TRANSAXLE AND POWER TRANSFER UNIT

CONTENTS

page

31TH AUTOMATIC TRANSAXLE 1
41TE AUTOMATIC TRANSAXLE 71
POWER TRANSFER UNIT 165

31TH AUTOMATIC TRANSAXLE

INDEX

page

GENERAL INFORMATION
31TH TRANSAXLE 2
FLUID LEVEL AND CONDITION 2
SELECTION OF LUBRICANT 3
SPECIAL ADDITIVES 3
DESCRIPTION AND OPERATION
CLUTCHES, BAND SERVOS, AND ACCUMULATOR 3
FLOW CONTROL VALVES 3
GEARSHIFT AND PARKING LOCK CONTROLS . . 4
GOVERNOR 4
HYDRAULIC CONTROL SYSTEM 3
PRESSURE REGULATING VALVES 3
PRESSURE SUPPLY SYSTEM 3
TORQUE CONVERTER CLUTCH SOLENOID WIRING CONNECTOR 4
TORQUE CONVERTER CLUTCH 3
DIAGNOSIS AND TESTING
CLUTCH AND SERVO AIR PRESSURE TESTS . 15
FLUID LEAKAGE-TRANSAXLE TORQUE CONVERTER HOUSING AREA 15
HYDRAULIC PRESSURE TESTS 13
ROAD TEST 4
THREE SPEED TRANSAXLE DIAGNOSIS AND TESTS 4
SERVICE PROCEDURES
ALUMINUM THREAD REPAIR 18
FLUID AND FILTER CHANGE 16
FLUID DRAIN AND REFILL 18
FLUSHING COOLERS AND TUBES 18
OIL PUMP VOLUME CHECK 19
REMOVAL AND INSTALLATION
FRONT PUMP OIL SEAL 21
PARK/NEUTRAL STARTING AND BACK-UP LAMP SWITCH 19
TRANSAXLE AND TORQUE CONVERTER REMOVAL 20
VEHICLE SPEED SENSOR PINION GEAR 19

page

DISASSEMBLY AND ASSEMBLY
ACCUMULATOR-RECONDITION 36
DIFFERENTIAL REPAIR 46
FRONT CLUTCH-RECONDITION 32
FRONT PLANETARY & ANNULUS GEAR-RECONDITION 35
KICKDOWN SERVO (CONTROLLED LOAD)-RECONDITION 37
LOW/REVERSE (REAR) SERVO-RECONDITION 36
OIL PUMP-RECONDITION 31
OUTPUT SHAFT REPAIR 43
PARKING PAWL 42
REAR CLUTCH-RECONDITION 33
TRANSAXLE 21
TRANSFER SHAFT REPAIR 38
VALVE BODY RECONDITION 27
CLEANING AND INSPECTION
VALVE BODY 50
ADJUSTMENTS
BAND ADJUSTMENT 51
BEARING ADJUSTMENT PROCEDURES 52
DIFFERENTIAL BEARING 53
GEARSHIFT CABLE ADJUSTMENT 51
HYDRAULIC CONTROL PRESSURE ADJUSTMENTS 52
OUTPUT SHAFT BEARING 52
THROTTLE PRESSURE LINKAGE ADJUSTMENT 51
TRANSFER SHAFT BEARING 54
SCHEMATICS AND DIAGRAMS
31TH TRANSAXLE HYDRAULIC SCHEMATIC . . 56
SPECIFICATIONS
31TH AUTOMATIC TRANSAXLE 64
31TH TORQUE SPECIFICATIONS 65
SPECIAL TOOLS
31TH AUTOMATIC TRANSAXLE 66

GENERAL INFORMATION

31TH TRANSAXLE

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

This transaxle combines torque converter, three speed transmission, final drive gearing, and differential into a front wheel drive system. The identification markings and usage of the transaxle are charted in Diagnosis and Tests.

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

Within this transaxle, there are three primary areas:

(1) Main center line plus valve body.

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

(3) Differential center line.

(4) Center distances between the main rotating parts in these three areas are held precise to maintain a low noise level.

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

(6) The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the converter is accomplished by circulating the transaxle fluid through a remote cooler. There are two types of coolers used. An oil-to-water type cooler located in the radiator side tank and/or an oil-to air heat exchanger. The torque converter assembly is a sealed unit that cannot be disassembled.

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

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

(9) The transaxle consists of:

- Two multiple-disc clutches
- An overrunning clutch
- Two servos
- A hydraulic accumulator
- Two bands
- Two planetary gear sets

This provides three forward ratios and a reverse ratio. The common sun gear of the planetary gear sets is connected to the front clutch by a driving shell. The drive shell is splined to the sun gear and front clutch retainer. The hydraulic system consists of an oil pump, and a single valve body which contains all of the valves except the governor valves. The transaxle sump and differential sump are both vented through the dipstick. Output torque from the main center line is delivered through helical gears to the transfer shaft. This gear set is a factor of the final drive (axle) ratio. The shaft also carries the governor and parking sprag. An integral helical gear on the transfer shaft drives the differential ring gear. The final drive gearing is completed with one of two gear ratios of 2.98 or 3.19 depending on model and application.

FLUID LEVEL AND CONDITION

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

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

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

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

In either case, the air bubbles can cause overheating, fluid oxidation, and varnishing. This can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from the transaxle dipstick 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.

GENERAL INFORMATION (Continued)

If there is any doubt about its condition, drain out a sample for a double check.

SELECTION OF LUBRICANT

It is important that the proper lubricant be used in these transmissions. Mopar ATF PLUS 3 (Automatic Transmission Fluid- type 7176) should be used to aid in ensuring optimum transmission performance. It is important that the transmission fluid be maintained at the prescribed level using the recommended fluids.

SPECIAL ADDITIVES

Chrysler Corporation does not recommend the addition of any fluids to the transmission, other than fluid listed above. An exception to this policy is the use of special dyes to aid in detecting fluid leaks. The use of transmission sealers should be avoided, since they may adversely affect seals.

DESCRIPTION AND OPERATION

TORQUE CONVERTER CLUTCH

A torque converter clutch is standard on all vehicles. The torque converter clutch is activated only in direct drive and is controlled by the engine electronics. A solenoid on the valve body, is powered by the powertrain control module to activate torque converter clutch.

HYDRAULIC CONTROL SYSTEM

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

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

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

PRESSURE SUPPLY SYSTEM

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

PRESSURE REGULATING VALVES

The pressure regulating valve controls line pressure dependent on throttle opening. The governor valve transmits regulated pressure to the valve body (in conjunction with vehicle speed) to control upshift and downshift.

The throttle valve transmits regulated pressure to the transaxle (dependent on throttle position) to control upshift and downshift.

FLOW CONTROL VALVES

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

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

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

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

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

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

The torque converter clutch solenoid allows for the electronic control of the torque converter clutch. It also disengages the torque converter at closed throttle. This is done during engine warm-up, and part-throttle acceleration.

The switch valve directs oil to apply the torque converter clutch in one position. The switch valve releases the torque converter clutch in the other position.

CLUTCHES, BAND SERVOS, AND ACCUMULATOR

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

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

DESCRIPTION AND OPERATION (Continued)

GEARSHIFT AND PARKING LOCK CONTROLS

The transaxle is controlled by a lever type gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), and D (drive), 2 (second), and 1 (first). The parking lock is applied by moving the selector lever past a gate to the P position. **Do not apply the parking lock until the vehicle has stopped; otherwise, a severe ratchet noise will occur.**

TORQUE CONVERTER CLUTCH SOLENOID WIRING CONNECTOR

If wiring connector is unplugged, the torque converter will not engage (Fig. 1) .

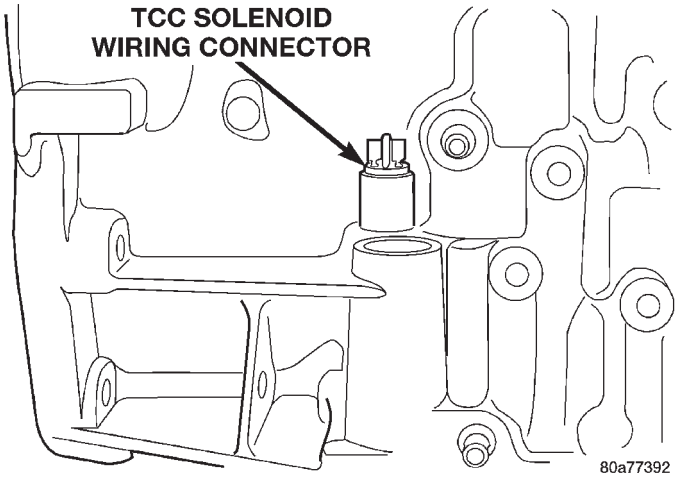


Fig. 1 Torque Converter Clutch Solenoid Wiring Connector

GOVERNOR

The governor may be serviced by removing the transaxle oil pan and valve body assembly. The governor may be unbolted from the governor support and removed from the transaxle for reconditioning or replacement.

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

DIAGNOSIS AND TESTING

THREE SPEED TRANSAXLE DIAGNOSIS AND TESTS

Automatic transaxle malfunctions may be caused by four general conditions:

(1) Poor engine performance
(2) Improper adjustments
(3) Hydraulic malfunctions
(4) Mechanical malfunctions

Diagnosis of these problems should always begin by checking the easily accessible variables; fluid level and condition, gearshift cable adjustment, and throttle pressure cable adjustment. Then perform a road test to determine if the problem has been corrected or that more diagnosis is necessary. If the problem exists after the preliminary tests and corrections are completed, hydraulic pressure tests should be performed

31TH HYDRAULIC TROUBLE CODE CHARTS

The following charts should be used to help diagnose hydraulic or mechanical faults in the transaxle .

ROAD TEST

Prior to performing a road test, check the fluid level, and control cable adjustments.

During the road test, the transaxle should be operated in each position to check for slipping and any variation in shifting.

If vehicle operates at high speeds, but has poor acceleration, the converter's overrunning clutch may be slipping. If acceleration is normal, but high throttle opening is needed for high speeds, the stator clutch may have seized.

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

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

The rear clutch is applied in both the D first gear and 1 first gear positions. Also the overrunning clutch is applied in D first gear and the low/reverse band is applied in 1 first gear position. If the transaxle slips in D range first gear, but does not slip in 1 first gear, the overrunning clutch is slipping. Similarly, if the transaxle slips in any two forward gears, the rear clutch is slipping.

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

The process of eliminating can be used to detect any unit which slips and to confirm proper operation of good units. Road testing can usually diagnose slipping units. Although the actual cause of the problem

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
HARSH ENGAGEMENT FROM NEUTRAL TO DRIVE	1. Engine idle speed too high. 2. Valve body malfunction. 3. Hydraulic pressure too high. 4. Worn or faulty rear clutch. 5. Engine performance.	1. Set engine curb idle. 2. Inspect valve body and repair. 3. Check fluid pressure at ports. 4. Replace discs and seals at rear clutch. 5. Set engine to specs.
HARSH ENGAGEMENT FROM NEUTRAL TO REVERSE	1. Low reverse band misadjusted. 2. Engine idle speed too high. 3. Low reverse band worn out. 4. Low reverse band, servo or linkage malfunction. 5. Hydraulic pressure too high. 6. Worn or faulty rear clutch. 7. Engine performance.	1. Adjust bands to specs. 2 Set up engine to specs. 3. Replace low reverse band. 4. Repair low reverse servo. Adjust reverse band and linkage. 5. Check fluid pressure at ports. 6. Replace discs and seals at rear clutch. 7. Set engine to specs.
DELAYED ENGAGEMENT FROM NEUTRAL TO DRIVE	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Incorrect gearshift linkage adjustment. 5. Oil filter clogged. 6. Faulty oil pump. 7. Worn input shaft seal rings. 8. Aerated fluid. 9. Engine idle speed too low. 10. Worn or faulty rear clutch.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Adjust gearshift linkage. 5. Replace oil filter. 6. Replace oil pump. 7. Replace input shaft seal rings. 8. Replace trans. fluid. 9. Set up engine to specs. 10. Replace discs and seals at rear clutch.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
DELAYED ENGAGEMENT FROM NEUTRAL TO REVERSE	1. Low reverse band misadjusted. 2. Hydraulic pressures too low. 3. Low reverse band worn out. 4. Valve body malfunction. 5. Low reverse band, servo or linkage malfunction. 6. Low fluid level. 7. Incorrect gearshift linkage adjustment. 8. Oil filter clogged. 9. Faulty oil pump. 10. Worn input shaft seal rings. 11. Aerated fluid. 12. Engine idle speed too low. 13. Worn reaction shaft support seal rings. 14. Worn or faulty front clutch.	1. Adjust bands to specs. 2. Check fluid pressure at ports. 3. Replace low reverse band. 4. Inspect valve body and repair. 5. Repair low reverse servo. Adjust reverse band and linkage. 6. Fill trans. to level. 7. Adjust gearshift linkage. 8. Replace oil filter. 9. Replace oil pump. 10. Replace input shaft seal rings. 11. Replace trans. fluid. 12. Set up engine to specs. 13. Inspect and replace reaction shaft support seal rings. 14. Replace discs and seals at front clutch.
RUNAWAY UPSHIFT	1. Hydraulic pressures too low. 2. Valve body malfunction. 3. Low fluid level. 4. Oil filter clogged. 5. Aerated fluid. 6. Incorrect throttle linkage. 7. Worn reaction shaft support seal rings. 8. Governor malfunction. 9. Kickdown band, servo or linkage malfunction. 10. Worn front clutch.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Replace oil filter. 5. Replace trans. fluid. 6. Adjust throttle linkage. 7. Replace reaction shaft support seal rings. 8. Inspect and repair governor. 9. Inspect and repair kickdown band, servo or linkage. 10. Replace discs and seals at front clutch.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO UPSHIFT	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Incorrect gearshift linkage adjustment. 5. Incorrect throttle linkage. 6. Governor support seal rings worn. 7. Worn reaction shaft support seal rings. 8. Governor malfunction. 9. Kickdown band, servo or linkage malfunction. 10. Worn front clutch. 11. Engine performance.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Adjust gearshift linkage. 5. Adjust throttle linkage. 6. Replace governor support seal rings. 7. Replace reaction shaft support seal rings. 8. Inspect and repair governor. 9. Inspect and repair kickdown band, servo or linkage. 10. Replace discs and seals at front clutch. 11. Set up engine to specs.
3-2 KICKDOWN RUNAWAY	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Aerated fluid. 5. Incorrect throttle linkage adjustment. 6. Kickdown band out of adjustment. 7. Governor support seal rings worn. 8. Kickdown band, servo or linkage malfunction. 9. Worn front clutch.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Replace trans. fluid. 5. Adjust throttle linkage. 6. Adjust kickdown band. 7. Replace governor support seal rings. 8. Inspect and repair kickdown band, servo or linkage. 9. Replace discs and seals at front clutch.
NO KICKDOWN OR NORMAL DOWNSHIFT	1. Valve body malfunction. 2. Incorrect throttle linkage adjustment. 3. Governor malfunction. 4. Kickdown band, servo or linkage malfunction.	1. Inspect valve body and repair. 2. Adjust throttle linkage. 3. Inspect and repair governor. 4. Inspect and repair kickdown band, servo or linkage.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
SHIFTS ERRATIC	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Incorrect gearshift linkage adjustment. 5. Oil filter clogged. 6. Faulty oil pump. 7. Aerated fluid. 8. Incorrect throttle linkage adjustment. 9. Governor support seal rings worn. 10. Worn reaction shaft support seal rings. 11. Governor malfunction. 12. Kickdown band, servo or linkage malfunction. 13. Worn front clutch. 14. Engine performance.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Adjust gearshift linkage. 5. Replace oil filter. 6. Replace oil pump. 7. Replace trans. fluid. 8. Adjust throttle linkage. 9. Replace governor support seal rings. 10. Replace reaction shaft support seal rings. 11. Inspect and repair governor. 12. Inspect and repair kickdown band, servo or linkage. 13. Replace discs and seals at front clutch. 14. Set up engine to specs.
SLIPS IN FORWARD DRIVE POSITIONS	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Incorrect gearshift linkage adjustment. 5. Oil filter clogged. 6. Faulty oil pump. 7. Worn input shaft seal rings. 8. Aerated fluid. 9. Incorrect throttle linkage adjustment. 10. Overrunning clutch not holding. 11. Worn rear clutch. 12. Overrunning clutch worn, broken or seized.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Adjust gearshift linkage. 5. Replace oil filter. 6. Replace oil pump. 7. Replace input shaft seal rings. 8. Replace trans. fluid. 9. Adjust throttle linkage. 10. Inspect and repair overrunning clutch. 11. Replace discs and seals at rear clutch. 12. Replace overrunning clutch assembly.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
SLIPS IN REVERSE ONLY	1. Low reverse band misadjusted. 2. Hydraulic pressure too low. 3. Low reverse band worn out. 4. Valve body malfunction. 5. Low reverse band, servo or linkage malfunction. 6. Low fluid level. 7. Incorrect gearshift linkage adjustment. 8. Faulty oil pump. 9. Aerated fluid. 10. Worn reaction shaft support seal rings. 11. Worn front clutch.	1. Adjust low reverse band. 2. Check fluid pressure at ports. 3. Replace low reverse band. 4. Inspect valve body and repair. 5. Repair low reverse servo. Adjust reverse band and linkage. 6. Fill trans. to level. 7. Adjust gearshift linkage. 8. Replace oil pump. 9. Replace trans. fluid. 10. Replace reaction shaft support seal rings. 11. Replace discs and seals at front clutch.
SLIPS IN ALL POSITIONS	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Oil filter clogged. 5. Faulty oil pump. 6. Worn input shaft seal rings. 7. Aerated fluid.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Replace oil filter. 5. Replace oil pump. 6. Replace input shaft seal rings. 7. Replace trans. fluid.
NO DRIVE IN ANY POSITION	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Oil filter clogged. 5. Faulty oil pump. 6. Planetary gear sets broken or seized.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Replace oil filter. 5. Replace oil pump. 6. Replace planetary gear sets.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO DRIVE IN FORWARD DRIVE POSITIONS	1. Hydraulic pressure too low. 2. Valve body malfunction. 3. Low fluid level. 4. Worn input shaft seal rings. 5. Overrunning clutch not holding. 6. Worn rear clutch. 7. Planetary gear sets broken or seized. 8. Overrunning clutch worn, broken or seized.	1. Check fluid pressure at ports. 2. Inspect valve body and repair. 3. Fill trans. to level. 4. Replace input shaft seal rings. 5. Inspect and repair overrunning clutch. 6. Replace discs and seals at rear clutch. 7. Replace planetary gear sets. 8. Replace overrunning clutch assembly.
NO DRIVE IN REVERSE	1. Hydraulic pressure too low. 2. Low reverse band worn out. 3. Valve body malfunction. 4. Low reverse band, servo or linkage malfunction. 5. Incorrect gearshift linkage adjustment. 6. Worn reaction shaft support seal rings. 7. Worn front clutch. 8. Worn rear clutch. 9. Planetary gear sets broken or seized.	1. Check fluid pressure at ports. 2. Replace low reverse band. 3. Inspect valve body and repair. 4. Repair low reverse servo. Adjust reverse band and linkage. 5. Adjust gearshift linkage. 6. Replace reaction shaft support seal rings. 7. Replace discs and seals at front clutch. 8. Replace discs and seals at rear clutch. 9. Replace planetary gear sets.
DRIVES IN NEUTRAL	1. Valve body malfunction. 2. Incorrect gearshift linkage adjustment. 3. Insufficient clutch plate clearance. 4. Worn rear clutch. 5. Rear clutch dragging.	1. Inspect valve body and repair. 2. Adjust gearshift linkage. 3. Check and adjust clutch plate clearance. 4. Replace discs and seals at rear clutch. 5. Inspect and repair rear clutch.
DRAGS OR LOCKS	1. Low reverse band worn out. 2. Kickdown band adjustment too tight. 3. Planetary gear sets broken or seized. 4. Overrunning clutch worn, broken or seized.	1. Replace low reverse band. 2. Adjust kickdown band. 3. Replace planetary gear sets. 4. Replace overrunning clutch assembly.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
GRATING, SCRAPING, OR GROWLING NOISE	1. Low reverse band worn out. 2. Kickdown band out of adjustment. 3. Drive shaft bushing damaged. 4. Planetary gear sets broken or seized. 5. Overrunning clutch worn, broken or seized.	1. Replace low reverse band. 2. Adjust kickdown band. 3. Replace drive shaft bushing. 4. Replace planetary gear sets. 5. Replace overrunning clutch assembly.
BUZZING NOISE	1. Valve body malfunction. 2. Low fluid level. 3. Aerated fluid. 4. Overrunning clutch inner race damaged.	1. Inspect valve body and repair. 2. Fill fluid to level. 3. Replace trans. fluid. 4. Replace overrunning clutch assembly.
HARD TO FILL, OIL BLOWS OUT FILLER HOLE	1. Oil filter clogged. 2. Aerated fluid. 3. High fluid level.	1. Replace oil filter. 2. Replace trans. fluid. 3. Adjust fluid level to specs.
TRANSAXLE OVERHEATS	1. Stuck cooler flow switch valve. 2. Engine idle speed too high. 3. Hydraulic pressures too low. 4. Low fluid level. 5. Incorrect gearshift linkage adjustment. 6. Faulty oil pump. 7. Kickdown band adjustment too tight. 8. Faulty cooling system. 9. Insufficient clutch plate clearance.	1. Replace switch valve behind oil pump housing. 2. Adjust engine idle to specs. 3. Check fluid pressure at ports. 4. Fill trans. to level. 5. Adjust gearshift linkage. 6. Replace oil pump. 7. Adjust kickdown band. 8. Check cooling system temperature and repair as needed. 9. Check and adjust clutch plate clearance.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
HARSH UPSHIFT	1. Hydraulic pressures too low. 2. Incorrect throttle linkage adjustment. 3. Kickdown band out of adjustment. 4. Hydraulic pressure too high. 5. Engine performance.	1. Check fluid pressure at ports. 2. Adjust throttle linkage. 3. Adjust kickdown band. 4. Check fluid pressure at ports. 5. Set up engine to specs.
DELAYED UPSHIFT	1. Incorrect throttle linkage adjustment. 2. Kickdown band out of adjustment. 3. Governor support seal rings worn. 4. Worn reaction shaft support seal rings. 5. Governor malfunction. 6. Kickdown band, servo or linkage malfunction. 7. Worn front clutch. 8. Engine performance.	1. Adjust throttle linkage. 2. Adjust kickdown band. 3. Replace governor support seal rings. 4. Replace reaction shaft support seal rings. 5. Inspect and repair governor. 6. Inspect and repair kickdown band, servo or linkage. 7. Replace discs and seals at front clutch. 8. Set up engine to specs.
NO TORQUE CONVERTER CLUTCH APPLICATION	1. Stuck cooler flow switch valve. 2. Hydraulic pressures too low. 3. Low fluid level. 4. Faulty oil pump. 5. Worn input shaft seal rings. 6. Aerated fluid.	1. Replace switch valve behind oil pump housing. 2. Check fluid pressure at ports. 3. Fill trans. to level. 4. Replace oil pump. 5. Replace input shaft seal rings. 6. Replace trans. fluid.

9521-208

DIAGNOSIS AND TESTING (Continued)

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

9121-183

ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

may not be detected. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

Therefore, unless the condition is obvious, the transaxle should never be disassembled until hydraulic pressure tests have been performed.

HYDRAULIC PRESSURE TESTS

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

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

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

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

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

Test port locations are shown in (Fig. 2) .

TEST ONE (SELECTOR IN 1)

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

(2) Operate engine at 1000 rpm for test.

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

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

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

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

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

TEST TWO (SELECTOR IN 2)

(1) Attach one gauge to line pressure port and tee another gauge into lower cooler line fitting. This will allow lubrication pressure readings to be taken..

(2) Operate engine at 1000 rpm for test.

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

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

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

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

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

TEST THREE (SELECTOR IN D)

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

(2) Operate engine at 1600 rpm for test.

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

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

(5) Line pressure should read 52 to 58 psi with throttle lever clockwise. Pressure should gradually

DIAGNOSIS AND TESTING (Continued)

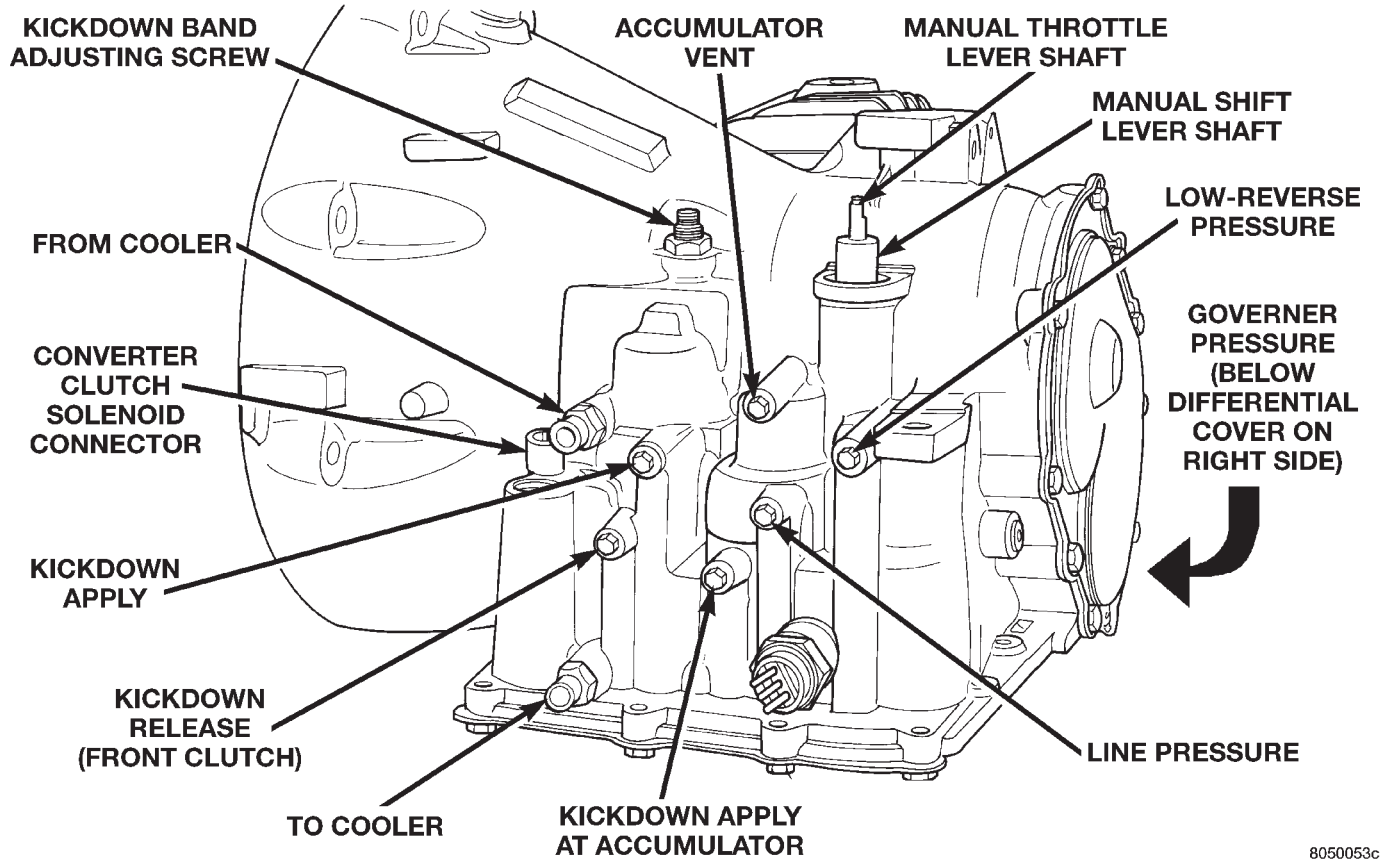


Fig. 2 Test Port Locations

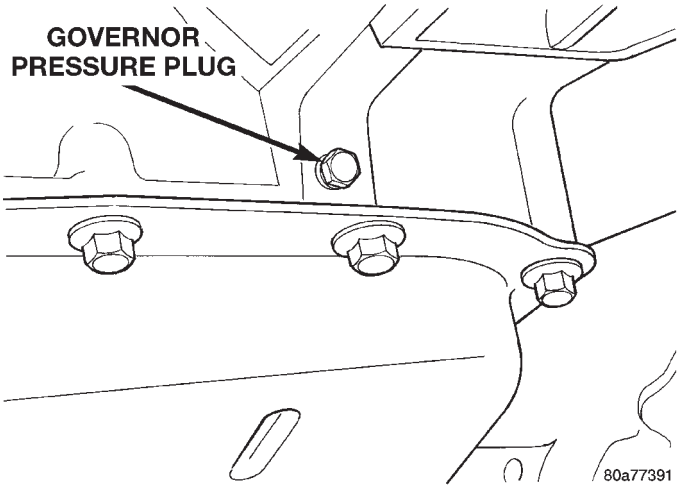


Fig. 3 Governor Pressure Tap

increase, as lever is moved counterclockwise to 80 to 88 psi.

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

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

TEST FOUR (SELECTOR IN REVERSE)

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

(2) Operate engine at 1600 rpm for test.

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

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

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

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

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

TEST RESULT INDICATIONS

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

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

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

DIAGNOSIS AND TESTING (Continued)

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

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

GOVERNOR PRESSURE

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

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

(2) Operate transaxle in third gear to read pressures. The governor pressure should respond smoothly to changes in mph and should return to 0 to 3 psi when vehicle is stopped. High pressure at standstill (above 3 psi) will prevent the transaxle from downshifting.

THROTTLE PRESSURE

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

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

CLUTCH AND SERVO AIR PRESSURE TESTS

A no drive condition might exist even with correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands, and servos can be located through a series of tests. This is done by substituting air pressure for fluid pressure (Fig. 4) .

The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passages. To make air pressure tests, proceed as follows:

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

Remove oil pan and valve body. Refer to Valve Body for removal procedure.

FRONT CLUTCH

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

REAR CLUTCH

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

KICKDOWN SERVO (FRONT)

Direct air pressure into KICKDOWN SERVO ON passage. Operation of servo is indicated by a tightening of front band. Spring tension on servo piston should release the band.

LOW AND REVERSE SERVO (REAR)

Direct air pressure into LOW-REVERSE SERVO APPLY passage. Operation of servo is indicated by a tightening of rear band. Spring tension on servo piston should release the band.

If clutches and servos operate properly, no upshift indicates that a malfunction exists in the valve body.

FLUID LEAKAGE-TRANSAXLE TORQUE CONVERTER HOUSING AREA

(1) Check for source of leakage.

(2) Since fluid leakage near the torque converter area may be from an engine oil leak, the area should be checked closely. Factory fill fluid is dyed red and, therefore, can be distinguished from engine oil.

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

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

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

(6) After performing this operation, inspect for leakage. If a leak persists, perform the following operation on the vehicle. This will determine if the torque converter or transaxle is leaking.

TORQUE CONVERTER LEAKAGE

Possible sources of torque converter leakage are:

- Torque converter weld leaks at the outside diameter (peripheral) weld.
- Torque converter hub weld.
- Torque converter impeller shell cracked adjacent to hub.
- At drive lug welds.

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

SERVICE PROCEDURES (Continued)

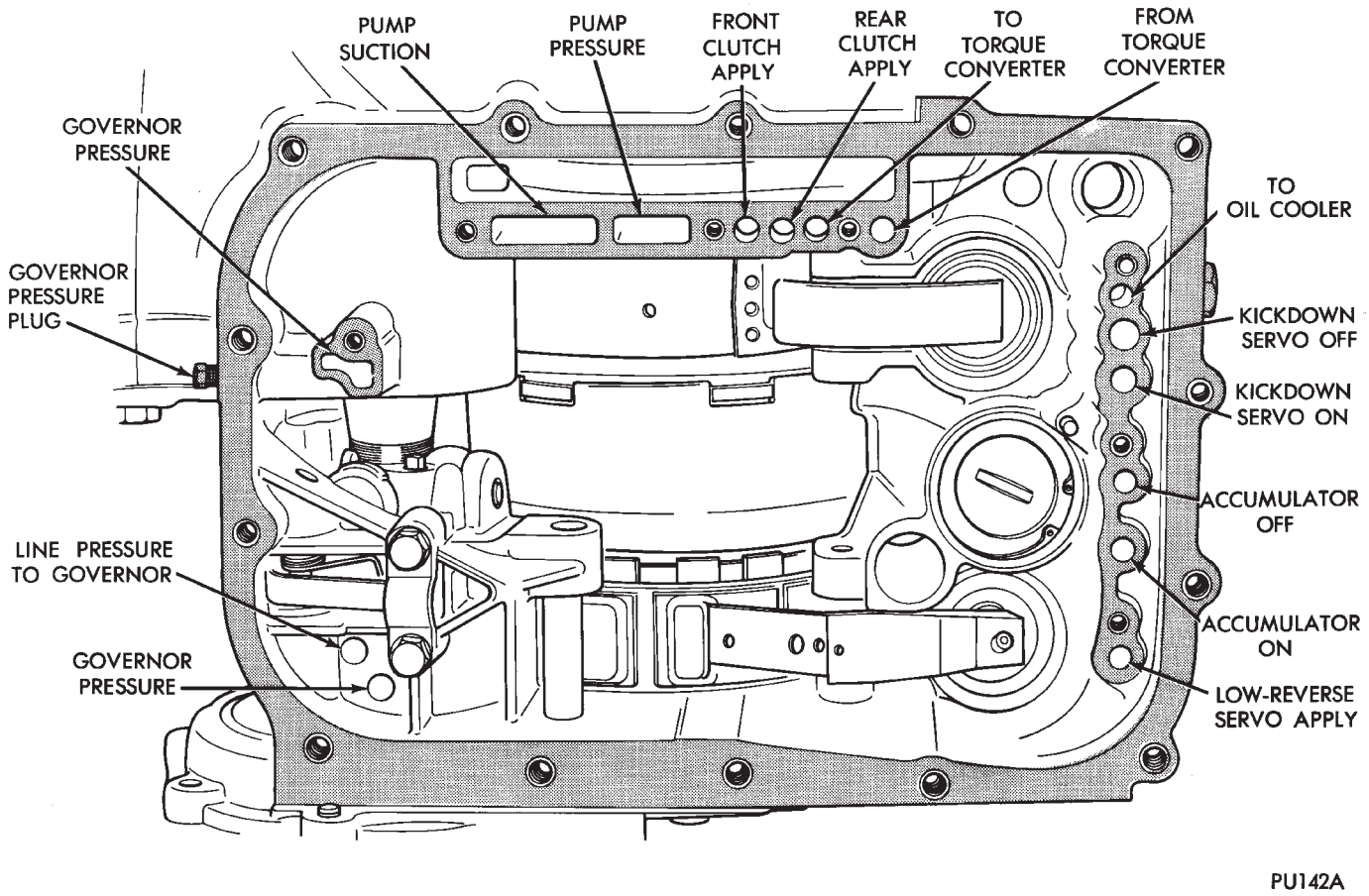


Fig. 4 Air Pressure Tests

SERVICE PROCEDURES

FLUID AND FILTER CHANGE

When the factory fill fluid is changed, only fluids labeled MOPAR® ATF PLUS 3 (Automatic Transmission fluid) Type 7176 should be used.

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

30,000 MILE TRANSAXLE OIL CHANGE

When a vehicle attains 30,000 miles on its odometer it is recommended that the transaxle oil be changed. To change the oil, use the procedure that follows:

It is recommended that a transaxle fluid exchanger (ATF 2000+ or equivalent) be used to replace the used fluid in the transaxle. If a fluid exchanger is not available use a fluid suction pump (Vacula™ or equivalent) to draw the fluid out of the dipstick tube. If a fluid suction pump is not available remove the oil pan and drain the fluid.

CAUTION: Chrysler Corporation does not recommend using any fluid exchanger that introduces additives into the transaxle.

TRANSAXLE FLUID EXCHANGER METHOD

(1) To perform the transaxle fluid exchange, the transaxle must be at operating temperature. Drive the vehicle till it reaches full operating temperature.

(2) Verify that the fill tank on the transaxle fluid exchanger (ATF 2000+ or equivalent) is clean and dry.

(3) Fill the tank to the recommended fill capacity with Mopar ATF Plus 3 Type 7176.

(4) Hookup the vehicle to the machine following the manufacturers instructions. Perform the exchange procedure following the instructions provided with the machine.

(5) Once machine has completed the fluid exchange. Check the fluid level and condition and fill to proper level with Mopar ATF Plus 3 Type 7176.

NOTE: Verify that the transaxle cooler lines are tightened to proper specifications. Cooler line torque specification is 2 N•m (18 in. lbs.).

DIPSTICK TUBE FLUID SUCTION METHOD

(1) When performing the fluid suction method, make sure the transaxle is at full operating temperature.

SERVICE PROCEDURES (Continued)

(2) To perform the dipstick tube fluid suction method, use a suitable fluid suction device (Vacula™ or equivalent).

(3) Insert the fluid suction line into the dipstick tube.

NOTE: Verify that the suction line is inserted to the lowest point of the transaxle oil pan. This will ensure complete evacuation of the fluid in the pan.

(4) Follow the manufacturers recommended procedure and evacuate the fluid from the transaxle.

(5) Remove the suction line from the dipstick tube.

(6) Add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(7) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(8) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(9) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range.

TRANSAXLE OIL PAN DROP METHOD

This procedure involves removing the transaxle oil pan to drain the transaxle fluid.

(1) Bring the vehicle up to normal operating temperature. Drive the vehicle a minimum of 10 miles.

(2) Raise the vehicle on the hoist.

(3) Loosen the transaxle oil pan and drain the fluid into a suitable container.

(4) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(5) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N•m (165 in. lbs.).

(6) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(7) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(8) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(9) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range. Drive the vehicle a minimum of 10 miles.

(10) Raise the vehicle on the hoist.

(11) Check for leaks around the transaxle oil pan sealing surfaces.

(12) Recheck the fluid level. The level should be in the HOT range.

SEVERE USAGE SERVICE

If the vehicle exhibits any of the following symptoms, it is recommended that the transaxle oil and filter be replaced.

- Transaxle oil discolored
- Transaxle oil has high mileage
- Oil feels grimy when rubbed between fingertips
- Poor shift quality
- Delayed gear engagement
- Vehicle shudder between shifts

TRANSAXLE OIL AND FILTER REPLACEMENT

This procedure involves changing the transaxle fluid and filter, driving the vehicle for 10 miles and changing the transaxle fluid a second time.

(1) Bring the vehicle up to normal operating temperature. Drive the vehicle a minimum of 10 miles.

(2) Raise the vehicle on the hoist.

(3) Loosen the transaxle oil pan and drain the fluid into a suitable container.

(4) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(5) Separate the filter and O-ring from the valve body. Inspect the O-ring for cuts or improper installation. This could lead to delayed garage shifts.

(6) Install a new filter. Replace the O-ring as necessary.

(7) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N•m (165 in. lbs.).

(8) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(9) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(10) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(11) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range. Drive the vehicle a minimum of 10 miles.

(12) Raise the vehicle on the hoist.

SERVICE PROCEDURES (Continued)

(13) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(14) Separate the filter from the valve body to allow additional fluid to drain from the transaxle. Inspect the filter O-ring for any damage and replace as necessary.

(15) After the transaxle has stopped draining, reinstall the filter and O-ring.

(16) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N•m (165 in. lbs.).

(17) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(18) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(19) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(20) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range.

FLUID DRAIN AND REFILL

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

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

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

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

(5) Pour four quarts of Mopar ATF PLUS 3 (Automatic Transmission Fluid) Type 7176 through the dipstick opening.

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

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

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

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. This repair consists of drilling out the worn-out damaged threads. Then tapping the hole with a Heli-Coil tap, or equivalent, and installing a Heli-Coil insert, or equivalent, into the 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.

FLUSHING COOLERS AND TUBES

When a transaxle failure has contaminated the fluid, the oil cooler(s) must be flushed. The cooler bypass valve in the transaxle must be replaced also. The torque converter must also be replaced with an exchange unit. This will ensure that metal particles or sludged oil are not later transferred back into the reconditioned (or replaced) transaxle.

The recommended procedure for flushing the coolers and tubes is to use Tool 6906A Cooler Flusher.

WARNING: WEAR PROTECTIVE EYEWEAR THAT MEETS THE REQUIREMENTS OF OSHA AND ANSI Z87.1–1968. WEAR STANDARD INDUSTRIAL RUBBER GLOVES.

KEEP LIGHTED CIGARETTES, SPARKS, FLAMES, AND OTHER IGNITION SOURCES AWAY FROM THE AREA TO PREVENT THE IGNITION OF COMBUSTIBLE LIQUIDS AND GASES. KEEP A CLASS (B) FIRE EXTINGUISHER IN THE AREA WHERE THE FLUSHER WILL BE USED.

KEEP THE AREA WELL VENTILATED.

DO NOT LET FLUSHING SOLVENT COME IN CONTACT WITH YOUR EYES OR SKIN: IF EYE CONTAMINATION OCCURS, FLUSH EYES WITH WATER FOR 15 TO 20 SECONDS. REMOVE CONTAMINATED CLOTHING AND WASH AFFECTED SKIN WITH SOAP AND WATER. SEEK MEDICAL ATTENTION.

COOLER FLUSH USING TOOL 6906A

(1) Remove cover plate filler plug on Tool 6906A. Fill reservoir 1/2 to 3/4 full of fresh flushing solution. Flushing solvents are petroleum based solutions generally used to clean automatic transmission components. **DO NOT** use solvents containing acids, water, gasoline, or any other corrosive liquids.

(2) Reinstall filler plug on Tool 6906A.

(3) Verify pump power switch is turned OFF. Connect red alligator clip to positive (+) battery post. Connect black (-) alligator clip to a good ground.

(4) Disconnect the cooler lines at the transmission.

NOTE: When flushing transmission cooler and lines, ALWAYS reverse flush.

SERVICE PROCEDURES (Continued)

(5) Connect the BLUE pressure line to the OUTLET (From) cooler line.

(6) Connect the CLEAR return line to the INLET (To) cooler line

(7) Turn pump ON for two to three minutes to flush cooler(s) and lines. Monitor pressure readings and clear return lines. Pressure readings should stabilize below 20 psi. for vehicles equipped with a single cooler and 30 psi. for vehicles equipped with dual coolers. If flow is intermittent or exceeds these pressures, replace cooler.

(8) Turn pump OFF.

(9) Disconnect CLEAR suction line from reservoir at cover plate. Disconnect CLEAR return line at cover plate, and place it in a drain pan.

(10) Turn pump ON for 30 seconds to purge flushing solution from cooler and lines. Turn pump OFF.

(11) Place CLEAR suction line into a one quart container of Mopar ATF Plus 3 ® type 7176 automatic transmission fluid.

(12) Turn pump ON until all transmission fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transmission cooler and lines. Turn pump OFF.

(13) Disconnect alligator clips from battery. Reconnect flusher lines to cover plate, and remove flushing adapters from cooler lines.

OIL PUMP VOLUME CHECK

After the new or repaired transmission has been installed, fill to the proper level with Mopar® ATF PLUS 3 (Type 7176) automatic transmission fluid. The volume should be checked using the following procedure:

(1) Disconnect the **From cooler** line at the transmission and place a collecting container under the disconnected line.

CAUTION: With the fluid set at the proper level, fluid collection should not exceed (1) quart or internal damage to the transmission may occur.

(2) Run the engine **at curb idle speed**, with the shift selector in neutral.

(3) If fluid flow is intermittent or it takes more than 20 seconds to collect one quart of ATF PLUS 3, disconnect the **To Cooler** line at the transaxle.

(4) Refill the transaxle to proper level and recheck pump volume.

(5) If flow is found to be within acceptable limits, replace the cooler. Then fill transmission to the proper level, using Mopar® ATF PLUS 3 (Type 7176) automatic transmission fluid.

(6) If fluid flow is still found to be inadequate, check the line pressure using the Transaxle Hydraulic Pressure Test procedure.

REMOVAL AND INSTALLATION

VEHICLE SPEED SENSOR PINION GEAR

When the sensor is removed for any reason, a NEW O-ring must be installed on its outside diameter.

REMOVAL

(1) Remove harness connector from sensor. Make sure weatherseal stays on harness connector.

(2) Remove bolt securing the sensor in the extension housing.

(3) Carefully pull sensor and pinion gear assembly out of extension housing.

(4) Remove pinion gear from sensor.

INSTALLATION

(1) To install, reverse the above procedure. Make sure extension housing and sensor flange are clean prior to installation. Always use a NEW sensor O-ring.

(2) Tighten bolt to 7 N·m (60 in. lbs.). Tighten speedometer cable to 4 N·m (35 in. lbs.).

PARK/NEUTRAL STARTING AND BACK-UP LAMP SWITCH

TEST

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

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

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

REMOVAL

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

INSTALLATION

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

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

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

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

REMOVAL AND INSTALLATION (Continued)

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

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

TRANSAXLE AND TORQUE CONVERTER REMOVAL

NOTE: Transaxle removal does NOT require engine removal.

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

REMOVAL

(1) Disconnect negative battery cable.

(2) Remove air cleaner and hoses.

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

(4) Unplug torque converter clutch connector, located near the dipstick. Unplug the gear position switch.

(5) Remove transaxle dipstick tube.

(6) Remove the transaxle cooler lines and plug.

(7) Install engine support fixture (Fig. 5) .

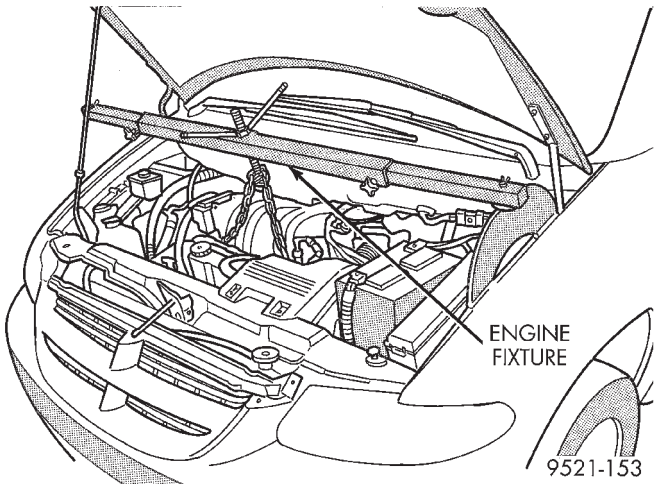


Fig. 5 Engine Support Fixture

(8) Remove bell housing upper bolts.

(9) Raise vehicle. Remove front wheels. Refer to Group 2, Suspension to remove or install wheel hub nut and both drive shafts.

CAUTION: The exhaust flex joint must be disconnected from the exhaust manifold anytime the engine is lowered. If the engine is lowered while the flex pipe is attached, damage will occur.

(10) Remove bolts securing exhaust flex joint to exhaust manifold. Disconnect exhaust pipe from manifold.

(11) Remove torque converter dust cover. Mark torque converter and drive plate with chalk, for reassembly. Rotate engine clockwise and remove torque converter mounting bolts.

(12) Remove engine mount bracket from front crossmember.

(13) Remove front mount insulator through-bolt and bellhousing bolts.

(14) Position transaxle jack (Fig. 6) .

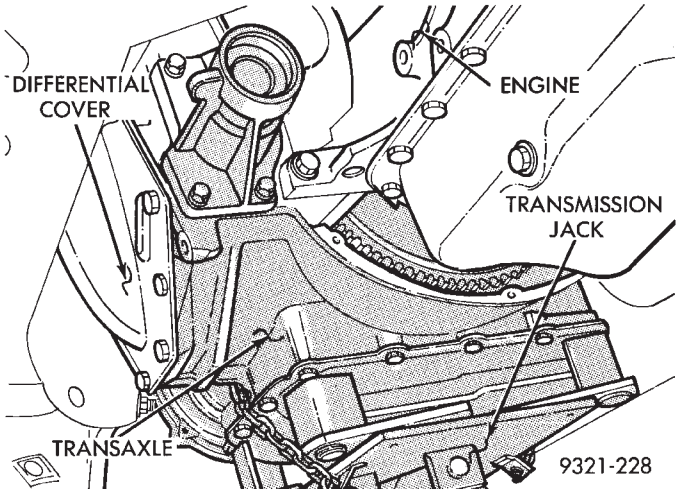


Fig. 6 Transaxle Jack

(15) Remove rear engine mount shield.

(16) Remove rear engine mount bracket bolts and bracket.

(17) Remove left engine mount thru-bolt.

(18) Remove left engine mount from transaxle.

(19) Remove starter. Remove lower bell housing bolts.

(20) Carefully work transaxle and torque converter assembly rearward off engine block dowels and disengage converter hub from end of crankshaft. **Attach a small C clamp to edge of bell housing. This will hold torque converter in place during transaxle removal.** Lower transaxle and remove assembly from under the vehicle.

(21) To remove torque converter assembly, remove C–clamp from edge of bellhousing and slide converter out of transaxle.

INSTALLATION

(1) When installing transaxle, reverse the above procedure.

(2) If torque converter was removed from transaxle be sure to align pump inner gear pilot flats with torque converter impeller hub flats.

(3) Adjust gearshift and throttle cables.

(4) Refill transaxle with Mopar ATF PLUS 3 (Automatic Transmission Fluid) Type 7176.

REMOVAL AND INSTALLATION (Continued)

FRONT PUMP OIL SEAL

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

REMOVAL

(1) Screw seal remover Tool C-3981-B into seal (Fig. 7), then tighten screw portion of tool to withdraw the seal.

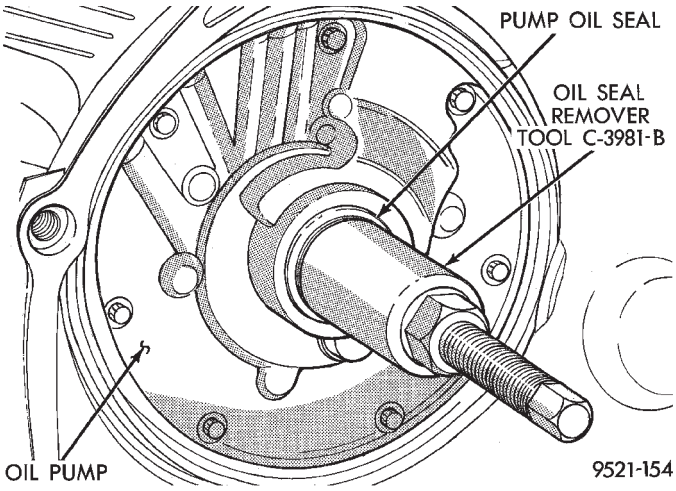


Fig. 7 Remove Pump Oil Seal

INSTALLATION

(1) To install a new seal, place seal in opening of the pump housing (lip side facing inward). Using Tool C-4193 and Handle Tool C-4171, drive new seal into housing until tool bottoms (Fig. 8).

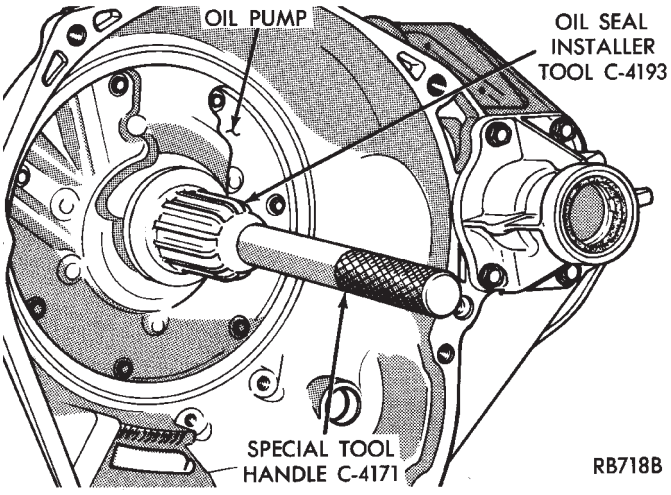


Fig. 8 Install Pump Oil Seal

DISASSEMBLY AND ASSEMBLY

TRANSAXLE

Prior to removing any transaxle parts, plug all openings and clean the unit, preferably with steam. When disassembling, each part should be washed in a suitable solvent, then dried with 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.

DISASSEMBLY

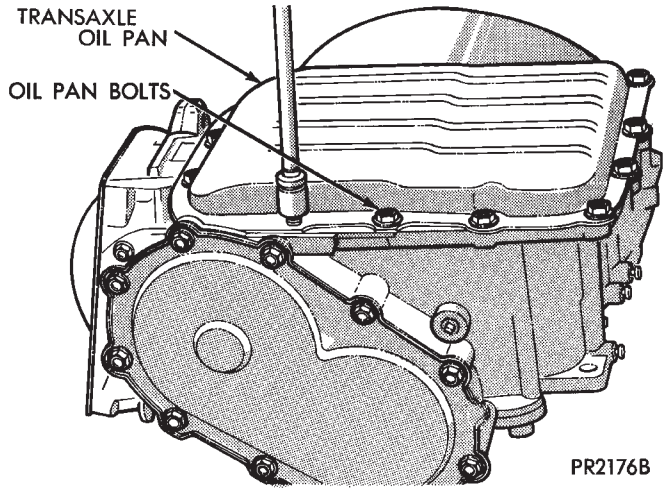


Fig. 9 Transaxle Oil Pan Bolts

Remove all old sealant before applying new sealant.

Use only Mopar® Silicone Rubber Sealant or equivalent when installing oil pan.

Put sealant on the oil pan flange (Fig. 10) and on all oil pan bolts (underside of bolt head).

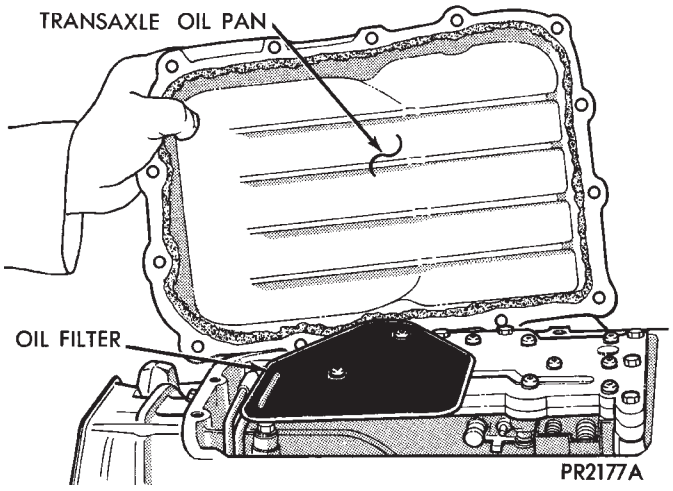


Fig. 10 Transaxle Oil Pan

DISASSEMBLY AND ASSEMBLY (Continued)

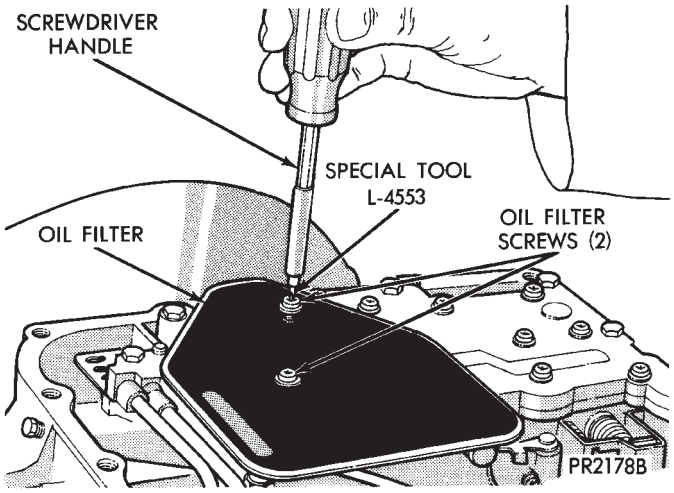


Fig. 11 Oil Filter Screws

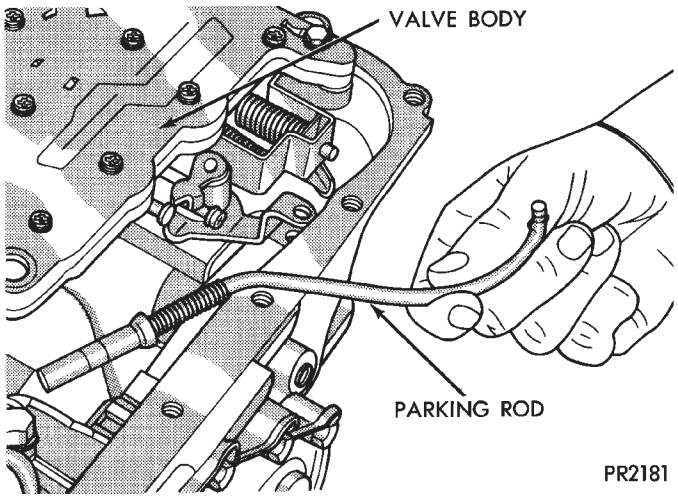


Fig. 14 Parking Rod

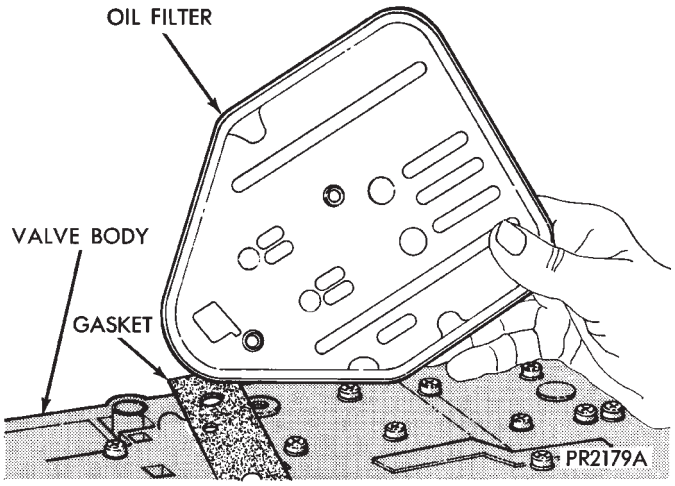


Fig. 12 Oil Filter

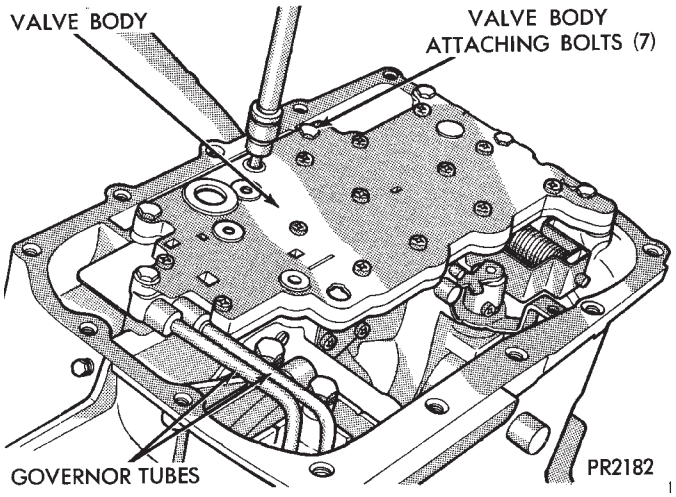


Fig. 15 Valve Body Attaching Bolts

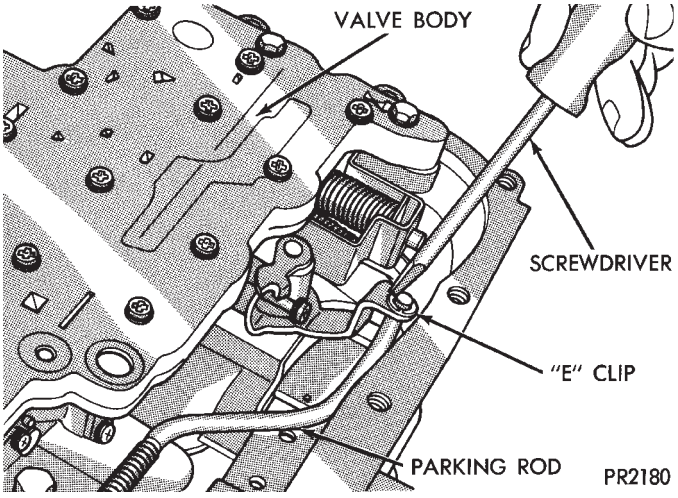


Fig. 13 Remove Parking Rod E-Clip

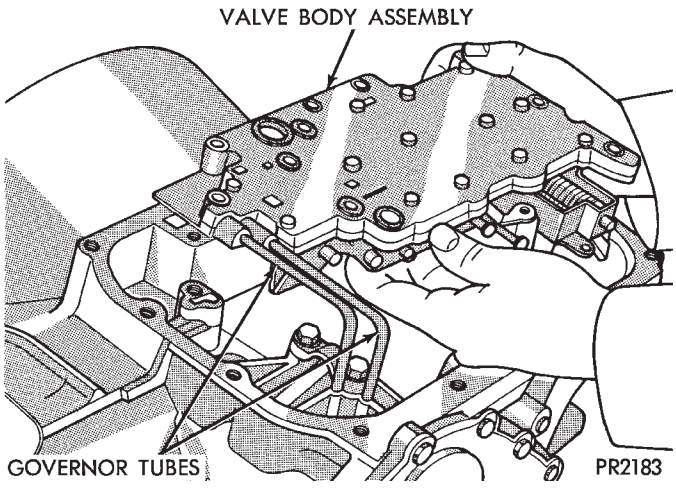


Fig. 16 Valve Body and Governor Tubes

Remove neutral starting and back-up lamp switch.

Measuring input shaft end play before disassembly will usually indicate if a thrust washer change is required. The thrust washer is located between input and output shafts.

DISASSEMBLY AND ASSEMBLY (Continued)

Attach a dial indicator to transaxle bell housing with its plunger seated against end of input shaft (Fig. 17).

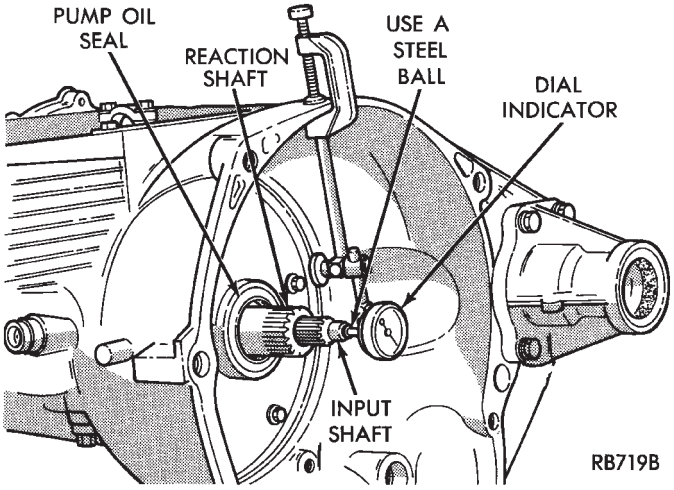


Fig. 17 Measure Input Shaft End Play

Move input shaft in and out to obtain end play reading. End play specifications are 0.19 to 1.50 mm (0.008 to 0.060 inch).

Record indicator reading for reference when reassembling the transaxle.

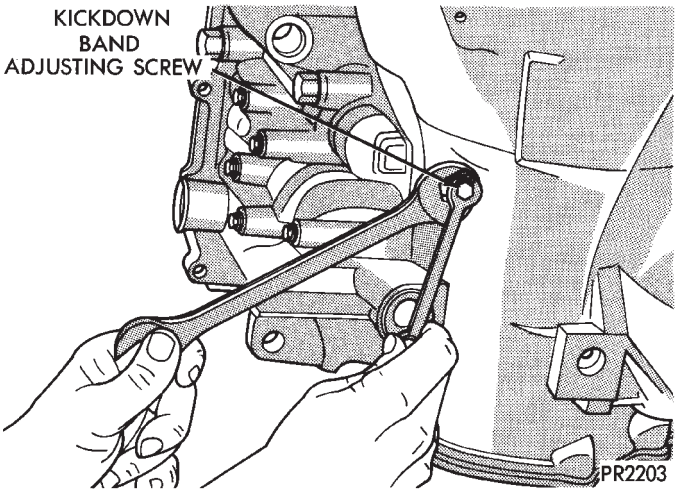


Fig. 18 Loosen Lock Nut and Tighten Kickdown Band Adjusting Screw

Remove Number 6 thrust washer from sun gear driving shell.

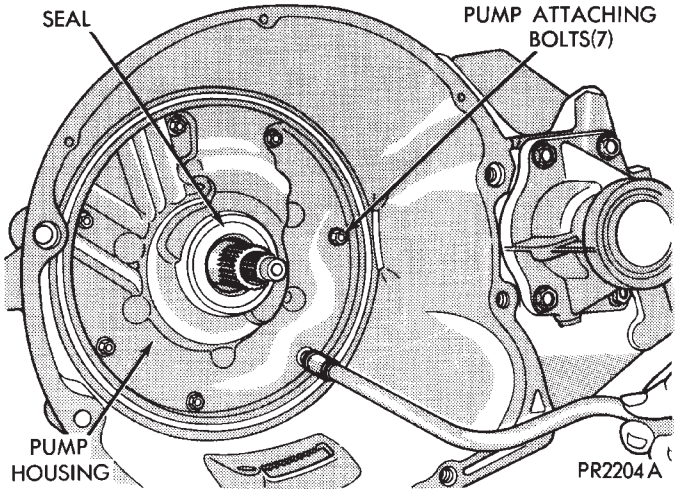


Fig. 19 Pump Attaching Bolts

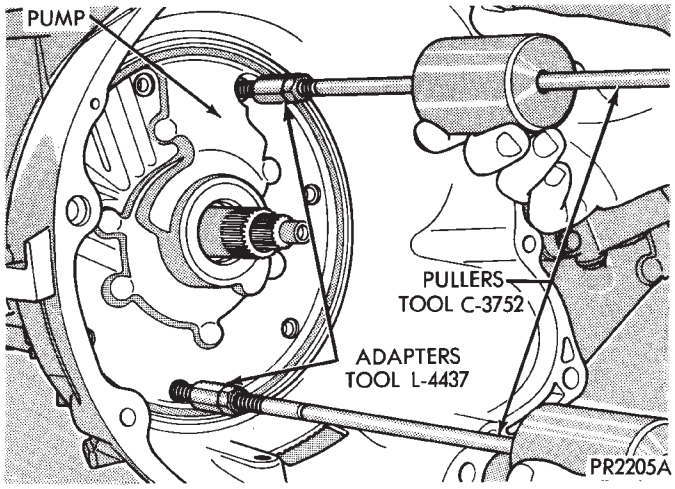


Fig. 20 Install Tool C-3752 with Adapters L-4437

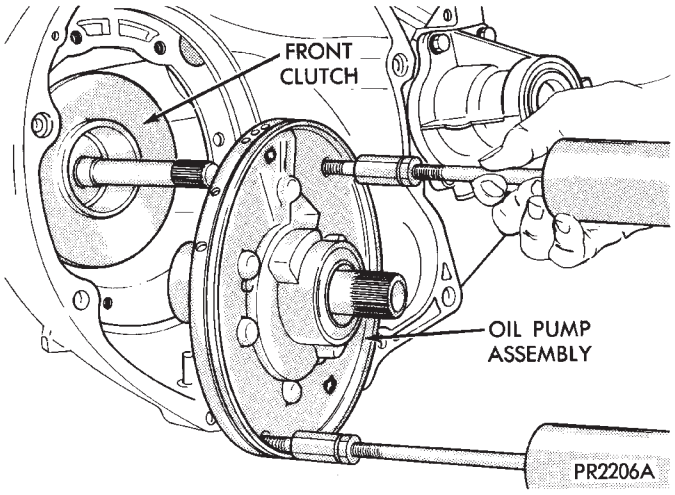


Fig. 21 Oil Pump with No. 1 Thrust Washer

DISASSEMBLY AND ASSEMBLY (Continued)

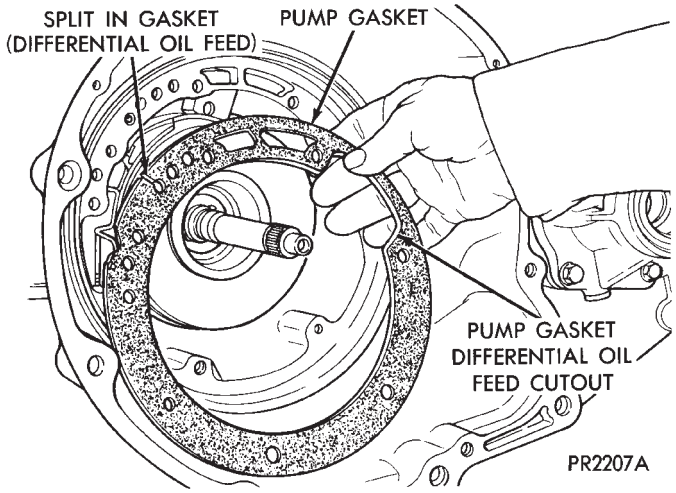


Fig. 22 Oil Pump Gasket

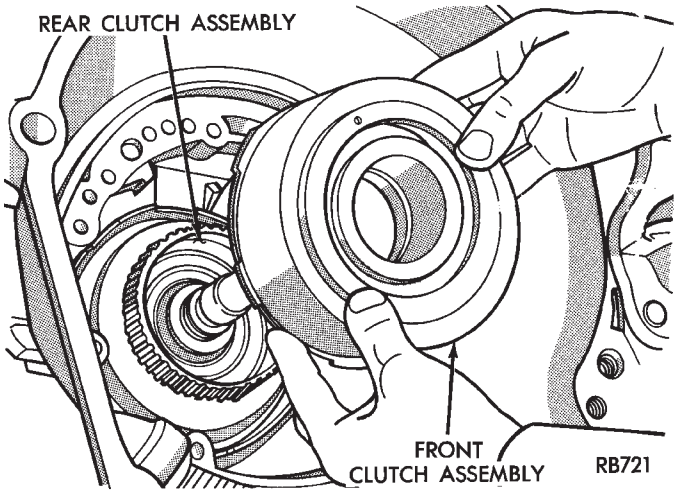


Fig. 25 Front Clutch Assembly

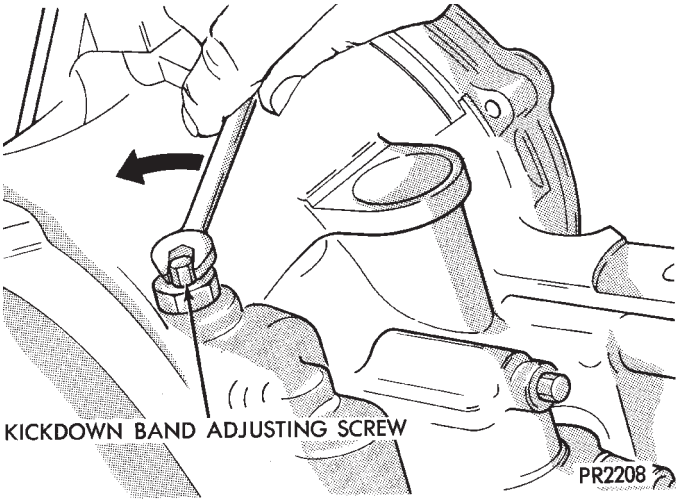


Fig. 23 Loosen Kickdown Band Adjusting Screw

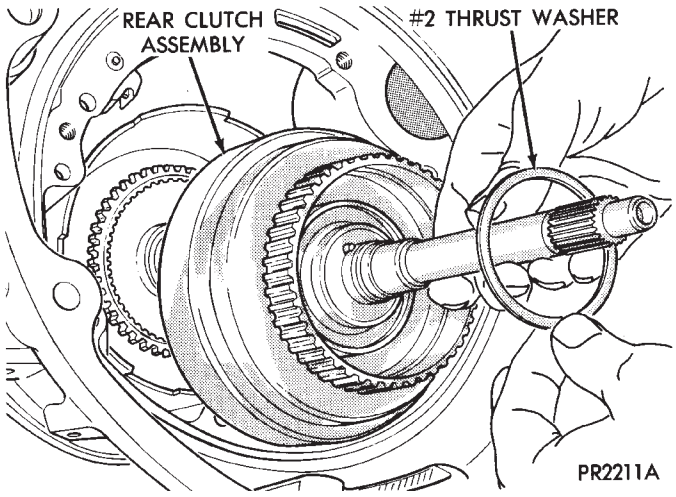


Fig. 26 No. 2 Thrust Washer and Rear Clutch

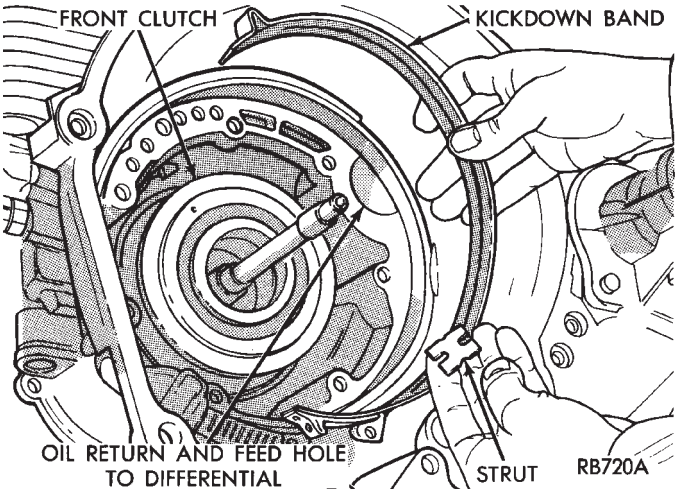


Fig. 24 Kickdown Band and Strut

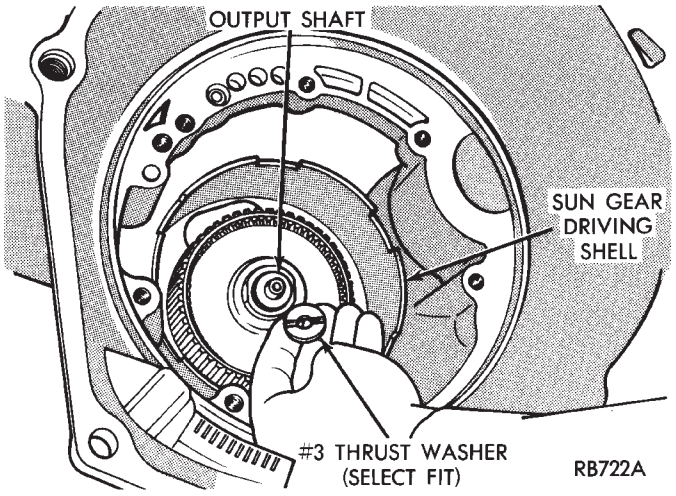


Fig. 27 No. 3 Thrust Washer

DISASSEMBLY AND ASSEMBLY (Continued)

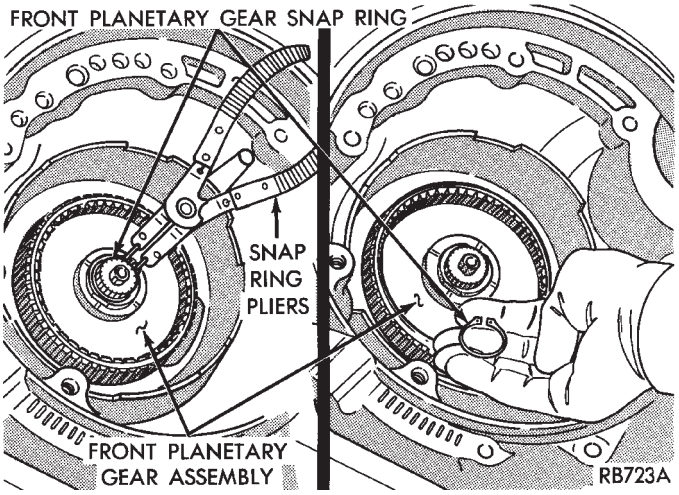


Fig. 28 Front Planetary Gear Snap Ring

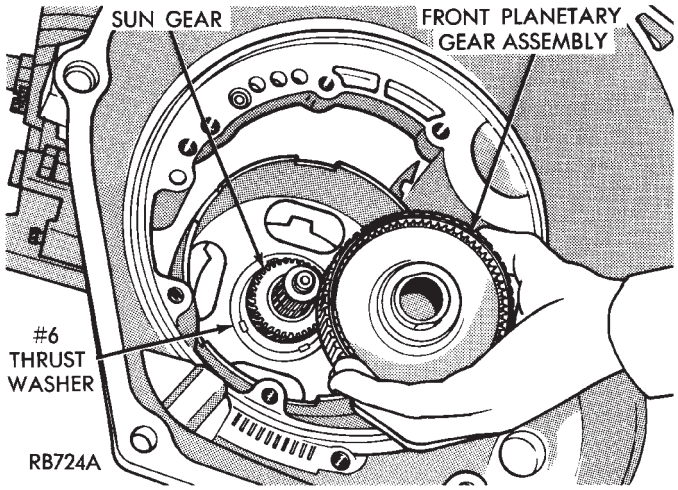


Fig. 29 Front Planetary Gear Assembly

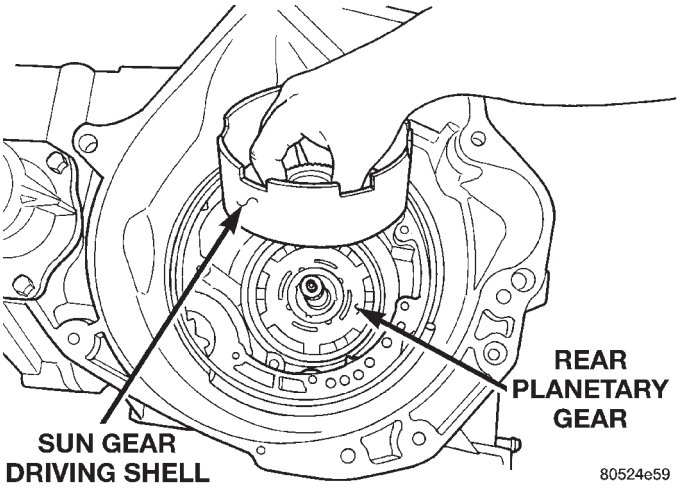


Fig. 30 Sun Gear Driving Shell

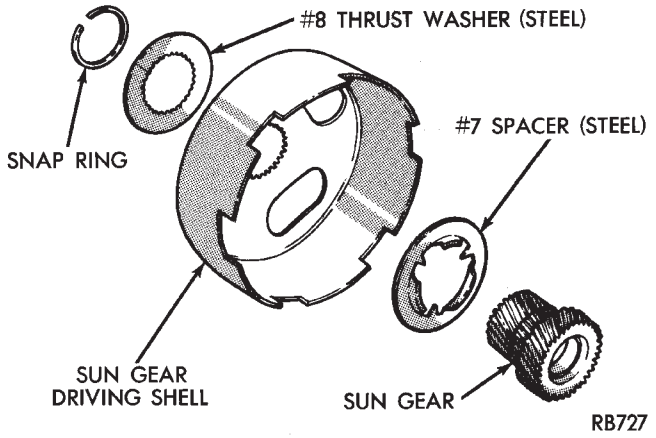


Fig. 31 Sun Gear Driving Shell Components

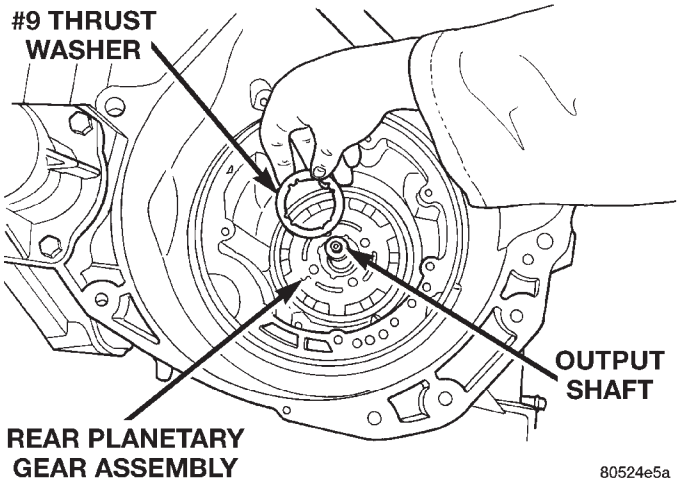


Fig. 32 No. 9 Thrust Washer

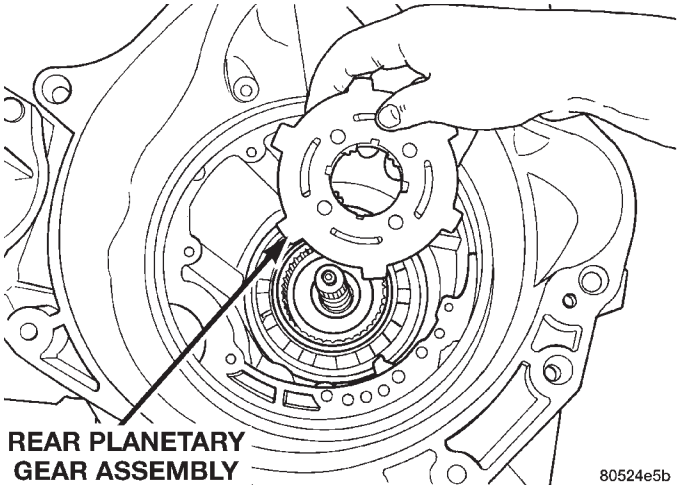


Fig. 33 Rear Planetary Gear Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

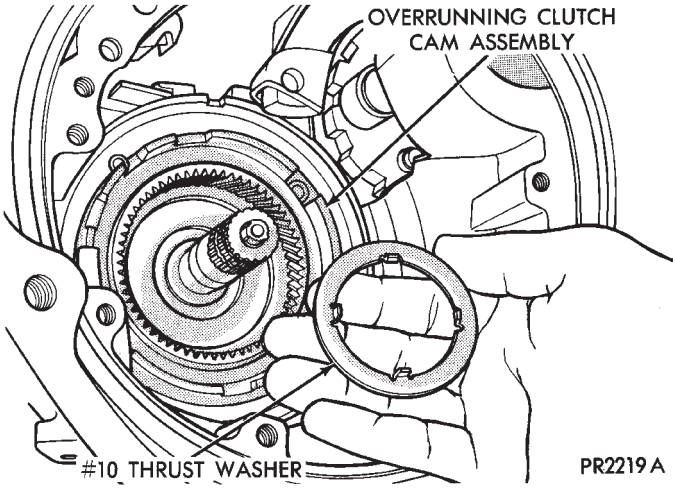


Fig. 34 No. 10 Thrust Washer

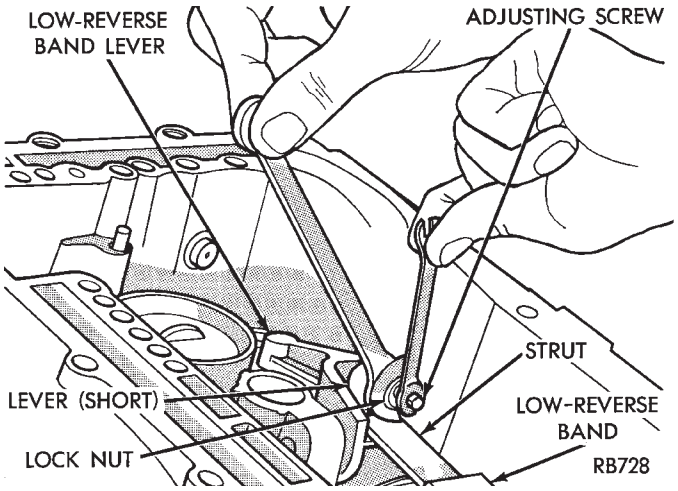


Fig. 37 Loosen or Adjust Low/Reverse Band

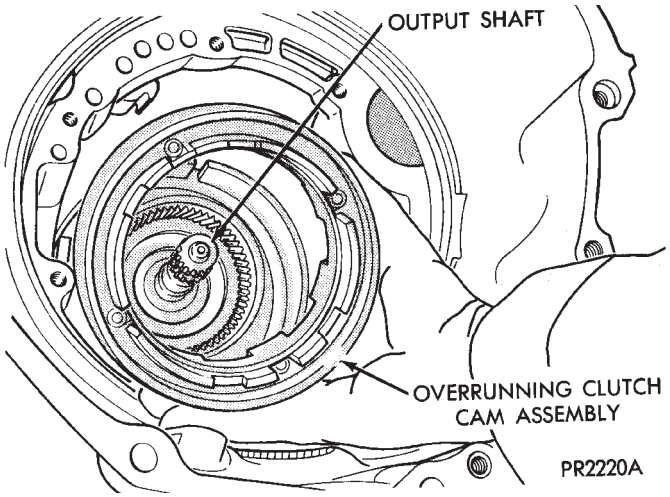


Fig. 35 Overrunning Clutch Cam Assembly

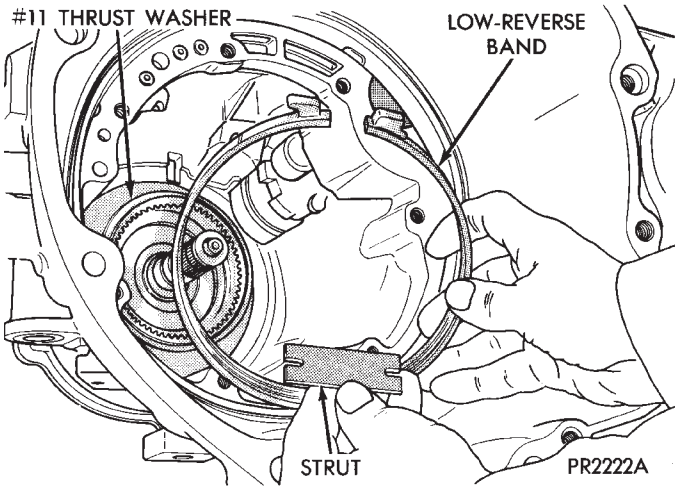


Fig. 38 Low/Reverse Band and Strut

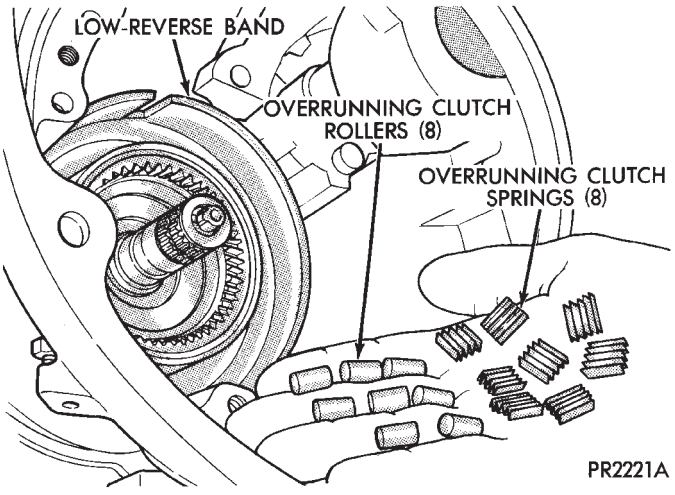


Fig. 36 Overrunning Clutch Rollers and Spring

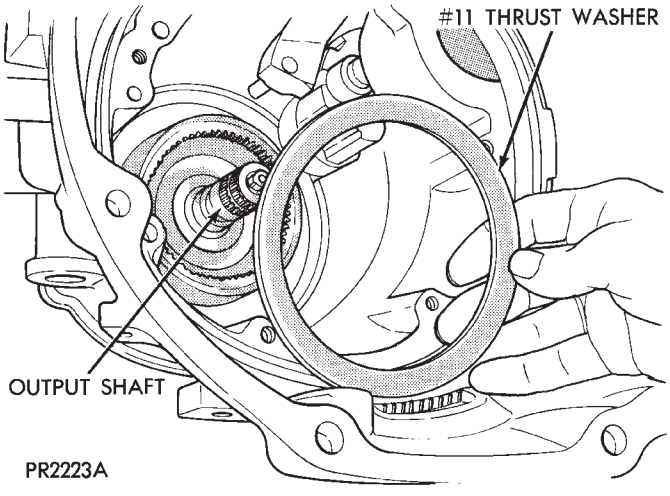


Fig. 39 No. 11 Thrust Washer

DISASSEMBLY AND ASSEMBLY (Continued)

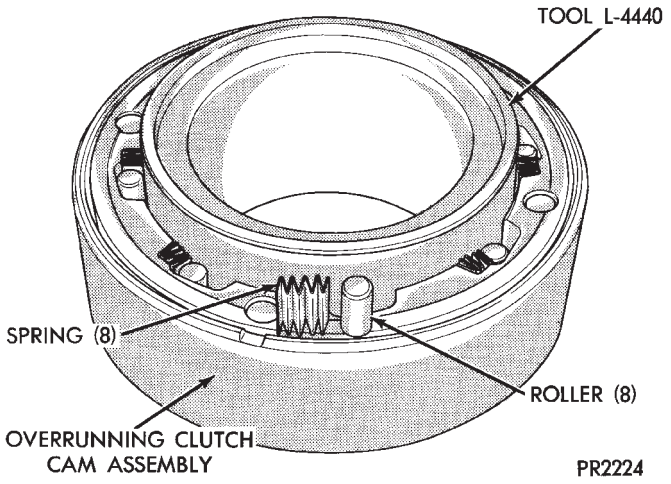


Fig. 40 Install Overrunning Clutch Rollers and Springs

ASSEMBLY

When rebuilding, reverse the above procedure.

VALVE BODY RECONDITION

NOTE: Tighten all valve body screws to 5 N·m (40 in. lbs.).

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

NOTE: TAG ALL SPRINGS AS THEY ARE REMOVED FOR REASSEMBLY IDENTIFICATION.

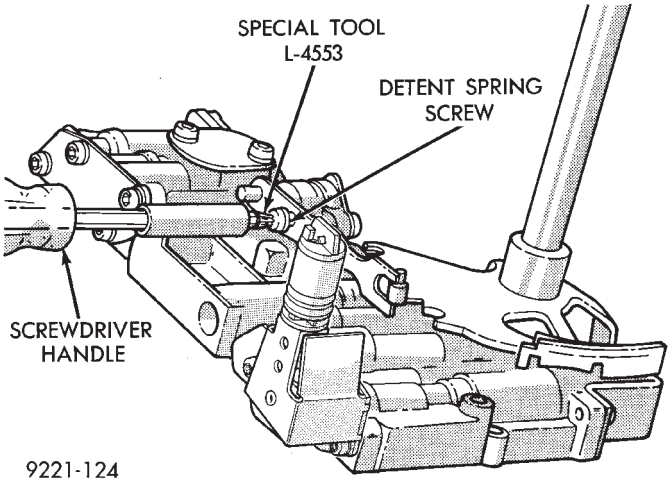


Fig. 41 Detent Spring Attaching Screw and Spring

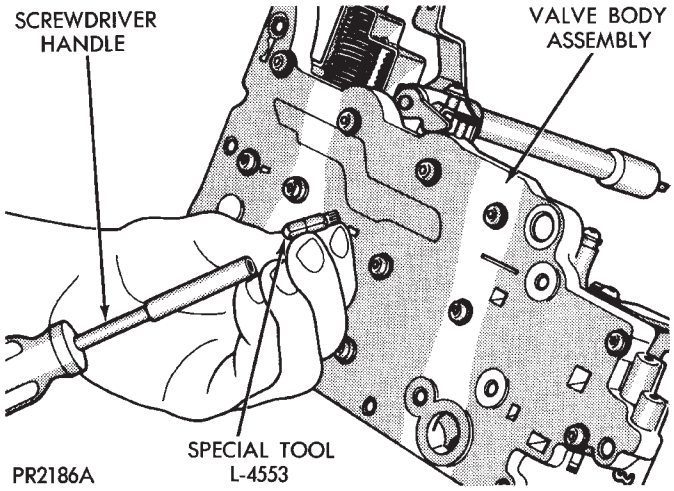


Fig. 42 Using Tool L-4553 on Valve Body Screw

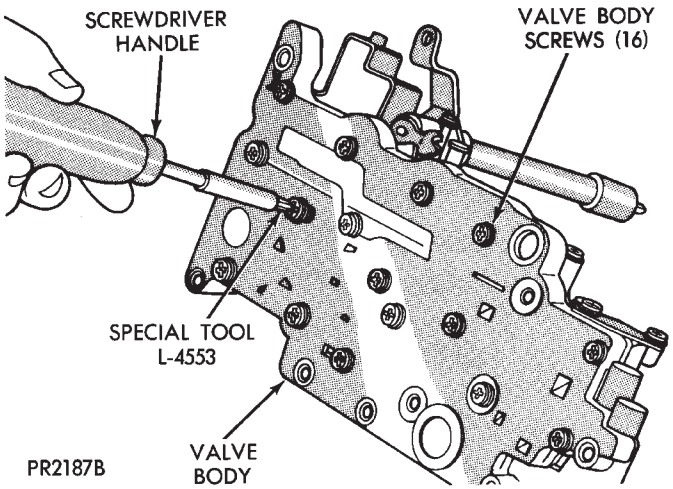


Fig. 43 Remove or Install Valve Body Screws

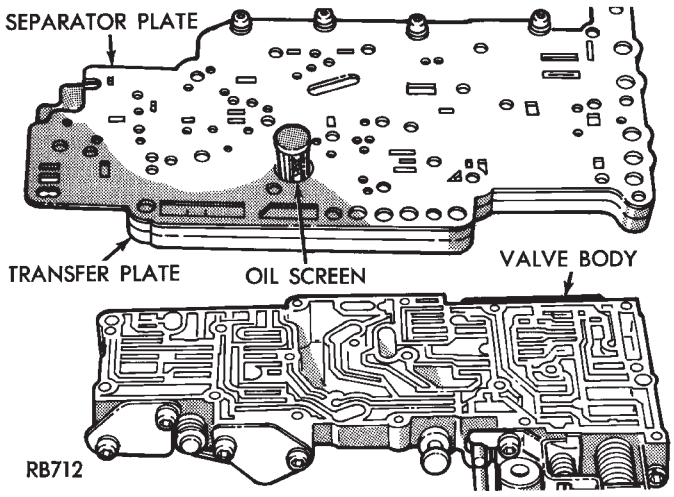


Fig. 44 Transfer Plate and Separator Plate

DISASSEMBLY AND ASSEMBLY (Continued)

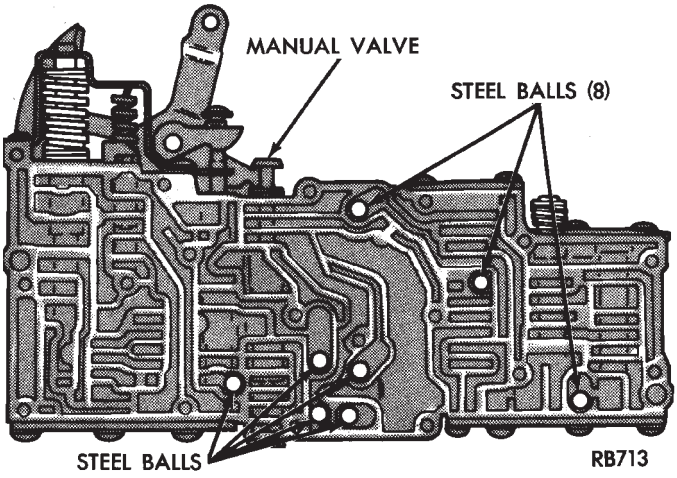


Fig. 45 Steel Ball Locations

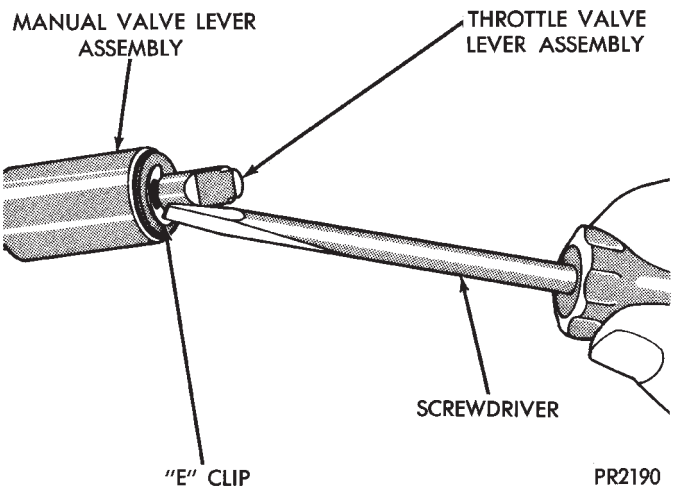


Fig. 46 Remove or Install Throttle Shaft E-Clip

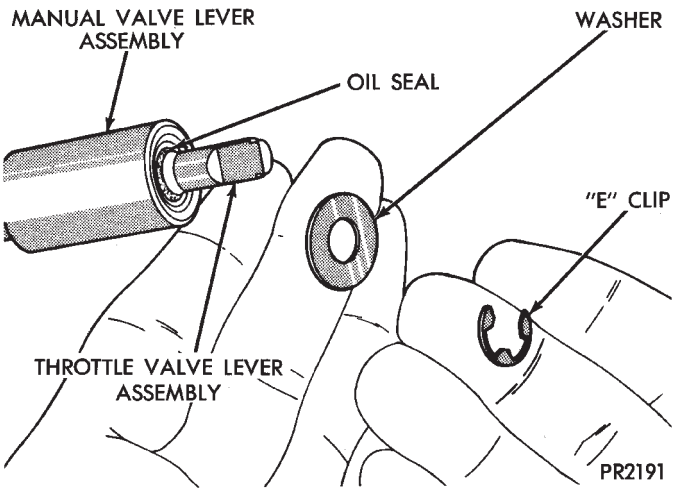


Fig. 47 Throttle Shaft E-Clip, Washer, and Seal

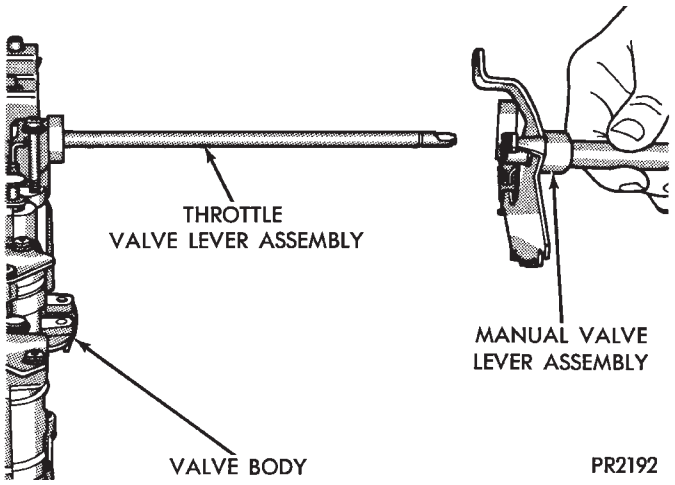


Fig. 48 Manual Valve Lever Assembly

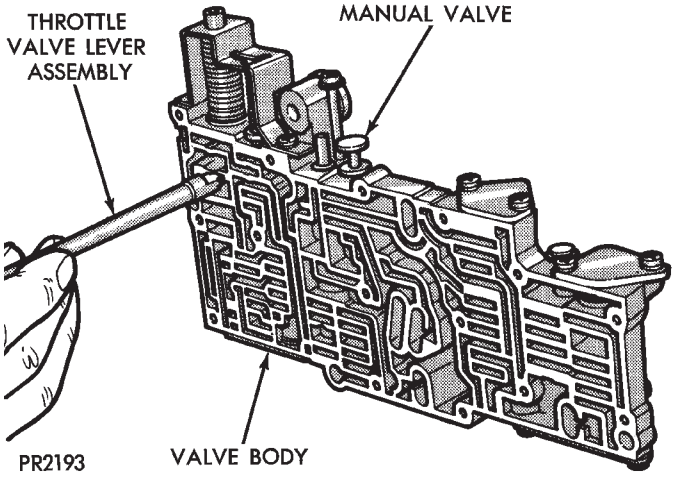


Fig. 49 Throttle Valve Lever Assembly

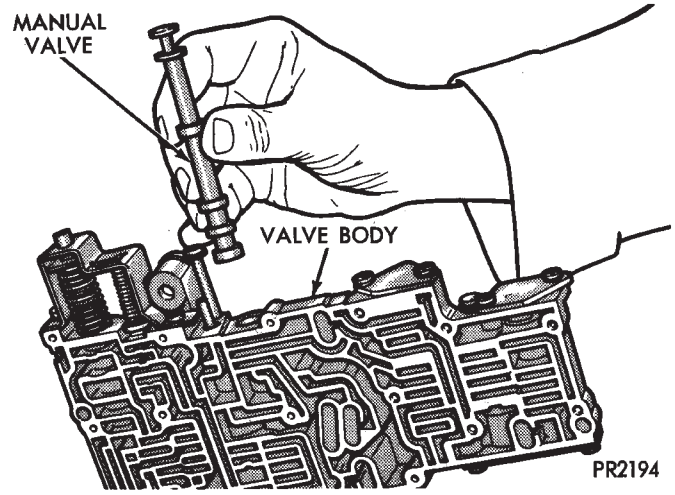


Fig. 50 Manual Valve

DISASSEMBLY AND ASSEMBLY (Continued)

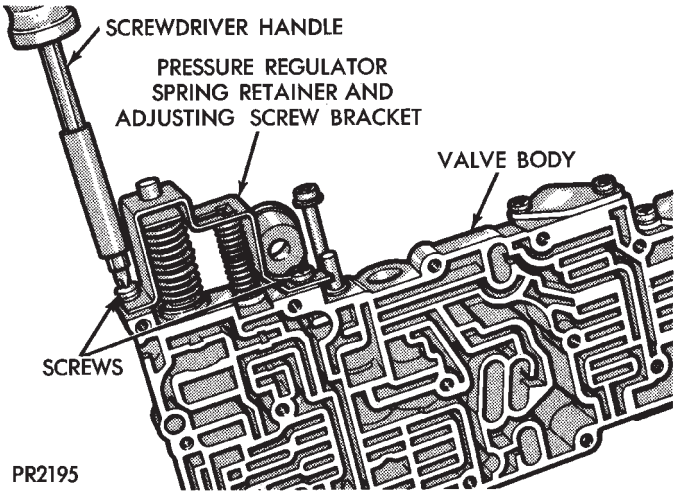


Fig. 51 Pressure Regulator and Adjusting Screw Bracket

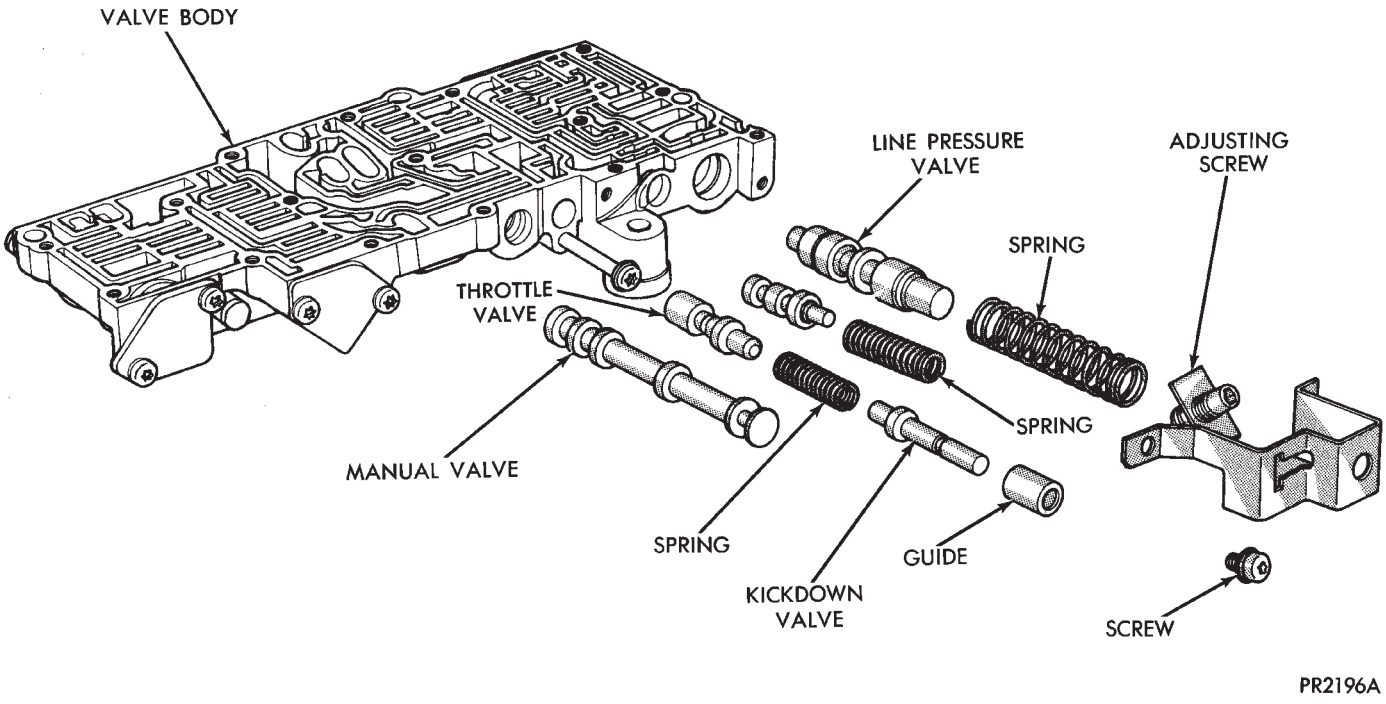


Fig. 52 Pressure Regulators and Manual Controls

DISASSEMBLY AND ASSEMBLY (Continued)

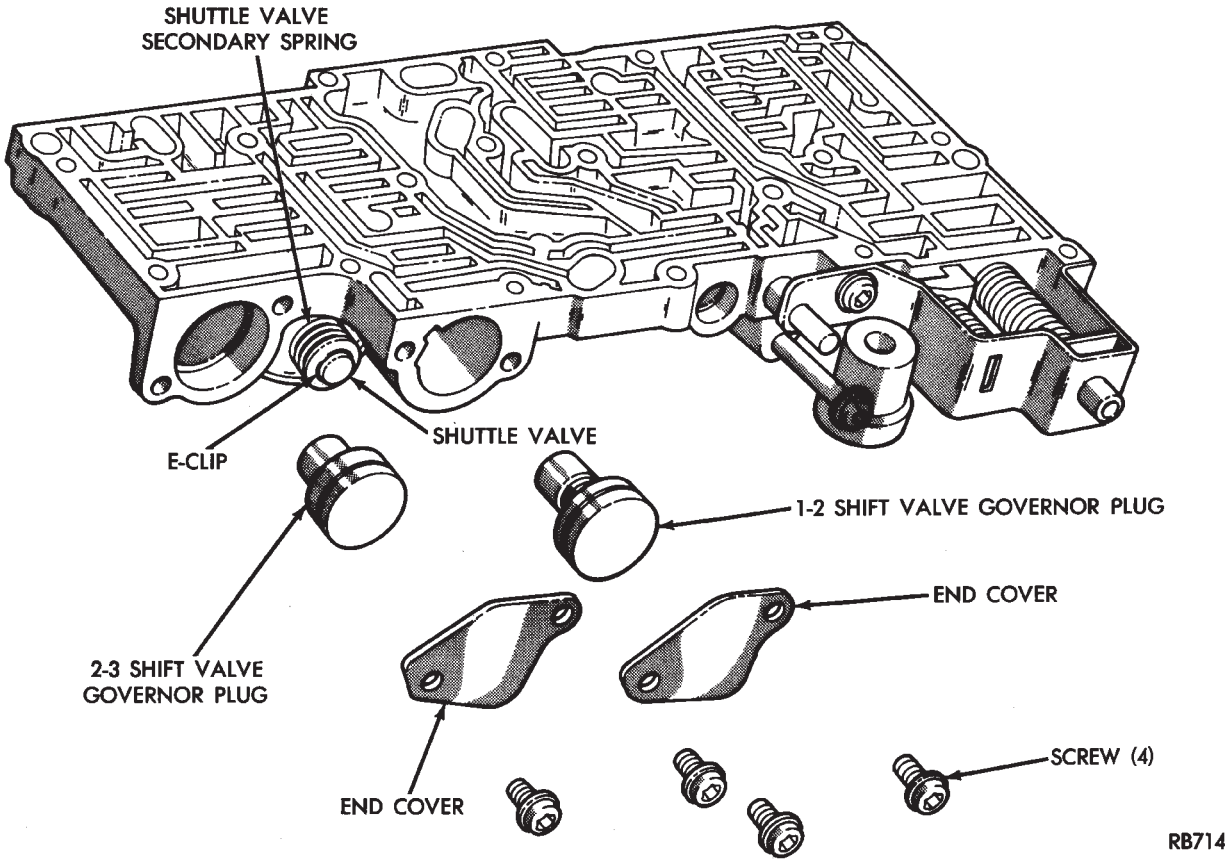


Fig. 53 Governor Plugs

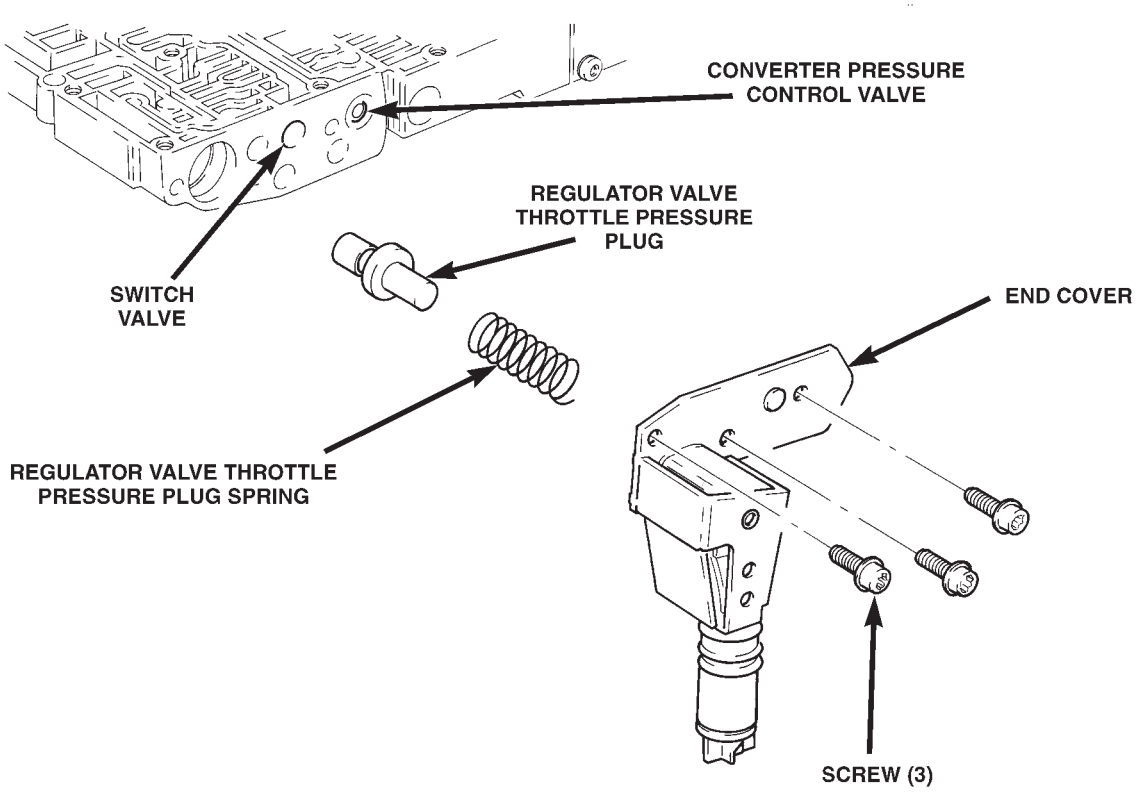


Fig. 54 Pressure Regulator Valve Plugs

80500534

DISASSEMBLY AND ASSEMBLY (Continued)

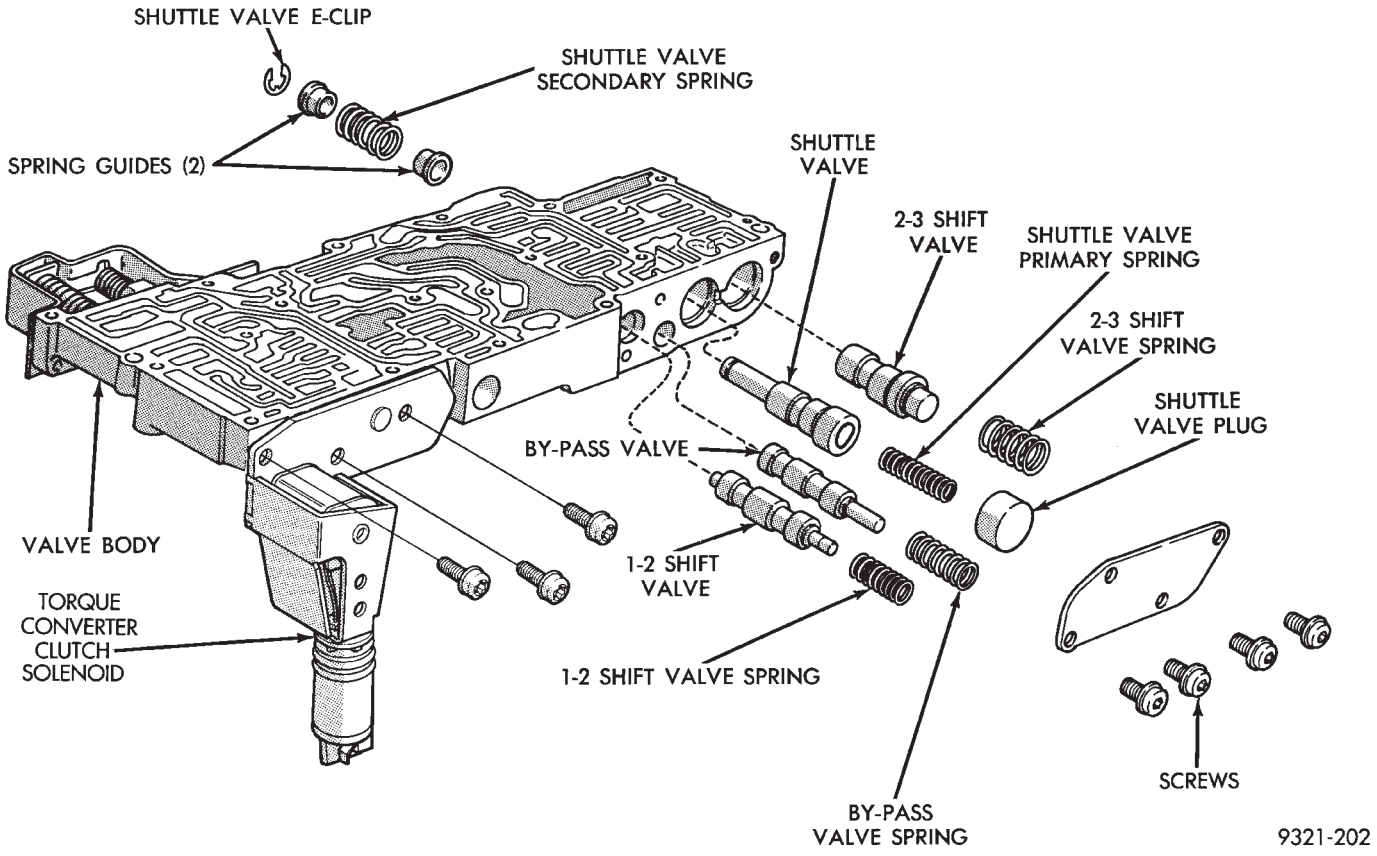


Fig. 55 Shift Valves and Shuttle Valve

OIL PUMP-RECONDITION

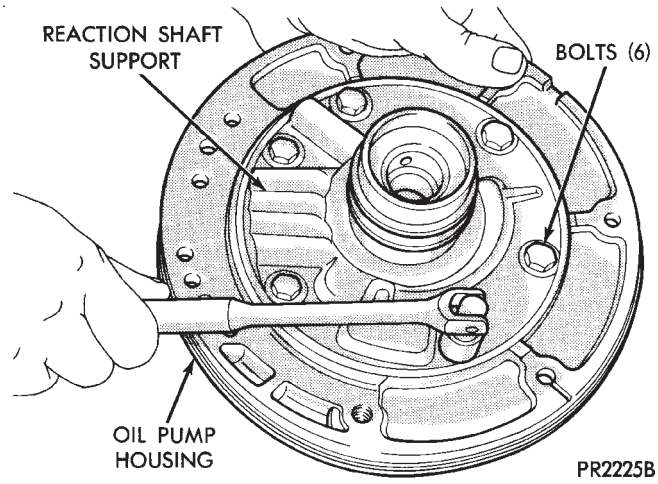


Fig. 56 Reaction Shaft Support Bolts

NOTE: Also, check gear side clearance with a straight edge and a feeler gauge (See Specifications).

