SECTION 5-C
TRANSMISSION REMOVAL AND INSTALLATION
DISASSEMBLY AND ASSEMBLY

CONTENTS OF SECTION 5-C

5-9 DISASSEMBLY OF TRANSMISSION TO REMOVE MAJOR PARTS AND UNITS

1. Preliminary Instructions

a. Before starting disassembly of the transmission it should be thoroughly cleaned externally to avoid getting dirt inside.

b. Place transmission on a CLEAN work bench and use CLEAN tools during disassembly. Provide CLEAN storage space for parts and units removed from transmission. An excellent working arrangement is provided by assembling the transmission to Holding Fixture J-8762. See Figure 5-100.

c. The transmission contains parts which are ground and highly polished, therefore, parts should be kept separated to avoid nicking and burring surfaces.

d. When disassembling transmission carefully inspect all gaskets at times of removal. The imprint of parts on both sides of an old gasket will show whether a good seal was obtained. A poor imprint indicates a possible source of oil leakage due to gasket condition, looseness of bolts, or uneven surfaces of parts.

e. None of the parts require forcing when disassembling or assembling transmission. Use a rawhide or plastic mallet to separate tight fitting cases - do not use a hard hammer.

5-10 REMOVAL OF OIL PAN, OIL STRAINER AND PIPE, VALVE BODY, LOW SERVO COVER AND PISTON ASSEMBLY

a. Removal of Oil Pan

NOTE: Transmission need not be removed from car to perform the following operations in Steps 3 through 12. Subparagraph d. Steps 1 through 5.

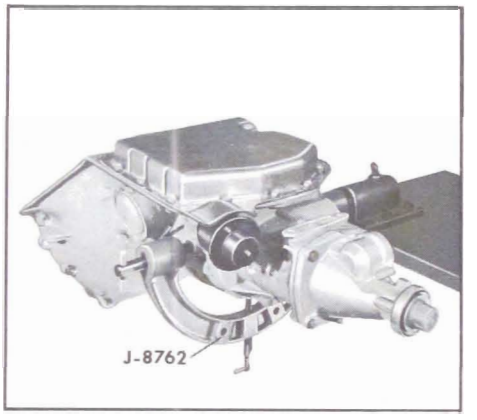

Figure 5-100

1. If transmission has been removed from car, assemble transmission in Fixture J-8763. See Figure 5-100.

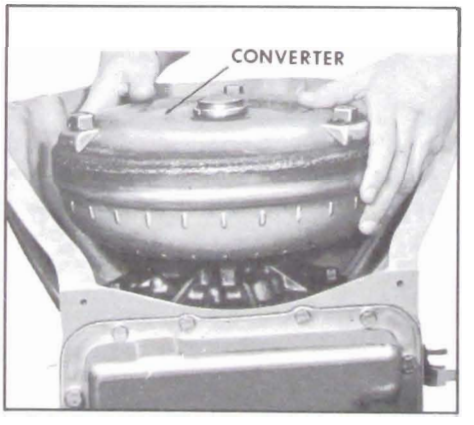

Figure 5-101

2. With transmission in horizontal position pull converter from case. See Figure 5-101.

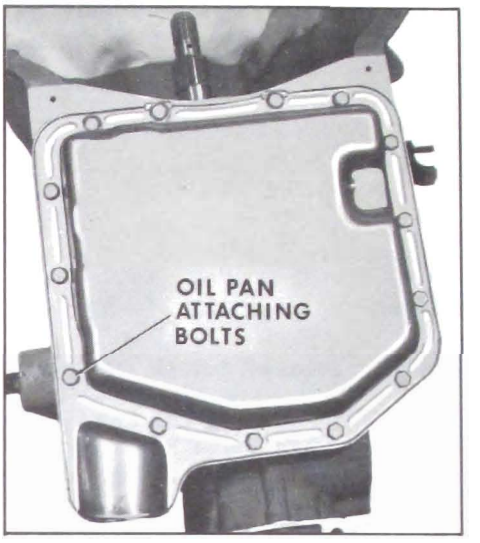

Figure 5-102

3. Remove fourteen (14) oil pan attaching bolts using a 1/2" socket. See Figure 5-102.

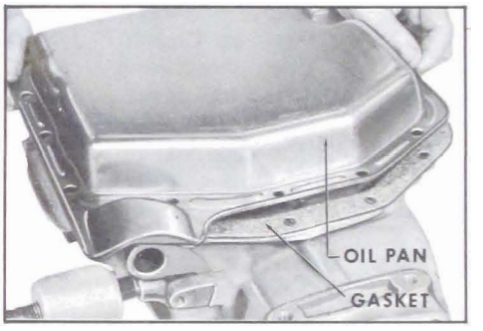

Figure 5-103

4. Remove oil pan and gasket from transmission. See Figure 5-103.

b. Removal of Oil Strainer and Pipe

1. Remove bolt retaining oil strainer to valve body using a 1/2" socket. See Figure 5-104.

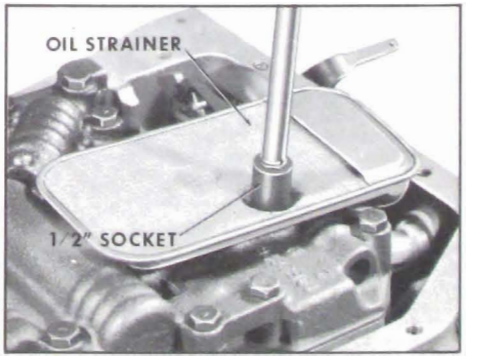

Figure 5-104

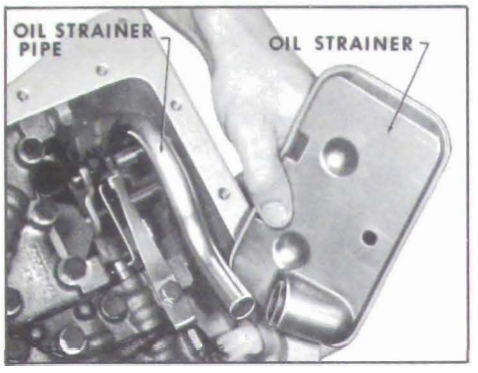

Figure 5-105

2. With a twisting motion remove oil strainer from oil strainer pipe. See Figure 5-105.

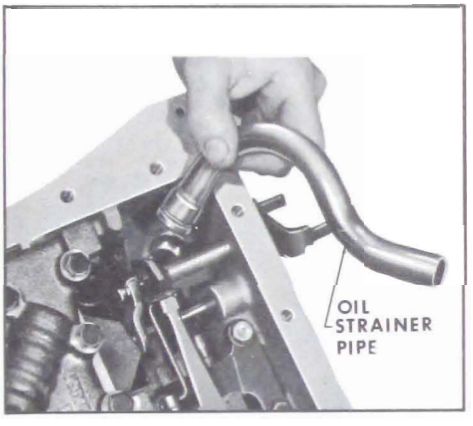

Figure 5-106

3. Lift oil strainer pipe from transmission case. See Figure 5-106.

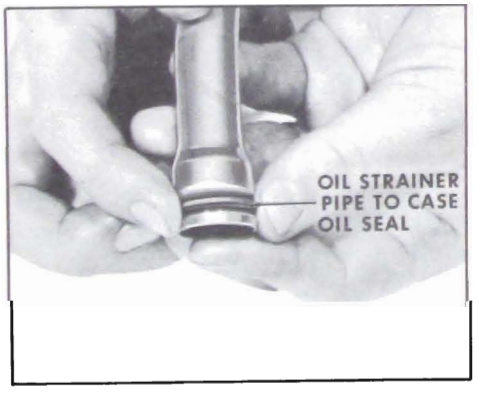

Figure 5-107

4. Examine oil strainer to case oil seal. If nicked, torn or worn, remove seal. See Figure 5-107.

Figure 5-108

5. Examine oil strainer to oil strainer pipe grommet. If nicked, torn or worn, remove grommet. See Figure 5-108.

c. Removal of Valve Body

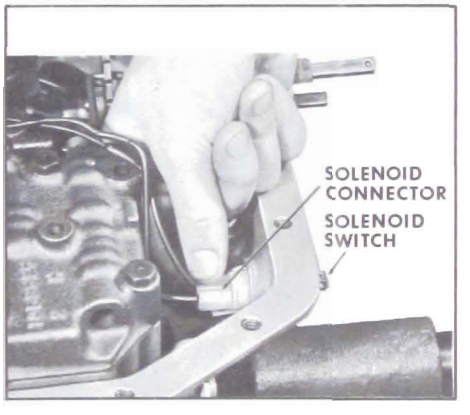

Figure 5-110

1. Disconnect solenoid connector from solenoid switch. See Figure 5-110.

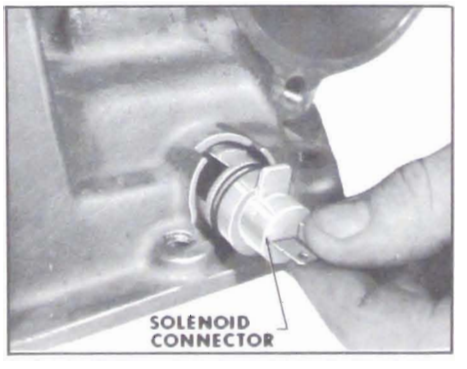

Figure 5-111

2. Remove solenoid switch from case. Inspect switch "O" ring. If nicked, torn or worn replace. See Figure 5-111.

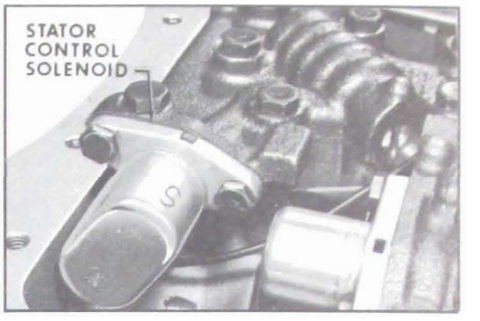

Figure 5-112

3. With a grease pencil mark stator control solenoid with an "S". This "S" will identify stator control solenoid for reassembly. See Figure 5-112.

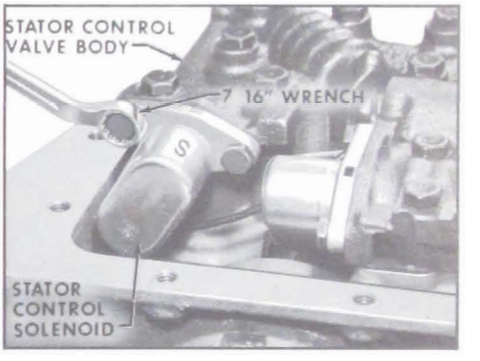

Figure 5-113

4. Remove two (2) solenoid to stator control valve body retaining bolts with 7/16" wrench. Remove stator control solenoid gasket. See Figure 5-113.

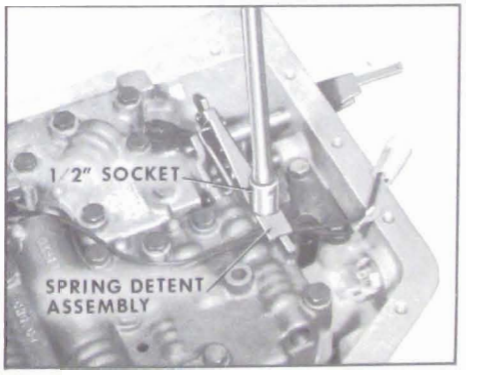

Figure 5-114

5. Remove spring detent assembly bolt with a 1/2" socket. Remove spring detent assembly from valve body. See Figure 5-114.

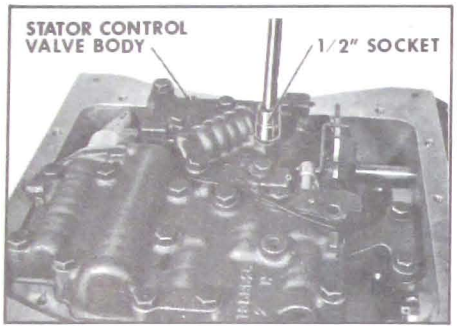

Figure 5-115

6. Remove seven (7) bolts retaining stator control valve body to transmission case using a 1/2" socket. Remove stator control valve body. See Figure 5-115.

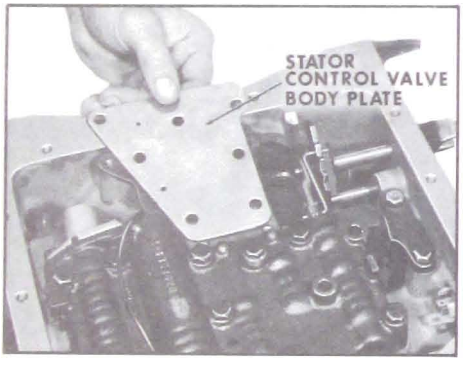

Figure 5-116

7. Remove stator control valve body plate. See Figure 5-116.

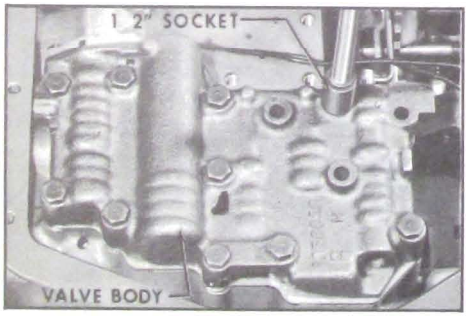

Figure 5-117

8. Remove eleven (11) valve body to case bolts only using a 1/2" socket. Do not remove valve body. See Figure 5-117.

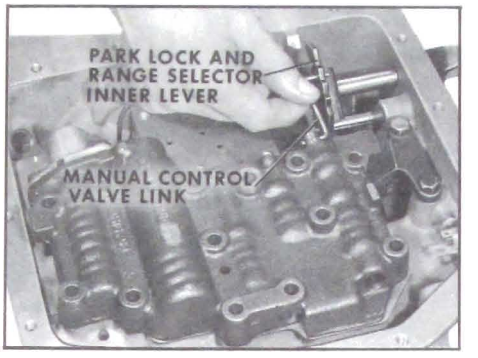

Figure 5-118

9. Remove manual control valve link by rotating valve body in a counterclockwise direction to remove link from Park lock and range selector inner valve. See Figure 5-118.

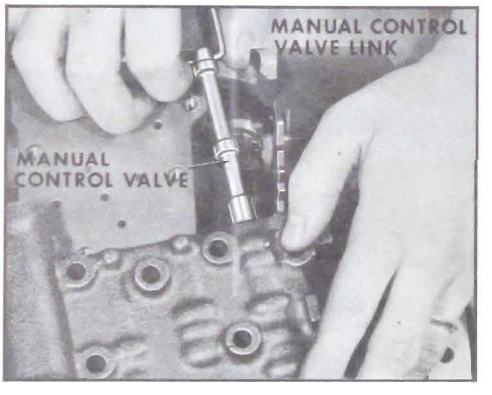

Figure 5-119

10. Remove manual control valve and link from valve body assembly. Remove valve body. See Figure 5-119.

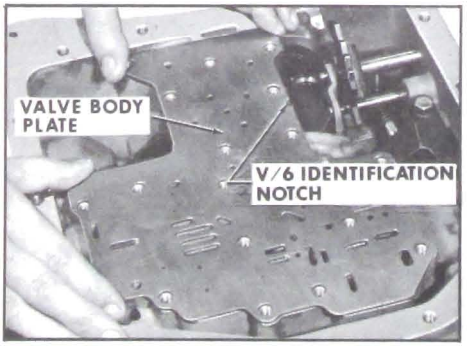

Figure 5-120

11. Remove valve body plate. See Figure 5-120.

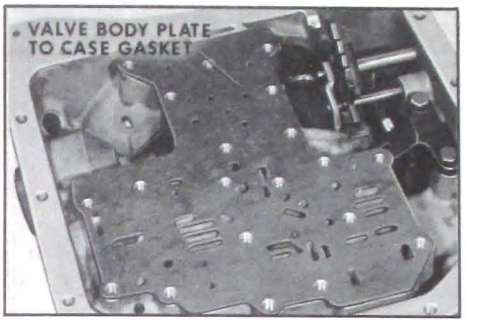

Figure 5-121

12. Remove valve body plate to case gasket. See Figure 5-121.

d. Removal of Low Servo Cover and Piston Assembly

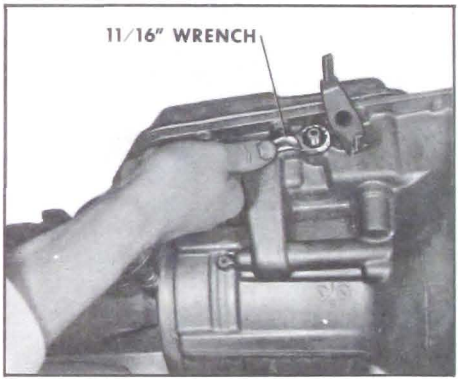

Figure 5-122

1. Release tension on low band adjusting screw retaining nut. Release tension on low band by turning adjusting screw in a counterclockwise direction. Use a 7/32" Allen Wrench. See Figure 5-122.

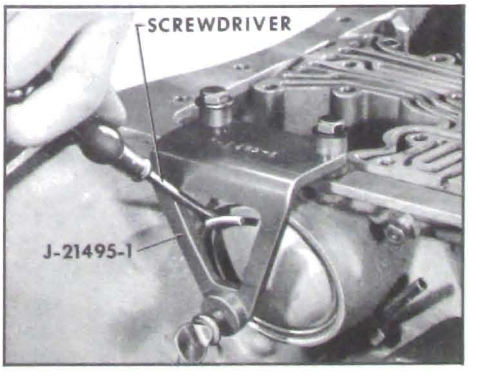

Figure 5-123

2. Remove low servo cover snap ring. Use tool J-21495-1 to compress servo cover so snap ring can be removed. See Figure 5-123.

Figure 5-124

3. Remove tool J-21495-1 from case. Remove low servo cover. NOTE: If necessary aid removal with screwdriver. See Figure 5-124.

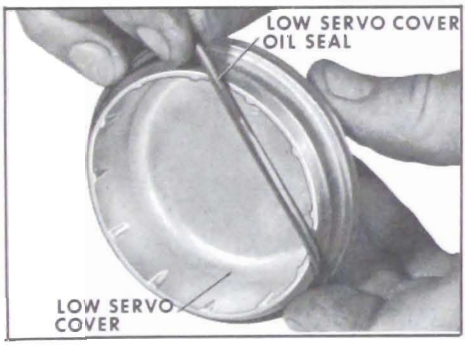

Figure 5-125

4. Inspect low servo cover seal. If nicked, torn or worn discard. See Figure 5-125.

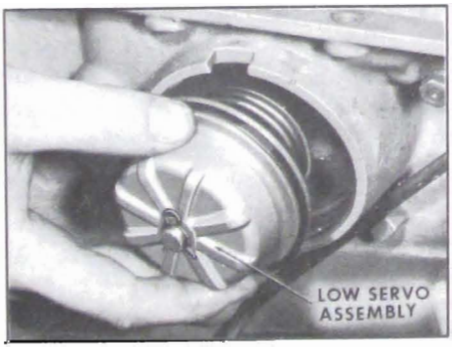

Figure 5-126

5. Remove low servo piston assembly from case. See Figure 5-126.

5-11 REMOVAL OF OIL PUMP, FORWARD CLUTCH, AND LOW BAND

a. Removal of Oil Pump

1. With transmission in vertical position, remove eight (8) pump attaching bolts with "O" ring

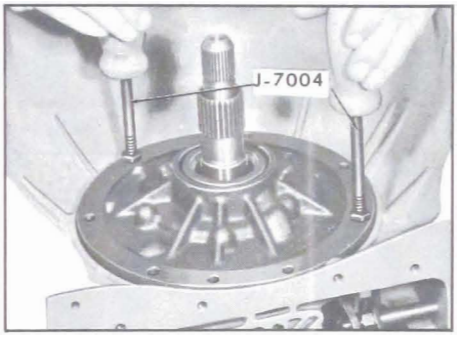

Figure 5-127

seals, then install Slide Hammers J-7004 into threaded holes in pump. Using slide hammers, loosen pump from case. Remove pump and gasket from case. See Figure 5-127.

b. Removal of Forward Clutch

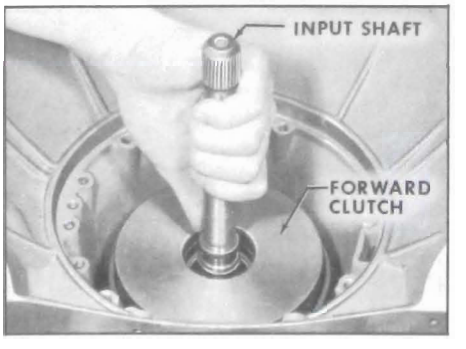

Figure 5-128

1. Remove input shaft from forward clutch drum. See Figure 5-128.

Figure 5-129

2. Examine input shaft oil rings. If nicked or worn, remove rings. See Figure 5-129.

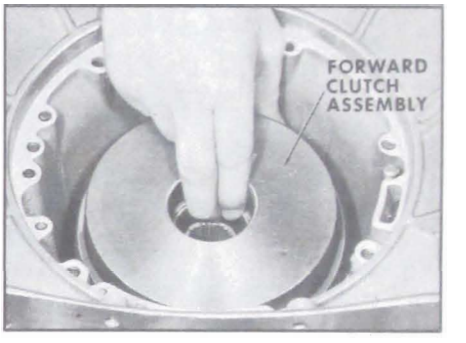

Figure 5-130

3. Remove forward clutch assembly by pulling straight out of case. Make certain low band has been released before attempting to remove forward clutch. See Fig-5-130.

c. Removal of Low Band

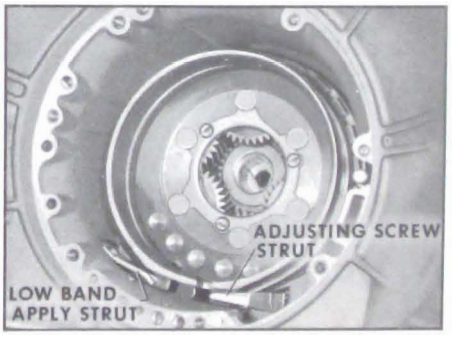

Figure 5-131

1. Remove low band and struts from inside the case. See Figure 5-131.

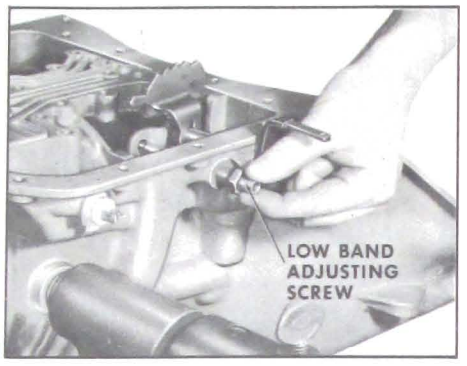

Figure 5-132

2. Remove low band adjusting screw. See Figure 5-132.

5-12 REMOVE SPEEDOMETER DRIVEN GEAR, REAR BEARING RETAINER, RETAINER OIL SEAL, RETAINER BUSHING, AND SPEEDOMETER DRIVE GEAR

a. Removal of Speedometer Driven Gear

NOTE: Transmission need not be removed from the car to perform the following operations, paragraph 5-12 and 5-13.

Figure 5-133

1. With transmission in horizontal position, remove speedometer driven gear sleeve retainer with a 1/2" wrench. See Figure 5-133.

Figure 5-134

2. Remove speedometer driven gear sleeve. See Figure 5-134.

b. Removal of Rear Bearing Retainer

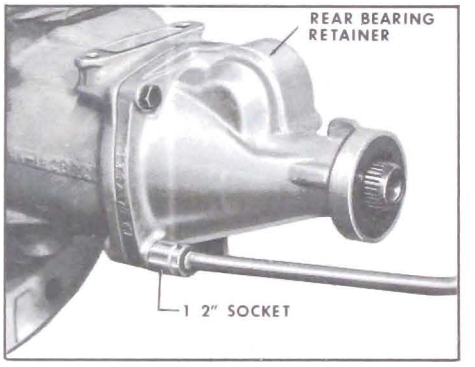

Figure 5-135

1. Remove four (4) rear bearing retaining bolts with a 9/16" socket. Remove rear bearing retainer from case. See Figure 5-135.

