

SECTION 5-D

TRANSMISSION DISASSEMBLY AND REASSEMBLY

CONTENTS OF SECTION 5-D

Paragraph	Subject	Page	Paragraph	Subject	Page
5-8	Disassembly of Major Units	5-107	5-22	Center Support and Intermediate Clutch Disassembly, Inspection and Reassembly.	5-131
5-9	Removal of Governor, Speedometer Driven Gear, Pan, Strainer, and Intake Pipe	5-108	5-23	Inspection of Reaction Carrier, Rear Sprag and Output Carrier Assemblies	5-134
5-10	Removal of Control Valve Assembly, Governor Pipes and Detent Spring Assembly	5-109	5-24	Pinion Replacement Procedure Reaction and Output Carrier Assemblies	5-134
5-11	Removal of Rear Servo, Solenoid Connector, Valve Body Spacer, Gasket, Front Servo, Manual Detent and Park Linkage	5-109	5-25	Inspection of Output Shaft	5-134
5-12	Removal of Rear Oil Seal and Extension Housing	5-112	5-26	Assembly of Rear Unit	5-137
5-13	Removal of Oil Pump.	5-112	5-27	Assembly of Units Into Transmission Case	5-139
5-14	Disassembly of Gear Unit Assembly	5-115	5-28	Rear Extension Housing Assembly	5-142
5-15	Governor Assembly.	5-116	5-29	Install Manual Linkage	5-143
5-16	Front Servo Disassembly, Inspection and Reassembly.	5-117	5-30	Installation of Check Balls, Front Servo, Gaskets, Spacer and Solenoid	5-143
5-17	Rear Servo Disassembly, Inspection and Reassembly.	5-118	5-31	Installation of Rear Servo Assembly	5-144
5-18	Control Valve Assembly Disassembly, Inspection and Reassembly.	5-119	5-32	Installation of Control Valve Assembly and Governor Pipes	5-145
5-19	Oil Pump Disassembly, Inspection and Reassembly of Oil Pump	5-120	5-33	Installation of Strainer and Intake Pipe	5-145
5-20	Forward Clutch Disassembly, Inspection and Reassembly	5-125	5-34	Installation of Modulator Valve and Vacuum Modulator	5-145
5-21	Direct Clutch and Intermediate Sprag Disassembly, Inspection and Reassembly.	5-128	5-35	Installation of Governor Assembly.	5-146
			5-36	Installation of Speedometer Driven Gear Assembly	5-146

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 converter 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.

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



Figure 5-500

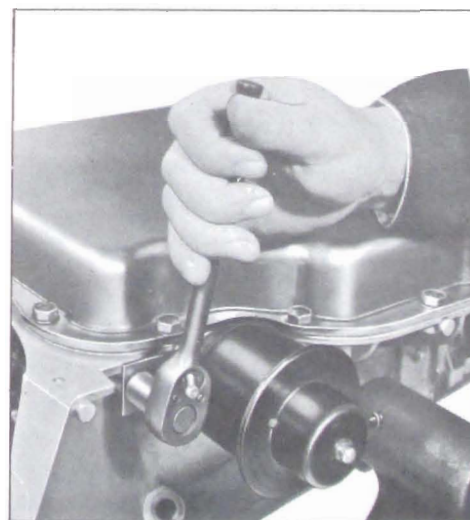


Figure 5-501

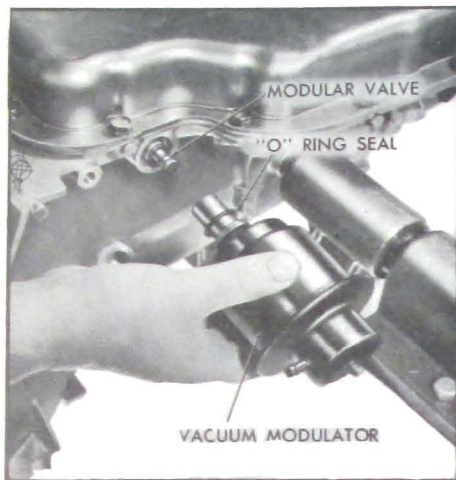


Figure 5-502

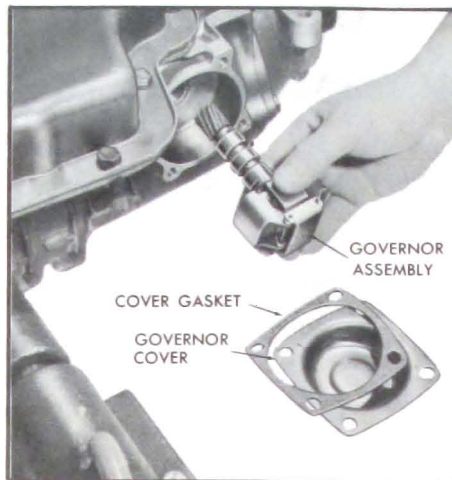


Figure 5-504

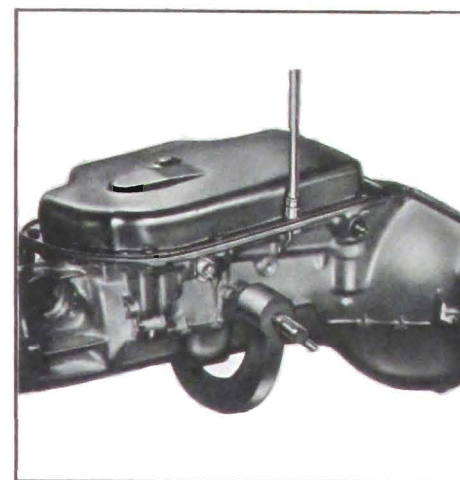


Figure 5-507

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.

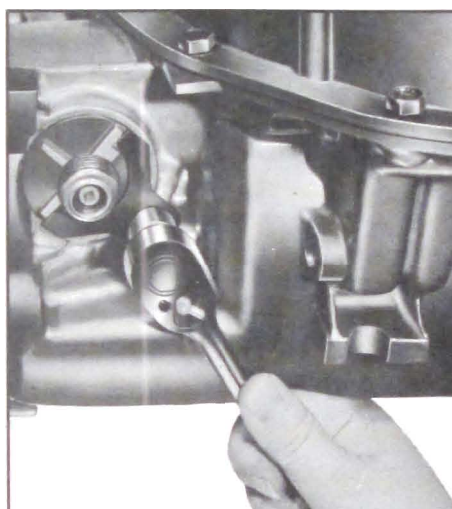


Figure 5-505

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

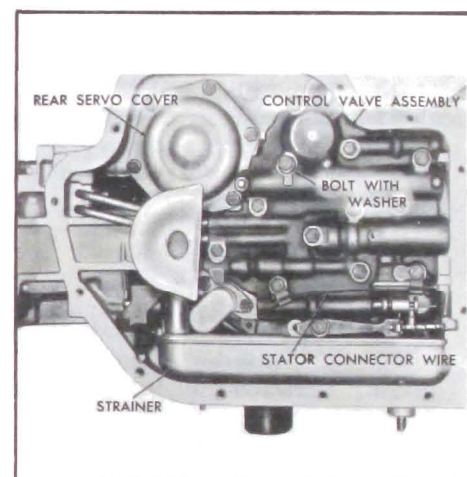


Figure 5-508

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

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

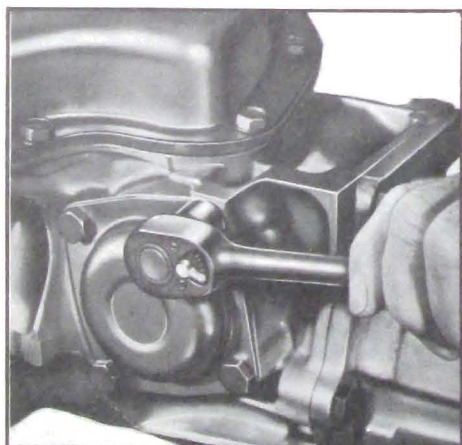


Figure 5-503

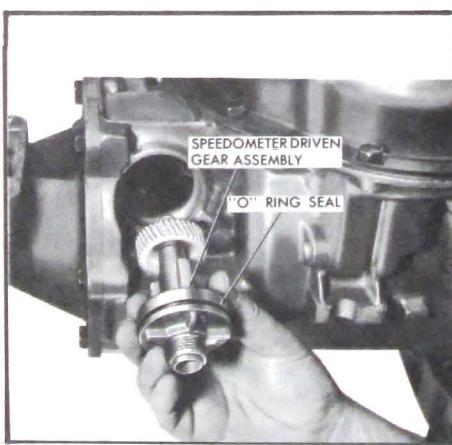


Figure 5-506

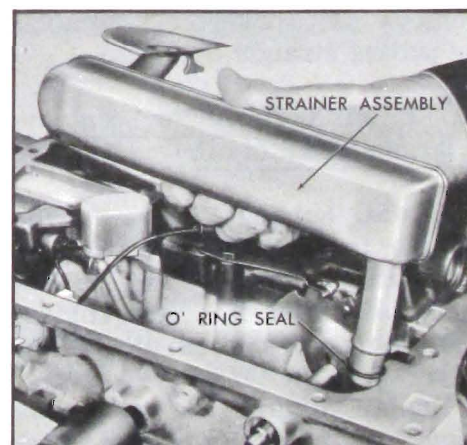


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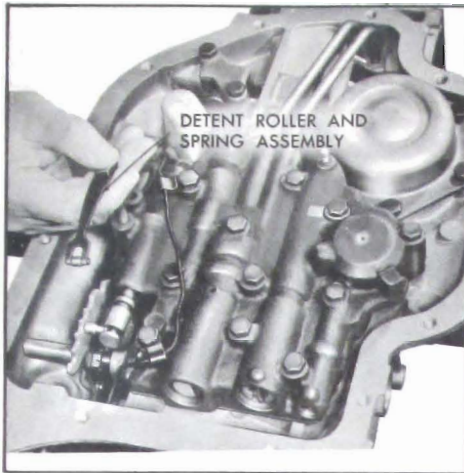


Figure 5-511

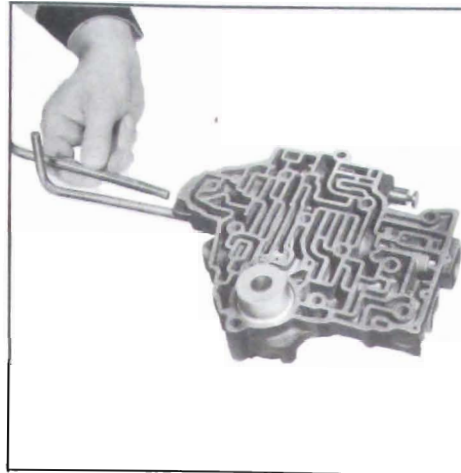


Figure 5-513

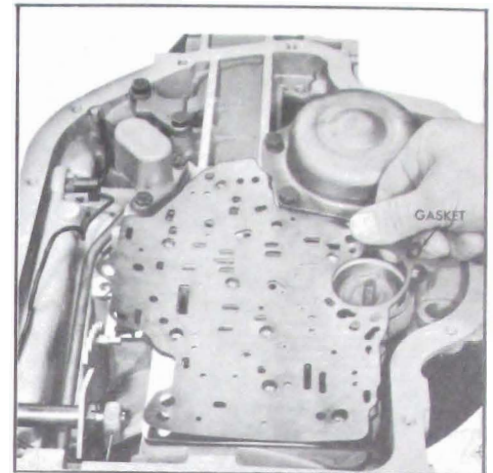


Figure 5-515

7. Remove the pump intake pipe and strainer assembly. See 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.

NOTE: Do not remove solenoid attaching screws and leave clips attached to wire.

2. Remove the control valve body assembly and governor pipes. See 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.

4. Remove the control valve assembly to spacer gasket. See Figure 5-515.

5. Disconnect stator connector from case sleeve connector. See Figure 5-514.

6. Disconnect detent electric wire (short) from stator connector.

NOTE: Do not remove electric wire long from stator connector.

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 5-516.

2. Remove the rear servo assembly from the case. See Figure 5-517.

3. Remove the servo accumulator spring. See Figure 5-518.

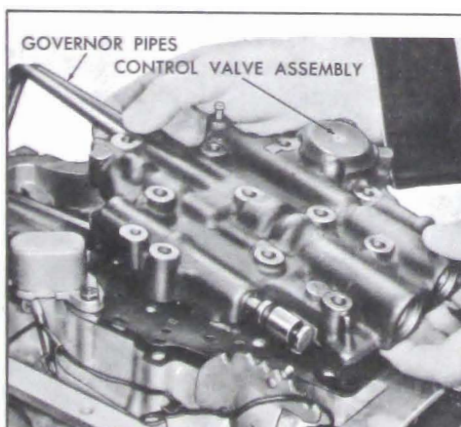


Figure 5-512

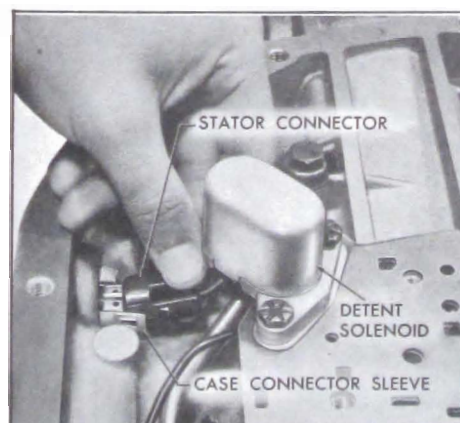


Figure 5-514



Figure 5-516

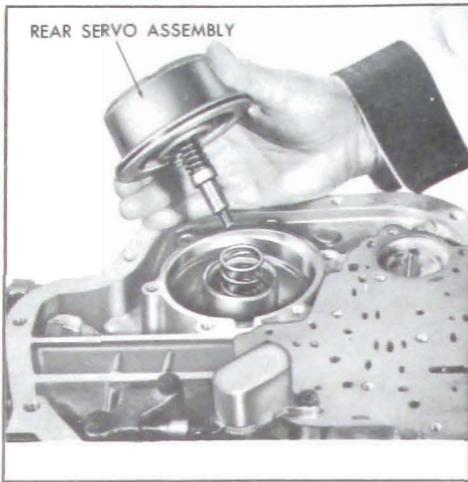


Figure 5-517

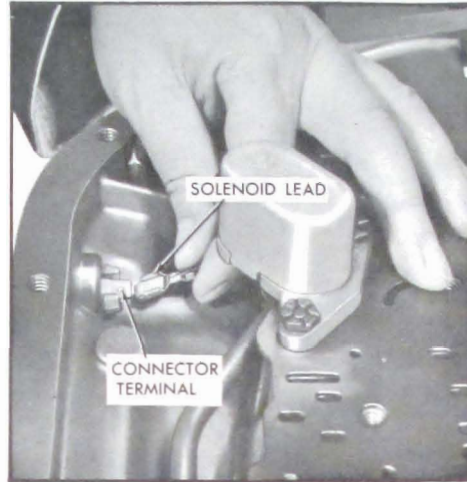


Figure 5-519

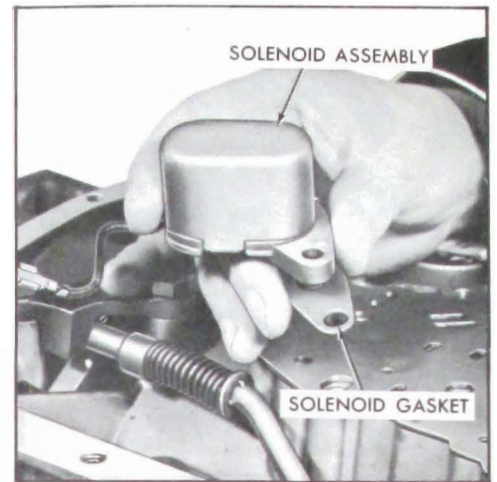


Figure 5-522

4. Disconnect solenoid lead from connector terminal. See Figure 5-519.

5. Check band apply Pin.

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

b. Apply 25 ft. lb. torque and select proper pin to be used during assembly of transmission. See Figure 5-520.

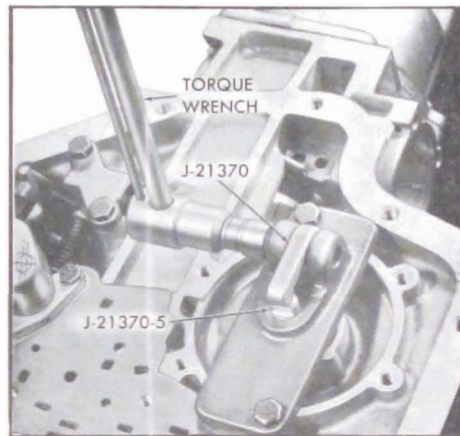


Figure 5-520

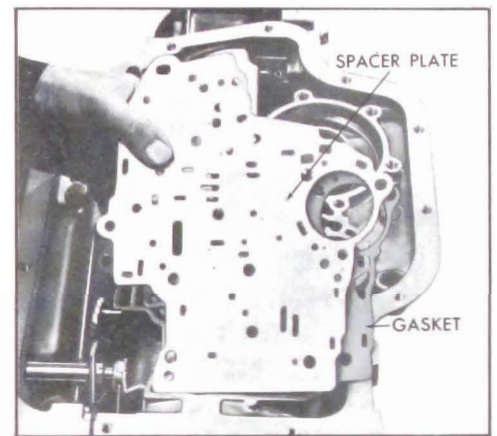


Figure 5-523

There are three selective pins identified as follows:

<u>Pin Identification</u>	<u>Pin Size</u>
3 Rings	Long
2 Rings	Medium
1 Ring	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.

6. Compress fingers on connector and withdraw connector and "O" ring seal. See Figure 5-521.

7. Remove the solenoid attaching screws, solenoid assembly and gasket. See Figure 5-222.

8. Remove the control valve assembly spacer plate and gasket. See Figure 5-523.

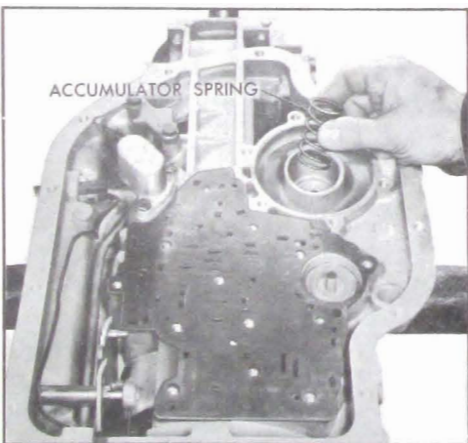


Figure 5-518



Figure 5-521

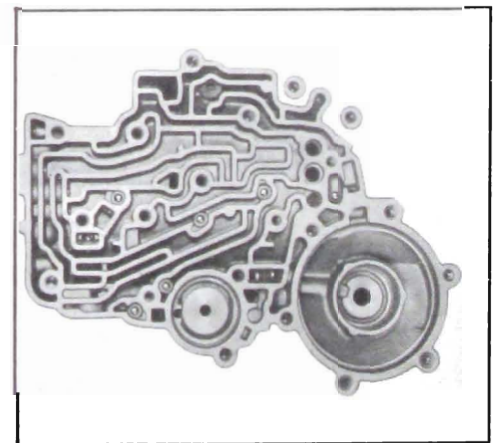


Figure 5-524

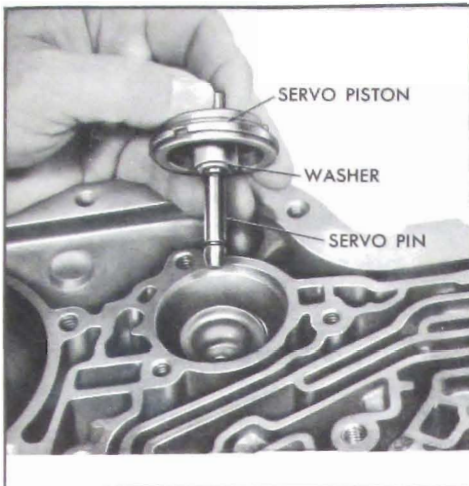


Figure 5-525

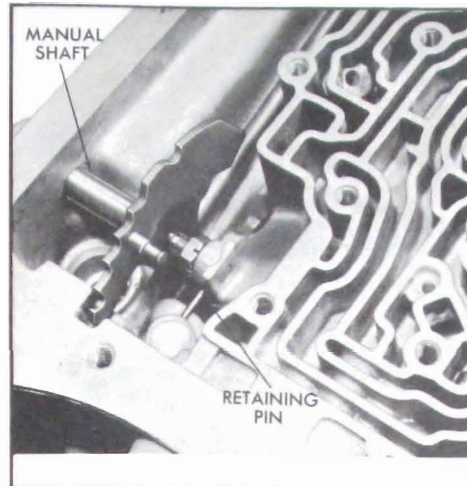


Figure 5-527

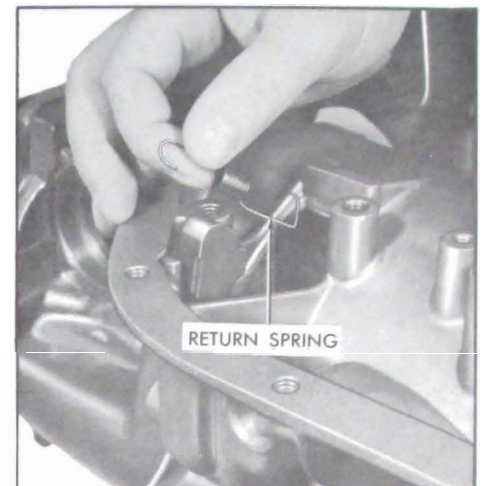


Figure 5-530

9. Remove six (6) check balls from cored passages in transmission case. See Figure 5-524.

10. Remove front servo piston, washer, pin, retainer and spring from transmission. See Figure 5-525.

11. If it becomes necessary to remove the internal manual linkage proceed as follows:

a. Unthread the jam nut holding detent lever to manual shaft. See Figure 5-526.

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

b. Remove manual shaft retaining pin from case. See Figure 5-527.

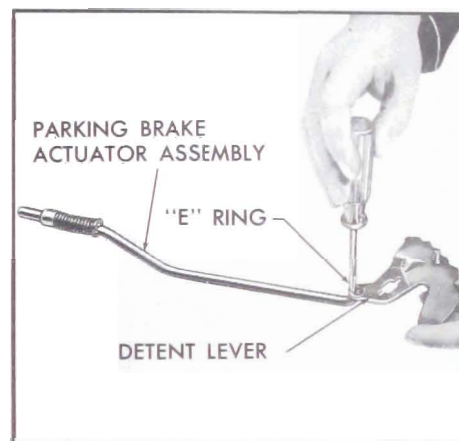


Figure 5-528

c. Remove the detent lever from the manual shaft.

d. Remove the manual shaft and jam nut from case.

