SECTION 5-D

TRANSMISSION DISASSEMBLY AND REASSEMBLY

CONTENTS OF SECTION 5-D

5-8 DISASSEMBLY OF MAJOR UNITS

1. With transmission in cradle on portable jack, remove J-21366, remove the converter assembly, by pulling straight out.

NOTE: The convertor contains a large amount of oil.

2. Install holding Fixture J-8763 on the transmission so that the modulator assembly will be located on the side of the holding fixture that is nearest the bench.

3. Install fixture and transmission into holding Tool Base, J-3289-20, with bottom pan facing up. See Figure 5-500.

4. Remove modulator assembly attaching screw and retainer. See Figure 5-501.

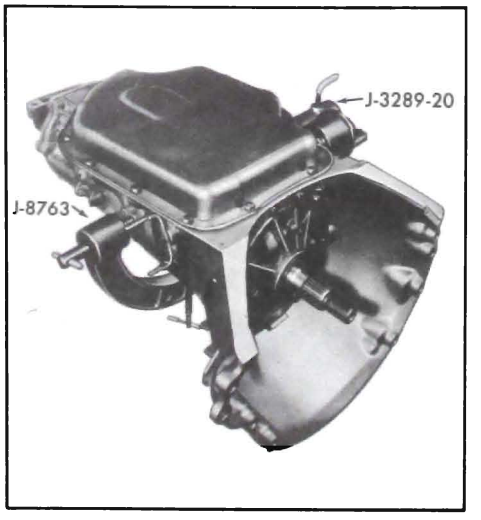

Figure 5-500

5. Remove modulator assembly and "O" ring seal from case. See Figure 5-502.

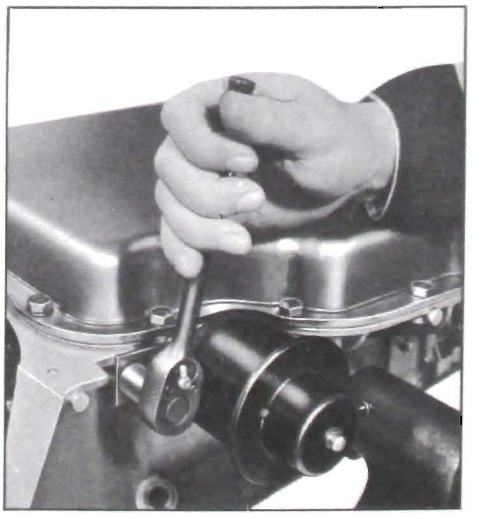

Figure 5-501

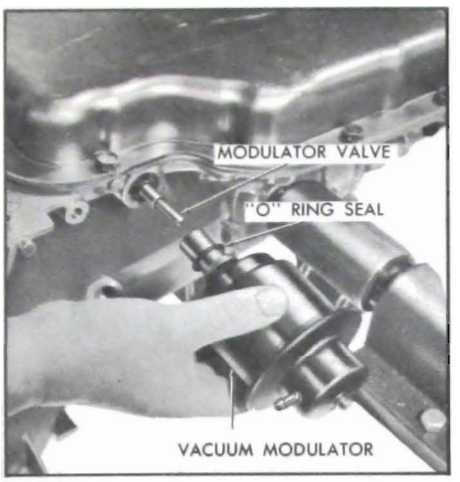

Figure 5-502

6. Remove modulator valve from transmission case.

5-9 REMOVAL OF GOVERNOR SPEEDOMETER DRIVEN, GEAR, PAN, STRAINER AND INTAKE PIPE

NOTE: The following operations can be performed with transmission in car.

1. Remove attaching screws, governor cover and gasket. See Figure 5-503.

2. Withdraw governor assembly from case.

3. Remove the speedometer driven gear attaching screw and retainer. See Figure 5-505.

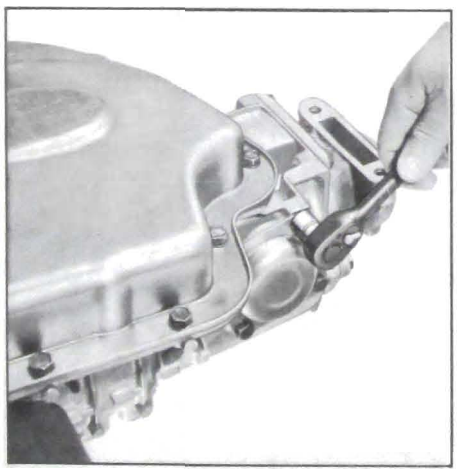

Figure 5-503

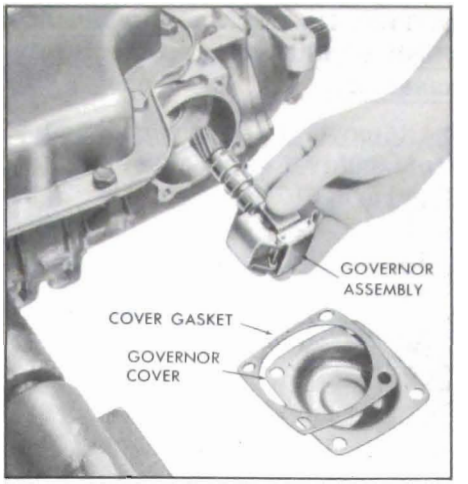

Figure 5-504

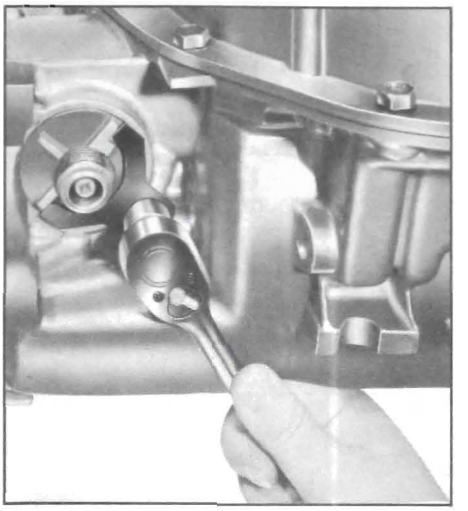

Figure 5-505

4. Withdraw speedometer driven gear assembly from case. See Figure 5-506.

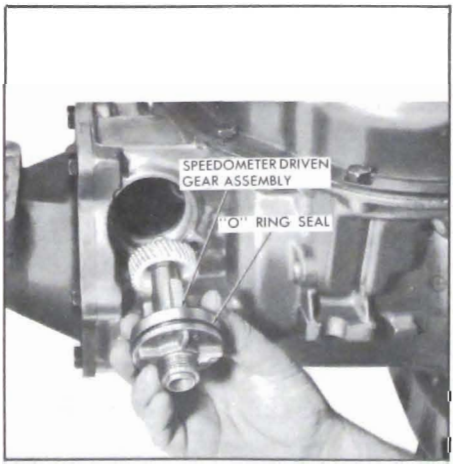

Figure 5-506

5. Remove bottom pan attaching screws. See Figure 5-507.

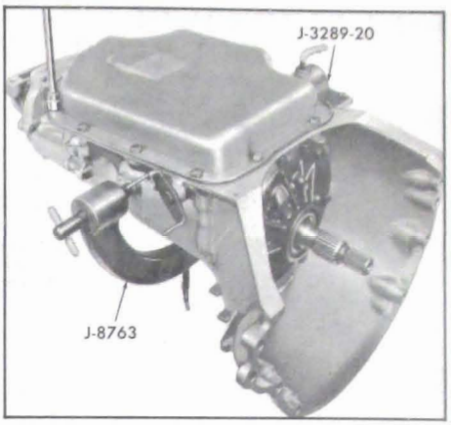

Figure 5-507

6. Remove bottom pan and gasket. See Figure 5-508.

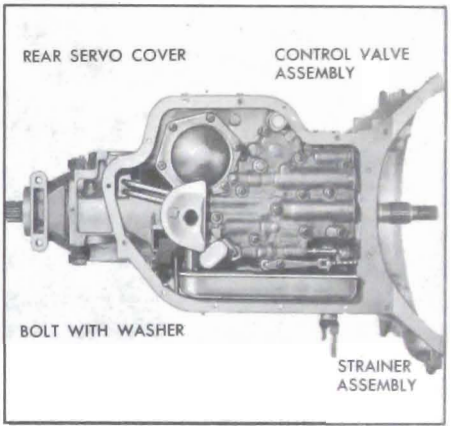

Figure 5-508

7. Remove the pump intake pipe and strainer assembly. See Figure 5-510.

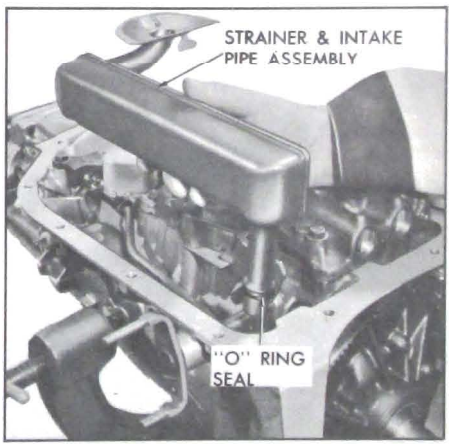

Figure 5-510

8. Remove the intake pipe to case "O" ring seal.

5-10 REMOVAL OF CONTROL VALVE ASSEMBLY, GOVERNOR PIPES AND DETENT SPRING ASSEMBLY

NOTE: The following operations can be performed with transmission in car.

1. Remove the control valve body attaching screws and detent roller and spring assembly. See Figure 5-511.

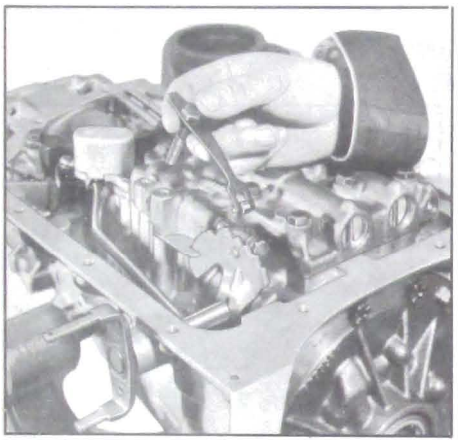

Figure 5-511

NOTE: Do not remove solenoid attaching screws.

2. Remove the control valve body assembly and governor pipes. See Figure 5-512.

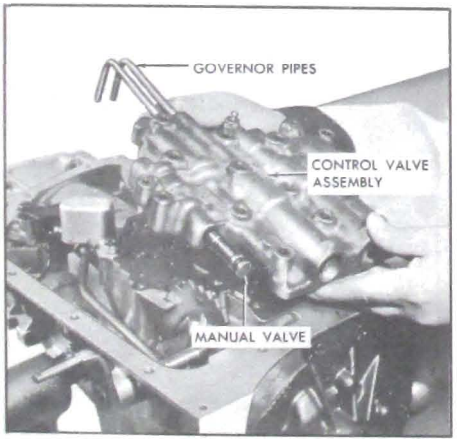

Figure 5-512

NOTE: Do not allow manual valve to fall out of control valve assembly.

3. Remove the governor pipes from control valve assembly. See Figure 5-513.

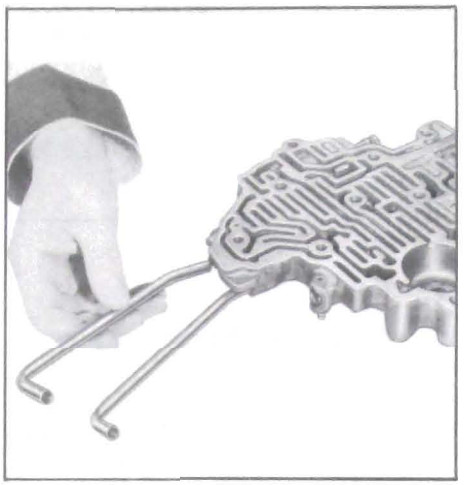

Figure 5-513

4. Remove the control valve assembly to spacer gasket. See Figure 5-514.

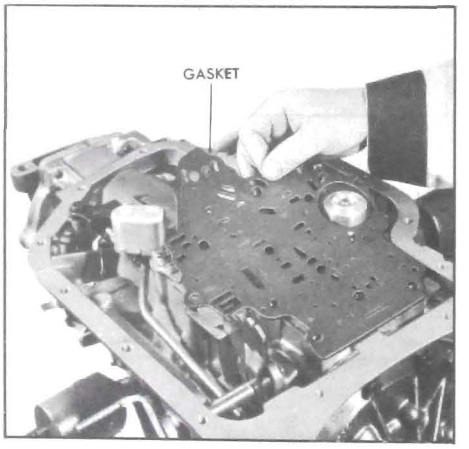

Figure 5-514

5-11 REMOVAL OF REAR SERVO, SOLENOID, CONNECTOR, VALVE BODY SPACER, GASKET, FRONT SERVO, MANUAL DETENT AND PARK LINKAGE

1. Remove the rear servo cover attaching screws, the servo cover and gasket. (Discard gasket). See Figure 5-515.

Figure 5-515

2. Remove the rear servo assembly from the case. See Figure 5-516.

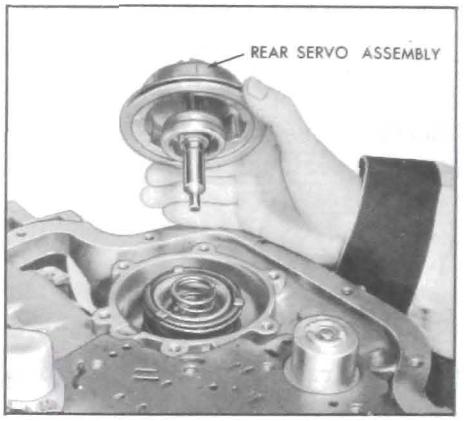

Figure 5-516

3. Remove the servo accumulator springs. See Figure 5-517.

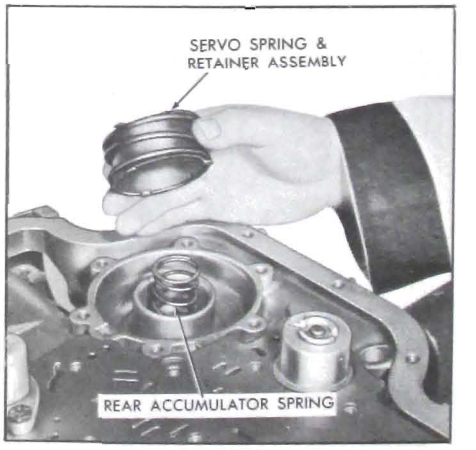

Figure 5-517

4. Disconnect solenoid lead from connector terminal. See Figure 5-518.

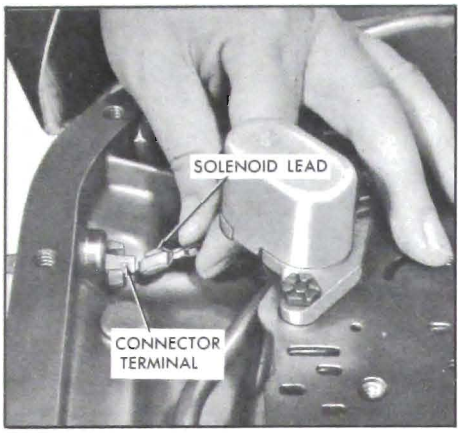

Figure 5-518

5. Compress fingers on connector and withdraw connector and "O" ring seal. See Figure 5-520.

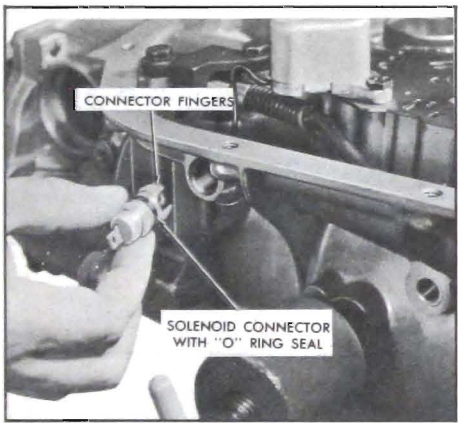

Figure 5-520

6. Remove the solenoid attaching screws, solenoid assembly and gasket. See Figure 5-521.

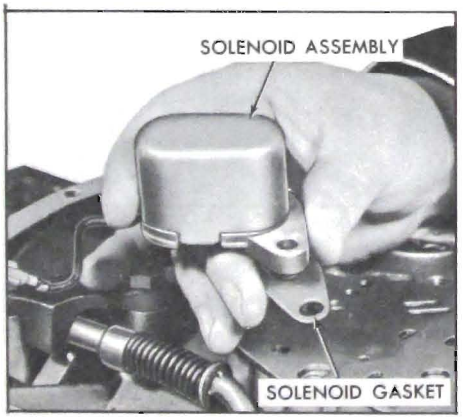

Figure 5-521

7. Remove the control valve assembly spacer plate and gasket. See Figure 5-522.

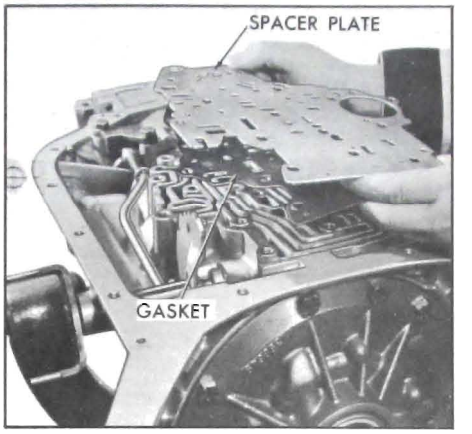

Figure 5-522

8. Remove four (4) check balls from cored passages in transmission case. See Figure 5-523.

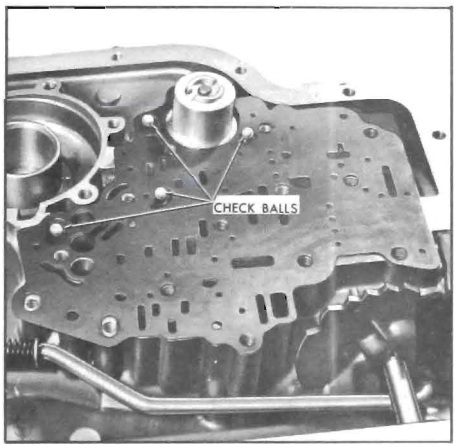

Figure 5-523

9. Remove the front servo assembly.

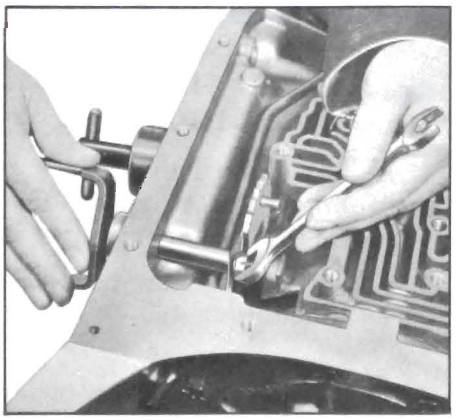

Figure 5-524

10. Unthread the jam nut holding detent lever to manual shaft. See Figure 5-524.

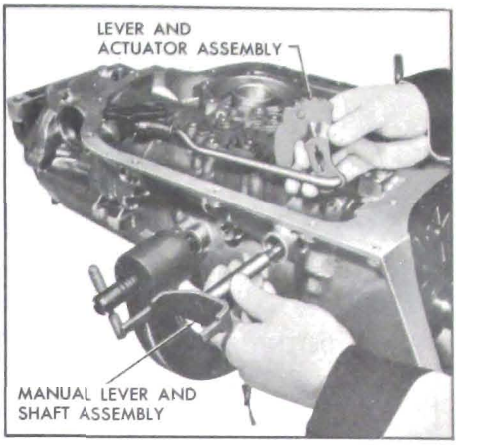

Figure 5-525

11. Remove the detent lever from the manual shaft. See Figure 5-525.

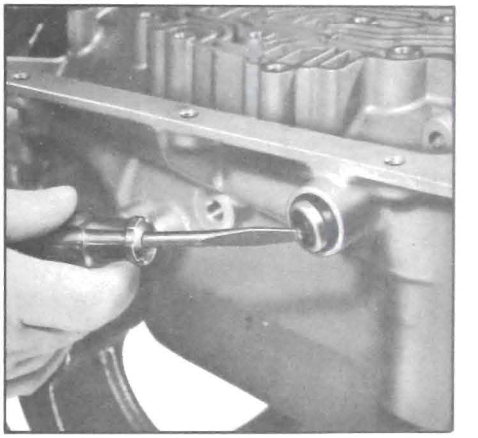

Figure 5-526

12. Remove the manual shaft from case.

NOTE: If necessary to replace, pry the manual shaft seal out of case. See Figure 5-526.

CAUTION: Do not lose the jam nut as it becomes free from the manual shaft.

