



## GENERAL MOTORS 125C (3T40)

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## INTRODUCTION THM 125C (3T40)

*Updated  
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We wish to thank General Motors Corporation for the information and illustrations that have made this booklet possible. This booklet contains the general description, diagnosis and overhaul procedures necessary to repair, overhaul or service the THM 125C (3T40) transaxle. In addition to this booklet for the assembly and disassembly procedures, the Green "Update Handbook" available from ATSG is also necessary to inform you of the many engineering changes that have occurred over the years.

The THM 125C transaxle represents the addition of a converter clutch to the THM 125 transaxle that was introduced in 1980. The Torque Converter Clutch was added to increase fuel economy by eliminating the fluid coupling of the transmission at road load conditions, replacing it with a direct mechanical connection.

The torque converter smoothly couples the engine to the planetary gear system through three multiple disc clutch packs, one roller clutch and one band, to produce three forward speeds and reverse. Changing of the gear ratios and application of the converter clutch is controlled automatically.

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NOTES----NOTES----NOTES

# MAINTENANCE AND ADJUSTMENTS

## TRANSAXLE OIL PROCEDURES

### Checking Transaxle Oil Level

Approximately 3.8 liters (4 qts.) of fluid are required to refill transaxle after the pan has been drained. The fluid capacity of the 125C transaxle and converter assembly is approximately 8.5 liters (9 qts.) but correct level is determined by mark on the dipstick rather than by amount added. Use only Dexron® II automatic transmission fluid or its equivalent.

If the oil changes to a darker color at an early stage, from the usual red color and/or to a strong odor, this is normal even though it is usually associated with overheated transmission fluid. It is not a positive sign of required maintenance or transaxle failure.

Due to the shape of the filler tube, oil level readings may be misleading. Look carefully for full oil ring on both sides of dipstick. Recheck if any question of oil level occurs.

Check oil level as follows:

1. Place transaxle in "Park" and leave in "Park." Apply parking brake and block wheels start engine and let idle (carburetor off fast idle step). **DO NOT RACE ENGINE.**

**MOVE THE LEVER THROUGH THE RANGES .**

2. Vehicle should be on level surface.

3. Check oil level on dipstick.

The oil level at room temperature of approximately 21°C (70°F) should be 13mm (1/2") above the "Full" mark, or between the two dimples on the dipstick, Figure 7A-1. The oil level should be between the "Add" and "Full" marks at normal operating temperature 200°F (90°C). This temperature is obtained after at least 15 miles (24 km) of expressway driving or equivalent city driving. The transaxle oil is stored in the valve body cover. Oil level will decrease on the dipstick when warm. Also, at normal operating temperature, the oil will heat the gage end of the dipstick to a degree where the average person cannot grasp it firmly with his bare hand without discomfort.

**MAINTAIN OIL LEVEL BETWEEN THE "ADD" AND "FULL" MARKS AT NORMAL OPERATING TEMPERATURE.**

**DO NOT OVERFILL TRANSAXLE, AS THIS MAY CAUSE FOAMING AND LOSS OF OIL THROUGH THE VENT.**

4. If oil is low, check for possible causes.

### Drain Intervals

The transaxle operating temperature resulting from the type of driving conditions under which the car is used is the main consideration in establishing the proper frequency of transaxle fluid changes.

Change the transaxle fluid and replace strainer every 15,000 miles if the car is usually driven under one or more of the following severe transaxle service conditions.

1. In heavy city traffic.
2. Where the outside temperature regularly reaches 90°F. (32°C.).
3. In very hilly or mountainous areas.

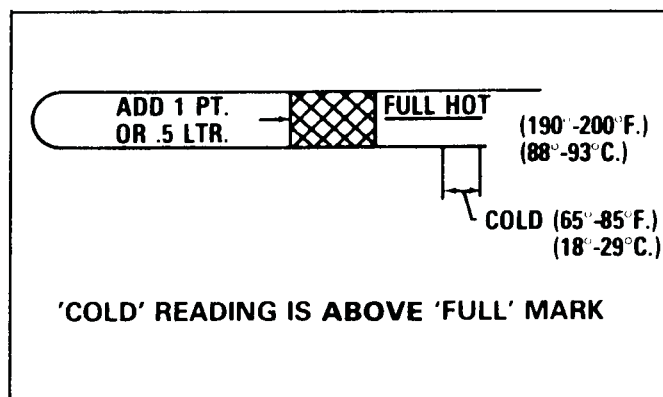


Figure 7A-1 Transaxle Dipstick

4. Frequent trailer pulling.

5. Commercial use, such as taxi, police car, or delivery service.

If you do not use your car under any of these conditions, change the fluid and replace strainer every 100,000 miles.

**NOTICE: DO NOT OVERFILL.** It takes only one pint to raise level from "ADD" to "FULL" with a hot transaxle. Overfilling can cause damage to transaxle.

### Fluid Capacities

Pan removal - 3.8 liters (4 qts.)

Overhaul - 5.7 liters (6 qts.)

### Fluid and Filter Change

1. Raise car.
2. With drain pan placed under transaxle oil pan, remove oil pan attaching bolts from front and side of pan.
3. Loosen rear pan attaching bolts approximately four (4) turns.
4. Carefully pry transaxle oil pan loose with screwdriver, allowing fluid to drain.
5. Remove remaining bolts and remove oil pan and gasket. Discard gasket.
6. Drain fluid from oil pan. Clean pan with solvent and dry thoroughly with clean compressed air.
7. Remove strainer and "O" ring seal.
8. Install strainer and new "O" ring seal locating strainer against dip stick stop.
9. Install new gasket on oil pan and install oil pan. Tighten attaching bolt to 16 N·m (12 ft. lbs.).
10. Lower car, add approximately 3.8 liters (4 qts.) of Dexron® II Automatic Transmission Fluid or its equivalent through filler tube.

11. With selector lever in "park" position, apply parking brake and block wheels, start engine and let idle (carburetor off fast idle step). **DO NOT RACE ENGINE.**

**MOVE THE LEVER THROUGH THE RANGES .**

12. With selector lever in "PARK" range, check for proper fluid level.

Figure 7A-12 T.C.C. Wiring Schematic - (Computer Command Control)

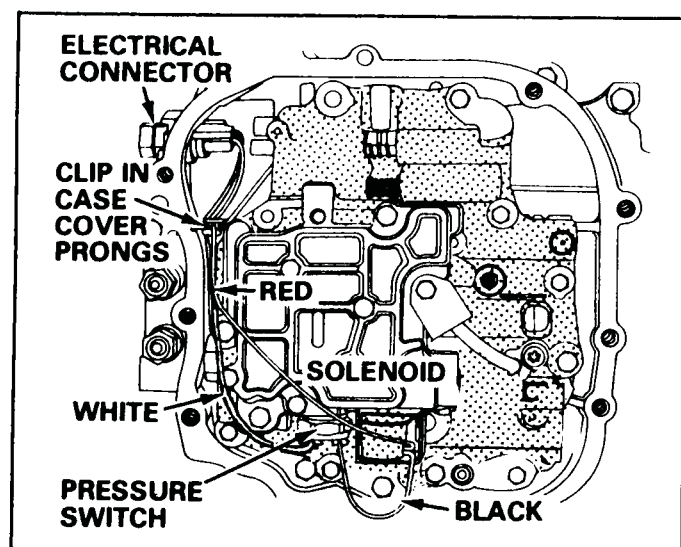


Figure 7A-11 Auxillary Valve Body - (Computer Command Control)

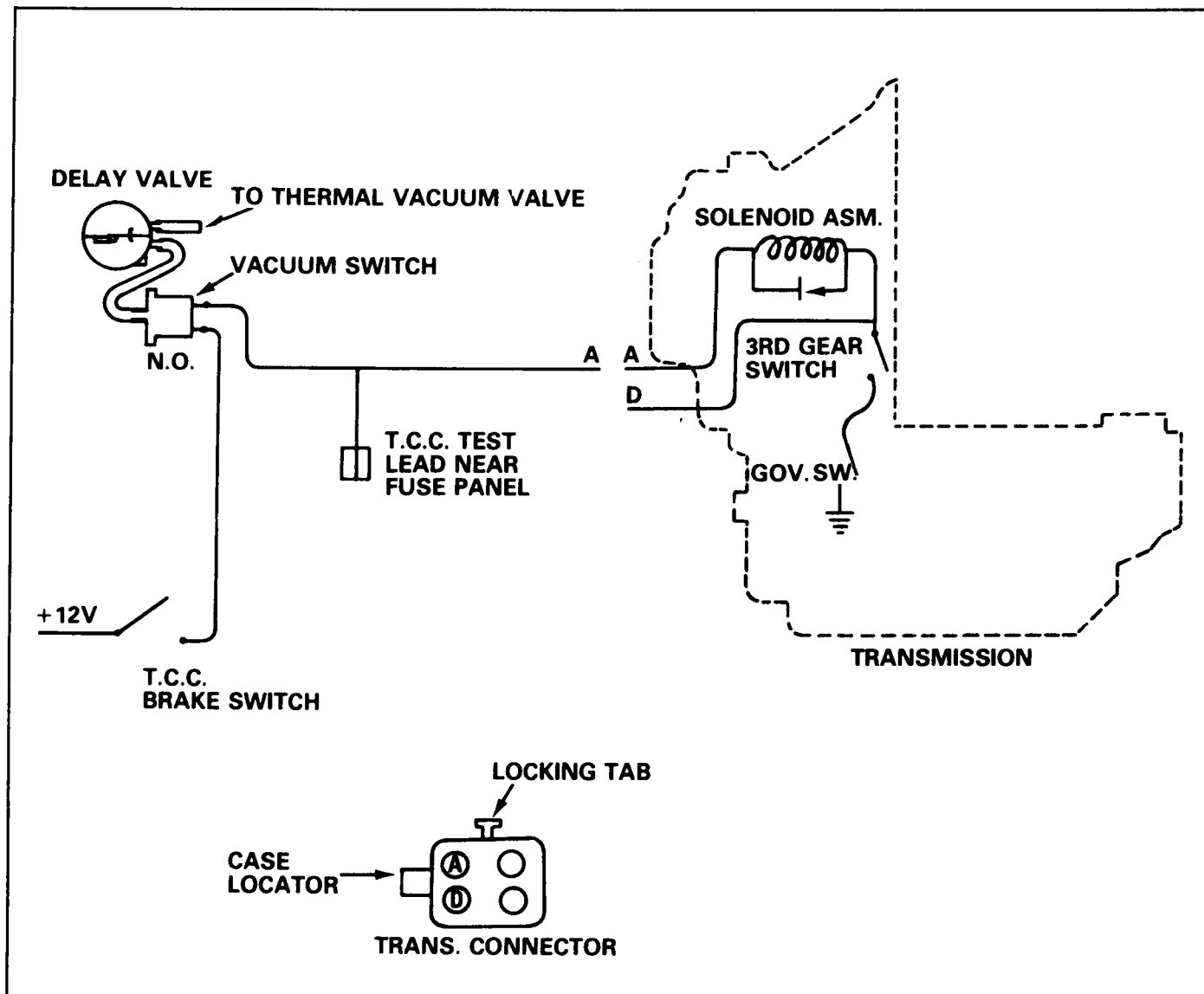


Figure 7A-14 T.C.C. Wiring Schematic - (Exc. Computer Command Control)

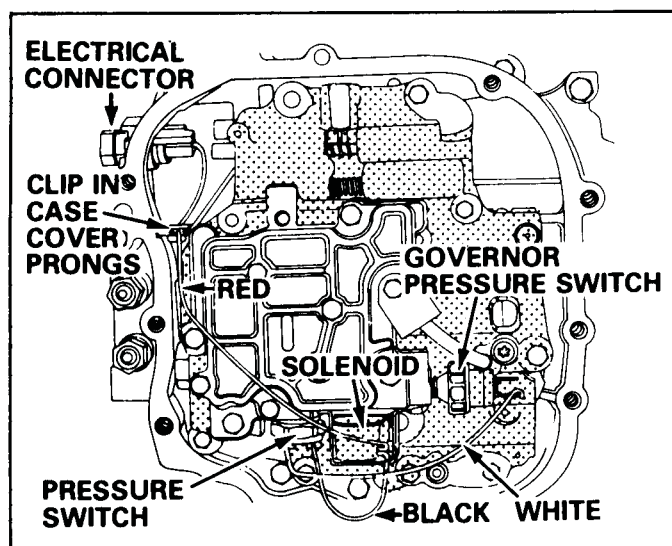
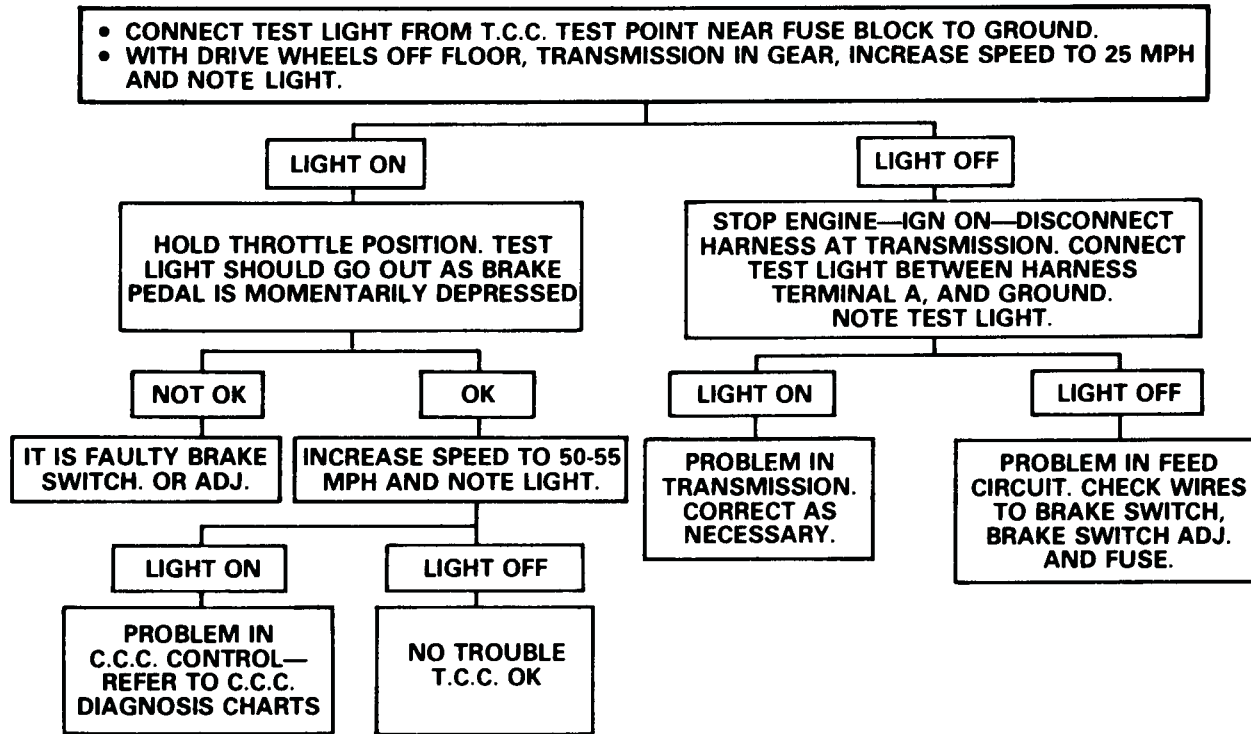


Figure 7A-13 Auxillary Valve Body - (Exc. Computer Command Control)

## TRANSMISSION CONVERTER CLUTCH (T.C.C.) ELECTRICAL DIAGNOSIS

CARS EQUIPPED WITH COMPUTER COMMAND CONTROL (C.C.C.)

MECHANICAL CHECKS SUCH AS LINKAGE, OIL LEVEL, ETC. SHOULD BE PERFORMED PRIOR TO USING THIS CHART. ALSO CHECK FOR A CODE 24. IF PRESENT, SEE SECTION 6E.



## TRANSMISSION CONVERTER CLUTCH (T.C.C.) ELECTRICAL DIAGNOSIS

CARS NOT EQUIPPED WITH COMPUTER COMMAND CONTROL (C.C.C.)

MECHANICAL CHECKS SUCH AS LINKAGE, OIL LEVEL, ETC. SHOULD BE PERFORMED PRIOR TO USING THIS CHART.

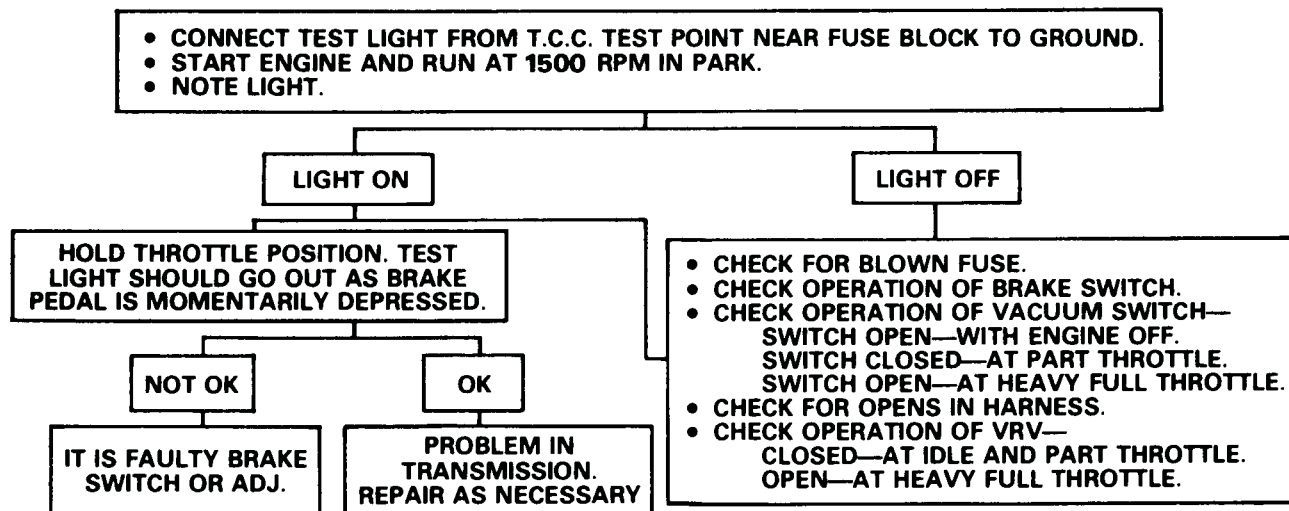


Figure 7A-15 T.C.C. Electrical Diagnosis



# ON-CAR SERVICE

## ON-CAR SERVICEABLE COMPONENTS

The following parts can be serviced with the transaxle in the car. For part removal and installation procedures not listed in this section, refer to the disassembly and reassembly sections.

1. Throttle valve control cable and/or sleeve seal.
2. Transaxle filler pipe and/or sleeve seal.
3. Transaxle governor assembly and speedometer gear assembly.
4. Transaxle intermediate servo assembly and direct clutch accumulator check valve.
5. Transaxle valve body assembly, spacer plate, gaskets, throttle lever and bracket assembly, pump shaft, valve body cover and gasket.
6. Transaxle converter to flexplate bolts.
7. Transaxle oil pan and/or gasket, strainer assembly and "O" ring.
8. Lo and Reverse pipe, "O" ring seal and oil seal.
9. Dip-stick stop bracket, parking pawl and return spring.
10. Output shaft, axle joint retaining ring, snap ring (shaft) and axle oil seals.
11. Case cover, cooler fittings, manual valve, electrical connector, 1-2 accumulator piston, spring and seal, thermo-static element assembly, manual detent spring and roller assembly, sprockets, drive link and thrust washers.
12. 3rd clutch pressure switch, governor pressure switch, solenoid, auxiliary valve body, cover and gasket.

## 125C TRANSAXLE ASSEMBLY REMOVAL

1. Disconnect negative battery cable from transaxle (see Figure 7A-25).
2. Using a 1/4" x 2" long bolt, insert bolt in hole at front R.H. motor mount to prevent mount mislocation during transaxle removal, Figure 7A-16.
3. Remove carburetor air cleaner and disconnect T.V. cable at carburetor.
4. Remove bolt securing T.V. cable to transaxle. Pull up on cable cover at transaxle until cable is seen. Disconnect cable from transaxle rod, Figure 7A-17.
5. Remove bolt securing engine wire harness at top front of transaxle.
6. Remove hose from air management valve, allowing the engine wire harness to be pulled up and out of way.
7. Install Engine Support Fixture, J-22825-1 and J-22825-20. Fixture must be modified and installed as shown in Figure 7A-18. Raise engine enough to take pressure from motor mounts.

**CAUTION: Engine support must be located in center of cowl and fasteners must be torqued before supporting engine. Fixture is not intended to support entire weight of engine and transaxle. Bodily injury could result with improper use of support fixture.**

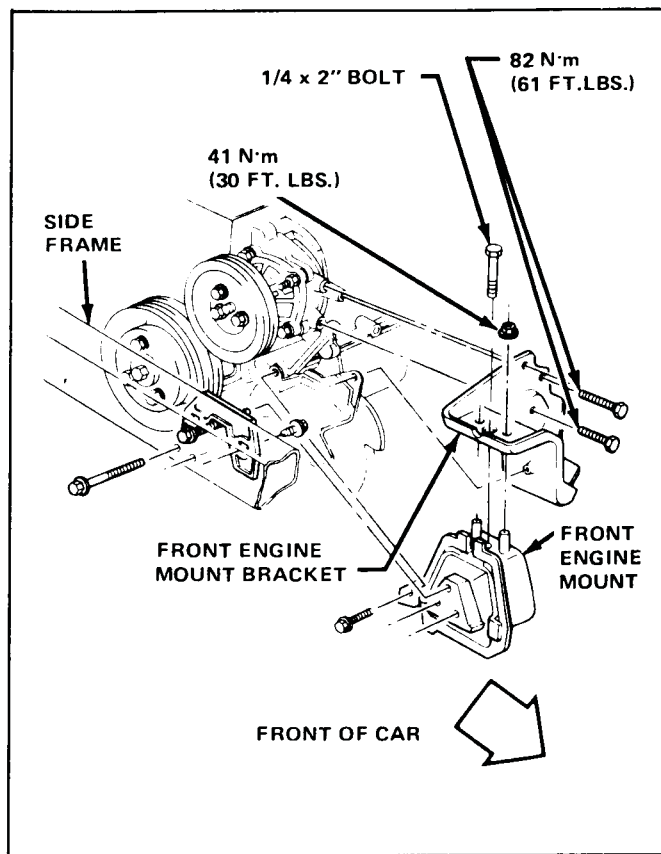


Figure 7A-16 Securing Engine Mount

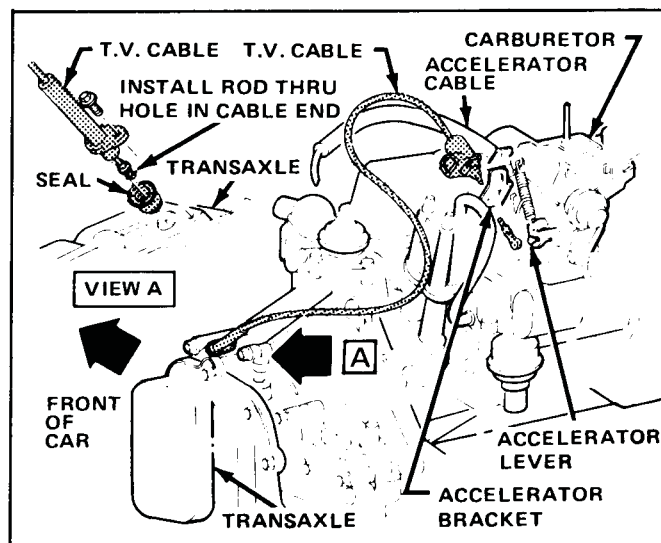


Figure 7A-17 T.V. Control Cable

8. Remove top transaxle mount and bracket assembly, Figure 7A-19. It may be necessary to raise engine to allow removal.

9. Disconnect shift control linkage from transaxle, Figure 7A-20.

10. Remove top transaxle to engine mounting bolts. Loosen transaxle to engine bolt near starter but do not remove, Figure 7A-19.



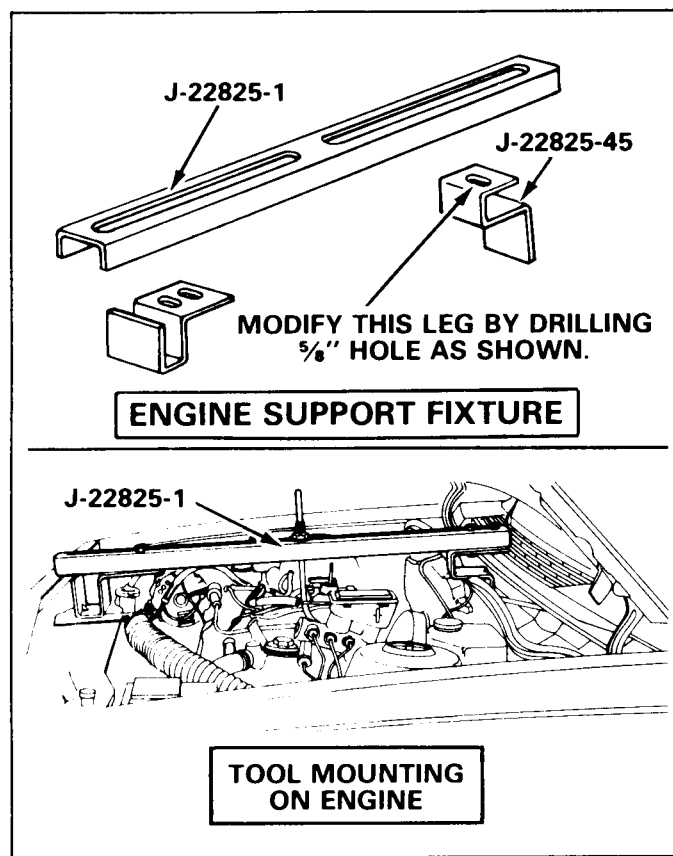


Figure 7A-18 Engine Support Fixture

11. Unlock steering column and raise car.
12. Remove both front wheel/tire assemblies.
13. Remove cotter pin and loosen a castelled ball joint nut until ball joint separates from control arm, Figure 7A-21.
14. Repeat on other side.
15. Remove bolt securing stabilizer bar to L.H. lower control arm, Figure 7A-21.
16. Remove six bolts securing L.H. front suspension support assembly, Figure 7A-21.
17. Assemble Axle Shaft Removal Tool, J-28468, to Slide Hammer, J-23907.
18. Position axle shaft removal tool behind axle shaft cones and pull cones out away from transaxle. Remove axle shafts and plug transaxle bores to reduce fluid leakage.
19. Remove nut securing transaxle control cable bracket to transaxle. Then, remove engine to transaxle stud, Figure 7A-20.
20. Disconnect speedometer cable from transaxle, Figure 7A-22.
21. Disconnect transaxle strut (stabilizer) at transaxle, Figure 7A-19.
22. Remove four screws securing torque converter shield and remove shield from transaxle, Figure 7A-23.
23. Remove three bolts securing torque converter to flex plate, Figure 7A-19.
25. Disconnect transaxle cooler lines and plug to prevent leakage, Figure 7A-24.
26. Remove starter, Figure 7A-25.

27. Remove screws holding brake and fuel line brackets to L.H. side of underbody. This will allow the brake and fuel lines to be moved for clearance during transaxle removal.

28. Remove the remaining bolt securing transaxle to engine located near the starter, Figure 7A-19.

29. Remove transaxle by sliding to L.H. side and away from engine.

## TRANSAXLE INSTALLATION

To reinstall the transaxle, the removal procedure is reversed, though several things should be noted:

1. Reinstall both axle shafts **after** transaxle is in place.
2. When reinstalling the front suspension support assembly, it is necessary to follow the tightening sequence to maintain suspension alignment, Figure 7A-21.
3. A suspension alignment check should be made after transaxle installation is complete.
4. Adjust T.V. cable.

## TRANSAXLE OIL PAN

### Removal & Installation

1. Raise car on hoist.
2. Remove oil pan and gasket. Discard gasket.
3. Remove oil strainer and "O" ring seal. Discard "O" ring.
4. Reverse procedure for oil pan installation. Replace the "O" ring seal on the oil strainer and the gasket on the oil pan.

## LO AND REVERSE PIPES

### Removal & Installation

1. Raise car on hoist.
2. Remove oil pan and gasket. Discard gasket.
3. Remove oil strainer and "O" ring seal. Discard "O" ring.
4. Remove reverse oil pipe, seal back-up ring and "O" ring seal, Figure 7A-26.
5. Remove low and reverse cup plug assembly.
6. Reverse procedure for installation and replace "O" ring and gasket.

## PARKING PAWL SHAFT

### Removal & Installation

1. Raise car on hoist.
2. Remove oil pan and gasket. Discard gasket.
3. Remove oil strainer and "O" ring seal. Discard "O" ring.
4. Remove dipstick stop, rod retainer and parking lock bracket, Figure 7A-27.
5. Remove clip, pin, rod and spring.
6. Reverse procedure for installation and replace "O" ring and gasket.

## INTERMEDIATE SERVO

### Removal & Installation

1. Raise car on hoist.

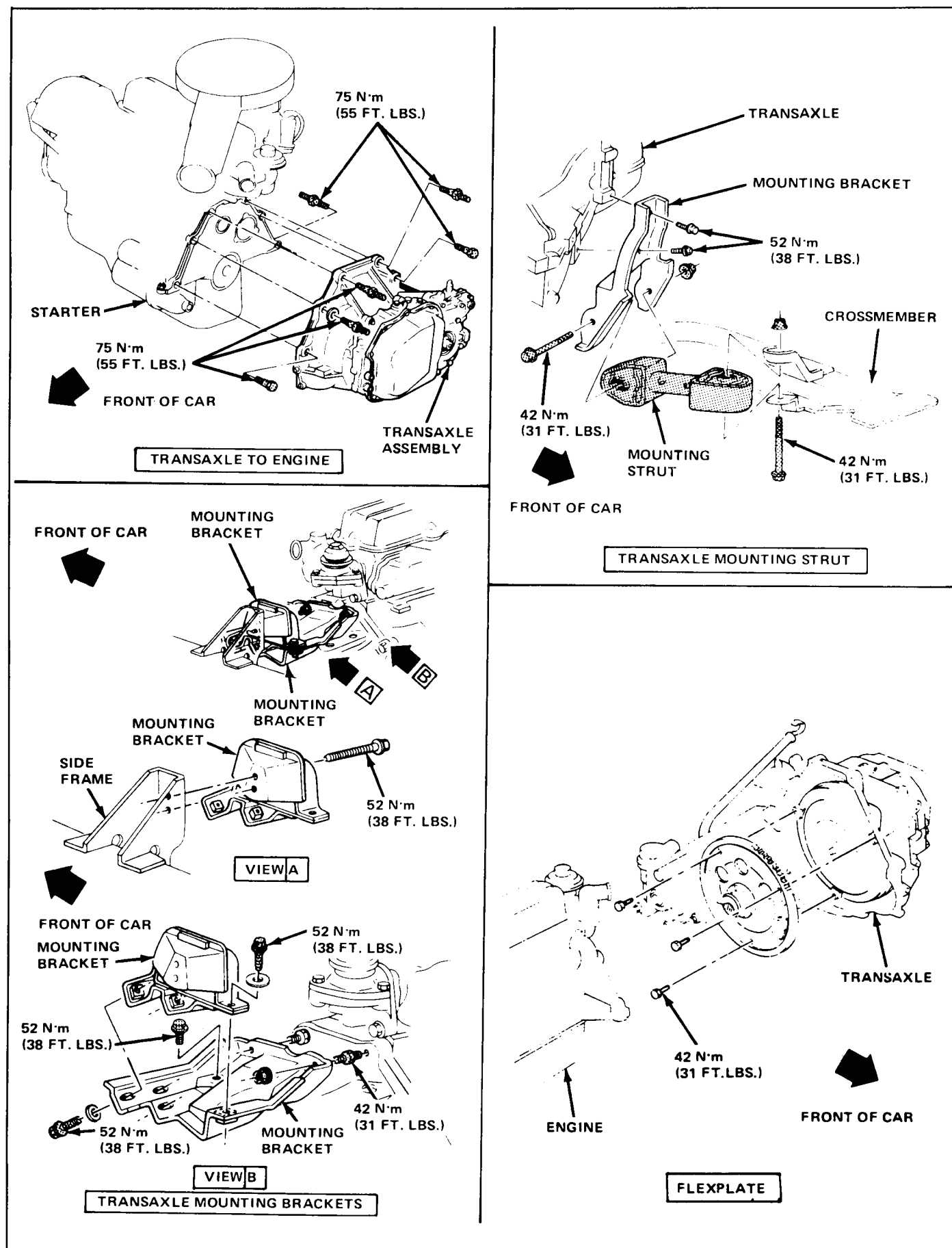


Figure 7A-19 Transaxle Mounting

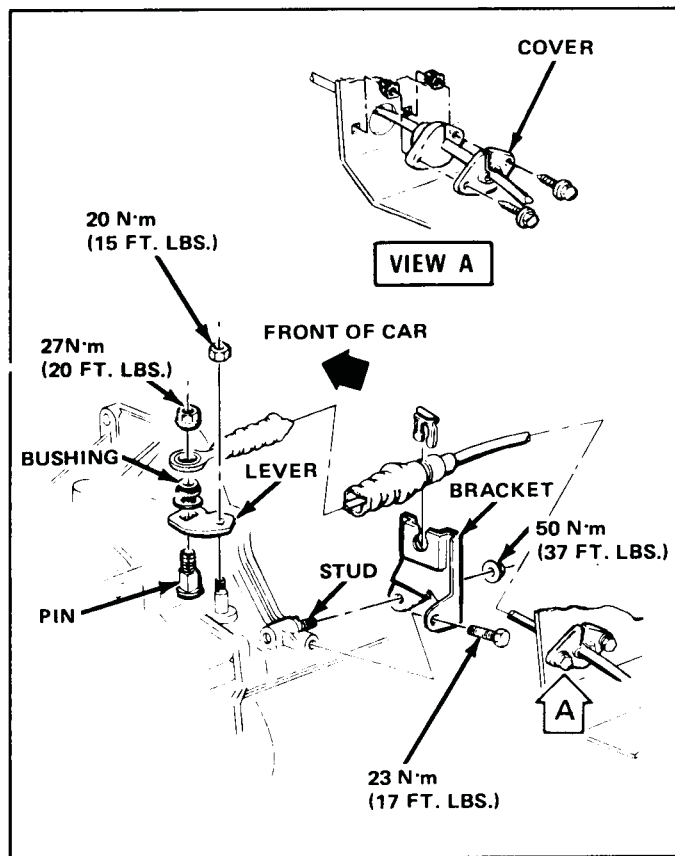


Figure 7A-20 Shift Control Linkage

2. Remove oil pan and gasket. Discard gasket.
3. Remove oil strainer and "O" ring seal. Discard "O" ring.
4. Remove reverse oil pipe retaining brackets, intermediate servo cover and gasket, Figure 7A-26.
5. Remove intermediate servo assembly.
6. Reverse procedure for installation of servo, replacing two gaskets and one "O" ring.

## ACCUMULATOR CHECK VALVE

### Removal & Installation

1. Raise car on hoist.
2. Remove oil pan and gasket. Discard gasket.
3. Remove oil strainer and "O" ring seal. Discard "O" ring.
4. Remove reverse oil pipe retaining brackets, intermediate servo cover and gasket, Figure 7A-26. Discard gasket.
5. Remove intermediate servo assembly.
6. Remove third accumulator check valve and spring.
7. Reverse procedure for installation. Replace two gaskets and one "O" ring.

## SPEEDOMETER DRIVE GEAR

### Removal & Installation

1. Raise car on hoist.
2. Disconnect speedometer cable from transaxle, Figure 7A-22.

3. Remove speedometer driven gear and sleeve assembly, Figure 7A-28.

4. Remove governor cover and "O" ring. Discard "O" ring.

5. Remove speedometer drive gear assembly.

6. Reverse procedure for installation of speedometer drive gear, using a **new** "O" ring for the governor cover.

## SPEEDOMETER DRIVEN GEAR

### Removal & Installation

1. Raise car on hoist.
2. Disconnect speedometer cable from transaxle, Figure 7A-22.
3. Remove speedometer driven gear and sleeve assembly, Figure 7A-28.
4. Reverse procedure for installation of speedometer driven gear.

## GOVERNOR COVER & ASSEMBLY

### Removal & Installation

1. Raise car on hoist.
2. Disconnect speedometer cable from transaxle, Figure 7A-22.
3. Remove speedometer driven gear and sleeve assembly, Figure 7A-28.
4. Remove governor cover and "O" ring. Discard "O" ring.
5. Remove governor assembly.
6. Reverse procedure for installation of governor assembly, using a **new** "O" ring for the governor cover.

## FILLER TUBE

### Removal & Installation

1. Remove dip stick and tube mounting bracket, Figure 7A-29.
2. Raise car on hoist.
3. Pull tube from transaxle.
4. Lower car and pull tube from the top and out of car.
5. Reverse procedure for filler tube installation.

## T.V. CABLE

### Removal & Installation

1. Remove carburetor air cleaner.
2. Disconnect T.V. cable at carburetor, Figure 7A-17.
3. Remove bolt securing T.V. cable to transaxle. Pull up on cable cover at transaxle until cable is seen. Disconnect cable from transaxle rod, Figure 7A-17.
4. Reverse procedure for T.V. cable installation and adjust cable.

## VALVE BODY COVER

### Removal & Installation

1. Raise car on hoist.
2. Remove left front wheel/tire assembly.
3. Remove five screws securing lower left air deflector to body and remove deflector, Figure 7A-30.

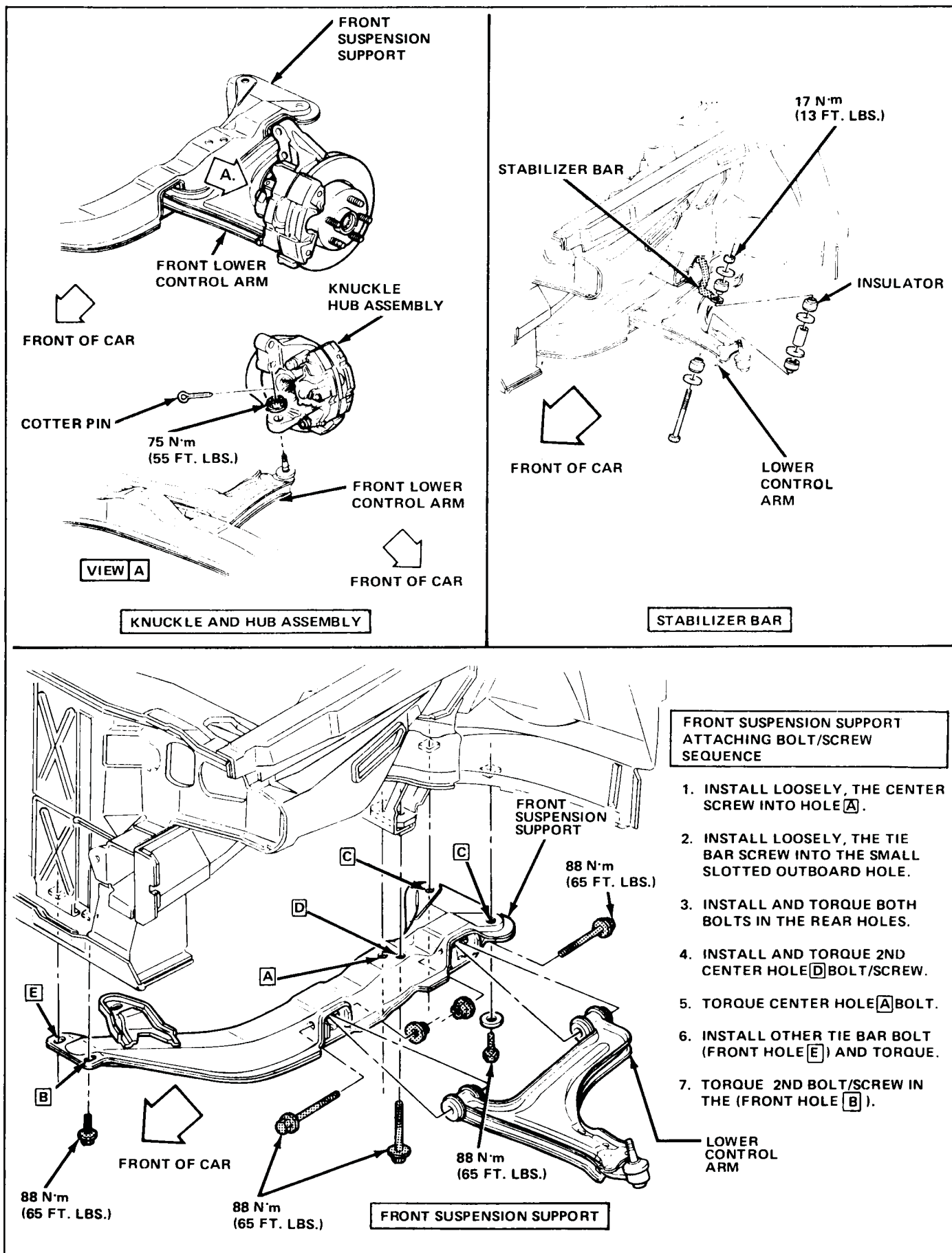


Figure 7A-21 Control Arm Attachings

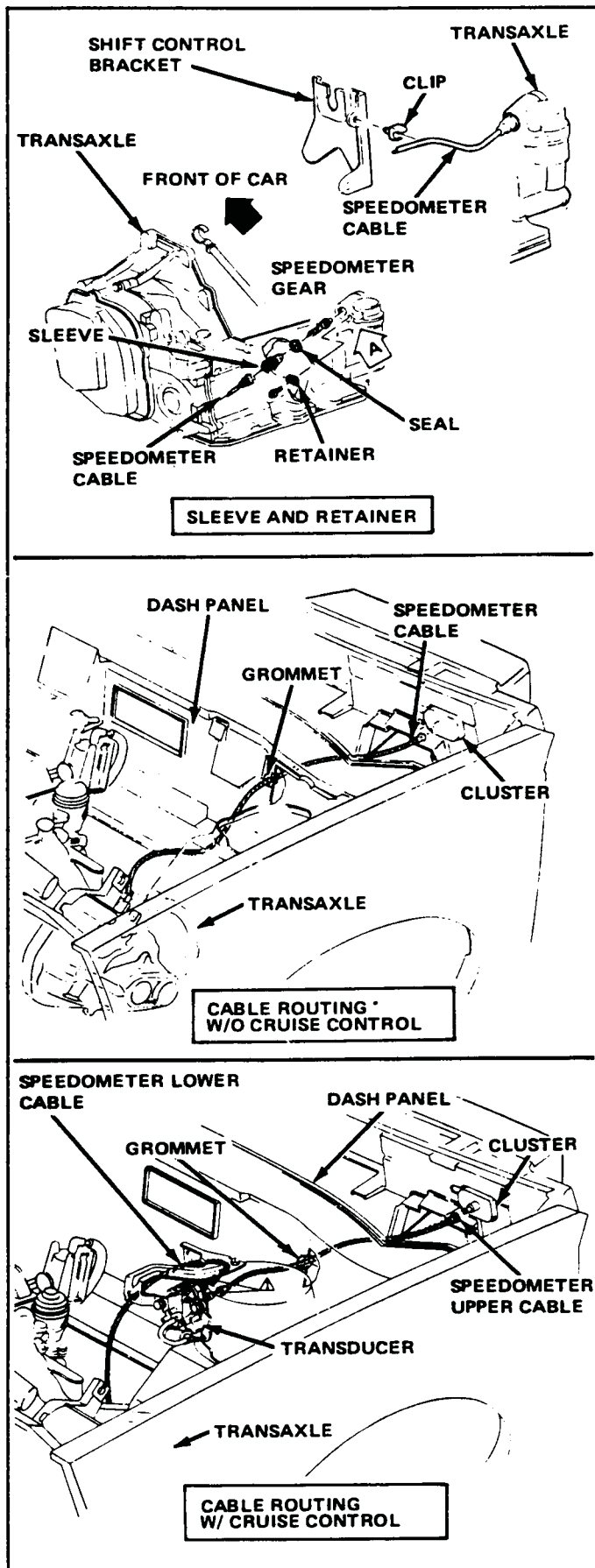


Figure 7A-22 Speedometer Cable

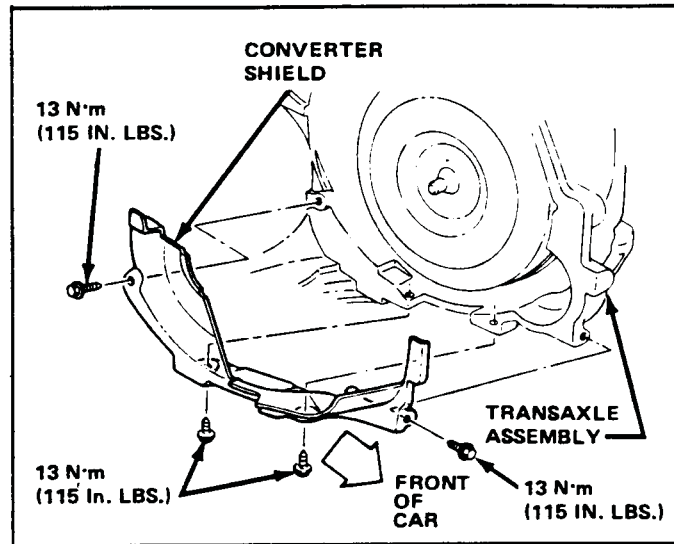


Figure 7A-23 Transaxle Converter Shield

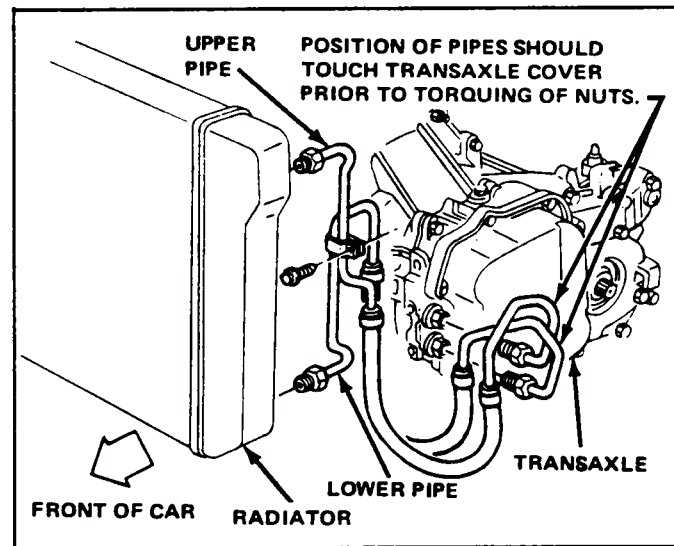


Figure 7A-24 Transaxle Cooler Pipes

4. Remove eleven bolts securing valve body cover to transaxle, Figure 7A-28. Discard cover gasket.

5. Reverse procedures for valve body cover installation. Add transmission fluid as necessary.

## VALVE BODY AND OIL PUMP

### Removal & Installation

1. Disconnect negative battery cable.
2. Raise car on hoist.
3. Remove left front wheel/tire assembly.
4. Remove five screws securing lower left air deflector to body and remove deflector, Figure 7A-30.
5. Remove eleven bolts securing valve body cover to transaxle, Figure 7A-28. Discard cover gasket.
6. Remove valve body and pump assembly and separate from the auxillary valve body.
7. Reverse procedure for valve body and oil pump installation. Add transmission fluid as necessary.



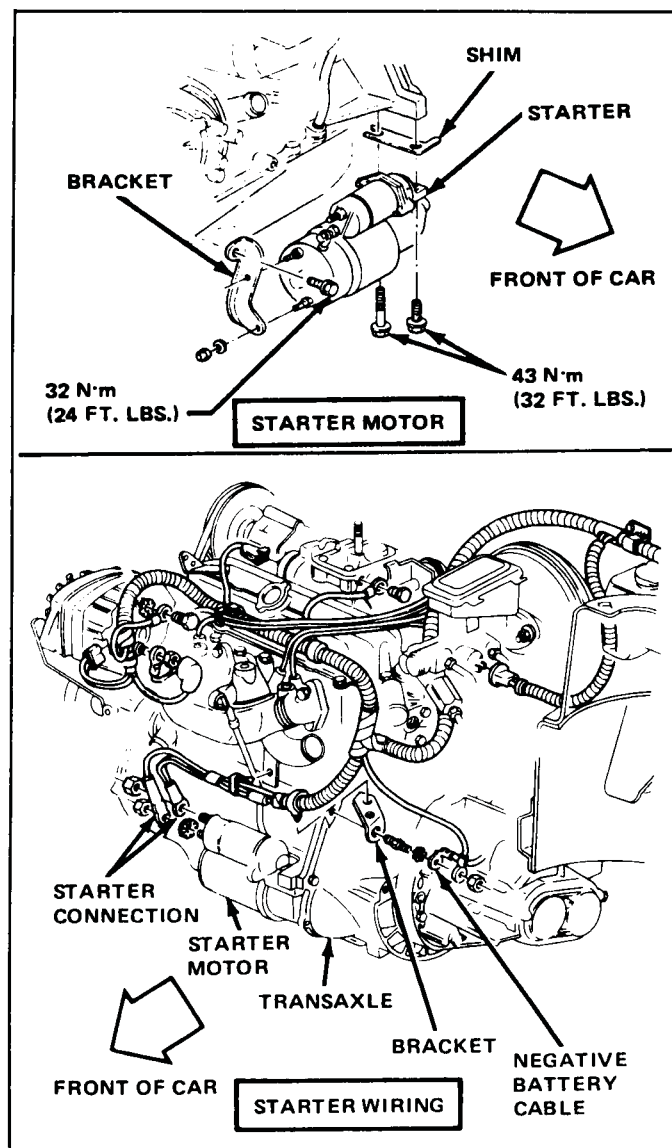


Figure 7A-25 Starter Removal

## AUXILLARY VALVE BODY

### Removal & Installation

1. Disconnect negative battery cable.
2. Remove carburetor air cleaner and disconnect T.V. cable at carburetor.
3. Remove bolt securing T.V. cable to transaxle. Pull up on cable cover at transaxle until cable is seen. Disconnect cable from transaxle rod, Figure 7A-17.
4. Raise car on hoist.
5. Remove left front wheel/tire assembly.
6. Remove five screws securing lower left air deflector to body and remove deflector, Figure 7A-30.
7. Remove eleven bolts securing valve body cover to transaxle. Discard cover gasket.
8. Remove bolt that secures T.C.C. solenoid to auxillary valve body and remove solenoid from valve body, Figure 7A-31.
9. Disconnect T.C.C. wires from 3rd gear pressure switch. Remove switch from valve body by unscrewing switch, Figure 7A-31.

10. Remove bolts securing auxillary valve body cover and remove cover, Figure 7A-31.

11. Remove bolt securing T.V. linkage and bracket assembly to valve body and remove T.V. linkage.

12. Remove remaining bolts securing auxillary valve body to transaxle and remove valve body.

13. Reverse procedure for auxillary valve body installation. Add transmission fluid as necessary.

## TRANSAXLE CASE COVER REMOVAL

1. Disconnect negative battery cable.
2. Using a 1/4" x 2" long bolt, insert bolt in hole at front R.H. motor mount to prevent mount mislocation during case cover removal, Figure 7A-16.
3. Remove carburetor air cleaner and disconnect T.V. cable at carburetor.
4. Remove bolt securing T.V. cable to transaxle. Pull upon cable cover at transaxle until cable is seen. Disconnect cable from transaxle rod, Figure 7A-17.
5. Install engine support fixture, J-22825-1 and J-22825-20. Fixture must be modified and installed as shown in Figure 7A-18. Raise engine enough to take pressure from motor mounts.

**CAUTION:** Engine support must be located in center of cowl and fasteners must be torqued before supporting engine. Fixture is not intended to support entire weight of engine and transaxle. Bodily injury could result with improper use of support fixture.

6. Remove transaxle engine mount bolts.
7. Raise car on hoist.
8. Remove left front wheel/tire assembly.
9. Remove air deflector, Figure 7A-30.
10. Remove eleven bolts securing valve body cover to transaxle, Figure 7A-28.
11. Disconnect electrical connector from transaxle case.
12. Remove valve body, detent mechanism and five check balls, Figure 7A-31.
13. Remove oil pump drive shaft, Figure 7A-28.
14. Remove cotter pin and loosen a castelled ball joint nut until ball joint separates from control arm, Figure 7A-21.
15. Loosen bolt securing stabilizer bar to L.H. lower control arm, Figure 7A-21.
16. Loosen two bolts at rear of L.H. suspension support and remove the other four bolts, Figure 7A-21.
17. Disconnect transaxle cooler lines and plug to prevent leakage, Figure 7A-24.
18. Disconnect external transaxle electrical connector, Figure 7A-32.
19. Disconnect lower transaxle mount from transaxle, Figure 7A-19.
20. Remove case attaching bolts and disconnect manual valve, Figure 7A-32.
21. Install two bolts (12 x 1.95 x 14) in dowl pin holes and tighten equally to pull case cover loose.



## AUTOMATIC TRANSAXLE DIAGNOSIS AND UNIT REPAIR

### 125C

#### GENERAL DESCRIPTION

The 125C automatic transaxle is a fully automatic unit consisting primarily of a 4-element hydraulic torque converter, compound planetary gear set and dual sprocket and drive link assembly. In addition, this transaxle incorporates a differential and final drive gear set.

The 4-element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. The pressure plate, when applied, provides a mechanical direct drive coupling of the engine to the planetary gears.

Three multiple-disc clutches, a roller clutch and a band provide the friction elements required to obtain the desired function of the planetary gear sets.

A hydraulic system pressurized by a vane type pump provides the working pressure required to operate the friction elements and automatic controls.

#### DIAGNOSIS

##### ROAD TEST PROCEDURE

###### Drive Range:

Position the selector lever in DRIVE RANGE and accelerate the vehicle. A 1-2 and 2-3 shift should occur at these throttle openings. (The shift points will vary with the throttle openings). Check the part throttle 3-2 downshift at 30 m.p.h. (50 km/h) by quickly opening the throttle approximately three-fourths. At 50 m.p.h. (80 km/h) the transmission should downshift 3-2 by depressing the accelerator fully.

###### Intermediate Range:

Position the selector lever in INTERMEDIATE RANGE and accelerate the vehicle. A 1-2 shift should occur

at all the throttle openings. (No 2-3 shift can be obtained in this range.) The 1-2 shift point will vary with the throttle opening. Check the detent 2-1 downshift at 20 m.p.h. (32 km/h). The transaxle should downshift 2-1. The 1-2 shift in INTERMEDIATE RANGE is somewhat firmer than in DRIVE RANGE. This is normal.

Position the selector lever in DRIVE RANGE. With the vehicle speed at approximately 50 m.p.h. (80 km/h) and closed or 0 throttle, move the selector lever to INTERMEDIATE RANGE. The transaxle should downshift into 2nd. An increase in engine r.p.m. and an engine braking effect should be noticed.

###### Lo Range:

Position the selector lever in LO RANGE and accelerate the vehicle. No upshift should occur in this range.

At 40 m.p.h. (64 km/h), with throttle closed, move the selector lever to Lo. A 2-1 downshift should occur in the speed range of approximately 45 to 25 m.p.h. (72 to 40 km/h), depending on valve body calibration. The 2-1 downshift at closed throttle will be accompanied by increased engine r.p.m. and an engine braking effect should be noticed. Stop vehicle.