NOTE: If necessary to replace, pry the manual shaft seal out of case.

e. Remove parking actuator rod and detent lever assembly.

f. If necessary, remove the detent lever retaining "E" ring and detent lever. See Figure 5-528.

g. Remove attaching screws and parking bracket. See Figure 5-529.

h. Remove parking pawl return spring. See Figure 5-530.

i. Remove parking pawl shaft retainer. See Figure 5-531.

j. Remove parking pawl shaft, "O" ring seal and parking pawl. See Figure 5-532.

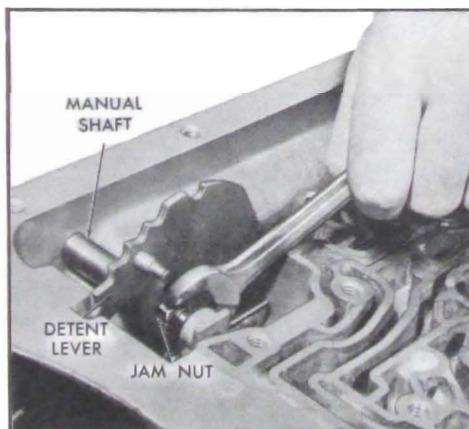


Figure 5-526

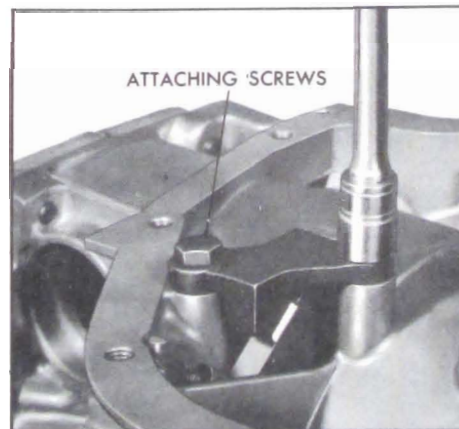


Figure 5-529

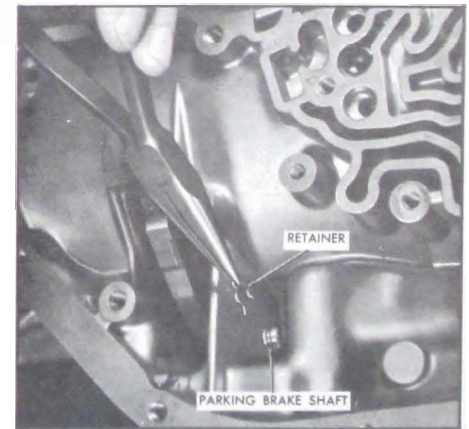


Figure 5-531

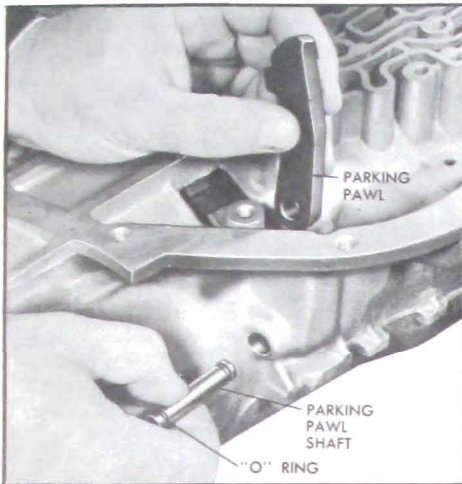


Figure 5-532

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 5-533.
2. Remove extension housing to case attaching bolts. See Figure 5-534.
3. Remove the extension housing and extension housing to case seal. See Figure 5-535.
4. Make front unit end play as follows:
 - a. Remove one front pump attaching bolt and bolt seal.

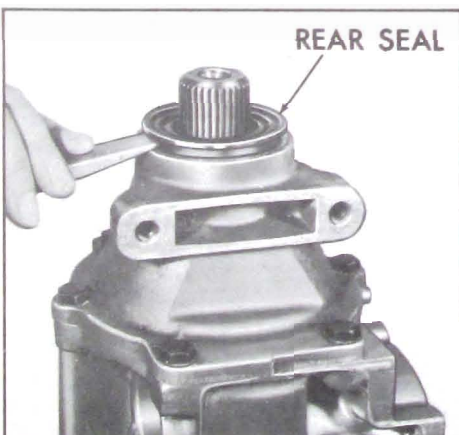


Figure 5-533

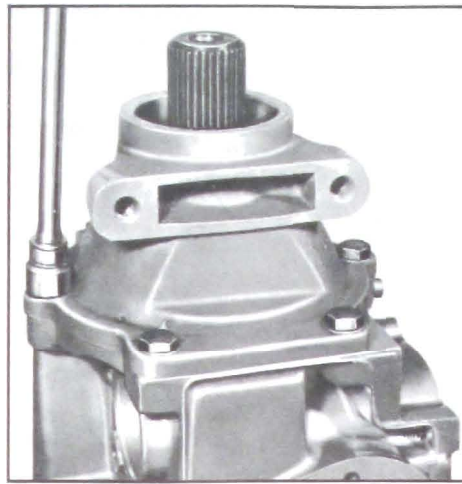


Figure 5-534

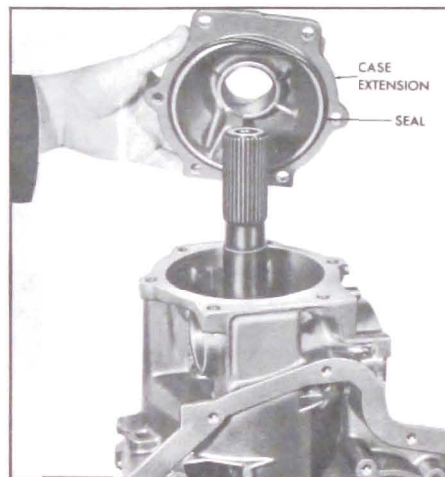


Figure 5-535

- b. Install a 5/16-18 threaded slide hammer bolt or J-7004, into bolt hole in pump. (See illustration for location).
- c. Mount dial indicator on the

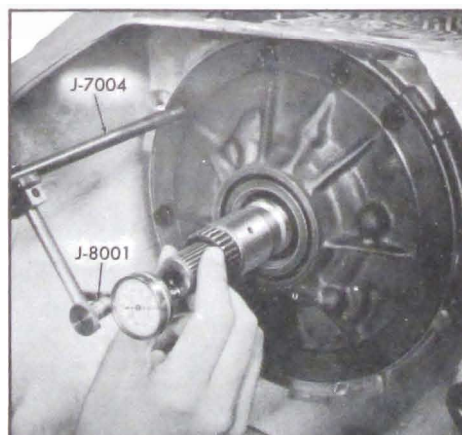


Figure 5-536

rod and index indicator to register with end of turbine shaft. See Figure 5-536.

- d. Push on turbine shaft rearward.
- e. Push output shaft forward.
- f. Set dial indicator to Zero.
- g. Pull turbine shaft forward.

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.

Thickness	Color
.060-.064	Yellow
.071-.075	Blue
.082-.086	Red
.093-.097	Brown
.104-.108	Green
.115-.119	Black
.126-.130	Purple

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

5-13 REMOVAL OF OIL PUMP

1. If necessary to replace, pry front seal from pump. See Figure 5-537.
2. Remove the pump attaching bolts. See Figure 5-538.
3. Install 5/16-18 threaded side Hammers, J-7004, into bolt holes in the pump body and remove. See Figure 5-539 pump assembly from case. (See illustration for location of threaded holes.)

NOTE: As pump is removed guide electrical wire and connector from transmission case.

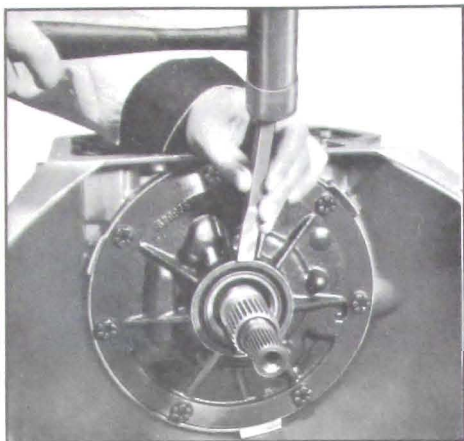


Figure 5-537

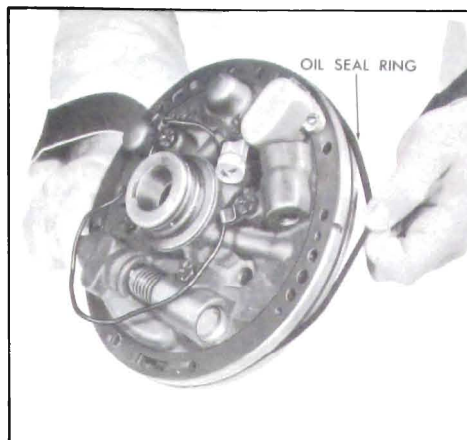


Figure 5-540

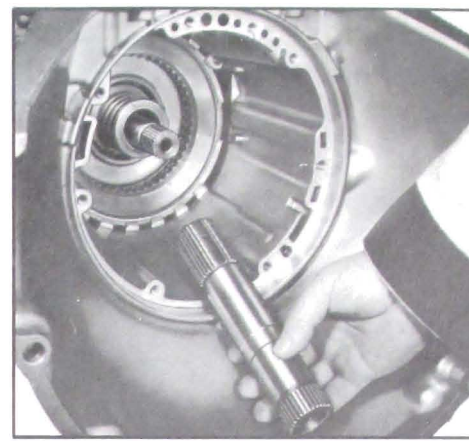


Figure 5-543

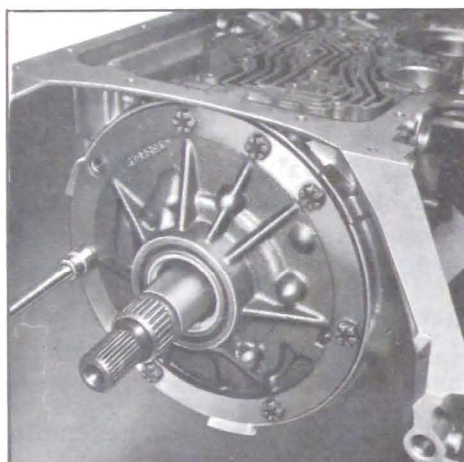


Figure 5-538

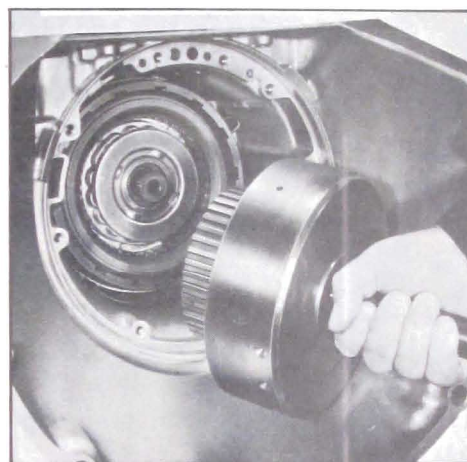


Figure 5-541

4. Remove and discard pump to case seal ring. See Figure 5-540.

5. Remove forward clutch and turbine shaft assembly from transmission. See Figure 5-541.

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

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

8. Remove the front band assembly.

9. Remove the sun gear shaft. See Figure 5-543.

10. Check rear end play as follows:

a. Install J-7004 with 3/16 adapter into an extension housing attaching bolt hole.

b. Mount the dial indicator, J-8001 on the rod and index with the end of the output shaft. See Figure 5-544.

c. Move 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

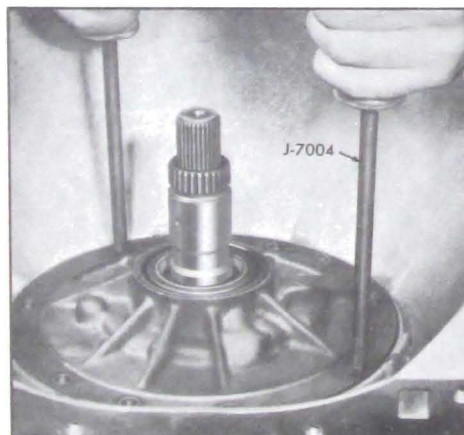


Figure 5-539

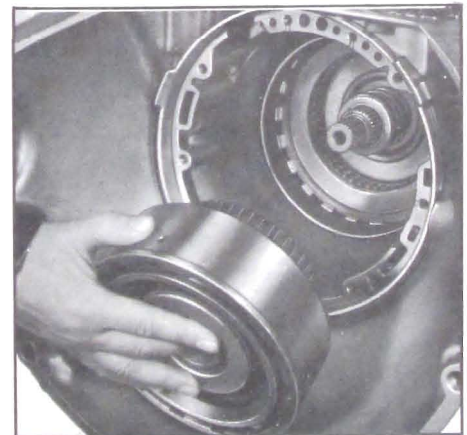


Figure 5-542

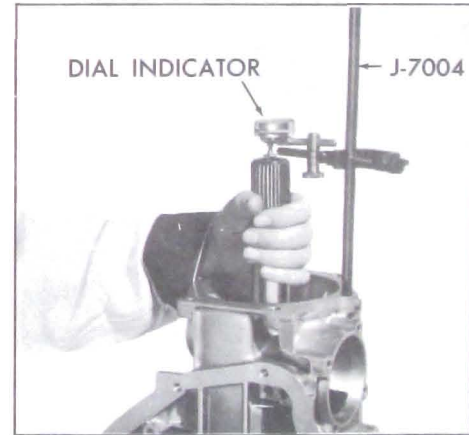


Figure 5-544

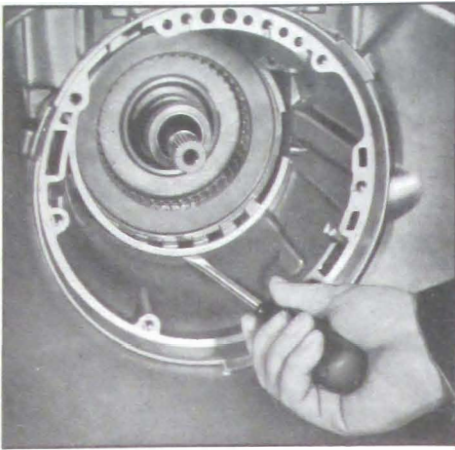


Figure 5-545

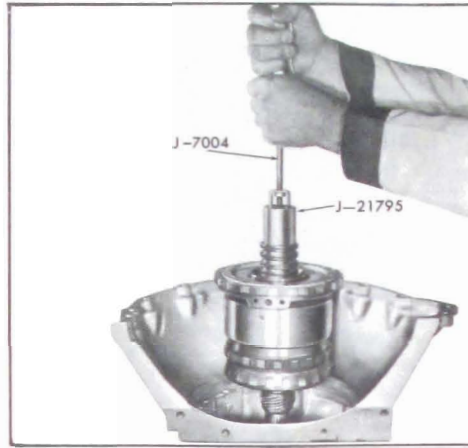


Figure 5-548



Figure 5-551

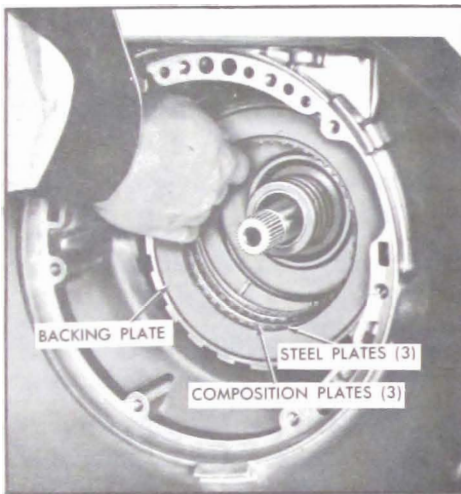


Figure 5-546

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.

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

11. Remove the case center support to case bolt.

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

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

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

15. Remove the entire gear unit assembly by lifting with Gear Assembly Installing and Removing Tool J-21795 with J-7004 Slide Hammer. See Figure 5-548.

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

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

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

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

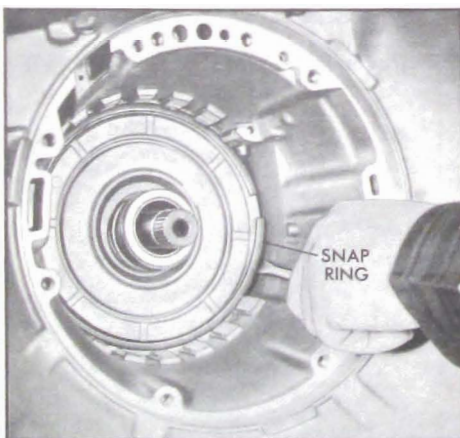


Figure 5-547



Figure 5-550

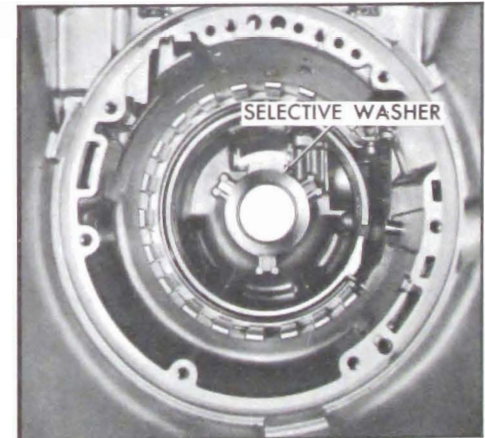


Figure 5-552

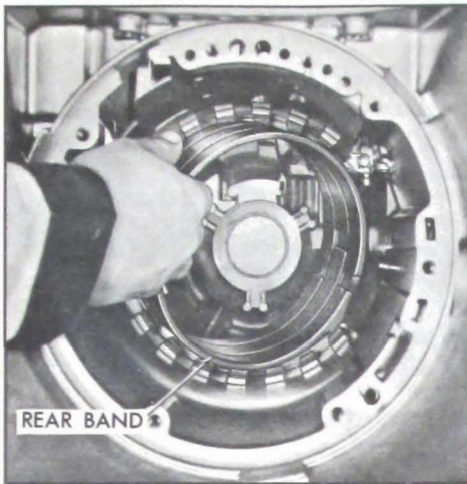


Figure 5-553



Figure 5-555

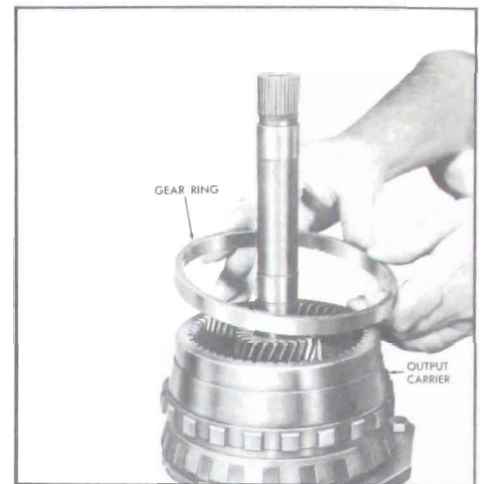


Figure 5-558

5-14 DISASSEMBLY OF GEAR UNIT ASSEMBLY

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

2. Remove the center support to reaction carrier bronze thrust washer. See 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.

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

5. Remove front internal gear ring from output carrier assembly. See Figure 5-558.



Figure 5-556



Figure 5-560

6. Remove sun gear. See Figure 5-560.

7. Remove reaction carrier to output carrier thrust washer. See Figure 5-561.

8. Turn assembly over and place mainshaft in hole in work bench.

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



Figure 5-554

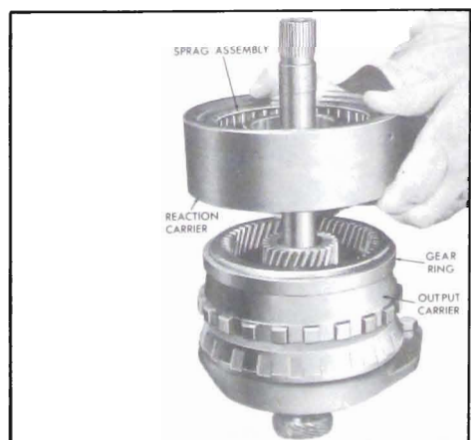


Figure 5-557



Figure 5-561

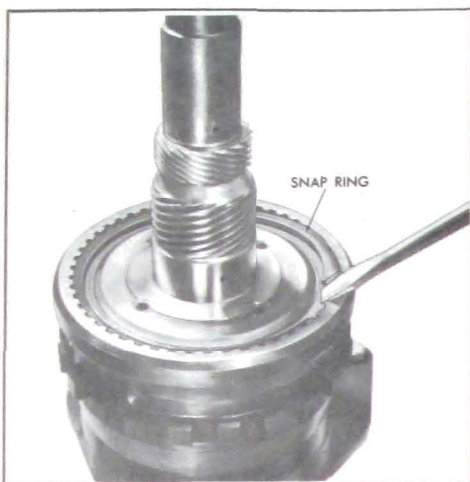


Figure 5-562



Figure 5-564

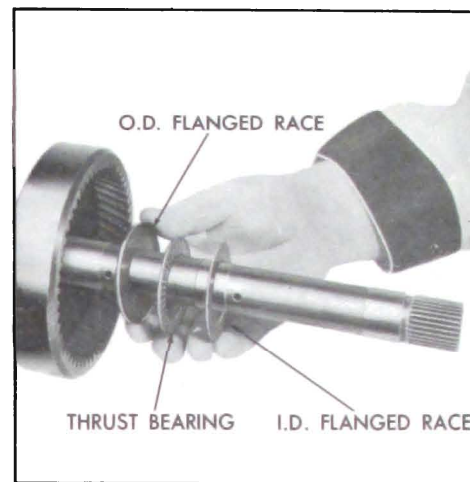


Figure 5-567

10. Remove output shaft.

NOTE: If replacement of the drive speed 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 speed gear. See Figure 5-563.

b. Install new speedo drive and drive to approximately 5.6". See Figure 5-564.

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

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

NOTE: Do not drop bearings.