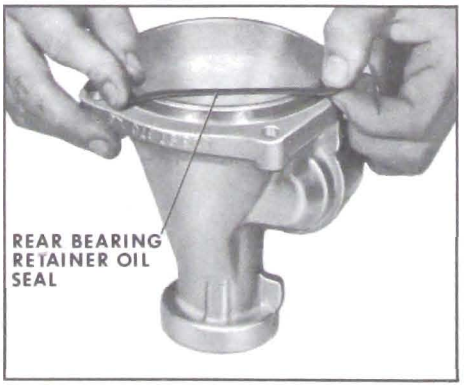

Figure 5-136

2. Remove rear bearing retainer oil seal. See Figure 5-136.

c. Removal of Rear Bearing Retainer Oil Seal

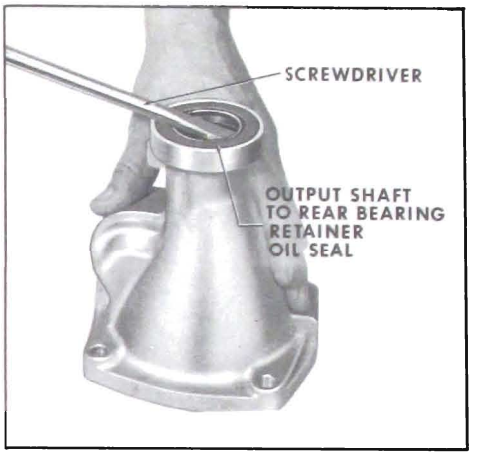

Figure 5-137

1. Inspect and if necessary remove output shaft to rear bearing retainer oil seal. See Figure 5-137.

d. Removal of Rear Bearing Retainer Bushing

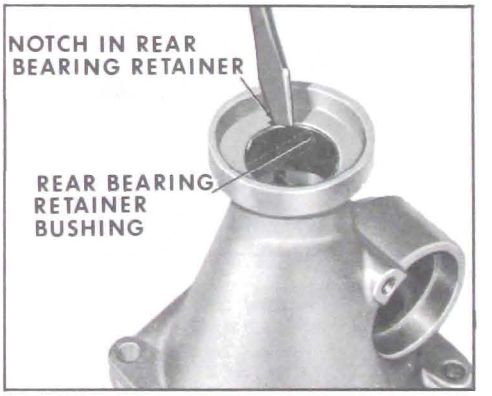

Figure 5-138

1. Inspect and if necessary replace rear bearing retainer bushing. Place screwdriver in notch in rear bearing retainer, then tap screwdriver with hammer to collapse bushing. See Figure 5-138.

e. Removal of Speedometer Driving Gear

1. Place transmission in Park range, then remove speedometer

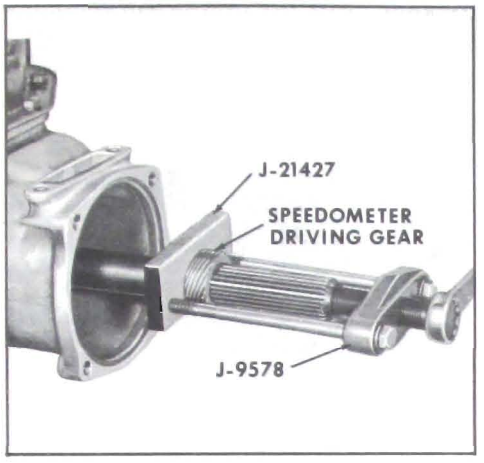

Figure 5-140

driving gear with J-9578. See Figure 5-140.

5-13 REMOVAL OF GOVERNOR AND VACUUM MODULATOR

a. Removal of Governor

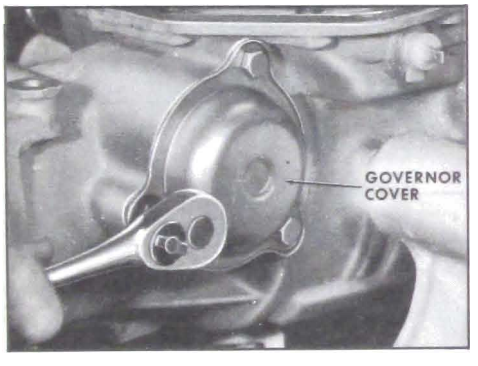

Figure 5-141

1. Remove three (3) attaching bolts retaining governor cover to case using a 1/2" socket. Remove cover and gasket. See Figure 5-141.

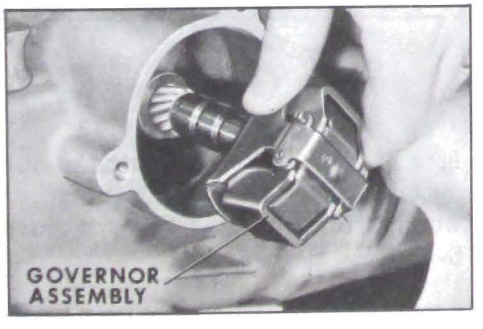

Figure 5-142

2. With a twisting motion slide governor assembly out of its bore in case. See Figure 5-142.

b. Removal of the Vacuum Modulator Assembly

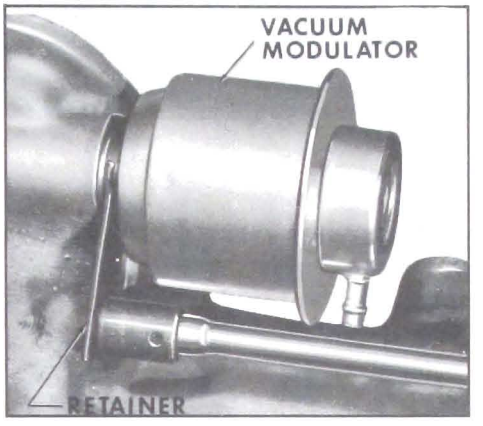

Figure 5-143

1. Remove vacuum modulator retainer bolt and retainer using a 1/2" socket. Remove vacuum modulator and valve assembly. See Figure 5-143.

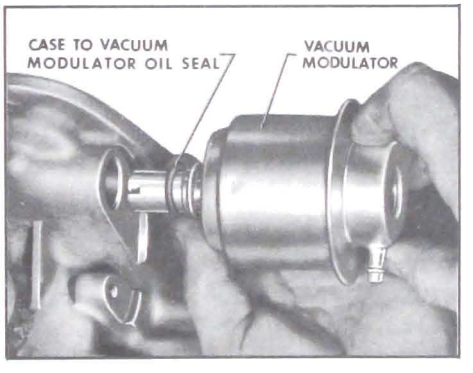

Figure 5-144

2. Inspect and if necessary remove vacuum modulator to case oil seal. See Figure 5-144.

5-14 REMOVAL OF PLANETARY GEAR SET, REVERSE CLUTCH AND PARKING LOCK MECHANISM

a. Removal of Planetary Gear Set

1. Remove planet carrier assembly from case, using care not to damage case bushing. See Figure 5-145.

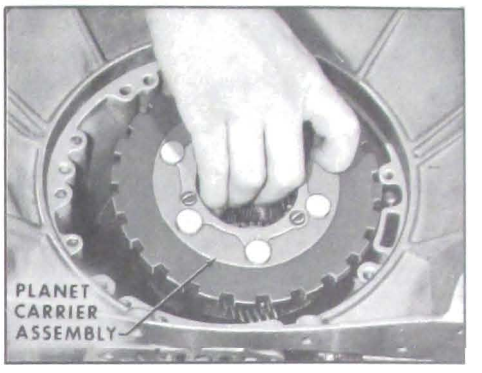

Figure 5-145

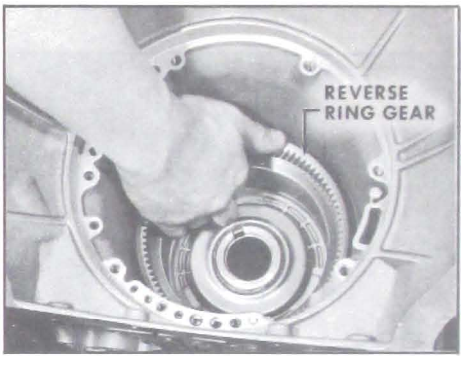

Figure 5-146

2. Remove reverse ring gear from case. See Figure 5-146.

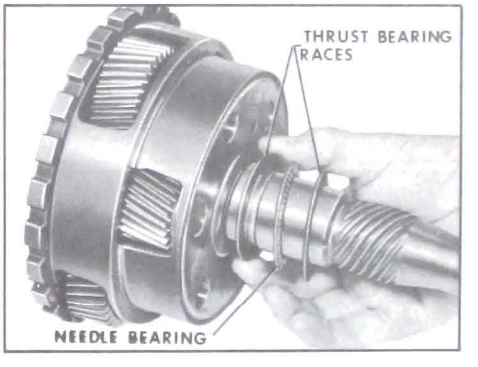

Figure 5-147

3. Remove needle bearing and two (2) bearing races from rear of planet carrier. See Figure 5-147.

b. Removal of Reverse Clutch

1. Place transmission in vertical position and remove reverse

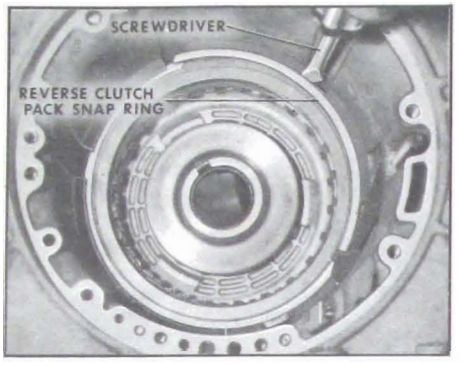

Figure 5-148

clutch pack snap ring with screwdriver. See Figure 5-148.

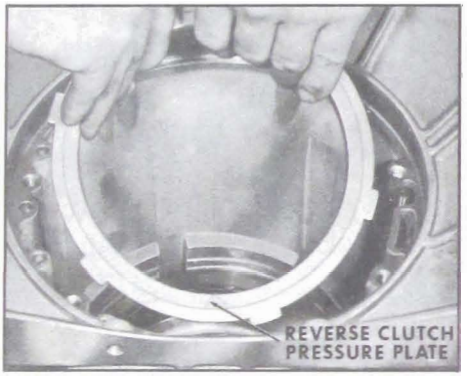

Figure 5-150

2. Lift reverse clutch pressure plate from transmission case. See Figure 5-150.

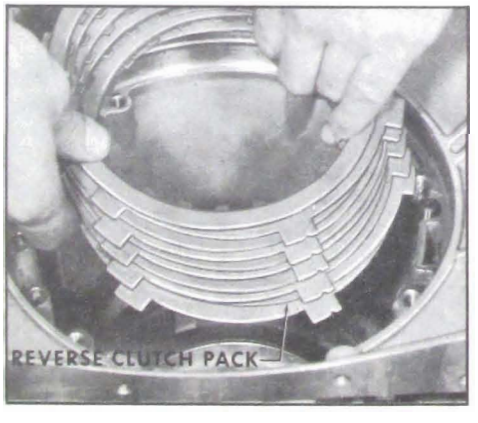

Figure 5-151

3. Remove reverse clutch pack from transmission case. See Figure 5-151.

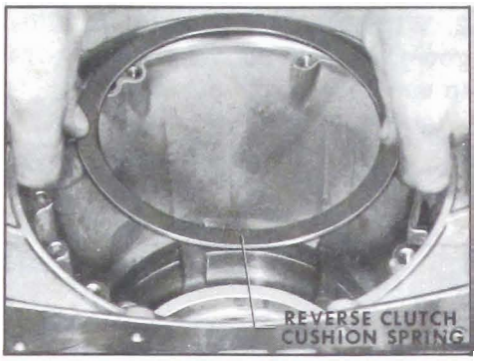

Figure 5-152

4. Remove reverse clutch cushion spring. See Figure 5-152.

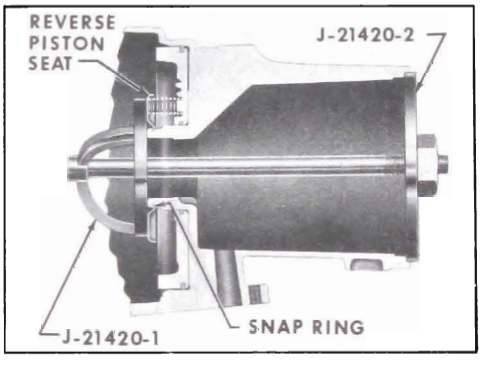

Figure 5-153

5. To remove reverse piston, center tool J-21420-1 on reverse piston return seat. Install Flat Plate J-21420-2 over threaded shaft at rear of case. Tighten wing nut to compress piston return seat; then remove snap ring with Pliers J-5586. See Figure 5-153.

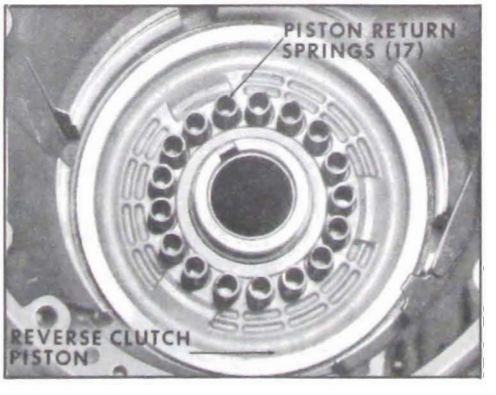

Figure 5-154

6. Remove tool J-21420-2 being careful that piston return seat does not catch in snap ring groove. Lift off piston return seat and remove seventeen (17) piston return springs. See Figure 5-154.

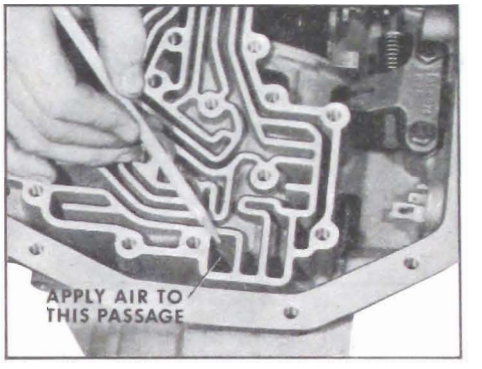

Figure 5-155

7. Place transmission in a horizontal position and remove reverse clutch piston with compressed air. As air is applied to the rear surface of the piston, it will pop out far enough so it can be removed. Insert air nozzle to rear of case as shown in figure. See Figure 5-155.

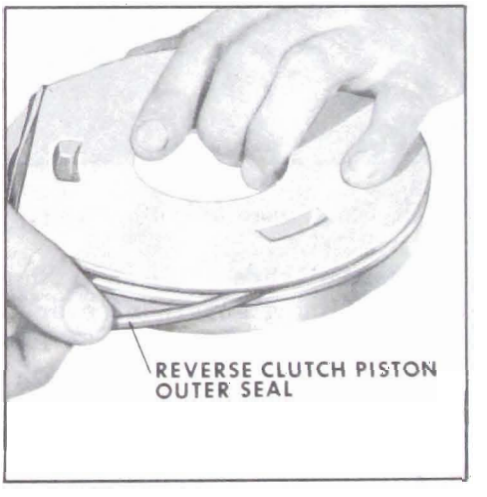

Figure 5-156

8. Examine reverse clutch piston outer seal. If nicked, torn or worn, remove seal. See Figure 5-156.

9. Examine reverse clutch piston inner seal. If nicked, torn or

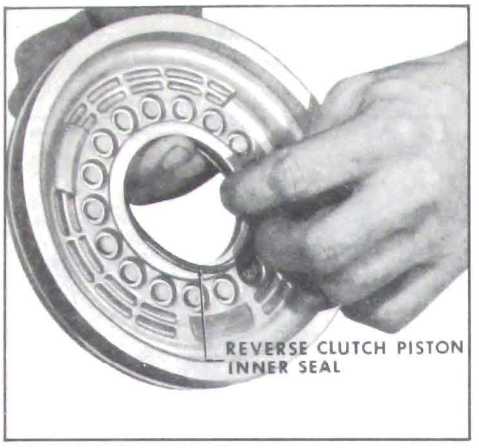

Figure 5-157

worn, remove seal. See Figure 5-157.

c. Removal of Range Selector Lever and Shaft, and Parking Lock Actuator

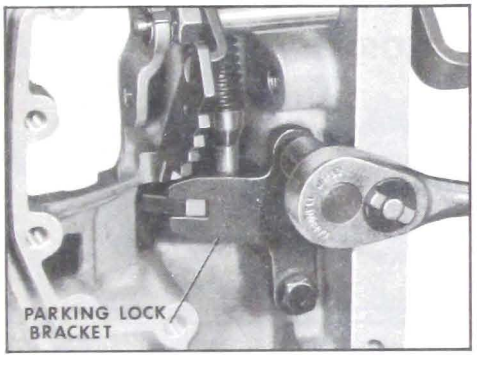

Figure 5-158

1. Remove two (2) parking lock bracket bolts with 1/2" socket. Remove parking lock bracket. See Figure 5-158.

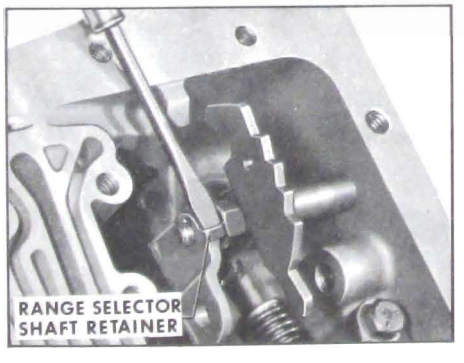

Figure 5-160

2. Remove range selector shaft retainer. See Figure 5-160.

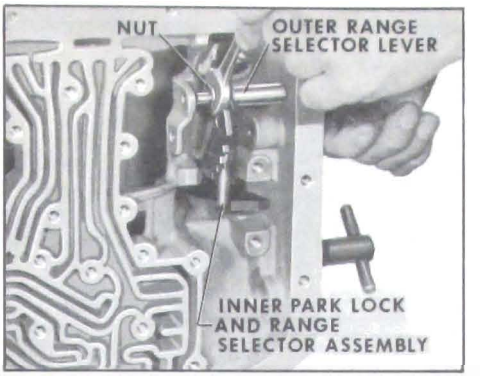

Figure 5-161

3. With a 9/16" wrench fully loosen nut that retains outer range selector lever to inner park lock and range selector lever. See Figure 5-161.

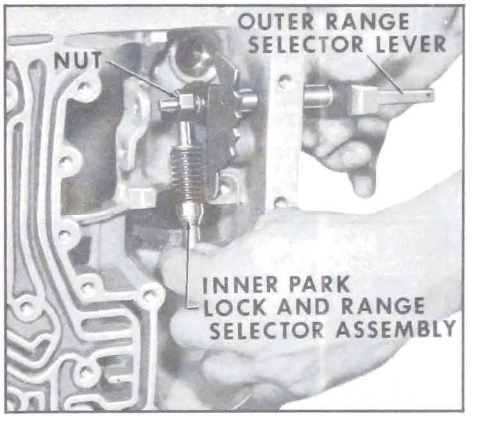

Figure 5-162

4. Slide outer range selector lever out of case. Remove nut, inner park lock and range selector lever. See Figure 5-162.

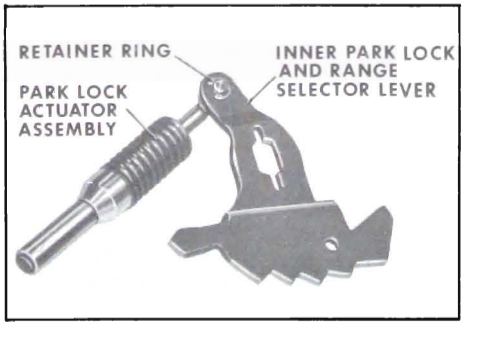

Figure 5-163

5. Remove retaining ring which holds inner park lock and range selector to park lock assembly. See Figure 5-163.

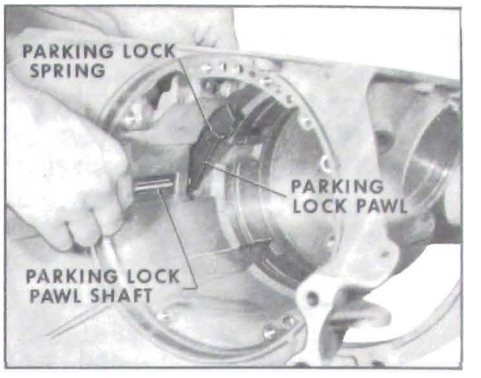

Figure 5-164

6. Slide parking lock pawl shaft out of parking lock pawl. Remove parking lock pawl and spring. See Figure 5-164.

Figure 5-165

7. Examine outer shift lever oil seal. If nicked, torn or worn, replace seal. See Figure 5-165.

d. Removal of Case Bushing

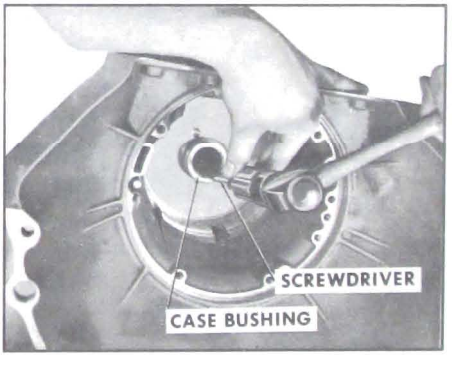

Figure 5-166

1. Inspect case bushing for nicks, scoring or excessive wear. If damaged, replace as follows: Place screwdriver in notch in case, then tap screwdriver with

hammer to collapse bushing. See Figure 5-166.

5-15 VALVE BODY DISASSEMBLY INSPECTION AND REASSEMBLY

a. Disassembly

NOTE: Transmission need not be removed from the car to perform the following operations. Paragraph 5-15, 5-16 and 5-17.

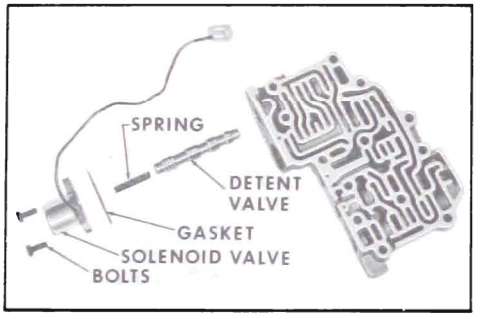

Figure 5-167

1. Remove two (2) bolts attaching stator and detent solenoid valve. Remove the solenoid valve, gasket, spring and stator and detent valve. See Figure 5-167.

NOTE: Notice cutout notch on solenoid valve gasket.

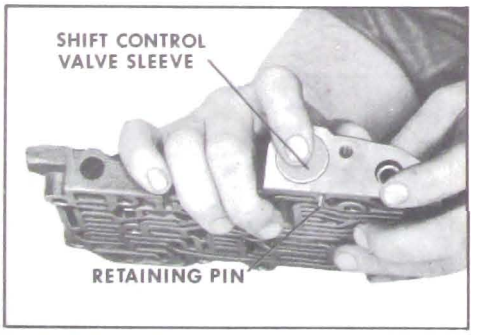

Figure 5-168

2. Depress shift control valve sleeve and remove retaining pin by turning valve body over so pin will fall free. Remove shift control valve sleeve, shift control valve, spring, washer, and shift valve. See Figure 5-168.

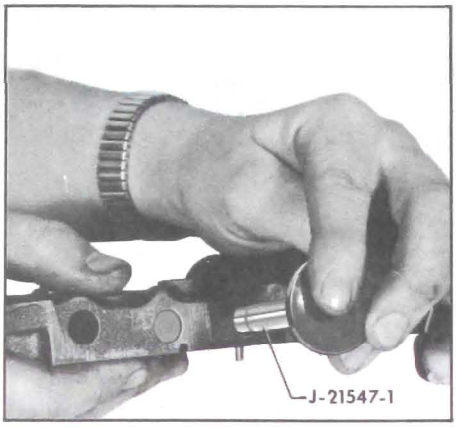

Figure 5-170

3. Depress modulator limit spring with tool J-21547-1. Turn valve body over and retaining pin will fall free. Remove spring and valve from body. See Figure 5-170.

NOTE: Modulator limit spring is under moderate pressure. Care should be exercised in removal.

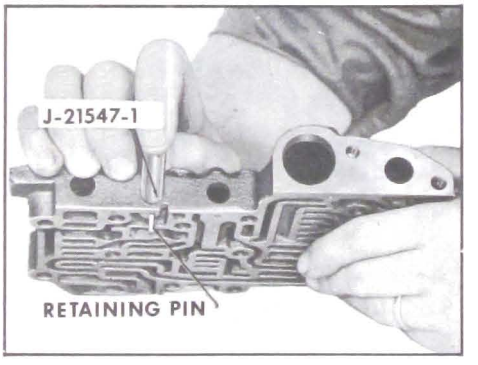

Figure 5-171

4. Depress high speed down shift timing valve plug and remove pin by turning valve body over so pin will fall free. See Figure 5-171.

b. Inspection

1. Thoroughly clean all valves and valve body in solvent. Inspect valves and valve body for evidence of wear or damage due to foreign material. Dry valve body and valves with clean air blast.