###### Reverse Range:

Position the selector lever in REVERSE POSITION and check for reverse operation.

###### Converter Clutch

Install an engine tachometer. **Engine must be at normal operating temperature.**

Position the selector lever in drive range. With vehicle speed between 40-45 mph (64-72 km/h), in third gear, the converter clutch will apply. Observe the tachometer. A drop of about 200 rpm's will occur.



# PRELIMINARY CHECK PROCEDURE

CHECK TRANSMISSION OIL LEVEL • CHECK AND ADJUST T.V. CABLE  
CHECK OUTSIDE MANUAL LINKAGE AND CORRECT • CHECK ENGINE TUNE  
INSTALL OIL PRESSURE GAGE\* • CONNECT TACHOMETER TO ENGINE  
CHECK OIL PRESSURES IN THE FOLLOWING MANNER:

## Minimum T.V. Line Pressure Check

Set the T.V. cable to specification; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m.'s indicated in the chart below.

## Full T.V. Line Pressure Check

Full T.V. line pressure readings are obtained by tying or holding the T.V. cable to the full extent of its travel; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m.'s indicated in the chart below.

\*For line pressure tap location see Fig. A-10, Item 405.

**CAUTION** Brakes must be applied at all times.

**NOTICE** Total running time for this combination not to exceed 2 minutes.

MODEL	RANGE	MINIMUM T.V.		MAXIMUM T.V.	
		kPa	P.S.I.	kPa	P.S.I.
BA,BC,BD,BP,CA,CJ,PD,CB,CC,JS,CM,PH,JP,PF,PR,PK,PN,PW,HX,PA CD,CF,CH,CK,CL,CT,CU,CX,HL,HN,HS,HU JB,JD,JF,JJ,JK,JM,JN,JR,JW,RD	Park @ 1000 RPM	455-510 510-585 395-440	65-75 75-85 55-65	No T.V. pressure in Park. Line pressure is the same as Park at Minimum T.V.	
JD, JM JF, JK JN JW JR JJ RD JB PA JP BA, BC, BD, BP, CA, CB, CC, CM, JS, PH, PK, PN, PW CJ HX PD, PF CD CT, CX CF, CK, CL, CU, HL, HN, HS, HU	Reverse @ 1000 RPM	690-765 690-765 690-765 690-765 760-840 760-840 760-840 760-840 760-840 780-860 805-890 805-890 805-890 805-890 805-890 895-1020 895-1020 895-1020	100-112 100-112 100-112 100-112 110-122 110-122 110-122 110-122 110-122 113-125 117-130 117-130 117-130 117-130 117-130 130-148 130-148 130-148	1400-1590 1600-1785 1185-1320 1510-1720 1510-1680 1635-1815 1635-1815 1635-1815 1760-1955 1810-2057 1487-1655 1510-1710 1630-1850 1715-1910 1750-1985 1692-1912 1720-1980 1840-2115	203-230 230-260 170-190 220-250 220-245 235-265 235-265 255-285 262-300 215-240 220-248 235-270 250-277 255-290 245-277 250-287 267-307
JB, JF, JK JD, JM JN JR JJ, RD JW JP BA, BC, BD, BP, CA, CC, CB, CM, JS, PH, PR, PK, PN, PW CJ HX PD, PF PA CD CX, CT CF, CK, CL, CU, HL, HN, HS, HU	Neutral/ Drive @ 1000 RPM	395-437 395-437 395-437 395-437 395-437 395-437 459-507 459-507 459-507 459-507 459-507 459-507 510-582 510-582 510-582	55-65 55-65 55-65 55-65 55-65 55-65 67-74 67-74 67-74 67-74 67-74 67-74 74-85 74-85 74-85	915-1020 800-906 675-753 785-875 850-950 863-981 849-944 863-977 930-1055 979-1090 998-1133 1065-1211 966-1091 982-1130 1050-1208	132-148 116-132 98-110 114-127 125-138 125-143 123-137 125-142 135-153 142-158 145-165 155-176 140-158 142-164 152-175
JD, JF, JK, JM, JN, JW BA,BC,BD,BP,CA,CB,CC,CM,CJ,HX,JP,JS,PD,PF,PH,PR,PK,PN,PW JB, JJ, JR, RD CD, CF, CK, CL, CT, CU, CX, HL, HN, HS, HU PA	Intermediate/ LO @ 1000 RPM	680-750 787-870 826-910 877-998 957-1057	99-109 114-126 120-132 127-145 139-154	No T.V. pressure in Intermediate or Lo. Line pressure is the same as Intermediate/ Lo at Minimum T.V.	

Line pressure is basically controlled by pump output and the pressure regulator valve. In addition, line pressure is boosted in Reverse, Intermediate and Lo by the reverse boost valve.

Also, in the Neutral, Drive and Reverse positions of the selector lever, the line pressure should increase with throttle opening because of the T.V. system. The T.V. system is controlled by the T.V. cable, the throttle lever and bracket assembly and the T.V. link, as well as the control valve pump assembly.

H 125C-29-7

Figure A-1 Preliminary Checking Procedure

## CAUSES OF BURNED CLUTCH PLATES OR BAND

A burned clutch or band is generally caused by some condition such as low pressure and/or leaks that prevent proper application. During diagnosis or inspection, this cause must be found.

A cut or damaged seal may be the cause of a clutch problem or may be the result of a burned clutch. If a clutch is burned, excessive piston travel may result and allow one or more of the piston seals to come out of the bore and become cut or folded. When looking for the cause of the problem, the condition of the piston seals should be considered; but further inspection should be made to determine if some other area is the cause of the problem, to prevent a repeat problem.

**EXAMPLE:** A leak at an intermediate servo piston seal may be the cause of a burned direct clutch and/or intermediate band because the oil pressure that applies the direct clutch also releases the servo piston.

### In All Cases of Burned Clutch Plates or Band - Check for

1. The Driven Sprocket Support
  - a. The drive sprocket support seal rings may be leaking.
  - b. The case cover gaskets are not sealing. Case cover gasket leaking.
  - c. The driven sprocket support sleeve may be loose or mispositioned.
  - d. Loose attaching bolts. Torque to 24 N·m (18 ft. lbs.)
2. The Case Cover and Case
  - a. Blocked or interconnected oil channels.
  - b. The sealing surfaces may be damaged or leaking.
  - c. The check balls may be missing or out of location.
  - d. Porosity.
3. The Control Valve Pump Assembly
  - a. The control valve pump assembly to case cover bolts may be loose.
  - b. The sealing surfaces on the control valve pump assembly, spacer plate, and/or gaskets are damaged or leaking.
  - c. The valves may be leaking, binding, or sticking.
  - d. The channels may be blocked or interconnected.

If low line pressure is present, refer to the possible causes.

**NOTICE:** Burned clutch plates can be caused by incorrect usage of clutch plates. Engine coolant in the transmission fluid can cause severe damage to clutch plate material and result in pieces of composition material peeling off.

### Burned Direct Clutch Only\*

1. The Direct Clutch Assembly
  - a. The seals may be cut, missing or rolled out of groove.
  - b. The exhaust ball capsule in the housing may be damaged and not sealing.
  - c. The piston or the housing may be damaged, leaking.
  - d. The snap ring may not be fully seated.
2. The Intermediate Servo Assembly
  - a. The wrong servo pin - check selectivity.

- b. The seals may be missing or damaged.
  - c. The servo bore is scored or damaged.
  - d. The servo orifice bleed plug may be missing.
  - e. The band apply pin could be tight in the case bore.
3. The Case Cover and Case
  - a. The #5 check ball missing or off location may be the case cover.
  - b. The accumulator exhaust check valve may be missing or not sealing in the case.

### Burned Forward Clutch Only\*

1. The Forward Clutch Assembly
  - a. The seal rings on the input shaft could be damaged or missing.
  - b. The Input shaft feed passage or the orifice are restricted.
  - c. Holes not drilled in piston or waved steel clutch plate not installed next to piston.
  - d. The selective backing plate or snap ring may be incorrectly installed, or incorrect selective backing plate.
  - e. The piston seals may be missing or damaged.
  - f. The piston insert may be missing.
  - g. The piston, housing, or shaft could be damaged, leaking.
2. The Control Valve Pump Assembly
  - a. The valve body pipe is loose or leaking.
  - b. Pressure regulator valve roll pin damaged or worn.

### Burned Lo and Reverse Clutch Only\*

1. The Lo and Reverse Clutch Assembly
  - a. The housing seals are damaged.
  - b. The piston or seals are damaged.
  - c. Wrong number of clutch plates.
2. The Control Valve Pump Assembly
  - a. The reverse boost valve is sticking.
3. The Case Cover and Case
  - a. The #4 or #5 check ball is missing or off location in the case cover.
  - b. The Lo and Reverse pipe is leaking in the case bore.
  - c. The Lo and Reverse clutch housing to case cup plug assembly is restricted, damaged, or not seated properly.
  - d. The Lo and Reverse pipe to case "O" ring and/or seal backup ring is damaged or missing.

### Burned Intermediate Band Only\*

1. The Intermediate Band
  - a. The band is not properly installed and aligned in the case.
  - b. The apply pin is not engaged.
2. The Intermediate Servo Assembly
  - a. The wrong servo pin - check the selectivity.
  - b. The seals are missing or damaged.
  - c. The servo bore is scored or damaged.
  - d. The band apply pin is tight or undersize in the case bore.
3. The Case Cover and the Case
  - a. The accumulator check valve and/or spring is missing or not sealing properly.
  - b. The direct clutch accumulator cup plug is missing.

- c. The #1 or #2 check balls are missing or off location.
- d. The 1-2 accumulator piston is missing or the seal is leaking.
- 4. The Control Valve Pump Assembly
  - a. The 1-2 accumulator valve is sticking.
  - \* See also above section labeled "IN ALL CASES OF BURNED CLUTCH PLATES OR BAND."

### THE CAUSES OF LOW OIL PRESSURE

- 1. Low oil level.
- 2. The T.V. system (the pressure is low in Neutral, Drive, and low to normal in Intermediate and Reverse.)
  - a. The T.V. cable is misadjusted or sticking.
  - b. The T.V. linkage may be binding, incorrect cable.
  - c. The throttle valve may be stuck in the bore.
  - d. The shift T.V. valve is stuck.
- 3. The oil strainer is plugged.
- 4. The oil strainer "O" ring seal is leaking or damaged.
- 5. The control valve and pump assembly bolts are loose.
- 6. The control Valve Assembly.
  - a. The #5 or #6 check ball is missing or off location.
  - b. The below listed valves may be stuck or damaged.
    - 1) The T.V. valve and plunger.
    - 2) The Shift T.V. valve.
    - 3) The pressure regulator valve.
    - 4) The T.V. boost valve.

- 5) The pressure relief valve.
- c. The 1-2 accumulator piston and/or seal is leaking or missing.
- d. Internal leaks.
- 7. (Lo only) The Lo blow off valve is damaged, #4 check ball is missing or off location.
- 8. (Reverse only) The Lo-Reverse clutch housing to case cup plug assembly is leaking.
- 9. The pump vane seals are cut or missing.
- 10. The intermediate oil passages to pressure regulator is blocked.
- 11. The driven sprocket support to case cover is leaking.

### CAUSES OF HIGH OIL PRESSURE

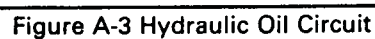
- 1. The T.V. system (the pressure is high in the Neutral, Drive and normal to high in intermediate and Reverse).
  - a. The T.V. cable is misadjusted, sticking or broken.
  - b. The T.V. linkage is binding or incorrect cable.
  - c. The throttle valve is stuck.
  - d. The shift T.V. valve is stuck.
  - e. The T.V. lifter is bent, damaged or too short.
- 2. The control Valve and Pump Assembly valves may be sticking or damaged.
  - a. The T.V. valve and plunger.
  - b. The shift T.V. valve.
  - c. The pressure regulator valve.
  - d. The T.V. boost valve.
  - e. The pump slide stuck.
- 3. (Lo only) The Lo blow off valve may be stuck closed.
- 4. The internal pump or case cover may be leaking.

RANGE REFERENCE CHART

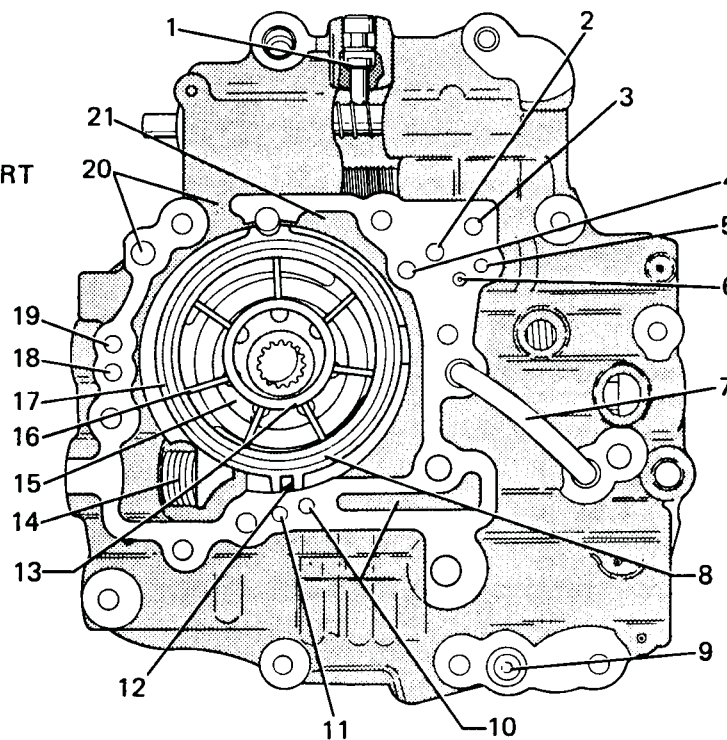
RANGE	GEAR	DIRECT CLUTCH	INTERMEDIATE BAND	FORWARD CLUTCH	ROLLER CLUTCH	LO - REVERSE CLUTCH
PARK - NEUT.						
DRIVE	FIRST SECOND THIRD	APPLIED	APPLIED	APPLIED APPLIED APPLIED	HOLDING	
INTERMEDIATE	FIRST SECOND		APPLIED	APPLIED APPLIED	HOLDING	
LO	FIRST			APPLIED	HOLDING	APPLIED
REVERSE		APPLIED				APPLIED

H 125C-33-2

Figure A-2 Range Reference Chart



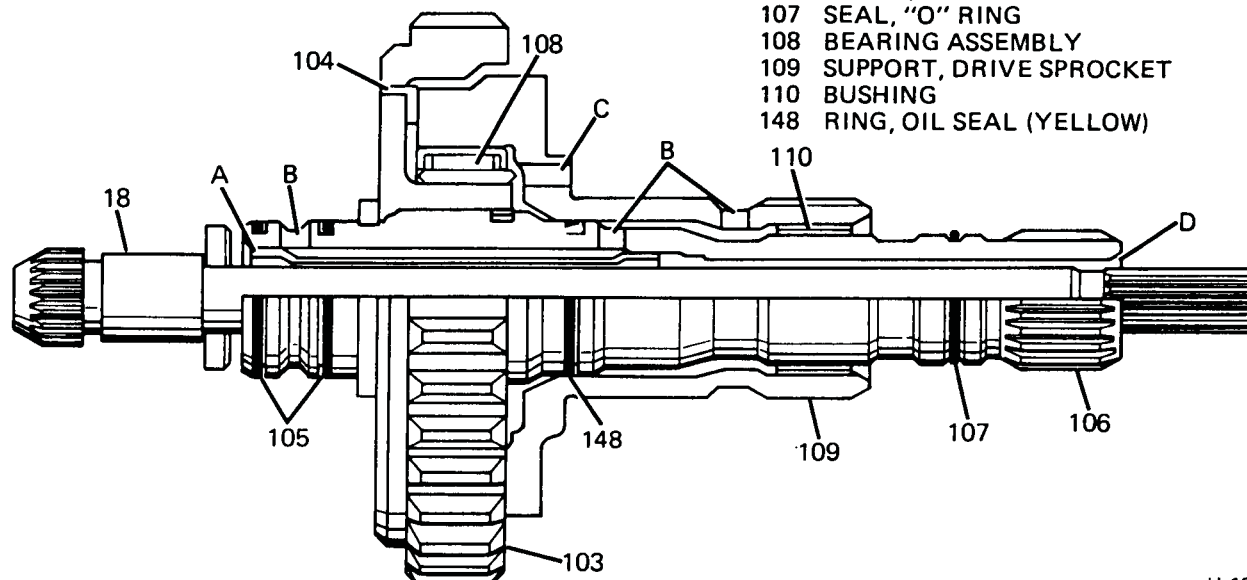
- 1 VALVE, LINE BOOST
- 2 LINE
- 3 CONVERTER FEED
- 4 APPLY
- 5 SHIFT TV EXHAUST
- 6 SHIFT TV (ORIFICE CUP PLUG)
- 7 VALVE BODY PIPE (DRIVE)
- 8 SLIDE COVER SEAL & SEAL SUPPORT
- 9 LO BLOW OFF
- 10 GOVERNOR
- 11 3RD CLUTCH
- 12 SLIDE SEAL & SEAL SUPPORT
- 13 VANE RING
- 14 SPRING, PRIMING
- 15 ROTOR
- 16 VANE
- 17 SLIDE
- 18 TO COOLER
- 19 RELEASE
- 20 EXHAUST
- 21 DECREASE



H 125C-7-2

Figure A-4 Variable Capacity Vane Oil Pump

- A SLEEVE, STEEL
- B CONVERTER, FEED (T.C.C. APPLY)
- C CONVERTER SEAL, DRAINBACK
- D CONVERTER TO COOLER (T.C.C. RELEASE)
- 18 SHAFT, OIL PUMP DRIVE
- 103 SPROCKET, DRIVE
- 104 WASHER, THRUST
- 105 RING, OIL SEAL (GREEN)
- 106 SHAFT, TURBINE
- 107 SEAL, "O" RING
- 108 BEARING ASSEMBLY
- 109 SUPPORT, DRIVE SPROCKET
- 110 BUSHING
- 148 RING, OIL SEAL (YELLOW)

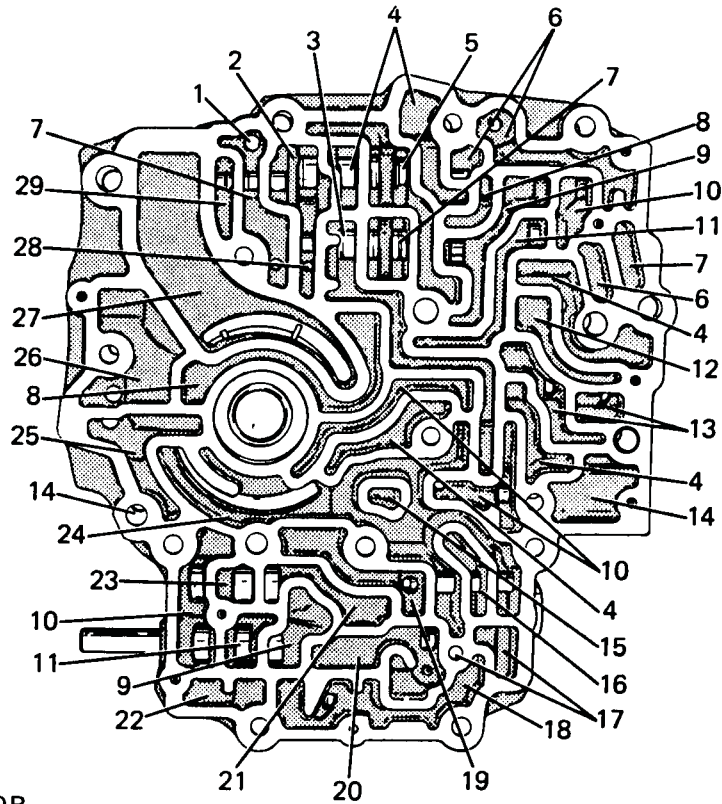


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Figure A-5 Converter Oil Passages - Parts Cut-Away View



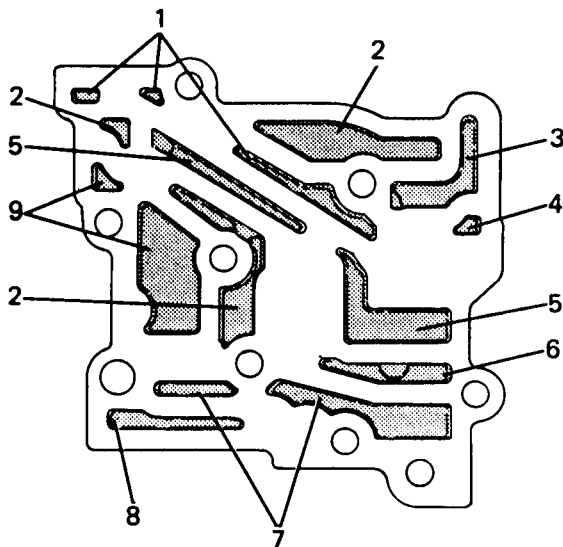
- 1 #1 CHECK BALL
- 2 GOVERNOR
- 3 RND
- 4 DRIVE
- 5 2ND
- 6 LO - 1ST
- 7 DIRECT CLUTCH (3RD)
- 8 LO
- 9 DETENT
- 10 SHIFT TV
- 11 PART THROTTLE
- 12 LUBE
- 13 1-2 ACCUMULATOR
- 14 EXHAUST
- 15 APPLY
- 16 CONVERTER FEED
- 17 TV
- 18 TV EXHAUST
- 19 DECREASE
- 20 RNDI
- 21 REVERSE
- 22 VOID
- 23 INTERMEDIATE
- 24 LINE
- 25 RELEASE
- 26 TO COOLER
- 27 INTAKE
- 28 DRILLED HOLE
- 29 DIRECT CLUTCH ACCUMULATOR



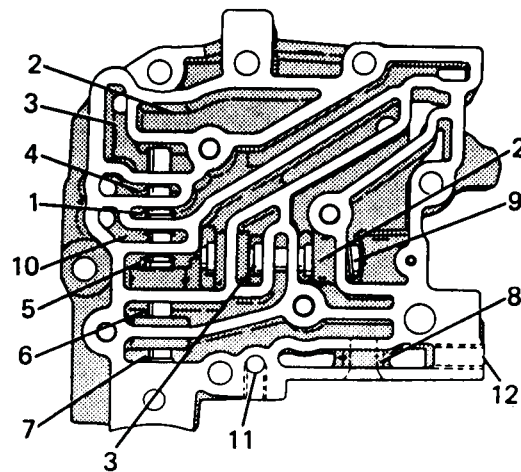
H 125C-8

Figure A-6 Valve Body Passages

- 1 CONVERTER FEED
- 2 LINE
- 3 EXHAUST
- 4 RELEASE
- 5 APPLY
- 6 REGULATED LINE
- 7 SOLENOID CIRCUIT
- 8 GOVERNOR
- 9 SHIFT TV
- 10 TO COOLER
- 11 3RD CLUTCH
- 12 DRILLED & TAPPED HOLE (NON C3 ONLY)



AUXILIARY VALVE BODY COVER

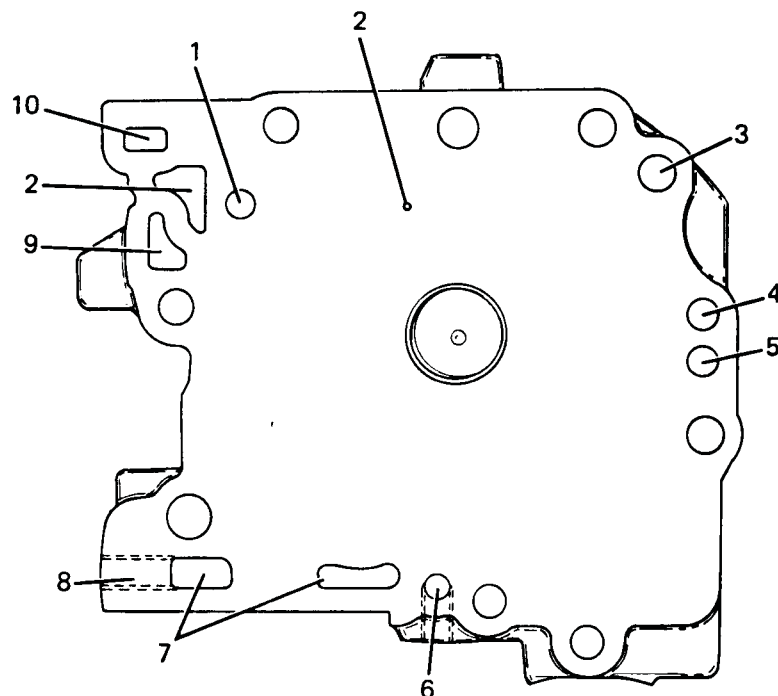


AUXILIARY VALVE BODY

H125C-2-4

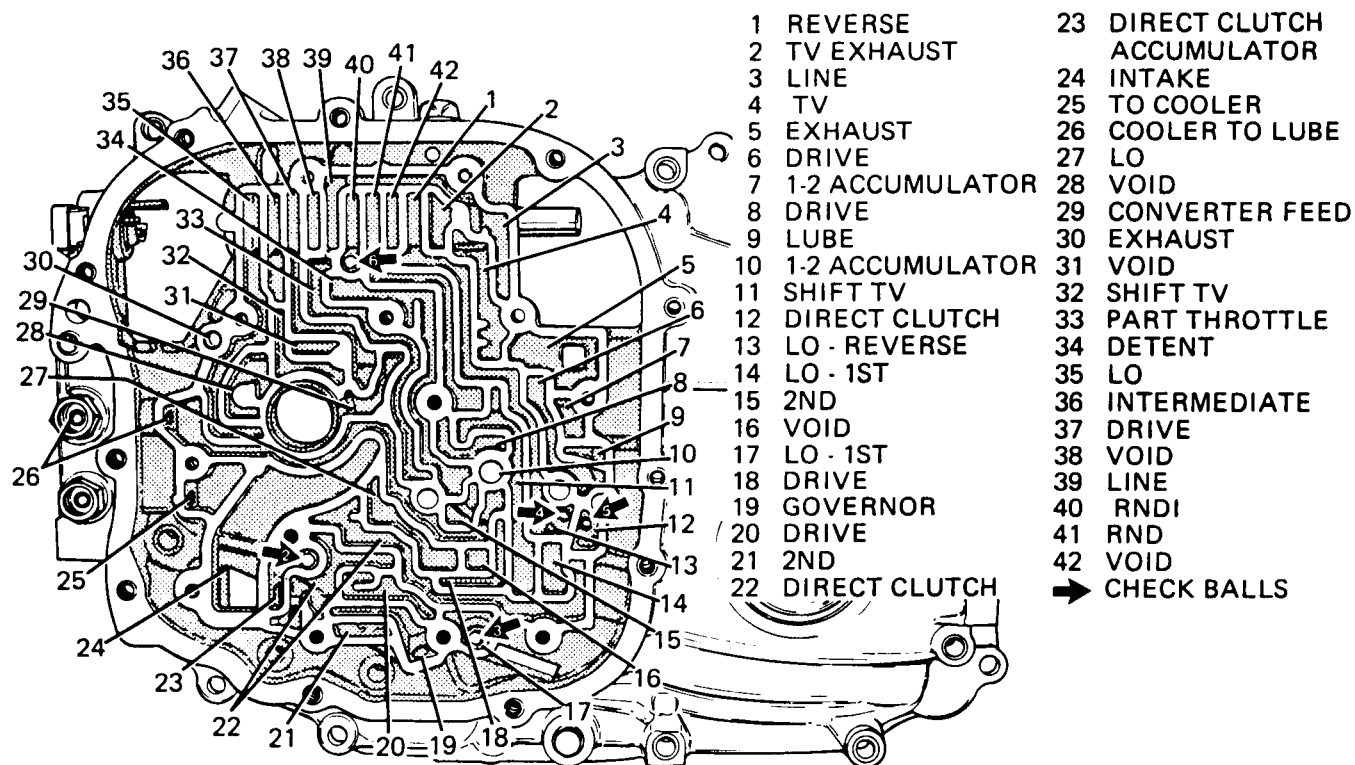
Figure A-7 Auxiliary Valve Body and Cover

- 1 APPLY
- 2 LINE
- 3 EXHAUST
- 4 RELEASE
- 5 TO COOLER
- 6 DIRECT CLUTCH (3RD)
- 7 GOVERNOR
- 8 DRILLED & TAPPED HOLE (NON C3 ONLY)
- 9 SHIFT TV
- 10 CONVERTER FEED



H 125C-1

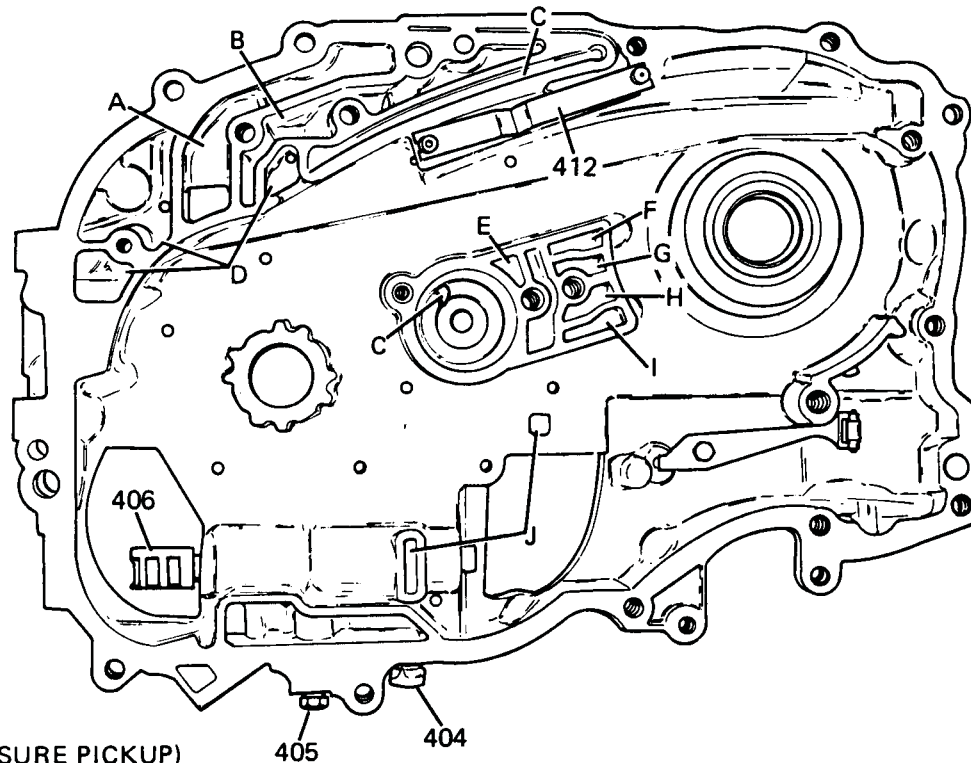
Figure A-8 Auxiliary Valve Body - Pump Side



H 125C-9

Figure A-9 Case Cover - Valve Body Side

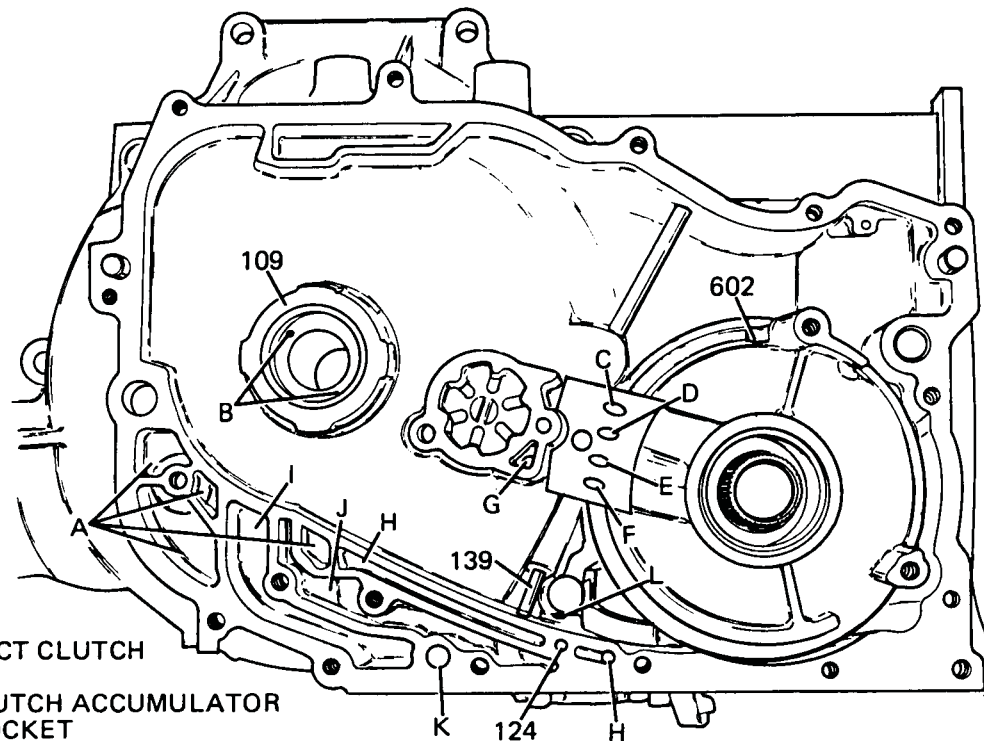




- A INTAKE
- B ACCUMULATOR, DIRECT CLUTCH
- C 2ND
- D VOID
- E LO - REVERSE
- F DIRECT CLUTCH
- G REVERSE
- H DRIVE
- I LUBE
- J EXHAUST
- 404 VENT ASSEMBLY
- 405 PLUG, PIPE (LINE PRESSURE PICKUP)
- 406 VALVE, MANUAL
- 412 THERMO-ELEMENT

H 125-137\*

Figure A-10 Case Cover - Case Side



- A VOID
- B DRAINBACK, SEAL
- C LUBE
- D DRIVE
- E REVERSE
- F DIRECT CLUTCH
- G LO - REVERSE
- H 2ND
- I INTAKE
- J ACCUMULATOR, DIRECT CLUTCH
- K GOVERNOR
- L EXHAUST, DIRECT CLUTCH ACCUMULATOR
- 109 SUPPORT, DRIVE SPROCKET
- 124 ACCUMULATOR, DIRECT CLUTCH (CUP PLUG)
- 139 PIPE, LO - REVERSE
- 602 SUPPORT, DRIVEN SPROCKET

H 125-291\*

Figure A-11 Case - Case Cover Side

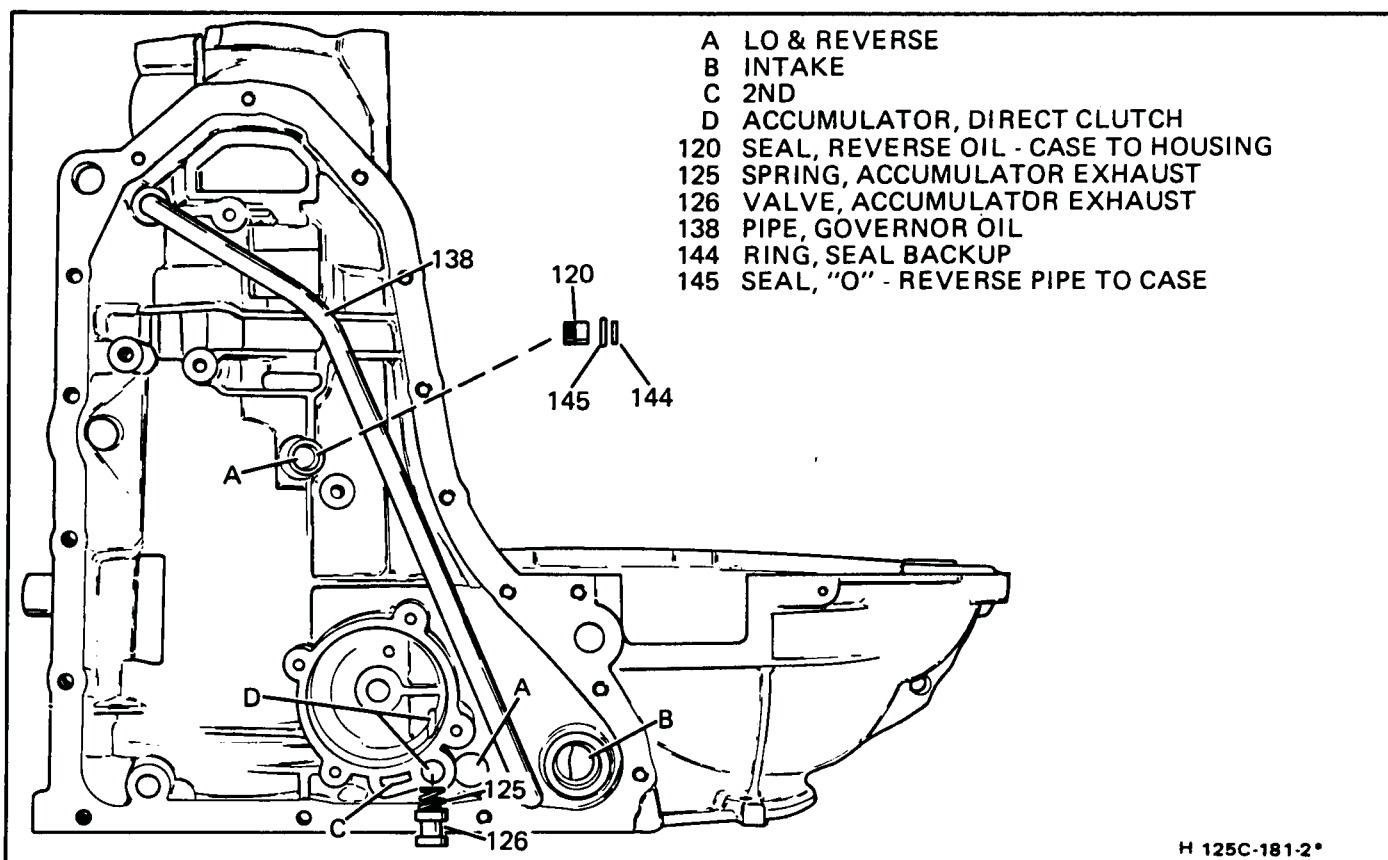


Figure A-12 Case - Oil Pan Side

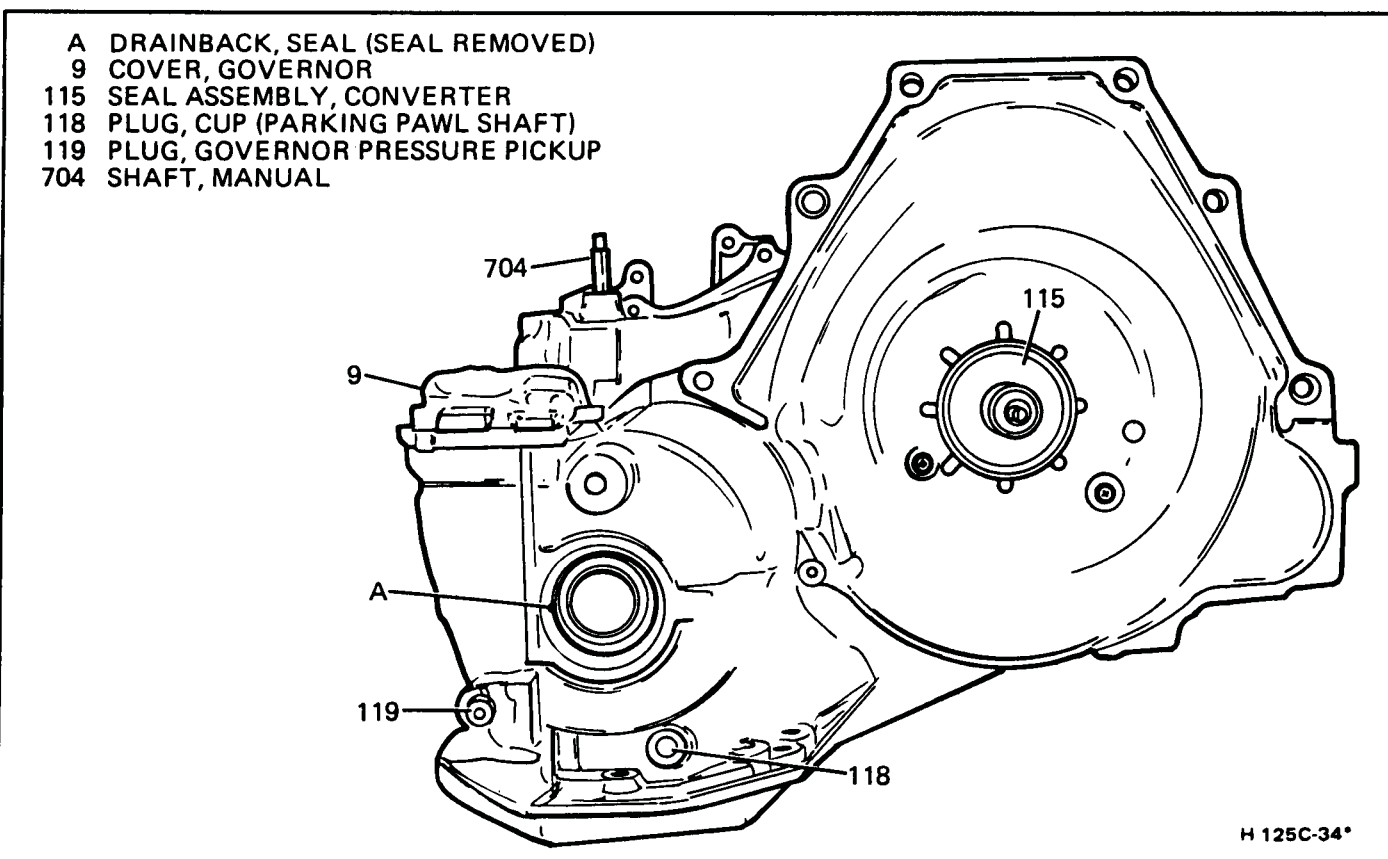


Figure A-13 Case - Right Hand Axle End

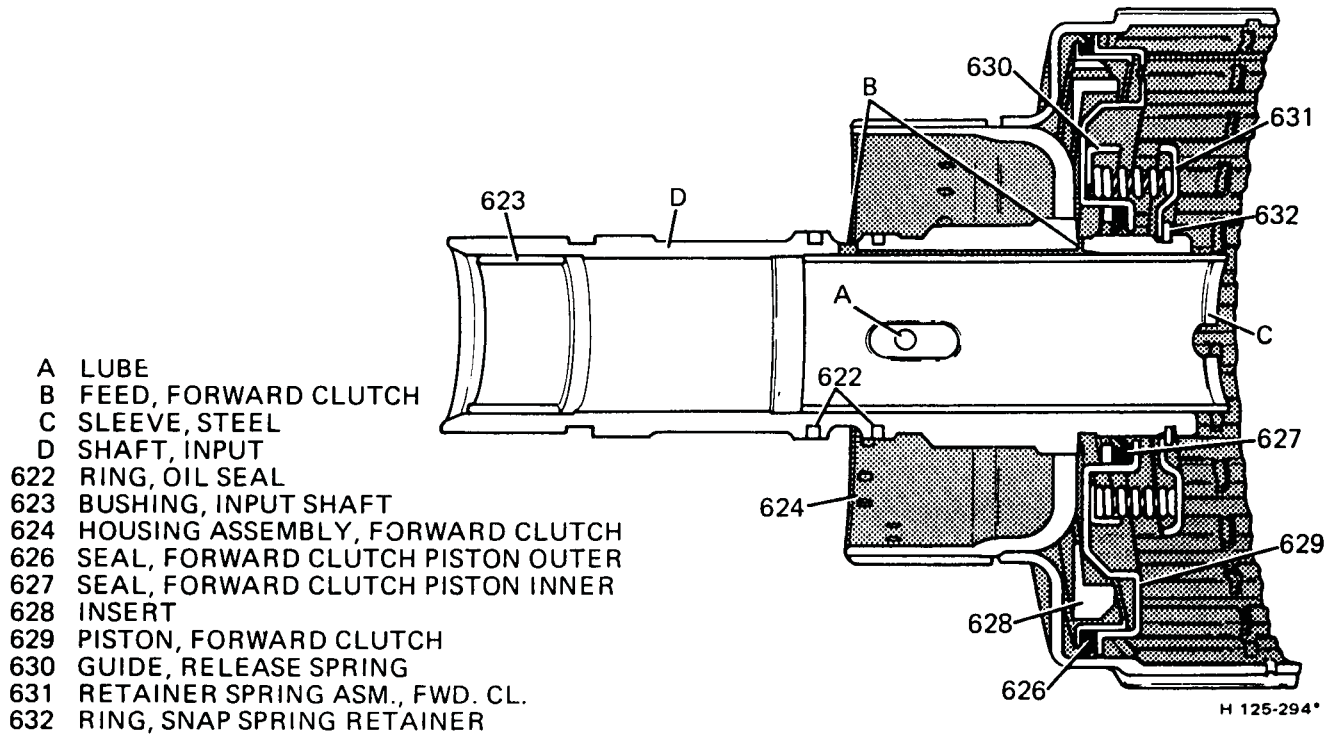


Figure A-14 Forward Clutch Assembly - Cut-Away View

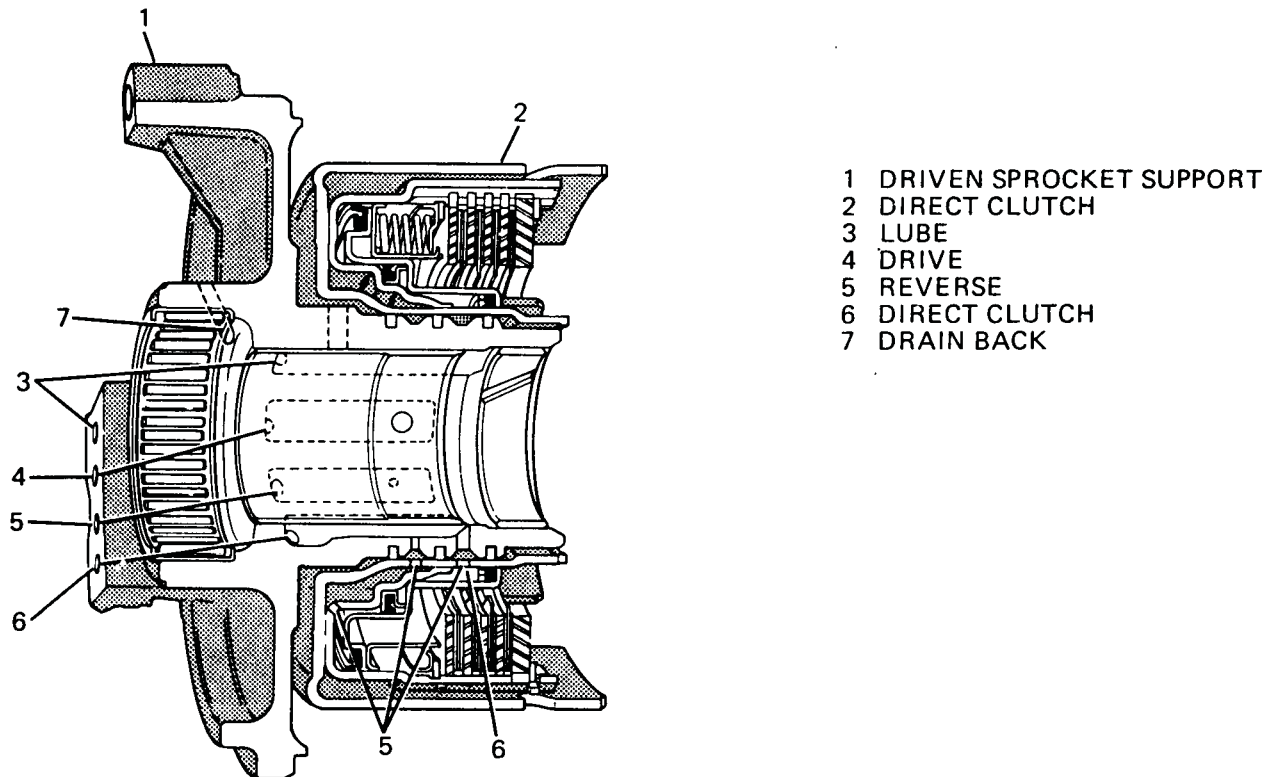
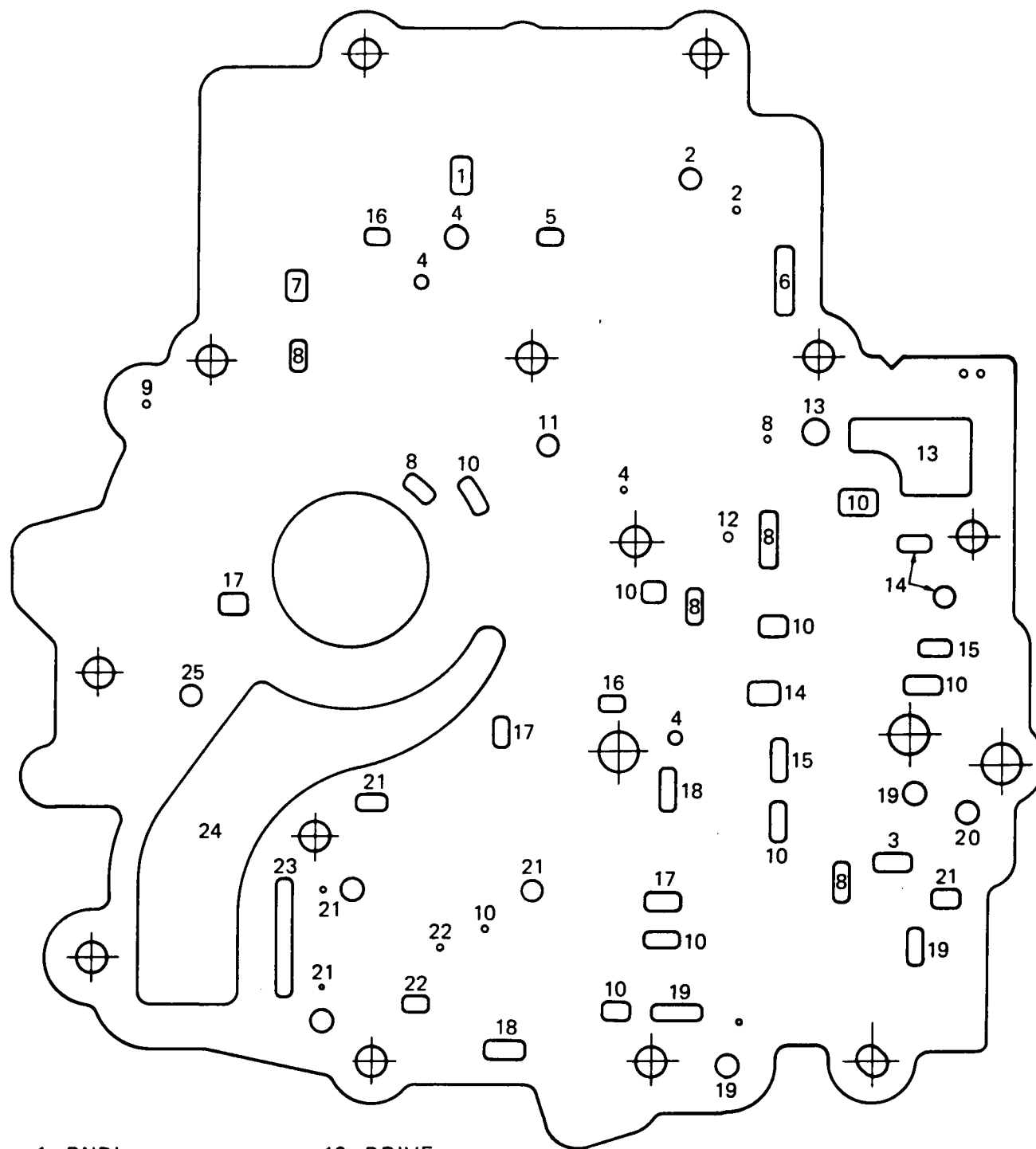


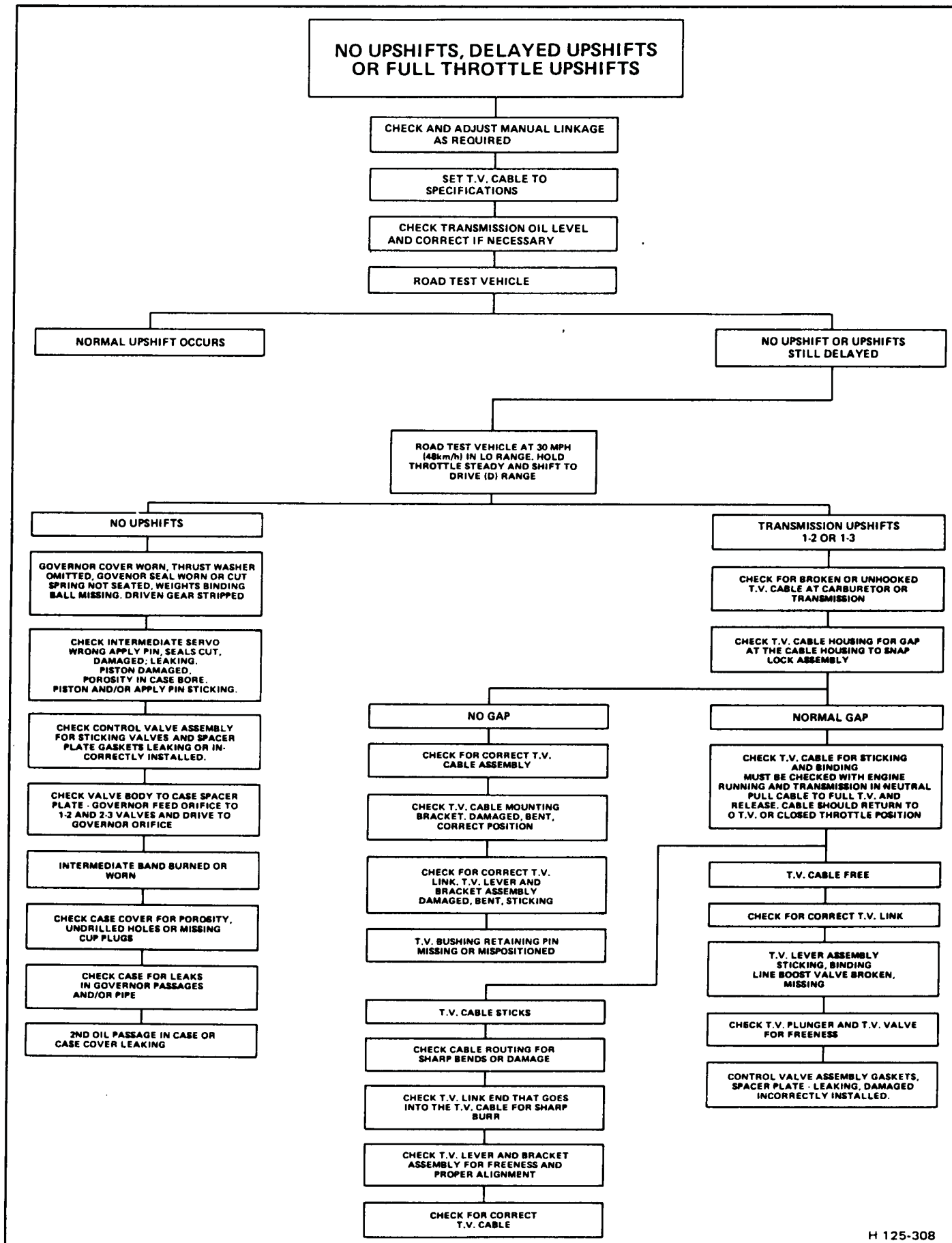
Figure A-15 Driven Sprocket Support - Cut-Away View



