PREVIOUS
MENU

INDEX

GO TO PAGE

AUTOMATIC TRANSMISSION SERVICE GROUP

INTRODUCTION
CHRYSLER A604

The new A604 computer controlled Automatic Overdrive Transaxle has some unique features. This unit contains no bands or freewheel devices (sprags or one-way roller clutches). The shift cycles are controlled by the onboard computer. The computer is designed if a problem is encountered to have the transmission default to second speed, reverse, park and neutral. Through a series of fault codes the technician will be able to diagnosis the cause of the malfunction. This booklet is designed to give the technician an introduction to the operation and differences in this unit compared to previous units.

We thank CHRYSLER CORPORATION for the information and illustrations that have made this booklet possible

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CHRYSLER A-604

ELECTRONIC, FOUR-SPEED AUTOMATIC TRANSAXLE

Features and Benefits: An all-new, electronically-controlled, four-speed automatic transaxle is available with the 3.0 L V-6 engine in New Yorker, New Yorker Landau, Dynasty, Spirit ES, Acclaim LX, Caravan LE, all Grand Caravan models, Voyager LE, and all Grand Voyager models.

The customer will find this all-new transaxle to be very smooth and unobtrusive while providing reduced noise, improved highway fuel economy, faster and smoother response, and improved shift quality.

The transaxle provides faster acceleration in conjunction with a 3.43:1 final drive ratio, a ratio 6% to 23% higher than the ratio used with previous three-speed transmissions. When the transmission shifts to fourth gear, which is overdrive, the overall ratio drops to 2.36:1 to provide quieter operation. To provide good fuel economy in conjunction with the lower overall ratio, the torque converter locks in fourth gear, thereby eliminating slippage.

Shifts are very smooth due to fully adaptive electronic control which senses the speed changes between components within the gear train as shifts occur and adjusts hydraulic pressure as needed. This control method contrasts sharply with conventional automatic transmissions which shift by applying hydraulic pressure through orifices and mechanical accumulators based on a predetermined set of assumptions about engine output and friction material characteristics.

Chrysler Motors' use of **fully-adaptive electronic transmission controls** in its new four-speed automatic transaxle

A unique feature of electronic control is partial lock up of the torque converter which produces a smooth transition to full lock up. The speed differential between the input and output shafts of the transmission prior to lock up is typically 250 rpm. Partial lock up brings that differential into the range of 50-100 rpm, then completes the lock up. Adaptive control can do this because it can sense the speed differential and apply just enough pressure to the lock-up clutch to achieve the small slippage. After partial lock-up is achieved, pressure is increased incrementally until full lock-up is complete.

The electronic adaptive controls provide kick-down shifts with a smoothness that is unmatched by any previous unit, and in so doing, make the powertrain feel more responsive without increasing harshness. Being adaptive, these controls inherently compensate for changes in engine or friction element torque and provide good, consistent shift quality for the life of the transmission.

ELECTRONIC FOUR-SPEED AUTOMATIC TRANSAXLE

Function: The transmission provides forward ratios of 2.84, 1.57, 1.0, and 0.69 with lockup available in 4th gear; the Reverse ratio is 2.21. The shift quadrant has six positions: P, R, N, OD, D, and L. The OD position is actually a "D" inside an "O" to indicate overdrive operation. When OD is selected, the transmission shifts normally through all four speeds. It is recommended for most driving. The D position is used for hilly or mountainous driving. When D is selected, the transmission uses only 1st, 2nd, and 3rd gears. When operating in D or L positions torque converter lock-up occurs in third gear for improved transmission cooling when towing trailers on steep grades. If high engine coolant temperature occurs, the torque converter will also lock up in 2nd gear. The L position provides maximum engine braking for descending steep grades. Unlike most current transmissions, up-shifts are provided to 2nd or 3rd at peak engine speeds if the accelerator is depressed. This provides engine over-speed protection and maximum performance.

Description: The electronic controls make the transmission unique in a number of ways. First, the adaptive controls are used to significantly reduce complexity. Relative to today's three-speed unit, the new transaxle requires no additional gearing, one less overrunning clutch, and only one more friction element. It has 20 fewer part numbers than today's three-speed unit. The resulting compactness allows the new four-speed transaxle to package in the same vehicles and with the same ground clearance as the three-speed unit and the lockup torque converter is similar to the one used in other front-wheel drive units. Torque capacity for future vehicles and engines has been assured by using larger gearing throughout than in the present three-speed transaxle; yet it weighs only 5.9 kg (13 pounds) more and is only 13 mm (0.5 in.) longer. For manufacturing simplification, the planetary gears are the same diameter and length and have the same number of teeth as those used in our three-speed rear-drive passenger car unit. Also, the engine-to-differential center line dimension has been preserved, simplifying installation in existing vehicles.

ELECTRONIC FOUR-SPEED AUTOMATIC TRANSAXLE AND FINAL DRIVE

The transmission uses only clutches to change ratios. Clutches provide smooth, consistent shifts whereas bands, which are used in some transmissions, are harder to control and less consistent.

Actuation and release of the clutches is controlled by ball-type solenoid valves, which were chosen for maximum reliability in the transmission operating environment. Moreover, the solenoids operate the valves directly without any intermediate element.

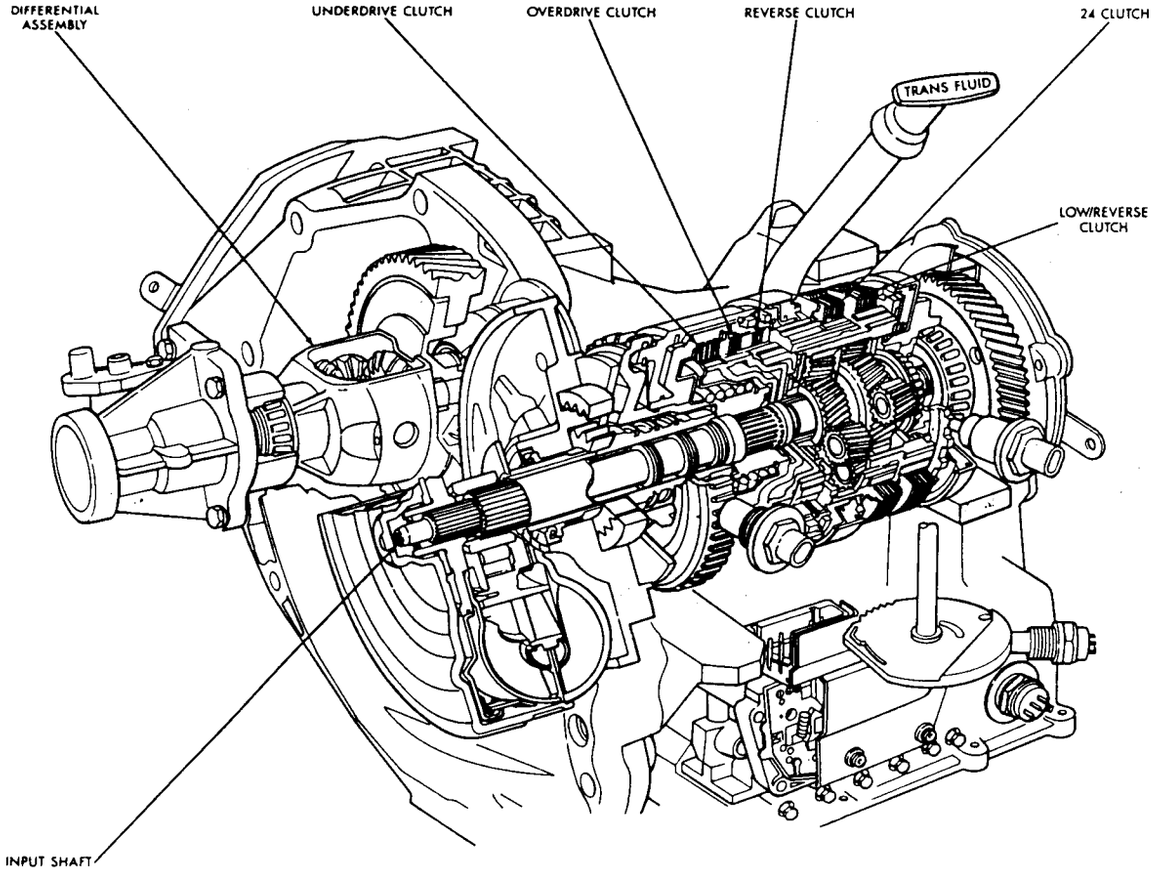
Further simplification is achieved through a unique logic-controlled switching valve which permits one solenoid to control the application of two friction elements. Any selection of 2nd, 3rd, or 4th gear elements causes this valve to

release Low Gear. A failure cannot reselect it. When a shift to Low Gear is appropriate, the logic first determines that no malfunctions exist, then a specific sequence of solenoid commands is used to shift the valve and again select Low Gear.

The control electronics are located underhood in a potted, die cast aluminum housing with a sealed, 40-way connector. On New Yorker, and New Yorker Landau, Dynasty, Spirit and Acclaim, the control computer is located on the right fender side shield. On Caravan and Voyager it is located on the right side of the dash panel.

The transmission control computer for the Dodge Caravan and Plymouth Voyager includes control logic to protect the transmission from overheating. In trailer towing situations where the vehicle is operated in "D" which does not permit a shift to overdrive, the torque converter will lock up in 2nd as well as 3rd gear if the coolant temperature becomes moderately high. This reduces transmission heat rejection by reducing torque converter slippage and reduces engine heat rejection by lowering engine speed.

Through the use of SMD's (surface mount devices) and ASIC's (application-specific integrated circuits), the controller size was minimized. The electrical power requirements of the control system have been minimized by using switch-mode, current-controlled solenoid drivers and an efficient CMOS (complementary metal-oxide semi-conductor) microprocessor. These features combine to provide a state-of-the-art control system for the transmission.



A-604 4-SPEED

ELECTRONIC AUTOMATIC TRANSAXLE

GENERAL INFORMATION

The A-604 electronic four-speed FWD transaxle is the first use of fully-adaptive controls in a production automotive transmission. Adaptive controls are those which perform their functions based on real-time feedback sensor information, just as is done by electronic antilock brake controls. Although the transaxle is conventional in that it uses hydraulically-applied clutches to shift a planetary geartrain, its use of electronics to control virtually all functions is unique.

Operation

The transaxle provides forward ratios of 2.84, 1.57, 1.00, and 0.69 with torque converter lockup available in 2nd, direct, or overdrive gear; the Reverse ratio is 2.21. The shift lever is conventional with six positions: P, R, N, OD, D, and L. When OD is selected the transaxle shifts normally through all four speeds with lockup in overdrive; this position is recommended for most driving. The D position is tailored for use in hilly or mountainous driving. When D is selected, the transmission uses only 1st, 2nd, and direct gears with 2-direct shift delayed to 40 mph or greater. When operating in D or L positions torque converter lockup occurs in direct gear for improved transmission cooling when towing trailers and steep grades. If high engine coolant temperature occurs, the torque converter will also lock up in 2nd gear. The L position provides maximum engine braking for descending steep grades. Unlike most current transaxles, upshifts are provided to 2nd or direct at peak engine speeds if the accelerator is depressed. This provides engine over-speed protection and maximum performance.

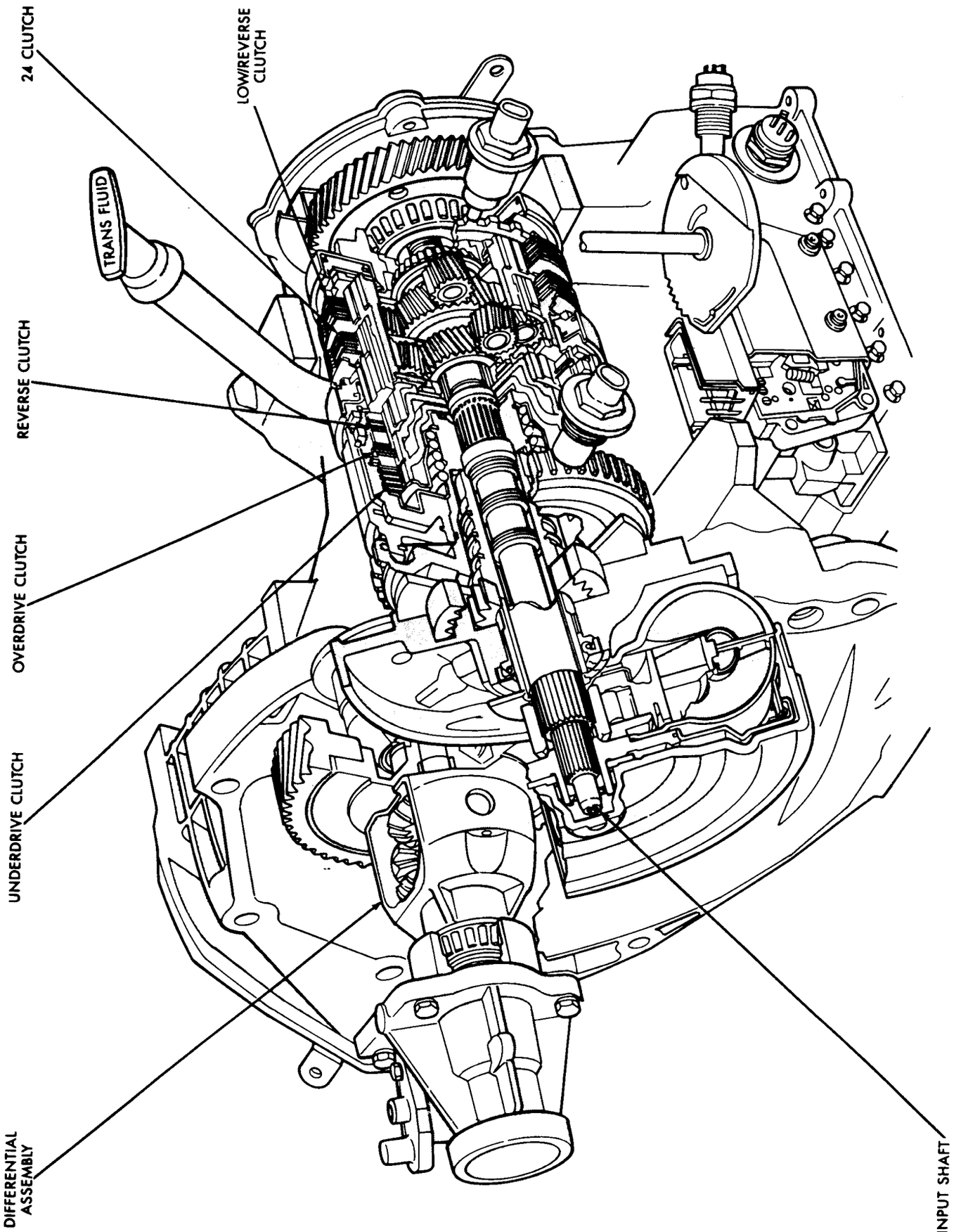
Clutch and Gear

The A-604 transaxle consists of three multiple-disc input clutches, two multiple-disc grounded clutches, four hydraulic accumulators, and two planetary gearsets to provide 4 speeds forward and a reverse ratio. Since this transaxle is expected to operate properly with today's high-speed engines, its clutch-apply pistons were designed with centrifugally-balanced oil cavities so that quick response and good control can be achieved at any speed. A unique push/pull piston is incorporated for two of the three input clutches without any added pressure seals; the third clutch requires one additional seal.

Hydraulics

The hydraulics of the new transaxle provide the manual shift lever select function, main line pressure regulation, and torque converter and cooler flow control. Oil flow to the friction elements is controlled directly by four solenoid valves. The hydraulics also include a unique logic-controlled "solenoid switch valve" which locks out the 1st gear reaction element with the application of 2nd, direct, or overdrive gear elements, and redirects the 1st gear solenoid output so that it can control torque converter lockup operation. To regain access to 1st gear, a special sequence of solenoid commands must be used to unlock and move the solenoid switch valve. This precludes any application of the 1st gear reaction element with other elements applied unless specifically commanded by a properly functioning controller; it also allows one solenoid to control two friction elements.

Small, high-rate accumulators are provided in each controlled friction element circuit. These serve to absorb the pressure responses, and allow


24 CLUTCH
LOW/REVERSE CLUTCH
TRANS FLUID
REVERSE CLUTCH
OVERDRIVE CLUTCH
UNDERDRIVE CLUTCH
DIFFERENTIAL ASSEMBLY
INPUT SHAFT

the controls to read and respond to changes that are occurring.

Solenoids

Since the solenoid valves perform virtually all control functions, these valves must be extremely durable and tolerant of normal dirt particles. For that reason hardened-steel poppet and ball valves are used. These are free from any close operating clearances, and the solenoids operate the valves directly without any intermediate element. Direct operation means that these units must have very high output so that they can close against the sizeable flow areas and high line pressures. Fast response is also required to meet the control requirements.

Two of the solenoids are normally-venting and two are normally-applying; this was done to provide a default mode of operation. With no electrical power, the transmission provides 2nd gear in "OD," "D," or "L" shift lever positions, neutral in "N", reverse in "R", and park in "P". The choice of 2nd gear was made to provide adequate breakaway performance while still accommodating highway speeds.

Sensors

Other electrical components include: three pressure switches to identify solenoid application, two speed sensors to read input (torque converter turbine) and output (parking sprag) speeds, and position switches to indicate the manual shift lever position. The pressure switches are incorporated in an assembly with the solenoids. Engine speed, throttle position, temperature, etc., are also observed. Some of these signals are read directly from the engine control sensors; others are read from a C^2D multiplex circuit with the engine controller.

Electronics

The control electronic unit is located underhood in a potted, diecast aluminum housing with a sealed, 60-way connector.

Adaptive Controls

These controls function by reading the input and output speeds over 140 times a second and responding to each new reading. This provides the precise and sophisticated friction element control needed to make smooth clutch-to-clutch shifts for all gear changes without the use of overrunning clutches or other shift quality aids. As with most automatic transaxles, all shifts involve releasing one element and applying a different element. In simplified terms, the upshift logic allows the releasing element to slip backwards slightly to ensure that it does not have excess capacity; the apply element is filled until it begins to make the speed change to the higher gear; its apply pressure is then controlled to maintain the desired rate of speed change until the shift is complete. The key to providing excellent shift quality is precision; for example, as mentioned, the release element for upshifts is allowed to slip backwards slightly; the amount of that slip is typically less than a total of 20 degrees. To achieve that precision, **the controller learns the characteristics of the particular transaxle that it is controlling; it learns the release rate of the releasing element, the apply time of the applying element, the rate at which the apply element builds pressure sufficient to begin to make the speed change,** and so on. This method achieves more precision than would be possible with exacting tolerances and it can adapt to any changes that occur with age or environment, for example, altitude, temperature, engine output, etc.

For kickdown shifts, the control logic allows the releasing element to slip and then controls the rate at which the input (and engine) accelerate; when the lower gear speed is achieved, the releasing element reapplies to maintain that speed until the apply element is filled. This provides quick response since the engine begins to accelerate immediately and a smooth torque exchange since the release element can control the rate of torque increase. This control can make any powertrain feel more responsive without increasing harshness.

Since adaptive controls respond to input speed changes, they inherently compensate for changes in engine or friction element torque and provide good, consistent shift quality for the life of the transaxle.

Diagnostics

These controls also provide comprehensive, onboard transaxle diagnostics, and, thanks to the learning of individual characteristics, the information available can be truly revealing. For example, apply element buildup rate indicates solenoid performance. Also included are self-diagnostic functions which allow the technician to test the integrity of the electronic controls without requiring a roadtest. Moreover, the controller continuously monitors its critical functions, records any malfunctions, and the number of engine starts since the last malfunction so that the technician can use the information in the event of a customer complaint.

Diagnosis and Tests

DIAGNOSIS—GENERAL

CAUTION: Before attempting any repair on the A-604 Electronic Automatic Transaxle, always check for fault codes with the DRBII using the "Powertrain Diagnostic Test Procedure Manual (A-604)."

Automatic transaxle malfunctions may be caused by four general conditions: poor engine performance, improper adjustments, hydraulic malfunctions, mechanical malfunctions, and electronic malfunctions. Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level and condition, gearshift 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 checks should be peformed.

Fluid Level and Condition

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

Since this torque converter fills in both the "P" Park and "N" Neutral positions, place the selector level 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 oil level indicator.

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 accumulator operation. Foaming can also result in fluid escaping from the transaxle vent 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 PRNDL and neutral safety switch provides a quick check to confirm proper manual linkage adjustment.

Move the selector level 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 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 and refer to DRBII in the "Diagnostic Test Procedure Manual."

Road Test

Prior to performing a road test, be certain that the fluid level and condition, and control cable adjustment 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.

In most cases, the clutch 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.

The process of eliminating can be used to de-

ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

Shift Lever Position	Start Safety	Park Sprag	CLUTCHES				
			Underdrive	Overdrive	Reverse	2/4	Low/ Reverse
P — PARK	X	X					X
R — REVERSE					X		X
N — NEUTRAL	X						X
OD — OVERDRIVE First			X				X
Second			X			X	
Direct			X	X			
Overdrive				X		X	
D — DRIVE* First			X				X
Second			X			X	
Direct			X	X			
L — LOW* First			X				X
Second			X			X	
Direct			X	X			

*Vehicle upshift and downshift speeds are increased when in these selector positions.

tect 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.

SHIFT QUALITY QUICK-LEARN PROCEDURE

This procedure will quickly optimize shift quality after battery disconnect.

The transaxle operating temperature must be warm before learning is allowed. To warm up transaxle fluid, observe the following chart:

AMBIENT TEMP. (°F)	ENGINE IDLE TIME (MINUTES)
0	8
20	6
40	4
60	2
80	0

Upshift Learn Procedure

(1) Maintain constant throttle opening during shifts.

CAUTION: Do not move accelerator pedal during the upshifts.

(2) Accelerate vehicle with throttle opening angle in range of 10 to 50 degrees

(3) Make 15 to 20 1-2, 2-3, and 3-4 upshifts. **Accelerating from stop to approximately 45 mph each time at moderate throttle angle (20-25°) is sufficient.**

Kickdown Learn Procedure

(1) With vehicle speed below 25 mph, make 5 to 8 wide-open-throttle kickdowns to 1st gear from either 2nd or 3rd gear. Allow for 5 seconds or more of operation in 2nd or 3rd prior to the kickdown.

(2) With vehicle speed greater than 25 mph, make 5 to 8 part throttle to wide-open throttle kickdowns to either 3rd or 2nd gear from 4th gear (for example, 4-3 or 4-2 kickdowns). Allow for 5 seconds or more of operation in 4th, preferably at road-load throttle, prior to performing the kickdown.

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 shift 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.

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

Test port locations are shown in (Figure 1).

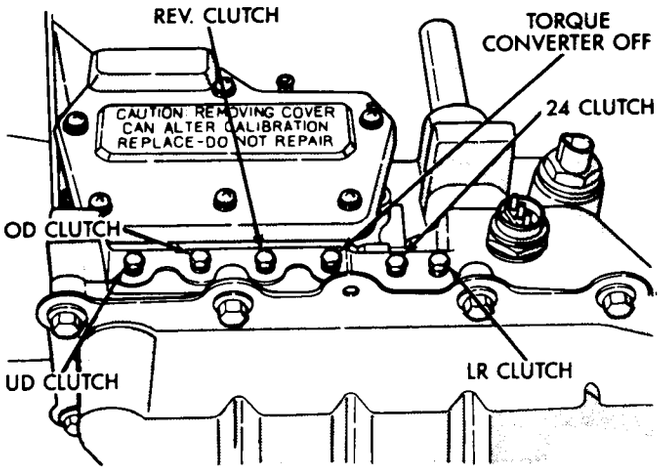


Fig. 1—Pressure Taps

Test One (Selector in L—1st gear)

(1) Attach pressure gauge to the low/reverse clutch tap.

(2) Move selector lever to the L position.

(3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed to 20 mph.

(4) Low/reverse clutch pressure should read 115 to 145 psi.

(5) This test checks pump output, pressure regulation and condition of the low/reverse clutch hydraulic circuit and shift schedule.

Test Two (Selector in D—2nd gear)

(1) Attach gauge to the underdrive clutch tap.

(2) Move selector lever to the D position.

(3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 30 mph.

(4) Underdrive clutch pressure should read 110 to 145 psi.

(5) This test checks the underdrive clutch hydraulic circuit as well as the shift schedule.

Test Three (overdrive clutch check)

(1) Attach gauge to the overdrive clutch tap.

(2) Move selector lever to the circle D position.

(3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 20 mph.

(4) Overdrive clutch pressure should read 74 to 95 psi.

(5) Move selector lever to the D position and increase indicated vehicle speed to 30 mph.

(6) The vehicle should be in second gear and overdrive clutch pressure should be less than 5 psi.

(7) This test checks the overdrive clutch hydraulic circuit as well as the shift schedule.

Test Four (Selector in Circle D—overdrive gear)

(1) Attach gauge to the 2/4 clutch tap.

(2) Move selector lever to the circle D position.

(3) Allow vehicle front wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 30 mph.

(4) The 2/4 clutch pressure should read 75 to 95 psi.

(5) This test checks the 2/4 clutch hydraulic circuit.

Test Five (Selector in circle D—overdrive lockup)

(1) Attach gauge to the lockup off pressure tap.

(2) Move selector lever to the circle D position.

(3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed to 50 mph.

Caution: Both wheels must turn at the same speed.

(4) Lockup off pressure should be less than 5 psi.

(5) This test checks the lockup clutch hydraulic circuit.

Test Six (Selector in Reverse)

(1) Attach gauge to the reverse clutch tap.

(2) Move selector lever to the reverse position.

(3) Read reverse clutch pressure with output stationary (foot on brake) and throttle opened to achieve 1500 rpm.

(4) Reverse clutch pressure should read 165 to 235 psi.

(5) This test checks the reverse clutch hydraulic circuit.

Test Result Indications

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

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

(3) Clutch circuit leaks are indicated if pressures do not fall within the specified pressure range.

(4) If the overdrive clutch pressure is greater than 5 psi in step 6 of Test Three, a worn reaction shaft seal ring is indicated.

A-604 PRESSURE CHECK SPECIFICATIONS

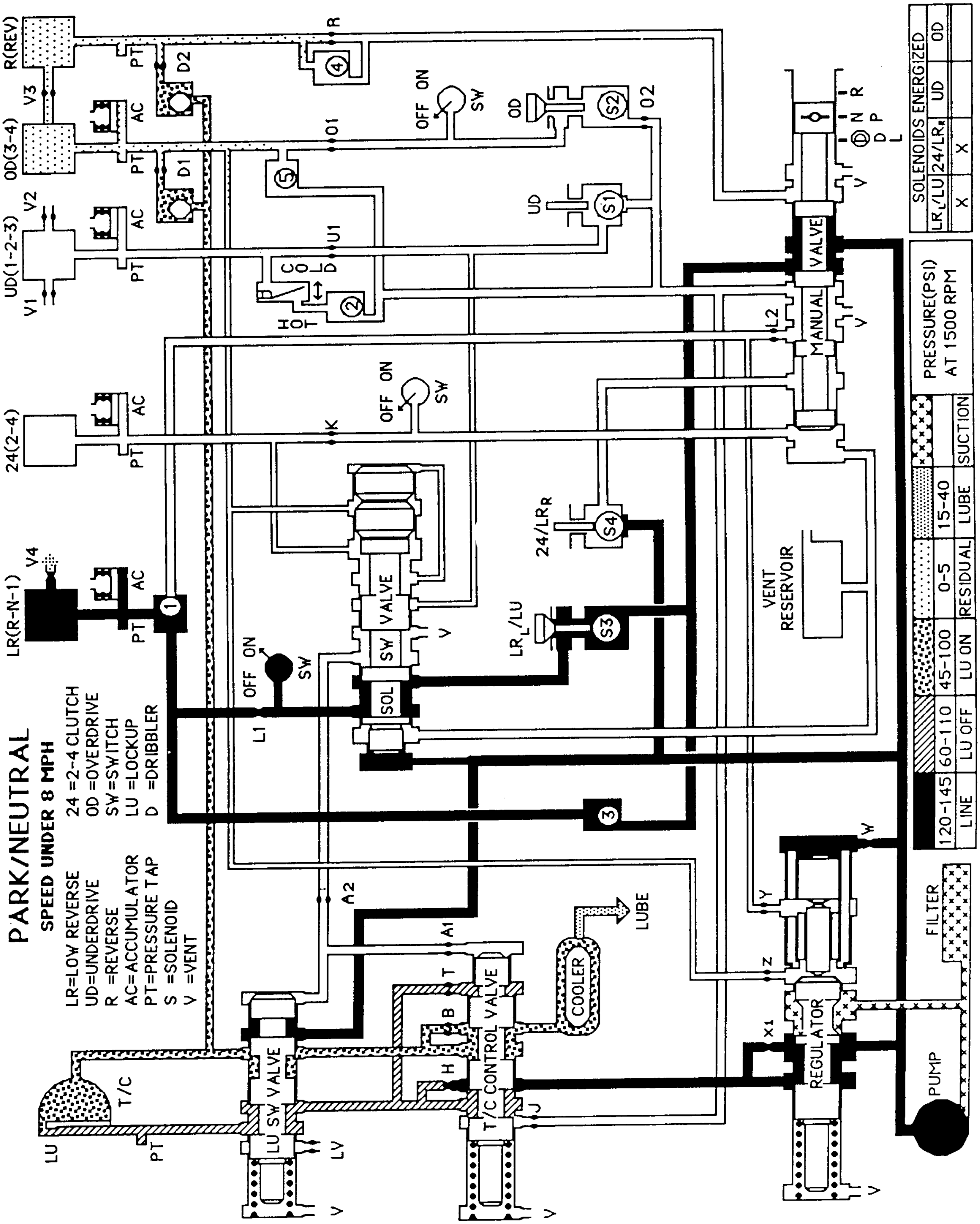
(on hoist, with front wheels free to turn)
PRESSURE TAP ORDER ON CASE FROM BELLHOUSING TO END COVER
ALL PRESSURE ARE PSI

Gear Selector Position	Actual Gear	PRESSURE TAPS					
		Under-Drive Clutch	Over-Drive Clutch	Reverse Clutch	Lockup Off	2/4 Clutch	Low/ Reverse Clutch
PARK * 0 mph	PARK	0-2	0-5	0-2	60-110	0-2	115-145
REVERSE * 0 mph	REVERSE	0-2	0-7	165-235	50-100	0-2	165-235
NEUTRAL * 0 mph	NEUTRAL	0-2	0-5	0-2	60-110	0-2	115-145
L # 20 mph	FIRST	110-145	0-5	0-2	60-110	0-2	115-145
D # 30 mph	SECOND	110-145	0-5	0-2	60-110	115-145	0-2
D # 45 mph	DIRECT	75-95	75-95	0-2	60-90	0-2	0-2
OD # 30 mph	OVERDRIVE	0-2	75-95	0-2	60-90	75-95	0-2
OD # 50 mph	OVERDRIVE LOCKUP	0-2	75-95	0-2	0-5	75-95	0-2

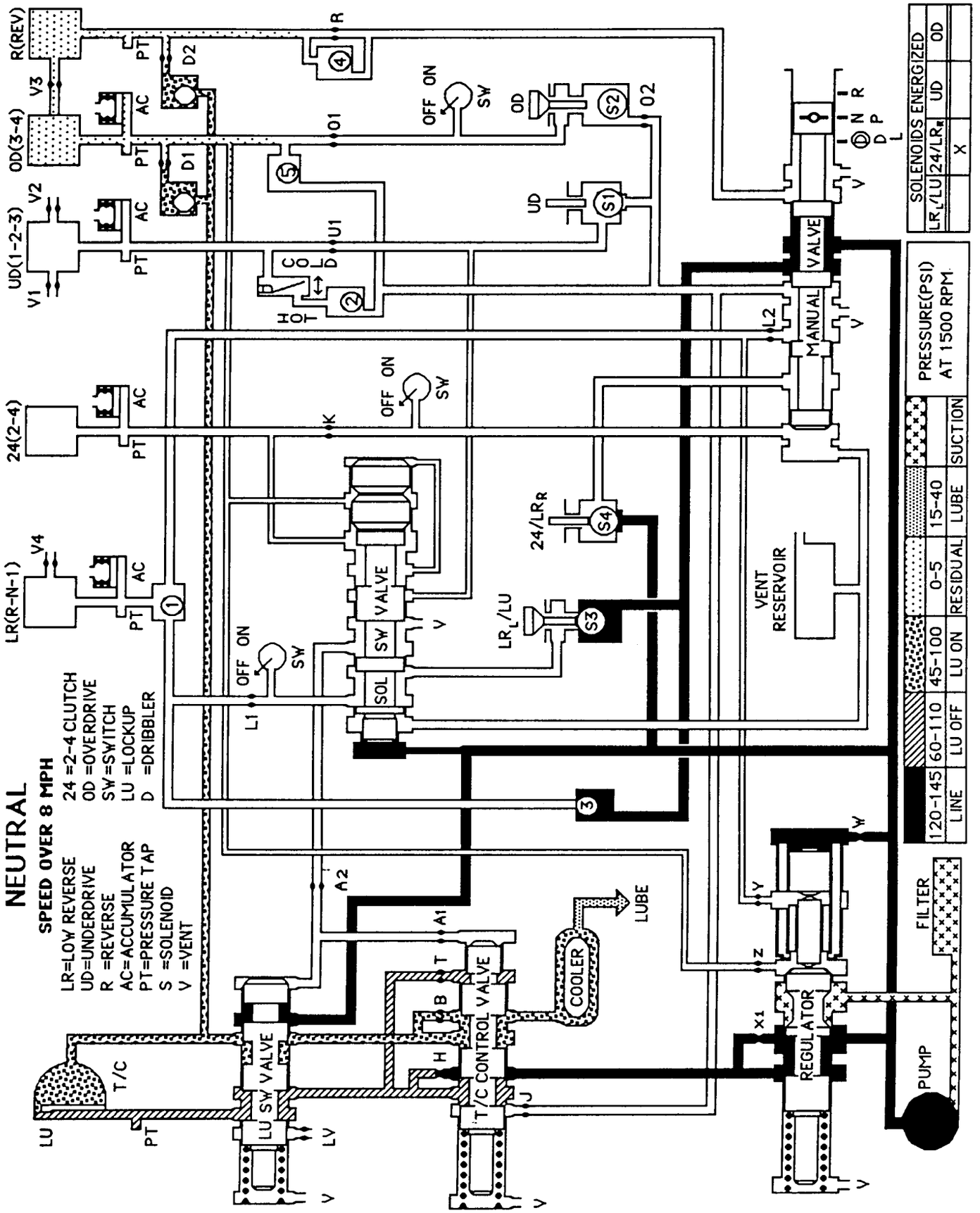
***Engine speed at 1500 rpm**
#CAUTION: Both front wheels must be turning at same speed.

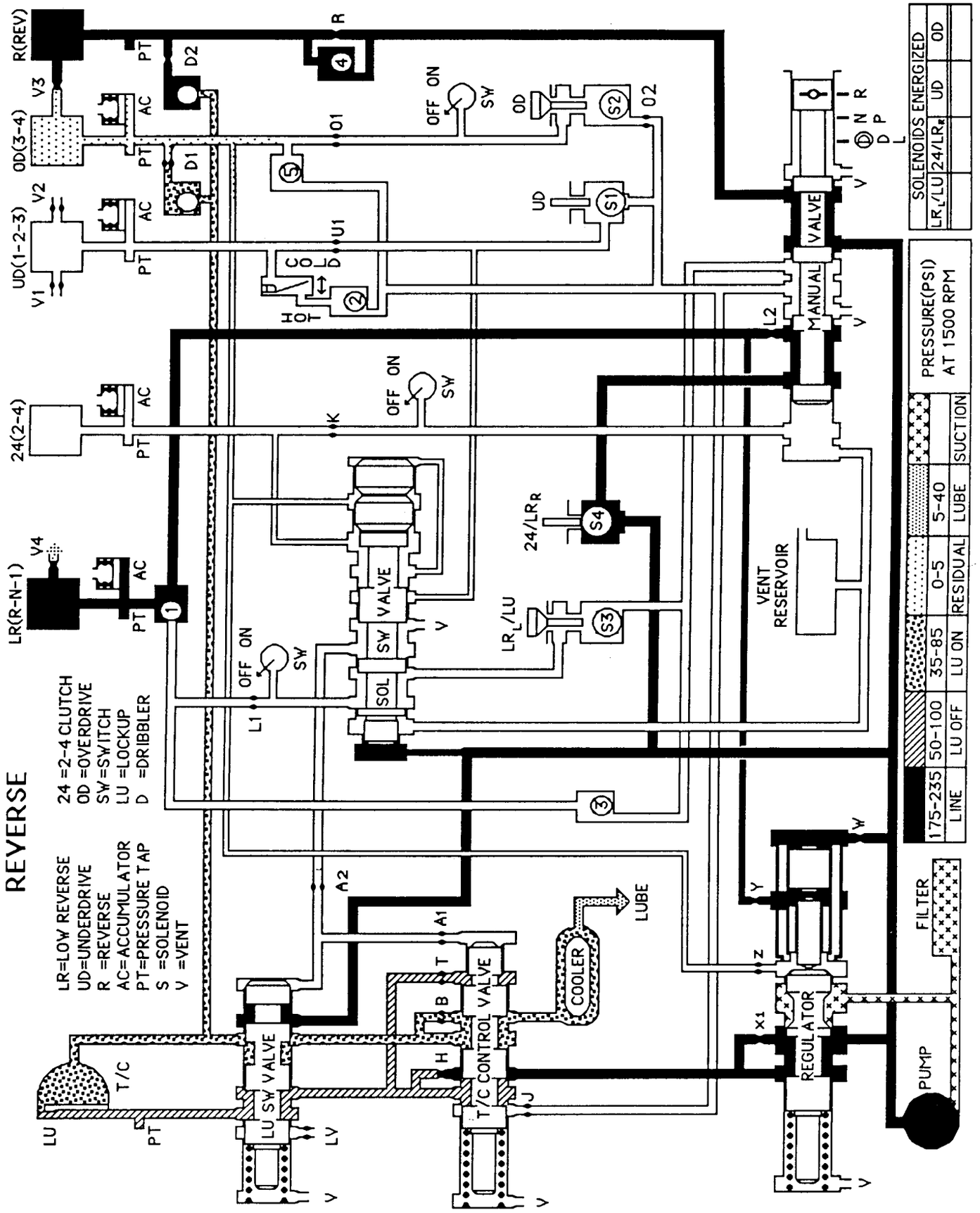
DEFAULT CODE CHART "A"

Default Code Number	21	22	23	24	25	26	27	31	32	33	37	38	39
Condition	OD clutch—Pressure too low	2/4 clutch—Pressure too low	2/4 clutch and OD clutch—Pressures too low	L/R clutch—Pressure too low	L/R clutch and OD clutch—pressures too low	L/R clutch and 2/4 clutch—pressures too low	OD, 2/4, and L/R clutches—pressures too low	OD clutch pressure switch response failure	2/4 pressure switch response failure	2/4 and OD clutch pressure response failures	Solenoid switch valve failure	Partial lockup control out of range	Speed ratio default
Low fluid level	X	X	X	X	X	X	X	X	X	X			X
Aerated fluid (high fluid level)	X	X	X	X	X	X	X	X	X	X			
Worn or damaged reaction shaft support seal rings	X												X
Worn or damaged input shaft seal rings												X	X
Worn pump	X	X	X	X	X	X	X	X	X	X		X	X
Damage or failed clutches:													
UD clutch													X
OD clutch	X							X					X
Reverse clutch													X
2/4 clutch		X							X				X
L/R clutch				X									X
Damaged clutch seals	X	X	X	X	X	X	X						X
Worn or damaged accumulator seal rings	X	X	X	X	X	X	X						X
Plugged filter	X	X	X	X	X	X	X			X			X
Stuck/sticky valves	X	X	X	X	X	X	X				X	X	X
Solenoid switch valve											X		
Lockup switch valve												X	
Torque converter control valve												X	
Regulator valve	X	X	X	X	X	X	X						X
Valve body leakage	X	X	X	X	X	X	X	X	X	X	X	X	X
Pressures too high	X	X	X	X	X	X	X					X	X
Internal solenoid leak	X	X	X	X	X	X	X	X	X	X	X	X	X
Torque converter lockup clutch failure	X	X	X	X	X	X	X	X				X	
Faulty cooling system	X	X	X	X	X	X	X						X
Damaged speed sensor gear teeth													X
Planetary gearsets broken or seized													X



PARK/NEUTRAL
SPEED UNDER 8 MPH
LR=LOW REVERSE
UD=UNDERDRIVE
R =REVERSE
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
V1
V2
V3
V4
AC
PT
D1
D2
01
02
U1
L1
L2
A1
A2
K
R
T
B
H
J
LV
W
Y
Z
X1
HOT
COLD
OFF ON
SW
S1
S2
S3
S4
UD
OD
LR/LU
24/LR
SOL
SW VALVE
MANUAL VALVE
R N D D L
VENT RESERVOIR
T/C
LU
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
REGULATOR
PUMP
FILTER
PRESSURE(PSI) AT 1500 RPM
120-145 LINE
60-110 LU OFF
45-100 LU ON
0-5 RESIDUAL
15-40 LUBE
SUCTION
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
X
X


NEUTRAL
SPEED OVER 8 MPH
LR=LOW REVERSE
UD=UNDERDRIVE
R =REVERSE
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON SW
OD
UD
MANUAL VALVE
VENT RESERVOIR
FILTER
PUMP
REGULATOR
COOLER
LUBE
T/C
LU SW VALVE
T/C CONTROL VALVE
SOL SW VALVE
SOLENOIDS ENERGIZED
LR/LU 24/LR UD OD
X
PRESSURE(PSI) AT 1500 RPM
LINE 120-145 LU OFF 60-110 LU ON 45-100 RESIDUAL 0-5 LUBE 15-40 SUCTION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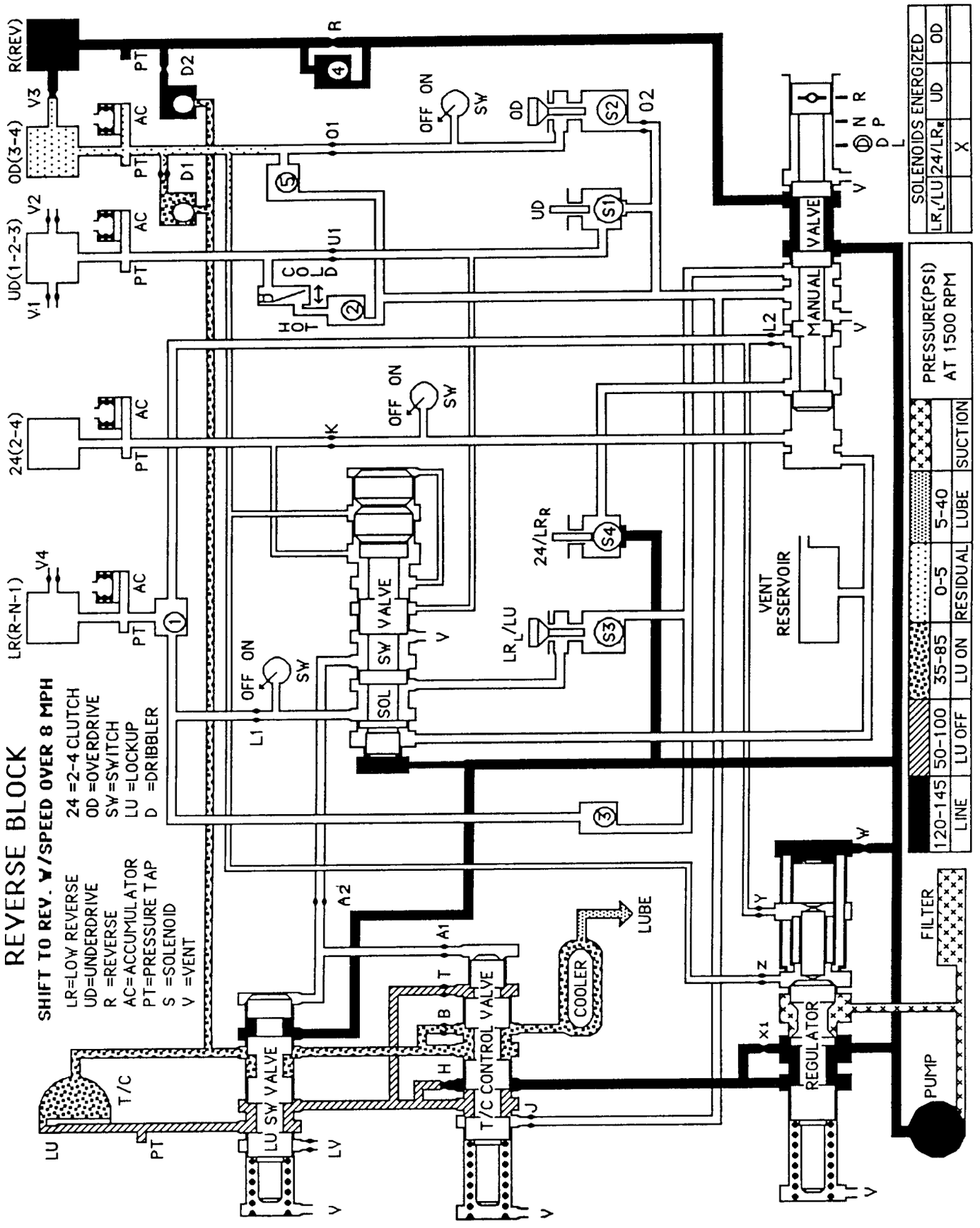
UD=UNDERDRIVE
R =REVERSE
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
24(2-4)
LR(R-N-1)
V1
V2
V3
V4
PT
AC
D1
D2
O1
O2
U1
K
L1
L2
A1
A2
OFF ON SW
OD
UD
MANUAL VALVE
VALVE SW SOL V
VENT RESERVOIR
LR_L/LU
24/LR_R
S1
S2
S3
S4
T/C
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
FILTER
PUMP
REGULATOR
SOLENOIDS ENERGIZED
LR_L/LU 24/LR_R UD OD
PRESSURE(PSI) AT 1500 RPM
175-235 LINE
50-100 LU OFF
35-85 LU ON
0-5 RESIDUAL
5-40 LUBE
SUCTION


