TURBO HYDRA-MATIC 350-375B AUTOMATIC TRANSMISSION

CONTENTS

DESCRIPTION AND OPERATION

DESCRIPTION OF TURBO HYDRA-MATIC 350-375B AUTOMATIC TRANSMISSION

The Turbo Hydra-Matic 350-375B transmission, see Figure 7C-1, is a fully automatic unit consisting primarily of 3-element hydraulic torque converter and two planetary gear sets. Four multiple-disc clutches, two roller clutches, and an intermediate overrun band provide the friction elements required to obtain the desired function of the two planetary gear sets.

The 3-element torque converter consists of a pump, turbine and a stator assembly. The stator is mounted on a one way roller clutch which will allow the stator to turn clockwise, but not counterclockwise. References to clockwise and counterclockwise are determined by looking toward rear of car.

The torque converter is of welded construction and is serviced as a complete assembly. The unit is filled with oil and is attached to the engine crankshaft by a flywheel, thus always rotates at engine speed. The converter pump is an integral part of the converter housing, therefore, the pump blades, rotating at engine speed, set the oil within the converter into motion and direct it to the turbine, causing the turbine to rotate.

As the oil passes throughout the turbine it is traveling in such a direction that if it were not redirected by the stator it would hit the rear of the converter pump blades and impede its pumping action. So at low turbine speeds, oil is redirected by the stator to the converter pump in such a manner that it actually assists the converter pump to deliver power, or multiply engine torque.

As turbine speed increases, the direction of oil leaving the turbine changes and flows against the rear side of the stator vanes in a clockwise direction. Since the stator is now impeding the smooth flow of oil, its roller clutch releases and it revolves freely on its shaft. Once the stator becomes inactive, there is no further multiplication of engine torque within the converter. At this point, the converter is merely acting as a fluid coupling as both the converter pump and turbine are being driven at approximately the same speed.

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

Operation of the turbo-hydramatic 375B transmission is identical to the 350, with the physical difference being an increase in the number of direct clutch plates from four to five. This will increase torque capacity.

High Output Oil Pump - To be selected for maximum output from the current production assemblies.

Close Limit Governor and Modulator - To provide more precise pressure control.

High Capacity Transmission Oil Cooler - Same as used with current Upper Series THM-400 transmissions.

External control connections to the transmission are:

1. Manual Linkage - To select the desired operating range.

2. Engine Vacuum - To operate the vacuum modulator.

3. Cable Control - To operate the detent valve.

The following shift points are approximate and vary depending on rear axle ratio.

In Drive-range at minimum throttle the 1st shift will occur at 9-14 mph, and the 2nd shift at 15-20 mph. At maximum throttle the 1st shift will occur at 40-50 mph, and the 2nd shift at 68-78 mph.

The detent valve is activated by a cable that is connected to the accelerator lever assembly. When the throttle is half open, the valve is actuated causing throttle downshift at speeds below 50 mph. When the throttle is fully open the detent valve is actuated causing the transmission to downshift from approximately 3-1 at speeds below 40 mph and 3-2 below 75 mph.

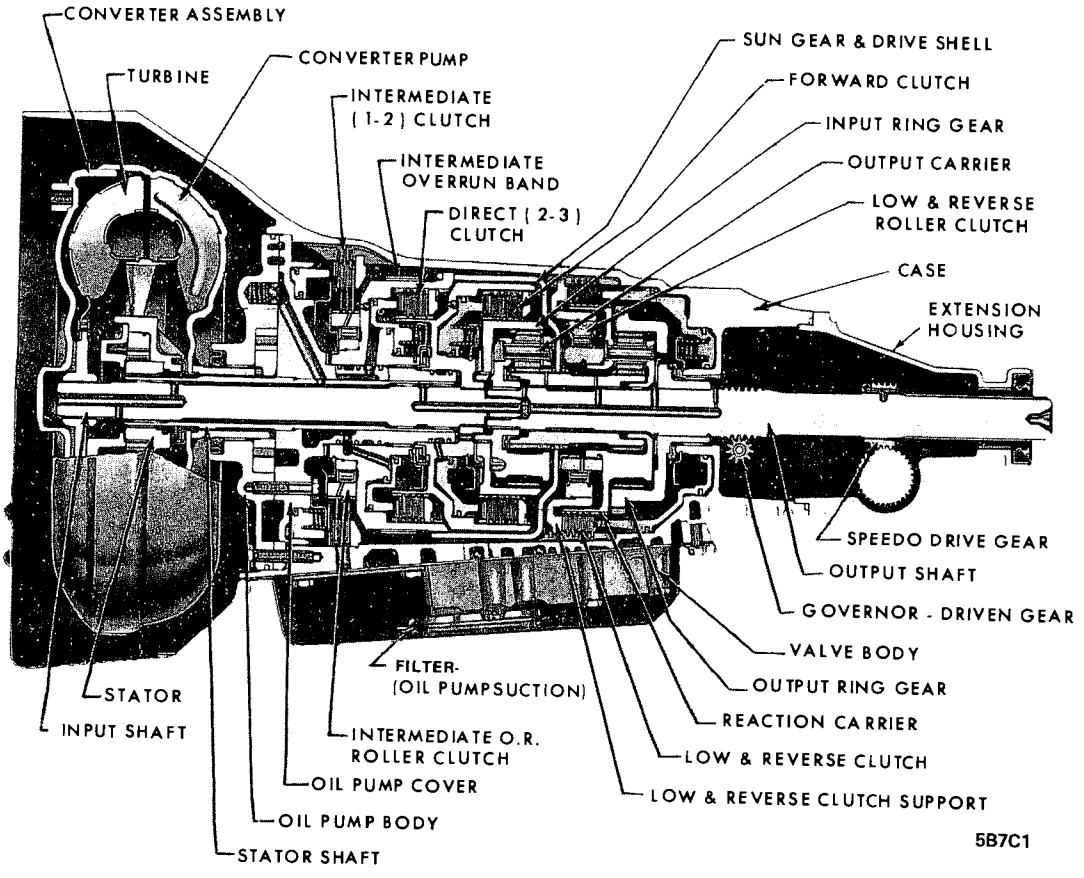


Figure 7C-1 - 350-375B Automatic Transmission

SEQUENCE FOR TURBO HYDRA-MATIC 350-375B TRANSMISSION DIAGNOSIS

1. Check and correct oil level.
2. Check detent cable adjustment.
3. Check and correct vacuum line and fittings.
4. Check and correct manual linkage.
5. Road test car.

a. Install oil pressure gage.

b. Road test using all selective ranges, noting when discrepancies in operation or oil pressure occur.

c. Attempt to isolate the unit or circuit involved in the malfunction.

d. If engine performances indicates an engine tune-up is required, this should be performed before road testing is completed or transmission correction attempted. Poor engine performance can result in rough shifting or other malfunctions.

TURBO HYDRA-MATIC 350-375B TRANSMISSION CHECKING PROCEDURES

Before diagnosis of any transmission complaint is attempted, there must be understanding of oil checking procedure and what appearance the oil should have. Many times a transmission malfunction can be traced to low oil level or improper reading of dipstick. Due to the transmission fluid that is now being used it may appear to be darker and have a stronger odor. This is normal, and not a positive sign of required maintenance or transmission failure.

Also when the dipstick is removed, it should be noted whether the oil is devoid of air bubbles or not. Oil with air bubbles gives an indication of an air leak in the suction lines, which can cause erratic operation and slippage. Water in the oil imparts a milky, pink cast to the oil and can cause spewing.

EXTERNAL OIL LEAKS

Determining Source of Oil Leak

Before attempting to correct an oil leak, the actual source of the leak must be determined. In many cases, the source of the leak can be deceiving due to "wind flow" around the engine and transmission.

The suspected area should be wiped clean of all oil before inspecting for the source of the leak. Red dye is used in the transmission oil at the assembly plant and will indicate if the oil leak is from the transmission.

The use of a "Black Light" to locate the point at which the oil is leaking is helpful. Comparing the oil from the leak to that on the engine or transmission dipstick, when viewed by black light, will determine the source of the leak - engine or transmission.

Oil leaks around the engine and transmission are generally carried toward the rear of the car by air stream. For example, a transmission oil filler tube to case leak will sometimes appear as a leak at the rear of the transmission. In determining the source of a leak, proceed as follows:

1. Degrease underside of transmission.
2. Road test to get unit at operating temperature.
3. Inspect for leak with engine running.
4. With engine off, check for oil leaks due to the raised oil level caused by drain back.

Possible Points of Oil Leaks

1. Transmission Oil Pan Leak.

a. Attaching bolts not correctly torqued.

b. Improperly installed or damaged pan gasket.

c. Oil pan gasket mounting face not flat.

2. Extension Housing.

a. Attaching bolts not correctly torqued.

b. Rear seal assembly damaged or improperly installed.

c. Square seal, extension to case, damaged or improperly installed.

3. Case Leak.

a. Filler pipe "O" ring seal damaged or missing; misposition of filler pipe bracket to engine.

b. Modulator assembly "O" ring seal damaged or improperly installed.

c. Detent cable connector "O" ring seal damaged or improperly installed.

d. Governor cover not tight, gasket damaged or leak between case face and gasket.

e. Speedometer gear "O" ring damaged.

f. Manual shaft seal damaged or improperly installed.

g. Line pressure tap plug loose.

4. Leak at Front of Transmission.

a. Front pump seal leaks.

(1) Seal lip cut. Check converter hub, etc.

(2) Bushing moved and damaged. Oil return hole plugged.

(3) No oil return hole.

b. Front pump attaching bolts loose or bolt washer type seals damaged or missing.

c. Front pump housing "O" ring damaged or cut.

d. Converter leak in weld area.

e. Porous casting (pump).

5. Oil Comes Out Vent Pipe.

a. Transmission over-filled.

b. Water in oil.

c. Foreign material between pump and case or between pump cover and body.

d. Case - porous near converter bosses. Front pump cover or housing oil channels shy or stock near breather.

e. Pump to case gasket mis-positioned.

Case Porosity Repair

Turbo Hydra-Matic 350-375B transmission external oil leaks caused by case porosity can be successfully repaired with the transmission in the car by using the following recommended procedures:

1. Road test and bring the transmission to operating temperature, approximately 190 degrees F.

2. Raise car on a hoist or jack stand, engine running, and locate source of oil leak. Check for oil leaks in Low, Drive, and Reverse.

3. Shut engine off and thoroughly clean area to be repaired with a suitable cleaning solvent and a brush - air dry.

A clean, dry soldering acid brush can be used to clean the area and also to apply the epoxy cement or equivalent.

4. Using instructions of the manufacturer, mix a sufficient amount of epoxy (or equivalent) to make the repair. Make certain the area to be repaired is fully covered.

5. Allow cement to cure for *3 hours* before starting engine.

6. Road test and check for leaks.

CONVERTER STATOR OPERATION DIAGNOSIS

1. The stator assembly freewheels in both directions.

If the stator roller clutch becomes ineffective, the stator assembly freewheels at all times in both directions. With this condition, the vehicle will tend to have poor acceleration from a standstill. At speeds above 30-35 m.p.h., the vehicle may act normal. If poor acceleration problems are noted, it should first be determined that the exhaust system is not blocked, the engine is in good tune and the transmission is in first (1st) gear when starting out.

If the engine will freely accelerate to high r.p.m. in Neutral (N), it can be assumed that the engine and exhaust system are normal. Driving the vehicle in Reverse (R) and checking for poor performance will help determine if the stator is freewheeling at all times.

2. The stator assembly remains locked up at all times.

If the stator assembly remains locked up at all times, the engine r.p.m. and vehicle speed will tend to be limited or restricted at high speeds. The vehicle performance when accelerating from a standstill will be normal. Engine overheating may be noted. Visual examination of the converter may reveal a blue color from the overheating that will result.

Under both conditions 1 or 2, if the converter has been removed from the transmission, the stator roller clutch can be checked by inserting a finger into the splined inner race of the roller clutch and trying to turn the race in both directions. The inner race should turn freely in the clockwise direction, but not turn or be very difficult to turn in the counterclockwise direction.

(NOTE: Do not use such items as the pump cover or stator shaft to turn the race as the results may be misleading.)

A failed vacuum modulator can cause one or more of the following complaints.

1. Harsh upshifts and downshifts.

2. Delayed upshifts.

3. Soft upshifts and downshifts.

4. Slips in low, drive and reverse.

5. Transmission overheating.

6. Engine burning transmission oil.

If any one of the above complaints are encountered, the modulator must be checked.

The vacuum modulator, see Figure 7C-2, has three areas to be checked. If any one of the three (3) areas fail to pass the prescribed checks, the modulator must be replaced.

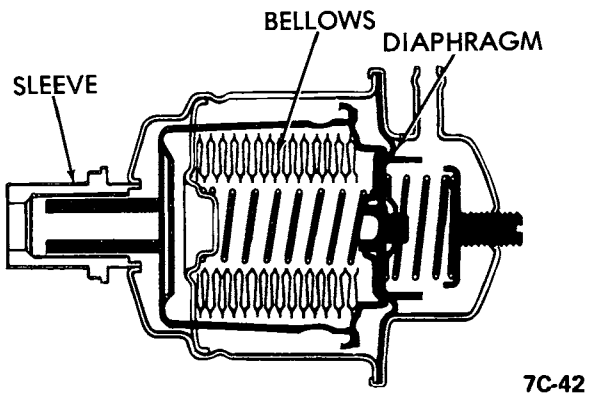


Figure 7C-2 - Vacuum Modulator Assembly

1. Bellows Comparison Check.

To check bellows load proceed as follows:

a. Insert one end of the comparison gage J-24466 into the suspected modulator sleeve. Insert the opposite end of the gage into a known, good modulator *of the same part number* as the suspected modulator. This part number of the modulator assembly is located on the back side of the modulator.

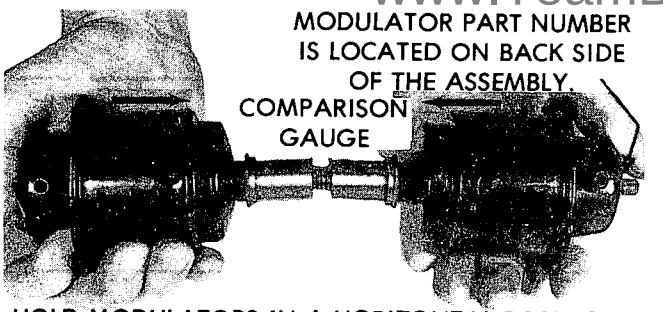
b. Holding the modulators in a horizontal position, see Figure 7C-3, bring them slowly together under pressure. The modulator bellows in question, if bad, will reach the center line of the comparison gage before the known good modulator lines up with the outer gage line. See Figure 7C-4.

If the modulator bellows in question is good, both modulator assemblies will be within the outer gage lines as the assemblies are slowly brought together. See Figure 7C-5.

2. Vacuum Diaphragm Leak Check.

Turn modulator so vacuum line stem points downward. If transmission oil comes out the vacuum diaphragm is bad.

Gasoline and/or water vapor may settle in the vacuum side of the modulator. If this is found WITHOUT the presence of oil, the modulator MUST NOT BE CHANGED.



HOLD MODULATORS IN A HORIZONTAL POSITION, AS SHOWN. BRING THEM SLOWLY TOGETHER UNDER PRESSURE. 7C-43

Figure 7C-3 - Holding Modulator in Horizontal Position

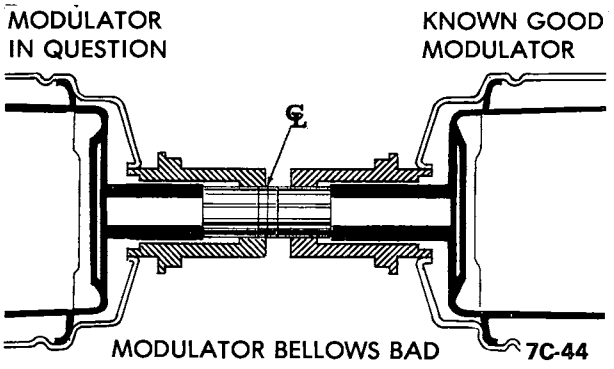


Figure 7C-4 - Modulator Bellows - (Bad)

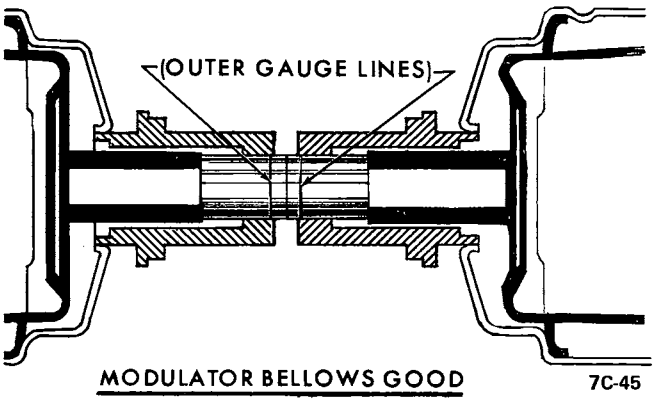


Figure 7C-5 - Modulator Bellows - (Good)

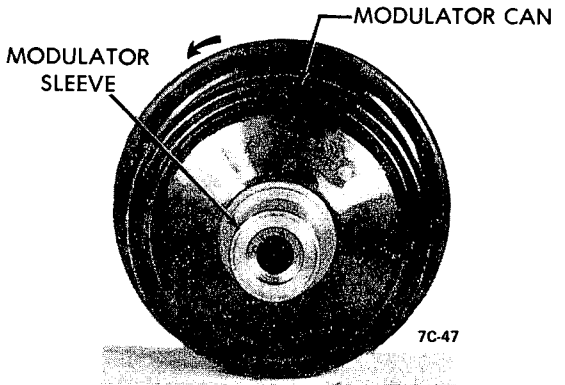
Check solution that comes out of the modulator for evidence of lubricity. If the solution does not have the feel of oiliness it can be assumed the solution is a mixture of gas and/or water. The only way transmission oil can be on the vacuum side of the modulator is by a leak in the vacuum diaphragm.

If oil is found, the modulator must be replaced. If oil is not found in the vacuum side of the modulator but the transmission oil level is continually low, and *no external leaks are found,* there is a possibility that a pin hole leak exists in the diaphragm and the modulator should be replaced.

3. Inspection for External Damage.

a. Check for dents or cracks in modulator.

b. Check modulator valve sleeve alignment. Roll modulator on a flat surface to determine if the sleeve is concentric to the modulator can. See Figure 7C-6. If the sleeve is bent, runout will be visible, and modulator must be replaced.



ROLL MODULATOR ON FLAT SURFACE TO DETERMINE IF THE SLEEVE IS CONCENTRIC TO THE MODULATOR CAN. IF THE SLEEVE IS BENT, RUNOUT WILL BE VISIBLE.

Figure 7C-6 - Checking Modulator Sleeve Alignment

If the modulator passes the above checks, the following items should also be checked as a possible cause of the problem.

1. Check freeness of modulator valve in modulator.

2. Check freeness of modulator valve in transmission case.

3. Check the vacuum line from the manifold to modulator for holes, cracks or dents. Check the rubber hose connections at the modulator and at the intake manifold for leaks.

TURBO HYDRA-MATIC 350-375B TROUBLE DIAGNOSIS CHART

*Refer to section at end of Diagnosis Chart dealing with causes of improper vacuum at modulator.

Condition	Possible Cause	Correction
No drive in drive range - (install pressure gauge).	1. Low oil level.	*1.Correct level - check for external leaks or vacuum modulator (leaking diaphragm will evacuate oil from unit).

Condition	Possible Cause	Correction
	2. Manual linkage adjustment.	2. See Section 7E.
	3. Low oil pressure.	3a. Filter assembly - blocked. b. Pump assembly - pressure regulator, pump drive gear - tangs damaged by converter. c. Case - porosity in intake bore.
	4. Control valve assembly.	4. Manual valve disconnected from inner lever.
	5. Forward clutch.	5a. Forward clutch does not apply - piston cracked; seals missing, damaged; clutch plates burned. b. Pump feed circuit to forward clutch oil seal rings missing or broken on pump cover; leak in feed circuits; pump to case gasket mispositioned or damaged. Clutch drum ball check stuck or missing.
	6. Roller clutch assembly.	6. Broken spring or damaged cage.
Oil pressure high or low	1. High oil pressure.	*1a. Vacuum line or fittings leaking. *b. vacuum modulator. c. Modulator valve. d. Pressure regulator. e. Oil pump.
	2. Low oil pressure.	*2a. Vacuum line or fittings obstructed. *b. Vacuum modulator. c. Modulator valve. d. Pressure regulator. e. Governor. f. Oil pump.
1-2 shift - full throttle only.	1. Detent valve	1. Sticking or linkage misadjusted.
	2.Vacuum leak.	*2.Vacuum line or fittings leaking.
	3. Control valve assembly.	3a. Valve body gaskets - leaking, damaged, incorrectly installed. b. Detent valve train stuck. c. 1-2 valve stuck.
	4. Case assembly.	4. Porosity.

Condition	Possible Cause	Correction
First speed only - no 1-2 shift.	1. Governor assembly.	1a. Governor valve sticking. b. Driven gear loose, damaged or worn (check for pin in case and length of pin showing); also, check output shaft drive gear for nicks or rough finish, if driven gear shows damage.
	2. Control valve assembly.	2a. 1-2 shift valve train stuck closed. b. Governor feed channels blocked. c. Valve body gaskets - leaking, damaged, incorrectly installed.
	3. Case	3a. Porosity between channels. b. Governor feed channel blocked, governor bore scored or worn, allowing cross pressure leak.
	4. Intermediate clutch.	4a. Clutch piston seals - missing, improperly assembled, cut. b. Intermediate roller clutch. Broken spring or damaged cage.
First and second speeds only, no 2-3 shift.	1. Control valve assembly.	1a. 2-3 shift train stuck. b. Valve body gaskets - leaking, damaged, incorrectly installed.
	2. Direct clutch.	2a. Pump hub - direct clutch oil seal rings - broken, missing. b. Clutch piston seals - missing, improperly assembled, cut, piston ball check stuck or missing.
Drive in "Neutral".	1. Manual linkage.	1. Misadjusted
	2. Forward clutch.	2. Clutch does not release - (this condition will also cause "No Reverse").
No motion in "Reverse", or slips in "Reverse" - (install pressure gauge).	1. Low oil level.	1. Add oil.
	2. Manual linkage.	2. Misadjusted. Refer to Group 7E.
	3. Oil pressure.	3a. Modulator valve stuck. b. Modulator and reverse boost valve stuck. c. Pump hub - direct clutch oil seal rings broken, missing. d. Direct clutch piston seal cut or missing. e. Low and reverse clutch piston seal cut or missing. f. No. 1 check ball missing.

Condition	Possible Cause	Correction
	4. Control valve assembly.	4a. Valve body gaskets - leaking, damaged, incorrectly installed (other malfunctions may also be indicated). b. 2-3 valve train stuck in upshifted position. This will also cause 1-3 upshift in drive range. c. 1-2 valve train stuck in upshifted position.
	5. Intermediate servo.	5a. Piston or pin stuck so intermediate overrun band is applied.
	6. Low and reverse clutch.	6. Piston out or seal damaged or missing.
	7. Direct clutch.	7a. Outer seal damaged or missing. b. Clutch plates burned - may be caused by stuck ball check in piston.
	8. Forward clutch.	8. Clutch does not release (will also cause "Drive" in "Neutral".
Slips in all ranges, slips on take-off - (install pressure gauge).	1. Oil level low.	1. Add oil.
	2. Oil pressure.	*2a. Vacuum modulator inoperative. b. Vacuum modulator valve sticking. c. Filter assembly - plugged or leaks.
	3. Case	3a. Pressure regulator valve stuck. b. Pump to case gasket damaged or incorrectly installed.
	4. Forward clutch slipping.	4. Cross leaks, porosity.
		5a. If burned, look for cause. b. Oil seal rings on pump cover broken or worn.
Slips 1-2 shift - (install pressure gauge).	1. Oil level low.	1. Add oil.
	2. Oil pressure.	2a. Vacuum modulator assembly inoperative. b. Modulator valve sticking. c. Pump pressure regulator valve.
	3. 2-3 accumulator.	3. Oil ring damaged or missing.

Condition	Possible Cause	Correction
	4. 1-2 accumulator.	4. Oil ring missing or damaged, case bore damaged.
	5. Pump to case gasket.	5. Mispositioned
	6. Case	6. Pososity between channels.
	7. Intermediate clutch.	7. Piston seals missing or damaged; clutch plates burned.
Rough 1-2 shift - (install pressure gauge).	1. Oil pressure.	*1a. Vacuum modulator - check for loose fittings, restrictions in line. b. Modulator valve stuck. c. Valve body - regulator or boost valve stuck. d. Pump to case gasket - off location or damaged.
	2. Case	2. Porosity between channels.
	3. 1-2 accumulator assembly.	3a. Oil rings damaged. b. Piston stuck. c. Broken or missing spring. d. Bore damaged. e. Check accumulator feed hole in valve body plate.
Slips 2-3 shift - (install pressure gauge).	1. Oil level low.	1. Add oil.
	2. Oil pressure low.	*2a. Modulator assembly. b. Modulator valve. c. Pump pressure regulator valve or boost valve; pump to case gasket off location.
	3. Case	3. Porosity
	4. Direct clutch.	4a. Piston seals leaking, or ball check leak.
Rough 2-3 shift - (install pressure gauge).	1. Oil pressure high	*1a. Vacuum leak. b. Modulator valve sticking. c. Valve body - pressure regulator or boost valve inoperative.
	2. 2-3 accumulator assembly.	2a. 2-3 accumulator spring missing, broken. b. Accumulator piston stuck.
No engine braking - L2 - 2nd gear.	1. Intermediate servo and 2-3 accumulator.	1a. Servo or accumulator oil rings or bores leaking. b. Servo piston stuck.

Condition	Possible Cause	Correction
	2. Intermediate overrun band.	2. Intermediate overrun band broken, burned (check for cause).
	3. Oil pressure low.	3. Pressure regulator and/or boost valve stuck.
No engine braking - L-1 - 1st gear.	1. Manual low control valve assembly.	1. Stuck
	2. Oil pressure low.	2. Pressure regulator and/or boost valve stuck.
	3. Low and reverse clutch.	3. Piston inner seal damaged or missing.
No part throttle downshift - (install pressure gauge).	1. Oil pressure.	*1a. Vacuum modulator assembly, modulator valve, pressure regulator valve train (other malfunctions may also be noticed).
	2. Detent valve and linkage.	2. Sticks or disconnected or broken.
	3. 2-3 shift valve.	3. Stuck
No detent downshifts.	1. Control valve assembly.	1. 2-3 valve stuck.
	2. Detent valve and linkage.	2. Sticks or disconnected or broken.
Low or high shift points - (install pressure gauge).	1. Oil pressure.	*1a. Engine vacuum - check at transmission end of the modulator pipe. *b. Vacuum modulator assembly vacuum line connections at engine and transmission, modulator valve, pressure regulator valve train.
	2. Governor	2a. Valve sticking. b. Feed holes restricted or leaking, pipes damaged or mispositioned. c. Feed line plugged.
	3. Detent valve and linkage.	3. Stuck open. (Will cause late shifts.)
	4. Control valve assembly.	4a. 2-3 valve train sticking. b. 1-2 shift valve train sticking.
	5. Case	5. Pososity

Condition	Possible Cause	Correction
Won't hold in "Park".	1. Manual linkage.	1. Misadjusted
	2. Internal linkage.	2a. Parking brake lever and actuator assembly. Check for chamfer on actuator rod sleeve. b. Parking pawl broken or inoperative.
Locks up in manual low (usually hot only).	1. Converter pressure leaking into direct clutch thru stator shaft.	1a. Check stator shaft index.
	2. Direct clutch.	1a. Direct clutch bore undersize or piston oversize. b. Direct clutch feed hole shy small chamber.
Second gear start or slips second gear only.	1. Intermediate clutch.	1a. Wrong number of clutch plates or wrong piston.
Locks up in reverse (usually hot only).	1. Forward clutch.	1a. Bore undersize or piston oversize.
	2. Direct clutch.	2. Direct clutch. feeding forward clutch thru stator shaft. (check stator shaft index).
Locks in reverse from park to reverse only.	1. Parking pawl.	1a. Parking pawl staying in due to a burr on leading edge.
Cold morning reverse no drive till engine warms up.	1. Pressure regulator bore or sleeve tight.	1a. Remove and repair.
Shifts cold but not warm.	1. Governor assembly.	1a. Nylon gear roll pin shy.
No drive-but has manual low.	1. Low reverse roller clutch.	1a. Low reverse roller clutch installed backwards.
No 1-2 shift-makes 1-3 shift and 3-1 shift, but has all shifts manually.	1. Intermediate roller clutch.	1a. Intermediate roller clutch not locking.
Governor nylon gear stripped 360°.	1. Case pin.	1a. Governor case pin missing.
	2. Output shaft.	2a. Output shaft rough or worn.
Governor gear stripped one side.	1. Governor sizing in bore.	1a. Repair or replace as necessary.
Slow reverse (cold only).	1. Low oil level.	1a. Adjust oil level.

Condition	Possible Cause	Correction
Harsh 1-2 shift.	1. 1-2 accumulator.	1a. Piston or spring. b. Accumulator feed hole in valve body plate.
Slow reverse (hot only).	1. Valve body. 2. Shift selector lever.	1a. Leaking valve body support plate. 2a. Bent or S-hook hole off location. b. S-hook bent. c. Detent roller spring hole off location. d. Manual valve S-hook hole off location.

CAUSES OF IMPROPER VACUUM AT MODULATOR

1. Engine.

a. Tune up.

b. Loose vacuum fittings.

c. Vacuum operated accessory leak (hoses, vacuum advance, etc.)

d. Engine exhaust system restricted.

2. Vacuum line to modulator.

a. Leak.

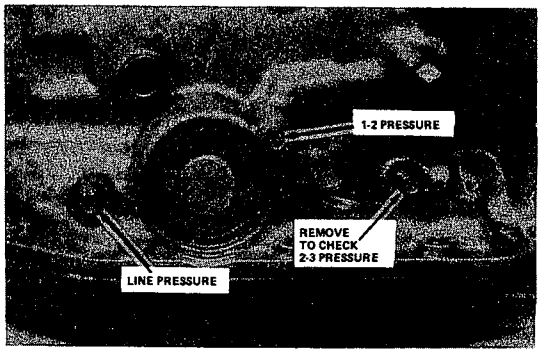
b. Loose fitting.

c. Restricted orifice or incorrect orifice size.

d. Carbon build up at modulator vacuum fitting.

e. Pinched line.

f. Grease in pipe (no or delayed upshift-cold).



TRANSMISSION LINE PRESSURE CHECKS

		P,N &D	L2 L1	R
MINIMUM PSI (Car coasting at 25 MPH)		62	84	86
MAXIMUM PSI (Stall check or Hoist check, see below)	ALTITUDE ABOVE SEA LEVEL			
	0 Ft.	153	153	239
	2,000	153	153	224
	4,000	145	147	205
	6,000	134	139	191
	8,000	124	132	176
	10,000	115	125	164
	12,000	106	118	151
	14,000	98	112	139

STALL CHECK

Stall engine at full throttle for no more than 10 seconds in Reverse, Drive, L2 or L1 range.

HOIST CHECK

Run the engine at 1200 RPM with the modulator vacuum pipe dis-connected. Lock the brakes at 0 MPH.

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Figure 7C-8

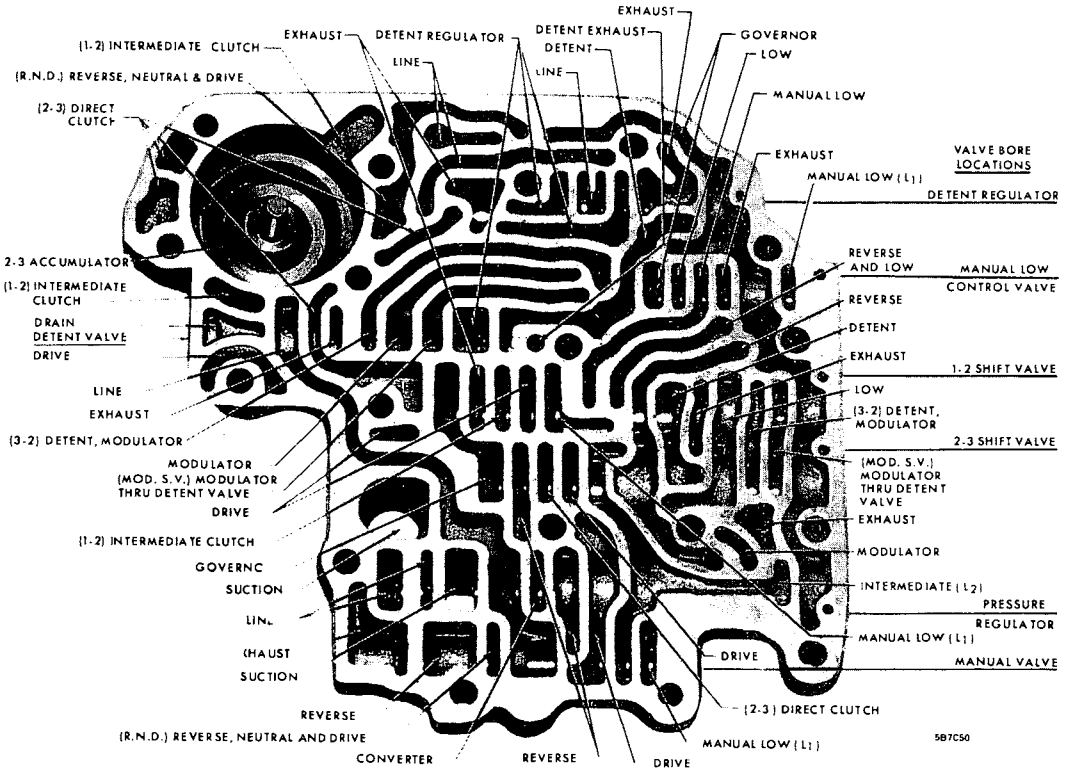


Figure 7C-9 - Identification of Oil Channels in Valve Body

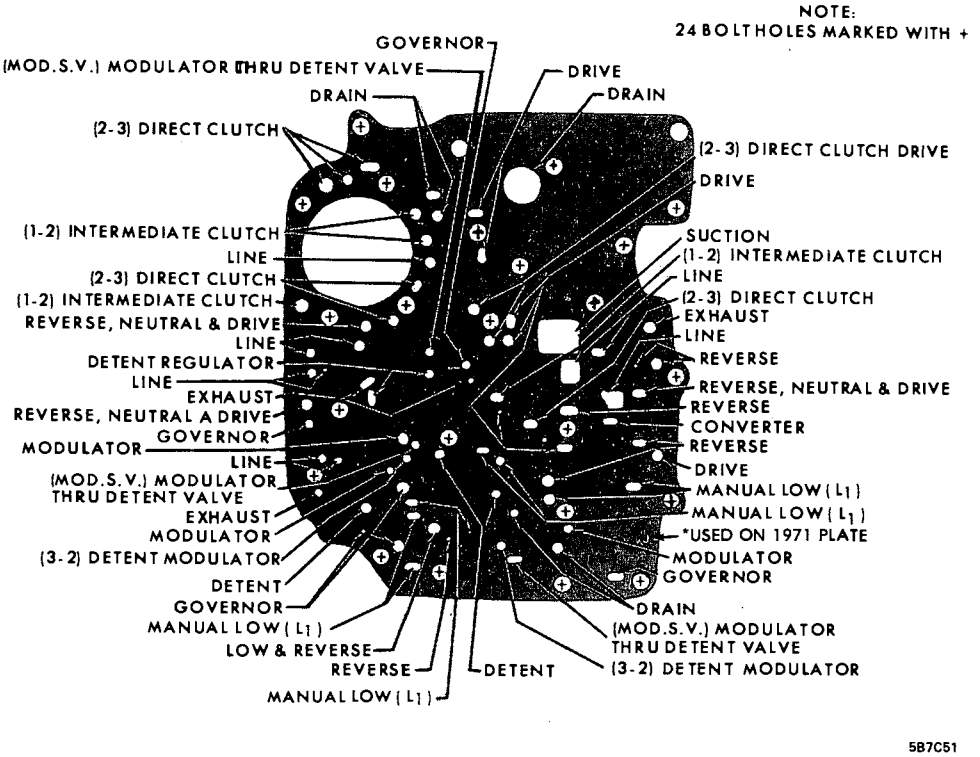


Figure 7C-10 - Valve Body Spacer Plate

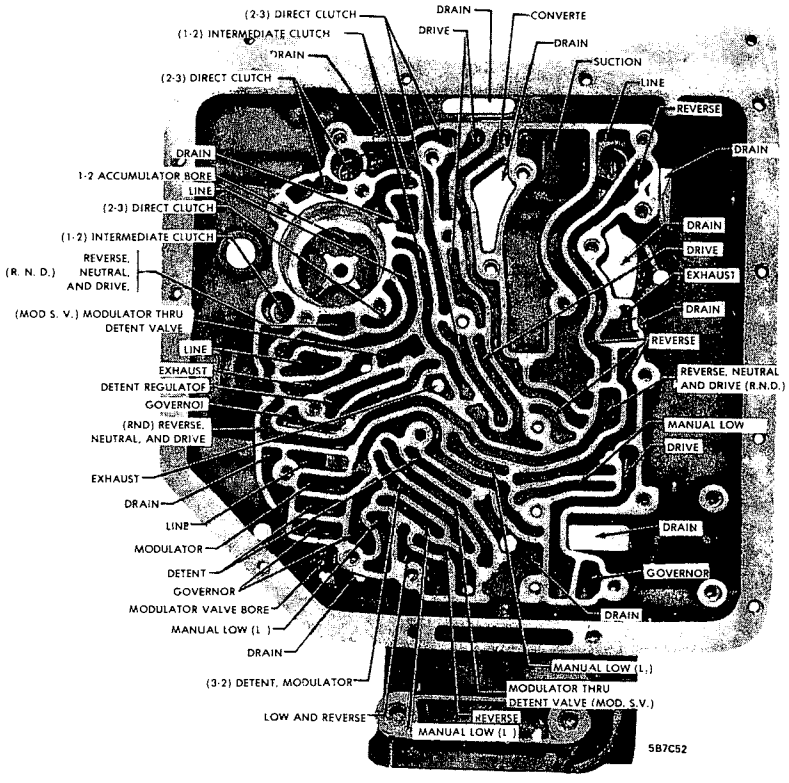


Figure 7C-11 - Identification of Oil Channels in Case Face

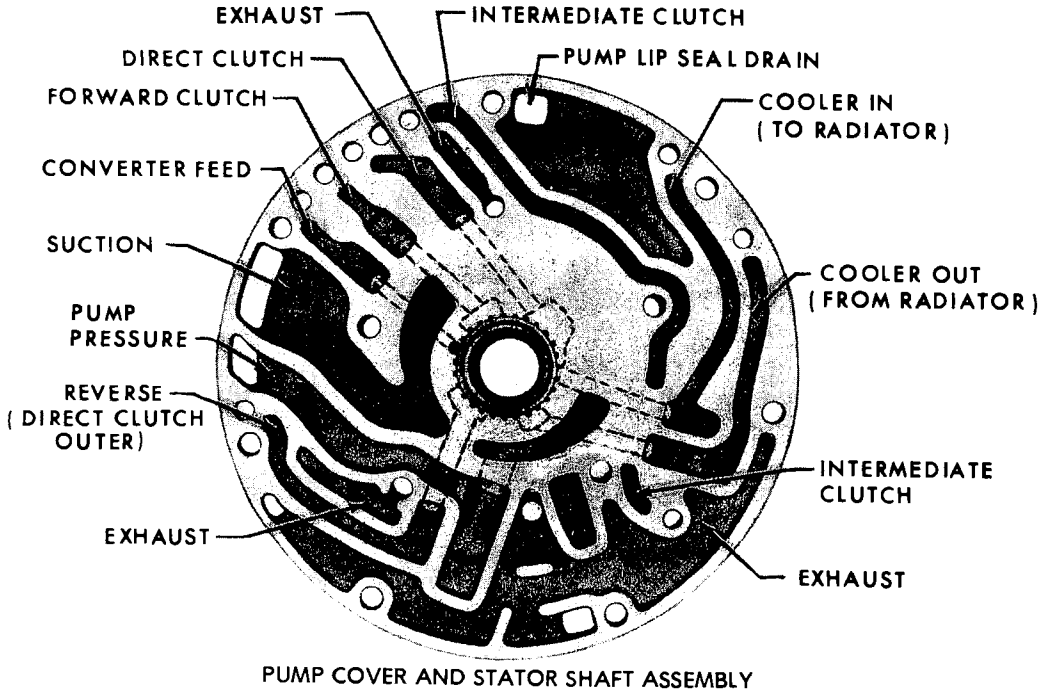


Figure 7C-12 - Identification of Oil Channels in Pump Cover and Stator Shaft Face