- |                  |                 |                             |
|------------------|-----------------|-----------------------------|
| 1 RNDI           | 10 DRIVE        | 19 LO - 1ST OR REV.         |
| 2 T.V.           | 11 T.C.C. APPLY | 20 3RD CL. (DIRECT) OR REV. |
| 3 LO - 1ST       | 12 RND          | 21 3RD CL. (DIRECT)         |
| 4 DETENT         | 13 S.T.V. EXH.  | 22 GOVERNOR                 |
| 5 REVERSE        | 14 1-2 ACCUM.   | 23 3RD CL. (DIRECT) ACCUM.  |
| 6 LINE           | 15 LUBE         | 24 SUCTION                  |
| 7 INTERMEDIATE   | 16 P.T.V.       | 25 TO COOLER                |
| 8 S.T.V.         | 17 LO           |                             |
| 9 T.C.C. EXHAUST | 18 2ND          |                             |

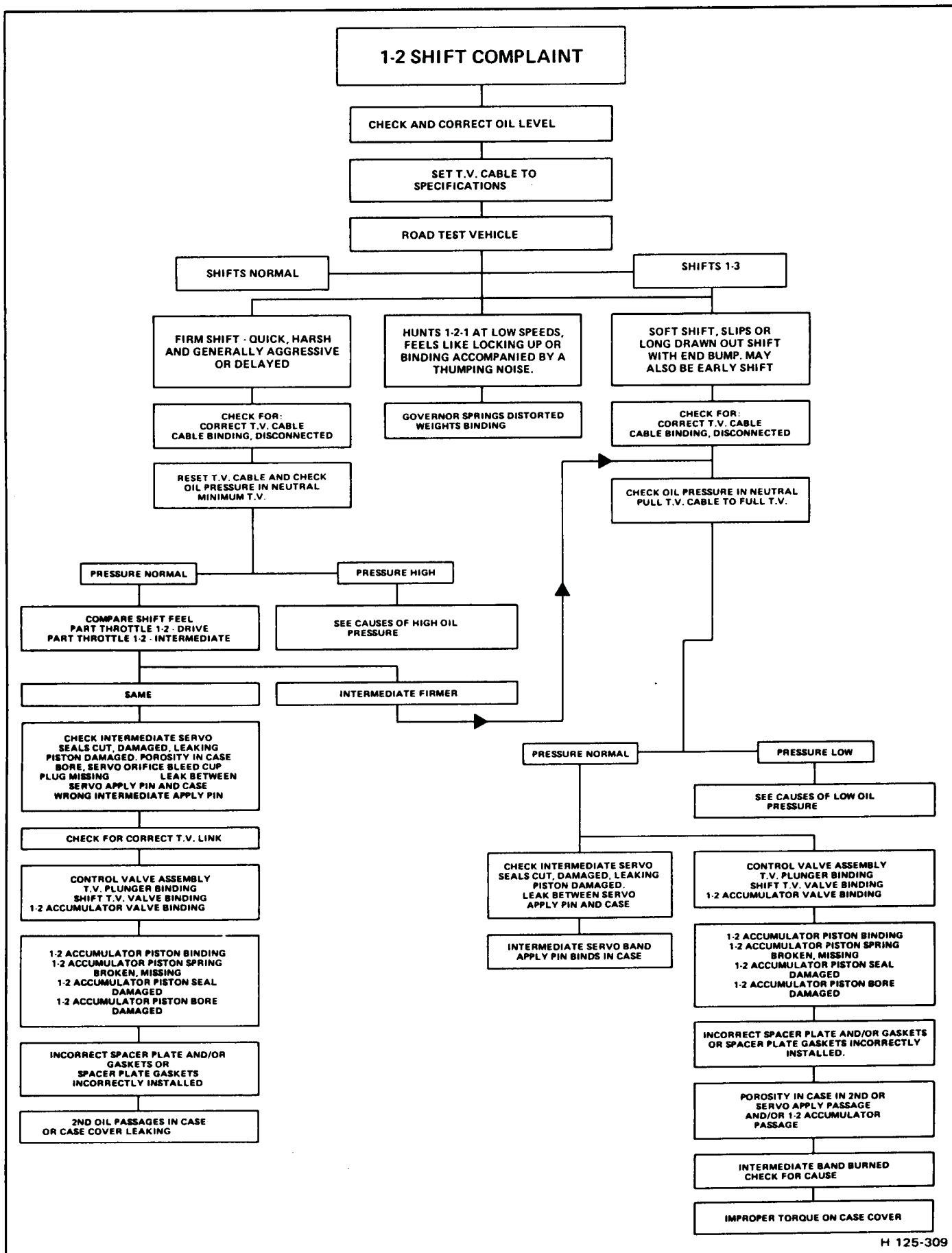
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Figure A-16 Valve Body Spacer Plate - Typical



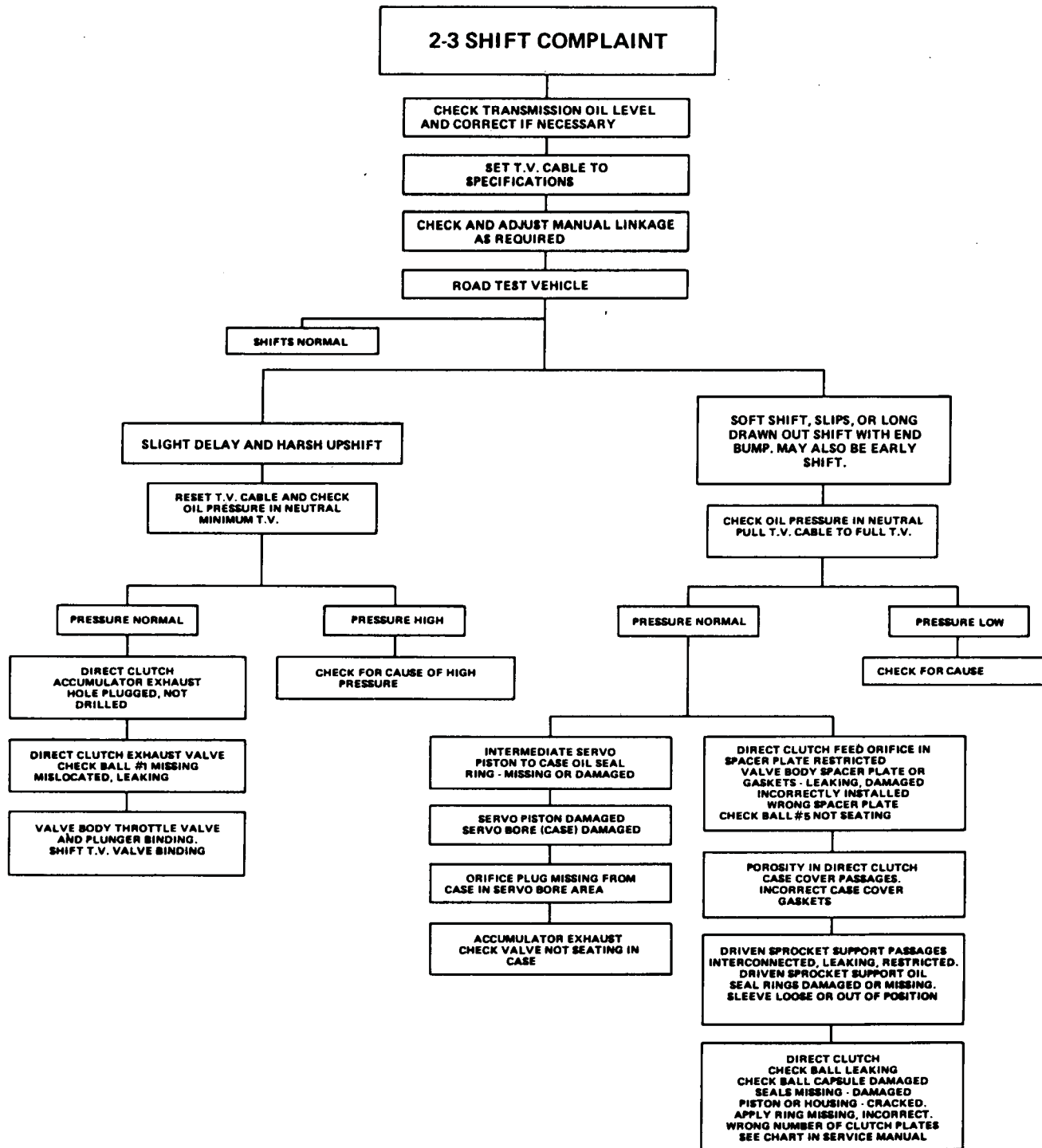
H 125-308

Figure A-17 Upshift Complaint



H 125-309

Figure A-18 1-2 Shift Complaint



H 125-310

Figure A-19 2-3 Shift Complaint



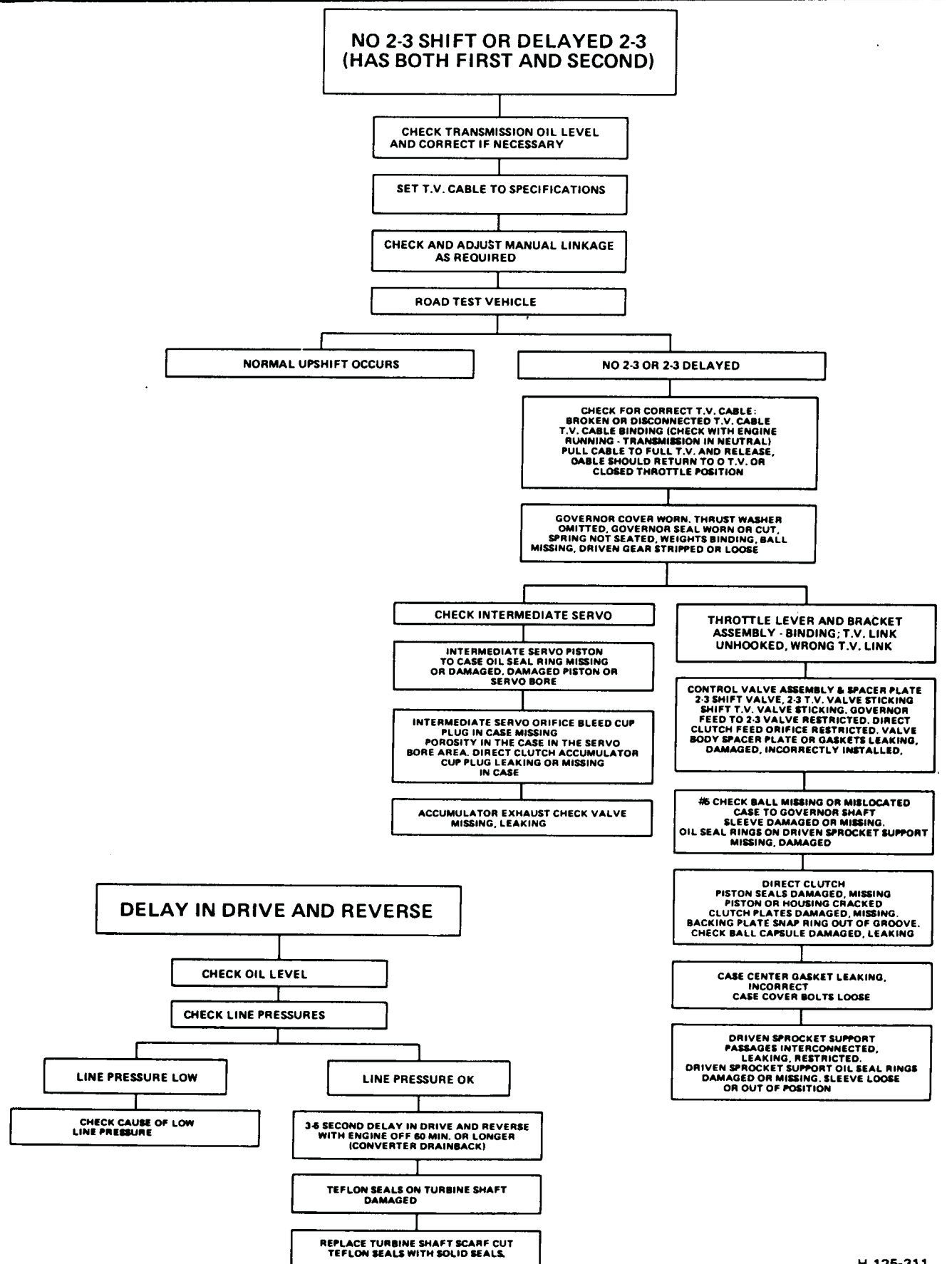
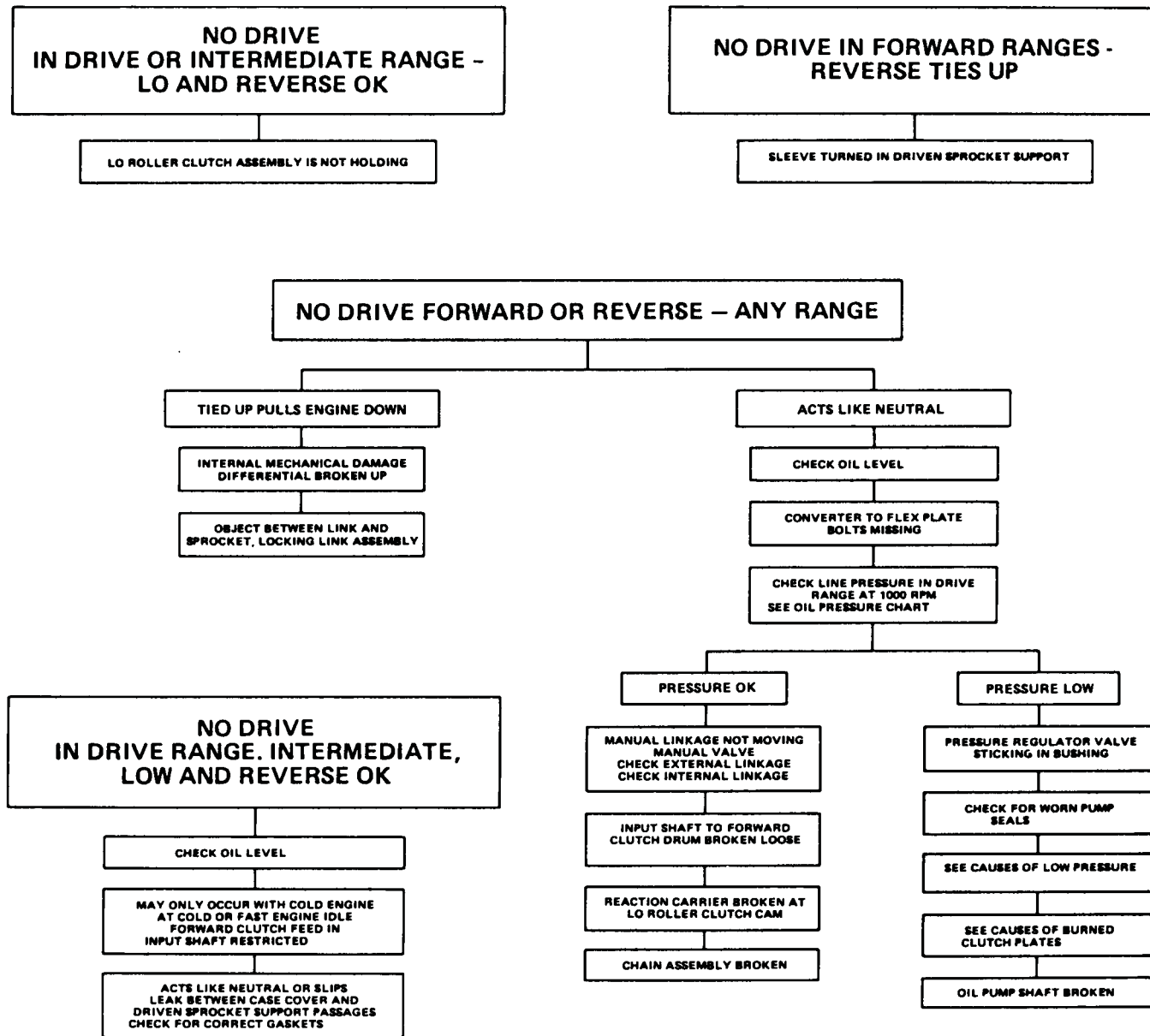
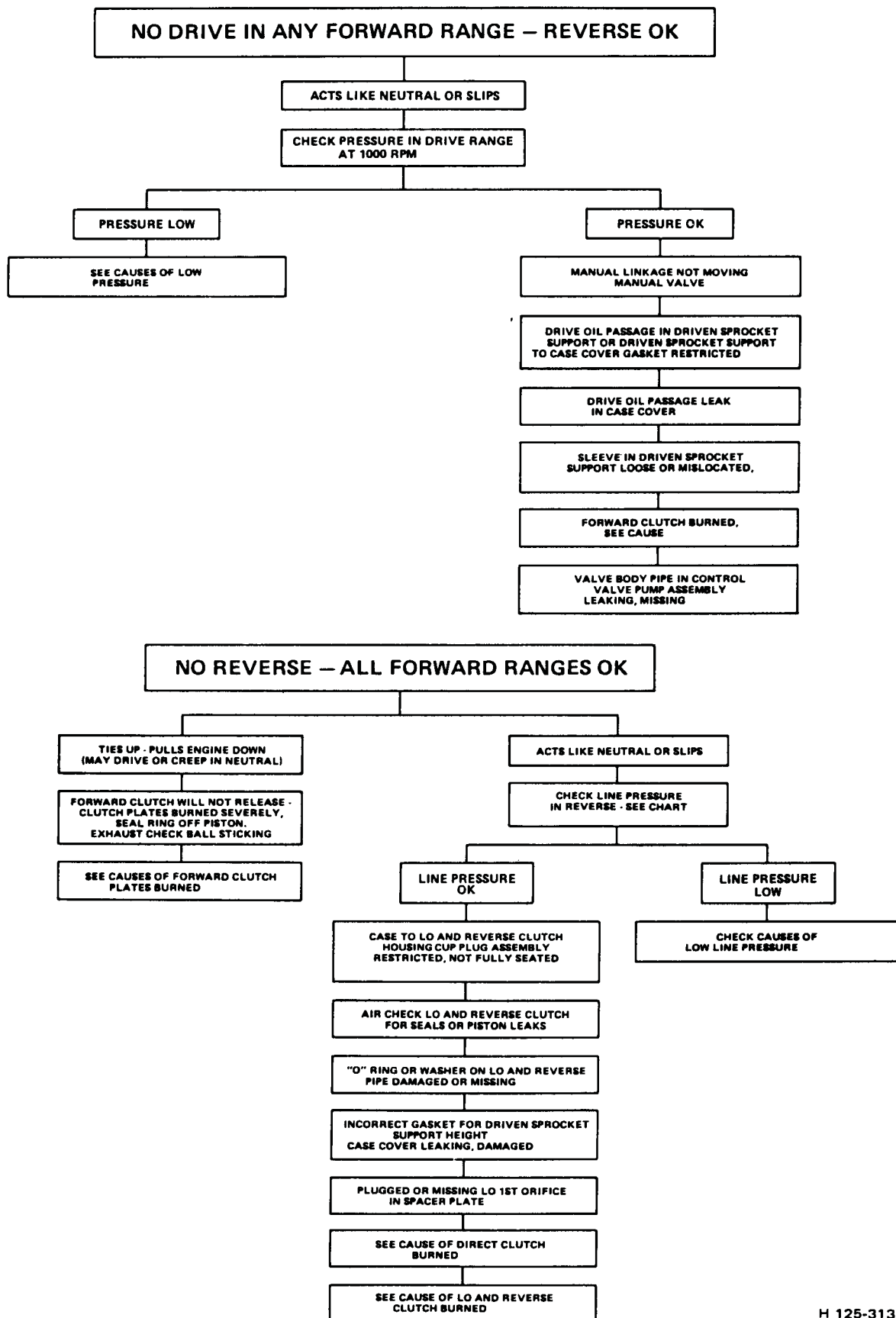


Figure A-20 No 2-3 or Delayed 2-3



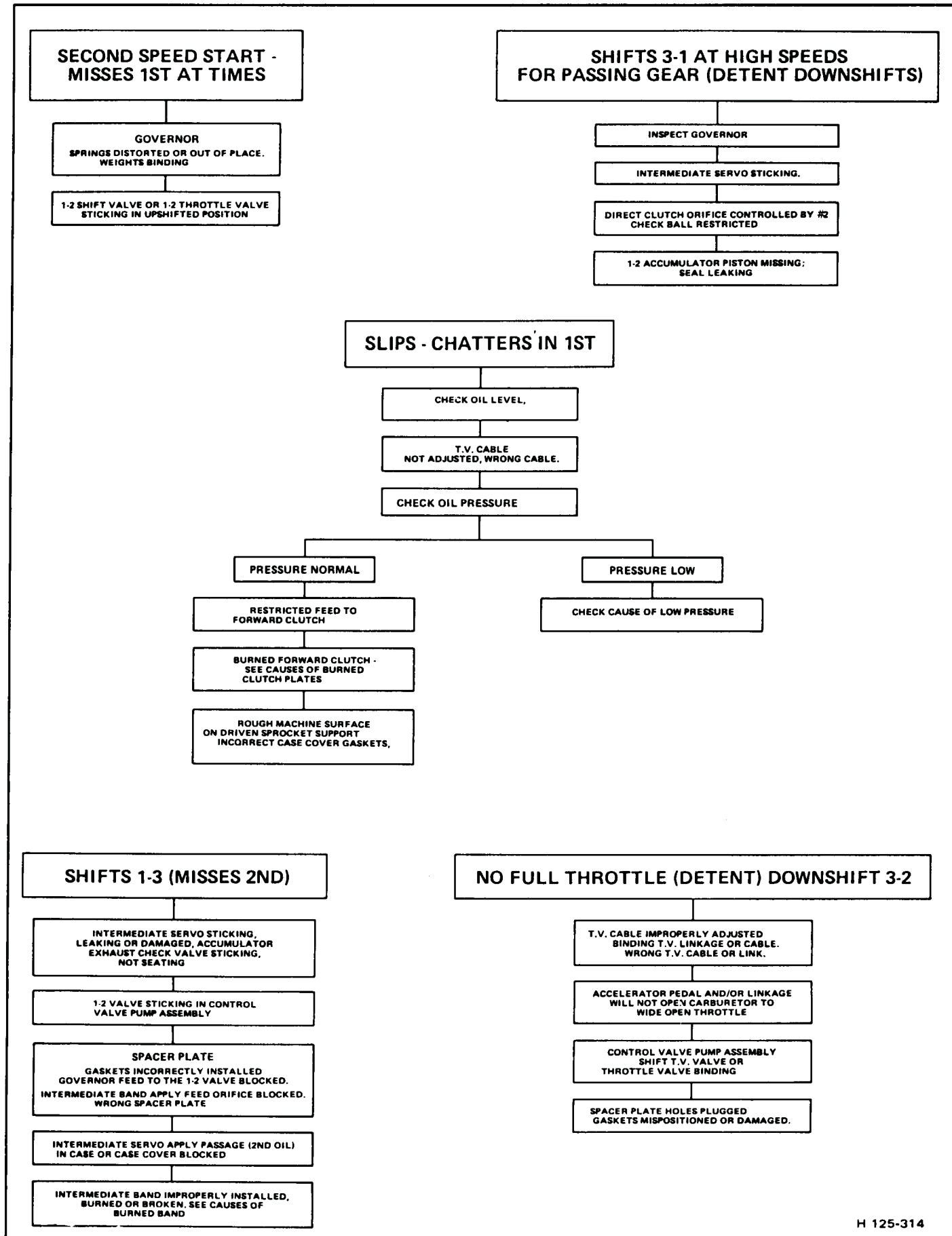
H 125-312

Figure A-21 No Drive



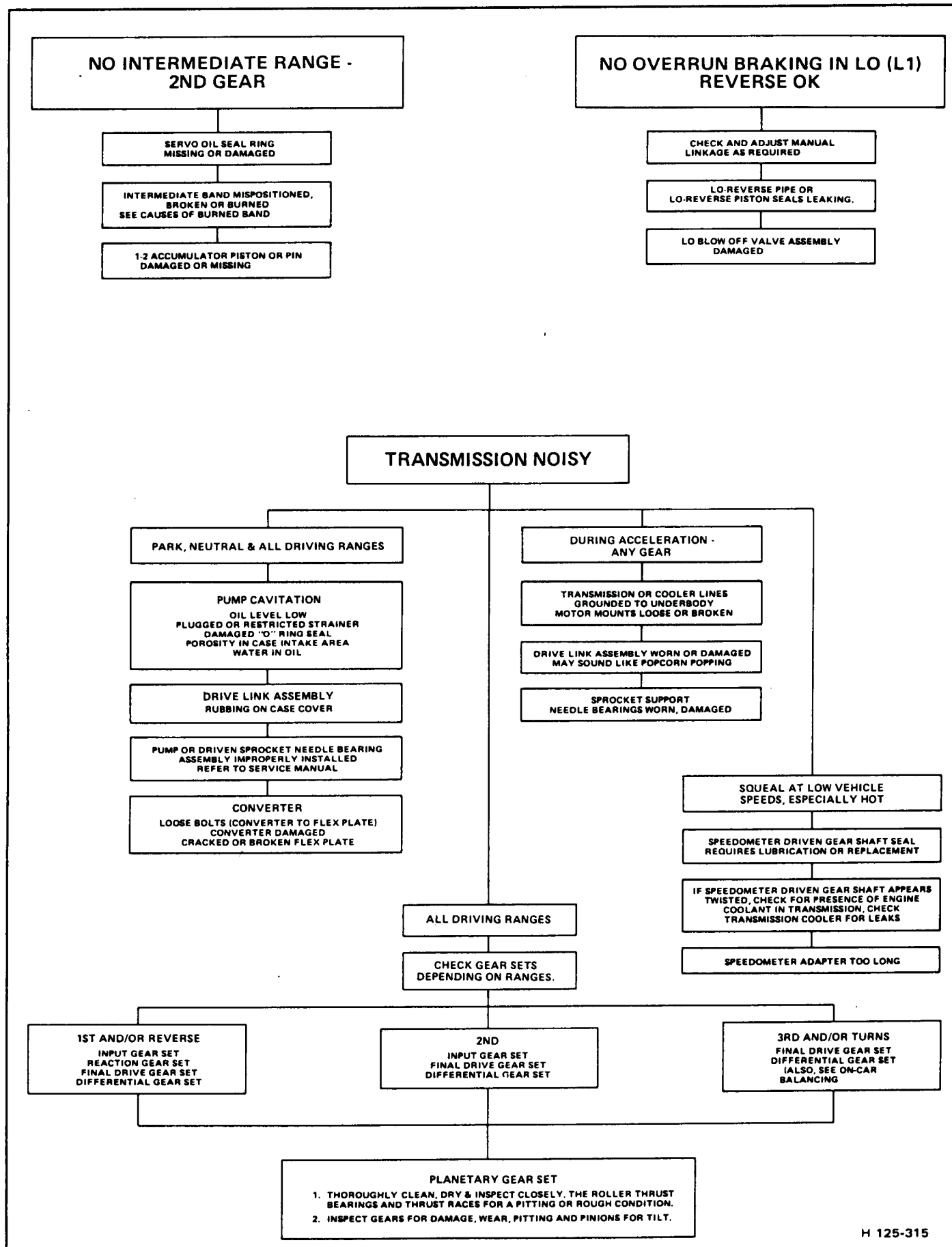
H 125-313

Figure A-22 No Reverse



H 125-314

Figure A-23 Shift Complaint



H 125-315

Figure A-24 Transmission Noisy

## DISASSEMBLY

### Remove or Disconnect

1. J-21366 Converter holding strap
2. Converter (1)

### Install or Connect (Figure 1)

Tools Required:

- J-28664 - Transaxle Holding Fixture
- J-3289-20 - Fixture Base

**CAUTION:** To reduce the possibility of personal injury or transaxle damage, make sure, when doing the next step, that all the bolts for the support fixture J-28664 are installed as shown and torqued to 11 N·m (8 ft.-lbs.).

1. J-28664 fixture
2. Fixture into J-3289-20 base
3. Drain the transmission fluid.

## Governor Assembly

### Remove or Disconnect (Figure 2)

1. Bolt (14 and retainer (13)
2. Speedo sleeve (12) and gear (10)
3. Screws (8)
4. Governor cover (9) and "O" ring (7)
5. Bearing (6)
6. Gear (5)
7. Governor assembly (4)

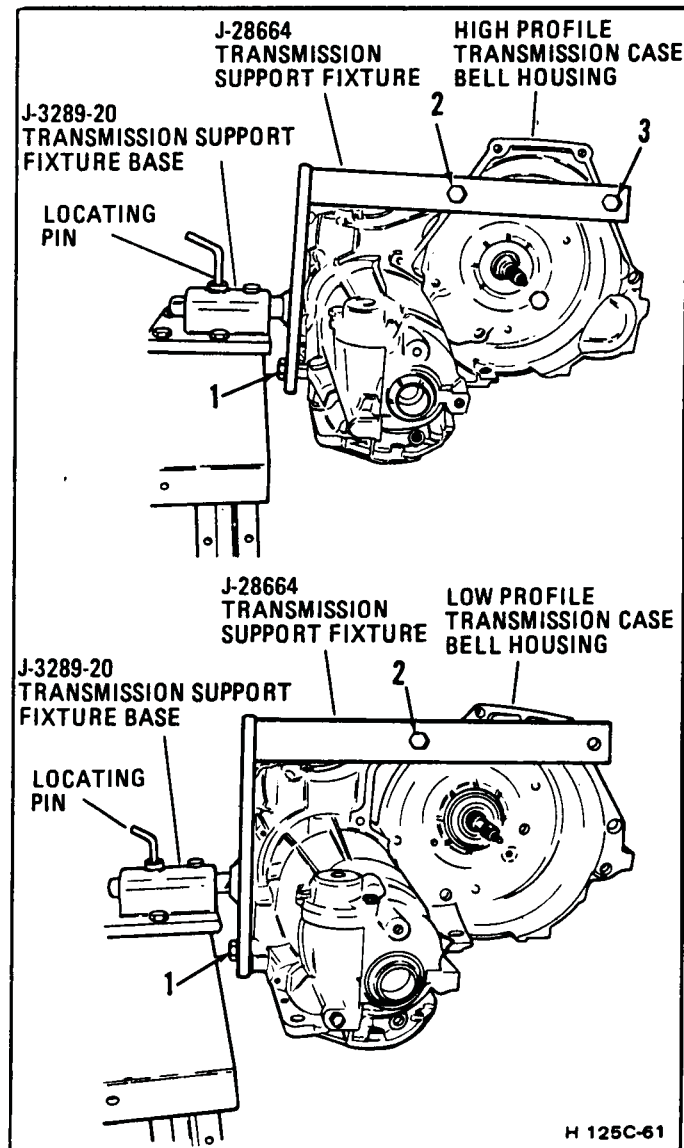


Figure 1 Transaxle in Holding Fixture

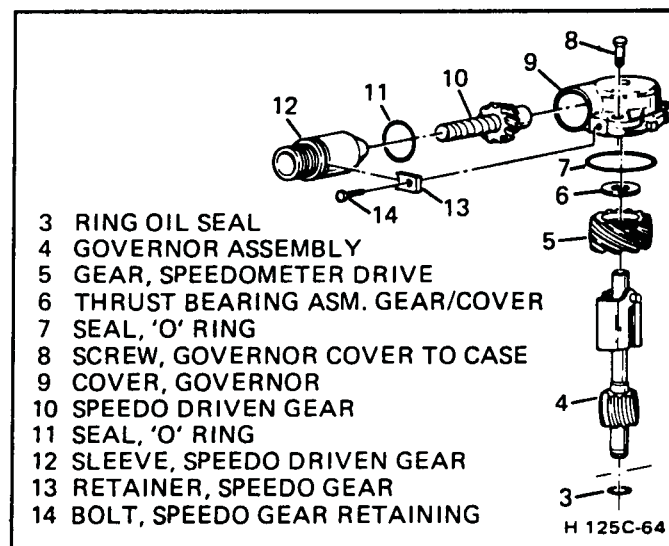
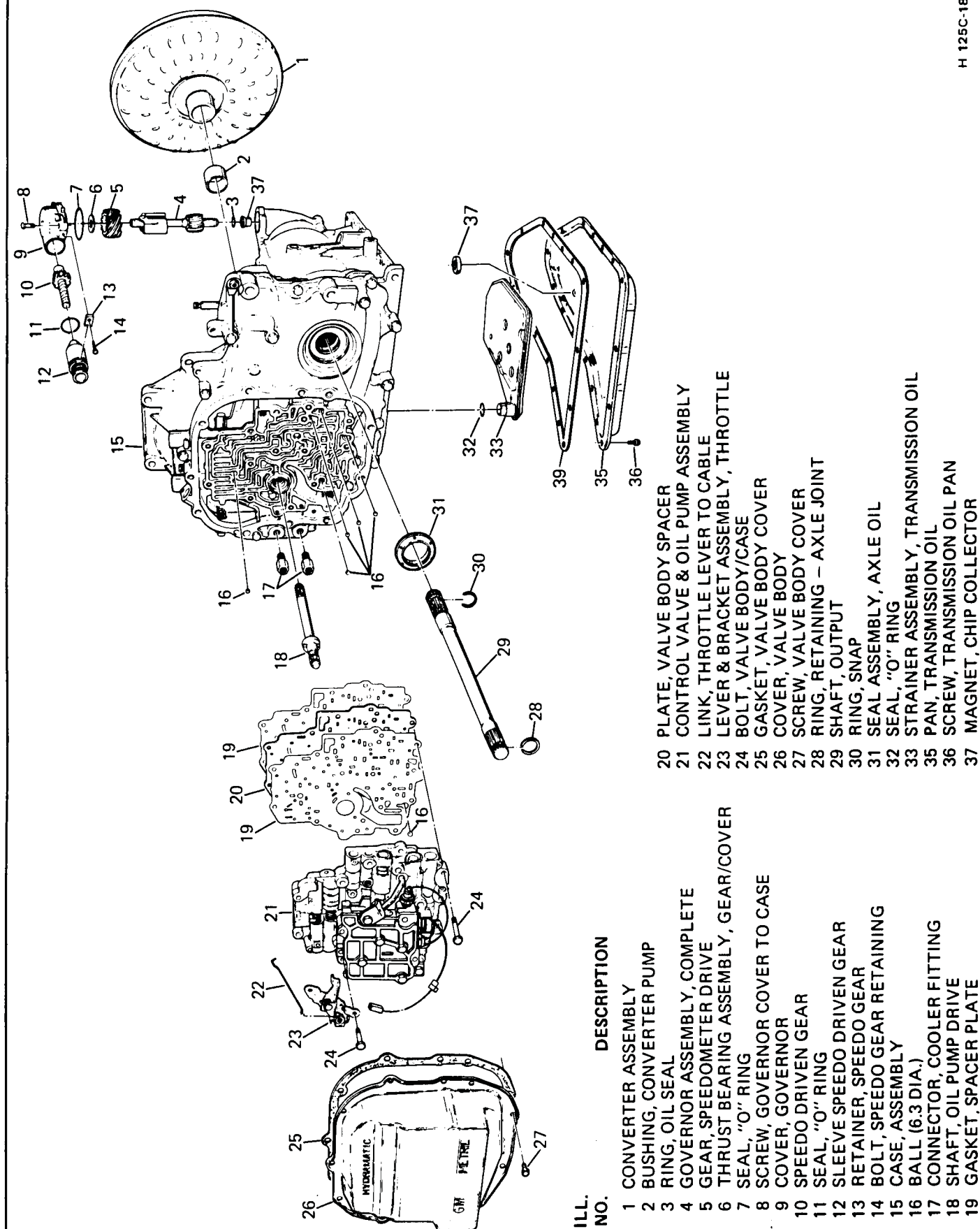


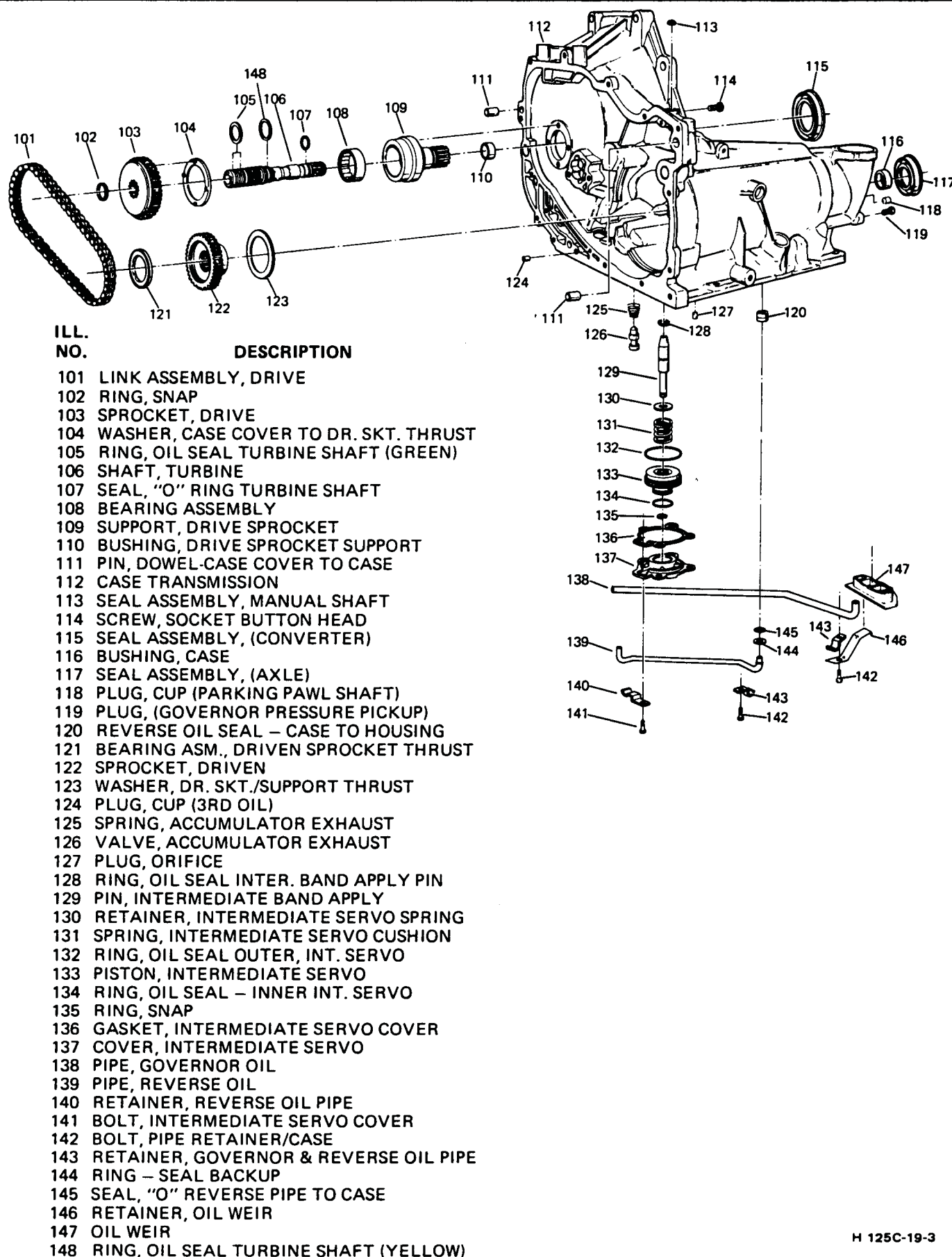
Figure 2 Governor Assembly



H 125C-18-3

Figure 3 External Components





H 125C-19-3

Figure 4 Drive Link Assembly, Servo, Oil Pipes

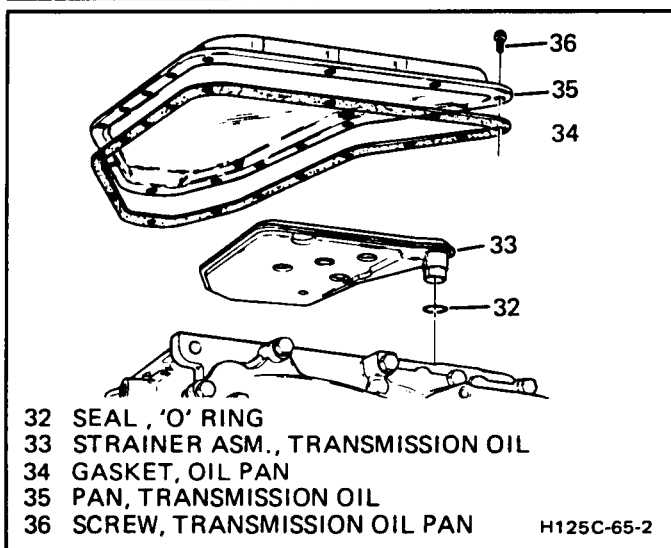


Figure 5 Bottom Pan &amp; Oil Strainer

**Bottom Pan, Oil Strainer, Oil Pipes****↔ Remove or Disconnect (Figures 3 and 5)**

1. Bolts (36)
2. Pan (35) — Leave two bolts in place finger tight — tap with a rubber mallet to break the R.T.V. sealant bead or gasket set.
3. Strainer (33) and "O" ring (32)

**↔ Remove or Disconnect (Figures 4 and 6)**

1. Bolts (141) and (142)
2. Brackets (140) and retainers (143)
3. Servo cover (137) and gasket (136)
4. Servo assembly (129 - 135)
5. "E" ring (135) from pin (129)
6. Pin (129) from piston (133)

**📏 Measure (Figures 7 and 8)**

Tool Required:

J-28535 Intermediate band apply pin gage

1. Install J-28535 on case (112) and pin (129) into the gage.
2. With a torque wrench apply 11.2 N·m (100 inch pounds) of torque.
3. If the white line appears in the window the pin length is correct.
  - If the white line does not appear, select another length pin. (Figure 6) Repeat procedure.
4. Remove pin gage.

**↔ Remove or Disconnect (Figures 9 & 10)**

1. Bolt (712)
2. Stop bracket (711)
3. Bracket (710)
4. Bolts (146)
5. Weir (147)
6. Check valve (126) and spring (125)
7. Pipe (139), backup ring (144) and "O" Ring (145)

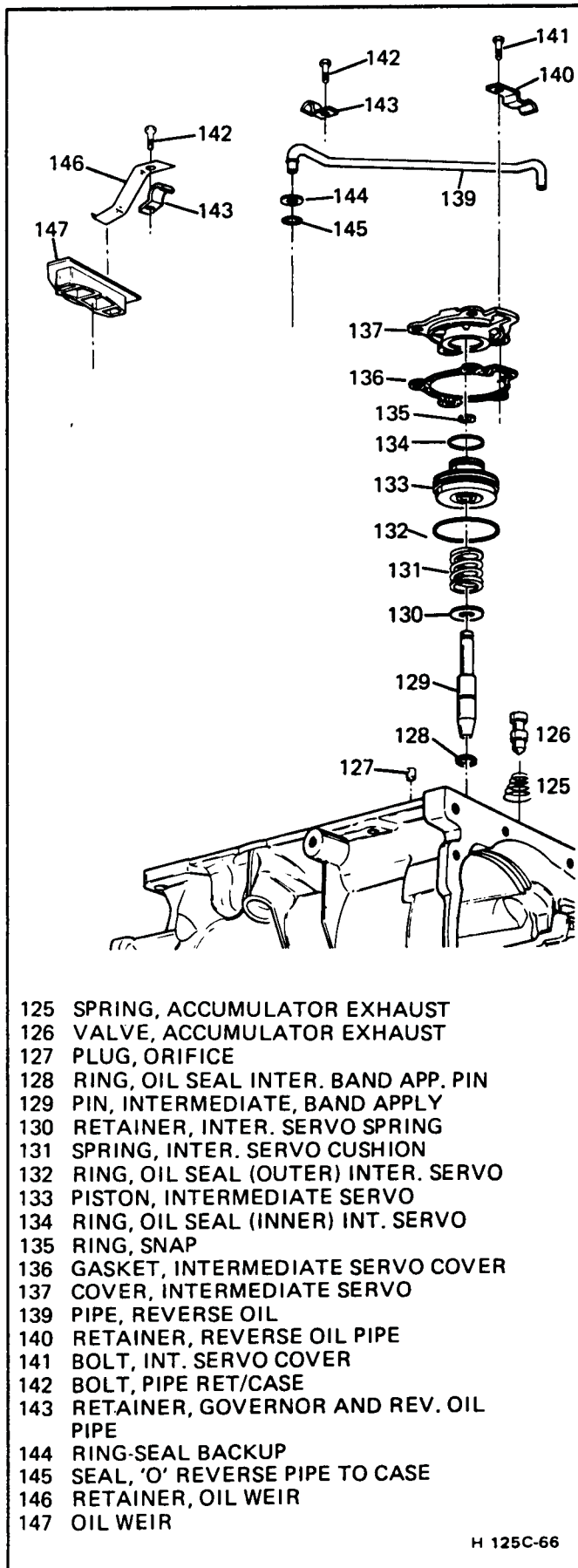


Figure 6 Oil Pipes &amp; Servo Assembly

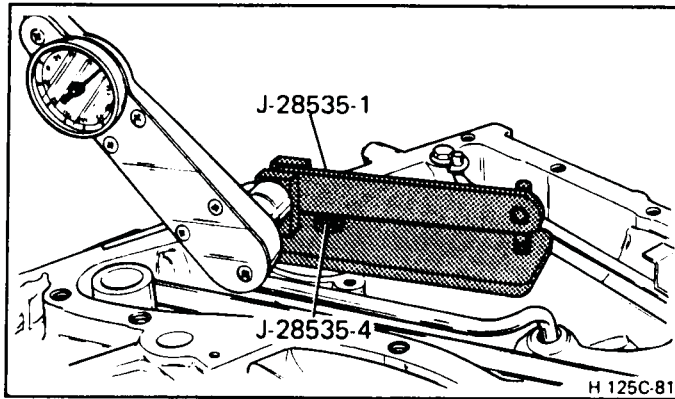


Figure 7 Checking for Proper Apply Pin

INTERMEDIATE BAND APPLY PIN	
LENGTH	IDENTIFICATION
Short .....	2 Grooves
Medium .....	1 Groove
Long .....	No Grooves

H 125-317

Figure 8 Apply Pin Chart

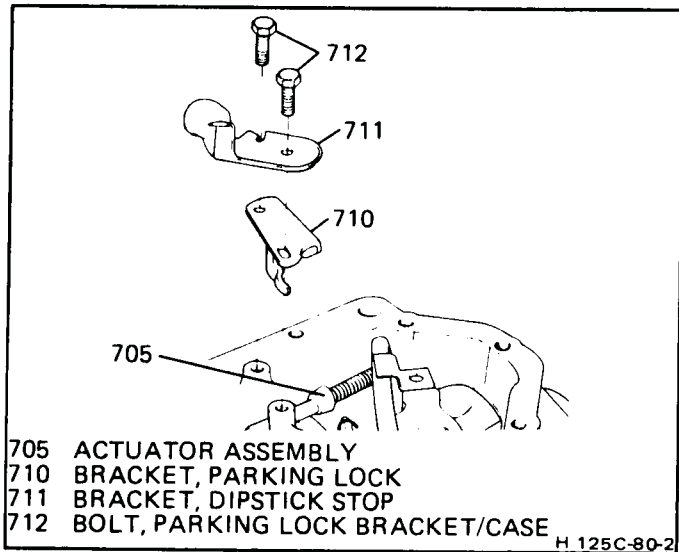


Figure 9 Dip Stick Stop & Brackets

## LOW AND REVERSE SEAL AND OUTPUT SHAFT

↔ Remove or Disconnect (Figure 11 & 12)

Tool Required:

J-28583 - "C" ring remover, output shaft  
Modified No. 4 screw extractor

1. Lo and reverse seal (120)
  - Use a modified No. 4 screw extractor
2. Output shaft "C" ring (30) with J-28583
  - Push ring with remover - rotate shaft (29) - pull the ring with needle nose pliers
3. Output shaft (29) from case

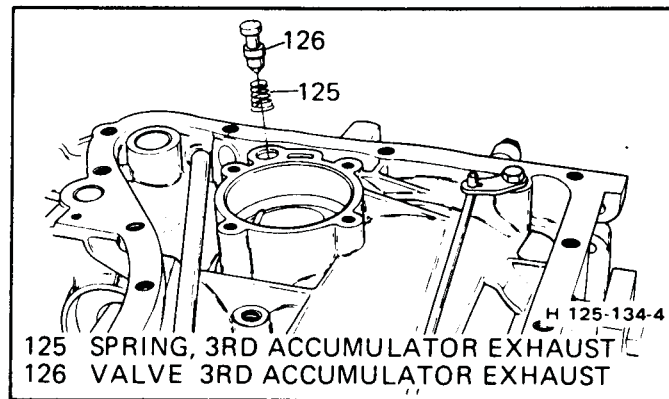


Figure 10 3rd Accumulator Exhaust Valve & Spring

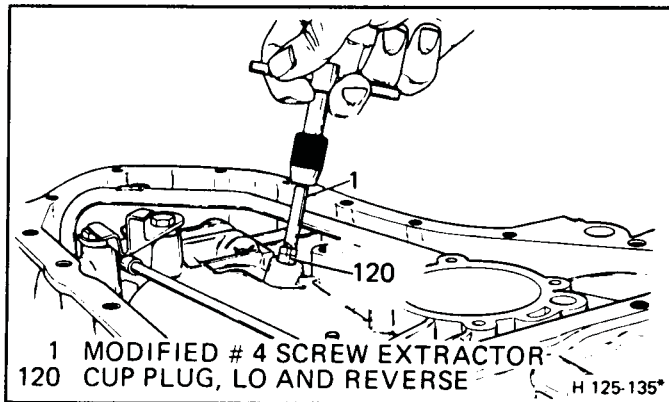


Figure 11 Lo & Reverse Cup Plug

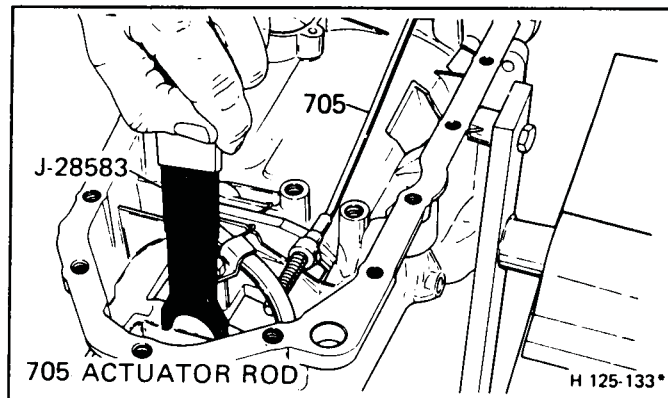


Figure 12 Expanding "C" Ring

## SIDE COVER AND CONTROL VALVE PUMP ASSEMBLY

↔ Remove or Disconnect (Figures 13 and 14)

1. Screws (27) (Leave two screws finger tight - tap the cover (26) with rubber mallet.)
2. Cover (26)
3. Bolts (24) - Do not remove the screw marked "A" (Figure 14)
4. Bracket assembly (23) and T.V. cable link (22)
5. Valve body (21) - Do not place the machined side on the bench
6. Number one check ball (16)
7. Pump shaft (18)
8. Spacer plate (20) and gaskets (19)
9. Five check balls (Figure 15)

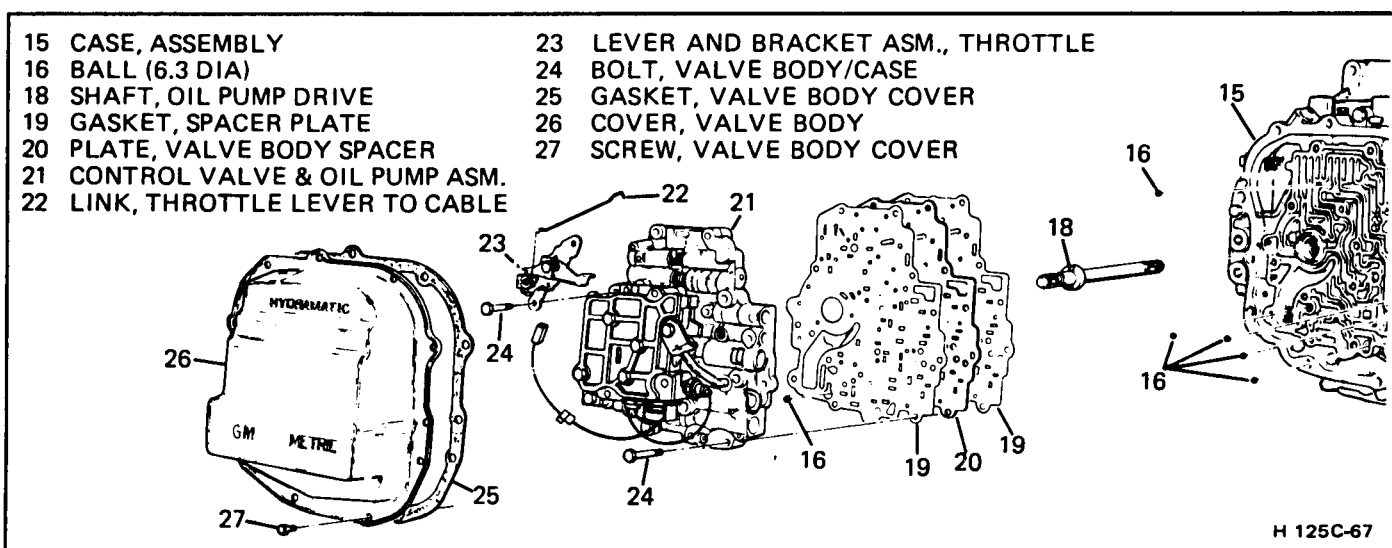


Figure 13 Side Cover &amp; the Control Valve, Pump Assembly

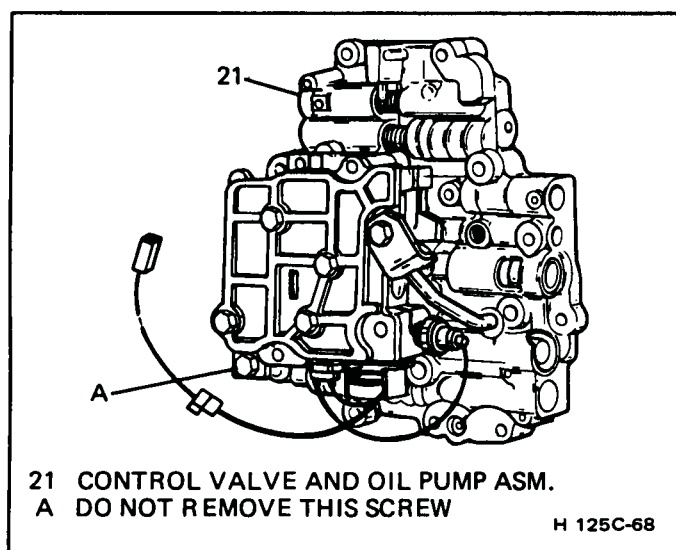


Figure 14 Control Valve/Pump Assembly

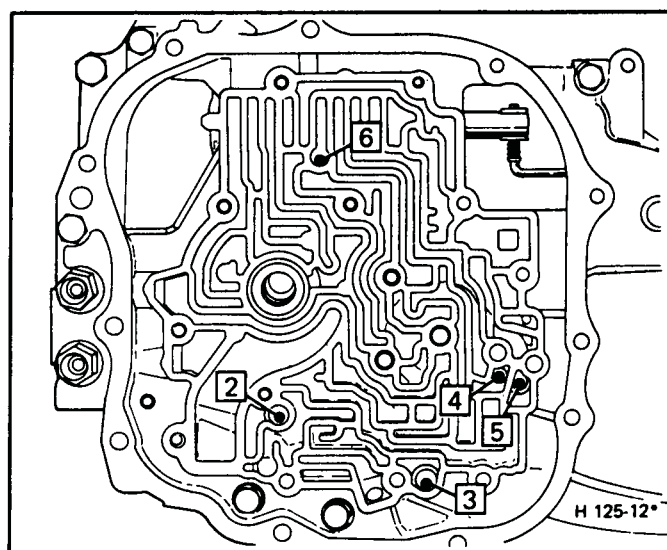


Figure 15 Check Ball Locations

## Input Shaft to Case Cover Selective Snap Ring End Play Check



**Measure** (Figures 16, 17 and 18)

Tools required:

- J-26958-10 Adapter Plug
- J-26958 Loading tool
- J-26958-11 Bracket
- J-28544 Input shaft lifter
- J-25025-7 Dial indicator post
- ( J-26900-12 or 58001 (M) dial indicator )

1. Install the adapter plug J-26958-10, loading tool J-26958 and bracket J-26958-11.  
Tighten the loading tool knob until tight.
2. Install the dial indicator set and lifter.
3. Push the lifter down then zero the dial indicator.
4. Pull the lifter up.
5. Reading should be 0.10-0.84 mm (.004"-0.33"). See Figure 18. For choice of selective snap rings for proper end play ranges - record the reading.
6. Remove the dial indicator set and the lifter.