13. Remove parking actuator rod and detent lever assembly.

14. If necessary, remove the detent lever retaining "E" ring and detent lever. See Figure 5-527.

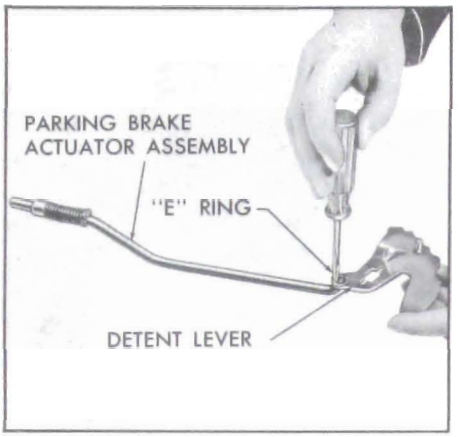

Figure 5-527

15. Remove attaching screws and parking bracket. See Figure 5-228.

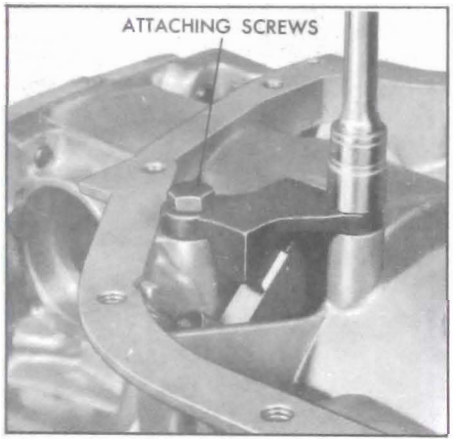

Figure 5-528

16. Remove parking pawl return spring. See Figure 5-529.

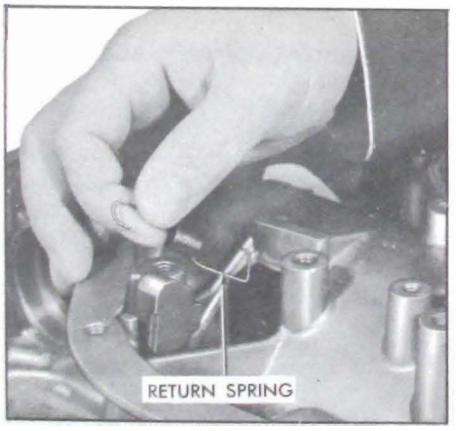

Figure 5-529

17. Remove parking pawl shaft retainer. See Figure 5-530.

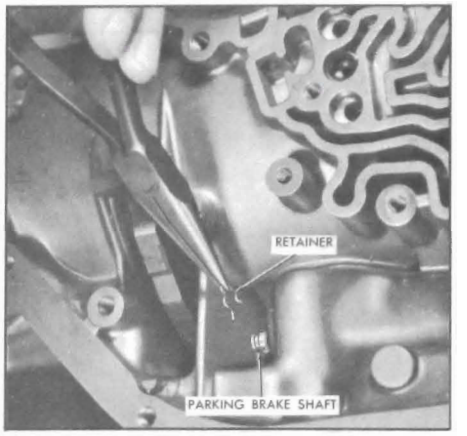

Figure 5-530

18. Remove parking pawl shaft, "O" ring seal and parking pawl. See Figure 5-531.

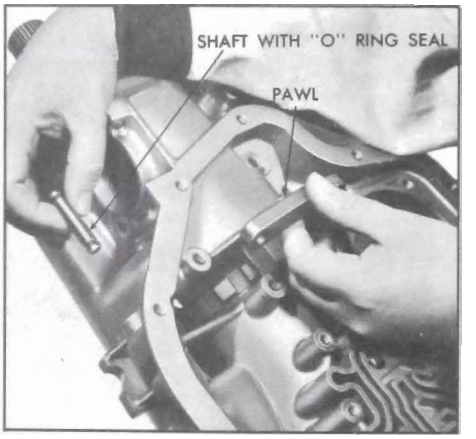

Figure 5-531

5-12 REMOVAL OF REAR OIL SEAL AND EXTENSION HOUSING

1. If necessary to replace, pry the rear oil seal from the extension housing. See Figure 5-532.

2. Remove extension housing to case attaching bolts. See Figure 5-533.

3. Remove the extension housing and extension housing to case seal. See Figure 5-534.

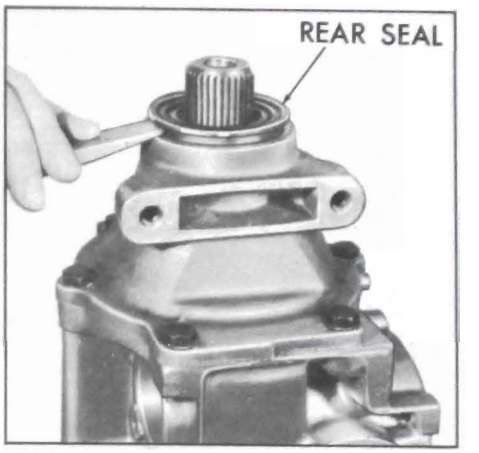

Figure 5-532

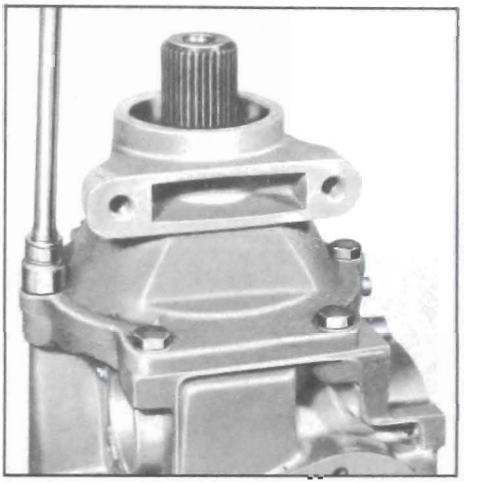

Figure 5-533

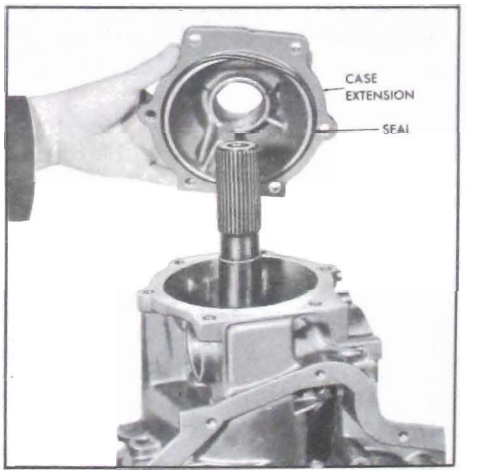

Figure 5-534

5-13 REMOVAL OF OIL PUMP

1. If necessary to replace, pry front seal from pump. See Figure 5-535.

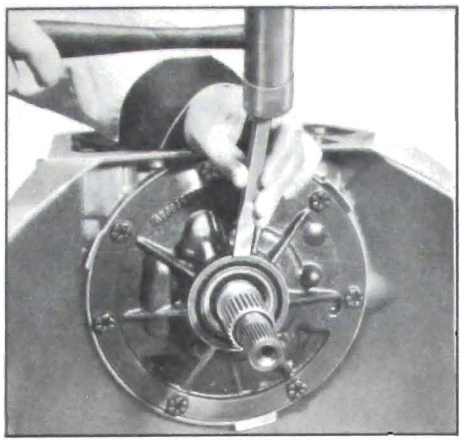

Figure 5-535

2. Remove the pump attaching bolts. See Figure 5-536

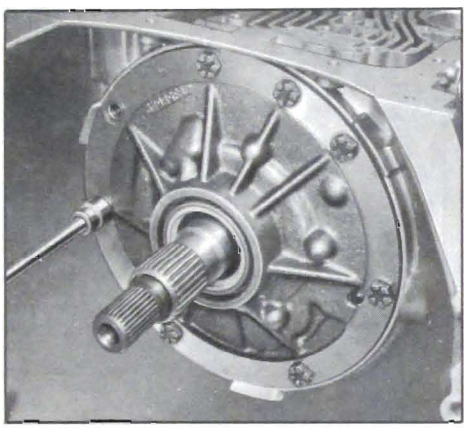

Figure 5-536

3. Install 5/16-18 threaded slide hammers, J-7004 or J-6125, into bolt holes in the pump body and remove. See Figure 5-537 pump assembly from case. (See illustration for location of threaded holes.)

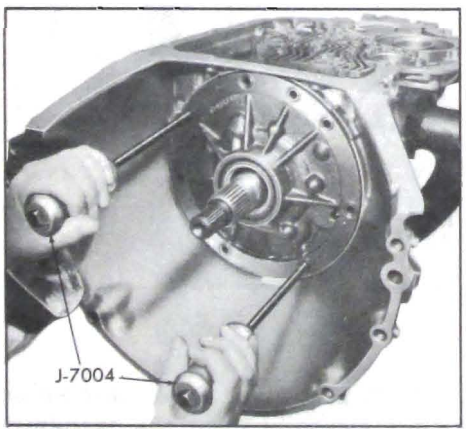

Figure 5-537

4. Remove and discard pump to case seal ring. See Figure 5-538.

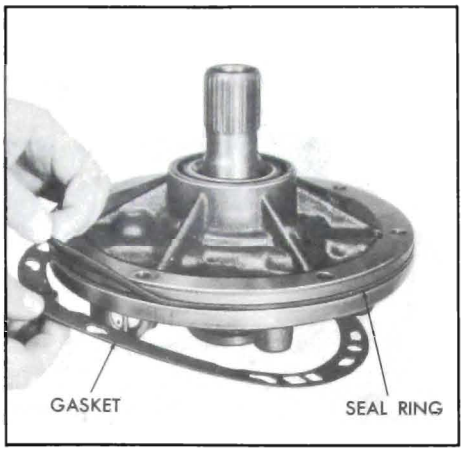

Figure 5-538

5. Remove the pump to case gasket.

6. Remove turbine shaft from transmission. See Figure 5-540.

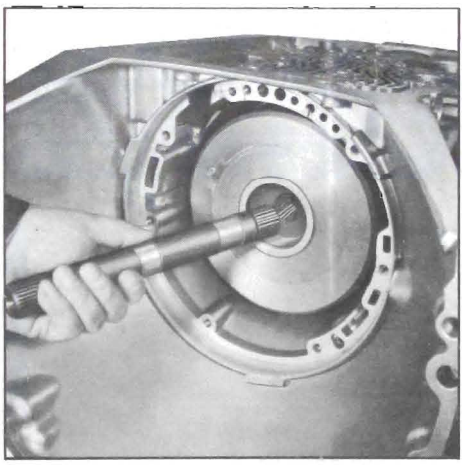

Figure 5-540

7. Remove forward clutch assembly. See Figure 5-541.

8. Remove forward clutch hub to direct clutch housing bronze thrust washer, if it did not come out with forward clutch housing assembly.

9. Remove the direct clutch assembly. See Figure 5-542.

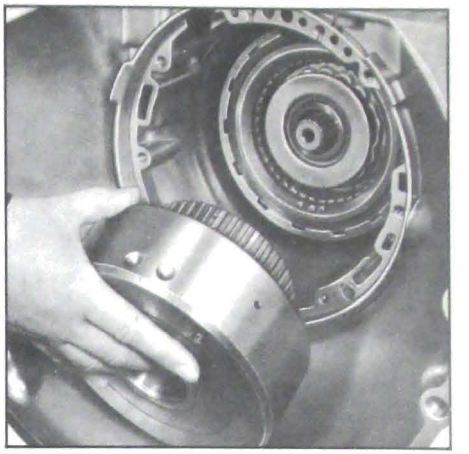

Figure 5-541

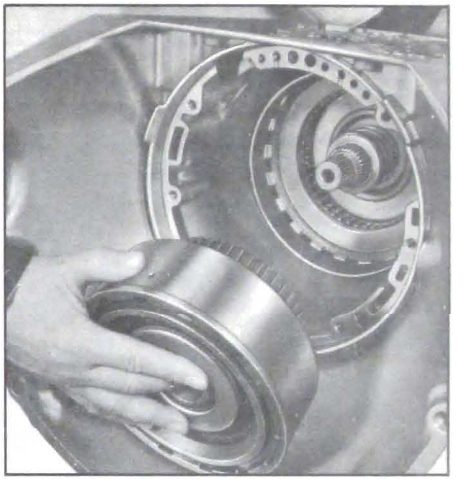

Figure 5-542

10. Remove the front band assembly. See Figure 5-543.

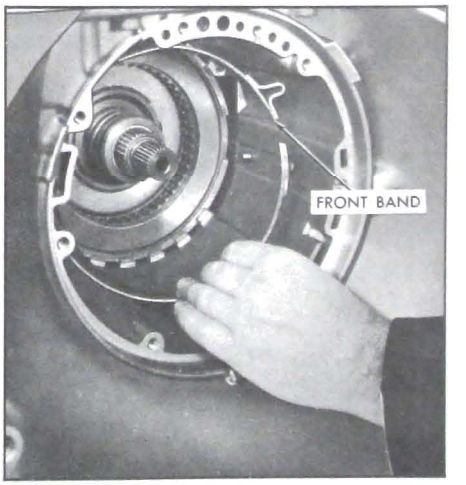

Figure 5-543

11. Remove the sun gear shaft, See Figure 5-544.

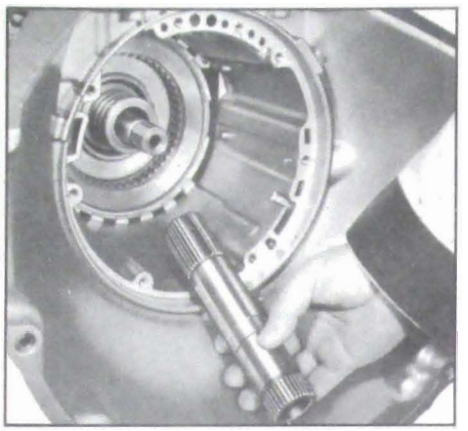

Figure 5-544

12. Remove the case center support to case bolt and center support locating screw. See Figure 5-544A.

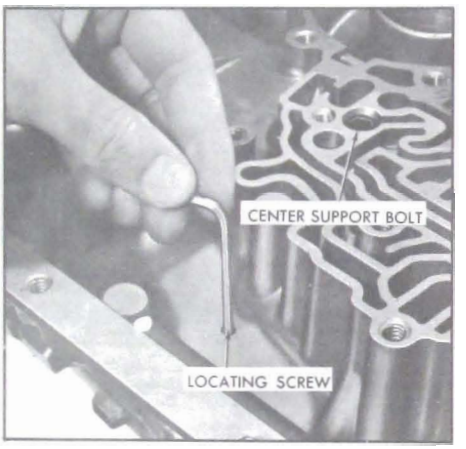

Figure 5-544A

13. Remove the intermediate clutch backing plate to case snap ring. See Figure 5-545.

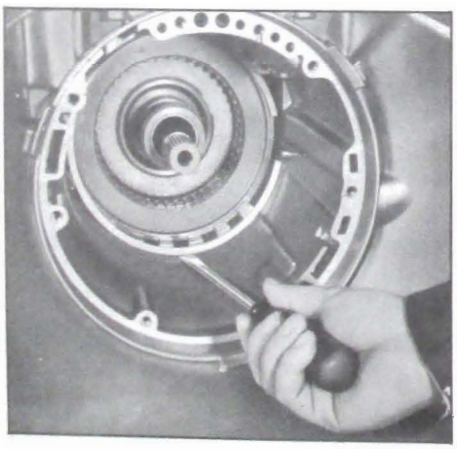

Figure 5-545

14. Remove the intermediate clutch backing plate, 3 composition, and 3 steel clutch plates. See Figure 5-546.

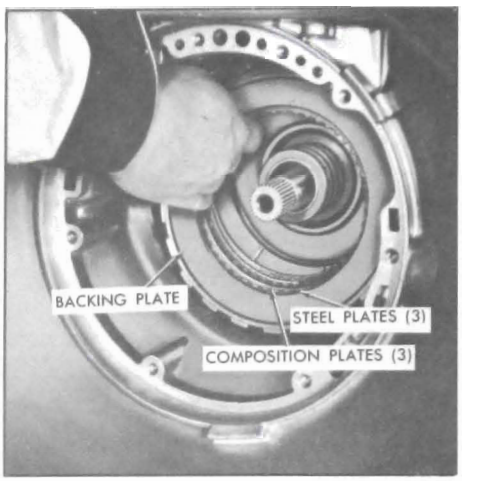

Figure 5-546

15. Remove the center support to case retaining snap ring. See Figure 5-547.

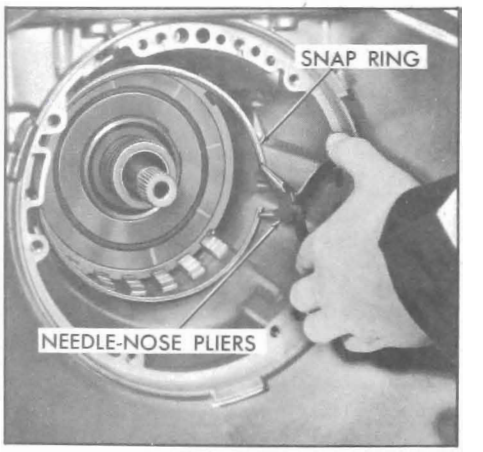

Figure 5-547

16. Remove the entire gear unit assembly by lifting with Gear Assembly Installing and Removing Tool J-21365 with J-7004 slide hammer. See Figure 5-548.

17. Remove the output shaft to case thrust washer from the rear of the output shaft or inside the case. See Figure 5-550.

Figure 5-548

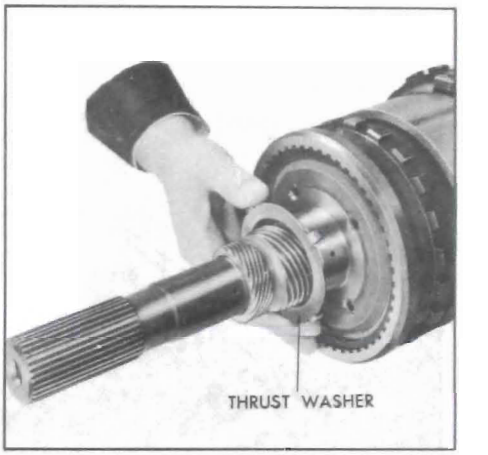

Figure 5-550

18. Place the gear unit assembly with output shaft facing down in hole in work bench. See Figure 5-551.

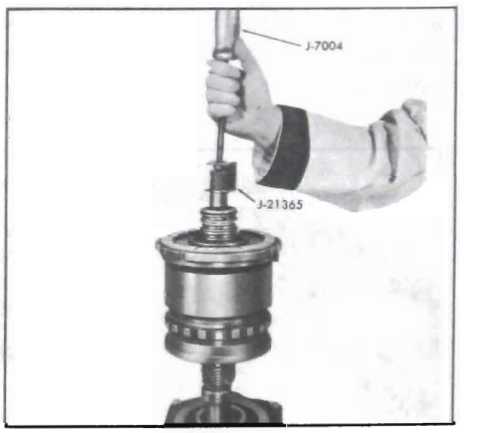

Figure 5-551

19. Remove the rear unit selective washer from the transmission case. See Figure 5-552.

Figure 5-552

20. Remove the rear band assembly. See Figure 5-553.

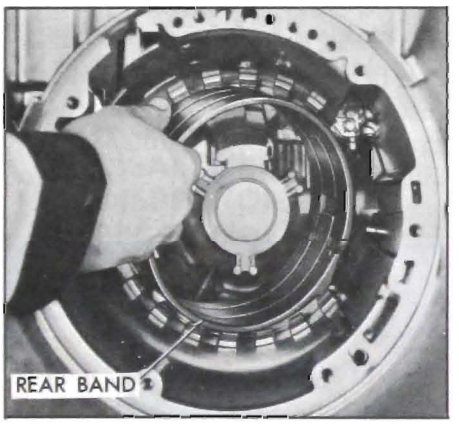

Figure 5-553

5-14 DISASSEMBLY OF GEAR UNIT ASSEMBLY

1. Remove the case center support assembly. See Figure 5-554.

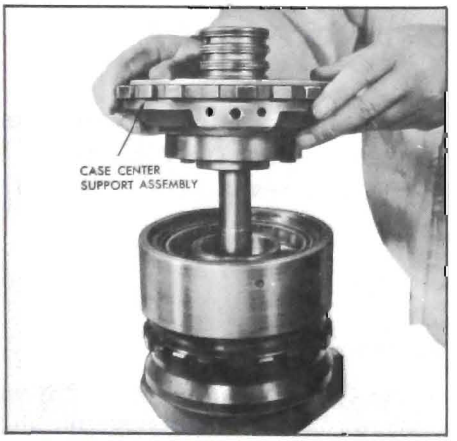

Figure 5-554

2. Remove the center support to reaction carrier bronze thrust washer. See Figure 5-555.

Figure 5-555

3. Remove the center support to sun gear races and thrust bearing. See Figure 5-556.

NOTE: One of the races may have been removed with the center support.

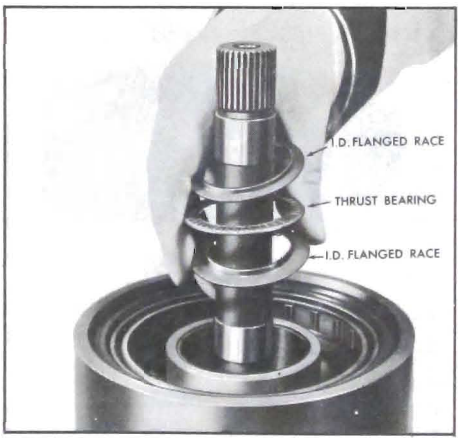

Figure 5-556

4. Remove the reaction carrier and sprag assembly. See Figure 5-557.

5. Remove sun gear. See Figure 5-558.

6. Remove reaction carrier to output carrier thrust washer. See Figure 5-560.

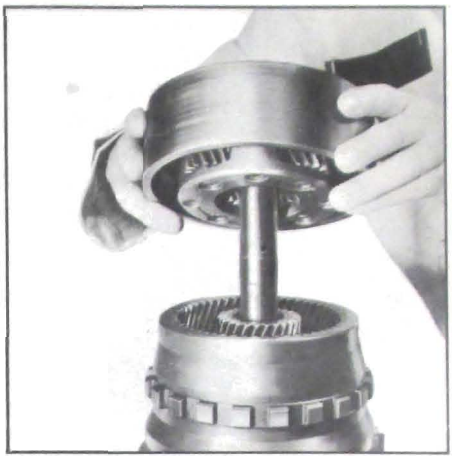

Figure 5-557

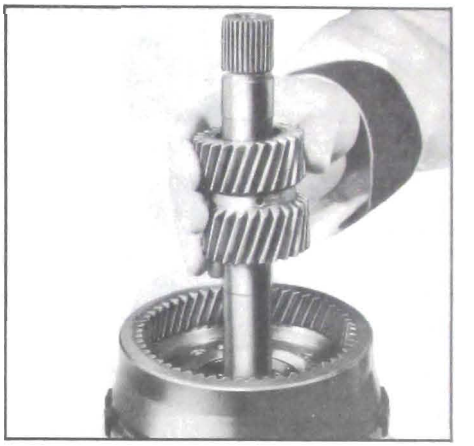

Figure 5-558

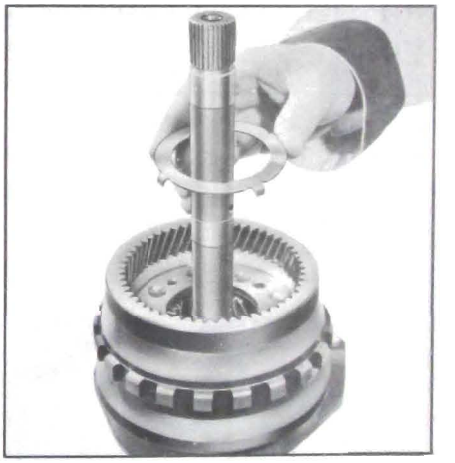

Figure 5-560

7. Turn assembly over and place mainshaft in hole in work bench. See Figure 5-561.

8. Remove output shaft to rear carrier snap ring. See Figure 5-562.

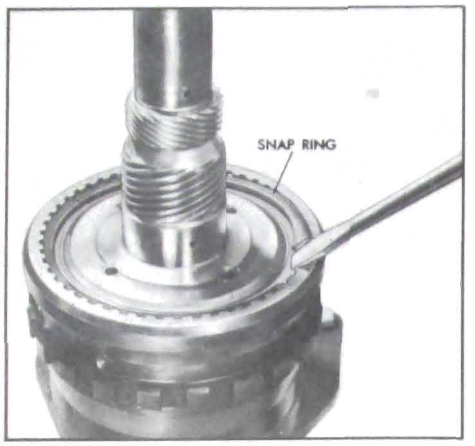

Figure 5-561

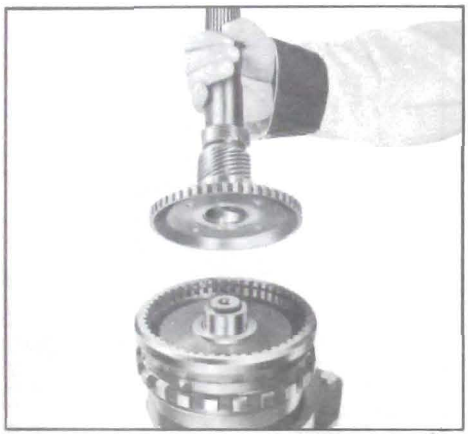

Figure 5-562

9. Remove output shaft.

NOTE: If replacement of the drive speedo gear is necessary remove in the following manner.

a. Install Speedo Gear Removing Tool, J-21427 and J-9578, on output shaft and remove drive speedo gear. See Figure 5-563.

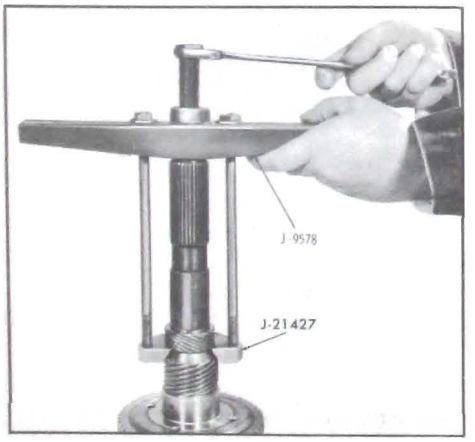

Figure 5-563

b. Install new speedo drive and drive to approximately 5.6" using tool, J-5154. See Figure 5-564.

