AUTOMATIC TRANSMISSION - 42RLE

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AUTOMATIC TRANSMISSION - 42RLE

DESCRIPTION

The 42RLE (Fig. 1) is a four-speed transmission that is a conventional hydraulic/mechanical assembly controlled with adaptive electronic controls and monitors. The hydraulic system of the transmission consists of the transmission fluid, fluid passages, hydraulic valves, and various line pressure control components. An input clutch assembly which houses the underdrive, overdrive, and reverse clutches is used. It also utilizes separate holding clutches: 2nd/4th gear and Low/Reverse. The primary mechanical components of the transmission consist of the following:

- Three multiple disc input clutches
- Two multiple disc holding clutches
- Four hydraulic accumulators
- Two planetary gear sets
- Hydraulic oil pump
- Valve body
- Solenoid/Pressure switch assembly

Control of the transmission is accomplished by fully adaptive electronics. Optimum shift scheduling is accomplished through continuous real-time sensor feedback information provided to the Transmission Control Module (TCM) portion of the Powertrain Control Module (PCM).

The TCM is the heart of the electronic control system and relies on information from various direct and indirect inputs (sensors, switches, etc.) to determine driver demand and vehicle operating conditions. With this information, the TCM can calculate and perform timely and quality shifts through various output or control devices (solenoid pack, transmission control relay, etc.).

The TCM also performs certain self-diagnostic functions and provides comprehensive information (sensor data, DTC's, etc.) which is helpful in proper diagnosis and repair. This information can be viewed with the DRB® scan tool.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

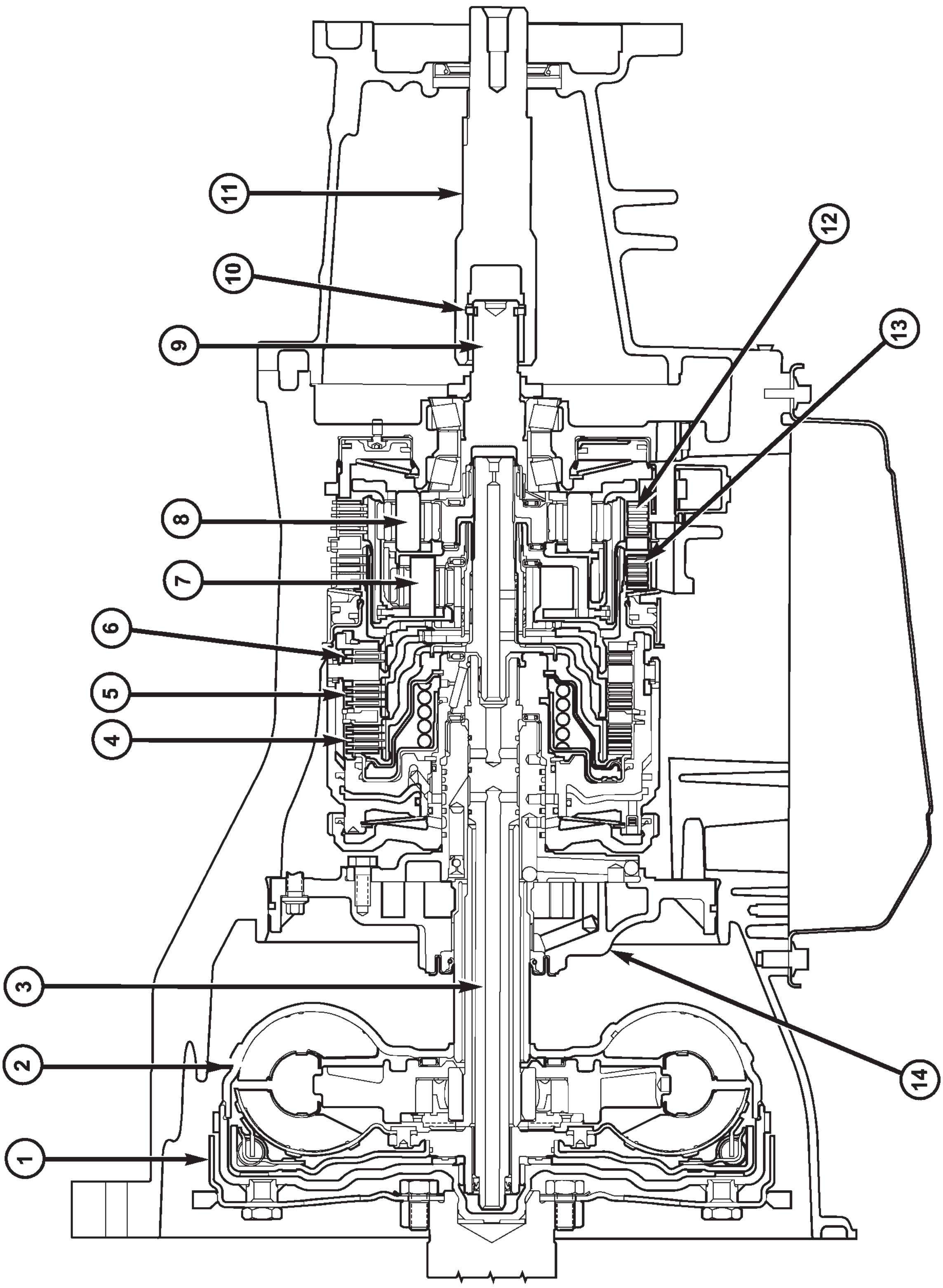

Fig. 1 42RLE Automatic Transmission

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1 - DRIVEPLATE
2 - TORQUE CONVERTER
3 - INPUT SHAFT
4 - UNDERDRIVE CLUTCH
5 - OVERDRIVE CLUTCH
6 - REVERSE CLUTCH
7 - FRONT PLANET CARRIER
8 - REAR PLANET CARRIER
9 - OUTPUT SHAFT
10 - SNAP RING
11 - STUB SHAFT
12 - LOW/REVERSE CLUTCH
13 - 2/4 CLUTCH
14 - OIL PUMP

TRANSMISSION IDENTIFICATION

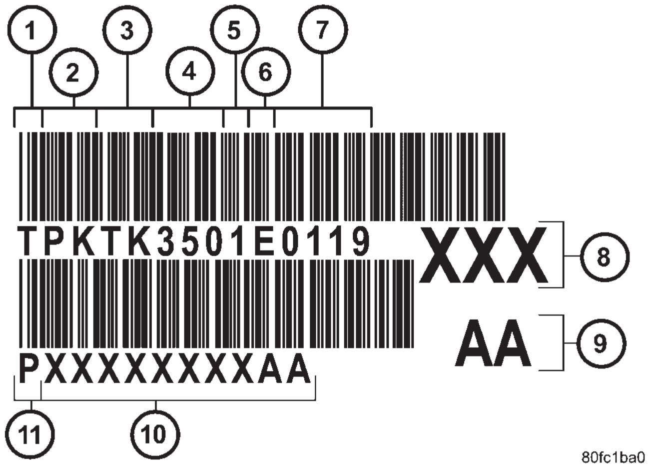

Fig. 2 Identification Label Breakdown

1 - T=TRACEABILITY
2 - SUPPLIER CODE (PK=KOKOMO)
3 - COMPONENT CODE (TK=KOKOMO TRANSMISSION)
4 - BUILD DAY (350=DEC. 15)
5 - BUILD YEAR (1=2001)
6 - ASSEMBLY LINE CODE
7 - BUILD SEQUENCE NUMBER
8 - LAST THREE OF P/N
9 - CHANGE LEVEL
10 - TRANSMISSION PART NUMBER
11 - P=PART NUMBER

The 42RLE transmission can be identified by a barcode label that is affixed to the upper left area of the bellhousing.

The label contains a series of digits that can be translated into useful information such as transmission part number (10), date of manufacture (4, 5), manufacturing origin (2), assembly line identifier (6), build sequence number (7), etc. (Fig. 2).

If the tag is not legible or is missing, the “PK” number, which is stamped into the left rear flange of the transmission case, can be referred to for identification. The entire part number, build code, and sequence number are stamped into the flange.

OPERATION

The 42RLE transmission ratios are:

First	2.84 : 1
Second	1.57 : 1
Third	1.00 : 1
Overdrive	0.69 : 1
Reverse	2.21 : 1

AUTOMATIC TRANSMISSION - 42RLE (Continued)

FIRST GEAR POWERFLOW

In first gear range, torque input is through the underdrive clutch (1) (Fig. 3) to the underdrive hub assembly. The underdrive hub is splined to the rear sun gear. When the underdrive clutch is applied, it rotates the underdrive hub and rear sun gear. The L/R clutch (2) is applied to hold the front carrier/rear annulus assembly. The rear sun gear drives the rear planetary pinion gears. The rear planetary pinion gears are forced to walk around the inside of the stationary rear annulus gear. The pinions are pinned to the rear carrier and cause the rear carrier assembly to rotate as they walk around the annulus gear. This provides the torque output for first gear. The other planetary gearset components are freewheeling. The first gear ratio is 2.84:1.

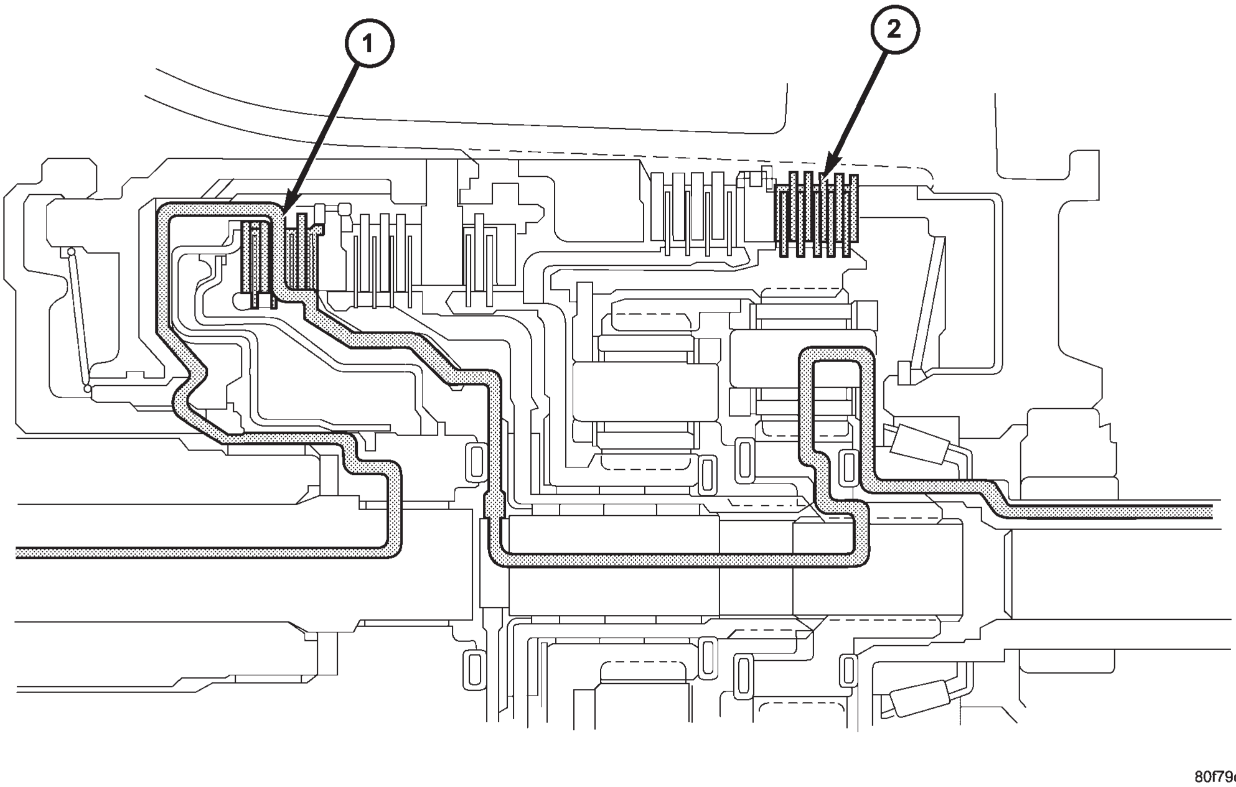

Fig. 3 First Gear Powerflow

1 - UNDERDRIVE CLUTCH APPLIED (Turns Rear Sun)

2 - LOW-REVERSE CLUTCH APPLIED (Holds Rear Annulus/Front Carrier)

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SECOND GEAR POWERFLOW

Second gear is achieved by having both planetary gear sets (Fig. 4) contribute to torque multiplication. As in first gear, torque input is through the underdrive clutch (1) to the rear sun gear. The 2/4 clutch (2) is applied to hold the front sun gear stationary. The rotating rear sun gear turns the rear planetary pinions. The rear pinions rotate the rear annulus/front carrier assembly. The pinions of the front carrier walk around the stationary front sun gear. This transmits torque to the front annulus/rear carrier assembly, which provides output torque and a gear ratio of 1.57:1.

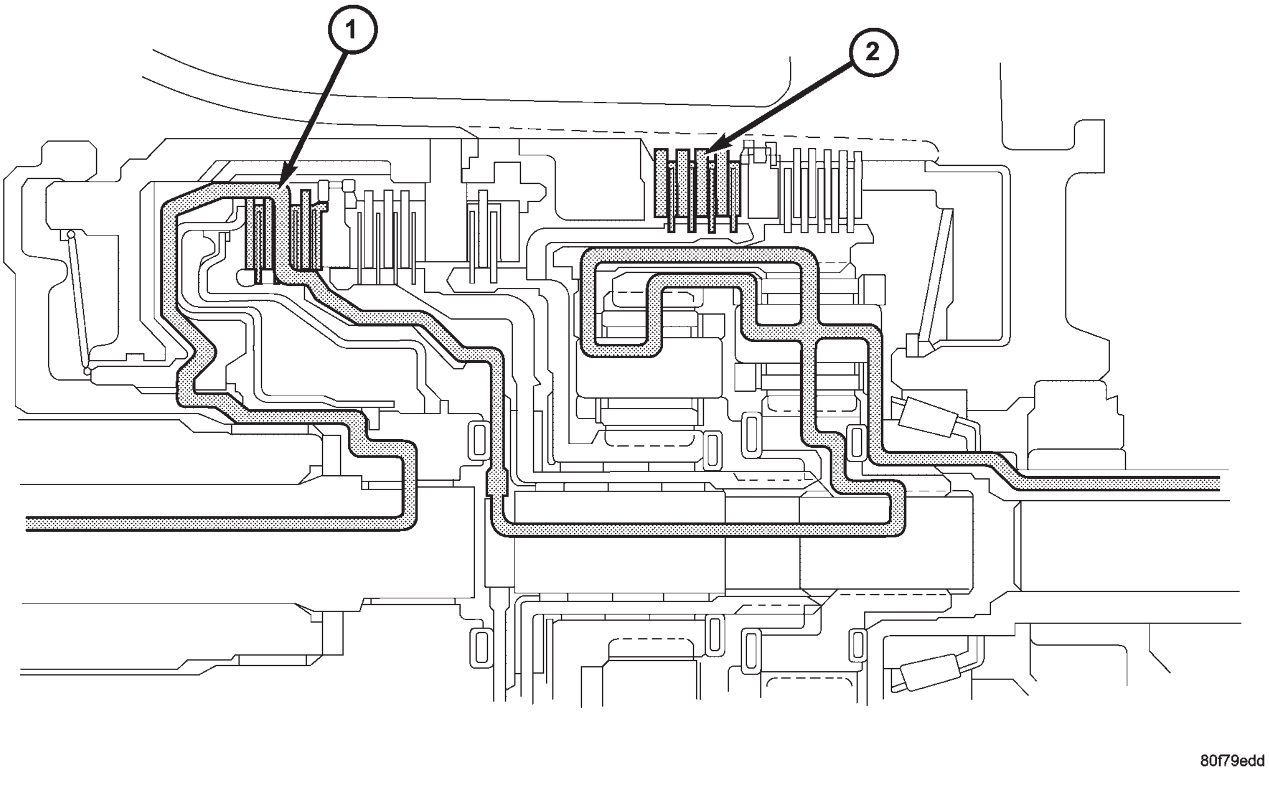

Fig. 4 Second Gear Powerflow

1 - UNDERDRIVE CLUTCH APPLIED (Turns Rear Sun)
2 - 2-4 CLUTCH APPLIED (Holds Front Sun)

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THIRD GEAR POWERFLOW

In third gear, two input clutches are applied to provide torque input: the underdrive clutch (1) (Fig. 5) and overdrive clutch (2). The underdrive clutch rotates the rear sun gear, while the overdrive clutch rotates the front carrier/rear annulus assembly. The result is two components (rear sun gear and rear annulus gear) rotating at the same speed and in the same direction. This effectively locks the entire planetary gearset together and is rotated as one unit. The gear ratio in third is 1:1.

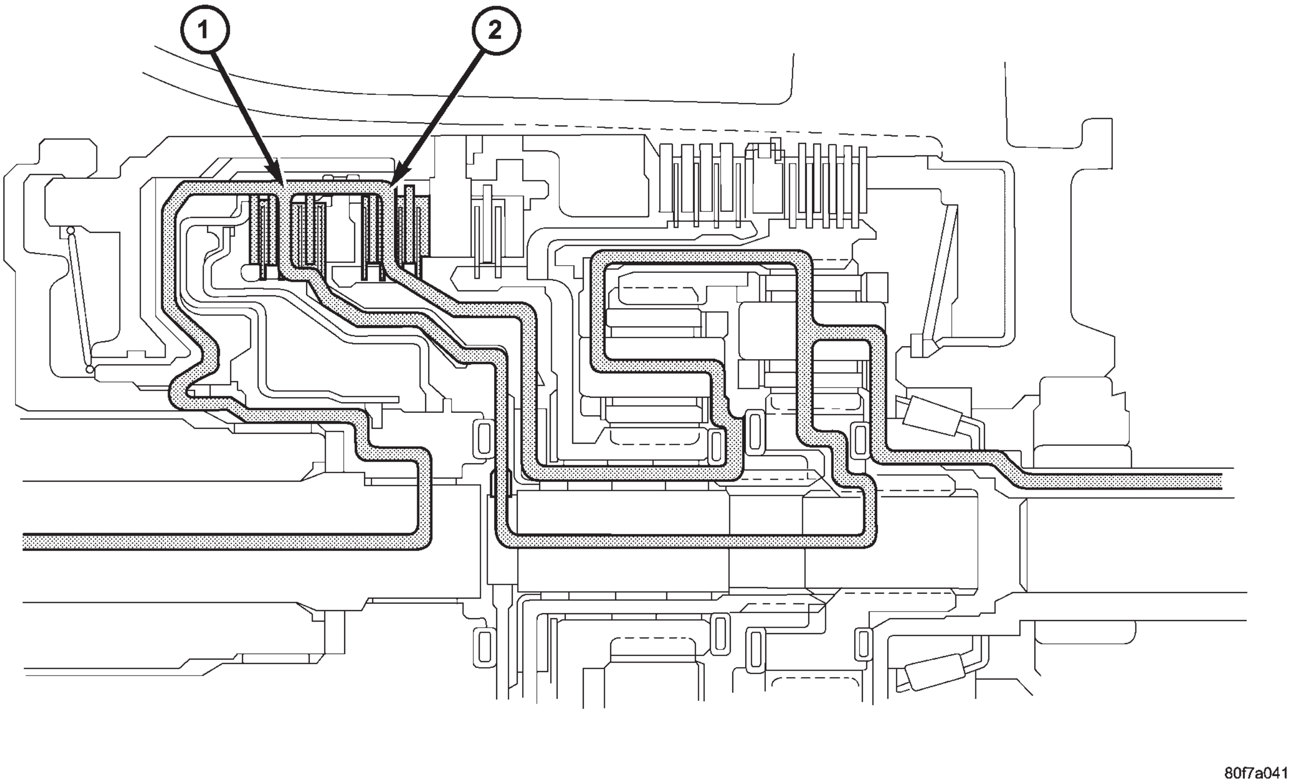

Fig. 5 Third Gear Powerflow

1 - UNDERDRIVE CLUTCH APPLIED (Turns Rear Sun)

2 - OVERDRIVE CLUTCH APPLIED (Turns Front Carrier/Rear Annulus)

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FOURTH GEAR POWERFLOW

In fourth gear input torque is through the overdrive clutch (1) (Fig. 6) which drives the front carrier. The 2/4 clutch (2) is applied to hold the front sun gear. As the overdrive clutch rotates the front carrier, it causes the pinions of the front carrier to walk around the stationary front sun gear. This causes the front carrier pinions to turn the front annulus/rear carrier assembly which provides output torque. In fourth gear, transmission output speed is more than engine input speed. This situation is called overdrive and the gear ratio is 0.69:1.

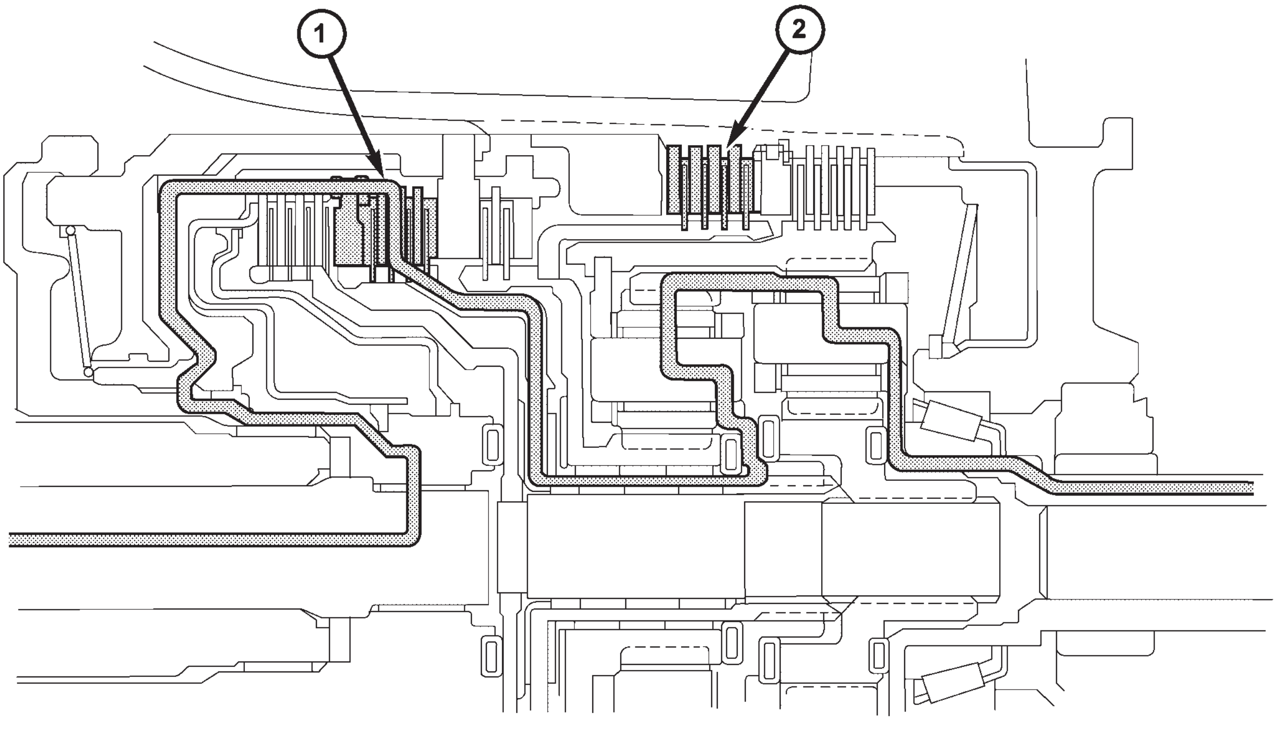

Fig. 6 Fourth Gear Powerflow

1 - OVERDRIVE CLUTCH APPLIED (Turns Rear Sun)

2 - 2-4 CLUTCH APPLIED (Holds Front Sun)

AUTOMATIC TRANSMISSION - 42RLE (Continued)

REVERSE GEAR POWERFLOW

In reverse, input (Fig. 7) power is through the reverse clutch (1). When applied, the reverse clutch drives the front sun gear through the overdrive hub and shaft. The L/R clutch (2) is applied to hold the front carrier/rear annulus assembly stationary. The front carrier is being held by the L/R clutch so the pinions are forced to rotate the front annulus/rear carrier assembly in the reverse direction. Output torque is provided, in reverse, with a gear ratio of 2.21:1.

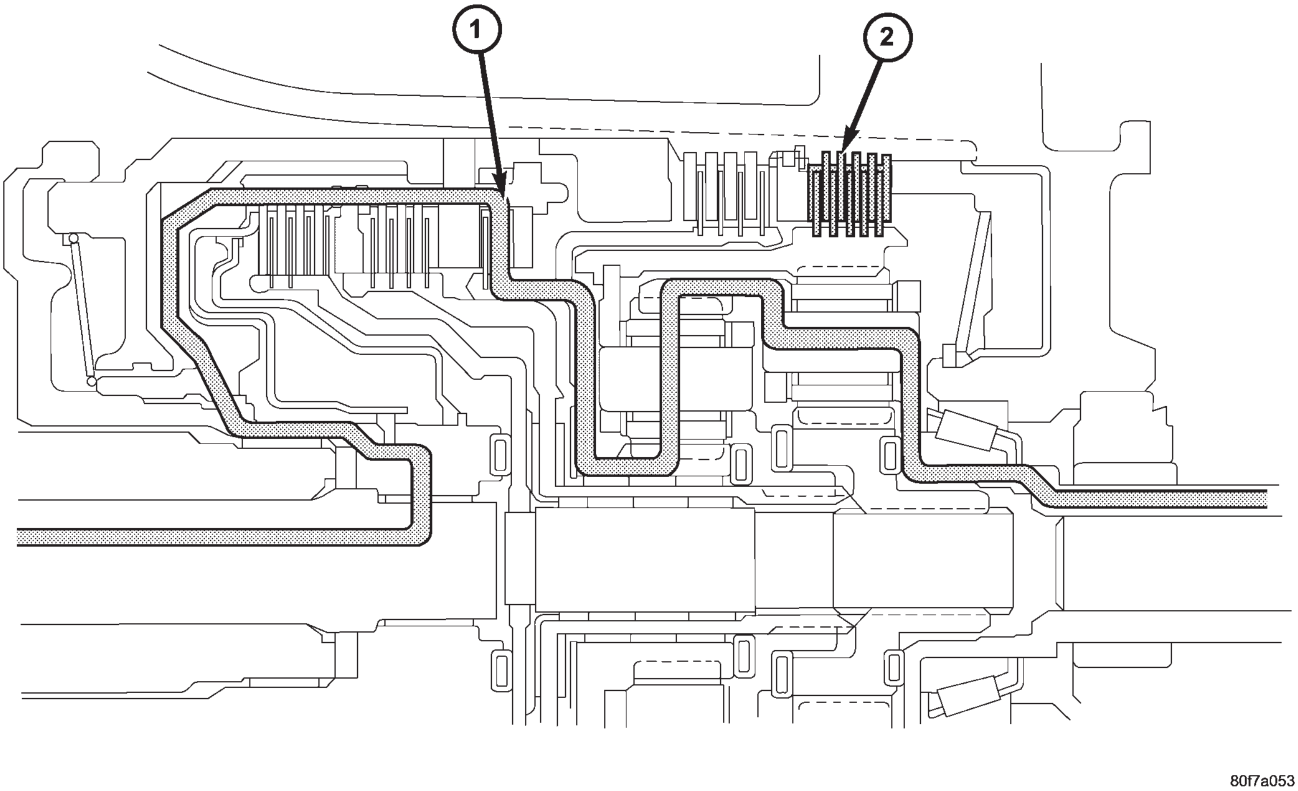

Fig. 7 Reverse Gear Powerflow

1 - LOW-REVERSE CLUTCH APPLIED (Holds Rear Annulus Front Carrier)
2 - REVERSE CLUTCH APPLIED (Turns Front Sun)

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - AUTOMATIC TRANSMISSION

CAUTION: Before attempting any repair on the 42RLE Four Speed Automatic Transmission, always check for proper shift cable adjustment. Also check for diagnostic trouble codes with the DRB® scan tool and the 42RLE Transmission Diagnostic Procedure Manual.

42RLE automatic transmission malfunctions may be caused by these general conditions:
- Poor engine performance
- Improper adjustments
- Hydraulic malfunctions
- Mechanical malfunctions
- Electronic malfunctions

When diagnosing a problem always begin with recording the complaint. The complaint should be defined as specific as possible. Include the following checks:
- Temperature at occurrence (cold, hot, both)
- Dynamic conditions (acceleration, deceleration, upshift, cornering)
- Elements in use when condition occurs (what gear is transmission in during condition)
- Road and weather conditions
- Any other useful diagnostic information.

After noting all conditions, check the easily accessible variables:
- Fluid level and condition
- Shift cable adjustment
- Diagnostic trouble code inspection

Then perform a road test to determine if the problem has been corrected or that more diagnosis is necessary. If the problem exists after the preliminary tests and corrections are completed, hydraulic pressure checks should be performed.

DIAGNOSIS AND TESTING - ROAD TEST

Prior to performing a road test, verify that the fluid level, fluid condition, and linkage adjustment have been approved.

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

If the vehicle operates properly at highway speeds, but has poor acceleration, the converter stator overrunning clutch may be slipping. If acceleration is normal, but high throttle opening is needed to maintain highway speeds, the converter stator clutch may have seized. Both of these stator defects require replacement of the torque converter and thorough transmission cleaning.

Slipping clutches can be isolated by comparing the “Elements in Use” chart with clutch operation encountered on a road test. This chart identifies which clutches are applied at each position of the selector lever.

A slipping clutch may also set a DTC and can be determined by operating the transmission in all selector positions.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

ELEMENTS IN USE AT EACH POSITION OF SELECTOR LEVER

Shift Lever Position	INPUT CLUTCHES			HOLDING CLUTCHES	
	Underdrive	Overdrive	Reverse	2/4	Low/Reverse
P - PARK					X
R - REVERSE			X		X
N - NEUTRAL					X
OD - OVERDRIVE					
First	X				X
Second	X			X	
Direct	X	X			
Overdrive		X		X	
D - DRIVE*					
First	X				X
Second	X			X	
Direct	X	X			
L - LOW*					
First	X				X
Second	X			X	
Direct	X	X			
* Vehicle upshift and downshift speeds are increased when in these selector positions.					

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 diagnose slipping units, but the cause of the malfunction cannot be determined. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

DIAGNOSIS AND TESTING - HYDRAULIC PRESSURE TESTS

Pressure testing is a very important step in the diagnostic procedure. These tests usually reveal the cause of most transmission 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 the wheels to turn, and position tachometer so it can be read.

Using special adapters L-4559, attach 300 psi gauge(s) C-3293SP to the port(s) required for test being conducted.

Test port locations are shown in the Pressure Taps graphic. (Fig. 8)

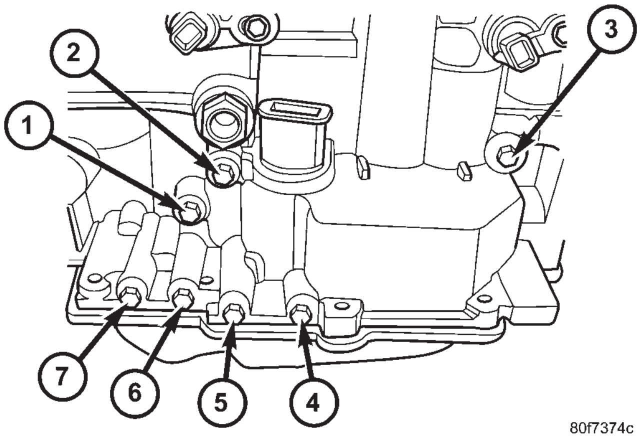

Fig. 8 Pressure Taps

1 - TORQUE CONVERTER CLUTCH OFF
2 - REVERSE
3 - LOW/REVERSE
4 - 2/4
5 - UNDERDRIVE
6 - TORQUE CONVERTER CLUTCH ON
7 - OVERDRIVE

AUTOMATIC TRANSMISSION - 42RLE (Continued)

TEST ONE - SELECTOR IN MANUAL 1 (1st Gear)

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

(1) Attach pressure gauge to the low/reverse clutch tap.
(2) Move selector lever to the MANUAL 1 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.

TEST TWO - SELECTOR IN MANUAL 2 (Second 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 MANUAL 2 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 TWO A - SELECTOR IN DRIVE (OD ON - Fourth 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 DRIVE position. Verfy that the OD switch is ON.
(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 controller is at fault.

TEST THREE - SELECTOR IN DRIVE (OD OFF - Third and Second Gear)

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

(1) Attach gauge to the overdrive clutch tap.
(2) Move selector lever to the DRIVE 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 DRIVE 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.

TEST FOUR - SELECTOR IN DRIVE (OD ON - Fourth Gear)

NOTE: This test checks the 2/4 clutch hydraulic circuit.

(1) Attach gauge to the 2/4 clutch tap.
(2) Move selector lever to the DRIVE position.
(3) Allow vehicle front wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 30 mph. Vehicle should be in fourth gear.
(4) The 2/4 clutch pressure should read 75 to 95 psi.

TEST FIVE-SELECTOR IN DRIVE (OD ON - Fourth Gear, CC on)

NOTE: These tests check the torque converter clutch hydraulic circuit.

(1) Attach gauge to the torque converter clutch off pressure tap.
(2) Move selector lever to the DRIVE position.
(3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 50 mph. Vehicle should be in 4th gear, CC on.

CAUTION: Both wheels must turn at the same speed.

(4) Torque converter clutch off pressure should be less than 5 psi.
(5) Now attach the gauge to the torque converter clutch on pressure tap.
(6) Move selector to the OD position.
(7) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 50 mph.
(8) Verify the torque converter clutch is applied mode using the RPM display of the DRB scan tool.
(9) Torque converter clutch on pressure should be 60-90 psi.

TEST SIX-SELECTOR IN REVERSE

NOTE: This test checks the reverse clutch hydraulic circuit.

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

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(2) Move selector lever to the REVERSE position.

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

(4) Reverse and low/reverse clutch pressure should read 165 to 235 psi.

TEST RESULT INDICATIONS

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

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

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

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

(5) If the underdrive clutch pressure is greater than 5 psi in Step 4 of Test Two-A, a defective solenoid/pressure switch assembly or controller is the cause.

ALL PRESSURE SPECIFICATIONS ARE PSI (ON HOIST, WITH WHEELS FREE TO TURN)

Gear Selector Position	Actual Gear	PRESSURE TAPS						
		Underdrive Clutch	Overdrive Clutch	Reverse Clutch	Torque Converter Clutch Off	Torque Converter Clutch On	2/4 Clutch	Low/ Reverse Clutch
PARK - 0 mph *	PARK	0-2	0-5	0-2	60-110	45-100	0-2	115-145
REVERSE - 0 mph *	REVERSE	0-2	0-7	165-235	50-100	35-85	0-2	165-235
NEUTRAL - 0 mph *	NEUTRAL	0-2	0-5	0-2	60-110	45-100	0-2	115-145
Low - 20 mph #	FIRST	110-145	0-5	0-2	60-110	45-100	0-2	115-145
Third - 30 mph #	SECOND	110-145	0-5	0-2	60-110	45-100	115-145	0-2
Third - 45 mph #	DIRECT	75-95	75-95	0-2	60-90	45-80	0-2	0-2
OD - 30 mph #	OVERDRIVE	0-2	75-95	0-2	60-90	45-80	75-95	0-2
OD - 50 mph #	OVERDRIVE WITH TCC	0-2	75-95	0-2	0-5	60-95	75-95	0-2

*** Engine Speed at 1500 rpm**

 # CAUTION: Both wheels must be turning at same speed.

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DIAGNOSIS AND TESTING - CLUTCH AIR PRESSURE TESTS

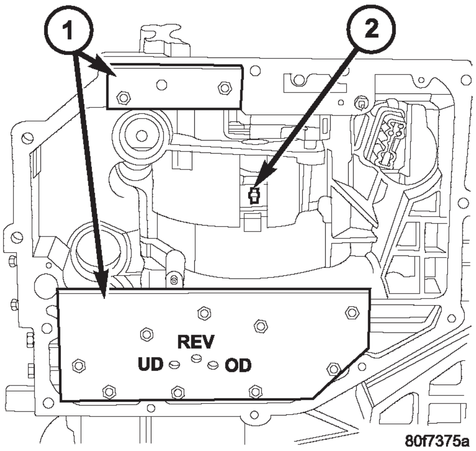


Fig. 9 Air Pressure Test Plate

1 - AIR PRESSURE TEST PLATES
2 - 2/4 CLUTCH RETAINER HOLE

Inoperative clutches can be located by substituting air pressure for fluid pressure. The clutches may be tested by applying air pressure to their respective passages after the valve body has been removed. Use Special Tool 6599-1 (1) and 6599-2 (1) to perform test (Fig. 9).

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.

(1) Remove oil pan and valve body. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/VALVE BODY - REMOVAL)

(2) Apply air pressure to the holes in the special tool (1), one at a time.

(3) Listen for the clutch to apply. It will give a slight thud sound. If a large amount of air is heard escaping, the transmission must be removed from vehicle, disassembled and all seals inspected.

2/4 CLUTCH

Apply air pressure to the feed hole located on the 2/4 clutch retainer (2). 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.

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.

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.

LOW/REVERSE CLUTCH

Apply air pressure to the low/reverse clutch feed hole passage. 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

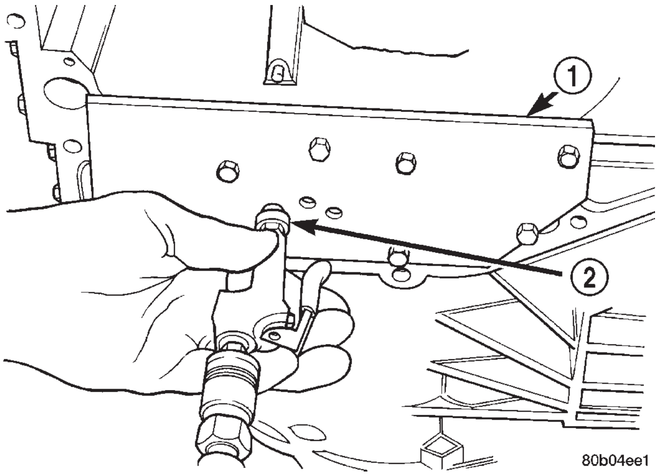


Fig. 10 Testing Underdrive Clutch

1 - AIR PRESSURE TEST PLATE 6599-1
2 - AIR NOZZLE

Because this clutch piston cannot be seen, its operation is checked by function. Air pressure is applied to the low/reverse or 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 (Fig. 10) 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.

DIAGNOSIS AND TESTING - FLUID LEAKAGE

FLUID LEAKAGE - TORQUE CONVERTER HOUSING AREA

When diagnosing converter housing fluid leaks, three actions must be taken before repair:

(1) Verify proper transmission fluid level.

(2) Verify that the leak originates from the converter housing area and is transmission fluid.

(3) Determine the true source of the leak.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

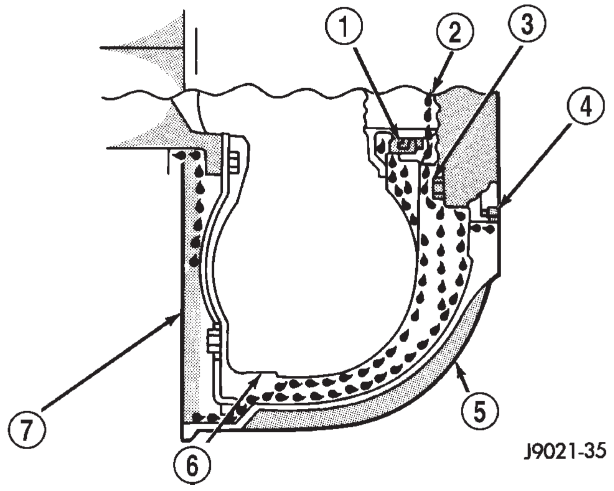


Fig. 11 Converter Housing Leak Paths

1 - PUMP SEAL
2 - PUMP VENT
3 - PUMP BOLT
4 - PUMP GASKET
5 - CONVERTER HOUSING
6 - CONVERTER
7 - REAR MAIN SEAL LEAK

Fluid leakage at or around the torque converter area (Fig. 11) 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.

Some suspected converter housing fluid leaks may not be leaks at all. They may only be the result of residual fluid in the converter housing, or excess fluid spilled during factory fill, or fill after repair. Converter housing leaks have several potential sources. Through careful observation, a leak source can be identified before removing the transmission for repair.

Pump seal leaks tend to move along the drive hub (Fig. 11) and onto the rear of the converter. Pump o-ring or pump body leaks follow the same path as a seal leak. Pump attaching bolt leaks are generally deposited on the inside of the converter housing and not on the converter itself. Pump seal or gasket leaks (Fig. 11)usually travel down the inside of the converter housing.

TORQUE CONVERTER LEAKAGE

Possible sources of torque converter leakage are:

- Torque converter weld leaks at the outside diameter weld. (Fig. 12)
- Torque converter hub weld. (Fig. 12)

STANDARD PROCEDURE - ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transmission 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.

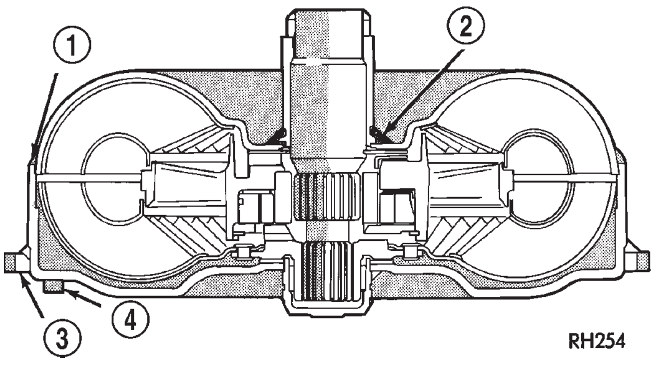


Fig. 12 Converter Leak Points - Typical

1 - OUTSIDE DIAMETER WELD
2 - TORQUE CONVERTER HUB WELD
3 - STARTER RING GEAR
4 - LUG

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

REMOVAL

(1) Disconnect battery negative cable.

(2) Raise and support vehicle.

(3) Disconnect and lower or remove necessary exhaust components.

(4) Remove engine-to-transmission bending braces or engine collar.

(5) Remove starter motor. (Refer to 8 - ELECTRICAL/STARTING/STARTER MOTOR - REMOVAL)

(6) On 4.0L engine equipped vehicles, disconnect and remove crankshaft position sensor (Fig. 13). Retain sensor attaching bolt.

CAUTION: The crankshaft position sensor can be damaged during transmission removal (or installation) if the sensor is left in place. To avoid damage, remove the sensor before removing the transmission.

(7) If transmission is being removed for overhaul, remove transmission oil pan, drain fluid and reinstall pan. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/FLUID - STANDARD PROCEDURE)

(8) Remove torque converter access cover.

(9) Rotate crankshaft in clockwise direction until converter bolts are accessible. Then remove bolts one at a time. Rotate crankshaft with socket wrench on dampener bolt.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

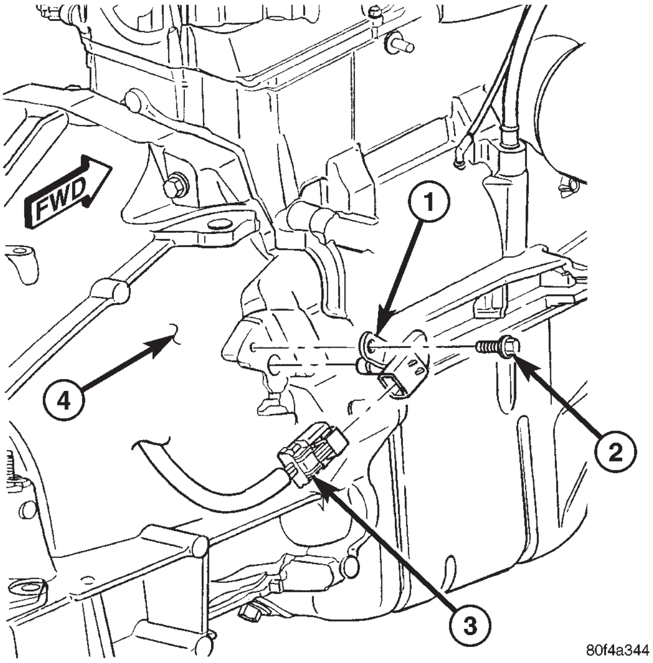


Fig. 13 Crankshaft Position Sensor

1 - CRANKSHAFT POSITION SENSOR
2 - MOUNTING BOLT
3 - ELECTRICAL CONNECTOR
4 - TRANSMISSION BELLHOUSING

(10) Mark propeller shaft and axle yokes for assembly alignment. Then disconnect and remove propeller shafts. (Refer to 3 - DIFFERENTIAL & DRIVELINE/PROPELLER SHAFT/PROPELLER SHAFT - REMOVAL)

(11) Disconnect wires from the input and output speed sensors (Fig. 14).

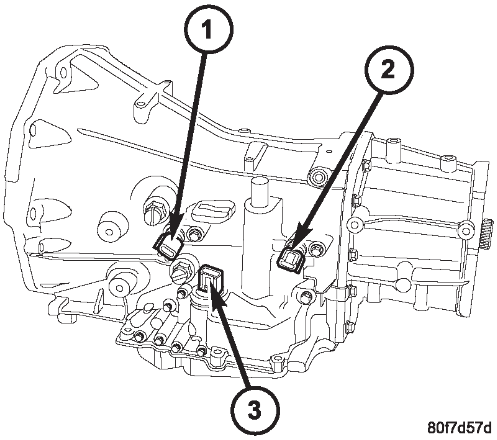


Fig. 14 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

(12) Disconnect wires from the transmission range sensor (Fig. 14) and the solenoid/pressure switch assembly (Fig. 15).

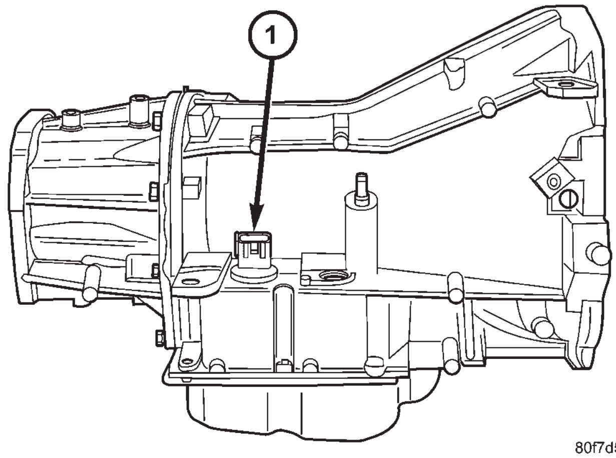


Fig. 15 Solenoid/Pressure Switch Assembly

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY CONNECTOR

(13) Disconnect gearshift cable from transmission manual valve lever.

(14) Disconnect shift rod from transfer case shift lever or remove shift lever from transfer case.

(15) Support rear of engine with safety stand or jack.

(16) Raise transmission slightly with service jack to relieve load on skid plate and transmission support.

(17) Remove bolts securing rear support (Fig. 16) and cushion to transmission and skid plate. Raise transmission slightly, slide exhaust hanger arm from bracket and remove rear support.

(18) Remove bolts attaching skid plate (Fig. 16) to frame and remove skid plate. (Refer to 13 - FRAME

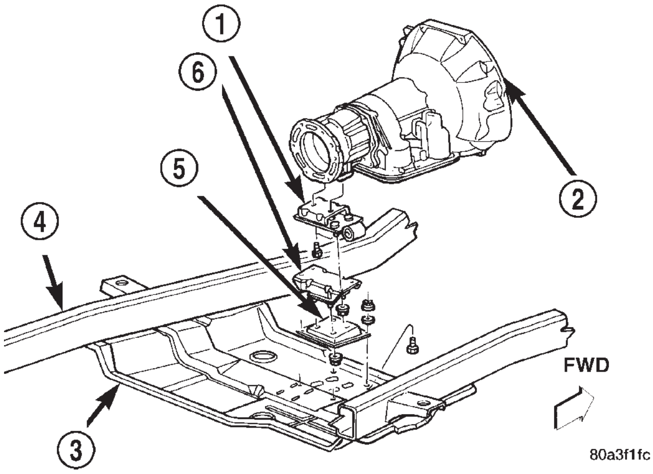


Fig. 16 Transmission Mount - Automatic Transmission

1 - TRANSMISSION SUPPORT BRACKET
2 - AUTOMATIC TRANSMISSION
3 - SKID PLATE
4 - FRAME
5 - TRANSMISSION MOUNT SUPPORT BRACKET
6 - CUSHION

AUTOMATIC TRANSMISSION - 42RLE (Continued)

& BUMPERS/FRAME/TRANSFER CASE SKID PLATE - REMOVAL)

(19) Disconnect transfer case vent hose.

(20) Remove transfer case. (Refer to 21 - TRANSMISSION/TRANSFER CASE - REMOVAL)

(21) Remove fill tube bracket bolts and pull tube out of transmission. Retain fill tube seal. Remove the bolt attaching transfer case vent tube to converter housing.

(22) Disconnect fluid cooler lines at transmission.

(23) Remove all converter housing bolts.

(24) Carefully work transmission and torque converter assembly rearward off engine block dowels.

(25) Hold torque converter in place during transmission removal.

(26) Lower transmission and remove assembly from under the vehicle.

(27) To remove torque converter, carefully slide torque converter out of the transmission.

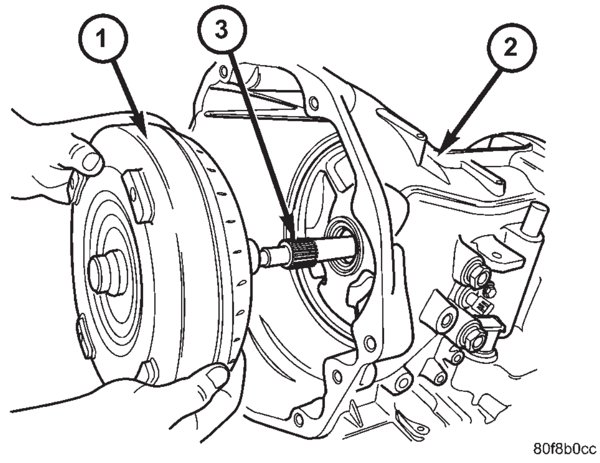


Fig. 17 Remove Torque Converter

1 - TORQUE CONVERTER
2 - TRANSMISSION
3 - INPUT SHAFT

DISASSEMBLY

NOTE: If the transmission is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the DRBIII® Scan Tool (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE).

Before disassembling transmission, move the shift lever clockwise as far as it will go and then remove the shift lever.

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 the torque converter from the transmission input shaft (Fig. 17).

(2) Measure input shaft end play using Tool 8266. Set up Tool 8266 and a dial indicator as shown in (Fig. 18). Move input shaft in and out to obtain end play reading. End play specifications are 0.13 to 0.64 mm (0.005 to 0.025 inch). Record indicator reading for reference when reassembling the transmission. If endplay exceeds the specified range, the #4 thrust plate needs to be inspected and changed if necessary.

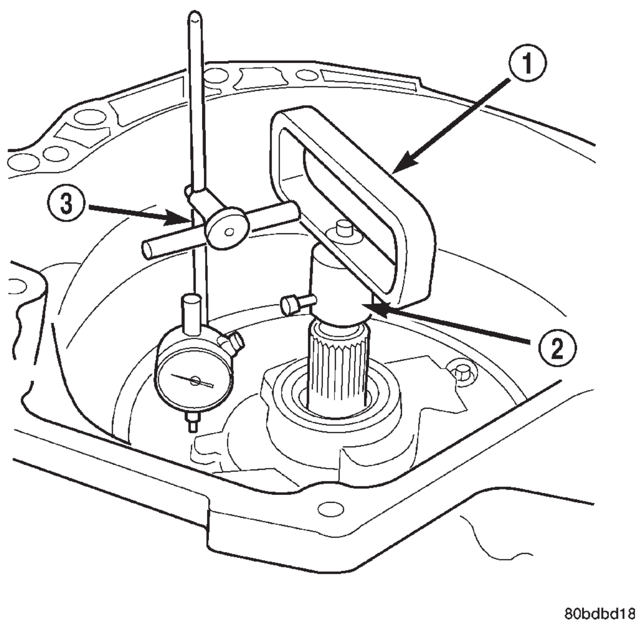


Fig. 18 Measure Input Shaft End Play Using Tool 8266 - Typical

1 - TOOL 8266-8
2 - TOOL 8266-2
3 - TOOL C-3339

NOTE: The four bolts along the bottom of the adapter housing have a sealing patch applied from the factory. Note the locations of these bolts and seperate these bolts for reuse.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(3) Remove the bolts (Fig. 19) that hold the adapter housing onto the transmission case.

(4) Remove the adapter (Fig. 21) housing from the transmission case. There are two pry slots (Fig. 20) located near the bottom corners of the housing for separating the housing from the transmission case.

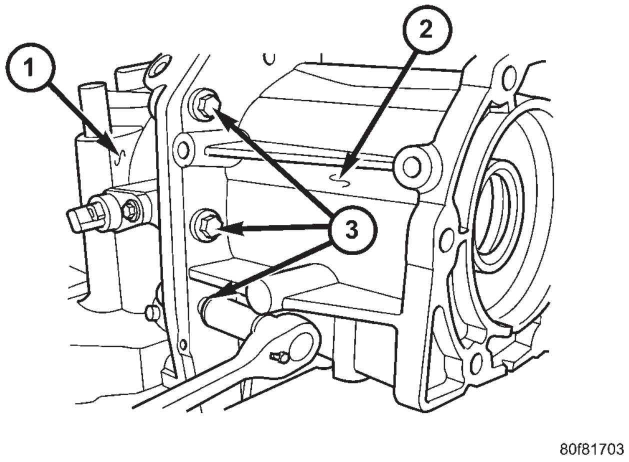


Fig. 19 Remove Adapter Housing Bolts

1 - TRANSMISSION CASE
2 - ADAPTER HOUSING
3 - BOLTS

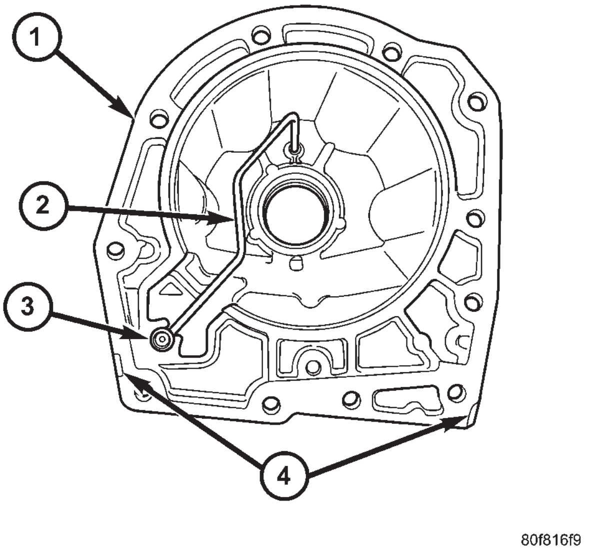


Fig. 20 Lube Tube Grommet

1 - HOUSING
2 - LUBE TUBE
3 - GROMMET
4 - PRY SLOTS

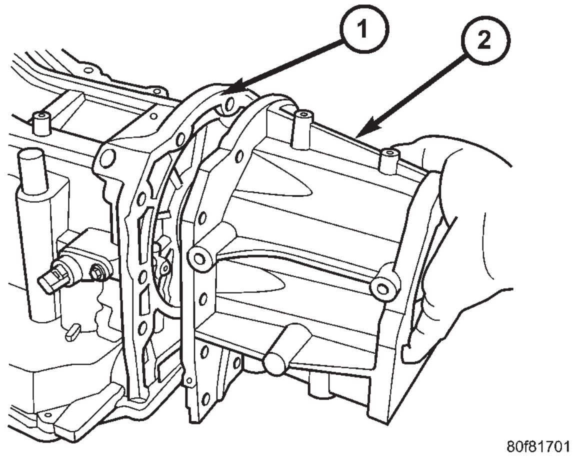


Fig. 21 Remove Adapter Housing

1 - TRANSMISSION CASE
2 - ADAPTER HOUSING

(5) Inspect the lube tube grommet (Fig. 20) for damage. If the grommet lip is damaged, it will need to be replaced.

(6) Using a Slide Hammer C-3752 (Fig. 22), remove the 4X4 stub shaft (Fig. 23) from the transmission output shaft. Inspect the cir-clip on the shaft for damage and replace the clip if necessary.

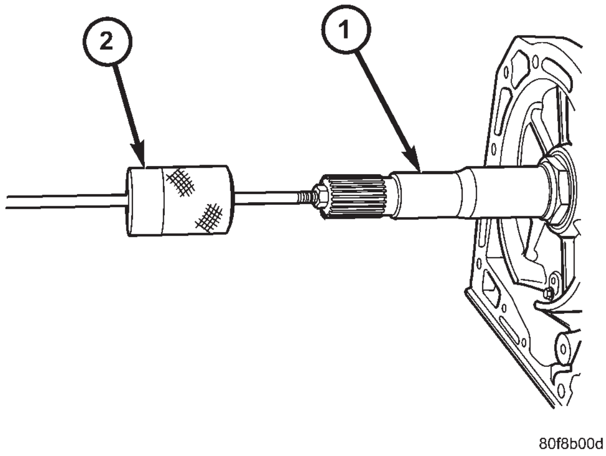


Fig. 22 Remove the 4X4 Stub shaft Using C-3752

1 - 4X4 STUB SHAFT
2 - PULLER C-3752

AUTOMATIC TRANSMISSION - 42RLE (Continued)

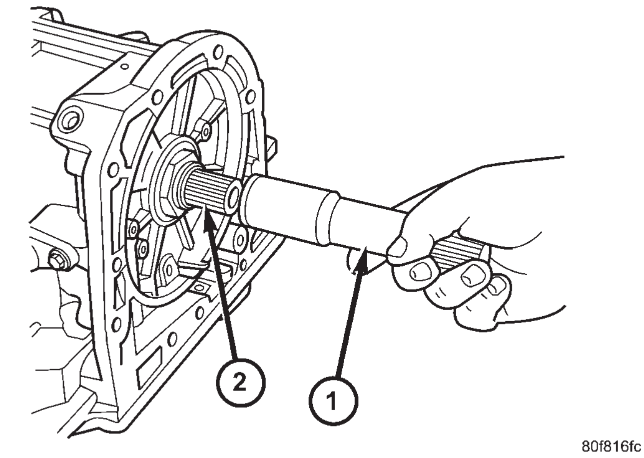


Fig. 23 Remove 4X4 Stub Shaft

1 - STUB SHAFT
2 - OUTPUT SHAFT

(7) Remove the input speed sensor bolt (Fig. 24).
(8) Remove the output speed sensor bolt (Fig. 25).