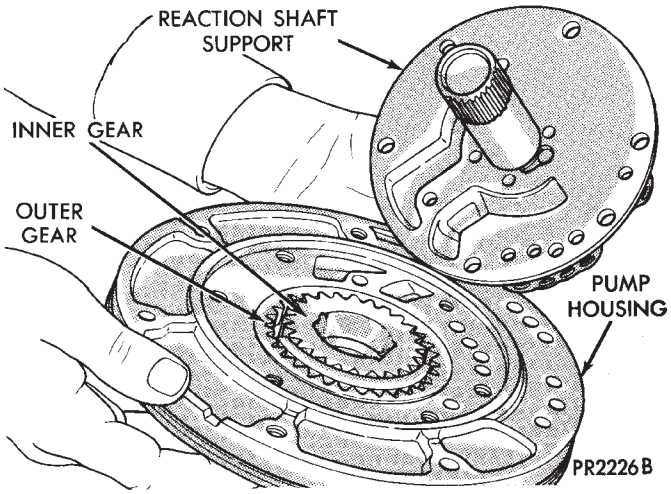


Fig. 57 Reaction Shaft Support

DISASSEMBLY AND ASSEMBLY (Continued)

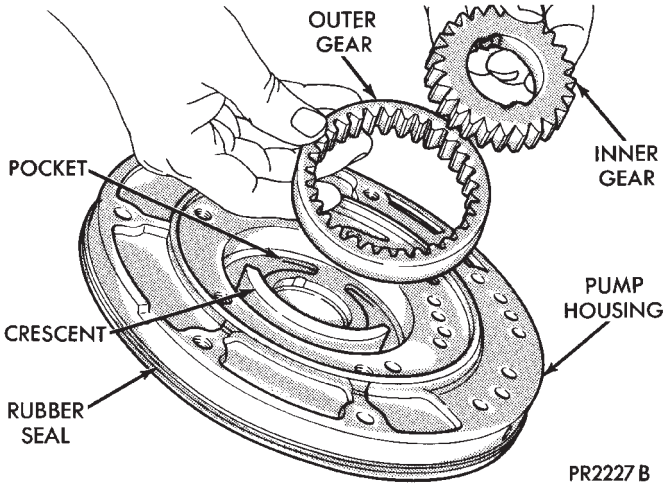


Fig. 58 Inner and Outer Pump Gears

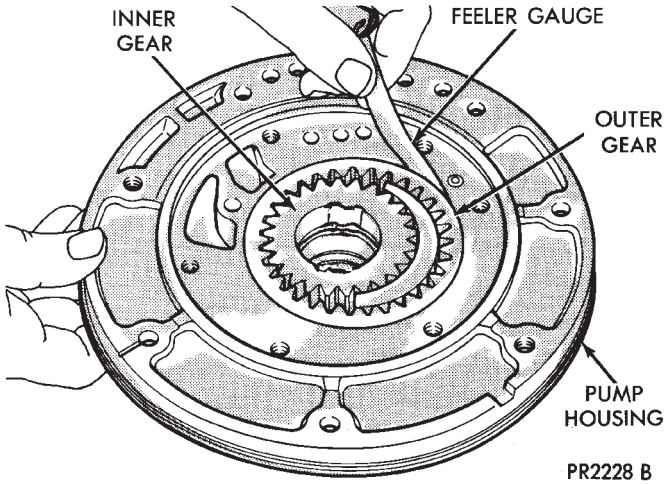


Fig. 59 Measuring Pump Clearance (Gear to Pocket)

FRONT CLUTCH-RECONDITION

INSPECTION

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

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

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

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

DISASSEMBLY

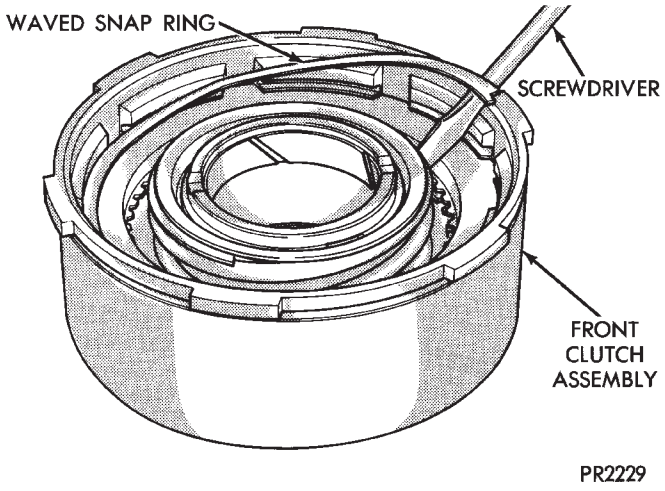


Fig. 60 Front Clutch Waved Snap Ring

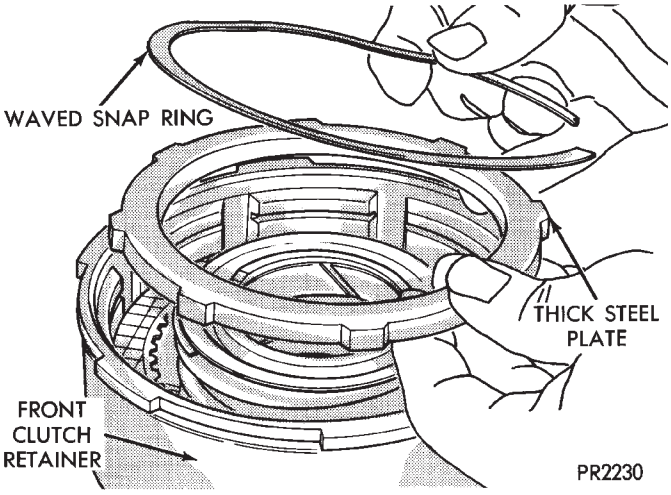


Fig. 61 Thick Steel Plate and Waved Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

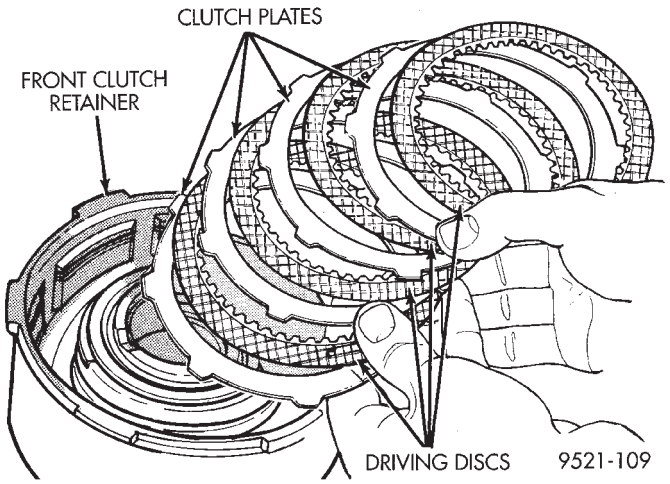


Fig. 62 Front Clutch (4-Disc Shown)

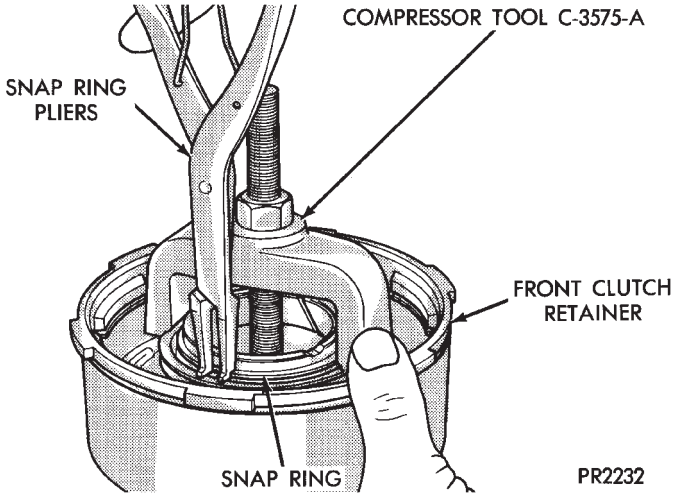


Fig. 63 Front Clutch Return Spring Snap Ring

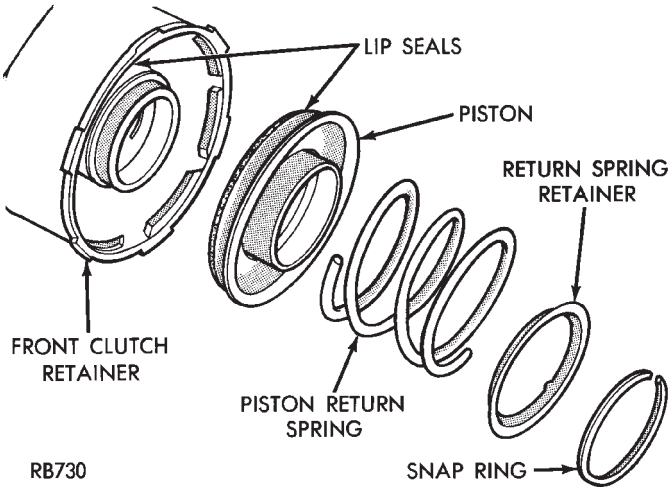


Fig. 64 Front Clutch Return Spring and Piston

ASSEMBLY

To reassemble, reverse the above procedure.

MEASURING PLATE CLEARANCE

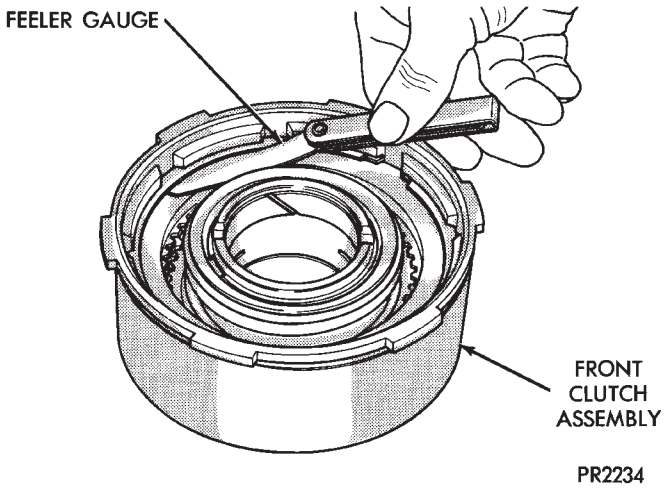


Fig. 65 Measuring Front Clutch Plate Clearance

REAR CLUTCH-RECONDITION

INSPECTION

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

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in the grooves. Note ball check in piston; make sure ball moves freely. Inspect seal rings surfaces in clutch retainer for nicks or deep scratches; light scratches will not interfere with sealing of the seals. Inspect neoprene seal rings for deterioration, wear and hardness. Inspect piston spring and waved snap ring for distortion or breakage.

Inspect teflon and/or cast iron seal rings on input shaft for wear. Do not remove rings unless conditions warrant. Inspect rear clutch to front clutch No. 2 thrust washer for wear. Washer thickness should be .061 to .063 inch, replace if necessary.

DISASSEMBLY

Press out input shaft, if required.

ASSEMBLY

To reassemble, reverse the above procedure.

DISASSEMBLY AND ASSEMBLY (Continued)

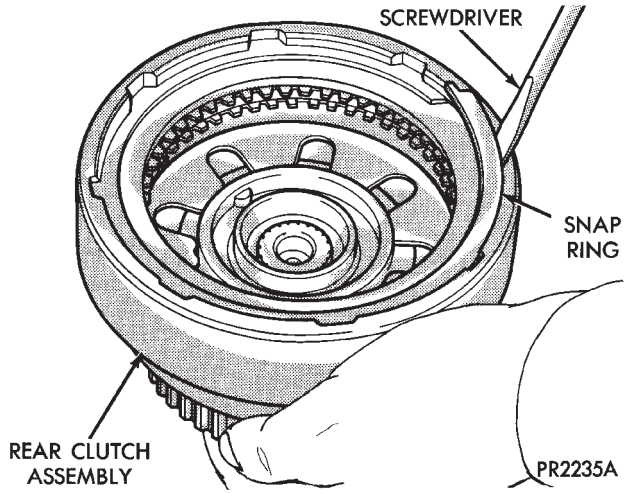


Fig. 66 Rear Clutch Outer Snap Ring

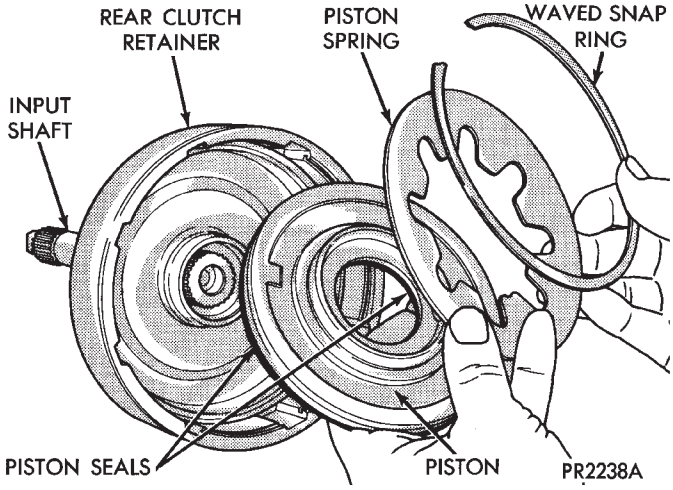


Fig. 69 Rear Clutch Piston and Piston Spring

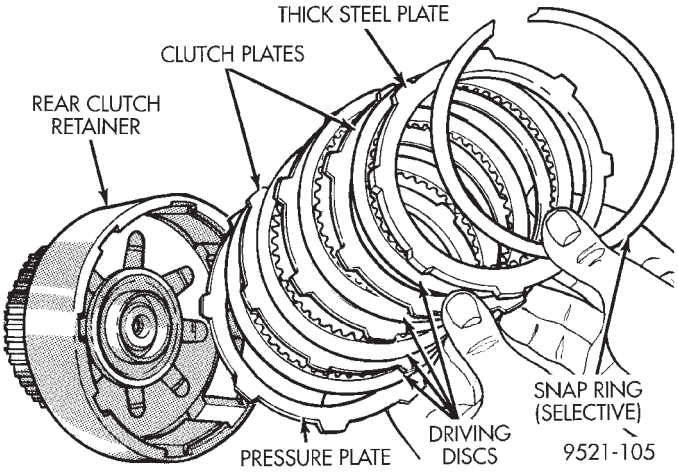


Fig. 67 Rear Clutch (4-Disc Shown)

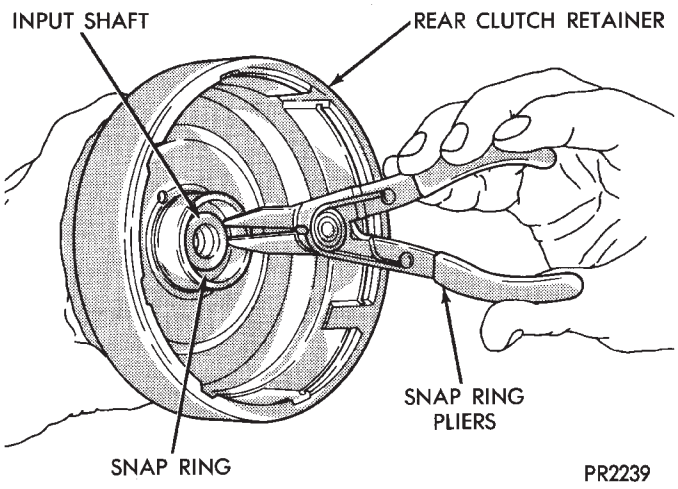


Fig. 70 Remove or Install Input Shaft Snap Ring

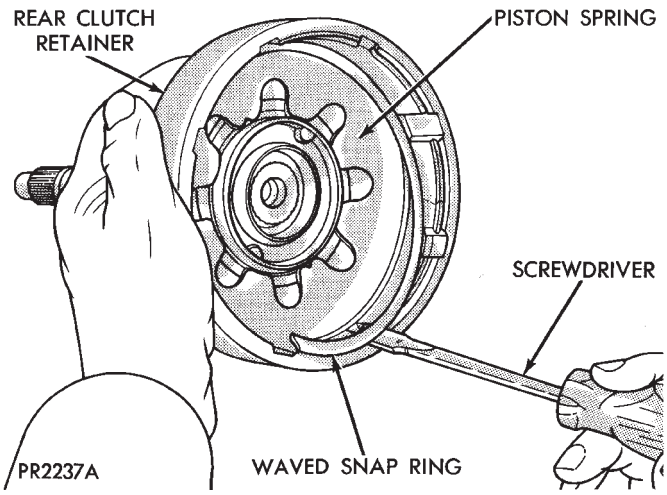


Fig. 68 Piston Spring Waved Snap Ring

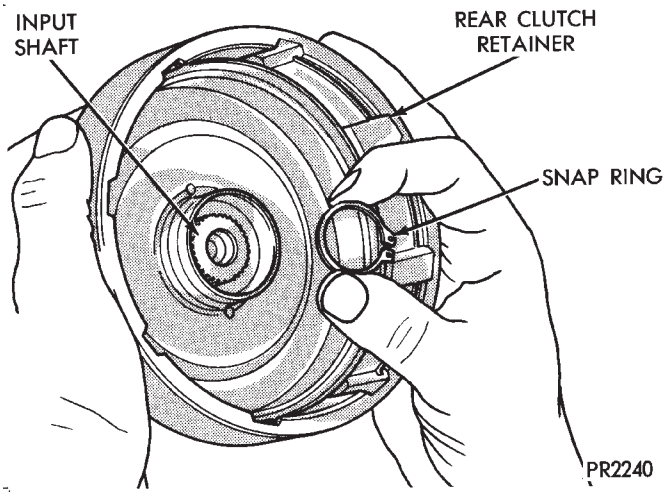


Fig. 71 Input Shaft Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

MEASURING PLATE CLEARANCE

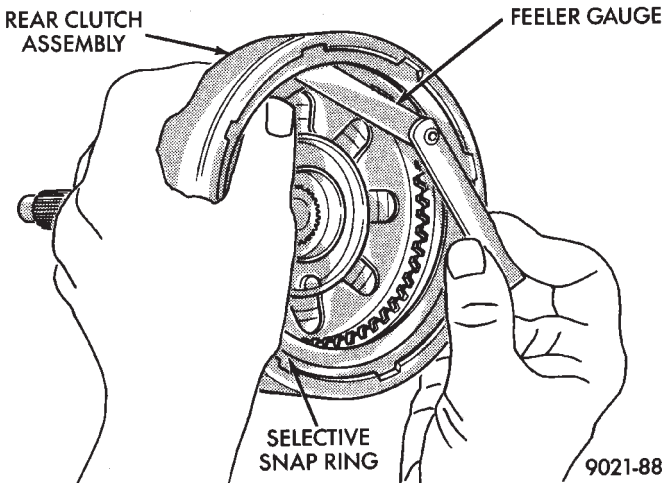


Fig. 72 Measuring Rear Clutch Plate Clearance

FRONT PLANETARY & ANNULUS GEAR-RECONDITION

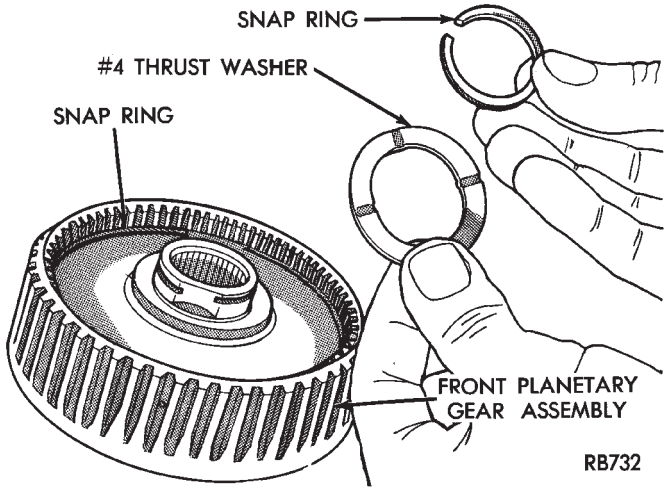


Fig. 73 Front Planetary Gear Snap Ring and No. 4 Thrust Washer (Always Install a New Snap Ring)

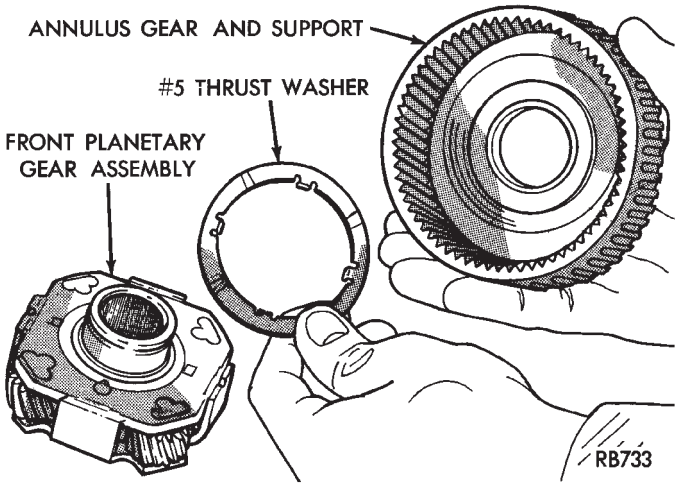


Fig. 74 Front Planetary Gear

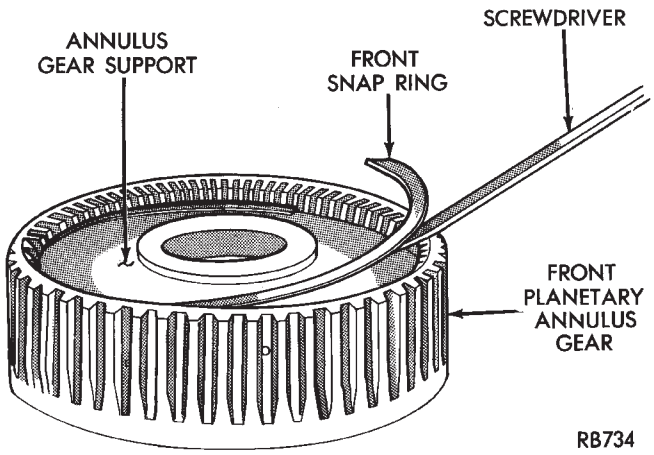


Fig. 75 Annulus Gear Support Front Snap Ring

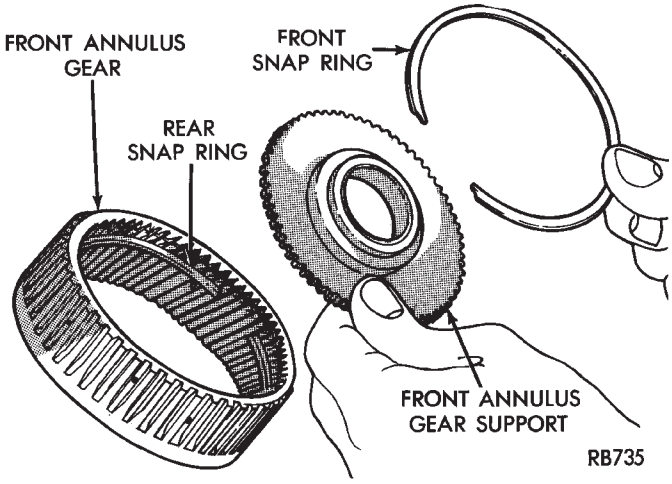


Fig. 76 Front Annulus Gear Support and Snap Ring

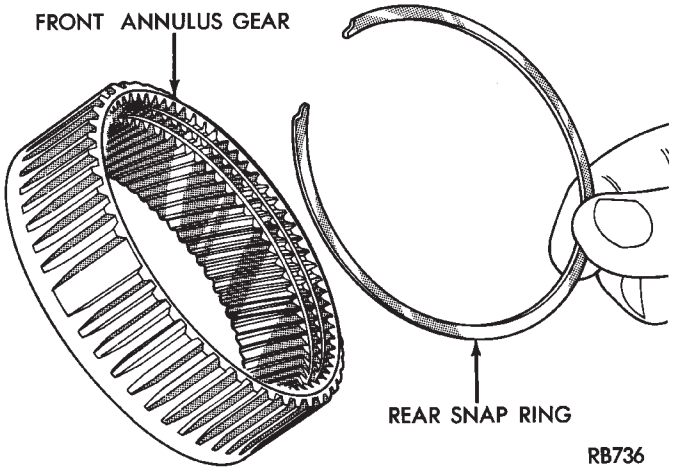


Fig. 77 Front Annulus Gear Support Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

LOW/REVERSE (REAR) SERVO-RECONDITION

DISASSEMBLY

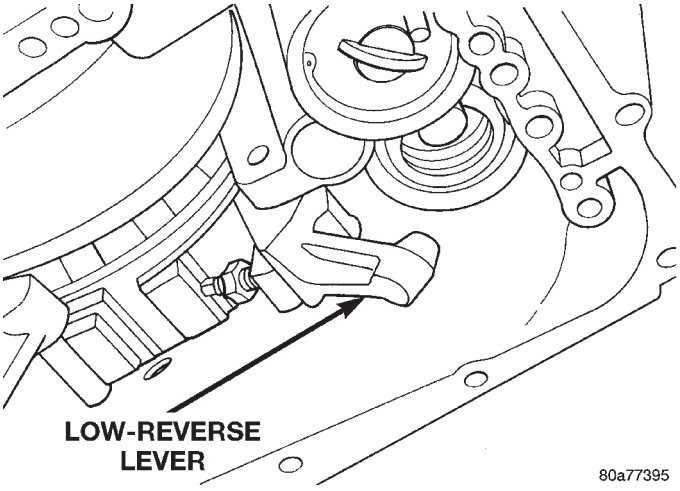


Fig. 78 Low/Reverse Lever

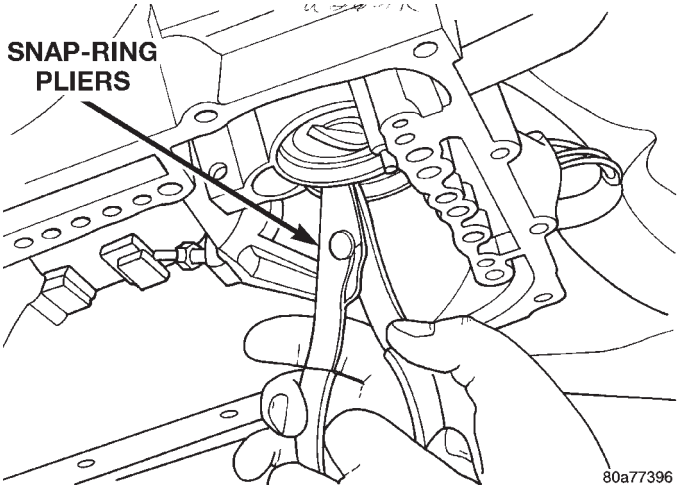


Fig. 79 Low/Reverse Servo Snap Ring

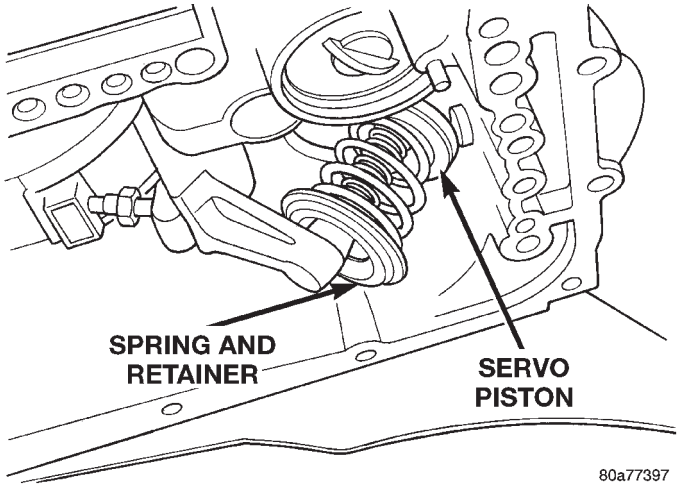


Fig. 80 Remove Retainer, Spring and Servo

ASSEMBLY

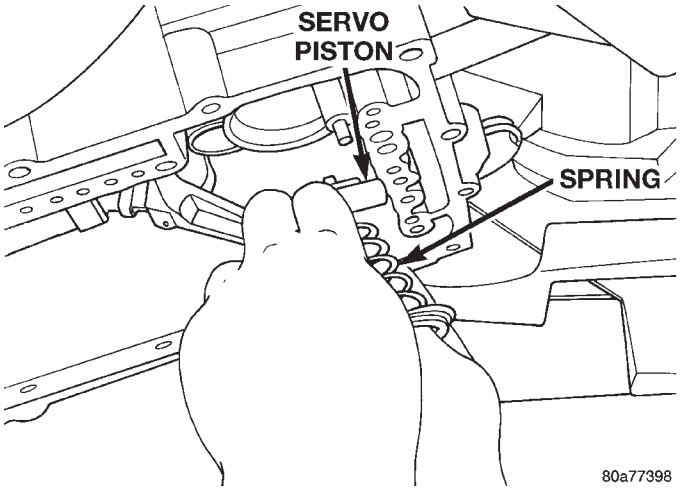


Fig. 81 Low/Reverse Servo Assembly

To assemble, reverse the above procedure.

ACCUMULATOR-RECONDITION

DISASSEMBLY

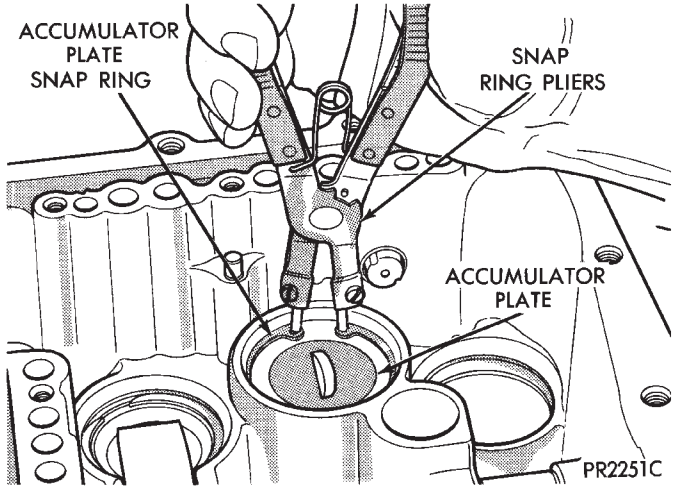


Fig. 82 Accumulator Snap Ring

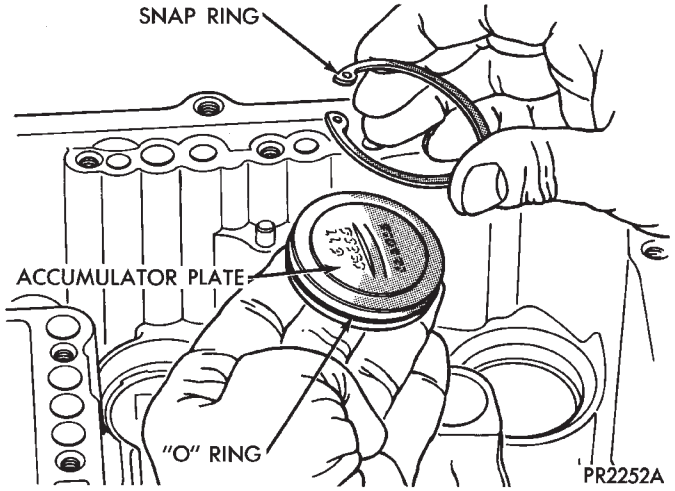


Fig. 83 Accumulator Plate and Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

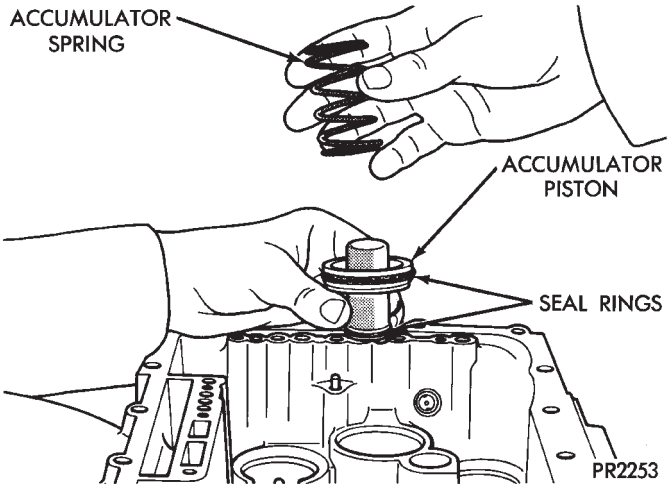


Fig. 84 Accumulator Spring and Piston

ASSEMBLY

To assemble, reverse the above procedure.

KICKDOWN SERVO (CONTROLLED LOAD)-RECONDITION

DISASSEMBLY

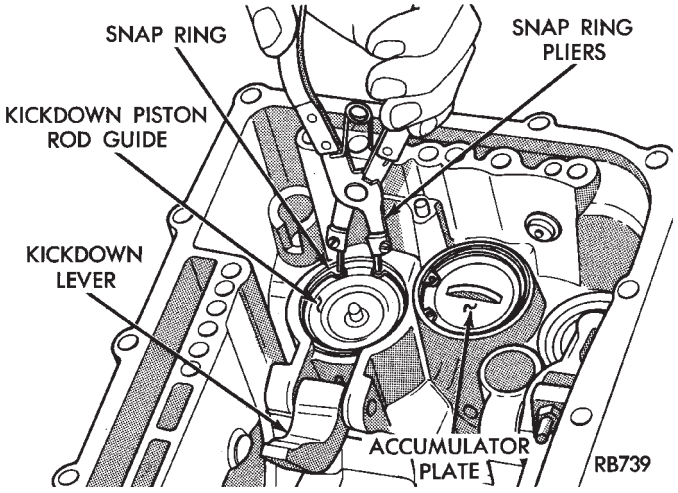


Fig. 85 Kickdown Servo Snap Ring

ASSEMBLY

To assemble, reverse the above procedure.

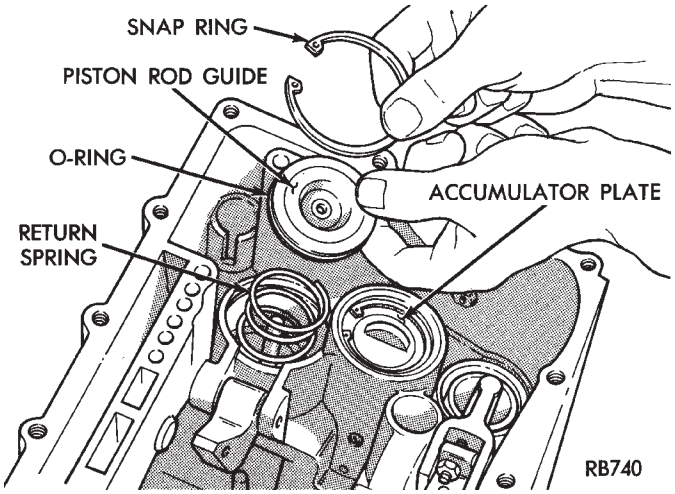


Fig. 86 Kickdown Servo Rod Guide and Snap Ring

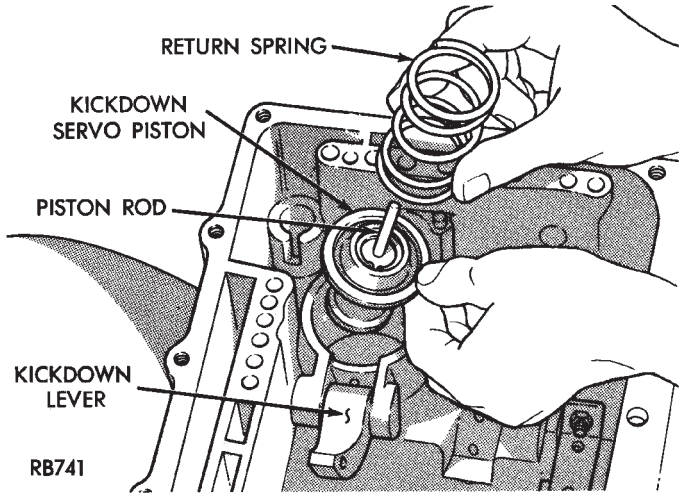


Fig. 87 Kickdown Piston Return Spring and Piston

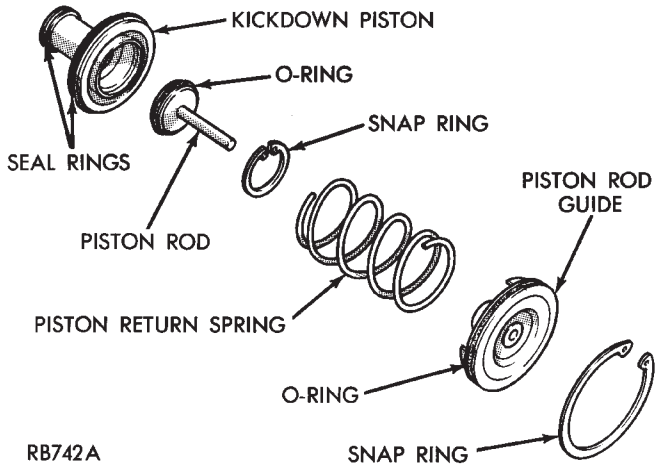


Fig. 88 Controlled Load Kickdown Servo

DISASSEMBLY AND ASSEMBLY (Continued)

TRANSFER SHAFT REPAIR

DISASSEMBLY

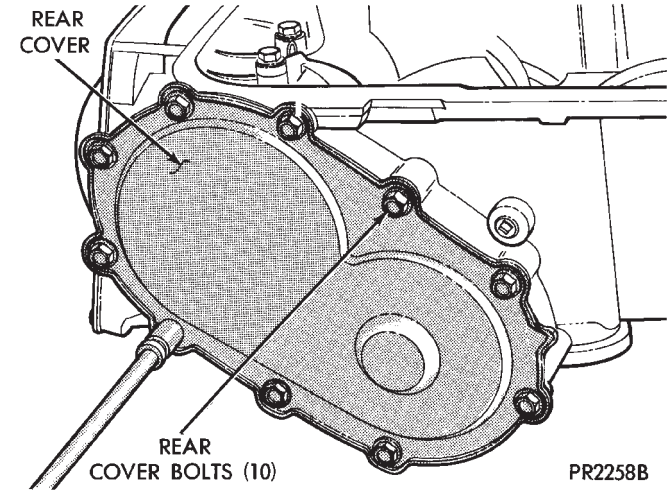


Fig. 89 Rear Cover Bolts

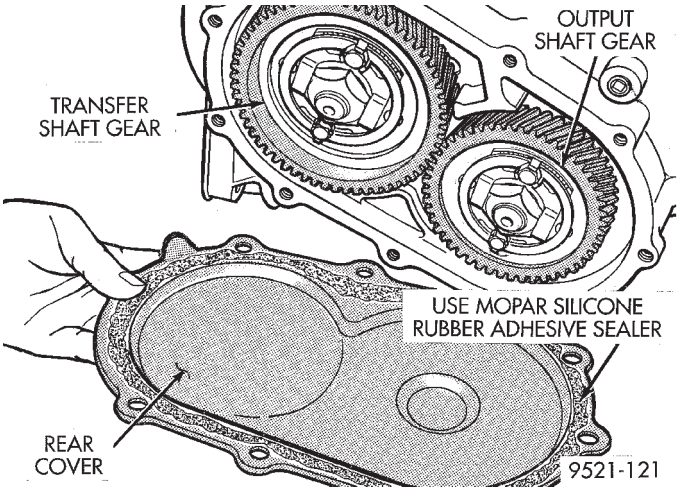


Fig. 90 Remove or Install Rear Cover

NOTE: Remove old sealant before applying new sealant. Use Mopar® RTV sealant or equivalent when installing cover.

NOTE: Remove or install both governor valves and governor body.

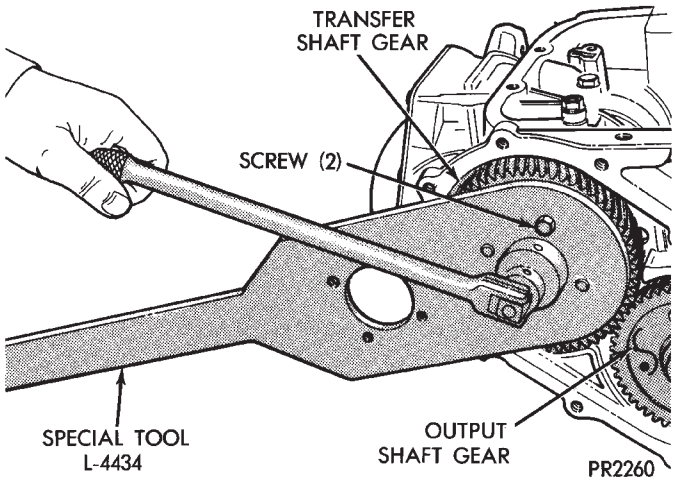


Fig. 91 Remove Transfer Shaft Gear Retaining Nut

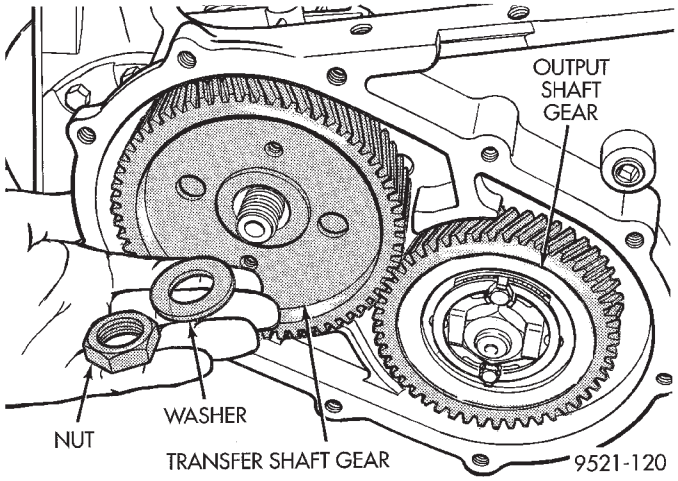


Fig. 92 Transfer Shaft Gear Nut and Washer

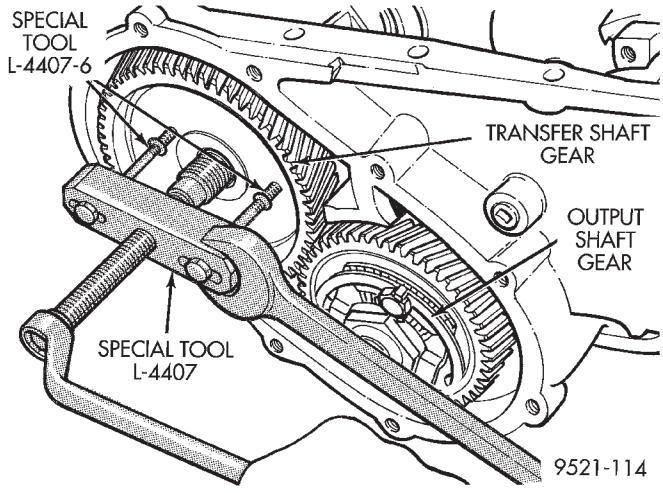


Fig. 93 Remove Transfer Shaft Gear

DISASSEMBLY AND ASSEMBLY (Continued)

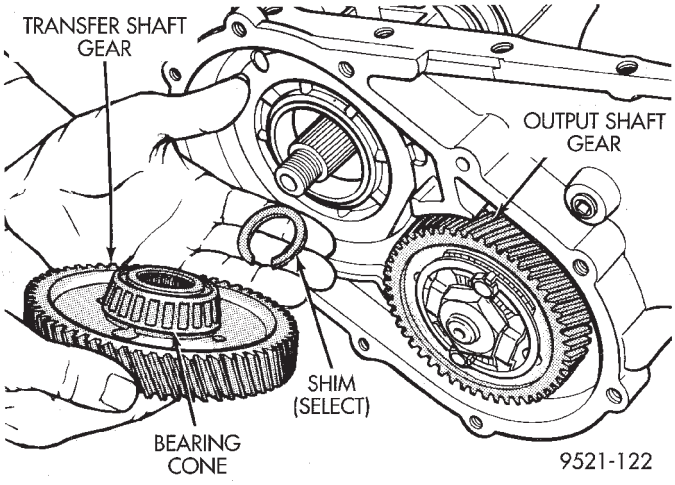


Fig. 94 Transfer Shaft Gear and (Select) Shim

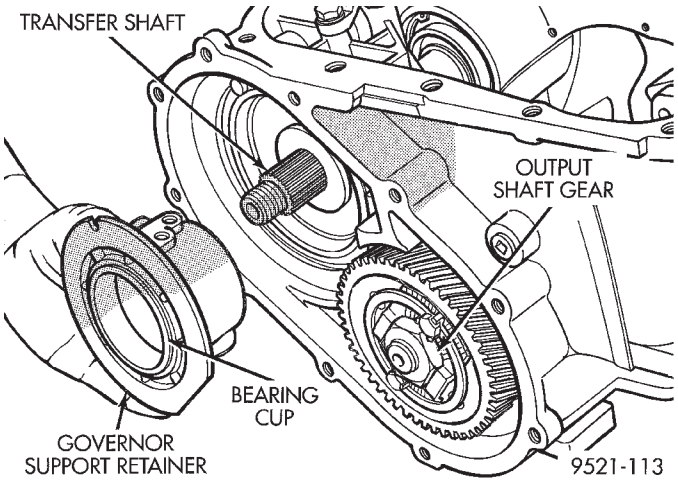


Fig. 97 Governor Support Retainer

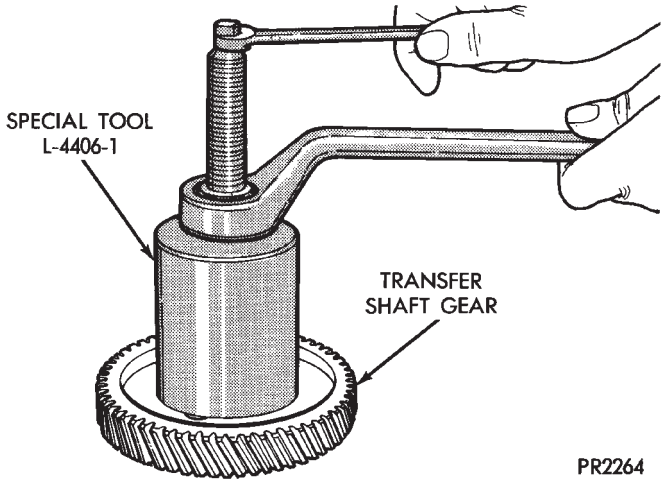


Fig. 95 Using Tool L-4406-1 with Adapter L-4406-3, Remove Transfer Shaft Gear Bearing Cone

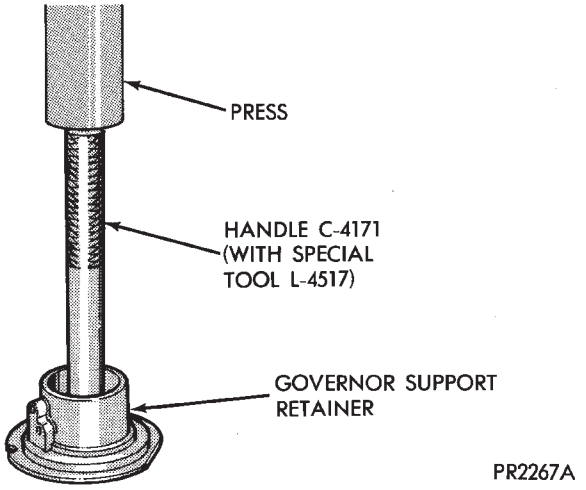


Fig. 98 Remove Governor Support Retainer Bearing Cup

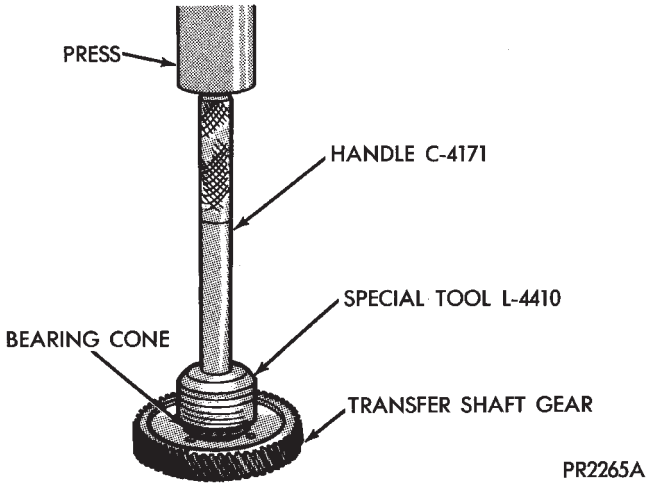


Fig. 96 Install Transfer Shaft Gear Bearing Cone

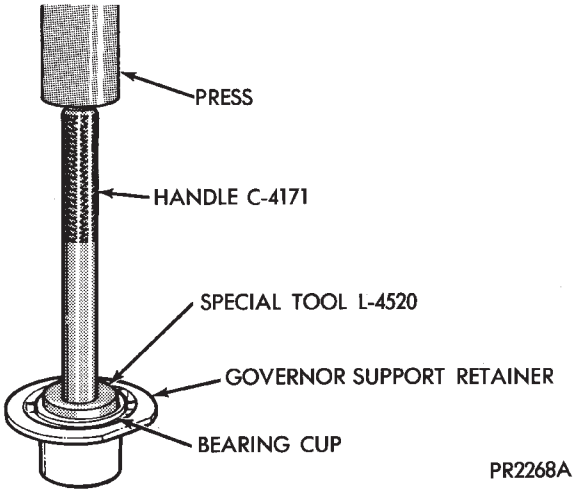


Fig. 99 Install Governor Support Retainer Bearing Cup

DISASSEMBLY AND ASSEMBLY (Continued)

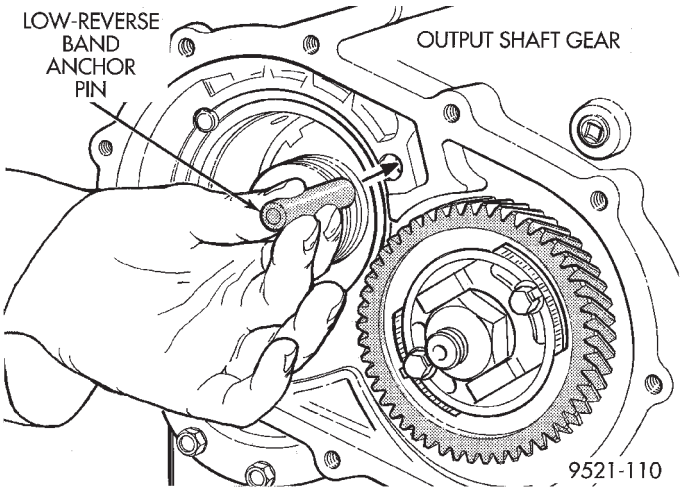


Fig. 100 Low-Reverse Band Anchor Pin

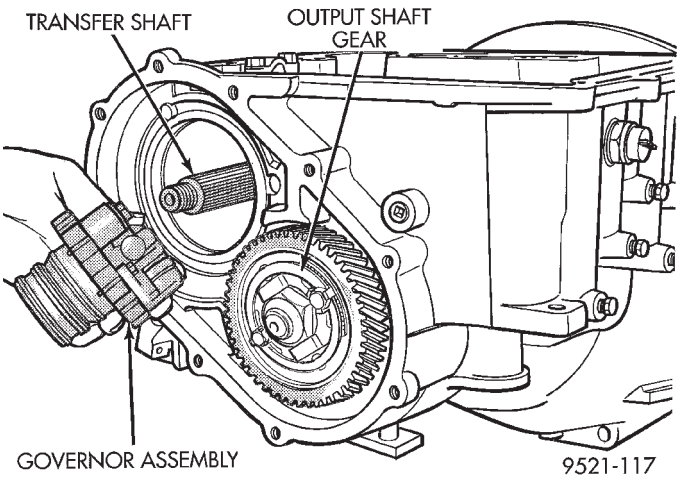


Fig. 101 Governor Assembly

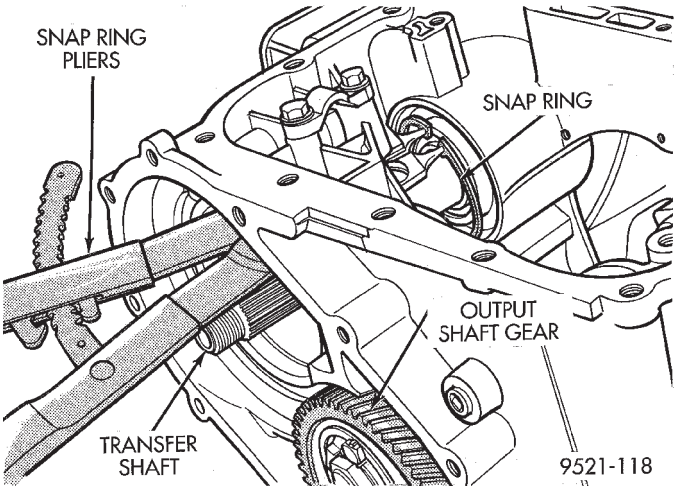


Fig. 102 Transfer Shaft Bearing Snap Ring

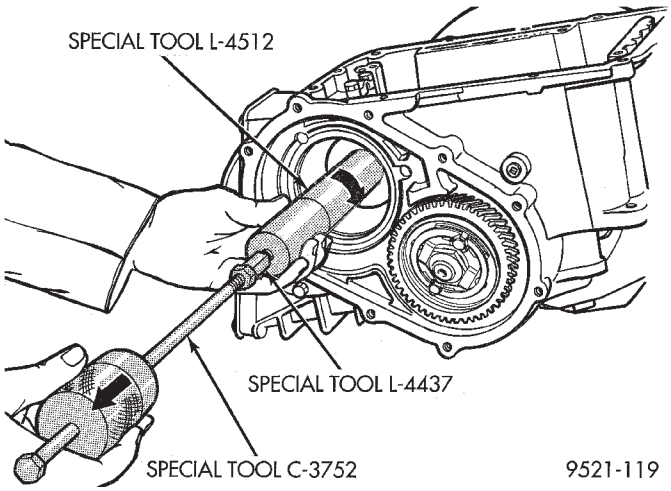


Fig. 103 Remove Transfer Shaft and Bearing Retainer Assembly

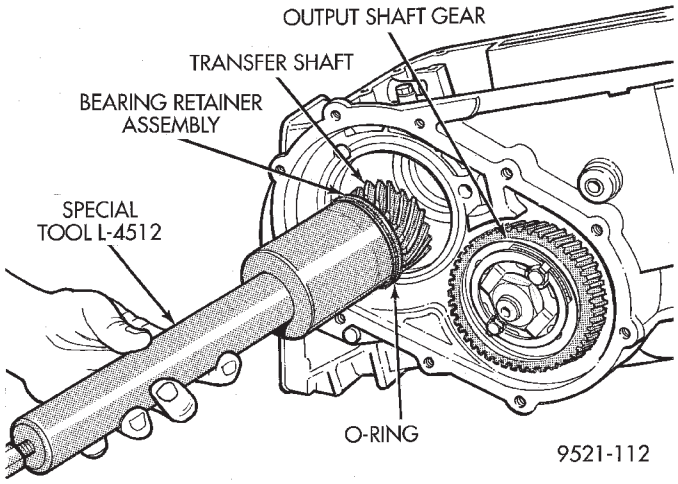


Fig. 104 Remove or Install Transfer Shaft and Bearing Retainer Assembly Using Tool L-4512

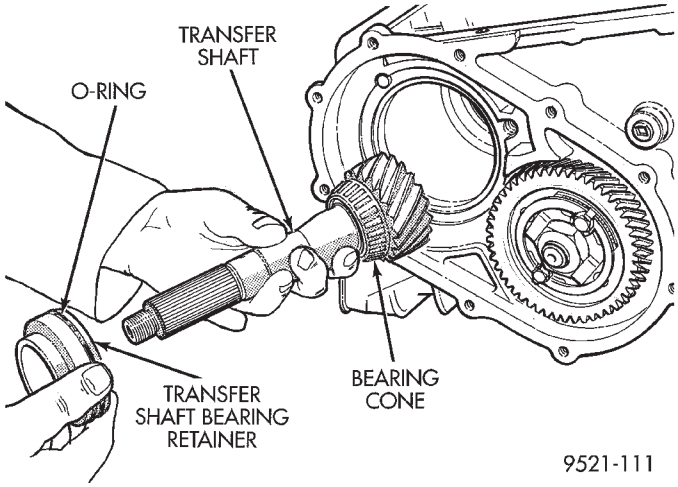


Fig. 105 Transfer Shaft and Bearing Retainer

DISASSEMBLY AND ASSEMBLY (Continued)

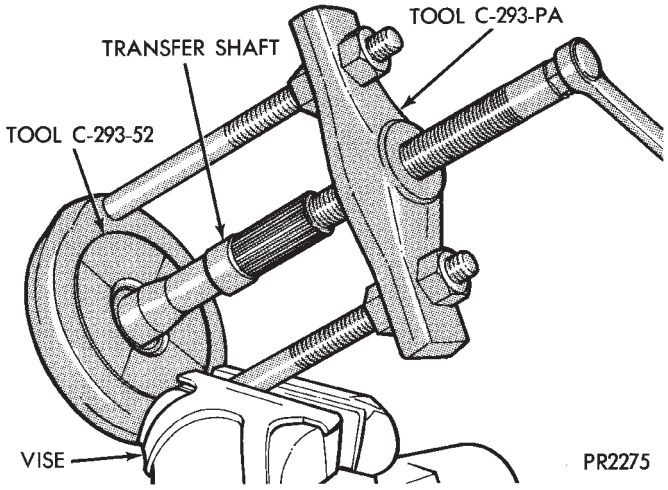


Fig. 106 Remove Transfer Shaft Bearing Cone

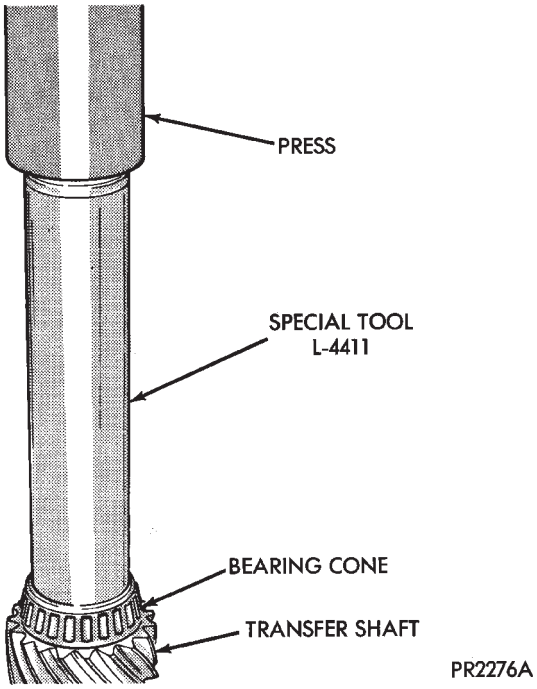


Fig. 107 Install Transfer Shaft Bearing Cone

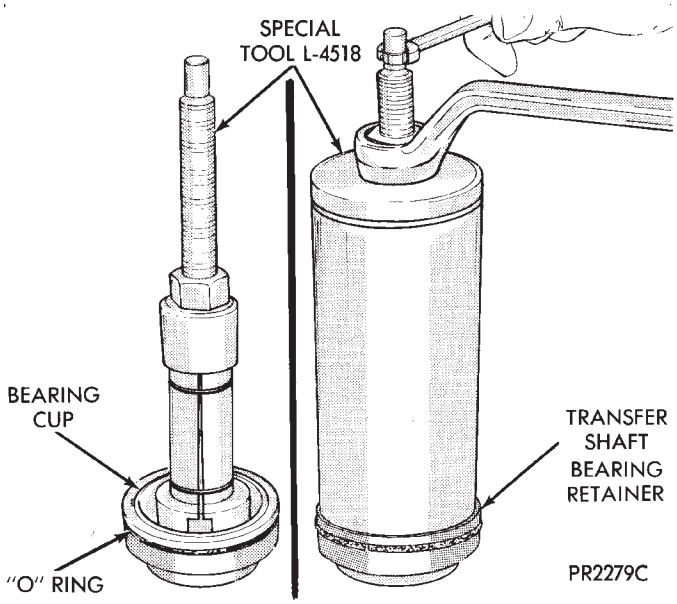


Fig. 108 Remove Transfer Shaft Bearing Cup

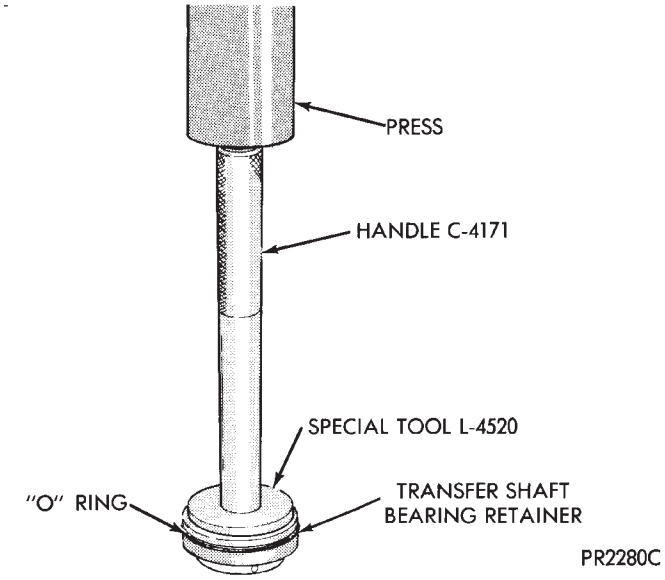


Fig. 109 Install Transfer Shaft Bearing Cup

DISASSEMBLY AND ASSEMBLY (Continued)

DETERMINING SHIM THICKNESS

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

- Transaxle case
- Transfer shaft
- Transfer shaft gear
- Transfer shaft bearings
- Governor support retainer
- Transfer shaft bearing retainer
- Retainer snap ring
- Governor support

Refer to Bearing Adjustment Procedure in rear of this section to determine proper shim thickness.

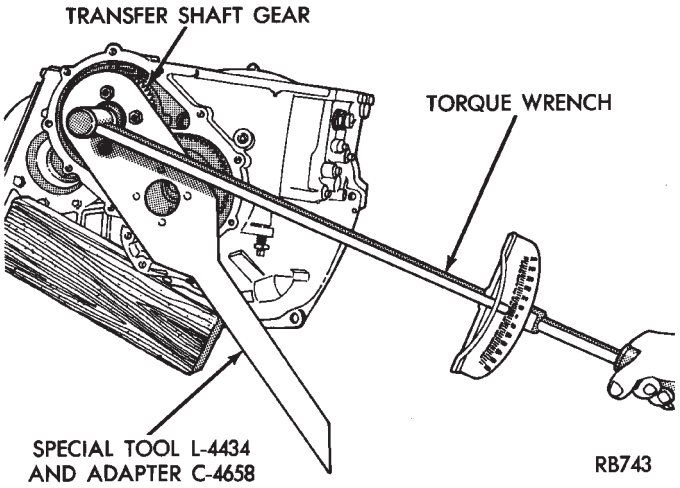


Fig. 110 Tighten Transfer Shaft Gear Retaining Nut to 271 N·m (200 ft. lbs.)

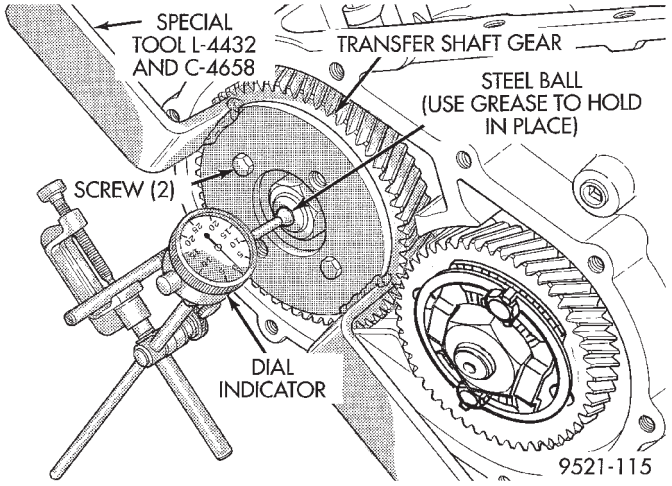


Fig. 111 Checking Transfer Shaft End Play

ASSEMBLY

To install transfer shaft, reverse the above procedure.

PARKING PAWL

DISASSEMBLY

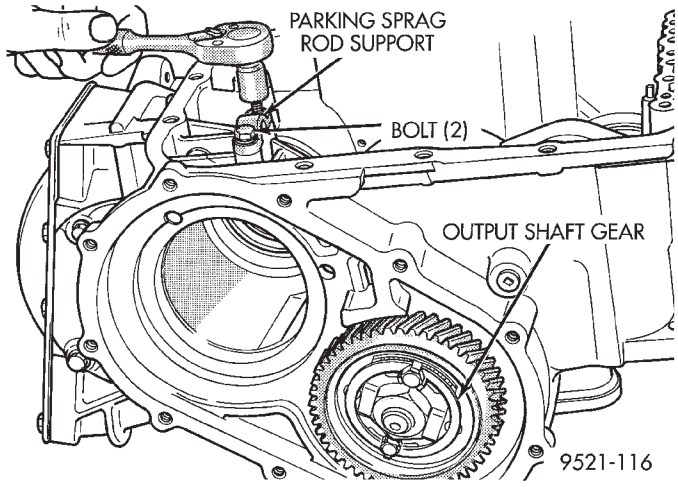


Fig. 112 Parking Sprag Rod Support

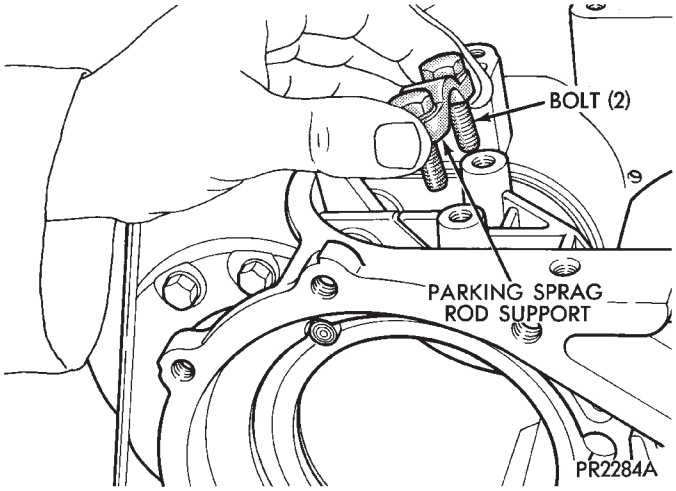


Fig. 113 Support and Bolts

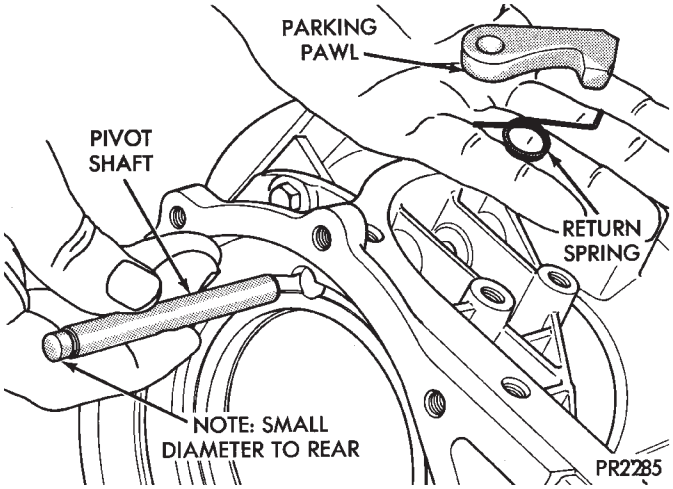


Fig. 114 Parking Pawl, Return Spring, and Pivot Shaft

ASSEMBLY

To install, reverse the above procedure.

DISASSEMBLY AND ASSEMBLY (Continued)

OUTPUT SHAFT REPAIR

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

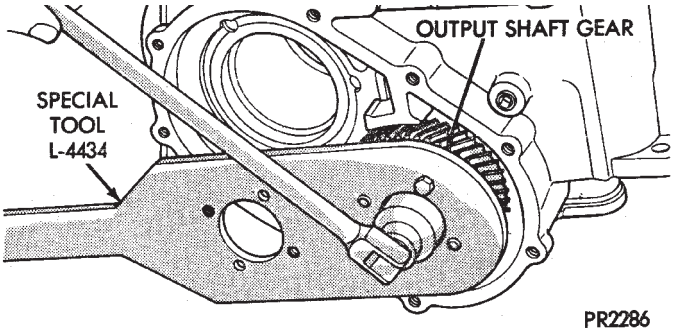


Fig. 115 Remove Output Shaft Retaining Nut and Washer

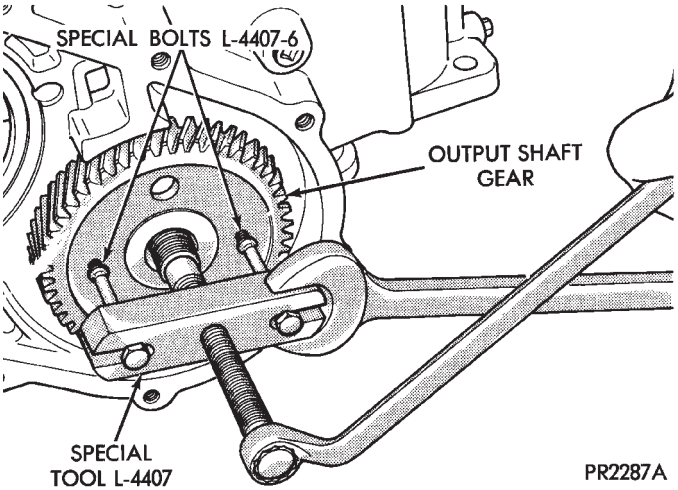


Fig. 116 Remove Output Shaft Gear

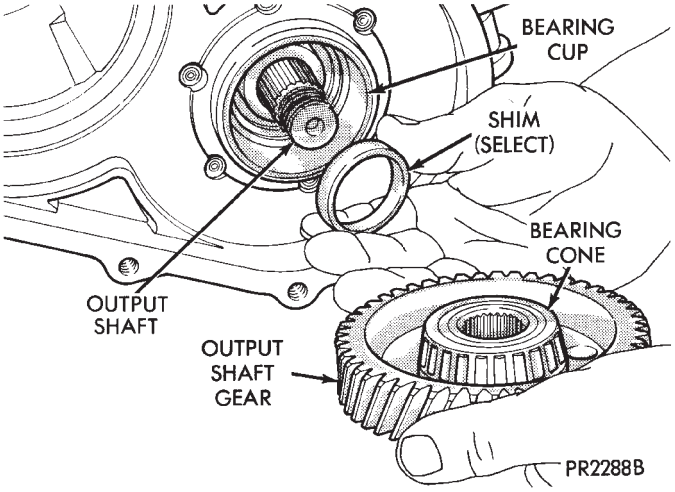


Fig. 117 Output Shaft Gear and (Select) Shim

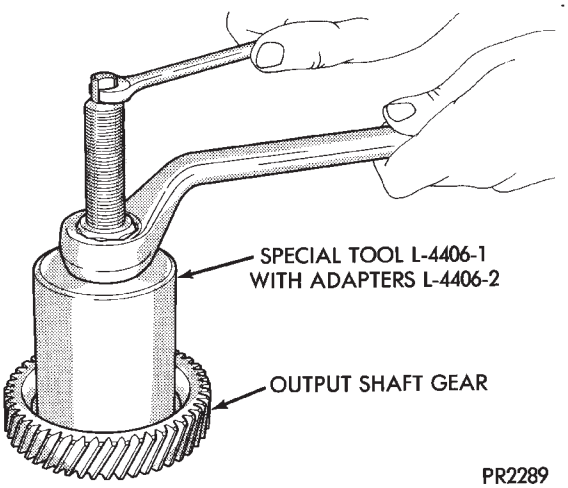


Fig. 118 Remove Output Shaft Gear Bearing Cone

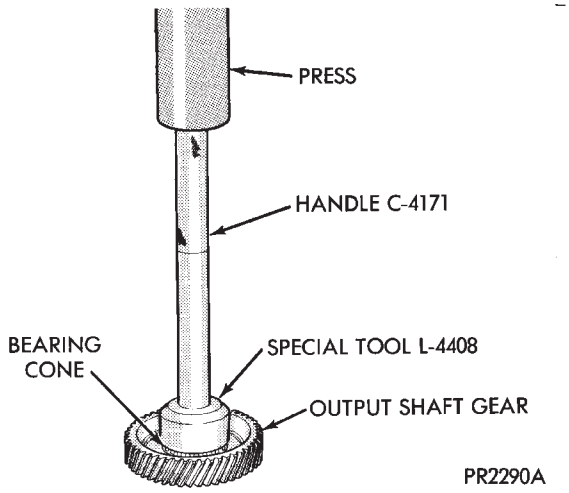


Fig. 119 Install Output Shaft Gear Bearing Cone

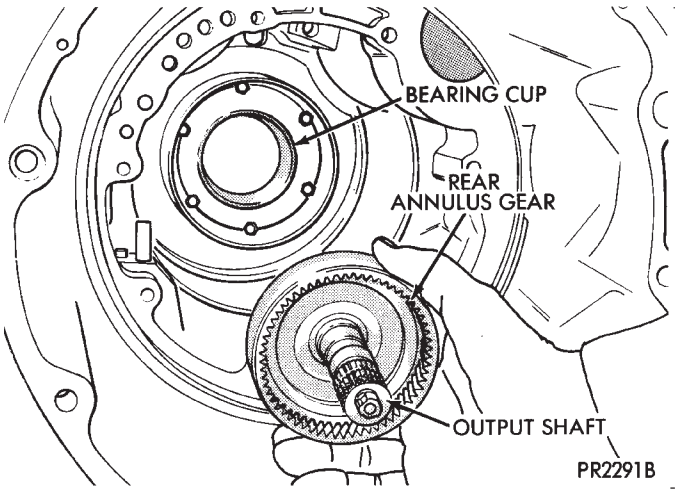


Fig. 120 Remove Output Shaft and Rear Annulus Gear Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

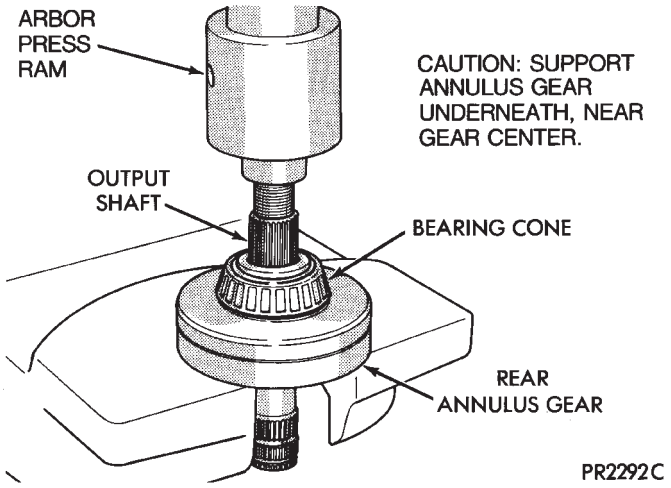


Fig. 121 Remove Output Shaft

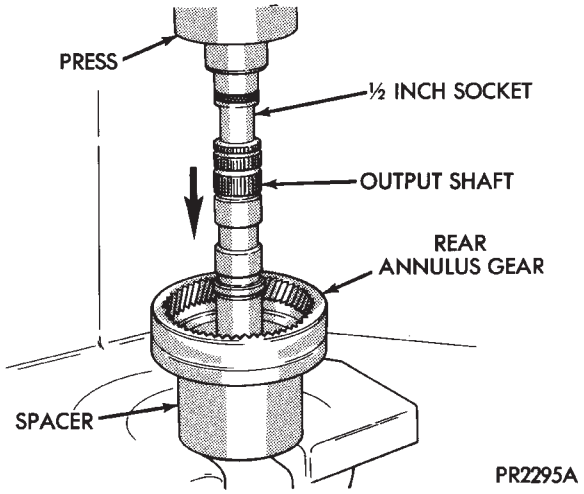


Fig. 124 Install Output Shaft into Rear Planetary Annulus Gear

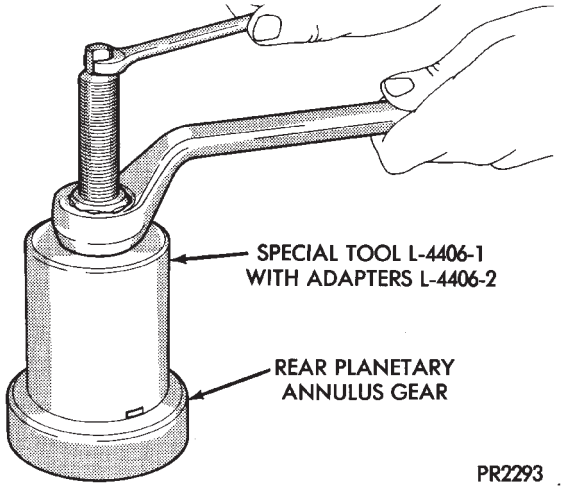


Fig. 122 Remove Rear Planetary Annulus Gear Bearing Cone

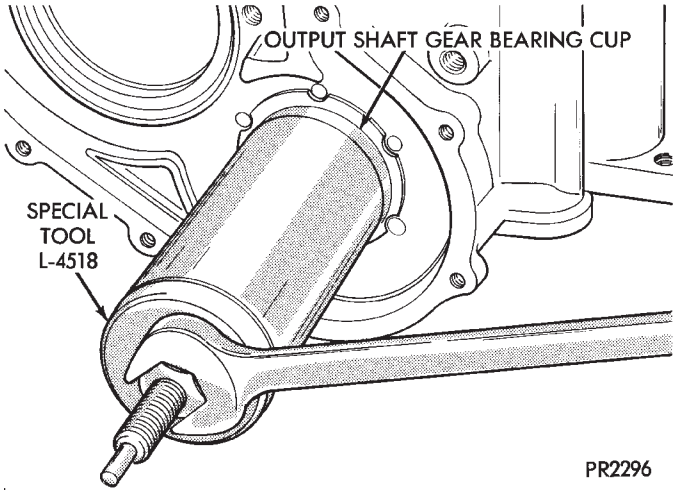


Fig. 125 Remove Output Shaft Gear Bearing Cup

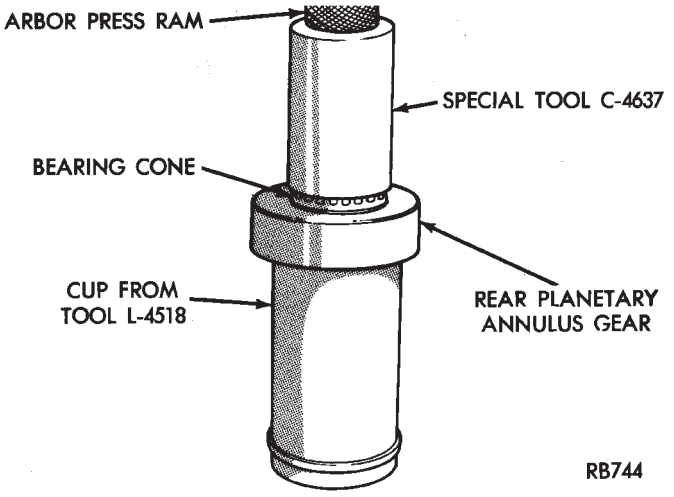


Fig. 123 Install Rear Planetary Annulus Gear Bearing Cone

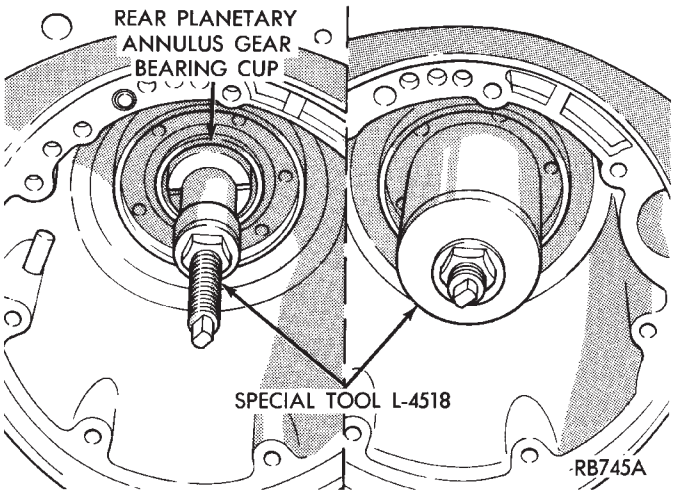


Fig. 126 Remove Rear Planetary Annulus Gear Bearing Cup

DISASSEMBLY AND ASSEMBLY (Continued)

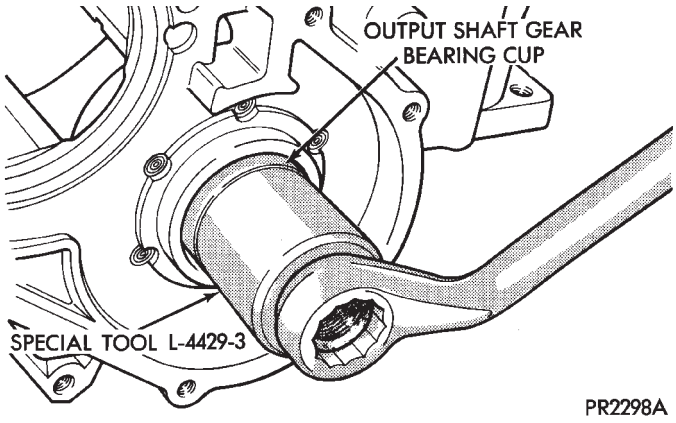


Fig. 127 Install Output Shaft Gear Bearing Cup

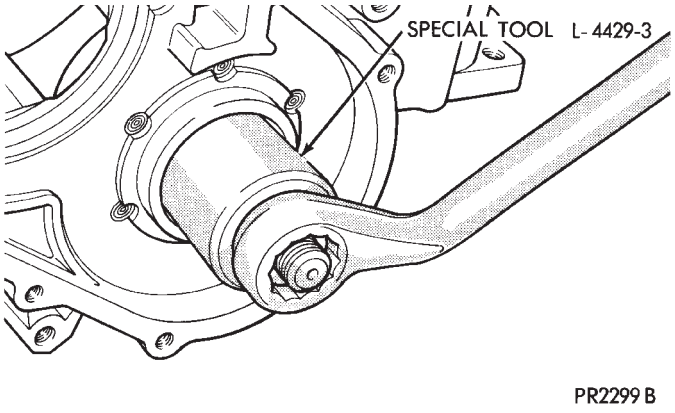


Fig. 128 Install Rear Planetary Annulus Gear Bearing Cup

DETERMINING SHIM THICKNESS

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

- Transaxle case
- Output shaft
- Rear planetary annulus gear
- Output shaft gear
- Rear annulus and output shaft gear bearing cones
- Overrunning clutch race cups

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

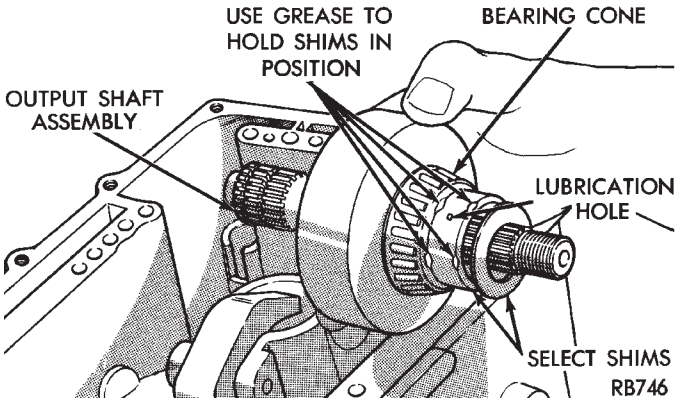


Fig. 129 Install Output Shaft Assembly

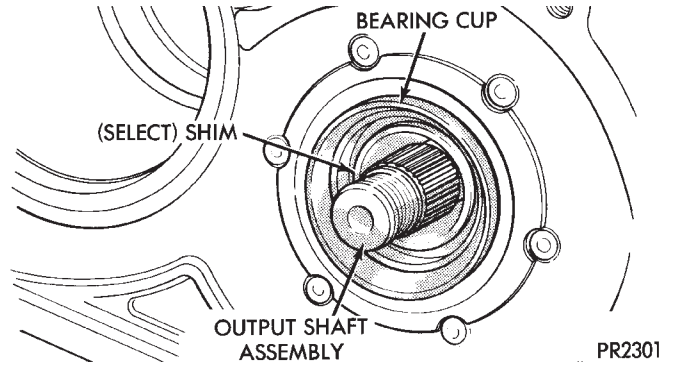


Fig. 130 Output Shaft and (Select) Shims in Position

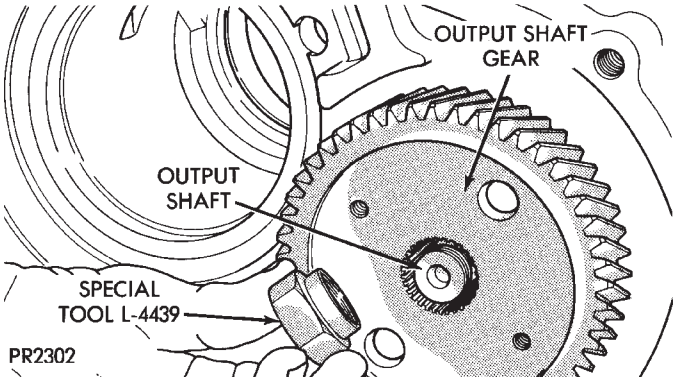


Fig. 131 Start Output Shaft Gear onto Output Shaft

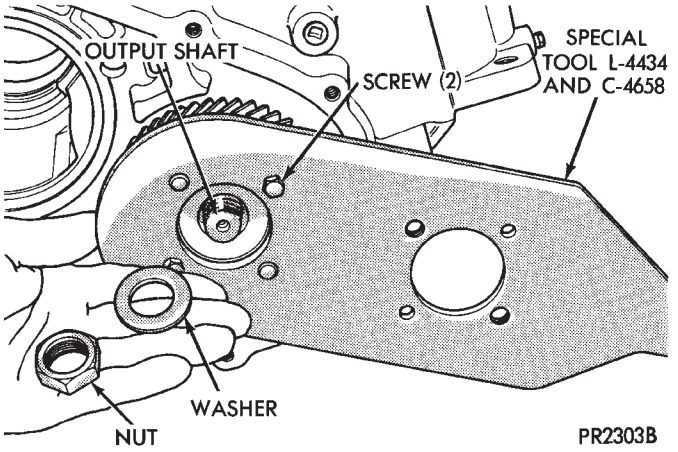


Fig. 132 Holding Output Shaft Gear

DISASSEMBLY AND ASSEMBLY (Continued)

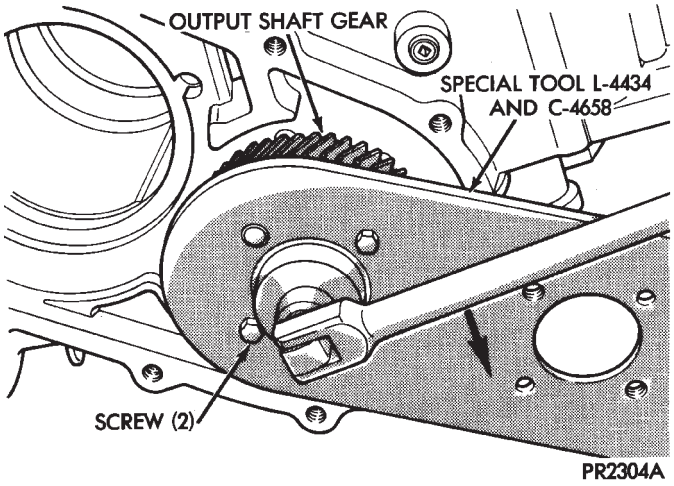


Fig. 133 Tighten Output Shaft Retaining Nut to 271 N·m (200 ft. lbs.)

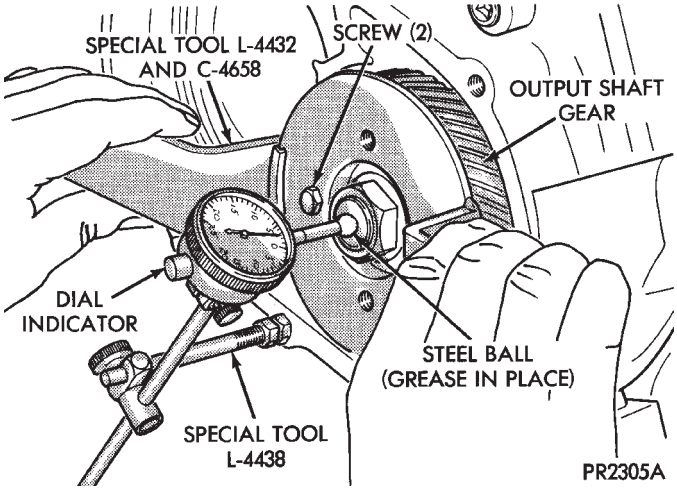


Fig. 134 Checking Output Shaft End Play

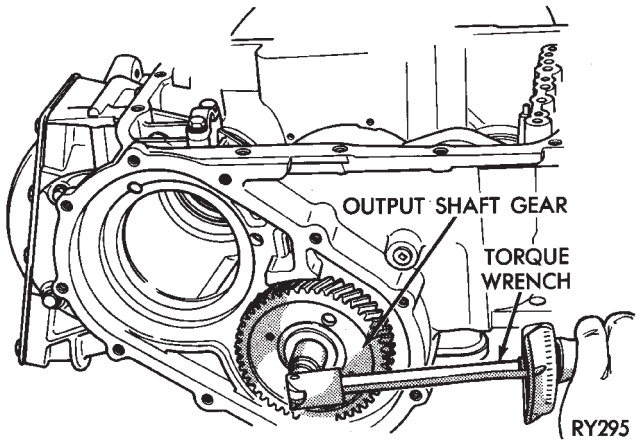


Fig. 135 Checking Bearings Turning Torque

DIFFERENTIAL REPAIR

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

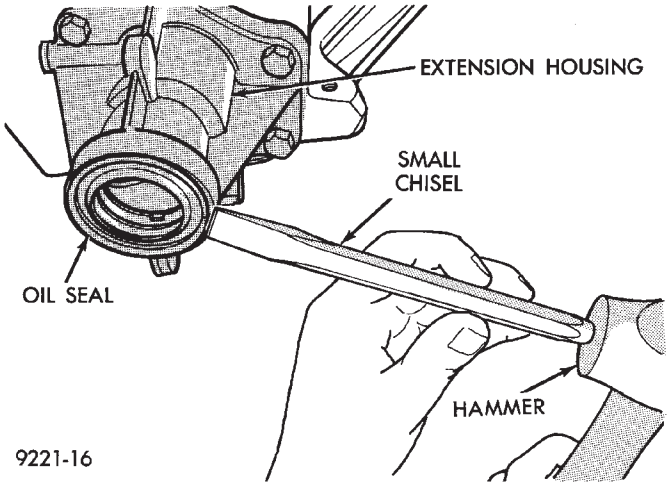


Fig. 136 Remove Extension Seal

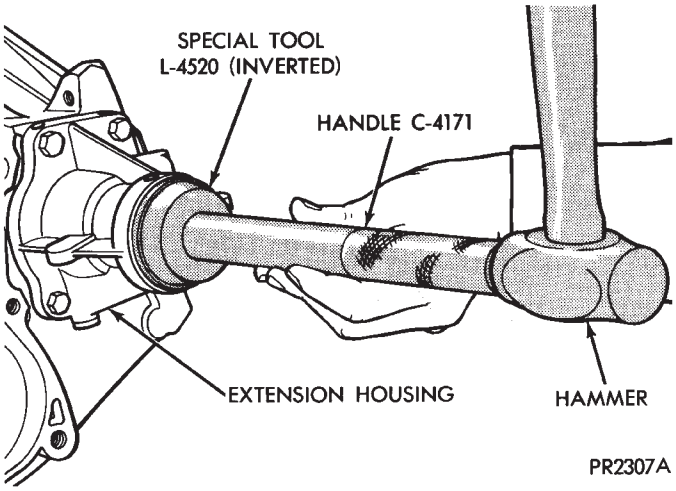


Fig. 137 Install New Seal into Extension

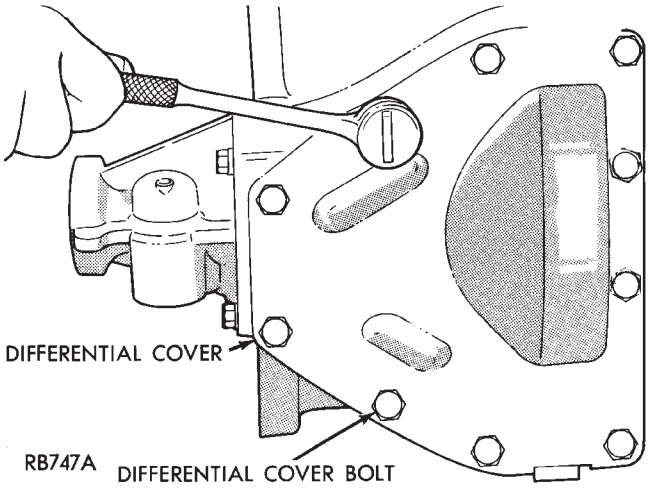


Fig. 138 Differential Cover Bolts

DISASSEMBLY AND ASSEMBLY (Continued)

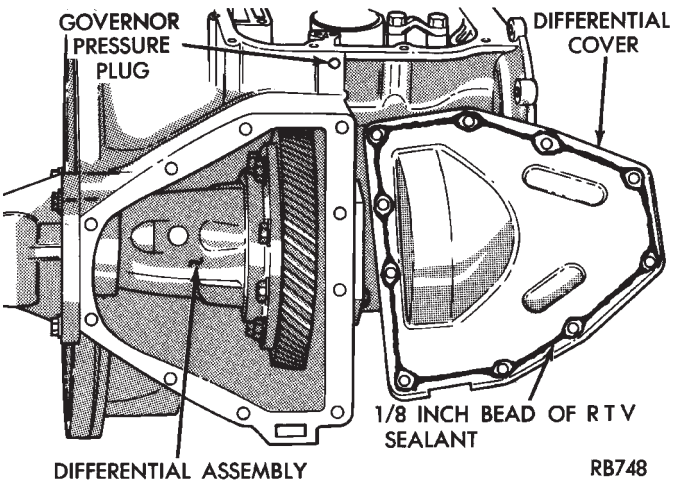


Fig. 139 Remove or Install Differential Cover

NOTE: Use Mopar® RTV sealant, or equivalent, when installing differential cover.

