Section 3
Disassembly

3-1. GENERAL INFORMATION

3-2. During disassembly, refer to the illustrations provided with the text. In addition, an exploded view of the complete assembly and major subassemblies can be seen on the illustration in Section P, Parts. These exploded view illustrations are listed at the beginning of Section P.

3-3. This section provides instructions for complete disassembly of the transmission. If the transmission is not due for overhaul, and repair affecting specific parts is required, disassemble only to the extent necessary to gain access to these parts. Parts removed from the transmission as subassemblies or groups need not be disassembled for repair unless they contain the affected parts.

3-4. REMOVAL AND INSTALLATION OF TRANSMISSION

3-5. Refer to paragraph 2-23 and 2-25.

3-6. TRANSMISSION DISASSEMBLY

3-7. REMOVAL OF VALVE AND PUMP HOUSING ASSEMBLY.

With the transmission held in a suitable fixture and in its approximate installed position, begin disassembly as follows (see figure 3-1):

1. Remove dipstick (1 or 1A). Position transmission over suitable container, remove drain plug (2) and drain all fluid from transmission.

2. Remove seven bolts (3), one bolt (3A) and washer (3B). Pull valve and pump housing assembly (4) from case (46), keeping mounting faces parallel until pump clears end of input shaft assembly (28).

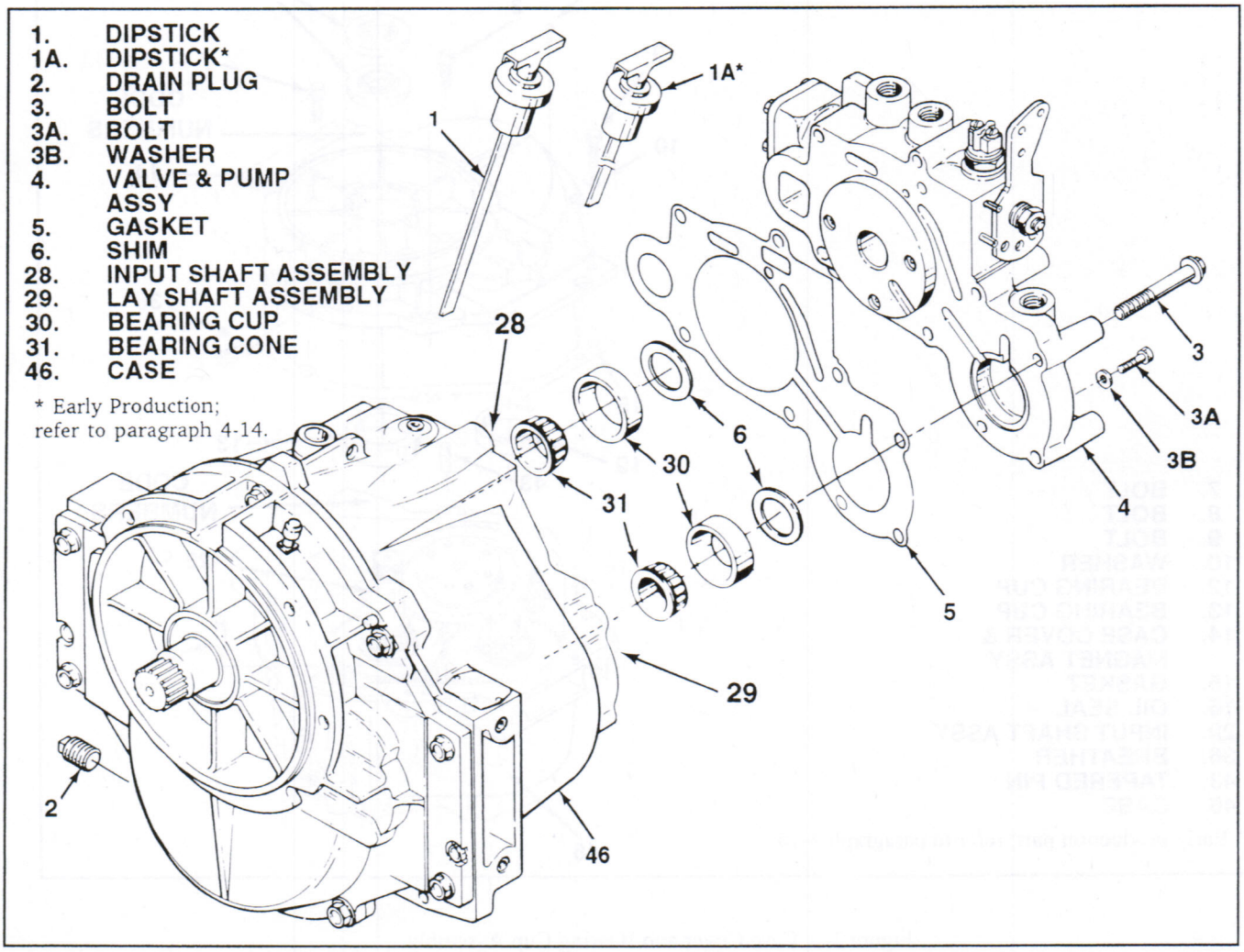


Figure 3-1. Valve and Pump Housing Assembly

3. Remove shim(s) (6), outer bearing cup(s) (30) and bearing cone(s) (31) from input shaft assembly (28) and lay shaft assembly (29).

4. Refer to paragraph 3-13 for disassembly of valve and pump assembly (4).

5. Remove gasket (5). If necessary to scrape, defer this until after transmission is completely disassembled.

NOTE: If output shaft or clutch assemblies are to be removed, nut (17) may be loosened at this time.

3-8. REMOVAL OF CASE COVER AND BEARING CUP ASSEMBLY. Position the transmission with the pump (just removed) end down. Support the transmission with fixture T-5007 (see Section T) or in another suitable manner to provide clearance for exposed end of input shaft and balance transmission. Proceed as follows (see figure 3-2):

1. Carefully tap small OD end of tapered pins (43) to remove from case cover and magnet assembly (14). (Note direction of taper)

2. Remove two bolts (7), five bolts (8), four bolts (9), four washers (10), and bolt (47).

3. Pull case cover and magnet assembly (14) straight up off of case (46) until cover and bearing cup assembly clears end of input shaft assembly (28).