NOTE: The speed sensor bolts have a sealing patch applied from the factory. Seperate these bolts for reuse.

(9) Remove the input and output speed sensors (Fig. 26). Identify the speed sensors for re-installation since they are not interchangeable.

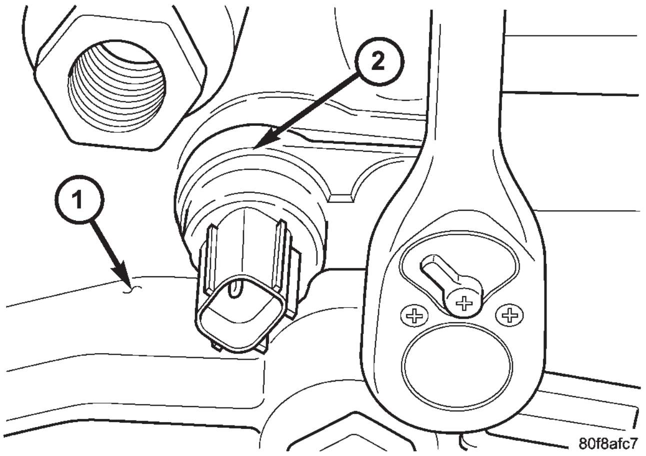


Fig. 24 Remove Input Speed Sensor Bolt

1 - INPUT SPEED SENSOR
2 - TRANSMISSION CASE

NOTE: One of the oil pan bolts has a sealing patch applied from the factory. Seperate this bolt for reuse.

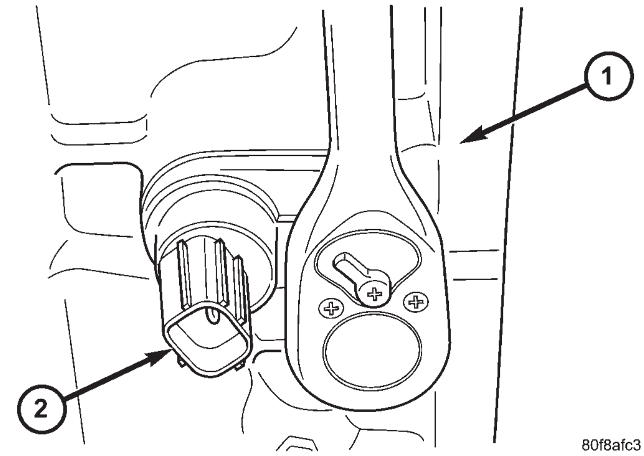


Fig. 25 Remove Output Speed Sensor Bolt

1 - OUTPUT SPEED SENSOR
2 - TRANSMISSION CASE

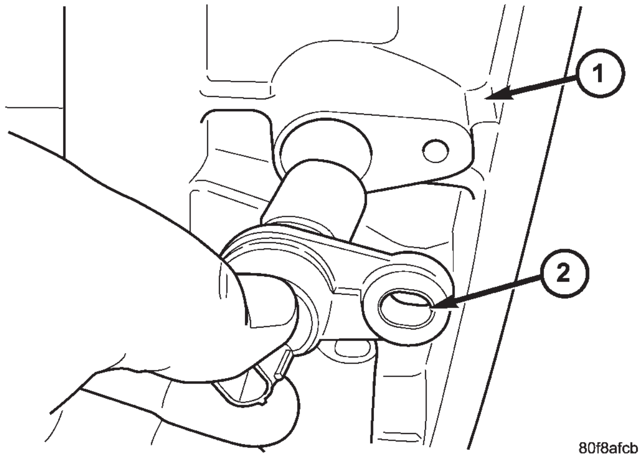


Fig. 26 Remove Output Speed Sensor

1 - OUTPUT SPEED SENSOR
2 - TRANSMISSION CASE

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(10) Remove the transmission oil pan bolts (Fig. 27).

(11) Remove the transmission oil pan (Fig. 28).

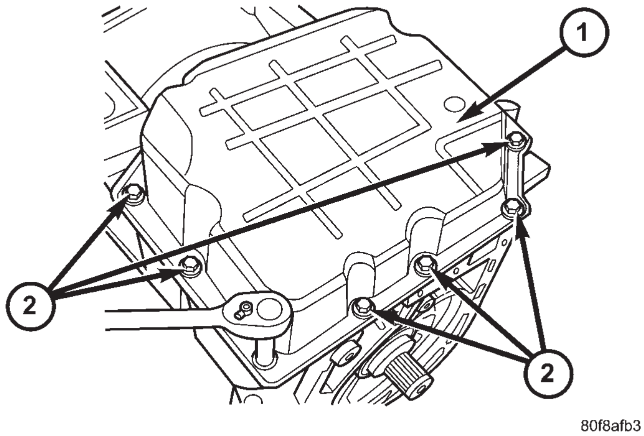


Fig. 27 Remove Transmission Oil Pan Bolts

1 - TRANSMISSION OIL PAN
2 - BOLTS

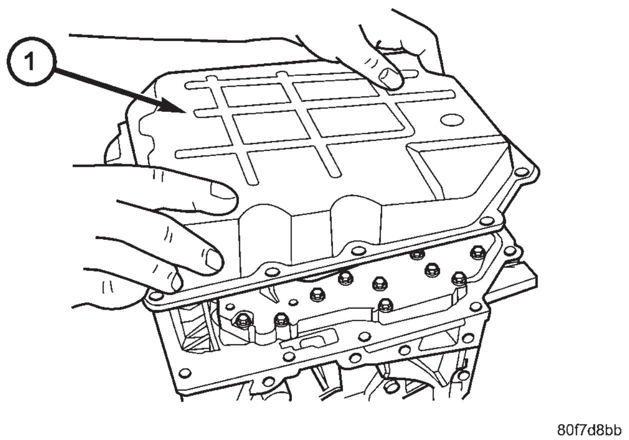


Fig. 28 Remove Transmission Oil Pan

1 - TRANSMISSION OIL PAN

(12) Remove the transmission oil filter screws (Fig. 29).

(13) Remove transmission oil filter (Fig. 30).

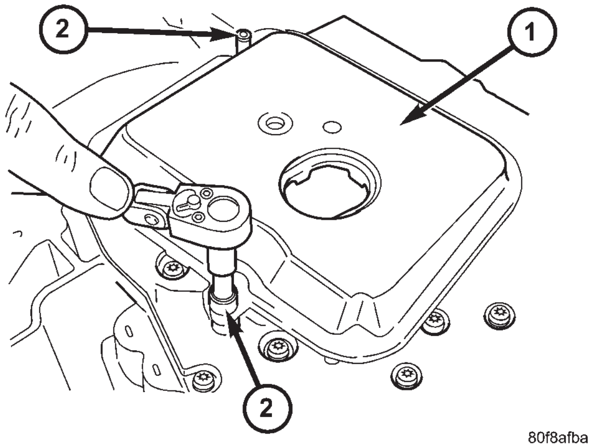


Fig. 29 Remove Oil Filter Screws

1 - OIL FILTER
2 - SCREWS

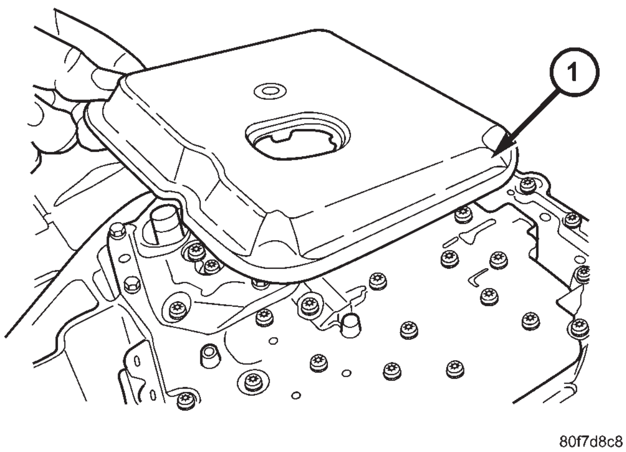


Fig. 30 Remove Transmission Filter

1 - TRANSMISSION FILTER

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(14) Remove the oil filter o-ring from the valve body (Fig. 31).

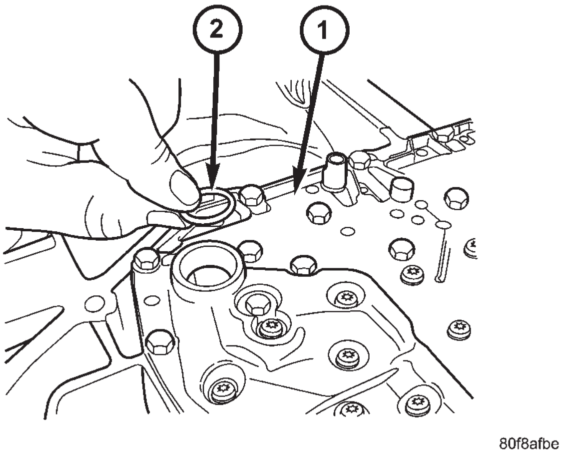


Fig. 31 Remove Oil Filter O-Ring

1 - VALVE BODY
2 - O-RING

(15) Remove valve body-to-case bolts (Fig. 32).

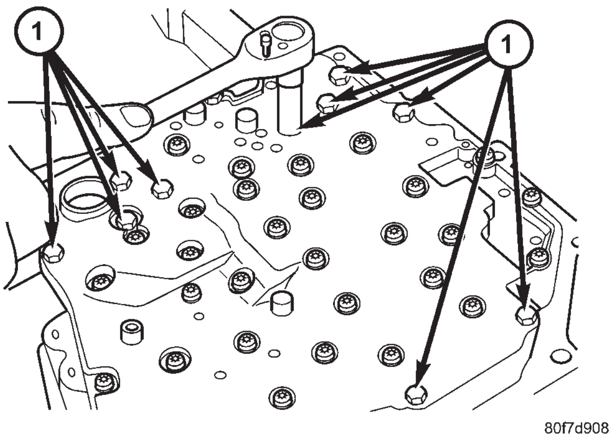


Fig. 32 Remove Valve Body Bolts

1 - BOLTS

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

(16) Remove valve body from transmission (Fig. 33).

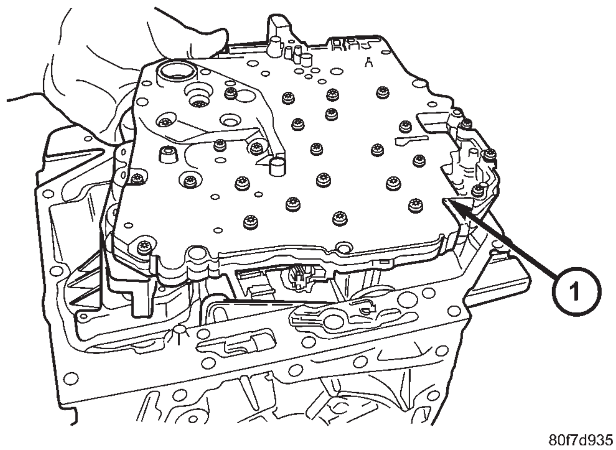


Fig. 33 Remove Valve Body From Transmission

1 - VALVE BODY

(17) Remove underdrive and overdrive accumulators (Fig. 34).

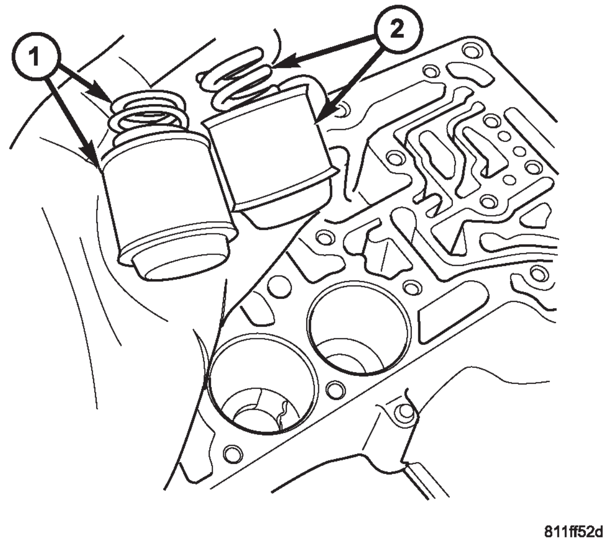


Fig. 34 Underdrive and Overdrive Accumulators

1 - OVERDRIVE PISTON AND SPRING
2 - UNDERDRIVE PISTON AND SPRING

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(18) Remove the low/reverse accumulator snap ring (Fig. 35).

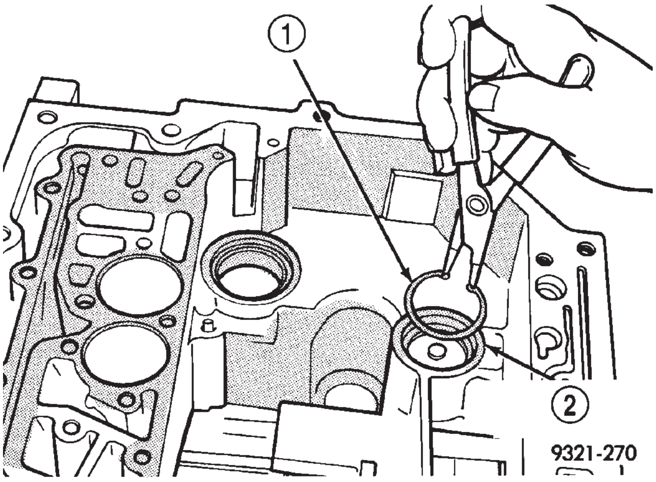


Fig. 35 Remove Low/Reverse Accumulator

1 - SNAP RING
2 - LOW/REVERSE ACCUMULATOR

(19) Remove the low/reverse accumulator plug (Fig. 36).

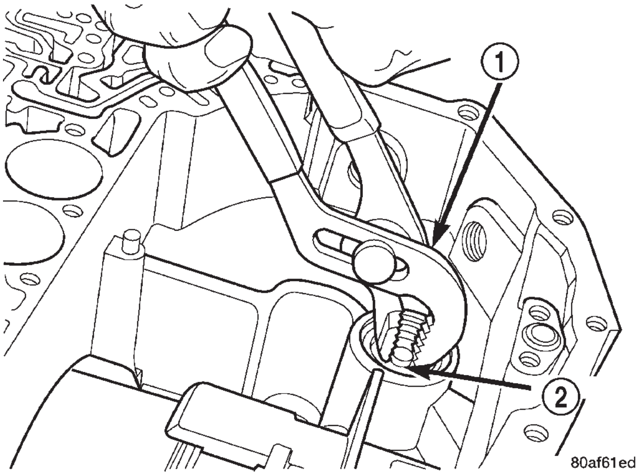


Fig. 36 Remove Low/Reverse Accumulator Plug

1 - ADJUSTABLE PLIERS
2 - PLUG

(20) Remove low/reverse accumulator piston using suitable pliers (Fig. 37). Remove piston and springs (Fig. 38).

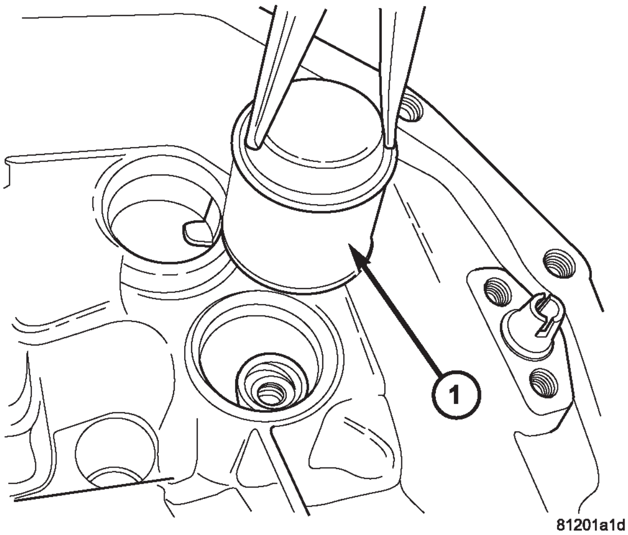


Fig. 37 Low/Reverse Accumulator Piston

1 - ACCUMULATOR PISTON

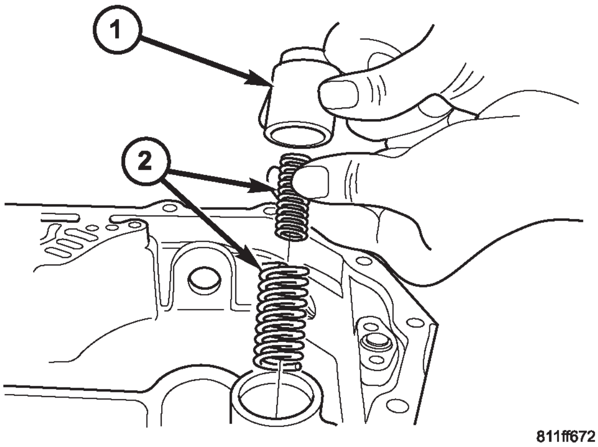


Fig. 38 Low/Reverse Accumulator

1 - PISTON
2 - RETURN SPRINGS

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(21) Remove and discard the oil pump-to-case bolts (Fig. 39). The oil pump bolts are not to be reused.

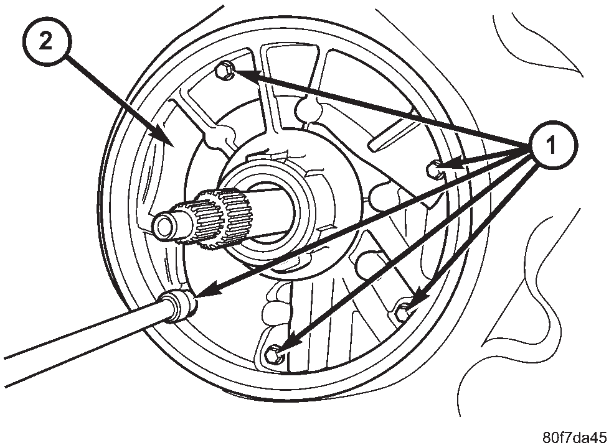


Fig. 39 Remove Oil Pump Attaching Bolts

1 - BOLTS
2 - OIL PUMP

(22) Remove oil pump using C-3752 Pullers (Fig. 40).

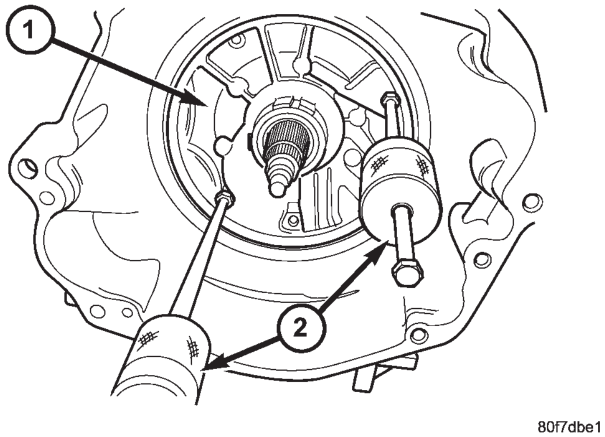


Fig. 40 Oil Pump Pullers

1 - OIL PUMP
2 - PULLERS

(23) Remove oil pump while pushing in on input shaft (Fig. 41).

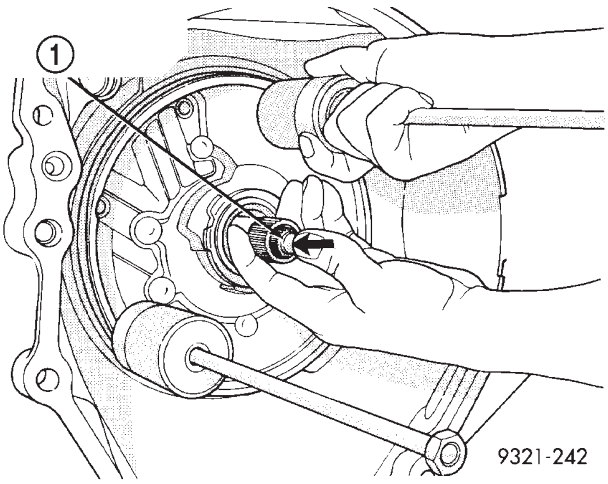


Fig. 41 Remove Oil Pump

1 - “PUSH IN” ON INPUT SHAFT WHILE REMOVING PUMP

(24) Remove oil pump gasket (Fig. 42).

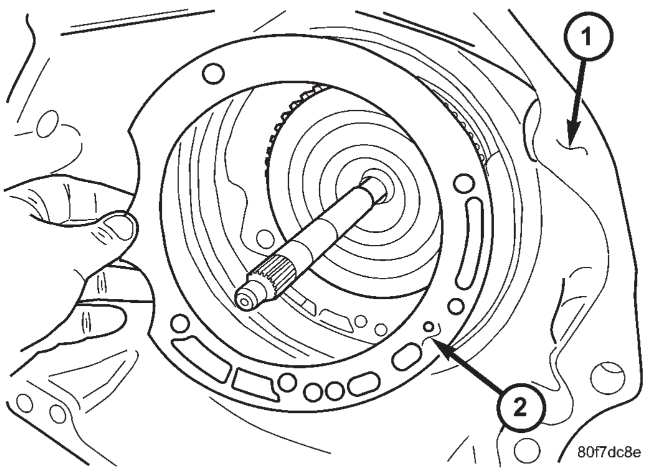


Fig. 42 Remove Oil Pump Gasket

1 - BELLHOUSING
2 - OIL PUMP GASKET

CAUTION: By-pass valve must be replaced if transmission failure occurs.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(25) Remove the cooler by-pass valve (Fig. 43).

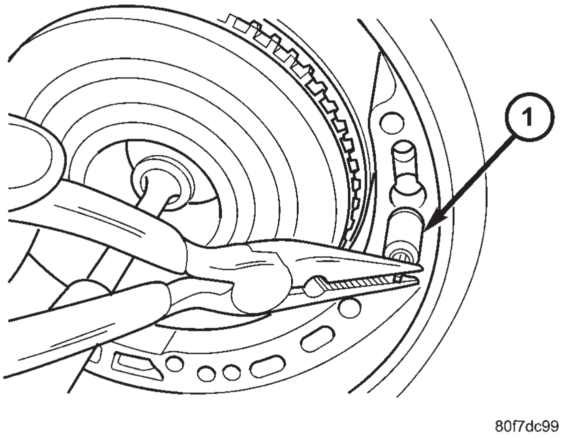


Fig. 43 Remove By-Pass Valve

1 - BYPASS VALVE

(26) Remove the #1 caged needle bearing (Fig. 44).

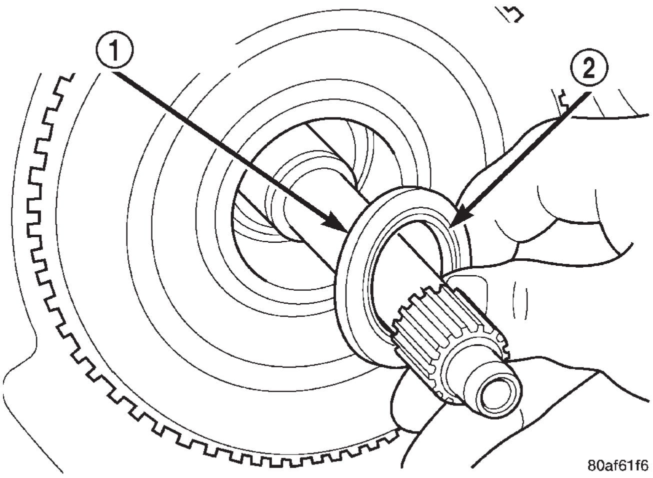


Fig. 44 Remove No. 1 Caged Needle Bearing

1 - #1 CAGED NEEDLE BEARING
2 - NOTE: TANGED SIDE OUT

(27) Remove the input clutch assembly (Fig. 45).

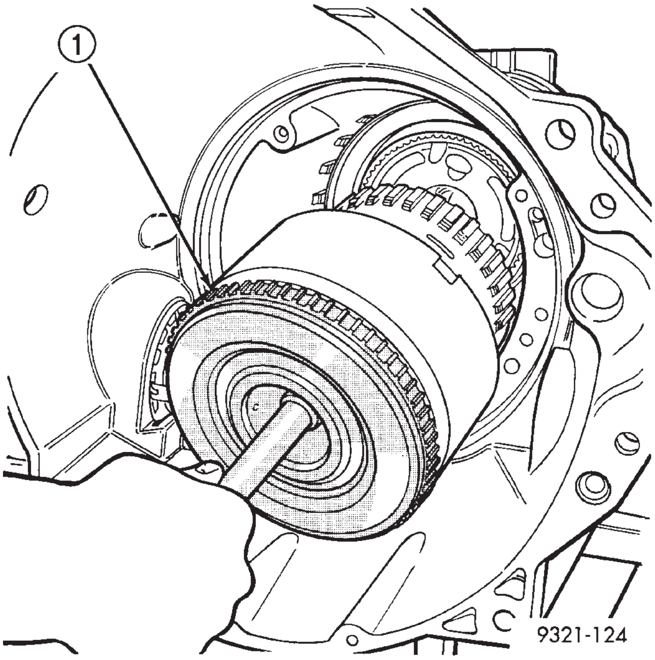


Fig. 45 Remove Input Clutch Assembly

1 - INPUT CLUTCH ASSEMBLY

(28) Remove the #4 thrust plate (Fig. 46).

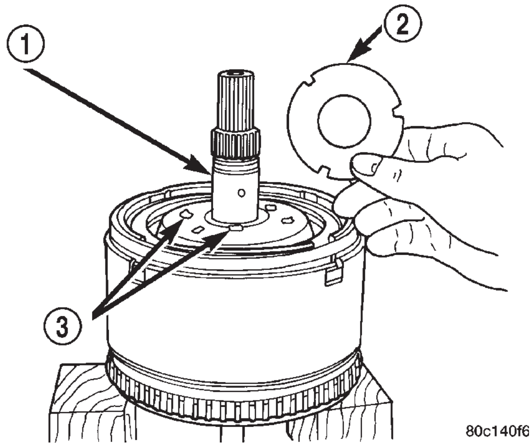


Fig. 46 Remove #4 Thrust Plate

1 - OVERDRIVE SHAFT ASSEMBLY
2 - #4 THRUST PLATE (SELECT)
3 - PETROLATUM FOR RETENTION

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(29) Remove the front sun gear assembly and #4 thrust washer (if still in place) (Fig. 47).

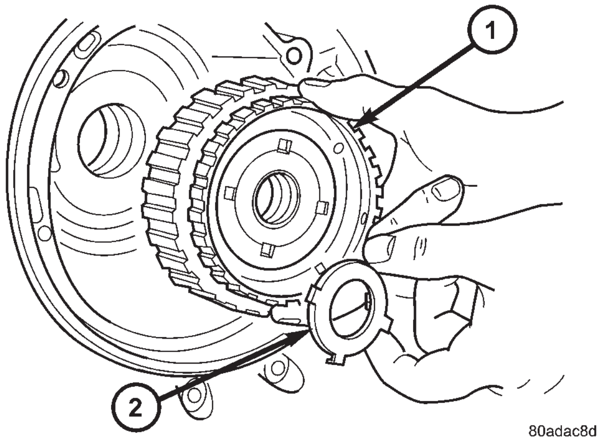


Fig. 47 Remove Front Sun Gear Assembly

1 - FRONT SUN GEAR ASSEMBLY
2 - #4 THRUST WASHER (FOUR TABS)

(30) Remove the front carrier/rear annulus and #6 needle bearing (Fig. 48).

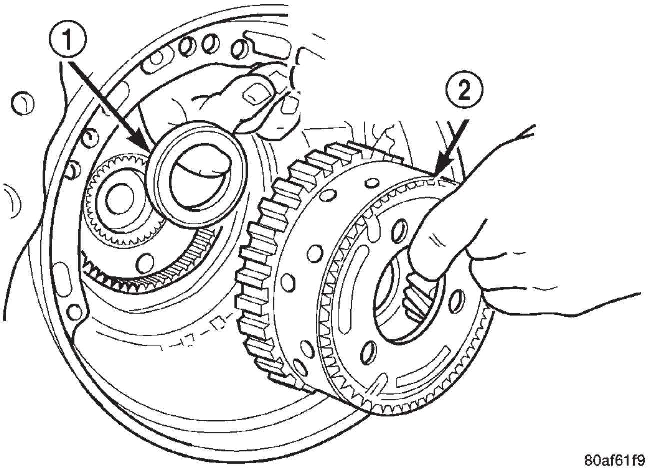


Fig. 48 Remove Front Carrier/Rear Annulus

1 - #6 NEEDLE BEARING
2 - FRONT CARRIER AND REAR ANNULUS ASSEMBLY (TWIST AND PULL OR PUSH TO REMOVE OR INSTALL).

(31) Remove the rear sun gear and #7 needle bearing (Fig. 49) and (Fig. 50).

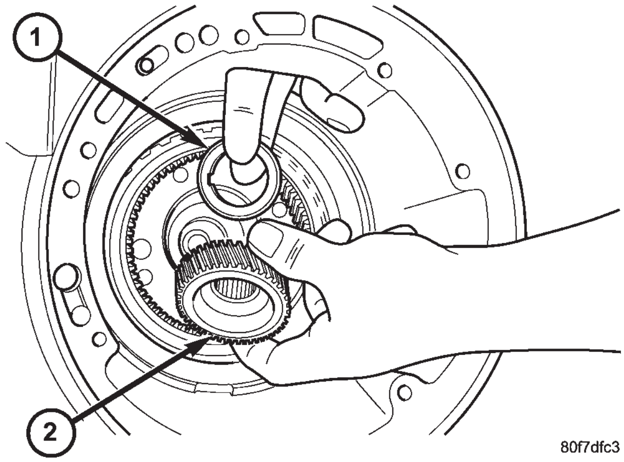


Fig. 49 Remove Rear Sun Gear

1 - #7 NEEDLE BEARING
2 - REAR SUN GEAR

NOTE: The number seven needle bearing has three antireversal tabs and is common with the number five and number two position. The orientation should allow the bearing to seat flat against the rear sun gear (Fig. 50).

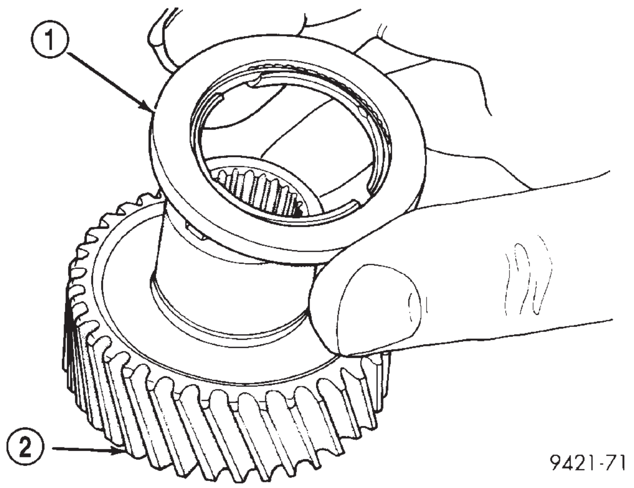


Fig. 50 Number 7 Bearing

1 - #7 BEARING
2 - REAR SUN GEAR

AUTOMATIC TRANSMISSION - 42RLE (Continued)

NOTE: Verify that Tool 5058A is centered properly over the 2/4 clutch retainer before compressing. If necessary, fasten the 5058A bar to the bellhousing flange with any combination of locking pliers and bolts to center the tool properly.

(32) Install and load Tool 5058A to remove the 2/4 clutch retainer snap ring (Fig. 51).

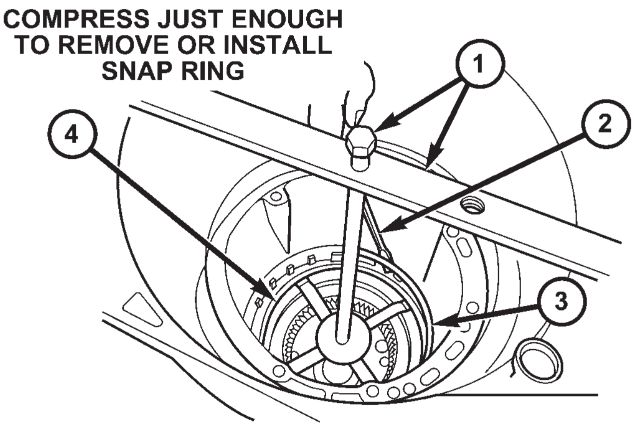


Fig. 51 Remove 2/4 Clutch Retainer Snap Ring

1 - TOOL 5058
2 - SCREWDRIVER
3 - SNAP RING
4 - 2/4 CLUTCH RETAINER

NOTE: The 2/4 Clutch Piston has bonded seals which are not individually serviceable. Seal replacement requires replacement of the piston assembly.

(33) Remove the 2/4 clutch retainer (Fig. 52) and (Fig. 53).

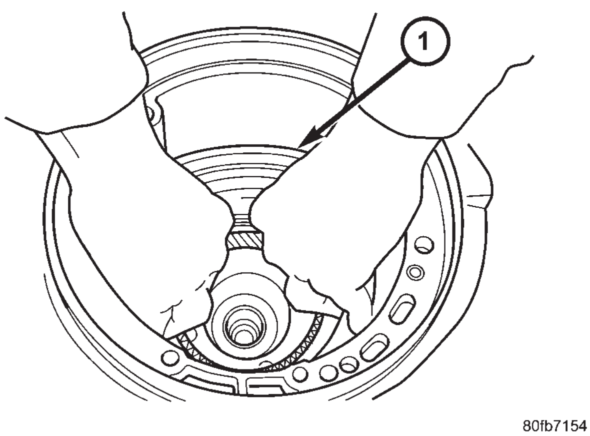


Fig. 52 Remove 2/4 Clutch Retainer

1 - 2/4 CLUTCH RETAINER

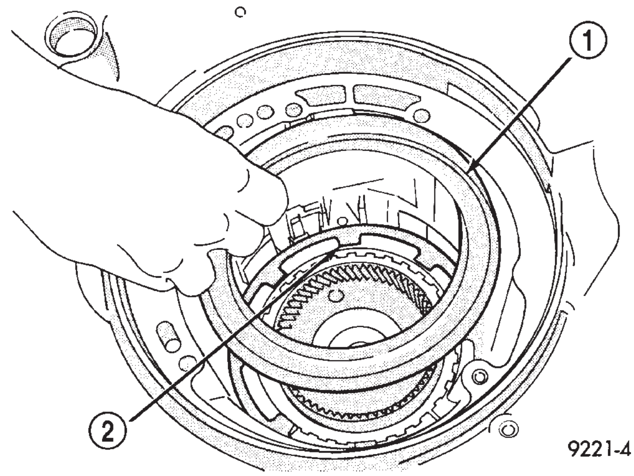


Fig. 53 2/4 Clutch Retainer

1 - 2/4 CLUTCH RETAINER
2 - 2/4 CLUTCH RETURN SPRING

(34) Remove the 2/4 clutch return spring (Fig. 54).

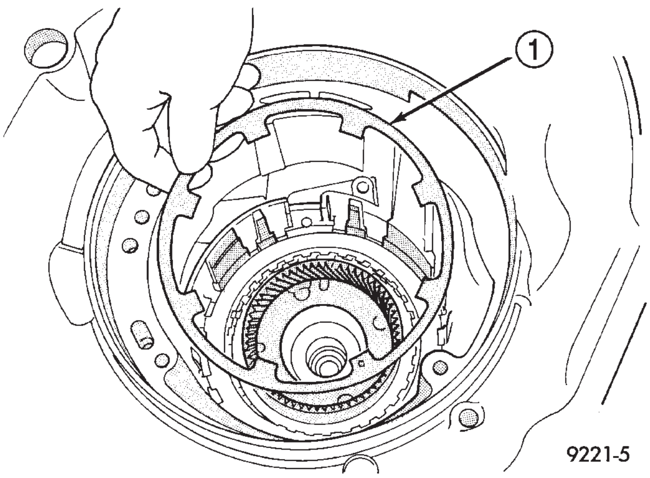


Fig. 54 Remove 2/4 Clutch Return Spring

1 - 2/4 CLUTCH RETURN SPRING

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(35) Remove the 2/4 clutch pack (Fig. 55).

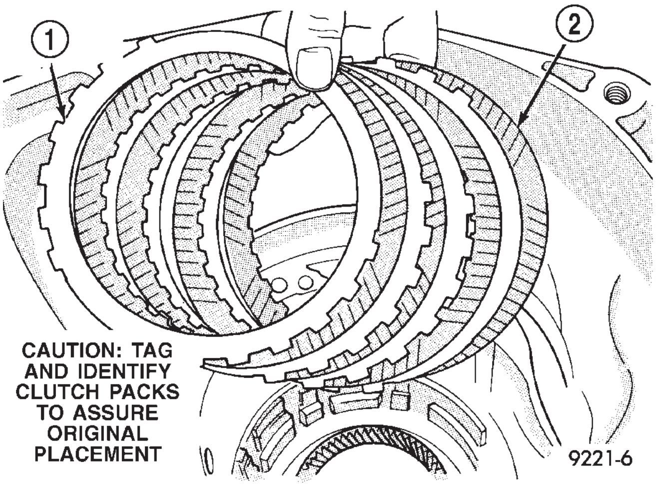


Fig. 55 Remove 2/4 Clutch Pack

1 - CLUTCH PLATE (4)
2 - CLUTCH DISC (4)

(36) Remove the tapered snap ring (Fig. 56).

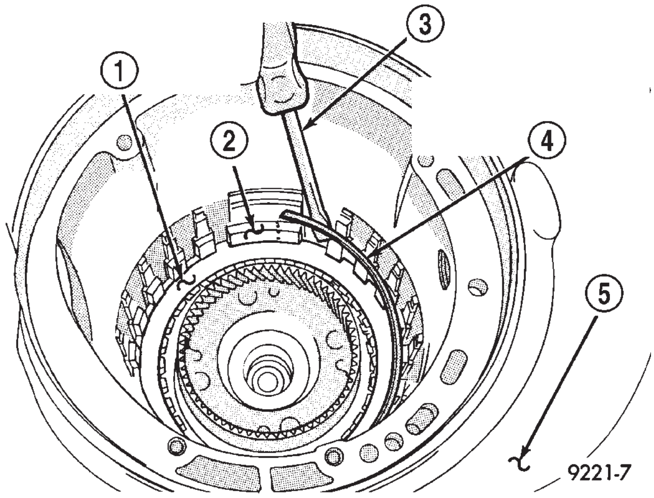


Fig. 56 Remove Tapered Snap Ring

1 - LOW/REVERSE CLUTCH REACTION PLATE
2 - LONG TAB
3 - SCREWDRIVER
4 - LOW/REVERSE TAPERED SNAP RING (TAPERED SIDE UP)
5 - OIL PAN FACE

(37) Remove the low/reverse reaction plate (Fig. 57).

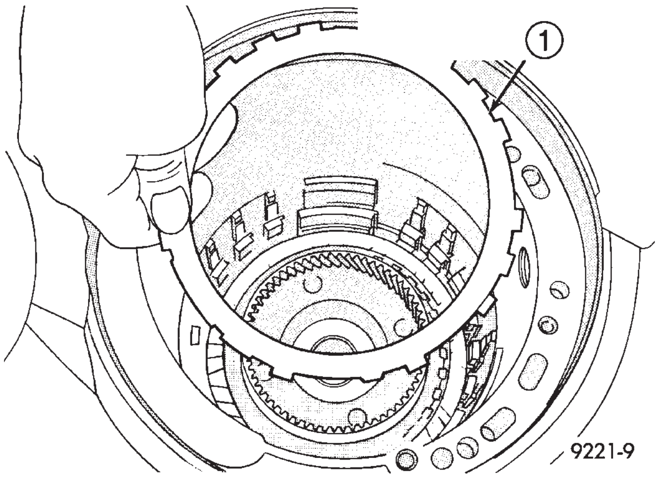


Fig. 57 Remove Low/Reverse Reaction Plate

1 - LOW/REVERSE REACTION PLATE (FLAT SIDE UP)

(38) Remove one (1) low/reverse clutch disc to facilitate snap ring removal (Fig. 58).

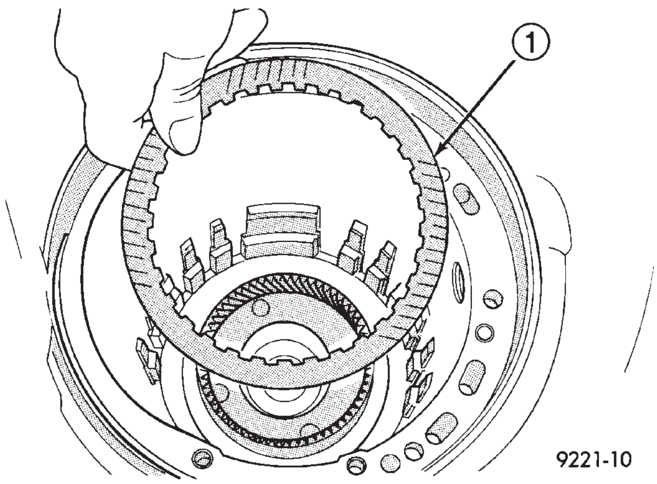


Fig. 58 Remove One Disc

1 - ONE DISC FROM LOW/REVERSE CLUTCH

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(39) Remove the low/reverse reaction plate snap ring (Fig. 59).

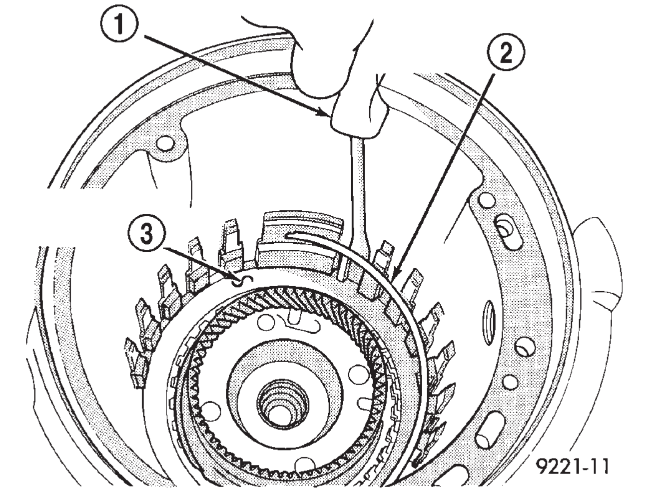


Fig. 59 Remove Low/Reverse Reaction Plate Snap Ring

1 - SCREWDRIVER
2 - LOW/REVERSE REACTION PLATE FLAT SNAP RING
3 - DO NOT SCRATCH CLUTCH PLATE

(40) Remove the low/reverse clutch pack (Fig. 60).

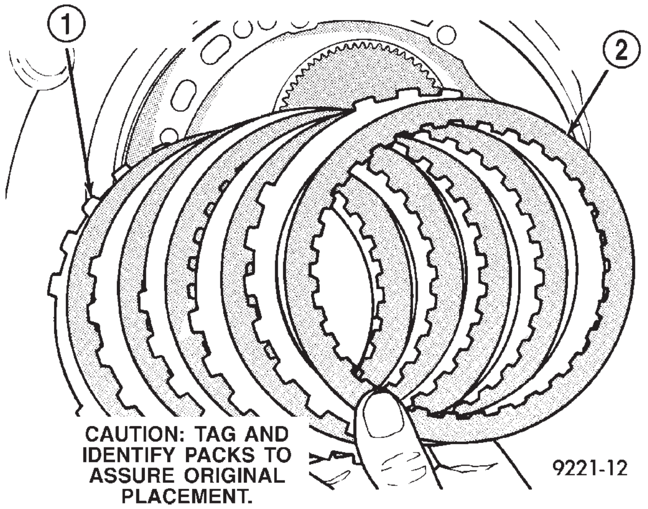


Fig. 60 Remove Low/Reverse Clutch Pack

1 - CLUTCH PLATES (5)
2 - CLUTCH DISCS (5)

CAUTION: Failure to grind and open stakes of the output shaft nut will result in thread damage to the shaft during nut removal.

WARNING: WEAR SAFETY GOGGLES WHILE GRINDING STAKE NUTS.

(41) Using a die grinder or equivalent, grind the stakes in the shoulder of the shaft nuts as shown in (Fig. 61) (Fig. 62). Do not grind all the way through the nut and into the shaft. There are two stakes on each nut.

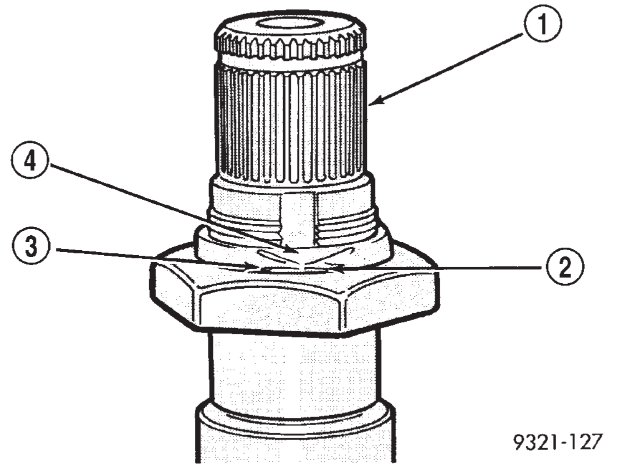


Fig. 61 Grinding Stakes

1 - TRANSFER SHAFT
2 - GRIND HERE
3 - GRIND HERE
4 - NUT STAKE

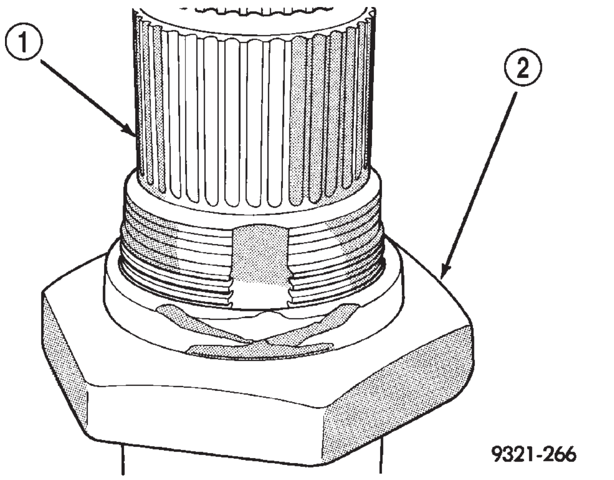


Fig. 62 Stake Grinding Pattern

1 - TRANSFER SHAFT
2 - TRANSFER SHAFT NUT

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(42) Using a small chisel, carefully open the stakes on nut (Fig. 63).

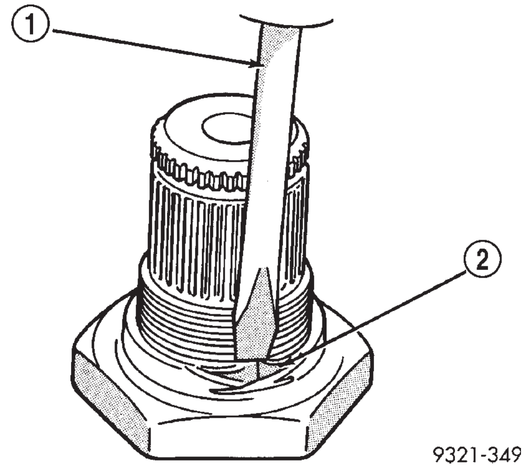


Fig. 63 Opening Nut Stakes

1 - CHISEL
2 - NUT STAKE

(43) Use special tool 6497 and 6498A to remove the transfer shaft nut or the output shaft nut (Fig. 64).

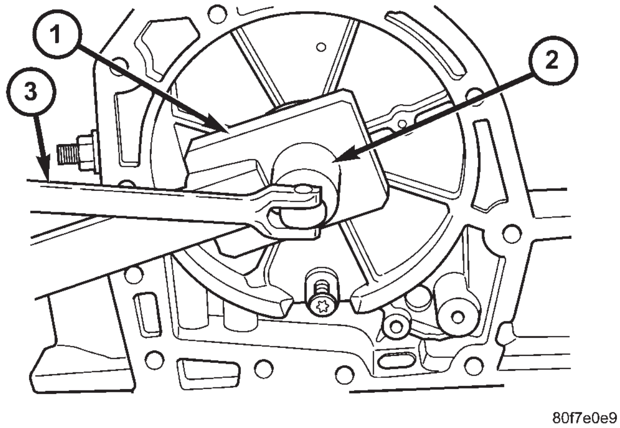


Fig. 64 Remove Output Shaft Nut

1 - SPECIAL TOOL 6497
2 - SPECIAL TOOL 6498A
3 - BREAKER BAR

(44) Remove the output shaft from case using a shop press (Fig. 65).

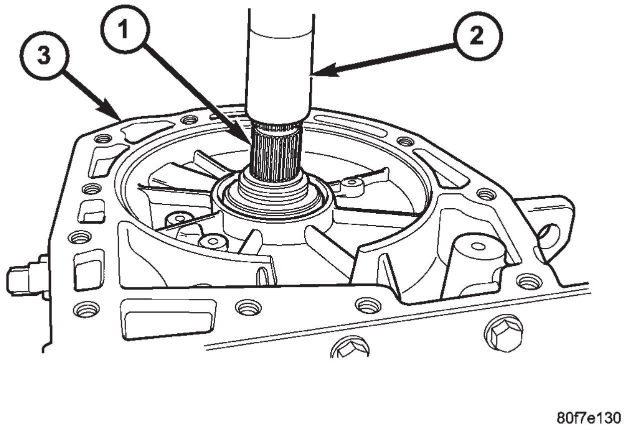


Fig. 65 Use Arbor Press to Remove Output Shaft from Case

1 - OUTPUT SHAFT
2 - ARBOR PRESS
3 - TRANSMISSION CASE

Use special tool 6596 with a shop press to remove the front output shaft bearing cup (Fig. 66).

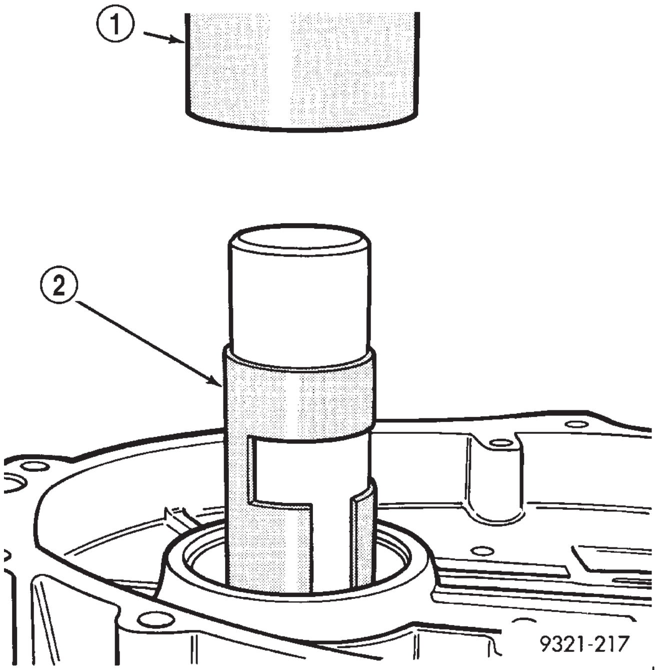


Fig. 66 Remove Front Bearing Cup - Typical

1 - ARBOR PRESS
2 - SPECIAL TOOL 6596

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(45) Use special tool 6597 and handle C-4171 and C-4171-2 to press the rear output shaft bearing cup rearward (Fig. 67).

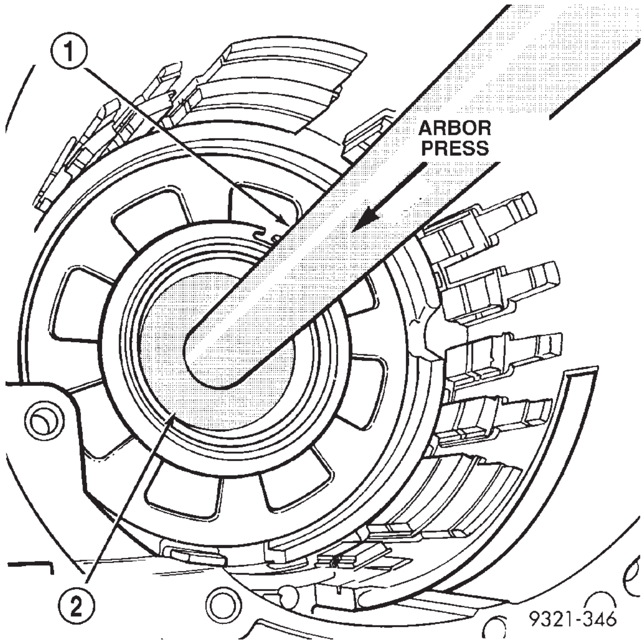


Fig. 67 Remove Rear Bearing Cup

1 - SPECIAL TOOL 4171 AND 4171-2
2 - SPECIAL TOOL 6597

(46) Remove the rear carrier front bearing cone (Fig. 68).

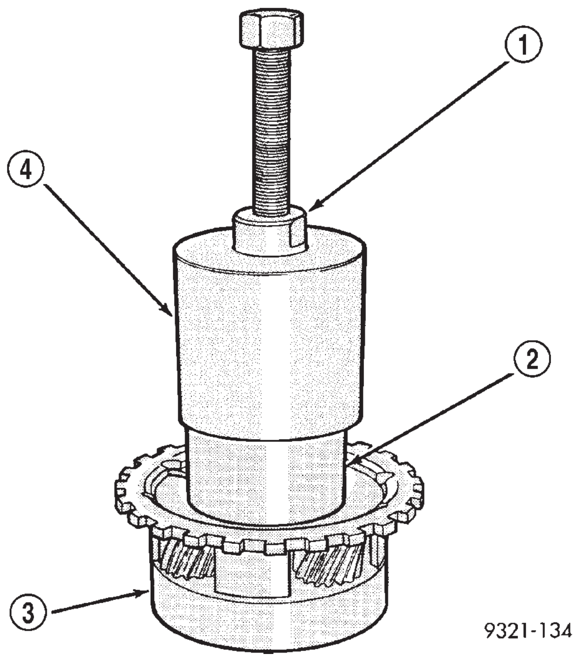


Fig. 68 Remove Rear Carrier Front Bearing Cone

1 - SPECIAL TOOL 5048-1
2 - SPECIAL TOOL 6545
3 - REAR CARRIER
4 - SPECIAL TOOL 5048

(47) Install and load compressor (Fig. 69) as shown in (Fig. 70).

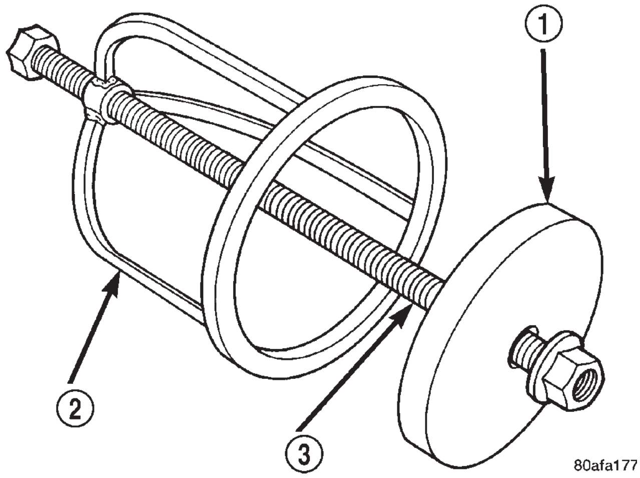


Fig. 69 Low/Reverse Spring Compressor Tool

1 - TOOL 6057
2 - TOOL 5059
3 - TOOL 5058-3

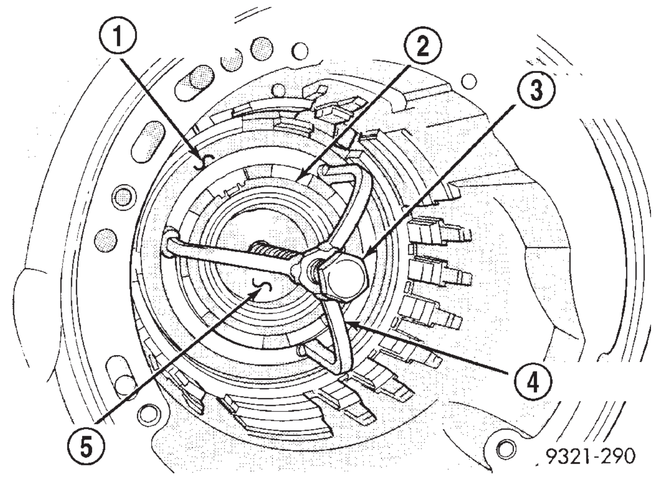


Fig. 70 Compressor Tool in Use

1 - LOW/REVERSE CLUTCH RETURN SPRING
2 - SNAP RING (INSTALL AS SHOWN)
3 - TOOL 5058A-3
4 - TOOL 5059A
5 - SPECIAL TOOL 6057

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(48) Remove the low/reverse belleville spring snap ring (Fig. 71).