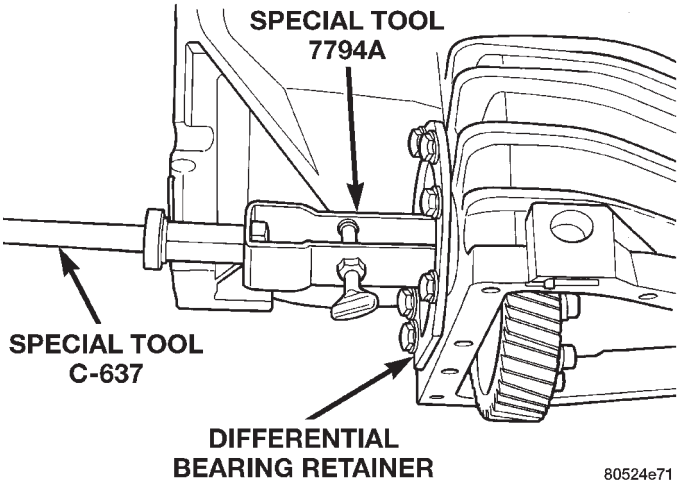


Fig. 140 Remove Bearing Retainer Axle Seal

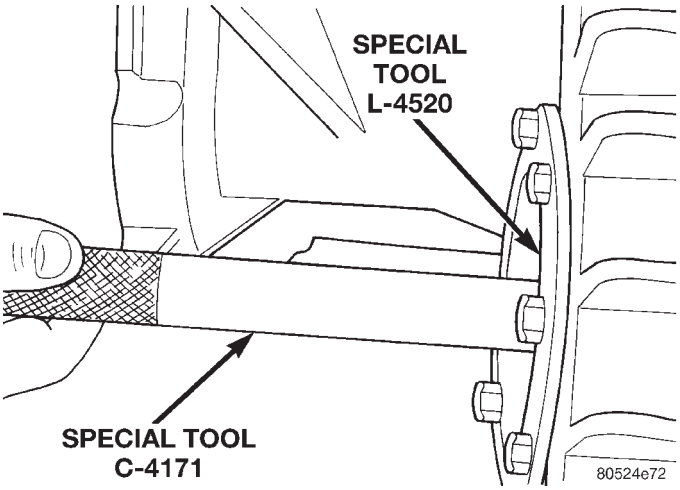


Fig. 141 Install Bearing Retainer Axle Seal

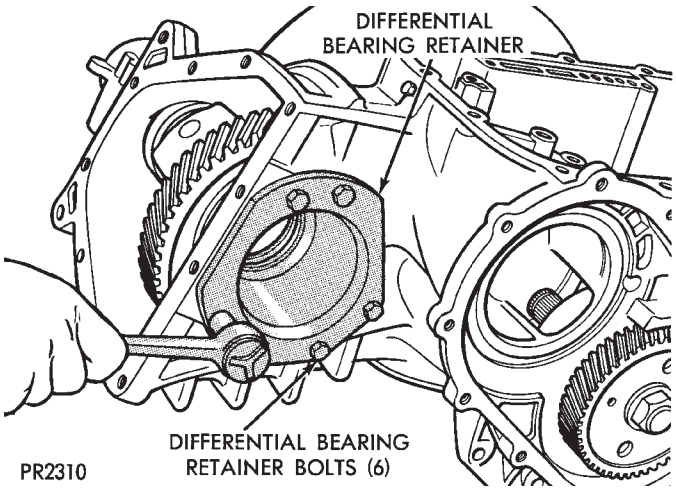


Fig. 142 Differential Bearing Retainer Bolts

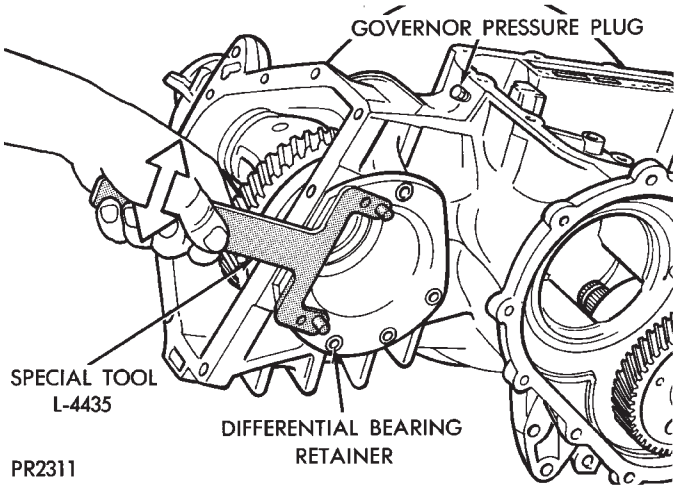


Fig. 143 Remove or Install Bearing Retainer

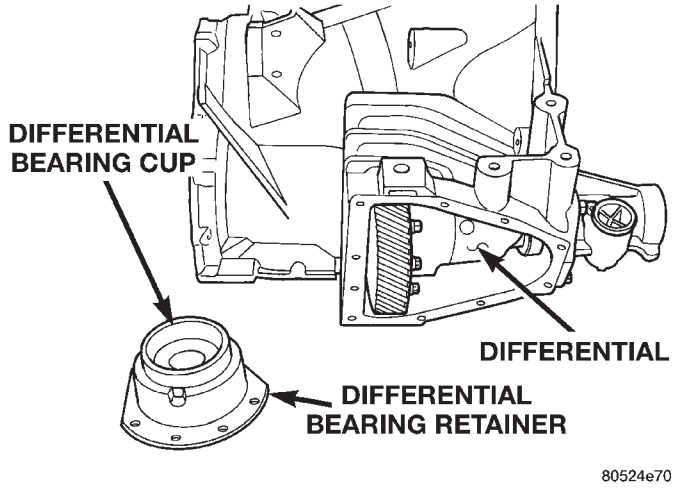


Fig. 144 Differential Bearing Retainer (Typical)

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Use Mopar® RTV sealant, or equivalent, when installing differential bearing retainer.

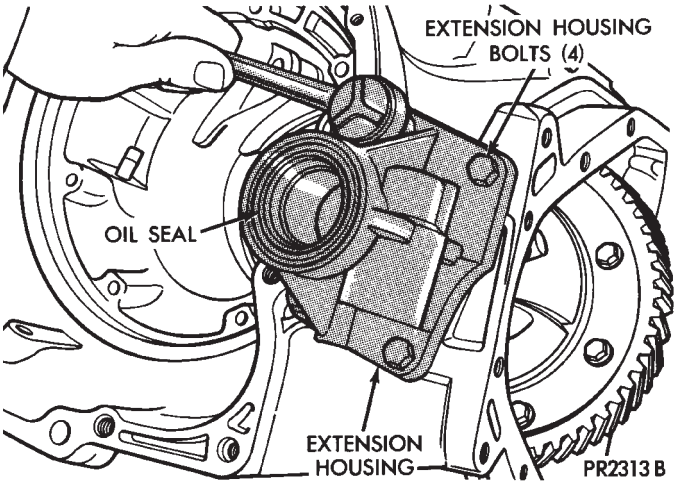


Fig. 145 Extension Bolts

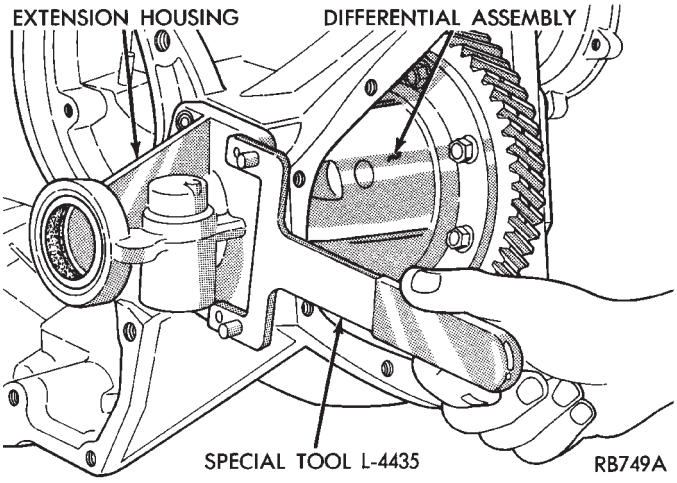


Fig. 146 Remove or Install Extension Housing

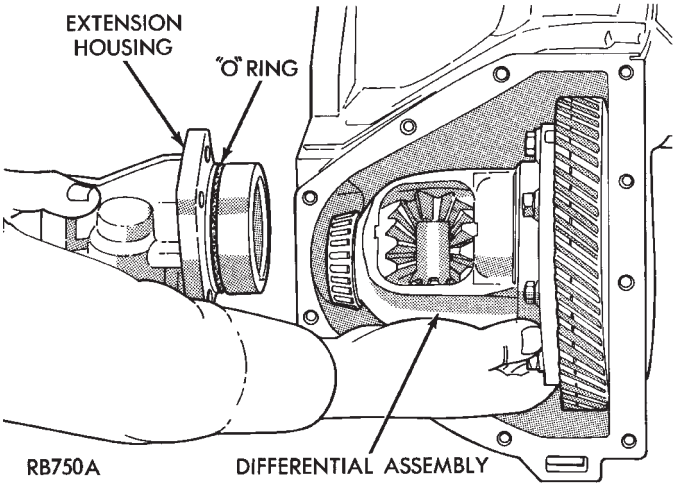


Fig. 147 Differential and Extension

WARNING: HOLD ONTO DIFFERENTIAL ASSEMBLY TO PREVENT IT FROM ROLLING OUT OF HOUSING.

Use Mopar® Silicone Rubber Adhesive Sealant, or equivalent, when installing extension housing.

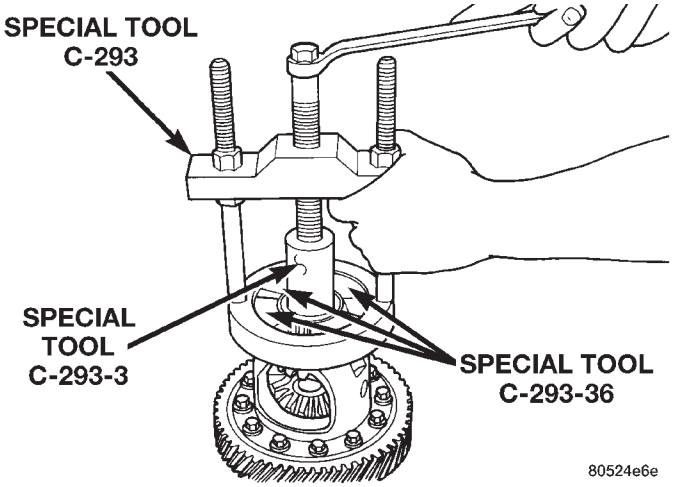


Fig. 148 Remove Differential Bearing Cone (Extension Housing Side)

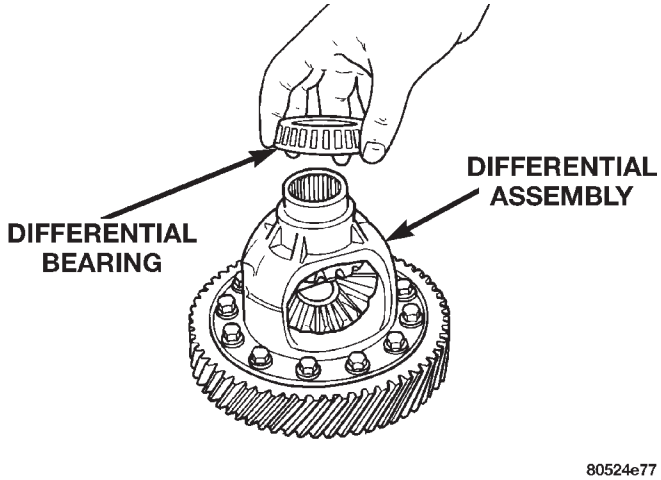


Fig. 149 Position Bearing Cone Onto Differential

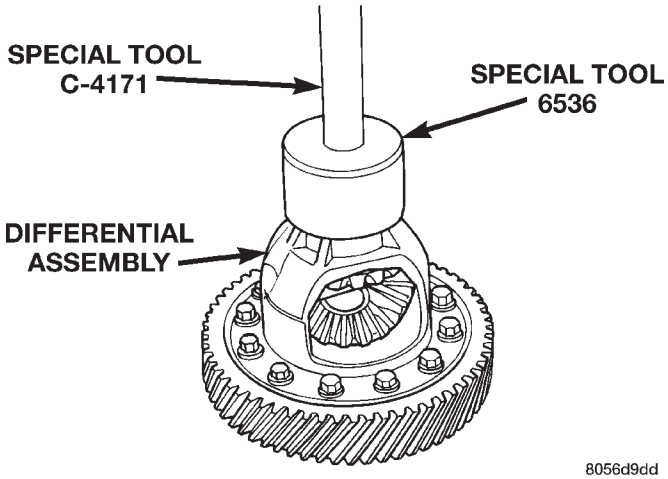


Fig. 150 Install Differential Bearing Cone

DISASSEMBLY AND ASSEMBLY (Continued)

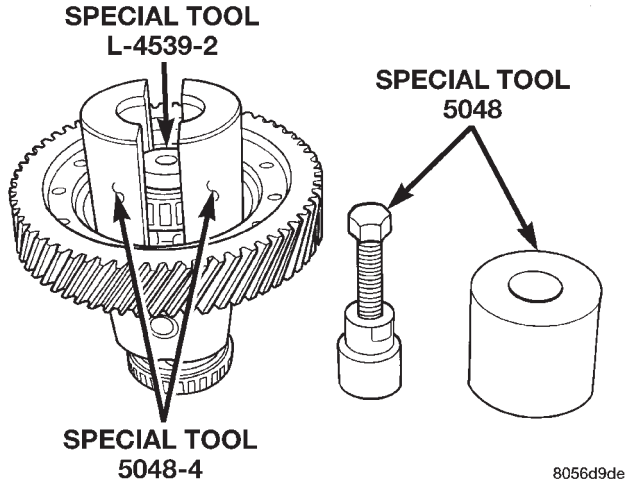


Fig. 151 Position Button and Collets Onto Differential and Bearing (Ring Gear Side)

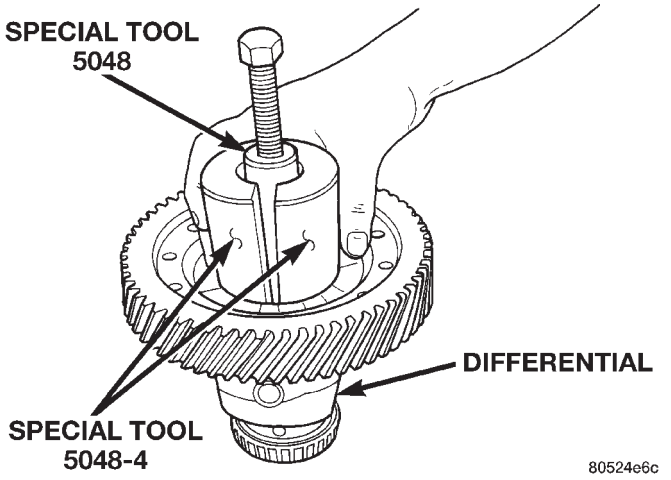


Fig. 152 Position Tool 5048 Over Button and Collets at Differential Bearing

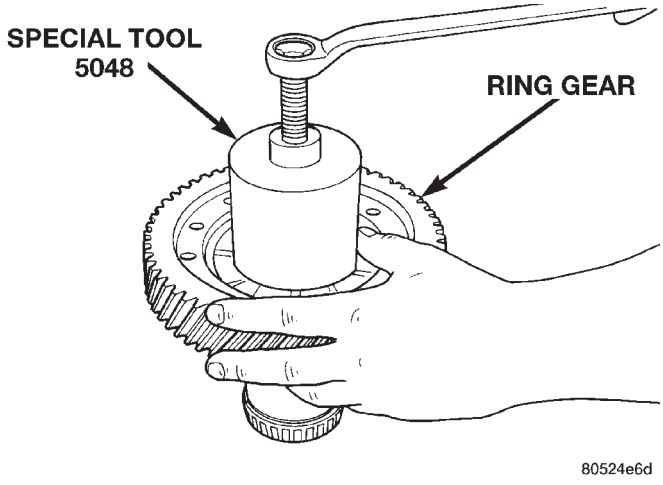


Fig. 153 Remove Differential Bearing Cone

To install the differential bearing cup and cone on the ring gear side, use Special Tool 5052, and Special Tool C-4171.

NOTE: The differential is serviced as an assembly. The only parts that are serviceable within the differential are the differential bearing cups and cones. If any other part fails within the differential, you must replace the differential assembly along with the transfer shaft.

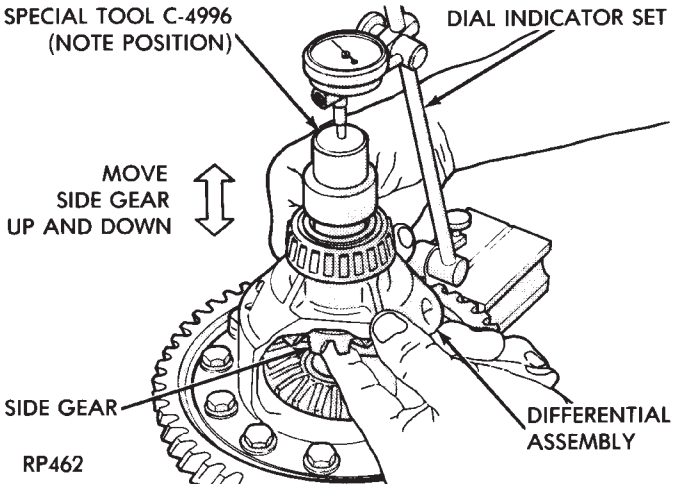


Fig. 154 Checking Side Gear End Play

CAUTION: Side gear end play must be BETWEEN 0.001 to 0.013 inch.

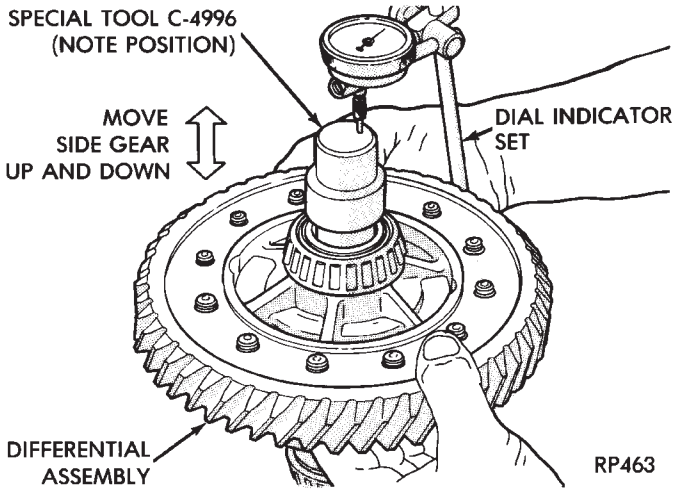


Fig. 155 Checking Side Gear End Play (Typical)

DISASSEMBLY AND ASSEMBLY (Continued)

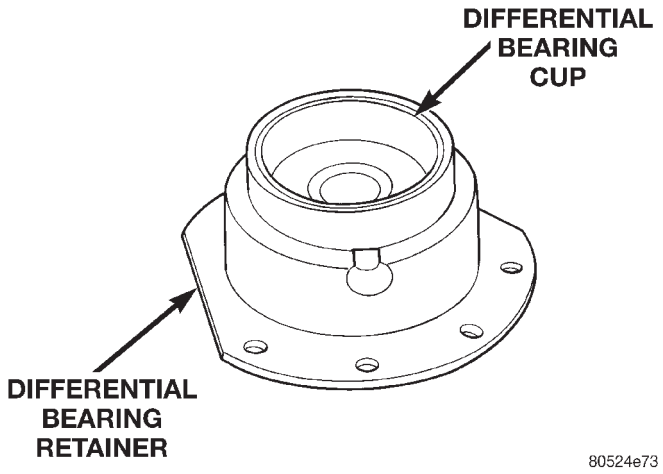


Fig. 156 Differential Bearing Retainer

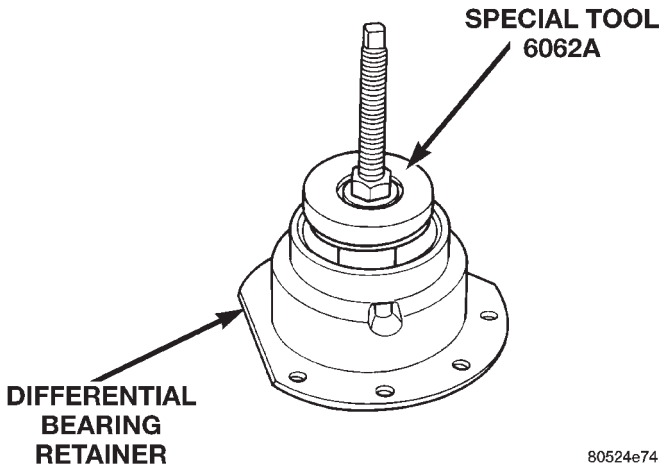


Fig. 157 Position Bearing Cup Remover Tool in Retainer

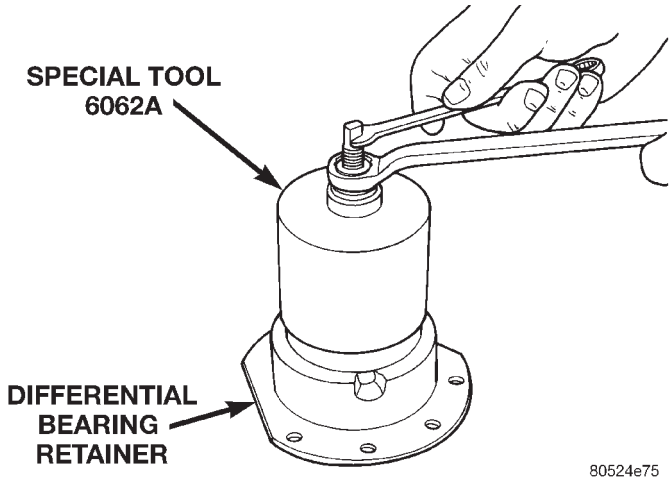


Fig. 158 Remove Bearing Cup

To remove the differential bearing cup from the extension housing/adapter side, use Special Tool 6062A, Remover. To install the differential bearing cup on the extension housing/adapter side, use Special Tool 6536, Driver and Special Tool C-4171, Handle.

DETERMINING SHIM THICKNESS

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

- Transaxle case
- Differential carrier
- Differential bearing retainer
- Extension housing
- Differential bearing cups and cones

Refer to Bearing Adjustment Procedure in rear of this section to determine proper shim thickness.

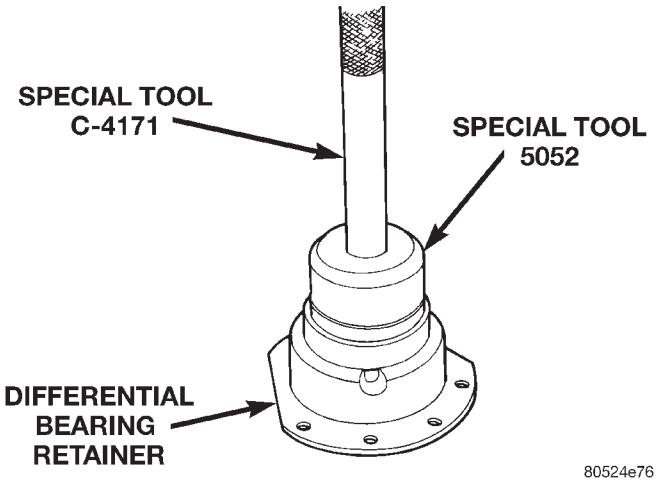


Fig. 159 Install Bearing Cup

CLEANING AND INSPECTION

VALVE BODY

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

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

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

CLEANING AND INSPECTION (Continued)

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

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

ADJUSTMENTS

GEARSHIFT CABLE ADJUSTMENT

Lift and rotate the gearshift hand lever into the park (P) gate position and remove the ignition key. This confirms the shift lever is in the gated park (P) position.

After confirming the park gate position, turn the ignition switch. If the starter will operate, the park gate position is correct. Move the shift lever into the neutral (N) position. If the starter will operate in this position, the linkage is properly adjusted. If the starter fails to operate in either position, linkage adjustment is required.

(1) Park the vehicle on level ground and set the parking brake.

(2) Place the gearshift lever in park (P) gate position and remove key.

(3) Loosen the cable adjustment screw at the transaxle operating lever (Fig. 160).

(4) Pull the transaxle operating lever fully forward to the park detent position.

(5) Release the park brake, then rock the vehicle to assure it is in park lock. Reset the park brake.

(6) Tighten the cable adjustment screw to 8 N·m (70 in. lbs.). Gearshift cable should now be properly adjusted.

(7) Verify PRNDL indicator still displays the corresponding gear completely. If not, readjustment of PRNDL may be required.

(8) Check adjustment by using the preceding procedure.

THROTTLE PRESSURE LINKAGE ADJUSTMENT

The throttle pressure rod adjustment is very important to proper transaxle operation. This adjustment positions a valve which controls shift speed, shift quality, and part throttle downshift sensitivity. If the setting is too short, early shifts and slippage between shifts may occur. If the setting is too long, shifts may be delayed and part throttle downshifts may be very sensitive.

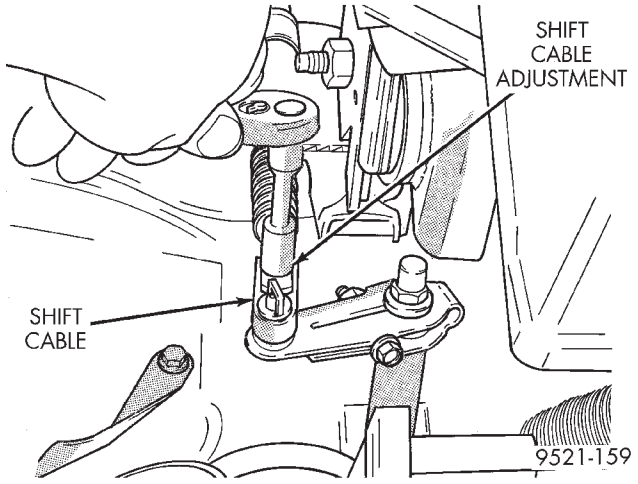


Fig. 160 Gearshift Cable Adjustment

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

ROD ADJUSTMENT PROCEDURE

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

(2) Loosen adjustment swivel lock screw.

(3) To insure proper adjustment, swivel must be free to slide along flat end of throttle rod. Disassemble and clean or repair parts to assure free action, if necessary.

(4) Hold transaxle throttle lever firmly toward engine, against its internal stop. Tighten swivel lock screw to 11 N·m (100 in. lbs.)

(5) The adjustment is finished and linkage backlash was automatically removed by the preload spring.

(6) If lubrication is required see Group 0, Lubrication.

BAND ADJUSTMENT

KICKDOWN BAND (FRONT)

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

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

(2) Using wrench, tighten adjusting screw to 8 N·m (72 in. lbs.).

ADJUSTMENTS (Continued)

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

LOW/REVERSE BAND (REAR)

To adjust low-reverse band, proceed as follows:

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

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

(3) Back off adjusting screw the number of turns listed under Specifications. This chart is located at the rear of this section.

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

HYDRAULIC CONTROL PRESSURE ADJUSTMENTS

LINE PRESSURE

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

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

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

THROTTLE PRESSURE

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

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

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

(3) While compressing spring, turn throttle lever stop screw with adapter C-4553. Turn until head of screw touches throttle lever tang, with throttle lever cam touching tool and throttle valve bottomed. Be sure adjustment is made with spring fully compressed and valve bottomed in the valve body.

BEARING ADJUSTMENT PROCEDURES

(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.

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

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

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

NOTE: All bearing adjustments must be made with no other component interference or gear intermesh, except the transfer gear bearing.

(5) Refer to the conversion chart in specifications to convert inches to millimeter measurements. Refer to bearing shim chart for proper shim thicknesses.

OUTPUT SHAFT BEARING

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

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

(3) To measure bearing end play:

(4) Attach Tool L-4432 to the output shaft gear.

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

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

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

(8) Once bearing end play has been determined, refer to the output shaft bearing shim chart.

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

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

(11) Use Tool L-4434 to remove the retaining nut and washer. To remove the output shaft gear use Tool L-4407.

(12) Remove the two gauging shims and install the proper shim combination, making sure to install the 12.65, 13.15, or 13.65 mm shim first. Use grease to

ADJUSTMENTS (Continued)

hold the shims in place. Install the output shaft gear and bearing assembly.

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

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

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

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

Average Conversion .05 mm = .002 inch 9121-17

OUTPUT SHAFT BEARING SHIM CHART

DIFFERENTIAL BEARING

(1) Position the transaxle assembly vertically on the support stand, differential bearing retainer side up.

(2) Install Tool L-4436A into the differential and onto the pinion mate shaft .

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

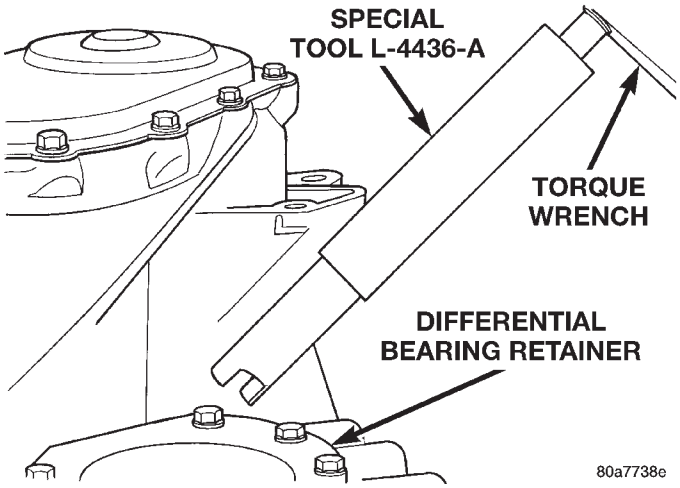


Fig. 161 Tool L-4436 and Torque Wrench

(4) Using Tool L-4436A and an inch-pound torque wrench, check the turning torque of the differential. **The turning torque should be between 5 and 18 inch-pounds.**

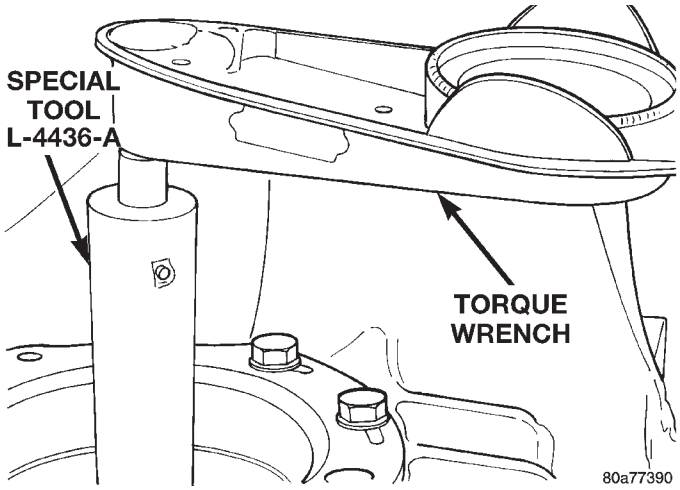


Fig. 162 Checking Differential Bearings Turning Torque

(5) If the turning torque is within specifications, remove tools. Setup is complete.

(6) If turning torque is not within specifications proceed with the following steps.

(a) Remove differential bearing retainer from the transaxle case.

(b) Remove the bearing cup from the differential bearing retainer using Tool 6062A.

(c) Remove the existing shim from under the cup.

(d) Measure the existing shim.

ADJUSTMENTS (Continued)

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

Oil Baffle is not required when making shim selection.

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

(f) Install the differential bearing retainer using Tool 5052 and C-4171. Seal the retainer to the housing with MOPAR® Adhesive Sealant and torque bolts to 28 N·m (250 in. lbs.).

DIFFERENTIAL BEARING SHIM CHART

SHIM THICKNESS	
MM	**INCH**
.980	0.0386
1.02	0.0402
1.06	0.0418
1.10	0.0434
1.14	0.0449
1.18	0.0465
1.22	0.0481
1.26	0.0497
1.30	0.0512
1.34	0.0528
1.38	0.0544
1.42	0.0560
1.46	0.0575
1.50	0.0591
1.54	0.0607
1.58	0.0623
1.62	0.0638
1.66	0.0654
1.70	0.0670
2.02	0.0796
2.06	0.0812

(7) Using Tool L-4436A and an inch-pound torque wrench, recheck the turning torque of the differential. **The turning torque should be between 5 and 18 inch-pounds.**

TRANSFER SHAFT BEARING

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

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

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

(4) To measure bearing end play:

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

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

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

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

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

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

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

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

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

ADJUSTMENTS (Continued)

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

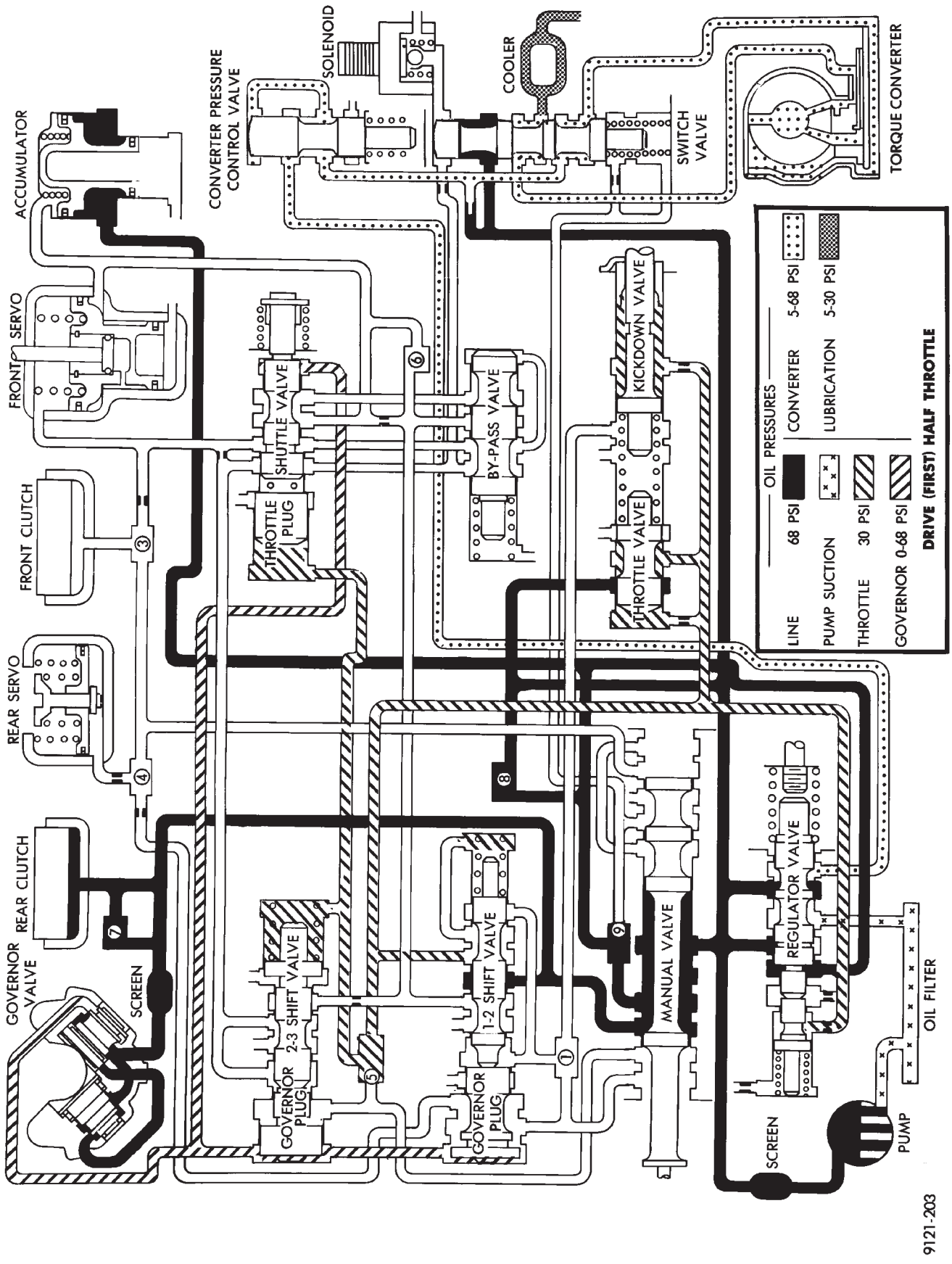
9121-15

TRANSFER BEARING SHIM CHART

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

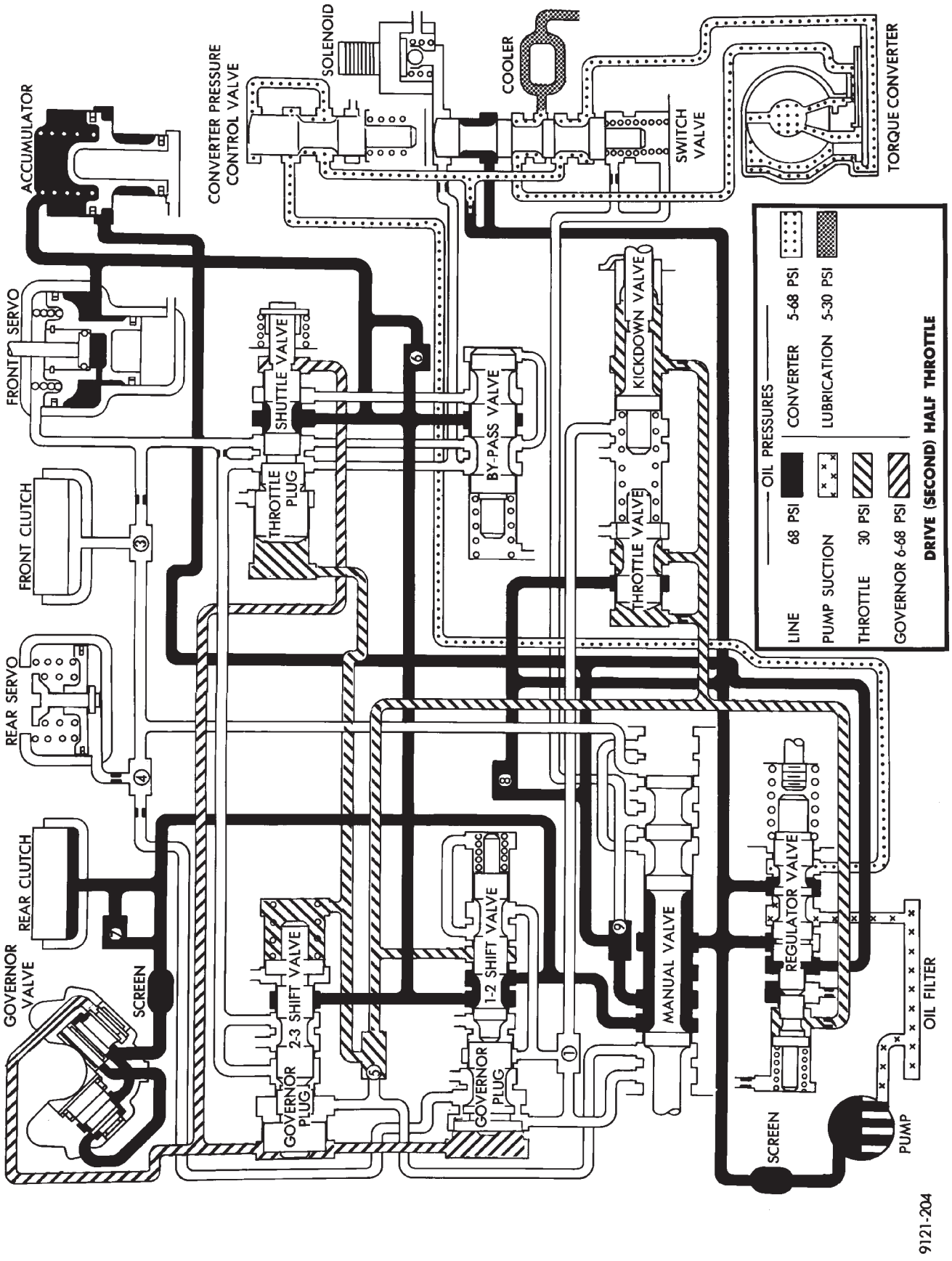
SCHEMATICS AND DIAGRAMS

31TH TRANSAXLE HYDRAULIC SCHEMATIC



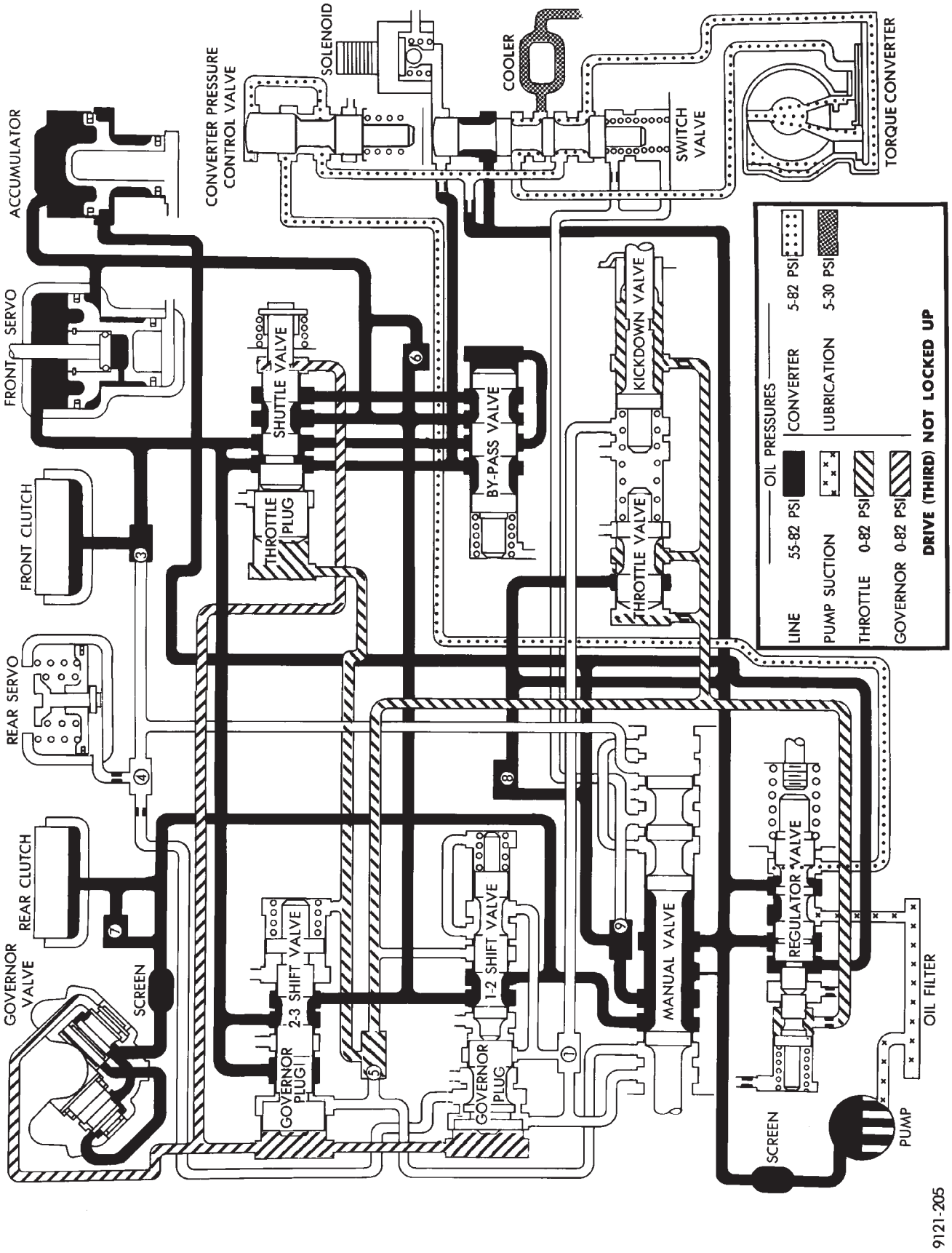
31TH TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)

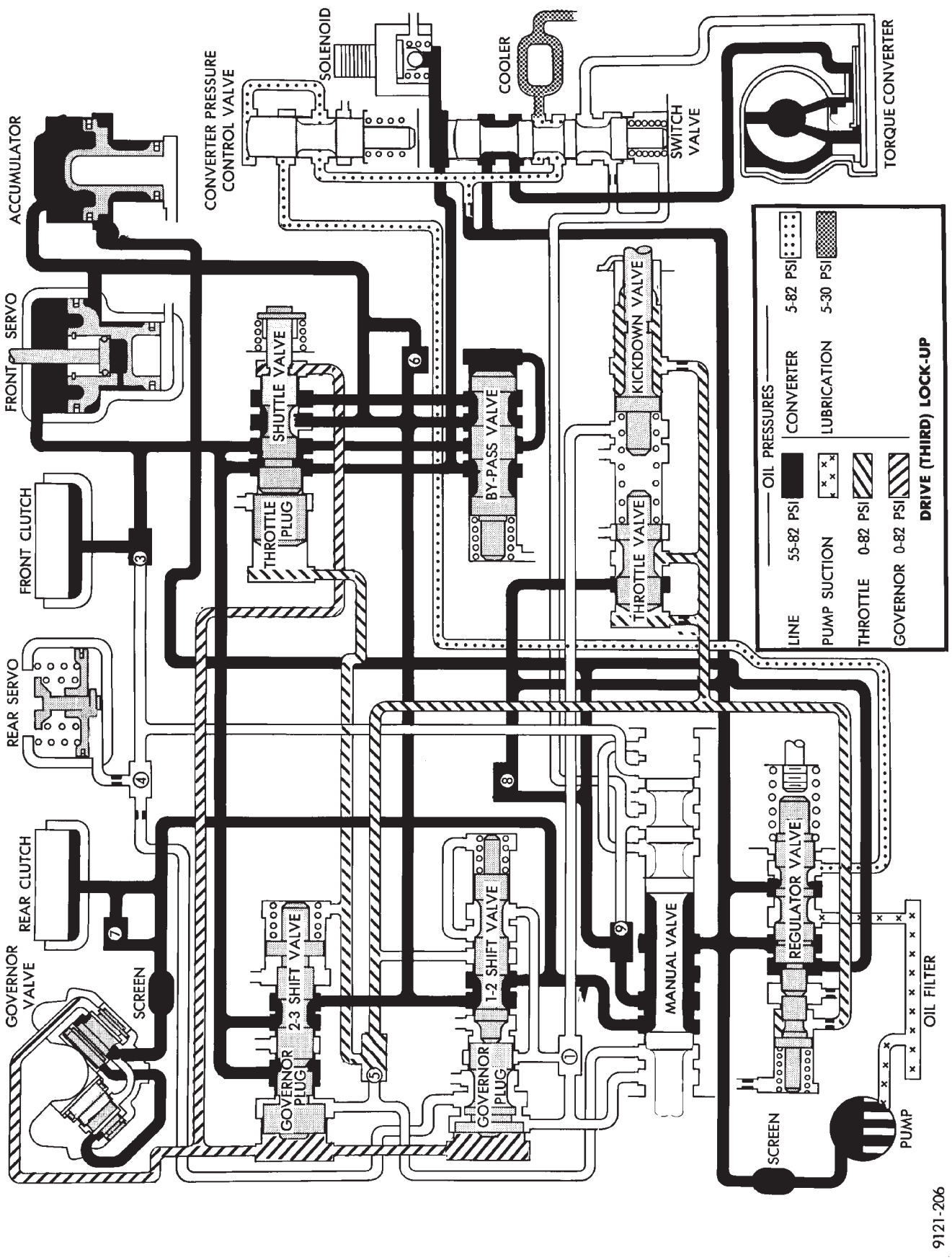


31TH TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



SCHEMATICS AND DIAGRAMS (Continued)



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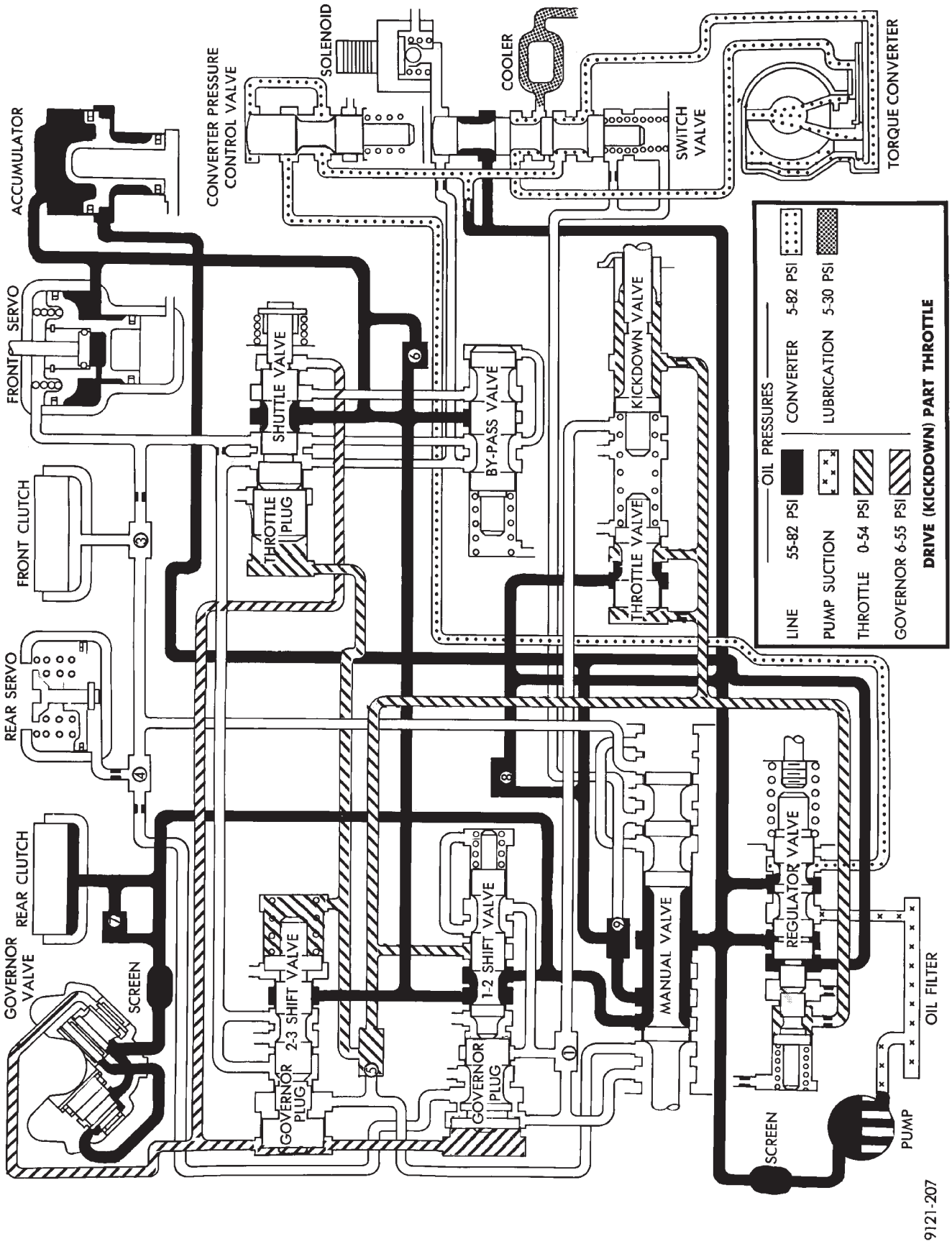
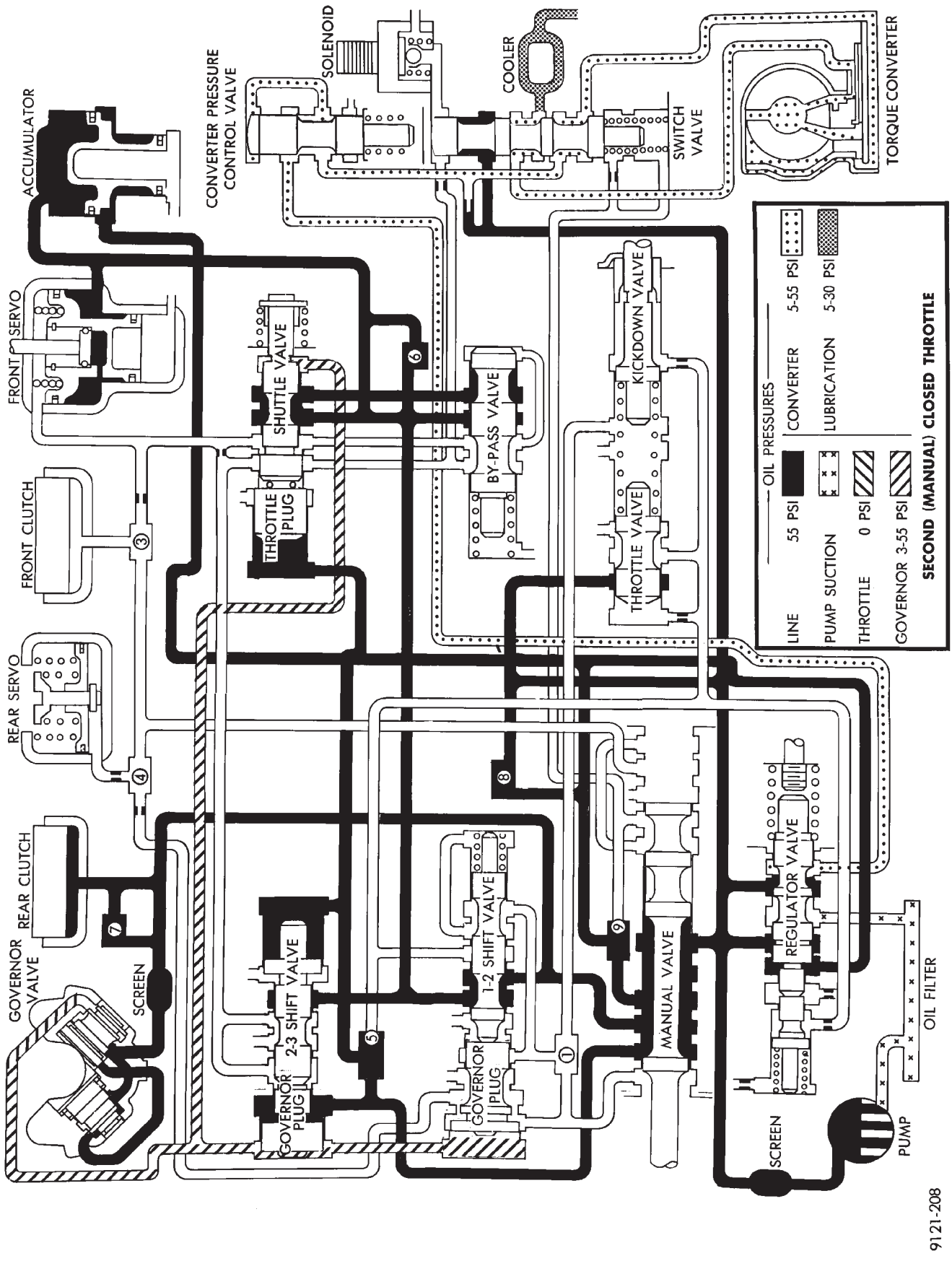
31TH TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



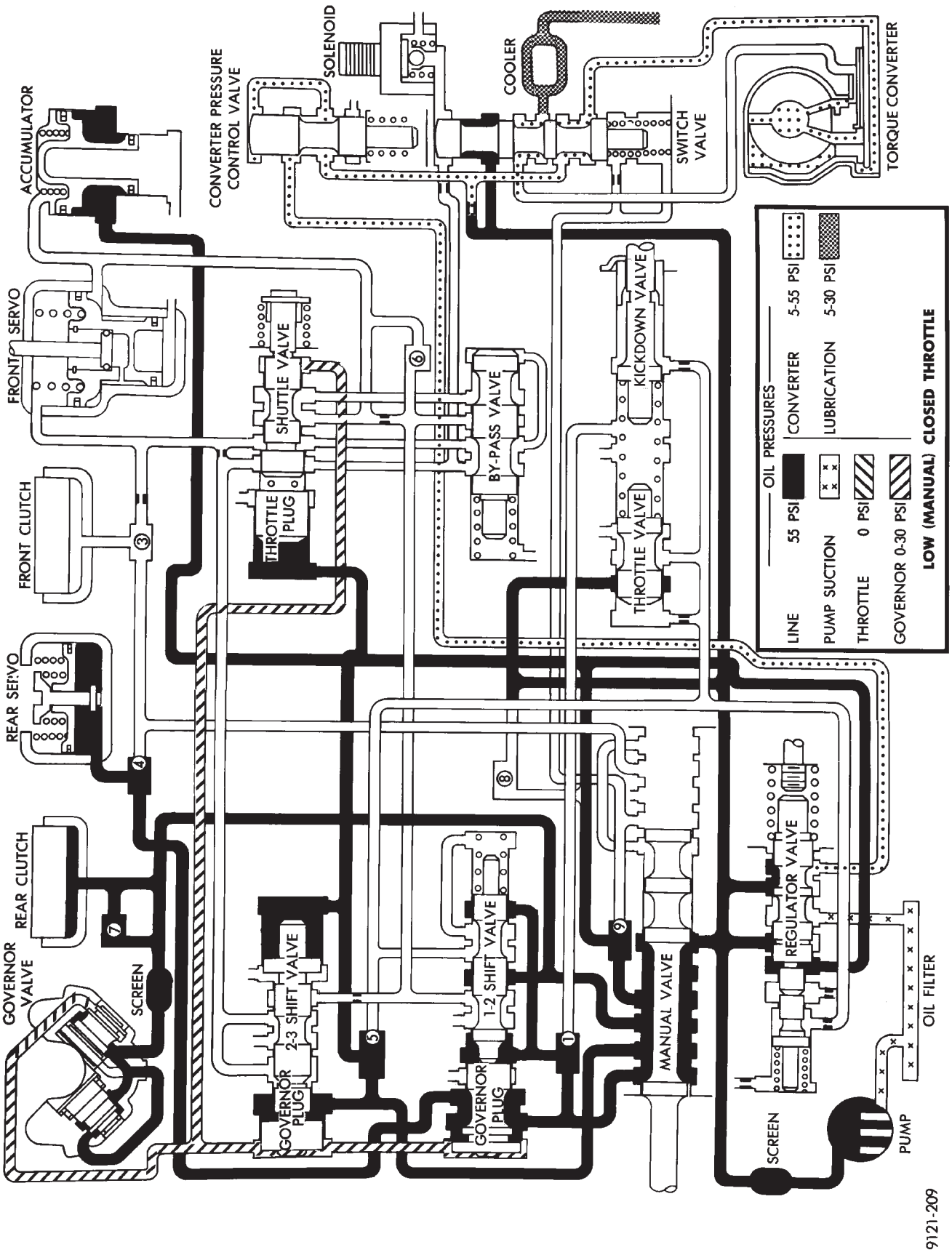
31TH TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)

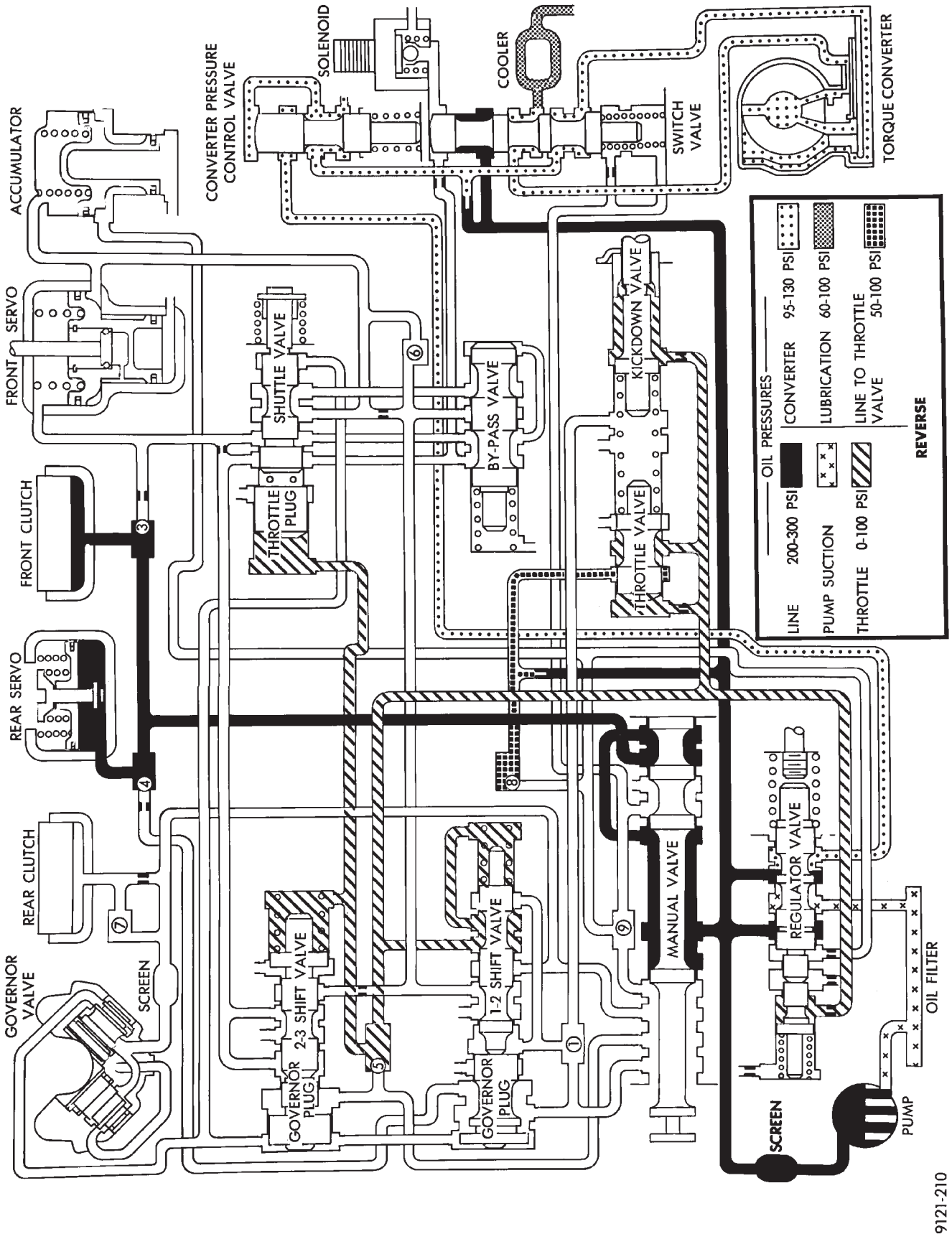


31TH TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



SCHEMATICS AND DIAGRAMS (Continued)



9121-210

31TH TRANSAXLE HYDRAULIC SCHEMATIC

SPECIFICATIONS

31TH AUTOMATIC TRANSAXLE

Type . . . . . .Automatic three speed with torque converter and integral differential
Torque Converter Diameter . . . . . .241 millimeters (9.48 in.)
Oil Capacity . . . . . .8.6 Liters (18.25 pints)
Oil Type . . . . . .Mopar® ATF PLUS 3 Type 7176
Cooling Method . . . . . .Water Heat Exchanger and/or air to oil heat exchanger
Lubrication . . . . . .Pump (internal-external gear-type

Gear Ratios

Transmission Portion

First Gear 2.69
Second Gear. 1.55
Third Gear. 1.00
Reverse Gear 2.10

Pump Clearances

Outer Gear To Pocket. . . . . .0.045-0.141mm (0.0018-0.0056 in.)
Outer Gear Side Clearance. . . . . .0.020-0.046mm (0.0008-0.0018 in.)
Inner Gear Side Clearance . . . . . .0.020-0.046mm (0.0008-0.0018 in.)

Tapered Roller Bearing Settings

Differential Assembly . . .6 to 12 in. lbs. Drag Torque
Output Hub. . . . . .0 to 3 in. lbs. Drag Torque
Transfer Shaft . . . . . .0.002 to 0.010 in. End Play
Overall Drag At Output Hub . . . . . .3 to 16 in. lbs. Drag Torque

Clutch Pack Clearances

Front Clutch (Not Adjustable) . . . . . .1.27-2.79mm (0.050-0.110 in.)
Rear Clutch . . . . . .0.71-1.10mm (0.028-0.043 in.)

Band Adjustment

Kickdown, Backed Off From 8 N·m (72 in. lbs.) . . . . . 2 1/4 Turns
Low-Reverse, Backed Off From 5 N·m (41 in. lbs.) . . . . . .3 1/2 Turns

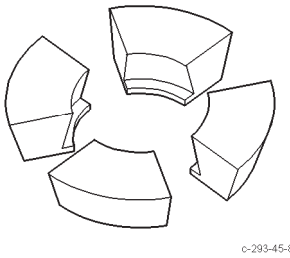
SPECIFICATIONS (Continued)

31TH TORQUE SPECIFICATIONS

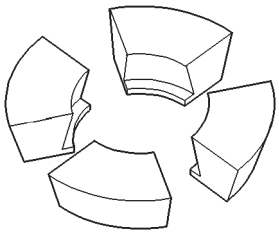
DESCRIPTION	TORQUE		DESCRIPTION	TORQUE
Bell Housing Cover Bolts	12 N·m (106 in. lbs.)		Output Shaft Nut	271 N·m (200 ft. lbs.)
Cooler Hose To Rad. Conn.	12 N·m (105 in. lbs.)		Park/Neutral Switch	34 N·m (25 ft. lbs.)
Cooler Line Conn.	28 N·m (250 in. lbs.)		Pressure Check Plug	5 N·m (45 in. lbs.)
Diff. Bear. Ret. To Case Bolt	28 N·m (250 in. lbs.)		Pump To Case Bolts	31 N·m (275 in. lbs.)
Diff. Cover To Case Bolt	19 N·m (165 in. lbs.)		Reaction Shaft Assembly Bolt	28 N·m (250 in. lbs.)
Exten. Hous. To Case Bolt	28 N·m (250 in. lbs.)		Rear Cover To Case Screw	19 N·m (165 in. lbs.)
Flex Plate To Crankshaft Bolts	95 N·m (70 ft. lbs.)		Reverse Band Adj. Lock Nut	14 N·m (125 in. lbs.)
Flex Plate To Torque Conv. Bolts	68 N·m (50 ft. lbs.)		Reverse Band Shaft Plug	7 N·m (60 in. lbs.)
Fluid Filter Screw	5 N·m (45 in. lbs.)		Ring Gear Screw	95 N·m (70 ft. lbs.)
Front Motor Mount Bolt	54 N·m (40 ft. lbs.)		Speedo. To Ext. Hous. Screw	7 N·m (60 in. lbs.)
Governor Counterweight Screw	28 N·m (250 in. lbs.)		Sprag Ret. To Transfer Case Bolt	28 N·m (250 in. lbs.)
Governor To Support Bolt	7 N·m (60 in. lbs.)		Starter To Trans. Bell Bolts	54 N·m (40 ft. lbs.)
Kickdown Band Adj. Lock Nut	47 N·m (35 ft. lbs.)		Throttle Cable To Trans. Case Bolt	12 N·m (105 in. lbs.)
Left Motor Mount Bolts	54 N·m (40 ft. lbs.)		Throttle Lever To Trans. Shaft Bolts	12 N·m (105 in. lbs.)
Lower Bell Housing Cover Screw	41 N·m (30 ft. lbs.)		Trans. To Cyl. Block Bolt	95 N·m (70 ft. lbs.)
Manual Cable To Trans. Case Bolt	28 N·m (250 in. lbs.)		Transfer Shaft Nut	271 N·m (200 ft. lbs.)
Manual Control Lever Screw	12 N·m (105 i n. lbs.)		Transfer Gear Strap Bolts	23 N·m (17 ft. lbs.)
Oil Pan To Trans. Case Screw	19 N·m (165 in. lbs.)		Valve Body Assy. To Case Bolts	12 N·m (105 in. lbs.)
Output Gear Strap Bolts	23 N·m (17 ft. lbs.)		Valve Body Screw	5 N·m (45 in. lbs.)

SPECIAL TOOLS

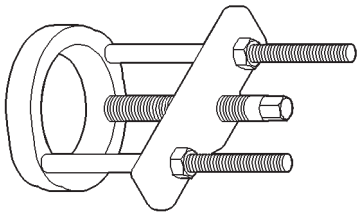
31TH AUTOMATIC TRANSAXLE



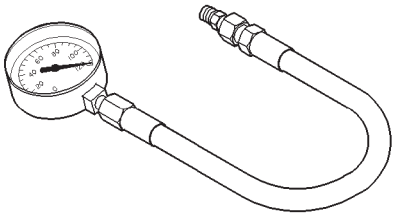
Adapter Blocks C-293–45



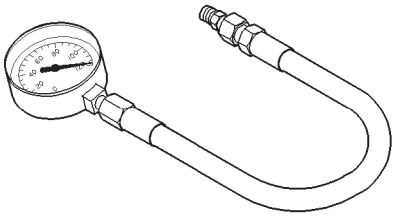
Adapter Blocks C-293–52



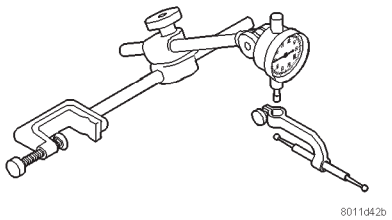
Puller Press C-293–PA



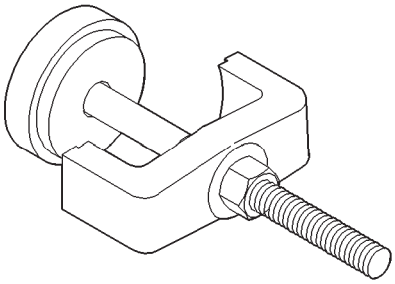
Pressure Gauge (Low) C-3292



Pressure Gauge (High) C-3293SP

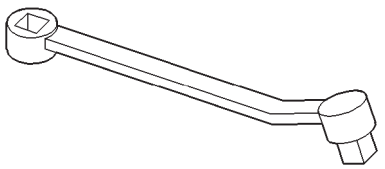


Dial Indicator C-3339

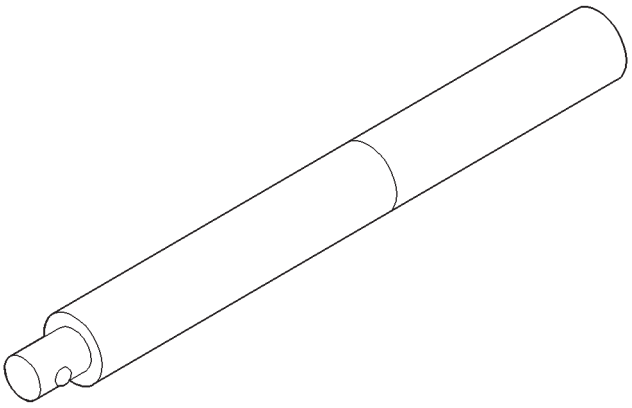


Spring Compressor C-3575–A

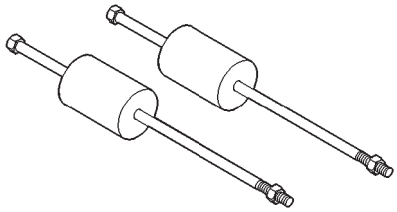
SPECIAL TOOLS (Continued)



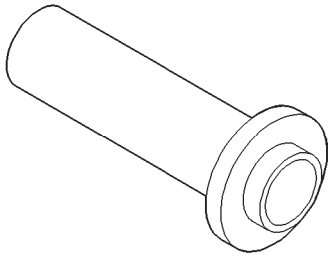
Band Adjusting Adapter



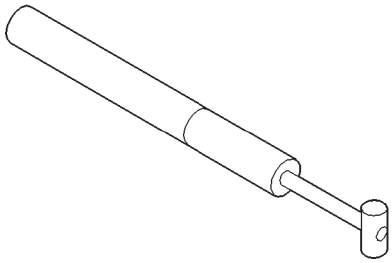
Universal Handle C-4171



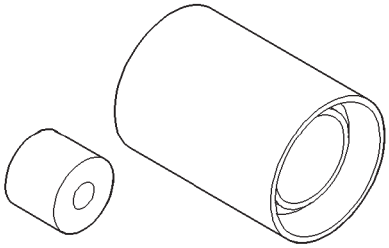
Oil Pump Puller C-3752



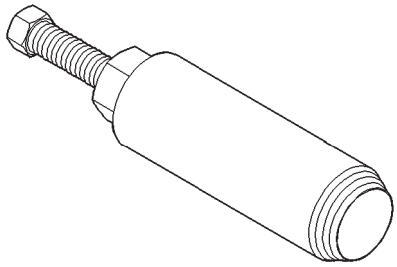
Seal Installer C-4193A



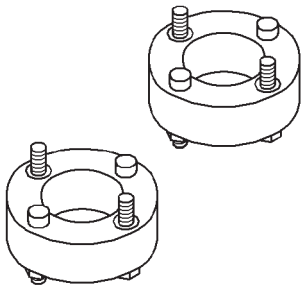
Throttle Setting Gauge



Bearing Installer C-4637

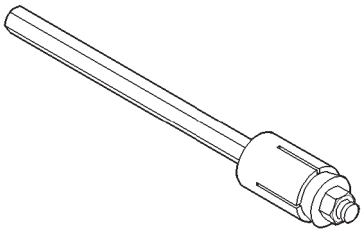


Seal Puller C-3981B

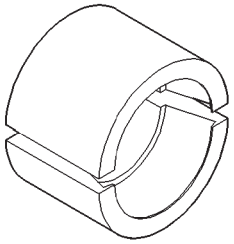


Adapter C-4658

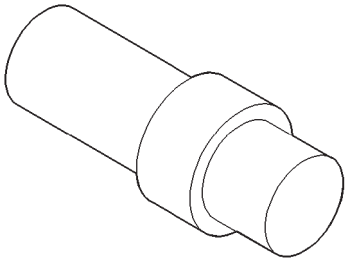
SPECIAL TOOLS (Continued)



Torque Tool C-4995



Bearing Remover Jaws L-4406–2



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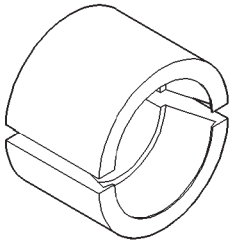
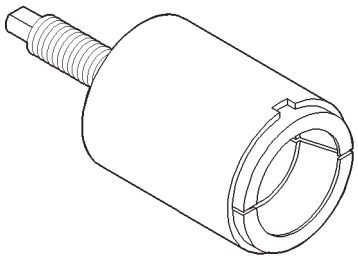
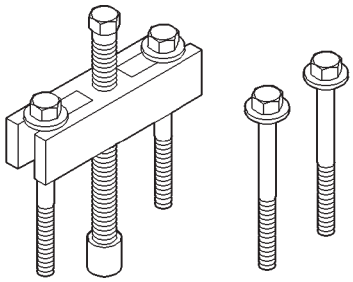


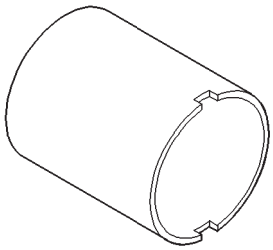
Adapter L-4406–3



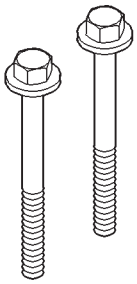
Remover Kit L-4406



Gear Puller L-4407A

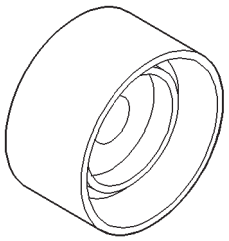


Bearing Remover Cup L-4406–1

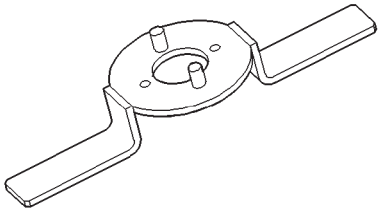


Puller L-4407–6

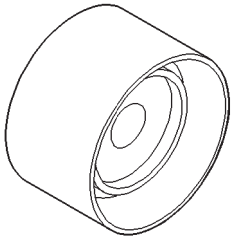
SPECIAL TOOLS (Continued)



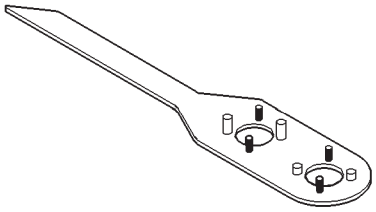
Bearing Installer L-4408



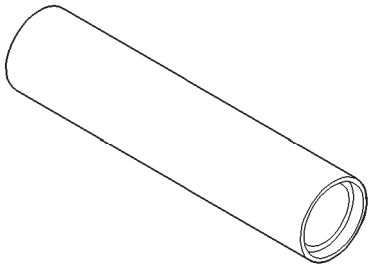
Gear Checking Plate L-4432



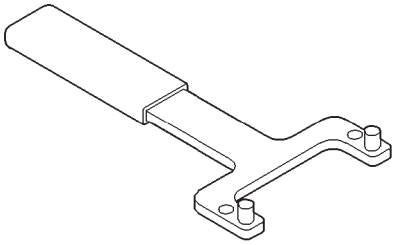
Bearing Installer L-4410



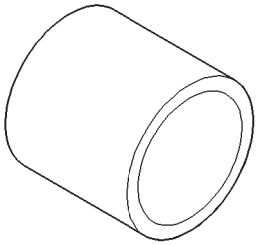
Gear Removing Plate L-4434



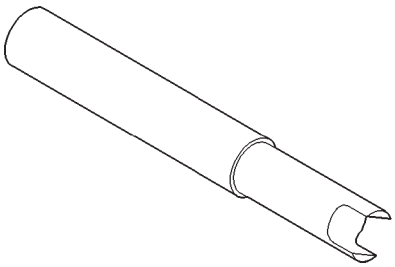
Bearing Installer L-4411



Bearing Puller L-4435

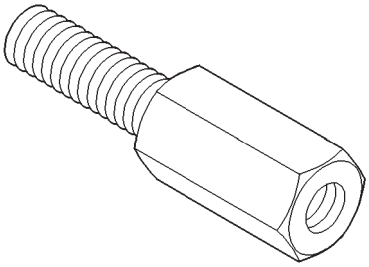


Installer Adapter L-4429-3

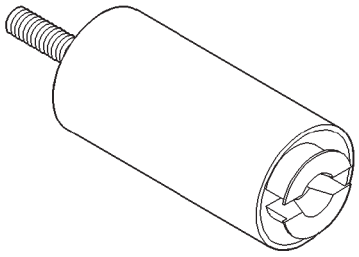


Differential Tool L-4436A

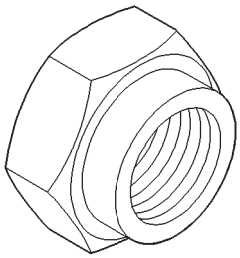
SPECIAL TOOLS (Continued)



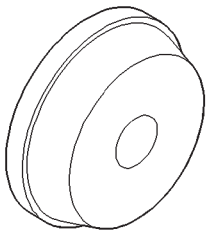
Housing Remover Adapter L-4437



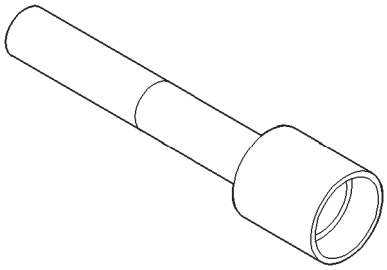
Special Jaw Set L-4518



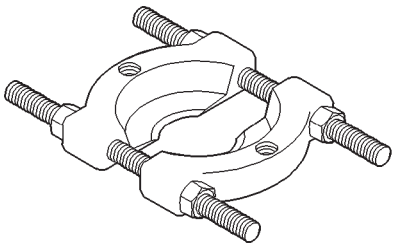
Starter Nut L-4439



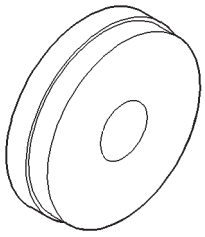
Installer L-4520



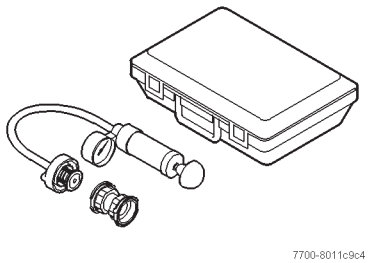
Transfer Shaft Remover-Installer L-4512



Bearing Splitter P-334



Bearing Cup Remover L-4517



Cooling System Tester 7700

41TE AUTOMATIC TRANSAXLE

INDEX

page

GENERAL INFORMATION
41TE FOUR SPEED AUTOMATIC TRANSAXLE . 71
FLUID LEVEL AND CONDITION 72
SELECTION OF LUBRICANT 72
SPECIAL ADDITIVES 72
DESCRIPTION AND OPERATION
ADAPTIVE CONTROLS 73
CLUTCH AND GEAR 72
ELECTRONICS 73
GEARSHIFT AND PARKING LOCK CONTROLS . 74
HYDRAULICS 73
ON-BOARD DIAGNOSTICS 74
SENSORS 73
SHIFT POSITION INDICATOR 74
SOLENOIDS 73
TORQUE MANAGEMENT 74
TRANSMISSION CONTROL MODULE 74
TRANSMISSION RANGE SENSOR 74
DIAGNOSIS AND TESTING
41TE TRANSAXLE GENERAL DIAGNOSIS 75
CLUTCH AIR PRESSURE TESTS 77
FLUID LEAKAGE-TORQUE CONVERTER HOUSING AREA 78
HYDRAULIC PRESSURE TESTS 75
ROAD TEST 75
SHIFT POSITION INDICATOR 78
SERVICE PROCEDURES
ALUMINUM THREAD REPAIR 81
FLUID AND FILTER CHANGE 79
FLUID DRAIN AND REFILL 81
FLUSHING COOLERS AND TUBES 81

page

OIL PUMP VOLUME CHECK 82
PINION FACTOR PROCEDURE 83
TRANSAXLE QUICK LEARN PROCEDURE 82
REMOVAL AND INSTALLATION
GEARSHIFT CABLE 83
MANUAL VALVE LEVER (SHIFT LEVER) 84
OIL PUMP SEAL 92
SOLENOID ASSEMBLY-REPLACE 85
SPEED SENSOR-INPUT 86
SPEED SENSOR-OUTPUT 86
TRANSAXLE 89
TRANSMISSION CONTROL MODULE 87
TRANSMISSION RANGE SENSOR 85
VALVE BODY 88
DISASSEMBLY AND ASSEMBLY
DIFFERENTIAL REPAIR 139
INPUT CLUTCHES-RECONDITION 110
TRANSAXLE ASSEMBLE 122
TRANSAXLE DISASSEMBLE 95
VALVE BODY RECONDITION 92
CLEANING AND INSPECTION
CLEANING VALVE BODY 144
ADJUSTMENTS
GEARSHIFT CABLE ADJUSTMENT 144
SCHEMATICS AND DIAGRAMS
41TE TRANSAXLE HYDRAULIC SCHEMATICS . 145
SPECIFICATIONS
41TE AUTOMATIC TRANSAXLE 158
41TE TORQUE SPECIFICATIONS 158
SPECIAL TOOLS
41TE AUTOMATIC TRANSAXLE 159

GENERAL INFORMATION

41TE FOUR SPEED AUTOMATIC TRANSAXLE

The 41TE four-speed FWD transaxle uses fully-adaptive controls. Adaptive controls are those which perform their functions based on real-time feedback sensor information. The transaxle uses hydraulically applied clutches to shift a planetary gear train.

TRANSAXLE IDENTIFICATION

The 41TE transaxle identification code is printed on a label. The label is located on the transaxle case next to the solenoid assembly (Fig. 1).

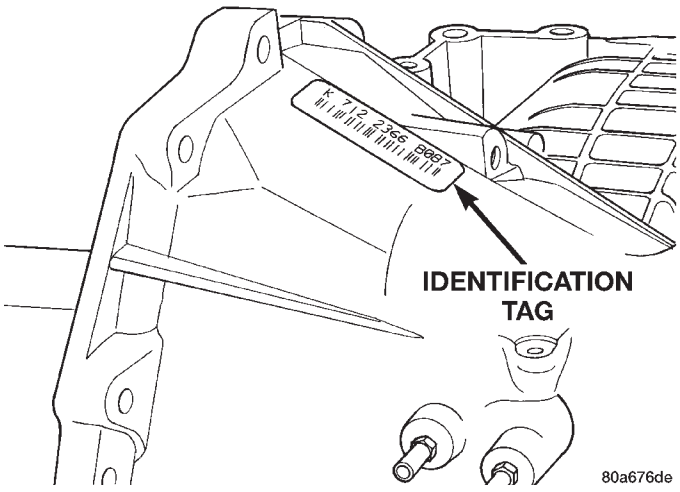


Fig. 1 Identification Tag Location

GENERAL INFORMATION (Continued)

OPERATION

The gear ratios for the 41TE transaxle are as follows:

- **1st—2.84**
- **2nd—1.57**
- **3rd—1.00**
- **OD—0.69**
- **Reverse—2.21**

Final Drive Ratio is dependent on which engine option is selected.

- 2.4 Liter: 3.91 FDR
- 3.3 Liter: 3.62 FDR
- 3.8 Liter: 3.45 FDR

The torque converter clutch is available in 2nd, direct, or overdrive gear;. The shift lever is conventional with six positions: P, R, N, OD, 3, and L available. When OD is selected the transaxle shifts through all four speeds with torque converter clutch available in overdrive. This position is recommended for most driving. The 3 position is tailored for use in hilly or mountainous driving. When 3 is selected, the transmission uses only 1st, 2nd, and direct gears with 2nd-direct shift delayed to 40 mph or greater. When operating in 3 or L positions torque converter clutch application occurs in direct gear. This improves transmission cooling under heavy loads. If high engine coolant temperature occurs, the torque converter clutch will also engage 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 gear at peak engine speeds if the accelerator is depressed. This provides engine over-speed protection and maximum performance.

FLUID LEVEL AND CONDITION

NOTE: The transmission and differential sump have a common oil sump with an opening between the two.

The torque converter fills in both the (P) Park and (N) Neutral positions. Place the selector lever in (P) Park to check the fluid level. **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. This 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.

SELECTION OF LUBRICANT

It is important that the proper lubricant be used in the 41TE transaxle. MOPAR® ATF PLUS 3 (Automatic Transmission Fluid—type 7176) should be used to aid in assuring optimum transmission performance. Fluids of the type labeled DEXRON II Automatic Transmission Fluid are **not recommended**. It is important that the transmission fluid be maintained at the prescribed level using the recommended fluids.

SPECIAL ADDITIVES

Chrysler Corporation does not recommend the addition of any fluids to the transaxle, other than the fluid listed above. An exception to this policy is the use of special dyes to aid in detecting fluid leaks. The use of transmission sealers should be avoided, since they may adversely affect seals.

DESCRIPTION AND OPERATION

CLUTCH AND GEAR

The transaxle consists of:

- Three multiple disc input clutches
- Two multiple disc grounded clutches
- Four hydraulic accumulators
- Two planetary gear sets

This provides four forward ratios and a reverse ratio. The input clutch-apply pistons were designed with centrifugally balanced oil cavities so that quick response and good control can be achieved at any speed. A push/pull piston is incorporated for two of the three input clutches.

DESCRIPTION AND OPERATION (Continued)

CAUTION: Some clutch packs appear similar, but they are not the same. Do not interchange clutch components, as they might fail.

HYDRAULICS

The hydraulics of the transaxle provide:

- Manual shift lever select function
- Main line pressure regulation
- 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 torque converter clutch control valve. This valve locks out the 1st gear reaction element with the application of 2nd, direct, or overdrive gear elements. It also redirects the 1st gear solenoid output so that it can control torque converter clutch operation. To regain access to 1st gear, a sequence of commands must be used to move the solenoid TCC control valve. This precludes any application of the 1st gear reaction element with other elements applied. 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 the controls to read and respond to changes that are occurring.

SOLENOIDS

The solenoid valves perform most control functions, these valves must be extremely durable and tolerant of dirt. For that reason hardened-steel poppet and ball valves are used. These are free from any close operating clearances. The solenoids operate the valves directly without any intermediate element. Direct operation means that these units must have very high output. They must 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), (3), or (L) shift lever positions. All other transmission lever positions will operate normally. The choice of 2nd gear was made to provide adequate breakaway performance while still accommodating highway speeds.

SENSORS

There are three pressure switches to identify solenoid application. There are two speed sensors to read input (torque converter turbine) and output (parking sprag) speeds. There is also a transmission range sensor 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 multiplex circuit with the powertrain control module.

ELECTRONICS

The 41TE Transmission Control Module (TCM) is located underhood in a potted, die-cast aluminum housing. The module used is a new controller called EATX III. The TCM has 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. The use of overrunning clutches or other shift quality aids are not required. 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. This ensures that it does not have excess capacity. The apply element is filled until it begins to make the speed change to the higher gear. The apply pressure is then controlled to maintain the desired rate of speed change. This continues until the shift is made. The key to providing excellent shift quality is precision. For example, 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 TCM learns the traits of the transaxle that it is controlling. It learns the release rate of the releasing element and the apply time of the applying element. It also learns the rate at which the apply element builds pressure sufficient to begin making the speed change. This method achieves more precision than would be possible with exacting tolerances. It can also adapt to any changes that occur with age or environment.

For kickdown shifts, the control logic allows the releasing element to slip. 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. This also provides 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.

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

DESCRIPTION AND OPERATION (Continued)

TORQUE MANAGEMENT

Most 41TE transaxles utilize torque management. Torque management is a unique function of the Powertrain Control Module (PCM). The PCM receives output signals from the Transmission Control Module (TCM) and many various engine sensors. The PCM evaluates these signals and decides if it is necessary to decrease the output of the engine's torque. This reduction in torque does not interfere with the normal operation of the vehicle. This reduction in torque will prolong the life of the drivetrain components. Torque reduction is not noticeable in normal driving functions. The torque reduction function shuts off above 16 MPH.

ON-BOARD DIAGNOSTICS

This vehicle utilizes a diagnostic system called OBDII. The powertrain control module communicates with the Transmission Control Module. Whenever the transaxle sets a fault in the Transmission Control Module (dependent on which fault is set), the powertrain control module will turn on a MIL (Malfunction Indicator Lamp) on the instrument cluster. By reading the code in the powertrain control module it will tell you where the fault occurred. If the fault occurred in the transaxle, the controller will read a **CODE 45.** For further information regarding OBDII, refer to Group 25, Emission Systems.

These controls provide comprehensive, on-board transaxle diagnostics. The information available can aid in transaxle diagnosis. For example, apply element buildup rate indicates solenoid performance. Also included are self diagnostic functions. Self diagnostics allow the technician to test the condition of the electronic controls. The Transmission Control Module continuously monitors its critical functions. It also records any malfunctions, and the number of engine starts since the last malfunction. This allows the technician to use the information in the event of a customer complaint.

TRANSMISSION CONTROL MODULE

Do not interchange Transmission Control Modules with previous year transmission control modules. If a same year TCM is being used from a different vehicle, the following procedures must be performed:

- Quick Learn Procedure
- Electronic Pinion Factor Procedure

The Transmission Control Module is located on the right inner fender panel, in the engine compartment. It is held in place by four mounting screws.

NOTE: If the Transmission Control Module has been replaced, the following procedures must be performed:

- Quick Learn Procedure: This procedure will allow the transmission control module to learn the characteristics of the vehicle.
- Electronic Pinion Factor Procedure: This procedure will reprogram the TCM to compensate for different tire sizes and final drive ratios.

GEARSHIFT AND PARKING LOCK CONTROLS

The transaxle is controlled by a lever type gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), and D (drive), 2 (second), and 1 (first). The parking lock is applied by moving the selector lever past a gate to the P position. **Do not apply the parking lock until the vehicle has stopped; otherwise, a severe ratchet noise will occur.**

TRANSMISSION RANGE SENSOR

The 41TE transaxle is equipped with a transmission range sensor that is located on top of the valve body. This sensor will allow for accurate transmission gear position measurement.

To service the transmission range sensor (TRS), you must remove the valve body. For repair procedures, refer to the Removal and Installation section within this group.

Also located within the TRS is a transmission temperature sensor. This sensor is used to measure the transmission fluid sump temperature. The transmission temperature sensor is serviced with the TRS as a unit.

SHIFT POSITION INDICATOR

The shifter position indicator is located in the instrument cluster. The shifter position indicator outlines with a box the gear position the transaxle manual valve lever is in.

The transmission range sensor (located on the valvebody) sends a signal to the TCM on the position of the transaxle manual valve lever. The TCM receives the switch signal and processes the data. The TCM sends the Shift Lever Position (SLP) information to the BCM via the CCD bus. The BCM then outlines with a box the appropriate shifter position indicator in the instrument cluster.

To replace the shifter position indicator, refer to Group 8E, Instrument Panel And Gauges.

DIAGNOSIS AND TESTING

41TE TRANSAXLE GENERAL DIAGNOSIS

CAUTION: Before attempting any repair on a 41TE four speed automatic transaxle, check for Diagnostic Trouble Codes with the DRBIII scan tool. Always use the Powertrain Diagnostic Test Procedure Manual.

Transaxle malfunctions may be caused by these general conditions:

- Poor engine performance
- Improper adjustments
- Hydraulic malfunctions
- Mechanical malfunctions
- 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 persists after the preliminary tests and corrections are completed, hydraulic pressure checks should be performed.

ROAD TEST

Prior to performing a road test, check the fluid level.

During the road test, the transaxle should be operated in each position to check for slipping and any variation in shifting.

If vehicle operates properly at high speeds, but has poor acceleration, the converter's overrunning clutch may be slipping. If acceleration is normal, but high throttle opening is needed for high speeds, the clutch may have seized. Both of these stator defects require replacement of the torque converter.

The clutch that is slipping can be determined by noting the transaxle operation in all selector positions. Then comparing which internal units are applied in those positions. The **Elements in Use Chart** provides a basis for road test analysis.

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

HYDRAULIC PRESSURE TESTS

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

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	
3 — DRIVE GEAR*							
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. 9221-93

ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

DIAGNOSIS AND TESTING (Continued)

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 (Fig. 2).

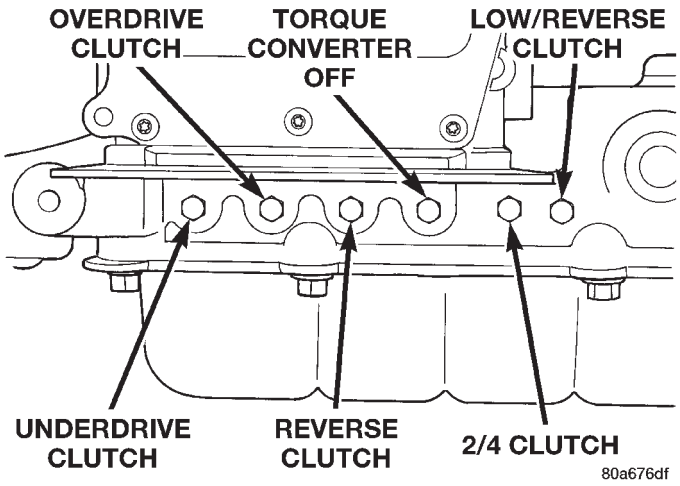


Fig. 2 Pressure Taps

TEST ONE-SELECTOR IN LOW 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 DRIVE 2nd GEAR

NOTE: This test checks the underdrive clutch hydraulic circuit as well as the shift schedule.

(1) Attach gauge to the underdrive clutch tap.

(2) Move selector lever to the 3 position.

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

(4) In second gear the underdrive clutch pressure should read 110 to 145 psi.

TEST 2A–SELECTOR IN OD

NOTE: This test checks the underdrive clutch hydraulic circuit as well as the shift schedule.

(1) Attach gauge to the UD clutch tap.

(2) Move selector lever to the OD position.

(3) Allow wheels to rotate freely and increase throttle opening to achieve an indicated speed of 40 mph.

(4) Underdrive clutch pressure should read below 5 psi. If not, than either the solenoid assembly or TCM is at fault.

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 (3) 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 DRIVE, 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 DRIVE, OVERDRIVE

(1) Attach gauge to the torque converter clutch 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 of 50 mph.

CAUTION: Both wheels must turn at the same speed.

(4) Torque converter clutch off pressure should be less than 5 psi.

(5) This test checks the torque converter clutch hydraulic circuit.

TEST SIX-SELECTOR IN REVERSE

(1) Attach gauge to the reverse and LR 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.

DIAGNOSIS AND TESTING (Continued)

(4) Reverse and LR 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 4 of Test Three, a worn reaction shaft seal ring or a defective solenoid assembly is indicated.

(5) If the underdrive clutch pressure is greater than 5 psi in Step 4 of Test 2A, a defective solenoid assembly or TCM is the cause.

CLUTCH AIR PRESSURE TESTS

Inoperative clutches can be located using a series of tests by substituting air pressure for fluid pressure (Fig. 3) (Fig. 4). The clutches may be tested by applying air pressure to their respective passages. The valve body must be removed and Tool 6056 installed. To make air pressure tests, proceed as follows:

NOTE: 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.

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.

ALL PRESSURE SPECIFICATIONS ARE PSI

(on hoist, with front wheels free to turn)

Gear Selector Position	Actual Gear	PRESSURE TAPS					
		Under-Drive Clutch	Over-Drive Clutch	Reverse Clutch	Torque Converter Clutch 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
3 # 30 mph	SECOND	110-145	0-5	0-2	60-110	115-145	0-2
3 # 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 WITH TCC	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.

9321-200

PRESSURE CHECK SPECIFICATIONS

DIAGNOSIS AND TESTING (Continued)

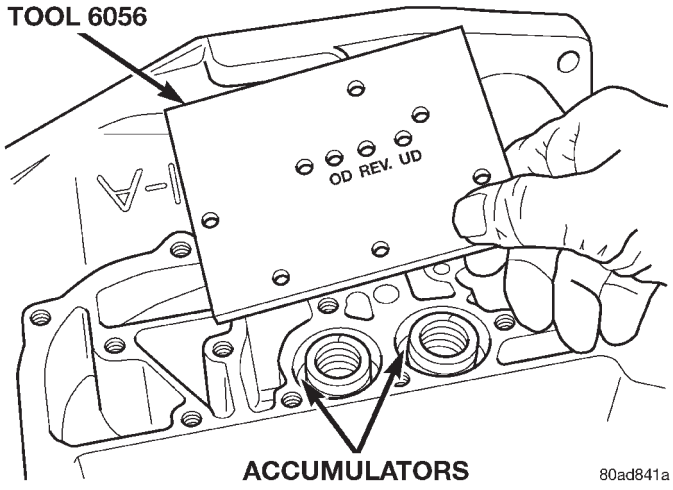


Fig. 3 Air Pressure Test Plate

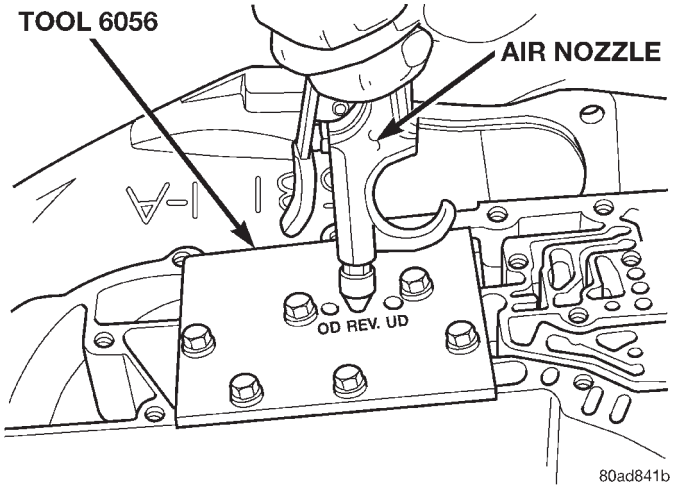


Fig. 4 Testing Reverse Clutch

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. 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 cannot 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-TORQUE CONVERTER HOUSING AREA

(1) Check for source of leakage.

(2) 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 red and, therefore, can be distinguished from engine oil.

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

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

(5) 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.

(6) After performing this operation, inspect for leakage. If a leak persists, perform the following operation on the vehicle. This will determine if the torque converter or transaxle is leaking.

TORQUE CONVERTER LEAKAGE

Possible sources of torque converter leakage are:

- Torque converter weld leaks at the outside (peripheral) weld.
- Torque converter hub weld.

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

SHIFT POSITION INDICATOR

The transmission range sensor (on the valve body) sends a signal to the TCM on the position of the transaxle manual valve lever. The TCM receives the switch signal and processes the data. The TCM sends the Shift Lever Position (SLP) information to the BCM via the CCD bus. The BCM then outlines with a box the appropriate shifter position indicator in the instrument cluster.

DIAGNOSIS AND TESTING (Continued)

If a problem arises with the shifter position indicator, consult the following chart for diagnostic information. If the malfunction cannot be corrected using the chart, consult the proper diagnostic manual.

To replace the shifter position indicator, refer to Group 8E, Instrument Panel And Gauges.

CONDITION	POSSIBLE CAUSE
ALL PRND3L DISPLAY LIGHTS ″ON″ IN P&N GEAR POSITIONS	1.Check wiring and connectors
	2. Faulty trans. range sensor
	3. Faulty manual lever
ALL DISPLAY LIGHTS ″ON″ IN ALL GEAR POSITIONS	1. Check wiring & connectors
	2. Faulty trans. range sensor
	3. Faulty manual lever
	4. CCD communication malfunction
	5. Check oil level
ALL DISPLAY LIGHTS ″OFF″	1. Normal transient condition between P&R and R&N gear positions
	2. Check shift lever linkage
	3. Body controller malfunction
	4. Check wiring and connectors
	5. Faulty cluster
ALL DISPLAY LIGHTS ″OFF″ ACCOMPANIED BY A ″NO BUS″ MESSAGE	1. CCD communication malfunction
DISPLAY LIGHTS OUT OF SEQUENCE WITH SHIFT LEVER	1. Check wiring and connectors
	2. Faulty trans. range sensor
	3. Faulty manual lever
	4. CCD communication malfunction

SERVICE PROCEDURES

FLUID AND FILTER CHANGE

When the factory fill fluid is changed, only fluids labeled MOPAR® ATF PLUS 3 (Automatic Transmission fluid) Type 7176 should be used.

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

30,000 MILE TRANSAXLE OIL CHANGE

When a vehicle attains 30,000 miles on its odometer it is recommended that the transaxle oil be changed. To change the oil, use the procedure that follows:

It is recommended that a transaxle fluid exchanger (ATF 2000+ or equivalent) be used to replace the used fluid in the transaxle. If a fluid exchanger is not available use a fluid suction pump (Vacula™ or equivalent) to draw the fluid out of the dipstick tube. If a fluid suction pump is not available remove the oil pan and drain the fluid.

CAUTION: Chrysler Corporation does not recommend using any fluid exchanger that introduces additives into the transaxle.

TRANSAXLE FLUID EXCHANGER METHOD

(1) To perform the transaxle fluid exchange, the transaxle must be at operating temperature. Drive the vehicle till it reaches full operating temperature.

(2) Verify that the fill tank on the transaxle fluid exchanger (ATF 2000+ or equivalent) is clean and dry.

(3) Fill the tank to the recommended fill capacity with Mopar ATF Plus 3 Type 7176.

(4) Hookup the vehicle to the machine following the manufacturers instructions. Perform the exchange procedure following the instructions provided with the machine.

(5) Once machine has completed the fluid exchange. Check the fluid level and condition and fill to proper level with Mopar ATF Plus 3 Type 7176.

NOTE: Verify that the transaxle cooler lines are tightened to proper specifications. Cooler line torque specification is 2 N·m (18 in. lbs.).

SERVICE PROCEDURES (Continued)

DIPSTICK TUBE FLUID SUCTION METHOD

(1) When performing the fluid suction method, make sure the transaxle is at full operating temperature.

(2) To perform the dipstick tube fluid suction method, use a suitable fluid suction device (Vacula™ or equivalent).

(3) Insert the fluid suction line into the dipstick tube.

NOTE: Verify that the suction line is inserted to the lowest point of the transaxle oil pan. This will ensure complete evacuation of the fluid in the pan.

(4) Follow the manufacturers recommended procedure and evacuate the fluid from the transaxle.

(5) Remove the suction line from the dipstick tube.

(6) Add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(7) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(8) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(9) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range.

TRANSAXLE OIL PAN DROP METHOD

This procedure involves removing the transaxle oil pan to drain the transaxle fluid.

(1) Bring the vehicle up to normal operating temperature. Drive the vehicle a minimum of 10 miles.

(2) Raise the vehicle on the hoist.

(3) Loosen the transaxle oil pan and drain the fluid into a suitable container.

(4) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(5) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N•m (165 in. lbs.).

(6) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(7) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(8) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(9) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range. Drive the vehicle a minimum of 10 miles.

(10) Raise the vehicle on the hoist.

(11) Check for leaks around the transaxle oil pan sealing surfaces.

(12) Recheck the fluid level. The level should be in the HOT range.

SEVERE USAGE SERVICE

If the vehicle exhibits any of the following symptoms, it is recommended that the transaxle oil and filter be replaced.

- Transaxle oil discolored
- Transaxle oil has high mileage
- Oil feels grimy when rubbed between fingertips
- Poor shift quality
- Delayed gear engagement
- Vehicle shudder between shifts

TRANSAXLE OIL AND FILTER REPLACEMENT

This procedure involves changing the transaxle fluid and filter, driving the vehicle for 10 miles and changing the transaxle fluid a second time.

(1) Bring the vehicle up to normal operating temperature. Drive the vehicle a minimum of 10 miles.

(2) Raise the vehicle on the hoist.

(3) Loosen the transaxle oil pan and drain the fluid into a suitable container.

(4) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(5) Separate the filter and O-ring from the valve body. Inspect the O-ring for cuts or improper installation. This could lead to delayed garage shifts.

(6) Install a new filter. Replace the O-ring as necessary.

(7) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N·m (165 in. lbs.).

(8) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(9) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(10) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

SERVICE PROCEDURES (Continued)

(11) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range. Drive the vehicle a minimum of 10 miles.

(12) Raise the vehicle on the hoist.

(13) Remove the pan and clean all sealant from the pan and transaxle mating surfaces. Clean the magnet and the inside of the pan.

(14) Separate the filter from the valve body to allow additional fluid to drain from the transaxle. Inspect the filter O-ring for any damage and replace as necessary.

(15) After the transaxle has stopped draining, reinstall the filter and O-ring.

(16) Apply a 1/8 inch bead of Mopar RTV Sealant to the mounting flange of the transaxle oil pan. Apply RTV Sealant to the underside of the attaching bolts. Attach the oil pan to the transaxle. Tighten the bolts to 19 N·m (165 in. lbs.).

(17) Lower the vehicle and add 4 Quarts of Mopar ATF Plus 3 Type 7176 transaxle fluid.

(18) Start the engine and allow it to idle for a minimum of one minute. With the parking brake applied, press your foot on the service brake and cycle the transaxle from park to all gear positions ending in neutral or park.

(19) Check the transaxle fluid level and add an appropriate amount to bring the transaxle fluid level to 3mm (1/8 in.) below the ADD mark on the dipstick.

(20) Recheck the fluid level after the transaxle is at normal operating temperature. The level should be in the HOT range.

FLUID DRAIN AND REFILL

(1) Raise vehicle on a hoist (See Group 0, Lubrication). 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 MOPAR® RTV sealant. Tighten oil pan bolts to 19 N·m (165 in. lbs.).

(5) Pour four quarts of MOPAR® ATF PLUS 3 (Automatic Transmission Fluid) Type 7176 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.

CAUTION: Do not overfill transaxle. Do not add oil if level is between: Lower holes for warm oil (100°F). Upper holes for hot oil (180°F).

(8) Recheck fluid level after transaxle is at normal operating temperature. The level should be in the HOT region (Fig. 5).

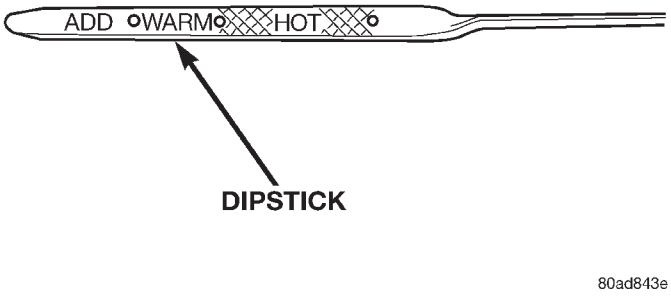


Fig. 5 Oil Level Indicator

(9) To prevent dirt from entering transaxle, make certain that dipstick is seated into the dipstick fill tube.

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. This repair consists of drilling out the worn-out damaged threads. Then tap the hole with a special Heli-Coil tap, or equivalent, and installing a Heli-Coil insert, or equivalent, into the 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.

FLUSHING COOLERS AND TUBES

When a transaxle failure has contaminated the fluid, the oil cooler(s) must be flushed. The cooler bypass valve in the transaxle must be replaced also. The torque converter must also be replaced with an exchange unit. This will insure that metal particles or sludged oil are not later transferred back into the reconditioned (or replaced) transaxle.

The recommended procedure for flushing the transaxle cooler is to use Tool 6906A Cooler Flusher.

SERVICE PROCEDURES (Continued)

WARNING: WEAR PROTECTIVE EYEWEAR THAT MEETS THE REQUIREMENTS OF OSHA AND ANSI Z87.1–1968. WEAR STANDARD INDUSTRIAL RUBBER GLOVES.

KEEP LIGHTED CIGARETTES, SPARKS, FLAMES, AND OTHER IGNITION SOURCES AWAY FROM THE AREA TO PREVENT THE IGNITION OF COMBUSTIBLE LIQUIDS AND GASES. KEEP A CLASS (B) FIRE EXTINGUISHER IN THE AREA WHERE THE FLUSHER WILL BE USED.

KEEP THE AREA WELL VENTILATED.

