PREVIOUS
MENU

A-413 and A-670 TORQUEFLITE AUTOMATIC TRANSAXLES

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AUTOMATIC TRANSMISSION SERVICE GROUP

INTRODUCTION

A–670

The A-670 is a three speed automatic transaxle, built by the Chrysler Corporation. This three speed transaxle differs from the A-404 series of transmissions with the addition of the lock-up solenoid, transmission housing, clutch drum, final drive carrier and more. We have put the updated parts together with the previous parts showing the running changes and the interchangeability.

This booklet was designed to help the technician identify the parts differences by putting the illustrations in the assembly sections.

We thank the Chrysler Corporation for information and illustrations used in this booklet.

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NOTES----NOTES----NOTES----NOTES

GENERAL INFORMATION

Safety goggles should be worn at all times when working on these transaxles.

These transaxles combine a torque converter, fully automatic 3 speed transmission, final drive gearing, and differential into a compact front-wheel-drive system. The unit is basically a "Metric" design.

The identification markings and usage of the transaxle are charted in Diagnosis and Tests.

Transaxle operation requirements are different for each vehicle and engine combination and some internal parts will be different to provide for this. Therefore, when replacing parts, refer to the seven digit part number stamped on rear of the transaxle oil pan flange.

Within this transaxle, there are 3 primary areas:

(1) Main center line plus valve body (similar to the rear-wheel-drive TorqueFlite).

(2) Transfer shaft center line (includes governor and parking sprag).

(3) Differential center line.

Center distances between the main rotating parts in these 3 areas are held precisely to maintain a low noise level through smooth accurate mesh of the gears connecting the center lines.

The torque converter, transaxle area, and differential are housed in an integral aluminum die casting. **The "differential oil sump" is common with the "transaxle sump." Separate filling of the differential is NOT necessary.**

The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the converter is accomplished by circulating the transaxle fluid through an oil-to-air type cooler, located in front of the radiator. The torque converter assembly is a sealed unit that cannot be disassembled.

The transaxle fluid is filtered by an internal filter attached to the lower side of the valve body assembly.

Engine torque is transmitted to the torque converter then, through the input shaft to the multiple-disc clutches in the transaxle. The power flow depends on the application of the clutches and bands. Refer to "Elements in Use Chart" in Diagnosis and Tests section.

The transaxle consists of two multiple-disc clutches, an overrunning clutch, two servos, a hydraulic accumulator, two bands, and two planetary gear sets to provide three forward ratios and a reverse ratio. The common sun gear of the planetary gear sets is connected to the front clutch by a driving shell which is splined to the sun gear and to the front clutch retainer. The hydraulic system consists of an oil pump, and a single valve body which contains all of the valves except the governor valves.

The transaxle sump and differential sump are both vented through the dipstick.

Output torque from the main center line is delivered through helical gears to the "transfer shaft." This gear set is a factor of the final drive (axle) ratio. The shaft also carries the governor and parking sprag.

An integral helical gear on the transfer shaft drives the differential ring gear. The final drive gearing is completed with two gear sets producing an overall top gear ratio of 3.02 for 2.5L and 3.02 for 3.0L engines.

Lockup Torque Converter

The lockup torque converter is standard on vehicles equipped with the 3.0L engine.

The lockup mode is activated only in direct drive and is controlled by the engine electronics. A lockup solenoid on the valve body transfer

plate, is powered by the Single Engine Module Controller (S.M.E.C.) to activate torque converter lockup.

HYDRAULIC CONTROL SYSTEM

The hydraulic control circuits show the position of the various valves with color coded passages to indicate those under hydraulic pressure for all operations of the transaxle.

The hydraulic control system makes the transaxle fully automatic, and has four important functions to perform. In a general way, the components of any automatic control system may be grouped into the following basic groups:

The pressure supply system, the pressure regulating valves, the flow control valves, the clutches, and band servos.

Taking each of these basic groups or systems in turn, the control system may be described as follows:

Pressure Supply System

The pressure supply system consists of an oil pump driven by the engine through the torque converter. The single pump furnishes pressure for all the hydraulic and lubrication requirements. **Oil pump housing assemblies are available with preselected pump gears.**

Pressure Regulating Valves

The pressure regulating valves consist of a regulator valve which controls line pressure at a value dependent on throttle opening.

The governor valve transmits regulated pressure to the valve body (in conjunction with vehicle speed) to control upshift and downshift.

The throttle valve transmits regulated pressure to the transaxle (in conjunction with throttle position) to control upshift and downshift.

Flow Control Valves

The manual valve provides the different transaxle drive ranges as selected by the vehicle operator.

The 1-2 shift valve automatically shifts the transaxle from first to second or from second to first, depending on the vehicle operation.

The 2-3 shift valve automatically shifts the transaxle from second to third or from third to second depending on the vehicle operation.

The kickdown valve makes possible a forced downshift from third to second, second to first, or third to first (depending on vehicle speed) by depressing the accelerator pedal past the detent "feel" near wide open throttle.

The shuttle valve has two separate functions and performs each independently of the other. The first is that of providing fast release of the kickdown band, and smooth front clutch engagement when the driver makes a "lift-foot" upshift from second to third. The second function of the shuttle valve is to regulate the application of the kickdown servo and band when making third to second kickdowns.

The by-pass valve provides for smooth application of the kickdown band on 1-2 upshifts.

The lockup solenoid allows for the electronic control of the lockup clutch inside the torque converter. Electronic control of the torque converter lockup includes unlocking the torque converter at closed throttle, during engine warmup, and during part-throttle acceleration.

The switch valve directs oil to apply the lockup clutch in one position and releases the lockup clutch in the other position.

Clutches, Band Servos, and Accumulator

The front and rear clutch pistons, and both servo pistons are moved hydraulically to engage the clutches and apply the bands. The pistons are released by spring tension when hydraulic pressure is released. On the 2-3 upshift, the kickdown servo piston is released by spring tension and hydraulic pressure.

The accumulator controls the hydraulic pressure on the apply side of the kickdown servo during the 1-2 upshift; thereby, cushioning the kickdown band application at any throttle position.

OPERATING INSTRUCTIONS

The quality of the shifts is very important; all shifts should be smooth and positive with no noticeable engine runaway. See "Diagnosis and Tests" for chart.

Gearshift and Parking Lock Controls

The transaxle is controlled by a "lever type" gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), and D (drive), 2 (second), and 1 (first). The parking lock is applied by moving the selector lever past a gate to the "P" position.

Do not apply the parking lock until the vehicle has stopped; otherwise, a severe ratcheting noise will occur.

Starting the Engine

The engine will start with the selector lever in

either the P (park) or N (neutral) positions. As a safety precaution when starting in the N (neutral) position, apply the parking or foot brake. The TorqueFlite Transaxle will not permit starting the engine by pushing or towing the vehicle.

Mountain Driving

When driving in the mountains with either heavy loads or when pulling trailers, the 2 (second) or 1 (low) position should be selected on upgrades which require heavy throttle for 1/2 mile or more. This reduces possibility of overheating the transaxle and torque converter under these conditions.

Towing Vehicle

Refer to Lubrication and Maintenance, "Group 0" for towing instructions.

TORQUEFLITE DIAGNOSIS AND TESTS

DIAGNOSIS—GENERAL

Automatic transaxle malfunctions may be caused by four general conditions: poor engine performance, improper adjustments, hydraulic malfunctions, and mechanical malfunctions. Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level and condition, gearshift cable adjustment, and throttle pressure cable adjustment. Then perform a road test to determine if the problem has been corrected or that more diagnosis is necessary. If the problem exists after the preliminary tests and corrections are completed, hydraulic pressure tests should be performed.

Fluid Level and Condition

The transmission and differential sump have a common oil sump with a communicating opening between the two.

Before removing the dipstick, wipe all dirt off of the protective disc and the dipstick handle.

Since this torque converter fills in both the "P" Park and "N" Neutral positions, place the selector lever in "P" Park to be sure that the fluid level check is accurate. **The engine should be running at idle speed for at least one minute, with the vehicle on level ground. This will assure complete oil level stabilization between differential and transmission.** The fluid should be at normal operating temperature (approximately 82°C or 180°F). The fluid level is correct if it is in the "HOT" region (cross-hatched area) on the dipstick.

Low fluid level can cause a variety of conditions because it allows the pump to take in air along with the fluid. As in any hydraulic system, air bubbles make the fluid spongy, therefore, pressures will be low and build up slowly.

Improper filling can also raise the fluid level too high. When the transaxle has too much fluid, the gears churn up foam and cause the same conditions which occur with a low fluid level.

In either case, the air bubbles can cause overheating, fluid oxidation, and varnishing, which can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from the transaxle vent (dipstick handle) where it may be mistaken for a leak.

Along with fluid level, it is important to check the condition of the fluid. When the fluid smells burned, and is contaminated with metal or friction material particles, a complete transaxle overhaul is needed. Be sure to examine the fluid on the dipstick closely. If there is any doubt about its condition, drain out a sample for a double check.

After the fluid has been checked, seat the dipstick fully to seal out water and dirt.

Gearshift Linkage

Normal operation of the neutral safety switch provides a quick check to confirm proper manual linkage adjustment.

Move the selector lever slowly upward until it clicks into the "P" Park notch in the selector gate. If the starter will operate the "P" position is correct.

After checking "P" position move the selector slowly toward "N" Neutral position until the lever drops at the end of the "N" stop in the selector gate. If the starter will also operate at this point the gearshift linkage is properly adjusted. If adjustment is required, refer to "Gearshift Linkage Adjustment" in "Maintenance and Adjustments".

Throttle Pressure Cable

The throttle pressure cable adjustment is very important to proper transaxle operation. This

ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

Lever Position	Start Safety	Parking Sprag	Clutches: Front	Clutches: Rear	Clutches: Lockup	Clutches: Over-running	Bands: (Kickdown) Front	Bands: (Low-Rev.) Rear
P—PARK	X	X						
R—REVERSE			X					X
N—NEUTRAL	X							
D—DRIVE:								
First				X		X		
Second				X			X	
Third			X	X	X			
2—SECOND:								
First				X		X		
Second				X			X	
1—LOW (First)				X				X

adjustment positions a valve which controls shift speed, shift quality, and part throttle downshift sensitivity. If the setting is too long, early shifts and slippage between shifts may occur. If the setting is too short, shifts may be delayed and part throttle downshifts may be very sensitive.

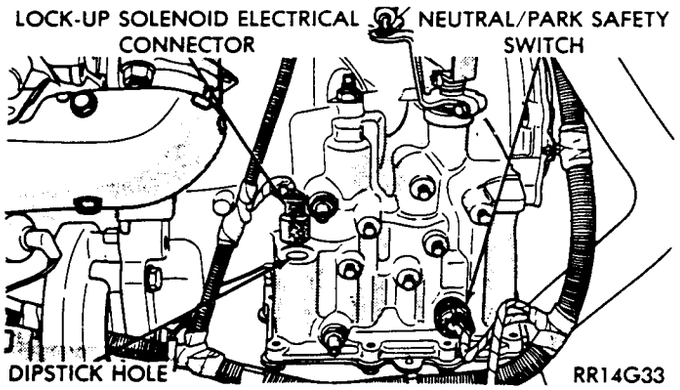


Fig. 1—Lockup Solenoid Wiring Connector

Lockup Solenoid Wiring Connector

If wiring connector is unplugged, the torque converter will not lock up.

Road Test

Prior to performing a road test, be certain that the fluid level and condition, and control cable adjustments have been checked and approved.

During the road test, the transaxle should be operated in each position to check for slipping and any variation in shifting. Note whether the shifts are harsh or spongy.

Observe closely for slipping or engine speed flare-up. Slipping or flare-up in any gear usually indicates clutch, band, or overrunning clutch problems. If the condition is far advanced, an overhaul will probably be necessary to restore normal operation.

In most cases, the clutch or band that is slipping can be determined by noting the transaxle operation in all selector positions and by comparing which internal units are applied in those positions. The "Elements in Use Chart" provides a basis for road test analysis.

By observing that the rear clutch is applied in both the "D" first gear and "1" first gear positions, but that the overrunning clutch is applied in "D" first and the low and reverse band is applied in "1" first, if the transaxle slips in "D" range first gear but does not slip in "1" first gear, the overrunning clutch must be the unit that is slipping. Similarly, if the transaxle slips in any two forward gears, the rear clutch is the slipping unit.

Using the same procedure, the rear clutch and front clutch are applied in "D" third gear. If the transaxle slips in third gear, either the front clutch or the rear clutch is slipping. By selecting another gear which does not use one of those units, the unit which is slipping can be determined. If the transaxle also slips in reverse, the front clutch is slipping. If the transaxle does not slip in reverse, the rear clutch is slipping.

This process of elimination can be used to detect any unit which slips and to confirm proper operation of good units. However, although road test analysis can usually diagnose slipping units, the actual cause of the malfunction usually cannot be decided. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

Therefore, unless the condition is obvious, like no drive in "D" range first gear only, the transaxle should never be disassembled until hydraulic pressure tests have been performed.

HYDRAULIC PRESSURE TESTS

Pressure testing is a very important step in the diagnostic procedure. These tests usually reveal the cause of most transaxle problems.

Before performing pressure tests, be certain that fluid level and condition, and control cable adjustments have been checked and approved. Fluid must be at operating temperature (150 to 200 degrees F.).

Install an engine tachometer, raise vehicle on hoist which allows front wheels to turn, and position tachometer so it can be read.

Disconnect throttle cable and shift cable from transaxle levers so they can be controlled from outside the vehicle.

Attach 150 psi gauges to ports required for test being conducted. A 300 psi gauge (C-3293) is required for "reverse" pressure test at rear servo.

Test port locations are shown in (Fig. 3).

Test One (Selector in "1")

(1) Attach gauges to "line" and "low-reverse" ports.

(2) Operate engine at 1000 rpm for test.

(3) Move selector lever on transaxle all the way rearward ("1" position).

(4) Read pressures on both gauges as throttle lever on transaxle is moved from full clockwise position to full counterclockwise position.

(5) Line pressure should read 52 to 58 psi with throttle lever clockwise and gradually increase, as lever is moved counterclockwise, to 80 to 88 psi.

(6) Low-reverse pressure should read the same as line pressure within 3 psi.

(7) This tests pump output, pressure regulation, and condition of rear clutch and rear servo hydraulic circuits.

Test Two (Selector in "2")

(1) Attach gauge to "line pressure" port and "tee" into lower cooler line fitting to read "lubrication" pressure.

(2) Operate engine at 1000 rpm for test.

(3) Move selector lever on transaxle one "detent" forward from full rearward position. This is selector "2" position.

(4) Read pressures on both gauges as throttle lever on transaxle is moved from full clockwise position to full counterclockwise position.

(5) Line pressure should read 52 to 58 psi with throttle lever clockwise and gradually increase, as lever is moved counterclockwise, to 80 to 88 psi.

(6) Lubrication pressure should be 10 to 25 psi with lever clockwise and 10 to 35 psi with lever full counterclockwise.

(7) This tests pump output, pressure regulation, and condition of rear clutch and lubrication hydraulic circuits.

Test Three (Selector in "D")

(1) Attach gauges to "line" and "kickdown release" ports.

(2) Operate engine at 1600 rpm for test.

(3) Move selector lever on transaxle two "detents" forward from full rearward position. This is selector "D" position.

(4) Read pressures on both gauges as throttle lever on transaxle is moved from full clockwise position to full counterclockwise position.

(5) Line pressure should read 52 to 58 psi with throttle lever clockwise and gradually increase, as lever is moved counterclockwise to 80 to 88 psi.

(6) Kickdown release is pressurized only in direct drive and should be same as line pressure within 3 psi, up to kickdown point.

(7) This tests pump output, pressure regulation, and condition of rear clutch, front clutch. and hydraulic circuits.

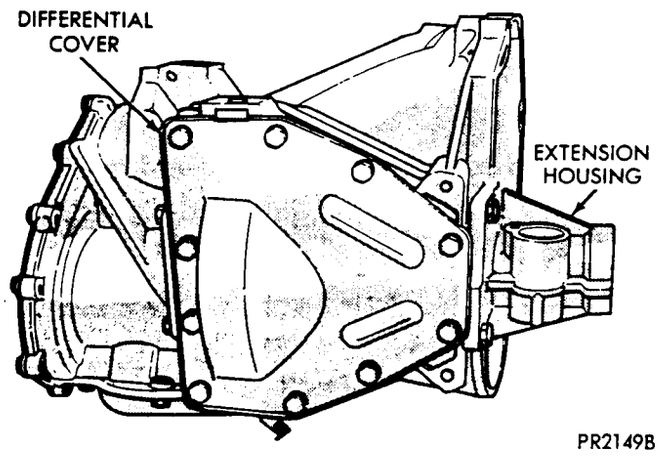


Fig. 1—Transaxle (Right Side)

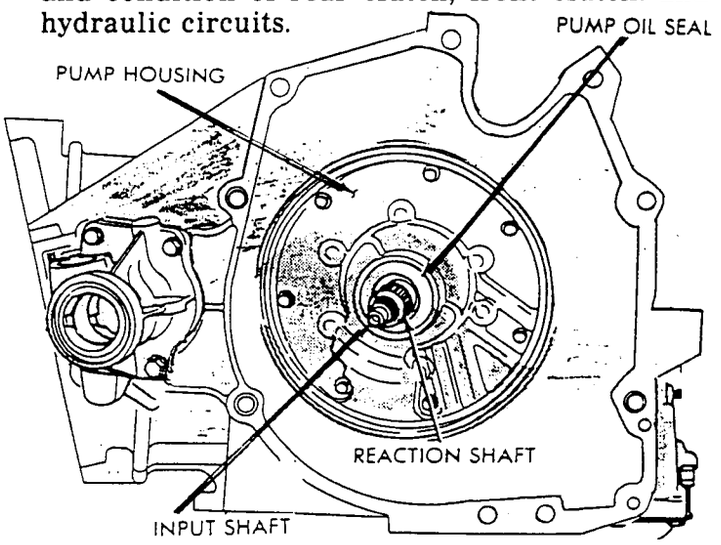


Fig. 2—Transaxle (Front End View)

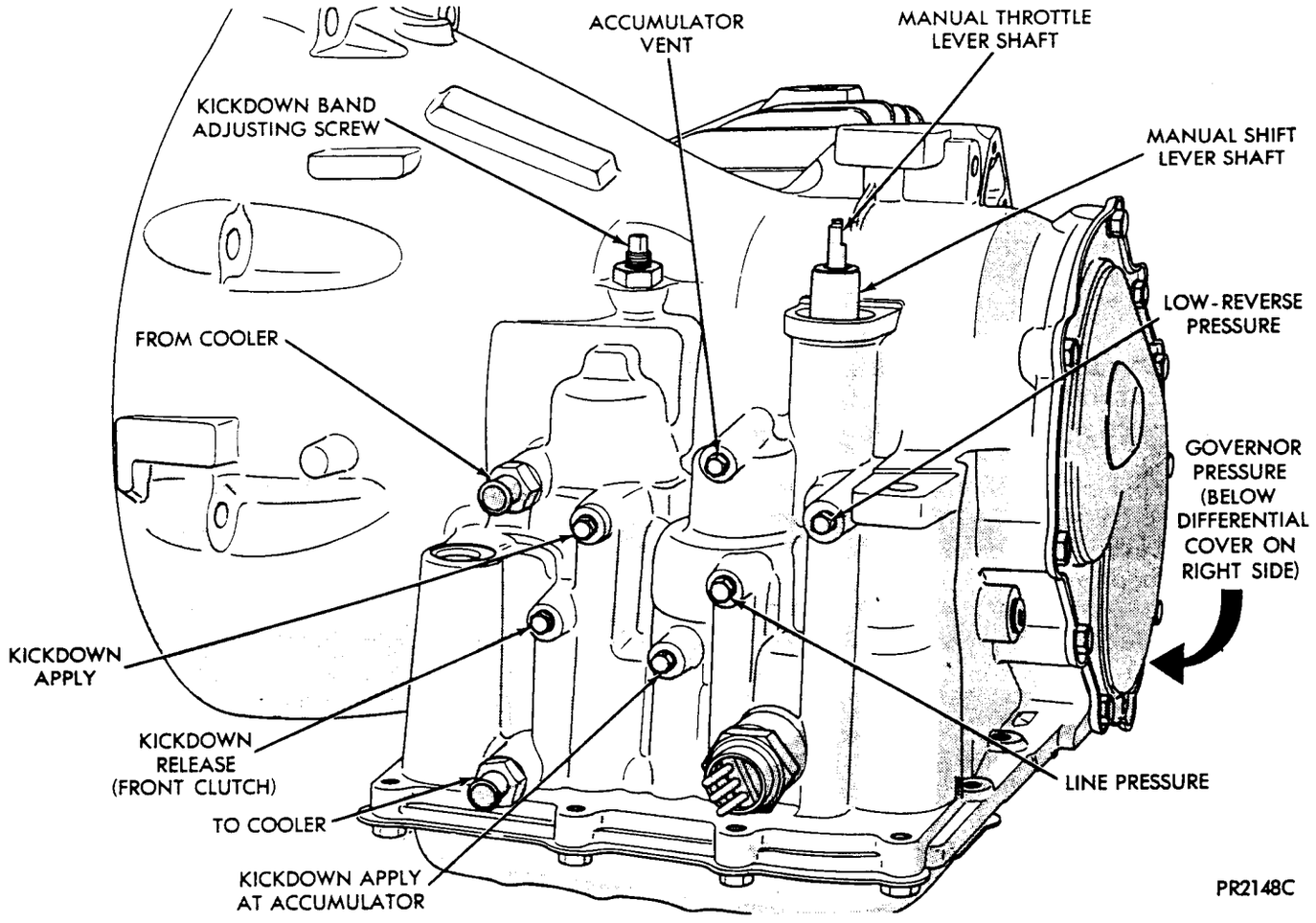


Fig. 3—Transaxle (Left Side)

Test Four (Selector in Reverse)

(1) Attach 300 psi gauge to "low-reverse" port.

(2) Operate engine at 1600 rpm for test.

(3) Move selector lever on transaxle four "detents" forward from full rearward position. This is selector "R" position.

(4) Low-reverse pressure should read 180 to 220 psi with throttle lever clockwise and gradually increase, as lever is moved counterclockwise to 260 to 300 psi.

(5) This tests pump output, pressure regulation, and condition of front clutch and rear servo hydraulic circuits.

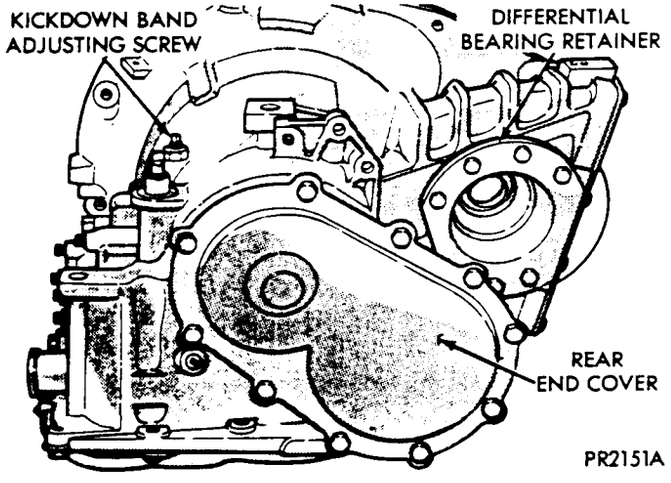


Fig. 4—Transaxle (Rear End View)

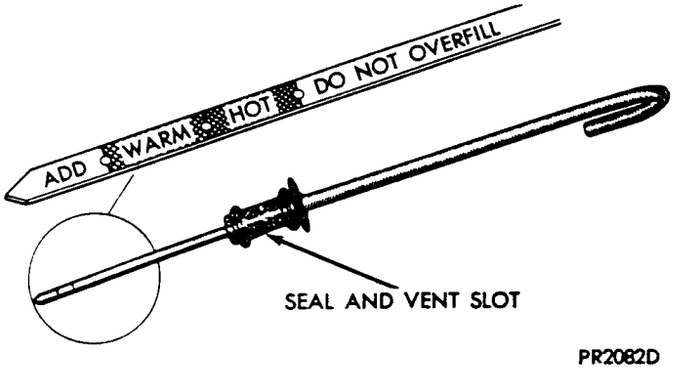


Fig. 5—Dipstick and Transaxle Vent

(6) Move selector lever on transaxle to "D" position to check that low-reverse pressure drops to zero.

(7) This tests for leakage into rear servo, due to case porosity, which can cause reverse band burn out.

Test Result Indications

(1) If proper line pressure, minimum to maximum, is found in any one test, the pump and pressure regulator are working properly.

(2) Low pressure in "D, 1, and 2" but correct pressure in "R" indicates rear clutch circuit leakage.

(3) Low pressure in "D and R" but correct pressure in "1" indicates front clutch circuit leakage.

(4) Low pressure in "R and 1" but correct pressure in "2" indicates rear servo circuit leakage.

(5) Low line pressure in all positions indicates a defective pump, a clogged filter, or a stuck pressure regulator valve.

Governor Pressure

Test only if transaxle shifts at wrong vehicle speeds when throttle cable is correctly adjusted.

(1) Connect a 0-150 psi pressure gauge to governor pressure take-off point, located at lower right side of case, below differential cover (Fig. 3).

(2) Operate transaxle in third gear to read pressures and compare speeds shown in chart.

If governor pressures are incorrect at the given vehicle speeds, the governor valves are probably sticking. The governor pressure should respond smoothly to changes in mph and should return to 0 to 3 psi when vehicle is stopped. High pressure at standstill (above 3 psi) will prevent the transaxle from downshifting.

Throttle Pressure

No gauge port is provided for throttle pressure. Incorrect throttle pressure should only be suspected if part throttle upshift speeds are either delayed or occur too early in relation to vehicle speeds, with correctly adjusted throttle cable. Engine runaway on either upshifts or downshifts can also be an indicator of incorrect (low) throttle pressure setting, or misadjusted throttle cable.

In no case should throttle pressure be adjusted until the transaxle throttle cable adjustment has been verified to be correct.

TORQUE CONVERTER STALL TEST

WARNING: Do not let anyone stand in front of vehicle during test.

The stall test consists of determining the engine speed obtained at full throttle in "D" position only, with the front wheels blocked. This test checks the torque converter stator clutch operation, and the holding ability of the transaxle clutch. The transaxle oil level should be checked and the engine brought to normal operating temperature before stall operation.

Both the parking and service brakes must be fully applied and front wheels blocked while making this test.

Do not hold the throttle open any longer than is necessary to obtain a maximum engine speed reading, and never longer than five seconds at a time. If more than one stall check is required, operate the engine at approximately 1,000 rpm in neutral for 20 seconds to cool the transmission fluid between runs. If engine speed exceeds the maximum limits shown, release the accelerator immediately since transaxle clutch slippage is indicated.

Stall Speed Above Specification

If stall speed exceeds the maximum specified in chart by more than 200 rpm, transaxle clutch slippage is indicated. Follow the transaxle oil pressure and air pressure checks outlined in this section to determine the cause of slippage.

Stall Speed Below Specification

Low stall speeds with a properly tuned engine indicate torque converter stator clutch problems. A road test will be necessary to identify the exact problem.

If stall speeds are 250-350 rpm below minimum specification, and the vehicle operates properly at highway speeds, but has poor through-gear acceleration, the stator overrunning clutch is slipping.

TORQUEFLITE TRANSAXLE STALL SPEED CHART

Engine Liter	Transaxle Type	Torque Converter Diameter	Stall Speed Engine rpm
2.5	A-413	9-1/2 inches (241 millimeters)	2225-2425
3.0	A-670	9-1/2 inches (241 millimeters)	2200-2400

If stall speed and acceleration are normal, but abnormally high throttle opening is required to maintain highway speeds, the stator clutch has seized.

Both of these stator defects require replacement of the torque converter.

Noise

A whining or siren-like noise due to fluid flow is normal during stall operation with some torque converters; however, loud metallic noises from loose parts or interference within the assembly indicate a defective torque converter. To confirm that the noise originates within the torque converter, operate the vehicle at light throttle in D and N on a hoist and listen under the transaxle bell housing.

CLUTCH AND SERVO AIR PRESSURE TESTS

A **no drive** condition might exist even with correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands, and servos can be located through a series of tests by substituting air pressure for fluid pressure (Fig. 6).

Compressed air supply must be free of all dirt or moisture. Use a pressure of 30 psi.

The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passages after the valve body assembly has been removed. To make air pressure tests, proceed as follows:

Remove oil pan and valve body (see "Disassembly—Subassembly Removal").

Front Clutch

Apply air pressure to the front clutch apply passage and listen for a dull "thud" which indicates that front clutch is operating. Hold air pressure on for a few seconds and inspect system for excessive oil leaks.

Rear Clutch

Apply air pressure to the rear clutch apply passage and listen for a dull "thud" which indicates that rear clutch is operating. Also inspect for excessive oil leaks. If a dull "thud" cannot be heard in the clutches, place finger tips on clutch housing and again apply air pressure. Movement of piston can be felt as the clutch is applied.

Kickdown Servo (Front)

Direct air pressure into front servo apply passage. Operation of servo is indicated by a

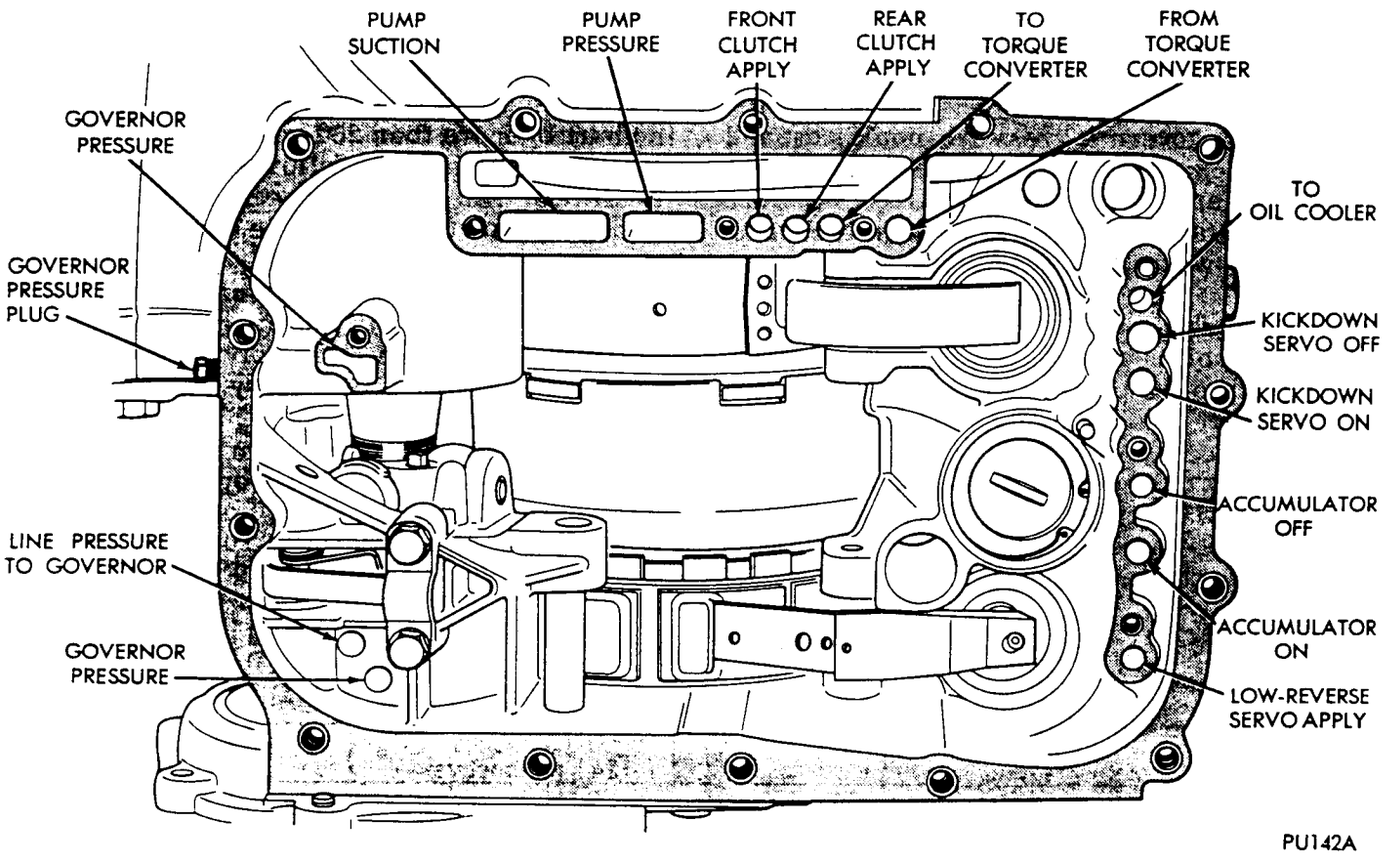


Fig. 6—Air Pressure Tests

tightening of front band. Spring tension on servo piston should release the band.

Low-Reverse Servo (Rear)

Direct air pressure into rear servo apply passage. Operation of servo is indicated by a tightening of rear band. Spring tension on servo piston should release the band.

If clutches and servos operate properly, "no upshift" or "erratic shift" conditions indicate that malfunctions exist in the valve body.

FLUID LEAKAGE—TRANSAXLE TORQUE CONVERTER HOUSING AREA

(1) Check for Source of Leakage.

Since fluid leakage at or around the torque converter area may originate from an engine oil leak, the area should be examined closely. Factory fill fluid is dyed red and, therefore, can be distinguished from engine oil.

(2) Prior to removing the transaxle, perform the following checks:

When leakage is determined to originate from the transaxle, check fluid level prior to removal of the transaxle and torque converter.

High oil level can result in oil leakage out the vent in the dipstick. If the fluid level is high, adjust to proper level.

After performing this operation, inspect for leakage. If a leak persists, perform the following operation on the vehicle to determine if it is the torque converter or transaxle that is leaking.

Leakage Test Probe

(1) Remove torque converter housing dust shield.

(2) Clean the inside of torque converter housing (lower area) as dry as possible. A solvent spray followed by compressed air drying is preferable.

(3) Fabricate and fasten test probe (Fig. 7) securely to convenient dust shield bolt hole. Make

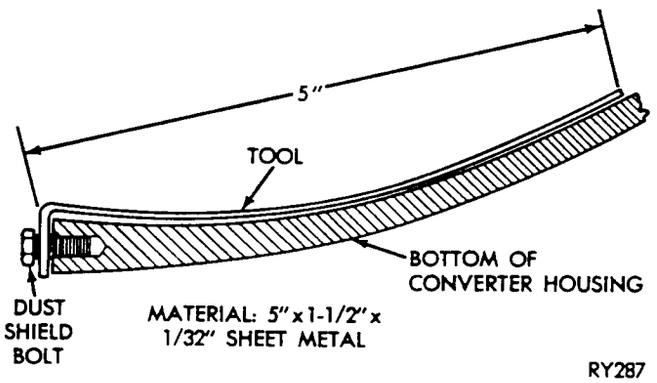


Fig. 7—Leak Locating Test Probe Tool

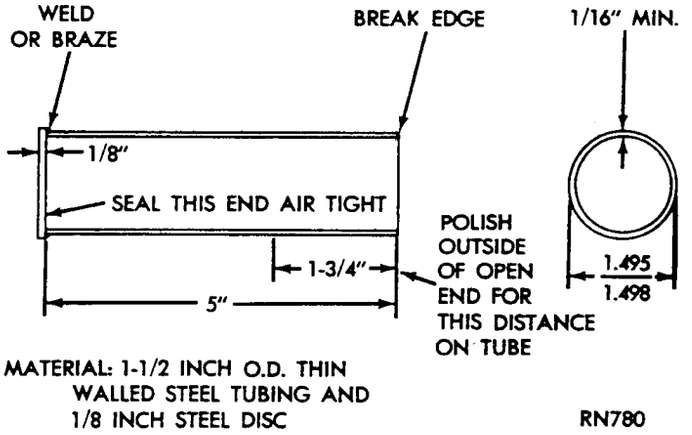


Fig. 8—Torque Converter Hub Seal Cup

certain torque converter is cleared by test probe. Tool must be clean and dry.

(4) Run engine at approximately 2,500 rpm with transaxle in neutral, for about 2 minutes. Transaxle must be at operating temperature.

(5) Stop engine and carefully remove tool.

(6) If upper surface of test probe is dry, there is no torque converter leak. A path of fluid across probe indicates a torque converter leak. Oil leaking under the probe is coming from the transaxle torque converter area.

(7) Remove the transaxle and torque converter assembly from vehicle for further investigation. The fluid should be drained from the transaxle. Reinstall oil pan (with R.T.V. sealant) at specified torque.

Possible sources of transaxle torque converter area fluid leakage are:

(1) Torque converter hub seal.

(a) Seal lip cut, check torque converter hub finish.

(b) Bushing moved and/or worn.

(c) Oil return hole in pump housing plugged or omitted.

(d) Seal worn out (high-mileage vehicles).

(2) Fluid leakage at the outside diameter from pump housing O-ring.

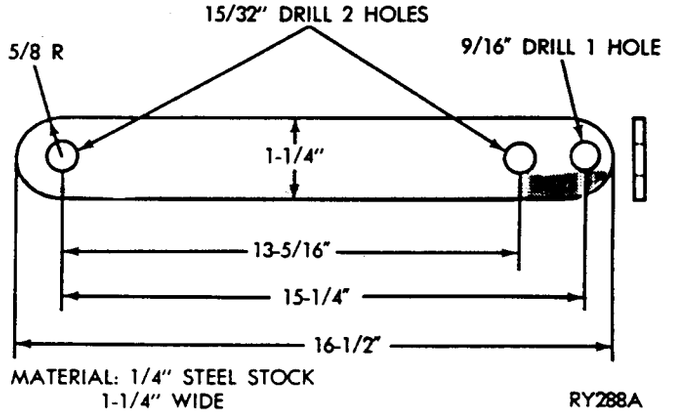


Fig. 9—Hub Seal Cup Retaining Strap

(3) Fluid leakage at the front pump to case bolts. Check condition of washers on bolts and use new bolts if necessary.

(4) Fluid leakage due to case or front pump housing porosity.

Torque Converter Leakage

Possible sources of torque converter leakage are:

(a) Torque converter weld leaks at the outside diameter (peripheral) weld.

(b) Torque converter hub weld.

Hub weld is inside and not visible. Do not attempt to repair. Replace torque converter.

Air Pressure Test of Transaxle

Fabricate equipment needed for test as shown in figures 8 and 9.

The transaxle should be prepared for pressure test as follows after removal of the torque converter:

(1) Install a dipstick bore plug and plug oil cooler line fitting (lower fitting).

(2) With rotary motion, install torque converter hub seal cup over input shaft, and through the torque converter hub seal until the cup bottoms against the pump gear lugs. Secure with cup retainer strap (Fig. 9) using starter upper hole and opposite bracket hole.

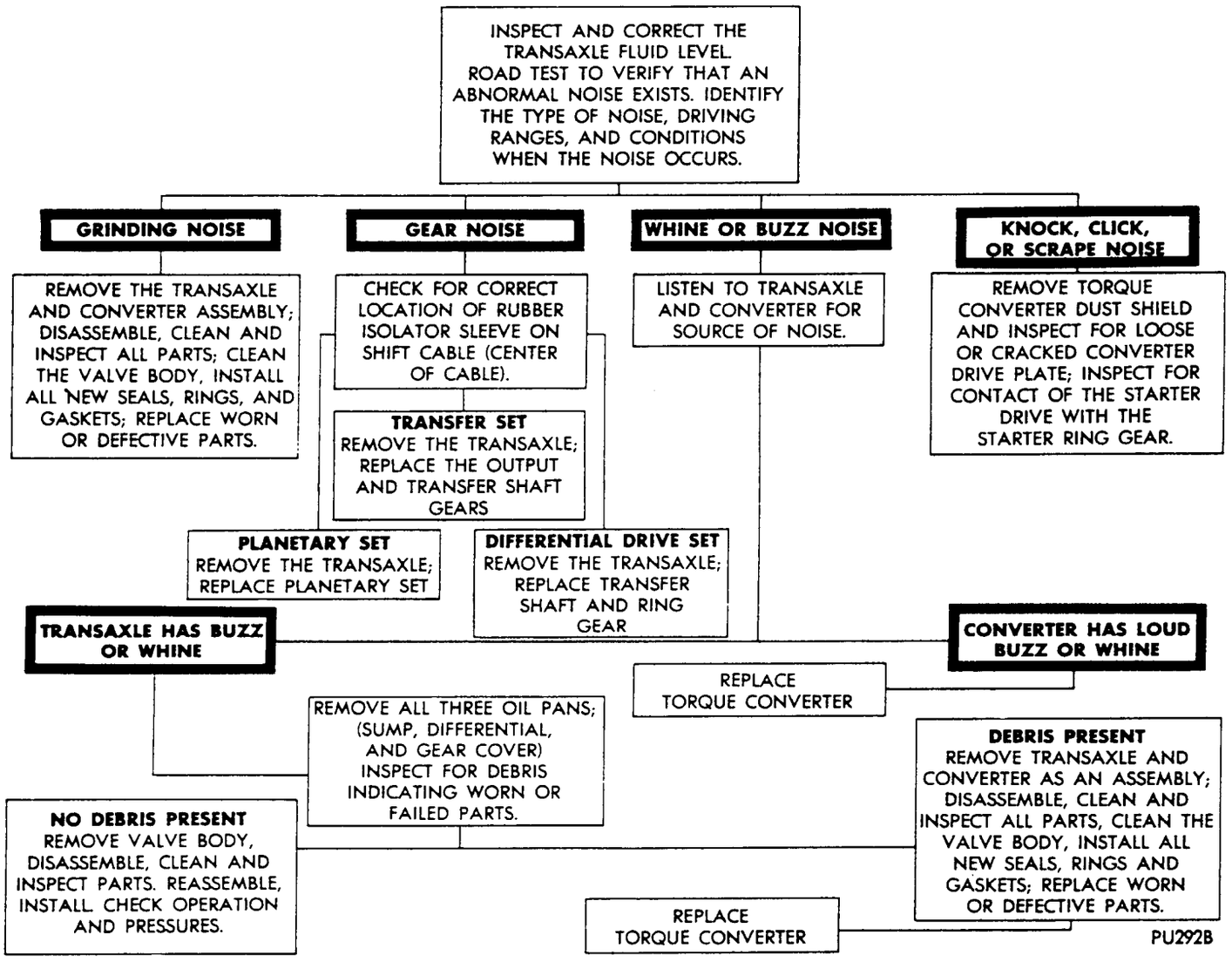
(3) Attach and clamp hose from nozzle of Tool C-4080 to the upper cooler line fitting position in case.

CAUTION: Do not, under any circumstances, pressurize a transaxle to more than 10 psi.

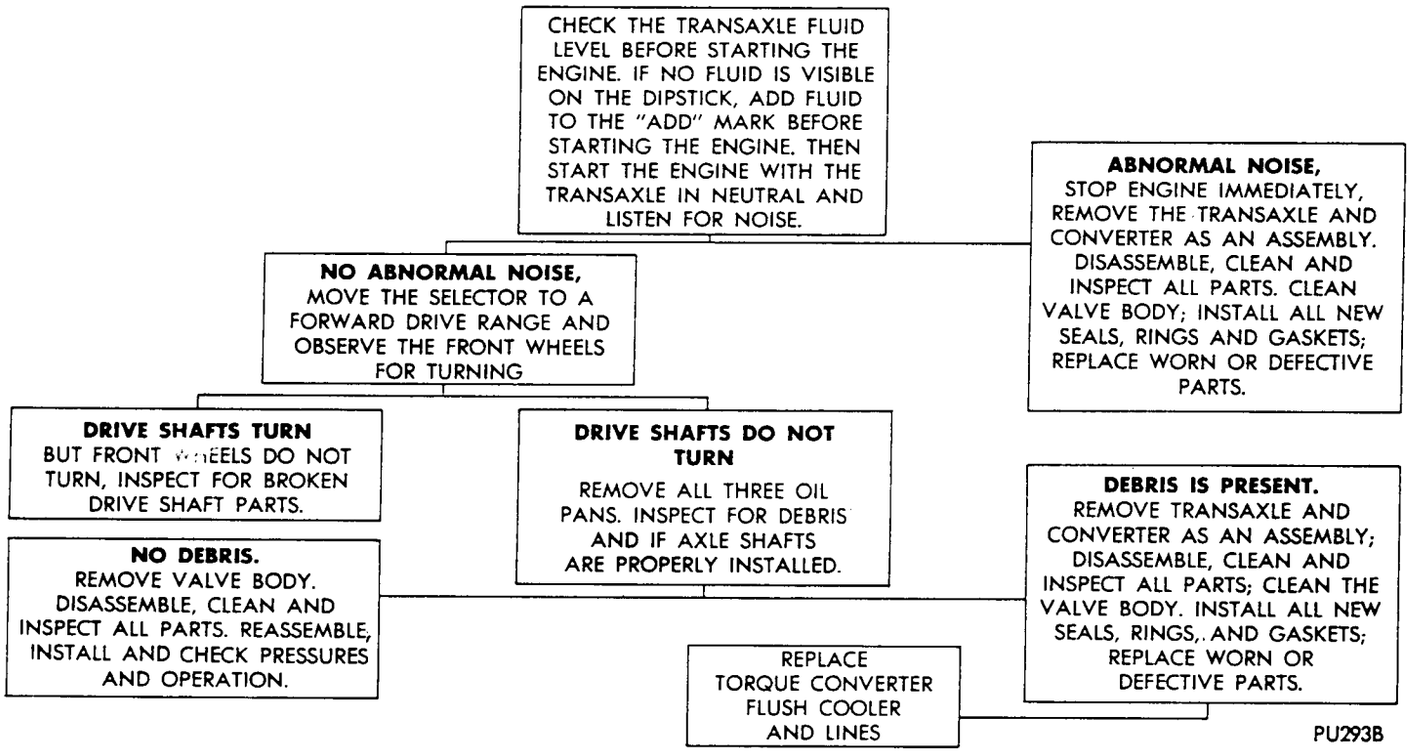
(4) Pressurize the transaxle using Tool C-4080 until the pressure gauge reads 8 psi. Position transaxle so that pump housing and case front may be covered with soapy solution or water. Leaks are sometimes caused by porosity in the case or pump housing.

If a leak source is located, that part and all associated seals, O-rings, and gaskets should be replaced with new parts.