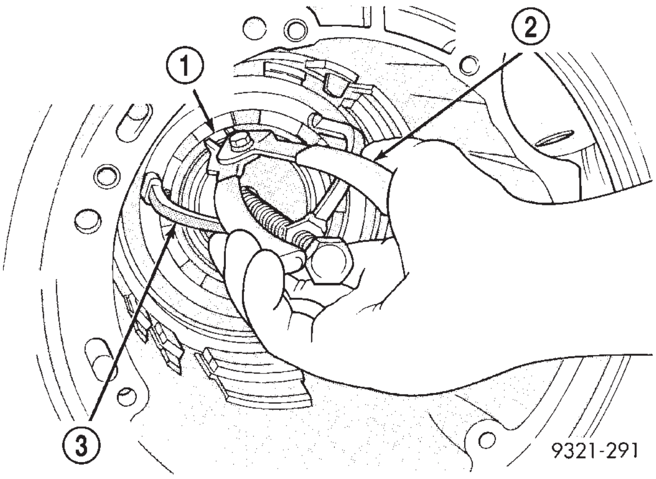


Fig. 71 Remove Snap Ring

1 - SNAP RING OPENING MUST BE BETWEEN SPRING LEVERS (AS SHOWN)
2 - SNAP RING PLIERS
3 - SPECIAL TOOL 5059A

(49) Remove the low/reverse piston belleville spring (Fig. 72).

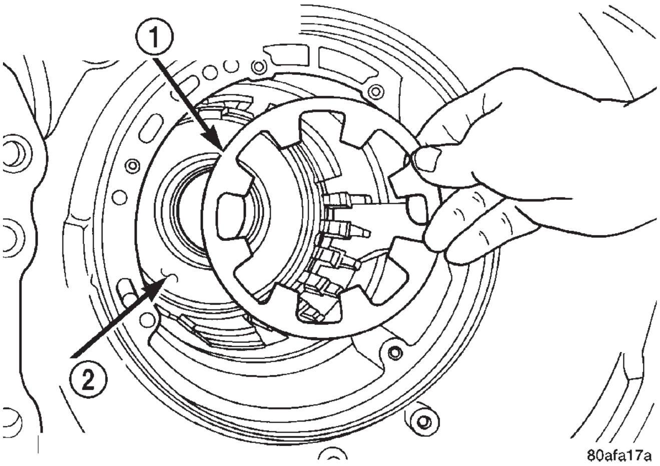


Fig. 72 Low/Reverse Piston Belleville Spring

1 - LOW/REVERSE PISTON RETURN SPRING
2 - PISTON

(50) Remove the park sprag pivot retaining screw.

(51) Drive out the anchor shaft using suitable punch (Fig. 73).

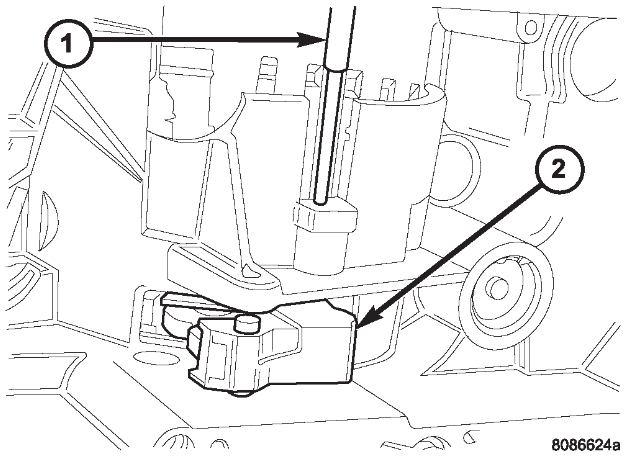


Fig. 73 Anchor Shaft Removal

1 - PIN PUNCH
2 - GUIDE BRACKET ASSEMBLY

(52) Remove the guide bracket pivot shaft (Fig. 74). Inspect all components (Fig. 75) for wear and replace if necessary.

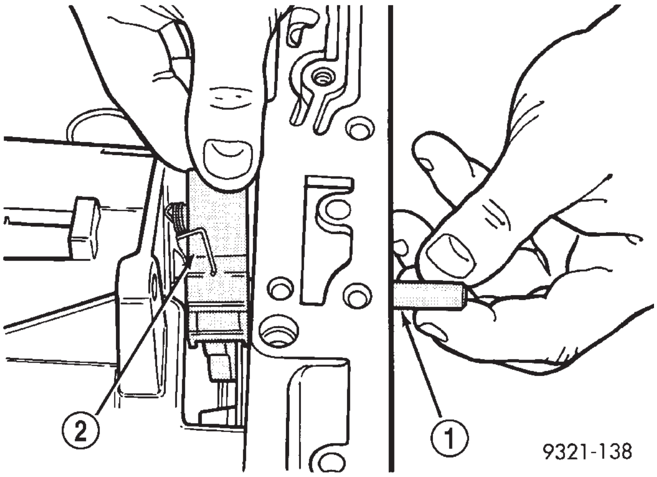


Fig. 74 Remove Guide Bracket Pivot Shaft

1 - PIVOT PIN
2 - GUIDE BRACKET ASSEMBLY

AUTOMATIC TRANSMISSION - 42RLE (Continued)

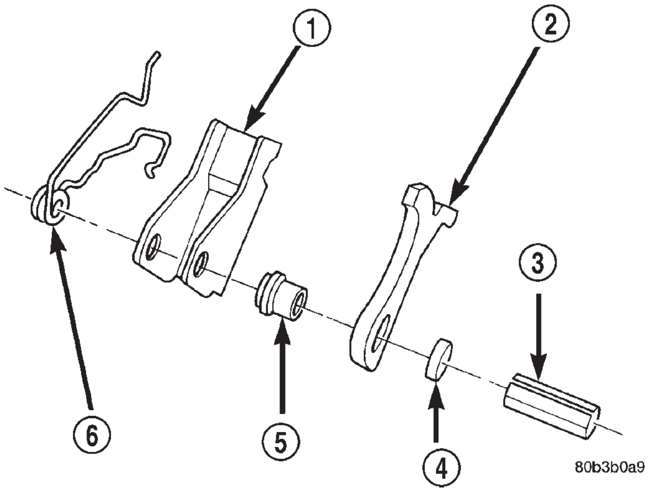


Fig. 75 Guide Bracket Disassembled

1 - GUIDE BRACKET
2 - PAWL
3 - SPLIT SLEEVE
4 - SPACER
5 - STEPPED SPACER
6 - ANTIRATCHET SPRING

NOTE: The Low/Reverse Clutch Piston has bonded seals which are not individually serviceable. Seal replacement requires replacement of the piston assembly.

(53) Remove the low/reverse clutch piston (Fig. 76).

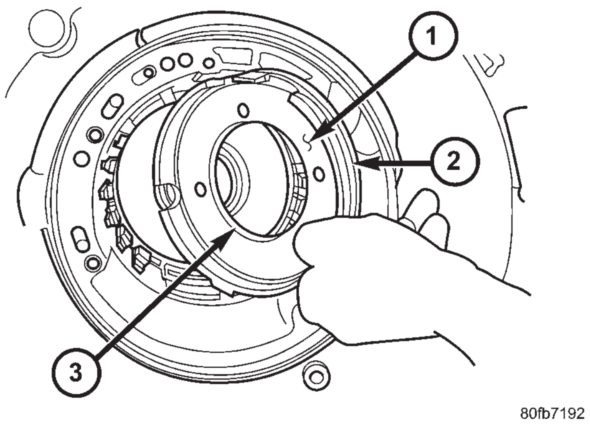


Fig. 76 Remove Low/Reverse Clutch Piston

1 - LOW/REVERSE CLUTCH PISTON
2 - BONDED SEAL
3 - BONDED SEAL

(54) Remove the low/reverse piston retainer screws.

(55) Remove low/reverse piston retainer (Fig. 77).

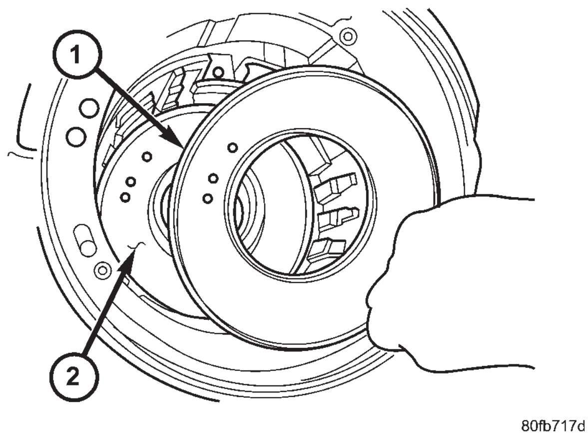


Fig. 77 Remove Piston Retainer

1 - LOW/REVERSE CLUTCH PISTON RETAINER
2 - GASKET

(56) Remove the low/reverse piston retainer gasket (Fig. 78).

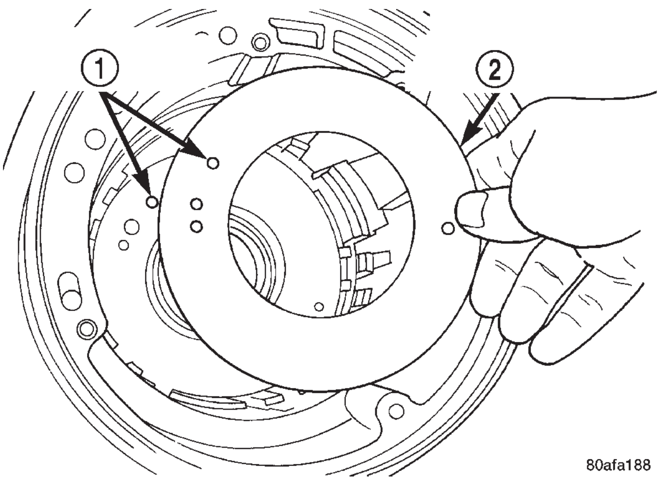


Fig. 78 Remove Piston Retainer Gasket

1 - GASKET HOLES MUST LINE UP
2 - LOW/REVERSE CLUTCH PISTON RETAINER GASKET

AUTOMATIC TRANSMISSION - 42RLE (Continued)

ASSEMBLY

NOTE: If the transmission assembly is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the DRBIII® Scan Tool (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE).

(1) Install the output bearing cups using Special Tool - 5050A (Fig. 79).

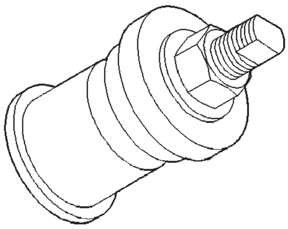


Fig. 79 Bearing Cup Installation Special Tool - 5050A

(2) Install low/reverse piston retainer gasket (Fig. 80).

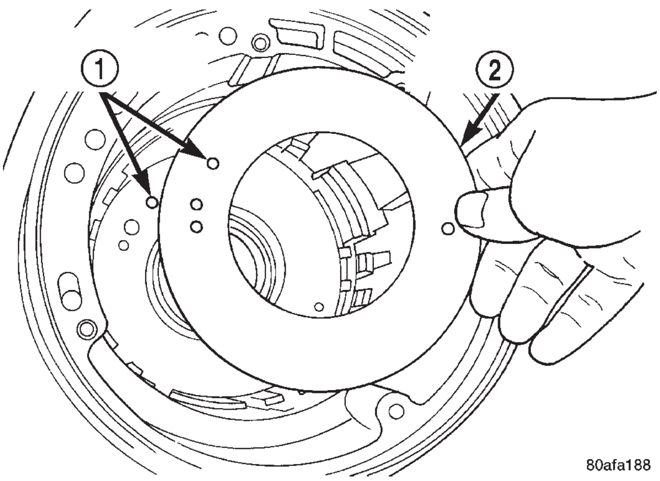


Fig. 80 Install Piston Retainer Gasket

1 - GASKET HOLES MUST LINE UP
2 - LOW/REVERSE CLUTCH PISTON RETAINER GASKET

(3) Install low/reverse piston retainer (Fig. 81).

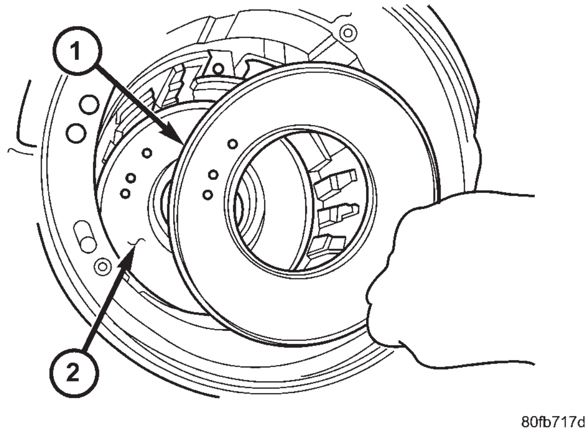


Fig. 81 Install Piston Retainer

1 - LOW/REVERSE CLUTCH PISTON RETAINER
2 - GASKET

(4) Install low/reverse piston retainer-to-case screws (Fig. 82) and torque to 5 N·m (45 in. lbs.).

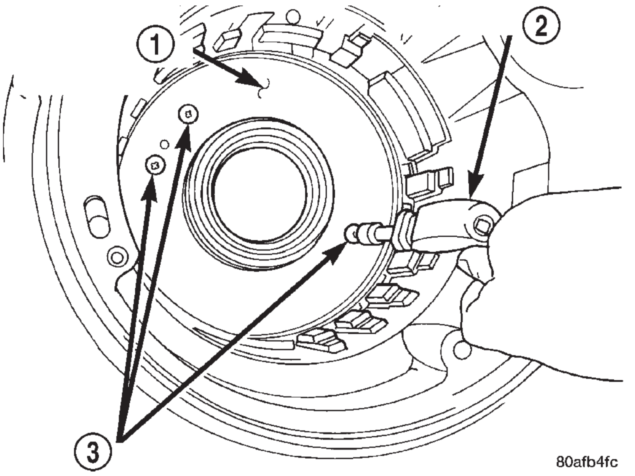


Fig. 82 Install Retainer Attaching Screws

1 - LOW/REVERSE CLUTCH PISTON RETAINER
2 - SCREWDRIVER
3 - TORX-LOC SCREWS

AUTOMATIC TRANSMISSION - 42RLE (Continued)

NOTE: The Low/Reverse Clutch Piston has bonded seals which are not individually serviceable. Seal replacement requires replacement of the piston assembly.

(5) Install low/reverse clutch piston (Fig. 83).

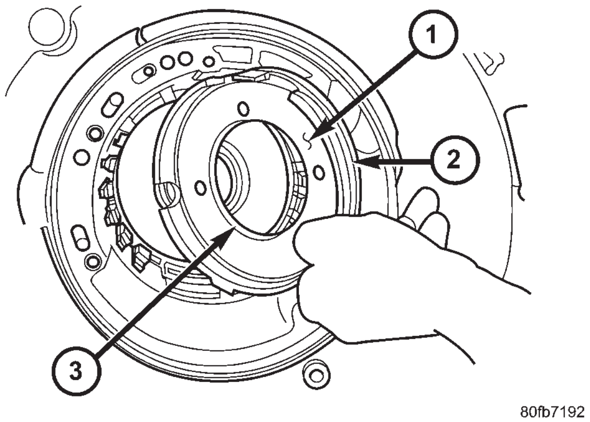


Fig. 83 Install Low/Reverse Clutch Piston

1 - LOW/REVERSE CLUTCH PISTON
2 - BONDED SEAL
3 - BONDED SEAL

(6) Assemble guide bracket assembly as shown in (Fig. 84) (Fig. 85).

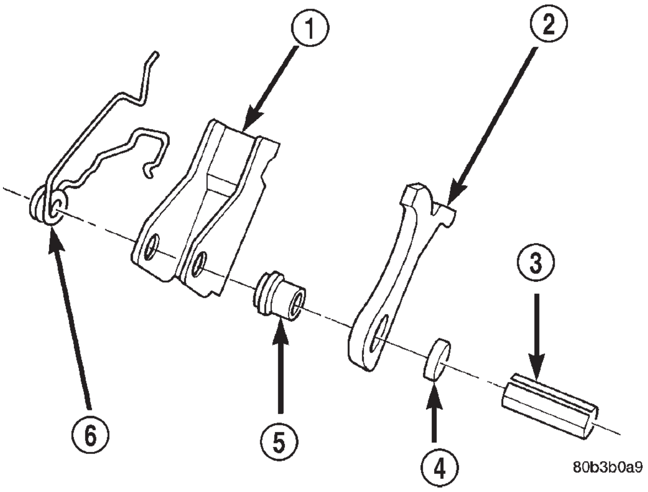


Fig. 84 Guide Bracket Assembly

1 - GUIDE BRACKET
2 - PAWL
3 - SPLIT SLEEVE
4 - SPACER
5 - STEPPED SPACER
6 - ANTIRATCHET SPRING

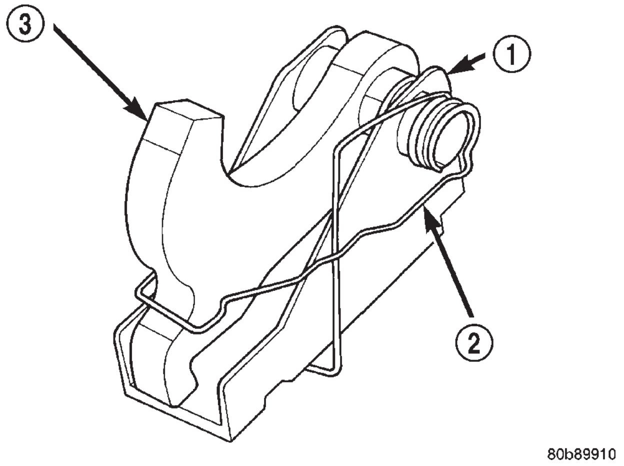


Fig. 85 Guide Bracket

1 - GUIDE BRACKET
2 - ANTIRATCHET SPRING (MUST BE ASSEMBLED AS SHOWN)
3 - PAWL

(7) Install guide bracket pivot shaft (Fig. 86).

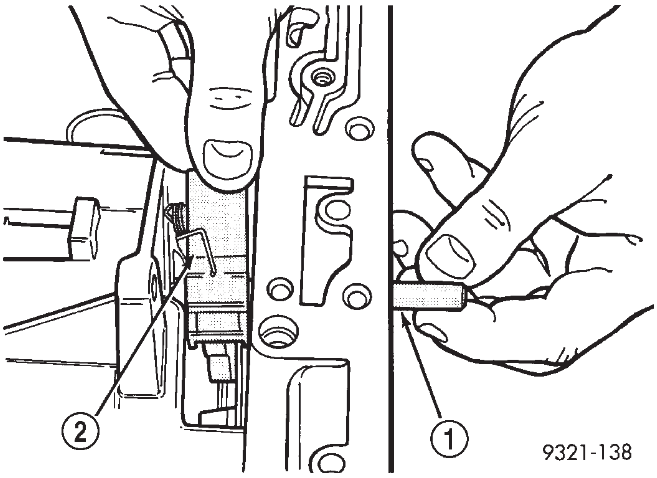


Fig. 86 Install Guide Bracket Pivot Pin

1 - PIVOT PIN
2 - GUIDE BRACKET ASSEMBLY

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

(8) Install park sprag pivot retaining screw and torque to 4.5 N·m (40 in. lbs.).

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(9) Install low/reverse piston belleville spring into position (Fig. 87).

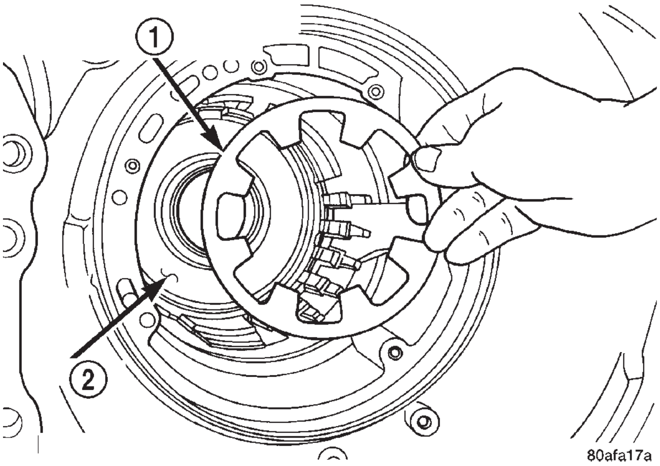


Fig. 87 Install Low/Reverse Piston Return Spring

1 - LOW/REVERSE PISTON RETURN SPRING
2 - PISTON

(10) Install and load low/reverse spring compressor tool as shown in (Fig. 88) (Fig. 89) to facilitate snap ring installation.

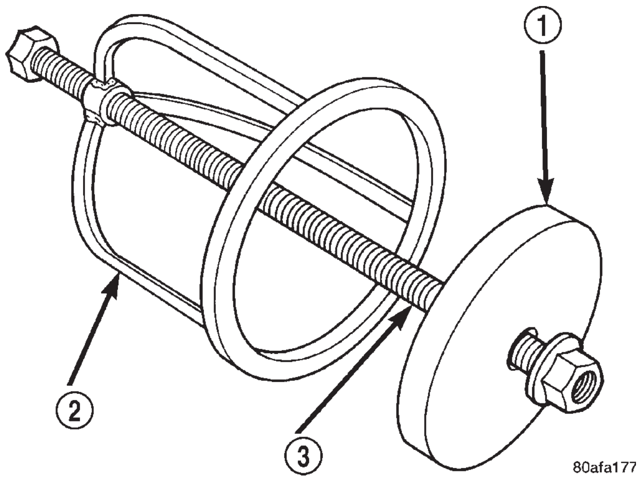


Fig. 88 Low/Reverse Spring Compressor Tool

1 - TOOL 6057
2 - TOOL 5059
3 - TOOL 5058-3

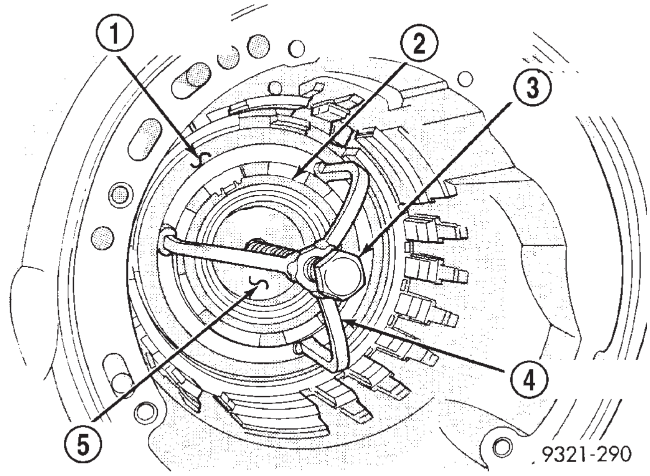


Fig. 89 Compressor Tool in Use

1 - LOW/REVERSE CLUTCH RETURN SPRING
2 - SNAP RING (INSTALL AS SHOWN)
3 - TOOL 5058A-3
4 - TOOL 5059A
5 - SPECIAL TOOL 6057

(11) Install snap ring and remove compressor tool (Fig. 90).

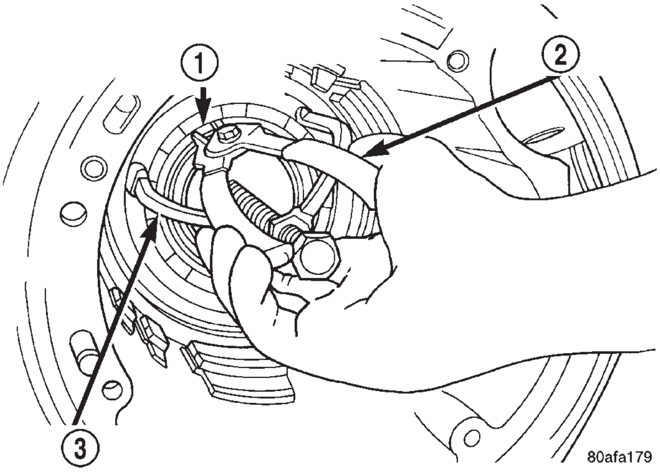


Fig. 90 Install Snap Ring

1 - SNAP RING OPENING MUST BE BETWEEN SPRING LEVERS (AS SHOWN)
2 - SNAP RING PLIERS
3 - TOOL 6057

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(12) Install rear carrier front bearing cone (Fig. 91).

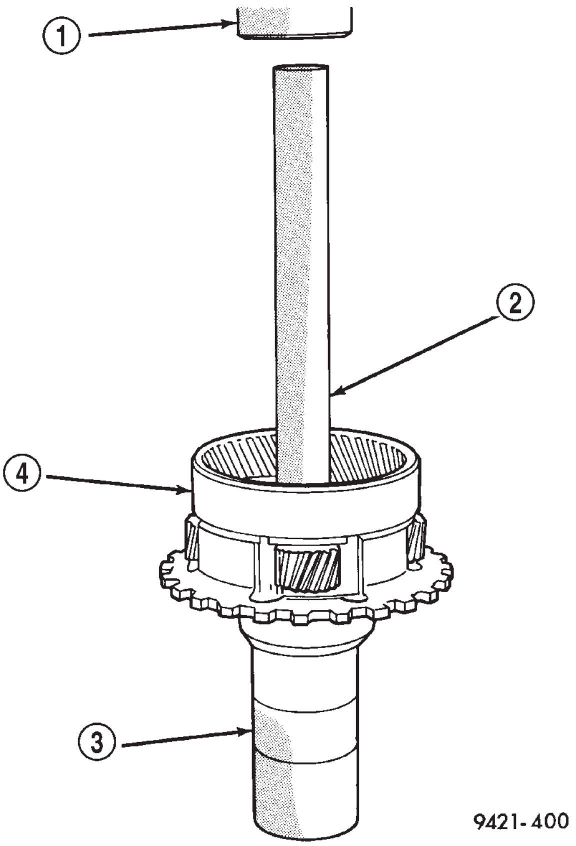


Fig. 91 Install Rear Carrier Front Bearing Cone

1 - ARBOR PRESS
2 - SPECIAL TOOL C-4171
3 - SPECIAL TOOL 6052
4 - REAR CARRIER

(13) Check output bearing preload. **Output bearing preload must be checked and/or adjusted if any of the following items have been replaced:**

- Output shaft (rear carrier assembly)
- Output shaft bearings
- Transmission case

(a) **PRELOAD CHECK/SHIM SELECTION:** Install rear output shaft bearing cone and special tool 6618A (Fig. 92).

(b) Install special tool 6618A (Fig. 93). Lightly tighten retaining screws. Screws should be below the plate surface, but do not snug screws.

(c) Turn case over on arbor press so that the plate is resting on the press base. **CAUTION: The output shaft will extend through the hole of tool 6618A. Ensure your press table has clearance for the output shaft.**

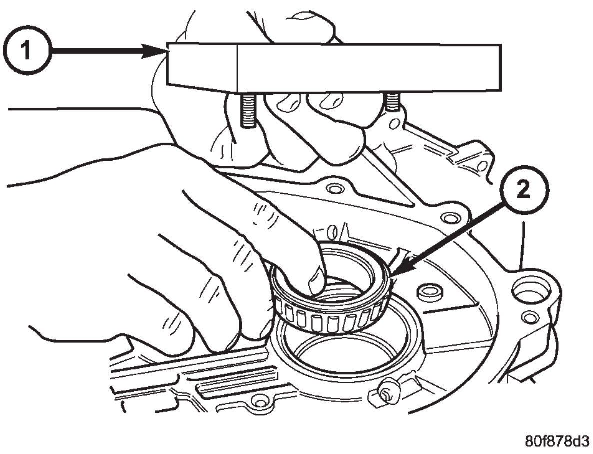


Fig. 92 Bearing Installation

1 - SPECIAL TOOL 6618-A
2 - REAR OUTPUT SHAFT BEARING

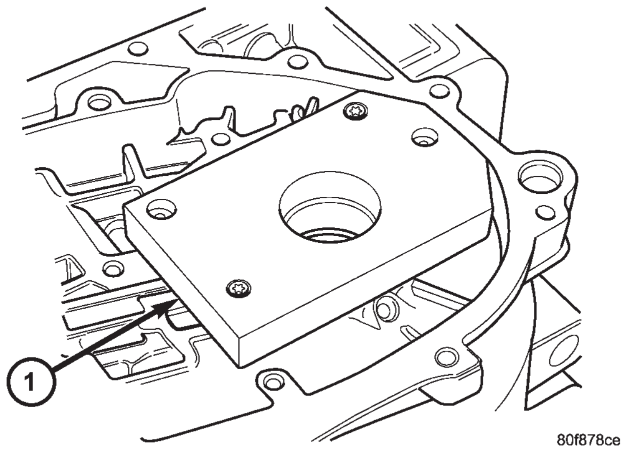


Fig. 93 Special Tool Installed

1 - SPECIAL TOOL 6618-A

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(d) Install shim on output shaft (Fig. 94). Apply small amount of petrolatum onto the shim to hold it in place. Use the original shim as a starting point. If original shim is not available, use the thickest shim available.

(e) Install output shaft/rear carrier into rear bearing. The shaft must be pressed into position. Use special tool MD-998911 (Disc) and C- 4171 and C4171-2 (Handle) to press shaft into rear bearing (Fig. 95).

(f) **Do not re-use old output shaft nut because the removed stake weakens the nut flange.** Using special tools 6497 and 6498-A, install new output shaft nut. Do not reuse old output shaft nut. Tighten new output shaft nut to 271 N·m (200 ft. lbs.).

(g) Check the turning torque of the output shaft (Fig. 96). The shaft should have 1 to 8 in. lbs. of turning torque. If the turning torque is **higher than** 8 in. lbs., install a thicker shim. If turning torque is **less than** 1 in. lb., install a thinner shim. Make sure there is no end play.

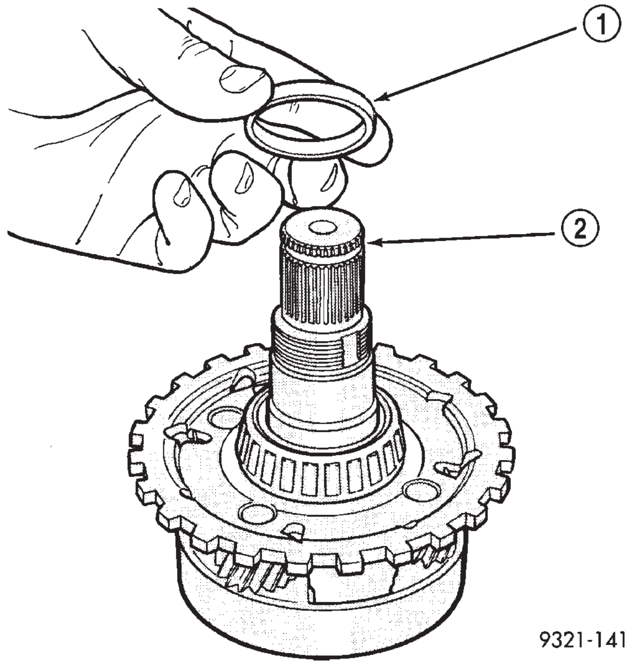


Fig. 94 Shim Installation

1 - SHIM
2 - OUTPUT SHAFT

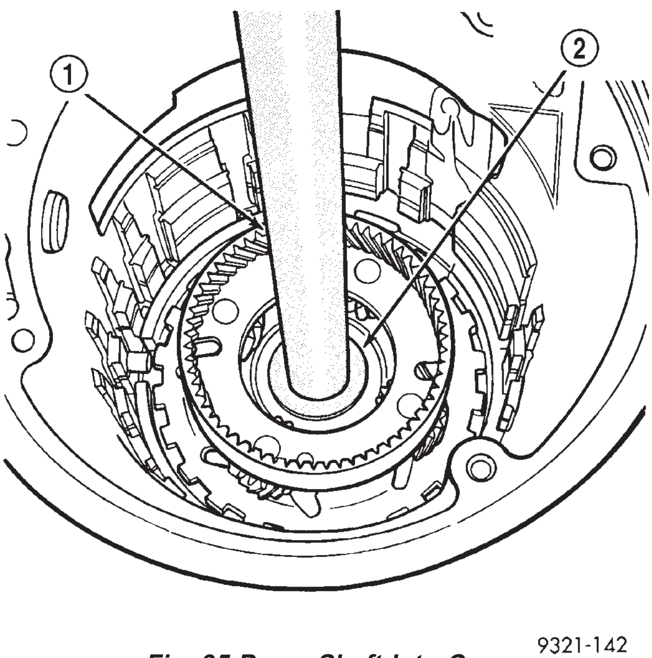


Fig. 95 Press Shaft Into Case

1 - SPECIAL TOOL C-4171 AND C-4171-2
2 - SPECIAL TOOL MD-998911

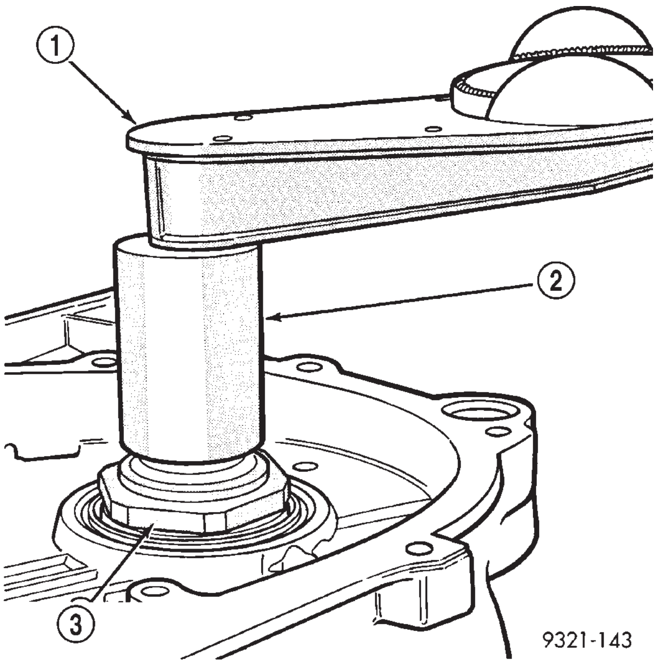


Fig. 96 Checking Turning Torque

1 - TORQUE WRENCH
2 - SPECIAL TOOL 6498-A
3 - OUTPUT SHAFT NUT

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(h) The new nut must be staked after the correct turning torque is obtained (Fig. 97) (Fig. 98). Use special tool 6639 to stake output shaft nut. **CAUTION: Failure to stake nut could allow the nut to back-off during use.**

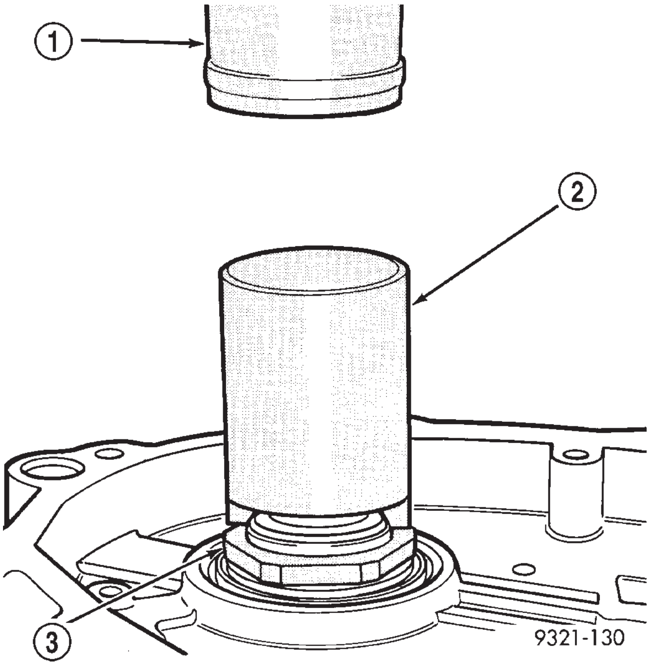


Fig. 97 Staking Output Shaft Nut - Typical

1 - ARBOR PRESS
2 - STAKING TOOL - 6639
3 - NEW NUT

(14) Install low/reverse clutch pack (Fig. 99). Leave uppermost disc out to facilitate snap ring installation.

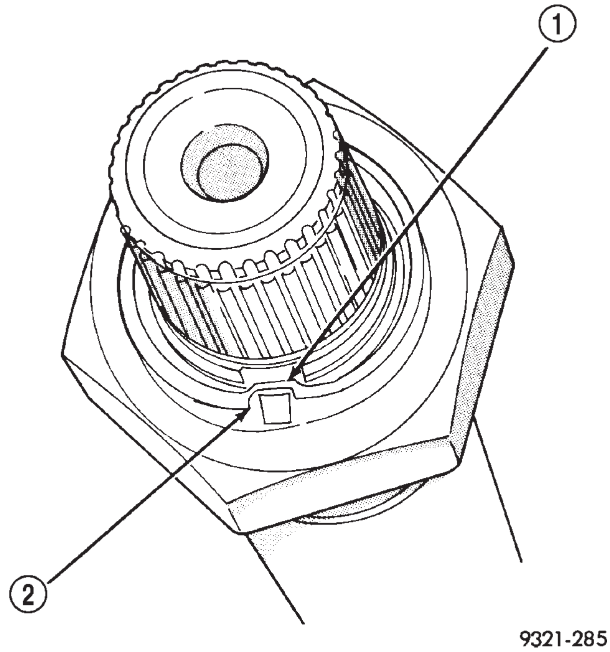


Fig. 98 Properly Staked Nut

1 - BOTTOMED IN SLOT
2 - CORRECTLY STAKED NUT

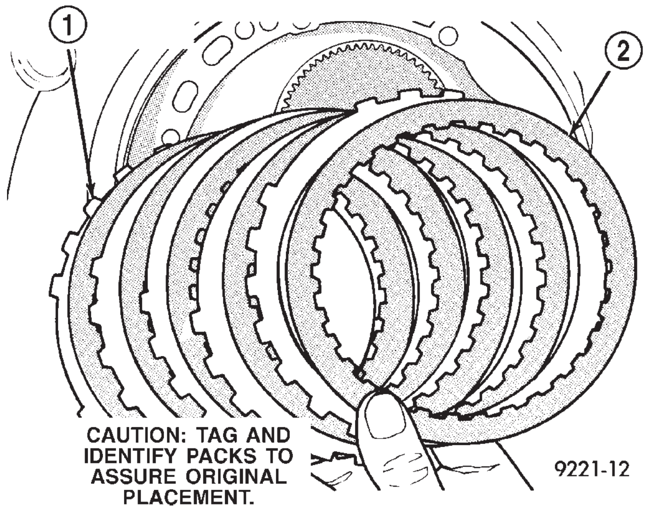


Fig. 99 Install Low/Reverse Clutch Pack

1 - CLUTCH PLATES (5)
2 - CLUTCH DISCS (5)

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(15) Install low/reverse reaction plate snap ring (Fig. 100).

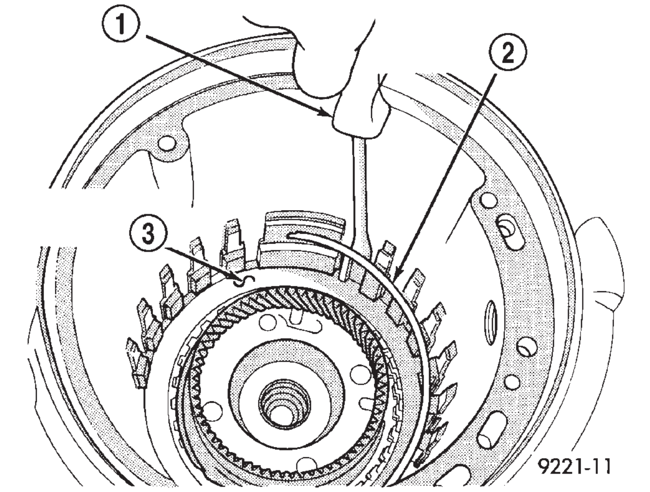


Fig. 100 Install Low/Reverse Reaction Plate Snap Ring

1 - SCREWDRIVER
2 - LOW/REVERSE REACTION PLATE FLAT SNAP RING
3 - DO NOT SCRATCH CLUTCH PLATE

(16) Install one low/reverse clutch disc (Fig. 101).

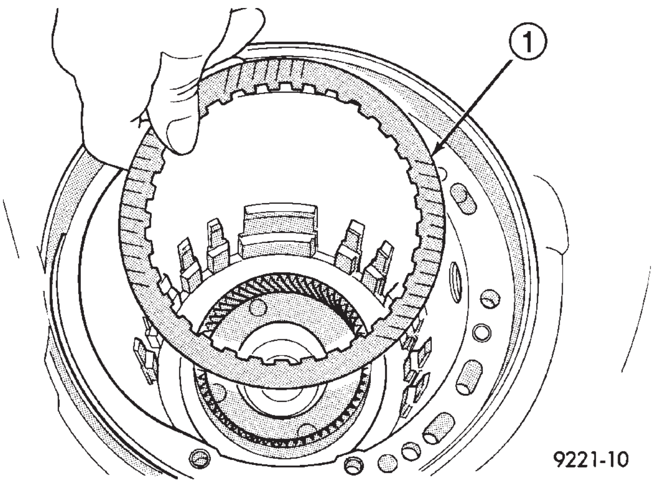


Fig. 101 Install One Disc

1 - ONE DISC FROM LOW/REVERSE CLUTCH

(17) Install low/reverse reaction plate with flat side up (Fig. 102).

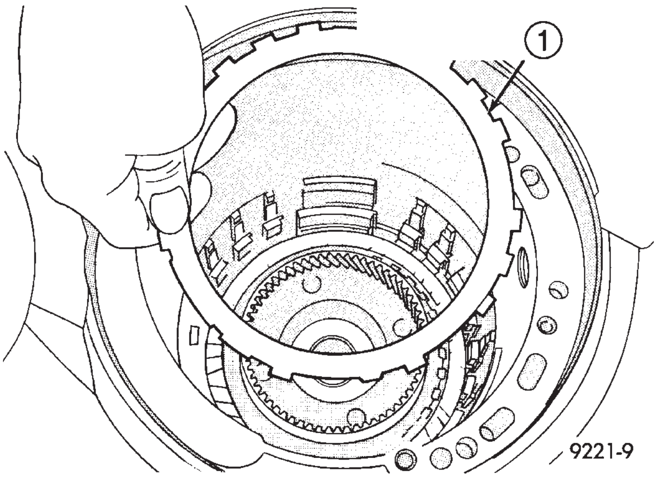


Fig. 102 Install Low/Reverse Reaction Plate

1 - LOW/REVERSE REACTION PLATE (FLAT SIDE UP)

(18) Install a new tapered snap ring (tapered side out) (Fig. 103). Make sure that the snap ring ends are oriented as shown (Fig. 104)

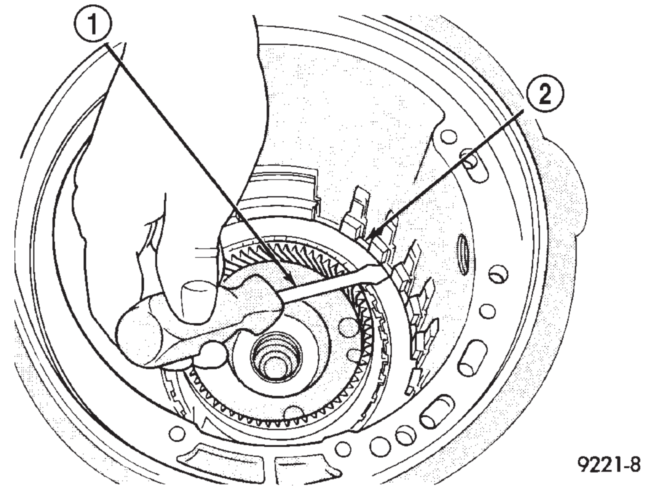


Fig. 103 Snap Ring Installed

1 - SCREWDRIVER
2 - TAPERED SNAP RING (INSTALL AS SHOWN)

AUTOMATIC TRANSMISSION - 42RLE (Continued)

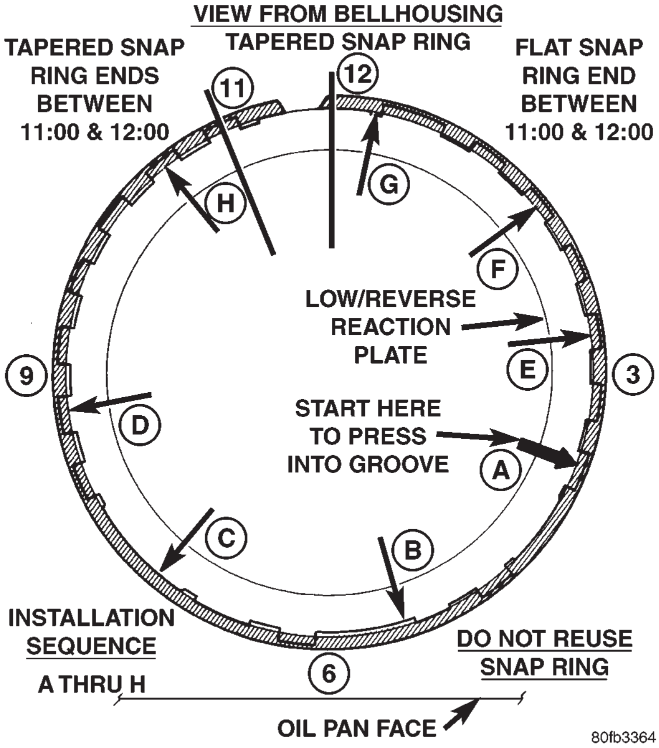


Fig. 104 Tapered Snap Ring Instructions

(19) Measure low/reverse clutch pack. Set up dial indicator as shown in (Fig. 105). Press down clutch pack with finger and zero dial indicator. Record measurement in four (4) places and take average reading. **Low/Reverse clutch pack clearance is 0.84 to 1.60 mm (0.033 to 0.063 inch).**

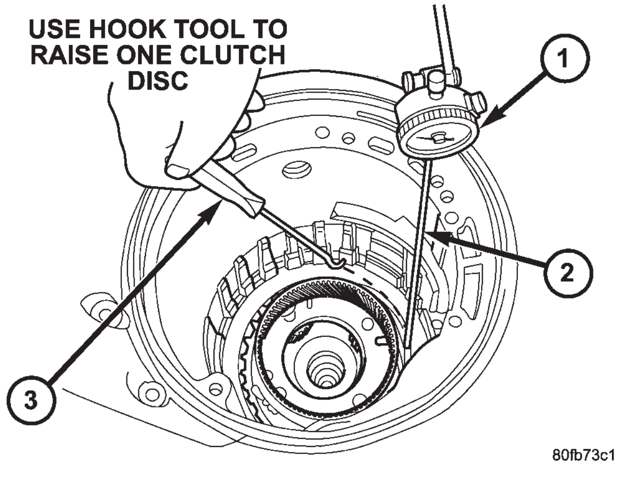


Fig. 105 Check Low/Reverse Clutch Clearance

1 - DIAL INDICATOR
2 - DIAL INDICATOR TIP TOOL 6268
3 - HOOK TOOL

(20) Select the proper low/reverse reaction plate to achieve specifications.

(21) Install 2/4 clutch pack (Fig. 106).

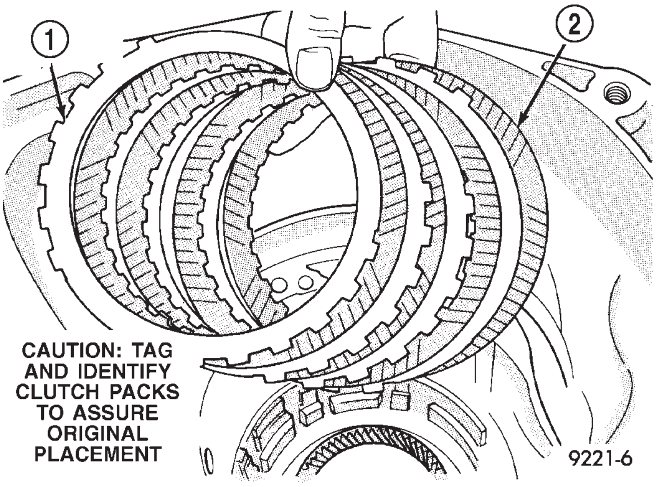


Fig. 106 Install 2/4 Clutch Pack

1 - CLUTCH PLATE (4)
2 - CLUTCH DISC (4)

NOTE: The 2/4 Clutch Piston has bonded seals which are not individually serviceable. Seal replacement requires replacement of the piston assembly.

(22) Install 2/4 clutch belleville spring (Fig. 107) (Fig. 108).

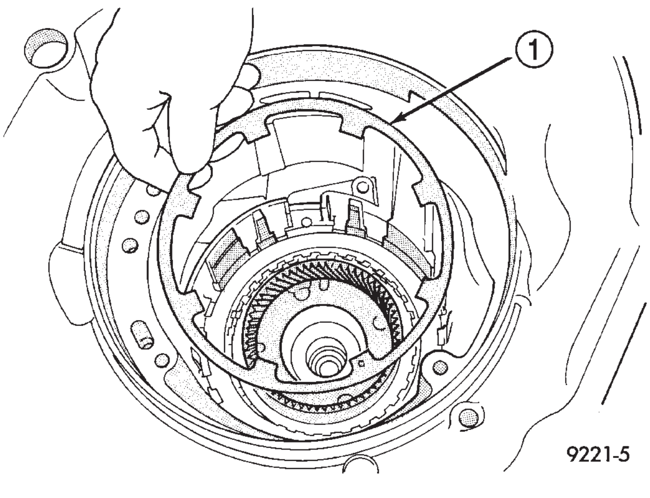


Fig. 107 Install 2/4 Clutch Return Spring

1 - 2/4 CLUTCH RETURN SPRING

AUTOMATIC TRANSMISSION - 42RLE (Continued)

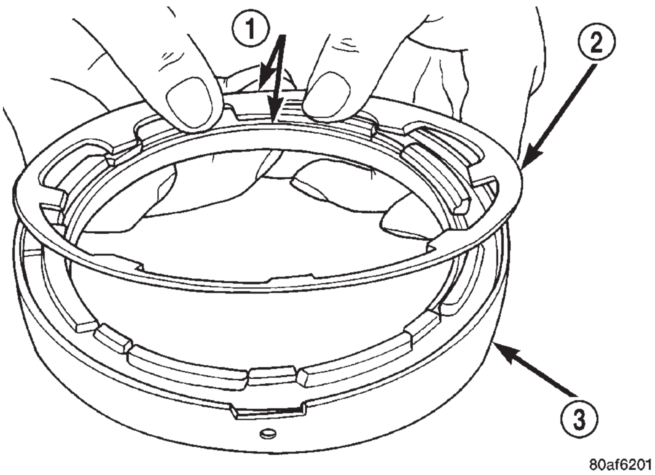


Fig. 108 Proper Orientation of 2/4 Clutch

1 - NOTE POSITION
2 - RETURN SPRING
3 - 2/4 CLUTCH RETAINER

(23) Install 2/4 clutch retainer (Fig. 109).

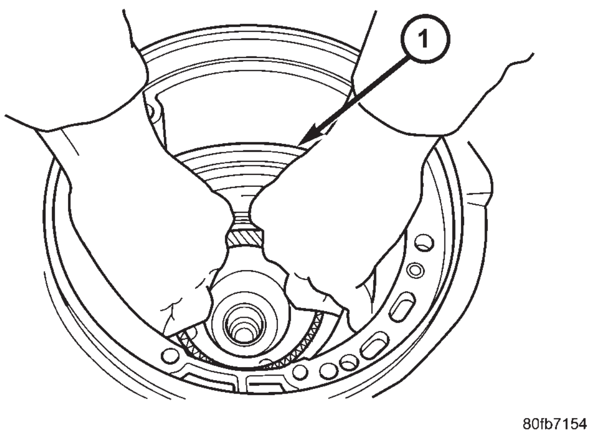


Fig. 109 Install 2/4 Clutch Retainer

1 - 2/4 CLUTCH RETAINER

NOTE: Verify that Tool 5058A is centered properly over the 2/4 clutch retainer before compressing. If necessary, fasten the 5058A bar to the bellhousing flange with any combination of locking pliers and bolts to center the tool properly.

(24) Set up Tool 5058 as shown in (Fig. 110). Compress 2/4 clutch just enough to facilitate snap ring installation.

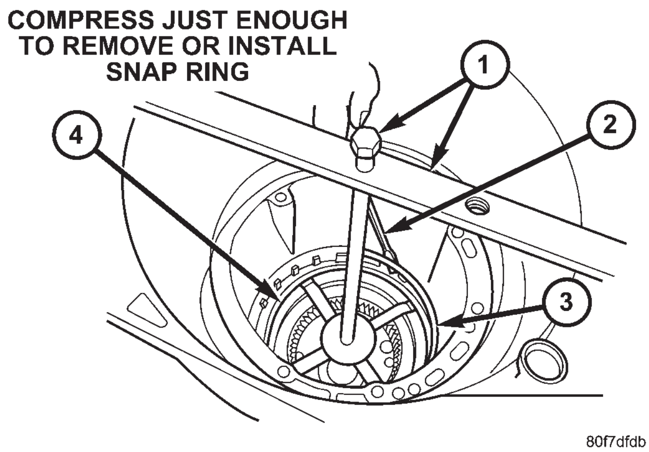


Fig. 110 Remove 2/4 Clutch Retainer Snap Ring

1 - TOOL 5058
2 - SCREWDRIVER
3 - SNAP RING
4 - 2/4 CLUTCH RETAINER

(25) **Measure 2/4 clutch clearance:** Set up dial indicator as shown in (Fig. 111). Press down clutch pack with finger and zero dial indicator. Record measurement in four (4) places and take average reading. **The 2/4 clutch pack clearance is 0.76 to 2.64 mm (0.030 to 0.104 inch).** If not within specifications, the clutch is not assembled properly or is excessively worn. **There is no adjustment for the 2/4 clutch clearance.**

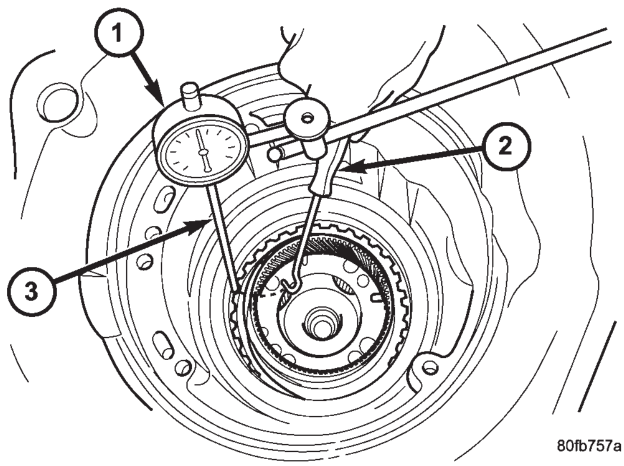


Fig. 111 Check 2/4 Clutch Clearance

1 - DIAL INDICATOR
2 - HOOK TOOL
3 - DIAL INDICATOR TIP TOOL 6268

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(26) Install the #7 needle bearing to the rear sun gear (Fig. 112). **The number 7 needle bearing has three antireversal tabs and is common with the number 5 and number 2 position. The orientation should allow the bearing to seat flat against the rear sun gear. A small amount of petrolatum can be used to hold the bearing to the rear sun gear.**

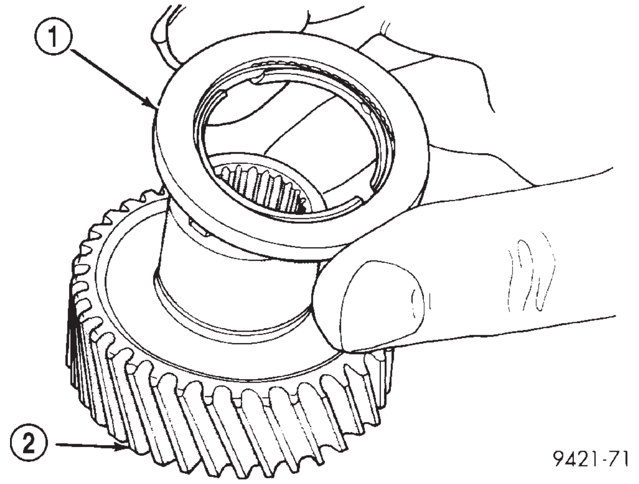


Fig. 112 Number 7 Bearing

1 - #7 BEARING
2 - REAR SUN GEAR

(27) Install rear sun gear and #7 needle bearing (Fig. 113).

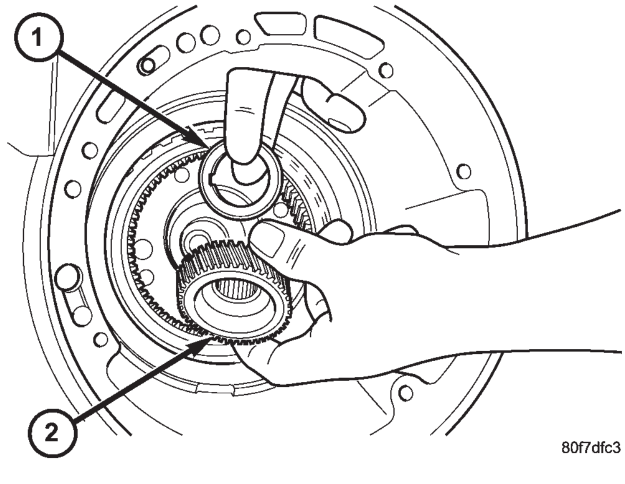


Fig. 113 Install Rear Sun Gear

1 - #7 NEEDLE BEARING
2 - REAR SUN GEAR

(28) Install front carrier/rear annulus assembly and #6 needle bearing (Fig. 114).