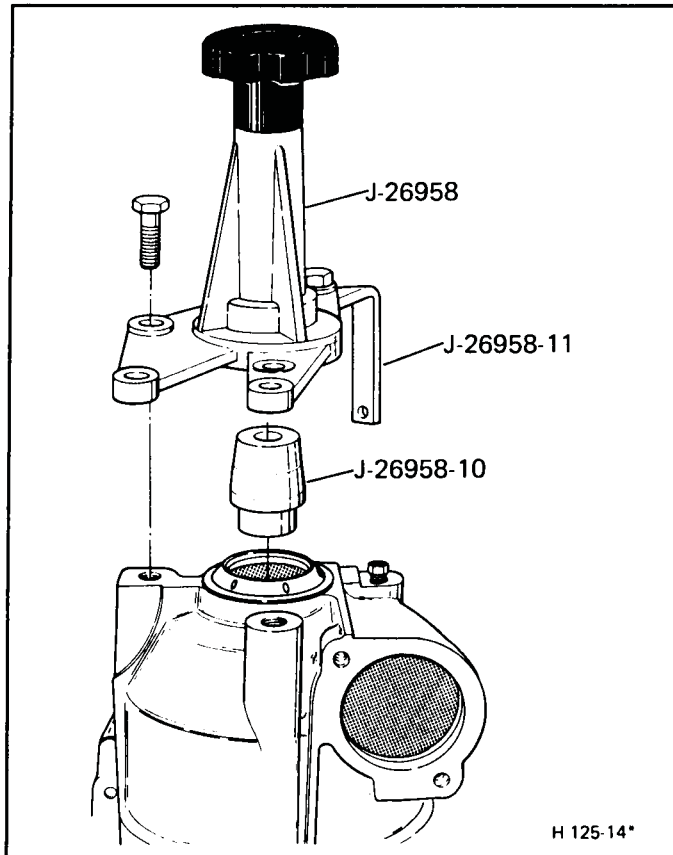


Figure 16 Output Shaft Loading Tool

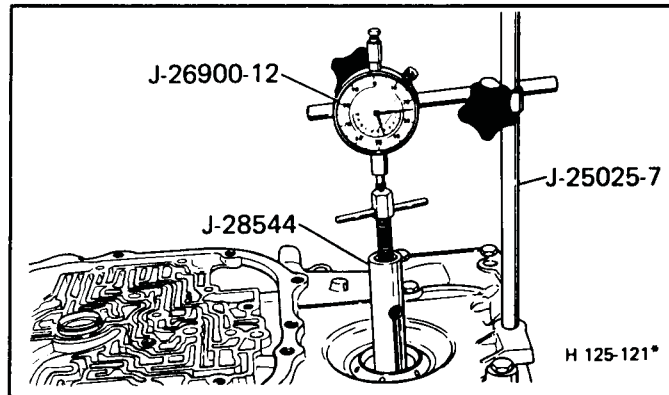


Figure 17 Input Shaft to Case Cover End Play

### INPUT SHAFT SELECTIVE SNAP RING (621)

Thickness	Identification/Color
1.83 - 1.93mm (0.071" - 0.076")	White
2.03 - 2.13mm (0.078" - 0.084")	Blue
2.23 - 2.33mm (0.088" - 0.092")	Brown
2.43 - 2.53mm (0.095" - 0.099")	Yellow
2.63 - 2.73mm (0.103" - 0.107")	Green

H 125-318

Figure 18 Selective Snap Ring Chart

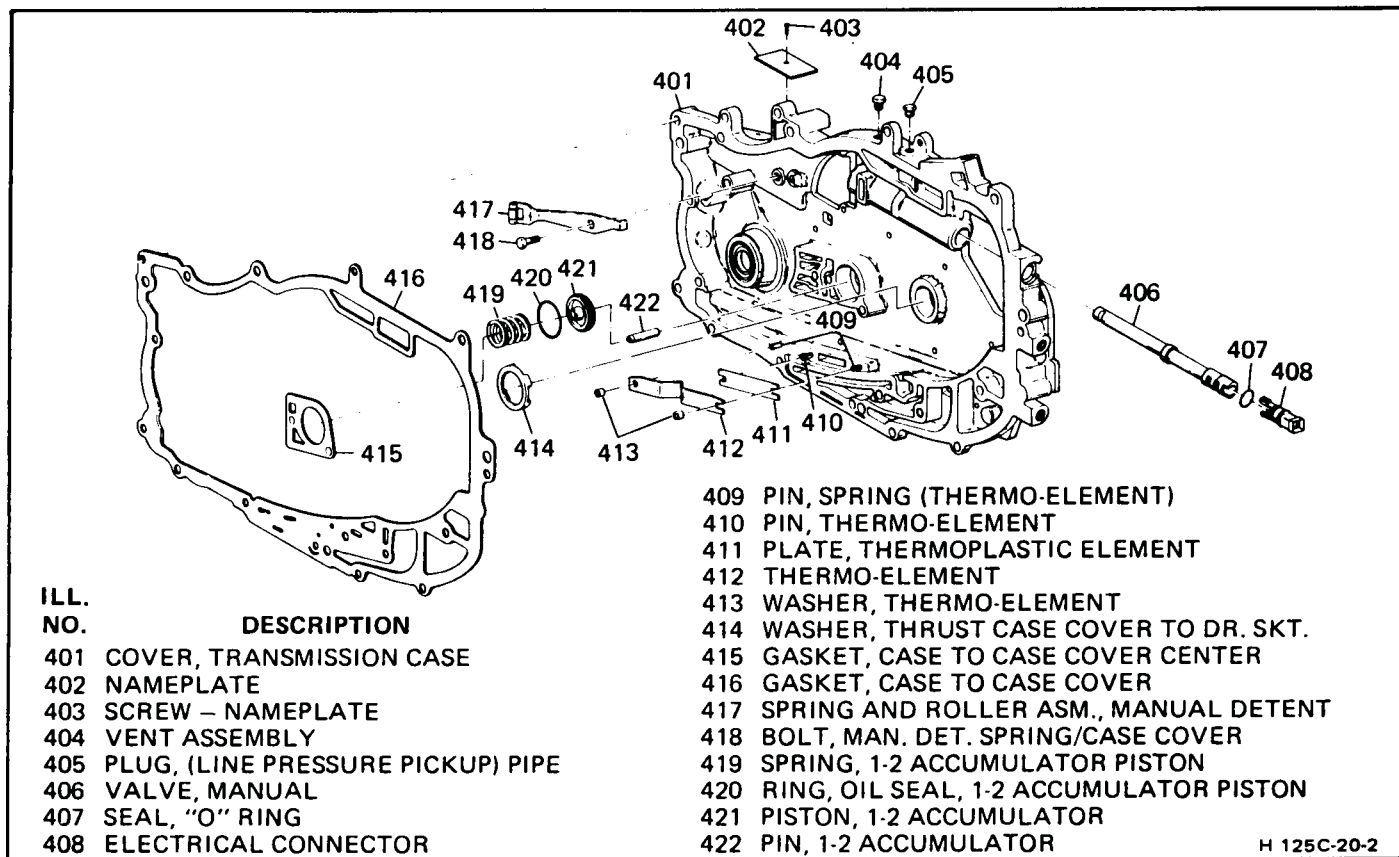


Figure 19 Case Cover - Case Side



# Case Cover

## Remove or Disconnect (Figures 19, 20, 21, and 22)

### Tools Required:

Two M12 bolts 50 mm (2" long)

1. Rod (70) from manual valve (406)
  2. All case cover attaching bolts including 2 TORX ® head bolts
    - Install two (2) M12 bolts 50 mm (2") long into dowel pin holes. Bolts will: self tap, bottom and separate the case (112) and the cover(401). Alternate tightening of the bolts.
- DO NOT PRY CASE COVER (401).**

- Place the case cover (401) on the bench, 1-2 accumulator side up.

3. Accumulator spring (419)
4. Piston (421)
5. Gasket (415)
6. Drive sprocket thrust washer (414)
7. Driven sprocket thrust washer (121)
8. Turbine shaft "O" ring (Figure 21)
9. Link assembly (101), drive and driven sprockets (103) (122)
10. Drive sprocket support thrust washer (104)
11. Driven sprocket support thrust washer (123)

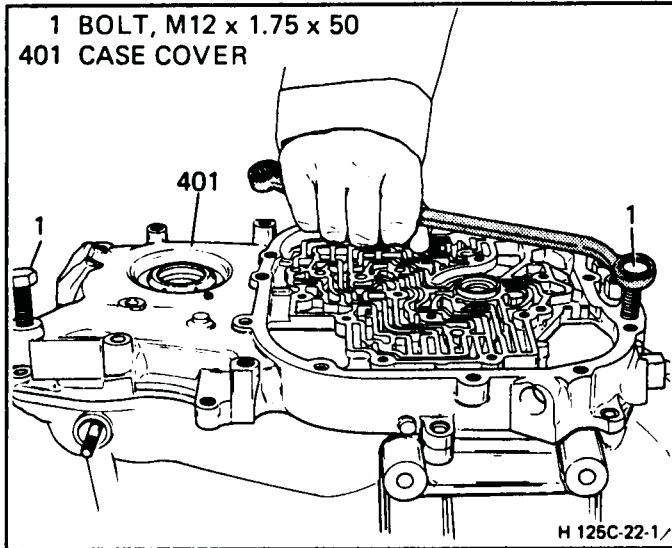


Figure 20 Case Cover Removal

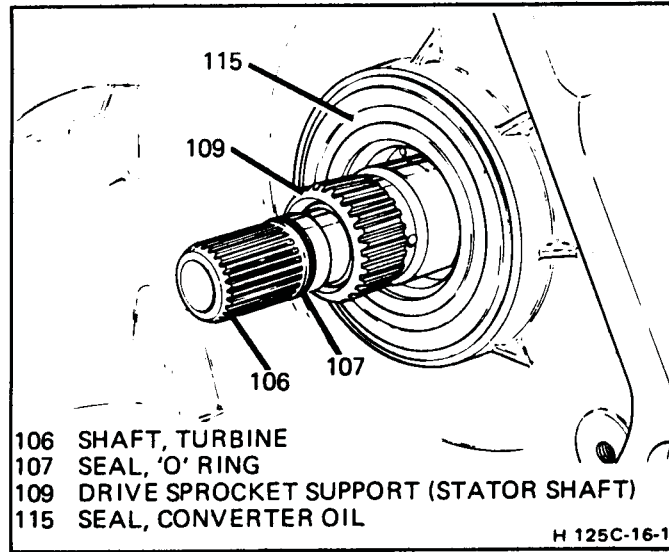


Figure 21 Turbine Shaft "O" Ring Seal

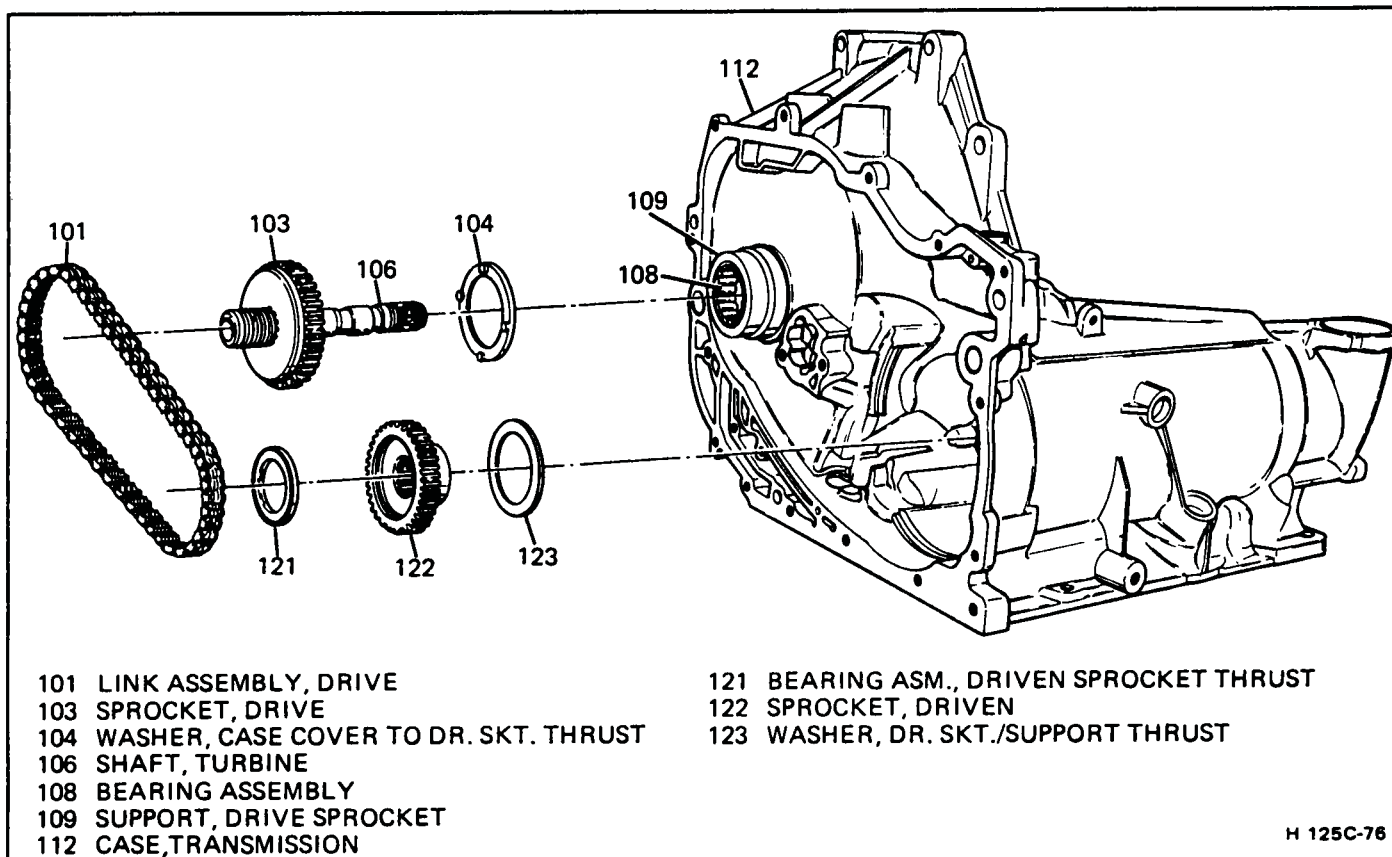


Figure 22 Drive Link Assembly



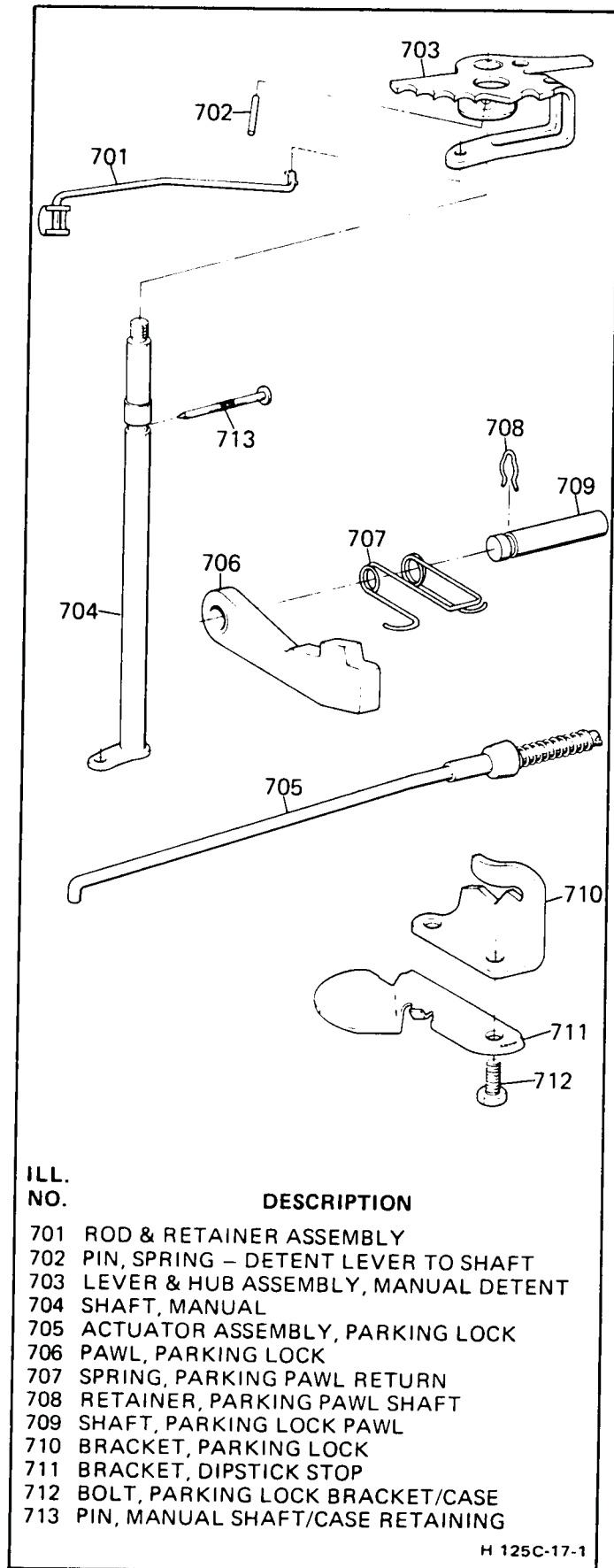


Figure 23 Manual Linkage

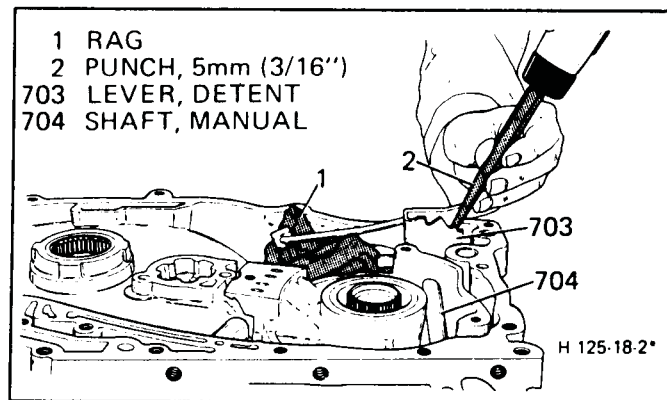


Figure 24 Retaining Pin Removal

## INPUT UNIT PARTS

←→ Remove or Disconnect (Figures 23, 24, 25, 26, 27, and 28)

- Pin (702)
  - Pin (713)
  - Detent lever (703)
  - Manual shaft (704)
  - Actuator rod (705)
- Driven sprocket support (602)
  - Thrust washer (605) (from direct clutch side)
- Plug (607) (Figure 27)
  - Band (606)

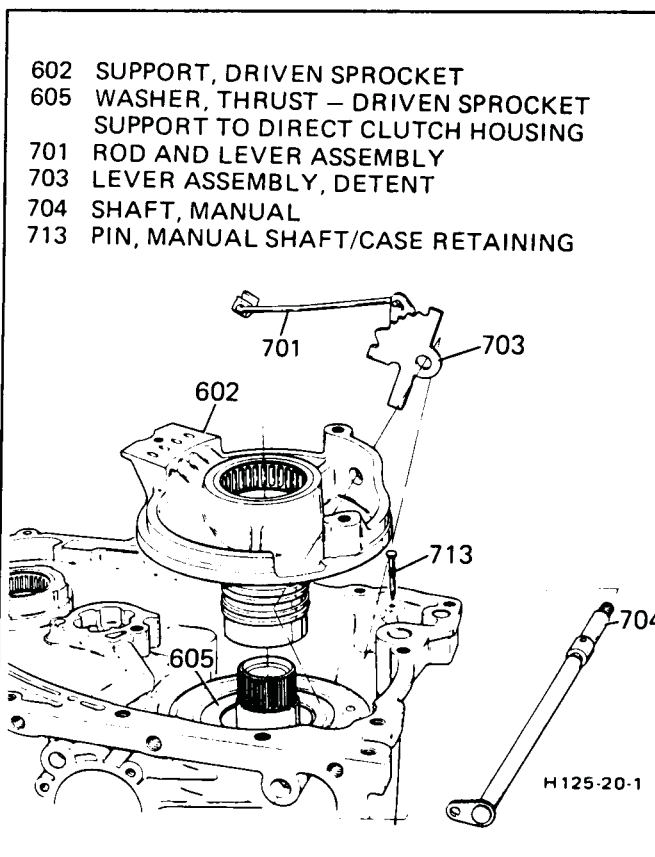
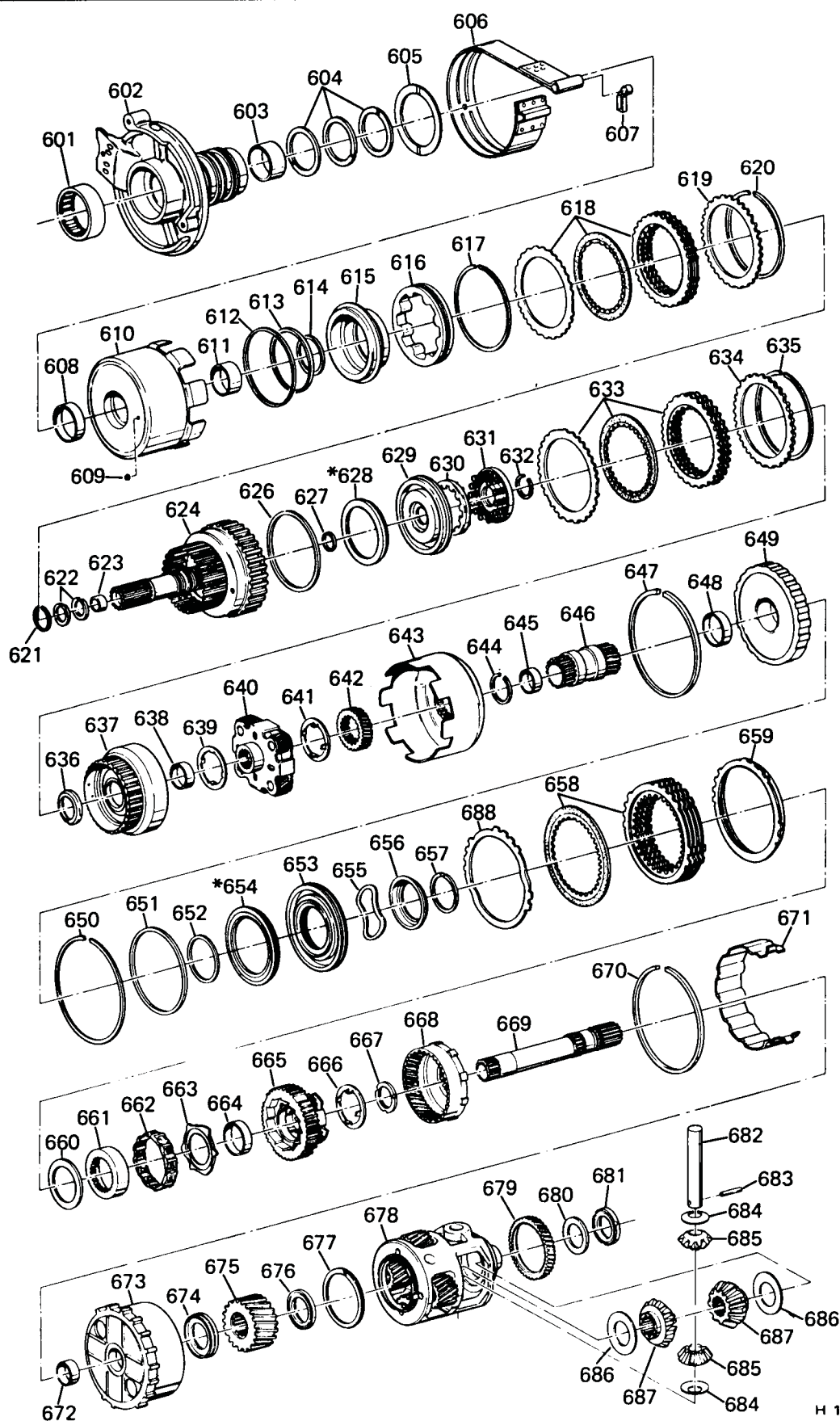


Figure 25 Removing Manual Linkage



\*NOT REQUIRED WITH CAST ALUMINUM PISTON

H 125-143-2

Figure 26 Internal Components

ILL. NO.	DESCRIPTION	
601	BEARING ASSEMBLY	645 BUSHING, REACTION SUN GEAR
602	SUPPORT ASSEMBLY, DRIVEN SPROCKET	646 GEAR, REACTION SUN
603	BUSHING, DRIVEN SPROCKET SUPPORT	647 RING, SNAP
604	RING, OIL SEAL	648 BUSHING, LO & REVERSE CLUTCH HOUSING
605	WASHER, THRUST	649 HOUSING, LO AND REVERSE
606	BAND ASSEMBLY, INTERMEDIATE	650 RING, SNAP
607	PLUG, BAND ANCHOR HOLE	651 SEAL, LO & REVERSE PISTON OUTER
608	BUSHING, DIRECT CLUTCH	652 SEAL, LO & REVERSE PISTON INNER
609	RETAINER & BALL ASM., CHECK VALVE	653 PISTON, LO AND REVERSE CLUTCH
610	HOUSING & DRUM ASM., DIRECT CLUTCH	*654 INSERT, LO & REVERSE CLUTCH PISTON
611	BUSHING, DIRECT CLUTCH DRUM	655 SPRING, LO & REVERSE CLUTCH RELEASE
612	SEAL, DIRECT CLUTCH PISTON OUTER	656 RETAINER, LO & REVERSE CLUTCH SPRING
613	SEAL, DIRECT CLUTCH CENTER	657 RING, SNAP
614	SEAL, DIRECT CLUTCH PISTON INNER	658 PLATE, LO & REVERSE CLUTCH
615	PISTON, DIRECT CLUTCH	659 PLATE, LO & REVERSE CLUTCH BACKING
616	APPLY RING & RELEASE SPRING ASM.	660 SPACER, REV. HOUSING/LO RACE SELECTIVE
617	RING, SNAP	661 RACE, LO ROLLER CLUTCH
618	PLATE, DIRECT CLUTCH	662 ROLLER ASSEMBLY, LO CLUTCH
619	PLATE, CLUTCH BACKING, DIRECT	663 WASHER, REACTION CARR./INT. GR. THRUST
620	RING, SNAP	664 BUSHING, REACTION CARRIER
621	SNAP RING, SELECTIVE	665 CARRIER ASSEMBLY, REACTION
622	RING, OIL SEAL	666 WASHER, REACTION CARR./INT. GR. THRUST
623	BUSHING, INPUT SHAFT	667 BEARING, REACTION SUN/INT. GR. THRUST
624	HOUSING ASSEMBLY, FORWARD CLUTCH	668 GEAR, REACTION INTERNAL
626	SEAL, FORWARD CLUTCH PISTON OUTER	669 SHAFT, FINAL DRIVE SUN GEAR
627	SEAL, FORWARD CLUTCH PISTON INNER	670 RING, SNAP
*628	INSERT	671 SPACER, FINAL DRIVE INTERNAL GEAR
629	PISTON, FORWARD CLUTCH	672 BUSHING, FINAL DRIVE INTERNAL GEAR
630	GUIDE, RELEASE SPRING	673 GEAR, FINAL DRIVE INTERNAL
631	RETAINER & SPRING ASM., FWD. CL.	674 BEARING, THRUST SUN GEAR/INT. GEAR
632	RING, SNAP SPRING RETAINER	675 GEAR, FINAL DRIVE SUN
633	PLATE, FORWARD CLUTCH	676 BEARING, THRUST SUN GEAR/CARRIER
634	PLATE, CLUTCH BACKING, FORWARD	677 RING, SPIRAL RETAINING
635	RING, SNAP	678 DIFFERENTIAL, CARRIER
636	WASHER, INPUT SHAFT THRUST	679 GEAR, GOVERNOR DRIVE
637	GEAR, AND INPUT INTERNAL	680 WASHER, DIFF. CARR./CASE SEL. THRUST
638	BUSHING, INPUT INTERNAL GEAR	681 BEARING ASM., DIFF. CARR./CASE THRUST
639	WASHER, INPUT CARR./IP. INT. GR. THRUST	682 SHAFT, DIFFERENTIAL PINION
640	CARRIER ASSEMBLY, INPUT	683 PIN, DIFF. PINION SHAFT RETAINING
641	WASHER, INPUT CARR./IP. SUN GR. THRUST	684 WASHER, PINION THRUST
642	GEAR, INPUT SUN	685 PINION, DIFFERENTIAL
643	DRUM, INPUT	686 WASHER, DIFF. SIDE GEAR THRUST
644	RING, SNAP SELECT. INPUT DRUM/SUN GEAR	687 GEAR, DIFFERENTIAL SIDE
		688 PLATE, LO & REVERSE CLUTCH WAVED
		*NOT REQUIRED WITH CAST ALUMINUM PISTON

LEGEND  
H 125-143-2L

Figure 27L Legend

- Direct and forward clutch assemblies (610 - 624) by lifting input shaft
- 4. Thrust washer (636)
- 5.
  - Internal gear (637)
  - Carrier (640) thrust washer (641)
  - Input sun gear (642)
  - Input drum (643)

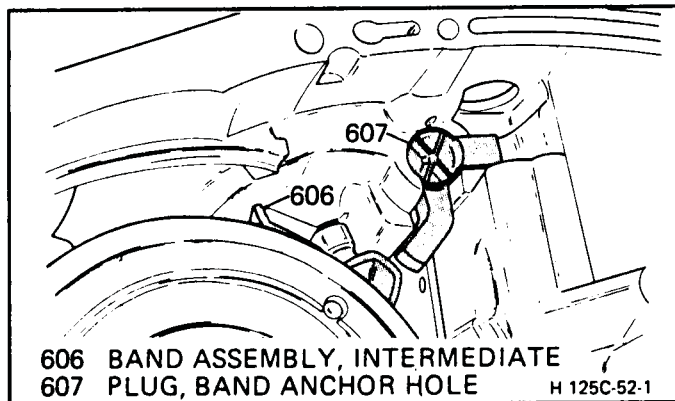


Figure 28 Band Anchor Hole Plug

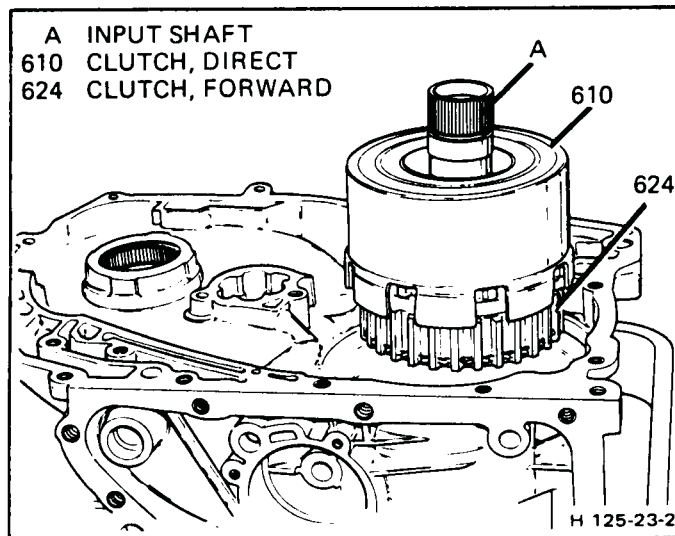


Figure 29 Removing Forward &amp; Direct Clutches

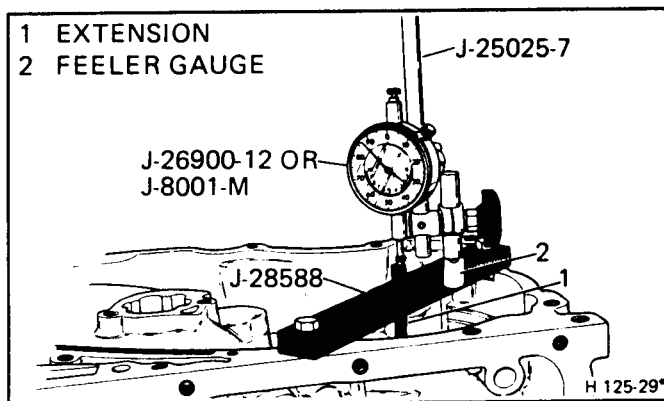


Figure 30 Selective Snap Ring End Play

### REACTION SUN GEAR TO INPUT DRUM SELECTIVE SNAP RING (644)

Thickness	Identification/Color
2.27 - 2.37mm (0.089" - 0.093")	Pink
2.44 - 2.54mm (0.096" - 0.100")	Brown
2.61 - 2.71mm (0.103" - 0.107")	Lt. Blue
2.78 - 2.88mm (0.109" - 0.113")	White
2.95 - 3.05mm (0.116" - 0.120")	Yellow
3.12 - 3.22mm (0.123" - 0.127")	Lt. Green
3.29 - 3.39mm (0.129" - 0.133")	Orange
3.46 - 3.56mm (0.136" - 0.140")	No Color

H 125-319-2

Figure 31 Selective Snap Ring Chart

### Reaction Sun Gear to Input Drum End Play



#### Measure (Figure 30 & 31)

##### Tools Required:

- J-26958 Loading tool
- J-26958-11 Bracket
- J-26958-10 Adapter plug
- J-28588 Gauge
- J-25025-7 Post
- J-26900-12 or J-8001M Dial indicator

1. Install tools as shown.  
The loading tool should already be in place.
  2. Position the gage extension between open ends of the snap ring (644). (Reaction sun gear (646) must be properly positioned.)
  3. Swing the gage under the extension shoulder.
  4. Zero the dial indicator.
  5. Position the snap ring (644) under the extension.
  6. Remove the gage from under the shoulder.
  7. The dial indicator should read 0.33 to 0.13 mm (0.013" to 0.005"). - record the reading.
- For correct snap ring selection, See Figure 31. Measure washer thickness (new or old) with a micrometer.

## Lo Roller Clutch Race Selective Spacer End Play



### Measure (Figures 32 and 33)

1. Use tools from "Selective Snap Ring End Play Check".
2. Pry up on internal gear (668) with J-28585 – Do not pry against the spacer (671).
3. The dial indicator reading should be 0.08-1.17 mm (0.003"-0.046"). Record reading.  
For correct washer selection see Figure 33.
4. Remove the dial indicator set and J-28588 gage.

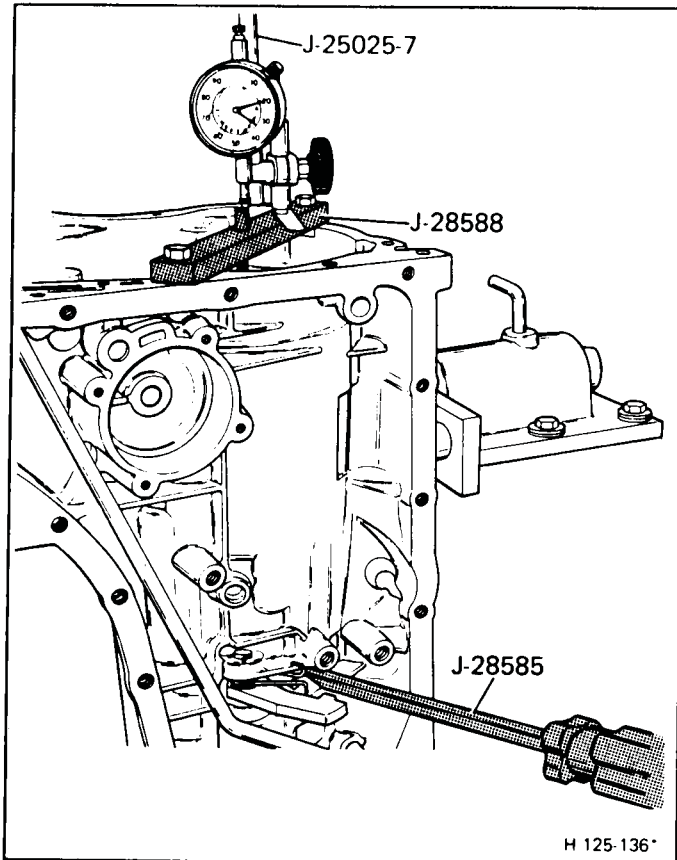


Figure 32 Lo Roller Clutch Race Selective Thrust Spacer

## REVERSE CLUTCH HOUSING TO LO RACE SELECTIVE SPACER (660)

Thickness	Identification
1.00 - 2.20mm (0.039" - 0.043")	1
1.42 - 1.52mm (0.056" - 0.060")	2
1.84 - 1.94mm (0.072" - 0.076")	3
2.26 - 2.36mm (0.089" - 0.093")	4
2.68 - 2.78mm (0.105" - 0.109")	5
3.10 - 3.20mm (0.122" - 0.126")	6

H 125-320

Figure 33 Lo Race Selective Spacer Chart

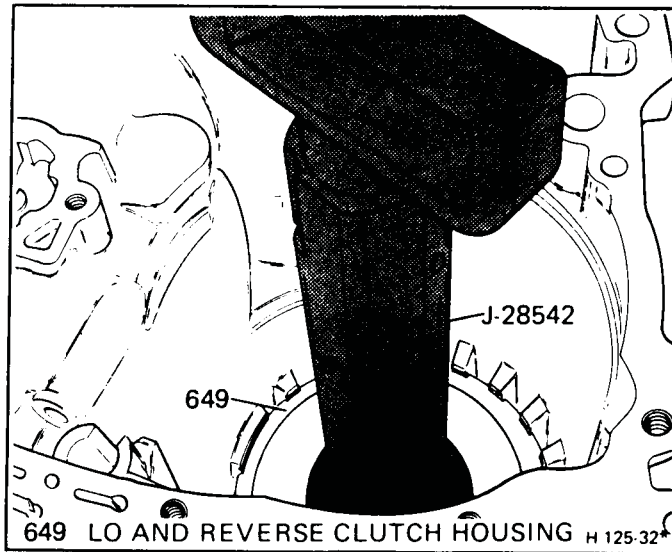


Figure 34 Removing the Lo & Reverse Clutch Housing

## REACTION UNIT PARTS



### Remove or Disconnect (Figures 25, 33, 34, 35 and 36)

Tool Required:

J-28542 Lo-Reverse Clutch Unit Remover and Installer

1. Sun gear (646)
2. Snap ring (644) – ring is 2.36 mm (0.092") thick
3. Lo reverse clutch housing (649) with J-28542
4. Snap ring (650)
5. Output carrier and roller clutch assemblies and lo reverse clutch plates (658 thru 668) by lifting shaft (669) (Figure 35).

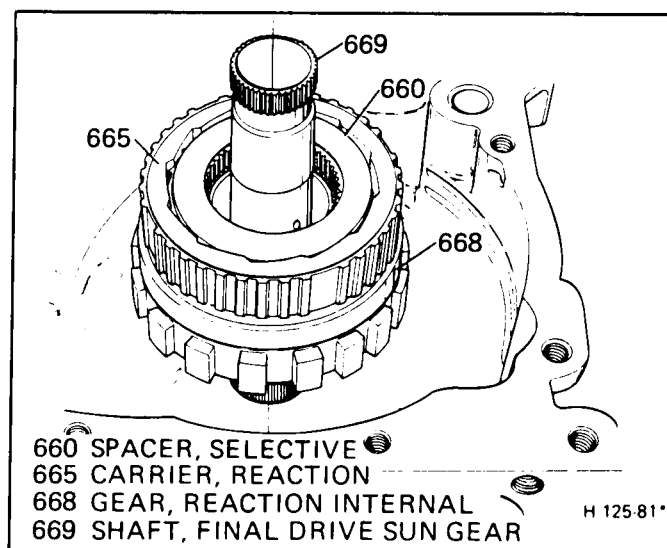


Figure 35 Removing Reaction Components



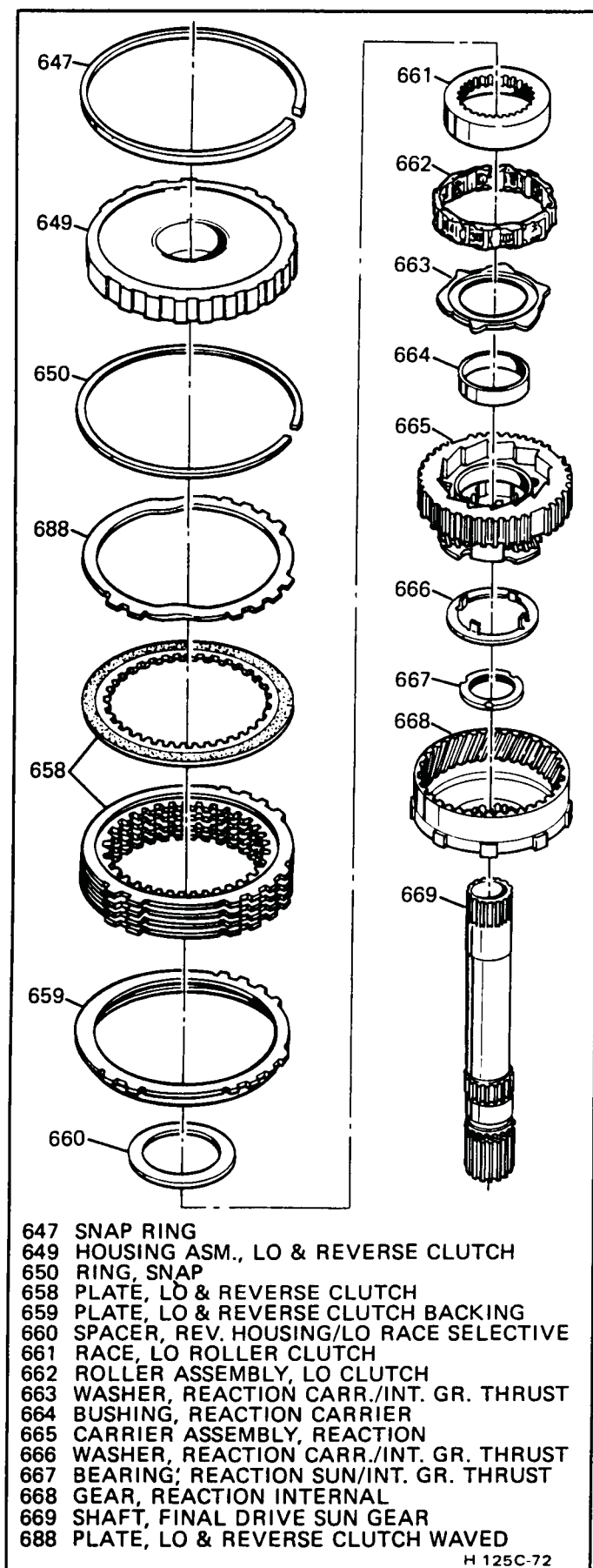


Figure 36 Reaction Components Disassembly

**Disassemble (Figure 26 and 36)**

- Clutch plates (658) & Backing plate (659)
- Roller clutch assembly (665)
- Internal gear (668)
- Shaft (669)

**FINAL DRIVE ASSEMBLY****Measure (Figures 37, 38, 39 and 40)****Tools Required:**

- J-26958-10 Adapter
- J-25025-7 Post
- J-26900-12 or J-8001M Dial indicator
- J-28585 Snap ring remover

1. Remove J-26958 and J-26958-11. Leave J-26958-10 adapter in place.
2. Install the dial indicator set so that stem contacts the adapter.

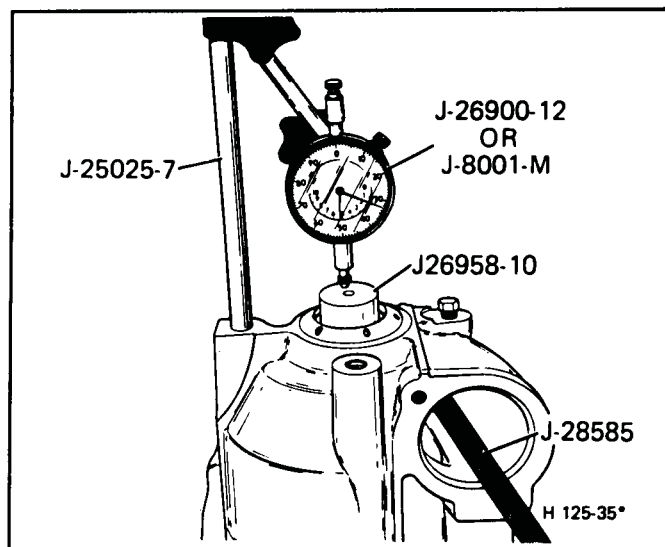


Figure 37 Final Drive End Play Selective Thrust Washer Measurement (680)

**FINAL DRIVE TO CASE END PLAY  
SELECTIVE THRUST WASHER (680)**

THICKNESS	IDENTIFICATION NO./COLOR
1.40 - 1.50mm (0.055" - 0.059")	0/Orange
1.50 - 1.60mm (0.059" - 0.062")	1/White
1.60 - 1.70mm (0.062" - 0.066")	2/Blue
1.70 - 1.80mm (0.066" - 0.070")	3/Pink
1.80 - 1.90mm (0.070" - 0.074")	4/Brown
1.90 - 2.00mm (0.074" - 0.078")	5/Green
2.00 - 2.10mm (0.078" - 0.082")	6/Black
2.10 - 2.20mm (0.082" - 0.086")	7/Purple
2.20 - 2.30mm (0.086" - 0.091")	8/Purple & White
2.30 - 2.40mm (0.091" - 0.095")	9/Purple & Blue

H 125-321-2

Figure 38 Final Drive End Play Chart



3. Lift up on the governor drive gear (679) with J-28585.
4. Reading on the dial indicator should be 0.12-0.82 mm (0.005"-0.032") – Record reading.  
For correct washer selection see Figure 37.
5. Remove the dial indicator set and the adpater.

**Remove or Disconnect (Figures 26, 38, 39 and 48)**

Tool Required:

J-28545 Final Drive Unit Remover and Installer

1. Snap ring (670) – Ring is 2.36 mm (0.092") thick.
2. Spacer (671)
3. Final drive assembly (673-688) with J-28545
4. Thrust bearing (681)
5. Selective washer (680)

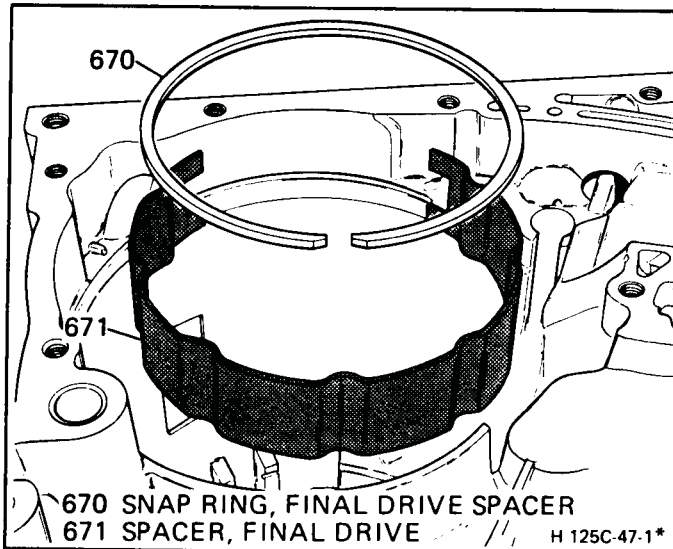


Figure 39 Final Drive Spacer & Snap Ring

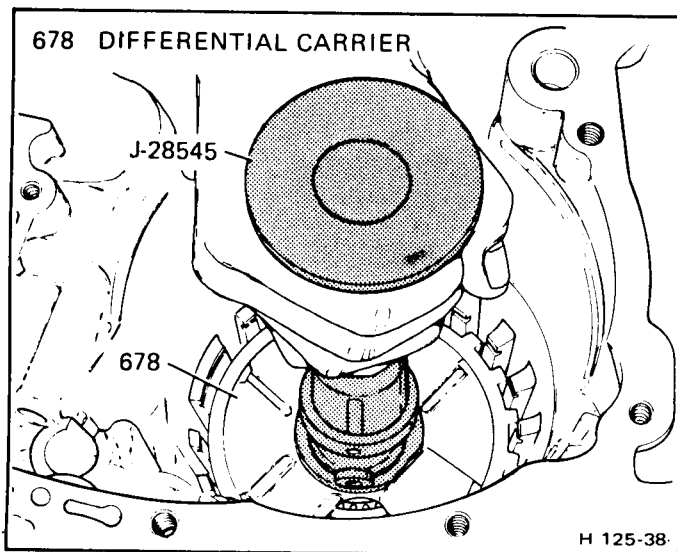


Figure 40 Removing Final Drive Assembly

**CASE ASSEMBLY**



**Clean**

- Case (112) thoroughly with solvent and air dry.



**Inspect (Figure 40)**

- Case – see Section 7A for Case Repair
  - Lug damage
  - Snap ring groove damage
  - Oil passage damage
  - Servo bore damage
  - Casting porosity
  - Stripped threads
- Case bushing (116) – for scoring
- Converter seal (115) – see drive sprocket support inspection replace
- Axle seal (117) – for damage

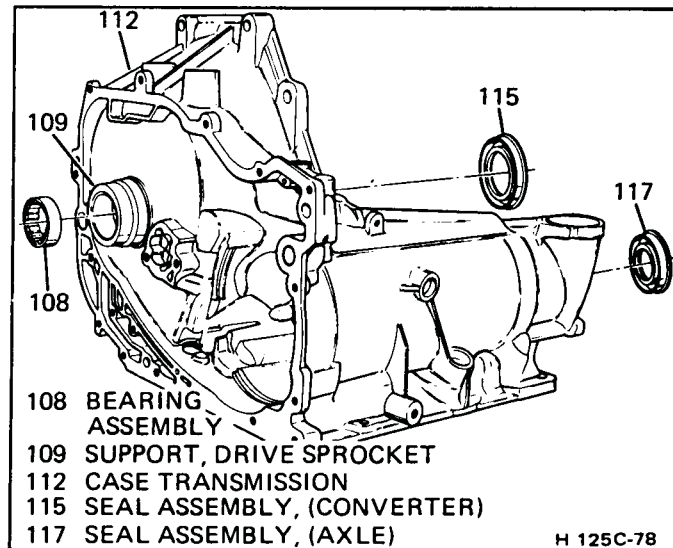


Figure 41 Axle Seals & Sprocket Bearing

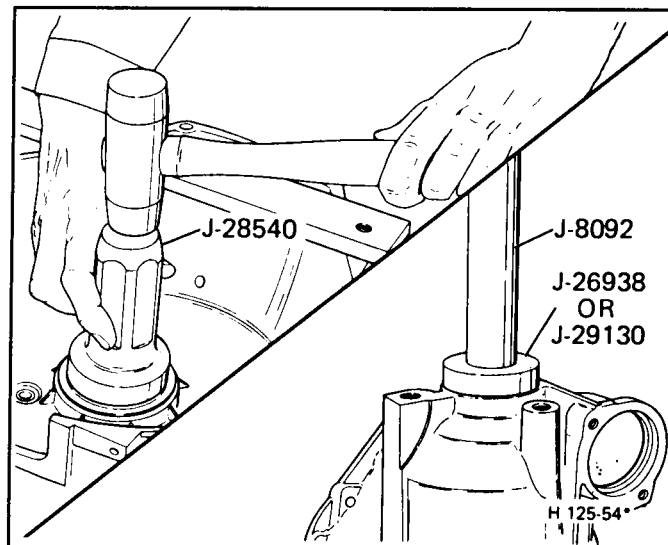


Figure 42 Converter Seal and Axle Seal Installation

## Seal Replacement Procedure

### Remove or Disconnect (Figure 41)

- Seal (115) or (117) – pry out

### Install or Connect (Figure 42)

Tools Required:

J-26938 or J-29130 Axle Seal Installer  
J-28540 Converter Seal Installer

- Seal (115) with J-28540
- Seal (117) with J-26938 or J-29130

### Inspect (Figure 41)

- Drive sprocket support bearing (108)  
If new bearing is required be sure to inspect drive sprocket (106) race for damage or wear

## Bearing Replacement Procedure

### Remove or Disconnect (Figure 43)

Tools Required:

J-26941 Bearing puller  
J-6125-1 or J-2619-01 Slide hammer  
J-6471-8 Adapter

- Bearing (108) with J tools

### Install or Connect (Figure 44)

Tools Required:

J-28677 Bearing Installer  
J-8092 Handle

- Bearing (108) identification side up with J-28677 and J-8092

### Inspect

- Drive sprocket support (109) for scoring

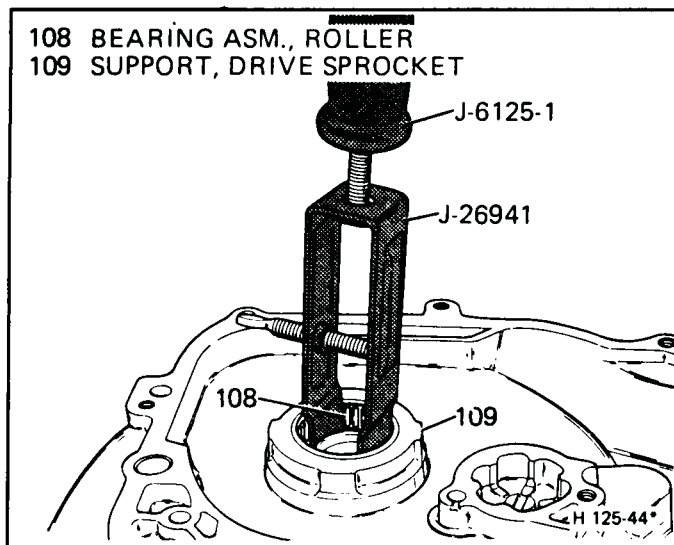


Figure 43 Removing Bearing

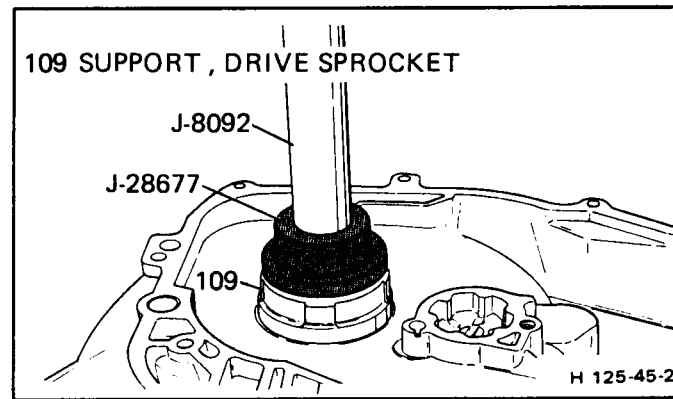


Figure 44 Installing Bearing

## Support Replacement Procedure

### Remove or Disconnect (Figure 45)

Tool Required:

J-25359-5 #40 Torx bit or equivalent

- Converter oil seal (115)
- Screws (114) with J-25359-5
- Support (109) from case

### Install or Connect (Figure 45)

- Support (109) into case
- Screws (114) – use thread locking compound

### Tighten

Tools Required:

J-25259 #40 Torx bit or equivalent

- Screws (114) to 24 N·m (18 ft. lbs.) with J-25359-5

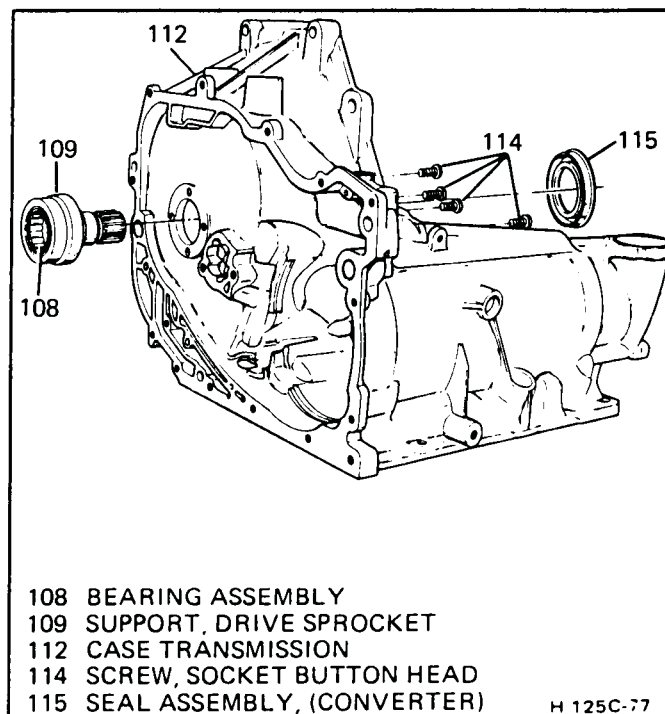


Figure 45 Sprocket Support Replacement



### Inspect

- Parking pawl (706) for damage

### Parking Pawl Replacement Procedure



#### Remove or Disconnect (Figure 46)

1. Cup plug with a screw extractor
2. Retainer (708)
3. Shaft (709)
4. Return spring (707)
5. Pawl (706)



#### Install or Connect

1. Return spring (707)
2. Pawl (706)
3. Shaft (709)
4. Retainer (708)
5. Cup Plug with a 9 mm (3/8") rod



### Inspect

- Governor pipe (138) for damage or cracks

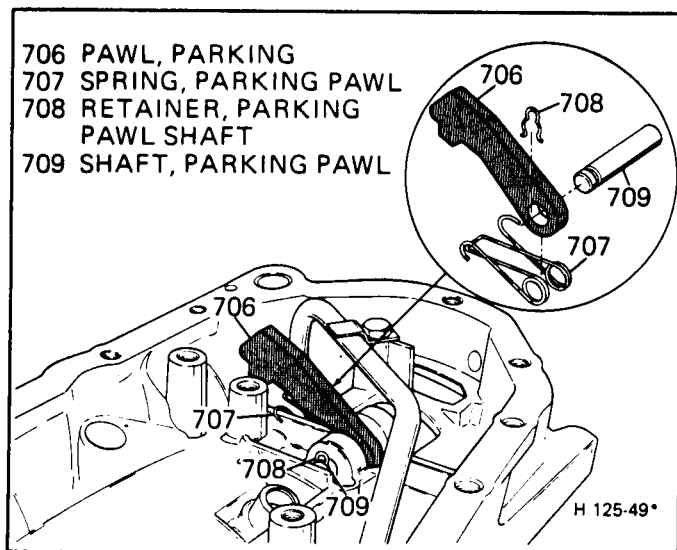


Figure 46 Parking Pawl



### Inspect

- 3rd oil cup plug (127) for cracks or loose fit

### 3rd Oil Cup Plug Replacement Procedure



#### Remove or Disconnect (Figure 48)

- Plug (127) – use #3 screw extractor with 13 mm (1/2") ground off.