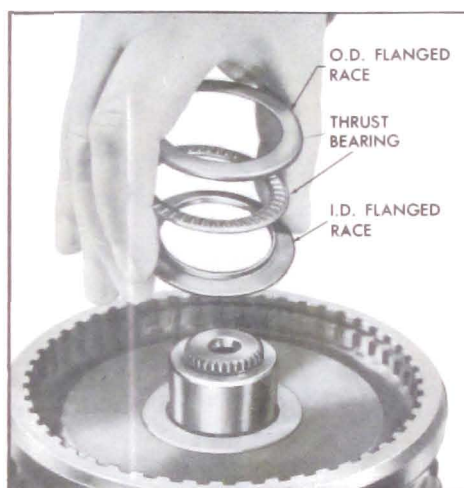


Figure 5-565

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

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

5-15 GOVERNOR ASSEMBLY

All components of the governor assembly, with the exception of the driven gear, are a select fit and each assembly is calibrated. The governor, including the driven gear, is serviced as a complete assembly. However, the driven gear can also be serviced separately.

It is necessary to disassemble the governor assembly in order to replace the driven gear. Disassembly may also be necessary

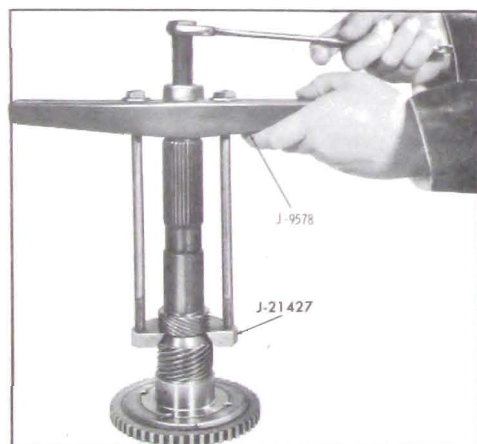


Figure 5-563

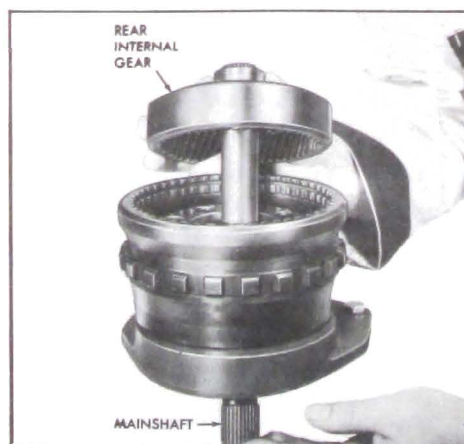


Figure 5-566

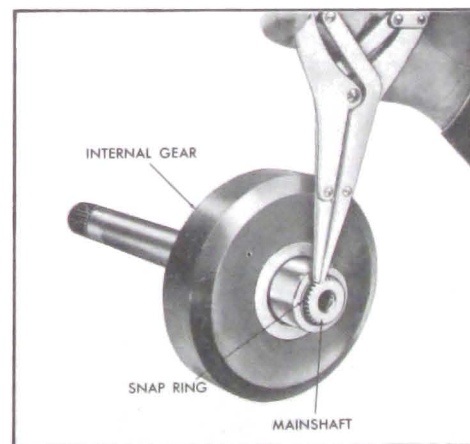


Figure 5-568

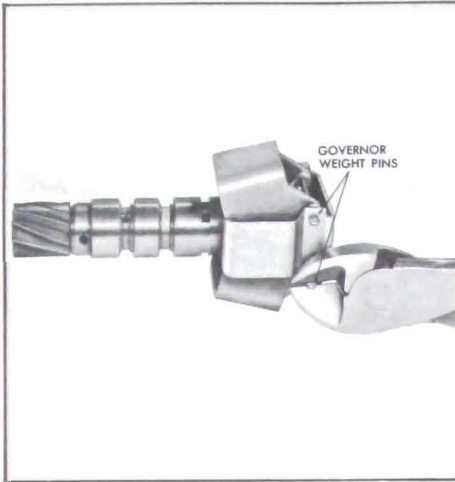


Figure 5-569

due to foreign material causing improper operation. In such cases, proceed as follows:

a. Disassembly

1. Cut off one end of each governor weight pin and remove pins, governor thrust cap, governor weights, and springs. Governor weights are interchangeable from side to side and need not be identified. See Figure 5-569.

2. Remove governor valve from governor sleeve. Be careful not to damage valve.

3. Perform the following inspections and replace governor driven gear, if necessary.

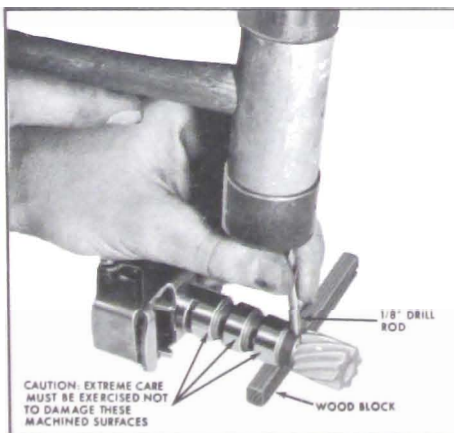


Figure 5-570

b. Inspection

1. Wash all parts 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 on governor sleeve.
8. Inspect governor weight springs for distortion or damage.
9. Check governor weights for free operation in their retainers.
10. Check valve opening at entry and exhaust (.020 inch minimum.)

c. Governor Driven Gear Replacement

To facilitate governor repair in the field, a governor driven gear and replacement pins are available for service use. The service package contains a nylon driven gear, two governor weight retaining pins and one governor gear retainer split pin. Replacement of gear must be performed with care in the following manner:

1. Drive out governor gear retaining split pin using small punch. See Figure 5-570.
2. Support governor on 3/16 inch plates installed in exhaust slots of governor sleeve, place in arbor press, and with a long punch, press gear out of sleeve.
3. Carefully clean governor sleeve of chips that remain from original gear installation.

4. Support governor on 3/16 inch plates, install in exhaust slots of sleeve, position new gear in sleeve and, with a suitable socket, press gear into sleeve until nearly seated. Carefully remove any chips that may have shaved off gear hub and press gear in until it bottoms on shoulder.

5. A new pin hole must be drilled through sleeve and gear. Locate hole position 90° from existing hole, center punch, and then while supporting governor in press, drill new hole through sleeve and gear using a standard (1/8 inch) drill.

6. Install retaining pin.

7. Wash governor assembly thoroughly to remove any chips that may have collected.

d. Assembly

1. Install governor valve in bore of governor sleeve.

2. Install governor weights and springs, and thrust cap on governor sleeve.

3. Align pin holes in thrust cap, governor weight assemblies and governor sleeve, and install new pins. Crimp both ends of pin to prevent them from falling out.

4. Check governor weight assemblies for free operation on pins.

5-16 FRONT SERVO INSPECTION

a. 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.

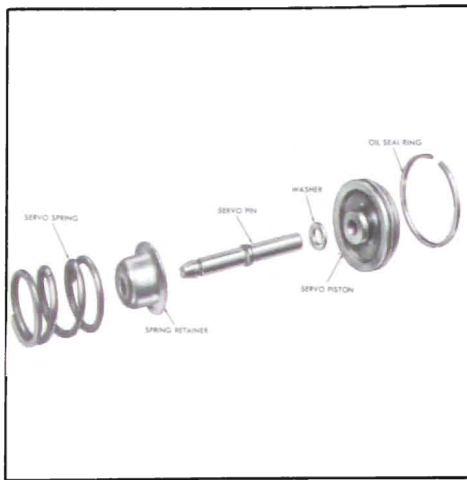


Figure 5-571

3. Inspect piston for cracks or porosity.

4. Check fit of servo pin in piston.

5-17 REAR SERVO DISASSEMBLY, INSPECTION AND REASSEMBLY

a. Disassembly

1. Remove the rear accumulator piston from rear servo piston.
2. Remove "E" ring retaining rear servo piston to band apply pin. See Figure 5-572.
3. Remove rear servo piston and seal from band apply pin. See Figure 5-573.

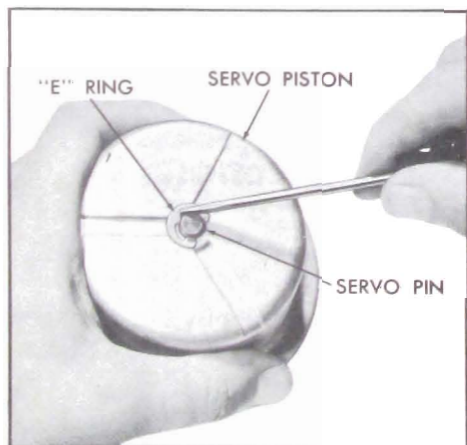


Figure 5-572



Figure 5-573

4. Remove washer, spring and retainer.

b. Inspection

1. Inspect freedom of accumulator ring in piston.
2. Inspect fit of band apply pin in servo piston.
3. Inspect band apply pin for scores and cracks.

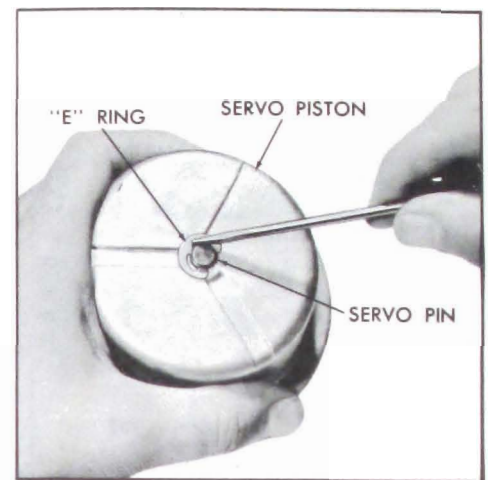


Figure 5-575

c. Reassembly

1. Install spring retainer, spring and washer on band apply pin. See Figure 5-574.
2. Install band apply pin retainer, spring and washer, into bore of servo piston and secure with "E" ring. See Figure 5-575.
3. Install oil seal ring on servo piston, if removed.

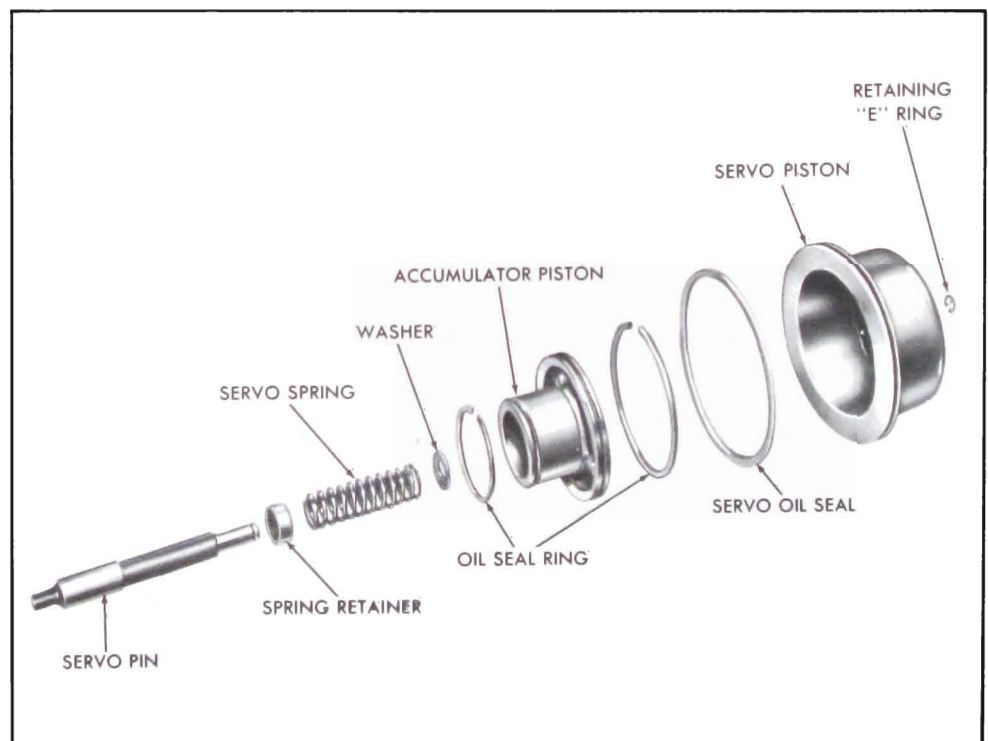


Figure 5-574

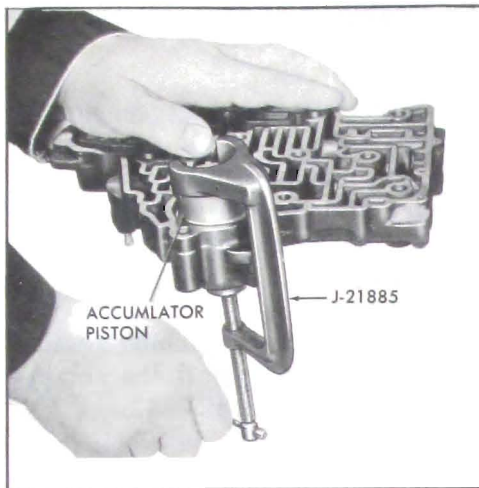


Figure 5-576

4. Install outer and inner oil rings on accumulator piston, if removed, and assemble into bore of servo piston.

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.
2. Remove manual valve from upper bore.
3. Install special tool J-21885, on accumulator piston valve and re-

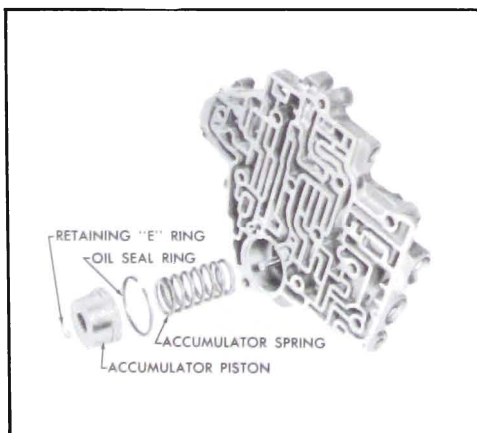


Figure 5-577

move retaining ring. See Figure 5-576.

4. Remove front accumulator piston and spring. See Figure 5-577.
5. On the right side, top bore, remove the retaining pin, 1-2 modulator bushing, 1-2 regulator valve, and 1-2 regulator spring. See Figure 5-582.
6. Remove the 1-2 detent valve and 1-2 valve. See Figure 5-582.
7. From the next bore, remove the retaining pin and 2-3 valve spring, 2-3 modulator bushing valve, and 3-2 intermediate spring. See Figure 5-582.
8. Remove the 2-3 valve. See Figure 5-582.
9. From the next bore remove the retaining pin, bore plug, 3-2 valve and spacer. See Figure 5-582.
10. At the other end of the assembly, top bore, remove the retaining pin and bore plug. See Figure 5-582.
11. Remove the detent valve, detent regulator valve, spring and spacer. See Figure 5-582.
12. In the next bore, check the operation of the 1-2 accumulator valve train by compressing the valve against the springs. See Figure 5-582.

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

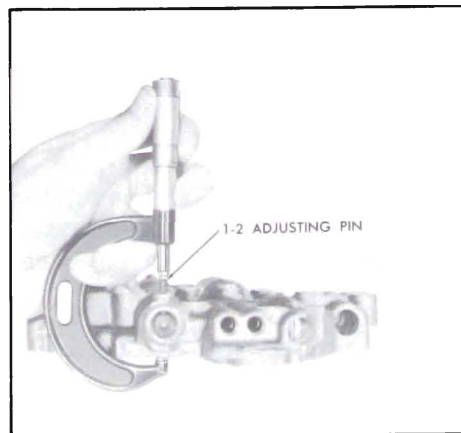


Figure 5-578

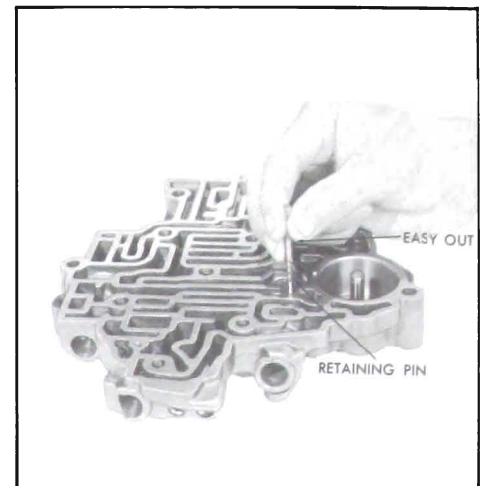


Figure 5-580

13. If removal is necessary, the exact position of the adjusting screw is determined before removal by using 1" to 2" micrometer and measuring from the top to the adjusting screw (remove burrs from adjusting screw) to the machined surface of the valve body and remove the screw if necessary. See Figure 5-578.
14. Remove the 1-2 accumulator secondary valve retainer pin from the machined face of the valve body with an easy-out type extractor and the 1-2 accumulator plug. See Figure 5-580.
15. Remove 1-2 accumulator bushing, secondary spring, and secondary valve.
16. From the same bore, remove the primary 1-2 accumulator valve and spring.

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.
4. Check all springs for distortion or collapsed coils.

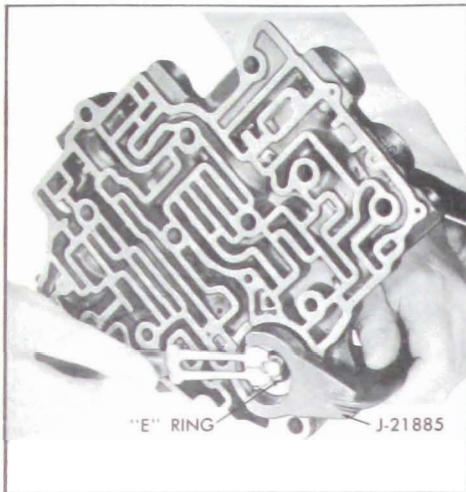


Figure 5-581

c. Reassembly

1. Install front accumulator spring and piston into valve body.
2. Install special Tool J-21885, and compress spring and piston and secure with retaining "E" ring. See Figure 5-581.

NOTE: Align piston and ring when entering bore.

3. If the 1-2 accumulator valve train was removed, install the 1-2 primary spring in the 1-2 primary valve into bore using a retaining pin as a retractor to hold the spring and valve in its operating position until bushing and 1-2 accumulator valve and spring is installed. See Figure 5-582.

4. Install the 1-2 accumulator secondary valve (wide land first)

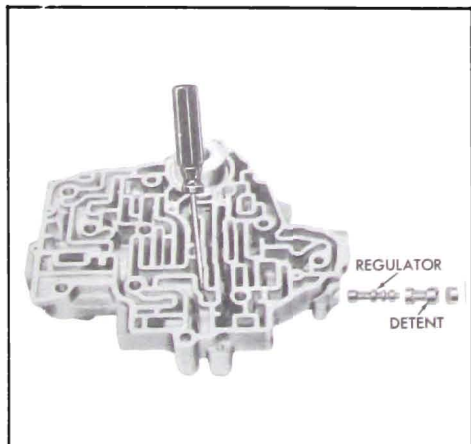


Figure 5-581A

into the 1-2 accumulator bushing. See Figure 5-582.

5. Install the 1-2 accumulator valve bushing into the bore.
6. Install retaining pin to hold 1-2 accumulator secondary valve.
7. Install the 1-2 accumulator valve, secondary spring and 1-2 accumulator plug into the bushing. See Figure 5-582.

8. Install adjusting screw and relocate to the measured position on removal.

9. In the next bore up, install the detent spring and spacer. Compress spring and secure with small screwdriver. See Figure 5-581A.

10. Install the detent regulator valve. Wide land first. See Figure 5-582.

11. Install the detent valve, narrow land first. See Figure 5-582.

12. Remove the screwdriver as the bore plug (hole out) and retaining pin are installed. See Figure 5-582.

13. In the lower right hand bore, install the 3-2 valve. See Figure 5-582.

14. Install the spacer, bore plug (hole out) and retaining pin. See Figure 5-582.

15. In the next bore up, install the 2-3 valve, stem end out, and 3-2 intermediate spring. See Figure 5-582.

16. Install the 2-3 modulator valve into the bushing and install both parts into the valve bore. See Figure 5-582.

17. Install the 2-3 valve spring, and install the retaining pin. See Figure 5-582.

18. In the next bore, install the

1-2 valve, stem end out. See Figure 5-582.

19. Install the 1-2 regulator valve, spring and detent valve, into the bushing, aligning spring in bore of detent valve, and install parts into the valve bore. See Figure 5-582.

20. Compress the bushing against the spring and install the retaining pin. See Figure 5-582.

21. Install the manual valve with detent pin groove to the right. See Figure 5-582.

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

a. Disassembly

1. Remove stator solenoid attaching bolts and solenoid and pump to case gasket. See Figure 5-583.
2. Place pump assembly in hole in bench.
3. Compress the regulator boost valve bushing against the pressure regulator spring and remove the snap ring, using J-5403 pliers. See Figure 5-584.

