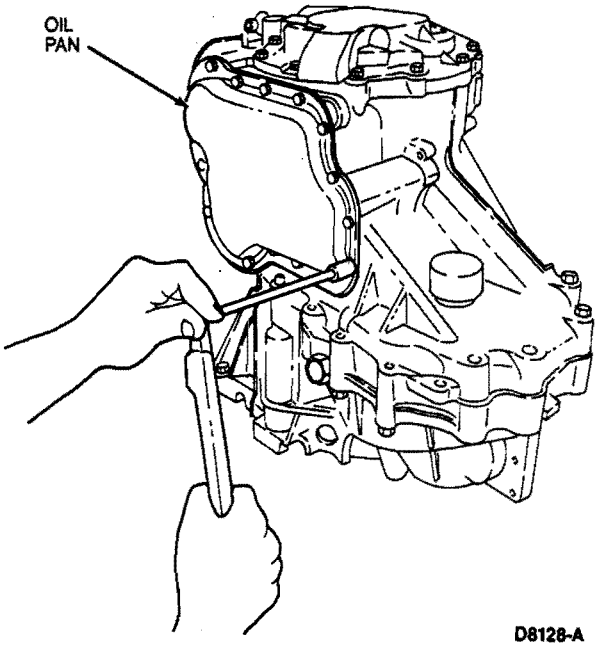
9. Remove the 4EAT wiring harness and harness clip.
10. Remove the oil pipes, oil hoses and switch box as an assembly.

    NOTE: Use a magnet to remove the ball and spring from the plug hole.

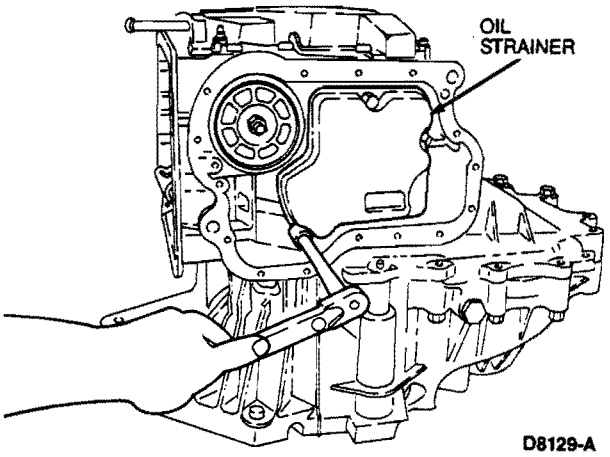


DISASSEMBLY AND ASSEMBLY (Continued)

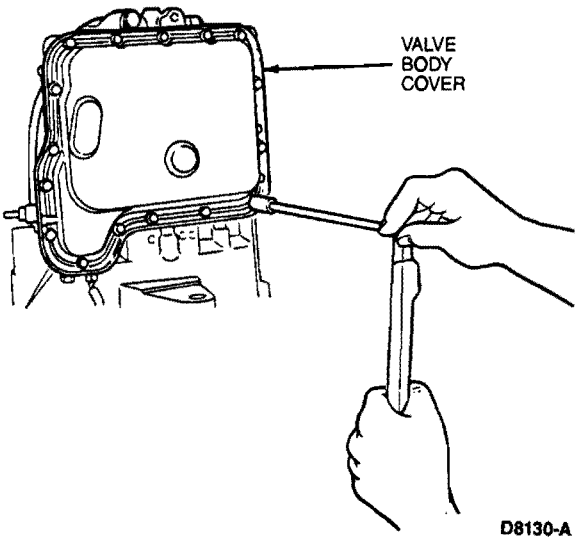
11. Remove the oil pan and gasket.



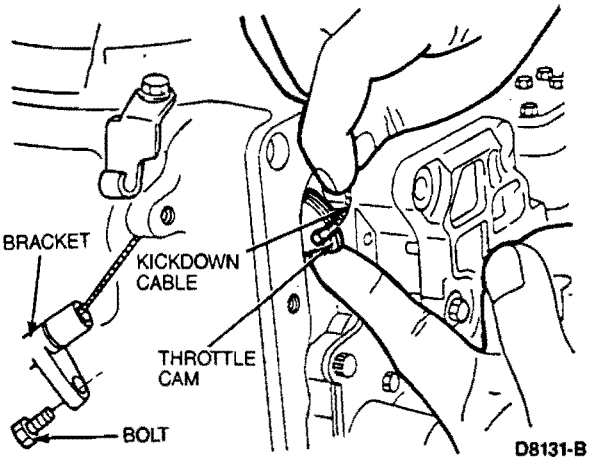
12. Remove the oil strainer and O-ring.



13. Remove the valve body cover and gasket.



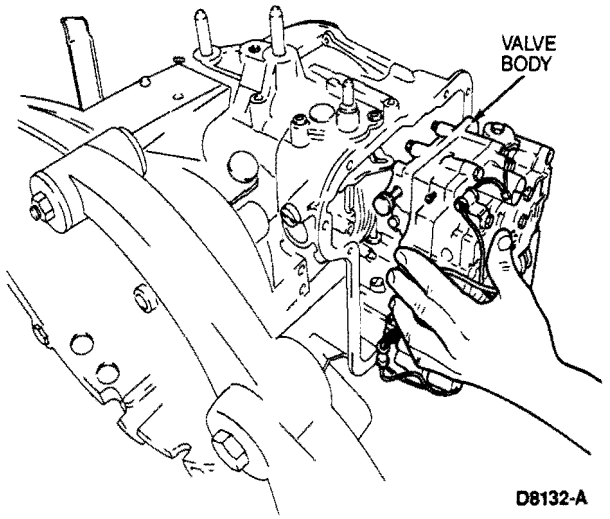
14. Remove the kickdown cable attaching bolt and bracket.
15. Remove the kickdown cable from the throttle cam.



16. Pinch the teeth of the solenoid connector mounted on the transaxle case. Remove it by pushing inward.

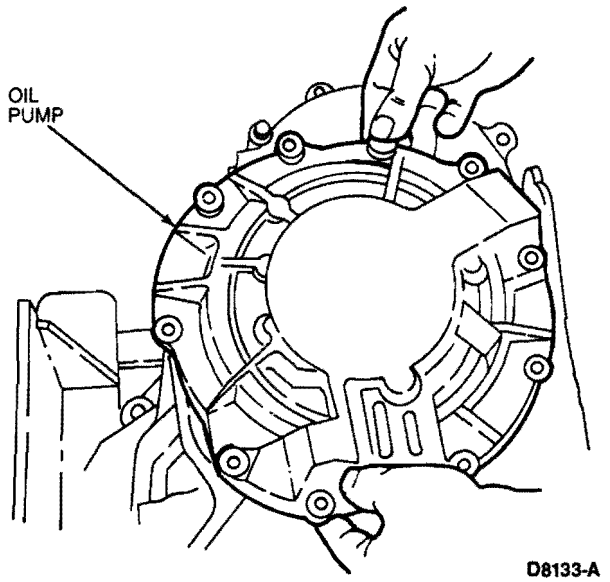
DISASSEMBLY AND ASSEMBLY (Continued)

17. Remove the attaching bolts from the valve body and carefully remove the valve body.



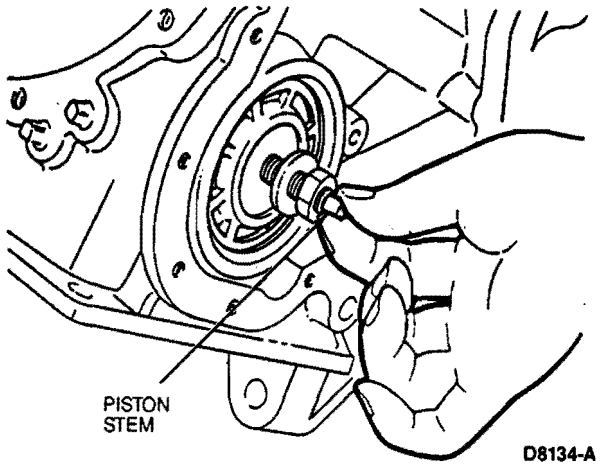
D8132-A

18. Remove the oil pump and gasket.



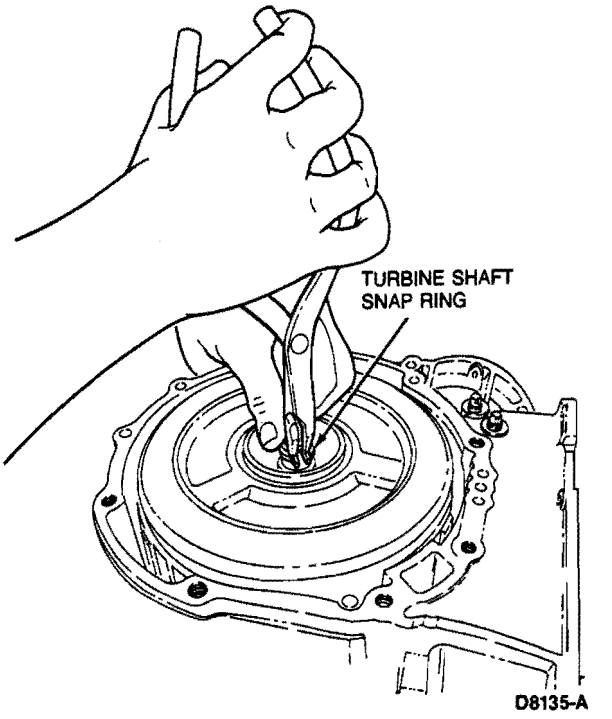
D8133-A

19. Remove the piston stem from the servo.



D8134-A

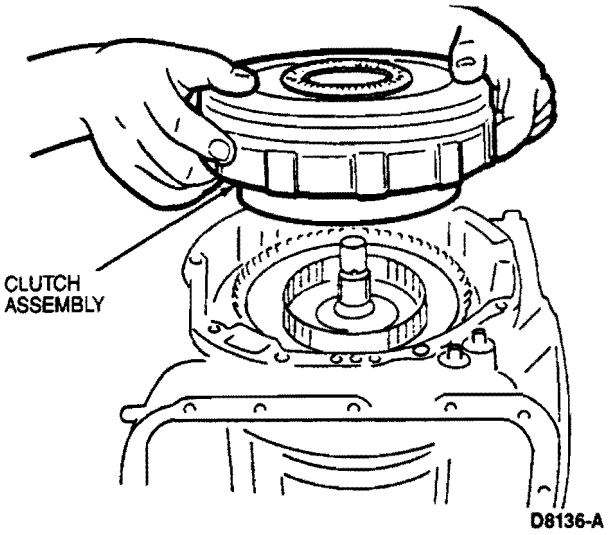
20. Remove the turbine shaft snap ring.



D8135-A

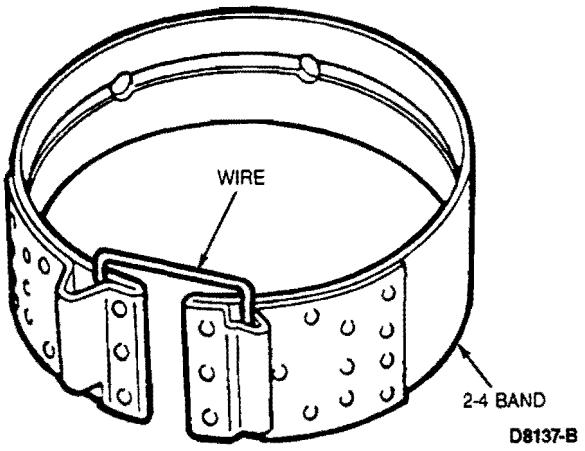
DISASSEMBLY AND ASSEMBLY (Continued)

21. Remove the clutch assembly.

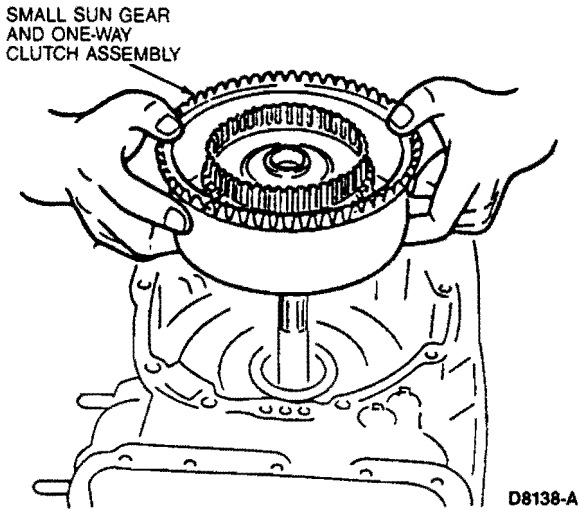


22. Remove the 2-4 band.

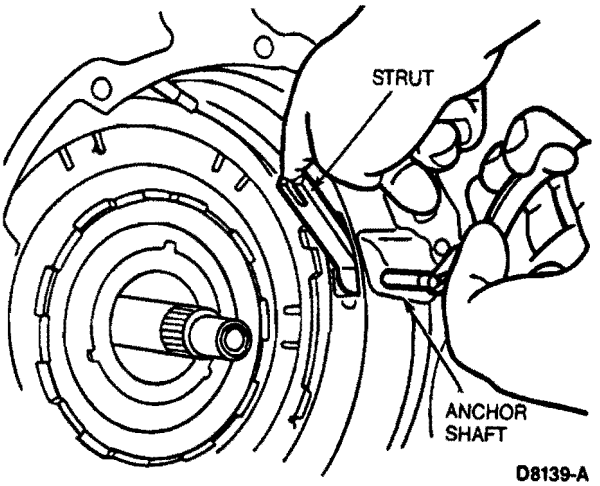
    NOTE: Secure the 2-4 band with wire to prevent warping.



23. Remove the small sun gear and one-way clutch assembly.

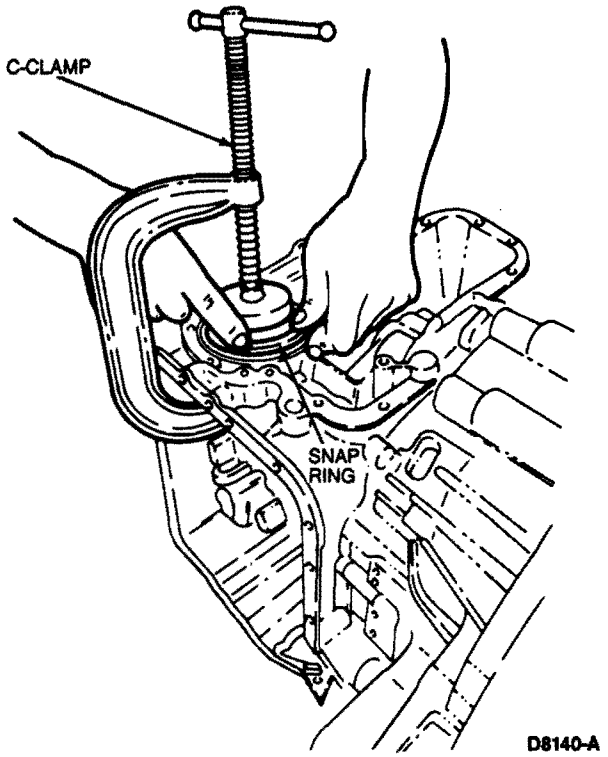


24. Pull the anchor shaft while holding the strut, then remove the strut.

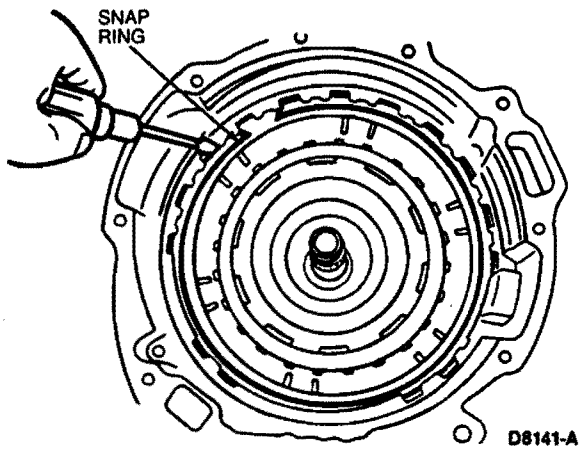


DISASSEMBLY AND ASSEMBLY (Continued)

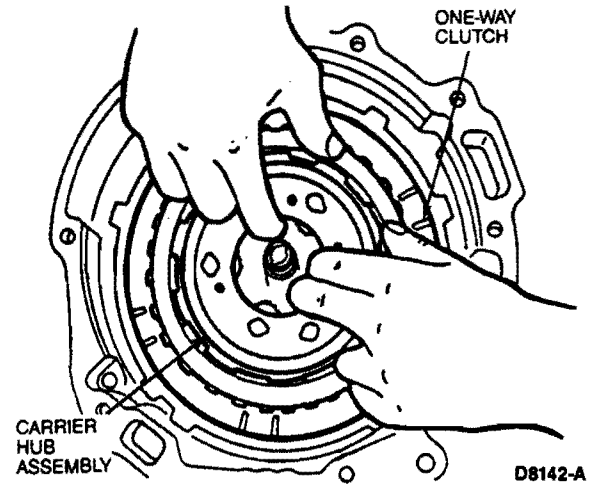
25. Use a C-clamp and socket to compress the servo. Remove the snap ring, servo and spring.



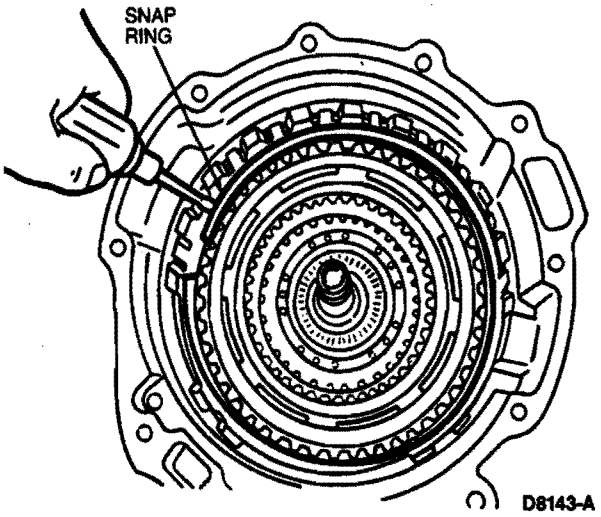
26. Remove the one-way clutch snap ring.



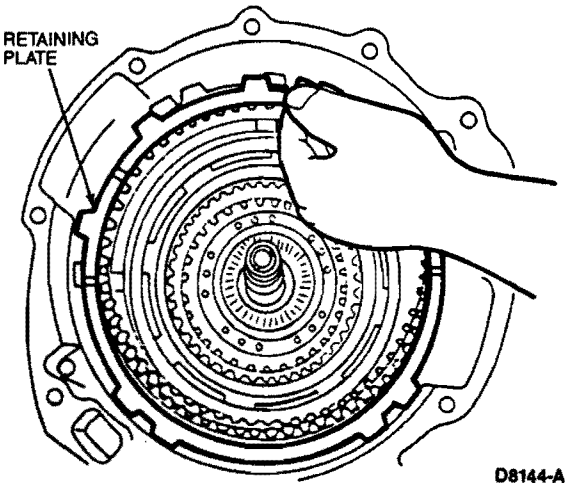
27. Remove the one-way clutch and carrier hub assembly.



28. Remove the low and reverse clutch snap ring.

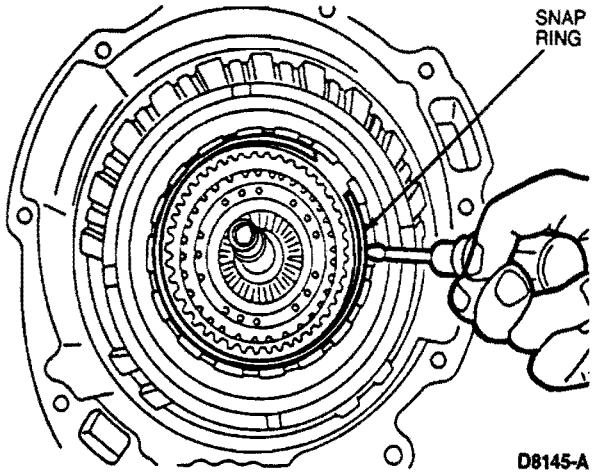


29. Remove the low and reverse clutch retaining plate and drive and driven plates.

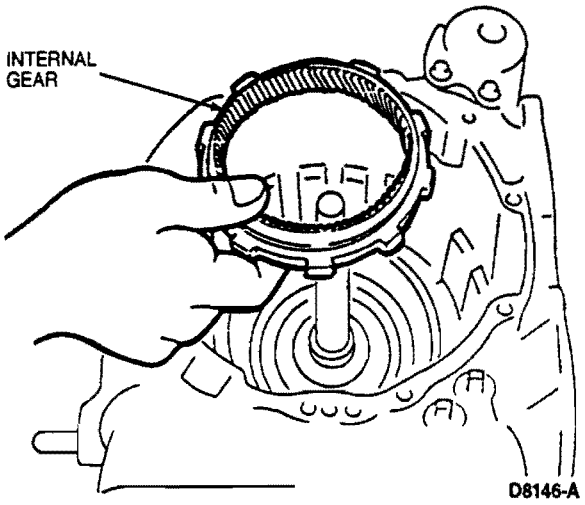


DISASSEMBLY AND ASSEMBLY (Continued)

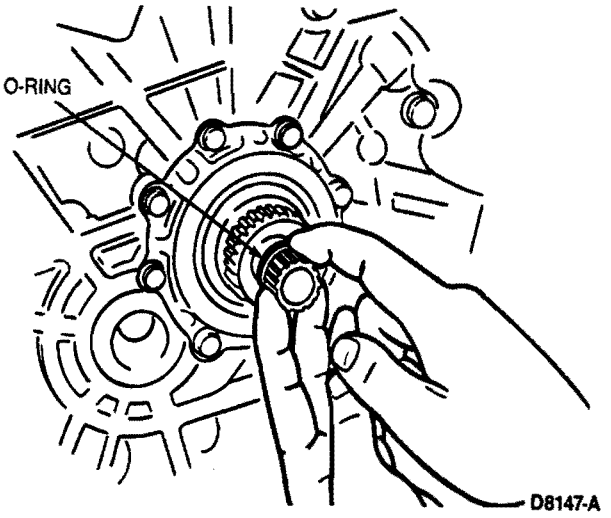
30. Remove the internal gear snap ring.



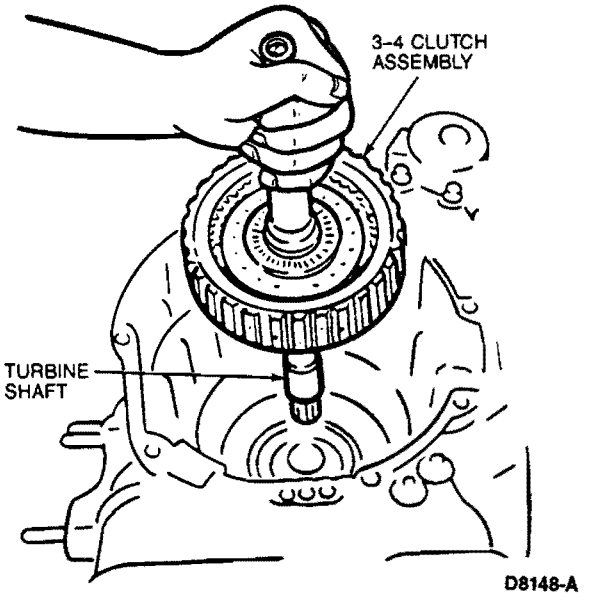
31. Remove the internal gear.



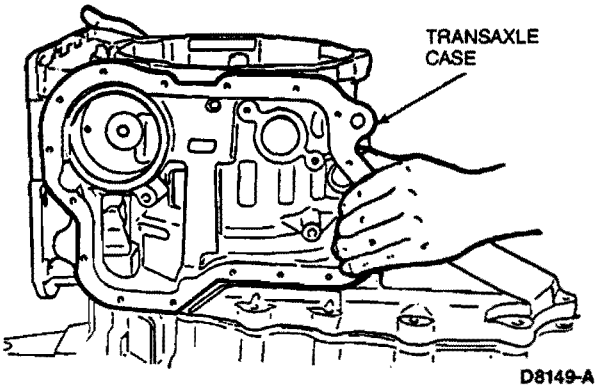
32. Remove the O-ring located on the converter housing side of the turbine shaft.



33. Pull out the turbine shaft and remove the 3-4 clutch assembly.

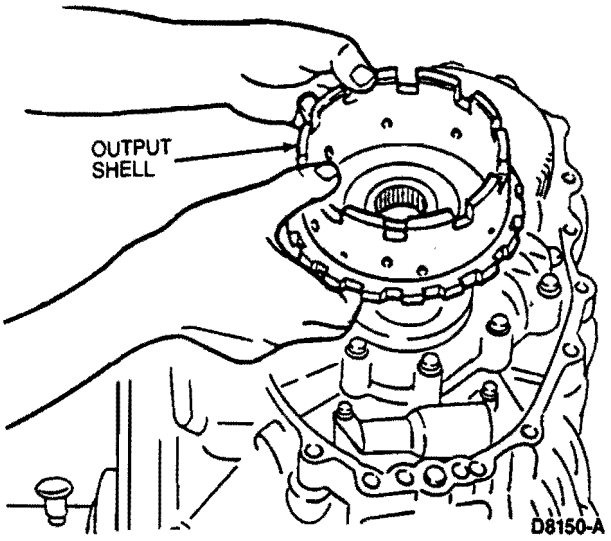


34. Remove the transaxle case bolts and transaxle case from the converter housing. If necessary, tap lightly with a plastic hammer.

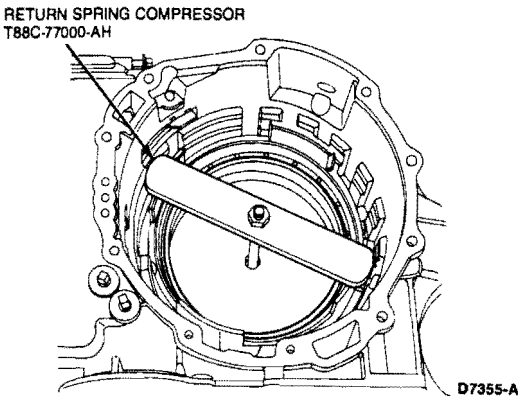


DISASSEMBLY AND ASSEMBLY (Continued)

35. Remove the output shell from the output gear.

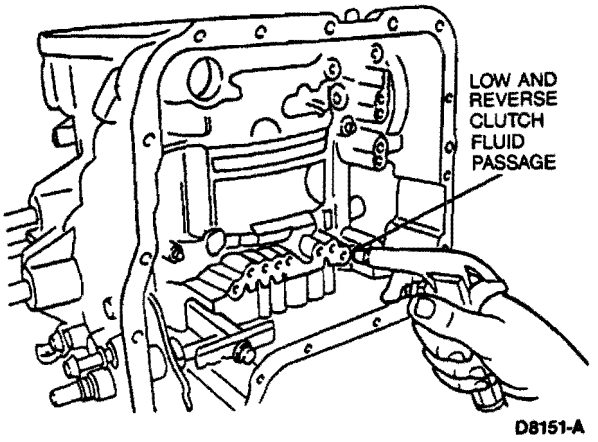


36. Compress the return spring and retainer using Return Spring Compressor T88C-77000-AH or equivalent.

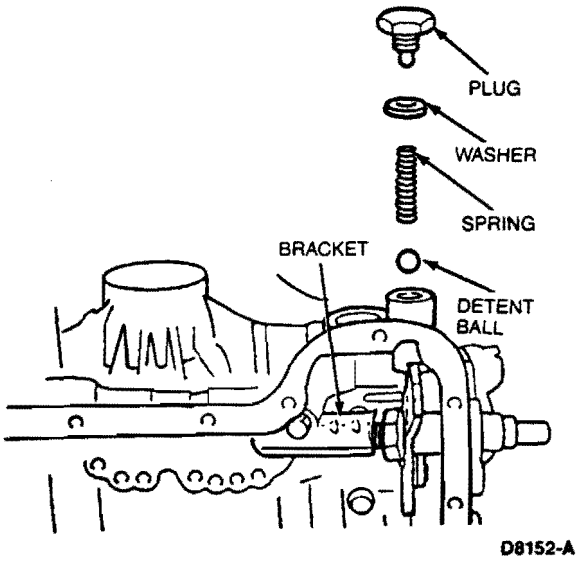


37. Remove the retainer snap ring, then the return spring and retainer.
38. Remove the return spring compressor.

39. Apply compressed air through the low and reverse clutch fluid passage to remove the low and reverse clutch piston.



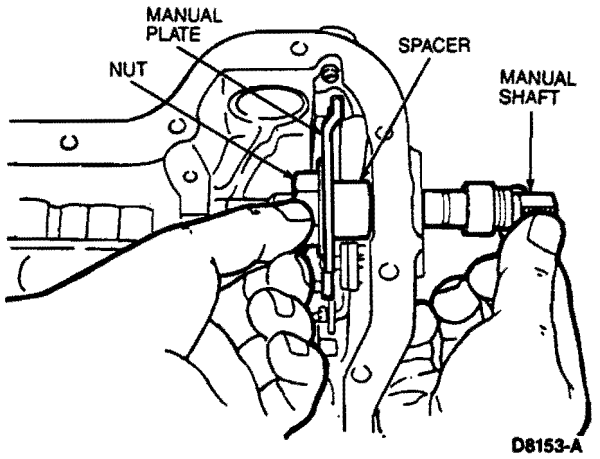
40. Remove the plug, washer, spring and detent ball.
41. Remove the bracket.



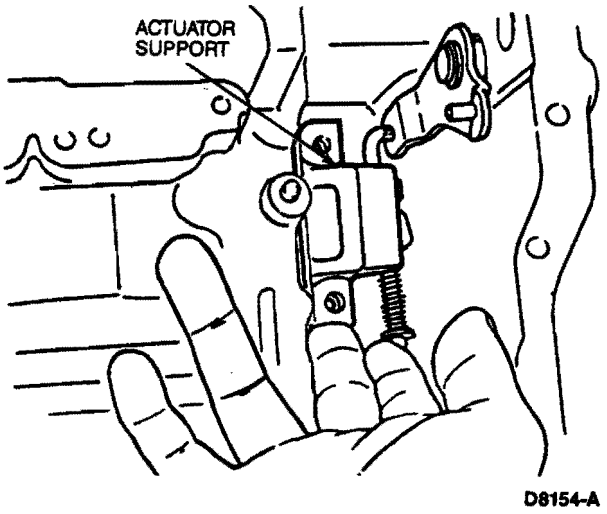
42. Loosen the manual shaft nut and pull the manual shaft out.

DISASSEMBLY AND ASSEMBLY (Continued)

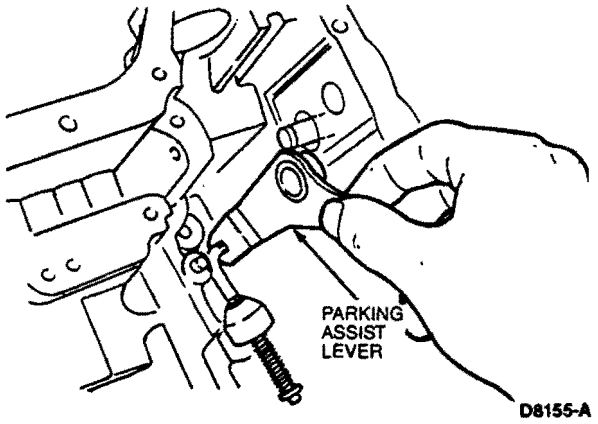
43. Remove the nut, washer, spacer and manual plate.



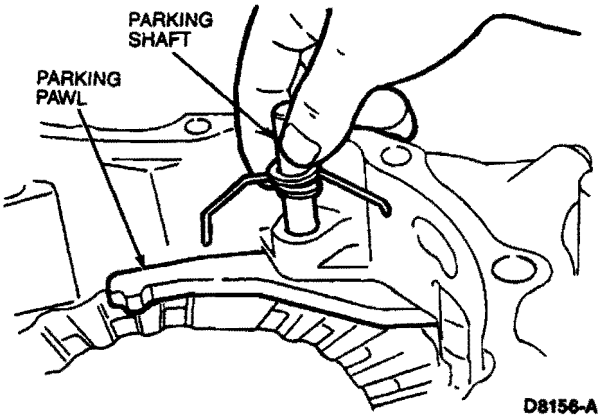
44. Remove the actuator support.