REVERSE BLOCK
SHIFT TO REV. W/SPEED OVER 8 MPH
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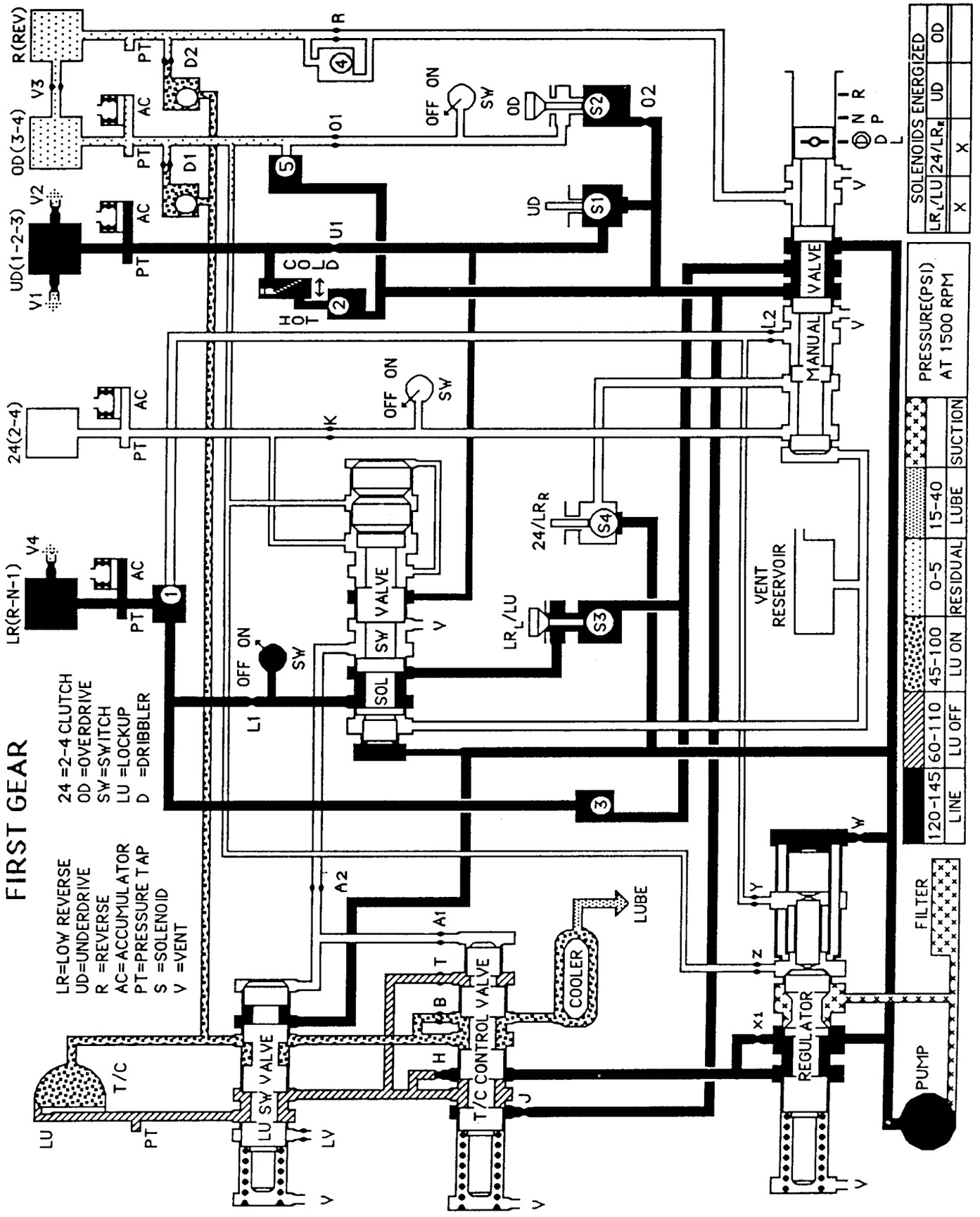
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
24(2-4)
LR(R-N-1)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON SW
VALVE SW SOL
V
T/C
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
FILTER
PUMP
REGULATOR
VENT RESERVOIR
MANUAL VALVE
OD
UD
24/LR
LR/LU
SOLENOIDS ENERGIZED
LR/LU 24/LR UD OD
X
PRESSURE(PSI) AT 1500 RPM
LINE 120-145
LU OFF 50-100
LU ON 35-85
RESIDUAL 0-5
LUBE 5-40
SUCTION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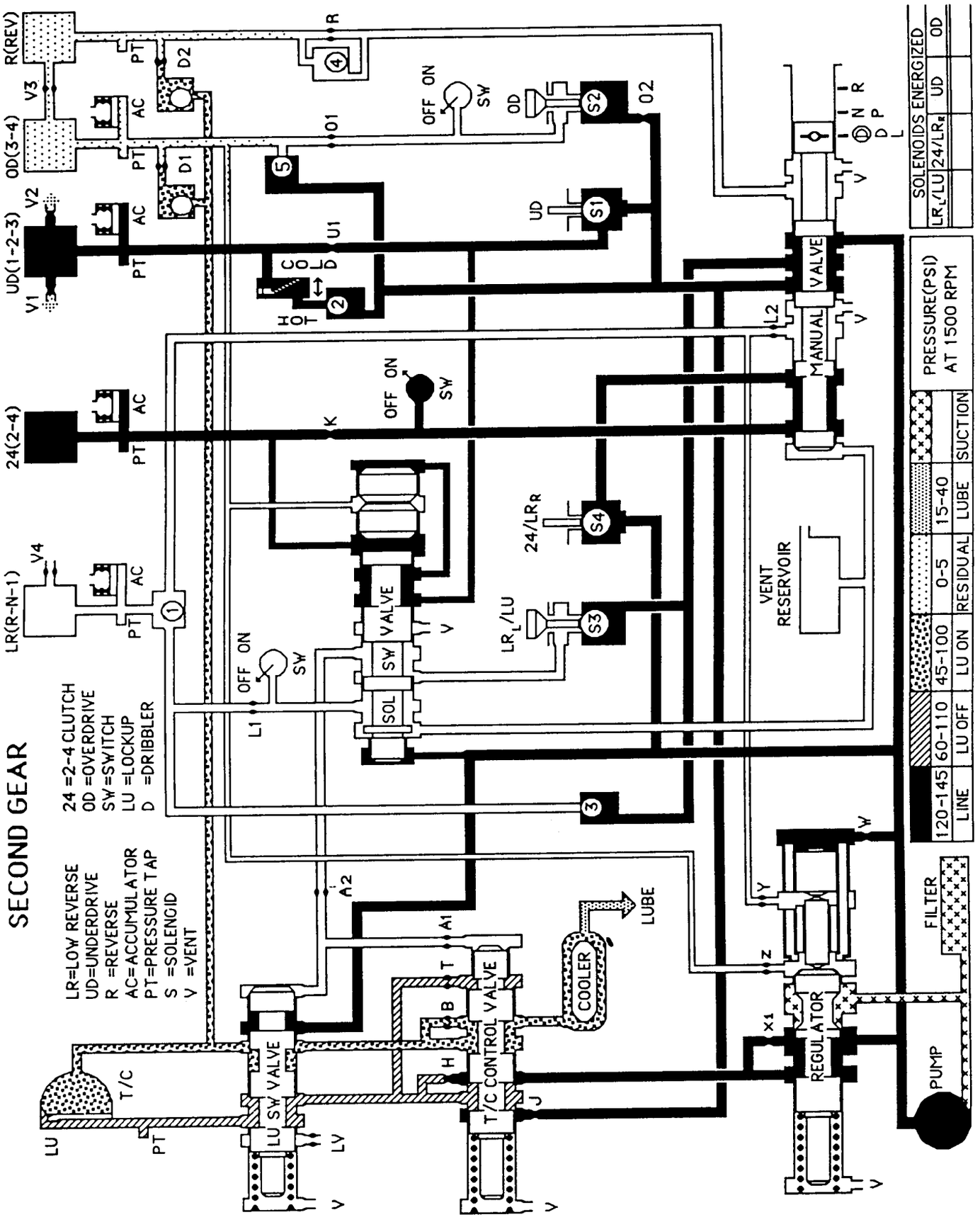
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
24(2-4)
LR(R-N-1)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON
SW
OD
UD
S1
S2
S3
S4
24/LR
LR/LU
VALVE
SOL
MANUAL
VENT
RESERVOIR
T/C
LU
LV
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
REGULATOR
PUMP
FILTER
SUCTION
SOLENOIDS ENERGIZED
PRESSURE(PSI) AT 1500 RPM
120-145
60-110
45-100
0-5
15-40
LINE
LU OFF
LU ON
RESIDUAL
LUBE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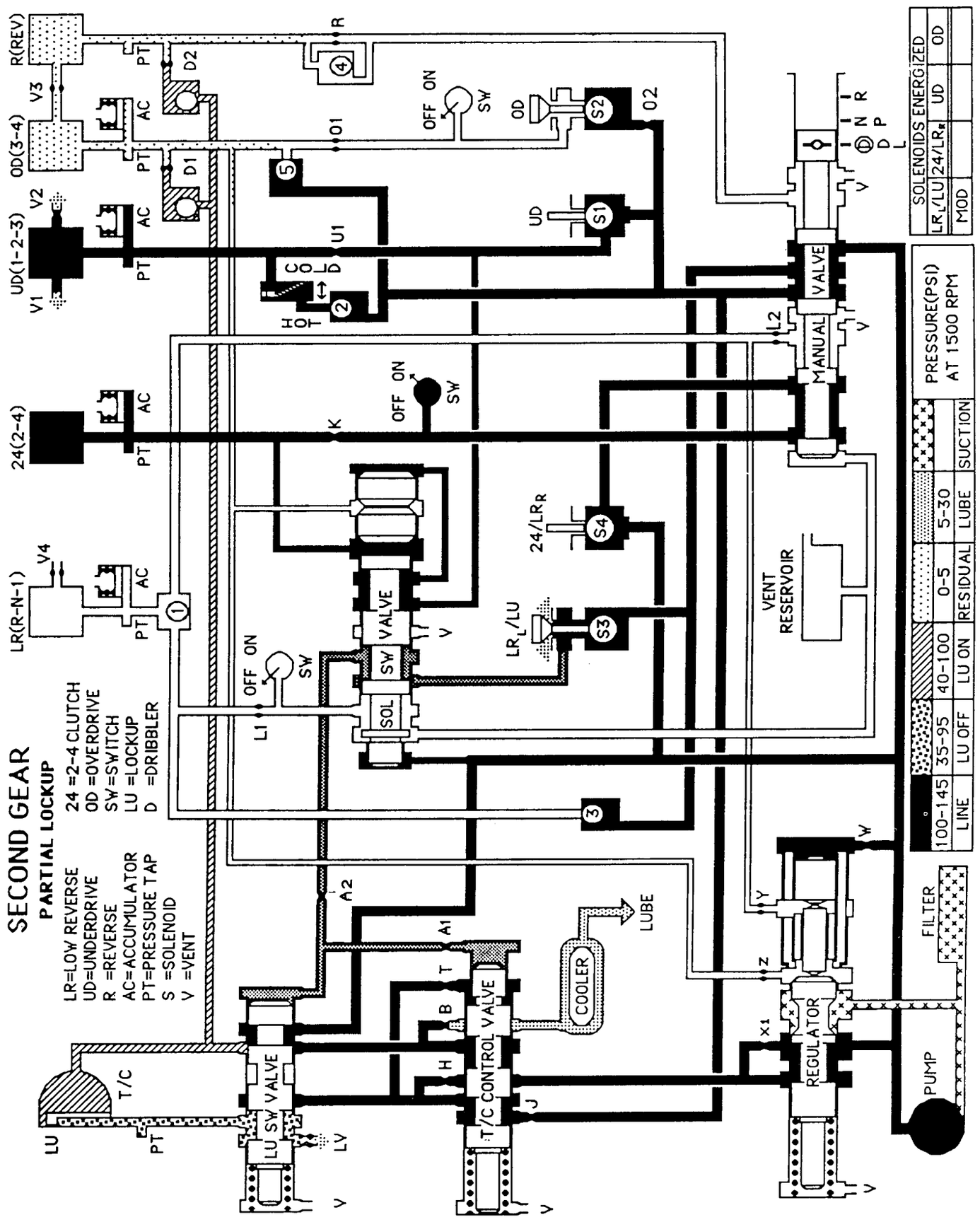
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON
SW
OD
UD
S1
S2
S3
S4
24/LR
LR/LU
VALVE
SOL
MANUAL
VENT
RESERVOIR
COOLER
LUBE
FILTER
PUMP
REGULATOR
T/C
CONTROL
LU SW
LU
LV
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
PRESSURE(PSI)
AT 1500 RPM
LINE
LU OFF
LU ON
RESIDUAL
LUBE
SUCTION
120-145
60-110
45-100
0-5
15-40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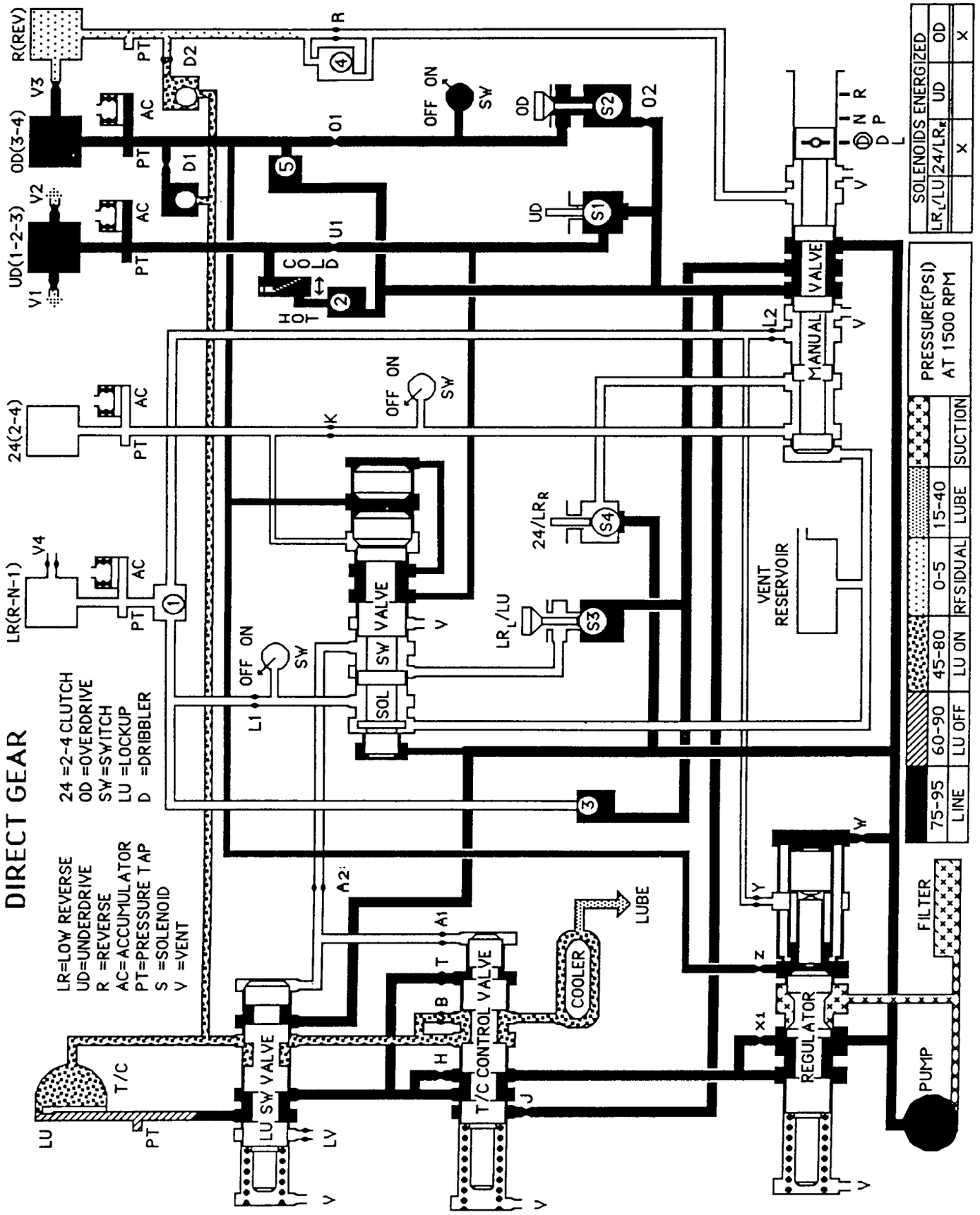
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON SW
HOT
COLD
VALVE
SOL
SW
MANUAL
VENT RESERVOIR
T/C
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
FILTER
REGULATOR
PUMP
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
MOD
PRESSURE(PSI) AT 1500 RPM
LINE
LU OFF
LU ON
RESIDUAL
LUBE
SUCTION
100-145
35-95
40-100
0-5
5-30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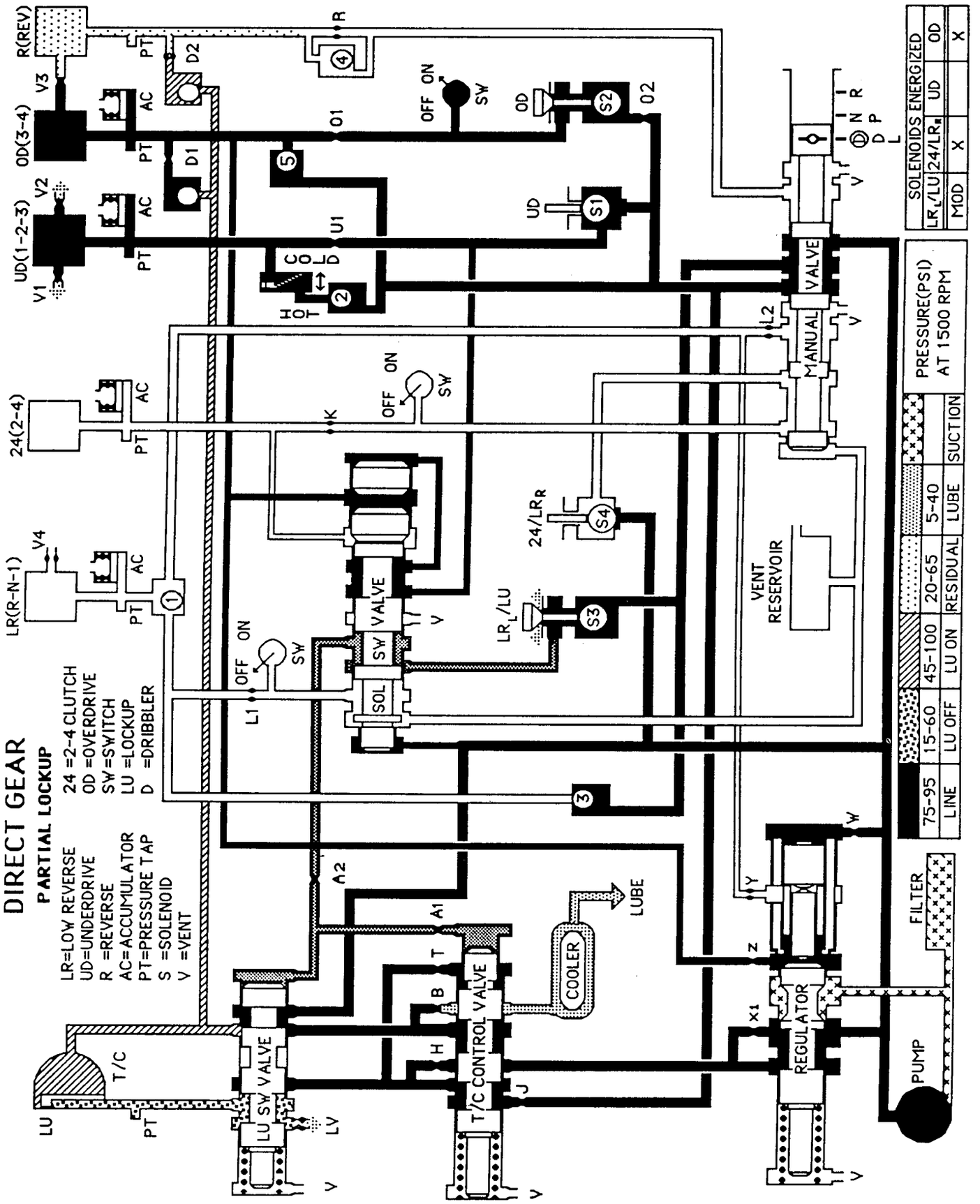
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
D1
D2
AC
PT
OFF ON SW
SOL
VALVE
MANUAL VALVE
VENT RESERVOIR
LR_L/LU
24/LR_R
T/C
LU SW VALVE
T/C CONTROL VALVE
COOLER
LUBE
REGULATOR
FILTER
PUMP
SOLENOIDS ENERGIZED
LR_L/LU | 24/LR_R | UD | OD
X | X
PRESSURE(PSI) AT 1500 RPM
75-95 LINE
60-90 LU OFF
45-80 LU ON
0-5 RFSIDUAL
15-40 LUBE
SUCTION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V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
24(2-4)
LR(R-N-1)
V1
V2
V3
V4
AC
PT
D1
D2
O1
O2
U1
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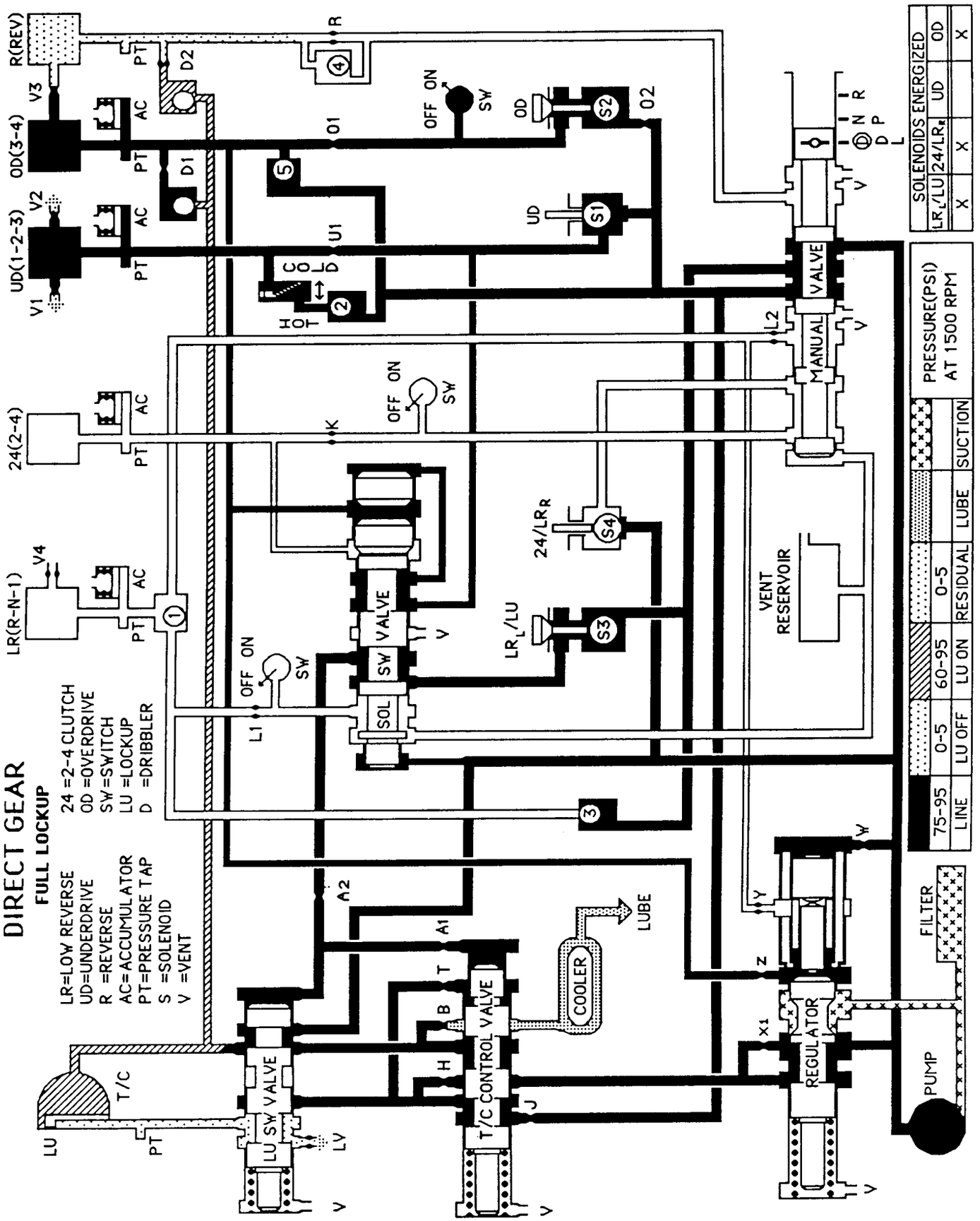
L1
L2
R
OFF ON SW
OD
UD
S1
S2
S3
S4
24/LR
LR/LU
COLD
HOT
VALVE
SOL
SW
MANUAL
VENT RESERVOIR
T/C
LU
LU SW VALVE
LV
T/C CONTROL VALVE
COOLER
LUBE
REGULATOR
PUMP
FILTER
A1
A2
B
H
J
T
X1
Y
Z
W
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
MOD
X
PRESSURE(PSI) AT 1500 RPM
LINE
75-95
15-60
LU OFF
45-100
LU ON
20-65
RESIDUAL
5-40
LUBE
SUCTION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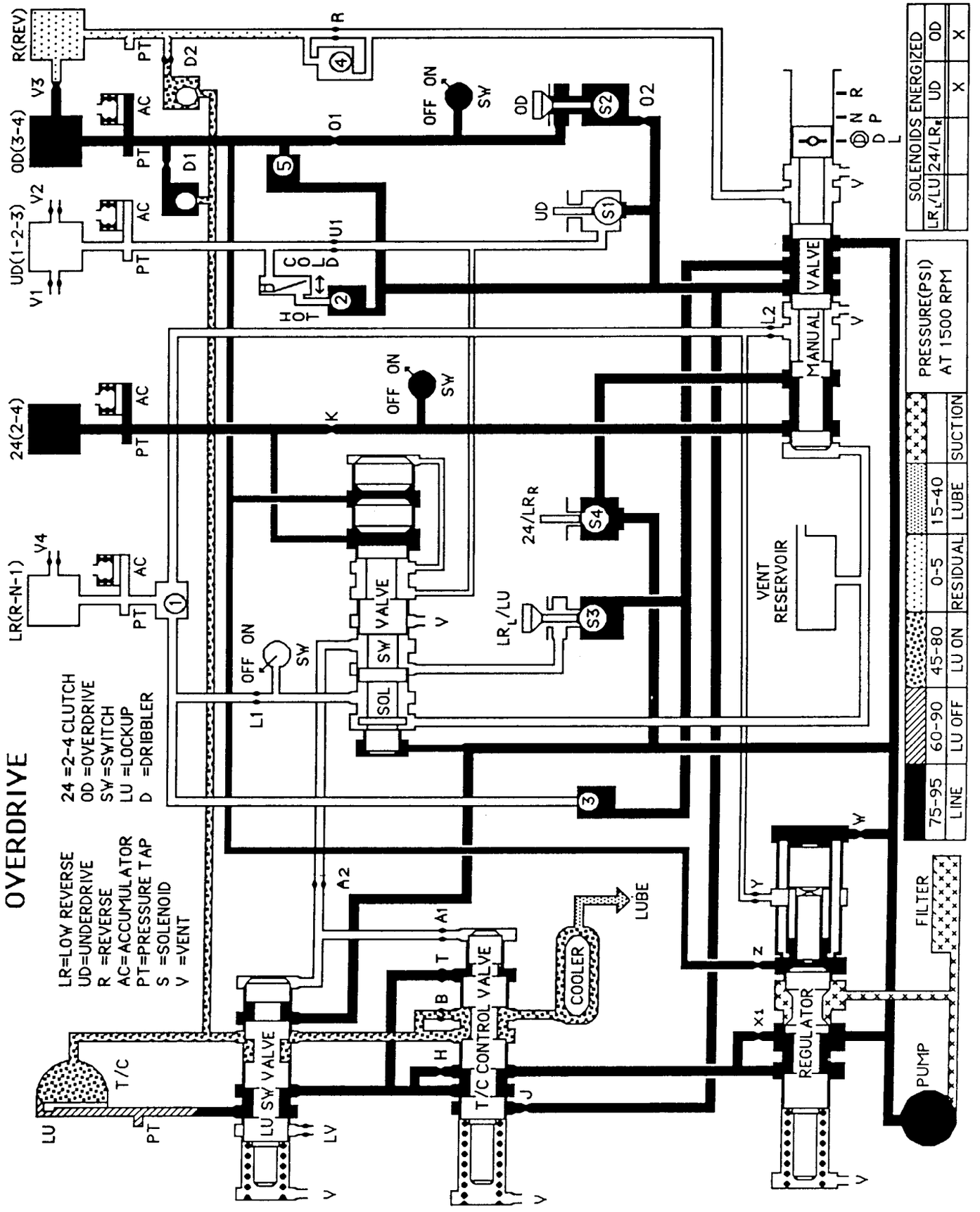
UD=UNDERDRIVE
R =REVERSE
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
D1
D2
AC
PT
OFF ON
SW
HOT
COLD
VALVE
SOL
MANUAL
VENT
RESERVOIR
COOLER
LUBE
FILTER
PUMP
REGULATOR
T/C
LU SW VALVE
T/C CONTROL VALVE
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
PRESSURE(PSI)
AT 1500 RPM
LINE
75-95
LU OFF
0-5
LU ON
60-95
RESIDUAL
0-5
LUBE
SUCTION
0-5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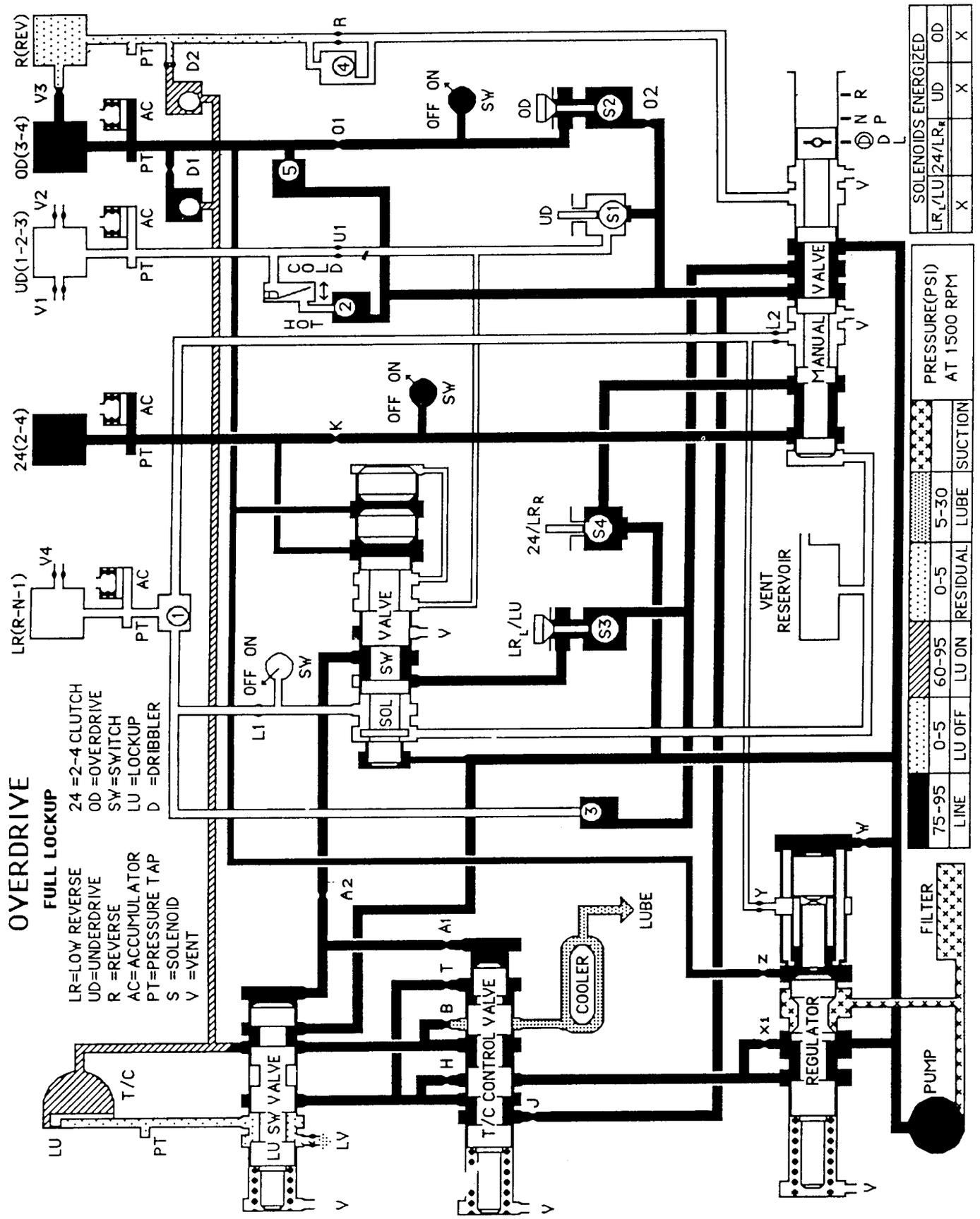
UD=UNDERDRIVE
R =REVERSE
AC=ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
24(2-4)
LR(R-N-1)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON SW
OD
UD
S1
S2
S3
S4
24/LR$_R$
LR$_L$/LU
VALVE
SW
SOL
MANUAL VALVE
VENT RESERVOIR
COOLER
LUBE
FILTER
PUMP
REGULATOR
T/C
T/C CONTROL VALVE
LU SW VALVE
SOLENOIDS ENERGIZED
LR$_L$/LU 24/LR$_R$ UD OD
PRESSURE(PSI) AT 1500 RPM
75-95 LINE
60-90 LU OFF
45-80 LU ON
0-5 RESIDUAL
15-40 LUBE
SUCTION


OVERDRIVE
FULL LOCKUP
LR=LOW REVERSE
UD=UNDERDRIVE
R =REVERSE
AC= ACCUMULATOR
PT=PRESSURE TAP
S =SOLENOID
V =VENT
24 =2-4 CLUTCH
OD =OVERDRIVE
SW=SWITCH
LU =LOCKUP
D =DRIBBLER
R(REV)
OD(3-4)
UD(1-2-3)
LR(R-N-1)
24(2-4)
V1
V2
V3
V4
AC
PT
D1
D2
OFF ON
SW
SOL
VALVE
MANUAL
REGULATOR
COOLER
LUBE
FILTER
PUMP
VENT
RESERVOIR
T/C
LU SW
T/C CONTROL
SOLENOIDS ENERGIZED
LR/LU
24/LR
UD
OD
PRESSURE(PSI)
AT 1500 RPM
LINE
LU OFF
LU ON
RESIDUAL
LUBE
SUCTION
75-95
60-95
5-30
0-5

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 converted 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 speeds exceeds the maximum limits shown, release the accelerator immediately since transaxle clutch slippage is indicated.

Stall Speed Above Specification

If stall speeds 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.

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 with the torque converter, operate the vehicle at light throttle in D and N on a hoist and listen under the transaxle bell housing.

CLUTCH AIR PRESSURE TESTS

Clutch Air Pressure Checks

Inoperative clutches can be located using a series of tests by substituting air pressure for fluid pressure (Figs. 2 and 3). The clutches may be tested by applying air pressure to their respective passages after the valve body has been removed and Tool 6056 has been installed. To make air pressure tests, proceed as follows:

The compressed air supply must be free of all dirt and moisture. Use a pressure of 30 PSI.

Remove oil pan and valve body. (See Valve body removal.)

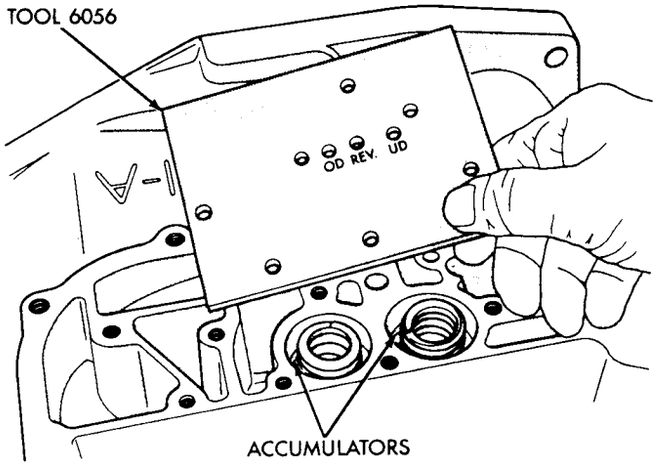


Fig. 2—Air Pressure Test Plate

Overdrive Clutch

Apply air pressure to the overdrive clutch apply passage and watch for the push/pull piston to move forward. The piston should return to its starting position when the air pressure is removed.

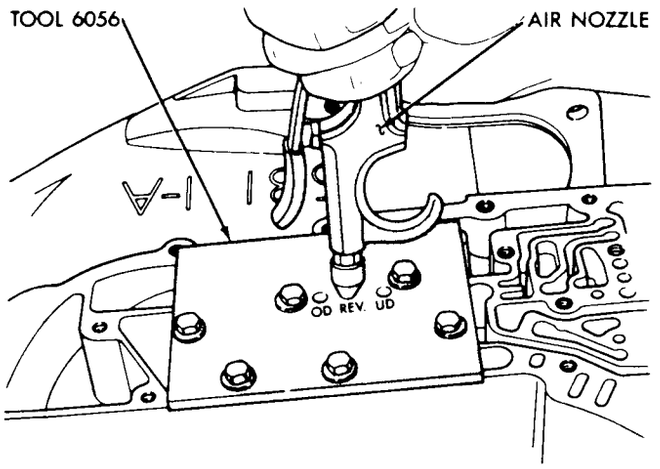


Fig. 3—Testing Reverse Clutch

Reverse Clutch

Apply air pressure to the reverse clutch apply passage and watch for the push/pull piston to move rearward. The piston should return to its starting position when the air pressure is removed.

2/4 Clutch

Apply air pressure to the feed hole located on the 2/4 clutch retainer. Look in the area where the 2/4 piston contacts the first separator plate and watch carefully for the 2/4 piston to move rearward. The piston should return to its original position after the air pressure is removed.

Low/Reverse Clutch

Apply air pressure to the low/reverse clutch feed hole (rear of case, between 2 bolt holes). Then, look in the area where the low/reverse piston contacts the first separator plate and watch carefully for the piston to move forward. The piston should return to its original position after the air pressure is removed.

Underdrive Clutch

Because this clutch piston can not be seen, its operation is checked by function. Air pressure is applied to the low/reverse and the 2/4 clutches. This locks the output shaft. Use a piece of rubber hose wrapped around the input shaft and a pair of clamp-on pliers to turn the input shaft. Next apply air pressure to the underdrive clutch. The input shaft should not rotate with hand torque. Release the air pressure and confirm that the input shaft will rotate.

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 manual shaft. 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.

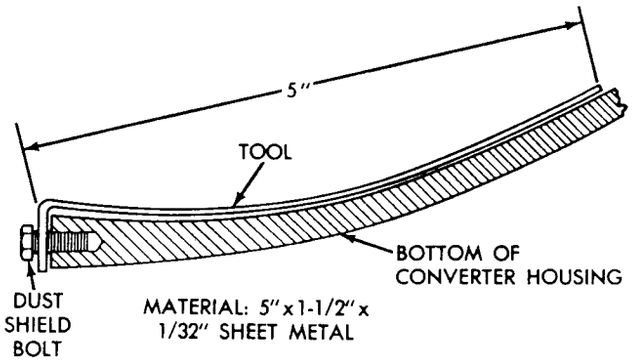


Fig. 4—Leak Locating Test Probe Tool

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. 4) securely to convenient dust shield bolt hole. Make 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 transaxle and torque converter assembly from vehicle for further investigation. The fluid should be drained from the transaxle. Reinstall oil pan (with RTV sealant) at specified torque.

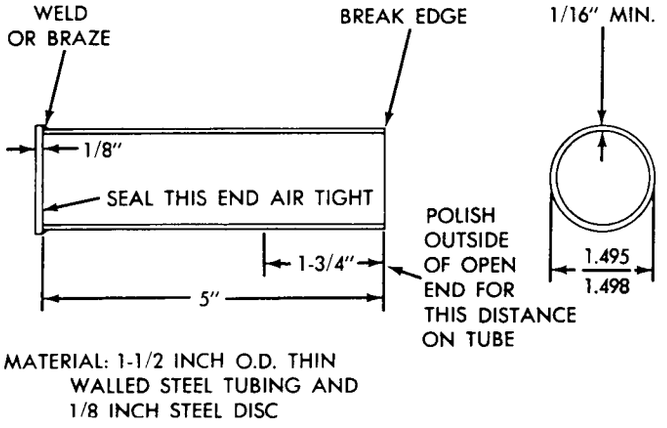


Fig. 5—Torque Converter Hub Seal Cup

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.

(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.

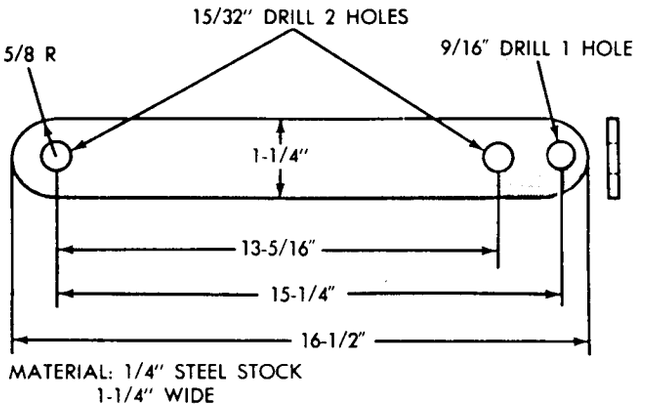


Fig. 6—Hub Seal Cup Retaining Strap

Air Pressure Test of Transaxle

Fabricate equipment needed for test as shown in figures 5 and 6.

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.

(2) With rotary motion, install converter hub seal cup over input shaft, and through the converter hub seal until the cup bottoms against the pump gear lugs. Secure with cup retainer strap (Fig. 6) using starter upper hole and opposite bracket hole.

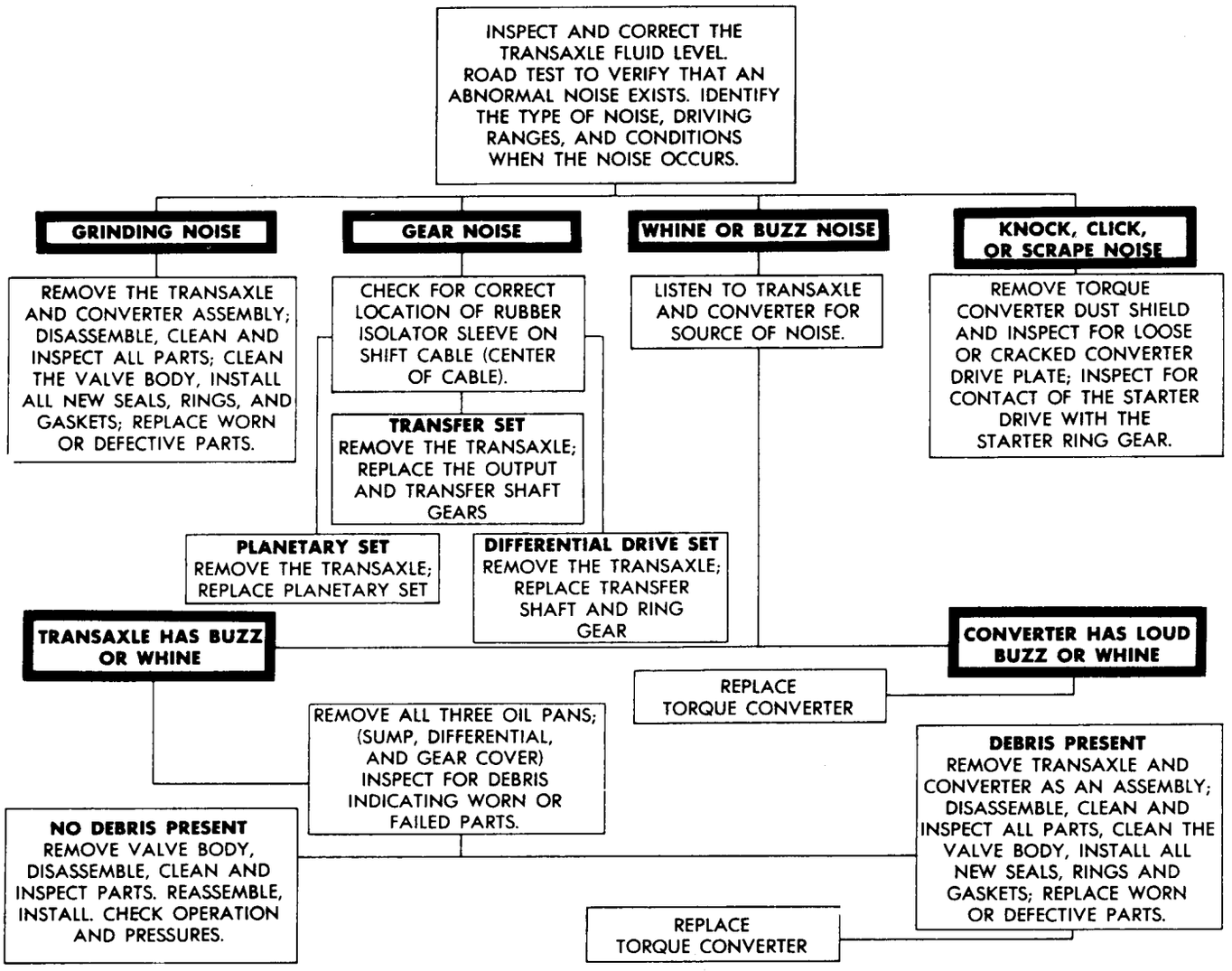
(3) Attach and clamp hose from nozzle of Tool C-4080 to the upper cooler line fitting position in case.