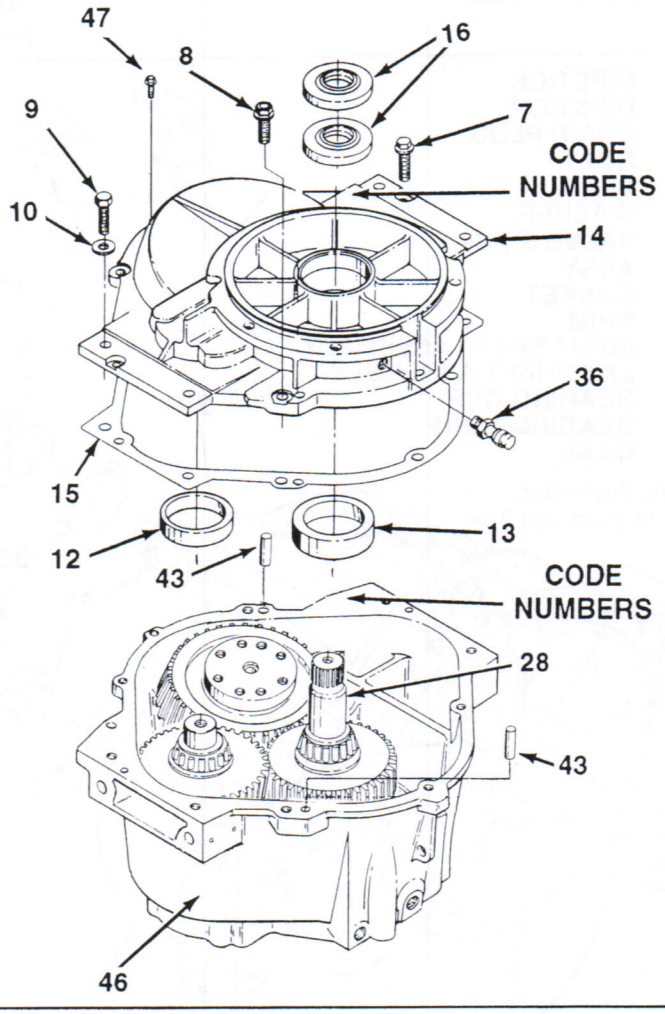
4. Do not remove bearing cups (12 and/or 13) unless replacement is required.

5. Remove gasket (15). If necessary to scrape, defer this until after transmission is completely disassembled.

6. Remove two oil seals (16) (Note some may only have one.) from case cover and magnet assembly (14).

7. Do not remove breather (36) unless replacement is required.

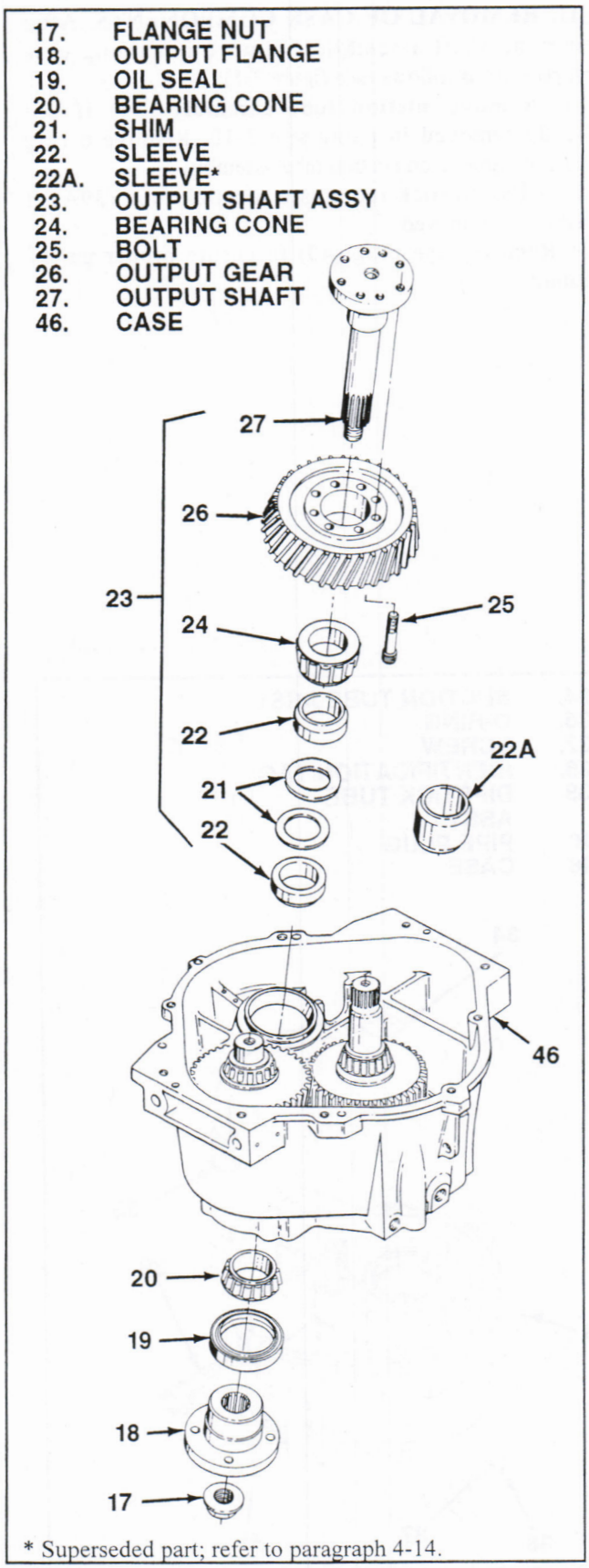
8. Case cover and magnet assembly (14) and case (46) are a matched set. See listing in Section P.



7. BOLT
8. BOLT
9. BOLT
10. WASHER
12. BEARING CUP
13. BEARING CUP
14. CASE COVER & MAGNET ASSY
15. GASKET
16. OIL SEAL
28. INPUT SHAFT ASSY
36. BREATHER
43. TAPERED PIN
46. CASE

* Early production part; refer to paragraph 4-14.

Figure 3-2. Case Cover and Bearing Cup Assembly



* Superseded part; refer to paragraph 4-14.

Figure 3-3. Output Shaft Assembly

WARNING: Case cover and magnet assembly (14) and case (46) are a matched set. Check the code numbers as shown in figure 5-18 to make sure a matched set is being disassembled. A mismatched case (46) and cover and magnet assembly (14) can result in severe transmission damage.

3-9. REMOVAL OF OUTPUT SHAFT ASSEMBLY. With the transmission resting so the exposed gears are resting in the case, proceed as follows see figure 3-3):

1. Holding output flange (18) with coupling wrench T-5005, remove flange nut (17). Remove output flange (18). Remove sealant from output flange, nut and end of output shaft (27) as required.

2. Grasp output gear (26) and remove output shaft assembly (23).

3. Remove shim(s) (21) and two sleeves (22) or one sleeve (22A).

NOTE: If one sleeve is removed, two sleeves must be installed when reassembled. Discard the single sleeve and shims removed. Do not use any of the original shims when assembling. Do not attempt to cut single sleeve (22A) in half for reuse.

NOTE: In normal field repair it will not be necessary to remove the output gear from the output shaft. If separation is necessary a suitable press will be required.

4. When it is necessary to remove the output gear (26) from the output shaft (27), bearing cone (24) must be removed first. Bearing cone (24) will be destroyed in the process of removal.

5. Remove eight bolts (25) and output gear (26) from output shaft (27) with suitable press.

3-10. REMOVAL OF INPUT AND LAY SHAFT ASSEMBLIES. With open end of transmission up, proceed as follows (see figure 3-4):

1. Remove two bolts (32), oil baffle (33) and the oil suction tube assembly with dipstick guide (34A), if used. Remove oil filler tube with dipstick tube assembly (39). If the oil dipstick tube (39A) is used, it need not be removed.