#### Install or Connect

- Plug (127) tap until seated in case – use a 6 mm (1/4") rod.



### Inspect

- Manual Shaft oil seal (113) for damage

### Manual Shaft Replacement Procedure



#### Remove or Disconnect

- Seal (113) – pry out – check bore for burrs. Smooth with fine stone if necessary.



#### Install or Connect

- Seal (113) lip side up use 13 mm or 9/16" socket – tap with mallet until seated.

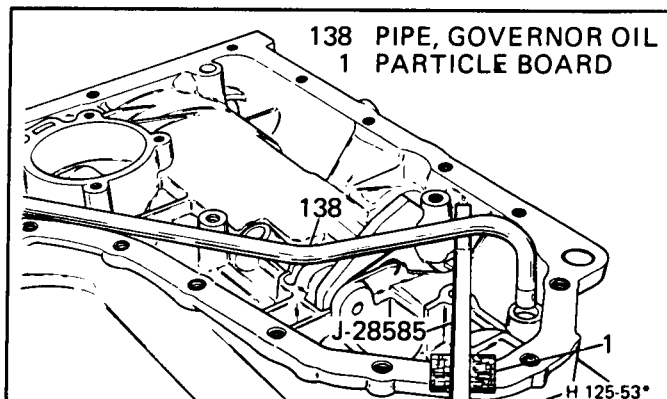


Figure 47 Governor Pipe Replacement

### Governor Pipe Replacement Procedure



#### Remove or Disconnect (Figure 47)

Tool Required:

J-28585 Snap Ring Remover

- Pipe (138) with J-28585, pry out. Use particle board to protect case. Pipe is sealed in place.



#### Install or Connect

1. Coat both ends of the pipe (138) with loctite ® or equivalent.
2. Pipe (138) into case (112), tap gently with a soft mallet.

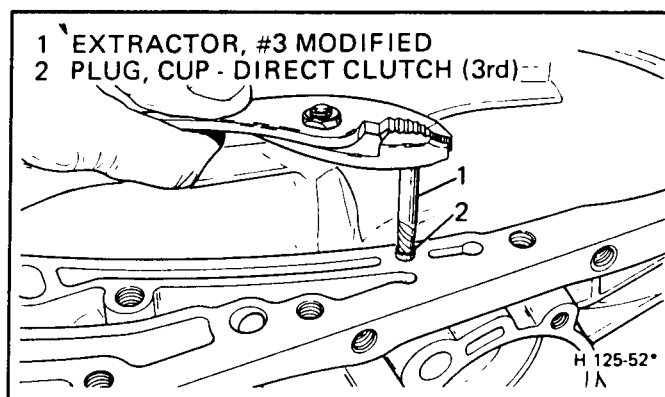


Figure 48 Cup Plug Removal

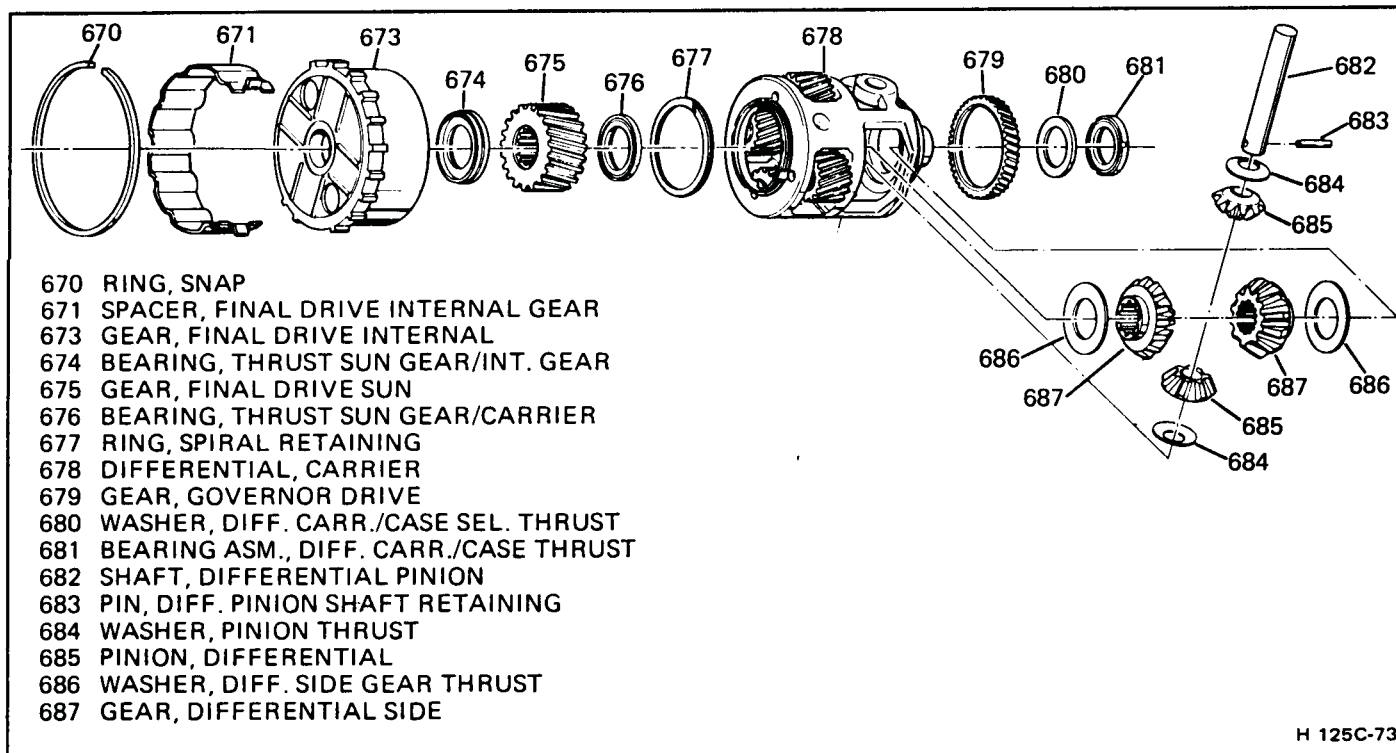


Figure 49 Final Drive Assembly

## DIFFERENTIAL AND FINAL DRIVE

### Disassemble (Figure 49)

1. Internal gear (673)
2. Thrust bearing (674)
3. Sun gear (675)
4. Thrust bearing (676)

End play range – 0.24 - 0.63 mm (0.009"-0.025")

- Internal gear (673) for damaged teeth or bearing surface
- Thrust bearing (674) for damage
- Sun gear (675) for damaged teeth or bearing surfaces
- Thrust bearing (676) for damage
- Governor drive gear (679) for wear

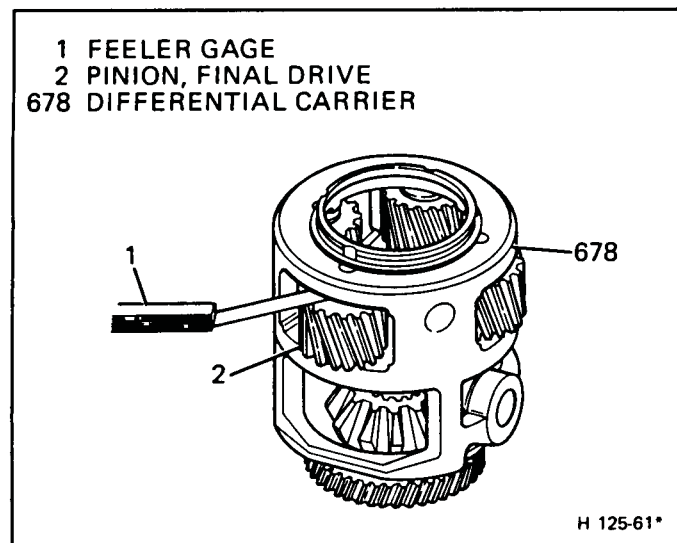


Figure 50 Final Drive Pinion End Play

### Inspect (Figure 50)

- Final drive pinions (678) for damage  
 Excessive end play - with a feeler gage

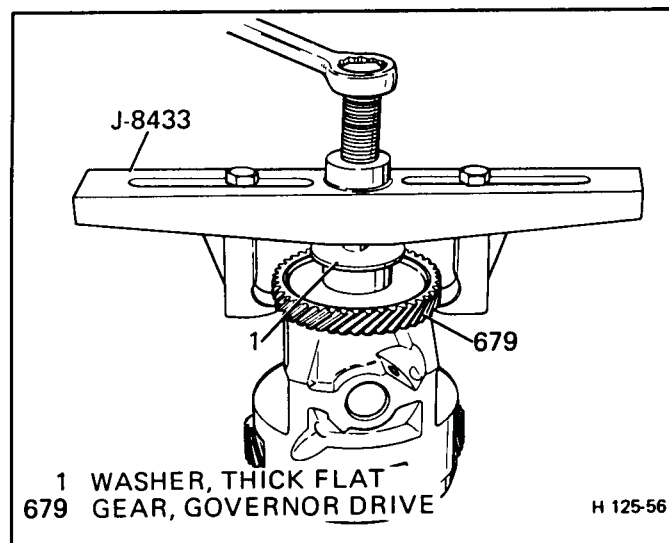


Figure 51 Governor Drive Gear Replacement

## Governor Drive Gear Replacement

### Remove or Disconnect (Figure 51)

Tool Required:

J-8433 Puller

- Governor drive gear (678) with J-8433 – place a thick flat washer or other protection on the hub to avoid damage



**Install or Connect**

- Drive gear – tap into position with a soft mallet.



**Inspect (Figure 49)**

- Pinions (685) and side gears (687) for damaged teeth

### Pinion Gear Replacement Procedure



**Disassemble (Figures 49 and 52)**

- Retaining pin (683) use a pin punch as shown
- Pinion shaft (682)
- Pinions (685), side gears (687) and washers (684 and 686)



**Inspect (Figure 49)**

- Washers (684 and 686) and carrier for damage



**Assemble (Figure 49)**

1. Side gears (687) and washer (686) into carrier
2. Pinion thrust washer (684) to pinions (685), retain with petrolatum
3. Pinions and thrust washers into carrier
4. Pinion shaft (682), slide through both pinions for alignment, then remove.
5. Rotate pinions into position, then replace shaft (682)
6. Retaining pin (683)



**Assemble (Figure 49)**

1. Thrust bearing (676) into carrier
2. Sun gear (675) stepped side facing up
3. Thrust bearing (674) outside race to internal gear
4. Internal gear (673) onto carrier

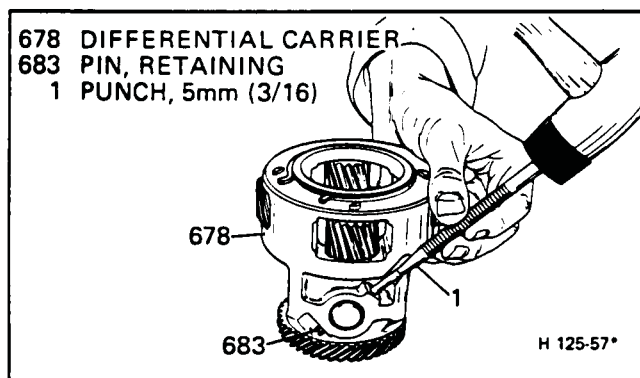


Figure 52 Pinion Shaft Retaining Pin



**Install or Connect (Figure 52)**

Tool Required:

J-28545 Final Drive Remover and Installer

1. Thrust washer (680) onto carrier assembly, retain with petrolatum

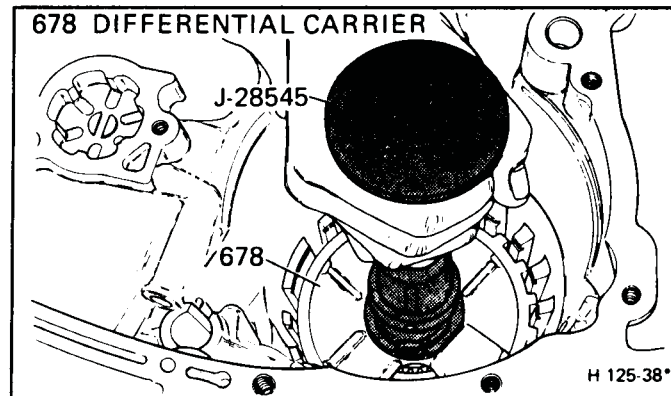


Figure 53 Installing the Final Drive Assembly

2. Thrust bearing (681) onto carrier assembly, inner race toward carrier, retain with petrolatum
3. Carrier assembly into case with J-28545



**Inspect**

- Spacer (671) for damage
- Snap ring (670) for damage



**Install or Connect (Figure 49)**

1. Spacer (671) into the transmission case



**Important**

The spacer (671) must fit into the case so that the parking pawl operates freely.

2. Snap ring into the snap ring groove.

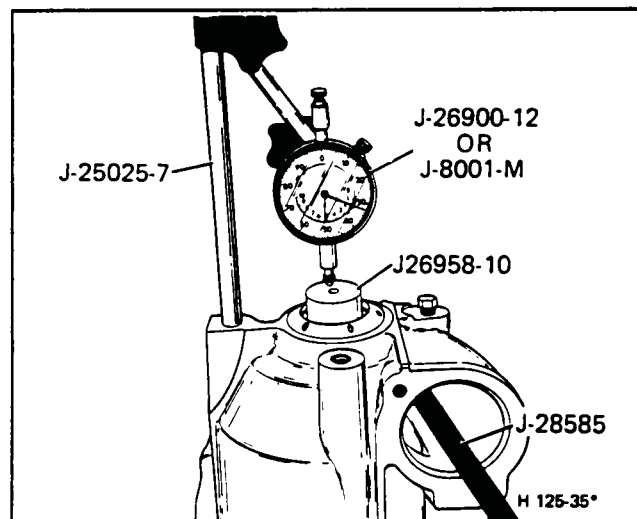


Figure 54 Final Drive End Play Selective Thrust Washer Measurement (680)

### Final Drive to Case End Play



**Measure (Figures 54 and 55)**

Tools Required:

J-26958-10 Adapter

J-25025-7 Post

J-26900-12 or J-800/M Dial indicator

J-28585 Snap ring remover

1. Install the dial indicator set so that stem contacts the adapter.
2. With J-28585 through the governor bore, lift up on the governor drive gear (679).



### FINAL DRIVE TO CASE END PLAY SELECTIVE THRUST WASHER (680)

THICKNESS	IDENTIFICATION NO./COLOR
1.40 - 1.50mm (0.055" - 0.059")	0/Orange
1.50 - 1.60mm (0.059" - 0.062")	1/White
1.60 - 1.70mm (0.062" - 0.066")	2/Blue
1.70 - 1.80mm (0.066" - 0.070")	3/Pink
1.80 - 1.90mm (0.070" - 0.074")	4/Brown
1.90 - 2.00mm (0.074" - 0.078")	5/Green
2.00 - 2.10mm (0.078" - 0.082")	6/Black
2.10 - 2.20mm (0.082" - 0.086")	7/Purple
2.20 - 2.30mm (0.086" - 0.091")	8/Purple & White
2.30 - 2.40mm (0.091" - 0.095")	9/Purple & Blue

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Figure 55 Final Drive End Play Chart

3. Reading on the dial indicator should be 0.12-0.82 mm (0.005"-0.032") For correct washer selection, see Figure 54.
4. Remove the dial indicator set and the adapter. Leave the adapter in place.
5. Install J-26958 and J-26958-11 - turn knob until it bottoms.

### REACTION CARRIER ASSEMBLY

#### Inspect (Figure 56)

- Sun gear shaft (669) for damage or wear
- Internal gear (668) for damage or wear
- Thrust bearing (667) for damage or wear

#### Assemble

1. Internal gear (668) onto sun gear shaft (669)
2. Thrust bearing (667) - inner race against internal gear (668)

### LO ROLLER CLUTCH ASSEMBLY

#### Disassemble (Figure 56)

1. Selective washer (660)
2. Race (661)
3. Clutch assembly (662)
4. Lo race thrust washer (663)
5. Reaction carrier thrust washer (666)

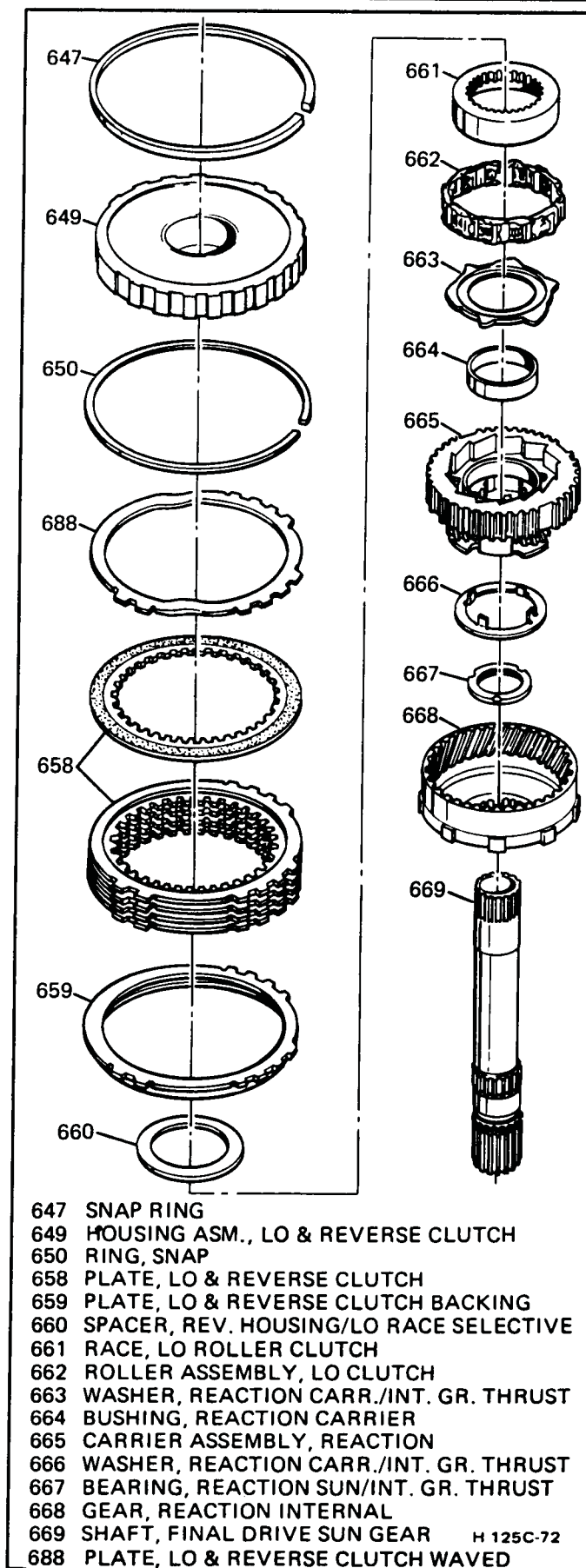
#### Inspect

- Selective spacer (660) for damage
- Lo roller clutch cam (665)
- Carrier bushing (664) for damage
- Reaction carrier pinions (665) for damage, rough bearings or tilt

#### Measure

- Pinions (665 - end play with feeler gage - end play range 0.24-0.69 mm (0.009"-0.027").

#### Inspect (Figure 56 and Figure 26)



- 647 SNAP RING  
 649 HOUSING ASM., LO & REVERSE CLUTCH  
 650 RING, SNAP  
 658 PLATE, LO & REVERSE CLUTCH  
 659 PLATE, LO & REVERSE CLUTCH BACKING  
 660 SPACER, REV. HOUSING/LO RACE SELECTIVE  
 661 RACE, LO ROLLER CLUTCH  
 662 ROLLER ASSEMBLY, LO CLUTCH  
 663 WASHER, REACTION CARR./INT. GR. THRUST  
 664 BUSHING, REACTION CARRIER  
 665 CARRIER ASSEMBLY, REACTION  
 666 WASHER, REACTION CARR./INT. GR. THRUST  
 667 BEARING, REACTION SUN/INT. GR. THRUST  
 668 GEAR, REACTION INTERNAL  
 669 SHAFT, FINAL DRIVE SUN GEAR  
 688 PLATE, LO & REVERSE CLUTCH WAVED

Figure 56 Reaction Components

- Clutch race (661) for damage, cracks or wear



- Rollers, springs and cage (662) for damage or wear
- Carrier (4 tanged) thrust washer (665) for scoring or distortion

**Assemble (Figure 56 and Figure 26)**

1. Thrust washer (663) into carrier assembly (665)
2. Rollers, into cage (662)
3. Clutch assembly (662)
4. Clutch race (661) – rotate into place.
5. Tanged thrust washer (666) – use petrolatum to hold in position.
6. Carrier (665) and clutch assembly into internal gear (668)
7. Selective spacer (660)
8. Reaction gear set (660-669) into case  
Make sure gear set does not contact spacer (671).

**LO AND REVERSE CLUTCH PLATES****Inspect (Figure 56)**

- Backing plate (659) for damage or cracks
- Lo and reverse clutch composition and steel plates (658) for wear or burning

**Install or Connect (Figure 56 and Figure 70)**

1. Backing plate (659) stepped side down into case
2. Lubricant on composition plates (658) before installation
3. Alternate composition plate first, then steel plate (See Figure 70)
4. Waved steel plate
5. Spacer ring (650) – ring is 1.07 mm (0.042") thick

**LO AND REVERSE CLUTCH HOUSING****Disassemble (Figure 57)**

1. Snap ring (656) – push down on spring retainer (657).
2. Waved spring (655)
3. Clutch piston (653)
4. Inner (652) and outer (651) seals from piston (653)

**Inspect (Figure 57)**

- Waved spring (655) for damage
- Inner (652) and outer (651) seals for nicks or rolling
- Clutch housing (649) for damage or plugged feed hole
- Clutch housing bushing for damage, cracks or scoring
- Clutch piston (653) for distortion, cracks or damage

**Assemble (Figures 57, 58 and 59)**

1. Seals (651 and 652) onto piston (653)
2. Piston (653) – with J-26744-A inner seal (652) first, then outer seal
3. Waved spring (655)
4. Retainer (656) – cupped side down
5. Snap ring (657) – push down on spring retainer (656).

**FUNCTIONAL CHECK**

Apply air (max 90 psi) to feed hole. Piston must apply and release when pressure is removed.

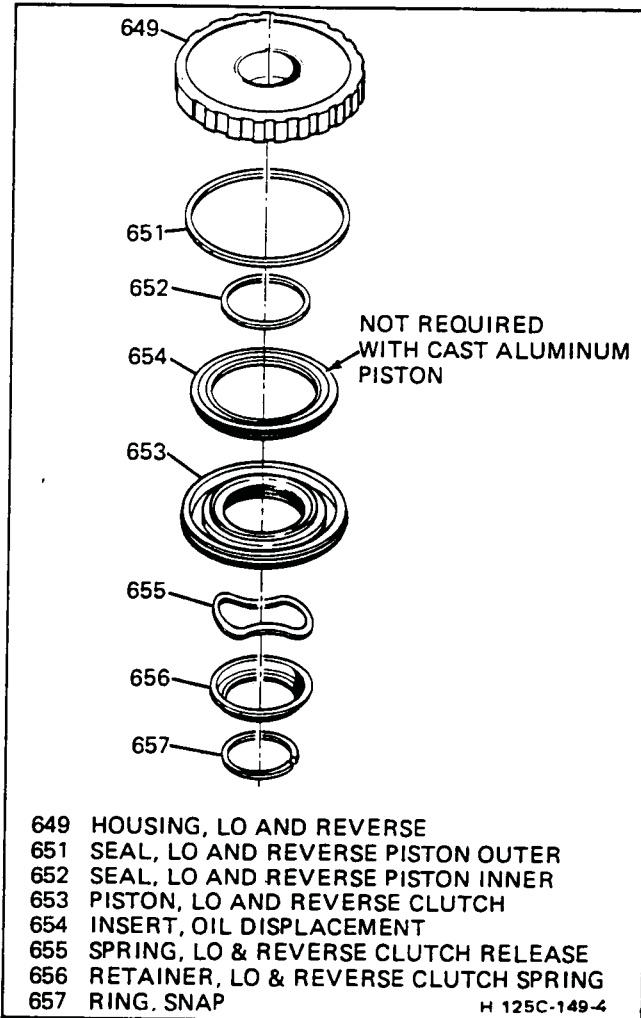


Figure 57 Lo &amp; Reverse Clutch Assembly

**Install or Connect (Figure 61)**

1. Lo and reverse clutch housing (649) with J-28542 into case

Align the clutch housing oil feed hole with the case feed hole.

If housing (649) does not go past snap ring groove – remove J-28542 and install sun gear (646). Rotate sun gear back and forth until the housing is properly positioned. Loosen J-26958 as needed.

2. Snap ring (647) – ring is 2.36 mm (0.092") thick.

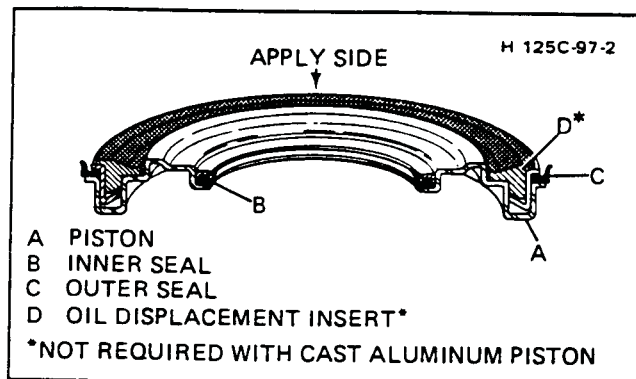


Figure 58 Typical Lo &amp; Rev. Clutch Apply Piston

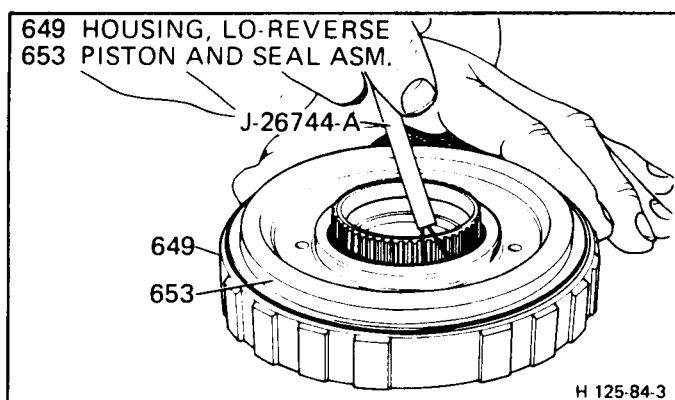


Figure 59 Installing the Lo &amp; Reverse Piston

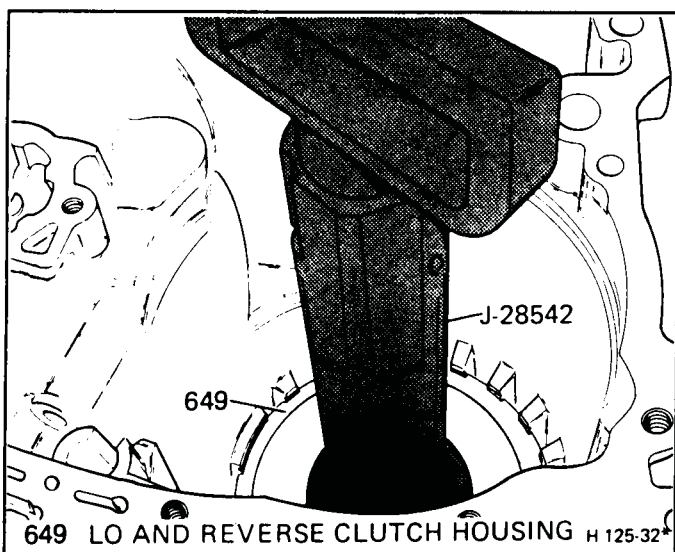


Figure 60 Installing the Lo &amp; Reverse Clutch

## REACTION SUN GEAR

### Inspect (Figure 65)

- Reaction sun gear (646) for cracks, splits, damaged splines, worn gear or journal and plugged lubrication holes.

### Install or Connect

- Sun gear (646) and selective snap ring (644).

## Selective Snap Ring End Play

### Measure (Figures 61 and 62)

#### Tools Required:

J-26958 Loading tool  
J-26958-11 Bracket  
J-26958-10 Adapter plug  
J-28588 Gage  
J-25025-7 Post  
J-26900-12 or J-8001M Dial indicator

- Install the tools as shown.
  - The loading tool should still be in place.
- Seat sun gear (646).
- Position the gage extension between open ends of snap ring (644).
- Swing the gage under the extension shoulder.
- Set the dial indicator at zero.
- Position the snap ring (644) under extension shoulder.
- Remove the gage from under the shoulder.
- The dial indicator should read 0.33 to 0.13 mm (0.013" to 0.005"). If not within tolerances, for correct selection see Figure 62 (Measure washer thickness (new or used) with micrometer).

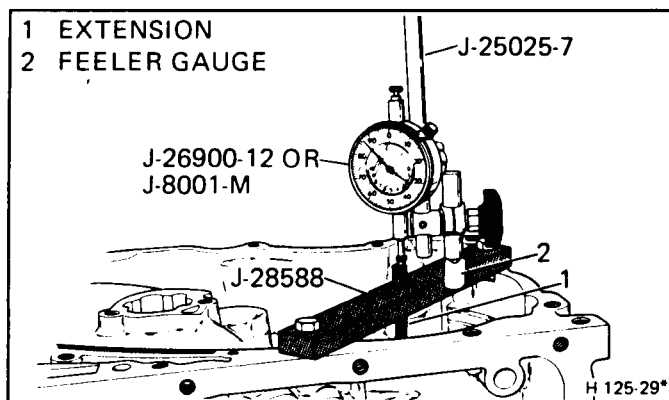


Figure 61 Selective Snap Ring End Play (Sun Gear/Input Drum)

## REACTION SUN GEAR TO INPUT DRUM SELECTIVE SNAP RING (644)

Thickness	Identification/Color
2.27 - 2.37mm (0.089" - 0.093")	Pink
2.44 - 2.54mm (0.096" - 0.100")	Brown
2.61 - 2.71mm (0.103" - 0.107")	Lt. Blue
2.78 - 2.88mm (0.109" - 0.113")	White
2.95 - 3.05mm (0.116" - 0.120")	Yellow
3.12 - 3.22mm (0.123" - 0.127")	Lt. Green
3.29 - 3.39mm (0.129" - 0.133")	Orange
3.46 - 3.56mm (0.136" - 0.140")	No Color

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Figure 62 Selective Snap Ring Chart

## Lo Roller Clutch Race Selective Spacer End Play

### Measure (Figures 63 and 64)

#### Tools Required:

Tools from previous measurement check  
J-28585 Snap Ring Remover

- Leave tools from "Selective Snap Ring End Play Check" in place.
- Pry up on internal gear (668) with J-28585 - Do not pry against spacer (671).

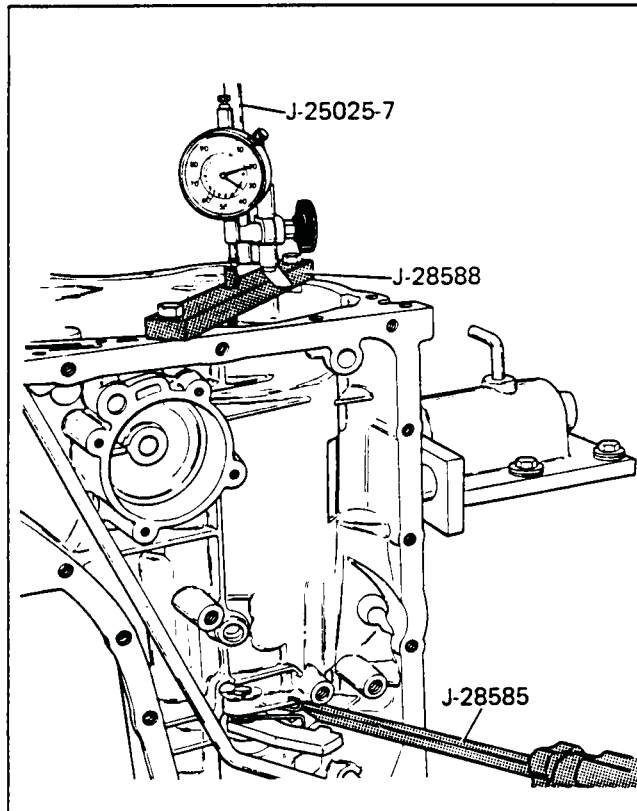


Figure 63 Lo Roller Clutch Race Selective Spacer

### REVERSE CLUTCH HOUSING TO LO RACE SELECTIVE SPACER (660)

Thickness	Identification
1.00 - 2.20mm (0.039" - 0.043")	1
1.42 - 1.52mm (0.056" - 0.060")	2
1.84 - 1.94mm (0.072" - 0.076")	3
2.26 - 2.36mm (0.089" - 0.093")	4
2.68 - 2.78mm (0.105" - 0.109")	5
3.10 - 3.20mm (0.122" - 0.126")	6

H 125-320

Figure 64 Lo Race Selective Spacer Chart

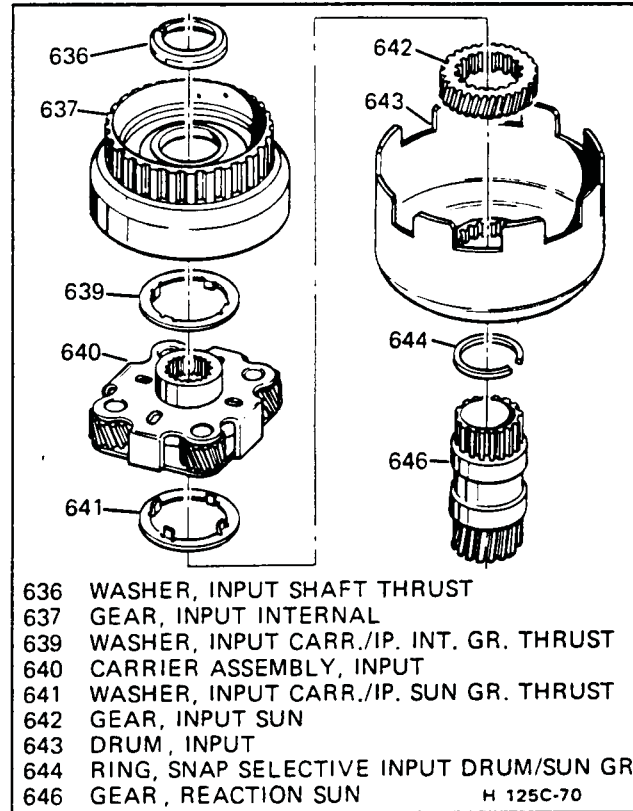
- Dial indicator reading should be 0.08-1.17 mm (0.003"-0.046"). For correct washer selection see Figure 64.
- Remove the dial indicator set and J-28588.

### INPUT UNIT PARTS



#### Inspect (Figure 65)

- Drum (643) for damage
- Thrust washer (641) for damage
- Carrier assembly (640) for
  - Pinion damage
  - Pinion tilt
  - Pinion end play – use the feeler gages – end play range 0.24-0.69 mm (0.009"-0.027")
- Thrust washer (639) for damage



- 636 WASHER, INPUT SHAFT THRUST  
 637 GEAR, INPUT INTERNAL  
 639 WASHER, INPUT CARR./IP. INT. GR. THRUST  
 640 CARRIER ASSEMBLY, INPUT  
 641 WASHER, INPUT CARR./IP. SUN GR. THRUST  
 642 GEAR, INPUT SUN  
 643 DRUM, INPUT  
 644 RING, SNAP SELECTIVE INPUT DRUM/SUN GR.  
 646 GEAR, REACTION SUN

H 125C-70

Figure 65 Input Components

- Internal gear (637) for gear tooth damage, clutch hub damage or scored bearing surfaces
- Sun gear (642) for damaged teeth or bearing surface



#### Assemble (Figure 65)

- Drum (643) onto the reaction sun gear (646) in the case
- Input sun gear (642) I.D. groove facing up onto the reaction sun gear (646)
- Tanged thrust washer (641) onto the carrier assembly (640) – retain with petrolatum.
- Carrier assembly (640) onto the sun gear (642) – sun gear must engage the pinions.
- Thrust washer (639)
- Internal gear (637)

### FORWARD CLUTCH ASSEMBLY



#### Disassemble (Figures 66 and 67)

##### Tools Required:

Arbor Press or J-23456 Clutch Pack Compressor

- Snap ring (635) from clutch housing (624)
- Backing plate (634)
- Steel and composition clutch plates (633)
- Snap ring (632) – use an arbor press or J-23456.
- Retainer and spring assembly (631) and guide (630)
- Piston (629)
- Insert (628)
- Piston seals (626 and 627)



#### Inspect (Figure 66)

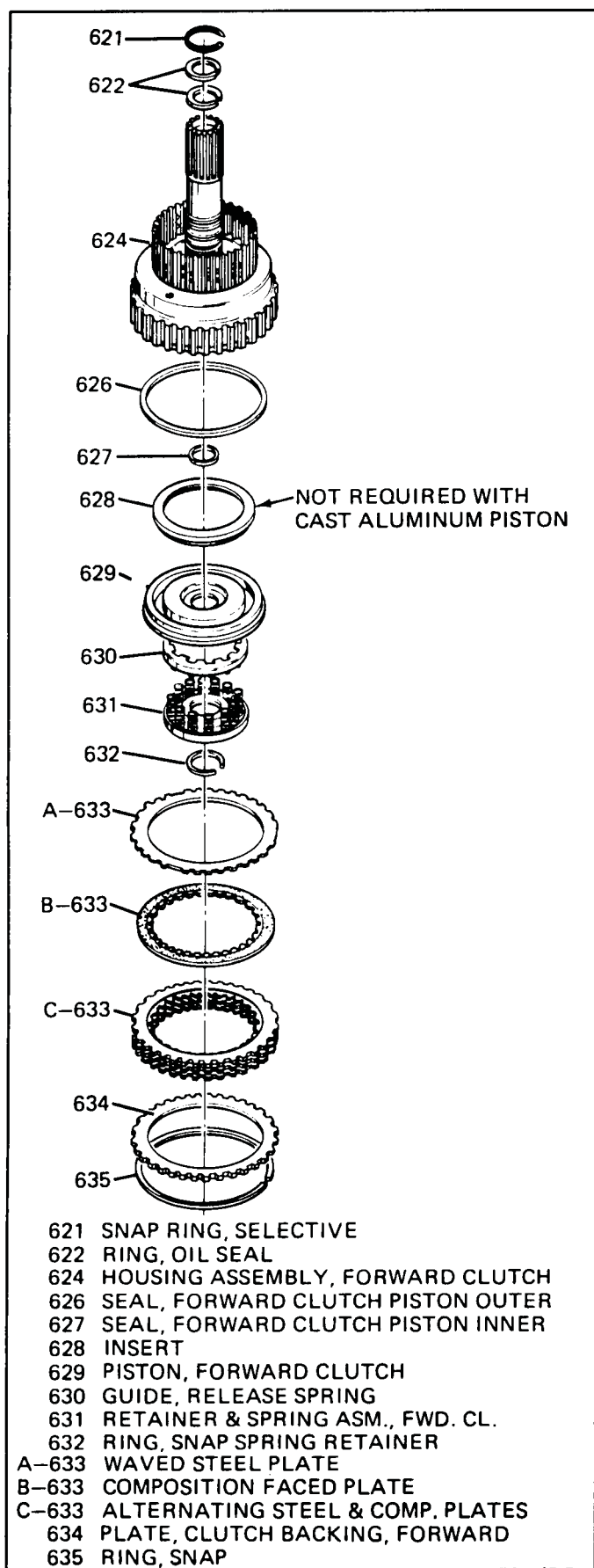


Figure 66 Forward Clutch Assembly

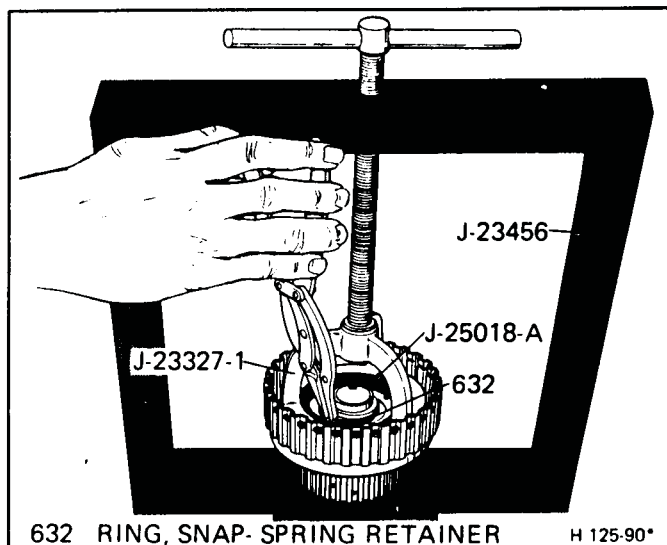


Figure 67 Forward Clutch Disassembly

- Forward clutch housing (624) for cracks, broken welds
- Input shaft (A) splines and journals for damage
- Input sleeve for damage, alignment and tightness – sleeve must not turn and slot must line up with input shaft hole.
- Seal rings (622) for damage – do not remove unless replacing.
- Piston (629) for damage or cracks
- Snap ring (621) for damage
- Insert (628) for damage
- Spring guide (630) for damage or distortion
- Retainer and spring assembly (631) for collapsed springs or bent retainer
- Composition and steel plates for wear or burning
- Waved steel plate (633) for wear or burning - flatness
- Backing plate (634) for damage or cracks

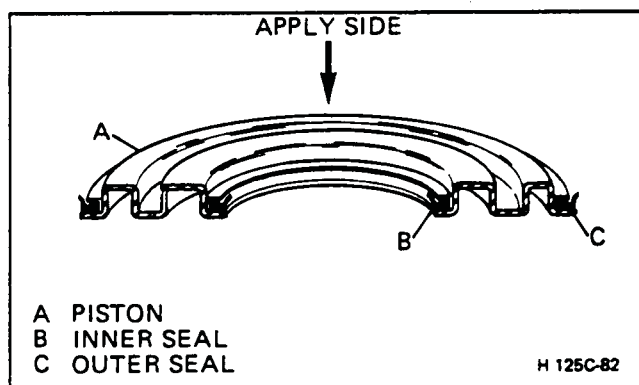


Figure 68 Typical Apply Piston

**Assemble (Figures 66, 67, 68, 69, and 70)****Tools Required:**

J-26744-A Seal Installer

J-23456 Clutch Pack Compressor

J-25018-A Adapter Forward Spring Compressor

1. Inner (627) and outer (626) seals – lips facing housing (624) (Figure 68)
2. Insert (628)

3. Piston assembly (629) with J-26744-A. Start inner seal (627) first.  
Do not cut the seals on the snap ring groove.
4. Spring guide (630)
5. Spring and retainer assembly (631)
6. Snap ring (632) – Use arbor press or J-23456 and J-25018-A.
7. Wave plate (633).
8. Lubricate composition plates (633).
9. Alternately composition and steel plates (633)
10. Backing plate (633) I.D. side up
11. Snap ring (632)
12. New seal rings (622) if required

**Measure**

- Snap ring (635) to backing plate (634) – end play range with a feeler gage must be 1.0-1.5 mm (.040"-.060"). For correct backing plate selection see Figure 69.

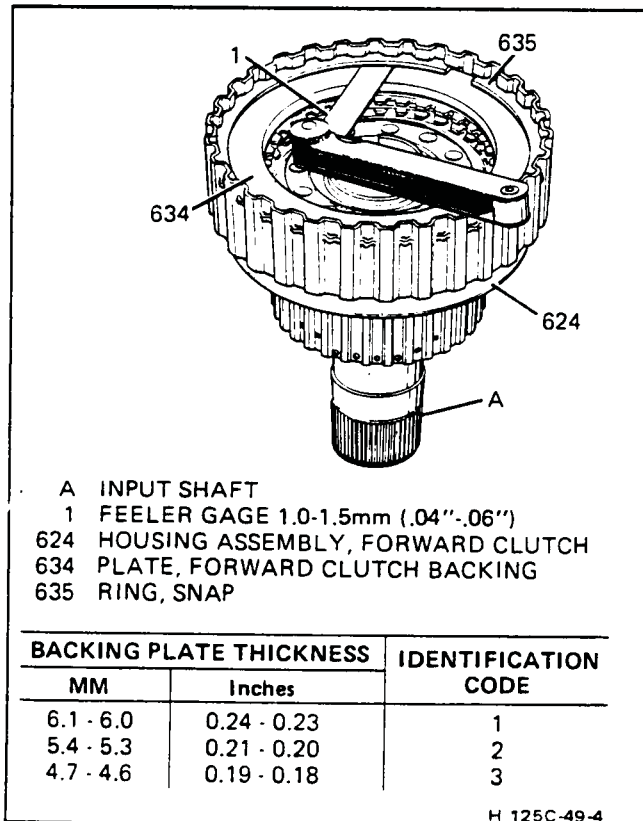


Figure 69 Forward Clutch Backing Plate Selection

**DIRECT CLUTCH ASSEMBLY****Disassemble (Figure 71)**

1. Snap ring (620)
2. Backing plate (619)
3. Composition and steel clutch plates (618)
4. Snap ring (617)
5. Apply ring and release spring assembly (616).
6. Piston (615)
  - Inner (614) and outer (612) seals
  - Center seal (613) from housing

**125C CLUTCH PLATE AND APPLY RING USAGE CHART**

CLUTCH	FLAT STEEL PLATE		COMP. FACED PLATE	WAVED PLATE		APPLY RING	
DIRECT	No.	Thick-ness	No.	No.	Thick-ness	I.D.	Thick-ness
CJ, CT, CD, CX, CF, PJ, PA, CU	5	2.3mm (0.09")	5	—	—	7	19.0mm (0.74")
ALL OTHERS	4	2.3mm (0.09")	4	—	—	1	23.1mm (0.90")
FORWARD ALL	3	1.9mm (0.08")	4	1	1.25mm (0.06")	—	—
LO & REVERSE ALL	4	2.2mm (.085")	5	1	1.94mm (0.08")	—	—

The direct and forward clutch flat steel clutch plates and the forward clutch waved steel plate should be identified by their thickness.

The direct and forward production installed composition-faced clutch plates must not be interchanged. For service, direct and forward clutch use the same compositioned-faced plates.

The forward clutch backing plate is selective. Refer to the Forward Clutch End Play Chart.

Measure the width of the clutch apply ring for positive identification.

H 125C-46-8

Figure 70 Clutch Plate Usage Chart

**Inspect**

- Housing (610) for
  - Bad welding
  - Band scoring
  - Heat damage
- Housing bushings for cracks, damage or scoring
- Piston (615) for damage or cracks
- Inner (614), outer (612) and center (613) seals for burrs, nicks or brittleness
- Apply ring and release spring assembly (616) for damage and collapsed springs
- Clutch plates (618) for wear or burning
- Backing plate (619) for damage, cracks or burning
- Snap rings (620), (617) for damage
- Check ball capsule for free operation

**Check Ball Capsule Replacement Procedure****Remove or Disconnect**

- Use a 9.5 mm (3/8") drift to drive out the ball capsule assembly.

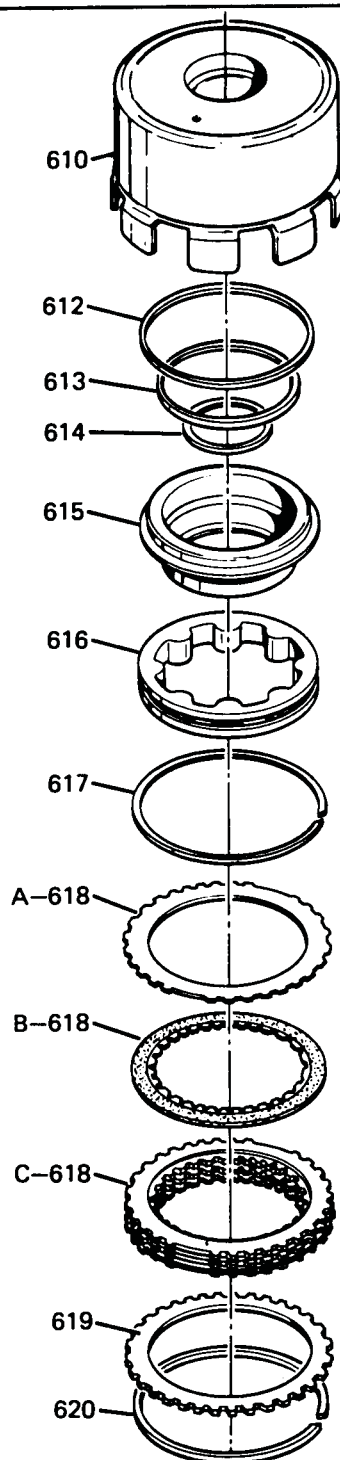
**Install or Connect**

- Seat the new capsule with the 9.5 mm (3/8") drift.