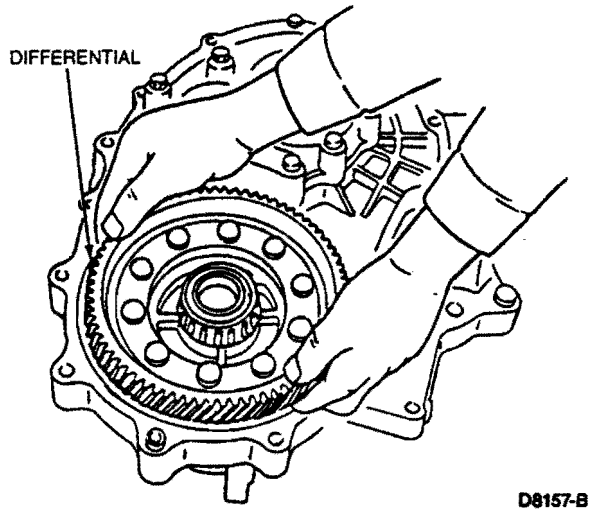
45. Remove the parking assist lever snap ring.
46. Remove the parking assist lever.



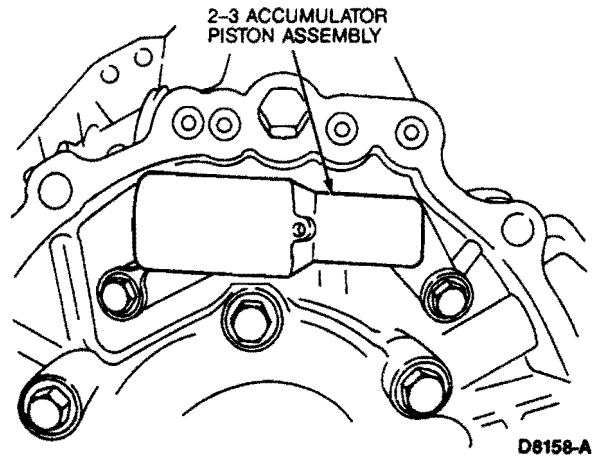
47. Remove the parking pawl snap ring.
48. Pull out the parking shaft, then remove the spring and parking pawl.



49. Remove the differential.

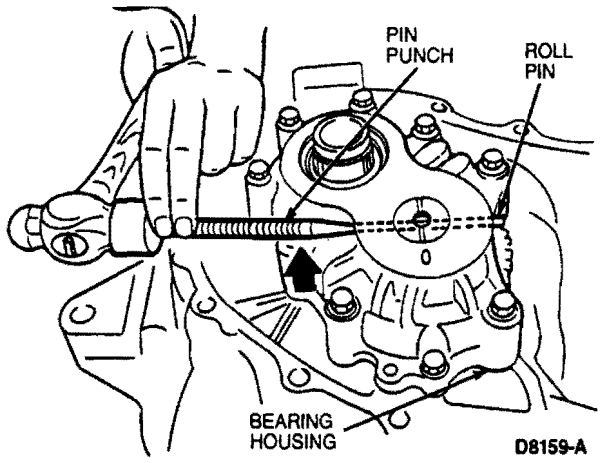


50. Remove the 2-3 accumulator.

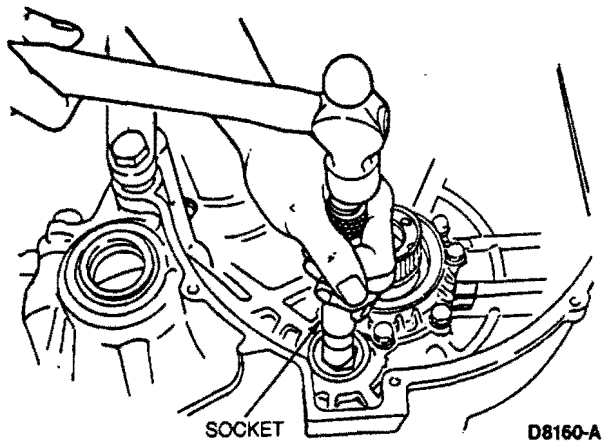


DISASSEMBLY AND ASSEMBLY (Continued)

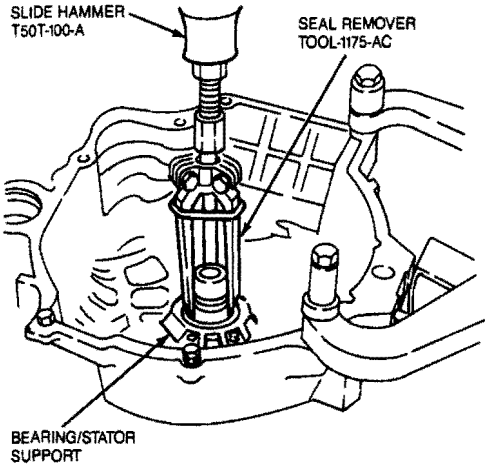
51. Remove the bearing housing bolt (located at the arrow in the figure) to access the roll pin.
52. Remove the roll pin using a pin punch.



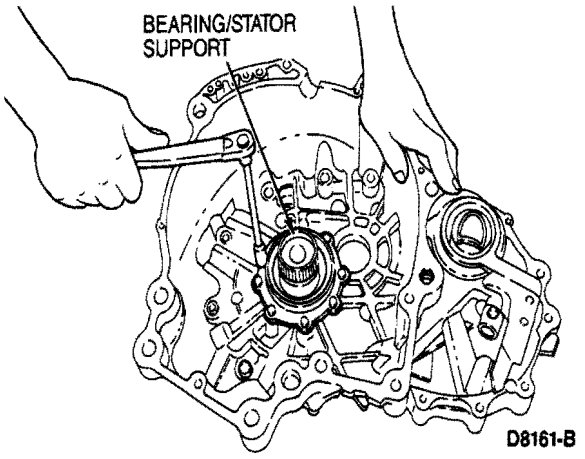
53. Remove the bearing housing. If necessary, tap lightly with a plastic hammer.
54. Use a socket to tap out the idler and output gear assemblies from the torque converter housing.



55. Remove the converter seal from the bearing / stator support using Seal Remover TOOL-1175-AC and Slide Hammer T50T-100-A or equivalent.

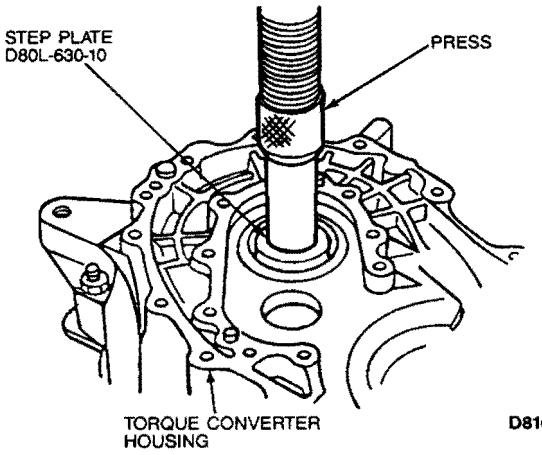


56. Remove the converter housing from the holding fixture.
57. Remove the bearing / stator support bolts.

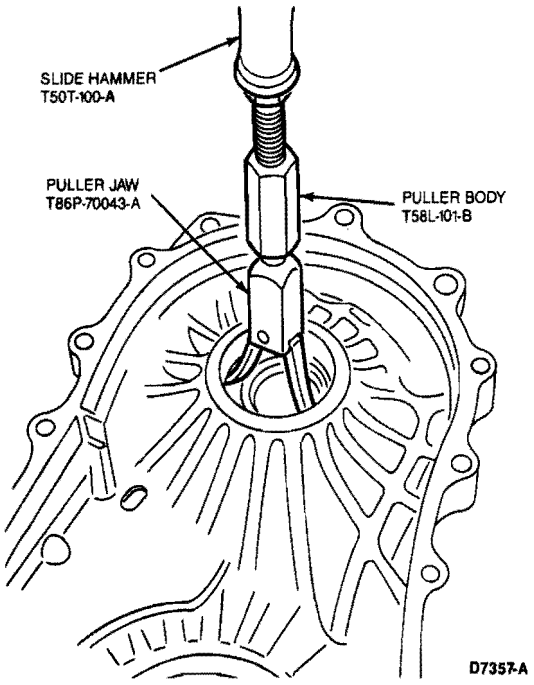


DISASSEMBLY AND ASSEMBLY (Continued)

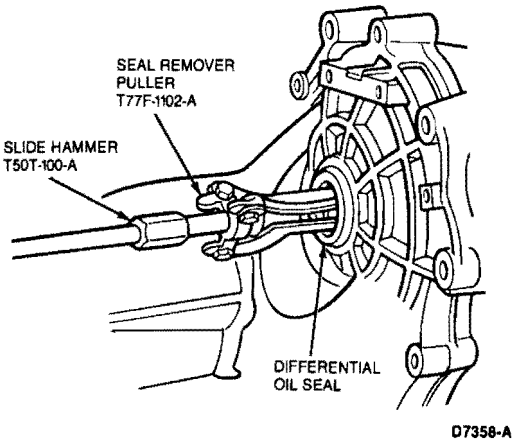
58. Press the bearing / stator support out of the torque converter housing using Step Plate D80L-630-10 or equivalent.



59. Remove the differential bearing cups using Stator and Driven Sprocket Bearing Remover T86P-70043-A, Puller Body T58L-101-B, and Slide Hammer T50T-100-A or equivalent. Remove the adjustment shim(s).



60. Remove the differential oil seals using Bearing Cup Puller T77F-1102-A and Slide Hammer T50T-100-A or equivalent.

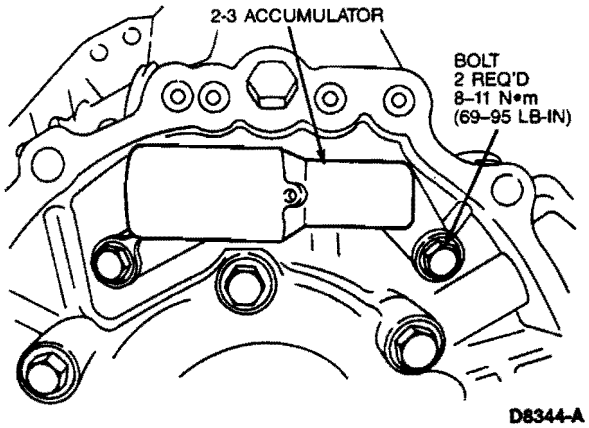


Assembly

NOTE: Whenever the transaxle is disassembled, the bearing preload must be adjusted. Adjust the bearing preload by following the shim selection procedure outlined in this Section.

1. Install the output gear and idler gear as an assembly by tapping them into the converter housing with a plastic hammer.
2. Install the bearing housing on the converter housing and tighten the bolts to 19-26 N·m (14-19 lb-ft).
3. Align the groove on the idle shaft with the matching mark on the bearing housing.
4. Tap the roll pin with a pin punch and hammer.

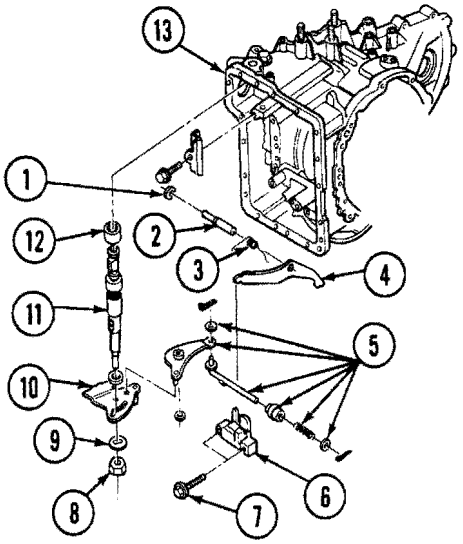
   NOTE: Apply the specified transaxle fluid to the O-rings before installing the 2-3 accumulator.
5. Install the 2-3 accumulator and new O-rings. Tighten the bolts to 8-11 N·m (69-95 lb-in).



6. Install the parking pawl and shaft.
7. Install the spring and snap ring.

DISASSEMBLY AND ASSEMBLY (Continued)

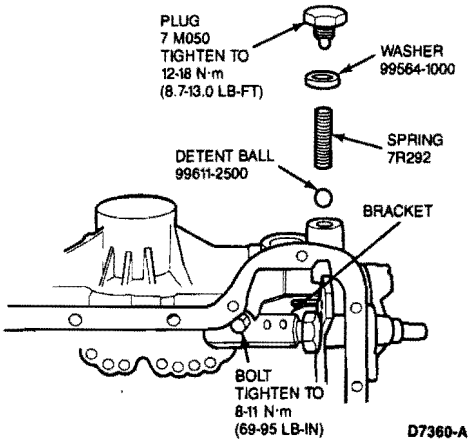
8. Move the shaft to check for proper parking pawl operation.
9. Install the parking assist lever and snap ring.
10. Install the actuator support. Tighten the two bolts to 11-14 N·m (8-10 lb-ft).
11. Install the manual shaft, spacer, manual plate, washer and nut. Tighten the nut to 41-55 N·m (30-41 lb-ft).



ITEM	DESCRIPTION
1.	SNAP RING 99576100
2.	SHAFT 7D071
3.	SPRING 7D070
4.	PARKING PAWL 7A441
5.	PARKING ASSIST LEVER 7A232
6.	ACTUATOR SUPPORT 7G101
7.	BOLT 7L295
8.	NUT 99922 1400
9.	WASHER 7Z037
10.	MANUAL PLATE 7A115
11.	MANUAL SHAFT 7A256
12.	SPACER 7341
13.	TRANSAXLE CASE

D7359-A

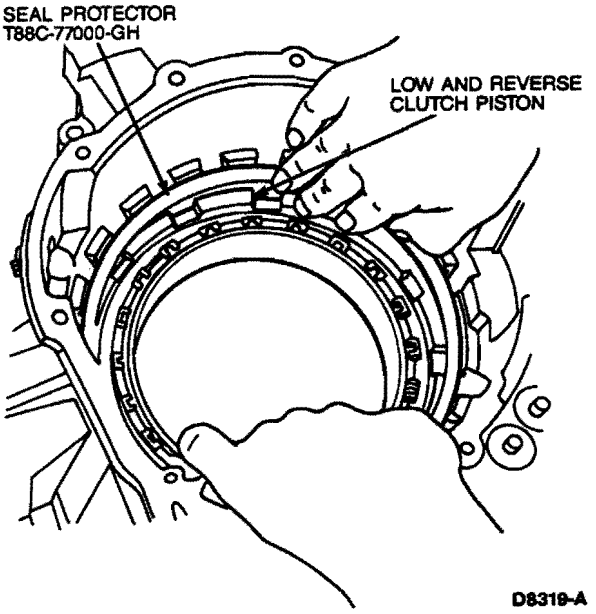
12. Install the bracket and bolt. Tighten the bolt to 8-11 N·m (69-95 lb-in).
13. Install the detent ball, spring, washer and plug. Tighten the plug to 12-18 N·m (8.7-13 lb-ft).



D7360-A

14. Attach Seal Protector T88C-77000-GH or equivalent to the low and reverse clutch piston.
15. Install the low and reverse clutch piston by pushing evenly around the circumference. Remove the protector.

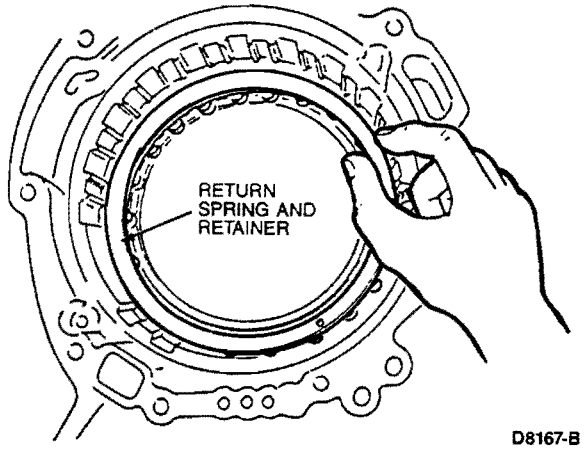
CAUTION: Be careful not to damage the outer seal.



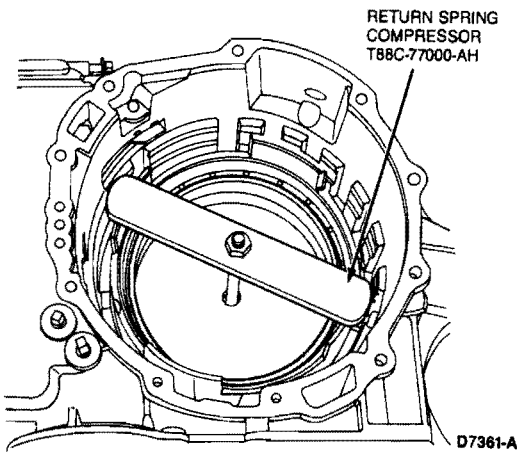
D8319-A

DISASSEMBLY AND ASSEMBLY (Continued)

16. Install the return spring and retainer.

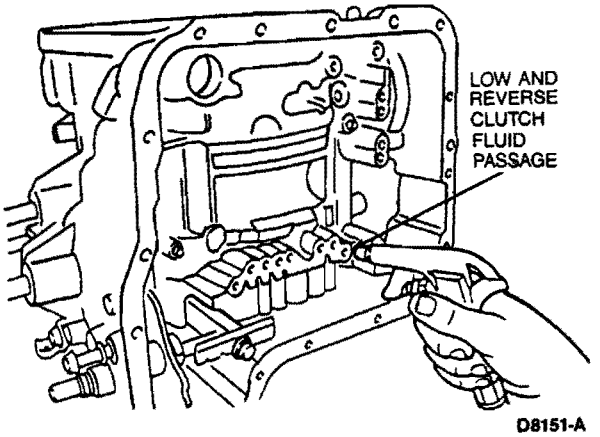


17. Compress the return spring and retainer using Return Spring Compressor T88C-77000-AH or equivalent.

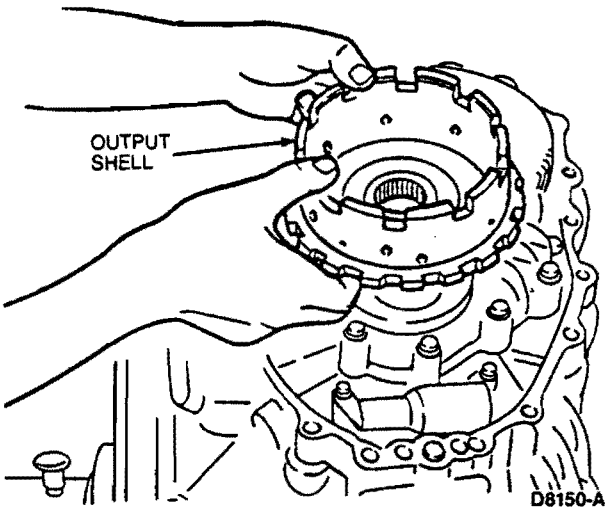


18. Install the snap ring.
19. Remove the return spring compressor.
20. Pour the specified transaxle fluid over the low and reverse clutch piston until it is fully submerged. Check that no bubbles appear from between the piston and seals when applying compressed air through the fluid passage.

CAUTION: The compressed air must be under 392 kPa (57 psi) and not applied for more than three seconds.



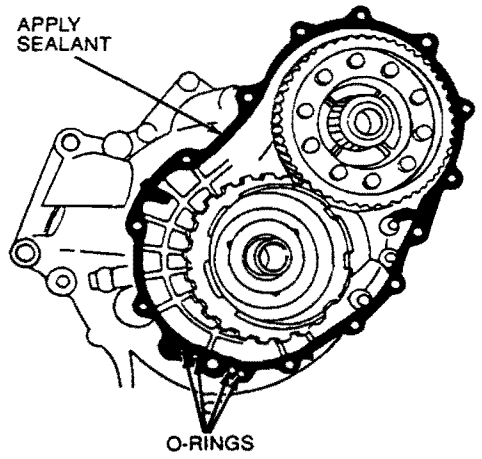
21. Install the output shell to the output gear.



22. Install the 72mm (2.83 inches) thrust washer onto the output shell.
23. Apply a thin coat of silicon sealant to the contact surfaces of the converter housing and transaxle case.

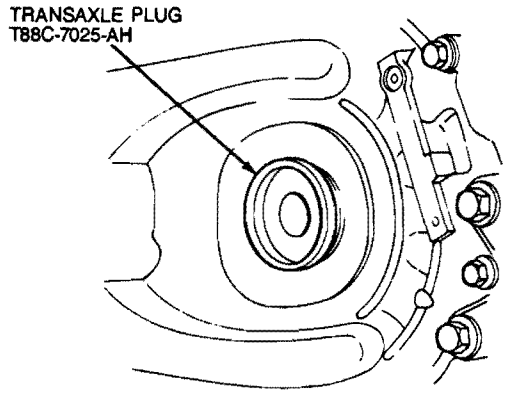
DISASSEMBLY AND ASSEMBLY (Continued)

24. Install new O-rings.



25. Install the transaxle case to the converter housing. Tighten the bolts to 37-52 N·m (27-38 lb-ft).
26. Install Transaxle Plugs T88C-7025-AH or equivalent to differential side gears.

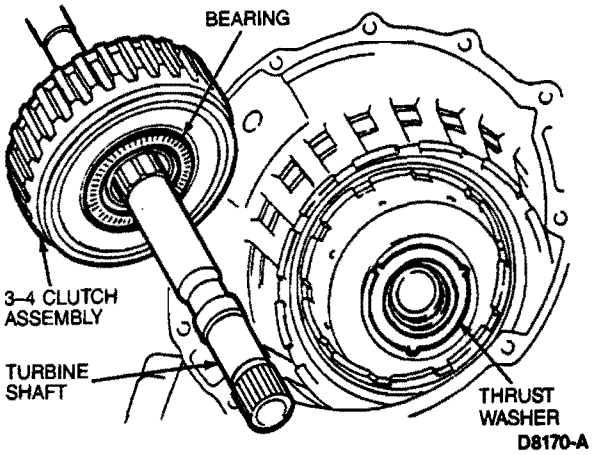
CAUTION: Failure to install the transaxle plugs may allow the differential side gears to become mispositioned.



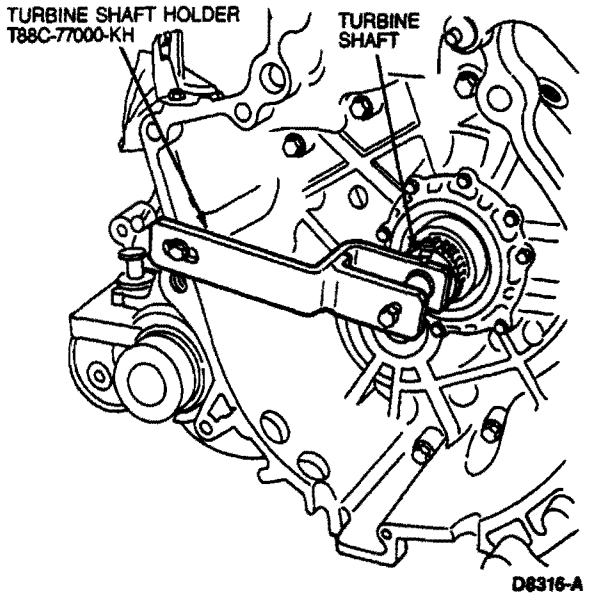
27. Place the 3-4 clutch assembly over the turbine shaft.

NOTE: Be sure that the thrust washer and needle bearing are installed in the correct position.

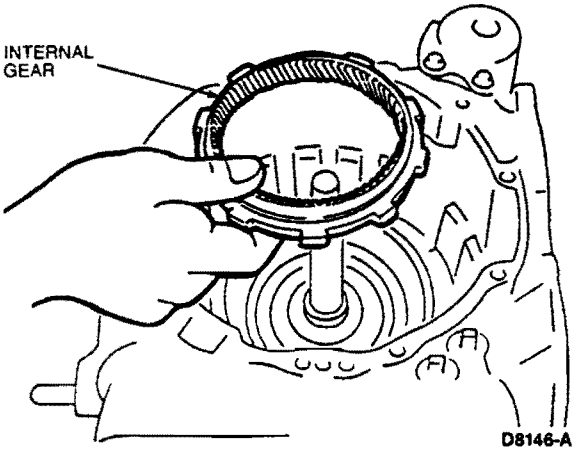
28. Install the turbine shaft and 3-4 clutch assembly into the transaxle case.



29. Install Turbine Shaft Holder T88C-77000-KH or equivalent and attach it to the turbine shaft.

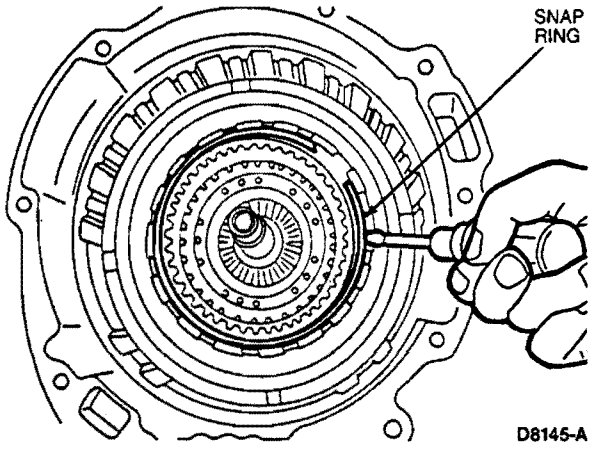


30. Install the internal gear.

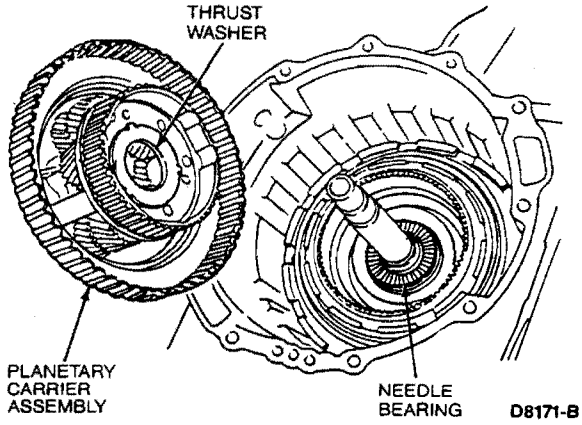


DISASSEMBLY AND ASSEMBLY (Continued)

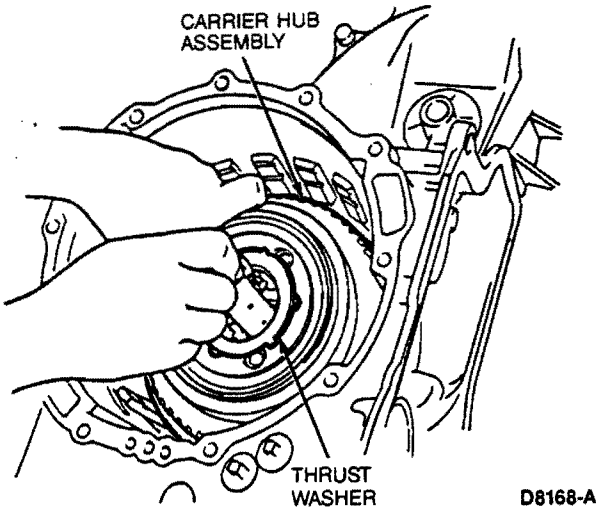
31. Install the internal gear snap ring.



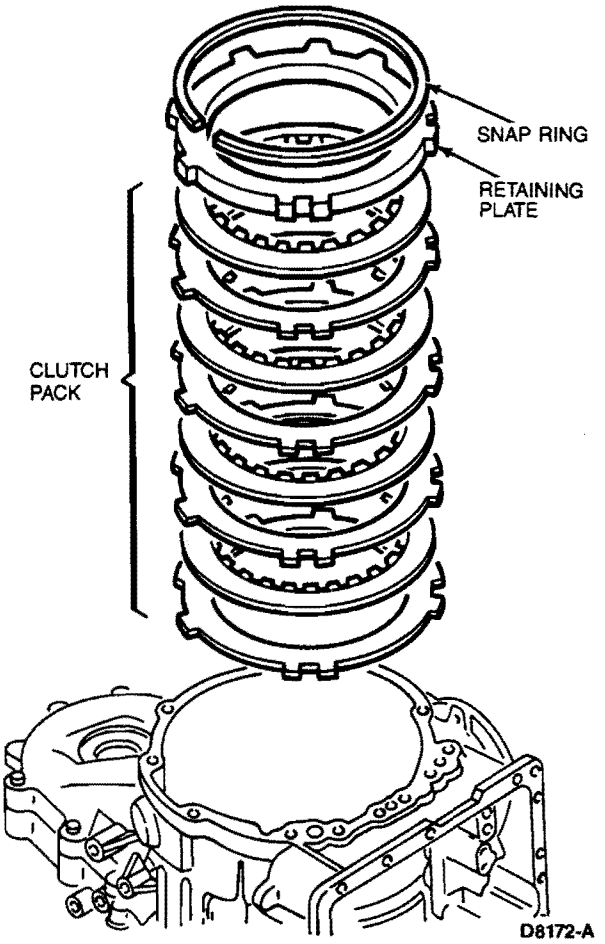
NOTE: Be sure the thrust washer and needle bearing are in the correct position before installing the carrier hub assembly.



32. Install the carrier hub assembly.



33. Install the low and reverse clutch pack, retaining plate and snap ring.



34. Measure the clearance between the snap ring and retaining plate. The clearance should be 2.1-2.4mm (0.083-0.094 inch). If clearance is not within specification, adjust it by selecting a retaining plate with an appropriate thickness from the chart.

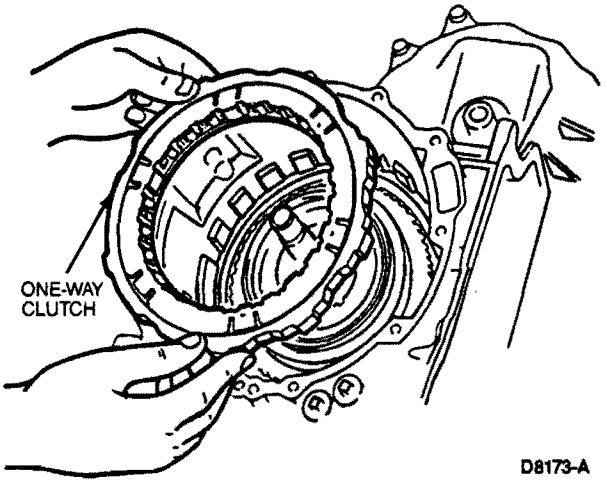
Part Number	Pressure Plate Thickness
E92Z-7B066-AD	6.8mm (0.268 inch)
E92Z-7B066-Y	7.0mm (0.276 inch)
E92Z-7B066-Z	7.2mm (0.283 inch)
E92Z-7B066-AA	7.4mm (0.291 inch)
E92Z-7B066-AB	7.6mm (0.299 inch)
E92Z-7B066-AC	7.8mm (0.307 inch)

CD8371-A

35. Install the one-way clutch.

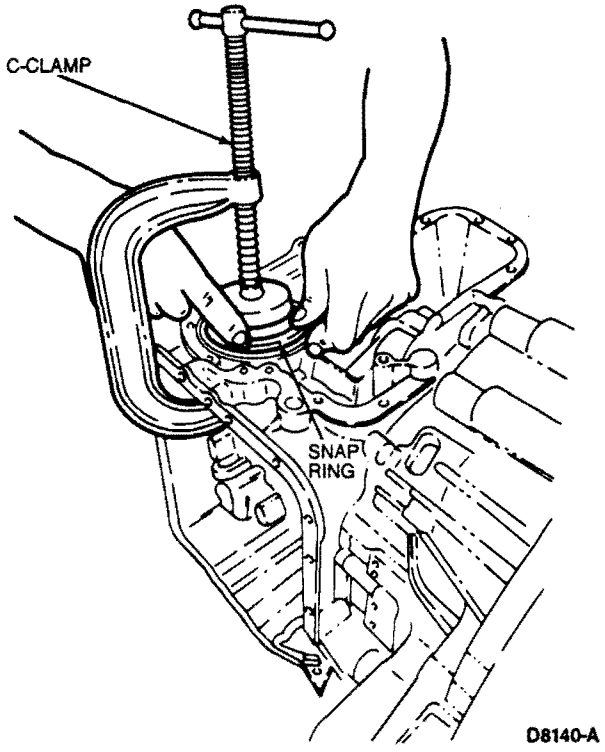
DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Turning the carrier hub assembly counterclockwise eases installation of the one-way clutch.