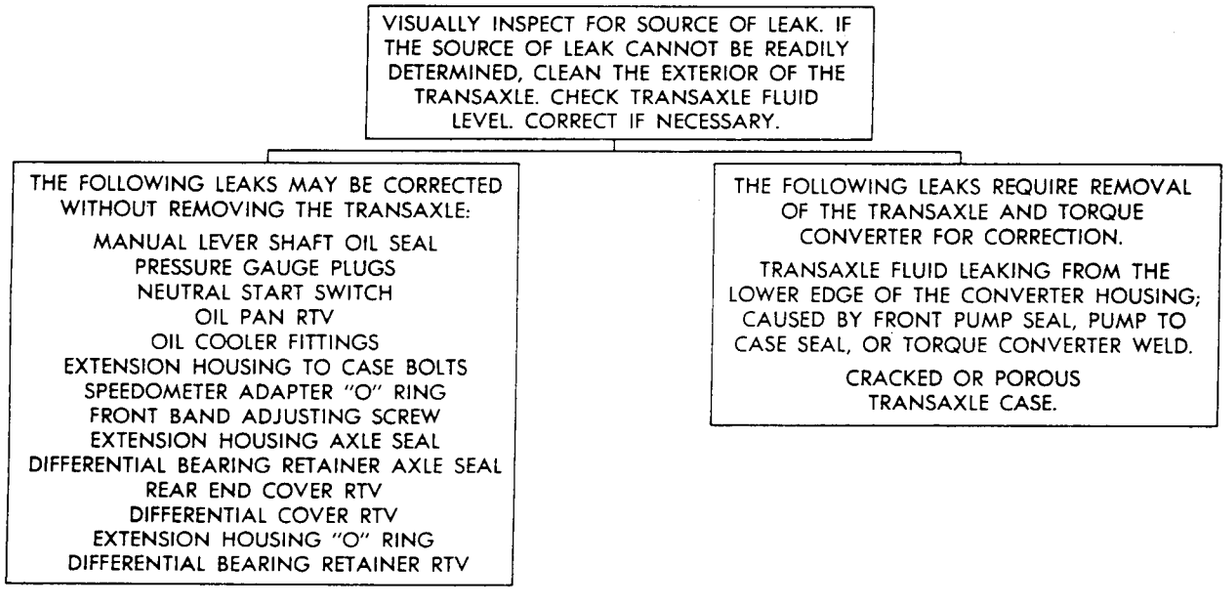
DIAGNOSIS GUIDE-ABNORMAL NOISE



DIAGNOSIS GUIDE-VEHICLE WILL NOT MOVE



DIAGNOSIS GUIDE-FLUID LEAKS



POSSIBLE CAUSE

CONDITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
HARSH ENGAGEMENT FROM NEUTRAL TO D			X			X																												X
R	X		X		X		X																		X				X					X
DELAYED ENGAGEMENT FROM NEUTRAL TO D				X		X		X	X	X	X	X	X	X											X				X					X
R	X			X	X	X	X	X	X	X	X	X	X	X															X					
RUNAWAY UPSHIFT				X		X		X		X			X		X					X		X	X										
NO UPSHIFT				X		X		X	X						X				X	X	X	X	X							X				X
3-2 KICKDOWN RUNAWAY				X		X		X					X		X	X			X			X	X											
NO KICKDOWN OR NORMAL DOWNSHIFT						X									X						X	X												
SHIFTS ERRATIC				X		X		X	X	X	X		X		X				X	X	X	X	X											X
SLIPS IN FORWARD DRIVE POSITIONS				X		X		X	X	X	X	X	X		X	X	X			X	X								X			X		
SLIPS IN REVERSE ONLY	X			X	X	X	X	X	X		X		X							X			X										
SLIPS IN ALL POSITIONS				X		X		X		X	X	X	X																					
NO DRIVE IN ANY POSITION				X		X		X	X	X	X																			X				
NO DRIVE IN FORWARD DRIVE POSITIONS				X		X		X				X					X													X	X			
NO DRIVE IN REVERSE				X	X	X	X		X											X			X							X				
DRIVES IN NEUTRAL						X			X																			X	X	X				
DRAGS OF LOCKS					X																					X					X	X		
GRATING, SCRAPING GROWLING NOISE					X											X	X	X													X	X		
BUZZING NOISE						X		X					X																				X	
HARD TO FILL, OIL BLOWS OUT FILLER HOLE										X			X											X										
TRANSAXLE OVERHEATS		X	X	X				X	X		X															X	X	X						
HARSH UPSHIFT				X											X	X									X								X	
DELAYED UPSHIFT															X	X			X	X	X	X	X											X

Engine performance
Overrunning clutch inner race damaged.
Overrunning clutch worn, broken or seized.
Planetary gear sets broken or seized.
Rear Clutch dragging.
Worn or faulty rear clutch.
Insufficient clutch plate clearance.
Faulty cooling system.
Kickdown band adjustment too tight.
Hydraulic pressure too high.
High fluid level.
Worn or faulty front clutch.
Kickdown servo band or linkage malfunction.
Governor malfunction.
Worn or broken reaction shaft support seal rings.
Governor support seal rings broken or worn.
Driveshaft(s) bushing(s) damaged.
Overrunning clutch not holding.
Kickdown band out of adjustment.
Incorrect throttle linkage adjustment.
Engine idle speed too low.
Aerated fluid.
Worn or broken input shaft seal rings.
Faulty oil pump.
Oil filter clogged.
Incorrect gearshift control linkage adjustment.
Low fluid level.
Low-reverse servo, band or linkage malfunction.
Valve body malfunction or leakage.
Low-reverse band worn out.
Hydraulic pressures too low.
Engine idle speed too high.
Stuck switch valve.
Low-reverse band mis-adjusted.

MAINTENANCE AND ADJUSTMENTS

LUBRICATION

Inspect fluid level on dipstick every six months (Fig. 1) with engine idling and transaxle in park or neutral position. **Allow the engine to idle for at least one minute with vehicle on level ground. This will assure complete oil level stabilization between differential and transmission.** A properly filled transaxle will read near the **ADD** mark when fluid temperature is 21 degrees Celsius (70 degrees Fahrenheit) and in the HOT region at 82 degrees Celsius (180 degrees Fahrenheit) (average operating temperature).

Fluid and Filter Changes

Fluid and filter changes or band adjustments are not required for average passenger vehicle usage.

Severe usage as defined below, requires that fluid and filter be changed, the magnet (on the inside of the differential cover) should be cleaned with a clean, dry cloth, and bands adjusted every 24 000 km (15,000 miles).

(a) More than 50% operation in heavy city traffic during hot weather above 32°C (90°F.)

(b) Police, Taxi, Commercial Type Operation, and Trailer Towing.

When the factory fill fluid is changed as recommended above, only fluids of the type labeled MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176 should be used. A band adjustment and filter change should be made at the time of the oil change and the magnet (on the inside of the oil pan) should be cleaned with a clean, dry cloth.

If the transaxle is disassembled for any reason, the fluid and filter should be changed, and the bands adjusted.

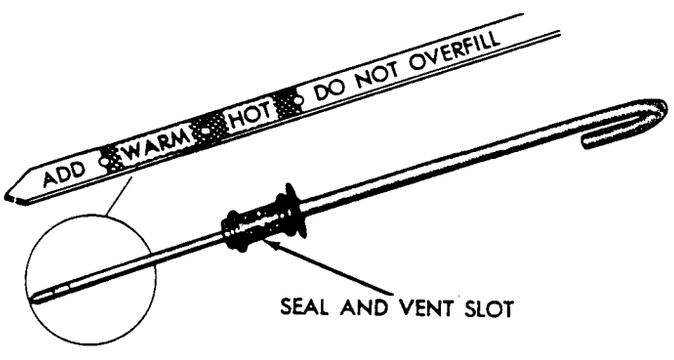


Fig. 1—Dipstick and Transaxle Vent

Drain and Refill

(1) Raise vehicle on a hoist (See Lubrication, "Group 0"). Place a drain container with a large opening, under transaxle oil pan.

(2) Loosen pan bolts and tap the pan at one corner to break it loose allowing fluid to drain, then remove the oil pan.

(3) Install a new filter and gasket on bottom of the valve body and tighten retaining screws to 5 N·m (40 inch-pounds).

(4) Clean the oil pan and magnet. Reinstall pan using new R.T.V. sealant. Tighten oil pan bolts to 19 N·m (165 in. lbs.).

(5) Pour four quarts of MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176 through the dipstick opening.

(6) Start engine and allow to idle for at least one minute. Then, with parking and service brakes applied, move selector lever momentarily to each position, ending in the park or neutral position.

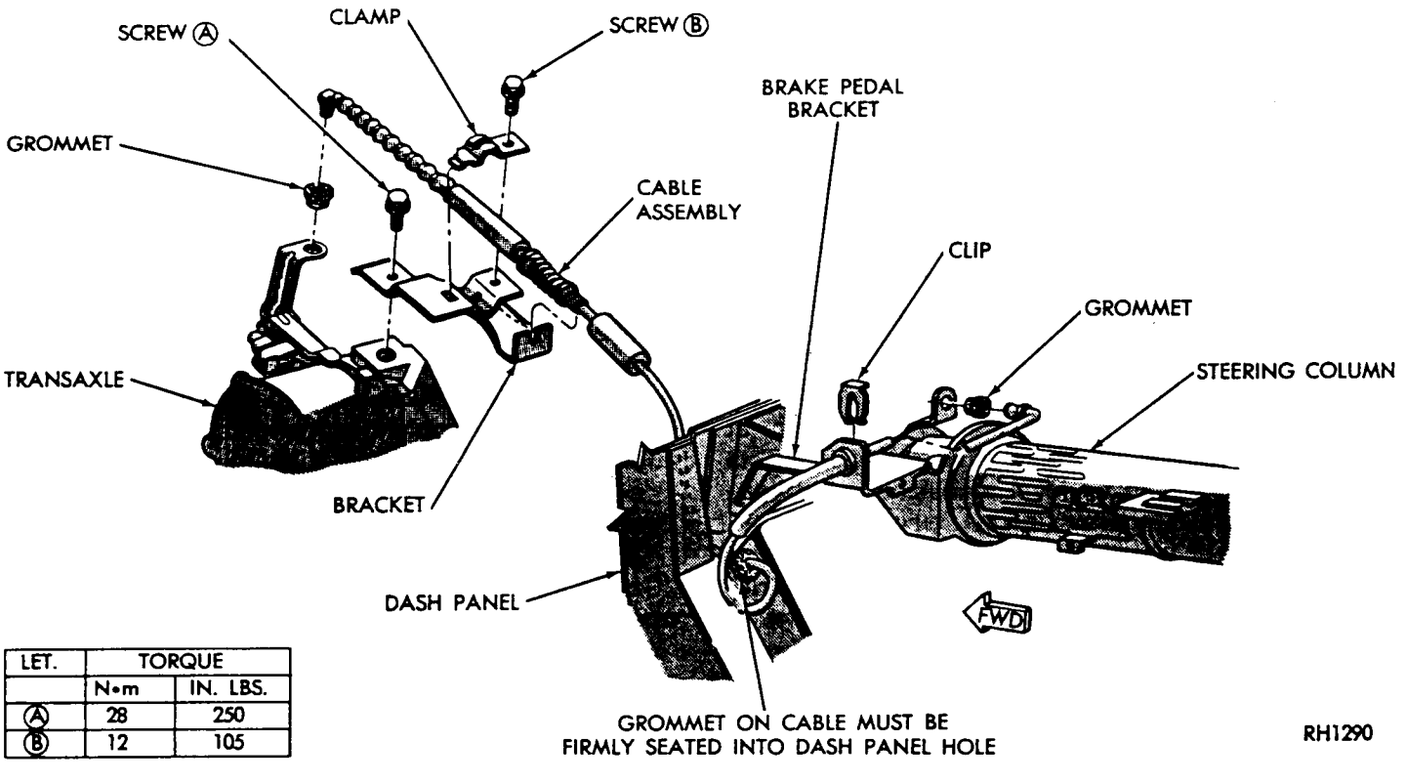
(7) Add sufficient fluid to bring level to 1/8 inch below the **ADD** mark.

Recheck fluid level after transaxle is at normal operating temperature. The level should be in the HOT region (Fig. 1).

To prevent dirt from entering transaxle, make certain that dipstick is fully seated into the dipstick opening.

GEARSHIFT LINKAGE ADJUSTMENT (Fig. 2)

When it is necessary to disassemble linkage cable from levers, which use plastic grommets as retainers, the grommets should be replaced with new grommets. Use a prying tool to force rod from grommet in lever, then cut away old grommet. Use pliers to snap new grommet into lever and rod into grommet.



LET.	TORQUE	
	N•m	IN. LBS.
Ⓐ	28	250
Ⓑ	12	105

Fig. 2—Gearshift Linkage

CAUTION: Set parking brake.

(1) Place gearshift lever in "P" (PARK) position.

(2) Loosen clamp bolt on gearshift cable bracket.

(3) Insure that preload adjustment spring engages fork on transaxle bracket.

(4) Pull the transaxle shift lever by hand all the way to the front detent position (PARK) and tighten clamp screw to 12 N·m (105 in. lbs). Gearshift linkage should now be properly adjusted.

(5) Check adjustment as follows:

(a) Detent position for "neutral" and "drive" should be within limits of hand lever gate stops.

(b) Key start must occur only when shift lever is in "park" or "neutral" positions.

(6) To remove button assembly, completely remove knob attaching fasteners. Pull knob "up" sharply. Proceed as outlined in Console Removal, "Group 23."

After console is back in place, install knob and button by reversing the above procedure.

THROTTLE PRESSURE CABLE ADJUSTMENT (Fig. 3)

With engine at operating temperature, adjust idle speed of engine using a tachometer. Refer to "Fuel System" Group 14 for idle speed Specifications.

Adjustment Procedure

(1) Perform transaxle throttle pressure cable adjustment while engine is at normal operating temperature.

(2) Loosen cable mounting bracket lock screw.

(3) Bracket should be positioned with both bracket alignment tabs touching the transaxle cast surface. Tighten lock screw to 12 N·m (105 in. lbs.) (Fig. 3).

(4) Release cross-lock on the cable assembly (pull cross-lock upward) (Fig. 3).

(5) To insure proper adjustment, the cable must be free to slide all the way toward the engine, against its stop, after the cross-lock is released.

(6) Move transaxle throttle control lever fully clockwise, against its internal stop, and press cross-lock downward into locked position (Fig. 3).

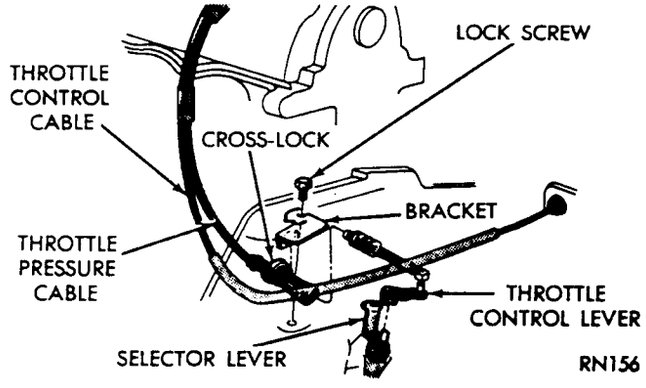


Fig. 3—Throttle Pressure Cable

(7) The adjustment is complete and transaxle throttle cable backlash was automatically removed.

(8) Test cable freedom of operation by moving the transaxle throttle lever forward (counterclockwise) and slowly release it to or confirm it will return fully rearward (clockwise).

(9) No lubrication is required for any component of the throttle cable system.

BAND ADJUSTMENTS

Kickdown Band (Front)

The kickdown band adjusting screw is located on the left side (top front) of the transaxle case.

(1) Loosen lock nut and back off nut approximately five turns. Test adjusting screw for free turning in the transaxle case.

(2) Using wrench, Tool C-3380-A with adapter Tool C-3705, tighten band adjusting screw to 5 N·m (47 to 50 in. lbs.). If adapter C-3705 is not used, tighten adjusting screw to 8 N·m (72 in. lbs.) which is the true torque.

(3) Back off adjusting screw the number of turns listed in "Specifications". Hold adjusting screw in this position and tighten lock nut to 47 N·m (35 ft. lbs.)

Low-Reverse Band (Rear)

To adjust low-reverse band, proceed as follows:

(1) Loosen and back off locknut approximately 5 turns.

(2) Using an inch-pound torque wrench, tighten adjusting screw to 5 N·m (41 in. lbs.) true torque.

(3) Back off adjusting screw the number of turns listed under "Specifications" in the rear of Transaxle Section in this service manual.

(4) Tighten locknut to 14 N·m (10 ft. lbs.).

HYDRAULIC CONTROL PRESSURE ADJUSTMENTS

Line Pressure

An incorrect throttle pressure setting will cause incorrect line pressure readings even though line pressure adjustment is correct. Always inspect and correct throttle pressure adjustment before adjusting the line pressure.

The approximate adjustment is 1-5/16 inches, measured from valve body to inner edge of adjusting nut. However, due to manufacturing tolerances, adjustment can be varied to obtain specified line pressure.

The adjusting screw may be turned with an Allen wrench. One complete turn of adjusting screw changes closed throttle line pressure approximately 1-2/3 psi. Turning adjusting screw counterclockwise increases pressure, and clockwise decreases pressure.

Throttle Pressure

Throttle pressures cannot be tested accurately; therefore, the adjustment should be measured if a malfunction is evident.

(1) Insert gauge pin of Tool C-3763 between the throttle lever cam and kickdown valve.

(2) By pushing in on tool, compress kickdown valve against its spring so throttle valve is completely bottomed inside the valve body.

(3) As force is being exerted to compress spring, turn throttle lever stop screw with adapter C-4553 with handle until head of screw touches the throttle lever tang with throttle lever cam touching tool and the throttle valve bottomed. Be sure adjustment is made with spring fully compressed and valve bottomed in the valve body.

SERVICE IN VEHICLE

GENERAL INFORMATION

Various transaxle components can be removed for repairs without removing the transaxle from the vehicle. The removal, reconditioning, and installation procedures for some of these components are covered here.

The valve body (see service out of vehicle) may be serviced in the vehicle, as can the parking sprag, governor assembly, and extension housing oil seal.

SPEEDOMETER PINION GEAR

When the speedometer pinion adapter is removed for any reason, a NEW O-ring must be installed on the outside diameter of the adapter.

Remove and Install

(1) Remove bolt and washer assembly securing speedometer pinion adapter in the extension housing.

(2) With cable housing connected, carefully work adapter and pinion out of the extension housing.

(3) Remove the retainer and remove the pinion from the adapter.

(4) If transmission fluid is found in cable housing, install a new speedometer pinion and seal assembly.

(5) If transmission fluid is found leaking between the cable and adapter, replace the small O-ring on the cable. Remove the adapter from the cable. Replace the O-ring.

(6) Install the adapter on the cable.

(7) Install the pinion on adapter with a new large O-ring and install retainer on pinion and adapter. Be sure the retainer is properly seated.

Before installing pinion, adapter, and cable assembly make sure adapter flange and its mating areas on extension housing are clean. Dirt or sand will cause misalignment resulting in speedometer pinion gear damage.

(8) Install bolt and washer. Tighten retainer bolt to 7 N·m (60 in. lbs.).

NEUTRAL STARTING AND BACK-UP LAMP SWITCH

Replacement and Test

The neutral starting switch is the center terminal of the 3 terminal switch. It provides ground for the starter solenoid circuit through the selector lever in only **Park** and **Neutral** positions.

(1) To test switch, remove wiring connector from switch and test for continuity between center pin of switch and transaxle case. Continuity should exist only when transaxle is in **Park** or **Neutral.**

(2) Check gearshift cable adjustment before replacing a switch which tests bad.

(3) Unscrew switch from transaxle case allowing fluid to drain into a container. Move selector lever to **Park** and then to **Neutral** positions, and inspect to see that the switch operating lever fingers are centered in switch opening in the case.

(4) Screw the switch, with a new seal, into transaxle case and tighten to 33 N·m (24 ft. lbs.). Retest switch with the test lamp.

(5) Add fluid to transaxle to bring up to proper level.

(6) The back-up lamp switch circuit is through the two outside terminals of the 3 terminal switch.

(7) To test switch, remove wiring connector from switch and test for continuity between the two outside pins.

(8) Continuity should exist only with transaxle in Reverse position.

(9) No continuity should exist from either pin to the case.

GOVERNOR

To service the governor assembly in the vehicle, it is **not** necessary to remove the transfer gear cover, transfer gear, and governor support. The governor may be serviced by removing the transaxle oil pan and valve body assembly. With the oil pan and valve body removed, the governor may be unbolted from the governor support and removed from the transaxle for reconditioning or replacement.

When cleaning or assembling the governor, make sure the governor valves move freely in the bores of the governor body.

ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transaxle case and valve body can be repaired by the use of Heli-Coils, or equivalent. Essentially, this repair consists of drilling out the worn-out damaged threads, tapping the hole with a special Heli-Coil Tap, or equivalent and installing a Heli-Coil insert, or equivalent, into the tapped hole. This brings the hole back to its original thread size.

Heli-Coil, or equivalent, tools and inserts are readily available from most automotive parts suppliers.

SERVICE OUT OF VEHICLE

OIL COOLERS AND TUBES REVERSE FLUSHING

When a transaxle failure has contaminated the fluid, the oil cooler(s) should be flushed and the torque converter replaced with an exchange unit to insure that metal particles or sludged oil are not later transferred back into the reconditioned (or replaced) transaxle.

(1) Place a 'length of flush hose' over the end of the lower (to cooler) oil cooler hose. Insert flush hose securely into a waste oil container.

(2) Apply compressed air to the upper oil cooler hose in very short, sharp blasts.

(3) Pump approximately one pint of MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176 into the upper (from cooler) oil cooler hose.

(4) Repeat step (2). Remove 'length of flush hose.'

TRANSAXLE AND TORQUE CONVERTER REMOVAL

Transaxle removal does NOT require engine removal.

(1) The transaxle and torque converter must be removed as an assembly; otherwise, the torque converter drive plate, pump bushing, or oil seal may be damaged. The drive plate will not support a load; therefore, none of the weight of the transaxle should be allowed to rest on the plate during removal.

(2) Disconnect or connect **negative** battery cable.

(3) Disconnect or connect throttle linkage and shift linkage from transaxle.

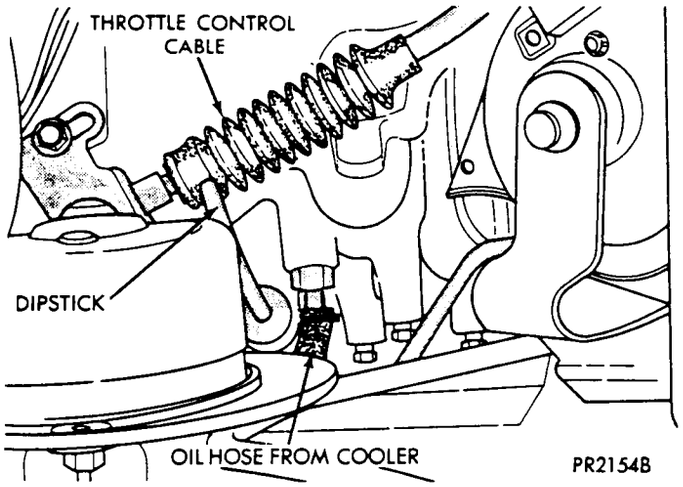


Fig. 1—Remove Oil Cooler Hoses

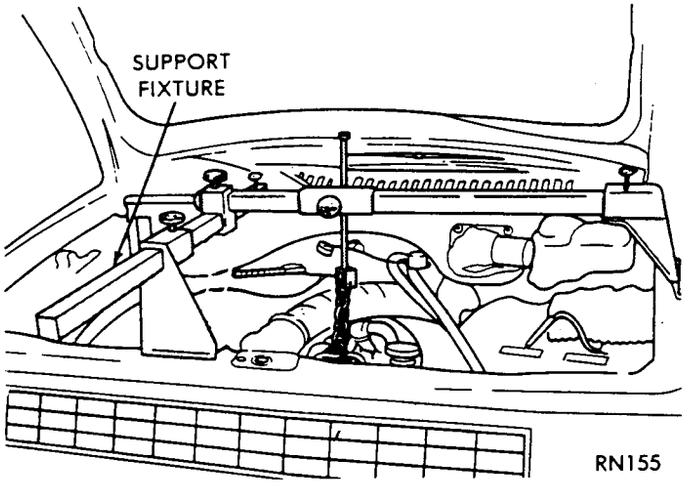


Fig. 2—Engine Support Fixture

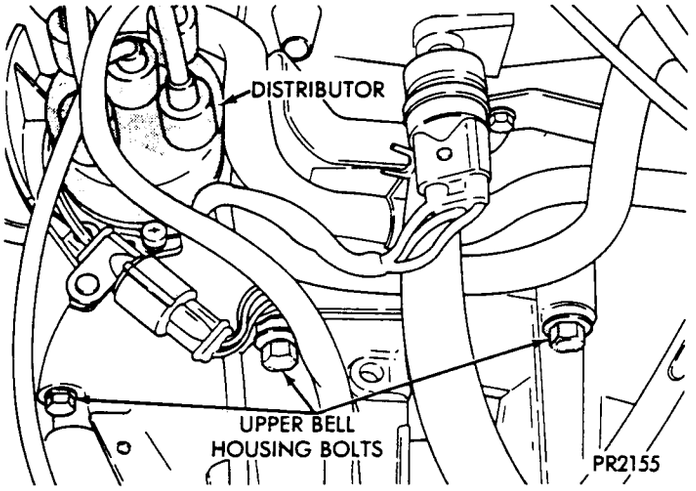


Fig. 3—Remove Bell Housing Upper Bolts

CAUTION: Raise vehicle. Remove front wheels. Refer to "Suspension, Group 2" to remove or install wheel hub nut and driveshafts.

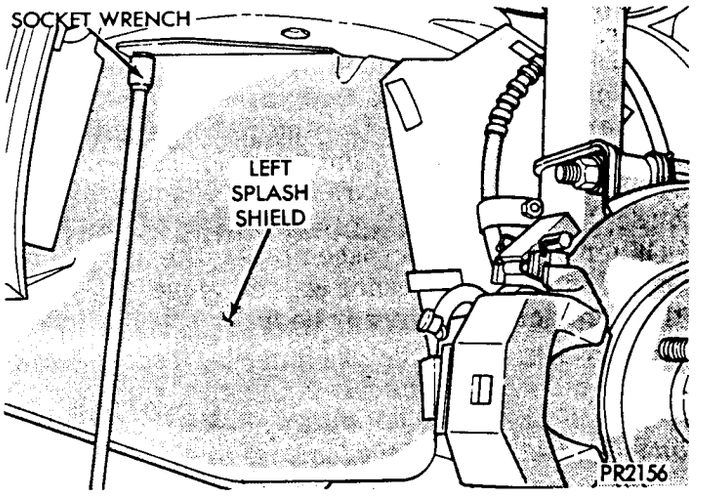


Fig. 4—Remove Left Splash Shield

Remove torque converter dust cover. Mark torque converter and drive plate with chalk, for reassembly. Remove torque converter mounting bolts.

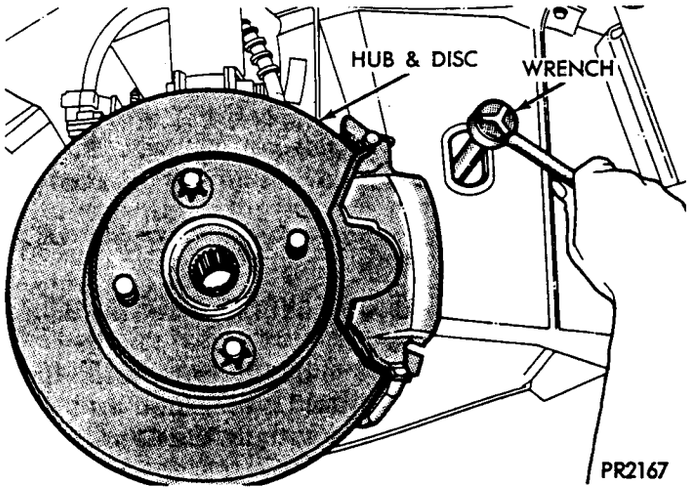


Fig. 5—Remove Access Plug in Right Splash Shield to Rotate Engine Crankshaft

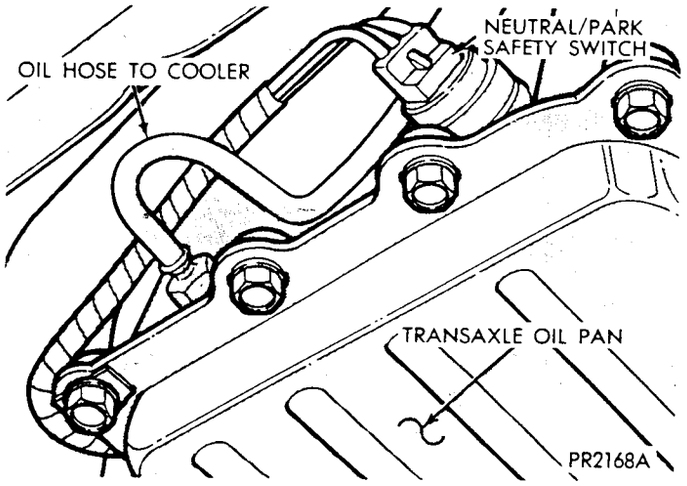


Fig. 6—Remove Wire to Neutral/Park Safety Switch

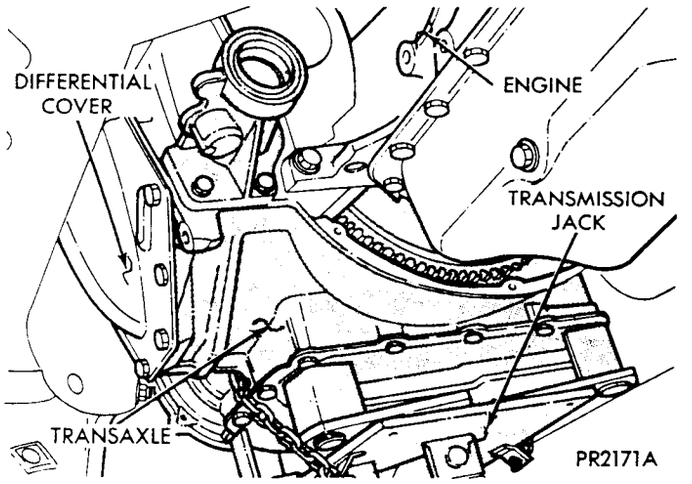


Fig. 9—Positioning Transmission Jack

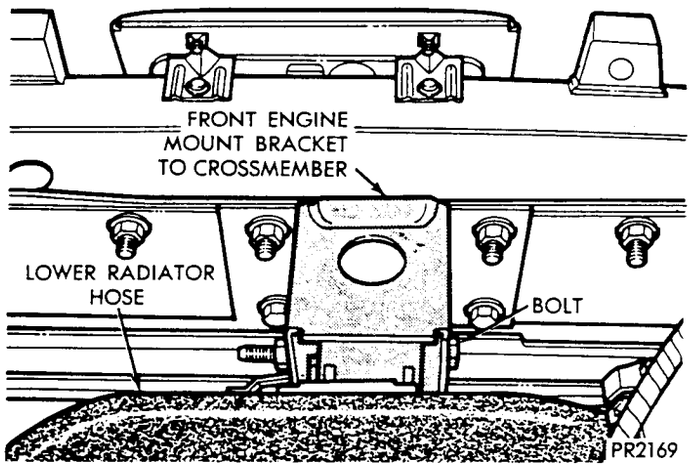


Fig. 7—Remove Engine Mount Bracket from Front Crossmember

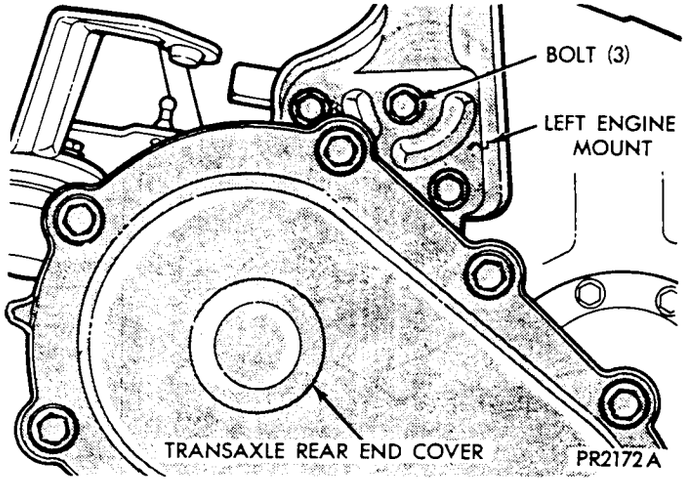


Fig. 10—Remove Left Engine Mount

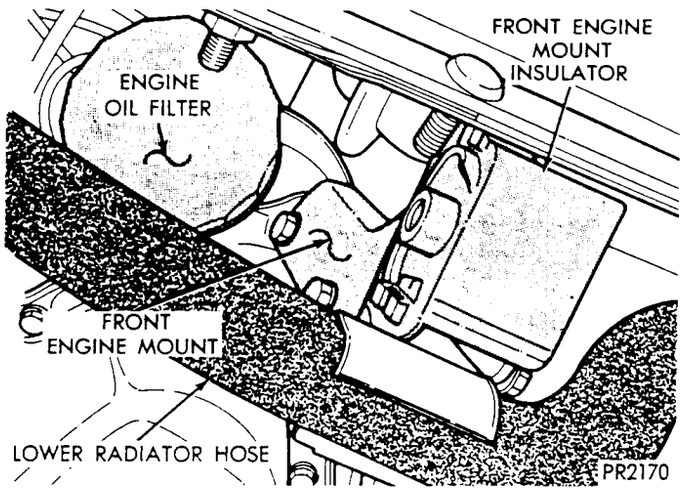


Fig. 8—Remove Front Mount Insulator Through-Bolt and Bell Housing Bolts

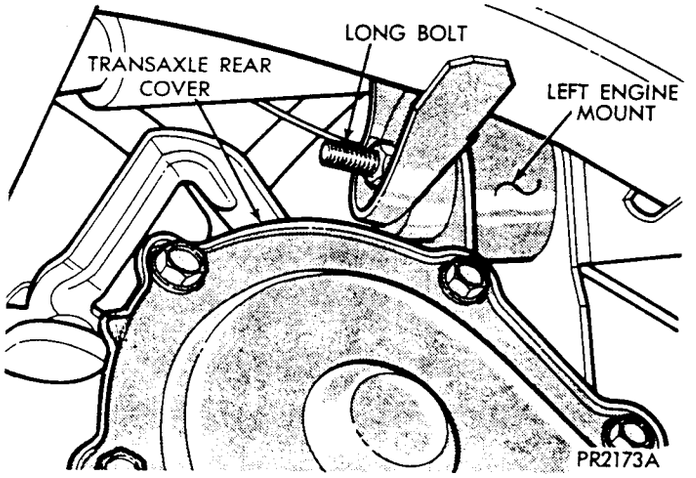


Fig. 11—Remove Left Engine Mount from Engine

Remove or install starter. Remove or install lower bell housing bolts.

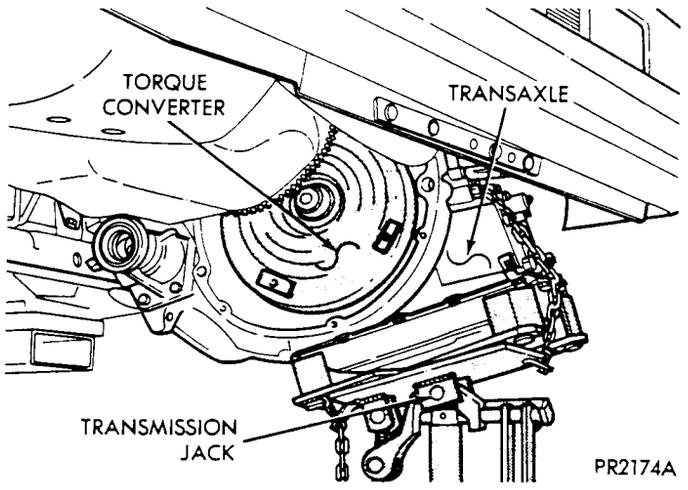


Fig. 12—Raise or Lower Transaxle

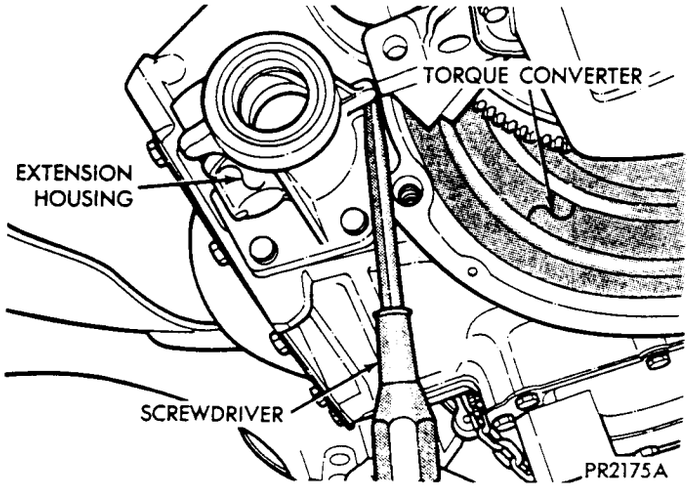


Fig. 13—Pry Engine for Clearance

When installing transaxle, reverse the above procedure.

Adjust gearshift and throttle cables.

Refill transaxle with MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176.

DISASSEMBLY—SUBASSEMBLY REMOVAL

Prior to removing any transaxle subassemblies, plug all openings and thoroughly clean exterior of the unit, preferably by steam. Cleanliness through entire disassembly and assembly cannot be overemphasized. When disassembling, each part should be washed in a suitable solvent, then dried by compressed air. **Do not wipe parts with shop towels.** All mating surfaces in the transaxles are accurately machined; therefore, careful handling of all parts must be exercised to avoid nicks or burrs.

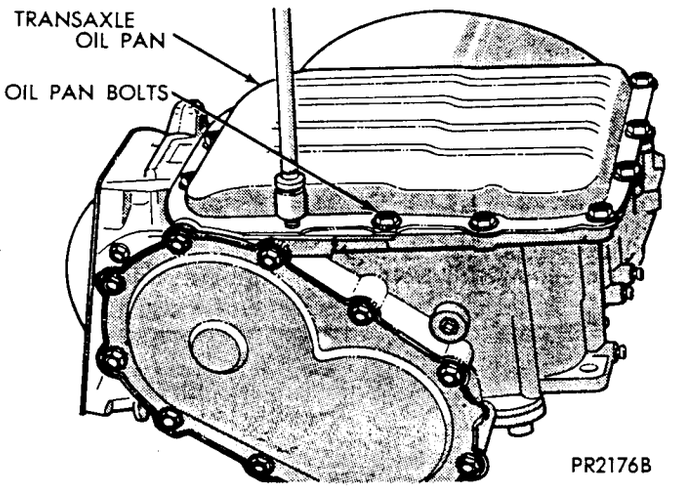


Fig. 1—Transaxle Oil Pan Bolts

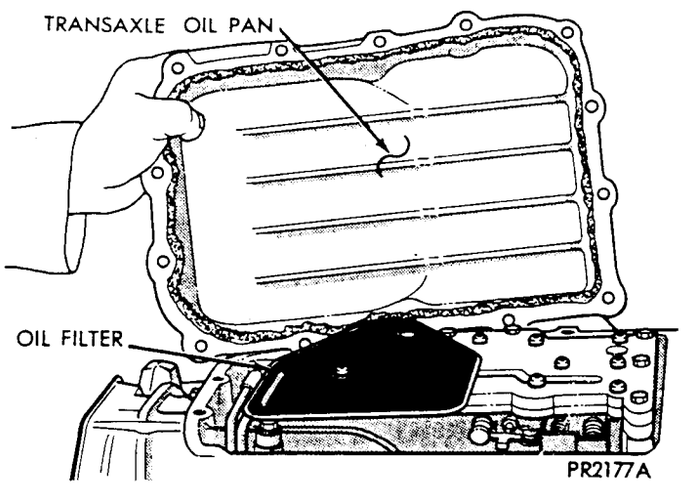


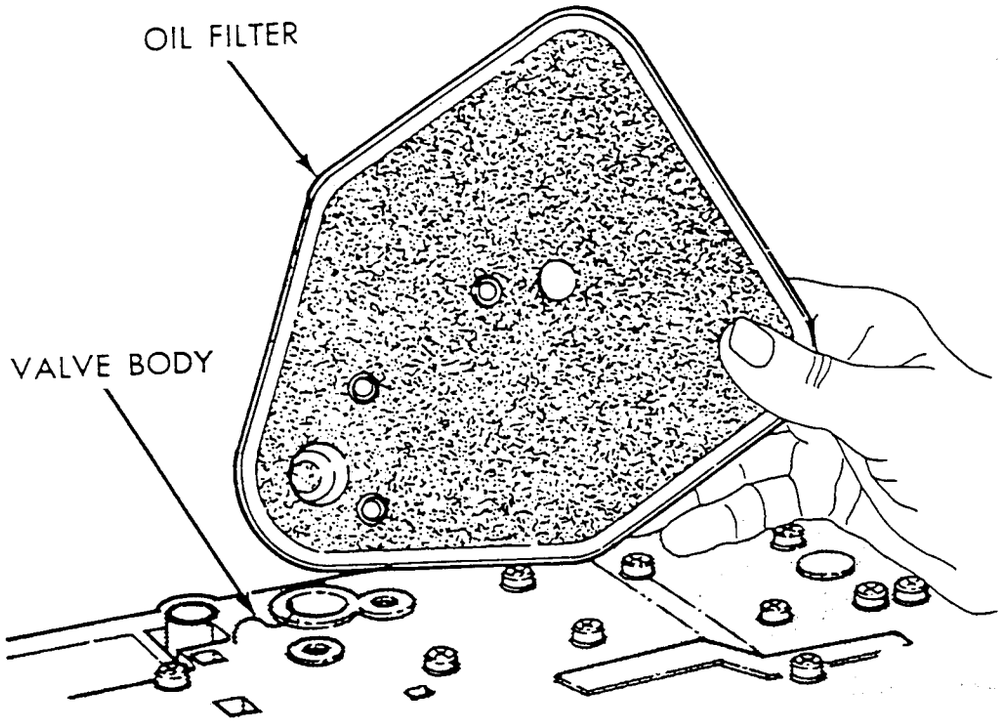
Fig. 2—Transaxle Oil Pan

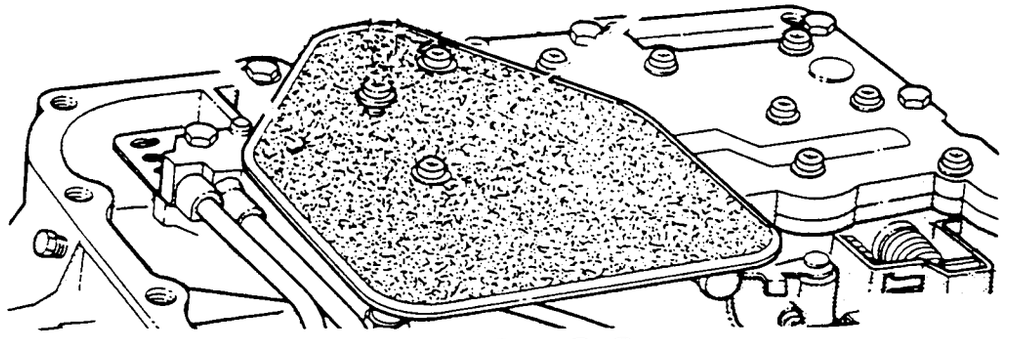
Remove all **old** R.T.V. sealant before applying new R.T.V. sealant.

Use only R.T.V. sealant when installing oil pan.

Put R.T.V. sealant on the oil pan flange (Fig. 2) and on all oil pan bolts (underside of bolt head).

Remember: Filter Change



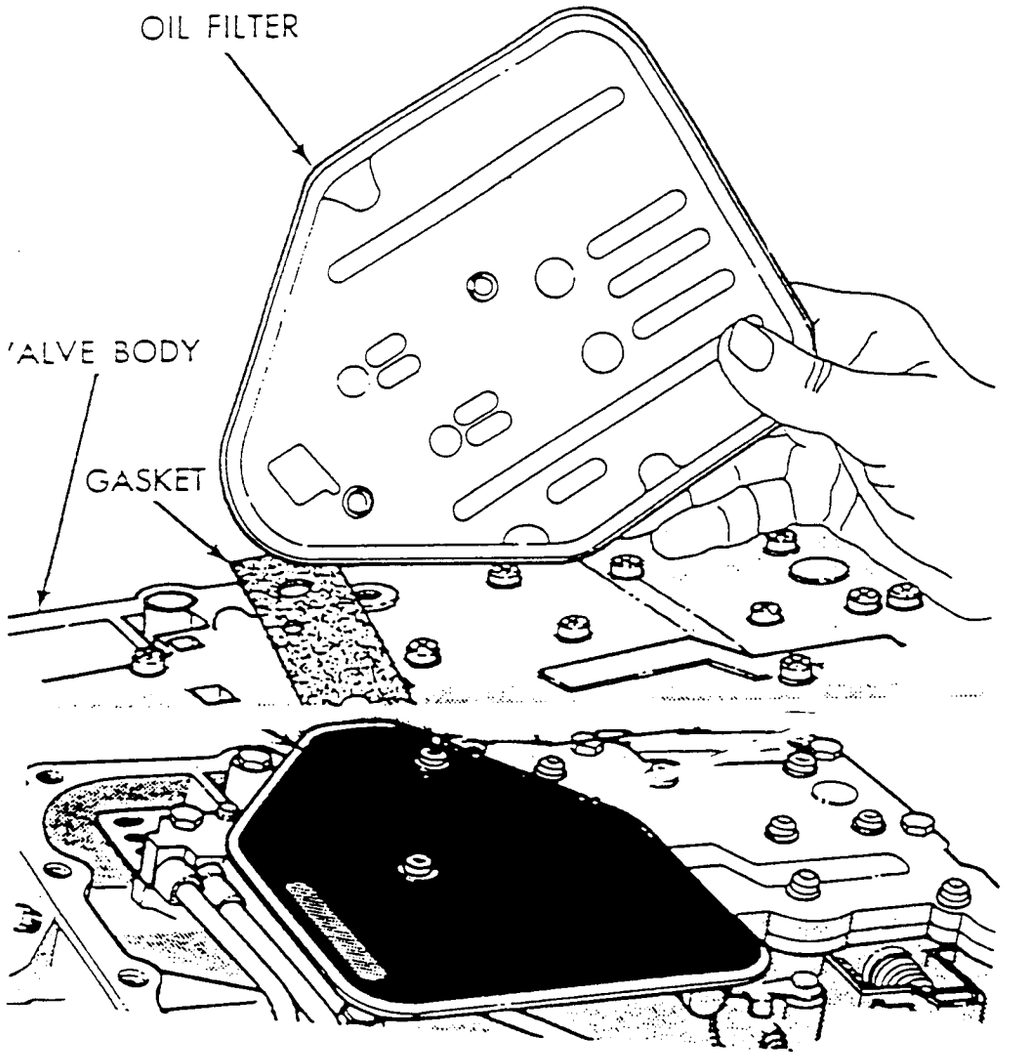


1978-82

Caution:

Do Not Install Early Filter On Late Transmission

Early Filter Installation Can Cause Delayed Engagement , Slipping , Pump Noise



1983-88

AUTOMATIC TRANSMISSION SERVICE GROUP

VALVE BODY RECONDITION

Tighten all valve body screws to 5 Newton-meters (40 inch-pounds)

Do not clamp any portion of valve body or transfer plate in a vise. Any slight distortion of the aluminum body or transfer plate will result in sticking valves, excessive leakage or both. **When removing or installing valves or plugs, slide them in or out carefully. Do not use force.**

TAG ALL SPRINGS AS THEY ARE REMOVED FOR REASSEMBLY IDENTIFICATION.

Cleaning and Inspection

Allow all parts to soak a few minutes in a suitable clean solvent. Wash thoroughly and blow dry with compressed air. Make sure all passages are clean and free from obstructions.

Inspect manual and throttle valve operating levers and shafts for being bent, worn or loose. If a lever is loose on its shaft, it should be replaced. **Do not attempt to straighten bent levers.**

Inspect all mating surfaces for burrs, nicks and scratches. Minor blemishes may be removed with crocus cloth, using only a very light pressure. Using a straightedge, inspect all mating surfaces for warpage or distortion. Slight distortion may be corrected, using a surface plate. Make sure all metering holes in steel plate are open. Using a pen light, inspect bores in valve body for scores, scratches, pits and irregularities.

Inspect all valve springs for distortion and collapsed coils. Inspect all valves and plugs for burrs, nicks, and scores. Small nicks and scores may be removed with crocus cloth, providing extreme care is taken not to round off sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between valve and valve body, thus reducing possibility of sticking. Inspect all valves and plugs for freedom of operation in valve body bores.

When bores, valves, and plugs are clean and dry, the valves and plugs should fall freely in the bores. The valve body bores do not change dimensionally with use. Therefore, a valve body that was functioning properly when vehicle was new, will operate correctly if it is properly and thoroughly cleaned. There is no need to replace valve body unless it is damaged in handling.