**Assemble (Figures 70, 71 and A-15)**

1. Center seal (613) – lips facing away from capsule
2. Inner seal (614) – lips facing capsule
3. Outer seal (612) – lips facing capsule
4. Piston (615)





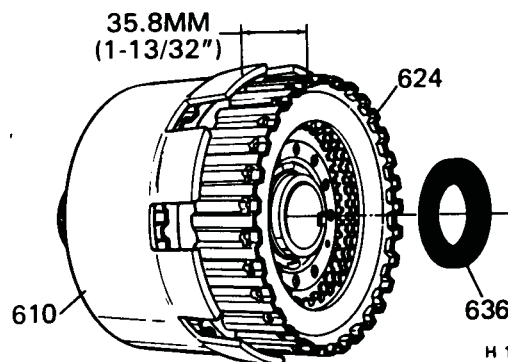
- 610 HOUSING & DRUM ASM., DIRECT CLUTCH  
612 SEAL, DIRECT CLUTCH PISTON OUTER  
613 SEAL, DIRECT CLUTCH CENTER  
614 SEAL, DIRECT CLUTCH PISTON INNER  
615 PISTON, DIRECT CLUTCH  
616 APPLY RING & RELEASE SPRING ASM.  
617 RING, SNAP  
A-618 STEEL CLUTCH PLATE  
B-618 COMPOSITION FACED PLATE  
C-618 ALTERNATING STEEL & COMP. PLATES  
619 PLATE, CLUTCH BACKING, DIRECT  
620 RING, SNAP

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Figure 71 Direct Clutch Assembly

5. Apply ring and release spring assembly (616)
6. Snap ring (617)
7. Lubricate composition plates (618)
8. Alternatel steel and composition plates (618)
9. Backing plate (619) (chamfered or highly polished side against composition plate)
10. Snap ring (620)

- 610 HOUSING, DIRECT CLUTCH  
624 HOUSING, FORWARD CLUTCH  
636 WASHER, THRUST (STEPPED SIDE OUT)



H 125-103\*A

Figure 72 Assembled Height of Clutch Assemblies

## FORWARD AND DIRECT CLUTCH



### Assemble (Figures 72, 73 and 74)

- Direct clutch assembly onto the forward clutch assembly. Rotate the direct clutch so that all clutch plates engage the clutch hub.
- Thrust washer stepped side out (636) - use petrolatum



### Measure (Figure 72)

- Assembled height 31 mm (1-7/32")



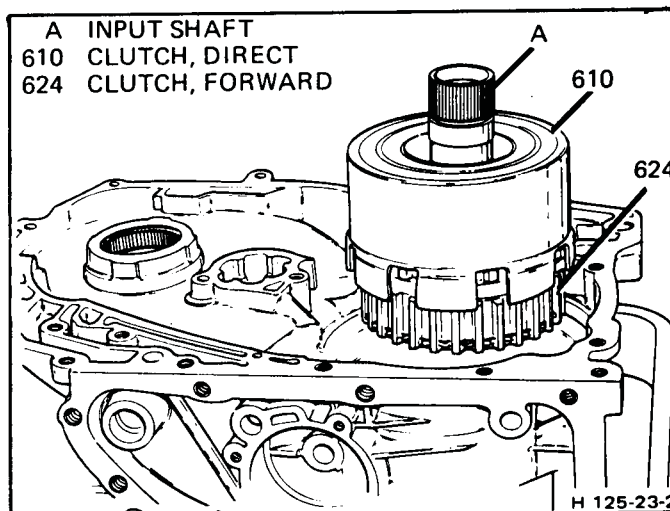
### Install or Connect (Figures 73 and 74)

- Forward and direct clutch assemblies into case



### Measure (Figure 74)

- Case face to housing - 42 mm (1-11/16")



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Figure 73 Installing the Clutch Assemblies



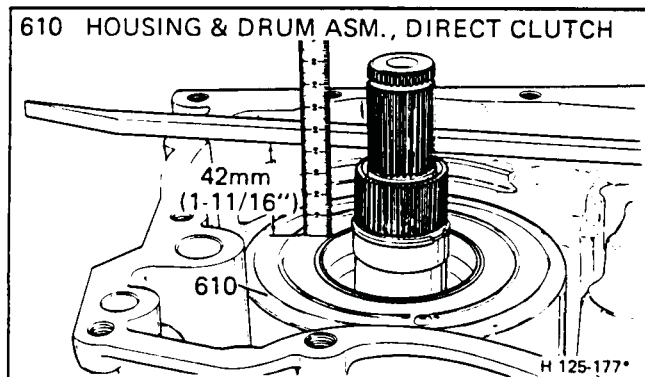


Figure 74 Proper Clutch Installation

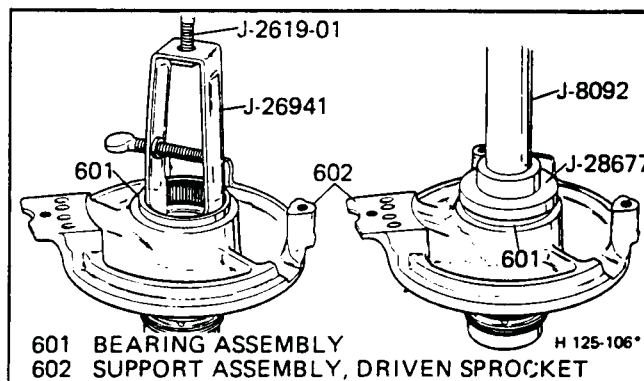


Figure 76 Bearing Replacement

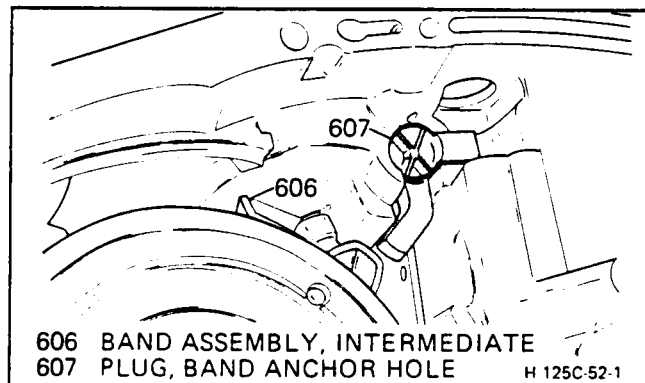


Figure 75 Intermediate Band Anchor Hole Plug

## INTERMEDIATE BAND ASSEMBLY



### Inspect

- Band (606) for burns, flaking or damage



### Install or Connect (Figure 75)

1. Band (606) – must engage the case lug
2. Plug (607).

## DRIVEN SPROCKET SUPPORT



### Inspect (Figure 76 and 26)

- Support (602) for cracks, burrs or damage – oil passage surface must be flat and smooth
- Bushing (603) for damage
- Thrust washer (605) for damage
- Oil seal rings (604) for nicks, cuts or damage

### Bearing Replacement Procedure



### Remove or Disconnect (Figure 76)

Tools Required:

J-26941 Transmission Case Bearing Cup Remover

J-6125-1 Slide Hammer

- Bearing assembly (601) – use J-26941 and J-6125-1
- Inspect race for damage

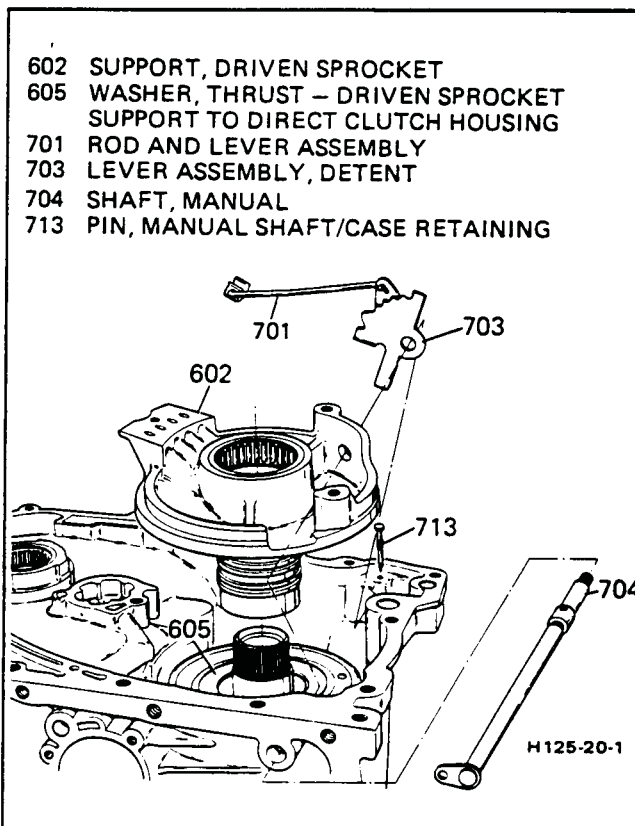


Figure 77 Driven Sprocket Support & Manual Linkage



### Install or Connect

- New bearing – manufacturing identification faces up



### Assemble (Figure 77 and Figure 26)

- Thrust washer (605) – retain with petrolatum.
- Support assembly (602) into the case. (Do not allow the direct clutch bushing to cut the oil seals.)

## MANUAL SHAFT



### Inspect (Figure 77)

- Rod and retainer assembly (701) for distortion or damage

- Detent lever (703) for damage
- Manual shaft (704) for damaged threads, raised edges on flats
- Parking lock actuator assembly (705) for damage or broken retainer lugs

### Assemble

1. Actuator (705) to manual shaft (704)
2. Detent lever (703) into case
3. Slide the manual shaft (704) into the case and engage the detent lever (703).
4. Tap the roll pin (702) into the detent lever with a 5 mm (3/16") drift.
5. Tap nail (703) into place.

## DRIVE LINK ASSEMBLY

### Inspect (Figure 78)

- Drive and driven sprockets (103) 122) teeth and splines for nicks, burrs, scoring or wear.
- Shaft (106) for damage, wear
- Seals (105) for damage
- Thrust washer (104) for damage or wear
- Link assembly (101) for damage or loose links

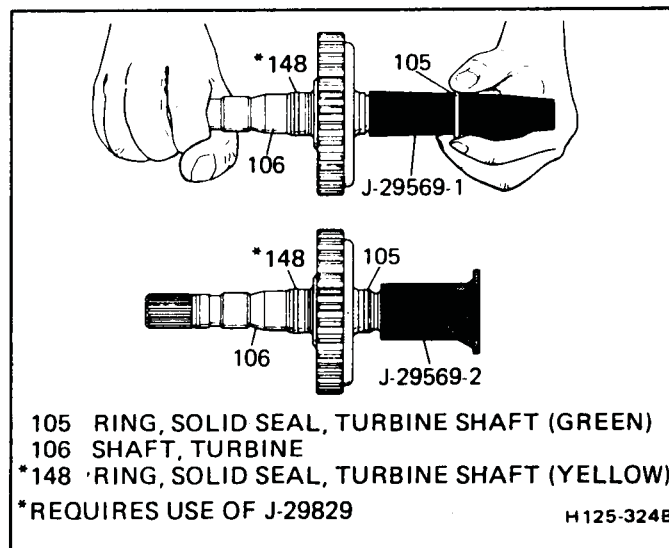


Figure 79 Turbine Shaft Seal Replacement

- Thrust bearing (121) for damage or wear
- Driven support thrust washer (123) for damage or wear

See drive link inspection in Section 7A.

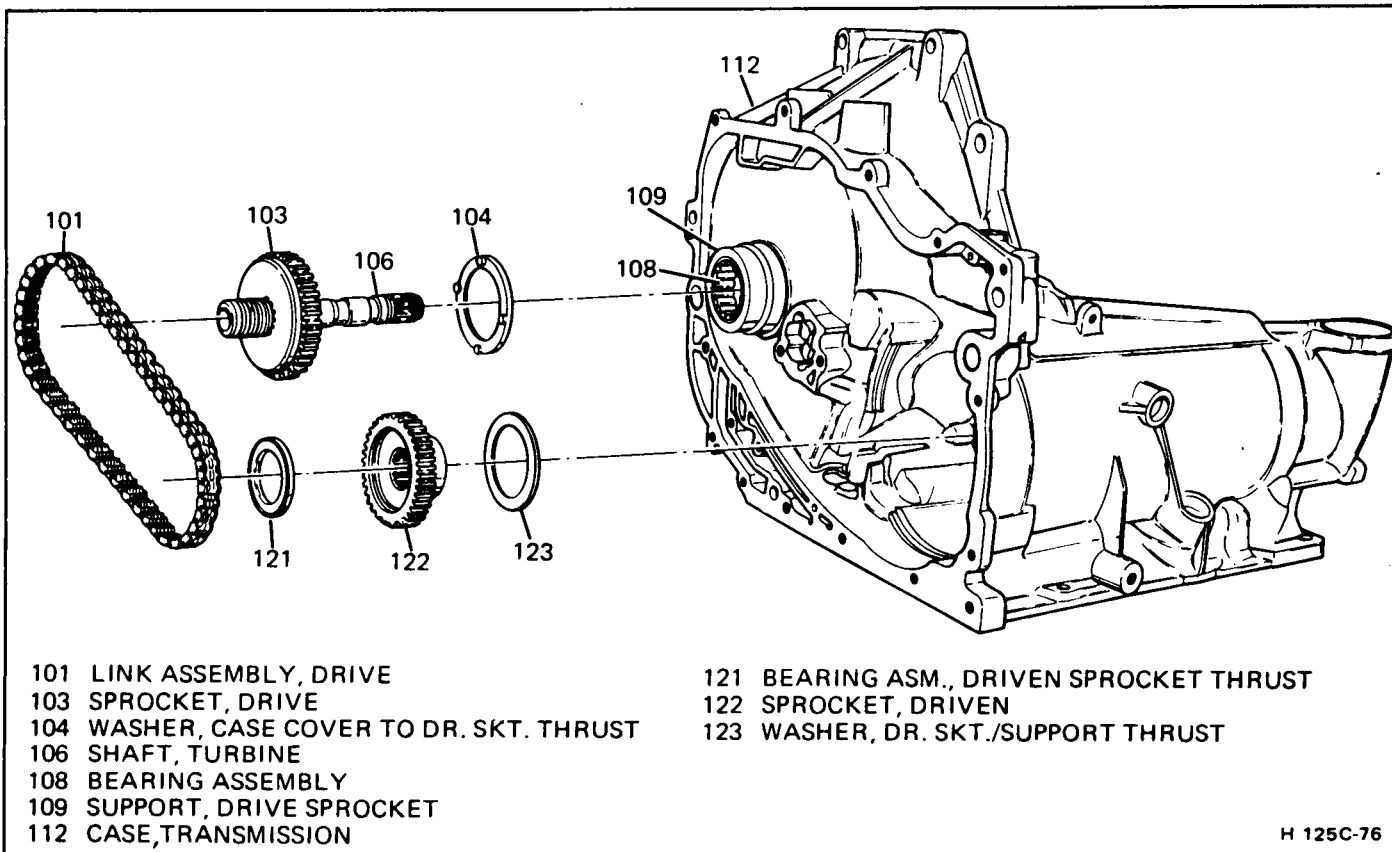


Figure 78 Drive Link Assembly

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## Turbine Shaft Seal and Drive Sprocket Replacement Procedure

### Remove or Disconnect (Figure 4 and 79)

- Seals (105) from turbine shaft (cut with a knife)
- Snap ring (102) from turbine shaft
- Drive sprocket (103) from turbine shaft

### Install or Connect (Figure 79)

Tools Required:

J-29569 Turbine Shaft Seal Installer

J-29829 Turbine Shaft Seal Installer

- Drive sprocket (103) onto turbine shaft
- Snap ring (102) onto turbine shaft
- Slide installer J-29569-1 over the turbine shaft and coat with petrolatum
- Guide new seals (105) over tool into seal ring grooves
- Size the seals with sizing tool J-29569-2
- Slide installer J-29829-1 over opposite end of turbine shaft and coat with petrolatum.
- Guide new seal (148) over tool into seal ring groove.
- Size the seal with sizing tool J-29829-2.

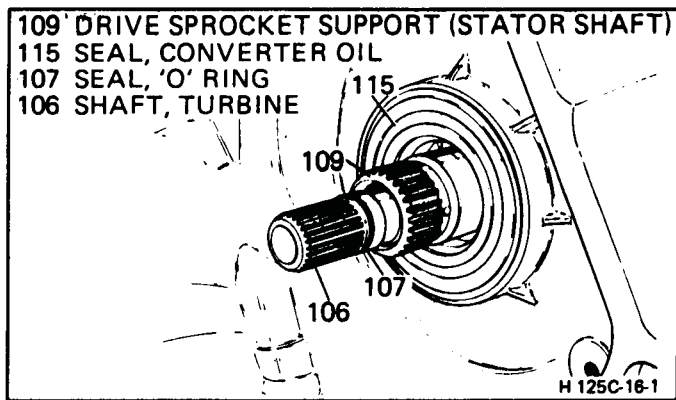
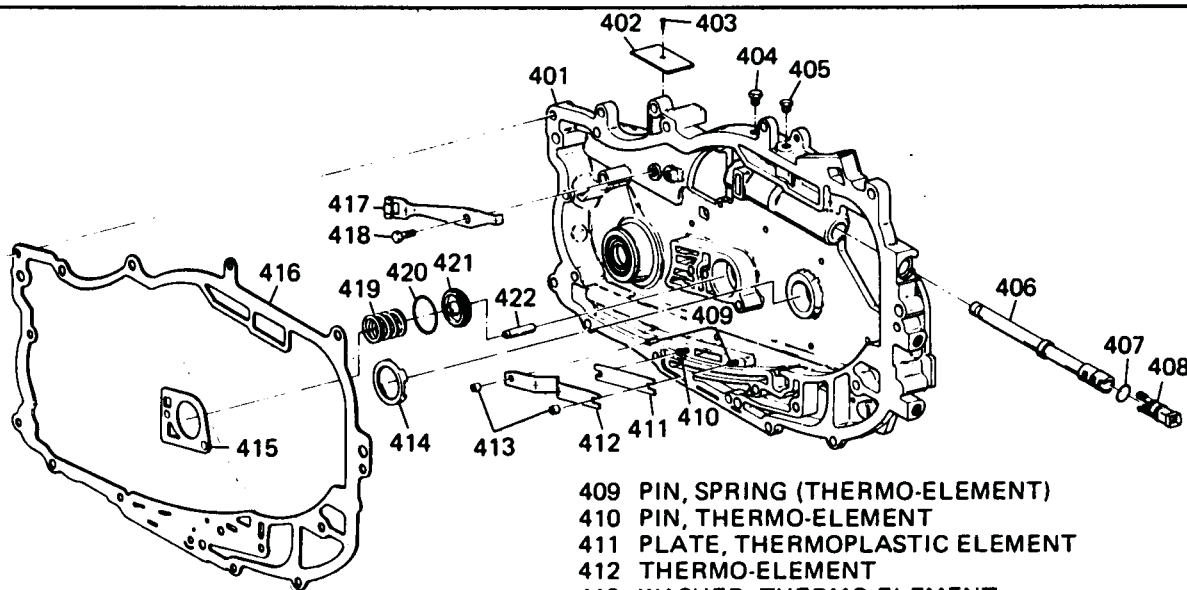


Figure 80 Turbine Shaft "O" Ring Seal

### Install or Connect (Figures 78 and 80)

1. Thrust washer (123) onto sprocket (122) and retain with petrolatum
2. Thrust washer (104) onto sprocket (103) and retain with petrolatum
3. Drive (103) and driven (122) sprockets into link assembly (101) - colored guide link up
4. Link assembly (101) and sprockets (103) and (122) into case (112)
5. New "O" ring (107) onto the turbine shaft from the converter side of case (Figure 80)
6. Thrust bearing (121) onto sprocket (122)



ILL.  
NO.

DESCRIPTION

- 401 COVER, TRANSMISSION CASE
- 402 NAMEPLATE
- 403 SCREW - NAMEPLATE
- 404 VENT ASSEMBLY
- 405 PLUG, (LINE PRESSURE PICKUP) PIPE
- 406 VALVE, MANUAL
- 407 SEAL, "O" RING
- 408 ELECTRICAL CONNECTOR

- 409 PIN, SPRING (THERMO-ELEMENT)
- 410 PIN, THERMO-ELEMENT
- 411 PLATE, THERMOPLASTIC ELEMENT
- 412 THERMO-ELEMENT
- 413 WASHER, THERMO-ELEMENT
- 414 WASHER, THRUST CASE COVER TO DR. SKT.
- 415 GASKET, CASE TO CASE COVER CENTER
- 416 GASKET, CASE TO CASE COVER
- 417 SPRING AND ROLLER ASM., MANUAL DETENT
- 418 BOLT, MAN. DET. SPRING/CASE COVER
- 419 SPRING, 1-2 ACCUMULATOR PISTON
- 420 RING, OIL SEAL, 1-2 ACCUMULATOR PISTON
- 421 PISTON, 1-2 ACCUMULATOR
- 422 PIN, 1-2 ACCUMULATOR

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Figure 81 Case Cover - Case Side

## CASE COVER ASSEMBLY

**Clean (Figures 81 and 84)**

- Apply gasket remover, then scrape the case cover gasket surface with a plastic scraper

**Inspect**

- Case cover (401) – see Section 7A for case cover repair
  - Casting porosity
  - Oil passage damage
  - 1-2 accumulator bore damage
- 1-2 accumulator piston (421), seal (420) and spring (419)
  - Cracked or damaged piston
  - Cut or nicked seal
  - Distorted spring
- Vent assembly (404) for damage

## Vent Assembly Replacement Procedure

**Remove or Disconnect**

- Vent assembly with pliers

**Install or Connect**

- Apply thread sealant to the vent (404) vent.
- Tap the vent (404) into case cover with a soft mallet.

**Inspect (Figure 81 and 84)**

- Detent spring and roller (417) for damage – replace as necessary.
- Cooler fittings (17) for thread damage

## Cooler Fitting Replacement Procedure

**Disassemble (Figure 84)**

- Cooler fittings (17) from case cover

**Assemble**

- Apply thread sealer to cooler fittings
- Cooler fittings (17) into case cover – 38 N·m (23 ft. lbs.)

**Inspect**

- Electrical connector (408) for damage
- Case cover sleeve – for feed hole alignment
- Manual valve (406) for damage – must slide freely in the bore
- Thrust washer (414) for damage
- Thermostatic element (409-413) for damage

## Thermostatic Element Replacement Procedure

**Disassemble (Figure 82)**

Tool Required:

- J-29023
- Washers (413)

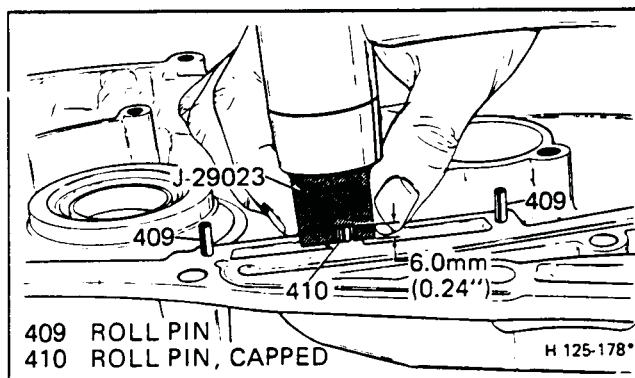


Figure 82 Setting Center Roll Pin Height

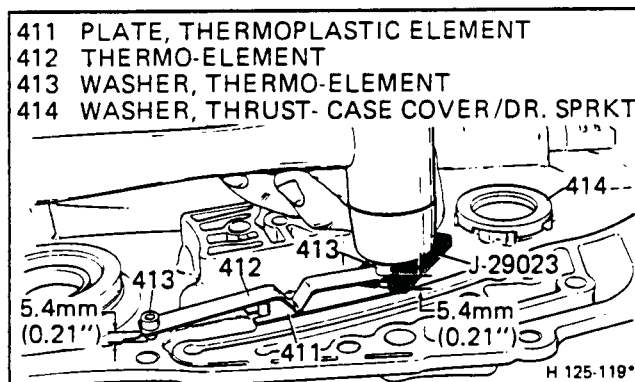


Figure 83 Setting Element Height

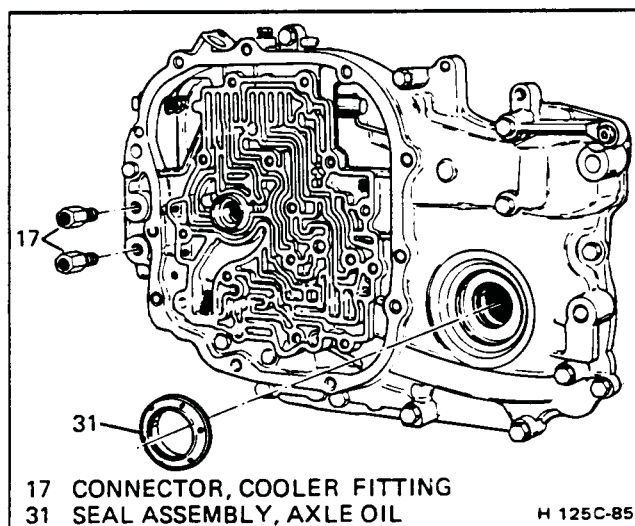


Figure 84 Left Hand Axle Seal &amp; Cooler Fittings

- Element (412)
- Element plate (411)

**Assemble (Figure 82 and 83)**

- Set thermo pin height with J-29023
- Install the element plate (411)
- Install the element (412)
- Install the washers (413) – use J-29023 to set the washer height.

**Inspect (Figure 84)**

- Left hand axle seal (31) for damage

## Seal Replacement Procedure



Remove or Disconnect

- Seal (31)



Install or Connect

- Seal (31) use J-26938 or J-29130



Assemble (Figure 81)

- Case cover
- Thrust washer (414) – use petrolatum to hold in place.
- Pin (422), chamfered end first
- Piston (421)
- Spring (419)
- Gasket (415) – use petrolatum to hold in place.



Install or Connect

- Loctite ® 515 or equivalent on both sides of gasket (416)
- Gasket (416) to case cover
- Case cover (401) to case
- Coat bolt (A) with thread sealer (Figure 84A).
- Retainer (701) to manual valve (406) (Figure 85)

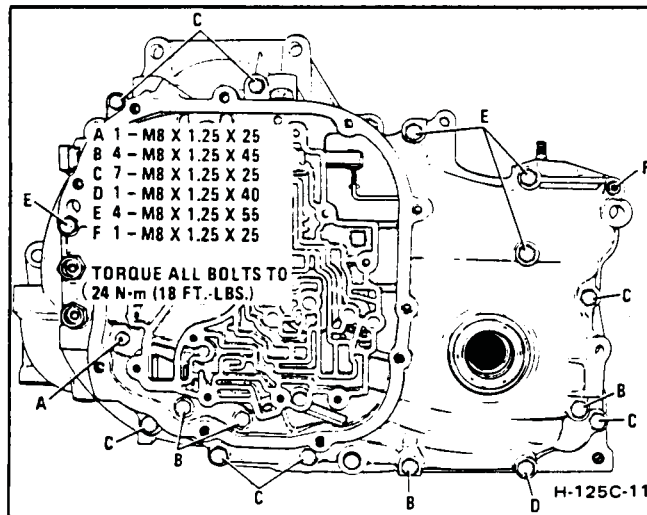


Figure 84A

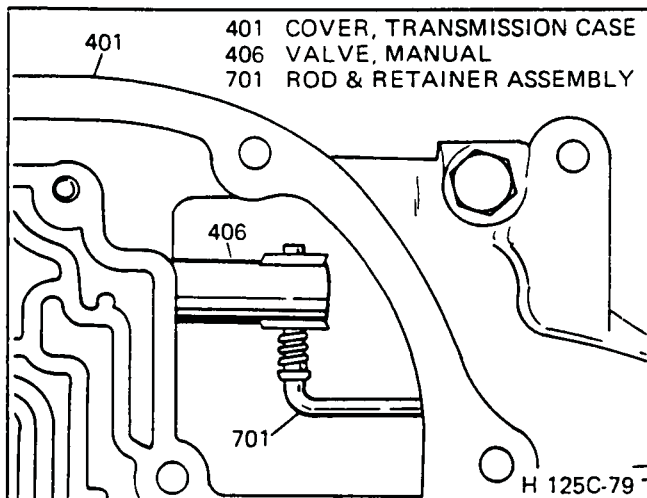


Figure 85 Manual Valve

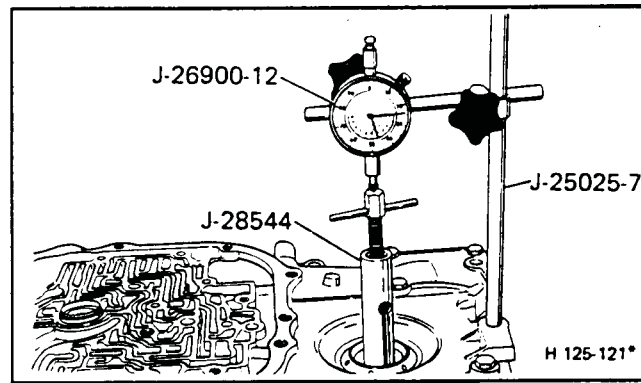


Figure 86 Input Shaft to Case Cover End Play

## INPUT SHAFT TO CASE COVER SELECTIVE SNAP RING (621)

Thickness	Identification/Color
1.83 - 1.93mm (0.071" - 0.076")	White
2.03 - 2.13mm (0.078" - 0.084")	Blue
2.23 - 2.33mm (0.088" - 0.092")	Brown
2.43 - 2.53mm (0.095" - 0.099")	Yellow
2.63 - 2.73mm (0.103" - 0.107")	Green

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Figure 87 Selective Snap Ring Chart

## Input Shaft End Play



Measure (Figures 86 and 87)

Tools required:

- J-26958-10 Adapter plug
- J-26958 Loading tool and J-26958-11 bracket
- J-28544 Input shaft lifter
- J-25025-7 Dial indicator post
- J-26900-12 or J-8001 Dial indicator

- Install essential tools
- Push the lifter down and zero the dial indicator.
- Pull the lifter up.
- Dial indicator reading should be 0.10-0.84 mm (.004-.033").  
See (Figure 87) for snap ring selection – correct as necessary.
- Remove tools.

## CONTROL VALVE AND OIL PUMP ASSEMBLY



Disassemble (Figures 88, 89, and 90L)

- Control Valve Assembly



Important

Valves and springs are **not** interchangeable. Keep them in the order shown.

- Position as shown.
- Start at the upper left and remove each valve train. Lay out the valve train as shown.



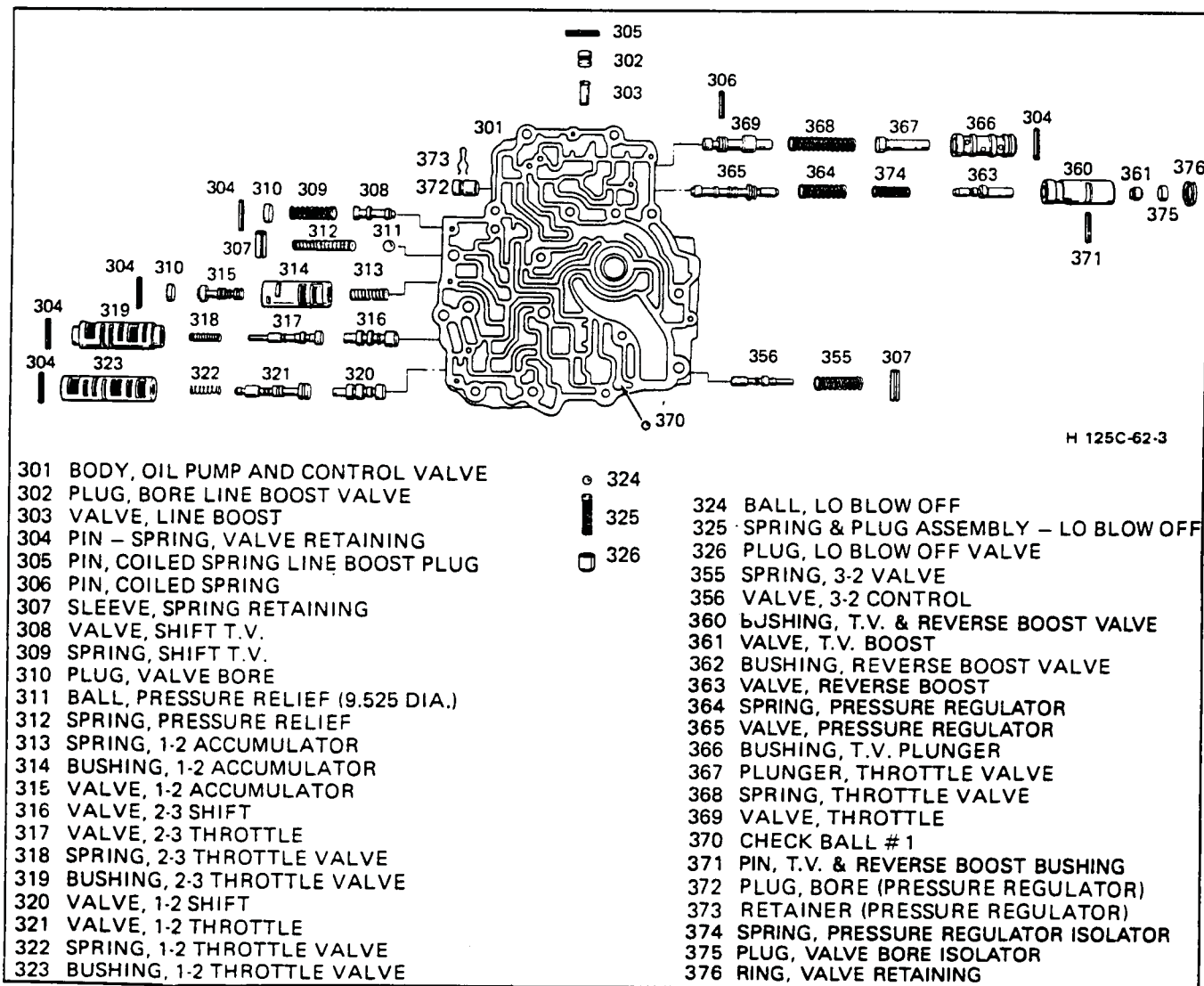
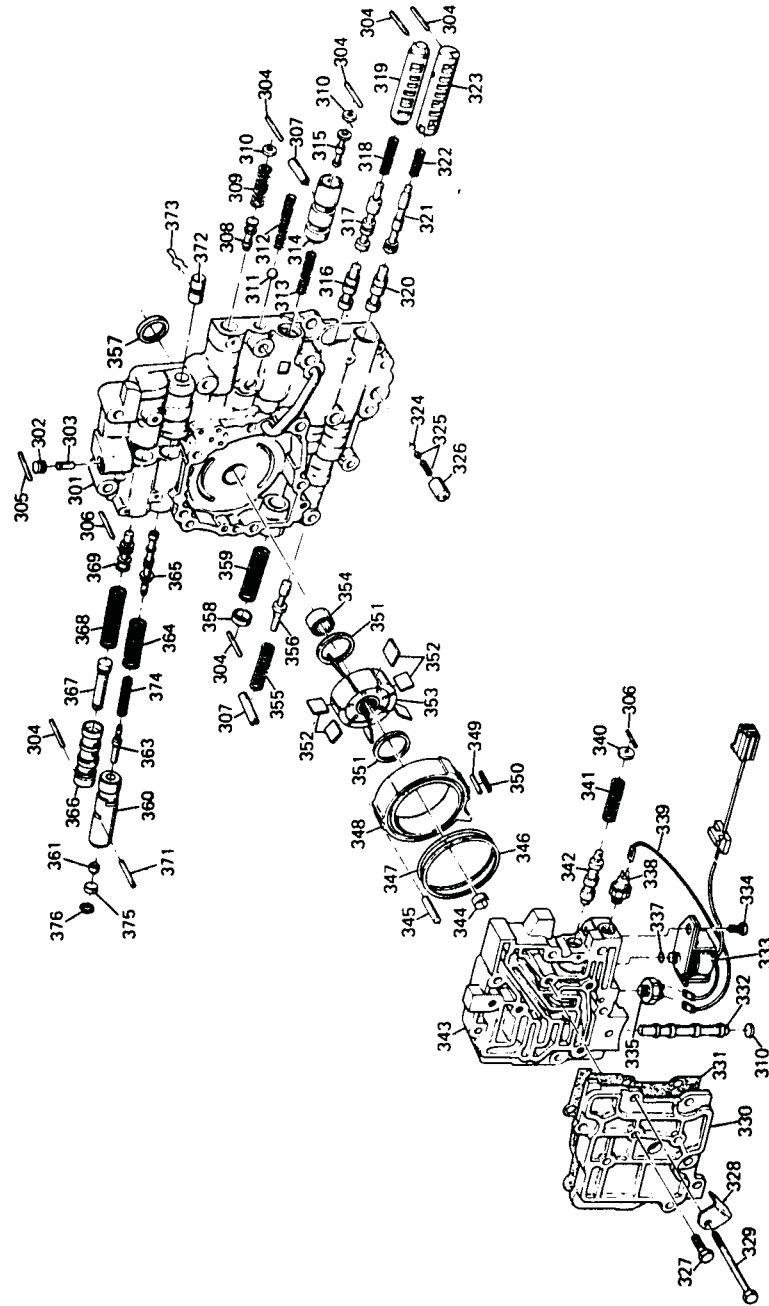


Figure 88 Control Valve - Pump Assembly

- Roll pins (307) - they are under pressure. Cover the bore when the pin is removed.
- Blind hole pins must be removed with a #49 drill bit (1.85 mm or .073"). Grind the taper off the bit.
- Oil pump and auxiliary valve body assembly
  1. Screw (327)
  2. Cover (330) and gasket (331)
  3. Screw (334), solenoid assembly (333) and "O" ring seal (337)
  4. Switches (335 & 338)
  5. Auxiliary valve body (343)
    - Converter clutch regulator valve, pin, bore plug and spring (306, 340, 41, 4.)
  6. C.C. Control valve (332) and plug (310)
  7. Pin (345) and slide (348)
  8. Vanes (352) and rotor (353)
  9. Pump vane ring (351)
- All valves, bushings and springs with solvent, air dry
- Inspect
  - Valve body (301) and auxiliary valve body (343)
    - Oil passage damage
    - Casting porosity
    - Machine face damage
    - Scored valve bores
    - Pump pocket for damage
    - Auxiliary valve body sleeve for damage
  - Valves, bushings and springs
    - Scored or cracked valves
    - Scored or cracked bushings
    - Collapsed springs
  - Pump rotor and vanes
    - Rotor damage (353)
    - Vane damage (352)
    - Vane rings for damage (351)
    - Slide seals (350)
    - Slide "O" rings seals (346 & 347)
  - Pump shaft bearing (354) for damage
- Clean
  - Valve body (301) and auxiliary valve body (340) with solvent - air dry. Lo blow off assembly - 326, 325, 324 must be replaced.





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Figure 89 Control Valve & Oil Pump Assembly

301 BODY, OIL PUMP & CONTROL VALVE	341 SPRING, CONVERTER CLUTCH REGULATOR
302 PLUG, BORE LINE BOOST VALVE	342 VALVE, CONVERTER CLUTCH REGULATOR
303 VALVE, LINE BOOST	343 BODY, AUXILIARY VALVE
304 PIN, VALVE RETAINING SPRING	344 SLEEVE, AUXILIARY VALVE BODY
305 PIN, COILED SPRING LINE BOOST PLUG	345 PIN, SLIDE PIVOT
306 PIN, COILED SPRING	346 RING, OIL SEAL (SLIDE TO COVER)
307 SLEEVE, SPRING RETAINING	347 SEAL, "O" RING (SLIDE)
308 VALVE, SHIFT T.V.	348 SLIDE, PUMP
309 SPRING, SHIFT T.V.	349 SUPPORT, PUMP SLIDE SEAL
310 PLUG, VALVE BORE	350 SEAL, PUMP SLIDE
311 BALL, PRESSURE RELIEF (9.525 DIA.)	351 RING, PUMP VANE
312 SPRING, PRESSURE RELIEF	352 VANE, PUMP
313 SPRING, 1-2 ACCUMULATOR	353 ROTOR, OIL PUMP
314 BUSHING, 1-2 ACCUMULATOR	354 BEARING ASSEMBLY, ROLLER PUMP SHAFT
315 VALVE, 1-2 ACCUMULATOR	355 SPRING, 3-2 VALVE
316 VALVE, 2-3 SHIFT	356 VALVE, 3-2 CONTROL
317 VALVE, 2-3 THROTTLE	357 SEAL, PUMP SHAFT
318 SPRING, 2-3 THROTTLE VALVE	358 PLUG, SPRING RETAINING
319 BUSHING, 2-3 THROTTLE VALVE	359 SPRING, PUMP PRIMING
320 VALVE, 1-2 SHIFT	360 BUSHING, T.V. & REVERSE BOOST VALVE
321 VALVE, 1-2 THROTTLE	361 VALVE, T.V. BOOST
322 SPRING, 1-2 THROTTLE VALVE	363 VALVE, REVERSE BOOST
323 BUSHING, 1-2 THROTTLE VALVE	364 SPRING, PRESSURE REGULATOR
324 BALL, LO BLOW OFF	365 VALVE, PRESSURE REGULATOR
325 SPRING & PLUG ASSEMBLY, LO BLOW OFF	366 BUSHING, T.V. PLUNGER
326 PLUG, LO BLOW OFF VALVE	367 PLUNGER, THROTTLE VALVE
327 BOLT, AUXILIARY V.B./VALVE BODY	368 SPRING, THROTTLE VALVE
328 RETAINER, VALVE BODY PIPE	369 VALVE, THROTTLE
329 BOLT, AUXILIARY VALVE BODY TO CASE	371 PIN, T.V. & REVERSE BOOST BUSHING
330 COVER, AUXILIARY VALVE BODY	372 PLUG, BORE (PRESSURE REGULATOR)
331 GASKET, AUXILIARY VALVE BODY COVER	373 RETAINER, PRESSURE REGULATOR
332 VALVE, CONVERTER CLUTCH CONTROL	374 SPRING, PRESSURE REGULATOR ISOLATOR
333 SOLENOID ASSEMBLY	375 PLUG, VALVE BORE ISOLATOR
334 BOLT, SOLENOID	376 RING, VALVE RETAINING
335 SWITCH, PRESSURE	
337 SEAL, "O" RING	
338 SWITCH, GOVERNOR PRESSURE (DIESEL ONLY)	
339 HARNESS, SOLENOID WIRE	
340 PLUG, VALVE BORE	

LEGEND  
H 125C-21-3

Figure 90L Control Valve and Oil Pump Ass'y. Legend

Oil Pump Rotor and Slide Replacement



Measure (Figure 91)

Tool Required:

- One Inch Micrometer
- Oil Pump Rotor (353) Thickness
- Oil Pump Slide (348) Thickness

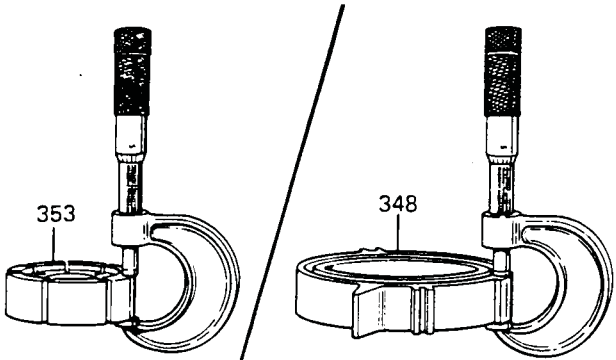


Important

Measurement of rotor/slide must be made on undamaged surfaces. Select similar size replacements. (Figure 91) Lightly hone both sides of replacement rotor or slide to remove any nicks or burrs.

OIL PUMP ROTOR SELECTION CHART	
THICKNESS (mm)	THICKNESS (in.)
17.917 - 17.929	0.7055 - 0.7059
17.930 - 17.942	0.7060 - 0.7064
17.943 - 17.955	0.7065 - 0.7069
17.956 - 17.968	0.7070 - 0.7074
17.969 - 17.981	0.7075 - 0.7079
OIL PUMP SLIDE SELECTION CHART	
THICKNESS (mm)	THICKNESS (in.)
17.955 - 17.967	0.7070 - 0.7074
17.968 - 17.980	0.7075 - 0.7079
17.981 - 17.993	0.7080 - 0.7084
17.994 - 18.006	0.7085 - 0.7089
18.007 - 18.020	0.7090 - 0.7094

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348 OIL PUMP SLIDE  
353 OIL PUMP ROTOR

Figure 91 Oil Pump Rotor and Slide Selection

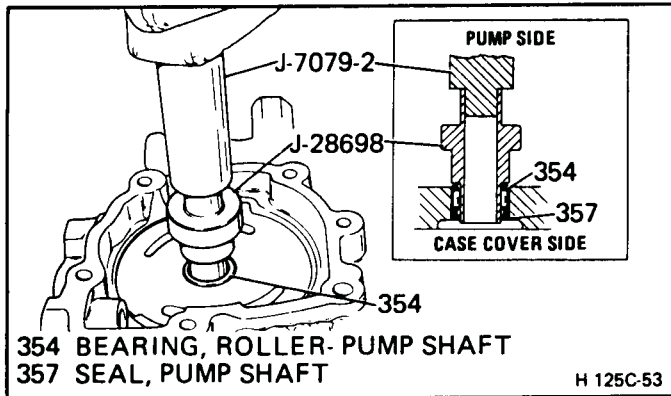


Figure 92 Pump Bearing Installation

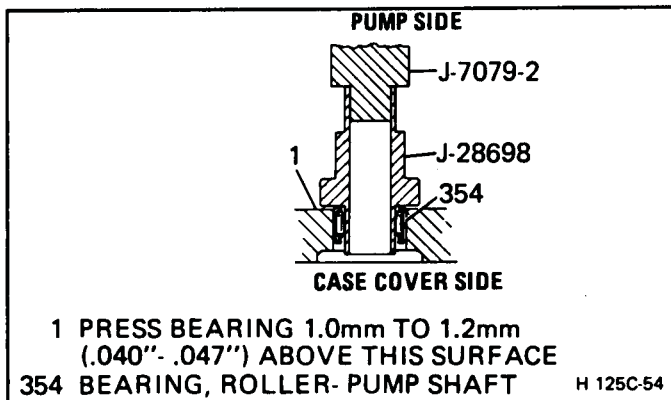


Figure 93 Bearing Dimension

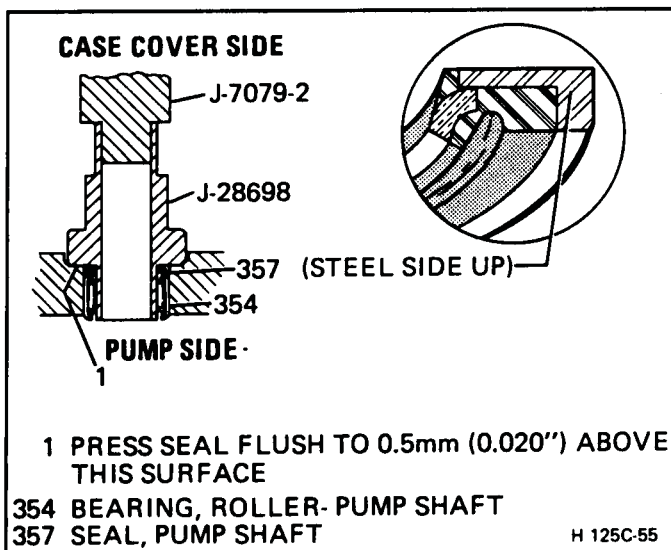


Figure 94 Bearing Seal Dimension

## Pump Shaft Bearing Replacement

### Remove or Disconnect

Tools Required:

J-28698 Pump Bearing Remover and Installer

J-7079-2 Driver Handle

- Bearing with J-28698 and J-7079-2 (Drive toward pump pocket)

### Install or Connect (Figures 92, 93, and 94)

Tools Required:

J-28698 Pump Bearing Remover and Installer

J-7079-2 Driver Handle

- New bearing, use J-28698 and J-7-79-2 – install from pump pocket side – bearing cup must be 0.45 - 0.15 mm (0.017\"-0.005\") below pump pocket

### Assemble (Figures 88 and 89)

- Oil pump assembly
  1. Pump slide (348) into pump pocket
  2. Slide seal support (349) and seal (350) into slide (348)
  3. Align side with pivot hole, then install pin (345)
  4. Vane ring (351) into pump pocket (1 of 2 rings)
  5. Vanes (352) and rotor (353) pocket
  6. Vane ring (351) top of rotor
  7. "O" ring seal (349) on top of rotor
  8. "O" ring seal (346) (slide to cover)
- Auxiliary valve body
  - Converter clutch regulator valve (342), spring (341), bore plug (340) and roll pin (306)
  - Control valve (332) and plug (310)
  - Switches (335 & 338)
  - Solenoid (333) with oil seal (337) and bolt (334) - attach leads
- Auxiliary valve body to valve body
  - Position as shown.
  - Install gasket (331) and cover (330).

### Tighten

Torque the bolts (327) to 11 N·m (8 ft. lbs.)

### Assemble (Figures 88, 89, and 90L)

- Control valve assembly
- All valves, springs, bushings, bore plugs and roll pins as shown

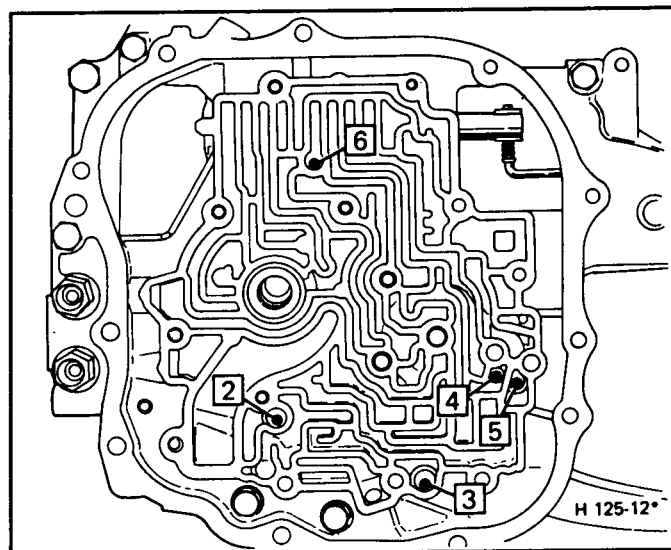


Figure 95 Check Ball Locations

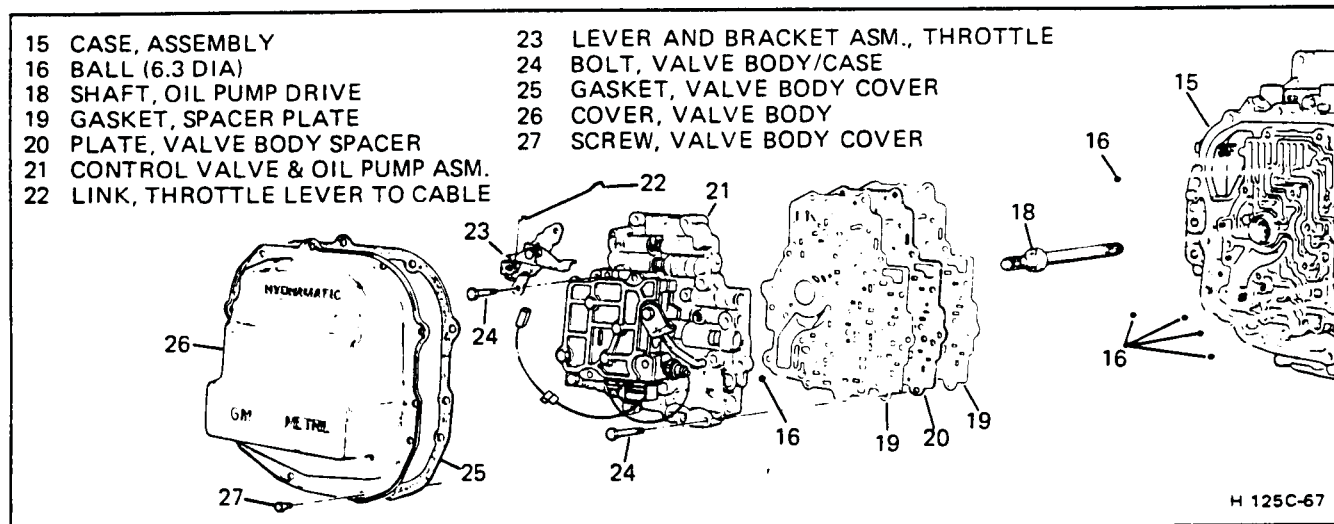


Figure 96 Control Valve Pump Assembly, Oil Pump Shaft

## CONTROL VALVE AND OIL PUMP ASSEMBLY

### Install or Connect (Figures 95, 96, 97, 98, 99 and 100)

1. Check balls (16), numbers 2, 3, 4 and 5
2. Gasket (19)
3. Plate (20)
4. Gasket (19)
5. Check ball (16) number one – on spacer plate
6. Shaft (18) – through case cover
7. 6 mm guide pins
8. Body assembly (21) – onto case cover
9. Retainer (328)
10. Bolts (327). Refer to Figure 98.
11. Coat bolt "F" Figure 98 with thread sealer.
12. Wiring harness.
13. Link (22)
14. Bracket assembly (23) – engage link (22)
15. Remove 6 mm guide pins.
16. Remaining bolts (327)



### Tighten

- Torque the bolts (327):  
M6 - 11 N·m (8 ft. lbs.).  
M8 - 24 N·m (18 ft. lbs.).

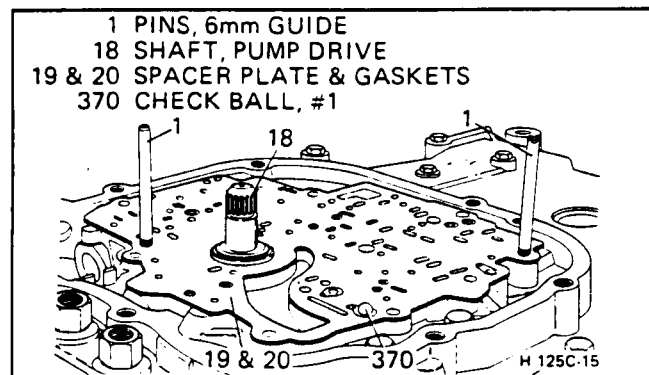


Figure 97 Spacer Plate &amp; Gaskets

### Install or Connect

1. Gasket (25) or apply R.T.V. silicon sealant

- A 9 – M6 X 1.0 X 45  
B 2 – M6 X 1.0 X 65  
C 4 – M6 X 1.0 X 25  
D 1 – M8 X 1.25 X 65  
E 1 – M8 X 1.25 X 85  
F 1 – M8 X 1.25 X 130  
G 3 – M6 X 1.0 X 90  
H 1 – M6 X 1.0 X 16  
I 1 – PIPE RETAINER

TORQUE ALL M6 BOLTS TO 11 N·m (8 FT.-LBS.)

TORQUE ALL M8 BOLTS TO 24 N·m (18 FT.-LBS.)

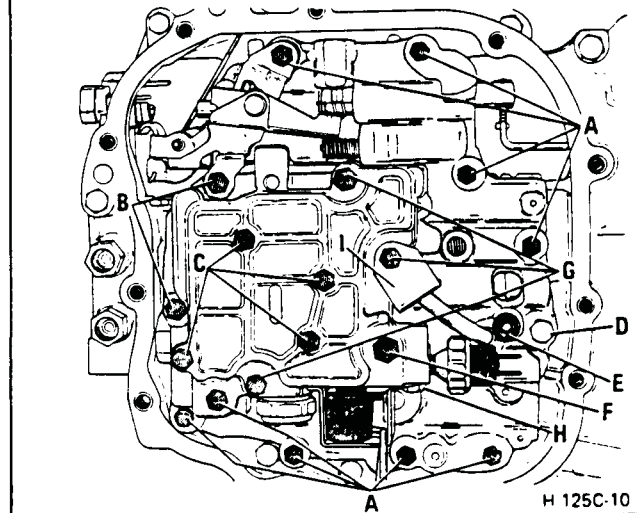


Figure 98 Valve Body Bolt Location

2. Cover (26)
3. Screws (27)



### Tighten

- Torque the screws (27) to 11 N·m (8 ft. lbs.).