DO NOT LET FLUSHING SOLVENT COME IN CONTACT WITH YOUR EYES OR SKIN: IF EYE CONTAMINATION OCCURS, FLUSH EYES WITH WATER FOR 15 TO 20 SECONDS. REMOVE CONTAMINATED CLOTHING AND WASH AFFECTED SKIN WITH SOAP AND WATER. SEEK MEDICAL ATTENTION.

COOLER FLUSH USING TOOL 6906A

(1) Remove cover plate filler plug on Tool 6906A. Fill reservoir 1/2 to 3/4 full of fresh flushing solution. Flushing solvents are petroleum based solutions generally used to clean automatic transmission components. **DO NOT** use solvents containing acids, water, gasoline, or any other corrosive liquids.

(2) Reinstall filler plug on Tool 6906A.

(3) Verify pump power switch is turned OFF. Connect red alligator clip to positive (+) battery post. Connect black (-) alligator clip to a good ground.

(4) Disconnect the cooler lines at the transmission.

NOTE: When flushing transmission cooler and lines, ALWAYS reverse flush.

(5) Connect the BLUE pressure line to the OUTLET (From) cooler line.

(6) Connect the CLEAR return line to the INLET (To) cooler line

(7) Turn pump ON for two to three minutes to flush cooler(s) and lines. Monitor pressure readings and clear return lines. Pressure readings should stabilize below 20 psi. for vehicles equipped with a single cooler and 30 psi. for vehicles equipped with dual coolers. If flow is intermittent or exceeds these pressures, replace cooler.

(8) Turn pump OFF.

(9) Disconnect CLEAR suction line from reservoir at cover plate. Disconnect CLEAR return line at cover plate, and place it in a drain pan.

(10) Turn pump ON for 30 seconds to purge flushing solution from cooler and lines. Turn pump OFF.

(11) Place CLEAR suction line into a one quart container of Mopar® ATF PLUS 3 Type 7176 automatic transmission fluid.

(12) Turn pump ON until all transmission fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transmission cooler and lines. Turn pump OFF.

(13) Disconnect alligator clips from battery. Reconnect flusher lines to cover plate, and remove flushing adapters from cooler lines.

OIL PUMP VOLUME CHECK

After the new or repaired transmission has been installed, fill to the proper level with Mopar ATF PLUS 3 (Type 7176) automatic transmission fluid. The volume should be checked using the following procedure:

(1) Disconnect the **From cooler** line at the transmission and place a collecting container under the disconnected line.

CAUTION: With the fluid set at the proper level, fluid collection should not exceed (1) quart or internal damage to the transmission may occur.

(2) Run the engine **at curb idle speed**, with the shift selector in neutral.

(3) If fluid flow is intermittent or it takes more than 20 seconds to collect one quart of ATF, disconnect the **To Cooler** line at the transaxle.

(4) Refill the transaxle to proper level and recheck pump volume.

(5) If flow is found to be within acceptable limits, replace the cooler. Then fill transmission to the proper level, using Mopar ATF PLUS 3 (Type 7176) automatic transmission fluid.

(6) If fluid flow is still found to be inadequate, check the line pressure using the Transaxle Hydraulic Pressure Test procedure.

(7) Check the cooler for debris on the external surfaces. Clean as necessary.

TRANSAXLE QUICK LEARN PROCEDURE

The quick learn procedure requires the use of the DRBIII scan tool.

This program allows the electronic transaxle system to recalibrate itself. This will provide the best possible transaxle operation. The quick learn procedure should be performed if any of the following procedures are performed:

- Transaxle Assembly Replacement
- Transmission Control Module Replacement
- Solenoid Pack Replacement
- Clutch Plate and/or Seal Replacement
- Valve Body Replacement or Recondition

To perform the Quick Learn Procedure, the following conditions must be met:

- The brakes must be applied
- The engine speed must be above 500 rpm
- The throttle angle (TPS) must be less than 3 degrees

SERVICE PROCEDURES (Continued)

- The shift lever position must stay until prompted to shift to overdrive
- The shift lever position must stay in overdrive after the Shift to Overdrive prompt until the DRBIII indicates the procedure is complete
- The calculated oil temperature must be above 60° and below 200°

(1) Plug the DRBIII scan tool into the data link connector. The connector is located under the instrument panel.
(2) Go to the Transmission screen.
(3) Go to the Miscellaneous screen.
(4) Select Quick Learn Procedure. Follow the instructions of the DRBIII to perform the Quick Learn Procedure.

PINION FACTOR PROCEDURE

The vehicle speed readings for the speedometer are taken from the output speed sensor. The TCM must be calibrated to the different combinations of equipment available. A procedure has been developed called Pinion Factor. It allows the technician to set the Transmission Control Module initial setting so that the speedometer readings will be correct.

Failure to perform this procedure will cause a No Speedometer Operation condition.

This procedure must be performed if the Transmission Control Module has been replaced.

To properly read or reset the Pinion Factor, it is necessary to use a DRBIII scan tool. Perform the following steps with the DRBIII scan tool to read or reset the Pinion Factor:

(1) Plug the DRBIII scan tool into the data link connector located under the instrument panel.
(2) Select the Transmission menu.
(3) Select the Miscellaneous menu.
(4) Select Pinion Factor. Then follow the instructions on the DRBIII scan tool screen.

REMOVAL AND INSTALLATION

GEARSHIFT CABLE

REMOVAL

(1) Remove cable eyelet attachment from transaxle operating lever pin (Fig. 6).
(2) Using pliers, squeeze ears of cable conduit attachment at mounting bracket (Fig. 7) and push through hole to remove (Fig. 8).
(3) Remove the under instrument panel silencer (Fig. 9). Refer to Group 8E, Instrument Panel And Gauges for more information.
(4) At the steering column attachment, remove the cable eyelet attachment from the shift lever pin.
(5) Using pliers, squeeze ears of cable attachment at mounting bracket then push through hole to remove.
(6) Unseat the dash grommet and remove the cable from the vehicle.

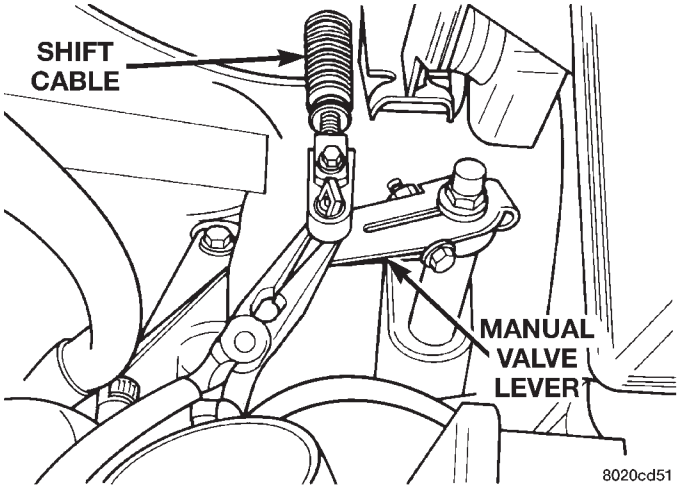


Fig. 6 Gearshift Cable

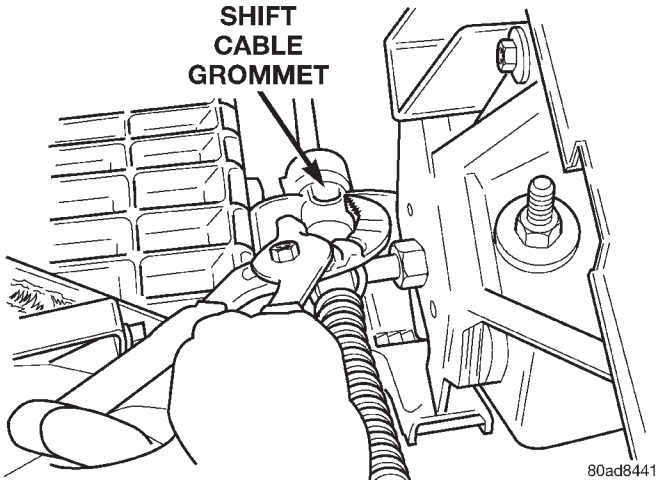


Fig. 7 Grommet Clips

INSTALLATION

(1) Install cable into steering column attachment bracket. Verify conduit ears are fully engaged. Verify cable does not interfere with brake pedal actuation.
(2) Attach cable eyelet fitting onto shift lever pin.
(3) Insert transaxle end of cable through dash panel hole and fully seat grommet.
(4) Install instrument panel silencer. Verify gearshift cable is routed through the slot in the silencer.

CAUTION: Failure to route the cable properly at the silencer may cause brake pedal interference.

(5) Attach transaxle end of cable to the mounting bracket on the transaxle. Assure the conduit attachment ears are fully seated.

REMOVAL AND INSTALLATION (Continued)

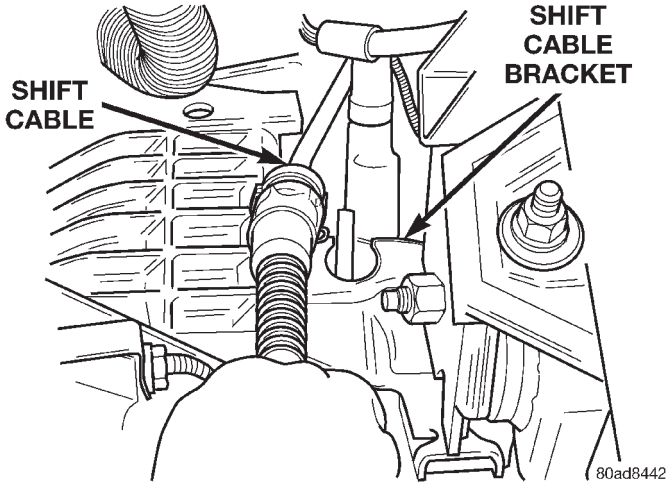


Fig. 8 Remove Cable From Bracket

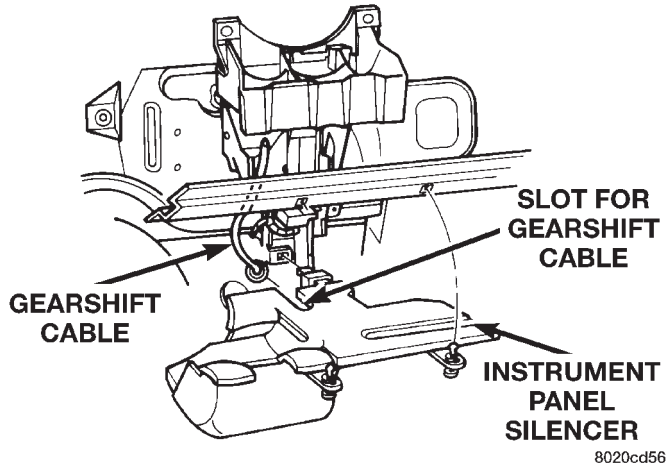


Fig. 9 Instrument Panel Silencer

(6) Attach cable eyelet fitting onto the transaxle operating lever.

(7) Complete adjustment using the gearshift cable adjustment procedure.

ADJUSTMENT

Lift and rotate the gearshift hand lever into the park (P) gate position and remove the ignition key. This confirms the shift lever is in the gated park (P) position.

After confirming the park gate position, turn the ignition switch. If the starter will operate, the park gate position is correct. Move the shift lever into the neutral (N) position. If the starter will operate in this position, the linkage is properly adjusted. If the starter fails to operate in either position, linkage adjustment is required.

(1) Park the vehicle on level ground and set the parking brake.

(2) Place the gearshift lever in park (P) gate position and remove key.

(3) Loosen the cable adjustment screw at the transaxle operating lever (Fig. 10).

(4) Pull the transaxle operating lever fully forward to the park detent position.

(5) Release the park brake, then rock the vehicle to assure it is in park lock. Reset the park brake.

(6) Tighten the cable adjustment screw to 8 N·m (70 in. lbs.). Gearshift cable should now be properly adjusted.

(7) Check adjustment by using the preceding procedure.

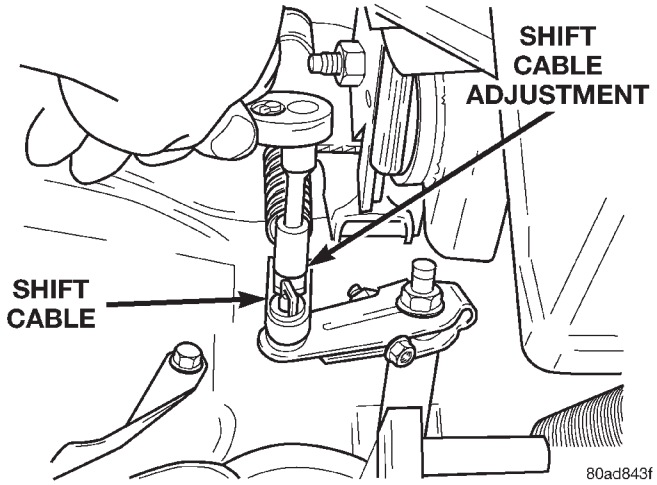


Fig. 10 Gearshift Cable

MANUAL VALVE LEVER (SHIFT LEVER)

REMOVAL

(1) Remove shift cable from lever (Fig. 11).

(2) Loosen the lever mounting bolt (Fig. 12). Do not remove bolt (not necessary).

(3) Pull up on lever and remove.

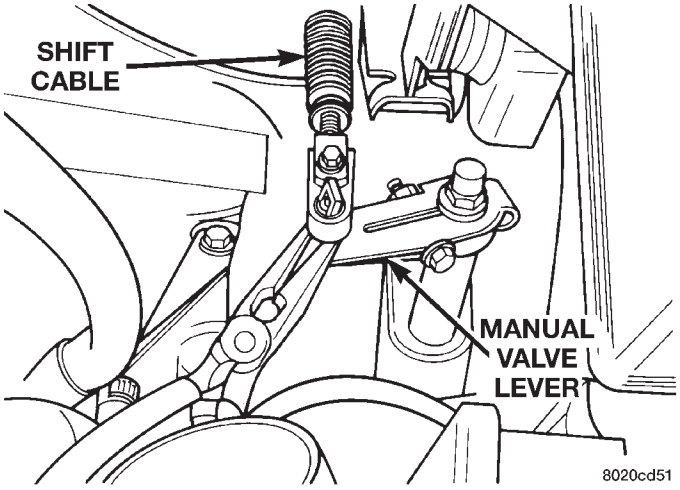


Fig. 11 Shift Cable

INSTALLATION

(1) For installation, reverse removal procedure.

REMOVAL AND INSTALLATION (Continued)

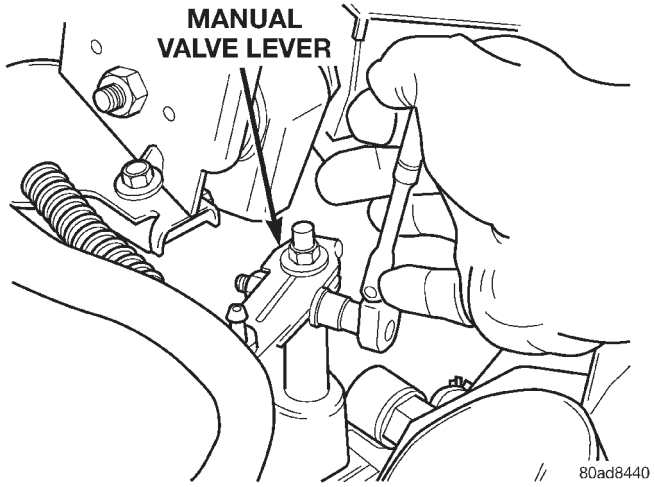


Fig. 12 Manual Valve Lever (Shift Lever)

SOLENOID ASSEMBLY-REPLACE

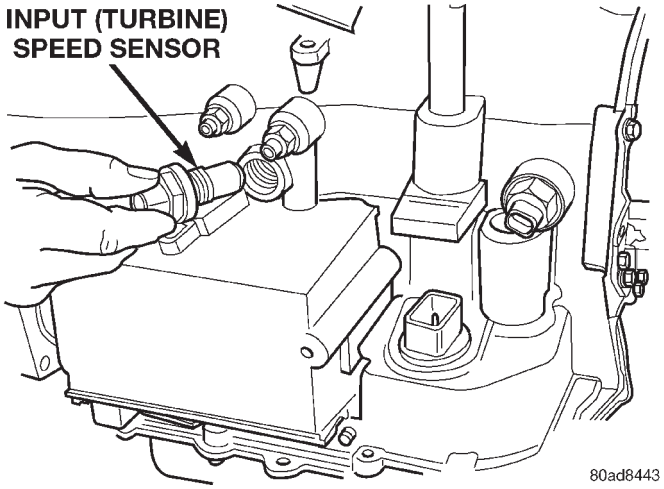


Fig. 13 Remove Input Speed Sensor

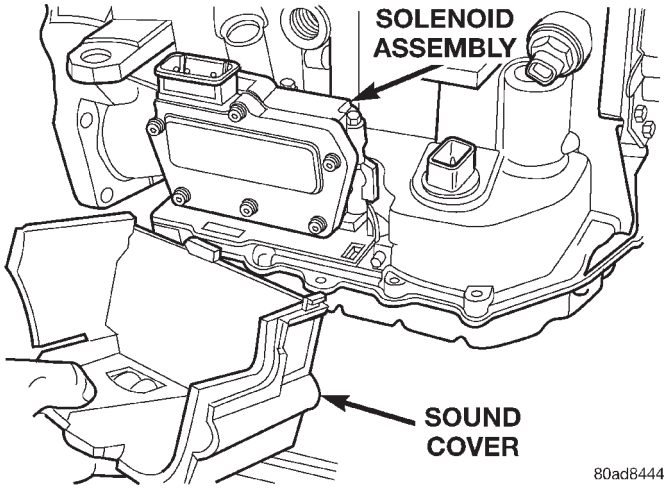


Fig. 14 Remove Sound Cover

To install solenoid assembly, reverse removal procedure. Tighten screws to 12 N·m (105 in. lbs.).

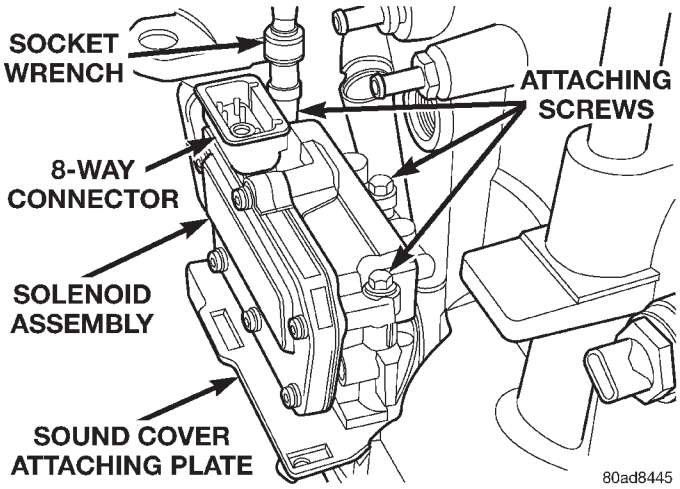


Fig. 15 Remove Attaching Screws

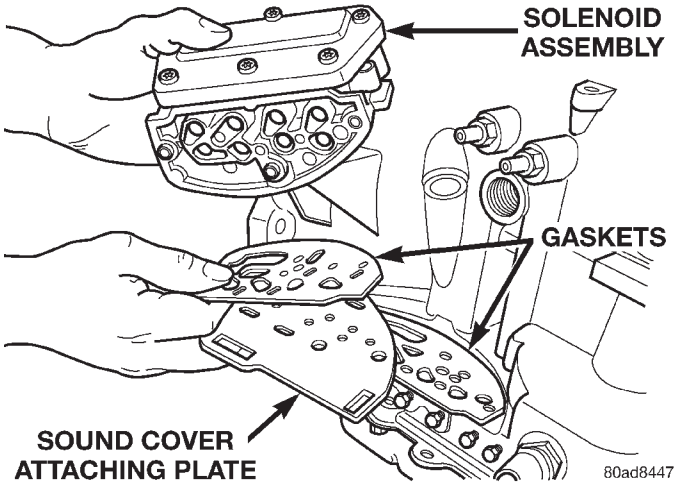


Fig. 16 Remove Solenoid Assembly

TRANSMISSION RANGE SENSOR

The transmission range sensor is located within the transaxle. To remove the TRS the transaxle oil pan and valve body must be removed.

REMOVAL

(1) Disconnect battery negative cable.
(2) Remove engine air cleaner and tube.
(3) Remove gearshift cable (Fig. 17).
(4) Remove manual valve lever.
(5) Disconnect transmission range sensor connector.
(6) Hoist vehicle.
(7) Carefully remove transaxle oil pan and drain fluid.
(8) Remove transaxle oil filter. Let transaxle oil drain fully.
(9) Remove valve body retaining bolts.
(10) Extract park rod from guide bracket and remove valve body from transaxle.
(11) Place valve body on workbench (Fig. 18).
(12) Remove TRS retaining screw (Fig. 19).

REMOVAL AND INSTALLATION (Continued)

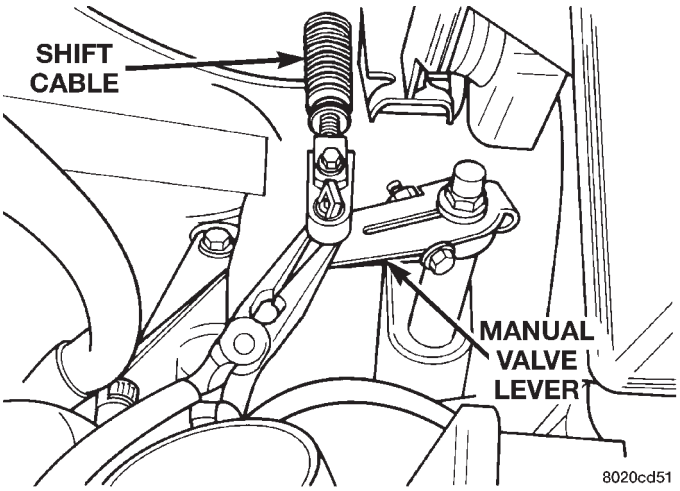


Fig. 17 Gearshift Cable And Manual Valve Lever

(13) Remove manual shaft seal (Fig. 20).

(14) Slide Transmission Range Sensor up the manual shaft and remove (Fig. 21).

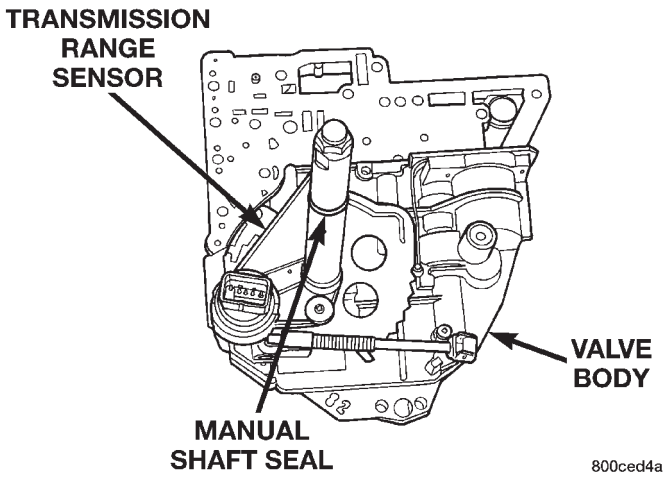


Fig. 18 Valve Body W/TRS

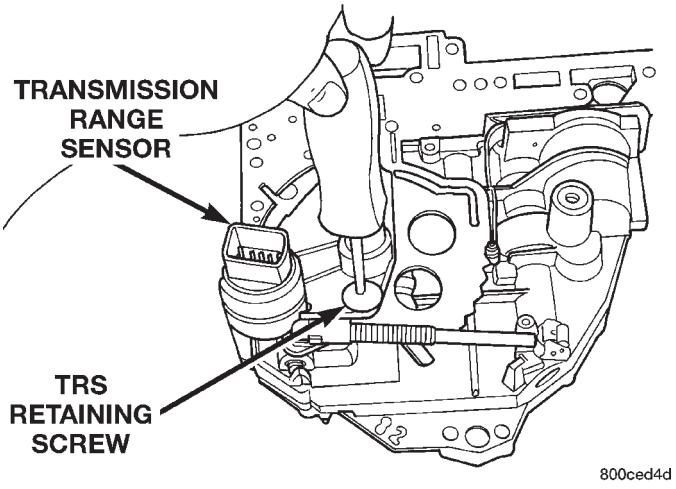


Fig. 19 Remove Retaining Screw

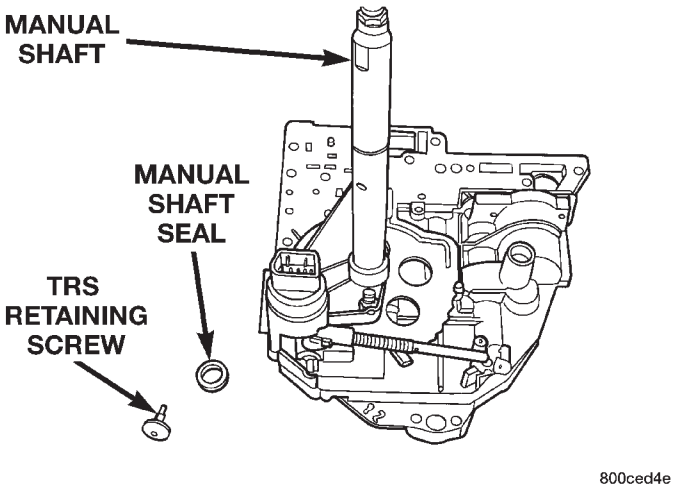


Fig. 20 Remove Manual Shaft Seal

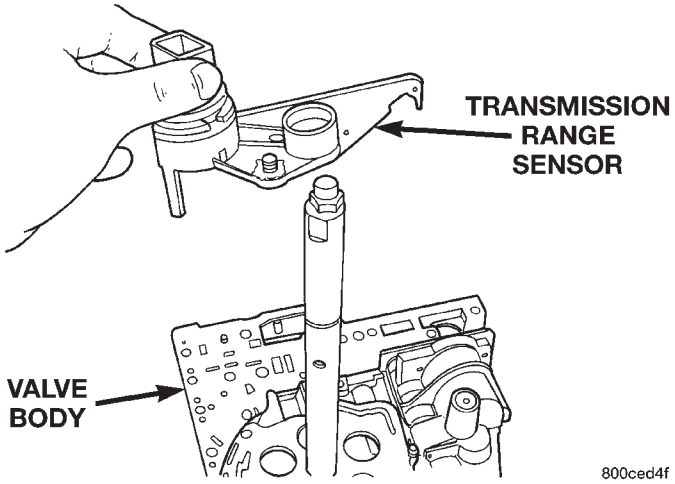


Fig. 21 Remove Transmission Range Sensor

INSTALLATION

(1) For installation, reverse removal procedure. Tighten TRS retaining screw to 5 N·m (45 in. lbs.) Reseal transaxle oil pan using RTV.

SPEED SENSOR-INPUT

CAUTION: When disconnecting speed sensor connector, be sure that the weather seal does not fall off or remain in old sensor.

The input speed sensor is located to the left of the manual shift lever (Fig. 22).

SPEED SENSOR-OUTPUT

CAUTION: When disconnecting speed sensor connector, be sure that the weather seal does not fall off or remain in old sensor.

The output speed sensor is located to the right of the manual shift lever (Fig. 23).

REMOVAL AND INSTALLATION (Continued)

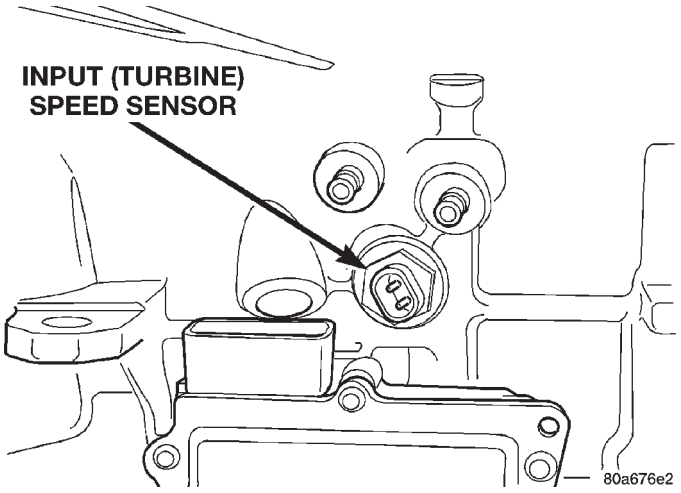


Fig. 22 Input (Turbine) Speed Sensor

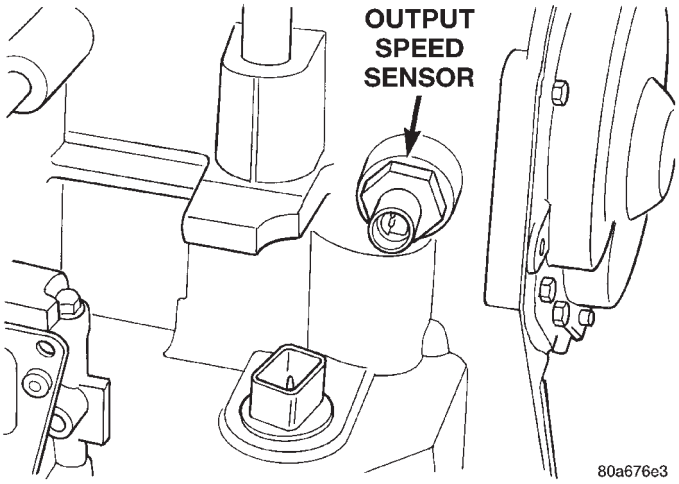


Fig. 23 Output Speed Sensor

TRANSMISSION CONTROL MODULE

Do not interchange Transmission Control Modules with previous year transmission control modules. If a same year TCM is being used from a different vehicle, the following procedures must be performed:

- Quick Learn Procedure
- Electronic Pinion Procedure

The Transmission Control Module is located on the right fender inner panel, in the engine compartment. It is held in place by four mounting screws.

NOTE: If the Transmission Control Module has been replaced, the following procedures must be performed:

- Quick Learn Procedure: This procedure will allow the transmission control module to learn the characteristics of the vehicle.
- Electronic Pinion Factor Procedure: This procedure will reprogram the TCM to compensate for different tire sizes and final drive ratios.

REMOVAL

(1) Loosen 60 way retaining screw, located in the center of the 60 way connector (Fig. 24). Then disconnect the 60 way connector on Transmission Control Module.

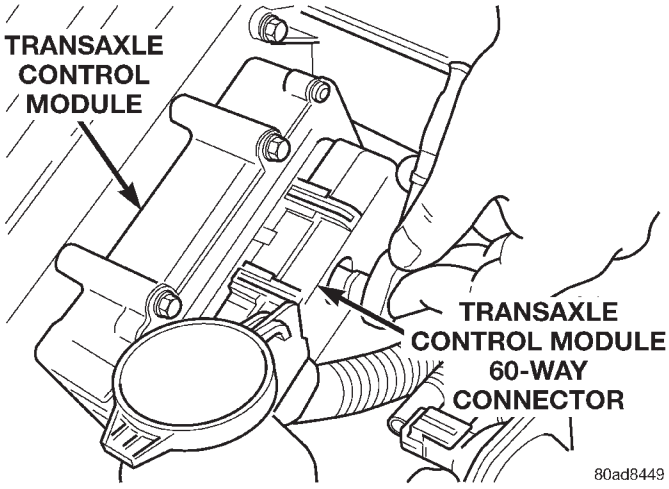


Fig. 24 Loosen Connector Screw

(2) Remove Transmission Control Module mounting screws and lift module from vehicle (Fig. 25) (Fig. 26).

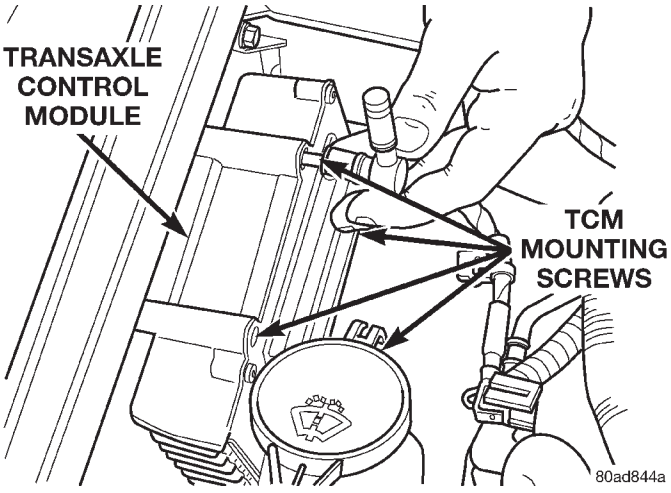


Fig. 25 Mounting Screws

INSTALLATION

(1) To install, reverse removal procedure.

REMOVAL AND INSTALLATION (Continued)

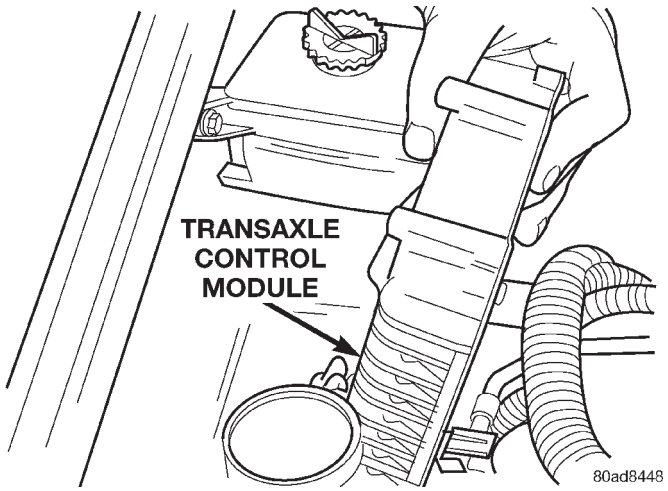


Fig. 26 Transaxle Control Module

VALVE BODY

REMOVAL

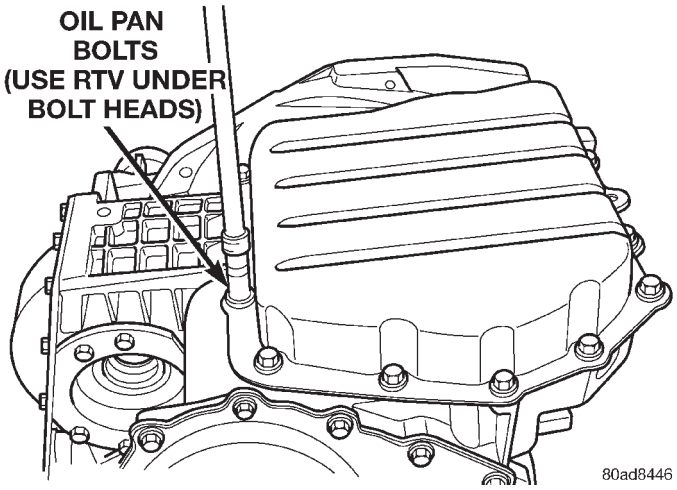


Fig. 27 Remove Oil Pan Bolts

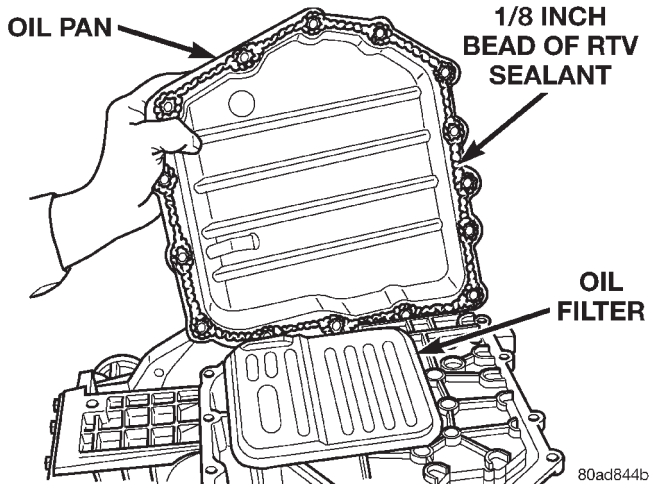


Fig. 28 Remove Oil Pan

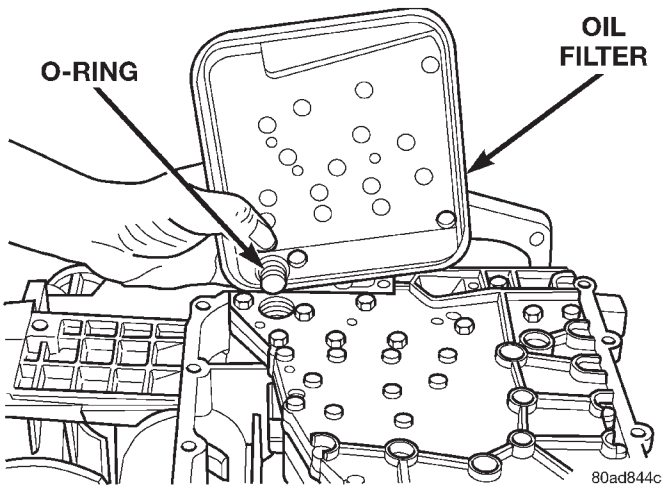


Fig. 29 Remove Oil Filter

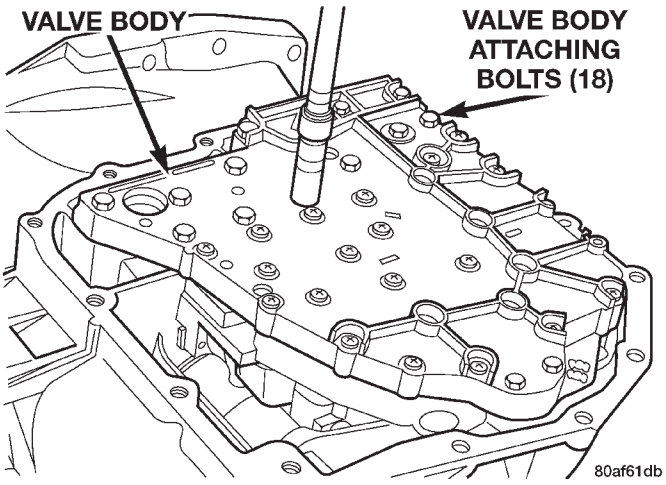


Fig. 30 Remove Valve Body Attaching Bolts

NOTE: To ease removal of the valve body, turn the manual valve lever fully clockwise.

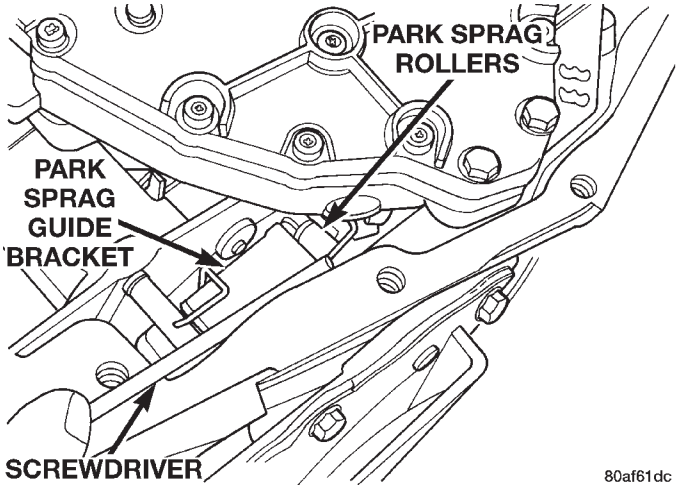


Fig. 31 Push Park Rod Rollers from Guide Bracket

REMOVAL AND INSTALLATION (Continued)

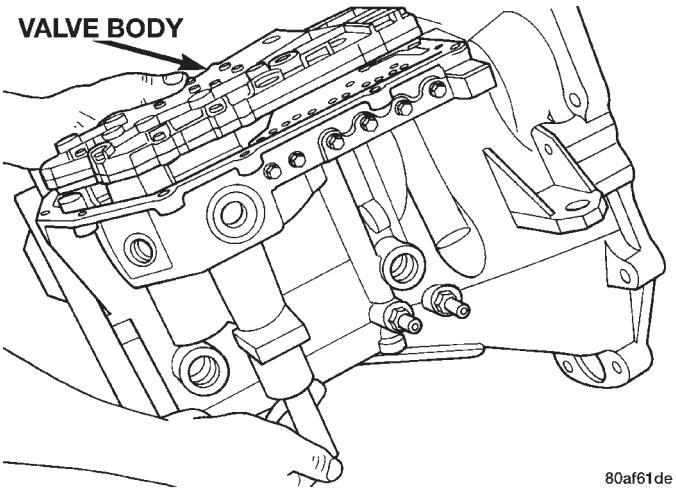


Fig. 32 Remove Valve Body

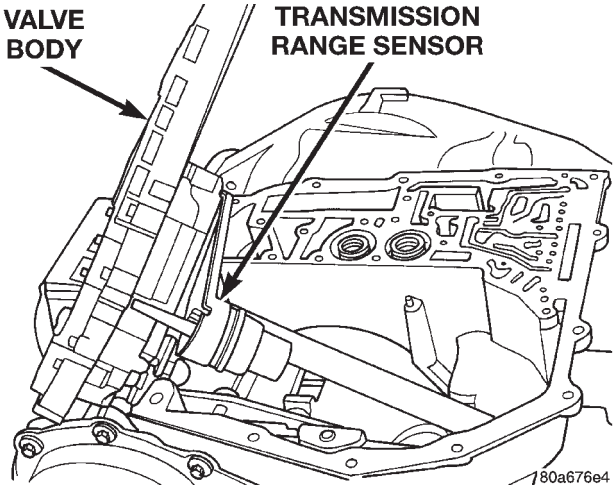


Fig. 33 Valve Body Removed

INSTALLATION

To install valve body, reverse removal procedure

CAUTION: The valve body manual shaft pilot may distort and bind the manual valve if the valve body is mishandled or dropped.

NOTE: To ease installation of the valve body, turn the manual valve lever fully clockwise.

Guide park rod rollers into guide bracket, while shifting manual lever assembly out of the installation position.

TRANSAXLE

Transaxle removal does NOT require engine removal.

See Group 7, Cooling to drain engine cooling system and remove coolant return extension (3.0 liter engine only).

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

REMOVAL

(1) Disconnect negative battery cable.

(2) Remove air cleaner duct. Disconnect transaxle shift linkage at manual valve lever (Fig. 34).

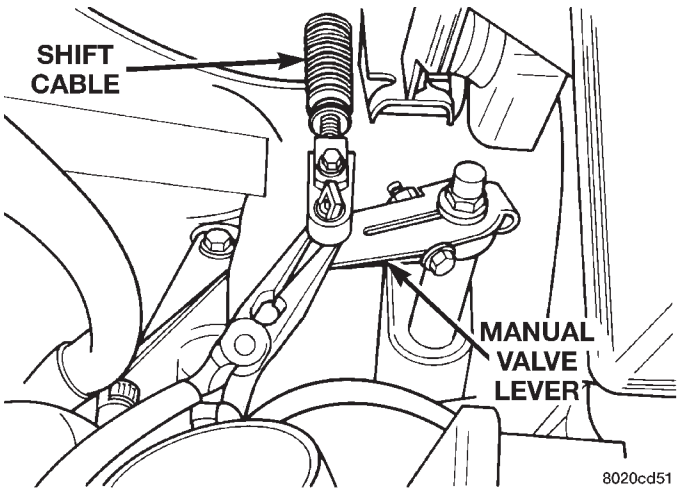


Fig. 34 Shift Linkage At Manual Valve Lever

(3) Squeeze grommet clips and remove cable at transaxle bracket (Fig. 35) (Fig. 36).

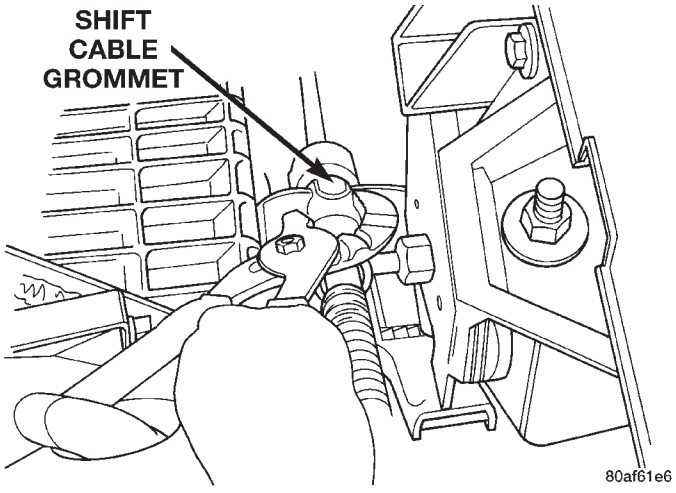


Fig. 35 Grommet Clips

(4) Remove 16–way engine harness connector from dipstick tube bracket. Remove dipstick tube bracket nut at cylinder head. Remove dipstick tube.

(5) Remove transaxle cooler lines.

(6) Remove connector at transaxle solenoid pack.

(7) Remove input and output speed sensor wiring connectors (Fig. 37) (Fig. 38).

REMOVAL AND INSTALLATION (Continued)

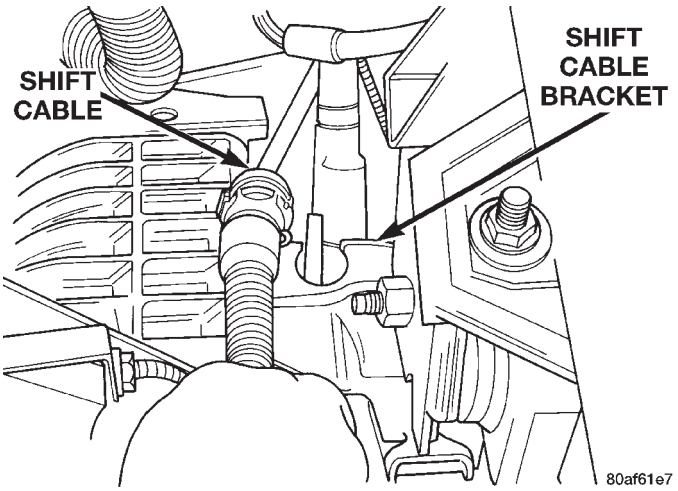


Fig. 36 Remove Cable From Bracket

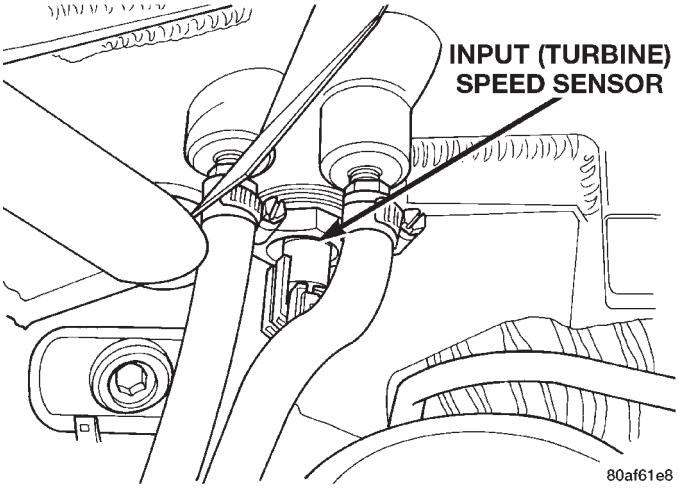


Fig. 37 Input (Turbine) Speed Sensor

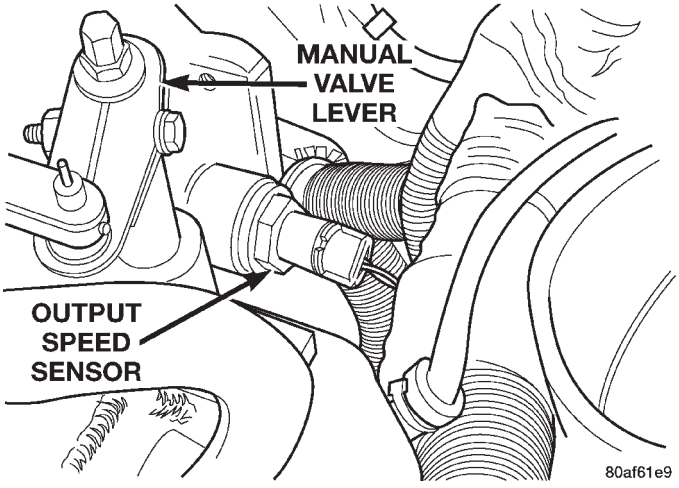


Fig. 38 Output Speed Sensor

(8) Disconnect electrical connector at transmission range sensor.

(9) Remove upper bellhousing upper bolts.

(10) Remove heater tube mounting bolt.

(11) Remove vehicle speed sensor wiring at sensor.

(12) Remove one rear engine mount bolt from top.

(13) Remove rear engine mount shield screw.

(14) Install engine support fixture and support engine (Fig. 39).

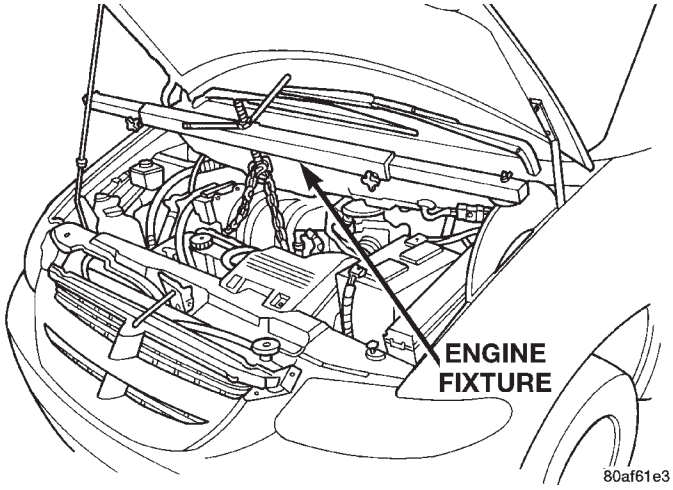


Fig. 39 Engine Support Fixture

(15) Raise vehicle. Remove front wheels. Refer to Group 2, Suspension to remove wheel hub nuts and both drive shafts.

CAUTION: The exhaust flex joint must be disconnected from the exhaust manifold anytime the engine is lowered. If the engine is lowered while the flex pipe is attached, damage will occur.

(16) Remove bolts securing exhaust flex joint to exhaust manifold. Disconnect exhaust pipe from manifold.

(17) Remove torque converter dust shield to gain access to torque converter bolts (Fig. 40).

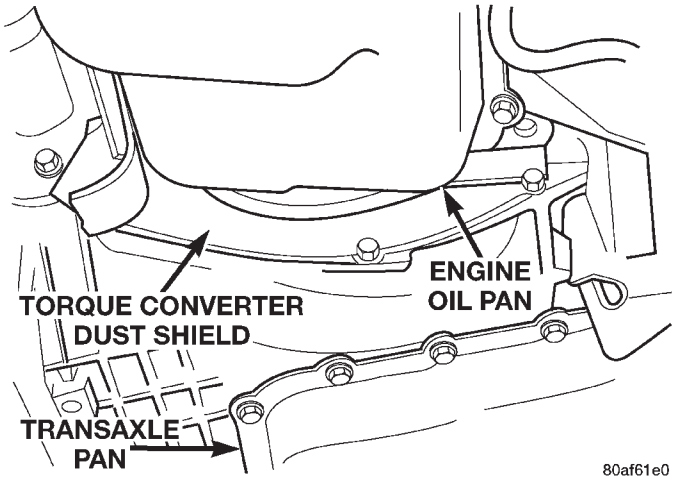


Fig. 40 Remove Torque Converter Dust Shield

REMOVAL AND INSTALLATION (Continued)

(18) Rotate engine clockwise to gain access to torque converter bolts (Fig. 41). Remove torque converter mounting bolts.

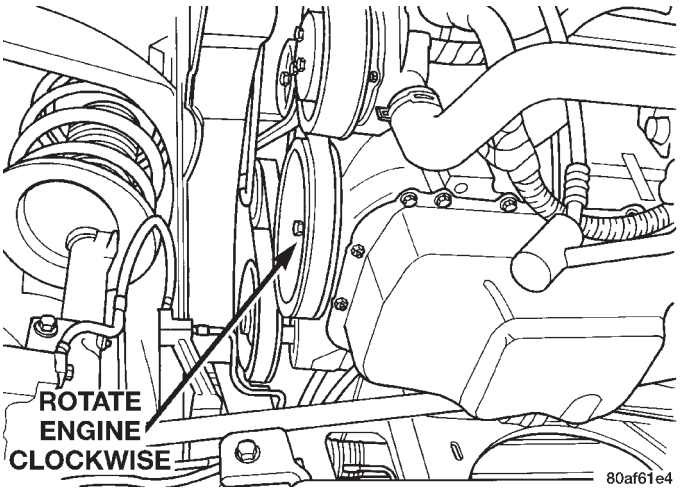


Fig. 41 Rotate Engine

(19) Remove front engine mount insulator and bracket (Fig. 42).

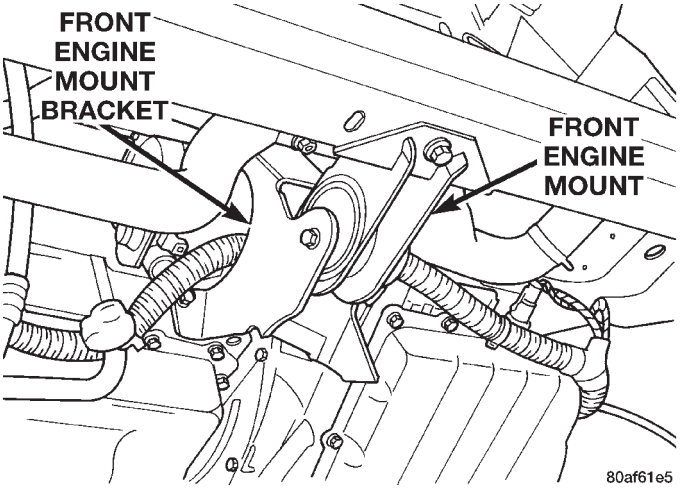


Fig. 42 Remove Front Engine Mount

(20) Remove rear engine mount shield.

(21) Remove rear engine mount bracket bolts and bracket.

(22) Remove starter bolts and set starter aside. Do not allow the starter to hang from battery cable (Fig. 43).

(23) Position transmission jack securely under transaxle (Fig. 44).

(24) Remove left fender splash shield.

(25) With transmission jack in position, remove the left transmission mount.

(26) Lower transaxle to access the crankshaft position sensor, remove crankshaft position sensor from bell housing. For installation procedure refer to section 8D of this service manual.

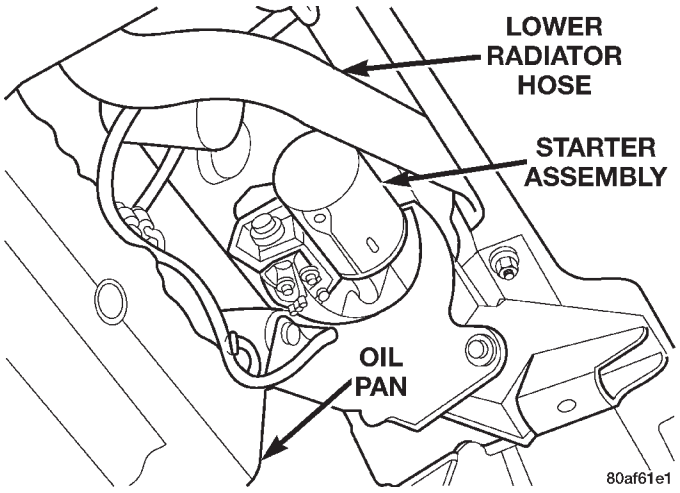


Fig. 43 Starter Assembly

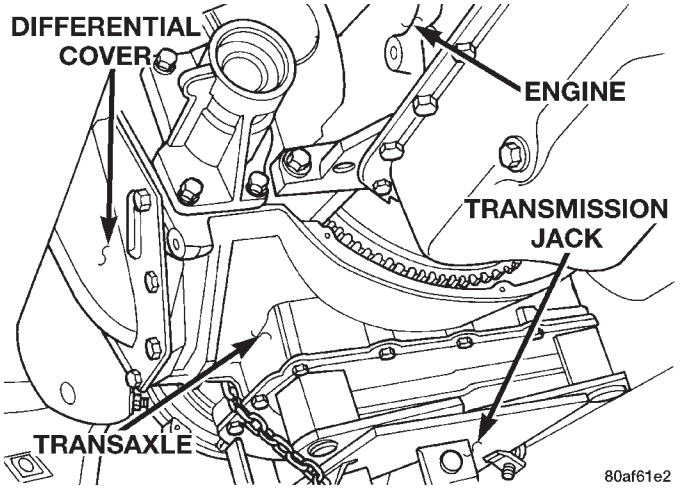


Fig. 44 Position Transmission Jack

CAUTION: Remove the crankshaft position sensor from the bell housing before transmission removal or installation.

(27) Remove lower bellhousing bolts.

(28) Carefully lower the transaxle assembly from vehicle.

INSTALLATION

(1) For installation of transaxle, reverse the above procedure.

(2) Check and/or adjust gearshift cable.

(3) Refill transaxle with MOPAR® ATF PLUS 3 (Automatic Transmission Fluid) Type 7176.

REMOVAL AND INSTALLATION (Continued)

OIL PUMP SEAL

REMOVAL

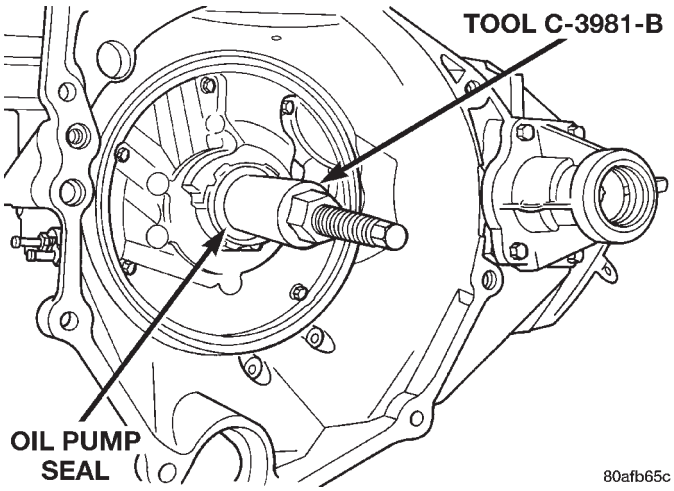


Fig. 45 Remove Oil Pump Seal

INSTALLATION

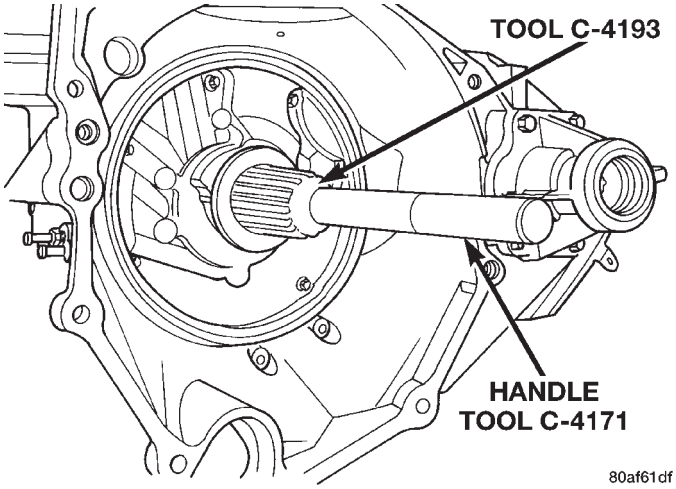


Fig. 46 Install Oil Pump Seal

DISASSEMBLY AND ASSEMBLY

VALVE BODY RECONDITION

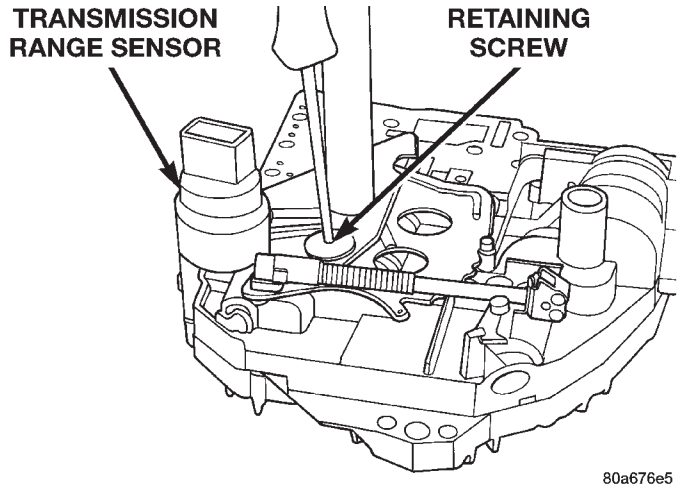


Fig. 47 Transmission Range Sensor Screw

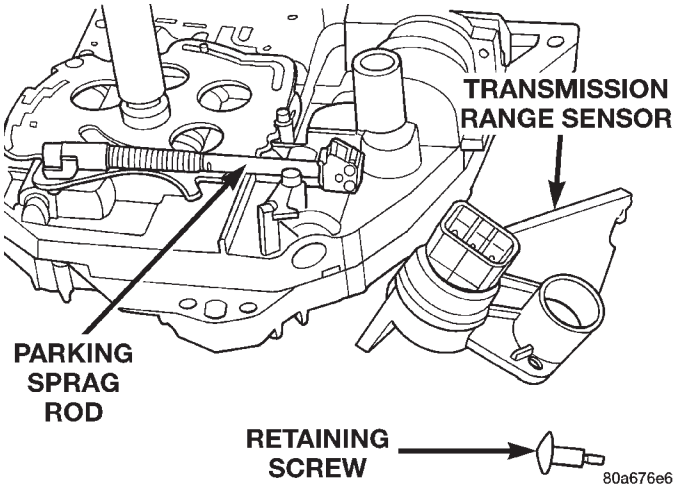


Fig. 48 Transmission Range Sensor Removed

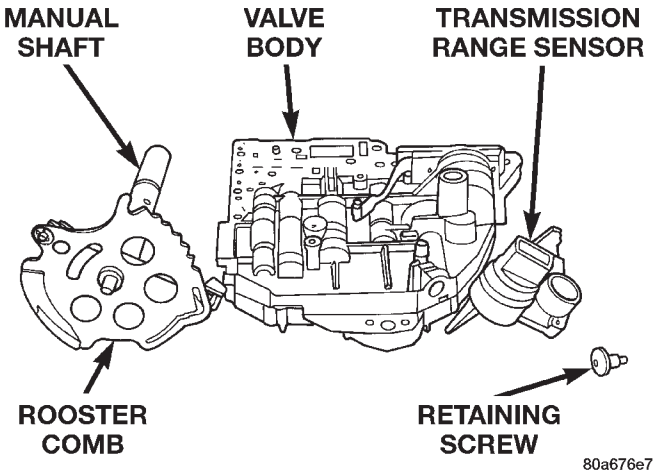


Fig. 49 Manual Shaft and Rooster Comb

DISASSEMBLY AND ASSEMBLY (Continued)

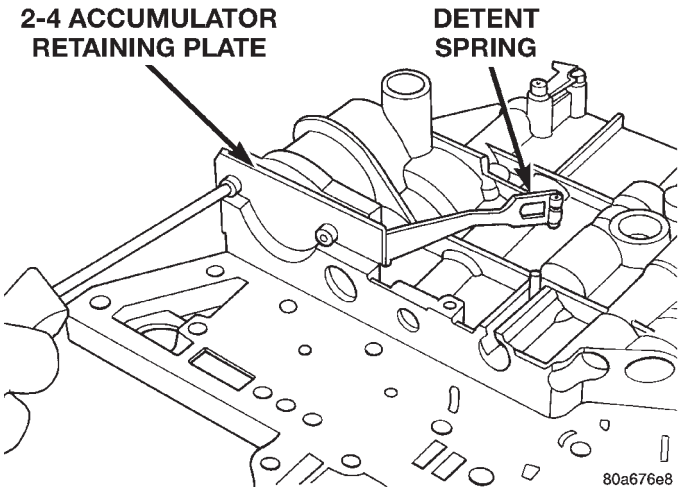


Fig. 50 2-4 Accumulator Plate

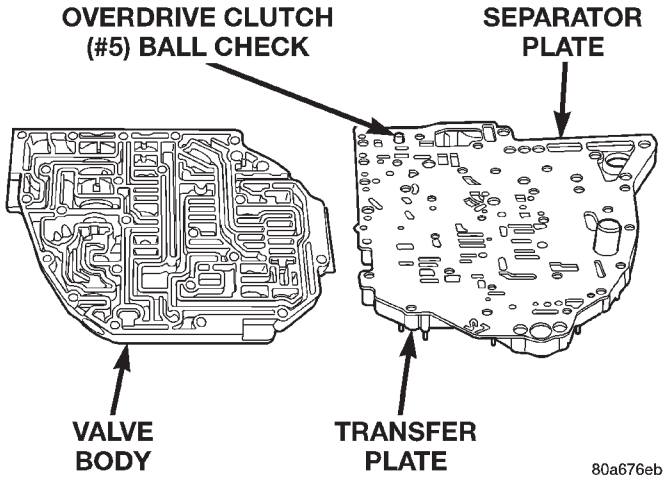


Fig. 53 Valve Body and Transfer Plate

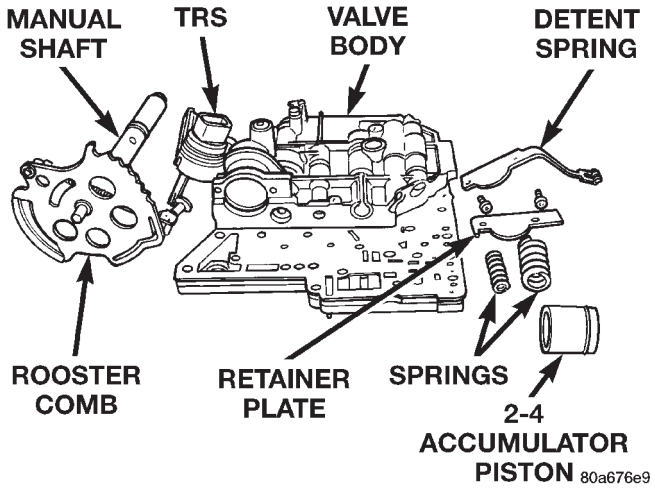


Fig. 51 TRS, Manual Shaft, and 2-4 Accumulator

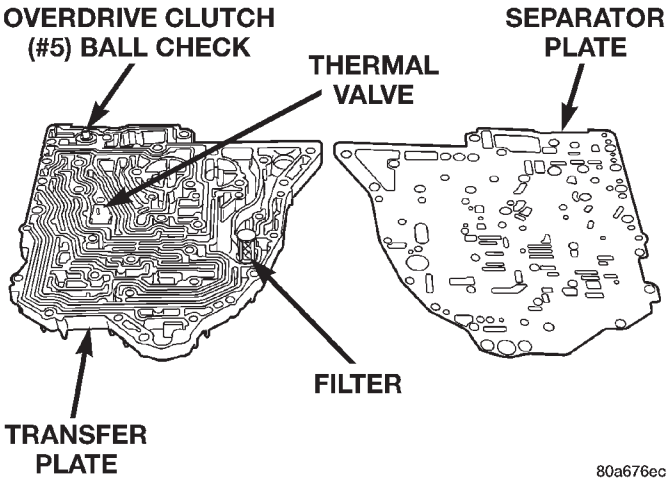


Fig. 54 Transfer Plate and Separator Plate

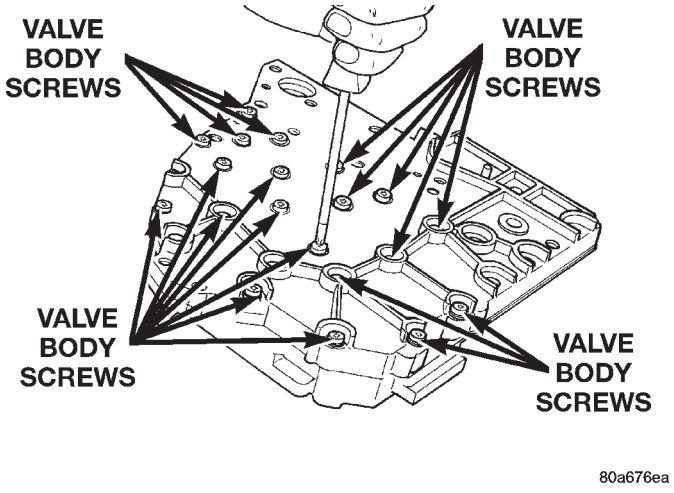


Fig. 52 Valve Body Screws

DISASSEMBLY AND ASSEMBLY (Continued)

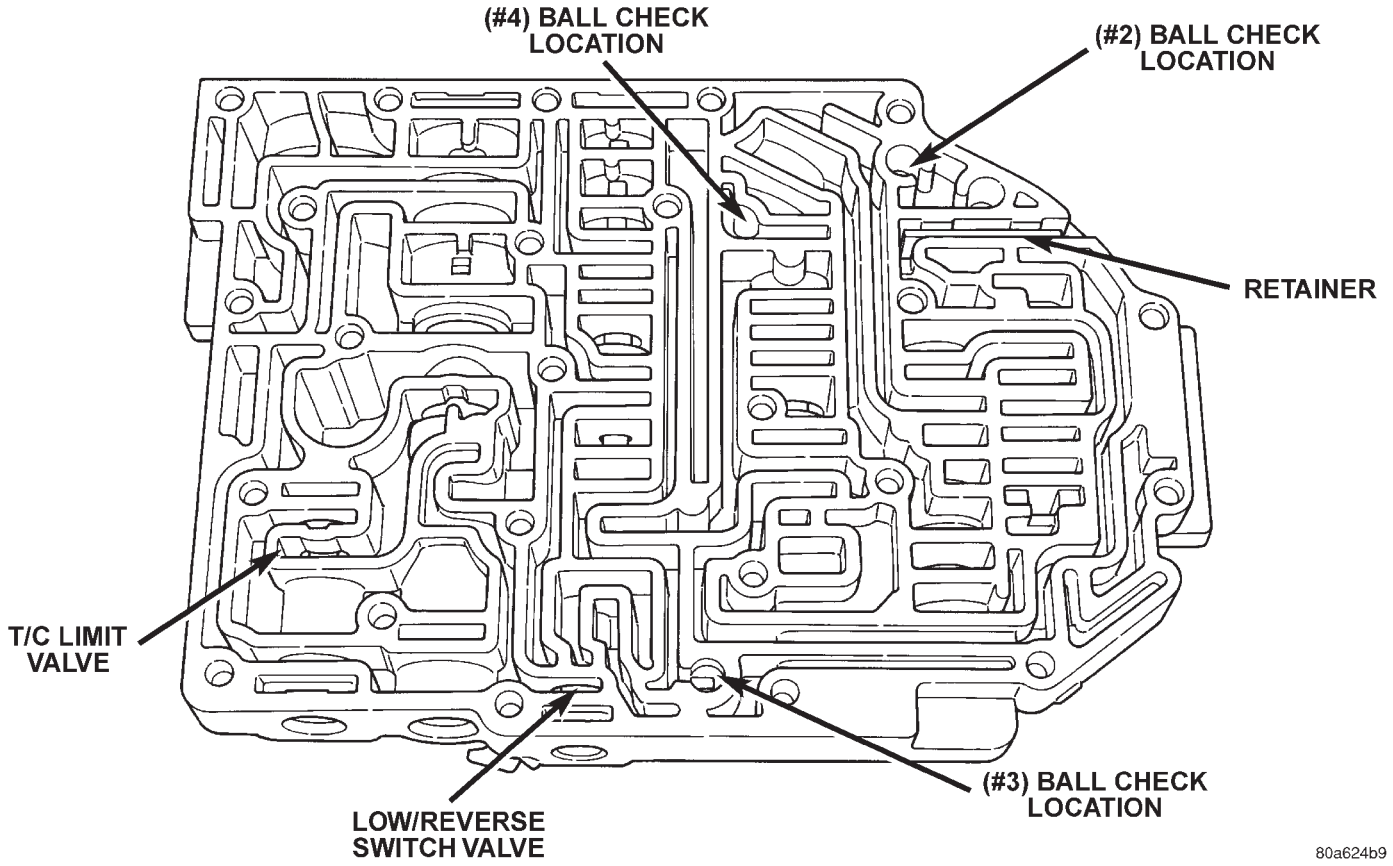


Fig. 55 Ball Check Location

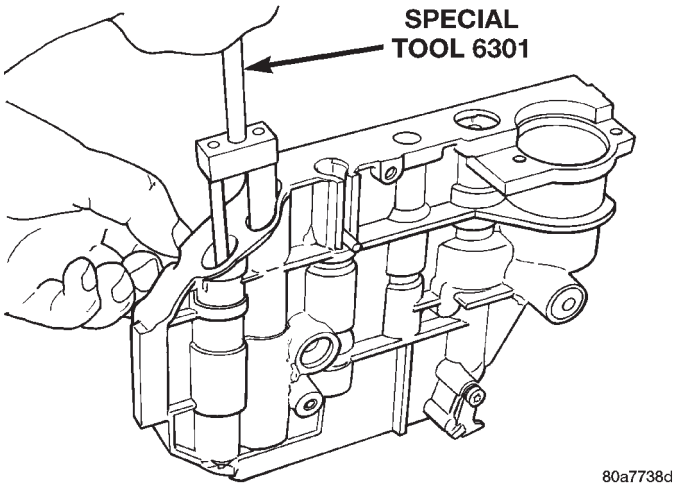


Fig. 56 Remove Dual Retainer Plate

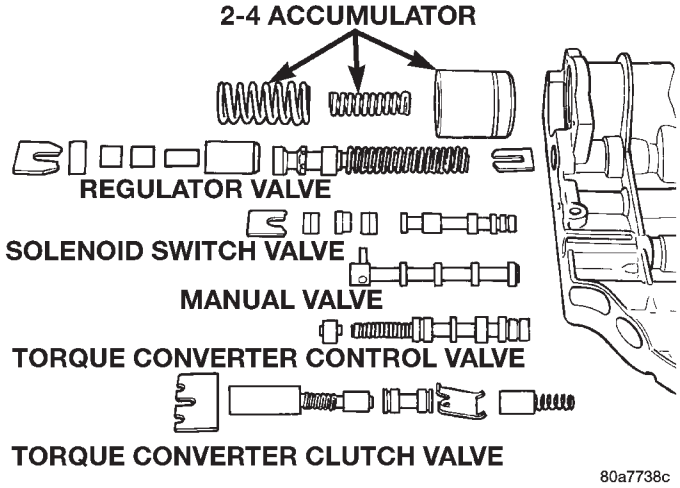


Fig. 57 Springs and Valves Location

DISASSEMBLY AND ASSEMBLY (Continued)

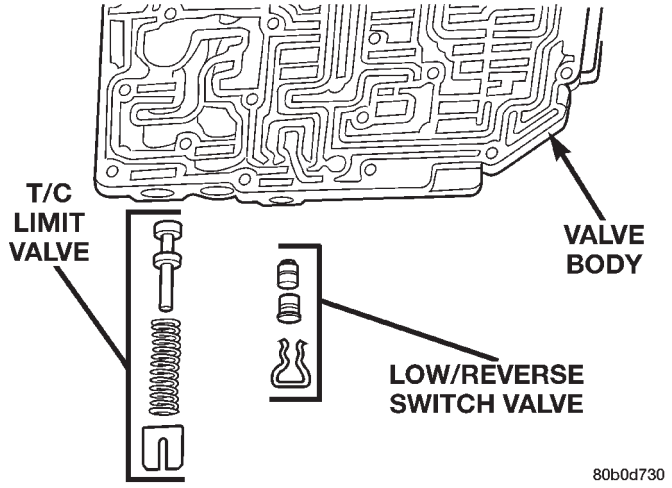


Fig. 58 Low/Reverse Switch Valve And T/C Limit Valve

TRANSAXLE DISASSEMBLE

NOTE: Tag all clutch pack assemblies, as they are removed, for reassembly identification.

CAUTION: Do not intermix clutch discs or plates as the unit might then fail.

(1) Remove input and output speed sensors.
(2) Remove transaxle solenoid pack (Fig. 59).

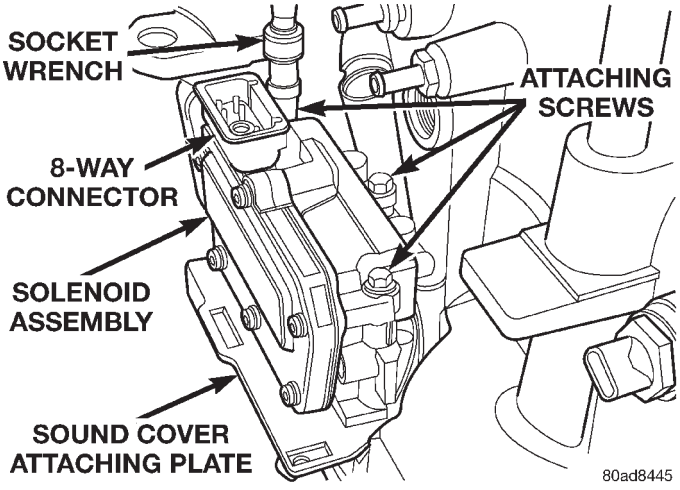


Fig. 59 Remove Solenoid Pack

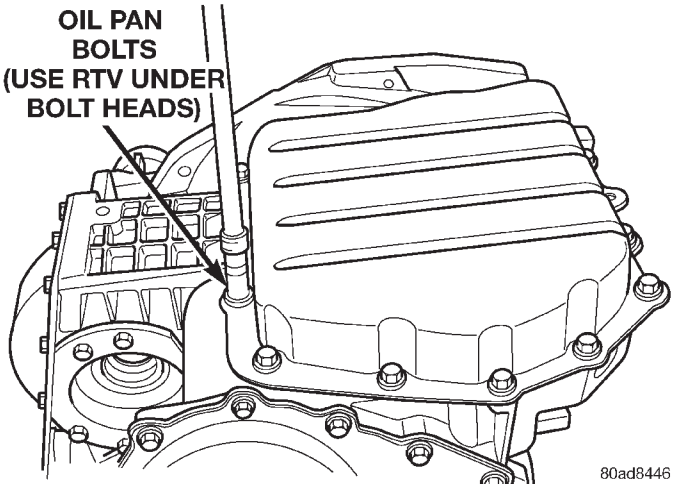


Fig. 60 Remove Oil Pan Bolts

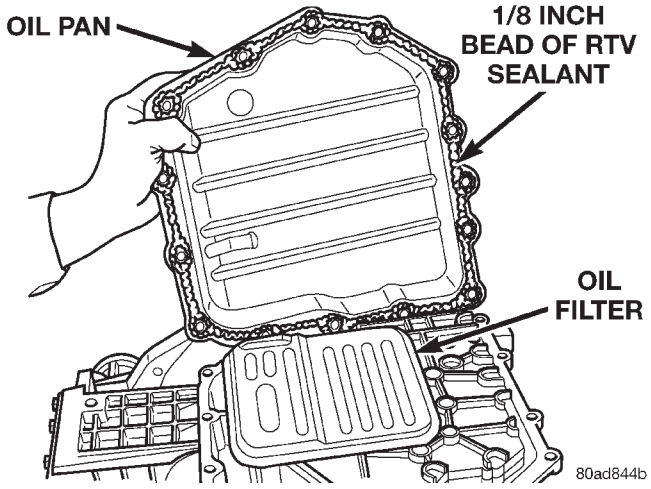


Fig. 61 Remove Oil Pan

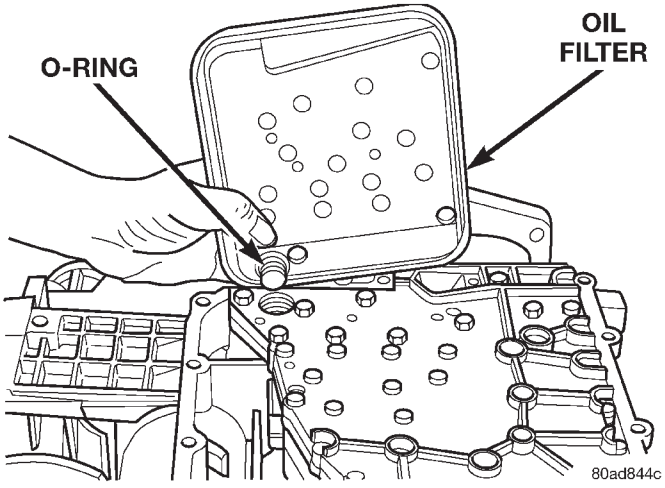


Fig. 62 Remove Oil Filter

DISASSEMBLY AND ASSEMBLY (Continued)

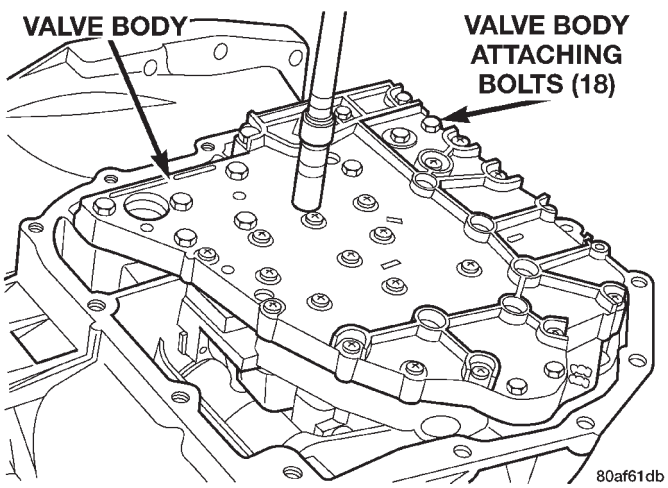


Fig. 63 Remove Valve Body Attaching Bolts

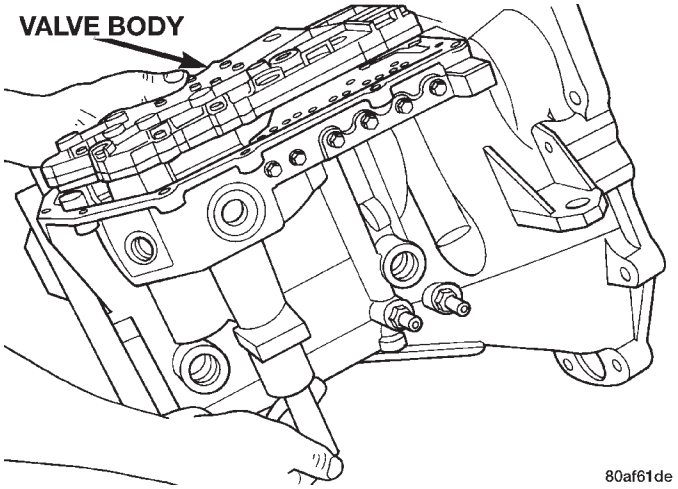


Fig. 65 Remove Valve Body

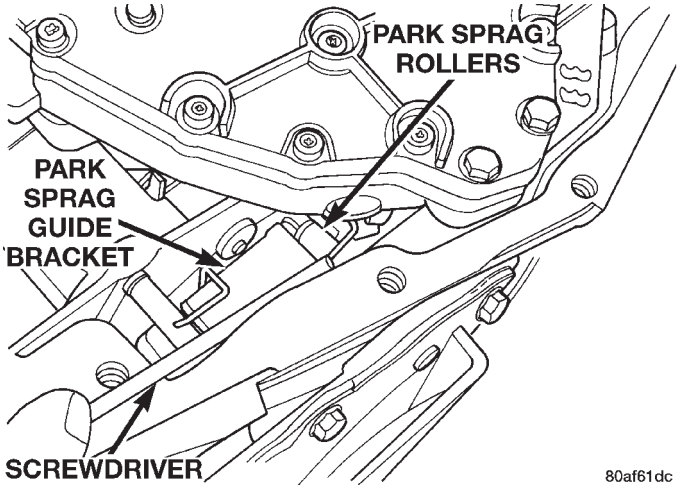


Fig. 64 Push Park Rod Rollers from Guide Bracket

NOTE: To ease removal of the valve body, turn the manual valve fully clockwise.

CAUTION: Do not handle the valve body from the manual valve. Damage could result.

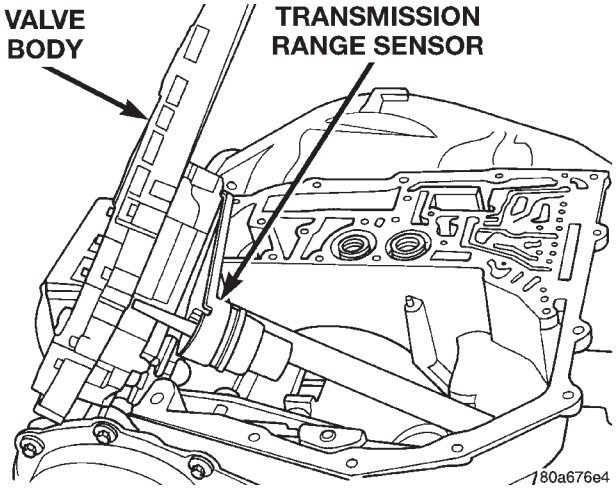


Fig. 66 Valve Body Removed

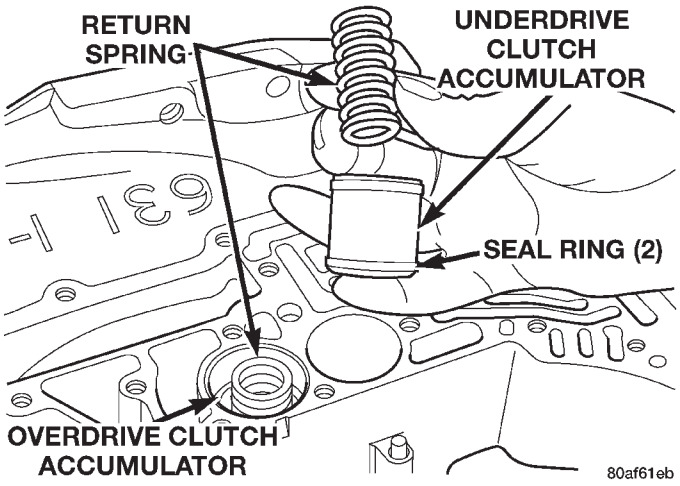


Fig. 67 Remove Accumulators

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Dependent on engine application, some accumulators will have two springs and others will have one spring. The springs are color coded according to application and year. When disassembling, mark accumulator spring location to ease assembly.

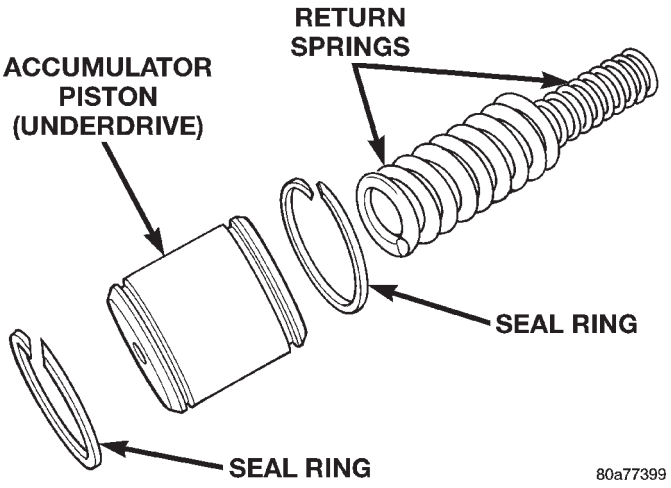


Fig. 68 Accumulator (Underdrive)

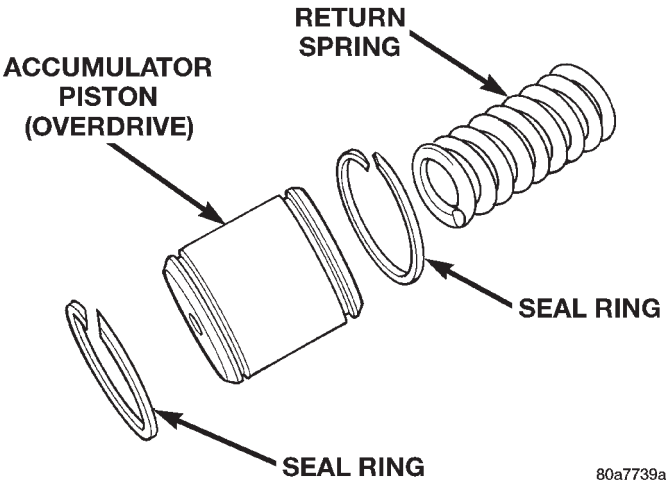


Fig. 69 Accumulator (Overdrive)

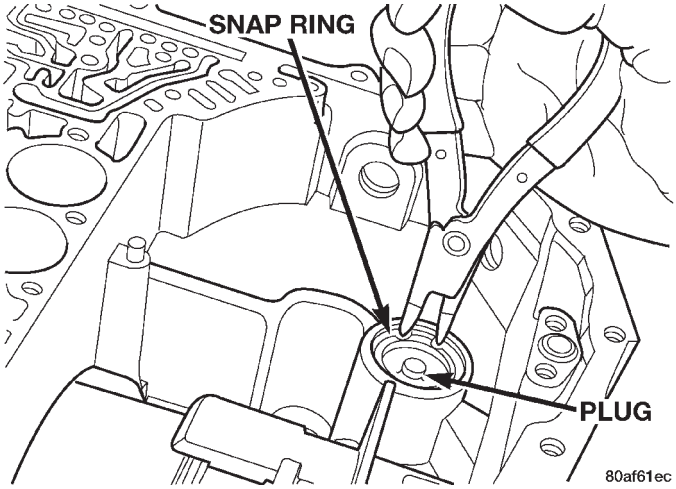


Fig. 70 Remove Low/Reverse Accumulator Snap Ring

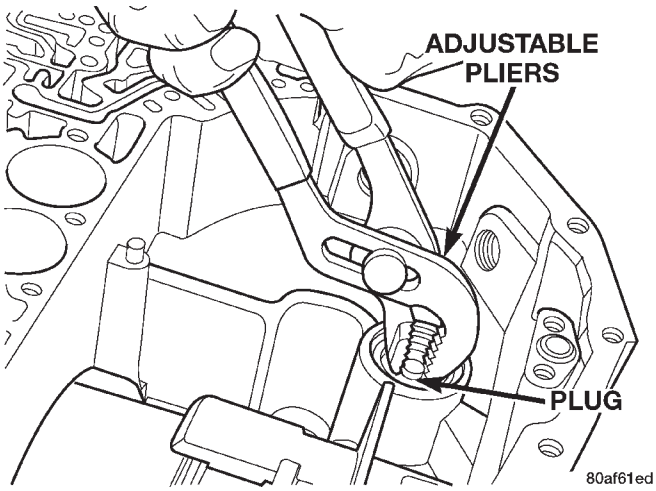


Fig. 71 Remove Low/Reverse Accumulator Plug (Cover)

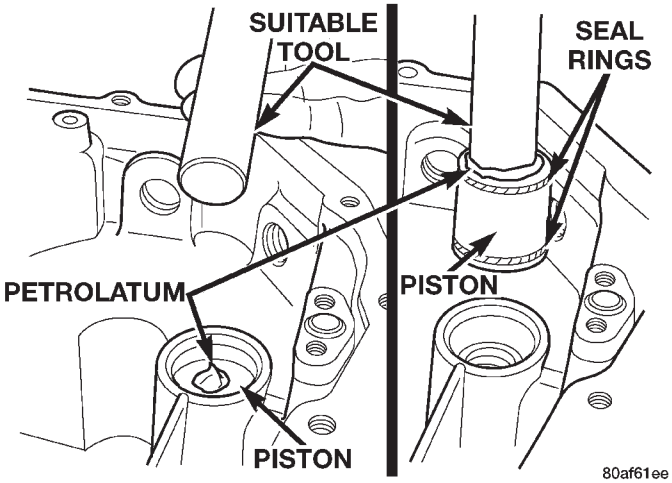


Fig. 72 Remove Low/Reverse Accumulator Piston

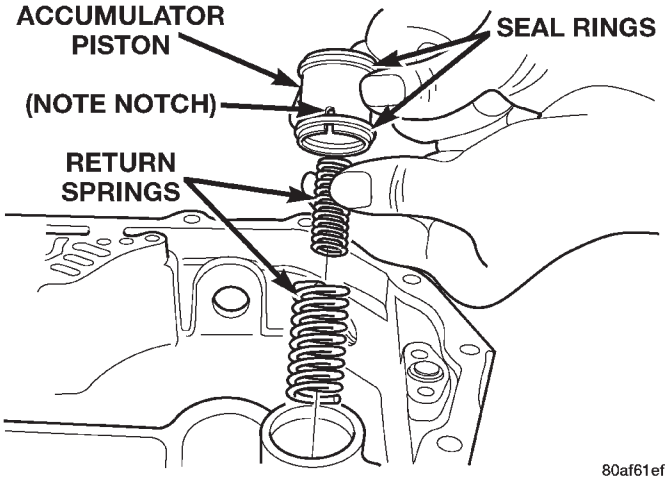


Fig. 73 Remove Low/Reverse Accumulator

DISASSEMBLY AND ASSEMBLY (Continued)

Measure the input shaft end play with the transaxle in the vertical position. This will ensure that the measurement will be accurate.

Measuring input shaft end play before disassembly will usually indicate when a #4 thrust plate change is required. The #4 thrust plate is located behind the overdrive clutch hub.

Attach a dial indicator to transaxle bell housing with its plunger seated against end of input shaft (Fig. 74).

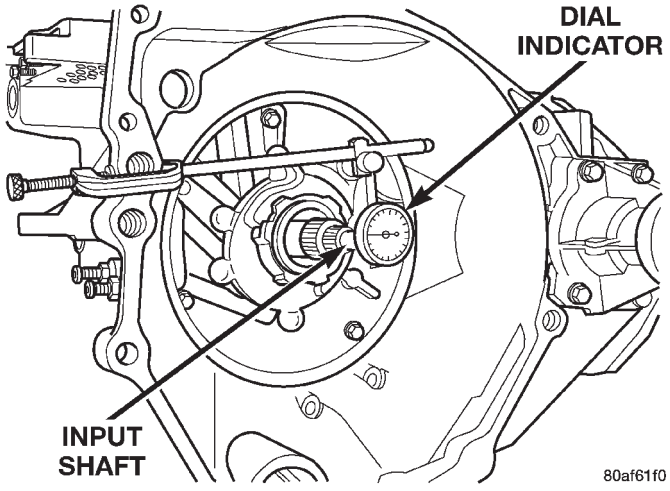


Fig. 74 Measure Input Shaft End Play

Move input shaft in and out to obtain end play reading. End play specifications are .13 to .64 mm (.005 to .025 inch).

Record indicator reading for reference when reassembling the transaxle.

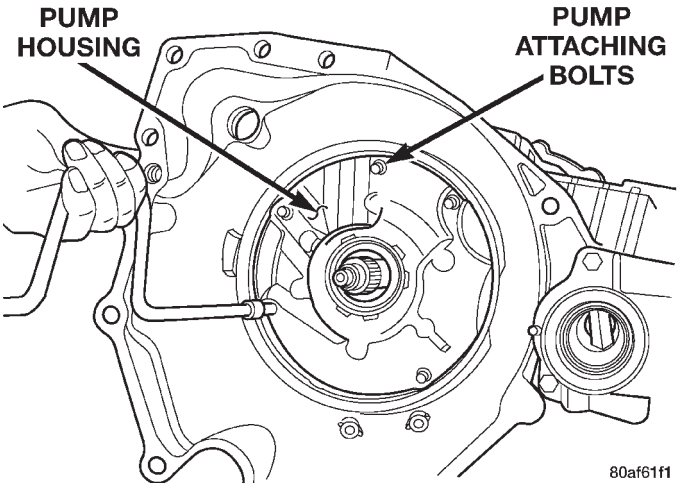


Fig. 75 Remove Pump Attaching Bolts

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

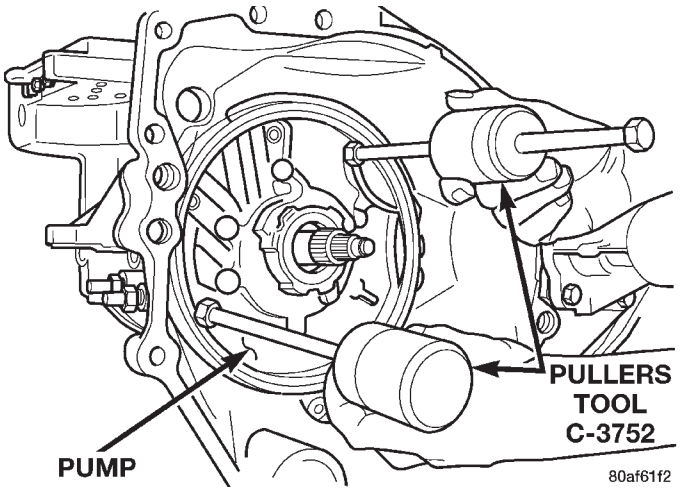


Fig. 76 Install Tool C-3752

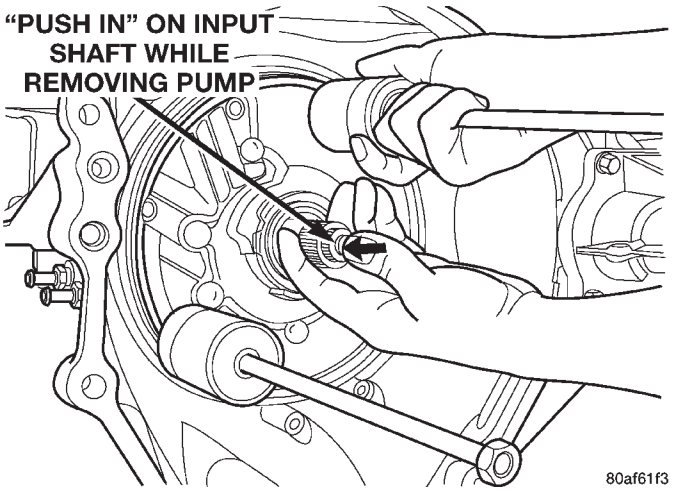


Fig. 77 Remove Oil Pump

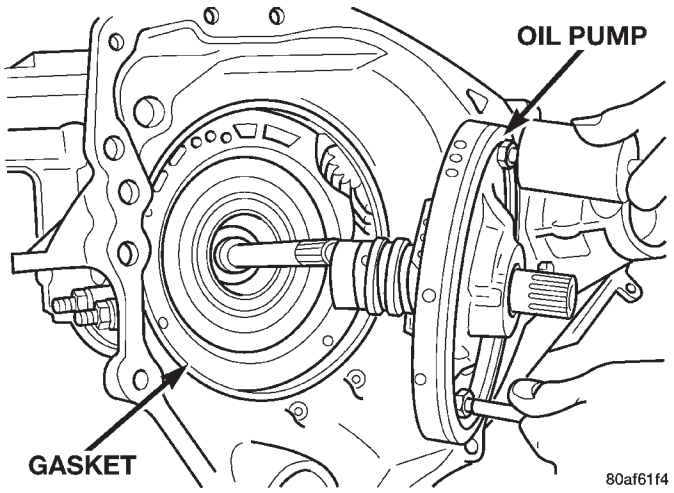


Fig. 78 Oil Pump Removed

OIL PUMP INSPECTION

When disassembling the transaxle it is necessary to inspect the oil pump for wear and damage.

(1) Remove the reaction shaft support bolts.

DISASSEMBLY AND ASSEMBLY (Continued)

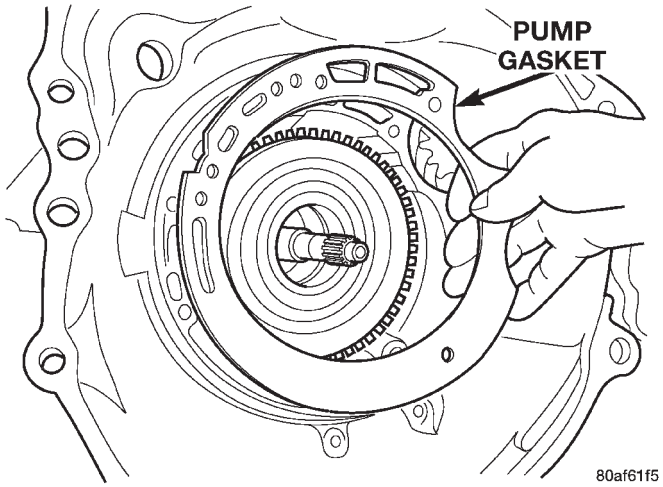


Fig. 79 Remove Oil Pump Gasket

(2) Remove reaction shaft support from pump housing (Fig. 80).

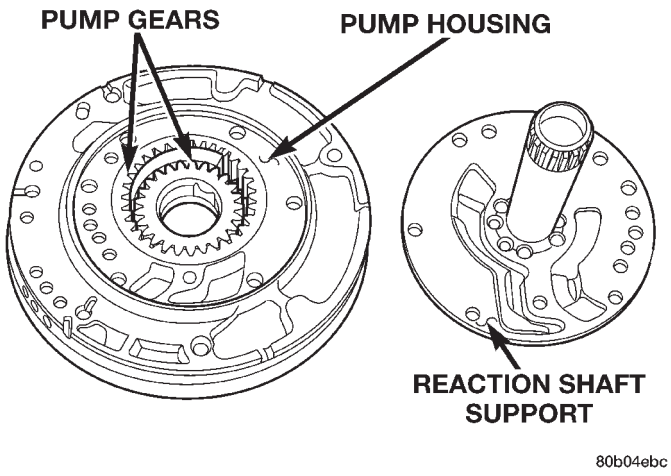


Fig. 80 Reaction Shaft Support

(3) Remove the pump gears and check for wear and damage.

(4) Install the gears and check clearances.

(5) Measure the clearance between the outer gear and the pump pocket (Fig. 81). Clearance should be 0.045-0.141mm (0.0018-0.0056 in.).

(6) Measure the clearance between the outer gear and the pump crescent. Clearance should be 0.020-0.046mm (0.0008-0.0018 in.) (Fig. 82).

(7) Measure the clearance between the inner gear and the pump crescent. Clearance should be 0.020-0.046mm (0.0008-0.0018 in.) (Fig. 83).

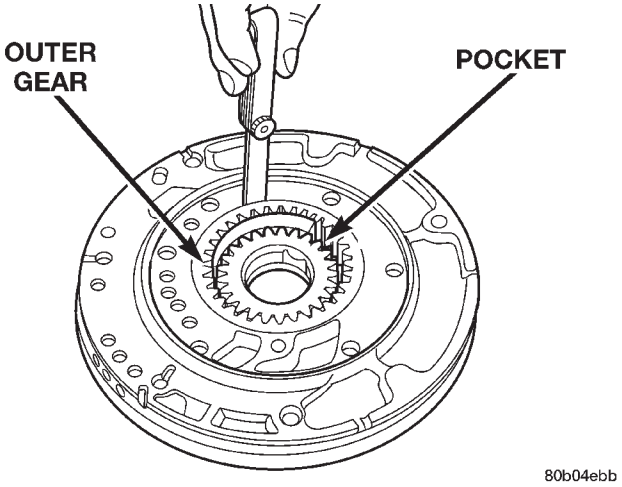


Fig. 81 Measure Outer Gear to Pocket

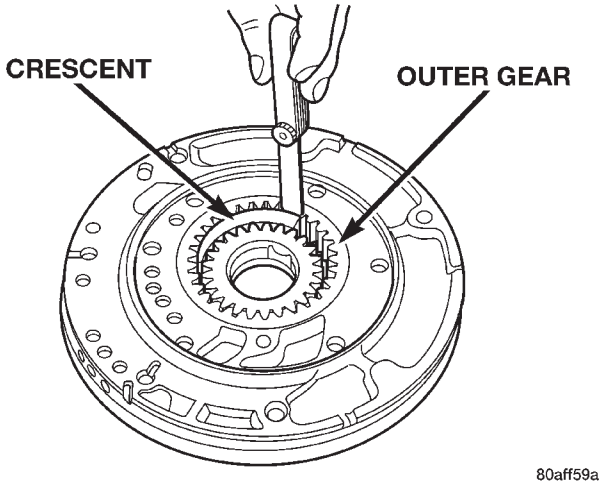


Fig. 82 Measure Outer Gear To Crescent

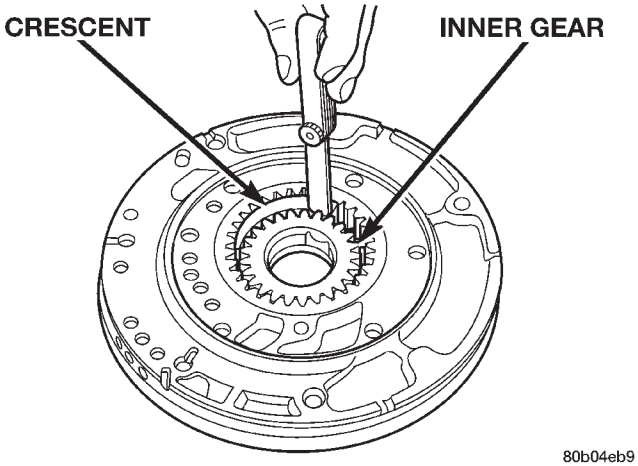


Fig. 83 Measure Inner Gear To Crescent

DISASSEMBLY AND ASSEMBLY (Continued)

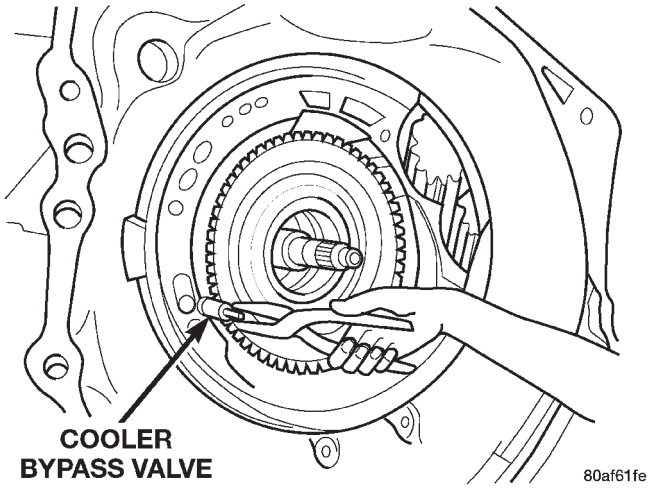


Fig. 84 Remove Bypass Valve

CAUTION: The cooler bypass valve must be replaced if a transaxle failure has occurred. Do not reuse old valve or attempt to clean old valve. When installing bypass valve, insert with O-ring end towards rear of case.