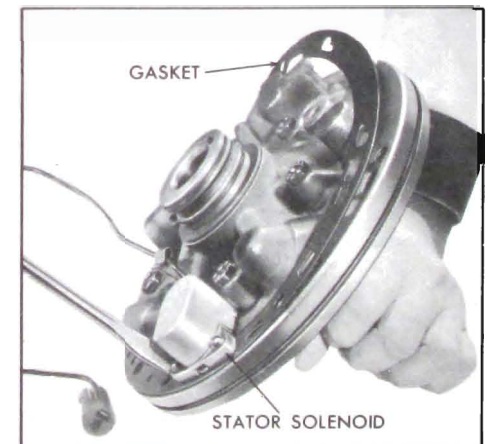


Figure 5-583

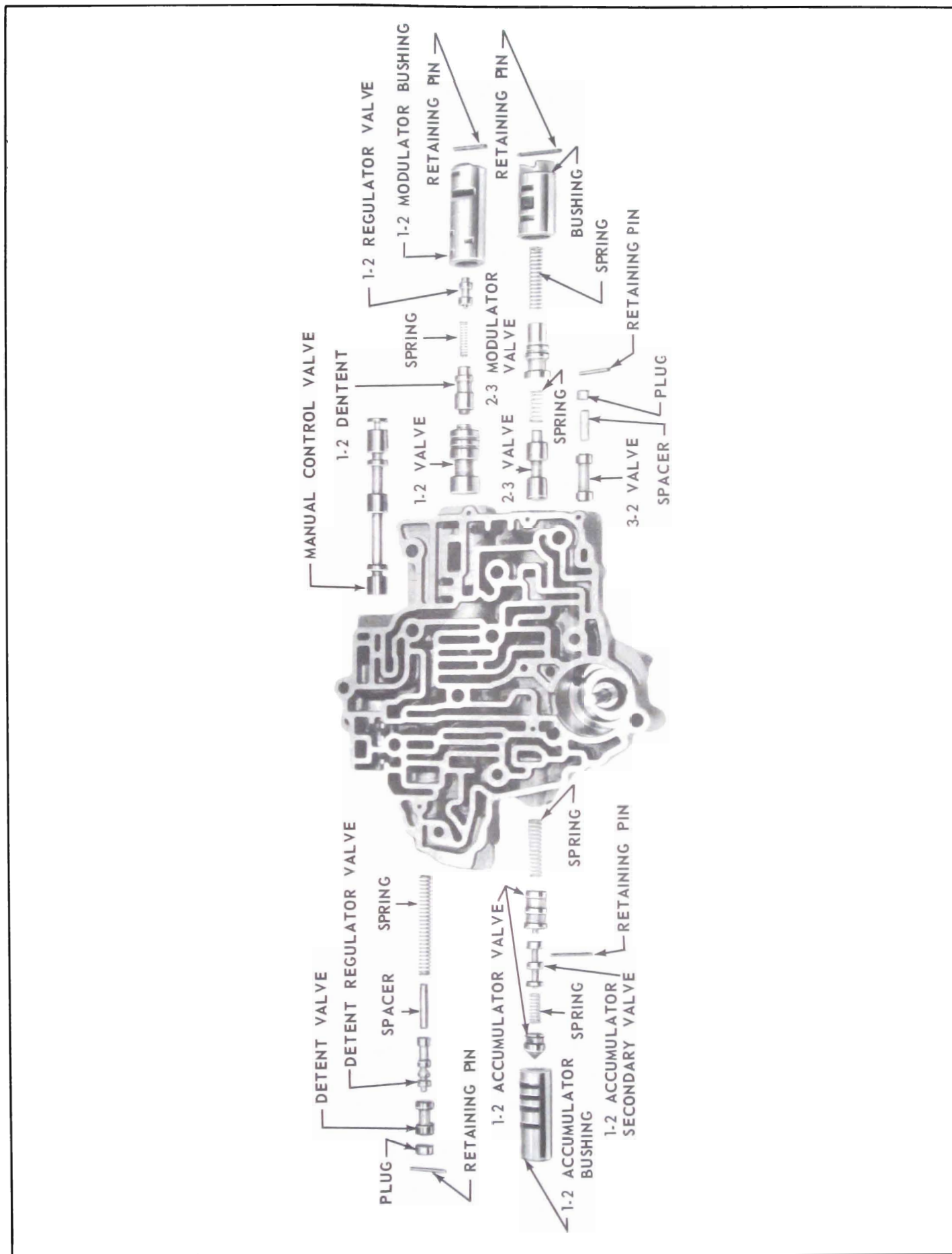


Figure 5-582

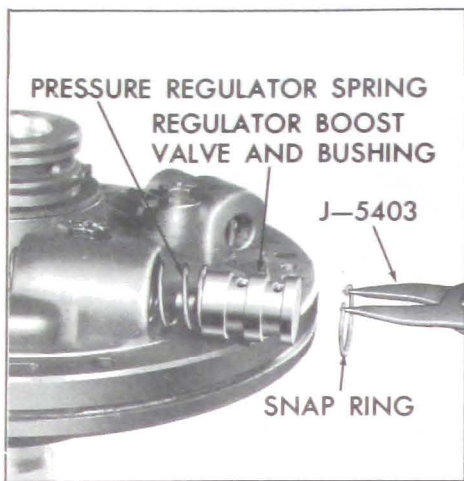


Figure 5-584

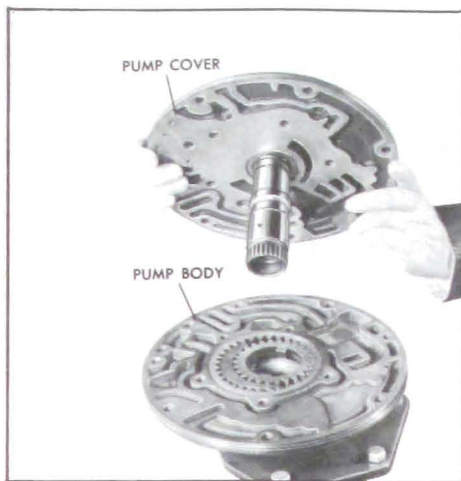


Figure 5-587



Figure 5-590

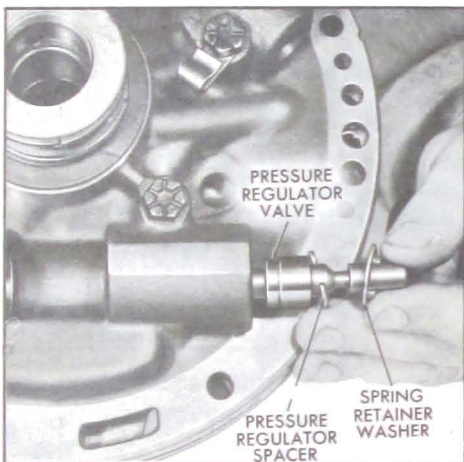


Figure 5-585

6. Remove the regulator valve, spring retainer and spacer(s), if present. See Figure 5-585.

7. Remove the pump cover to body attaching bolts. See Figure 5-586.

8. Remove pump cover from body. See Figure 5-587.

9. Remove the retaining pin and bore plug from the pressure regulator bore. See Figure 5-588.

10. Remove the stator valve retaining pin. See Figure 5-590.

11. Remove stator valve and spring. See Figure 5-591.

12. Remove the hook type oil rings from the pump cover. See Figure 5-592.

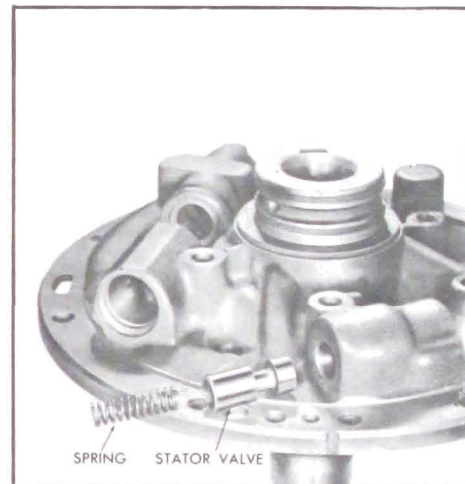


Figure 5-591

4. Remove the regulator boost valve bushing and valve.

5. Remove the pressure regulator spring.

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

NOTE: Do not remove the cooler by-pass seat, unless replacement



Figure 5-586

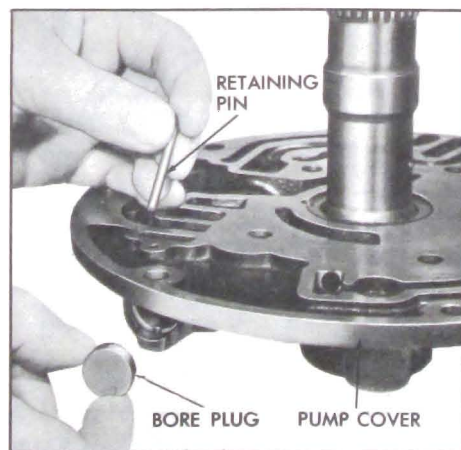


Figure 5-588

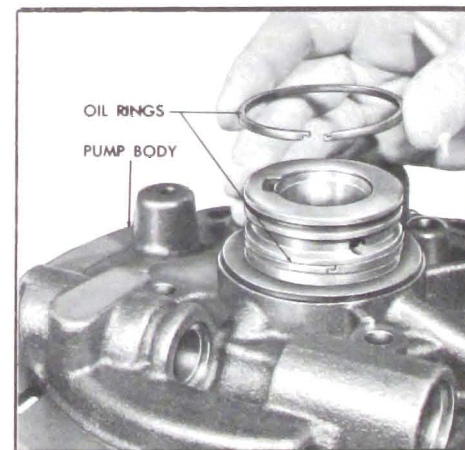


Figure 5-592

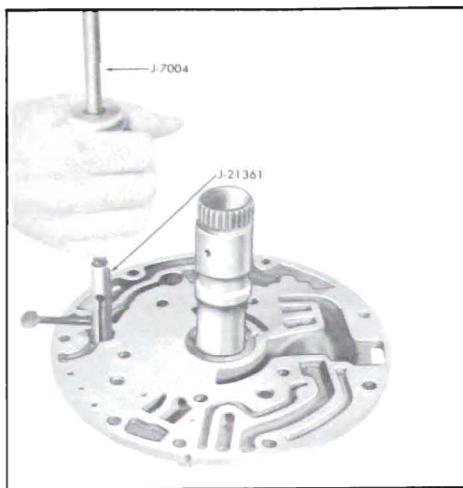


Figure 5-593

of the seat, valve or spring is necessary.

14. If necessary, remove the by-pass valve seats using Tool J-21361, attached to a slide hammer or J-7004. See Figure 5-593.

15. Remove the by-pass valve and spring.

16. Mark drive and driven gears for reassembly and remove drive gear. See Figure 5-594.

17. Remove driven gear from pump body. See Figure 5-595.

b. Inspection of Pump Body and Pump Cover

1. Inspect the gear pocket and crescent for scoring, galling or other damage. See Figure 5-596.

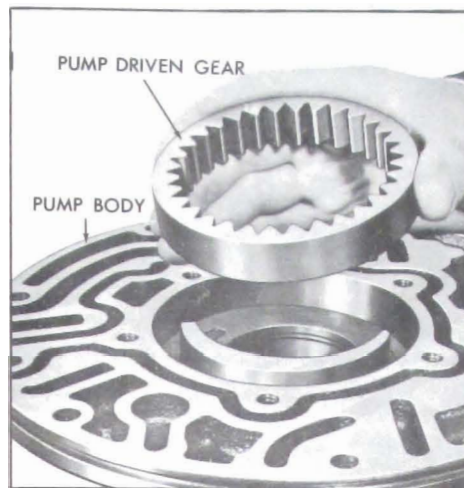


Figure 5-595

2. Place pump gears in pump and check the following clearance.

a. Pump body face to gear face clearance. Clearance should be .0008"-.0015". See Figure 5-597.

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

4. Check oil passages.

5. Check for damaged cover bolt attaching threads.

6. Check for overall flatness of pump body face.

7. Check bushing for scores or nicks. If damaged replace as follows:

a. Support oil pump on wood blocks. Using Tool J-21465-17 and Drive Handle J-8092 press bushing out of oil pump body.

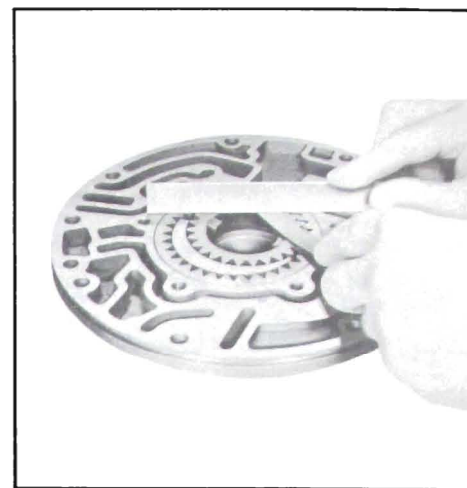


Figure 5-597

b. Using Tool J-21465-17 screw bushing into pump body until it is flush with top of front pump hub.

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

9. Inspect pump cover face for over all flatness. See Figure 5-598.

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

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

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

13. Inspect stator shaft for damaged splines, or scored bushings.

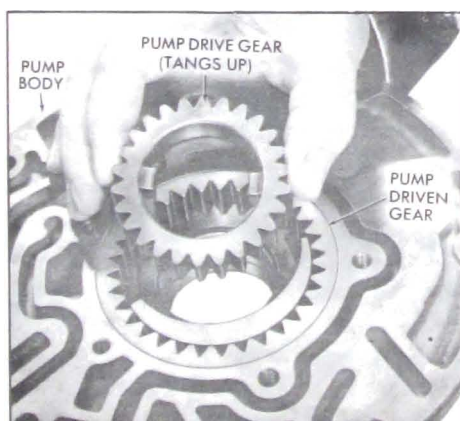


Figure 5-594

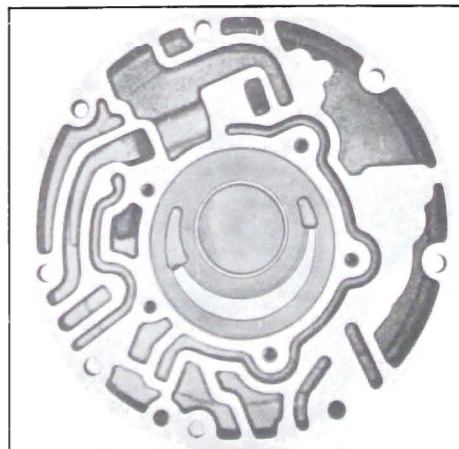


Figure 5-596



Figure 5-598

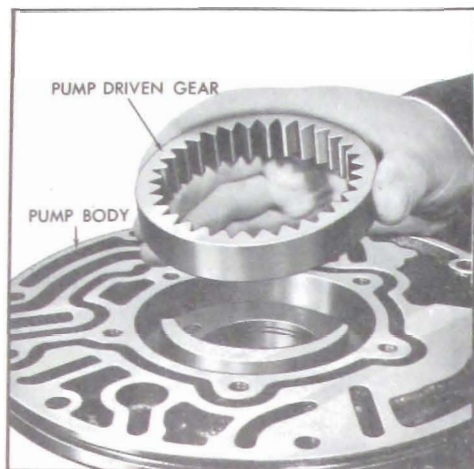


Figure 5-600

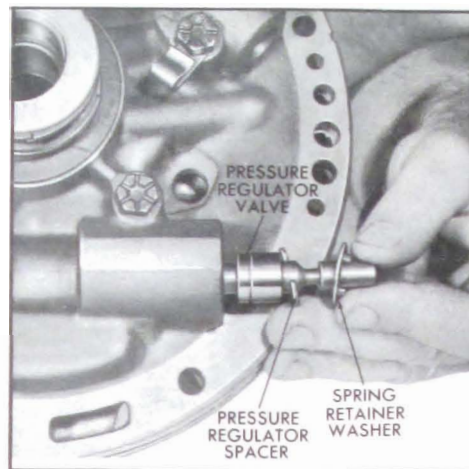


Figure 5-602



Figure 5-604

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 5-600 and 5-601.

NOTE: The drive gear with drive tangs up.

2. Install the pressure regulator spring spacer(s) if used, retainer and spring into the pressure regulator bore. See Figure 5-602.

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 5-603.

7. Install retaining pin. Install the previously selected front unit selective thrust washer (fiber) over the pump cover delivery sleeve.

8. Install two (2) hook type oil seal rings. See Figure 5-604.

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 5-605.

10. Assemble pump cover to pump body with attaching bolts and clip adjacent to stator valve. See Figure 5-606.

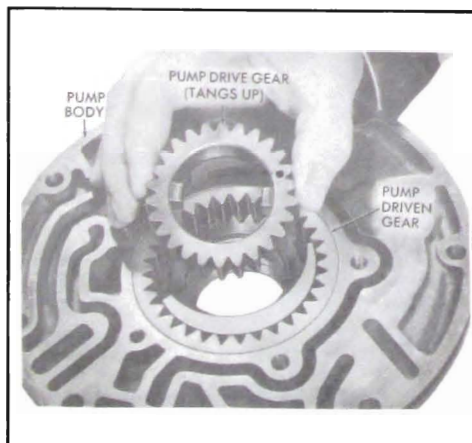


Figure 5-601

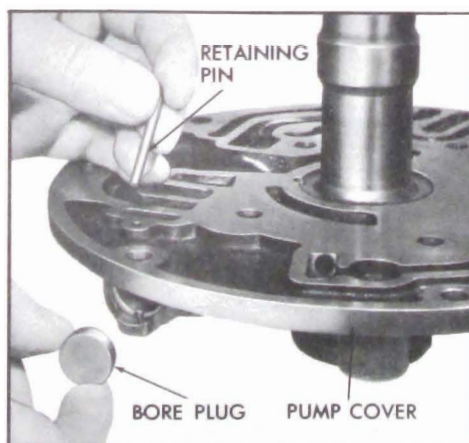


Figure 5-603

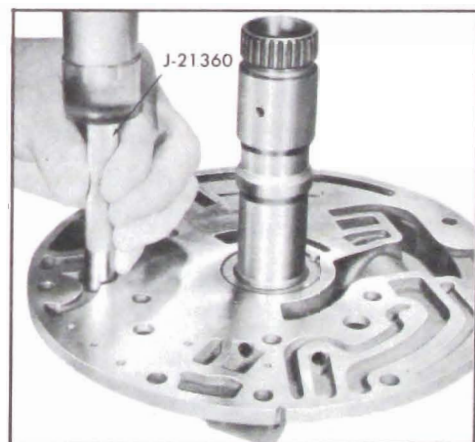


Figure 5-605

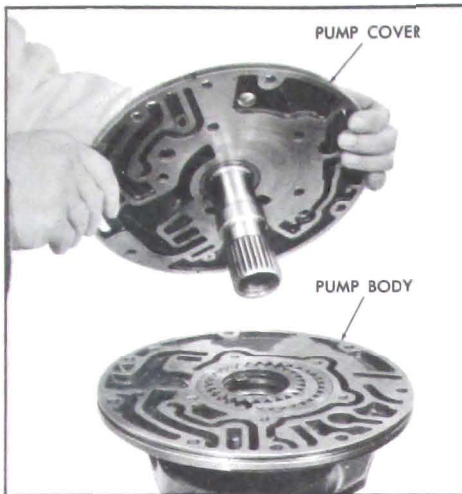


Figure 5-606

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

11. Place Pump Aligning Strap, J-21368, over pump body and

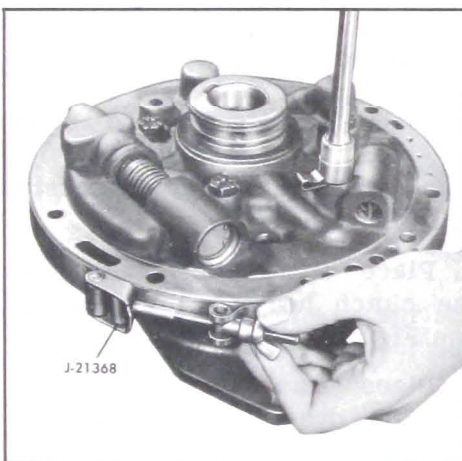


Figure 5-607

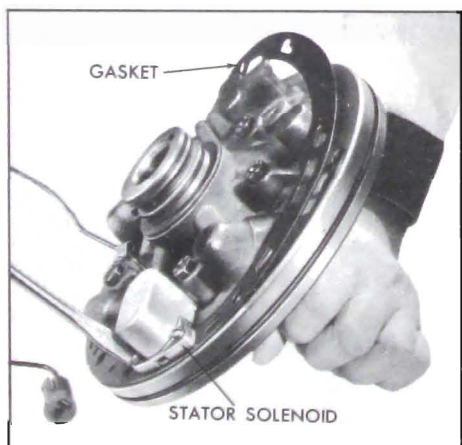


Figure 5-608



Figure 5-610

cover, and tighten tool. See Figure 5-607.

12. Tighten pump cover bolts.

13. Install 15-20 ft. lbs. torque and align pump to case gasket.

14. Attach stator solenoid with bolts. See Figure 5-608.

15. Attach stator wire to clip.

16. Install pump to case "O" ring seal.

5-20 FORWARD CLUTCH DISASSEMBLY, INSPECTION AND REASSEMBLY

a. Disassembly

1. Place forward clutch and turbine shaft in hole in bench and re-

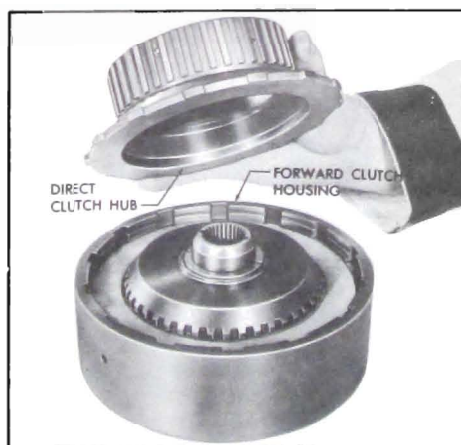


Figure 5-611

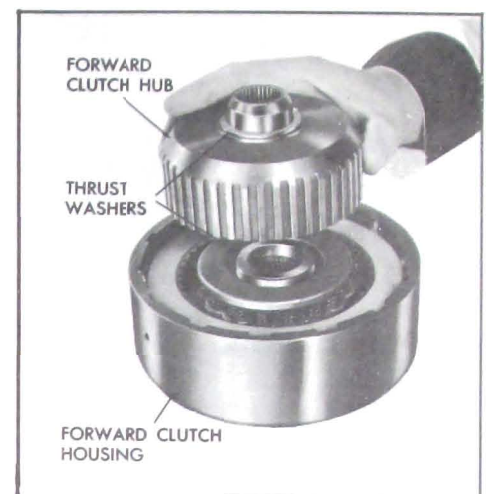


Figure 5-612

move the forward clutch housing to direct clutch hub snap ring. See Figure 5-610.

2. Remove the direct clutch hub. See Figure 5-611.

3. Remove the forward clutch hub and thrust washers. See Figure 5-612.

4. Remove five (5) composition and five (5) steel clutch plates. See Figure 5-613.

NOTE: The BU Model used on LeSabre series cars has (4) composition and (4) steel.