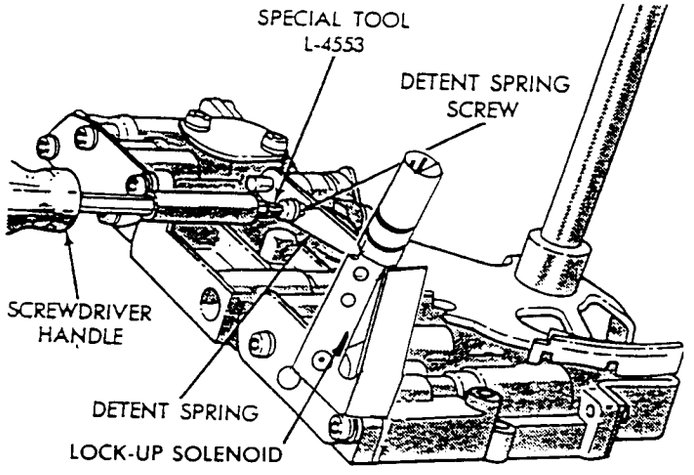


Fig. 1—Detent Spring Screw and Spring

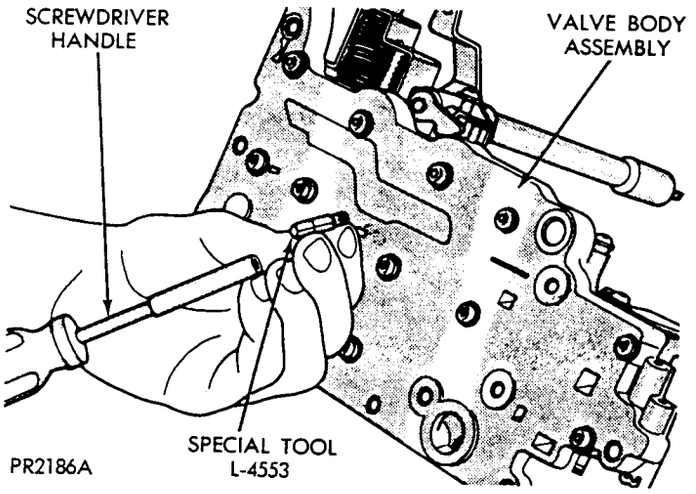


Fig. 2—Using Tool L-4553 on Valve Body Screws

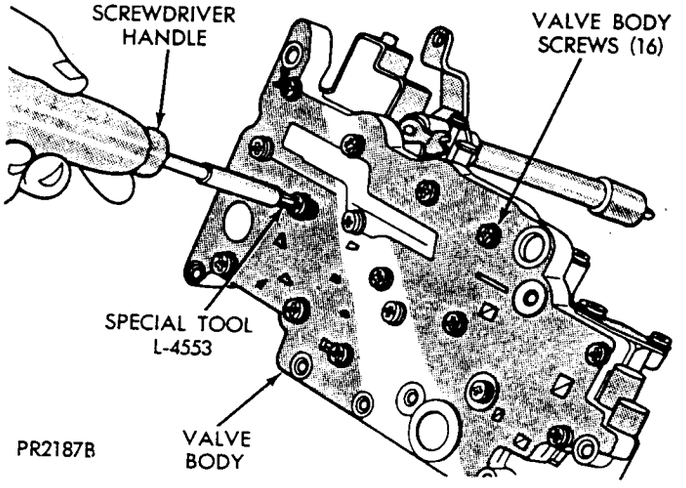


Fig. 3—Remove or Install Valve Body Screws

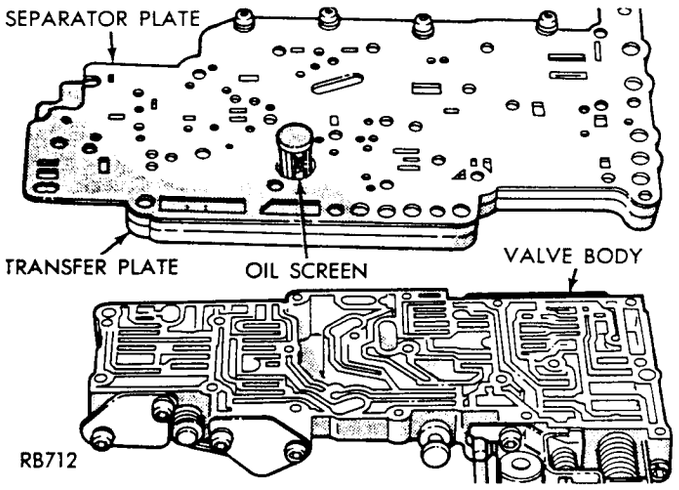


Fig. 4—Transfer Plate and Separator Plate

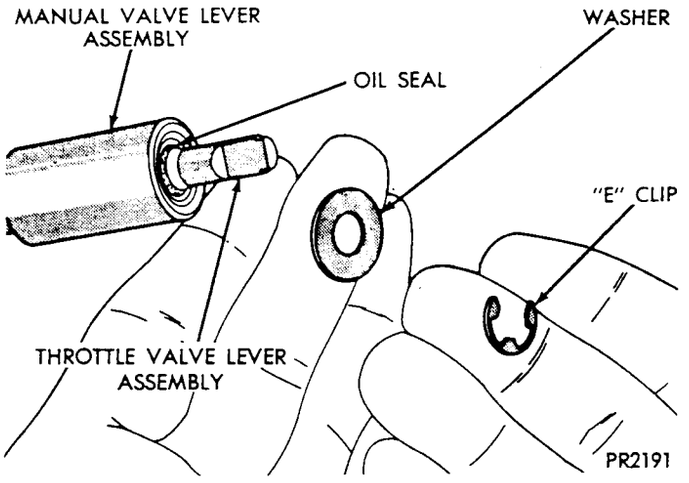


Fig. 7—Throttle Shaft E-Clip, Washer, and Seal

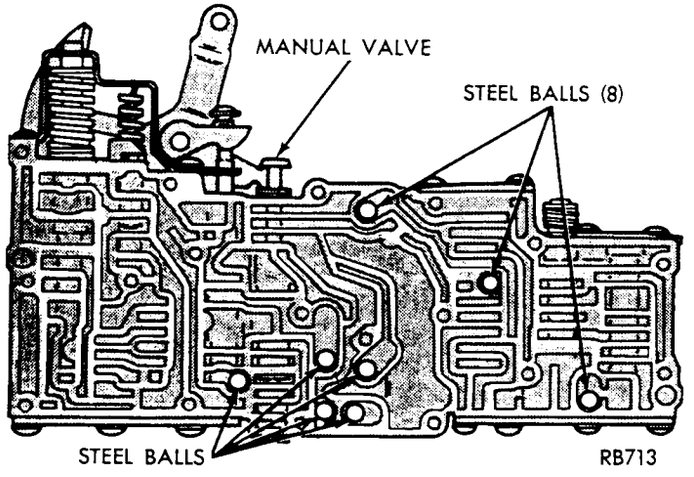


Fig. 5—Steel Ball Locations

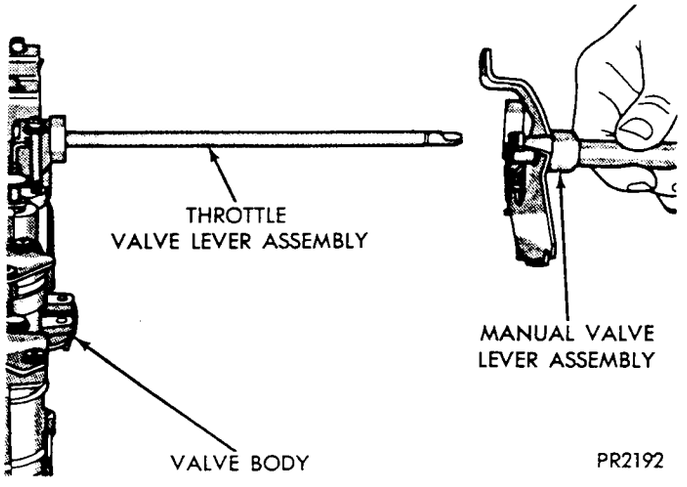


Fig. 8—Manual Valve Lever Assembly

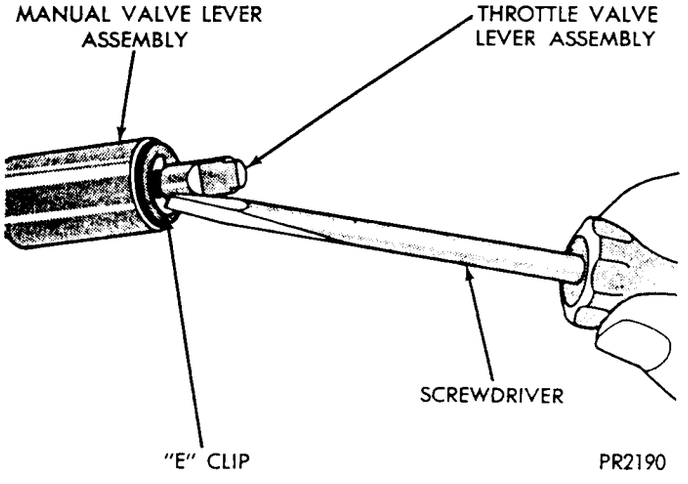


Fig. 6—Throttle Shaft E-Clip

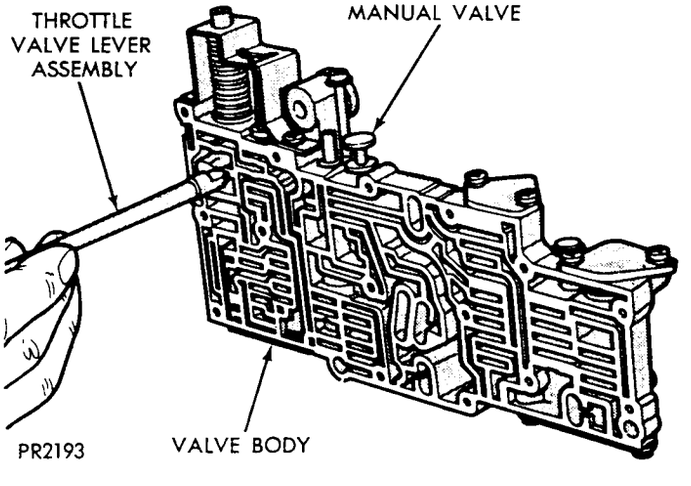


Fig. 9—Throttle Valve Lever Assembly

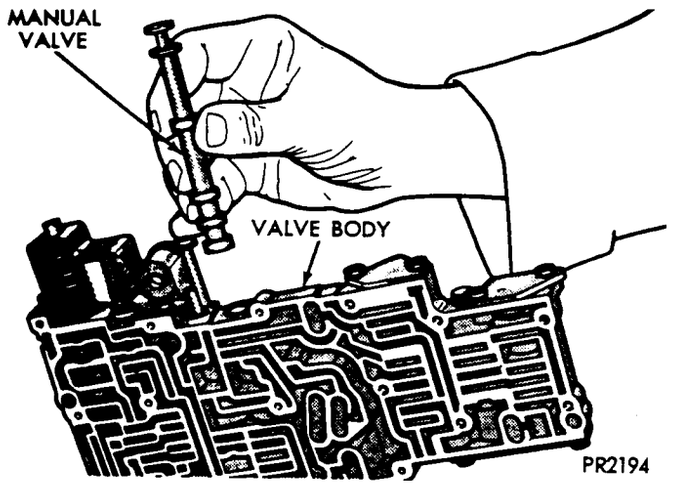


Fig. 10—Manual Valve

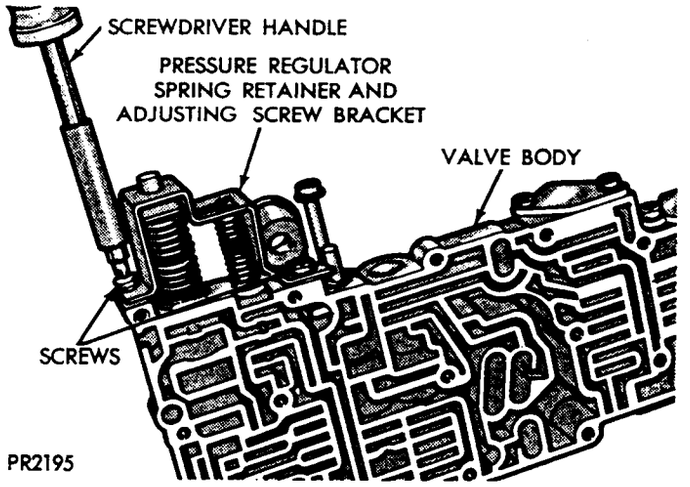


Fig. 11—Pressure Regulator and Adjusting Screw Bracket

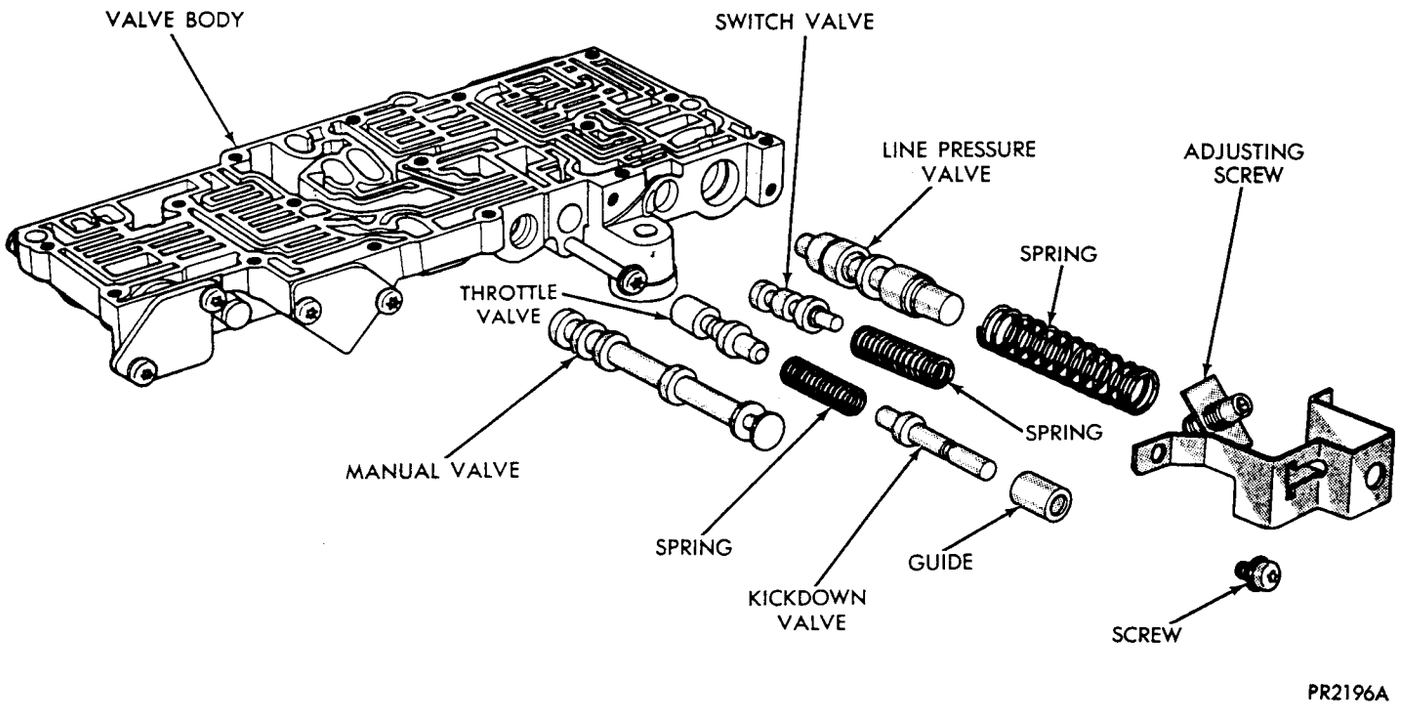


Fig. 12—Pressure Regulators and Manual Controls

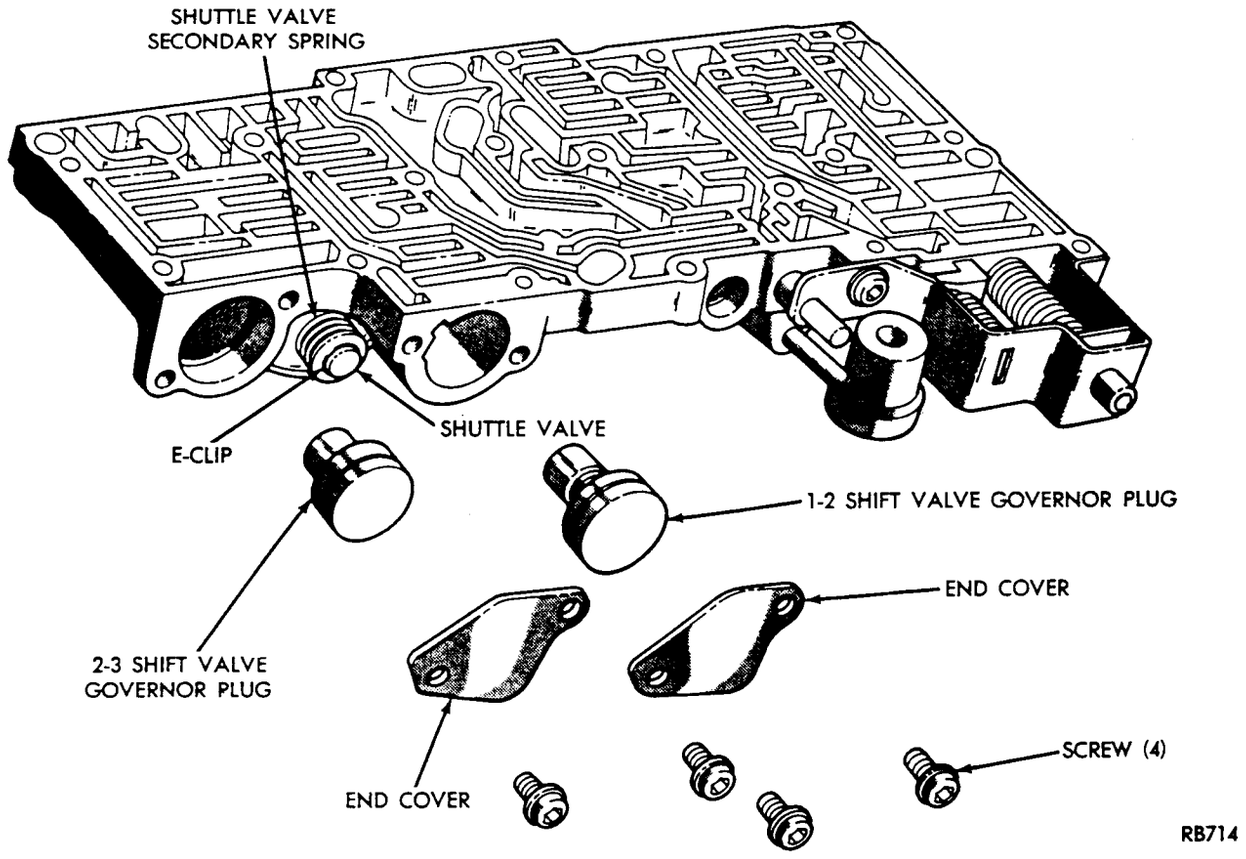


Fig. 13—Governor Plugs

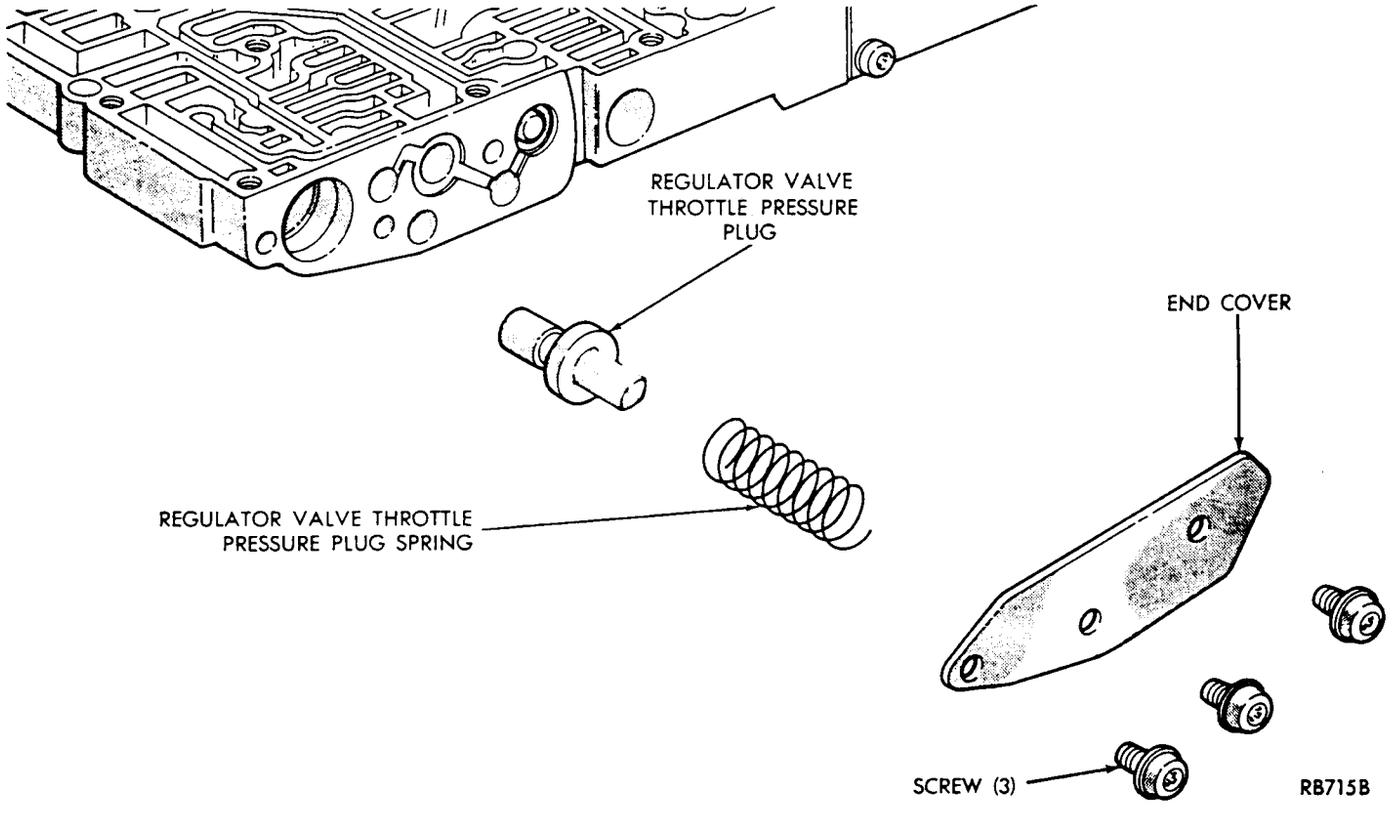


Fig. 14—Pressure Regulator Valve Plugs (Nonlockup)

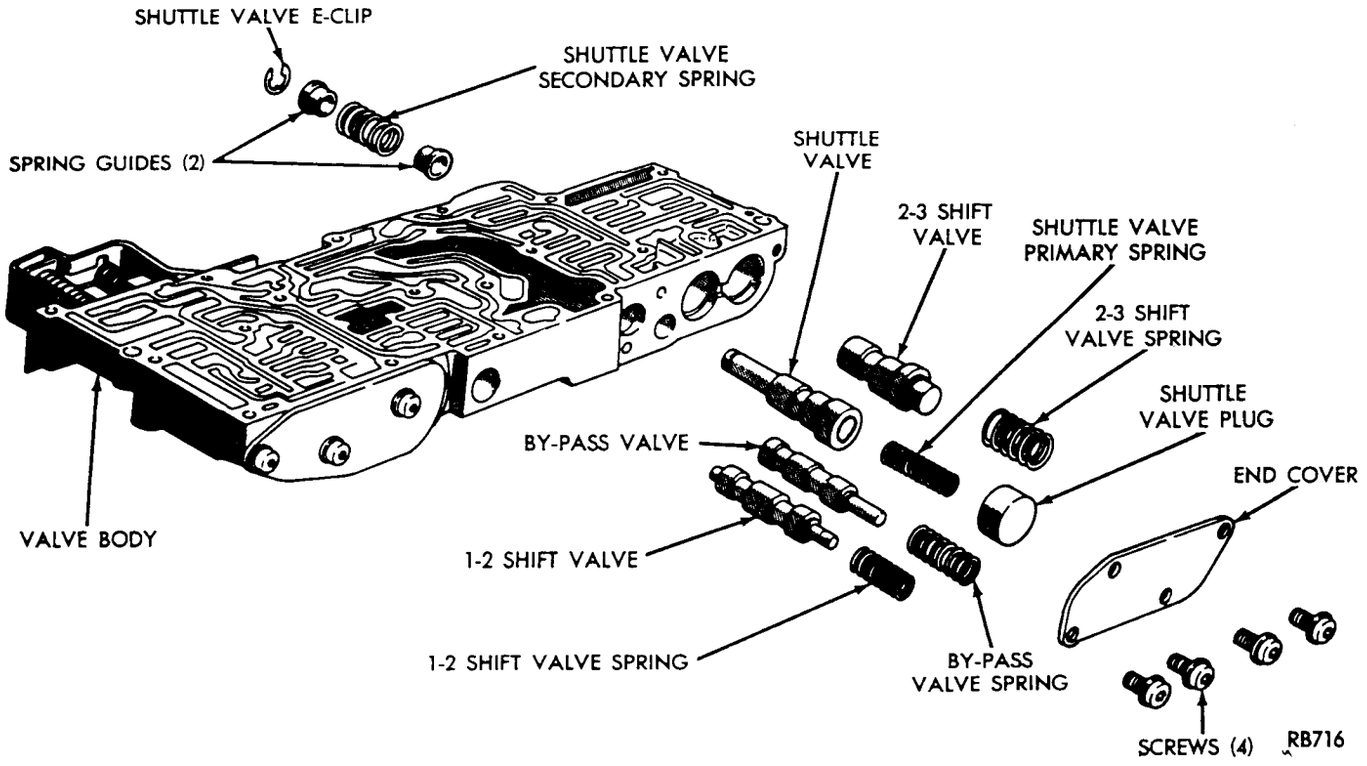


Fig. 15—Shift Valves and Shuttle Valve (Nonlockup)

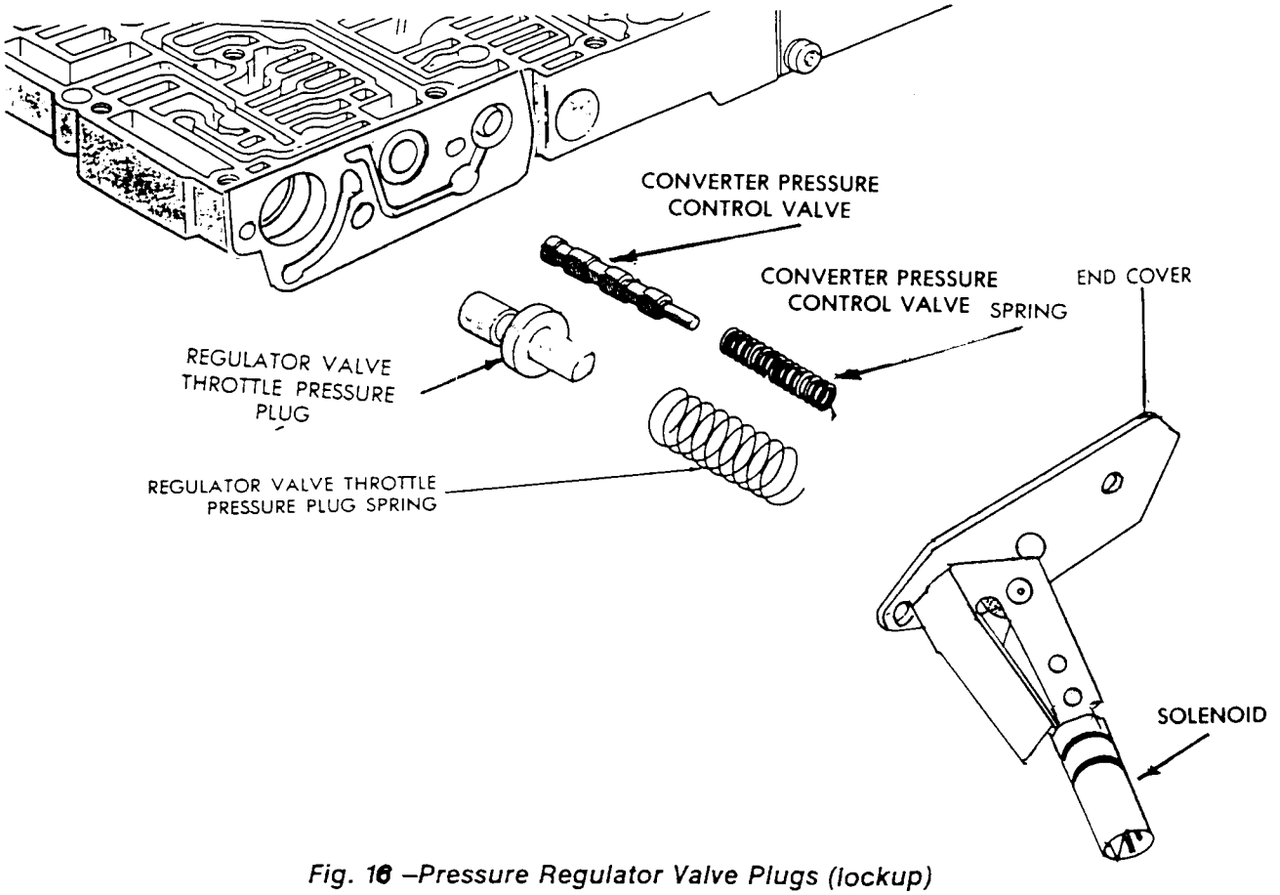


Fig. 16 –Pressure Regulator Valve Plugs (lockup)

TRANSAXLE RECONDITION

PUMP OIL SEAL

Replacement

The pump oil seal can be replaced without removing the pump and reaction shaft support assembly from the transaxle case.

(1) Screw seal remover Tool C-3981 into seal (Fig. 1), then tighten screw portion of tool to withdraw the seal.

(2) To install a new seal, place seal in opening of the pump housing (lip side facing inward). Using Tool C-4193 and Handle Tool C-4171, drive new seal into housing until tool bottoms (Fig. 2).

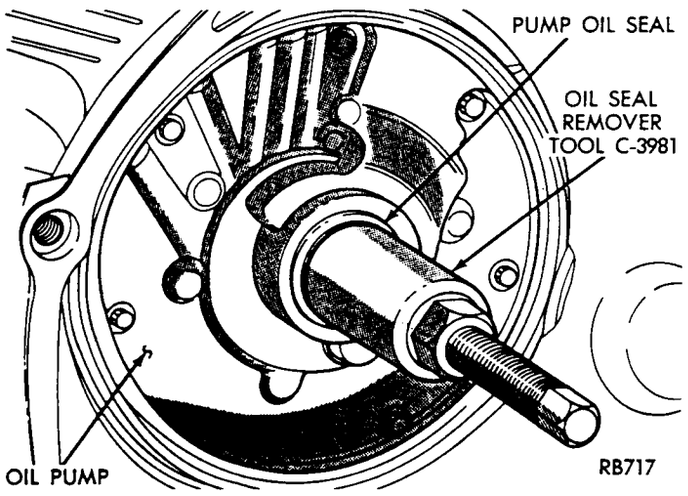


Fig. 1—Remove Pump Seal

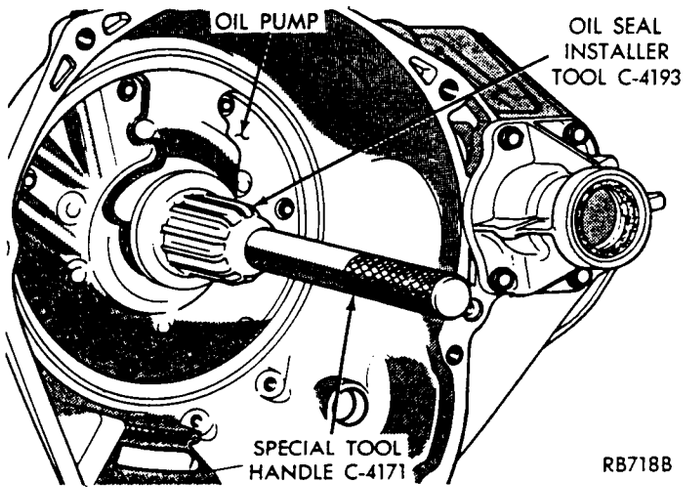


Fig. 2—Install Pump Seal

Input Shaft End Play

Measuring input shaft end play before disassembly will usually indicate when a thrust washer change is required, (except when major parts are replaced). The thrust washer is located between input and output shafts.

(1) Attach a dial indicator to transaxle bell housing with its plunger seated against end of input shaft (Fig. 3).

Move input shaft in and out to obtain end play reading. End play specifications are 0.19 to 1.50 mm (.008 to .060 inch).

(2) Record indicator reading for reference when reassembling the transaxle.