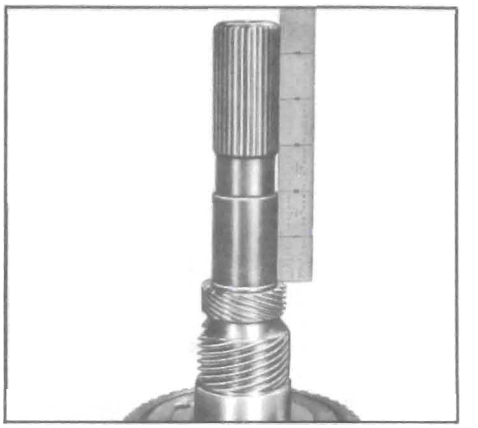

Figure 5-564

10. Remove output shaft to rear internal gear thrust bearing and two (2) races. See Figure 5-565.

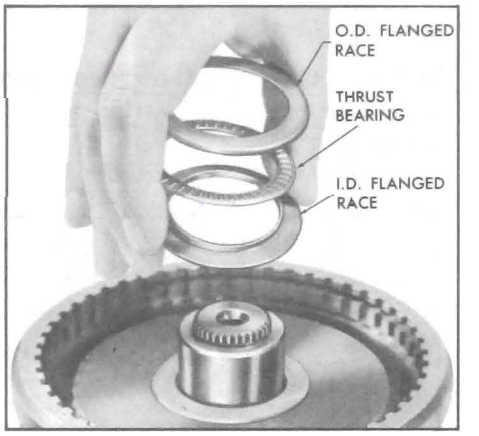

Figure 5-565

11. Remove rear internal gear and mainshaft. See Figure 5-566.

Figure 5-566

12. Remove the rear internal gear to sun gear thrust bearing and two (2) races. See Figure 5-567.

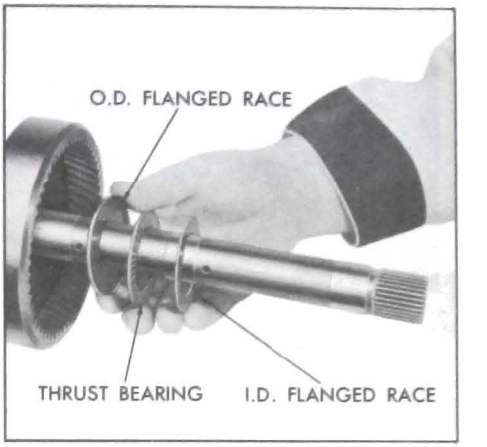

Figure 5-567

13. If necessary, remove the rear internal gear to mainshaft snap ring to remove mainshaft. See Figure 5-568.

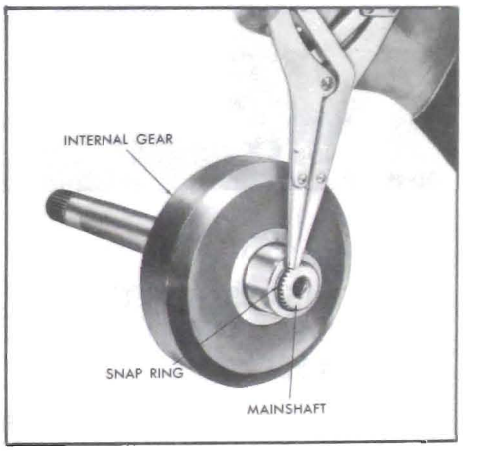

Figure 5-568

5-15 GOVERNOR ASSEMBLY

All components of the governor assembly, with the exception of the driven gear, are of a select fit and each assembly is calibrated. Therefore, the governor will be serviced as an assembly.

a. Inspection

1. Wash governor assembly in cleaning solvent, air dry and blow out all passages.

2. Inspect governor sleeve for nicks, burrs, scoring or galling.

3. Check governor sleeve for free operation in bore of transmission case.

4. Inspect governor valve for nicks, burrs, scoring or galling.

5. Check governor valve for free operation in bore of governor sleeve.

6. Inspect governor driven gear for nicks, burrs or damage.

7. Check governor driven gear for looseness in governor sleeve.

8. Inspect the governor weight springs for distortion or damage.

9. Check the governor weights for free operation in their retainers.

5-16 FRONT SERVO DISASSEMBLY, INSPECTION AND REASSEMBLY

a. Disassembly

1. Place servo assembly in vise so that piston and pin tend to compress spring. See Figure 5-570.

2. Remove piston retaining snap ring using J-4880 pliers.

3. Remove assembly from vise.

4. Remove front servo piston, spring and washer.

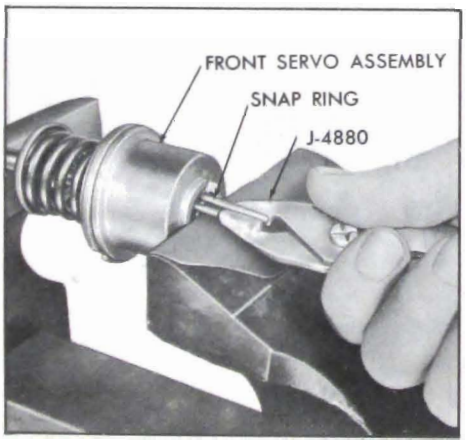

Figure 5-570

5. Remove snap ring and spring retainer from servo pin.

6. Remove oil ring from servo piston.

b. Inspection

1. Inspect servo pin for damaged snap ring groove. See Figure 5-571.

2. Inspect piston for damaged oil ring groove, check freedom of ring in groove.

3. Inspect piston for cracks or porosity.

4. Check fit of servo pin in piston.

c. Reassembly

1. Place small end of spring retainer over tapered end of piston pin.

2. Install retaining snap ring next to spring retainer.

3. Install oil ring on servo piston.

4. Install washer on piston pin end opposite spring retainer.

5. Install spring against spring retainer.

6. Install piston, large end over spring.

7. Place assembly in vise, compress piston pin against piston and install snap ring.

5-17 REAR SERVO DISASSEMBLY, INSPECTION AND REASSEMBLY

a. Disassembly

1. Remove snap ring retaining servo piston to band apply pin. See Figure 5-572.

2. Remove servo piston and washer from band apply pin. See Figure 5-573.

3. Remove second washer from band apply pin.

4. Remove accumulator piston from band apply pin.

5. Remove thrust washer from band apply pin.

6. Remove oil seal from servo piston.

7. Remove oil ring from accumulator piston.

b. Inspection

1. Inspect freedom of accumulator ring in piston.

2. Inspect fit of band apply pin in each piston.

3. Inspect band apply pin for scores, cracks, and opening of drilled passages.

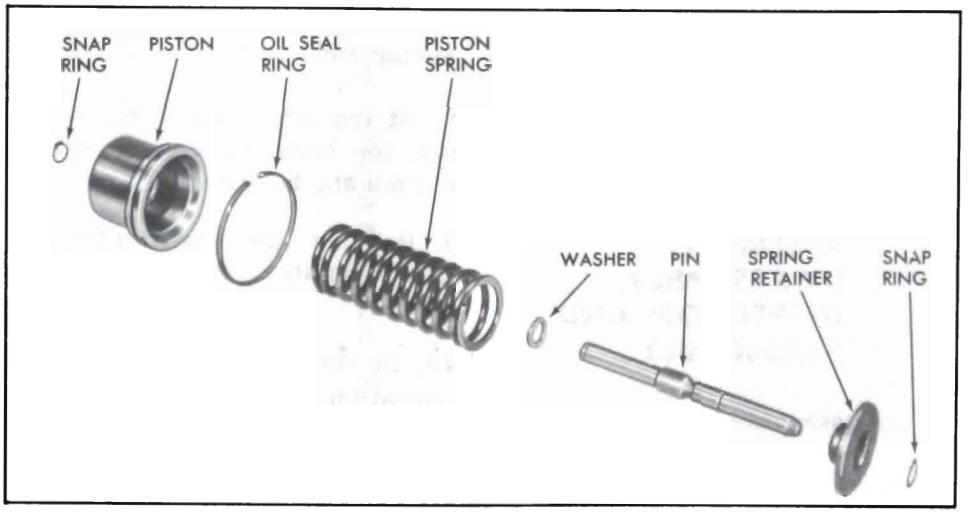

Figure 5-571

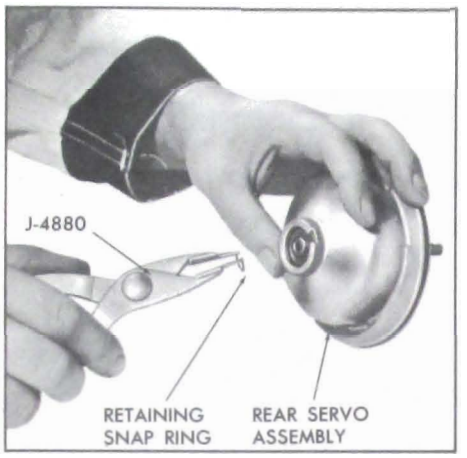

Figure 5-572

4. Inspect accumulator piston for open bleed passage.

5. Inspect band apply pin for proper identification as determined by pin selection check.

c. Reassembly

1. Install ring on accumulator piston.

2. Install seal on servo piston.

3. Install washer with large I.D. over piston pin.

4. Install accumulator piston, cupped end first, over band apply pin.

5. Install flat washer over band apply pin.

6. Install servo piston, large end first, over band apply pin.

7. Install third washer and snap ring.

5-18 CONTROL VALVE ASSEMBLY, DISASSEMBLY, INSPECTION AND REASSEMBLY

a. Disassembly

1. Position control valve assembly with cored face up and servo pocket nearest operator.

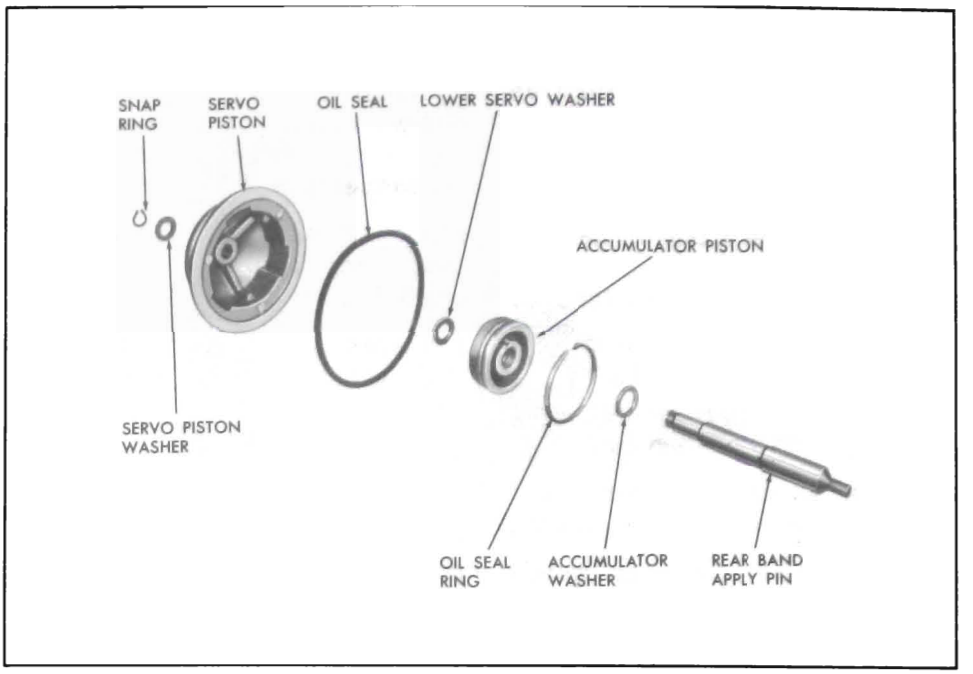

Figure 5-573

2. Remove manual valve from upper bore.

3. On the right side, next bore, remove the retaining pin, 1-2 bushing, 1-2 modulator valve and 1-2 spring.

4. Remove the 1-2 shift valve.

5. From the next bore remove the retaining pin and 2-3 bushing, 2-3 modulator valve and 2-3 spring.

6. Remove the 2-3 shift valve.

7. From the next bore remove the retaining pin, bore plug, 3-2 spring and valve.

8. At the other end of the assembly, top bore, remove the retaining pin and bore plug.

9. Remove the detent valve, detent regulator valve, spring and spacer.

10. In the next bore, check the operation of the 1-2 accumulator valve by moving the valve against the spring.

NOTE: The 1-2 accumulator valve is factory adjusted.

11. If removal is necessary, back out adjusting screw EXACTLY FOUR TURNS. Remove bore plug, spring and 1-2 accumulator valve. See Figure 5-575.

b. Inspection

1. Inspect all valves for scoring, cracks and free movement in their respective bores.

2. Inspect the bushing for cracks, scratches or distortion.

3. Inspect the body for cracks, or scored bores.

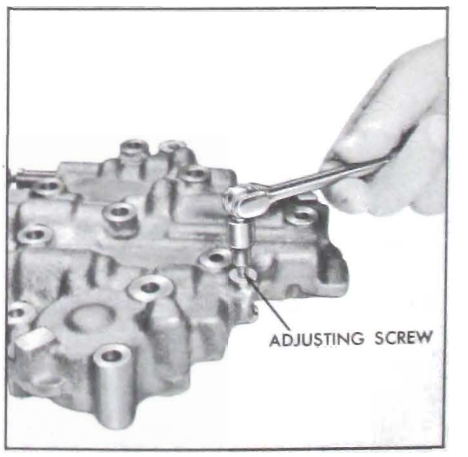

Figure 5-575

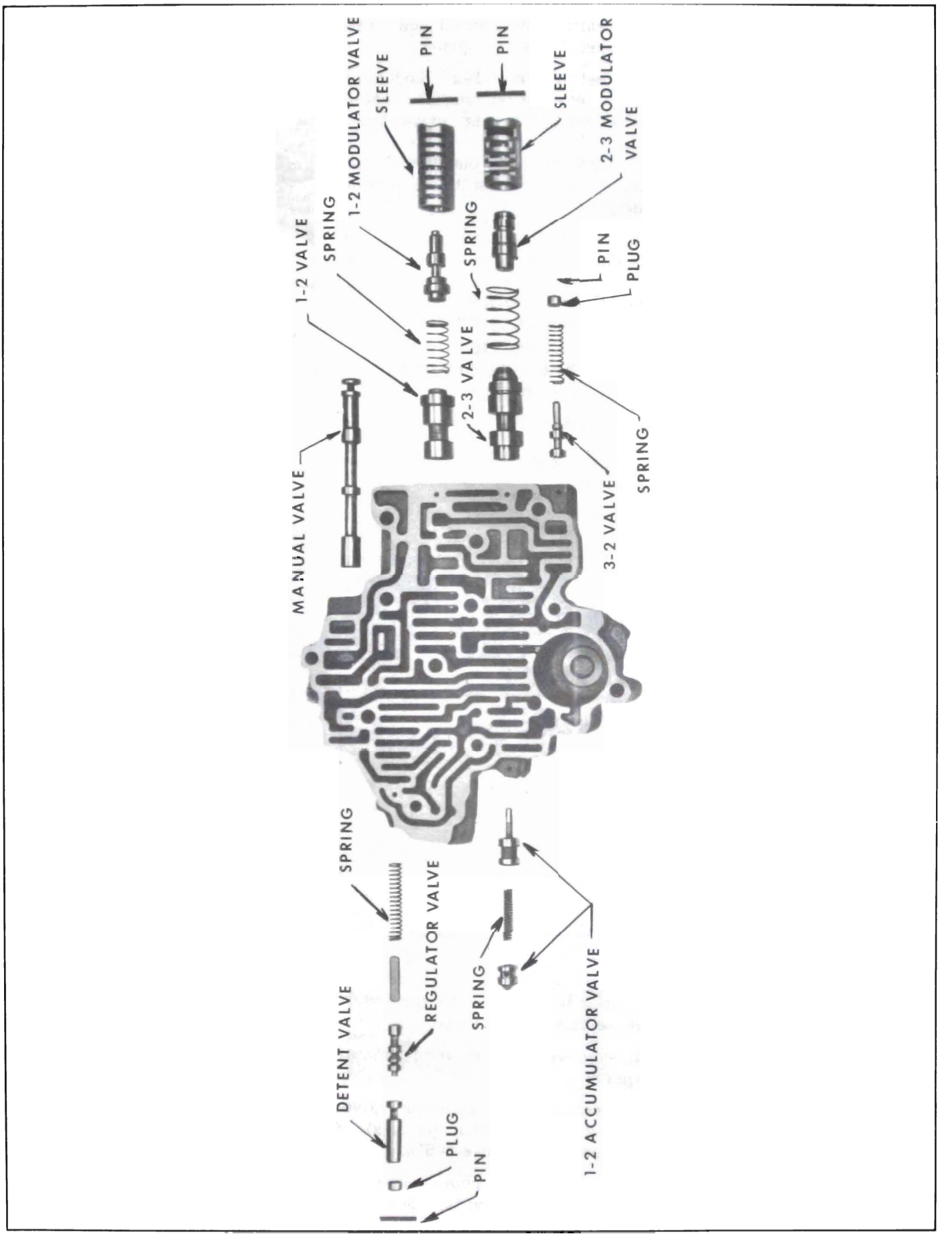
MANUAL VALVE
1-2 VALVE
SPRING
1-2 MODULATOR VALVE
SLEEVE
PIN
PIN
SLEEVE
2-3 MODULATOR VALVE
SPRING
2-3 VALVE
PIN
PLUG
SPRING
3-2 VALVE
SPRING
REGULATOR VALVE
DETENT VALVE
SPRING
PLUG
PIN
1-2 ACCUMULATOR VALVE

Figure 5-574

4. Check all springs for distortion or collapsed coils.

c. Reassembly

1. If the 1-2 accumulator valve was removed, install in lower left bore, small end first.

2. Install 1-2 accumulator spring.

3. Install bore plug over spring, compress bore plug, and tighten adjusting screw EXACTLY FOUR TURNS. See Figure 5-576.

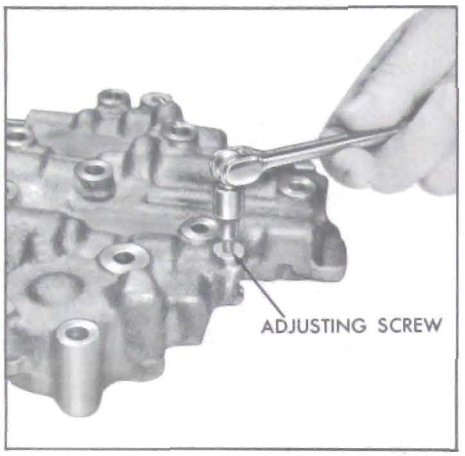

Figure 5-576

4. In the next bore up, install the detent spring and spacer.

5. Install the detent regulator valve as shown in Figure 5-574.

6. Install the detent valve, small land first.

7. Install the bore plug (hole out) and retaining pin.

8. In the lower right hand bore, install the 3-2 valve, stem out.

9. Install the 3-2 spring, bore plug (hole out) and retaining pin.

10. In the next bore up, install the 2-3 shift valve, and spring, straight land first.

11. Install the 2-3 modulator valve into the bushing and install both parts into the valve bore.

12. Compress the bushing against the spring and install the retaining pin.

13. In the next bore, install the 1-2 shift valve, small end first, and install the 1-2 spring.

14. Install the 1-2 modulator valve into the bushing and install both parts into the valve bore.

15. Compress the bushing against the spring and install the retaining pin.

16. Install the manual valve with detent pin groove to the right.

5-19 OIL PUMP DISASSEMBLY, INSPECTION AND REASSEMBLY OF OIL PUMP

a. Disassembly

1. Place pump assembly in hole in bench.

2. Compress the regulator boost valve bushing against the pressure regulator spring and remove the snap ring, using J-5403 pliers. See Figure 5-577.

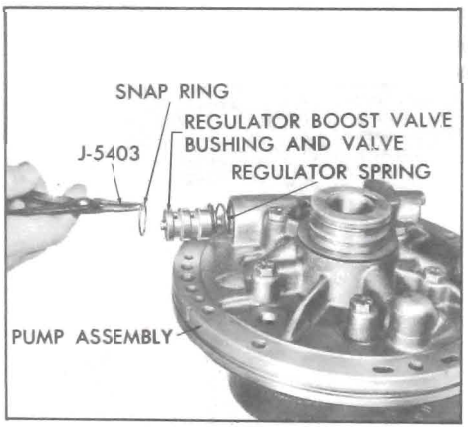

Figure 5-577

3. Remove the regulator boost valve bushing and valve.

4. Remove the pressure regulator spring.

5. Remove the regulator valve, spring retainer and spacer(s), if present. See Figure 5-578.

6. Remove the pump cover to body attaching bolts. See Figure 5-580.

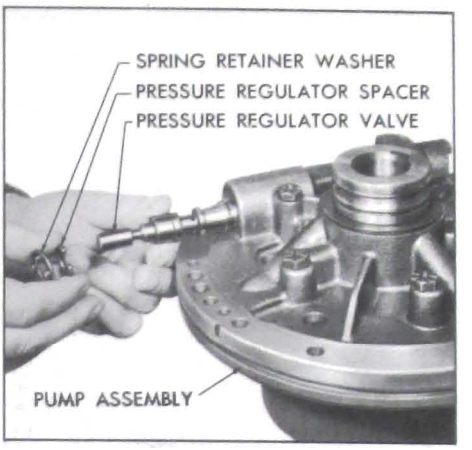

Figure 5-578

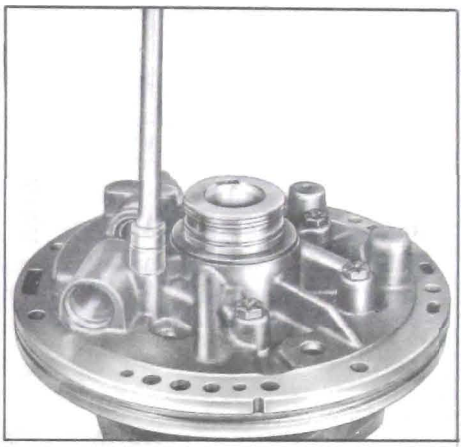

Figure 5-580

7. Remove pump cover from body. See Figure 5-581.

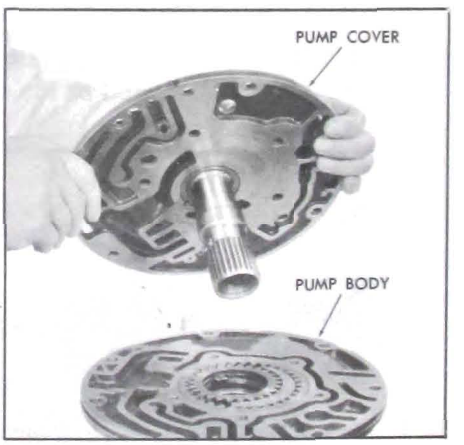

Figure 5-581

8. Remove the retaining pin and bore plug from the pressure regulator bore. See Figure 5-582.

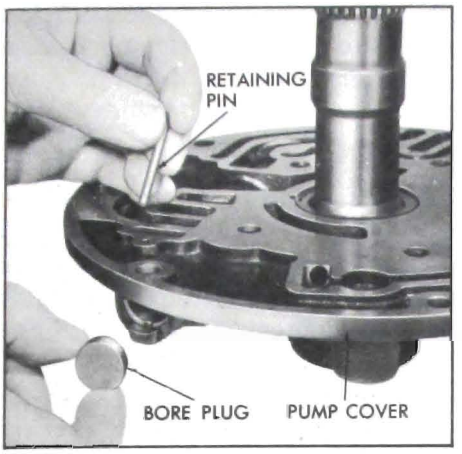

Figure 5-582

9. Remove the hook type oil rings from the pump cover. See Figure 5-583.

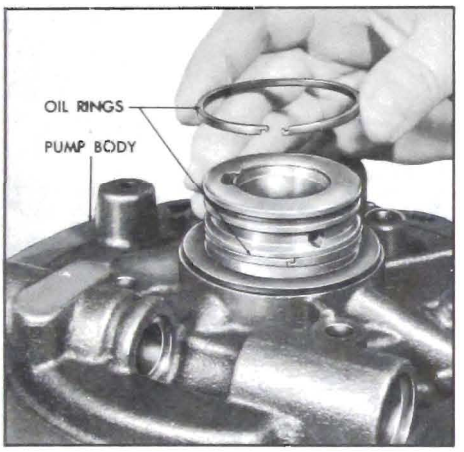

Figure 5-583

10. Remove the pump to forward clutch housing selective washer (fiber).

NOTE: Do not remove the cooler by-pass seats, unless replacement of the seats, valves or springs is necessary.