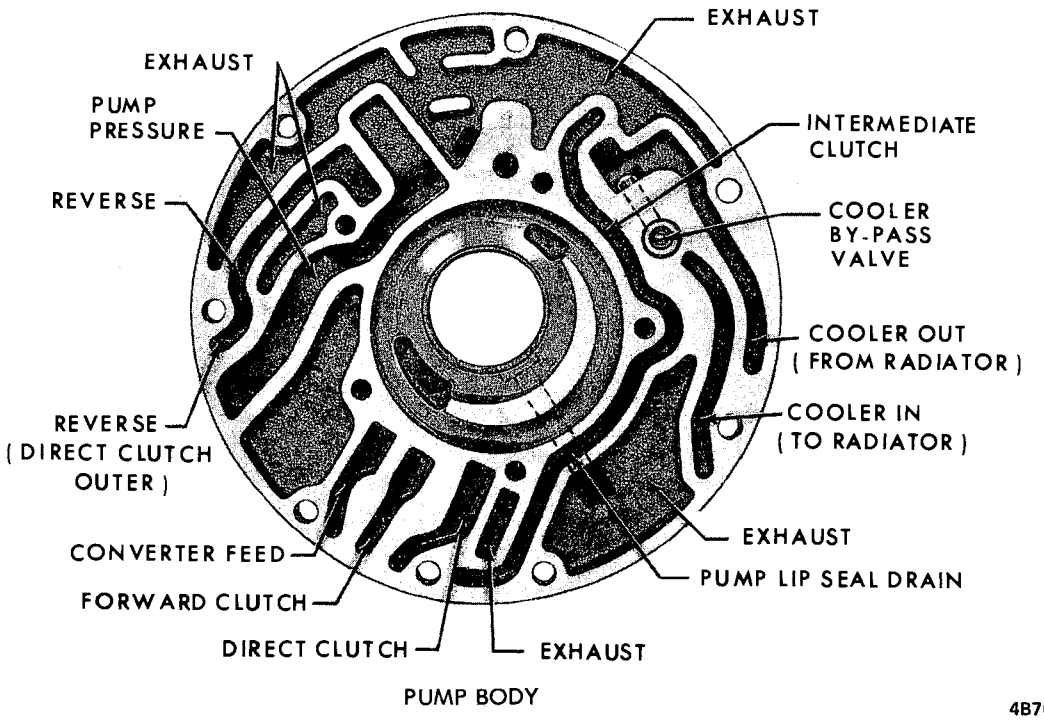


Figure 7C-13 - Identification of Oil Channels in Pump Body Front Face

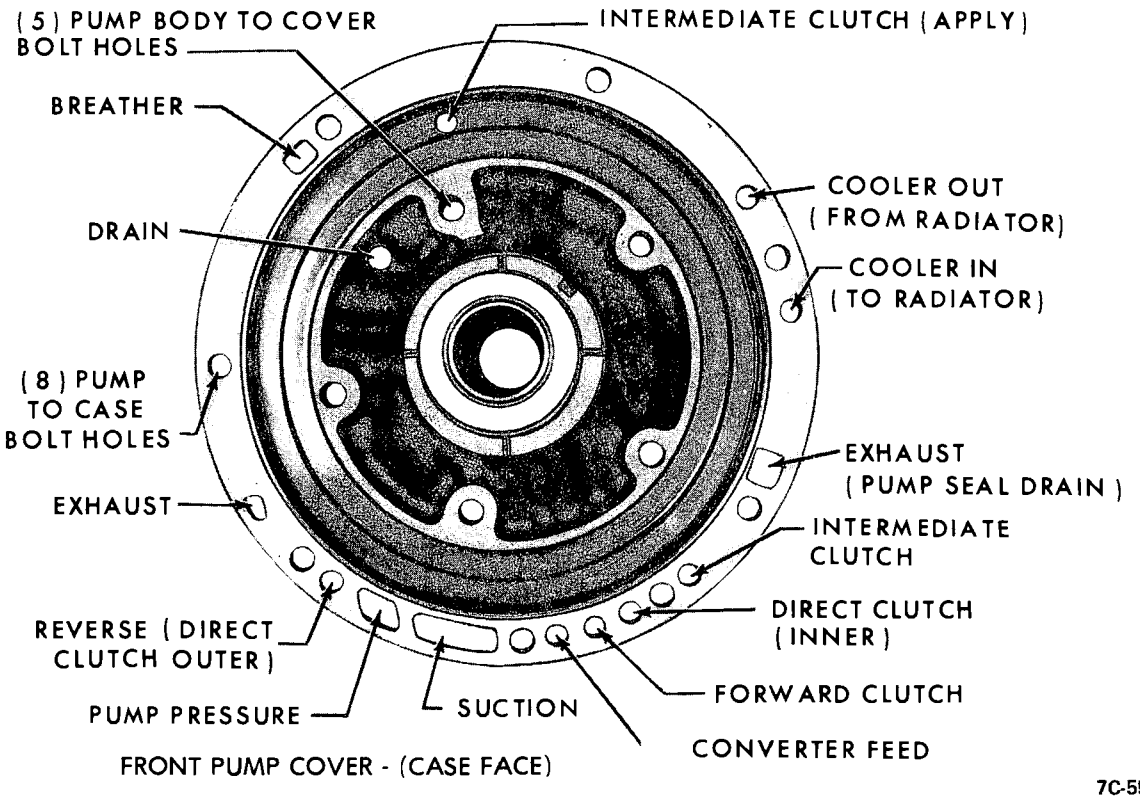


Figure 7C-14 - Identification of Oil Channels in Pump Cover Rear Face

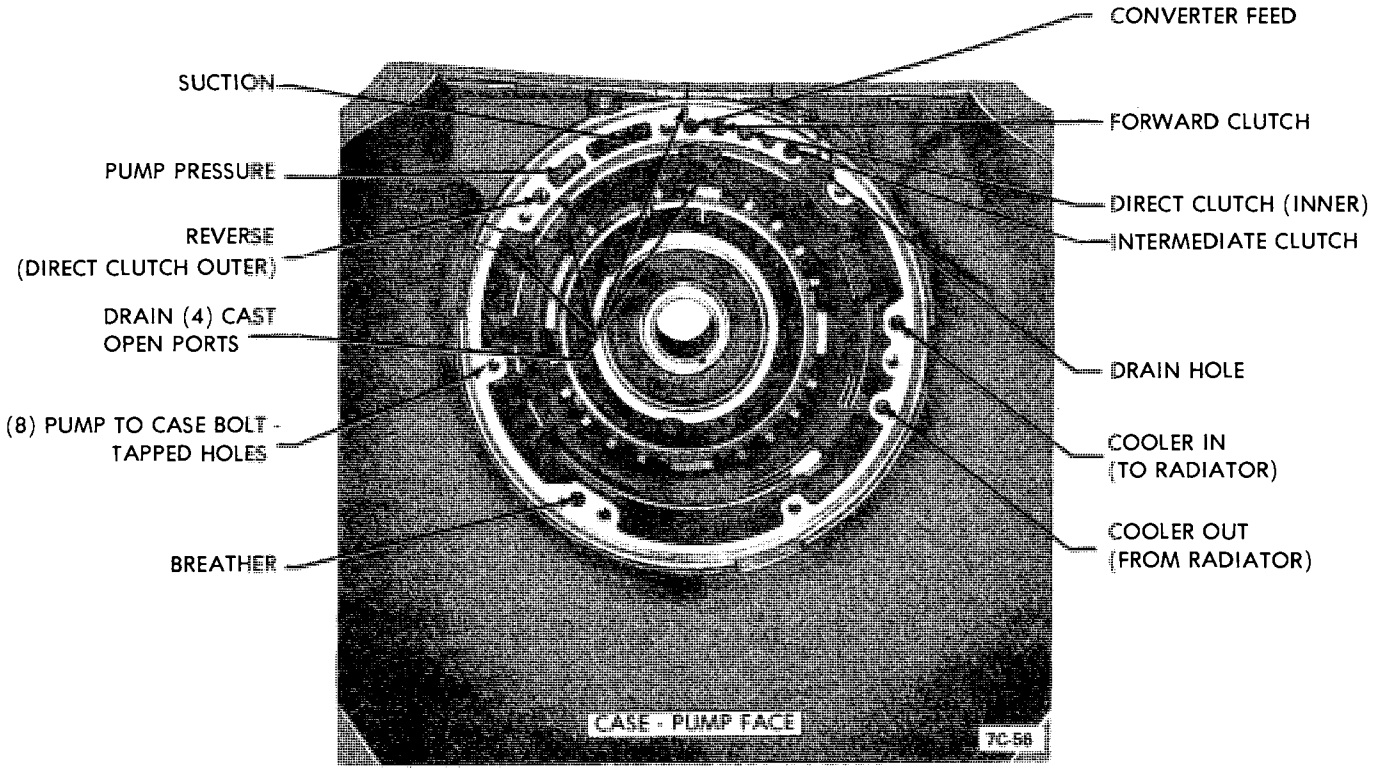


Figure 7C-15 - Case - Pump Identification of Oil Channels

MAINTENANCE AND ADJUSTMENTS

DETENT CABLE ADJUSTMENT SEE FIGURES 7C-16 AND 7C-17

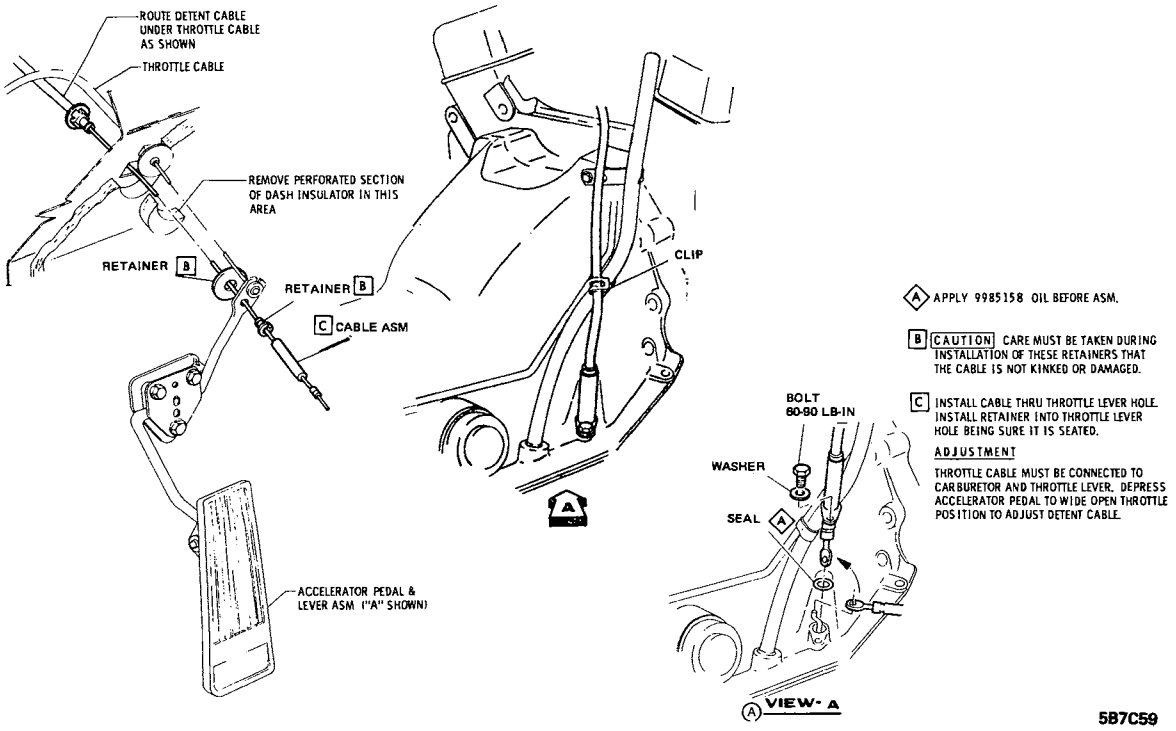


Figure 7C-16 - Transmission Detent Cable Adjustment - A and B Series

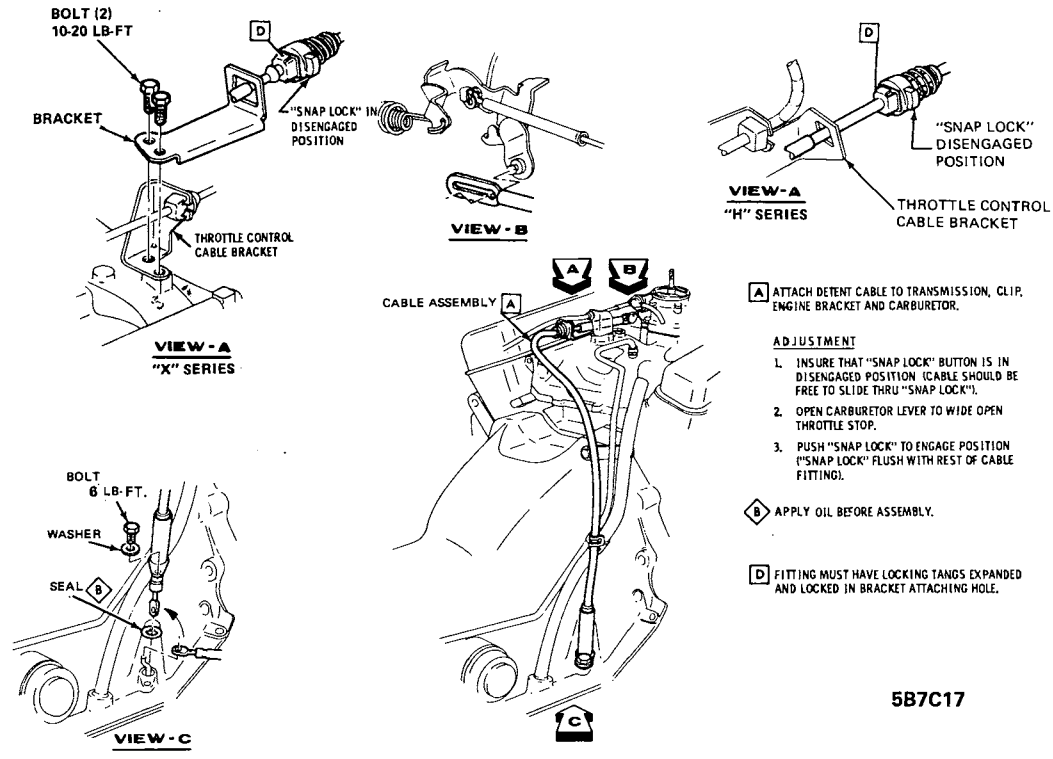


Figure 7C-17 Detent Cable Adjustment H and X Series

REMOVAL OF PROPELLER SHAFT YOKE SEAL (375B ONLY), SPEEDOMETER DRIVE GEAR, AND GOVERNOR

Removal of Propeller Shaft Yoke Seal (375B Only)

Remove propeller shaft yoke seal, using Tool J- 23103 and screwdriver. See Figure 7C-18.

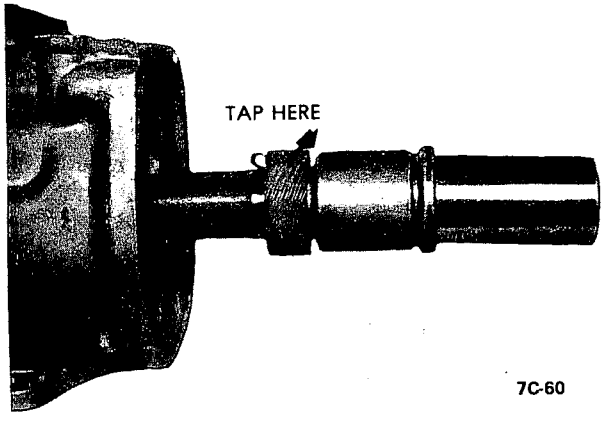


Figure 7C-18 - 375B Transmission

Removal and Installation of Speedometer Drive Gear

Removal

1. Depress retaining clip and remove from output shaft.

Installation

1. Align slot in speedometer drive gear with retaining clip and install. See Figure 7C-19.

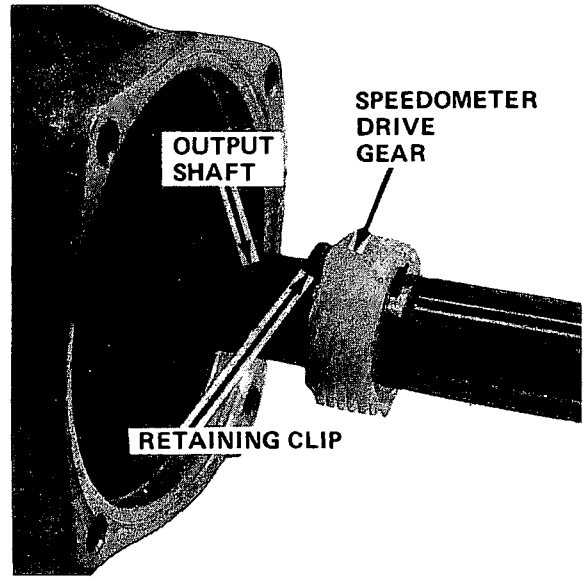


Figure 7C-19

Removal of Governor

1. Remove governor cover retainer wire with a screwdriver. See Figure 7C-20.

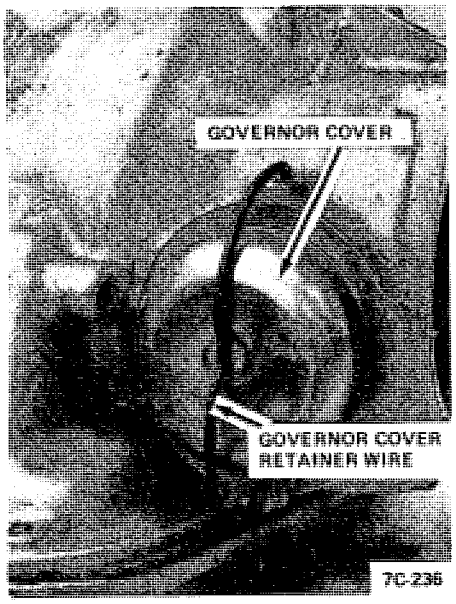


Figure 7C-20

2. Remove governor cover and "O" ring seal from case. Aid removal of cover with screwdriver. Use extreme care not to damage cover. If cover is damaged it must be replaced.

Remove "O" ring seal from governor cover, and replace. See Figure 7C-21.

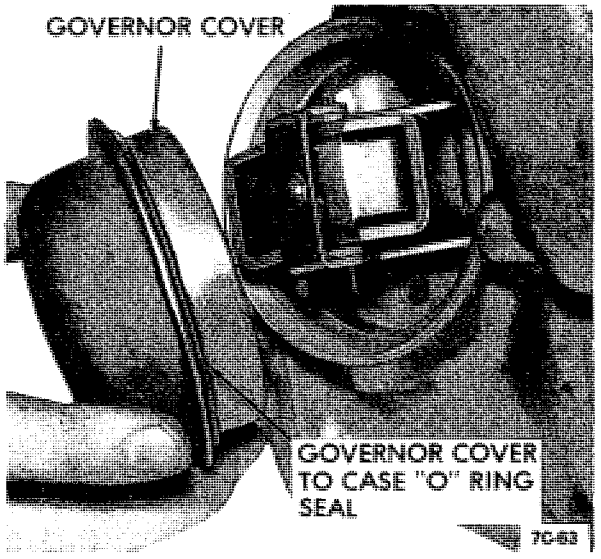


Figure 7C-21

3. Withdraw governor assembly from case. See Figure 7C-22.

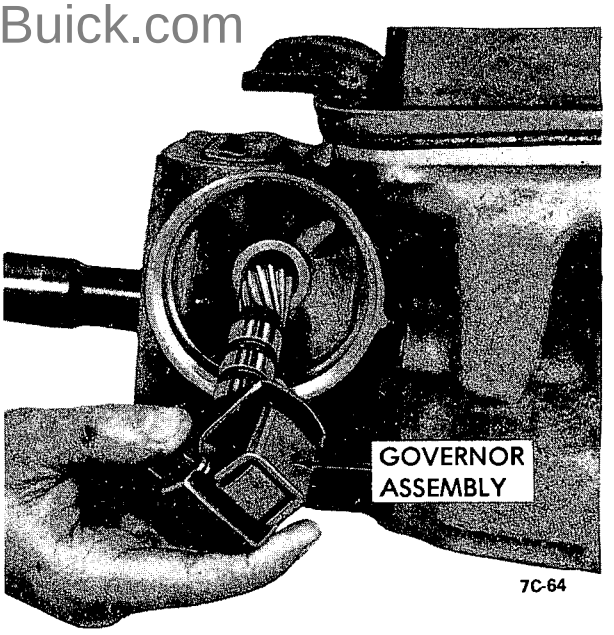


Figure 7C-22

Check governor bore and governor sleeve for scoring.

Refer to 400 section for governor overhaul procedures.

MAINTENANCE

Draining Oil Pan and Replacing Filter Assembly

With transmission in the car,

1. Raise car on hoist or place on jack stands, and provide container to collect draining fluid. Care should be taken if transmission is hot.

2. Remove oil pan and gasket. Discard gasket.

3. Drain fluid from oil pan. Clean pan with solvent and dry thoroughly with clean compressed air.

4. Remove filter assembly and gasket.

5. Install new oil filter to valve body gasket on filter. Install new filter assembly.

6. Install new gasket on oil pan and install pan. Tighten attaching bolts to 13 lb. ft.

7. Lower car and add 3 pints of transmission fluid through filler tube.

8. With manual control lever in Park position, start engine. DO NOT RACE ENGINE. Move manual control lever through each range.

9. Immediately check fluid level with selector lever in Park, engine running, and vehicle on LEVEL surface.

10. Add additional fluid to bring level to 1/4" below the "ADD" mark on the dipstick. Do not overfill.

Turbo Hydra-Matic 350-375B Towing Instructions

If a Buick equipped with Turbo Hydra-Matic 350-375B transmission must be towed, the following precautions must be observed:

The car may be towed safely on its rear wheels with the shift lever in neutral position at speeds of 35 miles per hour or less under most conditions.

However, the drive shaft must be disconnected or the car towed on its front wheels if tow speeds in excess of 35 mph are necessary.

Car must be towed for extended distances (over 50 miles) or, Transmission is not operating properly.

If car is towed on its front wheels, the steering wheel should be secured to keep the front wheels in a straight-ahead position.

Rocking Car

If it becomes necessary to rock the car to free it from sand, mud or snow, move the selector lever from "D" to "R" in a repeat pattern while simultaneously applying moderate pressure to the accelerator. Do not race engine. Avoid spinning wheels when trying to free the car.

REMOVAL OF OIL PAN, OIL FILTER, AND VALVE BODY WITH TRANSMISSION REMOVED

Removal of Oil Pan

1. Remove (13) oil pan attaching screw and washer assemblies, oil pan, and gasket. See Figure 7C- 23.

Figure 7C-23

Removal of Oil Filter

1. Remove two (2) filter assembly to valve body attaching screws. See Figure 7C-24.

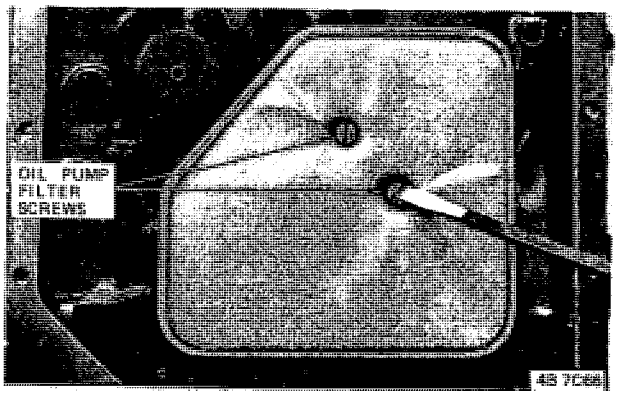


Figure 7C-24

2. Remove filter assembly and gasket from valve body. See Figure 7C-25.

Removal of Valve Body

1. Remove detent roller and spring assembly from valve body. Remove valve body to case attaching bolts. See Figure 7C-26.

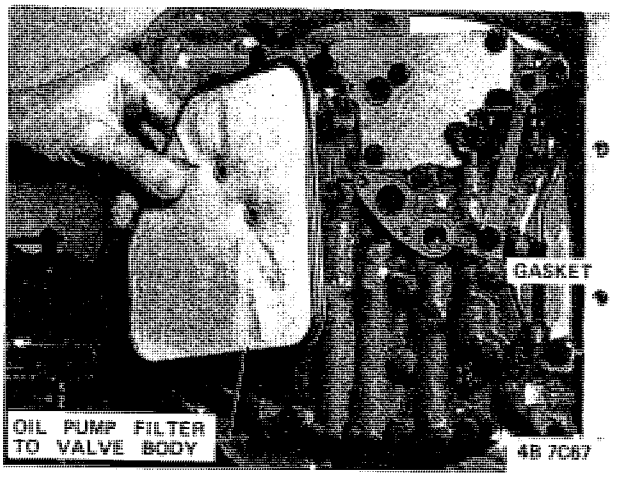


Figure 7C-25

2. Remove valve body from case while carefully guiding manual valve link from range selector inner lever. Remove detent control valve link from detent actuating lever.

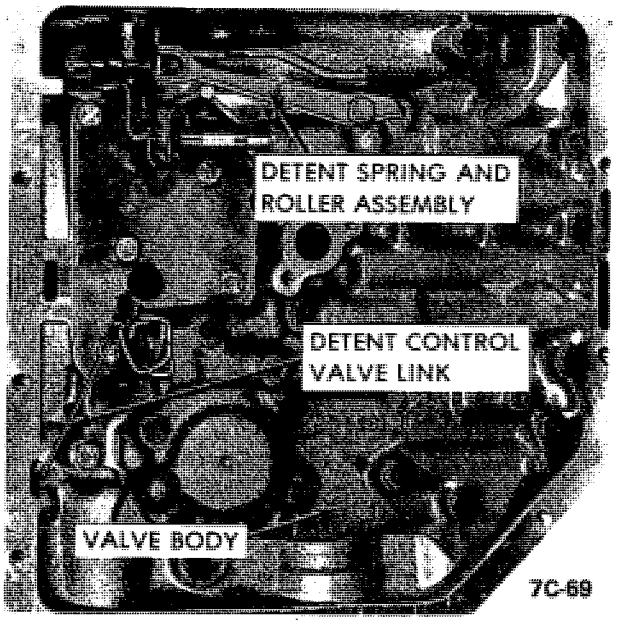


Figure 7C-26

3. Remove valve body to spacer plate gasket. See Figure 7C-27.

4. Remove spacer support plate bolts. Remove spacer support plate. See Figure 7C-28.

5. Remove valve body spacer plate and valve body spacer plate to case gasket. See Figure 7C-29. Be sure to note position of the four (4) plastic check balls so they are assembled correctly.

MAJOR REPAIR

TRANSMISSION ASSEMBLY - REMOVAL AND INSTALLATION

Removal

1. Place transmission in neutral, release parking brake, and disconnect the battery.

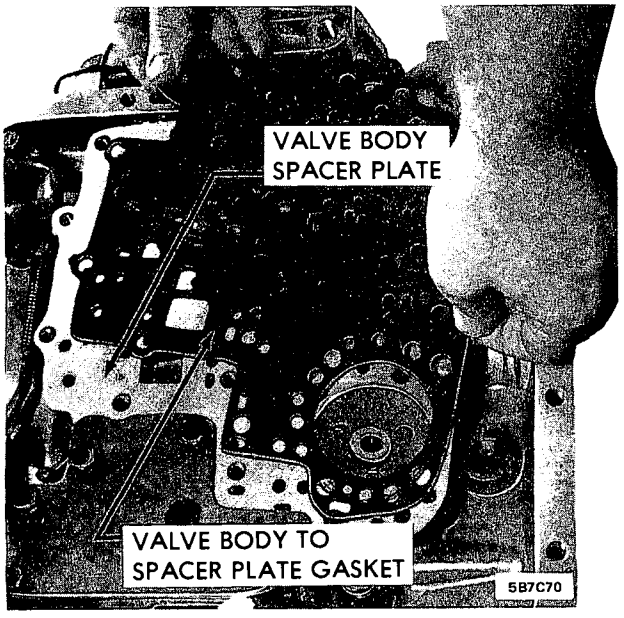


Figure 7C-27

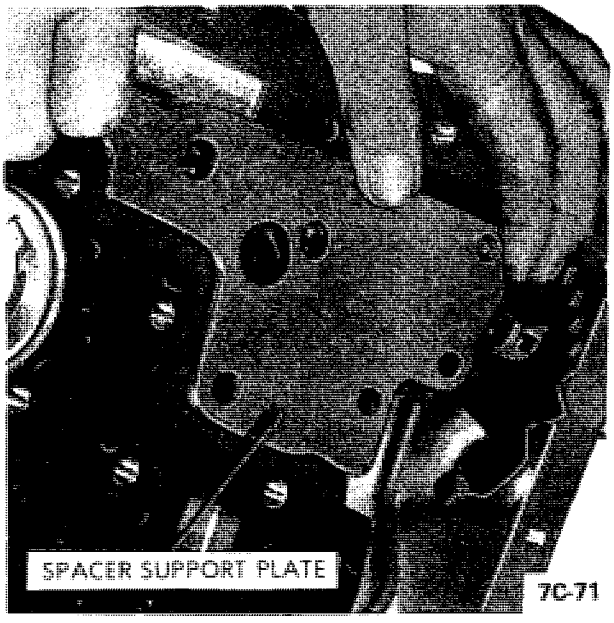


Figure 7C-28

2. Disconnect detent cable from accelerator lever or carburetor assembly.

3. Raise car and provide support for front and rear.

(NOTE: On some models the exhaust crossover pipe may have to be removed.)

4. Remove the propeller shaft. (H Series remove upper torque arm transmission end).

5. Remove vacuum line from vacuum modulator.

6. Being careful not to bend the detent cable remove plastic guide straight up from bracket and slide detent cable out through slot.

7. Remove detent cable from detent valve link. Do not bend cable.

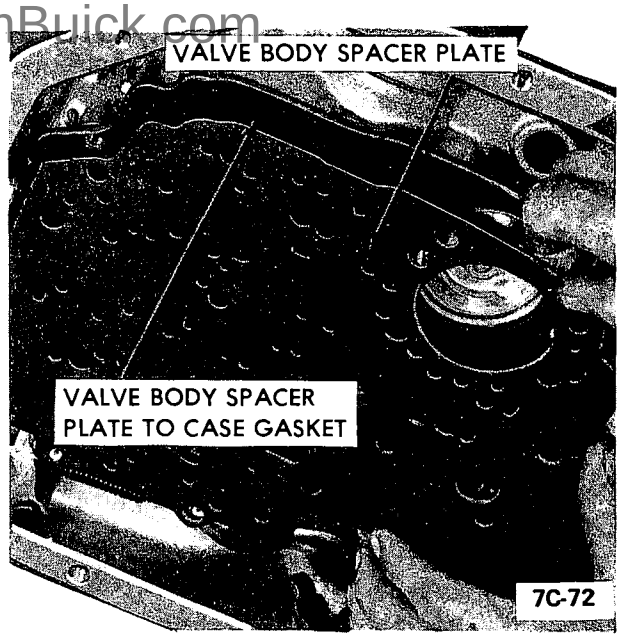


Figure 7C-29

8. Support engine at oil pan.

9. Assemble transmission to suitable transmission jack.

10. Remove transmission mounting pad to crossmember nut.

11. Raise transmission and remove crossmember to frame rail bolts. Remove crossmember.

12. Lower transmission enough to remove cooler lines, speedometer cable, shift linkage, catalytic converter bracket on A B Series, and the filler pipe.

13. Remove flywheel cover pan.

14. Mark flywheel and converter for reassembly in the same position, and remove three converter to flywheel bolts.

15. Remove transmission case to engine block bolts.

16. Slide transmission rearward and lower it away from car using tool J-21366 to hold converter in place.

Installation

The installation of the transmission is the reverse of removal except for the following reminder steps.

1. Connect converter and flywheel in original position.

2. Torque engine to transmission case bolts to 35 lb. ft.

3. Torque flywheel to converter bolts to 30 lb. ft.

4. Fill transmission with fluid as described in fluid recommendations O Section Maintenance.

PRELIMINARY INSTRUCTIONS

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

2. Place transmission on a CLEAN work bench and use

CLEAN tools during disassembly. Provide clean storage space for parts and units removed from transmission.

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

4. 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.

5. 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.