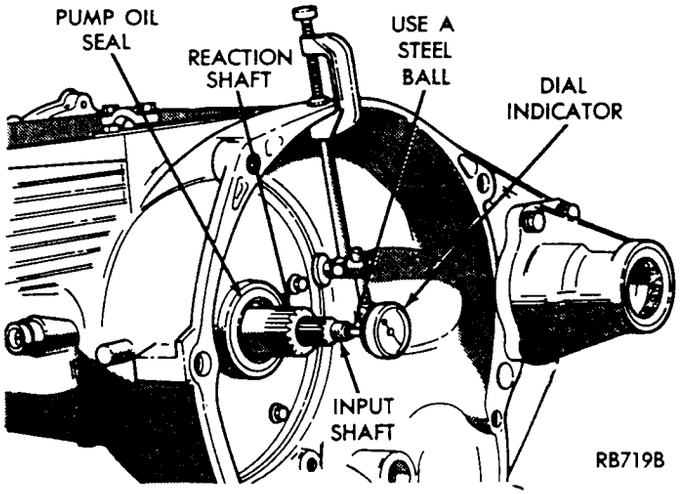


Fig. 3—Measure Input Shaft End Play

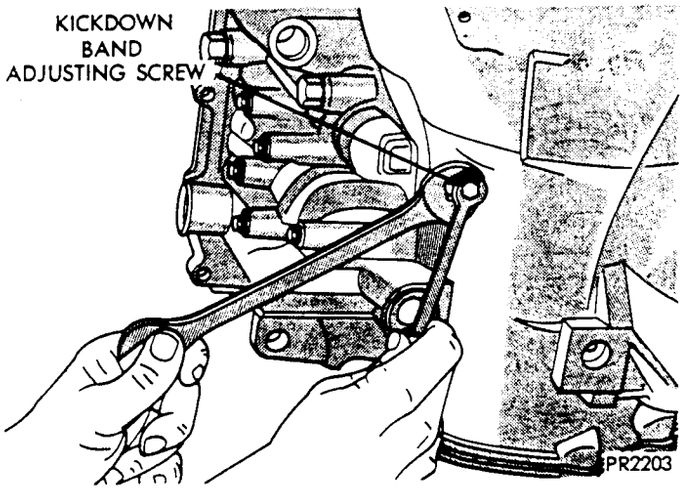


Fig. 4—Loosen Lock Nut and Tighten Kickdown Band Adjusting Screw

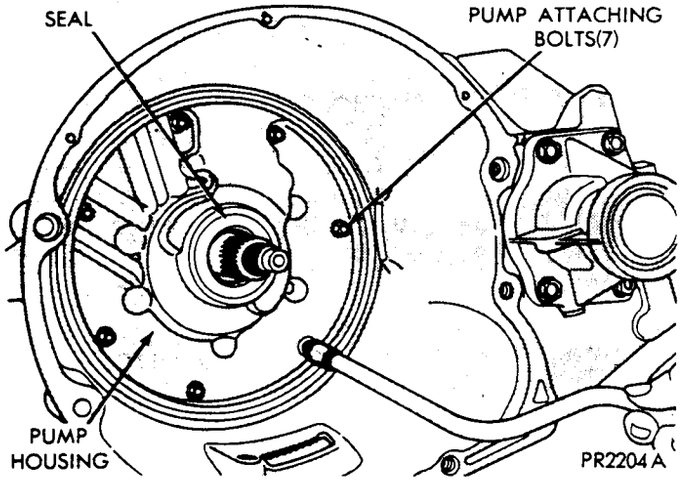


Fig. 5—Pump Attaching Bolts

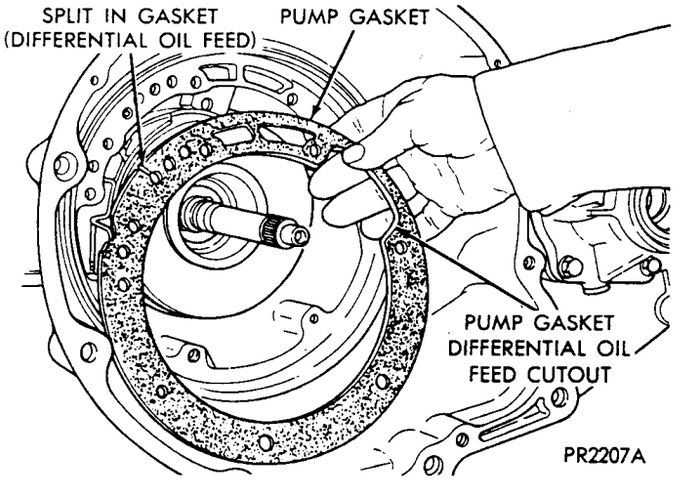


Fig. 8—Oil Pump Gasket

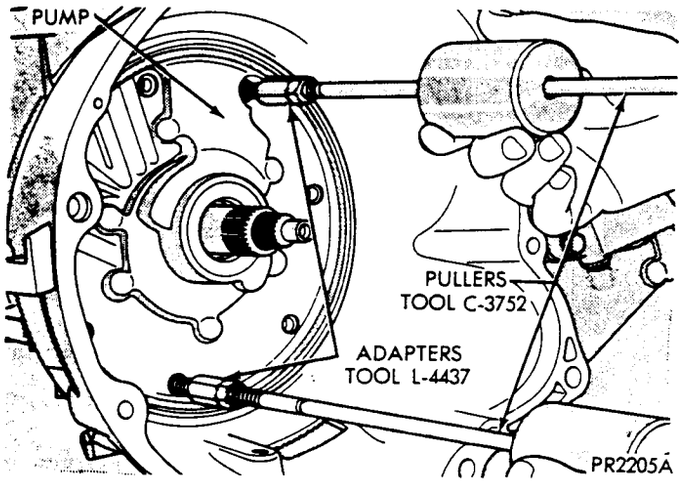


Fig. 6—Install Tool C-3752 with Adapters L-4437

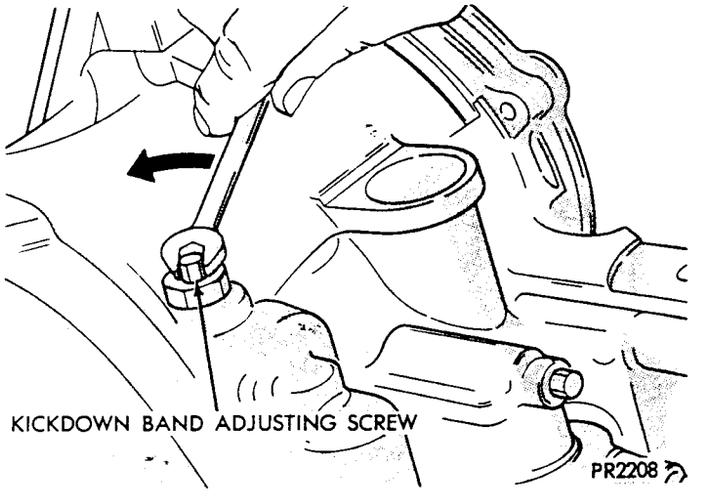


Fig. 9—Loosen Kickdown Band Adjusting Screw

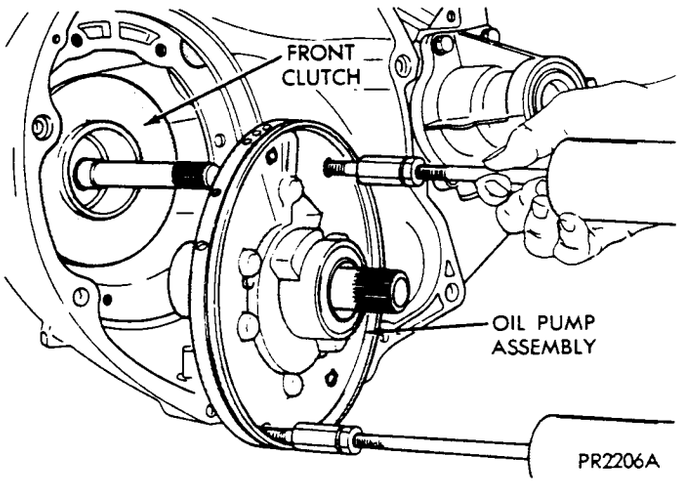


Fig. 7—Oil Pump with No. 1 Thrust Washer

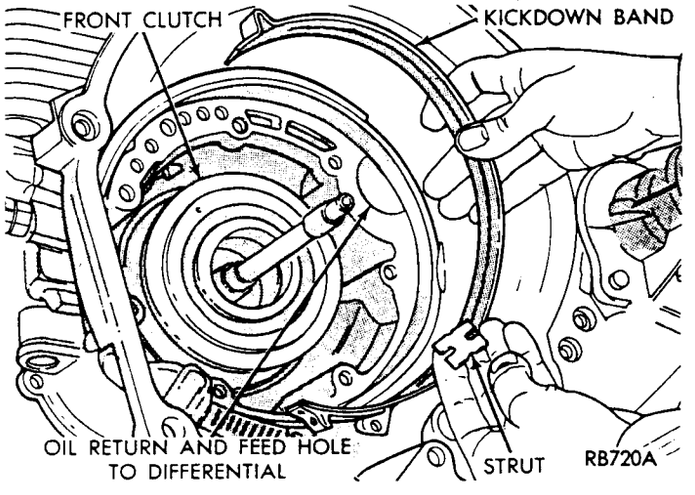


Fig. 10—Kickdown Band and Strut

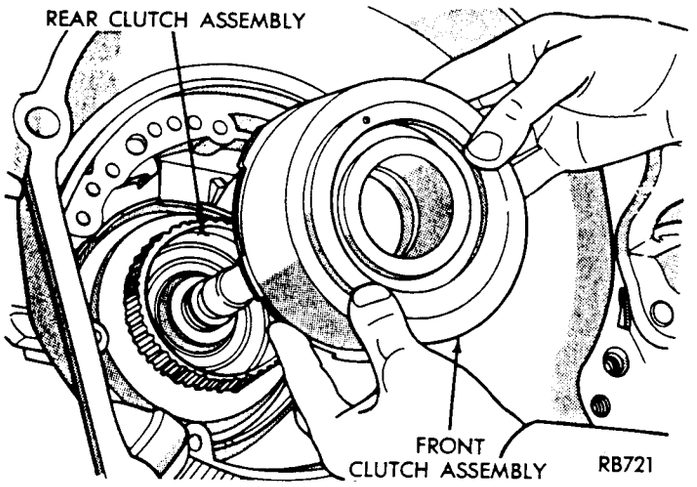


Fig. 11—Front Clutch Assembly

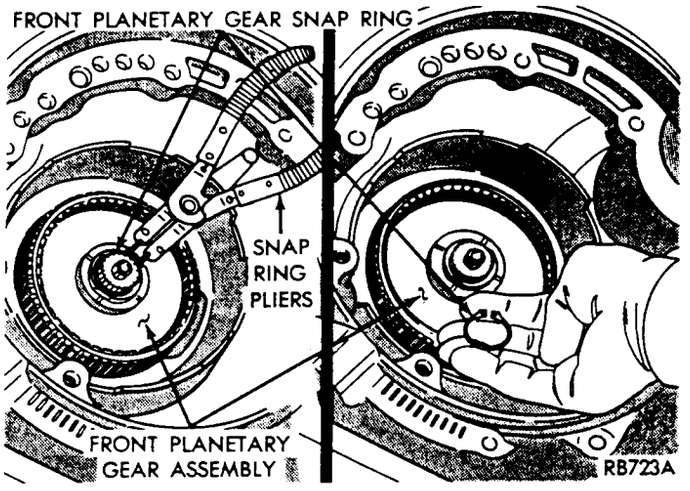


Fig. 14—Front Planetary Gear Snap Ring

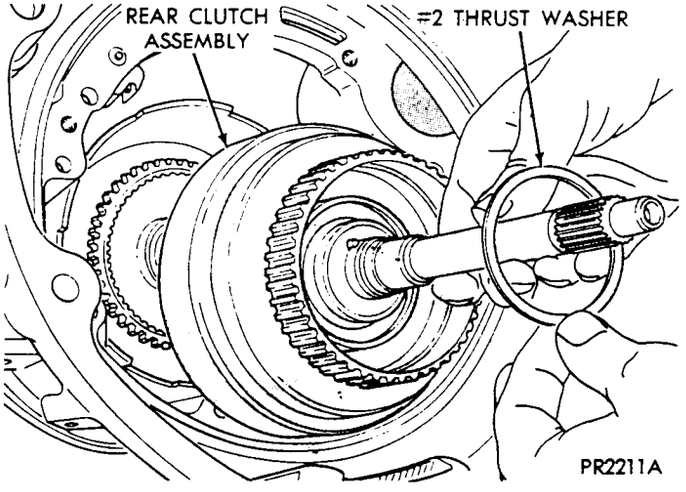


Fig. 12—No. 2 Thrust Washer and Rear Clutch

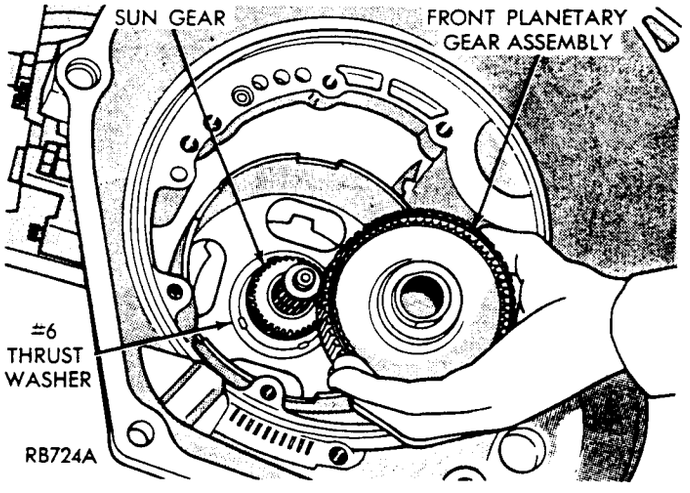


Fig. 15—Front Planetary Gear Assembly

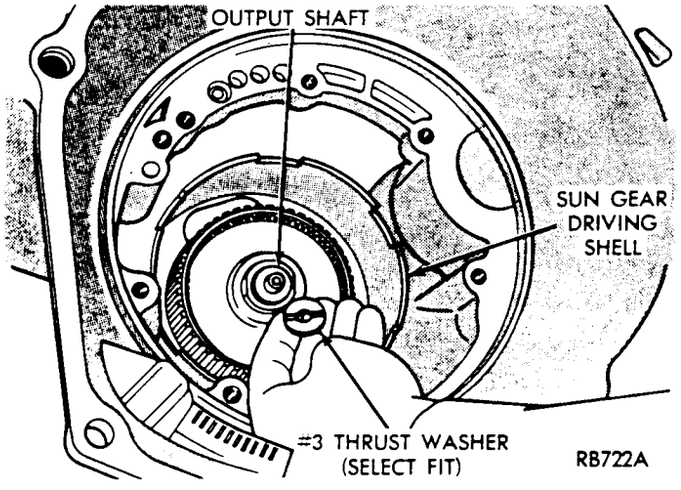


Fig. 13—No. 3 Thrust Washer

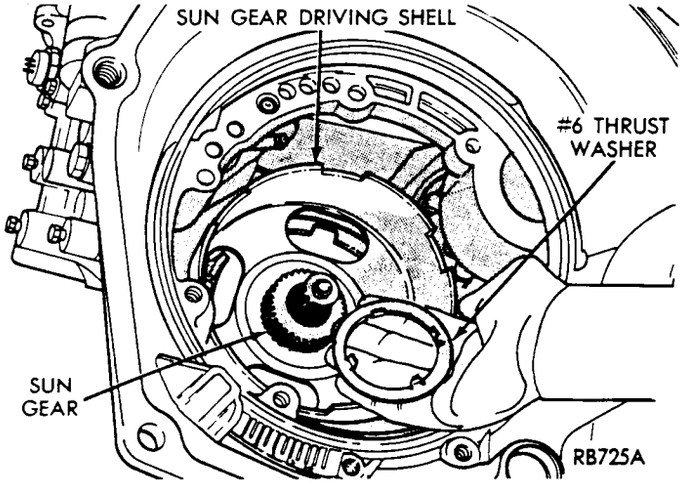


Fig. 16—No. 6 Thrust Washer

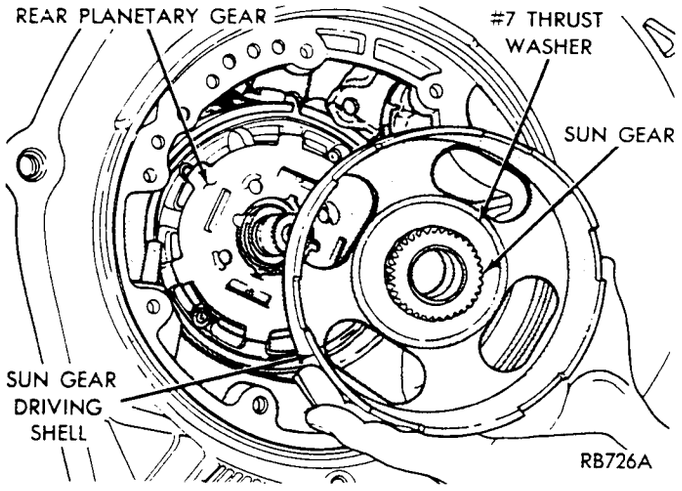


Fig. 17—Sun Gear Driving Shell

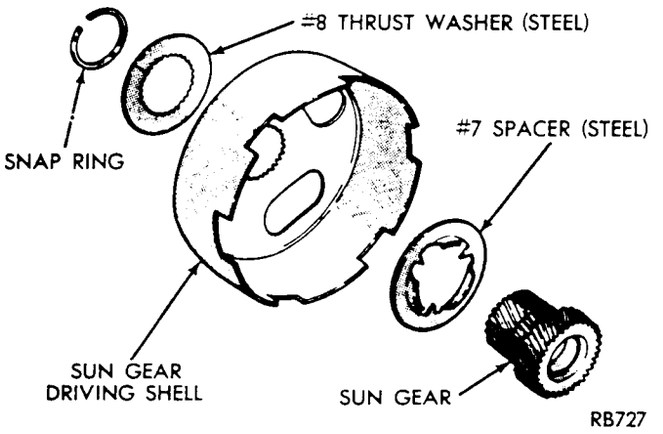


Fig. 18—Sun Gear Driving Shell Components

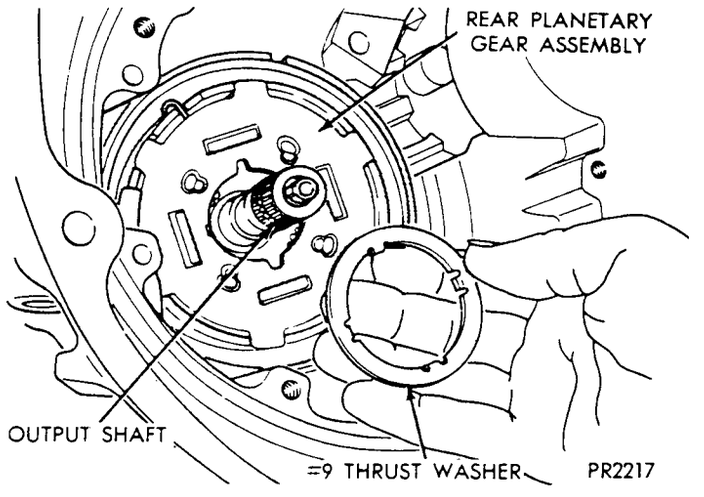


Fig. 19—No. 9 Thrust Washer

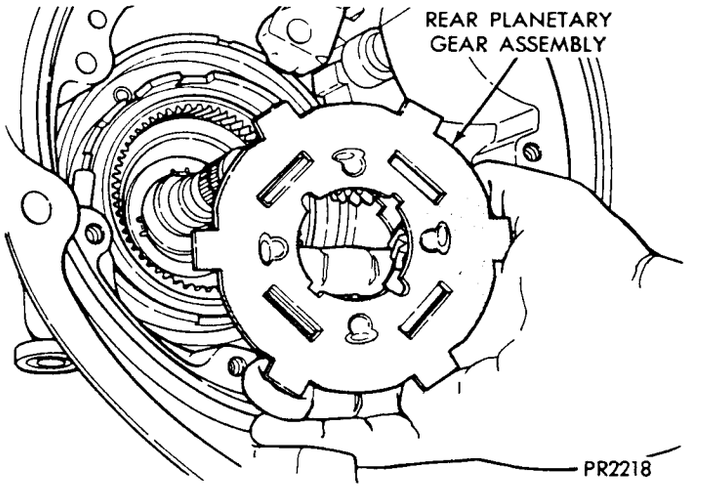


Fig. 20—Rear Planetary Gear Assembly

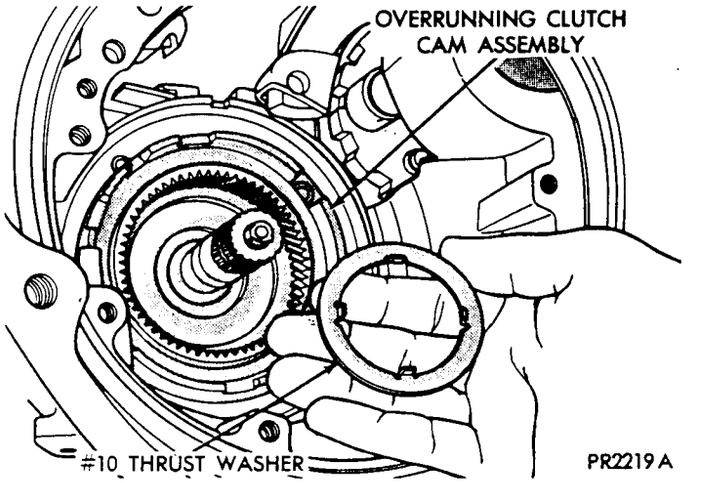


Fig. 21—No. 10 Thrust Washer

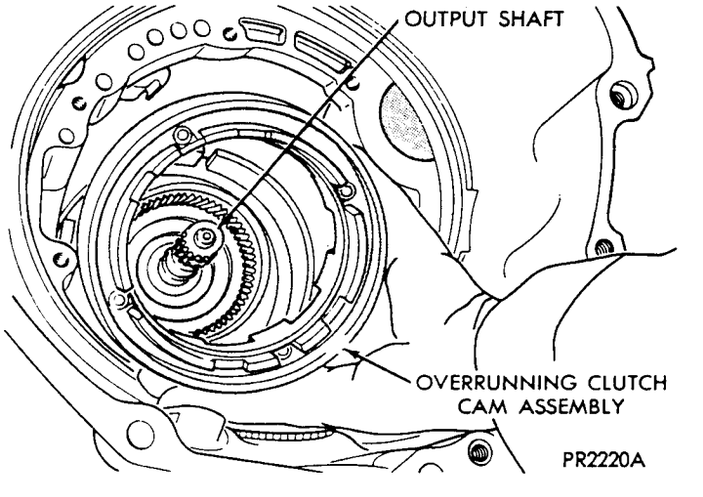


Fig. 22—Overrunning Clutch Cam Assembly

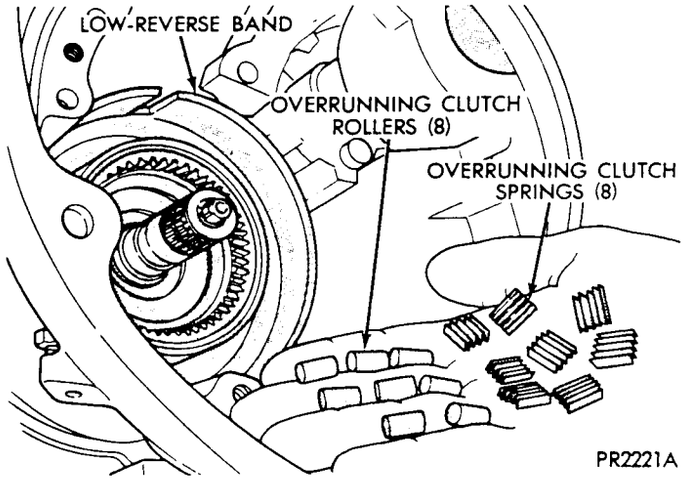


Fig. 23—Overrunning Clutch Rollers and Springs

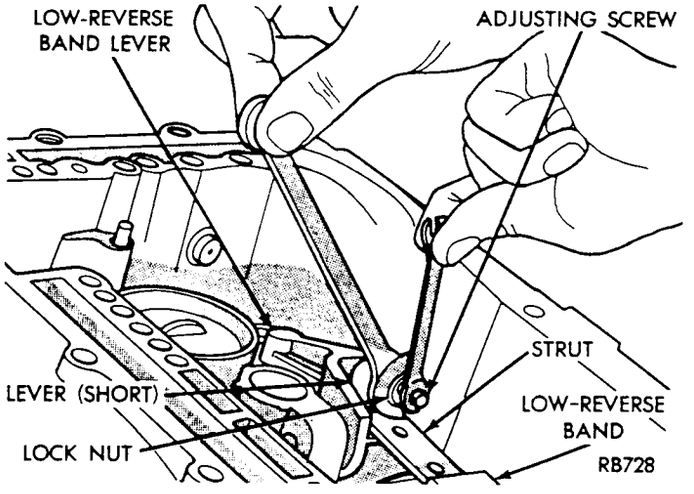


Fig. 24—Loosen or Adjust Low-Reverse Band

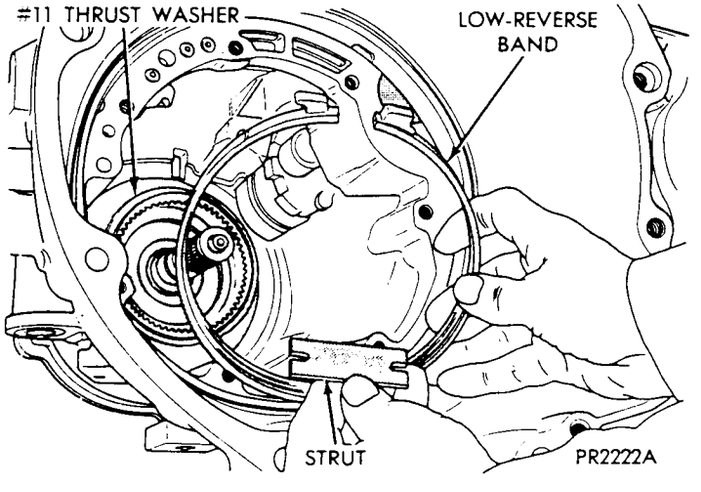


Fig. 25—Low-Reverse Band and Strut

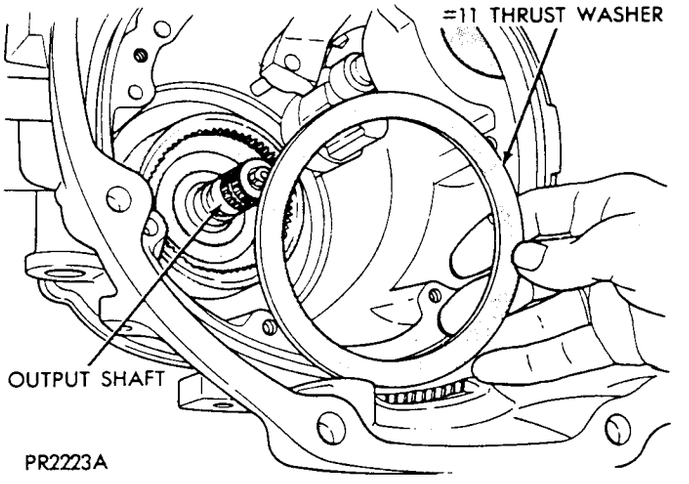


Fig. 26—No. 11 Thrust Washer

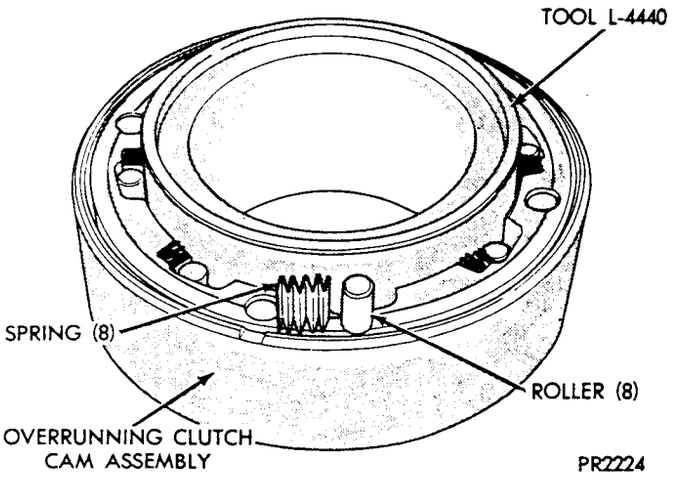


Fig. 27—Install Overrunning Clutch Rollers and Springs

ASSEMBLY—SUBASSEMBLY INSTALLATION

When rebuilding, reverse the above procedure.

SUBASSEMBLY—RECONDITION—PUMP

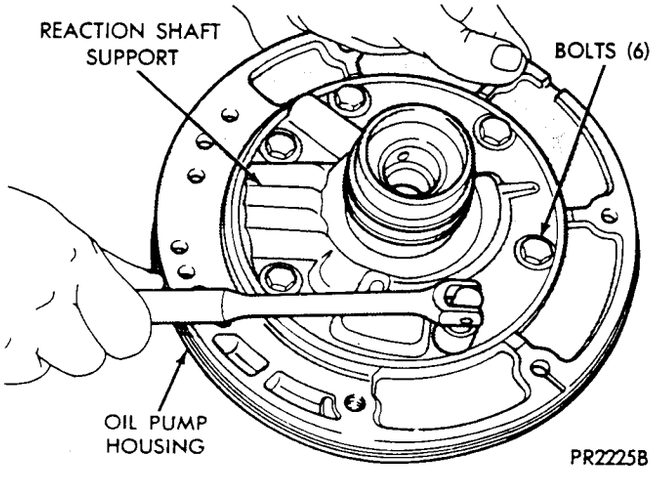
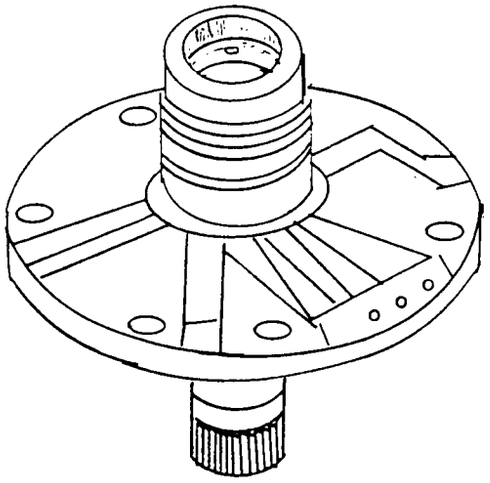
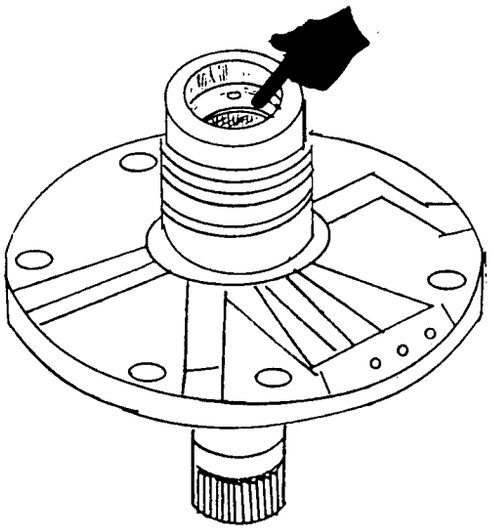


Fig. 1—Remove or Install Reaction Shaft Support Bolts

PARTS UPDATE PUMP STATOR SUPPORT



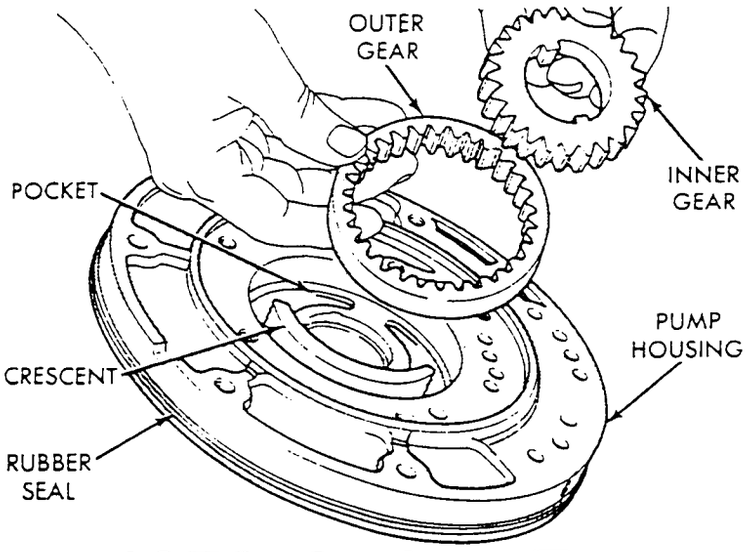
1978-1985



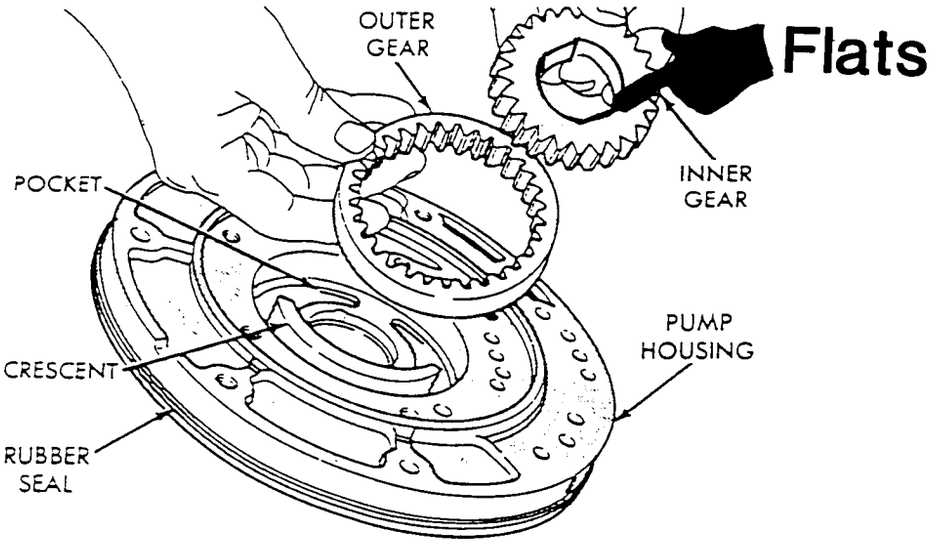
1986-1988

The stator support for the 1978 thru 1985 model has the turbine shaft bushing one inch down in the second bore. The 1986 stator support has the turbine shaft bushing flush in the second bore (see illustration). Some of the 1986 stator supports were machined to take the two ring turbine shaft. Some of the late 1986 stator supports were machined to take the three ring turbine shaft that was released with the 1987-1988 lockup units. When replacing a pump complete or a stator support, be sure to check the machined surface in the bore that it will take a three ring turbine shaft if that is what is to be installed.

PUMP CHANGE



1978–85 Lug Type



1986–88 Flats Type

Converter Change–Slot to Flats

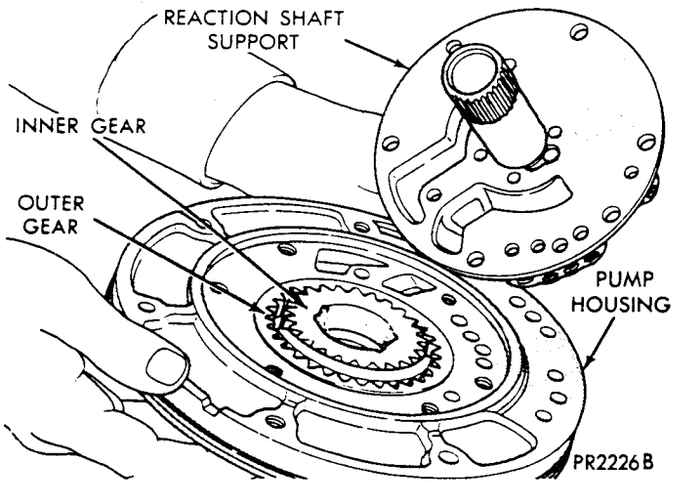


Fig. 2—Reaction Shaft Support

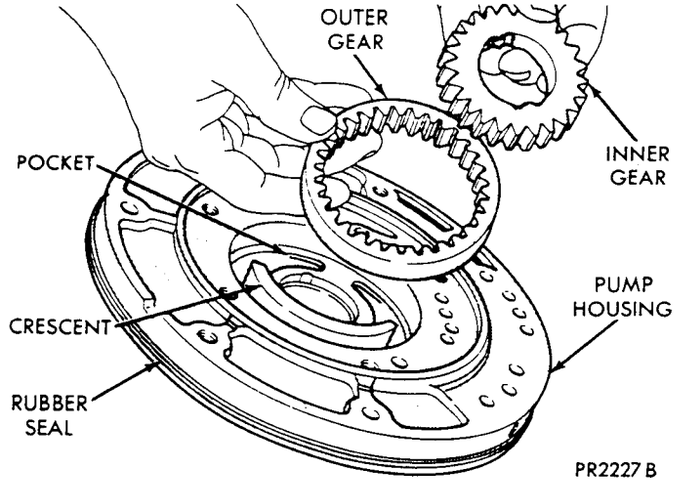


Fig. 3—Inner and Outer Pump Gears

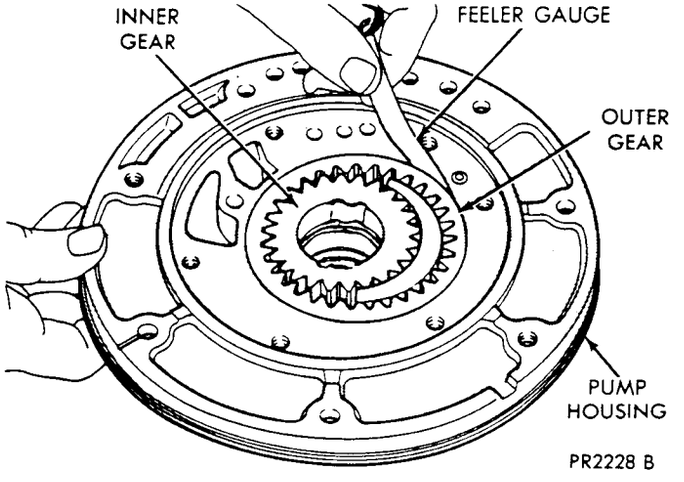


Fig. 4—Measuring Pump Clearance (Gear to Pocket)

Also, check gear side clearance with a straightedge and a feeler gauge (See Specifications).

FRONT CLUTCH

Inspection

Inspect plates and discs for flatness. They must not be warped or cone shaped.

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate surfaces for burning, scoring, or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in grooves. Inspect band contacting surface on clutch retainer for scores, the contact surface should be protected from damage during disassembly and handling. Note ball check in piston; make sure ball moves freely. Inspect piston seal surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of seals. Inspect clutch retainer inner bore surface for wear from reaction shaft support seal rings. Inspect clutch retainer bushing for wear or scores.

Inspect inside bore of piston for score marks, if light, remove with crocus cloth. Inspect seal grooves for nicks and burrs. Inspect seals for deterioration, wear, and hardness. Inspect piston spring, retainer and snap ring for distortion.

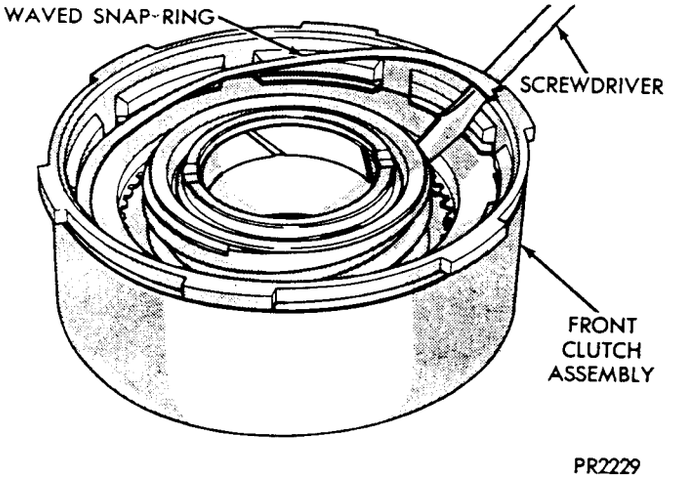


Fig. 1—Front Clutch Waved Snap Ring

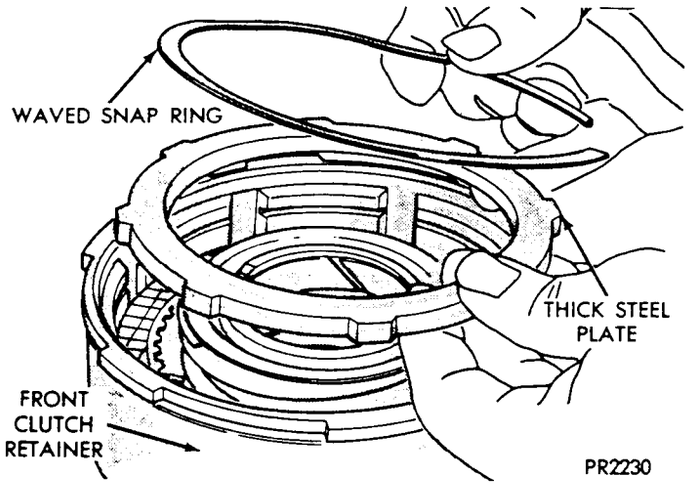


Fig. 2—Thick Steel Plate and Waved Snap Ring

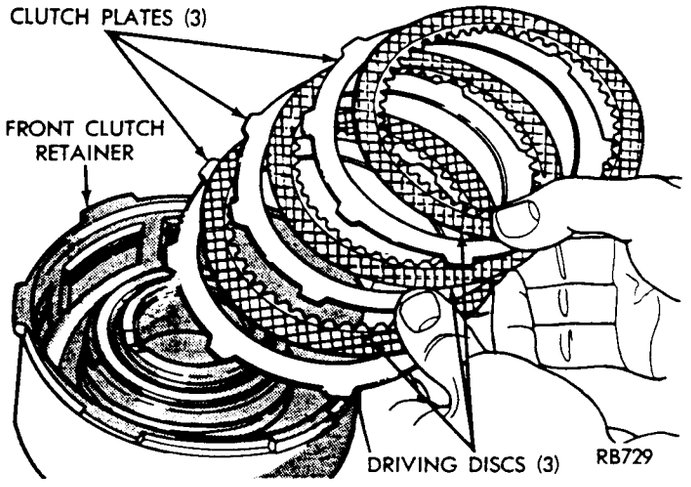


Fig. 3—Front Clutch (3-Disc Shown)

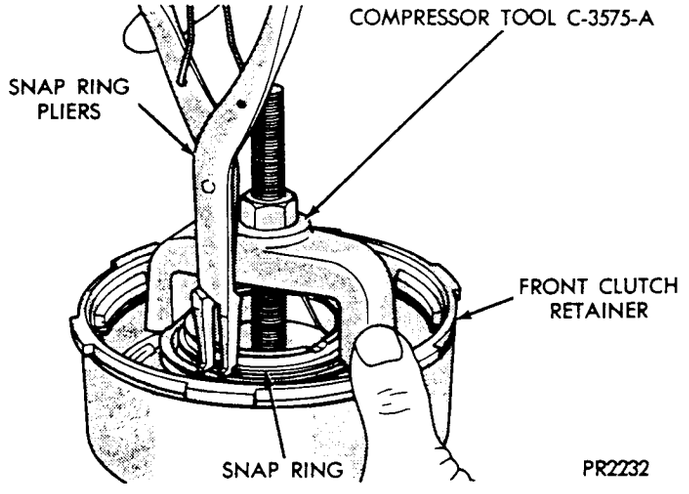


Fig. 4—Front Clutch Return Spring Snap Ring

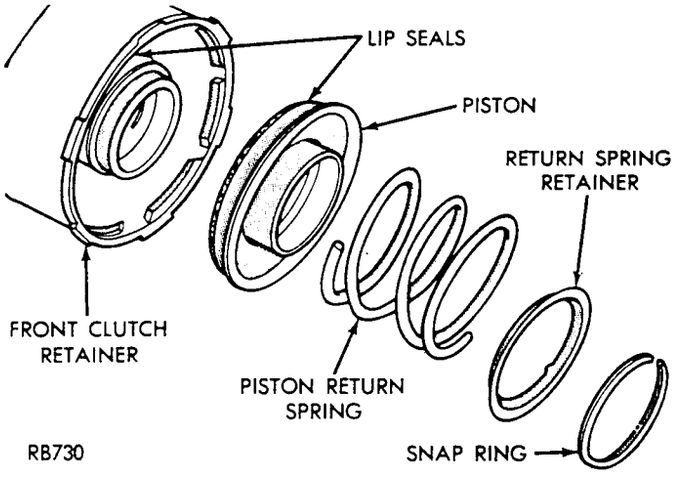


Fig. 5—Front Clutch Return Spring and Piston

To reassemble, reverse the above procedure.

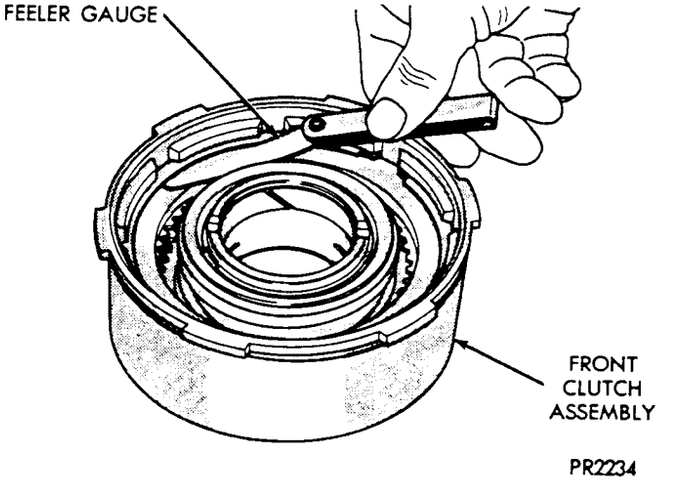


Fig. 6—Measuring Front Clutch Plate Clearance

REAR CLUTCH

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surface for burning, scoring, or damaged driving lugs. Replace if necessary. Inspect plates and discs for flatness, they must not be warped or cone-shaped.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in the grooves. Note ball check in clutch retainer, make sure ball moves freely. Inspect seal rings surfaces in clutch retainer for nicks or deep scratches; light scratches will not interfere

with sealing of the seals. Inspect neoprene seal rings for deterioration, wear and hardness. Inspect piston spring and waved snap ring for distortion or breakage.

Inspect teflon and/or cast iron seal rings on input shaft for wear. Do not remove rings unless conditions warrant. Inspect rear clutch to front clutch #2 thrust washer for wear. Washer thickness should be .061 to .063 inch, replace if necessary.

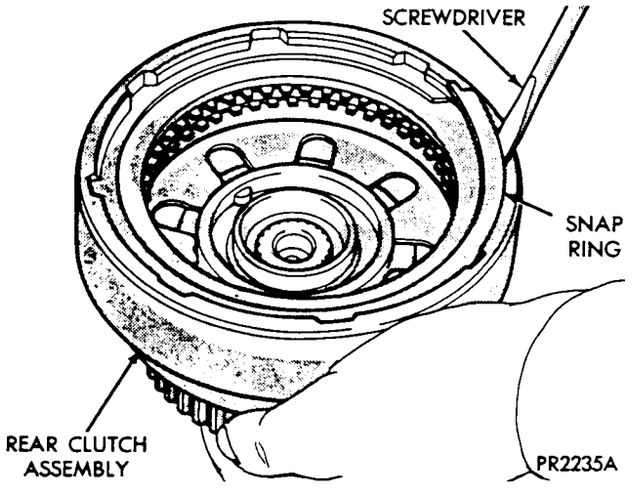


Fig. 1—Rear Clutch Outer Snap Ring

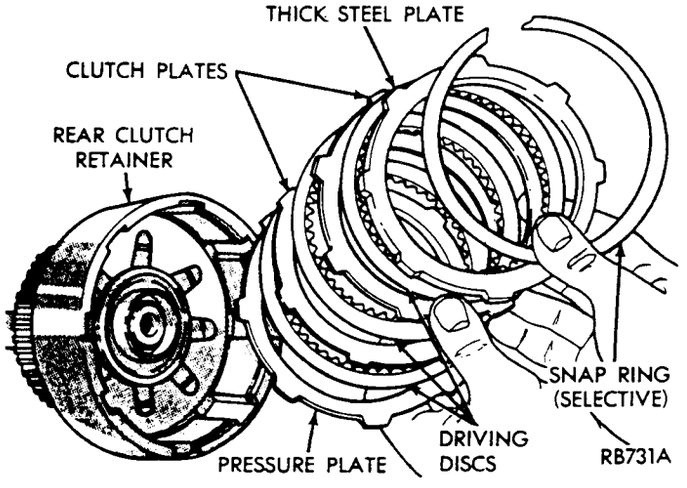


Fig. 2—Rear Clutch (3-Disc Shown)

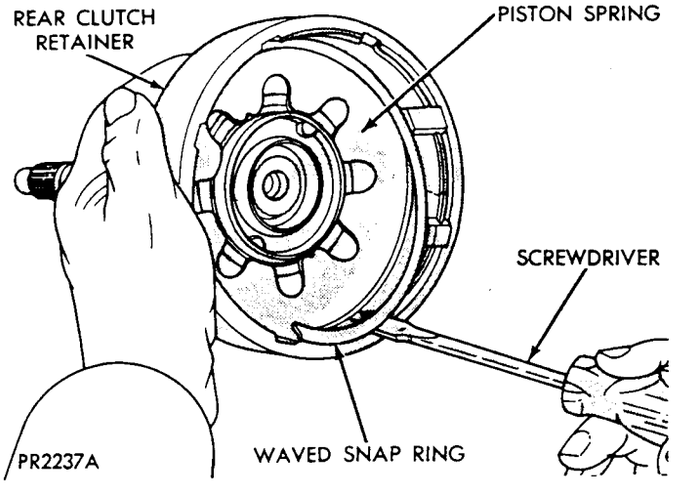


Fig. 3—Piston Spring Waved Snap Ring

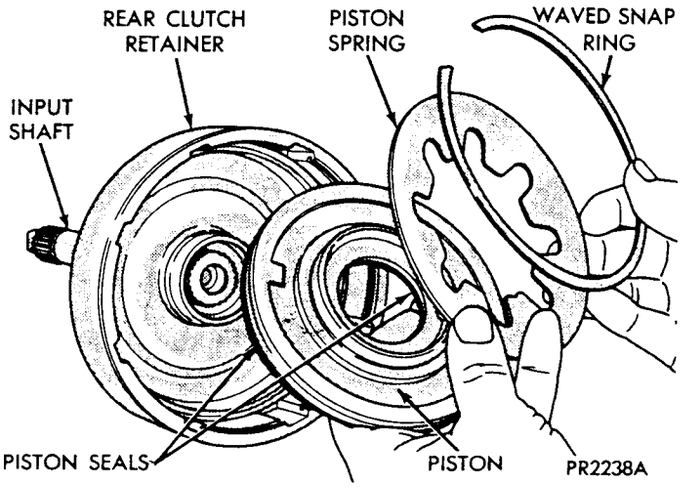


Fig. 4—Rear Clutch Piston and Piston Spring

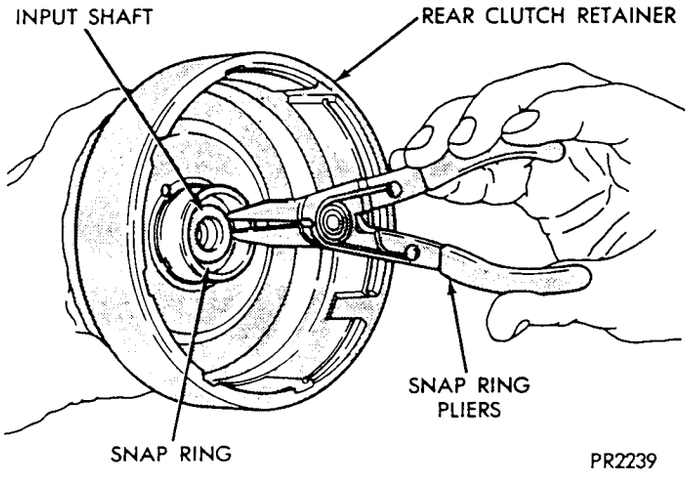
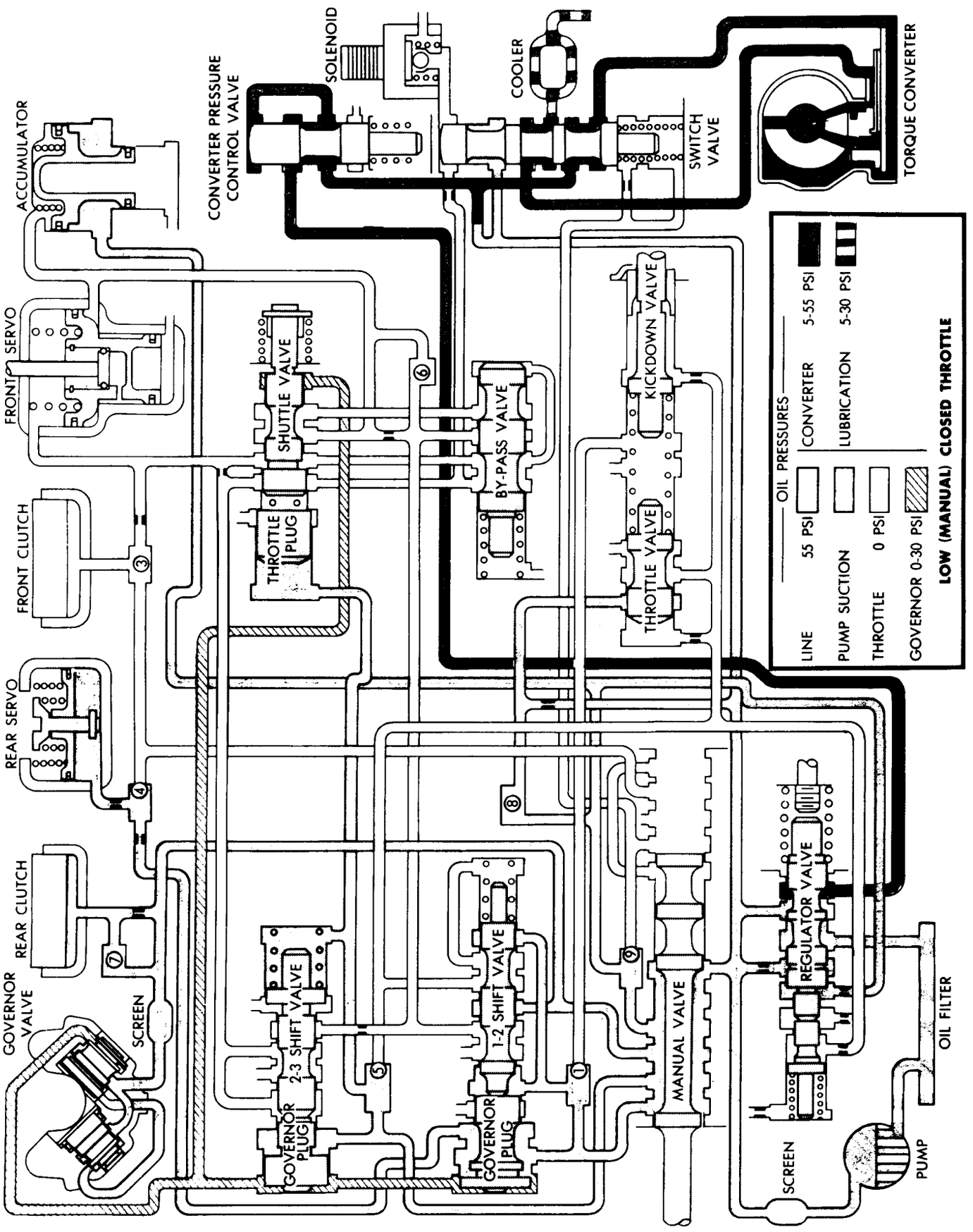