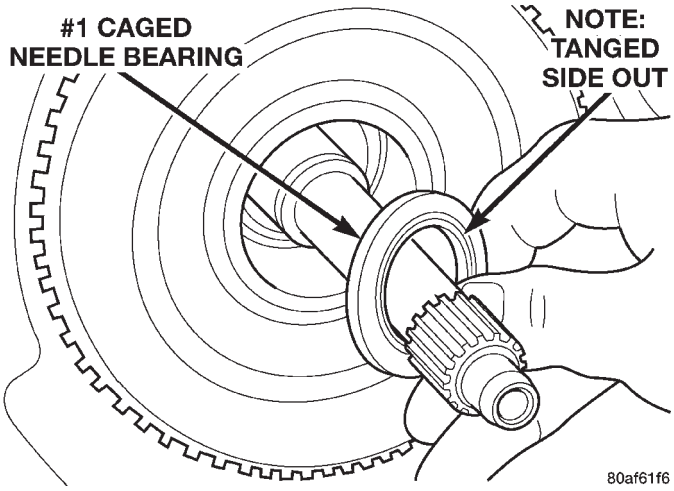


Fig. 85 Remove Caged Needle Bearing

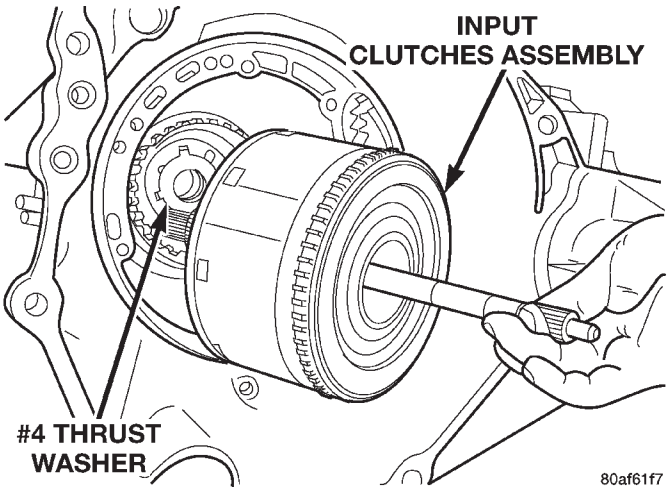


Fig. 86 Remove Input Clutches Assembly

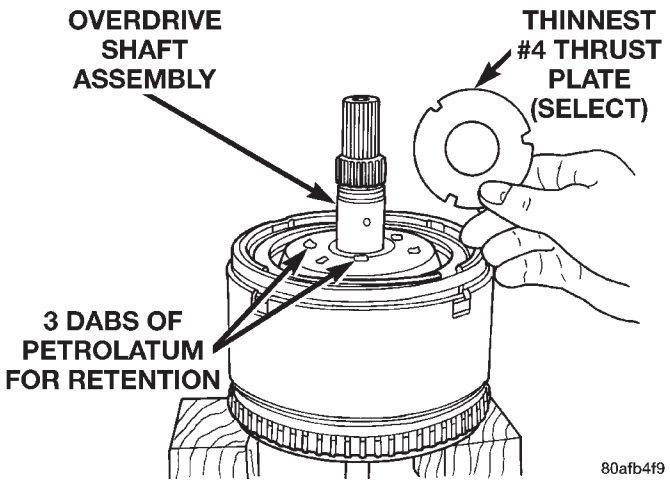


Fig. 87 No. 4 Thrust Plate

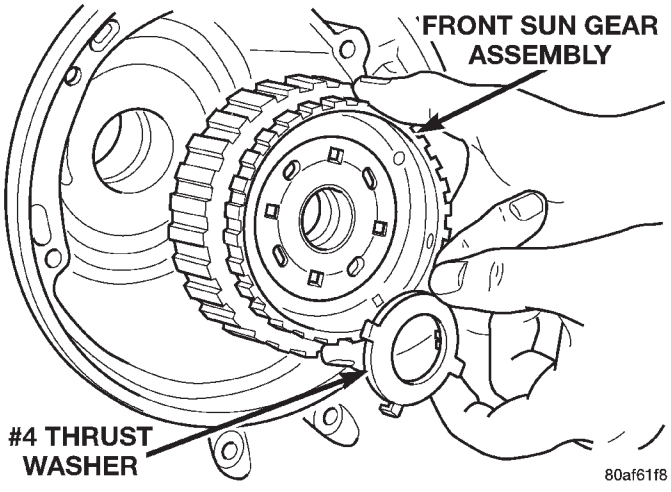


Fig. 88 Remove Front Sun Gear Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

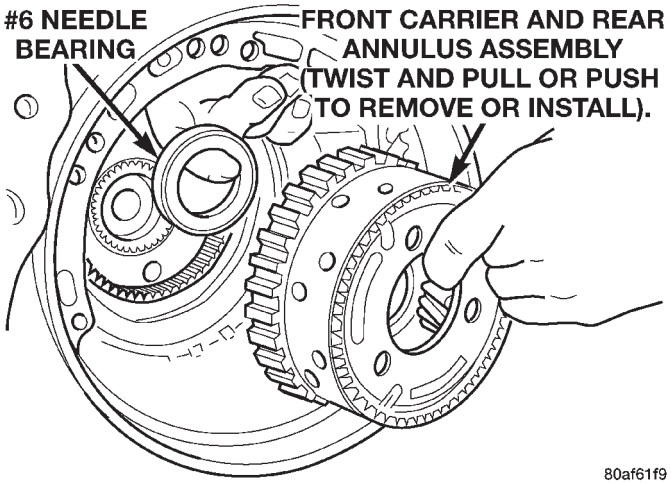


Fig. 89 Remove Front Carrier and Rear Annulus Assembly

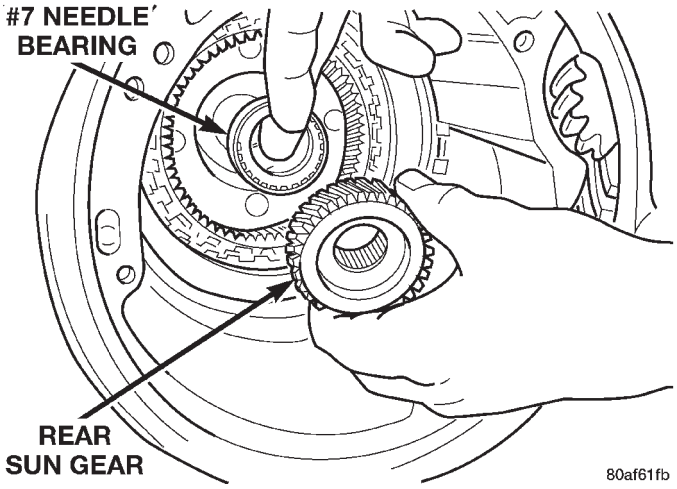


Fig. 90 Remove Rear Sun Gear

NOTE: Verify that Miller Tool 5058 is centered properly to the 2/4 clutch retainer before depressing the tool.

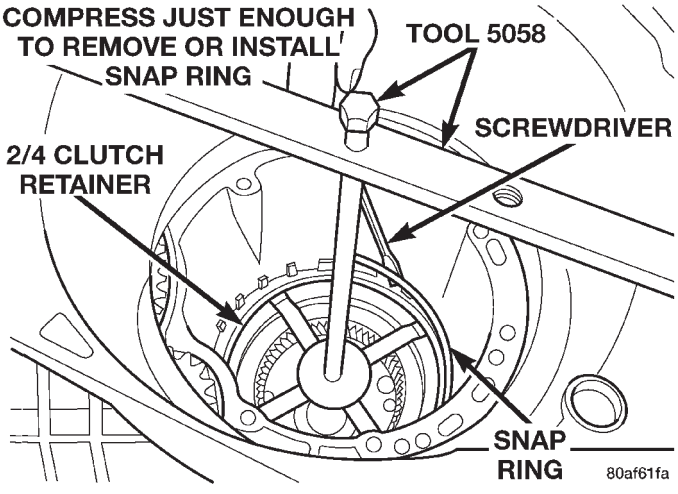


Fig. 91 Remove 2/4 Clutch Retainer Snap Ring

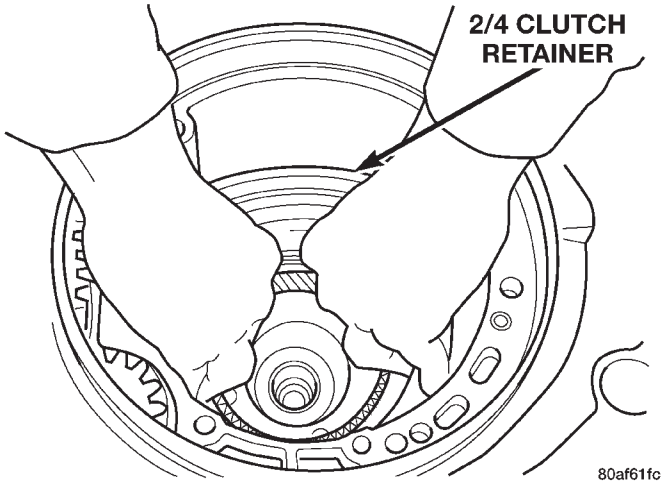


Fig. 92 Remove 2/4 Clutch Retainer

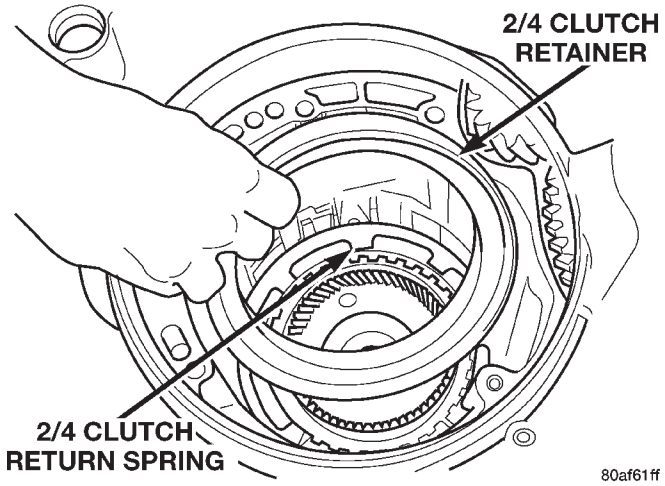


Fig. 93 2/4 Clutch Retainer

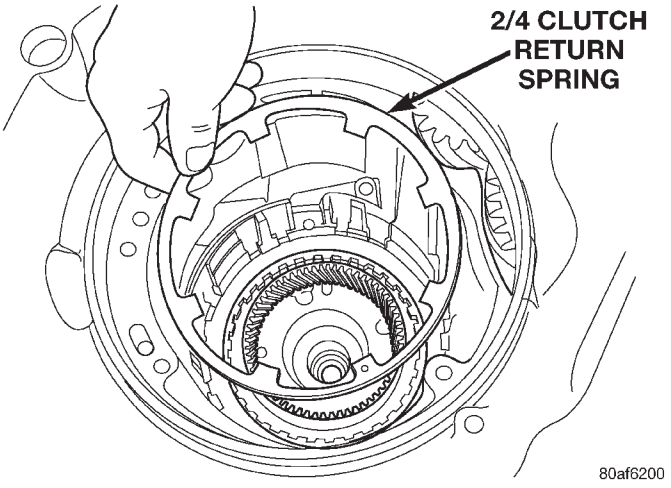


Fig. 94 Remove 2/4 Clutch Return Spring

DISASSEMBLY AND ASSEMBLY (Continued)

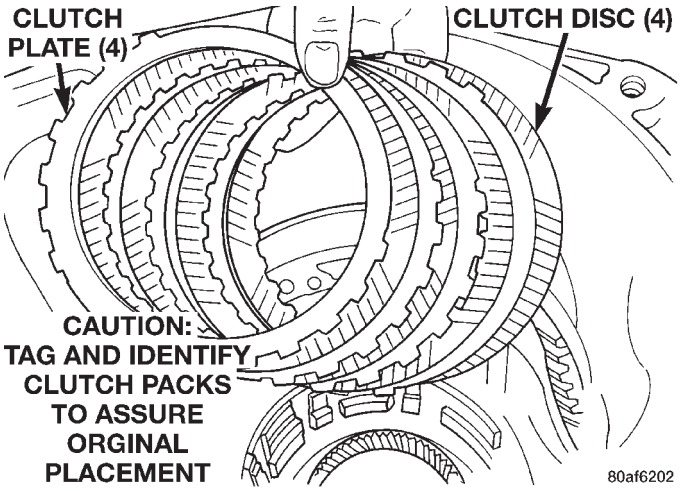


Fig. 95 Remove 2/4 Clutch Pack

NOTE: Tag 2/4 clutch pack for reassembly identification.

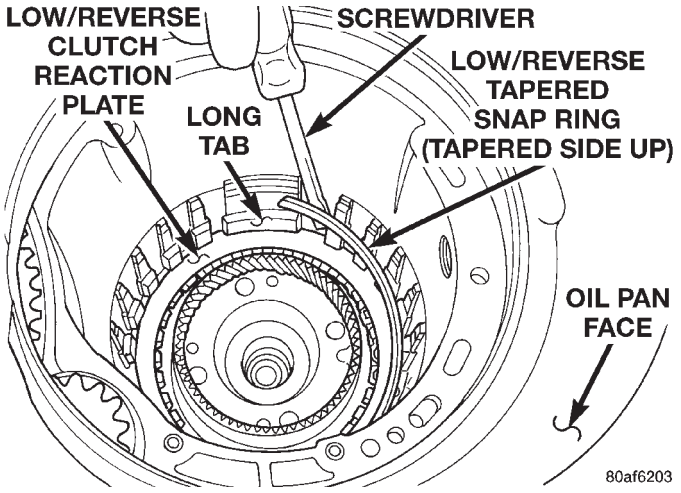


Fig. 96 Remove Tapered Snap Ring

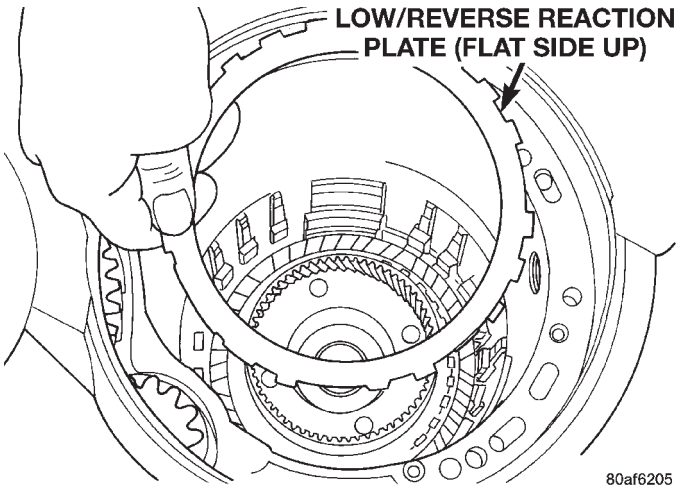


Fig. 97 Remove Low/Reverse Reaction Plate

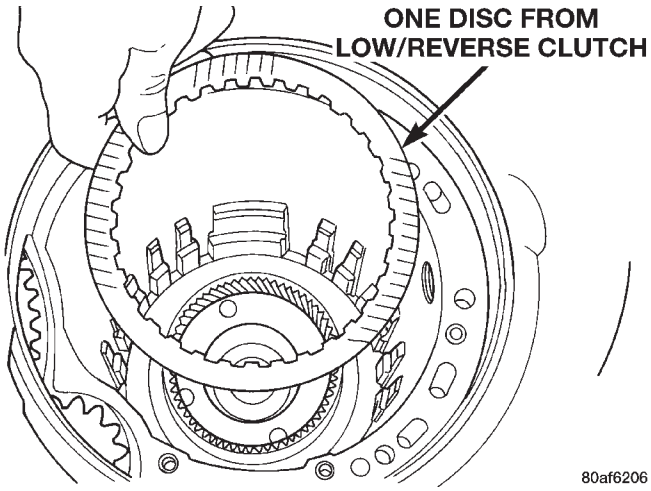


Fig. 98 Remove One Disc

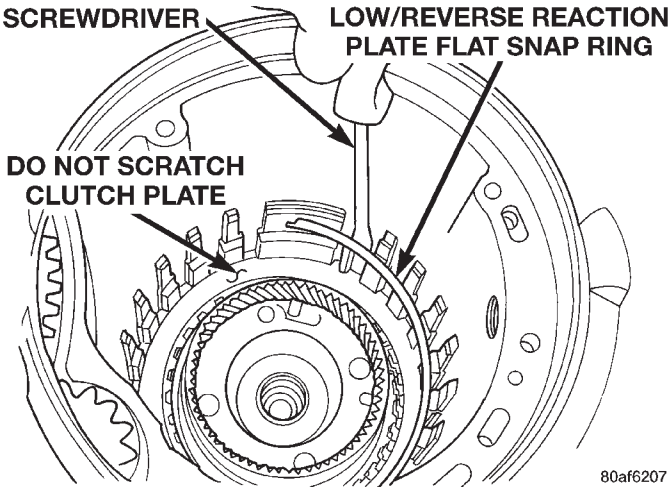


Fig. 99 Remove Low/Reverse Reaction Plate Snap Ring

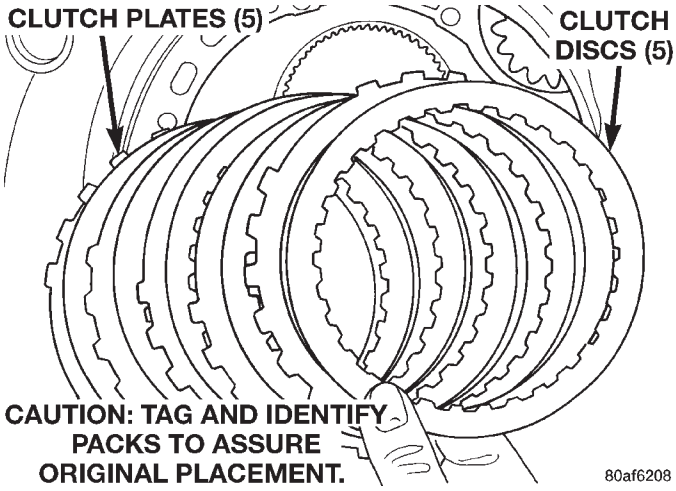


Fig. 100 Remove Low/Reverse Clutch Pack

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Tag low/reverse clutch pack for reassembly identification.

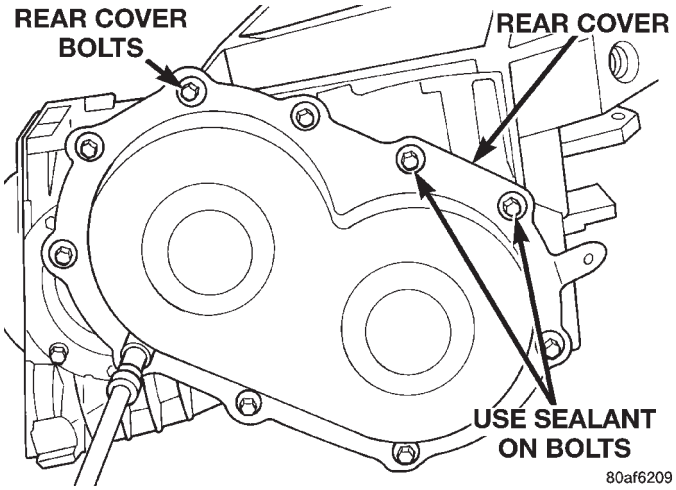


Fig. 101 Remove Rear Cover Bolts

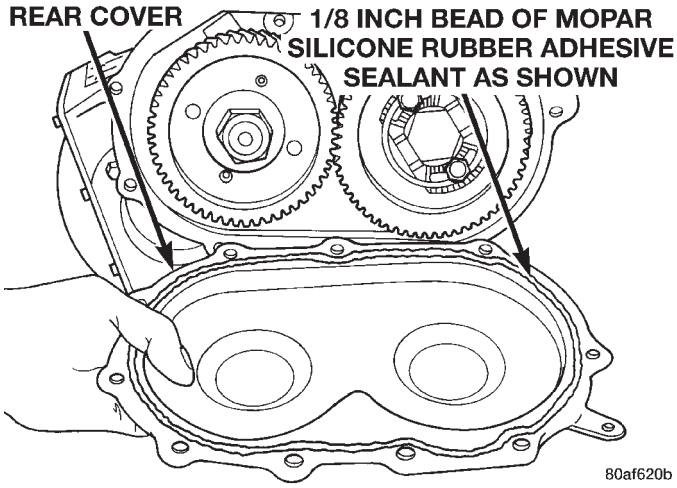


Fig. 102 Remove Rear Cover

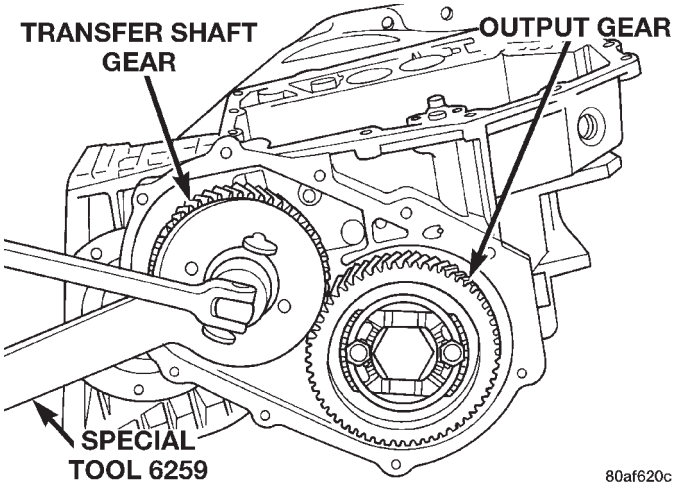


Fig. 103 Remove Transfer Shaft Gear Nut

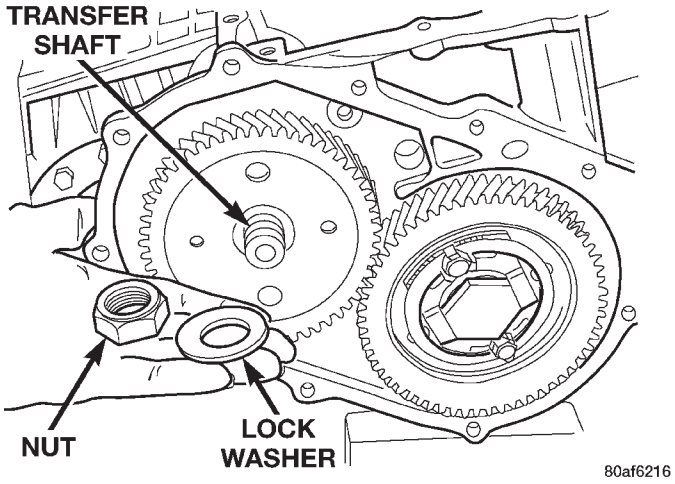


Fig. 104 Transfer Shaft Gear Nut and Coned Washer

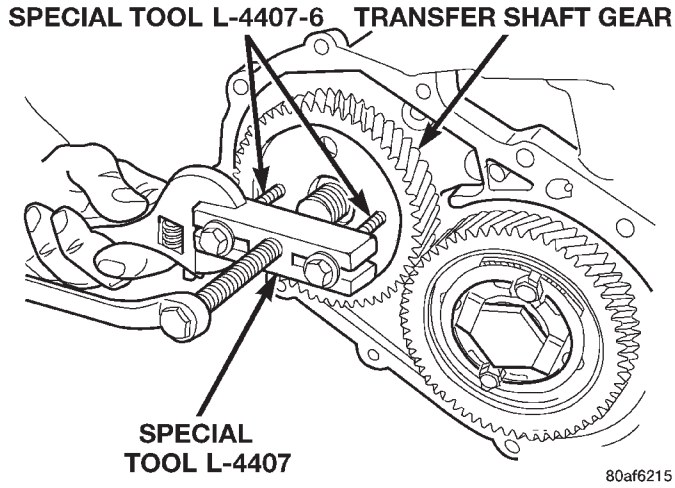


Fig. 105 Remove Transfer Shaft Gear

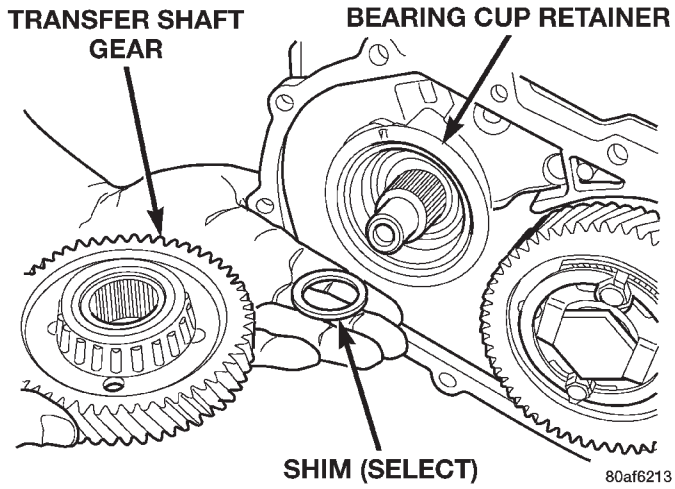


Fig. 106 Remove Transfer Shaft Gear and (Select) Shim

DISASSEMBLY AND ASSEMBLY (Continued)

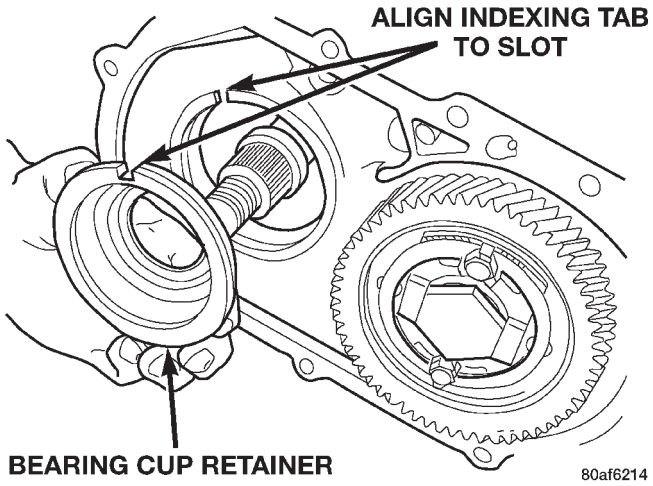


Fig. 107 Remove Bearing Cup Retainer

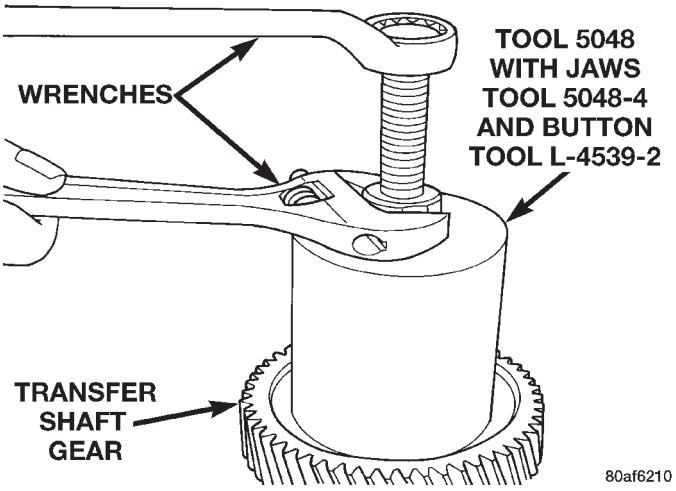


Fig. 108 Remove Transfer Gear Bearing Cone

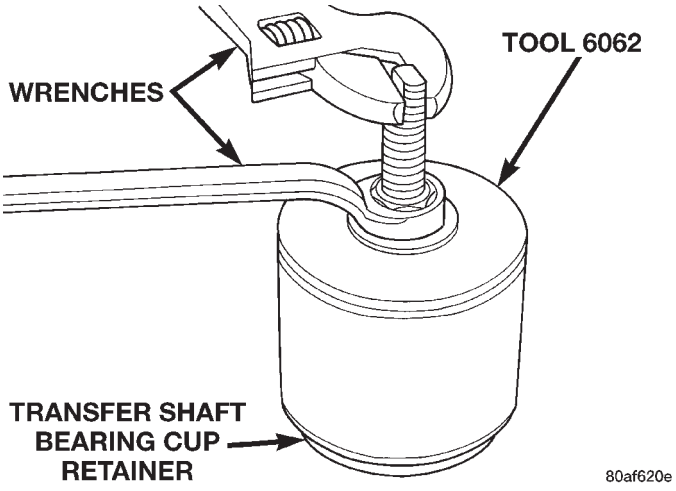


Fig. 109 Remove Transfer Shaft Bearing Cup

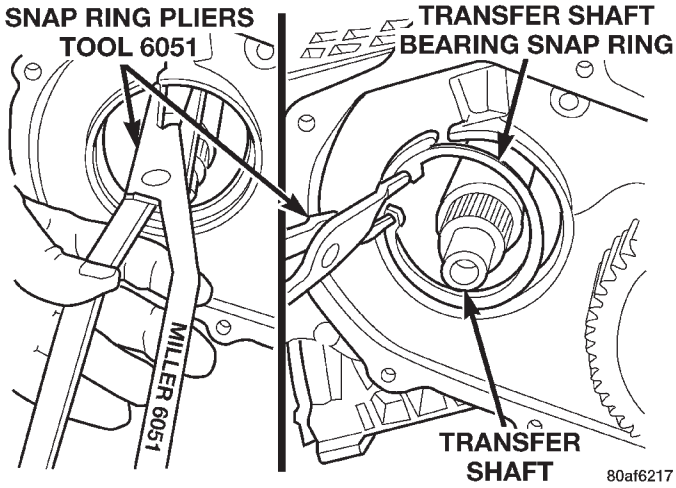


Fig. 110 Remove Transfer Shaft Bearing Snap Ring

NOTE: Screw Tool 5049-A onto transfer shaft. Remove transfer shaft.

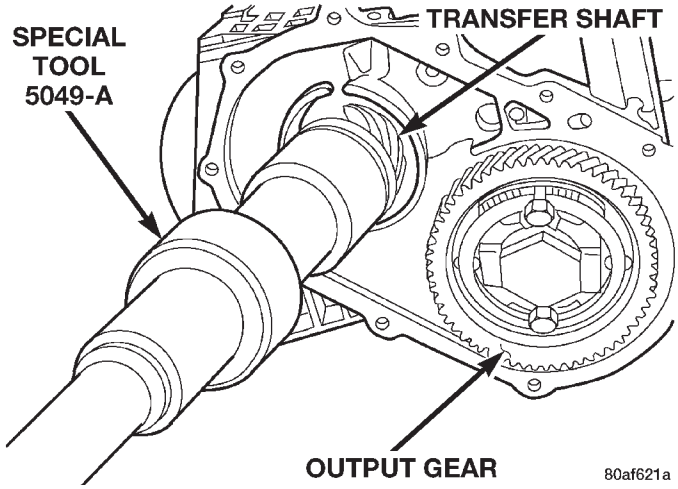


Fig. 111 Remove Transfer Shaft

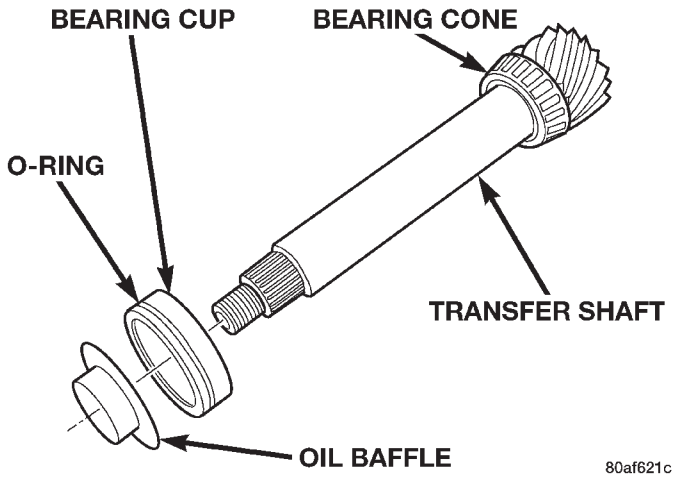


Fig. 112 Bearing Cup Removed

DISASSEMBLY AND ASSEMBLY (Continued)

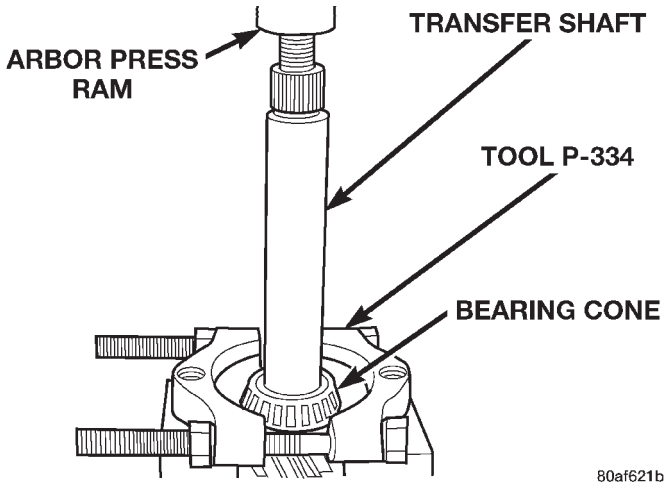


Fig. 113 Remove Transfer Shaft Bearing Cone

NOTE: Remove output gear stirrup and strap bolts.

All transaxles utilize a stirrup and retaining strap that is attached to the output gear. The stirrup prevents the output gear retaining bolt from turning and backing out of the rear carrier. The strap is used to hold the stirrup to the output gear and prevent the stirrup retaining bolts from backing out.

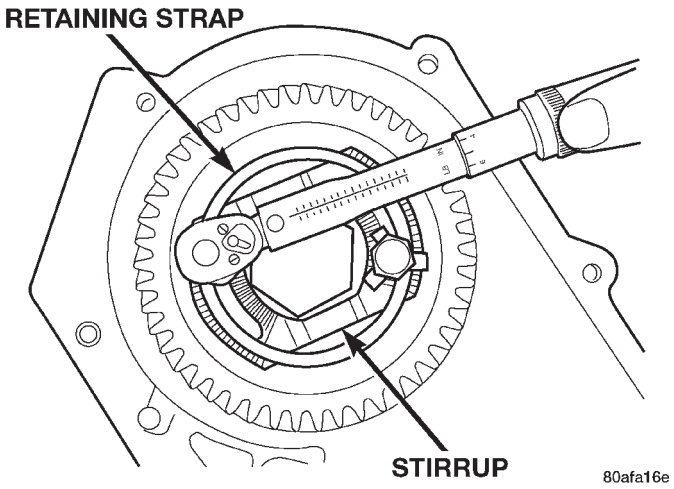


Fig. 114 Loosen Stirrup Strap Bolts

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

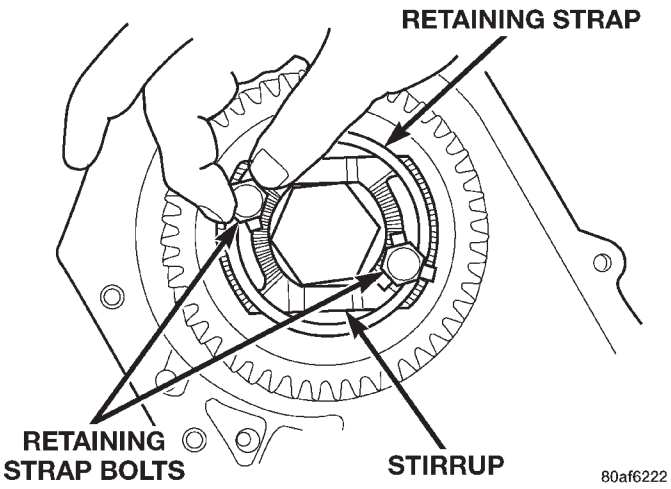


Fig. 115 Remove Strap Bolts

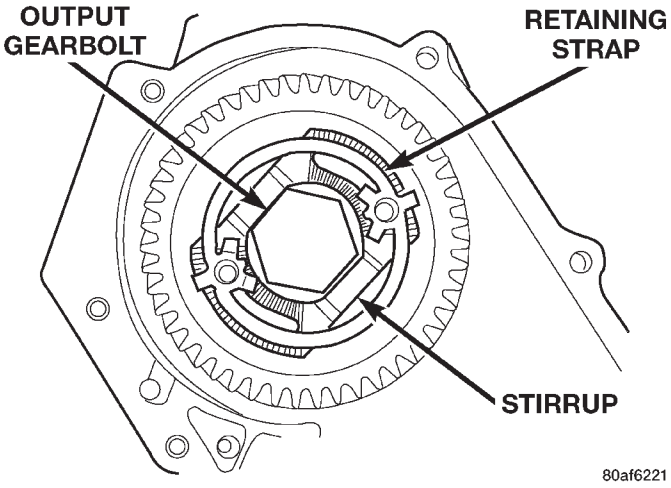


Fig. 116 Remove Stirrup Strap

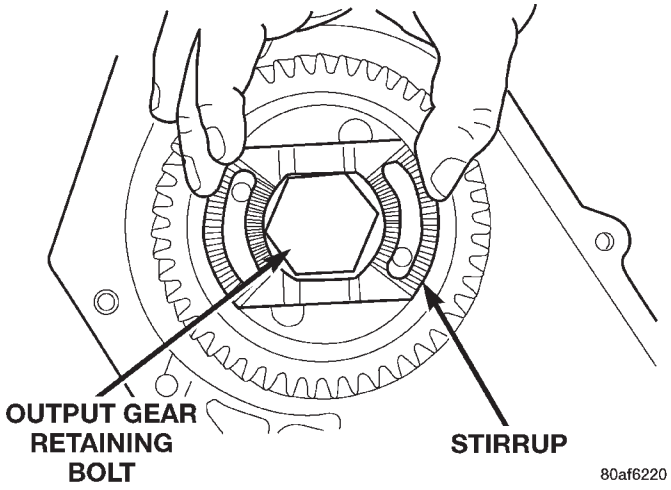


Fig. 117 Remove Stirrup

DISASSEMBLY AND ASSEMBLY (Continued)

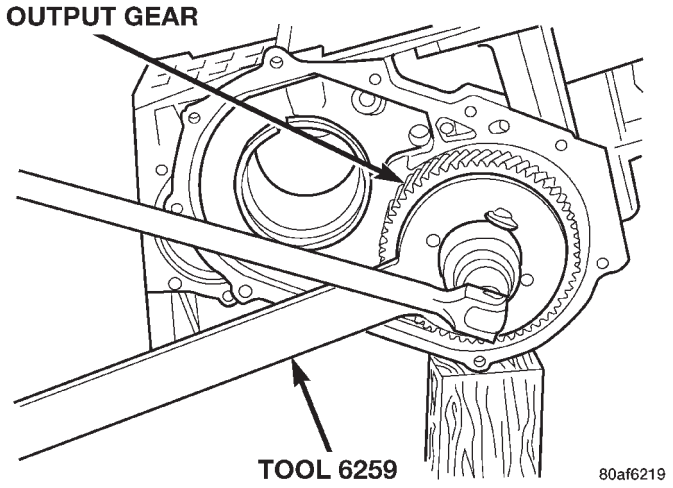


Fig. 118 Remove Output Gear Bolt

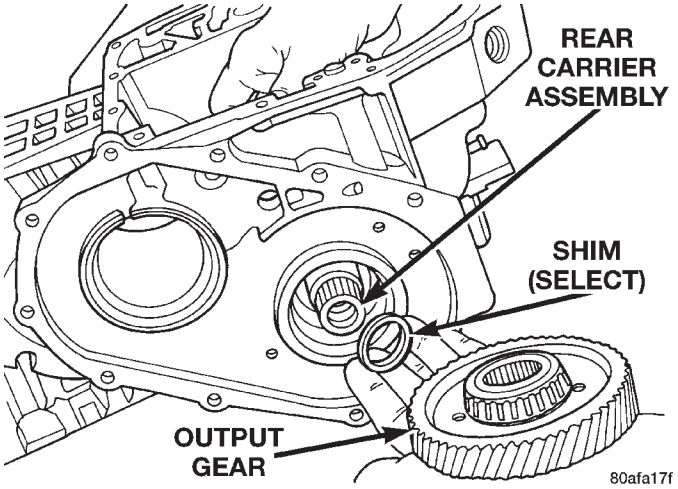


Fig. 121 Output Gear and (Select) Shim

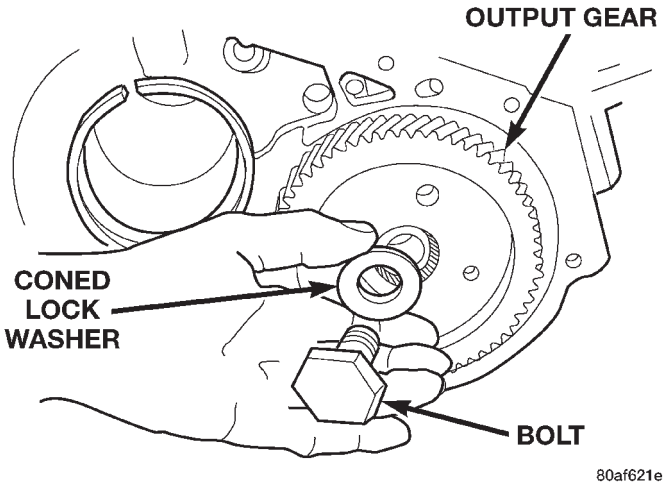


Fig. 119 Output Gear Bolt and Washer

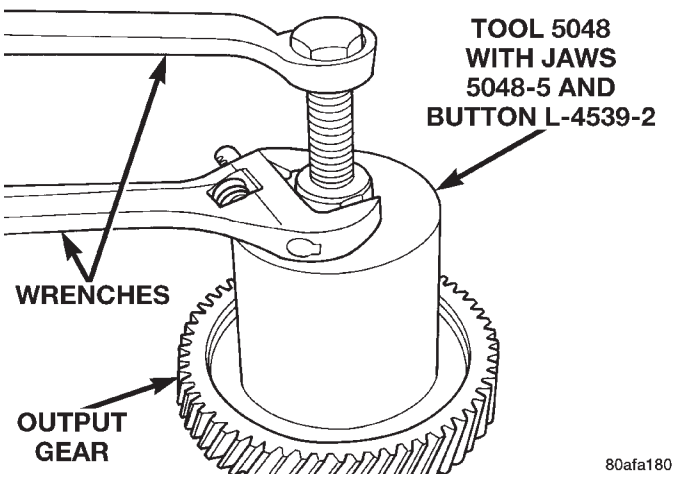


Fig. 122 Remove Bearing Cone

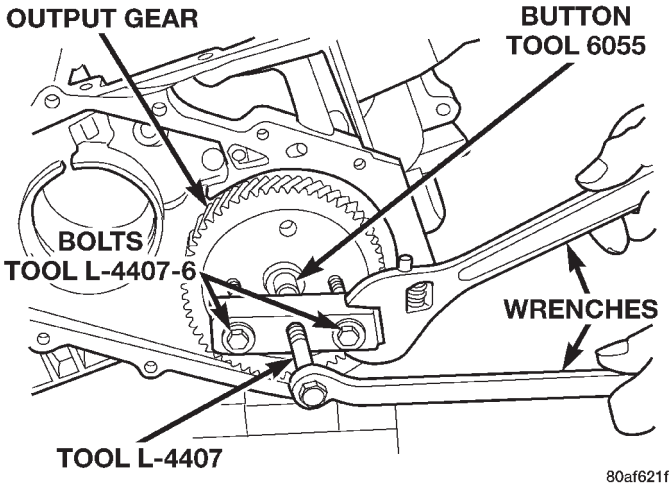


Fig. 120 Remove Output Gear

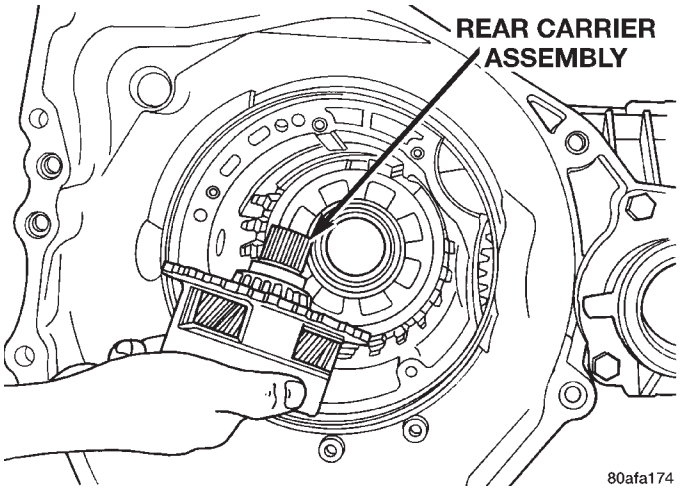


Fig. 123 Remove Rear Carrier Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

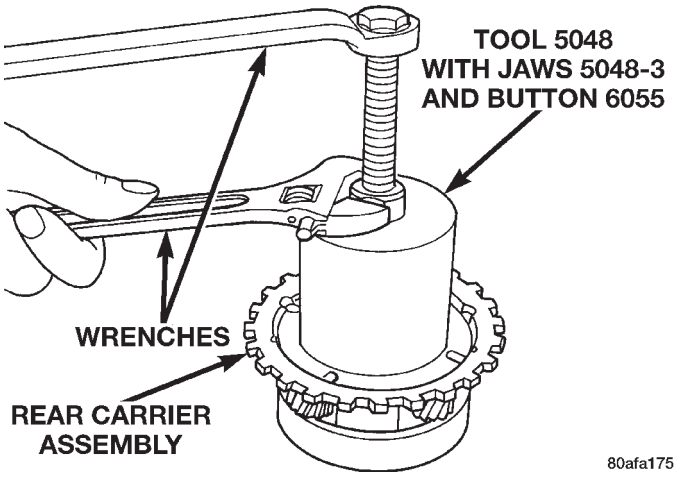


Fig. 124 Remove Rear Carrier Bearing Cone

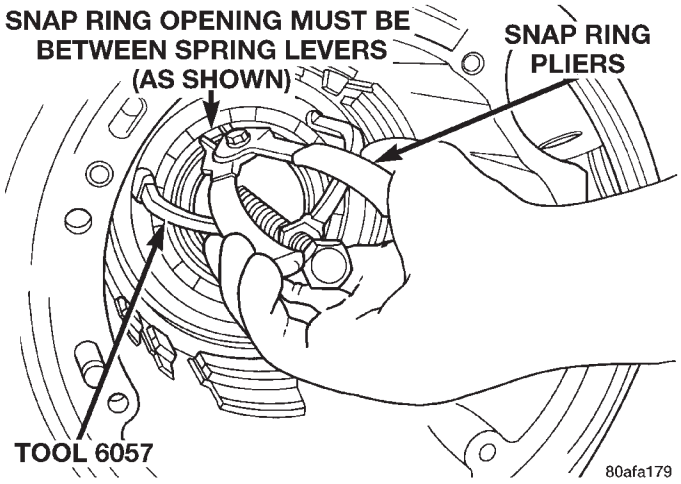


Fig. 127 Remove Snap Ring

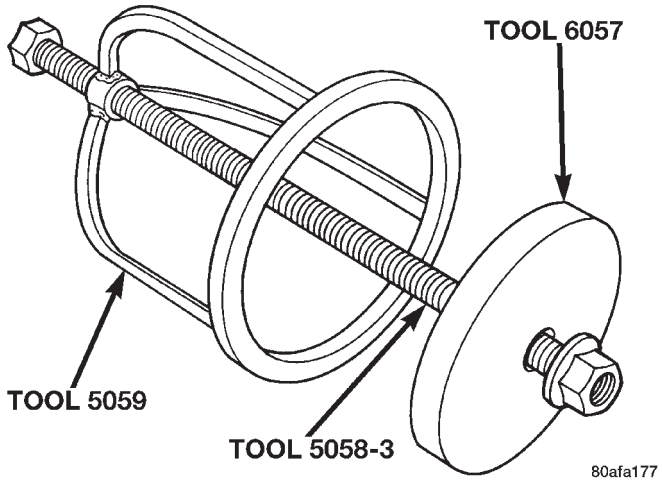


Fig. 125 Low/Reverse Spring Compressor Tool

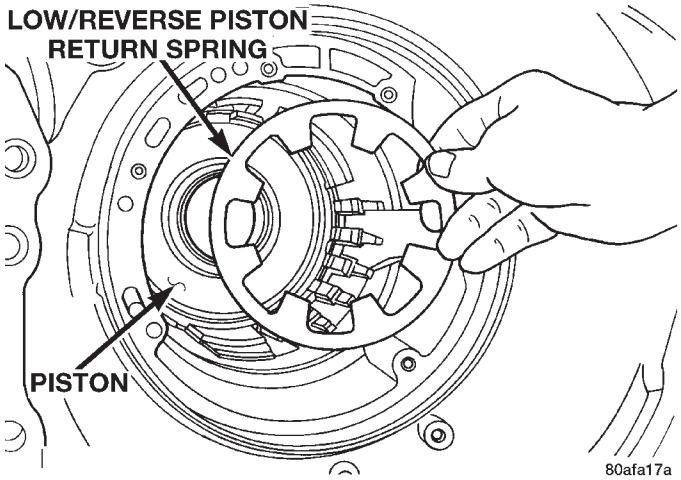


Fig. 128 Low/Reverse Piston Return Spring

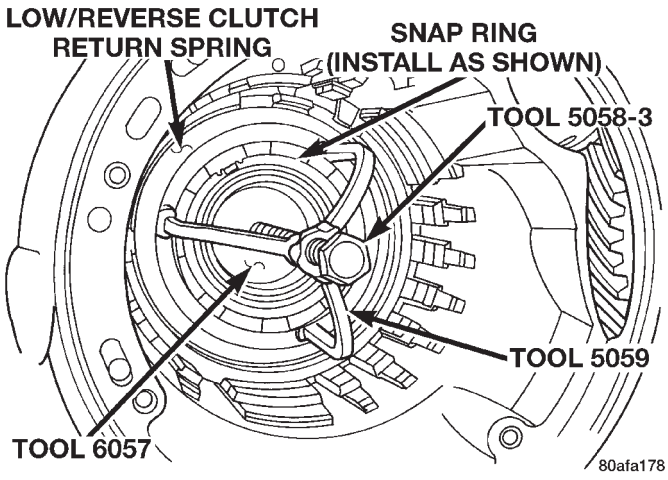


Fig. 126 Compressor Tool in Use

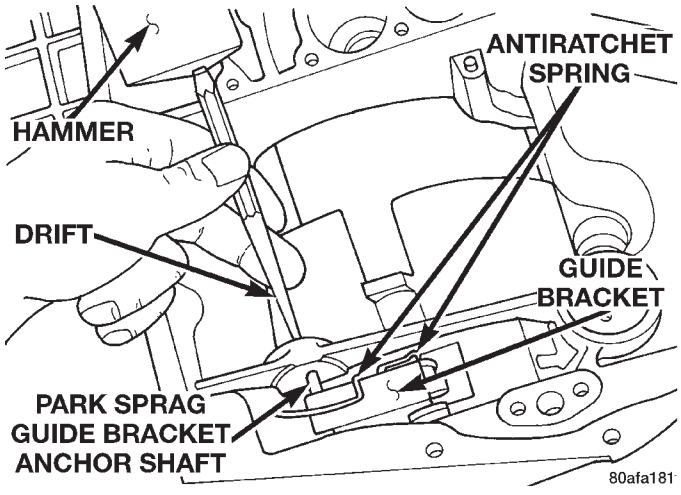


Fig. 129 Drive Out Anchor Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

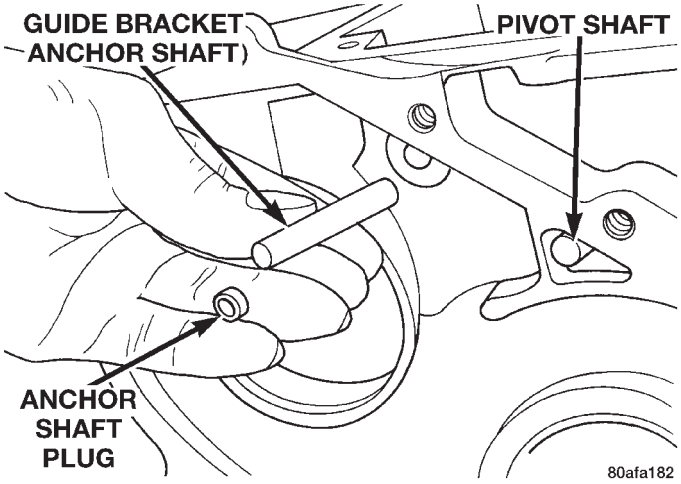


Fig. 130 Remove Anchor Shaft and Plug

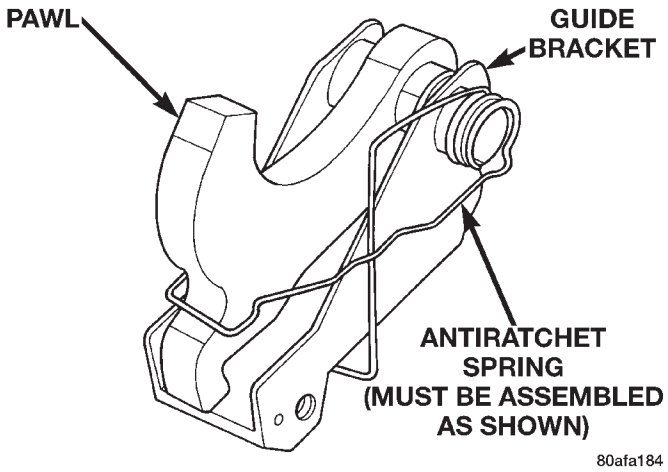


Fig. 133 Guide Bracket

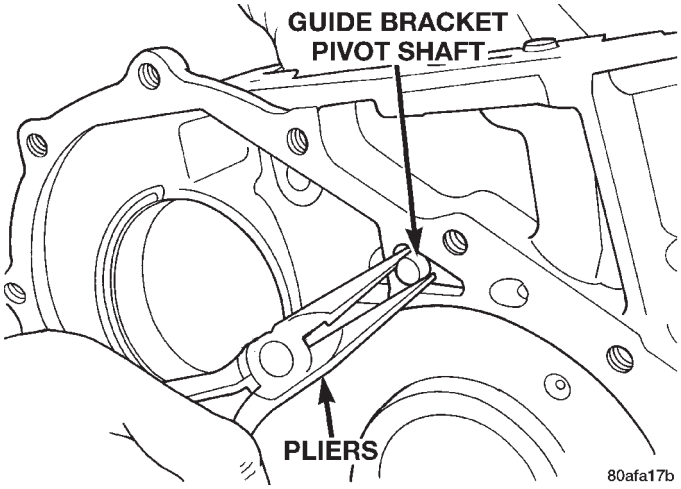


Fig. 131 Remove Guide Bracket Pivot Shaft

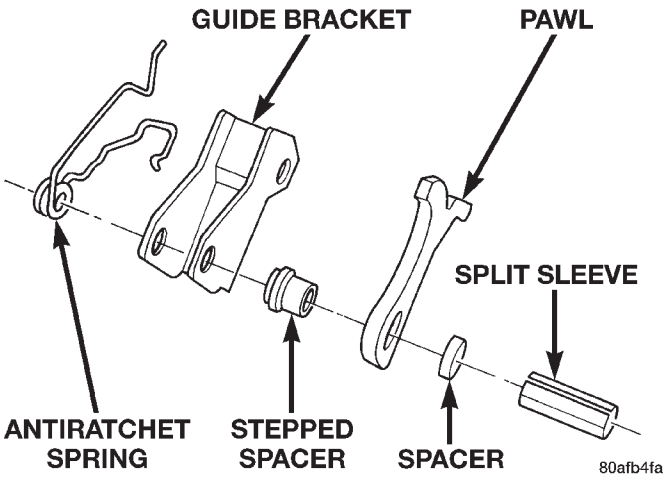


Fig. 134 Guide Bracket Disassembled

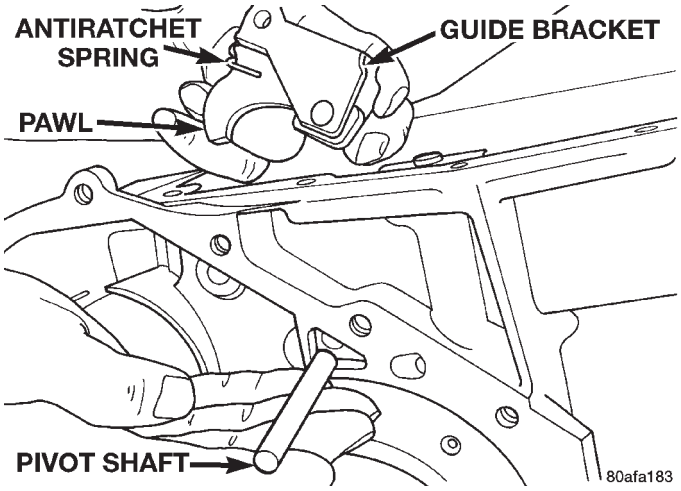


Fig. 132 Pivot Shaft and Guide Bracket

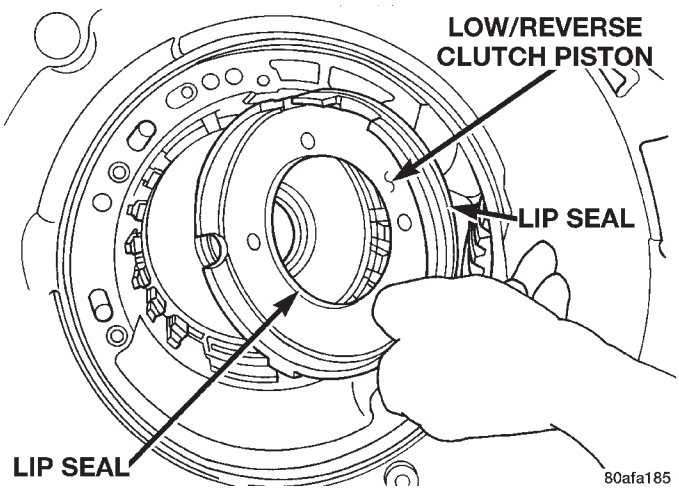


Fig. 135 Remove Low/Reverse Clutch Piston

DISASSEMBLY AND ASSEMBLY (Continued)

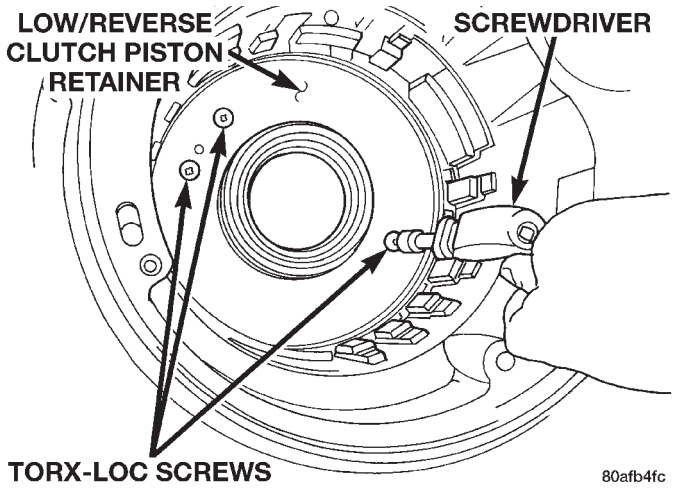


Fig. 136 Remove Piston Retainer Attaching Screws

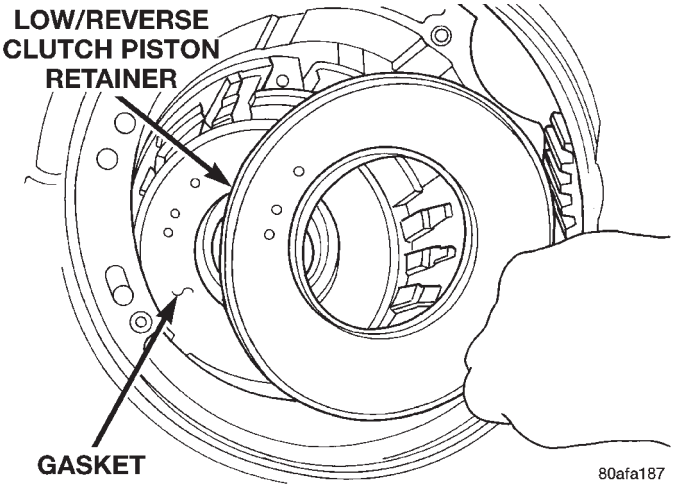


Fig. 137 Remove Piston Retainer

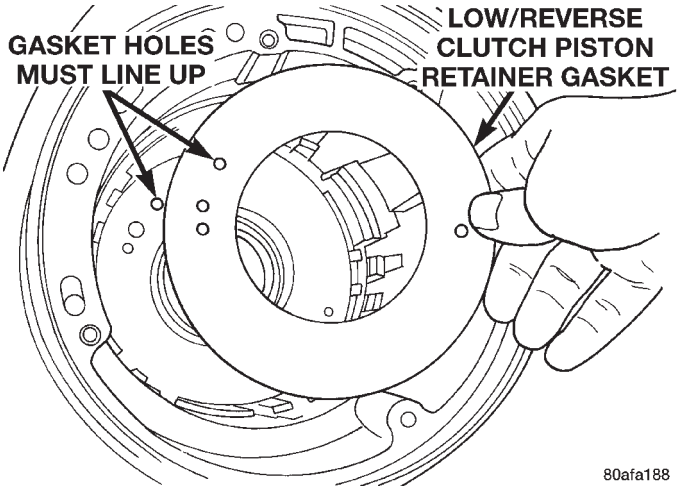


Fig. 138 Remove Piston Retainer Gasket

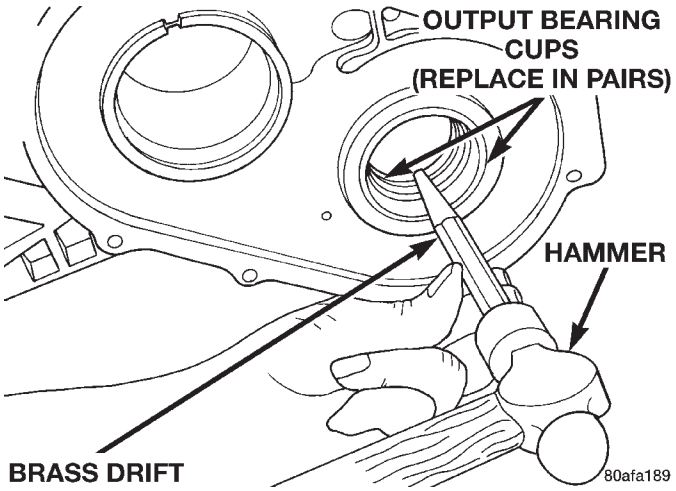


Fig. 139 Remove Output Bearing Inner Cup

CAUTION: Drift bearing cup all the way around.

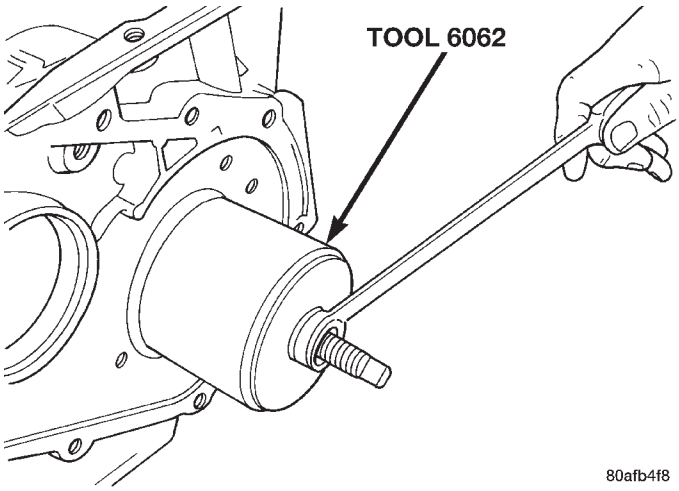


Fig. 140 Remove Output Bearing Outer Cup

This concludes the disassemble of the transaxle centerline. To disassemble the input clutch assembly, refer to Input Clutches-Recondition.

DISASSEMBLY AND ASSEMBLY (Continued)

INPUT CLUTCHES-RECONDITION

DISASSEMBLY

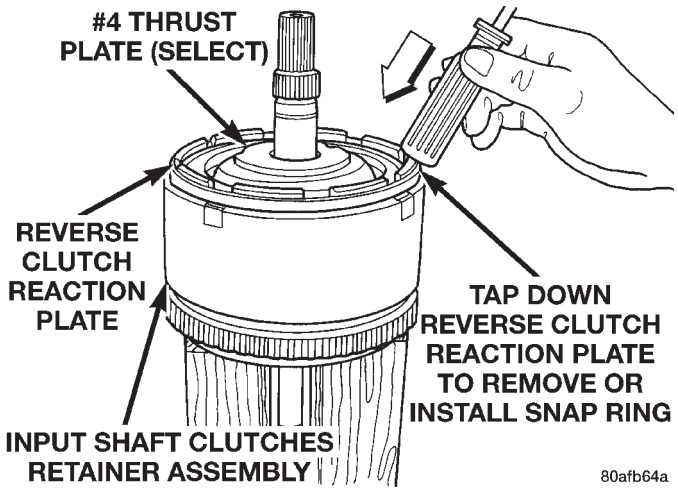


Fig. 141 Tapping Reaction Plate

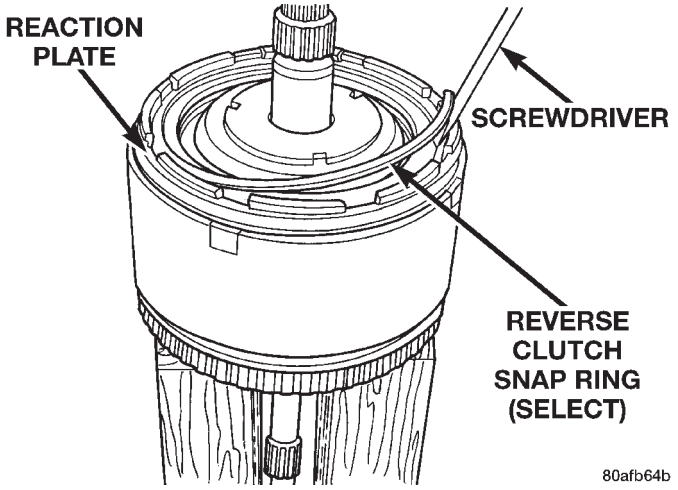


Fig. 142 Reverse Clutch Snap Ring

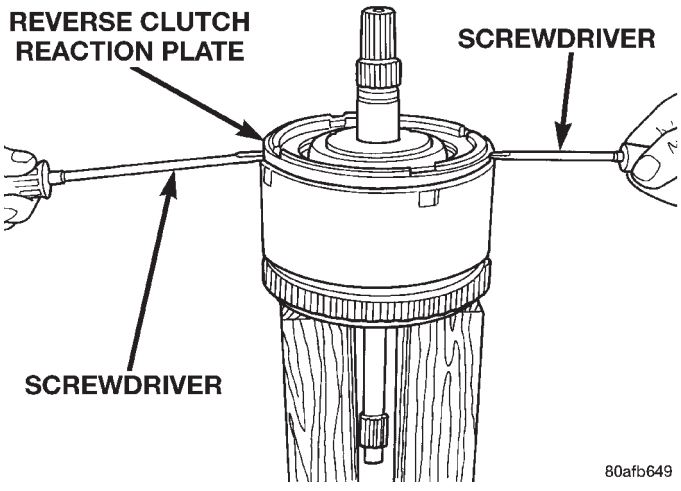


Fig. 143 Pry Reverse Clutch Reaction Plate

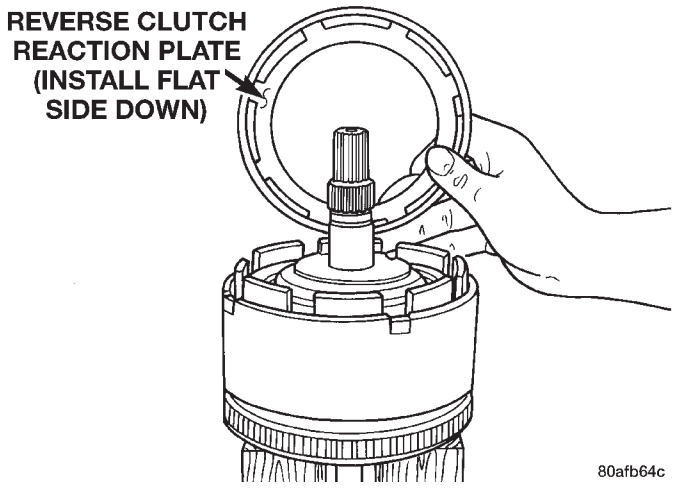


Fig. 144 Reverse Clutch Reaction Plate

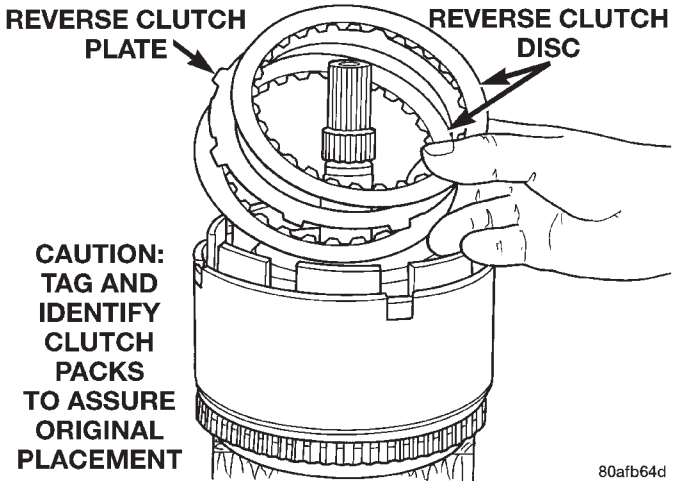


Fig. 145 Reverse Clutch Pack

NOTE: Tag reverse clutch pack for reassembly identification .

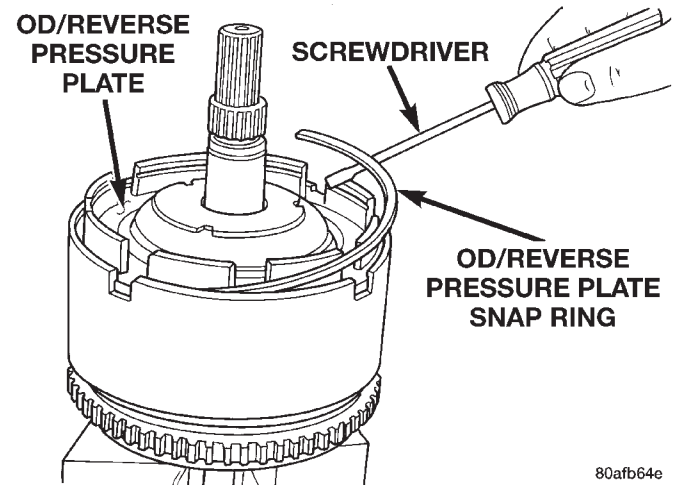


Fig. 146 OD/Reverse Pressure Plate Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

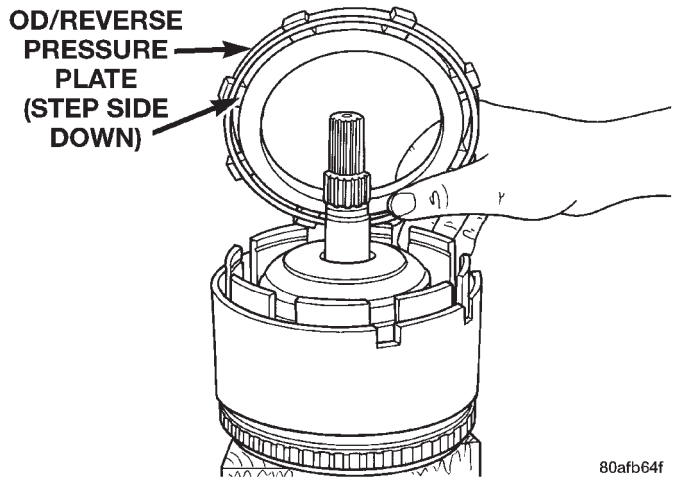


Fig. 147 OD/Reverse Pressure Plate

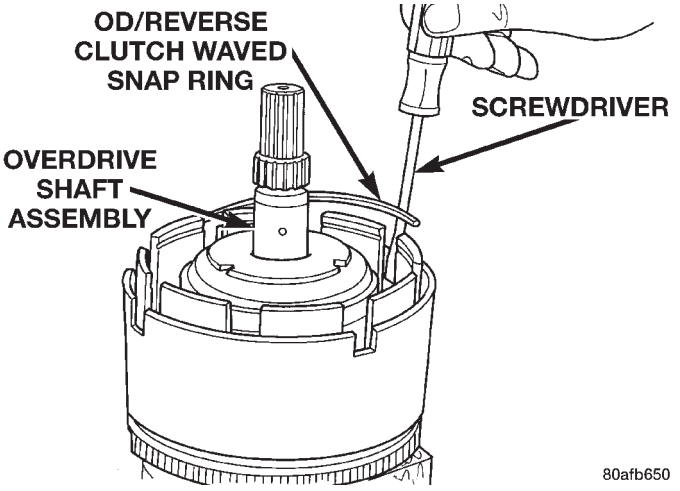


Fig. 148 Waved Snap Ring

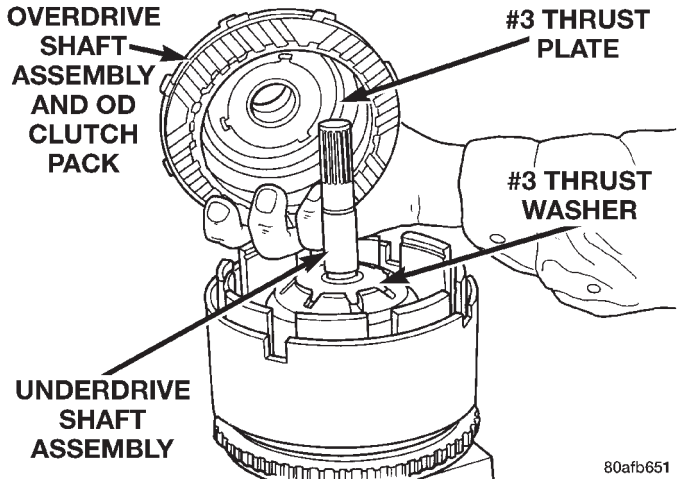


Fig. 149 Remove OD Clutch Pack

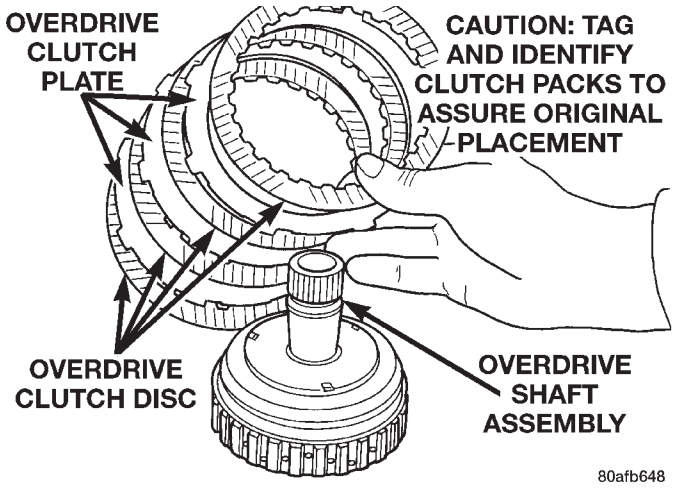


Fig. 150 Overdrive Clutch Pack

NOTE: Tag overdrive clutch pack for reassembly identification.

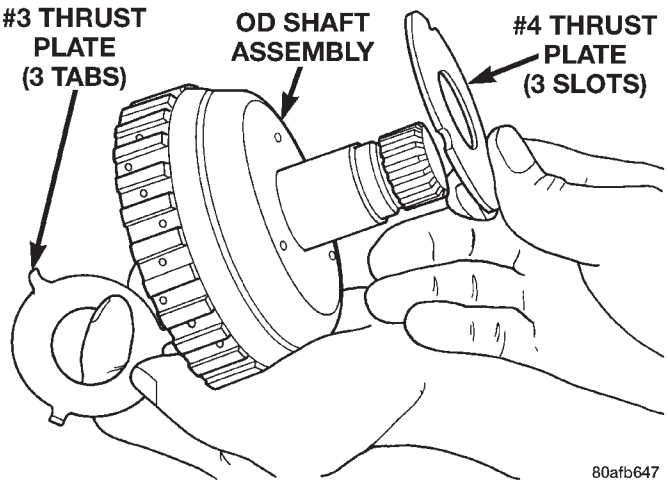


Fig. 151 Overdrive Shaft Assembly

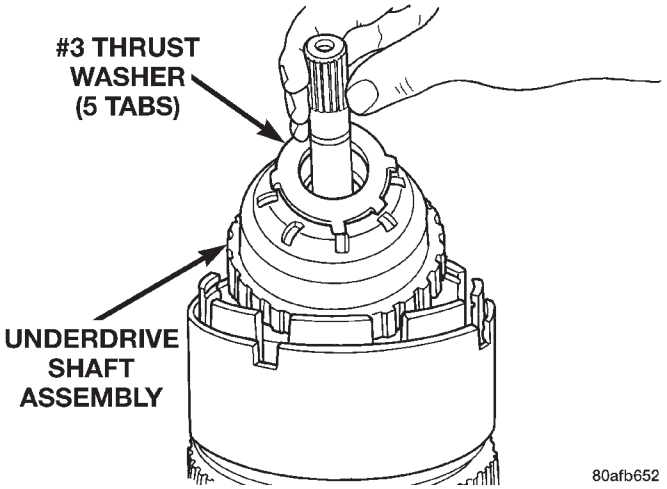


Fig. 152 Underdrive Shaft Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

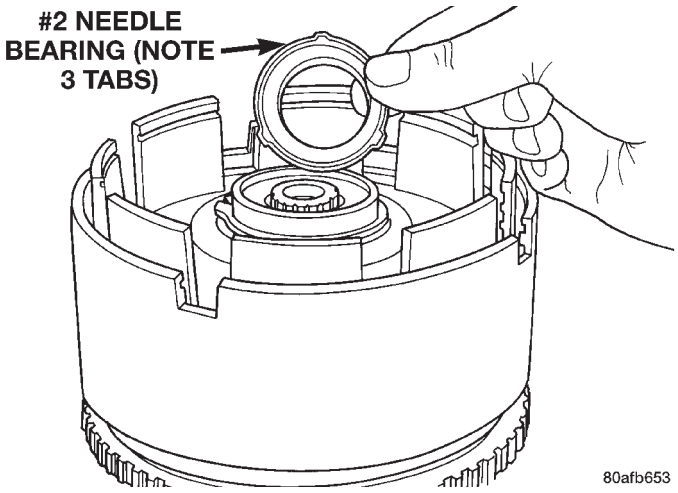


Fig. 153 No. 2 Needle Bearing

NOTE: The OD/UD Reaction Plate, Snap Rings, and Input Clutches Retainer is not interchangeable with previous year 41TE components. The snap rings are thicker and the position of the ring lands have changed.

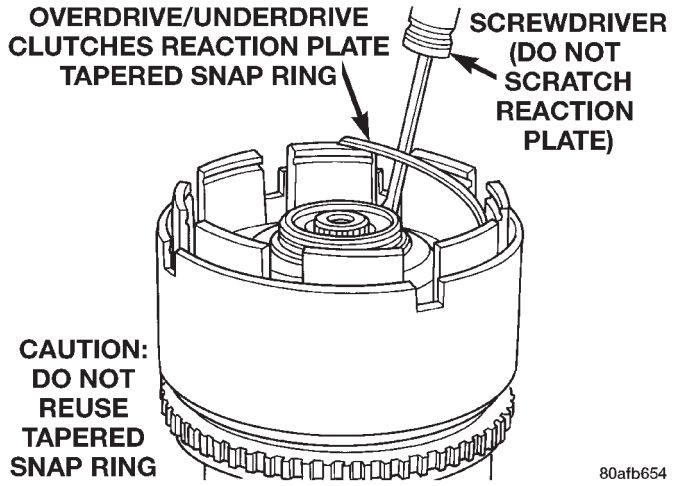


Fig. 154 OD/UD Reaction Plate Tapered Snap Ring

NOTE: The OD/UD clutches reaction plate has a step on both sides. Install the OD/UD clutches reaction plate tapered step side up.

NOTE: Tag underdrive clutch pack for reassembly identification.

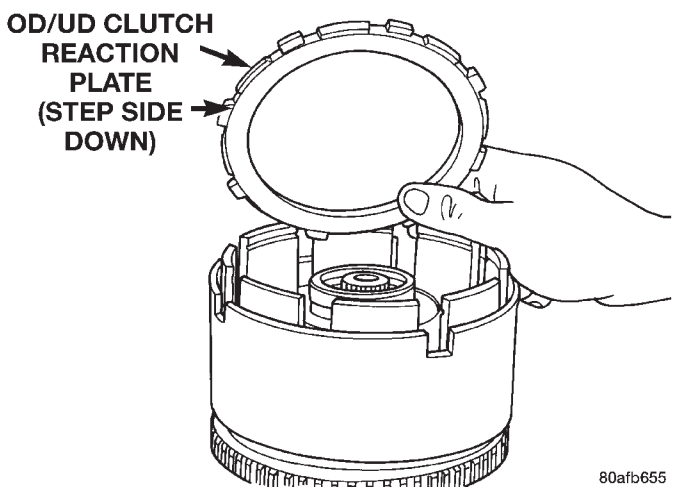


Fig. 155 OD/UD Reaction Plate

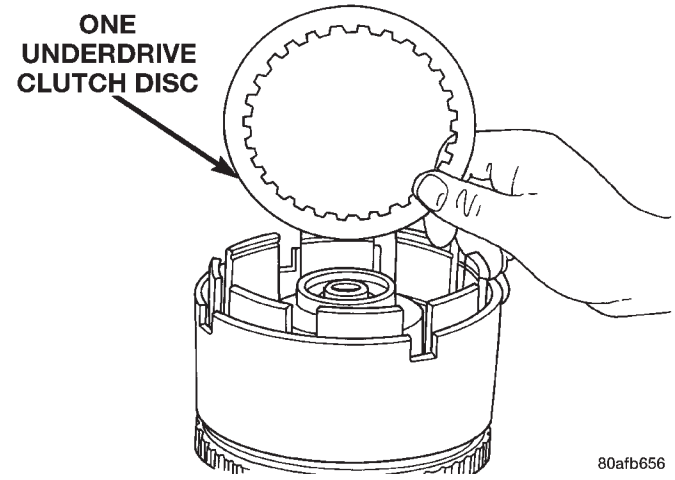


Fig. 156 Remove One UD Clutch Disc

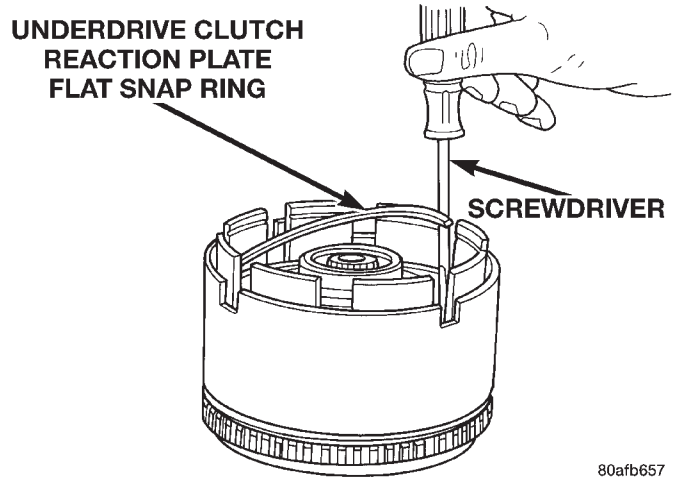


Fig. 157 UD Clutch Flat Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

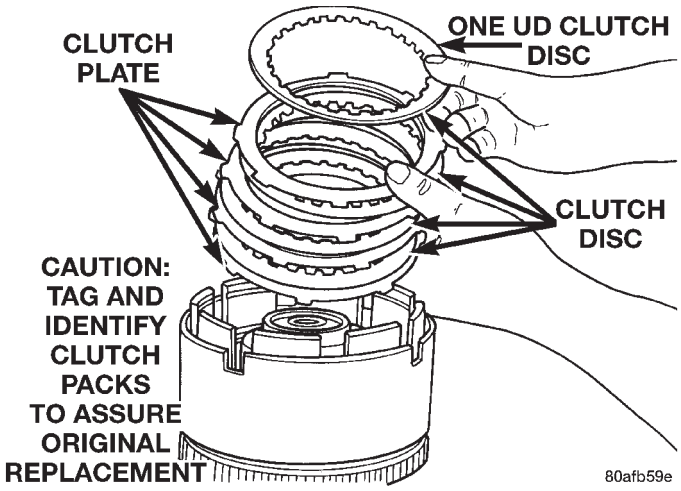


Fig. 158 Underdrive Clutch Pack

CAUTION: Compress return spring just enough to remove or install snap ring.

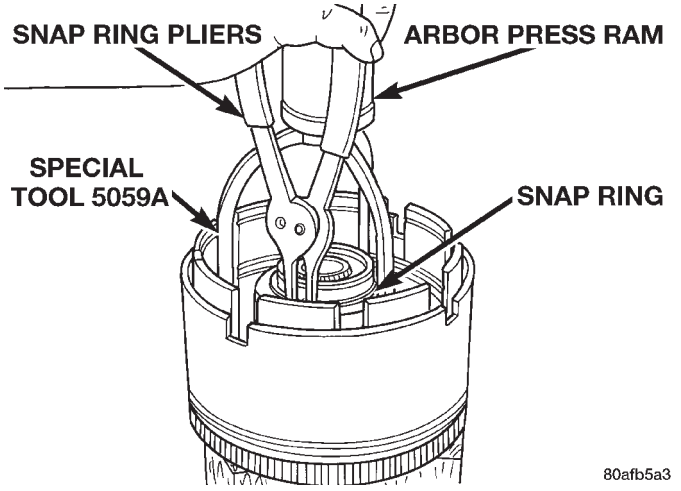


Fig. 159 UD Spring Retainer Snap Ring

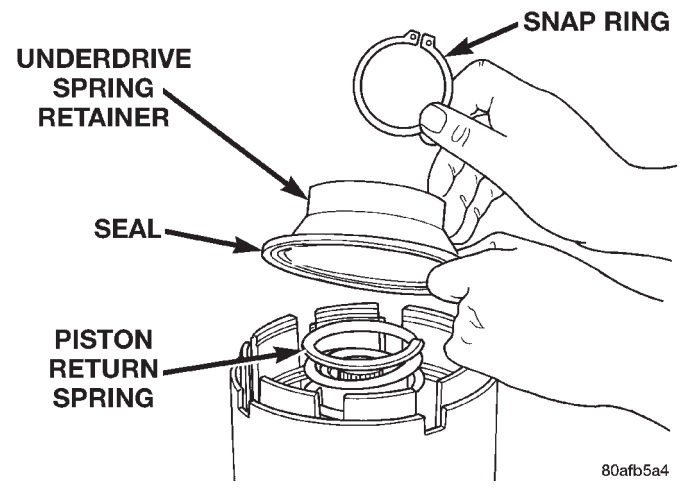


Fig. 160 UD Return Spring and Retainer

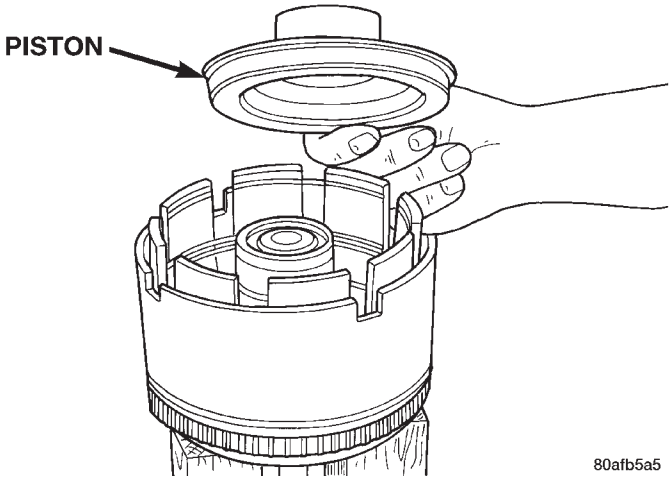


Fig. 161 Underdrive Clutch Piston

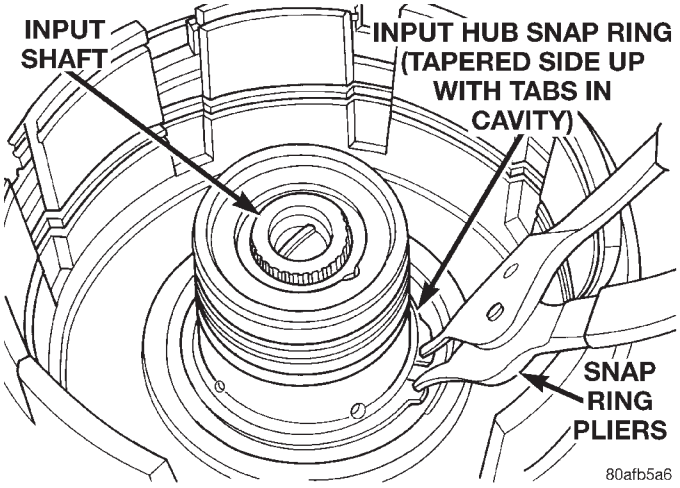


Fig. 162 Input Hub Tapered Snap Ring

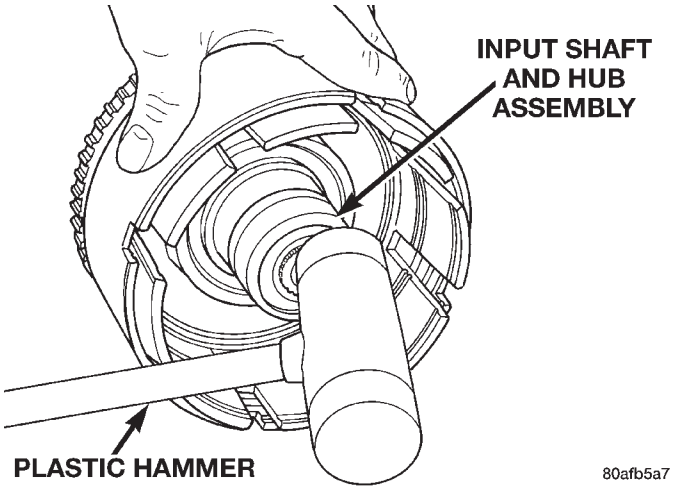


Fig. 163 Tap on Input Hub

DISASSEMBLY AND ASSEMBLY (Continued)

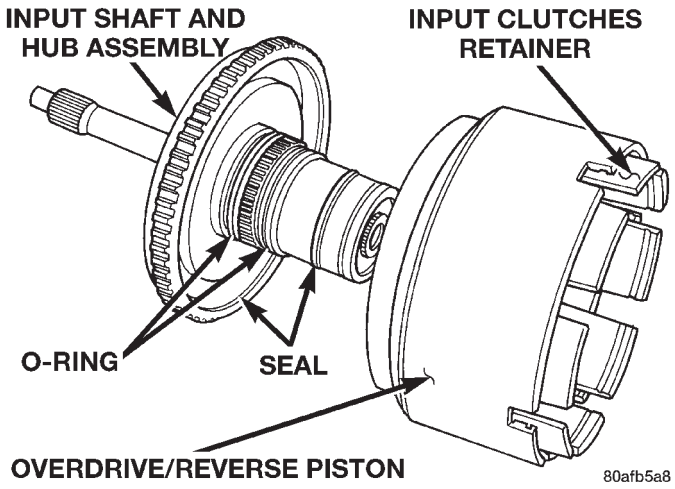


Fig. 164 Input Hub Removed

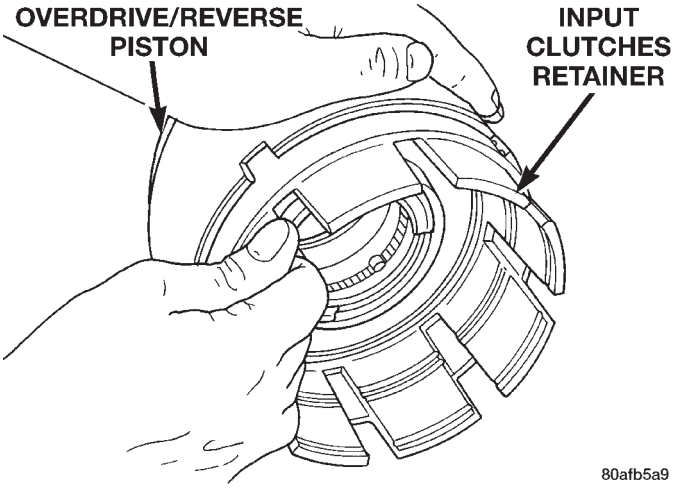


Fig. 165 Pull Retainer from Piston

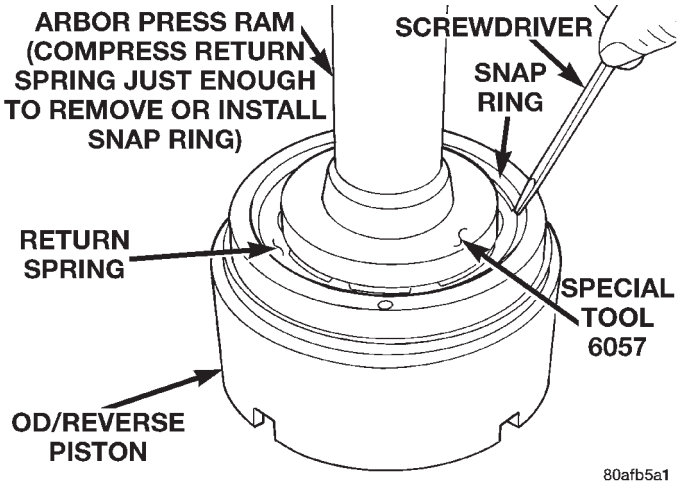


Fig. 166 Remove Snap Ring

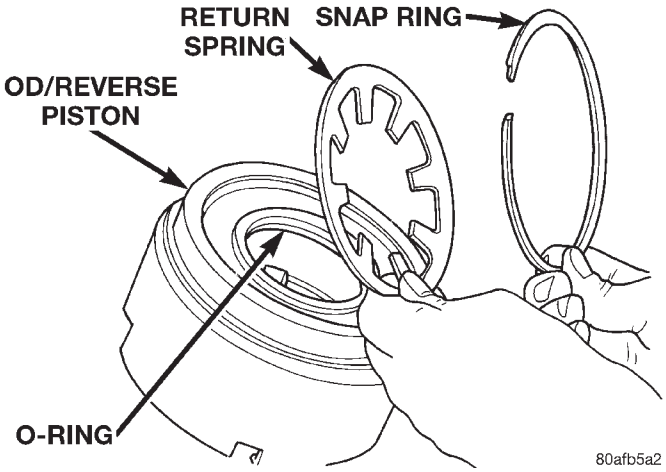


Fig. 167 Snap Ring and Return Spring

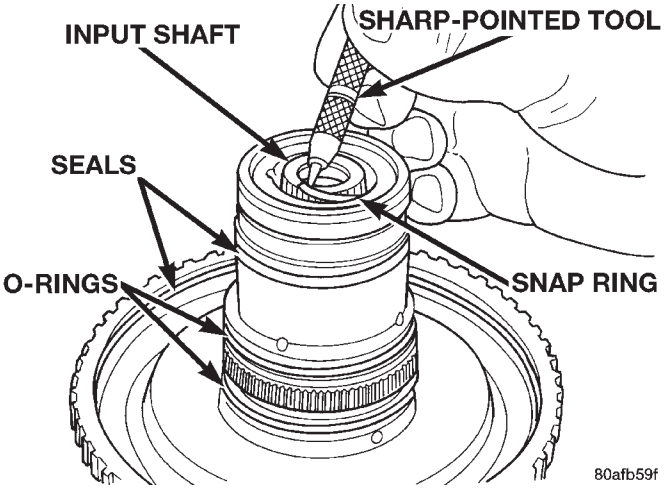


Fig. 168 Remove Input Shaft Snap Ring

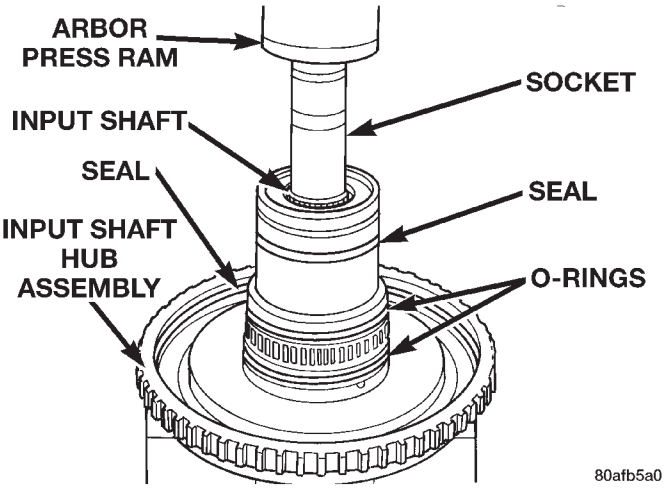


Fig. 169 Remove Input Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLY

Use petrolatum on all seals to ease assembly of components.

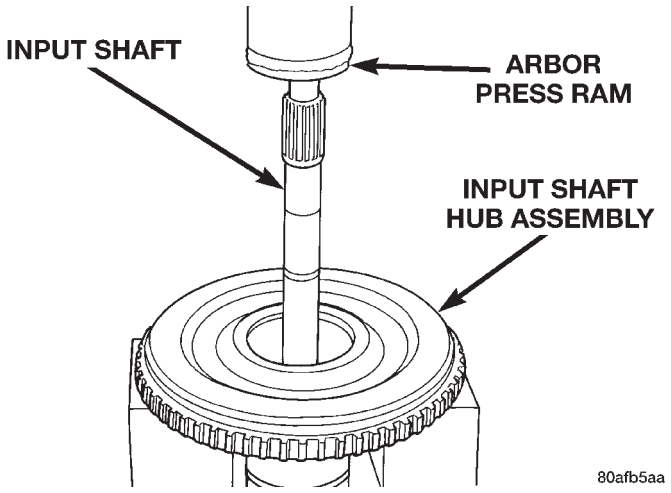


Fig. 170 Install Input Shaft

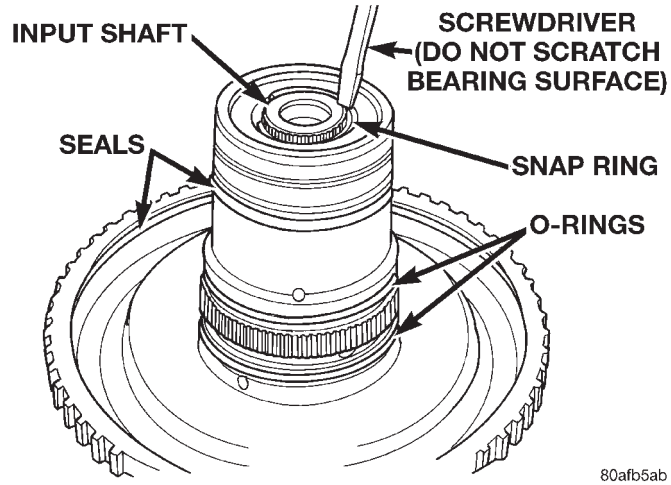


Fig. 171 Install Input Shaft Snap Ring

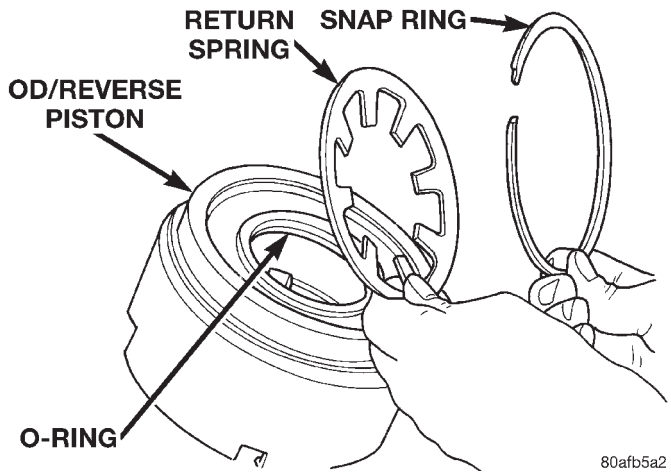


Fig. 172 Return Spring and Snap Ring

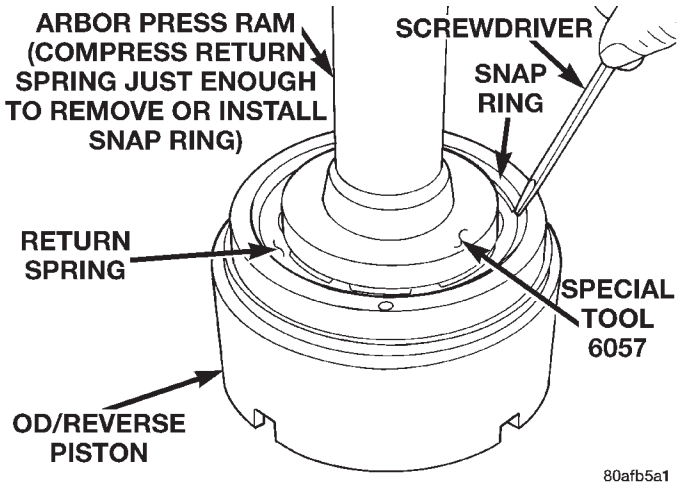


Fig. 173 Install Snap Ring

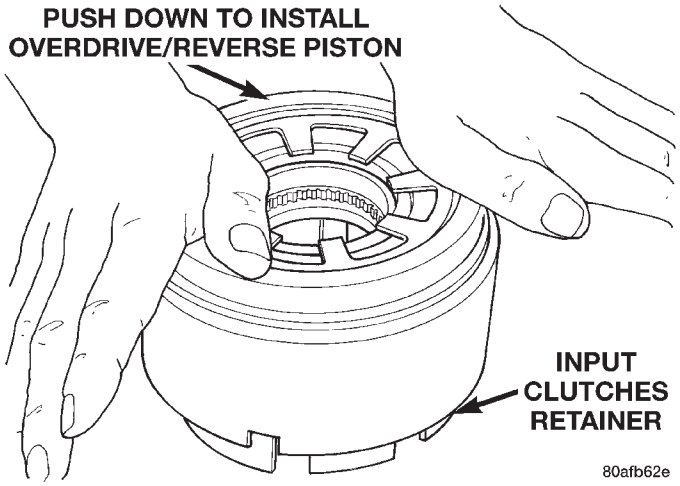


Fig. 174 Install OD/Reverse Piston

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: The OD/UD Reaction Plate, Snap Rings, and Input Clutches Retainer is not interchangeable with previous year 41TE components. The snap rings are thicker and the position of the ring lands have changed.

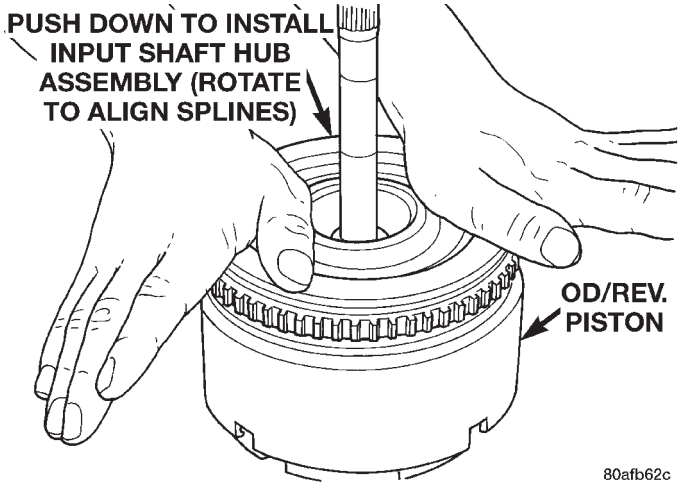


Fig. 175 Install Input Shaft Hub Assembly

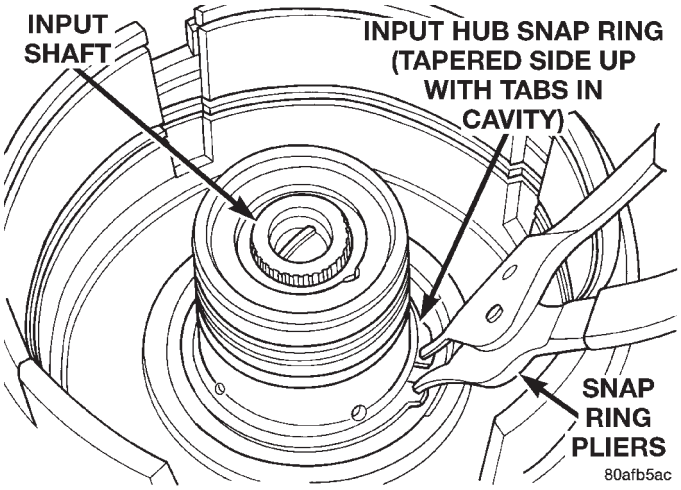


Fig. 176 Install Input Hub Tapered Snap Ring

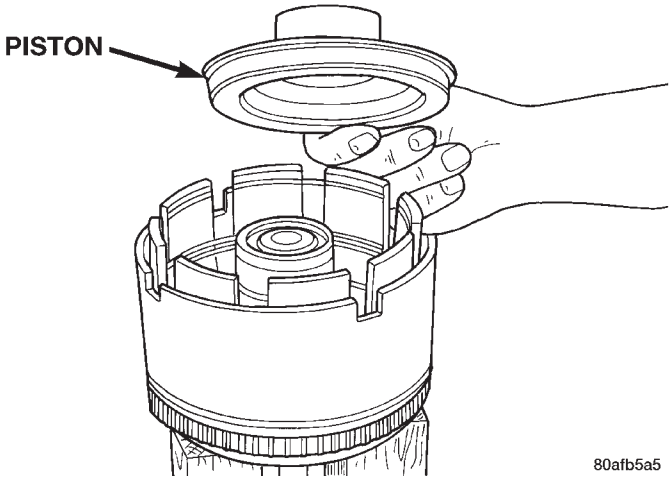


Fig. 177 Underdrive Clutch Piston

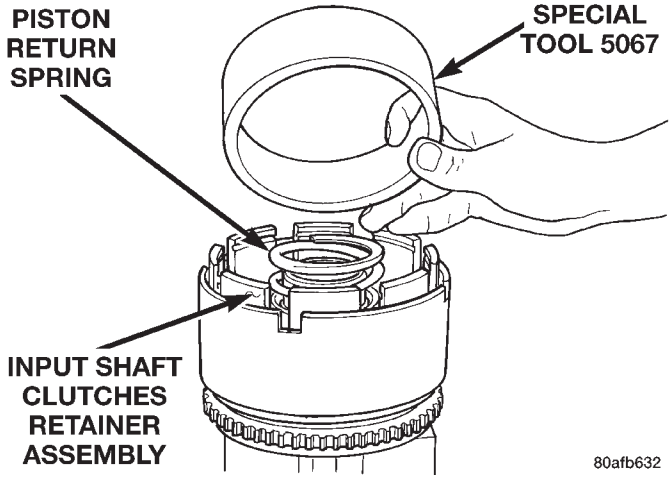


Fig. 178 Seal Compressor Special Tool 5067

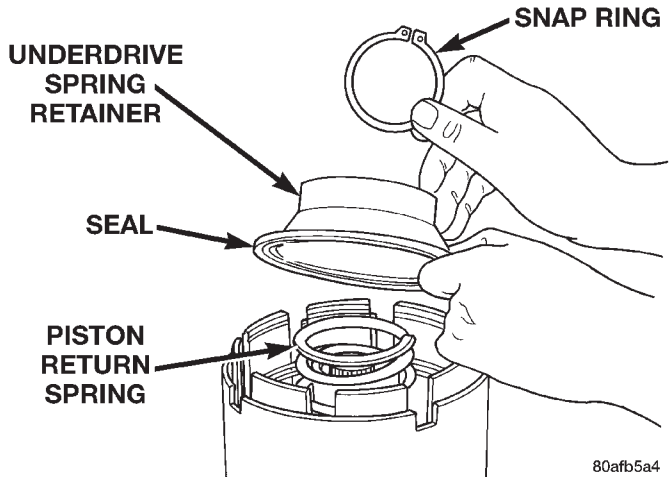


Fig. 179 UD Return Spring and Retainer

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Compress return spring just enough to remove or install snap ring.