2. Pull input shaft assembly (28) and lay shaft assembly (29) straight up out of case (46).

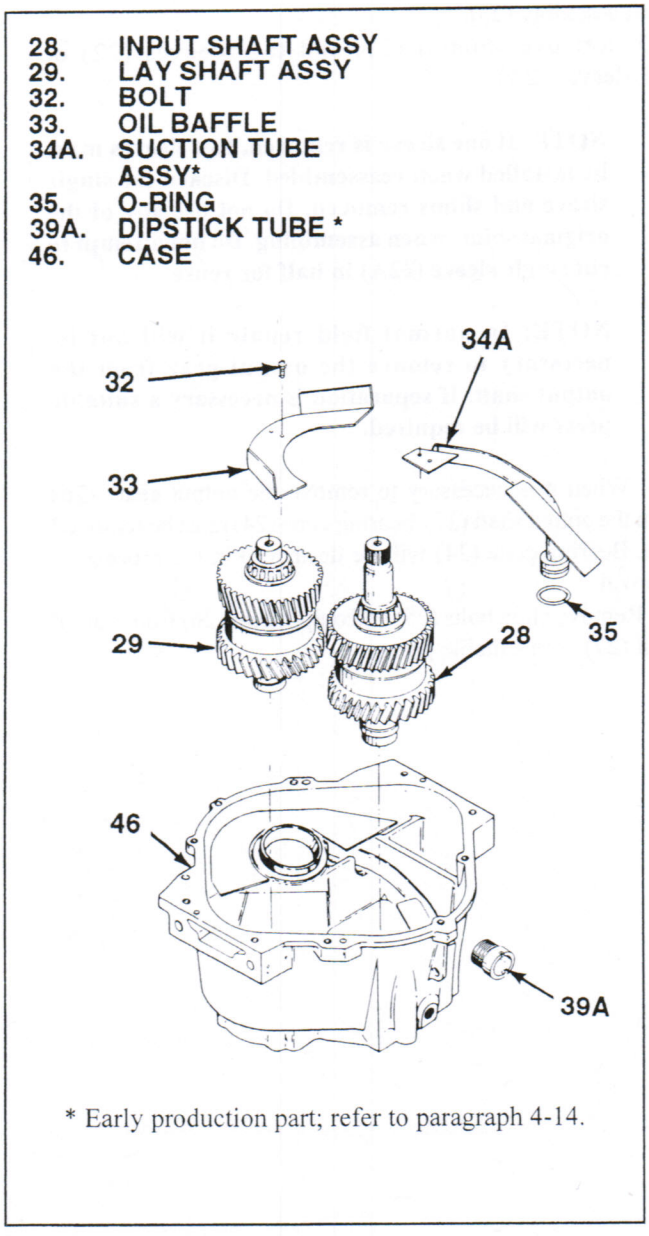
3. Refer to paragraph 3-16 for disassembly of input shaft assembly. Refer to paragraph 3-20 for disassembly of lay shaft assembly.

3-11. REMOVAL OF CASE COMPONENTS. After removing shaft assemblies, remove remaining case components as follows (see figure 3-5):

1. Remove suction tube assembly (34) if not already removed in paragraph 3-10. Remove o-ring (35) from groove on suction tube assembly.

2. If the dipstick requires a dipstick tube (39A) it need not be removed.

3. Remove pipe plug (40) to ensure proper galley cleaning.



* Early production part; refer to paragraph 4-14.

Figure 3-4. Input and Lay Shaft Assemblies

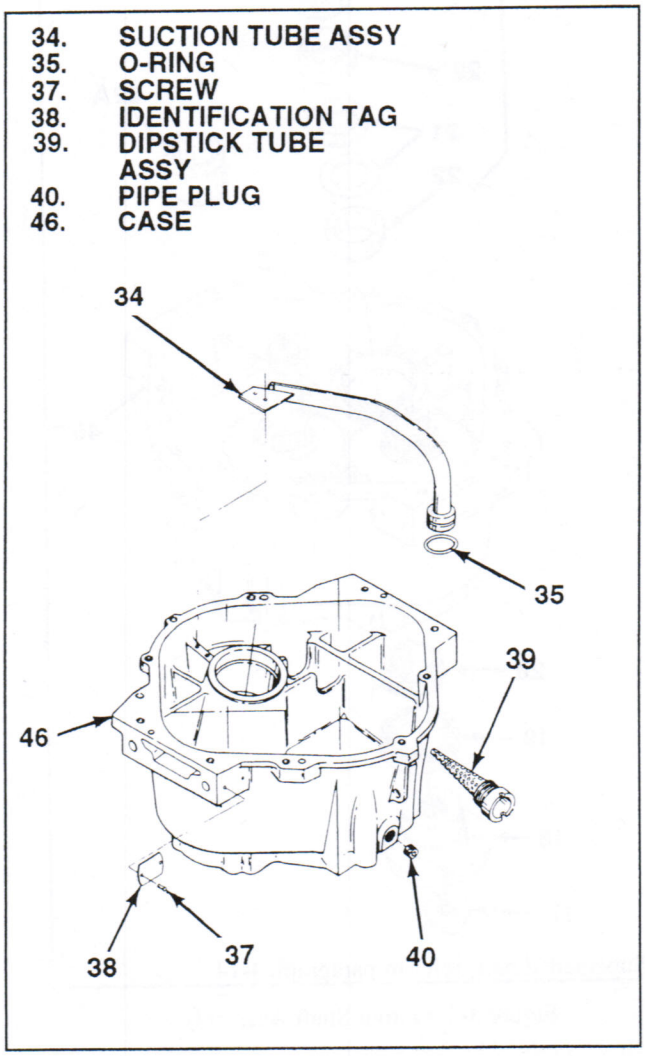


Figure 3-5. Case Components

3-12. DISASSEMBLY OF CASE ASSEMBLY. Remove parts from case assembly only if replacement is required. Then, as required, proceed as follows (see figure 3-6):

1. Remove thread inserts (42) using standard Heli-Coil (R) removal tools only if damaged.

2. Press or drive bearing cups (44 and 45) from transmission case (46) using care not to damage case.

3. Case cover and magnet assembly (14) and case (46) are a matched set. See listing in Section P.

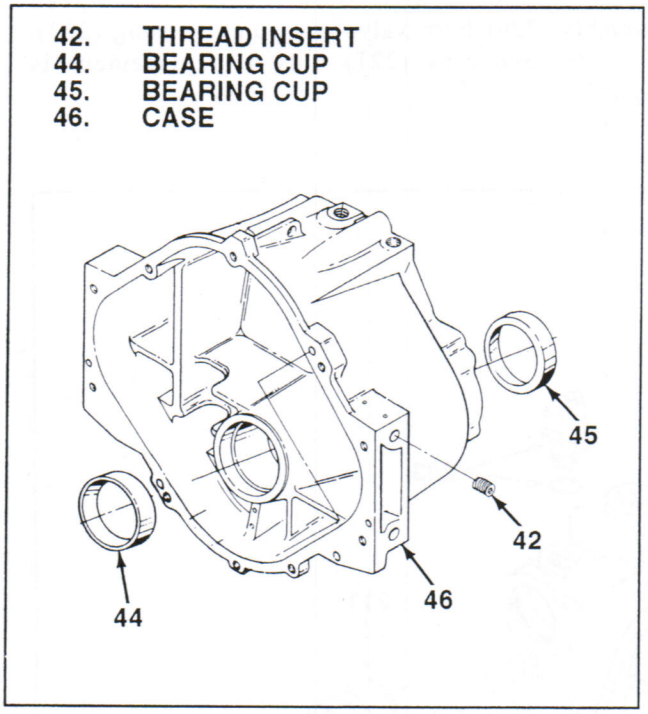


Figure 3-6. Case Assembly

3-13. DISASSEMBLY OF VALVE AND PUMP HOUSING ASSEMBLY

3-14. REMOVAL OF PUMP, SWITCH AND TRANSMISSION SHIFT LEVER. Proceed as follows (see figure 3-7):

1. Remove three bolts (201) and pump assembly (202). The pump contains matched parts and must be replaced as an assembly if necessary.