Fig. 5—Remove or Install Input Shaft Snap Ring


ACCUMULATOR
CONVERTER PRESSURE CONTROL VALVE
SOLENOID
COOLER
SWITCH VALVE
TORQUE CONVERTER
FRONT SERVO
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
SHUTTLE VALVE
THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
LINE 55 PSI
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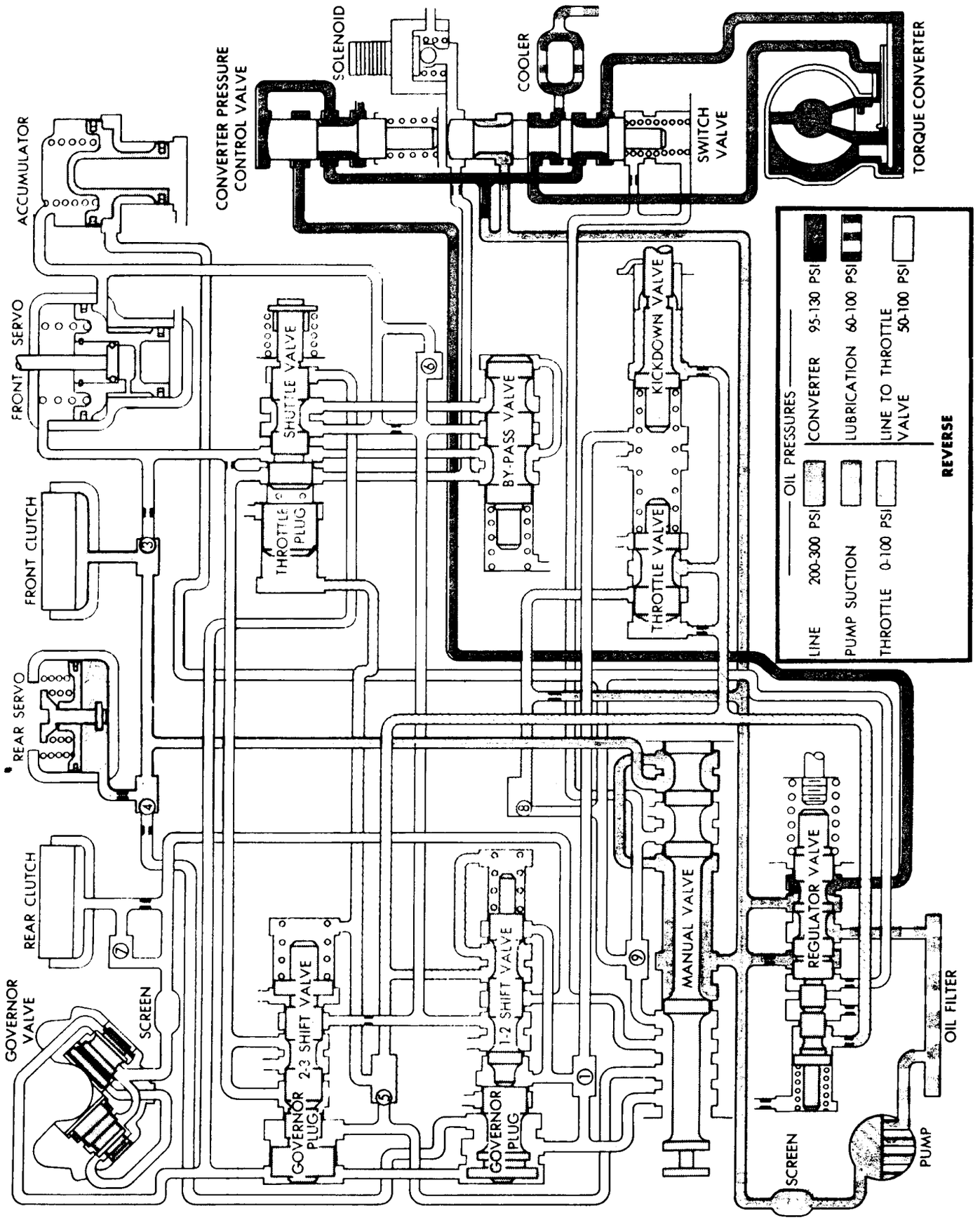
GOVERNOR 0-30 PSI
LOW (MANUAL) CLOSED THROTTLE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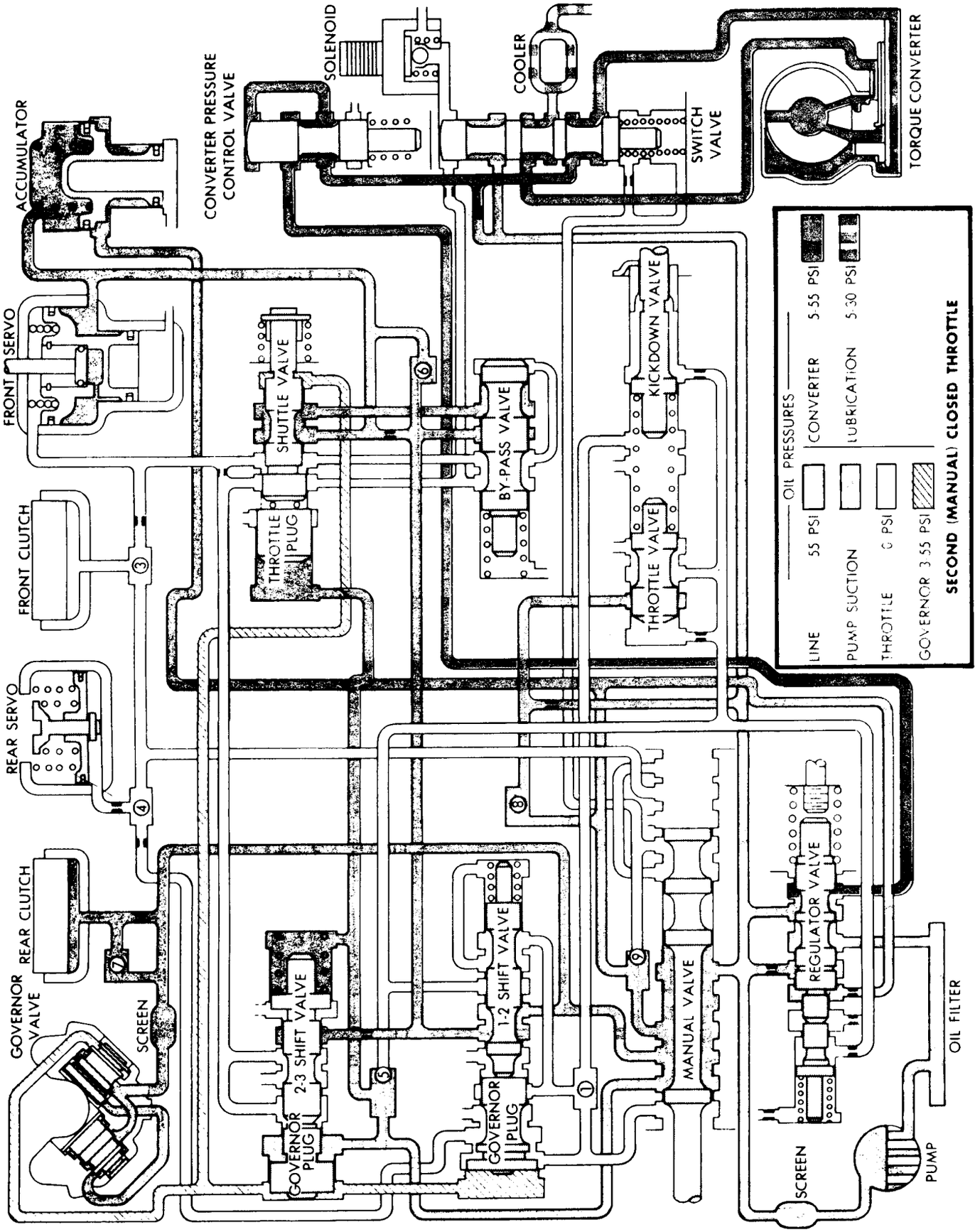
COOLER
CONVERTER PRESSURE CONTROL VALVE
SWITCH VALVE
TORQUE CONVERTER
ACCUMULATOR
FRONT SERVO
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
SHUTTLE VALVE
THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
OIL FILTER
PUMP
OIL PRESSURES
LINE 200-300 PSI
PUMP SUCTION
THROTTLE 0-100 PSI
CONVERTER 95-130 PSI
LUBRICATION 60-100 PSI
LINE TO THROTTLE VALVE 50-100 PSI
REVERSE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SOLENOID
COOLER
SWITCH VALVE
TORQUE CONVERTER
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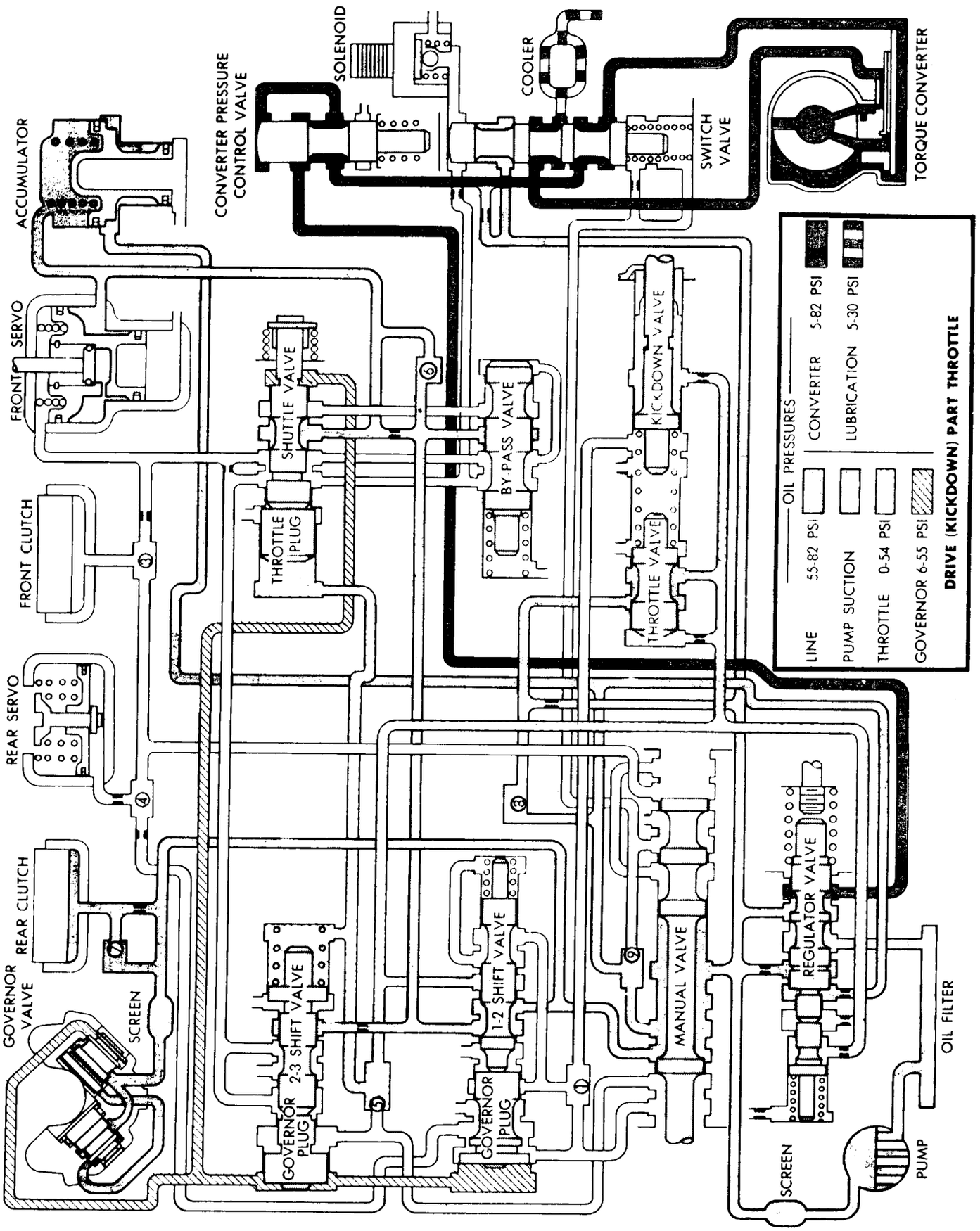
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
SHUTTLE VALVE
THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
LINE 55 PSI
PUMP SUCTION
THROTTLE 0 PSI
CONVERTER 5-55 PSI
LUBRICATION 5-30 PSI
GOVERNOR 3-55 PSI
SECOND (MANUAL) CLOSED THROTTLE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SOLENOID
COOLER
SWITCH VALVE
TORQUE CONVERTER
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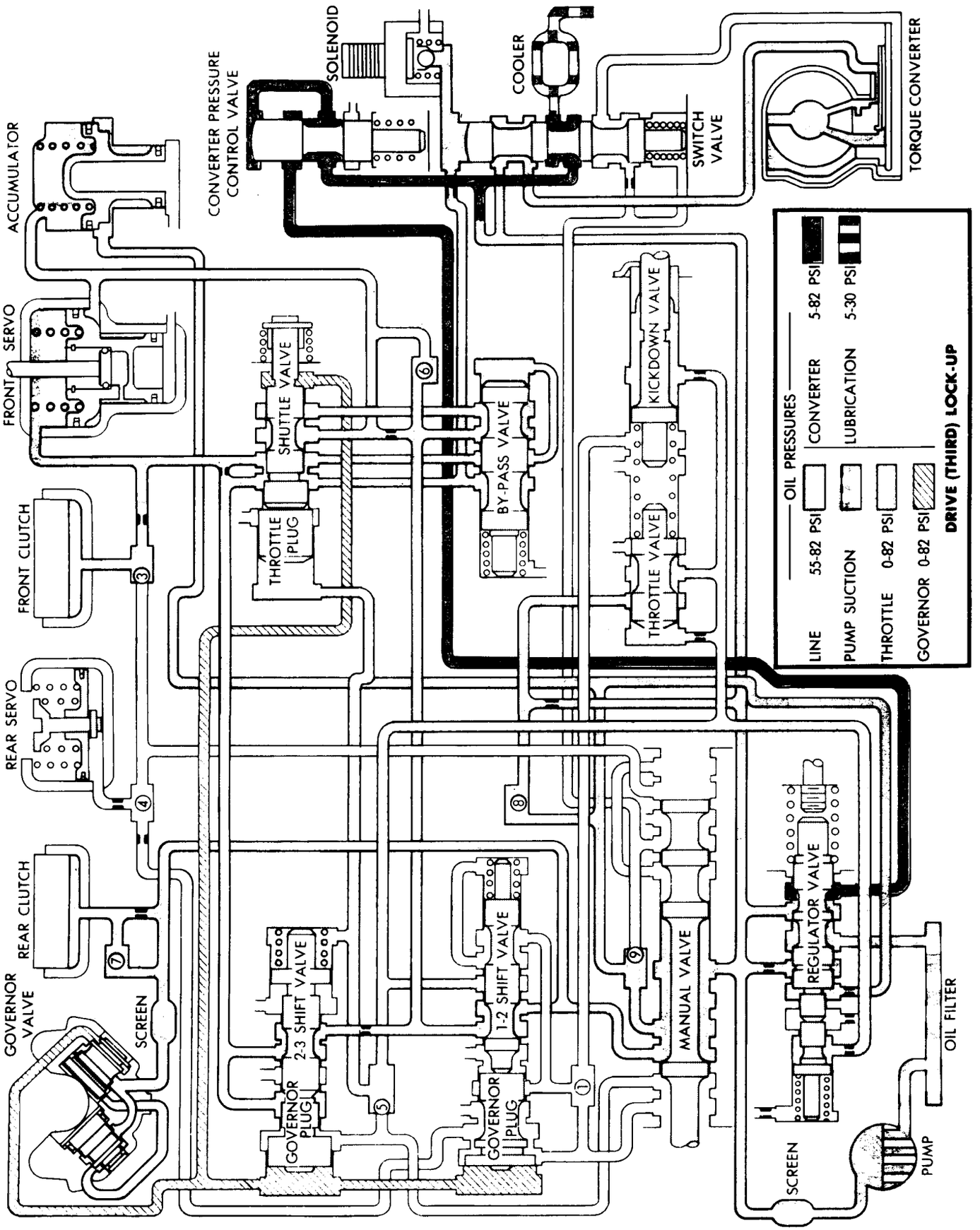
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
SHUTTLE VALVE
THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
LINE 55-82 PSI
PUMP SUCTION
THROTTLE 0-54 PSI
CONVERTER 5-82 PSI
LUBRICATION 5-30 PSI
GOVERNOR 6-55 PSI
DRIVE (KICKDOWN) PART THROTTLE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COOLER
SWITCH VALVE
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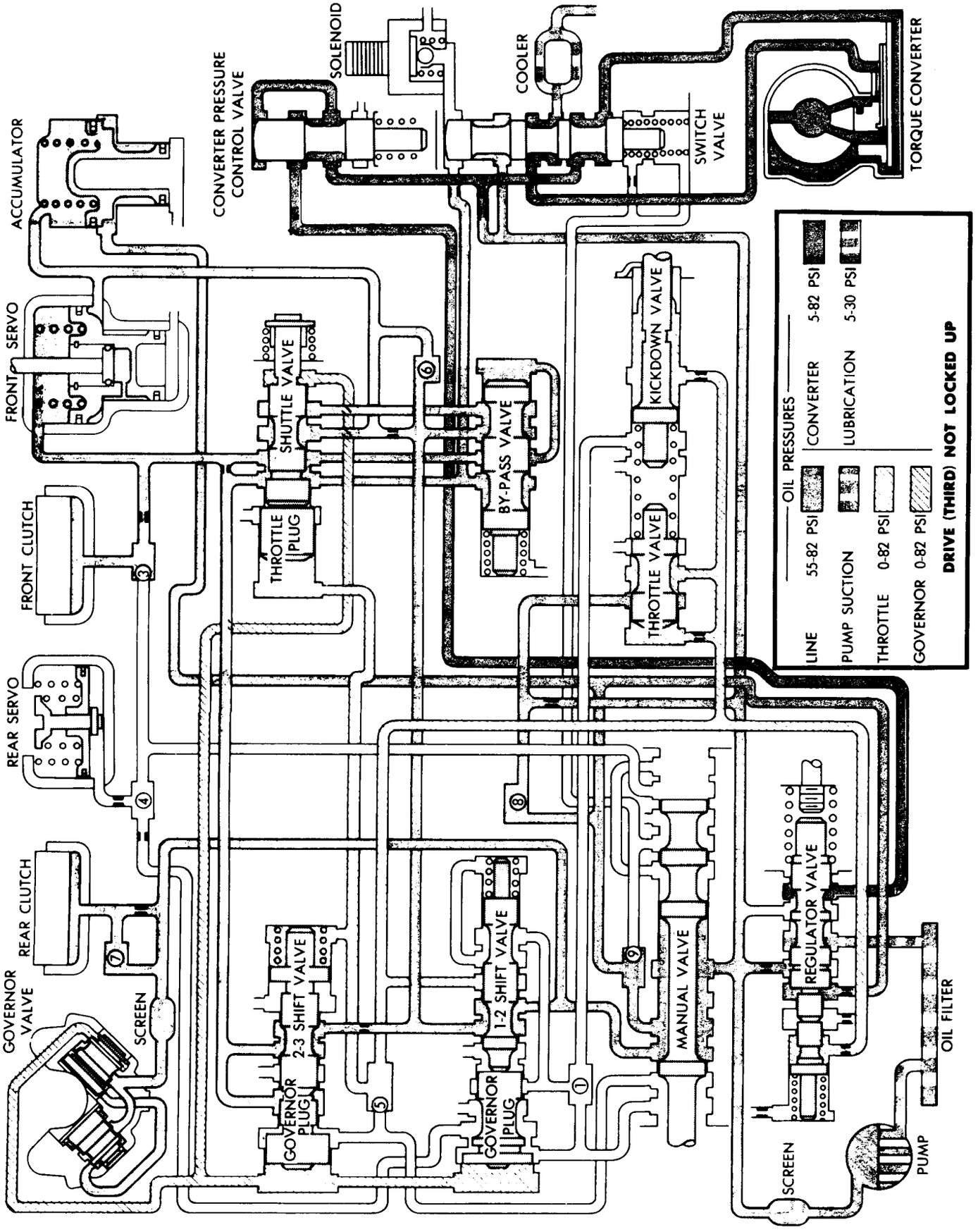
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE PLUG
THROTTLE VALVE
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
2-3 SHIFT VALVE
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
OIL FILTER
PUMP
OIL PRESSURES
LINE 55-82 PSI
PUMP SUCTION
THROTTLE 0-82 PSI
GOVERNOR 0-82 PSI
CONVERTER 5-82 PSI
LUBRICATION 5-30 PSI
DRIVE (THIRD) LOCK-UP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COOLER
SWITCH VALVE
TORQUE CONVERTER
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FRONT CLUTCH
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THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
LINE 55-82 PSI
PUMP SUCTION
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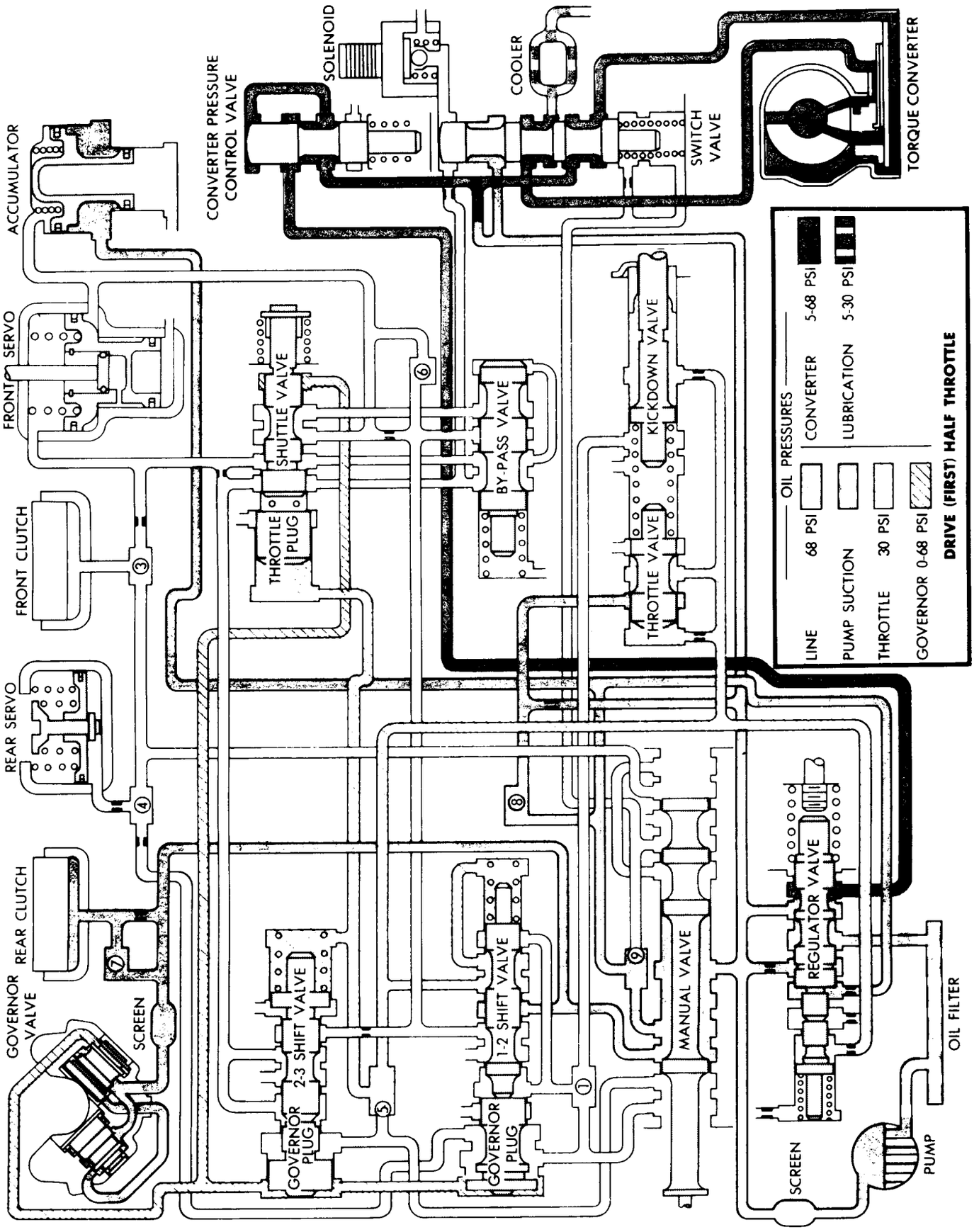
GOVERNOR 0-82 PSI
CONVERTER 5-82 PSI
LUBRICATION 5-30 PSI
DRIVE (THIRD) NOT LOCKED UP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FRONT SERVO
FRONT CLUTCH
REAR SERVO
REAR CLUTCH
GOVERNOR VALVE
SCREEN
CONVERTER PRESSURE CONTROL VALVE
SOLENOID
COOLER
SWITCH VALVE
TORQUE CONVERTER
THROTTLE PLUG
SHUTTLE VALVE
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
LINE 68 PSI
PUMP SUCTION
THROTTLE 30 PSI
GOVERNOR 0-68 PSI
CONVERTER 5-68 PSI
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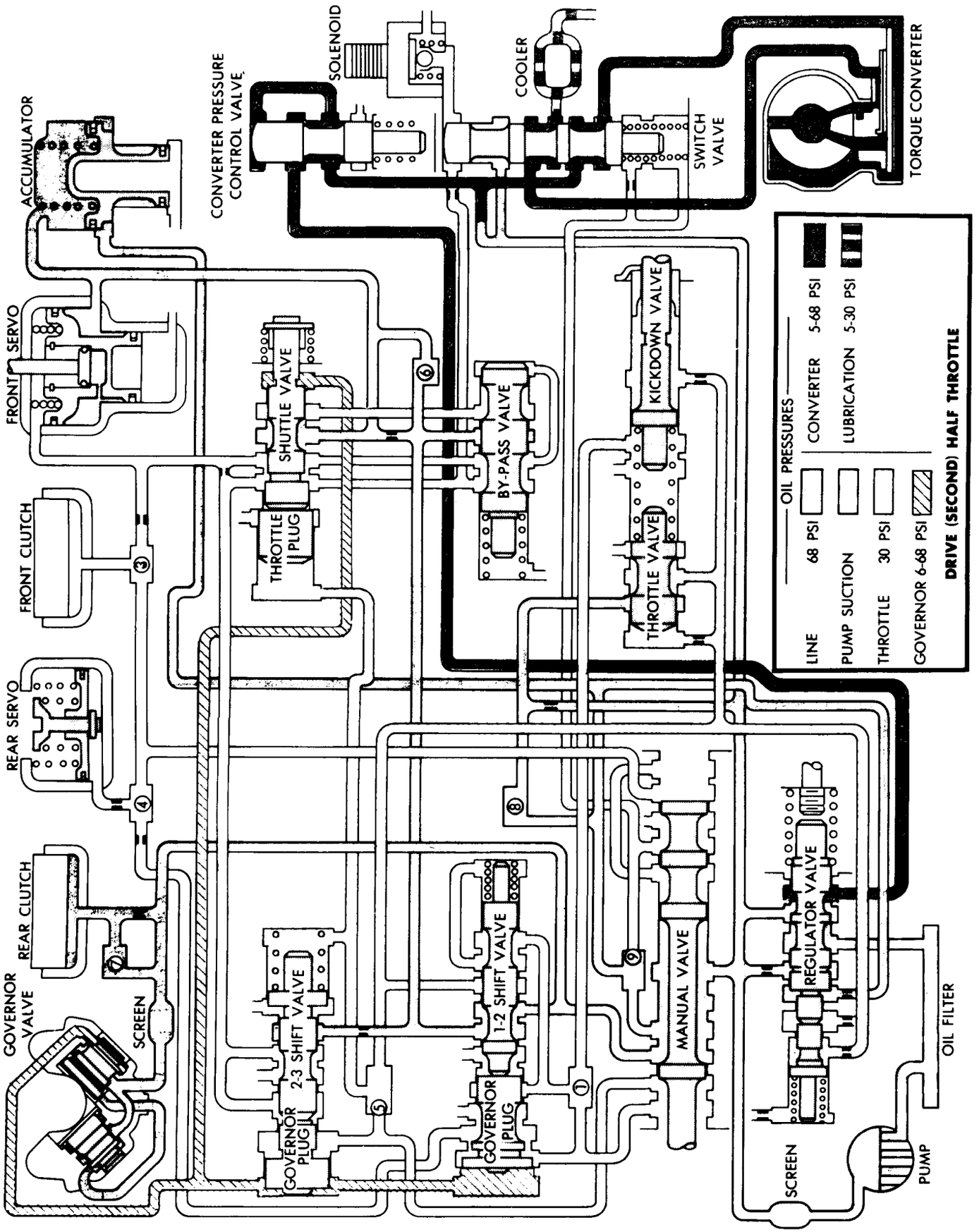
DRIVE (FIRST) HALF THROTTLE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COOLER
SWITCH VALVE
TORQUE CONVERTER
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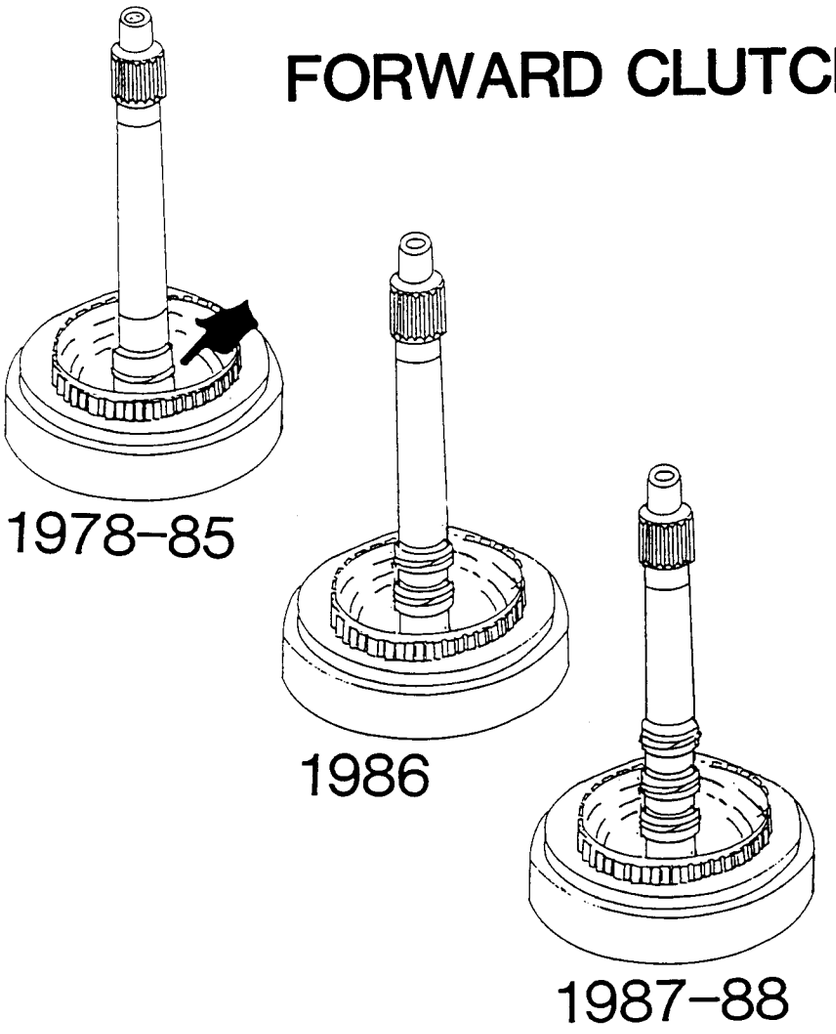
REAR CLUTCH
GOVERNOR VALVE
SCREEN
SHUTTLE VALVE
THROTTLE PLUG
BY-PASS VALVE
KICKDOWN VALVE
THROTTLE VALVE
2-3 SHIFT VALVE
GOVERNOR PLUG
1-2 SHIFT VALVE
GOVERNOR PLUG
MANUAL VALVE
REGULATOR VALVE
SCREEN
PUMP
OIL FILTER
OIL PRESSURES
CONVERTER 5-68 PSI
LUBRICATION 5-30 PSI
LINE 68 PSI
PUMP SUCTION
THROTTLE 30 PSI
GOVERNOR 6-68 PSI
DRIVE (SECOND) HALF THROTTLE

PARTS UPDATE

FORWARD CLUTCH DRUM



The turbine shaft in the forward clutch drum has one to three rings. All the drums have a large ring at the base of the shaft on the drum boss. The 1978 thru 1985 units had only one ring on the shaft. The 1986 units came with two rings on the turbine shaft still a non-lockup unit. Finally, the 1987-88 came with a three ring shaft on the A-670 lockup unit. It is important that the right stator support is used with the matching turbine shaft.

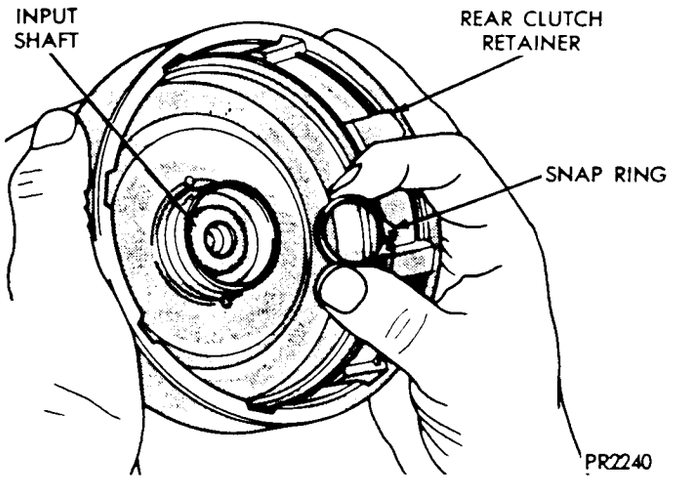


Fig. 6—Input Shaft Snap Ring

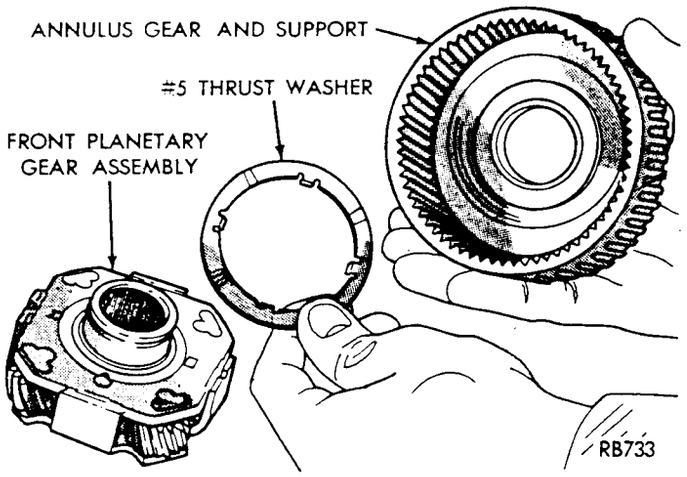


Fig. 2—Front Planetary Gear

Press out input shaft, if required.
To reassemble, reverse the above procedure.

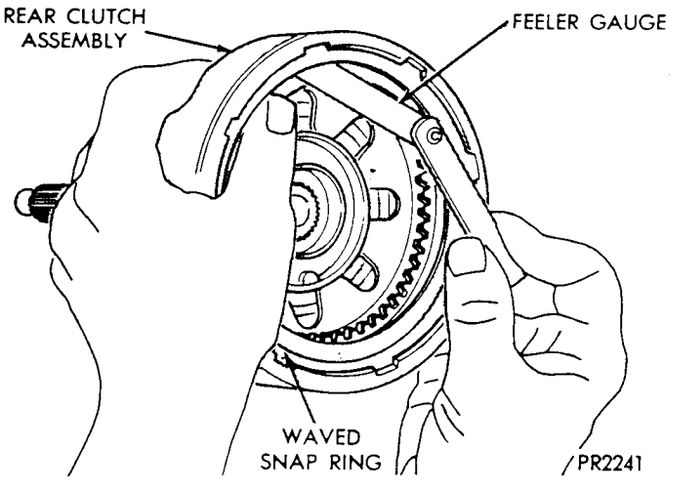


Fig. 7—Measuring Rear Clutch Plate Clearance

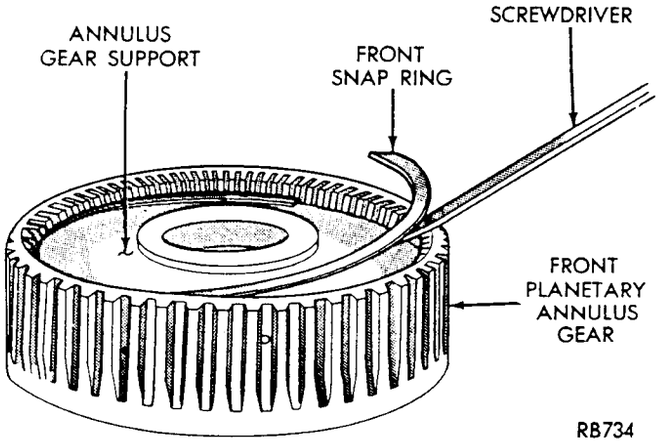


Fig. 3—Annulus Gear Support Front Snap Ring

FRONT PLANETARY & ANNULUS GEAR

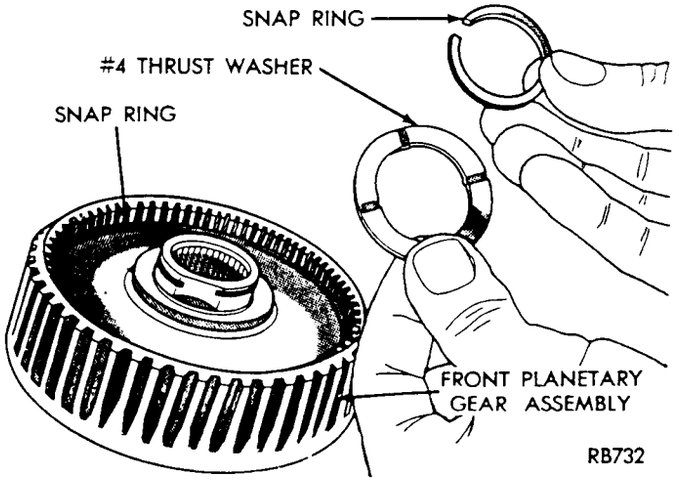


Fig. 1—No. 4 Thrust Washer (Install NEW Snap Ring)

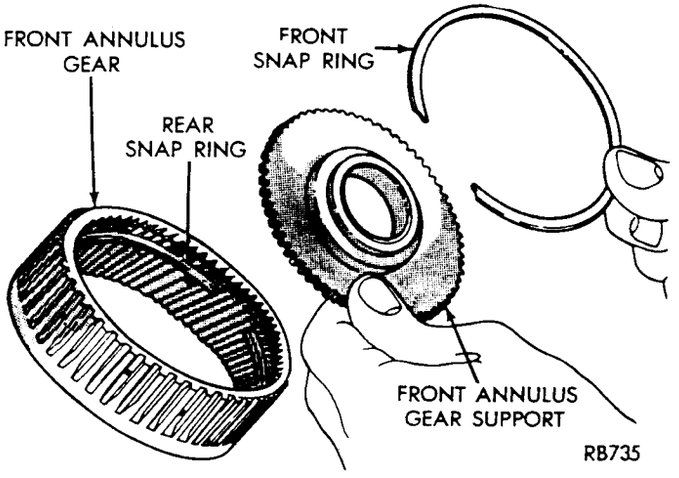


Fig. 4—Front Annulus Gear Support Snap Ring

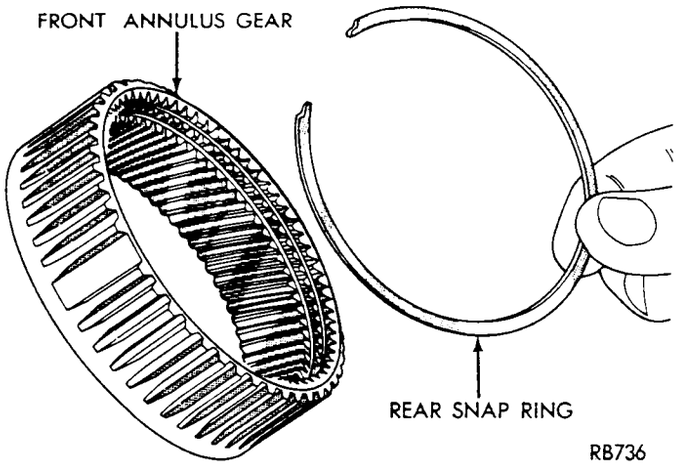


Fig. 5—Front Annulus Gear Support Snap Ring

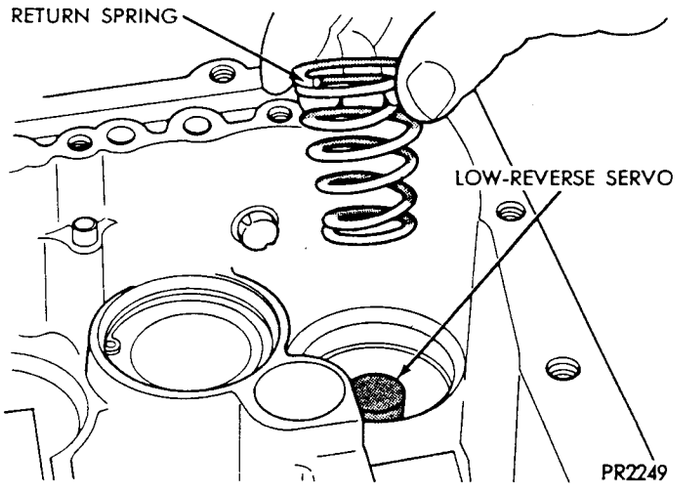


Fig. 3—Low-Reverse Servo Return Spring

LOW-REVERSE (REAR) SERVO

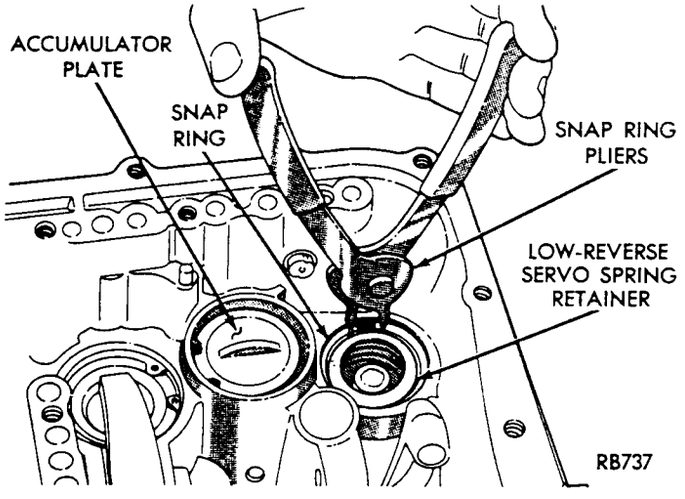


Fig. 1—Low-Reverse Servo Snap Ring

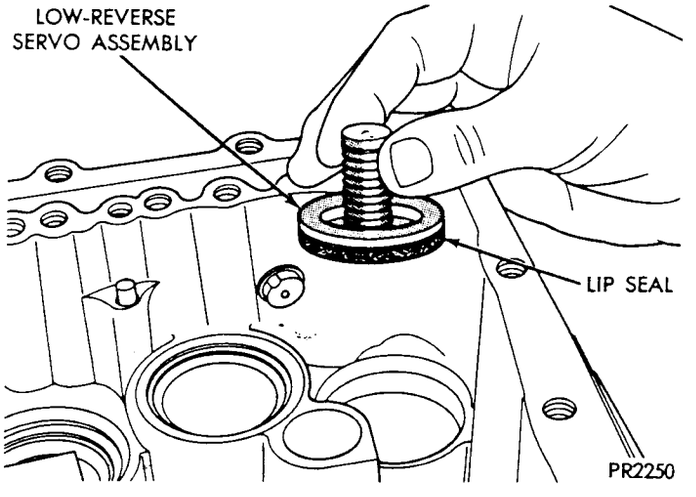


Fig. 4—Low-Reverse Servo Assembly

To assemble, reverse the above procedure.

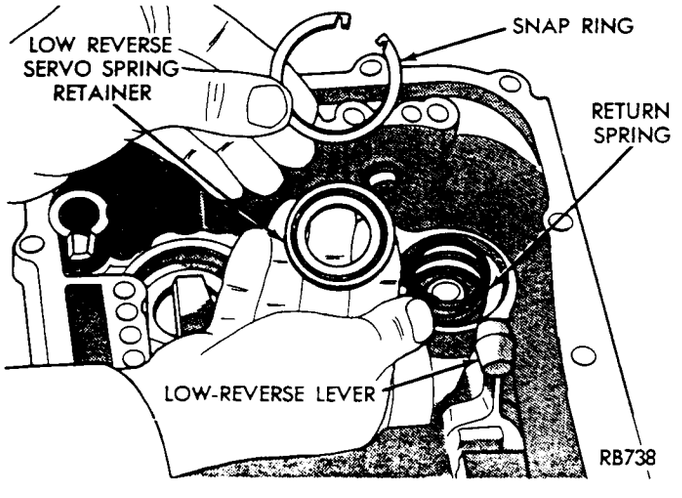


Fig. 2—Retainer and Snap Ring

ACCUMULATOR

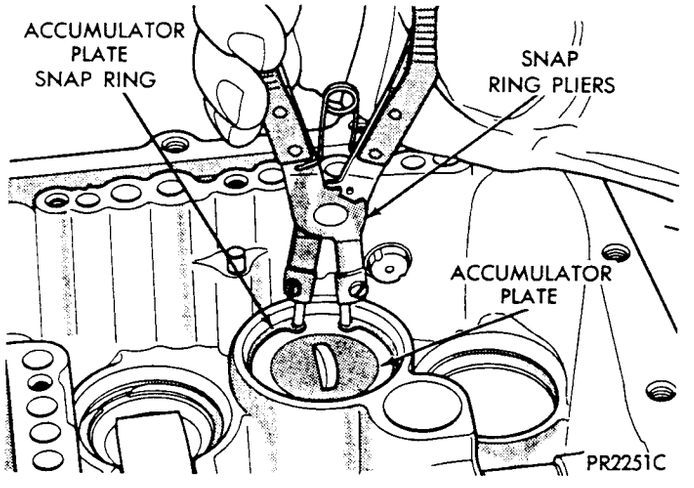


Fig. 1—Accumulator Snap Ring

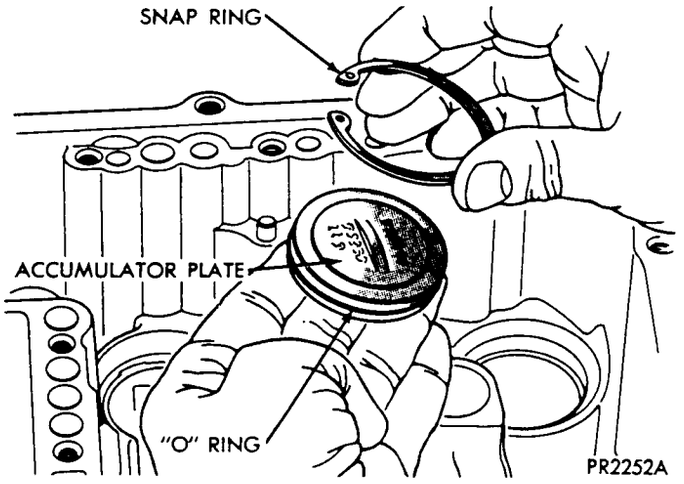


Fig. 2—Accumulator Plate and Snap Ring

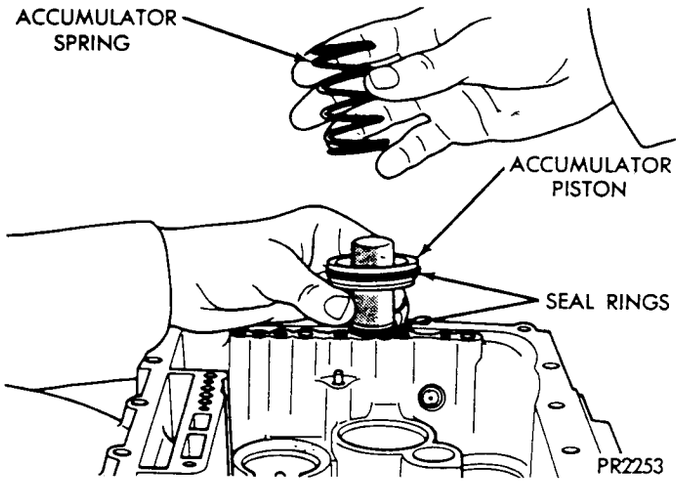


Fig. 3—Accumulator Spring and Piston

To assemble, reverse the above procedure.

KICKDOWN SERVO (CONTROLLED LOAD)

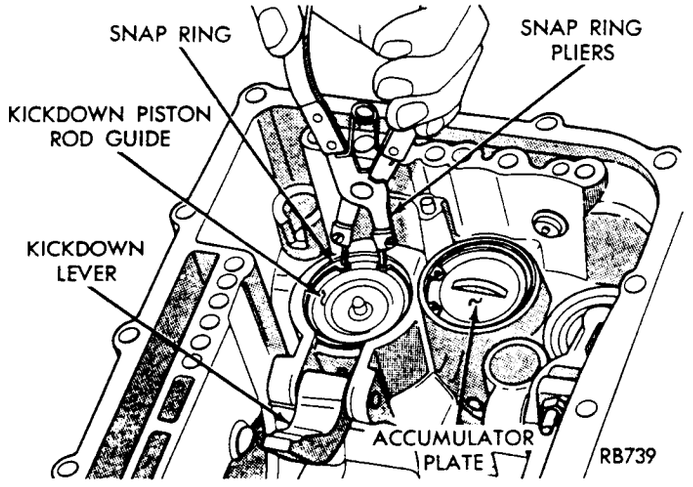


Fig. 1—Kickdown Servo Snap Ring

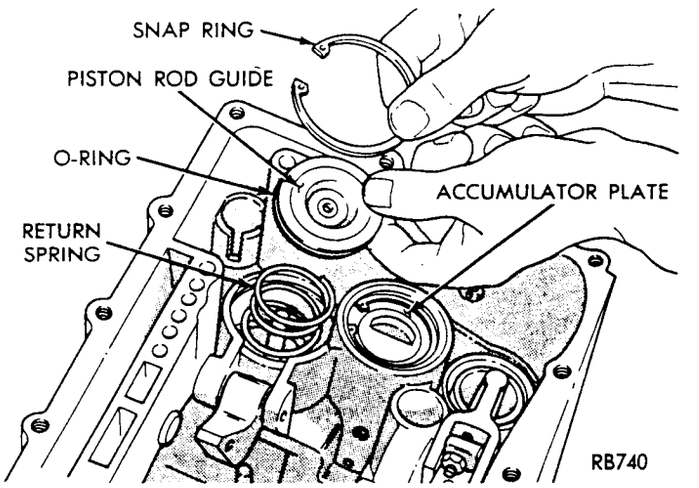


Fig. 2—Kickdown Servo Rod Guide and Snap Ring

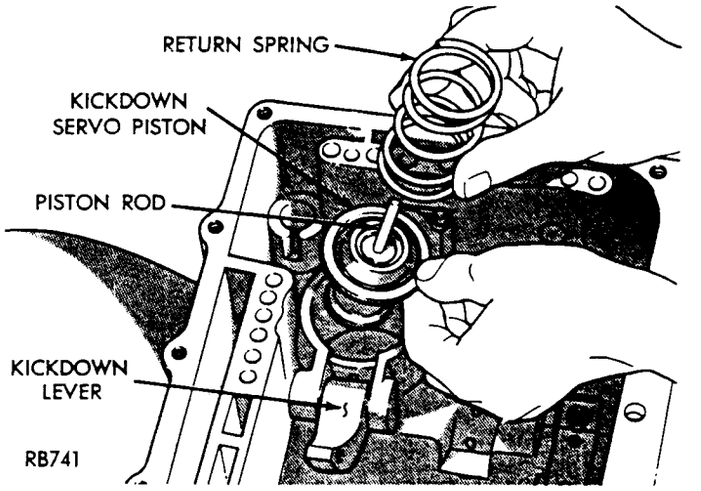


Fig. 3—Kickdown Piston Return Spring and Piston

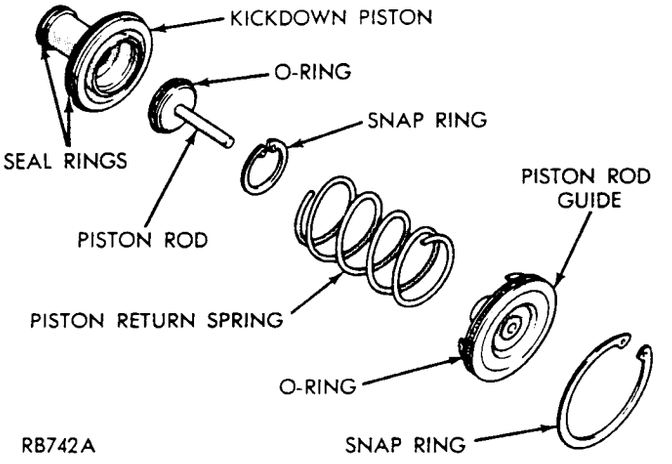


Fig. 4—Controlled Load Kickdown Servo

To assemble, reverse the above procedure.

TRANSFER SHAFT REPAIR

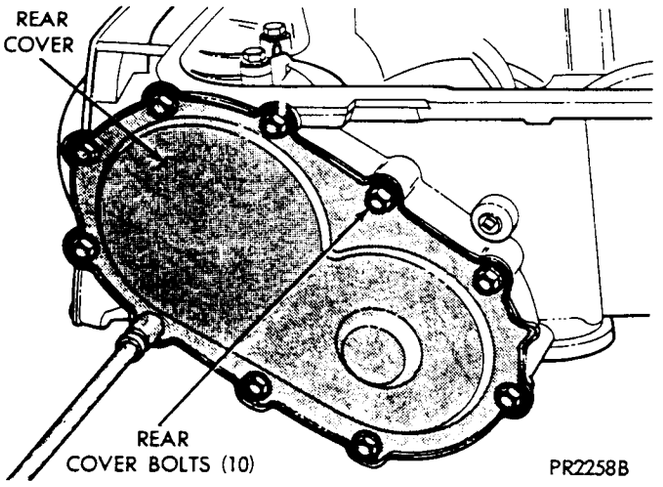


Fig. 1—Rear Cover Bolts

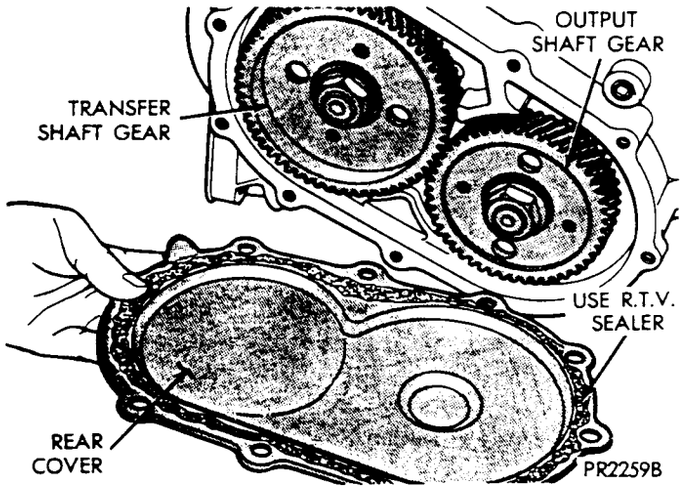


Fig. 2—Remove or Install Rear Cover

Remove old R.T.V. before applying new R.T.V. sealant. Use R.T.V. sealant when installing cover.