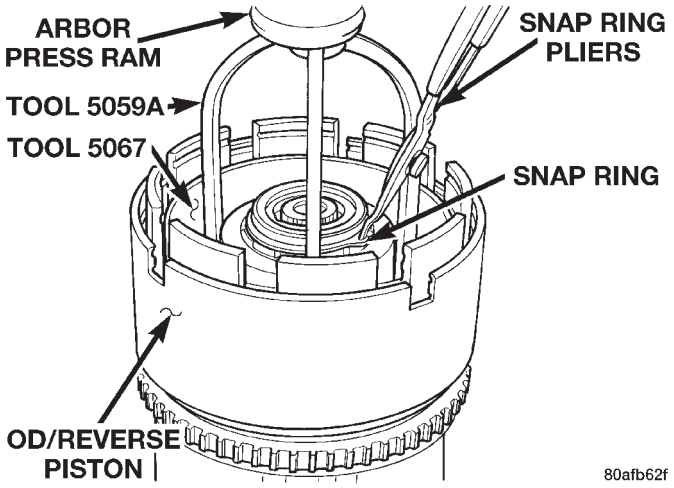


Fig. 180 Install UD Spring Retainer and Snap Ring

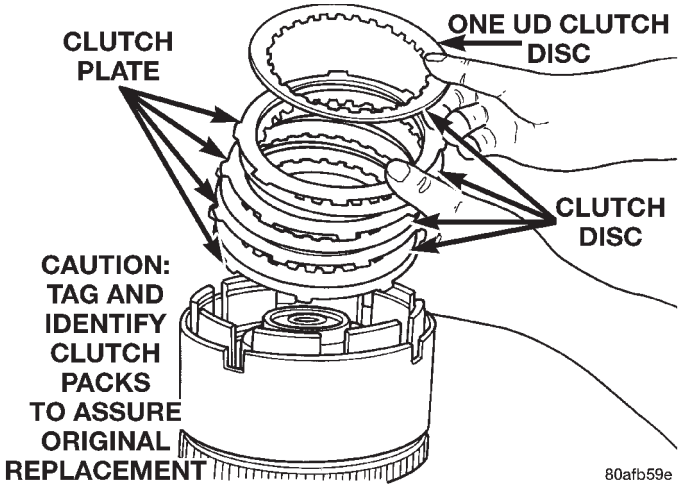


Fig. 181 Underdrive Clutch Pack

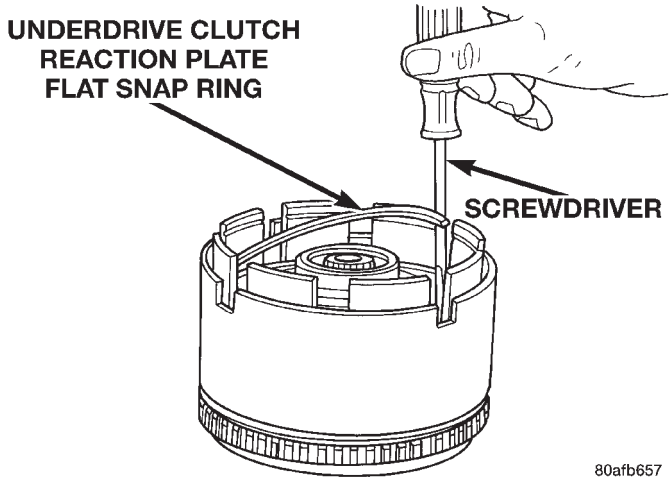


Fig. 182 UD Clutch Flat Snap Ring

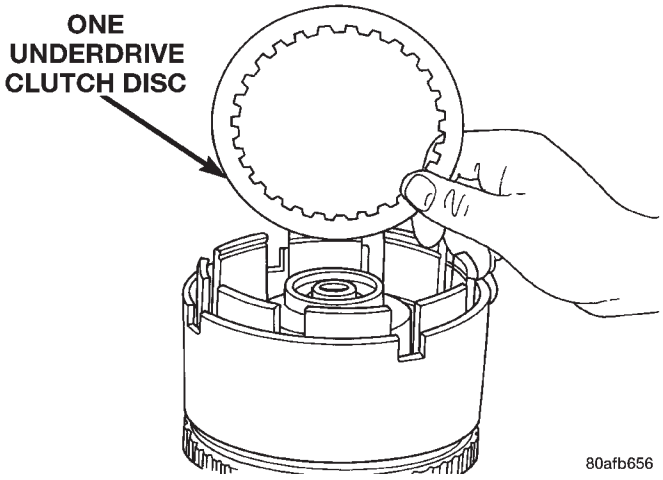


Fig. 183 Install Last UD Clutch Disc

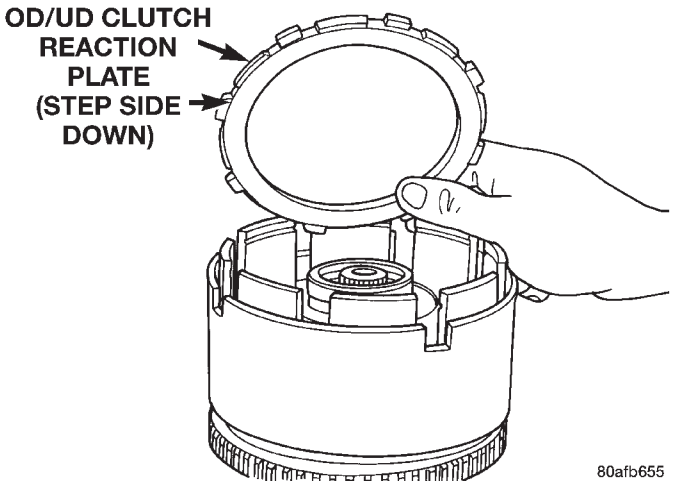


Fig. 184 OD/UD Reaction Plate

The OD/UD clutches reaction plate has a step on both sides. Install the OD/UD clutches reaction plate tapered step side up.

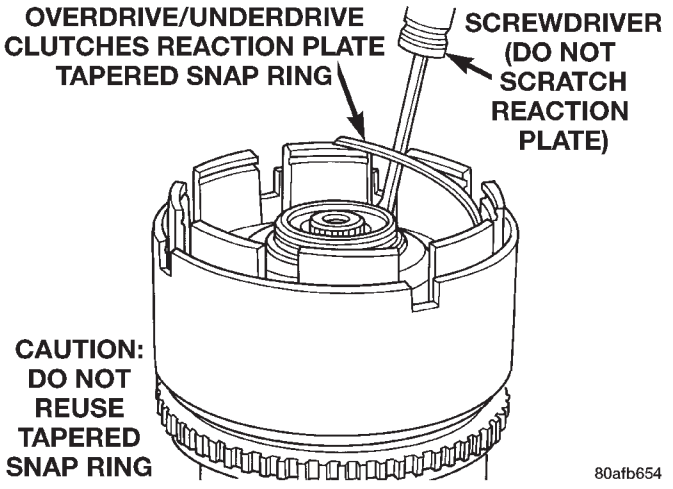


Fig. 185 Tapered Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Snap ring ends must be located within one finger of the input clutch hub. Be sure that snap ring is fully seated, by pushing with screwdriver, into snap ring groove all the way around.

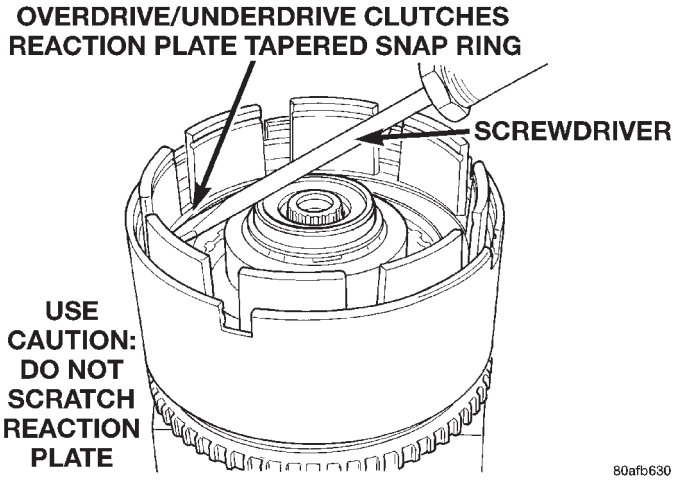


Fig. 186 Seating Tapered Snap Ring

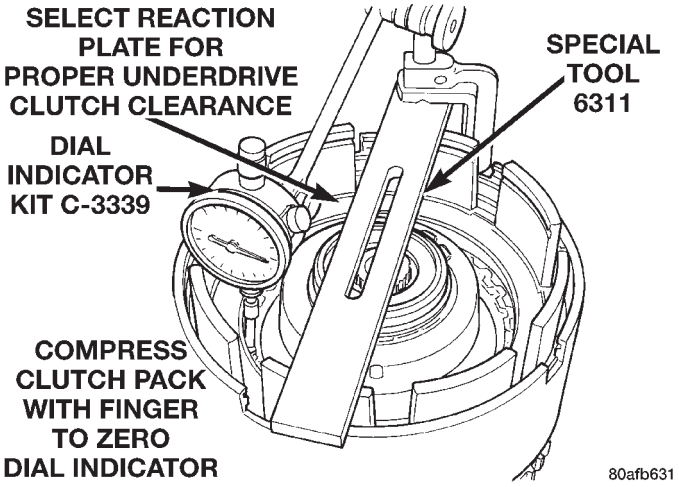


Fig. 187 Set Up Dial Indicator for Clutch Clearance

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

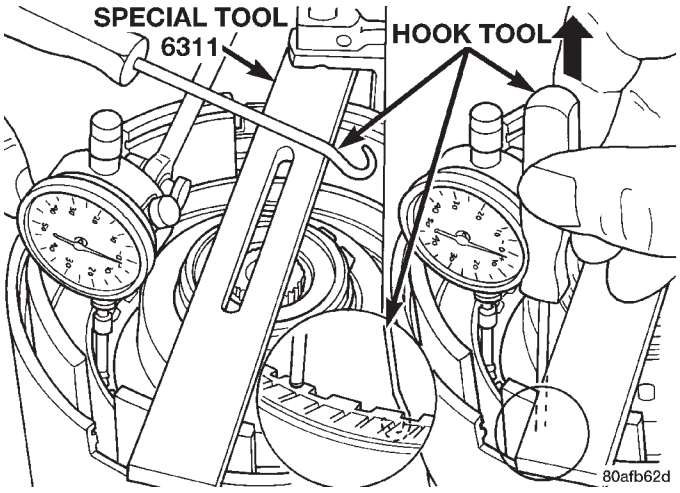


Fig. 188 Use Hook Tool to Raise One Clutch Disc

THICKNESS
6.99 mm (.275 in.)
6.50 mm (.256 in.)
6.01 mm (.237 in.)
5.52 mm (.217 in.)

9121-5

UNDERDRIVE REACTION PLATE CHART

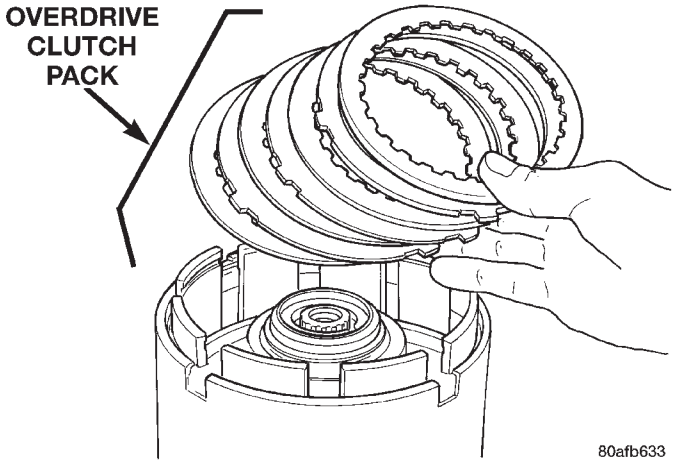


Fig. 189 Install OD Clutch Pack

DISASSEMBLY AND ASSEMBLY (Continued)

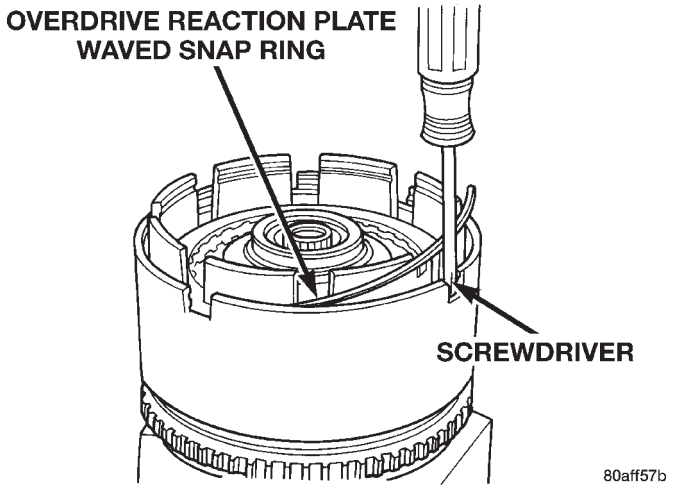


Fig. 190 Install Waved Snap Ring

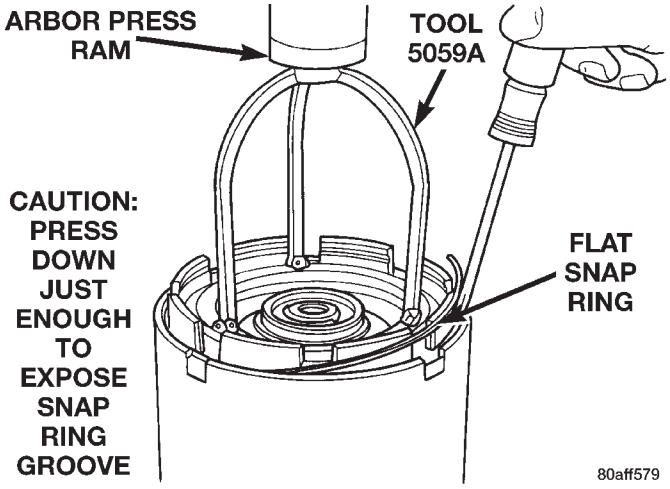


Fig. 193 Install Flat Snap Ring

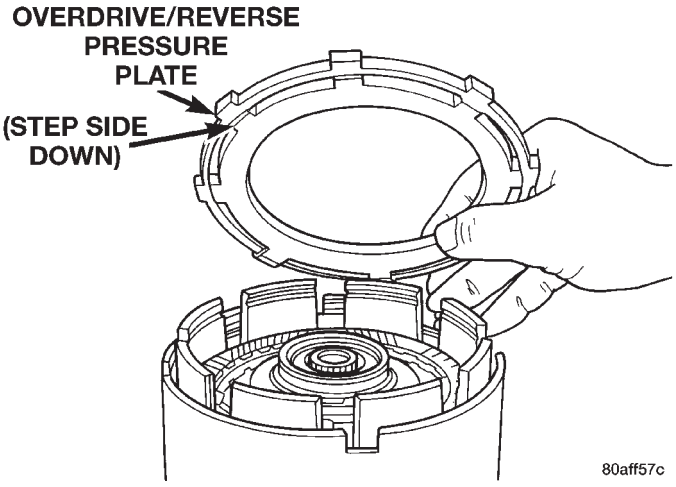


Fig. 191 OD/Reverse Pressure Plate

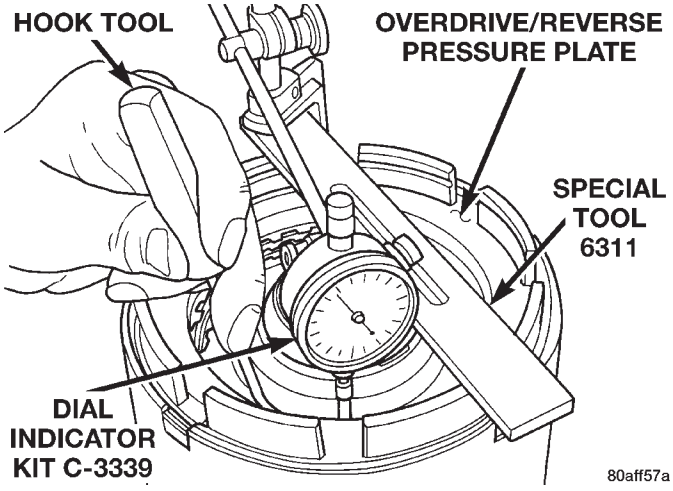


Fig. 194 Check OD Clutch Pack Clearance

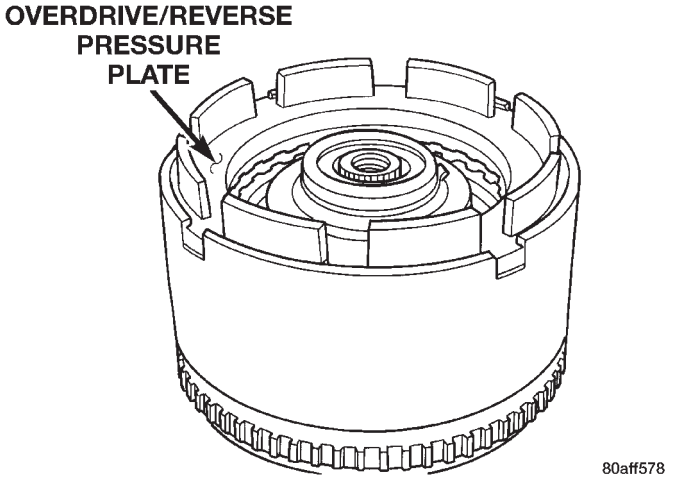


Fig. 192 Pressure Plate Installed

DISASSEMBLY AND ASSEMBLY (Continued)

The overdrive (OD) clutch pack clearance is 1.07 to 2.44 mm (.042 to .096 inch). If not within specifications, the clutch is not assembled properly. There is no adjustment for the OD clutch clearance.

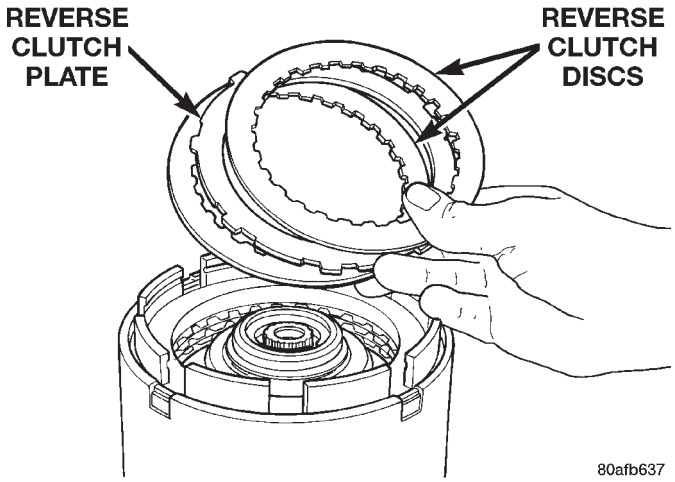


Fig. 195 Install Reverse Clutch Pack

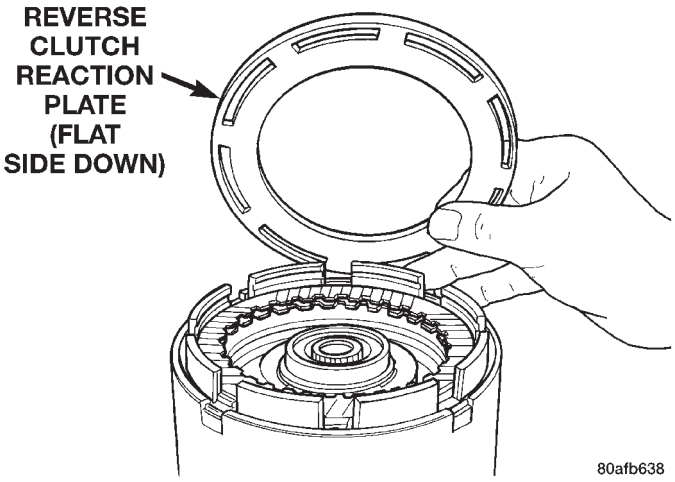


Fig. 196 Install Reaction Plate

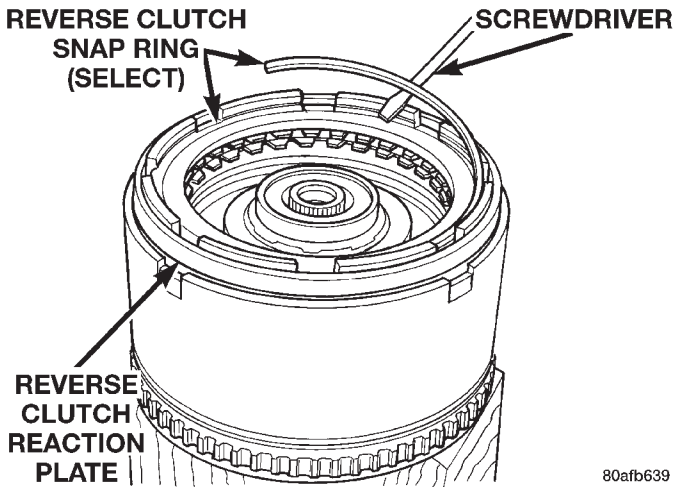


Fig. 197 Install Reverse Clutch Snap Ring

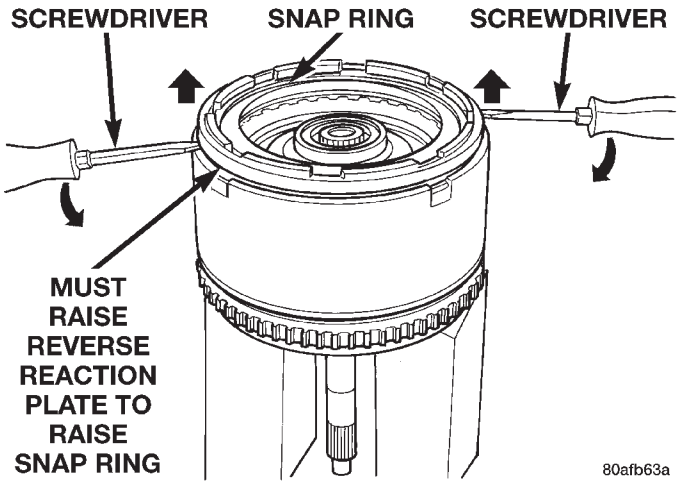


Fig. 198 Seating Snap Ring to Determine Reverse Clutch Clearance

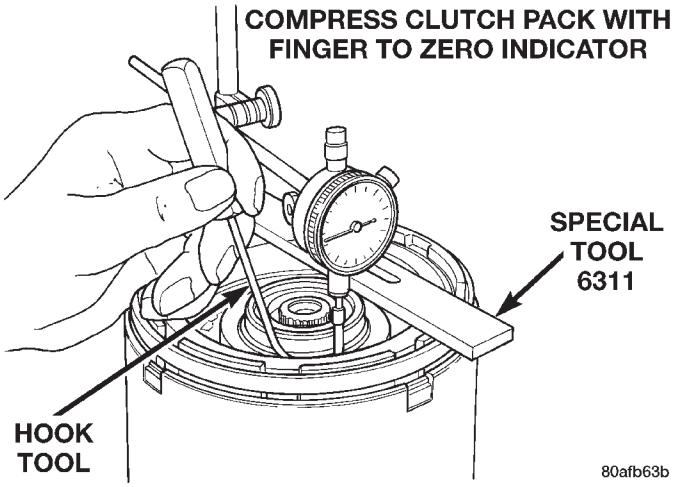


Fig. 199 Check Reverse Clutch Pack Clearance

DISASSEMBLY AND ASSEMBLY (Continued)

The reverse clutch pack clearance is 0.76 to 1.24 mm (.030 to .049 inch). Select the proper reverse clutch snap ring to achieve specifications:

THICKNESS
1.56 mm (.061 in.)
1.80 mm (.071 in.)
2.05 mm (.081 in.)
2.30 mm (.090 in.)

9121-6

REVERSE CLUTCH SNAP RING CHART

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

To complete the assembly of the input clutch retainer, the reverse clutch and the overdrive clutch must 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:

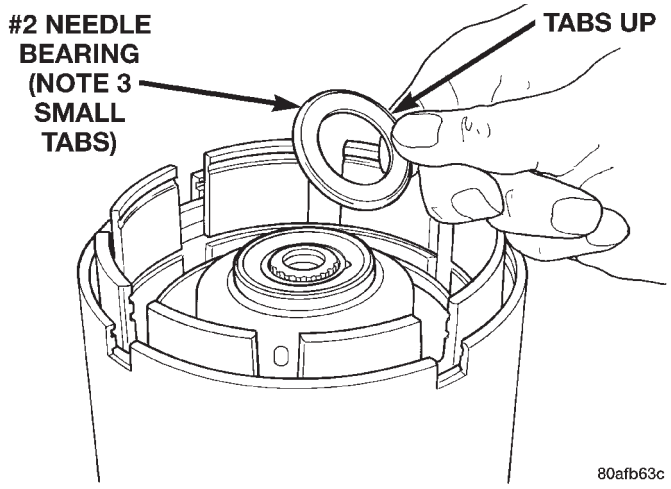


Fig. 200 Install No. 2 Needle Bearing

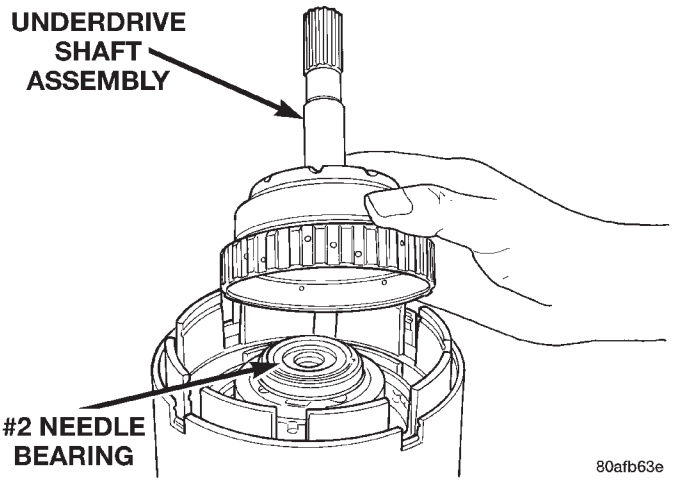


Fig. 201 Install Underdrive Shaft Assembly

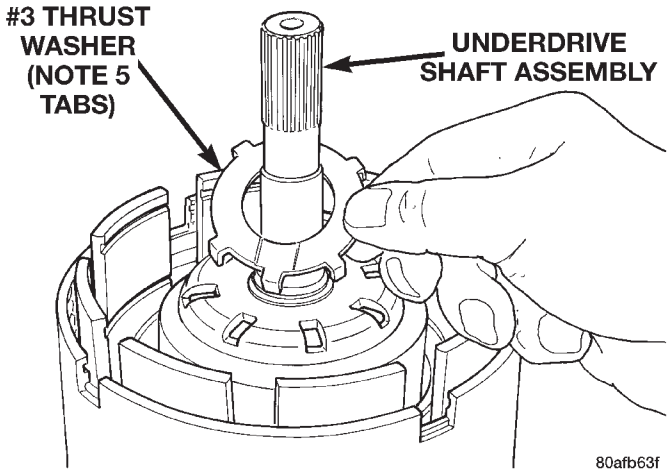


Fig. 202 Install No. 3 Thrust Washer

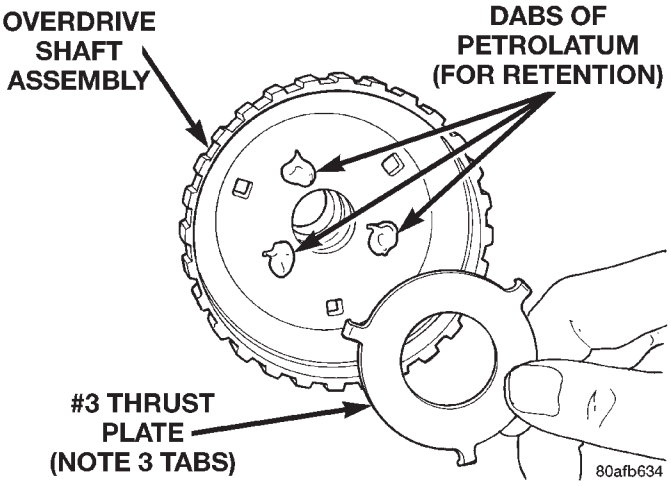


Fig. 203 Install No. 3 Thrust Plate

DISASSEMBLY AND ASSEMBLY (Continued)

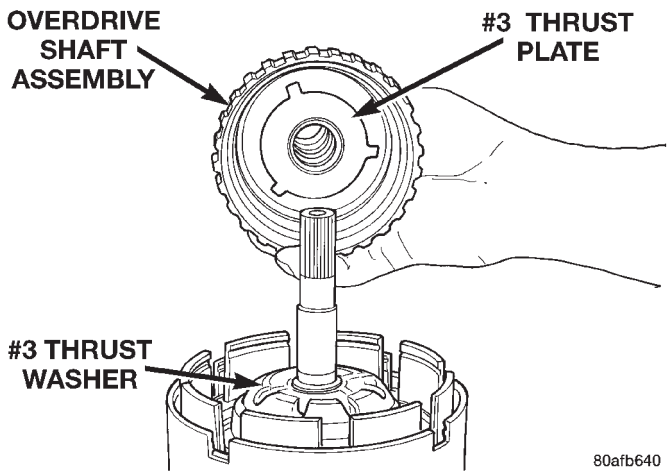


Fig. 204 Install Overdrive Shaft Assembly

Reinstall overdrive clutch and reverse clutch as shown. **Rechecking these clutch clearances is not necessary, as they were set and approved previously.**

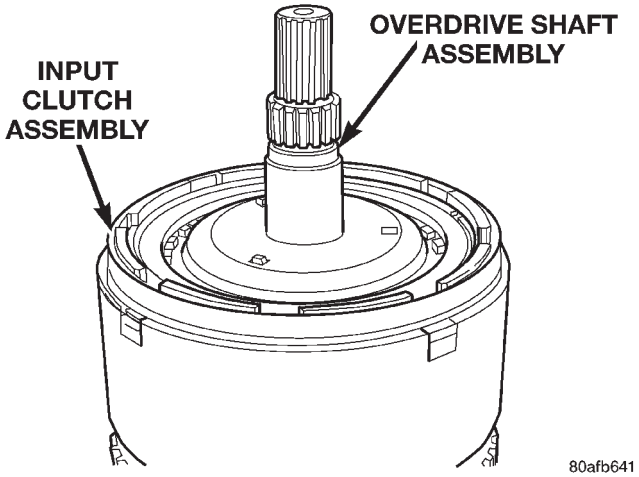


Fig. 205 Input Clutch Assembly

TRANSAXLE ASSEMBLE

To assemble the transaxle centerline, refer to the following procedures.

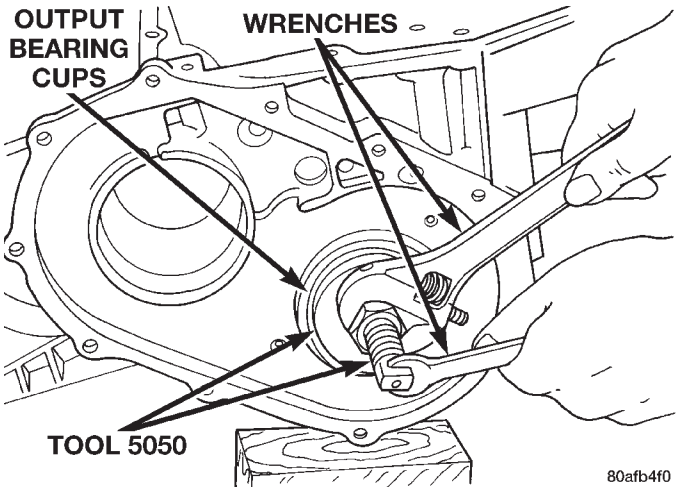


Fig. 206 Install Both Output Bearing Cups

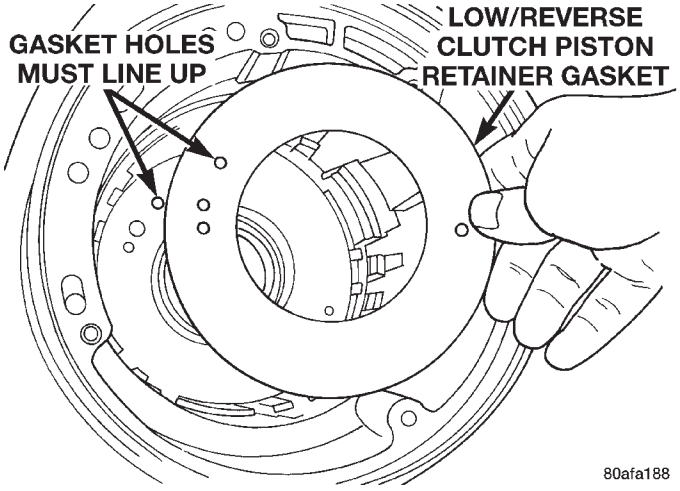


Fig. 207 Install Piston Retainer Gasket

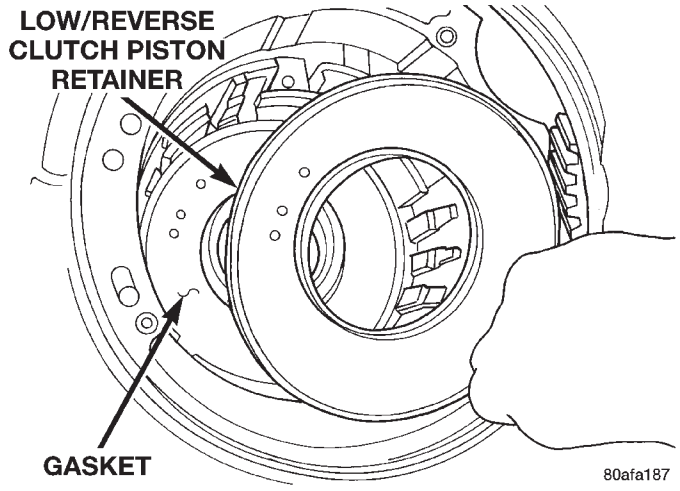


Fig. 208 Install Piston Retainer

DISASSEMBLY AND ASSEMBLY (Continued)

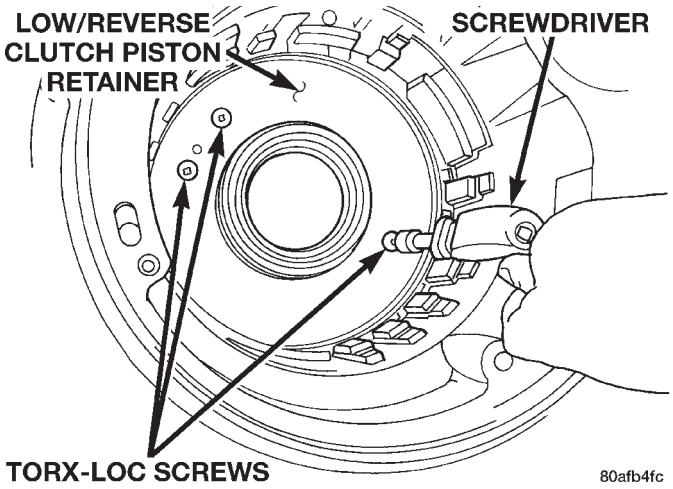


Fig. 209 Install Retainer Attaching Screws

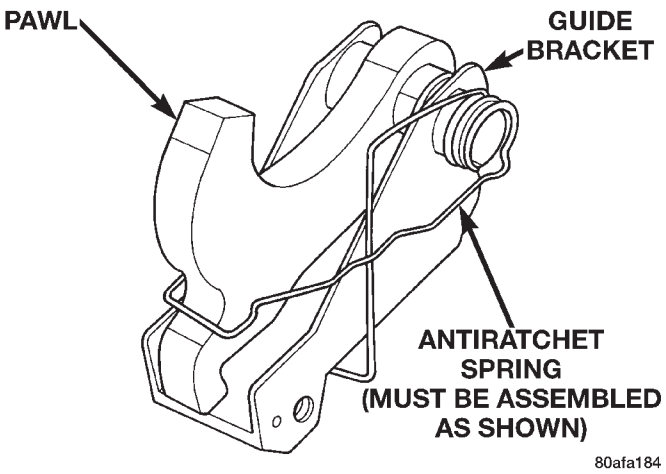


Fig. 212 Guide Bracket

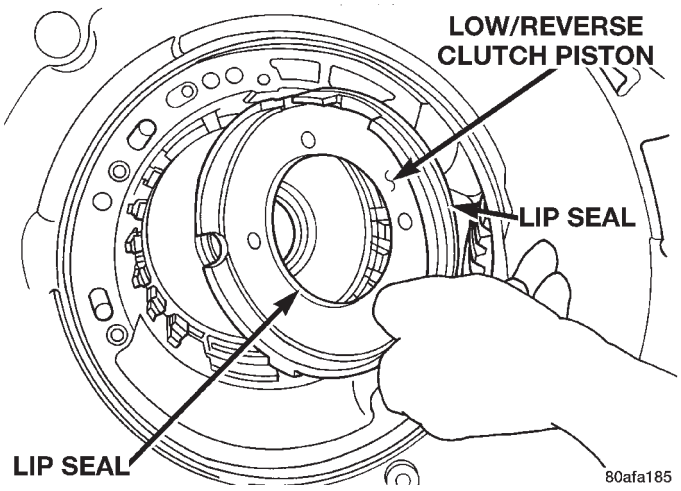


Fig. 210 Install Low/Reverse Clutch Piston

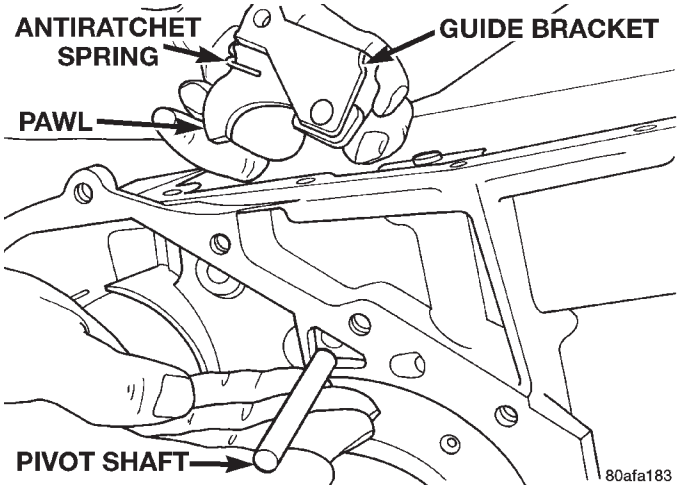


Fig. 213 Pivot Shaft and Guide Bracket

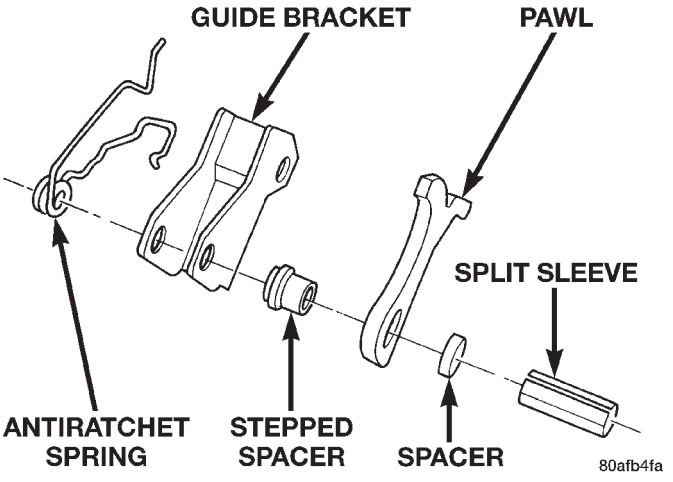


Fig. 211 Guide Bracket Disassembled

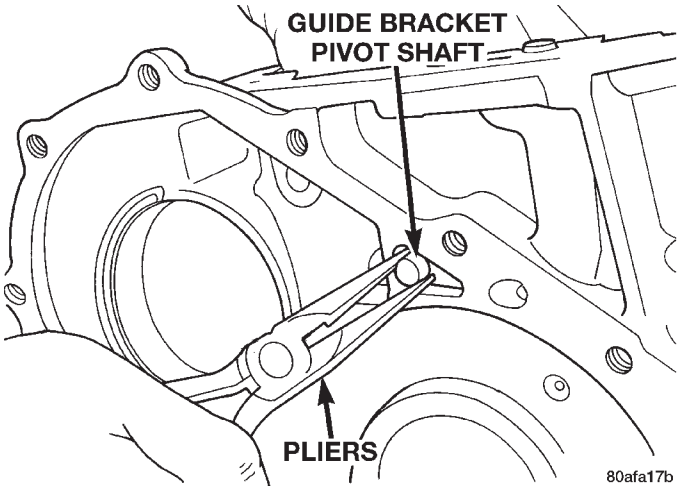


Fig. 214 Install Guide Bracket Pivot Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

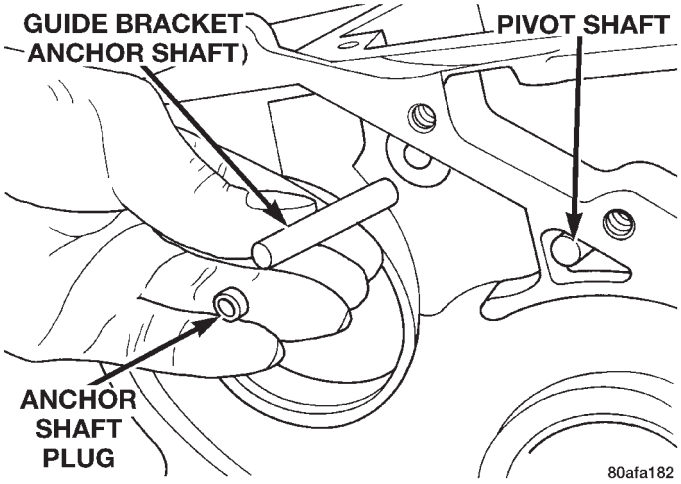


Fig. 215 Install Anchor Shaft and Plug

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

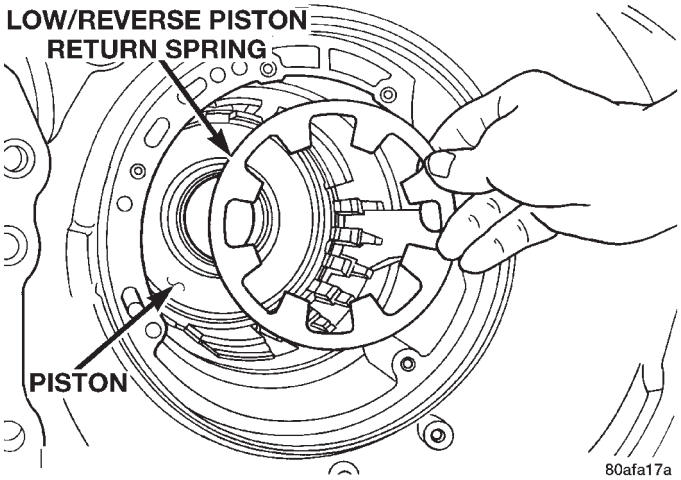


Fig. 216 Install Low/Reverse Piston Return Spring

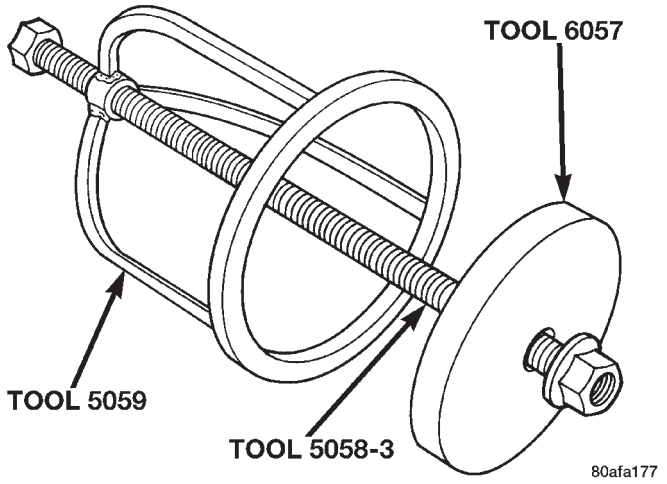


Fig. 217 Low/Reverse Spring Compressor Tool

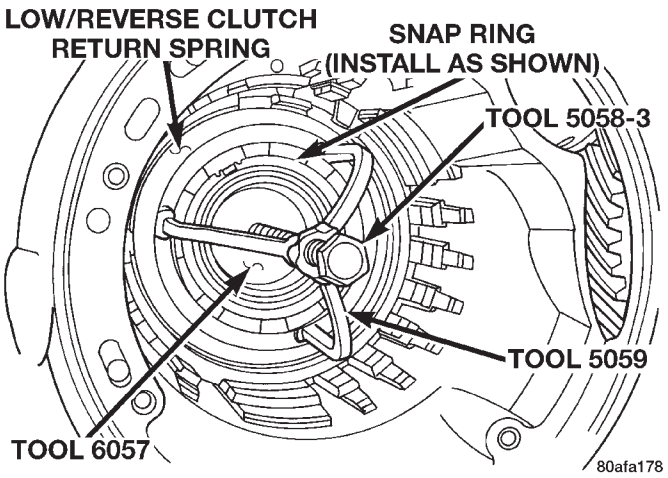


Fig. 218 Compressor Tool in Use

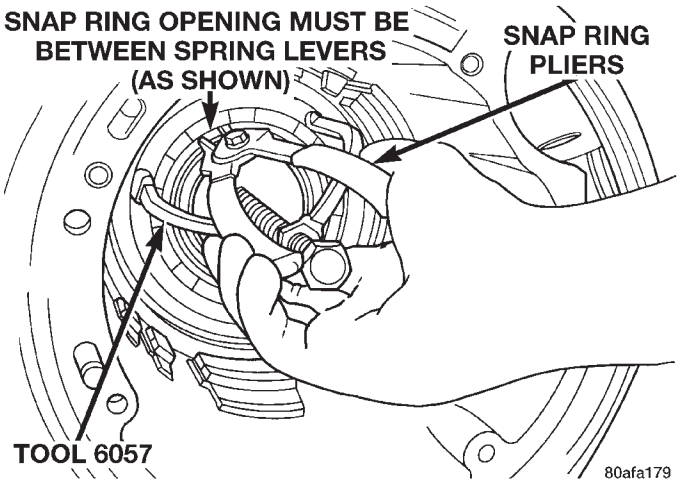


Fig. 219 Install Snap Ring

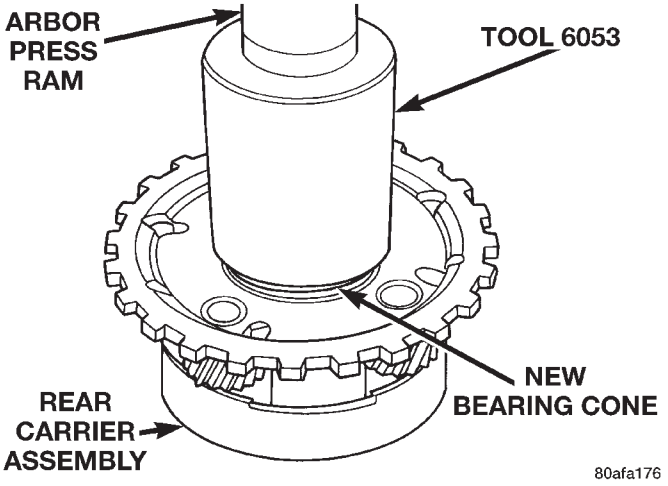


Fig. 220 Install Rear Carrier Bearing Cone

DISASSEMBLY AND ASSEMBLY (Continued)

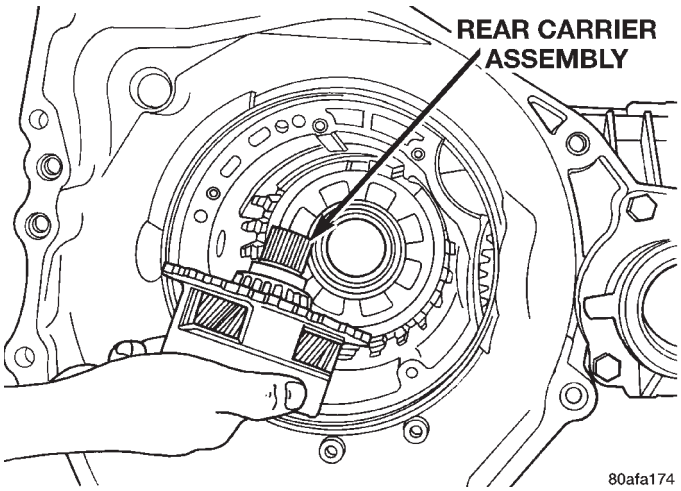


Fig. 221 Install Rear Carrier Assembly

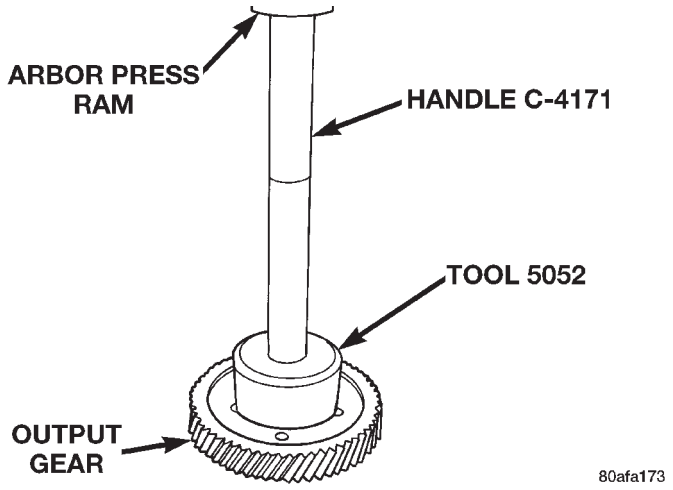


Fig. 222 Install Output Gear Bearing Cone

OUTPUT GEAR BEARING ADJUSTMENT

(1) With output gear removed: install a 4.50 mm (0.177 inch) gauging shim on the rear carrier assembly hub, using grease to hold the shim in place.

(2) Using Tool 6259, install output gear and bearing assembly. Torque to 271 N·m (200 ft. lbs.).

To measure bearing end play:

(3) Attach Tool L-4432 to the gear.

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

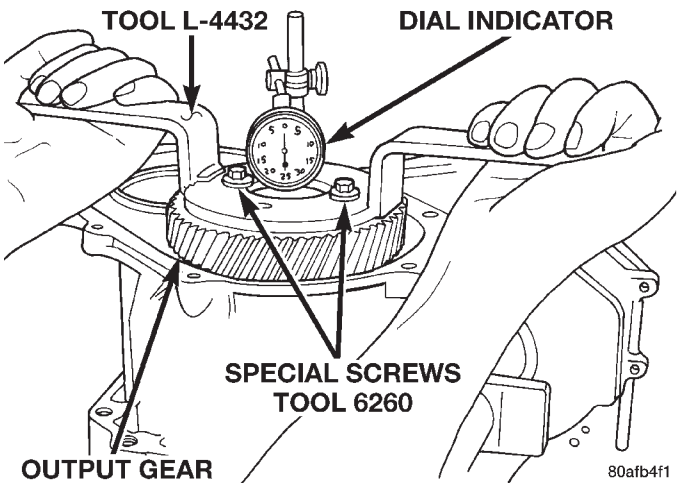


Fig. 223 Checking Output Gear Bearings End Play

(5) Using a dial indicator, mounted to the transaxle case, measure output gear end play (Fig. 223).

DISASSEMBLY AND ASSEMBLY (Continued)

OUTPUT GEAR BEARING SHIM CHART

End Play	Shim Needed	Part Number		End Play	Shim Needed	Part Number
.05mm .002 in.	4.42mm .174 in.	4412830		.53mm .021 in.	3.94mm .155 in.	4412818
.08mm .003 in.	4.38mm .172 in.	4412829		.56mm .022 in.	3.90mm .154 in.	4412817
.10mm .004 in.	4.38mm .172 in.	4412829		.58mm .023 in.	3.90mm .154 in.	4412817
.13mm .005 in.	4.34mm .171 in.	4412828		.61mm .024 in.	3.86mm .152 in.	4412816
.15mm .006 in.	4.30mm .169 in.	4412827		.64mm .025 in.	3.82mm .150 in.	4412815
.18mm .007 in.	4.30mm .169 in.	4412827		.66mm .026 in.	3.82mm .150 in.	4412815
.20mm .008 in.	4.26mm .168 in.	4412826		.69mm .027 in.	3.78mm .149 in.	4412814
.23mm .009 in.	4.22mm .166 in.	4412825		.71mm .028 in.	3.74mm .147 in.	4412813
.25mm .010 in.	4.22mm .166 in.	4412825		.74mm .029 in.	3.74mm .147 in.	4412813
.28mm .011 in.	4.18mm .165 in.	4412824		.76mm .030 in.	3.70mm .146 in.	4412812
.30mm .012 in.	4.14mm .163 in.	4412823		.79mm .031 in.	3.66mm .144 in.	4412811
.33mm .013 in.	4.14mm .163 in.	4412823		.81mm .032 in.	3.66mm .144 in.	4412811
.36mm .014 in.	4.10mm .161 in.	4412822		.84mm .033 in.	3.62mm .143 in.	4412810
.38mm .015 in.	4.10mm .161 in.	4412822		.86mm .034 in.	3.62mm .143 in.	4412810
.41mm .016 in.	4.06mm .160 in.	4412821		.89mm .035 in.	3.58mm .141 in.	4412809
.43mm .017 in.	4.02mm .158 in.	4412820		.91mm .036in.	3.54mm .139 in.	4412808
.46mm .018 in.	4.02mm .158 in.	4412820		.94mm .037 in.	3.54mm .139 in.	4412808
.48mm .019 in.	3.98mm .157 in.	4412819		.97mm .038 in.	3.50mm .138 in.	4412807
.51mm .020 in.	3.94mm .155 in.	4412818				

(6) Refer to the output gear bearing shim chart for the required shim to obtain proper bearing setting.

(7) Use Tool 6259 to remove the retaining bolt and washer. To remove the output gear, use Tool L-4407.

(8) Remove the gauging shim and install the proper shim (Fig. 224). Use grease to hold the shim in place. Install the output gear and bearing assembly (Fig. 225).

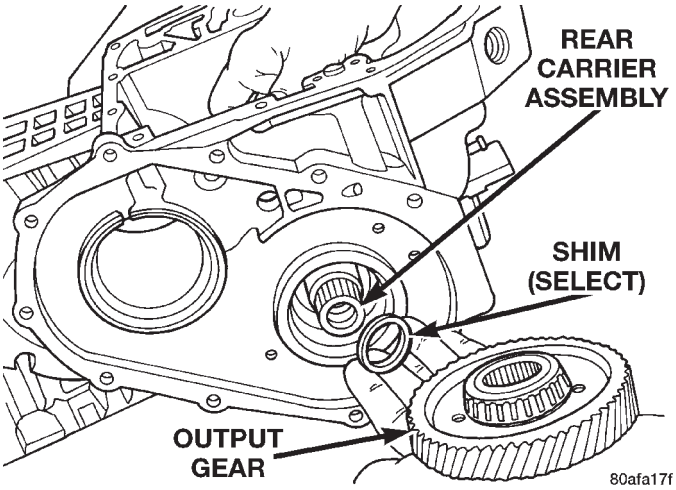


Fig. 224 Output Gear and (Select) Shim

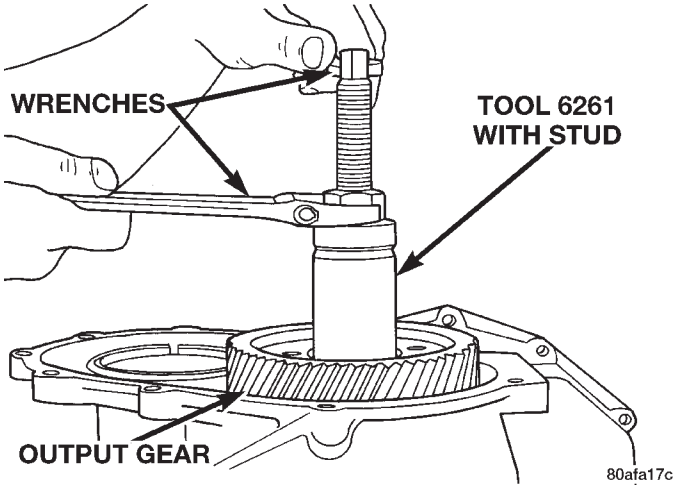


Fig. 225 Install Output Gear

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Always use new retaining bolt, old retaining bolt may not be reused.

(9) Install the new retaining bolt and washer (Fig. 226). Tighten to 271 N·m (200 ft. lbs.) (Fig. 227).

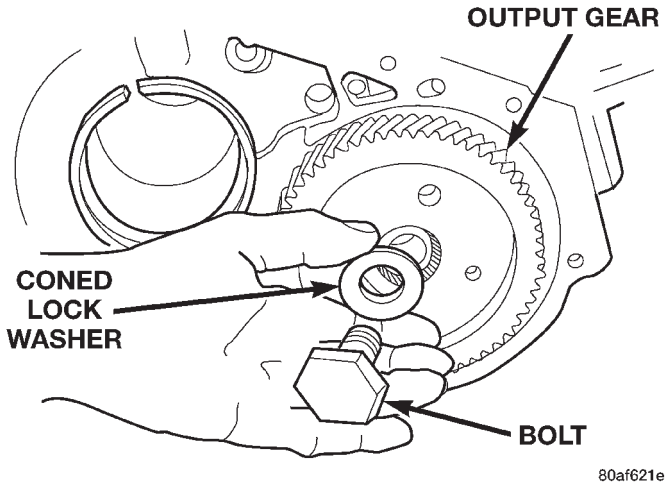


Fig. 226 Install Output Gear Bolt and Washer

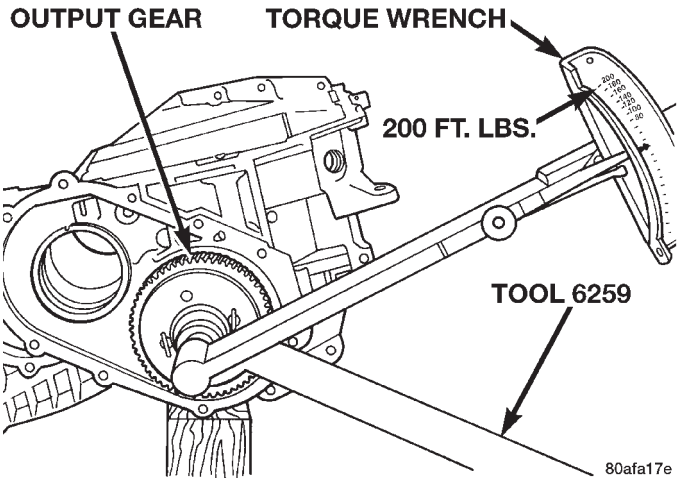


Fig. 227 Tighten Output Gear to 271 N·m (200 ft. lbs.)

(10) Using an inch-pound torque wrench, check the turning torque (Fig. 228). **The torque should be between 3 and 8 inch-pounds.**

If the turning torque is too high, install a .04 mm (.0016 inch) thicker shim. If the turning torque is too low, install a .04 mm (.0016 inch) thinner shim. Repeat until the proper turning torque is 3 to 8 inch pounds.

NOTE: Install output gear stirrup and strap bolts.

All transaxles utilize a stirrup and retaining strap that is attached to the output gear. The stirrup prevents the output gear retaining bolt from turning and backing out of the rear carrier. The strap is used to hold the stirrup to the output gear and prevent the stirrup retaining bolts from backing out.

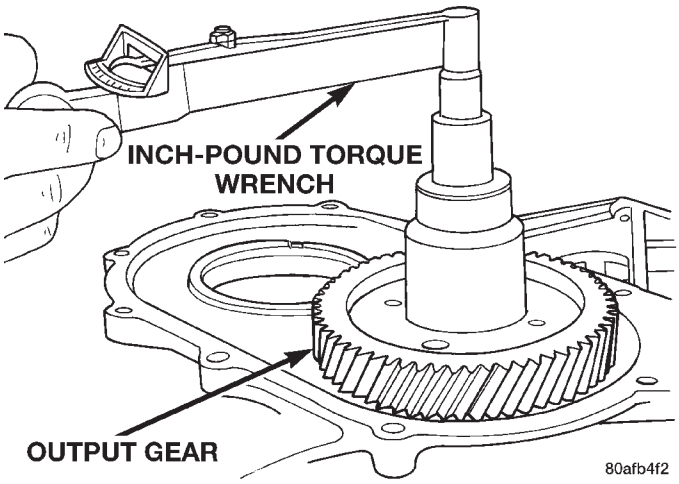


Fig. 228 Check Output Gear Bearings Turning Torque

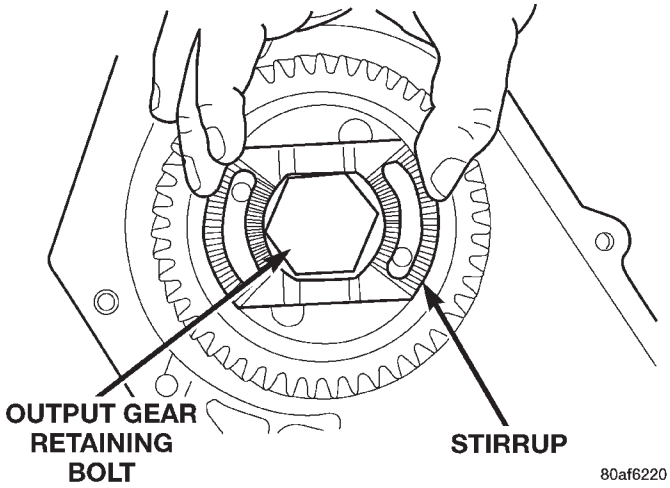


Fig. 229 Output Gear Retaining Bolt Stirrup (Serration Side Out)

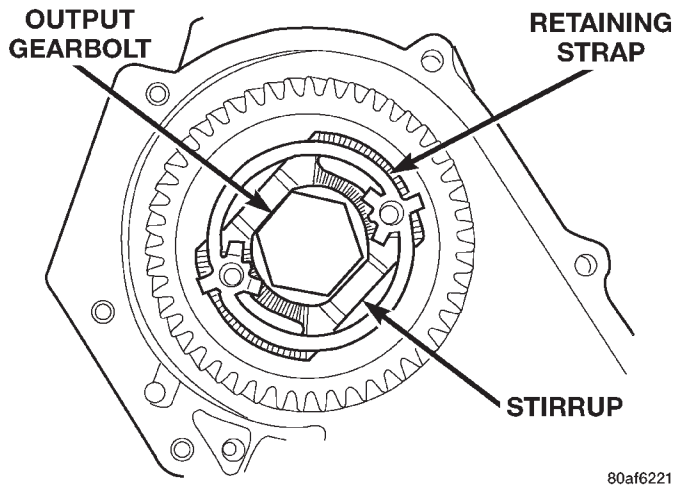


Fig. 230 Stirrup Strap (Align Strap Holes With Tapped Gear Holes)

DISASSEMBLY AND ASSEMBLY (Continued)

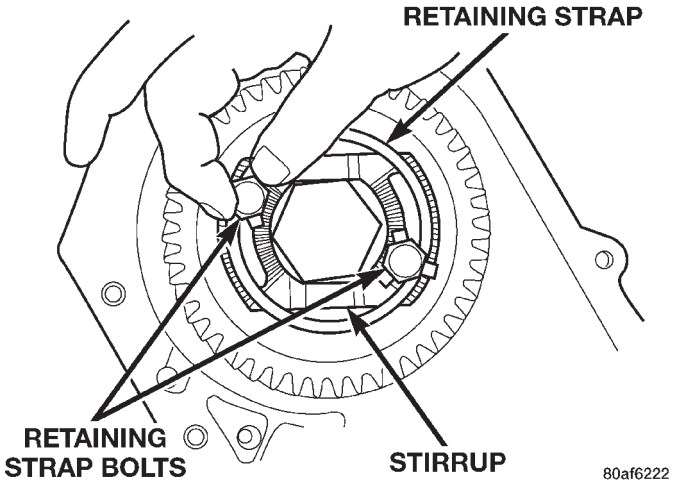


Fig. 231 Install Strap Bolts

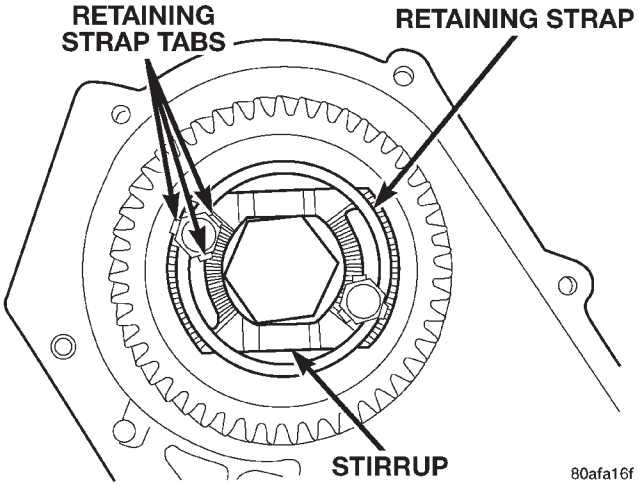


Fig. 234 Bend Tabs On Strap Up Against Flats Of Bolts

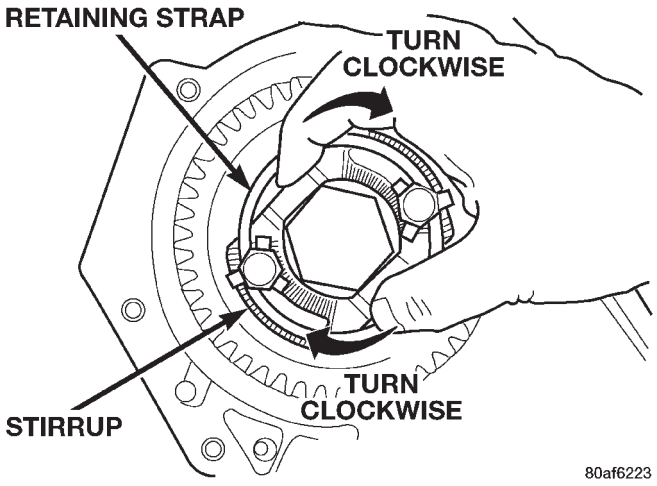


Fig. 232 Turn Stirrup Clockwise Against Flats Of Output Gear Retaining Bolt

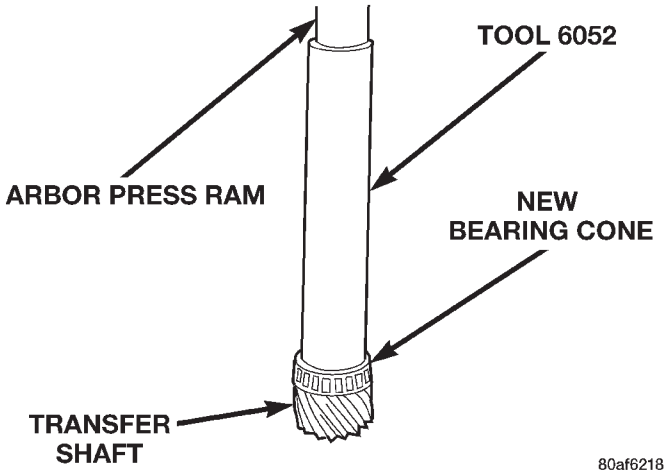


Fig. 235 Install Transfer Shaft Bearing Cone

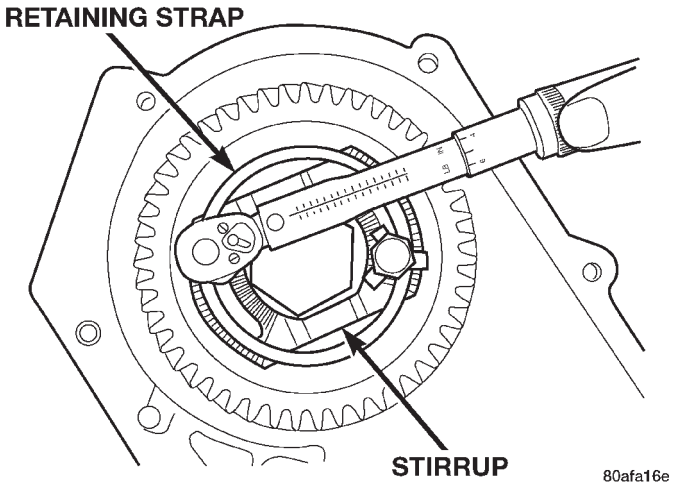


Fig. 233 Tighten Stirrup Strap Bolts To 23 N·m (200 in. lbs.)

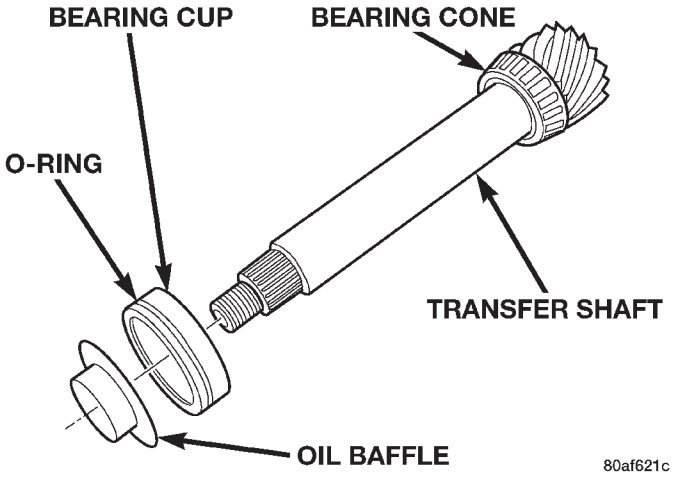


Fig. 236 Install Bearing Cup To Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Screw Tool 5049-A onto transfer shaft. Install transfer shaft.

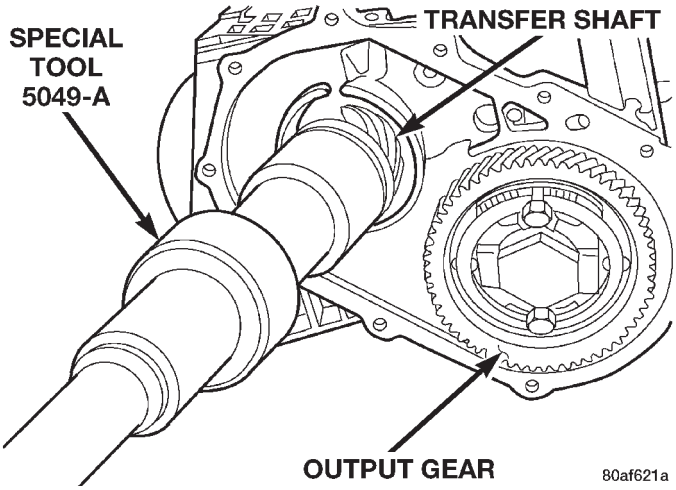


Fig. 237 Install Transfer Shaft

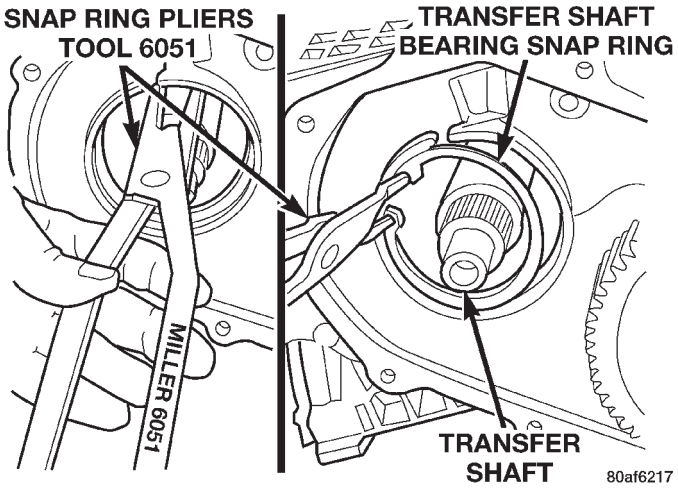


Fig. 238 Install Transfer Shaft Bearing Snap Ring

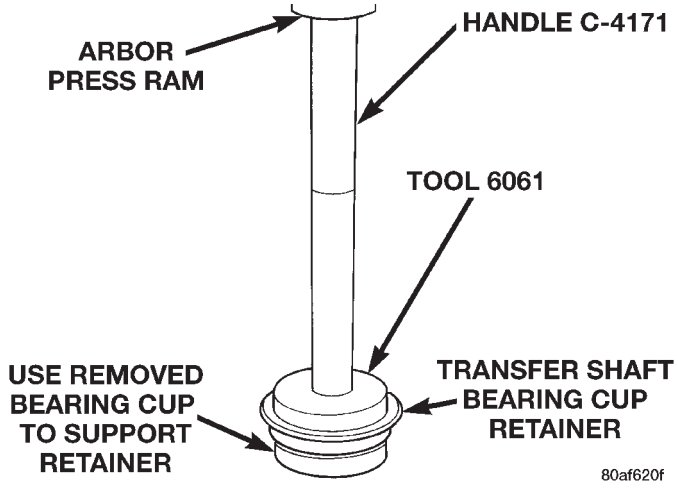


Fig. 239 Install Transfer Shaft Bearing Cup Into Retainer

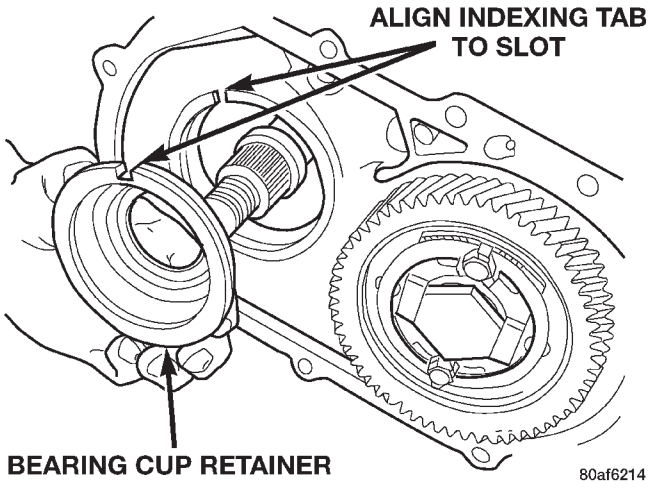


Fig. 240 Install Bearing Cup Retainer

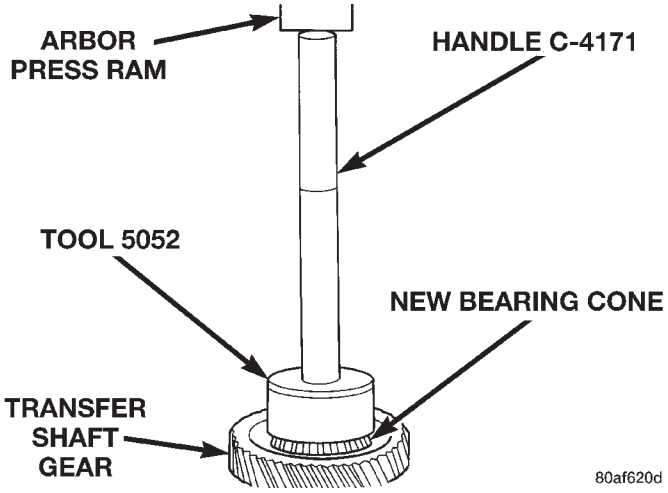


Fig. 241 Install Transfer Gear Bearing Cone

TRANSFER SHAFT BEARING

(1) Install a 4.66 mm (.184 inch) gauging shim on the transfer shaft.

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

To measure bearing end play:

- Attach Tool L-4432 to the transfer gear.
- Mount a steel ball with grease into the end of the transfer shaft.
- Push and pull the gear while rotating back and forth to insure seating of the bearing rollers.
- Using a dial indicator, measure transfer shaft end play.

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

(4) Use Tool 6259 to remove the retaining nut and washer. Remove the transfer shaft gear using Tool L-4407.

DISASSEMBLY AND ASSEMBLY (Continued)

TRANSFER SHAFT BEARING SHIM CHART

End Play	Shim Needed	Part Number		End Play	Shim Needed	Part Number
.05mm .002 in.	4.66mm .183 in.	4505588		.76mm .030 in.	3.94mm .155 in.	4412818
.08mm .003 in.	4.62mm .182 in.	4412835		.79mm .031 in.	3.90mm .154 in.	4412817
.10mm .004 in.	4.58mm .180 in.	4412834		.81mm .032 in.	3.90mm .154 in.	4412817
.13mm .005 in.	4.58mm .180 in.	4412834		.84mm .033 in.	3.86mm .152 in.	4412816
.15mm .006 in.	4.54mm .178 in.	4412833		.86mm .034 in.	3.82mm .150 in.	4412815
.18mm .007 in.	4.50mm .177 in.	4412832		.89mm .035 in.	3.82mm .150 in.	4412815
.20mm .008 in.	4.50mm .177 in.	4412832		.91mm .036 in.	3.78mm .149 in.	4412814
.23mm .009 in.	4.46mm .175 in.	4412831		.94mm .037 in.	3.74mm .147 in.	4412813
.25mm .010 in.	4.46mm .175 in.	4412831		.97mm .038 in.	3.74mm .147 in.	4412813
.28mm .011 in.	4.42mm .174 in.	4412830		.99mm .039 in.	3.70mm .146 in.	4412812
.30mm .012 in.	4.38mm .172 in.	4412829		1.02mm .040 in.	3.66mm .144 in.	4412811
.33mm .013 in.	4.38mm .172 in.	4412829		1.04mm .041 in.	3.66mm .144 in.	4412811
.36mm .014 in.	4.34mm .171 in.	4412828		1.07mm .042 in.	3.62mm .143 in.	4412810
.38mm .015 in.	4.30mm .169 in.	4412827		1.08mm .043 in.	3.62mm .143 in.	4412810
.41mm .016 in.	4.30mm .169 in.	4412827		1.12mm .044 in.	3.58mm .141 in.	4412809
.43mm .017 in.	4.26mm .168 in.	4412826		1.14mm .045 in.	3.54mm .139 in.	4412808
.46mm .018 in.	4.22mm .166 in.	4412825		1.17mm .046 in.	3.54mm .139 in.	4412808
.48mm .019 in.	4.22mm .166 in.	4412825		1.19mm .047 in.	3.50mm .138 in.	4412807
.50mm .020 in.	4.18mm .165 in.	4412824		1.22mm .048 in.	3.46mm .136 in.	4412806
.53mm .021 in.	4.18mm .165 in.	4412824		1.24mm .049 in.	3.46mm .136 in.	4412806
.56mm .022 in.	4.14mm .163 in.	4412823		1.27mm .050 in.	3.42mm .135 in.	4412805
.58mm .023 in.	4.10mm .161 in.	4412822		1.30mm .051 in.	3.38mm .133 in.	4412804
.61mm .024 in.	4.10mm .161 in.	4412822		1.32mm .052 in.	3.38mm .133 in.	4412804
.64mm .025 in.	4.06mm .160 in.	4412821		1.35mm .053 in.	3.34mm .132 in.	4412803
.66mm .026 in.	4.02mm .158 in.	4412820		1.37mm .054 in.	3.34mm .132 in.	4412803
.69mm .027 in.	4.02mm .158 in.	4412820		1.40mm .055 in.	3.30mm .130 in.	4412802
.71mm .028 in.	3.98mm .157 in.	4412819		1.45mm .057 in	3.26mm .128 in.	4412801
.74mm .029 in.	3.94mm .155 in.	4412818		1.47mm .058 in.	2.22mm .127 in.	4505570

DISASSEMBLY AND ASSEMBLY (Continued)

(5) Remove the gauging shim and install the correct shim (Fig. 242). Install the transfer gear and bearing assembly (Fig. 243).

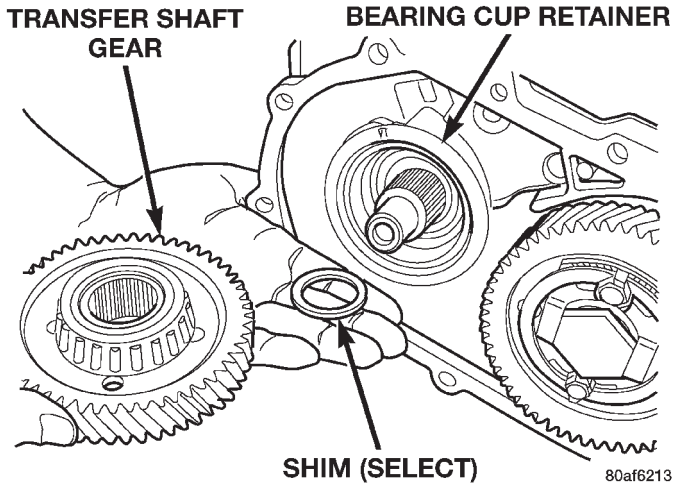


Fig. 242 Transfer Shaft Gear and (Select) Shim

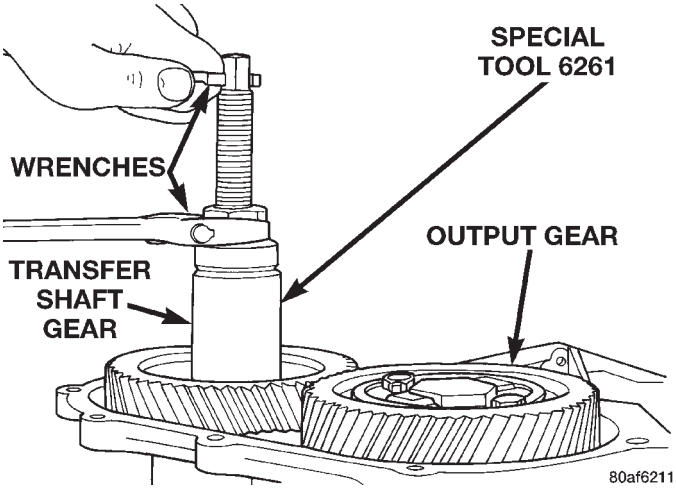


Fig. 243 Install Transfer Shaft Gear

CAUTION: Original retaining nut may not be reused. Always use a new retaining nut when reassembling.

(6) Install the new retaining nut and washer and torque to 271 N·m (200 ft. lbs.) (Fig. 244). **Measure transfer shaft end play, end play should be .05 to .10 mm (.002 to .004 inch).**

(7) Measure bearing end play as outlined in . End play should be between .05 mm and .10 mm (.002 to .004 inch).

NOTE: If end play is too high, install a .04 mm (.0016 inch) thinner shim. If end play is too low, install a .04 mm (.0016 inch) thicker shim combination. Repeat until .05 to .10 mm (.002 to .004 inch) end play is obtained.

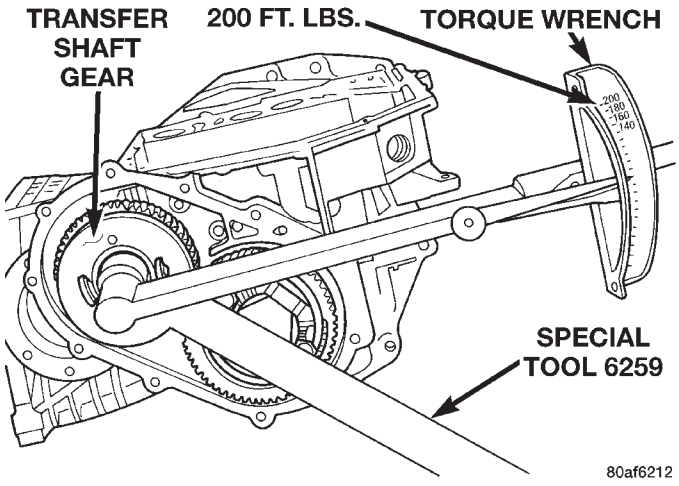


Fig. 244 Tighten Nut to 271 N·m (200 ft. lbs.)

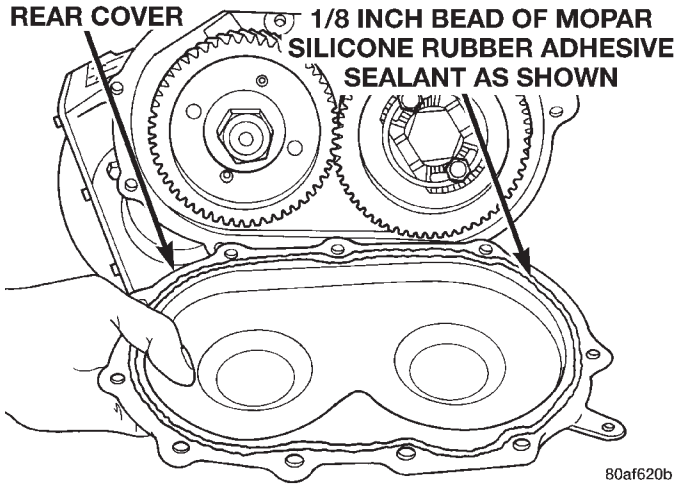


Fig. 245 Install Rear Cover

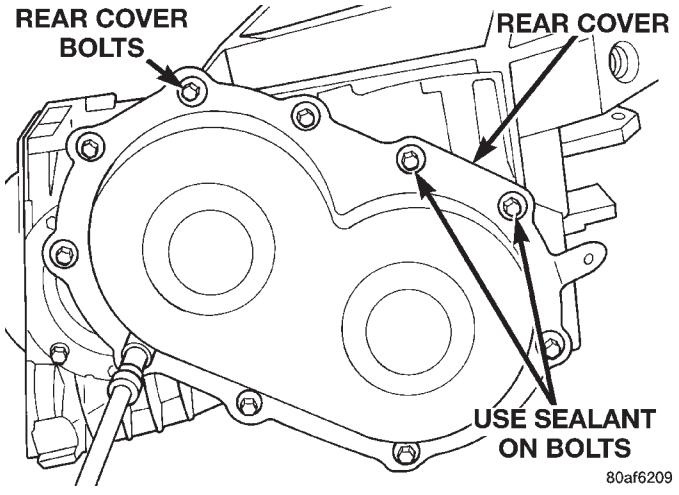


Fig. 246 Install Rear Cover Bolts

NOTE: Install the low/reverse reaction plate stepped side up.

DISASSEMBLY AND ASSEMBLY (Continued)

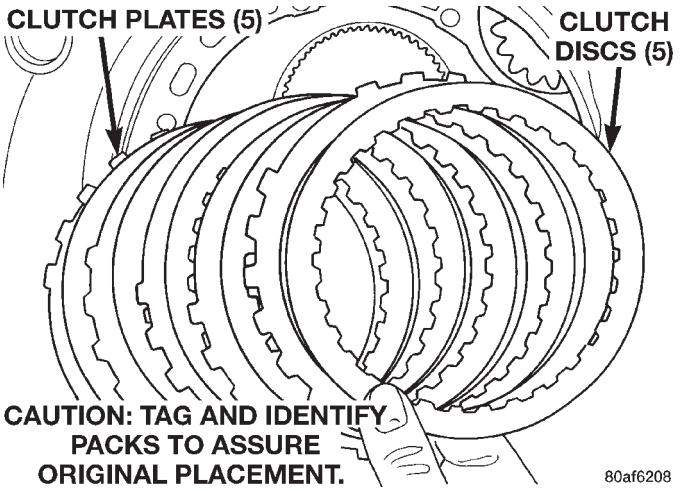


Fig. 247 Install Low/Reverse Clutch Pack

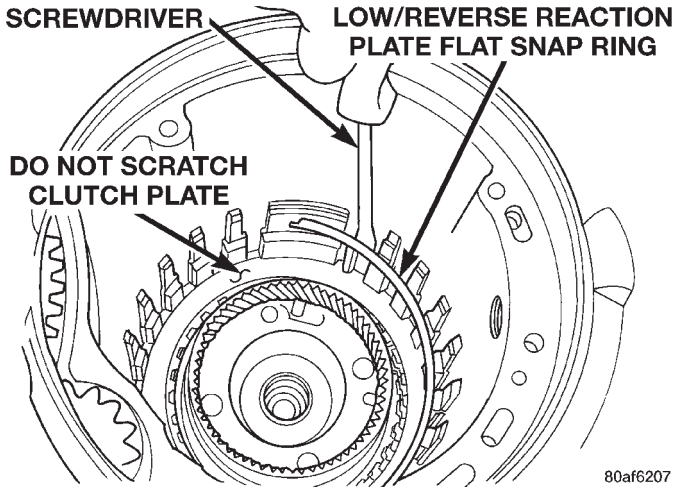


Fig. 248 Install Low/Reverse Reaction Plate Snap Ring

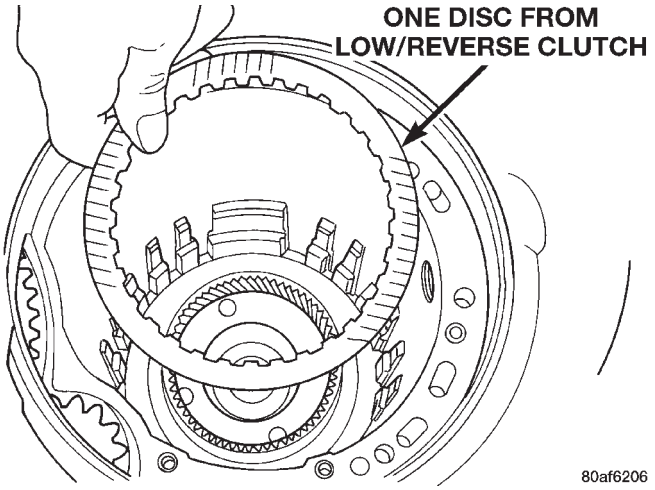


Fig. 249 Install One Disc

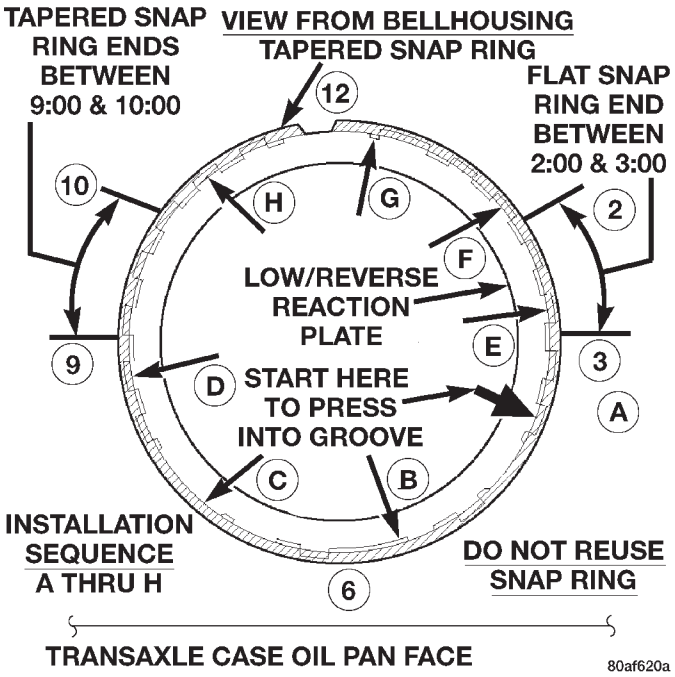


Fig. 250 Tapered Snap Ring Instructions

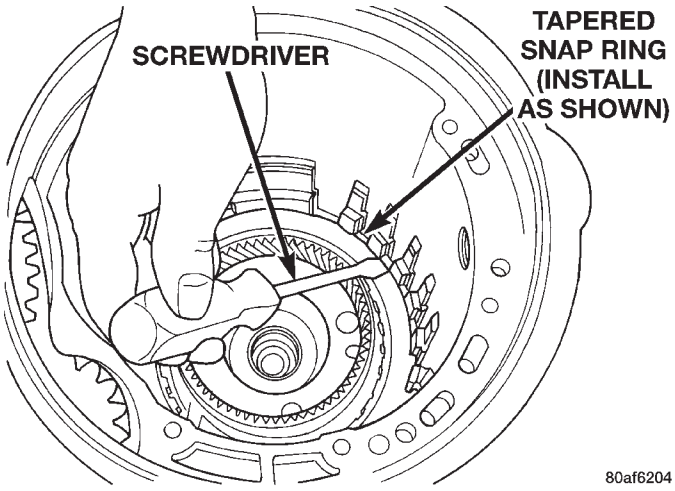


Fig. 251 Snap Ring Installed

DISASSEMBLY AND ASSEMBLY (Continued)

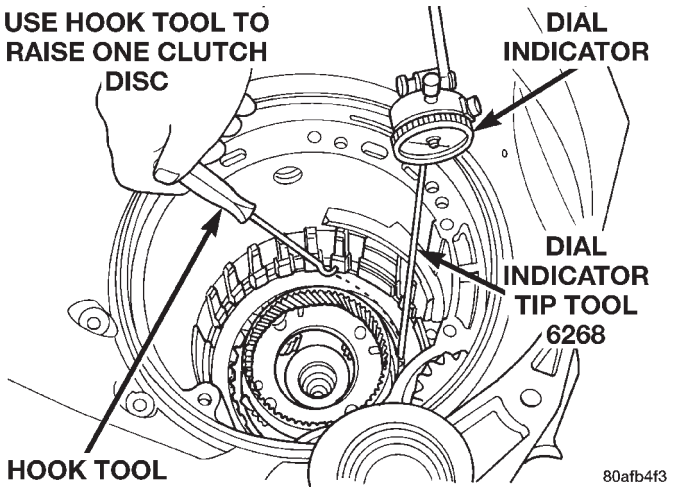


Fig. 252 Check Low/Reverse Clutch Clearance

Press down clutch pack with finger and zero dial indicator. **Low/Reverse clutch pack clearance is 0.89 to 1.04 (.035 to .042 inch).**

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

LOW/REVERSE REACTION PLATE CHART

PART NUMBER	THICKNESS
4567893	6.92mm (.273 in.)
4567899	6.66mm (.262 in.)
4567898	6.40mm (.252 in.)
4567897	6.14mm (.242 in.)
4567896	5.88mm (.232 in.)
4567895	5.62mm (.221 in.)
4567894	5.36mm (.211 in.)

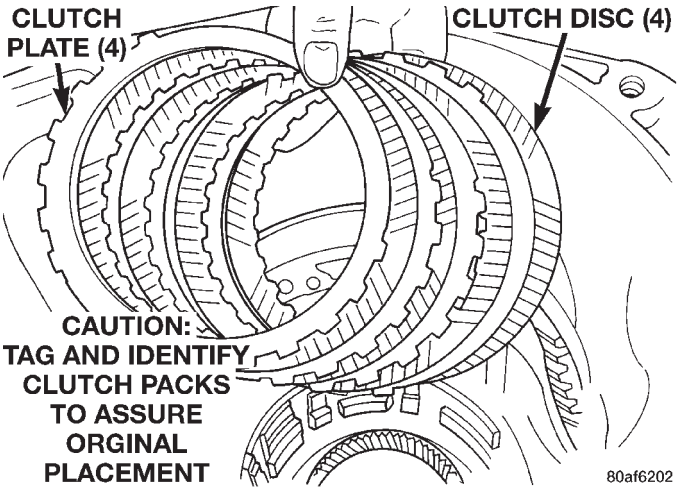


Fig. 253 Install 2/4 Clutch Pack

NOTE: When installing the 2-4 clutch plates and discs, the orientation should be alternated so the pilot pads of adjacent plates do not align, refer to (Fig. 254).

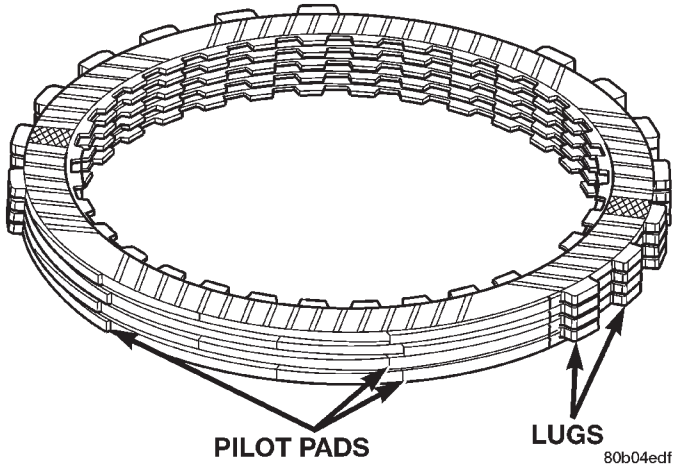


Fig. 254 Stagger 2/4 Clutch Plate Pads

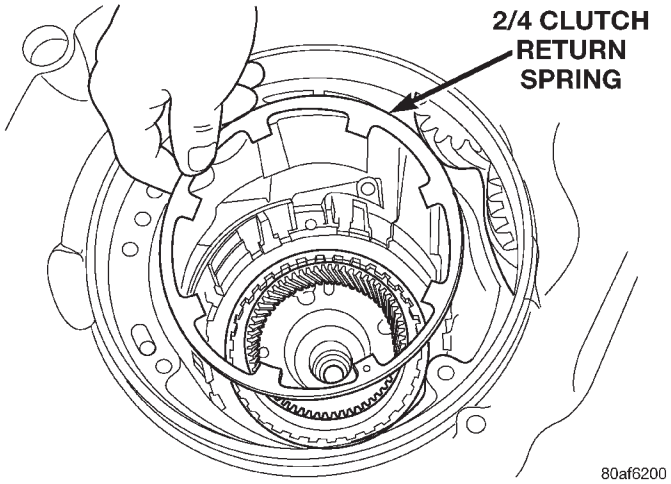


Fig. 255 Install 2/4 Clutch Return Spring

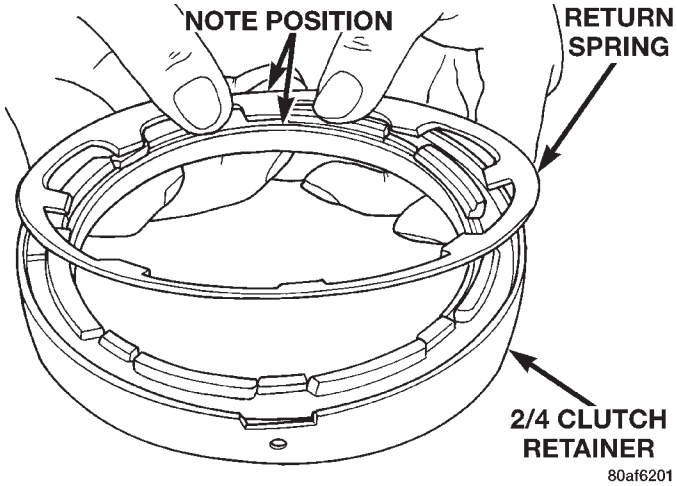


Fig. 256 Proper Orientation of 2/4 Clutch Retainer and Spring

DISASSEMBLY AND ASSEMBLY (Continued)

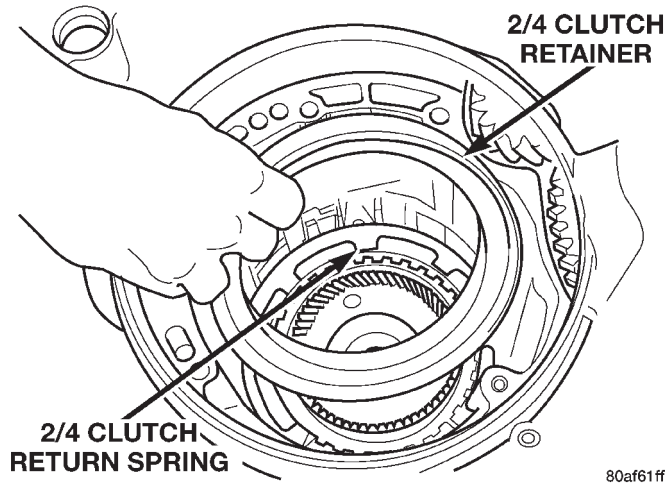


Fig. 257 Install 2/4 Clutch Retainer

NOTE: Verify that Miller Tool 5058 is centered properly to the 2/4 clutch retainer before depressing the tool.

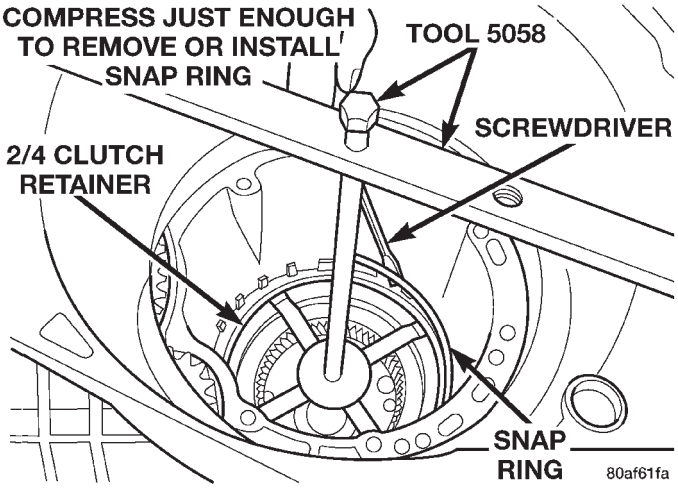


Fig. 258 Install 2/4 Clutch Retainer Snap Ring

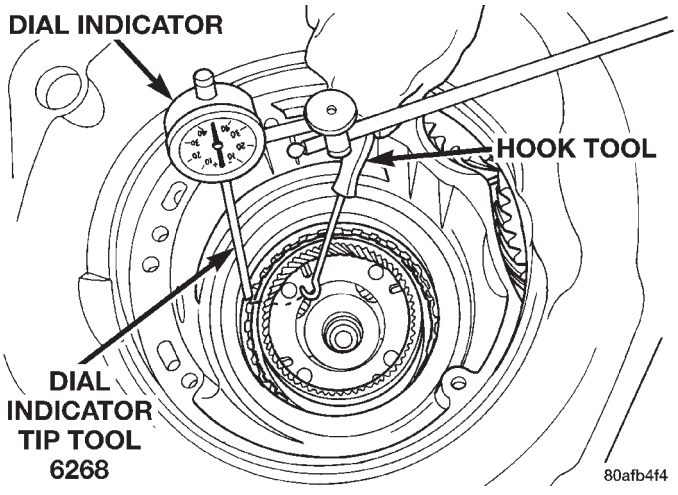


Fig. 259 Check 2/4 Clutch Clearance

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.**

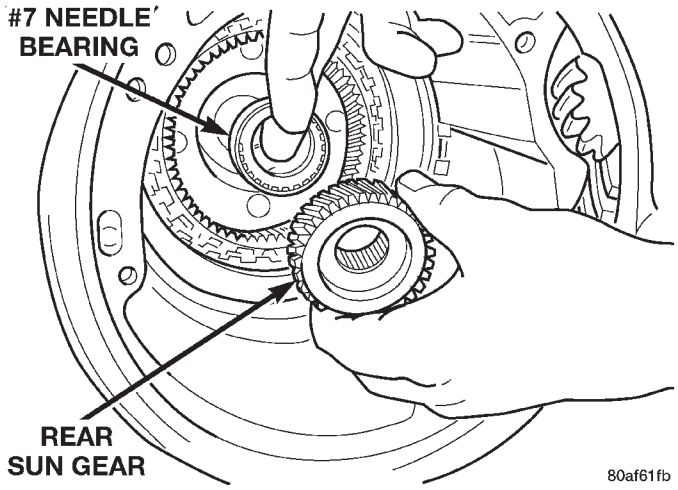


Fig. 260 Install Rear Sun Gear

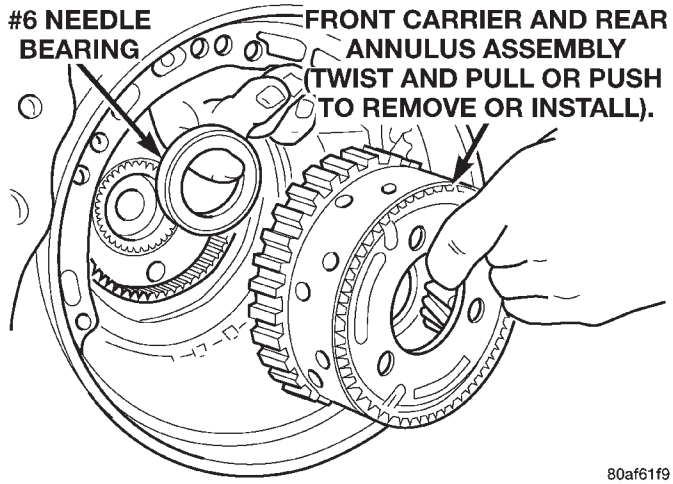


Fig. 261 Install Front Carrier and Rear Annulus Assembly

DETERMINING No. 4 THRUST PLATE THICKNESS—INPUT SHAFT END PLAY

To determine the proper thickness of the No. 4 thrust plate, select the thinnest No. 4 thrust plate. Using petrolatum (Fig. 263) to hold thrust plate in position, install input clutch assembly. Be sure the input clutch assembly is completely seated (Fig. 264).

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

Remove the oil pump O-ring (Fig. 265). You will be able to install and remove the oil pump and gasket very easily to select the proper No. 4 thrust plate.