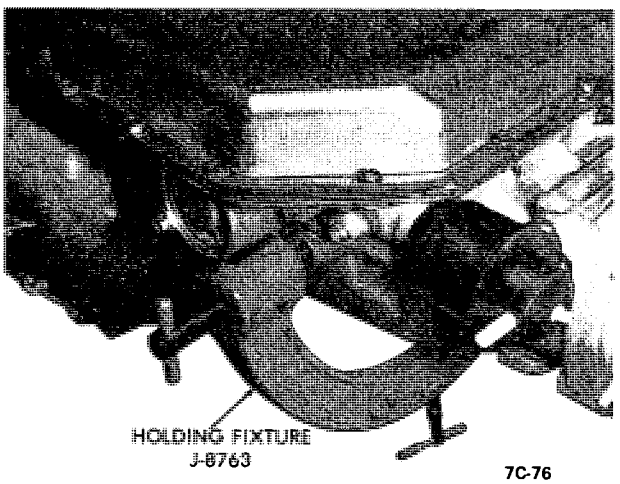


Figure 7C-32

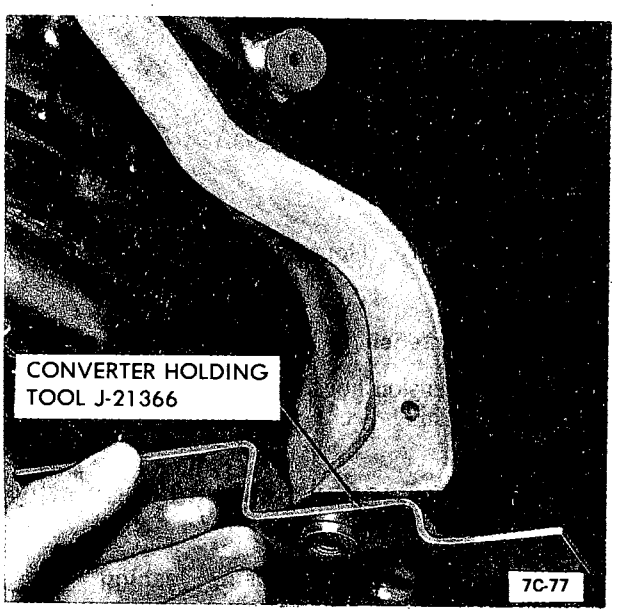


Figure 7C-33

REMOVAL OF CONVERTER HOLDING TOOL J-21366, CONVERTER, VACUUM MODULATOR

Removal of Converter

1. Assemble transmission in Fixture J-8763. Do not overtighten. See Figure 7C-32.

2. Remove converter Holding Tool J-21366. See Figure 7C-33.

3. With transmission in Holding Fixture J-8763, remove torque converter assembly. See Figure 7C-35.

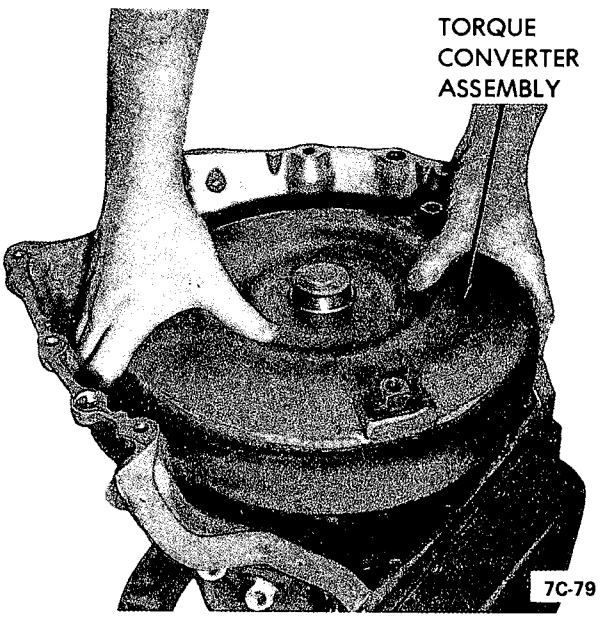


Figure 7C-35

Removal of Vacuum Modulator

1. Remove modulator assembly attaching bolt and retainer. See Figure 7C-36.

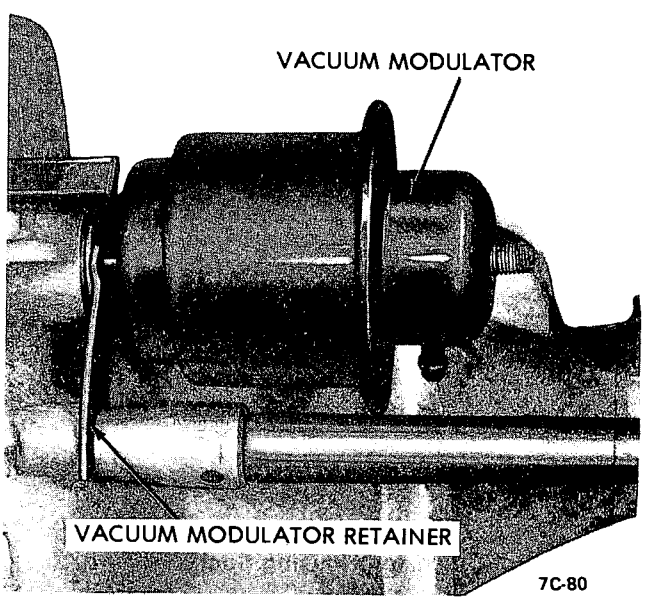


Figure 7C-36

2. Remove vacuum modulator assembly "O" ring seal and modulator valve from case. See Figure 7C-37.

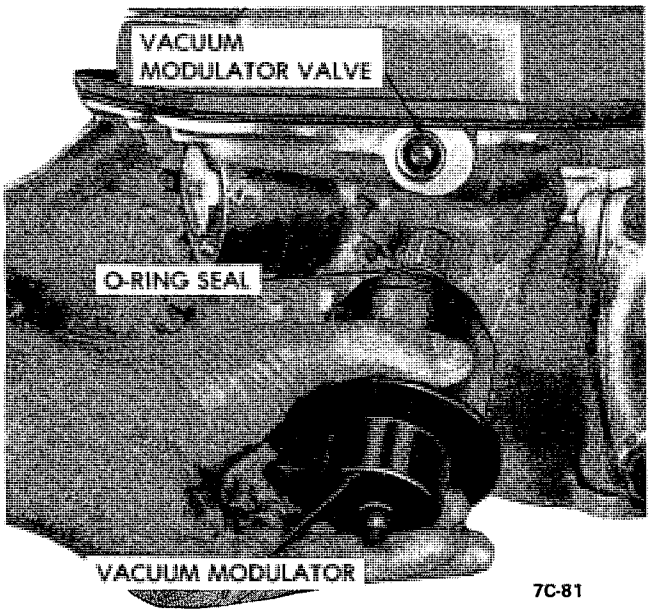


Figure 7C-37

REMOVAL OF EXTENSION HOUSING, LIP SEAL AND BUSHING

Removal of Extension Housing

1. Remove bolt retainer and speedometer driven gear from side of extension housing and remove four (4) extension housing to case attaching bolts. See Figure 7C-38.

(NOTE: Remove catalytic converter studs on A B Series.)

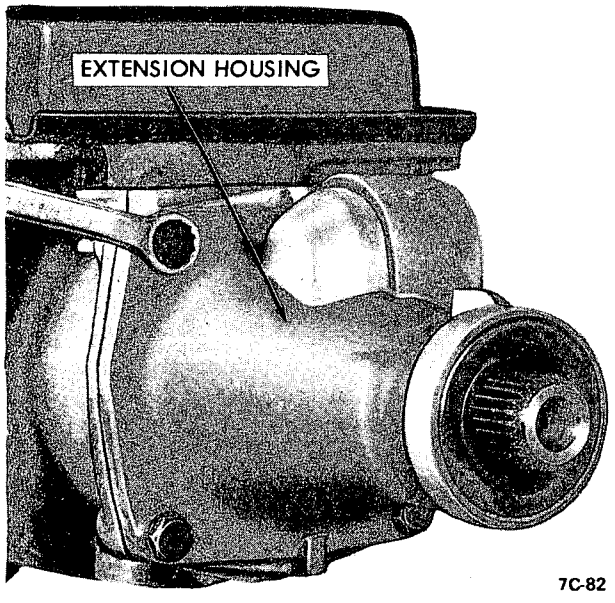


Figure 7C-38

Removal of Extension Housing Seal

1. Remove extension housing to case oil seal. See Figure 7C-39.

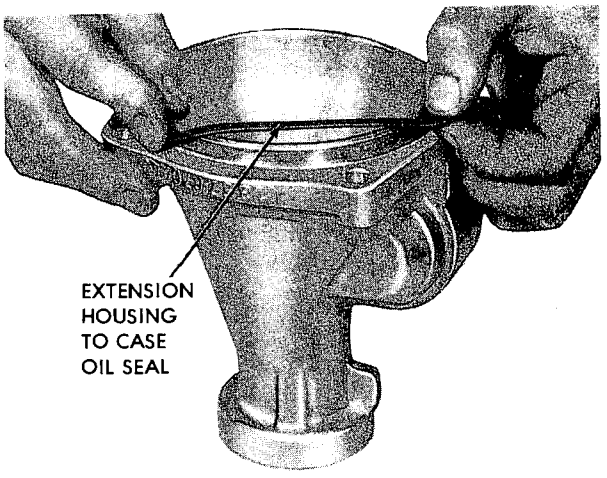


Figure 7C-39

Removal of Extension Housing Lip Seal

1. Remove extension housing lip seal using screwdriver. See Figure 7C-40.

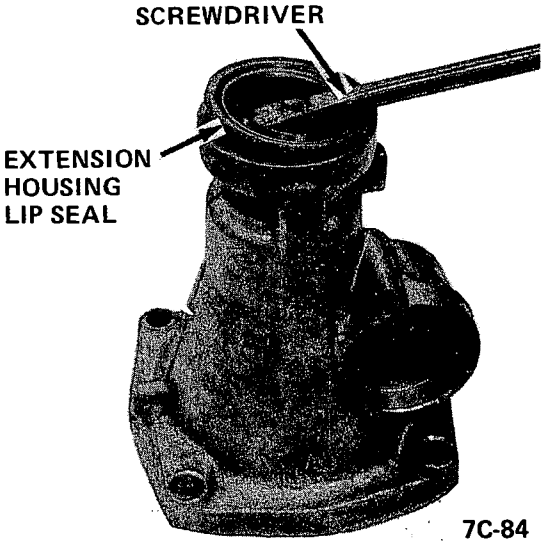


Figure 7C-40

Removal of Extension Housing Bushing

1. Remove extension housing bushing using screwdriver to collapse bushing. See Figure 7C-41.

INSTALL EXTENSION HOUSING BUSHING AND LIP SEAL

Installation of Extension Housing Bushing

1. Install extension housing bushing using Drive Handle J-8092 and Bushing Tool J-21424-1. See Figure 7C-42.

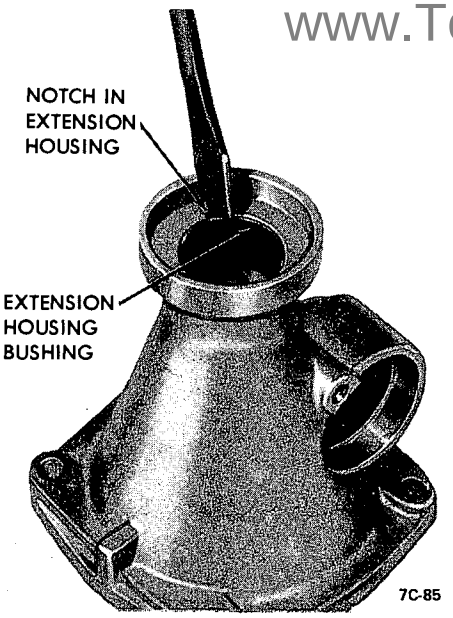


Figure 7C-41

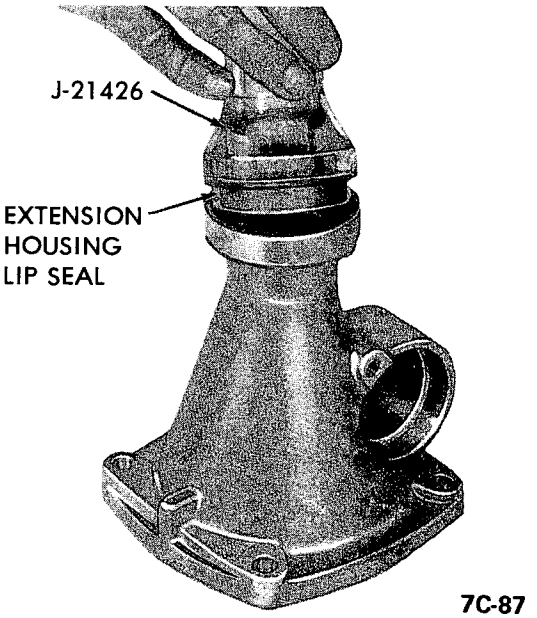


Figure 7C-43

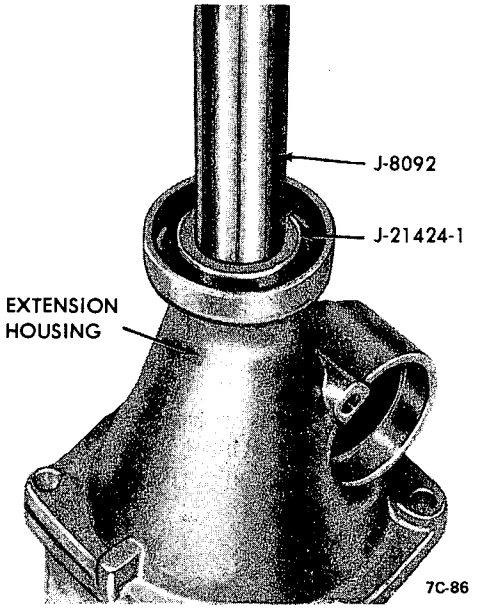


Figure 7C-42

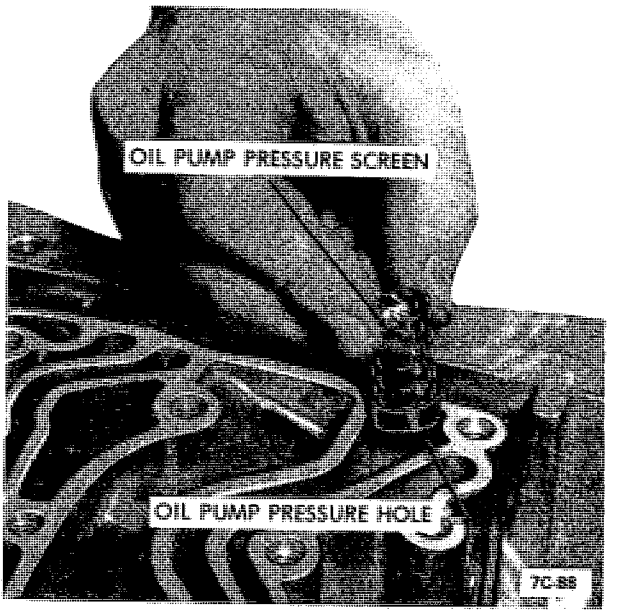


Figure 7C-44

Installation of Extension Housing Lip Seal

1. Install extension housing lip seal using Installer J-21426. See Figure 7C-43.

REMOVAL OF OIL PUMP SCREEN, GOVERNOR SCREENS, AND CHECK BALLS

Removal of Pressure Screen

1. Remove oil pump pressure screen from oil pump pressure hole in case, and clean. See Figure 7C-44.

2. Remove governor screens from case and clean. See Figure 7C-45.

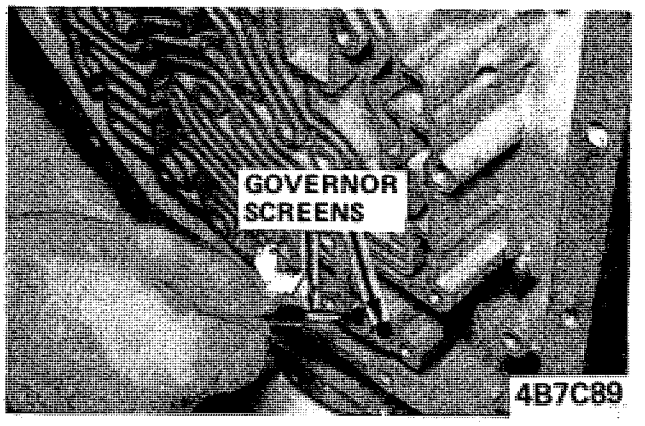


Figure 7C-45

Removal of Check Balls

1. Remove four check balls from case face.

REMOVAL OF MANUAL SHAFT, INNER, LEVER, PARKING PAWL, AND INTERMEDIATE SERVO PISTON

Removal of Range Selector Inner Lever

1. Remove manual control valve link retainer from range selector inner lever.

2. Remove manual shaft to case retainer with screwdriver. See Figure 7C-47.

3. Remove jam nut holding range selector inner lever to manual shaft.

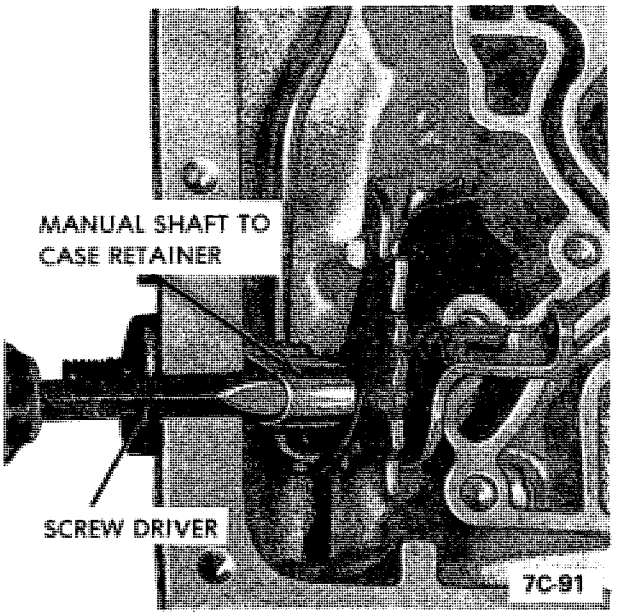


Figure 7C-47

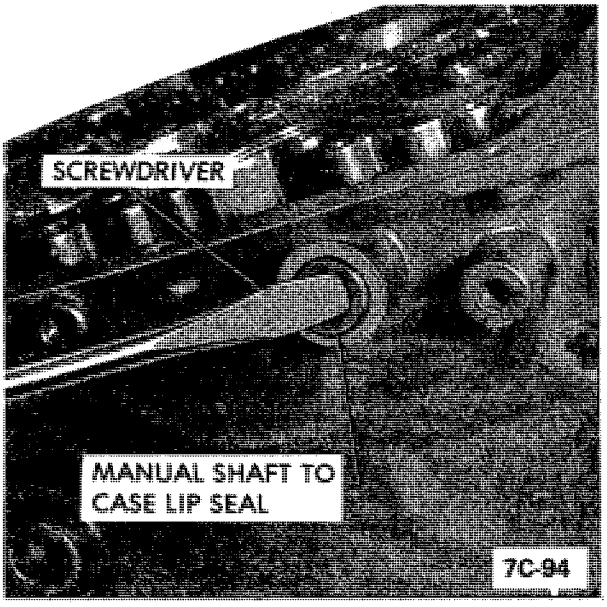


Figure 7C-48

4. Remove manual shaft from case. Remove range selector inner lever and parking pawl actuating rod.

5. Remove manual shaft to case lip seal, if necessary. See Figure 7C-48.

6. Remove parking lock bracket.

7. Remove parking pawl shaft retaining plug stake marks. Remove retaining plug, parking pawl shaft, parking pawl, and disengaging spring. See Figure 7C-49.

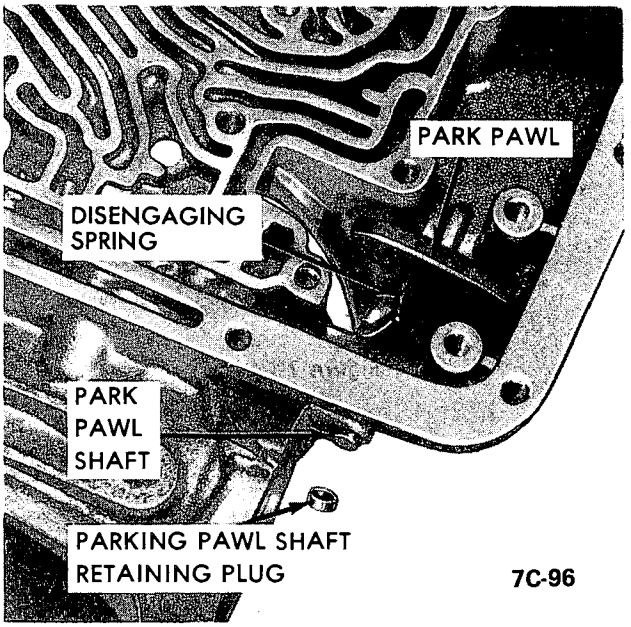


Figure 7C-49

B. Removal of Intermediate Servo Piston

1. Remove intermediate servo piston, washer, spring seat, and apply pin. See Figure 7C-50.

2. If the piston seal needs replacing, the piston assembly will have to be replaced. This is due to a plastic grooved piston that is not serviceable. (Piston and Seal are one assembly).

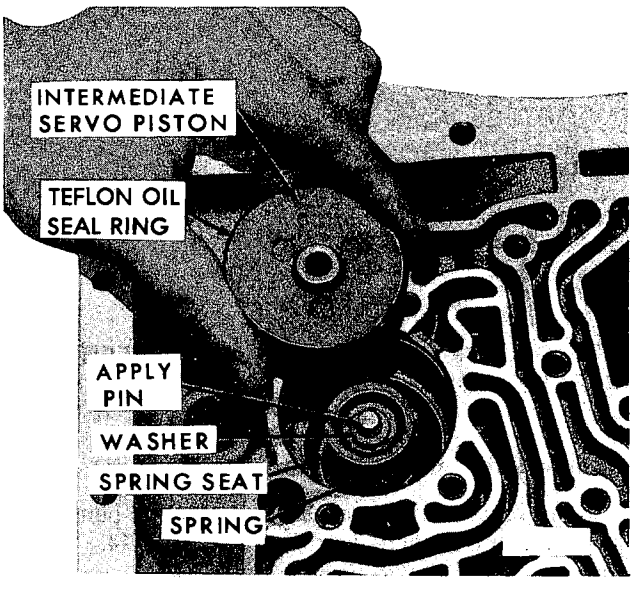


Figure 7C-50

REMOVAL OF PUMP ASSEMBLY, CUSHION SPRING, INTERMEDIATE CLUTCH PLATES, AND OVERRUN BRAKE BAND

Removal of Oil Pump Assembly

1. Remove eight (8) pump attaching bolts with washer type seals. Discard washer type seals.

2. Install two (2) threaded slide hammers J-7004 into threaded holes in pump body. Tighten jam nuts and remove pump assembly from case. See Figure 7C-53.

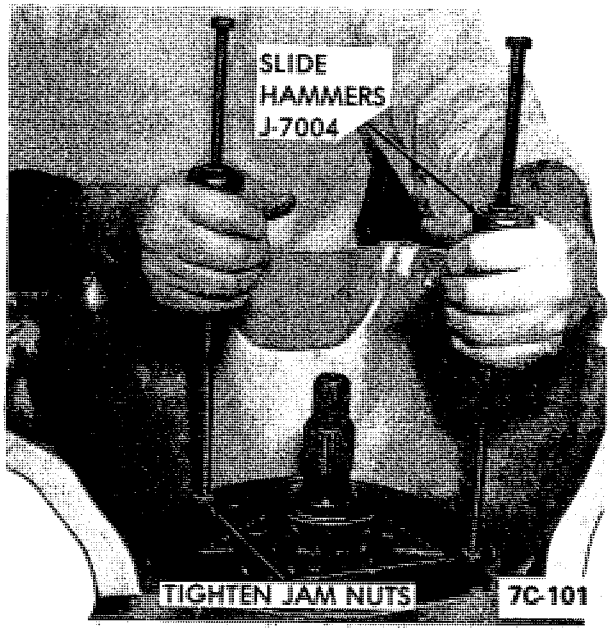


Figure 7C-53

3. Remove pump assembly to case gasket and discard.

Removal of Intermediate Clutch Cushion Spring, Intermediate Clutch Plates and Intermediate Overrun Brake Band

1. Remove intermediate clutch cushion spring.

2. Remove three (3) or (2) intermediate clutch faced plates and three (3) or (2) steel separator plates. See Figure 7C-54.

3. Inspect condition of the lined and steel plates. *Do not diagnose a lined drive plate by color.*

A. Dry lined plates with compressed air and inspect the lined surfaces for:

1. Pitting and flaking
2. Wear
3. Glazing
4. Cracking
5. Charring
6. Chips or metal particles imbedded in lining

If a lined drive plate exhibits any of the above conditions, replacement is required.

B. Wipe steel plates dry and check for heat discoloration. If the surface is smooth and an even color smear is indicated, the plates should be reused. If severe heat spot discoloration or surface scuffing is indicated, the plates must be replaced.

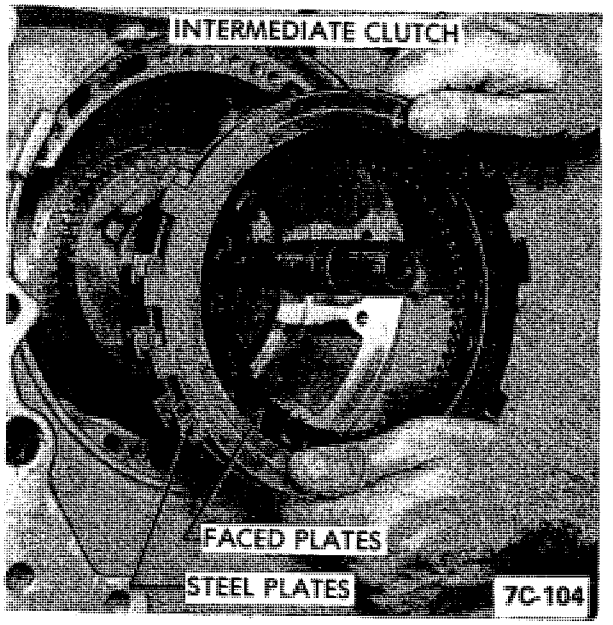


Figure 7C-54

4. Remove intermediate clutch pressure plate.

5. Remove intermediate overrun brake band. See Figure 7C-55.

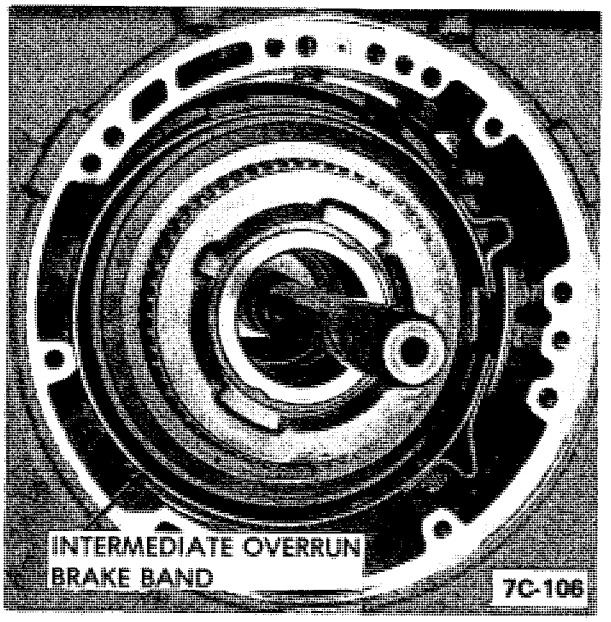


Figure 7C-55

REMOVAL OF DIRECT AND FORWARD CLUTCH ASSEMBLIES, INPUT RING GEAR, AND OUTPUT CARRIER

Removal of Direct and Forward Clutch Assemblies

1. Remove direct and forward clutch assemblies from case. See Figure 7C-56.

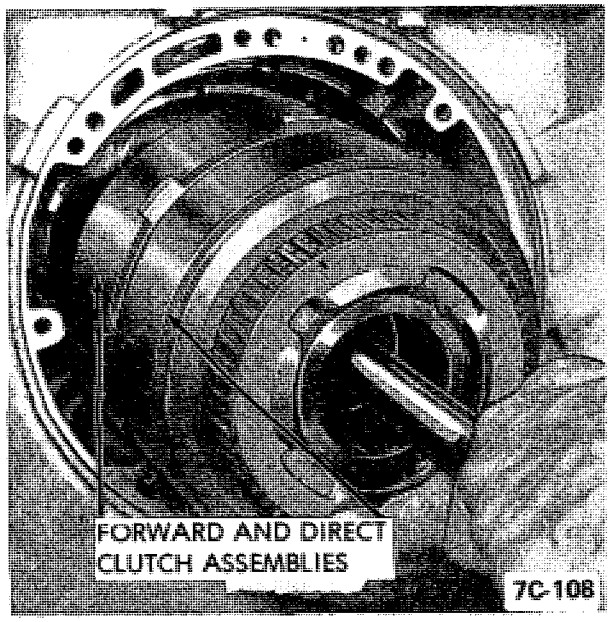


Figure 7C-56

Removal of Input Ring Gear

1. Remove forward clutch housing to input ring gear front thrust washer. Inspect for excessive wear or scoring.

2. Remove input ring gear. See Figure 7C-57.

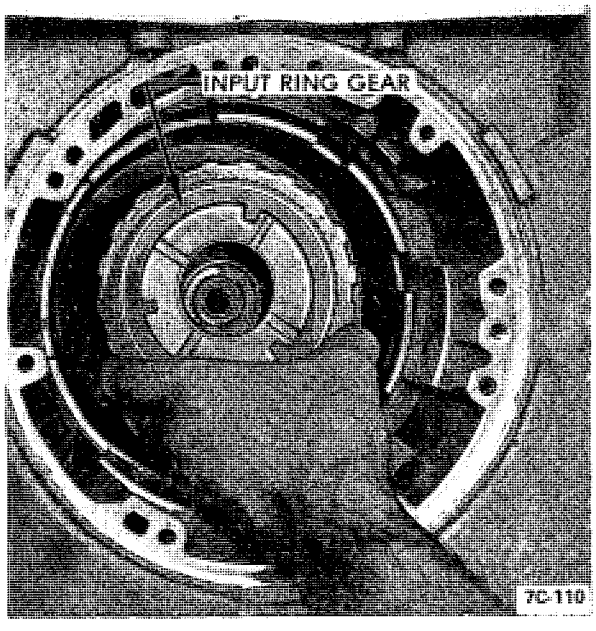


Figure 7C-57

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

a. Thread Tool J-23062-5 on Drive Handle J-8092, and remove bushing from ring gear. See Figure 7C-58.

b. Using Tool J-23062-5, press in new bushing .050" to .060" from inner surface of hub. See Figure 7C-58.

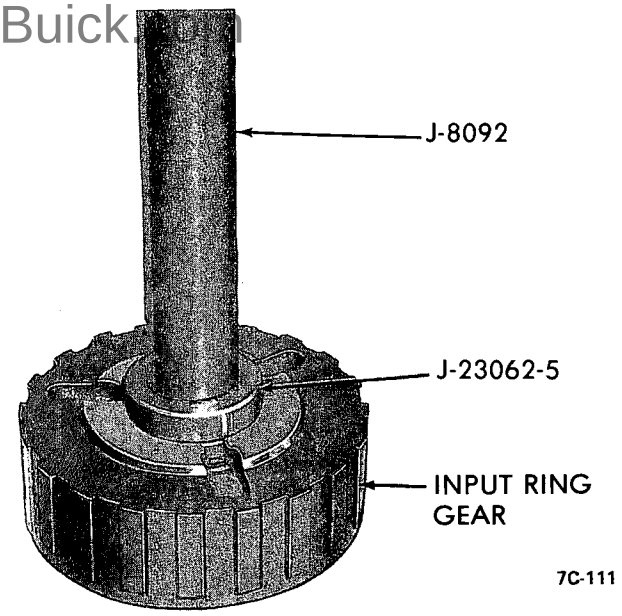


Figure 7C-58

Removal of Output Carrier Assembly

1. Remove input ring gear to output carrier needle thrust bearing.

2. Remove output carrier to output shaft snap ring and discard. See Figure 7C-59.

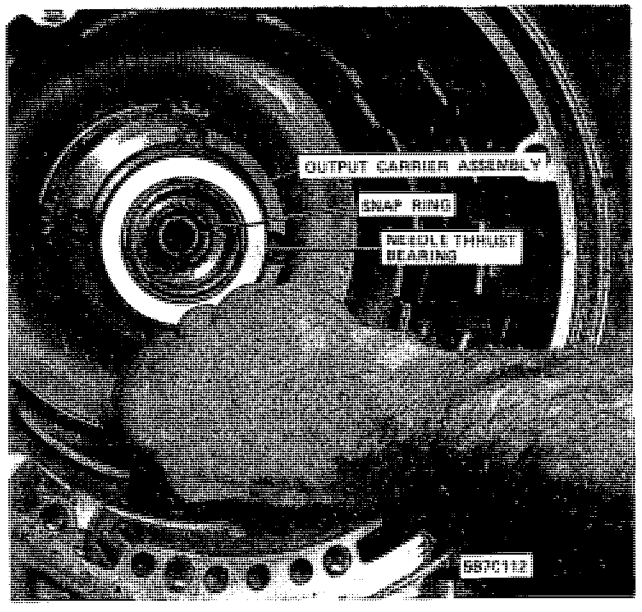


Figure 7C-59

3. Remove output carrier assembly.

REMOVAL OF SUN GEAR DRIVE SHELL, LOW AND REVERSE CLUTCH SUPPORT ASSEMBLY, LOW AND REVERSE CLUTCH PLATES, AND REACTION CARRIER

Removal of Sun Gear Drive Shell Assembly

1. Remove sun gear drive shell assembly. See Figure 7C-60.

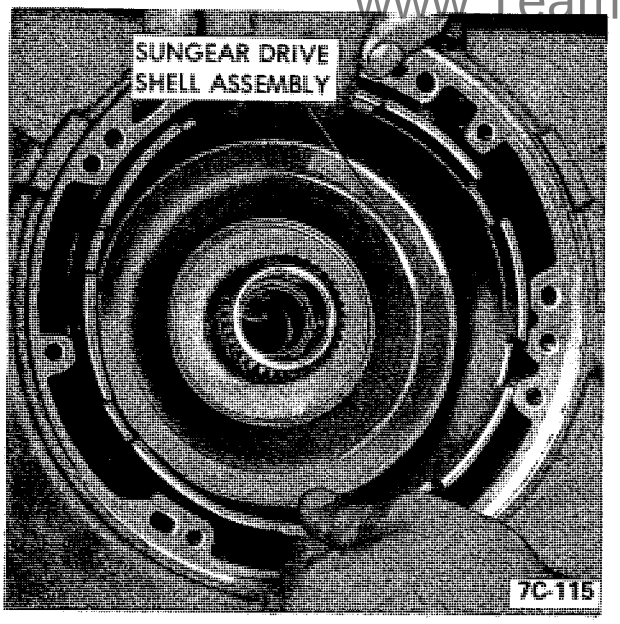


Figure 7C-60

Removal of Low and Reverse Clutch Support Assembly

1. Remove low and reverse roller clutch support to case retaining ring. See Figure 7C-61.

2. Grasp output shaft and pull up until low and reverse roller clutch and support assembly clear low and reverse clutch support retainer spring and remove support assembly.

3. Remove low and reverse clutch support retainer spring. See Figure 7C-61.

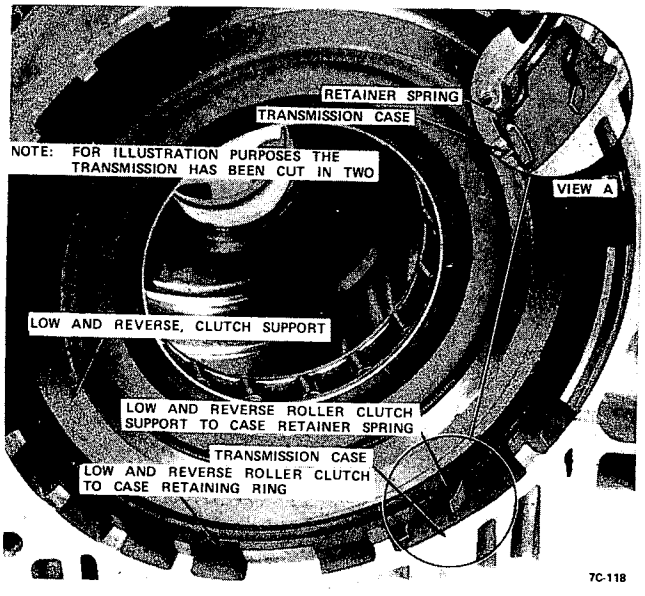


Figure 7C-61

Removal of Low and Reverse Clutch Plates

1. Remove five (5) or (4) low and reverse clutch faced plates and five (5) or (4) steel separator plates. See Figure 7C-62.