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 of 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

CHECK THE TRANSAXLE FLUID LEVEL BEFORE STARTING THE ENGINE. IF NO FLUID IS VISIBLE ON THE DIPSTICK, ADD FLUID TO THE "ADD" MARK BEFORE STARTING THE ENGINE. THEN START THE ENGINE WITH THE TRANSAXLE IN NEUTRAL AND LISTEN FOR NOISE.

ABNORMAL NOISE, STOP ENGINE IMMEDIATELY, REMOVE THE TRANSAXLE AND CONVERTER AS AN ASSEMBLY. DISASSEMBLE, CLEAN AND INSPECT ALL PARTS. CLEAN VALVE BODY; INSTALL ALL NEW SEALS, RINGS AND GASKETS; REPLACE WORN OR DEFECTIVE PARTS.

NO ABNORMAL NOISE, MOVE THE SELECTOR TO A FORWARD DRIVE RANGE AND OBSERVE THE FRONT WHEELS FOR TURNING

DRIVE SHAFTS TURN BUT FRONT WHEELS DO NOT TURN, INSPECT FOR BROKEN DRIVE SHAFT PARTS.

DRIVE SHAFTS DO NOT TURN REMOVE ALL THREE OIL PANS. INSPECT FOR DEBRIS AND IF AXLE SHAFTS ARE PROPERLY INSTALLED.

NO DEBRIS. REMOVE VALVE BODY. DISASSEMBLE, CLEAN AND INSPECT ALL PARTS. REASSEMBLE, INSTALL AND CHECK PRESSURES AND OPERATION.

DEBRIS IS PRESENT. REMOVE TRANSAXLE AND CONVERTER AS AN ASSEMBLY; DISASSEMBLE, CLEAN AND INSPECT ALL PARTS; CLEAN THE VALVE BODY. INSTALL ALL NEW SEALS, RINGS, AND GASKETS; REPLACE WORN OR DEFECTIVE PARTS.

REPLACE TORQUE CONVERTER FLUSH COOLER AND LINES

DIAGNOSIS GUIDE-FLUID LEAKS

VISUALLY INSPECT FOR SOURCE OF LEAK. IF THE SOURCE OF LEAK CANNOT BE READILY DETERMINED, CLEAN THE EXTERIOR OF THE TRANSAXLE. CHECK TRANSAXLE FLUID LEVEL. CORRECT IF NECESSARY.

THE FOLLOWING LEAKS MAY BE CORRECTED WITHOUT REMOVING THE TRANSAXLE:

MANUAL LEVER SHAFT OIL SEAL
PRESSURE GAUGE PLUGS
NEUTRAL START SWITCH
OIL PAN RTV
OIL COOLER FITTINGS
EXTENSION HOUSING TO CASE BOLTS
SPEEDOMETER ADAPTER "O" RING
FRONT BAND ADJUSTING SCREW
EXTENSION HOUSING AXLE SEAL
DIFFERENTIAL BEARING RETAINER AXLE SEAL
REAR END COVER RTV
DIFFERENTIAL COVER RTV
EXTENSION HOUSING "O" RING
DIFFERENTIAL BEARING RETAINER RTV

THE FOLLOWING LEAKS REQUIRE REMOVAL OF THE TRANSAXLE AND TORQUE CONVERTER FOR CORRECTION.

TRANSAXLE FLUID LEAKING FROM THE LOWER EDGE OF THE CONVERTER HOUSING; CAUSED BY FRONT PUMP SEAL, PUMP TO CASE SEAL, OR TORQUE CONVERTER WELD.

CRACKED OR POROUS TRANSAXLE CASE.

DIAGNOSIS CHART "B"

POSSIBLE CAUSE	HARSH ENGAGEMENT FROM NEUTRAL TO D	HARSH ENGAGEMENT FROM NEUTRAL TO R	DELAYED ENGAGEMENT FROM NEUTRAL TO D	DELAYED ENGAGEMENT FROM NEUTRAL TO R	POOR SHIFT QUALITY	SHIFTS ERRATIC	DRIVES IN NEUTRAL	DRAGS OR LOCKS	GRATING, SCRAPING, GROWLING NOISE	KNOCKING, NOISE	BUZZING NOISE	BUZZING NOISE DURING SHIFTS ONLY	HARD TO FILL, OIL BLOWS OUT FILLER TUBE	TRANSAXLE OVERHEATS	HARSH UPSHIFT	NO UPSHIFT INTO OVERDRIVE	NO LOCKUP	HARSH DOWNSHIFTS	HIGH SHIFT EFFORTS	HARSH LOCKUP SHIFT
Engine Performance	X	X				X									X			X		
Worn or faulty clutch(es)	X	X	X	X		X	X	X							X	X		X		
—Underdrive clutch	X		X			X	X	X										X		
—Overdrive clutch						X	X	X							X	X				
—Reverse clutch		X		X			X	X												
—2/4 clutch						X		X							X			X		
—Low/reverse clutch	X	X				X		X										X		
Clutch(es) dragging							X													
Insufficient clutch plate clearance							X							X						
Damaged clutch seals			X	X														X		
Worn or damaged accumulator seal ring(s)	X	X	X	X														X		
Faulty cooling system														X						
Engine coolant temp. too low																X	X			
Incorrect gearshift control linkage adjustment			X	X		X	X							X						
Shift linkage damaged																			X	
Chipped or damaged gear teeth								X	X											
Planetary gearsets broken or seized								X	X											
Bearings worn or damaged								X	X											
Driveshaft(s) bushing(s) worn or damaged									X											
Worn or broken reaction shaft support seal rings			X	X	X	X												X		
Worn or damaged input shaft seal rings			X	X													X			
Valve body malfunction or leakage	X	X	X	X	X	X	X				X						X	X	X	
Hydraulic pressures too low			X	X	X	X								X	X		X			
Hydraulic pressures too high	X	X													X			X		
Faulty oil pump			X	X		X								X			X			
Oil filter clogged			X	X	X	X							X							
Low fluid level			X	X	X	X					X			X			X	X		
High fluid level													X	X						
Aerated fluid			X	X	X	X					X		X	X			X	X		
Engine idle speed too low			X	X																
Engine idle speed too high	X	X												X				X		
Normal solenoid operation												X								
Solenoid sound cover loose												X								
Sticking lockup piston																				X

MAINTENANCE AND ADJUSTMENTS

LUBRICATION

Inspect fluid level on indicator 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 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 oil pan) should be cleaned with a clean, dry cloth 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, or DEXRON II, should be used. A 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.

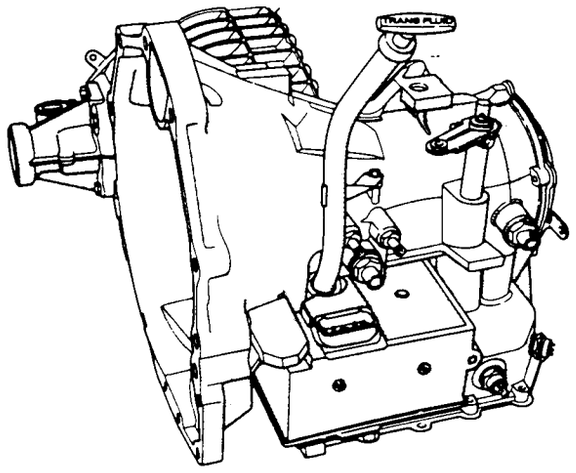


Fig. 1—Oil Level Indicator Location

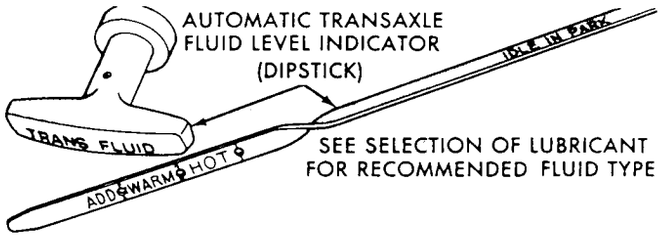


Fig. 2—Oil Level Indicator

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

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 O-ring on bottom of the valve body.

(4) Clean the oil pan and magnet. Reinstall pan using new RTV 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, or DEXRON II, through the fill tube.

(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 seated into the dipstick fill tube.

GEARSHIFT LINKAGE ADJUSTMENT

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.
CAUTION: Set parking brake.
(1) Place gearshift lever in "P" (PARK) position.
(2) Loosen clamp bolt on gearshift cable bracket.
(3) Column shift: Insure that preload adjustment spring engages fork on transaxle bracket.
(4) Pull the shift lever by hand all the way to the front detent position (PARK) and tighten lock screw to 11 N·m (100 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.

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, solenoid assembly, PRNDL Switch, Neutral/Safety switch, 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.).

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.

Teardown and Assembly

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 REMOVAL AND INSTALLATION

Removal (See A-413 Automatic Transaxle)
Installation (See A-413 Automatic Transaxle)

A-604 TRANSAXLE IDENTIFICATION

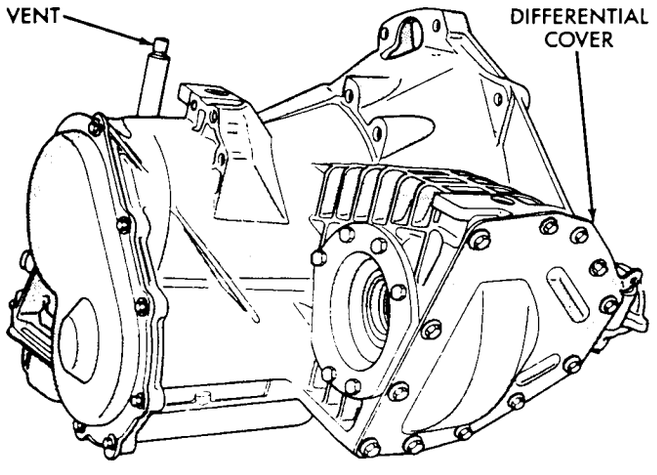


Fig. 1—Transaxle Right Side

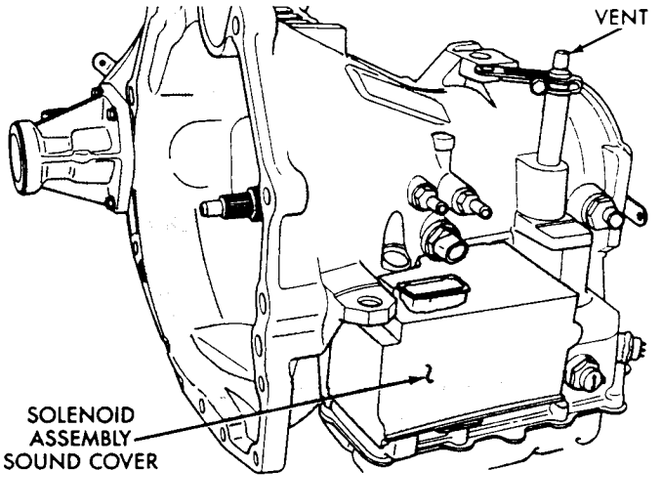


Fig. 2—Transaxle Left Side

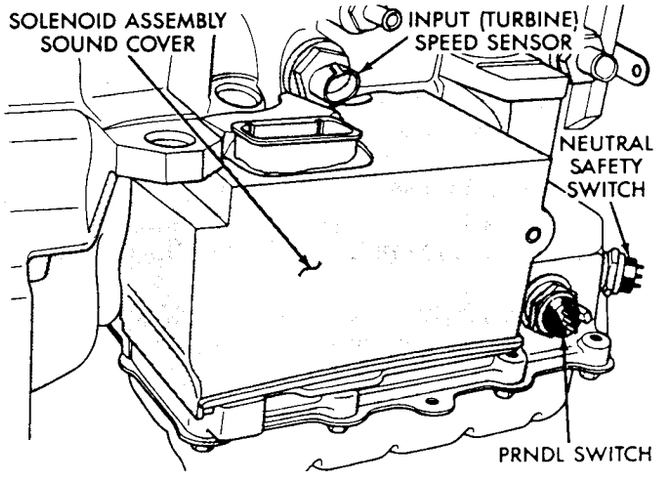


Fig. 3—Sound Cover Installed

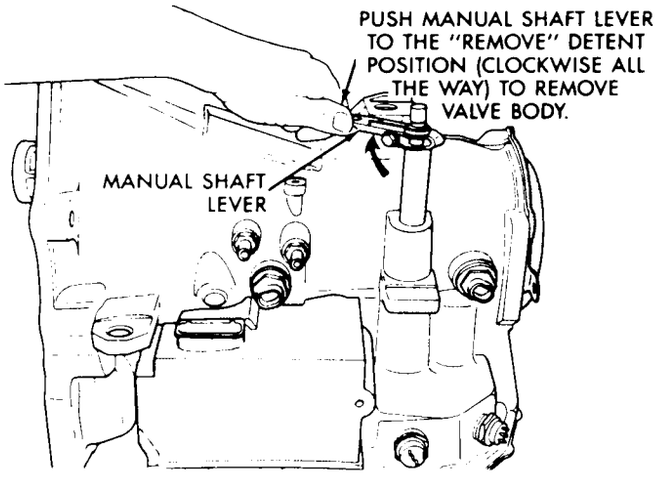


Fig. 4—Position Manual Valve

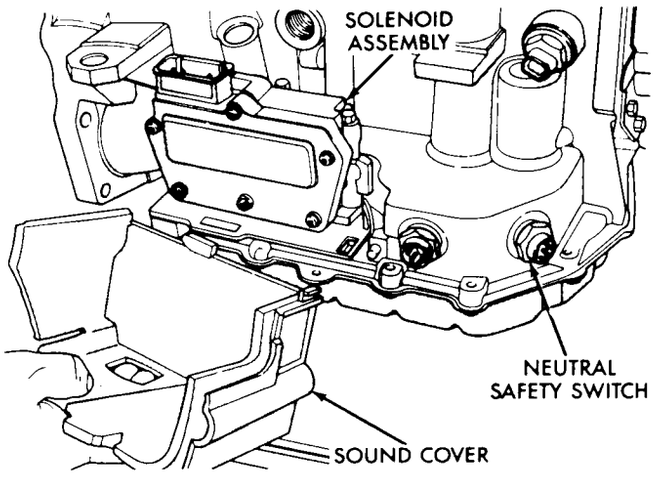


Fig. 3—Sound Cover

SOLENOID ASSEMBLY-REPLACE

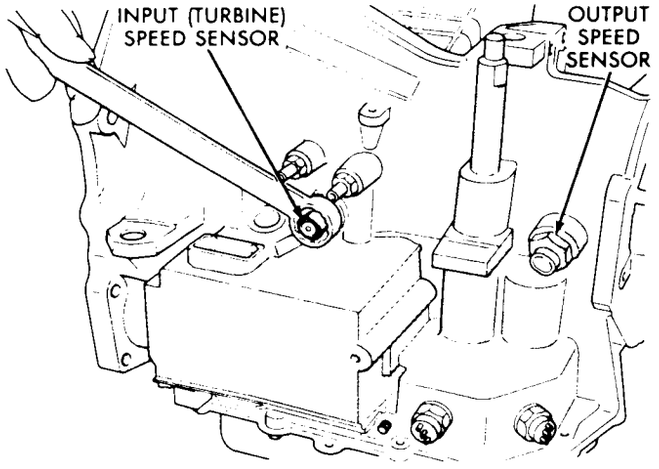


Fig. 1—Input Speed Sensor

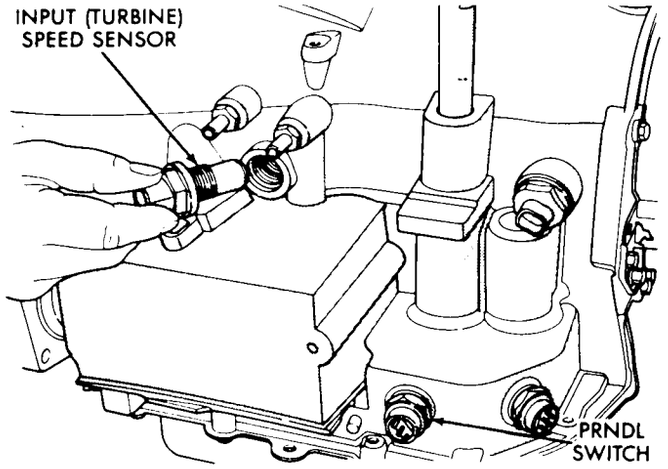


Fig. 2—Input Speed Sensor—Removed

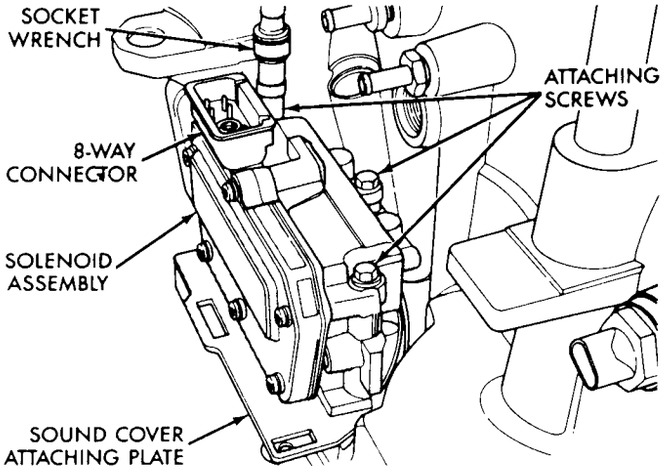


Fig. 4—Attaching Screws

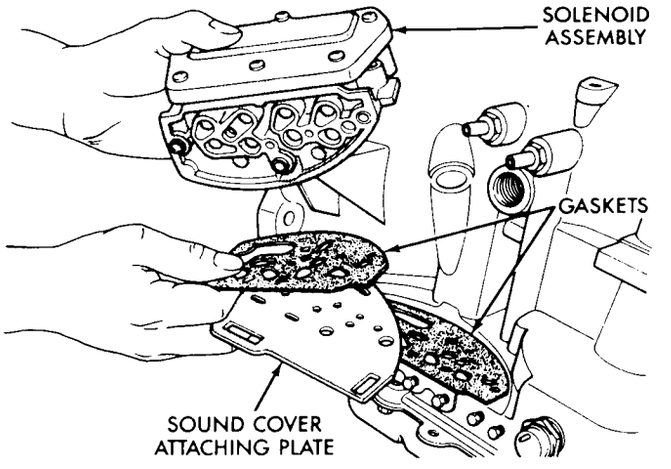


Fig. 5—Solenoid Assembly

PRNDL SWITCH

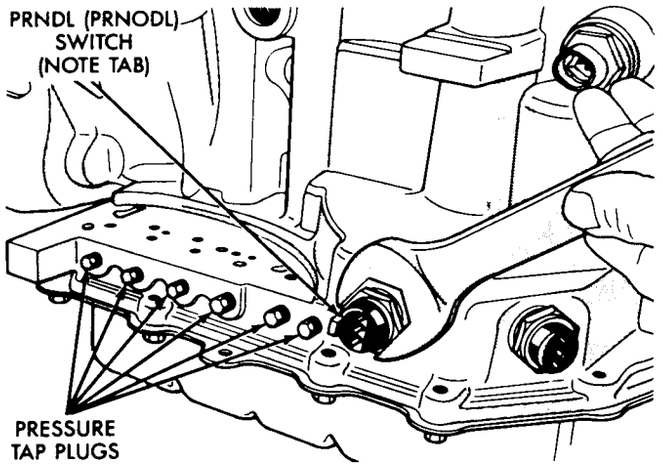


Fig. 1—PRNDL Switch

OUTPUT SPEED SENSOR

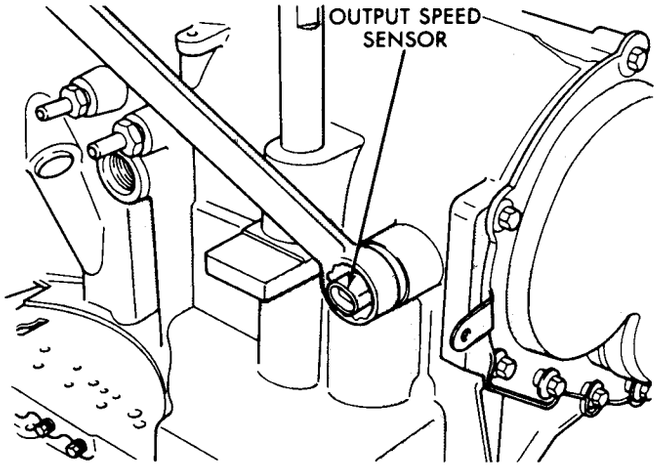


Fig. 1—Output Speed Sensor

NEUTRAL SAFETY SWITCH

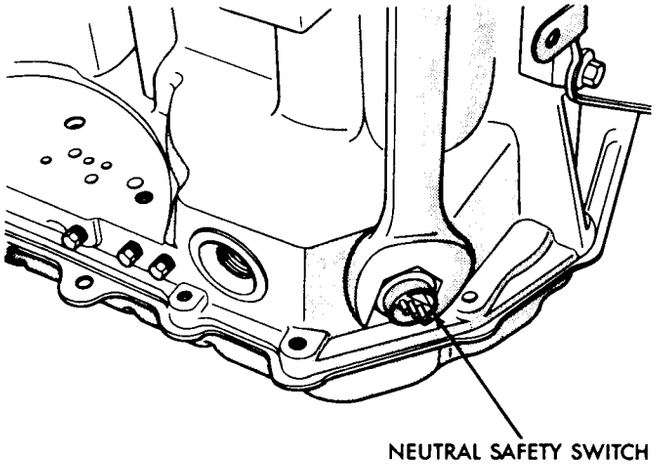
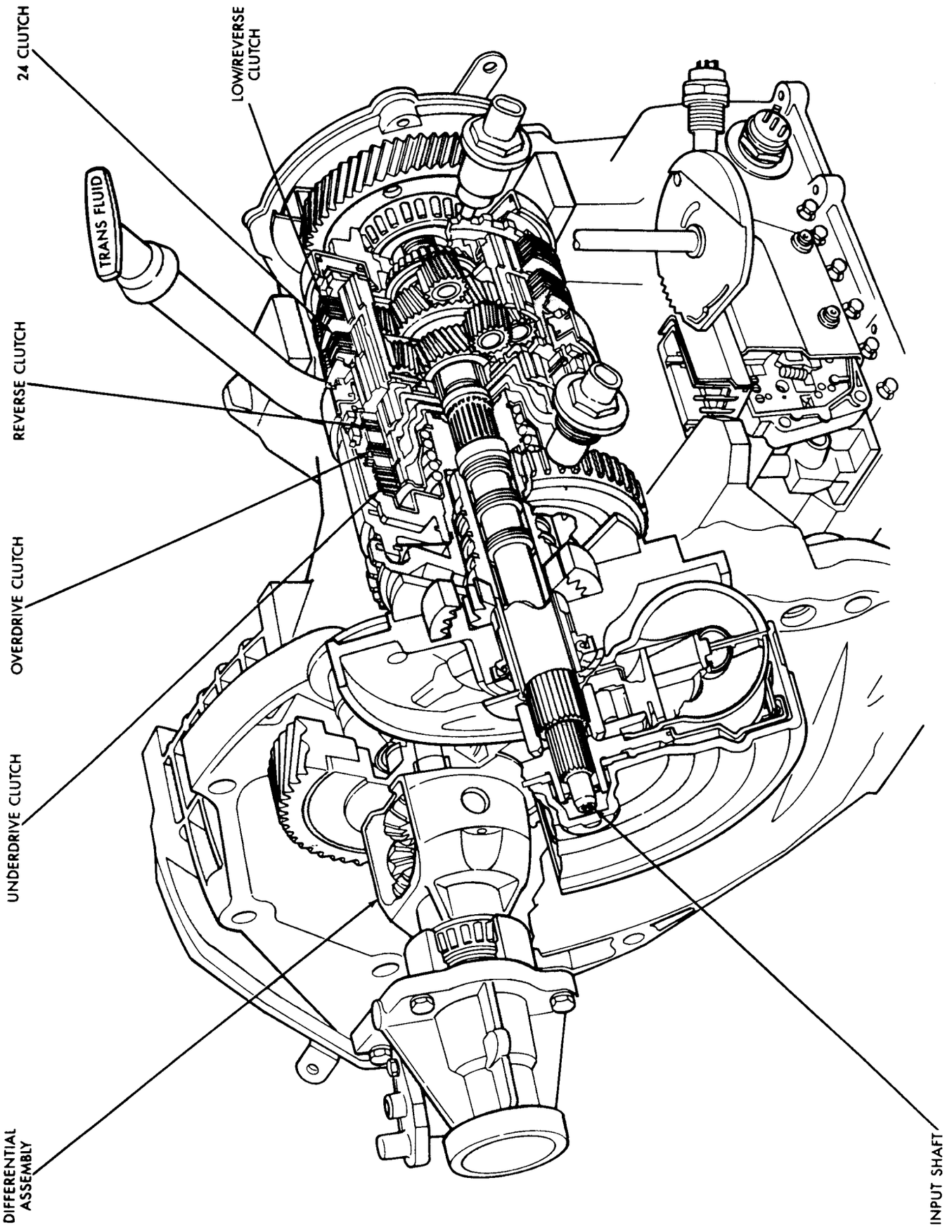


Fig. 1—Neutral Safety Switch


24 CLUTCH
LOW/REVERSE CLUTCH
TRANS FLUID
REVERSE CLUTCH
OVERDRIVE CLUTCH
UNDERDRIVE CLUTCH
DIFFERENTIAL ASSEMBLY
INPUT SHAFT

VALVE BODY

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.

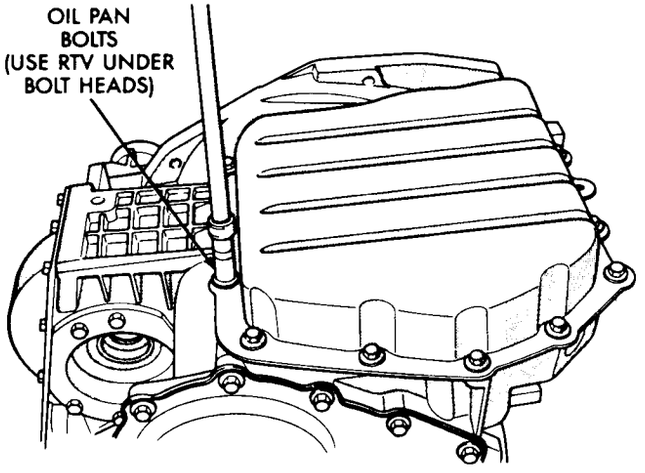


Fig. 1—Oil Pan Bolts

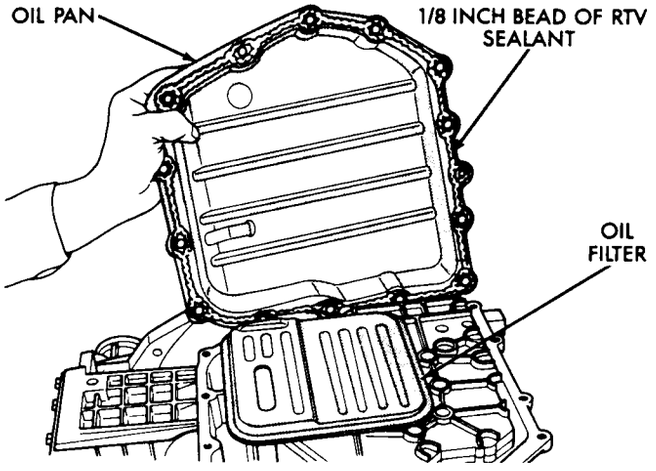


Fig. 2—Oil Pan

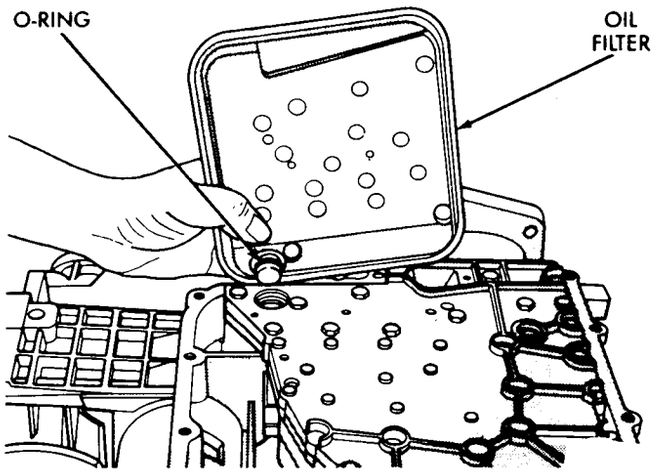


Fig. 3—Oil Filter

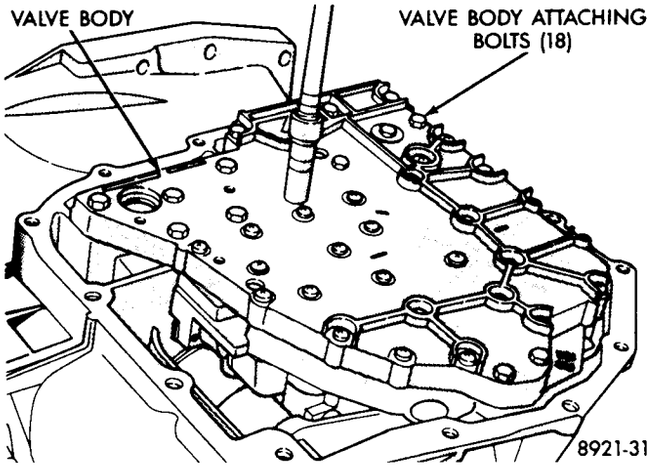


Fig. 4—Valve Body Attaching Bolts

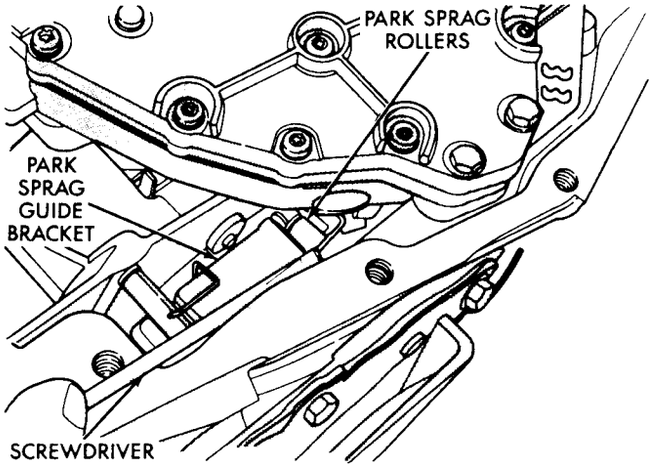


Fig. 5—Push Park Rod Rollers from Guide Bracket

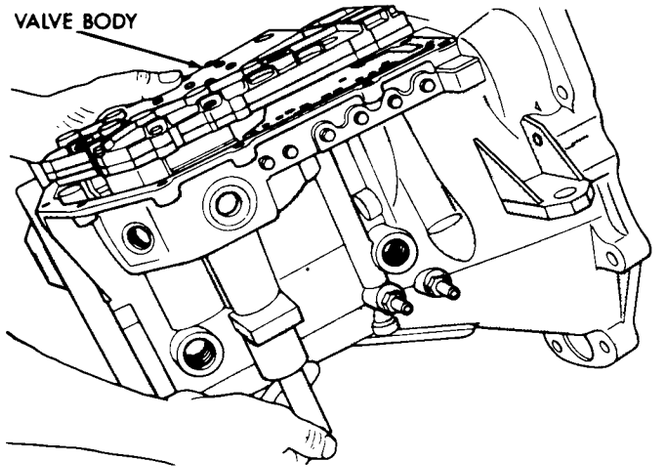


Fig. 6—Remove or Install Valve Body

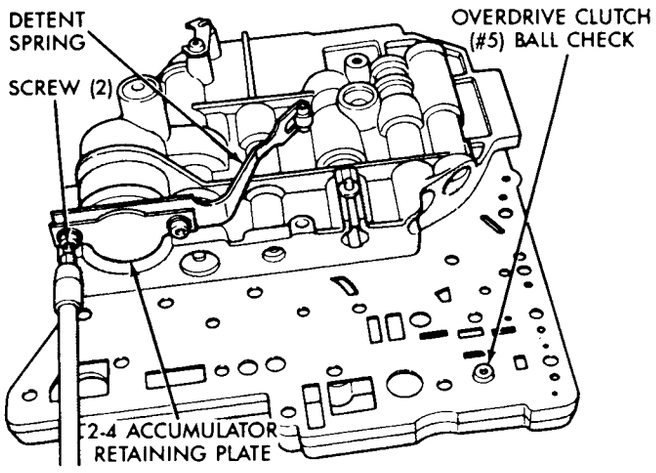


Fig. 9—Retaining Plate Screw

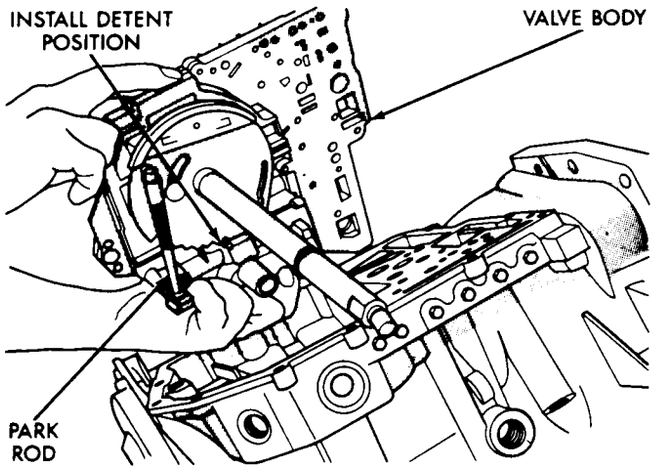


Fig. 7—Valve Body Removed

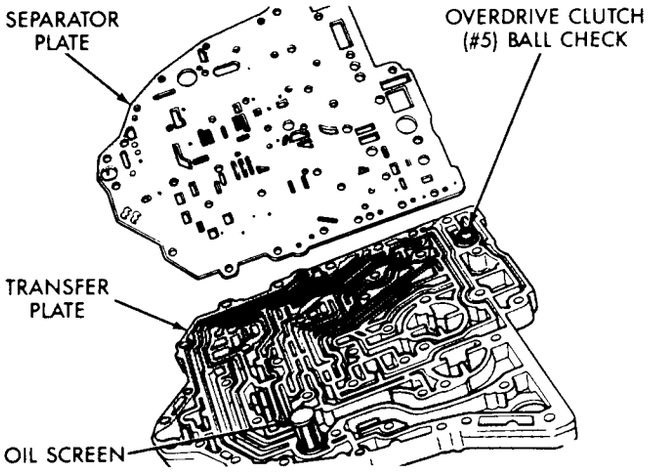


Fig. 10—Transfer Plate and Separator Plate

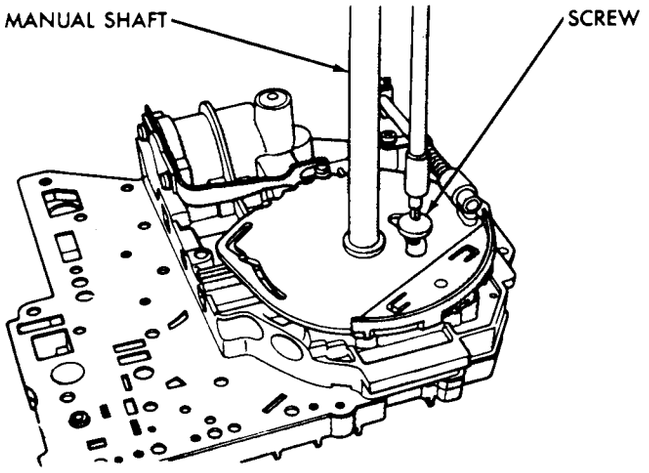


Fig. 8—Manual Shaft Screw

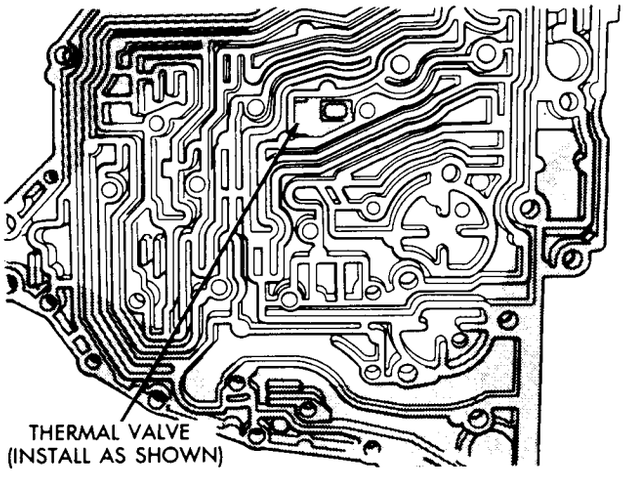


Fig. 11—Transfer Plate

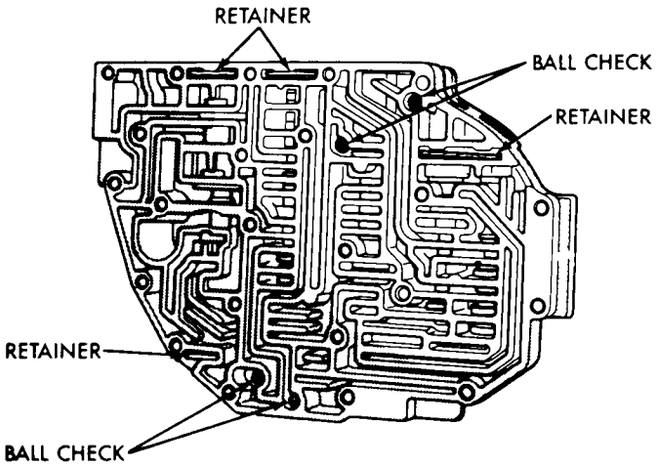


Fig. 12—Ball Check and Retainer Locations

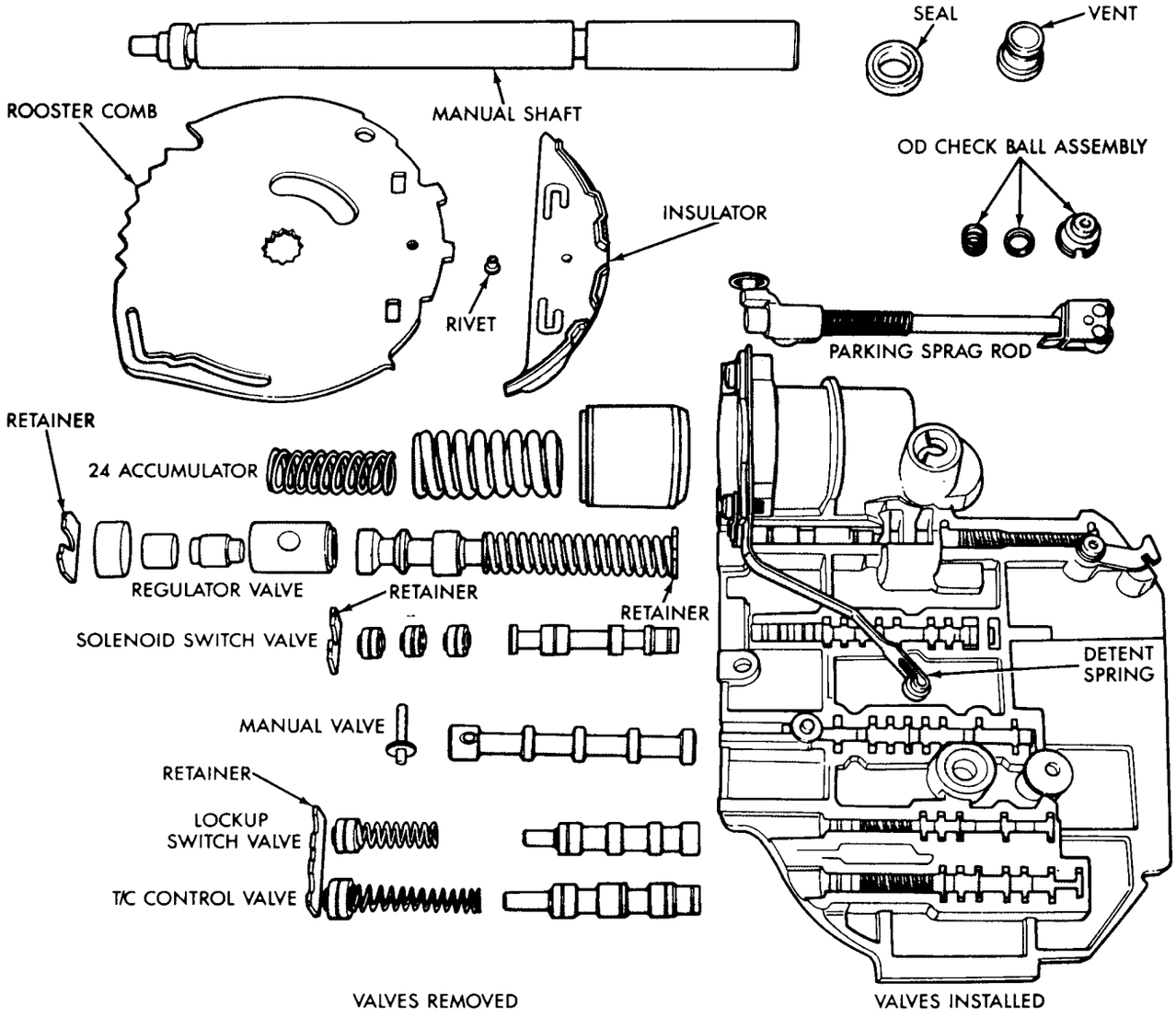


Fig. 13—Springs and Valves Identification

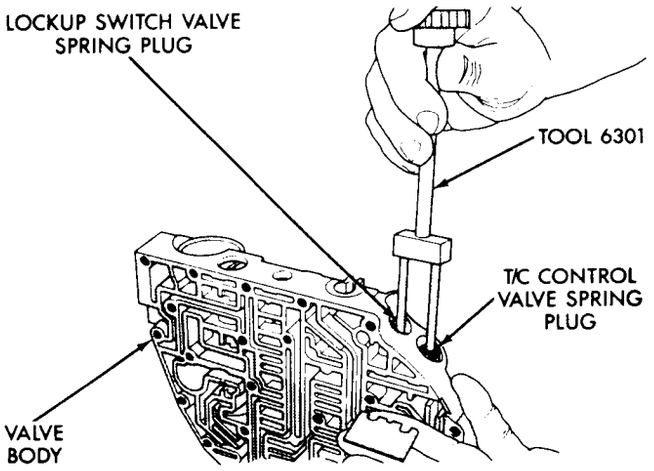


Fig. 14—Remove or Install Dual Retainer Plate

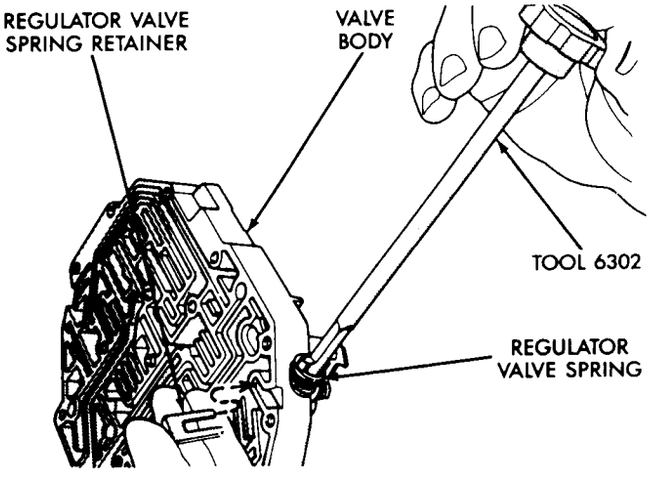


Fig. 15—Remove or Install Retainer Plate

When installing valve body assembly onto transaxle, observe Figure 5 and guide park rod rollers into guide bracket, while shifting manual lever assembly out of the installation position.