11. If necessary, remove the by-pass valve seats using tool J-21361, attached to a slide hammer, J-6125, or J-7004. See Figure 5-584.

12. Remove the by-pass valves and springs.

13. With pencil lead mark drive and driven gears for reassembly and remove drive. See Figure 5-585.

Figure 5-584

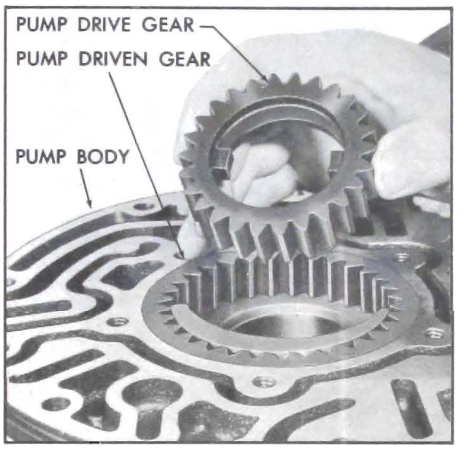

Figure 5-585

14. Remove driven gear from pump body. See Figure 5-585A.

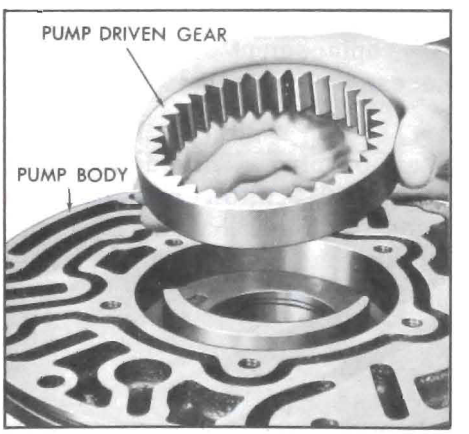

Figure 5-585A

b. Inspection of Pump Body and Pump Cover

1. Inspect the gear pocket and crescent for scoring, galling or other damage. See Figure 5-586.

Figure 5-586

2. Place pump gears in pump and check the following clearances while holding each gear towards the crescent.

a. Driven gear O.D. to body clearance. Clearance should be .0045"-.0011". See Figure 5-587.

Figure 5-587

b. Driven gear I.D. to crescent clearance. Clearance should be 000-.0052. See Figure 5-588.

c. Drive gear to crescent .004-.019. See Figure 5-590.

d. Pump body face to gear face clearance. Clearance should be .0008"-.0015". See Figure 5-591.

3. Check face of pump body for scores or nicks.

4. Check oil passages.

Figure 5-588

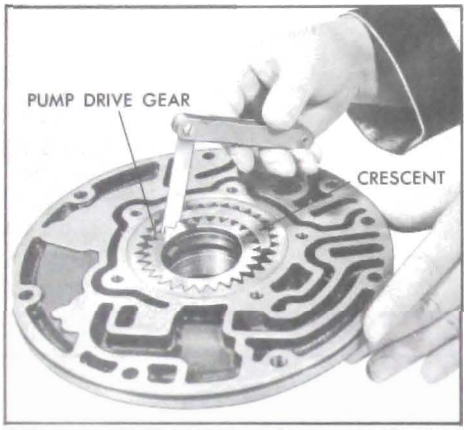

Figure 5-590

Figure 5-591

5. Check for damaged cover bolt attaching threads.

6. Check for overall flatness of pump body face.

7. Check bushing for scores or nicks.

8. Inspect the pump attaching bolt seals for damage, replace if necessary.

9. Inspect pump cover face for over all flatness. See Figure 5-592.

10. Check for scores or chips in pressure regulator bore.

11. Check that all passages are open and not interconnected.

Figure 5-592

12. Check for scoring or damage at pump gear face.

13. Inspect stator shaft for damaged splines, or scored bushings. If replacement of bushing is necessary proceed as follows:

a. Thread J-8647-1 into stator shaft bushing. Thread slide hammer J-2619 into remover. Clamp slide hammer handle into vise. Grasp stator shaft and remove.

b. Using Installer J-21465-3 install bushing.

14. Inspect oil ring grooves for damage or wear.

15. Inspect cooler by-pass valves for free operation and sealing qualities.

16. Inspect selective washer thrust face for wear or damage.

17. Inspect pressure regulator and boost valve for free operation.

c. Reassembly

1. Install the drive and driven pump gears into the pump body with alignment marks up. See Figures 5-593 and 5-593A.

NOTE: The drive gear with drive tangs up.

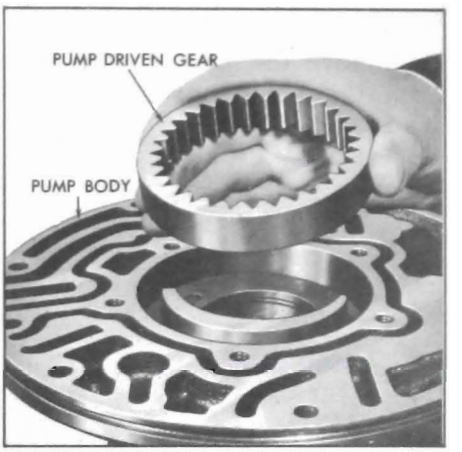

Figure 5-593

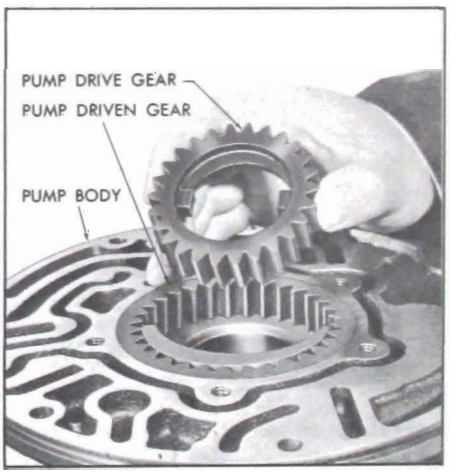

Figure 5-593A

2. Install the pressure regulator spring spacer(s) if required, retainer and spring into the pressure regulator bore.

3. Install the pressure regulator valve from opposite end of bore, stem end first.

4. Install the boost valve into the bushing, stem end out, and install both parts into the pump cover by compressing the bushing against the spring.

5. Install the retaining snap ring.

6. Install the pressure regulator valve bore plug and retaining pin into opposite end of bore. See Figure 5-594.

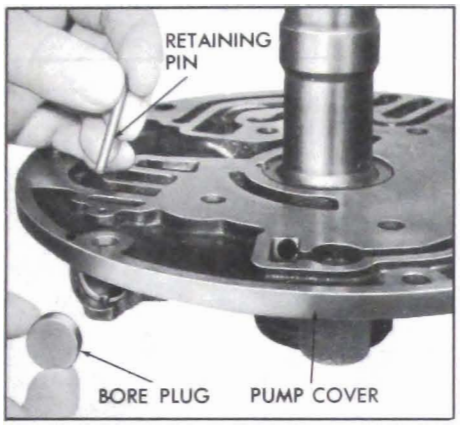

Figure 5-594

7. Install the previously selected front unit selective thrust washer (fiber) over the pump cover delivery sleeve. See Figure 5-595.

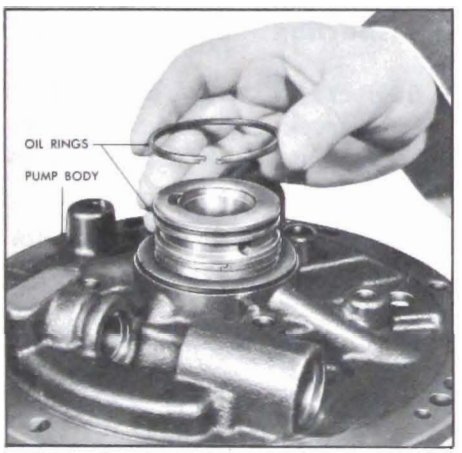

Figure 5-595

8. Install two (2) hook type oil seal rings.

9. If removed, install by-pass valve spring (large end first) valve and seat, using J-21360, drive the seat to the stop. See Figure 5-596.

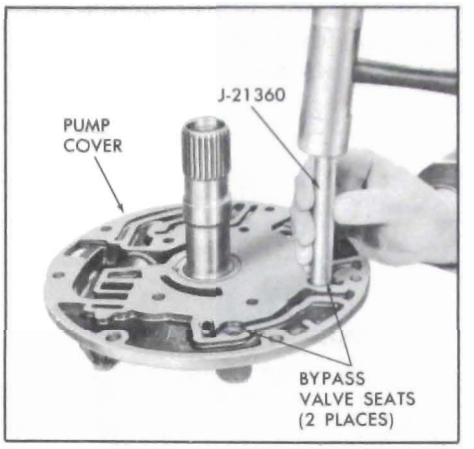

Figure 5-596

10. Assemble pump cover to pump body with attaching bolts. See Figure 5-597.

NOTE: Leave the bolts one turn loose at this time.

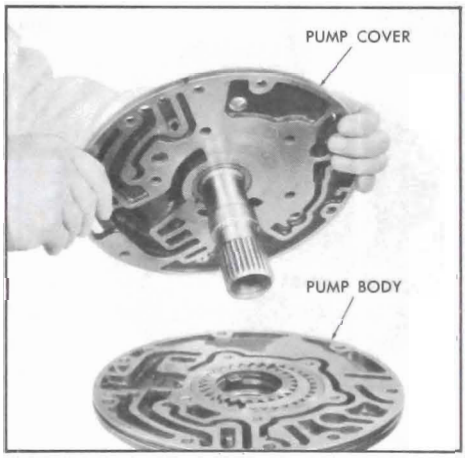

Figure 5-597

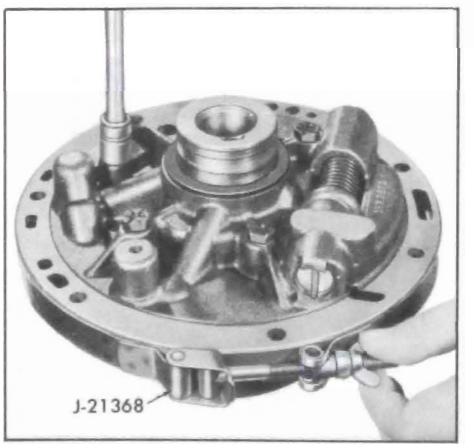

Figure 5-598

11. Place pump aligning strap, J-21368, over pump body and cover, and tighten tool. See Figure 5-598.

12. Tighten pump cover bolts.

13. Install the pump to case "O" ring seal.

5-20 FORWARD CLUTCH DISASSEMBLY, INSPECTION, AND REASSEMBLY

a. Disassembly

1. Remove the forward clutch housing to direct clutch hub snap ring. See Figure 5-600.

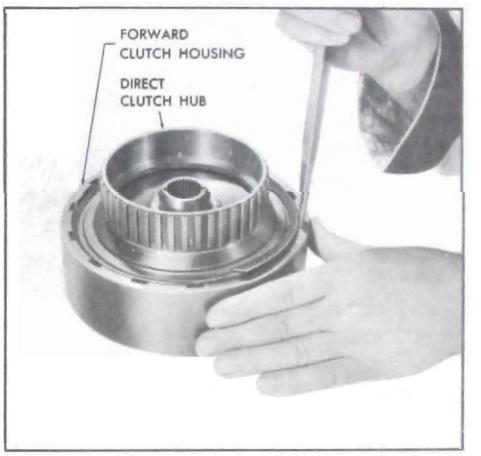

Figure 5-600

2. Remove the direct clutch hub. See Figure 5-601.

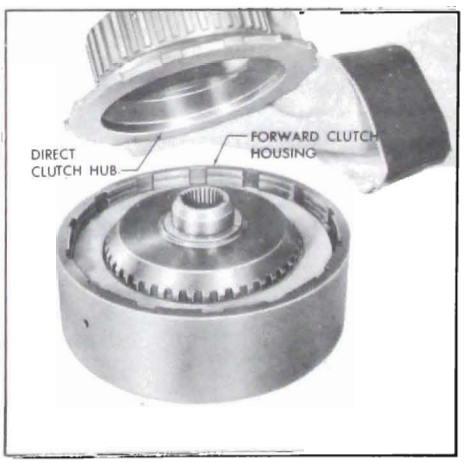

Figure 5-601

3. Remove the forward clutch hub and thrust washers. See Figure 5-602.

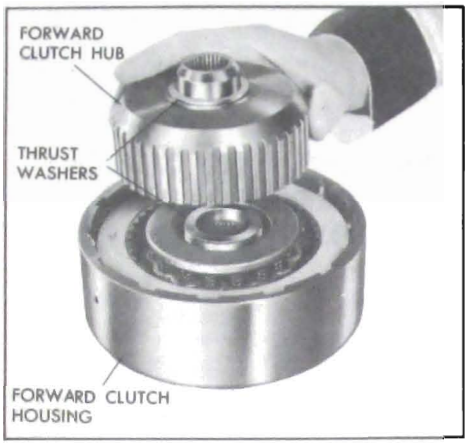

Figure 5-602

4. Remove five (5) composition and five (5) steel clutch plates. See Figure 5-603.

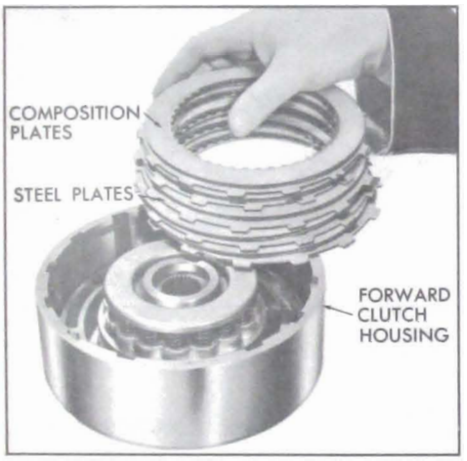

Figure 5-603

5. Using J-2590 clutch spring compressor, compress the spring retainer and remove the snap ring. See Figure 5-604.

6. Remove the tools, snap ring, spring retainer and sixteen clutch release springs. See Figure 5-605.

7. Remove the clutch piston. See Figure 5-606.

8. Remove the inner and outer clutch piston seals. See Figure 5-607.

9. Remove the center piston seal from the forward clutch housing. See Figure 5-608.

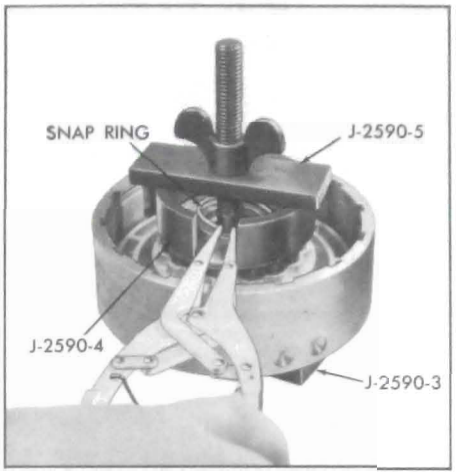

Figure 5-604

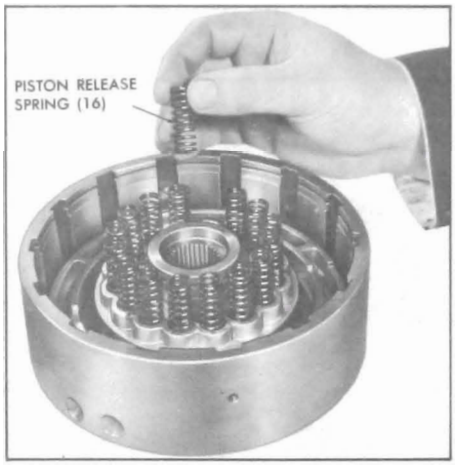

Figure 5-605

Figure 5-606

Figure 5-607

Figure 5-608

b. Inspection

1. Inspect the drive and driven clutch plates for signs of burning, scoring, or wear. See Figure 5-611.

2. Inspect sixteen springs for collapsed coils or signs of distortion.

3. Inspect the clutch hubs for worn splines, proper lubrication holes, thrust faces.

4. Inspect the piston for cracks.

5. Inspect the clutch housing for wear, scoring, open oil passages and free operation of the ball check.

c. Reassembly

1. Place new inner, and outer oil seals on clutch piston, lips

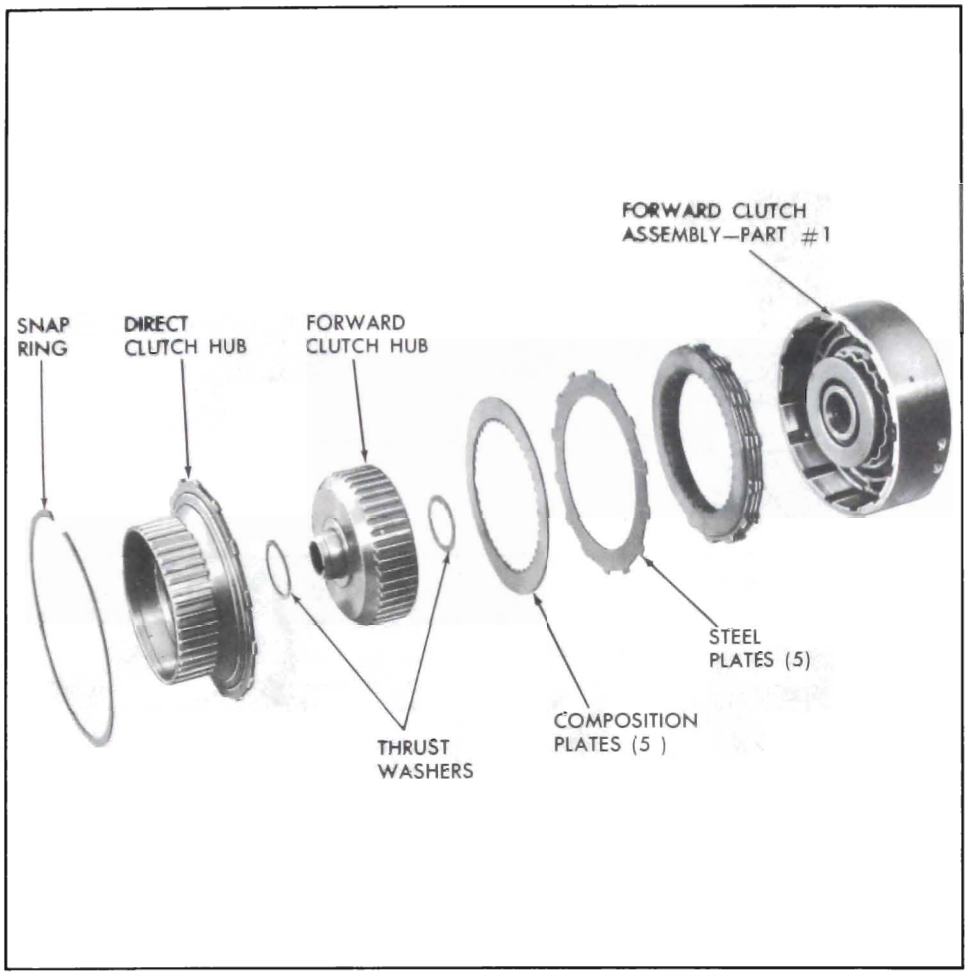

Figure 5-611

face away from spring pockets. See Figure 5-612.

2. Place a new center seal on the clutch housing, lip faces up. See Figure 5-613.

3. Place seal protector tool J-21362, over clutch hub and install outer clutch piston seal protector J-21409, into clutch drum and install piston. See Figure 5-614.

4. Install clutch release springs into pockets in piston. See Figure 5-615.

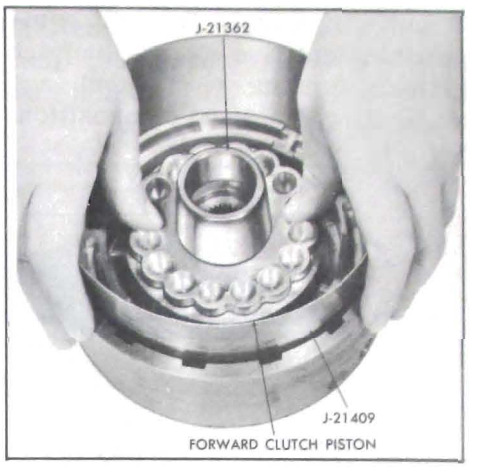

Figure 5-614

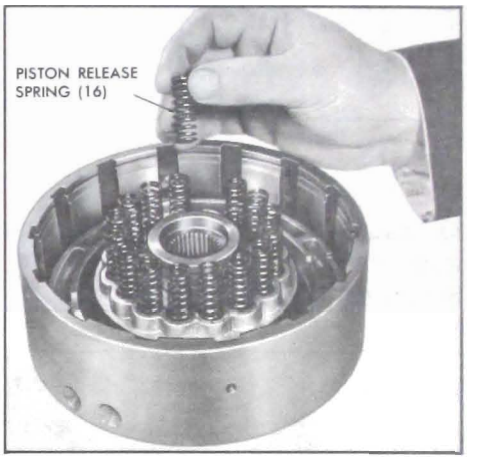

Figure 5-615

5. Place spring retainer and snap ring on springs.

6. Compress springs using clutch compressor tool or J-2590, and install snap ring. See Figure 5-616.

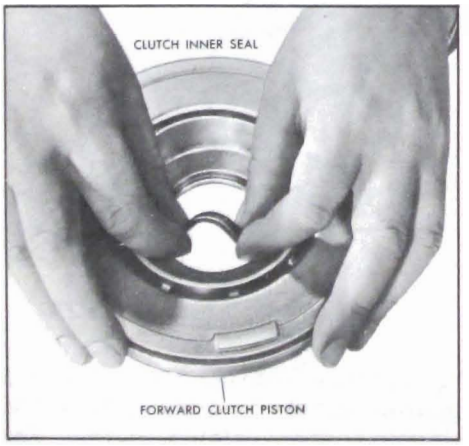

Figure 5-612

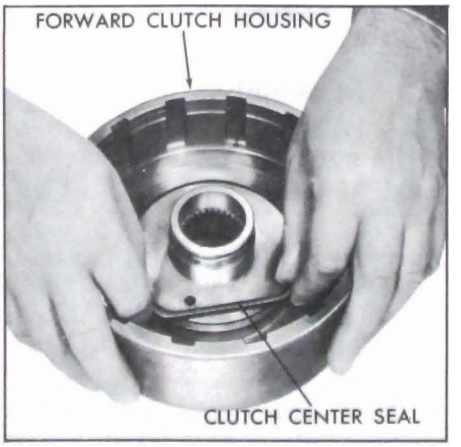

Figure 5-613

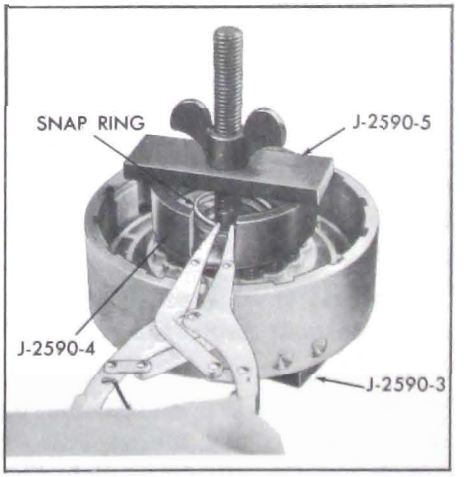

Figure 5-616

7. Oil and install five (5) composition and five (5) steel clutch plates, starting with steel and alternating steel and composition. See Figure 5-617.