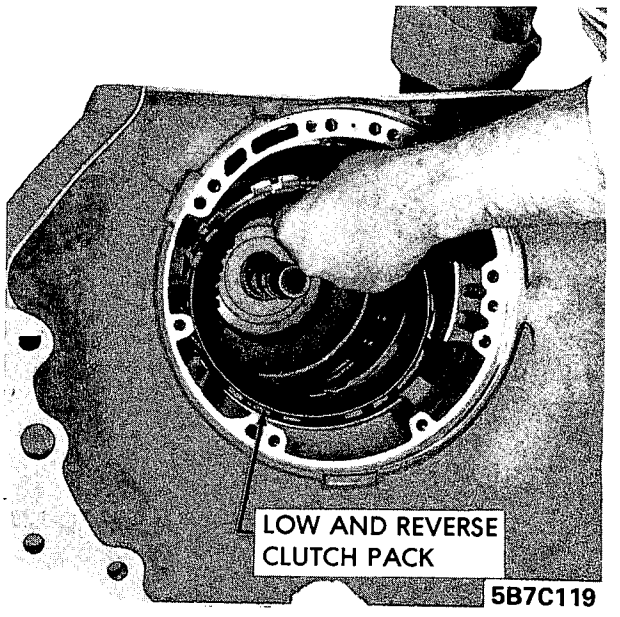


Figure 7C-62

Removal of Reaction Carrier Assembly

1. Remove reaction carrier assembly from output ring gear and shaft assembly. See Figure 7C-63.

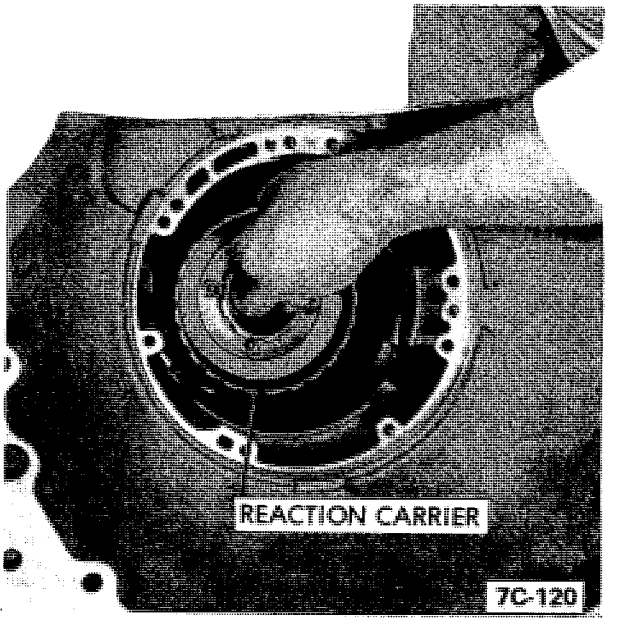


Figure 7C-63

2. Inspect reaction carrier bushing for wear or galling. If replacement is necessary proceed as follows:

a. Thread tool J-23062-3 on Drive Handle J-8092 and remove bushing. See Figure 7C-64.

b. Using Tool J-23062-3 press in new bushing flush to .010" from inner surface of hub. See Figure 7C-64.

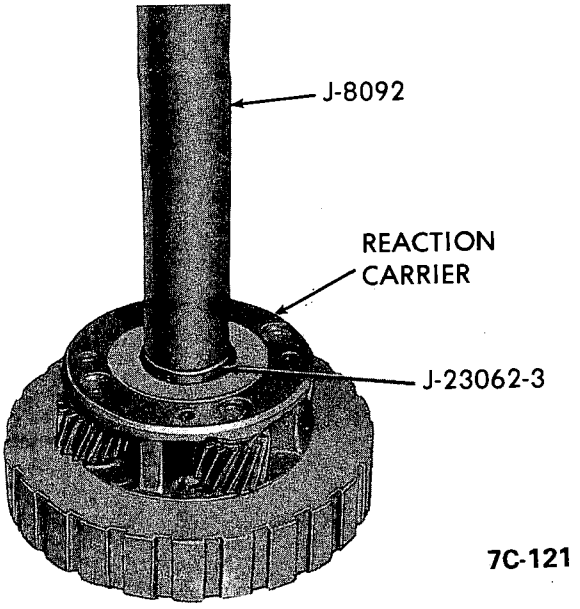


Figure 7C-64

REMOVAL OF OUTPUT RING GEAR AND SHAFT ASSEMBLY, AND OUTPUT RING GEAR TO CASE NEEDLE BEARING ASSEMBLY

Removal of Output Ring Gear and Shaft Assembly

1. Remove output ring gear and shaft assembly from case. See Figure 7C-65.

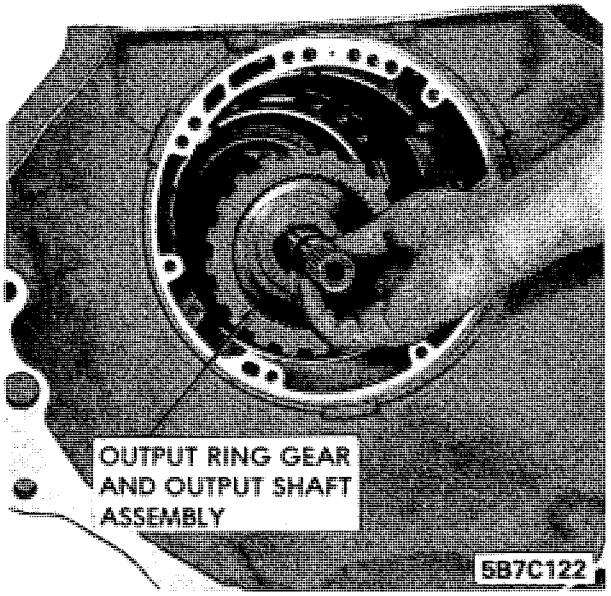


Figure 7C-65

2. Remove reaction carrier to output ring gear needle thrust bearing.

3. Remove output ring gear to output shaft snap ring and discard. Remove output ring gear from output shaft. See Figure 7C-66.

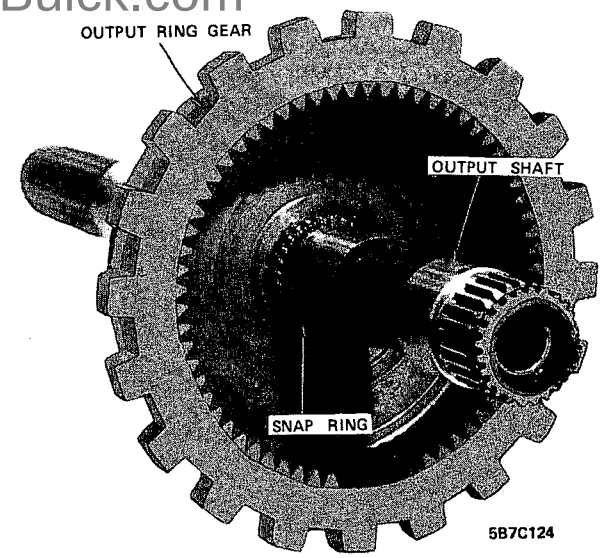


Figure 7C-66

4. Remove output ring gear to case needle bearing. See Figure 7C-67.

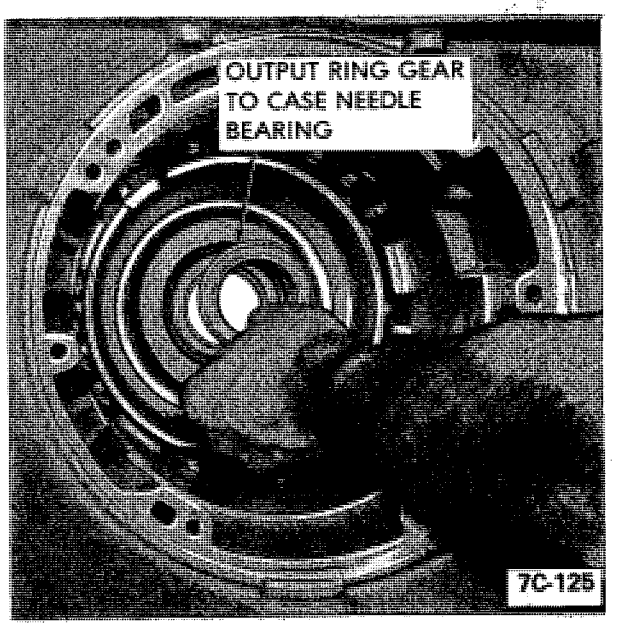


Figure 7C-67

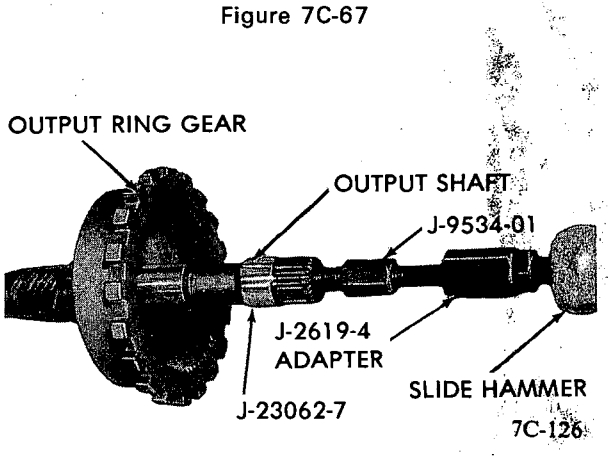


Figure 7C-69

5. Inspect output shaft bushing for wear or galling. If replacement is necessary proceed as follows:

a. Assemble J-9534-01 into Adapter J-2619-4 and assemble to Slide Hammer J-2619. Thread assembly into bushing. Clamp slide hammer into vise, grasp output shaft and remove bushing. See Figure 7C-69.

b. Using Tool J-23062-7, assembled into Drive Handle J-8092, press in new bushing .140" below end surface of shaft. See Figure 7C-70.

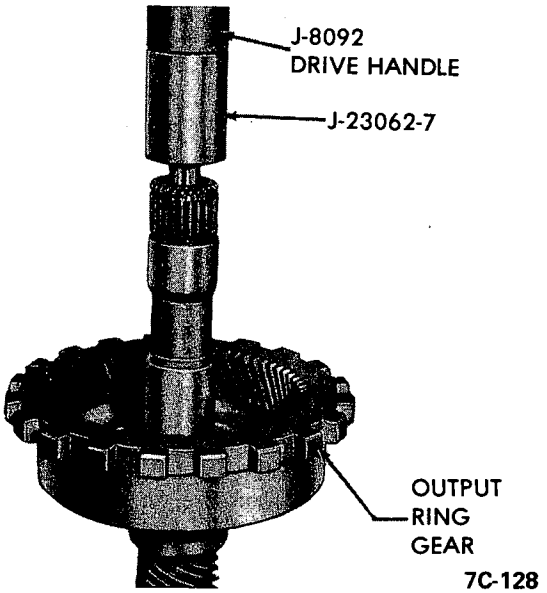


Figure 7C-70

REMOVAL OF LOW AND REVERSE CLUTCH PISTON, AND CASE BUSHING

Removal of Low and Reverse Clutch Piston

1. Using Tool J-21420-1 compress low and reverse clutch piston spring retainer and remove piston retaining ring, and spring retainer with springs. See Figure 7C-71.

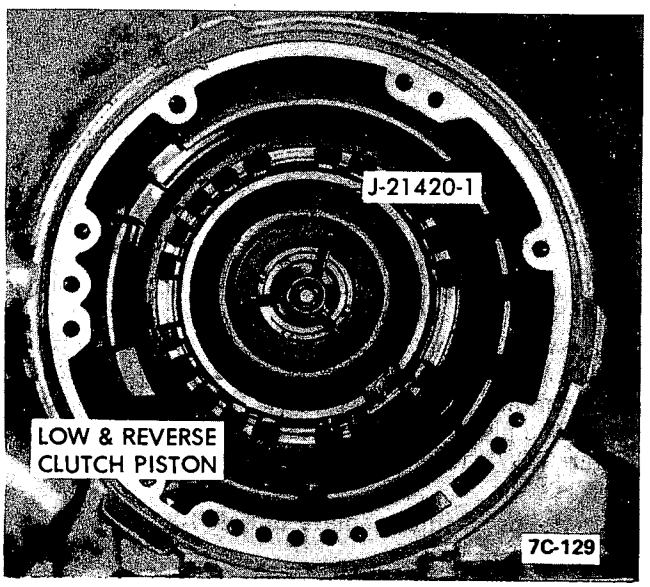


Figure 7C-71

2. Remove low and reverse clutch piston assembly. Aid removal with the use of compressed air in passage shown. See Figure 7C-73.

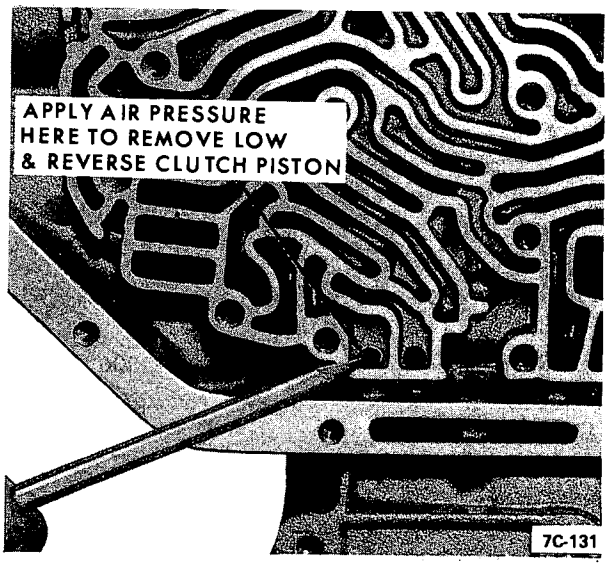


Figure 7C-73

Removal of Low and Reverse Clutch Piston Seals

1. Remove low and reverse clutch piston outer seal.

2. Remove low and reverse clutch piston center and inner seal. See Figure 7C-74.

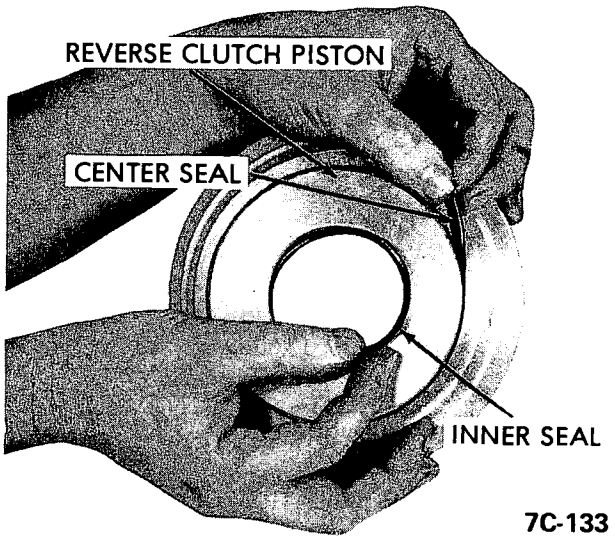


Figure 7C-74

Removal and Installation of Case Bushing

1. Inspect case bushing for nicks, scoring or excessive wear. If damaged, remove as follows: Assemble Tool J-23062-1 on Drive Handle J-8092 and remove bushing. See Figure 7C-75.

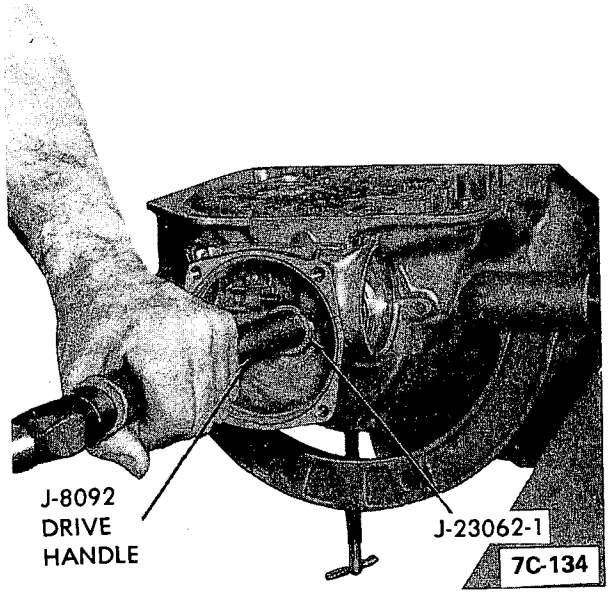


Figure 7C-75

2. Using Tool J-23062-1 and Drive Handle J-8092, press bushing to .195" below chamfered edge of case. Make certain split on bushing is opposite notch in case. See Figure 7C-76.

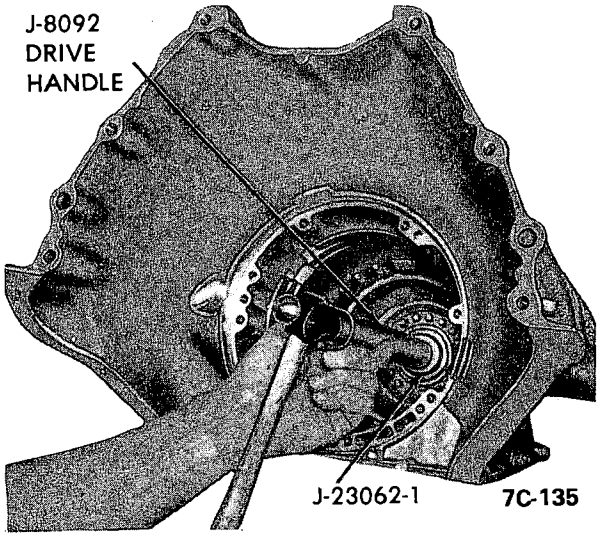


Figure 7C-76

REMOVAL AND INSTALLATION OF INTERMEDIATE CLUTCH 1-2 ACCUMULATOR Removal and installation of intermediate clutch 1-2 accumulator can be done without removal of transmission from car.

Removal of Intermediate Clutch 1-2 Accumulator Piston

1. Install Tool J-23069 to compress intermediate clutch 1-2 accumulator cover and remove retaining ring. See Figure 7C-77.

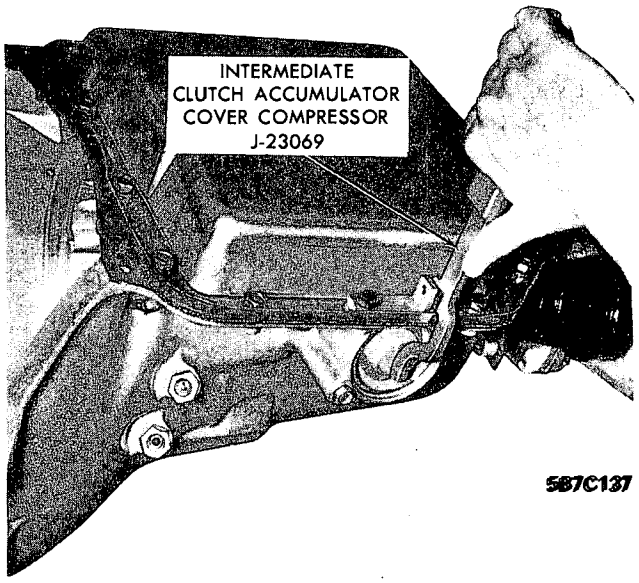


Figure 7C-77

2. Remove intermediate clutch 1-2 accumulator piston cover and "O" ring seal from case. See Figure 7C-78.

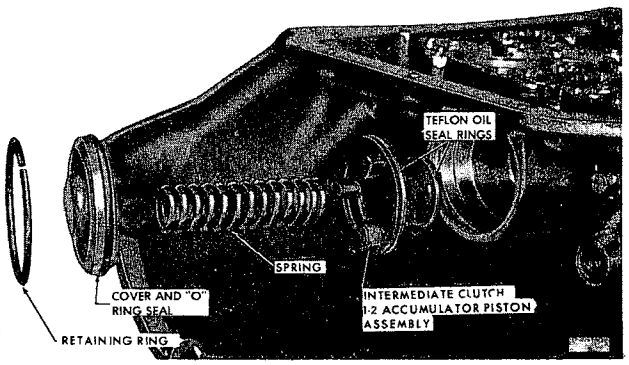


Figure 7C-78 Intermediate Clutch 1-2 Accumulator

3. Remove intermediate clutch 1-2 accumulator piston spring. See Figure 7C-78.

4. Remove intermediate clutch 1-2 accumulator piston assembly. *Inspect the inner and outer teflon oil seal rings for wearing or scoring. DO NOT REMOVE THESE TWO RINGS UNLESS THEY ARE DAMAGED.* If replacement of one or the other of the two rings is necessary. The piston assembly will have to be replaced. See Figure 7C-78. (Piston and Seal are one assembly).

Installation of Intermediate Clutch 1-2 Accumulator Piston

1. Install intermediate clutch 1-2 accumulator piston assembly. See Figure 7C-78.

2. Install intermediate clutch 1-2 accumulator piston spring. See Figure 7C-78.

3. Place "O" ring seal on intermediate clutch 1-2 accumulator piston cover, and install cover into case. See Figure 7C-78.

4. Install J-23069 tool and compress intermediate clutch 1-2 accumulator cover and install retaining ring. See Figure 7C-77.

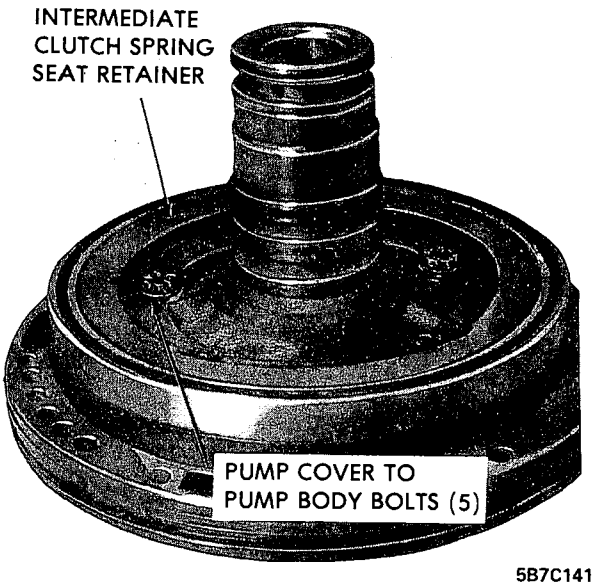


Figure 7C-79

DISASSEMBLY AND REASSEMBLY OF OIL PUMP ASSEMBLY

Disassembly of Oil Pump Assembly

1. Place assembly through hole in bench. Remove five (5) pump cover to body attaching bolts. See Figure 7C-79.

2. Remove intermediate clutch return spring seat retainer with springs and the intermediate clutch piston assembly. See Figure 7C-80.

3. Remove intermediate clutch piston inner and outer seals. See Figure 7C-81.

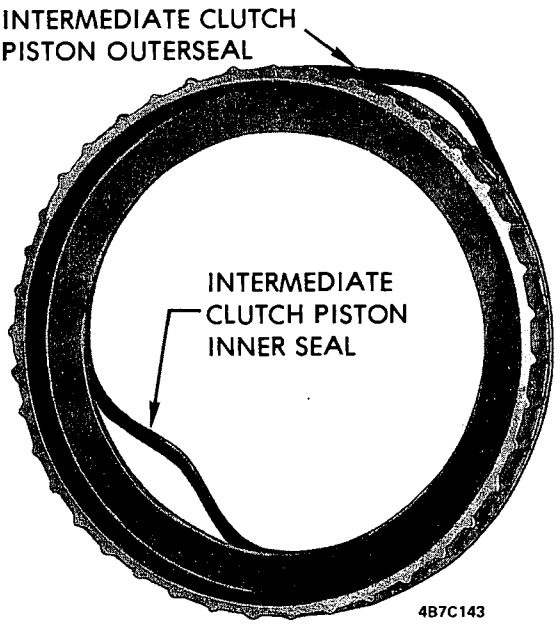


Figure 7C-81

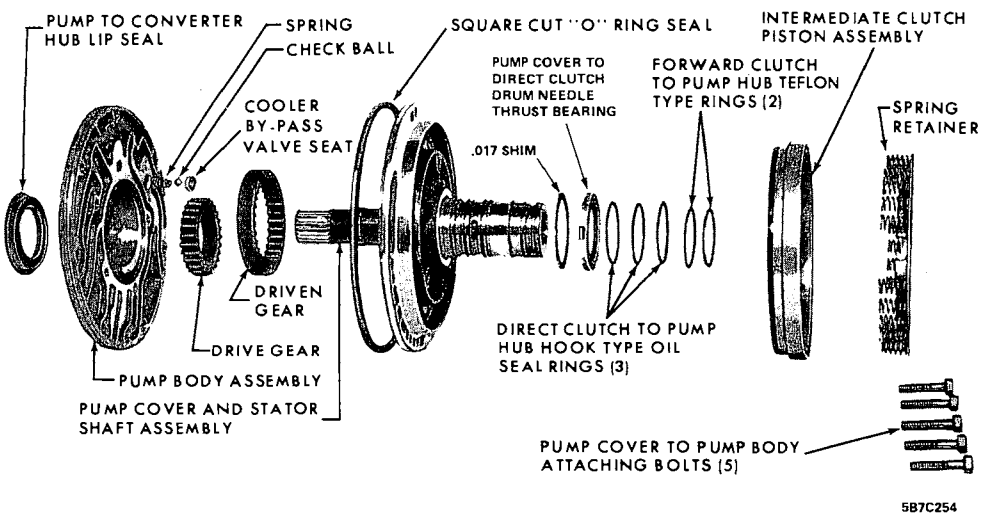


Figure 7C-80 Oil Pump Assembly

4. Remove three (3) direct clutch to pump hub hook type oil rings. Remove pump cover to direct clutch drum needle thrust bearing. Inspect the two (2) forward clutch to pump hub teflon oil seal rings, but do not remove them unless they are damaged. If replacement is necessary, use two metal hook type service replacement rings. See Figure 7C-80.

5. Remove pump cover and stator shaft assembly from pump body. See Figure 7C-82.

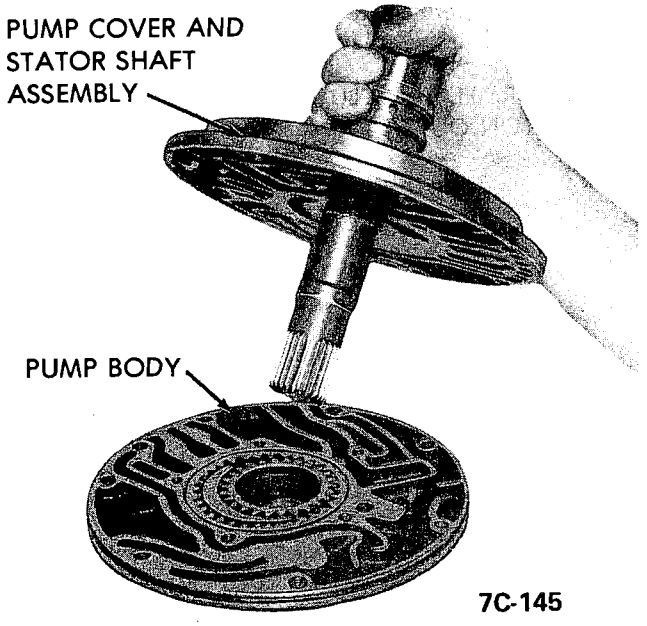


Figure 7C-82

6. Remove pump drive gear and driven gear from pump body. Inspect pump gears and cover for wear or scoring. See Figure 7C-83.

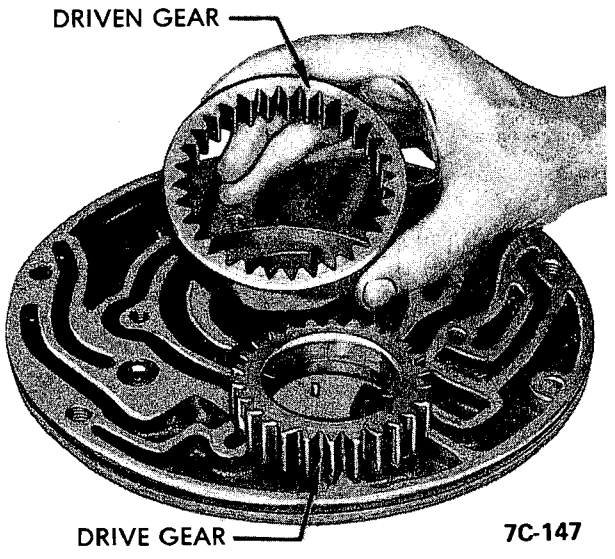


Figure 7C-83

7. Fill cooler by-pass passage with grease and insert Tool J-23134 and force by-pass valve seat, check ball, and spring from pump body. See Figure 7C-84.

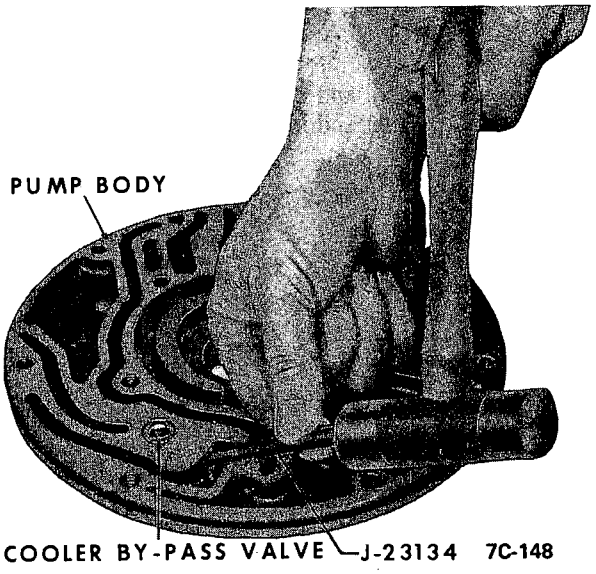


Figure 7C-84

8. Remove pump outside diameter to case square cut "O" ring seal and discard. See Figure 7C-86.

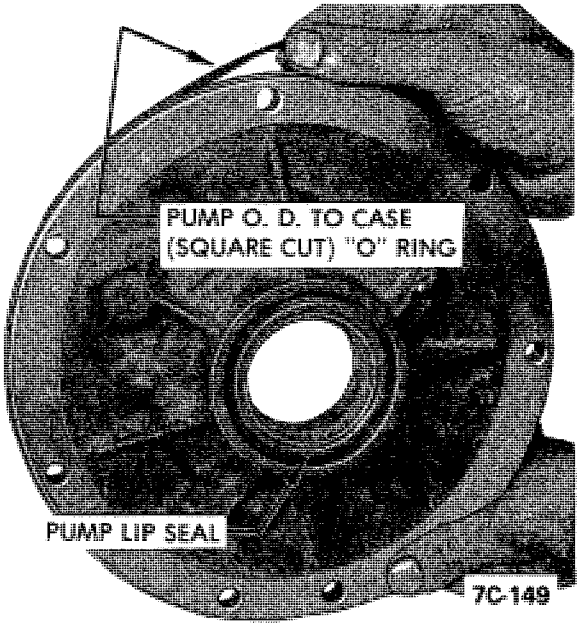


Figure 7C-86

9. Remove pump body to converter hub lip seal, if necessary and discard. See Figure 7C-87.

10. Place pump on wood blocks so surface finish is not damaged and install pump to converter hub lip seal using Seal Driver J-21359. See Figure 7C-88. Make certain lip seal is not turn or nicked.

11. Check oil pump bushing for nicks severe scoring or wear. If bushing replacement is necessary remove as follows: support pump on wood blocks. Use Tool J-21465-17 and Drive Handle J-8092 press bushing out of pump body.

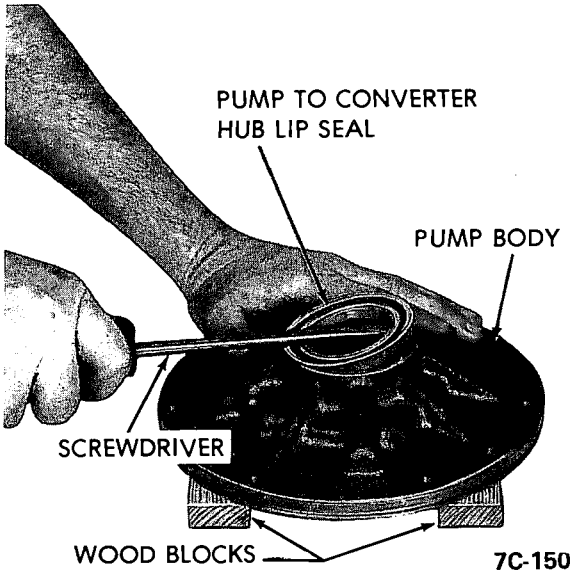


Figure 7C-87

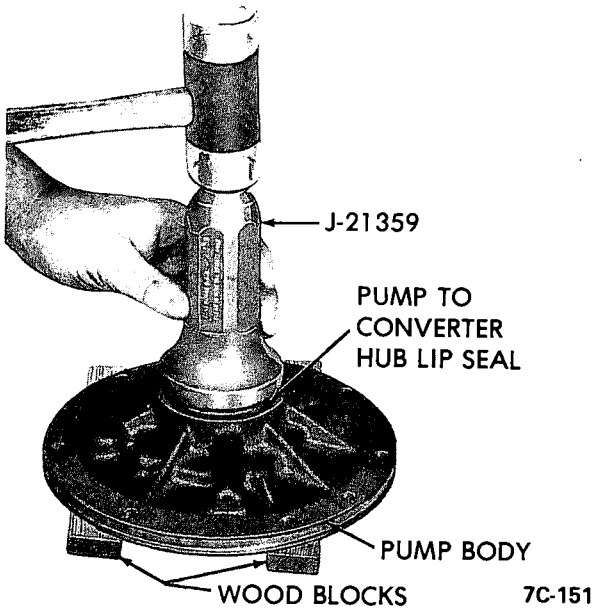


Figure 7C-88

To install new oil pump bushing use Tool J-21465-17 and Drive Handle J-8092 and press bushing into pump body from gear pocket face until it is flush to .010" below opposite face. (Front Pump Seal Side). See Figure 7C-89.

12. Check front stator shaft bushing for nicks, severe scoring or wear. If bushing replacement is necessary remove as follows: Assemble bushing remover J-21465-15 to adapter J-2619-4. Assemble this assembly to Slide Hammer J-2619. Clamp Slide Hammer into vise. Grasp stator shaft and remove bushing. See Figure 7C- 90.

13. Install front 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-8092 tap bushing into shaft to 1/4 inch below top of stator shaft. See Figure 7C-91. Extreme care must be taken so bushing is not driven past shoulder.

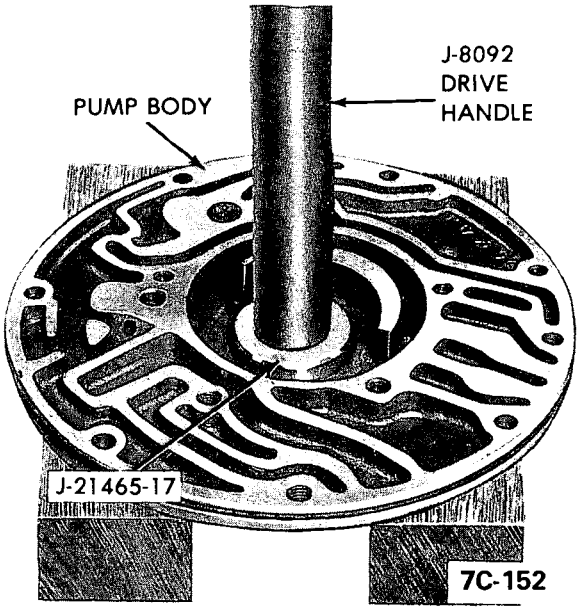


Figure 7C-89

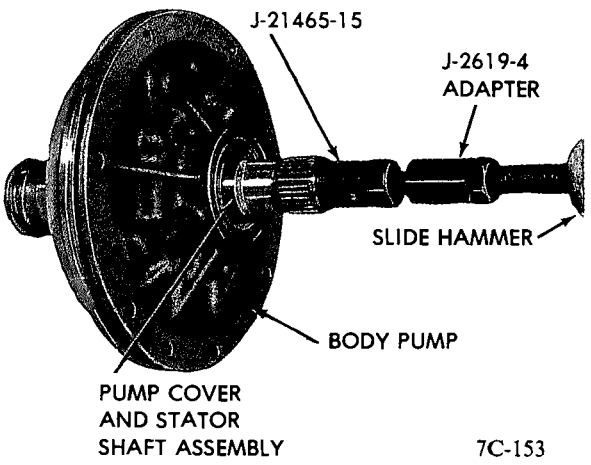


Figure 7C-90

14. If replacement of lower rear stator shaft bushing is required, proceed as follows: Thread Tool J-21465-15 into stator shaft lower rear bushing. Thread Slide Hammer J-2619 into remover. Clamp slide hammer into vise. Grasp stator shaft and remove bushing. See Figure 7C-92. If upper rear stator shaft bushing is required, repeat above procedure.

Using Tool J-23062-2 press upper rear stator shaft bushing 1-1/32 inch below top surface of oil pump delivery sleeve. See Figure 7C-93.

Using Tool J-23062-2 press lower rear stator shaft bushing flush to .010" below chamfer on oil pump delivery sleeve.