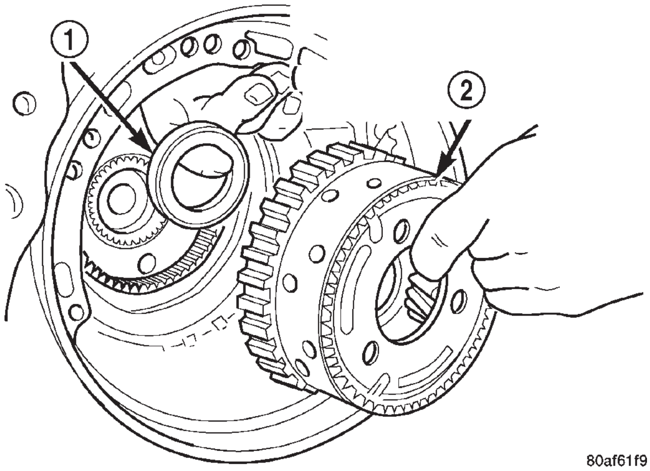


Fig. 114 Install Front Carrier/Rear Annulus

1 - #6 NEEDLE BEARING
2 - FRONT CARRIER AND REAR ANNULUS ASSEMBLY (TWIST AND PULL OR PUSH TO REMOVE OR INSTALL).

(29) Install front sun gear assembly and #4 thrust washer (Fig. 115).

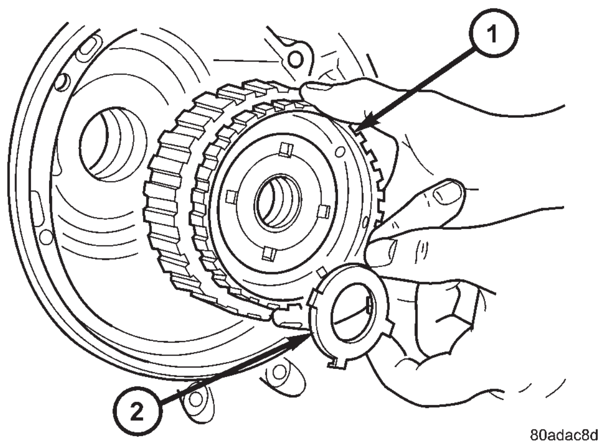


Fig. 115 Install Front Sun Gear Assembly

1 - FRONT SUN GEAR ASSEMBLY
2 - #4 THRUST WASHER (FOUR TABS)

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(30) **Determine proper #4 thrust plate thickness.**

(a) Select the thinnest #4 thrust plate thickness.

(b) Install #4 thrust plate (Fig. 116) using petrolatum to hold into position.

(c) Install input clutch assembly. Ensure the input clutch assembly is completely seated by viewing position through input speed sensor hole. **If the speed sensor tone wheel is not centered in the opening, the input clutch assembly is not seated properly.**

(d) Remove the oil pump o-ring (Fig. 117) and install oil pump and gasket to transmission. Tighten the oil pump bolts to 30 N·m (265 in. lbs.). **Use screw-in dowels or phillips-head screwdrivers to align pump to case. Be sure to reinstall O-ring on oil pump after selecting the proper No. 4 thrust plate.**

(e) Measure the input shaft end play with the transmission in the vertical position. This will ensure that the measurement will be accurate.

(f) Set up and measure endplay using End Play Set 8266 and Dial Indicator Set C3339 as shown in (Fig. 118).

(g) Measure input shaft end play. **Input shaft end play must be 0.127 to 0.635 mm (0.005 to 0.025 inch).** For example, if end play reading is 0.055 inch, select No. 4 Thrust Plate which is 0.071 to 0.074 thick. This should provide an input shaft end play reading of 0.020 inch, which is within specifications.

(h) Remove oil pump, gasket, and input clutch assembly to gain access to and install proper #4 thrust plate.

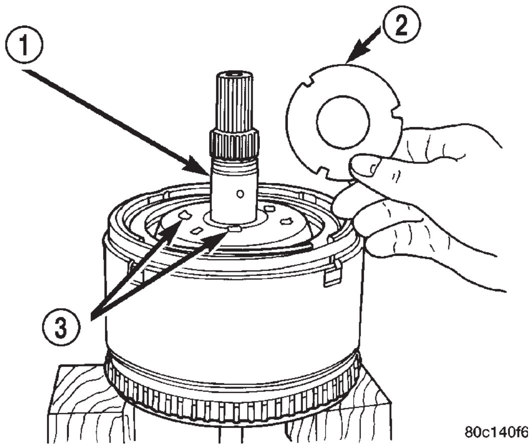


Fig. 116 Install #4 Thrust Plate

1 - OVERDRIVE SHAFT ASSEMBLY
2 - #4 THRUST PLATE (SELECT)
3 - PETROLATUM FOR RETENTION

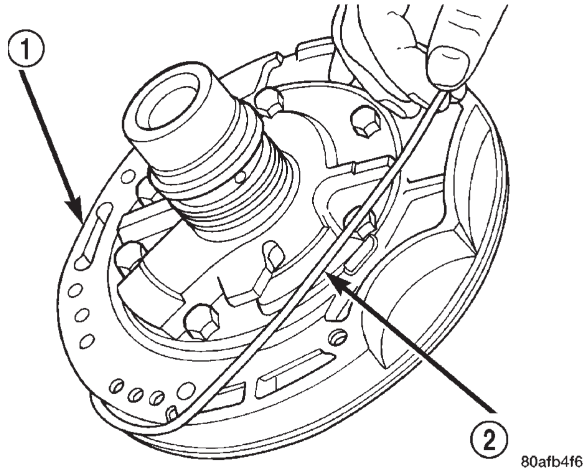


Fig. 117 Remove Oil Pump O-Ring

1 - OIL PUMP ASSEMBLY
2 - O-RING

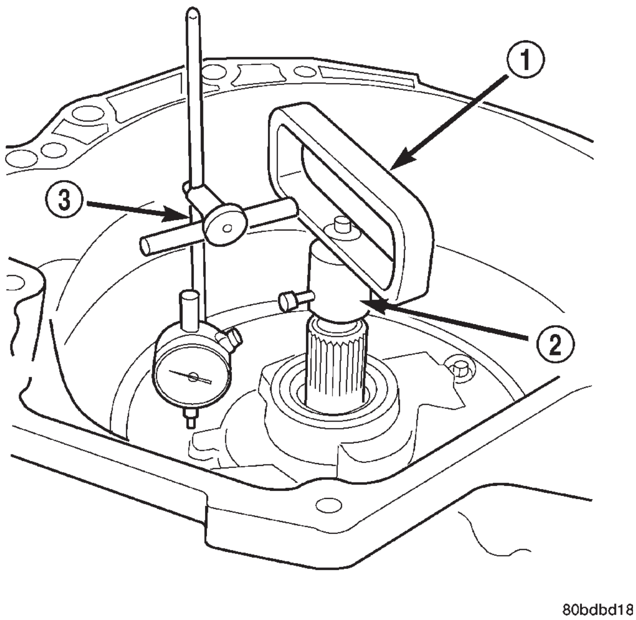


Fig. 118 Measure Input Shaft End Play Using Tool 8266 - Typical

1 - TOOL 8266-8
2 - TOOL 8266-2
3 - TOOL C-3339

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(31) Install input clutch assembly with proper thrust plate (Fig. 119).

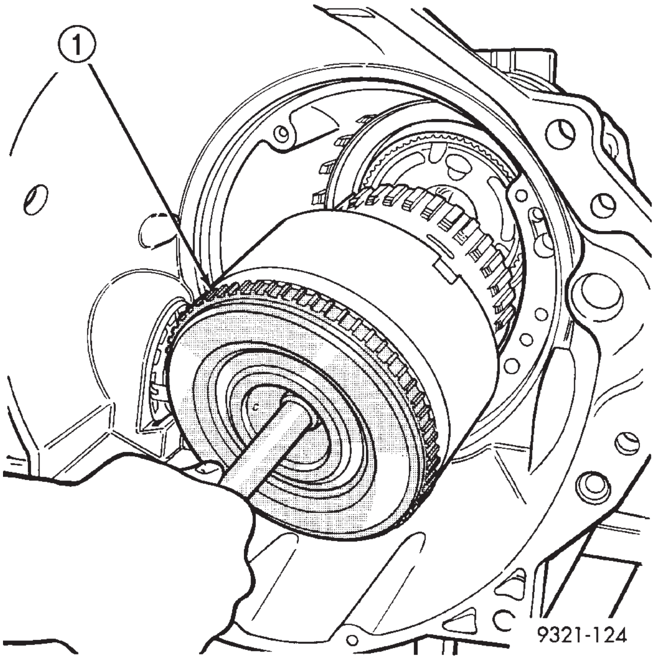


Fig. 119 Install Input Clutch Assembly

1 - INPUT CLUTCH ASSEMBLY

(32) Install #1 caged needle bearing (Fig. 120).

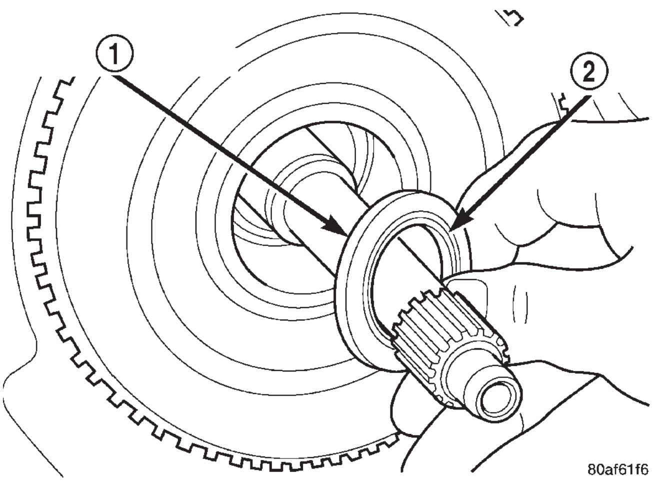


Fig. 120 Install No. 1 Caged Needle Bearing

1 - #1 CAGED NEEDLE BEARING
2 - NOTE: TANGED SIDE OUT

(33) Replace cooler by-pass valve if transmission failure has occurred (Fig. 121).

CAUTION: By-pass valve MUST be replaced if transmission failure occurs.

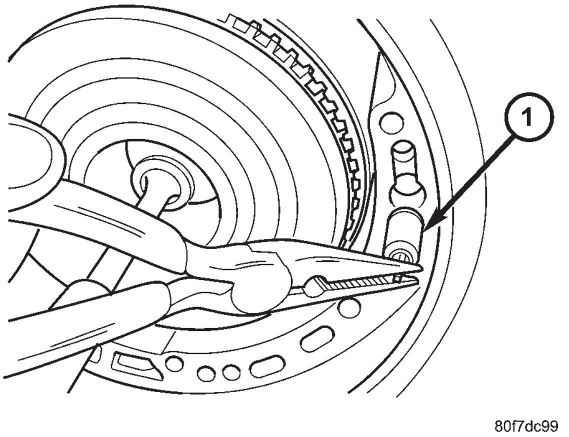


Fig. 121 Install By-Pass Valve

1 - BYPASS VALVE

NOTE: To align oil pump, gasket, and case during installation, use threaded dowels or phillips screwdrivers.

(34) Install oil pump gasket (Fig. 122).

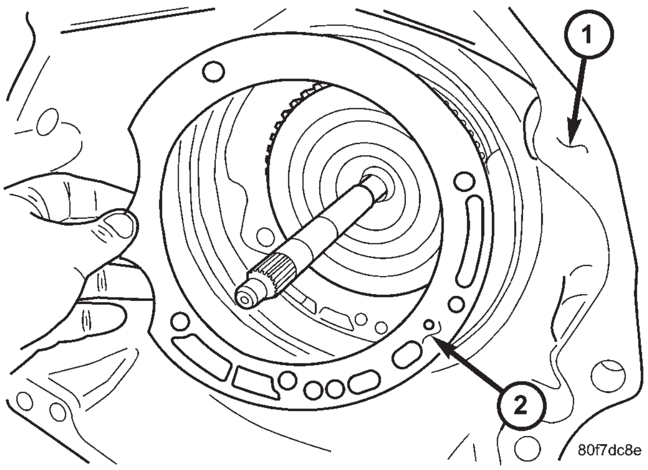


Fig. 122 Install Oil Pump Gasket

1 - BELLHOUSING
2 - OIL PUMP GASKET

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(35) Install oil pump and torque the new oil pump-to-case bolts to 30 N·m (265 in. lbs.) (Fig. 123). Do not reuse original oil pump bolts.

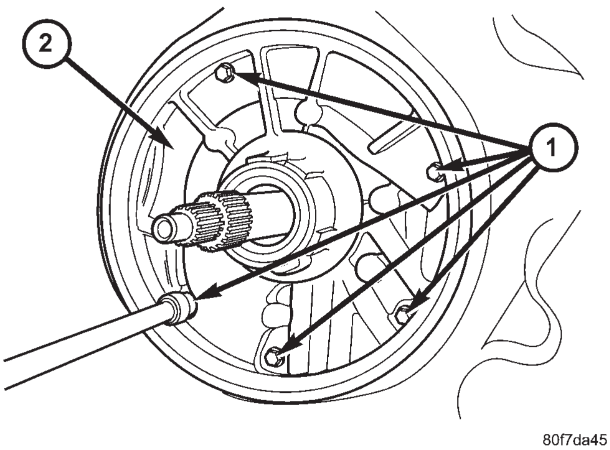


Fig. 123 Install Oil Pump Attaching Bolts

1 - BOLTS
2 - OIL PUMP

(36) Install low/reverse accumulator as shown in (Fig. 124).

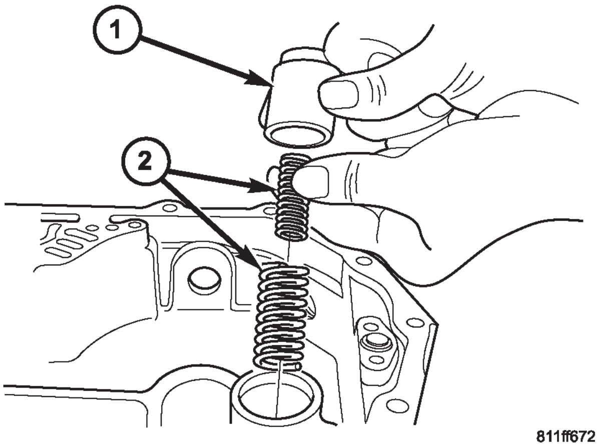


Fig. 124 Low/Reverse Accumulator

1 - PISTON
2 - RETURN SPRINGS

(37) Install low/reverse accumulator plug (Fig. 125).

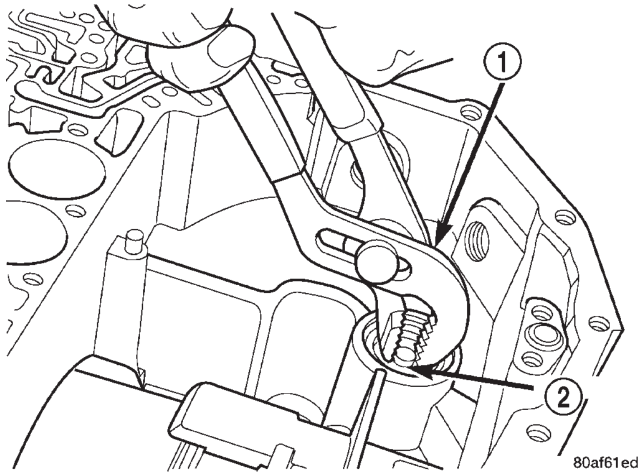


Fig. 125 Install Low/Reverse Accumulator Plug

1 - ADJUSTABLE PLIERS
2 - PLUG

(38) Install low/reverse accumulator snap ring (Fig. 126).

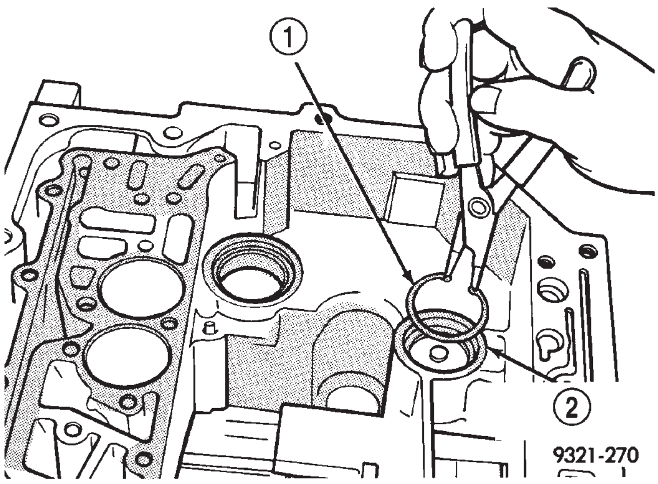


Fig. 126 Install Low/Reverse Accumulator Snap Ring

1 - SNAP RING
2 - LOW/REVERSE ACCUMULATOR

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(39) Install underdrive and overdrive accumulators and springs (Fig. 127).

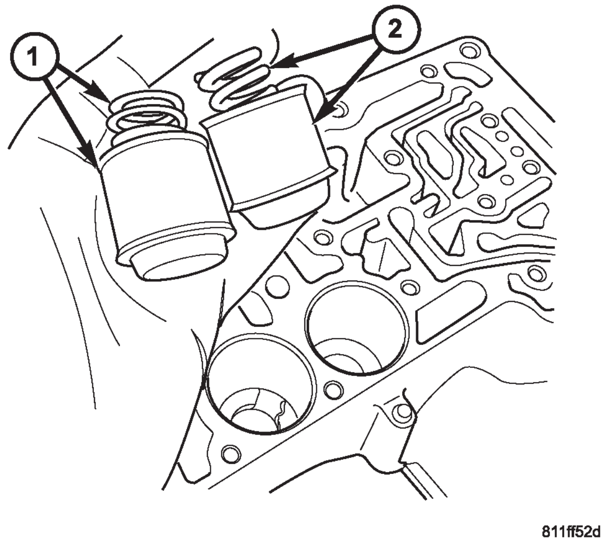


Fig. 127 Underdrive and Overdrive Accumulators

1 - OVERDRIVE PISTON AND SPRING
2 - UNDERDRIVE PISTON AND SPRING

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

(40) Install valve body into place as shown in (Fig. 128).

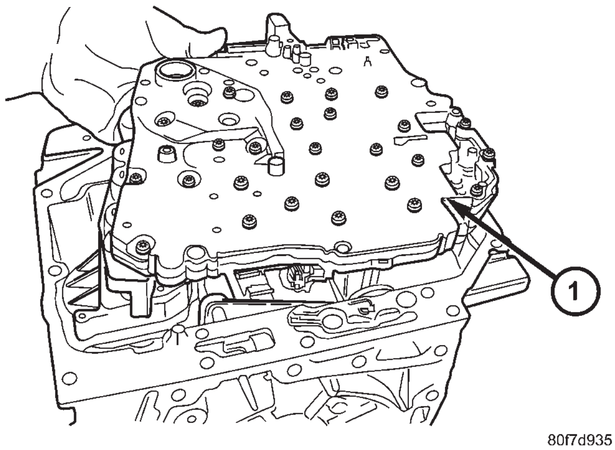


Fig. 128 Install Valve Body Onto Transmission

1 - VALVE BODY

(41) Install seven (7) valve body-to-case bolts (Fig. 129) and torque to 12 N·m (105 in. lbs.).

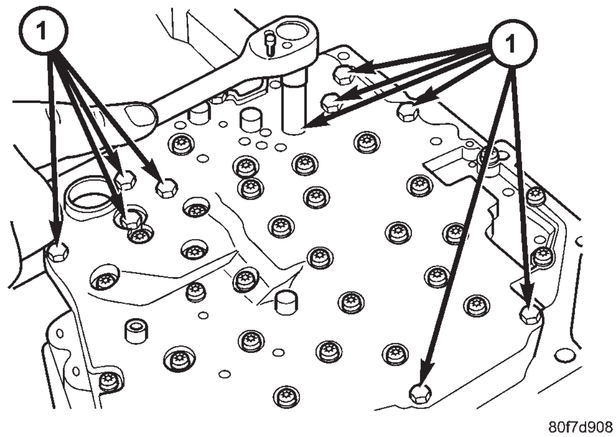


Fig. 129 Install Valve Body Bolts (7)

1 - BOLTS

(42) Install transmission oil filter (Fig. 130). Tighten the bolts to 5 N·m (45 in. lbs.)

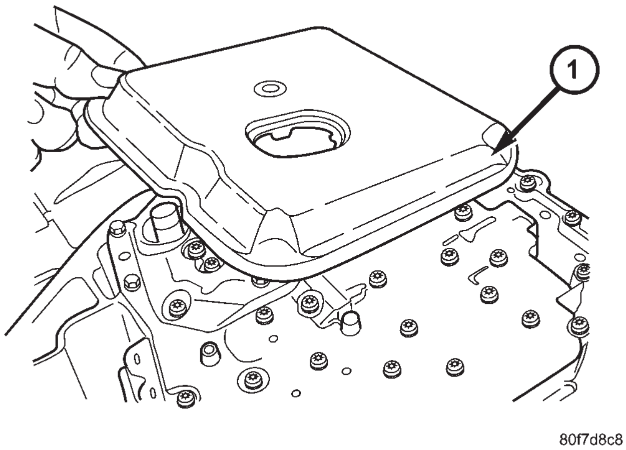


Fig. 130 Install Transmission Filter

1 - TRANSMISSION FILTER

AUTOMATIC TRANSMISSION - 42RLE (Continued)

NOTE: Before installing the oil pan bolt in the bolt hole located between the torque converter clutch on and U/D clutch pressure tap circuits (Fig. 131), it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

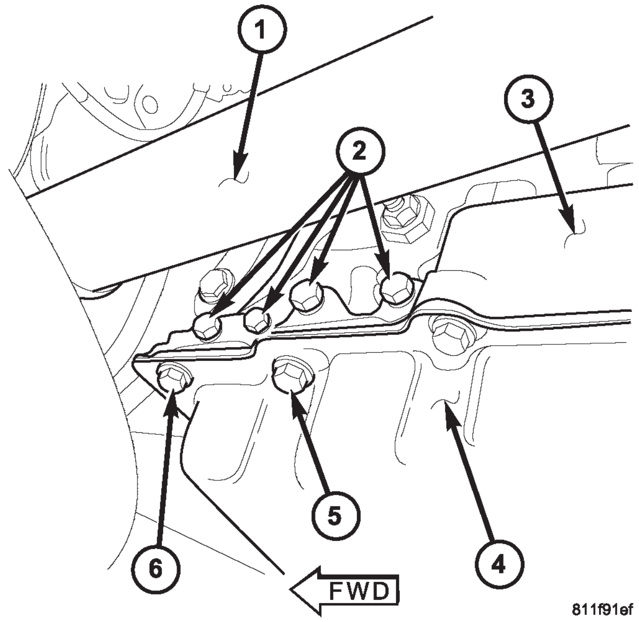


Fig. 131 Pan Fastener

1 - FRONT DRIVESHAFT
2 - PRESSURE PORTS
3 - TRANSMISSION CASE
4 - TRANSMISSION OIL PAN
5 - SECOND TRANSMISSION OIL PAN BOLT ON LEFT SIDE
6 - FIRST TRANSMISSION OIL PAN BOLT

(43) Install transmission oil pan (Fig. 132) with a bead of Mopar® ATF RTV. Torque oil pan-to-case bolts to 20 N·m (14.5 ft. lbs.).

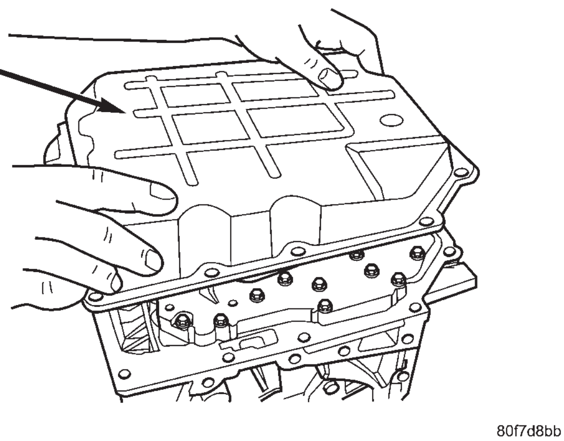


Fig. 132 Install Transmission Oil Pan

1 - TRANSMISSION OIL PAN

NOTE: Before installing either speed sensor bolt, it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

(44) Install both speed sensors into transmission case (Fig. 133). Torque the speed sensor bolts to 9 N·m (80 in. lbs.).

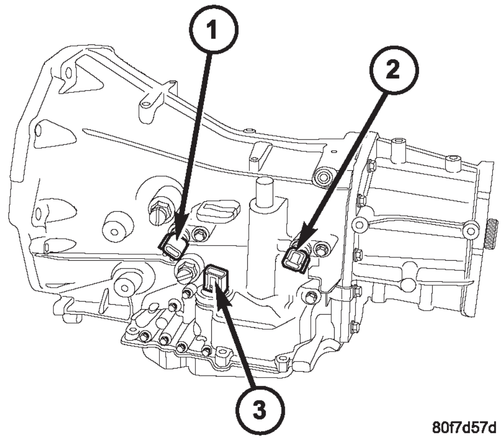


Fig. 133 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(45) As a final check of the transmission, measure the input shaft end play. This will 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 transmission bell housing with its plunger seated against end of input shaft (Fig. 134). Move input shaft in and out to obtain end play reading. **Input shaft end play must be 0.127 to 0.635 mm (0.005 to 0.025 inch).** If not within specifications, make the necessary thrust plate adjustment.

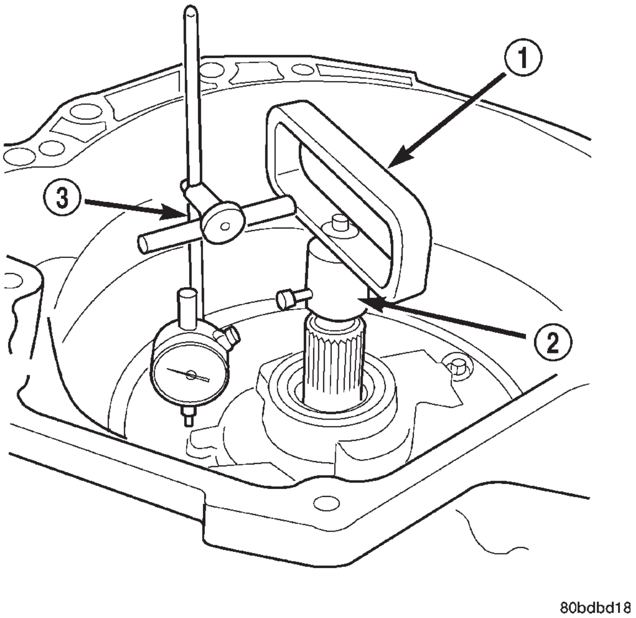


Fig. 134 Measure Input Shaft End Play Using Tool 8266 - Typical

1 - TOOL 8266-8
2 - TOOL 8266-2
3 - TOOL C-3339

(46) Inspect the lube tube grommet (Fig. 135) for damage. If the grommet lip is damaged, it will need to be replaced.

(47) Install the 4X4 stub shaft onto the transmission output shaft.

(48) Place a bead of Mopar® ATF RTV on the rear surface of the transmission case for the adapter housing.

(49) Install the adapter (Fig. 136) housing onto the transmission case.

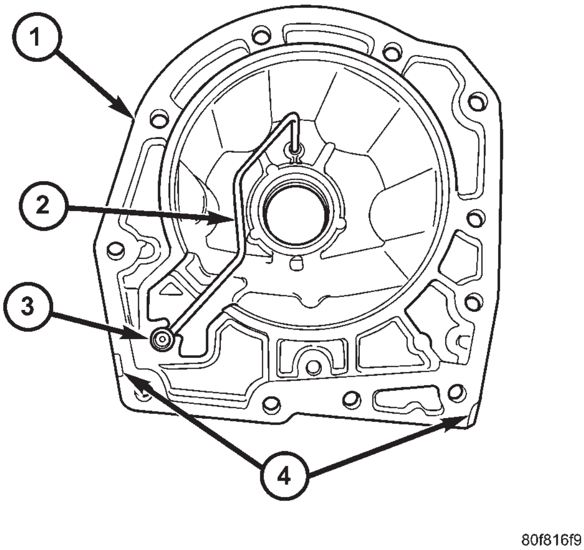


Fig. 135 Lube Tube Grommet

1 - HOUSING
2 - LUBE TUBE
3 - GROMMET
4 - PRY SLOTS

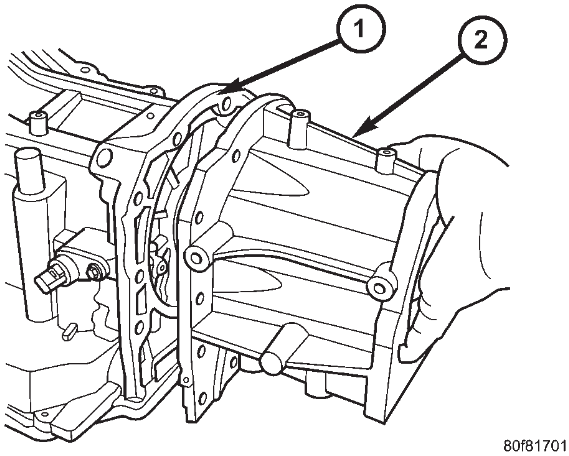


Fig. 136 Install Adapter Housing

1 - TRANSMISSION CASE
2 - ADAPTER HOUSING

AUTOMATIC TRANSMISSION - 42RLE (Continued)

NOTE: Before installing the lowermost four adapter housing bolts (Fig. 137), it will be necessary to replentish the sealing patch on the bolts using Mopar® Lock & Seal Adhesive.

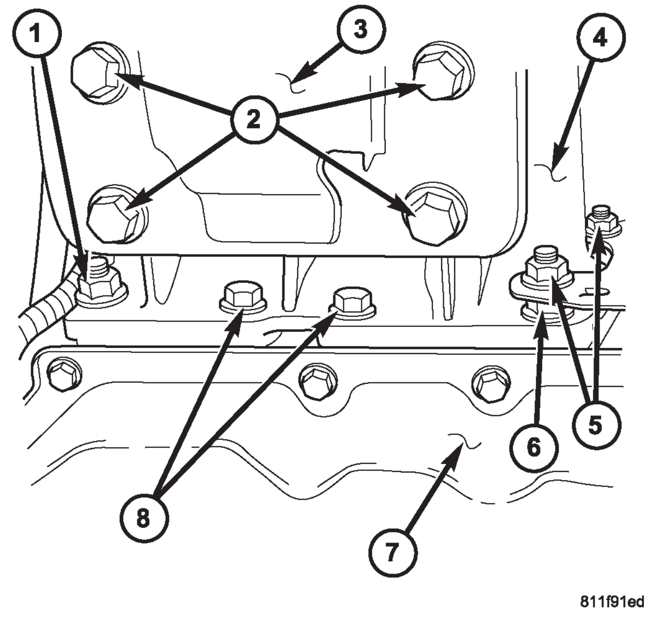


Fig. 137 Adapter Housing Fasteners

1 - STUD, ADAPTER/EXTENSION
2 - TRANSMISSION MOUNT FASTENERS (4)
3 - TRANSMISSION MOUNT
4 - TRANSMISSION CASE
5 - NUT, EXHAUST HANGER BRACKET (2)
6 - STUD, ADAPTER/EXTENSION
7 - TRANSMISSION OIL PAN
8 - BOLT, ADAPTER/EXTENSION (2)

(50) Install the bolts (Fig. 138) that hold the adapter housing onto the transmission case. Be sure to install any stud bolts to their original locations. Tighten the bolts to 54 N·m (40 ft.lbs.).

INSTALLATION

(1) Check torque converter hub and hub drive notches for sharp edges burrs, scratches, or nicks. Polish the hub and notches with 320/400 grit paper and crocus cloth if necessary. The hub must be smooth to avoid damaging pump seal at installation.

(2) Lubricate converter drive hub and oil pump seal lip with transmission fluid.

(3) Align converter and oil pump.

(4) Carefully insert converter in oil pump. Then rotate converter back and forth until fully seated in pump gears.

(5) Check converter seating with steel scale and straightedge (Fig. 139). Surface of converter lugs should be 1/2 in. to rear of straightedge when converter is fully seated.

(6) Temporarily secure converter with C-clamp.

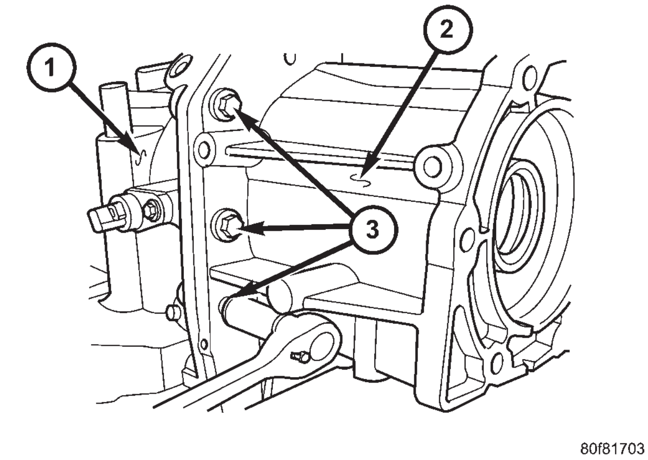


Fig. 138 Install Adapter Housing Bolts

1 - TRANSMISSION CASE
2 - ADAPTER HOUSING
3 - BOLTS

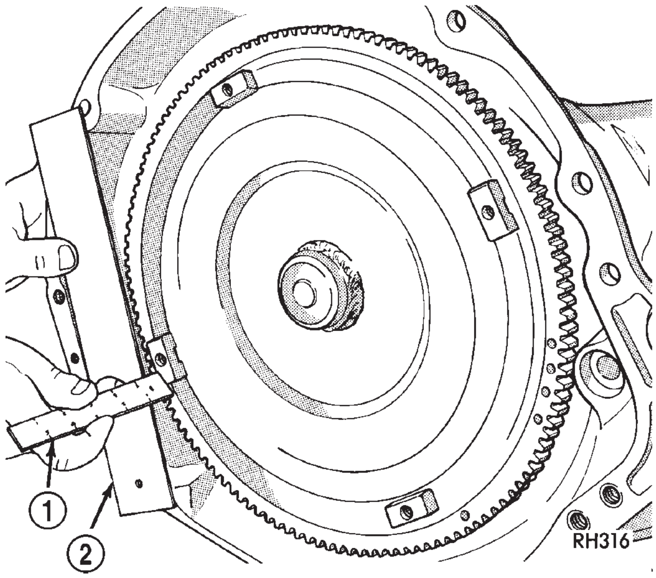


Fig. 139 Checking Converter Seating - Typical

1 - SCALE
2 - STRAIGHTEDGE

(7) Lightly grease crankshaft flange hole.

(8) Position transmission on jack and secure it with safety chains.

(9) Check condition of converter driveplate. Replace the plate if cracked, distorted or damaged. **Also be sure transmission dowel pins are seated in engine block and protrude far enough to hold transmission in alignment.**

(10) Raise transmission and align converter with drive plate and converter housing with engine block.

(11) Move transmission forward. Then raise, lower or tilt transmission to align converter housing with engine block dowels.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(12) Carefully work transmission forward and over engine block dowels until converter hub is seated in crankshaft.

(13) Install and tighten bolts that attach transmission converter housing to engine block.

CAUTION: Be sure the converter housing is fully seated on the engine block dowels before tightening any bolts.

(14) Install torque converter attaching bolts. Tighten bolts to 88 N·m (65 ft. lbs.).

(15) On 4.0L engine equipped vehicles, install the crankshaft position sensor (Fig. 140).

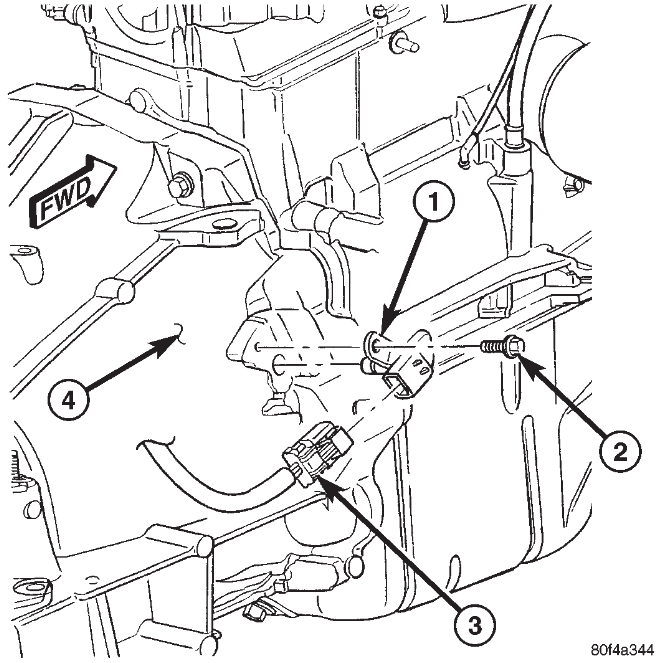


Fig. 140 Crankshaft Position Sensor

1 - CRANKSHAFT POSITION SENSOR
2 - MOUNTING BOLT
3 - ELECTRICAL CONNECTOR
4 - TRANSMISSION BELLHOUSING

(16) Install transmission fill tube and seal. Install new fill tube seal in transmission before installation.

(17) Connect transmission cooler lines to transmission.

(18) Install transfer case onto transmission. (Refer to 21 - TRANSMISSION/TRANSFER CASE - INSTALLATION)

(19) Install skid plate (Fig. 141) and attach transmission rear support to skid plate. (Refer to 13 - FRAME & BUMPERS/FRAME/TRANSFER CASE SKID PLATE - INSTALLATION)

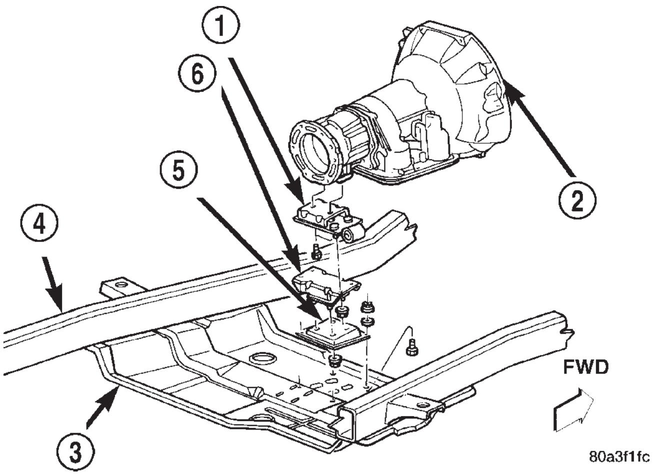


Fig. 141 Transmission Mount - Automatic Transmission

1 - TRANSMISSION SUPPORT BRACKET
2 - AUTOMATIC TRANSMISSION
3 - SKID PLATE
4 - FRAME
5 - TRANSMISSION MOUNT SUPPORT BRACKET
6 - CUSHION

(20) Remove engine support fixture.

(21) Remove transmission jack.

(22) Connect input and output speed sensor wires (Fig. 142).

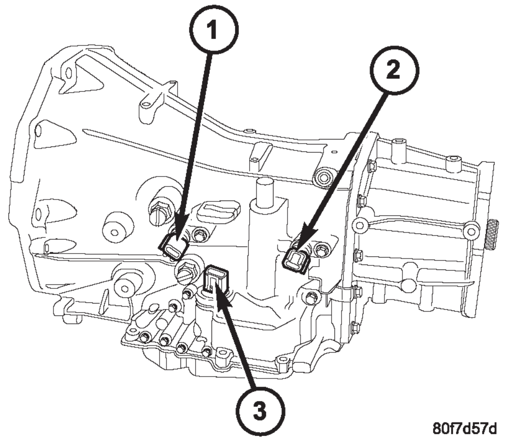


Fig. 142 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

AUTOMATIC TRANSMISSION - 42RLE (Continued)

(23) Connect wires to the transmission range sensor (Fig. 142) and the solenoid/pressure switch assembly (Fig. 143).

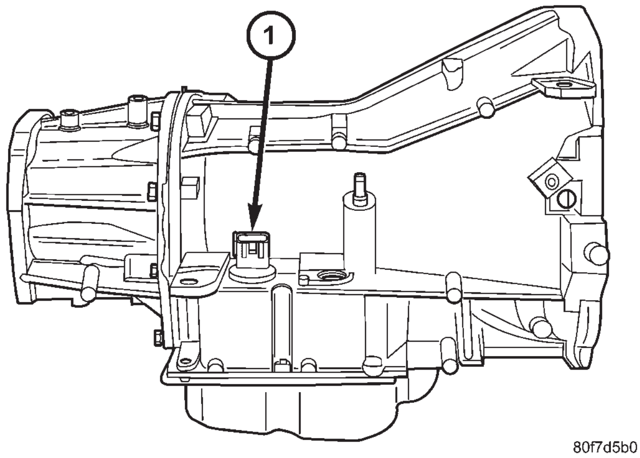


Fig. 143 Solenoid/Pressure Switch Assembly

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY CONNECTOR

(24) Install converter housing access cover.

(25) Install exhaust pipes and support brackets, if removed.

(26) Install starter motor (Refer to 8 - ELECTRICAL/STARTING/STARTER MOTOR - INSTALLATION) and cooler line bracket.

(27) Install new plastic retainer grommet on any shift linkage rod or lever that was disconnected. Grommets should not be reused. Use pry tool to remove rod from grommet and cut away old grommet. Use pliers to snap new grommet into lever and to snap rod into grommet at assembly.

(28) Connect gearshift cable.

(29) Connect transfer case shift linkage.

(30) Adjust gearshift linkage, if necessary.

(31) Align and connect propeller shaft(s). (Refer to 3 - DIFFERENTIAL & DRIVELINE/PROPELLER SHAFT/PROPELLER SHAFT - INSTALLATION)

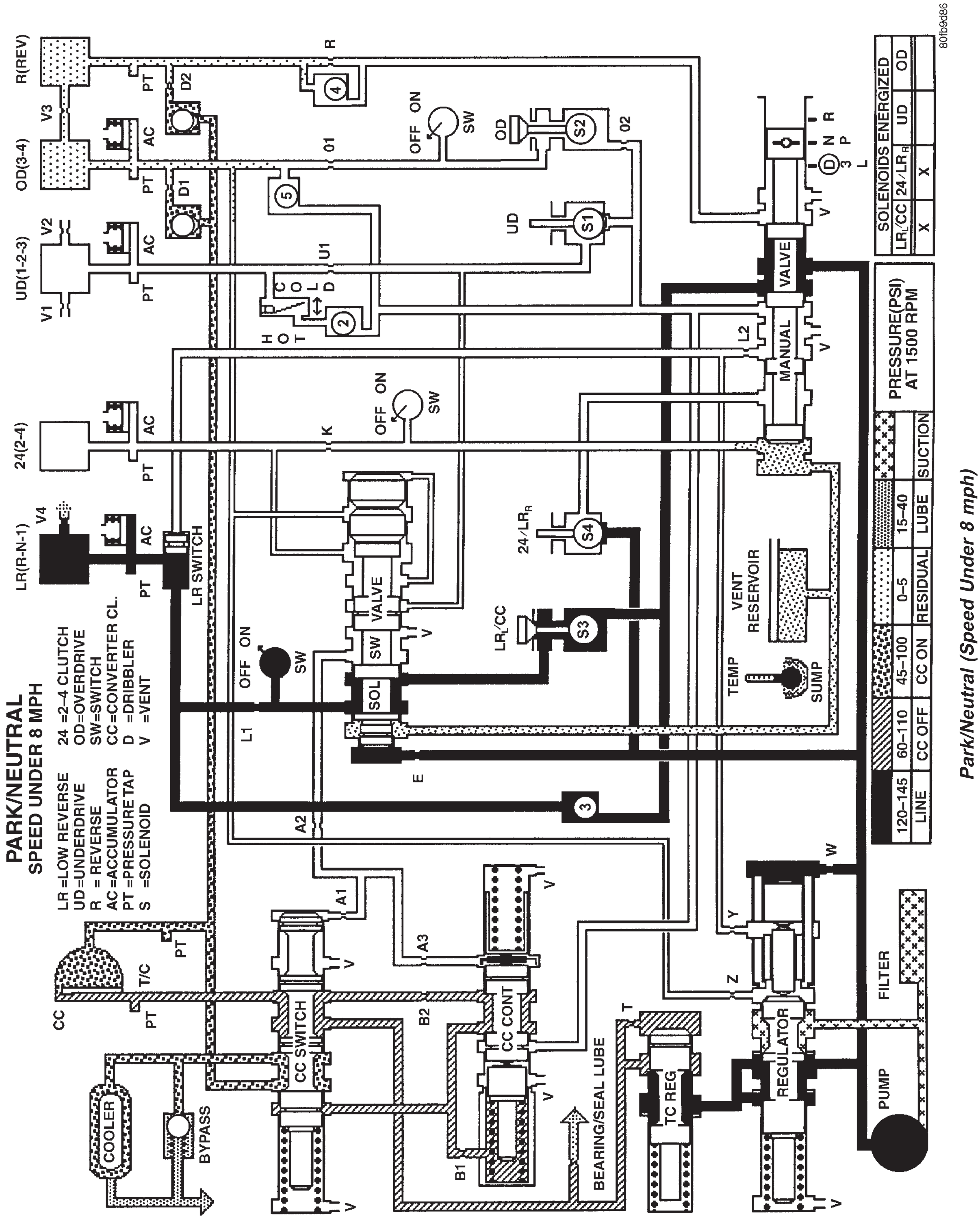
(32) Fill transfer case to bottom edge of fill plug hole.

(33) Lower vehicle and connect battery negative cable.

(34) Fill transmission to correct level with Mopar® ATF +4.

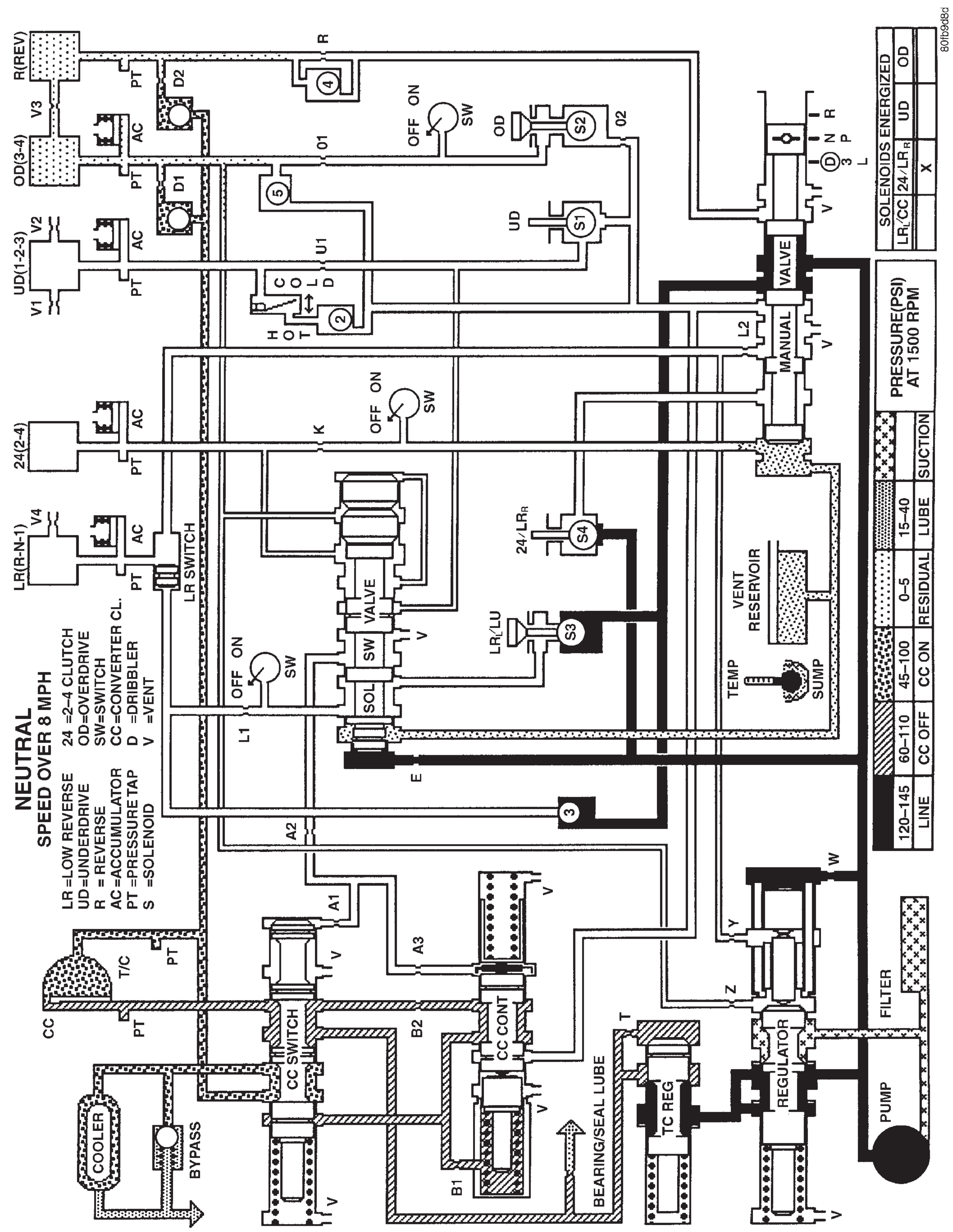
AUTOMATIC TRANSMISSION - 42RLE (Continued)

SCHEMATICS AND DIAGRAMS - 42RLE TRANSMISSION



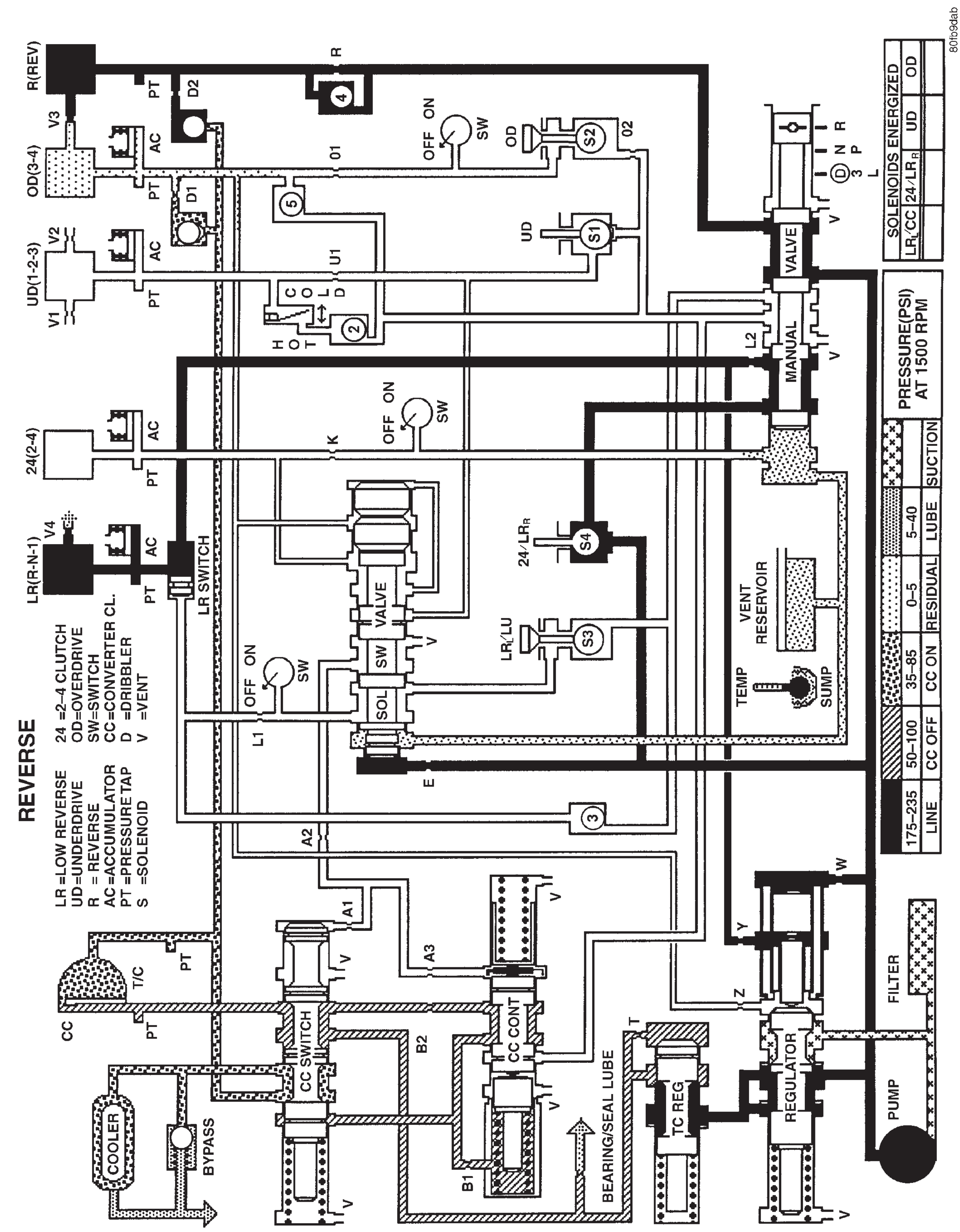
Park/Neutral (Speed Under 8 mph)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



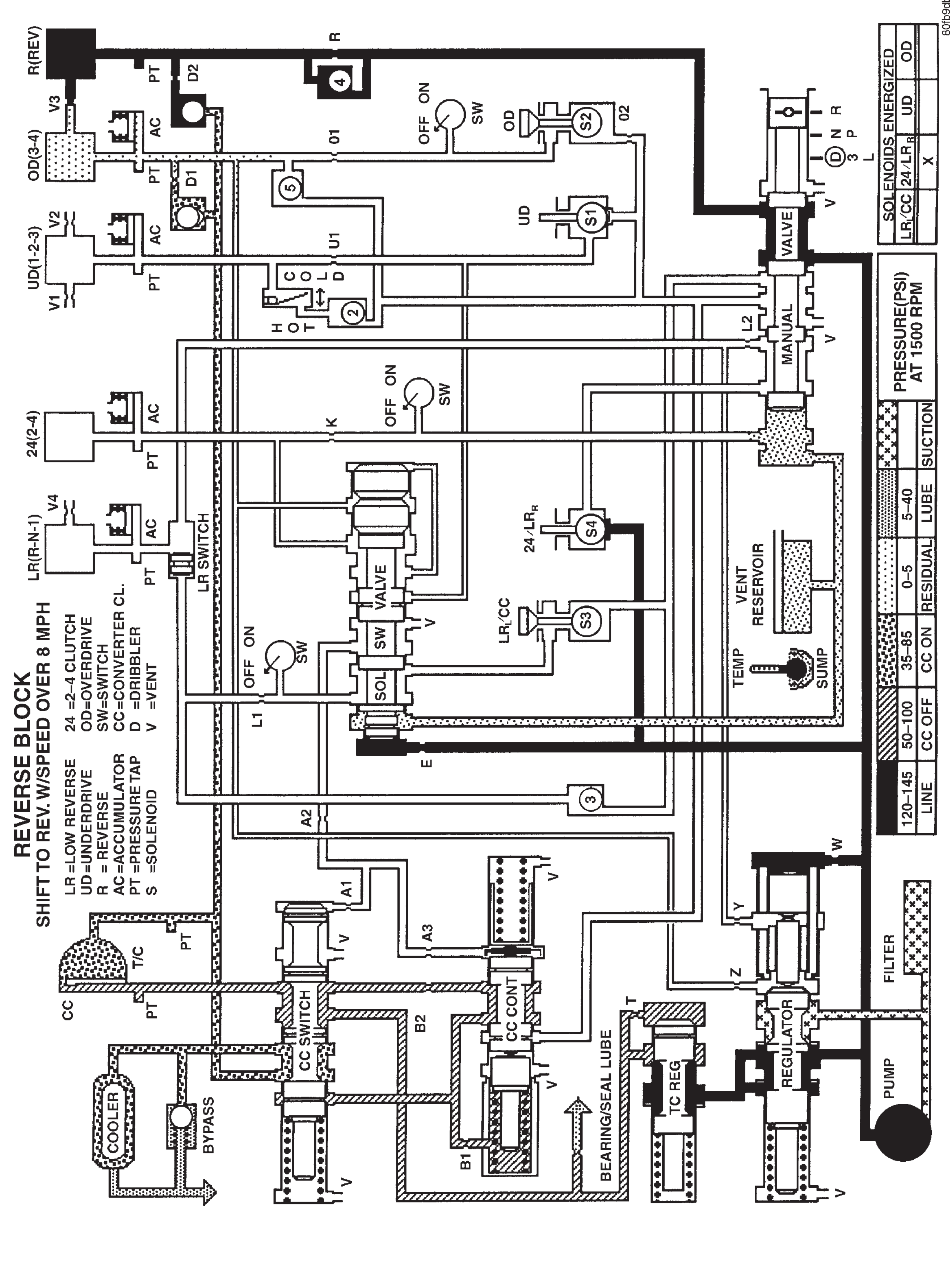
Neutral (Speed Over 8 mph)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