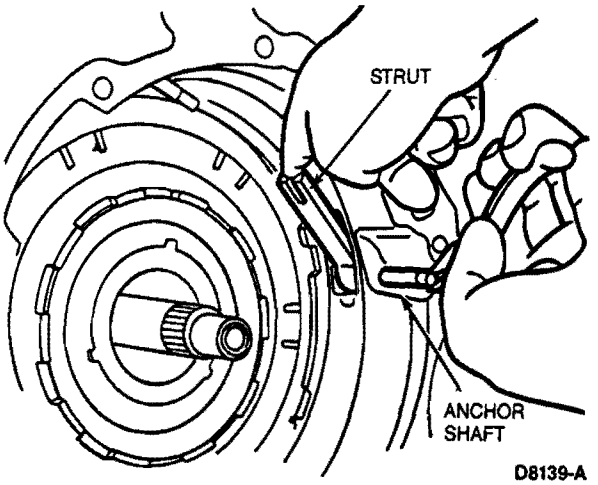
D8173-A

36. Install the one-way clutch snap ring.
37. Install the servo spring and servo.
38. Compress the servo with a C-clamp.



D8140-A

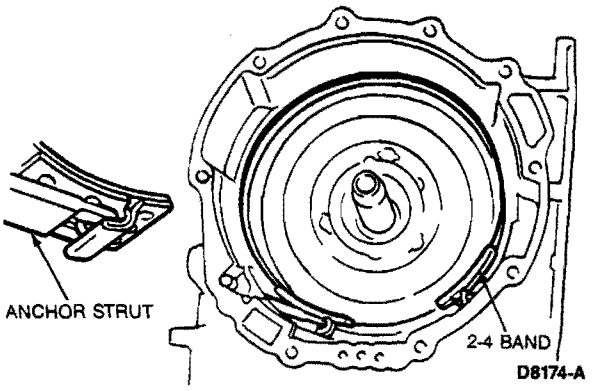
39. Install the snap ring, then remove the C-clamp.
40. Install the piston stem.
41. Install the anchor strut.



D8139-A

42. Install the 2-4 band in the transaxle case so it is fully expanded.

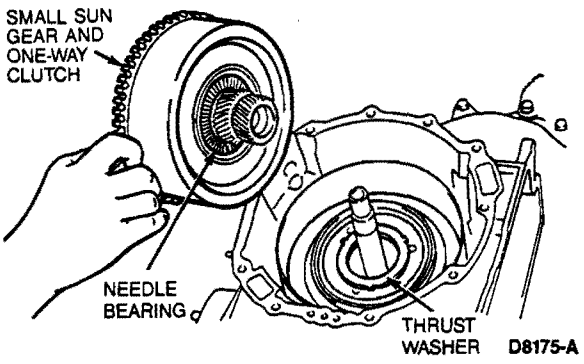
    NOTE: Interlock the 2-4 band and anchor strut as shown.



D8174-A

43. Install the small sun gear and one-way clutch by rotating it.

    NOTE: Be sure the thrust washer and needle bearing are installed in the correct position.

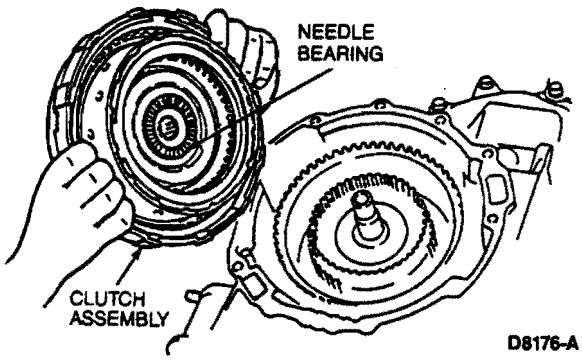


D8175-A

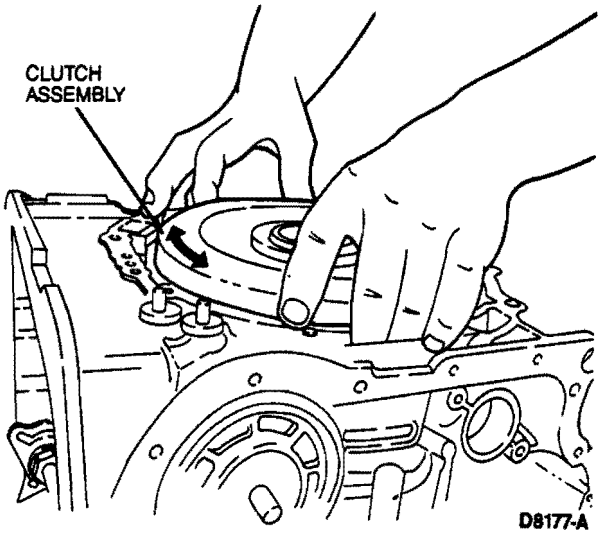
44. Pull the 2-4 band with pliers and install the piston stem in the correct position. Loosely tighten the piston stem by hand.

DISASSEMBLY AND ASSEMBLY (Continued)

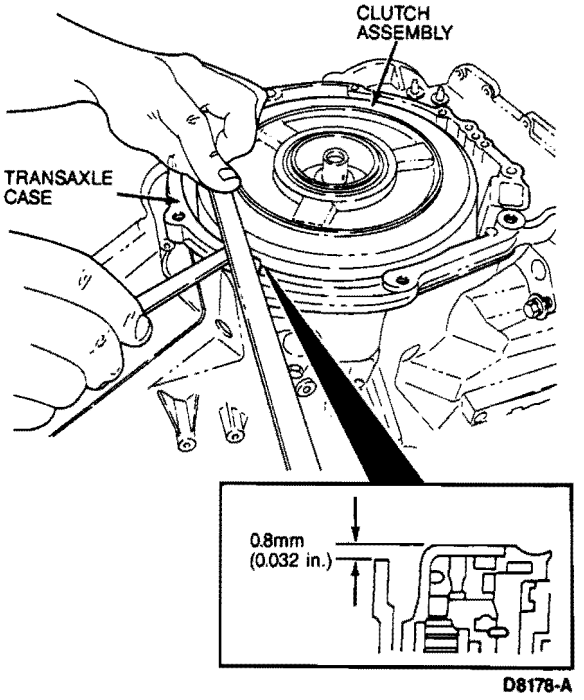
NOTE: Be sure the needle bearing is in the correct position before installing the clutch assembly.



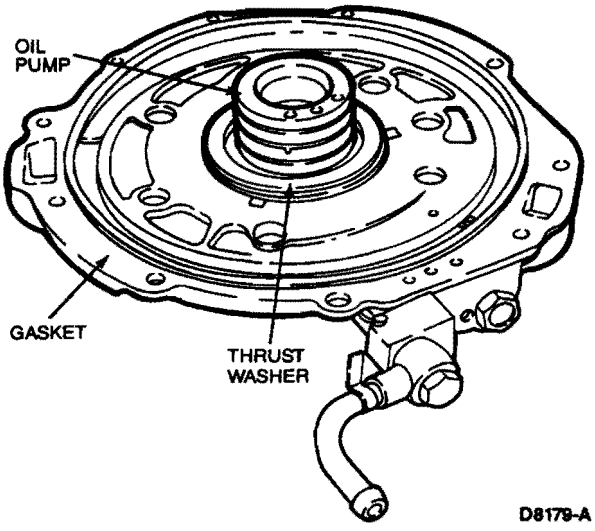
45. Install the clutch assembly by rotating it.



46. Measure the height difference between the reverse and forward drum and transaxle case. The height difference should be 0.8mm (0.032 inch).



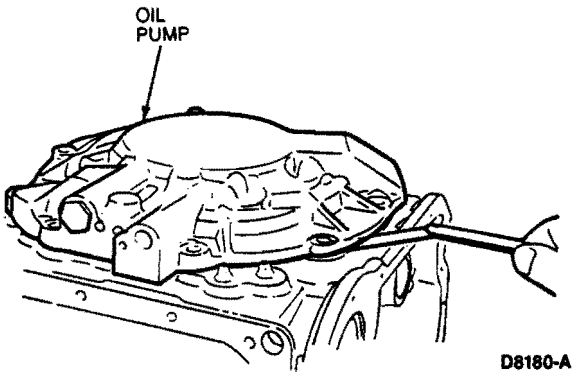
47. Place the needle bearing on the clutch assembly.
48. To adjust the total end play, remove the previous thrust washer and gasket from the oil pump.



49. Place a 2.2mm (0.087 inch) thrust washer on the oil pump.
50. Set the oil pump onto the clutch assembly.

DISASSEMBLY AND ASSEMBLY (Continued)

51. Measure the clearance between the transaxle case and the oil pump.



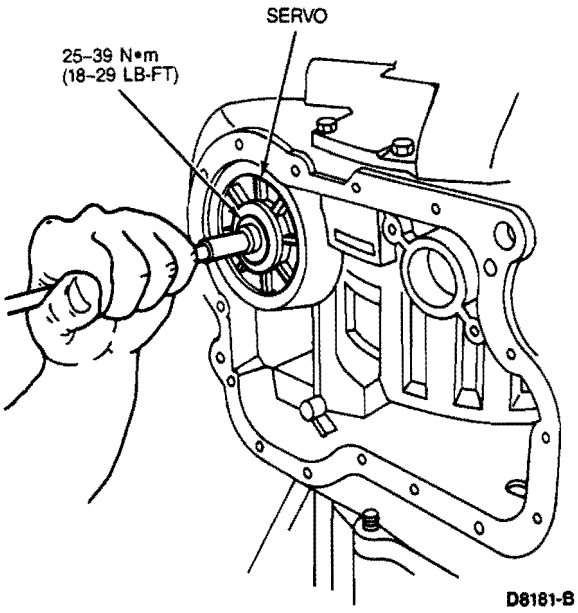
D8180-A

Select a suitable thrust washer from the following chart.

Clearance mm (inch)	Select this Thrust Washer Thickness mm (inch)	Part Number
0.91–1.10 (0.036–0.043)	1.2 (0.047)	E92Z-7D014-E
0.71–0.90 (0.028–0.035)	1.4 (0.055)	E92Z-7D014-F
0.51–0.70 (0.020–0.027)	1.6 (0.063)	E92Z-7D014-A
0.31–0.50 (0.012–0.019)	1.8 (0.071)	E92Z-7D014-B
0.11–0.30 (0.004–0.011)	2.0 (0.078)	E92Z-7D014-C
0.00–0.10 (0.036–0.043)	2.2 (0.047)	E92Z-7D014-D

CD8374-A

52. Remove the oil pump.
53. Place the selected thrust washer and a new gasket on the oil pump.
54. Install the oil pump onto the clutch assembly. Tighten the bolts to 19-26 N•m (14-19 lb-ft).
55. Loosen the locknut and tighten the piston stem to 9-11 N•m (78-95 lb-in).
56. Loosen the piston stem two turns.
57. Tighten the locknut to 25-39 N•m (18-29 lb-ft).

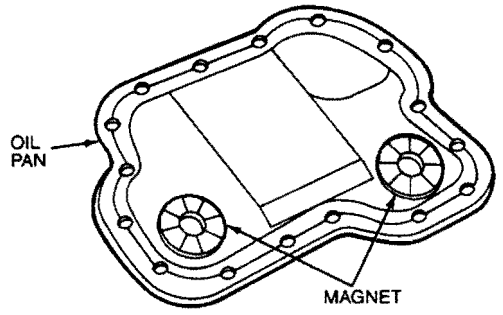


D8181-B

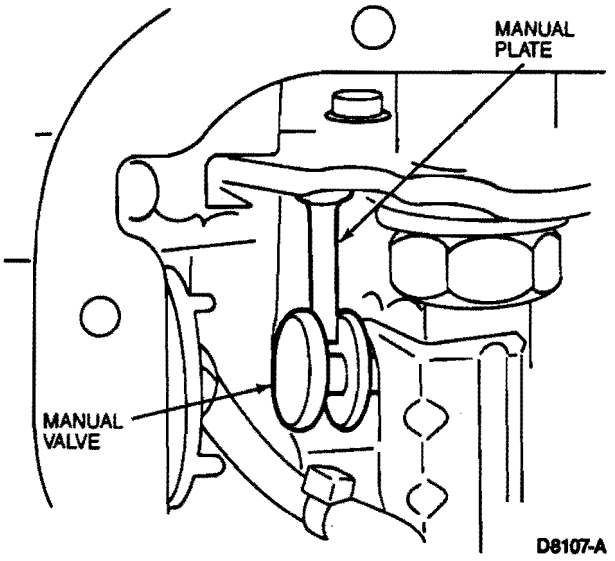
58. Install the oil strainer, with a new O-ring, to the transaxle. Tighten the bolts to 8-11 N•m (69-95 lb-in).

DISASSEMBLY AND ASSEMBLY (Continued)

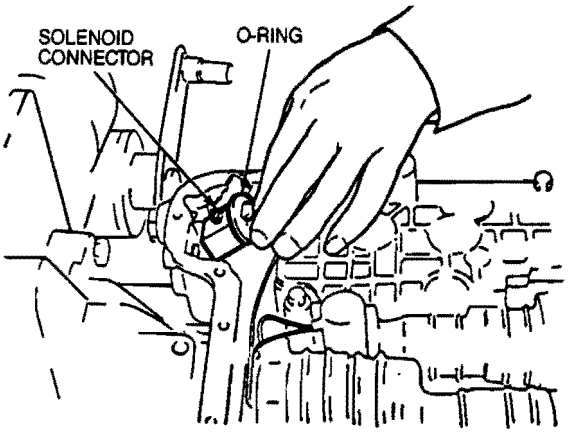
NOTE: Be sure the magnets are correctly positioned in the oil pan.



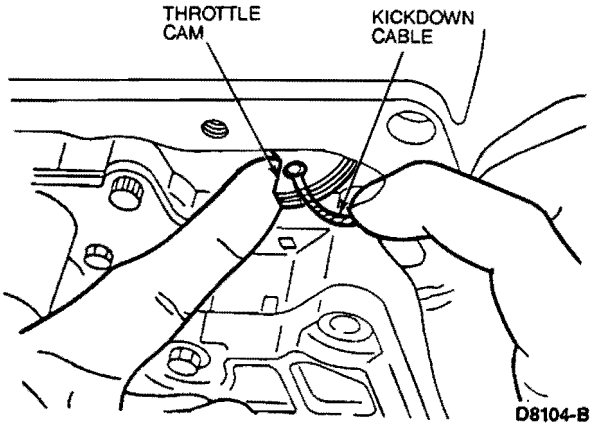
59. Install the oil pan with a new gasket. Tighten the bolts to 8-11 N•m (69-95 lb-in).
60. Align the manual valve with the pin on the manual plate, and install the valve body into the transaxle case. Tighten the bolts to 11-15 N•m (95-130 lb-in).



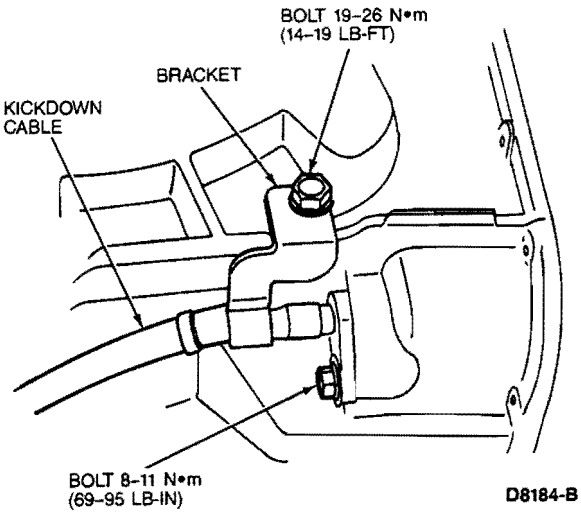
61. Install the solenoid connector with a new O-ring in the transaxle case.



62. Install a new O-ring on the bracket, then feed the kickdown cable through the transaxle case and connect it to the throttle cam.

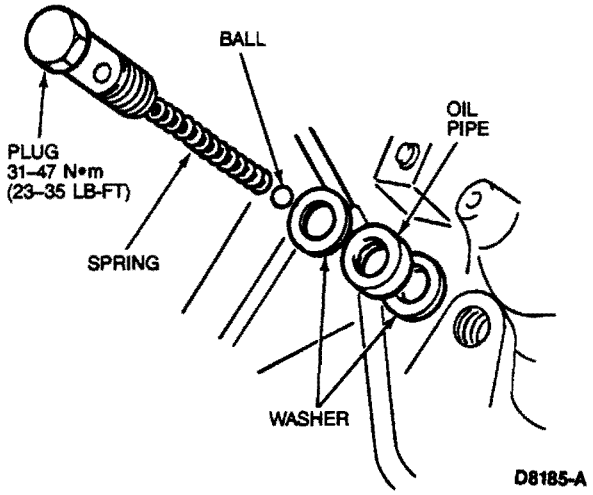


63. Install the kickdown cable attaching bolt and bracket. Tighten the attaching bolt to 8-11 N•m (69-95 lb-in) and the bracket bolt to 19-26 N•m (14-19 lb-ft).

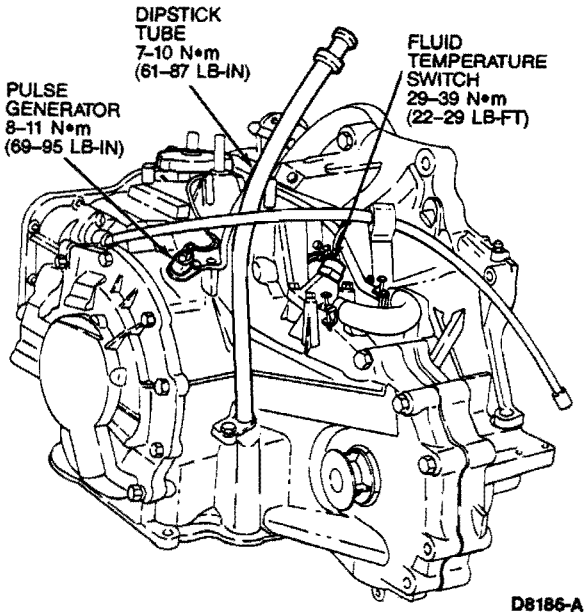


DISASSEMBLY AND ASSEMBLY (Continued)

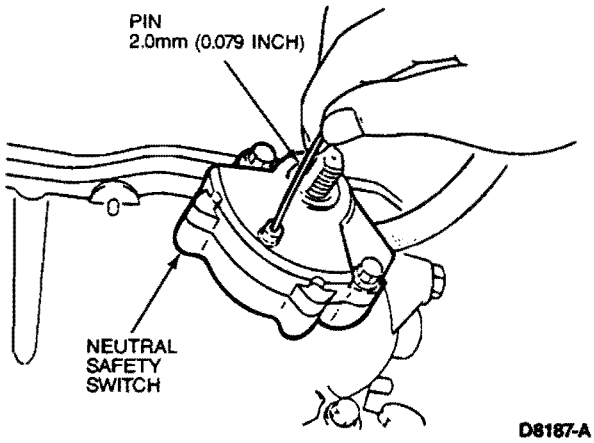
64. Install the valve body cover along with a new gasket. Tighten to 8-11 N·m (69-95 lb-in).
65. Install the oil pipes, oil hoses and switch box as an assembly. Tighten the switch box bolts to 16-24 N·m (12-17 lb-ft).
66. Install the harness clip and tighten to 8-11 N·m (69-95 lb-in).
67. Install the ball, spring, new washers and plug. Tighten the plug to 31-47 N·m (23-35 lb-ft).



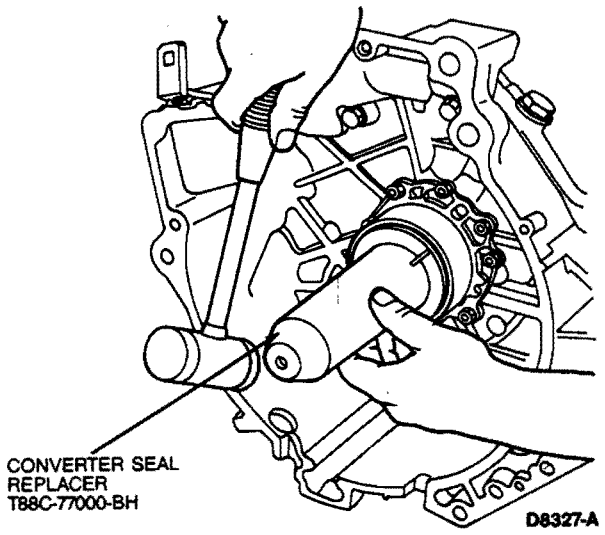
68. Install the solenoid connector.
69. Install the pulse generator and fluid temperature switch. Tighten the pulse generator bolt to 8-11 N·m (69-95 lb-in). Tighten the fluid temperature switch to 29-39 N·m (22-29 lb-ft).
70. Install the dipstick tube with a new O-ring. Tighten bolts to 7-10 N·m (61-87 lb-in).



71. Turn the manual shaft to the NEUTRAL position.
72. Install the neutral safety switch and loosely tighten the bolts.
73. Remove the screw and insert a 2.0mm (0.079 inch) pin. Move the neutral safety switch until the pin engages the switch alignment hole.



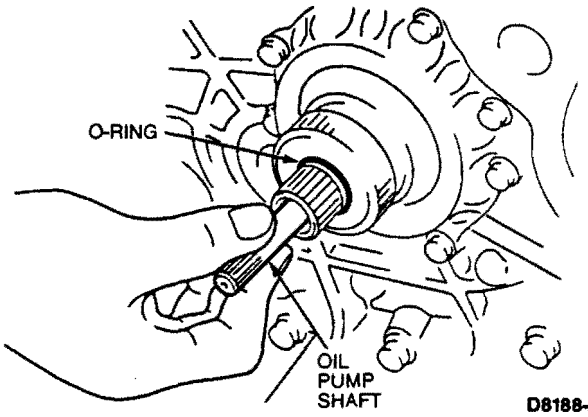
74. Tighten the switch bolts to 8-11 N·m (69-95 lb-in).
75. Remove the pin and install the screw.
76. Install the harness with the remaining clip, and tighten to 8-11 N·m (69-95 lb-in).
77. Remove the transaxle from the holding fixture.
78. Install the converter seal using Converter Seal Replacer T88C-77000-BH or equivalent.



79. Install the oil pump shaft.

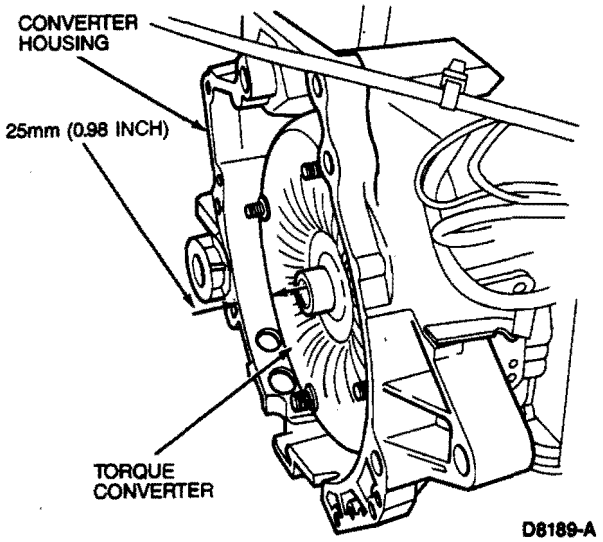
DISASSEMBLY AND ASSEMBLY (Continued)

80. Install a new O-ring onto the turbine shaft.

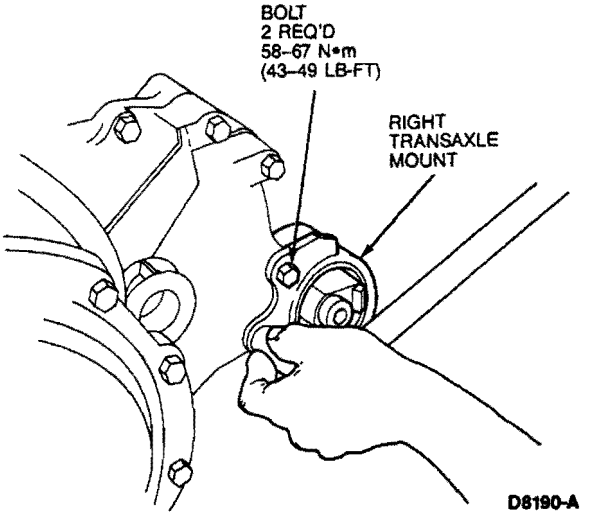


81. Fill the torque converter with specified transaxle fluid.
82. Install the torque converter in the converter housing while rotating it to align the splines.

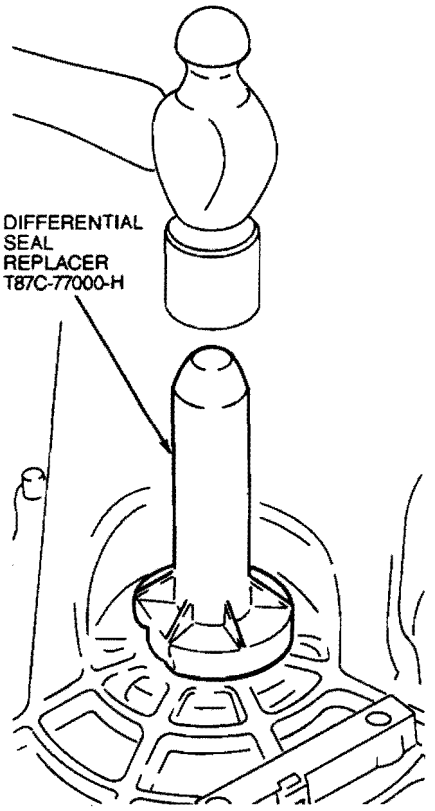
    CAUTION: Do not try to force the torque converter in, install it carefully.
83. Measure the distance between the torque converter and the end of the converter housing. The distance should be 25mm (0.98 inch).



84. Install the right transaxle mount and tighten the bolts to 58-67 N·m (43-49 lb-ft).



85. Install the differential oil seals using Differential Seal Replacer T87C-77000-H or equivalent.

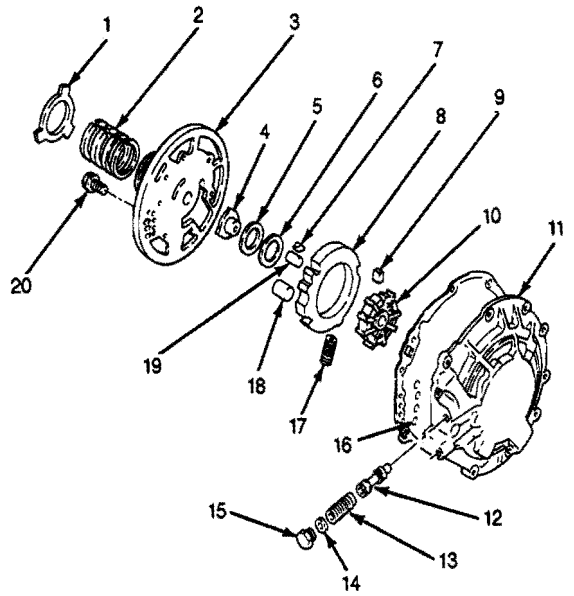


DISASSEMBLY AND ASSEMBLY (Continued)

Sub-Assemblies

Oil Pump

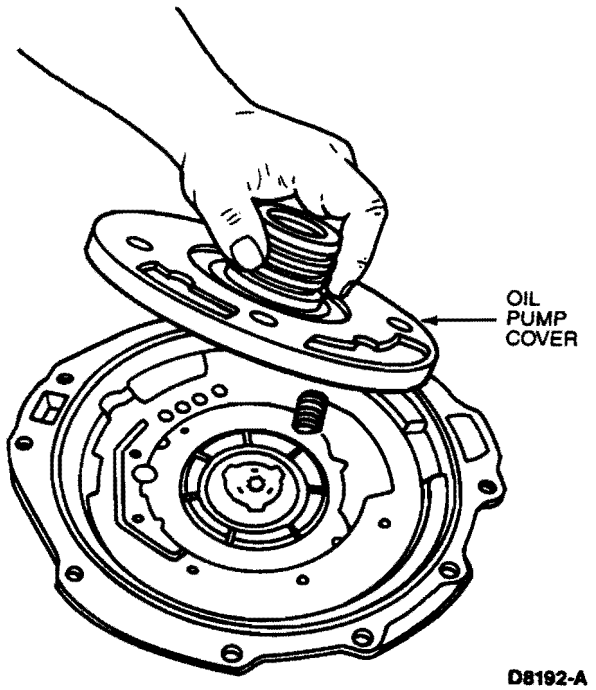
Disassembly



1. THRUST WASHER
2. SEAL RING
3. COVER
4. FLANGE
5. GUIDE RING
6. GUIDE SPRING
7. SEAL SPRING
8. CAM RING
9. VANE
10. ROTOR
11. OIL PUMP BODY
12. VALVE
13. SPRING
14. WASHER
15. PLUG
16. O-RING
17. SPRING
18. PIVOT ROLLER
19. SEAL PIN
20. BOLT

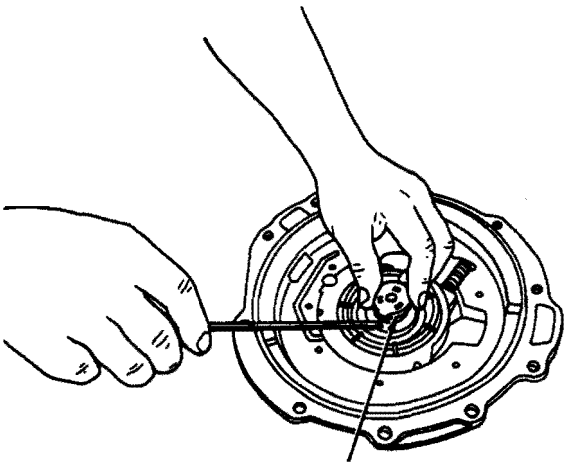
D8191-B

1. Remove the oil pump cover.



D8192-A

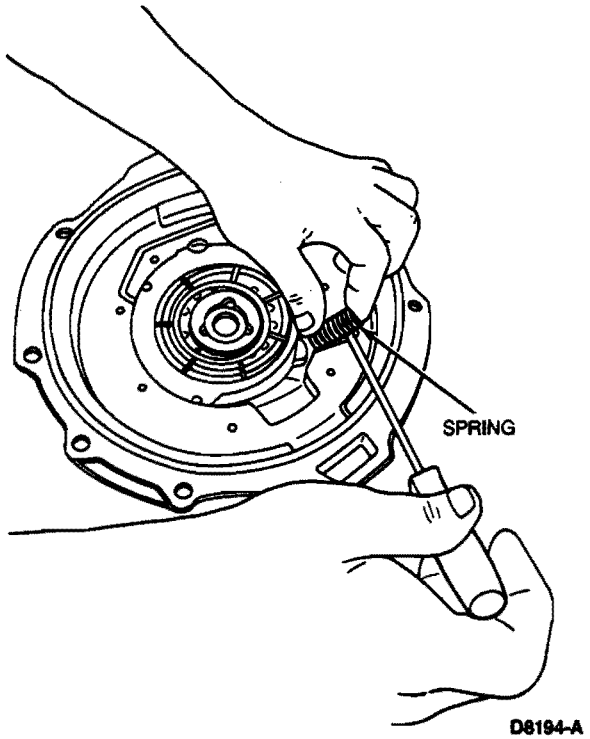
2. Remove the flange.