2. Remove switch assembly (203) and temperature sensor (101) if used.

3. Holding transmission shift lever (207) to prevent control valve (211) from turning and ball (208) and spring (209) from flying out, remove nut (204). Remove lock washer (205), flat washer (206), shift lever (207), ball (208) and spring (209).

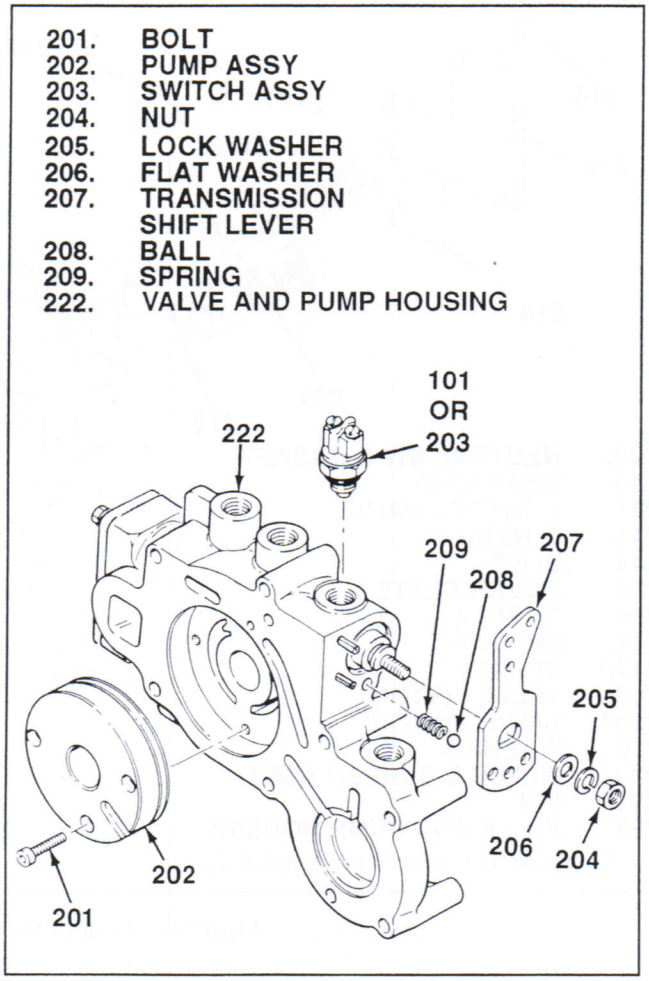


Figure 3-7. Pump, Switch and Transmission Shift Lever

3-15. REMOVAL OF CONTROL VALVE, PISTON AND SCREEN. After removing switch as described in paragraph 3-13, remove control valve, piston and screen as follows (see figure 3-8):

CAUTION: Control valve (211), valve piston (218 or 218A) and mating bores in valve and pump housing (222) are highly finished. Use care not to scratch or otherwise damage these surfaces. Damaged surfaces may result in, fluid leakage and shifting malfunctions.

1. Remove snap ring (210) and pull control valve (211). Temporarily thread nut (204) back onto control valve to aid in valve removal if necessary.

2. Remove o-ring (212) from groove in control valve (211).

3. Remove six bolts (214), cover plate (215) and gasket (216).

WARNING: Cover plate is preloaded with spring pressure from springs (217 and (217A). Care must be taken when removing springs.

If necessary to scrape gasket, defer this until after valve and pump assembly are completely disassembled.

4. Remove springs (217, and 217A if used), valve piston (218 or 218A), washer (219) and screen assembly (220) from valve and pump housing (222).

5. Remove pins (221) only if replacement is required.

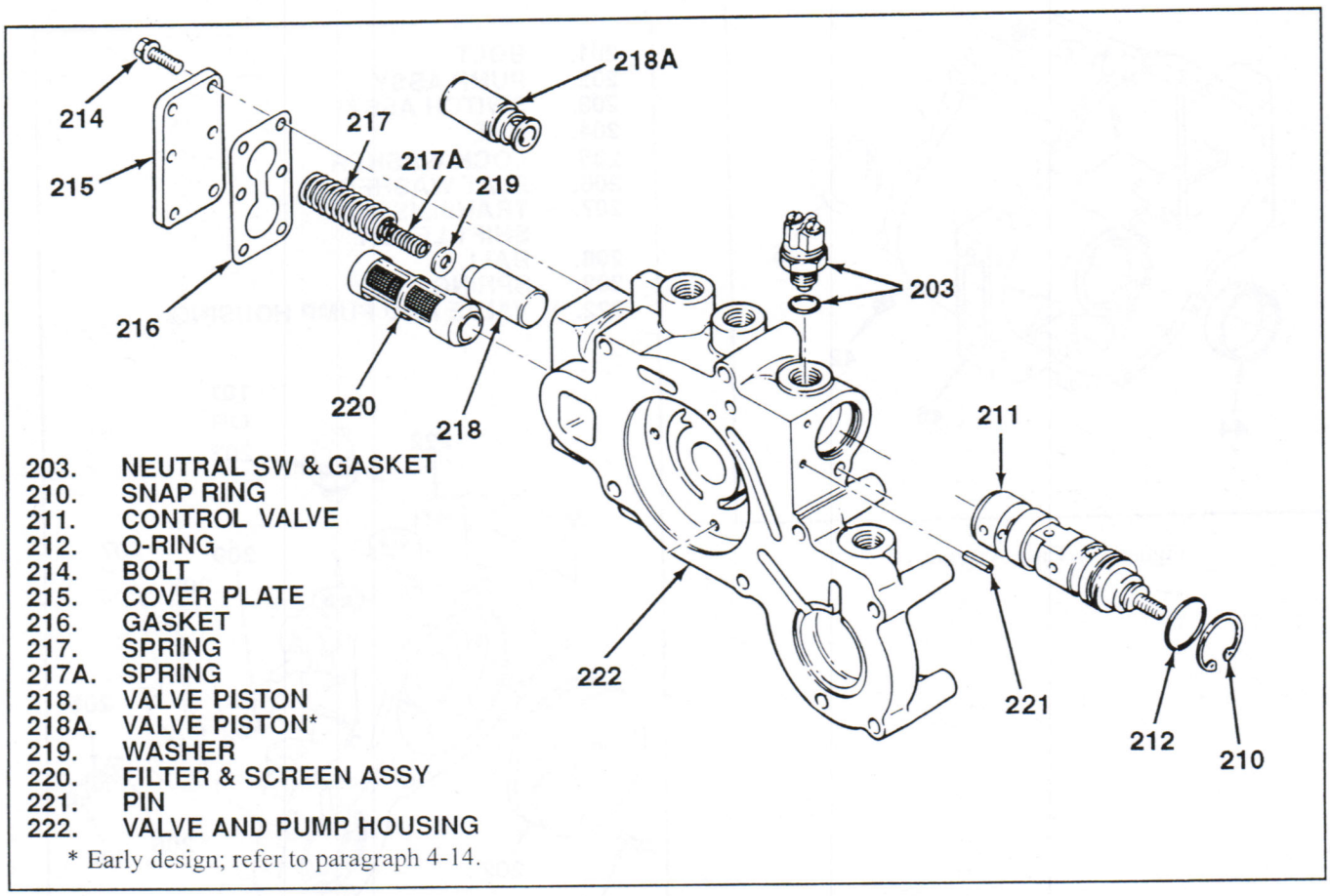


Figure 3-8. Control Valve, Piston and Filter

3-16. DISASSEMBLY OF INPUT SHAFT ASSEMBLY

3-17. REMOVAL OF CLUTCH GEAR AND BEARINGS. Proceed as follows (see figure 3-9):

1. Use a suitable collar behind clutch gear (304) to press bearing cone (301) from input shaft (329). Use care not to damage gear teeth.