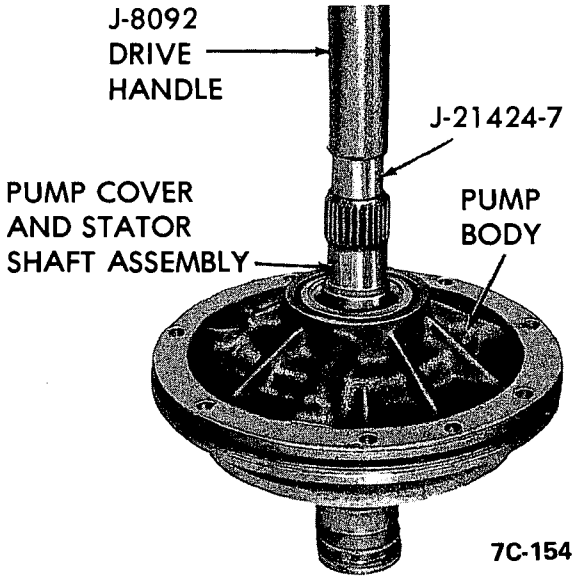


Figure 7C-91

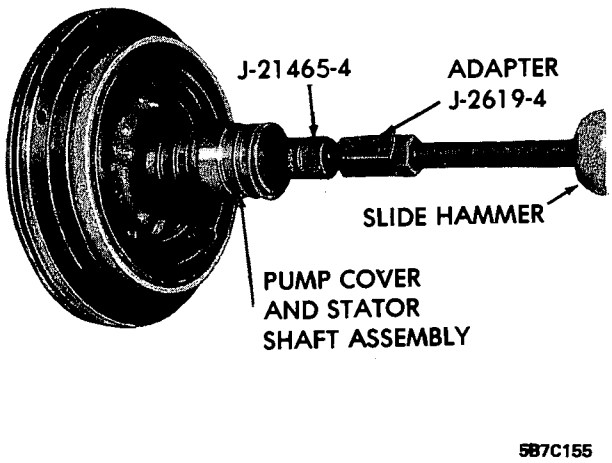


Figure 7C-92

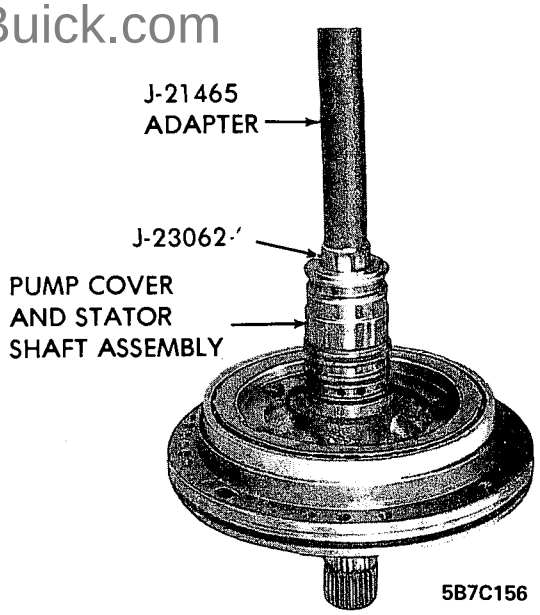


Figure 7C-93

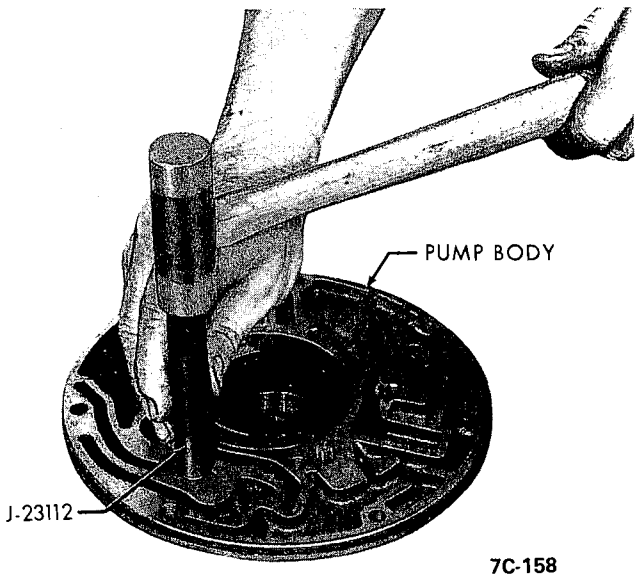


Figure 7C-94

Reassembly of Oil Pump Assembly

1. Install pump drive gear and driven gear.

Drive gear has off-set tangs, assemble with tang face up to prevent damage to converter. See Figure 7C-83.

2. Install cooler by-pass spring, check ball and seat. Using Tool J-23112, press seat into bore until top of seat is flush with face of pump body. See Figure 7C- 94.

3. Assemble pump cover to pump body. See Figure 7C-82.

4. Install intermediate clutch piston inner seal and outer seal. See Figure 7C-81.

5. Install intermediate clutch piston assembly into pump cover with the aid of a piece of .020" music wire crimped into copper tubing.

6. Install spring retainer and install five (5) attaching bolts, finger tight. See Figures 7C-80 and 7C-79.

7. Place pump aligning strap, J-21368 over pump body and cover and tighten.

8. Tighten attaching bolts. Torque to 18 lb.ft.

9. Install pump outside diameter to case (square cut) "O" ring seal. See Figure 7C-86. Use new square cut "O" ring seal.

10. Install three (3) direct clutch to pump hub hook type oil seal rings. Inspect two (2) forward clutch to pump hub teflon oil seal rings, for service if rings require replacement use hook type cast iron rings. See Figure 7C-80.

11. Check three (3) pump cover hub lube holes. Make certain they are not restricted. See Figure 7C-95.

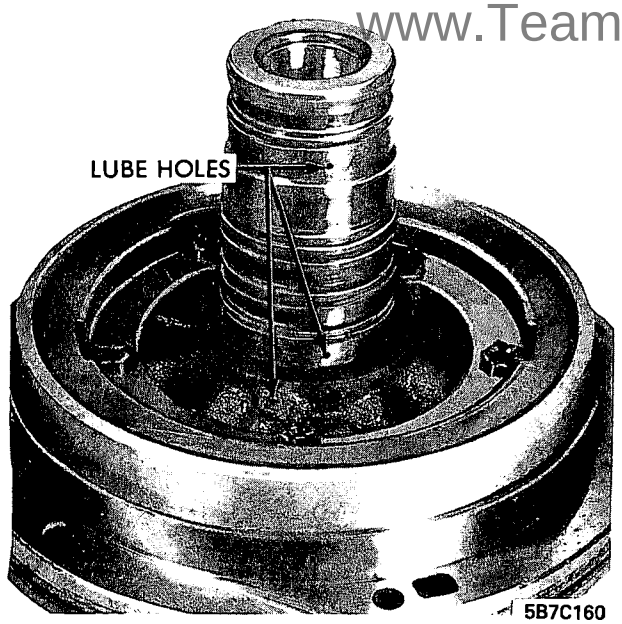


Figure 7C-95

DISASSEMBLY AND REASSEMBLY OF DIRECT CLUTCH

(NOTE: Refer to specifications in rear of this section to determine the required amount of lined and steel clutch plates to use with specific transmission model and engine combination. When replacing piston assembly specific part number must be used.)

Disassembly of Direct Clutch

1. Remove intermediate overrun clutch front retainer ring and retainer. See Figure 7C-96.

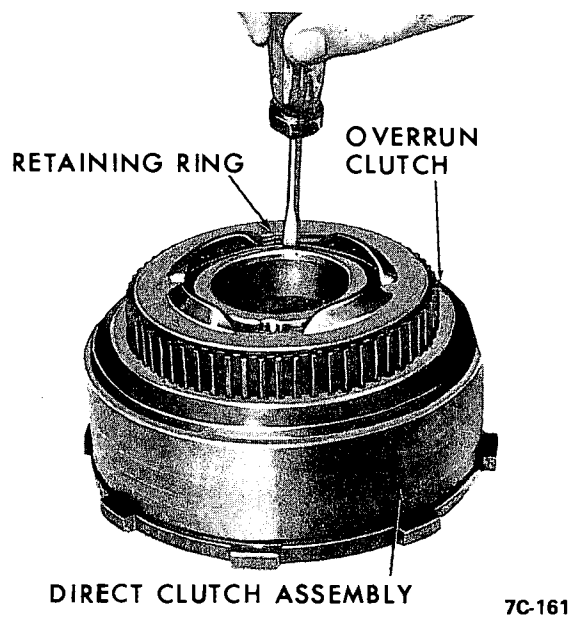


Figure 7C-96

2. Remove intermediate clutch overrun outer race. See Figure 7C-97.

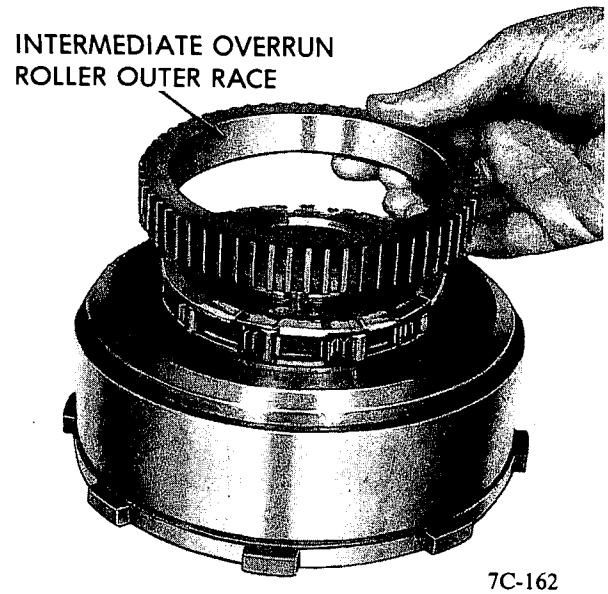


Figure 7C-97

3. Remove intermediate overrun roller clutch assembly. See Figure 7C-98.

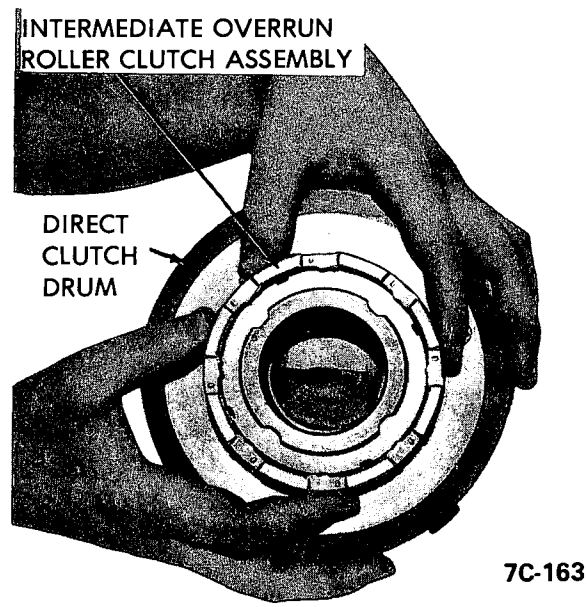


Figure 7C-98

4. Remove direct clutch drum to forward clutch housing needle roller bearing. See Figure 7C-99.

5. Remove direct clutch pressure plate to clutch drum retaining ring and pressure plate. See Figure 7C- 100.

6. Remove lined and steel plates from direct clutch housing. See Figure 7C-101.

7. Inspect condition of lined and steel plates. *Do not diagnose a lined drive plate by color.*

A. Dry lined plates with compressed air and inspect the lined surfaces for:

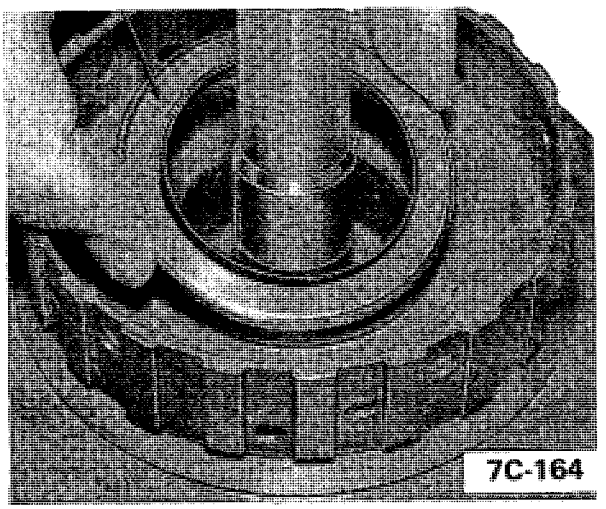


Figure 7C-99

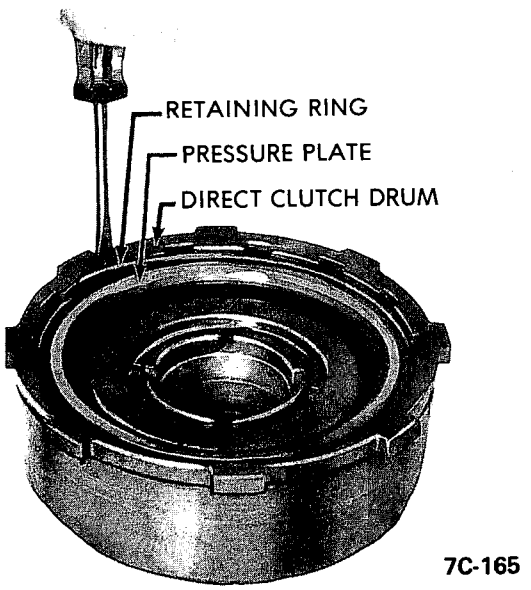


Figure 7C-100

1. Pitting and flaking
2. Wear
3. Glazing
4. Cracking
5. Charring
6. Chips or metal particles imbedded in lining

If a lined drive plate exhibits any of the above conditions, replacement is required.

B. Wipe steel plates dry and check for heat discoloration. If the surface is smooth and an even color smear is indicated, the plates should be reused. If severe heat spot discoloration or surface scuffing is indicated, the plates must be replaced.

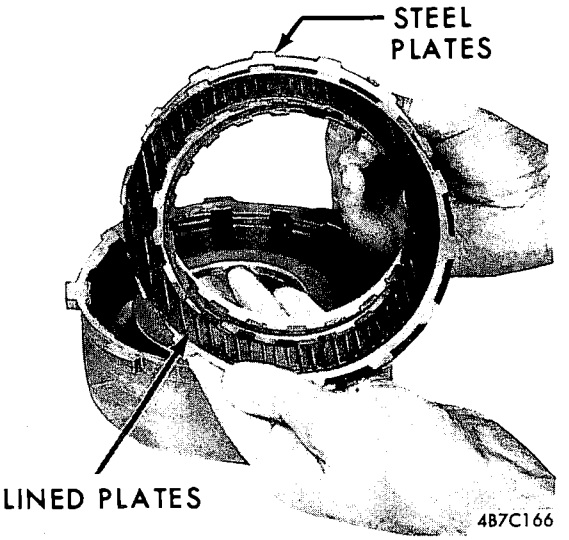


Figure 7C-101

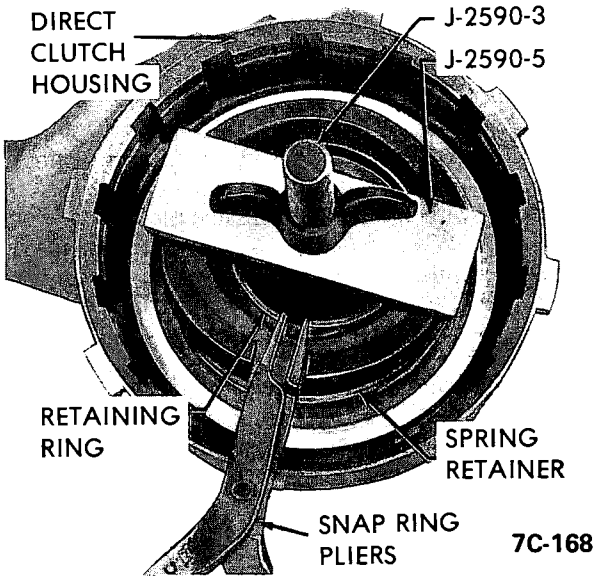


Figure 7C-103

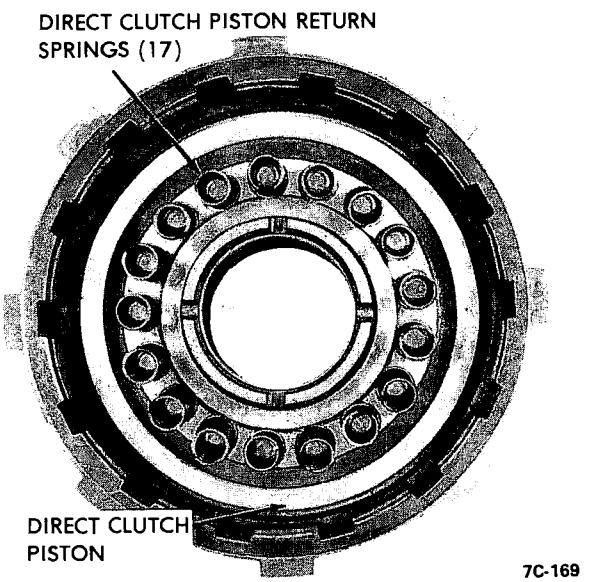


Figure 7C-104

8. Remove direct clutch piston return spring seat retaining ring and spring seat by using Tools J- 2590-3, J-2590-5, and snap ring pliers. See Figure 7C- 103.

9. Remove spring retainer, springs and piston. See Figure 7C-104.

10. Inspect the return springs. Evidence of extreme heat or burning in the area of the clutch may have caused the springs to take a heat set and would justify replacement of the springs.

11. Remove direct clutch piston inner and outer seals. See Figure 7C-105.

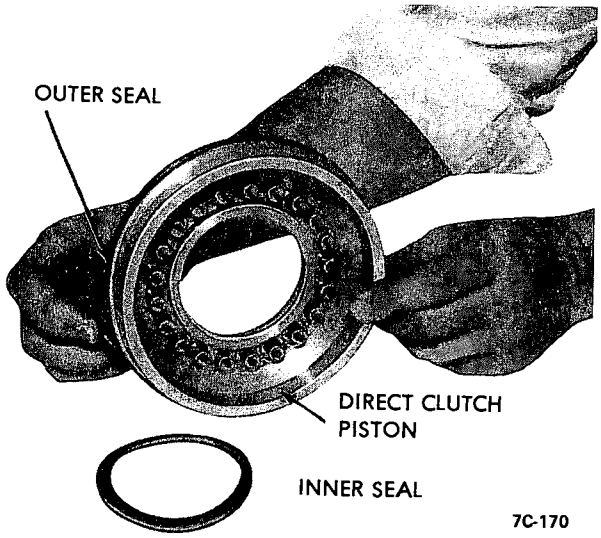


Figure 7C-105

12. Remove direct clutch piston center seal. See Figure 7C-106.

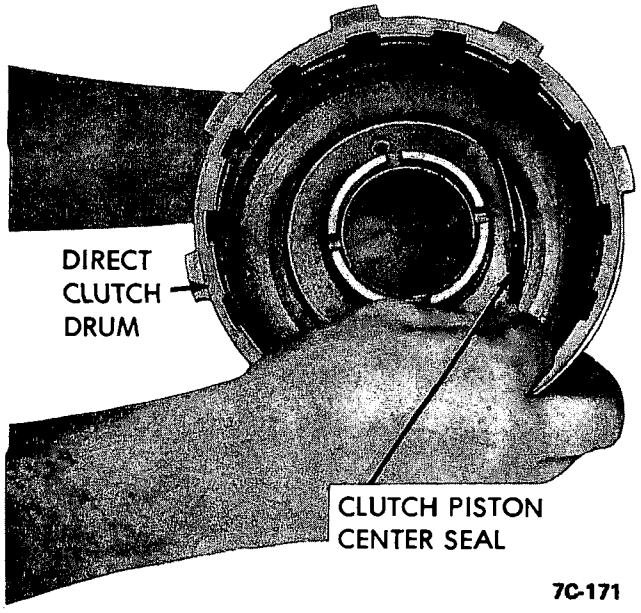


Figure 7C-106

13. If bushing replacement is necessary, use a Cape Chisel and remove bushing using care not to score inner surface of direct clutch drum. See Figure 7C- 107.

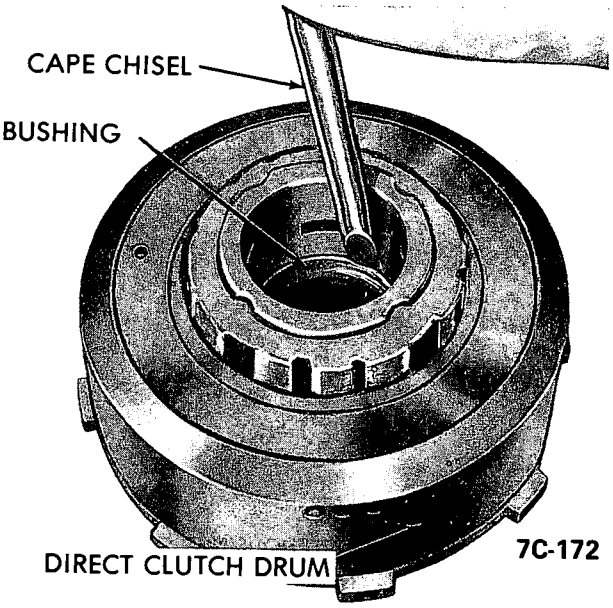


Figure 7C-107

14. Install direct clutch bushing using Tool J- 23062-4, Drive Handle J-8092, and install .010" below slot in retainer hub. See Figure 7C-108.

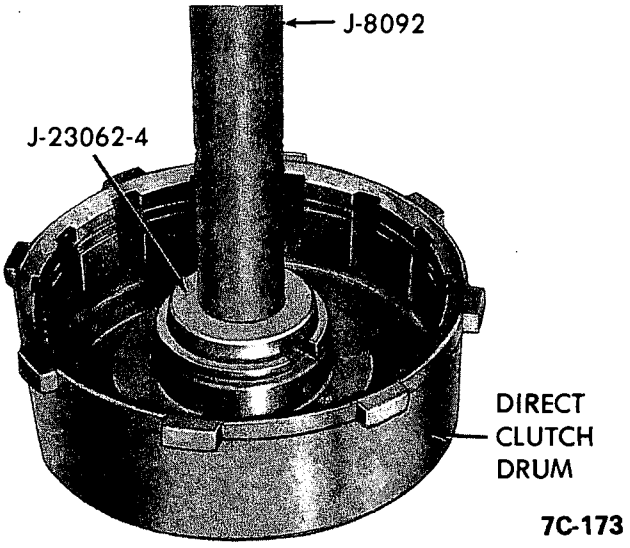


Figure 7C-108

Reassembly of Direct Clutch

1. Install direct clutch piston outer seal and inner seal. See Figure 7C-105.

2. Install direct clutch piston center seal. See Figure 7C-106.

3. Install the direct clutch piston into housing with the aid

of a piece of .020" music wire crimped into copper tubing. See Figure 7C-109.

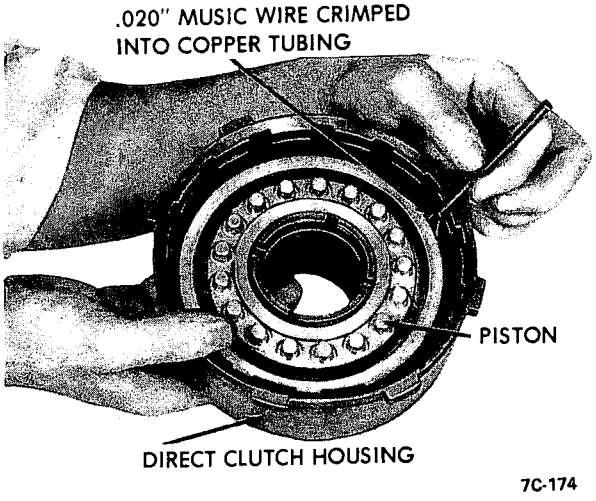


Figure 7C-109

4. Install spring retainer and springs. Compress spring retainer and install retaining ring, using Tools J-2590-3 and J- 2590-5. See Figure 7C-103.

5. Lubricate with transmission fluid and install faced plates and steel separator plates starting with a steel plate and alternating steel and faced. See Figure 7C-110.

6. Install direct clutch pressure plate and retaining ring. See Figure 7C-100.

7. Install intermediate overrun roller clutch assembly. See Figure 7C-112.

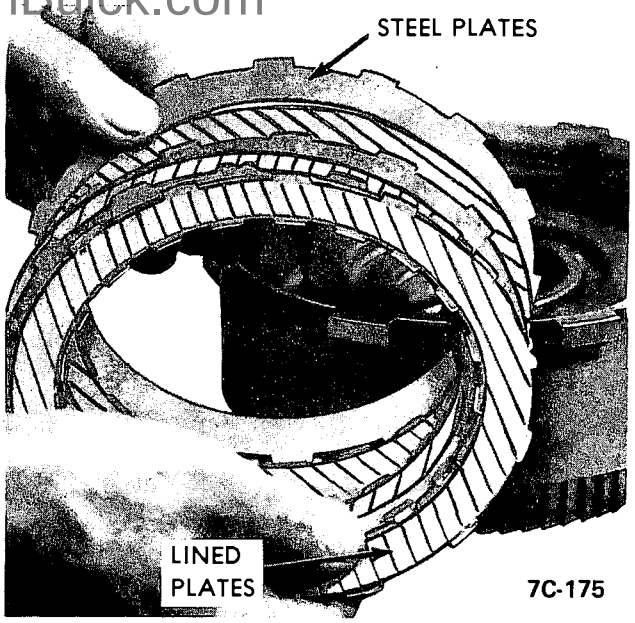


Figure 7C-110

Roller clutch assembly must be assembled with four (4) holes up (toward front of transmission).

8. Install intermediate clutch overrun outer race. See Figure 7C-112.

When the intermediate overrun clutch outer race is installed, it should free wheel in the counterclockwise direction only.

9. Install intermediate overrun clutch retainer, and retaining ring. See Figure 7C-112.

DISASSEMBLY AND REASSEMBLY OF FORWARD CLUTCH ASSEMBLY

(NOTE: Refer to specifications in rear of this section to determine the required amount of lined and steel clutch

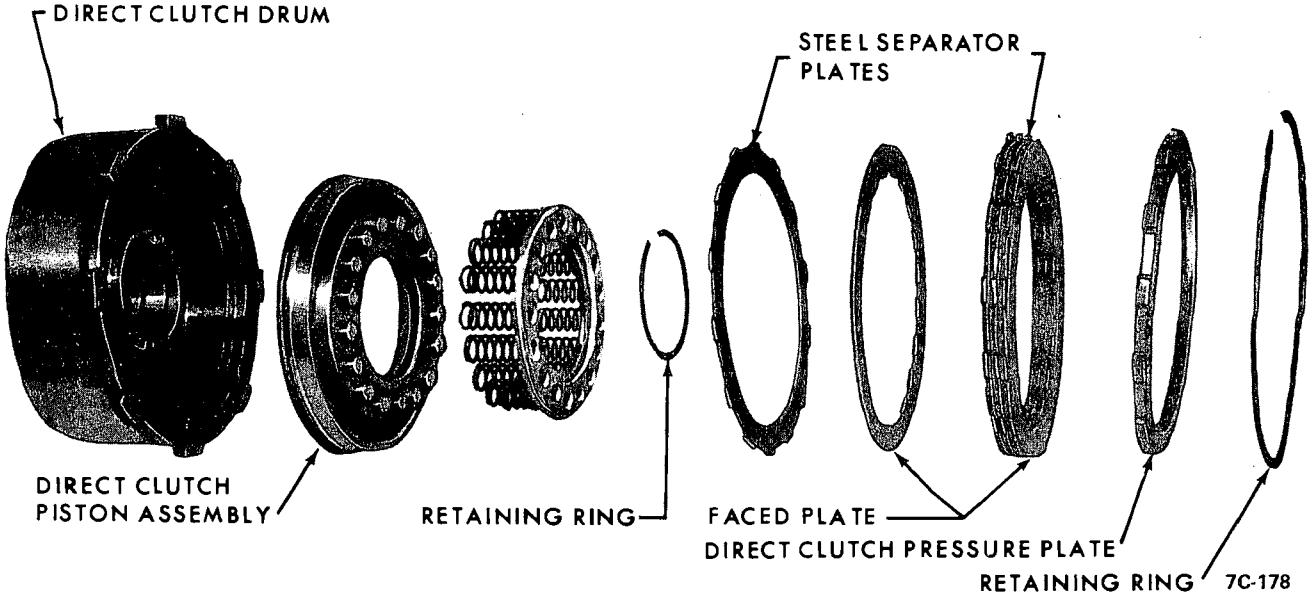


Figure 7C-111 - Direct Clutch Assembly - Exploded View

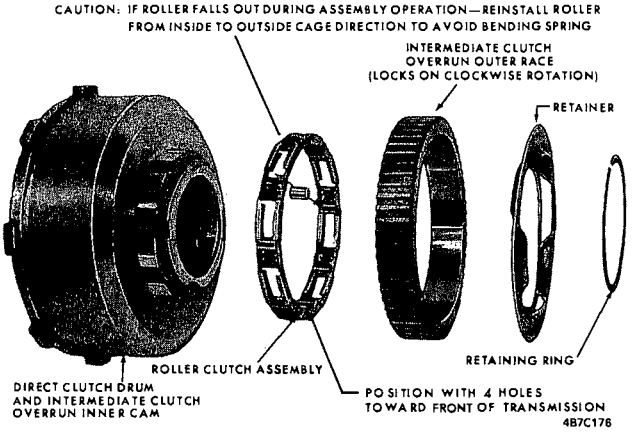


Figure 7C-112 - Intermediate Overrun Roller Clutch Assembly

plates to use with specific transmission model and engine combination. When replacing piston assembly specific part number must be used.)

Disassembly of Forward Clutch

1. Remove forward clutch drum to pressure plate retaining ring.

Remove forward clutch pressure plate. See Figure 7C-113.

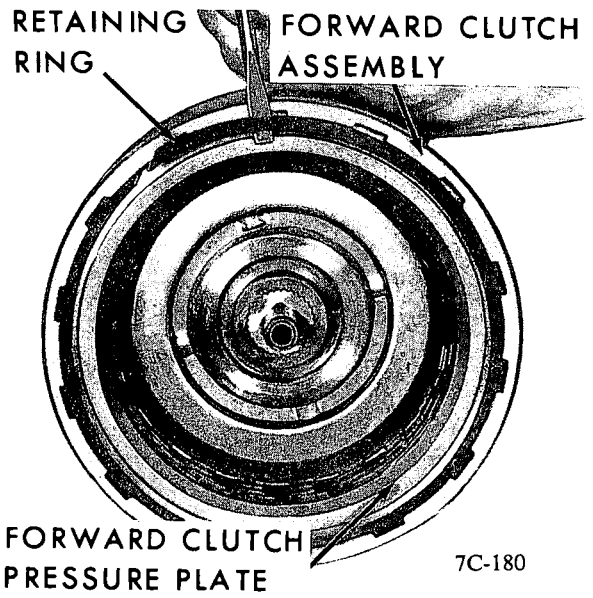


Figure 7C-113

2. Remove forward clutch housing faced plates, steel plates, and cushion spring. See Figure 7C-114.

3. Inspect condition of lined and steel plates. *Do not diagnose a lined drive plate by color.*

A. Dry lined plates with compressed air and inspect the lined surfaces for:

1. Pitting and flaking
2. Wear
3. Glazing
4. Cracking
5. Charring
6. Chips or metal particles imbedded in lining

If a lined drive plate exhibits any of the above conditions, replacement is required.

B. Wipe steel plates dry and check for heat discoloration.

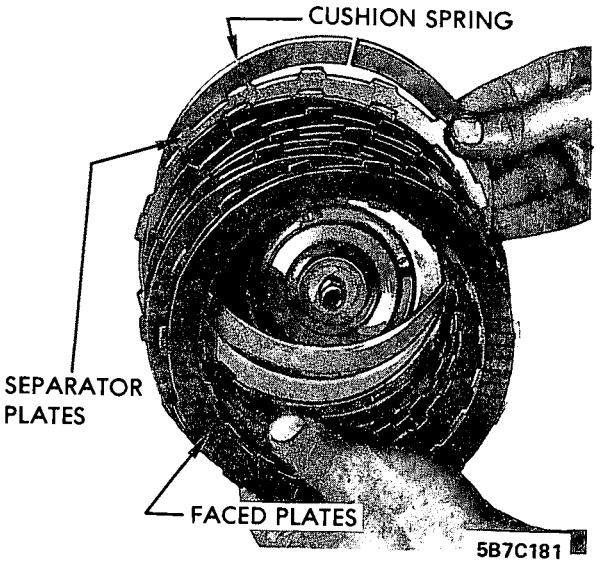


Figure 7C-114

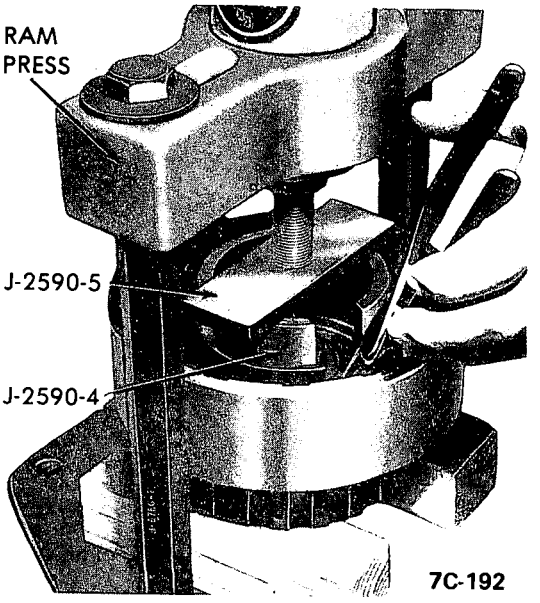


Figure 7C-115

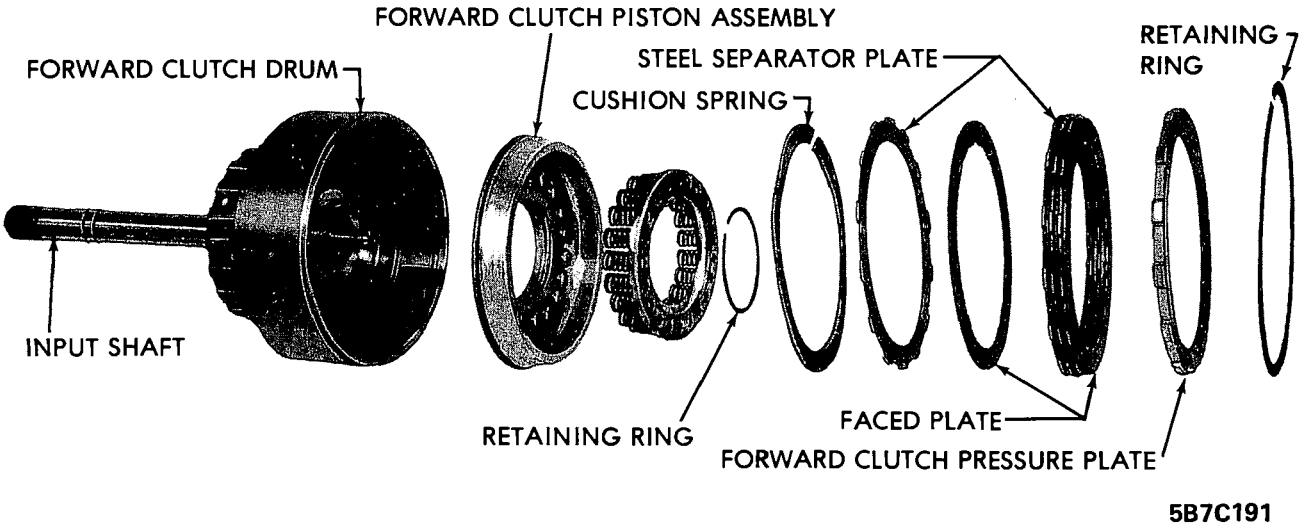


Figure 7C-116 Forward Clutch Assembly Exploded View

If the surface is smooth and an even color smear is indicated, the plates should be reused. If severe heat spot discoloration or surface scuffing is indicated, the plates must be replaced.

4. Remove spring retainer and springs by compressing with a ram press. See Figure 7C-115.

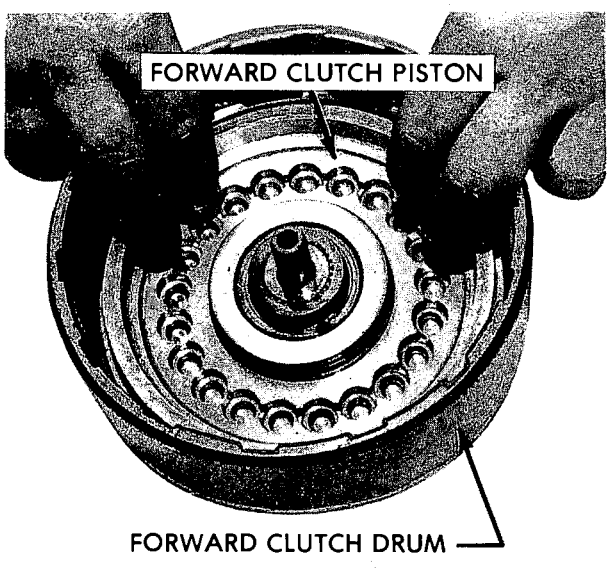


Figure 7C-117

5. Inspect the return springs. Evidence of extreme heat or burning in the area of the clutch may have caused the springs to take a heat set and would justify replacement of the springs.