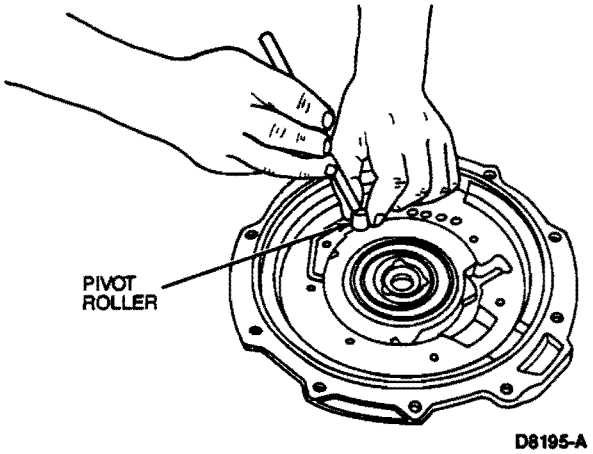
D8193-A

DISASSEMBLY AND ASSEMBLY (Continued)

3. Remove the spring.

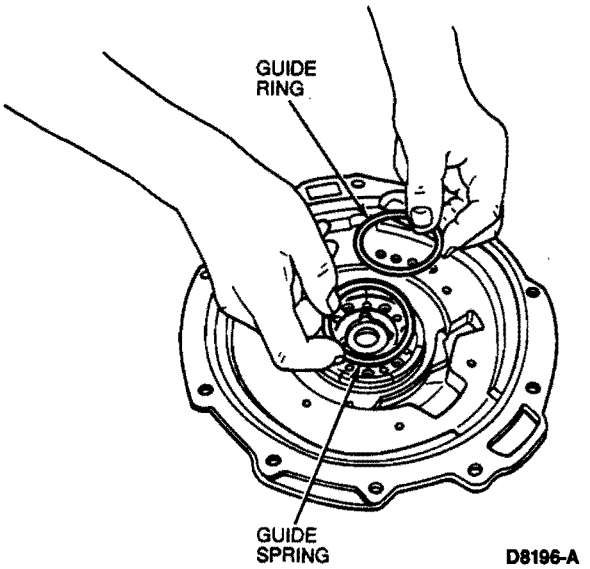


4. Remove the pivot roller.

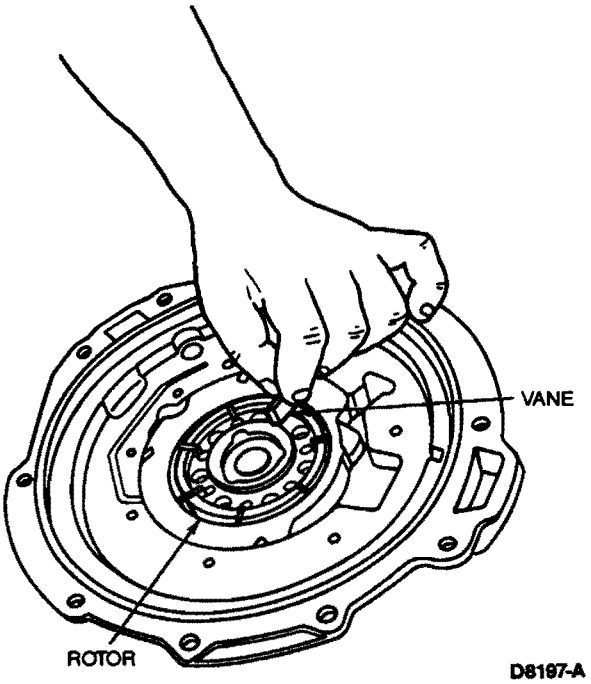


5. Remove the guide ring.

6. Remove the guide spring.

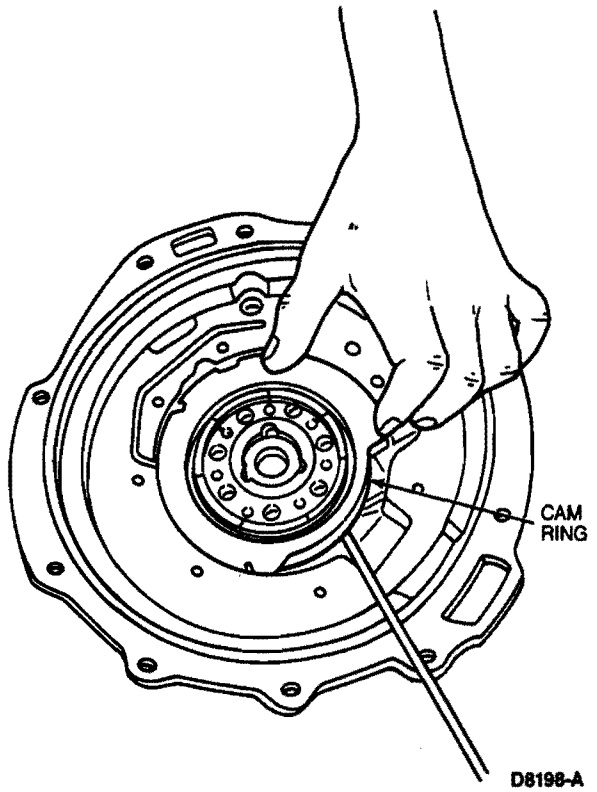


7. Remove the vanes from the rotor.

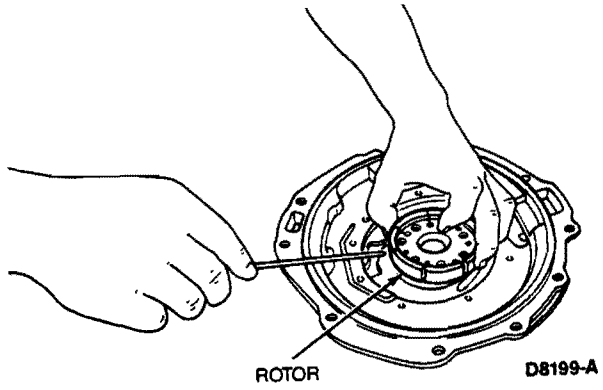


DISASSEMBLY AND ASSEMBLY (Continued)

8. Remove the cam ring.

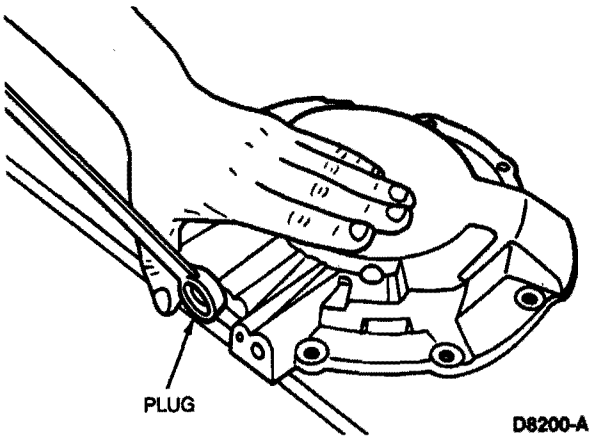


9. Remove the rotor.

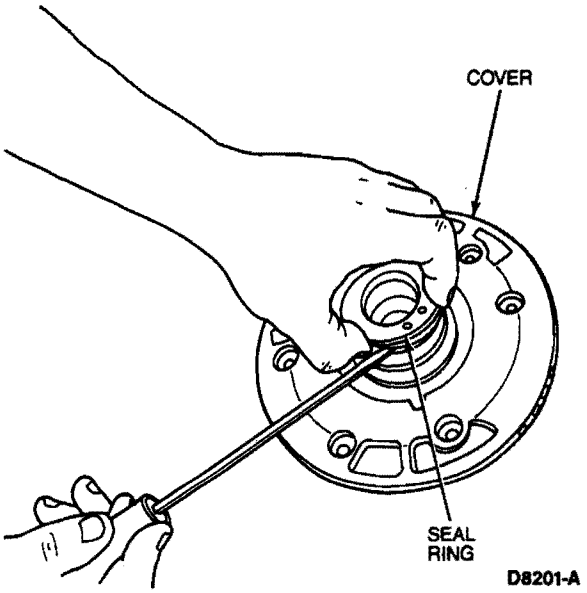


10. Remove the seal pin and spring.

11. Remove the plug, spring and valve.



12. Remove the thrust washer from the cover.
13. Remove the O-rings from the cover.
14. Remove the seal rings from the cover.

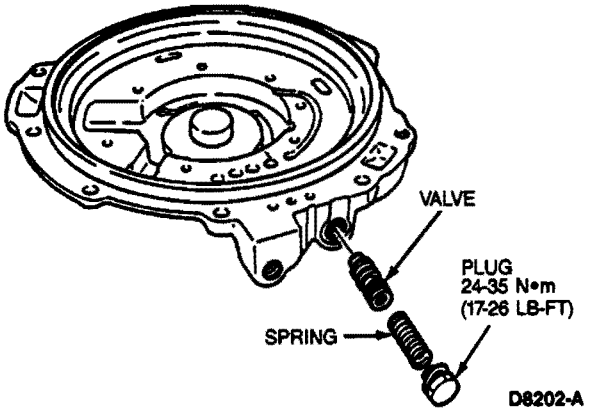


Assembly

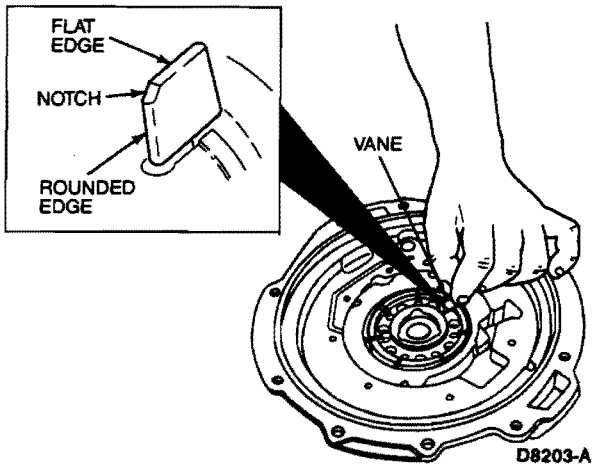
1. Install the valve and spring into the oil pump body and check that the valve moves smoothly.

DISASSEMBLY AND ASSEMBLY (Continued)

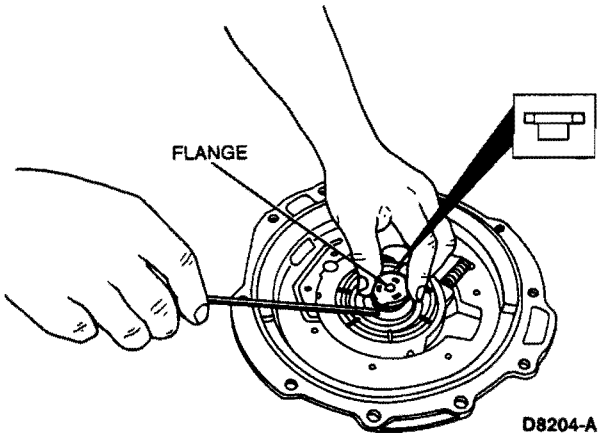
2. Install the plug and tighten to 24-35 N·m (17-26 lb-ft).



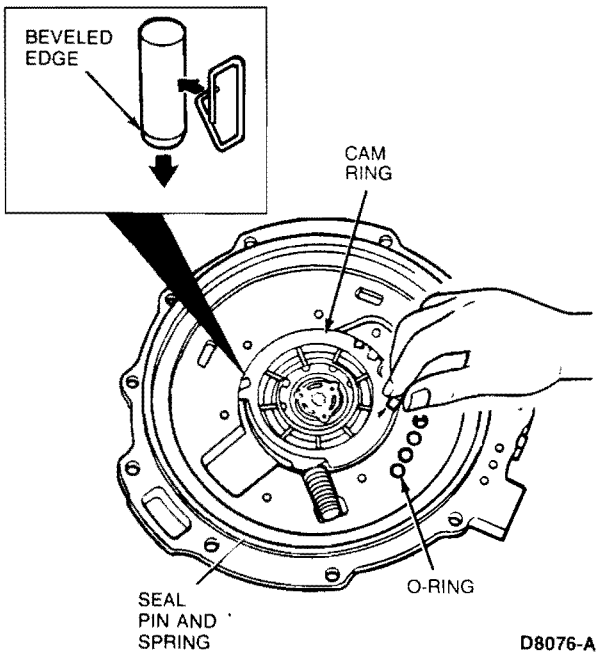
3. Install the cam ring and pivot roller.
4. Install the rotor.
5. Install the vanes into the rotor, with the flat edges and notches facing upward, as shown.



6. Install the guide spring.
7. Install the guide ring.
8. Install the flange with the beveled edge down, as shown.



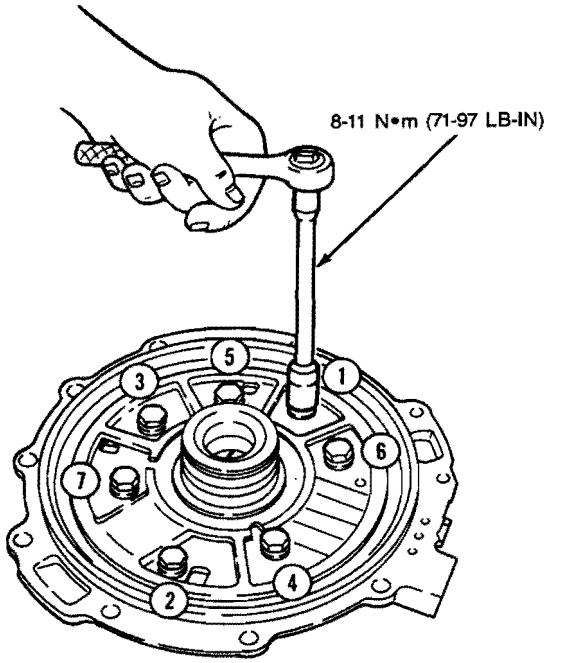
9. Install the spring.
10. Install new O-rings.
11. Install the seal pins and springs. Install the pins with the beveled edge down and the springs facing toward the cam ring.



12. Install the oil pump cover to the oil pump body.

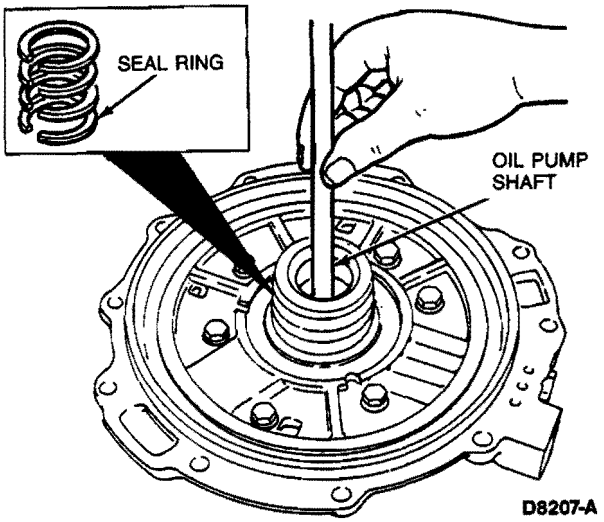
DISASSEMBLY AND ASSEMBLY (Continued)

13. Tighten the cover bolts in the sequence shown. Tighten to 8-11 N·m (71-97 lb-in).



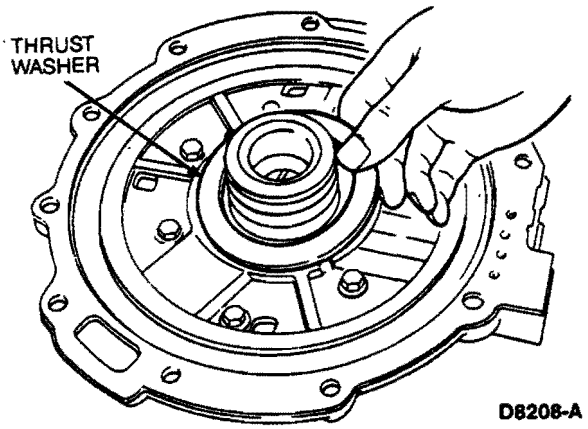
D8206-A

14. Install the oil pump shaft and check for smooth operation.
15. Install new seal rings.



D8207-A

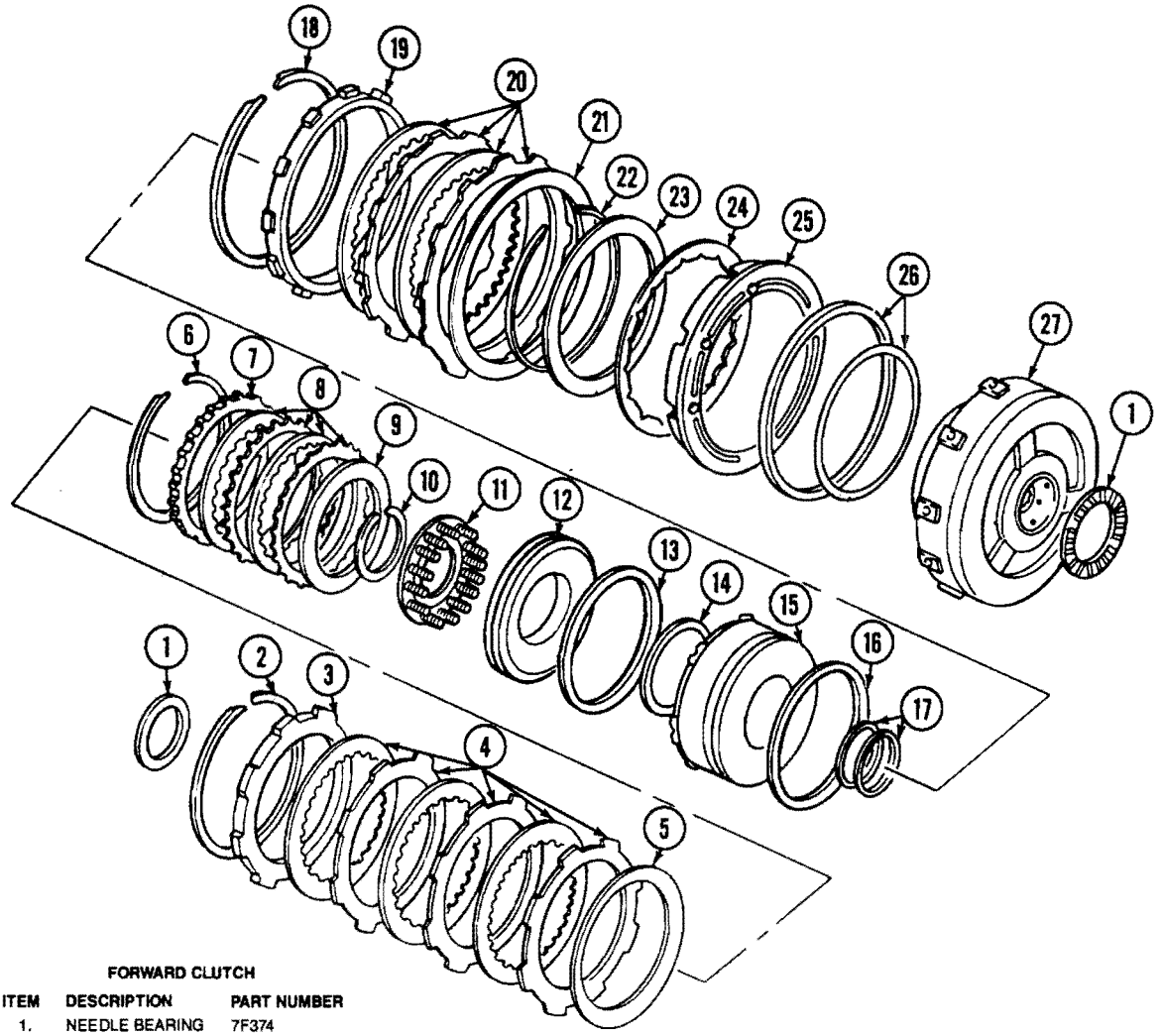
16. Apply petroleum jelly to the thrust washer and install it on the oil pump cover. The outer diameter of the thrust washer should be 88.0mm (3.46 inches).



D8208-A

DISASSEMBLY AND ASSEMBLY (Continued)

Clutch Assemblies



FORWARD CLUTCH

ITEM	DESCRIPTION	PART NUMBER
1.	NEEDLE BEARING	7F374
2.	SNAP RING	7D483
3.	PRESSURE PLATE	7B066
4.	CLUTCH PACK	7B164/7B442
5.	DISHED PLATE	7B070

COASTING CLUTCH

ITEM	DESCRIPTION	PART NUMBER
6.	SNAP RING	7D483
7.	PRESSURE PLATE	7B066
8.	CLUTCH PACK	7B164/7B442
9.	DISHED PLATE	7B070
10.	SNAP RING	7D256
11.	RETURN SPRING AND RETAINER	7F222
12.	COASTING PISTON	7E005
13.	OUTER SEAL	7F224
14.	INNER SEAL	7F225
15.	COASTING CLUTCH DRUM	7A262
16.	OUTER SEAL	7A548
17.	SEAL RINGS	7A294

REVERSE CLUTCH

ITEM	DESCRIPTION	PART NUMBER
18.	SNAP RING	7D483
19.	PRESSURE PLATE	7B066
20.	CLUTCH PACK	7B442/7B164
21.	DISHED PLATE	7B070
22.	SNAP RING	7A527
23.	RETURN SPRING STOPPER	7B437
24.	PISTON RETURN SPRING	7E085
25.	REVERSE PISTON	7D402
26.	SEAL RINGS	7D403/7D404
27.	REVERSE AND FORWARD DRUM	7D044

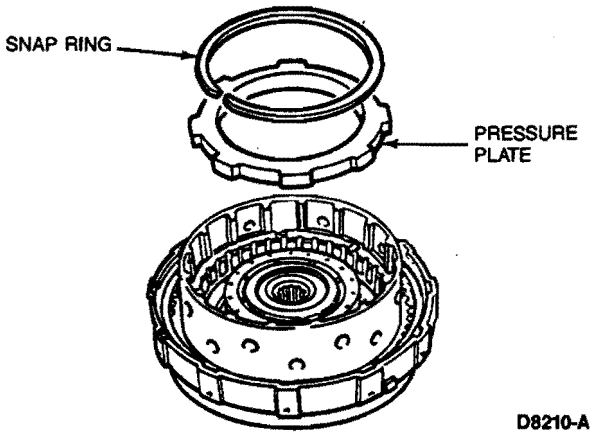
D7362-A

DISASSEMBLY AND ASSEMBLY (Continued)

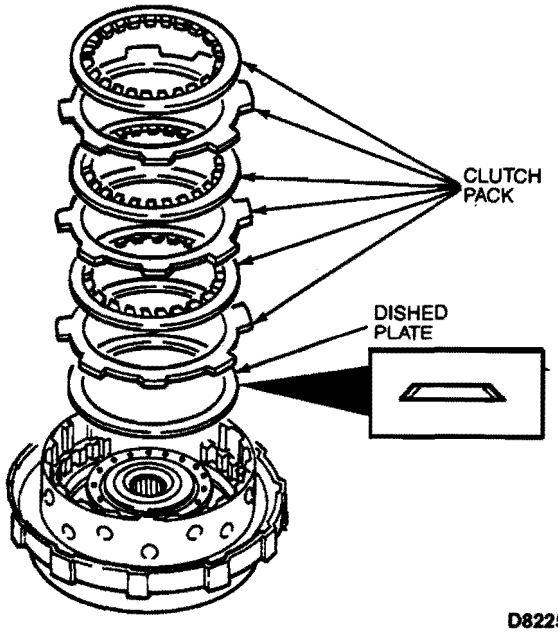
Forward Clutch

Disassembly

1. Remove the needle bearing.
2. Remove the snap ring.
3. Remove the pressure plate.



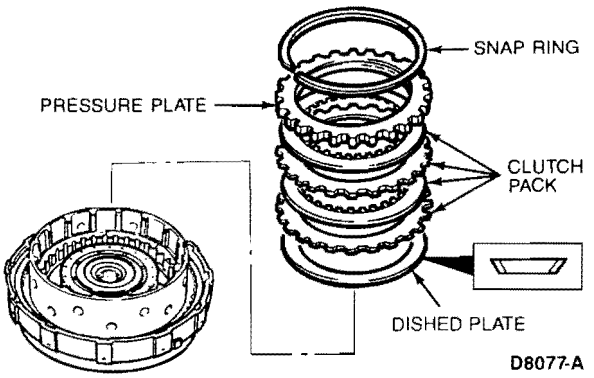
4. Remove the forward clutch pack.
5. Remove the dished plate.



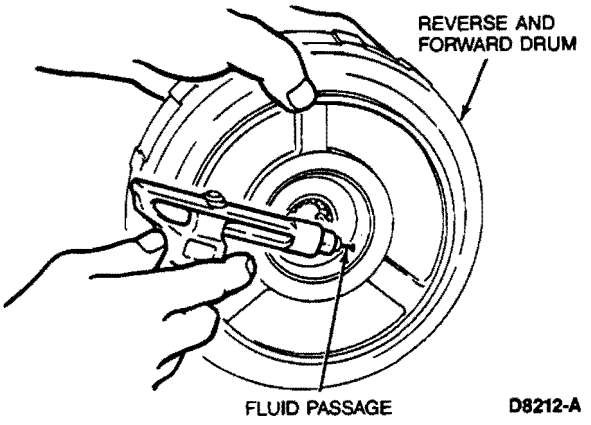
Coasting Clutch

Disassembly

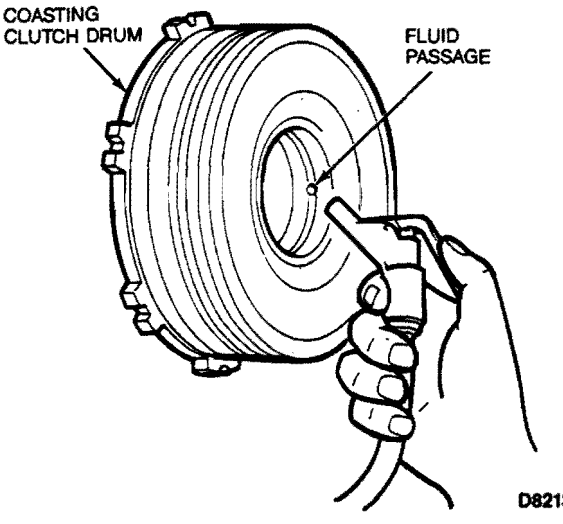
1. Remove the snap ring.
2. Remove the pressure plate.
3. Remove the coasting clutch pack.
4. Remove the dished plate.



5. Remove the spring compressor.
6. Remove the return spring and retainer.
7. Remove the coasting clutch drum from the clutch assembly by applying compressed air through the fluid passage.



8. Remove the coasting piston from the coasting clutch drum by applying compressed air through the fluid passage.

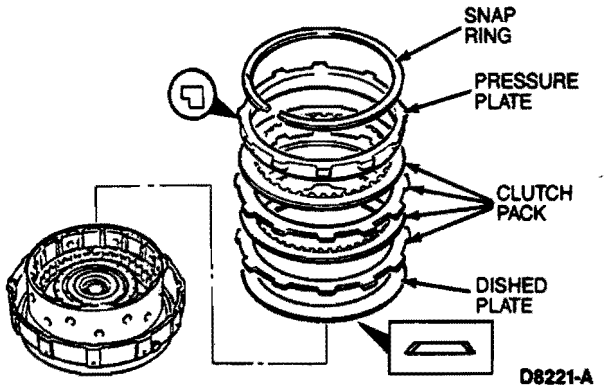


DISASSEMBLY AND ASSEMBLY (Continued)

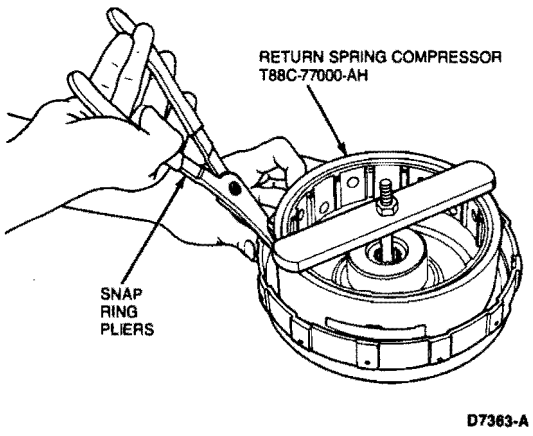
Reverse Clutch

Disassembly

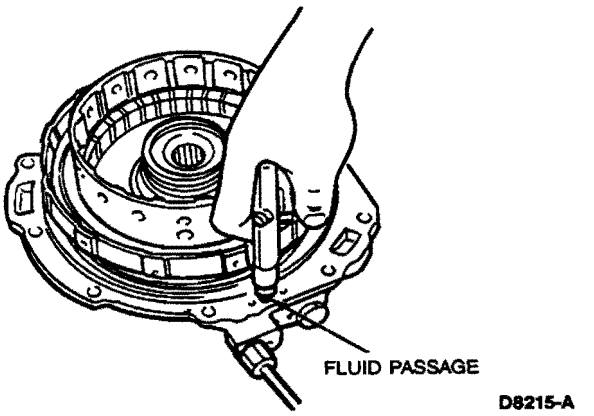
1. Remove the snap ring.
2. Remove the pressure plate.
3. Remove the reverse clutch pack.
4. Remove the dished plate.



5. Compress the piston return spring using Return Spring Compressor T88C-77000-AH or equivalent.
6. Remove one end of the snap ring from the groove with snap ring pliers. Once started, remove the snap ring with a screwdriver.



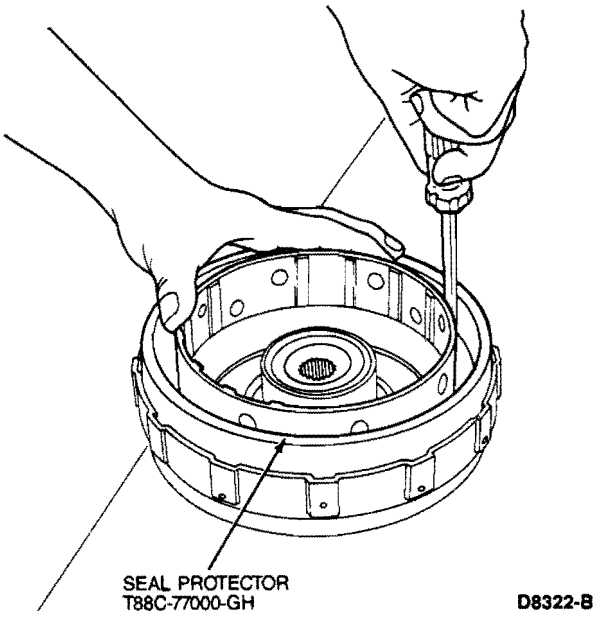
7. Remove the spring compressor.
8. Place the clutch assembly on the oil pump.
9. Apply compressed air through the fluid passage to remove the reverse piston.



Reverse Clutch

Assembly

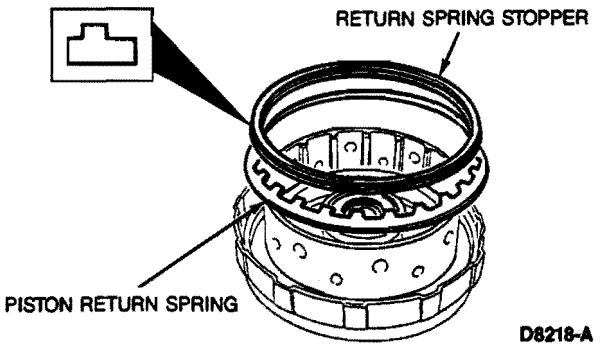
1. Apply the specified transaxle fluid to the inner and outer faces of new seals, and install them on the reverse piston.
2. Attach Seal Protector T88C-77000-GH or equivalent to the reverse piston. Install the reverse piston into the reverse and forward drum by pushing evenly around the circumference. If necessary, use a screwdriver to seat the piston. Remove the seal protector.



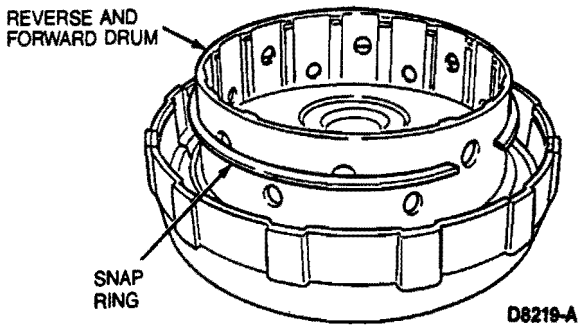
3. Install the piston return spring with the tabs facing away from the reverse piston.

DISASSEMBLY AND ASSEMBLY (Continued)

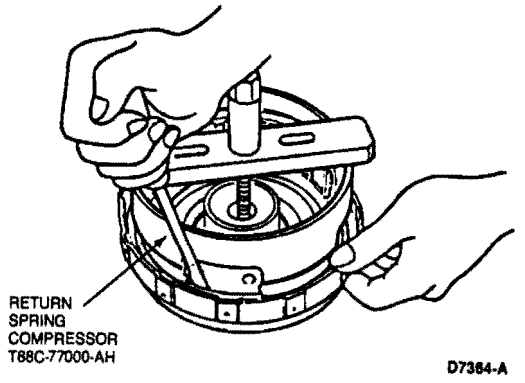
4. Install the return spring stopper with the step facing upwards.