2. Test each valve in its bore. All valves must move freely of their own weight.

c. Reassembly of Valve Body

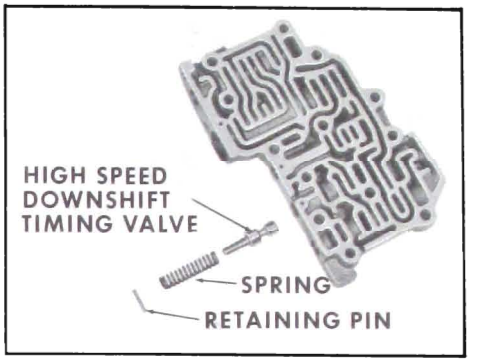

Figure 5-172

1. Install high speed downshift timing valve and spring. Depress spring with J-21547-1 and install retaining pin. See Figure 5-172.

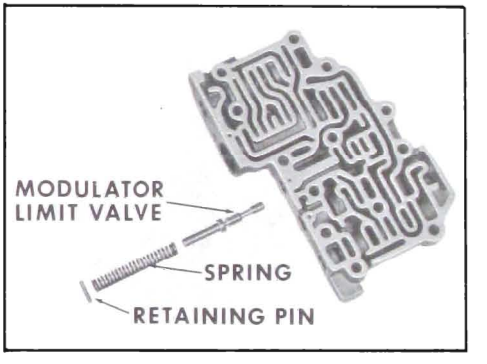

Figure 5-173

2. Install modulator limit valve, and spring into bore of valve body. With aid of tool J-21361 compress spring and install retaining pin. See Figure 5-173.

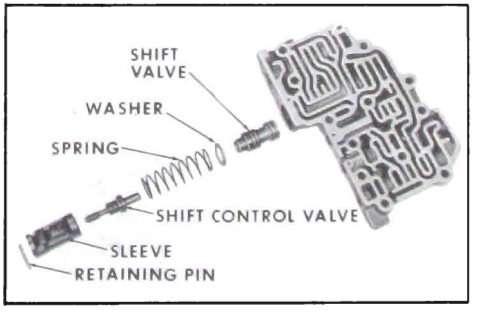

Figure 5-174

3. Install shift valve, washer, spring, shift control valve and shift control valve sleeve. Depress shift control valve sleeve

with thumb and install retaining pin. See Figure 5-174.

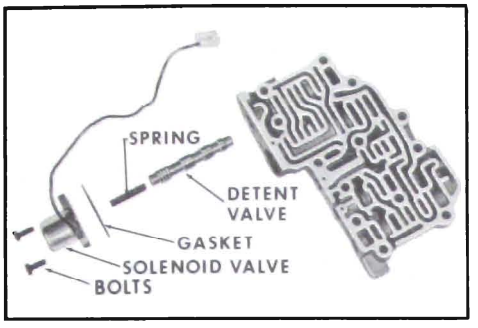

Figure 5-175

4. Install detent valve and spring. Install gasket to solenoid with notch facing bottom of valve body. Install solenoid to valve body using two 7/16" bolts. See Figure 5-175.

5-16 STATOR CONTROL VALVE BODY DISASSEMBLY AND REASSEMBLY

a. Disassembly

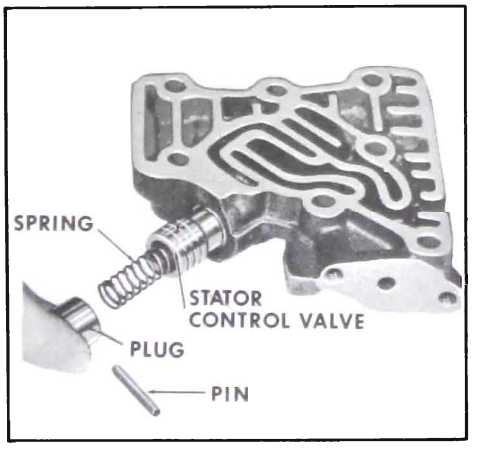

Figure 5-176

1. Compress stator control valve plug. Turn valve body over and retaining pin will fall free. Remove plug, spring and valve from body. See Figure 5-176.

b. Reassembly

2. Install stator control valve, spring and plug into bore of valve body. Compress plug and install retaining pin. See Figure 5-177.

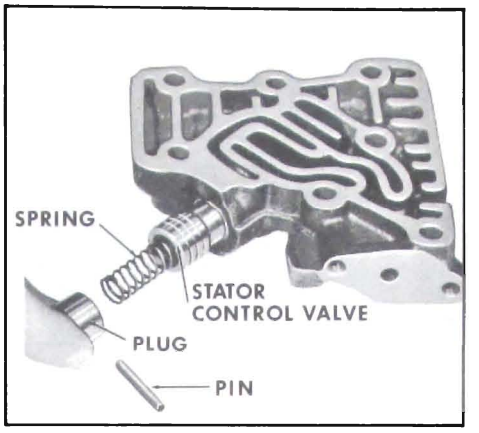

Figure 5-177

5-17 LOW SERVO DISASSEMBLY AND REASSEMBLY

a. Disassembly

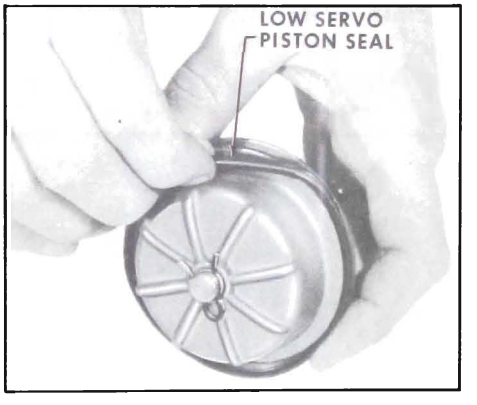

Figure 5-177A

1. Remove low servo piston seal. See Figure 5-177-A.

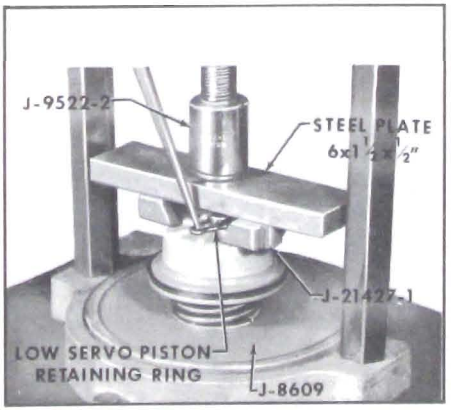

Figure 5-178

2. Compress low servo piston. EXTREME CAUTION MUST BE TAKEN WHEN THE LOW SERVO IS BEING COMPRESSED. Install J-9522-2 to hydraulic ram. Install J-21421-1 on top of servo piston. Install a piece of metal 6" x 1-1/2 x 1/2 between J-9522-2 and J-21421-1. Using hydraulic press compress piston and remove retaining pin.

NOTE: After retaining pin has been removed release hydraulic ram very slowly. See Figure 5-178.

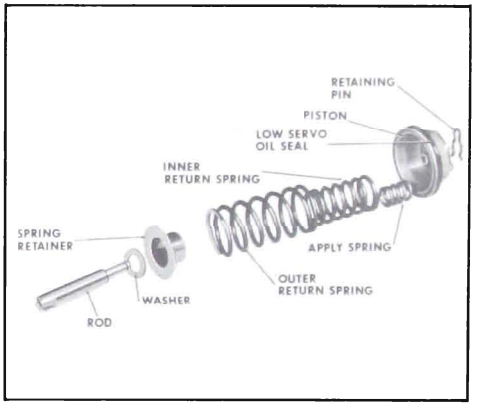

Figure 5-179

3. After hydraulic ram has been released remove piston low servo apply piston spring inner, outer return springs, spring retainer, washer and piston apply rod. See Figure 5-179.

b. Reassembly

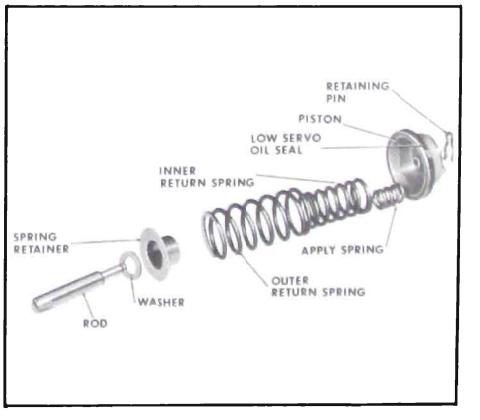

Figure 5-180

1. Assemble the inner and outer return springs into the piston. Install spring retainer. See Figure 5-180. Install this assembly into the ram press as shown in Figure 5-180.

2. Assemble tools on top of piston in same manner as removing. Center spring retainer over hole

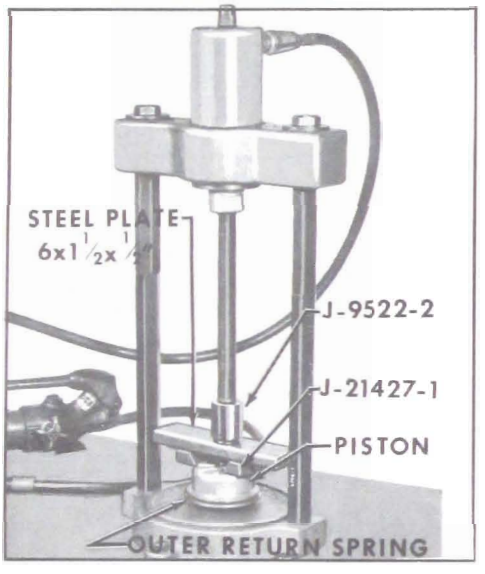

Figure 5-181

in press Plate J-8690. Compress springs. Install piston apply rod and washer through hole in press plate and install retainer pin.

CAUTION: BEFORE RELEASING RAM MAKE CERTAIN RETAINER PIN IS PROPERLY INSTALLED.

Install low servo piston seal. See Figure 5-181.

5-18 DISASSEMBLY, INSPECTION, AND THE REASSEMBLY OF THE OIL PUMP

a. Disassembly

1. Remove the two (2) hook type oil sealing rings from pump hub. See Figure 5-182.

Figure 5-182

Figure 5-183

2. Remove pump cover to forward clutch drum thrust washer. See Figure 5-183.

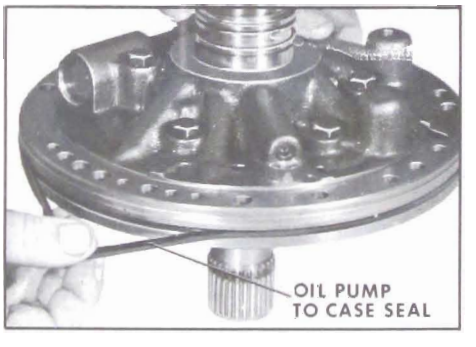

Figure 5-184

3. Remove oil pump to case seal and discard. See Figure 5-184.

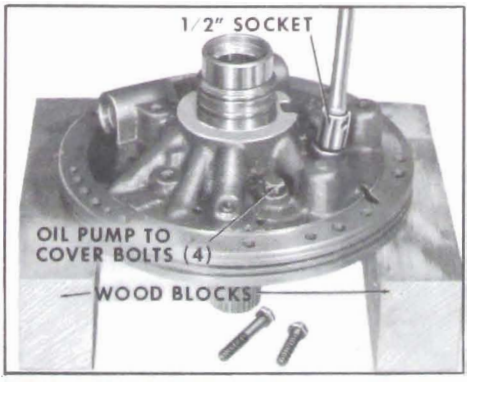

Figure 5-185

4. Support oil pump on wood blocks. Remove five (5) pump cover bolts with a 1/2" socket. Remove pump cover. See Figure 5-185.

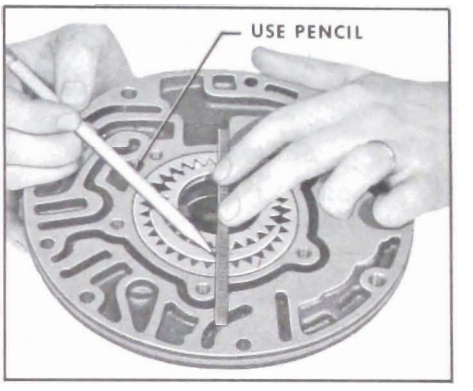

Figure 5-186

5. Mark, but do not scar, gear faces so gears can be reassembled in same manner. See Figure 5-186.

Figure 5-187

6. Remove oil pump drive gear. See Figure 5-187.

Figure 5-188

7. Remove oil pump driven gear. See Figure 5-188.

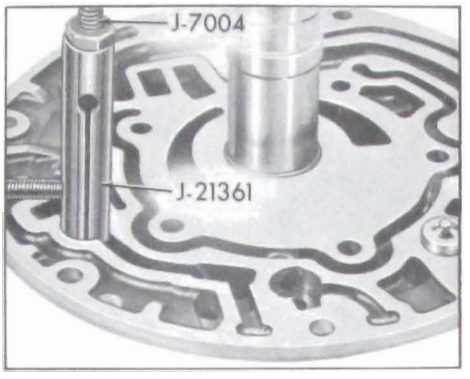

Figure 5-190

8. Remove seat, valve and spring from cooler by-pass valve and lube blow off valve. Use tool J-21361 to remove seat from bore in pump cover. See Figure 5-190.

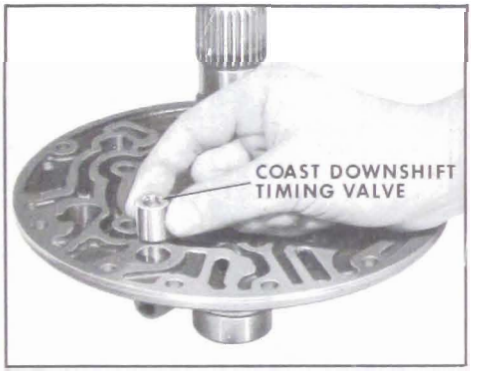

Figure 5-191

9. Remove coast downshift timing valve from the pump cover and inspect for damage. Carefully check to be sure the spring returns the ball to its seat. See Figure 5-191.

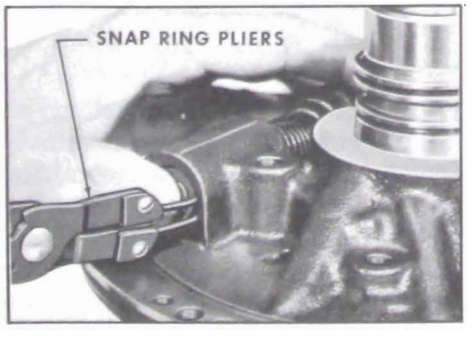

Figure 5-192

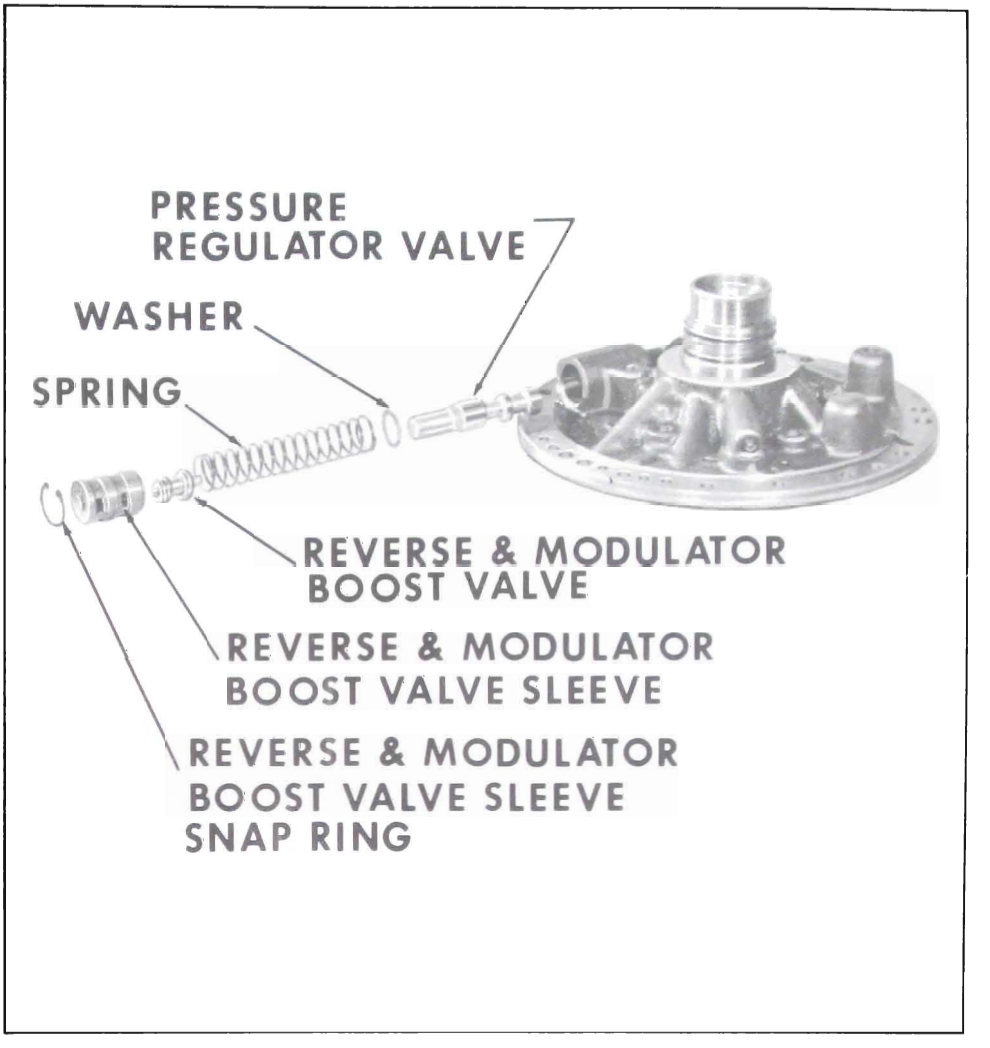

Figure 5-193

10. Compress reverse and modulator boost valve with thumb and remove retaining snap ring. See Figure 5-192.

CAUTION: Reverse and modulator boost valve sleeve is under extreme spring pressure. Extreme care should be taken after retaining snap ring has been removed.

11. After retaining snap ring has been removed, remove reverse and modulator boost valve sleeve and valve, spring, washer, and pressure regulator valve. See Figure 5-193.

12. Examine oil pump seal. If nicked, torn or worn remove seal as follows: Support oil pump body on wood blocks. Remove oil seal with a screwdriver and discard. See Figure 5-194.

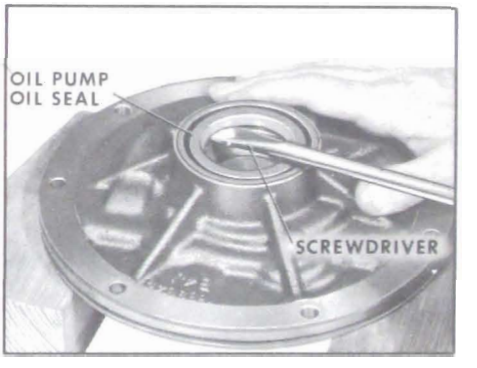

Figure 5-194

13. Check oil pump bushing for nicks, severe scoring or wear. If bushing replacement is necessary, replace pump body.

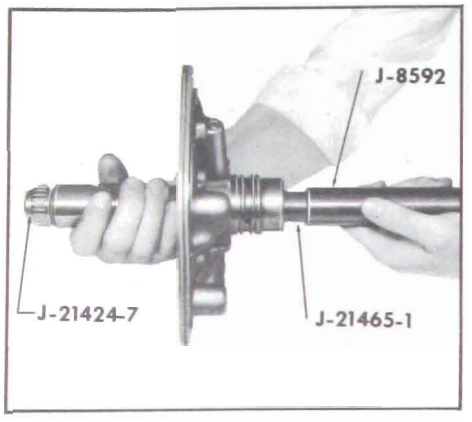

Figure 5-196

14. Check stator shaft bushing for nicks, severe scoring or wear. If bushing replacement is necessary proceed as follows: Assemble Bushing Remover J-21424-7 to Extension J-21465-13. Assemble this assembly to Drive Handle J-8592. Grasp stator shaft with hand using other hand and assembled tool drive out bushing. See Figure 5-196.

b. Inspection

1. Wash all parts in a cleaning solvent and blow out oil passages with compressed air.

2. Inspect pump gears for nicks or damage.

3. Inspect pump body for nicks or scoring.

4. Check condition of bushing in oil pump body, if damaged replace.

5. With parts clean and dry, install pump gears, noting mark on gears for identification of the side that faces the pump cover. After gears have been installed, proceed as follows:

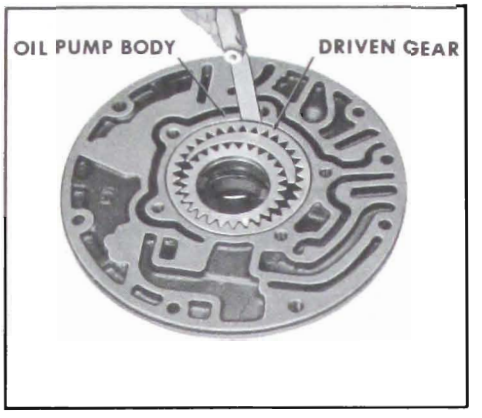

Figure 5-197

a. Check clearance between O.D. of driven gear and pump body. The clearance allowed is .0035/.0065. See Figure 5-197.

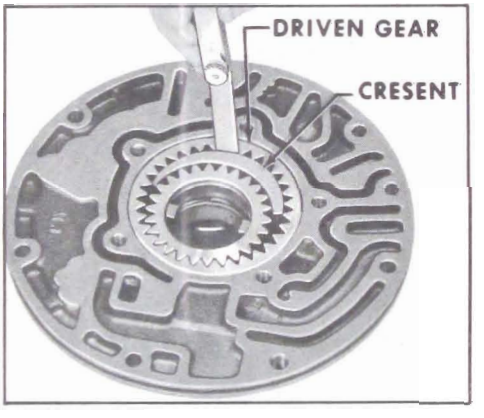

Figure 5-198

b. Check clearance between oil pump driven gear and crescent. The clearance allowed is .0005/.0100. See Figure 5-198.

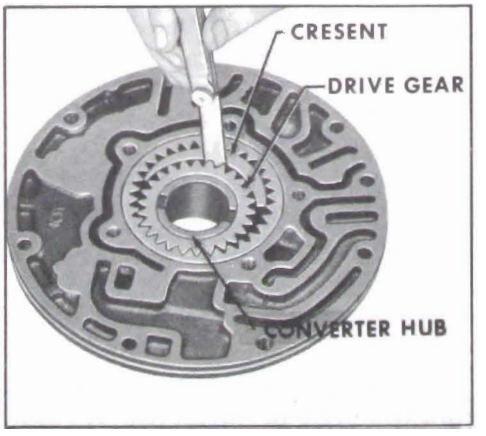

Figure 5-200

c. Install pump on converter hub. Check clearance between oil pump drive gear and crescent. The clearance allowed is .004/.009. See Figure 5-200.

Figure 5-201

d. Install pump on converter hub. With dial indicator set check end clearance. The clearance allowed is .0005/.0015. See Figure 5-201.

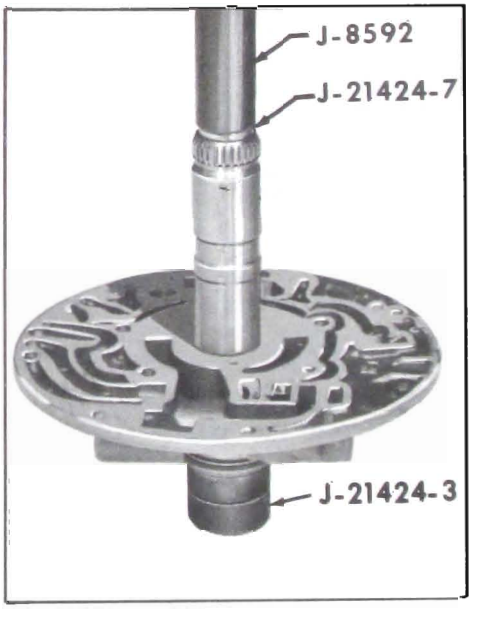

Figure 5-203

1. Install stator shaft bushing as follows: Support pump assembly on J-21424-7 before installing bushing. Install bushing into the front end of stator shaft. Using Installer J-21424-7 and Drive Handle J-8592 tap bushing into shaft until tool is flush with top of shaft. See Figure 5-203.