5. If necessary remove turbine shaft. See Figure 5-614.

6. Using J-2590 clutch spring compressor, compress the spring retainer and remove the snap ring. See Figure 5-615.

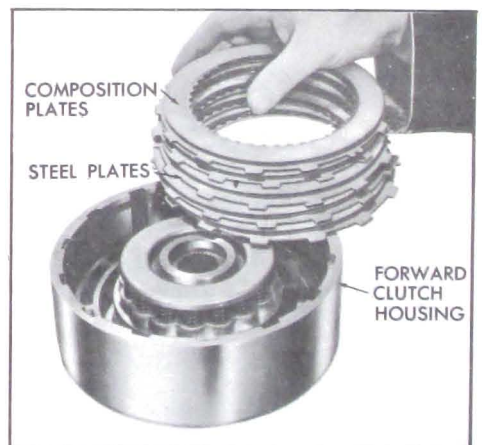


Figure 5-613

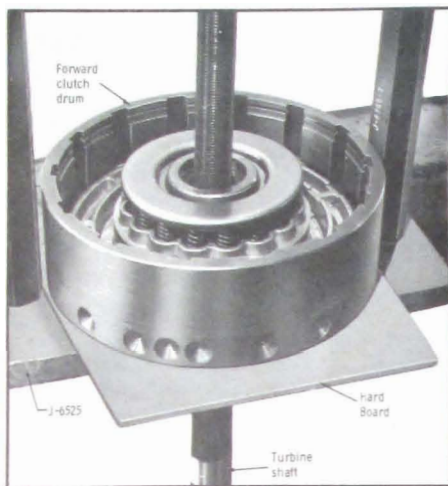


Figure 5-614

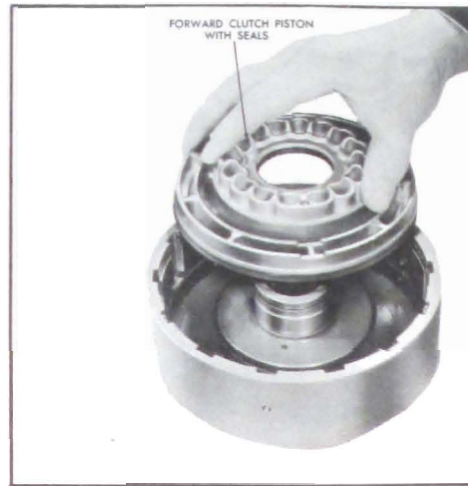


Figure 5-617

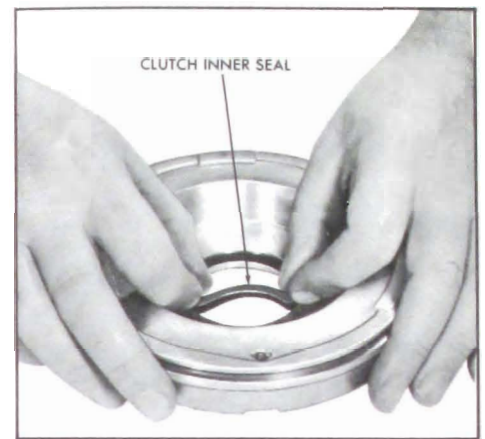


Figure 5-619

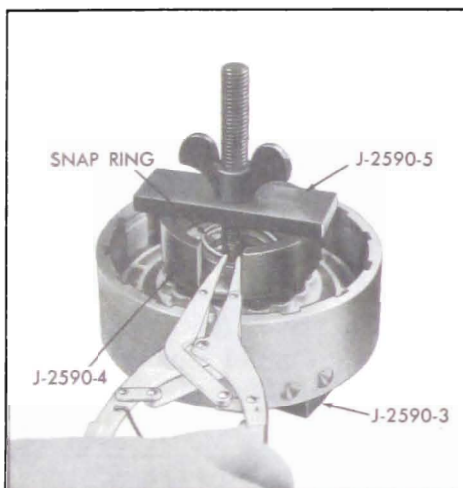


Figure 5-615

7. Remove the tools, snap ring, spring retainer and sixteen clutch release springs. See Figure 5-616.



Figure 5-616

8. Remove the clutch piston. See Figure 5-617.

9. Remove the inner and outer clutch piston seals. See Figure 5-618 and 5-619.

10. Remove the center piston seal from the forward clutch housing. See Figure 5-620.

b. Inspection

1. Inspect the drive and driven clutch plates for signs of burning, scoring, or wear. See Figure 5-621.

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 face away from spring pockets. See Figure 5-622.

2. Place a new center seal on the clutch housing, lip faces up. See Figure 5-623.

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 5-624.



Figure 5-618



Figure 5-620

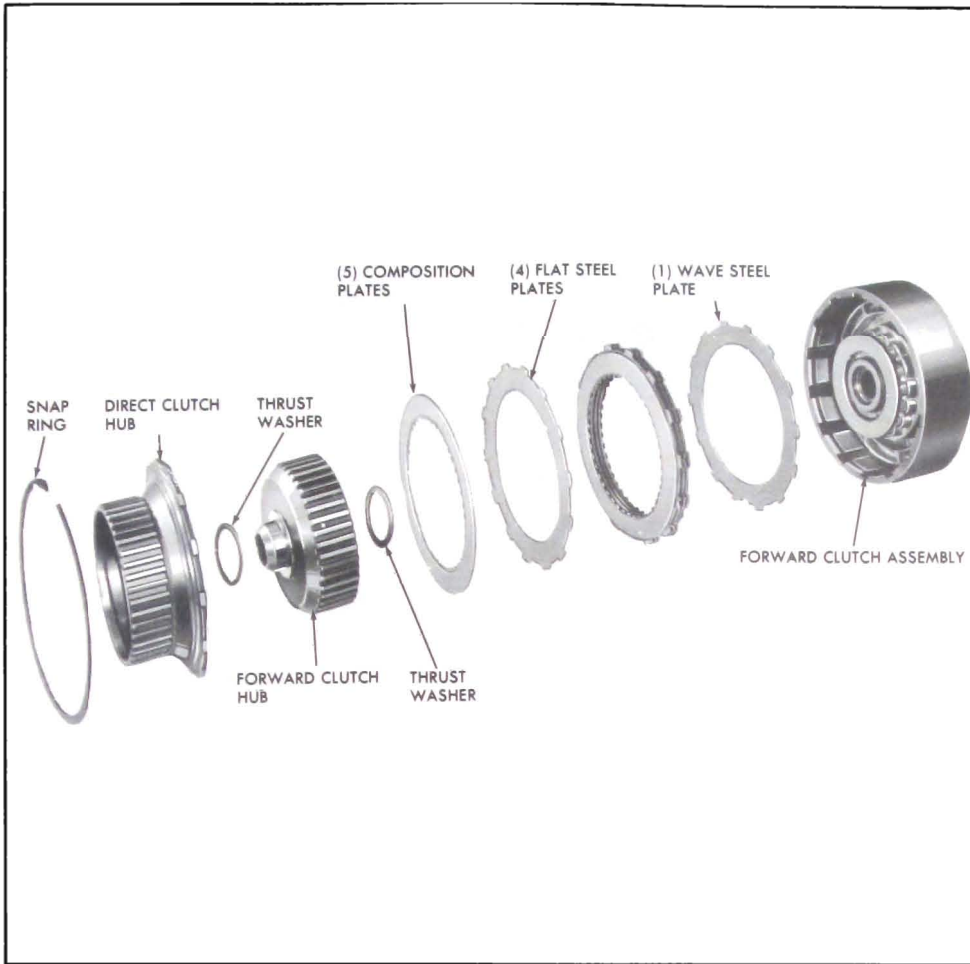


Figure 5-621

4. Install clutch release springs (blue) into pockets in piston. See Figure 5-625.

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 5-626.

7. If removed install oil seal ring on turbine shaft and install in forward clutch drum. See Figure 5-627.

8. Install the forward clutch hub

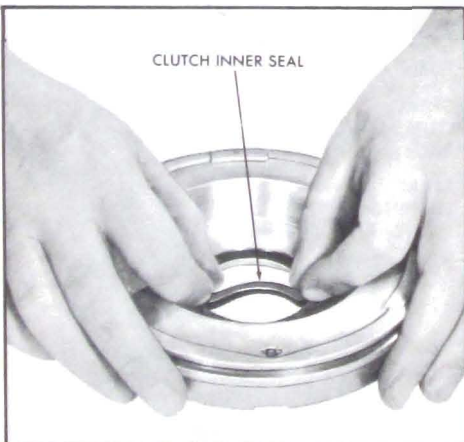


Figure 5-622



Figure 5-623

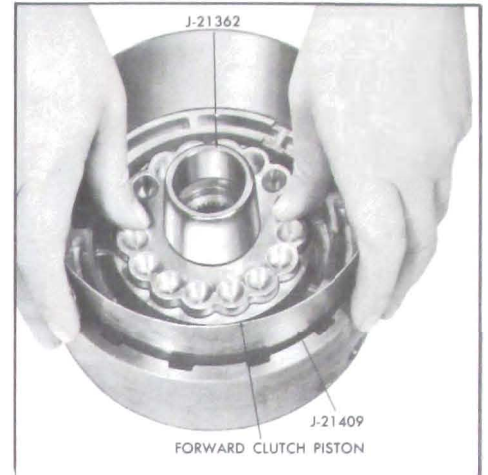


Figure 5-624

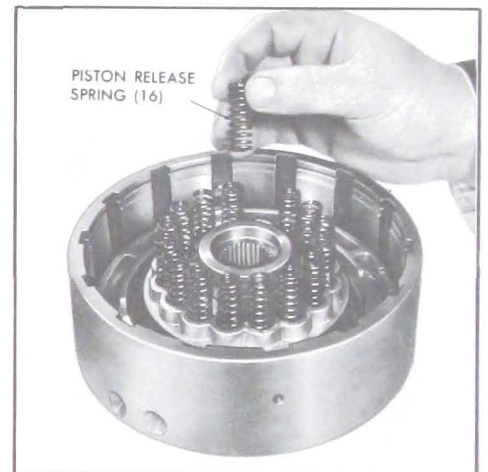


Figure 5-625

washers. Retain with petrolatum. See Figure 5-630.

9. Place forward clutch hub into forward clutch housing and clutch plates. See Figure 5-631.

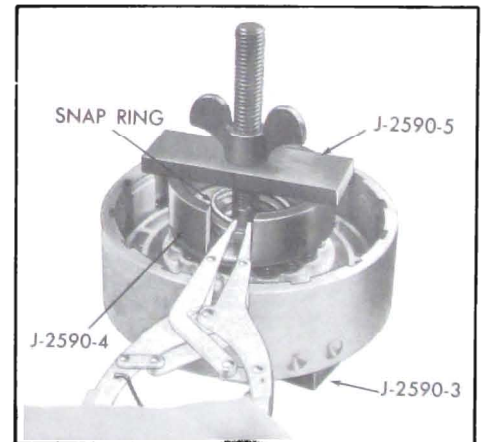


Figure 5-626

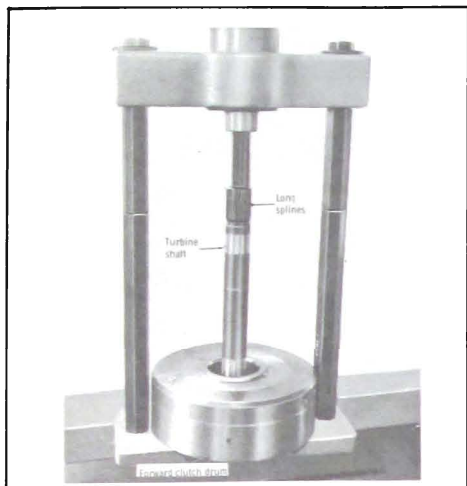


Figure 5-627

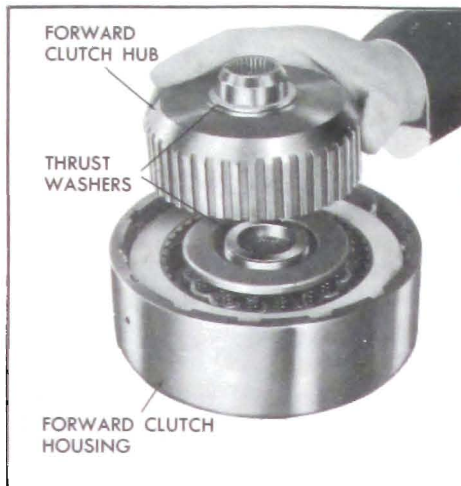


Figure 5-631

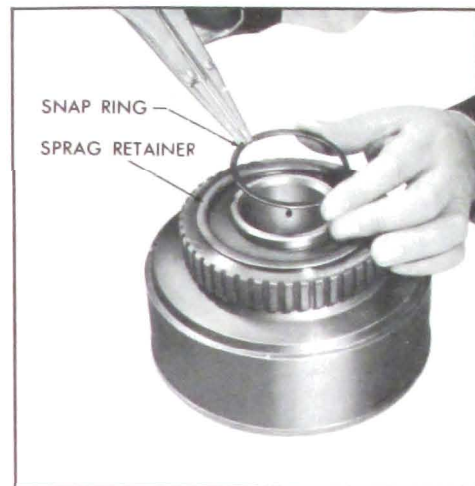


Figure 5-634

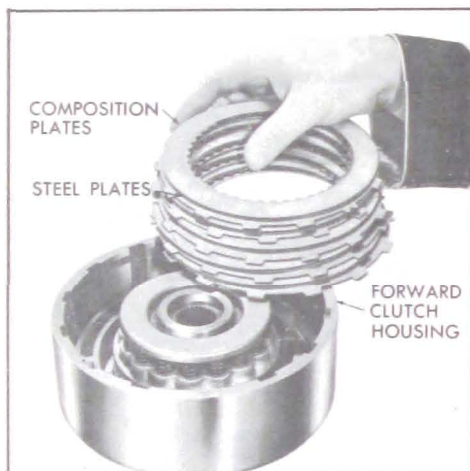


Figure 5-628

10. Oil and install five (5) composition and four (4) flat steel clutch plates and one (1) waved steel plate (plate with notches), starting with waved steel and al-



Figure 5-632

ternating steel and composition. See Figure 5-628. Model BU has 4 composition and 4 steel (3 flat and 1 waved).

11. Install the direct clutch hub

and retaining snap ring. See Figure 5-632.

12. Place forward clutch housing on pump delivery sleeve and air check clutch operation. See Figure 5-633.

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

a. Disassembly

1. Remove sprag retainer snap ring and retainer. See Figure 5-634.

2. Remove sprag outer race, bushings and sprag assembly. See Figure 5-635.

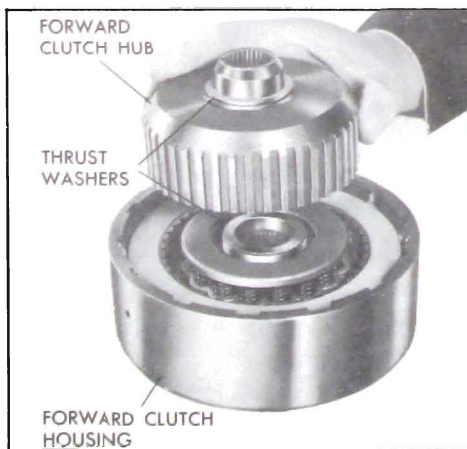


Figure 5-630

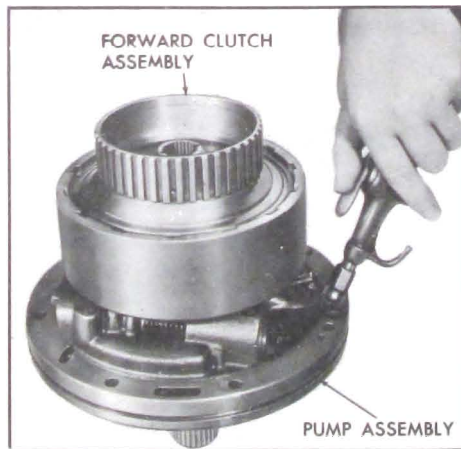


Figure 5-633

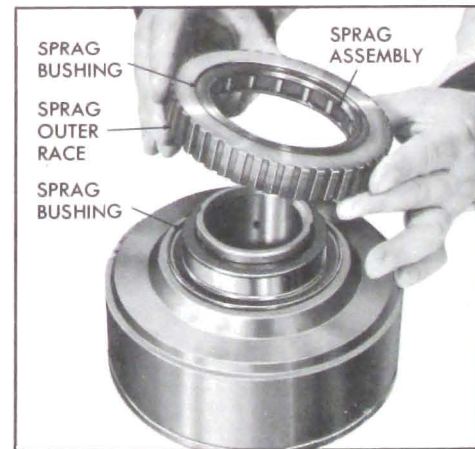


Figure 5-635

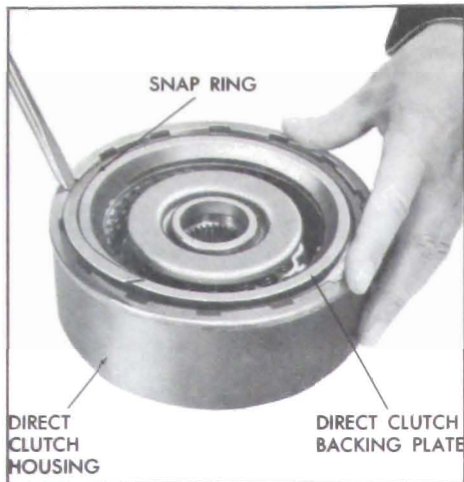


Figure 5-636

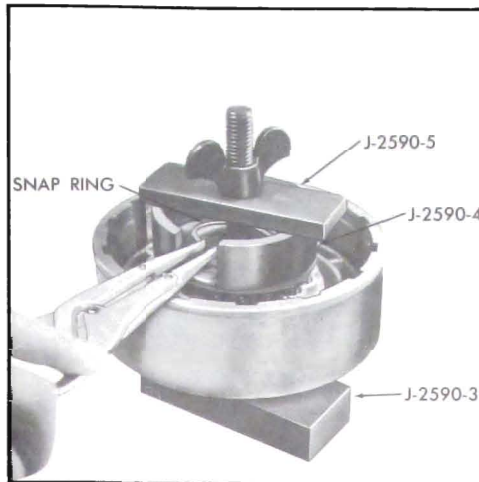


Figure 5-638



Figure 5-642

3. Turn unit over and remove backing plate to clutch housing snap ring. See Figure 5-636.

4. Remove direct clutch backing plate, (five) 5 composition and (five) 5 steel clutch plates. See Figure 5-637. Model BU uses (4) composition and (4) steel plates.

5. Using clutch compressor tool and/or J-2590, compress spring retainer and remove snap ring. See Figure 5-638.

6. Remove retainer and sixteen (16) piston release springs. See Figure 5-640.

7. Remove the direct clutch piston. See Figure 5-641.

8. Remove the outer seal from the piston. See Figure 5-642.



Figure 5-640



Figure 5-643

9. Remove the inner seal from the piston. See Figure 5-643.

10. Remove the center piston seal from the direct clutch housing. See Figure 5-643A.

b. Inspection

1. Inspect sprag assembly for popped or loose sprags. See Figure 5-644.

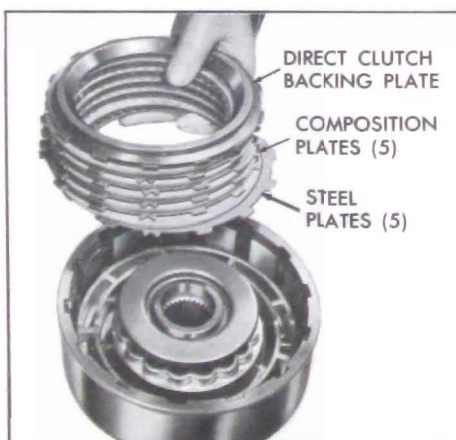


Figure 5-637



Figure 5-641

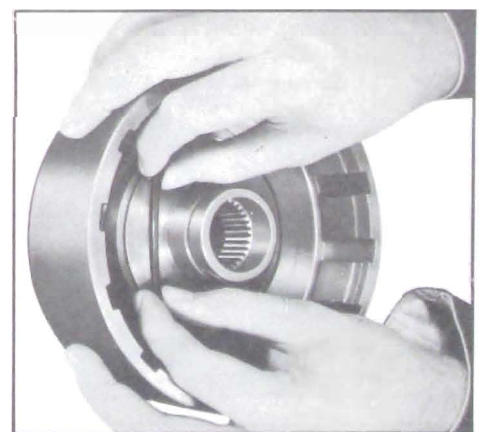


Figure 5-643A

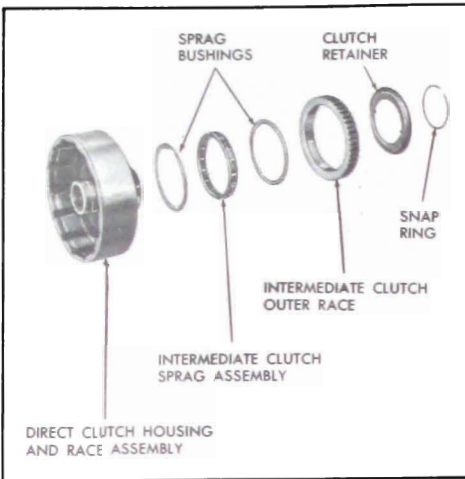


Figure 5-644



Figure 5-646

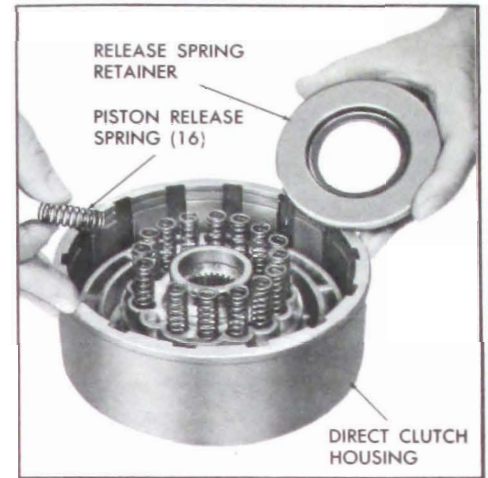


Figure 5-650

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 check.

c. Assembly

1. Install a new inner clutch piston seal on piston with lips facing



Figure 5-645

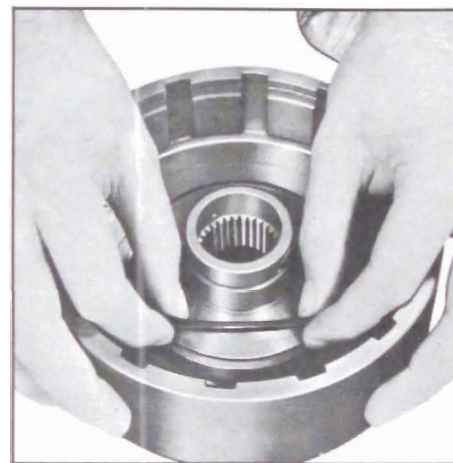


Figure 5-647

away from spring pockets. See Figure 5-645.

2. Install a new outer clutch piston seal. See Figure 5-646.

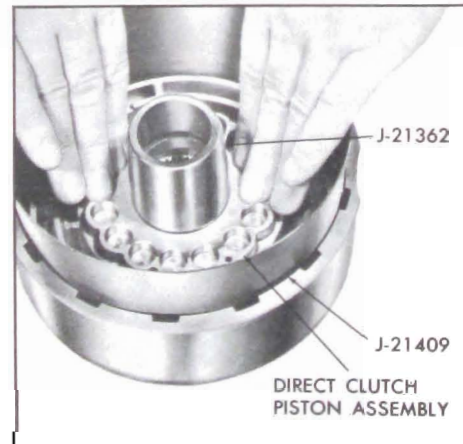


Figure 5-648

3. Install a new center seal on clutch housing with lip of seal facing up. See Figure 5-647.

4. Place Seal Protectors, Tools J-21362 - Inner, J-21409 - Outer, over hub and clutch housing and install clutch piston. See Figure 5-648.