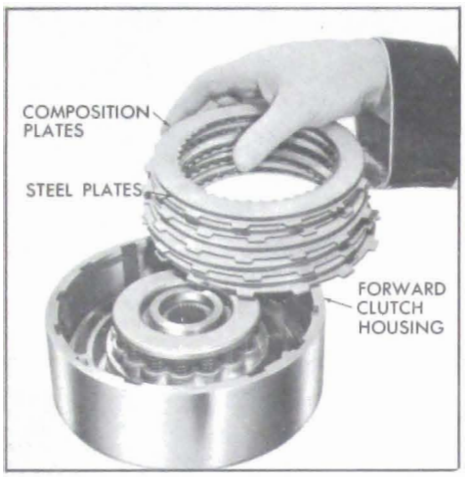

Figure 5-617

8. Install the forward clutch hub washers. Retain with petrolatum. See Figure 5-620.

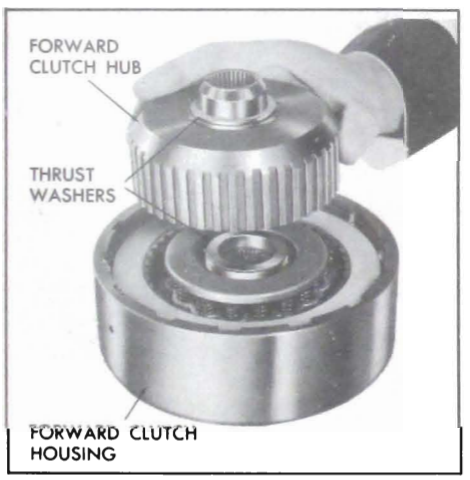

Figure 5-620

9. Place forward clutch hub into forward clutch housing and clutch plates.

10. Install the direct clutch hub and retaining snap ring. See Figure 5-621.

11. Place forward clutch housing on pump delivery sleeve and air check clutch operation. See Figure 5-622.

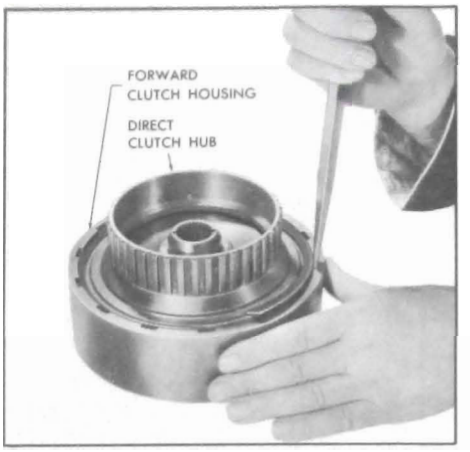

Figure 5-621

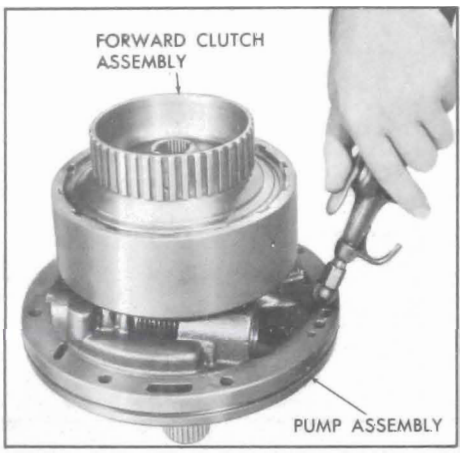

Figure 5-622

5-21 DIRECT CLUTCH AND INTERMEDIATE SPRAG DISASSEMBLY, INSPECTION, AND REASSEMBLY

a. Disassembly

1. Remove sprag retainer snap ring and retainer. See Figure 5-623.

2. Remove sprag outer race, bushings and sprag assembly. See Figure 5-624.

3. Turn unit over and remove backing plate to clutch housing snap ring. See Figure 5-625.

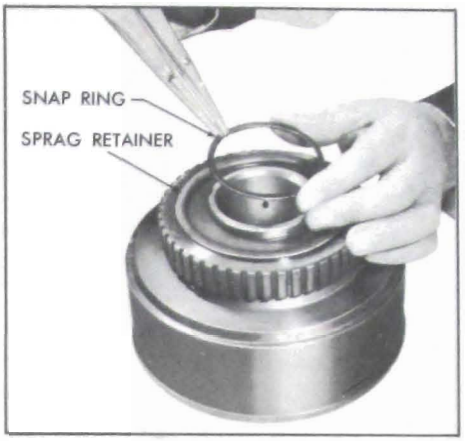

Figure 5-623

Figure 5-624

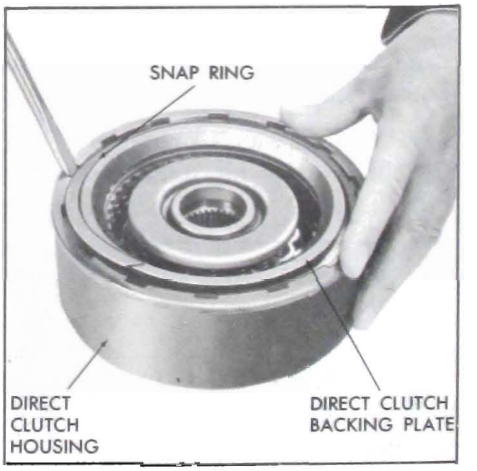

Figure 5-625

4. Remove direct clutch backing plate, (five) 5 composition and (five) 5 steel clutch plates. See Figure 5-626.

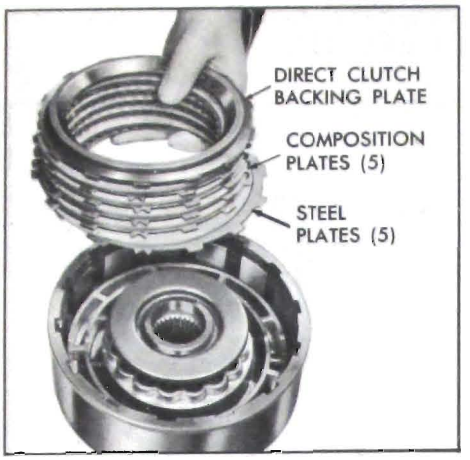

Figure 5-626

5. Using clutch compressor tool J-8765-1 and J-21409 or J-2590, compress spring retainer and remove snap ring. See Figure 5-627.

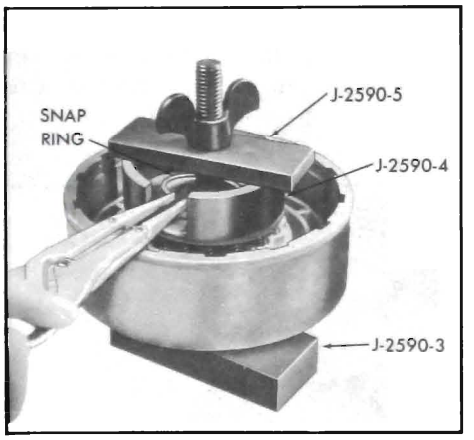

Figure 5-627

6. Remove retainer and sixteen (16) piston release springs. See Figure 5-628.

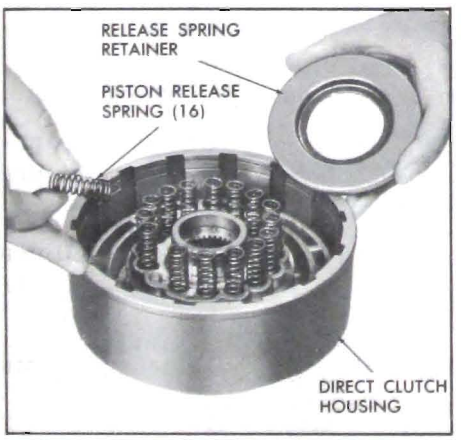

Figure 5-628

7. Remove the direct clutch piston. See Figure 5-630.

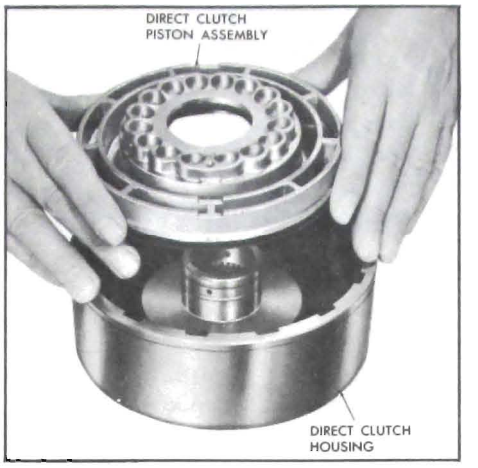

Figure 5-630

8. Remove the outer seal from the piston. See Figure 5-631.

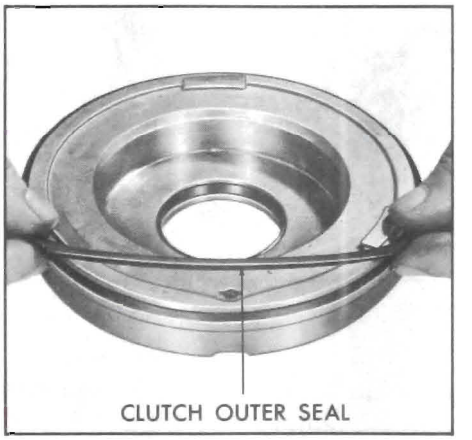

Figure 5-631

9. Remove the inner seal from the piston. See Figure 5-631A.

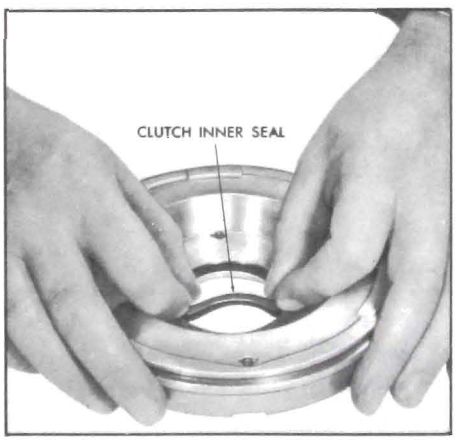

Figure 5-631A

10. Remove the center piston seal from the direct clutch housing. See Figure 5-632.

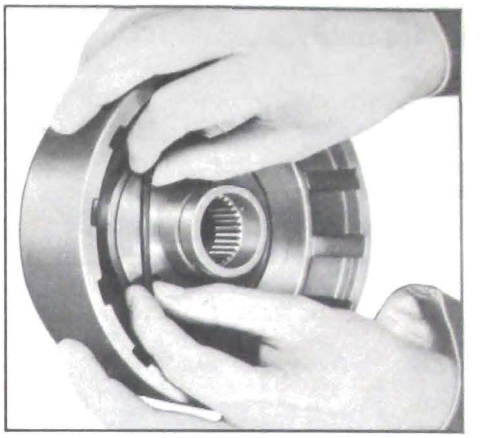

Figure 5-632

b. Inspection

1. Inspect sprag assembly for popped or loose sprags. See Figure 5-633.

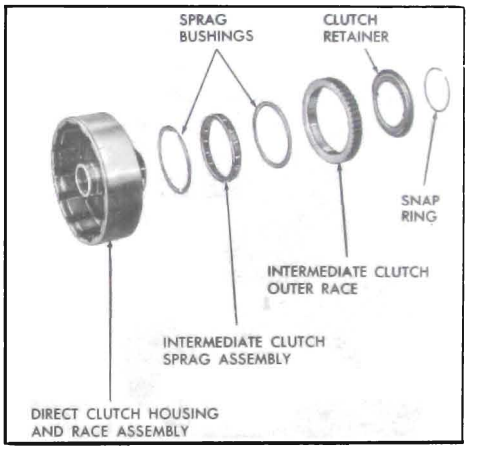

Figure 5-633

2. Inspect sprag bushings for wear or distortion.

3. Inspect the inner and outer races for scratches or wear.

4. Inspect the clutch housing for cracks, wear, proper opening of oil passages or wear on clutch plate drive lugs.

5. Inspect the drive and driven clutch plates for sign of wear or burning.

6. Inspect the backing plate for scratches or other damage.

7. Inspect the clutch piston for cracks and free operation of the ball checks.

c. Assembly

1. Install a new inner clutch piston seal on piston with lips facing away from spring pockets. See Figure 5-634.

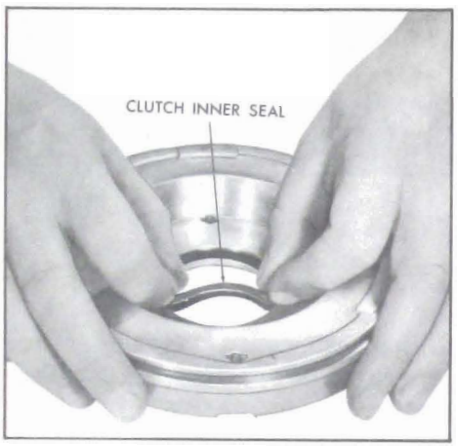

Figure 5-634

2. Install a new outer clutch piston seal. See Figure 5-635.

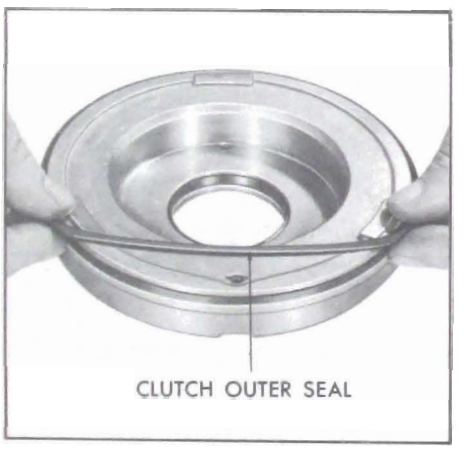

Figure 5-635

3. Install a new center seal on clutch housing with lip of seal facing up. See Figure 5-636.

4. Place seal protectors, tools J-21362 - Inner, J-21409 - Outer, over hub and clutch housing and install clutch piston. See Figure 5-637.

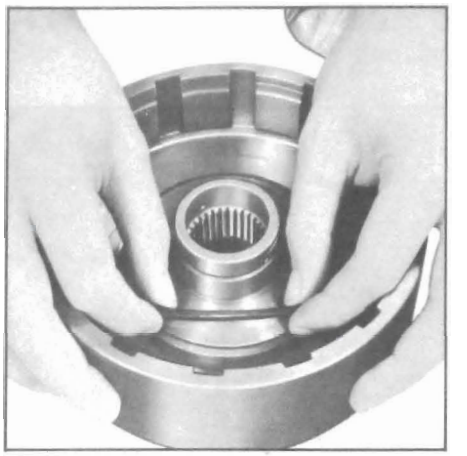

Figure 5-636

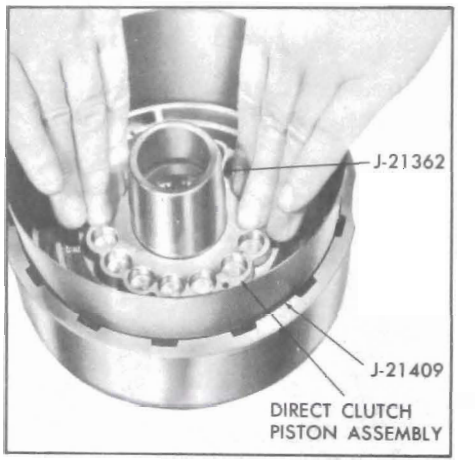

Figure 5-637

5. Install sixteen (16) springs into the piston. See Figure 5-638.

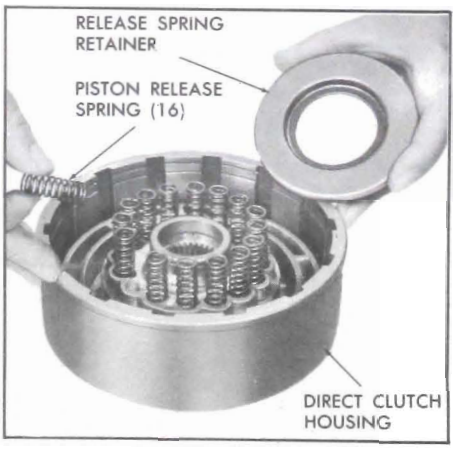

Figure 5-638

6. Place spring retainer and snap ring on retainer.

7. Using clutch compressor tool or J-2590, install snap ring. See Figure 5-639.

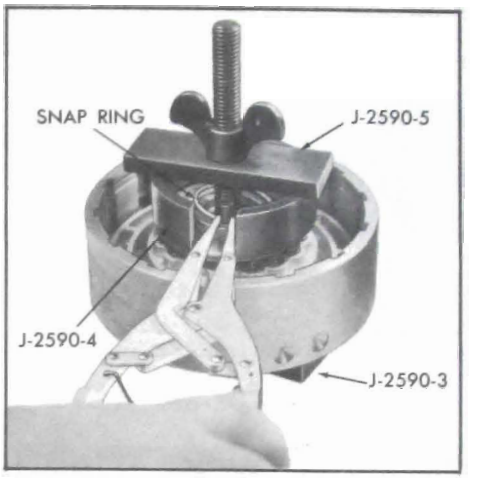

Figure 5-639

8. Install five (5) composition and five (5) steel clutch plates, starting with steel and alternating steel and composition. The steel plates must have the notches in the drive lugs one above the other. See Figure 5-640.

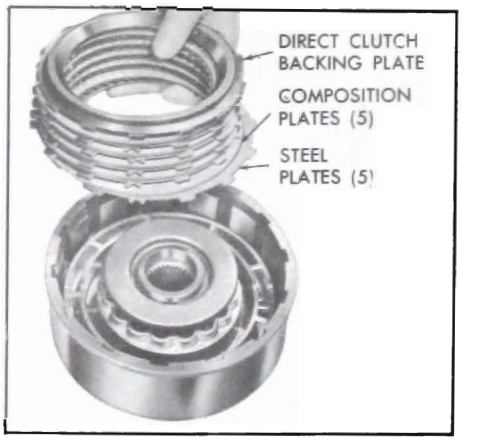

Figure 5-640

9. Install the clutch backing plate.

10. Install the backing plate retaining snap ring. See Figure 5-641.

11. Turn unit over and install one sprag bushing, cup side up, over inner race.

12. Install sprag assembly into outer race.

13. With ridge on inner cage facing down start sprag and outer

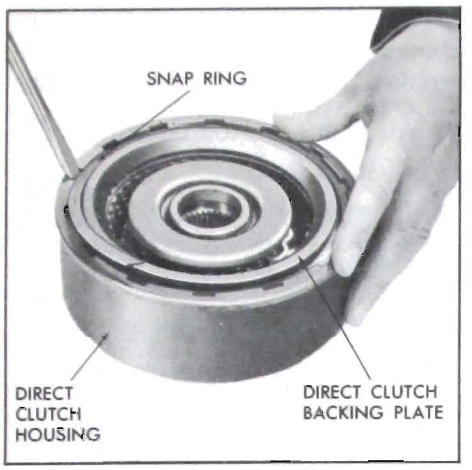

Figure 5-641

race over inner race with clockwise turning motion. See Figure 5-642.

NOTE: Outer race should not turn counterclockwise.

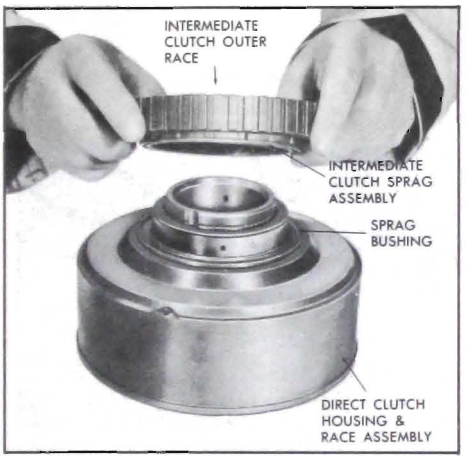

Figure 5-642

14. Install sprag retainer over sprag, cup side down. See Figure 5-643.

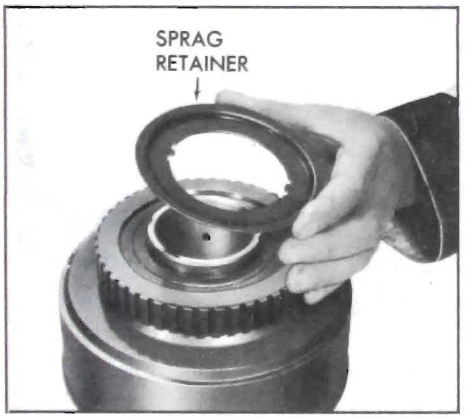

Figure 5-643

15. Install sprag retainer and snap ring. See Figure 5-644.

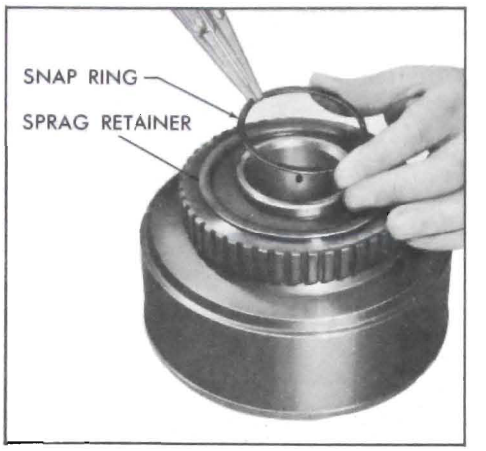

Figure 5-644

16. Place direct clutch assembly over center support and air check operation of direct clutch. See Figure 5-645.

NOTE: If air is applied through reverse passage it will escape from the direct clutch passage. This is normal.