### Install or Connect (Figure 101)

1. Shaft (29) into case
2. "C" ring (30) position with needle nose pliers.
3. With J-28583 push on "C" ring (30)

MODEL USAGE — BA, BC, BD, BP, CA, CB, CC, CD, CF, CJ, CK, CL, CM, CT, CU, CX, HL, HU, PA, PD, PF, PH, PJ, PK, PN, PR, PW

- 1 CLIP IN CASE COVER PRONGS
- 2 RED
- 3 WHITE
- 4 BLACK
- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 408 CONNECTOR, ELECTRICAL

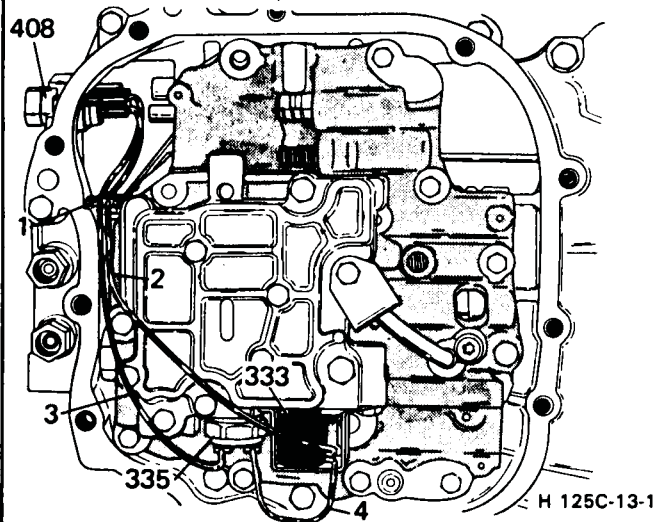
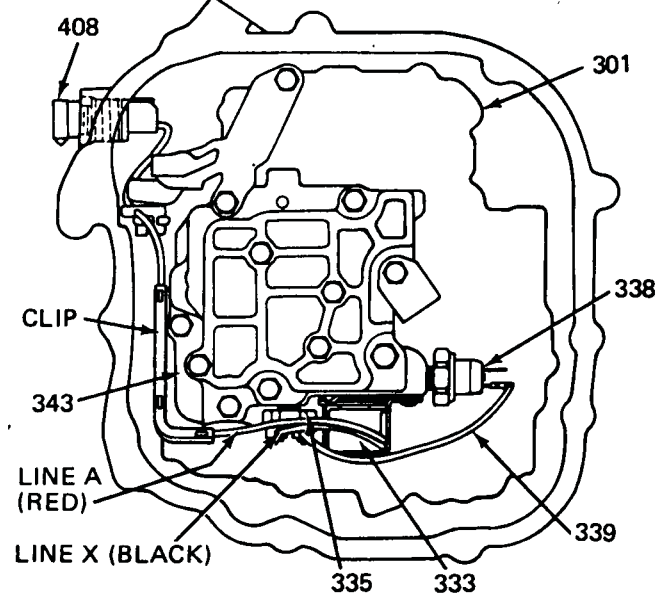


Figure 99 T.C.C. Wiring Diagram

MODEL HS

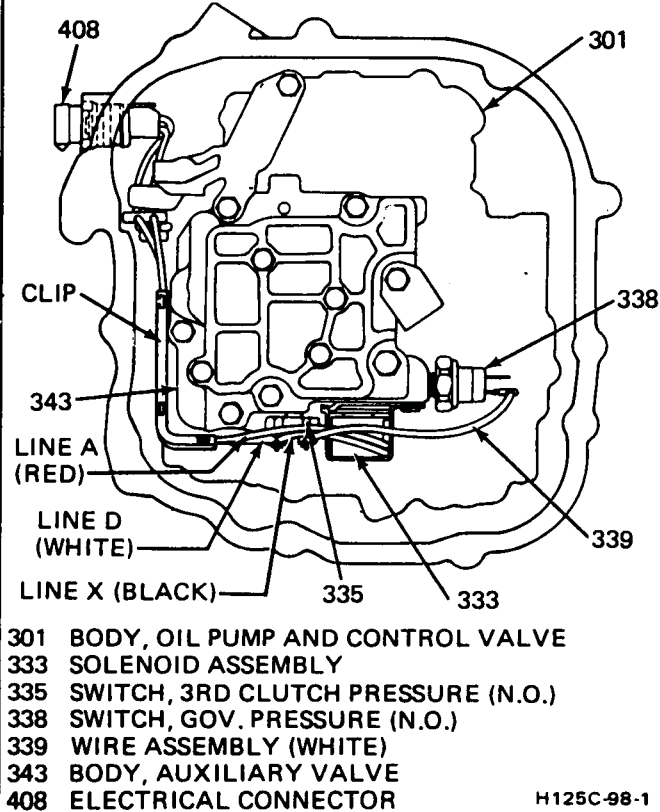


- 301 BODY, OIL PUMP AND CONTROL VALVE
- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 338 SWITCH, GOV. PRESSURE (N.O.)
- 339 WIRE ASSEMBLY (WHITE)
- 343 BODY, AUXILIARY VALVE
- 408 ELECTRICAL CONNECTOR

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Figure 100A T.C.C. Wiring Diagram

MODELS JD, JM, JN, JS, JW



- 301 BODY, OIL PUMP AND CONTROL VALVE
- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 338 SWITCH, GOV. PRESSURE (N.O.)
- 339 WIRE ASSEMBLY (WHITE)
- 343 BODY, AUXILIARY VALVE
- 408 ELECTRICAL CONNECTOR

H125C-98-1

Figure 100 T.C.C. Wiring Diagram



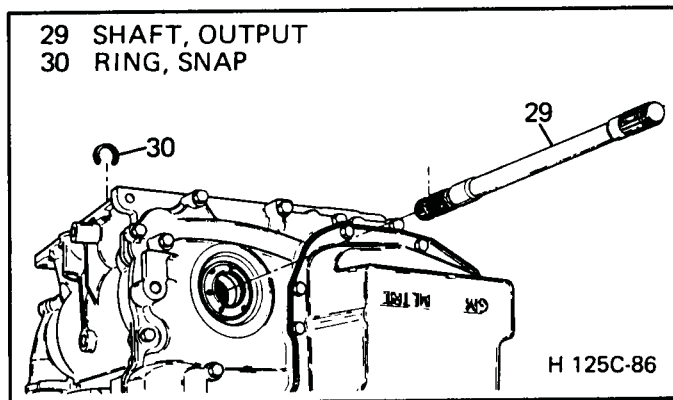


Figure 101 Output Shaft &amp; "C" Ring

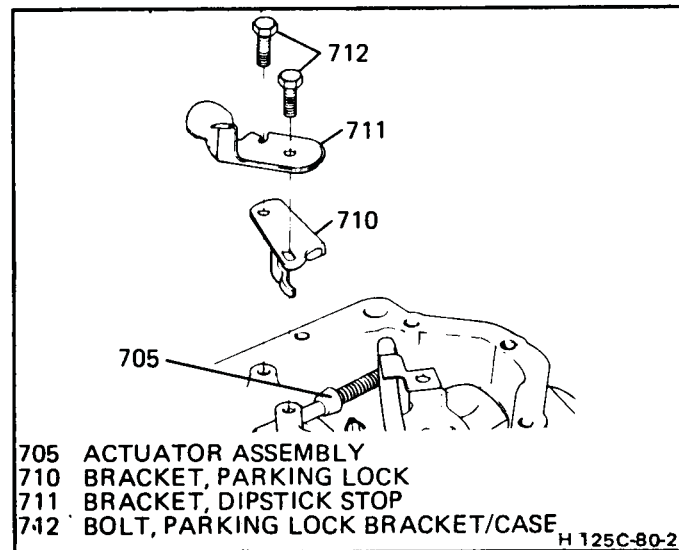


Figure 102 Dipstick Stop &amp; Parking Lock

### Reverse Pipe and Parking Bracket

#### Install or Connect (Figures 102 and 103)

1. Weir (147)
2. Bracket (143)
3. Retainer (143)
4. Screw (142)
5. Bracket (710)
6. Stop (711)
7. Screw (712)

#### Inspect

- Actuator Assembly (705) for proper action

#### Install or Connect (Figure 104)

- Cup plug (120) – use 9.5 mm (3/8") drift

#### Assemble (Figure 103)

1. Washer (144) onto pipe (139)
2. "O" ring (145) – retain with petrolatum
3. Pipe assembly (139)
4. Bracket (143)
5. Screw (142)

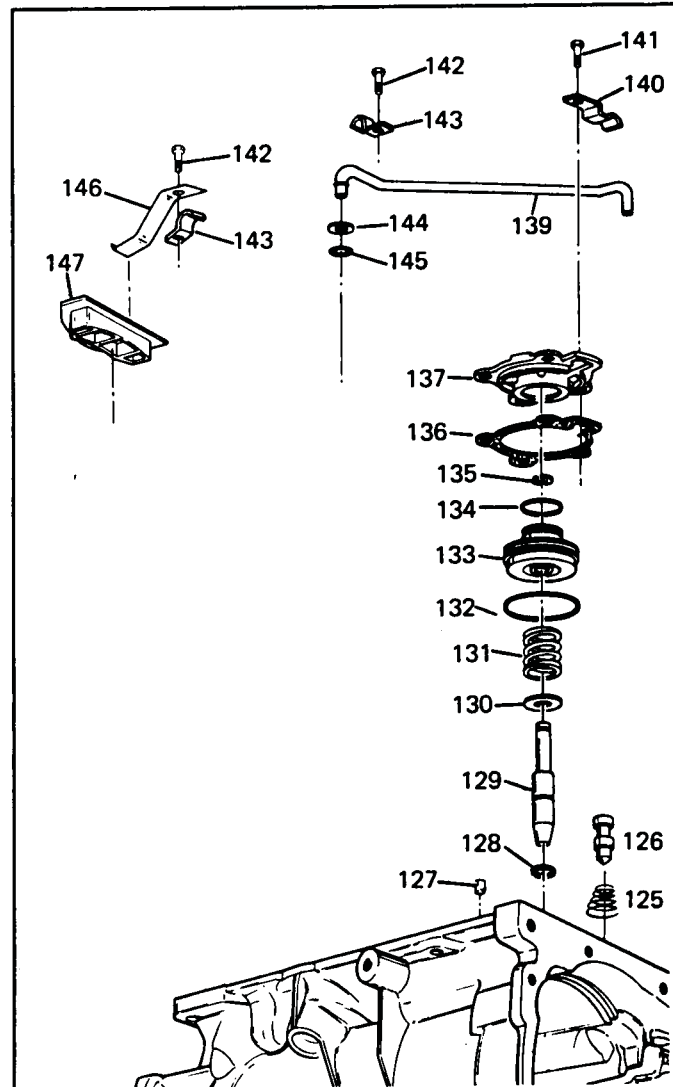


Figure 103 Oil Pipe &amp; Servo





### Tighten

- Torque the screws (142, 712, 142) to 24 N·m (18 ft. lbs.).

## INTERMEDIATE SERVO



### Disassemble (Figure 103)

1. "E" ring (135) from pin (129)
2. Piston (133) from pin (129)
3. Spring (131)
4. Retainer (130)



### Inspect

- Pin (129) for damage
- Seals (134 and 132) for cuts or nicks – proper scarf cut alignment.  
Do not remove seals (132 and 134) unless replacement is necessary.
- Spring (131) for damage
- Retainer (130) for damage
- Cover (137) for damage, cracks, porosity
- Piston (133) for cracks, seal groove damage



### Measure (Figures 105 and 106)

Tools Required:

J-28535 Intermediate Band apply pin gage

1. Install J-28535 on the case (112) and the pin (129) into the gage.
2. With a torque wrench apply 11.2 N·m (100 inch pounds of torque).

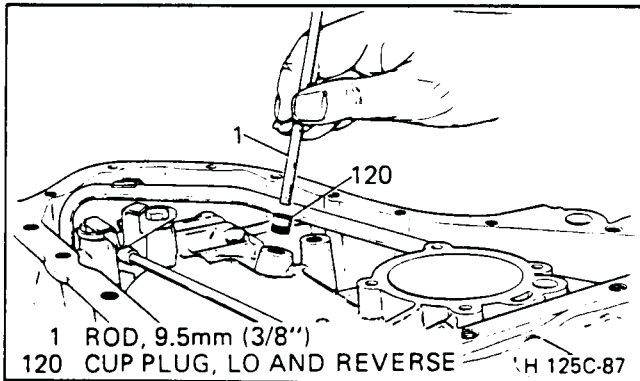


Figure 104 Lo & Reverse Cup Plug

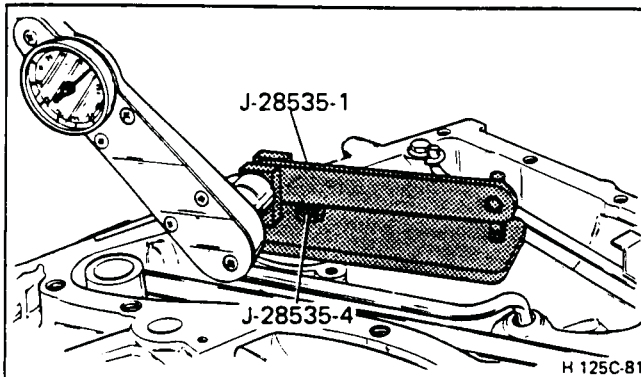


Figure 105 Checking for Proper Apply Pin

## INTERMEDIATE BAND APPLY PIN

### LENGTH

### IDENTIFICATION

Short . . . . .	.2 Grooves
Medium . . . . .	.1 Groove
Long . . . . .	No Grooves

H 125-317

Figure 106 Apply Pin Chart

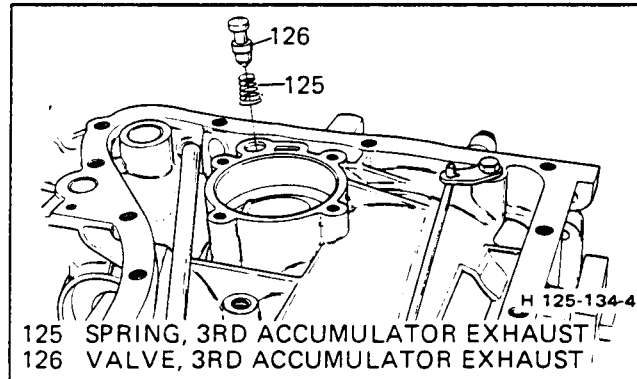


Figure 107 3rd Accumulator Exhaust Valve & Spring

3. If the white line appears in window the pin length is correct.  
- If the white line does not appear, select another length pin – Figure 106. Repeat procedure.
4. Remove pin gage.



### Assemble (Figure 103)

1. Retainer (130) onto pin (129)
2. Spring (131) against spacer (13)
3. Piston (133) onto pin
4. "E" ring (135) onto pin



### Install or Connect (Figures 107 and 103)

1. Spring (125) into bore
2. Check valve (126) into bore

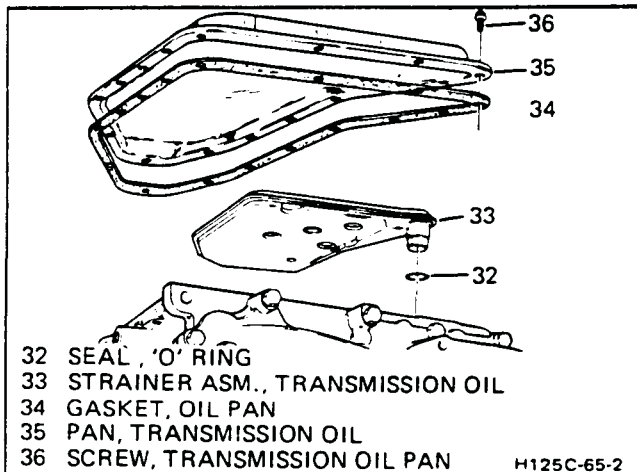


Figure 108 Bottom Pan & Oil Strainer

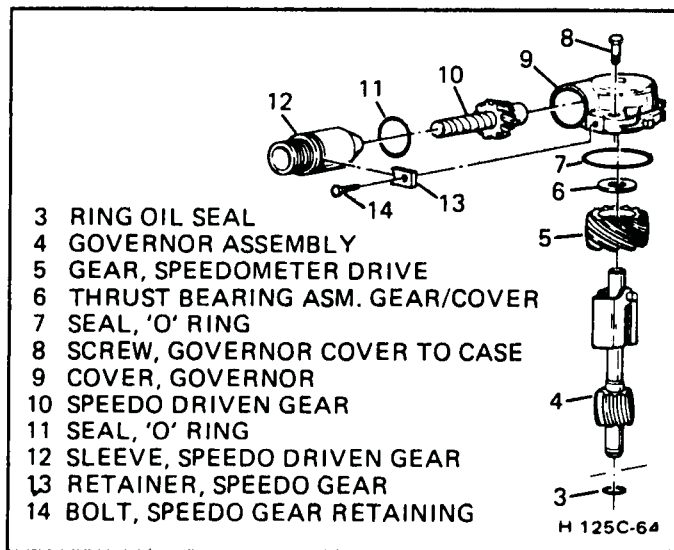


Figure 109 Governor Assembly

3. Servo assembly (133) into servo bore
4. Gasket (136)
5. Cover (137)
6. Bracket (140)
7. Screws (141)

### Tighten

- Torque the screws (141) to 11 N·m (8 ft. lbs.).

## OIL PAN AND STRAINER

### Install or Connect (Figure 108)

1. "O" ring (32) onto the strainer tube
2. Strainer (33) into the case
3. Gasket (34) or apply R.T.V. silicon sealant.
4. Pan (35) onto the case
5. Bolts (36)

### Tighten

- Torque the pan bolts (36) to 11 N·m (8 ft. lbs.).

## GOVERNOR AND SPEEDOMETER GEAR ASSEMBLY

### Clean

- Governor assembly (4)

### Inspect (Figure 109)

- Governor
  - Oil passage blocked
  - Damaged springs
  - Missing check balls
  - Seal (3) damage
  - Binding weights

## Seal Replacement Procedure

### Remove or Disconnect

- Seal (3) – cut off

### Install or Connect

- Seal (3) – use petrolatum

### Inspect

- Gear (5) for wear
- Bearing (6) for damage
- Cover (9) for porosity or cracks
- Gear (10) for wear
- "O" ring (11) for nicks or cuts
- Sleeve (12) for scoring

### Install or Connect (Figure 109)

1. Governor (4) assembly into case
2. Gear (5) onto governor
3. Bearing (6) onto gear
4. New "O" ring (7) into cover (9)
5. Cover (9)
- Make sure shaft (4) is piloted into cover.
6. Screw (8)

### Tighten

- Torque the screw (8) to 11 N·m (8 ft. lbs.)

### Assemble (Figure 109)

- "O" ring (11) onto sleeve (12)
- Gear (10) into sleeve (12)

### Install or Connect

1. Sleeve (12) into cover (9)
2. Retainer (13)
3. Screw (14)

### Tighten

- Torque the screw (14) to 9 N·m (75 inch pounds)

### Install or Connect

- Transaxle into transmission jack

### Remove or Disconnect

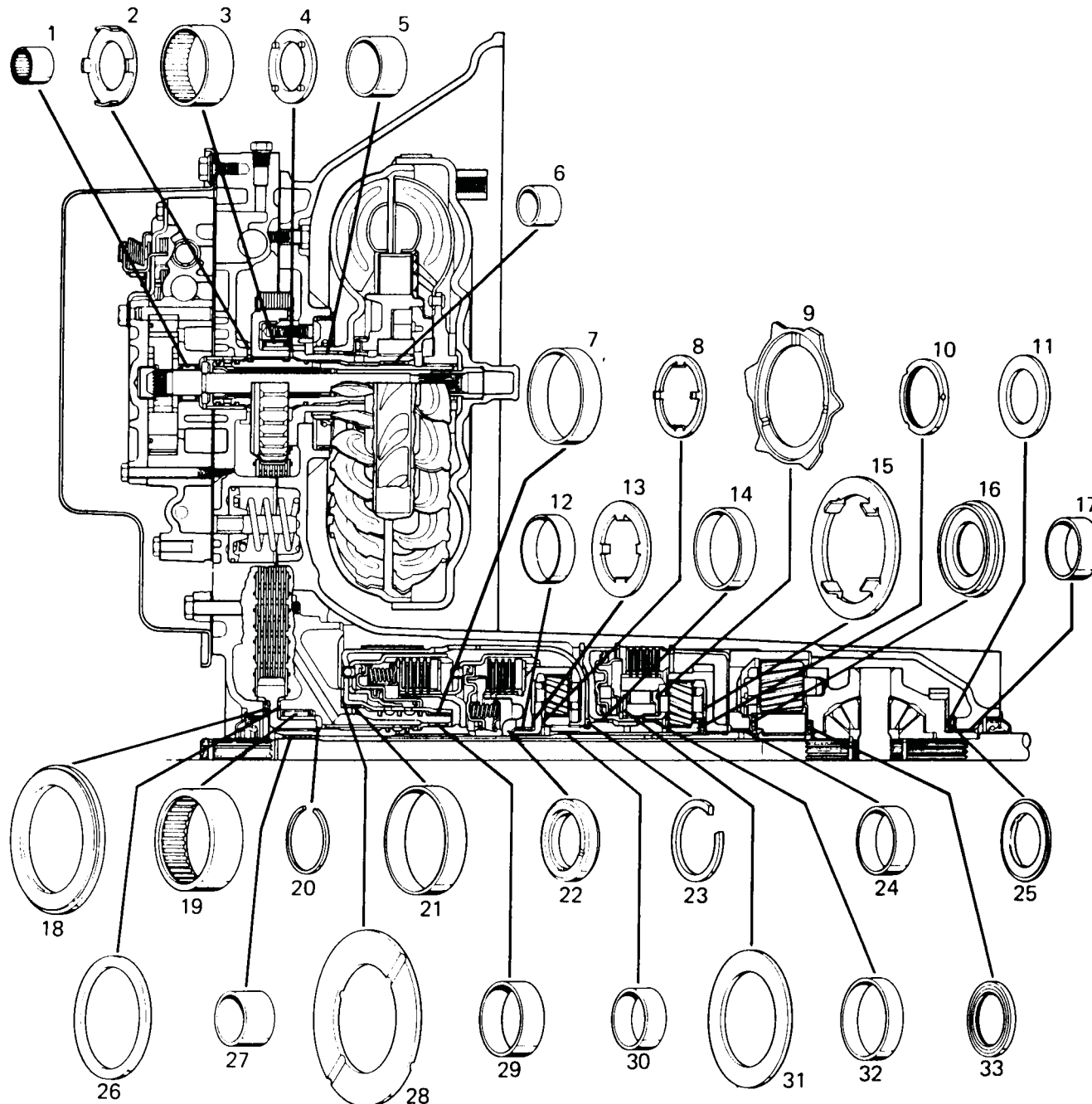
- J-28664

### Install or Connect

Tool Required:

J-21366 Converter Holding Strap

1. Converter (1)
2. J-21366 Converter retaining strap



- |   |  |
|---|--|
| 1. Pump Shaft Roller Bearing Assy. Group 4.226                  | 18. Driven Sprocket Thrust Bearing Assembly Group 4.131        |
| 2. Case Cover To Driven Sprocket Thrust Washer Group 4.131      | 19. Bearing Assembly Group 4.131                               |
| 3. Bearing Assembly Group 4.131                                 | 20. Selective Snap Ring Group 4.169                            |
| 4. Case Cover To Drive Sprocket Thrust Washer Group 4.131       | 21. Direct Clutch Bushing Group 4.169                          |
| 5. Converter Bushing Group 4.115                                | 22. Input Shaft Thrust Washer Group 4.158                      |
| 6. Drive Sprocket Support Bushing Group 4.226                   | 23. Selective Snap Ring Group 4.216                            |
| 7. Direct Clutch Drum Bushing Group 4.169                       | 24. Final Drive Internal Gear Bushing Group 4.319              |
| 8. Input Carrier To Input Sun Gear Thrust Washer Group 4.159    | 25. Differential Carrier To Case Thrust Brg. Assy. Group 4.176 |
| 9. Reaction Carrier To Lo Race Thrust Washer Group 4.180        | 26. Driven Sprocket Support Thrust Washer Group 4.131          |
| 10. Reaction Sun To Internal Gear Thrust Bearing Group 4.159    | 27. Input Shaft Bushing Group 4.158                            |
| 11. Differential Carrier To Case Sel. Thrust Washer Group 4.176 | 28. Thrust Washer Group 4.169                                  |
| 12. Input Internal Gear Bushing Group 4.158                     | 29. Driven Sprocket Support Bushing Group 4.226                |
| 13. Input Carrier To Input Int. Gear Thrust Washer Group 4.159  | 30. Reaction Sun Gear Bushing Group 4.159                      |
| 14. Lo And Reverse Clutch Housing Bushing Group 4.159           | 31. Reverse Housing To Lo Race Selective Washer Group 4.180    |
| 15. Reaction Carrier To Int. Gear Thrust Washer Group 4.180     | 32. Reaction Carrier Bushing Group 4.159                       |
| 16. Sun Gear To Internal Gear Thrust Bearing Group 4.178        | 33. Sun Gear To Carrier Thrust Bearing Group 4.159             |
| 17. Case Bushing Group 4.319                                    |  |

H 125-287

Figure 110 Bushing & Thrust Washer Locations



## Thm 125C Fwd / Direct Clutch Drum

**Subject:** New Forward and Direct Clutch For 1985 Production

**Model** All 1985 THM 125C

At the start of production for 1985 all **THM 125C** transaxles are being built with a new forward and direct clutch assembly (see Figures 1 & 2).

The 1985 production forward and direct clutch assemblies are not interchangeable with the 1984 or prior model year forward and direct clutch assemblies. See Figures 1 & 2 for identification.

For 1984 and past model service a new forward and direct clutch housing service assemblies are now available (see Figures 4 & 5). The direct clutch housing service package, Part Number 8653978, will contain the following:

- Direct clutch housing assembly
- Direct clutch piston assembly
- Direct clutch piston inner, outer and center seals
- Intermediate band assembly

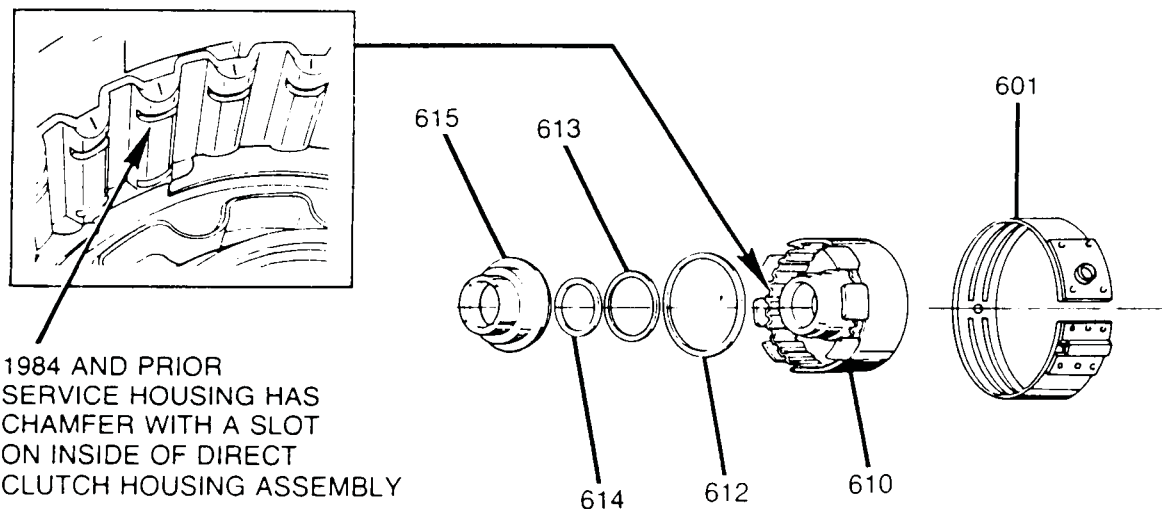
The forward clutch housing service package, Part Number 8653977, will contain the following:

- Forward clutch housing assembly

**NOTICE:** Do not use any component parts from the 1985 production forward clutch assembly or direct clutch assembly to service prior model year clutch assemblies. This includes the 1985 production composition clutch plates for both the forward and direct clutch. Refer to Figures 1 thru 6 for component identification and refer to the appropriate service parts book.

## AUTOMATIC TRANSMISSION SERVICE GROUP

## 1984 AND PRIOR DIRECT CLUTCH HOUSING SERVICE PACKAGE PART NUMBER 8653978



1984 AND PRIOR  
SERVICE HOUSING HAS  
CHAMFER WITH A SLOT  
ON INSIDE OF DIRECT  
CLUTCH HOUSING ASSEMBLY

601 BAND ASSEMBLY, INTERMEDIATE  
610 HOUSING & DRUM ASM., DIRECT CLUTCH  
612 SEAL, DIRECT CLUTCH PISTON OUTER

613 SEAL, DIRECT CLUTCH CENTER  
614 SEAL, DIRECT CLUTCH PISTON INNER  
615 PISTON, DIRECT CLUTCH

FIGURE 5  
DIRECT CLUTCH SERVICE PACKAGE

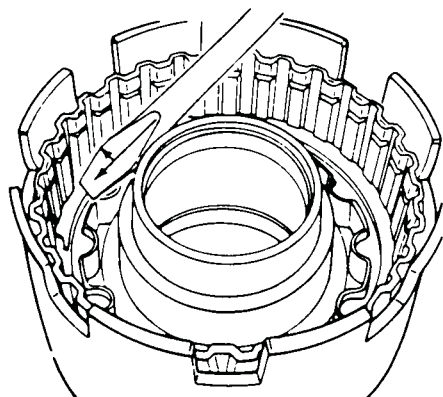


FIGURE A

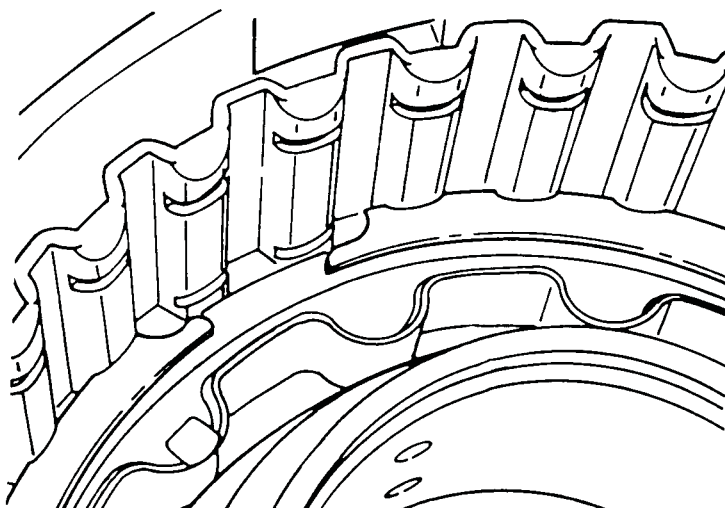
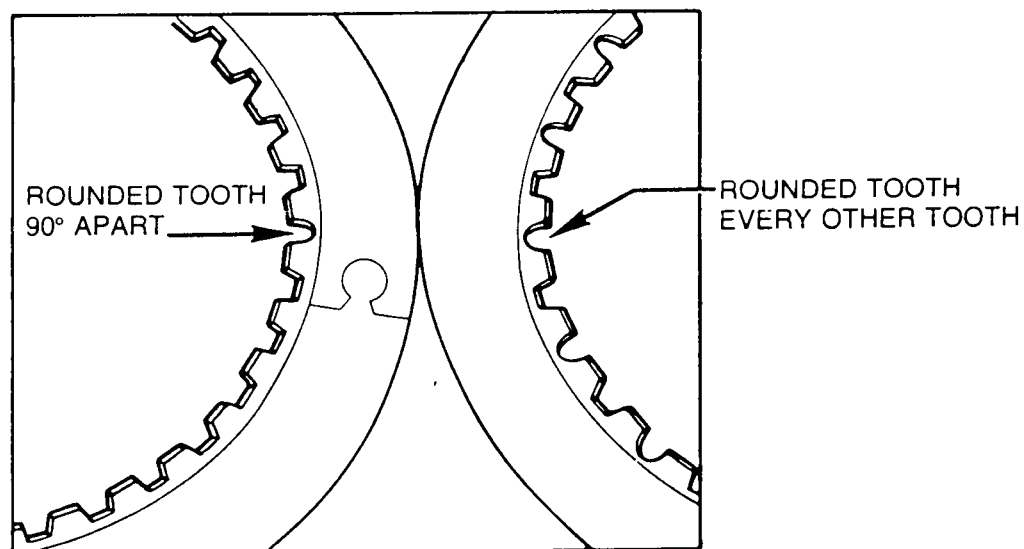


FIGURE B

SERVICE NOTE: THE SNAP RING THAT RETAINS THE APPLY RING AND RELEASE SPRING ASSEMBLY MAY NOT APPEAR TO BE FULLY SEATED IN THE SNAP RING GROOVE WHEN INSTALLED. THIS IS DUE TO THE GROOVE NOT BEING CUT AS DEEP AS PREVIOUS MODEL YEARS (SEE FIGURE B). WHEN INSTALLING THE SNAP RING USE A DOWNWARD AND OUTWARD PRESSURE TO ENSURE PROPER SEATING (SEE FIGURE A).

FIGURE 6  
NEW DIRECT CLUTCH SNAP RING POSITION



THE 1985 FORWARD AND DIRECT COMPOSITION CLUTCH PLATES ARE APPROXIMATELY 0.254 mm (.010") THINNER THAN PREVIOUS MODEL YEAR COMPOSITION PLATES. THE 1985 COMPOSITION PLATES ARE IDENTIFIED AS SHOWN ABOVE AND THE CLUTCH PACK MAY CONTAIN ONE OR BOTH TYPES.

FIGURE 3  
1985 COMPOSITION CLUTCH PLATE ASSEMBLY

1984 AND PRIOR FORWARD  
CLUTCH HOUSING SERVICE ASSEMBLY  
PART NUMBER 8653977

1984 AND PRIOR  
SERVICE HOUSING  
HAS CHAMFER  
WITH A SLOT ON  
INSIDE OF FORWARD  
CLUTCH HOUSING  
ASSEMBLY

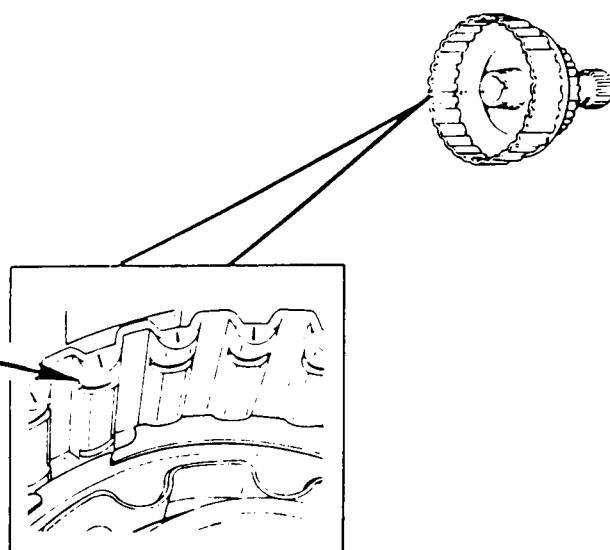


FIGURE 4  
FORWARD CLUTCH SERVICE PACKAGE



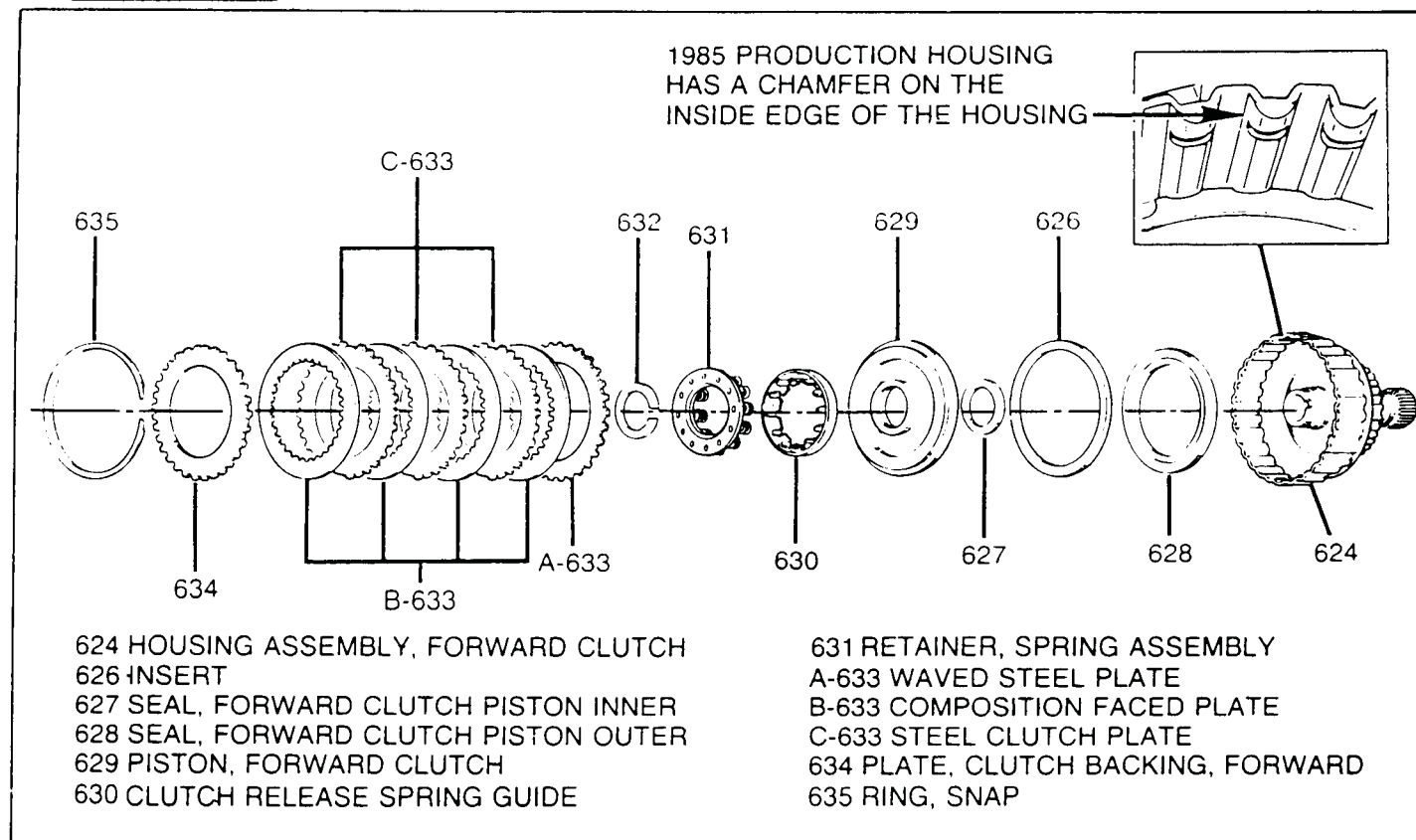


FIGURE 1  
1985 PRODUCTION FORWARD CLUTCH ASSEMBLY

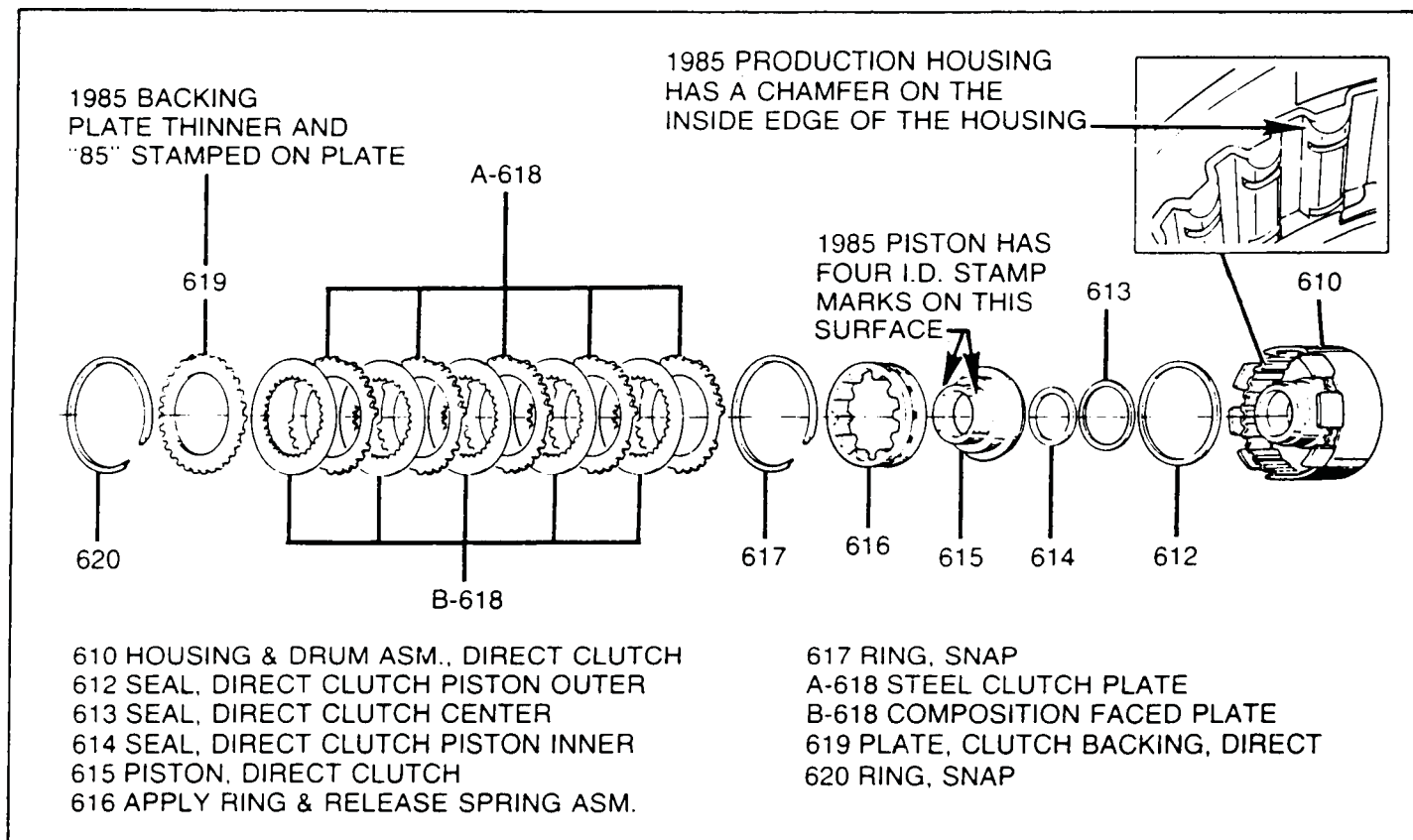


FIGURE 2  
1985 PRODUCTION DIRECT CLUTCH ASSEMBLY



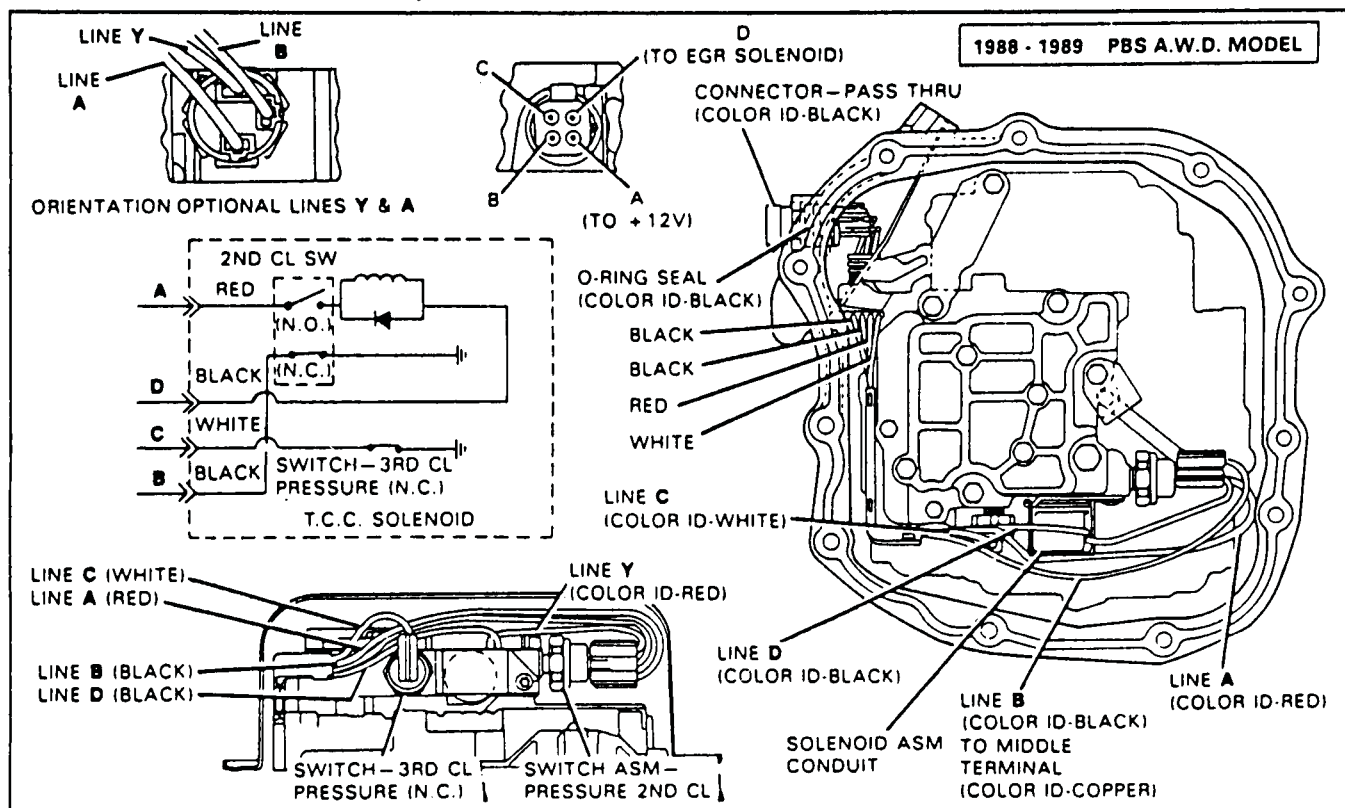
## THM 125C (3T40) REVISED WIRING DIAGRAMS

This bulletin covers revised wiring diagram information, and eight 1990 models that were added after the printing of the 1990 service manuals.

Refer to this bulletin whenever service to any 1990 wiring assembly is necessary.

REFER TO FIGURES 1 THRU 7 FOR WIRING DIAGRAMS

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AUTOMATIC TRANSMISSION SERVICE GROUP

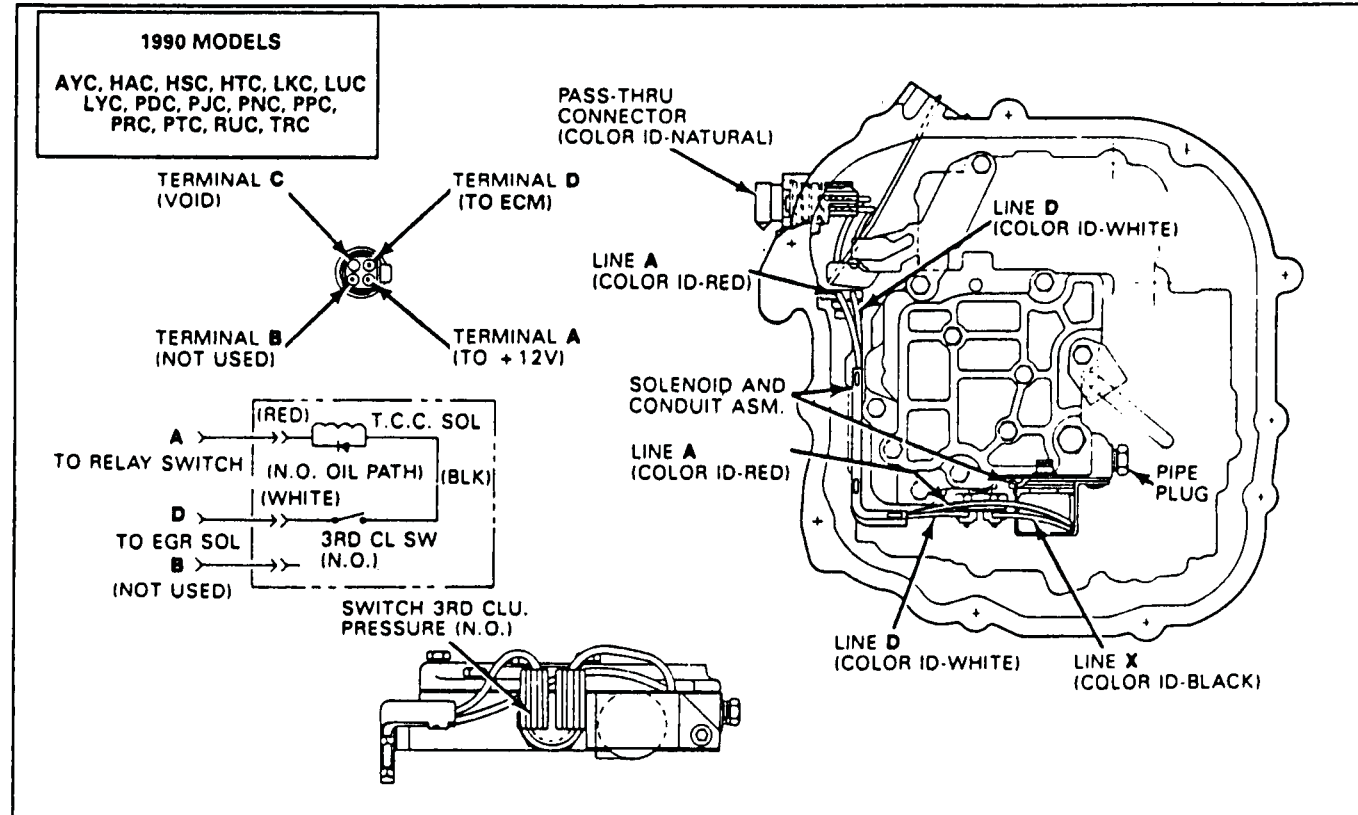


Figure 2

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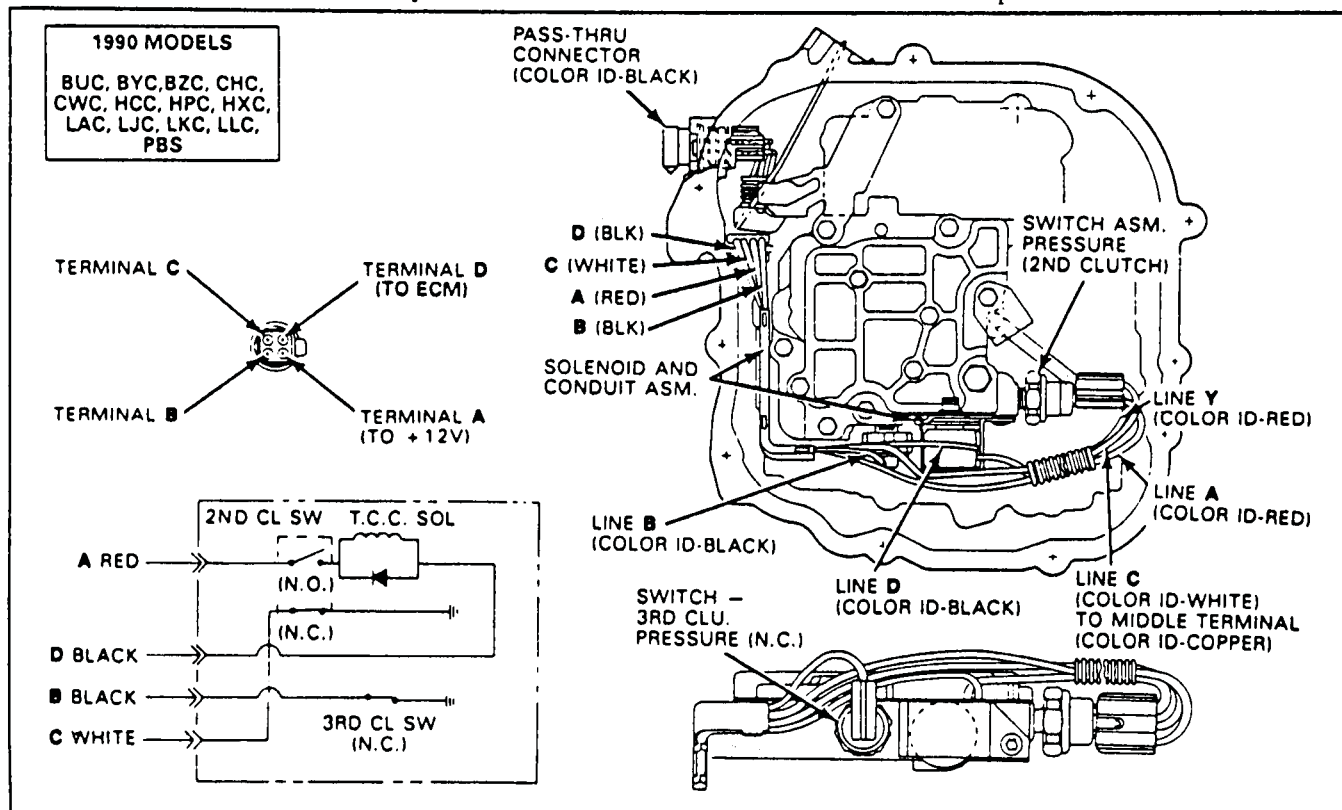