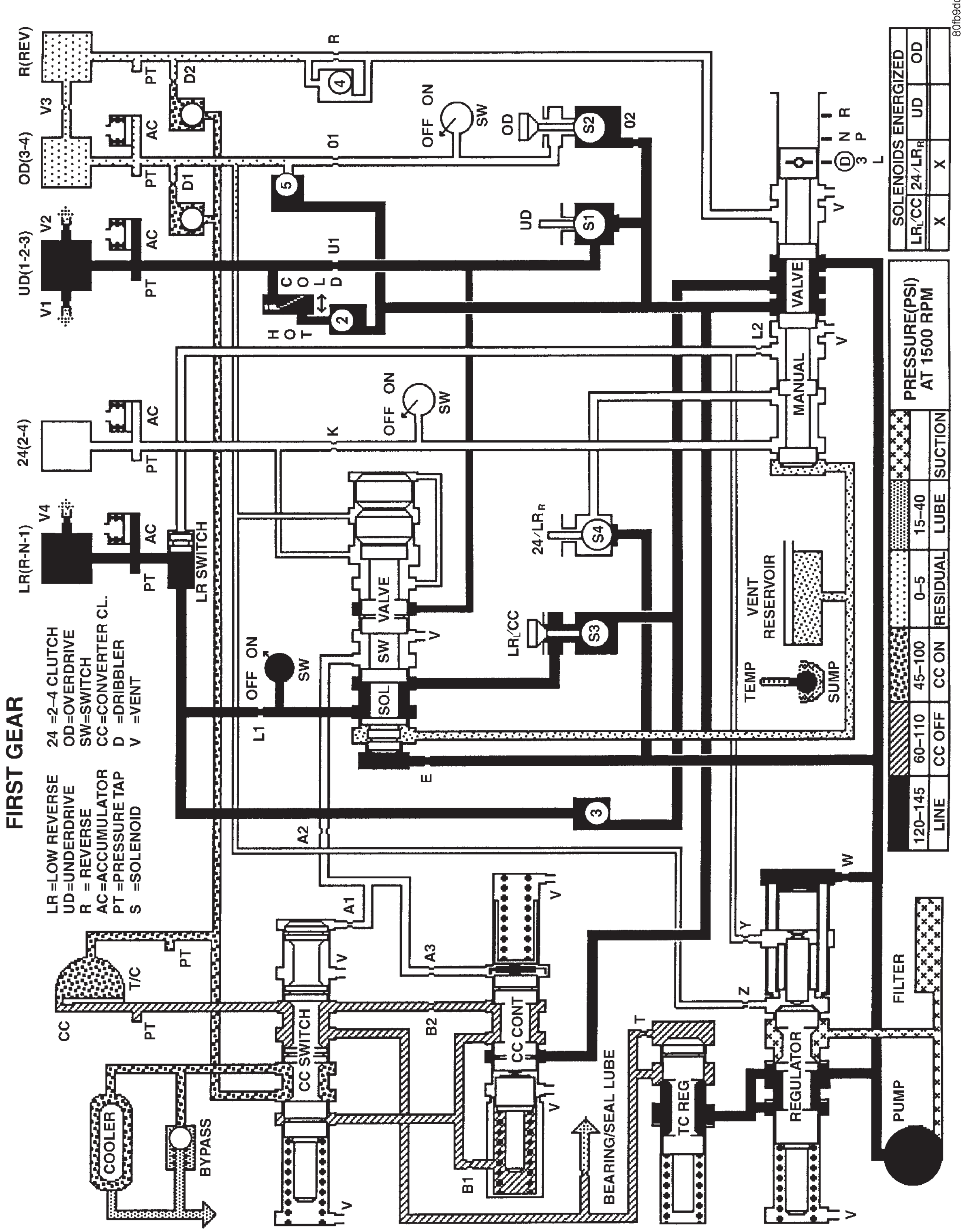
Reverse

AUTOMATIC TRANSMISSION - 42RLE (Continued)



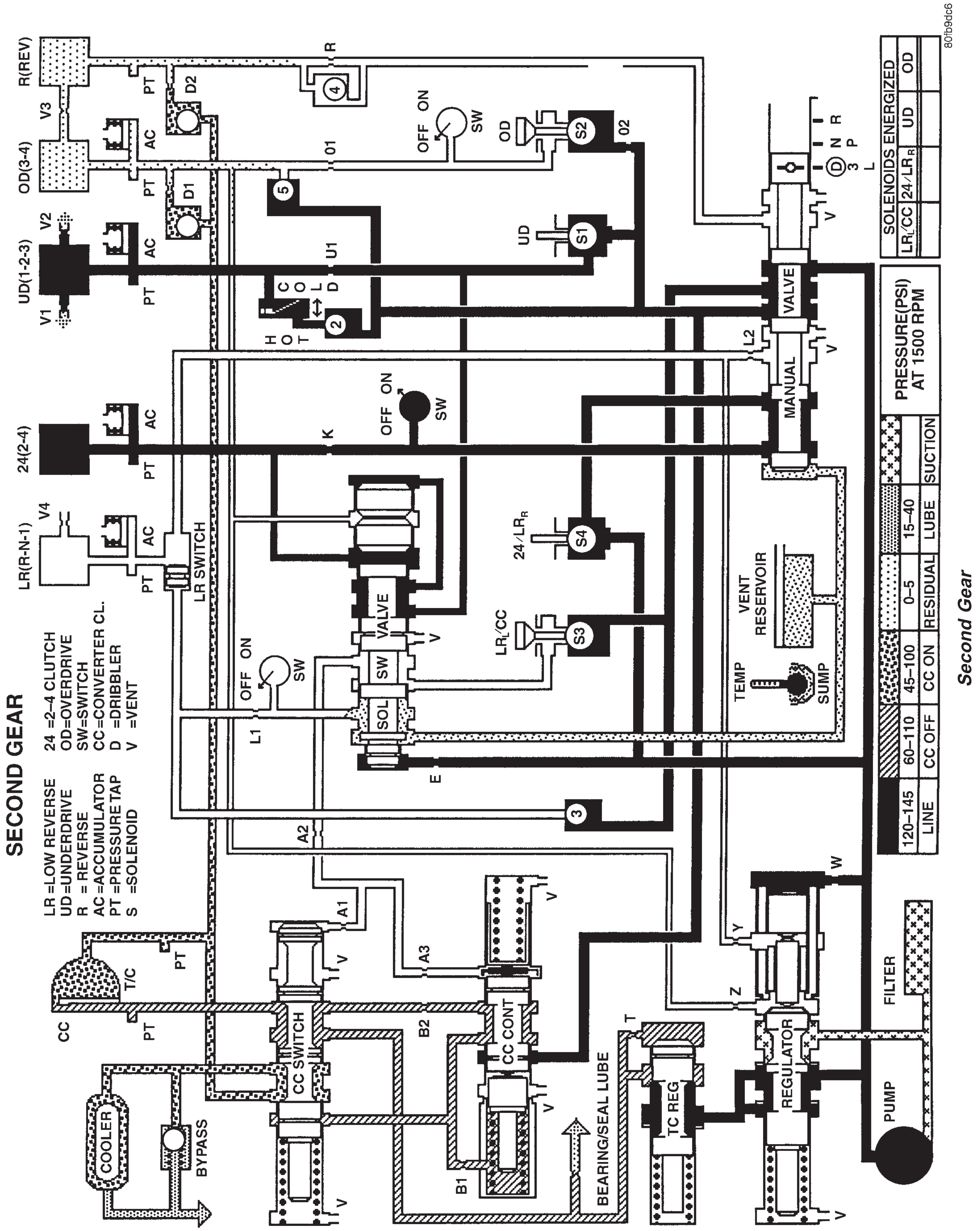
Reverse Block (Shift to Reverse w/Speed Over 8 mph)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



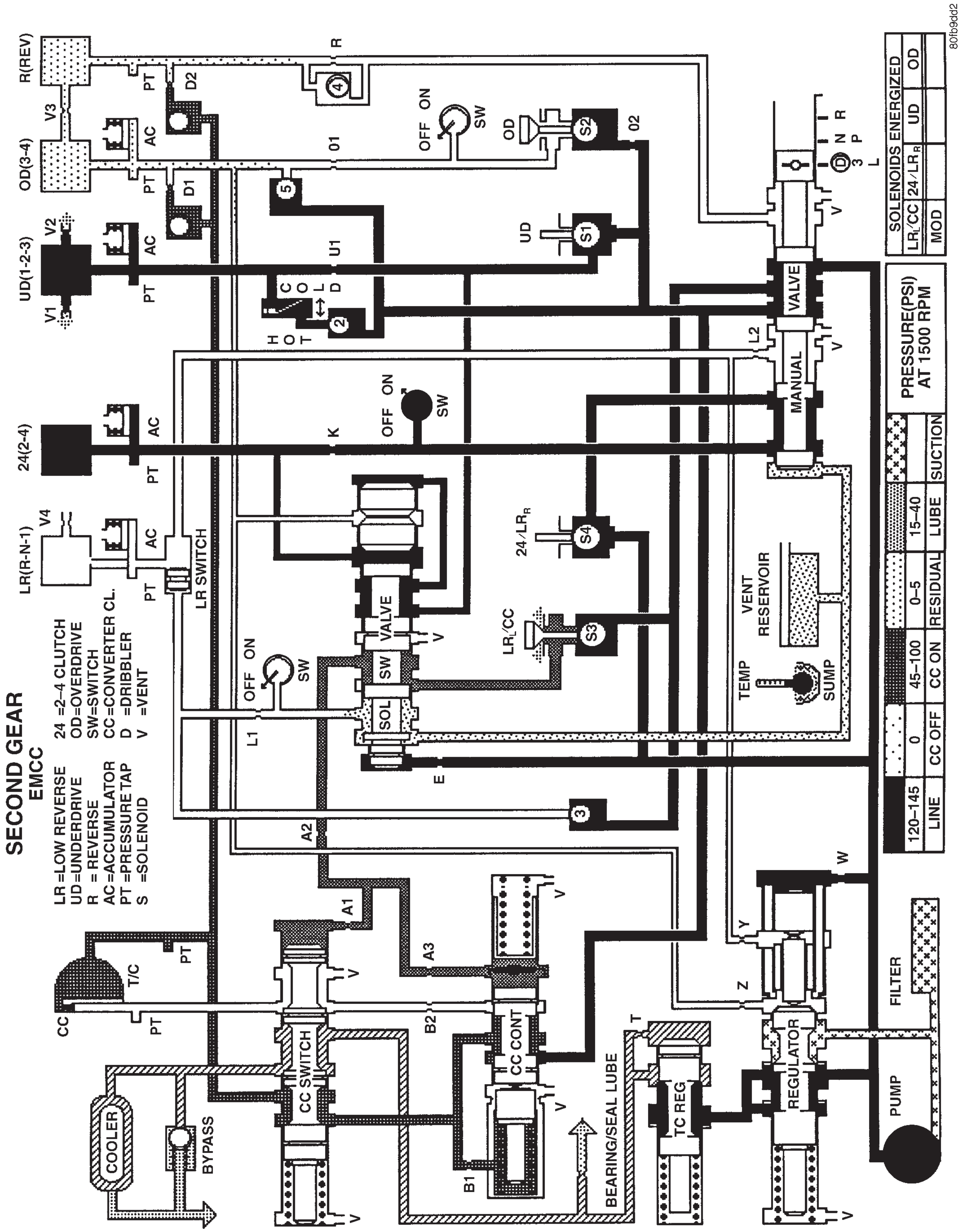
First Gear

AUTOMATIC TRANSMISSION - 42RLE (Continued)



Second Gear

AUTOMATIC TRANSMISSION - 42RLE (Continued)



Second Gear (EMCC)

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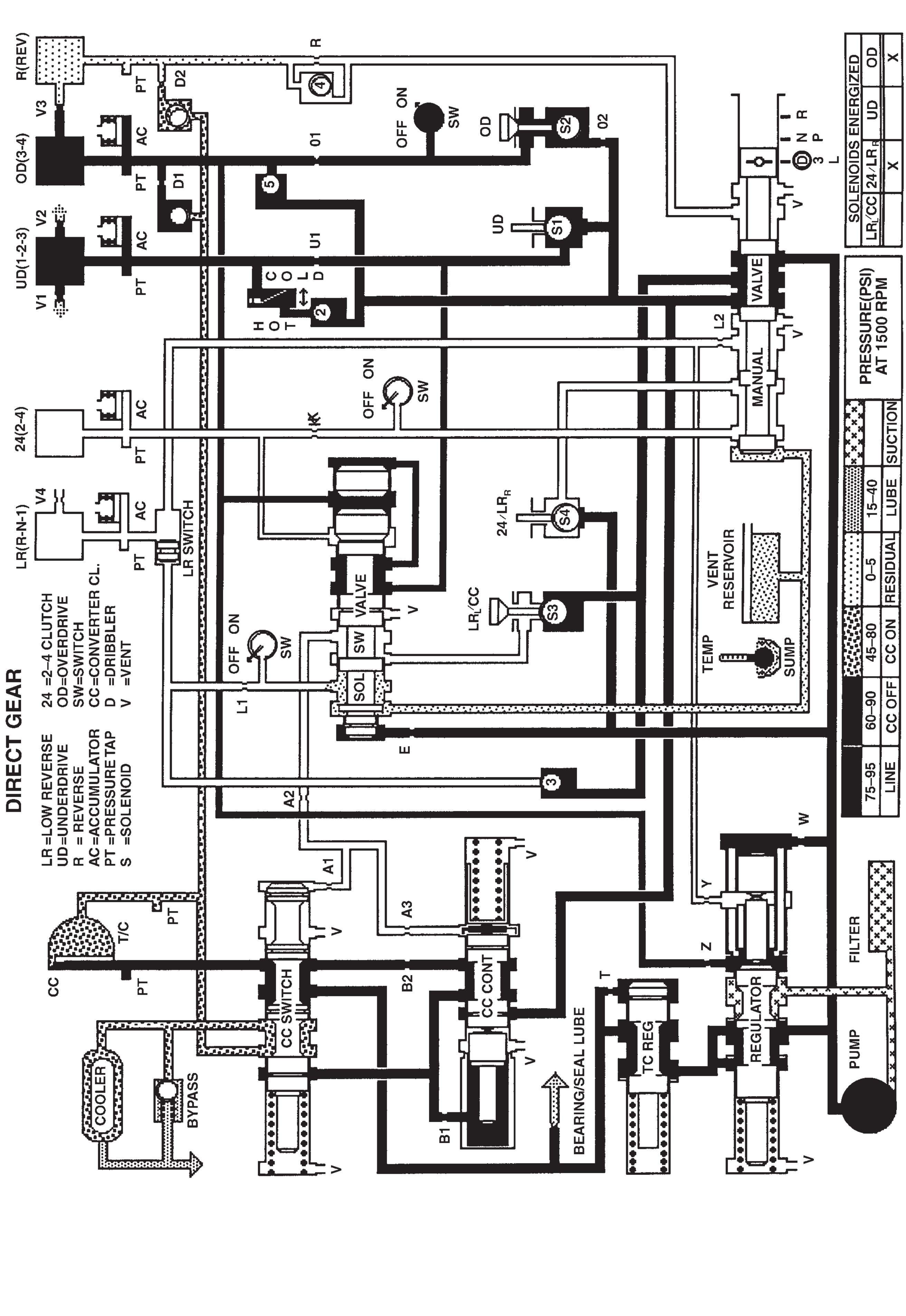

Direct Gear

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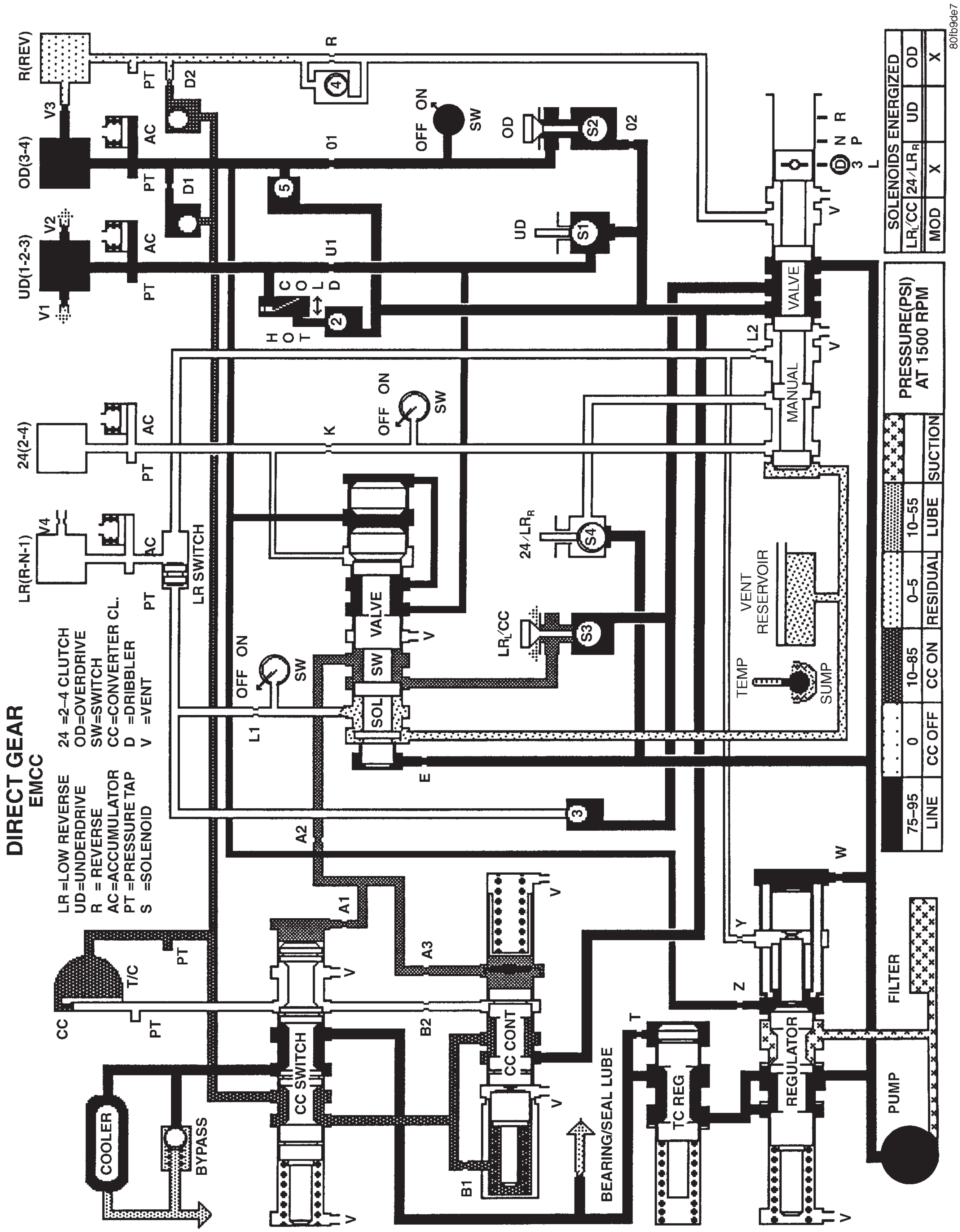
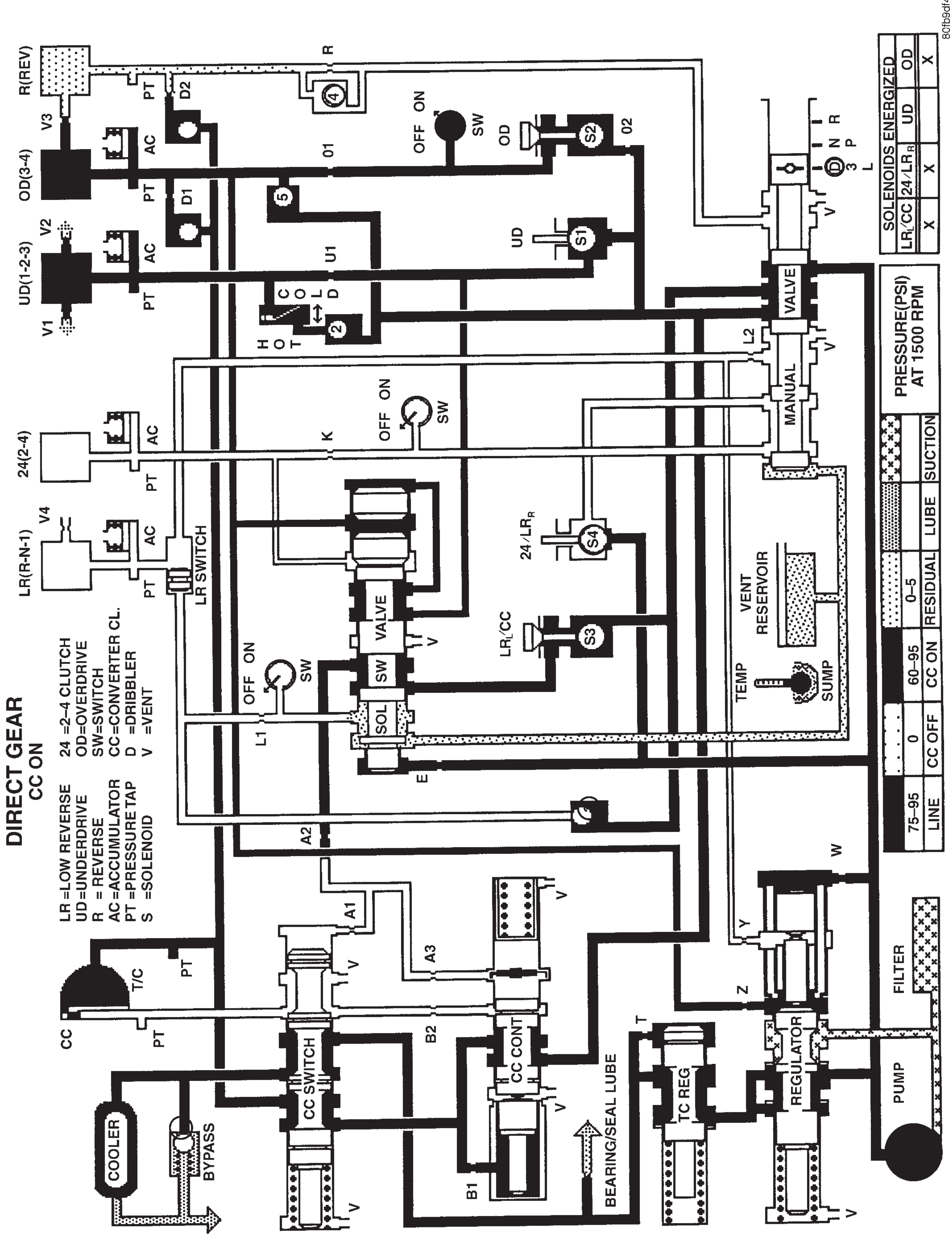


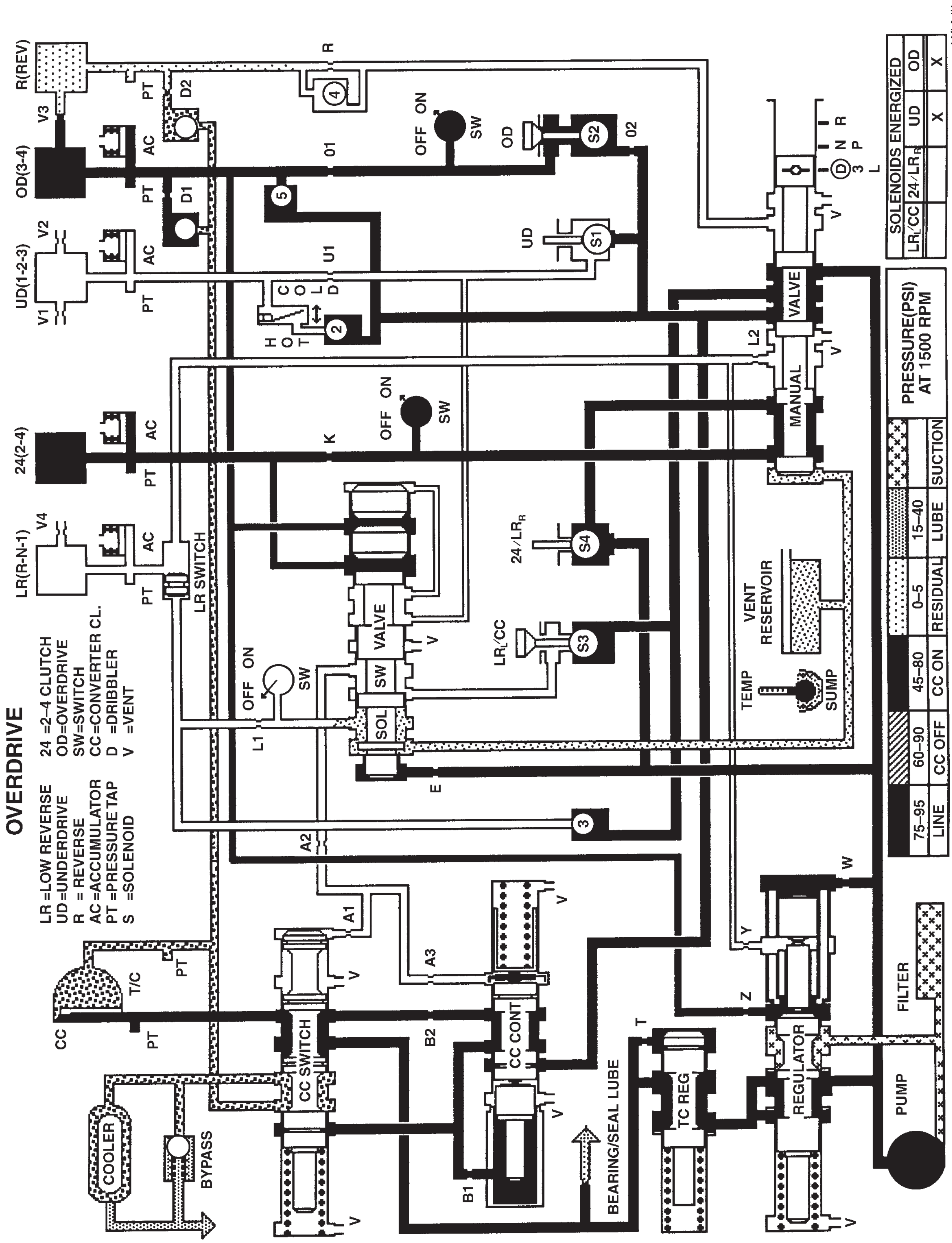
Direct Gear (EMCC)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



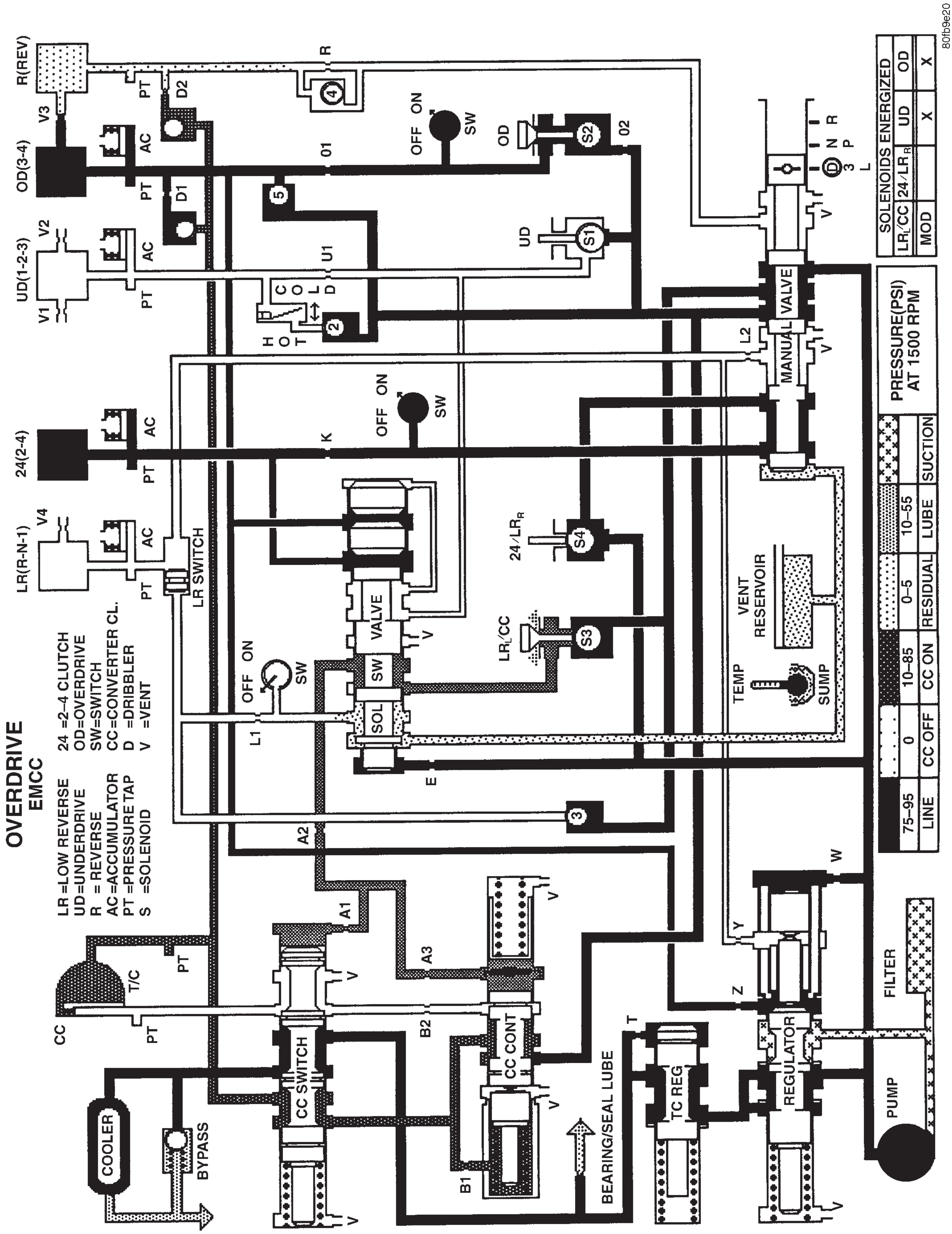
Direct Gear (CC On)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



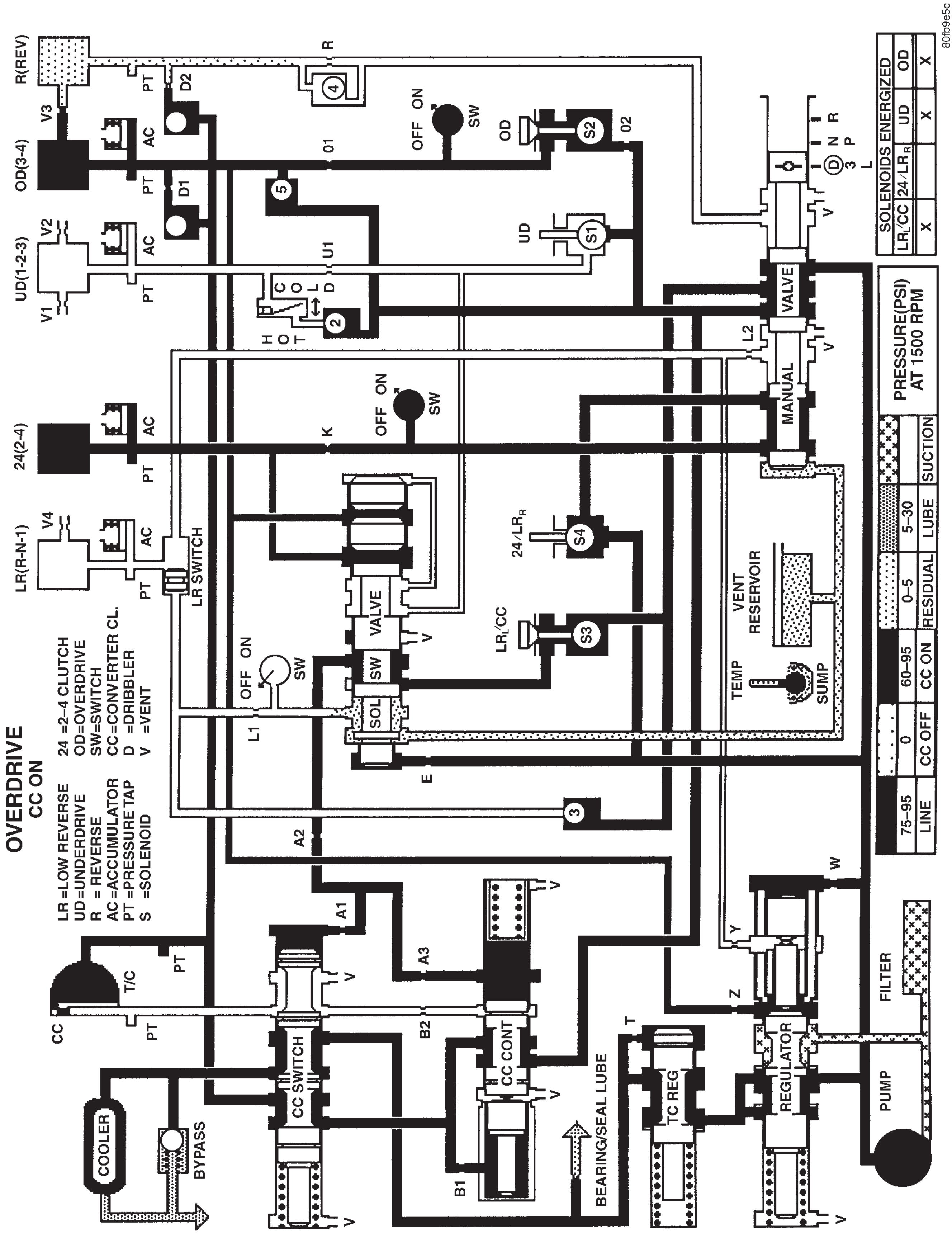
Overdrive

AUTOMATIC TRANSMISSION - 42RLE (Continued)



Overdrive (EMCC)

AUTOMATIC TRANSMISSION - 42RLE (Continued)



Overdrive (CC On)

AUTOMATIC TRANSMISSION - 42RLE (Continued)

SPECIFICATIONS

42RLE AUTOMATIC TRANSMISSION

GENERAL SPECIFICATIONS

Transmission Type	Four-Speed Automatic, Electronically Controlled, Fully Adaptive, Electronically Modulated Torque Converter
Lubrication Method	Pump (internal - external gear-type)
Cooling Method	Water Heat Exchanger and/or Air-to-Oil Heat Exchanger

GEAR RATIOS

1st Gear	2.84:1
2nd Gear	1.57:1
3rd Gear (Direct)	1.00:1
4th Gear (Overdrive)	0.69:1
Reverse Gear	2.21:1

BEARING PRELOAD (DRAG TORQUE)

Description	Metric	Standard
Output Shaft	0.22-0.903 N·m	1-8 in. lbs.

CLUTCH PACK

Description	Metric	Standard
Low/Reverse Clutch (Select Reaction Plate)	0.84-1.60 mm	0.033-0.063 in.
Two/Four Clutch (No Select)	0.76-2.64 mm	0.030-0.104 in.
Reverse Clutch (Select Snap Ring)	0.89-1.37 mm	0.035-0.054 in.
Overdrive Clutch (No Select)	1.07-3.25 mm	0.042-0.128 in.
Underdrive Clutch (Select Reaction Plate)	0.94-1.50 mm	0.037-0.059 in.

INPUT SHAFT

Description	Metric	Standard
End Play	0.127-0.635 mm	0.005-0.025 in.

AUTOMATIC TRANSMISSION - 42RLE (Continued)

OIL PUMP CLEARANCES

DESCRIPTION	METRIC	STANDARD
Outer Gear-to-Crescent	0.060-0.298 mm	0.0023-0.0117 in.
Inner Gear-to-Crescent	0.093-0.385 mm	0.0036-0.0151 in.
Outer Gear-to-Pocket	0.089-0.202 mm	0.0035-0.0079 in.
Outer Gear Side Clearance	0.020-0.046 mm	0.0008-0.0018 in.
Inner Gear Side Clearance	0.020-0.046 mm	0.0008-0.0018 in.

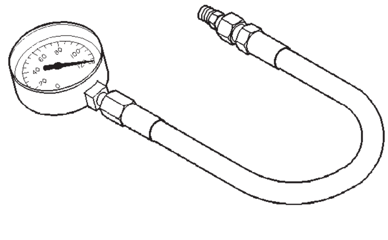
TORQUE SPECIFICATIONS

Description	N·m	Ft. Lbs.	In. Lbs.
Bolt, Converter-to-Driveplate	88	65	-
Bolt, Fluid Filter-to-Valve Body	5	-	45
Bolt, L/R Clutch Retainer-to-Case	5	-	45
Bolt, Adapter/Extension Housing	54	40	-
Bolt, Manual Valve Lever-to-Manual Valve	5	-	45
Bolt, Oil Pan-to-Case	20	14.5	-
Bolt, Oil Pump-to-Case	30	-	265
Bolt, Park Sprag Retainer	4.5	-	40
Bolt, Reaction Shaft Support Halves	28	-	250
Bolt, Solenoid/Pressure Switch Assy-to-Valve Body	5.5	-	50
Bolt, Valve Body-to-Case	12	-	105
Bolt, Valve Body-to-Transfer Plate	5	-	45
Fitting, Cooler Line	47.5	35	-
Nut, Output Shaft	271	200	-
Plug, Pressure Tap	5	-	45
Bolt, Input Speed-to-Case Sensor	9	-	80
Bolt, Output Speed-to-Case Sensor	9	-	80

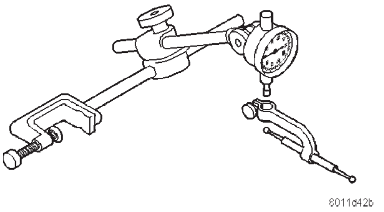
AUTOMATIC TRANSMISSION - 42RLE (Continued)

SPECIAL TOOLS

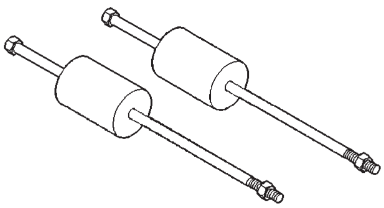
42RLE AUTOMATIC TRANSMISSION



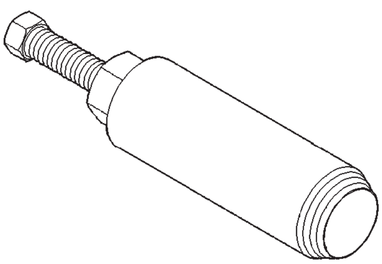
Pressure Gauge (High) C-3293SP



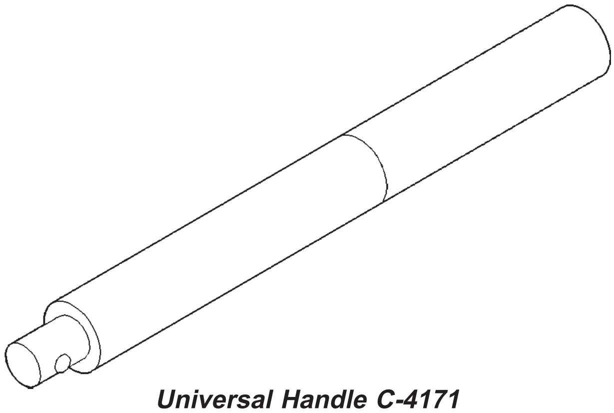
Dial Indicator C-3339



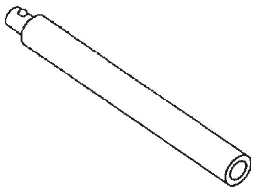
Hammer, Slide - C-3752



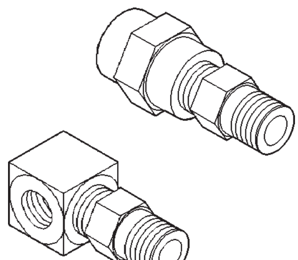
Puller, Seal - C-3981B



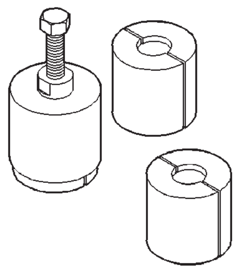
Universal Handle C-4171



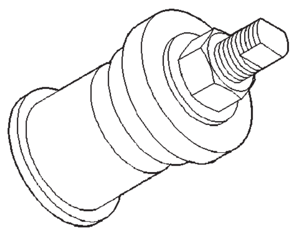
Extension, Handle - C-4171-2



Adapter Set - L-4559

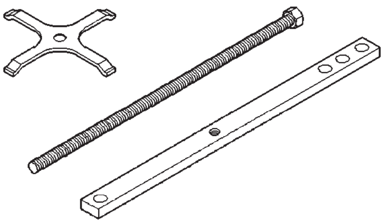


Puller Set 5048

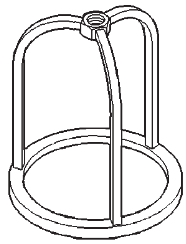


Installer - 5050A

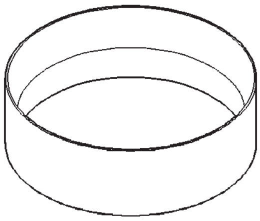
AUTOMATIC TRANSMISSION - 42RLE (Continued)



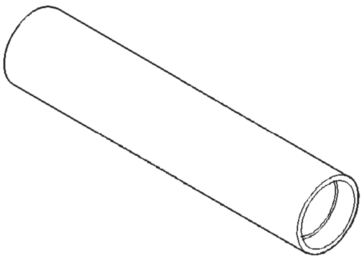
Compressor - 5058A



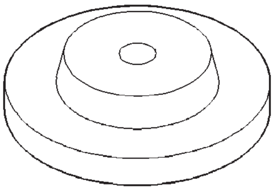
Compressor - 5059-A



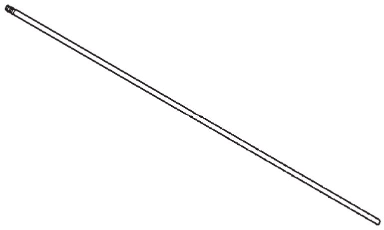
Installer - 5067



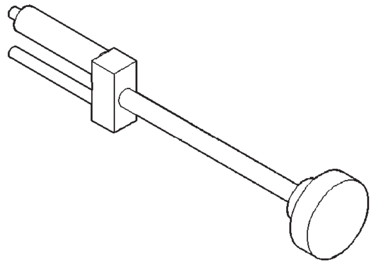
Installer - 6052



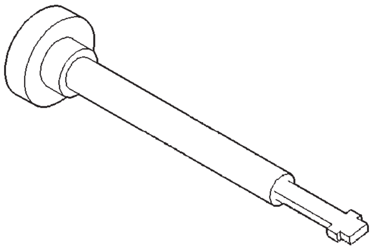
Disk - 6057



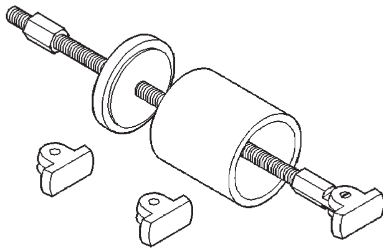
Tip - 6268



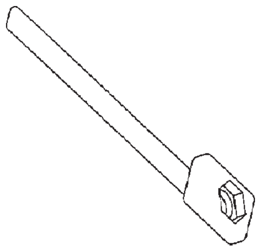
Remover/Installer - 6301



Remover/Installer - 6302

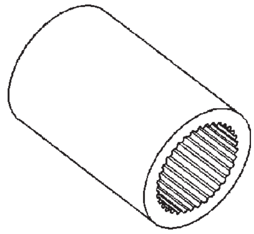


Remover 6310

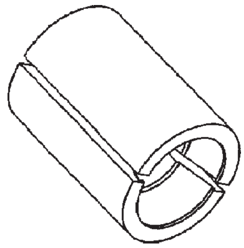


Wrench - 6497

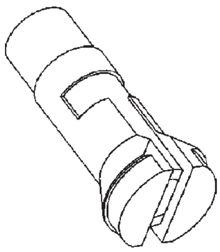
AUTOMATIC TRANSMISSION - 42RLE (Continued)



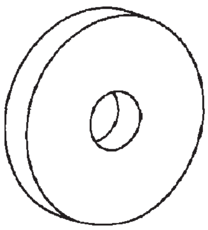
Wrench - 6498-A



Puller Jaws - 6545



Remover - 6596



Remover - 6597

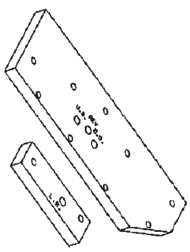
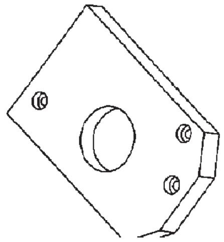
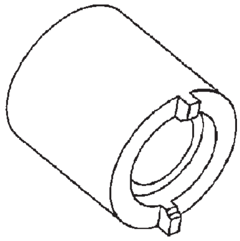


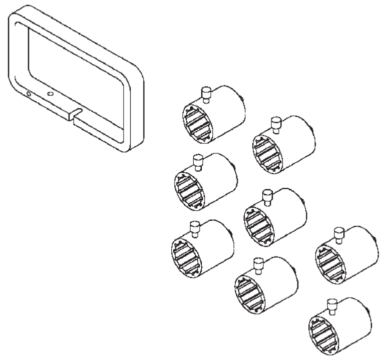
Plate Set - 6599



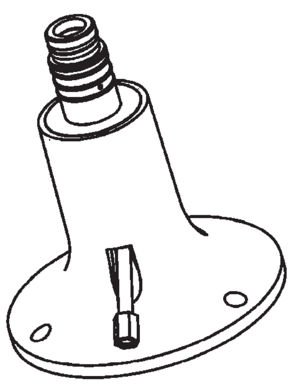
Plate, Support - 6618A



Tool, Staking - 6639



End Play Set - 8266



Fixture, Pressure - 8391

ACCUMULATOR

DESCRIPTION

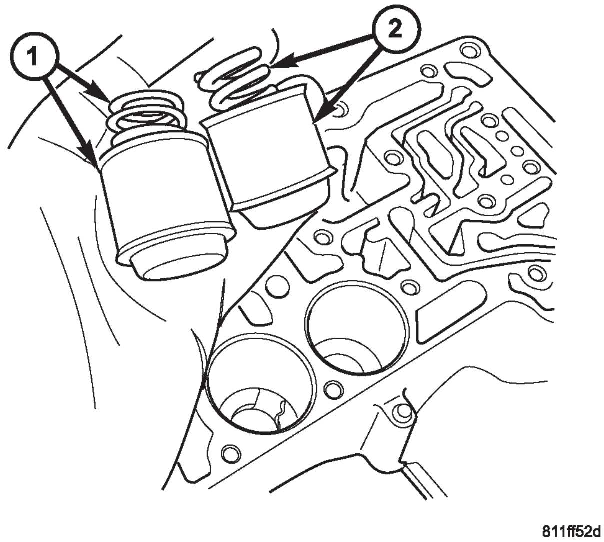


Fig. 144 Underdrive and Overdrive Accumulators

1 - OVERDRIVE PISTON AND SPRING
2 - UNDERDRIVE PISTON AND SPRING

The 42RLE underdrive, overdrive, low/reverse, and 2/4 clutch hydraulic circuits each contain an accumulator. An accumulator typically consists of a piston, return spring(s), and a cover or plug. The overdrive (1) and underdrive (2) accumulators are located within the transmission case, and are retained by the valve body (Fig. 144).

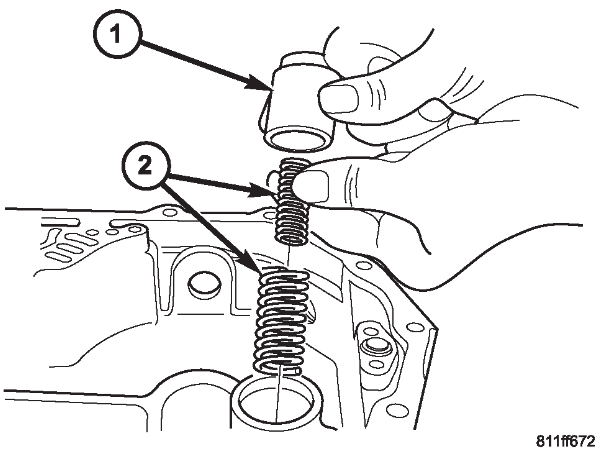


Fig. 145 Low/Reverse Accumulator

1 - PISTON
2 - RETURN SPRINGS

The low reverse (1) accumulator (Fig. 145) is also located within the transmission case, but the assembly is retained by a cover and a snap-ring.

The 2/4 accumulator (5) is located in the valve body. It is retained by a cover and retaining screws (Fig. 146).

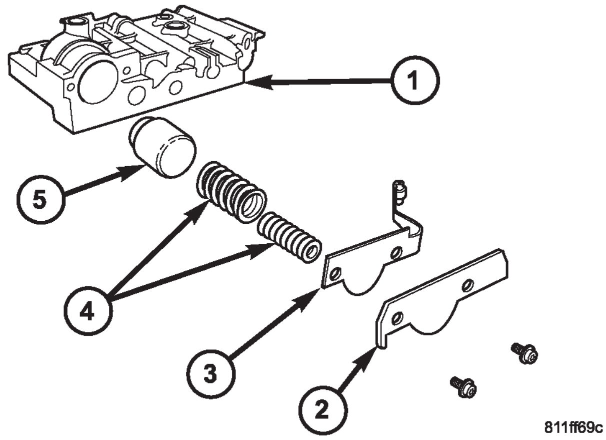


Fig. 146 2/4 Accumulator Assembly

1 - VALVE BODY
2 - RETAINER PLATE
3 - DETENT SPRING
4 - RETURN SPRINGS
5 - PISTON

OPERATION

The function of an accumulator is to cushion the application of a frictional clutch element. When pressurized fluid is applied to a clutch circuit, the application force is dampened by fluid collecting in the respective accumulator chamber against the piston and springs. The intended result is a smooth, firm clutch application.

ADAPTER HOUSING SEAL

REMOVAL

(1) Remove the transfer case (Refer to 21 - TRANSMISSION/TRANSFER CASE - REMOVAL).

(2) Using a screw mounted in a slide hammer, remove the adapter housing seal.

INSTALLATION

(1) Install a new adapter housing seal with Tool Handle C-4171 and Installer C-3860-A.

(2) Install the transfer case (Refer to 21 - TRANSMISSION/TRANSFER CASE - INSTALLATION).

BEARINGS

ADJUSTMENTS

BEARING ADJUSTMENT PROCEDURES

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

BEARINGS (Continued)

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.

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

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

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

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.

Oil all bearings before checking turning torque.

BRAKE TRANSMISSION SHIFT INTERLOCK MECHANISM

DESCRIPTION

The Brake Transmission Shifter/Ignition Interlock (BTSI), is a cable and solenoid operated system. It interconnects the automatic transmission floor mounted shifter to the steering column ignition switch (Fig. 147).

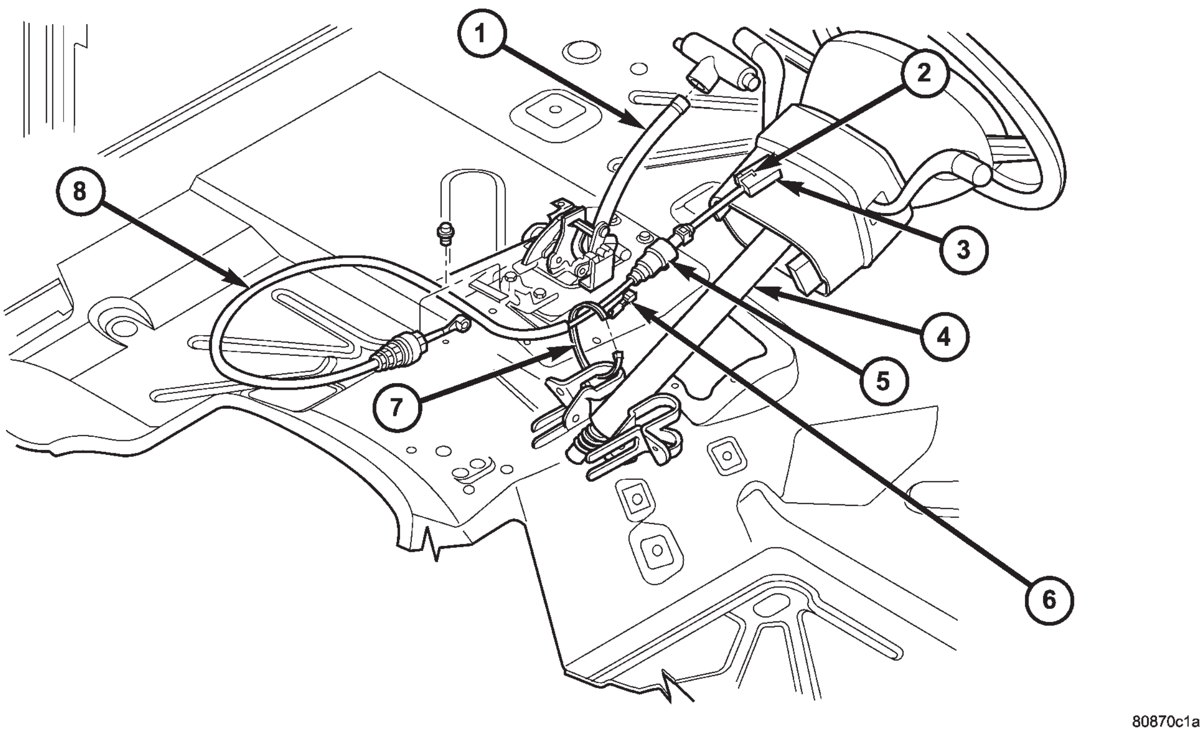


Fig. 147 Ignition Interlock Cable Routing

1 - SHIFT MECHANISM
2 - LOCK-TAB
3 - IGNITION LOCK INTERLOCK
4 - STEERING COLUMN
5 - SOLENOID
6 - WIRE CONNECTOR
7 - TIE STRAP
8 - PARK/BRAKE INTERLOCK CABLE

BRAKE TRANSMISSION SHIFT INTERLOCK MECHANISM (Continued)

OPERATION

The system locks the shifter into the PARK position. The Interlock system is engaged whenever the ignition switch is in the LOCK or ACCESSORY position. An additional electrically activated feature will prevent shifting out of the PARK position unless the brake pedal is depressed at least one-half an inch. A magnetic holding device in line with the park/brake interlock cable is energized when the ignition is in the RUN position. When the key is in the RUN position and the brake pedal is depressed, the shifter is unlocked and will move into any position. The interlock system also prevents the ignition switch from being turned to the LOCK or ACCESSORY position (Fig. 148) unless the shifter is fully locked into the PARK position.

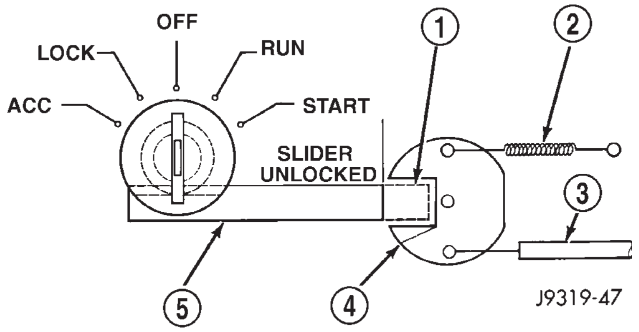


Fig. 148 Ignition Key Cylinder Actuation

1 - SLIDER LOCKED
2 - CAM RETURN SPRING
3 - INTERLOCK CABLE
4 - CAM
5 - SLIDER

REMOVAL

(1) Remove lower steering column cover. (Refer to 23 - BODY/INSTRUMENT PANEL/STEERING COLUMN OPENING COVER - REMOVAL)

(2) Remove lower steering column shroud.

(3) Remove tie strap near the solenoid retaining the brake transmission interlock cable to the steering column.

(4) Disengage wire connector from solenoid.

(5) With the ignition removed or in the unlocked position, disengage lock tab holding cable end to steering column (Fig. 149).

(6) Pull cable end from steering column.

(7) Remove the floor console and related trim. (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - REMOVAL)

(8) Disconnect the cable from the bellcrank (Fig. 150).

(9) Disconnect and remove the cable from the shift bracket.

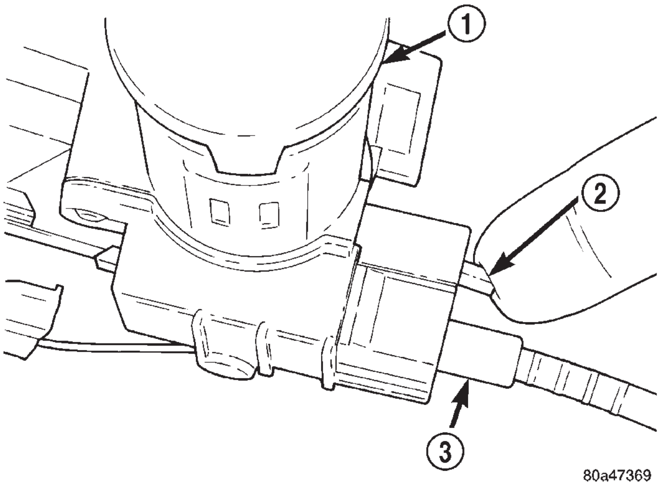


Fig. 149 Brake/Park Interlock Cable

1 - IGNITION LOCK
2 - LOCK TAB
3 - CABLE END

INSTALLATION

(1) Route replacement cable behind instrument panel and under floor console area to shift mechanism.

(2) Insert cable end into opening in steering column hub under ignition lock. Push cable inward until lock tab engages.

(3) Insert the cable end into the shifter bellcrank.

(4) Place gear selector in PARK.

(5) Push the spring-loaded cable adjuster forward and snap cable into bracket.

(6) Adjust the brake transmission shifter interlock cable.

(7) Verify that the cable adjuster lock clamp is pushed downward to the locked position.

(8) Test the park-lock cable operation.

(9) Install the floor console and related trim.

(10) Install tie strap to hold cable to base of steering column.

(11) Install lower steering column shroud and ignition lock.

(12) Install lower steering column cover.

ADJUSTMENTS

ADJUSTMENT - BRAKE TRANSMISSION SHIFT INTERLOCK CABLE

(1) Shift transmission into PARK.

(2) Remove shift lever bezel and console screws. Raise bezel and console for access to cable.

(3) Pull cable lock button up to release cable.

(4) Turn ignition switch to LOCK position.

(5) Use a spacer to create a one millimeter gap between the shifter pawl and top of the shift gate.