Figure 5-204

2. Using Installer J-21359 tap in new oil seal. See Figure 5-204.

Figure 5-205

3. Install new oil pump to case seal. See Figure 5-205.

4. Assemble pressure regulator valve, washer, spring, reverse and modulator boost valve and sleeve. See Figure 5-206.

5. Compress reverse and modulator boost valve with thumb, then install retaining snap ring. See Figure 5-207.

6. Install coast downshift timing valve "button end" up in cover. See Figure 5-208.

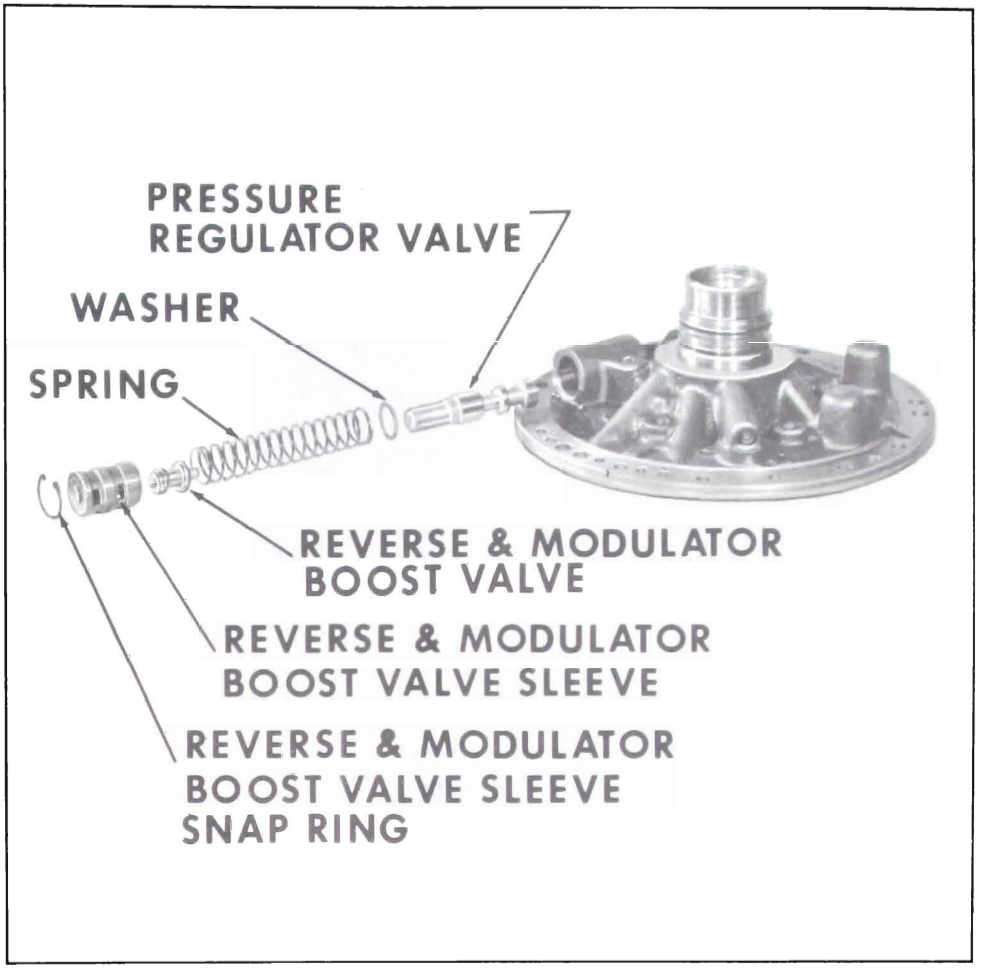

Figure 5-206

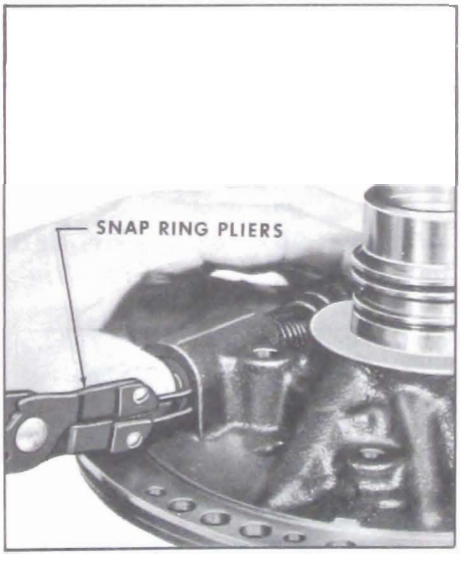

Figure 5-207

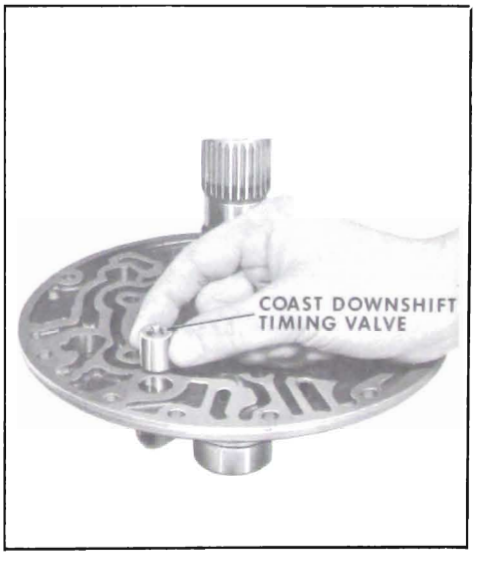

Figure 5-208

7. Install spring, valve, and seat into cooler by-pass valve and lube blow off valve. Using Tool J-21558 press seat into bore of pump body until tool bottoms on face of pump. See Figure 5-210.

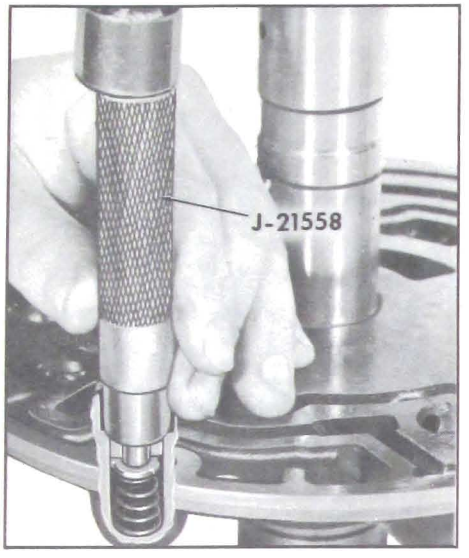

Figure 5-210

NOTE: Thrust washer and oil pump sealing ring will be installed during later operation.

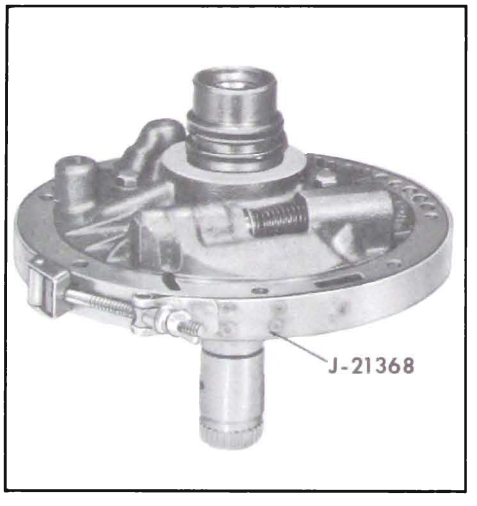

Figure 5-211

8. Install pump cover to pump body. Install five (5) retaining bolts but do not tighten. Place Tool J-21368 around pump to obtain proper alignment. Tighten bolts to 16-24 ft. lbs. torque. See Figure 5-211.

NOTE: The bolt location at the pressure regulator takes a longer bolt.

5-19 DISASSEMBLY, INSPECTION, and REASSEMBLY OF FORWARD CLUTCH

a. Disassembly

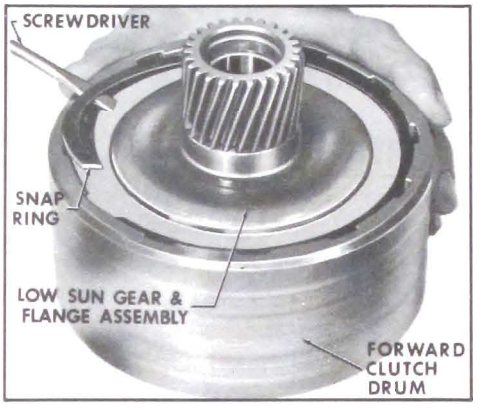

Figure 5-212

1. Remove low sun gear and flange assembly retaining snap ring. See Figure 5-212.

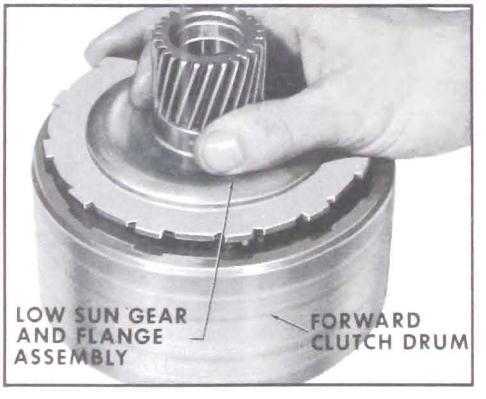

Figure 5-213

2. Remove low sun gear and flange assembly. See Figure 5-213.

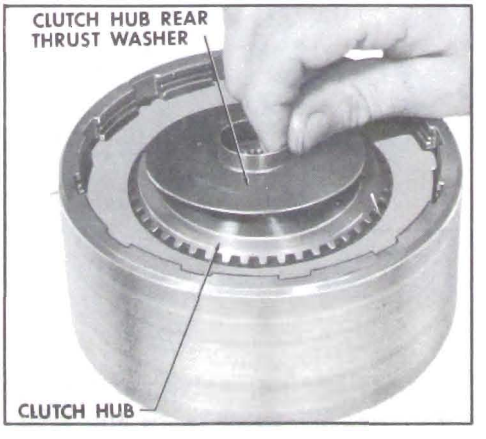

Figure 5-214

3. Remove clutch hub rear thrust washer. See Figure 5-214.

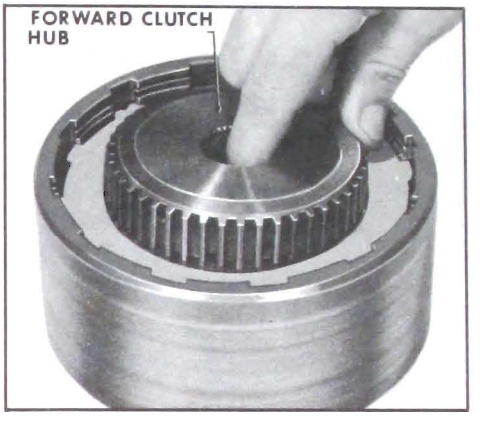

Figure 5-215

4. Lift forward clutch hub from clutch pack. See Figure 5-215.

Figure 5-216

5. Remove clutch hub front thrust washer. See Figure 5-216.

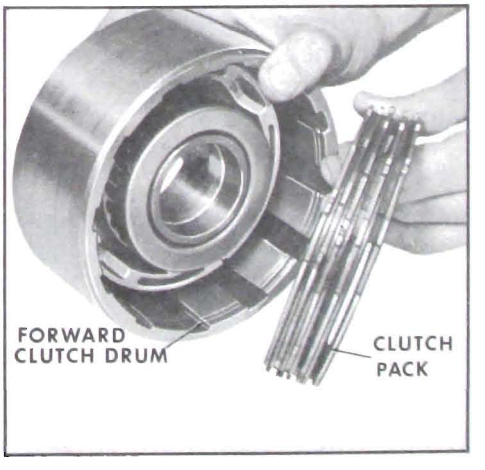

Figure 5-217

6. Remove clutch pack from forward clutch drum. See Figure 5-217.

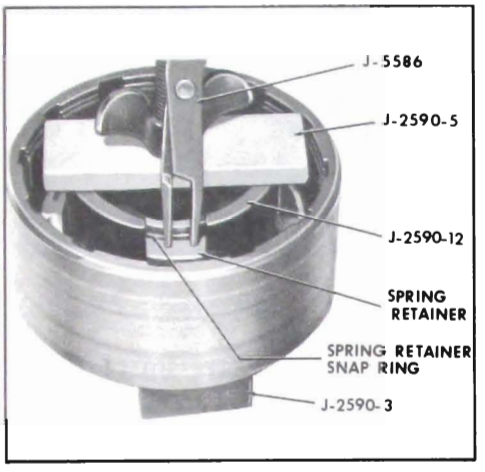

Figure 5-218

7. Using tools J-2590-3, J-2590-5, and J-2590-12 compress spring retainer. Remove snap ring. Then remove tool J-2590 and component parts, being careful that spring retainer does not catch in snap ring groove. See Figure 5-218.

NOTE: Place a piece of hard board between tool J-2590-3 and surface of forward clutch hub.

Figure 5-220

8. Lift off spring retainer and twenty-four (24) clutch springs. See Figure 5-220.

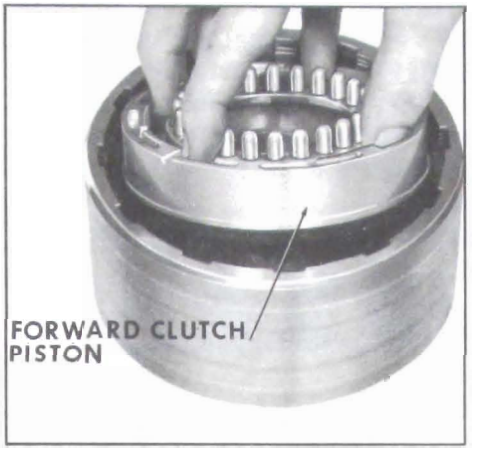

Figure 5-221

9. Lift up on forward clutch piston with a twisting motion and remove. See Figure 5-221.

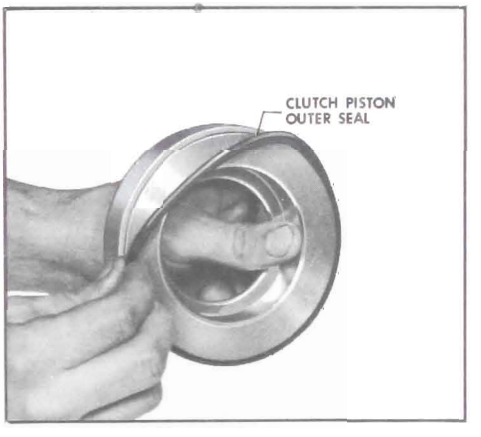

Figure 5-222

10. Examine forward clutch piston outer seal. If nicked, torn or worn, remove seal. See Fig-5-222.

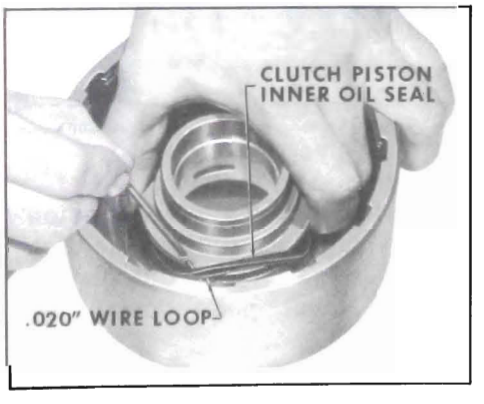

Figure 5-223

11. Examine forward clutch piston inner seal. If nicked, torn or worn, remove seal. See Figure 5-223.

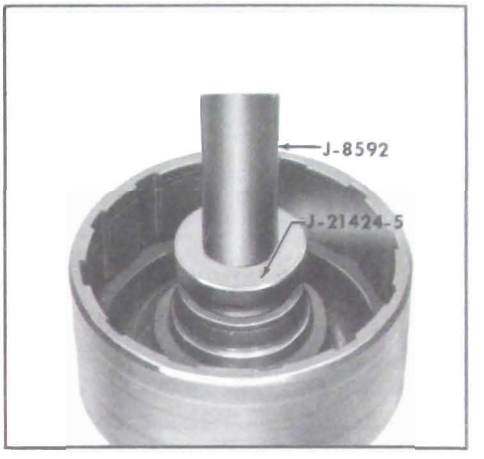

Figure 5-224

12. Check forward clutch drum bushing for nicks, severe scoring or wear. If bushing replacement is necessary proceed as follows: Using tool J-21424-5, press damaged bushing from forward clutch drum. See Figure 5-224.

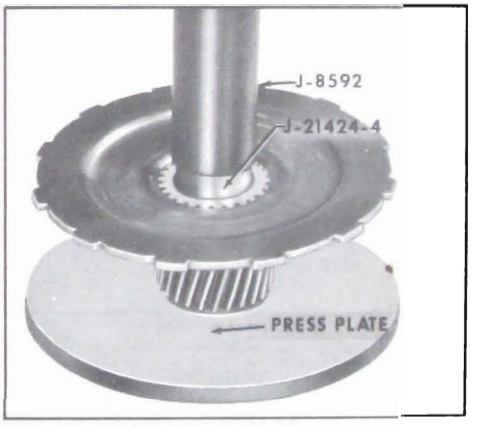

Figure 5-225

13. Check low sun gear and flange assembly bushing for nicks, severe scoring, or wear. If bushing replacement is necessary proceed as follows: Support low sun gear assembly on press plate using Tool J-21424-4 and Drive Handle J-8092 press out bushing. See Figure 5-225.

b. Inspection

1. Wash all parts in a suitable cleaning solvent. Use compressed air to dry.

2. Check steel ball in the forward clutch drum. Be sure it is free to move in hole and that orifice leading to front of clutch drum is open.

3. Check clutch plates for wear or scoring.

c. Reassembly

Figure 5-226

1. Install J-21424-5 in front of forward clutch drum. Using Drive Handle J-8092 press bushing into bore until tool J-21424-5 bottoms on hub. See Figure 5-226.

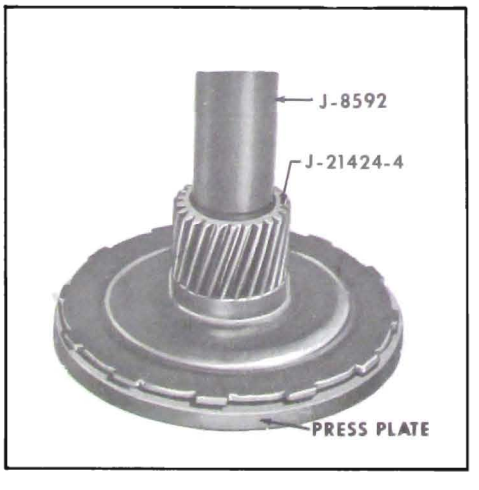

Figure 5-227

2. Install tool J-21424-4 into low sun gear. Using Drive Handle J-8092 press bushing into low sun gear until bushing installer is flush with top of low sun gear. See Figure 5-227.

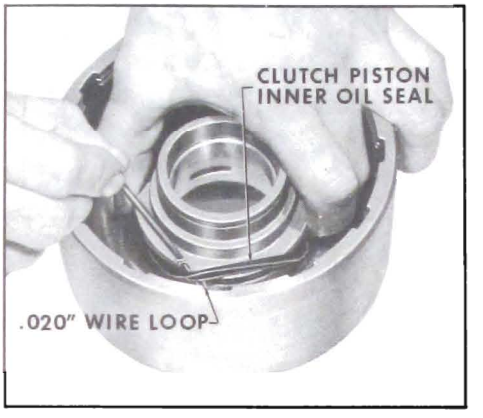

Figure 5-228

3. Lubricate with transmission oil and install new forward clutch piston inner seal with seal lip pointing downward. See Figure 5-228.

NOTE: Run hand around seal after it is installed to see if seal is fully in groove.

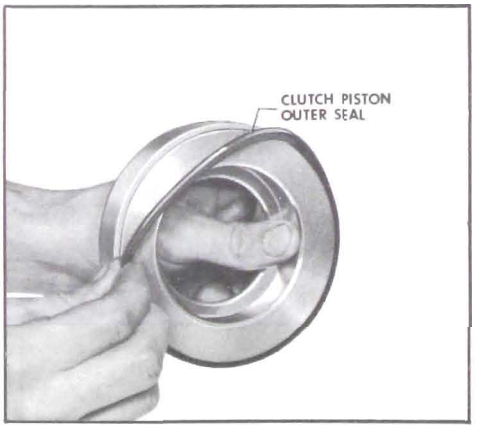

Figure 5-230

4. Lubricate with transmission oil and install new forward clutch piston outer seal in clutch piston. Seal lip must point down. See Figure 5-230.

5. Install forward clutch piston into clutch drum using a loop of

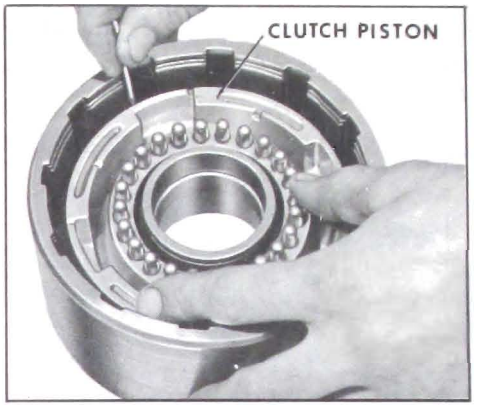

Figure 5-231

smooth wire to start lip of seal into bore. Piston should turn freely. See Figure 5-231.

NOTE: A satisfactory tool can be made by crimping a loop of .020" music wire in a short length of copper tubing.

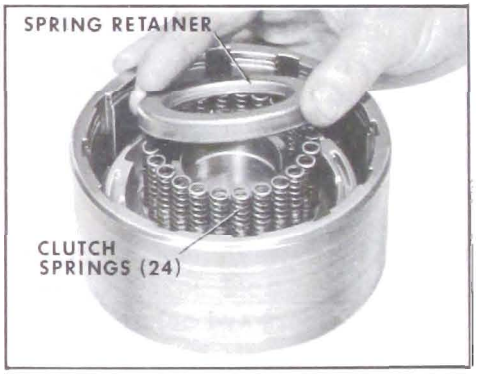

Figure 5-232

6. Carefully reassemble return springs, retainer and snap ring. See Figure 5-232.

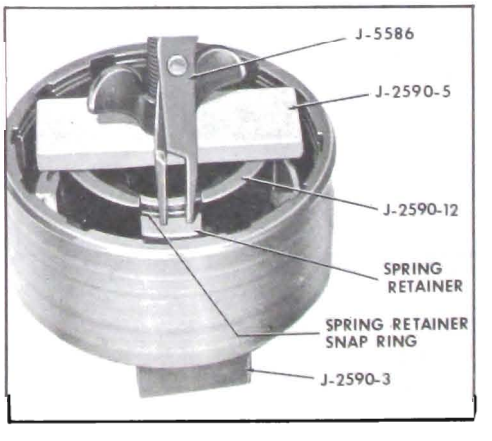

Figure 5-233

7. With spring retainer in place compress spring retainer with tools J-2590-3, J-2590-12 and J-2590-5 far enough so the spring retainer snap ring can be installed. Make sure retainer doesn't catch in snap ring groove when compressing springs. See Figure 5-233.

NOTE: Place a piece of hard board between tool J-2590-3 and forward clutch drum.

Figure 5-234

8. Install clutch hub front thrust washer to clutch hub (retain with grease) aligning tangs in clutch hub with grooves in thrust washer. Install clutch hub. See Figure 5-234.

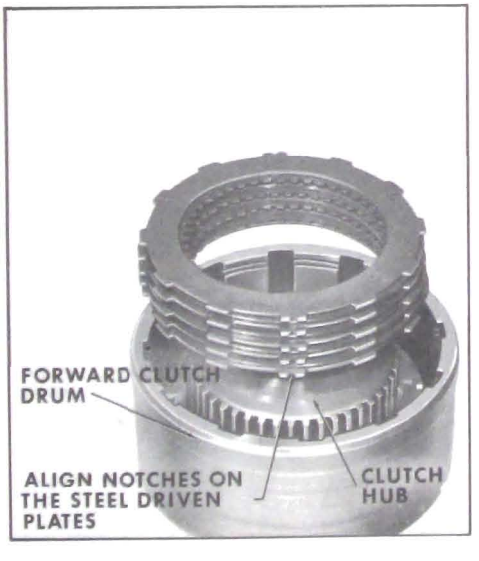

Figure 5-235

9. Align notches on steel driven plates. Install steel driven plates and lined drive plates alternately, beginning with a steel driven plate. See Figure 5-235.