DISASSEMBLY AND ASSEMBLY (Continued)

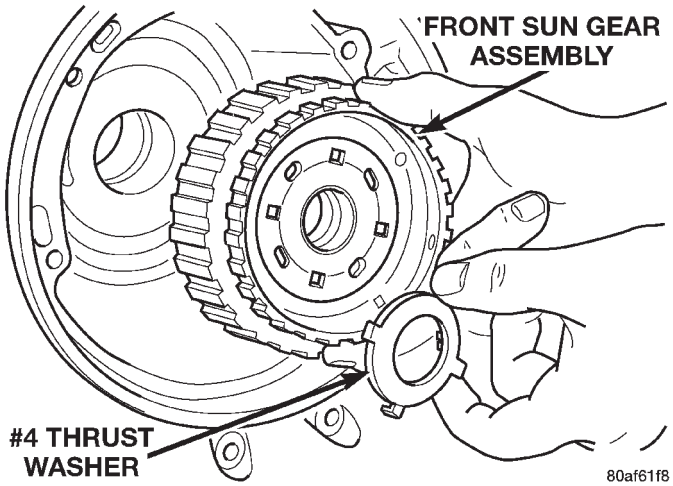


Fig. 262 Install Front Sun Gear Assembly

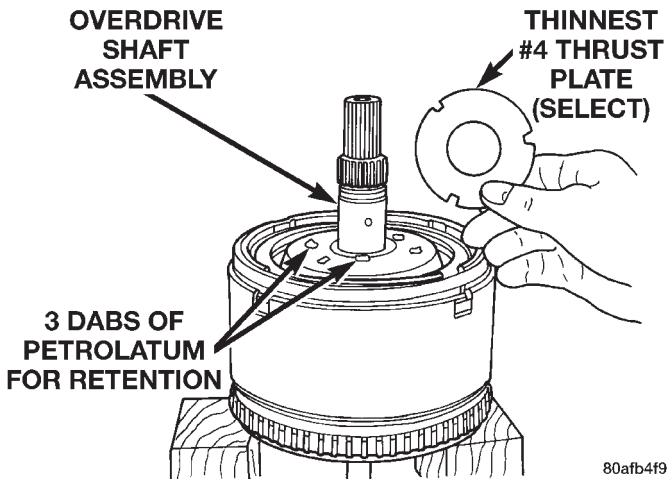


Fig. 263 Select Thinnest No. 4 Thrust Plate

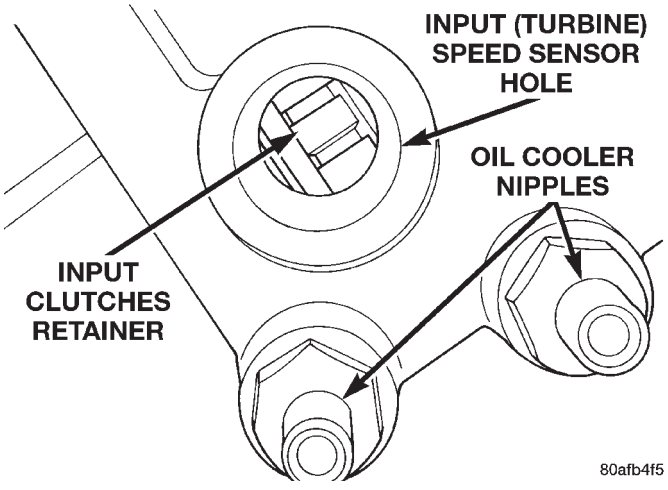


Fig. 264 View Through Input Speed Sensor Hole

NOTE: Use screw-in dowels or phillips-head screwdrivers to align pump to case.

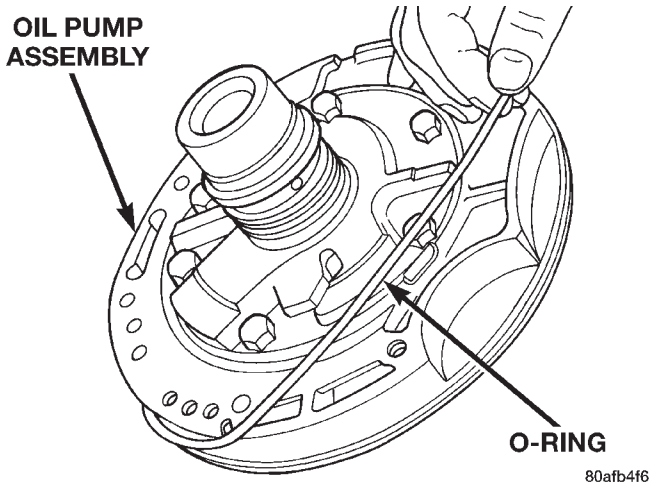


Fig. 265 Remove Oil Pump O-Ring

CAUTION: Be sure to reinstall O-ring on oil pump after selecting the proper No. 4 thrust plate.

Measure the input shaft end play with the transaxle in the vertical position. This will ensure that the measurement will be accurate.

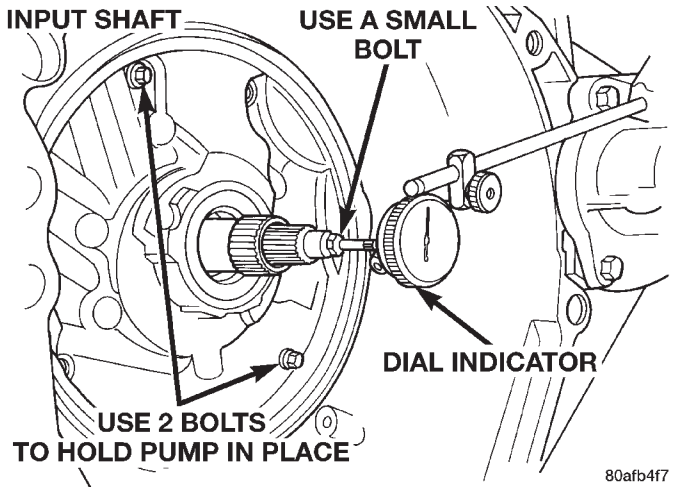


Fig. 266 Measure Input Shaft End Play

NOTE: Input shaft end play must be .005 to .025 inch.

For example, if end play reading is .055 inch, select No. 4 Thrust Plate which is .071 to .074 thick. This should provide an input shaft end play reading of .020 inch which is within specifications.

DISASSEMBLY AND ASSEMBLY (Continued)

See chart to select the proper No. 4 thrust plate.

NO. 4 THRUST PLATE CHART

PART NUMBER	THICKNESS
4431662	.91mm (.036 in.)
4431663	1.14mm (.045 in.)
4431664	1.37mm (.054 in.)
4431665	1.60mm (.063 in.)
3836237	1.73mm (.068 in.)
4431666	1.80mm (.071 in.)
3836238	1.96mm (.077 in.)
4431667	2.03mm (.080 in.)
3836239	2.16mm (.085 in.)
4431668	2.24mm (.088 in.)
3836240	2.39mm (.094 in.)
4431669	2.46mm (.097 in.)
3836241	2.62mm (.103 in.)
4446670	2.67mm (.105 in.)
4446671	2.90mm (.114 in.)
4446672	3.15mm (.124 in.)
4446601	3.38mm (.133 in.)

Reinstall the input clutches assembly with the selected thrust plate .

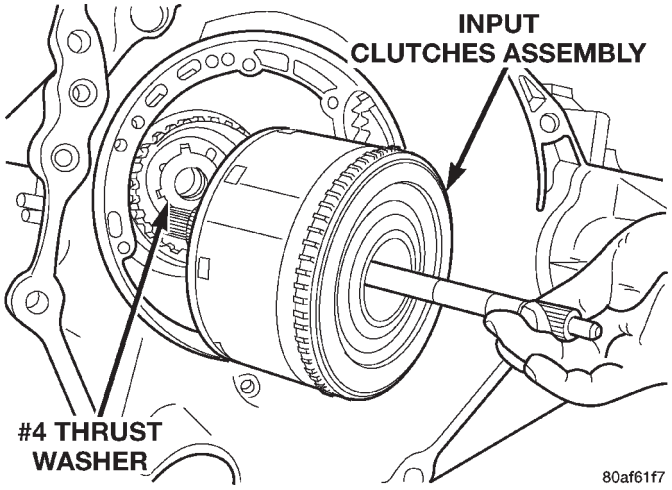


Fig. 267 Install Input Clutches Assembly

CAUTION: The cooler bypass valve must be replaced if a transaxle failure has occurred. Do not reuse old valve or attempt to clean old valve. When installing bypass valve, insert with O-ring end towards rear of case.

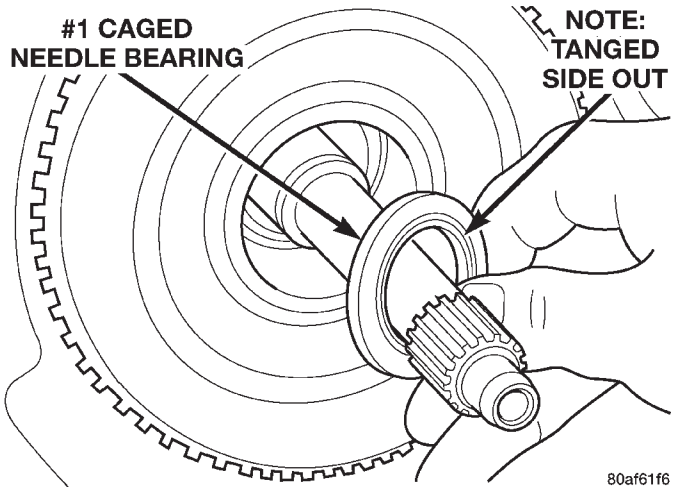


Fig. 268 Install Caged Needle Bearing

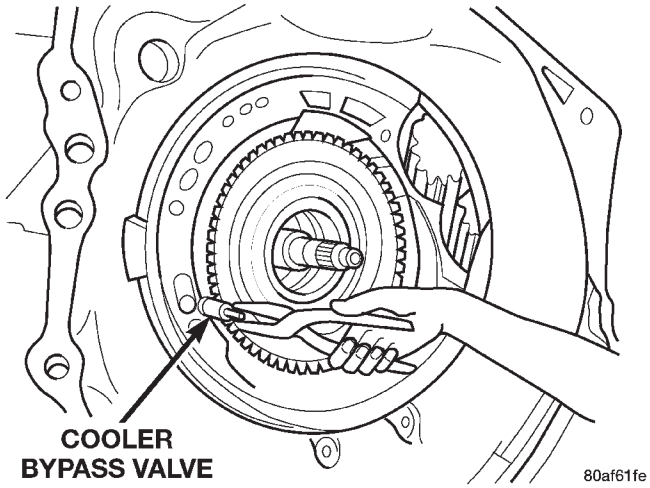


Fig. 269 Install Bypass Valve

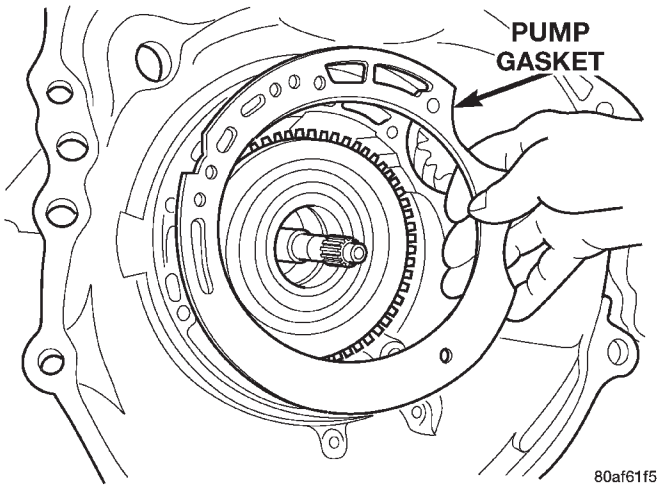


Fig. 270 Install Oil Pump Gasket

DISASSEMBLY AND ASSEMBLY (Continued)

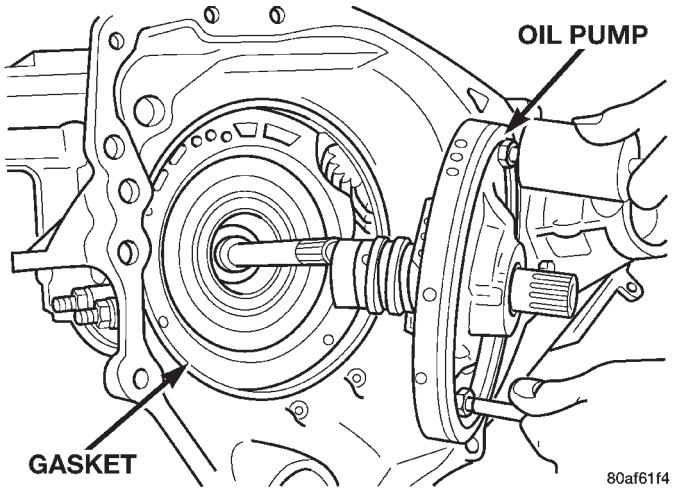


Fig. 271 Install Oil Pump

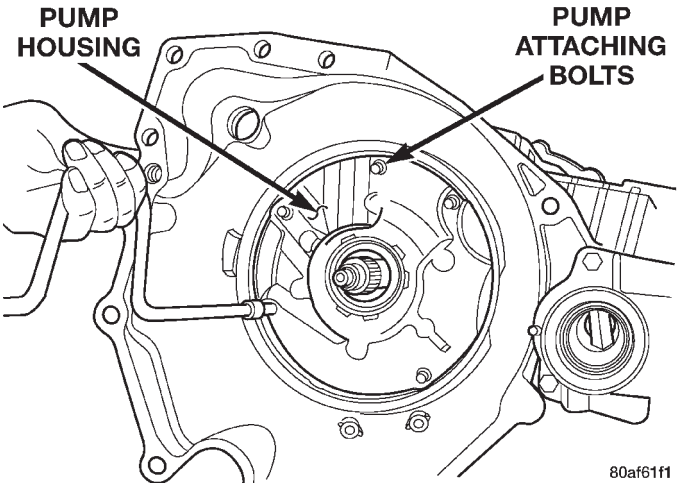


Fig. 272 Install Pump Attaching Bolts

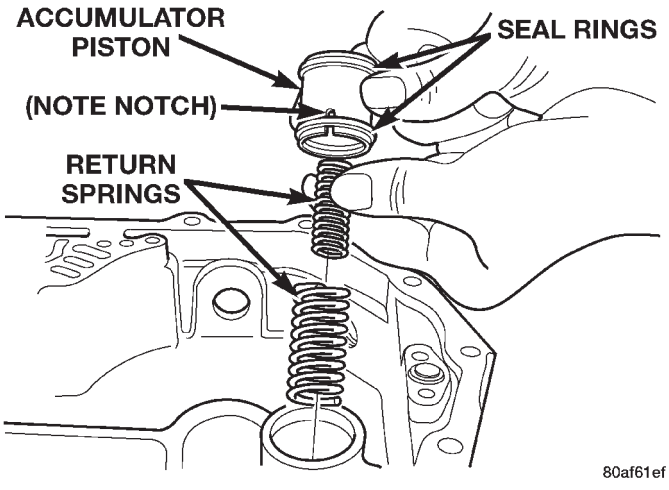


Fig. 273 Install Low/Reverse Accumulator

NOTE: Dependent on engine application, some accumulators will have two springs and others will have one spring. The springs are color coded for application and year.

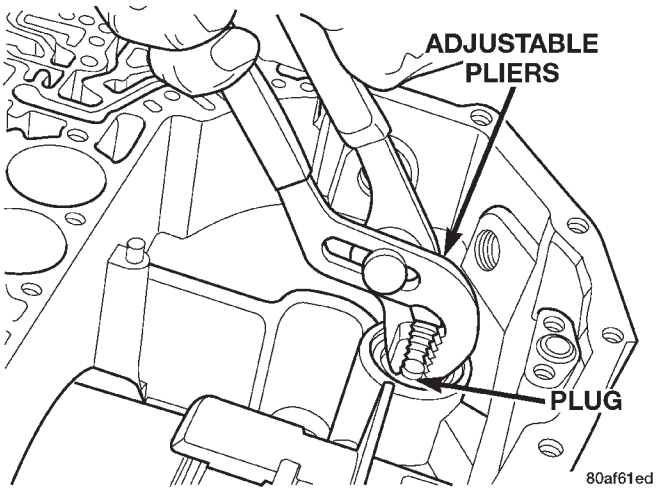


Fig. 274 Install Low/Reverse Accumulator Plug (Cover)

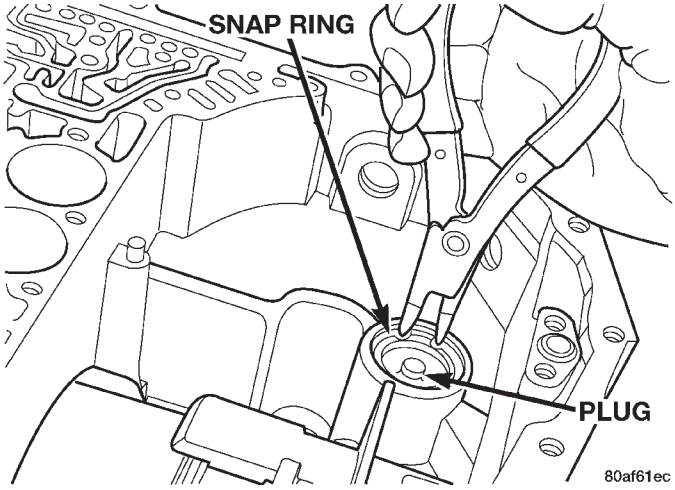


Fig. 275 Install Low/Reverse Accumulator Snap Ring

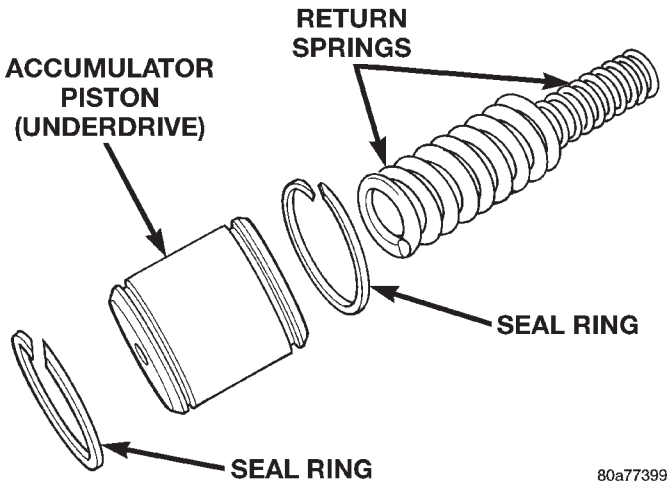


Fig. 276 Accumulator (Underdrive)

NOTE: To ease installation of the valve body, turn the manual valve fully clockwise.

DISASSEMBLY AND ASSEMBLY (Continued)

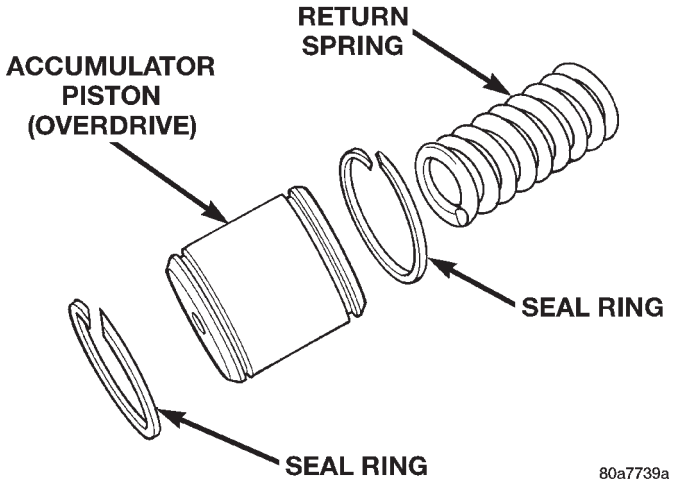


Fig. 277 Accumulator (Overdrive)

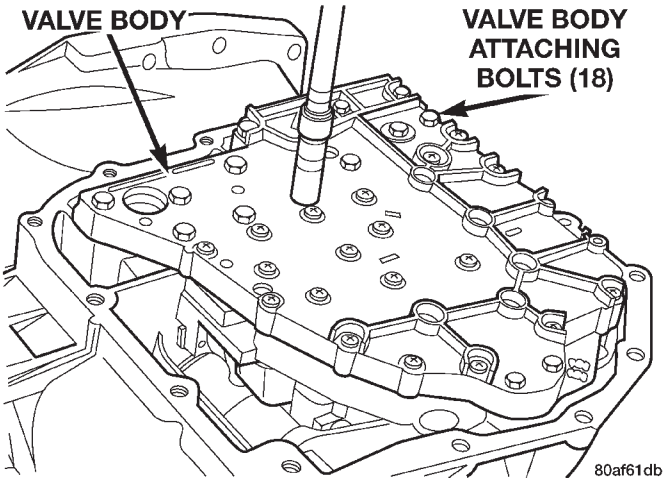


Fig. 280 Install Valve Body Attaching Bolts

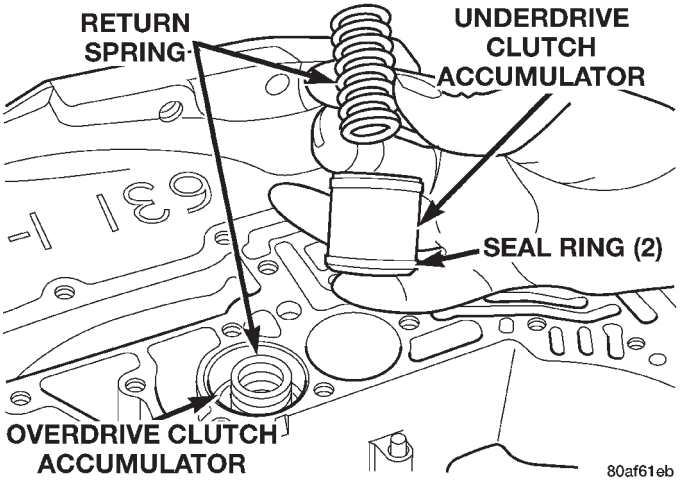


Fig. 278 Install Accumulators

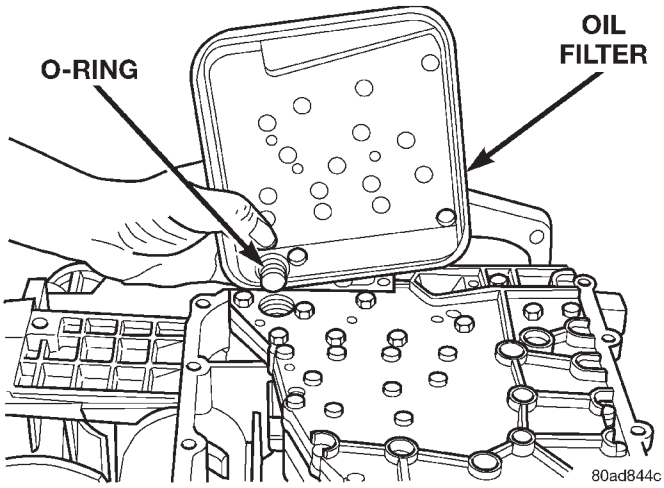


Fig. 281 Install Oil Filter

CAUTION: Do not handle the valve body from the manual valve. Damage could result.

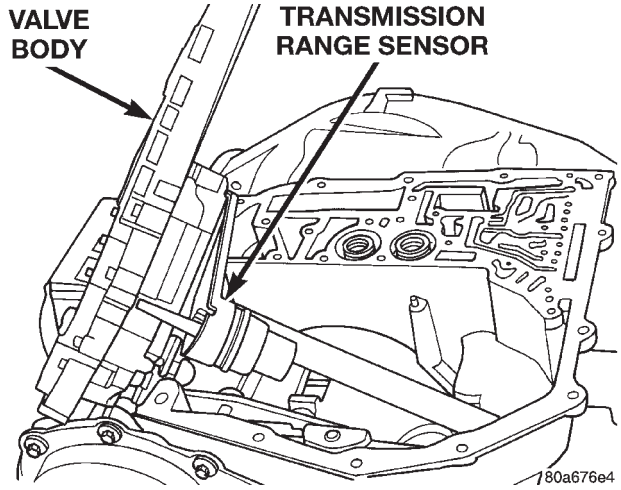


Fig. 279 Install Valve Body

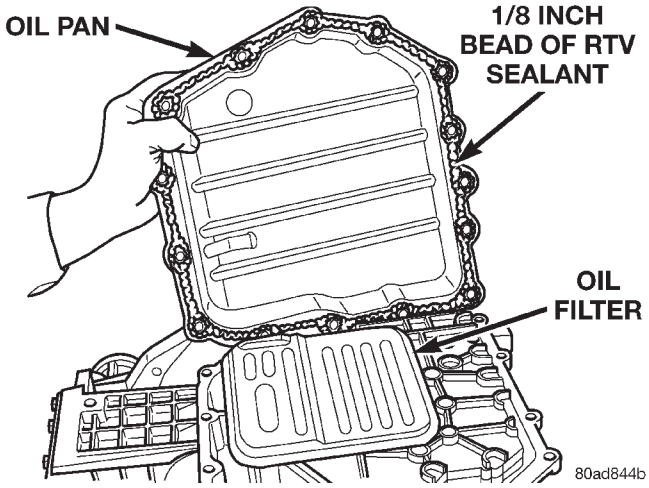


Fig. 282 Install Oil Pan

DISASSEMBLY AND ASSEMBLY (Continued)

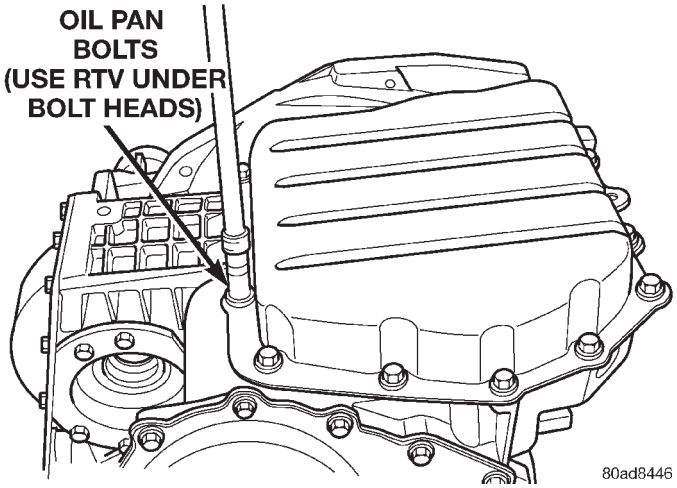


Fig. 283 Install Pan Bolts

(1) Install transaxle solenoid pack (Fig. 284).

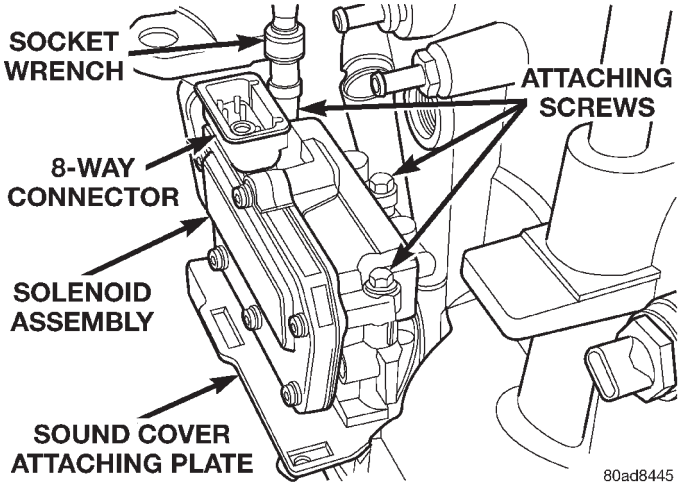


Fig. 284 Install Solenoid Pack

(2) Install input and output speed sensors.

This concludes the assembly of the transaxle centerline.

DIFFERENTIAL REPAIR

NOTE: The differential is serviced as an assembly. The only parts that are serviceable within the differential are the differential bearing cups and cones. If any other part fails within the differential, you must replace the differential assembly along with the transfer shaft.

DISASSEMBLE

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

(1) Remove the differential cover and bolts (Fig. 285) (Fig. 286).

(2) Remove the differential bearing retainer and bolts (Fig. 287) (Fig. 288).

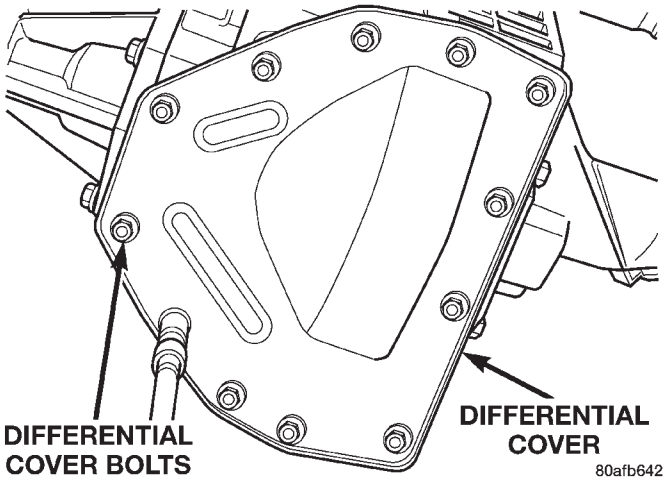


Fig. 285 Differential Cover Bolts

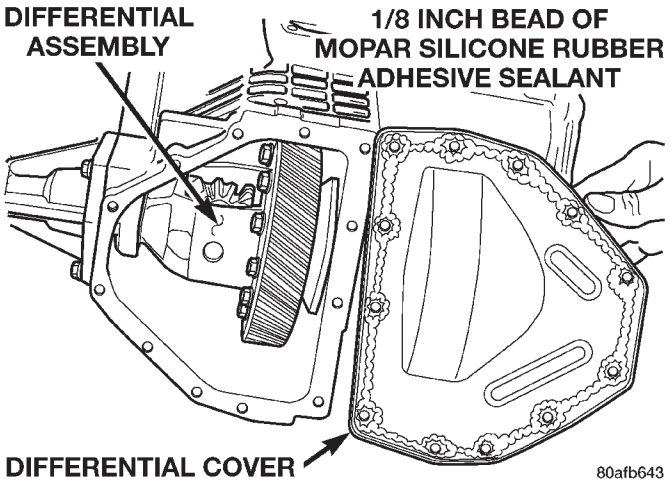


Fig. 286 Remove Differential Cover

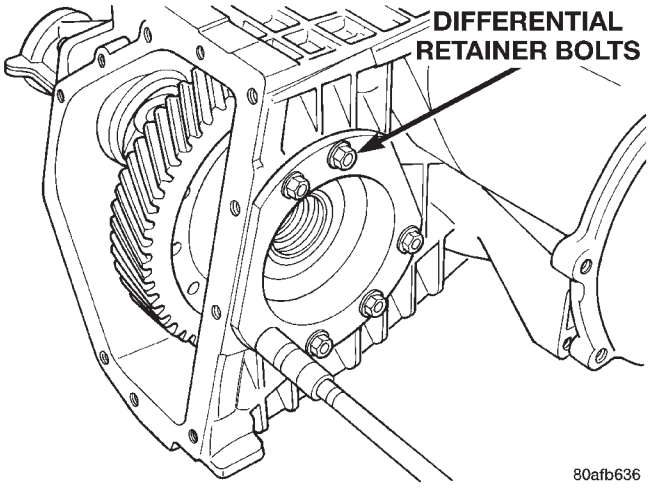


Fig. 287 Differential Retainer Bolts

(3) Using a plastic hammer, remove extension housing/adapter plate on the right side of the transaxle.

DISASSEMBLY AND ASSEMBLY (Continued)

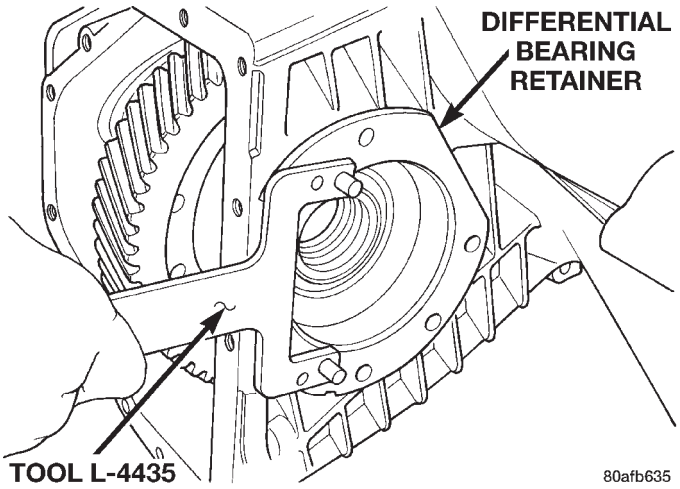


Fig. 288 Remove Bearing Retainer

WARNING: HOLD ONTO DIFFERENTIAL ASSEMBLY TO PREVENT IT FROM ROLLING OUT OF HOUSING.

(4) Use Miller Special Tool 5048, 5048-3 Collets, and L-4539-2 Button to remove the differential bearing cone on the extension housing side.

(5) Use Miller Special Tool 5048, 5048-4 Collets, and L-4539-2 Button to remove the differential bearing cone on the bearing retainer side (Fig. 289) (Fig. 290) (Fig. 291).

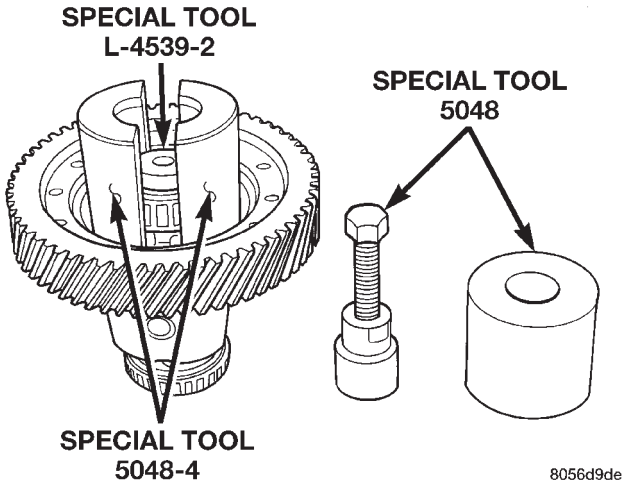


Fig. 289 Position Button and Collets Onto Differential and Bearing (Ring Gear Side)

(6) Using Miller Special Tool L-4518, remove the differential bearing race from the extension housing.

(7) Using Miller Special Tool 6062A, remove the differential bearing race from the bearing retainer (Fig. 292) (Fig. 293).

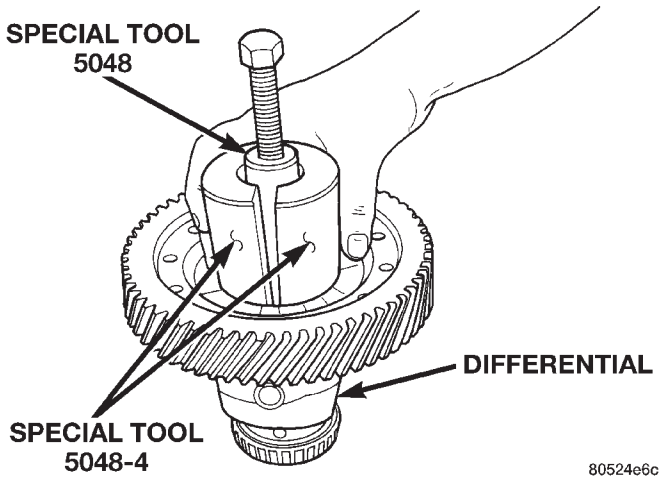


Fig. 290 Position Tool 5048 Over Button and Collets at Differential Bearing (Ring Gear Side)

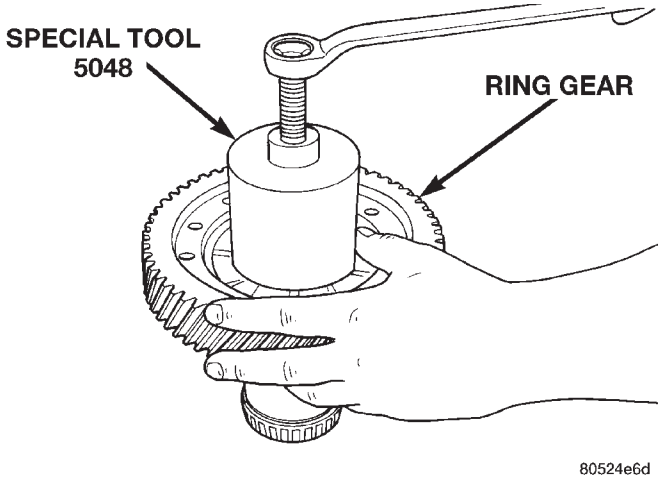


Fig. 291 Remove Differential Bearing Cone (Ring Gear Side)

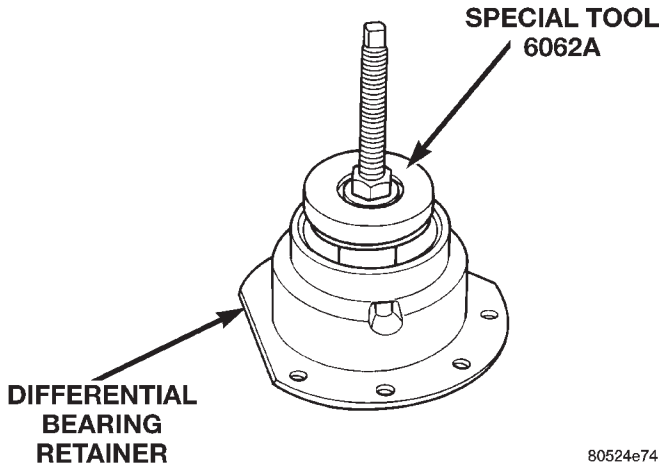


Fig. 292 Position Bearing Cup Remover Tool in Retainer

DISASSEMBLY AND ASSEMBLY (Continued)

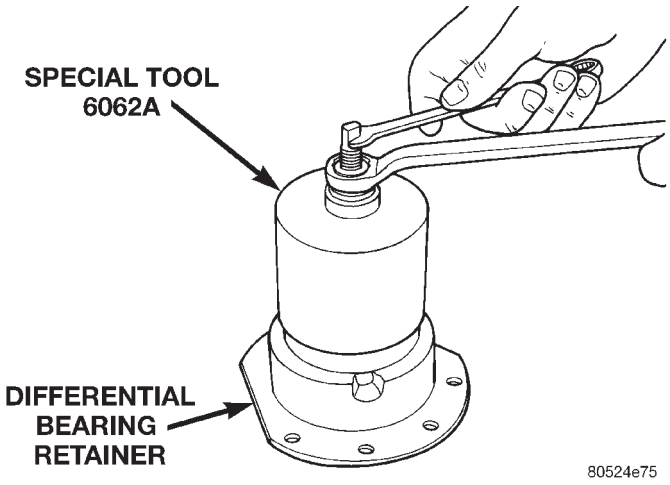


Fig. 293 Remove Bearing Cup

DIFFERENTIAL SERVICE TOOLS

COMPONENT	REMOVER	INSTALLER
Diff. Bear. On Retainer Side	5048, 5048-4 Collets, L-4539-2 Button	5052, C-4171
Diff. Bear. On Ext. Hous. Side	5048, 5048-3 Collets, L-4539-2 Button	L-4410, C-4171
Diff. Race. On Retainer Side	6062-A	6061, C-4171
Diff. Race. On Ext. Hous. Side	L-4518	L-4520, C-4171
Extension Housing Seal	7794-A, C-637 Slide Hammer	L-4520, C-4171
Bearing Retainer Seal	794-A, C-637 Slide Hammer	L-4520, C-4171

CHECKING SIDE GEAR END PLAY

Check side gear end play whenever the differential is removed for service.

NOTE: Side gear end play must be BETWEEN 0.001 to 0.013 inch.

ASSEMBLE

NOTE: Use Mopar® Silicone Rubber Adhesive Sealant, or equivalent, on retainer and extension housing/adapter plate to seal to case.

(1) Using Miller Special Tool L-4410, and C-4171, install differential bearing to differential (extension housing side) (Fig. 296).

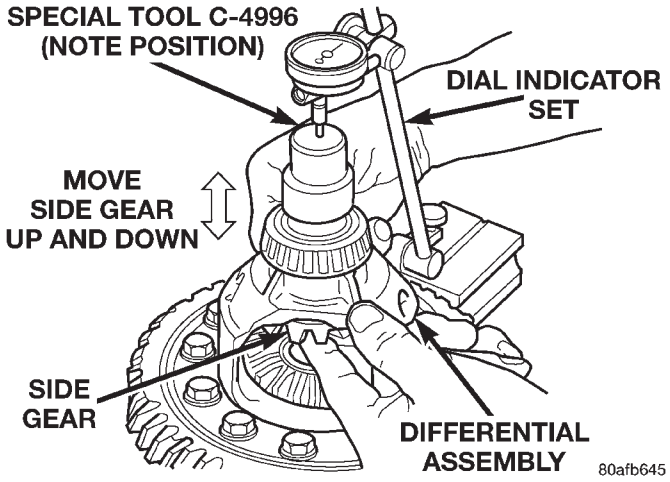


Fig. 294 Checking Side Gear End Play (Extension Housing Side)

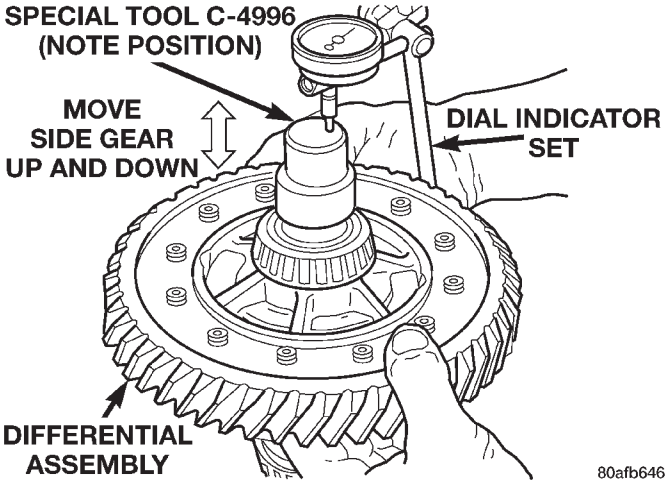


Fig. 295 Checking Side Gear End Play (Bearing Retainer Side)

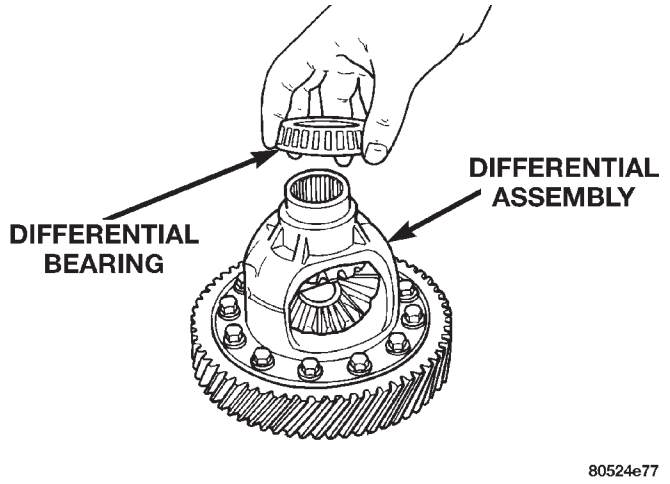


Fig. 296 Position Bearing Cone Onto Differential

DISASSEMBLY AND ASSEMBLY (Continued)

(2) Using Miller Special Tool 5052 and C-4171, install differential bearing to differential (bearing retainer side).

(3) Using Miller Special Tool 6061 and C-4171, install differential bearing race to bearing retainer (Fig. 297).

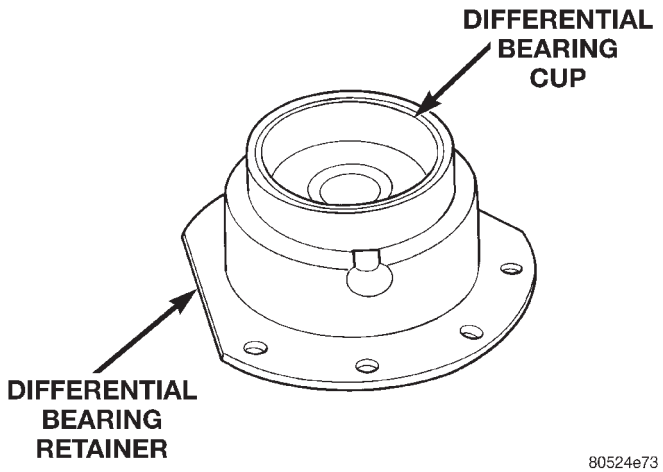


Fig. 297 Differential Bearing Retainer

(4) Using Miller Special Tool L–4520 and C-4171, install differential bearing to extension housing.

DIFFERENTIAL BEARING PRELOAD ADJUSTMENT

NOTE: Perform all differential bearing preload measurements with the transfer shaft and gear removed.

DIFFERENTIAL BEARING PRELOAD ADJUSTMENT USING EXISTING SHIM

(1) Position the transaxle assembly vertically on the support stand, differential bearing retainer side up.

(2) Install Tool L-4436A into the differential and onto the pinion mate shaft (Fig. 298).

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

(4) Using Tool L-4436A and an inch-pound torque wrench, check the turning torque of the differential (Fig. 299). **The turning torque should be between 5 and 18 inch-pounds.**

(5) If the turning torque is within specifications, remove tools. Setup is complete.

(6) If turning torque is not within specifications proceed with the following steps.

(a) Remove differential bearing retainer from the transaxle case.

(b) Remove the bearing cup from the differential bearing retainer using Tool 6062A.

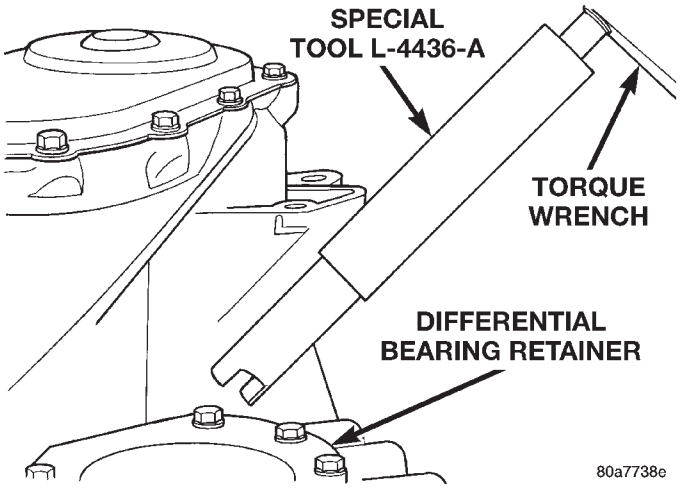


Fig. 298 Tool L-4436 and Torque Wrench

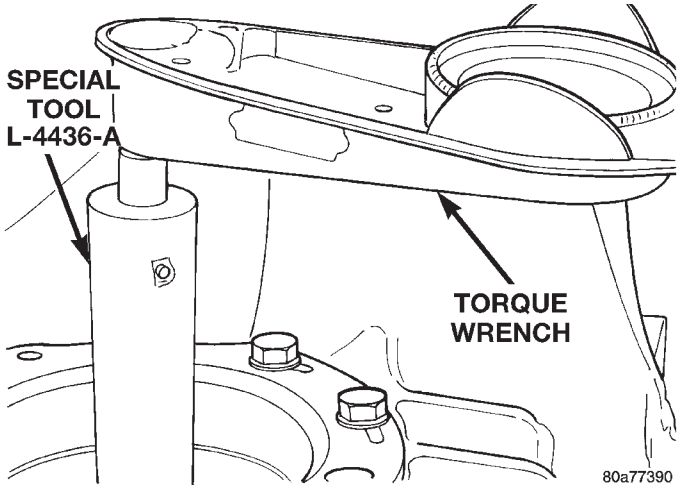


Fig. 299 Checking Differential Bearings Turning Torque

(c) Remove the existing shim from under the cup.

(d) Measure the existing shim.

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

Oil Baffle is not required to be installed when making shim selection.

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

(f) Install the differential bearing retainer using Tool 5052 and C-4171. Seal the retainer to the housing with MOPAR® Adhesive Sealant and torque bolts to 28 N·m (250 in. lbs.).

DISASSEMBLY AND ASSEMBLY (Continued)

(7) Using Tool L-4436A and an inch-pound torque wrench, recheck the turning torque of the differential (Fig. 299). **The turning torque should be between 5 and 18 inch-pounds.**

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

- Transaxle case
- Differential carrier
- Differential bearing retainer
- Extension housing
- Differential bearing cups and cones

(5) Position the transaxle assembly vertically on the support stand and install Miller Special Tool L-4436-A into the bearing retainer.

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

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

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

DIFFERENTIAL BEARING SHIM CHART

PART NUMBER	SHIM	THICKNESS
	MM	INCH
4659257	.980	0.0386
4659258	1.02	0.0402
4659259	1.06	0.0418
4659260	1.10	0.0434
4659261	1.14	0.0449
4659262	1.18	0.0465
4659263	1.22	0.0481
4659264	1.26	0.0497
4659265	1.30	0.0512
4659266	1.34	0.0528
4659267	1.38	0.0544
4659268	1.42	0.0560
4659269	1.46	0.0575
4659270	1.50	0.0591
4659271	1.54	0.0607
4659272	1.58	0.0623
4659273	1.62	0.0638
4659274	1.66	0.0654
4659275	1.70	0.0670
4659283	2.02	0.0796
4659284	2.06	0.0812

PRELOAD ADJUSTMENT W/O SHIM

(1) Remove the bearing cup from the differential bearing retainer using Miller special Tool 6062A.

(2) Remove existing shim from under bearing cup.

(3) Reinstall the bearing cup into the retainer using Miller Special Tool 6061, and C-4171.

NOTE: Oil baffle is not required when making the shim calculation.

(4) Install the bearing retainer into the case. Torque bolts to 28 N·m (250 in. lbs.).

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

(9) Using the end play measurement that was determined, add .18mm (.007 inch). This should give you between 5 and 18 inch pounds of bearing preload. Refer to the Differential Bearing Shim Chart to determine which shim to use.

(10) Remove the differential bearing retainer. Remove the bearing cup.

DISASSEMBLY AND ASSEMBLY (Continued)

(11) Install the oil baffle. Install the proper shim combination under the bearing cup.

(12) Install the differential bearing retainer. Seal the retainer to the housing with Mopar® Silicone Rubber Adhesive Sealant. Torque bolts to 28 N·m (250 in. lbs.).

(13) Using Miller Special Tool L-4436-A and an inch-pound torque wrench, check the turning torque of the differential (Fig. 299). The turning torque should be between 5-18 inch-pounds.

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

CLEANING AND INSPECTION

CLEANING VALVE BODY

Prior to removing any transaxle parts, plug all openings and clean 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.

NOTE: Tag all springs, as they are removed, for reassembly identification.

ADJUSTMENTS

GEARSHIFT CABLE ADJUSTMENT

Lift and rotate the gearshift hand lever into the park (P) gate position and remove the ignition key. This confirms the shift lever is in the gated park (P) position.

After confirming the park gate position, turn the ignition switch. If the starter will operate, the park gate position is correct. Move the shift lever into the neutral (N) position. If the starter will operate in this position, the linkage is properly adjusted. If the starter fails to operate in either position, linkage adjustment is required.

(1) Park the vehicle on level ground and set the parking brake.

(2) Place the gearshift lever in park (P) gate position and remove key.

(3) Loosen the cable adjustment screw at the transaxle operating lever (Fig. 300).

(4) Pull the transaxle operating lever fully forward to the park detent position.

(5) Release the park brake, then rock the vehicle to assure it is in park lock. Reset the park brake.

(6) Tighten the cable adjustment screw to 8 N·m (70 in. lbs.). Gearshift cable should now be properly adjusted.

(7) Check adjustment by using the preceding procedure.

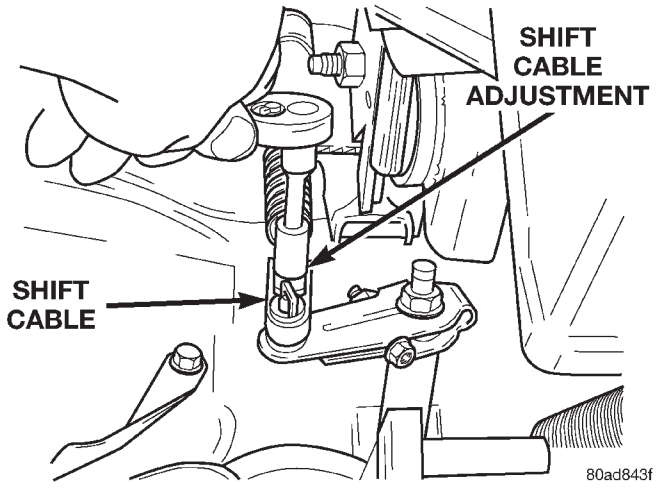
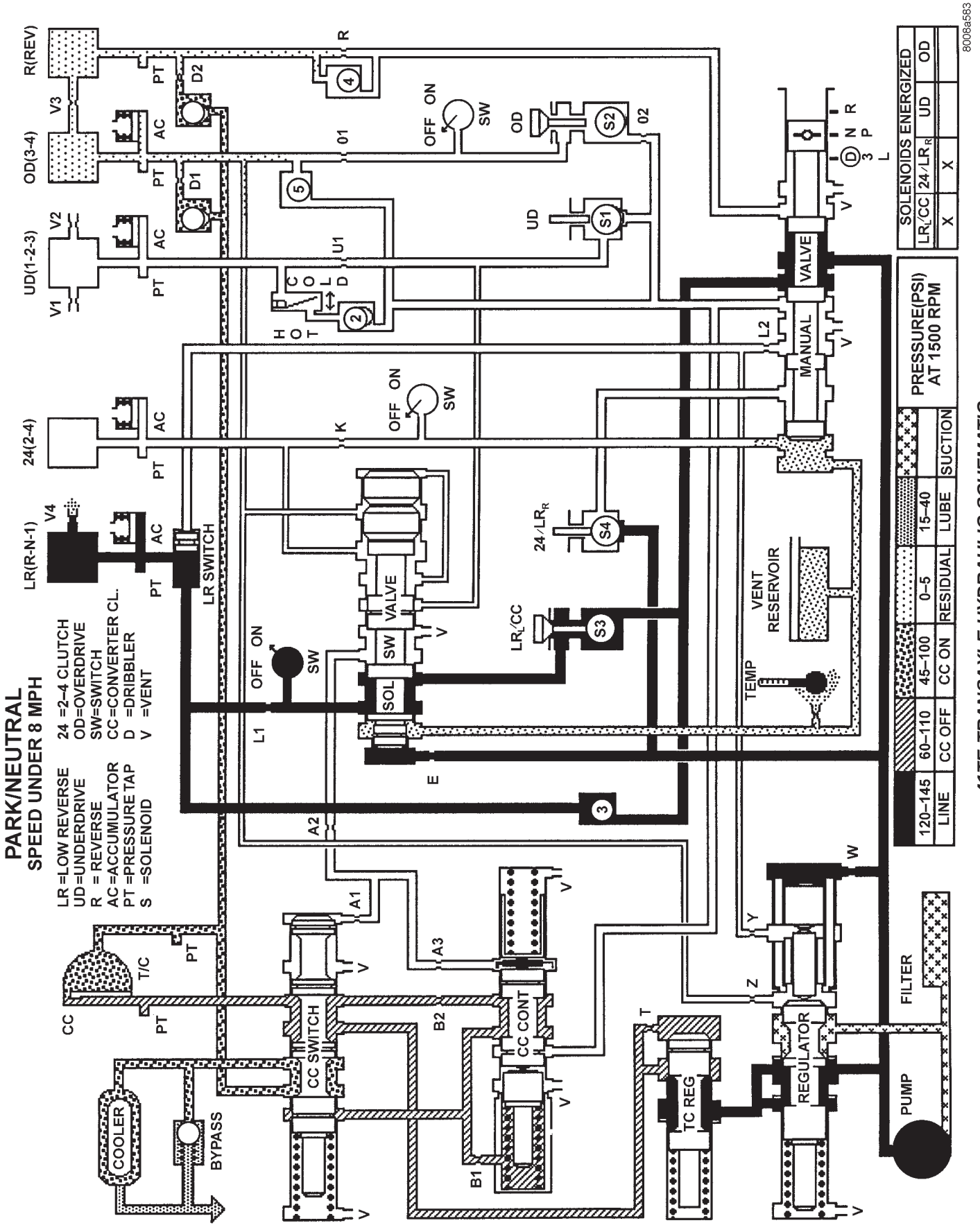


Fig. 300 Gearshift Cable Adjustment

SCHEMATICS AND DIAGRAMS

41TE TRANSAXLE HYDRAULIC SCHEMATICS



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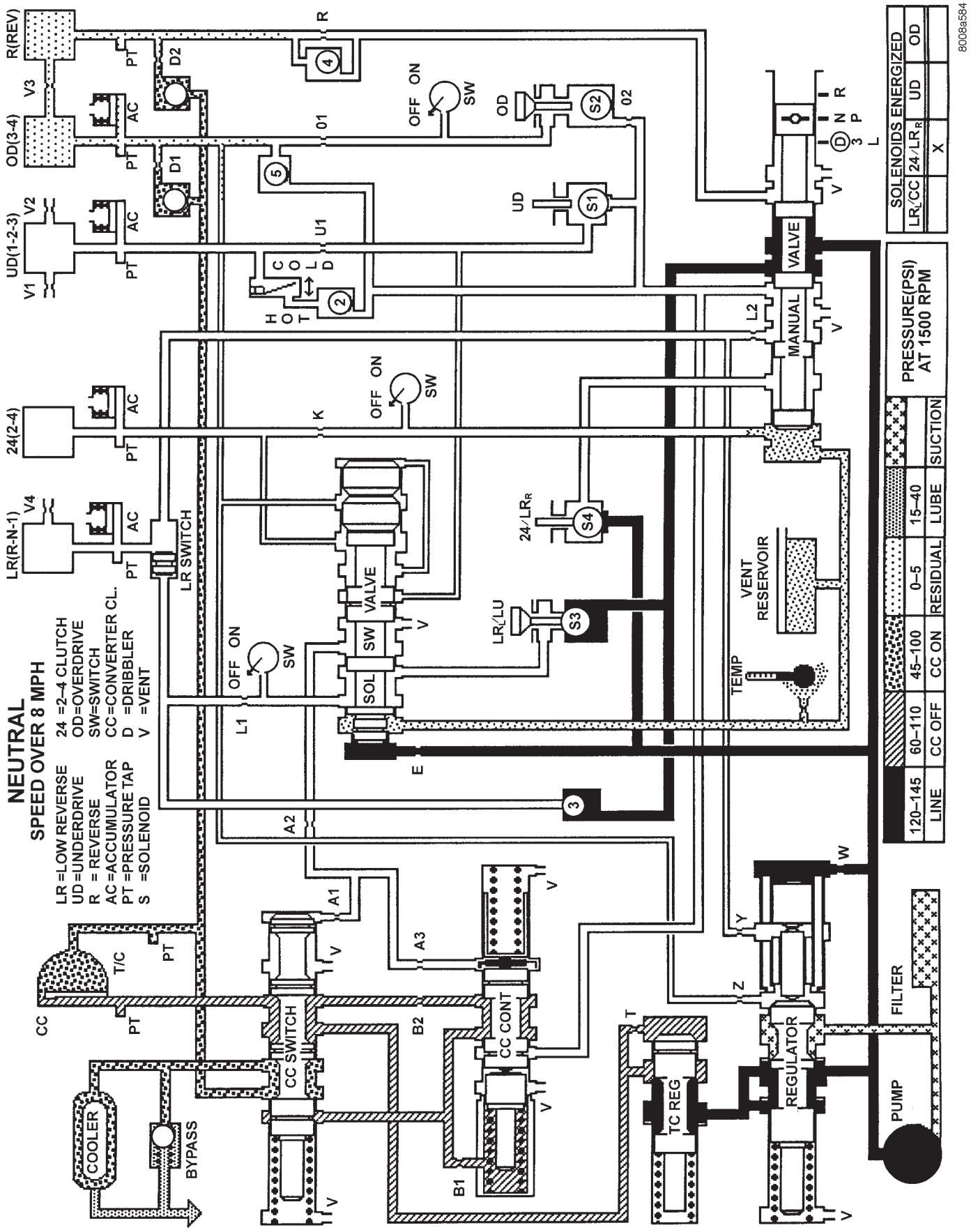
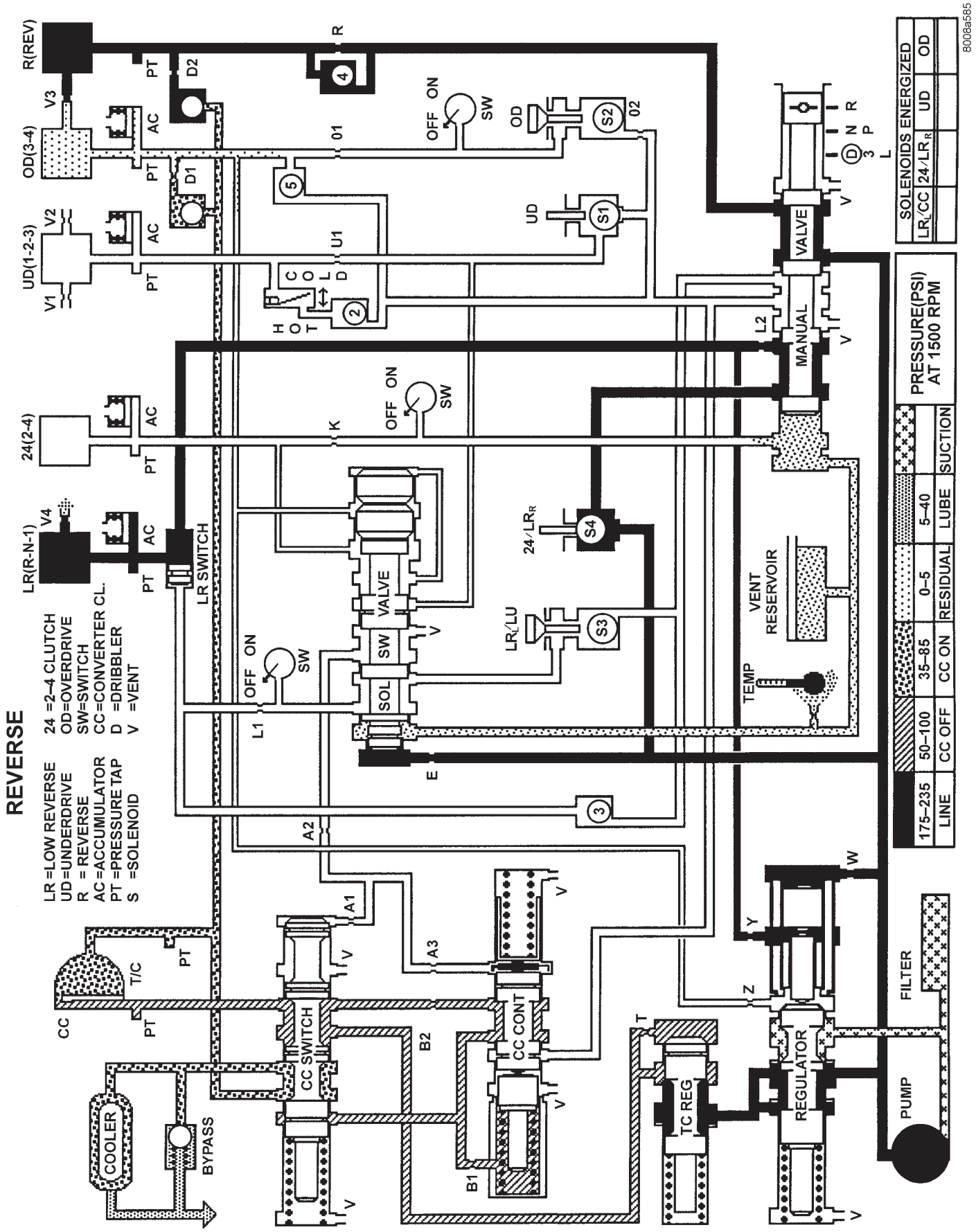
41TE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)

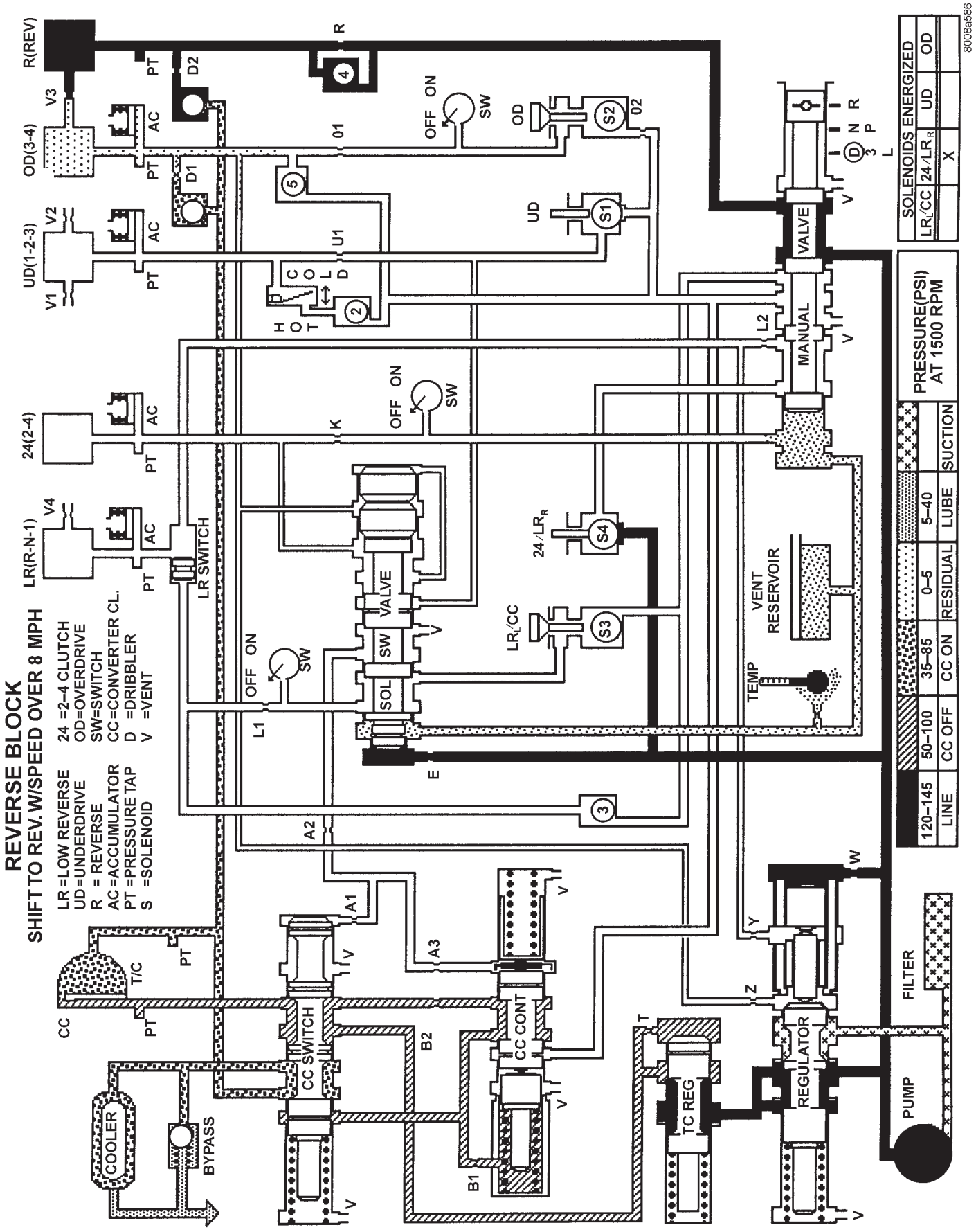


41TE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)

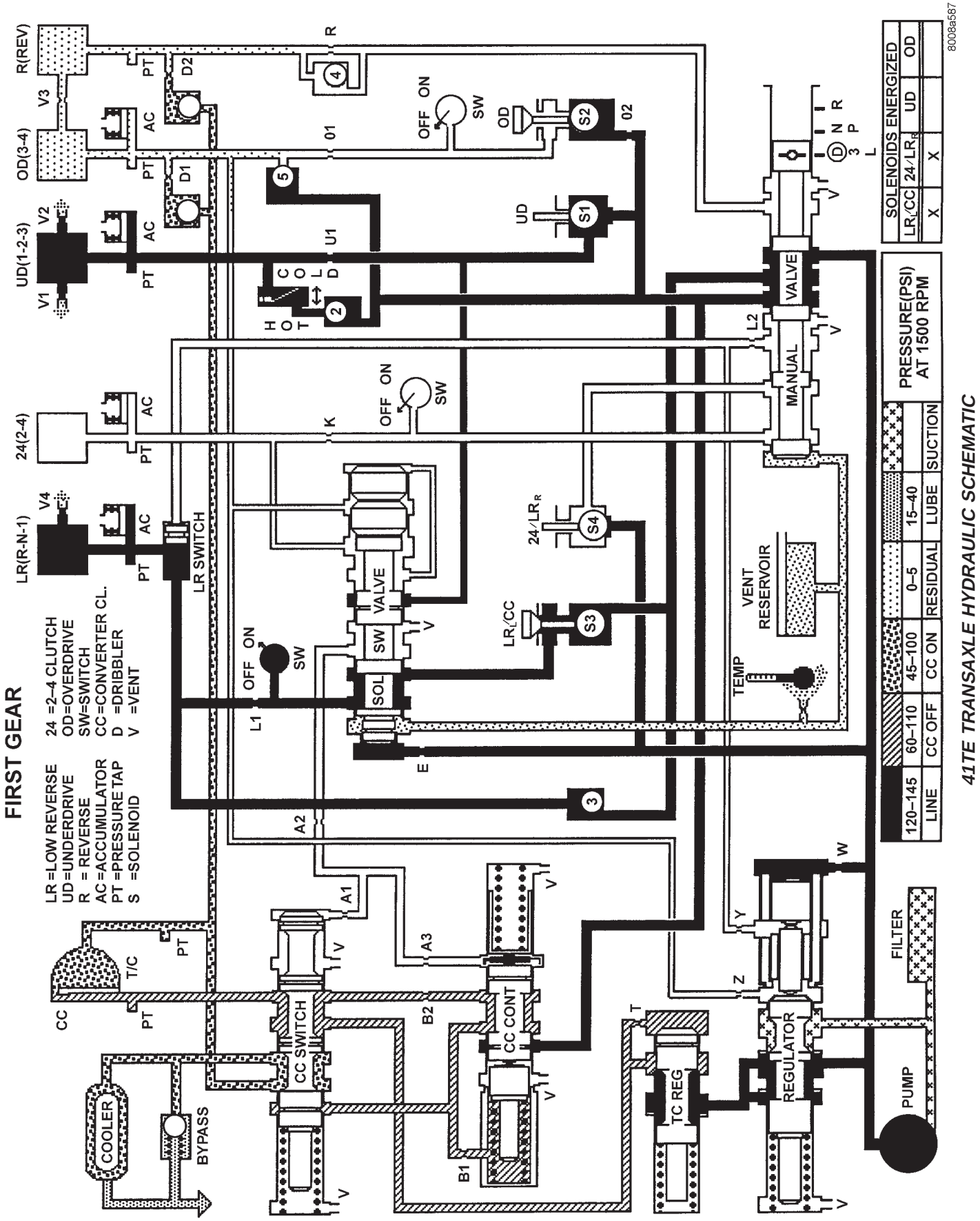


SCHEMATICS AND DIAGRAMS (Continued)



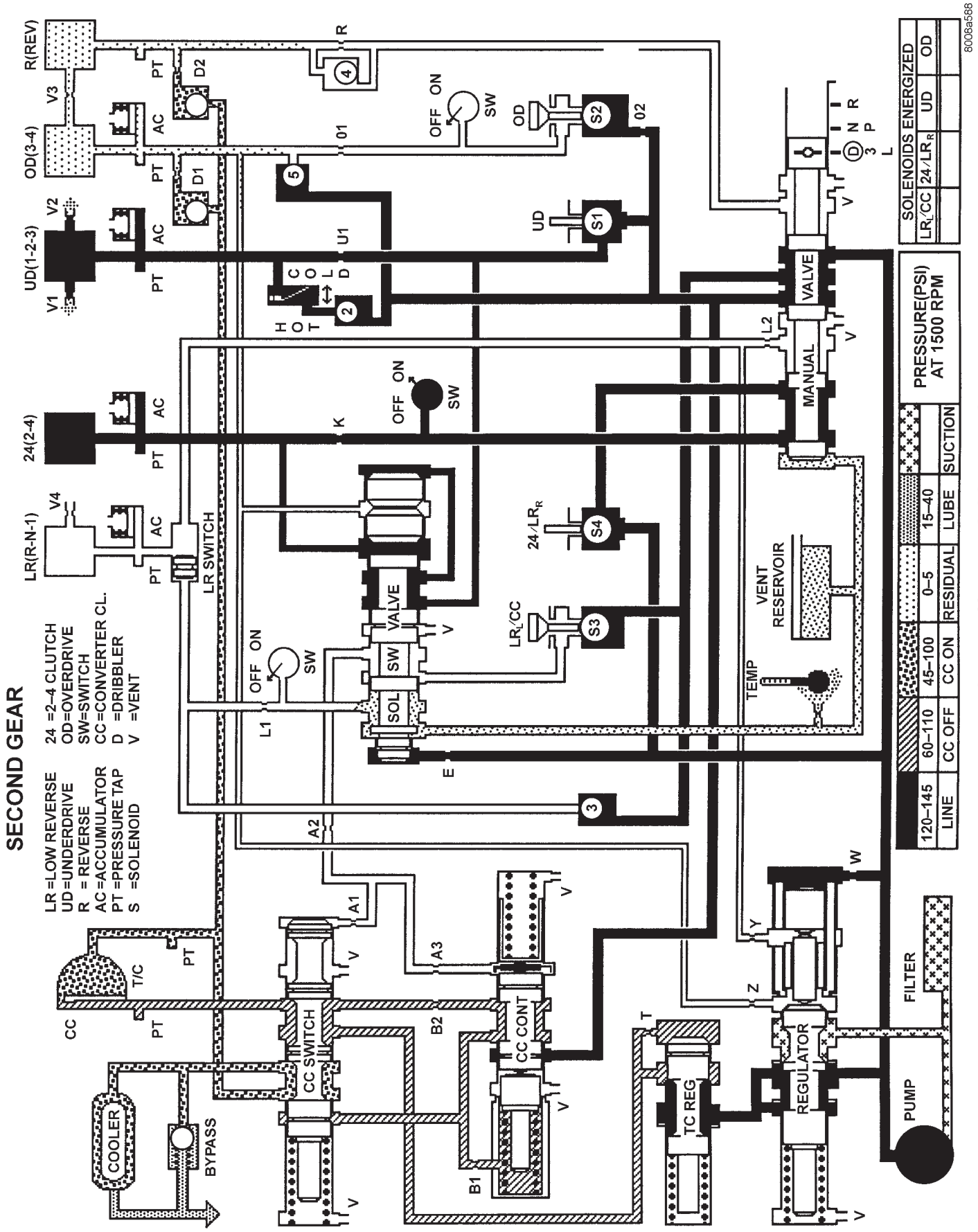
41TE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



41TE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



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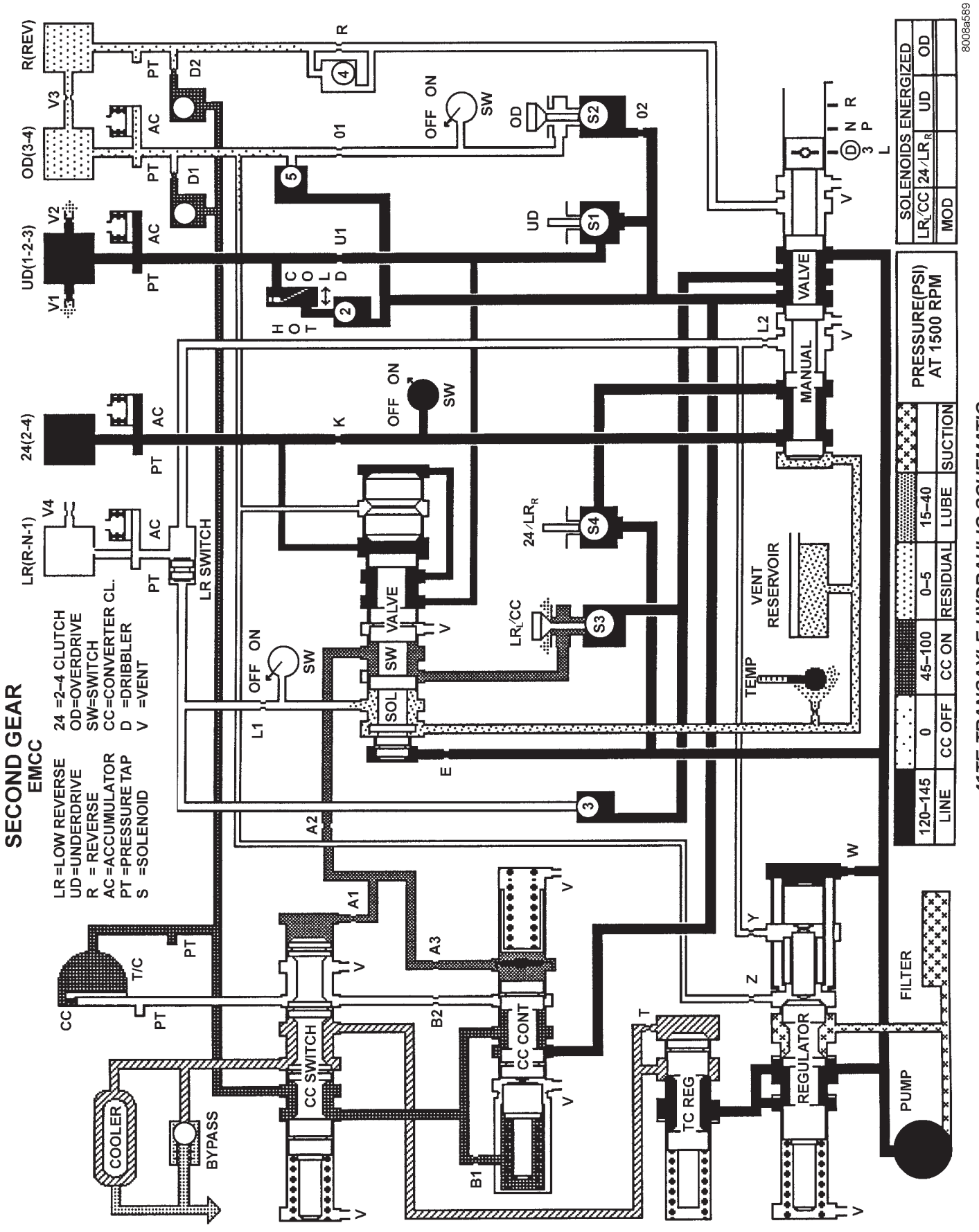

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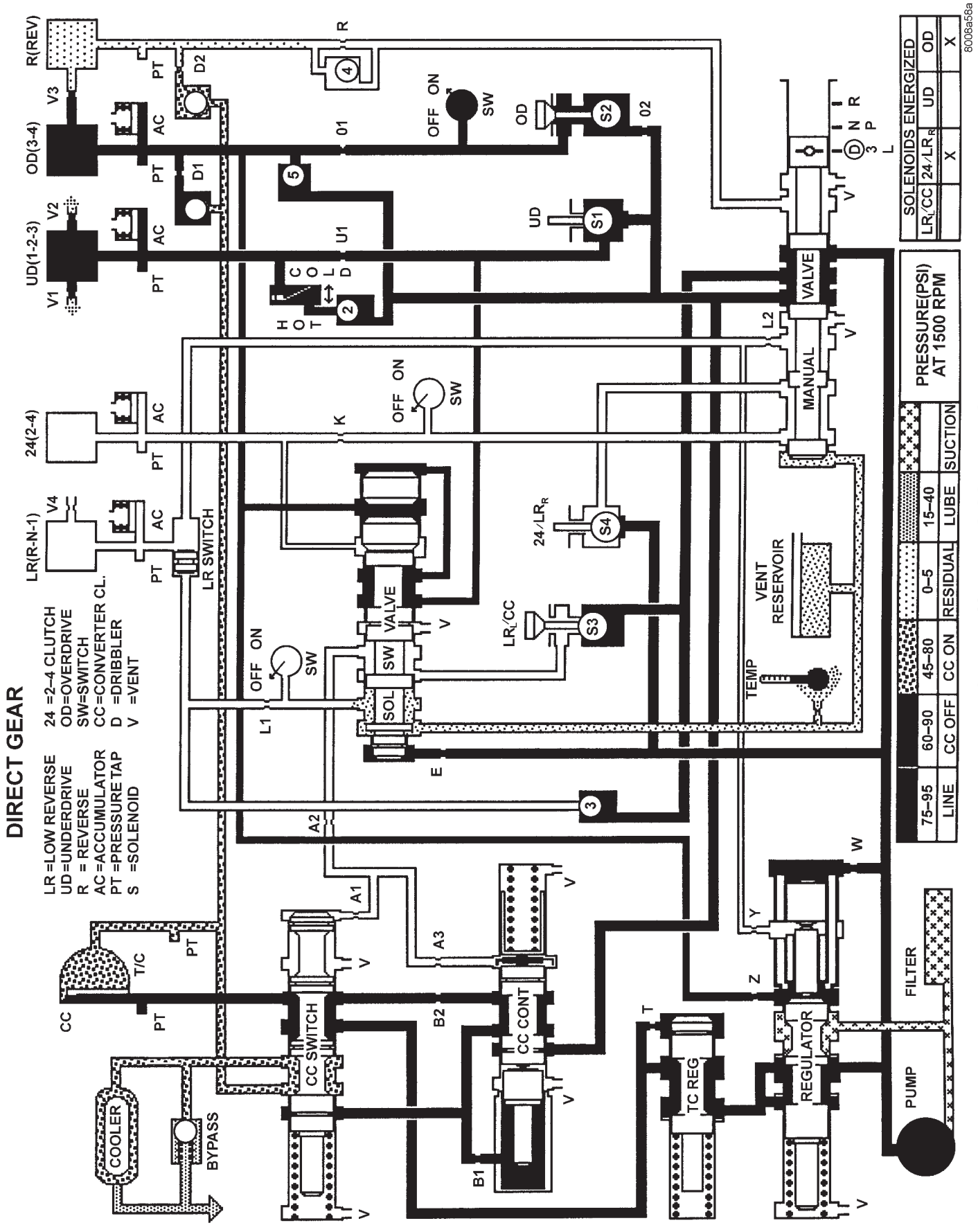

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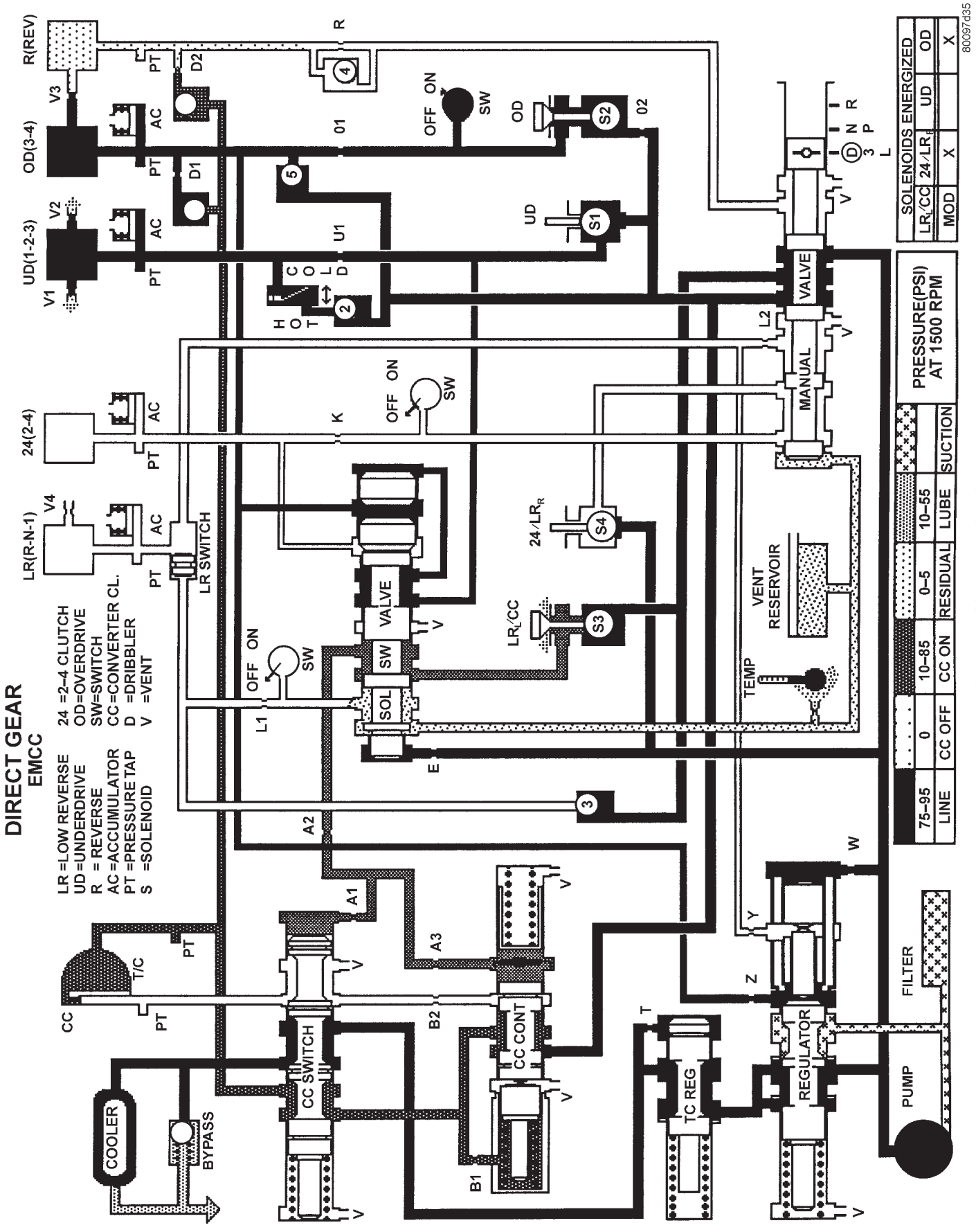

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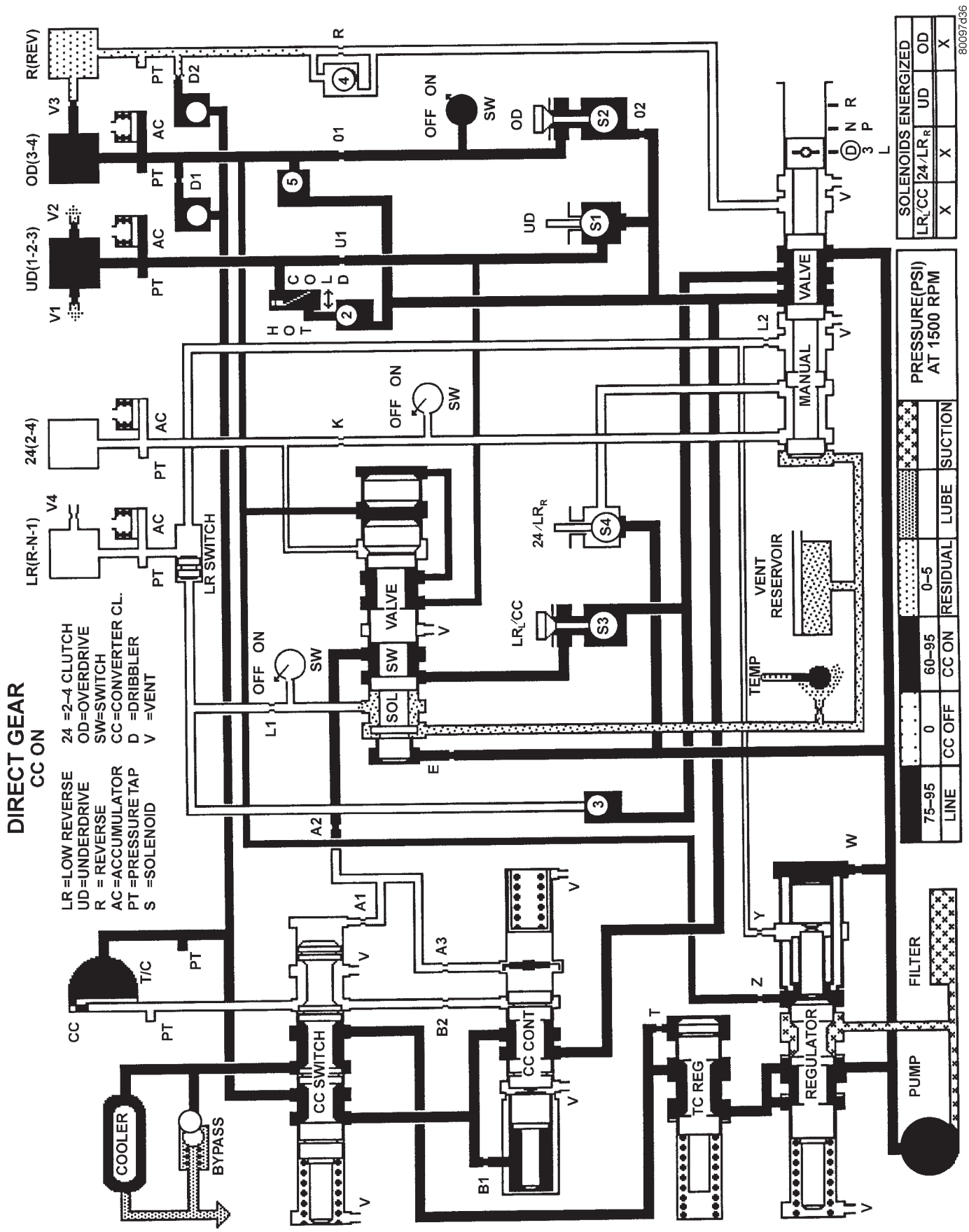

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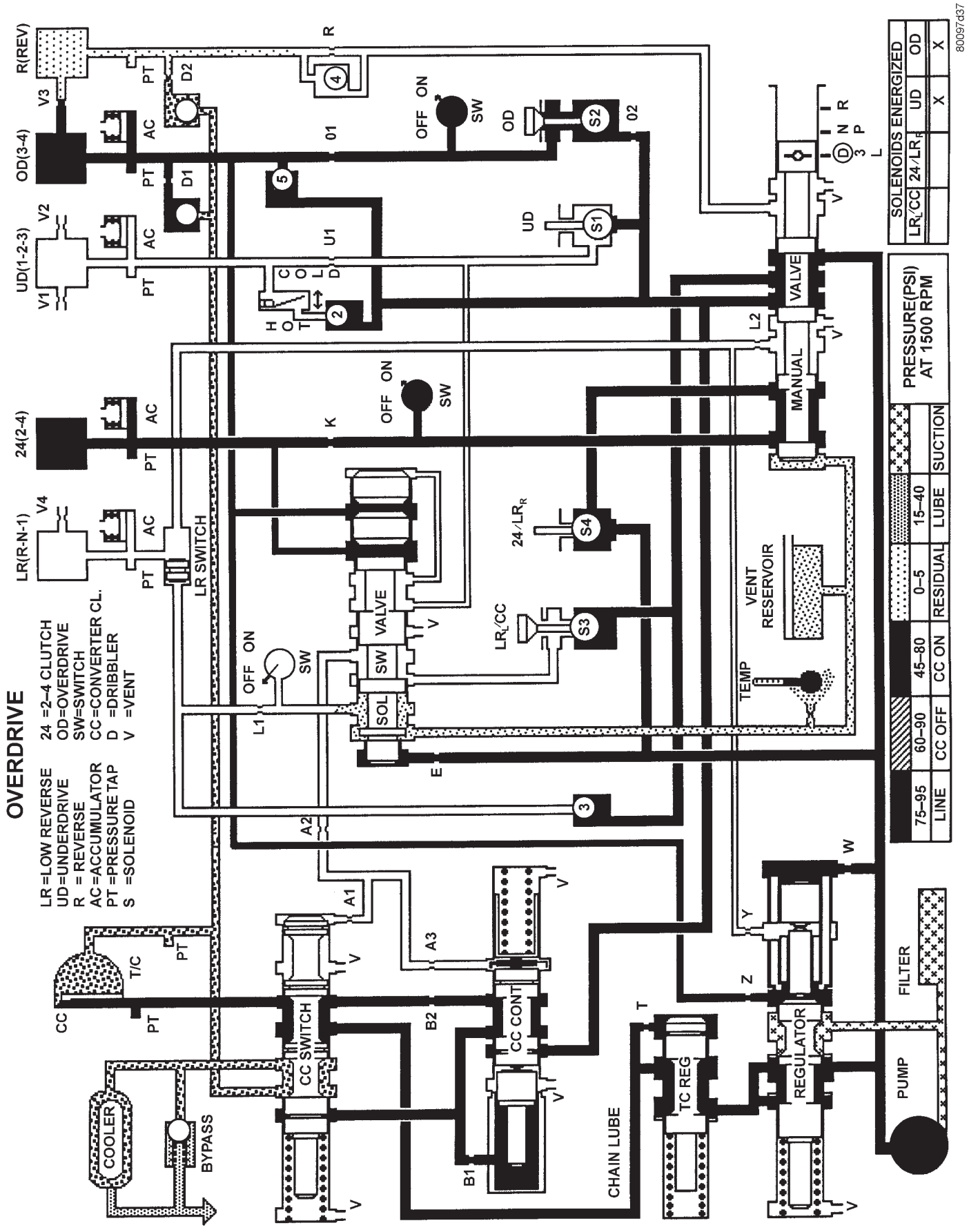
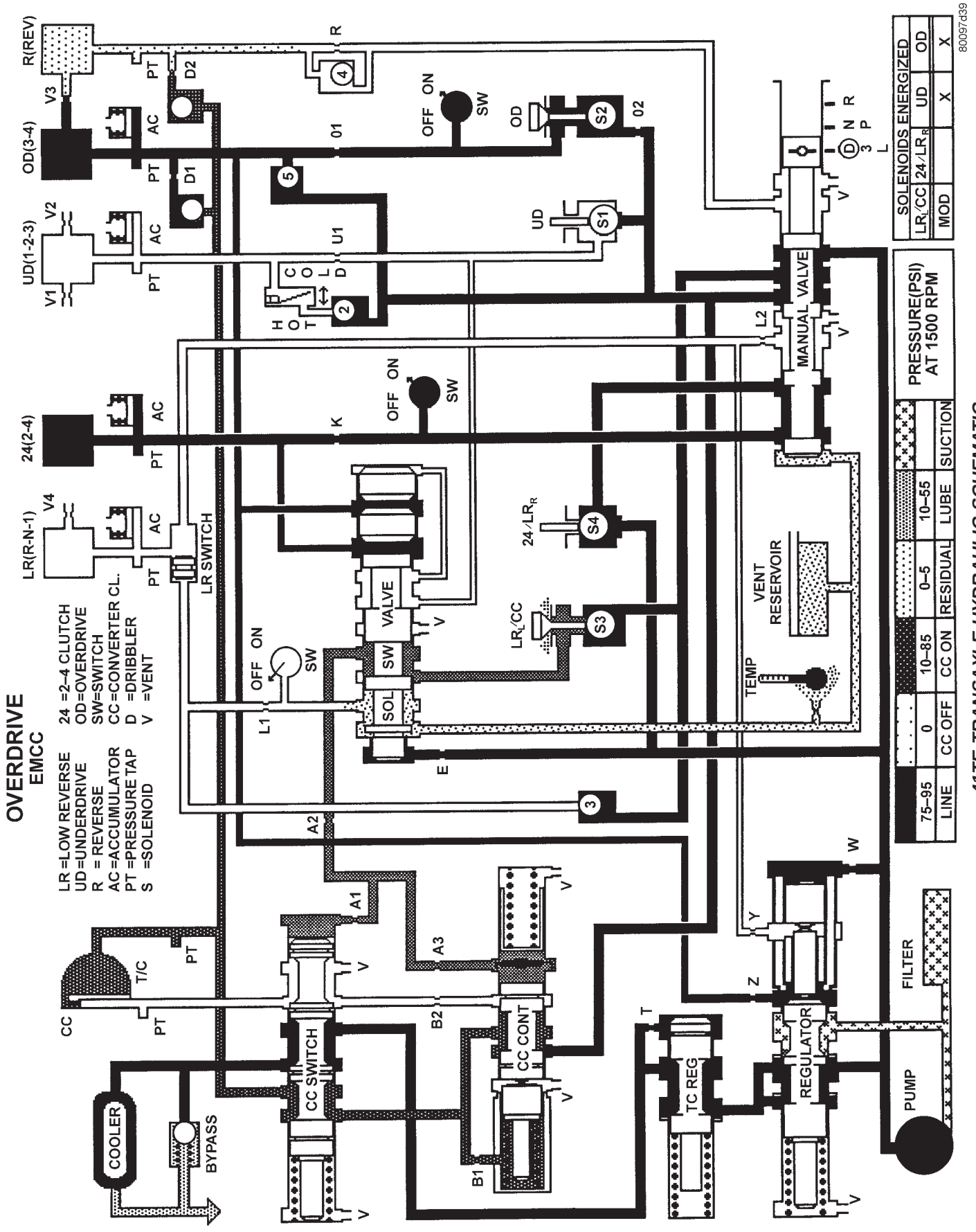
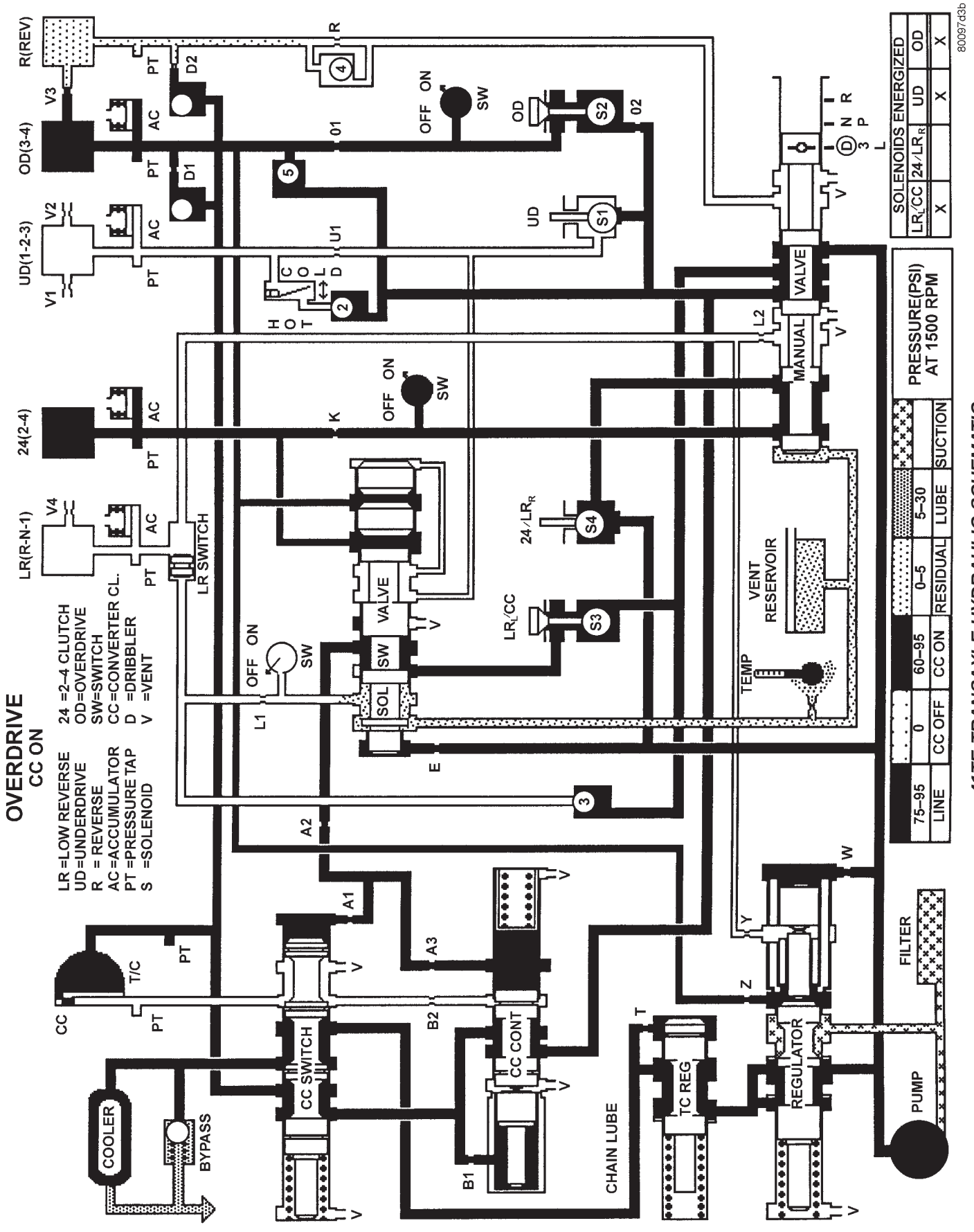


41TE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



SCHEMATICS AND DIAGRAMS (Continued)



41TE TRANSAXLE HYDRAULIC SCHEMATIC

SPECIFICATIONS

41TE AUTOMATIC TRANSAXLE

Type . . . . . .Fully adaptive, electronically controlled, four speed automatic with torque converter and integral differential
Torque Converter Diameter . . . . . .241 millimeters (9.48 in.)
Oil Capacity . . . . . .8.6 Liters (18.25 pints)
Oil Type. . . . . .Mopar® ATF PLUS 3Type 7176
Cooling Method . . . . . .Water Heat Exchanger and/or air to oil heat exchanger
Lubrication . . . . . .Pump (internal-external gear-type

Gear Ratios

Transmission Portion

First Gear 2.84
Second Gear. 1.57
Direct Gear 1.00
Overdrive Gear 0.69
Reverse Gear 2.21

Overall Top Gear Ratio

3.8 Liter. 2.38
3.3 Liter. 2.49
2.4 Liter. 2.69

Pump Clearances

Outer Gear To Pocket. . . . . .0.045-0.141mm (0.0018-0.0056 in.)
Outer Gear Side Clearance. . . . . .0.020-0.046mm (0.0008-0.0018 in.)
Inner Gear Side Clearance . . . . . .0.020-0.046mm (0.0008-0.0018 in.)

Tapered Roller Bearing Settings

Differential Assembly . . .5 to 18 in. lbs. Drag Torque
Output Hub. . . . . .3 to 8 in. lbs. Drag Torque
Transfer Shaft . . . . . .0.002 to 0.004 in. End Play
Overall Drag At Output Hub . . . . . .3 to 16 in. lbs. Drag Torque

Clutch Pack Clearances

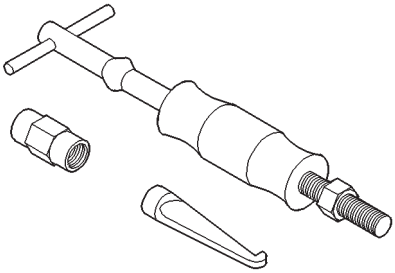
Low/Rev Clutch
(Select Reaction Plate) . . . . . .0.89-1.04mm (0.035-0.042 in.)
Two/Four Clutch
(No Selection). . . . . .0.76-2.64mm (0.030-0.104 in.)
Reverse Clutch (Select Snap Ring). . . . .0.76-1.24mm (0.030-0.049 in.)
Overdrive Clutch
(No Selection). . . . . .0.96-2.26mm (0.038-0.089 in.)
Underdrive Clutch
Select Pressure Plate) . . . . . .0.91-1.47mm (0.036-0.058 in.)
Transmission End Play . . . . . .0.12-0.63mm (0.005-0.025 in.)

41TE TORQUE SPECIFICATIONS

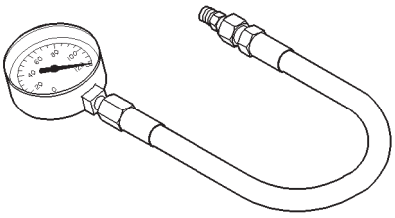
DESCRIPTION	TORQUE
Cooler Line Fittings	.12 N·m (105 in. lbs.)
Differential Cover	.19 N·m (165 in. lbs.)
Differential Ring Gear	.95 N·m (70 ft. lbs.)
Differential Bearing Ret.	.28 N·m (21 ft. lbs.)
Driveplate To Crank. Bolts	.95 N·m (70 ft. lbs.)
Driveplate To Torque Conv.	.75 N·m (55 ft. lbs.)
Eight Way Solenoid Conn.	.4 N·m (35 in. lbs.)
Extension Housing	.28 N·m (21 ft. lbs.)
Input Speed Sensor.	.27 N·m (20 ft. lbs.)
L/R Clutch Retainer.	.5 N·m (45 in. lbs.)
Oil Pan To Trans. Case.	.19 N·m (165 in. lbs.)
Output Gear Bolt	.271 N·m (200 ft. lbs.)
Output Gear Stirrup Ret.	.23 N·m (17 ft. lbs.)
Output Speed Sensor	.27 N·m (20 ft. lbs.)
Pressure Taps	.5 N·m (45 in. lbs.)
Pump To Case Bolts	.27 N·m (20 ft. lbs.)
Reaction Shaft Bolts	.27 N·m (20 ft. lbs.)
Rear End Cover	.19 N·m (14 ft. lbs.)
Sixty-Way Connector	.4 N·m (35 in. lbs.)
Solenoid Assembly To Case.	.12 N·m (105 in. lbs.)
Transmission Range Sensor	.5 N·m (45 in. lbs.)
Transfer Gear Nut	.271 N·m (200 ft. lbs.)
Transfer Plate To Case	.12 N·m (105 in. lbs.)
Valve Body To Case Bolts	.12 N·m (105 in. lbs.)
Valve Body Bolts	.5 N·m (45 in. lbs.)
Vent Assembly	.12 N·m (105 in. lbs.)