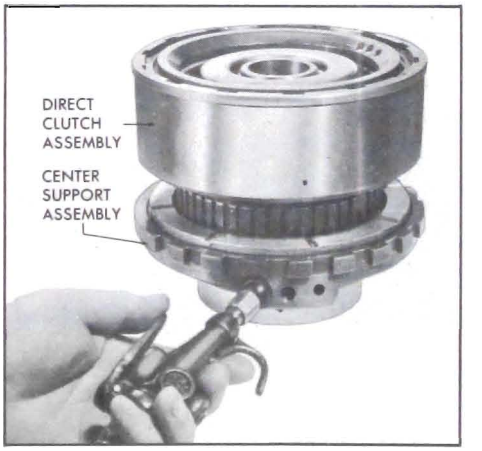

Figure 5-645

5-22 CENTER SUPPORT AND INTERMEDIATE CLUTCH DISASSEMBLY, INSPECTION, AND REASSEMBLY

a. Disassembly

1. Remove four (4) hook type oil seal rings from center support. See Figure 5-646.

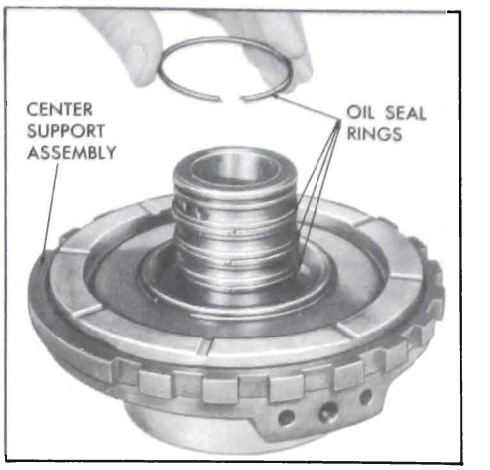

Figure 5-646

2. Using Clutch Compressor J-2590, compress the spring retainer and remove the snap ring. See Figure 5-647.

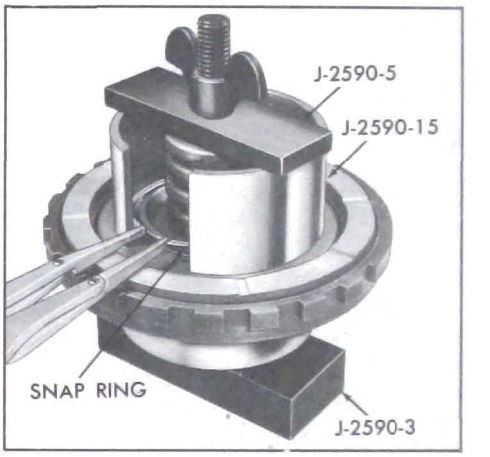

Figure 5-647

3. Remove the spring retainer and twelve (12) clutch release springs. See Figure 5-648.

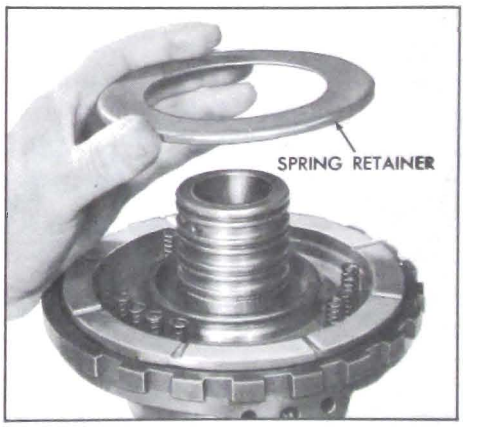

Figure 5-648

4. Remove the intermediate clutch piston. See Figure 5-650.

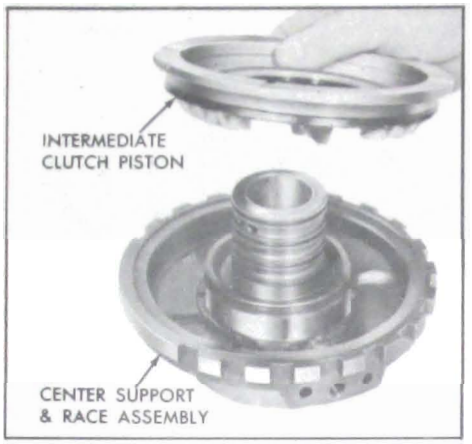

Figure 5-650

5. Remove the inner piston seal. See Figure 5-651.

NOTE: Do not remove the three (3) screws retaining the sprag inner race to the center support.

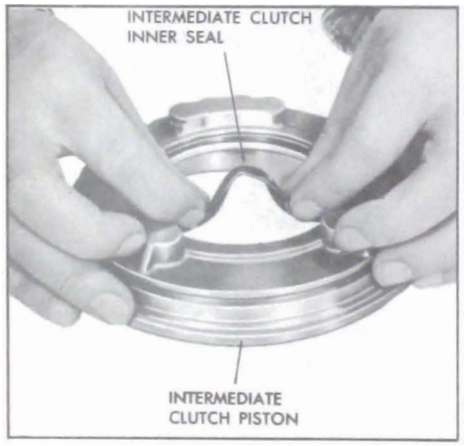

Figure 5-651

Figure 5-651A

6. Remove the outer piston seal. See Figure 5-651A.

b. Inspection

1. Inspect the sprag inner race for scratches or indentations. Be sure the lubrication hole is open. See Figure 5-652.

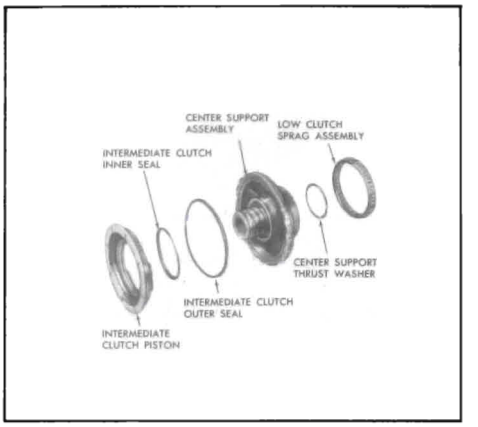

Figure 5-652

2. Inspect the bushing for scoring, wear or galling. If replacement is necessary proceed as follows:

a. Using tool J-21465-6 remove bushing.

b. From sprag side of support install bushing using tool J-21465-6. Install bushing flush to .010 below counterbore.

3. Check the oil ring grooves for damage.

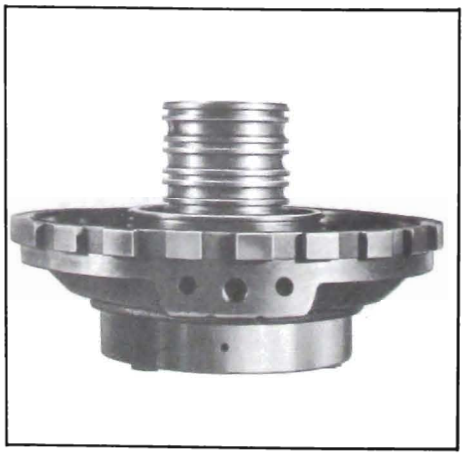

Figure 5-653

4. Air check the oil passages to be sure they are open and not interconnected. See Figure 5-653.

5. Inspect the piston sealing surfaces for scratches.

6. Inspect the piston seal grooves for nicks or other damage.

7. Inspect the piston for cracks or porosity.

8. Inspect the release springs for distortion.

c. Assembly

1. Install new inner seal on the piston with lip of the seal facing away from the spring pocket. See Figure 5-654.

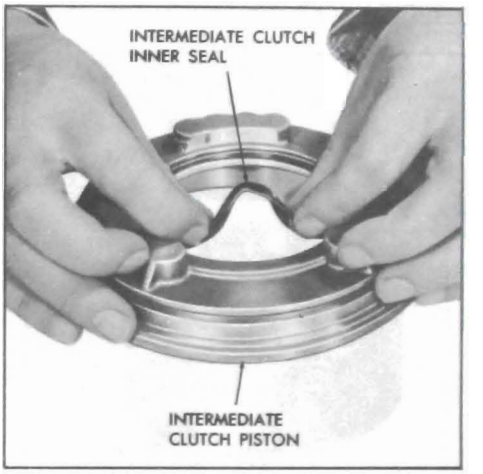

Figure 5-654

2. Install new outer seal. See Figure 5-654A.

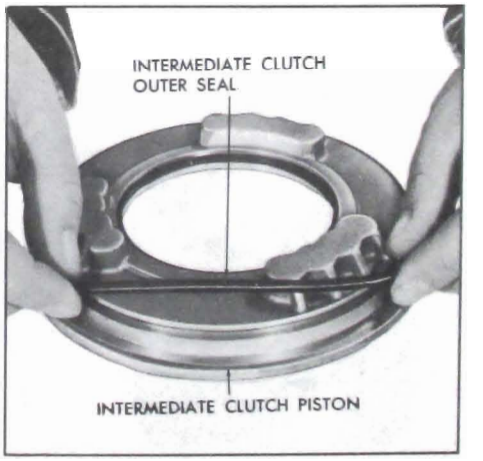

Figure 5-654A

3. Install inner seal protector, tool J-21363, on the center support hub, install the piston. See Figure 5-655.

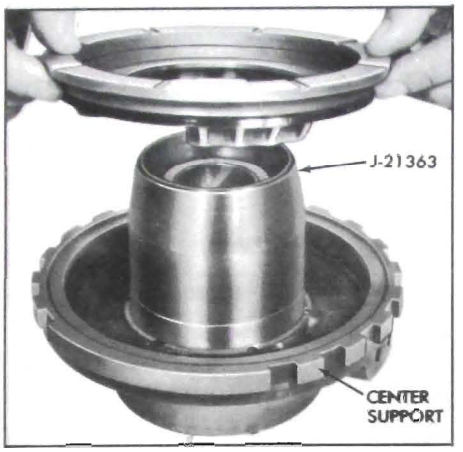

Figure 5-655

4. Install twelve (12) release springs into the piston. See Figure 5-656.

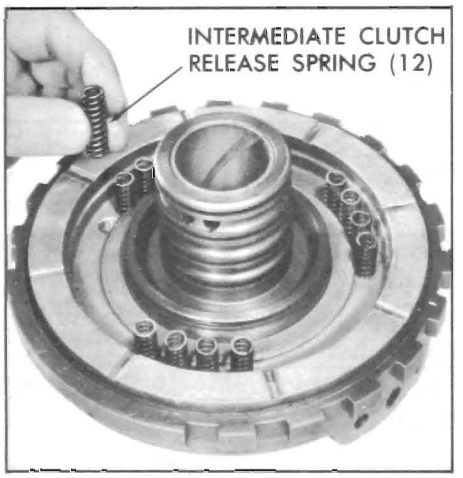

Figure 5-656

5. Place the spring retainer and snap ring over the springs.

6. Using the clutch spring compressor, compress the springs and install the snap ring. See Figure 5-657.

7. Install four (4) hook type oil rings. See Figure 5-658.

8. Air check operation of intermediate clutch piston. See Figure 5-560.

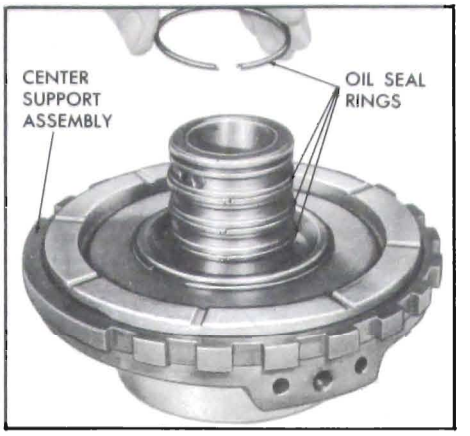

Figure 5-657

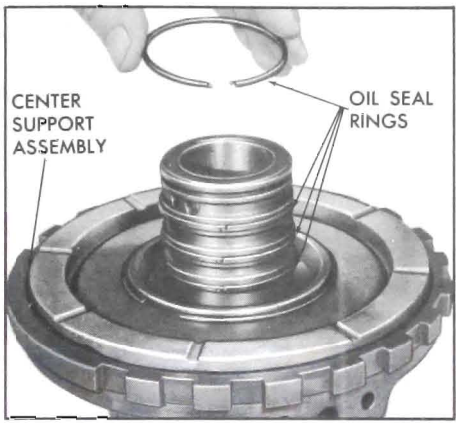

Figure 5-658

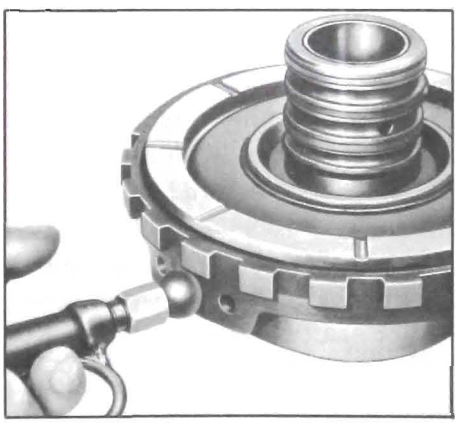

Figure 5-660

5-23 INSPECTION OF REACTION CARRIER, REAR SPRAG AND OUTPUT CARRIER ASSEMBLY

1. Inspect band surface on reaction carrier for signs of burning or scoring.

2. Inspect the sprag outer race for scoring or wear.

3. Inspect the thrust washer surfaces for signs of scoring or wear.

4. Inspect the bushing for damage. If bushing is damaged the reaction carrier must be replaced.

5. Inspect the pinions for damage, rough bearings or excessive tilt.

6. Check pinion end play. Pinion end play should be .009" - .024". See Figure 5-662.

Figure 5-662

7. Inspect the sprag for damaged members.

8. Inspect the sprag cage and retaining spring for damage.

9. Inspect the front internal gear for damaged teeth.

10. Inspect the pinions for damage, rough bearings or excessive tilt.

11. Check pinion end play. Pinion end play should be .009" - .024". See Figure 5-663.

12. Inspect the parking pawl lugs for cracks or damage.

13. Inspect the output locating splines for damage.

Figure 5-563

5-24 PINION REPLACEMENT PROCEDURE

1. Support the carrier assembly on its front face.

2. Using a tapered punch, drive or press the pinions out of the carrier. See Figure 5-664.

Figure 5-664

3. Remove the pinions, thrust washers and roller needle bearings.

4. Inspect the pinion pocket thrust faces for burrs and remove if present.

5. Install nineteen (19) needle bearings into each pinion, using petrolatum to hold the bearings in place. Use a pinion pin as a guide. See Figure 5-665.

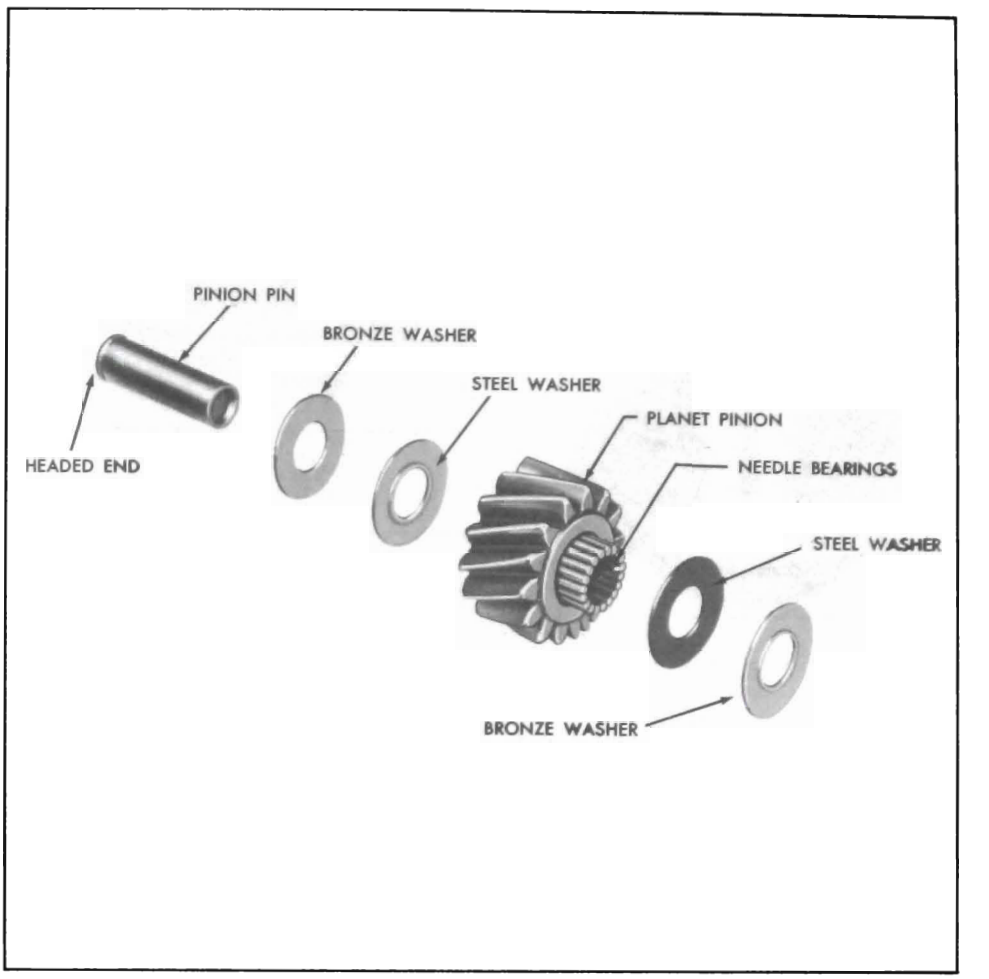

Figure 5-665

6. Place a bronze and steel thrust washer on each side of pinion so steel washer is against pinion, hold them in place with petrolatum.

7. Place the pinion assembly in position in the carrier and install a pilot shaft through the rear face of the assembly to hold the parts in place.

8. Drive a new pinion pin into place while rotating pinion from the front, being sure that the headed end is flush or below the face of the carrier. See Figure 5-666.

9. Place a large punch in a bench vise to be used as an anvil while staking the opposite end of the pinion pin in three places. See Figure 5-667.

NOTE: Both ends of the pinion pins must lie below the face of the carrier or interference may occur.

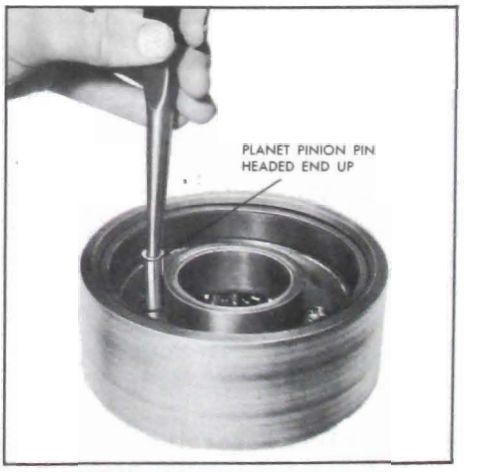

Figure 5-666

Figure 5-667

5-25 INSPECTION OF OUTPUT SHAFT

a. Output Shaft

1. Inspect the bushing for wear or galling. If replacement is necessary proceed as follows:

a. Thread Tool J-7451-1 into bushing using slide hammer J-2619.

b. Using Tool J-21465-1 install bushing.

2. Inspect the bearing and thrust washer surfaces for damage.

3. Inspect the governor drive gear for rough or damaged teeth.

4. Inspect the splines for damage.

5. Inspect the orificed cup plug in the lubrication passage.

6. Inspect the drive lugs for damage.

b. Inspection of Rear Internal Gear

1. Inspect the gear teeth for damage or wear.

2. Inspect the splines for damage.

3. Inspect the gear for cracks.

c. Inspection of Sun Gear

1. Inspect gear teeth for damage or wear.

2. Inspect splines for damage.

3. Be sure oil lubrication hole is open.

d. Inspection of Sun Gear Shaft

1. Inspect shaft for cracks or splits.

2. Inspect splines for damage.

3. Inspect bushings for scoring or galling.

4. Inspect the ground bushing journals for damage.

5. Be sure the oil lubrication hole is open.

e. Inspection of Turbine Shaft

1. Inspect for open lubrication passages at each end.

2. Inspect the splines for damage.

3. Inspect the ground bushing journals for damage.

4. Inspect the shaft for cracks or distortion.

f. Inspection of Main Shaft

1. Inspect the shaft for cracks or distortion.

2. Inspect the splines for damage.

3. Inspect the ground bushing journals for damage.

4. Inspect the snap ring groove for damage.

5. Inspect the orificed cup plug pressed into one end of the mainshaft. Be sure it is not plugged.

g. Inspection of Front and Rear Bands

1. Inspect the lining for cracks, flaking, burning or looseness. See Figure 5-668.

2. Inspect the bands for cracks or distortion.

3. Inspect the end for damage at the anchor lugs or supply lugs.

Figure 5-668

h. Inspection of Case Extension

1. Inspect the bushing for excessive wear or damage. If replacement is necessary proceed as follows:

a. Use J-8092 Driver Handle and Tool J-9640 and remove.

b. Using Tool J-9640 install bushing.

2. Inspect the seal ring groove for damage.

3. Inspect the housing for cracks or porosity.

4. Be sure rear seal drain back port is not obstructed.

i. Inspection of Modulator and Valve

1. Inspect the modulator assembly for any signs of bending or distortion. See Figure 5-670.

2. Inspect the "O" ring seal seat for damage.

3. Apply suction to the vacuum tube and check for diaphragm leaks.

4. Inspect the modulator valve for nicks or damage.

5. Check freeness of valve operation in case bore.

6. Check modulator bellows, modulator plunger is under pressure (16 lb.). If bellows is damaged the plunger will have very little pressure.

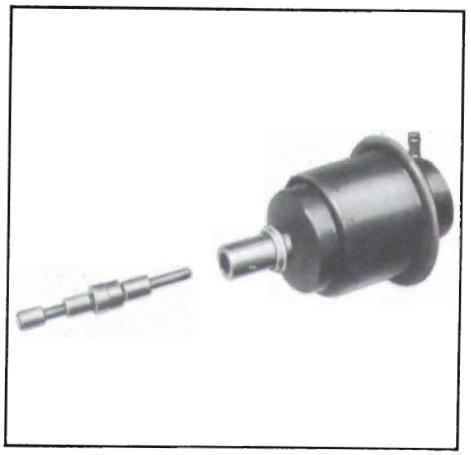

Figure 5-670

j. Inspection of Manual and Parking Linkage

1. Inspect the parking actuator rod for cracks, damaged snap ring groove or broken spring retainer lugs. See Figure 5-671.

2. Inspect the actuator spring for damage.

3. Inspect actuator for a free fit on the actuator rod.

4. Inspect the parking pawl for cracks or wear.

5. Inspect the manual shaft for damaged threads, rough oil seal journal or loose lever.

6. Inspect the inside detent lever for cracks or a loose pin.

7. Inspect the parking pawl shaft for damaged oil seal or retainer grooves.

8. Inspect the parking pawl return spring for deformed coils or ends.

9. Inspect the parking bracket for cracks or wear.

10. Inspect detent roller and spring assembly.

k. Inspection of Case Assembly

1. Inspect case assembly for cracks, porosity or interconnected passages.

2. Check for good retention of band anchor pins.

3. Inspect all threaded holes for thread damage.

4. Inspect the intermediate clutch driven plate lugs for damage or brinneling.

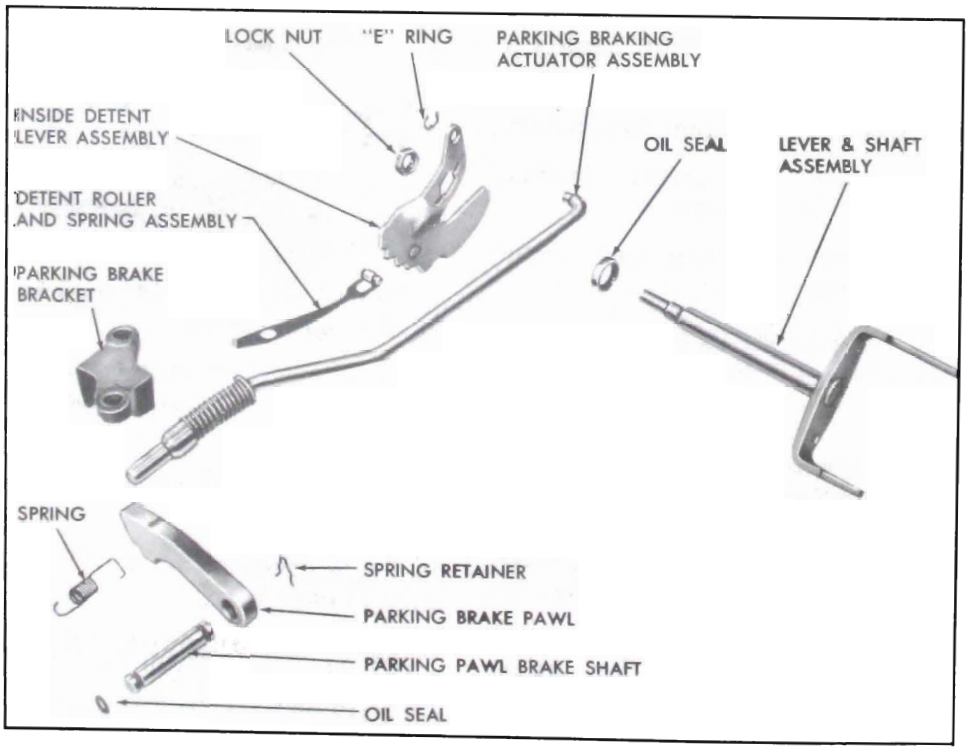

Figure 5-671

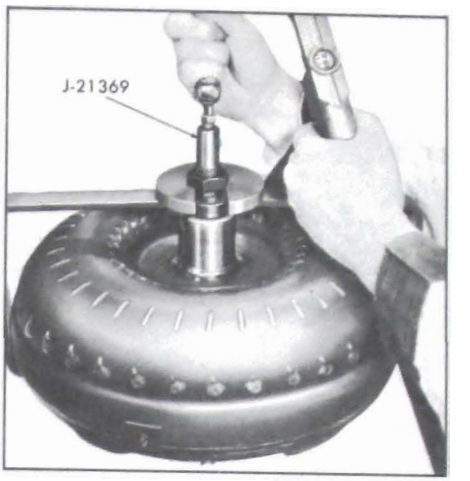

Figure 5-672

5. Inspect the snap ring grooves for damage.

6. Inspect the bore for the governor assembly for scratches or scoring.

7. Inspect the modulator valve bore for scoring or damage.

8. Inspect the cup plug inside the case for good staking and sealing.

l. Inspection of Torque Convertor

1. Check convertor for leaks as follows: (See Figure 5-672.)

a. Install Tool J-21369, and tighten.

b. Fill convertor with air; 80 psi.

c. Submerge in water and check for leaks.