ACCUMULATORS

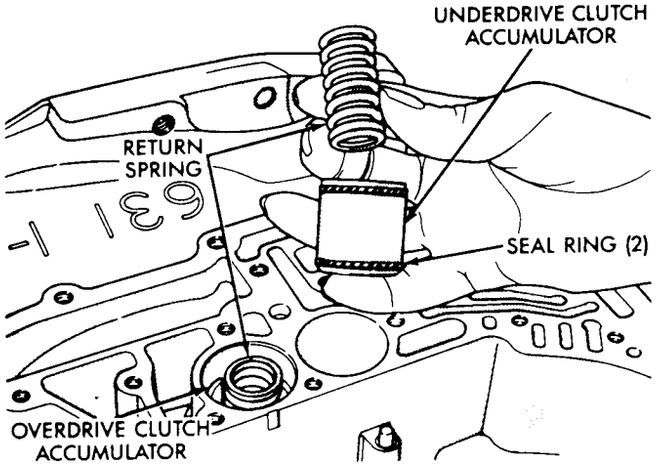


Fig. 1—Accumulators

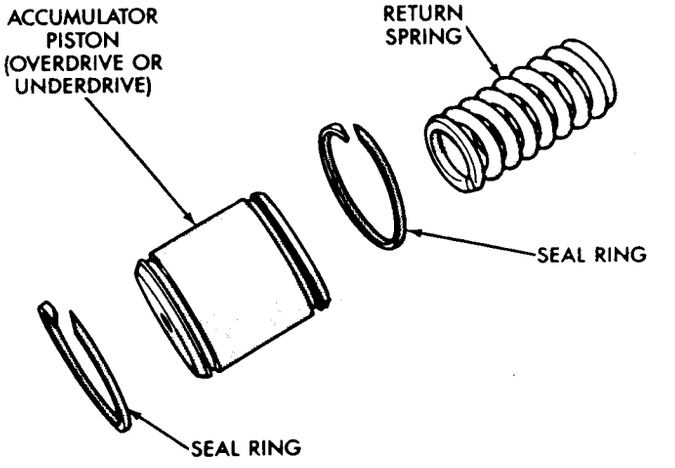


Fig. 2—Accumulator

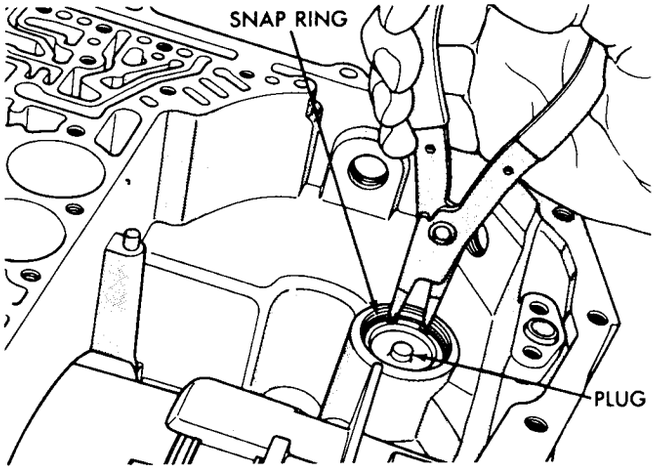


Fig. 3—Low/Reverse Accumulator Snap Ring

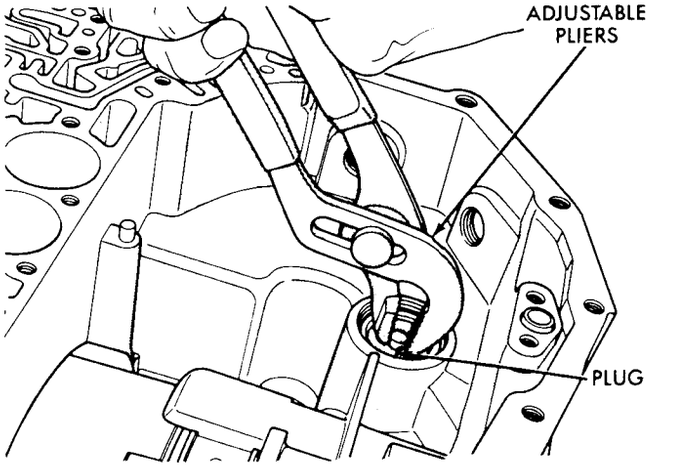


Fig. 4—Low/Reverse Accumulator Plug

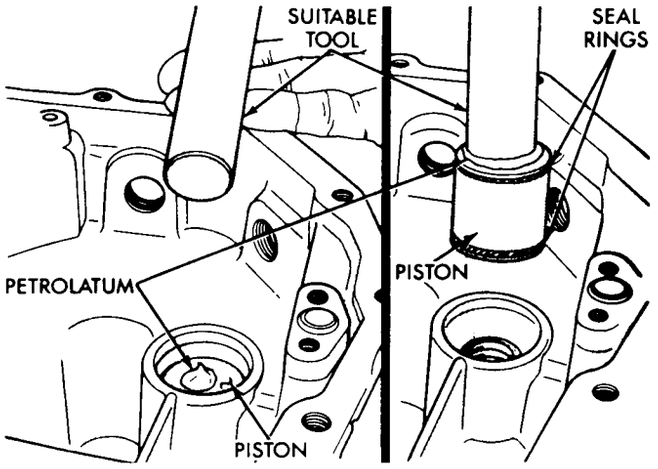


Fig. 5—Low/Reverse Accumulator Piston

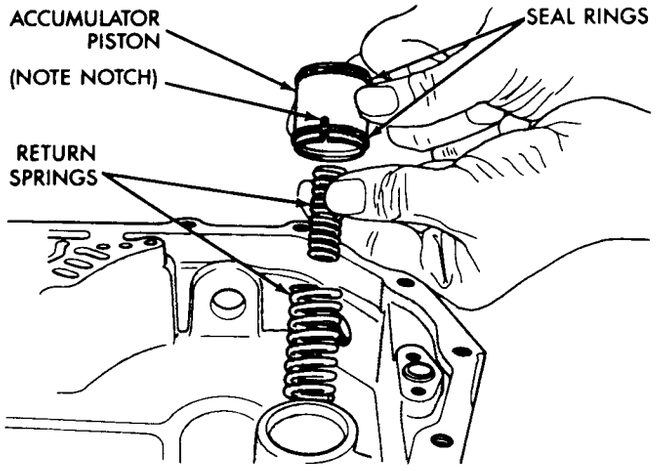


Fig. 6—Low/Reverse Accumulator

OIL PUMP SEAL REPLACE

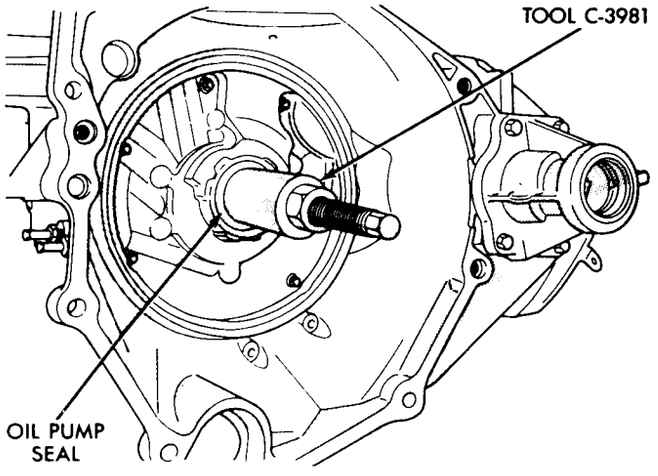


Fig. 1—Remove Oil Pump Seal

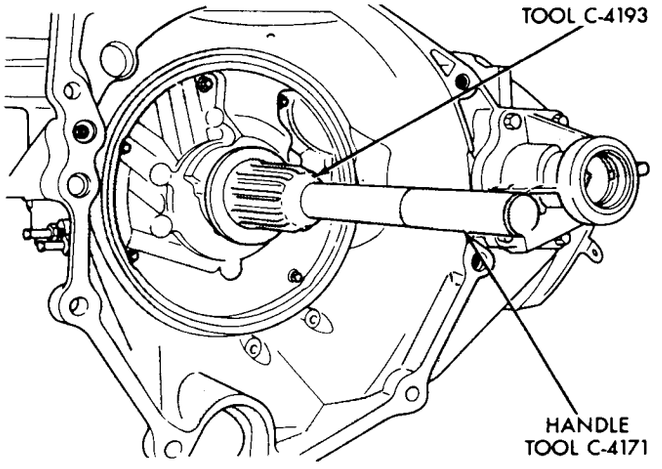


Fig. 2—Install Oil Pump Seal

TRANSAXLE RECONDITION

Input Shaft End Play

Measuring input shaft end play before disassembly will usually indicate when a #4 thrust plate change is required, (except when major parts are replaced). The thrust washer is located behind the input shaft.

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

Move input shaft in and out to obtain end play reading. End play specifications are .31 to .76 mm (.012 to .030 inch).

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

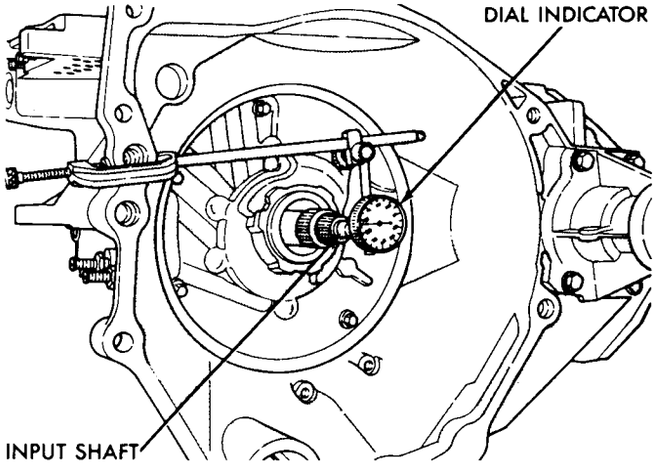


Fig. 1—Measure Input Shaft End Play

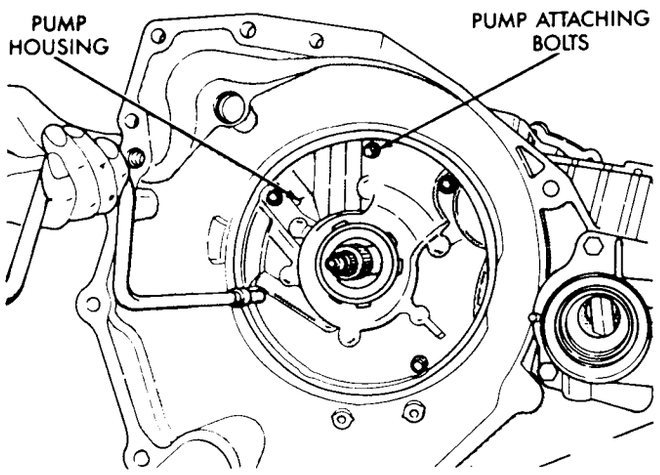


Fig. 2—Pump Attaching Bolts

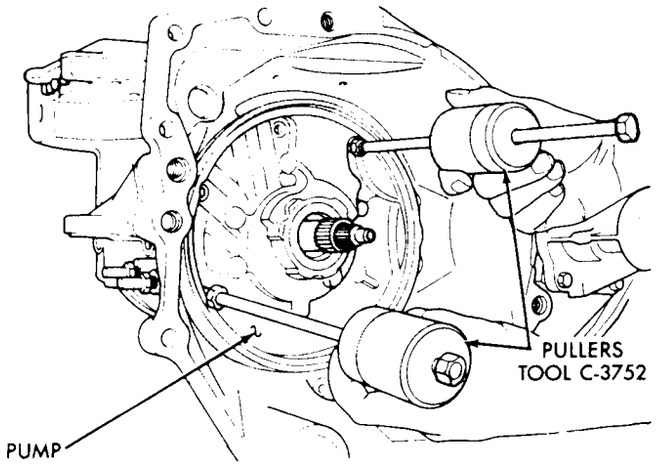


Fig. 3—Install Tool C-3752

CAUTION: Be sure input speed sensor is removed before removing oil pump.

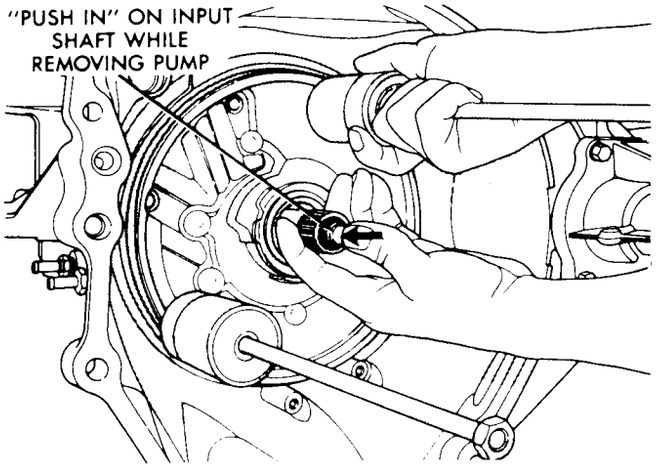


Fig. 4—Remove Oil Pump

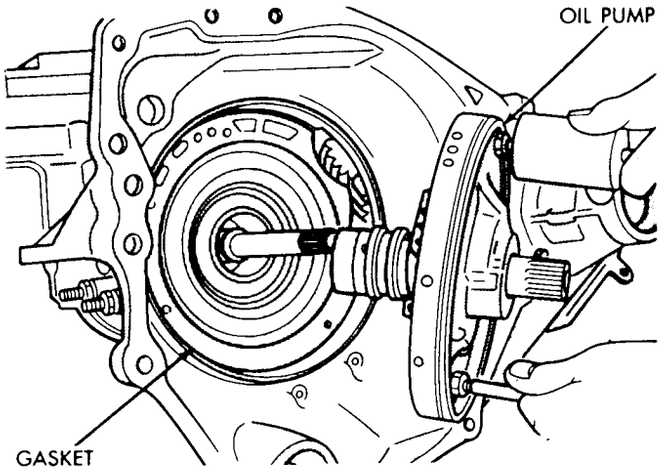


Fig. 5—Oil Pump Removed

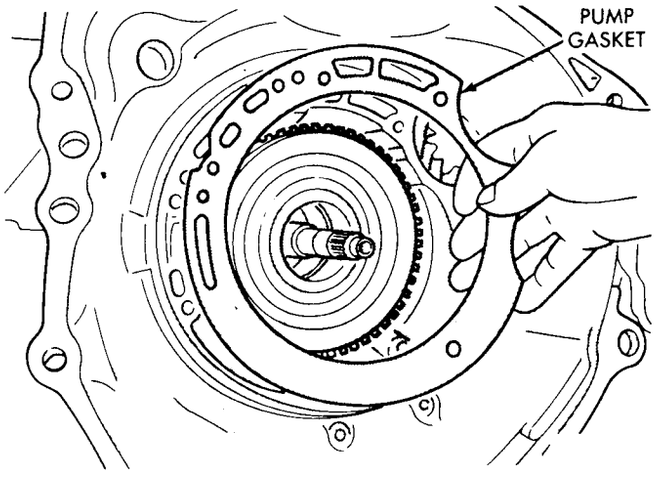


Fig. 6—Oil Pump Gasket

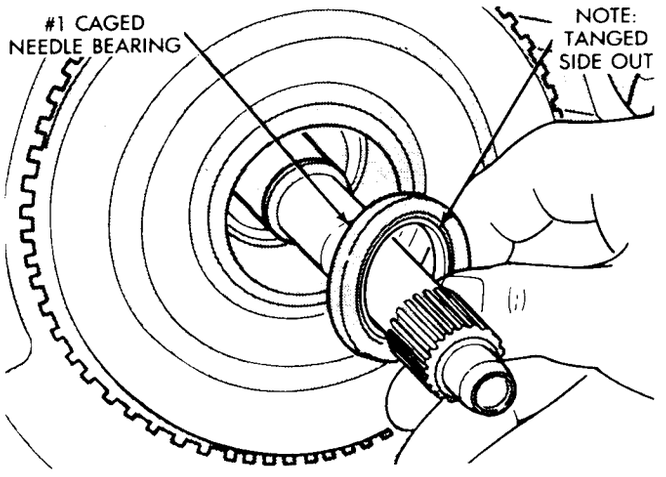


Fig. 7—#1 Caged Needle Bearing

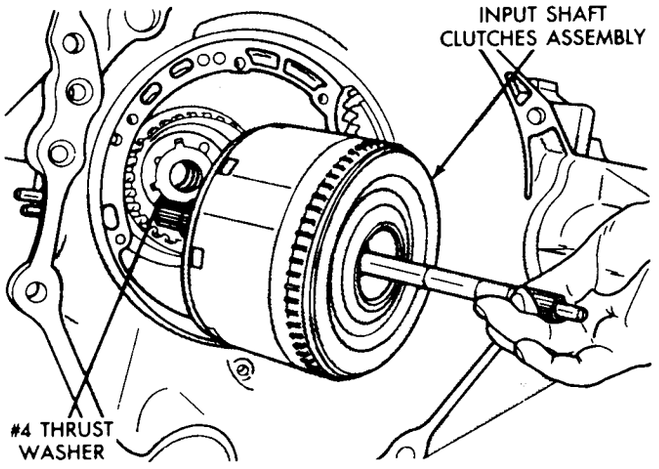


Fig. 8—Input Shaft Clutches Assembly

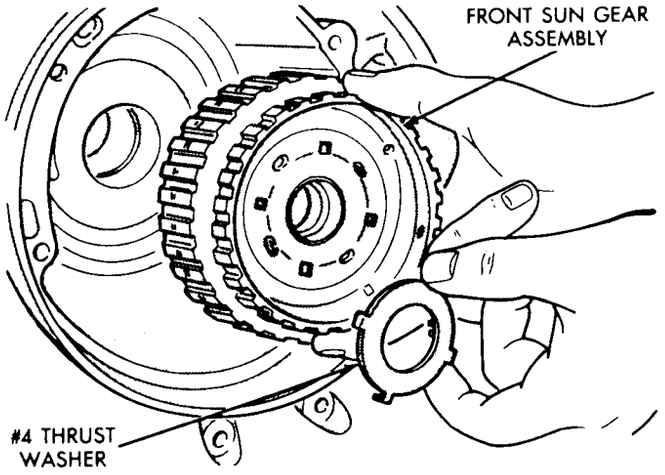


Fig. 9—Front Sun Gear Assembly

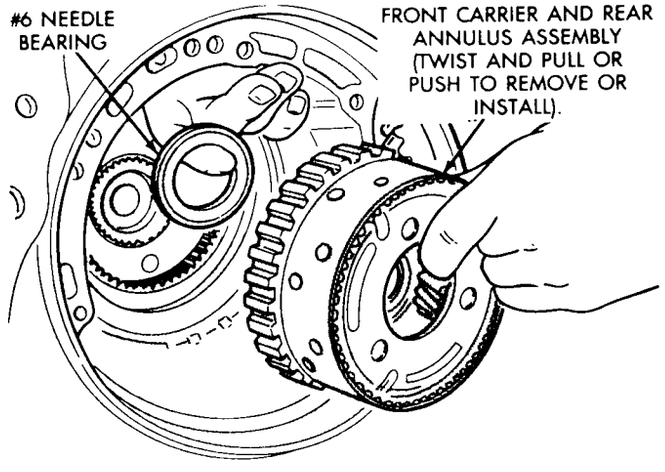


Fig. 10—Front Carrier and Rear Annulus Assembly

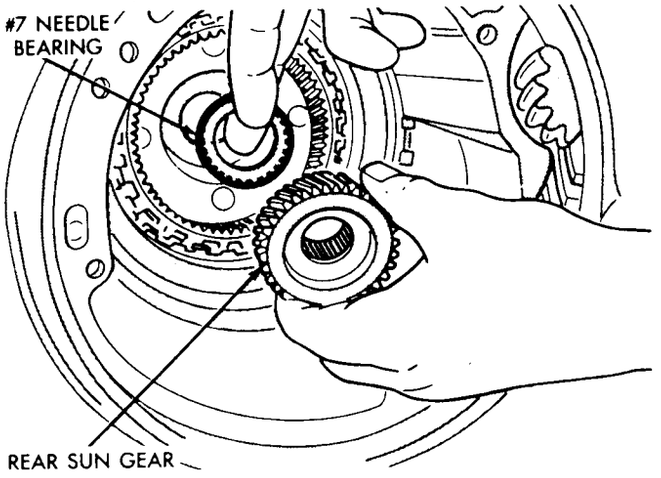


Fig. 11—Rear Sun Gear

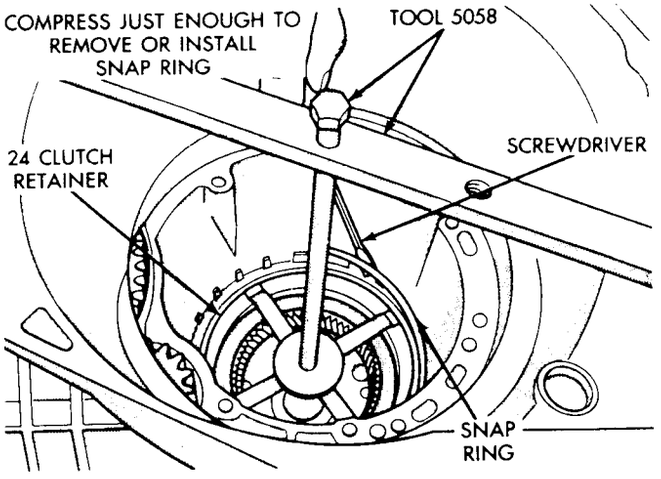


Fig. 12—2/4 Clutch Retainer Snap Ring

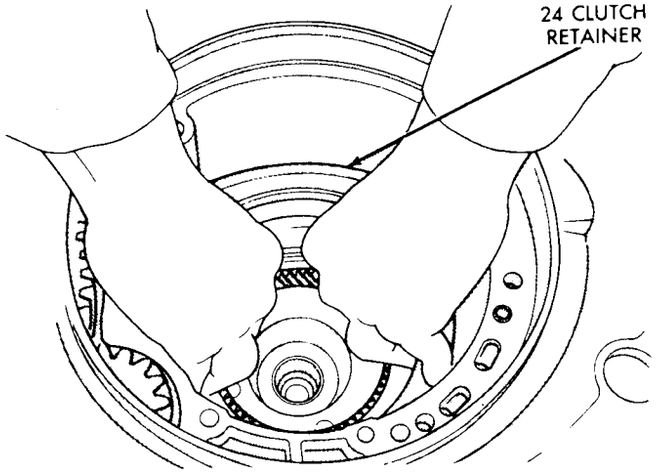


Fig. 13—Remove 2/4 Clutch Retainer

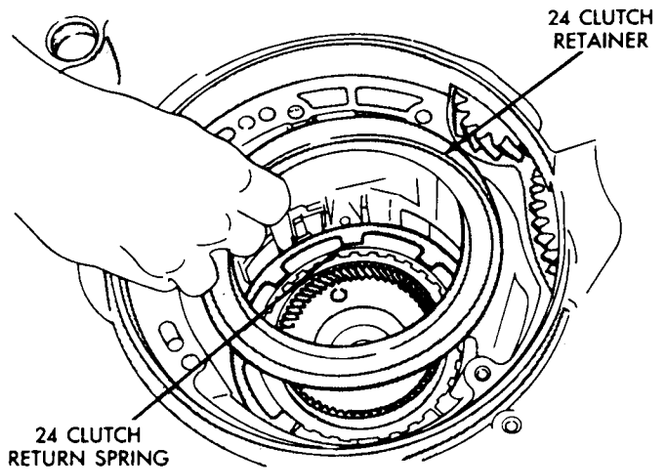


Fig. 14—2/4 Clutch Retainer

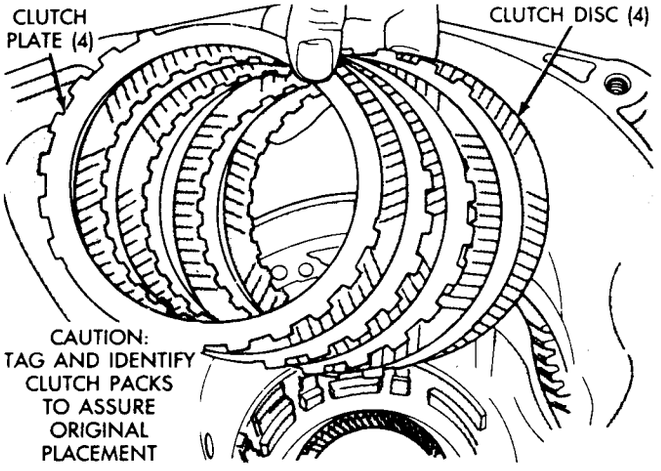


Fig. 17—2/4 Clutch Pack

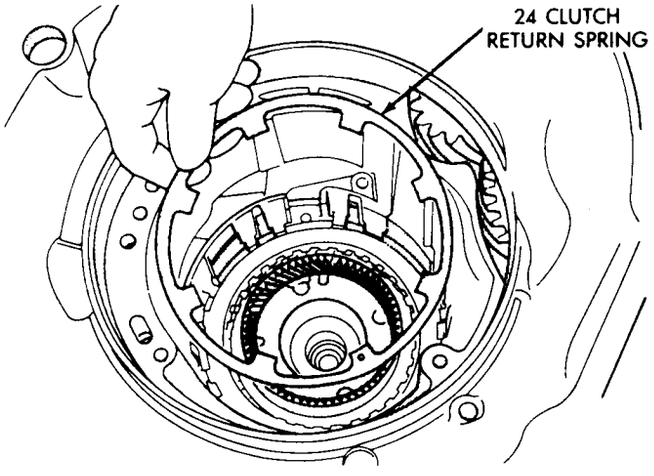


Fig. 15—2/4 Clutch Return Spring

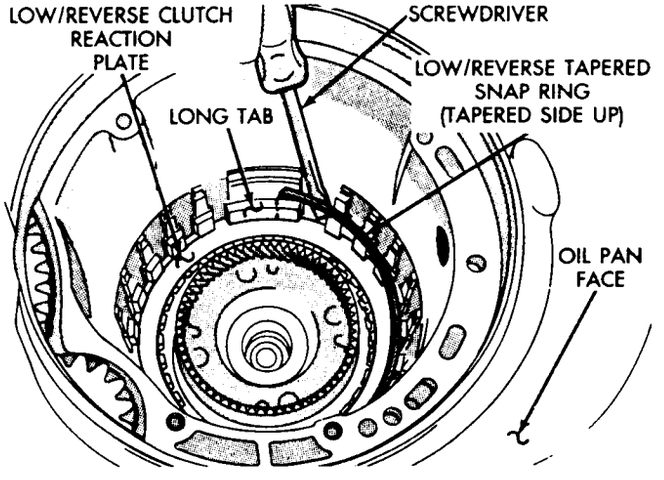


Fig. 18—Tapered Snap Ring

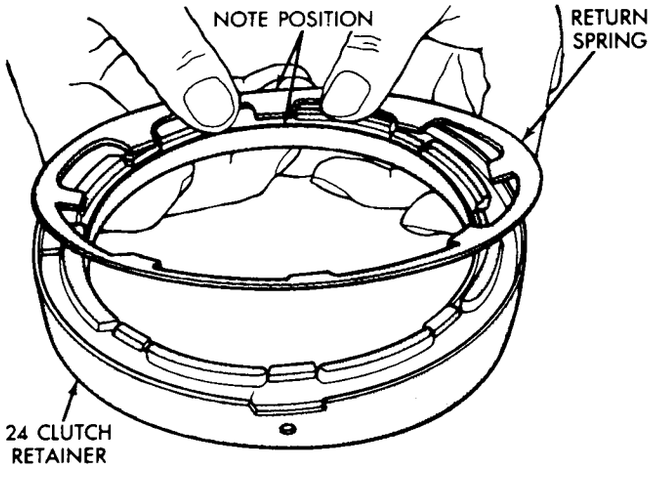


Fig. 16—2/4 Retainer and Spring Indexed

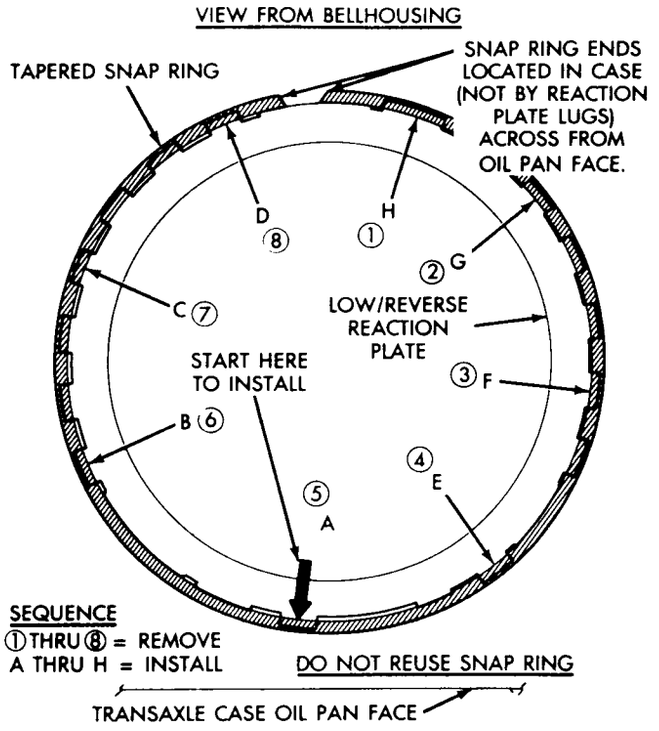


Fig. 19—Tapered Snap Ring Instructions

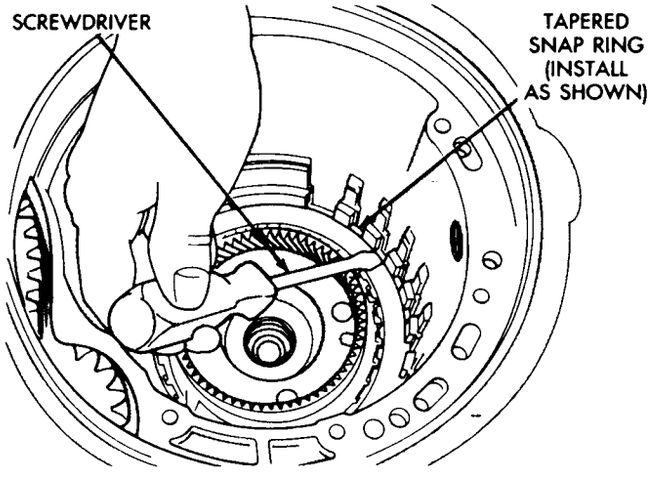


Fig. 20—Snap Ring Installed

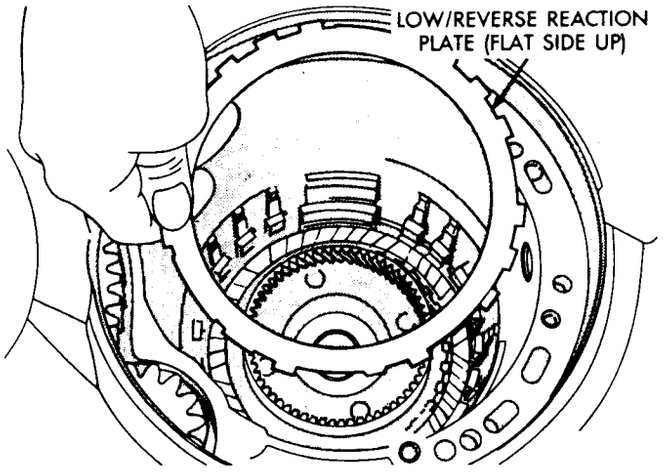


Fig. 21—Low/Reverse Reaction Plate

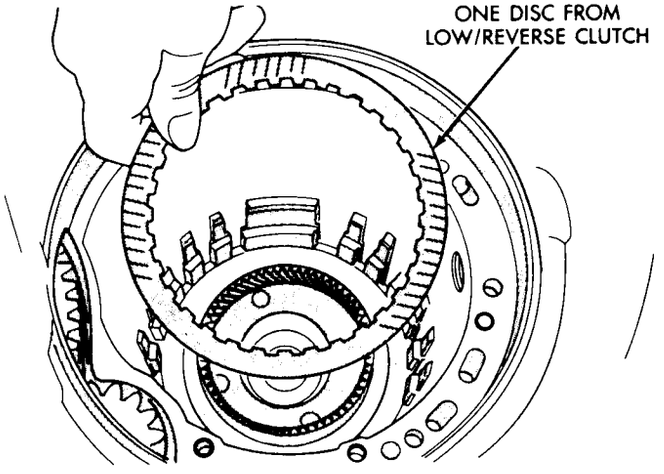


Fig. 22—Remove One Disc

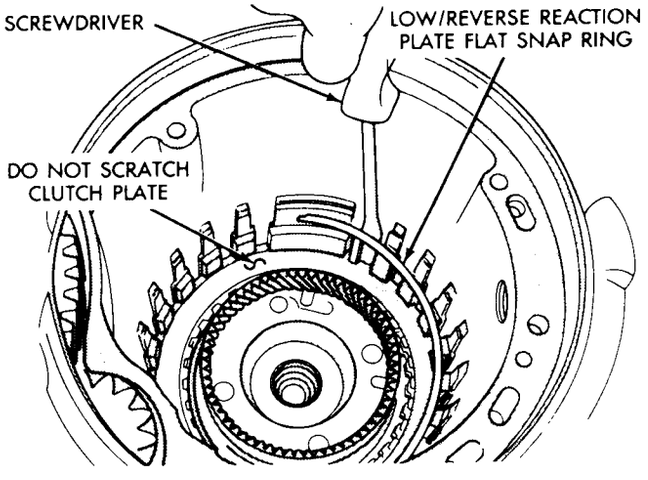


Fig. 23—Low/Reverse Reaction Plate Snap Ring

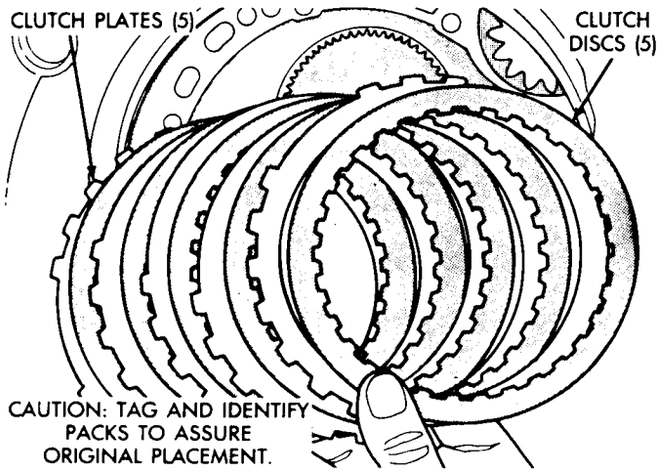


Fig. 24—Low/Reverse Clutch Pack

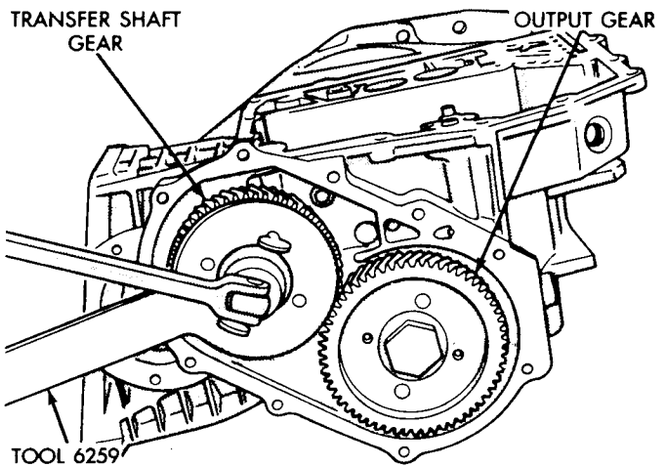


Fig. 27—Remove Transfer Shaft Gear Nut

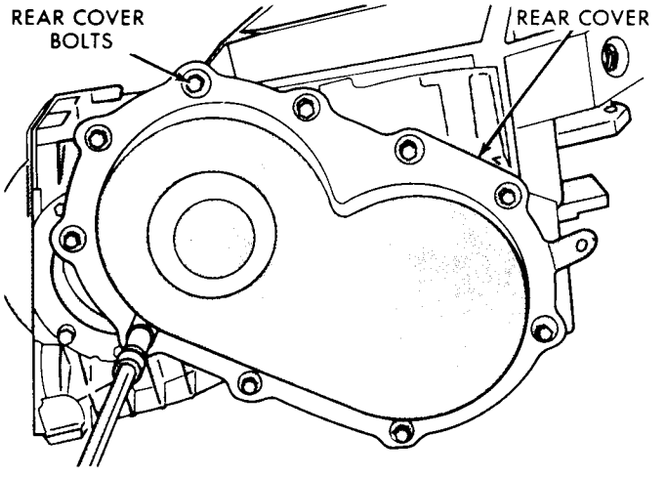


Fig. 25—Rear Cover Bolts

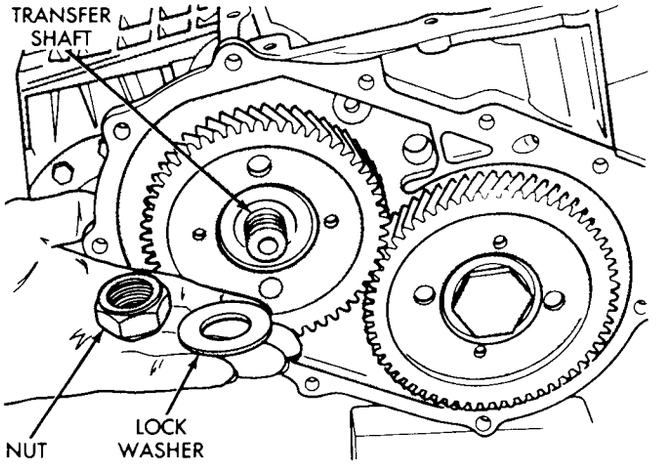


Fig. 28—Transfer Shaft Gear Nut and Washer

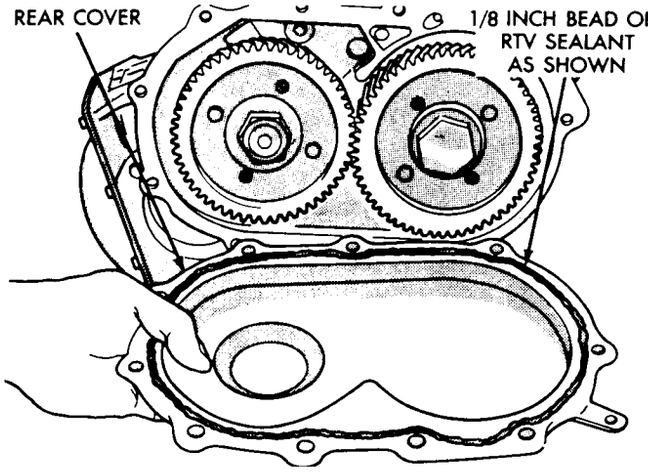


Fig. 26—Rear Cover

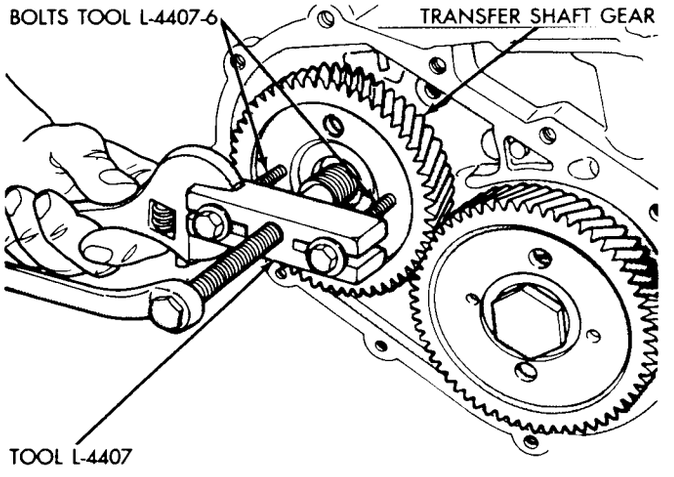


Fig. 29—Remove Transfer Shaft Gear

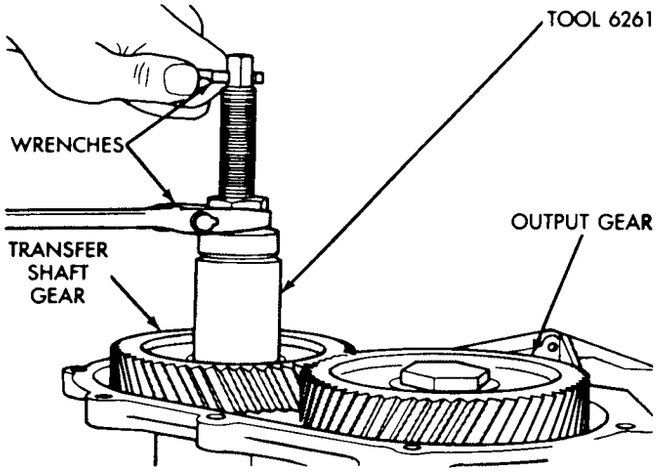


Fig. 30—Install Transfer Shaft Gear

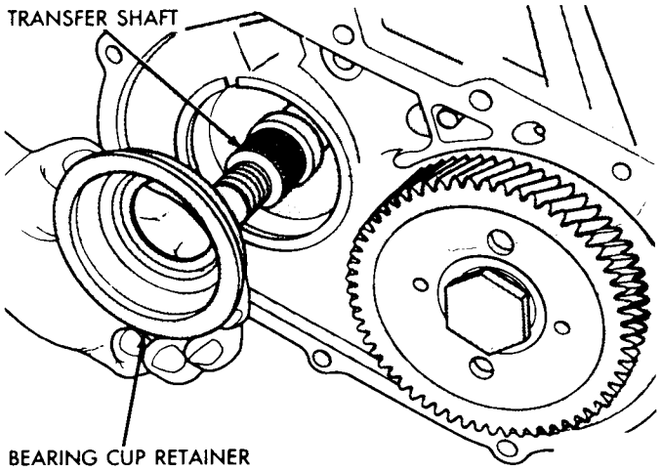


Fig. 33—Bearing Cup Retainer

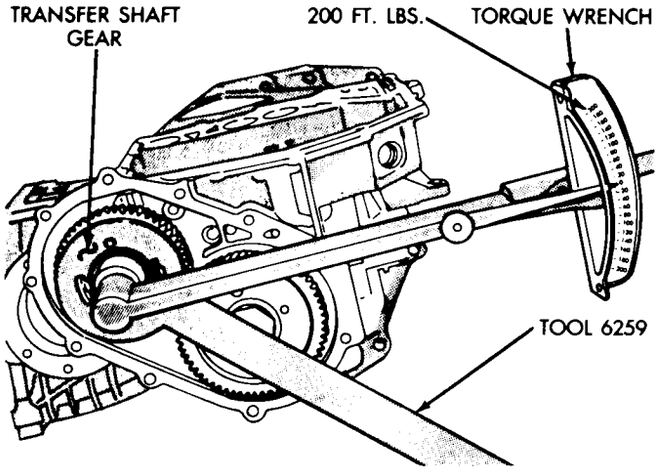


Fig. 31—Tighten Nut to 271 N·m (200 Ft. Lbs.)