NOTE: Cars equipped with V-6 engines have 4 drive plates and 5 driven plates. Cars equipped with V-8 engines have 5 drive plates and 6 driven plates.

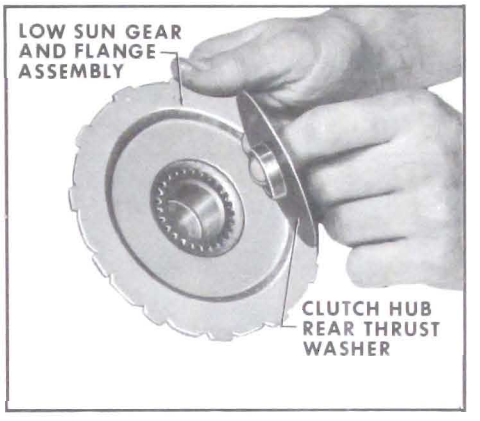

Figure 5-236

10. Install clutch hub rear thrust washer with its flange toward low sun gear and flange assembly. See Figure 5-236.

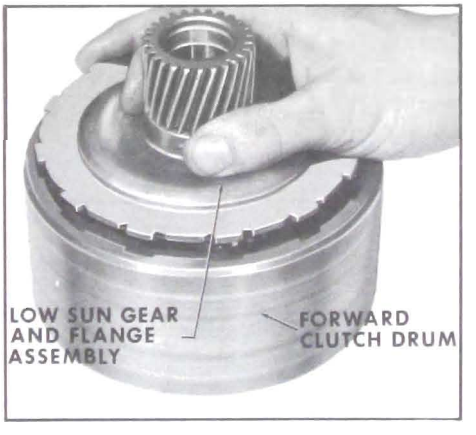

Figure 5-237

11. Install low sun gear and flange assembly. See Figure 5-237.

12. Install low sun gear and flange assembly retaining ring.

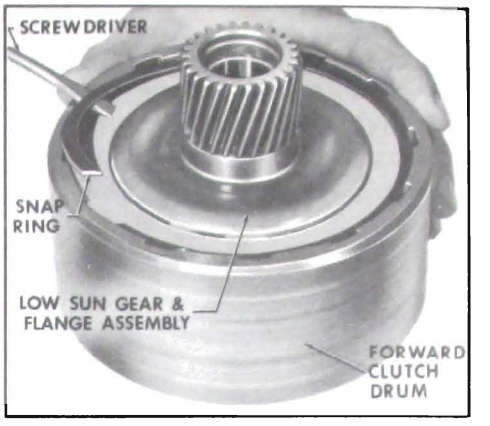

Figure 5-238

Position snap ring so gap is centered between slots in drum. See Figure 5-238.

5-20 SPEEDO DRIVEN GEAR DISASSEMBLY, AND REASSEMBLY

NOTE: Transmission need not be removed from the car to perform the following operations. Paragraph 5-20 and 5-21.

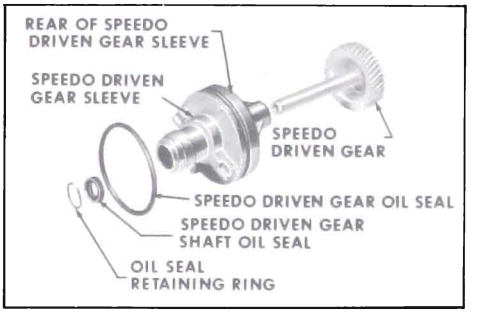

Figure 5-240

a. Disassembly

1. Remove speedo driven gear. See Figure 5-240.

2. Examine speedo driven gear oil seal. If nicked, torn or worn remove seal. See Figure 5-240.

3. Examine speedo driven gear shaft oil seal. If nicked, torn or worn remove seal.

b. Reassembly

1. Install speedo driven gear shaft oil seal with lip of seal pointing toward rear of speedo gear sleeve. Install oil seal retaining ring.

2. Install speedo driven gear oil seal. See Figure 5-240.

3. Install speedo driven gear.

5-21 DISASSEMBLY, INSPECTION AND REASSEMBLY OF GOVERNOR

a. Disassembly

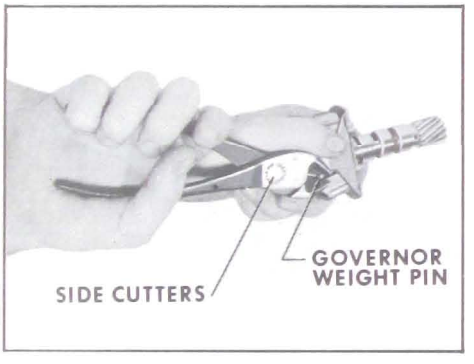

Figure 5-241

1. With side cutters remove governor weight pins. See Figure 5-241.

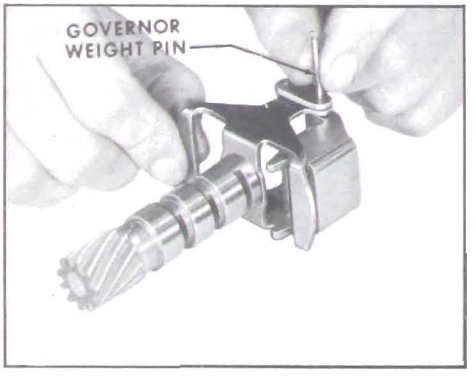

Figure 5-242

2. Remove governor weight pins. See Figure 5-242.

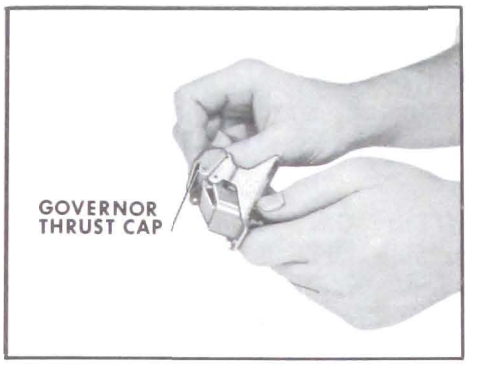

Figure 5-243

3. Remove governor thrust cap. See Figure 5-243.

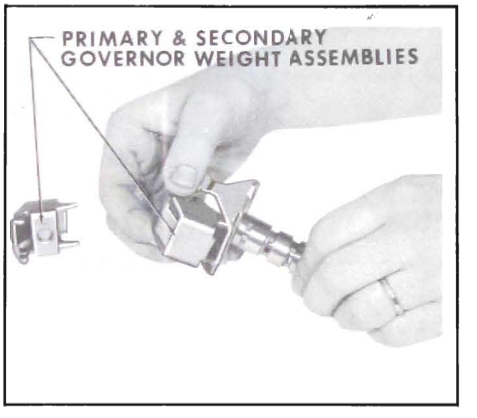

Figure 5-244

4. Remove both sets of primary and secondary governor weight assemblies. Separate primary and secondary weights, governor weight spring will fall free. See Figure 5-244.

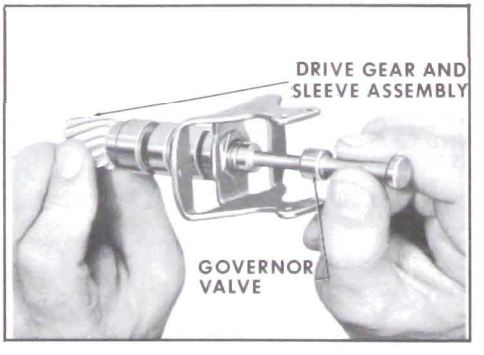

Figure 5-245

5. Remove governor valve from drive gear and sleeve assembly. See Figure 5-245.

b. Inspection

1. Clean all parts in a suitable cleaning solvent.

2. Inspect governor valve for nicks or burrs.

c. Reassembly

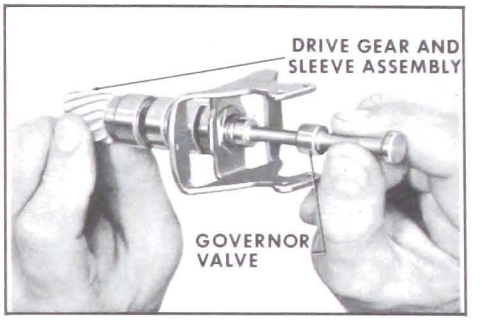

Figure 5-246

1. Install governor valve into drive gear and sleeve assembly. See Figure 5-246.

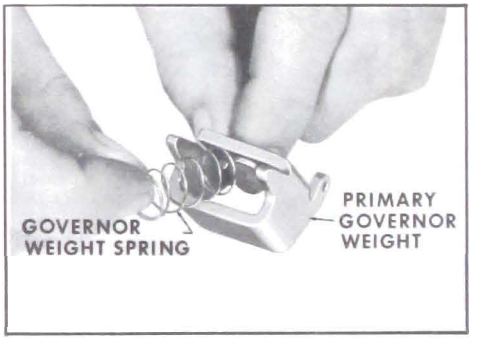

Figure 5-247

2. Install governor weight spring into primary governor weight. See Figure 5-247.

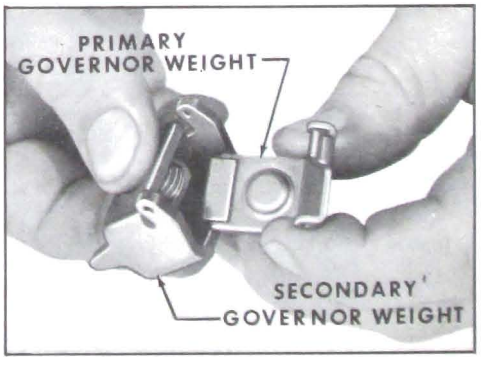

Figure 5-248

3. Retaining governor weight spring in primary governor weight with finger insert secondary governor weight. Repeat Steps 2 and 3 for other governor weight. See Figure 5-248.

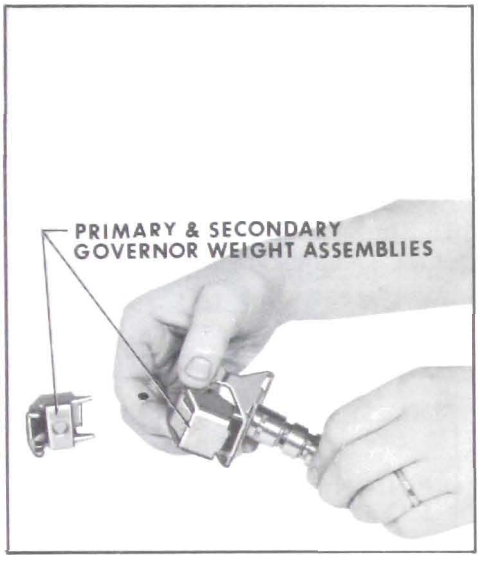

Figure 5-250

4. Install primary and secondary governor weights into drive gear and sleeve assembly. See Figure 5-250.

Figure 5-251

5. Install governor thrust cap. See Figure 5-251.

6. Install governor weight pins. See Figure 5-252.

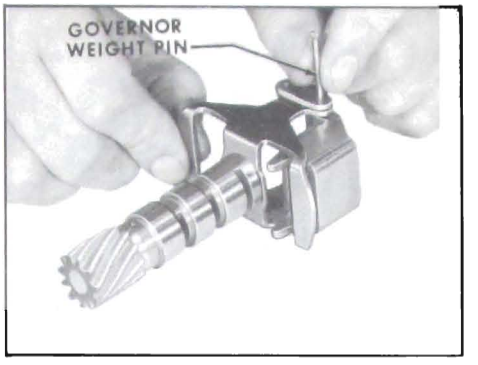

Figure 5-252

7. Install NEW governor weight pins. Crimp end of pins in a vise. See Figure 5-253.

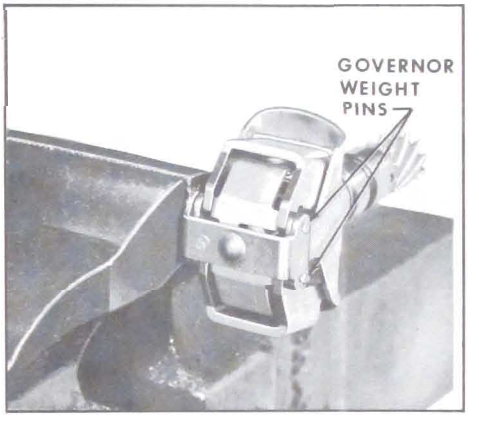

Figure 5-253

5-22 PLANET CARRIER DISASSEMBLY INSPECTION, AND ASSEMBLY

a. Disassembly

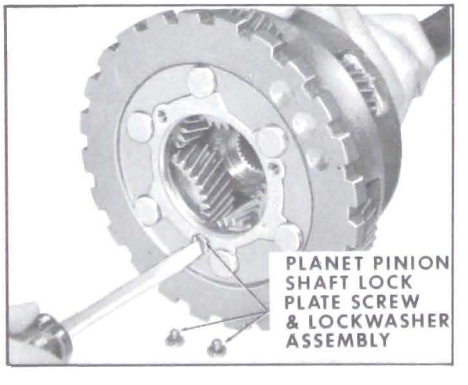

Figure 5-255

1. Remove three (3) planet pinion shaft lock plate screw and lock washers. See Figure 5-255.

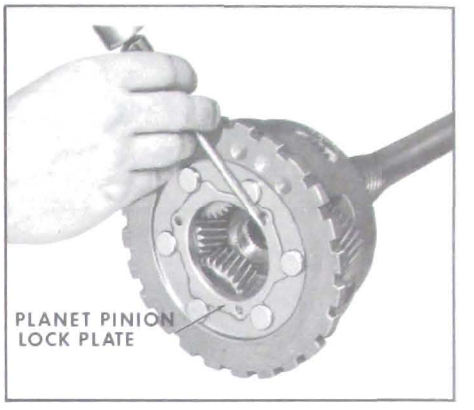

Figure 5-256

2. Rotate planet pinion lock plate and remove. See Figure 5-256.

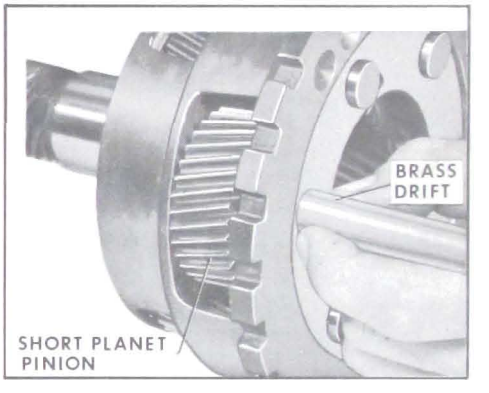

Figure 5-257

3. Start with the short planet pinion first. Insert Brass Drift into front of carrier. See Figure 5-257.

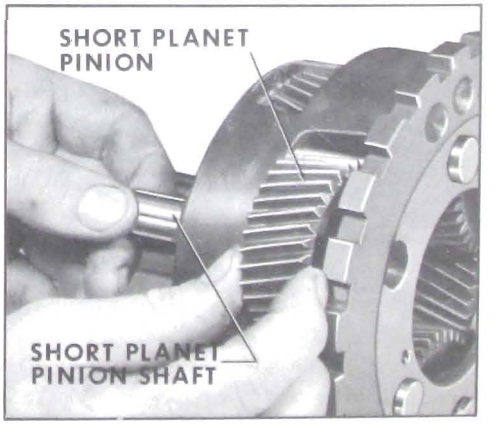

Figure 5-258

4. Remove pinion shaft and pinion gear from planet carrier. See Figure 5-528.

NOTE: Remove the other two (2) short planet pinion gears in same manner as described in Steps 4 and 5.

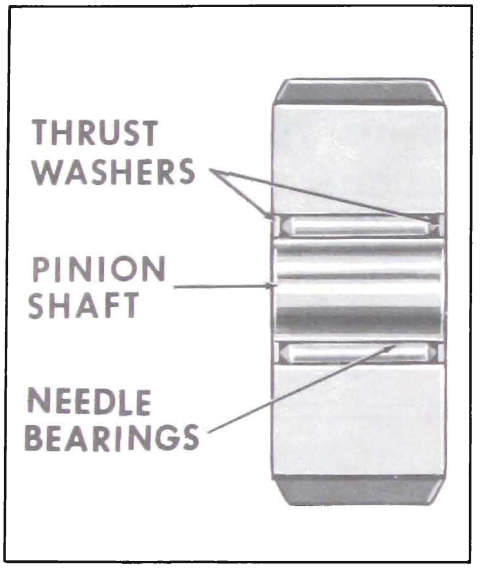

Figure 5-260

5. Remove needle bearings, and thrust washers (2) from the short planet pinion gear. See Figure 5-260.

Figure 5-261

6. Remove low sun gear needle thrust bearing. See Figure 5-261.

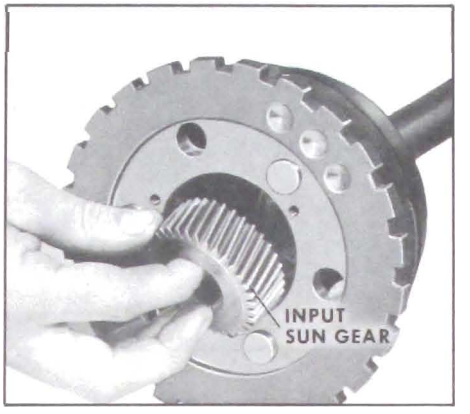

Figure 5-262

7. Remove input sun gear. See Figure 5-262.

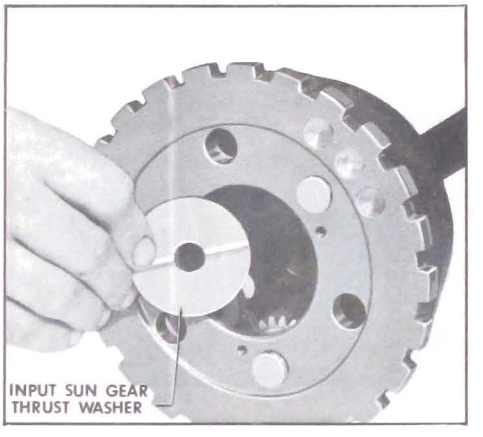

Figure 5-263

8. Remove input sun gear thrust washer. See Figure 5-263.

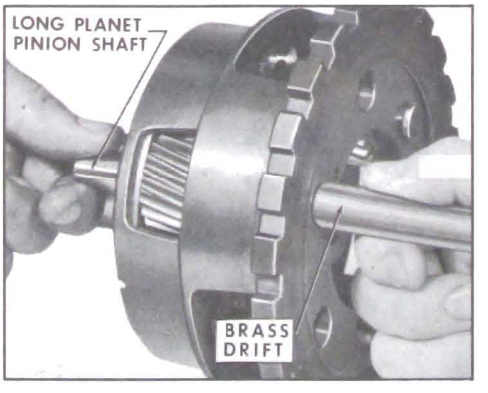

Figure 5-264

9. Insert Brass Drift through long planet pinion. Remove the long planet pinion shaft. See Figure 5-264.

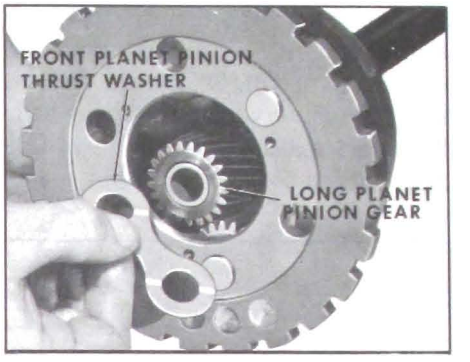

Figure 5-265

10. Remove front planet pinion thrust washer and long planet pinion gear. See Figure 5-265.

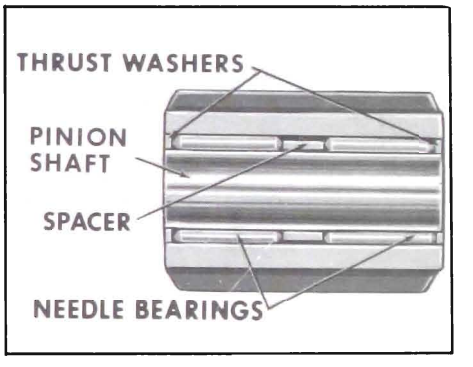

Figure 5-266

11. Remove needle bearings, spacer and two (2) thrust washers from the long planet pinion gear. See Figure 5-266.

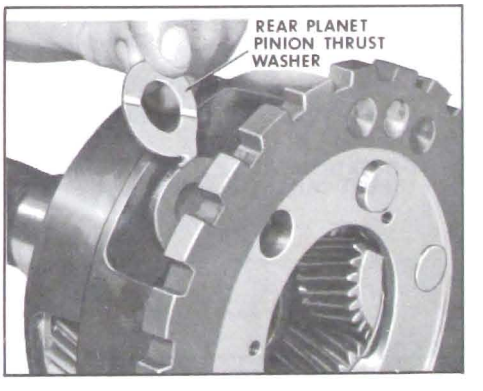

Figure 5-267

12. Remove rear planet pinion thrust washer. See Figure 5-267.

13. Check output shaft bushing for nicks, severe scoring or wear. If bushing replacement is necessary

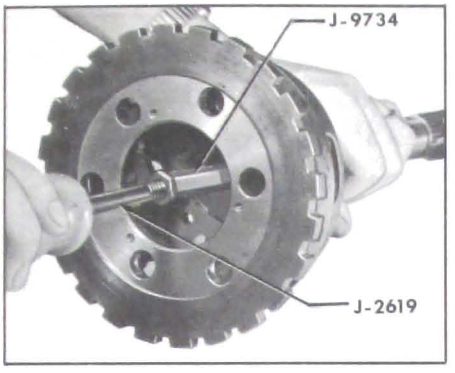

Figure 5-268

continue as follows: Install Bushing Remover J-9534 into bushing. Install Slide Hammer J-2619 into J-9534, using slide hammer remove bushing from planet carrier. See Figure 5-268.

b. Inspection of Planet Carrier Parts

1. Wash all parts in a cleaning solvent Air dry all parts.

2. Check the planet pinion gears and input sun gear tooth damage.

3. Check the planet pinion thrust washers and input sun gear thrust washer.

4. Check planet pinion needle bearings. If bearings show excessive wear, all the needle bearings must be replaced.

5. Check the planet pinion shafts closely, if worn replace the worn shafts.

6. Check the output shaft bushing, if worn replace.

c. Reassembly

1. Using tool J-21424-3 and J-8592 press the new bushing in until J-21424-3 touches the machined surface of the planet carrier assembly. See Figure 5-270.

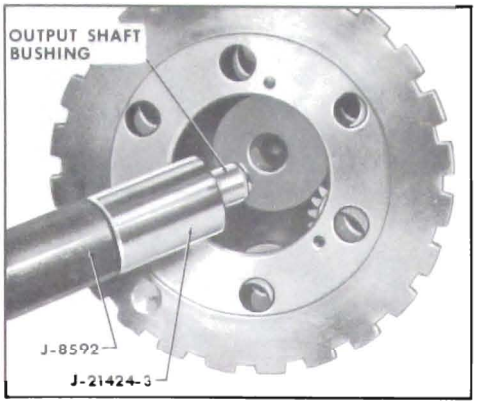

Figure 5-270

2. Install the long planet pinion gears first. Install the rear planet pinion thrust washer. Oil groove must be toward pinion gear. See Figure 5-271.

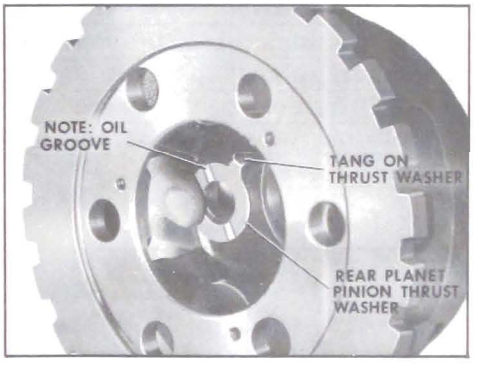

Figure 5-271

3. Install front planet pinion thrust washer. Retain thrust washer to case with grease. Oil grooves on the thrust washer must be toward the pinion gears. See Figure 5-272.