SPECIAL TOOLS

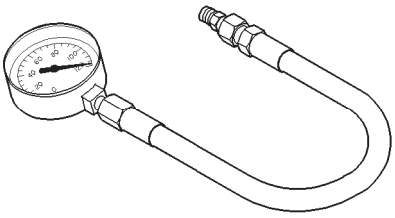
41TE AUTOMATIC TRANSAXLE



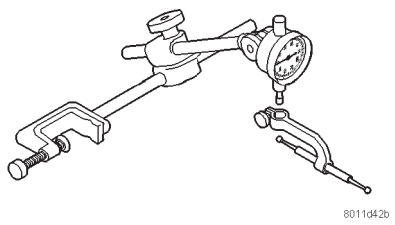
Puller C-637



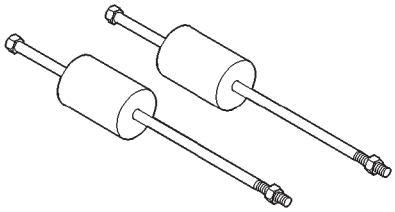
Pressure Gauge (Low) C-3292



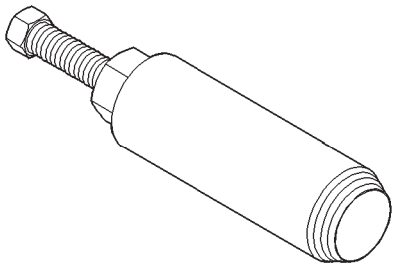
Pressure Gauge (High) C-3293SP



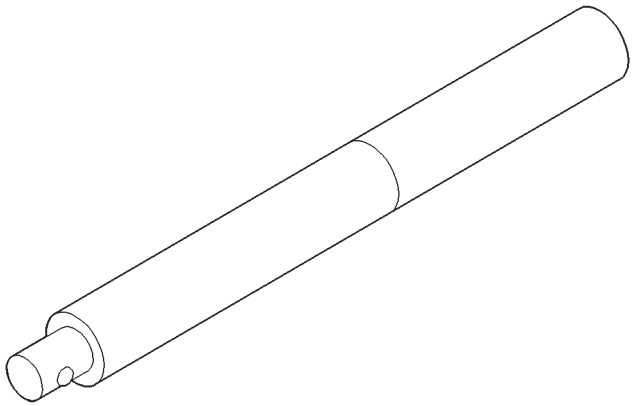
Dial Indicator C-3339



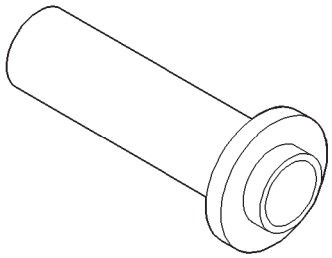
Oil Pump Puller C-3752



Seal Puller C-3981B

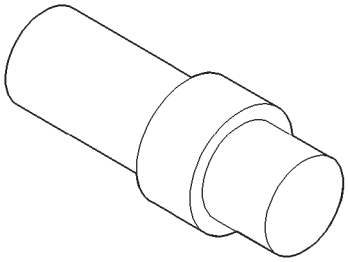


Universal Handle C-4171



Seal Installer C-4193A

SPECIAL TOOLS (Continued)



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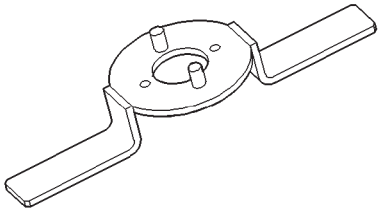

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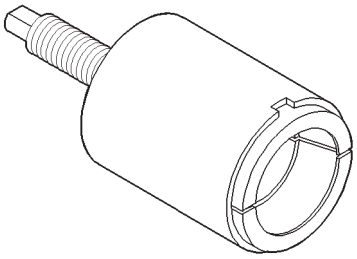

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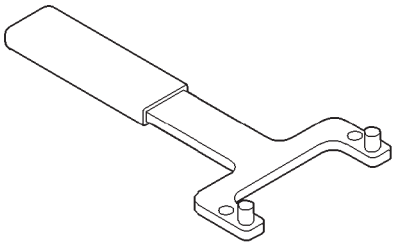

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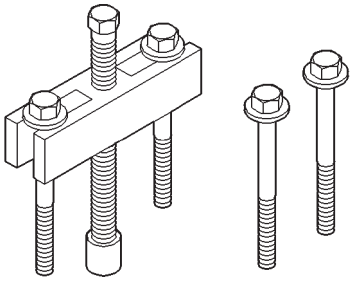

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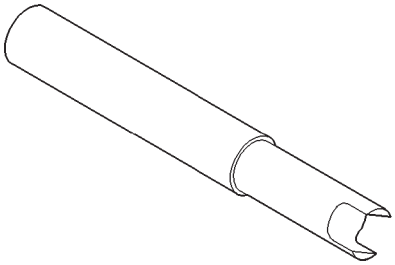

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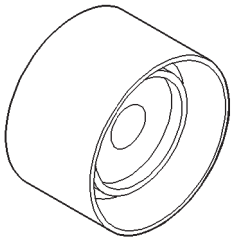

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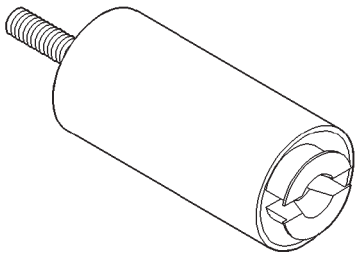

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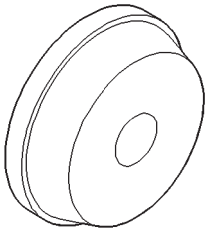

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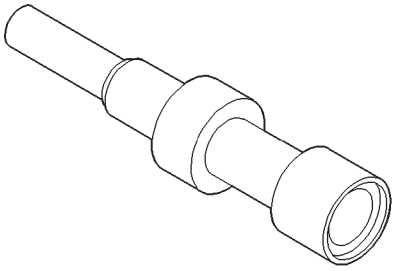

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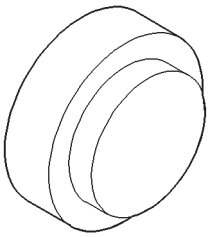

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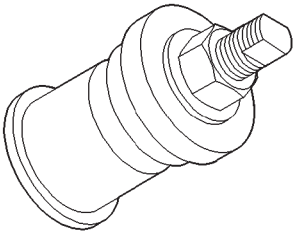

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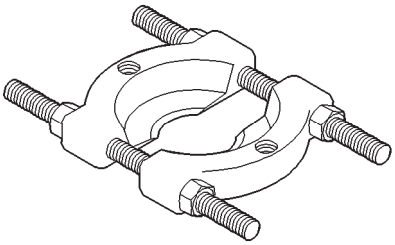

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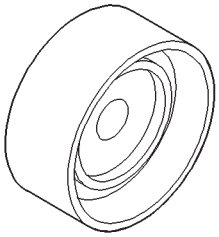

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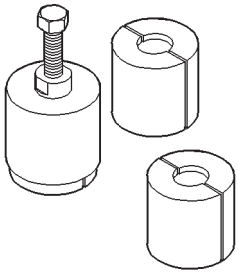

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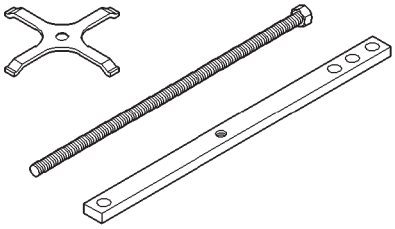

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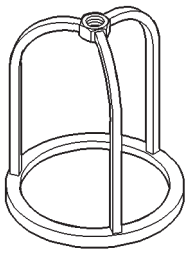

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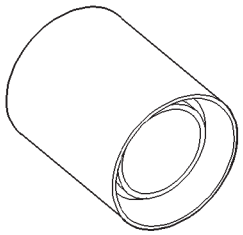

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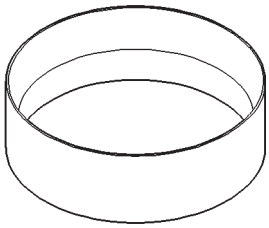

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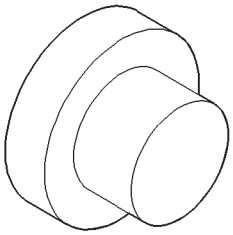

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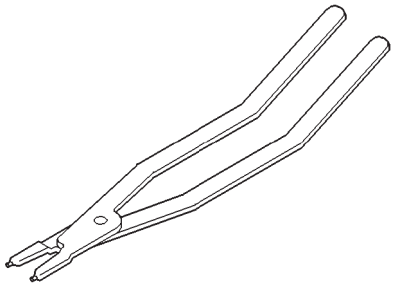

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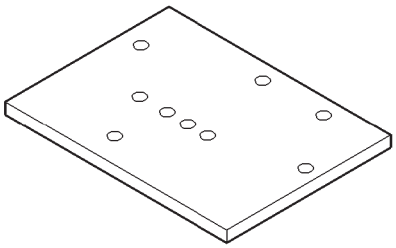

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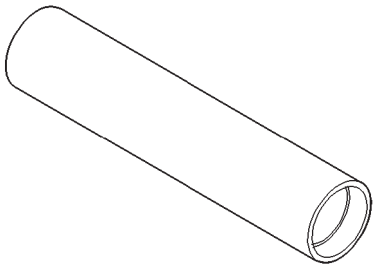

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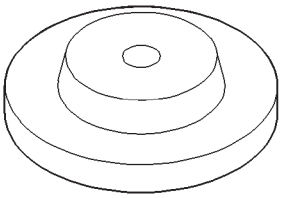

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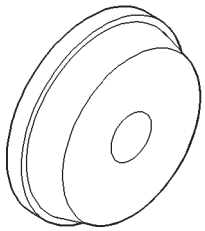

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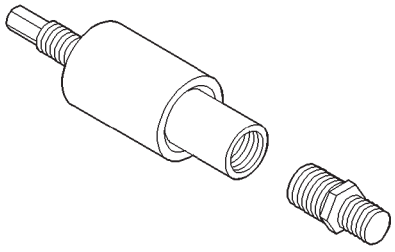

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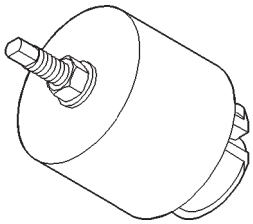

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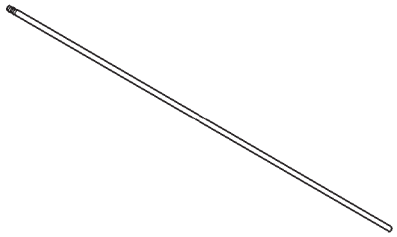

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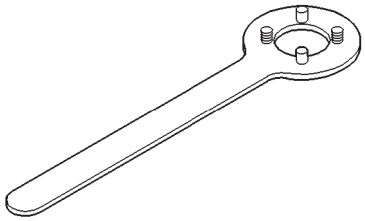

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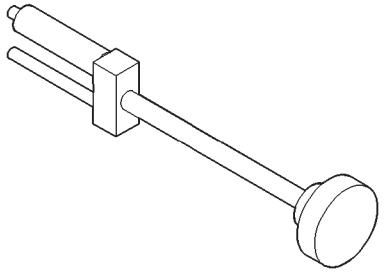

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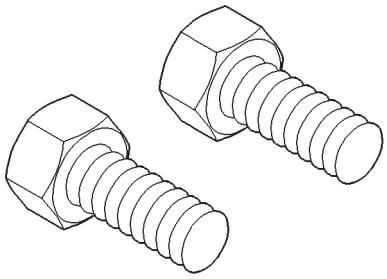

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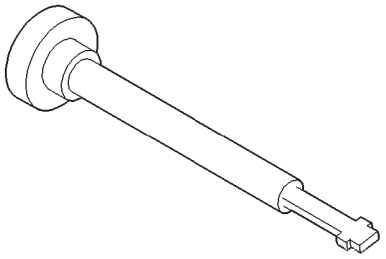

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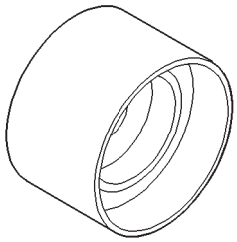

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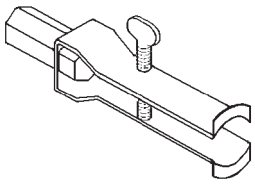

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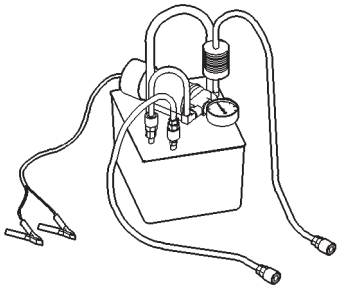


Cooler Flusher 6906A

POWER TRANSFER UNIT

INDEX

	page
GENERAL INFORMATION	
POWER TRANSFER UNIT	165
DIAGNOSIS AND TESTING	
FLUID LEAK DIAGNOSIS	167
SEAL IDENTIFICATION	165
REMOVAL AND INSTALLATION	
DIFFERENTIAL CARRIER SEAL	170
END COVER BALL BEARING	178
END COVER SEAL	169
HALF SHAFT INNER SEAL	175
INPUT SHAFT COVER SEAL	174
INPUT SHAFT END SEAL	177
INPUT SHAFT SEAL	169
OUTER HALF SHAFT SEAL	177
POWER TRANSFER UNIT (P.T.U.)	167
POWER TRANSFER UNIT OUTPUT SEAL	171
REAR COVER O-RING	171
ADJUSTMENTS	
OUTPUT FLANGE SHIM SELECTION	180
SPECIFICATIONS	
TORQUE	180
SPECIAL TOOLS	
SDP POWER TRANSFER UNIT	181

GENERAL INFORMATION

POWER TRANSFER UNIT

The Power Transfer Unit (P.T.U.) is attached to a modified automatic transaxle case where the right half shaft extension housing would normally be located. The Transfer Unit provides the power to the rear wheels through a hypoid ring gear and pinion set.

The Power Transfer Unit is sealed from the transaxle and has its own oil sump. The Unit uses SAE 85W-90 gear lubricant and holds 1.15 liters (1.22 quarts).

The Power Transfer Unit fill plug is located on the end cover (Fig. 1). **Do not mistake the black plastic inspection plug located on the P.T.U. case for the fill plug.**

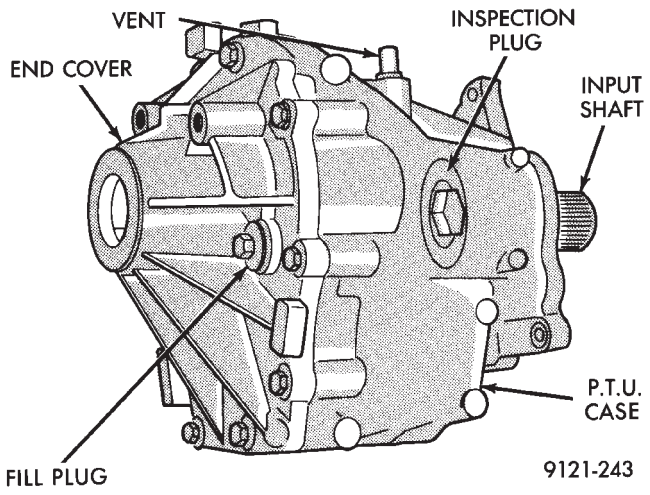


Fig. 1 Fill Plug Location

Service of the Power Transfer Unit is limited to:

- Seals
- Gaskets
- One ball bearing
- Output flange

If the ring gear and pinion, any tapered roller bearings, case, covers, or pinion carrier fail the entire unit must be replaced.

DIAGNOSIS AND TESTING

SEAL IDENTIFICATION

For accurate seal diagnosis, repair seal name and location is critical. Refer to (Fig. 2), (Fig. 3), (Fig. 4) and (Fig. 5) for correct seal name and location.

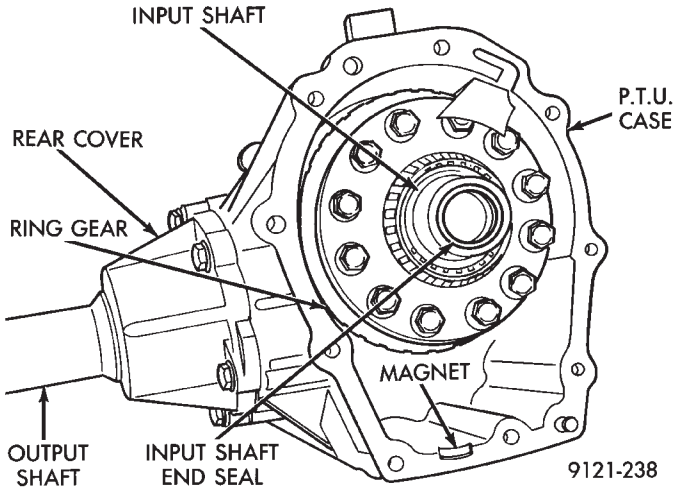
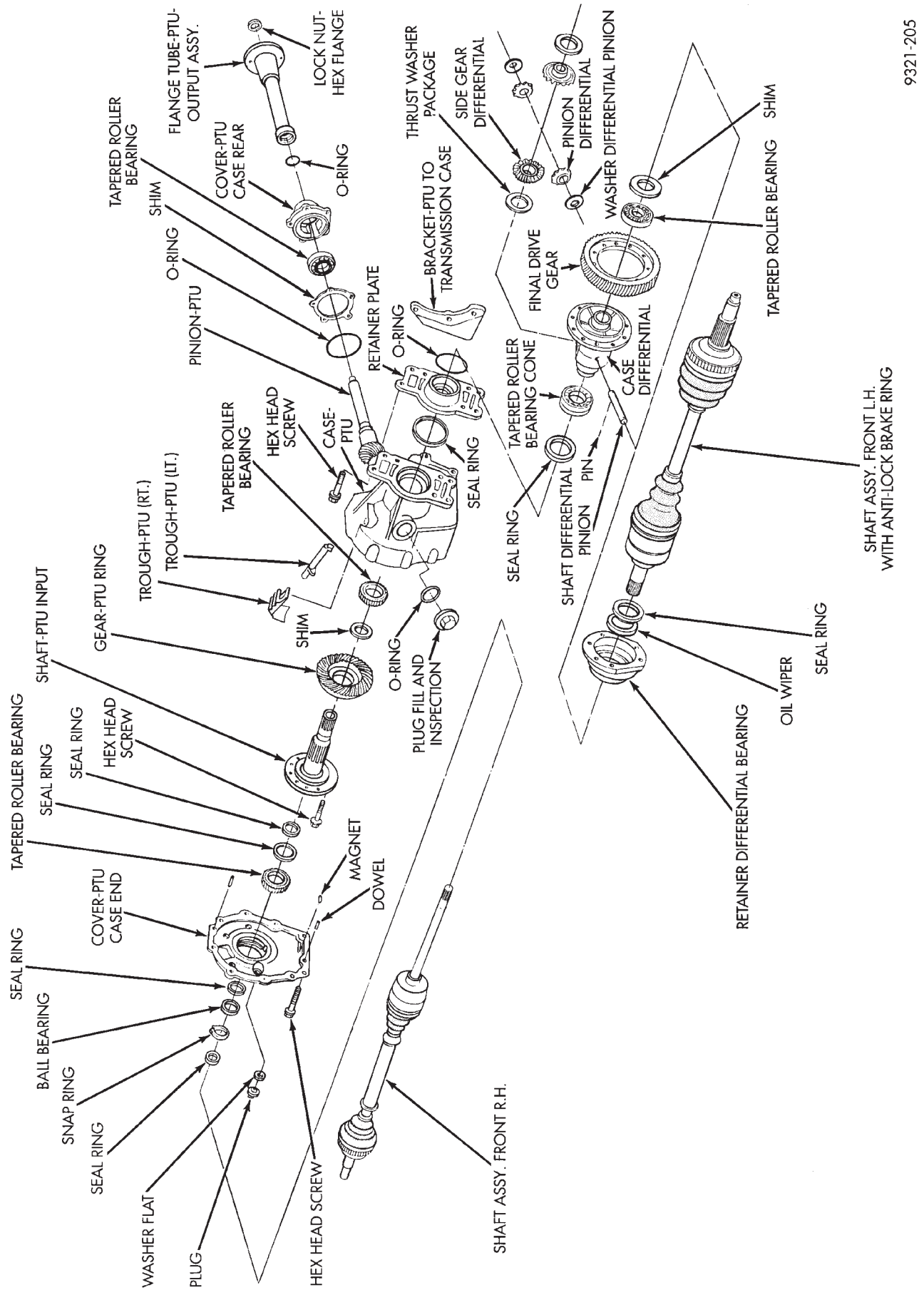


Fig. 2 Seal Location

DIAGNOSIS AND TESTING (Continued)



Power Transfer Unit Components

DIAGNOSIS AND TESTING (Continued)

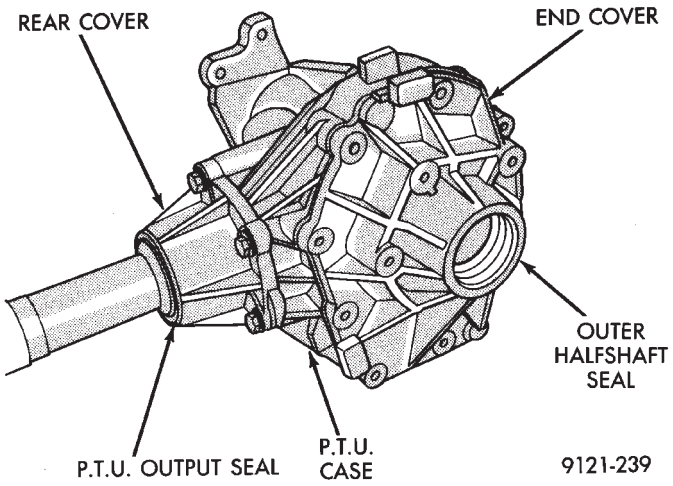


Fig. 3 Seal Location

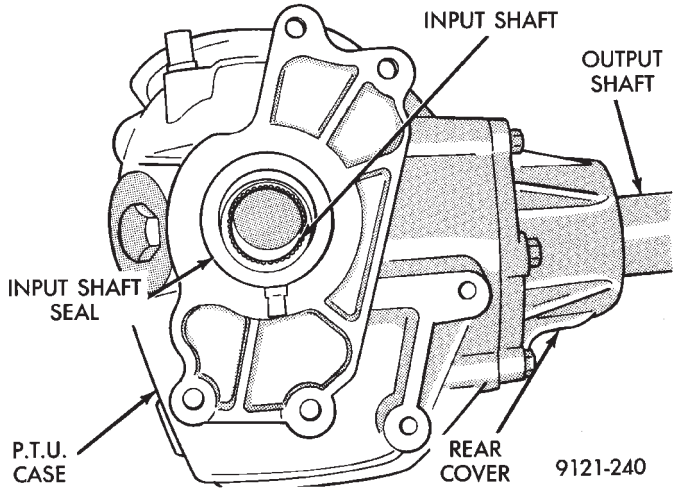


Fig. 4 Seal Location

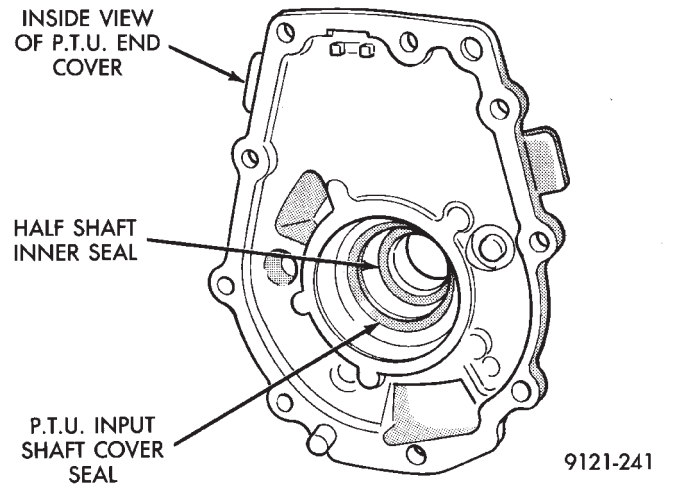


Fig. 5 Seal Location

FLUID LEAK DIAGNOSIS

When diagnosing fluid leaks on the Power Transfer Unit two weep holes are provided to diagnose certain seal leaks. These holes are located on the bottom side of the assembly (Fig. 6).

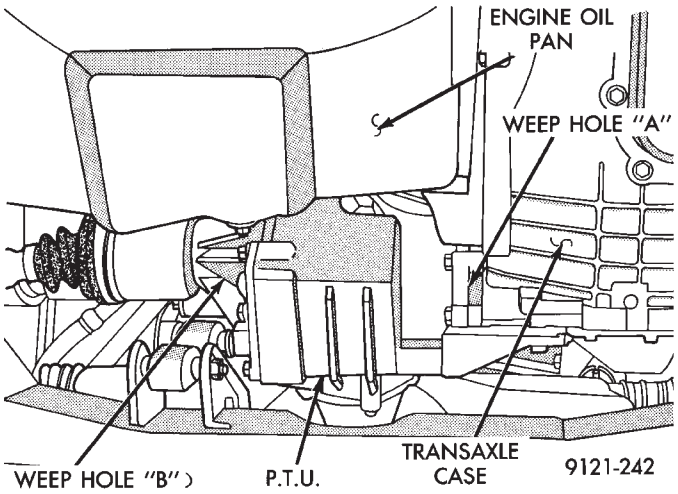


Fig. 6 Weep Hole Locations

If fluid leak is detected from either weep hole, seal replacement is necessary. **Do not attempt to repair the leak by sealing weep holes,** they must be kept clear of sealants for proper seal operation.

If fluid is leaking from weep hole A (Fig. 6) the type of fluid leaking will determine which seal needs to be replaced. If the fluid leaking is red in color (transmission fluid) this indicates that the Transmission differential carrier seal should be replaced. If the fluid leaking is light brown (gear lube) this indicates that the Power Transfer Unit input seal should be replaced. For replacement of these seals refer to Power Transfer Unit Service Procedures.

If fluid is leaking from weep hole B (Fig. 6) the type of fluid leaking will determine which seal is leaking. If the fluid leaking is red in color (transmission fluid) this indicates that the input shaft end seal should be replaced. If the fluid leaking is light brown (gear lube) this indicates that the half shaft inner seal and P.T.U. input shaft cover seal should be replaced. For replacement of these seals refer to Power Transfer Unit Service Procedures.

Before condemning any seal or gasket be sure that the rear rocker arm cover on the engine is not the cause of the oil leak. Oil leaking from the rocker arm cover is easily mistaken for a leaking Power Transfer Unit.

REMOVAL AND INSTALLATION

POWER TRANSFER UNIT (P.T.U.)

REMOVAL

(1) Raise vehicle and remove front wheels.

REMOVAL AND INSTALLATION (Continued)

CAUTION: A certain amount of oil will drain out of the transaxle when the drive shaft is removed.

(2) Remove right front drive shaft. Install a plug into the right driveshaft seal hole. Refer to Group 2, Suspension to remove or install wheel hub nut and right drive shaft.

(3) Mark propeller shaft front flange.

(4) Separate propeller shaft from P.T.U. assembly (Fig. 7).

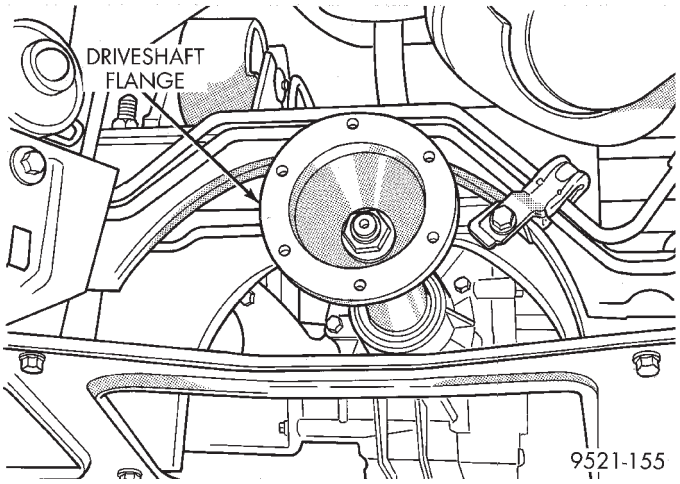


Fig. 7 Driveshaft Flange

CAUTION: Do not let propeller shaft to hang freely. Damage to the shaft will occur.

(5) Suspend propeller shaft from underbody of vehicle.

(6) Remove cradle plate (Fig. 8).

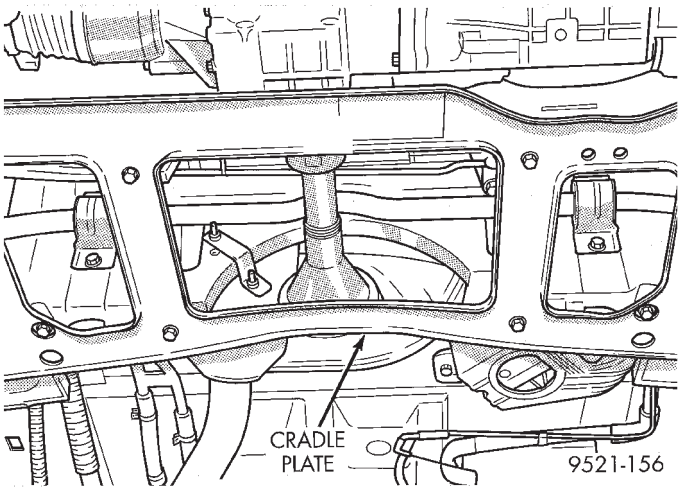


Fig. 8 Cradle Plate

(7) Remove the Power Transfer Unit mounting bracket bolts at the rear of the unit (Fig. 9).

(8) Remove the right outboard support bracket and bolts near the right axle shaft.

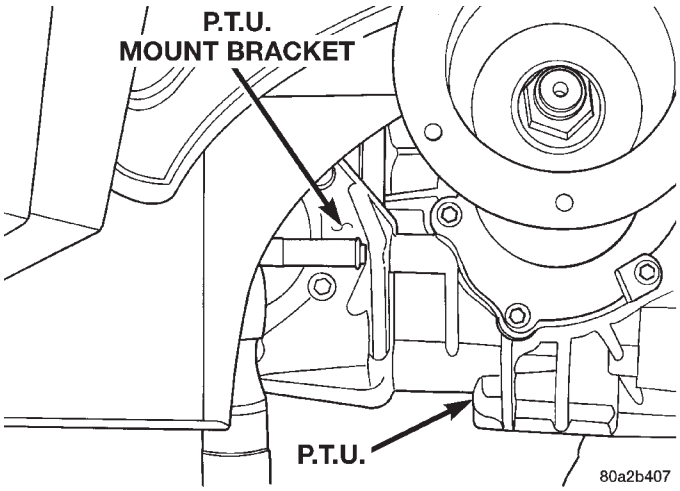


Fig. 9 Remove Rear P.T.U Bracket Bolts

(9) Remove the four mounting bolts for the P.T.U. (Fig. 10) and (Fig. 11).

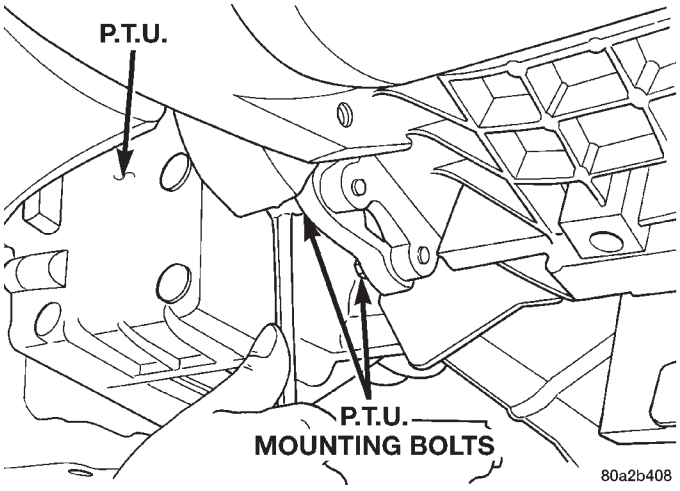


Fig. 10 P.T.U. Lower Mounting Bolts

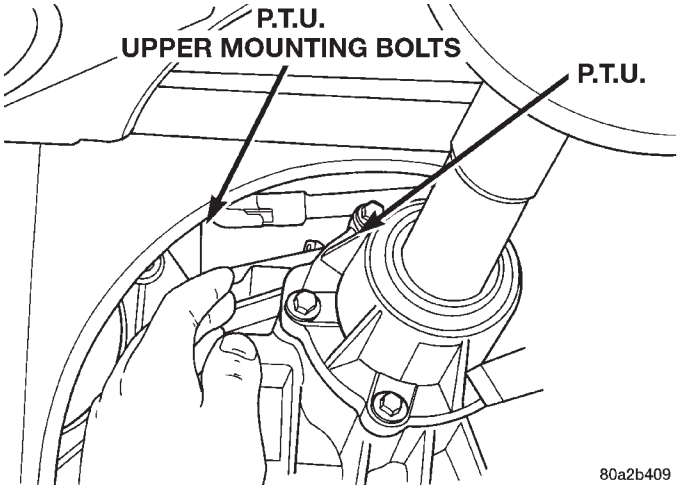


Fig. 11 P.T.U. Upper Mounting Bolts

(10) Remove P.T.U. assembly from vehicle.

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) To install, reverse removal procedure. Check transaxle fluid and P.T.U. fluid and fill to level.

(2) Refer to the Specifications section for the proper torque specifications.

END COVER SEAL

The Power Transfer Unit must be removed from the vehicle to perform this operation. Refer to Power Transfer Unit Removal in this section for procedures.

(1) Remove P.T.U. end cover bolts (Fig. 12).

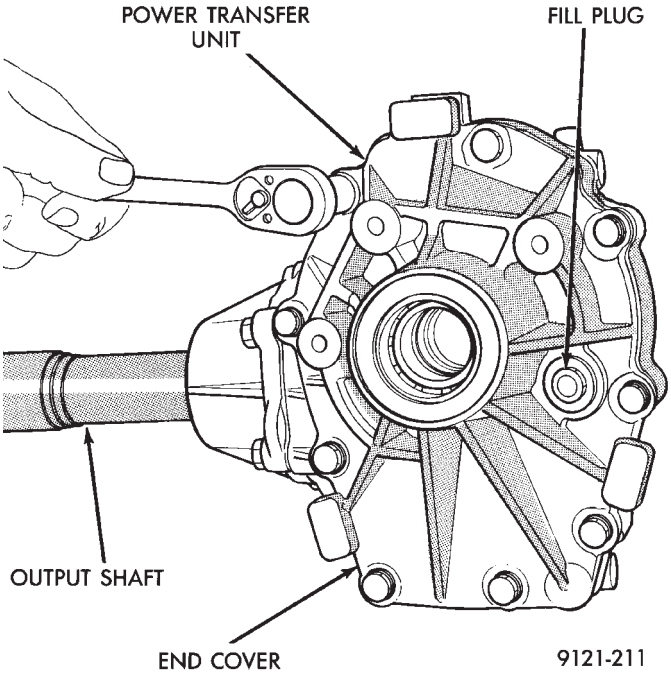


Fig. 12 P.T.U. End Cover Bolts

(2) Gently tap on end cover ears with a hammer to separate end cover from the case (Fig. 13).

(3) Clean and inspect sealer surfaces.

(4) Apply Mopar® Gasket Maker, Loctite Gasket Eliminator No.518 or equivalent to sealing surfaces.

(5) Reinstall cover and tighten bolts to 28 N·m (250 in. lbs.) in the sequence shown in (Fig. 14). Retighten first bolt after all others are tight.

CAUTION: When end cover is installed be careful not to damage the P.T.U. Input Shaft Cover Seal.

(6) Reinstall P.T.U. into vehicle.

(7) Check and fill fluids as required.

INPUT SHAFT SEAL

The Power Transfer Unit must be removed from the vehicle to service this seal. Refer to Power Transfer Unit Removal in this section for procedures.

REMOVAL

(1) Remove P.T.U. end cover bolts (Fig. 15).

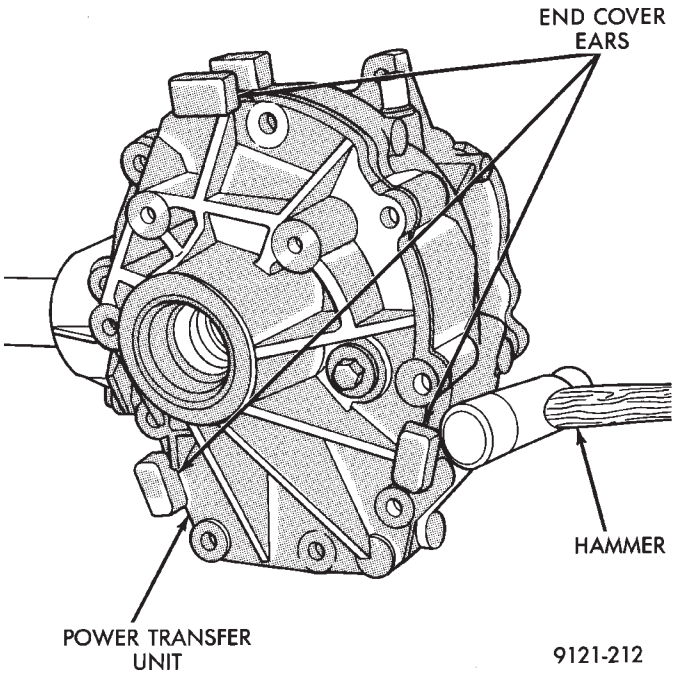


Fig. 13 End Cover Removal

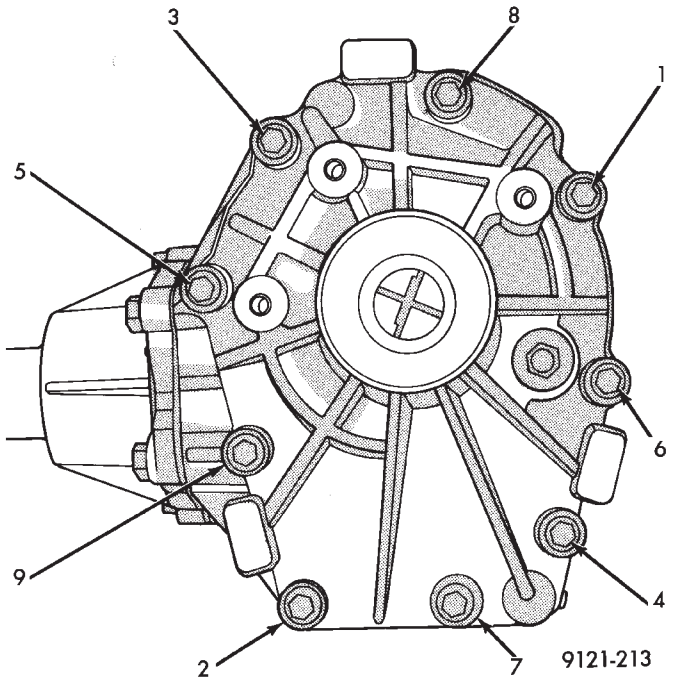


Fig. 14 Bolt Tightening Sequence

(2) Gently tap on end cover ears to separate cover from case (Fig. 16).

(3) Remove ring gear oil trough (Fig. 17).

(4) Remove input shaft and ring gear from case (Fig. 18).

(5) Use Special Tool No. 7794-A (seal puller) to remove seal (Fig. 19).

REMOVAL AND INSTALLATION (Continued)

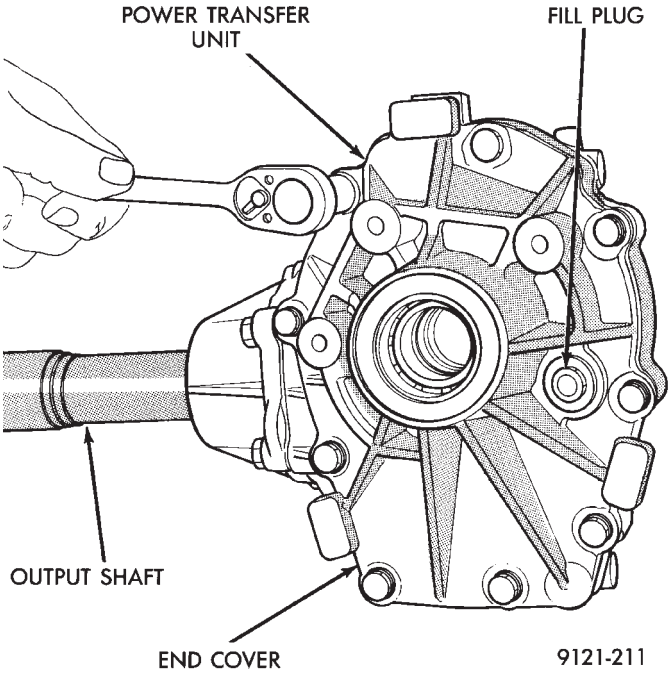


Fig. 15 P.T.U. End Cover Bolts

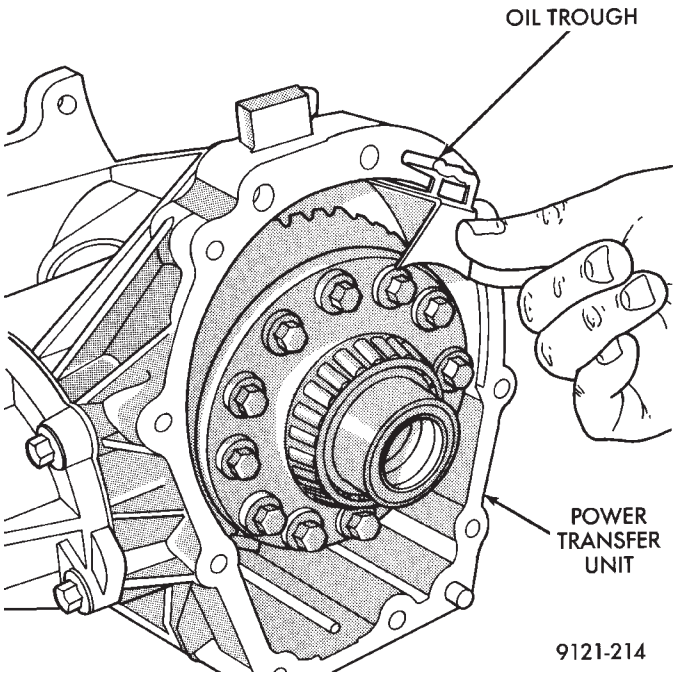


Fig. 17 Oil Trough

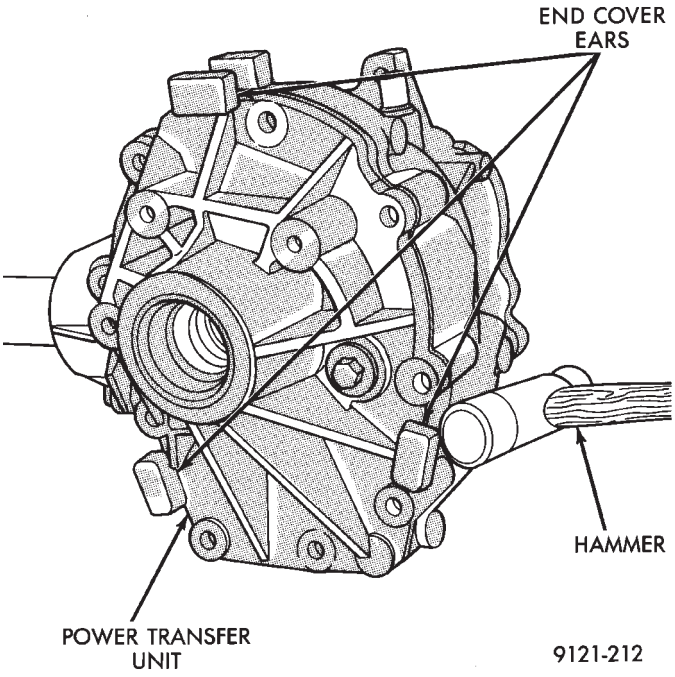


Fig. 16 End Cover Removal

INSTALLATION

(1) Clean and inspect seal area.

(2) Lay housing on bench and install new seal with seal driver C-4657 and handle C-4171 (Fig. 20). The seal must be installed with the spring side facing towards the ring gear. Drive the seal in until it bottoms against the case shoulder.

(3) Install input shaft.

(4) Install oil trough.

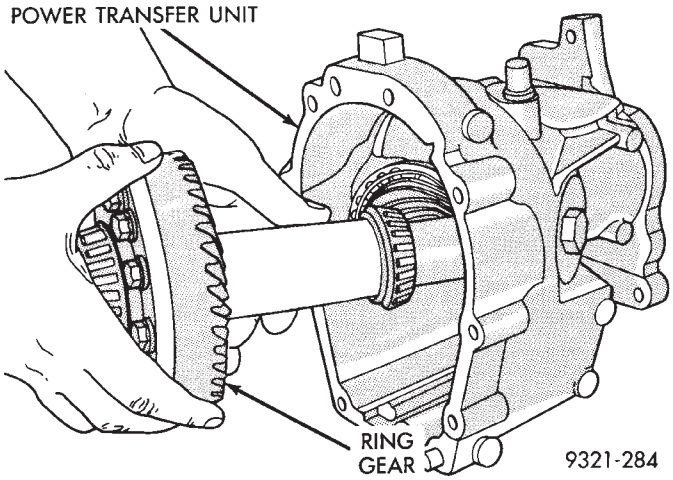


Fig. 18 Input Shaft and Ring Gear Removal

(5) Apply Mopar® Gasket Maker or equivalent to sealing surfaces of end cover and reinstall. Tighten bolts to 28 N·m (250 in. lbs.).

CAUTION: When end cover is installed be careful not to damage the P.T.U. Input Shaft Cover Seal.

(6) Reinstall P.T.U. assembly into vehicle.

(7) Check and fill fluids as required.

DIFFERENTIAL CARRIER SEAL

The Power Transfer Unit must be removed from the vehicle to replace this seal.

REMOVAL

(1) Remove P.T.U. from vehicle.

REMOVAL AND INSTALLATION (Continued)

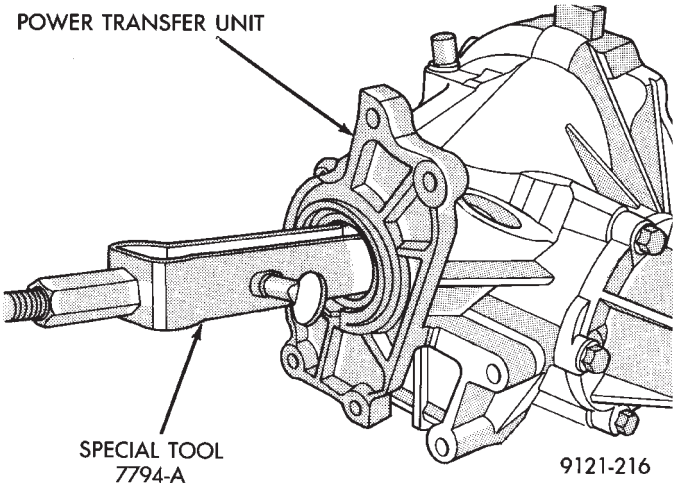


Fig. 19 Seal Removal

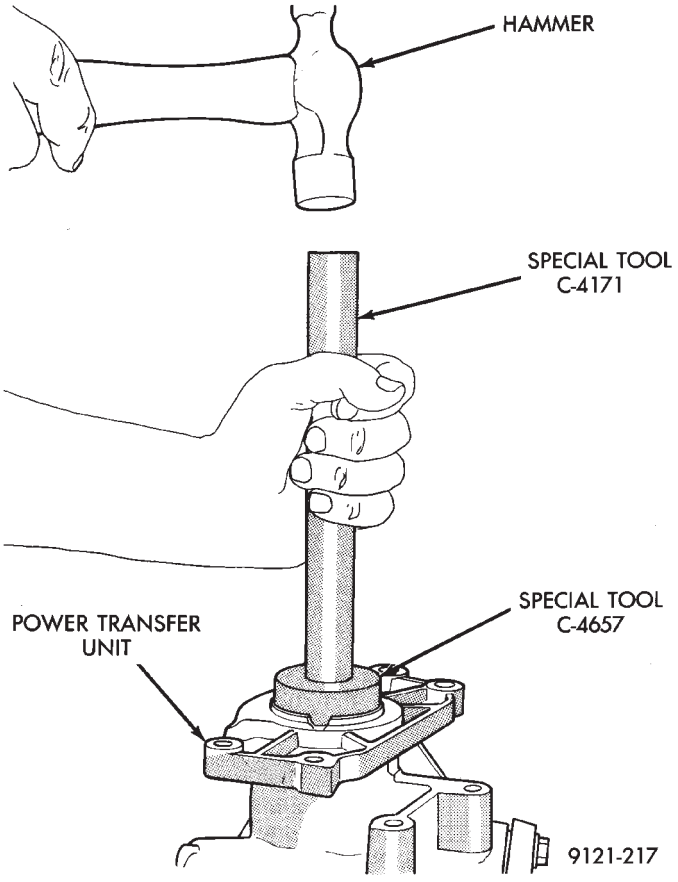


Fig. 20 Seal Installation

(2) Use a pry bar to remove seal from retainer plate (Fig. 21). Be careful not to damage seal journal when removing seal.

INSTALLATION

(1) Using a large socket, carefully install new seal. The spring side of the seal must face the transaxle differential.

(2) Reinstall the P.T.U. into the vehicle.

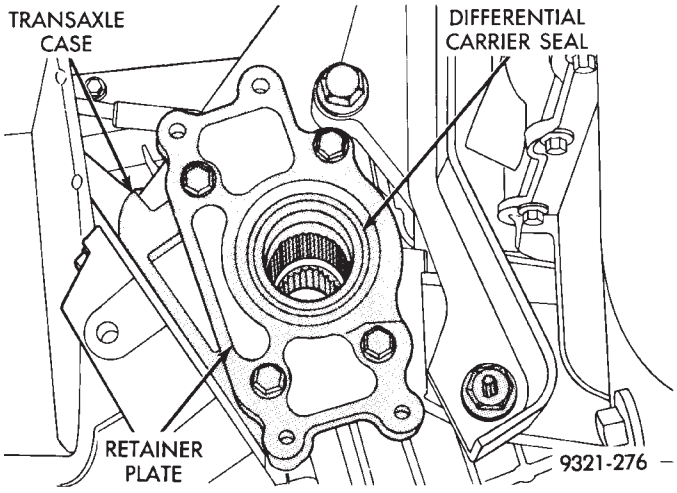


Fig. 21 Transaxle Differential Carrier Seal

(3) Check and fill fluids as required.

REAR COVER O-RING

REMOVAL

(1) Raise vehicle on hoist.

(2) Remove rear cover retaining bolts (Fig. 22).

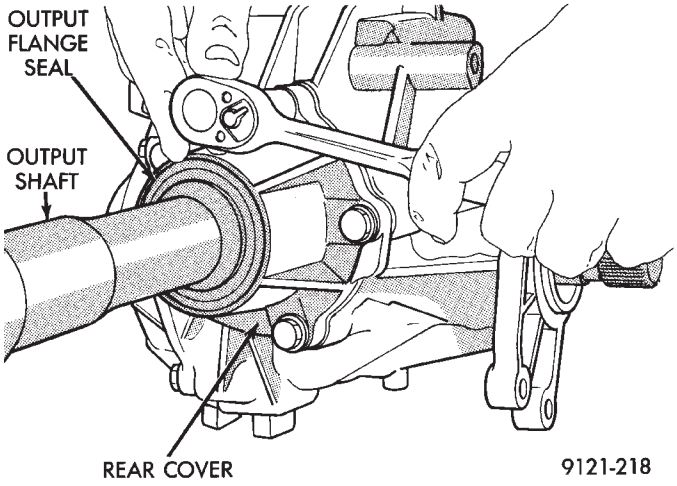


Fig. 22 Rear Cover Bolts

(3) Index rear cover to the case for later reassembly (Fig. 23).

(4) Pull rear cover out of the P.T.U. case (Fig. 24).

(5) Remove rear cover O-Ring (Fig. 25).

INSTALLATION

(1) To install, reverse removal procedure.

POWER TRANSFER UNIT OUTPUT SEAL

The power transfer unit must be removed from the vehicle to replace this seal.

REMOVAL AND INSTALLATION (Continued)

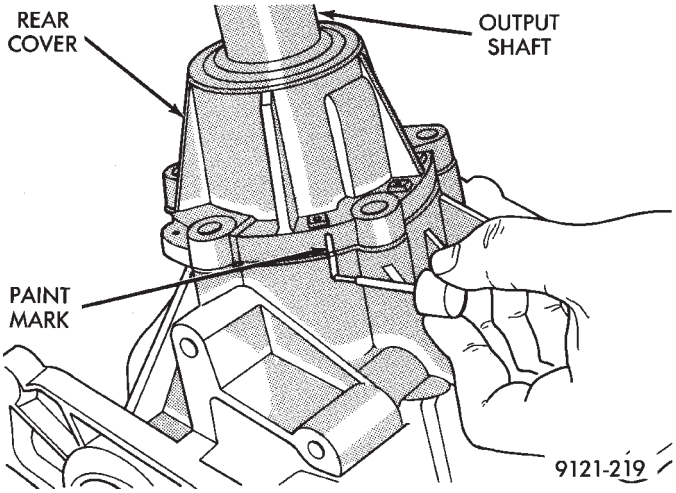


Fig. 23 Mark Rear Cover

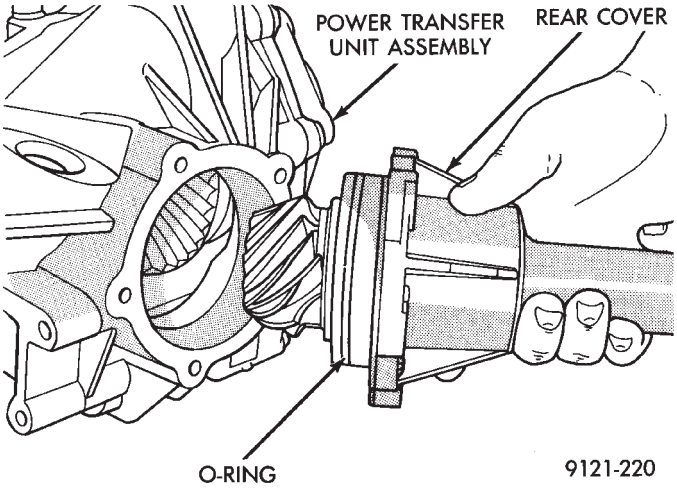


Fig. 24 Rear Cover Removal

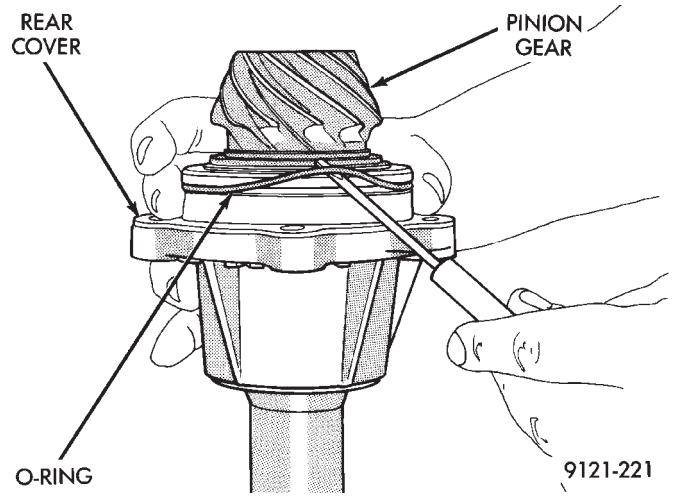


Fig. 25 O-Ring Removal

REMOVAL

(1) Raise vehicle on hoist.
(2) Remove propeller shaft.
(3) Remove rear cover retaining bolts (Fig. 26).

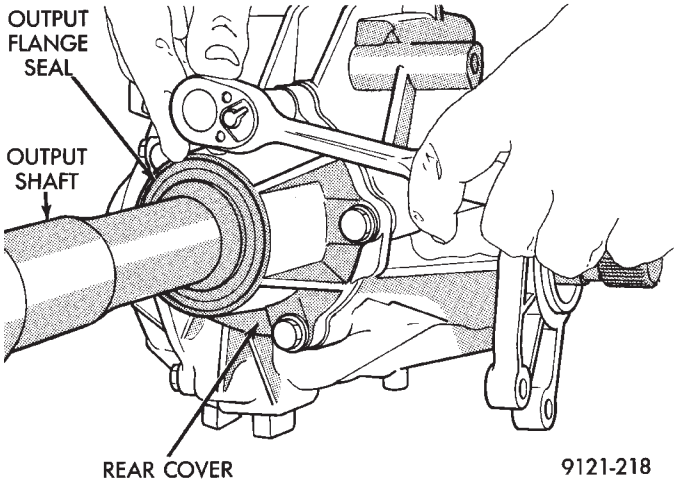


Fig. 26 Rear Cover Bolts

(4) Index rear cover to the case for later reassembly (Fig. 27).

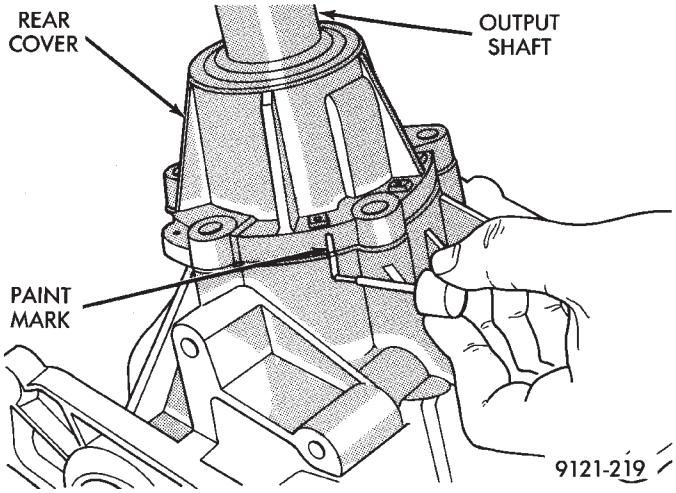


Fig. 27 Mark Rear Cover

(5) Pull rear cover out of the P.T.U. case (Fig. 28).

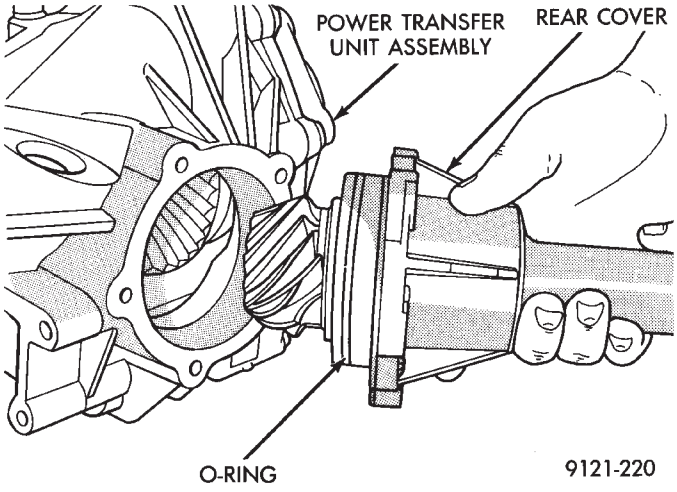


Fig. 28 Rear Cover Removal

REMOVAL AND INSTALLATION (Continued)

(6) Remove output flange nut (Fig. 29).

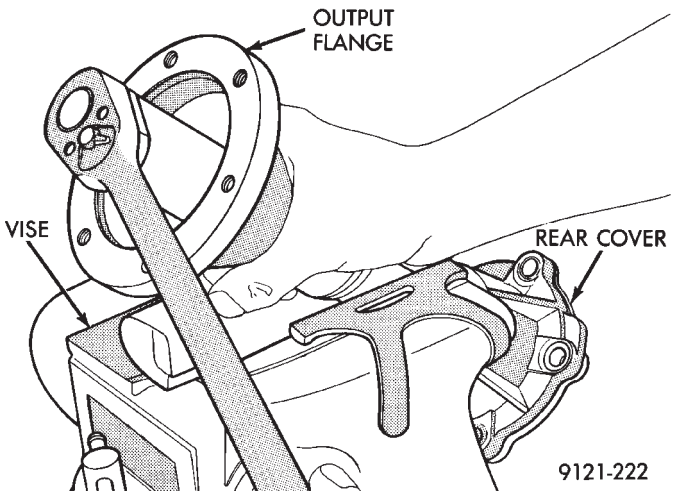


Fig. 29 Output Flange Nut

(7) Index the pinion to the flange (Fig. 30).

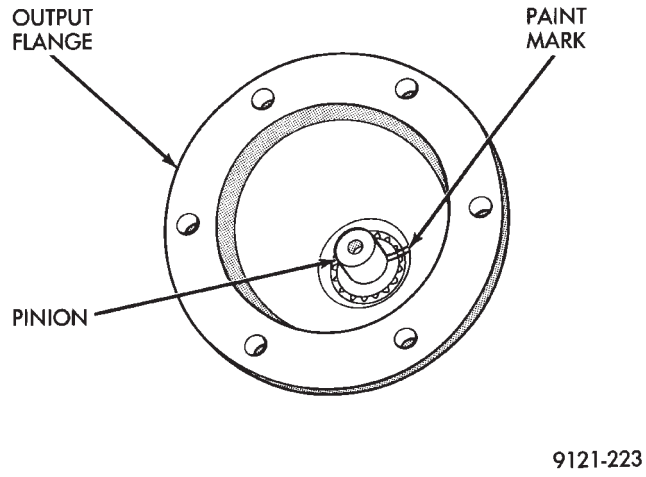


Fig. 30 Mark Flange and Shaft

(8) Using a hydraulic press, press off output flange from pinion.

(9) Use a hammer and chisel to remove output seal (Fig. 31).

CAUTION: If the output flange requires replacement, a new shim may be required. Refer to Output Flange Shim Selection procedure in this section to determine correct shim requirements.

INSTALLATION

(1) Install new seal with Seal Installer 5049 (Fig. 32).

(2) If the original flange is used, align index marks and press flange onto pinion. If a new flange is used disregard the alignment marks on the pinion and press flange onto the pinion.

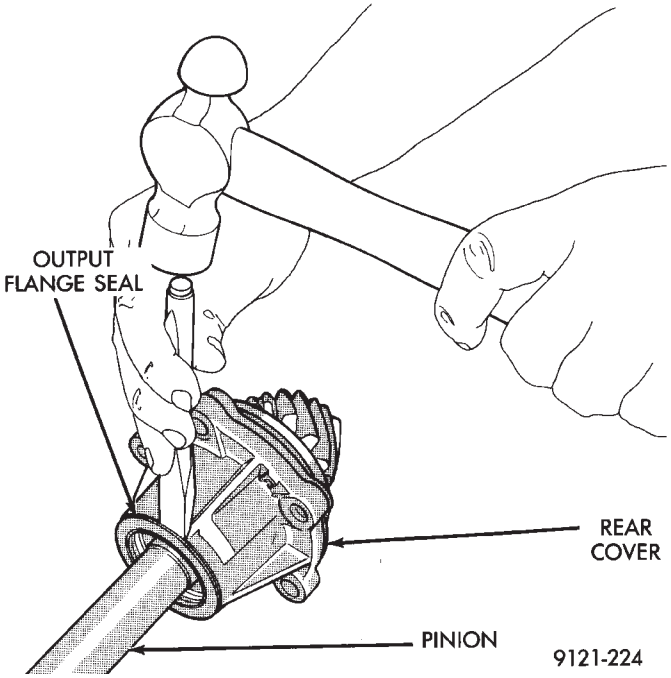


Fig. 31 Seal Removal

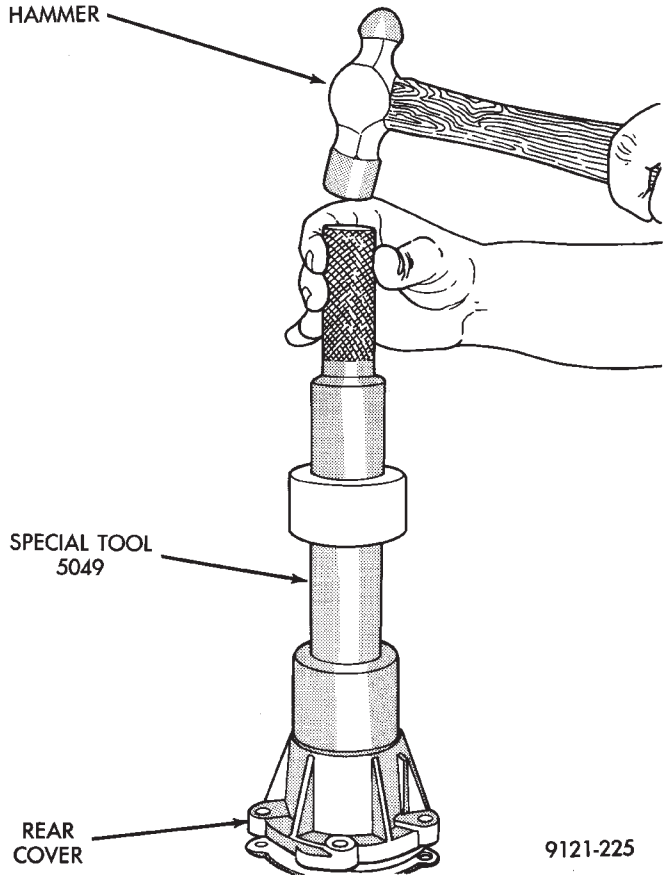


Fig. 32 Seal Installation

(3) Install flange nut and tighten to 244 N·m (180 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

(4) Install rear cover. Use care not to cut rear cover O-Ring when installing rear cover into P.T.U. housing.

(5) Install rear cover retaining bolts and tighten to 28 N·m (250 in. lbs.).

(6) Install propeller shaft.

(7) Check and fill fluids as required.

INPUT SHAFT COVER SEAL

The power transfer unit input shaft cover seal is the larger of the two seals located on the inside of the end cover. The differential bearing cup must be removed to service this seal.

The Power Transfer Unit must be removed from vehicle to perform this operation.

REMOVAL

(1) Remove P.T.U. end cover bolts (Fig. 33).

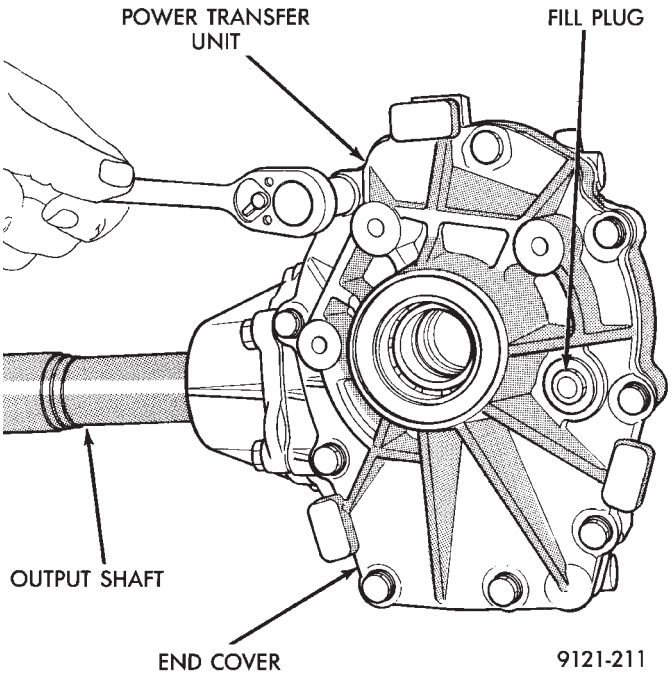


Fig. 33 P.T.U. End Cover Bolts

(2) Gently tap on end cover ears to separate cover from case (Fig. 34).

(3) Use special tool No. 6514 and remove the differential bearing race located in the end cover (Fig. 35). The race must be removed to gain access to the seal.

(4) Use special tool No. 7794-A to remove seal (Fig. 36).

INSTALLATION

(1) Clean and inspect seal area.

(2) Use special tool No. MD998803 and install seal (Fig. 37). When installing seal the spring side of the seal must face toward the special tool.

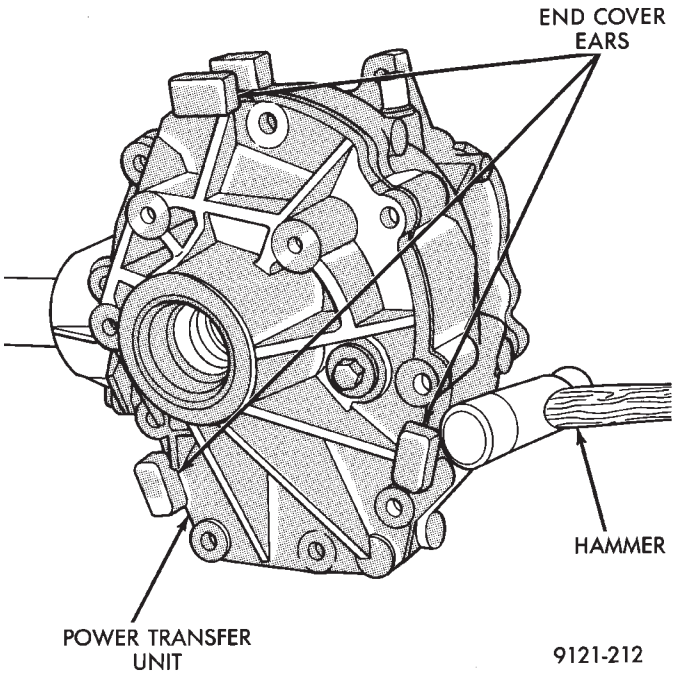


Fig. 34 End Cover Removal

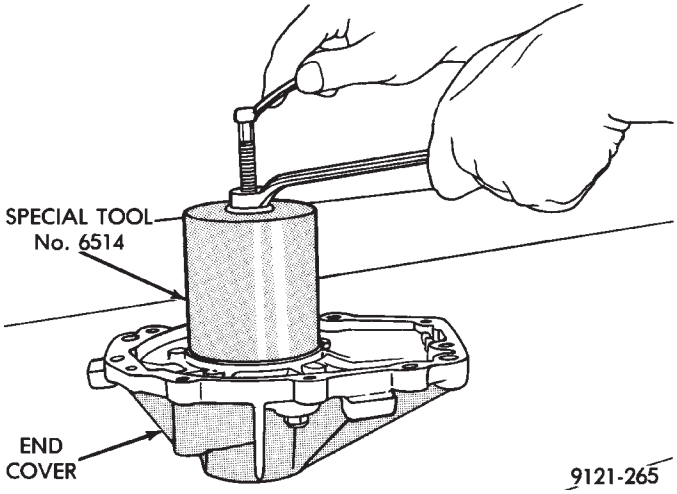


Fig. 35 Bearing Race Removal

(3) Reinstall the original bearing race and shim using special tool No. 6522 (Fig. 38) and (Fig. 39).

CAUTION: The original shim must be installed behind the bearing cup to maintain proper bearing preload.

(4) Apply Mopar® Gasket Maker, Loctite Gasket Eliminator No. 518 or equivalent to sealing surfaces of end cover.

(5) Place end cover onto P.T.U. case and install bolts. Tighten bolts to 28 N·m (250 in. lbs.) in the sequence shown in (Fig. 40). Retighten first bolt after all others are tight.

REMOVAL AND INSTALLATION (Continued)

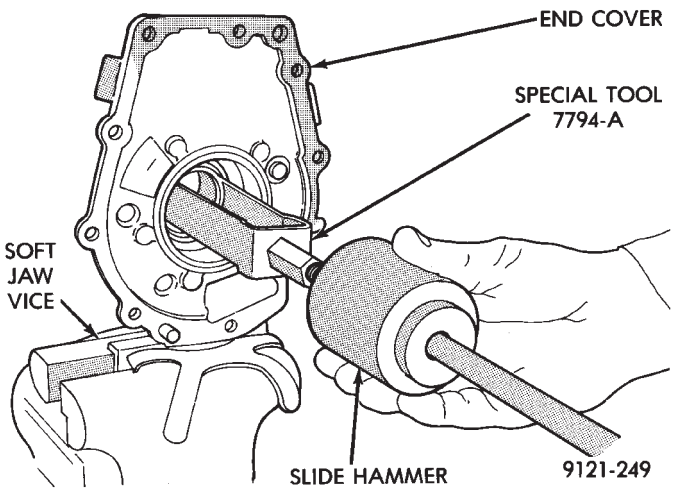


Fig. 36 Seal Removal

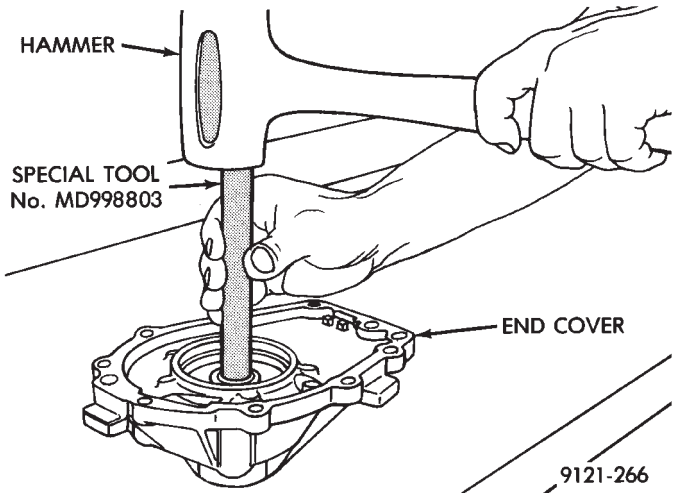


Fig. 37 Seal Installation

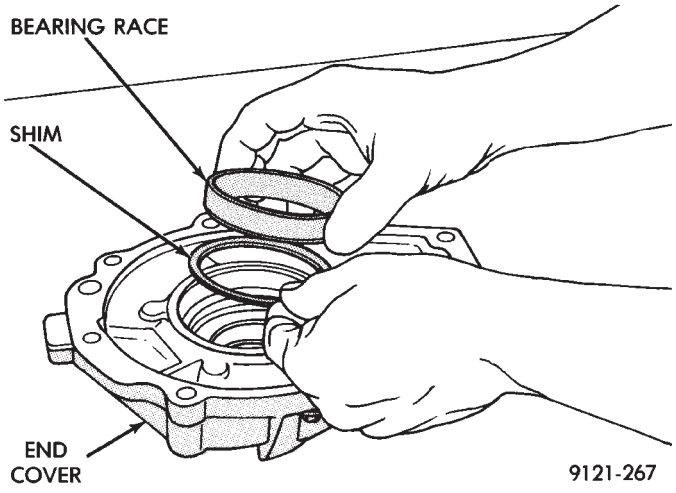


Fig. 38 Bearing Shim and Race

CAUTION: When end cover is installed be careful not to damage the P.T.U. Input Shaft Cover Seal.

(6) Reinstall P.T.U. assembly into vehicle.

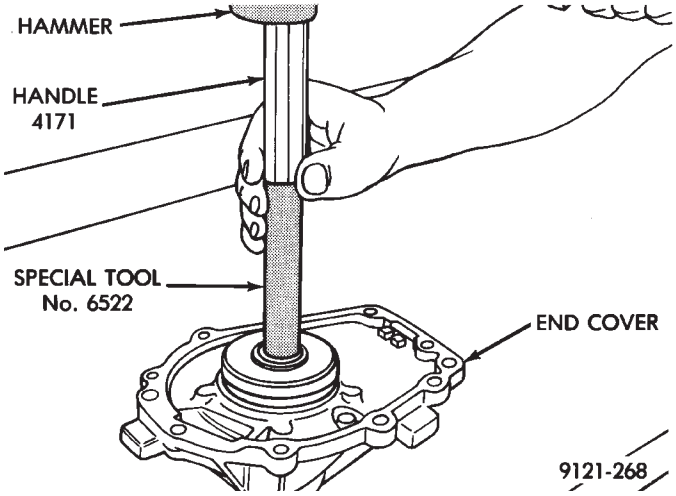


Fig. 39 Installing Bearing Race

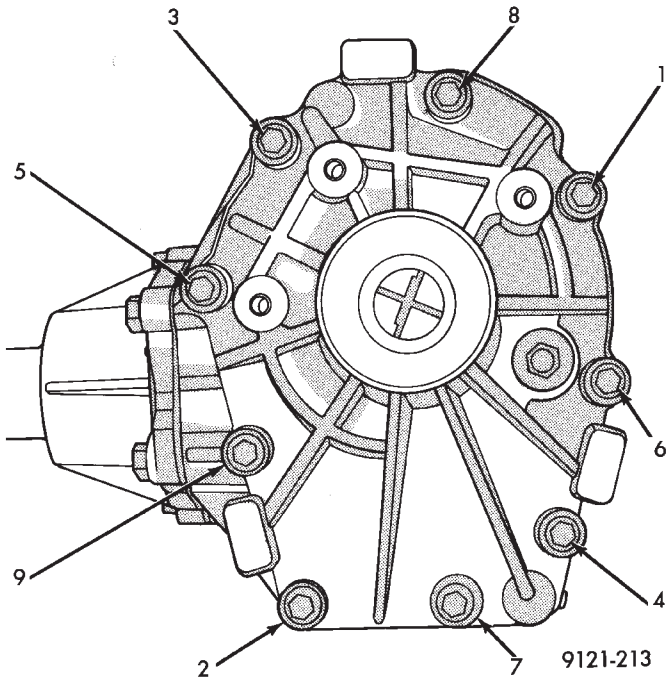


Fig. 40 Bolt Tightening Sequence

(7) Check and fill fluids as required.

HALF SHAFT INNER SEAL

The power transfer unit half shaft inner seal is the smaller of the two seals located on the inside of the end cover.

REMOVAL

(1) Remove power transfer unit from the vehicle.
(2) Remove end cover bolts (Fig. 41).
(3) Tap on end cover ears to separate cover from case (Fig. 42).
(4) Drive seal out with a hammer and small chisel (Fig. 43).

REMOVAL AND INSTALLATION (Continued)

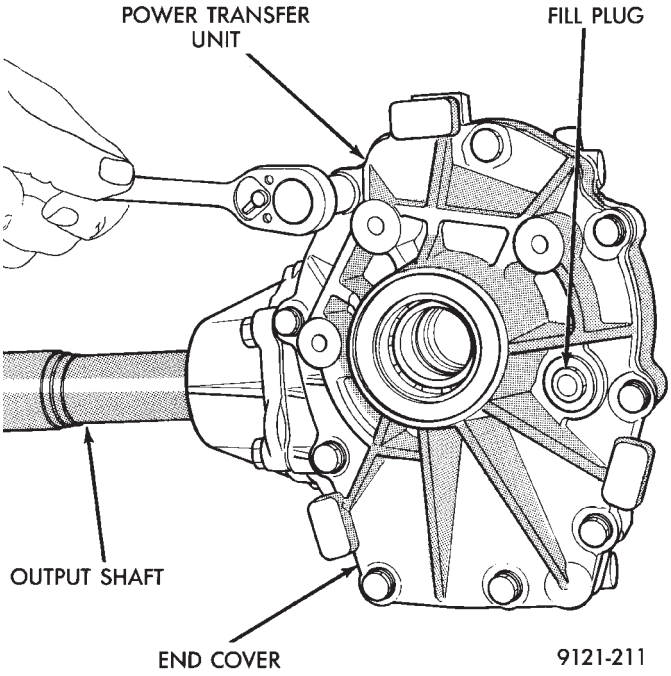


Fig. 41 End Cover Bolts

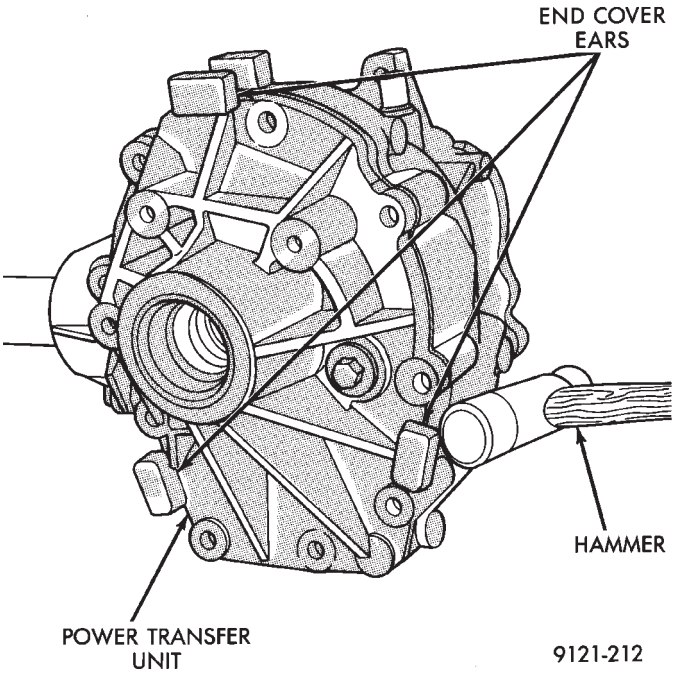


Fig. 42 End Cover Removal

INSTALLATION

(1) Clean and inspect seal area.

(2) Install seal with a 1 1/16 inch socket (Fig. 44). The seal must be installed with the spring side of the seal facing end cover ball bearing. The seal will bottom against a machined shoulder in the cover.

(3) Clean sealing surfaces of the end cover and P.T.U. case. Apply a bead of Mopar® Gasket Maker, Loctite Gasket Eliminator No. 518 or equivalent.

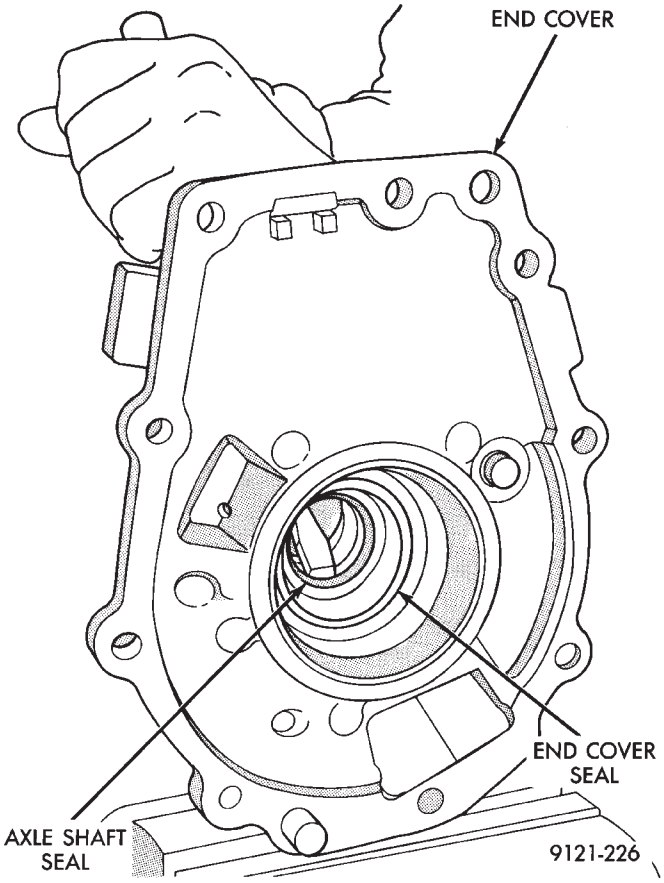


Fig. 43 Seal Removal

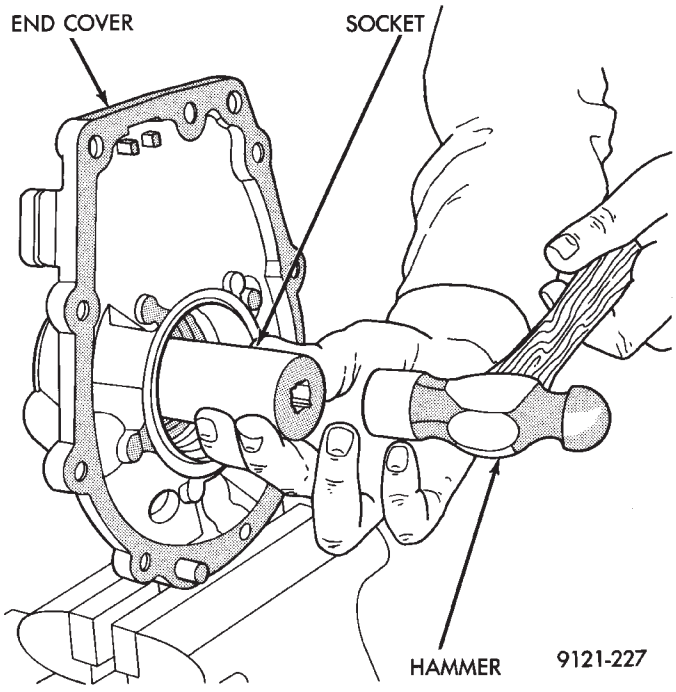


Fig. 44 Seal Installation

(4) Place end cover onto P.T.U. case and install bolts. Tighten bolts to 28 N·m (250 in. lbs.) in the

REMOVAL AND INSTALLATION (Continued)

sequence shown in (Fig. 45). Retighten first bolt after all other bolts are tight.

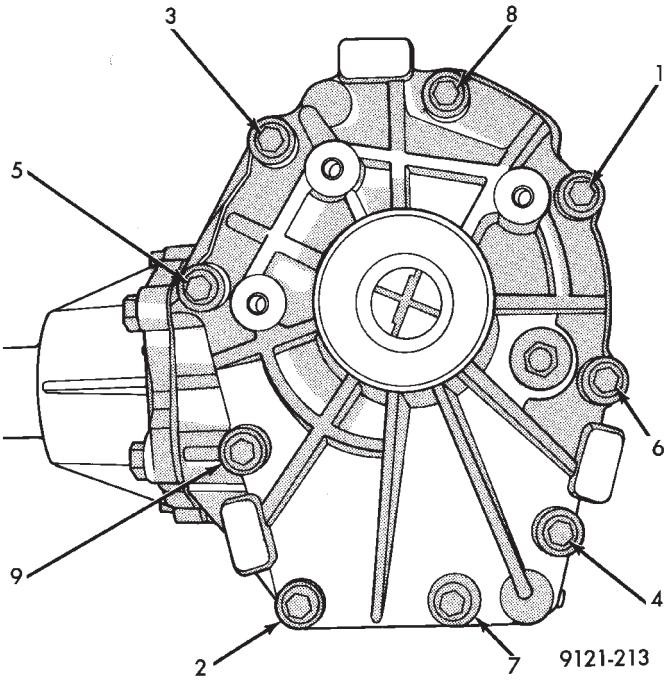


Fig. 45 Bolt Tightening Sequence

(5) Reinstall P.T.U. assembly.
(6) Check and fill fluids as required.

INPUT SHAFT END SEAL

The input shaft end seal is located on the end of the input shaft.

REMOVAL

(1) Remove power transfer unit from the vehicle.
(2) Remove end cover bolts (Fig. 46).
(3) Tap on end cover ears to separate end cover from case (Fig. 47).
(4) Pry out seal with a pry bar (Fig. 48).

INSTALLATION

(1) Clean and inspect seal area.
(2) Remove input shaft from housing and stand on soft block of wood. Install input shaft end seal with seal installer 5065 and handle C-4171.
(3) Lubricate seal lip after installing seal into input shaft.
(4) Clean sealing surfaces of the end cover and P.T.U. case. Apply a bead of Mopar® Gasket Maker, Loctite Gasket Eliminator No. 518 or equivalent.
(5) Place end cover onto P.T.U. case and install bolts. Tighten bolts to 28 N·m (250 in. lbs.) in the sequence shown in (Fig. 49). Retighten first bolt after all others are tight.

CAUTION: When end cover is installed be careful not to damage the P.T.U. Input Shaft Cover Seal.

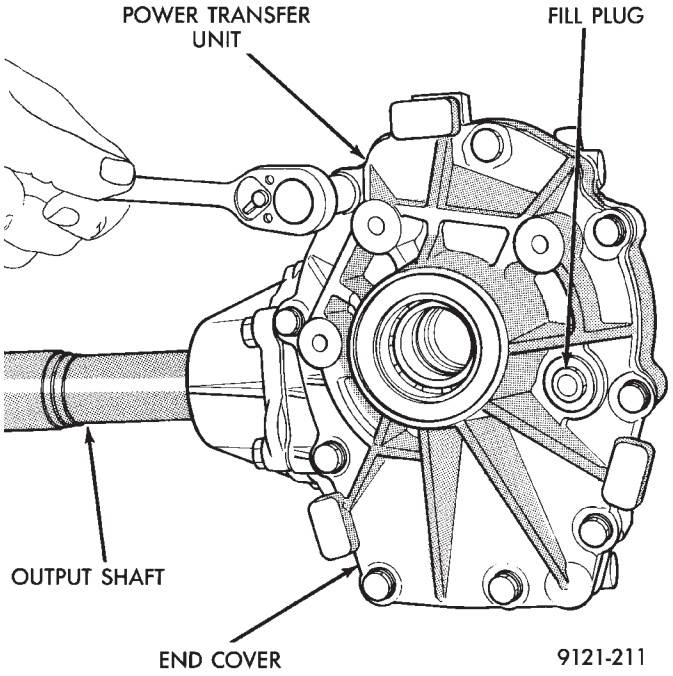


Fig. 46 End Cover Bolts

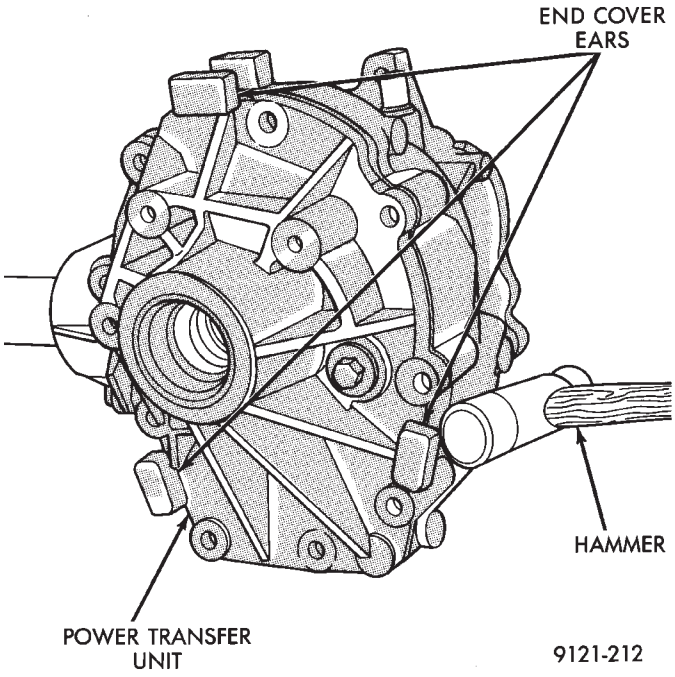


Fig. 47 Side Cover Removal

(6) Reinstall P.T.U. assembly.
(7) Check and fill fluids as required.

OUTER HALF SHAFT SEAL

The outer half shaft seal is located on the outside of the end cover. The P.T.U. does not have to be removed to replace this seal.

REMOVAL AND INSTALLATION (Continued)

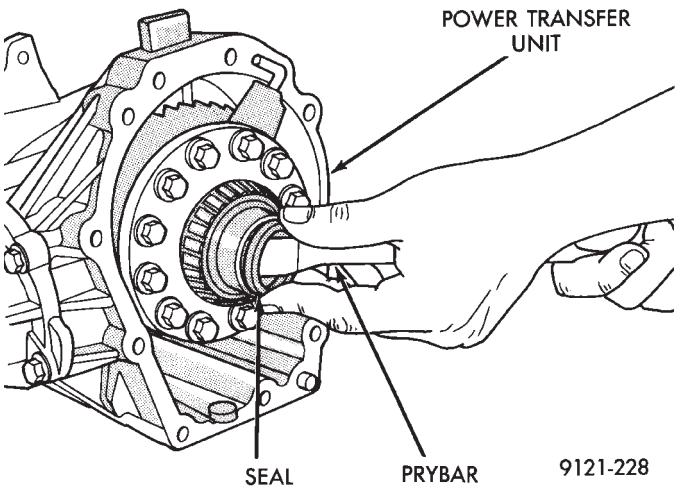


Fig. 48 Seal Removal

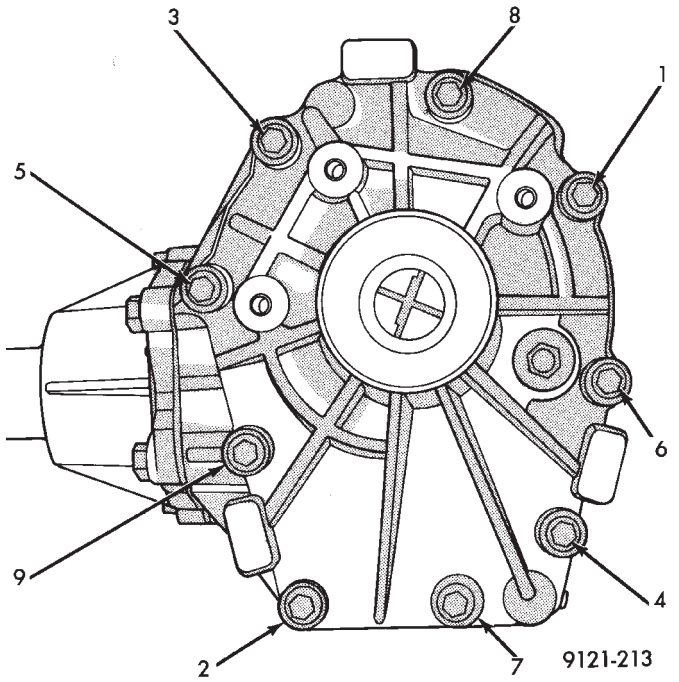


Fig. 49 Bolt Tightening Sequence

REMOVAL

(1) Lift vehicle on hoist.

(2) Remove right front half shaft from vehicle.

(3) Remove seal with a chisel and hammer (Fig. 50).

INSTALLATION

(1) Clean and inspect seal area.

(2) Install new seal with seal installer MD998334 (Fig. 51).

(3) Reinstall right front half shaft.

(4) Check and fill fluids as required.

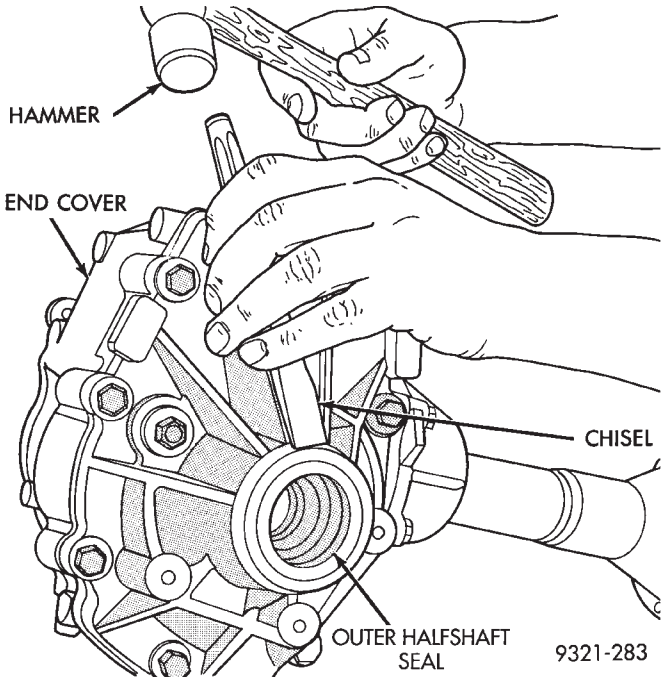


Fig. 50 Seal Removal

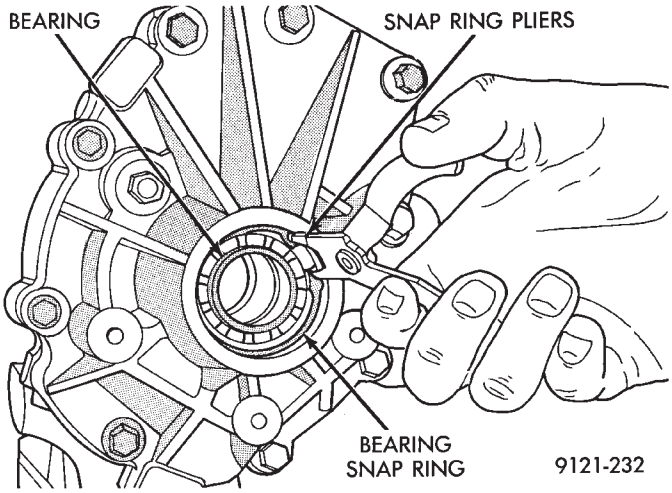


Fig. 51 Seal Installation

END COVER BALL BEARING

The end cover ball bearing can be removed and installed without removing the Power Transfer Unit from the vehicle. When replacing the bearing the output seal must be removed to gain access to the bearing.

REMOVAL

(1) Raise vehicle on hoist.

(2) Remove right front half shaft from vehicle.

(3) Remove output seal with a hammer and chisel (Fig. 52).

(4) Remove bearing retaining snap ring (Fig. 53).

(5) Use bearing puller MD998346 to remove bearing (Fig. 54).

REMOVAL AND INSTALLATION (Continued)

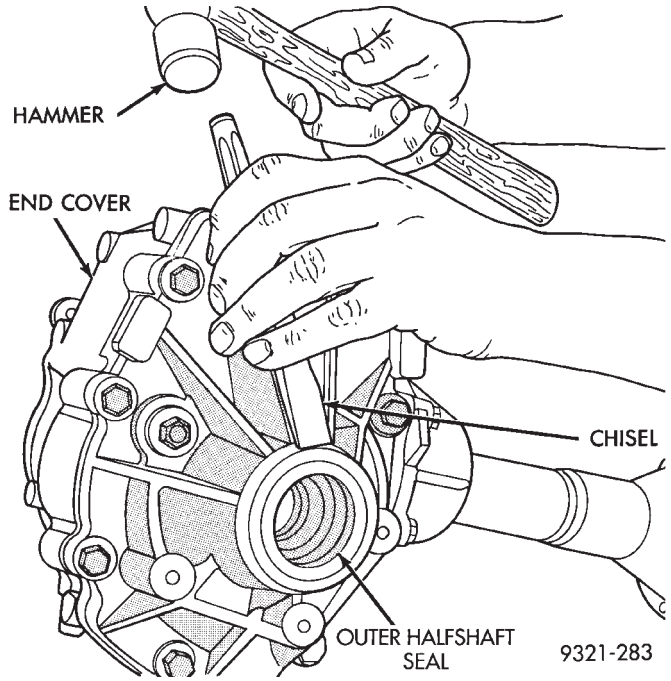


Fig. 52 Output Seal Removal

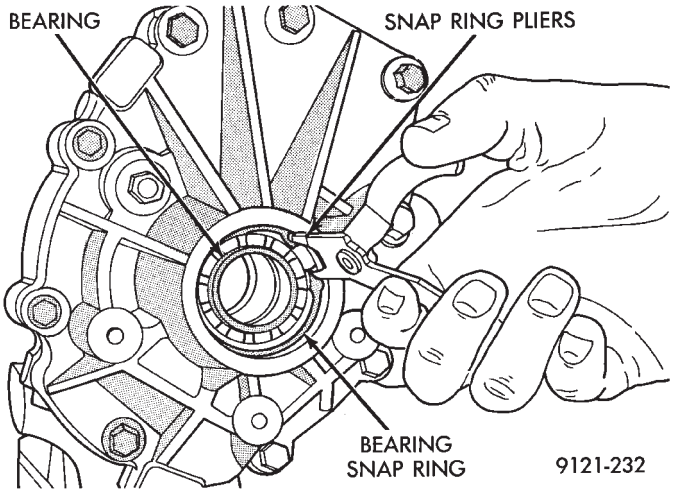


Fig. 53 Bearing Snap Ring

INSTALLATION

(1) Use bearing driver L-4530 and handle C-4171-2 to install bearing (Fig. 55).

(2) Install bearing retaining snap ring.

CAUTION: When installing bearing retaining snap ring, be sure to index the snap ring so that the snap ring does not cover bearing oil passage.

(3) Install new outer half shaft seal using MD998334 seal installer (Fig. 56). **Do not reuse the old seal.**

(4) Reinstall right front half shaft.

(5) Check and fill fluids as required.

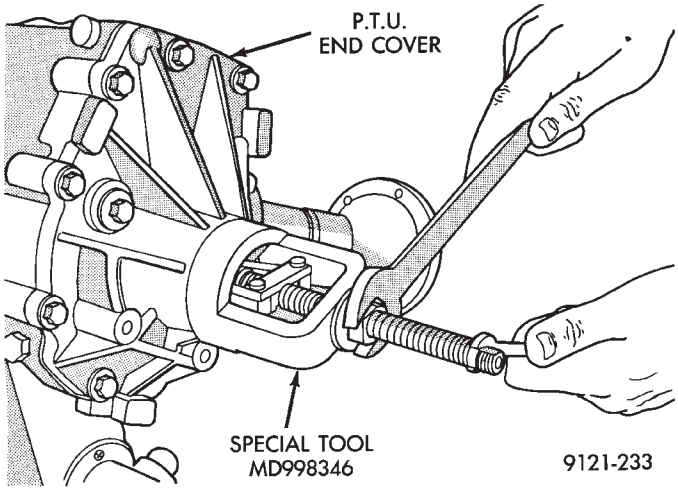


Fig. 54 Bearing Removal

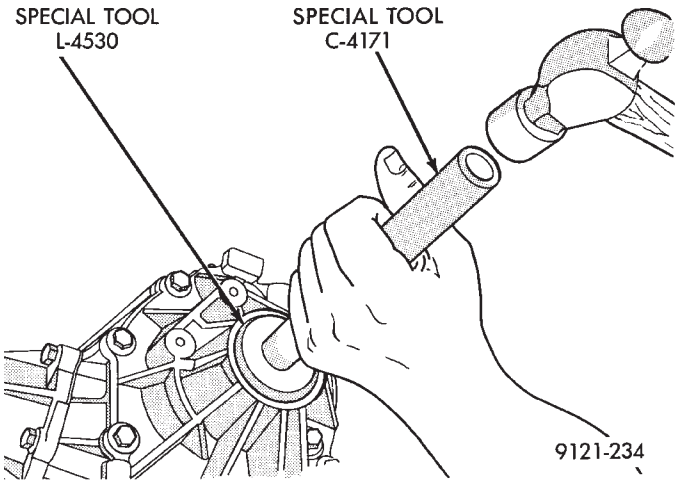


Fig. 55 Bearing Installation

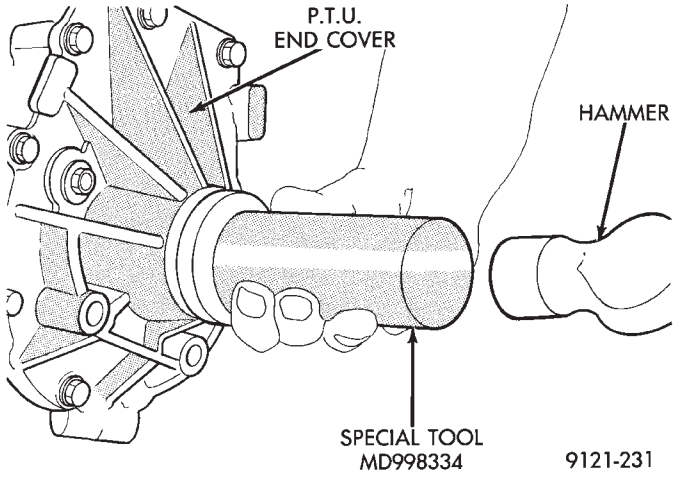


Fig. 56 Installing New Seal

ADJUSTMENTS

OUTPUT FLANGE SHIM SELECTION

This procedure is used when the output flange is replaced. Replacement of the output flange requires installation of the correct size shim to maintain bearing preload. **The shim must protrude from the new output flange the same distance that the original shim protruded from the original flange.**

(1) Stand the original output flange on end with shim side pointing up.

(2) Place original shim into groove in top of flange.

(3) Place a straight edge across the shim.

(4) Using feeler gauge, measure the distance between the straight edge and the top of the flange (Fig. 57). Record this measurement.

(5) Repeat steps Step 1 through Step 4 using the **new flange and the original shim.** Record this measurement.

(6) If measurements are not equal, use a new shim that protrudes from new output flange. Make sure it protrudes the same amount.

(7) For Example: The original shim protrudes 0.075 inch from the original output flange. Place the **original shim** into the new output flange. The protrusion of the shim in the new flange is 0.085 inch. This indicates that a 0.010 inch thinner shim is required to maintain the original protrusion.

(8) Install output flange and torque flange nut to 244 N·m (180 ft. lbs.).

(9) Check the turning torque of the pinion before installing the rear cover into the P.T.U. The turning torque should be between 2.0 N·m and 2.5 N·m (17 in. lbs. and 22 in. lbs.).

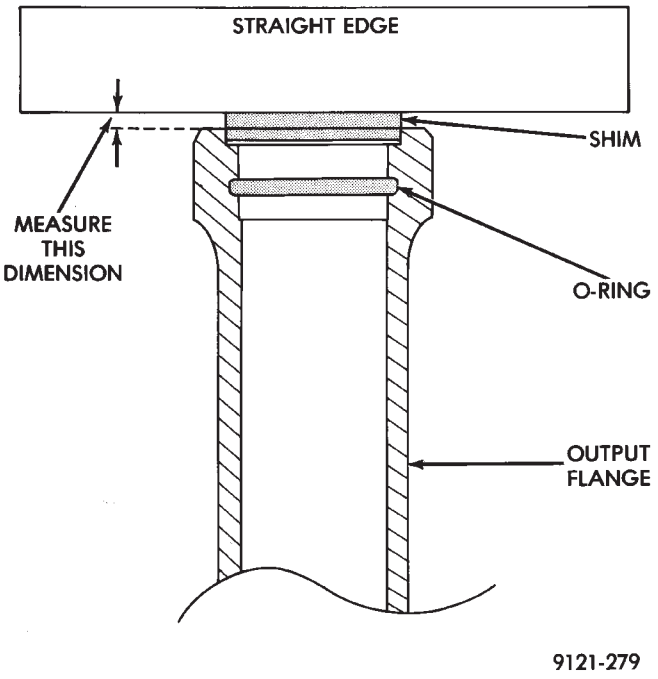


Fig. 57 Output Flange Shim Measurement

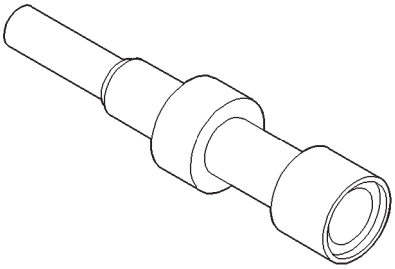
SPECIFICATIONS

TORQUE

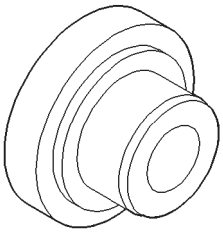
DESCRIPTION	TORQUE
End Cover	28 N·m (250 in. lbs.)
Fill Plug	27 N·m (240 in. lbs.)
Flange Nut	162 N·m (120 ft. lbs.)
Inspection Plug	20 N·m (180 in. lbs.)
Rear Cover	28 N·m (250 in. lbs.)
Ring Gear	94 N·m (70 ft. lbs.)

SPECIAL TOOLS

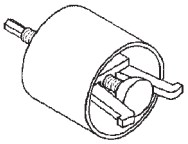
SDP POWER TRANSFER UNIT



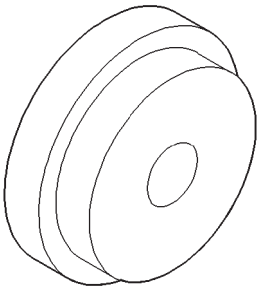
5049-a Seal Puller



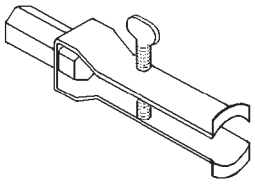
5065 Bearing Installer



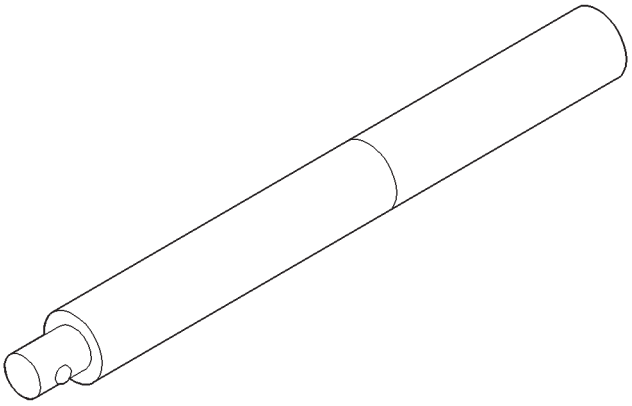
6514 Bearing Remover



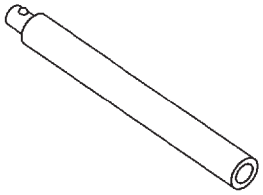
6522 Bearing Remover



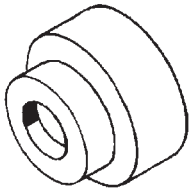
7794-a Bearing Remover



C-4171 Handle



C-4171-2 Handle Extension



C-4657 Seal Installer