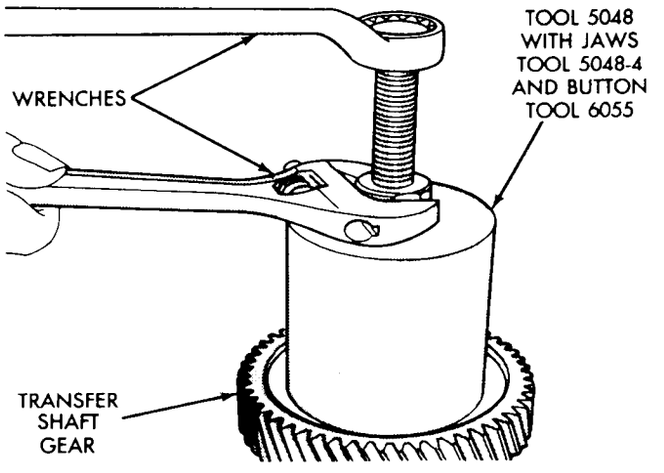


Fig. 34—Remove Transfer Shaft Bearing Cone

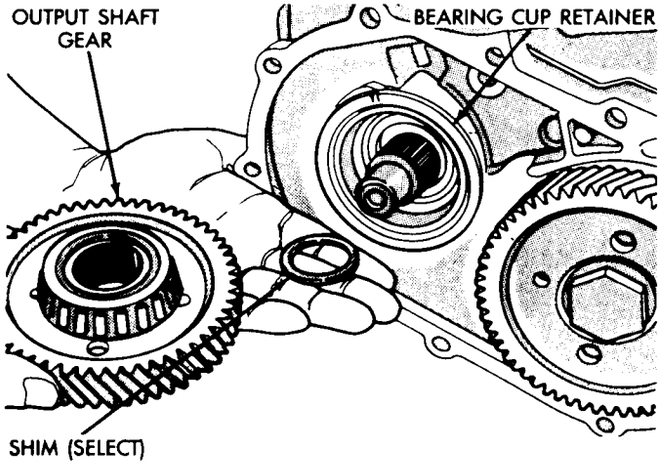


Fig. 32—Transfer Shaft Gear and (Select) Shim

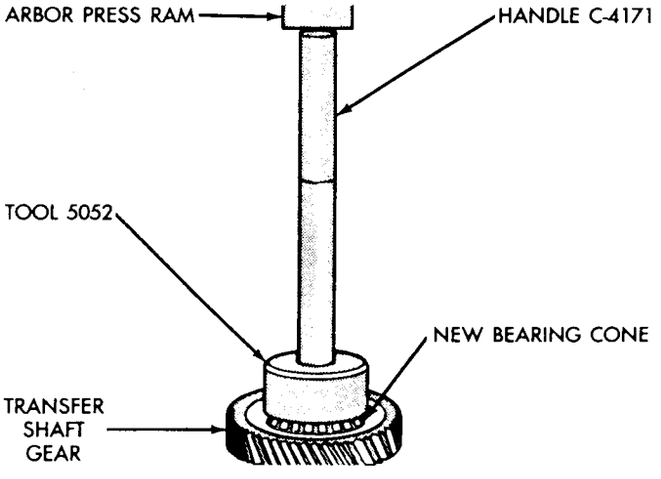


Fig. 35—Install Transfer Shaft Bearing Cone

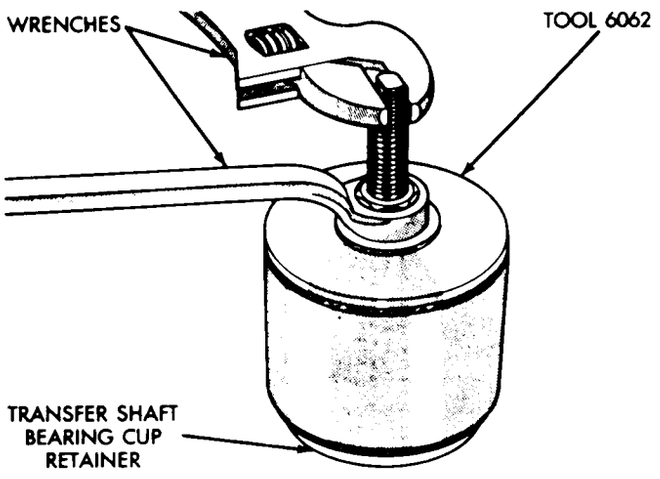


Fig. 36—Remove Transfer Shaft Bearing Cup

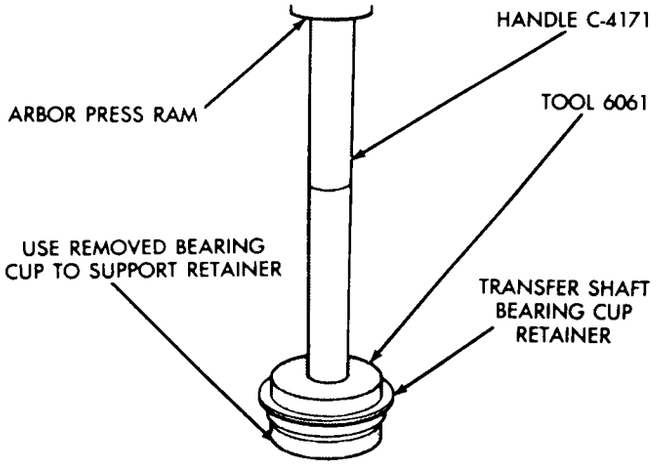


Fig. 37—Install New Bearing Cup

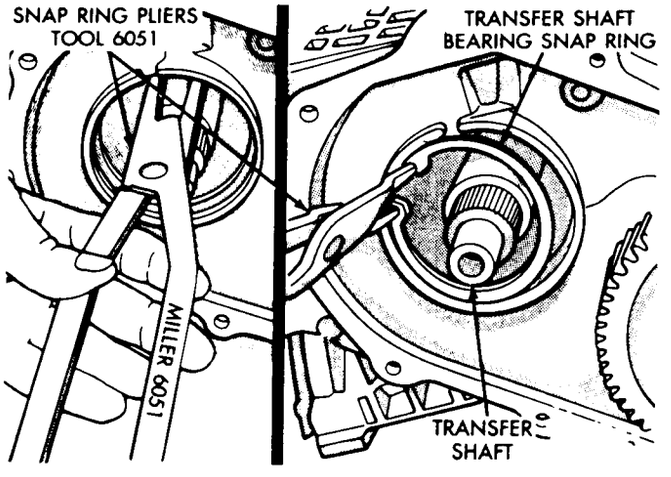


Fig. 38—Transfer Shaft Bearing Snap Ring

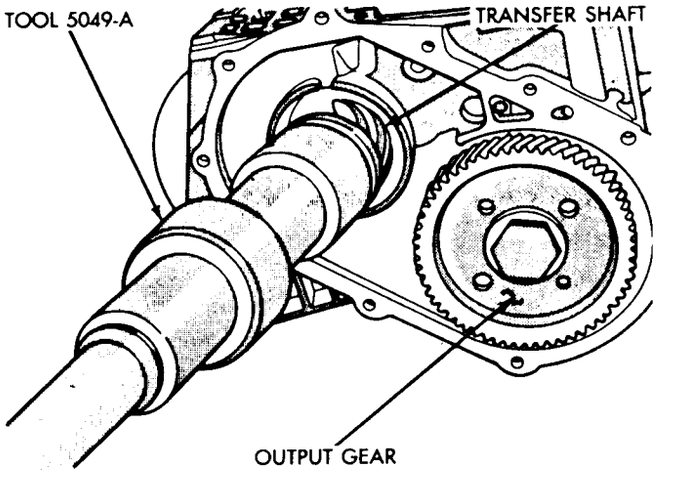


Fig. 39—Transfer Shaft

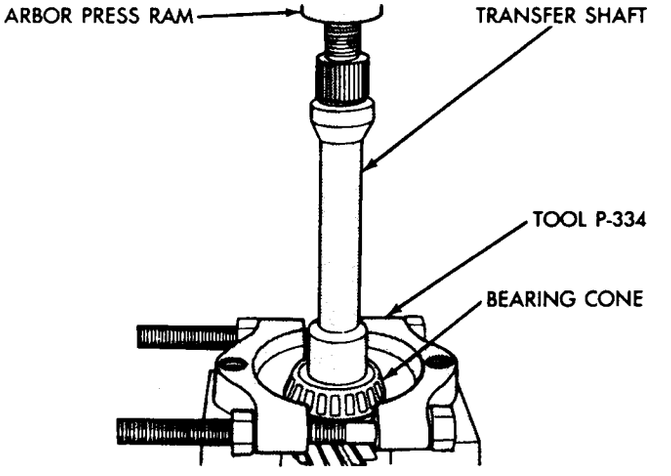


Fig. 40—Remove Transfer Shaft Bearing Cone

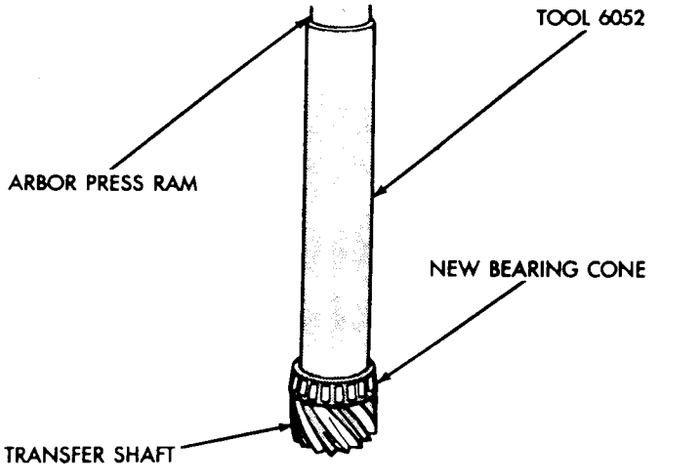


Fig. 41—Install Bearing Cone

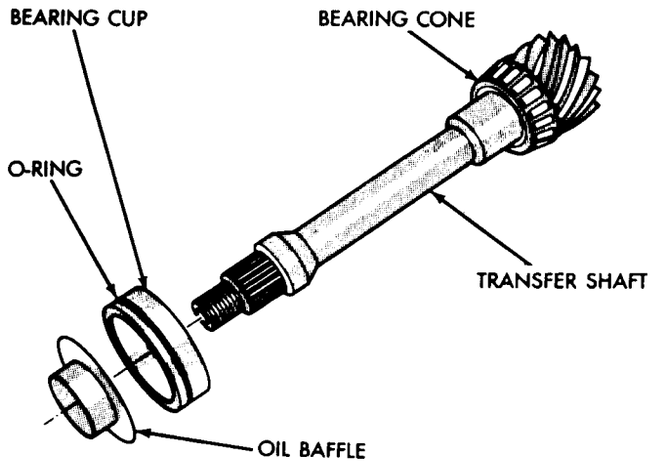


Fig. 42—Bearing Cup Removed

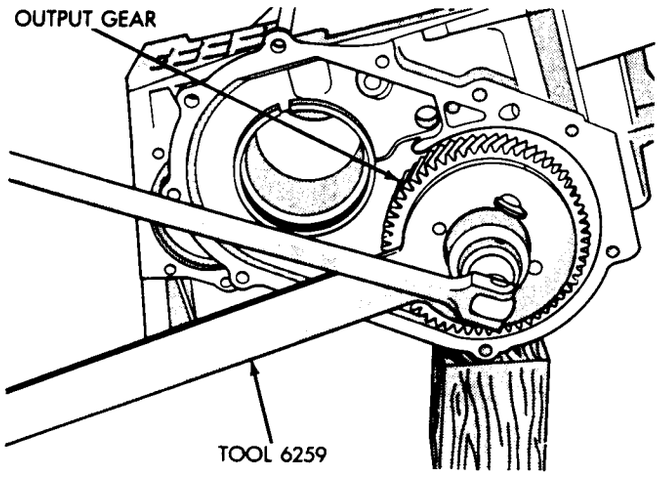


Fig. 43—Remove Output Gear Bolt

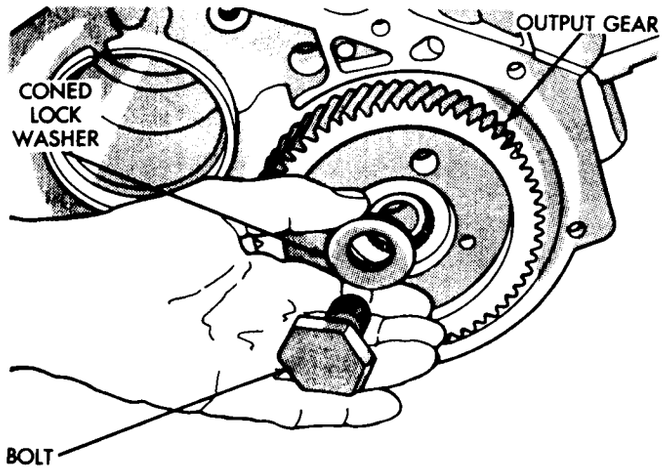


Fig. 44—Output Gear Bolt and Washer

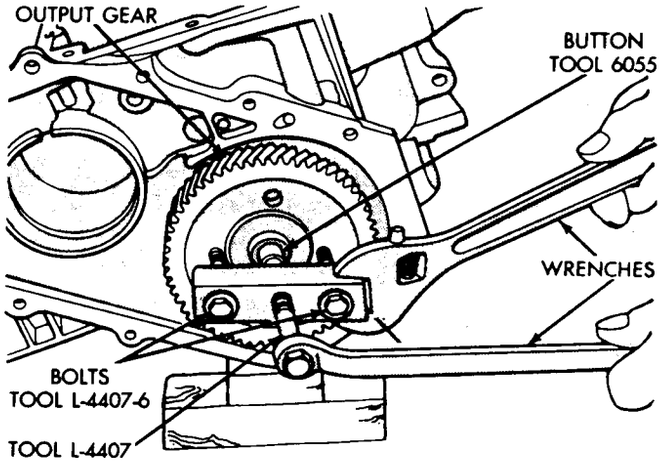


Fig. 45—Remove Output Gear

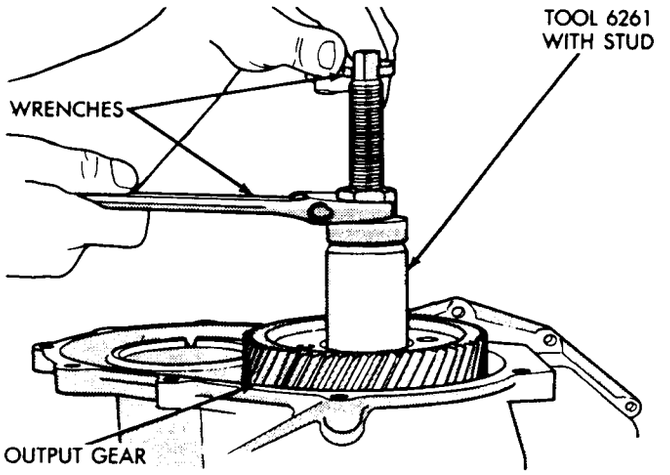
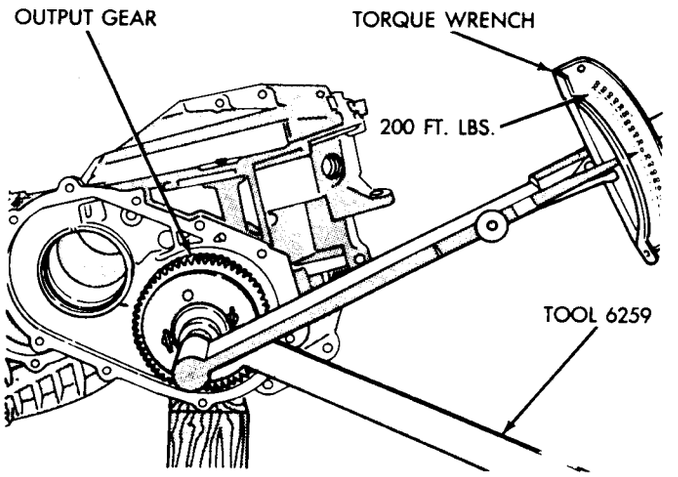


Fig. 46—Install Output Gear



Tighten Output Gear to 271 N·m (200 Ft. Lbs.)

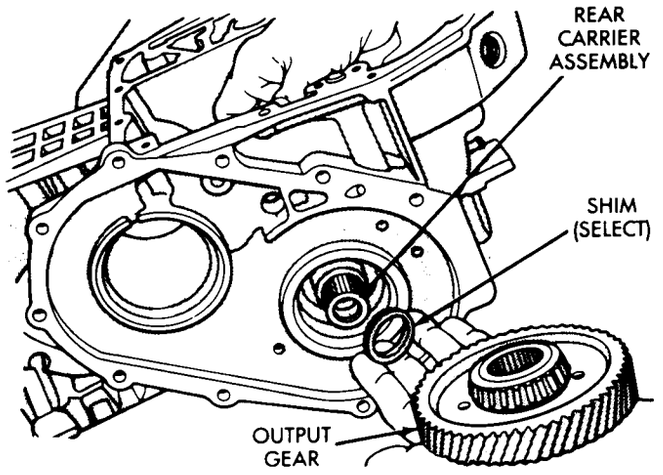


Fig. 47—Output Gear and (Select) Shim

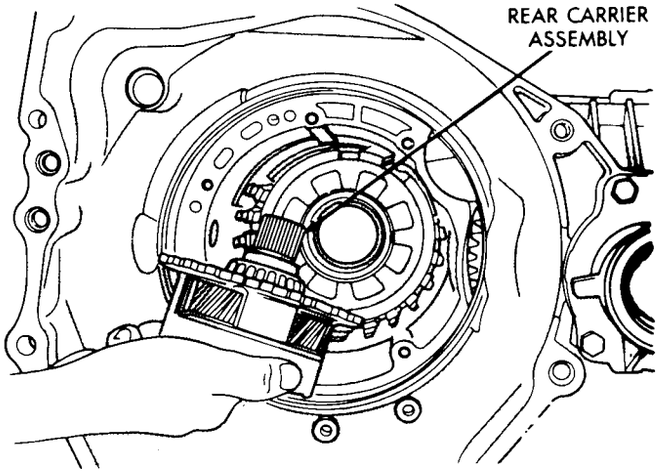


Fig. 50—Rear Carrier Assembly

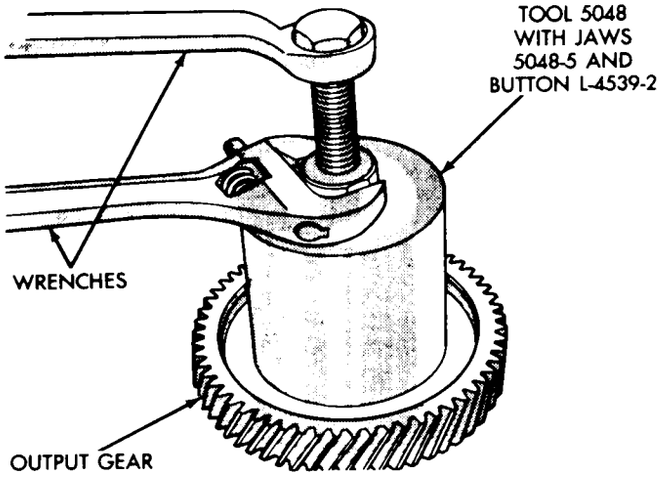


Fig. 48—Remove Bearing Cone

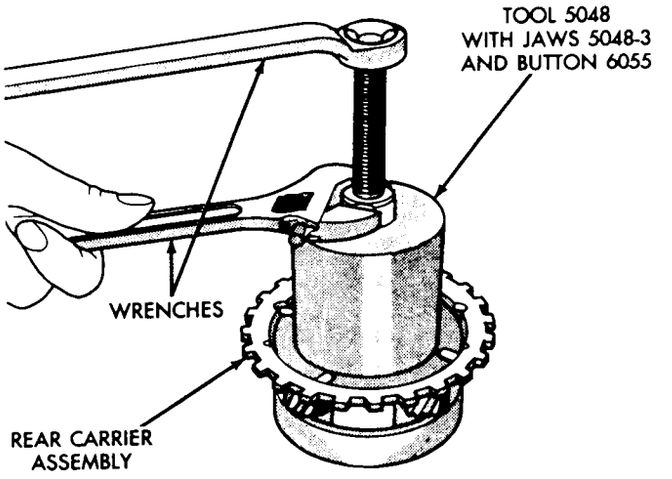


Fig. 51—Remove Rear Carrier Bearing Cone

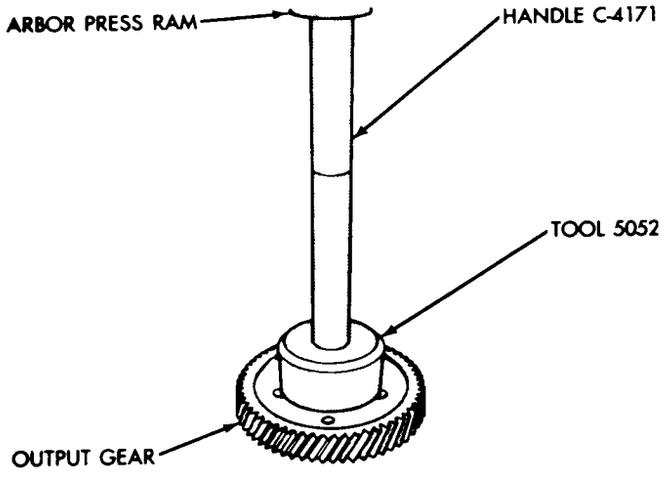


Fig. 49—Install New Bearing Cone

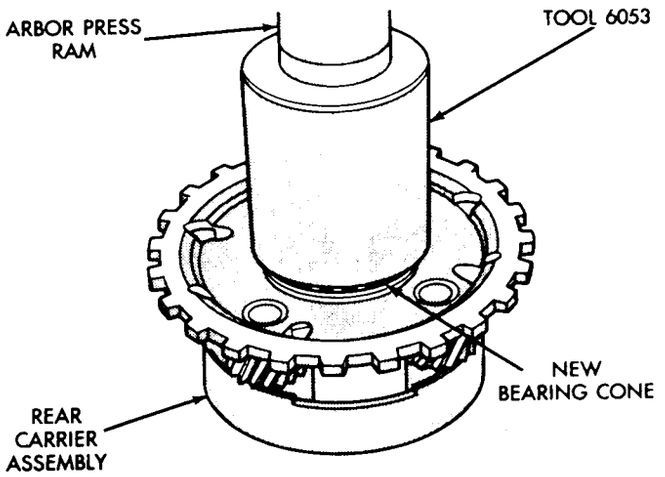


Fig. 52—Install Rear Carrier Bearing Cone

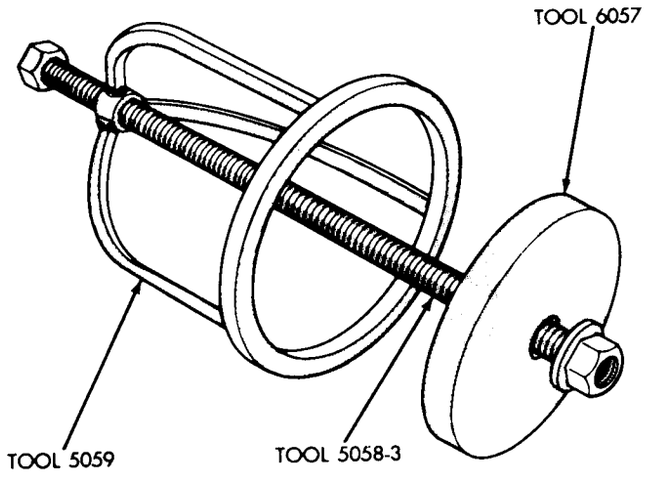


Fig. 53—Low/Reverse Spring Compressor Tool

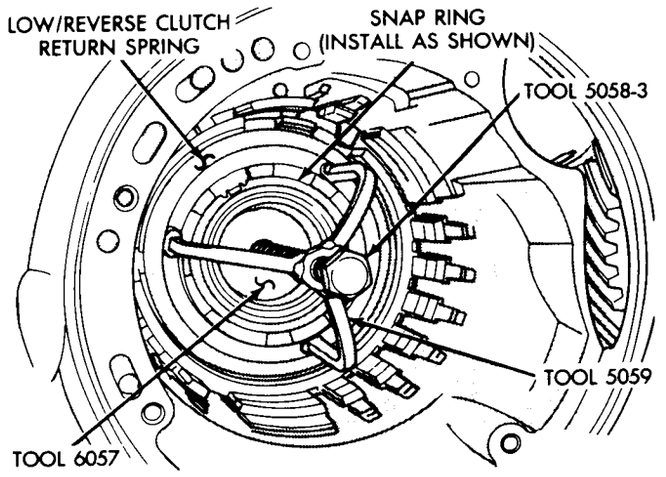


Fig. 54—Compressor Tool in Use

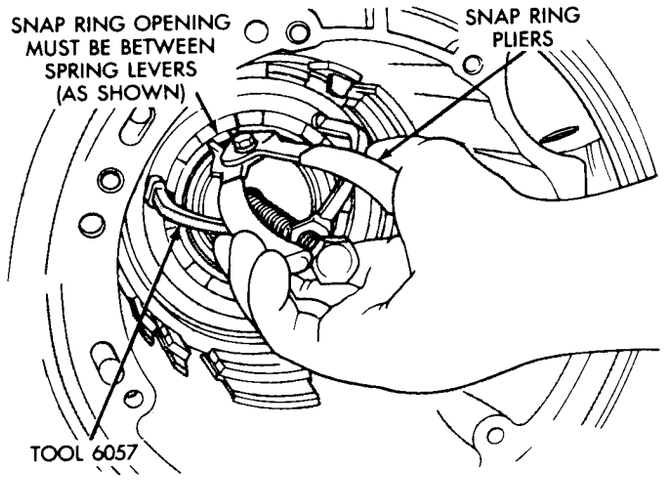


Fig. 55—Remove or Install Snap Ring

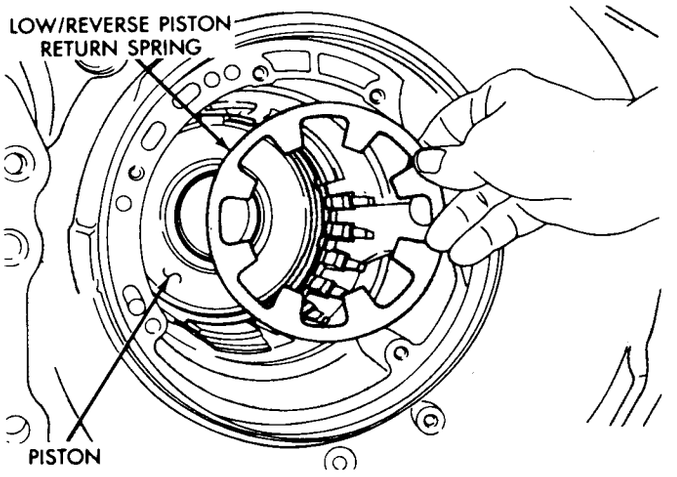


Fig. 56—Low/Reverse Piston Return Spring

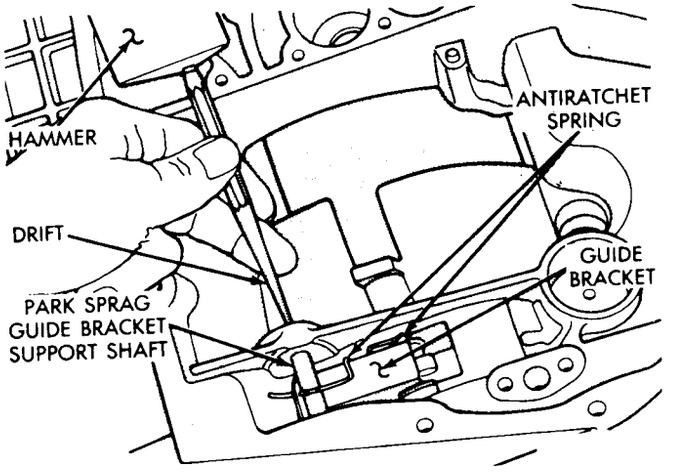


Fig. 57—Drive Out Support Shaft

CAUTION: When installing, be sure guide bracket and split sleeve touch the rear of the transaxle case.

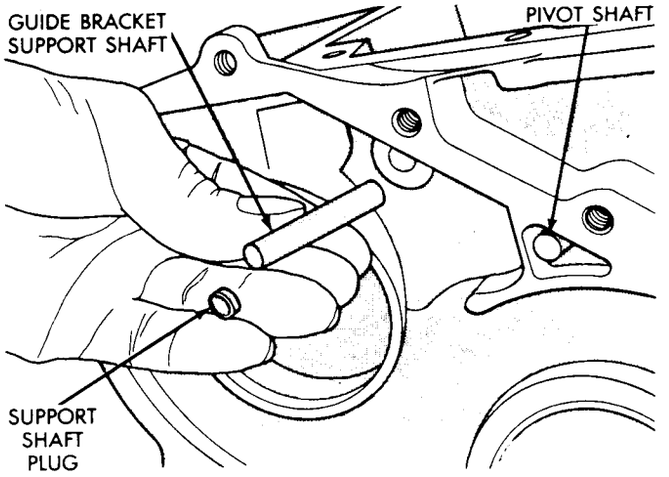


Fig. 58—Support Shaft and Plug

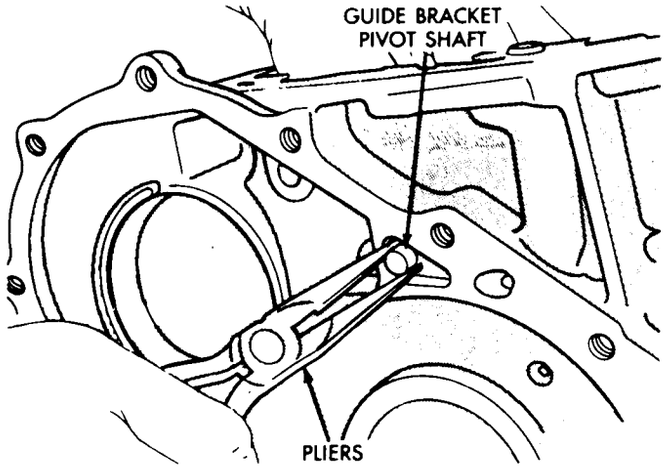


Fig. 59—Guide Bracket Pivot Shaft

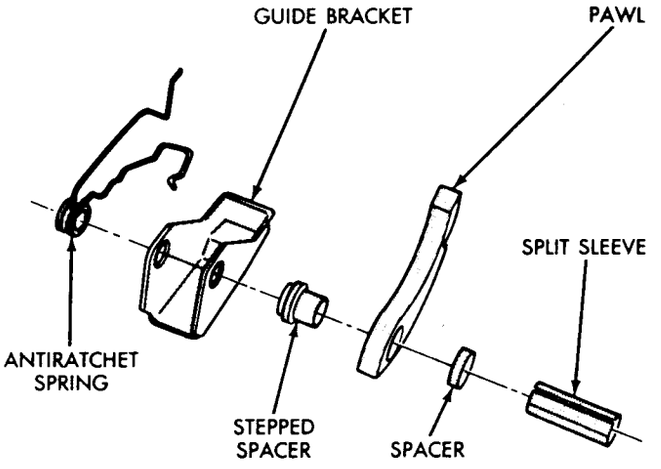


Fig. 62—Guide Bracket Disassembled

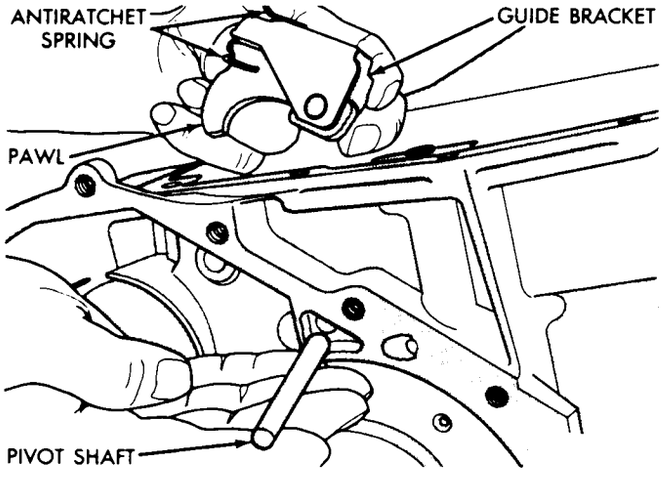


Fig. 60—Pivot Shaft and Guide Bracket

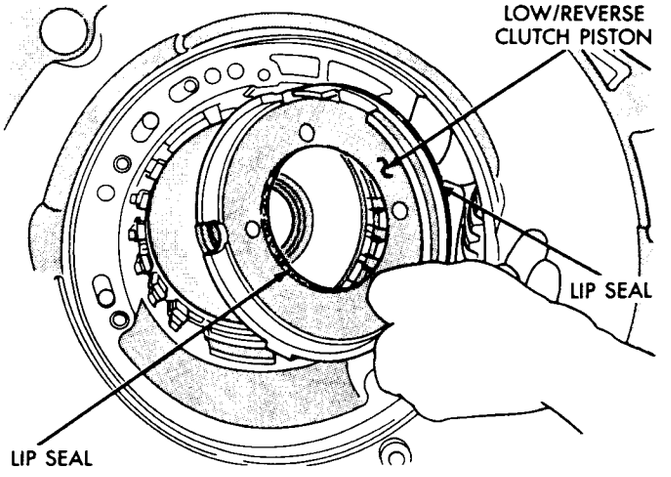


Fig. 63—Low/Reverse Clutch Piston

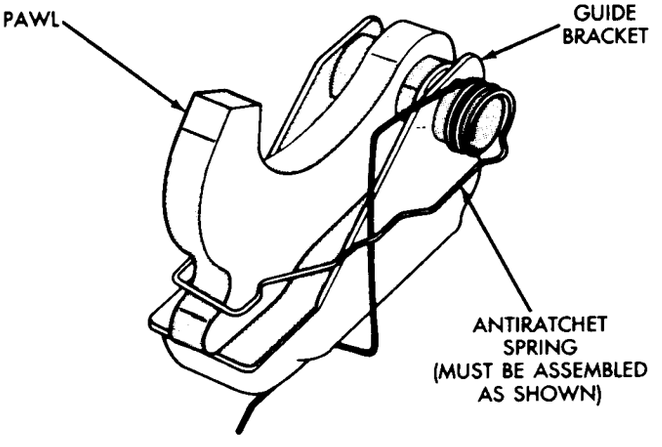


Fig. 61—Guide Bracket Assembled

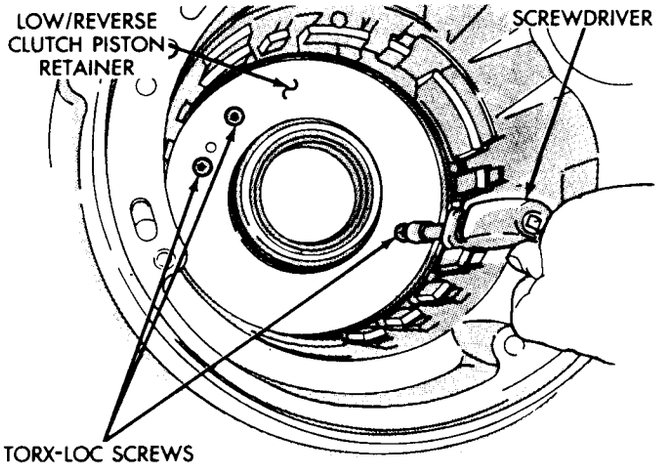


Fig. 64—Piston Retainer Attaching Screws

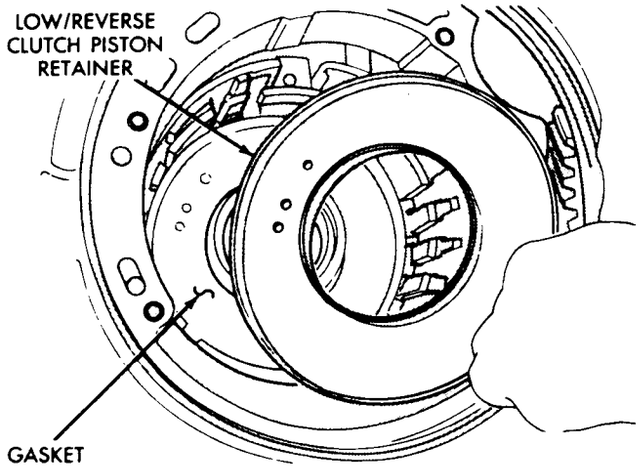


Fig. 65—Piston Retainer

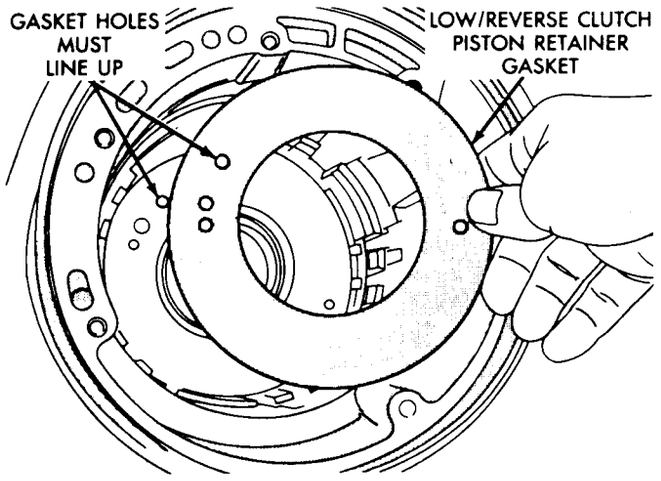


Fig. 66—Piston Retainer Gasket

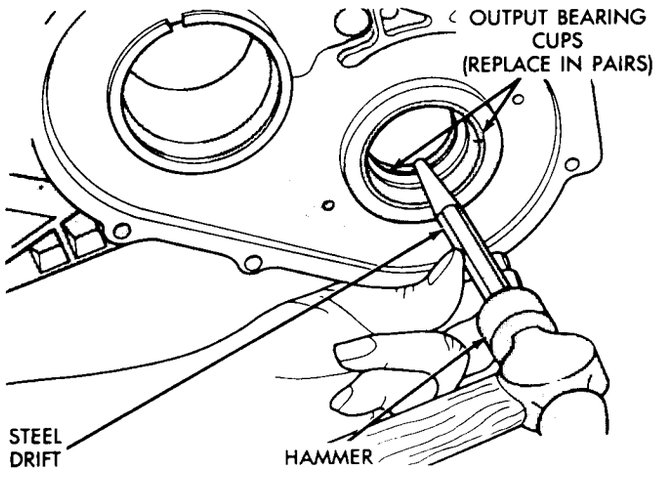


Fig. 67—Remove Both Output Bearing Cups

CAUTION: Drift bearing cups all the way around.

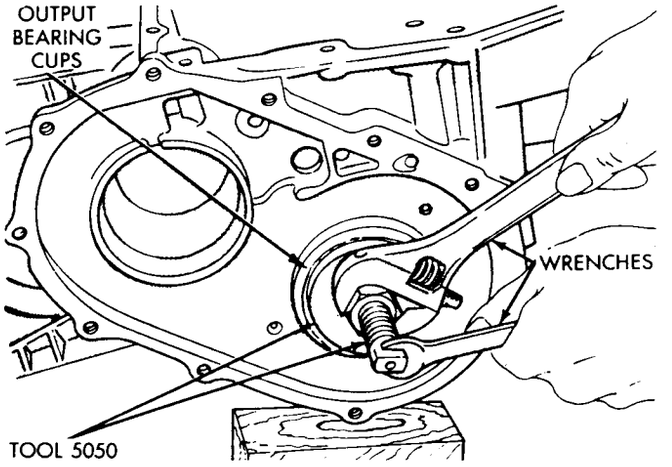


Fig. 68—Install Both Output Bearing Cups

To assemble, reverse the above procedure. Be sure to check both grounded clutch clearances (Figs. 71 and 72). Before installing the input clutches retainer, follow the instructions in "Determining #4 Thrust Plate Thickness" (Figs. 73, 74, 75, 76).

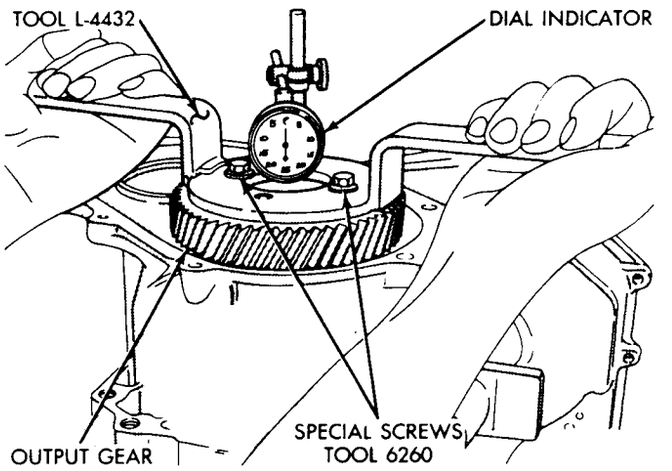


Fig. 69—Checking Output Gear Bearings End Play

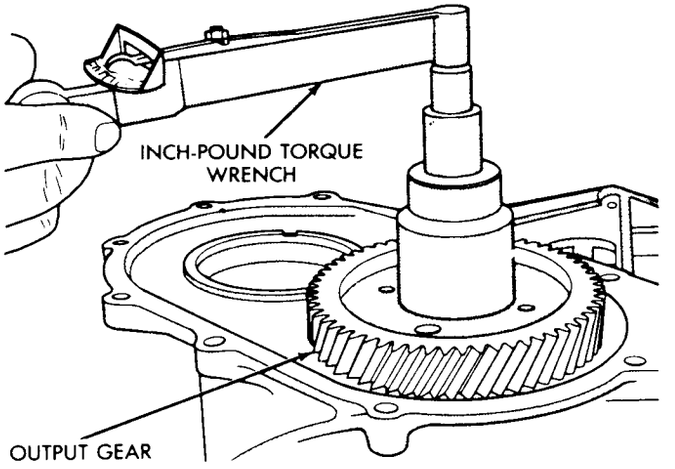


Fig. 70—Checking Output Gear Bearings Turning Torque

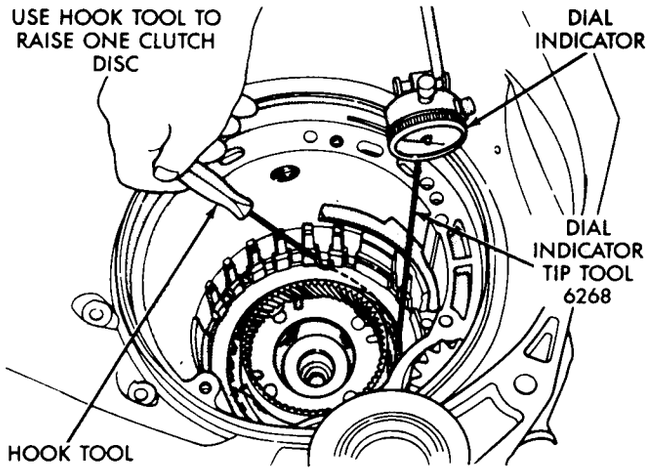


Fig. 71—Check Low/Reverse Clutch Clearance

Press down clutch pack with finger and zero dial indicator. **Low/Reverse clutch pack clearance is 1.04 to 1.65mm (.042 to .065 inch).**

Select the proper low/reverse reaction plate to achieve specifications:

PART NO.	Thickness
4377150	6.92 mm (.273 in.)
4377149	6.66 mm (.262 in.)
4377148	6.40 mm (.252 in.)
4412268	6.14 mm (.242 in.)
4412267	5.88 mm (.232 in.)
4412266	5.62 mm (.221 in.)
4412265	5.36 mm (.211 in.)

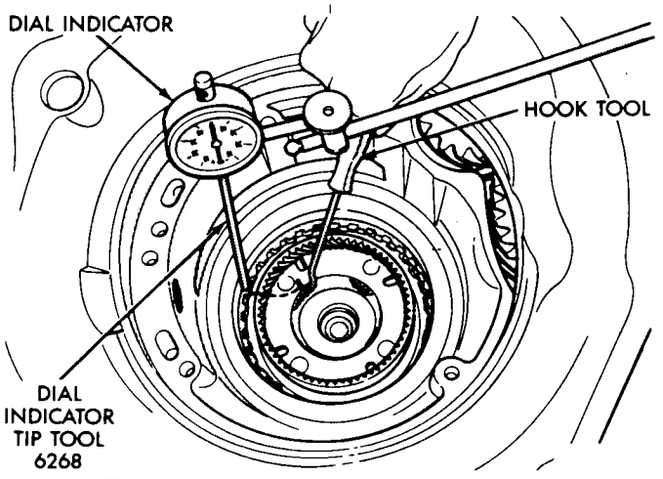


Fig. 72—Check 2/4 Clutch Clearance

Press down clutch pack with finger and zero dial indicator. **The 2/4 clutch pack clearance is 0.76 to 2.64mm (.030 to 104 inch).** If not within specifications, the clutch is not assembled properly. **There is no adjustment for the 2/4 clutch clearance.**

DETERMINING #4 THRUST PLATE THICKNESS (Input Shaft End Play) (Figs. 73, 74, 75, and 76)

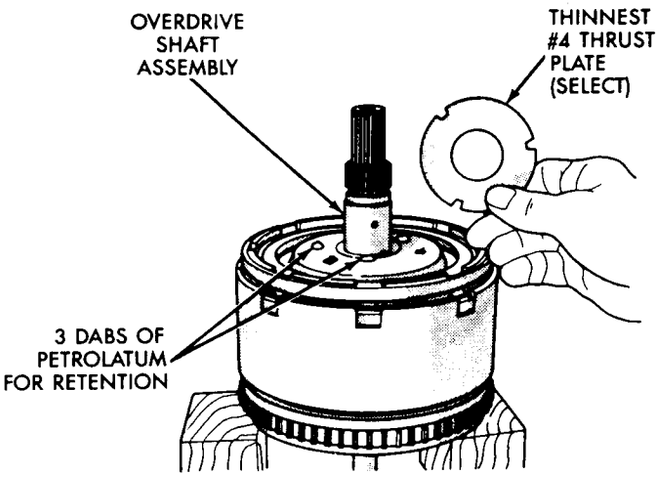


Fig. 73—Select Thinnest #4 Thrust Plate

To determine the proper thickness of the #4 thrust plate, select the thinnest #4 thrust plate. Using petrolatum (Fig. 73) to hold thrust plate in position, install input clutches retainer. Be sure the input clutches retainer is completely seated (Fig. 74).