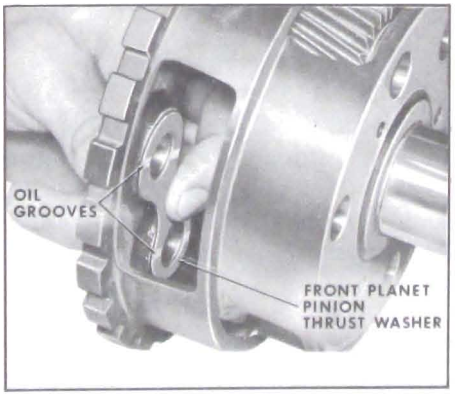

Figure 5-272

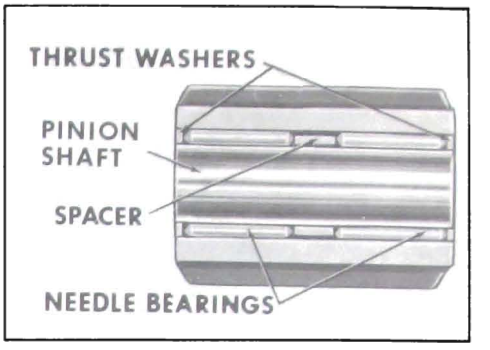

Figure 5-273

4. Coat inside pinion gear with petrolatum. Install Pinion Shaft J-21423 into long planet pinion gear. Install twenty (20) needle bearings, spacer, twenty more needle rollers, and two (2) thrust washers. See Figure 5-273. Carefully remove pinion shaft. With a twisting motion lock both sets of needle rollers in place. See Figure 5-273A.

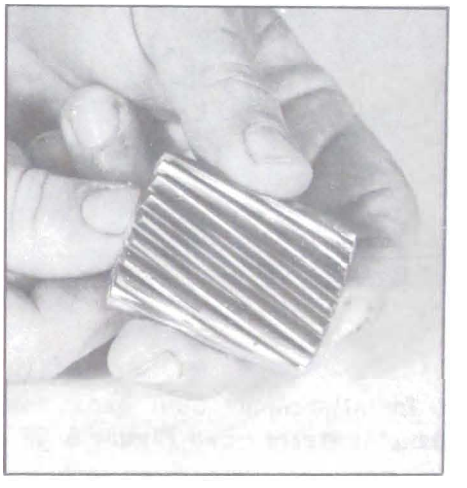

Figure 5-273-A

5. Position the long planet pinion assembly with the thrust washers at each end, in the planet carrier. Install the pinion shaft from the front of the carrier. As the shaft is being pushed in, make certain that it picks up the thrust washer. Turn the pinion shaft so the groove faces the center of the planet carrier. See Figure 5-274.

NOTE: Install the other two (2) long planet pinion gears as described in Steps 2-3-4-5.

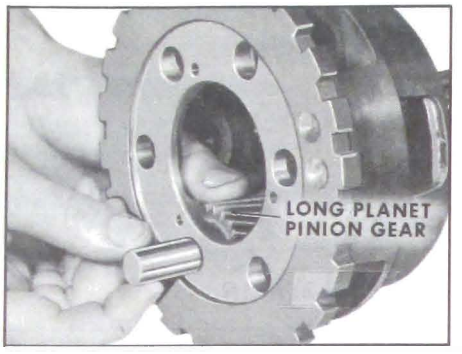

Figure 5-274

6. Install the input sun gear thrust washer with the oil groove facing input sun gear. See Figure 5-275.

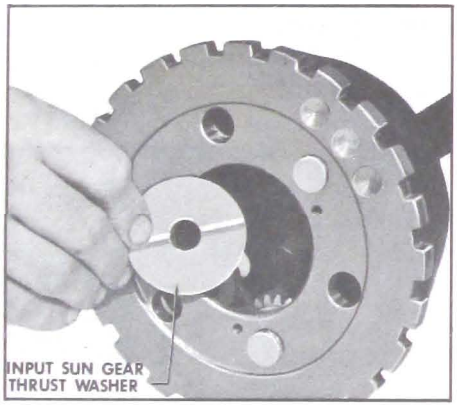

Figure 5-275

7. Install input sun gear into planet carrier. See Figure 5-276.

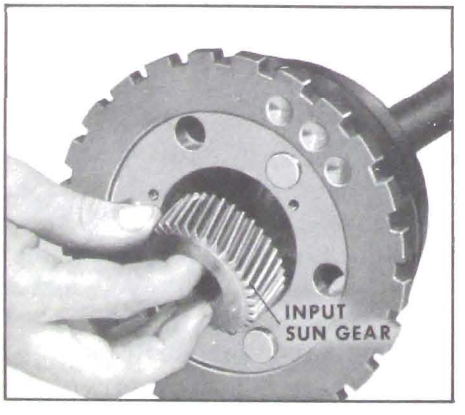

Figure 5-276

8. Install low sun gear needle thrust bearing. See Figure 5-277.

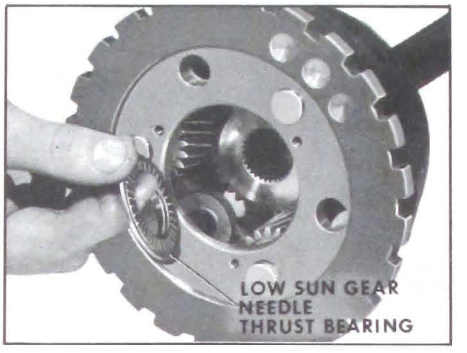

Figure 5-277

9. Install the rear planet pinion thrust washer. Oil groove must be toward pinion gear. See Figure 5-278.

NOTE: The front thrust washer already installed with the long planet pinions also is used for the short planet pinions as the two (2) pinions are paired together on one set of thrust washers.

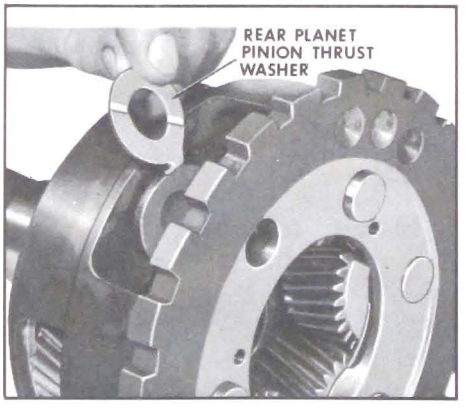

Figure 5-278

10. Install twenty (20) needle bearings, and one thrust washer in the pinion gear. See Figure 5-280. With a twisting motion, lock the needle rollers in place. See Figure 5-280A.

11. Position short planet pinion assembly and thrust washers at each end of the planet carrier. Install pinion shaft from the front of planet carrier. As the pinion shaft is being pushed in, make certain that it picks up the thrust washers. Turn the pinion shaft so the groove faces center of planet carrier. See Figure 5-281.

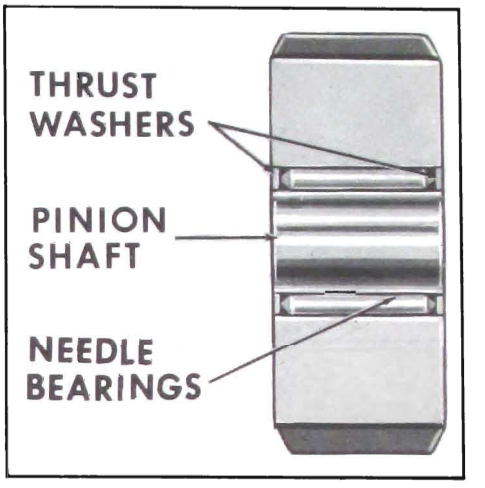

Figure 5-280

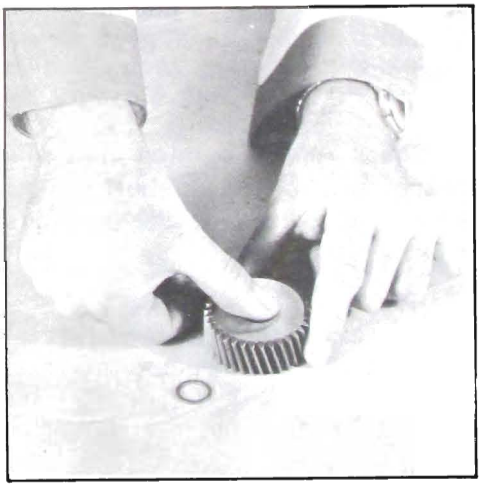

Figure 5-280A

12. Install planet pinion lock plate. Rotate plate so extended portions align with slots in planet pinion shafts, and three (3) attaching screw holes. See Figure 5-282.

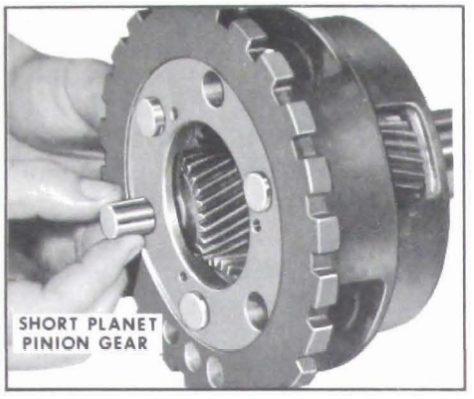

Figure 5-281

13. Install three (3) planet pinion shaft lock plate screw and lock washers. See Figure 5-283.

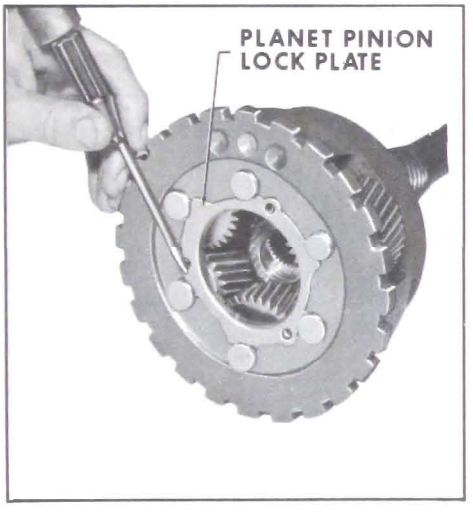

Figure 5-282

5-23 ASSEMBLY OF TRANSMISSION FROM MAJOR PARTS AND UNITS

a. General Instructions

1. Before starting to assemble the transmission make certain that all parts are absolutely clean. Keep hands and tools clean to avoid getting dirt into assembly. If work is stopped before assembly is completed cover all openings with clean cloths.

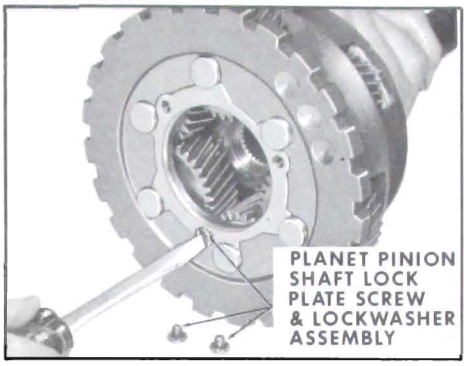

Figure 5-283

2. All moving parts should be given a light coating of transmission oil before installation. Thrust washers may be held in place with petroleum jelly, sparingly applied.

3. Do not take a chance on used gaskets and seals - use new ones to avoid oil leaks.

4. Use care to avoid making nicks or burrs on parts, particularly at bearing surfaces and surfaces where gaskets are used.

5. It is extremely important to tighten all parts evenly and in proper sequence, to avoid distortion of parts and leakage at gaskets and other joints. Use a reliable torque wrench to tighten all bolts and nuts to specified toruqe and in the specified sequence.

1. Install case bushing, make certain split on bushing is opposite notch in case. See Figure 5-284.

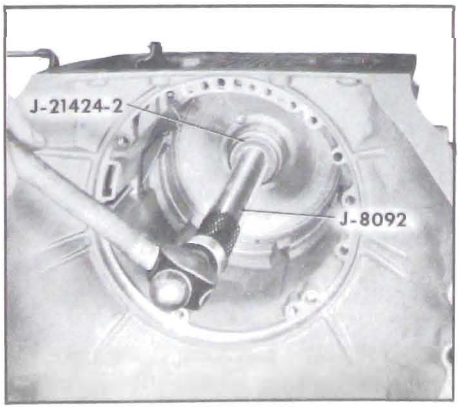

Figure 5-284

b. Installation of Range Selector Lever, Shaft and Parking Lock Actuator

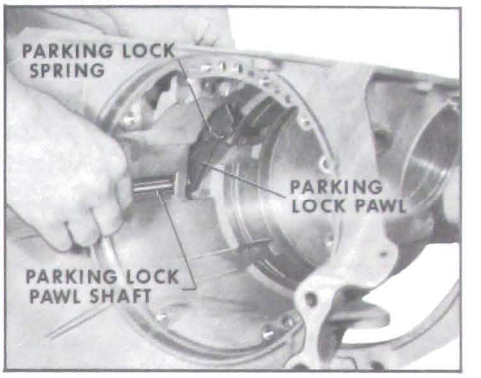

Figure 5-285

2. Retain parking lock pawl and spring in case with parking lock pawl shaft. See Figure 5-285.

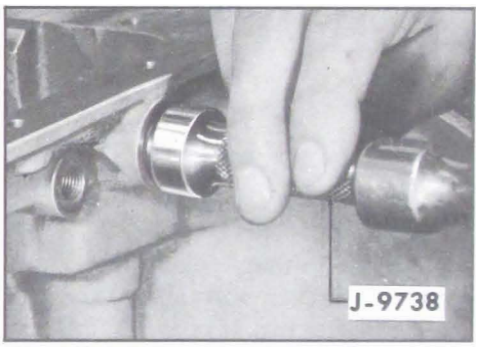

Figure 5-286

NOTE: Make certain parking pawl shaft is bottomed in its bore in case.

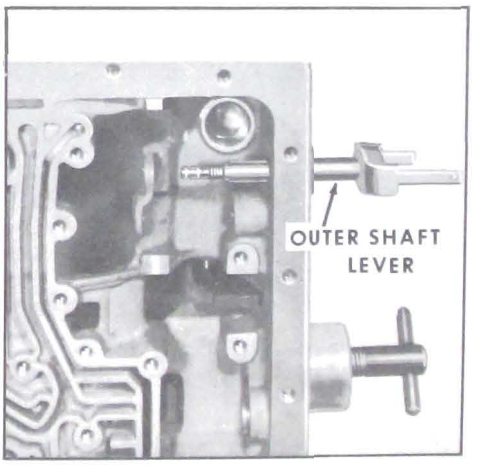

Figure 5-287

3. Install outer shift lever seal using J-9738. Make certain lip of seal points toward center of case. See Figure 5-286.

4. With a twisting motion insert outer range selector lever into case. See Figure 5-287.

5. Assemble park lock actuator assembly to inner park lock and range selector. See Figure 5-288.

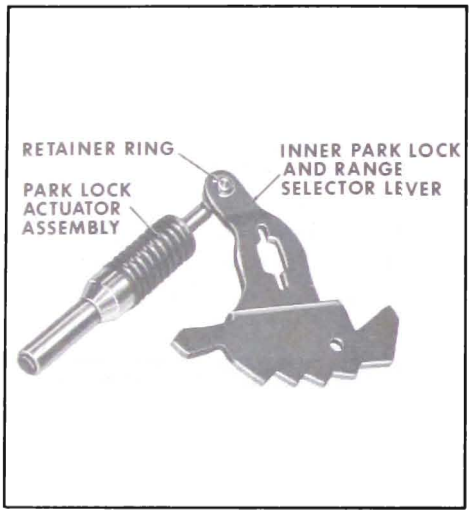

Figure 5-288

6. Install inner park lock and range selector assembly to outer range selector lever. Install nut on range selector lever. See Figure 5-290.

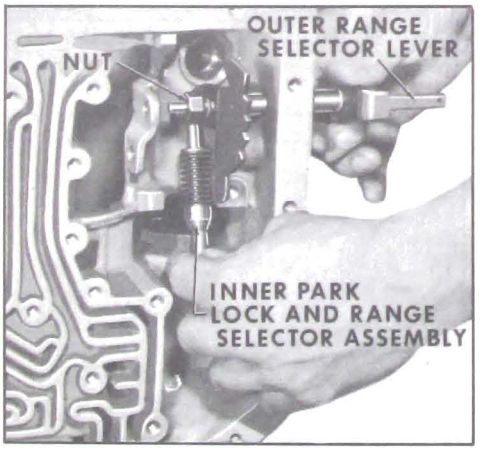

Figure 5-290

NOTE: Make certain longest end on range selector lever is to the bottom of transmission.

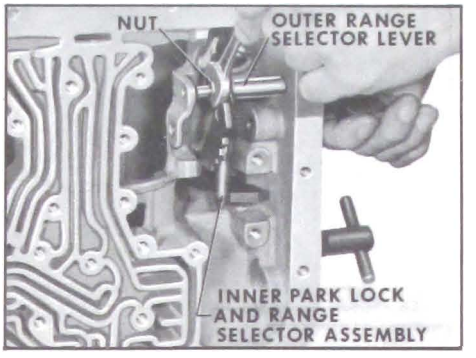

Figure 5-291

7. Slide outer range selector lever into case and tighten nut using a 9/16" wrench. See Figure 5-291.

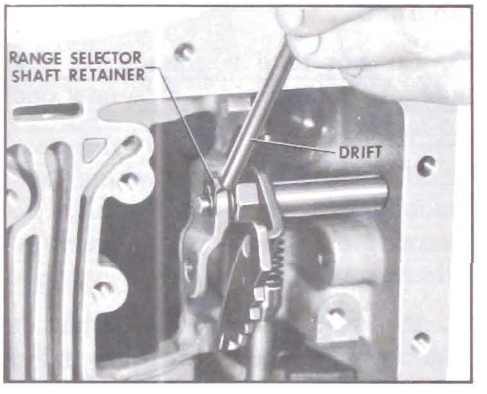

Figure 5-292

8. Install range selector shaft retainer. See Figure 5-292.

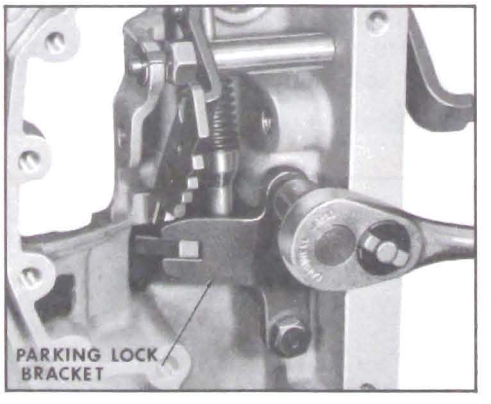

Figure 5-293

9. Install parking bracket to transmission case. Torque bolts to 8-12 ft. lbs. torque. See Figure 5-293.

c. Installing Reverse Clutch

Figure 5-294

1. Lubricate with transmission oil and install reverse clutch piston outer seal. See Figure 5-294.

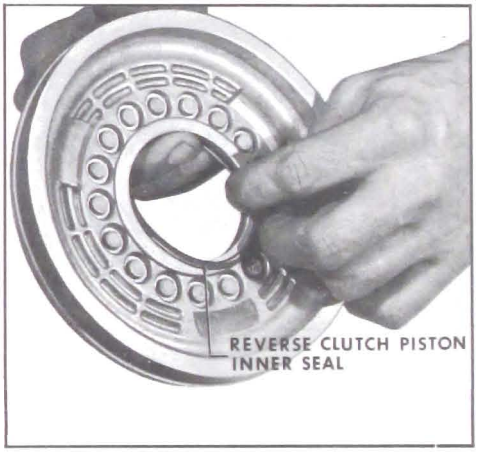

Figure 5-295

2. Lubricate with transmission oil and install reverse clutch piston inner seal. See Figure 5-295.

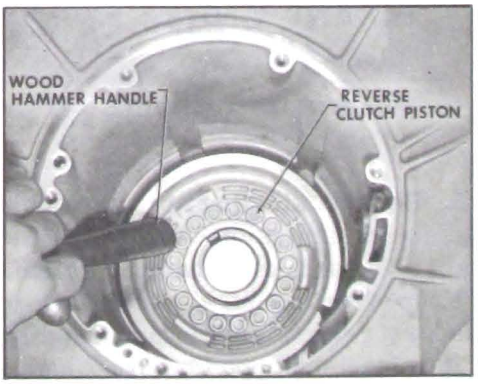

Figure 5-296

3. With transmission in vertical position install the reverse clutch piston into case. Tap piston with hammer handle to make certain piston is seated in case. See Figure 5-296.

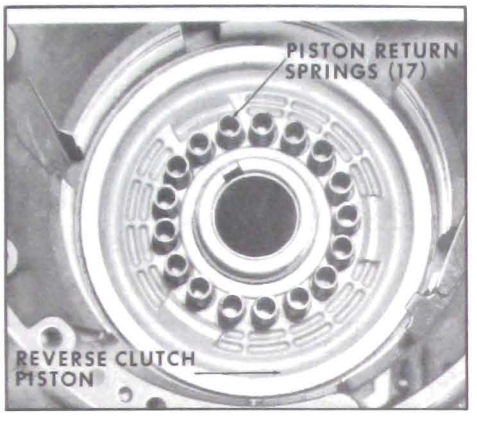

Figure 5-297

4. Install seventeen (17) clutch piston return springs. See Figure 5-297.

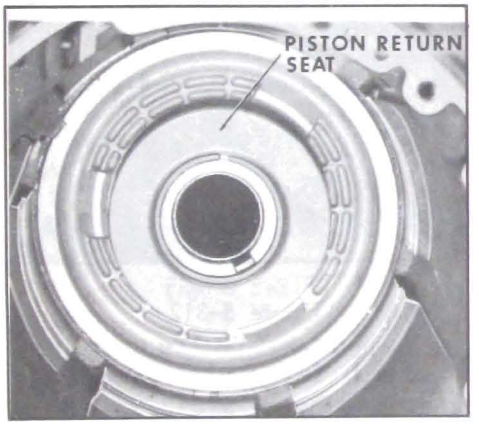

Figure 5-298

5. Position piston return seat on piston return springs. Place snap ring on return seat so that ring may be easily installed when seat is compressed with tool. See Figure 5-298.

6. Using J-21420-1 and J-21420-2 compress piston return seat so snap ring may be installed with J-5586 Pliers. See Figure 5-300.

CAUTION: Make certain inner edge of seat does not hang up on snap ring groove while being compressed.

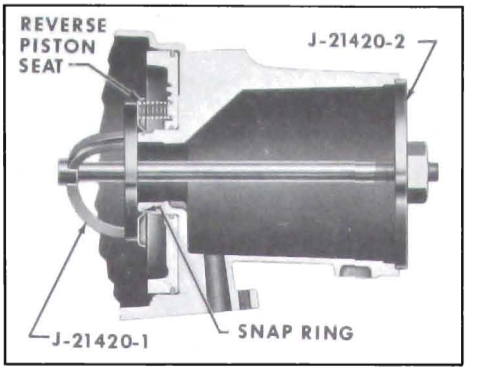

Figure 5-300

7. Install reverse clutch cushion spring. Install the cushion spring with the dish down. See Figure 5-301.

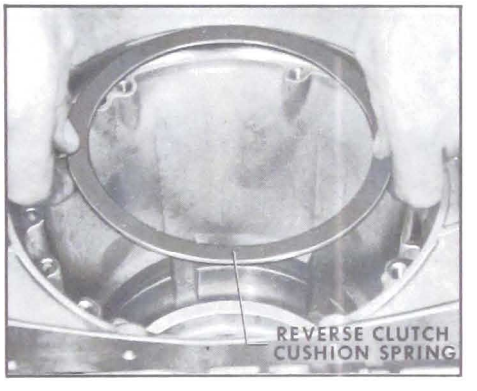

Figure 5-301

8. Align notches on the steel driven plates. Install the steel driven plates and lined drive plates alternately, beginning with

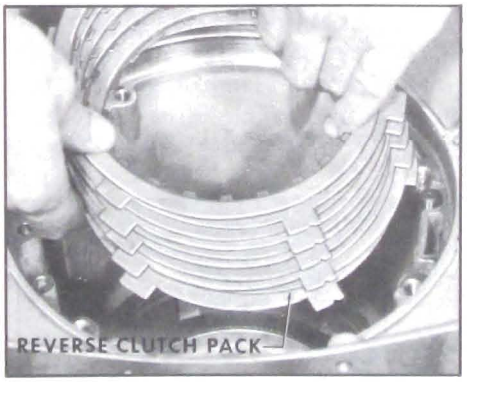

Figure 5-302

a steel driven plate. The notched lug on each driven plate goes in the 5 o'clock groove in case. See Figure 5-302.