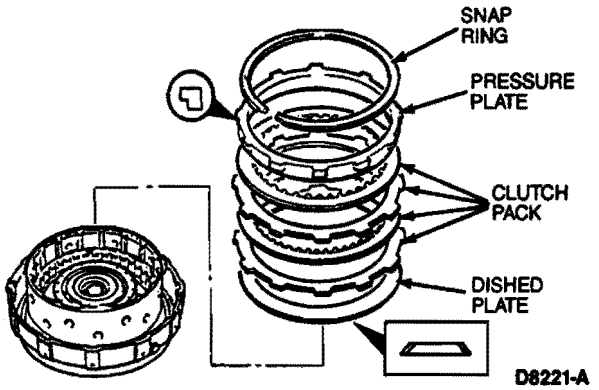
5. Install the snap ring half-way down the reverse and forward drum.



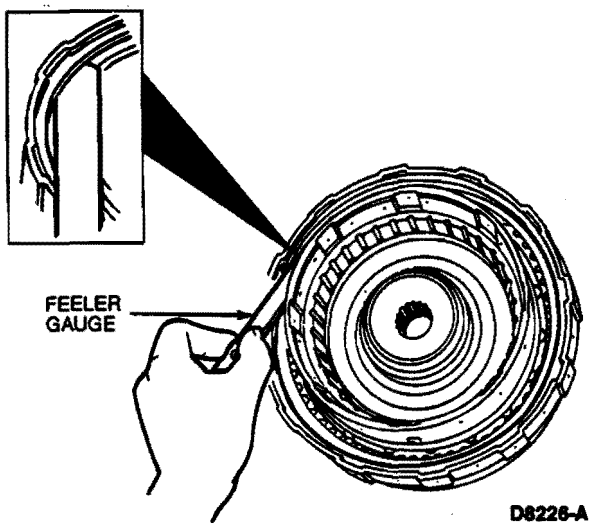
6. Compress the piston return spring using Return Spring Compressor T88C-77000-AH or equivalent.
7. Install the snap ring with a screwdriver.



8. Remove the spring compressor. Install the dished plate with the beveled side facing upward.
9. Install the reverse clutch pack.
10. Install the pressure plate with the step facing down.
11. Install the snap ring.



12. Use a feeler gauge to check the reverse clutch clearance. Measure between the snap ring and the pressure plate. If the clearance is not within 2.1-2.4mm (0.083-0.094 inch), adjust it by selecting an appropriate pressure plate from the following chart.



Part Number	Pressure Plate Thickness
E92Z-7B066-N	6.6mm (0.260 inch)
E92Z-7B066-O	6.8mm (0.268 inch)
E92Z-7B066-P	7.0mm (0.276 inch)
E92Z-7B066-Q	7.2mm (0.283 inch)
E92Z-7B066-R	7.4mm (0.291 inch)
E92Z-7B066-S	7.6mm (0.299 inch)

CD8369-A

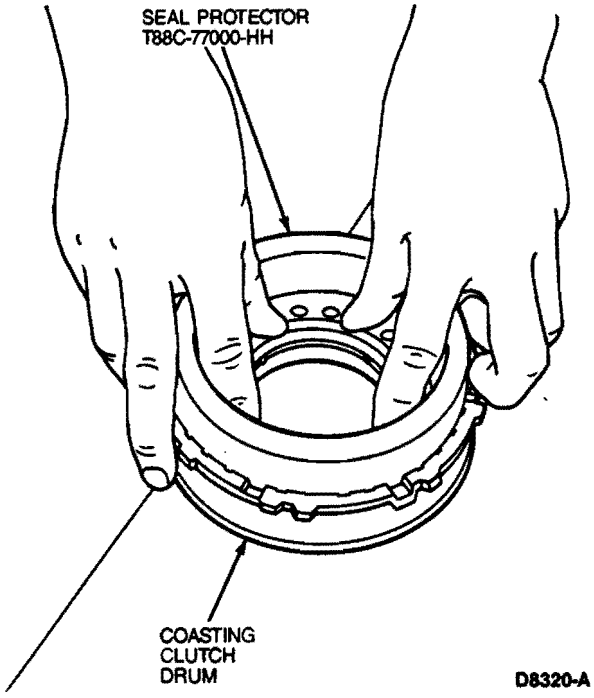
Coasting Clutch

Assembly

1. Apply the specified transaxle fluid to the new seals and install them on the coasting piston.

DISASSEMBLY AND ASSEMBLY (Continued)

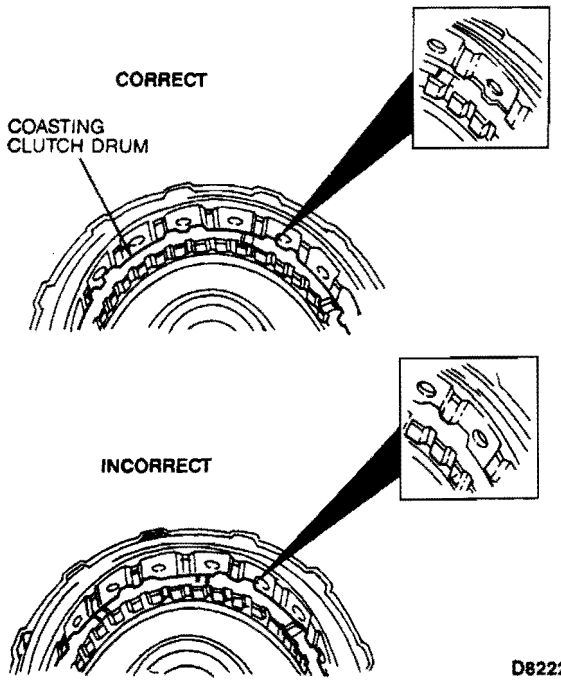
2. Attach Seal Protector T88C-77000-HH or equivalent to the coasting piston, and install the piston into the coasting clutch drum by pushing evenly around the circumference.



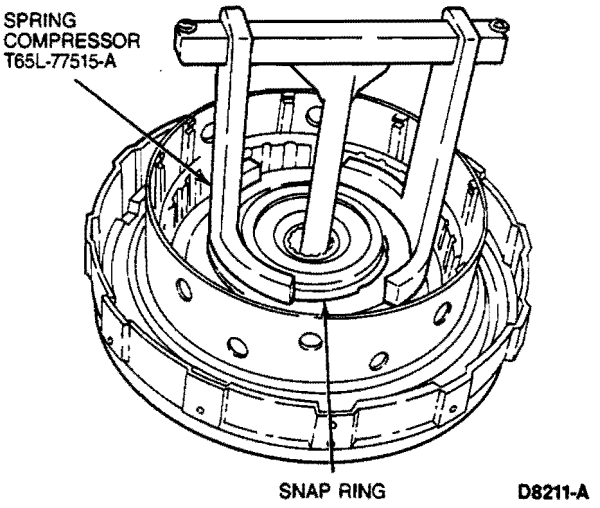
3. Apply the specified transaxle fluid to a new seal and install it on the coasting clutch drum.

   NOTE: Roll the outer seal lip down to ease installation.

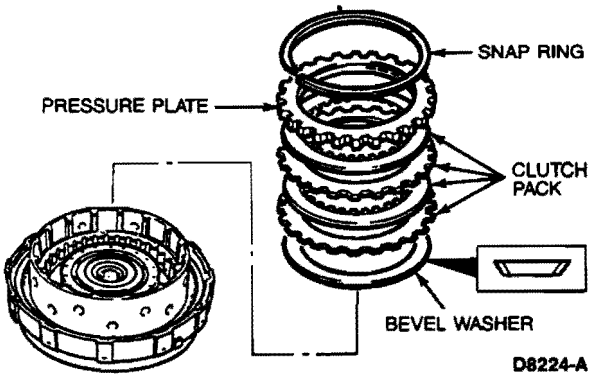
4. Install the coasting clutch drum into the reverse and forward drum, as shown.



5. Install the return spring and retainer.
6. Install Clutch Spring Compressor T65L-77515-A or equivalent and compress the return spring and retainer.
7. Install the snap ring.

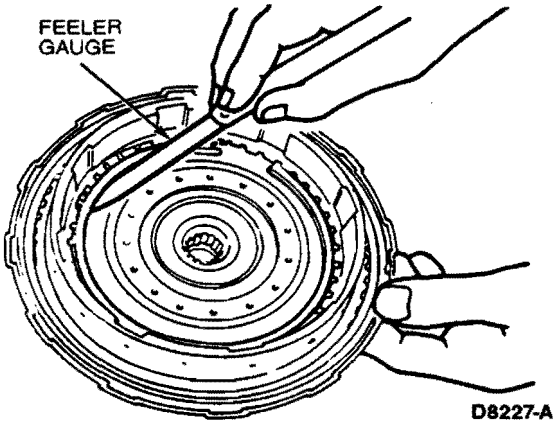


8. Remove the spring compressor.
9. Install the dished plate with the beveled side downward.
10. Install the coasting clutch pack.
11. Install the pressure plate.
12. Install the snap ring.



DISASSEMBLY AND ASSEMBLY (Continued)

13. Use a feeler gauge to check the coasting clutch clearance. Measure between the snap ring and the pressure plate.



D8227-A

If the clearance is not within 1.0-1.2mm (0.040-0.047 inch), adjust it by selecting an appropriate pressure plate from the following chart.

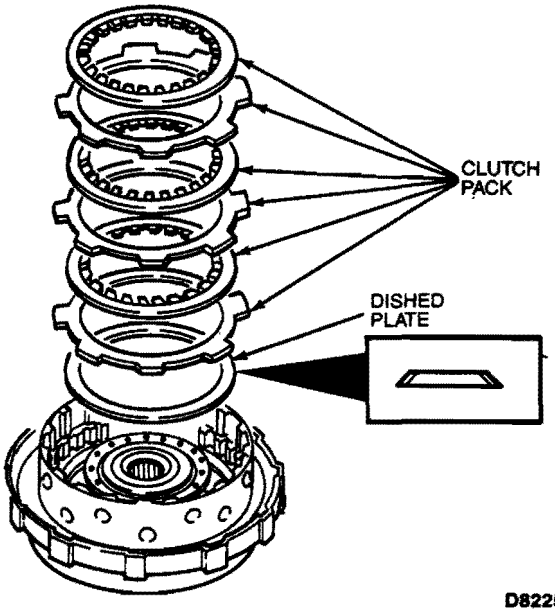
Part Number	Pressure Plate Thickness
E92Z-7B066-M	4.6mm (0.181 inch)
E92Z-7B066-G	4.8mm (0.189 inch)
E92Z-7B066-H	5.0mm (0.197 inch)
E92Z-7B066-J	5.2mm (0.205 inch)
E92Z-7B066-K	5.4mm (0.213 inch)
E92Z-7B066-L	5.6mm (0.220 inch)

CD8368-A

Forward Clutch

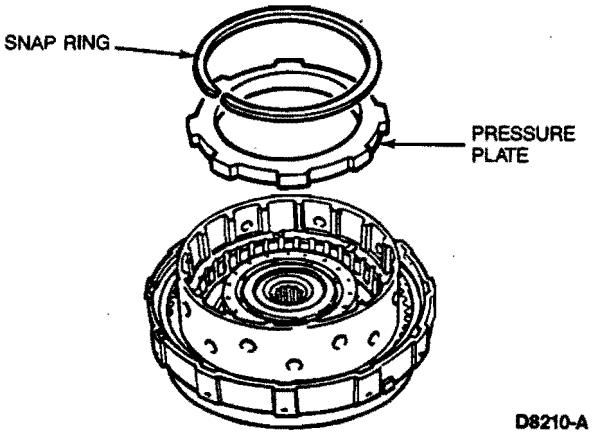
Assembly

1. Install the dished plate with the beveled side facing upward.
2. Install the forward clutch pack.



D8225-A

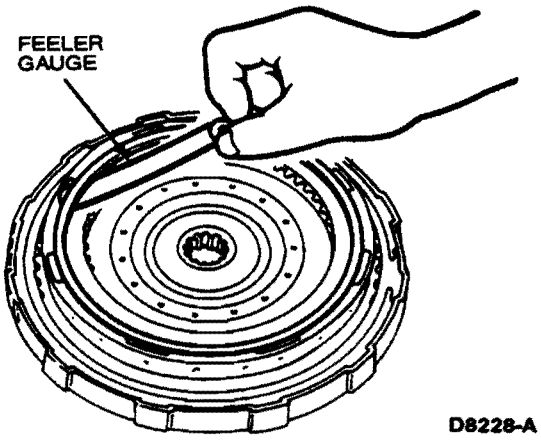
3. Install the pressure plate.
4. Install the snap ring.



D8210-A

DISASSEMBLY AND ASSEMBLY (Continued)

5. Use a feeler gauge to check the forward clutch clearance. Measure between the snap ring and the pressure plate.



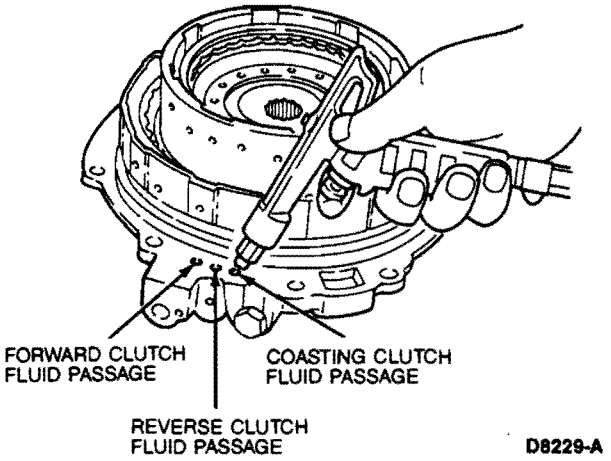
D8228-A

If the clearance is not within 1.0-1.2mm (0.040-0.047 inch), adjust it by selecting an appropriate pressure plate from the following chart.

Part Number	Pressure Plate Thickness
E92Z-7B066-A	5.9mm (0.232 inch)
E92Z-7B066-B	6.1mm (0.240 inch)
E92Z-7B066-C	6.3mm (0.248 inch)
E92Z-7B066-D	6.5mm (0.256 inch)
E92Z-7B066-E	6.7mm (0.264 inch)
E92Z-7B066-F	8.9mm (0.350 inch)

CD8367-A

6. Set the forward and reverse drum onto the oil pump. Check each clutch operation by applying a short burst of compressed air through the fluid passages as shown. As air pressure is applied, the clutch pack should compress. The pressure should not exceed 392 kPa (57 psi).
7. Pour the specified transaxle fluid until the reverse piston, coasting clutch drum and coasting piston are fully submerged. Apply a short burst of compressed air through the fluid passages as shown. Check that no bubbles come from between the piston and drum seal. The pressure should not exceed 392 kPa (57 psi).

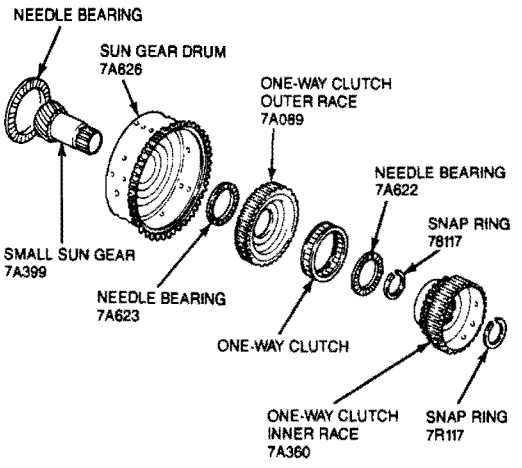


D8229-A

8. Apply petroleum jelly to needle bearings and install them on both sides of the clutch assembly. The outer diameter is 86.0mm (3.39 inches) for the oil pump side, and 56.1mm (2.21 inches) for the one-way clutch side.

Small Sun Gear and One-Way Clutch

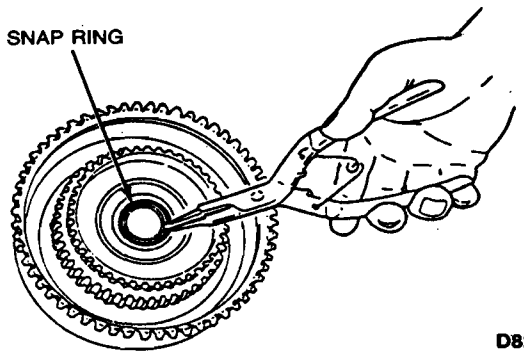
Disassembly



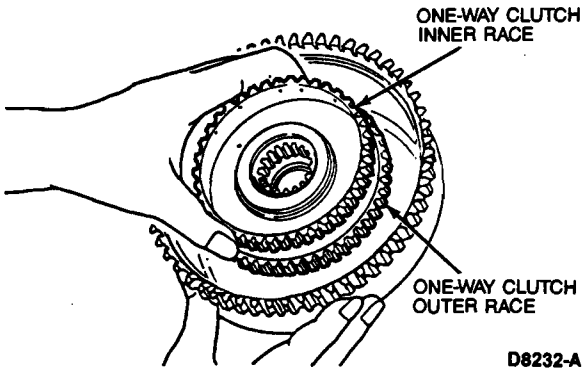
D7365-A

DISASSEMBLY AND ASSEMBLY (Continued)

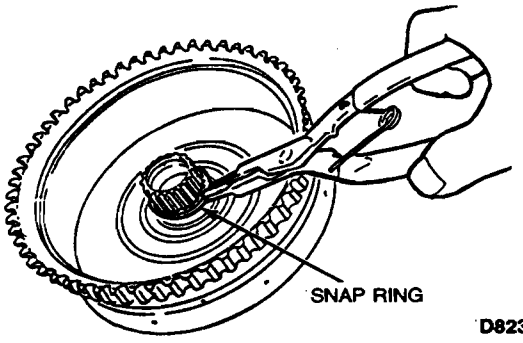
1. Remove the snap ring.



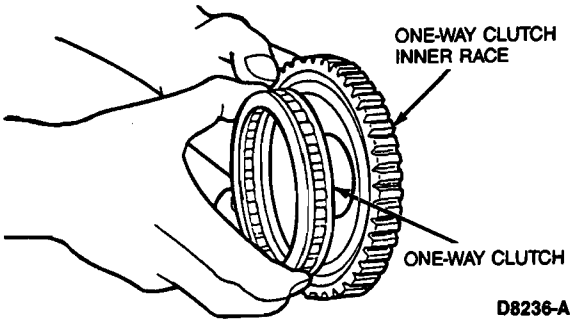
2. Remove the one-way clutch inner and outer races.



3. Remove the snap ring.



4. Remove the small sun gear from the sun gear drum.
5. Separate the one-way clutch inner race from the outer race.
6. Remove the one-way clutch.

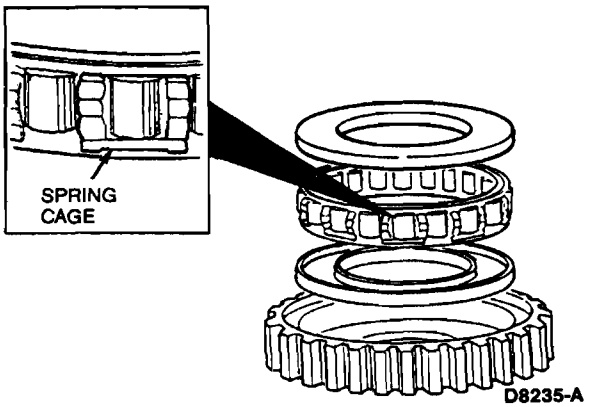


7. Remove the needle bearing.

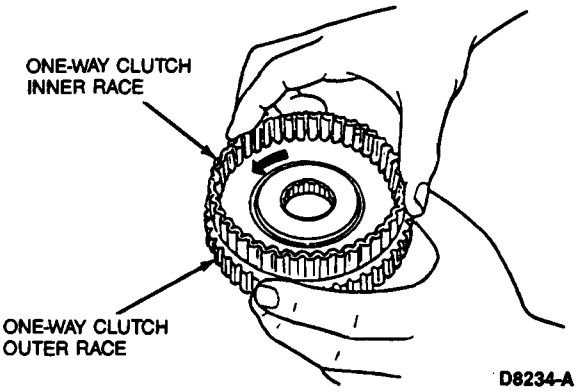
Assembly

1. Apply petroleum jelly to the needle bearing and install it to the one-way clutch inner race. The outer diameter is 62.1mm (2.44 inches).
2. Install the one-way clutch into the one-way clutch outer race.

   CAUTION: Check that the spring cage faces toward the outer race.



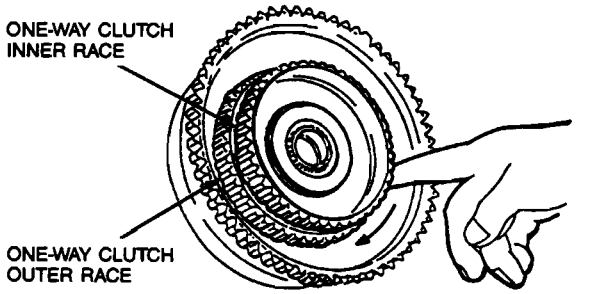
3. Install the one-way clutch inner race into the one-way clutch outer race by turning the inner race counterclockwise. Make sure that the inner race turns only counterclockwise.



DISASSEMBLY AND ASSEMBLY (Continued)

4. Install the small sun gear into the sun gear drum.
5. Install the snap ring.
6. Install the one-way clutch inner and outer races to the sun gear drum.

   NOTE: Align the splines of the one-way clutch inner race and small sun gear clutch hub.
7. Install the snap ring.
8. Hold the small sun gear and make sure that the one-way clutch outer race turns smoothly and only clockwise.

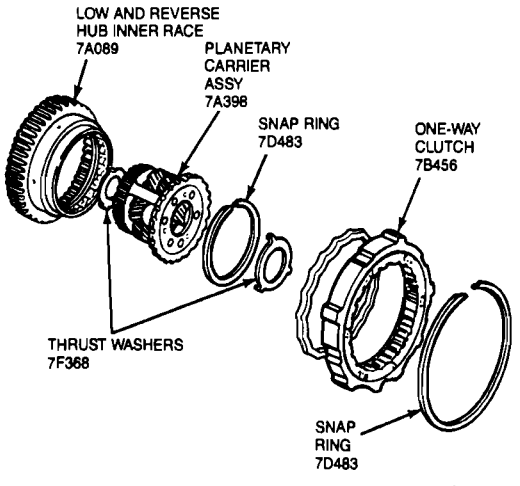


D8237-A

9. Apply petroleum jelly to the needle bearing and install it to the sun gear drum. The outer diameter is 72.0mm (2.83 inches).

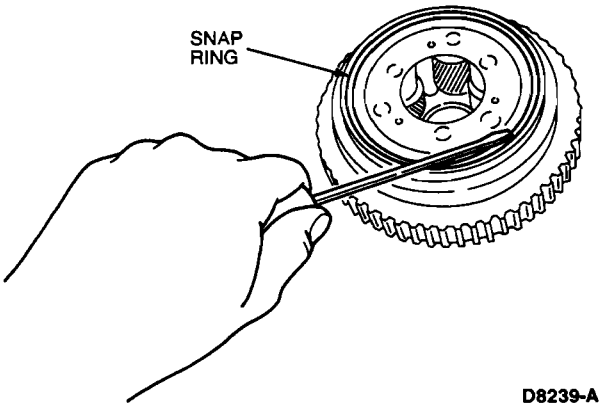
One-Way Clutch and Planetary Carrier Assembly

Disassembly



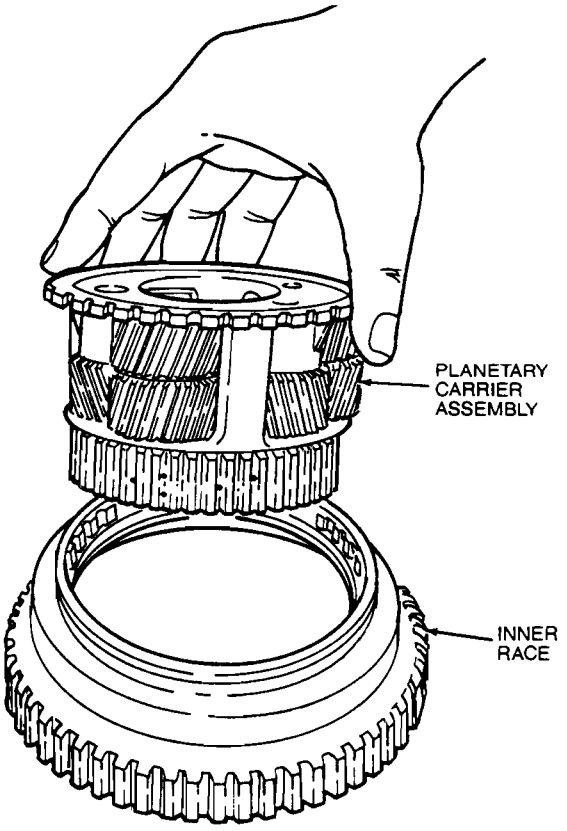
D7366-A

1. Remove the one-way clutch.
2. Remove the thrust washers.
3. Remove the snap ring.



D8239-A

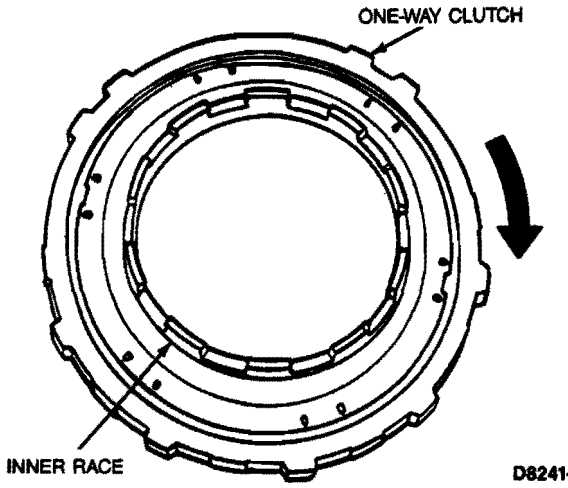
4. Remove the planetary carrier assembly from the inner race.



D8240-B

DISASSEMBLY AND ASSEMBLY (Continued)

5. Place the one-way clutch on the inner race and make sure that the one-way clutch rotates smoothly and only clockwise.

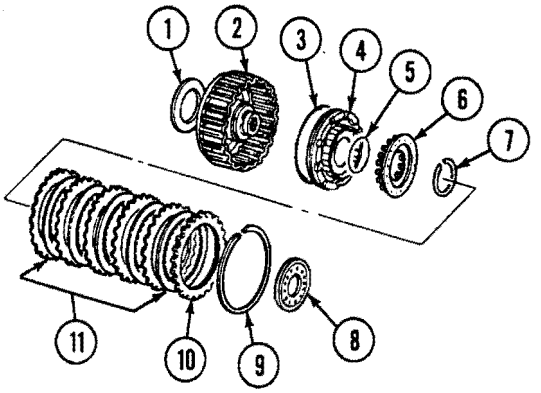


Assembly

1. Assemble the planetary carrier assembly to the inner race.
2. Install the snap ring.
3. Apply petroleum jelly to the thrust washers and install them on the one-way clutch and planetary carrier assembly. The outer diameter of the sun gear drum side should be 72.0mm (2.83 inches) for the sun gear drum side, and 57.0mm (2.21 inches) for the 3-4 clutch side.
4. Install the one-way clutch.

3-4 Clutch

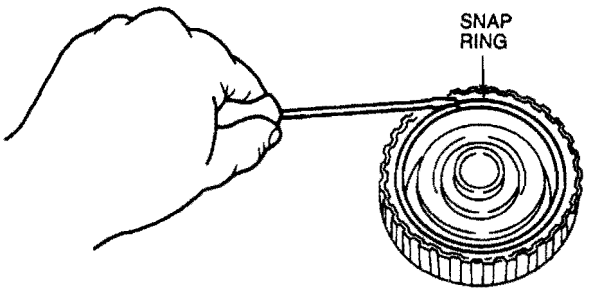
Disassembly



ITEM	DESCRIPTION
1.	NEEDLE BEARING 7F404
2.	3-4 CLUTCH DRUM 7F283
3.	OUTER SEAL 7A548
4.	3-4 CLUTCH PISTON 7A262
5.	INNER SEAL
6.	RETURN SPRING AND RETAINER 7F235
7.	SNAP RING 7C122
8.	NEEDLE BEARING 7D483
9.	SNAP RING 7D234
10.	PRESSURE PLATE 7B066
11.	CLUTCH PACK 7B442/7B164

D7387-A

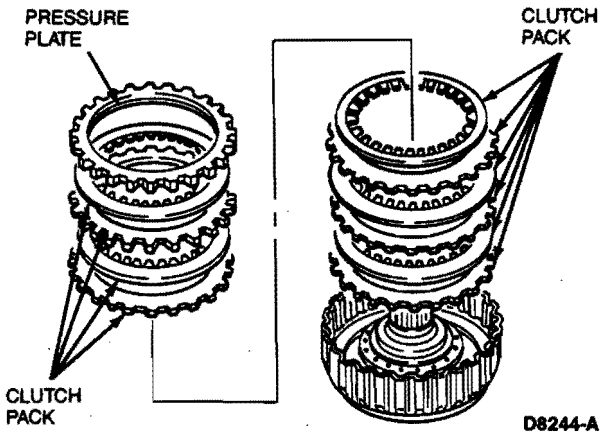
1. Remove the needle bearings.
2. Remove the snap ring.



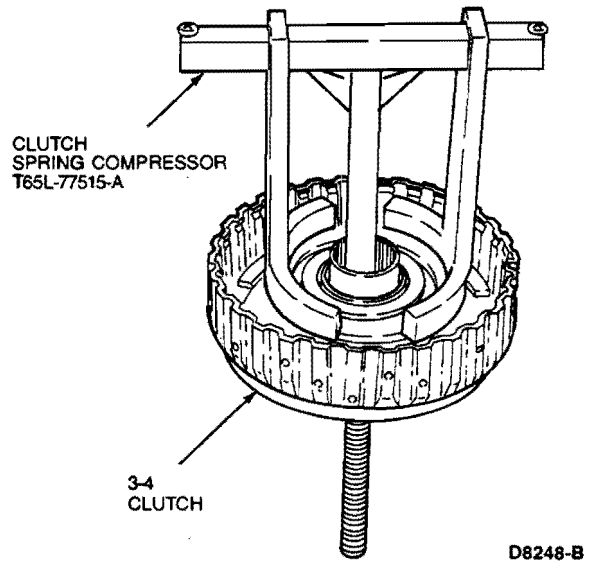
3. Remove the pressure plate.

DISASSEMBLY AND ASSEMBLY (Continued)

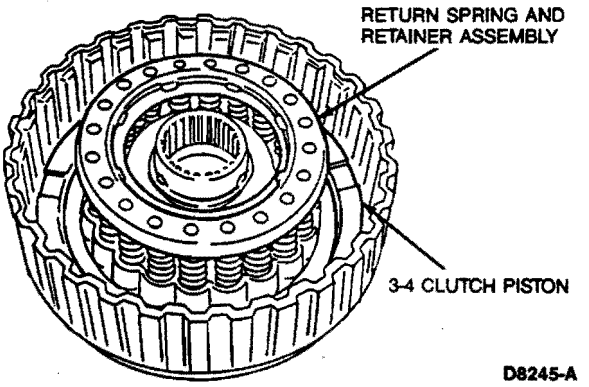
4. Remove the 3-4 clutch pack.



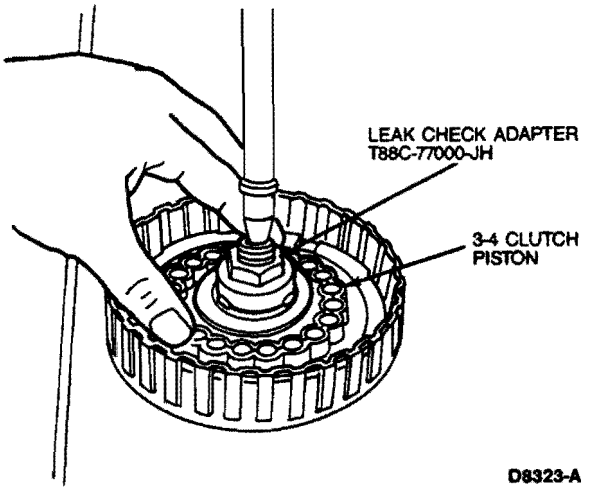
5. Install Clutch Spring Compressor T65L-77515-A or equivalent and compress the return spring and retainer assembly.