2. Thrust washer (302), spacer (303) will be removed with clutch gear (304).

3. Remove snap ring (305), three needle bearings (306) and snap ring (307) from input shaft (329). Snap ring (307) may be removed after clutches are removed for convenience.

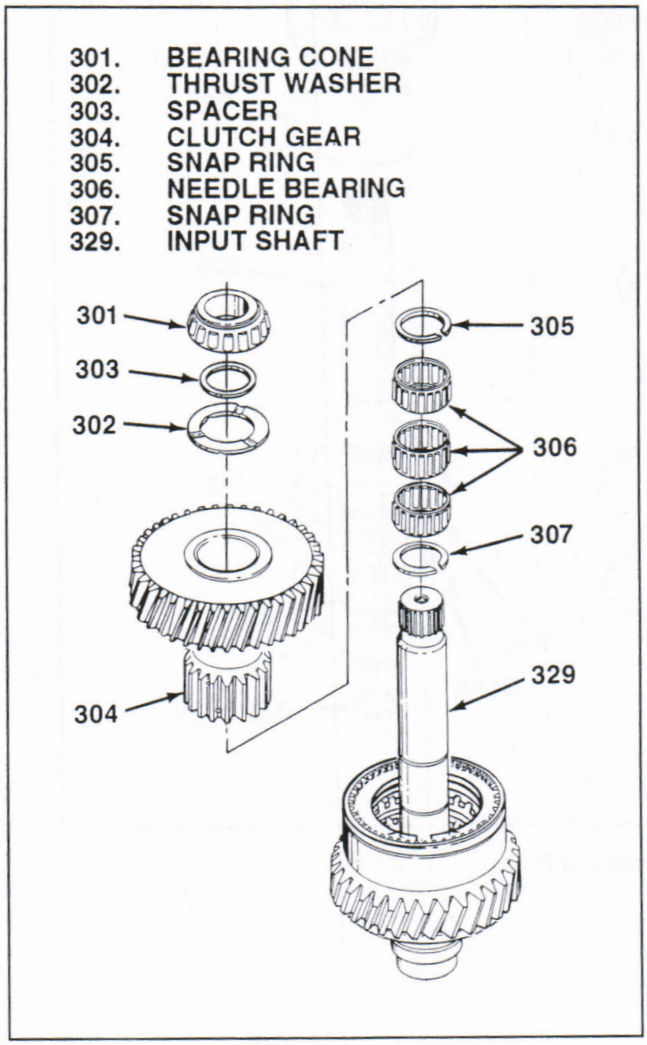


Figure 3-9. Input Clutch Gear and Bearings

3-18 REMOVAL OF CLUTCH GROUP. Support input shaft assembly with splined end up and proceed as follows (see figure 3-10):

1. Remove snap ring (308) and backing plate (309), or backing plate (309A) and one clutch plate (310A).

2. Alternately remove eight clutch disc assemblies (311) and seven clutch discs (312).

3. Remove remaining clutch plate (310).

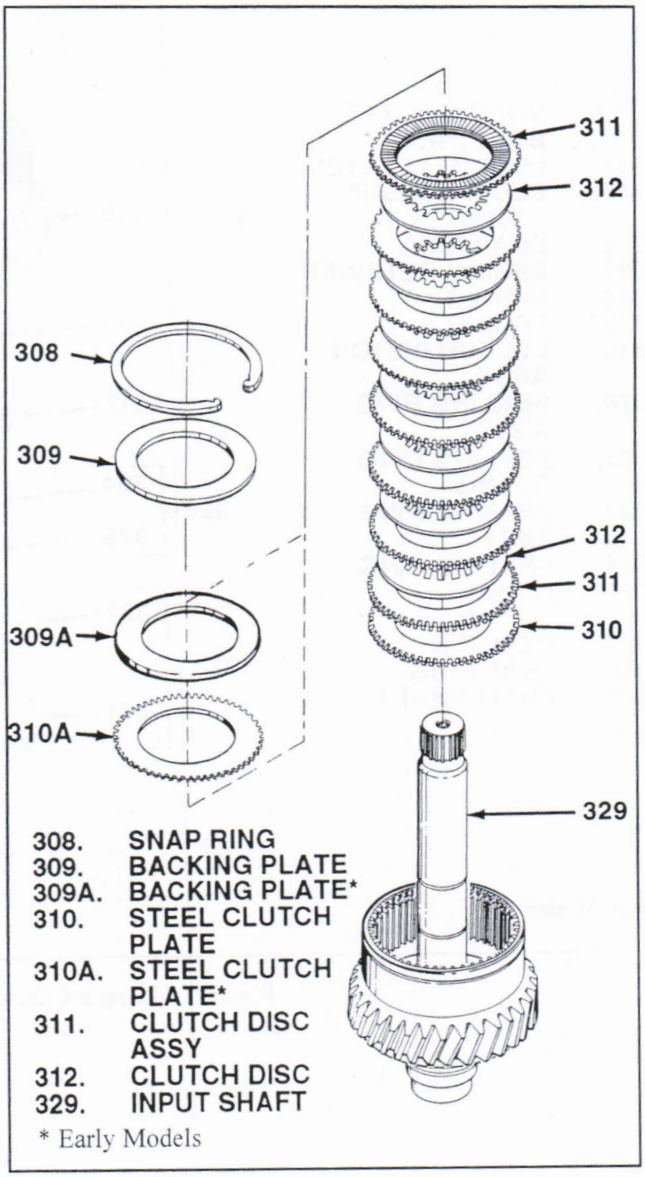


Figure 3-10. Input Clutch Group

3-19. REMOVAL OF CLUTCH CYLINDER AND PISTON. Proceed as follows (see figure 3-11):

CAUTION: OD and ID of clutch piston assembly (319) and mating bore in clutch gear cylinder (315) and OD on input shaft (329) are highly finished. Use care not to scratch or otherwise damage these surfaces. Damaged surfaces may result in fluid leakage and shift malfunctions.

1. Remove snap ring (307) if not already removed.
2. Remove twelve bolts (313) and lock plates if used.
3. Remove clutch gear cylinder (315) from input shaft (329).