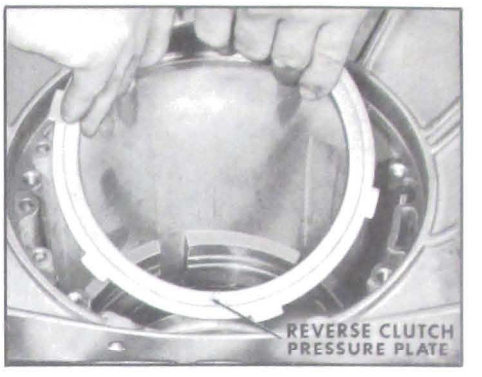

Figure 5-303

CAUTION: Steel plates are waved and should all face same direction. For this reason notches are provided to indicate correct installation.

NOTE: Cars equipped with V-6 engines have 5 driven and 4 drive clutch plates. Cars equipped with V-8 engine have 6 driven and 5 drive clutch plates.

9. Install reverse clutch pressure plate with the identification mark being installed in the 5 o'clock groove in case. See Figure 5-303.

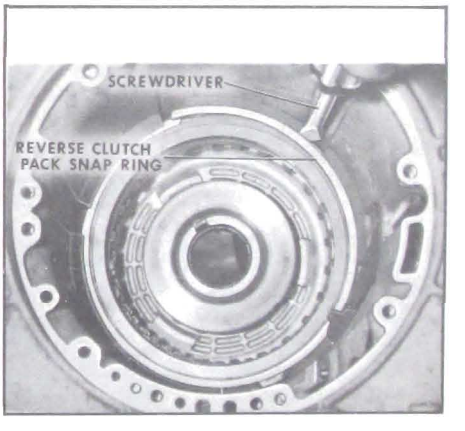

Figure 5-304

10. Install reverse clutch pack snap ring. See Figure 5-304.

11. Insert feeler gauge between any reaction plate and adjacent

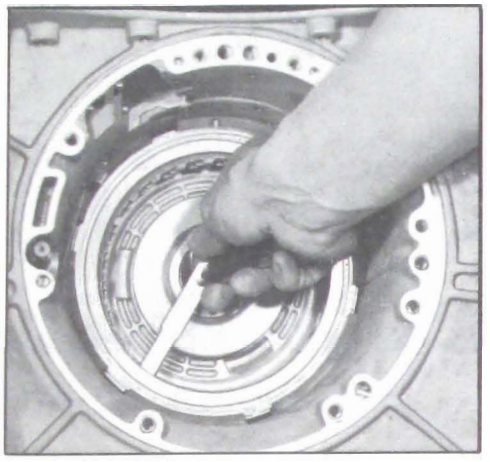

Figure 5-305

faced plate. See Figure 5-305. Clearance for the reaction plates are shown below:

Three selective plates are released for service. These plates are identified with one, two or three identification marks. Plates are graduated in size with one identification mark being the smallest. The clearance should be .020" - .058".

d. Installing Planetary Gear Set

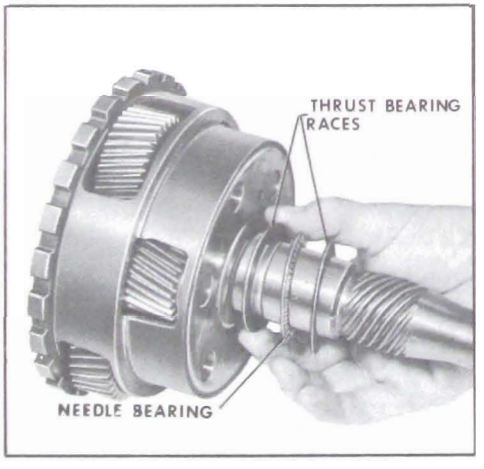

Figure 5-306

1. Install thrust bearing race with a lip, needle bearing, and a second plain thrust bearing race to the rear face of the planetary gear set. Retain with grease. See Figure 5-306.

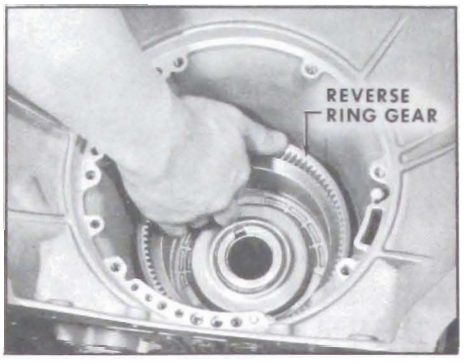

Figure 5-307

2. Install reverse ring gear into case. Rock and turn ring gear to pick up clutch plate splines. See Figure 5-307.

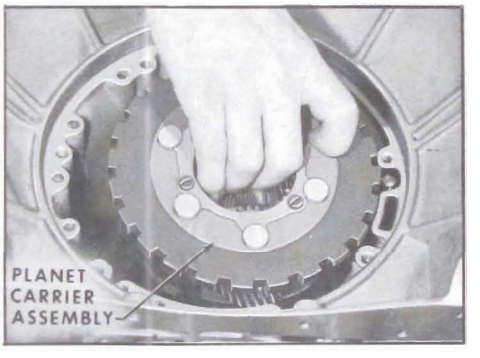

Figure 5-308

3. Install planetary gear set into case. See Figure 5-308.

5-24 INSTALLATION OF LOW SERVO ASSEMBLY, LOW BAND, AND FORWARD CLUTCH

a. Installation of Low Servo

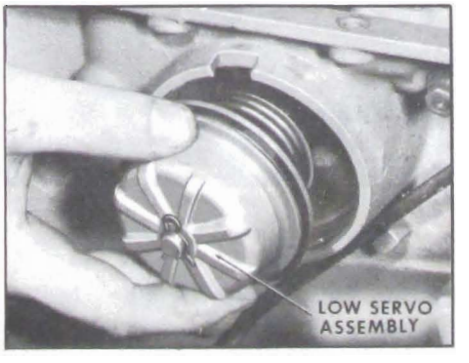

Figure 5-310

1. Install low servo piston assembly into case. See Figure 5-310.

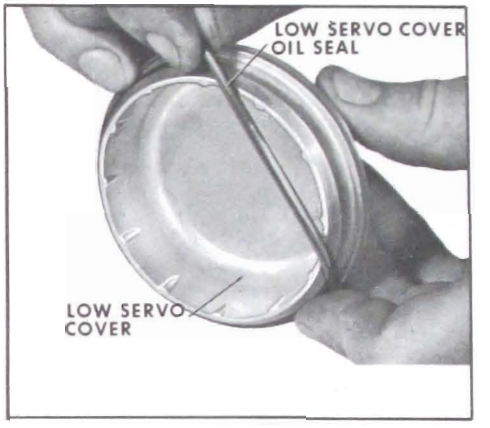

Figure 5-311

2. Install low servo cover oil seal. See Figure 5-311.

Figure 5-312

3. Install low servo cover to case. See Figure 5-312.

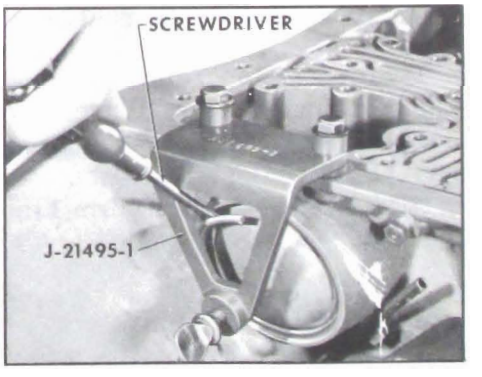

Figure 5-313

4. Compress low servo cover with J-21495-1 and install retaining snap ring. See Figure 5-313.

b. Installation of Low Band

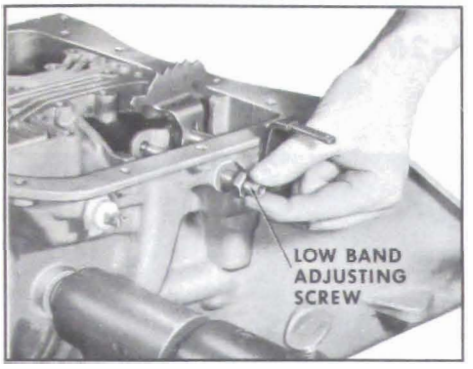

Figure 5-314

1. With transmission in vertical position install band adjusting screw into case. See Figure 5-314.

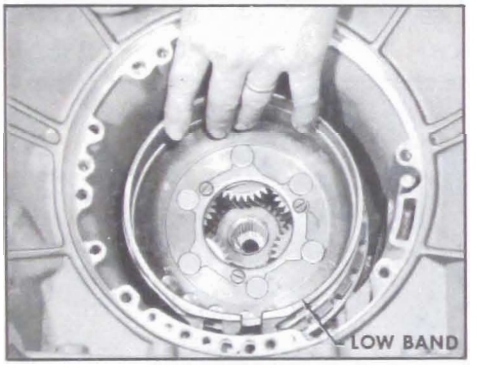

Figure 5-315

2. Install low band into case. See Figure 5-315.

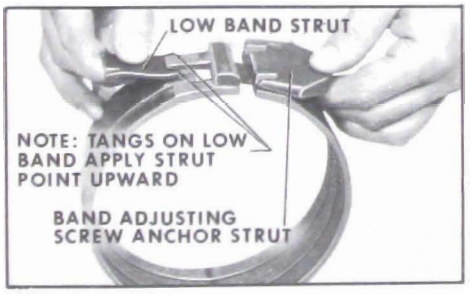

Figure 5-316

3. This picture is for illustration purposes only. It shows the proper positioning of the low band apply strut and band adjusting screw anchor strut. See Figure 5-316.

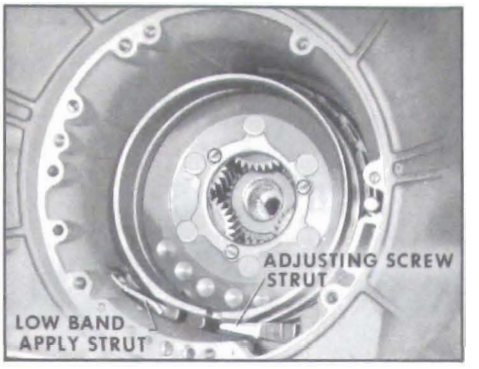

Figure 5-317

4. Install low band apply strut and band adjusting screw strut. After both struts have been installed, tighten low band adjusting screw enough to prevent struts from falling out. See Figure 5-317.

c. Installing the Forward Clutch Assembly

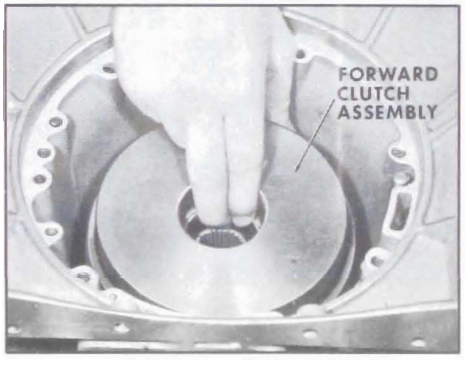

Figure 5-318

1. Install forward clutch assembly turning slightly to engage low sun gear with planet pinions. See Figure 5-318.

d. Check Forward Clutch to Oil Pump Clearance

1. Attach slide hammer bolt to threaded hole in oil pump. With flat of hand pump on end of input shaft so all parts are clear back. Install dial indicator set on rod and "O" dial indicator on end of input shaft. Push on end of output shaft to move everything forward, the reading obtained will be the

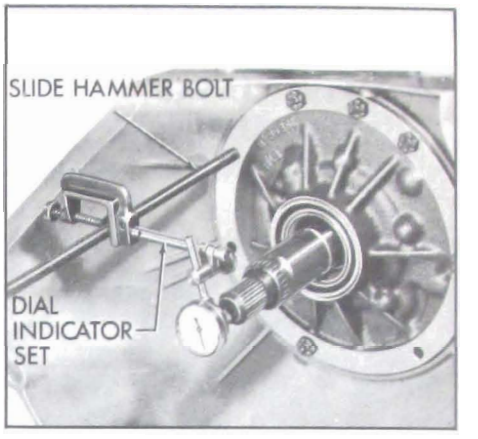

Figure 5-320

clearance. There are three selective thrust washers available, .099/.095, .081/.077 and .063/.059. Select and washer so the clearance will be between .008" and .051".

Figure 5-321

2. Grease and install selective fit washer to pump cover hub. See Figure 5-321.

Figure 5-322

3. Install two (2) pump cover to clutch drum oil sealing rings. See Figure 5-322.

5-25 INSTALLATION OF OIL PUMP GUIDE PIN, GASKET AND OIL PUMP ASSEMBLY

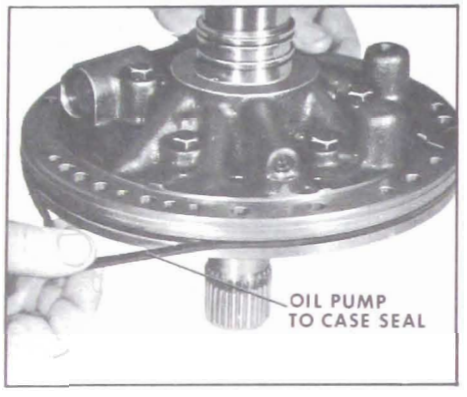

Figure 5-323

1. Install oil pump to case seal. See Figure 5-323.

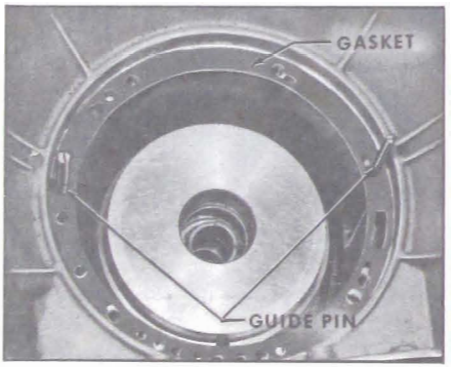

Figure 5-324

2. Install new pump gasket and guide pins. See Figure 5-324.

Figure 5-325

3. Install input shaft oil rings. See Figure 5-325.

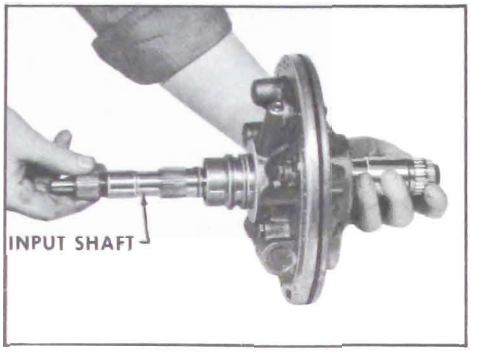

Figure 5-326

4. Coat input shaft oil rings with oil and install into oil pump. Then install pump into case. Apply a thin coat of oil around edge of pump. See Figure 5-326.

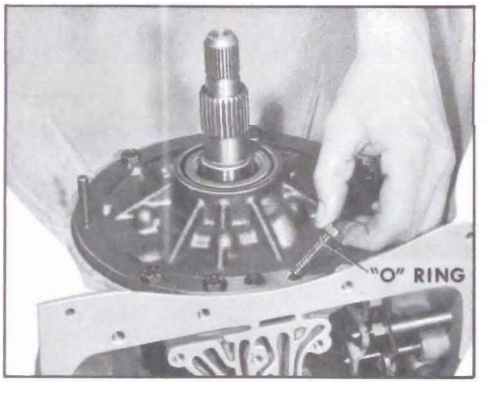

Figure 5-327

5. Remove guide pins and install eight (8) retaining bolts (with new O-rings under head). See Figure 5-327.

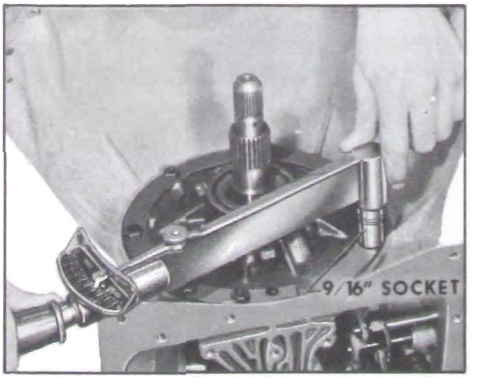

Figure 5-328

6. Torque the eight (8) pump retaining bolts to 16-24 ft. lbs. See Figure 5-328.

5-26 LOW BAND ADJUSTMENT

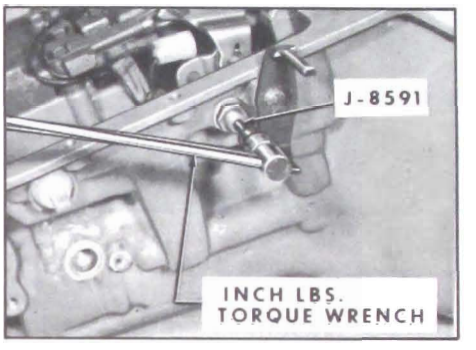

Figure 5-330

1. Adjust low band by first tightening adjusting screw to 40 in. lbs. torque. See Figure 5-330.

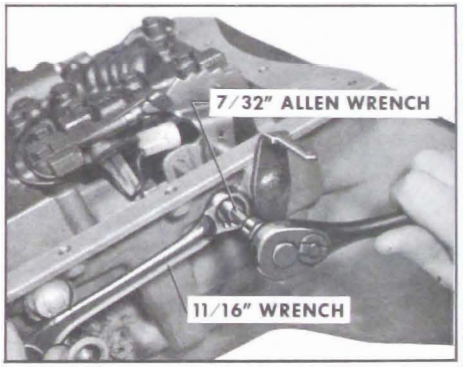

Figure 5-331

2. Back off band adjusting screw four (4) turns and lock nut. See Figure 5-331.

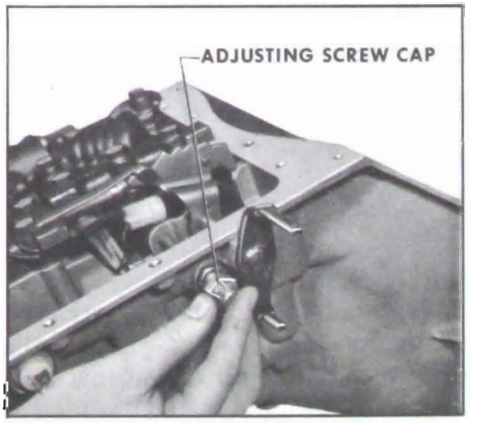

Figure 5-332

3. Install adjusting screw. cap. See Figure 5-332.

5-27 INSTALLATION OF SPEEDOMETER DRIVING GEAR

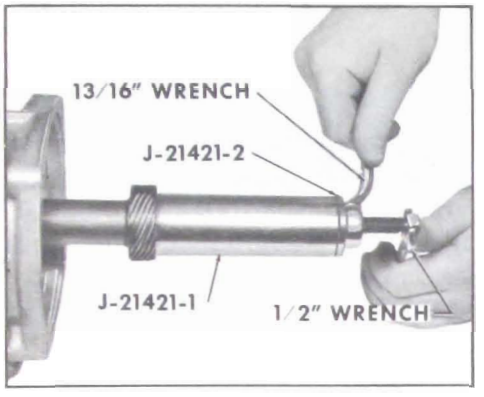

Figure 5-333

1. With transmission in a horizontal position install speedometer driving gear. Place transmission in Park range. Using tools J-21421-1 and J-21421-2 drive speedometer driving worm gear onto output shaft. Drive gear on until J-21421-2 bottoms on end of output shaft. When tool bottoms speedometer driving gear is in proper location. See Figure 5-333.

5-28 INSTALLATION OF REAR BEARING RETAINER BUSHING, OIL SEAL, BEARING RETAINER AND SPEEDO DRIVEN GEAR

a. Installation of Rear Bearing Retainer Bushing

1. Using Drive Handle J-8392 and Installer J-21424-1 install rear bearing reatainer bushing. See Figure 5-334.

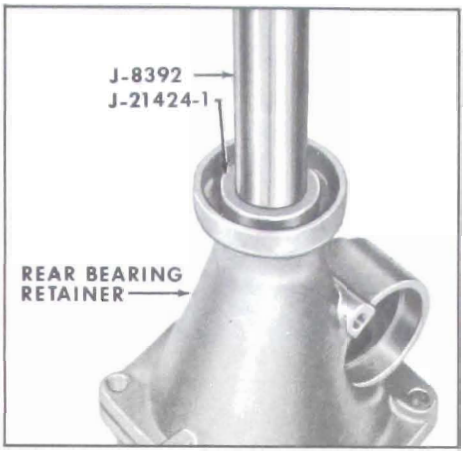

Figure 5-334

b. Installation of Output Shaft to Rear Bearing Retainer Oil Seal

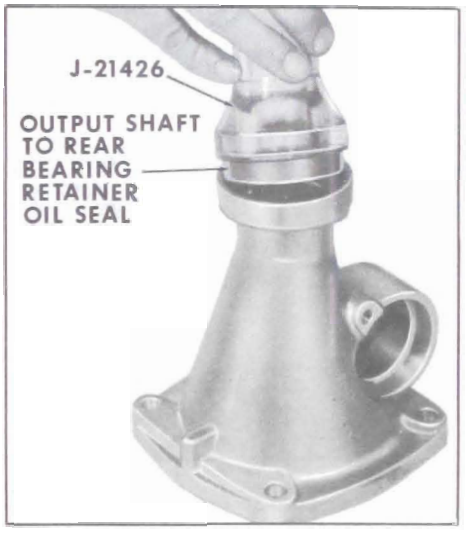

Figure 5-335

1. Install output shaft to rear bearing retainer oil seal using

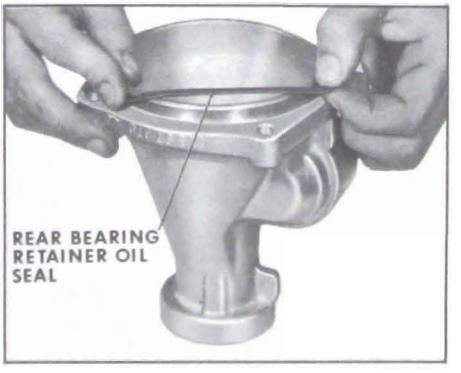

Figure 5-336

Installer J-21426. See Figure 5-335.

c. Installation of Rear Bearing Retainer

1. Install rear bearing retainer oil seal. See Figure 5-336.

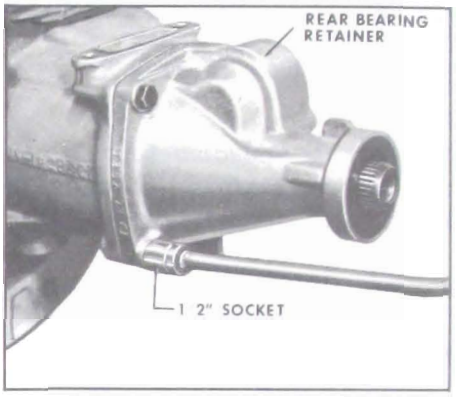

Figure 5-337.

2. Install rear bearing retainer to case and install four (4) retaining bolts, using a 9/16" socket. Torque bolts to 25-35 ft. lbs. torque. See Figure 5-337.

d. Installing Speedometer Driven Gear Assembly

Figure 5-338

1. Install speedo driven gear assembly into rear bearing retainer. See Figure 5-338.

Figure 5-339

2. Install speedometer driven gear sleeve retainer. Torque bolt to 8-12 ft. lb. torque.

5-29 INSTALLATION OF VALVE BODY

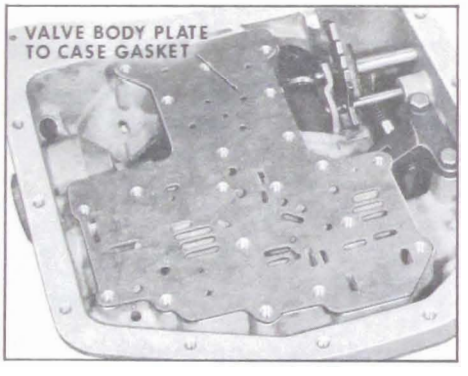

Figure 5-340

1. With transmission in horizontal position, install valve body to plate gasket. See Figure 5-340.

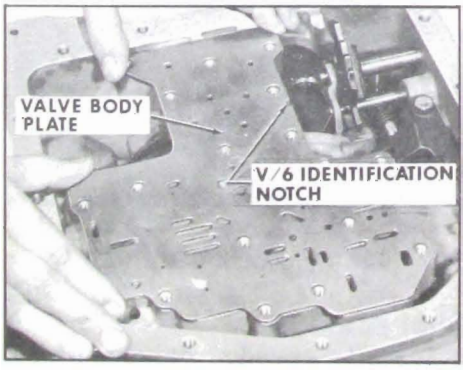

Figure 5-341

2. Install valve body plate.

NOTE: V/6 valve body plates have identification notch. See Figure 5-341.