6. Remove forward clutch piston assembly. See Figure 7C-117.

7. Remove forward clutch piston inner and outer seals. See Figure 7C-118.

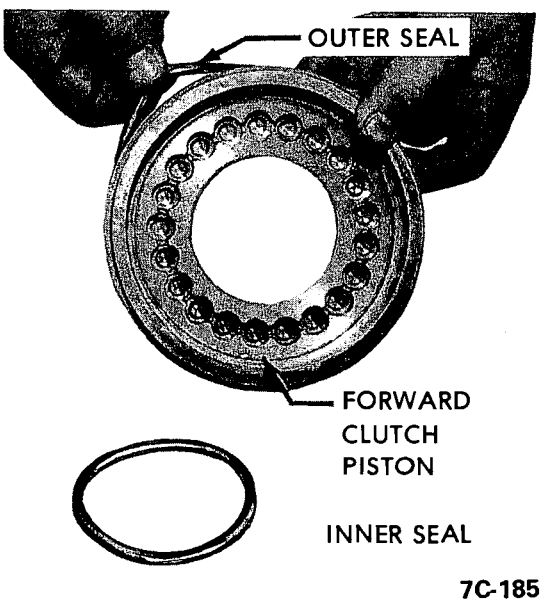


Figure 7C-118

8. Make certain forward clutch ball check exhaust is free of dirt, etc. See Figure 7C-120.

9. If the input shaft is scored it may be replaced using the following procedure.

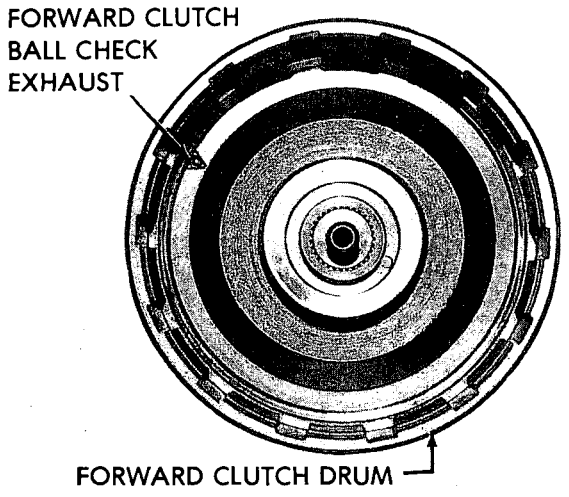


Figure 7C-120

a. Using wood blocks for support press input shaft out of forward clutch housing.

b. Taking care support forward clutch housing on rear thrust washer surface and press input shaft into housing until it is properly seated.

c. Runout at rear thrust washer surface should be no more than .005.

(NOTE: The input shaft and forward clutch housing are serviced separately.)

Reassembly of Forward Clutch Assembly

1. Install the forward clutch inner piston seal and outer piston seal. See Figure 7C-118.

2. Install the forward clutch piston assembly with aid of a piece of .020" music wire crimped into copper tubing. See Figure 7C-121.

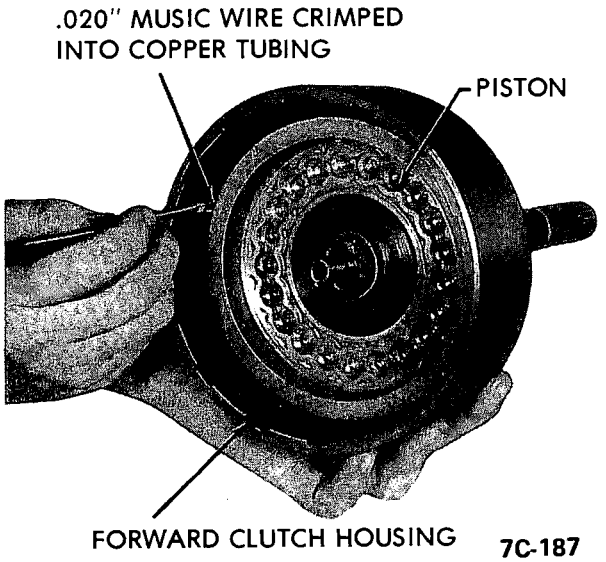


Figure 7C-121

3. Install spring retainer and springs. Compress spring retainer with an arbor press or ram press. See Figure 7C-115.

4. Lubricate with transmission fluid and install cushion spring, faced plates and steel separator plates, starting with the cushion spring and alternating steel and faced. See Figure 7C-116.

5. Install forward clutch pressure plate and retaining ring.

Using a feeler gage check clearance between forward clutch pressure plate and faced plate. See Figure 7C- 122.

The specifications for this transmission call for a clearance of no less than .011" and no greater than .082". There are three pressure plates available which are identified by tangs adjacent to the source identification mark. See Fig-

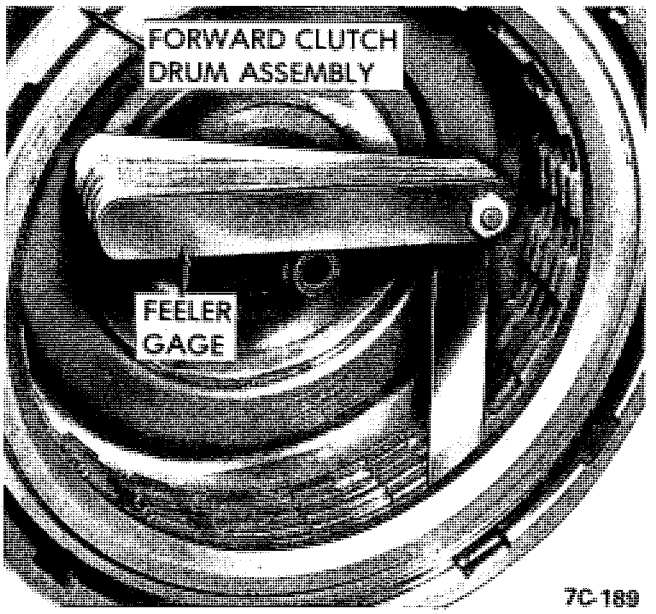


Figure 7C-122

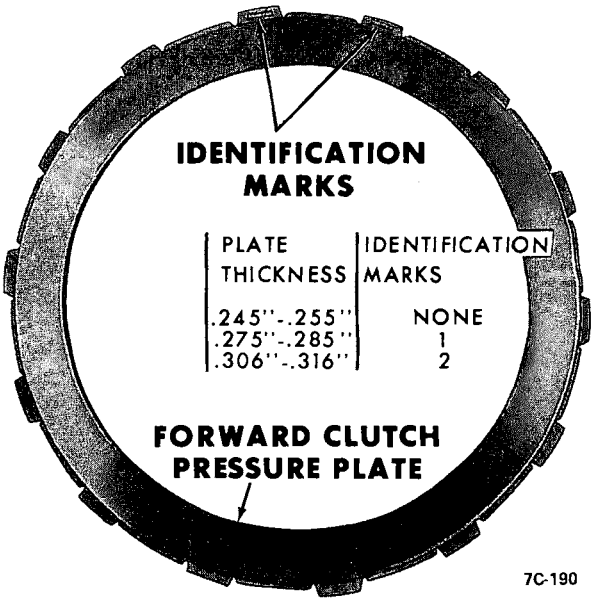


Figure 7C-123

ure 7C-123. These three pressure plates have different thicknesses.

If the clearance between the forward clutch pressure plate and the faced plate checks out to be less than .011", a thinner pressure plate should be used to have a clearance between .011" and .082". If the clearance checks out to be greater than .082", a thicker pressure plate should be used to have a clearance between .011" and .082". If the clearance checks out to be between .011" and .082", no change of pressure plate is necessary.

DISASSEMBLY AND REASSEMBLY OF SUN GEAR TO DRIVE SHELL

Disassembly of Sun Gear to Drive Shell

1. Remove sun gear to sun gear drive shell rear retaining ring. See Figure 7C-124.

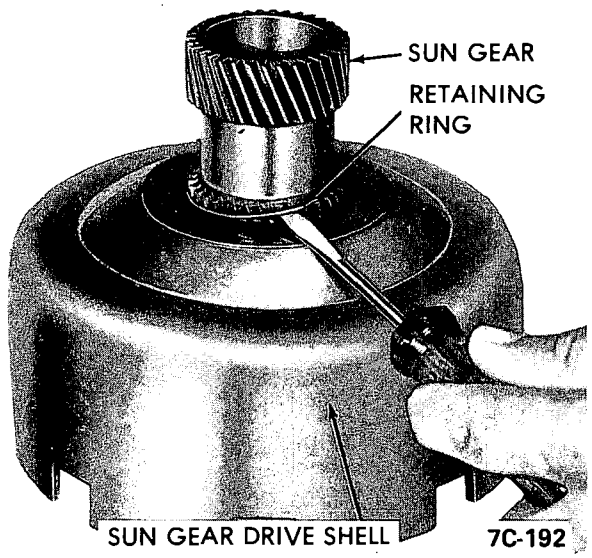


Figure 7C-124

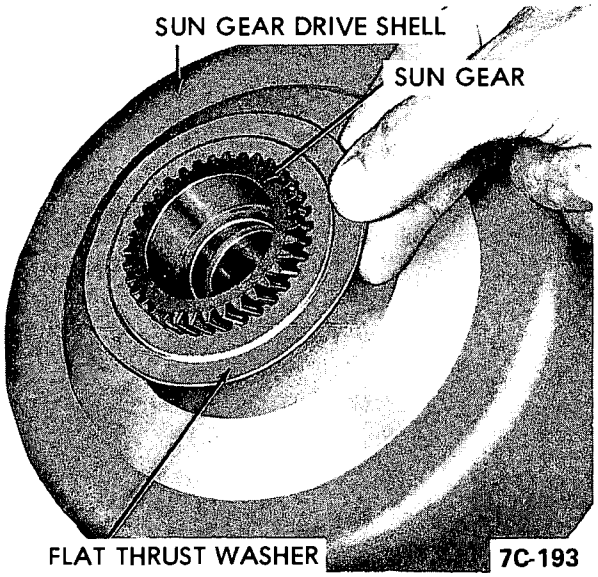


Figure 7C-125

2. Remove sun gear to drive shell flat rear thrust washer. See Figure 7C-125.

3. Remove front retaining ring from sun gear. See Figure 7C-126.

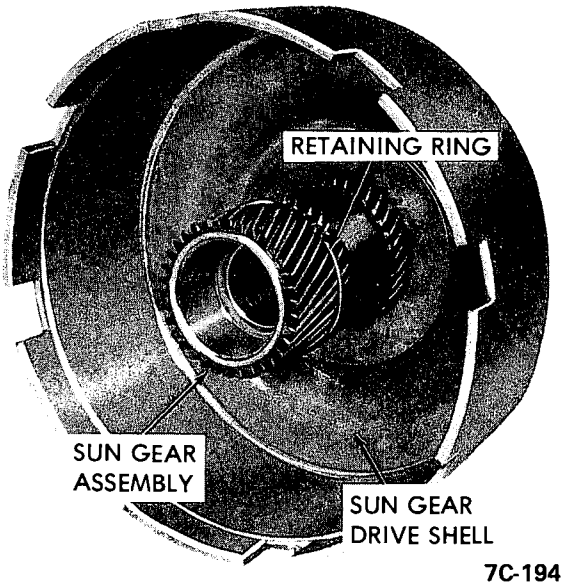


Figure 7C-126

If sun gear bushings replacement are necessary, remove with a cape chisel. See Figure 7C-127.

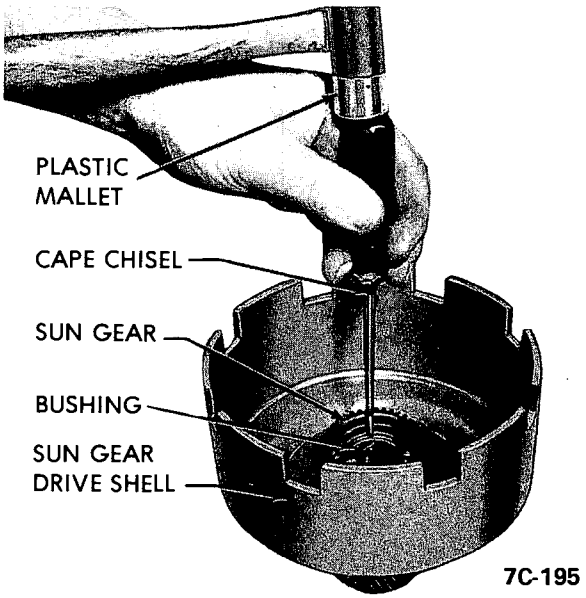


Figure 7C-127

Install sun gear bushings using Tool J-23062-3, J- 8092 and install flush to .010" below counterbores. See Figure 7C-128.

Reassembly of Sun Gear to Drive Shell

1. Install sun gear to drive shell front retaining ring, and install into drive shell. See Figure 7C-126. Use a new ring and do not overstress when installing.

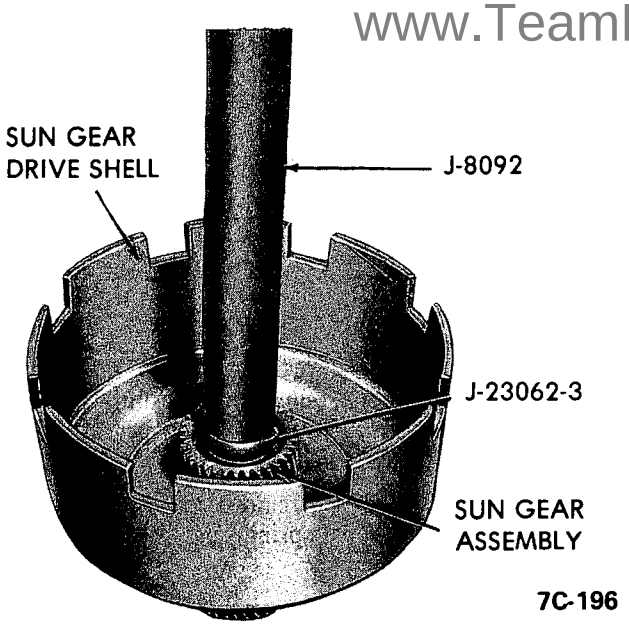


Figure 7C-128 - Bushing Installation

2. Install sun gear to drive shell flat thrust washer. See Figure 7C-125.

3. Install sun gear to sun gear drive shell rear retaining ring. See Figure 7C-124. Use a new ring and do not overstress when installing.

DISASSEMBLY AND REASSEMBLY OF LOW AND REVERSE ROLLER CLUTCH ASSEMBLY

Disassembly of Low and Reverse Roller Clutch Assembly.

Refer to Figure 7C-129.

1. Remove low and reverse clutch to sun gear shell thrust washer.

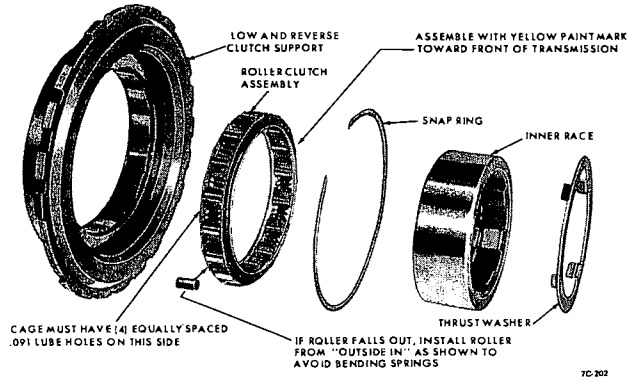


Figure 7C-129 Low and Reverse Clutch Support and Overrun Roller Clutch Assembly

2. Remove low and reverse overrun clutch inner race.

3. Remove low and reverse roller clutch retaining ring.

4. Remove low and reverse roller clutch assembly and visually inspect the rollers for wearing and scoring and check for any springs that may be collapsed.

Reassembly of Low and Reverse Roller Clutch Assembly

1. Install low and reverse roller clutch assembly to inner race. See Figure 7C-130. The inner race should free wheel in the clockwise direction only.

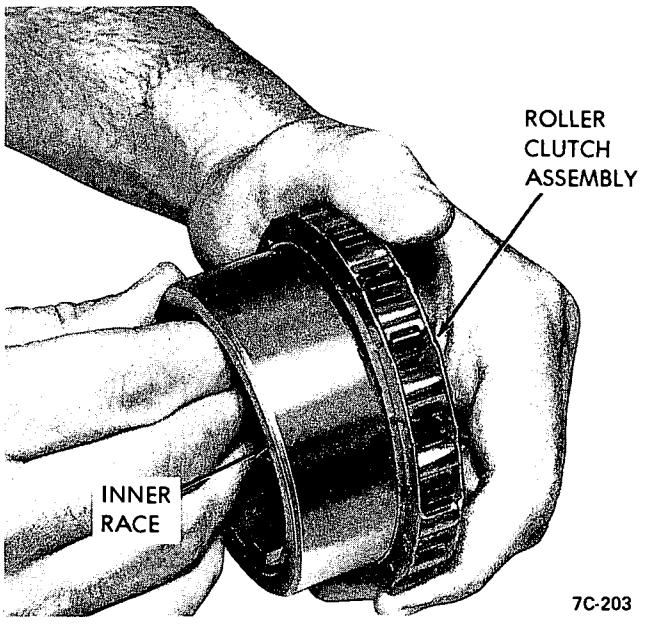


Figure 7C-130

2. Install low and reverse overrun roller clutch assembly and inner race into the low and reverse clutch support. See Figure 7C-131. Assemble with four (4) holes down or to rear of transmission.

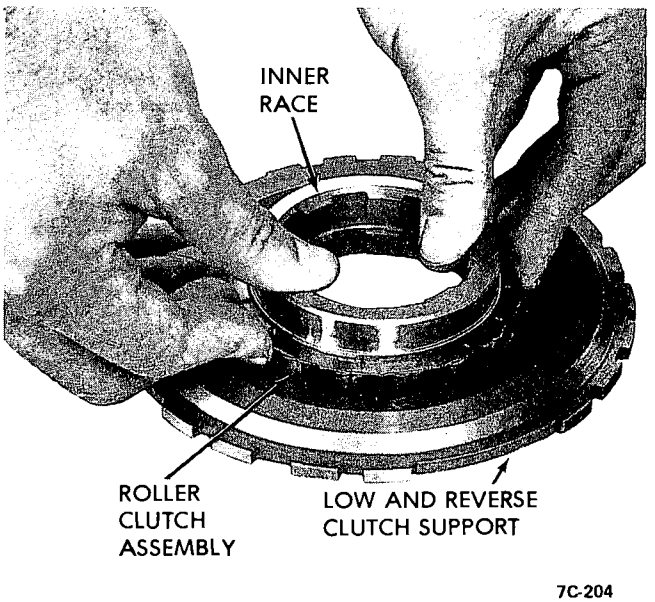


Figure 7C-131

3. Install low and reverse clutch to cam retaining ring. See Figure 7C-132.

4. Install low and reverse clutch to sun gear drive shell thrust washer. See Figure 7C-129.

VALVE BODY DISASSEMBLY, INSPECTION AND REASSEMBLY

Disassembly of Valve Body (Refer to Figure 7C-133)

Transmission need not be removed from car to perform the following operations.

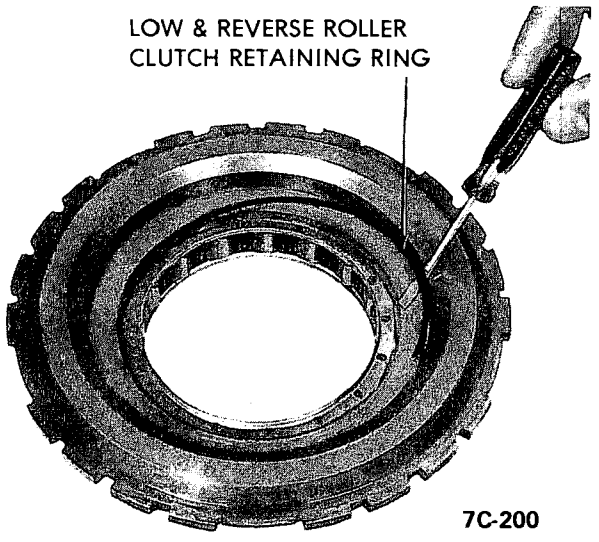


Figure 7C-132

1. Position valve body assembly with cored face up.

2. Remove manual valve from lower left hand bore (J).

3. From lower right hand bore (A) remove the pressure regulator valve train retaining pin, boost valve sleeve, intermediate boost valve, reverse and modulator boost valve, pressure regulator valve spring, and the pressure regulator valve.

4. From the next bore (B), remove the 2-3 shift valve train retaining pin, sleeve, control valve spring, 2-3 shift control valve, shift valve spring, and the 2-3 shift valve.

5. From the next bore (C), remove the 1-2 shift valve train retaining pin, sleeve, shift control valve spring, 1-2 shift control valve, and the 1-2 shift valve.

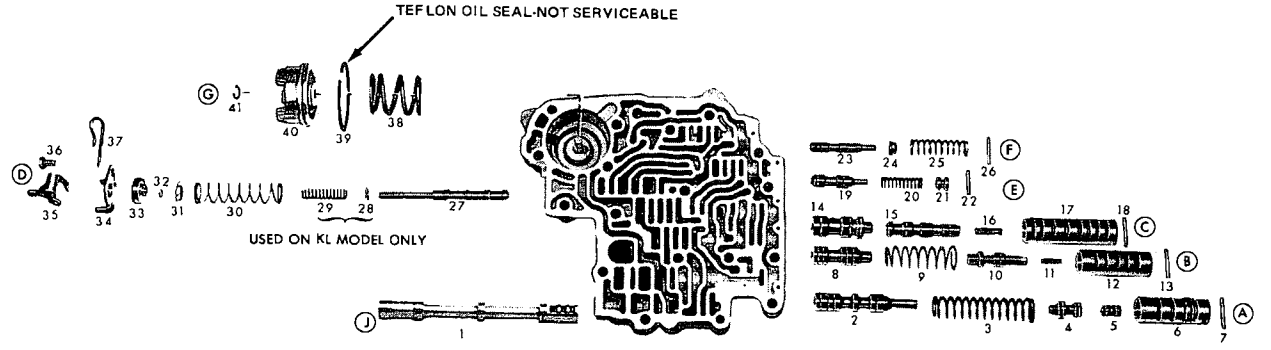
6. From the next bore (E), remove retaining pin, plug, manual low control valve spring, and the manual low control valve.

7. From the next bore (F), remove the retaining pin, spring, seat, and the detent regulator valve.

8. Install Tool J-22269, on direct clutch 2-3 accumulator piston and remove retaining "E" ring. (G) See Figure 7C-134.

9. Remove direct clutch 2-3 accumulator piston, and spring. (G) If the teflon piston seal needs replacing the piston assembly will have to be replaced. (Piston and Seal are one assembly).

10. From the next bore down (D) from the direct clutch accumulator, remove the detent actuating lever bracket bolt, bracket, actuating lever and retaining pin, stop, spring retainer, seat, outer spring, inner spring, washer and the detent valve. Use care when handling valve body assembly as valve body sleeve retaining pins may fall out.



J–1 MANUAL VALVE AND LINK ASSEMBLY

A
- 2 PRESSURE REGULATOR VALVE
- 3 PRESSURE REGULATOR VALVE SPRING
- 4 REVERSE AND MODULATOR BOOST VALVE
- 5 INTERMEDIATE BOOST VALVE
- 6 BOOST VALVE SLEEVE
- 7 RETAINING PIN

B
- 8 2-3 SHIFT VALVE
- 9 2-3 SHIFT VALVE SPRING
- 10 2-3 SHIFT CONTROL VALVE
- 11 2-3 SHIFT CONTROL VALVE SPRING
- 12 2-3 SHIFT CONTROL VALVE SLEEVE
- 13 RETAINING PIN

C
- 14 1-2 SHIFT VALVE
- 15 1-2 SHIFT CONTROL VALVE
- 16 1-2 SHIFT CONTROL VALVE SPRING
- 17 1-2 SHIFT CONTROL VALVE SLEEVE
- 18 RETAINING PIN

E
- 19 MANUAL LOW CONTROL VALVE
- 20 MANUAL LOW CONTROL VALVE SPRING
- 21 PLUG
- 22 RETAINING PIN

F
- 23 DETENT REGULATOR VALVE
- 24 DETENT REGULATOR VALVE SPRING SEAT
- 25 DETENT REGULATOR VALVE SPRING
- 26 RETAINING PIN

D
- 27 DETENT VALVE
- 28 WASHER
- 29 DETENT VALVE INNER SPRING
- 30 DETENT VALVE OUTER SPRING
- 31 DETENT VALVE OUTER SPRING SEAT
- 32 DETENT VALVE SPRING RETAINER
- 33 DETENT VALVE STOP
- 34 DETENT VALVE ACTUATING LEVER BRACKET
- 35 DETENT VALVE ACTUATING LEVER
- 36 RETAINING BOLT
- 37 RETAINING PIN

G
- 38 DIRECT CLUTCH ACCUMULATOR SPRING
- 39 OIL SEAL RING
- 40 DIRECT CLUTCH 2-3 ACCUMULATOR PISTON
- 41 RETAINER RING

VALVE BODY ASSEMBLY

5B7C205

Figure 7C-133 Valve Body Assembly

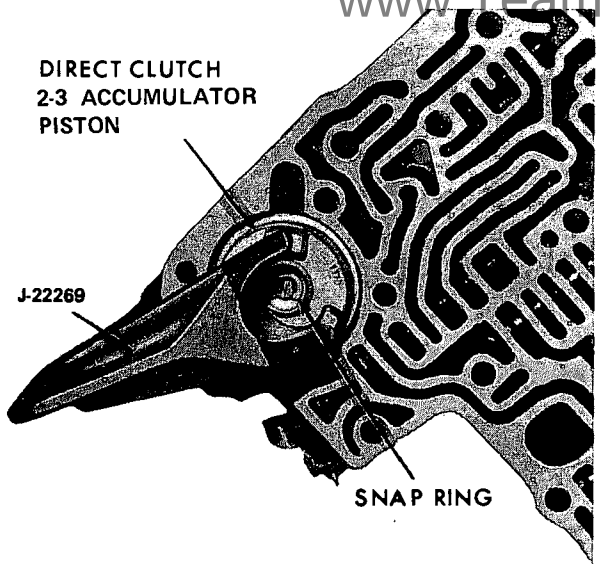


Figure 7C-134

Valve Body Inspection

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

2. Inspect valve body for cracks, scored bores, interconnected oil passages and flatness of mounting face.

3. Check all springs for distortion or collapsed coils.

Reassembly of Valve Body

1. Install direct clutch accumulator piston spring and piston into valve body.

2. Install special tool J-22269 and J-24675 (installs piston evenly) on direct clutch 2-3 accumulator piston and compress spring and piston and secure with retaining ring. See Figure 7C-134. Align piston and oil seal ring when entering bore.

3. Install the detent valve, washer, outer spring, inner spring, spring seat, and spring retainer. Install detent valve stop and detent valve actuating bracket. Torque bolt to 52 lb. in. Assemble detent actuating lever with retaining pin.

4. Install the pressure regulator valve, spring, reverse and modulator boost valve, intermediate boost valve, boost valve sleeve and retaining pin.

5. In the next bore up, install 2-3 shift valve, shift valve spring, 2-3 shift control valve, shift control valve spring, shift control valve sleeve and retaining pin.

6. In the next bore up, install the 1-2 shift valve, 1-2 shift control valve, control valve spring, control valve sleeve and retaining pin.

7. In the next bore up, install the manual low control valve, spring, plug and retaining pin.

8. In the top right hand bore, install the detent regulator valve, spring seat, spring and retaining pin.

ASSEMBLY OF TRANSMISSION FROM MAJOR PARTS AND UNITS

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.

2. When reassembling it is important that all thrust washer surfaces be given an initial lubrication. Bushings should be lubricated with transmission fluid. Thrust washers should be lubricated on both surfaces with petroleum jelly, (unmedicated) before installation.

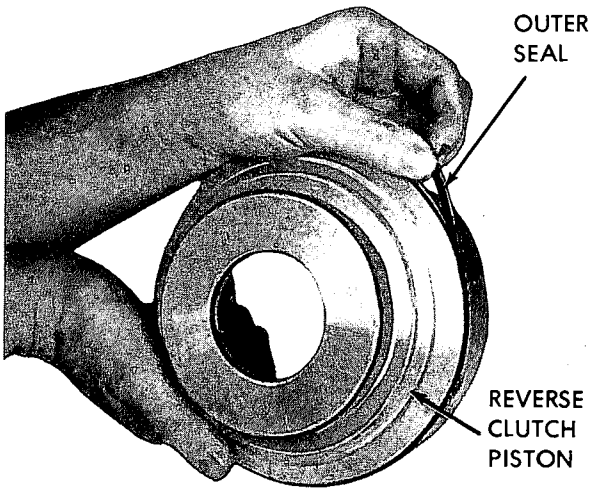


Figure 7C-135

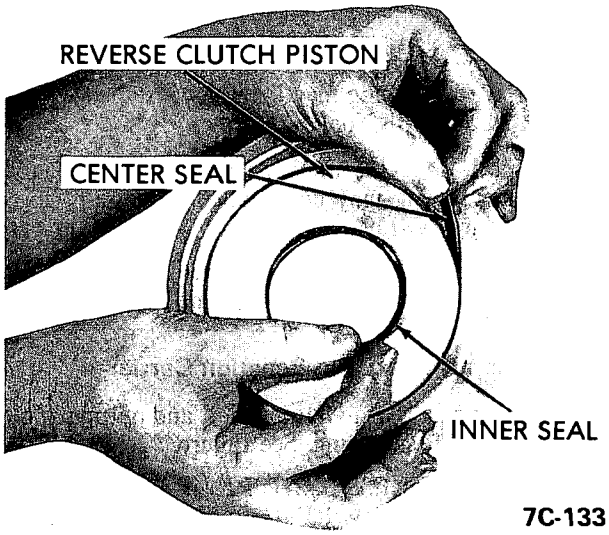


Figure 7C-137

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 on 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 torque and in the specified sequence.*

Installation of Low and Reverse Clutch Piston

1. Install low and reverse clutch piston outer seal. See *Figure* 7C-135.

2. Install low and reverse clutch piston center and inner seal. See Figure 7C-137.

3. Install low and reverse clutch piston assembly with notch in piston installed adjacent to parking pawl. See Figure 7C-138.

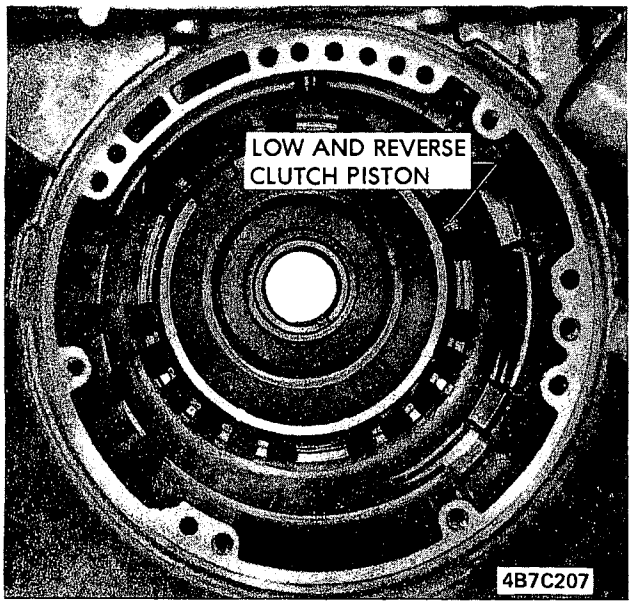


Figure 7C-138

4. Position piston return seat and springs. Place snap ring on return seat so that ring may be easily installed when seat is compressed with Tool J-21420.

5. Using tool J-21420-1 compress return seat so spring retainer retaining ring may be installed with snap ring pliers. See Figure 7C-139.

As spring retainer is compressed make certain inner edge of retainer does not hang up on snap ring groove.

Installing Output Shaft and Reaction Carrier

1. Install output ring gear to output shaft and output ring gear to output shaft snap ring. See Figure 7C-140.

DO NOT OVER STRESS SNAP RING ON ASSEMBLY. ALWAYS USE NEW RING ON REASSEMBLY.

2. Install reaction carrier to output ring gear needle thrust bearing with lip side face up. See Figure 7C-141.

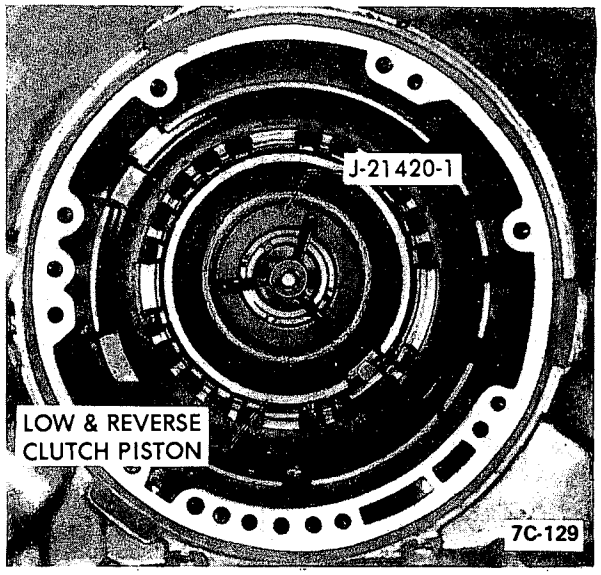


Figure 7C-139

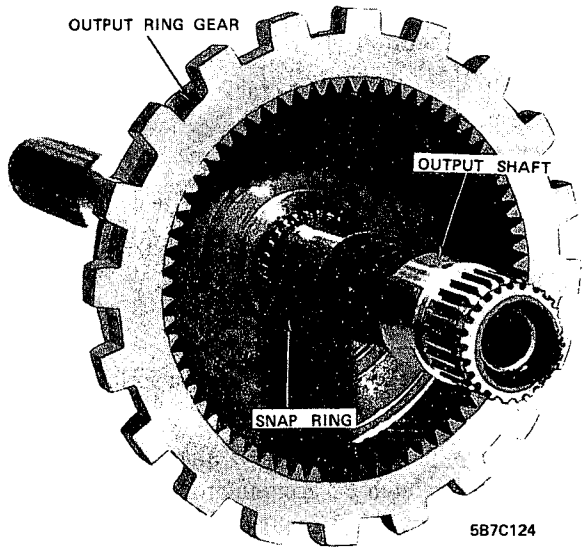


Figure 7C-140

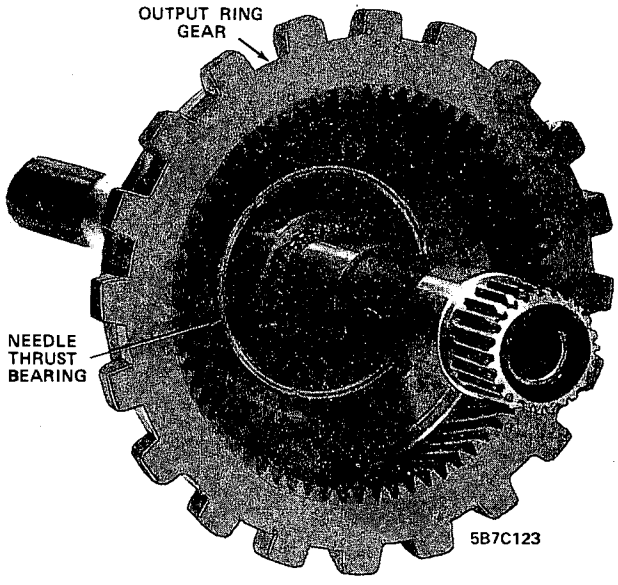


Figure 7C-141

3. Install output ring gear to case needle bearing assembly. See Figure 7C-142. Lip on inner race of bearing MUST point toward rear of transmission.