6. Remove the snap ring.
7. Remove the spring compressor.
8. Remove the return spring and retainer assembly.



9. Remove the 3-4 clutch piston using compressed air applied through Leak Check Adapter T88C-77000-JH.



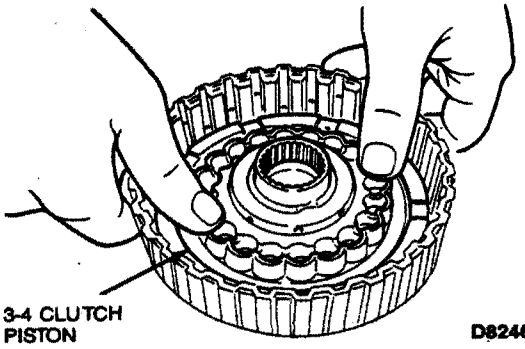
10. Remove the inner and outer seals from 3-4 clutch piston.

Assembly

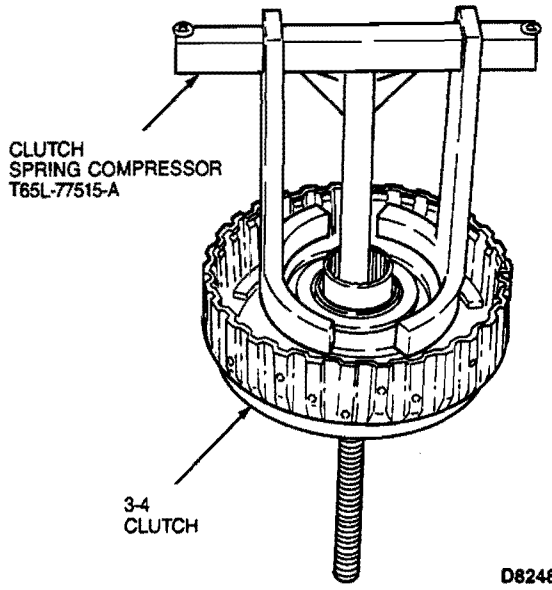
1. Apply the specified transaxle fluid to the inner and outer seals and install them onto the 3-4 clutch piston.

DISASSEMBLY AND ASSEMBLY (Continued)

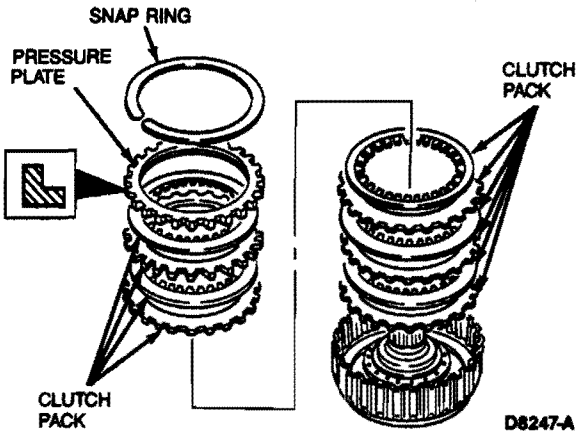
2. Install the 3-4 clutch piston by pushing evenly around the circumference.



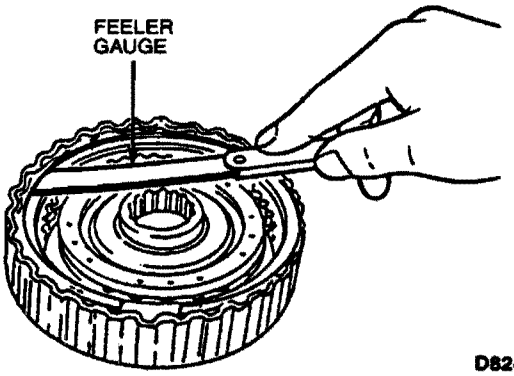
3. Install the return spring and retainer assembly.
4. Install Clutch Spring Compressor T65L-77515-A and compress the return spring and retainer assembly.



5. Install the snap ring.
6. Remove the clutch spring compressor.
7. Install the 3-4 clutch pack.
8. Install the pressure plate with the strip facing upward.
9. Install the snap ring.



10. Use a feeler gauge to check the 3-4 clutch clearance. Measure between the snap ring and the pressure plate.



If the clearance is not within 1.3-1.5mm (0.051-0.059 inch), adjust it by selecting a proper pressure plate from the following chart below.

Part Number	Pressure Plate Thickness
E92Z-7B066-T	4.0mm (0.157 inch)
E92Z-7B066-U	4.2mm (0.165 inch)
E92Z-7B066-V	4.4mm (0.173 inch)
E92Z-7B066-W	4.6mm (0.181 inch)
E92Z-7B066-X	4.8mm (0.189 inch)

CD8370-A

11. Apply petroleum jelly to needle bearings and install them on the 3-4 clutch. The outer diameter is 56.1mm (2.21 inches) for the planetary carrier side, and 72.1mm (2.84 inches) for the output shell side.
12. Install Leak Check Adapter T88C-77000-JH or equivalent and apply compressed air to check clutch operation.

CAUTION: Do not apply over 392 kPa (57 psi) of air pressure.

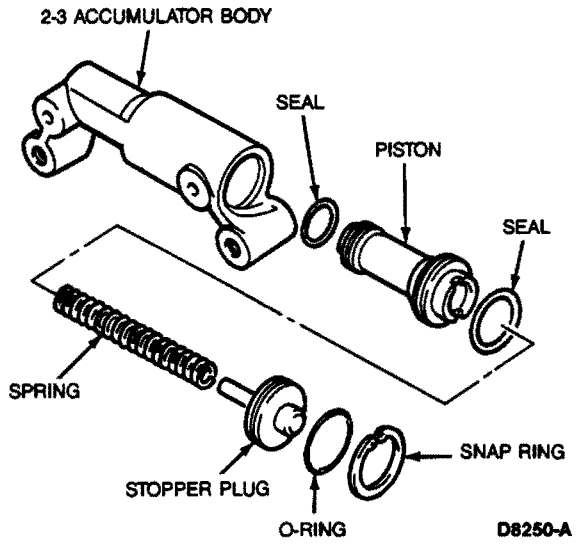
DISASSEMBLY AND ASSEMBLY (Continued)

13. Pour the specified transaxle fluid into the clutch drum so the 3-4 clutch piston is fully submerged. Apply compressed air to check that no bubbles come from the clutch piston seal.

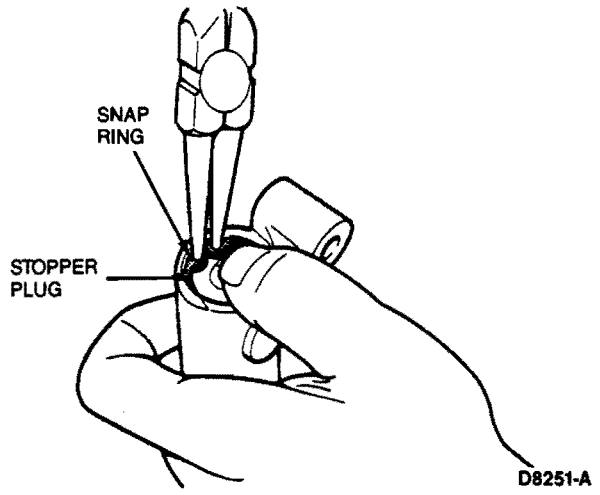
    CAUTION: Do not apply over 392 kPa (57 psi) of air pressure. Do not apply the air pressure for more than three seconds.

2-3 Accumulator

Disassembly



1. Remove the snap ring while holding in the stopper plug.



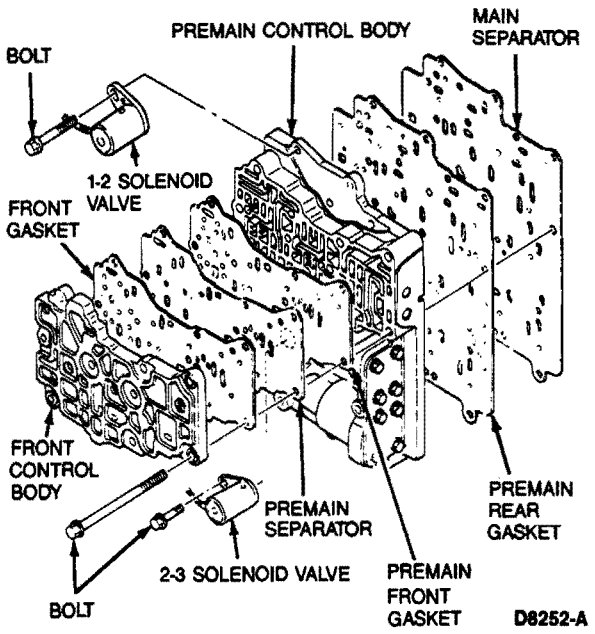
2. Remove the stopper plug.
3. Remove the spring.
4. Remove the piston.
5. Remove the O-ring from the stopper plug.
6. Remove the seals from the piston.

Assembly

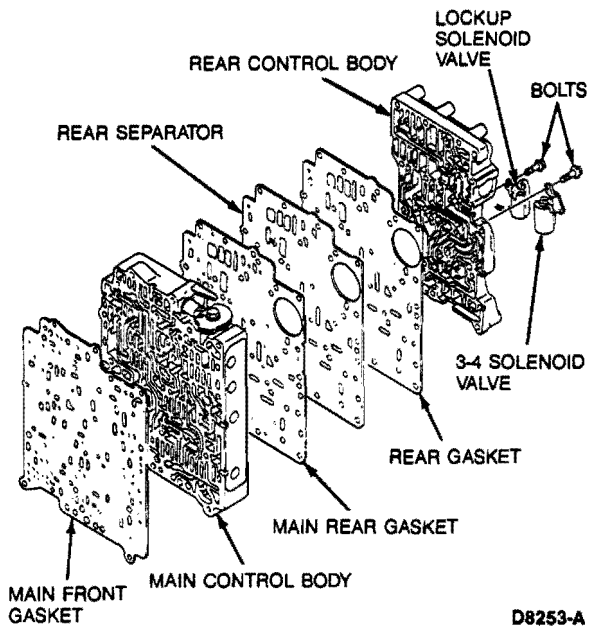
1. Apply the specified transaxle fluid to the seals and install them on the piston.
2. Apply the specified transaxle fluid to the O-ring and install it on the stopper plug.
3. Install the piston.
4. Install the spring.
5. Install the stopper plug.
6. Install the snap ring while holding in the stopper plug.

Valve Body

Disassembly

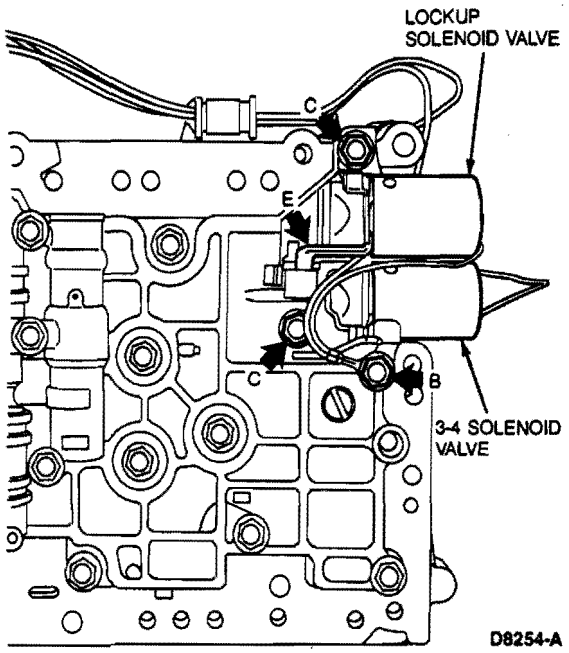


DISASSEMBLY AND ASSEMBLY (Continued)



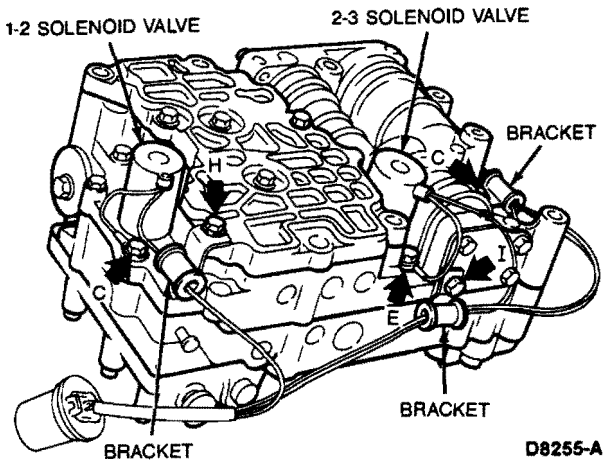
NOTE: Each valve body bolt has a letter on the bolt head which matches the letter placed near the bolt hole.

1. Remove the 3-4 solenoid valve.
2. Remove the lockup solenoid valve.

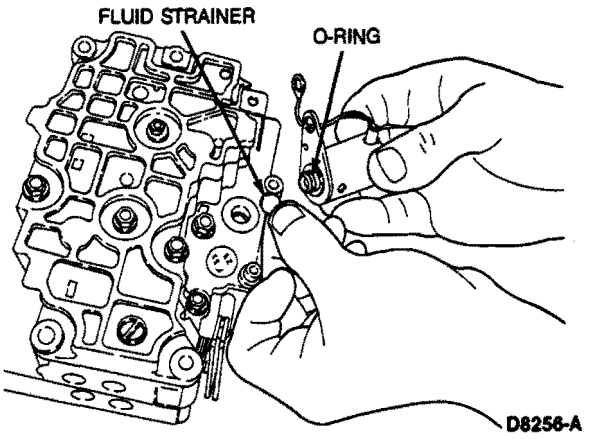


NOTE: Prior to performing Steps 3 and 4, note wire colors and locations to aid in assembly.

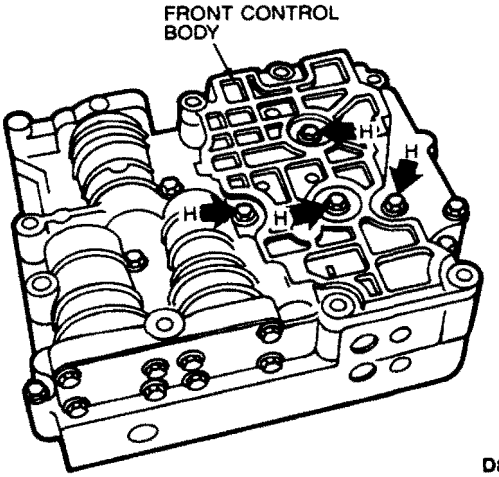
3. Remove the 1-2 solenoid valve.
4. Remove the 2-3 solenoid valve.
5. Remove the brackets and wire harness.



6. Remove the fluid strainers.
7. Remove the O-rings.

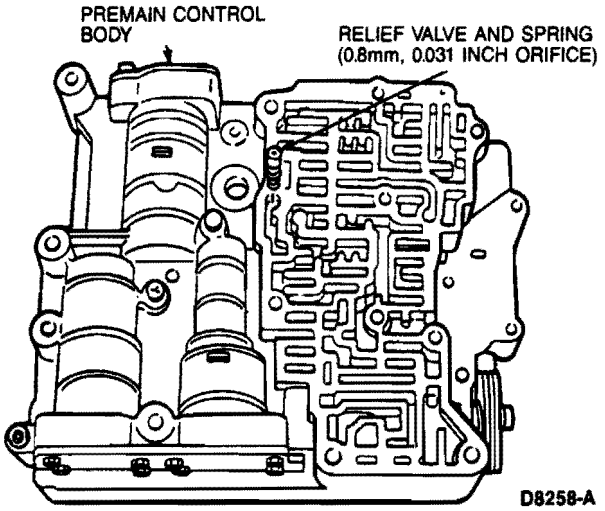


8. Remove the front control body bolts.
9. Remove the front control body with the premain separator as a unit.

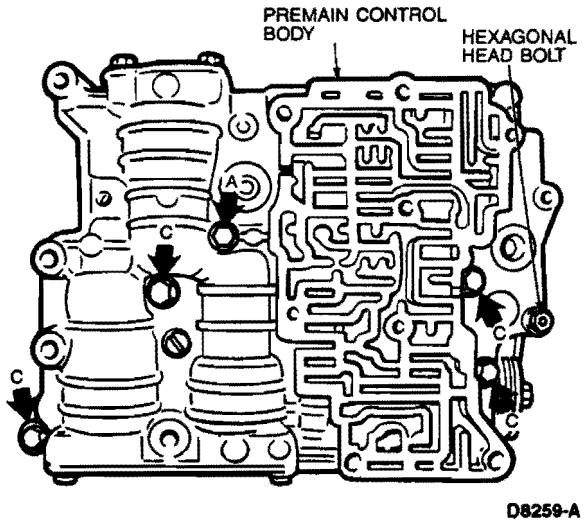


DISASSEMBLY AND ASSEMBLY (Continued)

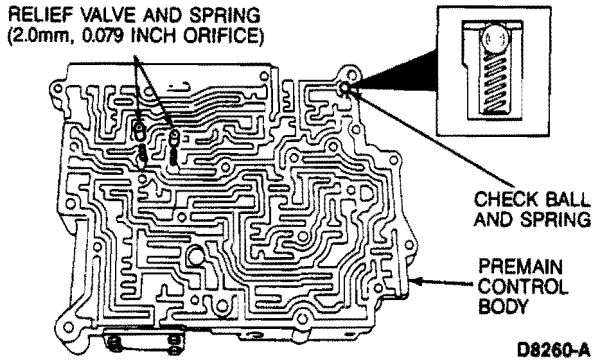
10. Remove the premain separator and front gasket from the front control body.
11. Remove the relief valve (0.8mm, 0.031 inch orifice) and spring from the premain control body.



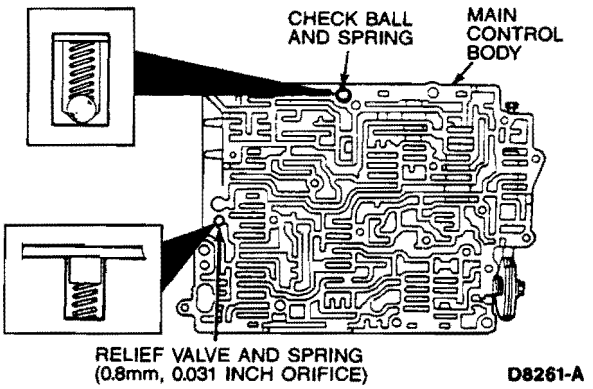
12. Remove the premain control body bolts, including the hexagonal head bolt.
13. Remove the premain control body and main separator as a unit.



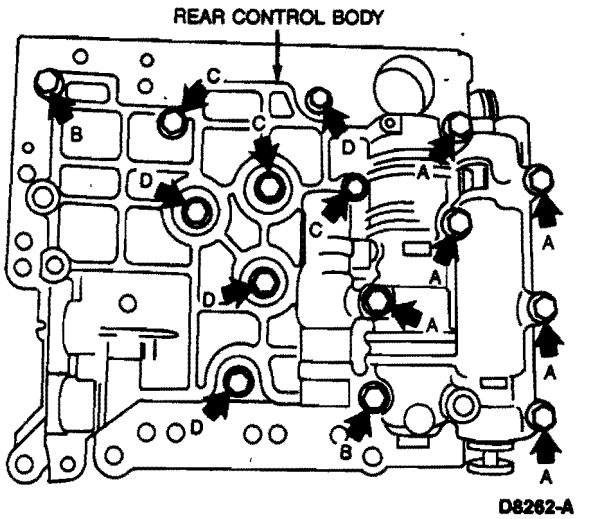
14. Remove the premain rear gasket, main front gasket, and main separator from the premain control body.
15. Remove the relief valves (2.0mm, 0.079 inch orifice) and springs from the premain control body.
16. Remove the check ball and spring from the premain control body.



17. Remove the relief valve (0.8mm, 0.031 inch orifice) and spring from the main control body.
18. Remove the check ball and spring from the main control body.



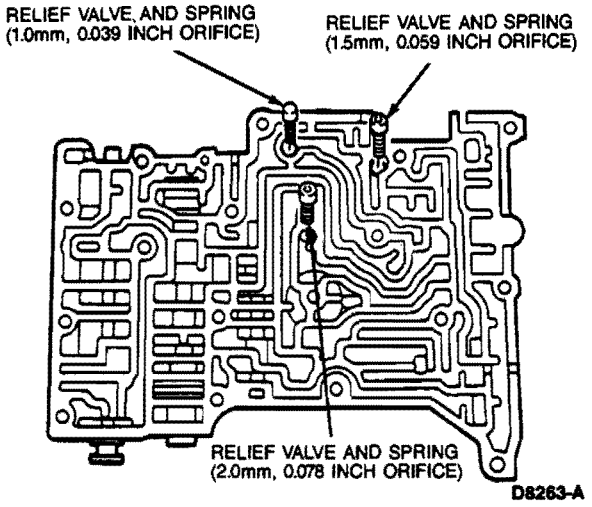
19. Turn the assembly over and remove rear control body bolts.
20. Remove the rear control body and rear separator as a unit.



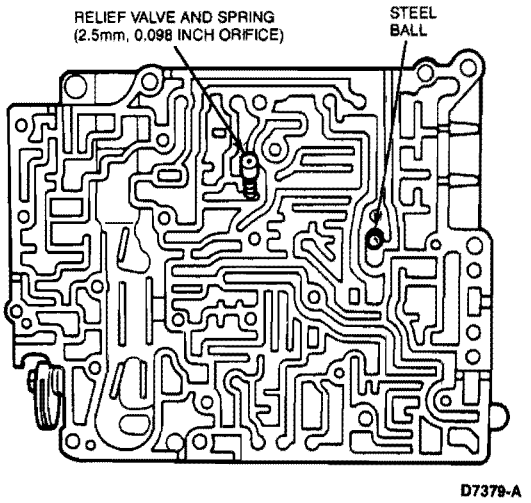
21. Remove the main rear gasket, rear gasket, and rear separator from the rear control body.

DISASSEMBLY AND ASSEMBLY (Continued)

22. Remove the relief valves (1.0mm, 0.039 inch; 1.5mm, 0.059 inch; 2.0mm, 0.078 inch orifice) and springs from the rear control body.



23. Remove the relief valve (2.5mm, 0.098 inch orifice) and spring from the main control body.
24. Remove the steel ball from the main control body.

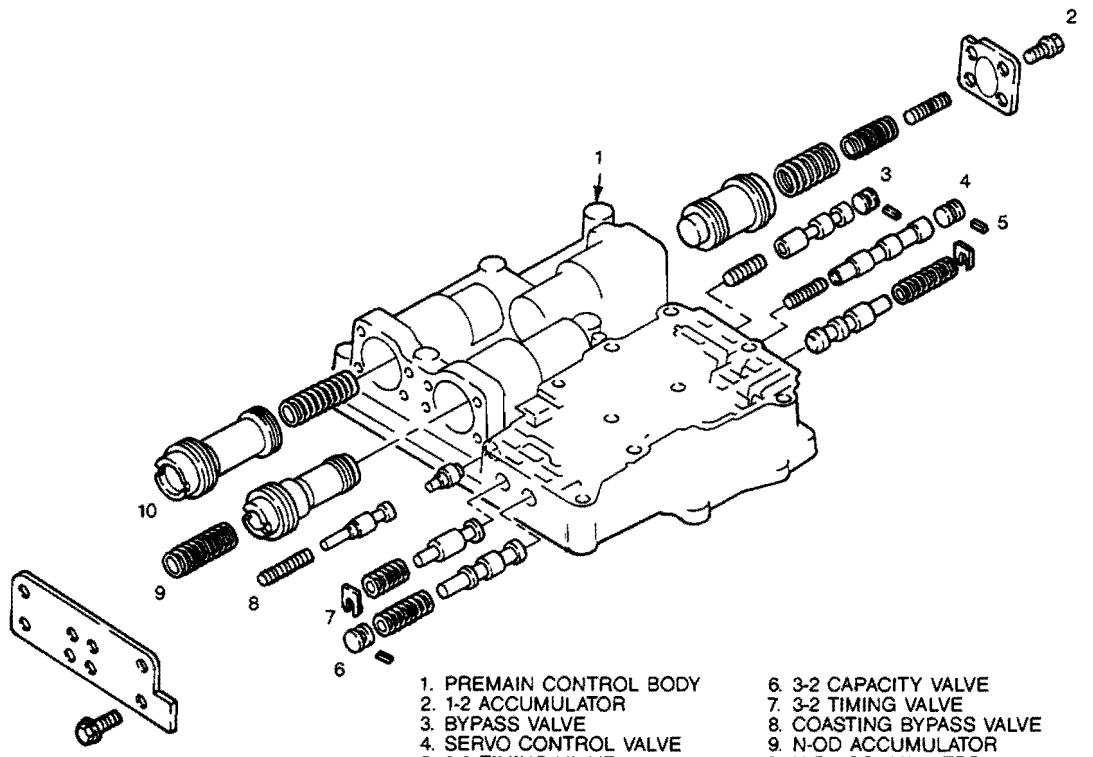


Premain Control Body

NOTE: The individual valves and springs are removed by removing the retaining clips and bore plugs. Refer to the following illustrations for valve and spring locations. Clean the valves, springs and valve body as necessary.

CAUTION: Some valves are aluminum and cannot be removed using a magnet. Remove these valves by tapping the valve body on the palm of the hand to slide the valve out of the bore. It may be necessary to remove the valves and springs using a pick. If so, use extreme caution to prevent damaging valves or valve bores.

DISASSEMBLY AND ASSEMBLY (Continued)

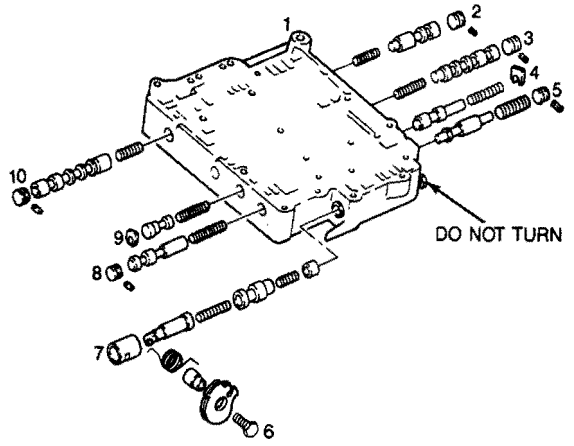


1. PREMAIN CONTROL BODY
2. 1-2 ACCUMULATOR
3. BYPASS VALVE
4. SERVO CONTROL VALVE
5. 2-3 TIMING VALVE
6. 3-2 CAPACITY VALVE
7. 3-2 TIMING VALVE
8. COASTING BYPASS VALVE
9. N-OD ACCUMULATOR
10. N-R ACCUMULATOR

D8265-B

Main Control Body

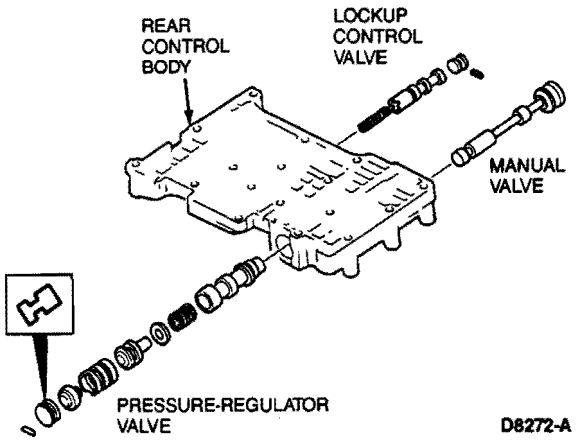
CAUTION: Do not turn the throttle valve adjusting screw.



1. MAIN CONTROL BODY
2. 2-3 SHIFT VALVE
3. 1-2 SHIFT VALVE
4. LOW REDUCING VALVE
5. PRESSURE-MODIFIER VALVE
6. THROTTLE CAM ASSEMBLY
7. THROTTLE VALVE ASSEMBLY
8. THROTTLE-MODULATOR VALVE
9. THROTTLE BACKUP VALVE
10. 3-4 SHIFT VALVE

D8266-A

Rear Control Body



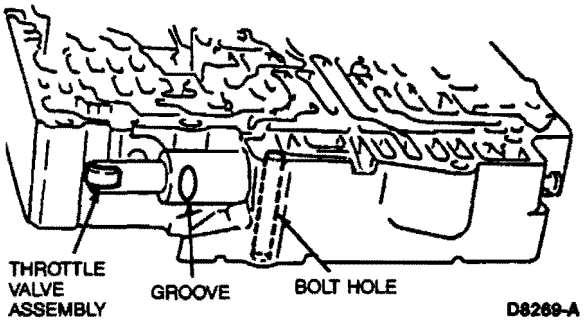
D8272-A

DISASSEMBLY AND ASSEMBLY (Continued)

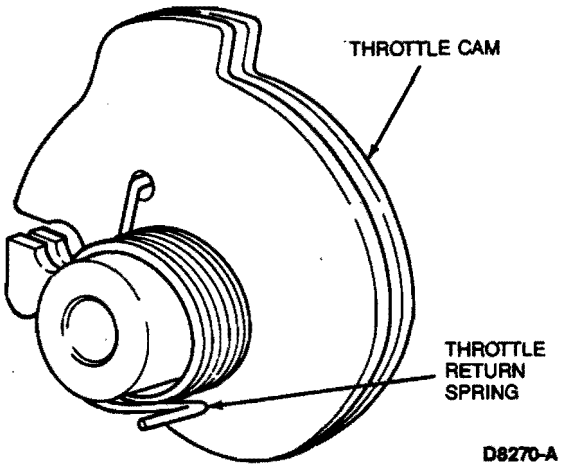
Assembly

Main Control Body

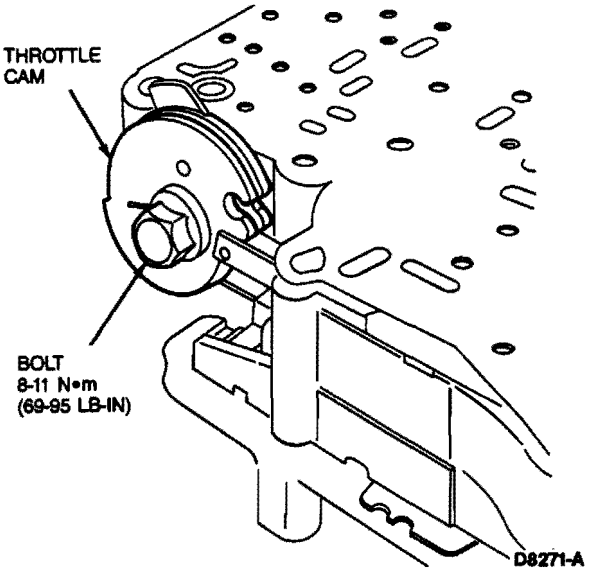
CAUTION: When installing the throttle valve assembly, make sure that the groove is aligned with the bolt hole.



1. Install the throttle return spring on the throttle cam as shown.

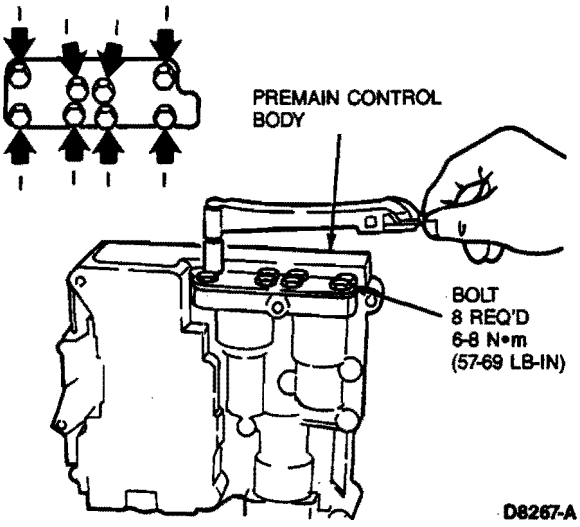


2. Tighten the throttle cam bolt to 8-11 N·m (69-95 lb-in).



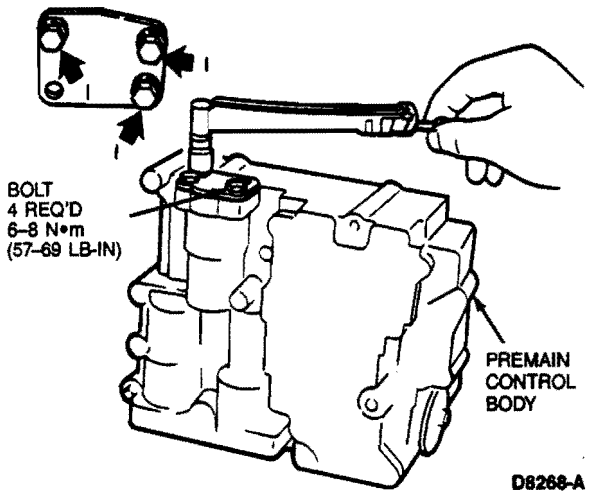
Premain Control Body

1. Tighten the N-R / N-OD accumulator plate to 6-8 N·m (57-69 lb-in)



DISASSEMBLY AND ASSEMBLY (Continued)

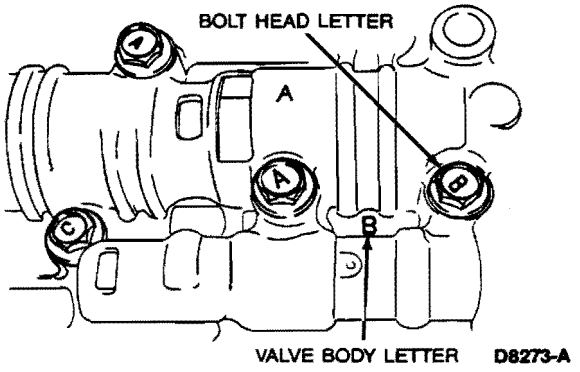
2. Tighten the 1-2 accumulator plate to 6-8 N·m (57-69 lb-in). Do not install the bolt which holds the harness bracket.