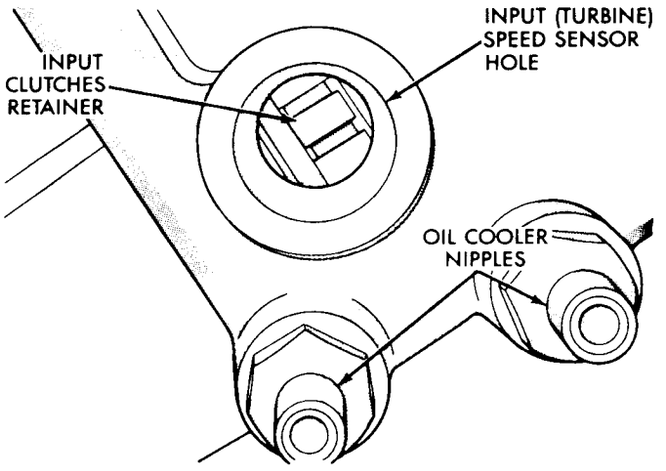


Fig. 74—View Through Input Speed Sensor Hole

CAUTION: If view through input speed sensor hole is not as shown above, the input clutches assembly is not seated properly.

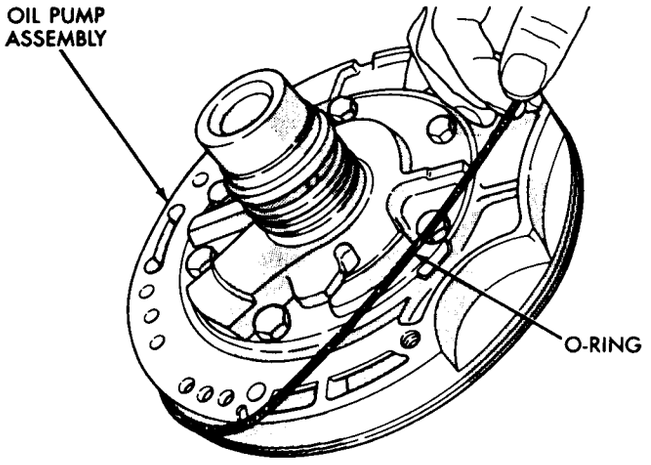


Fig. 75—Remove Oil Pump O-Ring

By removing the oil pump O-ring, you will be able to install and remove the oil pump very easily to select the proper #4 thrust plate.
CAUTION: Be sure to reinstall O-ring on oil pump after selecting the proper #4 thrust plate.

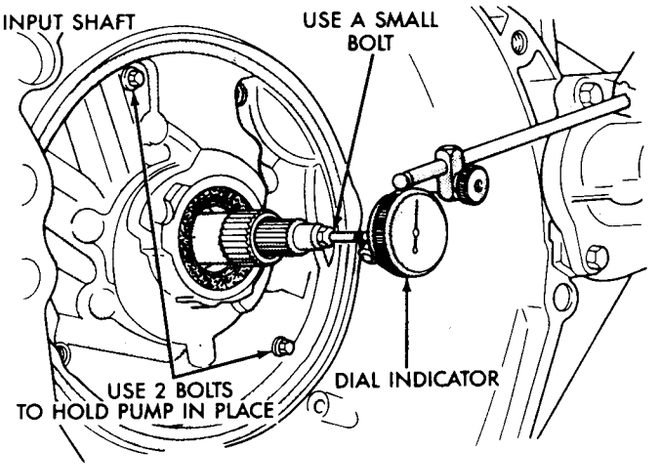


Fig. 76—Measure Input Shaft End Play

Input shaft end play must be .012 to .030 inch.
For example, if end play reading is .055 inch, select #4 Thrust Plate PN 4431666 which is .071 to .074 thick. This should provide an input shaft end play reading of .020 inch which is within specifications.
See chart below to select the proper #4 thrust plate.

SHIM THICKNESS mm	SHIM THICKNESS inch	PART NUMBER
0.93-1.00	.037-.039	4431662
1.15-1.22	.045-.048	4431663
1.37-1.44	.054-.057	4431664
1.59-1.66	.063-.066	4431665
1.81-1.88	.071-.074	4431666
2.03-2.10	.080-.083	4431667
2.25-2.32	.089-.091	4431668
2.47-2.54	.097-.100	4431669
2.69-2.76	.106-.109	4446670
2.91-2.98	.114-.117	4446671
3.13-3.20	.123-.126	4446672
3.35-3.42	.132-.135	4446601

SUBASSEMBLY RECONDITION

Input Shaft Clutches Retainer Assembly

Disassembly

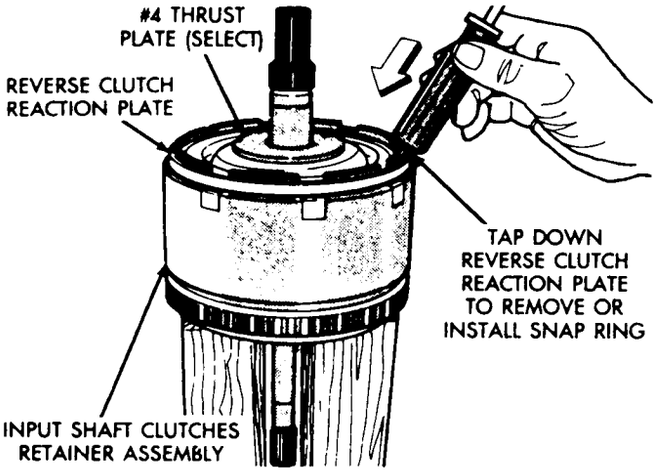


Fig. 1—Tapping Reaction Plate

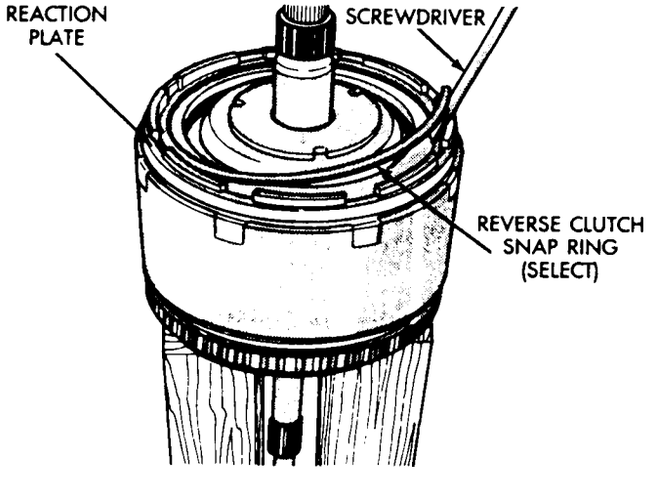


Fig. 2—Reverse Clutch Snap Ring

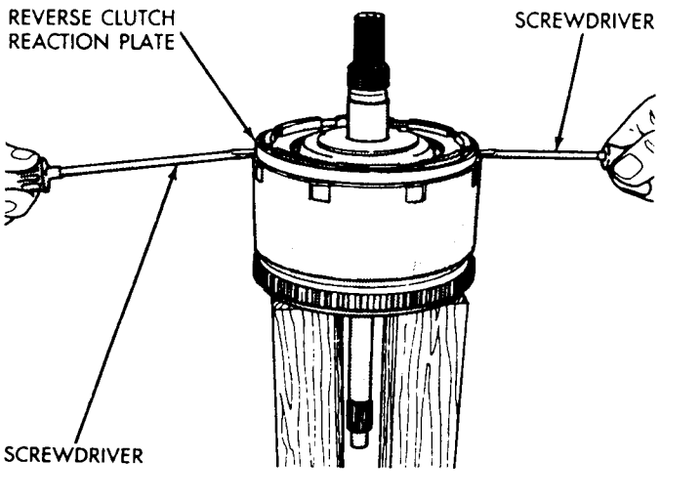


Fig. 3—Pry Reverse Clutch Reaction Plate

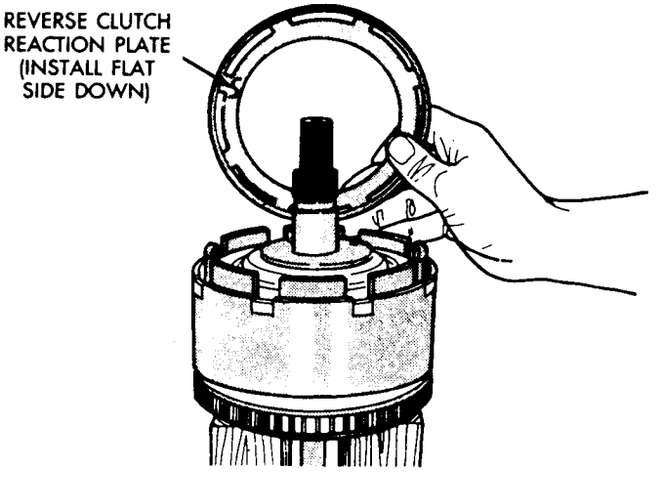


Fig. 4—Reverse Clutch Reaction Plate

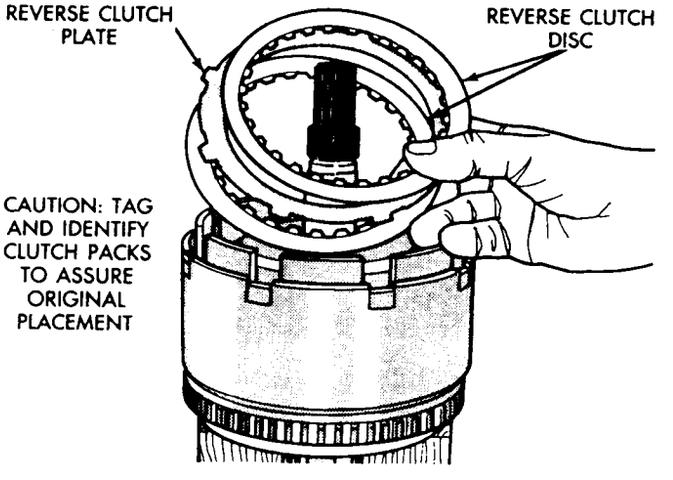


Fig. 5—Reverse Clutch Pack

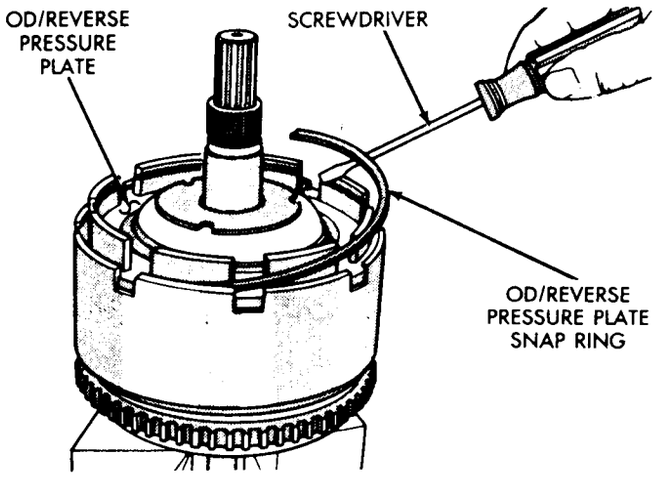


Fig. 6-OD/Reverse Pressure Plate Snap Ring

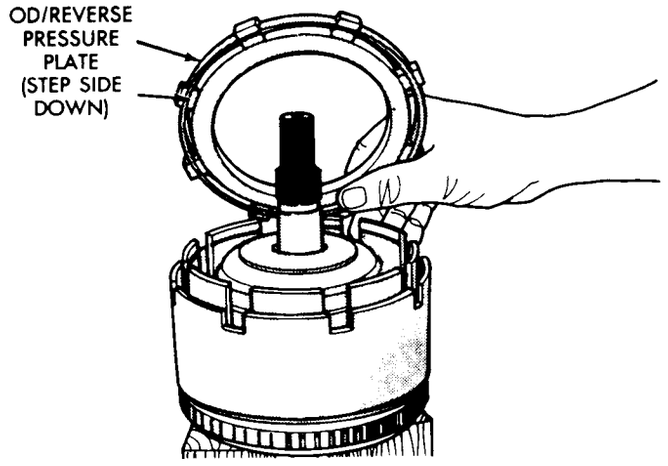


Fig. 7—OD/Reverse Presssure Plate

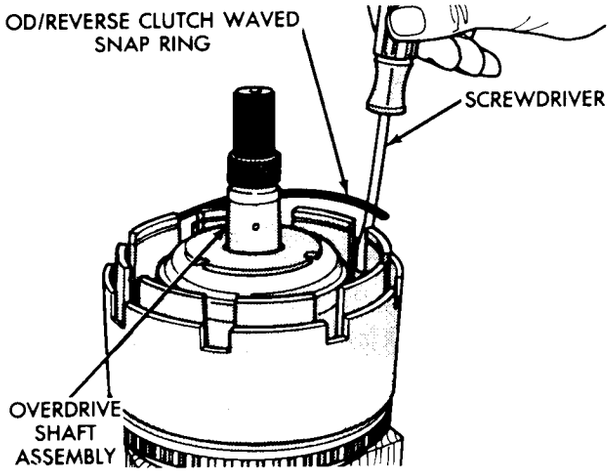


Fig. 8—Waved Snap Ring

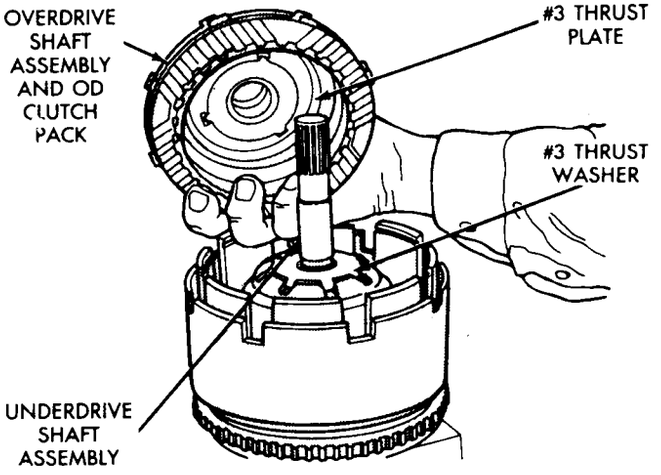


Fig. 9—Remove OD Clutch Pack

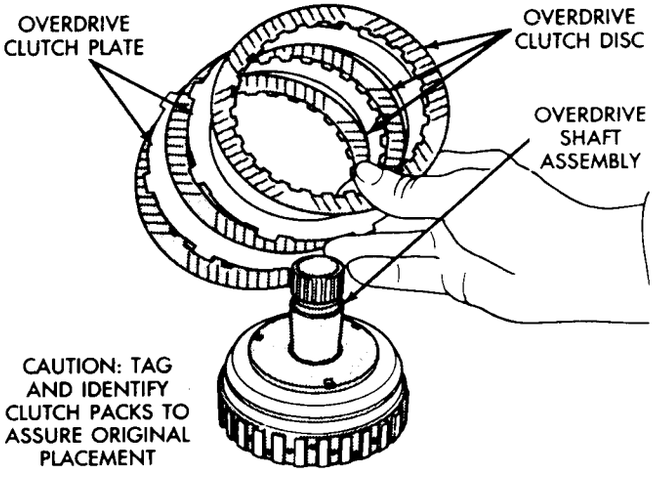


Fig. 10—Overdrive Clutch Pack

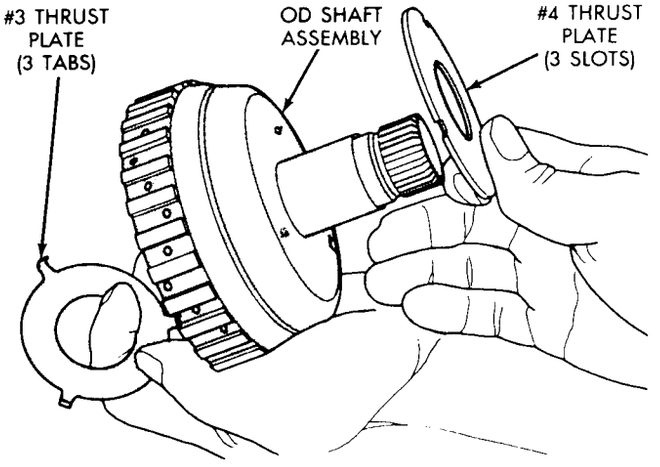


Fig. 11—Overdrive Shaft Assembly

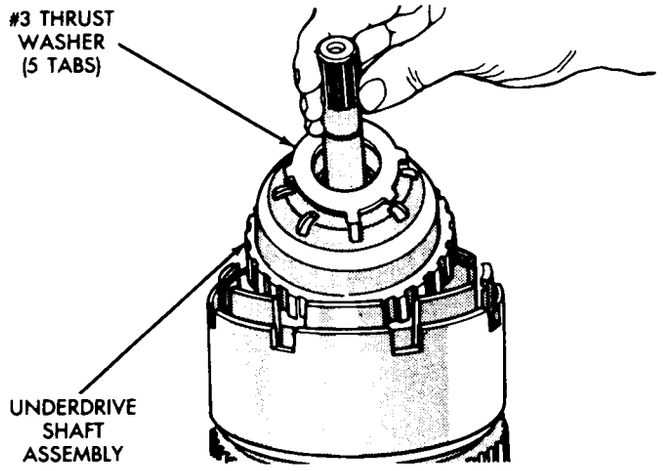


Fig. 12—Underdrive Shaft Assembly

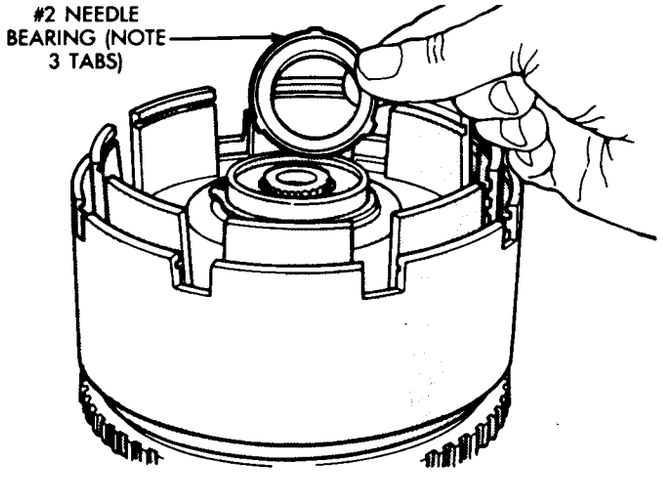


Fig. 13—#2 Needle Bearing

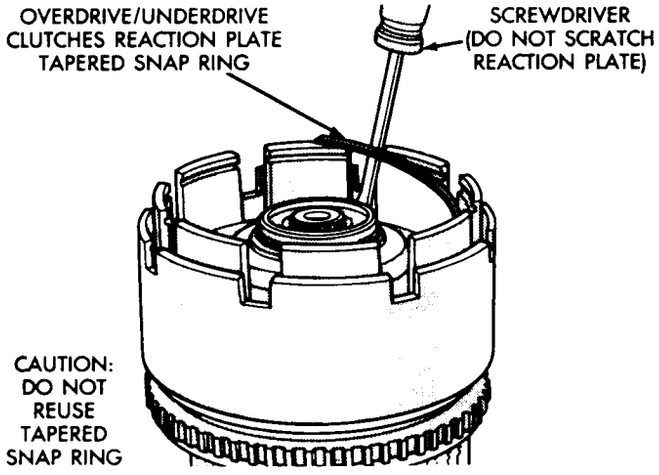


Fig. 14—OD/UD Reaction Plate Tapered Snap Ring

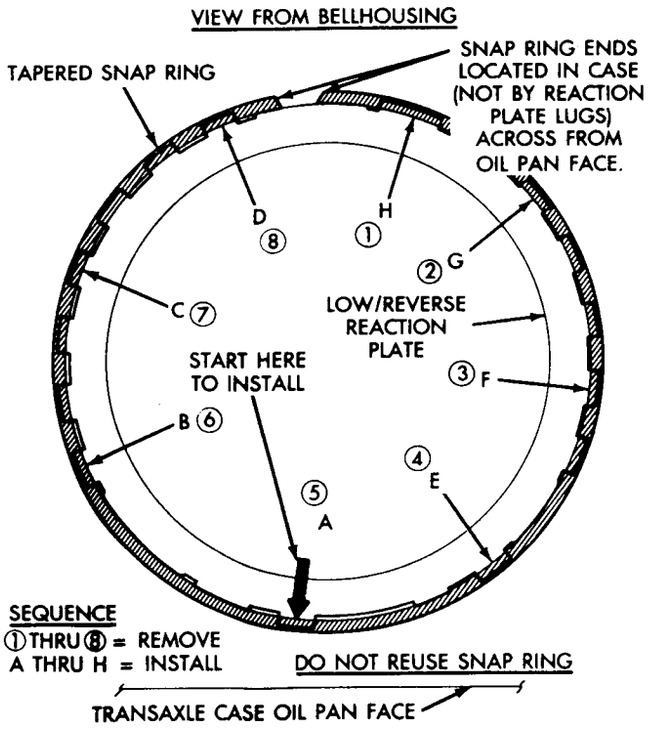


Fig. 15—Tapered Snap Ring Instructions

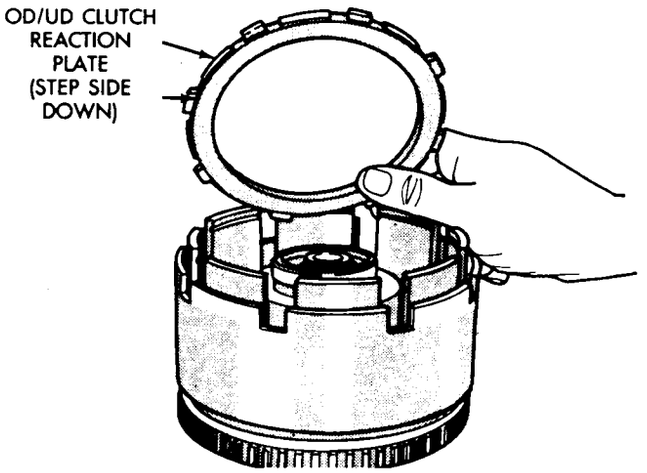


Fig. 16—OD/UD Reaction Plate

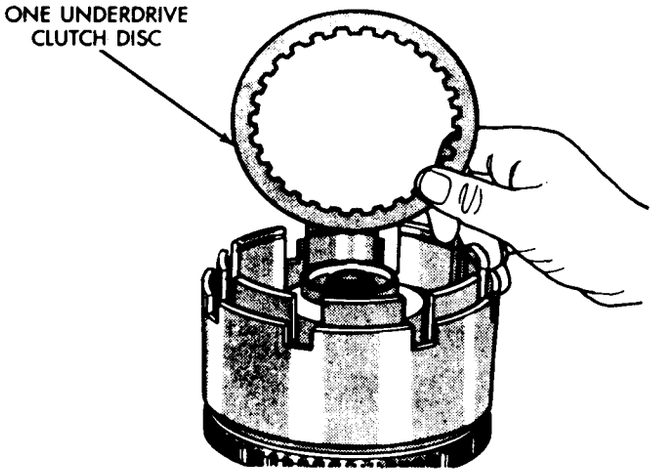


Fig. 17—Remove One UD Clutch Disc

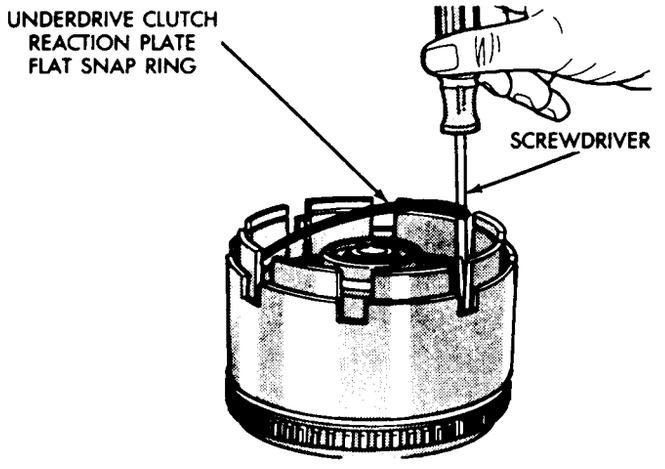


Fig. 18—UD Clutch Flat Snap Ring

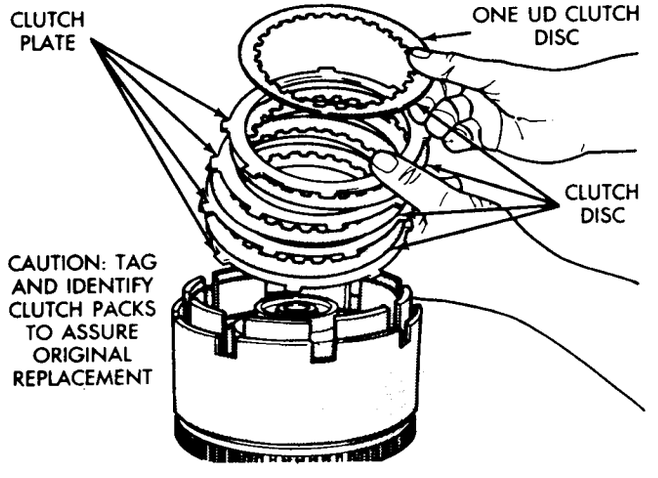


Fig. 19—Underdrive Clutch Pack

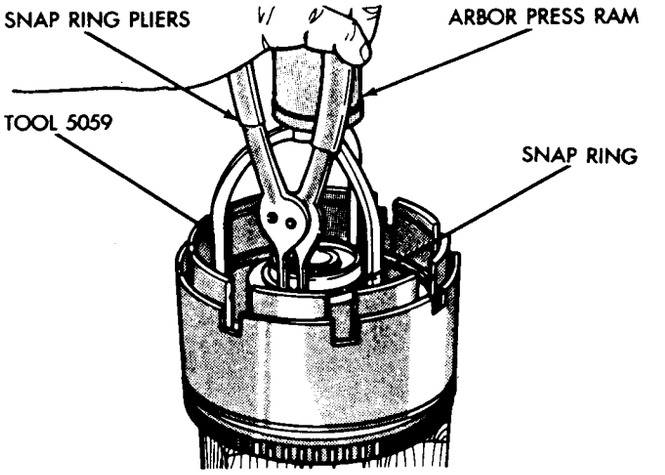


Fig. 20—UD Spring Retainer Snap Ring

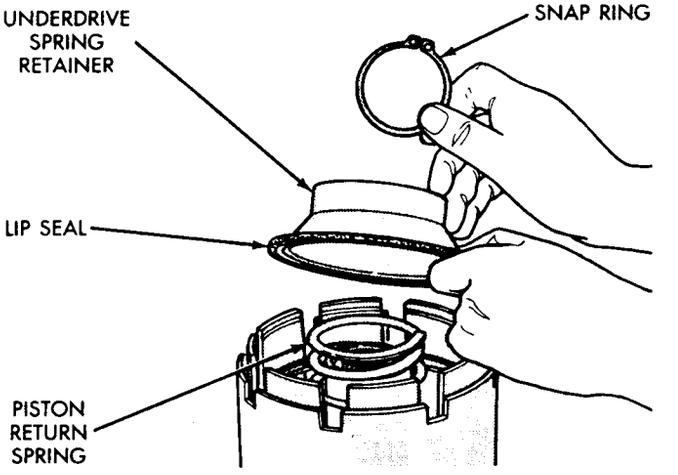


Fig. 21—UD Return Spring and Retainer

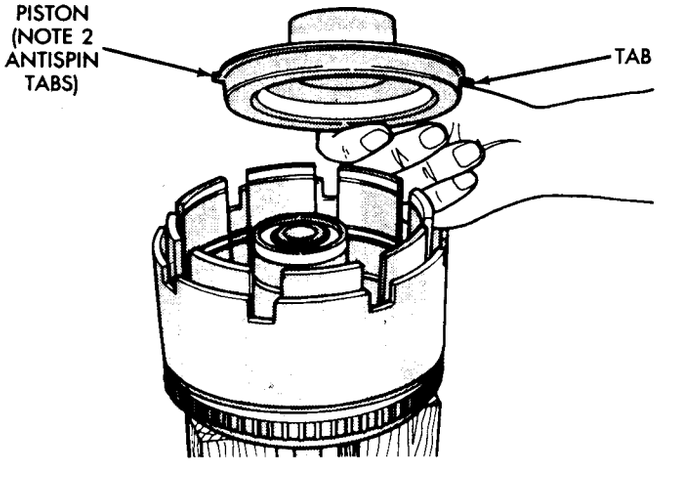


Fig. 22—Underdrive Clutch Piston

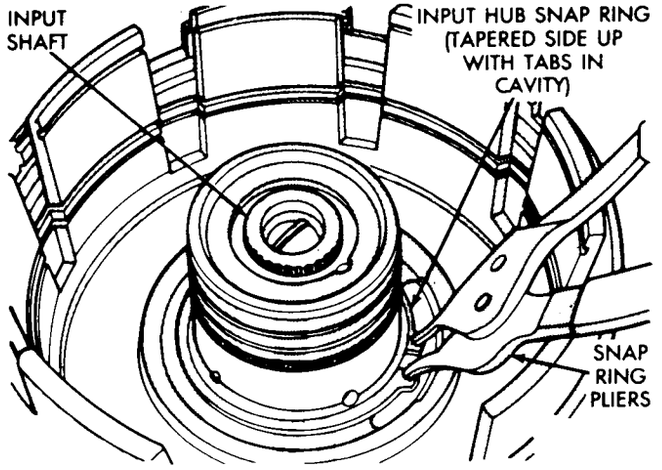


Fig. 23—Input Hub Tapered Snap Ring

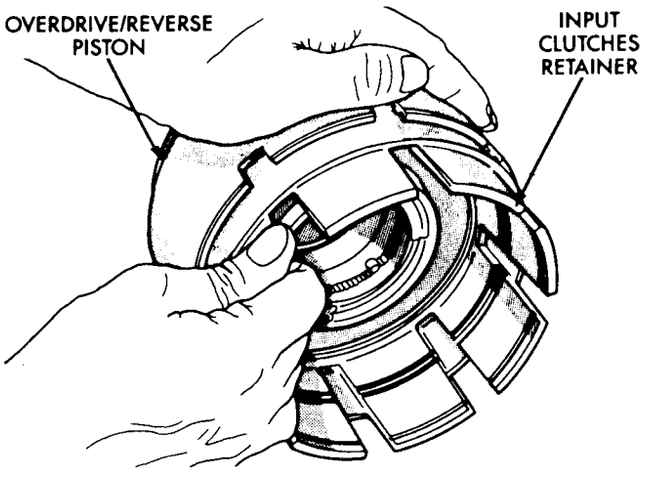


Fig. 26—Pull Retainer from Piston

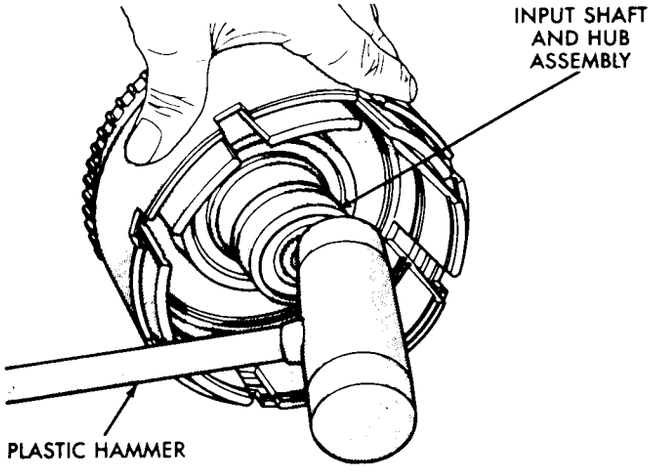


Fig. 24—Tap on Input Hub

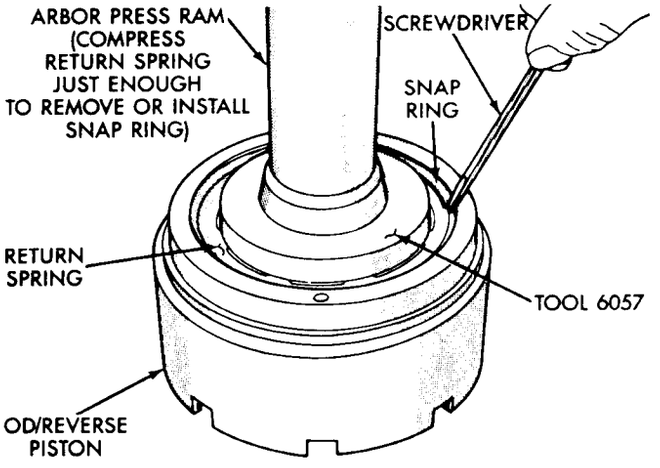


Fig. 27—Install Snap Ring

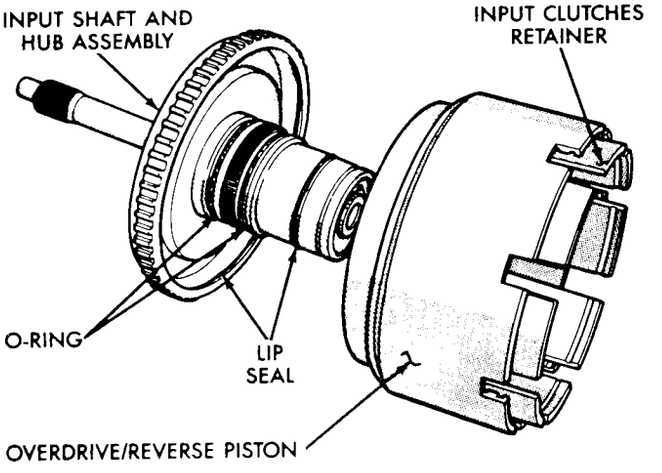


Fig. 25—Input Hub Removed

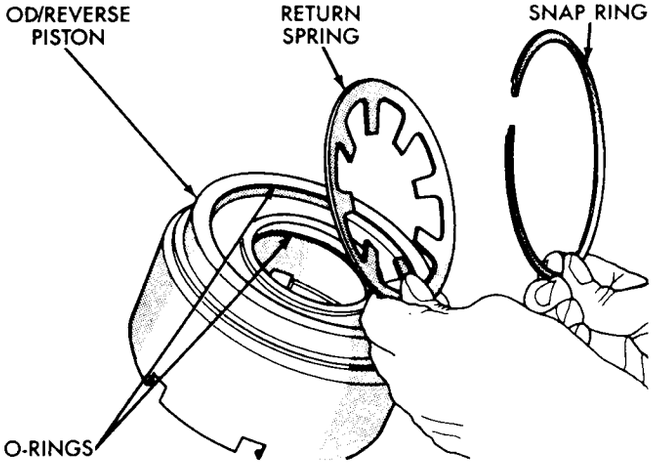


Fig. 28—Snap Ring and Return Spring

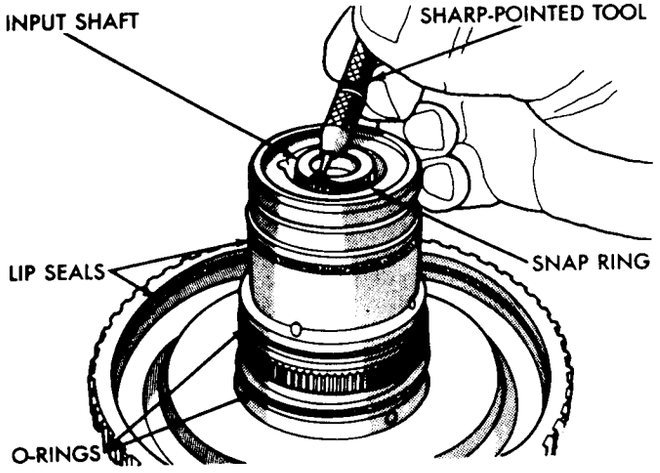


Fig. 29—Remove Input Shaft Snap Ring

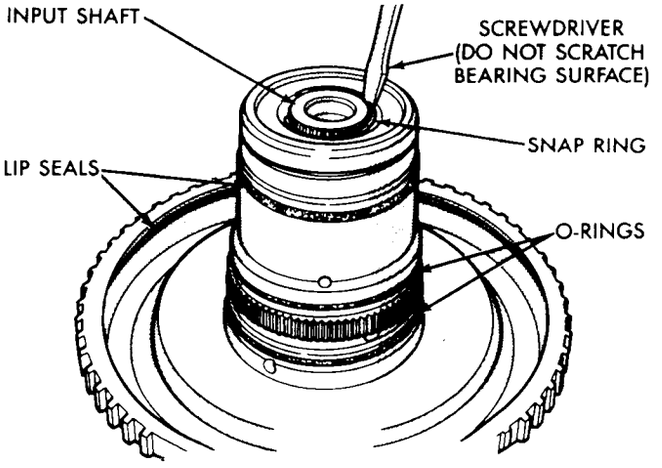


Fig. 2—Install Input Shaft Snap Ring

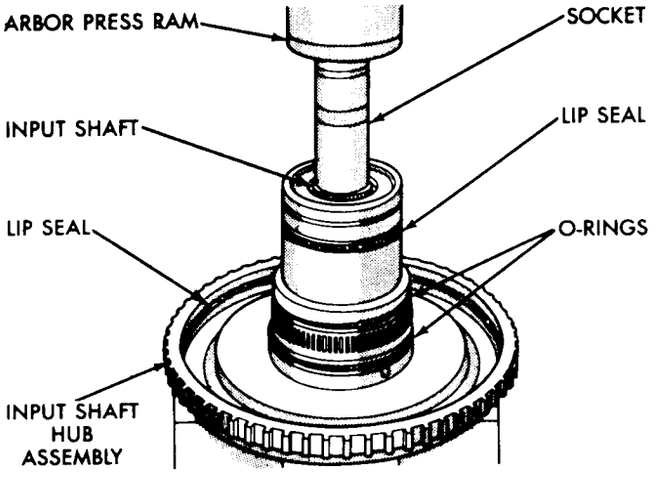


Fig. 30—Remove Input Shaft

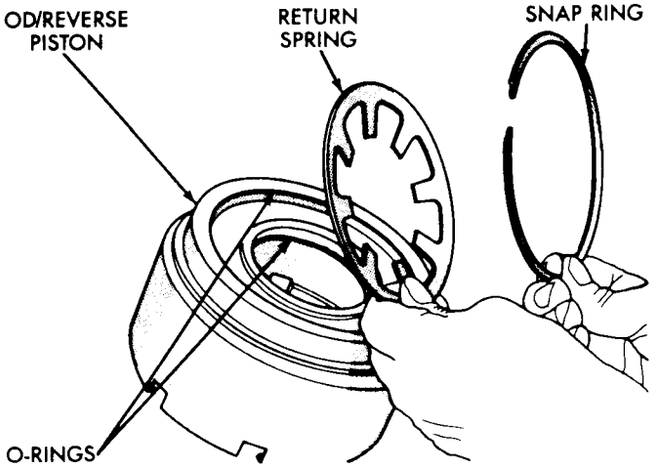


Fig. 3—Return Spring and Snap Ring

Assembly

Use petrolatum on all seals to ease assembly of components.