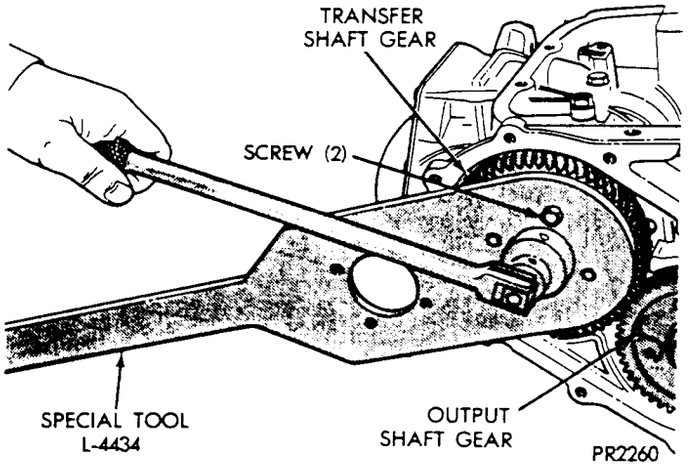


Fig. 3—Remove Transfer Shaft Gear Retaining Nut

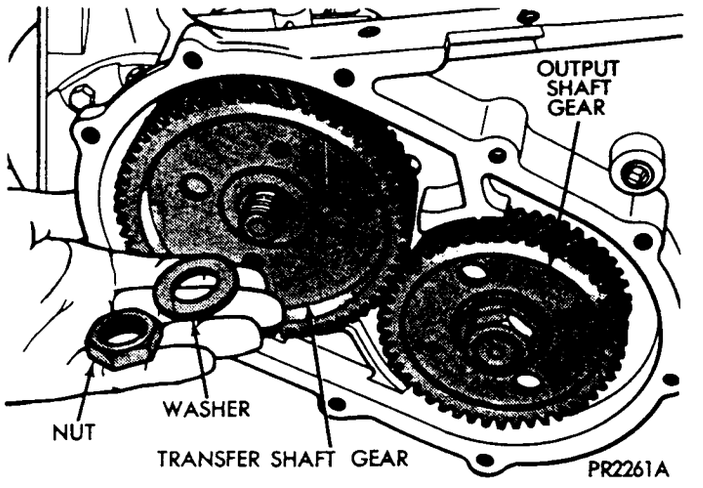


Fig. 4—Transfer Shaft Gear Nut and Washer

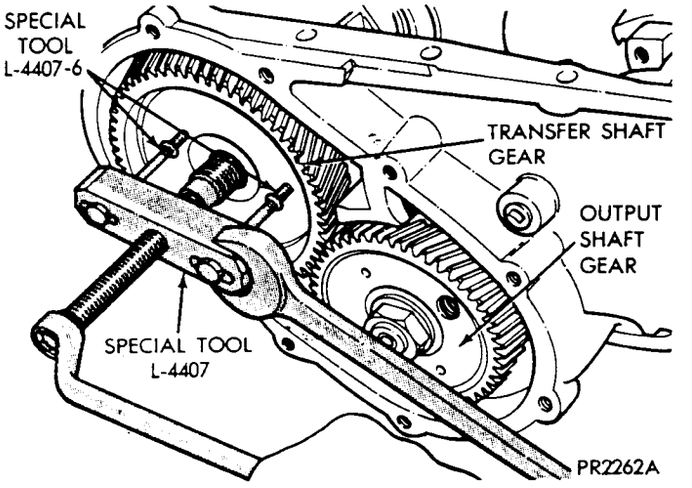


Fig. 5—Remove Transfer Shaft Gear

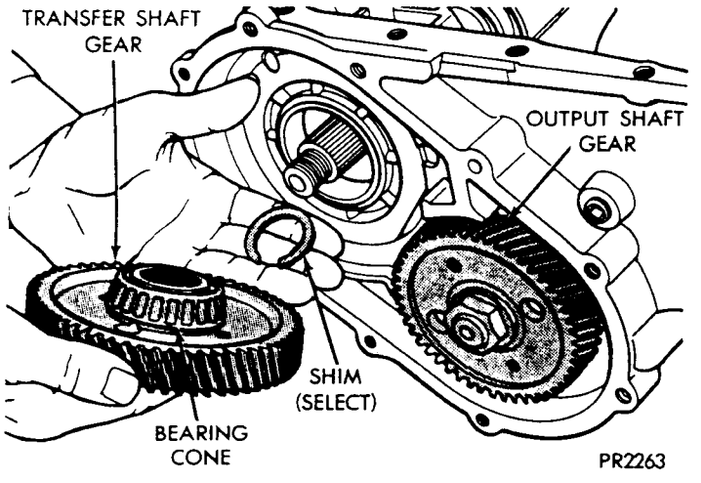


Fig. 6—Transfer Shaft Gear and (Select) Shim

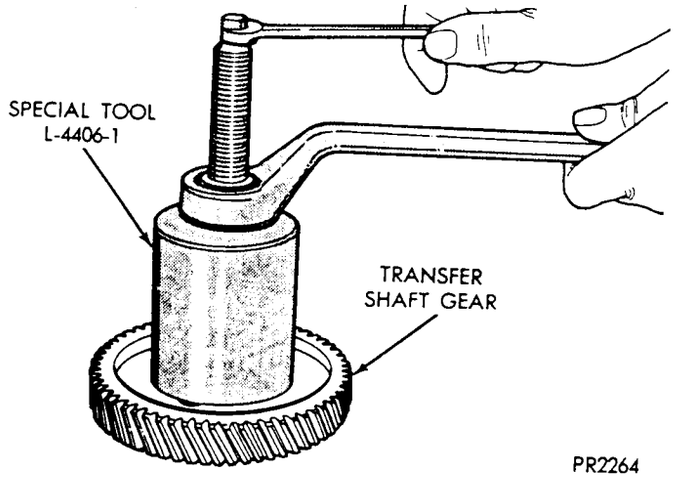


Fig. 7—Using Tool L-4406-1 with Adapter L-4406-3, Remove Transfer Shaft Gear Bearing Cone

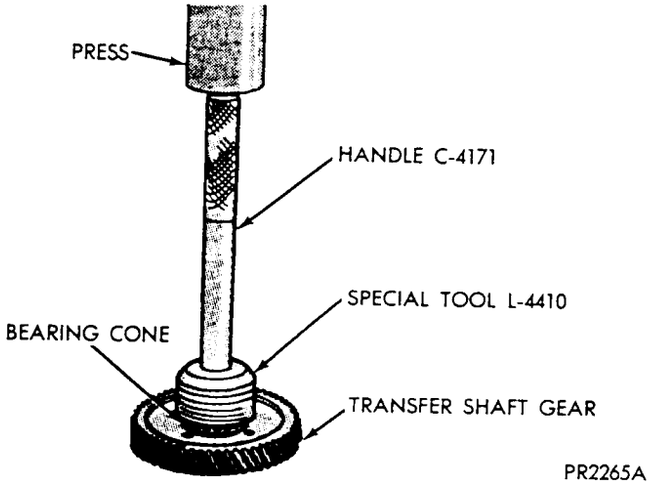


Fig. 8—Install Transfer Shaft Gear Bearing Cone

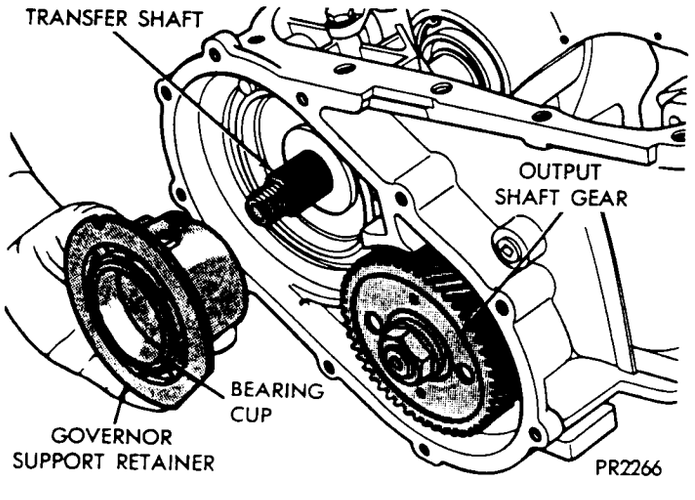


Fig. 9—Governor Support Retainer

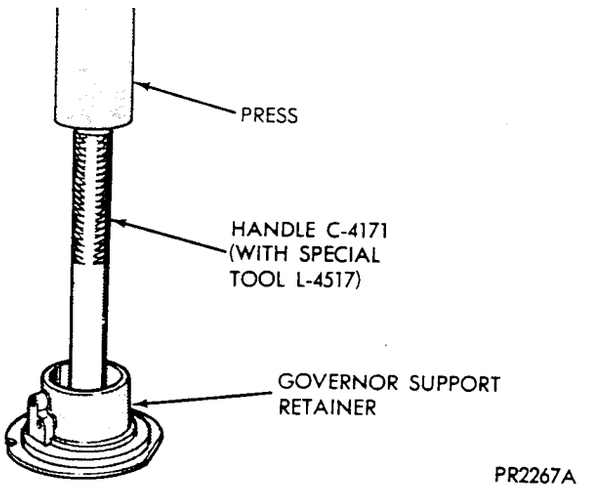


Fig. 10—Remove Governor Support Retainer Bearing Cup

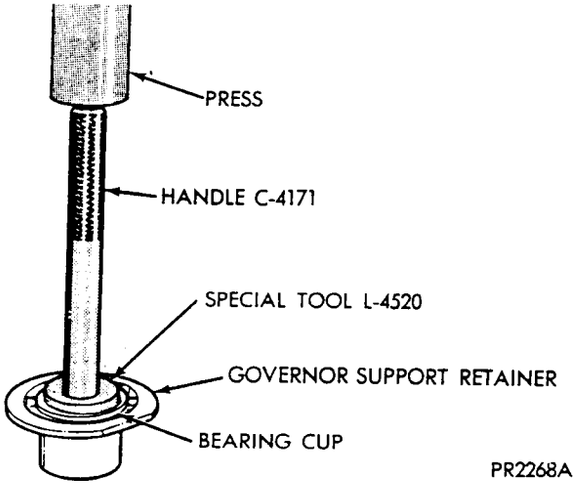


Fig. 11—Install Governor Support Retainer Bearing Cup

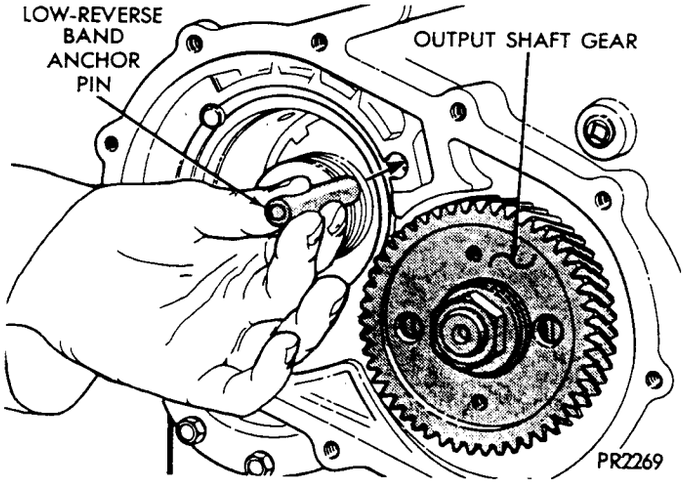


Fig. 12—Low-Reverse Band Anchor Pin

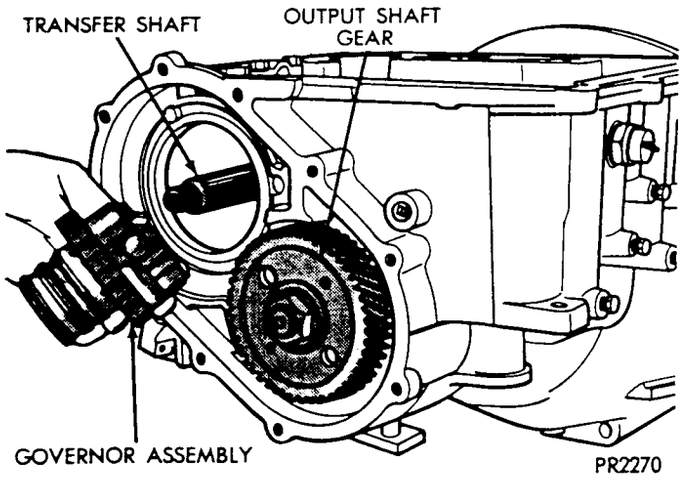


Fig. 13—Governor Assembly

Remove or install both governor valves and governor body.

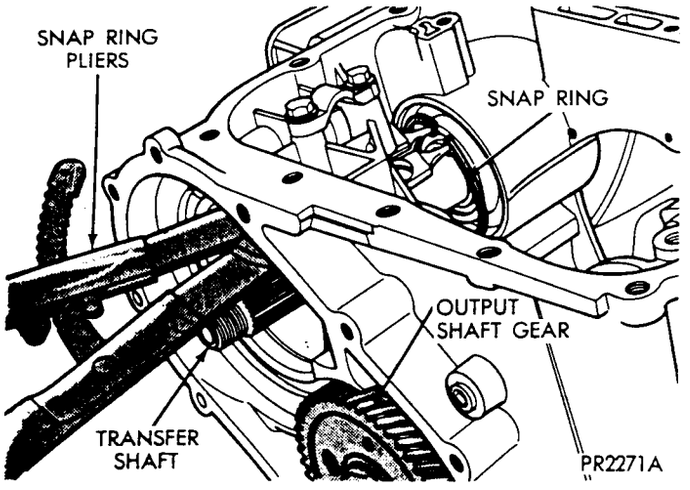


Fig. 14—Transfer Shaft Bearing Snap Ring

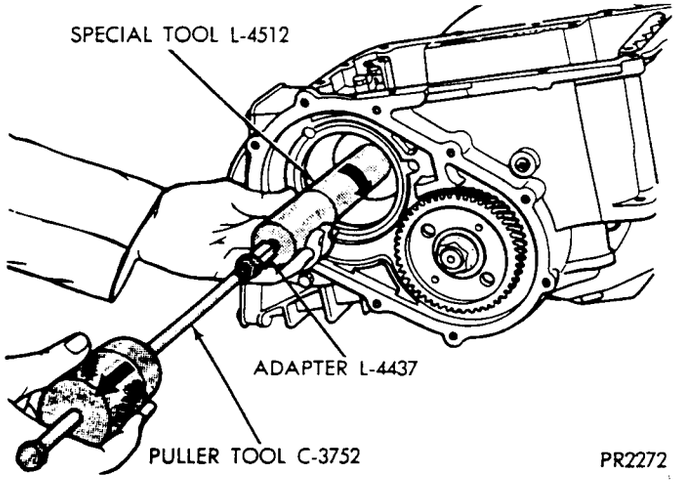


Fig. 15—Remove Transfer Shaft and Bearing Retainer Assembly

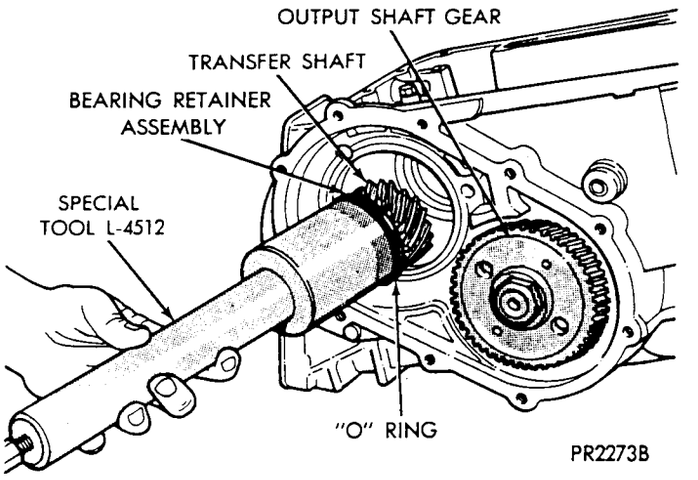


Fig. 16—Remove or Install Transfer Shaft and Bearing Retainer Assembly

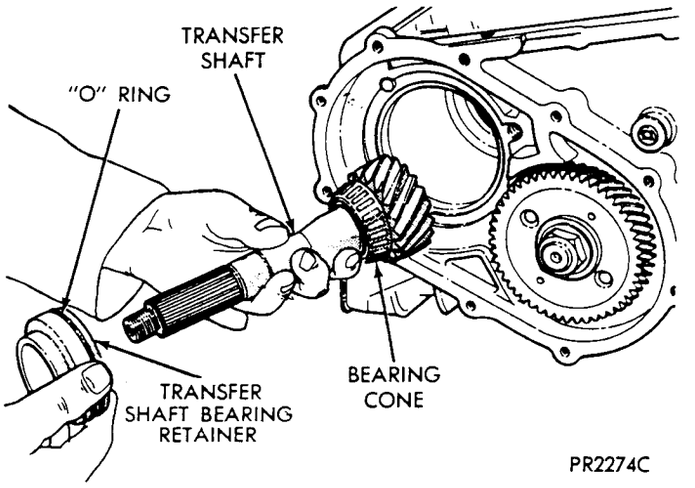


Fig. 17—Transfer Shaft and Bearing Retainer

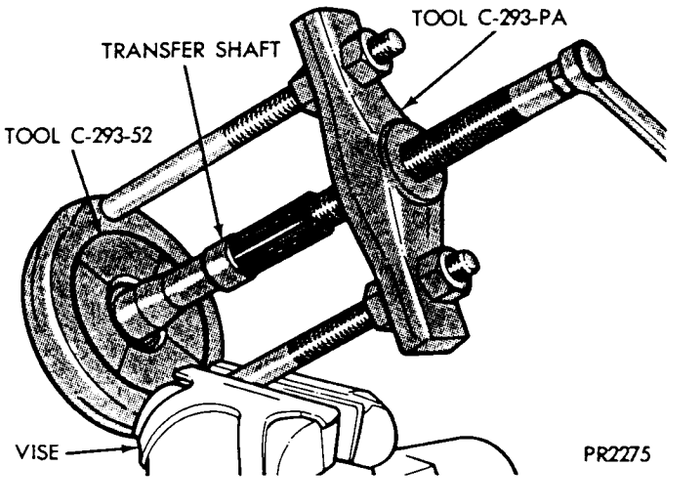


Fig. 18—Remove Transfer Shaft Bearing Cone

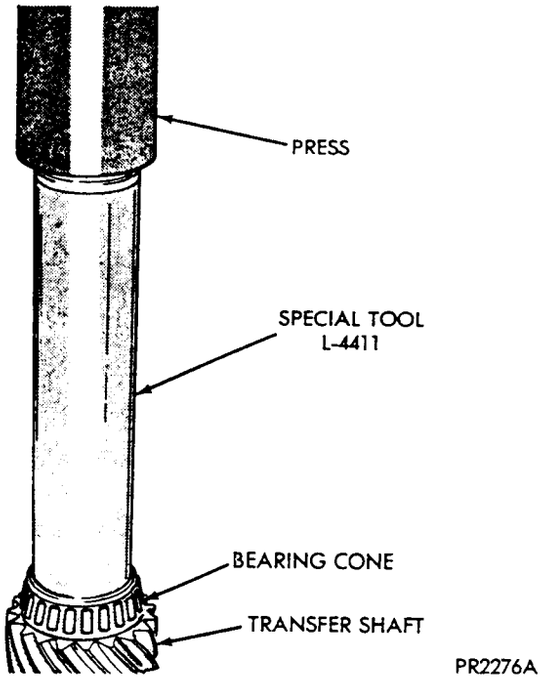


Fig. 19—Install Transfer Shaft Bearing Cone

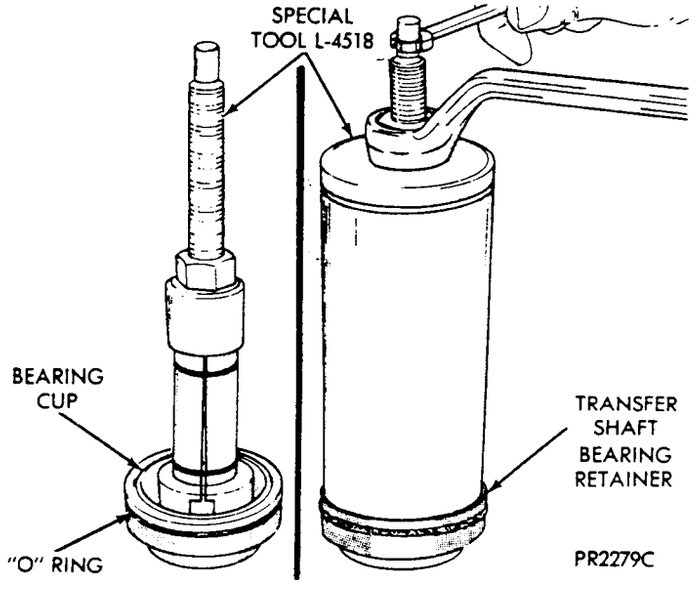


Fig. 20—Remove Transfer Shaft Bearing Cup

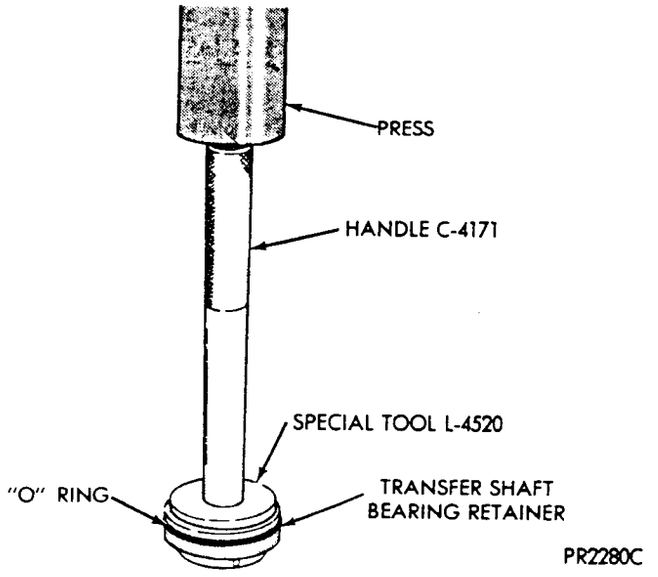


Fig. 21—Install Transfer Shaft Bearing Cup

To install transfer shaft, reverse the above procedure.

Determining Shim Thickness

Shim thickness need only be determined if any of the following parts are replaced: (a) transaxle case, (b) transfer shaft, (c) transfer shaft gear, (d) transfer shaft bearings, (e) governor support retainer, (f) transfer shaft bearing retainer, (g) retainer snap ring and (h) governor support. Refer to "Bearing Adjustment Procedure" in rear of this section to determine proper shim thickness for correct end play.

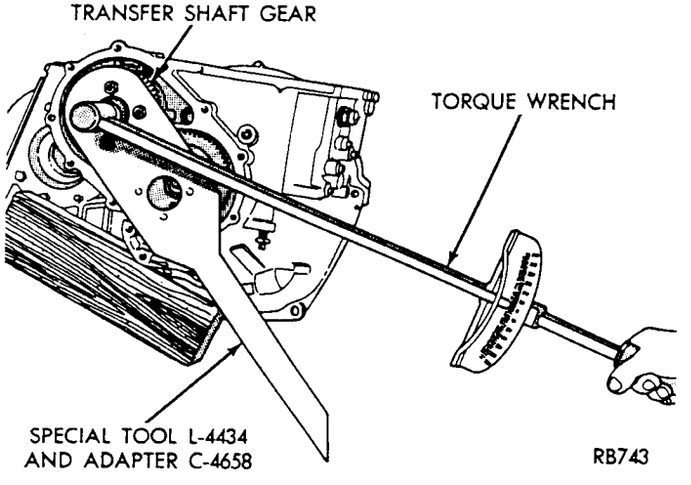


Fig. 22—Tighten Transfer Shaft Gear Retaining Nut to 271 N·m (200 ft. lbs.)

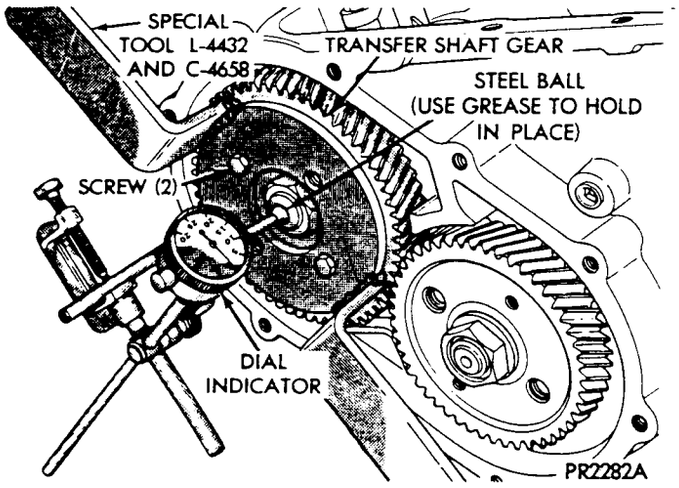


Fig. 23—Checking Transfer Shaft End Play

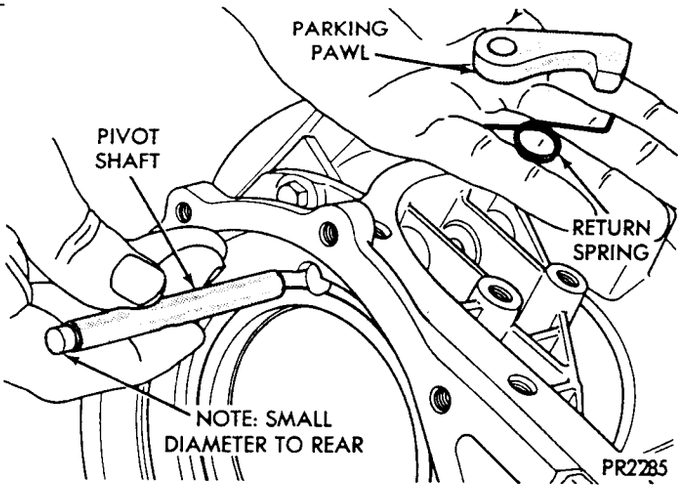


Fig. 3—Parking Pawl, Spring, and Shaft

PARKING PAWL

To install, reverse the above procedure.

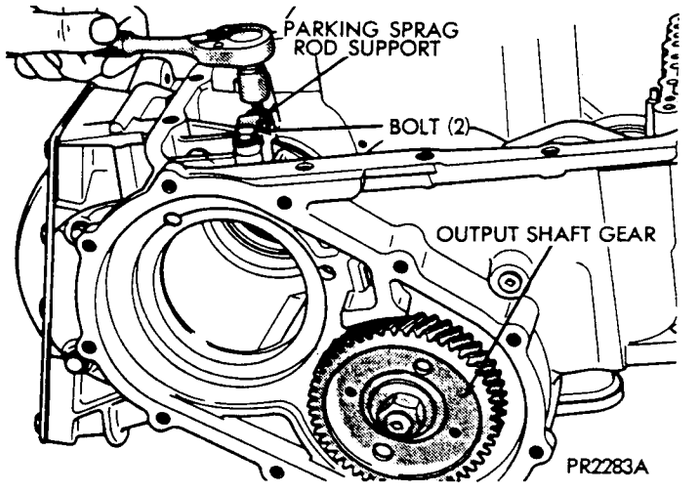


Fig. 1—Parking Sprag Rod Support Bolts

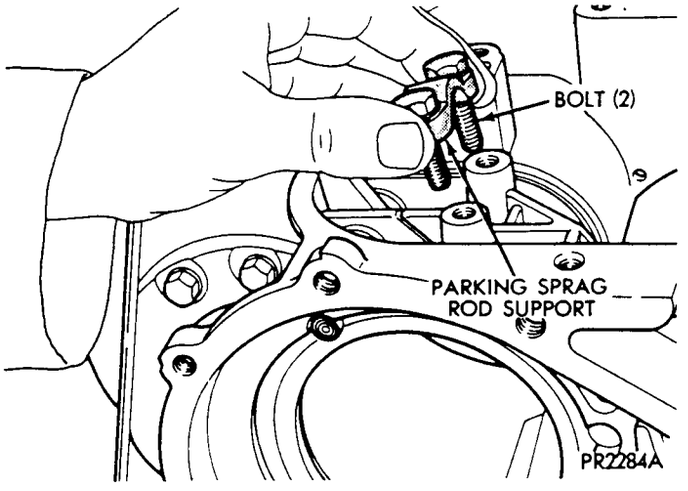


Fig. 2—Support and Bolts

OUTPUT SHAFT REPAIR

Transfer shaft should be removed for repair of output shaft. Planetary gear sets must be removed to accurately check output shaft bearing turning torque.

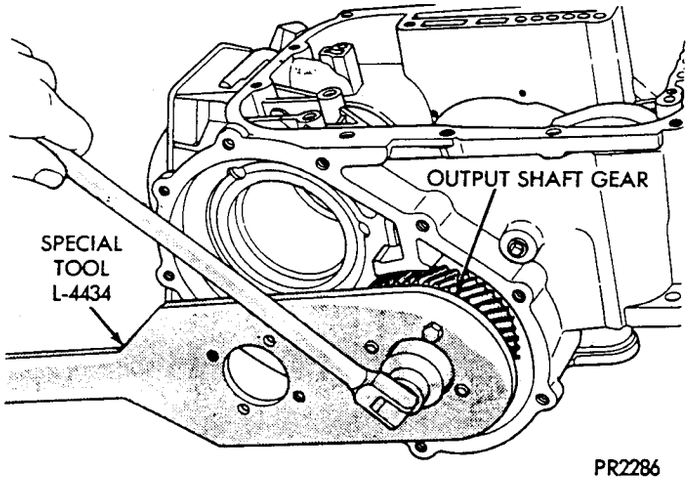


Fig. 1—Remove Output Shaft Retaining Nut and Washer

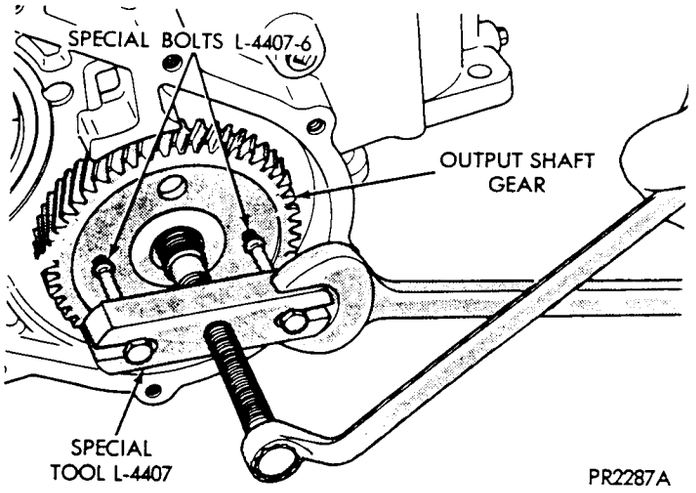


Fig. 2—Remove Output Shaft Gear

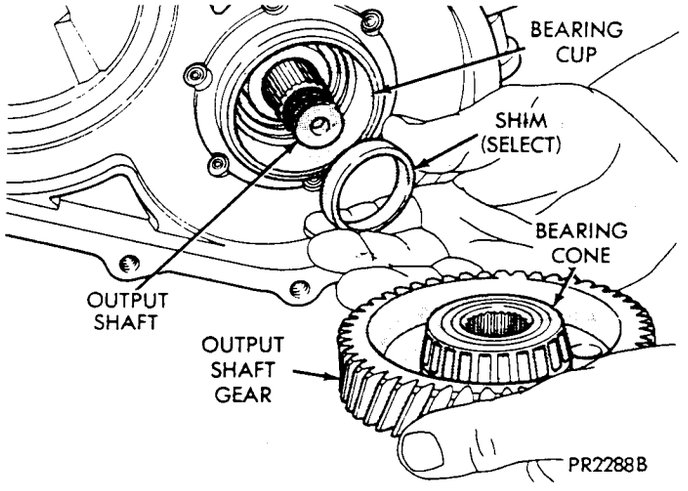


Fig. 3—Output Shaft Gear and (Select) Shim

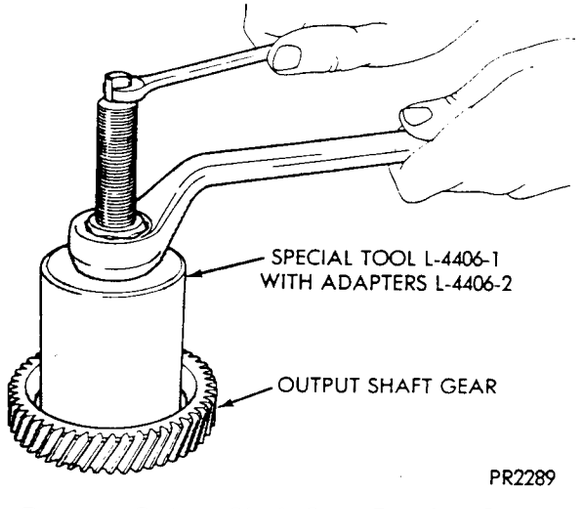


Fig. 4—Remove Output Shaft Gear Bearing Cone

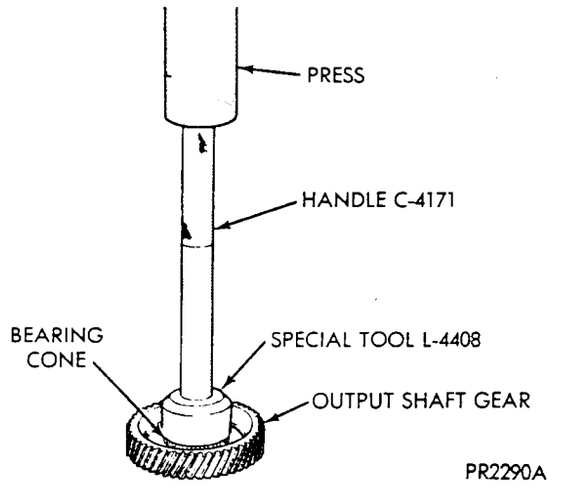


Fig. 5—Install Output Shaft Gear Bearing Cone

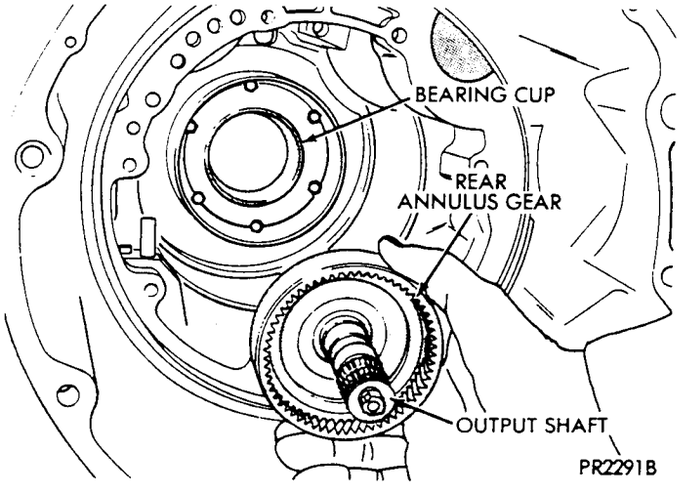


Fig. 6—Remove Output Shaft and Rear Annulus Gear Assembly

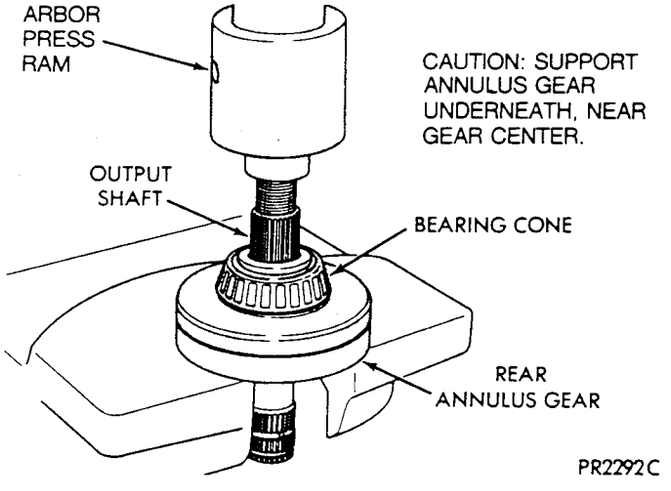


Fig. 7—Remove Output Shaft

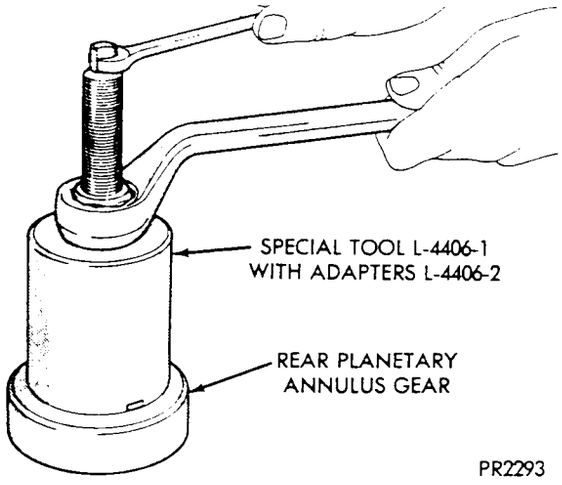


Fig. 8—Remove Rear Planetary Annulus Gear Bearing Cone

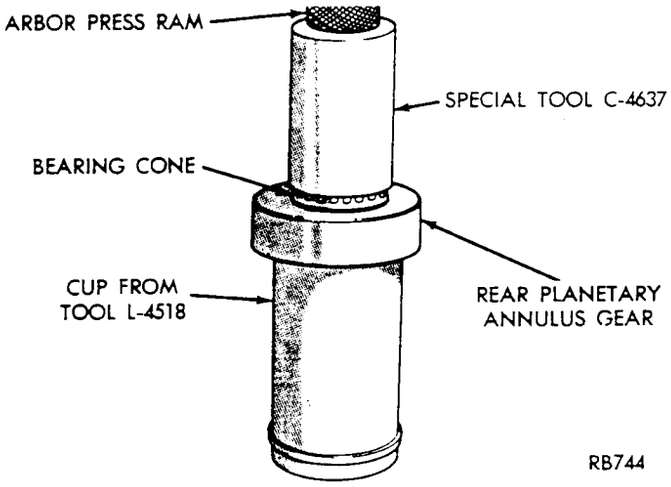


Fig. 9—Install Rear Planetary Annulus Gear Bearing Cone

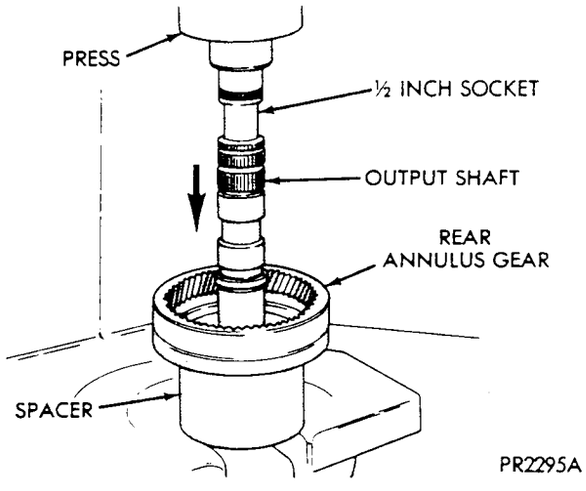


Fig. 10—Install Output Shaft into Rear Planetary Annulus Gear

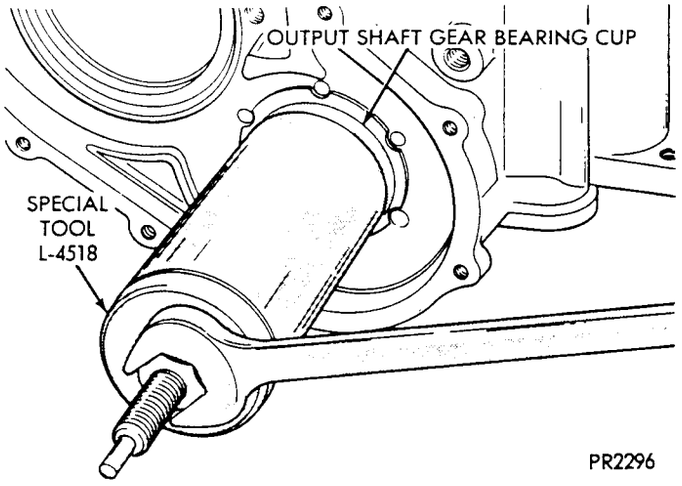


Fig. 11—Remove Output Shaft Gear Bearing Cup

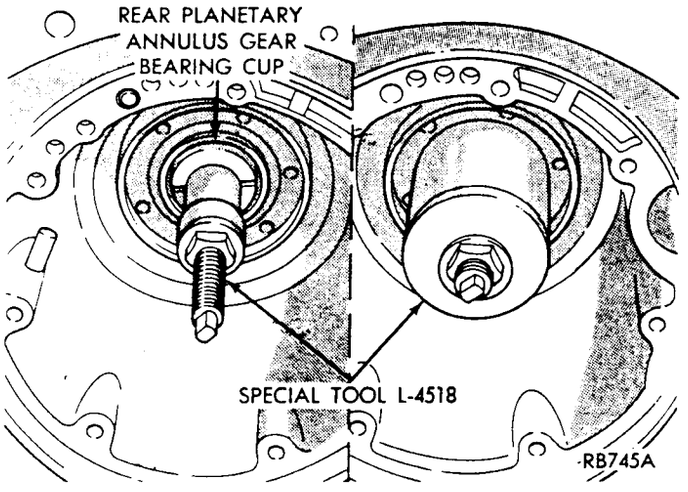


Fig. 12—Remove Rear Planetary Annulus Gear Bearing Cup

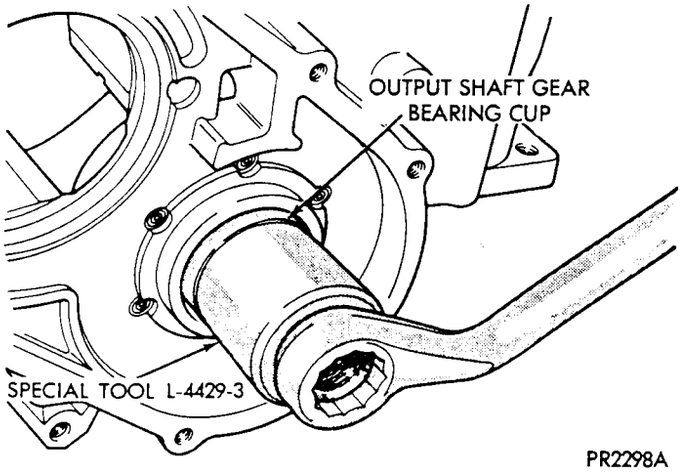


Fig. 13—Install Output Shaft Gear Bearing Cup

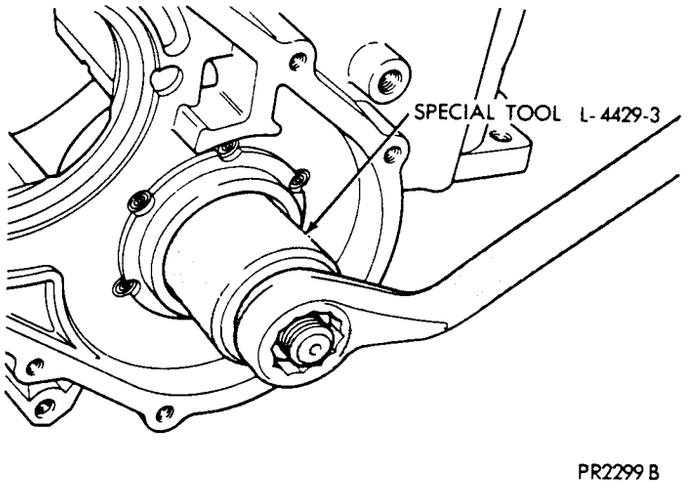


Fig. 14—Install Rear Planetary Annulus Gear Bearing Cup

Determining Shim Thickness

Shim thickness need only be determined if any of the following parts are replaced:

(a) transaxle case, (b) output shaft, (c) rear planetary annulus gear, (d) output shaft gear (e) rear annulus and output shaft gear bearing cones, and (f) overrunning clutch race cups.

Refer to "Bearing Adjustment Procedure" at the rear of this section, to determine proper shim thickness for correct bearing 'preload' and turning torque. **Check output shaft bearings turning torque, using an inch-pound torque wrench. If turning torque is 3 to 8 inch-pounds, the proper shim has been installed.**

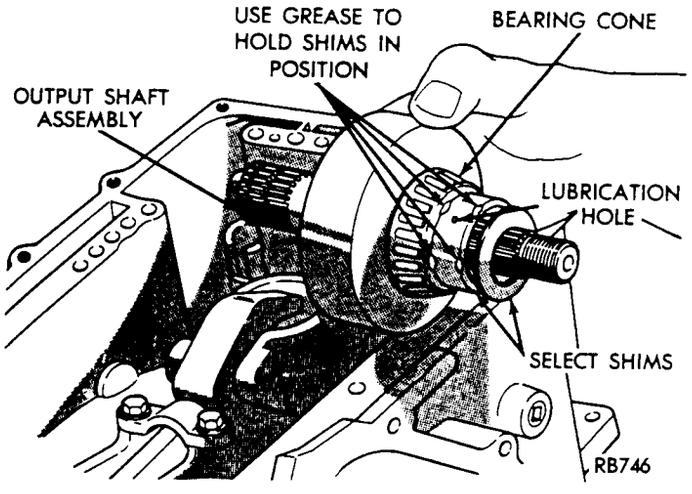


Fig. 15—Install Output Shaft Assembly

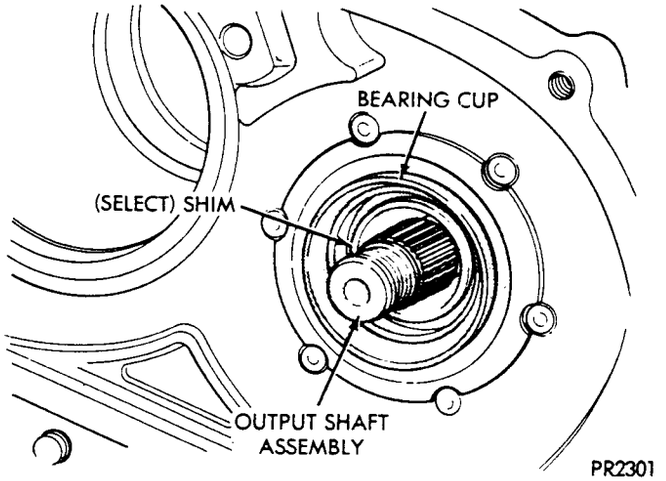


Fig. 16—Output Shaft (Select) Shims in Position

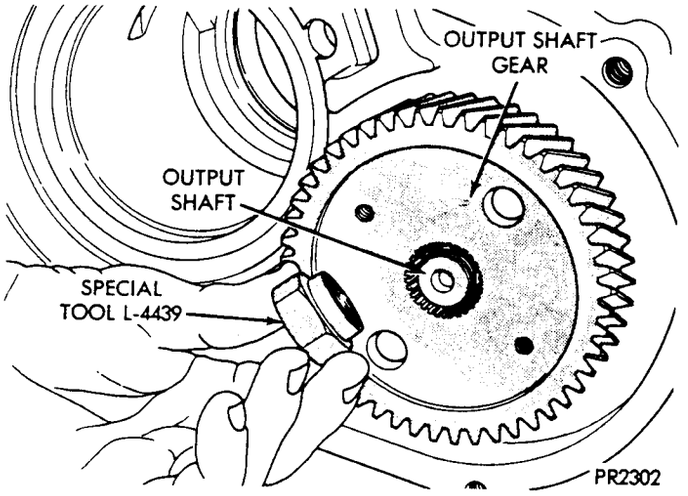


Fig. 17—Start Output Shaft Gear onto Output Shaft

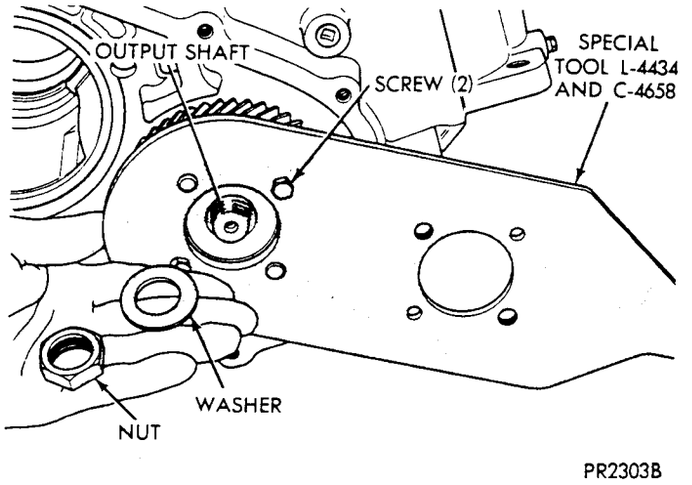


Fig. 18—Holding Output Shaft Gear

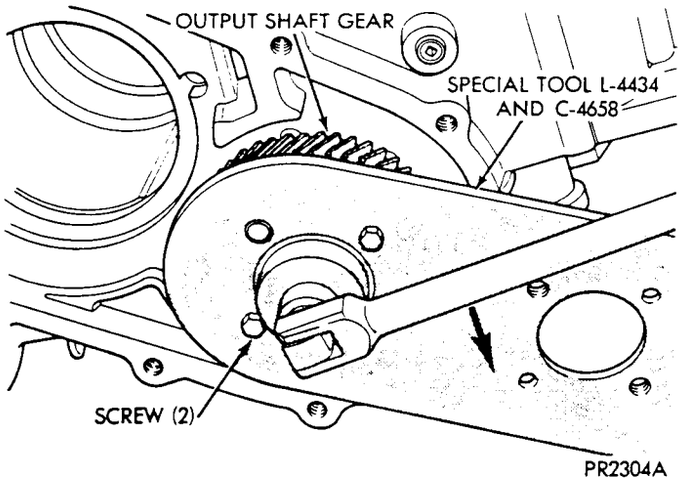


Fig. 19—Tighten Output Shaft Retaining Nut to 271 N·m (200 ft. lbs.)