2. Check convertor hub surfaces for signs of scoring or wear.

5-26 ASSEMBLY OF REAR UNIT

1. Install rear internal gear on end of mainshaft having snap ring groove.

2. Install internal gear retaining snap ring. See Figure 5-673.

3. Install the sun gear to internal gear thrust races and bearings

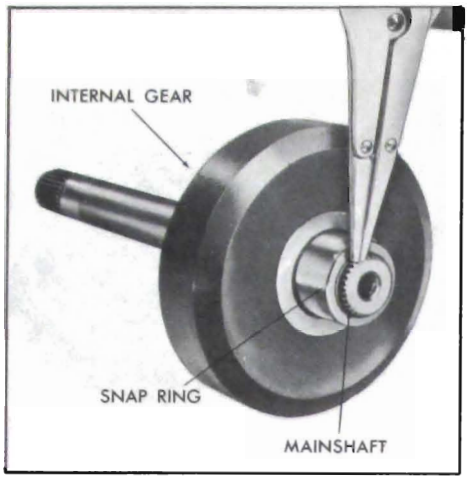

Figure 5-673

against the inner face of the rear internal gear as follows, and retain with petrolatum.

a. Place the large race against the internal gear with flange facing forward or up. See Figure 5-674.

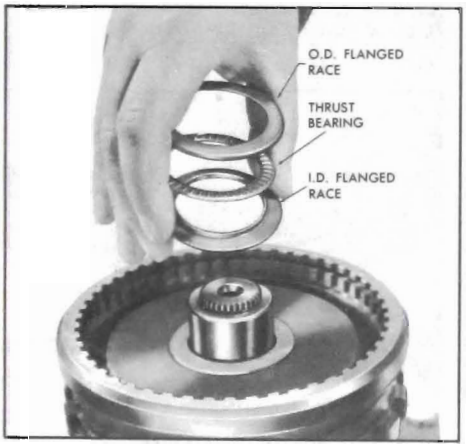

Figure 5-674

b. Place the thrust bearing against the race.

c. Place the small race against the bearing with the inner flange facing into the bearing or down.

4. Install the output carrier over the mainshaft so that the pinions mesh with the rear internal gear.

5. Place the above portion of the "build-up" through hole in bench so that the mainshaft hangs downward.

6. Install the rear internal gear to output shaft thrust races and bearings as follows; and retain with petrolatum. See Figure 5-674.

a. Place the small diameter race against the internal gear with the center flange facing up.

b. Place the bearing on the race.

c. Place the second race on the bearing with the outer flange cupped over the bearing.

7. Install the output shaft into the output carrier assembly. See Figure 5-675.

Figure 5-675

8. Install the output shaft to output carrier snap ring. See Figure 5-676.

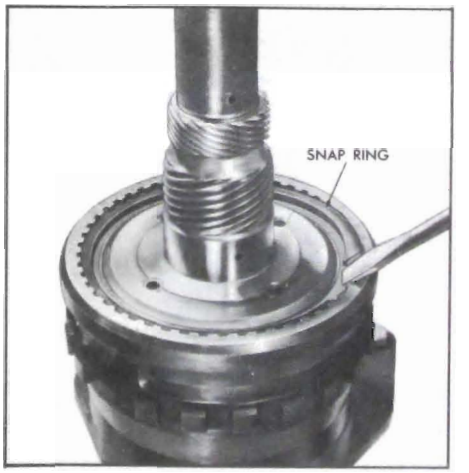

Figure 5-676

9. Install output shaft to case thrust washer, tabs in pockets.

10. Turn assembly over and support so that the output shaft hangs downward. See Figure 5-677.

Figure 5-677

11. Install the reaction carrier to output carrier thrust washer with the tabs facing down in pockets. See Figure 5-678.

Figure 5-678

12. Install the sun gear splines with chamfer down. See Figure 5-680.

13. Install the sun gear shaft.

14. Install the reaction carrier. See Figure 5-681.

15. Install the center support to sun gear thrust races and bearing as follows:

Figure 5-680

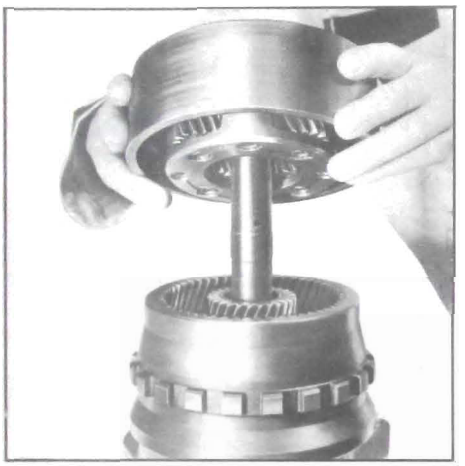

Figure 5-681

a. Install the large race, center flange up over the sun gear shaft.

b. Install the thrust bearing against the race.

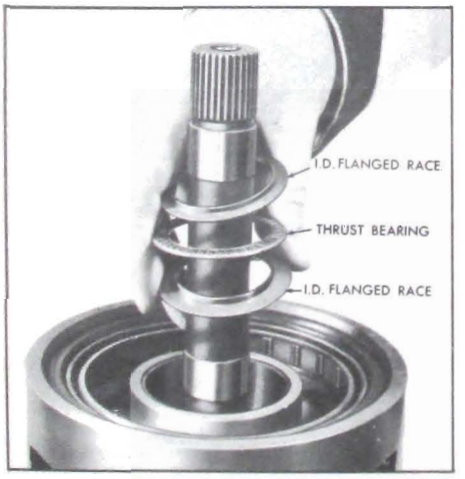

Figure 5-682

c. Install the second race, center flange up. See Figure 5-682.

16. Install the bronze center support to reaction carrier thrust washer into the recess in the center support. Retain with petrolatum. See Figure 5-683.

Figure 5-683

17. Using Tool J-21367, as a pilot, install the rear sprag assembly on case center support inner race with bronze drop strips up. See Figure 5-684.

18. Install the case center support and sprag assembly as follows:

a. Place a rubber band on the sprag assembly O.D. to hold the sprags in place. See Figure 5-685.

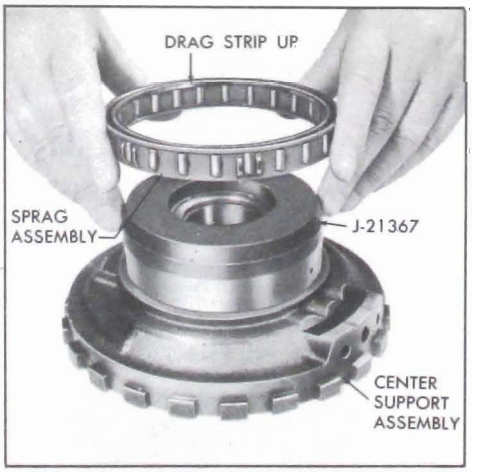

Figure 5-684

Figure 5-685

b. Start sprag assembly into outer race, remove the rubber band and finish installation by pressing on case support. See Figure 5-686.

NOTE: With reaction carrier held, case support should only turn counterclockwise.

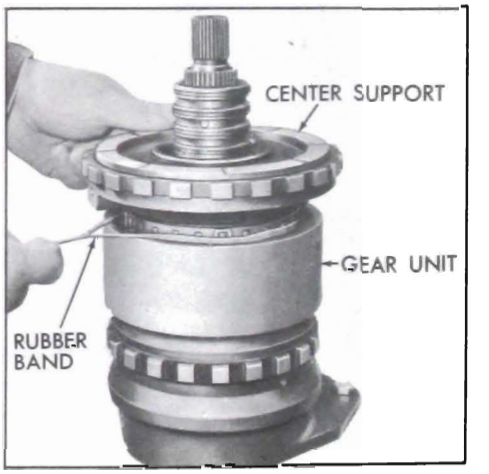

Figure 5-686

5-27 ASSEMBLY OF UNITS INTO TRANSMISSION CASE

1. Install the "O" ring seal on the park pawl shaft.

2. Install the parking pawl, tooth toward the inside case and parking pawl shaft. See Figure 5-687.

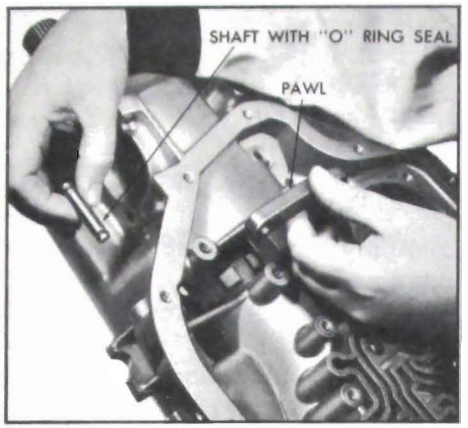

Figure 5-687

3. Install the parking pawl shaft retainer clip. See Figure 5-688.

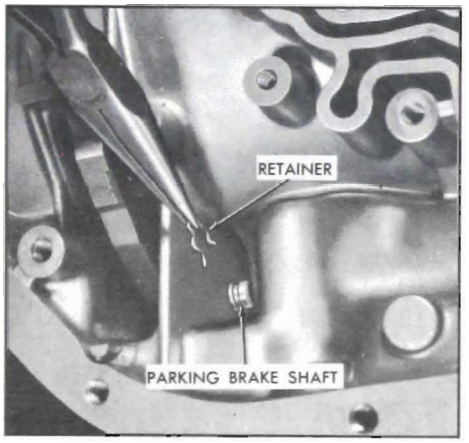

Figure 5-688

4. Install the parking pawl return spring, square end hooked on pawl. See Figure 5-690.

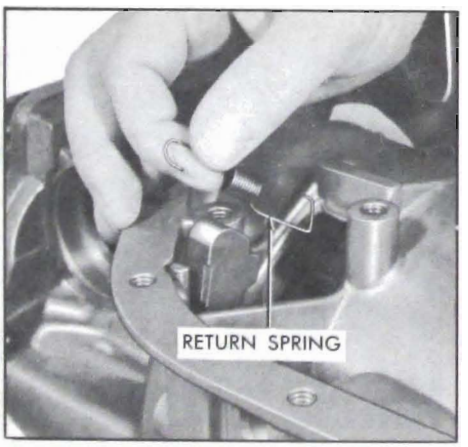

Figure 5-690

5. Install the parking brake bracket, guides over parking pawl, using two attaching bolts torque to 15-20 ft. lbs. See Figure 5-691.

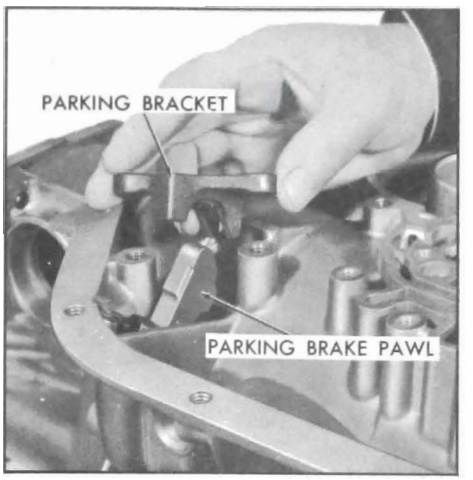

Figure 5-691

6. Install the rear band assembly so that the two lugs index with the two anchor pins. See Figure 5-692.

Figure 5-692

7. Install the rear selective washer into slots provided inside rear of transmission case. See Figure 5-693.

8. Install the complete gear unit assembly into the case. See Figure 5-694.

9. Oil and install center support

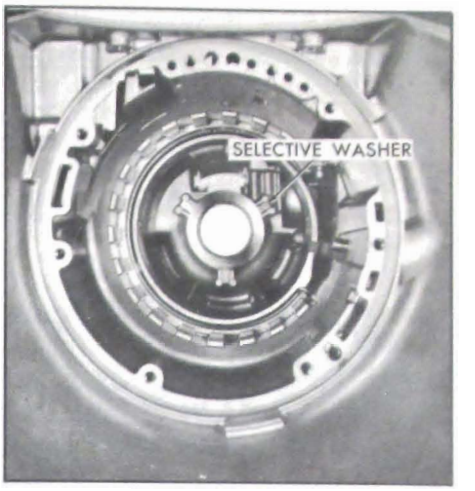

Figure 5-693

Figure 5-694

to case retaining snap ring with bevel facing top of transmission. Make certain ring is properly seated in case.

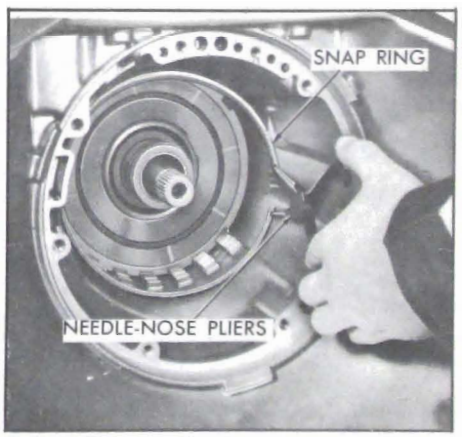

Figure 5-695

NOTE: Ring is tapered, flat side towards center support. See Figure 5-695.

10. Install center support locating screw, then install the case to center support screw. See Figure 5-696.

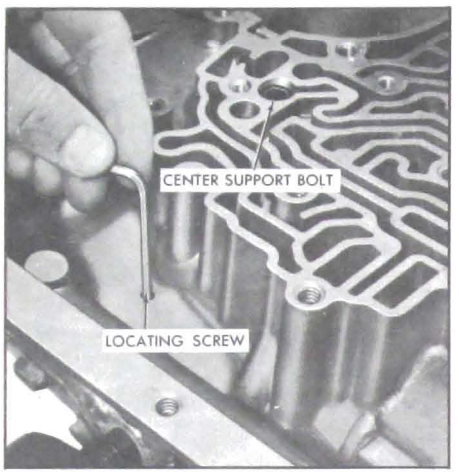

Figure 5-696

11. Install three (3) steel and three (3) composition intermediate clutch plates.

Start with steel, alternate the plates. See Figure 5-697.

12. Install the intermediate clutch backing plate.

13. Install the backing plate to case snap ring. Gap in snap ring should be opposite anchor pin. See Figure 5-698.

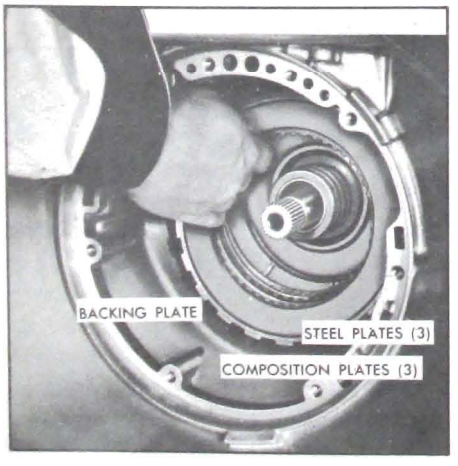

Figure 5-697

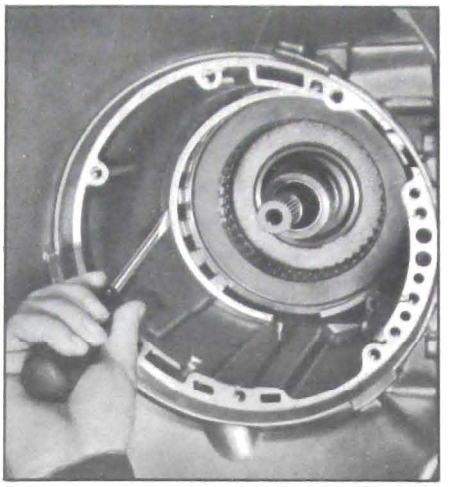

Figure 5-698

14. Check rear end play as follows: See Figure 5-700.

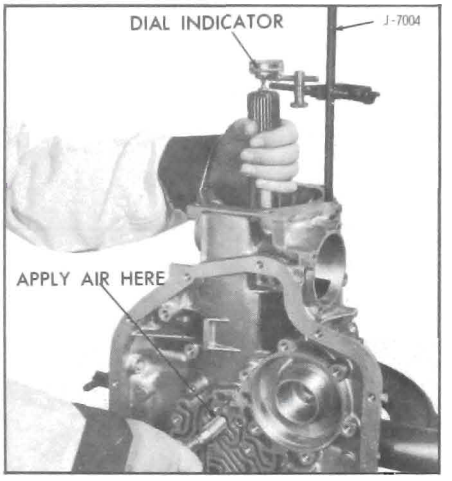

Figure 5-700

Figure 5-700A

a. Install J-7004 into an extension housing attaching bolt hole. See Figure 5-700A.

b. Mount the dial indicator, J-8001, on the rod and index with the end of the output shaft.

c. Apply air pressure to apply the intermediate clutch (center oil passage) while moving the output shaft in and out to read the end play. End play should be from .003" - .019". The selective washer controlling this end play is the steel washer having 3 lugs that is located between the thrust washer and the rear face of the transmission case.

If a different washer thickness is required to bring the end play within specification, it can be selected from the following chart.

Thickness	Notches
.078 - .082	None
.086 - .090	1 Tab Side
.094 - .098	2 Tabs Side
.102 - .106	1 Tab O.D.
.110 - .114	2 Tabs O.D.
.118 - .122	3 Tabs O.D.

15. Install front band with band anchor hole placed over the band anchor pin and apply lug facing servo hole. See Figure 5-701.

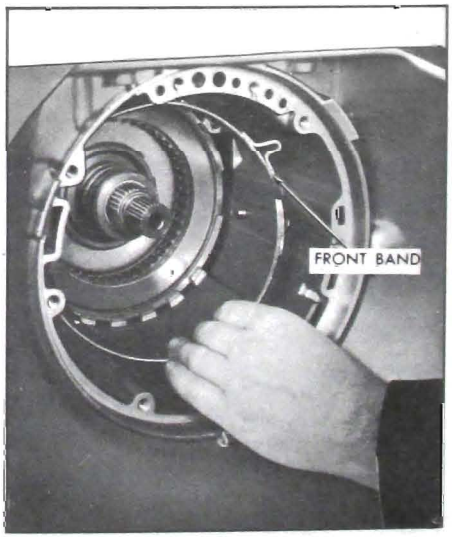

Figure 5-701

16. Install the direct clutch and intermediate sprag assembly. It will be necessary to twist the housing to allow the sprag outer race to index with the clutch drive plates. The housing hub will bottom on the sun gear shaft. See Figure 5-702.

NOTE: Removal of direct clutch, drive and driven plates, may be helpful.

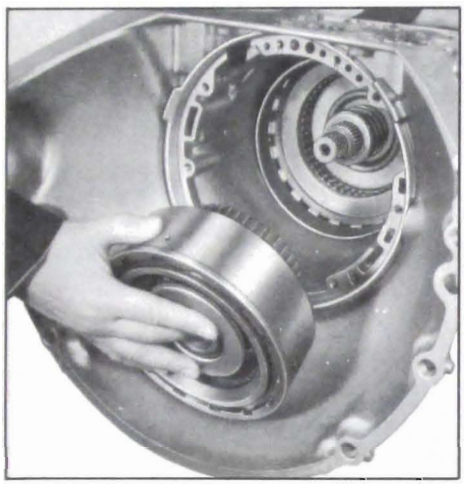

Figure 5-702

17. Install the forward clutch hub to direct clutch housing bronze thrust washer on the forward clutch hub. Retain with petrolatum.

18. Install the forward clutch assembly, indexing the direct clutch hub so end of the mainshaft will

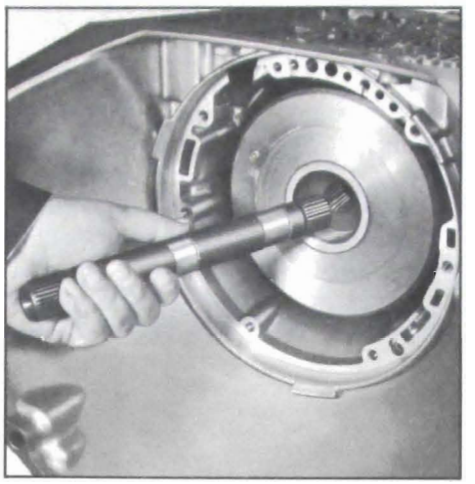

Figure 5-704

be flush with the end of the forward clutch hub, using the turbine shaft as tool. See Figure 5-703.

19. Install the turbine shaft, end with short spline into forward clutch housing. See Figure 5-704.

20. Position the pump to case gasket against the case face.

21. Install the front pump assembly and all but one attaching bolt and seal.

NOTE: If the turbine shaft can not be rotated as the pump is being pulled into place, the forward or direct clutch housings have not been properly installed to index with all the clutch plates. This condition must be corrected before the pump is pulled fully into place.

22. If necessary, install a new front seal, using tool J-21359, to drive the seal in place. See Figure 5-705.

23. Check front unit end play as follows. See Figure 5-706.

a. Remove one front pump attaching bolt, and bolt seal.

b. Install J-7004 slide hammer into bolt hole. (See illustration for location.)

c. Mount the dial indicator on the rod and index indicator to register with end of turbine shaft.

d. Hold output shaft forward while pushing turbine shaft rearward to its stop.

e. Set dial indicator to zero.

f. Push forward clutch housing forward using a rod inserted through the exhaust port in transmission case.

Read the resulting travel or end play which should be .003"-.024".

The selective washer controlling this end play is the phenolic resin washer located between the pump cover and the forward clutch housing. If more or less washer thickness is required to bring end play within specifications, select the proper washer from the chart below.