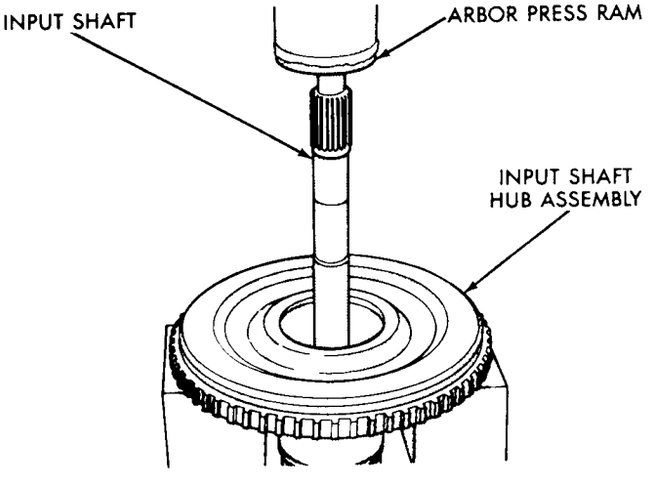


Fig. 1—Install Input Shaft

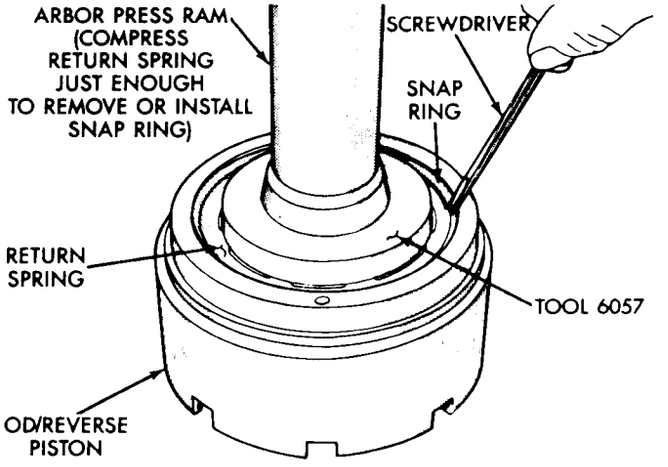


Fig. 4—Install Snap Ring

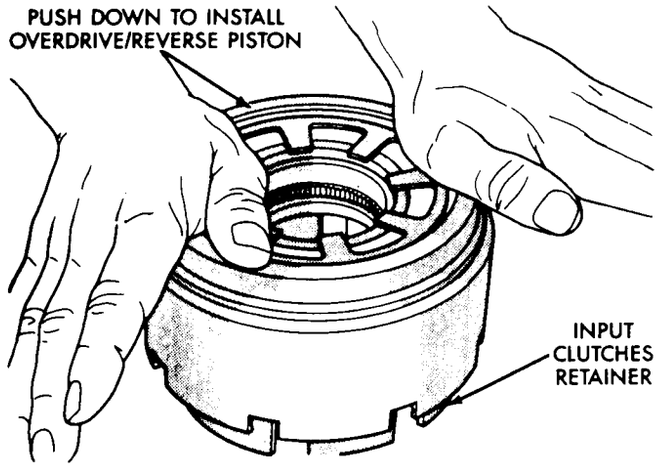


Fig. 5—Install OD/Reverse Piston

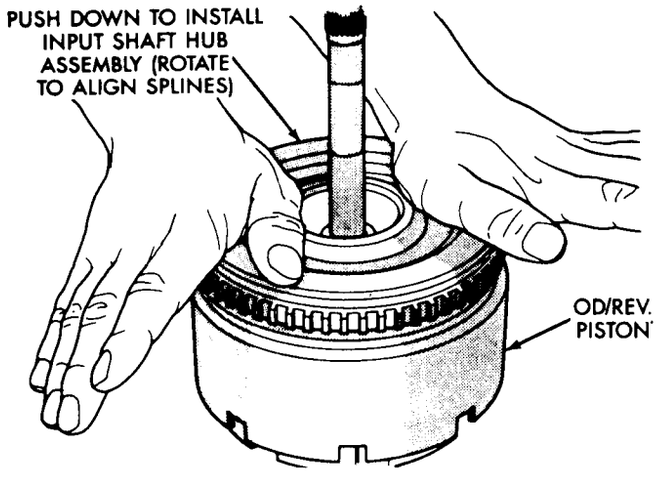


Fig. 6—Install Input Shaft Hub Assembly

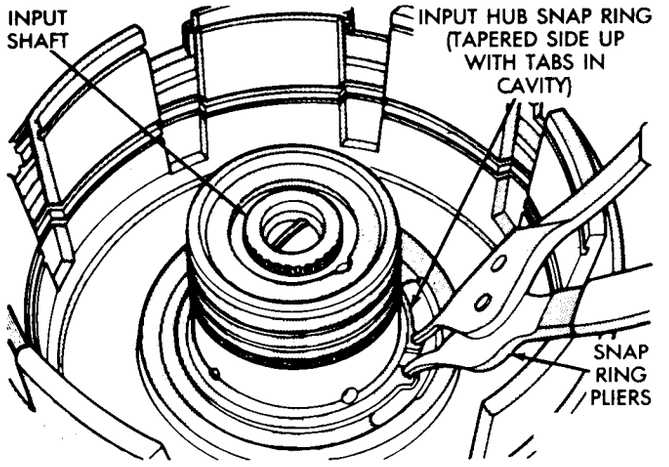


Fig. 7—Input Hub Tapered Snap Ring

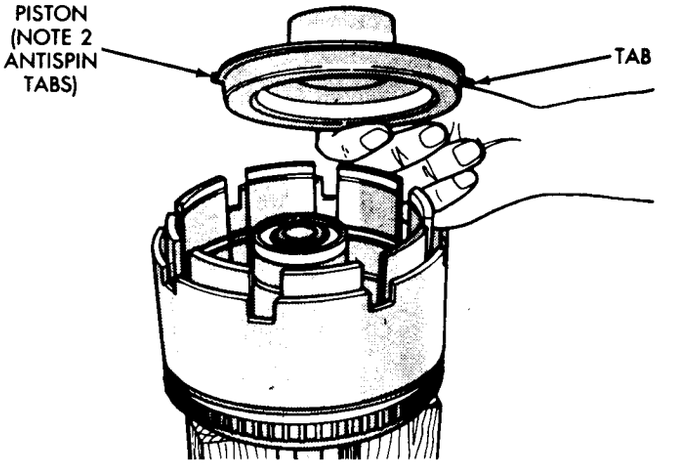


Fig. 8—Underdrive Clutch Piston

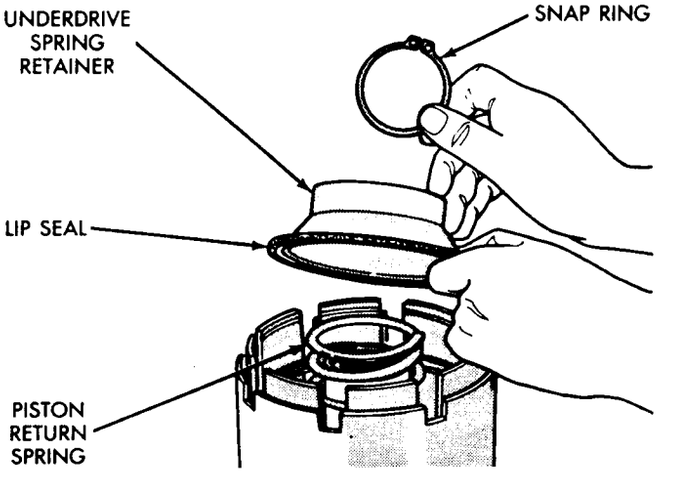


Fig. 9—UD Return Spring and Retainer

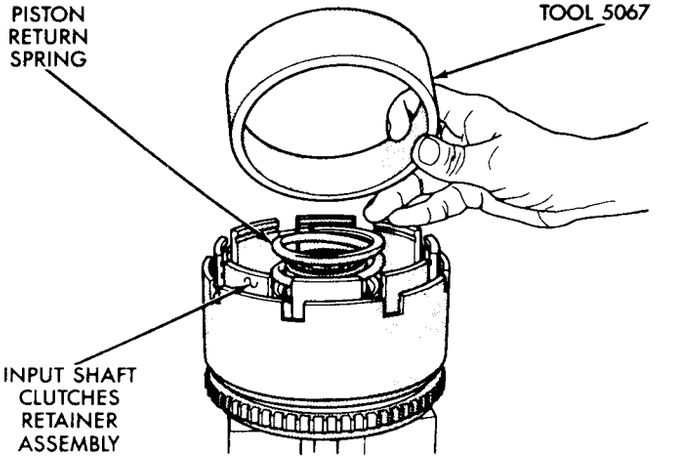


Fig. 10—Seal Compressor Tool 5067

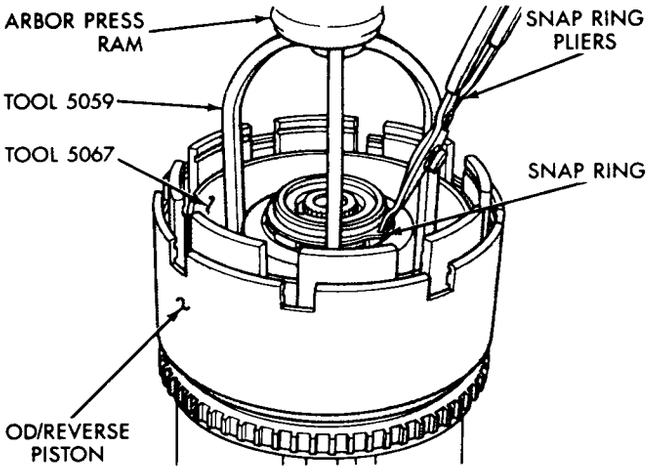


Fig. 11—Install UD Spring Retainer and Snap Ring

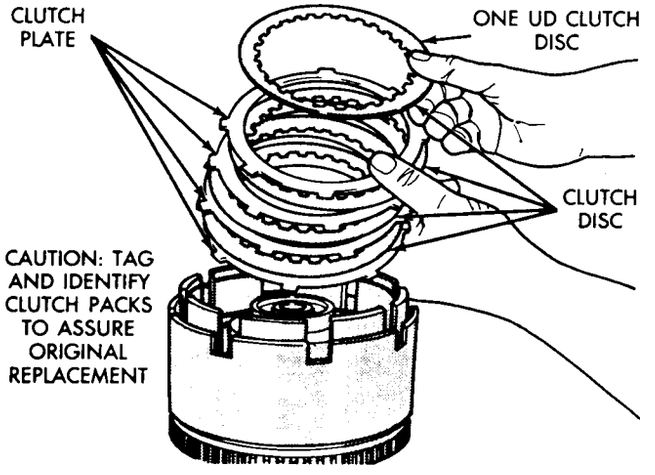


Fig. 12—Underdrive Clutch Pack

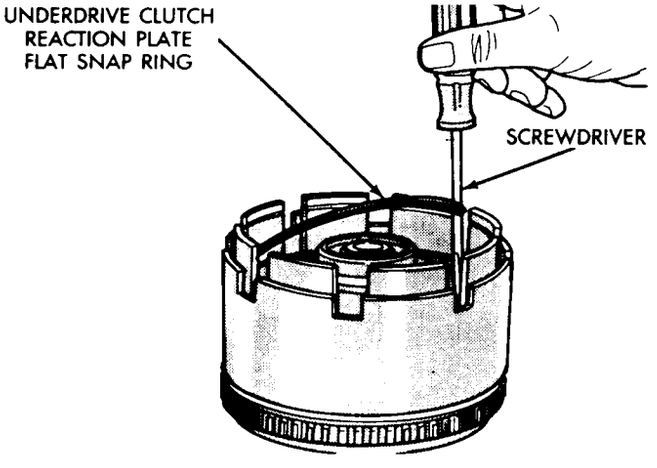


Fig. 13—UD Clutch Flat Snap Ring

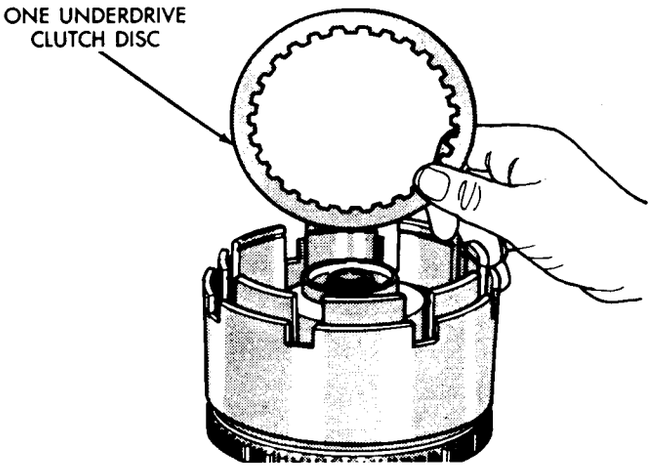


Fig. 14—Install Last UD Clutch Disc

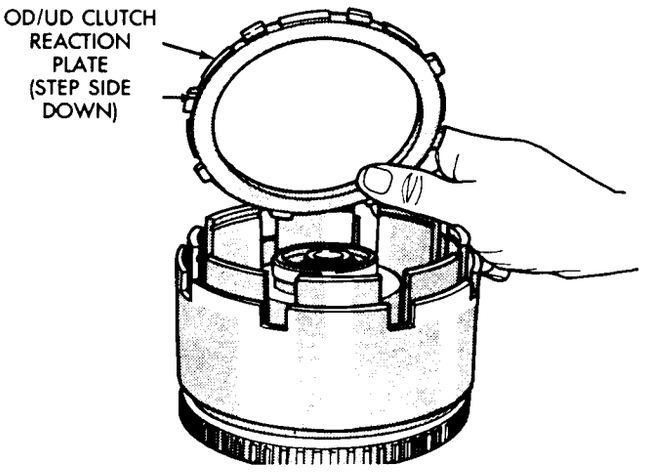


Fig. 15—OD/UD Reaction Plate

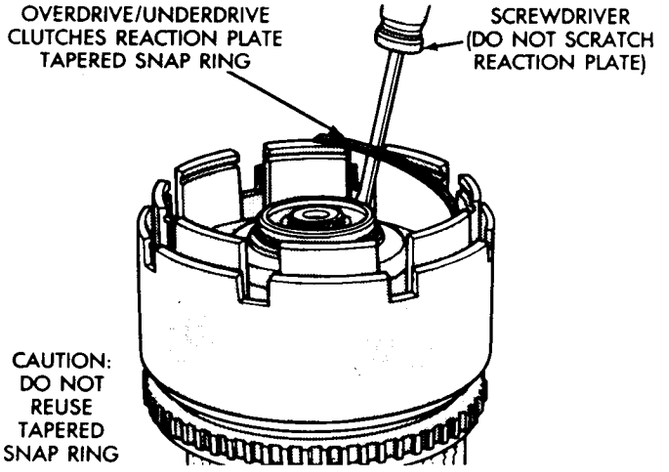


Fig. 16—Tapered Snap Ring

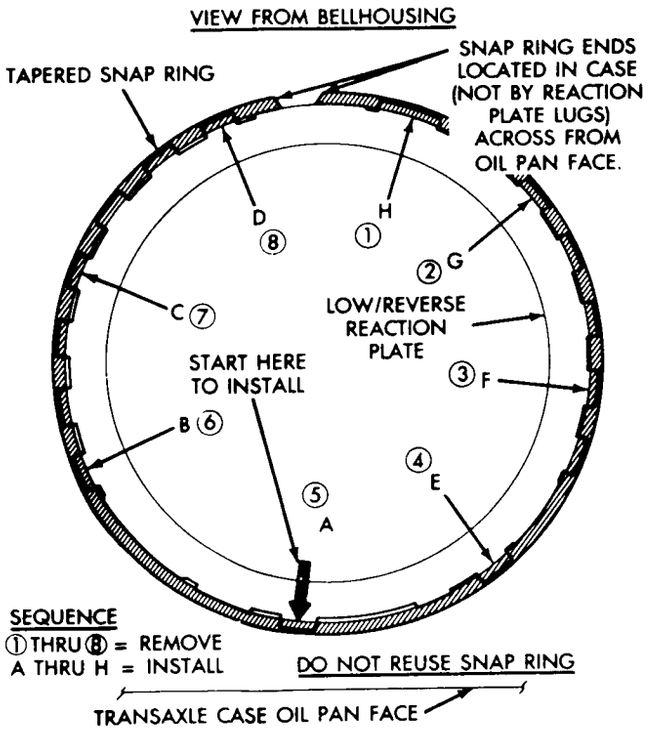


Fig. 17—Tapered Snap Ring Instructions

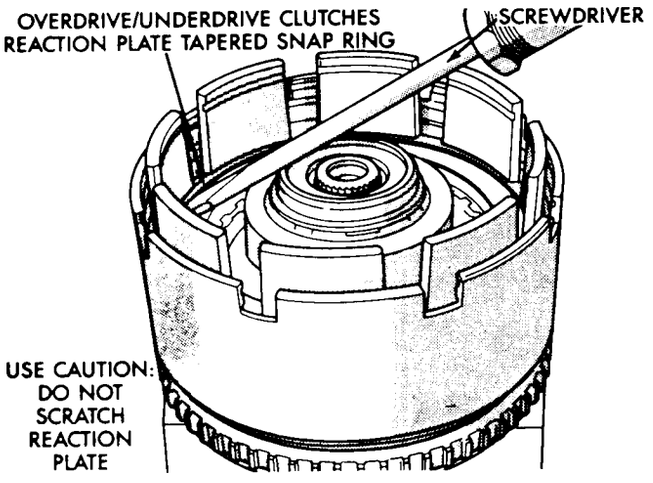


Fig. 18—Seating Tapered Snap Ring

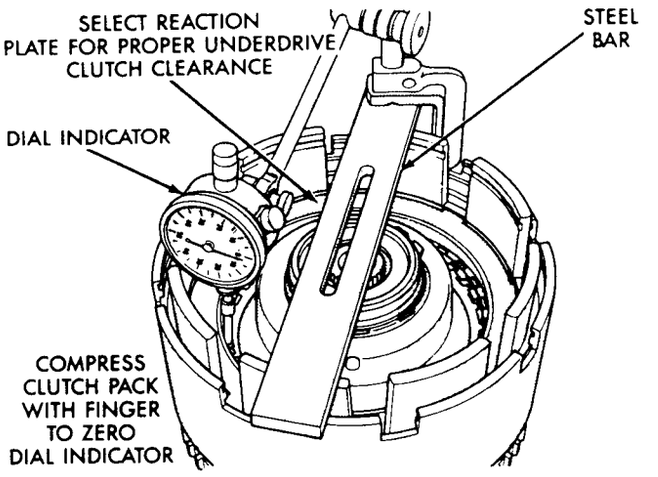


Fig. 19—Set Up Dial Indicator for Clutch Clearance

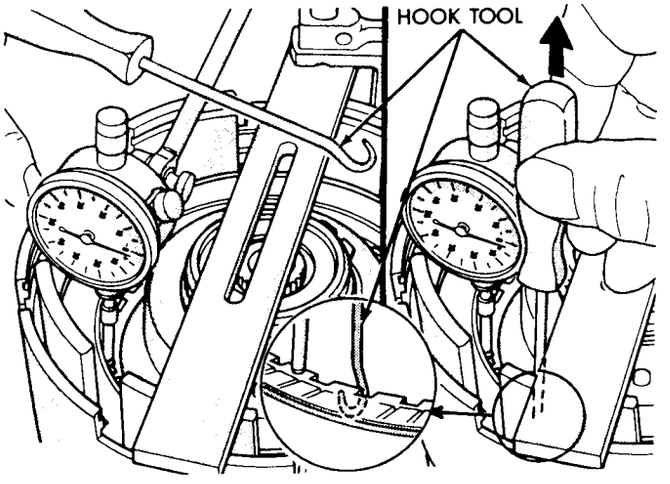


Fig. 20—Use Hook Tool to Raise One Clutch Disc

Underdrive clutch pack clearance must be 0.91 to 1.47mm (.036 to .058 inch). Select the proper reaction plate to achieve specifications:

PART NO.	THICKNESS
4377185	6.52 mm (.257 in.)
4377186	7.01 mm (.276 in.)
4377187	7.50 mm (.295 in.)
4377188	7.99 mm (.315 in.)

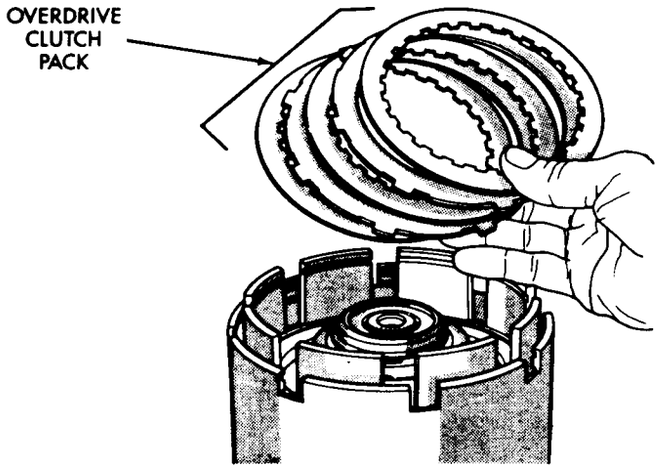


Fig. 21—Install OD Clutch Pack

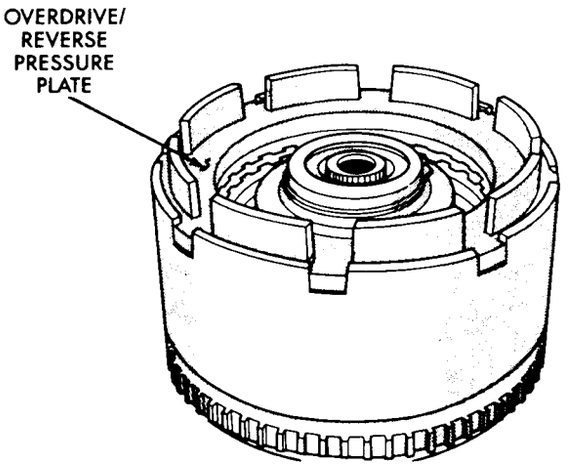


Fig. 24—Pressure Plate Installed

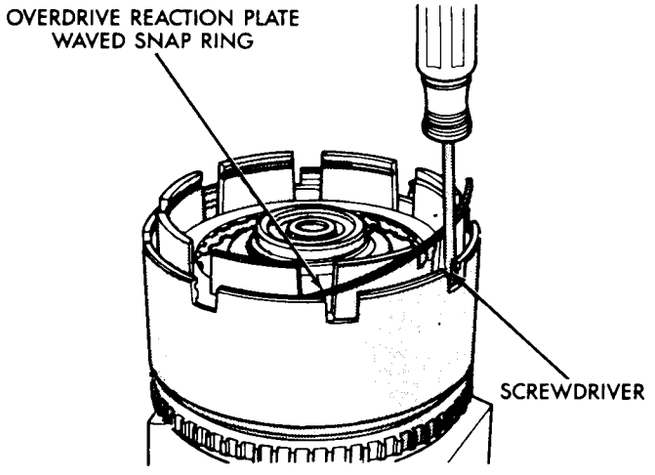


Fig. 22—Install Waved Snap Ring

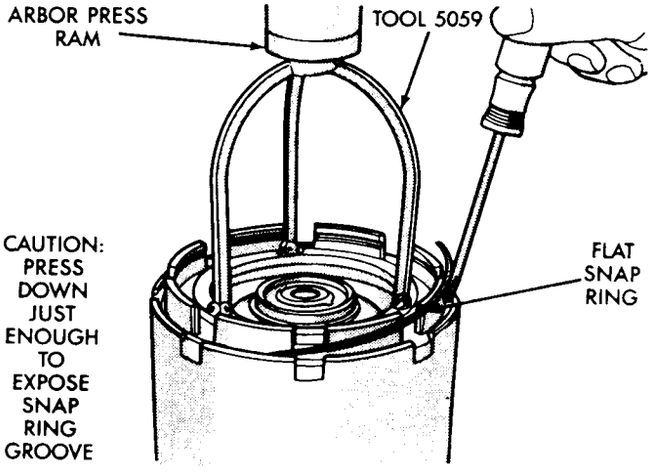


Fig. 25—Install Flat Snap Ring

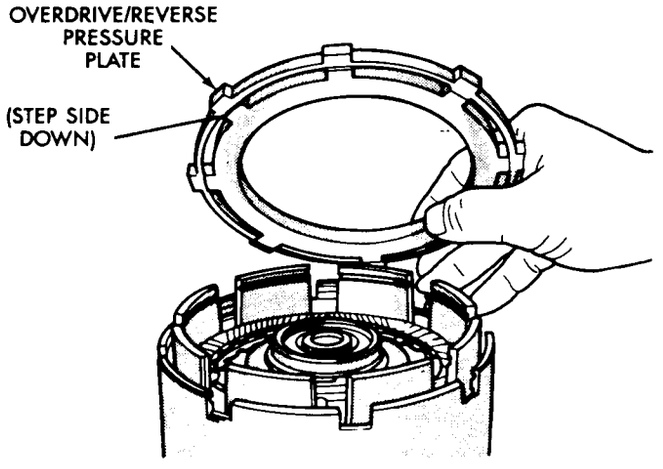


Fig. 23—OD/Reverse Pressure Plate

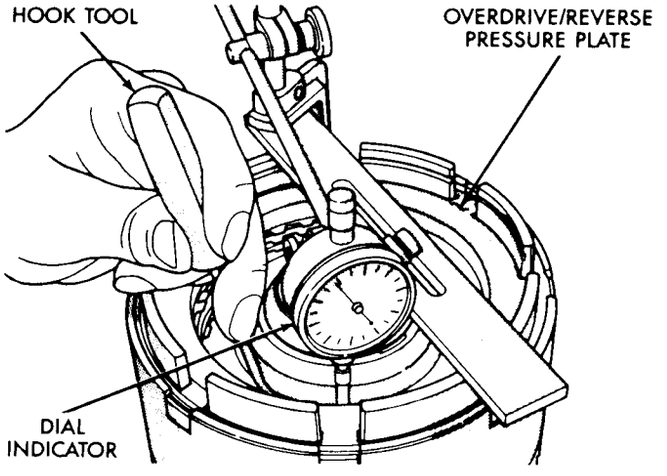


Fig. 26—Check OD Clutch Pack Clearance

The overdrive (OD) clutch pack clearance is .042 to .096 inch. If not within specifications, the clutch is not assembled properly. There is no adjustment for the OD clutch clearance.

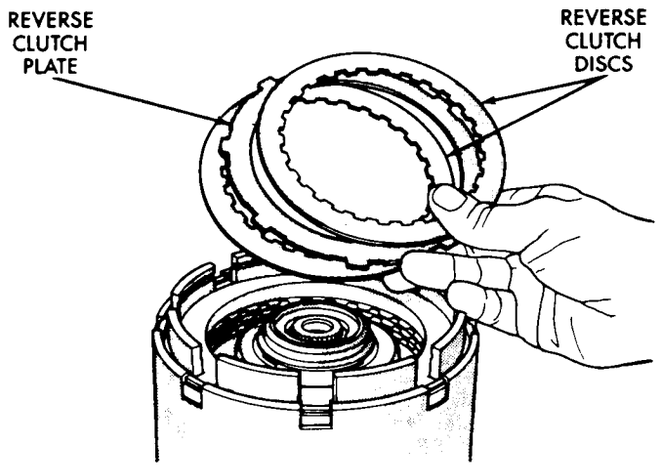


Fig. 27—Install Reverse Clutch Pack

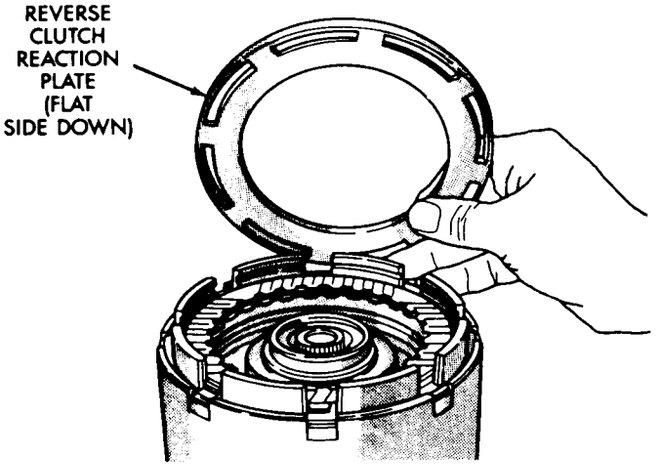


Fig. 28—Install Reaction Plate

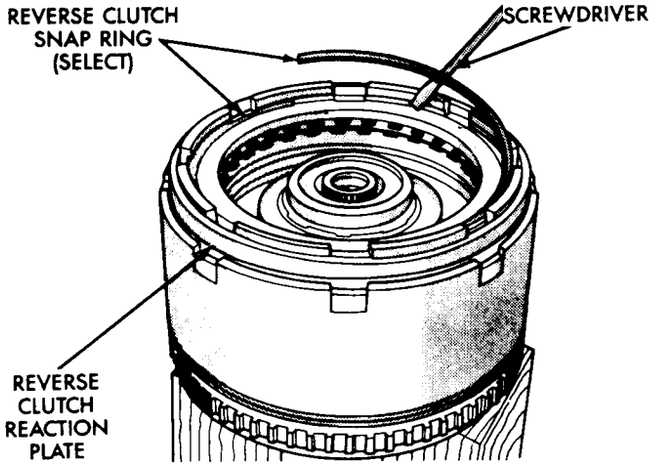


Fig. 29—Install Reverse Clutch Snap Ring

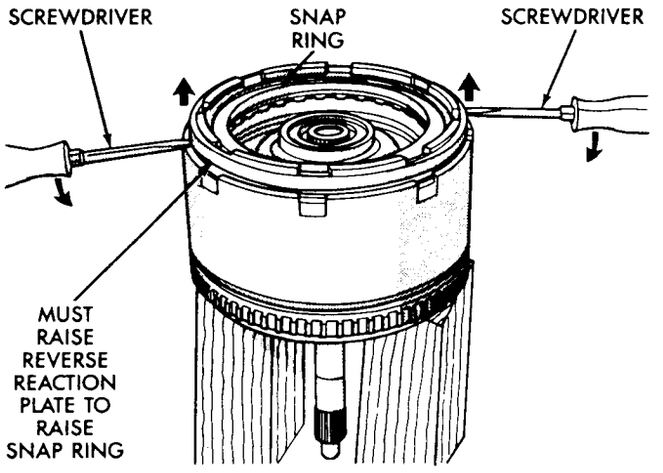


Fig. 30—Seating Snap Ring to Determine Reverse Clutch Clearance

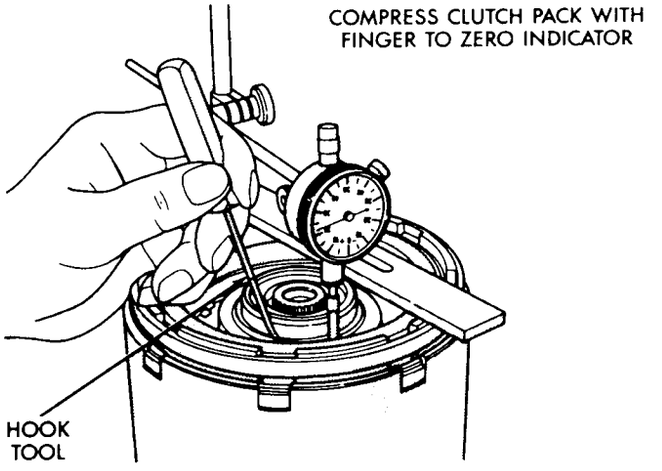


Fig. 31—Check Reverse Clutch Pack Clearance

The reverse clutch pack clearance is 0.76 to 0.99mm (.030 to .039 inch). Select the proper reverse clutch snap ring to achieve specifications:

PART NO.	THICKNESS
4377195	1.56 mm (.061 in.)
4412871	1.80 mm (.071 in.)
4412872	2.05 mm (.081 in.)
4412873	2.30 mm (.090 in.)

All clutch clearances in the input clutches retainer have been checked and approved.

To complete the assembly of the input clutches retainer, the reverse clutch and the overdrive clutch must now be removed from the retainer. **CAUTION: Do not intermix clutch parts. Keep in exact same order.**

Now proceed with the next phase of the assembly:

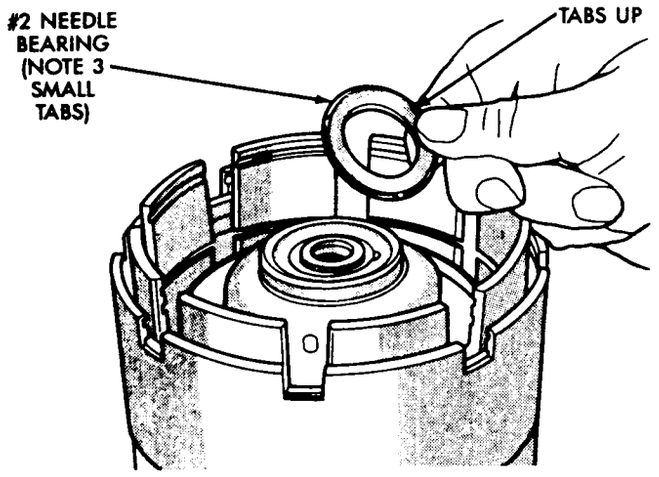


Fig. 32—Install #2 Needle Bearing

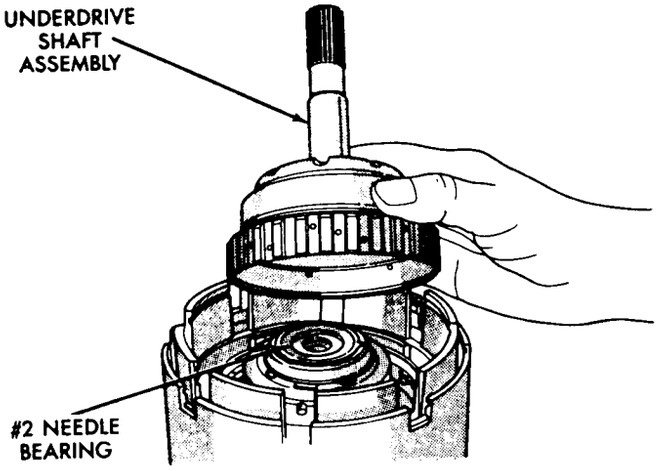


Fig. 33—Install Underdrive Shaft Assembly

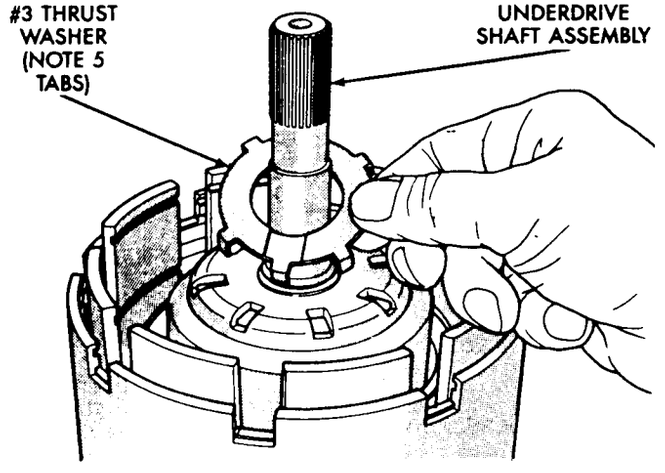


Fig. 34—Install #3 Thrust Washer

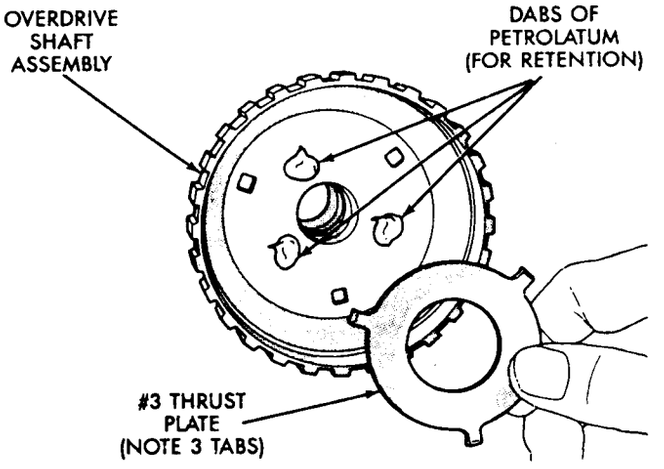


Fig. 35—Install #3 Thrust Plate

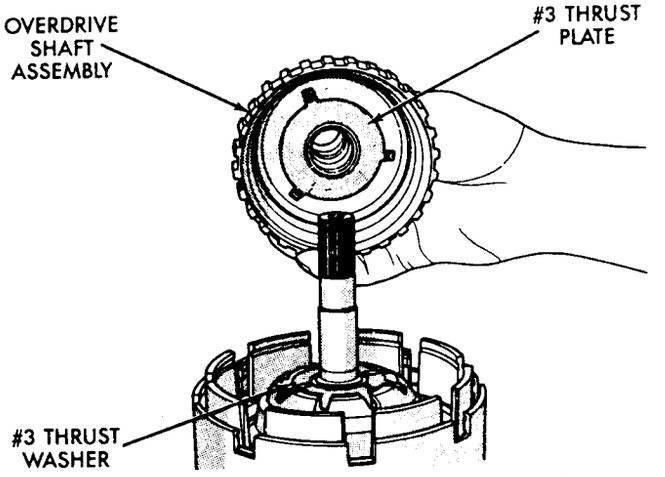


Fig. 36—Install Overdrive Shaft Assembly

Now that both shaft assemblies and thrust washers are properly installed, reinstall overdrive clutch and reverse clutch as shown in Figure 21 thru 29. **Rechecking these clutch clearances is not necessary, as they were set and approved previously.**

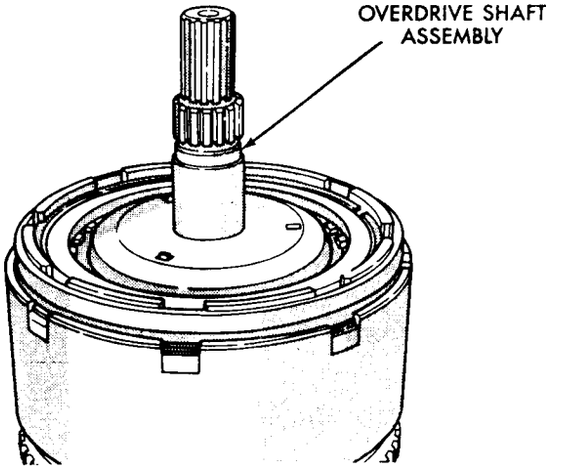


Fig. 37—Input Shaft Clutches Assembly

DIFFERENTIAL REPAIR

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

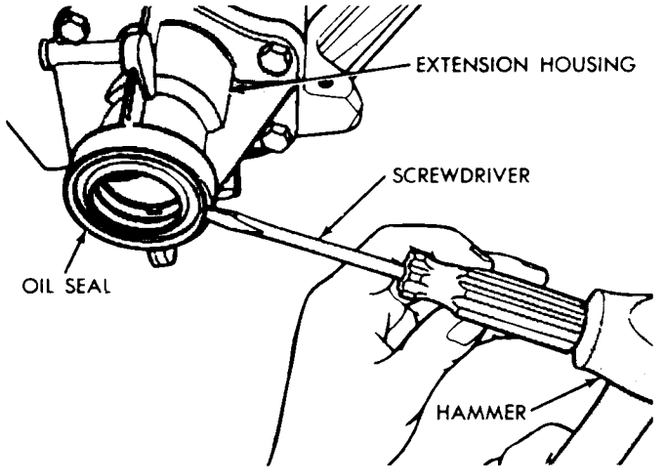


Fig. 1—Remove Extension Seal

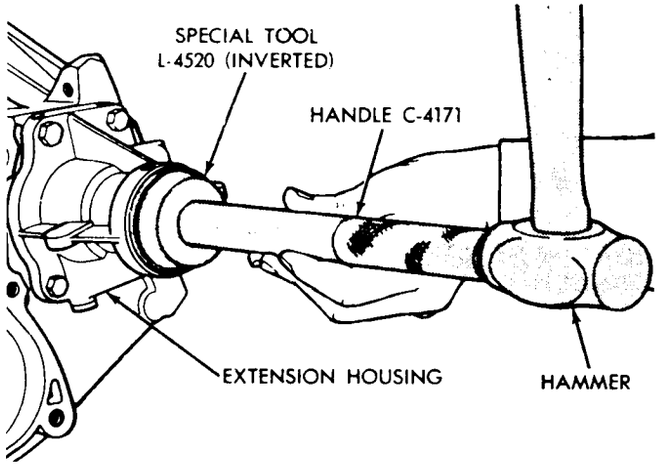


Fig. 2—Install New Seal Into Extension

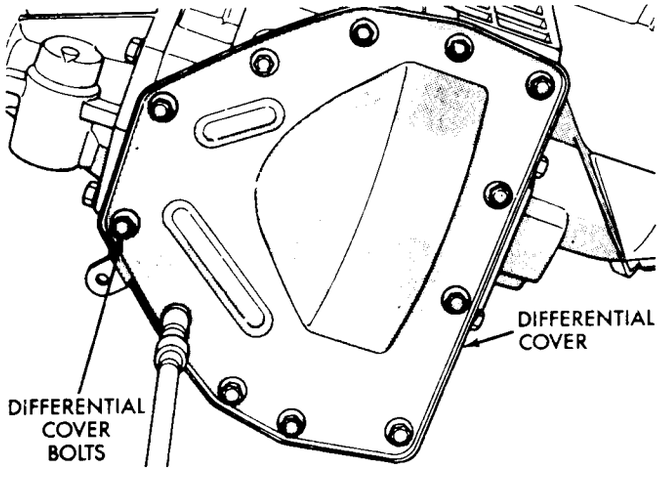


Fig. 3—Differential Cover Bolts

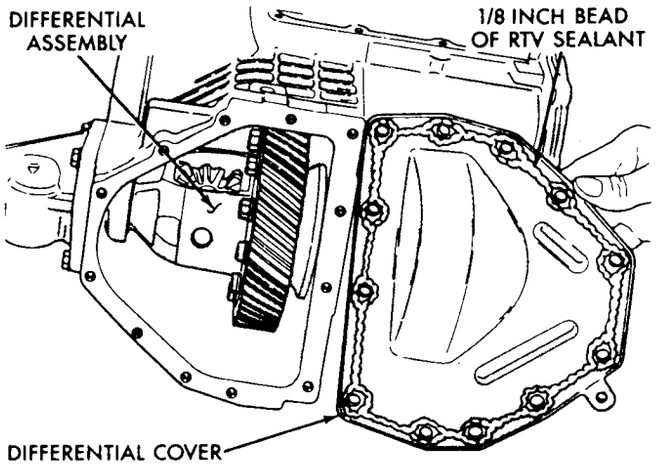


Fig. 4—Remove or Install Differential Cover

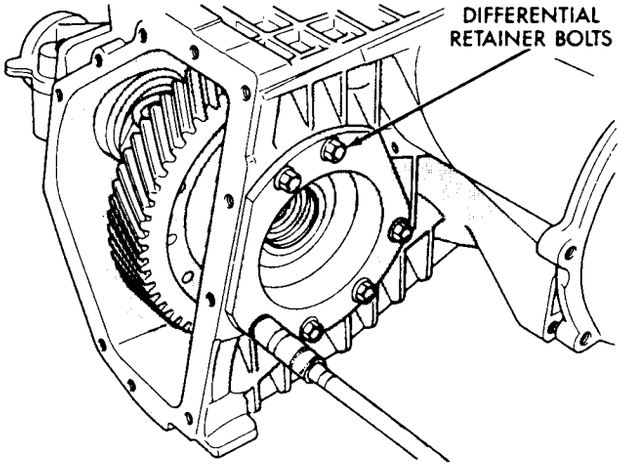


Fig. 5—Differential Retainer Bolts

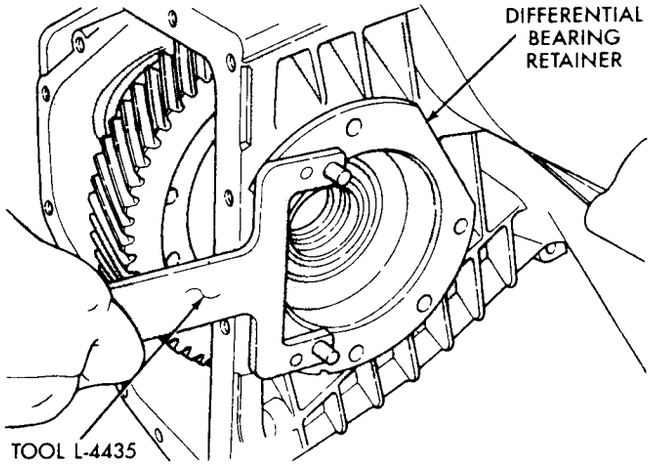


Fig. 6—Remove or Install Bearing Retainer

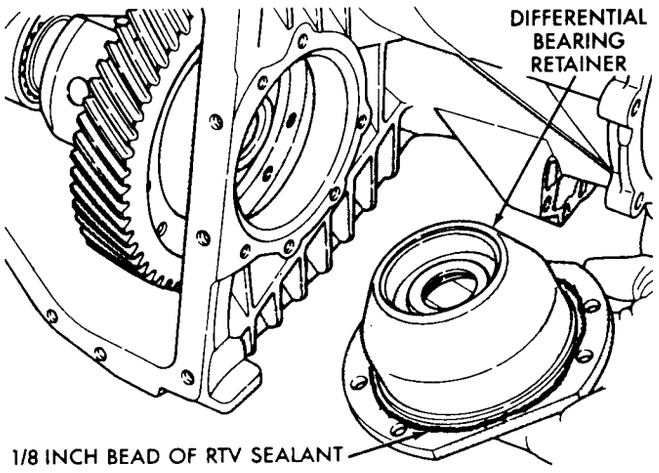


Fig. 7—Differential Bearing Retainer

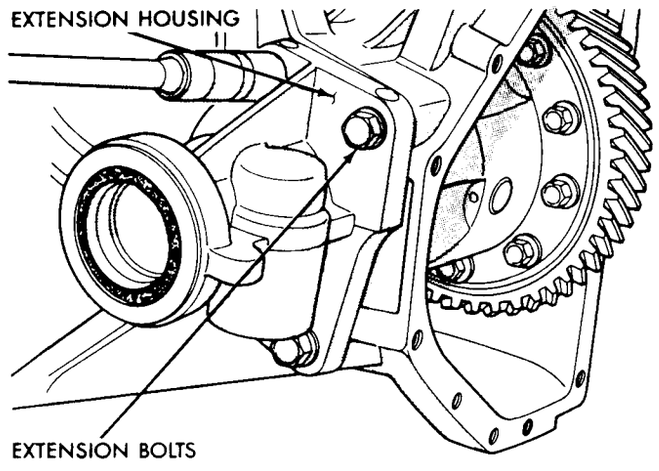


Fig. 8—Extension Bolts

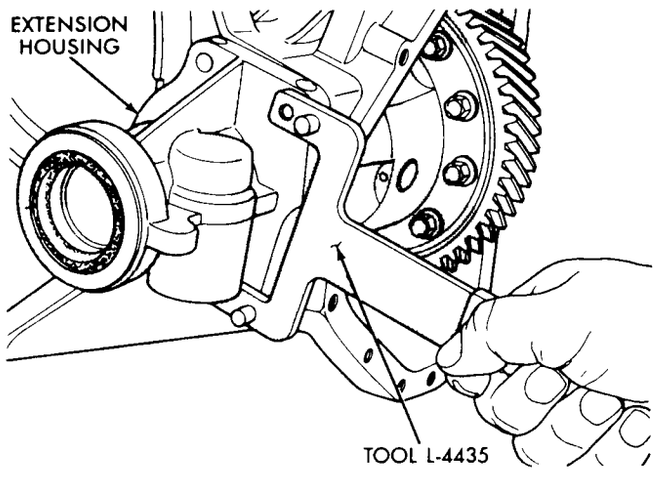


Fig. 9—Remove or Install Extension

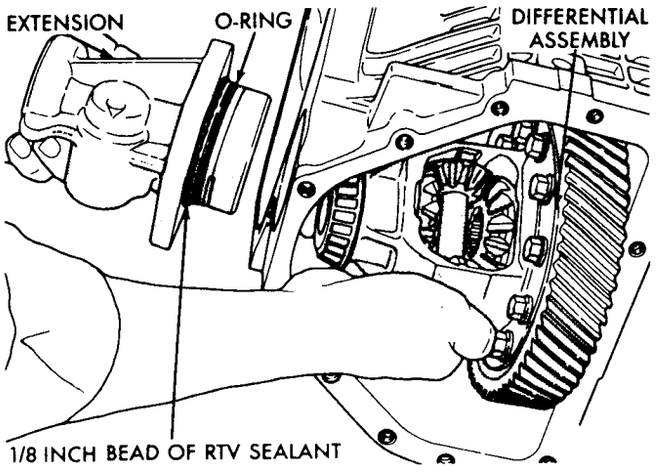


Fig. 10—Differential and Extension

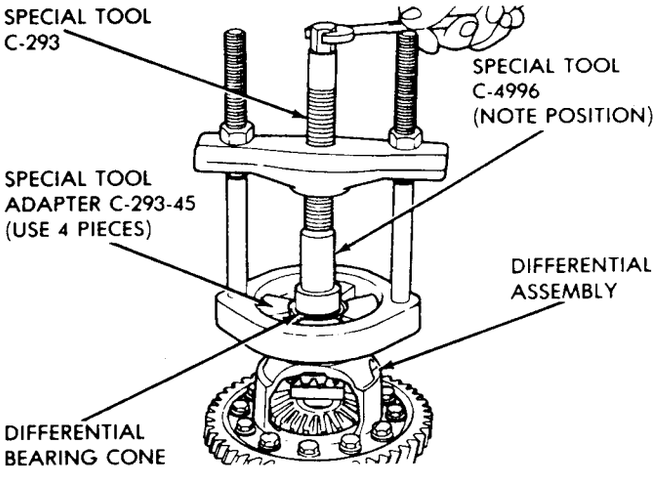


Fig. 11—Remove Differential Bearing Cone

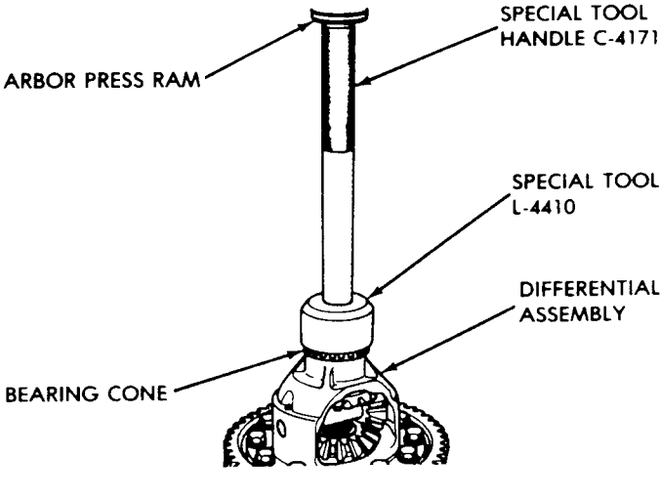


Fig. 12—Install Differential Bearing Cone

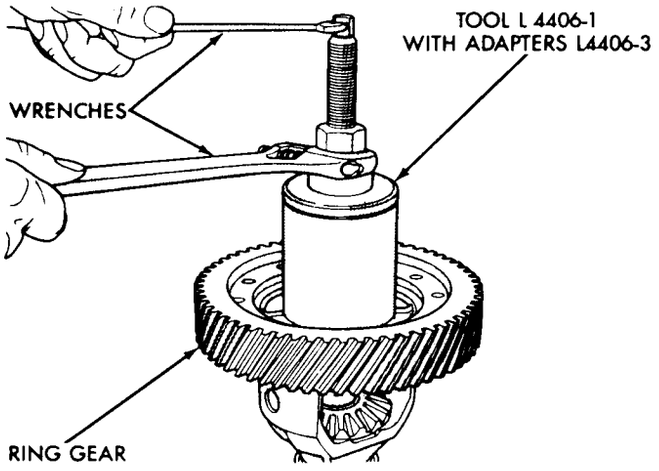


Fig. 13—Remove Differential Bearing Cone

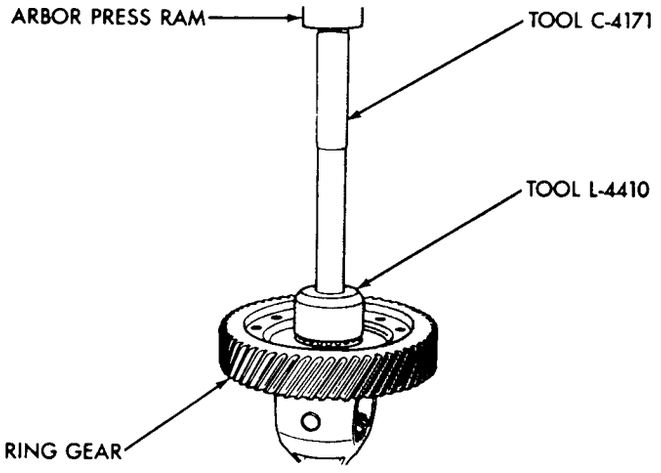


Fig. 14—Install Differential Bearing Cone

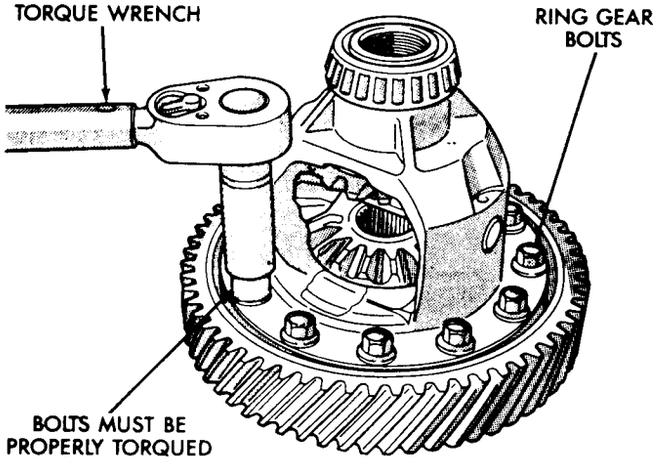


Fig. 15—Torque New Ring Gear Bolts to 95 N·m (70 Ft. Lbs.)