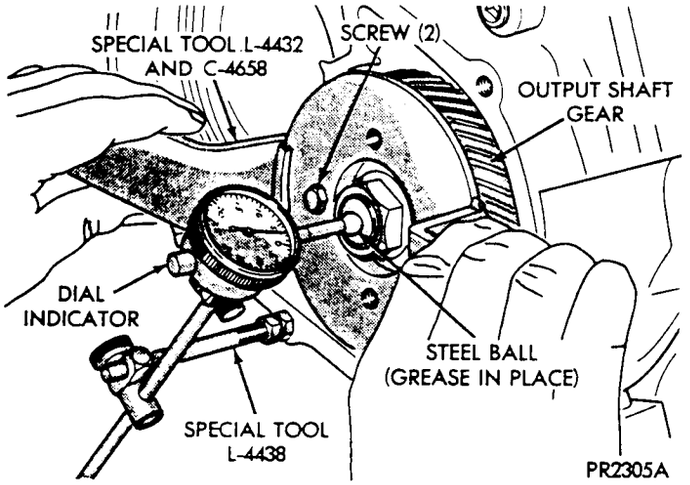


Fig. 20—Checking Output Shaft End Play

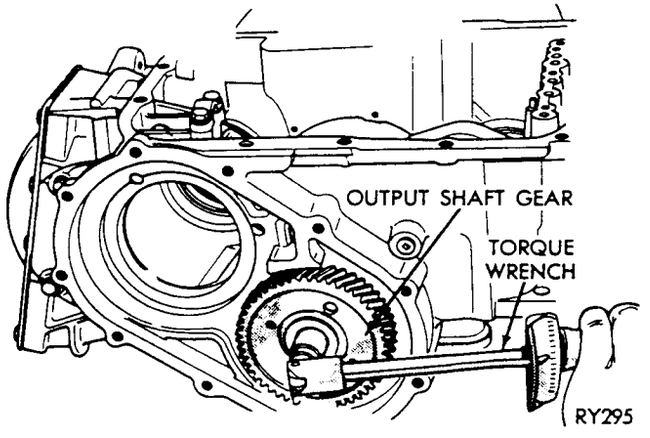


Fig. 21—Checking Bearings Turning Torque

DIFFERENTIAL REPAIR

The transfer shaft should be removed for differential repair and bearing turning torque checking.

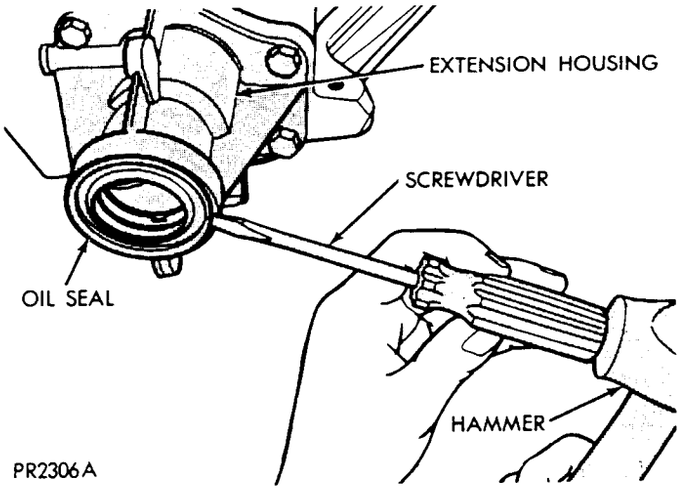


Fig. 1—Remove Extension Seal

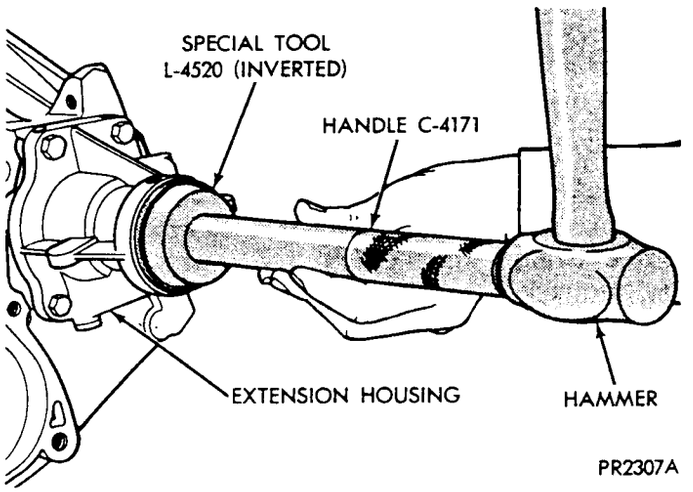


Fig. 2—Install New Seal into Extension

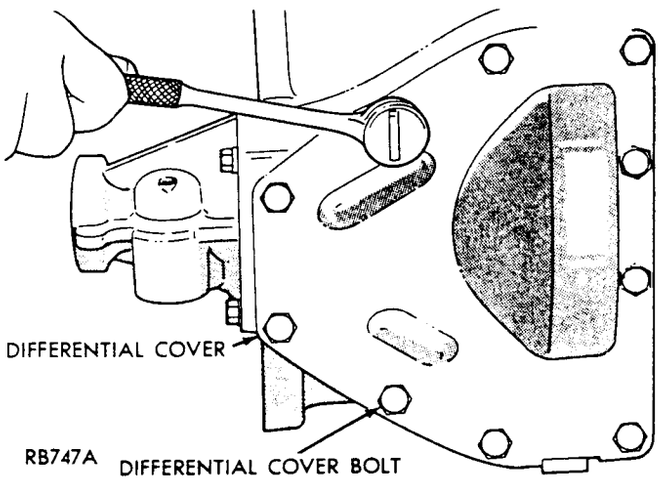
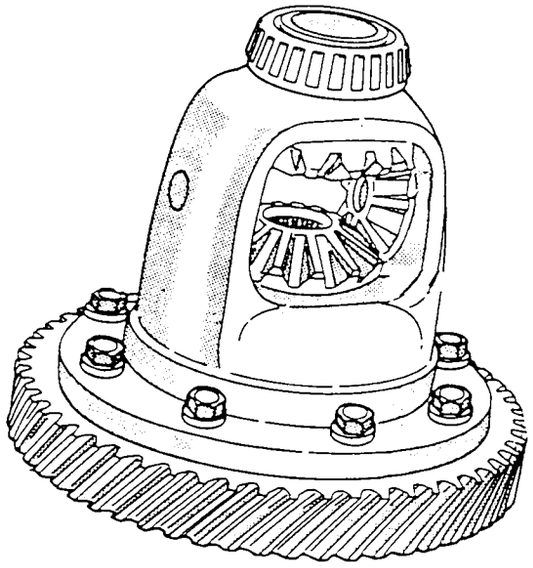


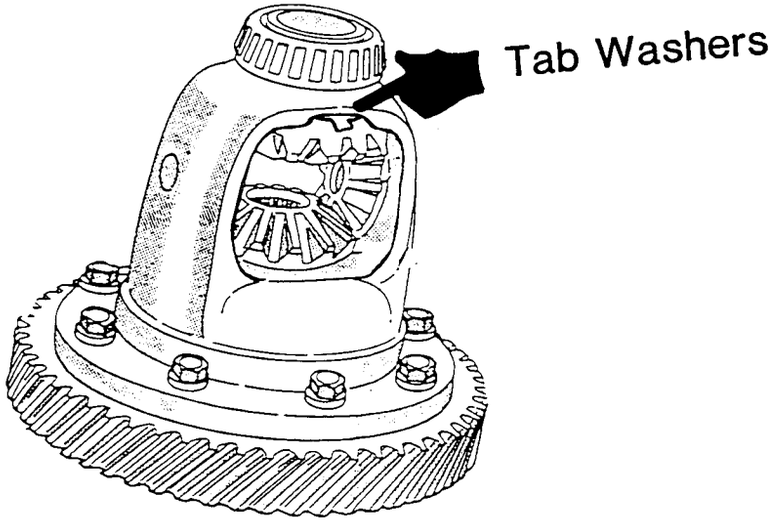
Fig. 3—Differential Cover Bolts

Remember Single Sump Units Must



1978-82

Have Tab Washers On Final Drives



1983-88

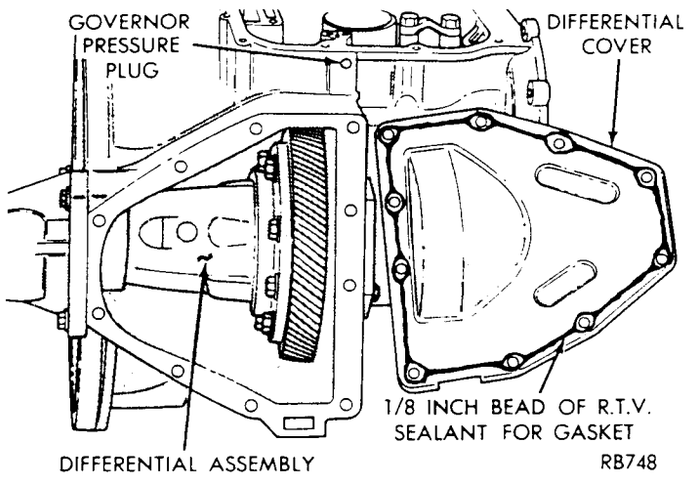


Fig. 4—Remove or Install Differential Cover

Use R.T.V. sealant when installing differential cover.

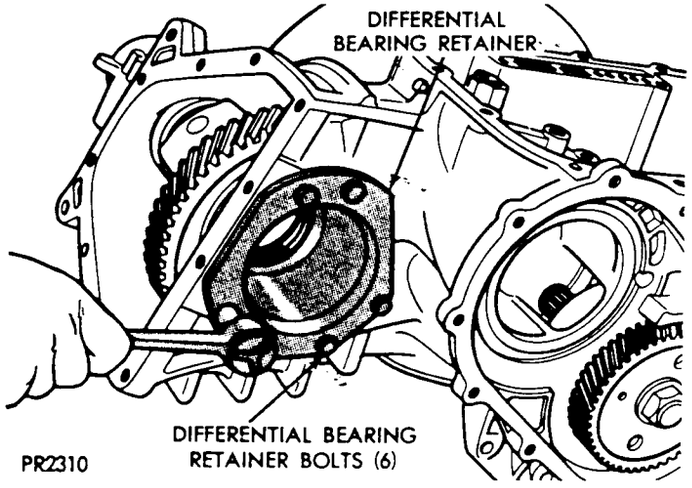


Fig. 5—Differential Bearing Retainer Bolts

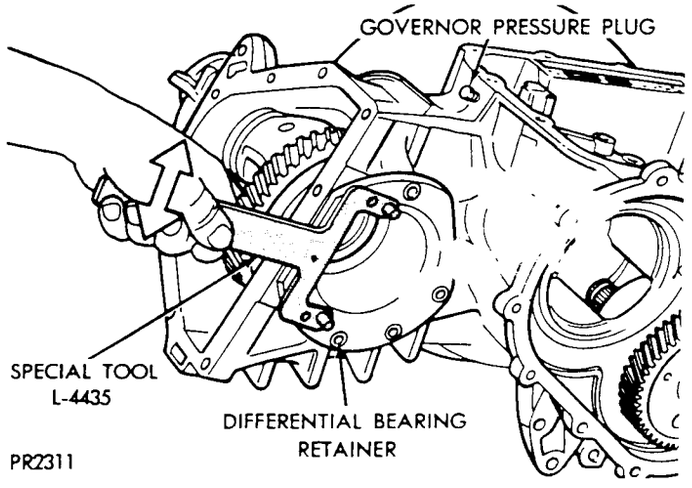


Fig. 6—Remove or Install Bearing Retainer

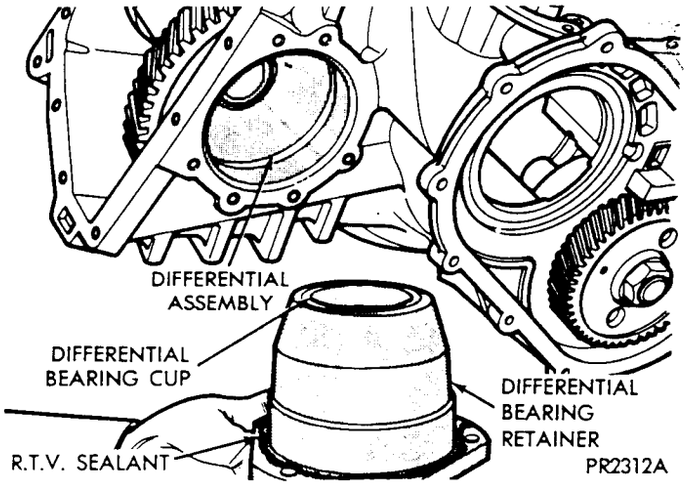


Fig. 7—Differential Bearing Retainer (Typical)

Use R.T.V. sealant when installing differential bearing retainer.

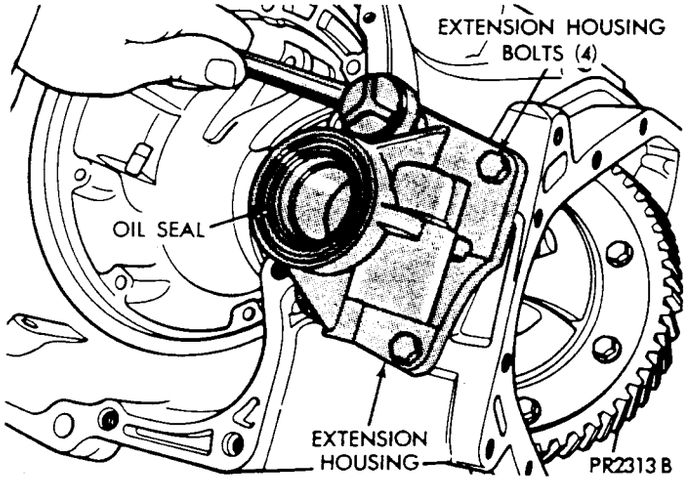


Fig. 8—Extension Bolts

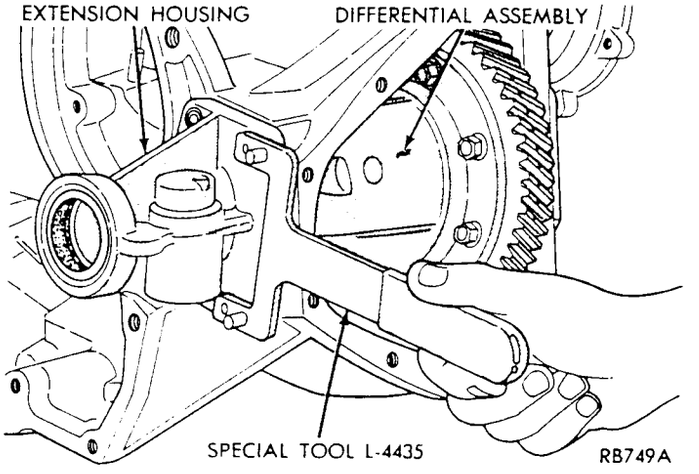


Fig. 9—Remove or Install Extension

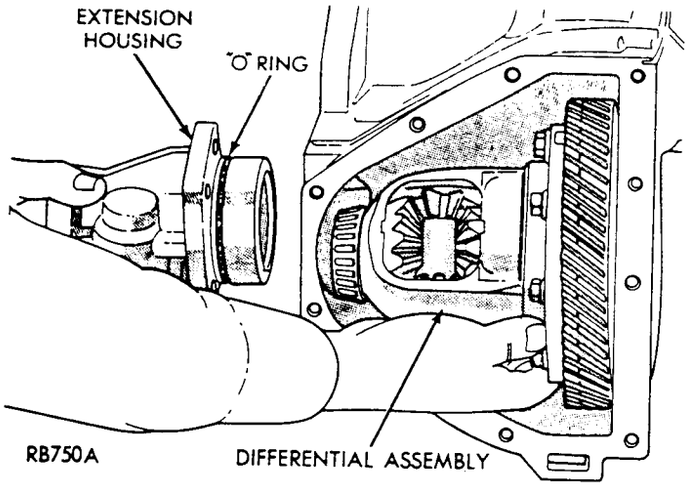


Fig. 10—Remove Differential Assembly

WARNING: HOLD ONTO DIFFERENTIAL ASSEMBLY TO PREVENT IT FROM ROLLING OUT OF HOUSING. Use R.T.V. sealant when installing extension housing.

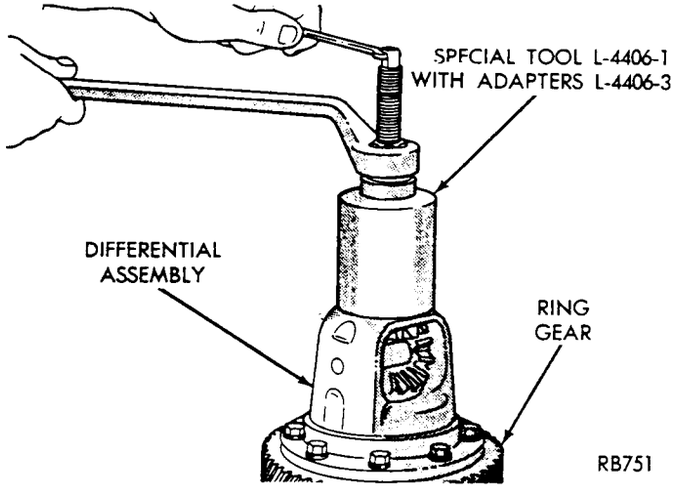


Fig. 11—Remove Differential Bearing Cone

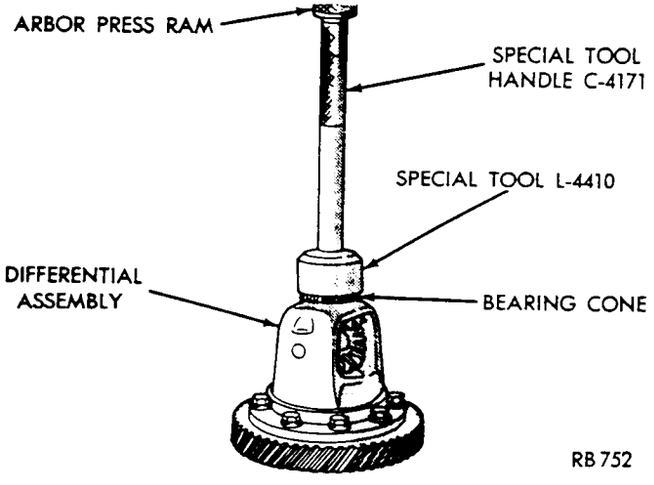


Fig. 12—Install Differential Bearing Cone

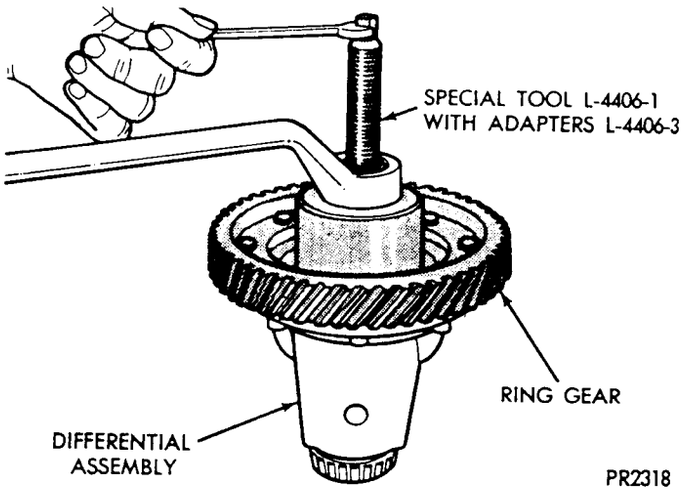


Fig. 13—Remove Differential Bearing Cone

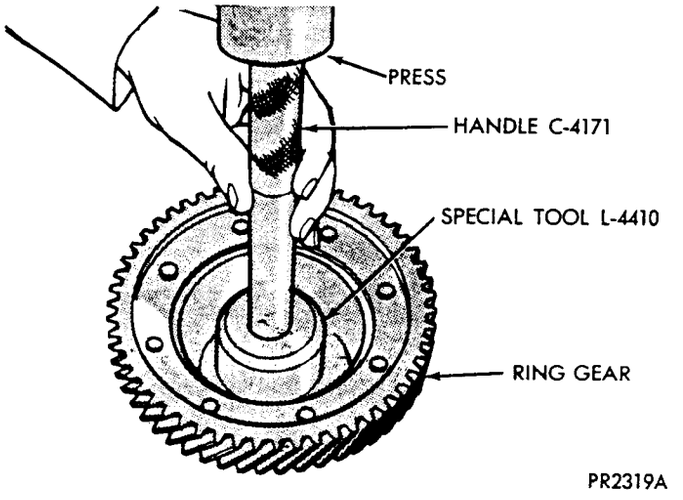


Fig. 14—Install Differential Bearing Cone

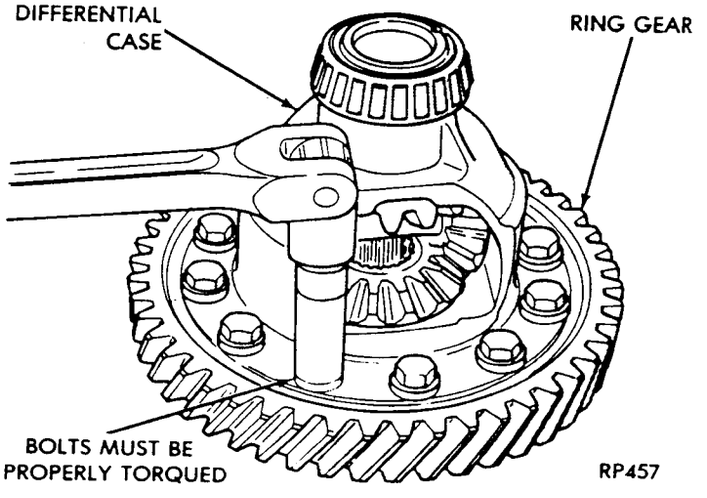


Fig. 15—Remove or Install Ring Gear Bolts and Ring Gear

CAUTION: Always install New ring gear bolts. Bolts must be properly torqued (see Tightening Reference).

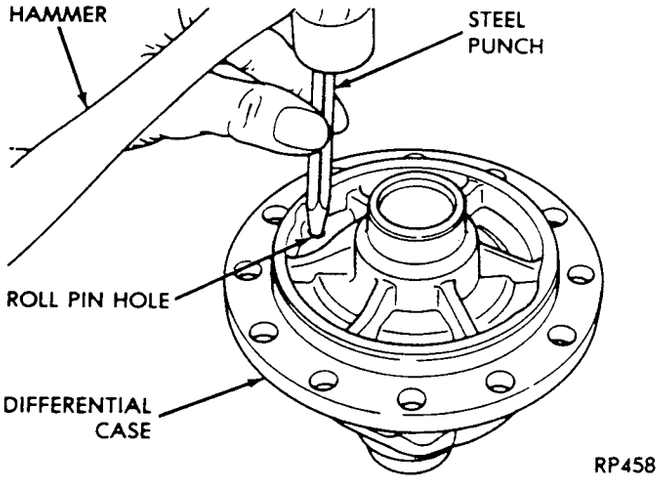


Fig. 16—Remove Pinion Shaft Roll Pin

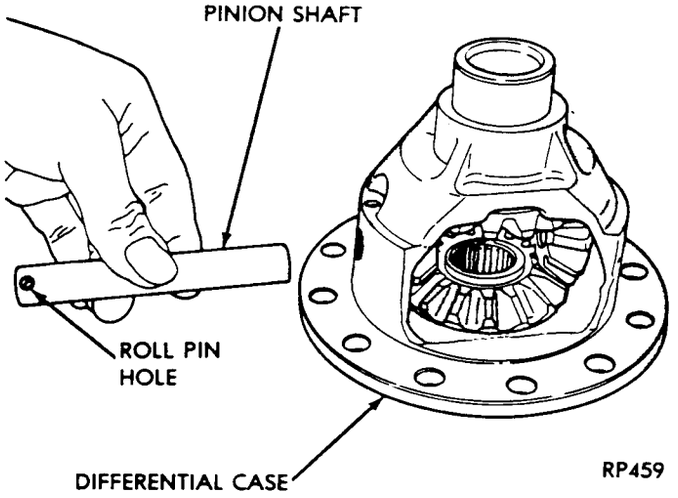


Fig. 17—Remove or Install Pinion Shaft

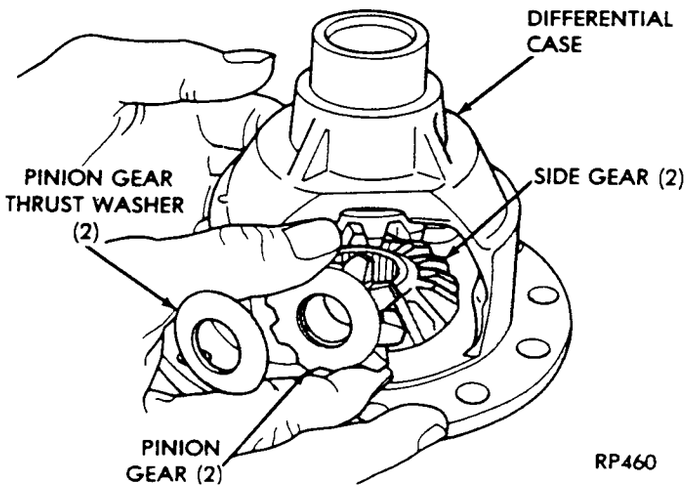


Fig. 18—Remove or Install Pinion Gears, Side Gears, and Tabbed Thrust Washers, by Rotating Pinion Gears to Opening in Differential Case

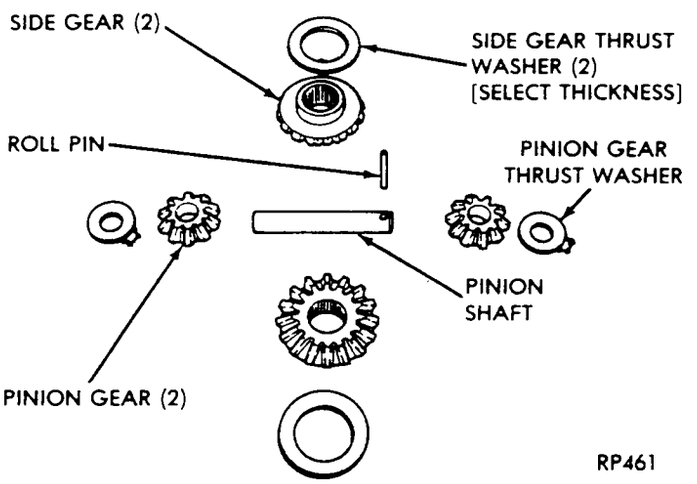


Fig. 19—Differential Gears

After assembling the differential side gears, pinion gears, and pinion gears **with** the pinion gear washers but **without** the side gear thrust washers, rotate the assembly 2 full revolutions both clockwise and counterclockwise.

Set up dial indicator as shown in Figure 20 and record end play. Rotate side gear 90° and record another end play. Again, rotate side gear 90° and record a final end play.

Using the smallest end play recorded, shim that side gear to within .001 to .013 inch.

The other side gear should be checked using the same procedure (Fig. 21).

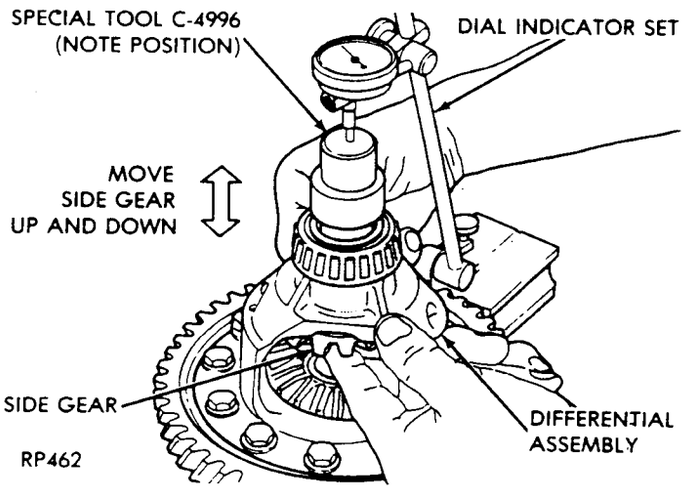
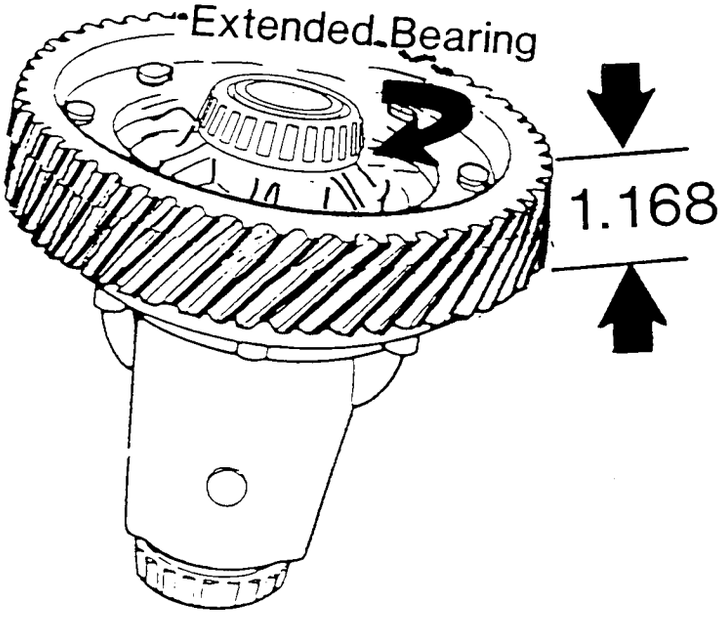


Fig. 20—Checking Side Gear End Play

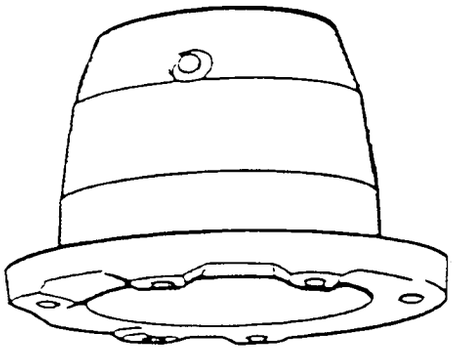
CAUTION: Side gear end play must be within .001 to .013 inch. 4 select thrust washers are available: .032, .037, .042, and .047 inch

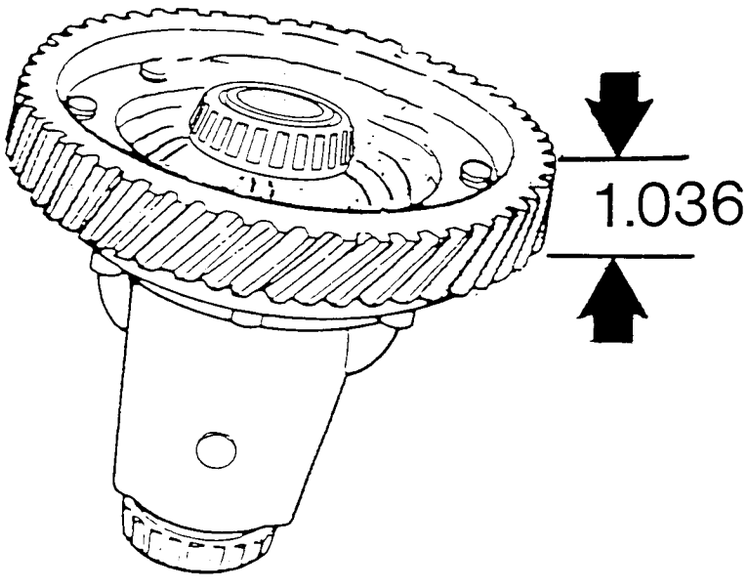
Final Drive & Bearing Support



1987-88

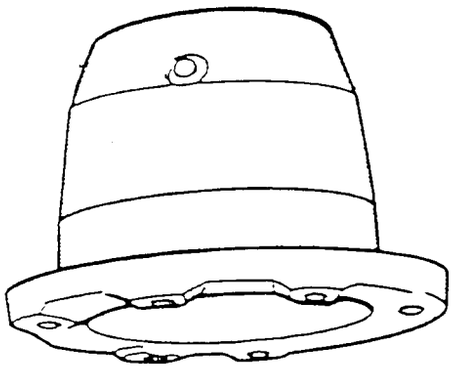
Late-Shorter





1983-86

Early-Taller



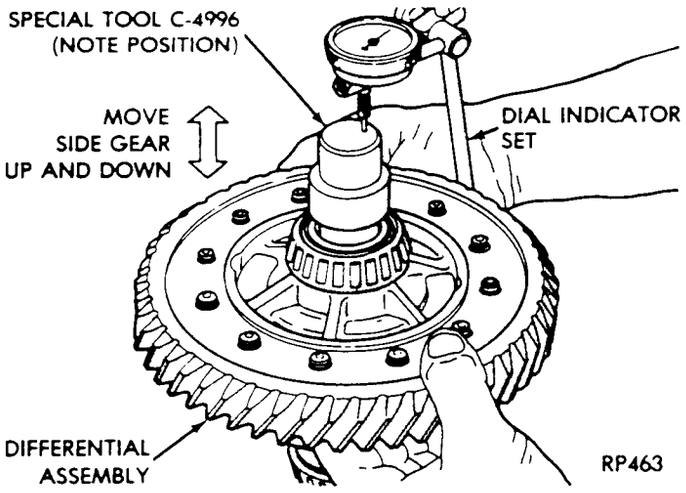


Fig. 21—Checking Side Gear End Play

CAUTION: Side gear end play must be within .001 to .013 inch. 4 select thrust washers are available: .032, .037, .042, and .047 inch

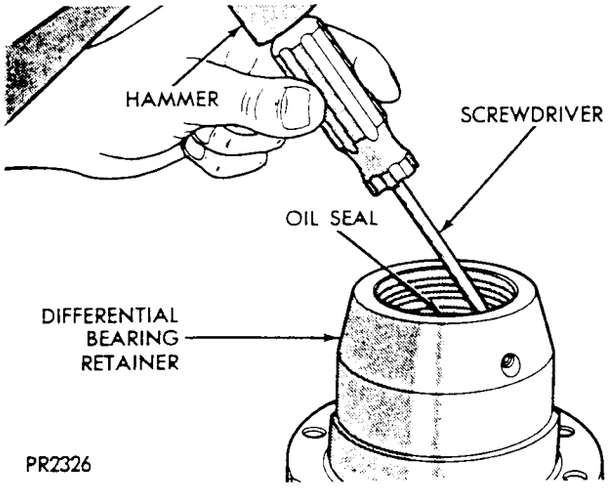


Fig. 22—Remove Oil Seal

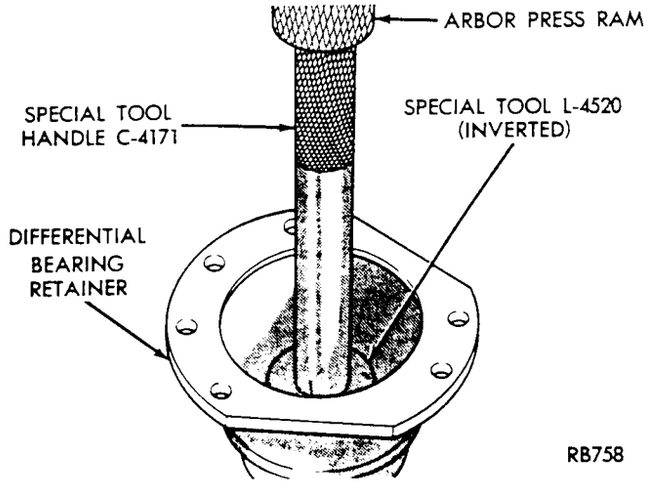


Fig. 23—Install New Oil Seal

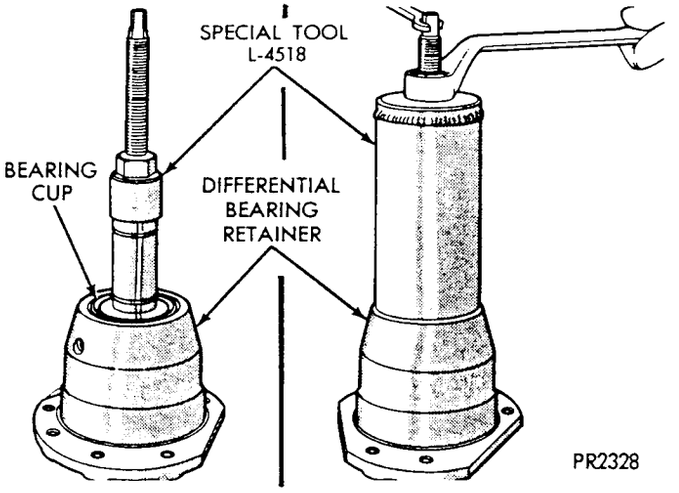


Fig. 24—Remove Bearing Cup

Determining Shim Thickness

Shim thickness need only be determined if any of the following parts are replaced:

(a) transaxle case
(b) differential carrier
(c) differential bearing retainer
(d) extension housing
(e) differential bearing cups and cones

Refer to "Bearing Adjustment Procedure" in rear of this section to determine proper shim thickness for correct bearing preload and proper bearing turning torque.

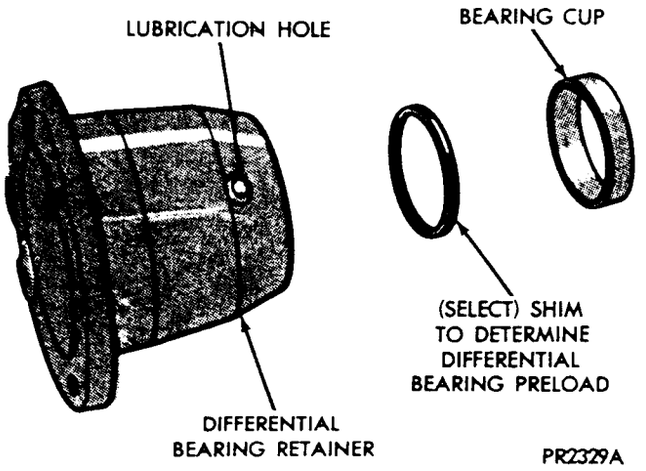


Fig. 25—Differential Bearing Retainer

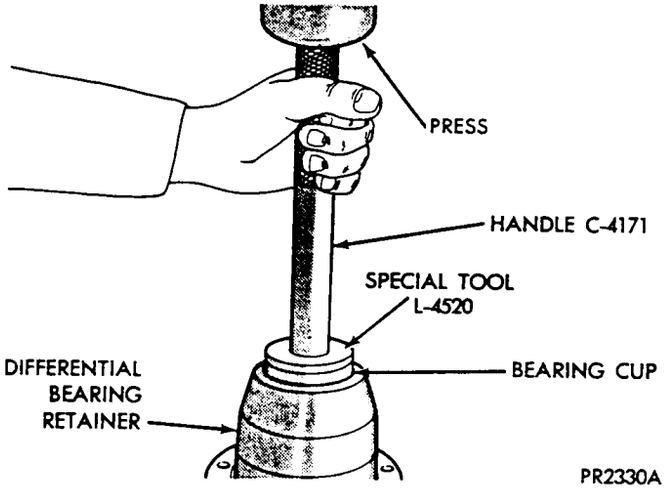


Fig. 26—Install Bearing Cup

When rebuilding, reverse the above procedure.

Remove old R.T.V. before applying new R.T.V. Sealant. Use R.T.V. Sealant on retainer to seal retainer to case.

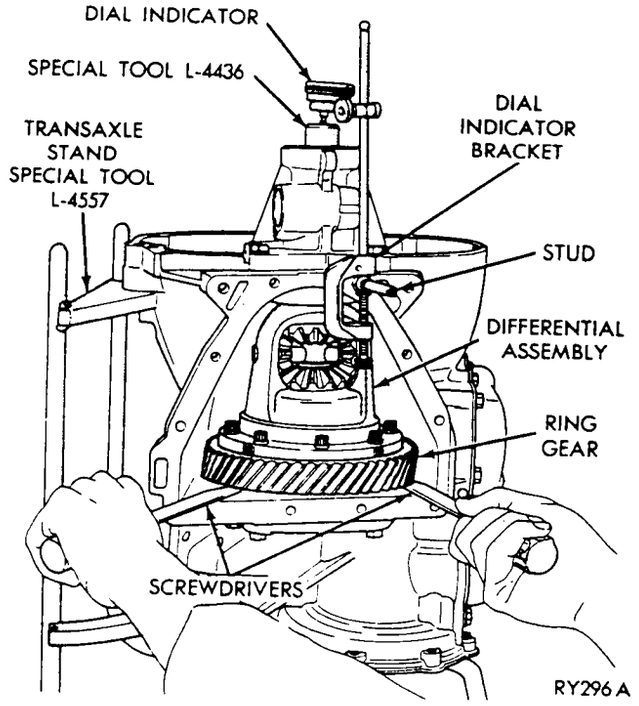


Fig. 27—Checking Differential End Play

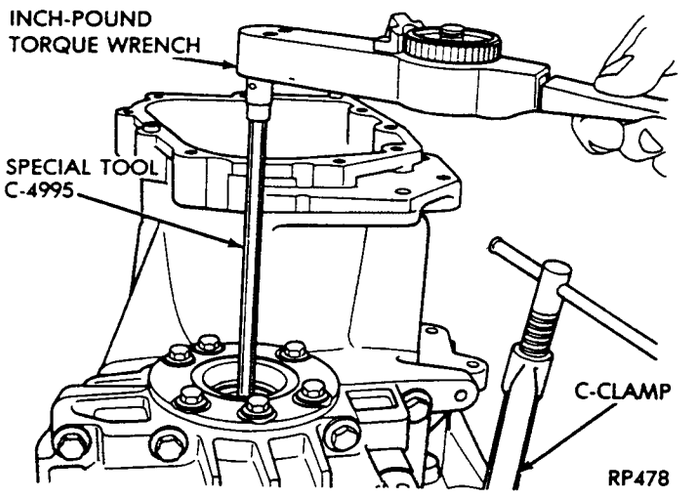


Fig. 28—Checking Differential Bearings Turning Torque

BEARING ADJUSTMENT PROCEDURE

GENERAL RULES ON SERVICING BEARINGS

(1) Take extreme care when removing and installing bearing cups and cones. **Use only an arbor press for installation,** as a hammer may not properly align the bearing cup or cone. Burrs or nicks on the bearing seat will give a false end play reading, while gauging for proper shims. Improperly seated bearing cup and cones are subject to low-mileage failure.

(2) Bearing cups and cones should be replaced if they show signs of pitting or heat distress.

If distress is seen on either the cup or bearing rollers, both cup and cone must be replaced.

Bearing end play and drag torque specifications must be maintained to avoid premature bearing failures.

Used (original) bearing may lose up to 50% of the original drag torque after break-in.

All bearing adjustments must be made with no other component interference or gear inter-mesh, except the transfer gear bearing.

Oil all bearings before checking turning torque.

OUTPUT SHAFT BEARING

With output shaft gear removed.

(1) Install a 13.65 mm (.537 inch) and a 1.34 mm (.053 inch) gauging shims on the planetary rear annulus gear hub using grease to hold the shims in place. The 13.65 mm shim has a larger inside diameter and must be installed over the output shaft first. The 1.34 mm shim pilots on the output shaft.

(2) Install output shaft gear and bearing assembly, torque to 271 N·m (200 ft. lbs.).

(3) To measure bearing end play:

(a) Attach Tool L-4432 to the transfer gear.

(b) Mount a steel ball with grease into the end of the output shaft.

(c) Push and pull the gear while rotating back and forth to insure seating of the bearing rollers.

(d) Using a dial indicator, mounted to the transaxle case, measure output shaft end play.

(4) Once bearing end play has been determined, refer to the output shaft bearing shim chart for the required shim combination to obtain proper bearing setting.

(a) The 12.65 mm (.498 inch), 13.15 mm (.518 inch) or 13.65 mm (.537 inch) shims are always installed first. **These shims have lubrication slots which are necessary for proper bearing lubrication.**

(b) Shims thinner than 12.65 mm listed in the chart are common to both the transfer shaft and output shaft bearings.

(5) Use Tool L-4424 to remove the retaining nut and washer. To remove the output shaft gear use Tool L-4407.

(6) Remove the two gauging shims and install the proper shim combination, making sure to install the 12.65, 13.15, or 13.65 mm shim first. Use grease to hold the shims in place. Install the output shaft gear and bearing assembly.

(7) Install the retaining nut and washer and torque to 271 N·m (200 ft. lbs.).

(8) Using an inch-pound torque wrench, check the turning torque. **The torque should be between 3 and 8 inch-pounds.**

If the turning torque is too high, install a .05 mm (.002 inch) thicker shim. If the turning torque is too low, install a .05 mm (.002 inch) thinner shim. Repeat until the proper turning torque is 3 to 8 inch pounds.

OUTPUT SHAFT BEARING SHIM CHART

End Play (with 13.65 mm and 1.34 mm gauging shims installed)		Required Shim Combination	Total Thickness	
mm	Inch	mm	mm	Inch
.0	.0	13.65 + 1.34	14.99	.590
.05	.002	13.65 + 1.24	14.89	.586
.10	.004	13.65 + 1.19	14.84	.584
.15	.006	13.65 + 1.14	14.79	.582
.20	.008	13.65 + 1.09	14.74	.580
.25	.010	13.65 + 1.04	14.69	.578
.30	.012	13.65 + .99	14.64	.576
.35	.014	13.65 + .94	14.59	.574
.40	.016	13.15 + 1.39	14.54	.572
.45	.018	13.15 + 1.34	14.49	.570
.50	.020	13.15 + 1.29	14.44	.568
.55	.022	13.15 + 1.24	14.39	.566
.60	.024	13.15 + 1.19	14.34	.564
.65	.026	13.15 + 1.14	14.29	.562
.70	.028	13.15 + 1.09	14.24	.560
.75	.030	13.15 + 1.04	14.19	.558
.80	.032	13.15 + .99	14.14	.556
.85	.034	13.15 + .94	14.09	.554
.90	.036	12.65 + 1.39	14.04	.552
.95	.038	12.65 + 1.34	13.99	.550
1.00	.040	12.65 + 1.29	13.94	.548
1.05	.042	12.65 + 1.24	13.89	.547
1.10	.044	12.65 + 1.19	13.84	.545
1.15	.046	12.65 + 1.14	13.79	.543
1.20	.048	12.65 + 1.09	13.74	.541
1.25	.049	12.65 + 1.04	13.69	.539
1.30	.051	12.65 + .99	13.64	.537
1.35	.053	12.65 + .94	13.59	.535

Average Conversion .05 mm = .002 inch

DIFFERENTIAL BEARING

(1) Remove the bearing cup from the differential bearing retainer using Tool L-4518, and remove the existing shim from under the cup.

(2) Install a .50 mm (.020 inch) gauging shim and reinstall the bearing cup into the retainer. Use an arbor press to install the cup.

Oil Baffle is not required when making shim selection.

(3) Install the bearing retainer into the case and torque bolts to 28 N·m (250 in. lbs.).

(4) Position the transaxle assembly vertically on the support stand and install Tool C-4995 into side gear.

(5) Rotate the differential at least one full revolution to ensure the tapered roller bearings are fully seated.

(6) Attach a dial indicator to the case and zero the dial indicator. Place the indicator tip on the end of Tool L-4436.

(7) Place a large screwdriver to each side of the ring gear and lift. Check the dial indicator for the amount of end play.