BRAKE TRANSMISSION SHIFT INTERLOCK MECHANISM (Continued)

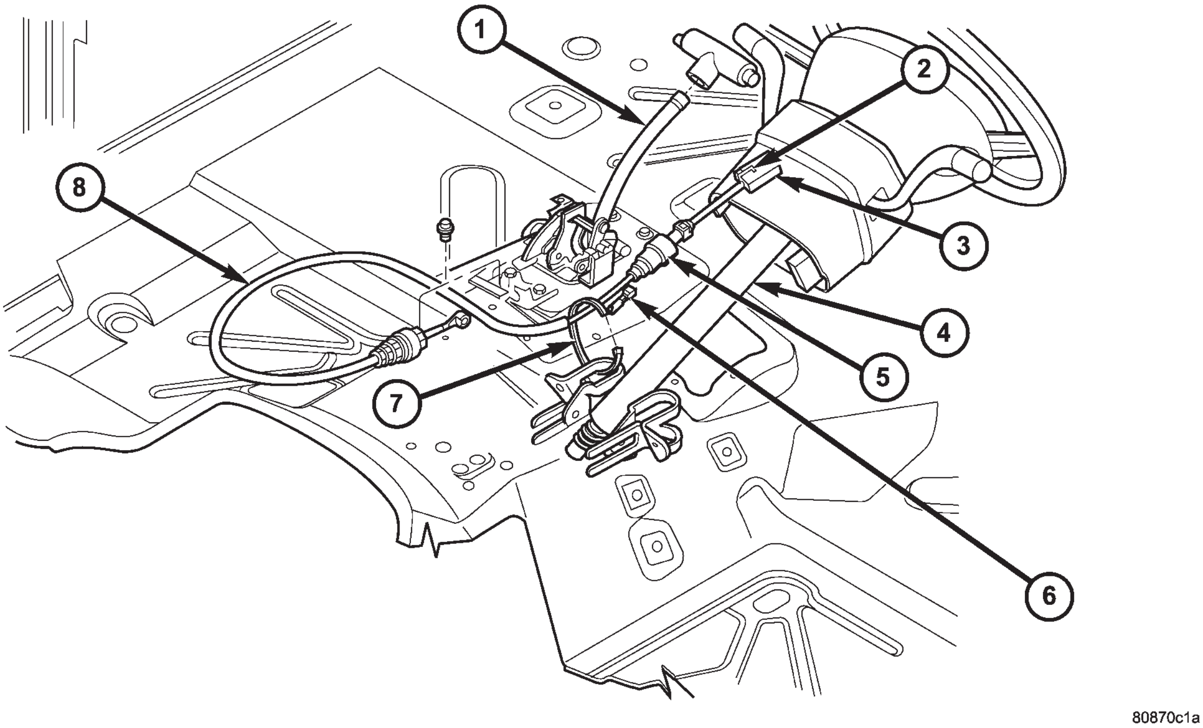


Fig. 150 Cable and Shifter

1 - SHIFT MECHANISM
2 - LOCK-TAB
3 - IGNITION LOCK INTERLOCK
4 - STEERING COLUMN
5 - SOLENOID
6 - WIRE CONNECTOR
7 - TIE STRAP
8 - PARK/BRAKE INTERLOCK CABLE

(6) Pull the cable forward and release.Ensure the cable end is seated in the bellcrank and press cable lock button down until it snaps in place.

(7) Check adjustment as follows:

(a) Check movement of release shift handle button (floor shift) or release lever (column shift). You should not be able to press button inward or move column lever.

(b) Turn ignition switch to RUN position.

(c) Shifting out of park should not be possible.

(d) Apply the brake and attempt to shift out of PARK. Shifting should be possible.

(e) While the transmission is shifted out of PARK, release the brake and attempt to shift through all gears. Release the shift button at least once during this procedure. The ignition key should not go to the LOCK position.

(f) Return transmission to the PARK position without applying the brake.

(8) Move shift lever back to PARK and check ignition switch operation. You should be able to turn switch to LOCK position and shift lever release button/lever should not move.

DRIVING CLUTCHES

DESCRIPTION

Three hydraulically applied input clutches are used to drive planetary components. The underdrive (2), overdrive (3), and reverse (4) clutches are considered input/driving clutches and are contained within the input clutch assembly (Fig. 151). The input clutch assembly also contains:

- Input shaft
- Input hub
- Clutch retainer
- Underdrive piston
- Overdrive/reverse piston
- Overdrive hub
- Underdrive hub

OPERATION

The three input clutches are responsible for driving different components of the planetary geartrain.

NOTE: (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING) for a collective view of which clutch elements are applied at each position of the selector lever.

DRIVING CLUTCHES (Continued)

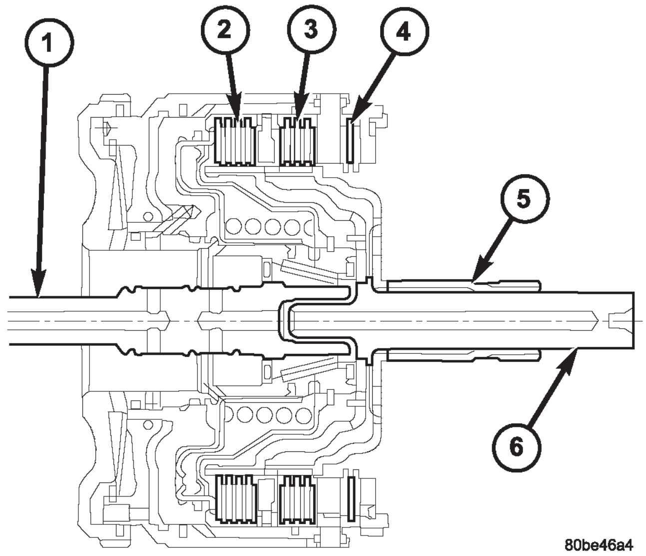


Fig. 151 Input Clutch Assembly

1 - INPUT SHAFT
2 - UNDERDRIVE CLUTCH
3 - OVERDRIVE CLUTCH
4 - REVERSE CLUTCH
5 - OVERDRIVE SHAFT
6 - UNDERDRIVE SHAFT

UNDERDRIVE CLUTCH

The underdrive clutch is hydraulically applied in first, second, and third (direct) gears by pressurized fluid against the underdrive piston. When the underdrive clutch is applied, the underdrive hub drives the rear sun gear.

OVERDRIVE CLUTCH

The overdrive clutch is hydraulically applied in third (direct) and overdrive gears by pressurized fluid against the overdrive/reverse piston. When the overdrive clutch is applied, the overdrive hub drives the front planet carrier.

REVERSE CLUTCH

The reverse clutch is hydraulically applied in reverse gear only by pressurized fluid against the overdrive/reverse piston. When the reverse clutch is applied, the front sun gear assembly is driven.

FLUID AND FILTER

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - CAUSES OF BURNT FLUID

Burnt, discolored fluid is a result of overheating which has two primary causes.

(1) A result of restricted fluid flow through the main and/or auxiliary cooler. This condition is usually the result of a damaged main cooler, or severe restrictions in the coolers and lines caused by debris or kinked lines.

(2) Heavy duty operation with a vehicle not properly equipped for this type of operation. Trailer towing or similar high load operation will overheat the transmission fluid if the vehicle is improperly equipped. Such vehicles should have an auxiliary transmission fluid cooler, a heavy duty cooling system, and the engine/axle ratio combination needed to handle heavy loads.

EFFECTS OF INCORRECT FLUID LEVEL

A low fluid level allows the pump to take in air along with the fluid. Air in the fluid will cause fluid pressures to be low and develop slower than normal. If the transmission is overfilled, the gears churn the fluid into foam. This aerates the fluid and causing the same conditions occurring with a low level. In either case, air bubbles cause fluid overheating, oxidation, and varnish buildup which interferes with valve and clutch operation. Foaming also causes fluid expansion which can result in fluid overflow from the transmission vent or fill tube. Fluid overflow can easily be mistaken for a leak if inspection is not careful.

FLUID CONTAMINATION

Transmission fluid contamination is generally a result of:

- adding incorrect fluid
- failure to clean dipstick and fill tube when checking level
- engine coolant entering the fluid
- internal failure that generates debris
- overheat that generates sludge (fluid breakdown)
- failure to replace contaminated converter after repair

The use of non-recommended fluids can result in transmission failure. The usual results are erratic shifts, slippage, abnormal wear and eventual failure due to fluid breakdown and sludge formation. Avoid this condition by using recommended fluids only.

The dipstick cap and fill tube should be wiped clean before checking fluid level. Dirt, grease and

FLUID AND FILTER (Continued)

other foreign material on the cap and tube could fall into the tube if not removed beforehand. Take the time to wipe the cap and tube clean before withdrawing the dipstick.

Engine coolant in the transmission fluid is generally caused by a cooler malfunction. The only remedy is to replace the radiator as the cooler in the radiator is not a serviceable part. If coolant has circulated through the transmission, an overhaul is necessary.

The torque converter should be replaced whenever a failure generates sludge and debris. This is necessary because normal converter flushing procedures will not remove all contaminants.

STANDARD PROCEDURE

STANDARD PROCEDURE - FLUID LEVEL CHECK

FLUID LEVEL CHECK

The transmission sump has a dipstick to check oil similar to most automatic transmissions. It is located on the left side of the engine. Be sure to wipe all dirt from dipstick handle before removing.

The torque converter fills in both the PARK and NEUTRAL positions. Place the selector lever in 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.** 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. The fluid level should be in COLD region at 70° F fluid temperature. Adjust fluid level as necessary. Use only Mopar® ATF+4, Automatic Transmission Fluid.

FLUID LEVEL CHECK USING DRB

NOTE: Engine and Transmission should be at normal operating temperature before performing this procedure.

(1) Start engine and apply parking brake.
(2) Connect DRBIII® scan tool and select transmission.
(3) Select sensors.
(4) Read the transmission temperature value.
(5) Compare the fluid temperature value with the chart.
(6) Adjust transmission fluid level shown on the dipstick according to the 42RLE Fluid Temperature Chart (Fig. 152). Use only Mopar® ATF+4, Automatic Transmission Fluid.
(7) Check transmission for leaks.

STANDARD PROCEDURE - FLUID/FILTER SERVICE

NOTE: Only fluids of the type labeled Mopar® ATF+4, Automatic Transmission Fluid, should be used in the transmission sump. A filter change should be made at the time of the transmission oil change. The magnet (on the inside of the oil pan) should also be cleaned with a clean, dry cloth.

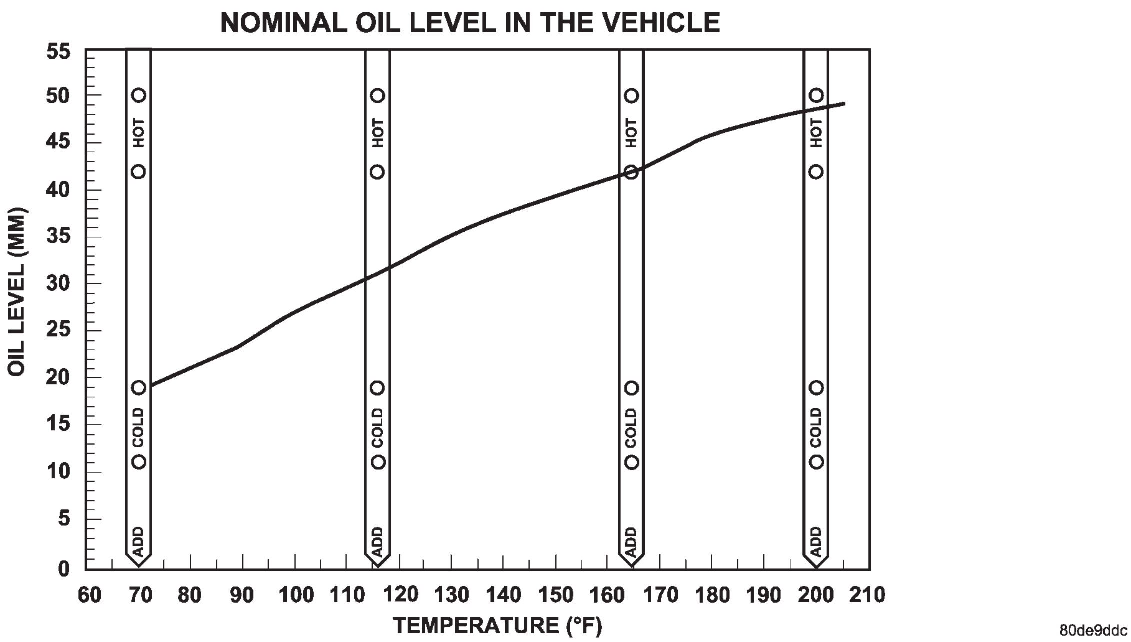


Fig. 152 42RLE Fluid Temperature Chart

FLUID AND FILTER (Continued)

NOTE: If the transmission is disassembled for any reason, the fluid and filter should be changed.

(1) Raise vehicle on a hoist. Place a drain container with a large opening, under transmission oil pan.

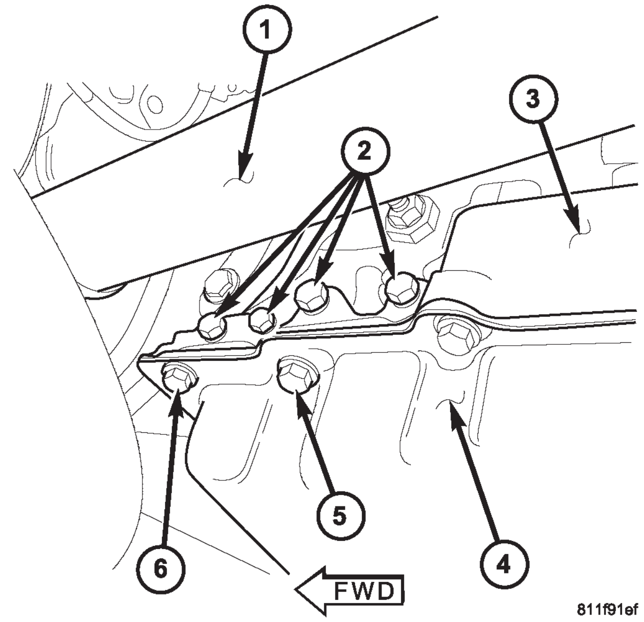


Fig. 153 Pan Fastener

1 - FRONT DRIVESHAFT
2 - PRESSURE PORTS
3 - TRANSMISSION CASE
4 - TRANSMISSION OIL PAN
5 - SECOND TRANSMISSION OIL PAN BOLT ON LEFT SIDE
6 - FIRST TRANSMISSION OIL PAN BOLT

NOTE: One of the oil pan bolts (5) has a sealing patch applied from the factory. Separate this bolt for reuse.

(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 and tighten retaining screws to 5 N·m (40 in. lbs.).

NOTE: Before installing the oil pan bolt (5) in the bolt hole located between the torque converter clutch on and U/D clutch pressure tap circuits (Fig. 153), it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

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

(5) Pour four quarts of Mopar® ATF+4, Automatic Transmission Fluid, 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) Check the transmission fluid level and add an appropriate amount to bring the transmission fluid level to 3mm (1/8 in.) below the lowest mark on the dipstick.

(8) Recheck the fluid level after the transmission has reached normal operating temperature (180°F.).

(9) To prevent dirt from entering transmission, make certain that dipstick is fully seated into the dipstick opening.

STANDARD PROCEDURE - TRANSMISSION FILL

To avoid overfilling transmission after a fluid change or overhaul, perform the following procedure:

(1) Remove dipstick and insert clean funnel in transmission fill tube.

(2) Add following initial quantity of Mopar® ATF +4, Automatic Transmission Fluid, to transmission:

(a) If only fluid and filter were changed, add **6 pints (3 quarts)** of ATF +4 to transmission.

(b) If transmission was completely overhauled, or torque converter was replaced or drained, add **10 pints (5 quarts)** of ATF +4 to transmission.

(3) Apply parking brakes.

(4) Start and run engine at normal curb idle speed.

(5) Apply service brakes, shift transmission through all gear ranges then back to NEUTRAL, set parking brake, and leave engine running at curb idle speed.

(6) Remove funnel, insert dipstick and check fluid level. If level is low, **add fluid to bring level to MIN mark on dipstick.** Check to see if the oil level is equal on both sides of the dipstick. If one side is noticably higher than the other, the dipstick has picked up some oil from the dipstick tube. Allow the oil to drain down the dipstick tube and re-check.

(7) Drive vehicle until transmission fluid is at normal operating temperature.

(8) With the engine running at curb idle speed, the gear selector in NEUTRAL, and the parking brake applied, check the transmission fluid level.

CAUTION: Do not overfill transmission, fluid foaming and shifting problems can result.

(9) Add fluid to bring level up to MAX arrow mark.

When fluid level is correct, shut engine off, release park brake, remove funnel, and install dipstick in fill tube.

GEARSHIFT CABLE

REMOVAL

(1) Shift transmission into PARK.

(2) Remove shift lever bezel and necessary console parts for access to shift lever assembly. (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - REMOVAL)

(3) Disconnect cable at shift lever (Fig. 154) and feed cable through dash panel opening to underside of vehicle.

(4) Raise vehicle.

(5) Disengage cable eyelet at transmission shift lever and removel cable from the mounting bracket. Then remove old cable from vehicle.

INSTALLATION

(1) Route cable through hole in dash panel. Fully seat cable grommet into dash panel.

(2) Place the auto transmission manual shift control lever in “PARK” detent (rearmost) position and rotate prop shaft to ensure transmission is in PARK.

(3) Snap the cable into the transmission bracket so the retaining clip is engaged and connect cable end fitting onto the manual control lever ball stud.

(4) Place the floor shifter lever in PARK position.

(5) Connect shift cable to shifter mechanism by snapping cable retaining ears into shifter bracket and press cable end fitting onto lever ball stud.

(6) Snap the cable into the transmission bracket so the retaining ears are engaged and connect cable end fitting onto the manual control lever ball stud.

(7) Adjust the shift mechanism.

(8) Install any floor console components removed previously. (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - INSTALLATION)

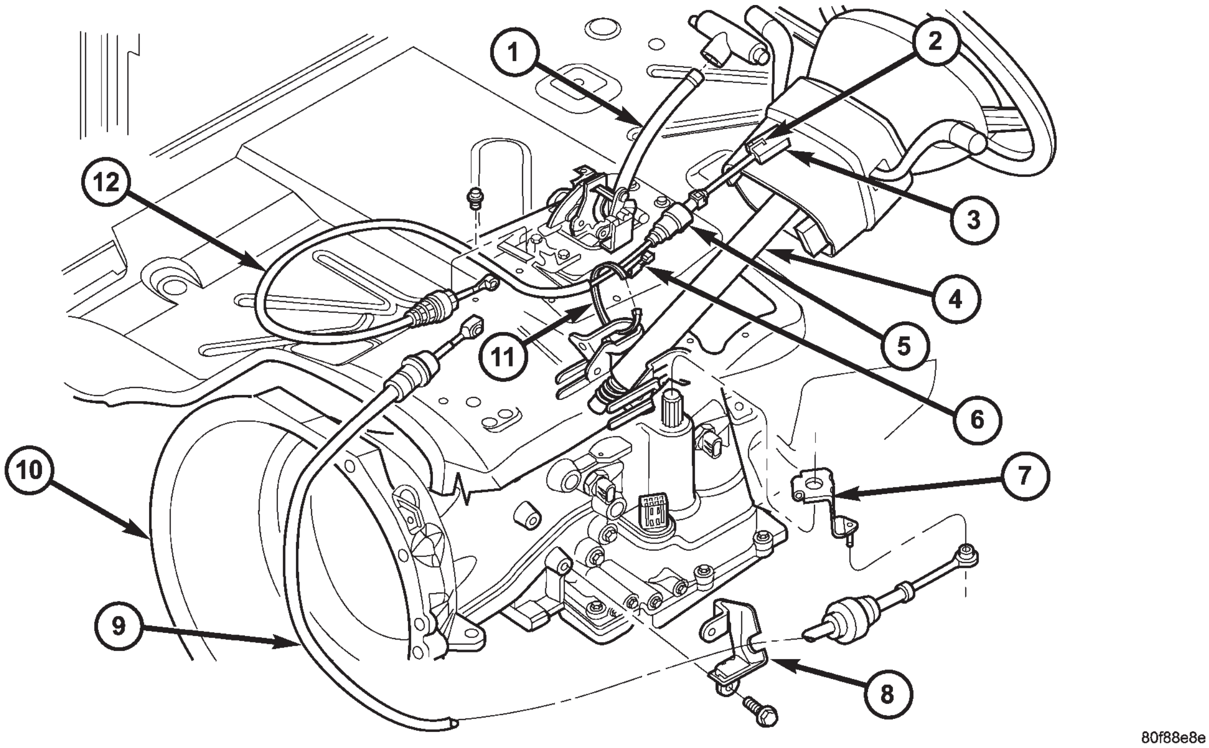


Fig. 154 Shifter Cable Routing

1 - SHIFT MECHANISM
2 - LOCK-TAB
3 - IGNITION LOCK INTERLOCK
4 - STEERING COLUMN
5 - SOLENOID
6 - WIRE CONNECTOR
7 - MANUAL LEVER
8 - CABLE BRACKET
9 - SHIFTER CABLE
10 - BELLHOUSING
11 - TIE STRAP
12 - PARK/BRAKE INTERLOCK CABLE

HOLDING CLUTCHES

DESCRIPTION

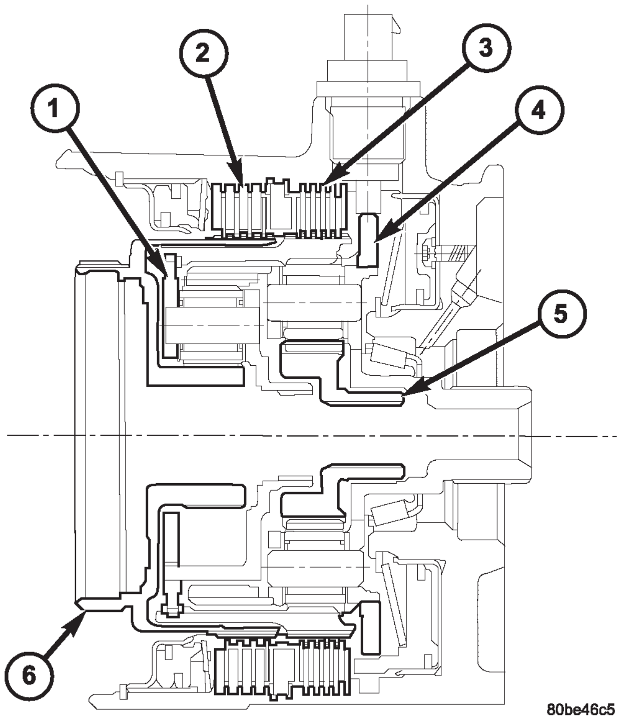


Fig. 155 2/4 and Low/Reverse Clutches

1 - FRONT PLANET CARRIER/REAR ANNULUS
2 - 2/4 CLUTCH
3 - L/R CLUTCH
4 - REAR PLANET CARRIER/FRONT ANNULUS
5 - REAR SUN GEAR
6 - FRONT SUN GEAR ASSEMBLY

Two hydraulically applied multi-disc clutches are used to hold planetary geartrain components stationary while the input clutches drive others. The 2/4 (2) and Low/Reverse (3) clutches are considered holding clutches and are contained at the rear of the transmission case (Fig. 155).

OPERATION

NOTE: (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING) for a collective view of which clutch elements are applied at each position of the selector lever.

2/4 CLUTCH

The 2/4 clutch is hydraulically applied in second and fourth gears by pressurized fluid against the 2/4 clutch piston. When the 2/4 clutch is applied, the front sun gear assembly is held or grounded to the transmission case.

LOW/REVERSE CLUTCH

The Low/Reverse clutch is hydraulically applied in park, reverse, neutral, and first gears by pressurized fluid against the Low/Reverse clutch piston. When the Low/Reverse clutch is applied, the front planet carrier/rear annulus assembly is held or grounded to the transmission case.

INPUT CLUTCH ASSEMBLY

DISASSEMBLY

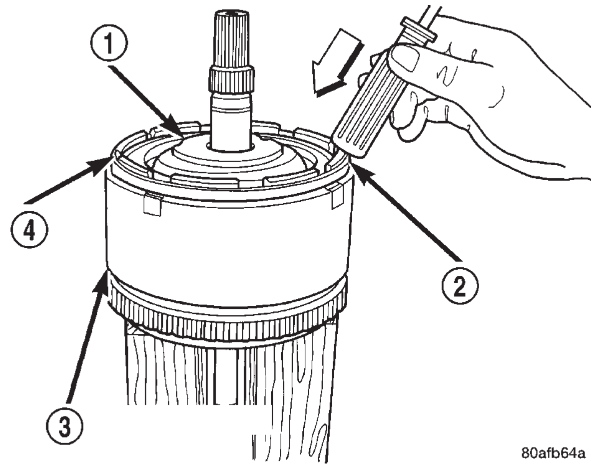


Fig. 156 Tapping Reaction Plate

1 - #4 THRUST PLATE (SELECT)
2 - TAP DOWN REVERSE CLUTCH REACTION PLATE TO REMOVE OR INSTALL SNAP RING
3 - INPUT CLUTCH RETAINER
4 - REVERSE CLUTCH REACTION PLATE

(1) Mount input clutch assembly to Input Clutch Pressure Fixture (Tool 8391).

(2) Tap down (2) reverse clutch reaction plate (4) to release pressure from snap ring (Fig. 156).

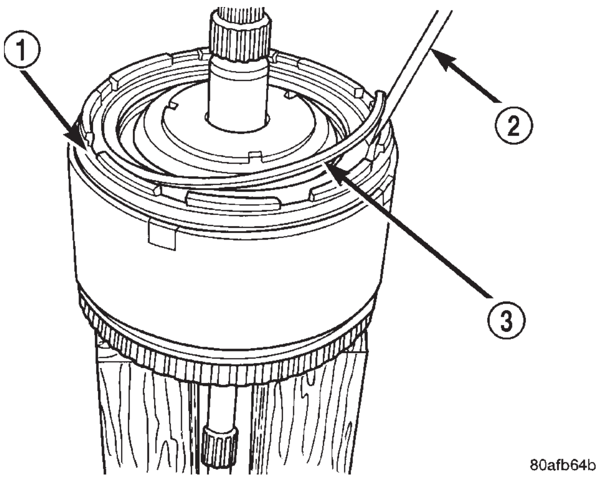


Fig. 157 Reverse Clutch Snap Ring

1 - REACTION PLATE
2 - SCREWDRIVER
3 - REVERSE CLUTCH SNAP RING (SELECT)

INPUT CLUTCH ASSEMBLY (Continued)

(3) Remove reverse clutch snap ring (3) (Fig. 157).

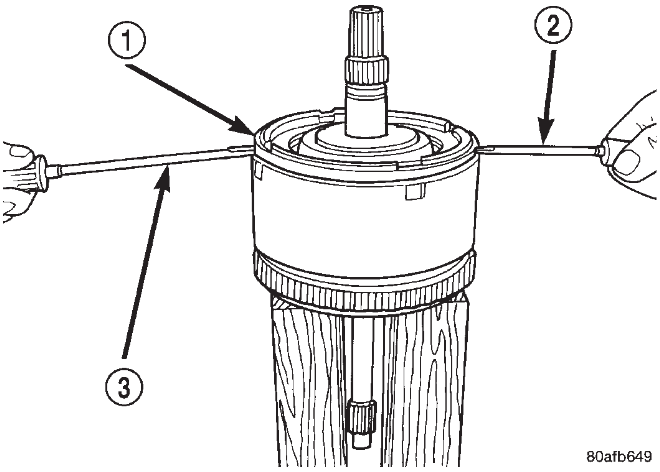


Fig. 158 Pry Reverse Clutch Reaction Plate

1 - REVERSE CLUTCH REACTION PLATE
2 - SCREWDRIVER
3 - SCREWDRIVER

(4) Pry up reverse clutch reaction plate (1) (Fig. 158).

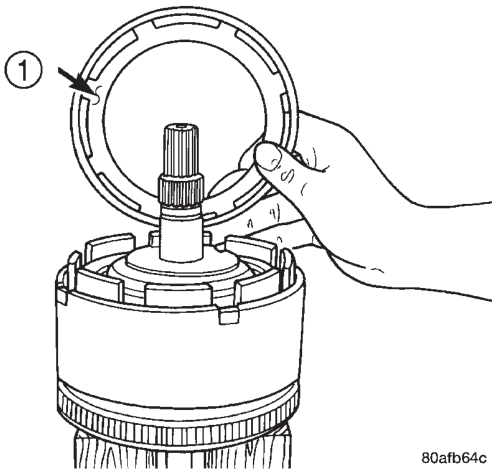


Fig. 159 Reverse Clutch Reaction Plate

1 - REVERSE CLUTCH REACTION PLATE (INSTALL FLAT SIDE DOWN)

(5) Remove reverse clutch reaction plate (1) (Fig. 159).

NOTE: Tag reverse clutch pack for reassembly identification.

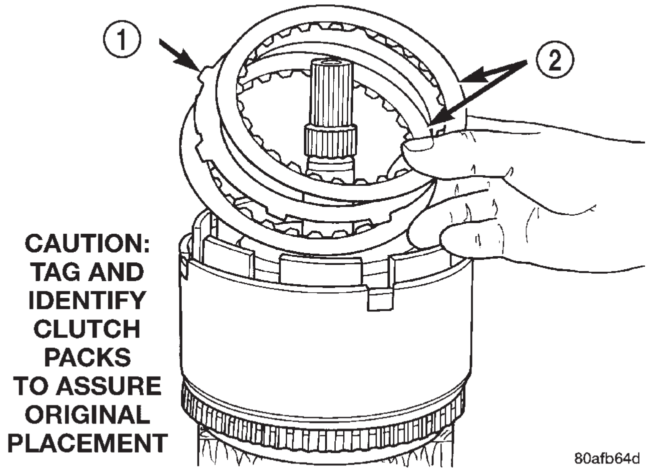


Fig. 160 Reverse Clutch Pack

1 - REVERSE CLUTCH PLATE
2 - REVERSE CLUTCH DISC

(6) Remove the reverse clutch pack (two fibers/one steel) (1, 2) (Fig. 160).

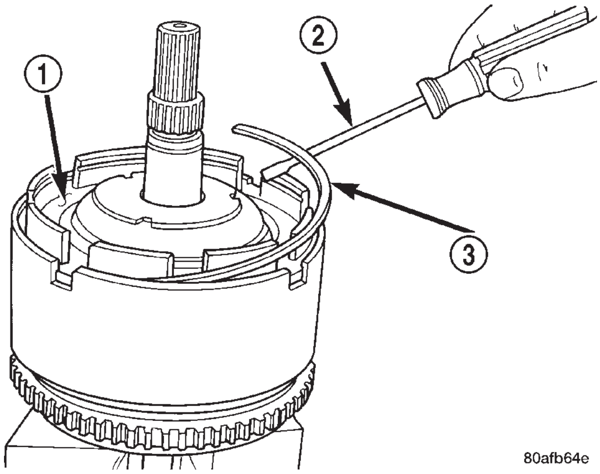


Fig. 161 OD/Reverse Pressure Plate Snap Ring

1 - OD/REVERSE PRESSURE PLATE
2 - SCREWDRIVER
3 - OD/REVERSE PRESSURE PLATE SNAP RING

(7) Remove the OD/Reverse reaction plate (1) snap ring (3) (Fig. 161).

INPUT CLUTCH ASSEMBLY (Continued)

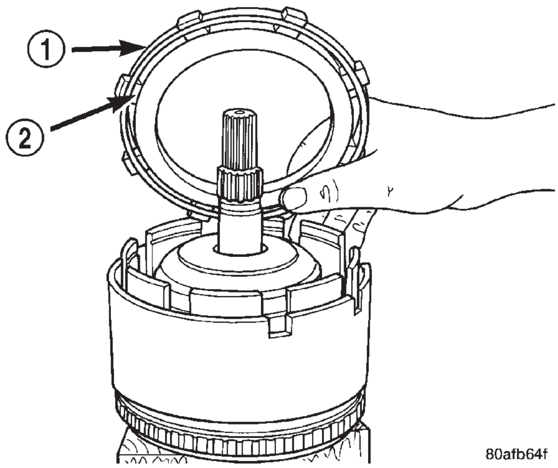


Fig. 162 OD/Reverse Reaction Plate

1 - OD/REVERSE PRESSURE PLATE (STEP SIDE DOWN)
2 - (STEP SIDE DOWN)

(8) Remove OD/Reverse pressure plate (1) (Fig. 162).

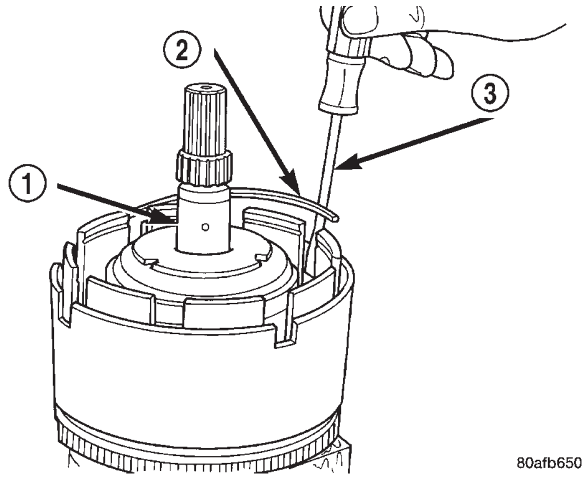


Fig. 163 Waved Snap Ring

1 - OVERDRIVE SHAFT ASSEMBLY
2 - OD/REVERSE CLUTCH WAVED SNAP RING
3 - SCREWDRIVER

(9) Remove OD/Reverse reaction plate wave snap ring (2) (Fig. 163).

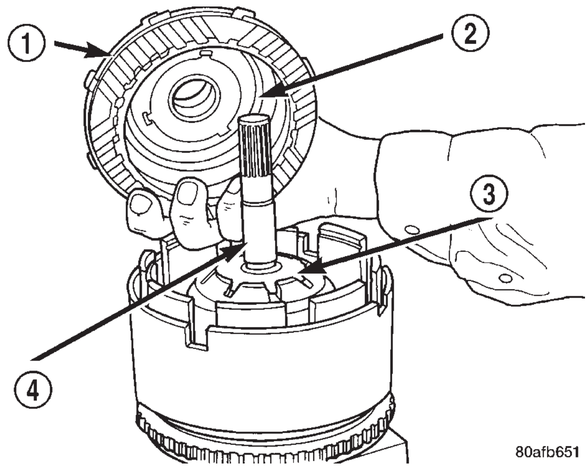


Fig. 164 Remove OD Clutch Pack

1 - OVERDRIVE SHAFT ASSEMBLY AND OD CLUTCH PACK
2 - #3 THRUST PLATE
3 - #3 THRUST WASHER
4 - UNDERDRIVE SHAFT ASSEMBLY

(10) Remove OD shaft/hub and OD clutch pack (1) (Fig. 164).

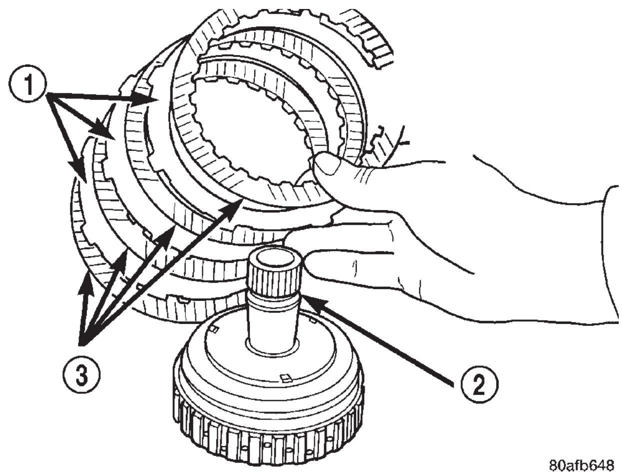


Fig. 165 Overdrive Clutch Pack

1 - OVERDRIVE CLUTCH PLATE
2 - OVERDRIVE SHAFT ASSEMBLY
3 - OVERDRIVE CLUTCH DISC

INPUT CLUTCH ASSEMBLY (Continued)

NOTE: Tag overdrive clutch pack for reassembly identification.

(11) Remove the overdrive clutch (1, 3) from the overdrive hub/shaft (2) (Fig. 165).

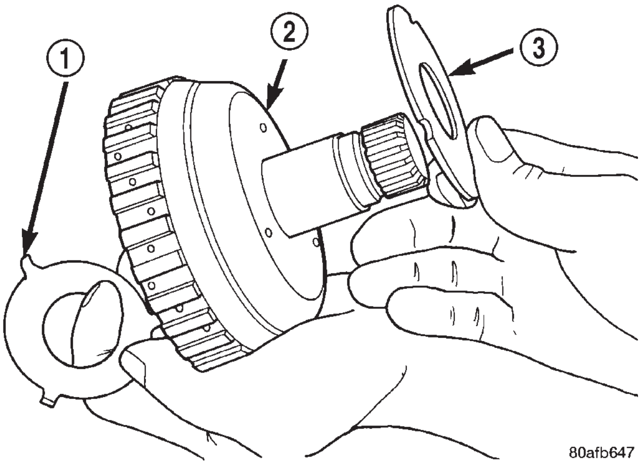


Fig. 166 #3 and #4 Thrust Washers

1 - #3 THRUST PLATE (3 TABS)
2 - OD SHAFT ASSEMBLY
3 - #4 THRUST PLATE (3 SLOTS)

(12) Remove and inspect number 3 and 4 thrust plates (1, 3) (Fig. 166).

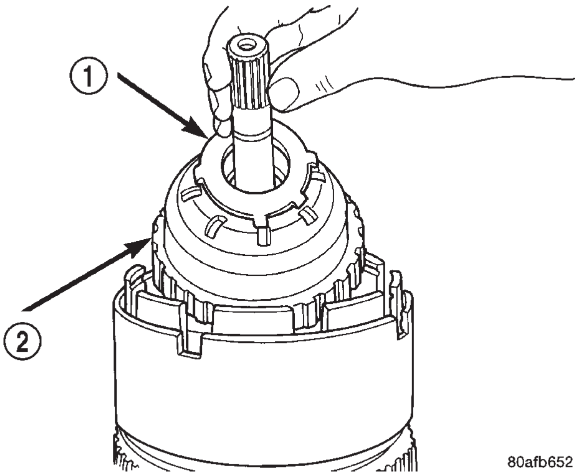


Fig. 167 Underdrive Shaft Assembly

1 - #3 THRUST WASHER (5 TABS)
2 - UNDERDRIVE SHAFT ASSEMBLY

(13) Remove the underdrive shaft assembly (2) (Fig. 167).

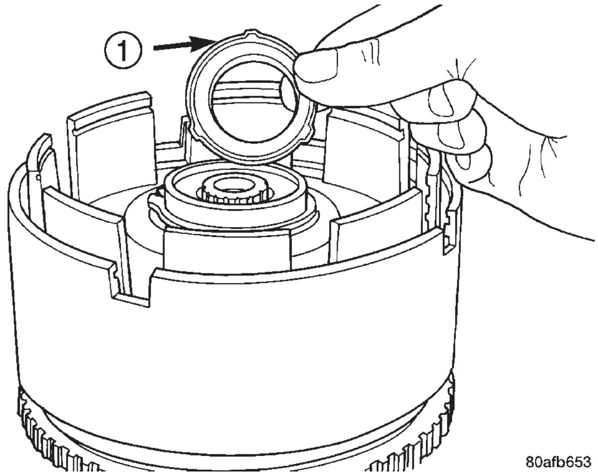


Fig. 168 No 2 Needle Bearing

1 - #2 NEEDLE BEARING (NOTE 3 TABS)

(14) Remove the number 2 needle bearing (1) (Fig. 168).

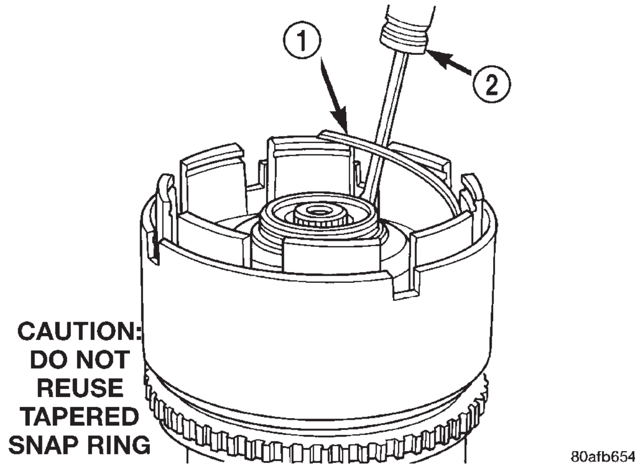


Fig. 169 Tapered Snap Ring

1 - OVERDRIVE/UNDERDRIVE CLUTCHES REACTION PLATE TAPERED SNAP RING
2 - SCREWDRIVER (DO NOT SCRATCH REACTION PLATE)

(15) Remove the OD/UD reaction plate tapered snap ring (1) (Fig. 169).

INPUT CLUTCH ASSEMBLY (Continued)

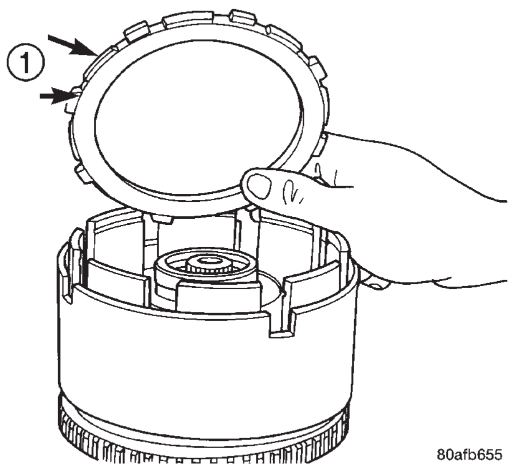


Fig. 170 OD/UD Reaction Plate

1 - OD/UD CLUTCH REACTION PLATE (STEP SIDE DOWN)

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

(16) Remove the OD/UD reaction plate (1) (Fig. 170).

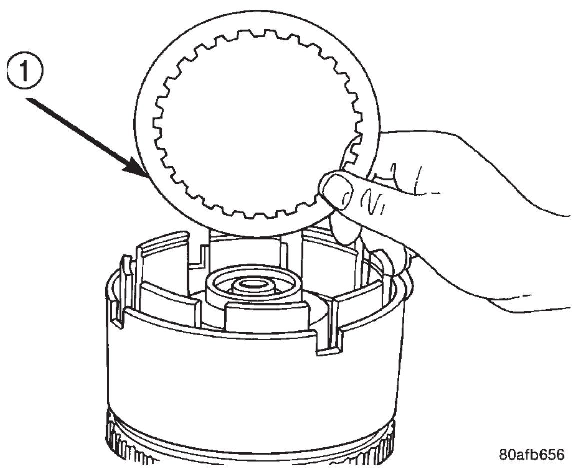


Fig. 171 Remove Last UD Clutch Disc

1 - ONE UNDERDRIVE CLUTCH DISC

(17) Remove the first UD clutch disc (1) (Fig. 171).

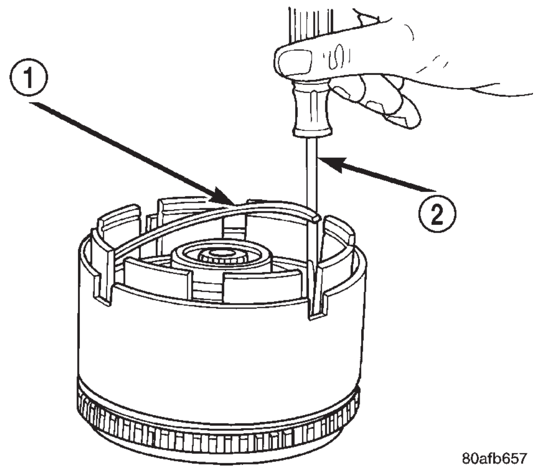


Fig. 172 UD Clutch Flat Snap Ring

1 - UNDERDRIVE CLUTCH REACTION PLATE FLAT SNAP RING
2 - SCREWDRIVER

(18) Remove the UD clutch flat snap ring (1) (Fig. 172).

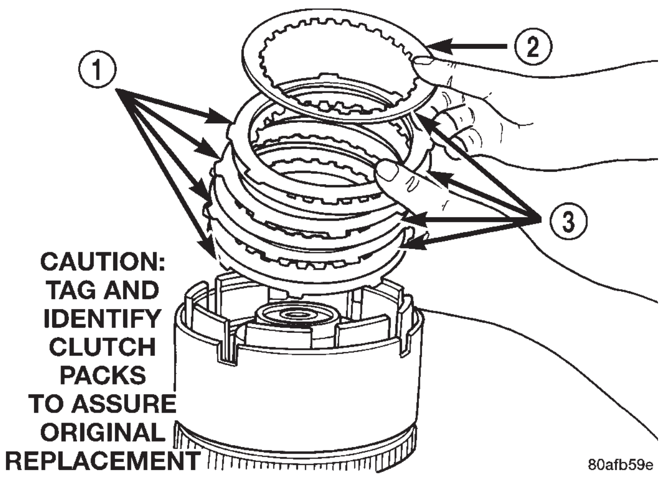


Fig. 173 Underdrive Clutch Pack

1 - CLUTCH PLATE
2 - ONE UD CLUTCH DISC
3 - CLUTCH DISC

NOTE: Tag underdrive clutch pack for reassembly identification.

(19) Remove the UD clutch pack (1, 3) (Fig. 173).

INPUT CLUTCH ASSEMBLY (Continued)

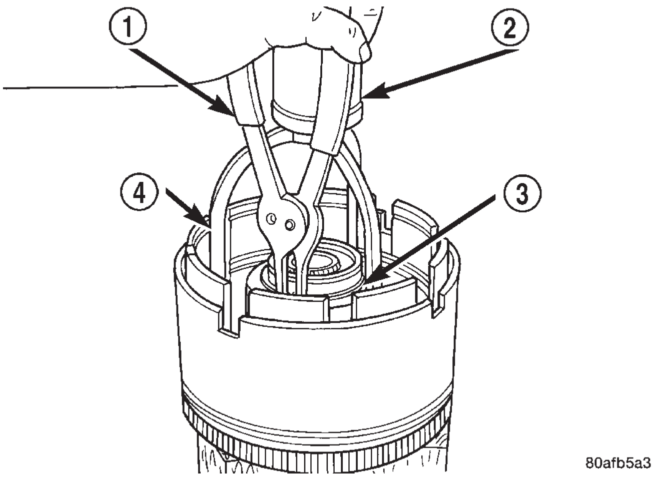


Fig. 174 UD Spring Retainer Snap Ring

1 - SNAP RING PLIERS
2 - ARBOR PRESS RAM
3 - SNAP RING
4 - SPECIAL TOOL 5059A

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

(20) Using Tool 5059A (4) and an arbor press (2), compress UD clutch piston enough to remove snap ring (3) (Fig. 174).

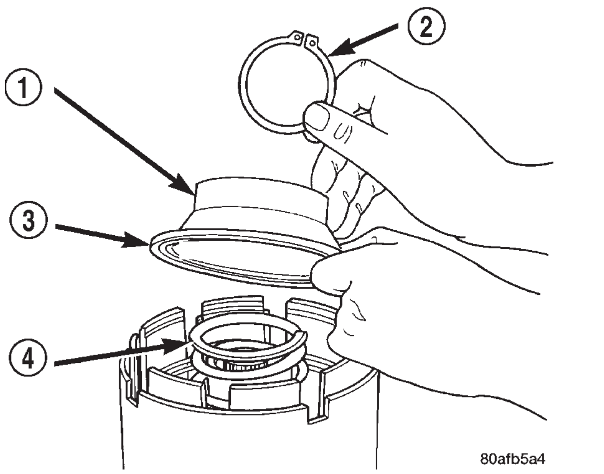


Fig. 175 UD Return Spring and Retainer

1 - UNDERDRIVE SPRING RETAINER
2 - SNAP RING
3 - SEAL
4 - PISTON RETURN SPRING

(21) Remove the underdrive spring retainer snap ring (2), spring retainer (1), and spring (4) (Fig. 175).

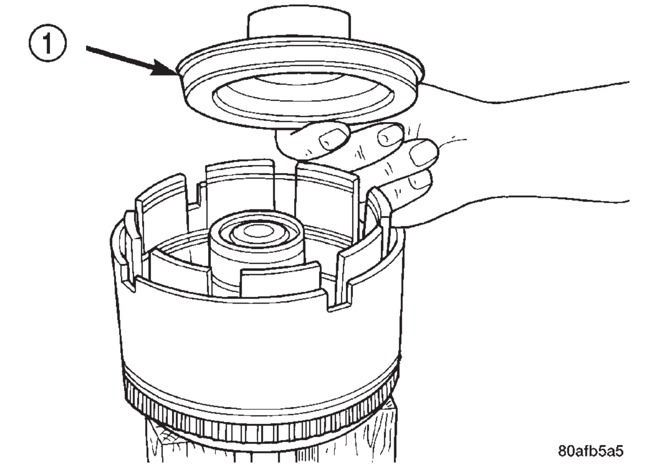


Fig. 176 Underdrive Clutch Piston

1 - PISTON

(22) Remove the UD clutch piston (1) (Fig. 176).

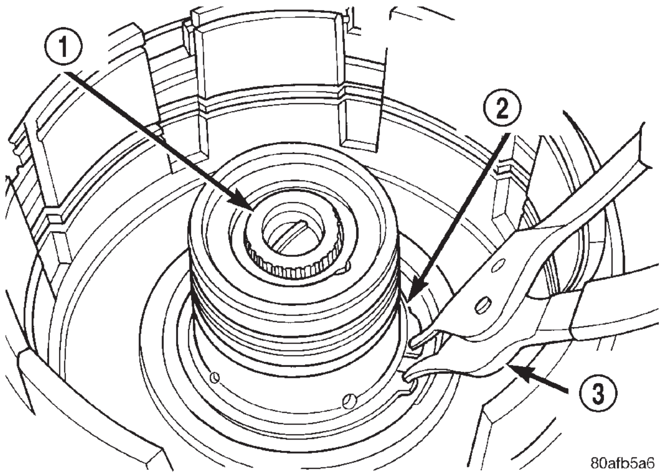


Fig. 177 Input Hub Tapered Snap Ring

1 - INPUT SHAFT
2 - INPUT HUB SNAP RING (TAPERED SIDE UP WITH TABS IN CAVITY)
3 - SNAP RING PLIERS

(23) Remove the input hub tapered snap ring (2) (Fig. 177).

INPUT CLUTCH ASSEMBLY (Continued)

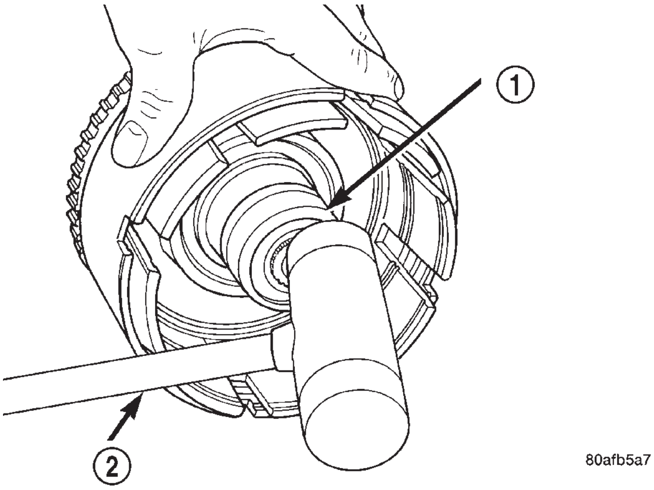


Fig. 178 Tap on Input Hub

1 - INPUT SHAFT AND HUB ASSEMBLY
2 - PLASTIC HAMMER

(24) Tap on input hub (1) with soft faced hammer (2) and separate input hub from OD/Reverse piston and clutch retainer (Fig. 178).

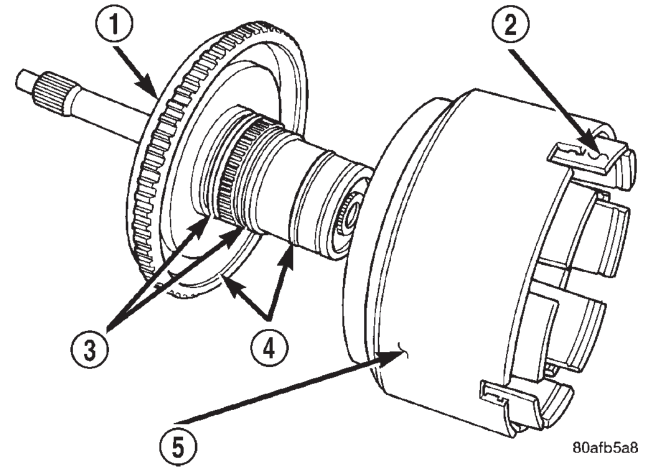


Fig. 179 Input Hub Removed

1 - INPUT SHAFT AND HUB ASSEMBLY
2 - INPUT CLUTCH RETAINER
3 - O-RING
4 - SEAL
5 - OVERDRIVE/REVERSE PISTON

(25) Separate the input hub from OD/Reverse piston (5) and clutch retainer (2) (Fig. 179).

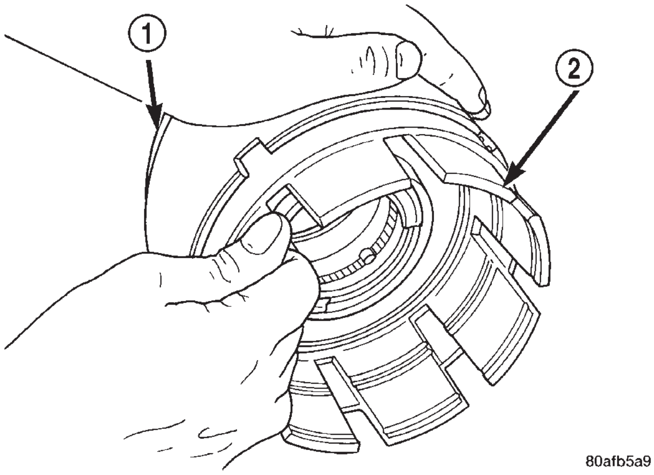


Fig. 180 Pull Retainer from Piston

1 - OVERDRIVE/REVERSE PISTON
2 - INPUT CLUTCH RETAINER

(26) Separate clutch retainer (2) from OD/Reverse piston (1) (Fig. 180).

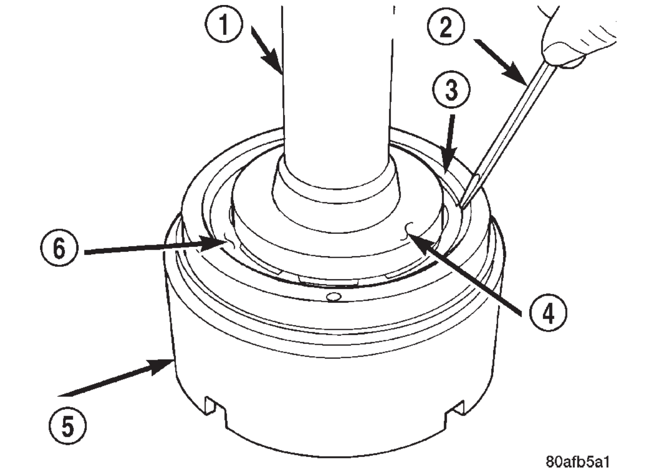


Fig. 181 Remove Snap Ring

1 - ARBOR PRESS RAM (COMPRESS RETURN SPRING JUST ENOUGH TO REMOVE OR INSTALL SNAP RING)
2 - SCREWDRIVER
3 - SNAP RING
4 - SPECIAL TOOL 6057
5 - OD/REVERSE PISTON
6 - RETURN SPRING

(27) Using Tool 6057 (4) and an arbor press(1), compress OD/Reverse piston (5) return spring just enough to remove snap ring (3) (Fig. 181).

INPUT CLUTCH ASSEMBLY (Continued)

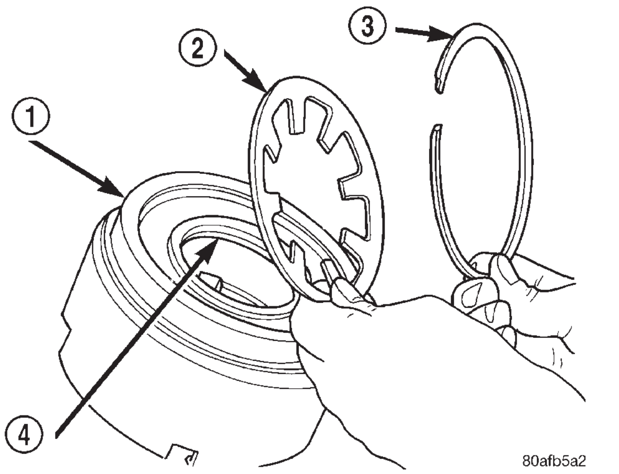


Fig. 182 Return Spring and Snap Ring

1 - OD/REVERSE PISTON
2 - RETURN SPRING
3 - SNAP RING
4 - O-RING

(28) Remove the OD/Reverse piston (5) return spring and snap ring (3) (Fig. 182).

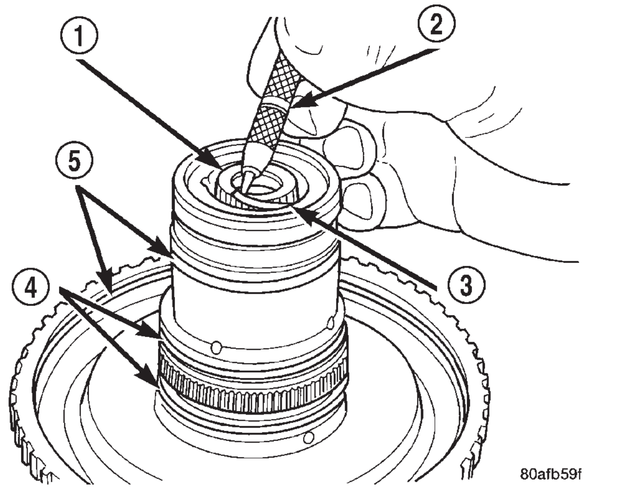


Fig. 183 Remove Input Shaft Snap Ring

1 - INPUT SHAFT
2 - SHARP-POINTED TOOL
3 - SNAP RING
4 - O-RINGS
5 - SEALS

(29) Remove input shaft (1) to input clutch hub snap ring (3) (Fig. 183).