5. Install sixteen (16) springs into the piston. See Figure 5-650.

6. Place spring retainer and snap ring on springs.

7. Using clutch compressor tool or J-2590, install snap ring. See Figure 5-651.

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

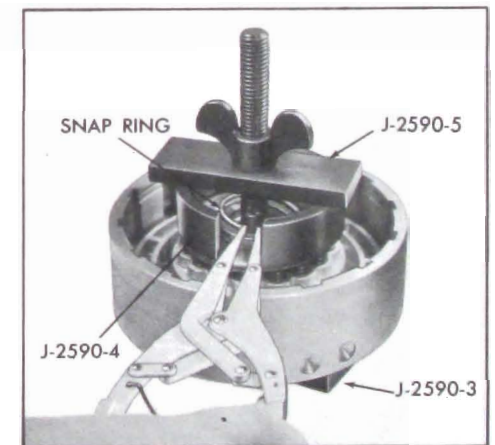


Figure 5-651

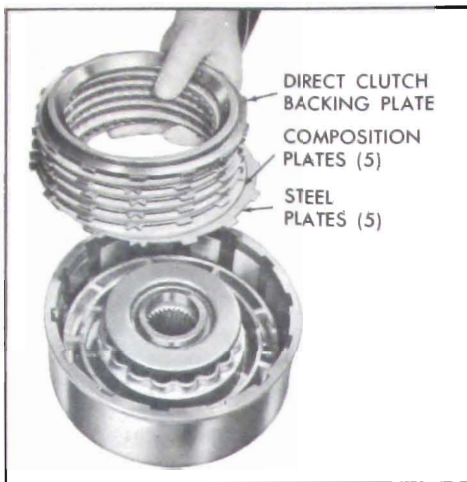


Figure 5-652

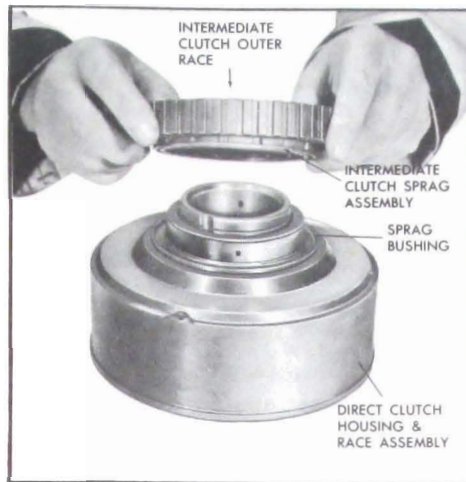


Figure 5-654

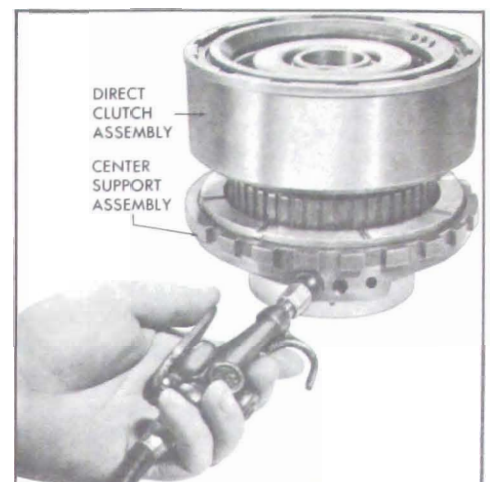


Figure 5-657

the drive lugs one above the other. See Figure 5-652.

9. Install the clutch backing plate.

10. Install the backing plate retaining snap ring. See Figure 5-653.

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 race over inner race with clockwise turning motion. See Figure 5-654.

NOTE: Outer race should not turn counterclockwise.



Figure 5-655

14. Install sprag retainer over sprag, cup side down. See Figure 5-655.

15. Install sprag retainer and snap ring. See Figure 5-656.

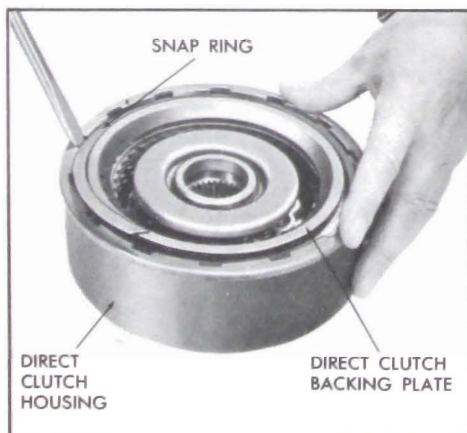


Figure 5-653

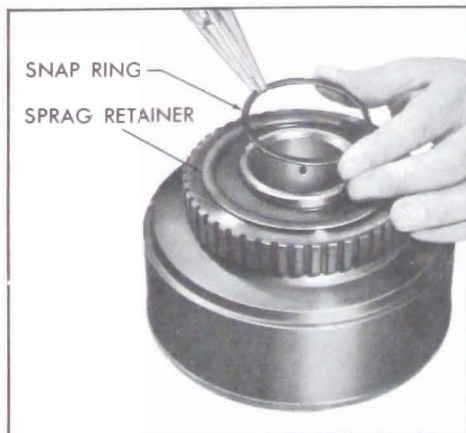


Figure 5-656

16. Place direct clutch assembly over center support and air check operation of direct clutch. See Figure 5-657.

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

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 5-658.

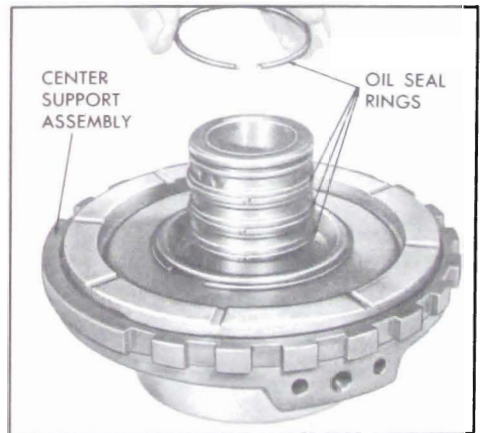


Figure 5-658

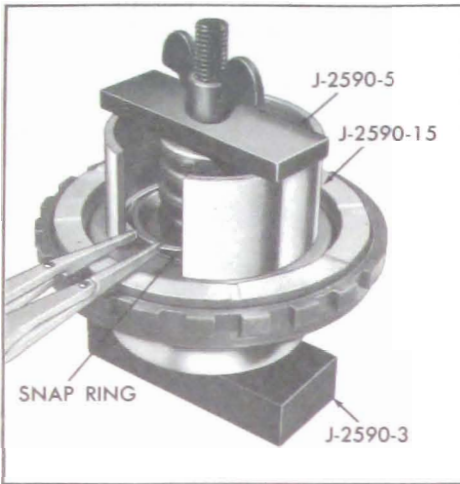


Figure 5-660

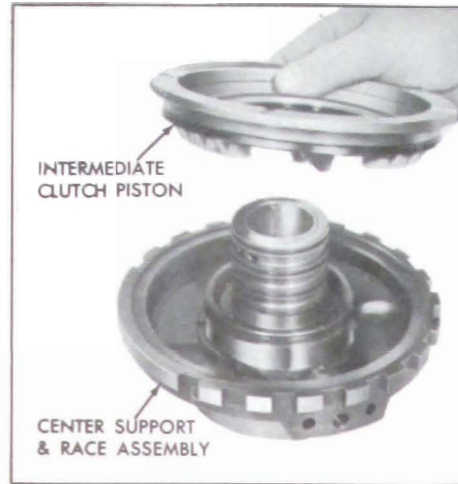


Figure 5-663

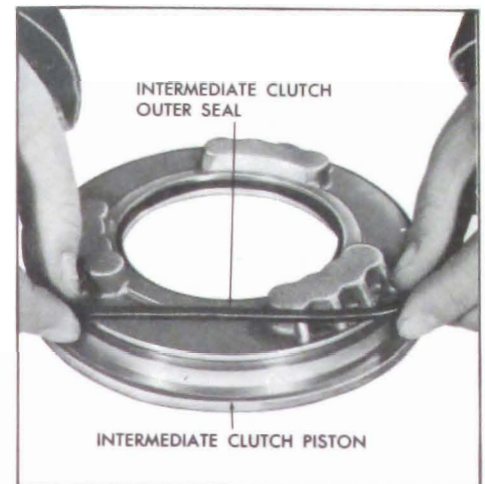


Figure 5-665



Figure 5-661

2. Using Clutch Compressor J-2590, compress the spring retainer and remove the snap ring. See Figure 5-660.



Figure 5-662

3. Remove the spring retainer. See Figure 5-661. Remove twelve (12) clutch release springs. See Figure 5-662.

4. Remove the intermediate clutch piston. See Figure 5-663.

5. Remove the inner piston seal. See Figure 5-664.

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

6. Remove the outer piston seal. See Figure 5-665.

b. Inspection

1. Inspect the sprag inner race for scratches or indentations. Be sure the lubrication hole is open. See Figure 5-666.

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.

4. Air check the oil passages to be sure they are open and not interconnected. See Figure 5-667.

5. Inspect for piston sealing surfaces for scratches.

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

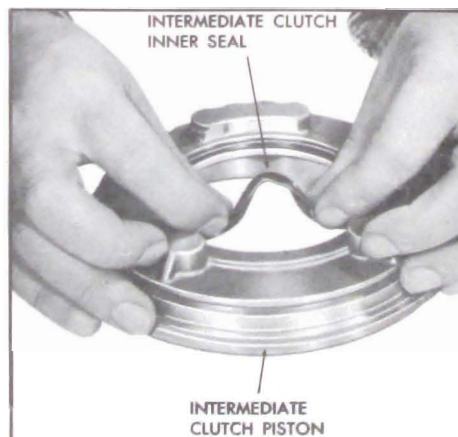


Figure 5-664

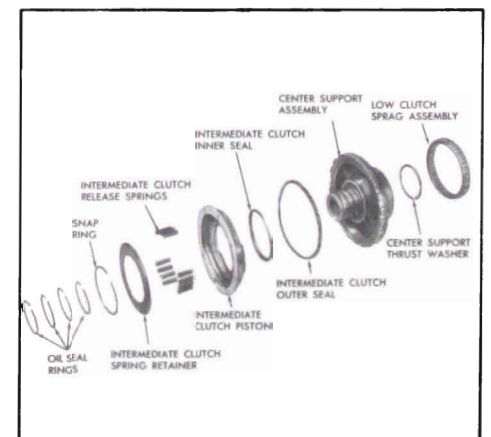


Figure 5-666



Figure 5-667

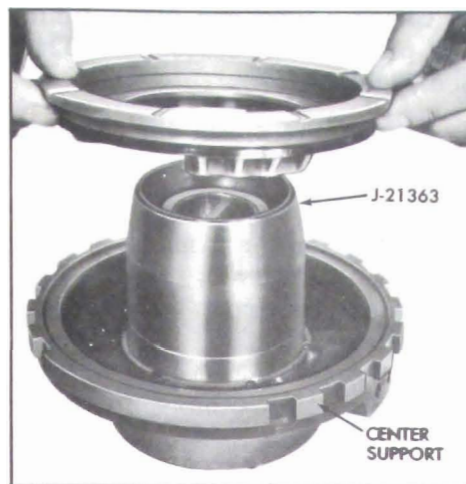


Figure 5-671

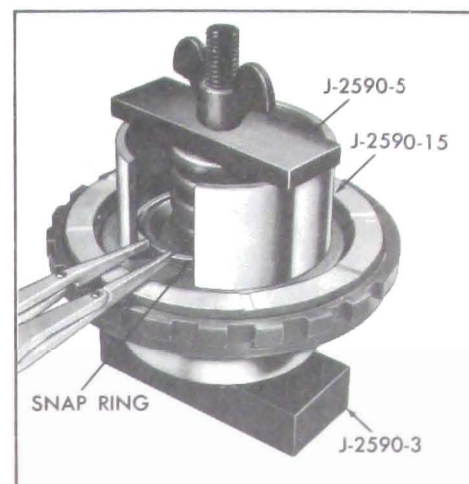


Figure 5-673

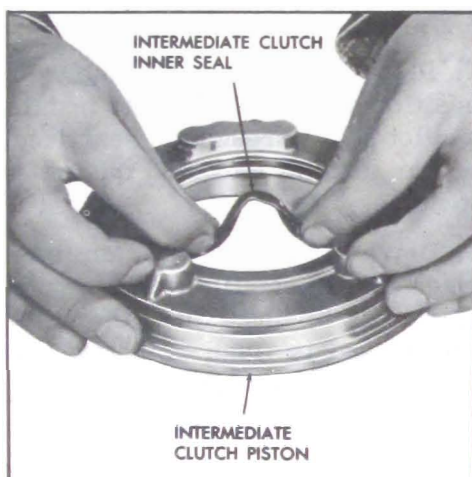


Figure 5-668

c. Assembly

1. Install new inner seal on the piston with lip of the seal facing away from the spring pocket. See Figure 5-668.

2. Install new outer seal. See Figure 5-670.

3. Install inner seal protector, Tool J-21363, on the center support hub, install the piston. See Figure 5-671.

4. Install twelve (12) release springs into the piston. See Figure 5-672.

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

6. Using the Clutch Spring Compressor, J-2590, compress the springs and install the snap ring. See Figure 5-673.

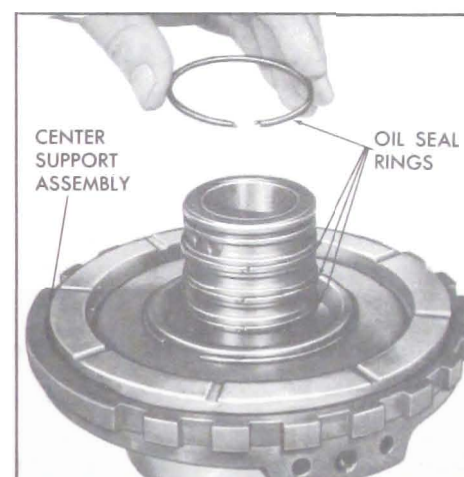


Figure 5-674

7. Inspect the piston for cracks or porosity.

8. Inspect the release springs for distortion.

7. Install four (4) hook type oil rings. See Figure 5-674.

8. Air check operation of intermediate clutch piston. See Figure 5-675.

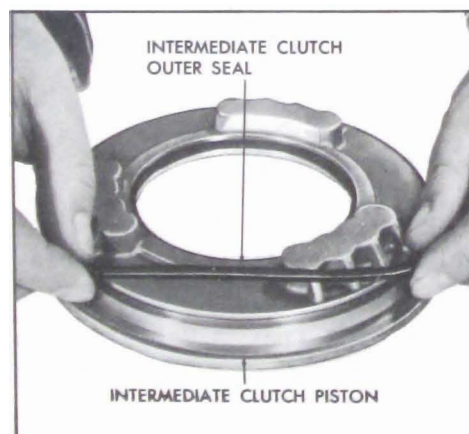


Figure 5-670

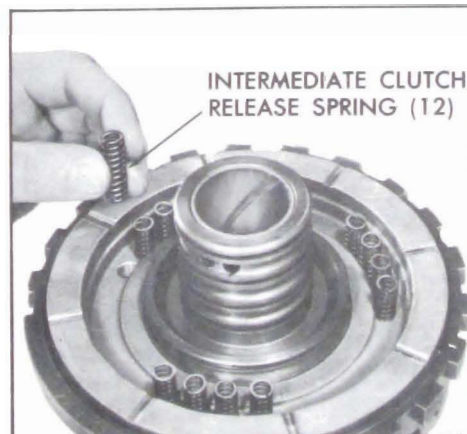


Figure 5-672

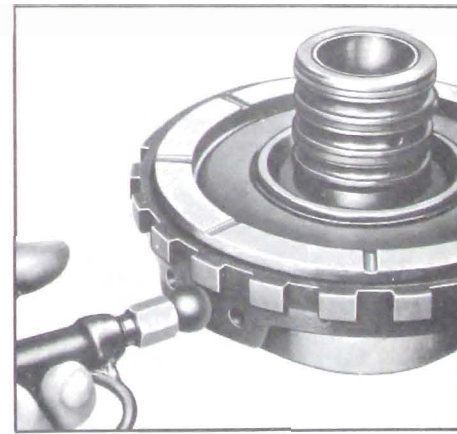


Figure 5-675



Figure 5-676

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.



Figure 5-678

6. Check pinion end play. Pinion end play should be .009" - .024". See Figure 5-676.
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 5-678.
12. Inspect the parking pawl lugs for cracks or damage.
13. Inspect the output locating splines for damage.
14. Inspect front internal gear ring for flaking or cracks.

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 5-680.



Figure 5-680

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 5-681.

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 5-682.

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 5-683.

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

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.

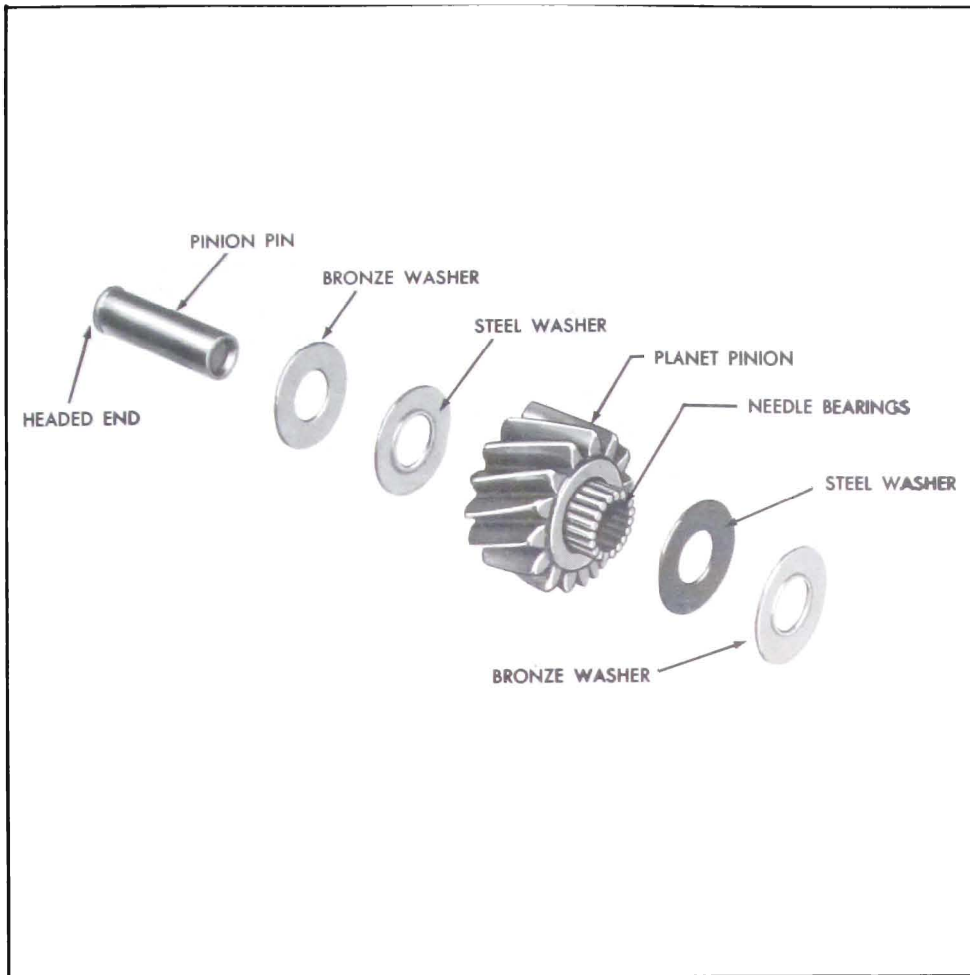


Figure 5-681

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.



Figure 5-682



Figure 5-683

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. Inspect the gear for cracks.

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 main shaft. Be sure it is not plugged.

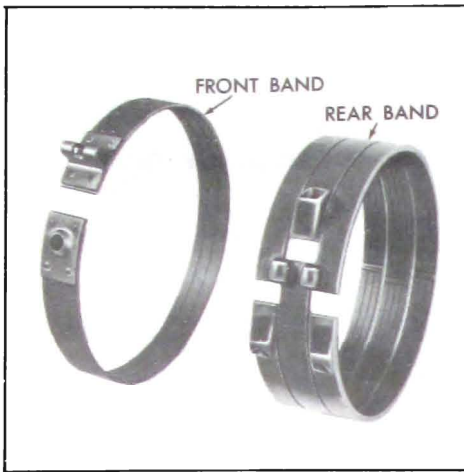


Figure 5-684

g. Inspection of Front and Rear Bands

1. Inspect the lining for cracks, flaking, burning or looseness. See Figure 5-684.
2. Inspect the bands for cracks or distortion.
3. Inspect the end for damage at the anchor lugs or supply lugs.

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.

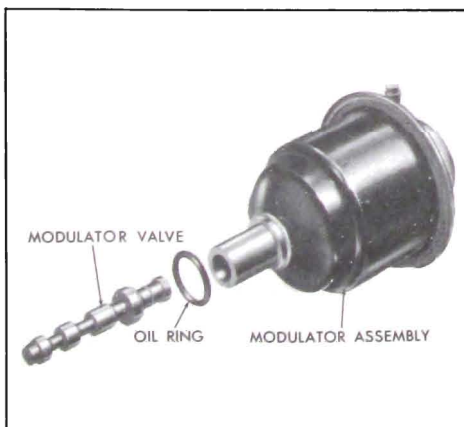


Figure 5-685

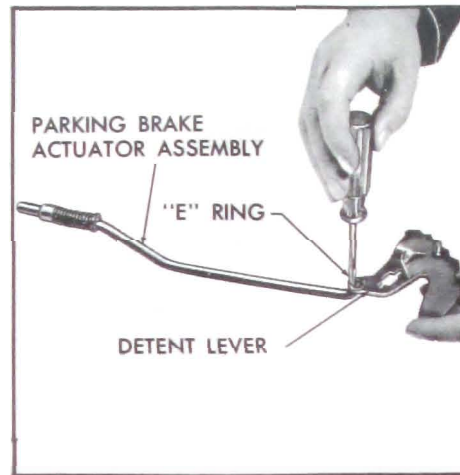


Figure 5-685A

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 5-685.
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.