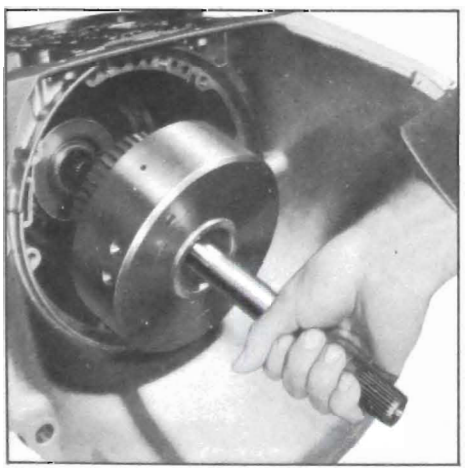

Figure 5-703

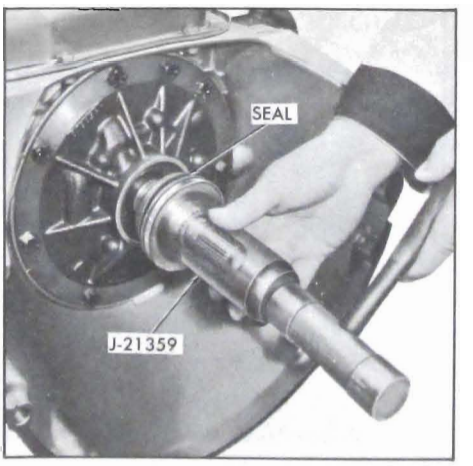

Figure 5-705

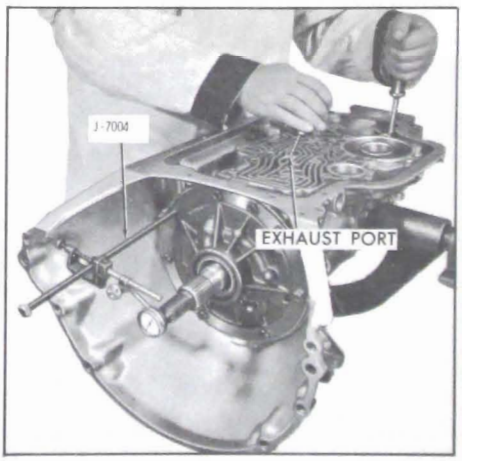

Figure 5-706

Thickness	Color
.060 - .064	Yellow
.071 - .075	Blue
.082 - .086	Red
.093 - .097	Brown
.104 - .108	Green
.115 - .119	Black

NOTE: An oil soaked washer may tend to discolor so that it will be necessary to measure the washer for its actual thickness.

24. Install the remaining front pump attaching bolt and seal. Torque bolts to 15-20 ft. lbs.

5-28 REAR EXTENSION HOUSING ASSEMBLIES

1. Install the extension housing to case "O" ring seal on the extension housing.

2. Attach the extension housing to the case using attaching bolts. Torque bolts to 20-25 ft. lbs.

3. If necessary, install a new rear seal, using Seal Installer Tool J-21464. See Figure 5-707.

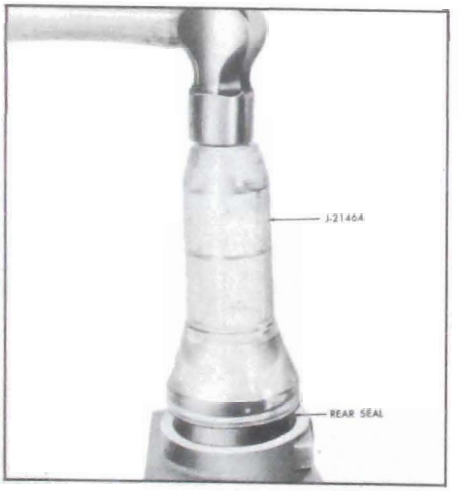

Figure 5-707

5-29 INSTALL MANUAL LINKAGE

1. If necessary, install a new manual shaft seal into the case.

2. Insert the actuator rod into the manual detent lever from the side opposite the pin.

3. Install the actuator rod retaining "E" ring.

4. Install the actuator rod plunger under the parking bracket and over the parking pawl.

5. Install the manual lever and shaft assembly through the case and detent lever. See Figure 5-708.

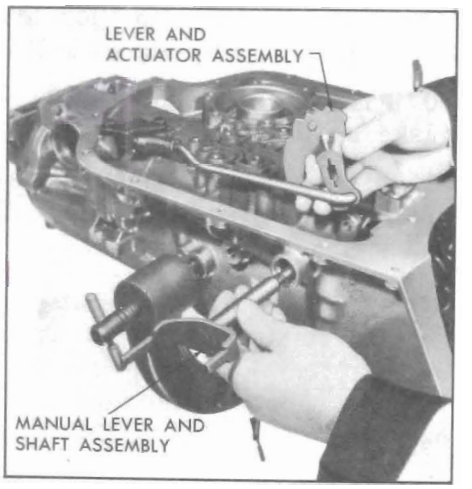

Figure 5-708

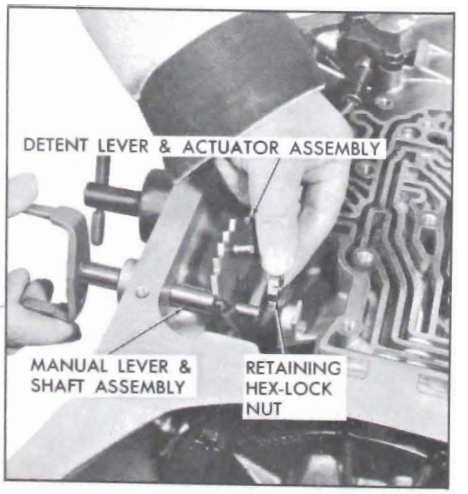

Figure 5-710

6. Install the retaining hex-lock nut on the manual shaft. See Figure 5-710.

NOTE: Start hex-nut on manual shaft, engaging manual valve with detent pin.

Tighten detent retaining nut.

5-30 INSTALLATION OF CHECK BALLS, FRONT SERVO, GASKETS, SPACER AND SOLENOID

1. Install the front servo assembly into the transmission case. Be sure the oil seal ring is started in the case bore. See Figure 5-711.

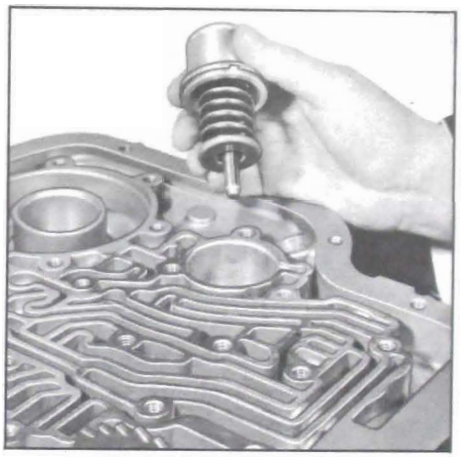

Figure 5-711

2. Install the valve body spacer to case gasket. (Gasket with tab.) See Figure 5-712.

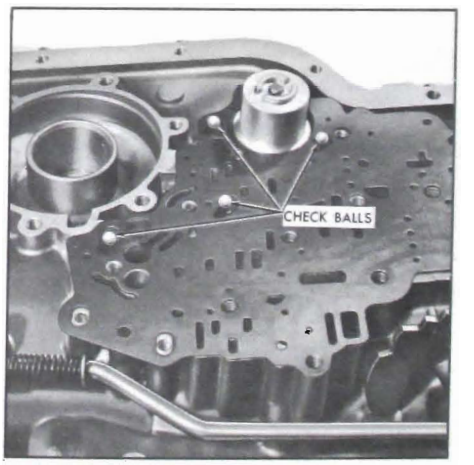

Figure 5-712

3. Install four (4) check balls into the transmission case pockets.

4. Install the valve body to case spacer.

5. Install the solenoid gasket. See Figure 5-713.

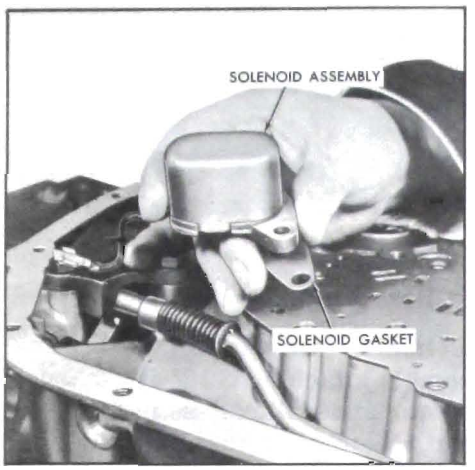

Figure 5-713

6. Install the solenoid assembly with connector facing outer edge of case, using attaching bolts.

NOTE: Do not tighten bolts at this time.

7. Install the "O" seal ring on the solenoid connector.

8. Install the connector with the lock tabs facing into the case. See Figure 5-714.

9. Connect the solenoid lead to the connector terminal. See Figure 5-715.

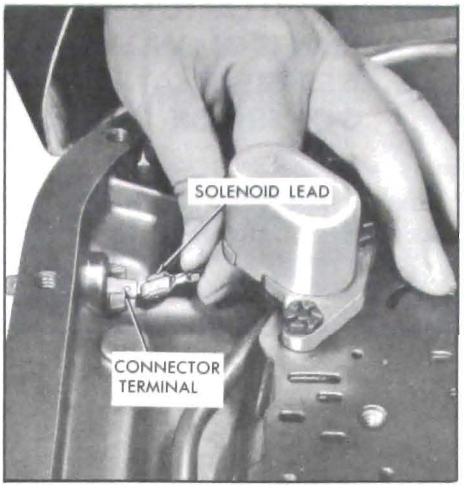

Figure 5-715

Figure 5-716

5-31 INSTALLATION OF REAR SERVO ASSEMBLY

NOTE: Before installing the rear servo assembly check band apply pin using tool J-21320 as follows:

a. Attach the band apply pin Selection Gauge J-21370, to the transmission case with attaching screws.

b. Apply 15 ft. lb. torque and select proper servo pin to be used from scale on tool. See Figure 5-715A.

c. Remove the tool and make note of the proper pin to be used during assembly of the transmission.

There are three selective pins identified as follows:

Pin Identification	Pin Size
Two	Long
One Ring	Med.
No Rings	Short

The identification ring is located on the band lug end of the pin. Selecting the proper pin is the equivalent of adjusting the band.

1. Install rear accumulator spring.

2. Install the rear servo spring assembly; the side of the retainer having the long ears, faces up or out of the case. See Figure 5-716.

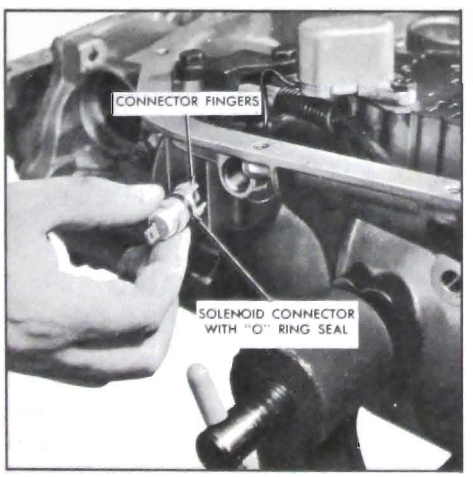

Figure 5-714

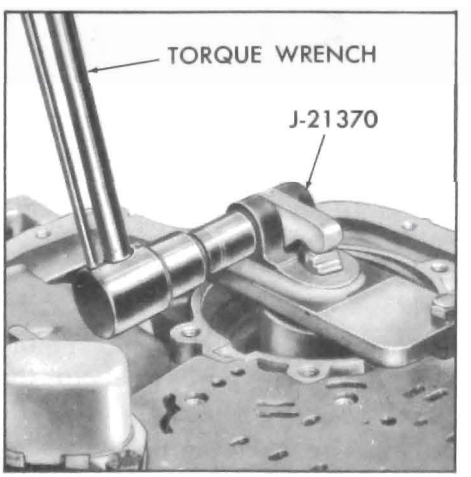

Figure 5-715A

Figure 5-717

3. Install the servo assembly, being sure to align the relieved pockets in the piston over the tabs on the spring retainer. See Figure 5-716.

4. Install the rear servo gasket and cover. See Figure 5-717.

5. Install attaching screws. Torque bolts to 15-20 ft. lbs. See Figure 5-718.

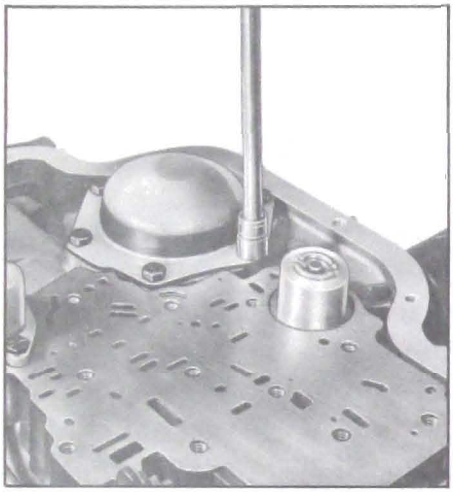

Figure 5-718

6. Air check piston to make certain seal has not been damaged. See Figure 5-720.

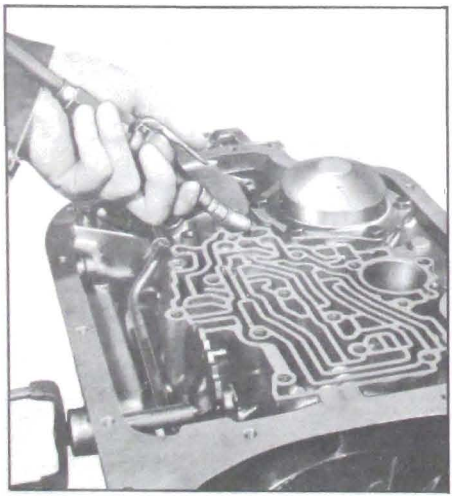

Figure 5-720

5-32 INSTALLATION OF CONTROL VALVE ASSEMBLY AND GOVERNOR PIPES

1. Install control valve to spacer gasket. See Figure 5-721.

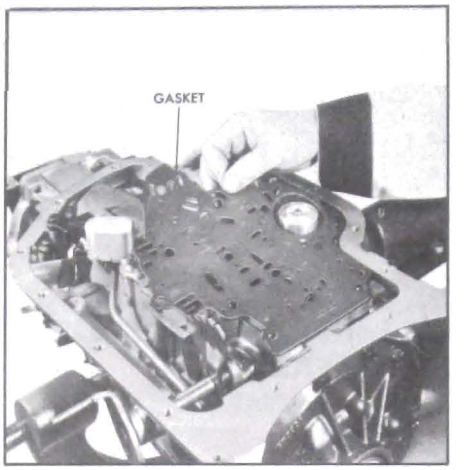

Figure 5-721

2. Install governor pipes into assembly. See Figure 5-722.

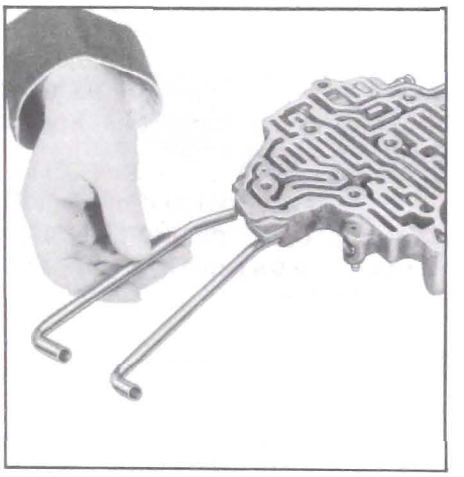

Figure 5-722

3. Install two guide pins (control valve assembly attaching screws with heads removed). See Figure 5-723.

4. Install control valve assembly and governor pipes to the transmission.

NOTE: Be sure the manual valve is properly indexed with the pin on the manual detent lever.

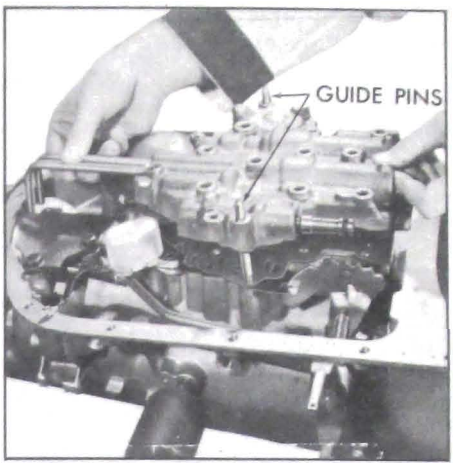

Figure 5-723

5. Remove guide pins.

6. Install the control valve assembly attaching bolts and manual detent and roller assembly. Center roller on detent. See Figure 5-724.

NOTE: One bolt has copper washer. See Figure 5-508.

7. Tighten the solenoid and control valve attaching bolts. Torque bolts to 6-10 ft. lbs.

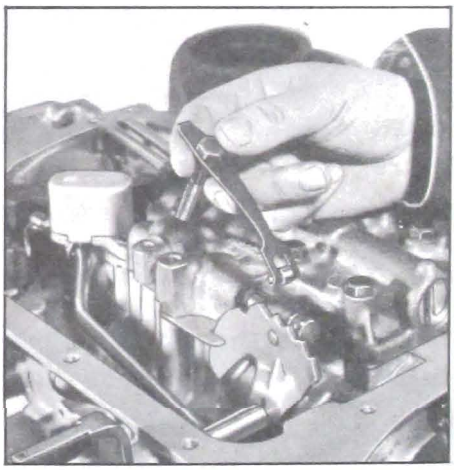

Figure 5-724

5-33 INSTALLATION OF STRAINER AND INTAKE PIPE

1. Install the case to intake pipe "O" seal ring on strainer and intake pipe assembly. See Figure 5-725.

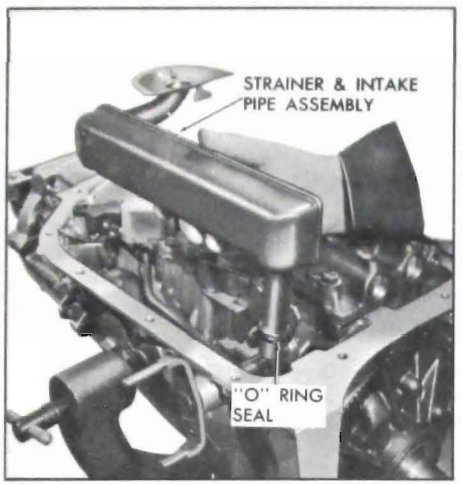

Figure 5-725

2. Install the strainer and intake pipe assembly.

3. Install a new bottom pan gasket and the bottom pan.

4. Install the modulator shield and all the bottom pan attaching screws. Torque bolts to 10-13 ft. lbs.

5-34 INSTALLATION OF MODULATOR VALVE AND VACUUM MODULATOR

1. Install the modulator valve into the case, stem end out. See Figure 5-726.

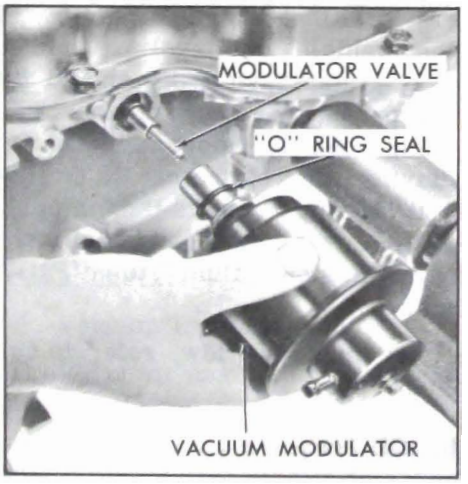

Figure 5-726

2. Install the "O" ring seal on the vacuum modulator.

3. Install the vacuum modulator into the case.

4. Install the modulator retainer and attaching bolt. Torque bolt to 15-20 ft. lbs. See Figure 5-727.

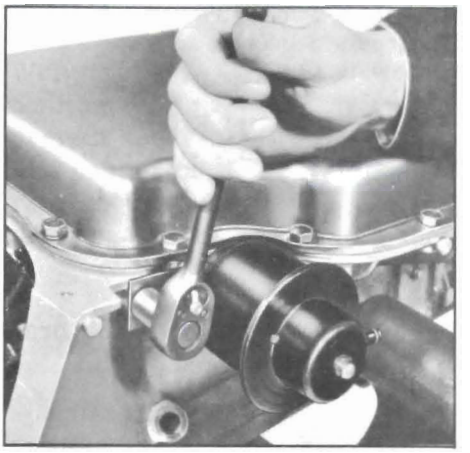

Figure 5-727

5-35 INSTALLATION OF GOVERNOR ASSEMBLY

1. Install the governor assembly into the case. See Figure 5-728.

2. Attach the governor cover and gasket with four (4) attaching bolts. Torque bolts to 15-20 ft. lbs. See Figure 5-730.

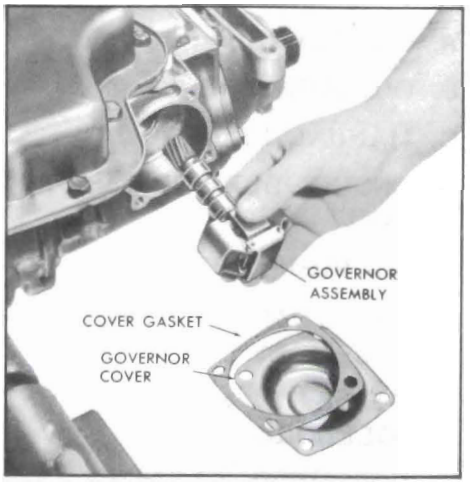

Figure 5-728

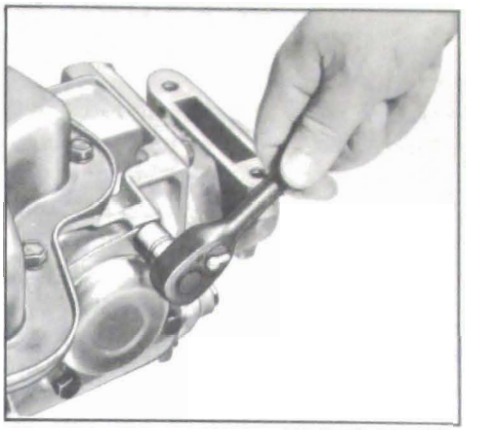

Figure 5-730

5-36 INSTALLATION OF SPEEDOMETER DRIVEN GEAR ASSEMBLY

1. Install the speedometer driven gear assembly. See Figure 5-731.

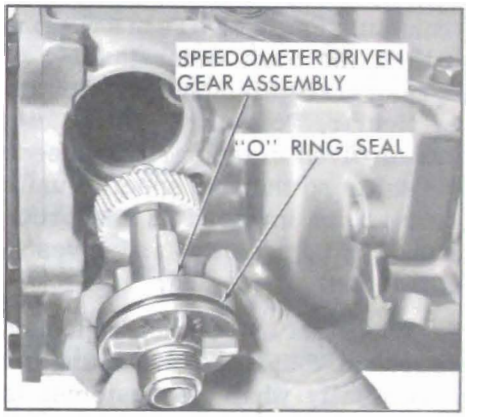

Figure 5-731

2. Install the speedometer driven gear retainer and attaching bolt. See Figure 5-732.

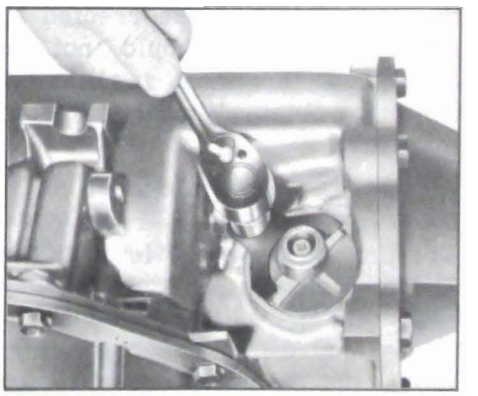

Figure 5-732