Figure 3

**1989 MODELS**  
HWC, HYC, HZC

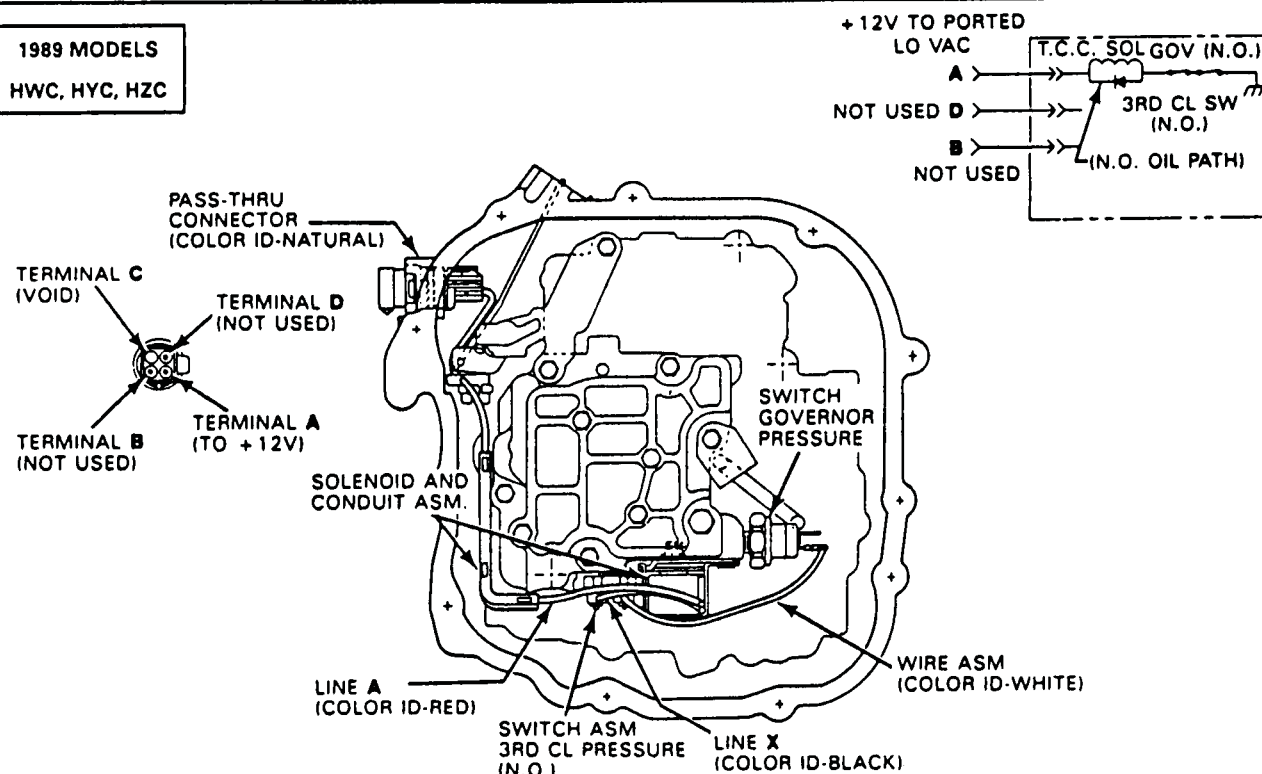


Figure 4

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**1990 MODELS**  
JDC, JMC

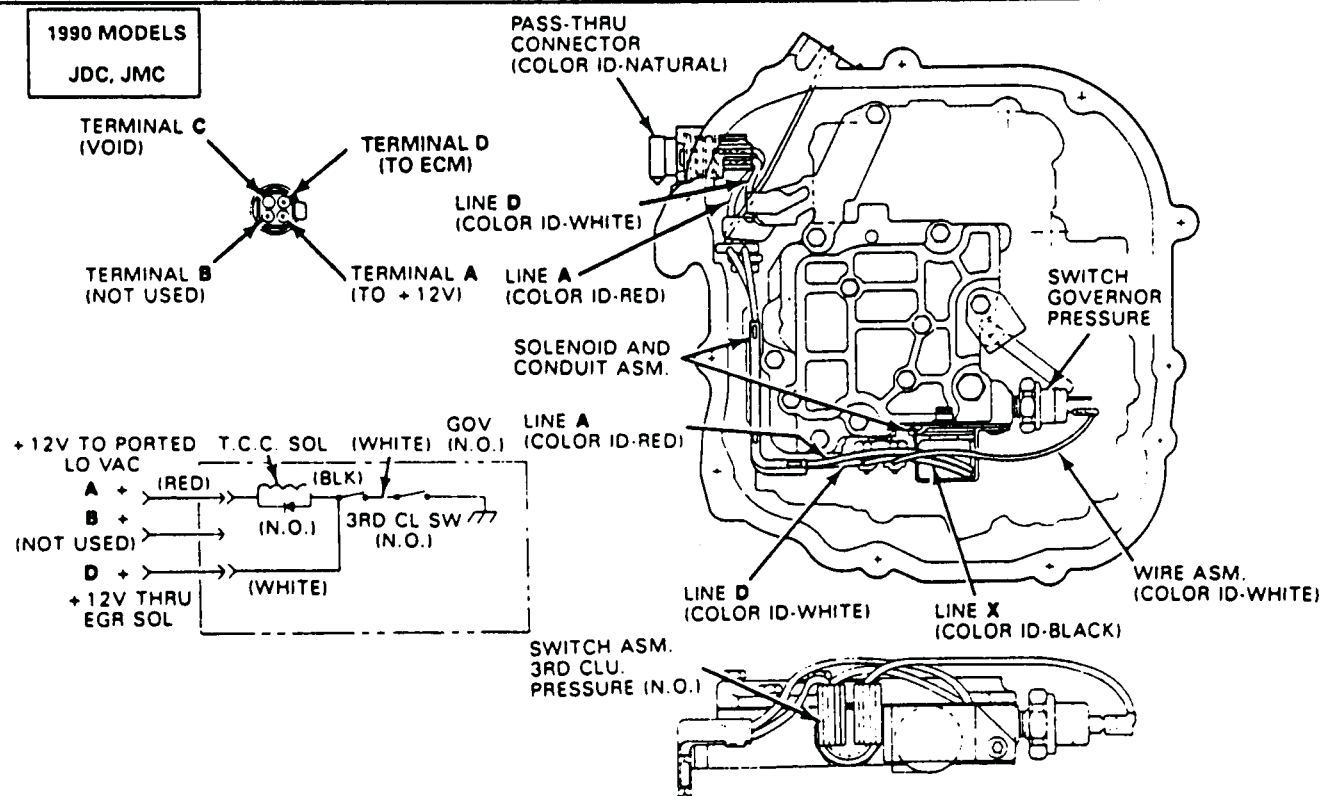


Figure 5

1990 MODELS  
KCC, KDC, KKC

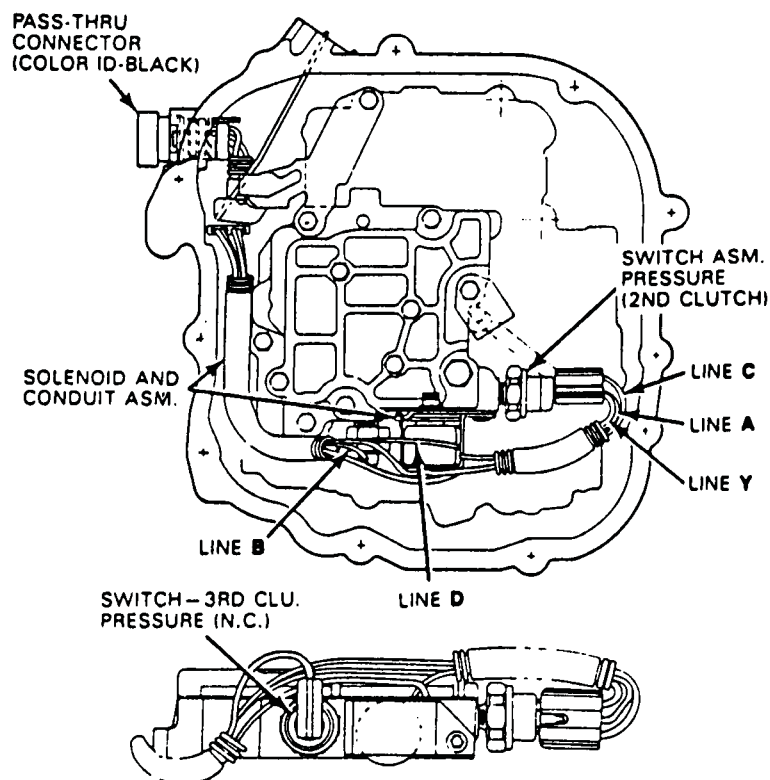
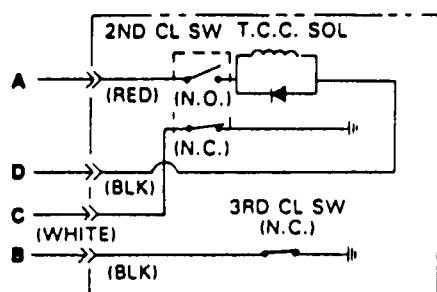
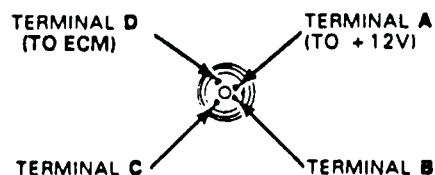


Figure 6

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1990 MODELS  
KXC

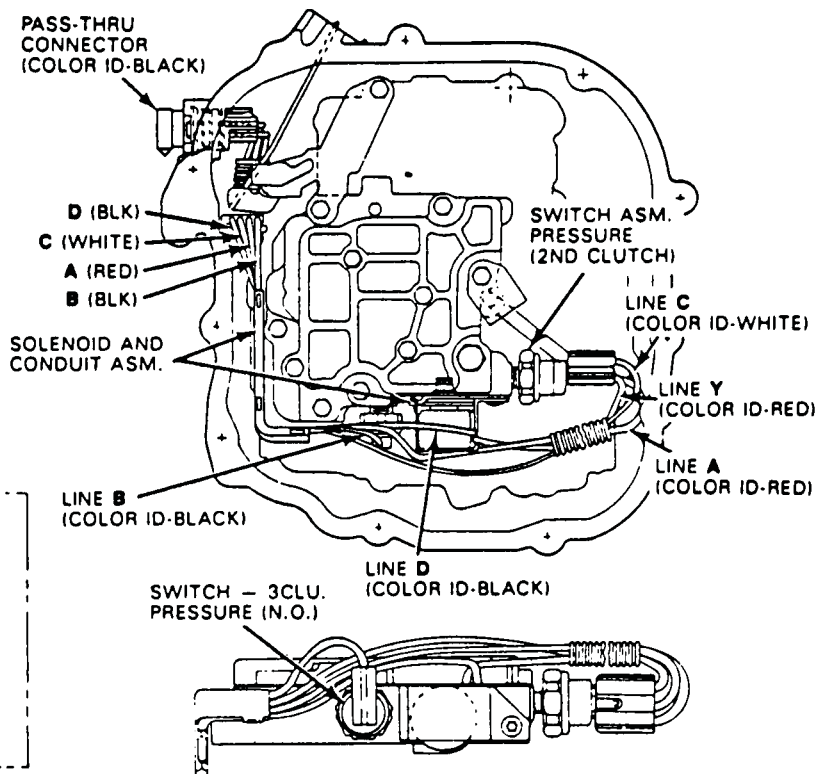
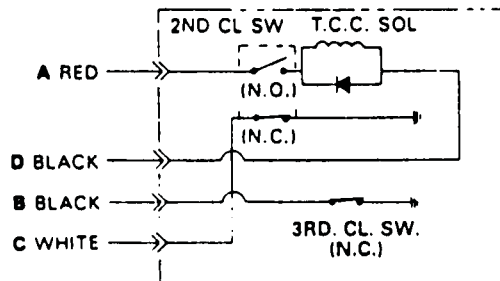
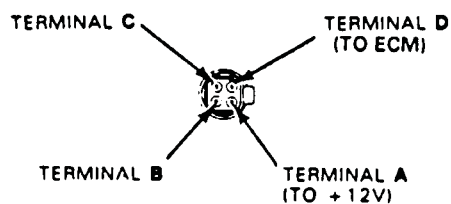


Figure 7



## CONVERTER SHUDDER

**Subject:** THM 125-C Torque Converter Clutch  
Shudder Diagnosis (Summarizes and  
Supersedes Hydra-matic Bulletins  
HM 82-25, HM 83-13 and HM 83-14)

**Model:** All THM 125-C

Some THM 125-C transmissions may exhibit torque converter clutch (T.C.C.) shudder as the TCC applies and/or after it applies when the accelerator pedal is depressed slowly (Crowd Shudder). These types of shudders are best described as a jerking sensation. In some cases the shudder may cause the instrument panel to vibrate.

Listed below are items which may cause a "TCC Apply Shudder" and/or a "TCC Crowd Shudder".

CONDITION		CAUSE AND CORRECTION
TCC Apply Shudder	TCC Crowd Shudder	
X	X	1. An intermittent incorrect signal from the vehicle speed sensor (V.S.S.). Dirt or grease on the reflective bar in the V.S.S. may be sending an incorrect or erratic signal so that the converter clutch engages early. Remove the V.S.S. and clean it.
X	X	2. The auxiliary valve body cover attaching bolts may be loose or the bolt threads/holes may be shallow. If the holes are shallow, the bolts will bottom out without torquing the cover down.
X		3. Some 1982 models were built with either an exhaust hole or an orifice cup plug in the auxiliary valve body cover. The auxiliary valve body cover was changed to a solid cover (no exhaust hole or orifice cup plug) in 1982. The service auxiliary valve body cover, part number 8643645, should be used on all models to prevent shudder. The service part does not have an orifice cup plug.
X		4. There are two types of auxiliary valve bodies in service. One has an orifice cup plug and the other does not (Fig. 1). If the transmission being serviced has the auxiliary valve body with the orificed cup plug, particles of the auxiliary valve body cover gasket may have torn loose. This material may be sticking the torque converter clutch apply valve and/or plugging the converter release orifice in the control valve body spacer plate. If this is found, disassemble the auxiliary valve body and thoroughly clean. Also, be sure to remove any gasket particles in the valve body spacer plate converter release orifice hole and replace the auxiliary valve body cover gasket, part number 8653947.





# Technical Service Information

Torque Converter Clutch Shudder Diagnosis  
(continued)

ALL THM 125-C

CONDITION		CAUSE AND CORRECTION										
TCC Apply Shudder	TCC Crowd Shudder											
	X	5. Check the valves in the auxiliary valve body for freeness. (They must move in and out of their bore without sticking.)										
X		6. For gas engine/transmissions, the auxiliary valve body converter clutch control regulator spring may be weak and require replacement with the new spring, part number 8637888. On February 20, 1984, for U.S. built and March 5, 1984 (Julian date 065) for Canada built THM 125-C transmissions. (Refer to Chart 1 for U.S. serial number break-points). The new spring part number 8637888, went into production and has a stronger load. For explanations of nameplates, refer to Fig. 2 (U.S.) and Fig. 3 (Canada).										
X	X	7. Inspect the pump shaft to valve body seal for cuts, damage, distortion.										
X	X	8. A new governor pressure switch went into production for diesel models only, in late April, 1982. This change corrects the "Shudder" feel, by raising the converter clutch apply speed. In servicing Diesel model transmissions for this condition, refer to the following chart for proper model usage for 1982 models:										
		<table><tr><th>Model</th><th>Governor Switch Part Number</th></tr><tr><td>OP, HU, HY, H6, HR</td><td>8643369</td></tr><tr><td>HW</td><td>8637296</td></tr><tr><td>HS</td><td>8643368</td></tr><tr><td>CD, HI, HC</td><td>8643367</td></tr></table>	Model	Governor Switch Part Number	OP, HU, HY, H6, HR	8643369	HW	8637296	HS	8643368	CD, HI, HC	8643367
Model	Governor Switch Part Number											
OP, HU, HY, H6, HR	8643369											
HW	8637296											
HS	8643368											
CD, HI, HC	8643367											
	X	9. Inspect the turbine shaft Teflon seals and "O" ring seal for damage, cuts, distortion (see Figure 4 for these parts). If the teflon seals require replacement, make sure they are installed and sized as shown in Fig. 5.										
X		10. Inspect the turbine shaft seal grooves. A step in the bottom corners of the seal groove will keep the seal from contacting the side wall of the groove and will prevent proper sealing (Fig. 6). If this condition is found, replace the turbine shaft and seals.										
	X	11. Check the case cover sleeve converter feed oil hole for being out of alignment with the oil channel in the case cover (Fig. 7).										
X		12. Check the converter end play, using tool J-29830A. The end play specification is .5mm (.020"). Converters with end play more than .5mm (.020") must be replaced.										
	X	13. The turbine shaft sleeve may be leaking excessively. If all of the above items are O.K., replace this shaft.										

AUTOMATIC TRANSMISSION SERVICE GROUP



## Technical Service Information

Torque Converter Clutch Shudder Diagnosis  
(continued)

ALL THM 125-C

MODEL	SERIAL NO.	MODEL	SERIAL NO.
CA	2226	EQ	11686
CB	156657	EW	1007
CE	67281	HC	1748
CF	5938	HM	2235
CT	4574	HP	1154
EB	2639	HS	11705
EF	6579	HX	4897
EI	5544	HY	20840
EJ	1006	PD	2080
EK	8843	PE	50353
EL	3594	PF	22983
EM	3062	PG	47268
EN	4984	PJ	6007
EP	2085	PW	67271

CHART 1 U.S. MODELS

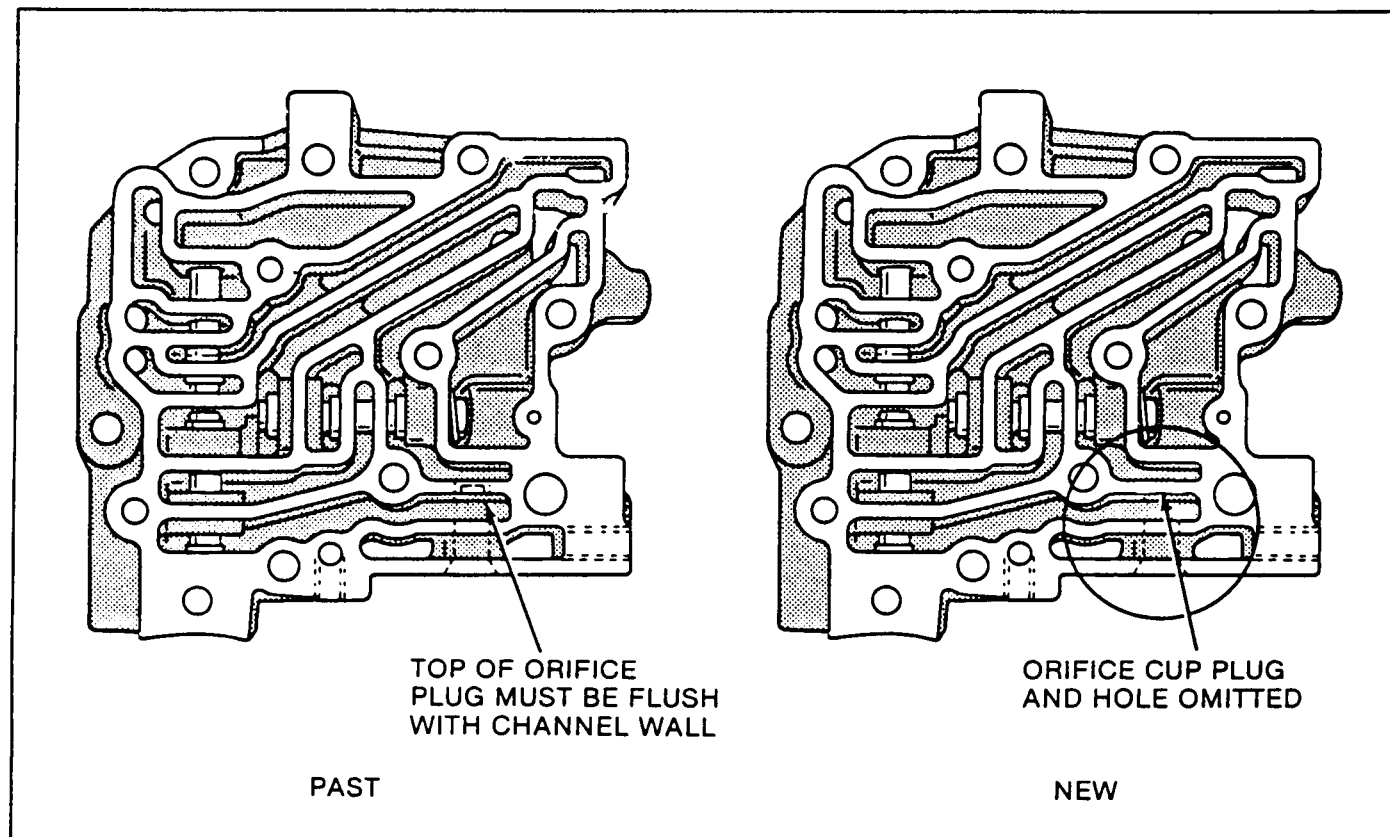


FIGURE 1 AUXILIARY VALVE BODY (COVER SIDE)

AUTOMATIC TRANSMISSION SERVICE GROUP

Torque Converter Clutch Shudder Diagnosis  
(continued)

ALL THM 125-C  
Page 4

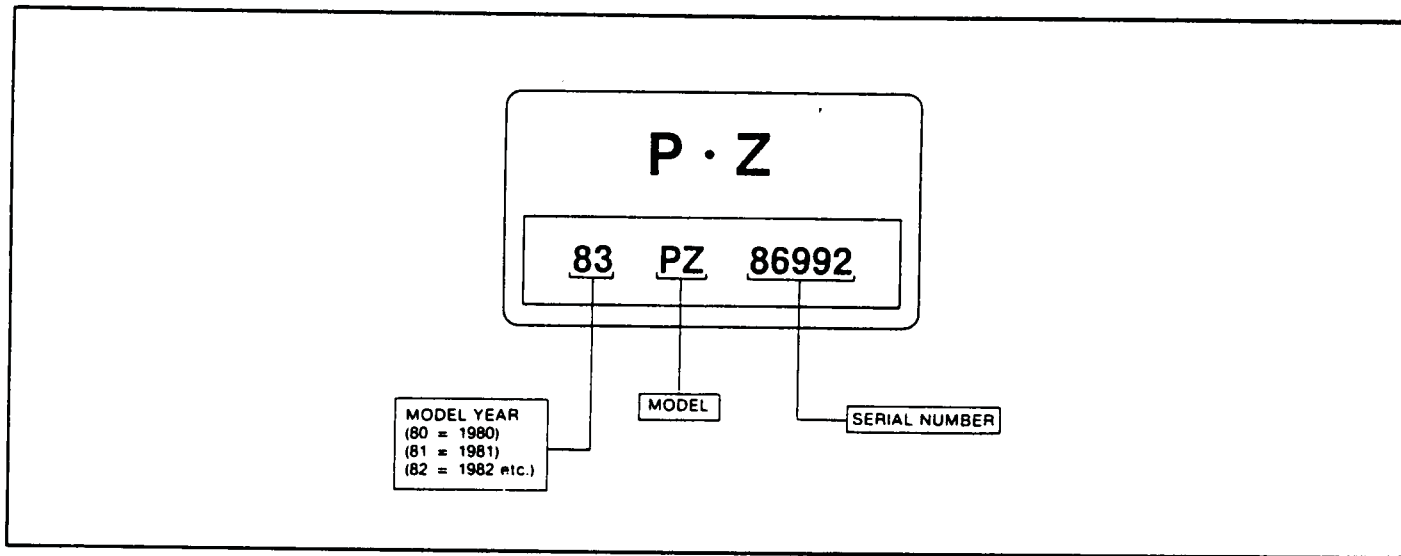


FIGURE 2 THM 125/125-C TRANSMISSION I.D. NAMEPLATE  
YPSILANTI, MICHIGAN

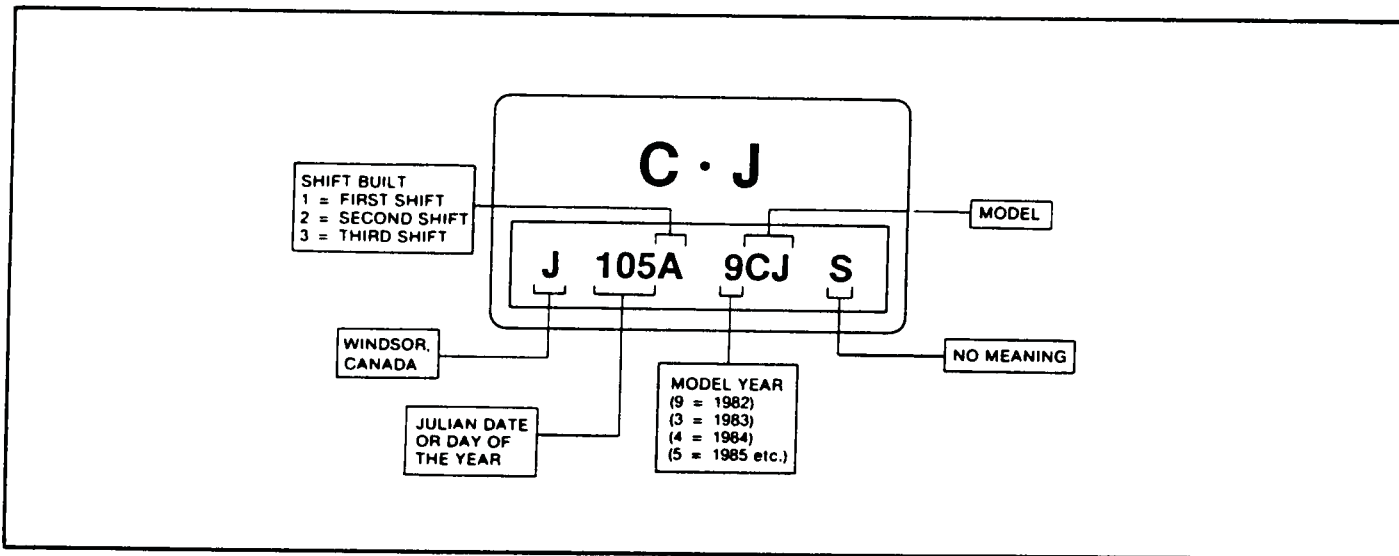


FIGURE 3 THM 125/125-C TRANSMISSION I.D. NAMEPLATE  
WINDSOR, CANADA

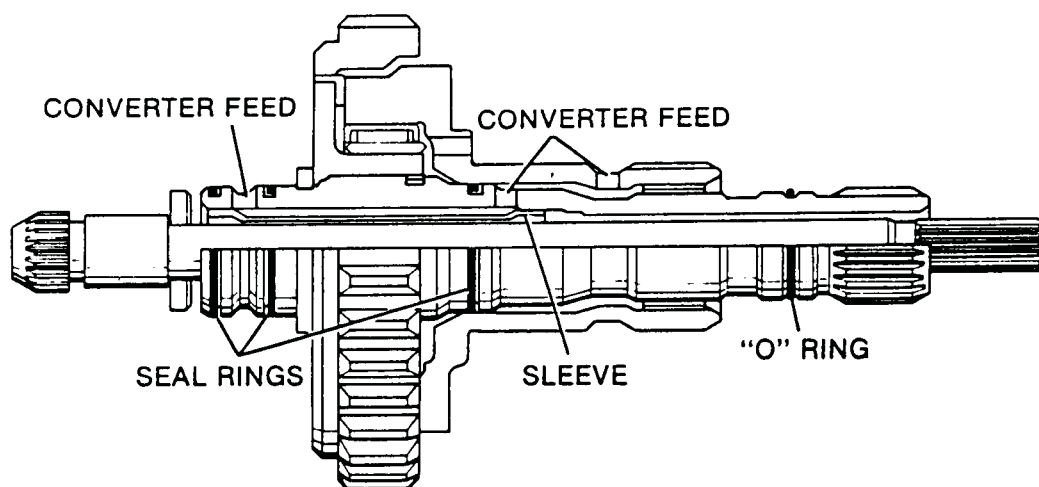


FIGURE 4

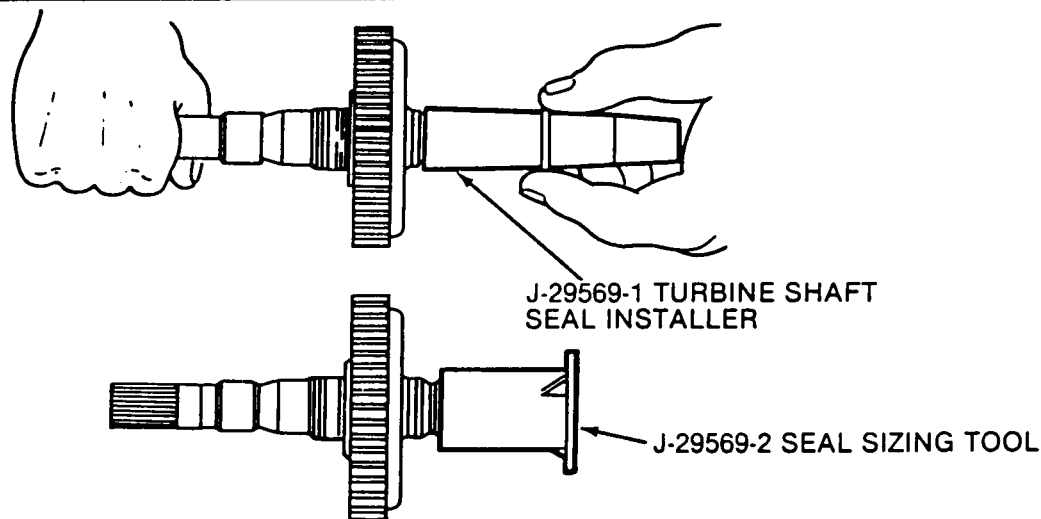


FIGURE 5 TURBINE SHAFT SEAL REPLACEMENT

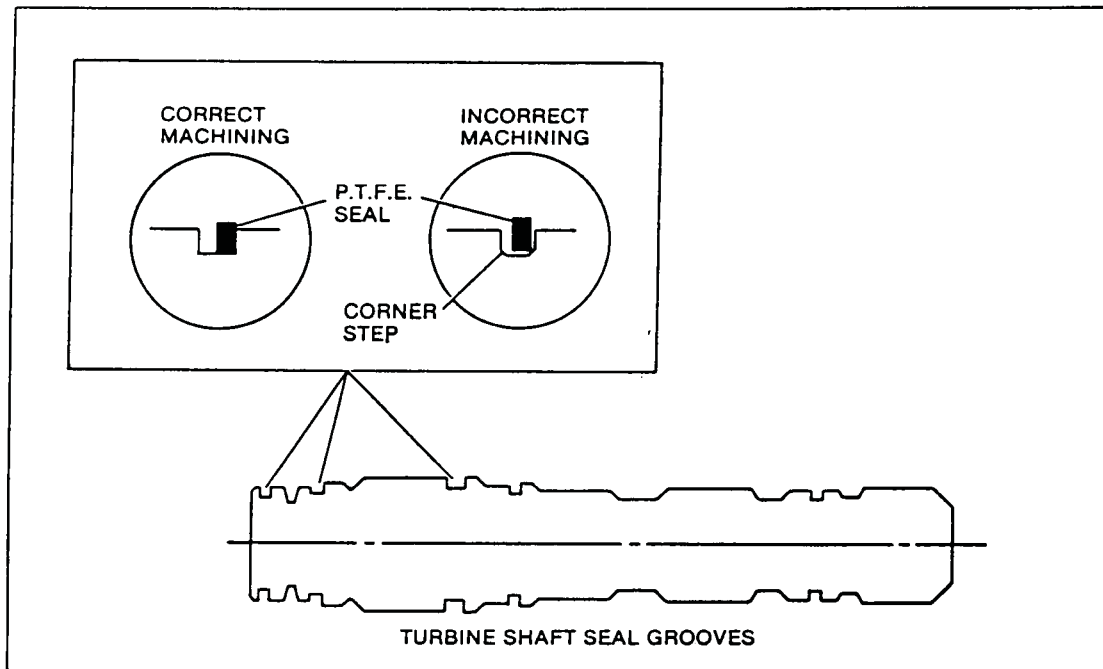


FIGURE 6

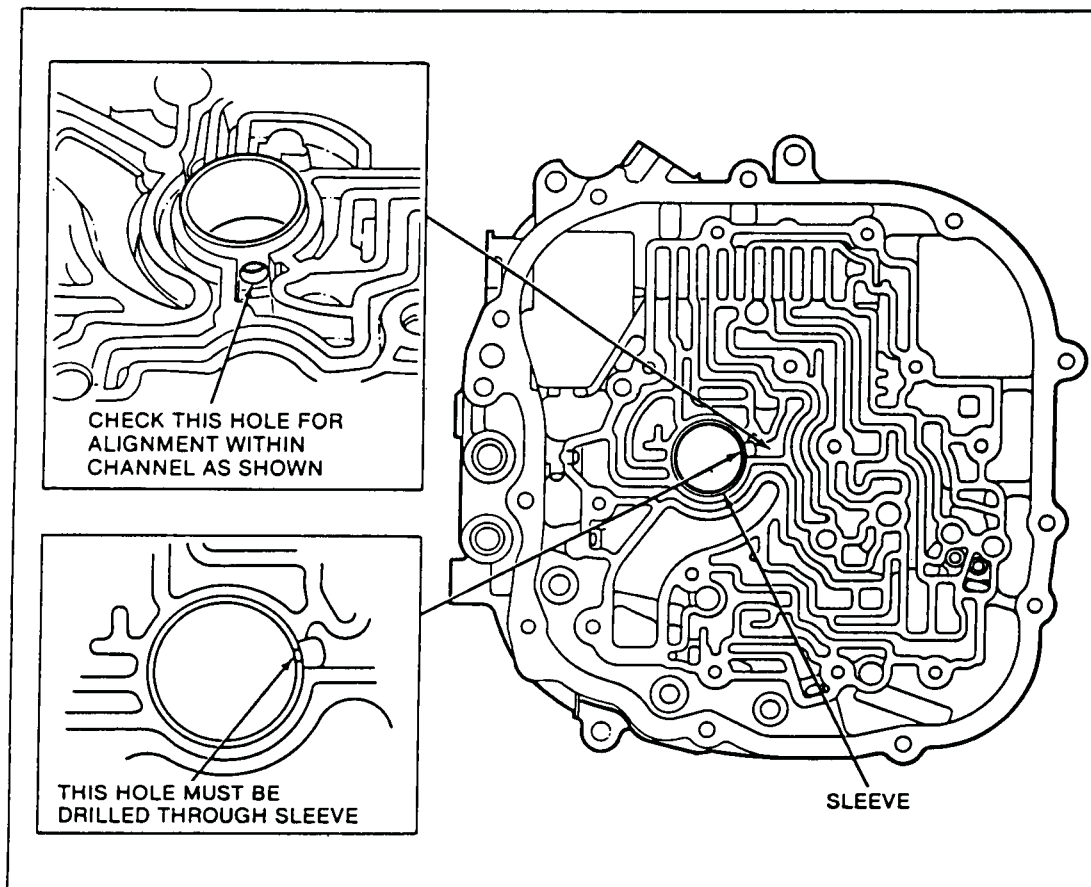


FIGURE 7 CASE COVER — VALVE BODY SIDE



## LUBE SLOT

**Subject:** 1985 Case Cover Oil Slot

**Model** All 1985 THM  
125C

Beginning approximately April 1984, a slot was added to the case cover of the THM 125C Transmission (Figure 1). The slot was added to the "Drive feed" oil circuit to allow transmission fluid to spray onto the drive link (chain) to provide additional lubrication. The slot is a "V" shaped groove cut into the case cover in the area and direction as shown in Figure 1. The slot is intentional and should not be considered as a damaged case cover.

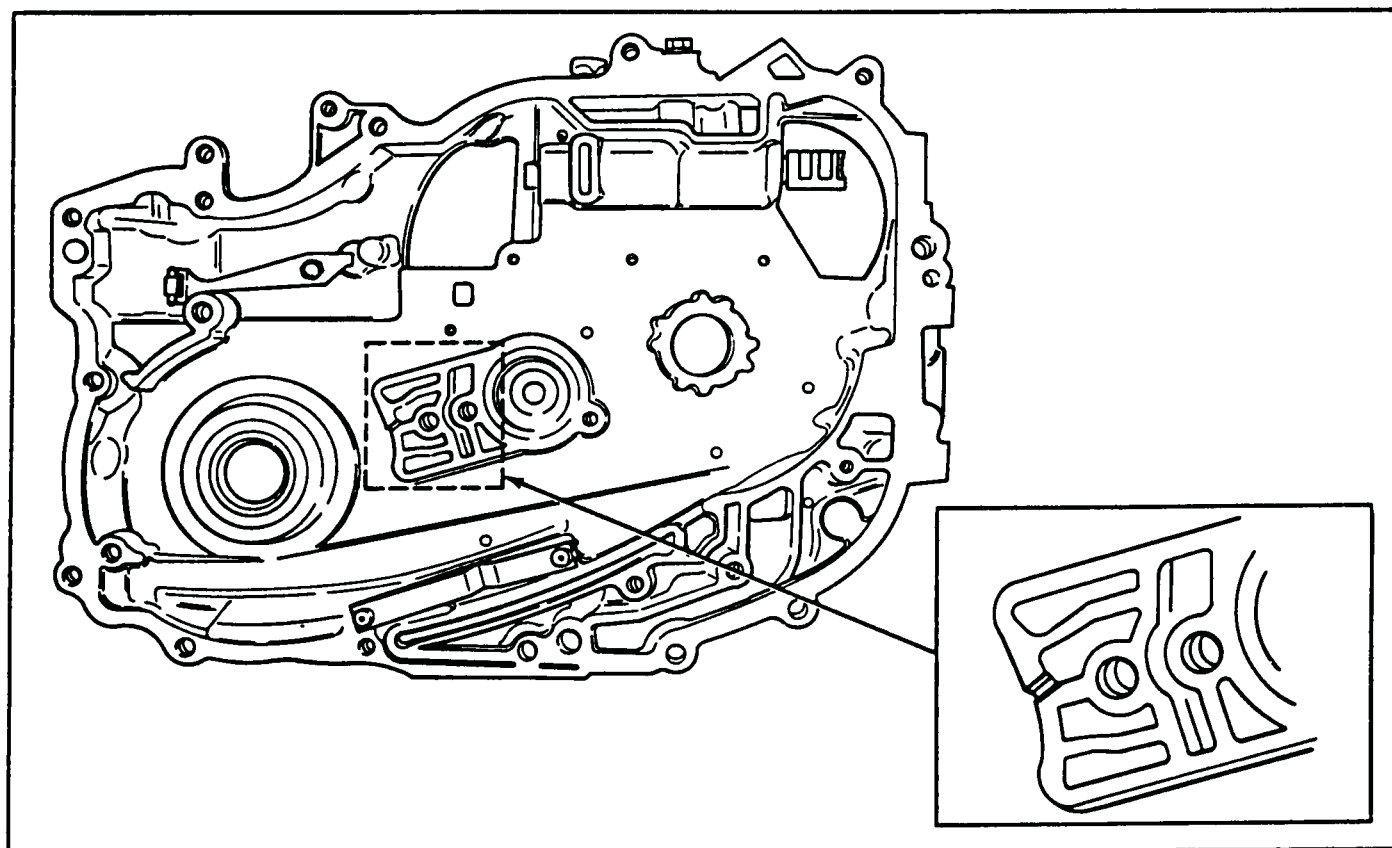


FIGURE 1 CASE COVER OIL LUBE SLOT

AUTOMATIC TRANSMISSION SERVICE GROUP





## OIL LEAK

**Subject:** Front Converter Seal Oil Leak

**Model:** THM 125-C All Models

Some THM 125-C transmissions may experience a front oil leak condition which is due to the front converter seal coming out of its seat in the case bore. This condition results from an oil pressure back-up behind the converter seal, which causes the converter seal to lose its seat in the case bore.

In servicing any THM 125-C transmission for this condition, it is recommended that an oil drainback hole be drilled into the converter seal bore of the transmission case (Figure 1).

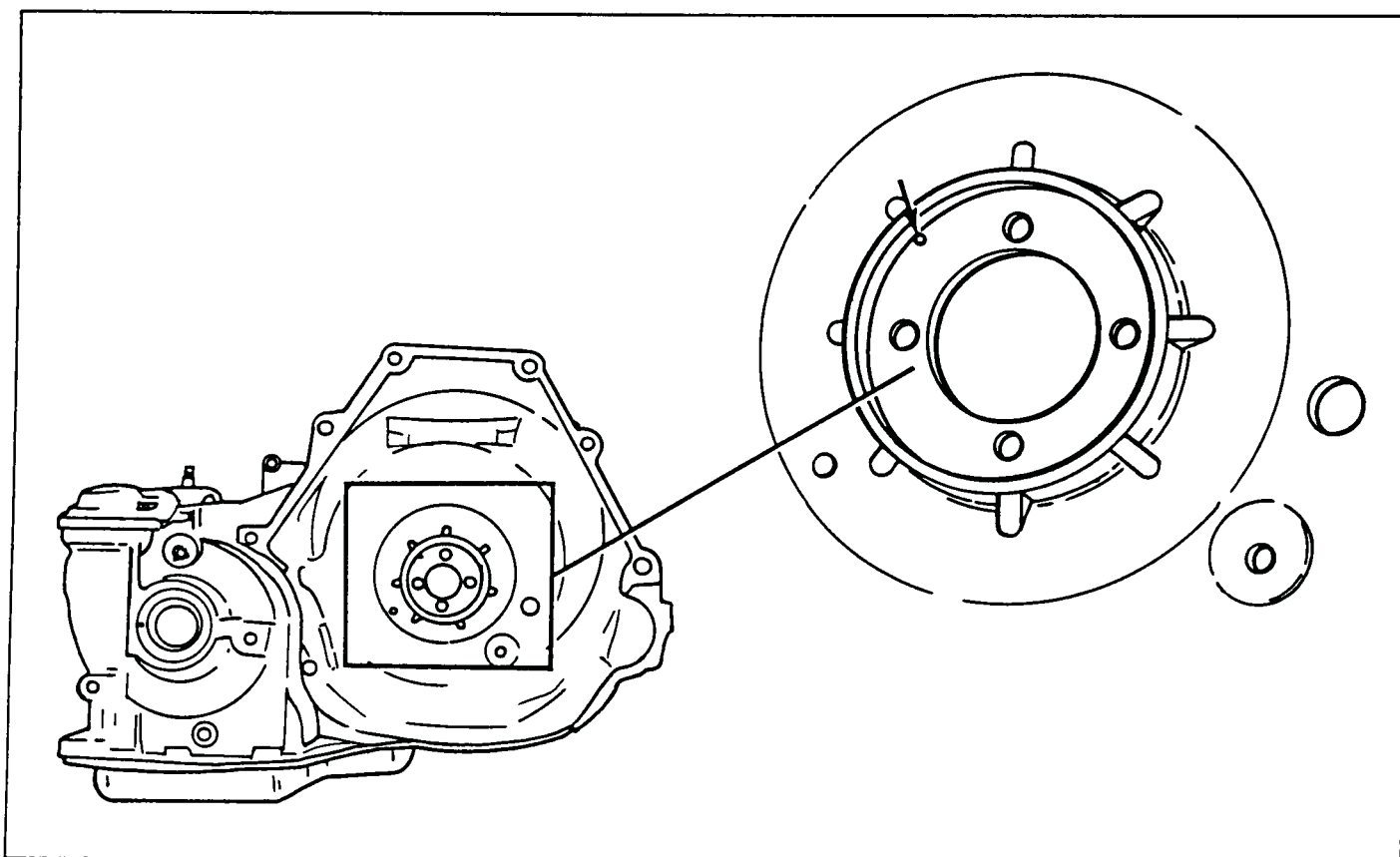


Figure 1

Proper location is important in drilling the hole. Refer to the following service procedure:

### SERVICE PROCEDURE

Always refer to the service manual for the proper removal and installation procedures of component parts.

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1. With the converter removed and the transmission in its holding fixture, (Tool No. J-28664), remove the valve body cover and gasket (or R.T.V. sealant).
2. Remove the throttle lever and bracket assembly.
3. Disconnect the wire assembly from the electrical connector.
4. Remove the control valve assembly, spacer plate and gaskets. (Use care not to lose the check balls which are loose.)
5. Disconnect the manual valve from the rod and retainer assembly.
6. Remove the transmission case cover.
7. Remove the drive link assembly. (Drive sprocket, driven sprocket, chain, thrust washers and bearings.)
8. Remove the converter oil seal.
9. Remove the drive sprocket support.
10. Drill, from the seal bore side, a 4.76 mm (3/16 in.) minimum diameter hole 2.03 mm (.080 in.) inside the radius of the converter seal bore (Figure 1). The hole must be drilled through so that it exits the other side of the sprocket support mating face, partially outward from the machined surface as shown (Figure 2).

USE CARE NOT TO TOUCH THE SEAL BORE DIAMETER WITH THE DRILL BIT.

11. Clean all aluminum chips from the case. The transmission must be thoroughly cleaned and all burrs removed from the drilled hole before reassembly.
12. Install the drive sprocket support and torque the four torx® head bolts to 24 N·m (18 ft.-lbs.).
13. Install a new converter oil seal (Part Number 8637906 for a 245 mm converter or 8631950 for a 254 mm converter) into the case. Use Tool No. J-28540.
14. Install the drive link assembly.
15. Install the transmission case cover. Torque all bolts to 24 N·m (18 ft.-lbs.).
16. Connect the rod and retainer assembly to the manual valve.
17. Install the control valve assembly, spacer plate and gaskets, placing the check balls in their proper locations. Torque all valve body to case cover attaching bolts to 11 N·m (8 ft.-lbs.), and all valve body to case attaching bolts to 24 N·m (18 ft.-lbs.).
18. Connect the wire assembly to the electrical connector.
19. Install the throttle lever and bracket assembly.
20. Install the valve body cover and gasket (or R.T.V. sealant). Torque all bolts to 16 N·m (12 ft.-lbs.).

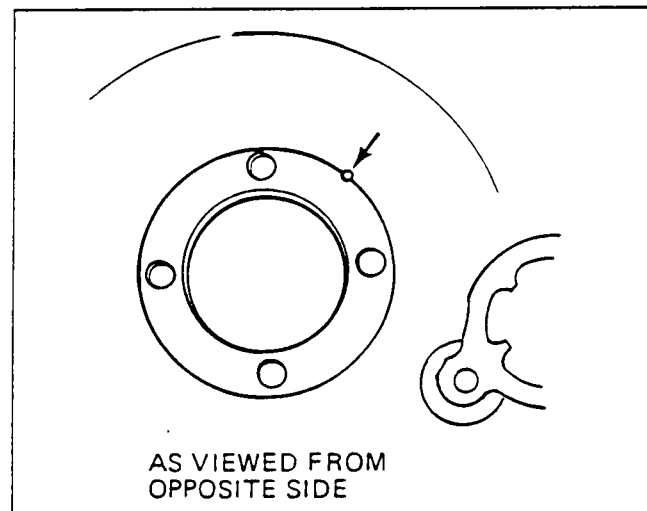


Figure 2

## BURNED BAND

Model: All THM 125 &  
125C Models

When diagnosing a burnt band and direct clutch condition, a possible cause might be a third accumulator check valve not seating properly. This allows the intermediate band to drag while the direct clutch is applied causing excessive friction.

When servicing THM 125 and 125C transmissions for a burnt band and direct clutch condition, order service package 8643964, which contains a new dual land third accumulator check valve and a conical spring, then refer to the following procedure.

### Service Procedure

1. Remove the intermediate servo cover and gasket.
2. Remove the third accumulator check valve and spring.
3. Inspect the third accumulator valve bore for presence of the valve seat (Figure 1). Also, inspect for wear or damage to the seat.
4. Plug the feed and exhaust holes in the bore using petrolatum (Figure 1).
5. Replace the third accumulator check valve with a dual land check valve. Center the valve so as to seat it properly.
6. Leak test the valve seat by pouring solvent into the accumulator check valve bore. Check for a leak on the inside of the case. (A small amount of leakage is acceptable.)
7. If the valve leaks, tap the valve with a brass rod and rubber mallet, to try to re-seat the valve.
8. Re-leak test the valve seat.
9. If the valve continues to leak, it will be necessary to replace the case.
10. If the valve doesn't leak, remove the check valve and install the new conical valve spring onto the valve (small end first). Install the valve into the case bore (Figure 2).
11. Install the servo gasket and cover. (Do Not Use Old Gasket.)

All THM 125 and 125C transmissions being serviced for a burnt band and direct clutch condition must have the new dual land third accumulator check valve and conical spring installed.

For further causes of a burnt band and direct clutch condition, refer to Hydra-matic Service Bulletin #81-22 as well as the Service Manual.

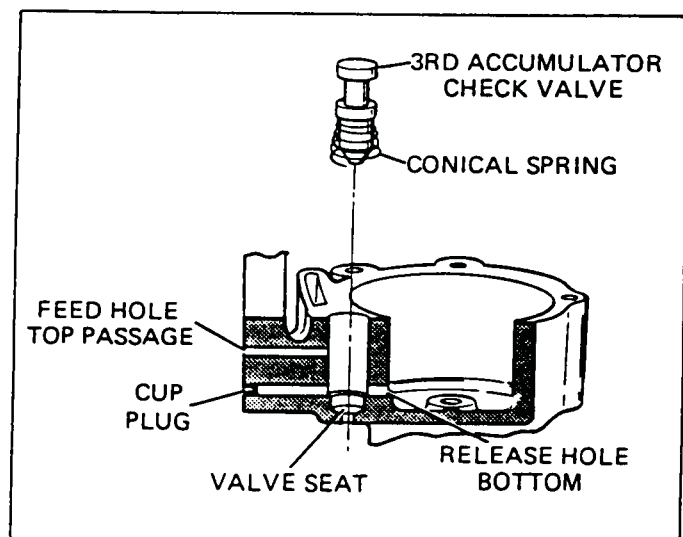


Figure 1

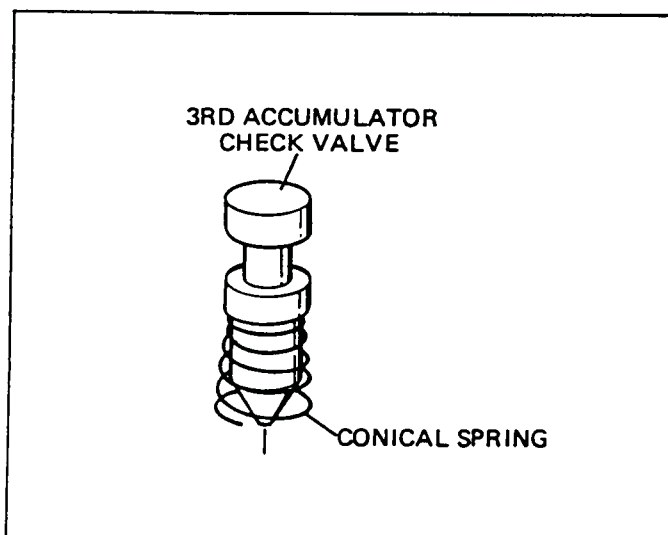


Figure 2



# BURNED FORWARD CLUTCH

**Subject:** Diagnosing a Burned Forward Clutch (Loss of Drive)

**Model** 1982 THM 125 & 125C

When determining the cause of a burned forward clutch in any 1982 THM 125 or 125C transmission, be certain to check the forward clutch housing for cracks as follows:

Air check the assembled clutch housing using approximately 30 psi, and watch for leaks at the areas shown in Figure 1. If a leak is found, replace the forward clutch housing.

If no cracks are evident, check the following items:

1. Check for missing or damaged seal rings on the input shaft.
2. Check for a missing or damaged input shaft thrust washer.
3. If the forward clutch contains a ball capsule, check it for damage or improper sealing.
4. Check the backing plate for correct installation.
5. Disassemble the clutch and air check the input shaft feed passage for restrictions or blockage.
6. Check the piston lip seals for cuts or damage.
7. Check all the surfaces which the seals contact for nicks or scratches, for example piston pocket and driven sprocket support sleeve.

If no cause is found, refer to Service Manual for further diagnosis.

After finding the cause of a burned clutch, reassemble the clutch replacing any worn or damaged parts. Then air check the clutch again and check for leaks.

Properly diagnosing the cause of a burned clutch will prevent a later reoccurrence of the same condition.

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To air check housing without checkball: use an air nozzle to apply 30 PSI air through hole #1. When air nozzle is removed from hole #1 pressure will exhaust.

To air check housing with checkball: cover hole #1 with thumb and apply 30 PSI air through checkball #2.

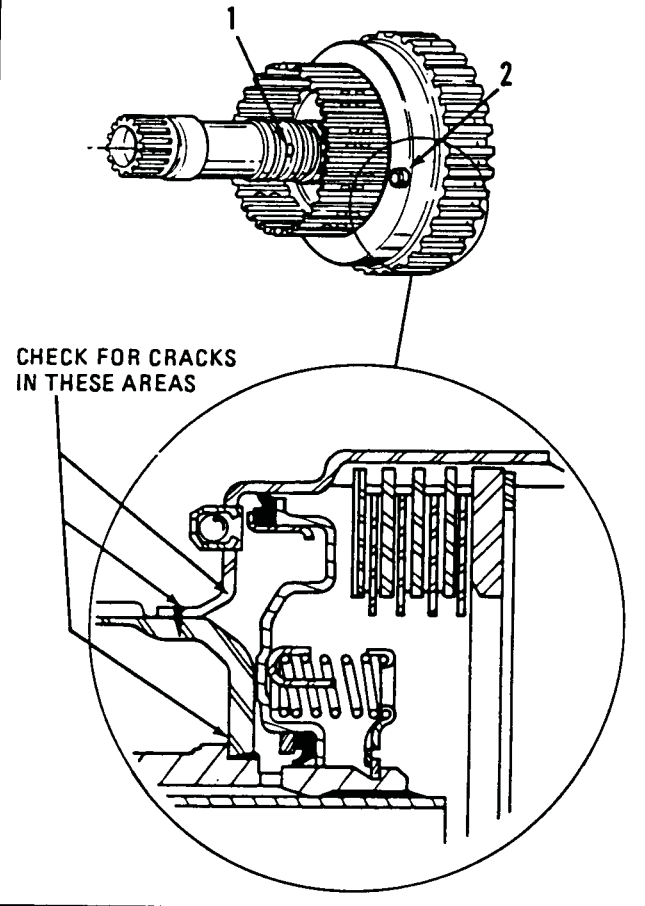


Figure 1



## DIESEL WIRING

Subject: Wiring Diagram for 1982 THM 125C Diesel

Model 1982 THM 125C

The wiring diagram for all 1982 THM 125C transmissions used with a diesel engine is shown below.

Please use Figure 1 to update your 1982 Service Manual.

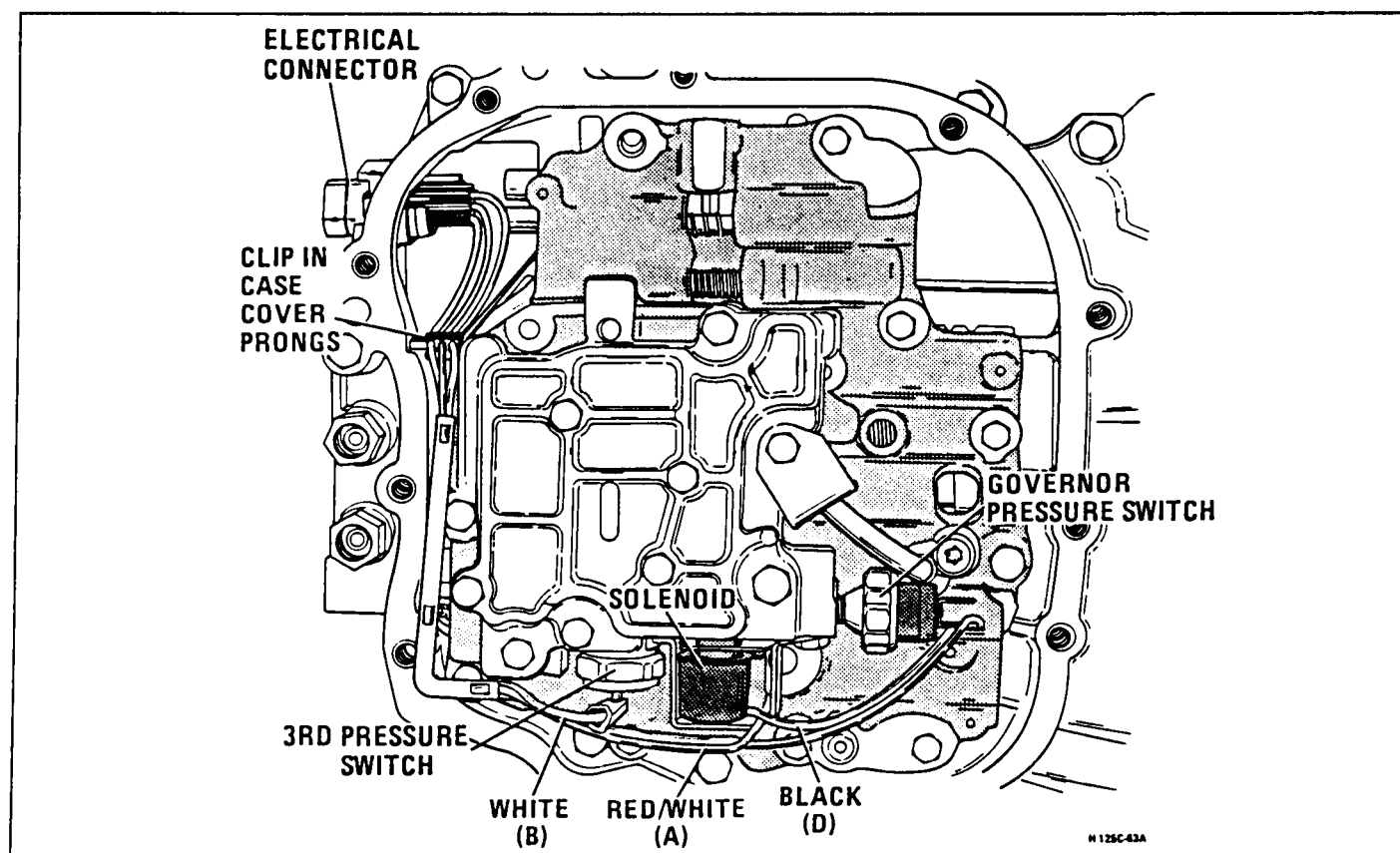


Figure 1

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