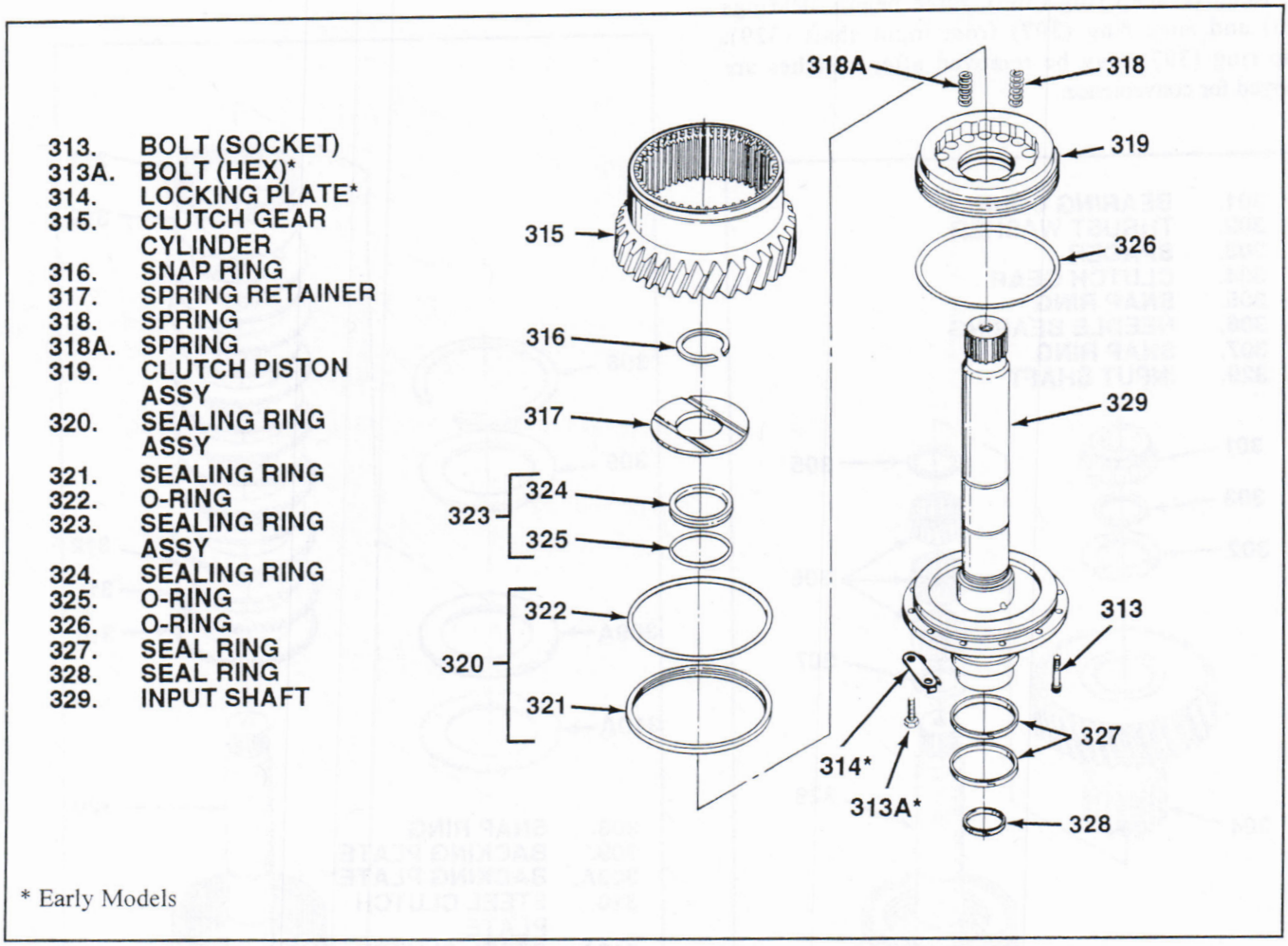


Figure 3-11. Input Clutch Cylinder and Piston

4. Support input shaft (329) in suitable holding fixture (see figure 3-12) in arbor press. Using assembly tool T-5001, press down on spring retainer (317) to compress springs (318, and 318A if used) slightly. Remove snap ring (316).

5. Slowly release arbor press, allowing springs (318, and 318A if used) to expand. Remove assembly tool and spring retainer (317). Remove sixteen springs (318) (transmissions 2001-000-011 thru -016) or four springs (318) and twelve springs (318A) (transmissions 2001-000-001 thru -006). Remove shaft assembly from arbor press and holding fixture.

6. Remove clutch piston assembly (319) from input shaft (329). Remove sealing ring assembly (320), consisting of sealing ring (321) and o-ring (322), from groove in piston OD. Remove sealing ring assembly (323), consisting of sealing ring (324) and o-ring (325), from groove in piston ID.