CAUTION: Do not damage the transaxle case and/or differential cover sealing surface.

DIFFERENTIAL BEARING SHIM CHART

End Play (with .50 mm gauging shim Installed)		Required Shim Combination	Total Thickness	
mm	Inch	mm	mm	Inch
.0	.0	.50	.50	.020
.05	.002	.75	.75	.030
.10	.004	.80	.80	.032
.15	.006	.85	.85	.034
.20	.008	.90	.90	.035
.25	.010	.95	.95	.037
.30	.012	1.00	1.00	.039
.35	.014	1.05	1.05	.041
.40	.016	.50 + .60	1.10	.043
.45	.018	.50 + .65	1.15	.045
.50	.020	.50 + .70	1.20	.047
.55	.022	.50 + .75	1.25	.049
.60	.024	.50 + .80	1.30	.051
.65	.026	.50 + .85	1.35	.053
.70	.027	.50 + .90	1.40	.055
.75	.029	.50 + .95	1.45	.057
.80	.031	.50 + 1.00	1.50	.059
.85	.033	.50 + 1.05	1.55	.061
.90	.035	1.00 + .60	1.60	.063
.95	.037	1.00 + .65	1.65	.065
1.00	.039	1.00 + .70	1.70	.067
1.05	.041	1.00 + .75	1.75	.069
1.10	.043	1.00 + .80	1.80	.071
1.15	.045	1.00 + .85	1.85	.073
1.20	.047	1.00 + .90	1.90	.075
1.25	.049	1.00 + .95	1.95	.077
1.30	.051	1.00 + 1.00	2.00	.079
1.35	.053	1.00 + 1.05	2.05	.081
1.40	.055	1.05 + 1.05	2.10	.083

(8) When the end play has been determined, refer to the Differential Bearing Shim Chart for the correct shim combination to obtain the proper bearing setting.

(9) Remove the differential bearing retainer. Remove the bearing cup and the .50 mm (.020 inch) gauging shim.

(10) Install the proper shim combination under the bearing cup. Make sure the oil baffle is installed properly in the bearing retainer, below the bearing shim and cup.

(11) Install the differential bearing retainer. Make sure to seal the retainer to the housing with RTV Sealant and torque bolts to 28 N·m (250 in. lbs.).

(12) Using Tool C-4995 and an inch-pound torque wrench, check the turning torque of the differential. **The turning torque should be between 5 and 18 inch-pounds.**

If the turning torque is too high, install a .05 mm (.002 inch) thinner shim. If the turning torque is too low, install a .05 mm (.002 inch) thicker shim. Repeat until 5 to 18 inch-pounds turning torque is obtained.

TRANSFER SHAFT BEARING

(1) Use Tool L-4434 to remove the retaining nut and washer. Remove the transfer shaft gear using Tool L-4407.

(2) Install a 2.29 mm (.090 inch) and a 1.39 mm (.055 inch) gauging shims on the transfer shaft behind the governor support.

(3) Install transfer shaft gear and bearing assembly and torque the nut to 271 N·m (200 ft. lbs.).

(4) To measure bearing end play:

(a) Attach Tool L-4432 to the transfer gear.

(b) Mount a steel ball with grease into the end of the transfer shaft.

(c) Push and pull the gear while rotating back and forth to insure seating of the bearing rollers.

(d) Using a dial indicator, measure transfer shaft end play.

(5) Refer to the Transfer Bearing Shim Chart for the required shim combination to obtain the proper bearing setting.

(6) Use Tool L-4424 to remove the retaining nut and washer. Remove the transfer shaft gear using Tool L-4407.

(7) Remove the two gauging shims and install the correct shim combination. Install the transfer gear and bearing assembly.

(8) Install the retaining nut and washer and torque to 271 N·m (200 ft. lbs.). Measure transfer shaft end play, end play should be .05 to .25 mm (.002 to .010 inch).

(9) Measure bearing end play as outlined in Step (4). End play should be between .05 mm and .25 mm (.002 to .010 inch).

If end play is too high, install a .05 mm (.002 inch) thinner shim combination. If end play is too low, install a .05 mm (.002 inch) thicker shim combination. Repeat until .05 to .25 mm (.002 to .010 inch) end play is obtained.

TRANSFER BEARING SHIM CHART

End Play (with 2.29 mm and 1.39 mm gauging shims installed)		Required Shim Combination	Total Thickness	
mm	Inch	mm	mm	Inch
.0	.0	2.29 + 1.39	3.68	.145
.05	.002	2.29 + 1.39	3.68	.145
.10	.004	2.29 + 1.39	3.68	.145
.15	.006	2.29 + 1.39	3.68	.145
.20	.008	2.29 + 1.34	3.63	.143
.25	.010	2.29 + 1.29	3.58	.141
.30	.012	2.29 + 1.24	3.53	.139
.35	.014	2.29 + 1.19	3.48	.137
.40	.016	2.29 + 1.14	3.43	.135
.45	.018	2.29 + 1.09	3.38	.133
.50	.020	2.29 + 1.04	3.33	.131
.55	.022	2.29 + .99	3.28	.129
.60	.024	1.84 + 1.39	3.23	.127
.65	.026	1.84 + 1.34	3.18	.125
.70	.028	1.84 + 1.29	3.13	.123
.75	.030	1.84 + 1.24	3.08	.121
.80	.032	1.84 + 1.19	3.03	.119
.85	.034	1.84 + 1.14	2.98	.117
.90	.036	1.84 + 1.09	2.93	.115
.95	.038	1.84 + 1.04	2.88	.113
1.00	.040	1.84 + .99	2.83	.111
1.05	.042	1.39 + 1.39	2.78	.109
1.10	.044	1.39 + 1.34	2.73	.107
1.15	.046	1.39 + 1.29	2.68	.105
1.20	.048	1.39 + 1.24	2.63	.103
1.25	.049	1.39 + 1.19	2.58	.101
1.30	.050	1.39 + 1.14	2.53	.099
1.35	.052	1.39 + 1.09	2.48	.097
1.40	.055	1.39 + 1.04	2.43	.095
1.45	.057	1.39 + .99	2.38	.093
1.50	.059	.94 + 1.39	2.33	.091
1.55	.061	.94 + 1.34	2.28	.089
1.60	.063	.94 + 1.29	2.23	.087

BEARING SHIM CHART

Shim Thickness			Bearing Usage		
mm	Inch	Part Number	Output Shaft	Transfer Shaft	Differential
0.94	.037	4207166	X	X	—
0.99	.039	4207167	X	X	—
1.04	.041	4207168	X	X	—
1.09	.043	4207169	X	X	—
1.14	.045	4207170	X	X	—
1.19	.047	4207171	X	X	—
1.24	.049	4207172	X	X	—
1.29	.051	4207173	X	X	—
1.34	.053	4207174	X*	X	—
1.39	.055	4207175	X	X*	—
1.84	.072	4207176	X	X	—
2.29	.090	4207177	X	X*	—
12.65	.498	4207162	X	—	—
13.15	.518	4207163	X	—	—
13.65	.537	4207164	X*	—	—
0.50	.020	4207134	—	—	X*
0.55	.022	4207135	—	—	X
0.60	.024	4207136	—	—	X
0.65	.026	4207137	—	—	X
0.70	.027	4207138	—	—	X
0.75	.029	4207139	—	—	X
0.80	.031	4207140	—	—	X
0.85	.033	4207141	—	—	X
0.90	.035	4207142	—	—	X
0.95	.037	4207143	—	—	X
1.00	.039	4207144	—	—	X
1.05	.041	4207145	—	—	X

*Also used as gauging shims

INCHES TO MILLIMETERS

All values in this table are exact

inches	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
	millimeters									
0.000	—	0.0254	0.0508	0.0762	0.1016	0.1270	0.1524	0.1778	0.2032	0.2286
0.010	0.2540	0.2794	0.3048	0.3302	0.3556	0.3810	0.4064	0.4318	0.4572	0.4826
0.020	0.5080	0.5334	0.5588	0.5842	0.6096	0.6350	0.6604	0.6858	0.7112	0.7366
0.030	0.7620	0.7874	0.8128	0.8382	0.8636	0.8890	0.9144	0.9398	0.9652	0.9906
0.040	1.0160	1.0414	1.0668	1.0922	1.1176	1.1430	1.1684	1.1938	1.2192	1.2446
0.050	1.2700	1.2954	1.3208	1.3462	1.3716	1.3970	1.4224	1.4478	1.4732	1.4986
0.060	1.5240	1.5494	1.5748	1.6002	1.6256	1.6510	1.6764	1.7018	1.7272	1.7526
0.070	1.7780	1.8034	1.8288	1.8542	1.8796	1.9050	1.9304	1.9558	1.9812	2.0066
0.080	2.0320	2.0574	2.0828	2.1082	2.1336	2.1590	2.1844	2.2098	2.2352	2.2606
0.090	2.2860	2.3114	2.3368	2.3622	2.3876	2.4130	2.4384	2.4638	2.4892	2.5146
0.100	2.5400	2.5654	2.5908	2.6162	2.6416	2.6670	2.6924	2.7178	2.7432	2.7686
0.110	2.7940	2.8194	2.8448	2.8702	2.8956	2.9210	2.9464	2.9718	2.9972	3.0226
0.120	3.0480	3.0734	3.0988	3.1242	3.1496	3.1750	3.2004	3.2258	3.2512	3.2766
0.130	3.3020	3.3274	3.3528	3.3782	3.4036	3.4290	3.4544	3.4798	3.5052	3.5306
0.140	3.5560	3.5814	3.6068	3.6322	3.6576	3.6830	3.7084	3.7338	3.7592	3.7846
0.150	3.8100	3.8354	3.8608	3.8862	3.9116	3.9370	3.9624	3.9878	4.0132	4.0386
0.160	4.0640	4.0894	4.1148	4.1402	4.1656	4.1910	4.2164	4.2418	4.2672	4.2926
0.170	4.3180	4.3434	4.3688	4.3942	4.4196	4.4450	4.4704	4.4958	4.5212	4.5466
0.180	4.5720	4.5974	4.6228	4.6482	4.6736	4.6990	4.7244	4.7498	4.7752	4.8006
0.190	4.8260	4.8514	4.8768	4.9022	4.9276	4.9530	4.9784	5.0038	5.0292	5.0546
0.200	5.0800	5.1054	5.1308	5.1562	5.1816	5.2070	5.2324	5.2578	5.2832	5.0386
0.210	5.3340	5.3594	5.3848	5.4102	5.4356	5.4610	5.4864	5.5118	5.5372	5.5626
0.220	5.5880	5.6134	5.6388	5.6642	5.6896	5.7150	5.7404	5.7658	5.7912	5.8166
0.230	5.8420	5.8674	5.8928	5.9182	5.9436	5.9690	5.9944	6.0198	6.0452	6.0706
0.240	6.0960	6.1214	6.1468	6.1722	6.1976	6.2230	6.2484	6.2738	6.2992	6.3246
0.250	6.3500	6.3754	6.4008	6.4262	6.4516	6.4770	6.5024	6.5278	6.5532	6.5786
0.260	6.6040	6.6294	6.6548	6.6802	6.7056	6.7310	6.7564	6.7818	6.8072	6.8326
0.270	6.8580	6.8834	6.9088	6.9342	6.9596	6.9850	7.0104	7.0358	7.0612	7.0866
0.280	7.1120	7.1374	7.1628	7.1882	7.2136	7.2390	7.2644	7.2989	7.3152	7.3406
0.290	7.3660	7.3914	7.4168	7.4422	7.4676	7.4930	7.5184	7.5438	7.5692	7.5946
0.300	7.6200	7.6454	7.6708	7.6962	7.7216	7.7470	7.7724	7.7978	7.8232	7.8486
0.310	7.8740	7.8994	7.9248	7.9502	7.9756	8.0010	8.0264	8.0518	8.0772	8.1026
0.320	8.1280	8.1534	8.1788	8.2042	8.2296	8.2550	8.2804	8.3058	8.3312	8.3566
0.330	8.3820	8.4074	8.4328	8.4582	8.4836	8.5090	8.5344	8.5598	8.5852	8.6106
0.340	8.6360	8.6614	8.6868	8.7122	8.7376	8.7630	8.7884	8.8138	8.8392	8.8646
0.350	8.8900	8.9154	8.9408	8.9662	8.9916	9.0170	9.0424	9.0678	9.0932	9.1186
0.360	9.1440	9.1694	9.1948	9.2202	9.2456	9.2710	9.2964	9.3218	9.3472	9.3726
0.370	9.3980	9.4234	9.4488	9.4742	9.4996	9.5250	9.5504	9.5758	9.6012	9.6266
0.380	9.6520	9.6774	9.7028	9.7282	9.7536	9.7790	9.8044	9.8298	9.8552	9.8806
0.390	9.9060	9.9314	9.9568	9.9822	10.0076	10.0330	10.0584	10.0838	10.1092	10.1346
0.400	10.1600	10.1854	10.2108	10.2362	10.2616	10.2870	10.3124	10.3378	10.3632	10.3886
0.410	10.4140	10.4394	10.4648	10.4902	10.5156	10.5410	10.5664	10.5918	10.6172	10.6426
0.420	10.6680	10.6934	10.7188	10.7442	10.7696	10.7950	10.8204	10.8458	10.8712	10.8966
0.430	10.9220	10.9474	10.9728	10.9982	11.0236	11.0490	11.0744	11.0998	11.1252	11.1506
0.440	11.1760	11.2014	11.2268	11.2522	11.2776	11.3030	11.3284	11.3538	11.3792	11.4046
0.450	11.4300	11.4554	11.4808	11.5062	11.5316	11.5570	11.5824	11.6078	11.6332	11.6586
0.460	11.6840	11.7094	11.7348	11.7602	11.7856	11.8110	11.8364	11.8618	11.8872	11.9126
0.470	11.9380	11.9634	11.9888	12.0142	12.0396	12.0650	12.0904	12.1158	12.1412	12.1666
0.480	12.1920	12.2174	12.2428	12.2682	12.2936	12.3190	12.3444	12.3698	12.3952	12.4206
0.490	12.4460	12.4714	12.4968	12.5222	12.5476	12.5730	12.5984	12.6238	12.6492	12.6746
inches	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009

SPECIFICATIONS
A-413 (2.5L ENGINE) and A-670 (3.0L ENGINE)
TORQUEFLITE AUTOMATIC TRANSAXLE

	Metric Measure	U.S. Measure
Type	Automatic Three Speed With Torque Converter and Integral Differential	
Torque Converter Diameter	241 millimeters	9.48 inches
Oil Capacity—Transaxle and Torque Converter:	8.4 Liters	8.9 qts.
Use MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176		
Cooling Method	Water-Heat Exchanger and/or oil-to-air heat exchanger	
Lubrication	Pump (Internal-External Gear Type)	
Gear Ratios:		
Transmission Portion: First	2.69	
Second	1.55	
Third	1.00	
Reverse	2.10	

OVERALL TOP GEAR RATIO CHART

	2.5L Engine	3.0L Engine
	Duty and overall Top Gear Ratio	Duty and overall Top Gear Ratio
H = Heavy duty	H 3.02	H 3.02

		(Millimeter)	(Inch)
Pump Clearances:			
Outer Gear to Pocket		.045-.141	.0018-.0056
Outer Gear Side Clearance		.020-.046	.0008-.0018
Inner Gear Side Clearance		.020-.046	.0008-.0018
End Play:		(Millimeter)	(Inch)
Input Shaft		.19-1.50	.008-.060
Front Clutch Retainer		.76-2.69	.030-.106
Front Carrier		.89-1.45	.007-.057
Front Annulus Gear		.09-0.50	.0035-.020
Planet Pinion		.15-0.59	.006-.023
Reverse Drum		.76-3.36	.030-.132
Clutch Clearance and Selective Snap Rings:		(Millimeter)	(Inch)
Front Clutch (Non-Adjustable) Measured from Reaction Plate to "Farthest" Wave	3 Disc	2.22-3.37	.087-.133
	4 Disc	2.29-3.71	.090-.146
Rear Clutch (3 and 4 Disc) Adjustable	3 Disc	.67-0.86	.026-.034
	4 Disc	.67-1.10	.026-.043
Selective Snap Rings (5)		1.22-1.27	.048-.050
		1.52-1.57	.060-.062
		1.73-1.78	.068-.070
		1.88-1.93	.074-.076
		2.21-2.26	.087-.089

Band Adjustment:
Kickdown, Backed off from 8 N·m (72 in. lbs.).....A-413 & A-670 ... 2-1/2 Turns
Low-Reverse..... A-413 & A-670 ..... 3-1/2 Turns backed off from 5 N·m (41 in. lbs.)

Thrust Washers:		(Millimeter)	(Inch)
Reaction Shaft Support (Phenolic)	No. 1	1.55-1.60	.061-.063
Rear Clutch Retainer (Phenolic)	No. 2	1.55-1.60	.061-.063
Output Shaft, Steel Backed Bronze (Select)	No. 3	1.98-2.03	.077-.080
		2.15-2.22	.085-.087
		2.34-2.41	.092-.095
Front Annulus, Steel Backed Bronze	No. 4	2.95-3.05	.116-.120
Front Carrier, Steel Backed Bronze	Nos. 5, 6	1.22-1.28	.048-.050
Sun Gear (Front)	No. 7	.85-0.91	.033-.036
Sun Gear (Rear)	No. 8	.85-0.91	.033-.036
Rear Carrier, Steel Backed Bronze	Nos. 9, 10	1.22-1.28	.048-.050
Rev. Drum, Phenolic	No. 11	1.55-1.60	.061-.063

Tapered Roller Bearing Settings:	(Millimeter)	(Inch)
Output Shaft	.0-0.07 Preload	.0-.0028 Preload
Transfer Shaft	.05-0.25 End Play	.002-.010 End Play
Differential	.15-0.29 Preload	.006-.012 Preload

SPEEDOMETER PINIONS (MANUAL and AUTOMATIC)

The chart below applies to **all front-wheel-drive vehicles** equipped with **Manual or Automatic Transaxles.**

Tire Size	Pinion Teeth and Color
P185 75 R14	19 Yellow
P195 75 R14	19 Yellow
P205 70 R14	19 Yellow

TIGHTENING REFERENCE

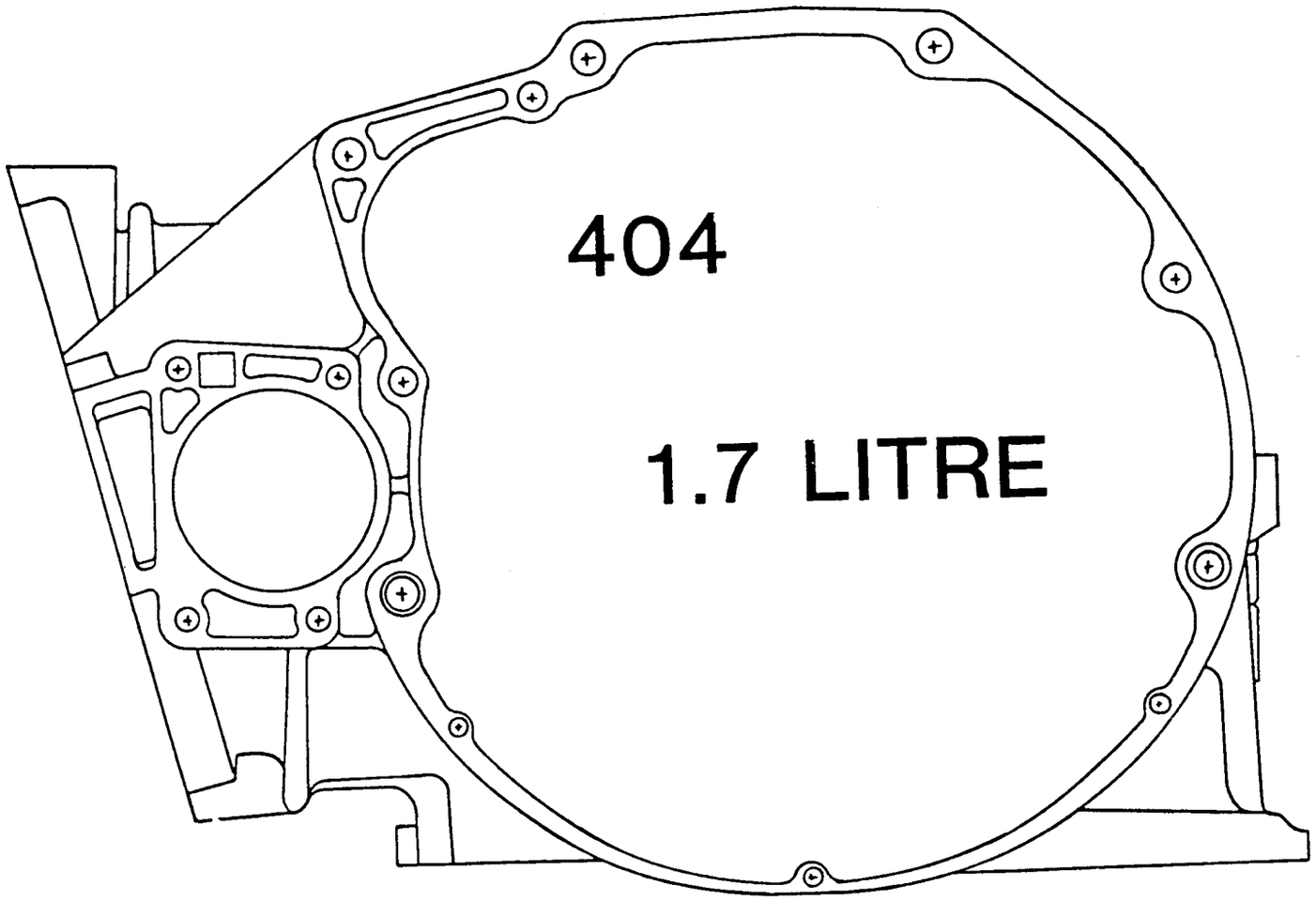
A-413 AND A-670 AUTOMATIC TRANSAXLES

Item	Qty.	Thread Size	Torque		
			Newton-meters	Inch-Pounds	Foot-Pounds
Bolt—Bell Housing Cover	3	M6-1-10	12	105	—
Bolt—Flex Plate to Crank	8	M10-1.5-18	95	—	70
Bolt—Flex Plate to Torque Converter	4	M10-1.5-13.2	74	—	55
Screw Assy. Transaxle to Cyl. Block	3	M12-1.75-65	95	—	70
Screw Assy. Lower Bell Housing Cover	3	M6-1-10	12	105	—
Screw Assy. Manual Control Lever	1	M6-1-35	12	105	—
Screw Assy. Speedometer to Extension	1	M6-1-14	7	60	—
Connector, Cooler Hose to Radiator	2	1/8-27 NPTF	12	110	—
Bolt—Starter to Transaxle Bell Housing	3	M10-1.5-30	54	—	40
Bolt—Throttle Cable to Transaxle Case	1	M6-1.0-14	12	105	—
Bolt—Throttle Lever to Transaxle Shaft	1	M6-1-25	12	105	—
Bolt—Manual Cable to Transaxle Case	1	M8-1.75-30	28	250	—
Bolt—Front Motor Mount	2	M10	54	—	40
Bolt—Left Motor Mount	3	M10-1.5-25	54	—	40
Dress Up:					
Connector Assembly, Cooler Line	2	M12-1.75-122	28	250	—
Plug, Pressure Check	7	1/16-27NPTF	5	45	—
Switch, Neutral Safety	1	3/4-16UNF	34	—	25
Differential Area:					
Ring Gear Bolt	12	M10-1.5	88	—	65
Bolt, Extension to Case	4	M8-1.25-28	28	250	—
Bolt, Differential Bearing Retainer to Case	6	M8-1.25-28	28	250	—
Screw Assy. Differential Cover to Case	10	M8-1.25-16	19	165	—
Transfer & Output Shaft Areas:					
Nut, Output Shaft	1	M20-1.5	271	—	200
Nut, Transfer Shaft	1	M20-1.5	271	—	200
Bolt, Gov. to Support	2	M5-0.8-20	7	60	—
Bolt, Gov. to Support	1	M5-0.8-30	7	60	—
Screw Assy., Governor Counterweight	1	M8-1.25-35	28	250	—
Screw Assy., Rear Cover to Case	10	M8-1.25-16	19	165	—
Plug, Reverse Band Shaft	1	1/4-18-NPTF	7	60	—
Pump & Kickdown Band Areas:					
Bolt, Reaction Shaft Assembly	6	M8-1.25-19	28	250	—
Bolt Assy., Pump to Case	7	M8-1.25-25	31	275	—
Nut, Kickdown Band Adjustment Lock	1	M12-1.75	47	—	35
Valve Body & Sprag Areas:					
Bolt, Sprag Retainer to Transfer Case	2	M8-1.25-23	28	250	—
Screw Assy., Valve Body	16	M5-0.8-11	5	40	—
Screw Assy., Transfer Plate	16	M5-0.8-25	5	40	—
Screw Assy., Filter	2	M5-0.8-30	5	40	—
Screw, Transfer Plate to Case	7	M6-1-30	12	105	—
Screw Assy., Oil Pan to Case	14	M8-1.25-16	19	165	—
Nut, Reverse Band Adjusting Lock	1	M8-1.25	14	120	—

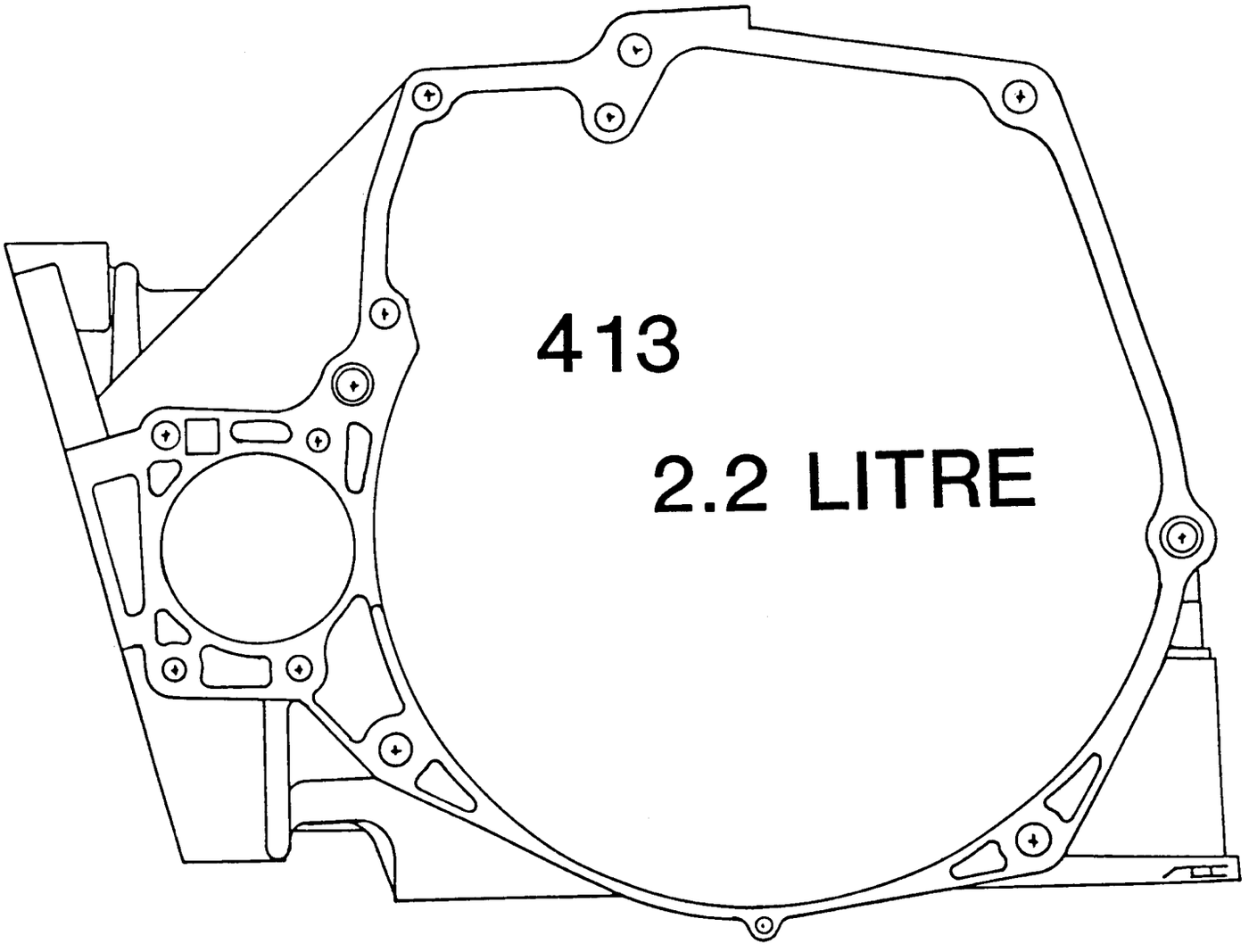
ATSG Technical Service Information

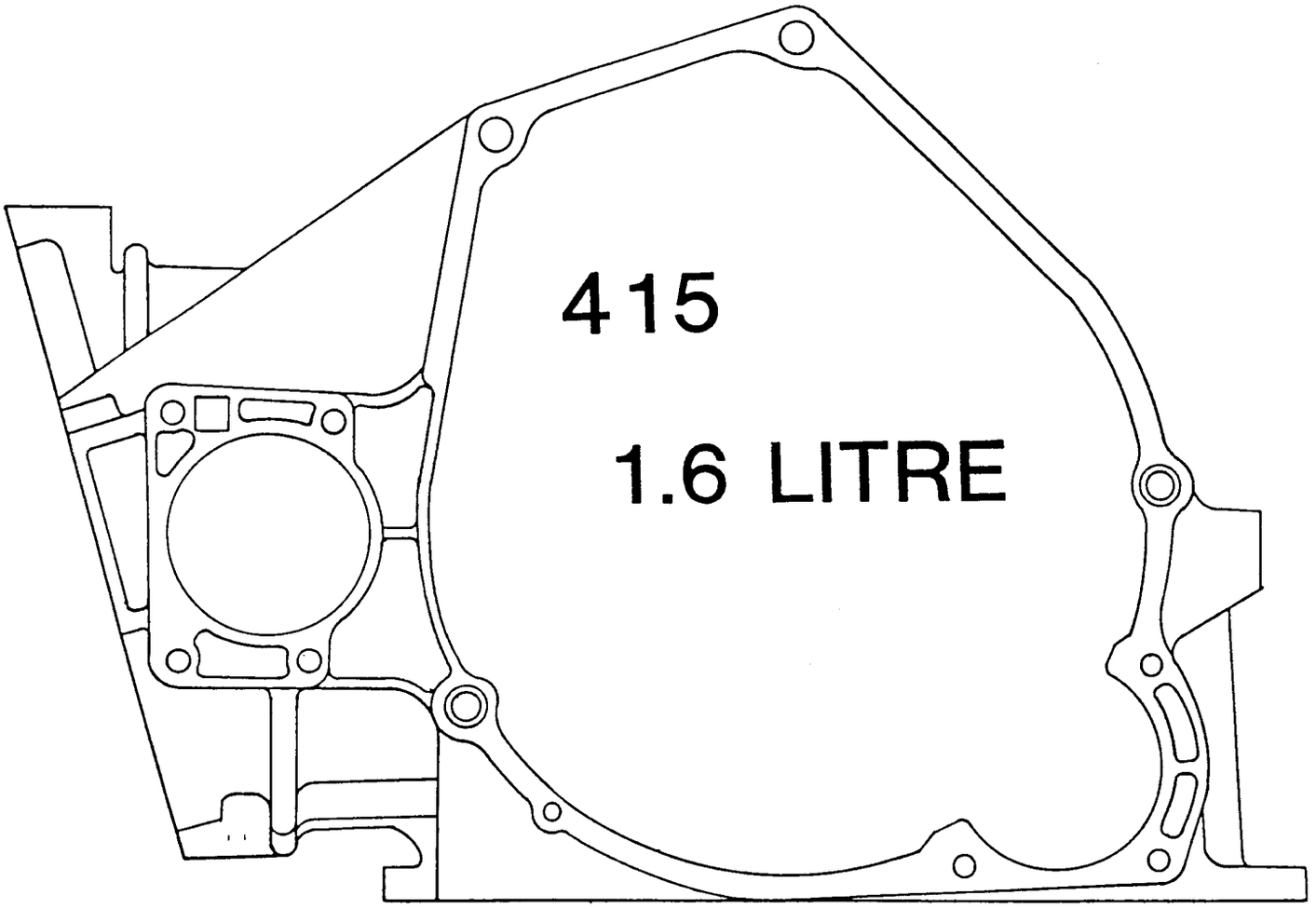
404

USE THE FOLLOWING DIAGRAMS TO HELP IDENTIFY THE TORQUE-FLITE FRONT WHEEL DRIVE CASES



AUTOMATIC TRANSMISSION SERVICE GROUP


413
2.2 LITRE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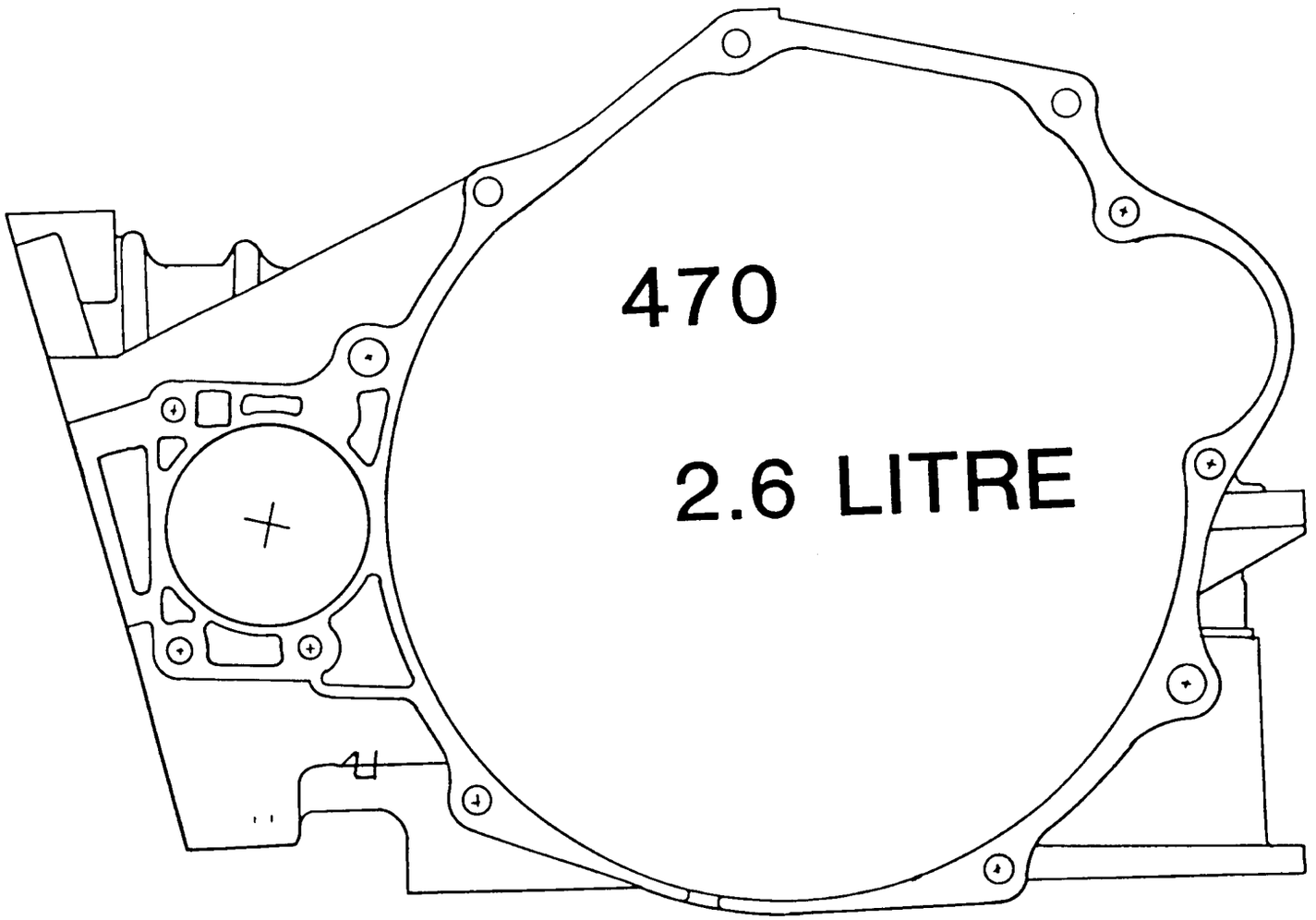
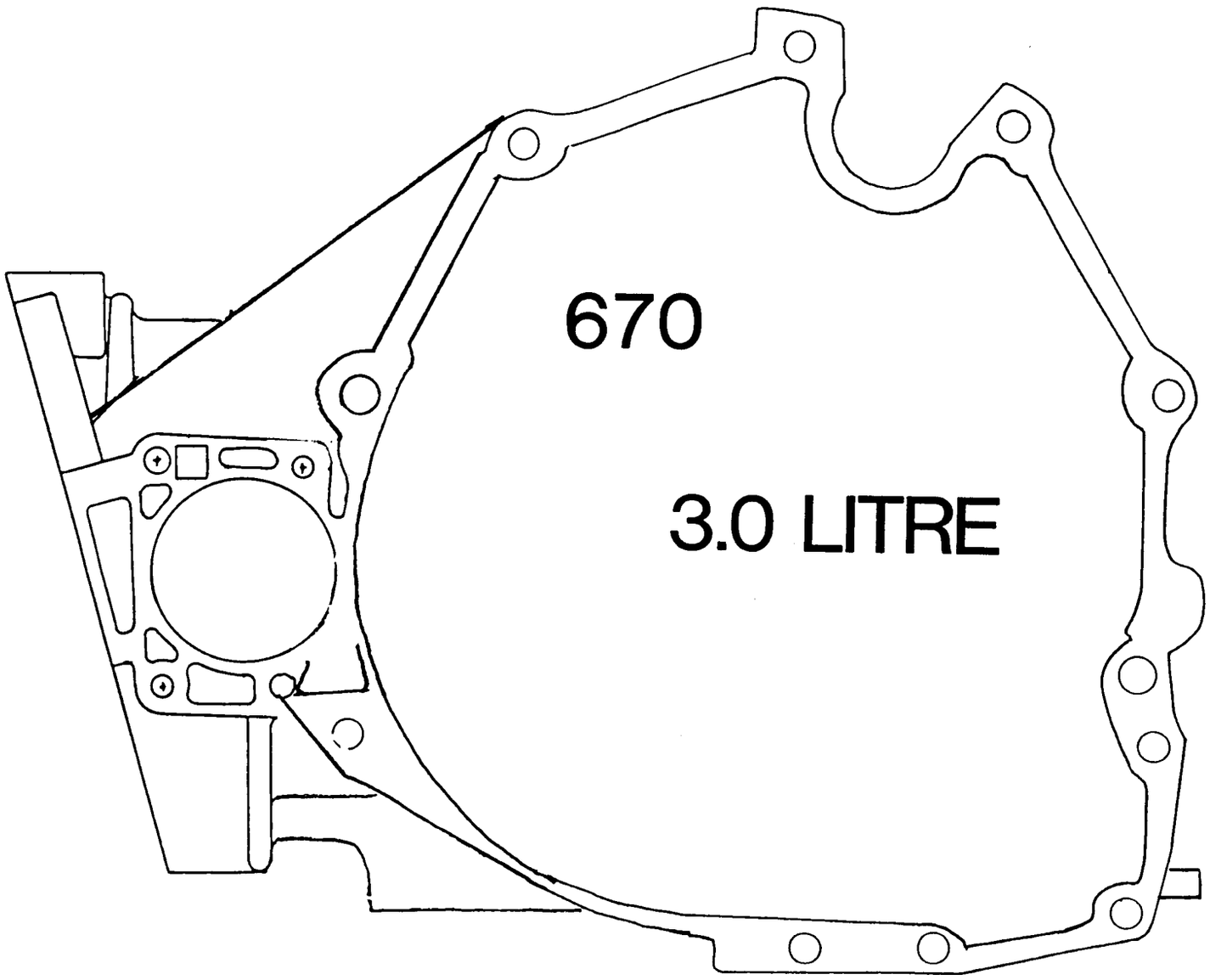
1.6 LITRE


470
2.6 LITRE


670
3.0 LITRE

Subject: END PLAY A-404

Setting of endplay in transaxles is of extreme importance. Since there are many selections of the thrust spacers or shims in the Torqueflite A-404 Transaxle precious time can be lost in setting up a unit that came to your shop completely disassembled with shims or spacers missing.

Below we are listing the"norm" shims or spacers most used. From this point it will be easier to start checking end play, plus have the advantage of knowing the size spacers msut often used.

SIL 80-12 gives a complete list of the size and part numbers of these shims.

NOTE: Both metric and english dimensions are used in making these checks.

For Example: The shim or spacer size is metric, and the measuring device is english.

OUT-PUT SHAFT:

8.32mm Spacer check torque drag should be 1 to 8 inch pounds.

TRANSFER -SHAFT:

2.78mm Spacer check end play should be .002 to .010 inch.

FINAL DRIVE:

1.22mm Shim check torque drag should be 5 to 18 inch pounds

QUALITY CONTROL

A-413

SYMPTOM/CONDITION

Customer concern of severely delayed 1-2 upshift after operating vehicle in reverse, particularly when transaxle is cold. The 1-2 upshift may not occur until vehicle has traveled as much as 1/4 of a mile and/or shift speed may be 10-12 MPH above normal shift speed range.

Subsequent shifts will be in the normal operating ranges.

NOTE: It is a normal condition for the shifts to be slightly delayed during very cold ambient temperatures due to transmission fluid viscosity, cold engine performance, etc.. Do not attempt to repair this condition if the shifts are only slightly delayed.

Check throttle cable adjustment and engine performance prior to attempting any repairs.

PARTS REQUIRED: 1- Throttle valve PN 4207230

REPAIR PROCEDURE:

1. Remove Trnasaxle oil pan and allow to drain.
2. Remove Valve body.
3. Remove throttle valve from valve body. Check the lands for proper size on the valve as shown in figure 1. If the lands if the lands on the valve are short, replace the valve.
4. Reinstall the valve body and torque screws to 5 N.m (40 inch puonds).
5. Reinstall the transaxle oil pan and add the the necessary fluid to bring to the proper fill level.
6. Road test vehicle for proper operation .

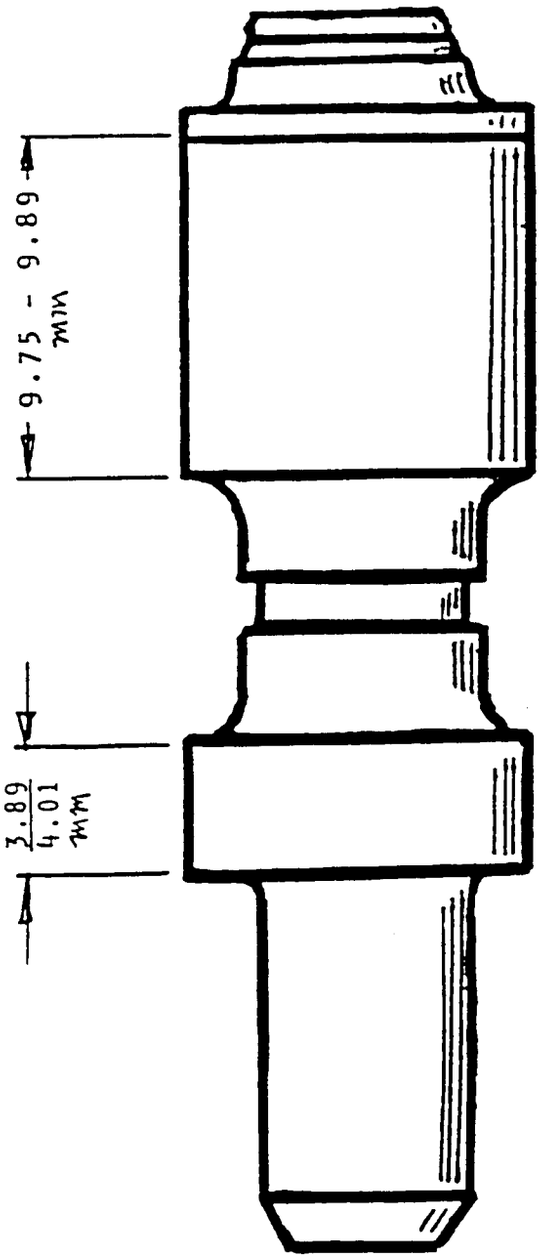


FIGURE #1

TORQUEFLITE A-413 / A-470

SYMPTOM/CONDITION

Customer concern of high effort to shift out of park position, particularly when vehicle is parked on a steep grade.

DIAGNOSIS

Inspect shift cable and linkage for proper routing and adjustment. If routing and adjustment are proper, the condition may be due to improper surface finish of the bullet end of the park sprag rod (Figure 3).

NOTE: Only transaxles built between 12-2-81 and 7-12-82 with serial numbers 7432-XXXX to 7654-XXXX are suspect for this condition.

PARTS REQUIRED

1 - Park Rod Assembly PN 4207130

REPAIR PROCEDURE

1. Remove the transaxle oil pan.

2. Remove the "E" clip retaining the park sprag rod to the valve body (Figure 4).

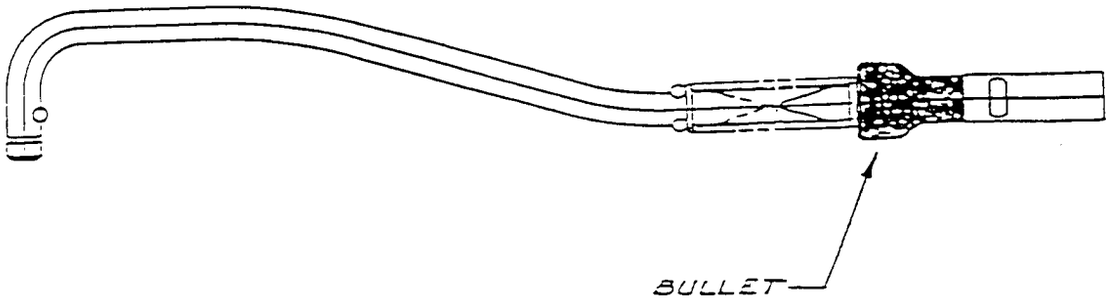
3. Remove the park sprag rod from the transaxle assembly and inspect the bullet end of the rod. If the bullet end surface is dark blue or black, replace the park rod assembly with PN 4207130 containing a bullet that is silver or light gray in color.

4. Reinstall "E" clip, install the transaxle oil pan, and refill with automatic transmission fluid.

NOTE: The manual shift lever (at the transmission) may have been bent if the vehicle operator has attempted to force a transmission with an improperly finished rod out of the park position. Therefore, after replacing the park sprag rod, check the shift lever and replace if lever is bent.

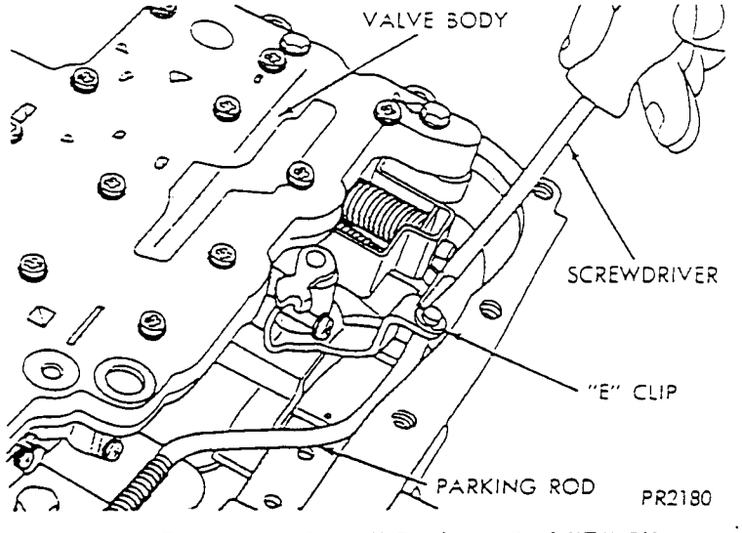
5. Check linkage adjustment and road test to verify operation.

FWD PARK SPRAG ROD ASSEMBLY



(Should be light gray or silver in color if surface treatment is acceptable)

Figure 3



Remove or Install Parking Rod "E" Clip

Figure 4