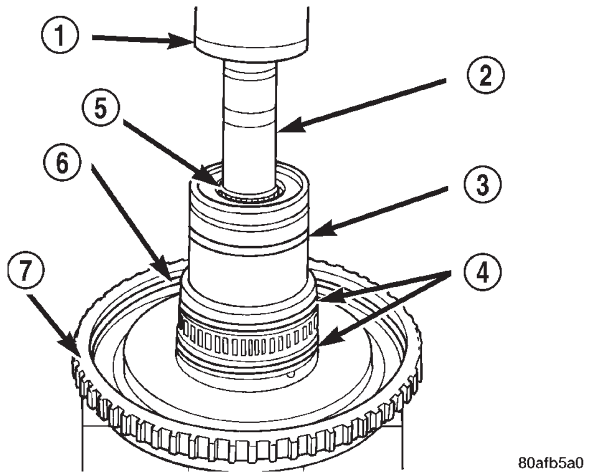


Fig. 184 Remove Input Shaft

1 - ARBOR PRESS RAM
2 - SOCKET
3 - SEAL
4 - O-RINGS
5 - INPUT SHAFT
6 - SEAL
7 - INPUT CLUTCH HUB

(30) Using a suitably sized socket (2) and an arbor press (1), remove input shaft (5) from input shaft hub (Fig. 184).

ASSEMBLY

Use petrolatum on all seals to ease assembly of components.

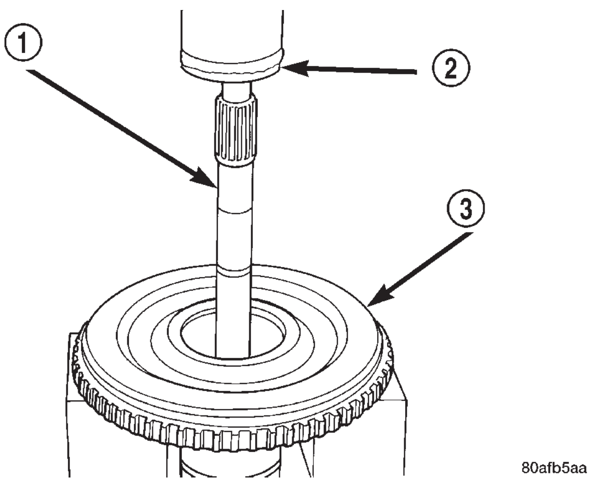


Fig. 185 Install Input Shaft

1 - INPUT SHAFT
2 - ARBOR PRESS RAM
3 - INPUT CLUTCH HUB

(1) Using an arbor press(2), install input shaft (1) to input shaft hub (2) (Fig. 185).

INPUT CLUTCH ASSEMBLY (Continued)

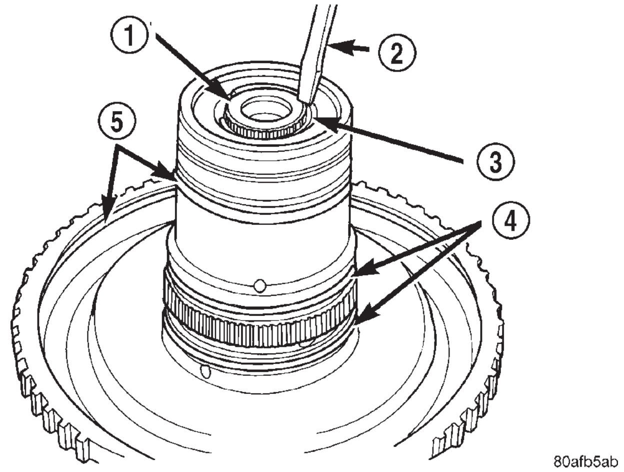


Fig. 186 Install Input Shaft Snap Ring

1 - INPUT SHAFT
2 - SCREWDRIVER (DO NOT SCRATCH BEARING SURFACE)
3 - SNAP RING
4 - O-RINGS
5 - SEALS

(2) Install input shaft snap ring (3) (Fig. 186).

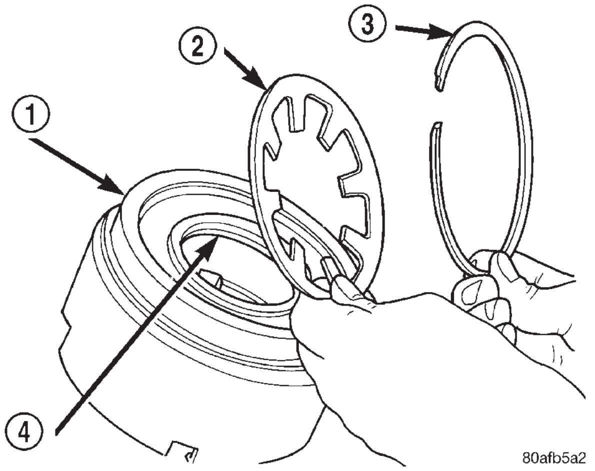


Fig. 187 Return Spring and Snap Ring

1 - OD/REVERSE PISTON
2 - RETURN SPRING
3 - SNAP RING
4 - O-RING

(3) Position the OD/Reverse piston return spring (2) and snap ring (3) onto the OD/Reverse piston (1) (Fig. 187).

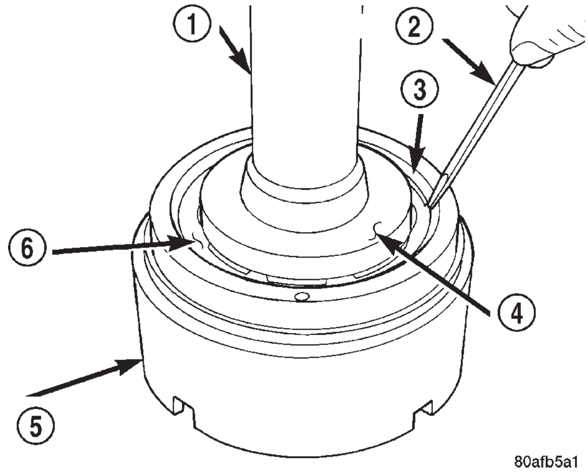


Fig. 188 Install Snap Ring

1 - ARBOR PRESS RAM (COMPRESS RETURN SPRING JUST ENOUGH TO REMOVE OR INSTALL SNAP RING)
2 - SCREWDRIVER
3 - SNAP RING
4 - SPECIAL TOOL 6057
5 - OD/REVERSE PISTON
6 - RETURN SPRING

(4) Using an arbor press (1) and Tool 6057 (4), install the OD/Reverse piston return spring (6) and snap ring (3) (Fig. 188).

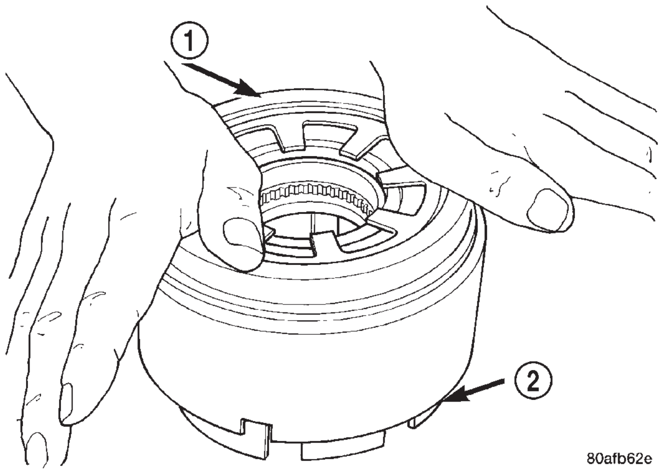


Fig. 189 Install OD/Reverse Piston

1 - PUSH DOWN TO INSTALL OVERDRIVE/REVERSE PISTON
2 - INPUT CLUTCHES RETAINER

(5) Install the OD/Reverse piston (1) assembly to the input clutch retainer (2) (Fig. 189).

INPUT CLUTCH ASSEMBLY (Continued)

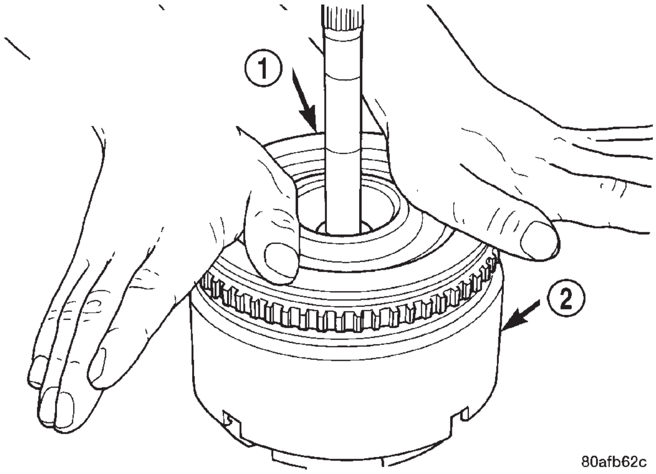


Fig. 190 Install Input Shaft Hub Assembly

1 - PUSH DOWN TO INSTALL INPUT SHAFT HUB ASSEMBLY (ROTATE TO ALIGN SPLINES)
2 - OD/REV. PISTON

(6) Install the input hub/shaft assembly (1) to the OD/Reverse piston/clutch retainer assembly (2) (Fig. 190).

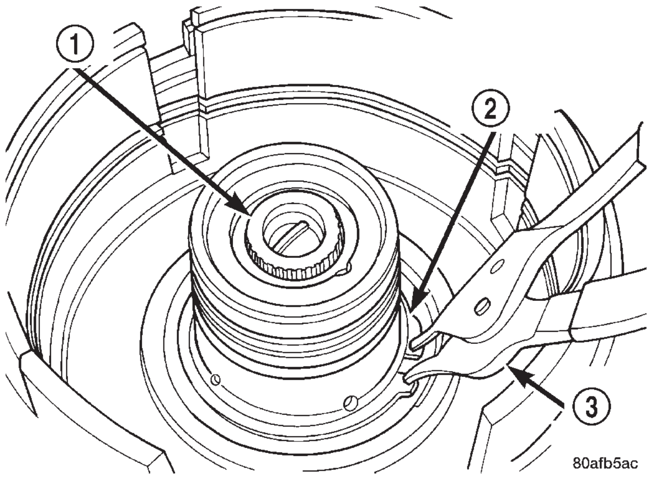


Fig. 191 Install Input Hub Tapered Snap Ring

1 - INPUT SHAFT
2 - INPUT HUB SNAP RING (TAPERED SIDE UP WITH TABS IN CAVITY)
3 - SNAP RING PLIERS

(7) Install input hub tapered snap ring (2) (Fig. 191). **Make sure snap ring is fully seated.**

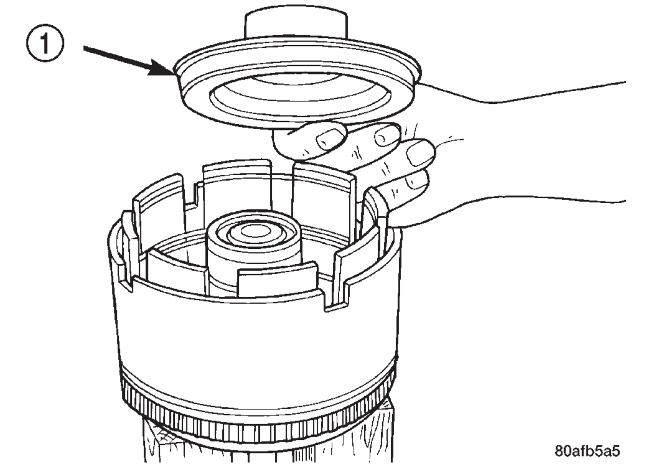


Fig. 192 Underdrive Clutch Piston

1 - PISTON

(8) Install the UD clutch piston (1) (Fig. 192).

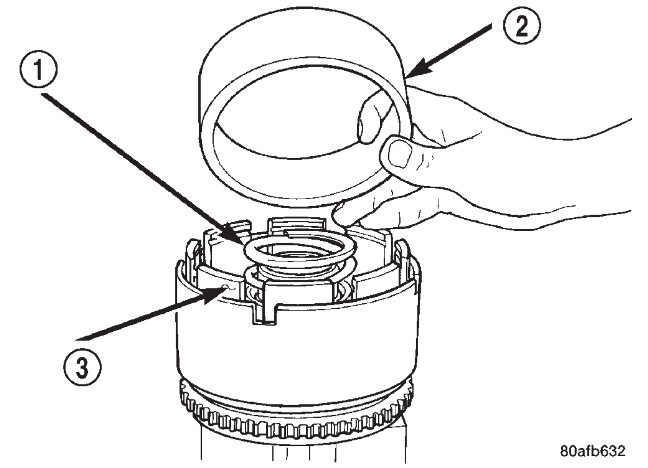


Fig. 193 Seal Compressor Special Tool 5067

1 - PISTON RETURN SPRING
2 - SPECIAL TOOL 5067
3 - INPUT CLUTCH RETAINER

(9) Install UD piston return spring (1)and Tool 5067 (2) (Fig. 193).

INPUT CLUTCH ASSEMBLY (Continued)

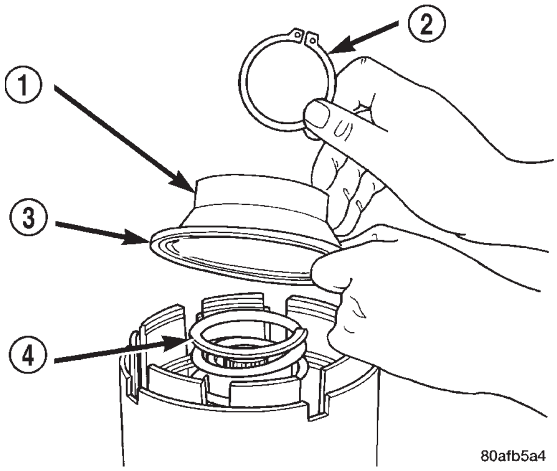


Fig. 194 UD Return Spring and Retainer

1 - UNDERDRIVE SPRING RETAINER
2 - SNAP RING
3 - SEAL
4 - PISTON RETURN SPRING

(10) Position the UD spring retainer (1) and snap ring (2) on the piston return spring (4) (Fig. 194).

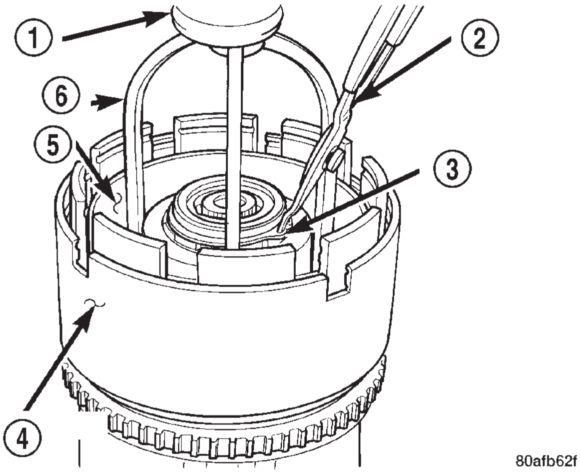


Fig. 195 Install UD Spring Retainer and Snap Ring

1 - ARBOR PRESS RAM
2 - SNAP RING PLIERS
3 - SNAP RING
4 - OD/REVERSE PISTON
5 - TOOL 5067
6 - TOOL 5059A

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

(11) Using Tool 5059A (6) and an arbor press (1), install the UD spring retainer and snap ring (3) (Fig. 195).

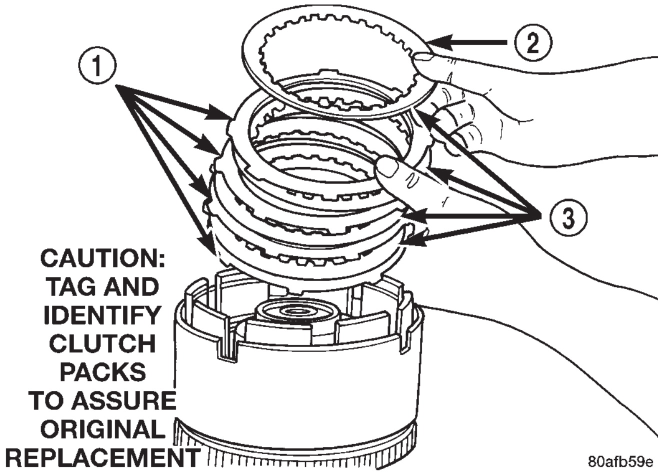


Fig. 196 Underdrive Clutch Pack

1 - CLUTCH PLATE
2 - ONE UD CLUTCH DISC
3 - CLUTCH DISC

(12) Install the UD clutch pack (four fibers/four steels) (1, 3) (Fig. 196). Leave the top disc (2) out until after the snap ring is installed.

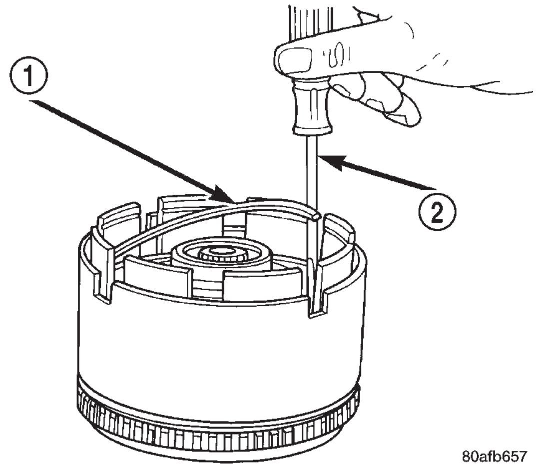


Fig. 197 UD Clutch Flat Snap Ring

1 - UNDERDRIVE CLUTCH REACTION PLATE FLAT SNAP RING
2 - SCREWDRIVER

(13) Install the UD clutch flat snap ring (1) (Fig. 197).

INPUT CLUTCH ASSEMBLY (Continued)

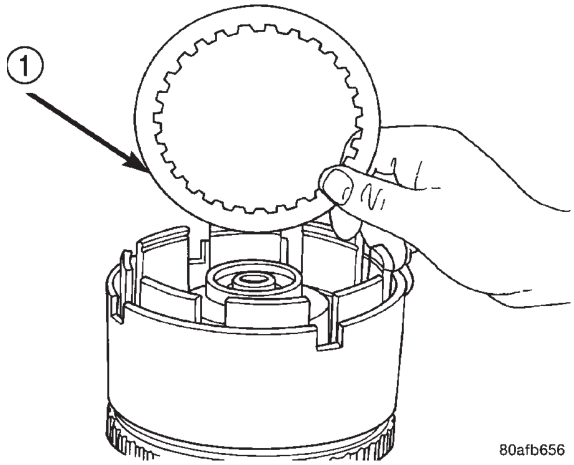


Fig. 198 Install Last UD Clutch Disc

1 - ONE UNDERDRIVE CLUTCH DISC

(14) Install the last UD clutch disc (1) (Fig. 198).

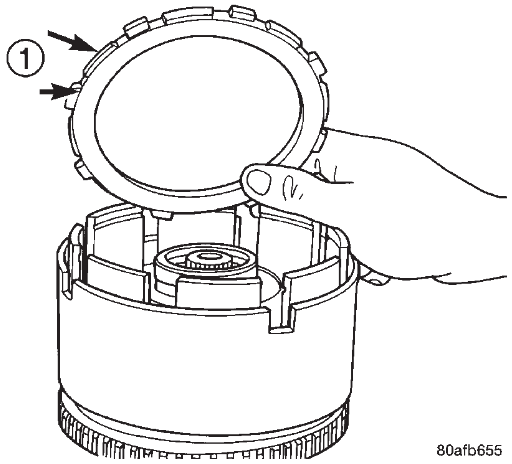


Fig. 199 OD/UD Reaction Plate

1 - OD/UD CLUTCH REACTION PLATE (STEP SIDE DOWN)

(15) Install the OD/UD clutch reaction plate (1) (Fig. 199). The OD/UD clutches reaction plate has a step on both sides. Install the OD/UD clutches reaction plate tapered step side up.

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.

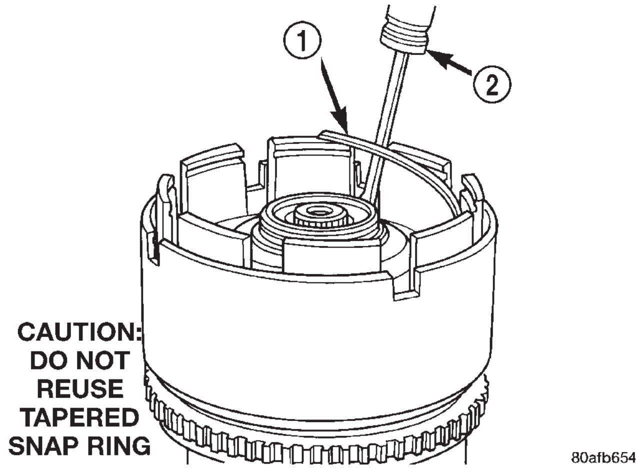


Fig. 200 Tapered Snap Ring

1 - OVERDRIVE/UNDERDRIVE CLUTCHES REACTION PLATE TAPERED SNAP RING
2 - SCREWDRIVER (DO NOT SCRATCH REACTION PLATE)

(16) Install the UD/OD tapered snap ring (1) (Fig. 200).

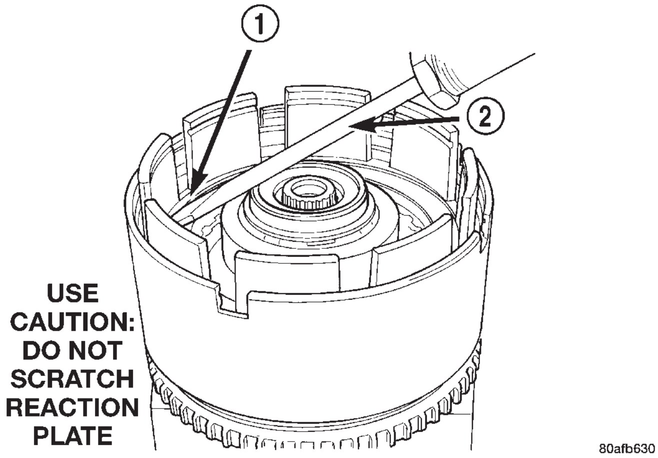


Fig. 201 Seating Tapered Snap Ring

1 - OVERDRIVE/UNDERDRIVE CLUTCHES REACTION PLATE TAPERED SNAP RING
2 - SCREWDRIVER

(17) Seat tapered snap ring (1) to ensure proper installation (Fig. 201).

INPUT CLUTCH ASSEMBLY (Continued)

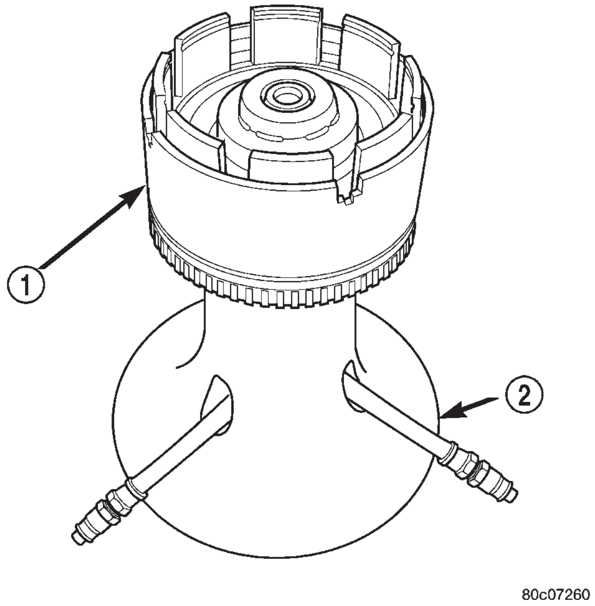


Fig. 202 Input Clutch Assembly on Pressure Fixture Tool - 8391

1 - INPUT CLUTCH ASSEMBLY
2 - INPUT CLUTCH PRESSURE FIXTURE - 8391

(18) Install input clutch assembly (1) to the Input Clutch Pressure Fixture 8391 (2) (Fig. 202).

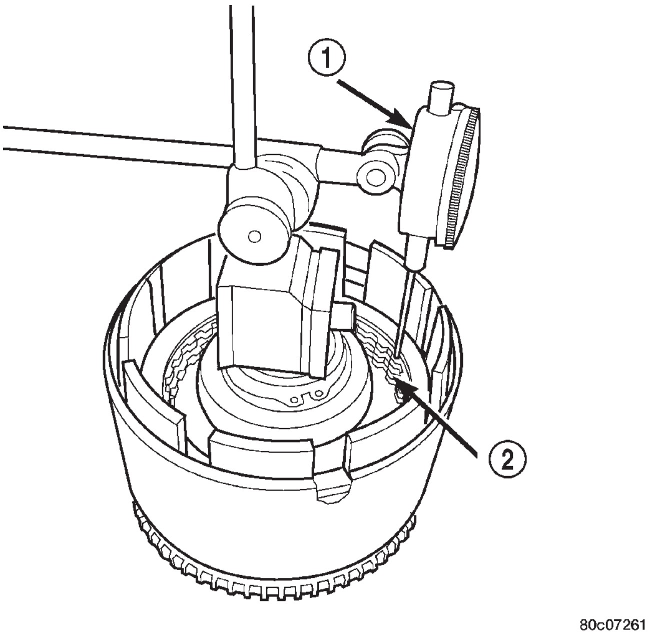


Fig. 203 Set Up Dial Indicator to Measure UD Clutch Clearance

1 - DIAL INDICATOR
2 - UNDERDRIVE CLUTCH

(19) Set up dial indicator (1) on the UD clutch pack (2) (Fig. 203).

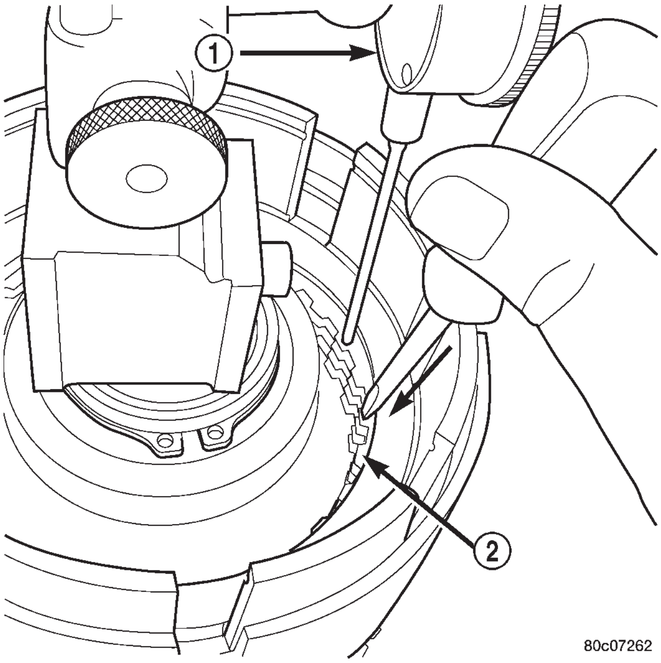


Fig. 204 Press Down on UD Clutch Pack and Zero Dial Indicator

1 - DIAL INDICATOR
2 - UNDERDRIVE CLUTCH

(20) Using moderate pressure, press down and hold (near indicator) the UD clutch pack (2) with screwdriver or suitable tool and zero dial indicator (1) (Fig. 204). When releasing pressure on clutch pack, indicator reading should advance 0.005-0.010 inches.

CAUTION: Do not apply more than 30 psi (206 kPa) to the underdrive clutch pack.

(21) Apply 30 psi (206 kPa) to the underdrive hose on Tool 8391 and measure UD clutch clearance. Measure and record UD clutch pack measurement in four (4) places, 90° apart.

(22) Take average of four measurements and compare with UD clutch pack clearance specification. **Underdrive clutch pack clearance must be 0.94-1.50 mm (0.037-0.059 in.).**

(23) If necessary, select the proper reaction plate to achieve specifications.

(24) Install the OD clutch pack (four fibers/three steels) (1) (Fig. 205).

(25) Install OD reaction plate waved snap ring (1) (Fig. 206).

(26) Install the OD/Reverse reaction plate (1) with large step down (towards OD clutch pack) (Fig. 207).

(27) Install OD reaction plate flat snap ring (3) (Fig. 208).

INPUT CLUTCH ASSEMBLY (Continued)

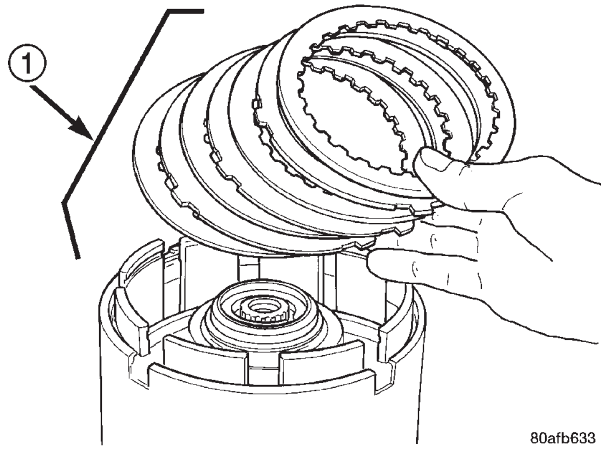


Fig. 205 Install OD Clutch Pack

1 - OVERDRIVE CLUTCH PACK

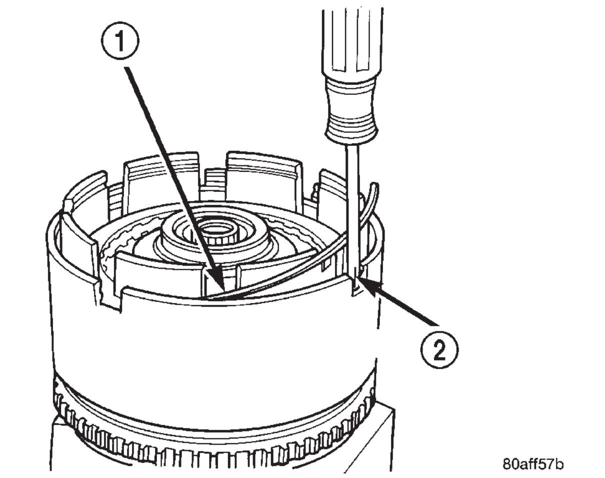


Fig. 206 Install Waved Snap Ring

1 - OVERDRIVE REACTION PLATE WAVED SNAP RING
2 - SCREWDRIVER

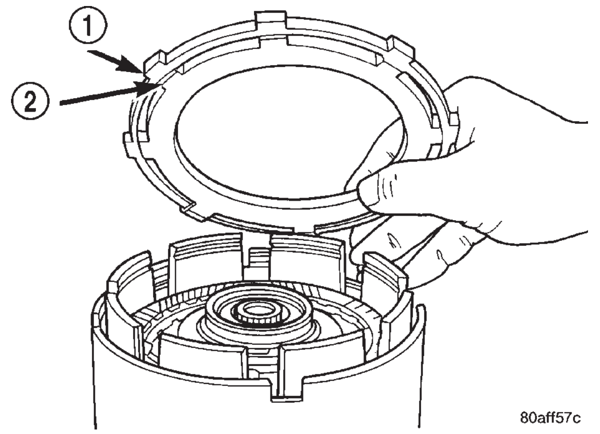


Fig. 207 OD/Reverse Reaction Plate

1 - OVERDRIVE/REVERSE PRESSURE PLATE
2 - (STEP SIDE DOWN)

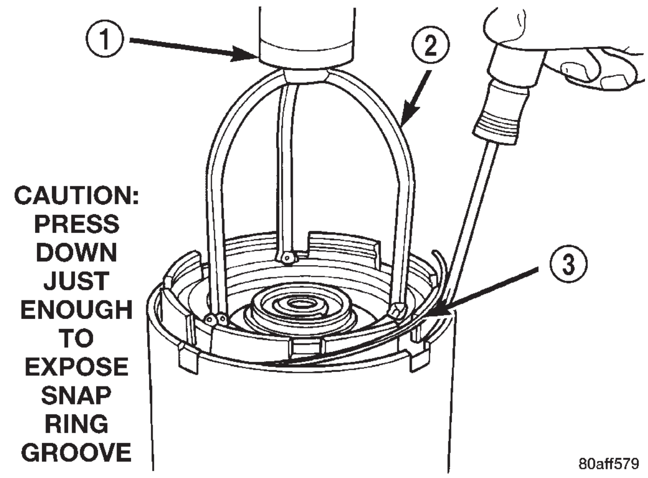


Fig. 208 Install Flat Snap Ring

1 - ARBOR PRESS RAM
2 - TOOL 5059A
3 - FLAT SNAP RING

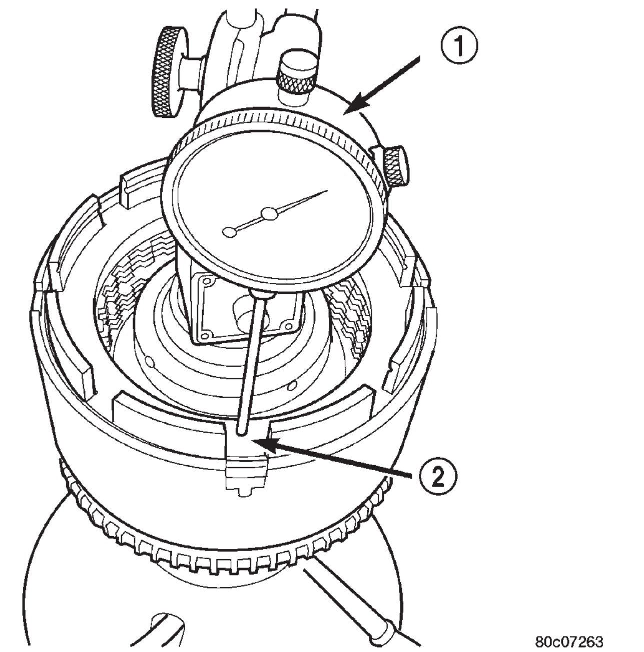


Fig. 209 Measure OD Clutch Pack Clearance

1 - DIAL INDICATOR
2 - OD/REVERSE PRESSURE PLATE

(28) Measure OD clutch pack clearance. Set up dial indicator (1) on top of the OD/Reverse reaction plate (2) (Fig. 209).

(29) Zero dial indicator and apply 30 psi (206 kPa) air pressure to the overdrive clutch hose on Tool 8391. Measure and record OD clutch pack measurement in four (4) places, 90° apart.

(30) Take average of four measurements and compare with OD clutch pack clearance specification. **The overdrive (OD) clutch pack clearance is 1.07-3.25 mm (0.042-0.128 in.).**

INPUT CLUTCH ASSEMBLY (Continued)

If not within specifications, the clutch is not assembled properly. There is no adjustment for the OD clutch clearance.

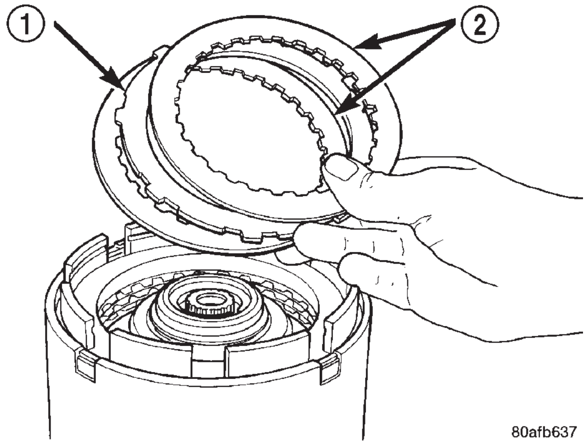


Fig. 210 Install Reverse Clutch Pack

1 - REVERSE CLUTCH PLATE
2 - REVERSE CLUTCH DISCS

(31) Install reverse clutch pack (two fibers/one steel) (1, 2) (Fig. 210).

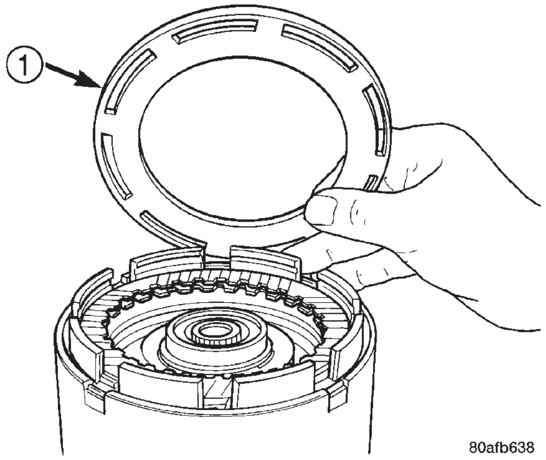


Fig. 211 Install Reaction Plate

1 - REVERSE CLUTCH REACTION PLATE (FLAT SIDE DOWN)

(32) Install reverse clutch reaction plate (1) with the flat side down towards reverse clutch (Fig. 211).

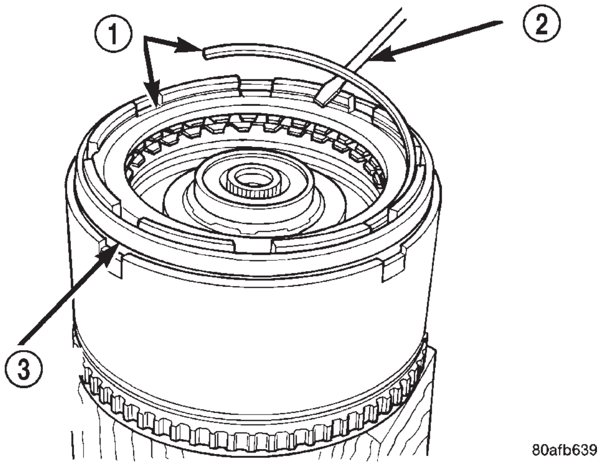


Fig. 212 Install Reverse Clutch Snap Ring

1 - REVERSE CLUTCH SNAP RING (SELECT)
2 - SCREWDRIVER
3 - REVERSE CLUTCH REACTION PLATE

(33) Tap reaction plate (3) down to allow installation of the reverse clutch snap ring (1). Install reverse clutch snap ring (1) (Fig. 212).

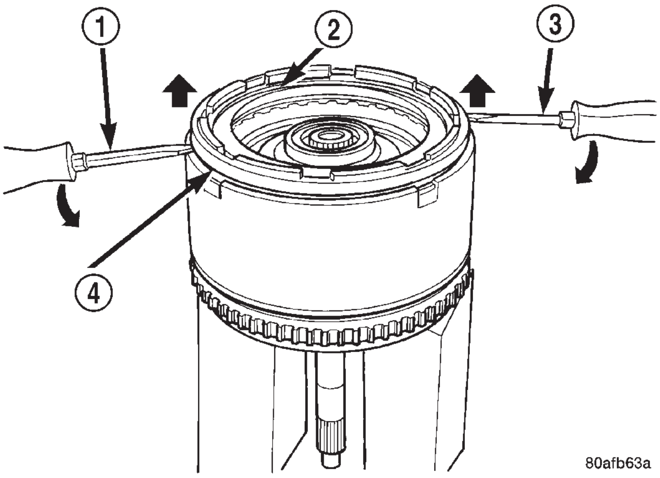


Fig. 213 Pry Up Reaction Plate

1 - SCREWDRIVER
2 - SNAP RING
3 - SCREWDRIVER
4 - MUST RAISE REVERSE REACTION PLATE TO RAISE SNAP RING

(34) Pry up reverse reaction plate (4) to seat against snap ring (2) (Fig. 213).

INPUT CLUTCH ASSEMBLY (Continued)

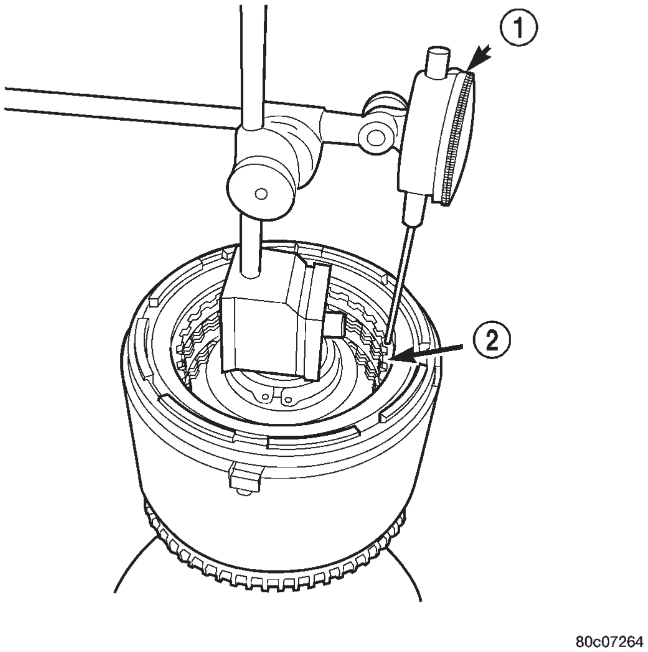


Fig. 214 Measure Reverse Clutch Pack Clearance

1 - DIAL INDICATOR
2 - REVERSE CLUTCH

(35) Set up a dial indicator (1) on the reverse clutch pack (2) (Fig. 214).

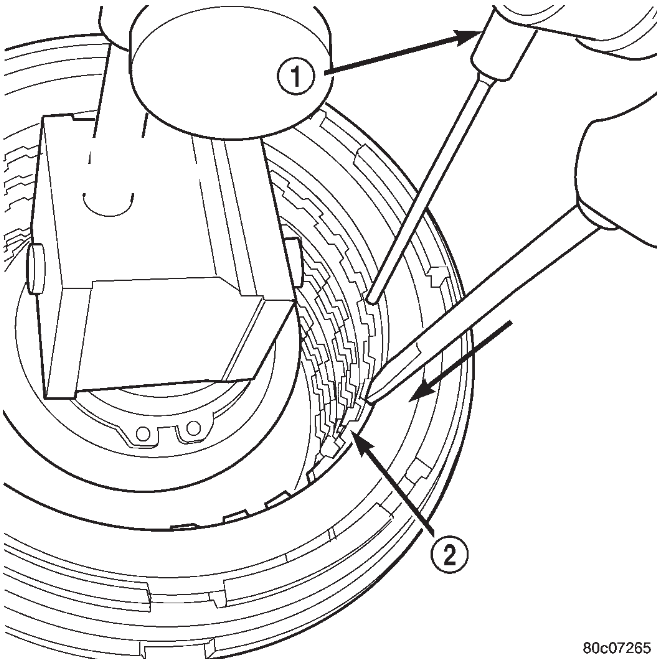


Fig. 215 Press Down on Reverse Clutch and Zero Indicator

1 - DIAL INDICATOR
2 - REVERSE CLUTCH

(36) Using moderate pressure, press down and hold (near indicator) reverse clutch disc (2) with screwdriver or suitable tool and zero dial indicator (1) (Fig. 215). When releasing pressure, indicator should advance 0.005-0.010 inches as clutch pack relaxes.

(37) Apply 30 psi (206 kPa) air pressure to the reverse clutch hose on Tool 8391. Measure and record reverse clutch pack measurement in four (4) places, 90° apart.

(38) Take average of four measurements and compare with reverse clutch pack clearance specification. **The reverse clutch pack clearance is 0.89-1.37 mm (0.035-0.054 in.).** Select the proper reverse clutch snap ring to achieve specifications.

(39) To complete the assembly, reverse clutch and overdrive clutch must be removed.

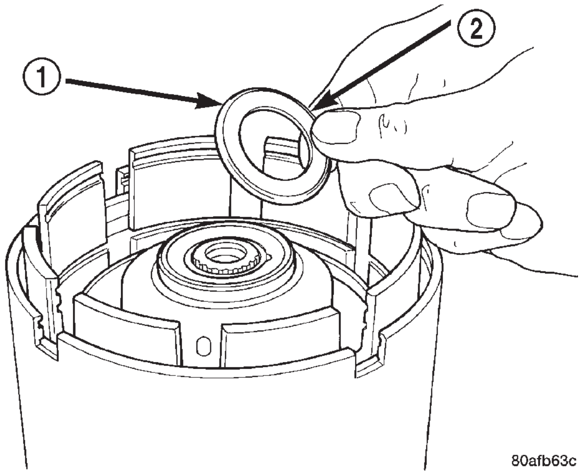


Fig. 216 Install No. 2 Needle Bearing

1 - #2 NEEDLE BEARING (NOTE 3 SMALL TABS)
2 - TABS UP

(40) Install the number 2 needle bearing (1) (Fig. 216).

INPUT CLUTCH ASSEMBLY (Continued)

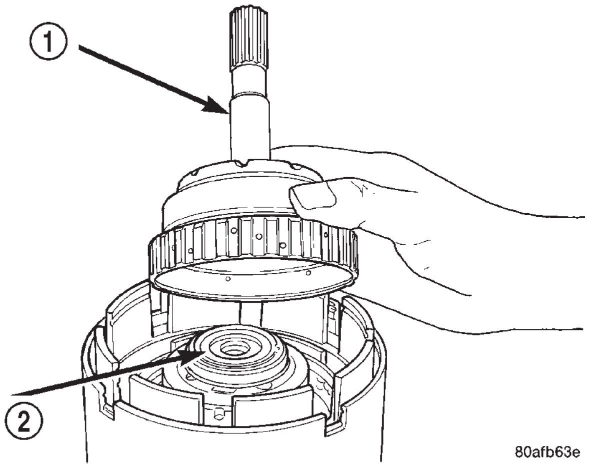


Fig. 217 Install Underdrive Shaft Assembly

1 - UNDERDRIVE SHAFT ASSEMBLY
2 - #2 NEEDLE BEARING

(41) Install the underdrive shaft assembly (1) (Fig. 217).

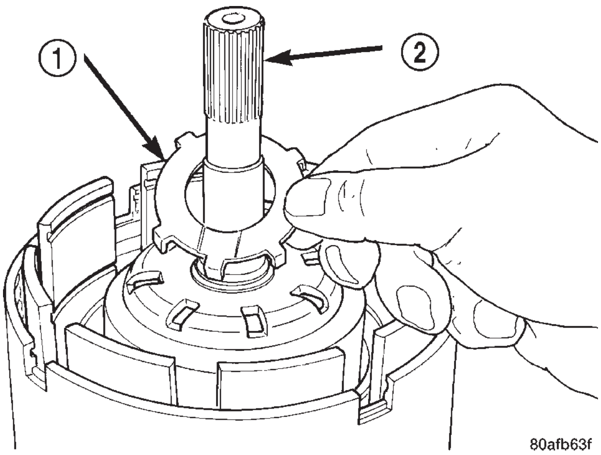


Fig. 218 Install No. 3 Thrust Washer

1 - #3 THRUST WASHER (NOTE 5 TABS)
2 - UNDERDRIVE SHAFT ASSEMBLY

(42) Install the number 3 thrust washer (1) (Fig. 218) to the underdrive shaft assembly (2). Be sure five tabs are seated properly.

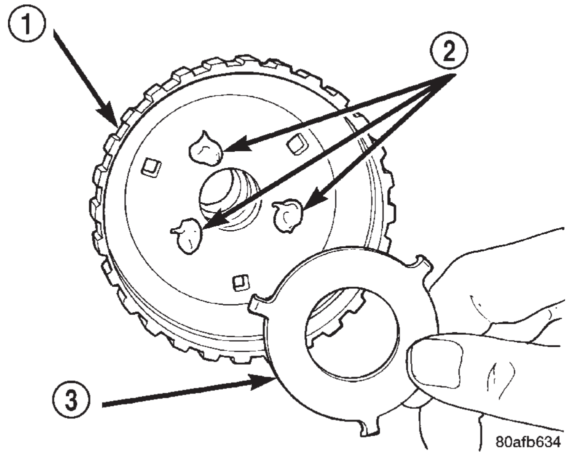


Fig. 219 Install No. 3 Thrust Plate

1 - OVERDRIVE SHAFT ASSEMBLY
2 - DABS OF PETROLATUM (FOR RETENTION)
3 - #3 THRUST PLATE (NOTE 3 TABS)

(43) Install the number 3 thrust plate (3) to the bottom of the overdrive shaft assembly (1). Retain with petrolatum or transmission assembly gel (2) (Fig. 219).

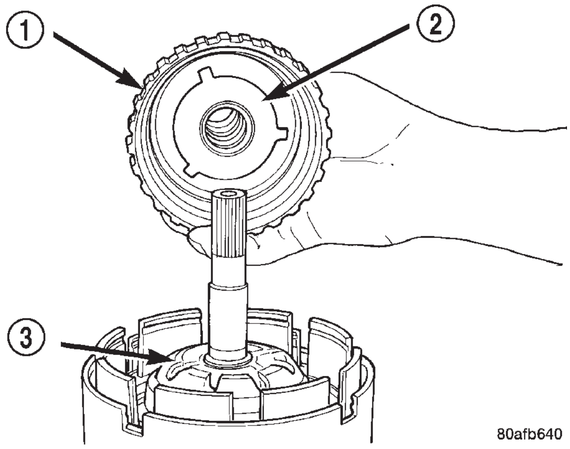


Fig. 220 Install Overdrive Shaft Assembly

1 - OVERDRIVE SHAFT ASSEMBLY
2 - #3 THRUST PLATE
3 - #3 THRUST WASHER

(44) Install the overdrive shaft assembly (1) (Fig. 220).

INPUT CLUTCH ASSEMBLY (Continued)

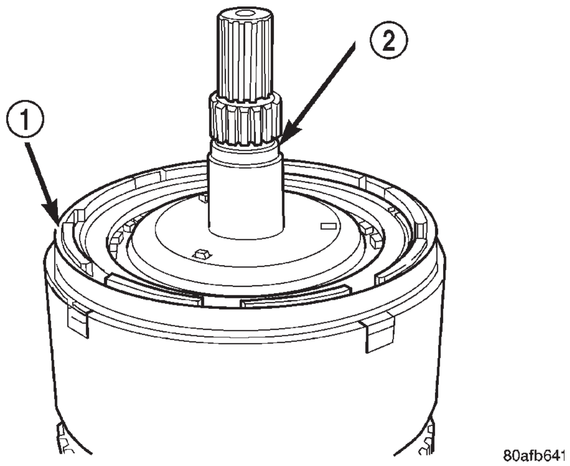


Fig. 221 Input Clutch Assembly

1 - INPUT CLUTCH ASSEMBLY
2 - OVERDRIVE SHAFT ASSEMBLY

(45) Reinstall overdrive and reverse clutch (Fig. 221). **Rechecking these clutch clearances is not necessary.**

INPUT SPEED SENSOR

DESCRIPTION

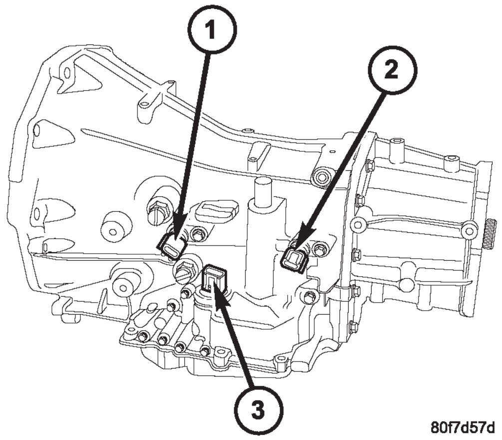


Fig. 222 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

The Input and Output Speed Sensors (Fig. 222) are two-wire magnetic pickup devices that generate AC signals as rotation occurs. They are mounted in the left side of the transmission case and are considered primary inputs to the Transmission Control Module (TCM).

OPERATION

The Input Speed Sensor provides information on how fast the input shaft is rotating. As the teeth of the input clutch hub pass by the sensor coil, an AC voltage is generated and sent to the TCM. The TCM interprets this information as input shaft rpm.

The Output Speed Sensor generates an AC signal in a similar fashion, though its coil is excited by rotation of the rear planetary carrier lugs. The TCM interprets this information as output shaft rpm.

The TCM compares the input and output speed signals to determine the following:

- Transmission gear ratio
- Speed ratio error detection
- CVI calculation

The TCM also compares the input speed signal and the engine speed signal to determine the following:

- Torque converter clutch slippage
- Torque converter element speed ratio

REMOVAL

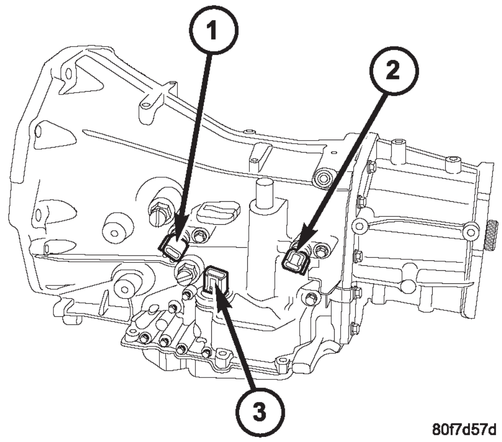


Fig. 223 Input Speed Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

(1) Raise vehicle.

(2) Place a suitable fluid catch pan under the transmission.

(3) Remove the wiring connector from the input speed sensor (Fig. 223).

NOTE: The speed sensor bolt has a sealing patch applied from the factory. Be sure to reuse the same bolt.

(4) Remove the bolt holding the input speed sensor to the transmission case.

(5) Remove the input speed sensor from the transmission case.

INPUT SPEED SENSOR (Continued)

INSTALLATION

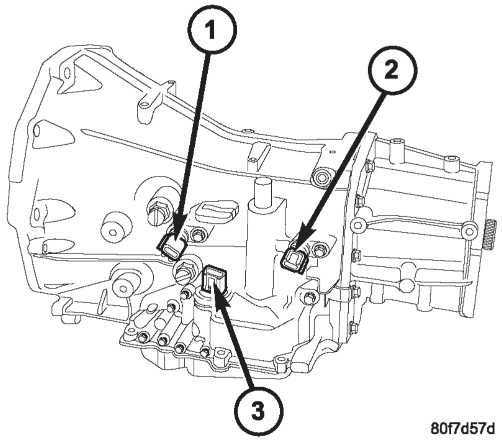


Fig. 224 Input Speed Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

(1) Install the input speed sensor (1) (Fig. 224)into the transmission case.

NOTE: Before installing the speed sensor bolt, it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

(2) Install the bolt to hold the input speed sensor into the transmission case. Tighten the bolt to 9 N·m (80 in.lbs.).
(3) Install the wiring connector onto the input speed sensor
(4) Verify the transmission fluid level. Add fluid as necessary.
(5) Lower vehicle.

OIL PUMP

DESCRIPTION

The oil pump is located in the pump housing inside the bell housing of the transmission case. The oil pump assembly (Fig. 225) consists of an inner (3) and outer (2) gear, a housing (1), and a cover that also serves as the reaction shaft support (6).

OPERATION

As the torque converter rotates, the converter hub rotates the inner and outer gears. As the gears rotate, the clearance between the gear teeth increases in the crescent area, and creates a suction at the inlet side of the pump. This suction draws fluid through the pump inlet from the oil pan. As the clearance between the gear teeth in the crescent area

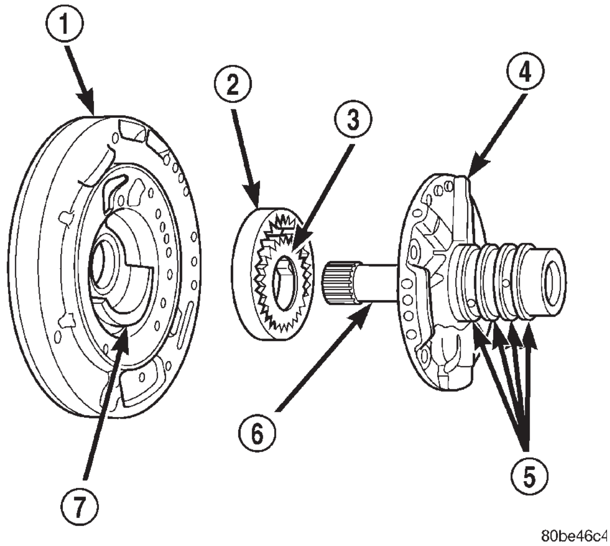


Fig. 225 Oil Pump Assembly

1 - PUMP HOUSING
2 - OUTER PUMP GEAR
3 - INNER PUMP GEAR
4 - REACTION SHAFT SUPPORT
5 - SEAL RINGS (4)
6 - REACTION SHAFT
7 - CRESCENT

decreases, it forces pressurized fluid into the pump outlet and to the valve body.

DISASSEMBLY

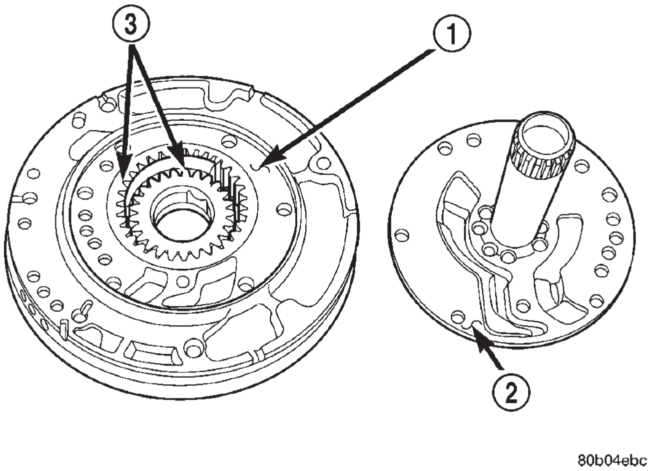


Fig. 226 Reaction Shaft Support

1 - PUMP HOUSING
2 - REACTION SHAFT SUPPORT
3 - PUMP GEARS

(1) Remove the reaction shaft support bolts.
(2) Remove the reaction shaft support(2) from the pump housing (1) (Fig. 226).