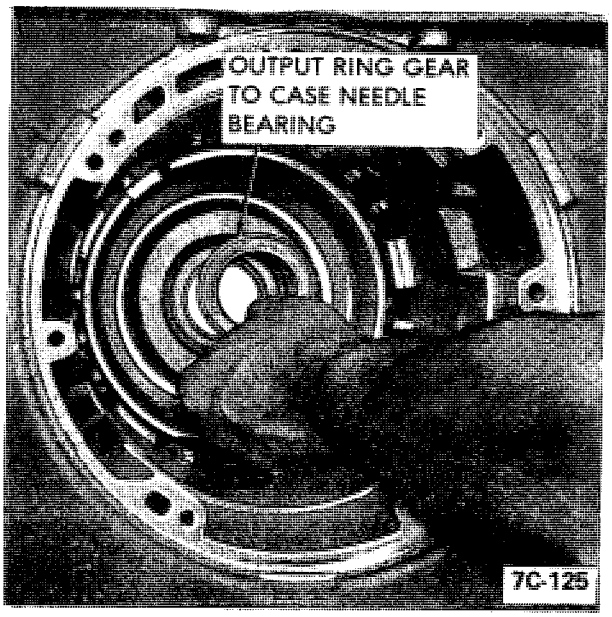


Figure 7C-142

4. Install reaction carrier assembly into output ring gear and shaft assembly. See Figure 7C-143.

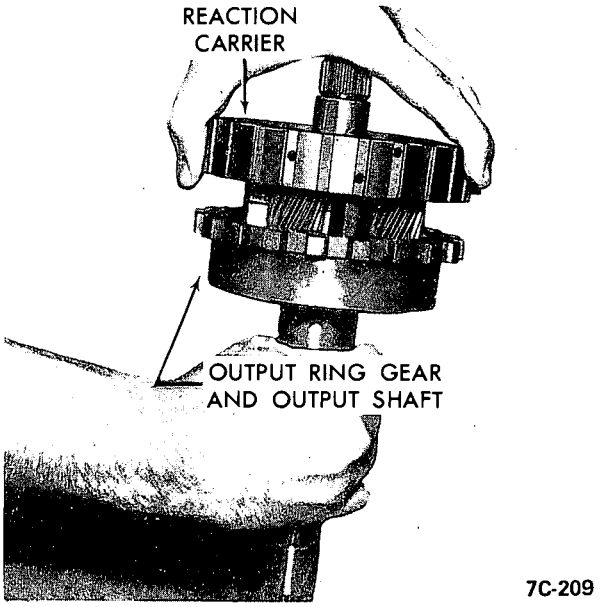


Figure 7C-143

5. Install output shaft and reaction carrier assembly into case.

Installing Low and Reverse Clutch Plates

(NOTE: Refer to specifications in rear of this section to determine the required amount of lined and steel clutch plates to use with specific transmission model and engine combination. When replacing piston assembly specific part number must be used.)

1. Oil and install low reverse clutch steel separator plates and faced plates, starting with a steel plate and alternating with faced plates. See Figure 7C-144.

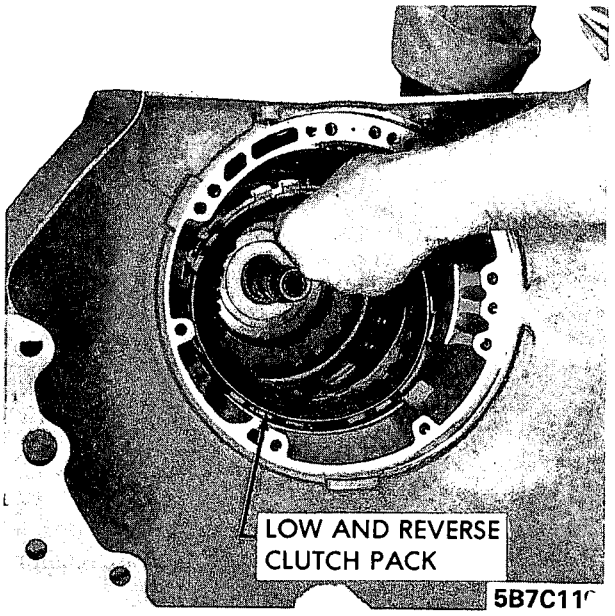
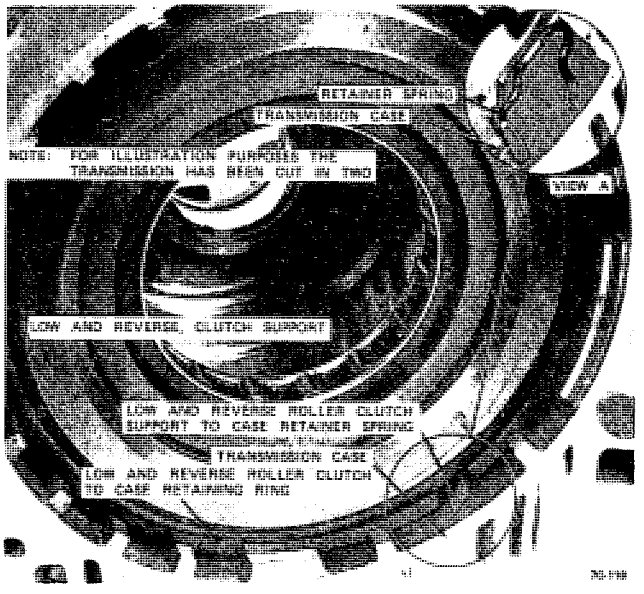


Figure 7C-144

2. Install low and reverse clutch support retainer spring. See Figure 7C-145.



LOCATION OF LOW AND REVERSE ROLLER CLUTCH SUPPORT TO CASE RETAINER SPRING

Figure 7C-145

3. Install low and reverse clutch support assembly pushing firmly until support assembly is seated past top of low and reverse clutch support retainer spring and retaining ring can be installed. See Figure 7C-146.

Make certain the splines on inner race of the roller clutch align with splines on reaction carrier.

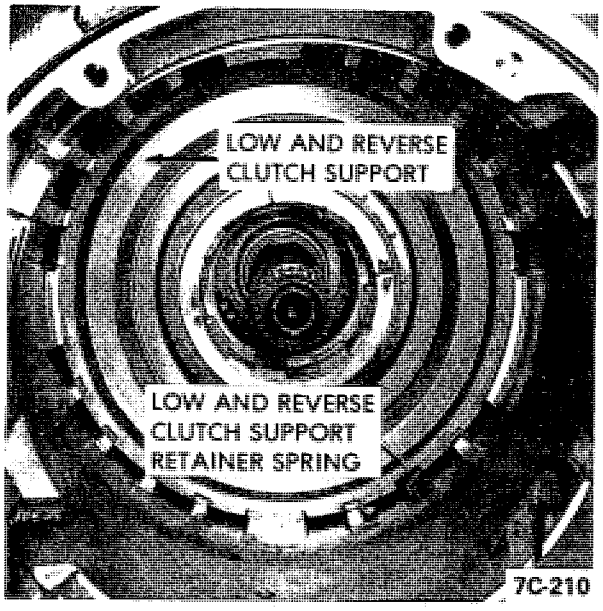


Figure 7C-146

4. Install low and reverse clutch support to case retaining ring. See Figure 7C-145.

Installing Sun Gear Drive Shell Assembly

1. Install low and reverse clutch support inner race to sun gear drive shell thrust washer and install sun gear drive shell assembly. See Figure 7C-147.

Figure 7C-147

Installing Output Carrier Assembly

1. Install output carrier assembly. See Figure 7C-148.

2. Install input ring gear to output carrier needle thrust bearing lip side face down. See Figure 7C-149.

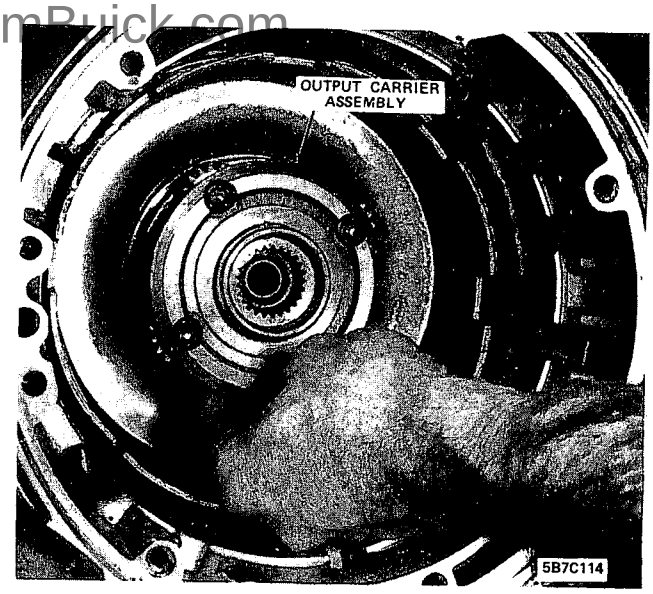


Figure 7C-148

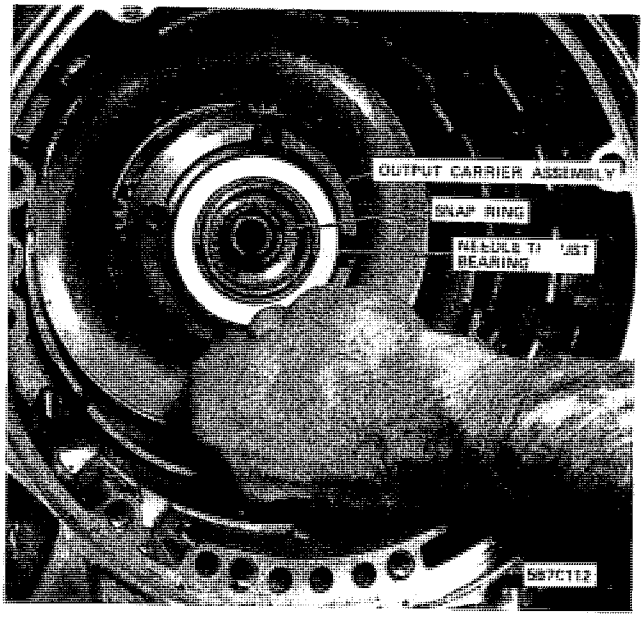


Figure 7C-149

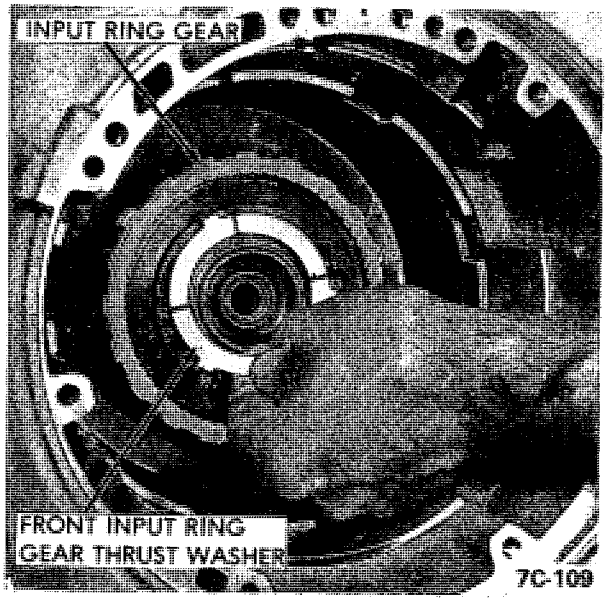


Figure 7C-151

3. Install output carrier to output shaft snap ring. Use new snap ring and do not over stress on installing. USE PROPER SNAP RING PLIERS. See Figure 7C-149.

Installing Input Ring Gear

1. Install input ring gear. See Figure 7C-151.

2. Install forward clutch housing to input ring gear front thrust washer. See Figure 7C-151. Washer has three (3) tangs.

Installing Direct and Forward Clutch Assemblies

1. Install direct clutch drum to forward clutch housing needle roller bearing. See Figure 7C-152.

Figure 7C-152

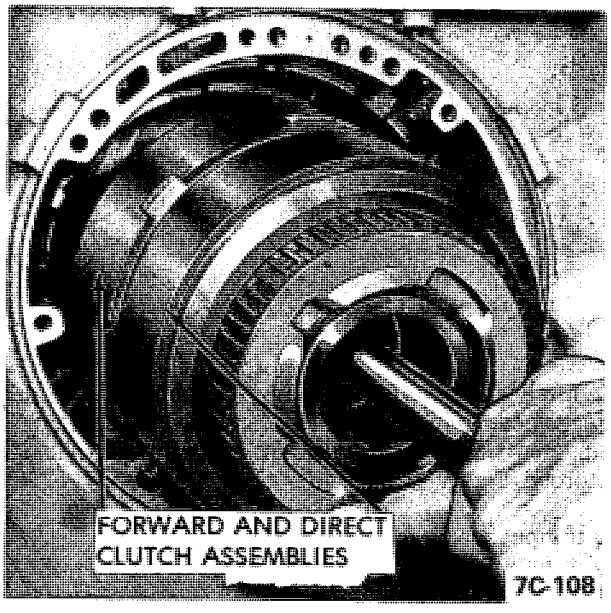


Figure 7C-153

2. Install direct clutch assembly to forward clutch assembly. Install assemblies into case making certain forward clutch faced plates are positioned over input ring gear and the tangs on direct clutch housing are installed into slots on the sun gear drive shell. See Figure 7C-153.

Installing Intermediate Clutch Overrun Brake Band

1. Install intermediate clutch overrun brake band. See Figure 7C-154.

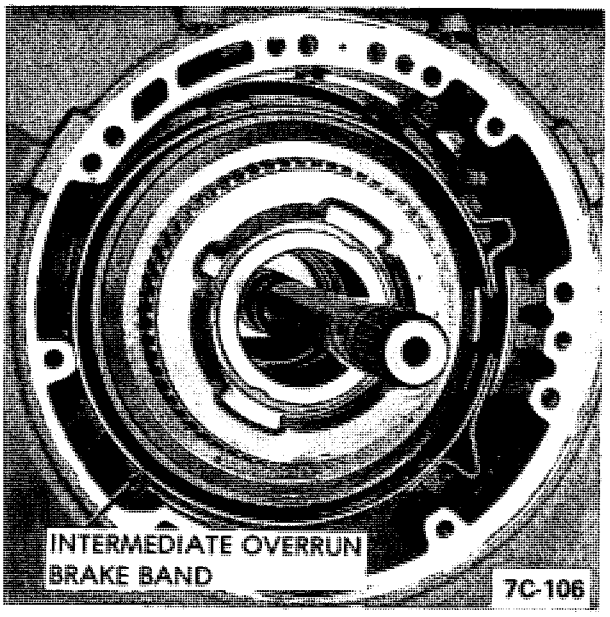


Figure 7C-154

Installing Intermediate Clutch Pressure Plate, Clutch Plates, and Cushion Spring

(NOTE: Refer to specifications in rear of this section to determine the required amount of lined and steel clutch

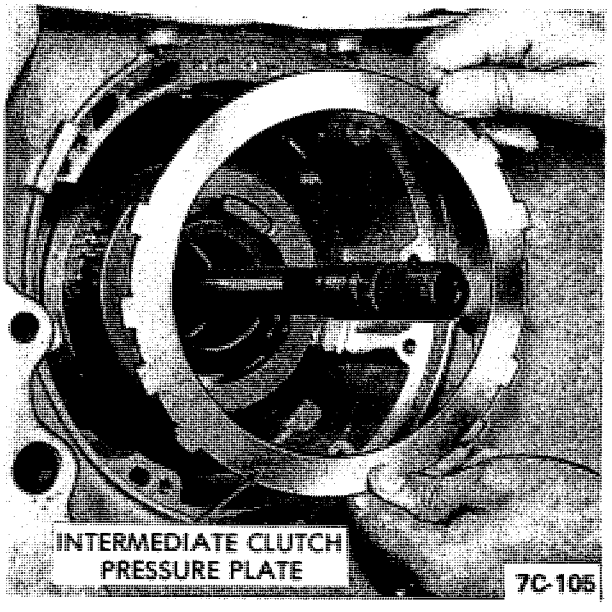


Figure 7C-156

plates to use with specific transmission model and engine. When replacing piston assembly specific part number must be used.)

1. Install intermediate clutch pressure plate. See Figure 7C-156.

2. Oil and install lined and steel intermediate clutch plates, starting with a lined plate and alternating steel and lined. See Figure 7C-157.

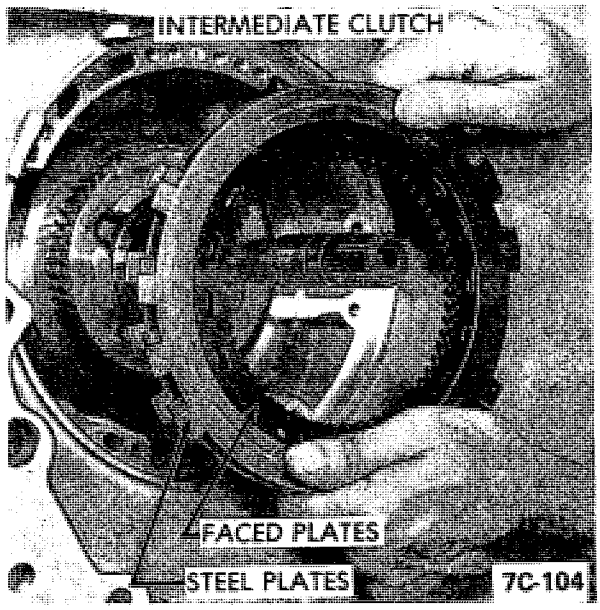


Figure 7C-157

3. Install intermediate clutch cushion spring. See Figure 7C-158.

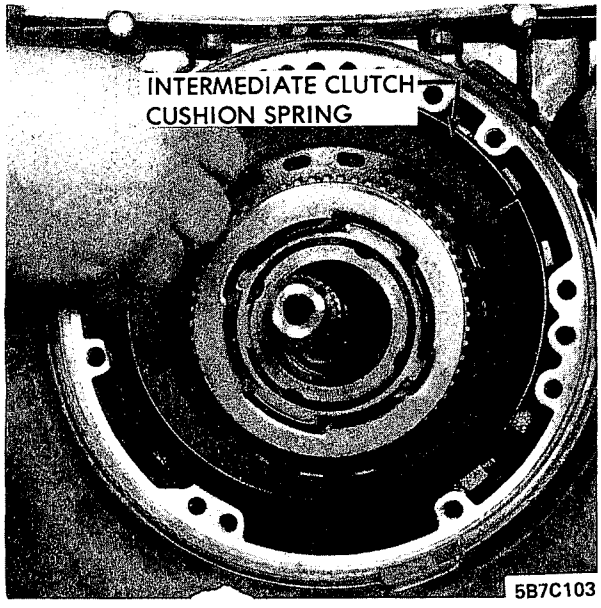


Figure 7C-158

Installing Oil Pump Assembly

1. Install original amount of .017 shims, and needle thrust bearing lip side face down on pump cover hub. Before installation apply petroleum jelly to both sides of shim and bearing. See Figure 7C-159.

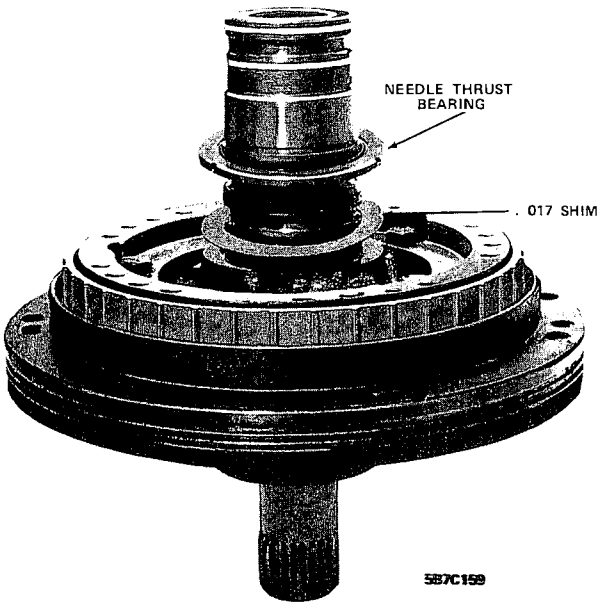


Figure 7C-159

2. Install new pump assembly to case gasket. See Figure 7C-160. Before installing pump lubricate case bore.

Figure 7C-160

3. Install guide pins into case. Install pump assembly into case, remove guide pins and install pump to case bolts. Using new washer type seals tighten alternately to 20 lb. ft. torque. See Figure 7C-161.

4. If input shaft cannot be rotated as the pump is being pulled into place, the direct and forward clutch housings have not been properly installed to index the faced plates with their respective parts. This condition must be corrected before the pump is pulled into place.

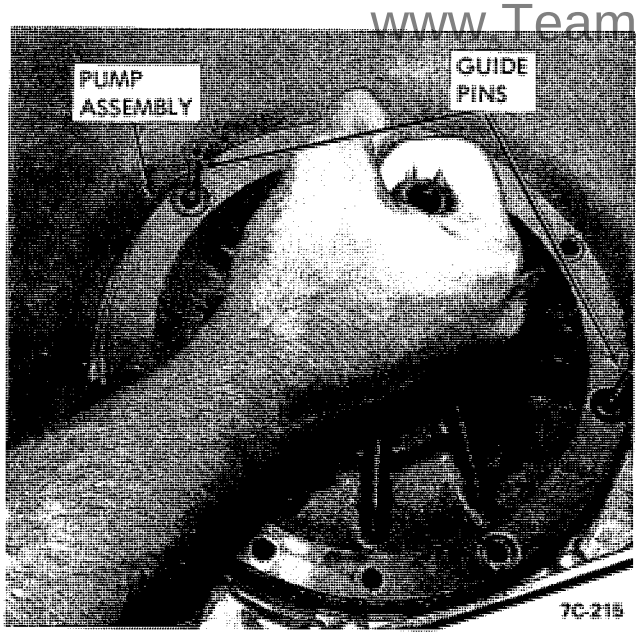


Figure 7C-161

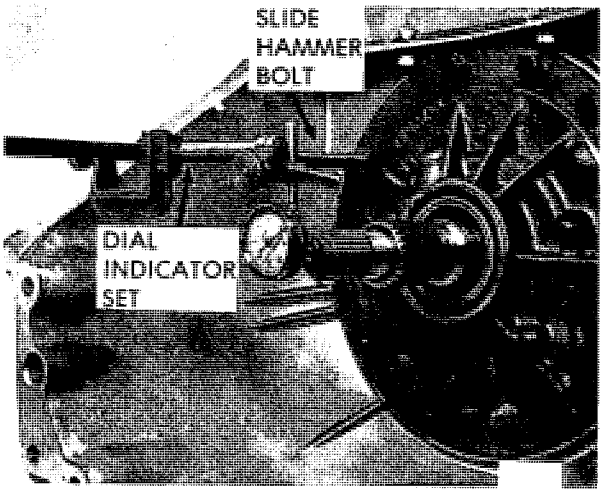


Figure 7C-162

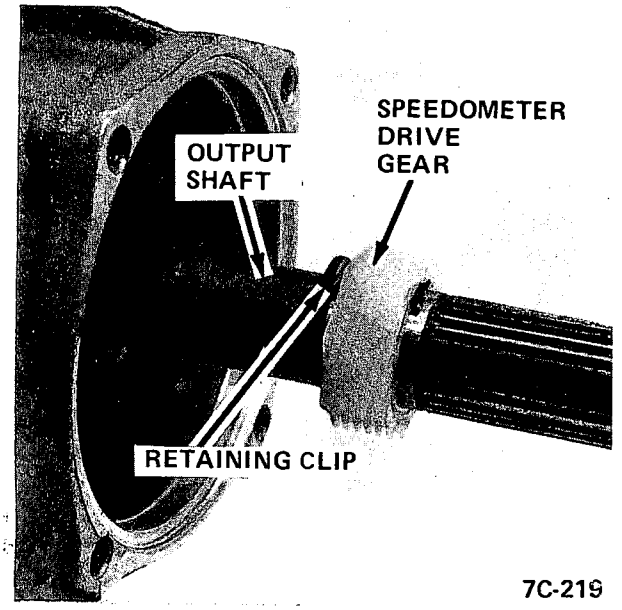


Figure 7C-163

5. Checking direct clutch to oil pump clearance, attach slide hammer bolt to threaded hole in oil pump. See Figure 7C-162. With flat of hand on end of input shaft move shaft rearward. Install Dial Indicator Set J-8001 on rod and "O" dial indicator on end of input shaft. Push on end of output shaft to move shaft forward, the reading obtained should be between .030 and .079. If the reading is incorrect remove pump assembly and install zero, one, or two .017 shims to obtain correct reading. See Figure 7C-159.

Installing Speedometer Drive Gear, and Propeller Shaft Yoke Seal

1. Place speedometer drive gear retaining clip into hole in output shaft. See Figure 7C-163.

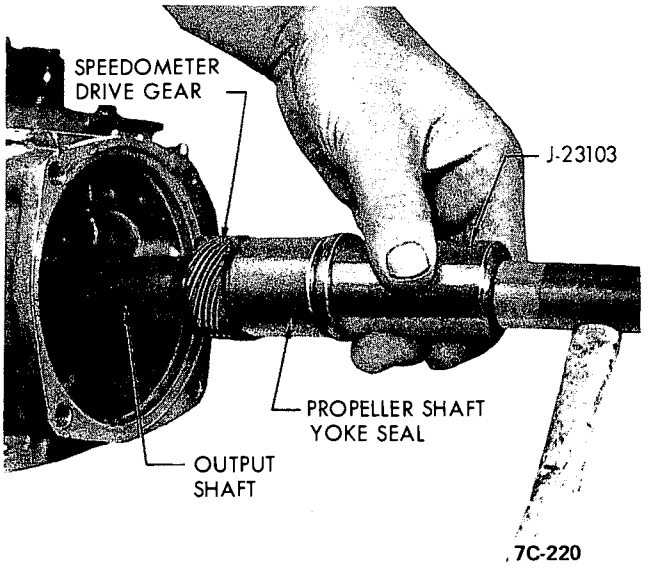


Figure 7C-164

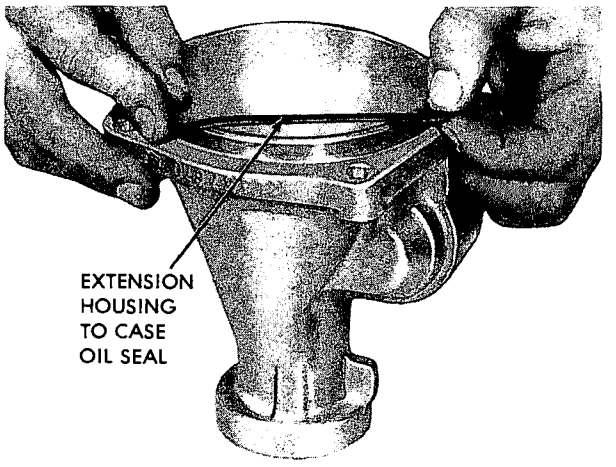


Figure 7C-165

2. Align slot in speedometer drive gear with retaining clip and install. See Figure 7C-163.

3. Install propeller shaft yoke seal (375B only), using Tool J-23103. See Figure 7C-164.

Installing Extension Housing

1. Install extension housing to case square cut "O" - ring seal. See Figure 7C-165.

2. Attach extension housing to case using attaching bolts. Torque to 35 lb.ft. See Figure 7C- 166.

(NOTE: Extension has studs for the catalytic converter support on the right side. A & B Series.)

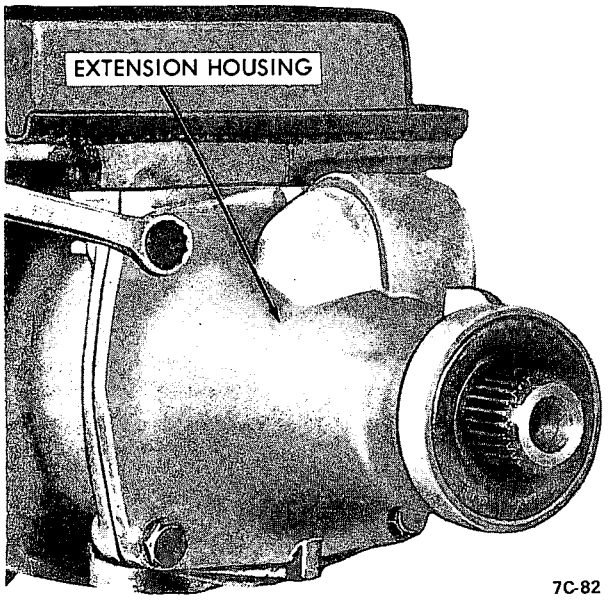


Figure 7C-166

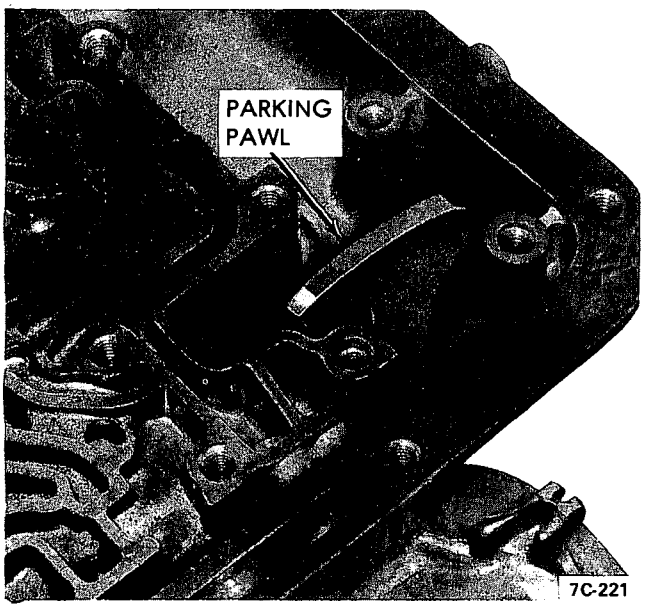


Figure 7C-167

3. Install speedometer driven gear, retainer and bolt. Torque bolt to 12 lb.ft.

Installing Parking Pawl and Actuating Rod

1. Install parking pawl, tooth toward the inside of case. See Figure 7C-167.

2. Install parking pawl shaft into case through disengaging spring. Install disengaging spring on parking pawl and slide shaft through parking pawl. See Figure 7C-168.

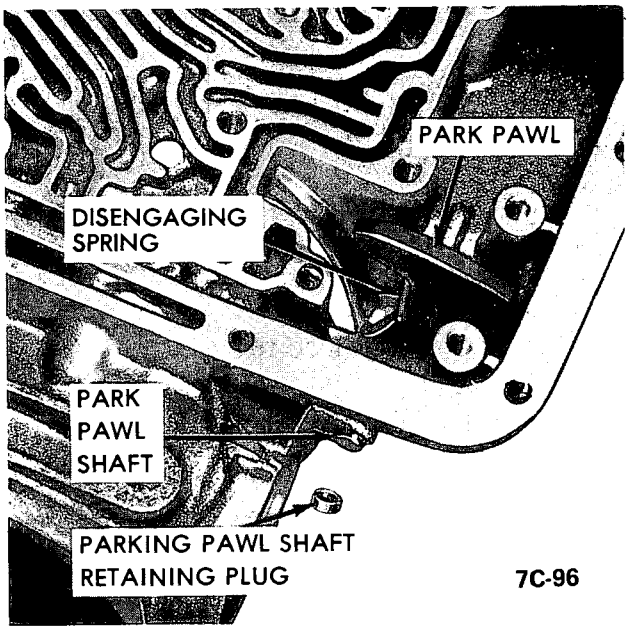


Figure 7C-168

3. Install parking pawl shaft retainer plug. Drive into case using a 3/8" dia. rod, until retainer plug is flush to .010" below face of case. Stake plug in three (3) places to retain plug in case. See Figure 7C-169.

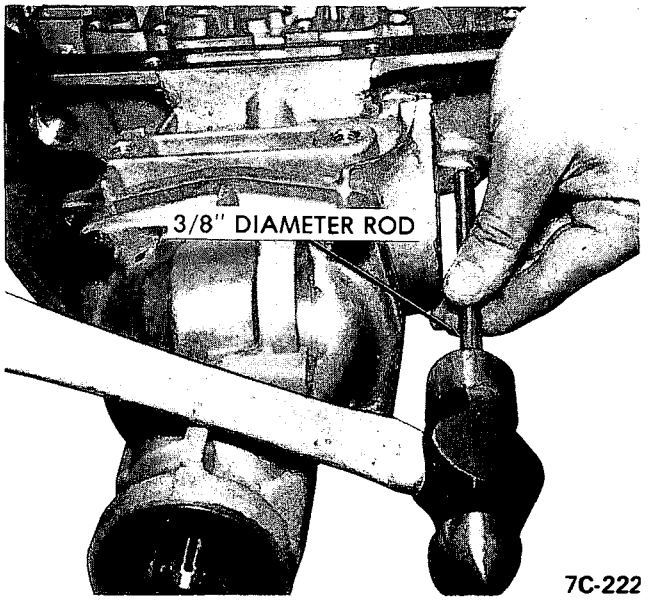


Figure 7C-169

4. Install park lock bracket, torque bolts to 29 lb.ft. See Figure 7C-171.

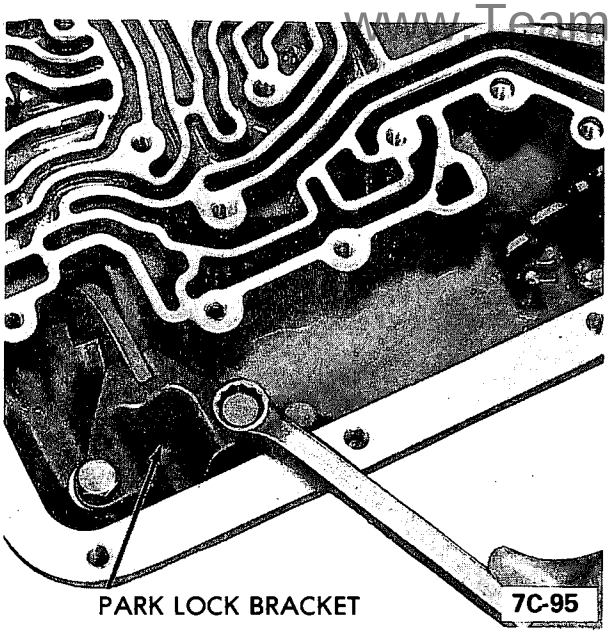


Figure 7C-171

5. Install actuating rod under the park lock bracket, and parking pawl. See Figure 7C-172.

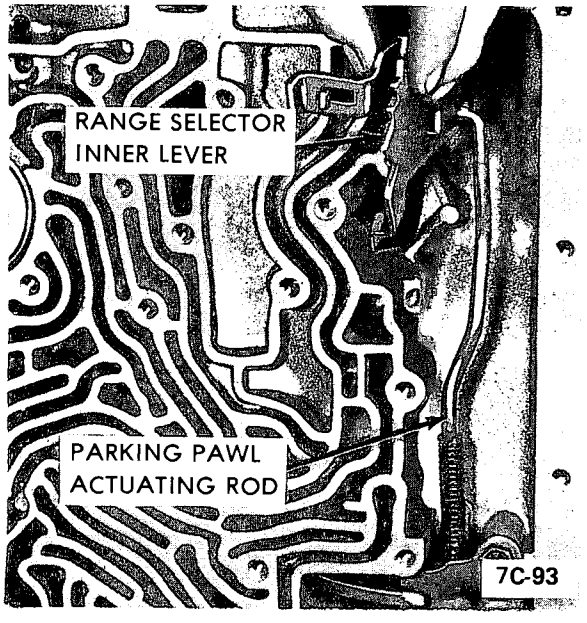


Figure 7C-172

Installing Manual Shaft and Range Selector Inner Lever

1. If a new manual shaft to case lip seal is necessary, use a 7/8" diameter rod and seat flush with case. See Figure 7C-173.

2. Install manual shaft through case and range selector inner lever.

3. Install retaining jam nut on manual shaft. Torque jam nut to 30 lb.ft. See Figure 7C-174. Install manual shaft to case retainer.

Figure 7C-173

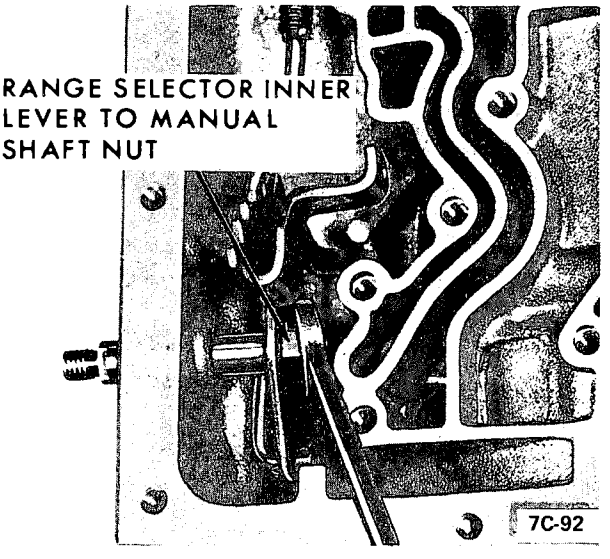


Figure 7C-174

Installing Intermediate Servo Piston, Check Balls, Oil Pump Pressure Screen and Governor Feed Screens

1. Install intermediate servo piston, apply pin, spring seat. See Figure 7C-175.

2. Install four (4) check balls into correct transmission case pockets. See Figure 7C-176.

If number one (1) check ball is omitted or incorrectly placed, transmission failure will result due to minimum line pressure.

If transmission is still in car, place check balls in proper position in spacer plate and gasket and carefully raise into position.