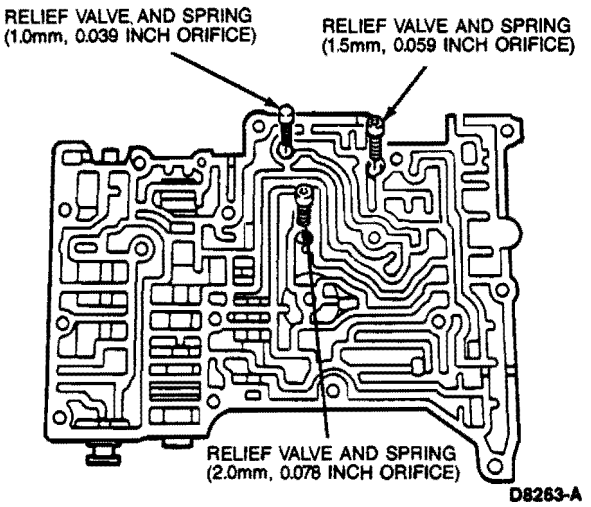
Valve Body

NOTE: Do not mix up the gaskets during assembly.

NOTE: Match the bolt head letter with the corresponding letter on the valve body.

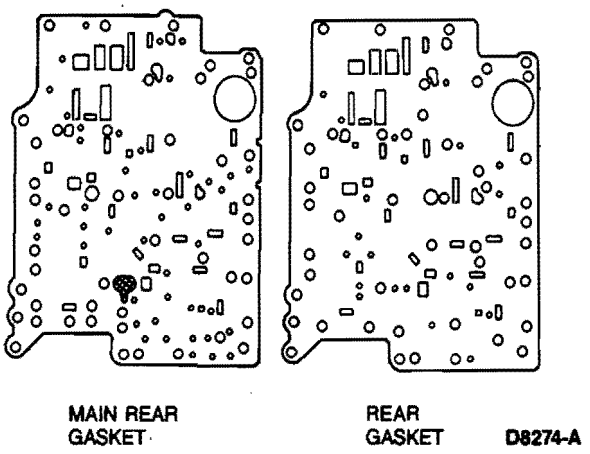


1. Install the relief valves (1.0mm, 0.039 inch; 1.5mm, 0.059 inch; 2.0mm, 0.078 inch orifice) and springs in the rear control body.



2. Install the gaskets on both sides of the rear separator, then install it onto the rear control body.

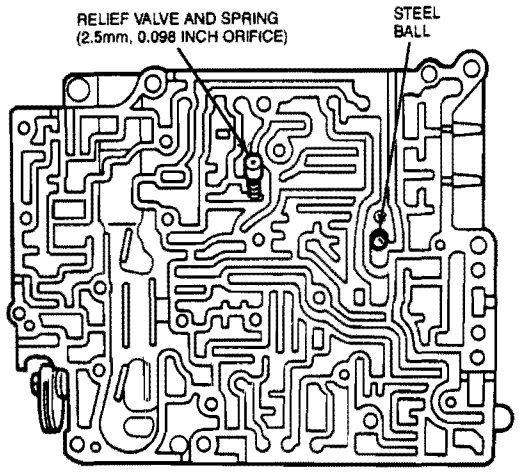
   NOTE: The rear gasket and main rear gasket are not interchangeable.



3. Install the relief valve (2.5mm, 0.098 inch orifice) and spring in the main control body.

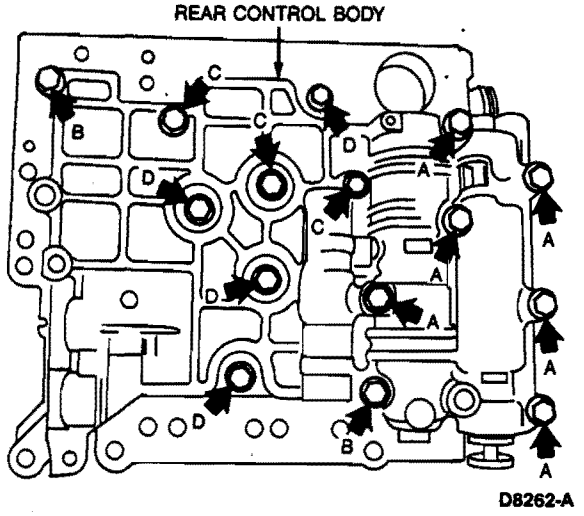
DISASSEMBLY AND ASSEMBLY (Continued)

4. Install the steel ball in the main control body.

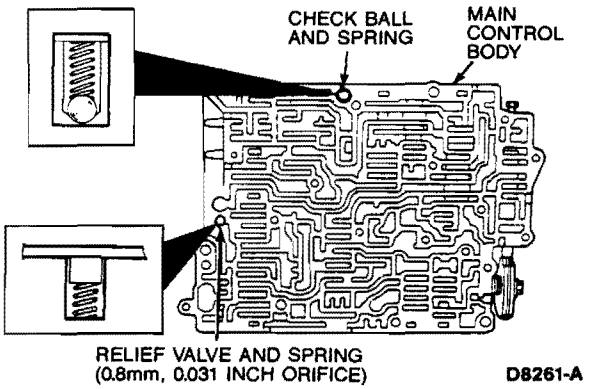


5. Install the rear control body to the main control body.
6. Loosely tighten the rear control body bolts.

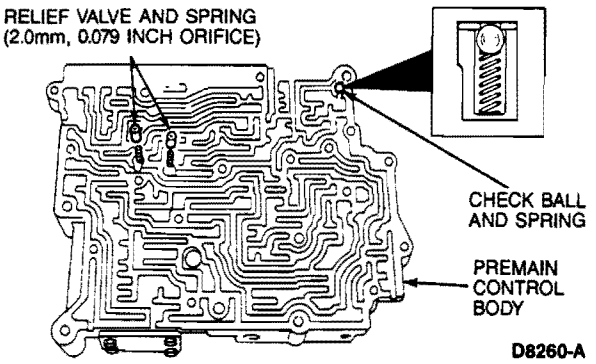
   NOTE: Match the bolt head letter with the letter on the valve body.



7. Turn the assembly over and install the relief valve (0.8mm, 0.031 inch orifice) and spring in the main control body.
8. Install the check ball and spring in the main control body, as shown.

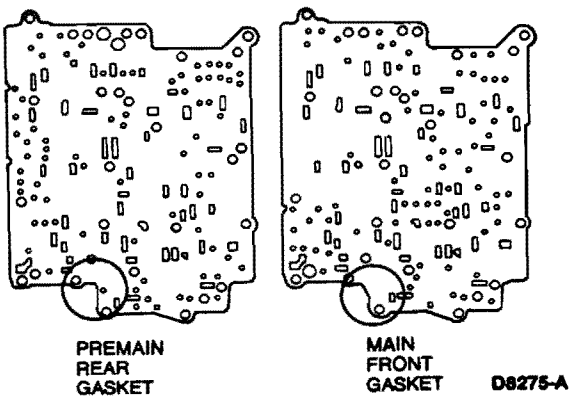


9. Install the relief valves (2.0mm, 0.079 inch orifice) and springs into the premain control body.
10. Install check ball and spring in the premain control body, as shown.



11. Install the gaskets on both sides of the main separator, then install it onto the premain control body.

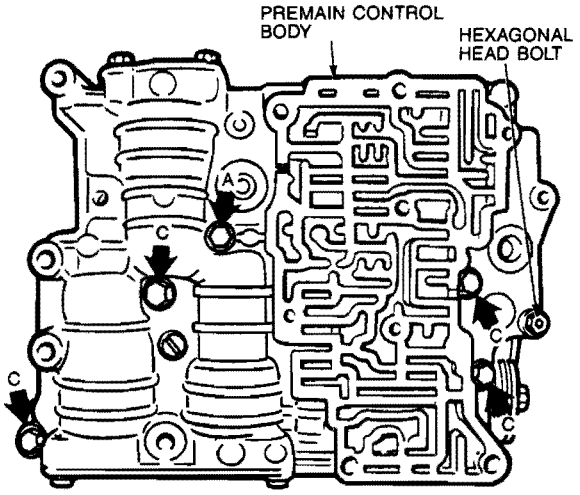
    NOTE: The premain rear gasket and main front gasket are not interchangeable.



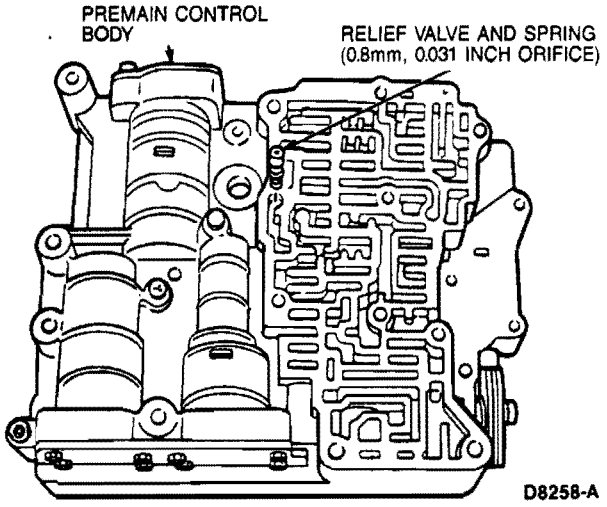
12. Set the premain control body onto the main control body.
13. Loosely tighten the premain control body bolts, including the hexagonal head bolt.

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Match the bolt head letter with the letter on the valve body.

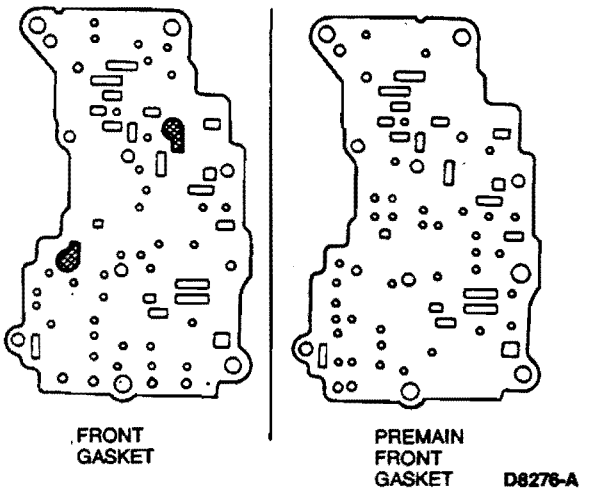


14. Install the relief valve (0.8mm, 0.031 inch orifice) and spring into the premain control body.



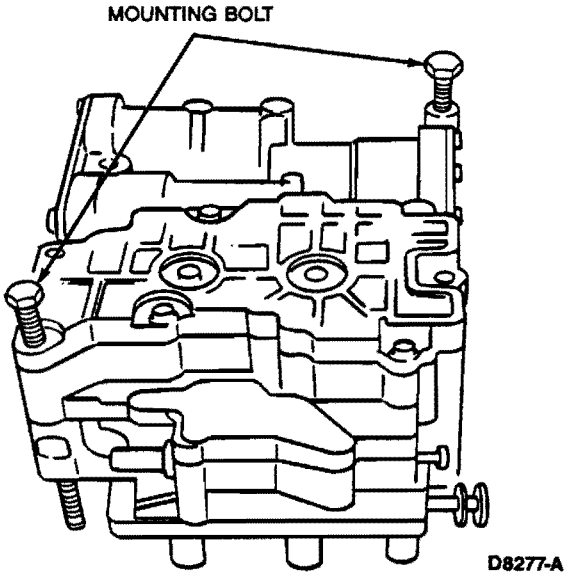
15. Install the gaskets on both sides of the premain separator, then install it onto the front control body.

    NOTE: The front gasket and premain front gasket are not interchangeable.



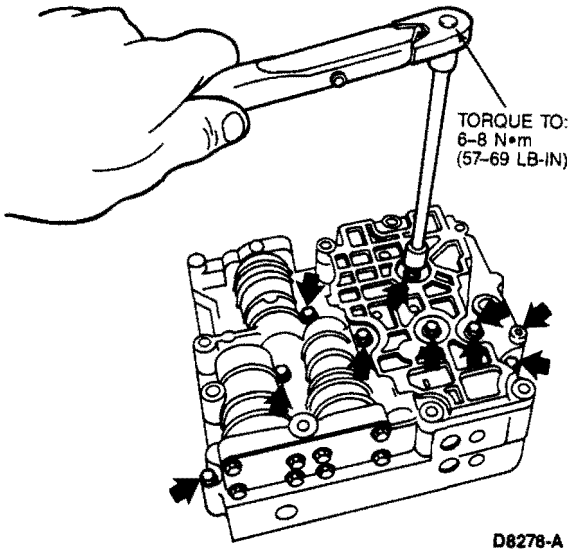
16. Install the front control body on the premain control body.
17. Loosely tighten the front control body bolts.

    NOTE: Match the bolt head letter with the letter on the valve body.
18. Install two valve body mounting bolts for alignment, as shown.

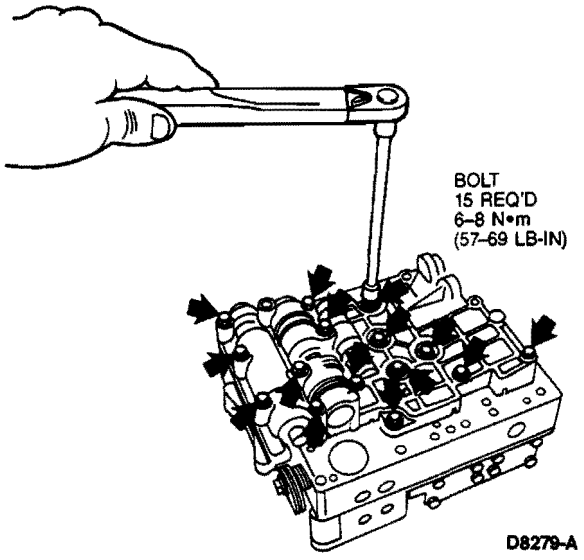


DISASSEMBLY AND ASSEMBLY (Continued)

19. Tighten the bolts on the front face of the valve body to 6-8 N•m (57-69 lb-in).

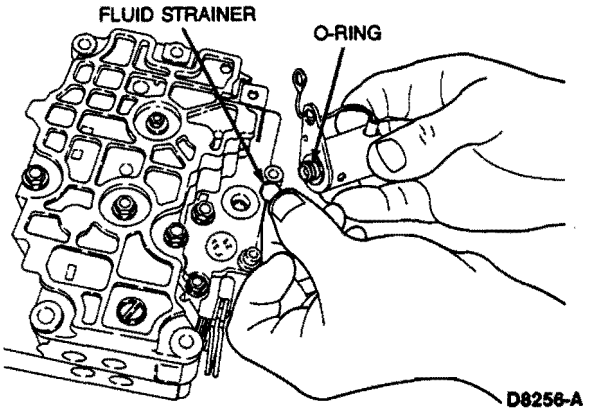


20. Tighten the bolts on the rear face of the valve body to 6-8 N•m (57-69 lb-in).

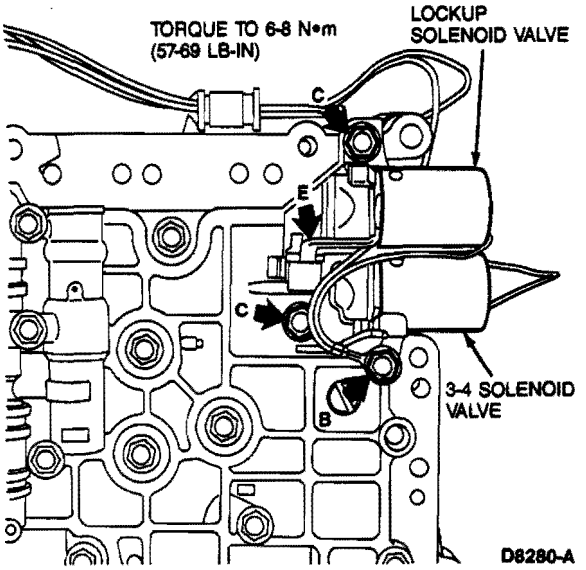


21. Install new fluid strainers.

22. Install new O-rings on the solenoid valves.



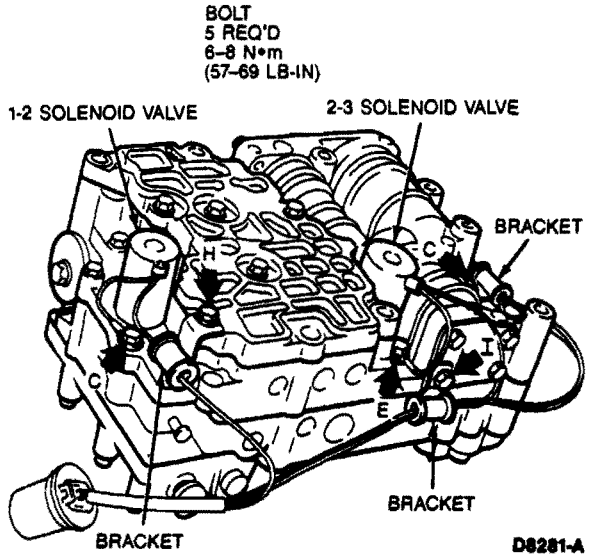
23. Install the 3-4 solenoid valve.
24. Install the lockup solenoid valve.
25. Tighten the solenoid valve bolts to 6-8 N•m (57-69 lb-in).



26. Install the 1-2 solenoid valve.
27. Install the 2-3 solenoid valve.
28. Tighten the solenoid valve bolts to 6-8 N•m (57-69 lb-in).

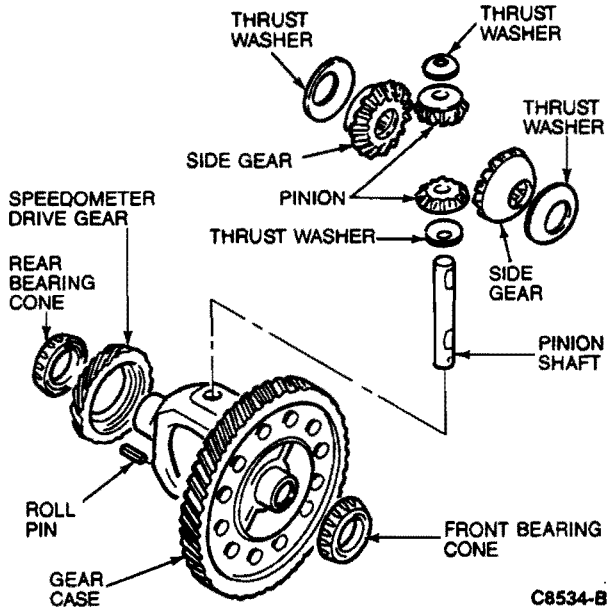
DISASSEMBLY AND ASSEMBLY (Continued)

29. Install the brackets and wire harness in their correct locations as noted in disassembly.

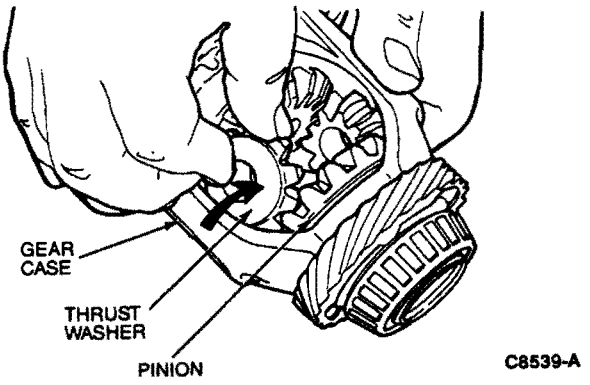


Differential

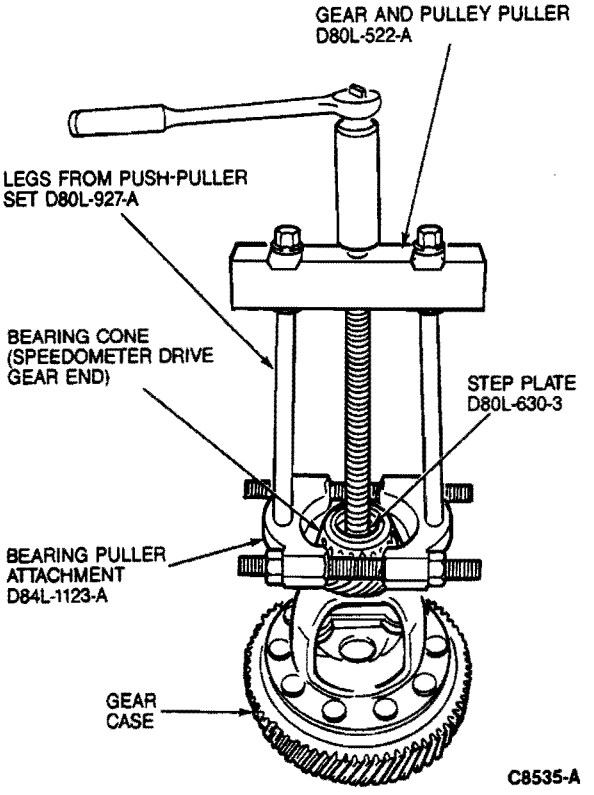
Disassembly



1. Remove the roll pin.
2. Remove the pinion shaft.
3. Remove the pinions and thrust washers by rotating them out of the gear case.



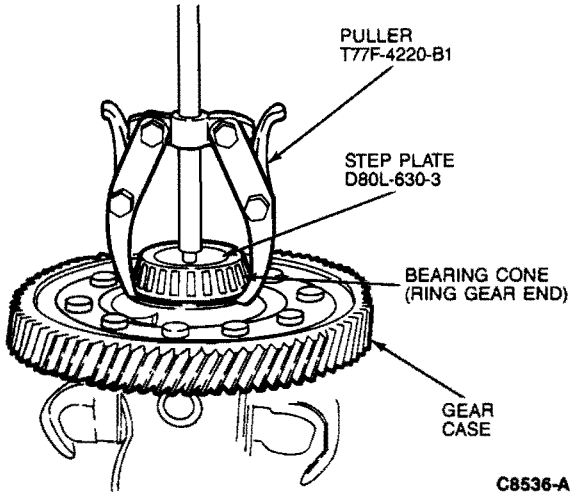
4. Remove the side gears and thrust washers.
5. Remove the bearing cone (speedometer drive gear end) using Gear and Pulley Puller D80L-522-A, Step Plate D80L-630-3, Bearing Puller Attachment D84L-1123-A, and the legs from Push Puller Set D80L-927-A or equivalent.



6. Remove the speedometer drive gear.

DISASSEMBLY AND ASSEMBLY (Continued)

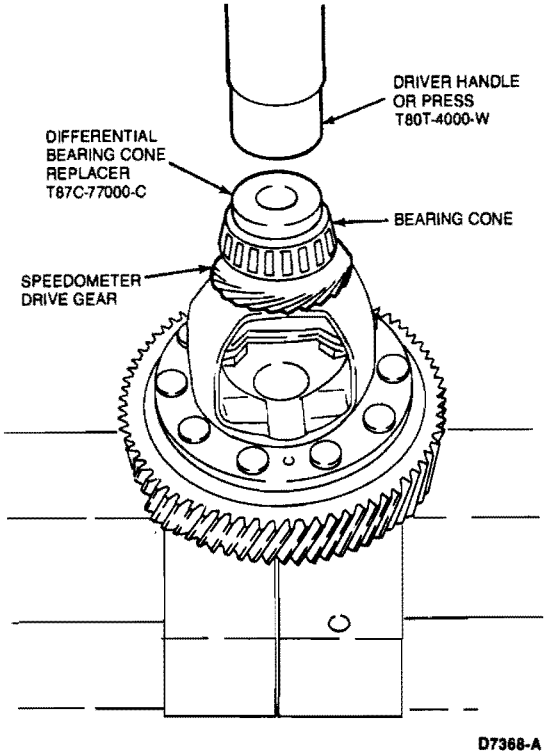
7. Remove the bearing cone (ring gear end) using Puller T77F-4220-B1 and Step Plate D80L-630-3 or equivalent.



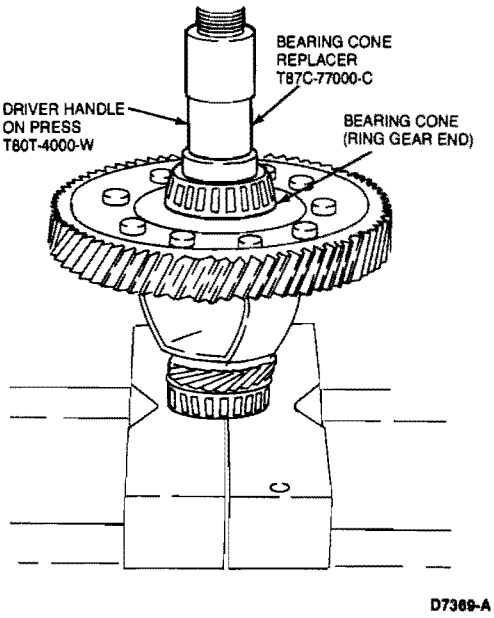
Assembly

NOTE: Whenever a bearing cone is removed, it must be replaced.

1. Install the speedometer drive gear and bearing cone using either Driver Handle T80T-4000-W or a press, and Differential Bearing Cone Replacer T87C-77000-C or equivalent.



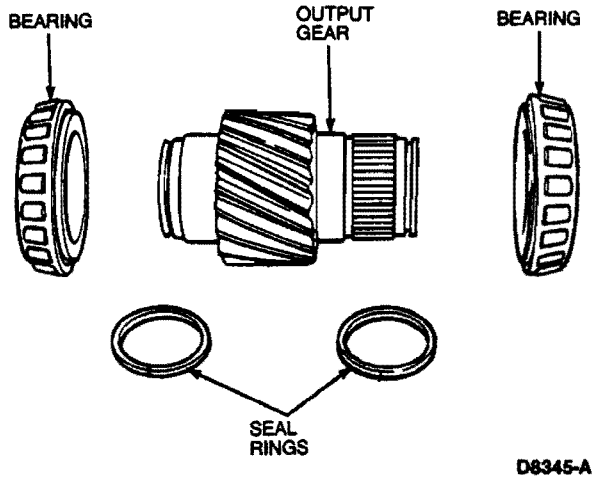
2. Install the bearing cone (ring gear end) using either Driver Handle T80T-4000-W or a press, and Bearing Cone Replacer T87C-77000-C or equivalent.



3. Install the thrust washers and pinions.
4. Install the pinion shaft.
5. Install the knock pin, then crimp it so that it cannot come out of the gear case.
6. Install the thrust washers and side gears.

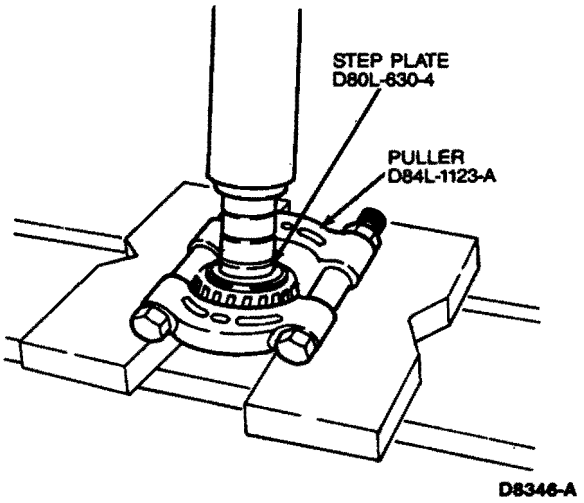
Output Gear

Disassembly



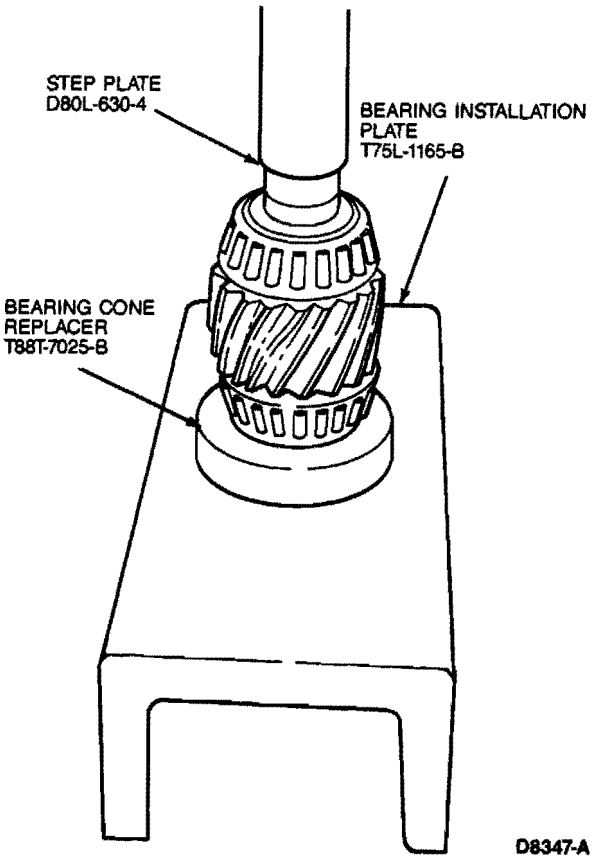
DISASSEMBLY AND ASSEMBLY (Continued)

1. Remove the seal rings.
2. Press off the output gear bearings using Step Plate D80L-630-4 and Puller D84L-1123-A or equivalent.



Assembly

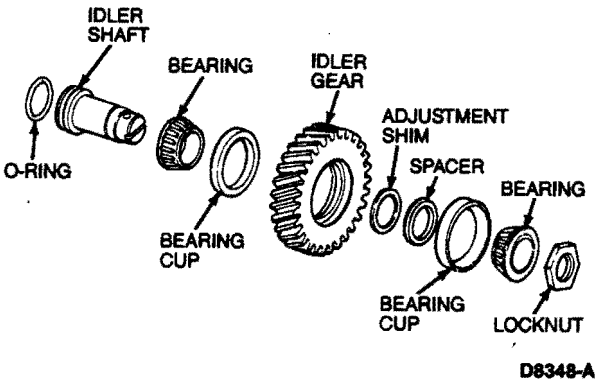
1. Press on the output gear bearings using Step Plate D80L-630-4, Bearing Cone Replacer T88T-7025-B and Bearing Installation Plate T75L-1165-B or equivalent.



2. Install the seal rings.

Idler Gear

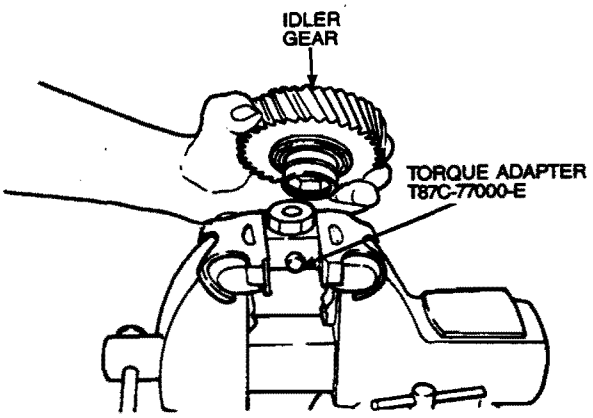
Disassembly



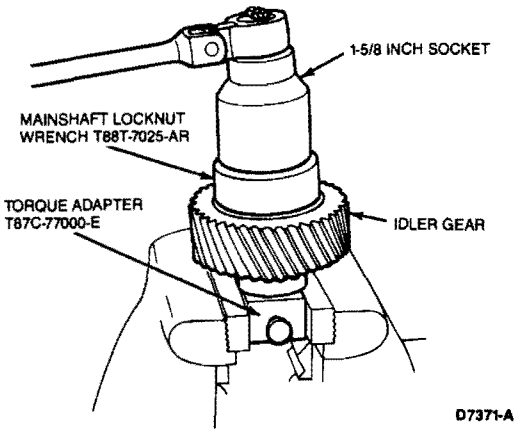
1. Secure the idler shaft in a vise using Torque Adapter T87C-77000-E.