CAUTION: Always install NEW ring gear bolts. Bolts must be properly torqued.

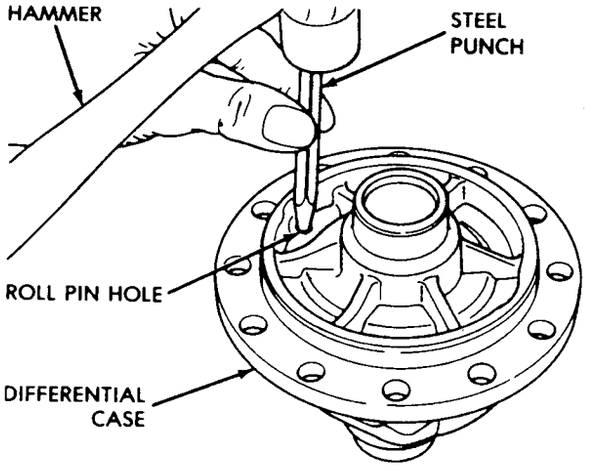


Fig. 16—Remove Pinion Shaft Roll Pin

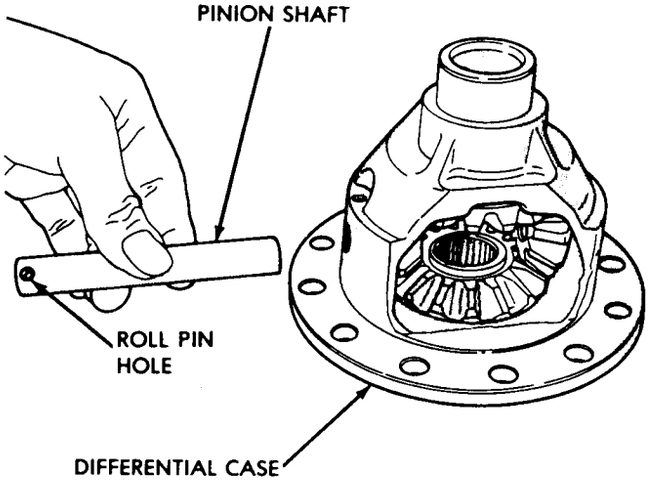


Fig. 17—Remove or Install Pinion Shaft

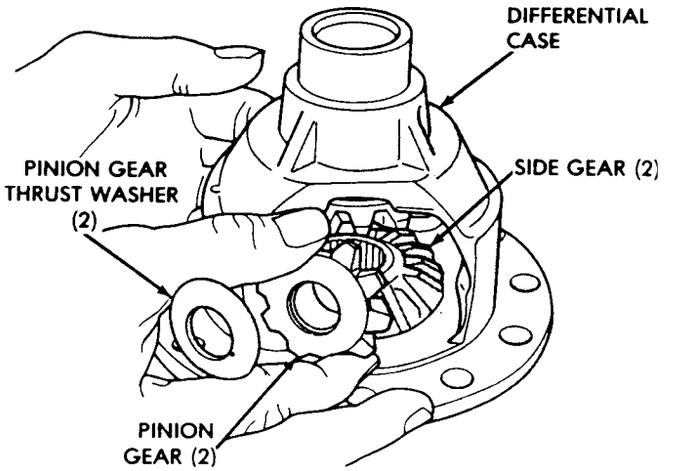


Fig. 18—Remove or Install Pinion Gears, Side Gears, and Tabbed Thrust Washers, by Rotating Pinion Gears to Opening in Differential Case

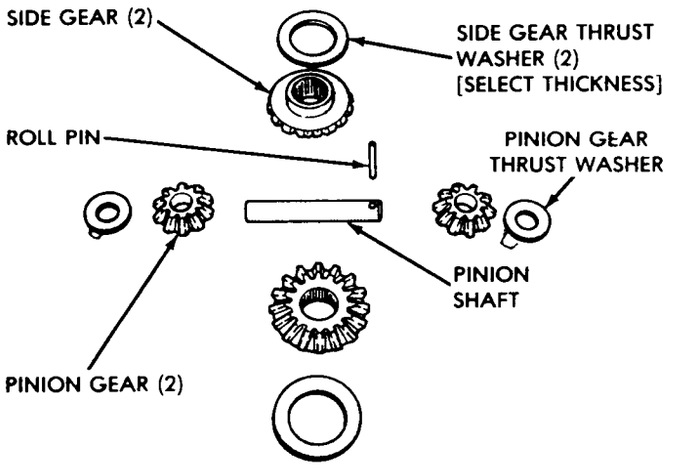


Fig. 19—Differential Gears

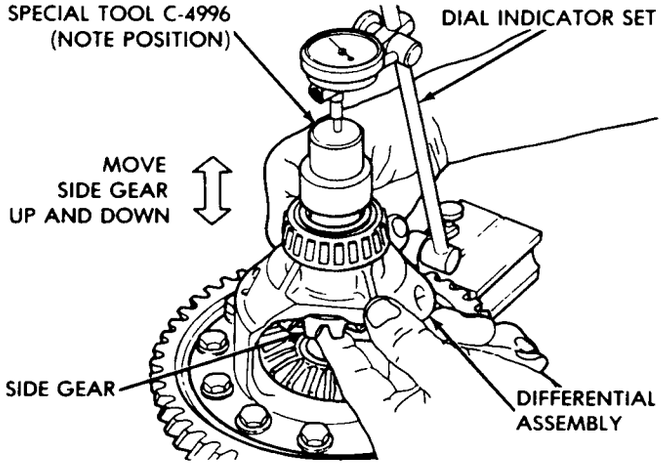


Fig. 20—Checking Side Gear End Play

CAUTION: Side gear end play must be within .001 to .013 inch.

4 select thrust washers are available: .032, .037, .042, and .047 inch.

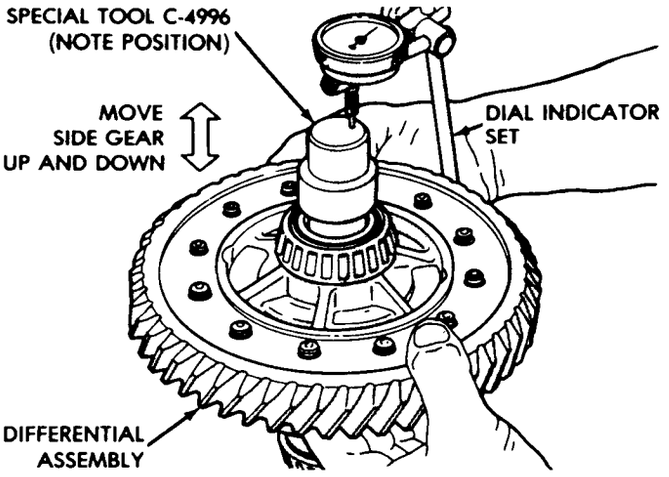


Fig. 21—Checking Side Gear End Play

CAUTION: Side gear end play must be within .001 to .013 inch.

4 select thrust washers are available: .032, .037, .042, and .047 inch.

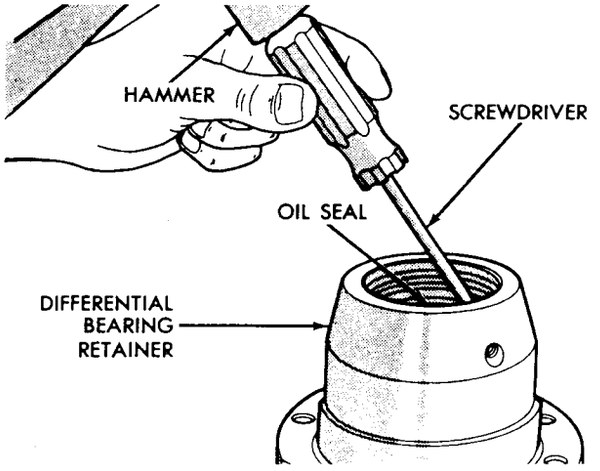


Fig. 22—Remove Oil Seal

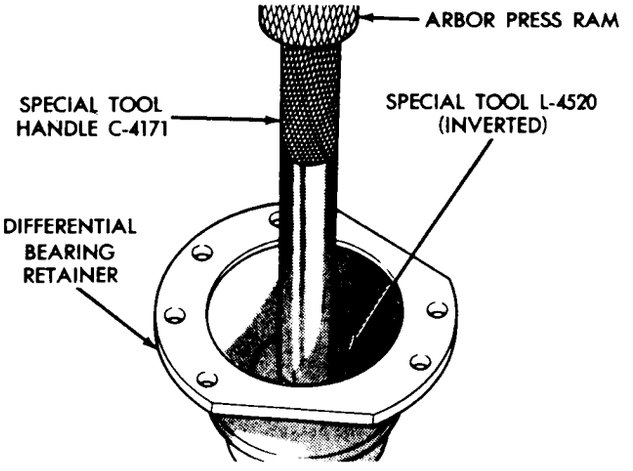


Fig. 23—Install New Oil Seal

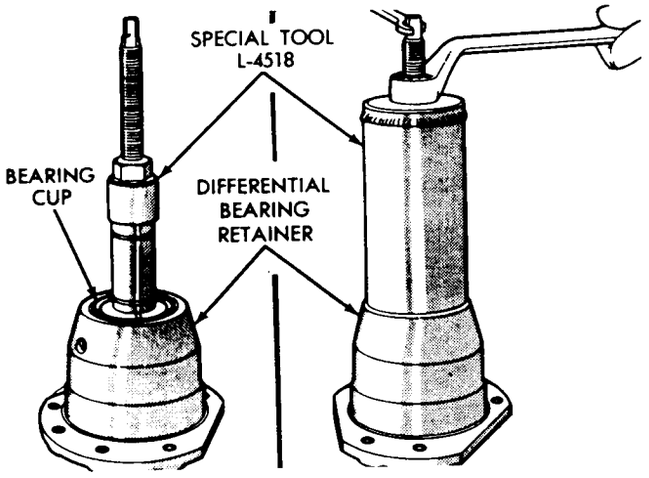


Fig. 24—Remove Bearing Cup

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.

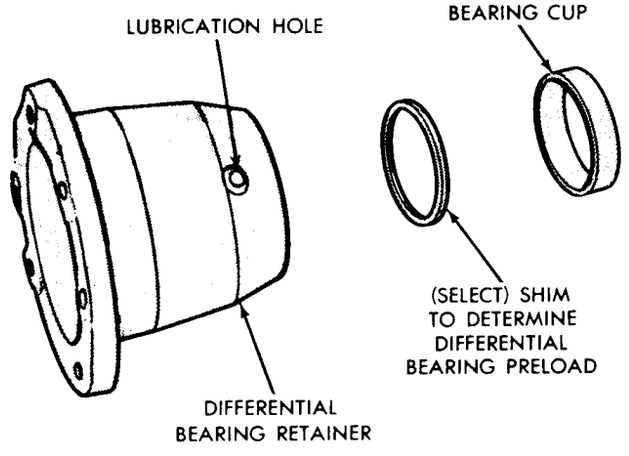


Fig. 25—Differential Bearing Retainer

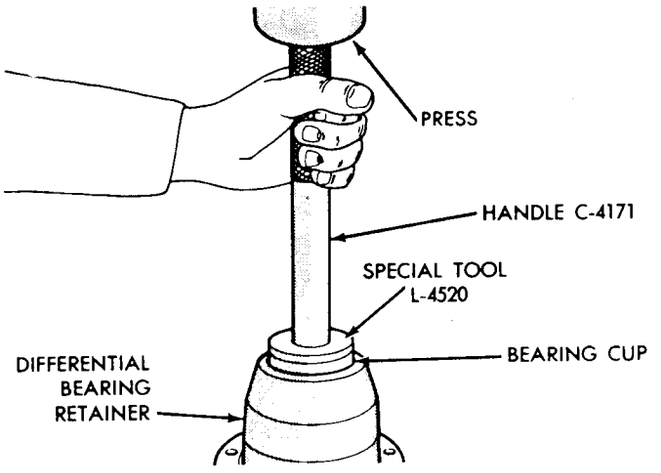


Fig. 26—Install Bearing Cup

When rebuilding, reverse the above procedure.

Remove old RTV before applying new RTV Sealant. Use RTV Sealant on retainer to seal retainer to case.

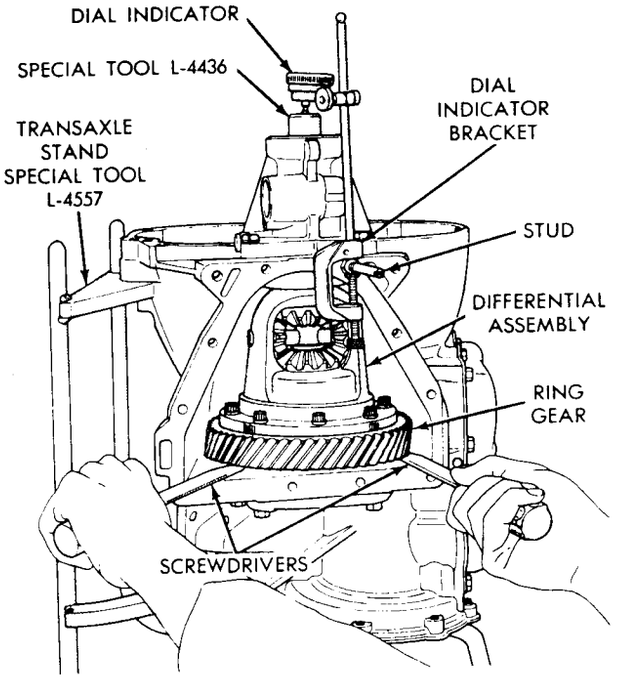


Fig. 27—Checking Differential End Play

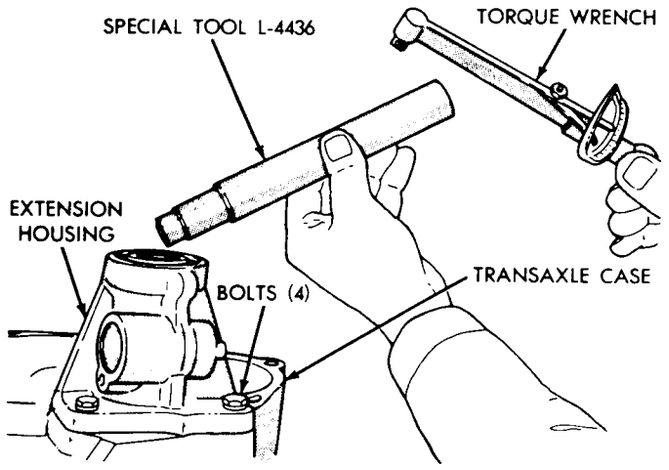


Fig. 28—Tool L-4436 and Torque Wrench

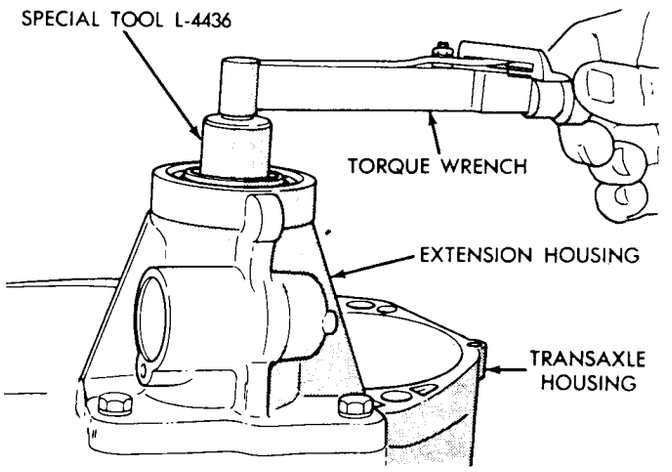


Fig. 29—Checking Differential Bearings Turning Torque

BEARING ADJUSTMENT PROCEDURES

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.

OUTPUT GEAR BEARINGS

The output gear tapered roller bearings must have a preload of .02 to .05 millimeter **(.0008 to .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.

DIFFERENTIAL BEARING SHIM CHART

End Play (with .50mm 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

(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 L-4436 into the extension.

(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.

(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 special Tool L-4436 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

The transfer shaft must have end play of .05 to .10 millimeter **(.002 to .004 inch).**

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	5.3086
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 3-SPEED 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:		
except fleet	8.4 Liters	8.9 qts.
fleet only	8.7 Liters	9.2 qts.
Use MOPAR ATF Automatic Transmission Fluid Type 7176 (or DEXRON II)		
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

Pump Clearances:	(Millimeter)	(Inch)
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....	.67-1.10	.026-.043
	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.)	2-1/2 Turns
Low-Reverse	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-.07 Preload	.0-.0028 Preload
Transfer Shaft	.05-.25 End Play	.002-.010 End Play
Differential	.15-.29 Preload	.006-.012 Preload

SPECIFICATIONS
A-604 4-SPEED AUTOMATIC TRANSAXLE

Type	Fully-adaptive, electronically-controlled, four-speed automatic with torque converter and integral differential	
Torque Converter Diameter	241 millimeters (9.48 inches)	
Oil Capacity—Transaxle and Torque Converter	8.6 Liters (18.25 pints)	
Oil Type	MOPAR ATF Type 7176 (or DEXRON II)	
Cooling Method	Water heat exchanger and/or air-to-oil heat exchanger	
Lubrication	Pump (internal-external gear type)	
Gear Ratios:		
Transmission portion:		
First	2.84	
Second	1.57	
Direct	1.00	
Overdrive	.69	
Reverse	2.21	
Overall Top Gear Ratio:		
(in overdrive)	2.36	
Pump Clearances:	(same as A-413 automatic transaxle)	
Tapered Roller Bearing Settings:	**(Millimeter)**	**(Inch)**
Output Gear	.02-.05 Preload	.0008-.002 Preload
Transfer Shaft	.05-.10 End Play	.002-.004 End play
Differential	.15-.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 and Construction	Pinion Teeth and Color
P185 75 R14	19 Yellow
P195 75 R14	19 Yellow
P205 70 R14	19 Yellow
P205 60 R15	19 Yellow
P195 70 R14	19 Yellow
All other original equipment tires	20 Blue

A-525/A-520/A-555 MANUAL TRANSAXLE FLUID FILL

Fill All Manual Transaxles with SAE 5W-30 Engine oil to bottom of fill hole in end cover:

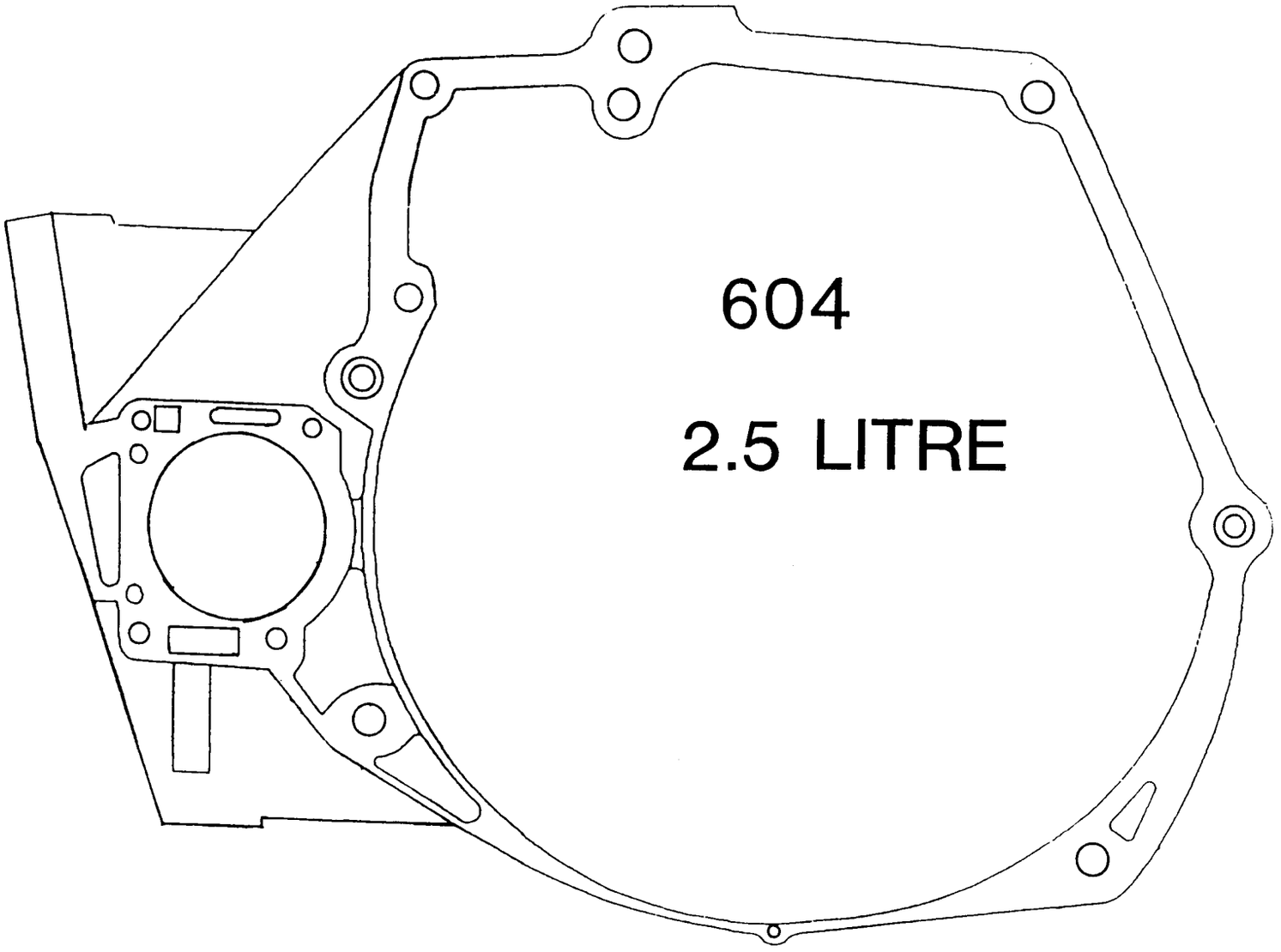
Transaxle	Metric Measure	U.S. Measure
A-525	2.1 Liters	2.3 Quarts
A-520/A-555	2.3 Liters	2.5 Quarts

TIGHTENING REFERENCE

Item	Qty.	Thread Size	Torque		
			Newton-meters	Inch-Pounds	Foot-Pounds
A-413 Automatic Transaxle:					
Bolt—Bell Housing Cover	3	9.8-M6-1-10	12	105	—
Bolt—Flex Plate to Crank	8	M10×1.5×18	95	—	70
Bolt—Flex Plate to Torque Converter	4	10.9-M10×1.5×13.2	74	—	55
Screw Assy. Transaxle to Cyl. Block	3	9.8A-M12-1.75-65	95	—	70
Screw Assy. Lower Bell Housing Cover	3	9.8-M6-1-10	12	105	—
Screw Assy. Manual Control Lever	1	9.8A-M6-1-35	12	105	—
Screw Assy. Speedometer to Extension	1	9.8A-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 Screw	12	12.9-M10-1.5-25	95	—	70
Bolt, Extension to Case	4	9.8-M8-1.25-28	28	250	—
Bolt, Differential Bearing Retainer to Case	6	9.8-M8-1.25-28	28	250	—
Screw Assy. Differential Cover to Case	10	9.8-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	9.8-M5-0.8-20	7	60	—
Bolt, Gov to Support	1	9.8-M5-0.8-30	7	60	—
Screw Assy., Governor Counterweight	1	M8-1.25-35	28	250	—
Screw Assy., Rear Cover to Case	10	9.8-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	9.8-M8-1.25-19	28	250	—
Bolt Assy., Pump to Case	7	10.9-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	9.8-M8-1.25-23	28	250	—
Screw Assy., Valve Body	16	9.8A-M5-0.8-11	5	40	—
Screw Assy., Transfer Plate	16	9.8A-M5-0.8-25	5	40	—
Screw Assy., Filter	2	9.8A-M5-0.8-30	5	40	—
Screw, Transfer Plate to Case	7	9.8-M6-1-30	12	105	—
Screw Assy., Oil Pan to Case	14	9.8-M8-1.25-16	19	165	—
Nut, Reverse Band Adjusting Lock	1	M8-1.25	14	120	—

TIGHTENING REFERENCE

Item	Thread Size	Torque		
		Newton-meters	Inch-Pounds	Foot-Pounds
A604 Electronic Automatic Transaxle:				
Cooler Line Fittings	1/8 × 27 NPT	12	110	—
Differential Cover	M8 × 1.25	19	165	—
Differential Ring Gear	M10 × 1.0 × 25	95	—	70
Differential Bearing Retainer	M8 × 1.25 × 23	28	—	21
Rear End Cover	M8 × 1.25	19	—	14
Extension Housing	M8 × 1.25 × 33	28	—	21
Input Speed Sensor	M22 × 1.5	27	—	20
L/R Clutch Retainer	M5 × 0.8	5	40	—
Neutral Safety Switch	3/4 IN. × 16	34	—	25
Oil Pan to Case	M8 × 1.25	19	—	14
Output Gear Bolt (1.5 inch hex)	M18 × 1.75	271	—	200
Output Speed Sensor	M24 × 2	27	—	20
Pressure Taps	1/16 – 27 NPTF	5	45	—
PRNDL Switch	M22 × 2.5	34	—	25
Pump to Case	M8 × 1.25	22	—	23
Reaction Shaft to Pump	M8 × 1.25	22	—	23
Solenoid Assy. to Case	M6 × 1.0 × 93.5	12	105	—
Transfer Plate to Case	M6 × 1.0	12	105	—
Transfer Gear Nut (1.25 inch hex)	M22 × 1.5	271	—	200
Valve Body & Transfer Plate	M5 × 0.8	5	40	—
Vent Assembly	1/8 PIPE	12	110	—
8-Way Solenoid Connector	M6 × 1.0	4	38	—
60-Way EATX Connector	M6 × 1.0	4	38	—



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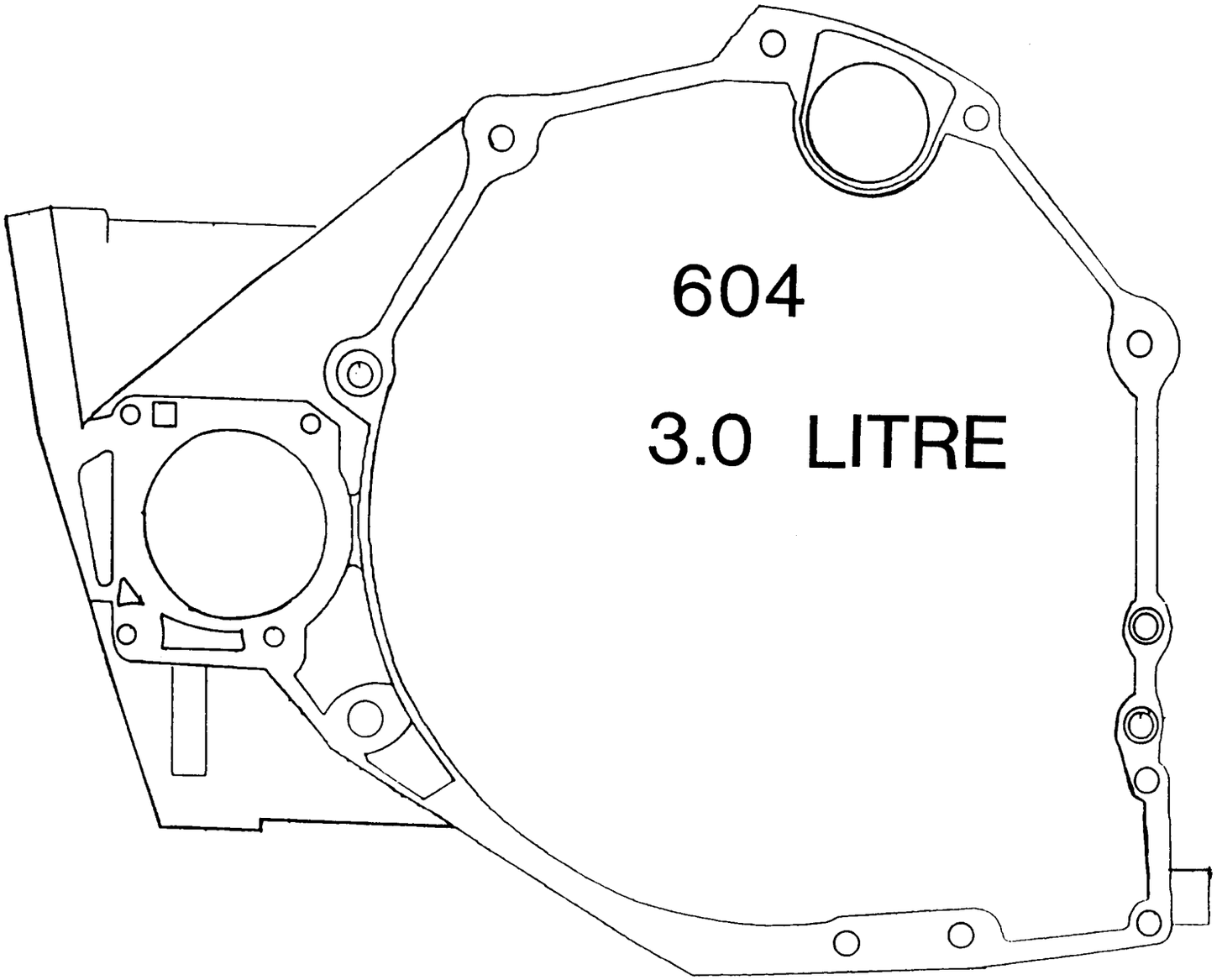
2.5 LITRE



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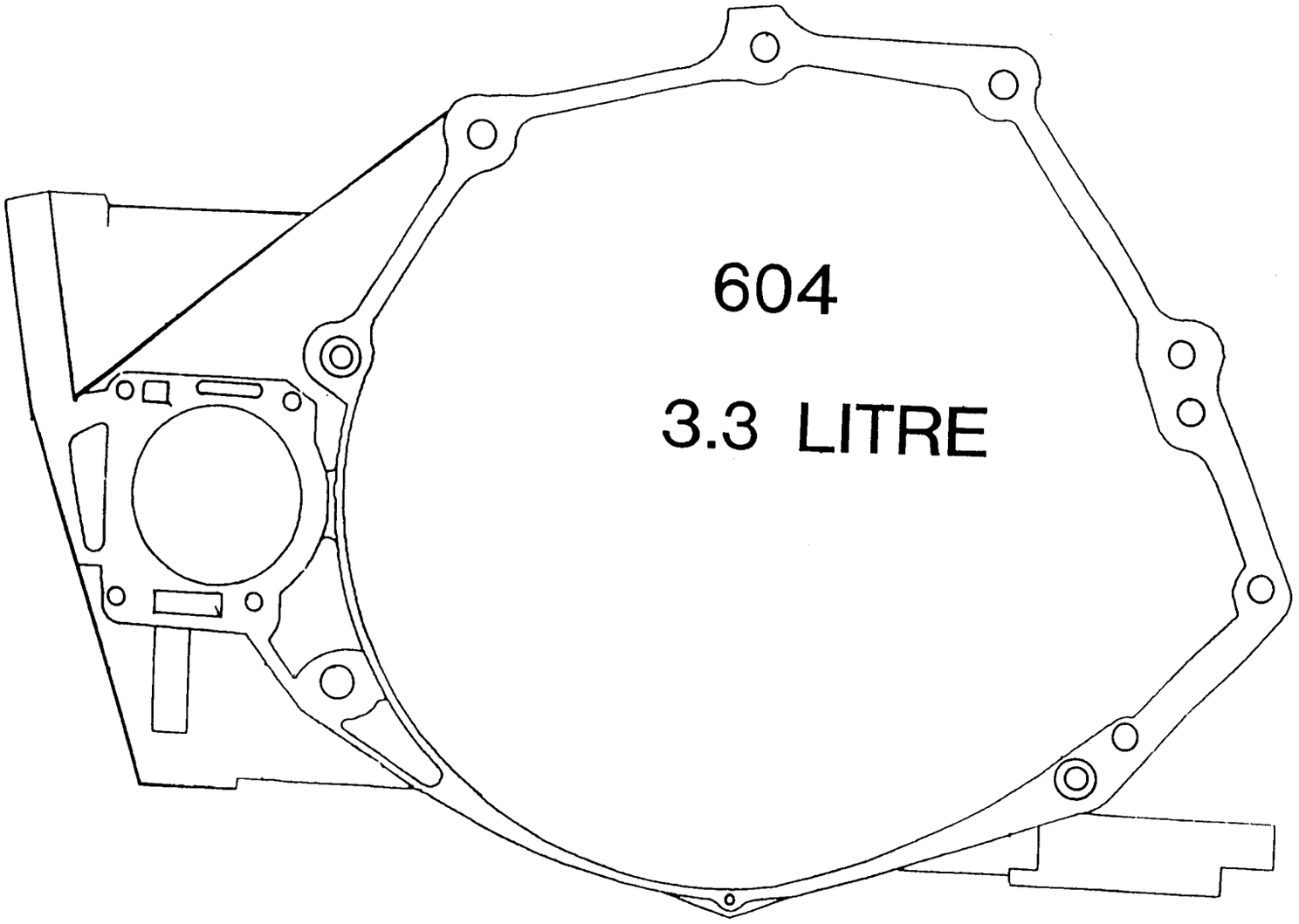
3.0 LITRE


604
3.3 LITRE

TORQUEFLITE A604
UPDATED REPAIR PACKAGE

This bulletin applies to all Dynasty, New Yorker, Landau, Ram Van, Caravan, and Voyager vehicles.

There is now available from OEM a new repair package, part nimber 4549248, that includes a new 4 ring front pump reaction shaft (See Figure 1), and a new input clutch hub with shallower "O" ring grooves to increase the compression of the "O" rings (See Figure 3). The new 4 ring front pump reaction shaft (Figure 1) provides better sealing for the overdrive clutch, and the new input clutch hub with shallower "O" ring grooves (Figure 3) provides better sealing for both the underdrive clutch and the reverse clutch. Both of these updated parts are highly recommended to provide better durability for the A604 transaxle.

There has also been a modification to the input clutch retainer as shown in Figure 2. The "Lip" can be machined off of the old style input clutch retainer, or it must be replaced with part number 4431609. Refer to Figure 2.

The new repair package also includes a new valve body spacer plate. Remove and "Discard" the old spacer plate, as the new spacer plate has a larger overdrive clutch feed orifice to provide increased oil flow to the overdrive clutch circuit.

If the transmission controller part number is 5234623, or 5234649, replace it with part number 5234678 (Or Subsequent) transmission controller.

During reassembly of the transaxle, select a washer to set input shaft end play to the "Preferred" setting of .005" - .015". The end play specification is actually .005" - .025" and is acceptable if the "Preferred" setting cannot be obtained.

SERVICE INFORMATION

New Repair Package	4549248
Gasket Package	4504558
Input Clutch Retainer (As Required)	4431609
Transmission Controller (As Required)	5234678

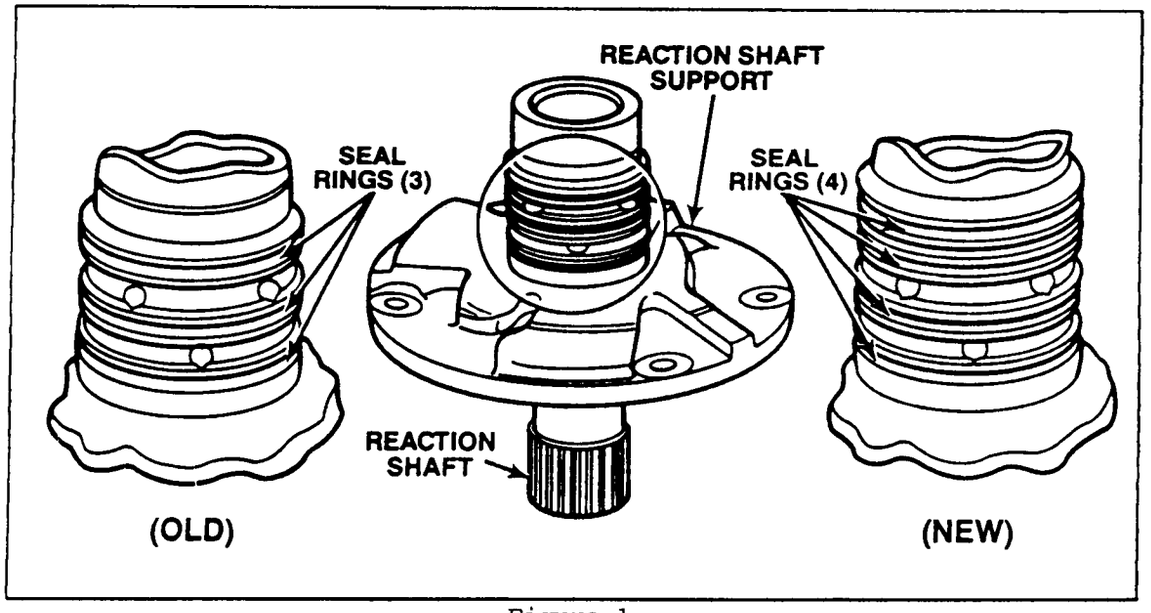


Figure 1

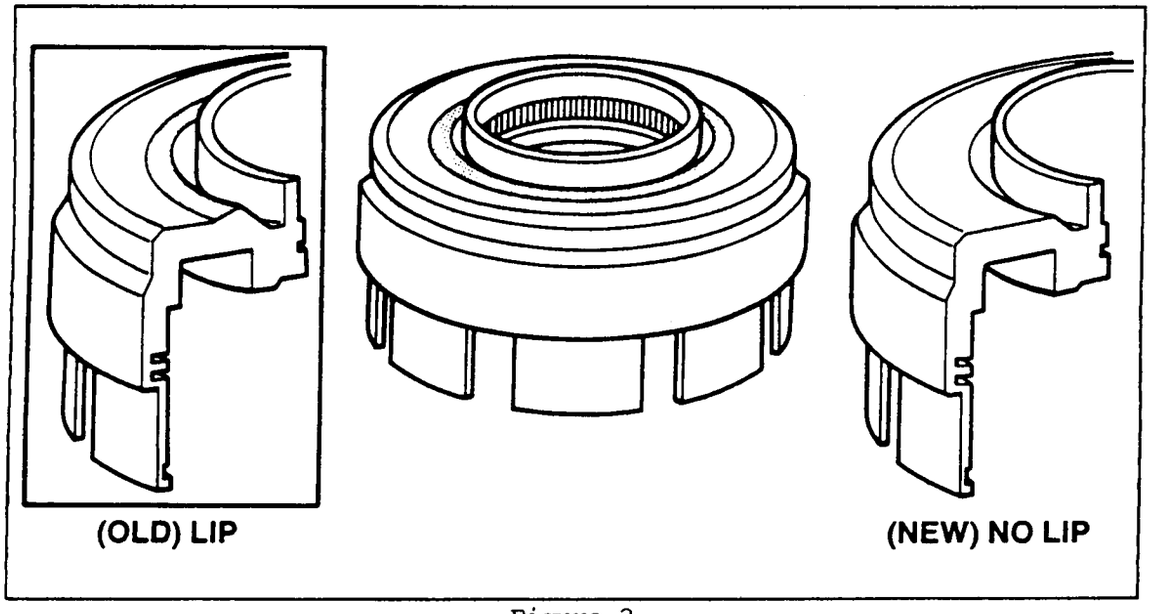


Figure 2

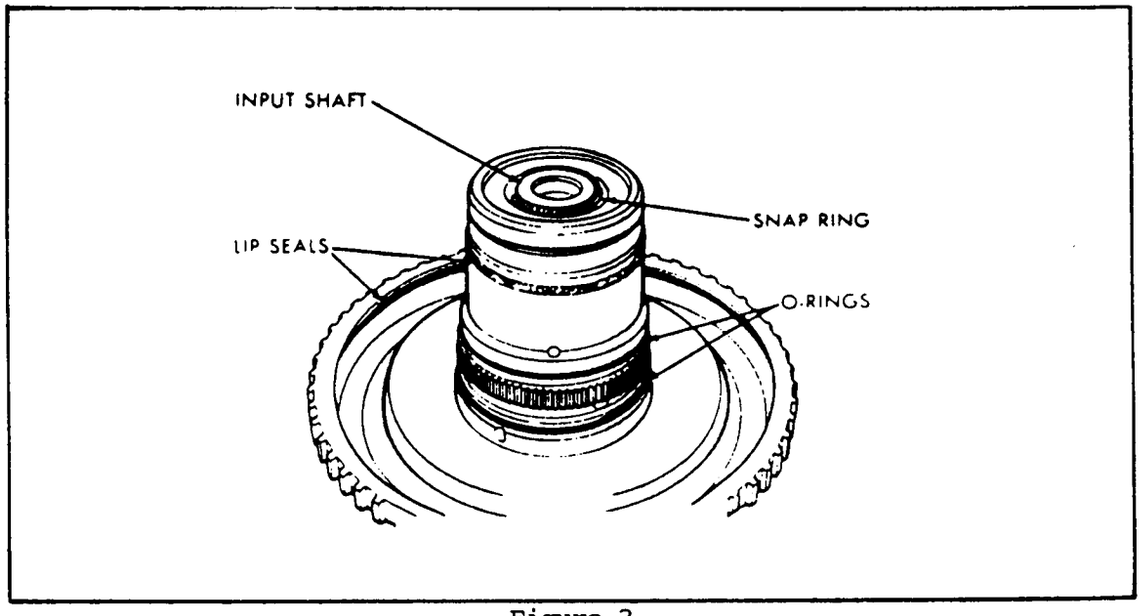


Figure 3

INPUT CLUTCH HUB O-RING CHART

Model Year	Part Number	Location	Color	Cross Section
1989	6501574	Front	Black	.070"
1989	6501548	Rear	Black	.070"
Running '89	6502272	Front	Orange	.070"
Running '89	6502270	Rear	Green	.070"
1990-1/4	6502271	Front	Blue	.103"
1990-1/4	6502269	Rear	Red	.103"

UD/OD REACTION PLATE CHART

1989		1990	
P/N	Thickness	P/N	Thickness
4377185	6.47-6.57 mm	4531570	5.47-5.57 mm
4377186	6.96-7.06 mm	4531569	5.96-6.06 mm
4377187	7.45-7.55 mm	4531568	6.45-6.55 mm
4377188	7.94-8.04 mm	4531567	6.94-7.04 mm