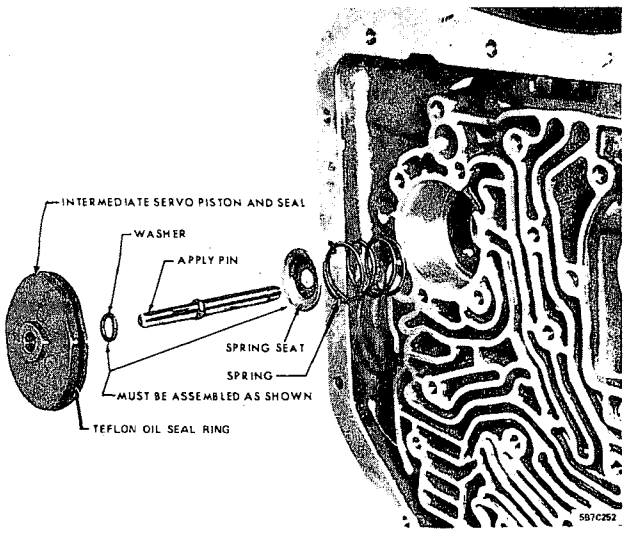


Figure 7C-175 Intermediate Servo Assembly - Exploded View

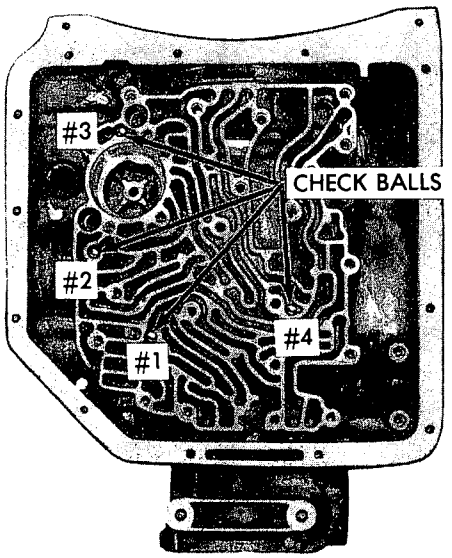


Figure 7C-176

3. Install oil pump pressure screen in the oil pump pressure hole in case. Ring end of screen must be installed toward case face. See Figure 7C-177. (*Clean before installing.)*

4. Install governor screens in the case. See Figure 7C-178. (*Clean before installing.)*

Installing Valve Body, Detent Roller and Spring Assembly, and Filter

1. Install valve body spacer plate to case gasket and valve body spacer plate. See Figure 7C-179.

2. Install valve body to spacer plate gasket. See Figure 7C-180.

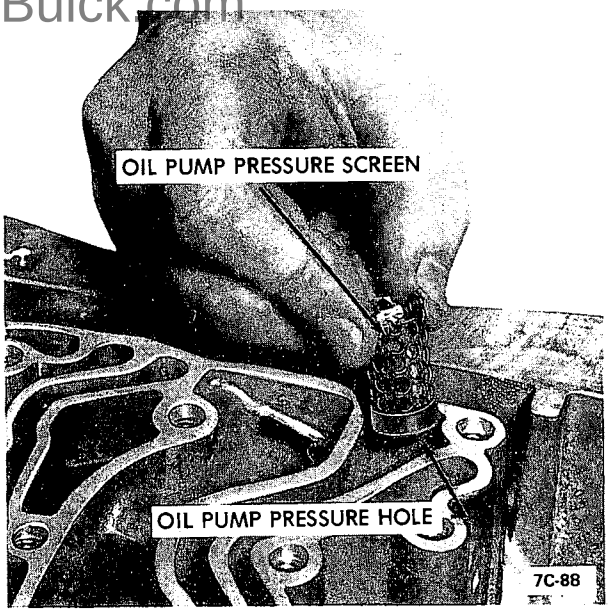


Figure 7C-177

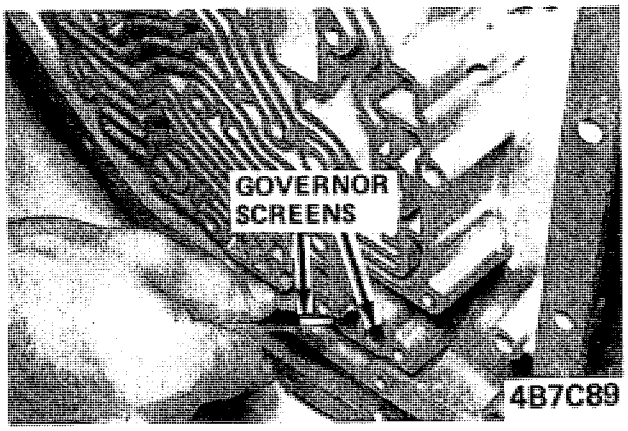


Figure 7C-178

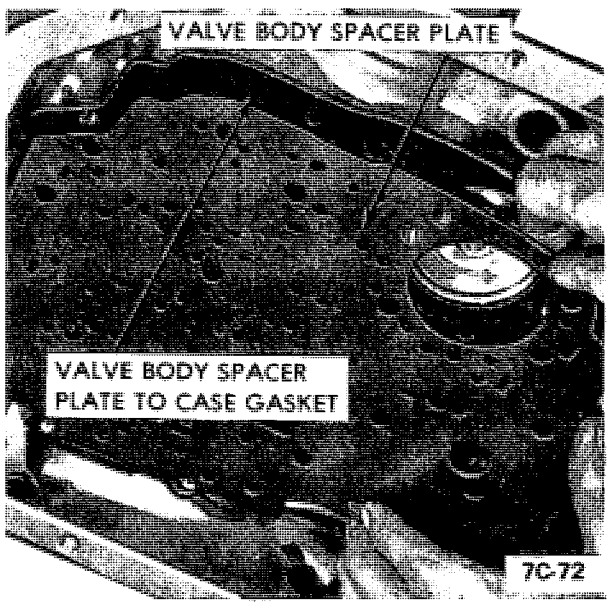


Figure 7C-179

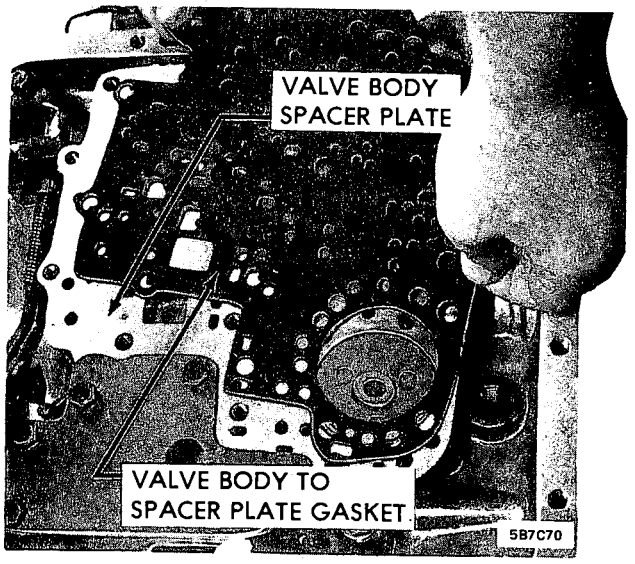


Figure 7C-180

3. Install spacer support plate. Torque bolts to 13 lb.ft. See Figure 7C-181.

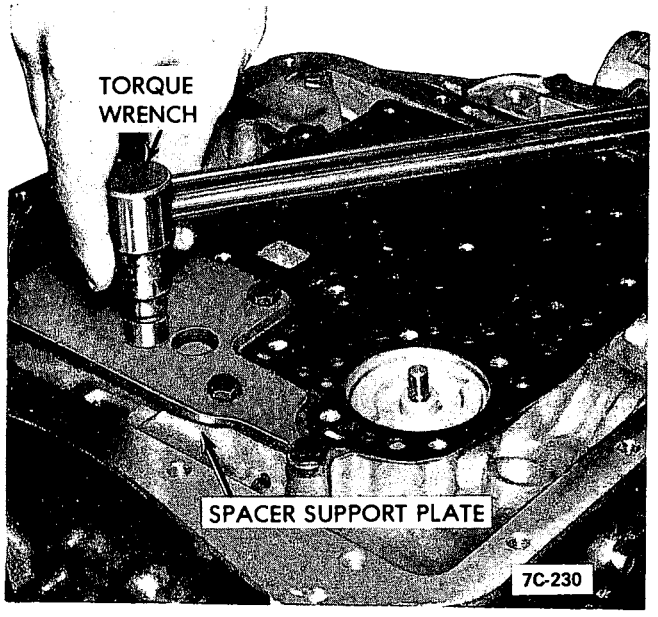


Figure 7C-181

4. Connect detent control valve wire to detent valve actuating lever. See Figure 7C-182.

5. Install valve body. Connect manual control valve link to range selector inner level. Torque bolts in random sequence to 13 lb.ft. leaving bolt loose for detent roller and spring assembly. See Figure 7C-183.

When handling valve body assembly do not touch sleeves as retainer pins will fall into transmission.

6. Install detent roller and spring assembly to valve body. See Figure 7C-184.

7. Install filter assembly gasket and filter. See Figure 7C-185. Install filter and gasket exactly as shown. Always replace filter when foreign material is found to be present.

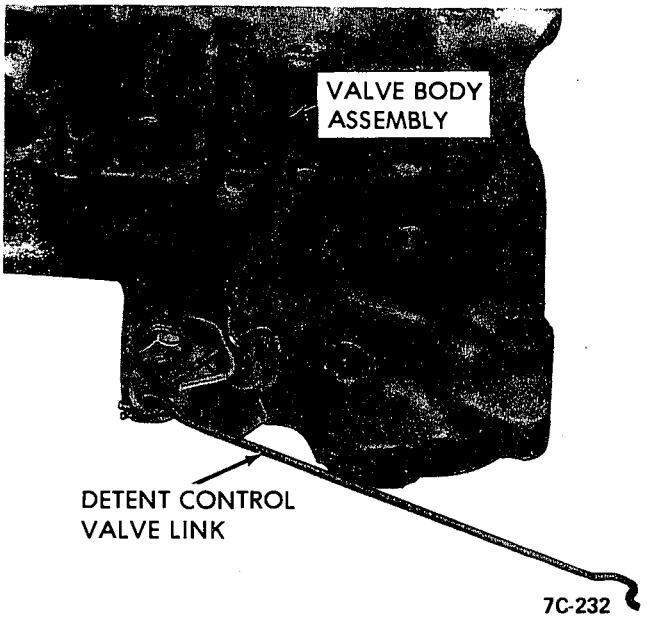


Figure 7C-182

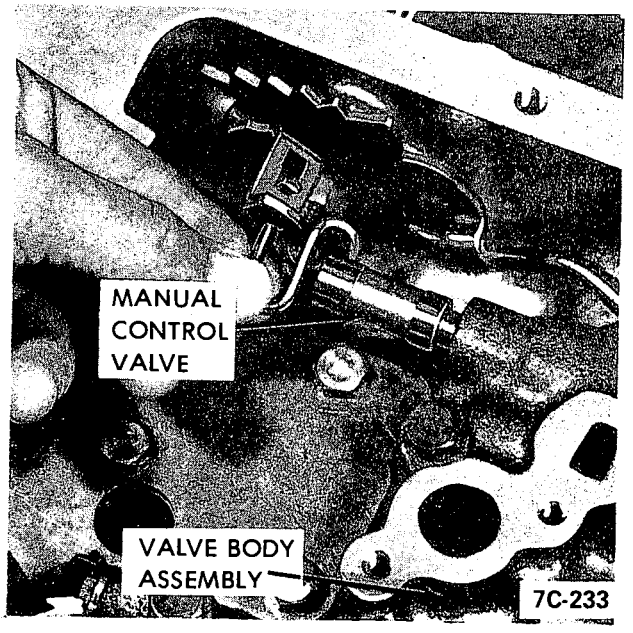


Figure 7C-183

Installing Oil Pan, Governor, and Modulator Valve

1. Install new bottom pan gasket and bottom pan. See Figure 7C-186.

2. Install governor assembly, cover and seal and retainer wire. See Figure 7C-188. Use extreme care not to damage cover. If cover is damaged it must be replaced.

3. Install vacuum modulator valve and modulator. See Figure 7C-189. Lubricate "O" ring seal to prevent damage, install retaining clip, and torque bolt to 12 lb. ft.

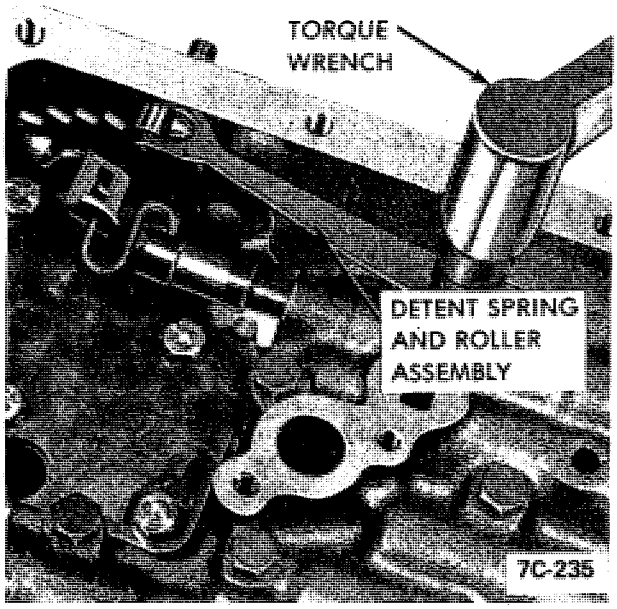


Figure 7C-184

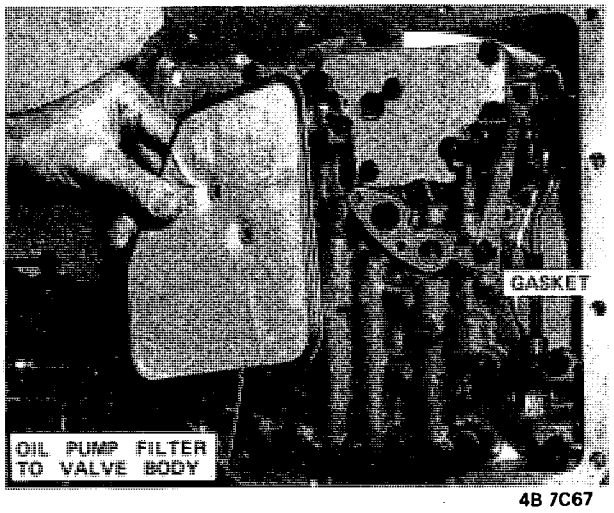


Figure 7C-185

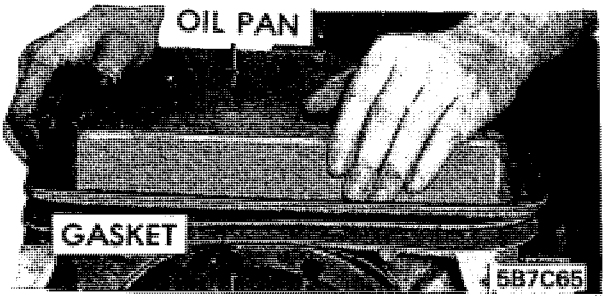


Figure 7C-186

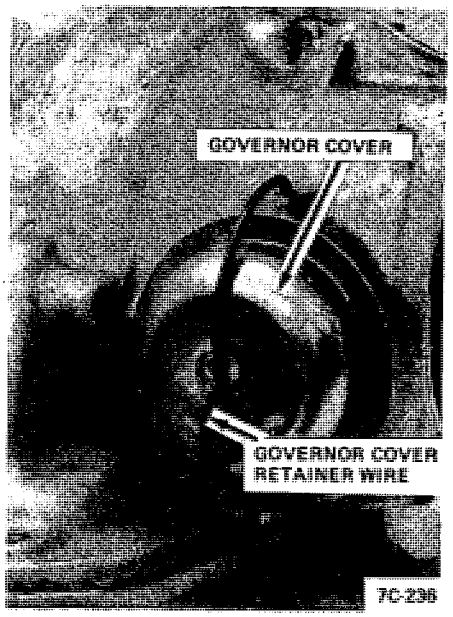


Figure 7C-188

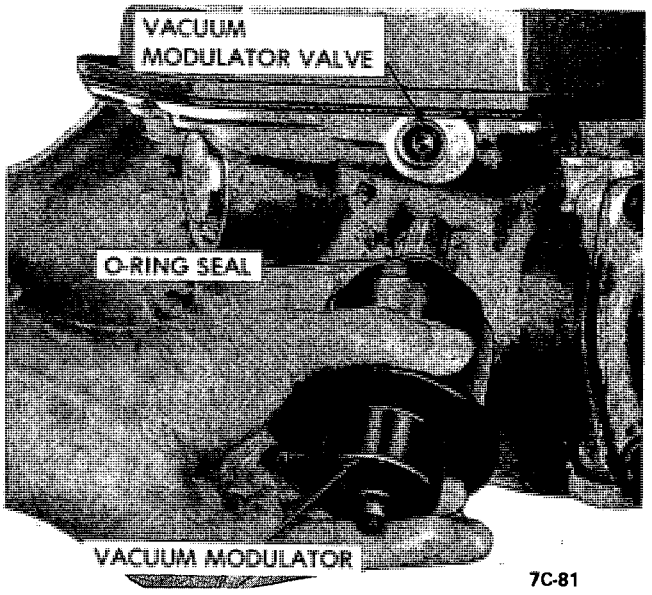


Figure 7C-189

CONVERTER CHECKING PROCEDURE

Check Converter For Leaks as Follows:

1. Install tool J-21369 and tighten. See Figure 7C-190.
2. Fill converter with air; 80 psi.
3. Submerge in water and check for leaks.

Check Converter End Clearance as Follows:

1. Install tool J-21371-2 and tighten brass nut. See Figure 7C-191.
2. Install Tool J-21371-3 and tighten hex nut. See Figure 7C-192.
3. Install dial indicator set at "O".

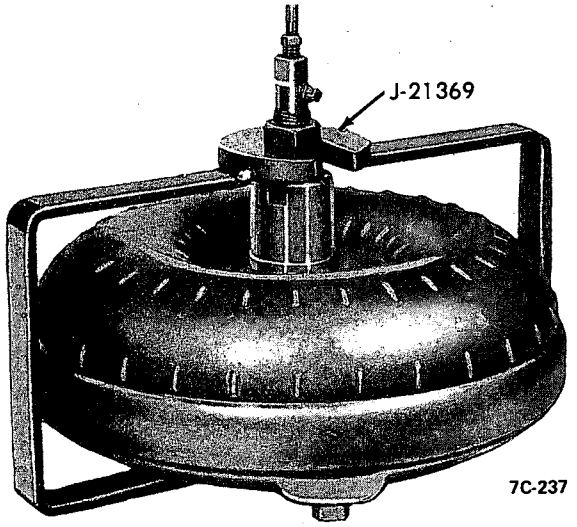


Figure 7C-190

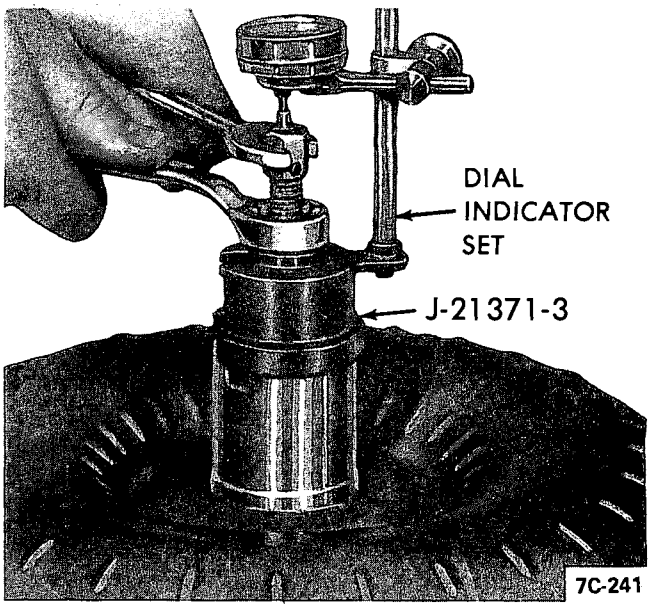


Figure 7C-192

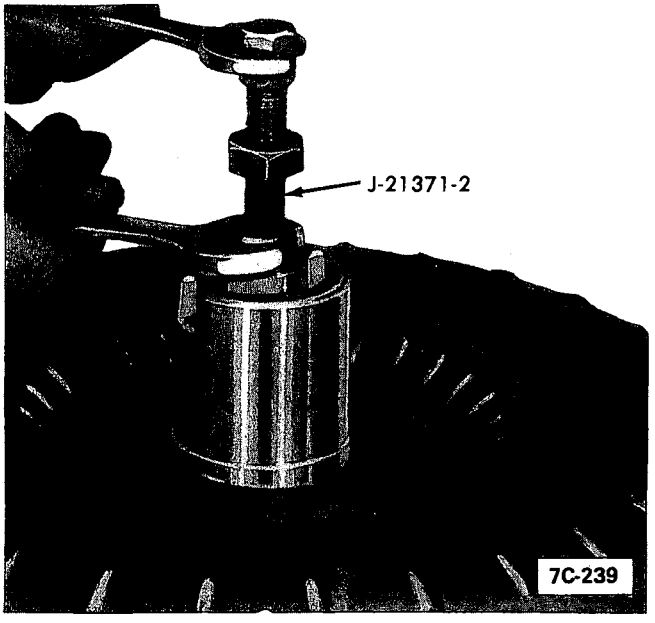


Figure 7C-191

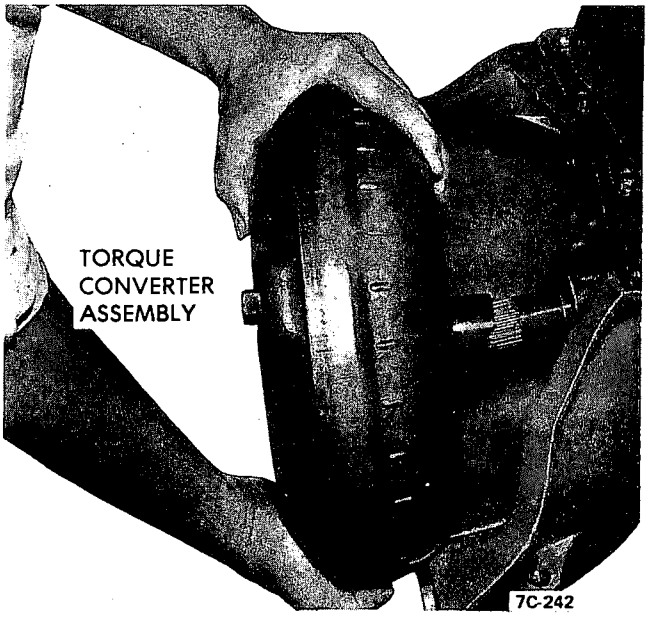


Figure 7C-193

4. Loosen hex nut. See Figure 7C-192. When nut is fully loosened the reading obtained on the dial indicator will be converter end clearance. If clearance is .050" or over and the oil has the appearance of having been mixed with aluminum paint, replace the converter.

Install Converter

See Figure 7C-193.

Install Converter Holding Tool J-21366

INSTALLATION OF GOVERNOR BUSHING

1. Remove transmission from car.

2. Remove the output shaft, valve body, support plate, and governor from the case.

3. Assemble transmission case in fixture J-8763 and mount in a vise. See Figure 7C-194.

4. Clean off excess stock from the governor o- ring seal to case mating surface. See Figure 7C-195.

5. *Loosely bolt the drill bushing fixture J- 22976-1 to the case.*

6. Place the alignment arbor J-22976-3 into the drill bushing fixture and down into the governor bore until it bottoms on the dowel pin. See Figure 7C-196.

7. Torque the bolts on the drill bushing fixture 8-12 lb. ft. *Do not over torque and strip the threads.*

The alignment arbor should be able to rotate freely after

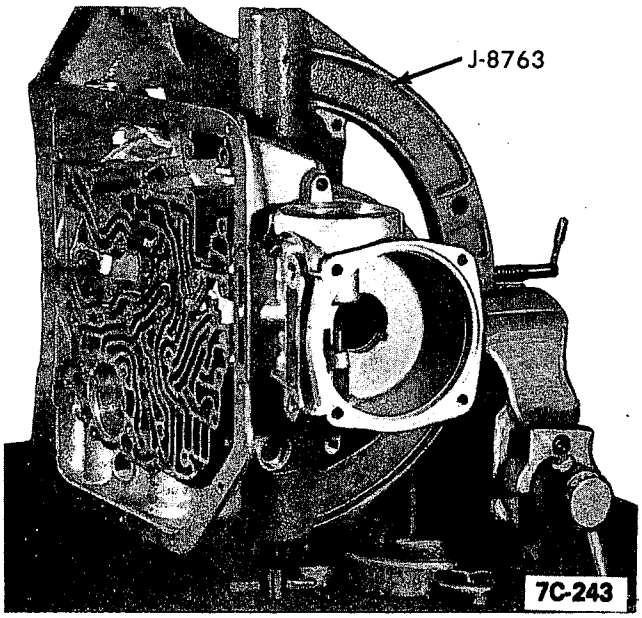


Figure 7C-194

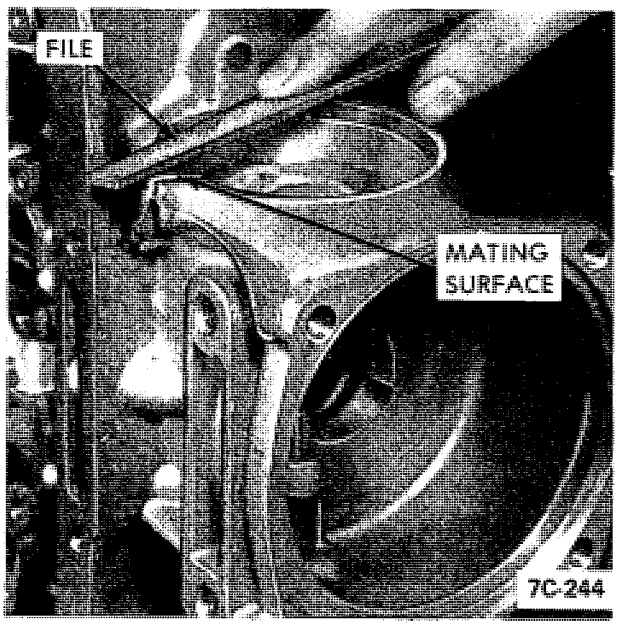


Figure 7C-195

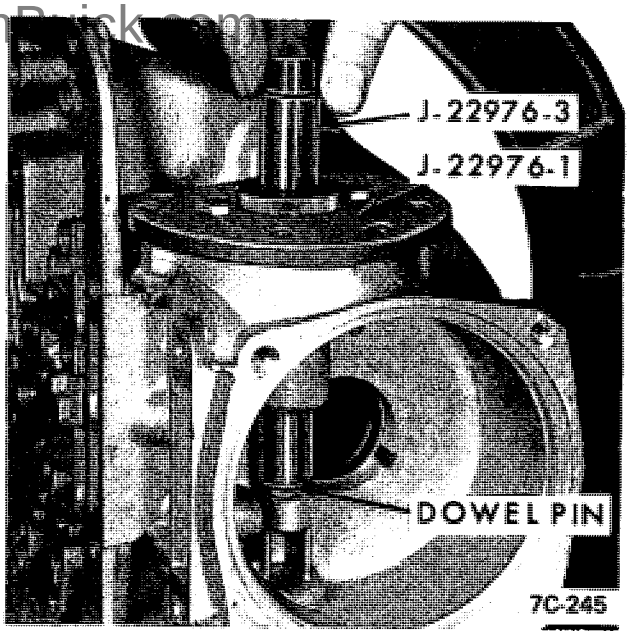


Figure 7C-196

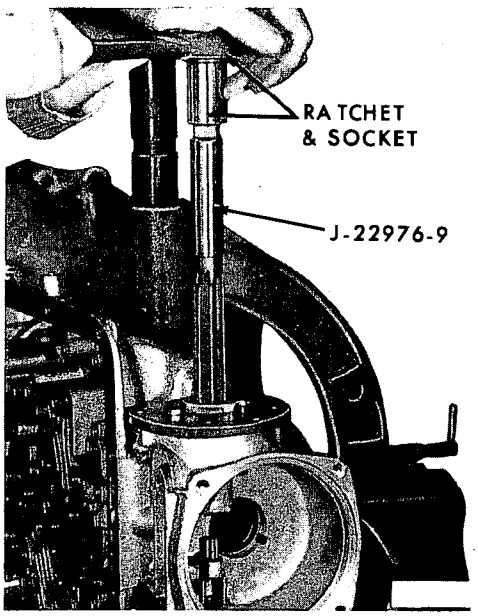


Figure 7C-197

the bolts are properly torqued. If the alignment arbor cannot be rotated by hand, recheck the work performed in step 4.

8. Remove the alignment arbor.

9. Using reamer J-22976-9 and drive rachet, *hand* ream the governor bore using the following procedure: (*Hand Ream Only*)

a. Oil the reamer, drill bushing, and governor bore.

b. Use 5-10 lbs. of feeding force on the reamer. See Figure 7C-197.

c. *After each 10 revolutions* remove the reamer and dip it into a cup full of transmission oil. This will clean the chips from the reamer and lubricate it. See Figure 7C-198.

d. When the reamer reaches the end of the bore, continue reaming the bore until the reamer bottoms out on the dowel pin in the case. *At this point, rotate the reamer 10 complete revolutions.*

e. Remove the reamer using a clockwise rotation and 5-10 lbs. force upward.

Pulling the reamer out without rotating it may score the bore causing a leak between the case and the bushing.

10. Remove the drill bushing fixture from the case.

11. Thoroughly clean the chips from the case, visually check the governor feed holes to insure that they are free from chips.

12. Install the bushing using the following procedure:

a. Note the two (2) notches at one end of the bushing.

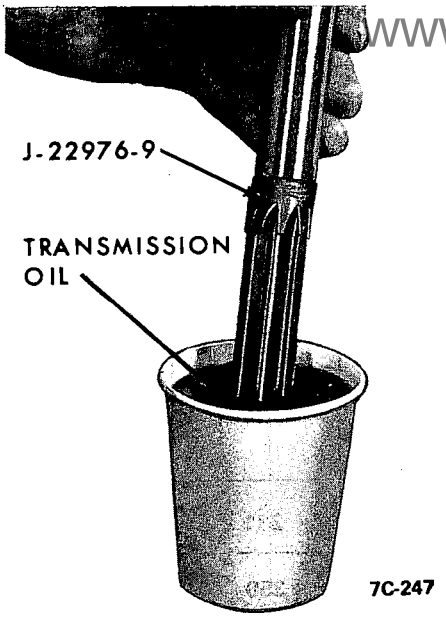


Figure 7C-198

b. Position the notches so that one notch is toward the front of the case and the other is toward the bottom of the case. See Figure 7C-199.

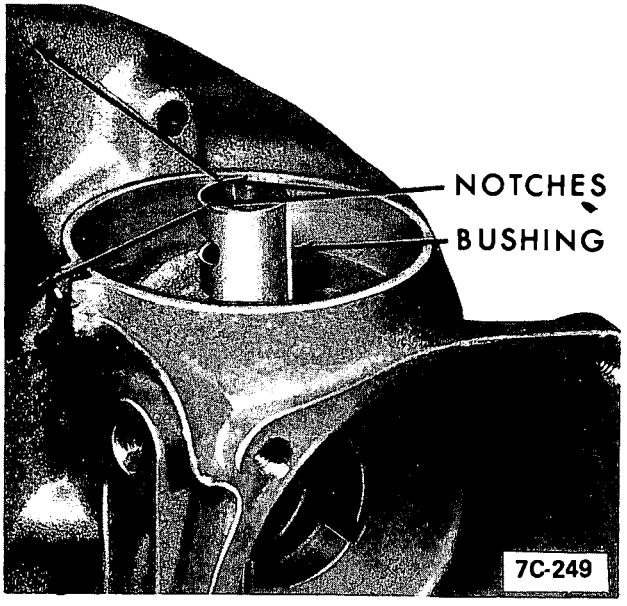


Figure 7C-199

c. Use J-22976-3 alignment arbor and bushing installer to drive the bushing into the case. See Figure 7C-200. A brass hammer should be used to strike the hardened steel bushing installer tool.

d. Drive the bushing until it is flush with the top of the bore and seated properly in the case. See Figure 7C-201.

13. Oil a new governor and insert it into the installed bushing. The governor should spin freely. If slight honing on the bushing is necessary, use crocus or fine emery cloth and move in a circular one-way direction only.

Transmission Identification Number and Car Serial Number

A production day and shift built number, transmission

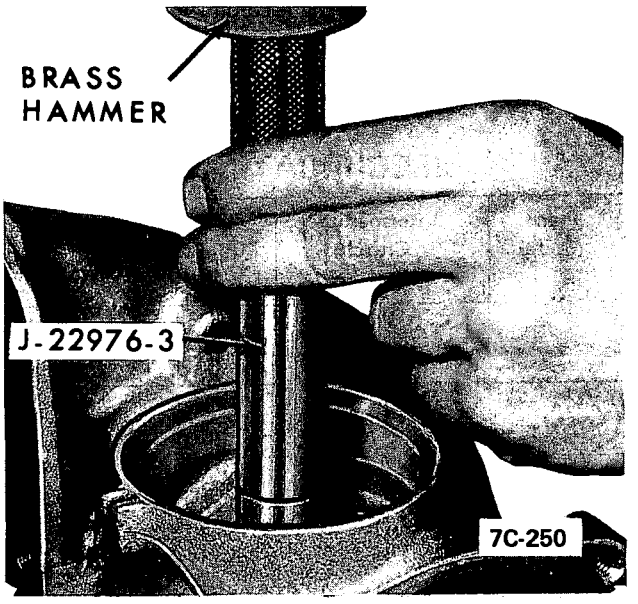


Figure 7C-200

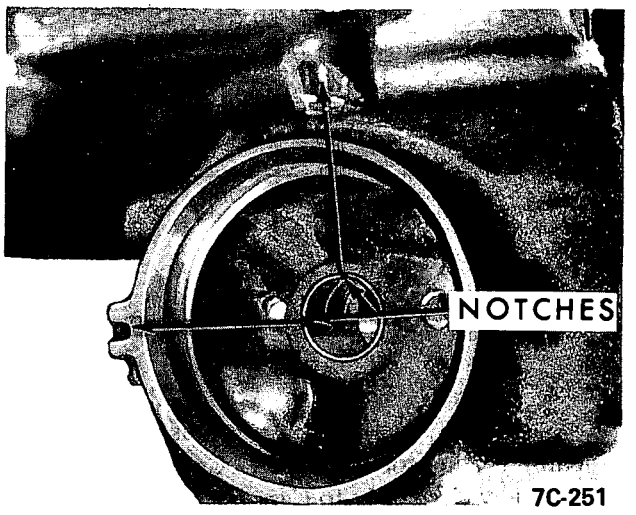
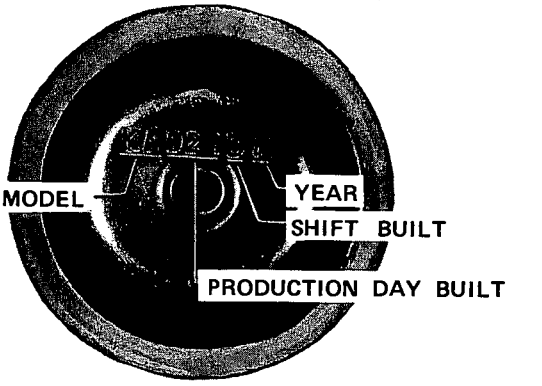


Figure 7C-201



MODEL IDENTIFICATION 5B7C257

Figure 7C-202

model and model year are stamped on the governor cover. See Figure 7C-202. Since the production day built number and model number furnishes the key to construction and interchangeability of parts in each transmission, they should be used when selecting replacement parts as listed in the master parts list. The model number and day built number should always be furnished *on product reports, warranty document forms, and all correspondence with factory concerning a particular transmission.*

SPECIFICATIONS TURBO HYDRA-MATIC 350 ,375B AUTOMATIC TRANSMISSION

Trans. Model	Intermediate Clutch		Direct Clutch		Forward Clutch		Low and Reverse Clutch		Engine Usage	Series
	Driven Plate	Drive Plate	Driven Plate	Drive Plate	Driven Plate	Drive Plate	Driven Plate	Drive Plate		
KX Fed. KD Cal.	2	2	3	3	4	4	4	4	231	H
KA	3	3	4	4	5	5	5	5	350	X
KC	2	2	3	3	4	4	4	4	231	X
KB	2	2	3	3	4	4	4	4	231	A
KE	3	3	4	4	5	5	5	5	350	A
NC Cal. LA Fed.	2	2	3	3	4	4	4	4	260	X
JE	2	2	3	3	4	4	4	4	250	X
KL	3	3	5	5	5	5	5	5	350	B

B. TIGHTENING SPECIFICATIONS

Location	Thread Size	Torque Lbs. Ft.
Oil Pan to Transmission Case	5/16 - 18	13
Pump Assembly to Transmission Case	5/16 - 18	20
Vacuum Modulator Retainer to Case	5/16 - 18	12
Valve Body Assembly to Case	5/16 - 18	13
Oil Channel Support Plate to Case	5/16 - 18	13
Pump Body to Pump Cover	5/16 - 18	15
Parking Lock Bracket to Case	5/16 - 18	29
Extension Housing to Case	3/8 - 16	35
Inside Shift Nut	3/8 - 16	30
External Test Plugs to Case	1/8 - 27	8

5B7C256

Figure 7C-203