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 5-685A.

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 brinelling.

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.



Figure 5-686

I. Inspection of Torque Converter

1. Check converter for leaks as follows: (See Figure 5-686.)

- a. Install Tool J-21369, and tighten.
- b. Fill converter with air; 80 psi.
- c. Submerge in water and check for leaks.

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

m. Check Converter End Clearance as Follows

a. Install Tool J-21371-2 and tighten brass nut. See Figure 5-687.

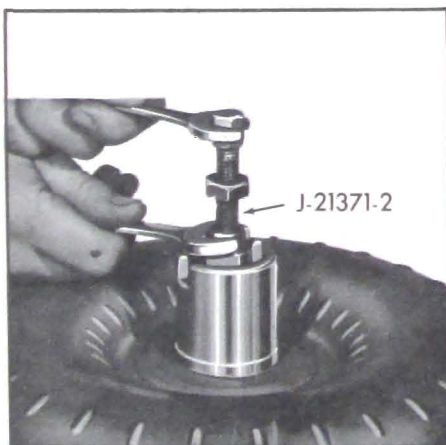


Figure 5-687

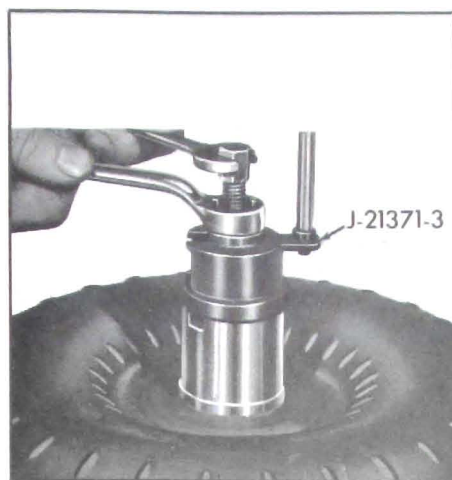


Figure 5-688

b. Install Tool J-21371-3 and tighten hex nut. See Figure 5-688.

c. Install dial indicator set at 0 as shown in Figure 5-370.

d. Loosen hex nut. When nut is fully loosened the reading obtained on the dial indicator will be converter end clearance. If clearance is .050" or over and the oil has the appearance of having been mixed with aluminum paint, replace the converter. See Figure 5-690.

5-26 ASSEMBLY OF REAR UNIT

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

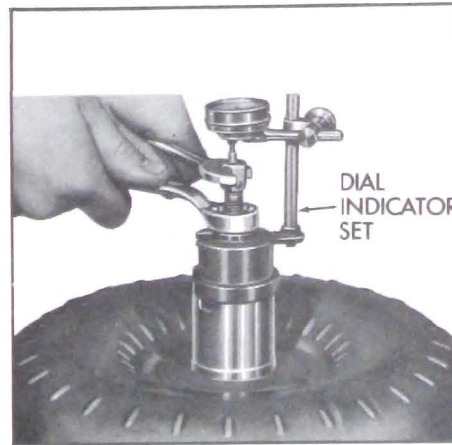


Figure 5-690

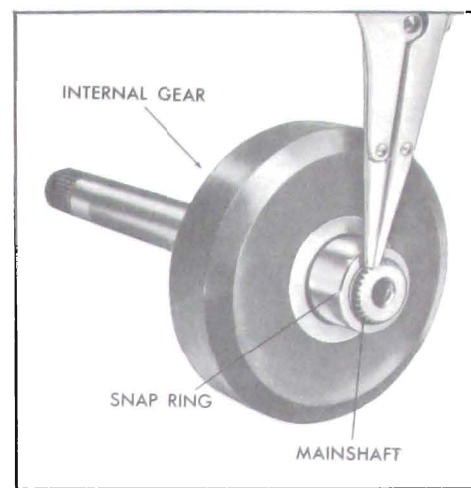


Figure 5-691

2. Install internal gear retaining snap ring. See Figure 5-691.

3. Install the sun gear to internal gear thrust races and bearings against the inner face of the rear internal gear as follows, and retain with petrolatum. See Figure 5-691A.

a. Place the large race against the internal gear with flange facing forward or up.

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.

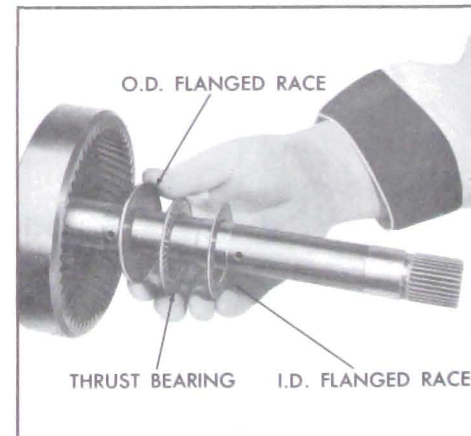


Figure 5-691A

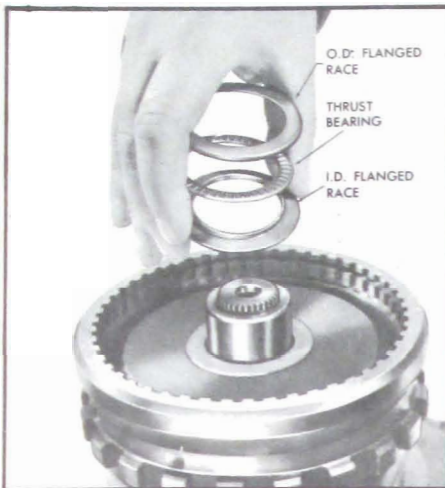


Figure 5-692



Figure 5-694



Figure 5-697

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 5-692.

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 5-693.

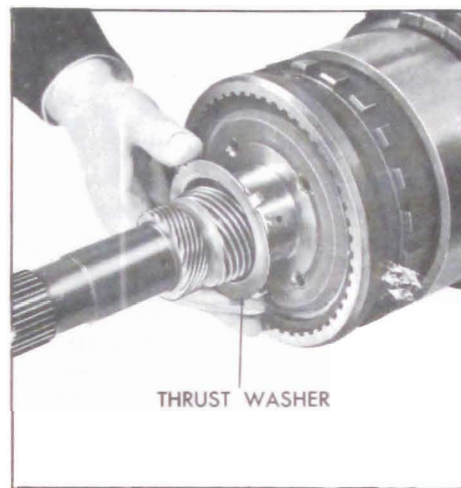


Figure 5-695

8. Install the output shaft to output carrier snap ring. See Figure 5-694.

9. Turn assembly over and support so that the output shaft hangs

downward. See Figure 5-695.

10. Install the reaction carrier to output carrier thrust washer with the tabs facing down in pockets. See Figure 5-696.

11. Install the sun gear splines with chamfer down. See Figure 5-697.

12. Install ring over output carrier. See Figure 5-698.

13. Install the sun gear shaft.

14. Install the reaction carrier. See Figure 5-700.

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

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

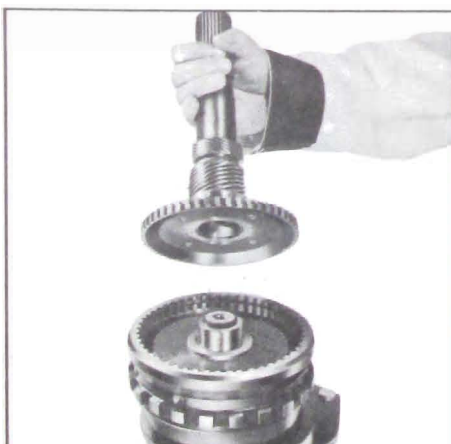


Figure 5-693



Figure 5-696

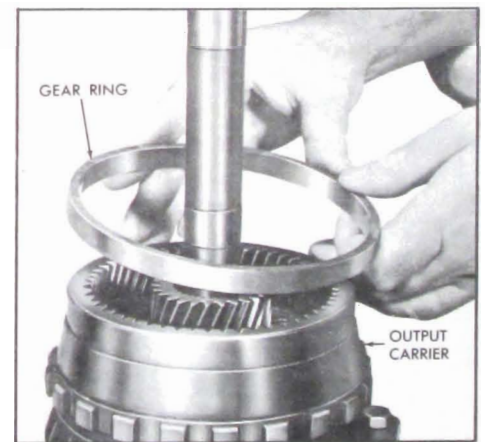


Figure 5-698



Figure 5-700



Figure 5-702

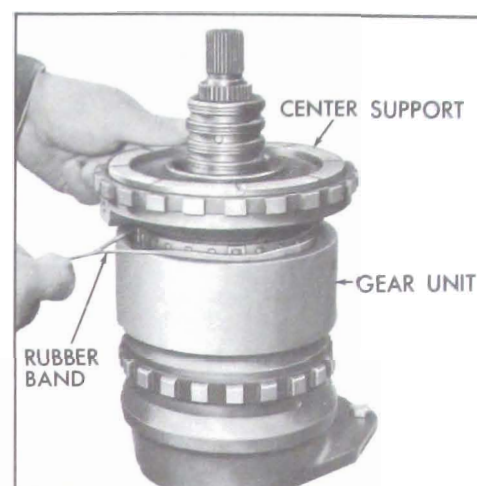


Figure 5-705

b. Install the thrust bearing against the race.

c. Install the second race, center flange up. See Figure 5-701.

16. Install the bronze center support to reaction carrier thrust washer into the recess in the center support. Retain with petrolatum. See Figure 5-702.

17. Using Tool J-21367, as a pilot, install the rear sprag assembly on case center support inner race with bronze drag strips up. See Figure 5-703.

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

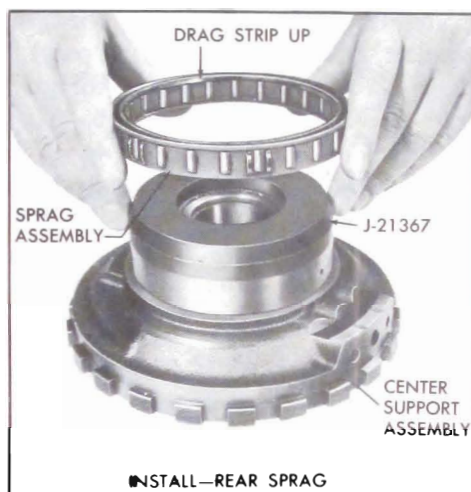


Figure 5-703

sprags in place. See Figure 5-704.

b. Start sprag assembly into outer race, remove the rubber band

and finish installation by pressing on case support. See Figure 5-705.

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

19. Install output shaft to case thrust washer, tags in pockets.

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 5-706.

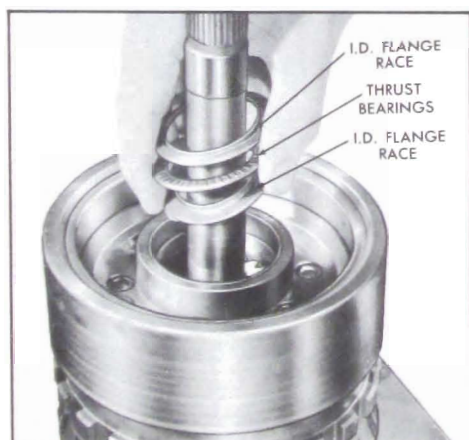


Figure 5-701



Figure 5-704

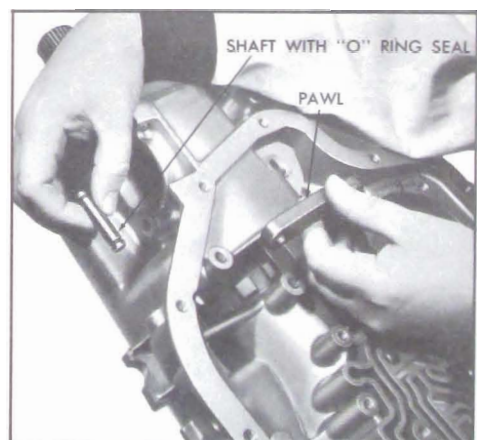


Figure 5-706

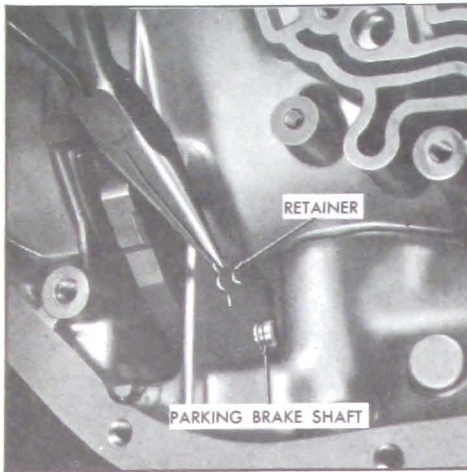


Figure 5-707

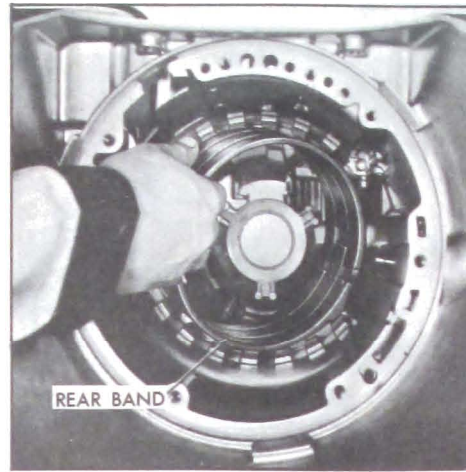


Figure 5-711

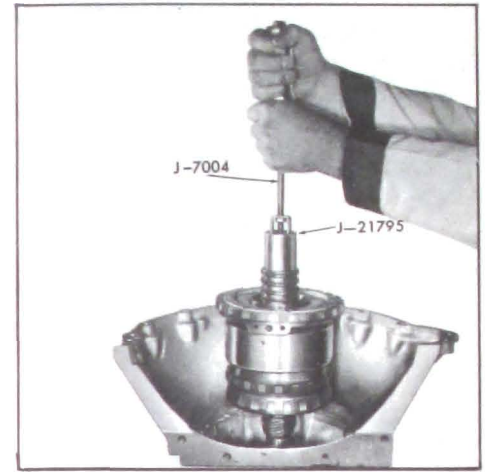


Figure 5-713

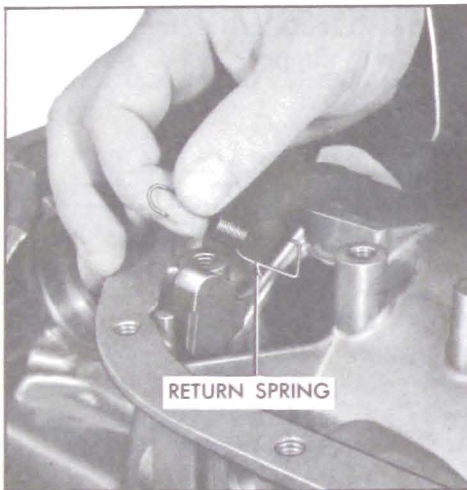


Figure 5-708

3. Install the parking pawl shaft retainer clip. See Figure 5-707.

4. Install the parking pawl return spring, square end hooked on pawl. See Figure 5-708.

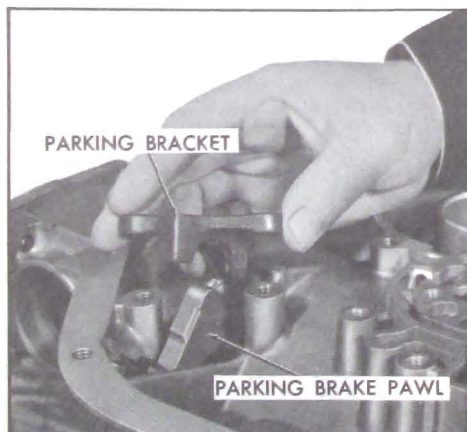


Figure 5-710

5. Install the parking brake bracket, guides over parking pawl, using two attaching bolts torque to 15-20 ft. lbs. See Figure 5-710.

6. Install the rear band assembly so that the two lugs index with the two anchor pins. See Figure 5-711. Check band to be sure band ends are seated on lugs.

7. Install the rear selective washer into slots provided inside rear of transmission case. See Figure 5-712.

8. Install the complete gear unit assembly into the case. See Figure 5-713.

9. Oil and install center support to case retaining snap ring with bevel side up, and locating gap adjacent to band anchor pin. Make



Figure 5-712

certain ring is properly seated in case.

10. Install center support screw (tool) for locating. Torque to 2-4 ft. lbs. See Figure 5-715.

11. Install case to center support bolt. Torque 20-25 ft. lbs.

11a. Remove center support screw.

12. Install three (3) steel and three (3) composition intermediate clutch plates. Start with steel, alternate the plates. See Figure 5-716.

13. Install the intermediate clutch backing plates ridge up.

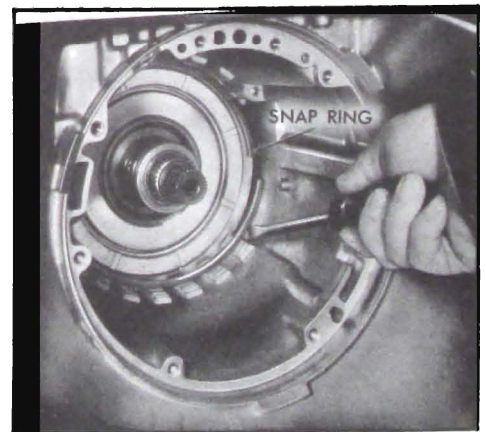


Figure 5-714

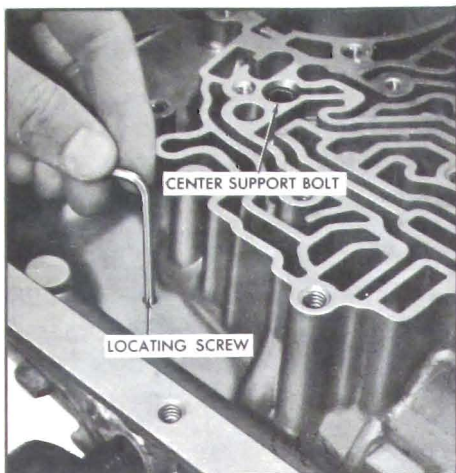


Figure 5-715

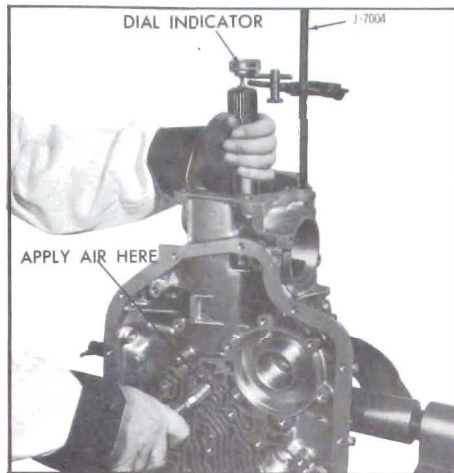


Figure 5-720

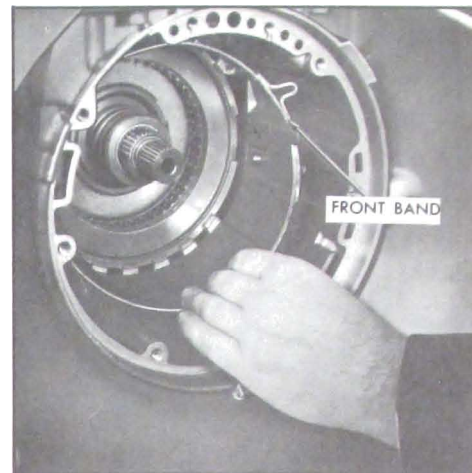


Figure 5-721

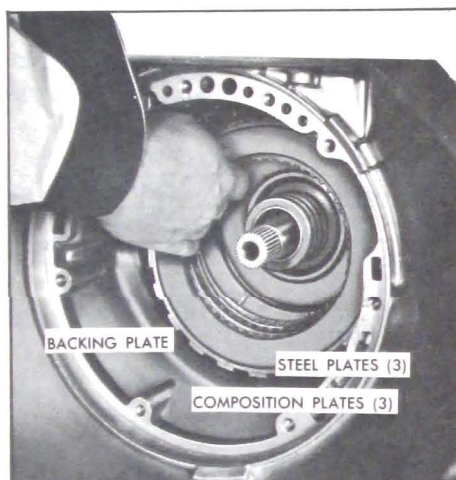


Figure 5-716

14. Install the backing plate to case snap ring. Gap in snap ring should be opposite anchor pin. See Figure 5-718.

15. Check rear end play as fol-

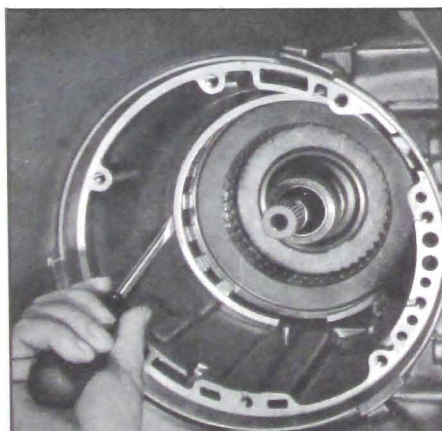


Figure 5-718

lows: See Figure 5-720.

a. Install J-7004 into an extension housing attaching bolt hole. See Figure 5-720.

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.

<u>Thickness</u>	<u>Notches</u>
.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.

16. Install front band with band anchor hole placed over the band anchor pin and apply lug facing servo hole. See Figure 5-721.

17. 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 5-722.

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

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

19. Install the forward clutch and torque shaft assembly, indexing the direct clutch hub so end of the mainshaft will bottom on end of the forward clutch hub. When forward clutch is seated it will be

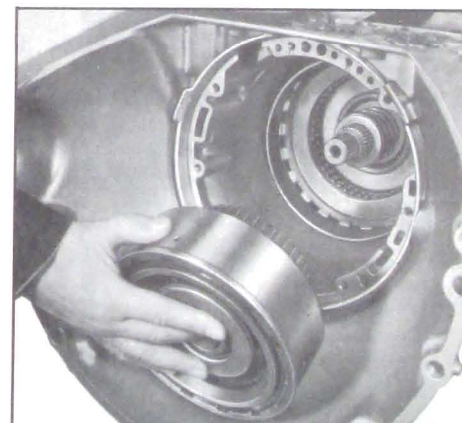


Figure 5-722

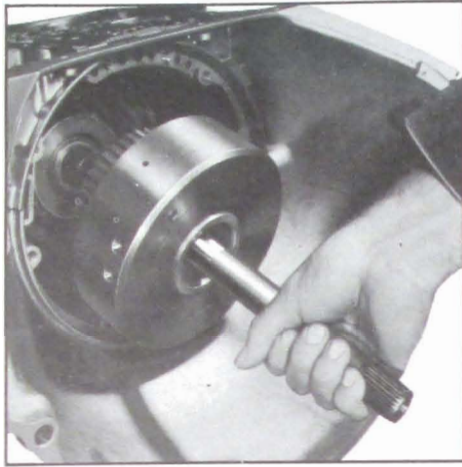


Figure 5-723

approximately 1-1/4" from pump face in case. See Figure 5-723.