DISASSEMBLY AND ASSEMBLY (Continued)

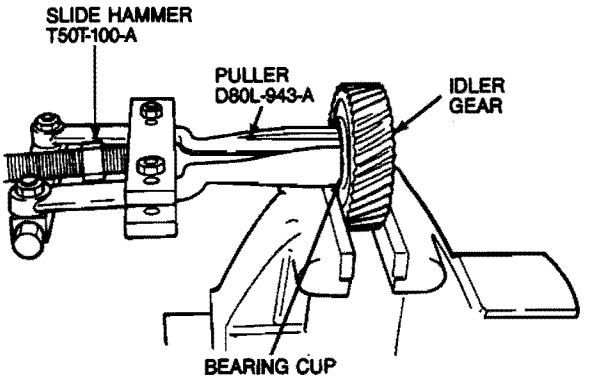
CAUTION: Use protective plates to prevent damage to the special tool.



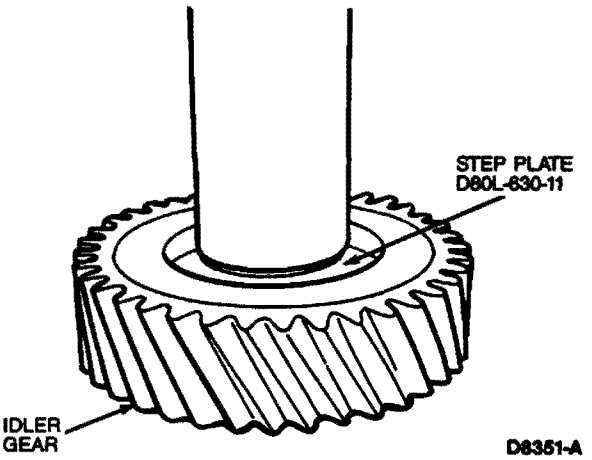
2. Remove the locknut using Mainshaft Locknut Wrench T88T-7025-AR or equivalent along with a 1-5/8 inch socket.



3. Remove the bearing.
4. Remove the spacer.
5. Remove the idler gear from the idler shaft.
6. Remove the adjustment shim.
7. Remove the other bearing.
8. Remove one bearing cup from the idler gear using Puller D80L-943-A and Slide Hammer T50T-100-A or equivalent.

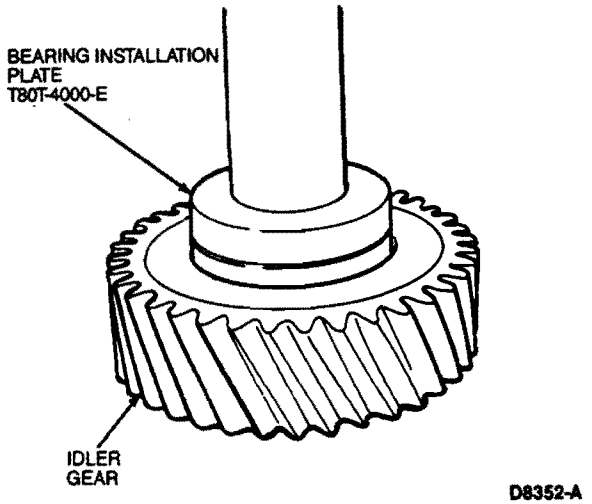


9. Press out the other bearing cup using Step Plate D80L-630-11 or equivalent.



Assembly

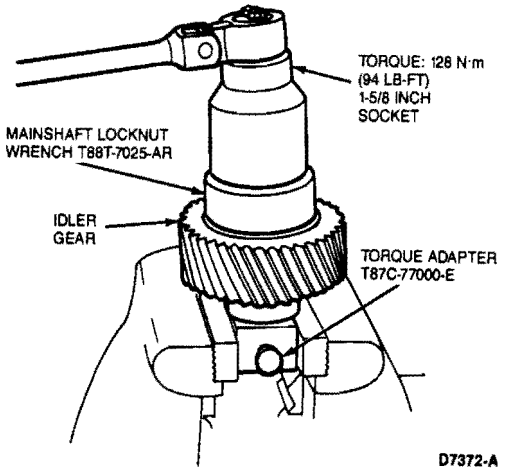
1. Press the bearing cups into the idler gear using Bearing Installation Plate T80T-4000-E or equivalent.



DISASSEMBLY AND ASSEMBLY (Continued)

2. Install the bearing onto the idler shaft.
3. Install the adjust shim.
4. Install the spacer.
5. Install the idler gear.
6. Install the other idler gear bearing.
7. Secure the idler shaft in a vise using Torque Adapter T87C-77000-E or equivalent.

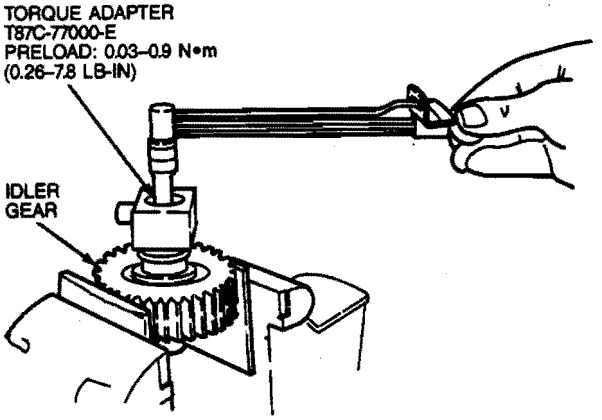
   CAUTION: Use protective plates to prevent damage to the special tool.
8. Tighten the locknut to 128 N·m (94 lb-ft) using Mainshaft Locknut Wrench T88T-7025-AR or equivalent along with a 1-5/8 inch socket.



9. Turn the idler gear and adapter over and secure the gear in a vise.

   CAUTION: Use protective plates to prevent damage to the idler gear.
10. Attach a pound-inch torque wrench, and measure the preload while tightening the locknut to 128-177 N·m (94-130 lb-ft). The preload should be 0.03-0.9 N·m (0.26-7.8 lb-in).

    NOTE: Read the preload when the idler shaft starts to turn.



11. If the specified preload is not reached within the specified tightening torque, select an appropriate adjustment shim(s) from the chart.

    NOTE: The preload can be reduced by increasing the thickness of the shims, or increased by reducing the thickness of the shims. Do not use more than seven shims.

Part Number	Shim Thickness
E92Z-7N112-F	0.10mm (0.004 inch)
E92Z-7N112-A	0.12mm (0.005 inch)
E92Z-7N112-B	0.14mm (0.006 inch)
E92Z-7N112-C	0.16mm (0.0063 inch)
E92Z-7N112-G	0.18mm (0.007 inch)
E92Z-7N112-D	0.20mm (0.008 inch)
E92Z-7N112-E	0.50mm (0.020 inch)

CD8372-B

Bearing Housing

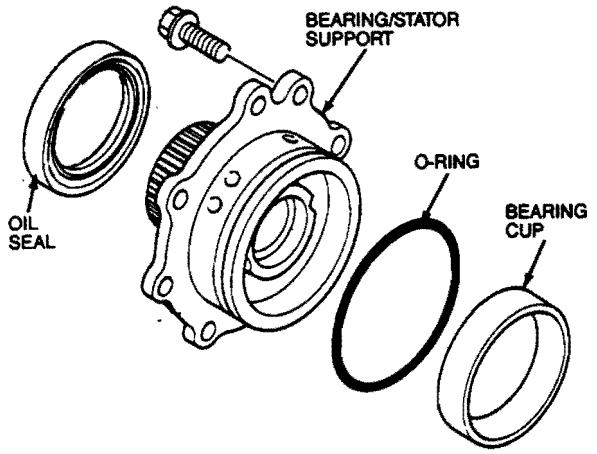
Disassembly and Assembly

Remove and install the bearing cup and adjustment shim(s) during the Bearing Preload and Shim Selection procedure outlined earlier in this Section.

DISASSEMBLY AND ASSEMBLY (Continued)

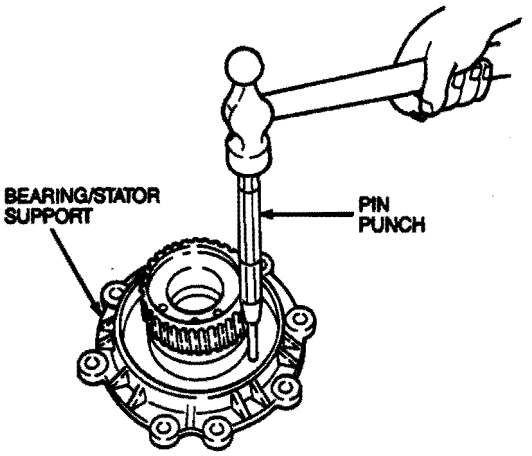
Bearing/Stator Support

Disassembly



D8355-A

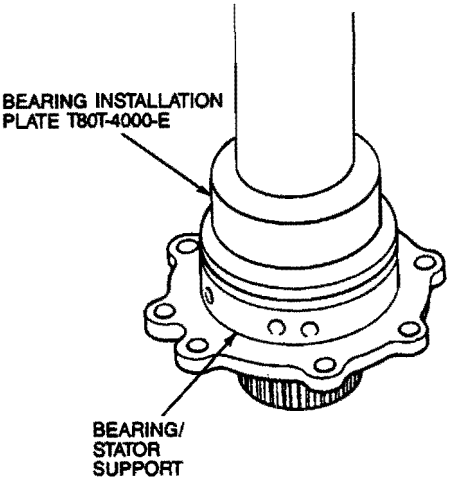
1. Remove the bearing cup with a pin punch.
2. Remove the O-ring.



D8356-A

Assembly

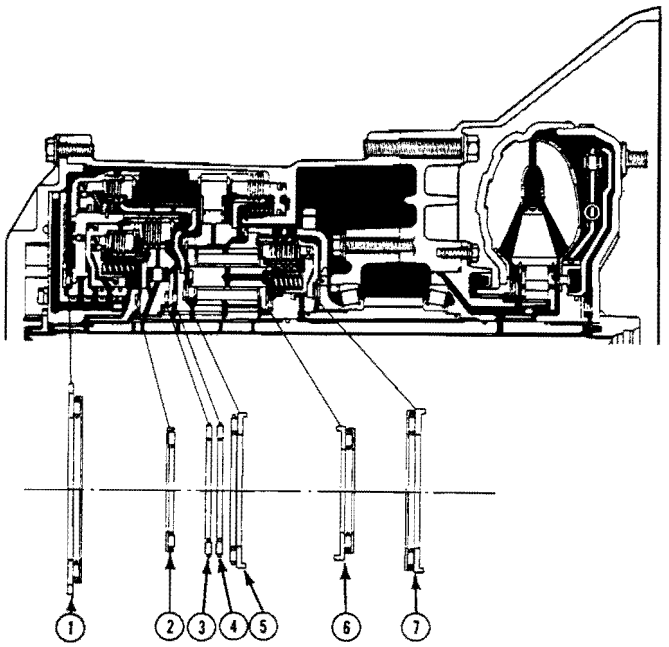
1. Install the O-ring.
2. Press the bearing cup into the cover using Bearing Installation Plate T80T-4000-E.



D8358-A

DISASSEMBLY AND ASSEMBLY (Continued)

Bearing Locator

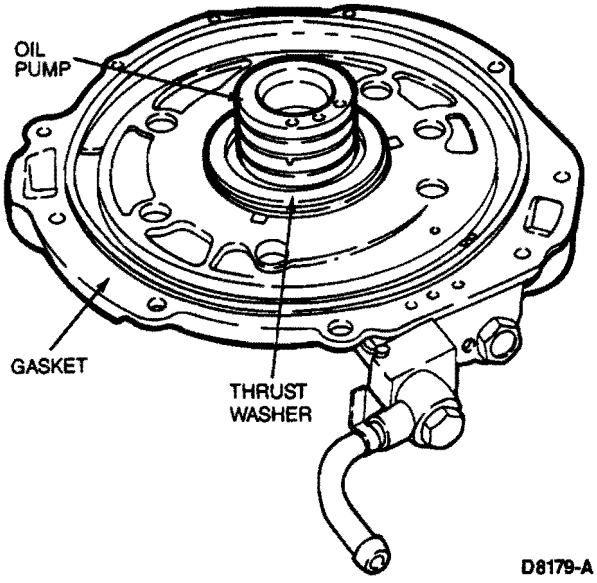


OUTER DIAMETER mm (in)

	1	2	3	4	5	6	7
NEEDLE BEARING	86.0 (3.39)	56.1 (2.21)	62.1 (2.44)	62.1 (2.44)	72.0 (2.83)	56.1 (2.21)	72.1 (2.84)
THRUST WASHER	88.0 (3.46)	—	—	—	72.0 (2.83)	57.0 (2.24)	72.0 (2.83)

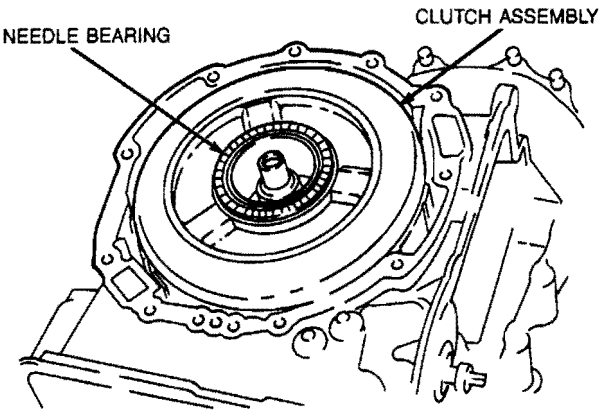
D8362-A

Thrust Washer No. 1



D8179-A

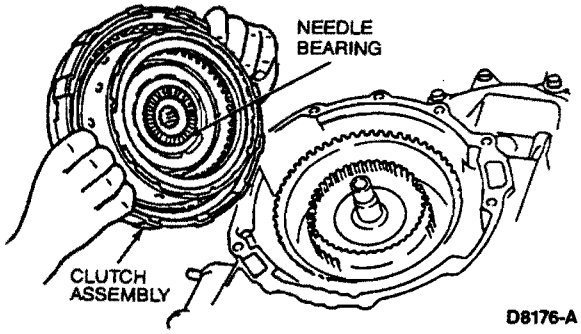
Needle Bearing No. 1



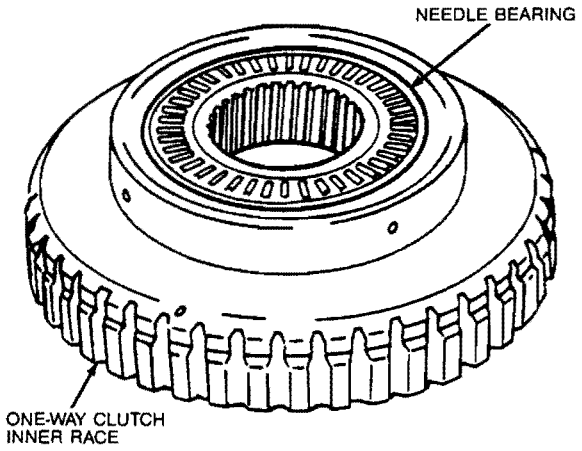
D8359-A

DISASSEMBLY AND ASSEMBLY (Continued)

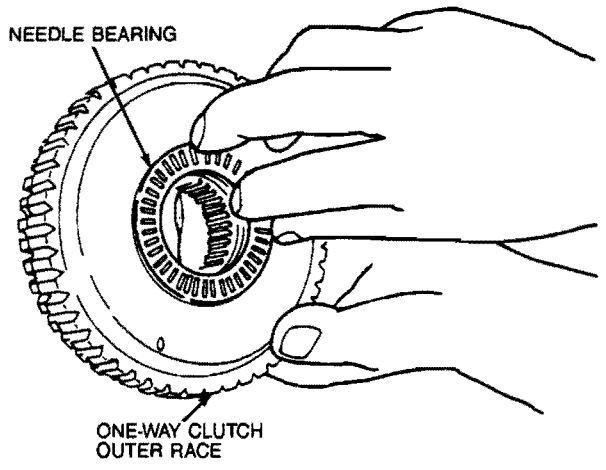
Needle Bearing No. 2



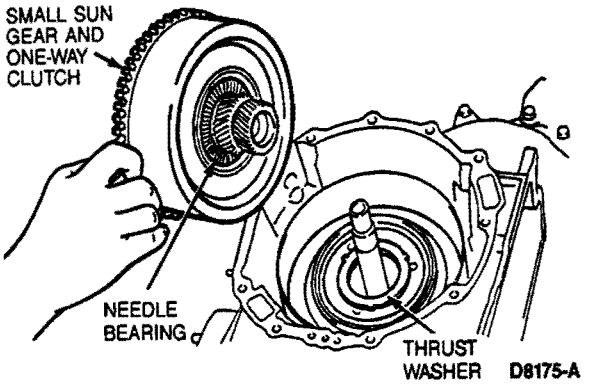
Needle Bearing No. 3



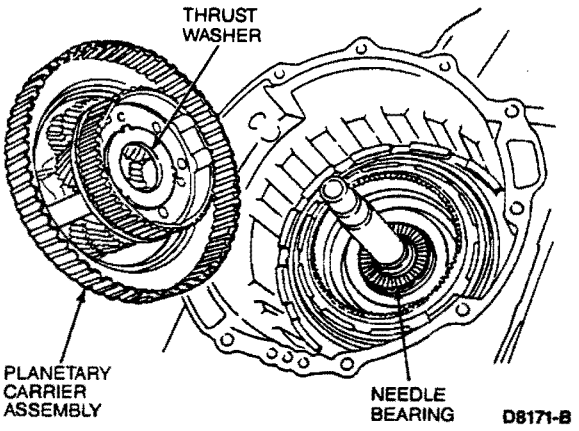
Needle Bearing No. 4



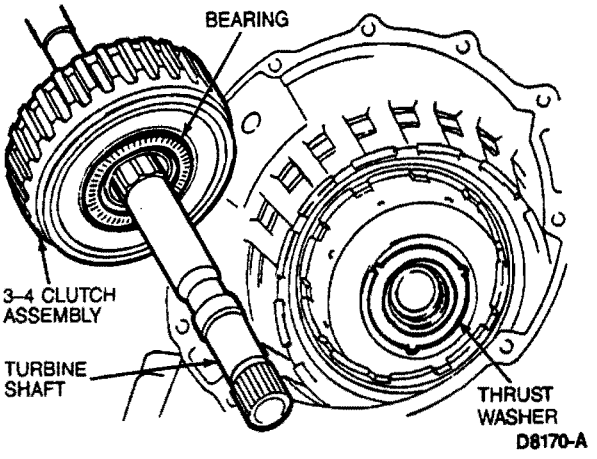
Needle Bearing and Thrust Washer No. 5



Needle Bearing and Thrust Washer No. 6



Needle Bearing and Thrust Washer No. 7



CLEANING AND INSPECTION

Transaxle

Clean the components with a suitable solvent and use compressed air to dry all parts and clean fluid passages.

CLEANING AND INSPECTION (Continued)

CAUTION: The composition clutch plates, valve body gaskets, bands, and synthetic seals should not be cleaned in a vapor degreaser or with any type of detergent solution. To clean these parts wipe them off with a lint-free cloth. New clutch plates or bands should be soaked in the specified transaxle fluid for two hours before being assembled.

Valve Body

1. Clean all parts thoroughly in clean solvent and blow dry with compressed air.
2. Inspect all valve and plug bores for scores. Check all fluid passages for obstructions. Inspect all mating surfaces for burrs and scores. If needed, use crocus cloth to polish valve and plugs. Avoid rounding the sharp edges of the valves and plugs with the crocus cloth.
3. Inspect all springs for distortion. Check all valves and plugs for free movement in their respective bores. Valves and plugs, when dry, must fall from their own weight into their respective bores.
4. Roll the manual valve on a flat surface to check for a bent condition. Replace, if necessary.

Needle Bearings

Wash the needle bearings thoroughly in cleaning solvent. Blow the bearings dry with compressed air. Lubricate with the specified transaxle fluid. Replace any bearings which show signs of pitting or roughness.

Torque Converter

The torque converter is welded together and cannot be disassembled.

1. Check the torque converter for damage or cracks and replace, if necessary.
2. Remove any rust from the pilot hub and boss of the converter.
3. Measure the inner diameter of the boss bushing. If it exceeds 53.076mm (2.090 inches), replace the torque converter.

When internal wear or damage has occurred in the transaxle, contaminants such as metal particles, clutch plate material, or band material may have been carried into the converter and oil cooler. These contaminants can be a major cause of recurring transaxle troubles and must be removed from the system before the transaxle is put back into service.

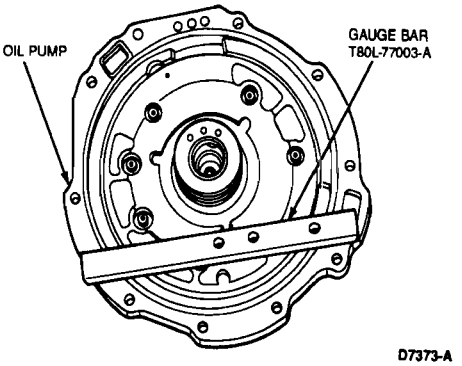
Whenever the transaxle has been disassembled to replace worn or damaged parts or because the valve body sticks due to foreign material, the torque converter, oil and oil cooler lines must be cleaned and flushed using Rotunda Torque Converter Cleaner 014-00028 or equivalent. Under no circumstances should an attempt be made to clean converters by hand.

The lack of a drain plug in the 4EAT converter increases the amount of residual flushing solvent retained in the converter after cleaning. This retained solvent is not acceptable, and a method of diluting is required. The following procedure is to be used after removal of the 4EAT torque converter from the cleaning equipment.

1. **Thoroughly drain** the remaining solvent through the hub.
2. Add 0.5L (0.53 quarts) of clean transaxle fluid into the converter. Agitate by hand.
3. **Thoroughly drain the solution through the converter hub.**

Oil Pump

1. Check the oil pump for a broken or worn seal ring, weakened springs and damaged or worn sliding surfaces. Replace as required.
2. Measure the following clearances using Gauge Bar T80L-77003-A or equivalent and a feeler gauge. If the clearances are not within specification, replace the oil pump.



Seal Pin—Oil Pump Cover

Standard Clearance: 0.005-0.020mm (0.0002-0.0008 inch).

Maximum Allowable Clearance: 0.060mm (0.002 inch).

Rotor—Oil Pump Cover

Standard Clearance: 0.005-0.020mm (0.0002-0.0008 inch).

CLEANING AND INSPECTION (Continued)

Maximum Allowable Clearance: 0.060mm (0.002 inch).

Cam Ring—Oil Pump Cover

Standard Clearance: 0.005-0.020mm (0.0002-0.0008 inch).

Maximum Allowable Clearance: 0.060mm (0.002 inch).

Vane—Oil Pump Cover

Standard Clearance: 0.015-0.050mm (0.0006-0.0020 inch).

Maximum Allowable Clearance: 0.080mm (0.003 inch).

Vane—Rotor Groove

Standard Clearance: 0.010-0.045mm (0.0004-0.0018 inch).

Maximum Allowable Clearance: 0.065mm (0.0026 inch).

3. Check each of the following parts for wear. If the wear limit is exceeded, replace the oil pump.

Sleeve—Oil Pump Body

Standard Outer Diameter: 28.00mm (1.102 inch).

Rotor Bushing

Standard Inner Diameter: 28.00mm (1.102 inch).

Maximum Allowable Inner Diameter: 28.05mm (1.104 inch).

Guide Ring

Standard Outer Diameter: 57.85mm (0.278 inch).

Minimum Allowable Outer Diameter: 57.70mm (0.272 inch).

Valve

Standard Outer Diameter: 12.00mm (0.472 inch).

Minimum Allowable Outer Diameter: 11.86mm (0.467 inch).

Seal Pin

Standard Outer Diameter: 6.00mm (0.236 inch).

Minimum Allowable Outer Diameter: 11.86mm (0.232 inch).

2-3 Accumulator

1. Check for a damaged or worn piston or stopper plug.
2. Check for a broken or worn spring. The spring free length for naturally aspirated vehicles should be 83.3mm (3.280 inches). The spring free length for turbo charged vehicles should be 75.4mm (2.968 inches).

Low and Reverse Clutch

1. Check for damaged or worn drive and driven plates. The minimum allowable drive plate thickness is 1.4mm (0.055 inch).
2. Check for a broken or worn piston or snap ring.
3. Check for a broken or weakened spring. The free length of each spring should be 20.5mm (0.807 inch). Replace as required.

Clutch Assembly

1. Check the drive and driven plates for damage or wear. The minimum thickness should be 1.4mm (0.055 inch).
2. Check the clutch piston and clutch drum and seal contact areas for damage. Check for broken or weakened springs. The free length of each spring should be 29.8mm (1.173 inch). Replace as required.

Small Sun Gear and One-Way Clutch

Check the sun gear drum, small sun gear, bushing, clutch hub and inner and outer races for damage or wear. Replace as required.

Planetary Carrier Assembly

Check the inner race, thrust washers, and gears for damage or wear. Replace as required.

3-4 Clutch

1. Check the drive and driven plates for damage or wear. The minimum thickness should be 1.4mm (0.055 inch).
2. Check the clutch piston and clutch drum and seal contact areas for damage.
3. Check for broken or worn springs. The free length of each spring should be 33.2mm (1.307 inch). Replace as required.

Differential

1. Check for damaged or worn gears.
2. Check for a cracked or damaged gear case.

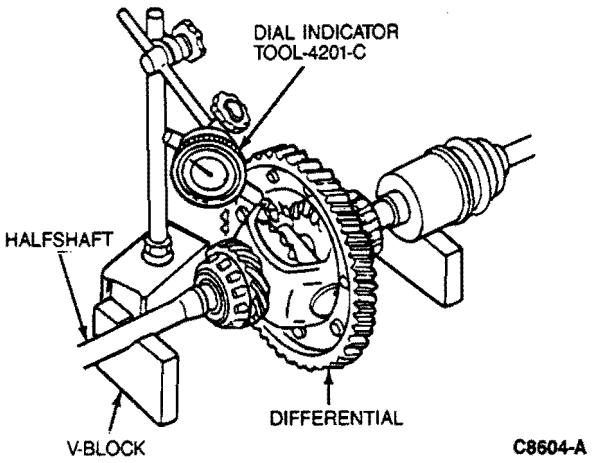
Side Gear and Pinion Backlash Check

1. Install the left and right halfshafts into the differential.
2. Support the halfshafts on V-blocks.

CLEANING AND INSPECTION (Continued)

3. Use Dial Indicator TOOL-4201-C with Magnetic Base / Flex Arm D78P-4201-C or equivalent to measure the backlash of both pinion gears. If the backlash is more than allowable, select a thrust washer with a different thickness.

   Backlash: 0-0.1mm (0-0.004 inch).



Speedometer Driven Gear Assembly

Vehicle Speed Sensor Assembly

1. Worn or damaged teeth or O-ring.
2. Worn or damaged seal.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Torque converter stall torque ratio		1.700 – 1.900:1
Gear ratio	First	2.800:1
	Second	1.540:1
	Third	1.000:1
	Fourth (OD)	0.700:1
	Reverse	2.333:1
Final gear ratio		3.700
Number of drive plates/ driven plates	Forward clutch	3/3
	Coasting clutch	2/2
	3–4 clutch	5/5
	Reverse clutch	2/2
	Low and reverse brake	4/4
Servo diameter (Piston outer dia./retainer inner dia.) mm (in.)		78mm/40mm (3.07 in./1.57 in.)
Transaxle Fluid	Type	Motorcraft MERCON or equivalent
	Capacity liters (U.S. qt., Imp. qt.)	6.8 liters (7.2 U.S. qt., 6.0 Imp. qt.)

CD8363-A

SPECIFICATIONS (Continued)

TORQUE SPECIFICATIONS

Description	Nem	Lb-Ft
Line Pressure Plug	5-10	43-87 (Lb-In)
Bearing Housing	19-26	14-19
Transaxle Case to Converter Housing	37-52	27-38
Valve Body	11-15	95-130 (Lb-In)
Transaxle to Engine	89-117	66-86
Center Transaxle Mount Bolts	36-54	27-40
Center Transaxle Mount Nuts	64-89	47-66
Transaxle to Left Mount	85-117	63-86
Left Mount to Bracket	67-93	49-69
Crossmember Bolts	36-54	27-40
Crossmember Nut	75-93	55-69
Right Transaxle Mount	85-117	63-86
Torque Converter	43-61	32-45
Converter Cover	8-11	69-95 (Lb-In)
Gusset Plate to Transaxle	37-52	27-38
Range Selector to Transaxle	29-39	22-29
2-3 Accumulator	8-11	69-95 (Lb-In)
Actuator Support	11-14	8-10
Manual Plate	41-55	30-41
Oil Pump	19-26	14-19
Oil Strainer	8-11	69-95 (Lb-In)
Oil Pan	8-11	69-95 (Lb-In)
Throttle Cable Bracket	19-26	14-19
Switch Box	16-24	12-17
Oil Line Plug	31-47	23-35
Pulse Generator	8-11	69-95 (Lb-In)
Fluid Temperature Switch	29-39	22-29
Dipstick Tube	7-10	61-87 (Lb-In)
Neutral Safety Switch	8-11	69-95 (Lb-In)
Throttle Cam	8-11	69-95 (Lb-In)
Drain Plug	39-59	29-43
Oil Cooler Line	16-24	11-17

SPECIAL SERVICE TOOLS

Tool Number	Description
T77F-1217-B	Differential Bearing Replacer
T87C-77000-H	Differential Seal Replacer
T88C-7025-AH	Transaxle Plug Set
T88C-77000-AH	Return Spring Compressor
T88C-77000-BH	Converter Seal Replacer
T88C-77000-C	Shim Selection Set
T88C-77000-DH	Preload Torque Adapter
T88C-77000-GH	Seal Protector
T88C-77000-HH	Seal Protector
T88C-77000-JH	Leak Checker Adapter
T88C-77000-KH	Turbine Shaft Holder
T88C-77000-CH4	Screws
T88C-77000-CH5	Screws
D78P-4201-C	Magnetic Base / Flex Arm
D80L-522-A	Gear and Pulley Puller
D80L-630-3	Step Plate
D80L-630-4	Step Plate
D80L-630-6	Step Plate
D80L-630-10	Step Plate
D80L-630-11	Step Plate
D80L-927-A	Push-Puller Set
T87C-77000-C	Bearing Cone Replacer
T88C-77000-L	Differential Rotator
T88C-7025-AR	Mainshaft Locknut Wrench
D80L-943-A	Puller
D84L-1123-A	Bearing Puller Attachment
D87C-77000-A	Transmission Test Adapters
T87C-77000-J1	Shim Selection Kit
D88L-6000-A	Engine Support Bar
T50T-100-A	Slide Hammer
T57L-500-B	Bench Mounting Fixture
T57L-77820-A	Pressure Gauge
T60K-4616-A	Bearing Cup Installer
T65L-77515-A	Clutch Spring Compressor
T75L-1165-B	Bearing Installation Plate
T77F-1102-A	Bearing Cup Puller
T80L-77003-A	Gauge Bar
T80L-77100-A	Guide Pins
T80T-4000-E	Pinion Bearing Cup Replacer
T80T-4000-W	Driver Handle
T86P-70043-A	Bearing Replacer
T87C-77000-E	Torque Adapter
T88T-7025-A	Socket (55mm)
T88T-7025-B	Bearing Cone Replacer
TOOL-1175-AC	Seal Remover
TOOL-4201-C	Dial Indicator
T77F-4220-B1	Puller
T58L-101-B	Puller

ROTUNDA EQUIPMENT

Model	Description
007-00041	Super STAR II Tester
059-00010	Inductive Dwell-Tach-Volt-Ohmmeter
007-00037	4EAT Tester
055-00101	Tachometer
014-00737	Pressure Tester
014-00456	Fittings
014-00210	Transmission Jack
014-00028	Torque Converter Cleaner