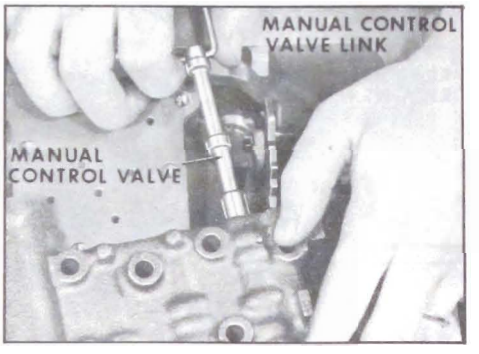

Figure 5-342

3. Install manual control valve and link into valve body assembly. See Figure 5-342.

Figure 5-343

4. Install manual control valve link into park, lock and range selector inner lever. See Figure 5-343.

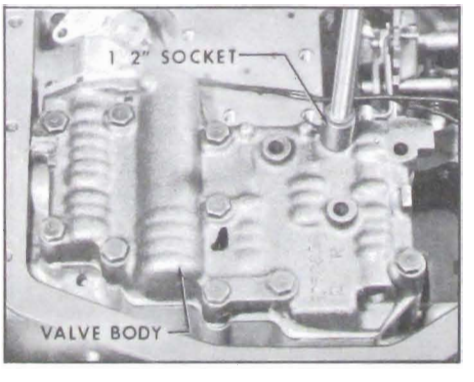

Figure 5-344

5. Install eleven (11) valve body to case retaining bolts. Torque bolts to 8-11 ft. lbs. See Figure 5-344.

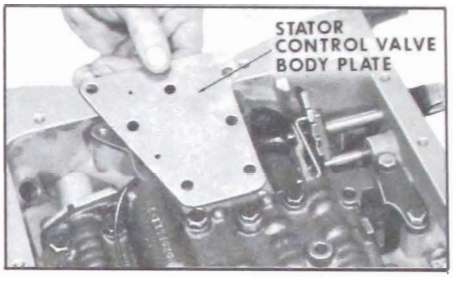

Figure 5-345

6. Install the stator control valve plate. See Figure 5-345.

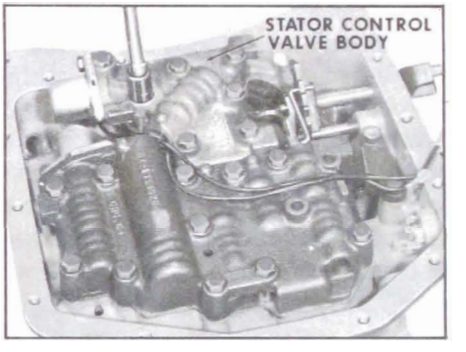

Figure 5-346

7. Install stator control valve body and seven (7) bolts retaining the stator control valve body. Torque bolts to 8-11 ft. lbs. See Figure 5-346.

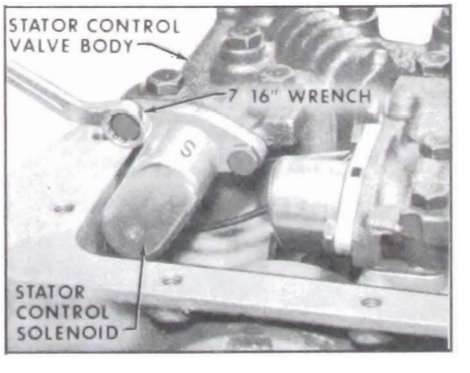

Figure 5-347

8. Install stator control solenoid and gasket to stator control valve body. Torque bolts to 8-12 ft. lbs. See Figure 5-347.

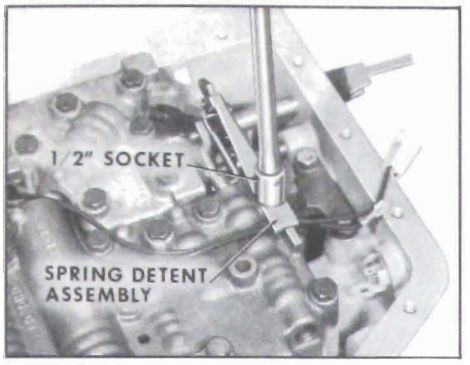

Figure 5-348

9. Before installing spring detent assembly note routing of solenoid wires. Install spring detent assembly. Torque bolt to 8-12 ft. lbs. center spring over detent plate. See Figure 5-348.

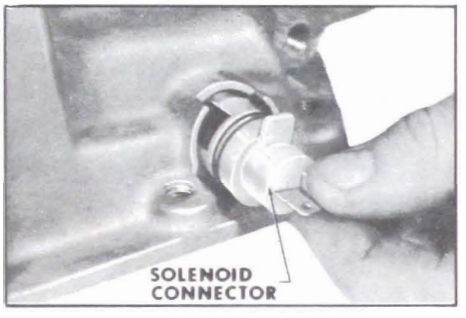

Figure 5-350

10. Install solenoid switch into case. See Figure 5-350.

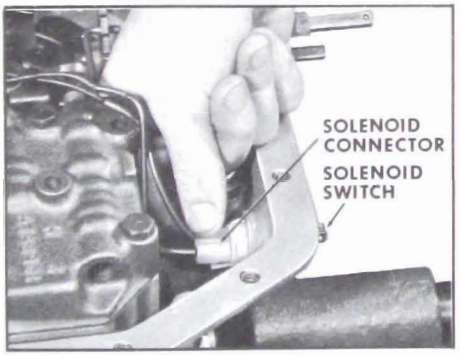

Figure 5-351

11. Install solenoid connector to solenoid switch. See Figure 5-351.

12. Install oil strainer pipe to case seal. See Figure 5-352.

Figure 5-352

13. Install strainer pipe to transmission case. See Figure 5-353.

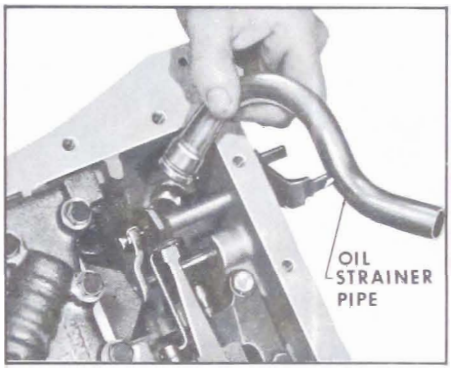

Figure 5-353

14. Install oil strainer to oil strainer pipe grommet. See Figure 5-354.

Figure 5-354

15. With a turning motion, install oil strainer to oil strainer pipe. See Figure 5-355.

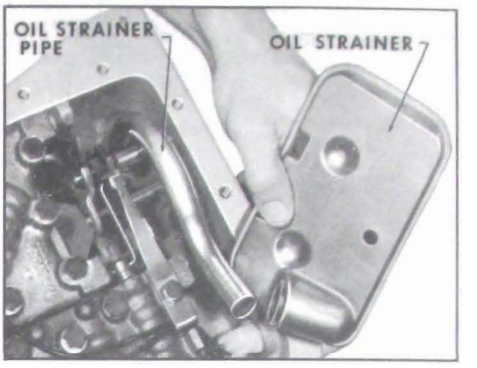

Figure 5-355

16. Torque oil strainer retaining bolt to 8-12 ft. lbs. See Figure 5-356.

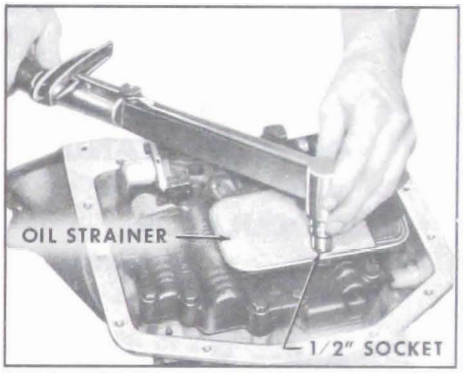

Figure 5-356

17. Install oil pan gasket and pan. See Figure 5-357.

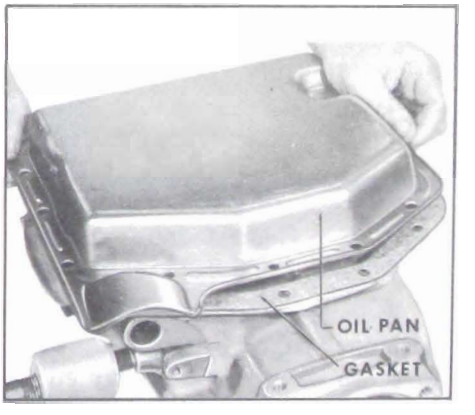

Figure 5-357

18. Install fourteen (14) oil pan attaching bolts. Torque bolts to 10-12 ft. lbs. See Figure 5-358.

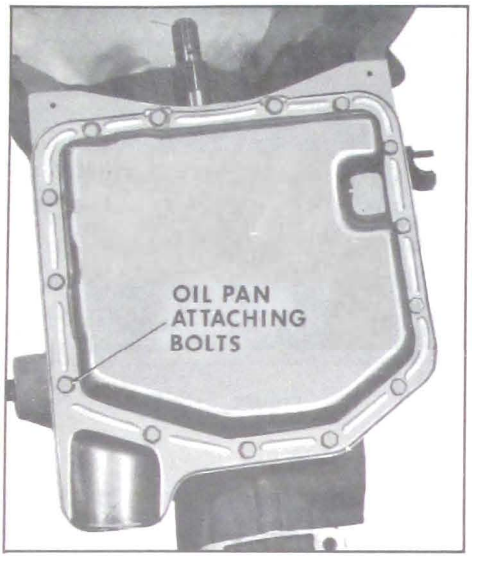

Figure 5-358

5-30 INSTALLATION OF GOVERNOR AND VACUUM MODULATOR

a. Installation of Governor

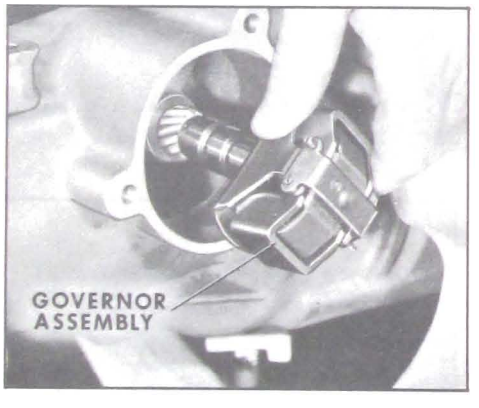

Figure 5-360

1. Slide governor into its bore in case. Turn governor assembly so teeth on governor gear engage teeth on output shaft. See Figure 5-360.

2. Install governor gasket and cover to case. Torque bolts to 8-12 ft. lbs. See Figure 5-361.

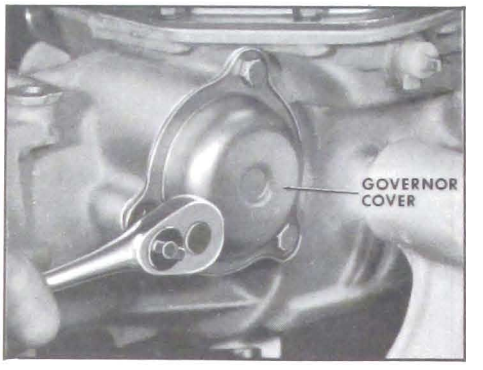

Figure 5-361

b, Installation of Vacuum Modulator

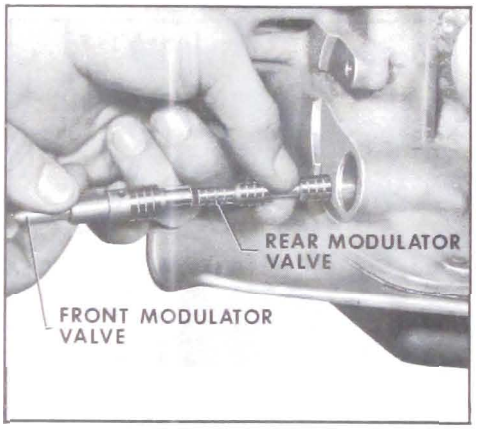

Figure 5-362

1. Slide rear modulator valve into front modulator valve then install into bore in case. See Figure 5-362.

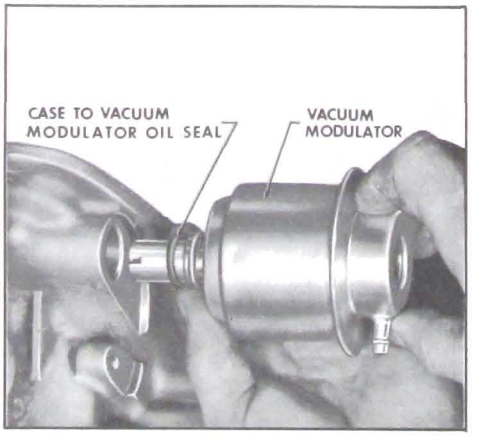

Figure 5-363

2. Install case to vacuum modulator oil seal. Install modulator into case. See Figure 5-363.

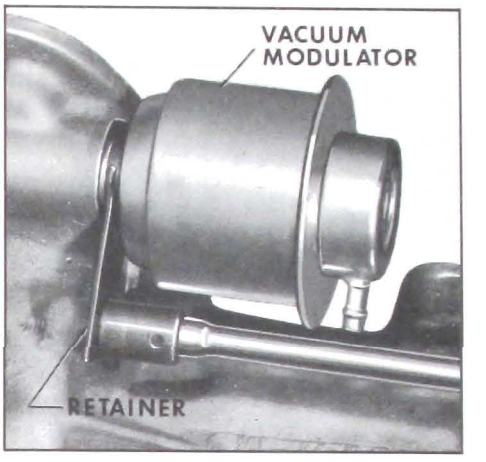

Figure 5-364

NOTE: V/6 vacuum modulators have a brown daub of paint for identification. V/8 has no paint identification.

3. Install vacuum modulator retainer. Install retainer so tang points toward vacuum modulator. Torque bolt to 8-12 ft. lbs. See Figure 5-364.

5-31 CHECKING CONVERTER

1. Check converter for leaks as follows:

a. Install tool J-21369 and tighten. See Figure 5-365.

Figure 5-365

b. Fill converter with air; 80 psi.

c. Submerge in water and check for leaks.

2. Check converter end clearance as follows:

a. Install tool J-21371-2 and tighten brass nut. See Figure 5-366.

Figure 5-366

b. Install tool J-21371-3 and tighten hex nut See Figure 5-367.

Figure 5-367

c. Install dial indicator set at 0 as shown in Figure 5-368.

d. Loosen hex nut. When nut is fully loosened the reading obtained on the dial indicator will be converter end clearance. If

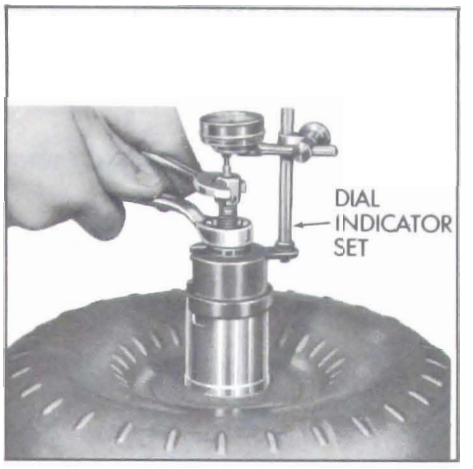

Figure 5-368

clearance is .050" or over and the oil has the appearance of having been mixed with aluminum paint, replace the converter. See Figure 5-368.

3. Install converter. See Figure 5.369.

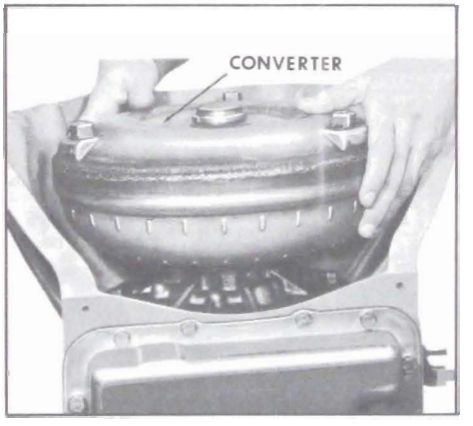

Figure 5-369

5-32 TROUBLE DIAGNOSIS GUIDE

a. No Drive in Any Selector Position; Cannot Load Engine

1. Low oil level.
2. Clogged oil strainer screen or suction pipe loose.
3. Defective pressure regulator valve.
4. Front pump defective.
5. Input shaft broken.

b. Engine Speed Flares on Standstill Starts But Acceleration Lags

1. Low oil level.
2. Clogged oil strainer screen.
3. Servo piston seal leaking.
4. Band facing worn.
5. Low band apply struts disengaged or broken.

c. Engine Speed Flares on Upshifts

1. Low oil level.
2. Improper band adjustment.
3. Clogged oil strainer screen.
4. Forward clutch partially applied.
5. Forward clutch plates worn.
6. Forward clutch piston hanging up.
7. Forward clutch drum relief ball not sealing.
8. Vacuum modulator.

d. Upshifts Harsh

1. Vacuum modulator line broken or disconnected.
2. Vacuum modulator diaphgram leaks.
3. Vacuum modulator valve stuck.

e. Closed Throttle (coast) Downshift Harsh

1. Improper low band adjustment.
2. High engine idle speed.
3. Downshift timing valve malfunction.
4. High main line pressure. Check the following:

a. Vacuum modulator line broken or disconnected.

b. Modulator diaphragm ruptured.

c. Sticking pressure regulator coast valve, pressure regulator valve or vacuum modulator valve.

f. Clutch Failure

1. Low band adjusting screw backed off more than specified.

2. Improper order of clutch plate assembly.

3. Extended operation with low oil level.

4. Forward clutch drum relief ball stuck.

g. Car Creeps Excessively in Drive

1. Idle speed too high.

2. Closed throttle stator switch improperly adjusted.

h. Car Creeps in Neutral

1. Forward clutch or low band not released.

i. No drive in Reverse

1. Reverse clutch piston stuck.

2. Reverse clutch plates worn out.

3. Reverse clutch seal leaking excessively.

4. Blocked reverse clutch apply orifice.

j. Transmission Case and Extension Oil Seal

1. Extension oil seal.

2. Outer shift lever oil seal.

3. Speedometer driven gear fitting.

4. Oil cooler pipe connections.

5. Vacuum modulator assembly and case.

k. Oil forced out of Filler Tube

1. Oil level too high, foaming caused by planet carrier running in oil.

2. Water in oil.

3. Leak in pump suction circuits.

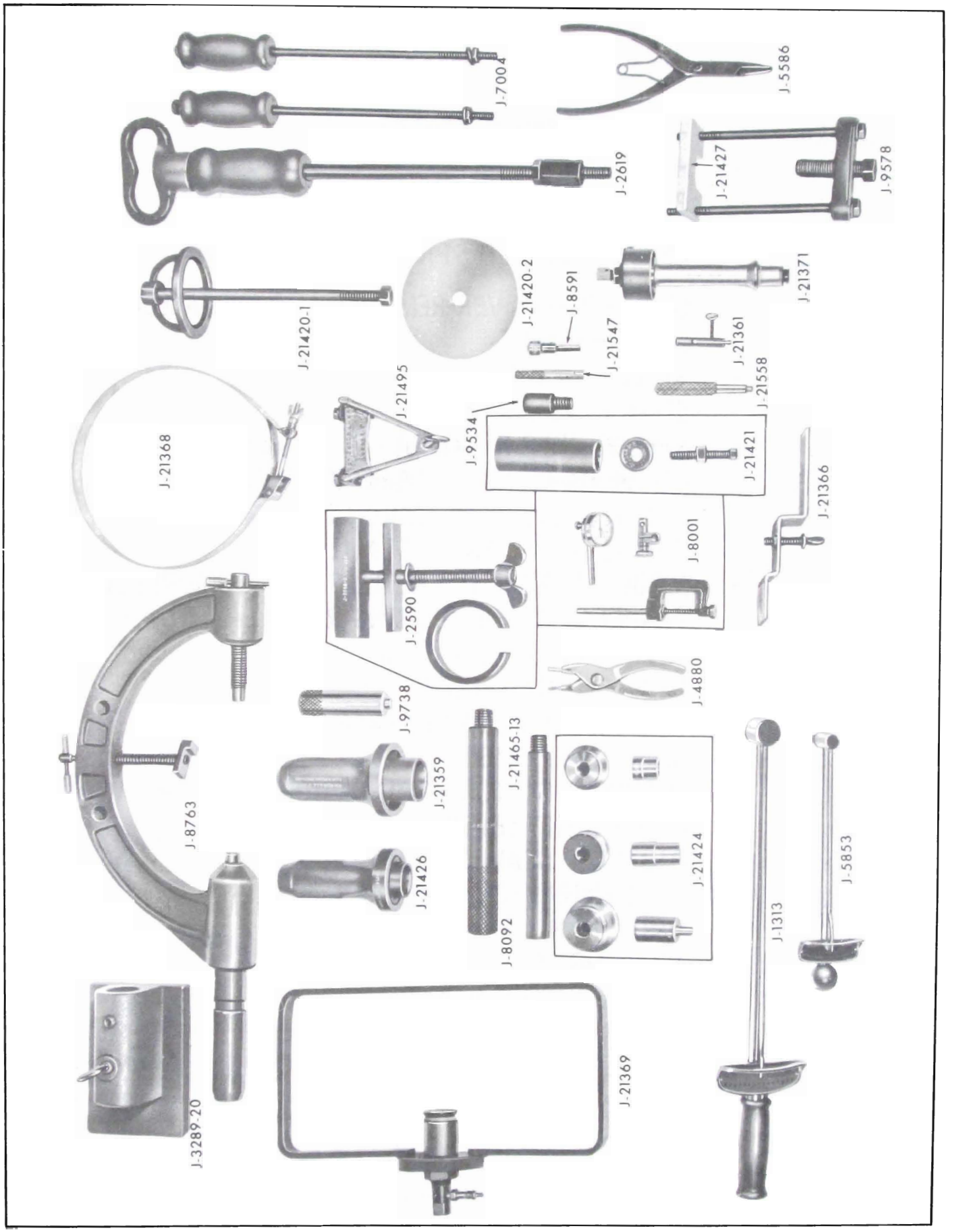

Figure 5-370—Special Tools

J-3289-20	-	HOLDING FIXTURE BASE
J-8763	-	HOLDING FIXTURE
J-21368	-	PUMP BODY TO COVER ALIGNMENT BAND
J-21420-1 J-21420-2	-	REVERSE CLUTCH SPRING COMPRESSOR
J-21495	-	LOW SERVO COVER REMOVER AND INSTALLER
J-7004	-	SLIDE HAMMER
J-2619	-	SLIDE HAMMER
J-5586	-	SNAP RING PLIERS
J-9578	-	SPEEDO GEAR REMOVER
J-21371	-	CONVERTER END PLAY CHECKING FIXTURE
J-21361	-	CHECK VALVE SEAT REMOVER
J-21558	-	CHECK VALVE SEAT INSTALLER
J-21547	-	MODULATOR LIMIT VALVE SPRING COMPRESSOR
J-9534	-	PLANET CARRIER BUSHING REMOVER
J-21421	-	SPEEDO GEAR INSTALLER
J-8001	-	DIAL INDICATOR SET
J-21366	-	CONVERTER HOLDING STRAP
J-4880	-	SNAP RING PLIERS
J-2590	-	FORWARD CLUTCH SPRING COMPRESSOR
J-9738	-	OUTER SHIFT LEVER SEAL INSTALLER
J-21359	-	OIL PUMP SEAL INSTALLER
J-21426	-	CASE EXTENSION OIL SEAL INSTALLER
J-8093	-	DRIVE HANDLE
J-21424	-	BUSHING SET
J-1313	-	FT. LB. TORQUE WRENCH
J-5853	-	IN. LB. TORQUE WRENCH
J-21369	-	CONVERTER PRESSURE CHECK FIXTURE

Figure 5-371—Special Tool Identification