20. Install the front pump assembly guiding wire through case hole at pressure regulator. See Figure 5-724.

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

22. Install the front pump assembly and all but one attaching bolt and seal. Torque 20-25 ft. lbs.

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.



Figure 5-724

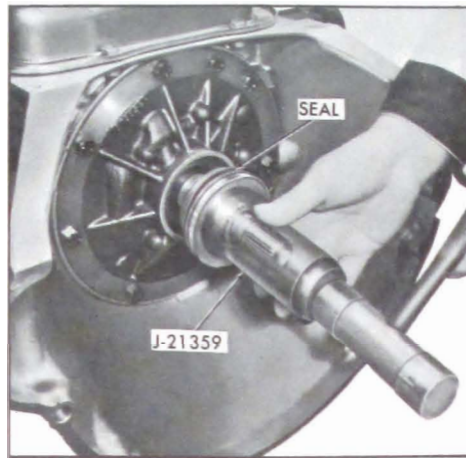


Figure 5-725

23. If necessary, install a new front seal, using Tool J-21359, to drive the seal in place. See Figure 5-725.

24. Check front unit end play as follows: See Figure 5-726.

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. Push turbine shaft rearward.

e. Push output shaft forward.

f. Set dial indicator to zero.

g. Pull turbine shaft forward.

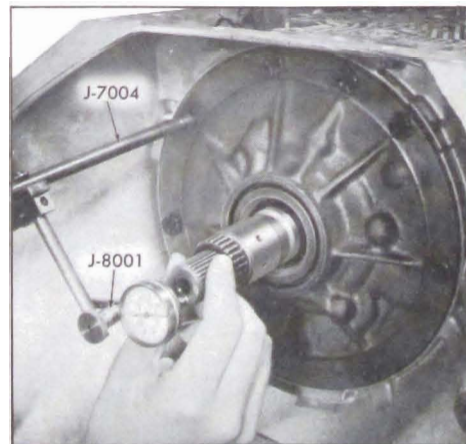


Figure 5-726

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.

Thickness	Color
.060 - .064	Yellow
.071 - .075	Blue
.082 - .086	Red
.093 - .097	Brown
.104 - .108	Green
.115 - .119	Black
.126 - .130	Purple

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

25. Install the remaining front pump attaching bolt and seal. Torque bolts to 20-25 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.



Figure 5-727

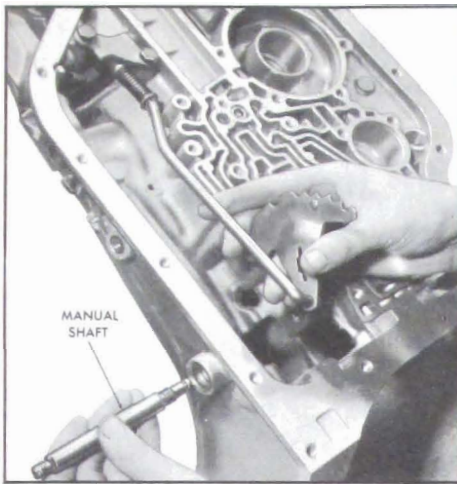


Figure 5-728

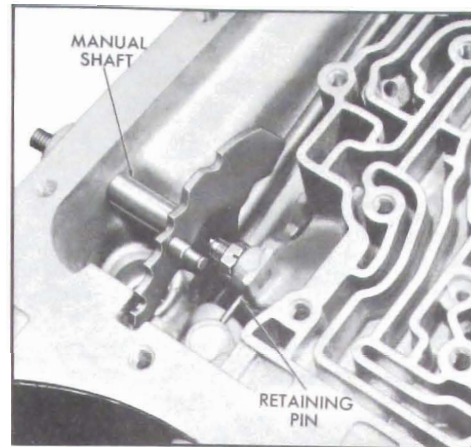


Figure 5-731

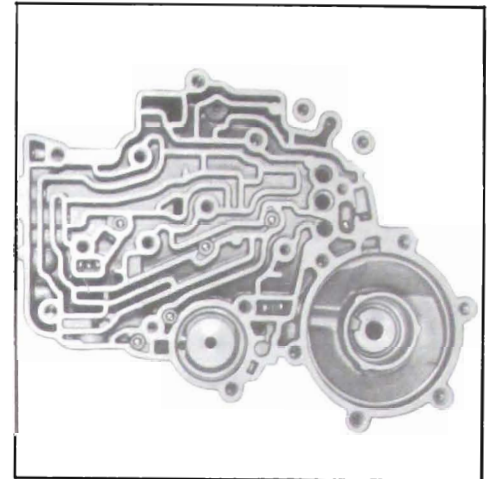


Figure 5-733

3. If necessary, install a new rear seal, using Seal Installer Tool J-21464. See Figure 5-727.

5-29 INSTALL MANUAL LINKAGE

1. If necessary, install a new manual shaft seal into the case.
2. If removed, insert the accumulator rod into manual detent lever from side opposite 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

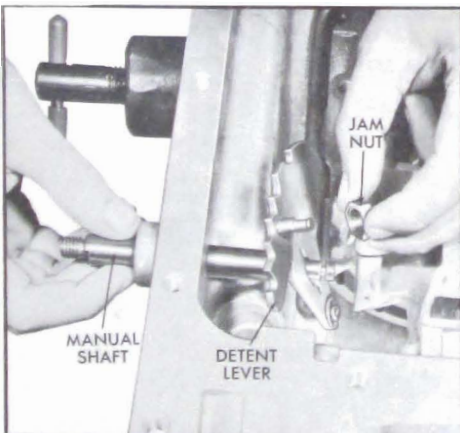


Figure 5-730

and detent lever. See Figure 5-728.

6. Install the retaining hex-lock nut on the manual shaft. See Figure 5-730.

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

7. Install retaining pin indexing with groove in manual shaft. See Figure 5-731.

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

1. Install the front servo spring and retainer into the transmission case.

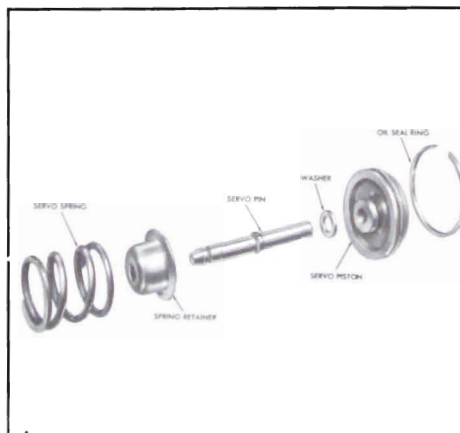


Figure 5-732

2. Install flat washer on front servo pin on end opposite taper.

3. Install pin and washer into case so that tapered end is contacting band.

4. Install oil seal ring on front servo piston if removed, and install on apply pin so that identification numbers on shoulders are positioned toward bottom of pan. See Figure 5-732.

5. Check freeness of piston by stroking piston bore.

6. Install six (6) check balls into the transmission case pockets. See Figure 5-733.

7. Install the valve body spacer to case gasket. (Gasket with extension for solenoid).

8. Install valve body to case spacer plate.

9. Install the solenoid gasket. See Figure 5-734.

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

NOTE: Do not tighten bolts at this time.

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

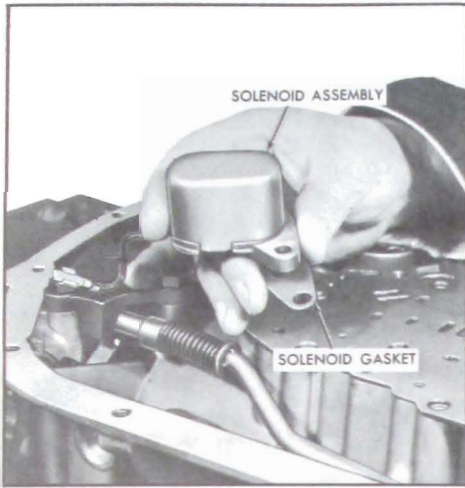


Figure 5-734

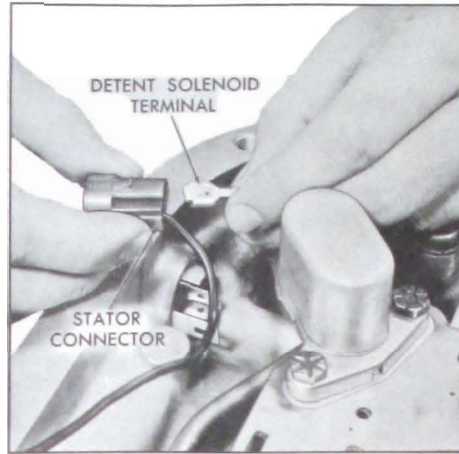


Figure 5-736

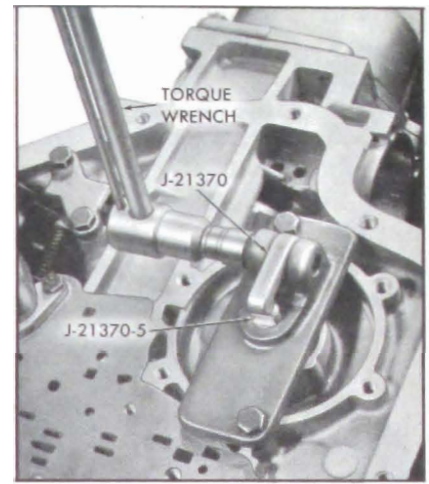


Figure 5-737

12. Install the connector with the lock tabs facing into the case. See Figure 5-735.

13. Install detent connector terminal into stator connector, pushing inward so that terminal connections are locked.

NOTE: Check by pulling on detent connector wire. If detent connector wire can be removed, turn wire connector over and re-install into stator connector. If both wires were removed, re-install as shown in Figure 5-736.

5-31 INSTALLATION OF REAR SERVO ASSEMBLY

NOTE: Before installing the rear servo assembly check band apply

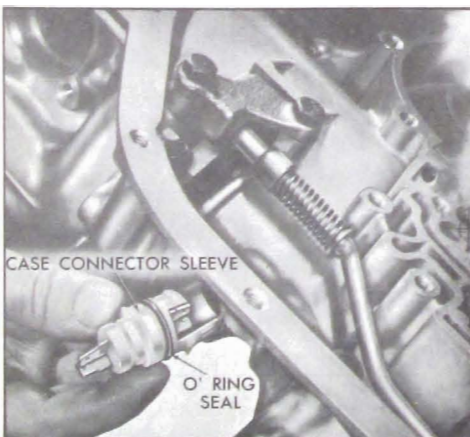


Figure 5-735

pin using Tool J-21370 as follows:

a. Attach the band apply pin Selection Gauge J-21370, to the transmission case with attaching screws. **NOTE:** Attach tool attaching screws finger tight and check freeness of pin. Torque attaching screw and recheck to make certain pin does not bind.

b. Apply 25 ft. lb. torque and select proper servo pin to be used from scale on tool. See Figure 5-737.

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 three rings	Long
Two Rings	Med.
One Ring	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 into case.

2. Install rear servo assembly into case. See Figure 5-738.



Figure 5-738

3. Install the rear servo gasket and cover. See Figure 5-740.

4. Install attaching screws. Torque bolts to 15-20 ft. lbs. See Figure 5-741.

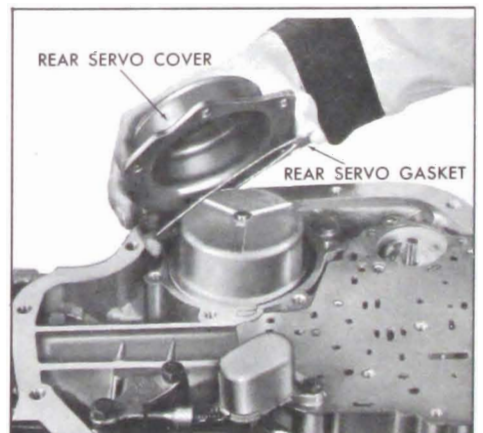


Figure 5-740

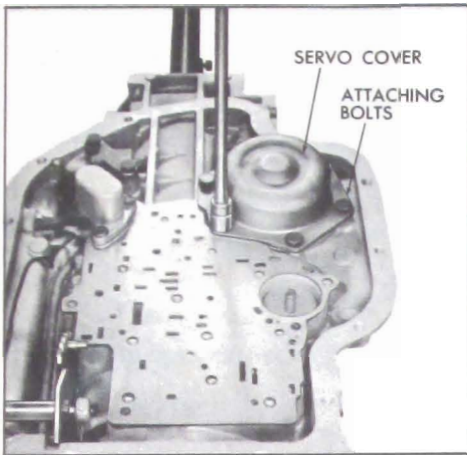


Figure 5-741

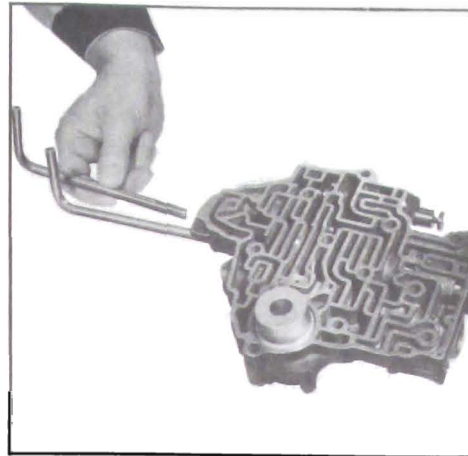


Figure 5-743

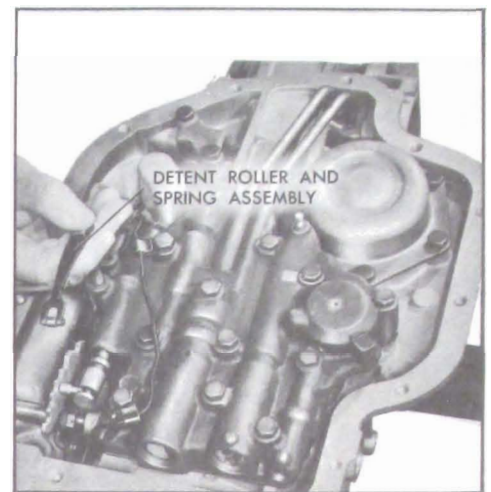


Figure 5-745

5-32 INSTALLATION OF CONTROL VALVE ASSEMBLY AND GOVERNOR PIPES

1. Install control valve to spacer gasket. See Figure 5-742.
2. Install governor pipes into assembly. See Figure 5-743.
3. Install two guide pins (control valve assembly attaching screws with heads removed). See Figure 5-744.
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.

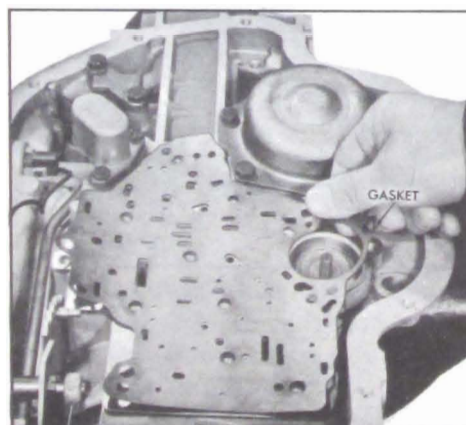


Figure 5-742

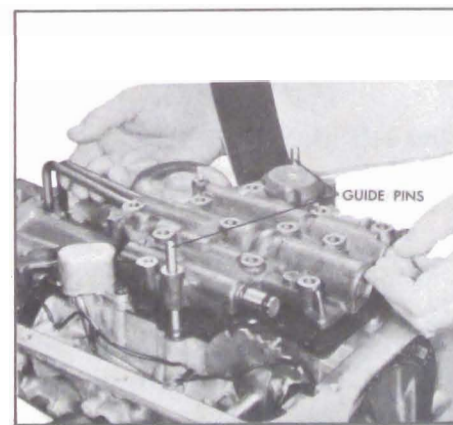


Figure 5-744

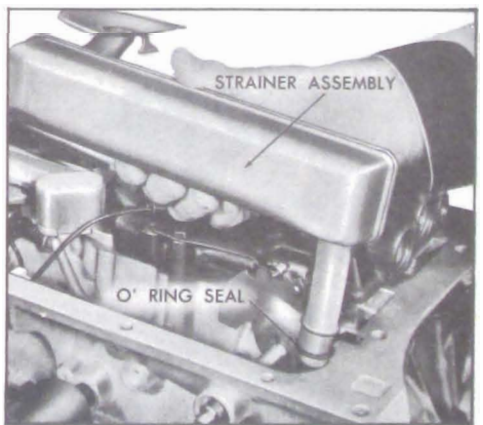


Figure 5-746

5. Remove guide pins.
 6. Install the control valve assembly attaching bolts, washer, electric wire clips and manual detent and roller assembly. Center roller on detent. See Figure 5-745.
- NOTE:** One bolt has copper washer. See Figure 5-508.
7. Attach stator solenoid electric wire to clips.
 8. Tighten the solenoid and control valve attaching bolts. Torque bolts to 6-10 ft. lbs.

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 5-746.

2. Install the strainer and intake pipe assembly.
3. Install a new bottom pan gasket and the bottom pan.

5-34 INSTALLATION OF MODULATOR VALVE AND VACUUM MODULATOR

1. Install the modulator valve into the case, stem end out. See Figure 5-747.
2. Install the "O" ring seal on the vacuum modulator.

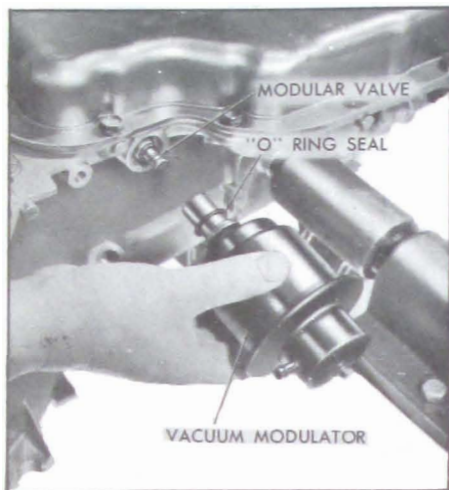


Figure 5-747

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 5-748.

5-35 INSTALLATION OF GOVERNOR ASSEMBLY

1. Install the governor assembly into the case. See Figure 5-750.

2. Attach the governor cover and gasket with four (4) attaching bolts. Torque bolts to 15-20 ft. lbs. See Figure 5-751.

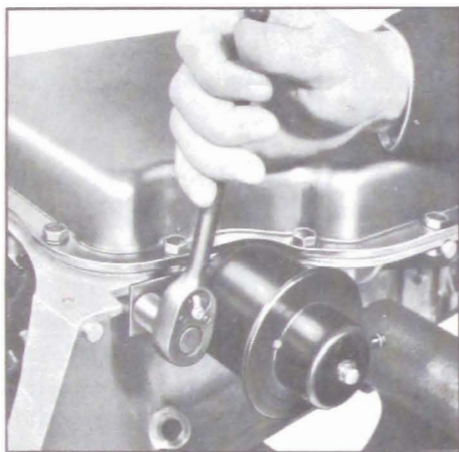


Figure 5-748

5-36 INSTALLATION OF SPEEDOMETER DRIVEN GEAR ASSEMBLY

1. Install the speedometer driven gear assembly. See Figure 5-752.

2. Install the speedometer driven gear retainer and attaching bolt. See Figure 5-753.

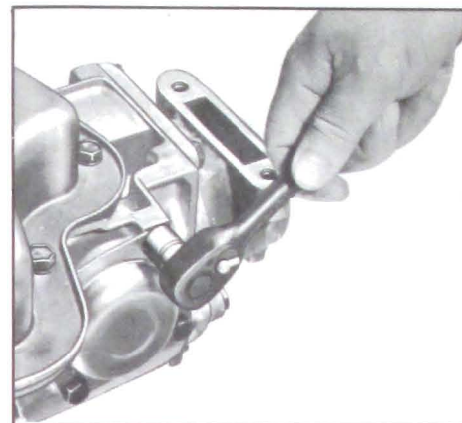


Figure 5-751

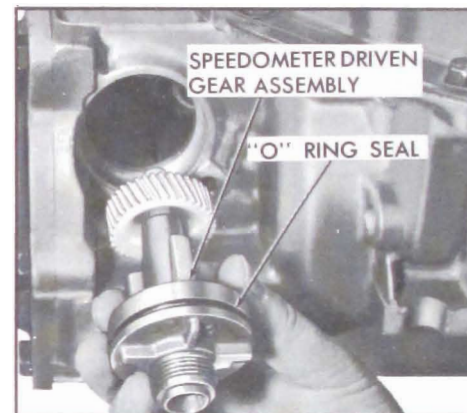


Figure 5-752

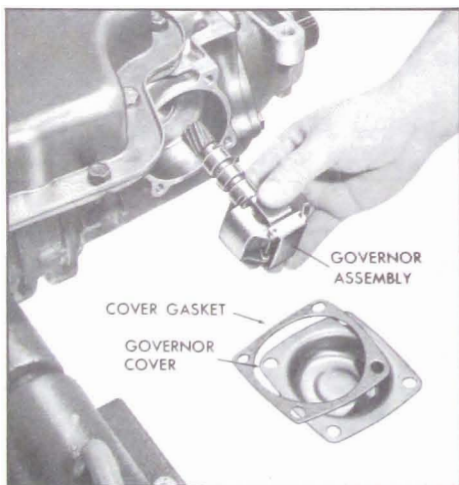


Figure 5-750

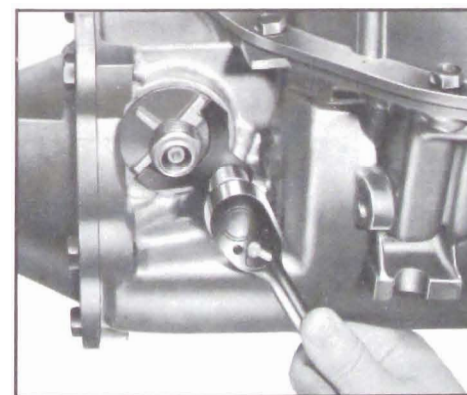


Figure 5-753