7. Remove o-ring (326), two seal rings (327) and seal ring (328) from input shaft (329).

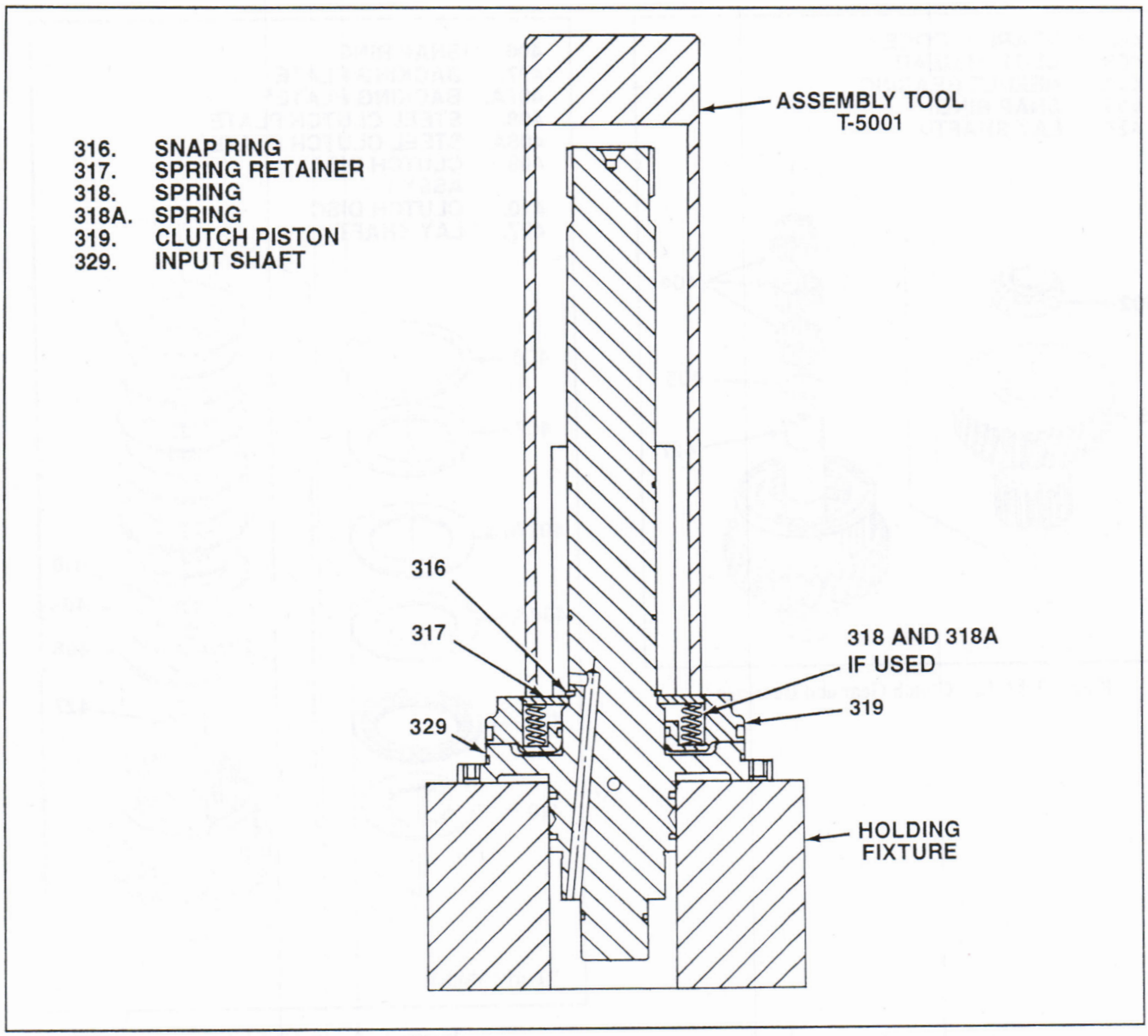


Figure 3-12. Removing Snap Ring

3-20. DISASSEMBLY OF LAY SHAFT ASSEMBLY

3-21. REMOVAL OF CLUTCH GEAR AND BEARINGS. Proceed as follows (see figure 3-13):

1. Use a suitable collar behind clutch gear (403) to press bearing cone (402) from lay shaft (427). Use care not to damage gear teeth. Remove clutch gear.

2. Remove three needle bearings (404) and snap ring (405) from lay shaft (427). Snap ring (405) may be removed after clutches are removed if convenient.

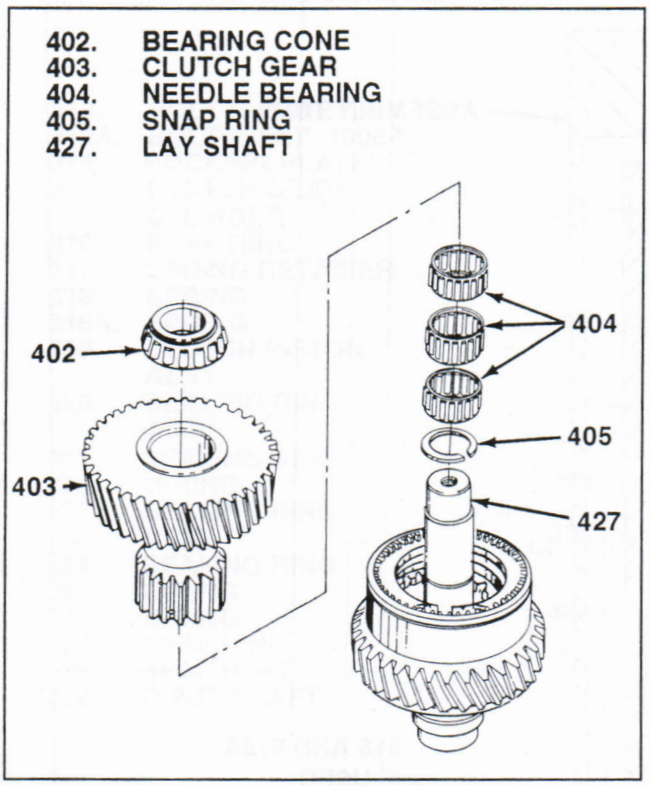


Figure 3-13. Lay Clutch Gear and Bearings

3-22. REMOVAL OF CLUTCH GROUP. Support lay shaft assembly with splined end up and proceed as follows (see figure 3-14):

1. Remove snap ring (406) and backing plate (407), or backing plate (407A) and one clutch plate (408A).

2. Alternately remove eight clutch disc assemblies (409) and seven clutch discs (410).

3. Remove remaining clutch plate (408) and snap ring (405) if not removed earlier.

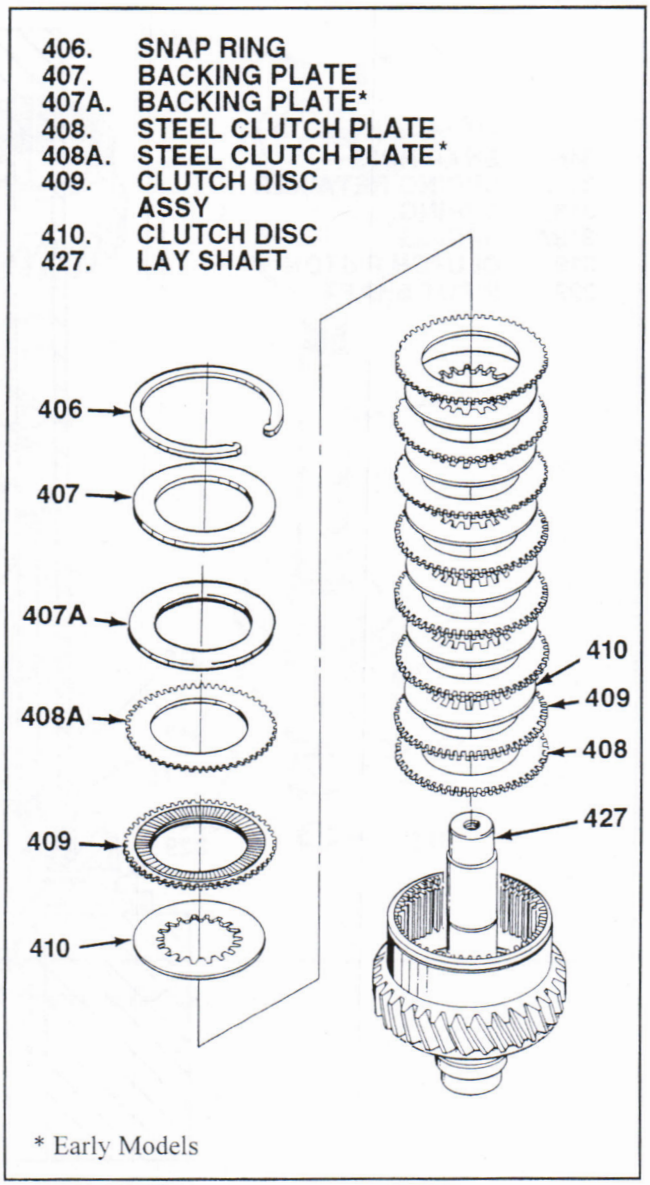


Figure 3-14. Lay Clutch Group

3-23. REMOVAL OF CLUTCH CYLINDER AND PISTON. Proceed as follows (see figure 3-15):

CAUTION: OD and ID of clutch piston assembly (418) and mating bore in clutch gear cylinder (413) and OD on lay shaft (427) are highly finished. Use care not to scratch or otherwise damage these surfaces. Damaged surfaces may result in fluid leakage and shift malfunctions.

1. Remove twelve bolts (411) and lock plates if used.

2. Remove clutch gear cylinder (413) from lay shaft (427).

3. Support lay shaft (427) in suitable holding fixture (see figure 3-16) in arbor press. Using assembly tool T-5001, press down on spring retainer (416) to compress springs (417, and 417A if used) slightly. Remove snap ring (414).

4. Slowly release arbor press, allowing springs (417, and 417A if used) to expand. Remove assembly tool, thrust washer (415), and spring retainer (416). Remove sixteen springs (417) (transmissions 2001-000-011 thru -016) or four springs (417) and twelve springs (417A) (transmissions 2001-000-001 thru -006 and 2001-000-R01 thru 2001-000-R06). Remove shaft assembly from arbor press and holding fixture.

5. Remove clutch piston assembly (418) from lay shaft (427). Remove sealing ring assembly (419), consisting of sealing ring (420) and o-ring (421), from groove in piston OD. Remove sealing ring assembly (422), consisting of sealing ring (423) and o-ring (424), from groove in piston ID.

6. Remove o-ring (425) and seal rings (426) from lay shaft (427).

7. Remove snap ring (428), spacer (429), spring (430) and ball (431) from lay shaft (427).

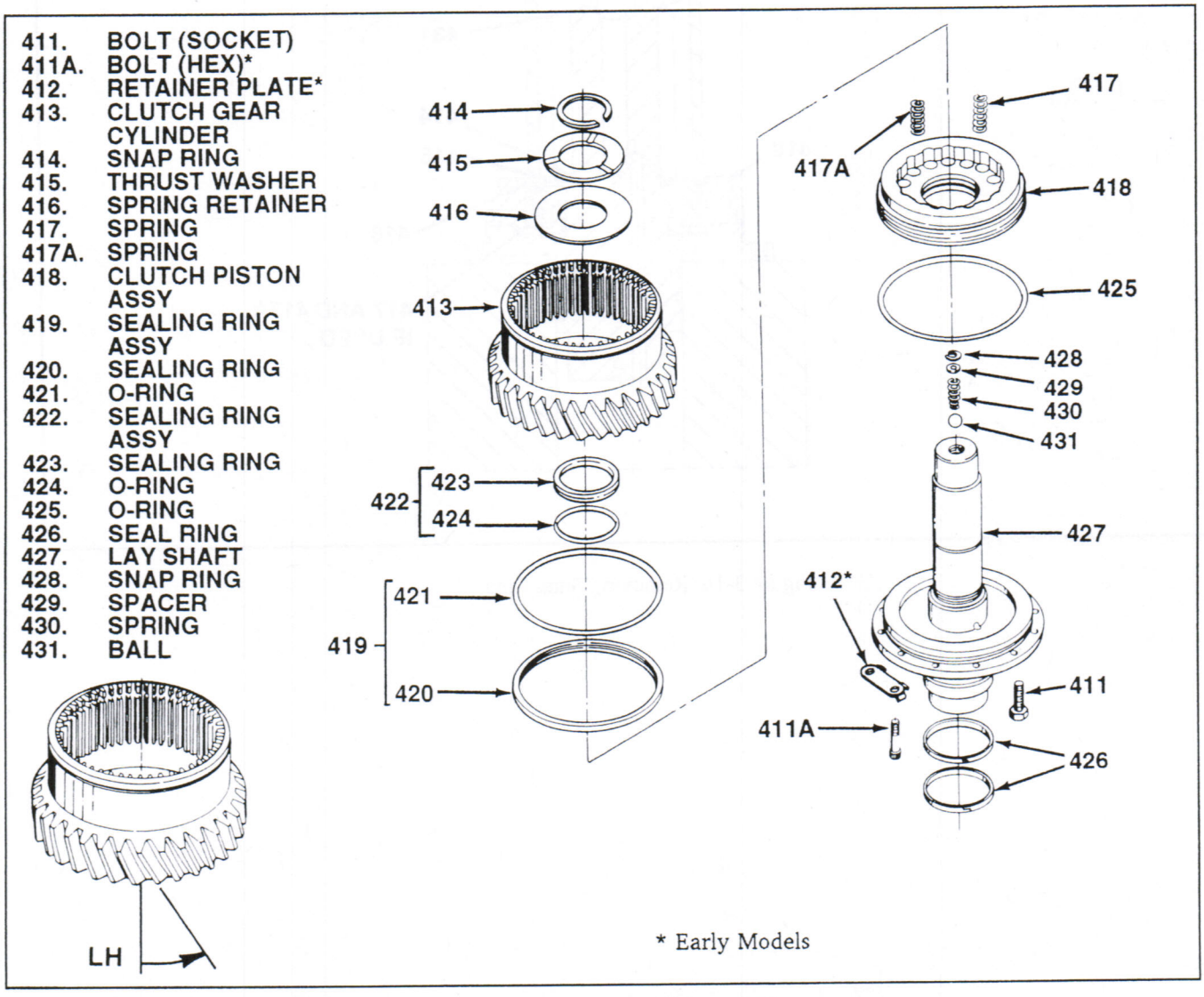


Figure 3-15. Lay Clutch Cylinder and Piston

414. SNAP RING
415. THRUST WASHER
416. SPRING RETAINER
417. SPRING
417A. SPRING
418. CLUTCH PISTON
427. LAY SHAFT
428. SNAP RING
429. SPACER
430. SPRING
431. BALL

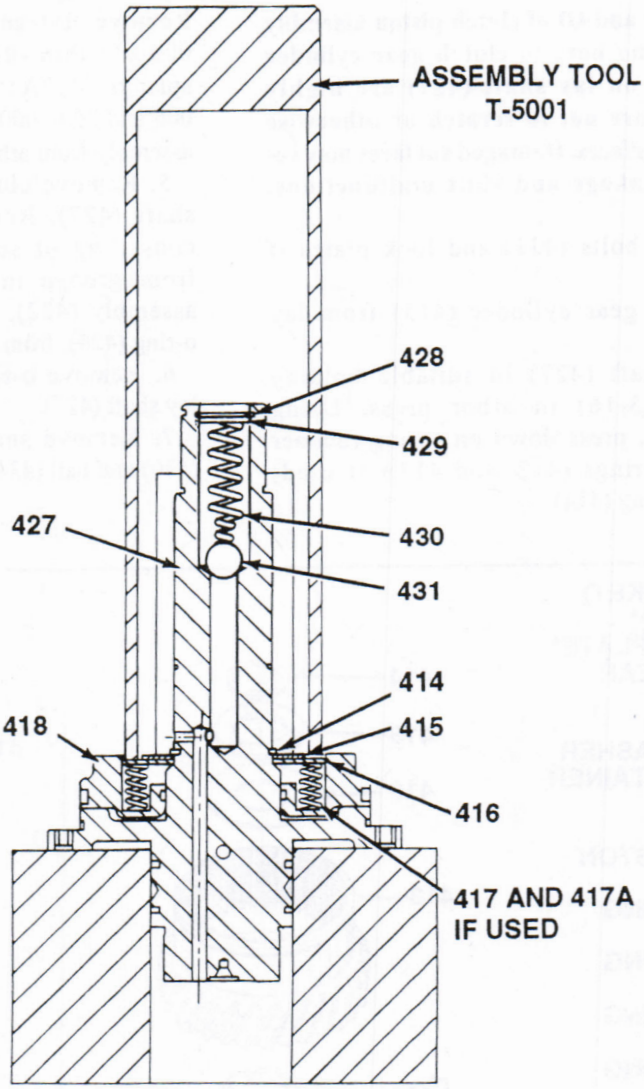


Figure 3-16. Removing Snap Ring