OIL PUMP (Continued)

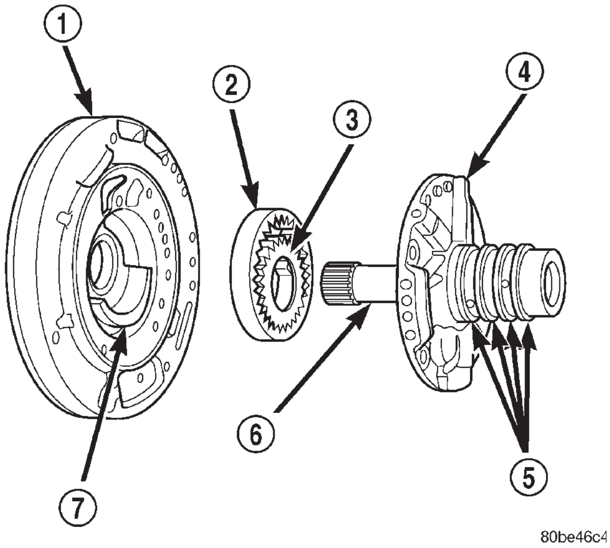


Fig. 227 Oil Pump Assembly

1 - PUMP HOUSING
2 - OUTER PUMP GEAR
3 - INNER PUMP GEAR
4 - REACTION SHAFT SUPPORT
5 - SEAL RINGS (4)
6 - REACTION SHAFT
7 - CRESCENT

(3) Remove the pump gears (2, 3) (Fig. 227) and check for wear and damage on pump housing (1) and gears (2, 3).

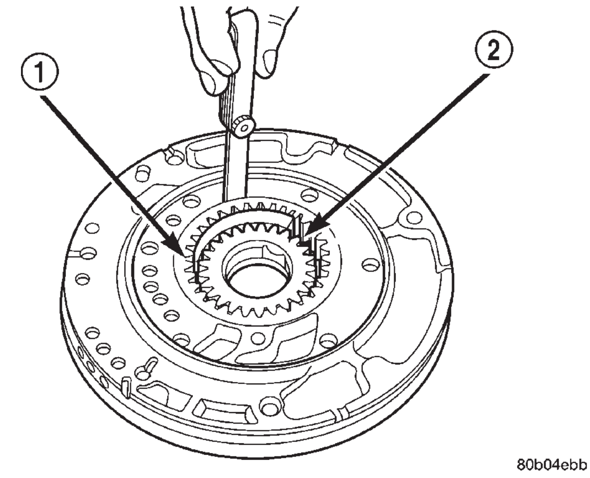


Fig. 228 Measure Outer Gear to Pocket

1 - OUTER GEAR
2 - POCKET

(4) Re-install the gears and check clearances.

(5) Measure the clearance between the outer gear (1) and the pump pocket (2) (Fig. 228). Clearance should be 0.089-0.202 mm (0.0035-0.0079 in.).

(6) Measure clearance between outer gear and crescent. Clearance should be 0.060-0.298 mm (0.0023-0.0117 in.).

(7) Measure clearance between inner gear and crescent. Clearance should be 0.093-0.385 mm (0.0036-0.0151 in.).

(8) Position an appropriate piece of Plastigage across both pump gears.

(9) Align the Plastigage to a flat area on the reaction shaft support housing.

(10) Install the reaction shaft to the pump housing. Tighten the bolts to 27 N·m (20 ft. lbs.).

(11) Remove bolts and carefully separate the housings. Measure the Plastigage following the instructions supplied.

(12) Clearance between outer gear side and the reaction shaft support should be 0.020-0.046 mm (0.0008-0.0018 in.). Clearance between inner gear side and the reaction shaft support should be 0.020-0.046 mm (0.0008-0.0018 in.).

ASSEMBLY

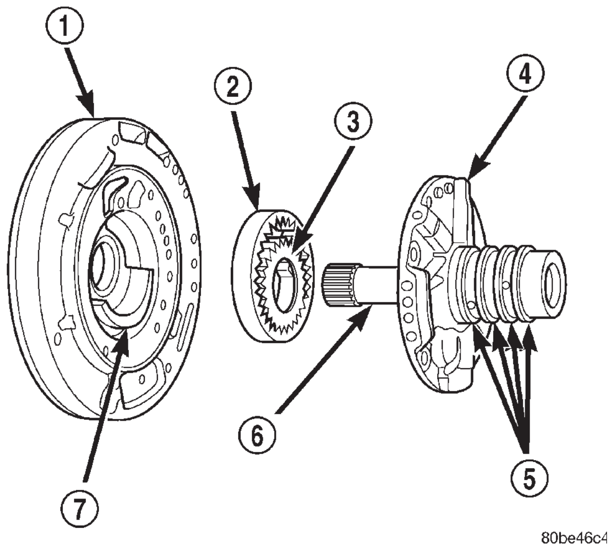


Fig. 229 Oil Pump Assembly

1 - PUMP HOUSING
2 - OUTER PUMP GEAR
3 - INNER PUMP GEAR
4 - REACTION SHAFT SUPPORT
5 - SEAL RINGS (4)
6 - REACTION SHAFT
7 - CRESCENT

(1) Assemble oil pump as shown (Fig. 229)

(2) Install and torque reaction shaft support-to-oil pump housing bolts to 28 N·m (20 ft. lbs.) torque.

OUTPUT SPEED SENSOR

DESCRIPTION

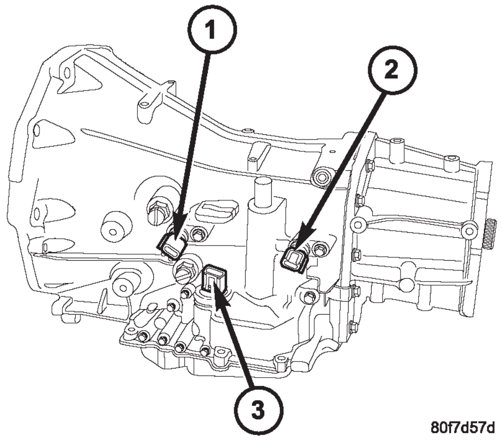


Fig. 230 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

The Input and Output Speed Sensors (Fig. 230) are two-wire magnetic pickup devices that generate AC signals as rotation occurs. They are mounted in the left side of the transmission case and are considered primary inputs to the Transmission Control Module (TCM).

OPERATION

The Input Speed Sensor provides information on how fast the input shaft is rotating. As the teeth of the input clutch hub pass by the sensor coil, an AC voltage is generated and sent to the TCM. The TCM interprets this information as input shaft rpm.

The Output Speed Sensor generates an AC signal in a similar fashion, though its coil is excited by rotation of the rear planetary carrier lugs. The TCM interprets this information as output shaft rpm.

The TCM compares the input and output speed signals to determine the following:

- Transmission gear ratio
- Speed ratio error detection
- CVI calculation

The TCM also compares the input speed signal and the engine speed signal to determine the following:

- Torque converter clutch slippage
- Torque converter element speed ratio

REMOVAL

(1) Raise vehicle.

(2) Place a suitable fluid catch pan under the transmission.

(3) Remove the wiring connector from the output speed sensor (2) (Fig. 231).

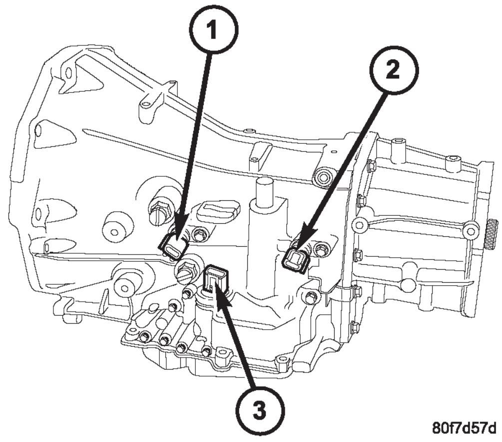


Fig. 231 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

NOTE: The speed sensor bolt has a sealing patch applied from the factory. Be sure to reuse the same bolt.

(4) Remove the bolt holding the output speed sensor to the transmission case.

(5) Remove the output speed sensor (2) from the transmission case.

INSTALLATION

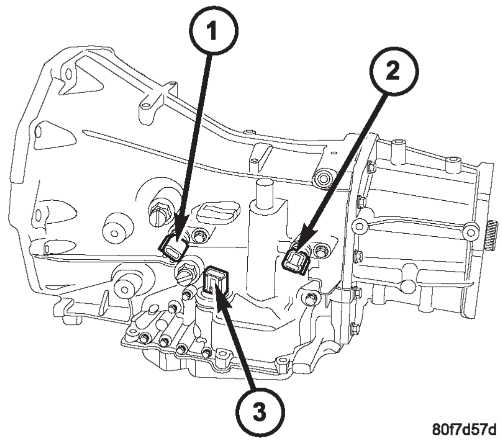


Fig. 232 Input and Output Speed Sensors and Transmission Range Sensor

1 - INPUT SPEED SENSOR
2 - OUTPUT SPEED SENSOR
3 - TRANSMISSION RANGE SENSOR

(1) Install the output speed sensor (2) (Fig. 232) into the transmission case.

OUTPUT SPEED SENSOR (Continued)

NOTE: Before installing the speed sensor bolt, it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

(2) Install the bolt to hold the output speed sensor into the transmission case. Tighten the bolt to 9 N·m (80 in.lbs.).

(3) Install the wiring connector onto the output speed sensor

(4) Verify the transmission fluid level. Add fluid as necessary.

(5) Lower vehicle.

OVERDRIVE SWITCH

DESCRIPTION

The overdrive OFF (control) switch is located in the center console (Fig. 233). The switch is a momentary contact device that signals the PCM to toggle current status of the overdrive function.

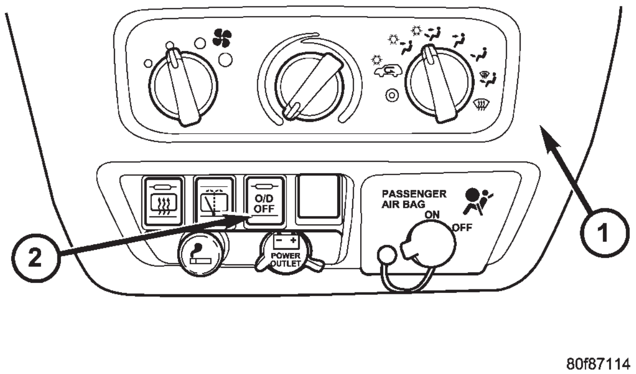


Fig. 233 Overdrive Off Switch

1 - ACCESSORY SWITCH BEZEL
2 - OVERDRIVE OFF SWITCH

OPERATION

At key-on, overdrive operation is allowed. Pressing the switch once causes the overdrive OFF mode to be entered and the overdrive OFF switch lamp to be illuminated. Pressing the switch a second time causes normal overdrive operation to be restored and the overdrive lamp to be turned off. The overdrive OFF mode defaults to ON after the ignition switch is cycled OFF and ON. The normal position for the control switch is the ON position. The switch must be in this position to energize the solenoid and allow a 3-4 upshift. The control switch indicator light illuminates only when the overdrive switch is turned to the OFF position, or when illuminated by the transmission control module.

REMOVAL

(1) Remove the accessory switch bezel (Fig. 234) (Refer to 23 - BODY/INSTRUMENT PANEL/ACCESSORY SWITCH BEZEL - REMOVAL).

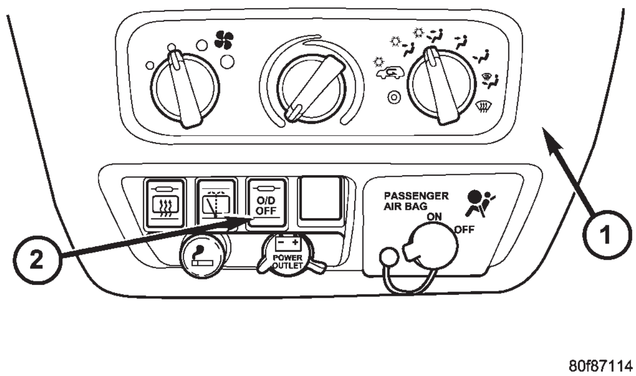


Fig. 234 Overdrive Off Switch

1 - ACCESSORY SWITCH BEZEL
2 - OVERDRIVE OFF SWITCH

(2) Remove the overdrive off switch from the accessory switch bezel.

INSTALLATION

(1) Install the overdrive off switch to the accessory switch bezel.

(2) Install the accesory switch bezel (Refer to 23 - BODY/INSTRUMENT PANEL/ACCESSORY SWITCH BEZEL - INSTALLATION).

PLANETARY GEARTRAIN

DESCRIPTION

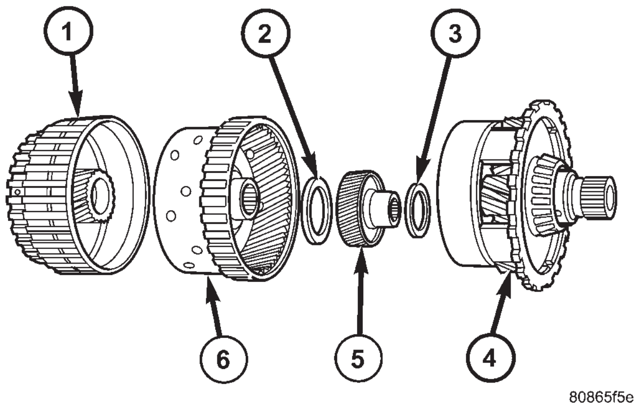


Fig. 235 Planetary Geartrain

1 - FRONT SUN GEAR ASSEMBLY
2 - #6 THRUST BEARING
3 - #7 THRUST BEARING
4 - REAR CARRIER FRONT ANNULUS ASSEMBLY
5 - REAR SUN GEAR
6 - FRONT CARRIER REAR ANNULUS ASSEMBLY

The planetary geartrain is located between the input clutch assembly and the rear of the transmission case. The planetary geartrain consists of two sun gears, two planetary carriers, two annulus (ring) gears, and one output shaft (Fig. 235).

OPERATION

The planetary geartrain utilizes two planetary gear sets that connect the transmission input shaft to the output shaft. Input and holding clutches drive or lock different planetary members to change output ratio or direction.

OIL PUMP SEAL

REMOVAL

(1) Remove the transmission from the vehicle (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE - REMOVAL).

(2) Remove the torque converter from the transmission bellhousing.

(3) Use special tool C-3981B to remove oil pump seal.

INSTALLATION

(1) Clean and inspect oil pump seal seat. Then install seal using special tool C-4193-A.

(2) Clean and inspect torque converter hub. If nicks, scratches or hub wear are found, torque converter replacement will be required.

CAUTION: If the torque converter is being replaced, apply a light coating of grease to the crankshaft pilot hole. Also inspect the engine drive plate for cracks. If any cracks are found replace the drive plate. Do not attempt to repair a cracked drive plate. Always use new torque converter to drive plate bolts.

(3) Apply a light film of transmission oil to the torque converter hub and oil seal lips. Then install torque converter into transmission. Be sure that the hub lugs mesh with the front pump lugs when installing.

(4) Reinstall the transmission into the vehicle. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - INSTALLATION)

SHIFT MECHANISM

DESCRIPTION

The shift mechanism is cable operated and provides six shift positions. The shift indicator is located on the console next to the gear shift. The shift positions are:

- Park (P)
- Reverse (R)
- Neutral (N)
- Drive (D)
- Manual Second (2)
- Manual Low (1)

OPERATION

Manual low (1) range provides first gear only. Over run braking is also provided in this range. Manual second (2) range provides first and second gear only. Drive range provides first, second, and third gear ranges.

DIAGNOSIS AND TESTING - SHIFT MECHANISM

(1) The floor shifter lever and gate positions should be in alignment with all transmission PARK, NEUTRAL, and gear detent positions.

(2) Engine starts must be possible with floor shift lever in PARK or NEUTRAL gate positions only. Engine starts must not be possible in any other gear position.

(3) With floor shift lever handle push-button not depressed and lever in:

SHIFT MECHANISM (Continued)

(a) PARK position - Apply forward force on center of handle and remove pressure. Engine starts must be possible.
(b) PARK position - Apply rearward force on center of handle and remove pressure. Engine starts must be possible.
(c) NEUTRAL position - Normal position. Engine starts must be possible.
(d) NEUTRAL position - Engine running and brakes applied, apply forward force on center of shift handle. Transmission shall not be able to shift from NEUTRAL to REVERSE.

ADJUSTMENTS - SHIFT MECHANISM

Check adjustment by starting the engine in PARK and NEUTRAL. Adjustment is CORRECT if the engine starts only in these positions. Adjustment is INCORRECT if the engine starts in one but not both positions. If the engine starts in any position other than PARK or NEUTRAL, or if the engine will not start at all, the TRS may be faulty.

Gearshift Adjustment Procedure

(1) Shift transmission into PARK.
(2) Remove floor console as necessary for access to the shift cable adjustment. (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - REMOVAL)
(3) Loosen the shift cable adjustment nut.
(4) Raise vehicle.
(5) Unsnap cable eyelet from transmission shift lever.
(6) Verify transmission shift lever is in PARK detent by moving lever fully rearward. Last rearward detent is PARK position.
(7) Verify positive engagement of transmission park lock by attempting to rotate propeller shaft. Shaft will not rotate when park lock is engaged.
(8) Snap cable eyelet onto transmission shift lever.
(9) Lower vehicle
(10) Tighten the shift cable adjustment screw to 12 N·m (105 in.lbs.).
(11) Verify correct operation.
(12) Install any floor console components removed for access. (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - INSTALLATION)

SOLENOID

DESCRIPTION

The typical electrical solenoid used in automotive applications is a linear actuator. It is a device that produces motion in a straight line. This straight line motion can be either forward or backward in direction, and short or long distance.

A solenoid is an electromechanical device that uses a magnetic force to perform work. It consists of a coil of wire, wrapped around a magnetic core made from steel or iron, and a spring loaded, movable plunger, which performs the work, or straight line motion.

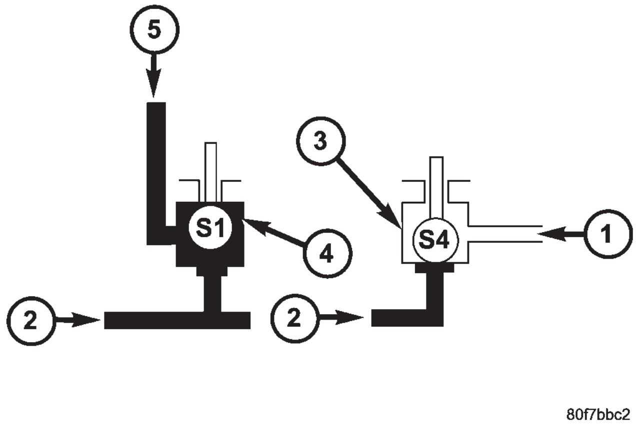


Fig. 236 2/4 - Low Reverse and Underdrive Solenoids

1 - MANUAL VALVE
2 - LINE PRESSURE
3 - 2/4 - LOW REVERSE SOLENOID ENERGIZED
4 - UNDERDRIVE SOLENOID DE-ENERGIZED
5 - UNDERDRIVE CLUTCH

The solenoids used in transmission applications are attached to valves which can be classified as **normally open (Fig. 236)** or **normally closed (Fig. 237)**. The **normally open** solenoid valve is defined as a valve which allows hydraulic flow when no current or voltage is applied to the solenoid. The **normally closed** solenoid valve is defined as a valve which does not allow hydraulic flow when no current or voltage is applied to the solenoid. These valves perform hydraulic control functions for the transmission and must therefore be durable and tolerant of dirt particles. For these reasons, the valves have hardened steel poppets and ball valves. The solenoids operate the valves directly, which means that the solenoids must have very high outputs to close the valves against the sizable flow areas and line pressures found in current transmissions. Fast response time is also necessary to ensure accurate control of the transmission.

The strength of the magnetic field is the primary force that determines the speed of operation in a particular solenoid design. A stronger magnetic field will cause the plunger to move at a greater speed than a weaker one. There are basically two ways to increase the force of the magnetic field:

1. Increase the amount of current applied to the coil or
2. Increase the number of turns of wire in the coil.

SOLENOID (Continued)

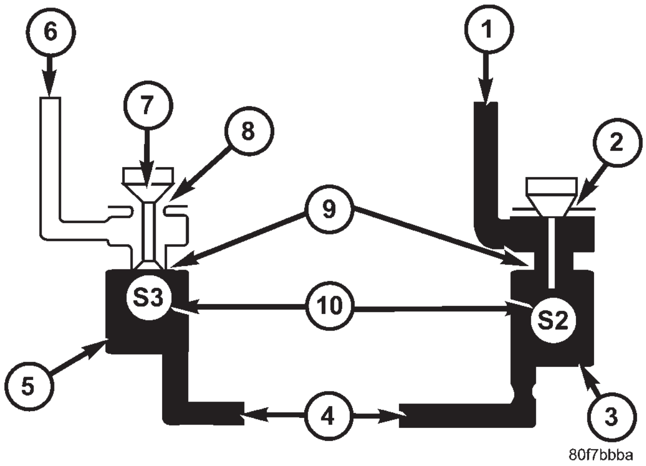


Fig. 237 Low Reverse/Converter Clutch and Overdrive Solenoids

1 - OVERDRIVE CLUTCH
2 - NO VENT
3 - OVERDRIVE SOLENOID ENERGIZED
4 - MANUAL VALVE
5 - LOW REVERSE/CONVERTER CLUTCH SOLENOID DE-ENERGIZED
6 - SOLENOID SWITCH VALVE
7 - TAPER
8 - VENT TO SUMP
9 - ORIFICE
10 - CHECK BALL

The most common practice is to increase the number of turns by using thin wire that can completely fill the available space within the solenoid housing. The strength of the spring and the length of the plunger also contribute to the response speed possible by a particular solenoid design.

A solenoid can also be described by the method by which it is controlled. Some of the possibilities include variable force, pulse-width modulated, constant ON, or duty cycle. The variable force and pulse-width modulated versions utilize similar methods to control the current flow through the solenoid to position the solenoid plunger at a desired position somewhere between full ON and full OFF. The constant ON and duty cycled versions control the voltage across the solenoid to allow either full flow or no flow through the solenoid's valve.

OPERATION

When an electrical current is applied to the solenoid coil, a magnetic field is created which produces an attraction to the plunger, causing the plunger to move and work against the spring pressure and the load applied by the fluid the valve is controlling. The plunger is normally directly attached to the valve which it is to operate. When the current is removed from the coil, the attraction is removed and the plunger will return to its original position due to spring pressure.

The plunger is made of a conductive material and accomplishes this movement by providing a path for the magnetic field to flow. By keeping the air gap between the plunger and the coil to the minimum necessary to allow free movement of the plunger, the magnetic field is maximized.

SOLENOID/PRESSURE SWITCH ASSY

DESCRIPTION

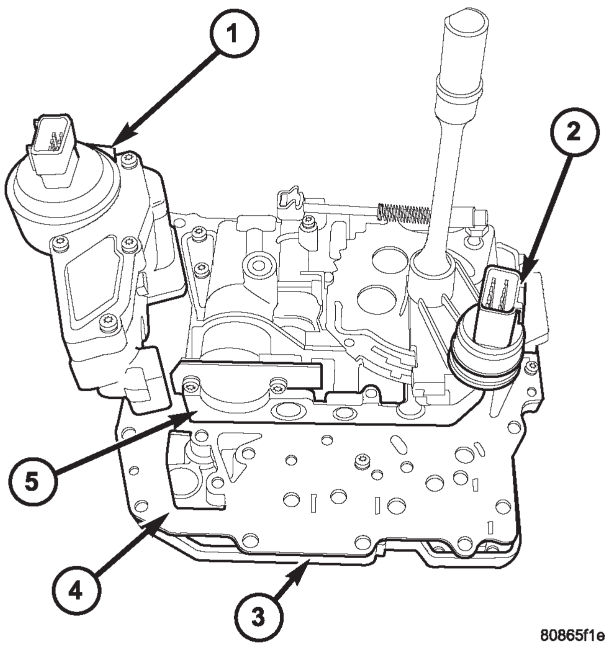


Fig. 238 Valve Body Assembly

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - TRS
3 - TRANSFER PLATE
4 - SEPARATOR PLATE
5 - VALVE BODY

The Solenoid/Pressure Switch Assembly (1) (Fig. 238) is inside the transmission and mounted to the valve body assembly. The assembly consists of four solenoids that control hydraulic pressure to the L/R, 2/4, OD, and UD friction elements (transmission clutches), and the torque converter clutch. The reverse clutch is controlled by line pressure from the manual valve in the valve body. The solenoids are contained within the Solenoid/Pressure Switch Assembly, and can only be serviced by replacing the assembly.

The solenoid assembly also contains pressure switches that monitor and send hydraulic circuit information to the TCM. Likewise, the pressure switches can only be service by replacing the assembly.

SOLENOID/PRESSURE SWITCH ASSY (Continued)

OPERATION

SOLENOIDS

The solenoids receive electrical power from the Transmission Control Relay through a single wire. The TCM energizes or operates the solenoids individually by grounding the return wire of the solenoid needed. When a solenoid is energized, the solenoid valve shifts, and a fluid passage is opened or closed (vented or applied), depending on its default operating state. The result is an apply or release of a frictional element.

The 2/4 and UD solenoids are normally applied, which allows fluid to pass through in their relaxed or "off" state. By design, this allows transmission limp-in (P,R,N,2) in the event of an electrical failure.

The continuity of the solenoids and circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the TCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a speed ratio or pressure switch error occurs.

PRESSURE SWITCHES

The TCM relies on three pressure switches to monitor fluid pressure in the L/R, 2/4, and OD hydraulic circuits. The primary purpose of these switches is to help the TCM detect when clutch circuit hydraulic failures occur. The range for the pressure switch closing and opening points is 11-23 psi. Typically the switch opening point will be approximately one psi lower than the closing point. For example, a switch may close at 18 psi and open at 17 psi. The switches are continuously monitored by the TCM for the correct states (open or closed) in each gear as shown in the following chart:

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OP	OP	OP
P/N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
D	OP	OP	CL
OD	OP	CL	CL

OP = OPEN

CL = CLOSED

A Diagnostic Trouble Code (DTC) will set if the TCM senses any switch open or closed at the wrong time in a given gear.

The TCM also tests the 2/4 and OD pressure switches when they are normally off (OD and 2/4 are tested in 1st gear, OD in 2nd gear, and 2/4 in 3rd gear). The test simply verifies that they are operational, by looking for a closed state when the corresponding element is applied. Immediately after a shift into 1st, 2nd, or 3rd gear with the engine speed above 1000 rpm, the TCM momentarily turns on element pressure to the 2/4 and/or OD clutch circuits to identify that the appropriate switch has closed. If it doesn't close, it is tested again. If the switch fails to close the second time, the appropriate Diagnostic Trouble Code (DTC) will set.

REMOVAL

NOTE: If the Solenoid/Pressure Switch Assembly is being replaced, the Quick Learn Procedure must be performed. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)

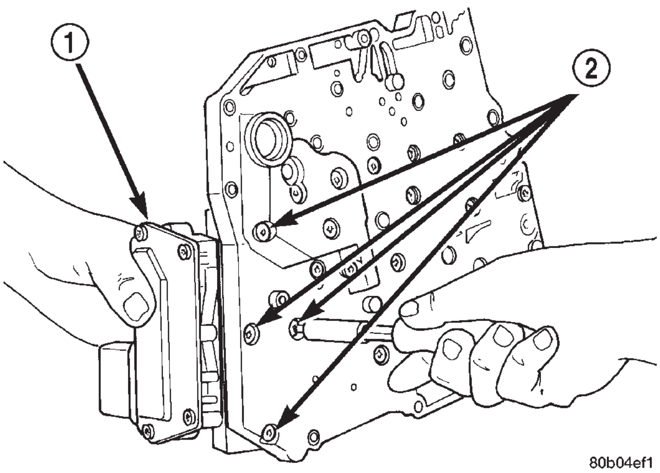


Fig. 239 Solenoid Retaining Screws

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - RETAINING SCREWS

(1) Raise vehicle on hoist.

(2) Remove valve body assembly from transmission. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/VALVE BODY - REMOVAL)

(3) Remove Solenoid/Pressure Switch Assembly retaining screws (2) from solenoid (Fig. 239).

SOLENOID/PRESSURE SWITCH ASSY (Continued)

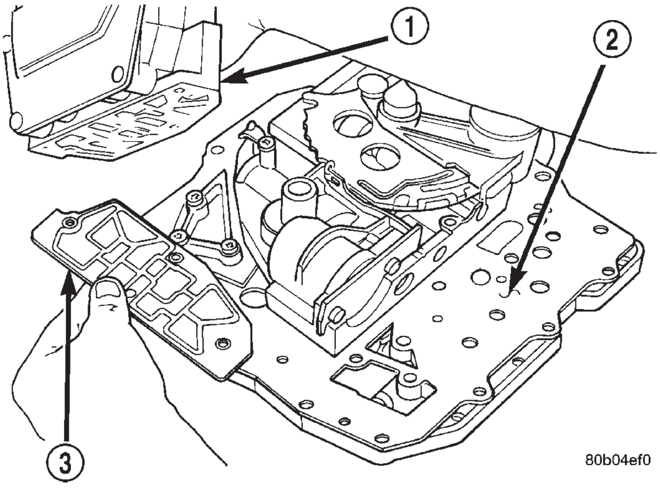


Fig. 240 Solenoid/Pressure Switch Assembly and Screen

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - VALVE BODY
3 - SCREEN

(4) Remove Solenoid/Pressure Switch Assembly (1) and screen from valve body (2) (Fig. 240).

INSTALLATION

NOTE: If the Solenoid/Pressure Switch assembly is being replaced, the Quick Learn Procedure must be performed. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)

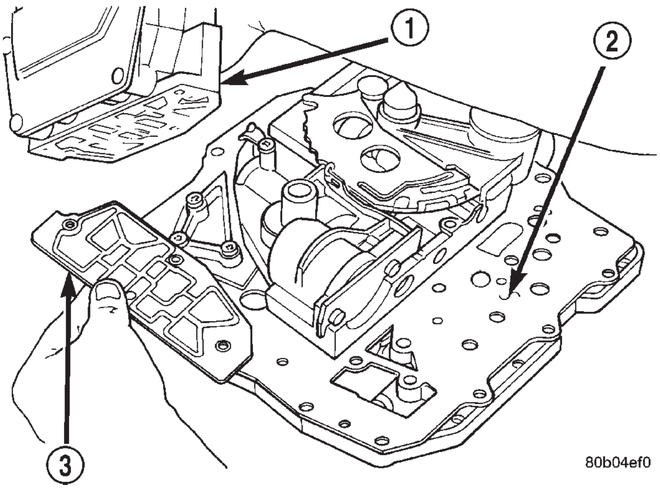


Fig. 241 Solenoid/Pressure Switch Assembly and Screen

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - VALVE BODY
3 - SCREEN

(1) Install Solenoid/Pressure Switch Assembly (1) (Fig. 241) and screen (3) to the separator and transfer plates.

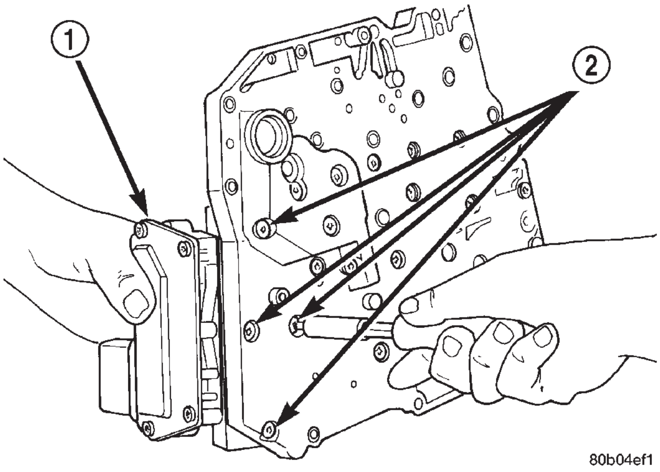


Fig. 242 Solenoid Retaining Screws

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - RETAINING SCREWS

(2) Install and tighten retaining screws (2) (Fig. 242) to 5.5 N·m (50 in. lbs.) torque.

(3) Install valve body. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/VALVE BODY - INSTALLATION)

TORQUE CONVERTER

DESCRIPTION

The torque converter (Fig. 243) is a hydraulic device that couples the engine crankshaft to the transmission. The torque converter consists of an outer shell with an internal turbine, a stator, an overrunning clutch, an impeller and an electronically applied converter clutch. The converter clutch provides reduced engine speed and greater fuel economy when engaged. Clutch engagement also provides reduced transmission fluid temperatures. The torque converter hub drives the transmission oil (fluid) pump.

The torque converter is a sealed, welded unit that is not repairable and is serviced as an assembly.

CAUTION: The torque converter must be replaced if a transmission failure resulted in large amounts of metal or fiber contamination in the fluid.

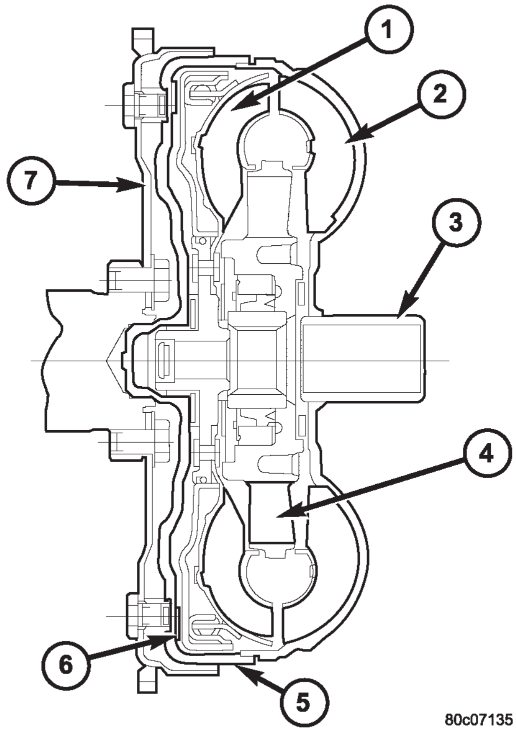


Fig. 243 Torque Converter Assembly

1 - TURBINE
2 - IMPELLER
3 - HUB
4 - STATOR
5 - FRONT COVER
6 - CONVERTER CLUTCH DISC
7 - DRIVE PLATE

TORQUE CONVERTER (Continued)

IMPELLER

The impeller (Fig. 244) is an integral part of the converter housing. The impeller consists of curved blades placed radially along the inside of the housing on the transmission side of the converter. As the converter housing is rotated by the engine, so is the impeller, because they are one and the same and are the driving members of the system.

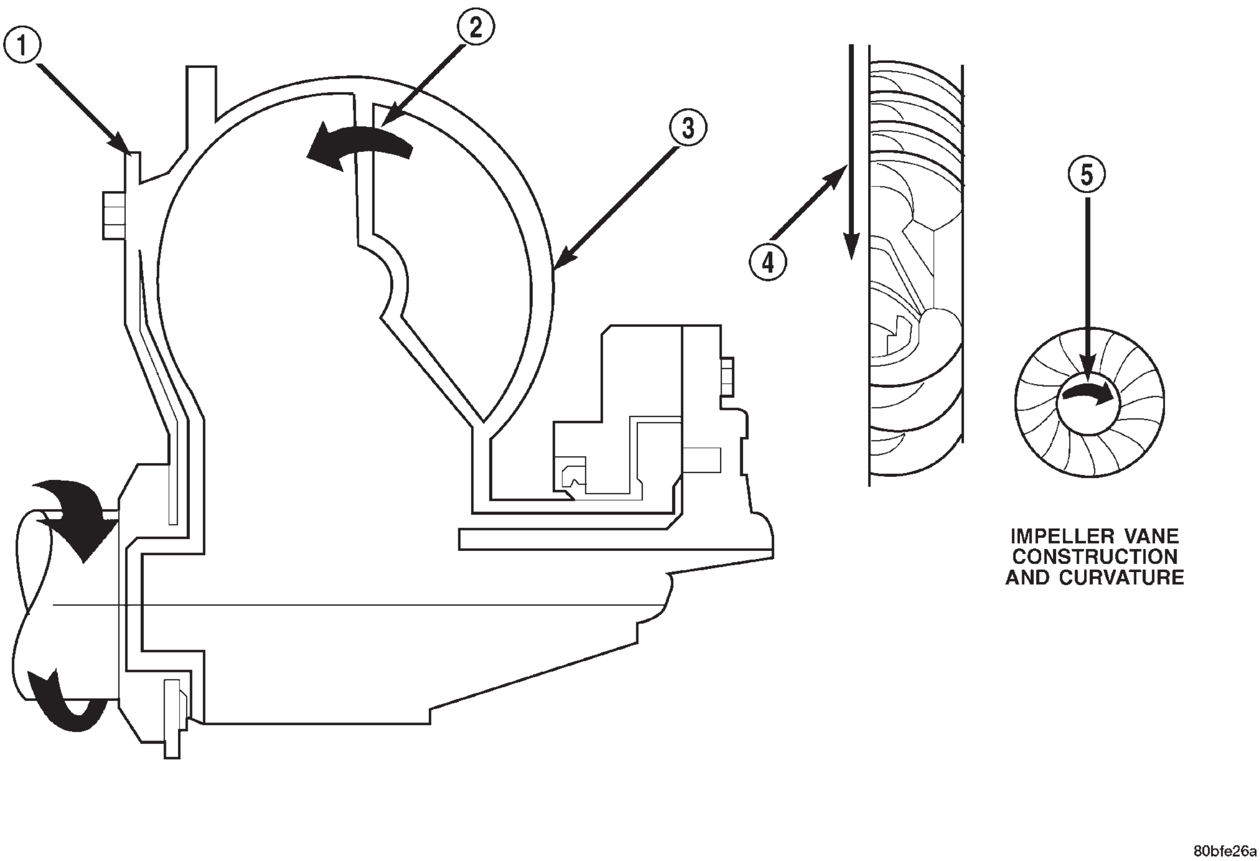


Fig. 244 Impeller

1 - ENGINE FLEXPLATE
2 - OIL FLOW FROM IMPELLER SECTION INTO TURBINE SECTION
3 - IMPELLER VANES AND COVER ARE INTEGRAL
4 - ENGINE ROTATION
5 - ENGINE ROTATION

TORQUE CONVERTER (Continued)

TURBINE

The turbine (Fig. 245) is the output, or driven, member of the converter. The turbine is mounted within the housing opposite the impeller, but is not attached to the housing. The input shaft is inserted through the center of the impeller and splined into the turbine. The design of the turbine is similar to the impeller, except the blades of the turbine are curved in the opposite direction.

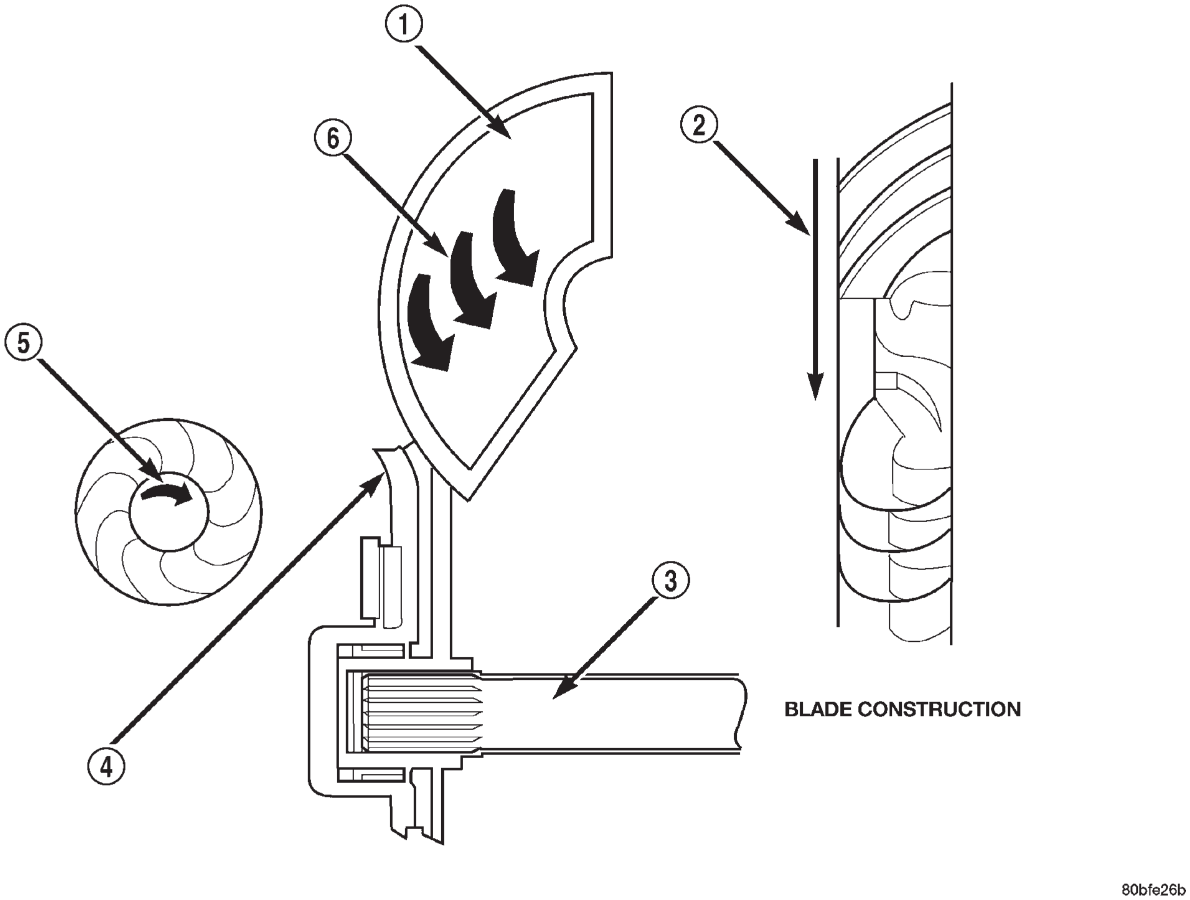


Fig. 245 Turbine

1 - TURBINE VANE
2 - ENGINE ROTATION
3 - INPUT SHAFT
4 - PORTION OF TORQUE CONVERTER COVER
5 - ENGINE ROTATION
6 - OIL FLOW WITHIN TURBINE SECTION

TORQUE CONVERTER (Continued)

STATOR

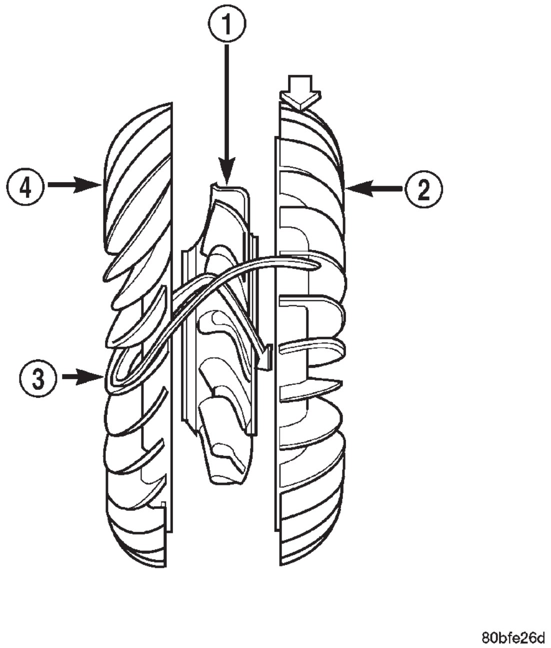


Fig. 246 Stator Location

1 - STATOR
2 - IMPELLER
3 - FLUID FLOW
4 - TURBINE

The stator assembly (Fig. 246) is mounted on a stationary shaft which is an integral part of the oil pump. The stator (1) is located between the impeller (2) and the turbine (4) within the torque converter case.

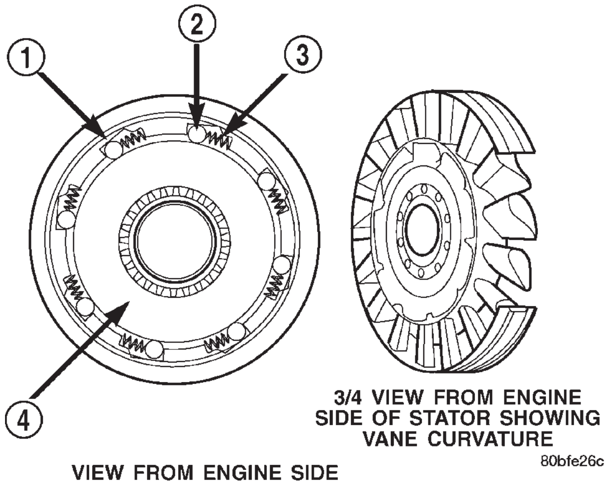


Fig. 247 Stator Components

1 - CAM (OUTER RACE)
2 - ROLLER
3 - SPRING
4 - INNER RACE

The stator contains an over-running clutch (1-4) (Fig. 247), which allows the stator to rotate only in a clockwise direction. When the stator is locked against the over-running clutch, the torque multiplication feature of the torque converter is operational.

TORQUE CONVERTER CLUTCH (TCC)

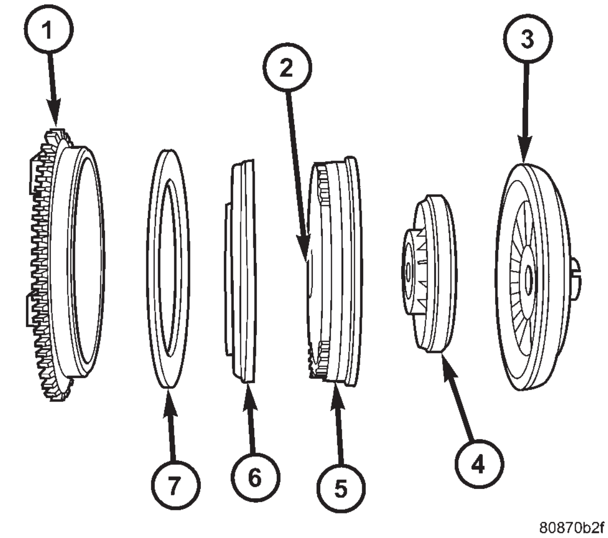


Fig. 248 Torque Converter Clutch (TCC)

1 - IMPELLER FRONT COVER
2 - THRUST WASHER ASSEMBLY
3 - IMPELLER
4 - STATOR
5 - TURBINE
6 - PISTON
7 - FRICTION DISC

The TCC (Fig. 248) was installed to improve the efficiency of the torque converter that is lost to the slippage of the fluid coupling. Although the fluid coupling provides smooth, shock-free power transfer, it is natural for all fluid couplings to slip. If the impeller (3) and turbine (5) were mechanically locked together, a zero slippage condition could be obtained. A hydraulic piston (6) with friction material (7) was added to the turbine assembly (5) to provide this mechanical lock-up.

In order to reduce heat build-up in the transmission and buffer the powertrain against torsional vibrations, the TCM can duty cycle the L/R-CC Solenoid to achieve a smooth application of the torque converter clutch. This function, referred to as Electronically Modulated Converter Clutch (EMCC) can occur at various times depending on the following variables:

- Shift lever position
- Current gear range
- Transmission fluid temperature
- Engine coolant temperature
- Input speed
- Throttle angle
- Engine speed

TORQUE CONVERTER (Continued)

OPERATION

The converter impeller (Fig. 249) (driving member), which is integral to the converter housing and bolted to the engine drive plate, rotates at engine speed. The converter turbine (driven member), which reacts from fluid pressure generated by the impeller, rotates and turns the transmission input shaft.

TURBINE

As the fluid that was put into motion by the impeller blades strikes the blades of the turbine, some of the energy and rotational force is transferred into the turbine and the input shaft. This causes both of them (turbine and input shaft) to rotate in a clockwise direction following the impeller. As the fluid is leaving the trailing edges of the turbine's blades it continues in a "hindering" direction back toward the impeller. If the fluid is not redirected before it strikes the impeller, it will strike the impeller in such a direction that it would tend to slow it down.

STATOR

Torque multiplication is achieved by locking the stator's over-running clutch to its shaft (Fig. 250). Under stall conditions (the turbine is stationary), the oil leaving the turbine blades strikes the face of the stator blades and tries to rotate them in a counterclockwise direction. When this happens the overrunning clutch of the stator locks and holds the stator from rotating. With the stator locked, the oil strikes the stator blades and is redirected into a "helping" direction before it enters the impeller. This circulation of oil from impeller to turbine, turbine to stator, and stator to impeller, can produce a maximum torque multiplication of about 2.4:1. As the turbine begins to match the speed of the impeller, the fluid that was hitting the stator in such as way as to cause it to lock-up is no longer doing so. In this condition of operation, the stator begins to free wheel and the converter acts as a fluid coupling.

TORQUE CONVERTER CLUTCH (TCC)

The torque converter clutch is hydraulically applied and is released when fluid is vented from the hydraulic circuit by the torque converter control (TCC) solenoid on the valve body. The torque converter clutch is controlled by the Powertrain Control Module (PCM). The torque converter clutch engages in fourth gear, and in third gear under various conditions, such as when the O/D switch is OFF, when the vehicle is cruising on a level surface after the vehicle has warmed up. The torque converter clutch will disengage momentarily when an increase in engine load is sensed by the PCM, such as when the vehicle begins to go uphill or the throttle pressure is increased.

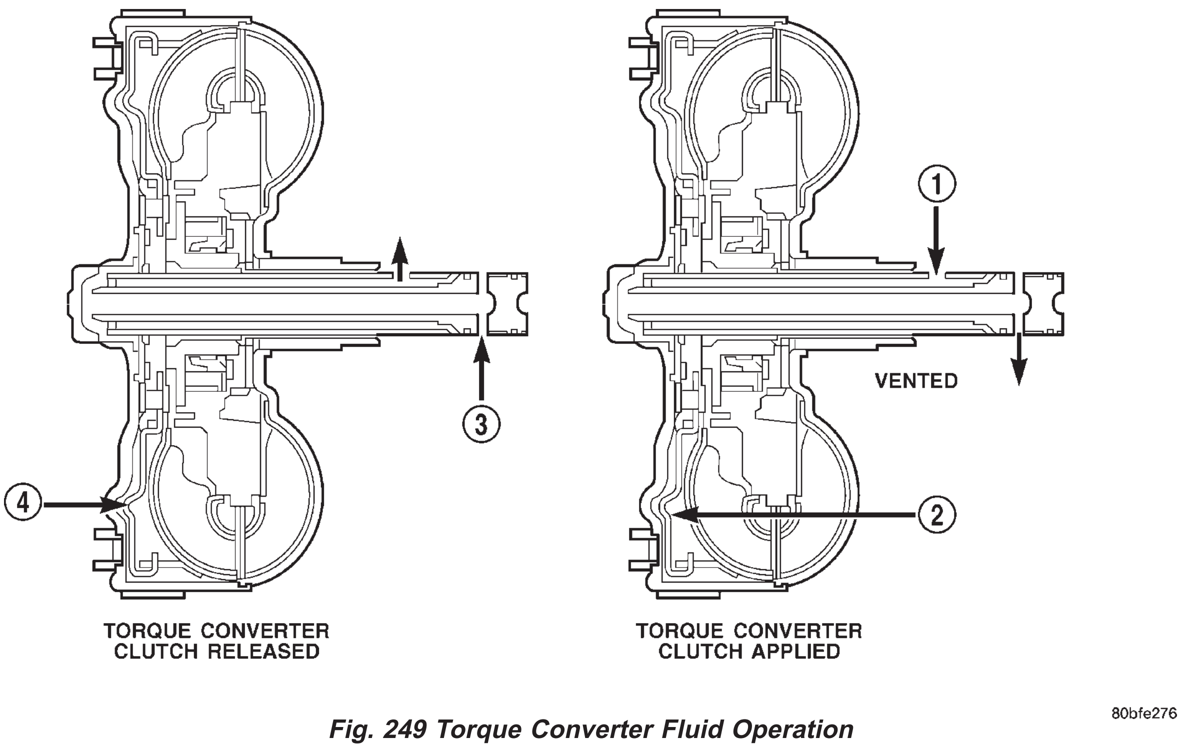


Fig. 249 Torque Converter Fluid Operation

1 - APPLY PRESSURE
2 - THE PISTON MOVES SLIGHTLY FORWARD
3 - RELEASE PRESSURE
4 - THE PISTON MOVES SLIGHTLY REARWARD

TORQUE CONVERTER (Continued)

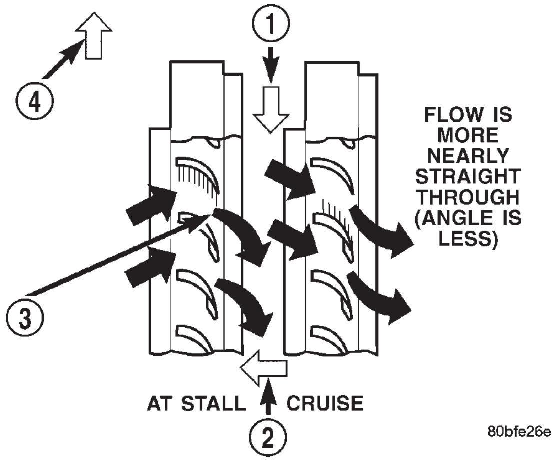


Fig. 250 Stator Operation

1 - DIRECTION STATOR WILL FREE WHEEL DUE TO OIL PUSHING ON BACKSIDE OF VANES
2 - FRONT OF ENGINE
3 - INCREASED ANGLE AS OIL STRIKES VANES
4 - DIRECTION STATOR IS LOCKED UP DUE TO OIL PUSHING AGAINST STATOR VANES

REMOVAL

(1) Remove transmission and torque converter from vehicle. (Refer to 21 - TRANSMISSION/AUTOMATIC - 45RFE/545RFE - REMOVAL)

(2) Place a suitable drain pan under the converter housing end of the transmission.

CAUTION: Verify that transmission is secure on the lifting device or work surface, the center of gravity of the transmission will shift when the torque converter is removed creating an unstable condition. The torque converter is a heavy unit. Use caution when separating the torque converter from the transmission.

(3) Pull the torque converter forward until the center hub clears the oil pump seal.

(4) Separate the torque converter from the transmission.

INSTALLATION

NOTE: Check converter hub and drive notches for sharp edges, burrs, scratches, or nicks. Polish the hub and notches with 320/400 grit paper or crocus cloth if necessary. The hub must be smooth to avoid damaging the pump seal at installation.

(1) Lubricate oil pump seal lip with transmission fluid.

(2) Place torque converter in position on transmission.

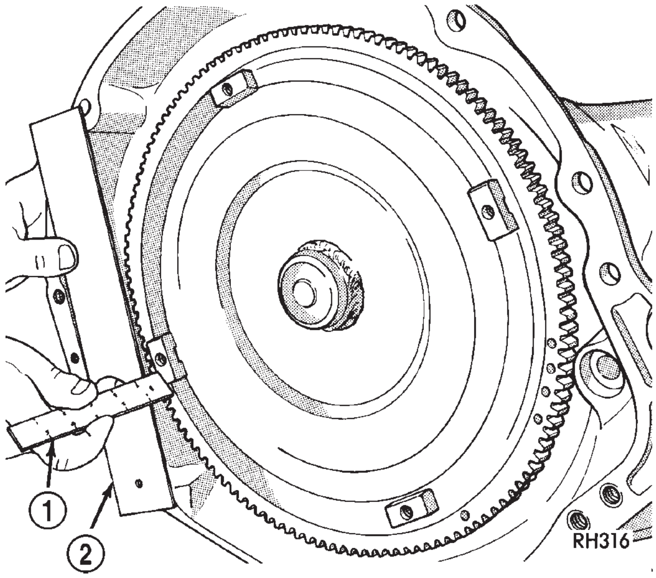


Fig. 251 Checking Torque Converter Seating - Typical

1 - SCALE
2 - STRAIGHTEDGE

CAUTION: Do not damage oil pump seal or bushing while inserting torque converter into the front of the transmission.

(3) Align torque converter to oil pump seal opening.

(4) Insert torque converter hub into oil pump.

(5) While pushing torque converter inward, rotate converter until converter is fully seated in the oil pump gears.

(6) Check converter seating with a scale (1) and straightedge (2) (Fig. 251). Surface of converter lugs should be 1/2 in. to rear of straightedge when converter is fully seated.

(7) If necessary, temporarily secure converter with C-clamp attached to the converter housing.

(8) Install the transmission in the vehicle.

(9) Fill the transmission with the recommended fluid.

TRANSMISSION CONTROL RELAY

DESCRIPTION

The relay is supplied fused B+ voltage, energized by the TCM, and is used to supply power to the solenoid pack when the transmission is in normal operating mode.

TRANSMISSION CONTROL RELAY (Continued)

OPERATION

When the relay is "off", no power is supplied to the solenoid pack and the transmission is in "limp-in" mode. After a controller reset, the TCM energizes the relay. Prior to this, the TCM verifies that the contacts are open by checking for no voltage at the switched battery terminals. After this is verified, the voltage at the solenoid pack pressure switches is checked. After the relay is energized, the TCM monitors the terminals to verify that the voltage is greater than 3 volts.

TRANSMISSION RANGE SENSOR

DESCRIPTION

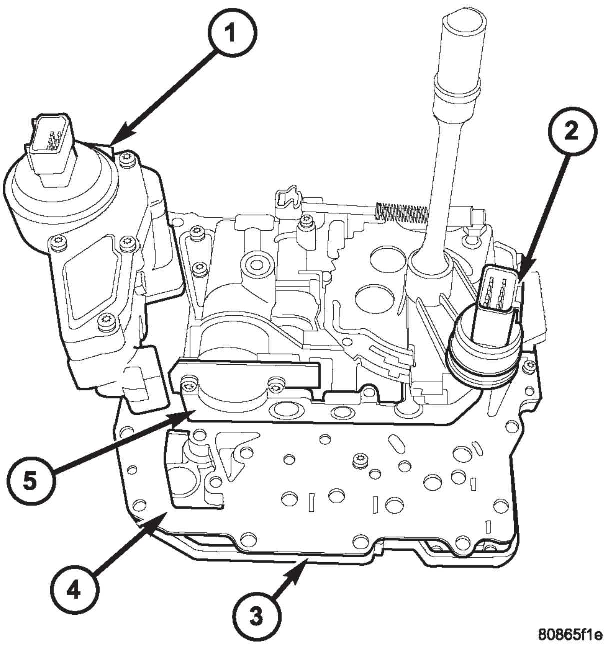


Fig. 252 Valve Body Assembly

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - TRS
3 - TRANSFER PLATE
4 - SEPARATOR PLATE
5 - VALVE BODY

The Transmission Range Sensor (TRS) (2) (Fig. 252) is mounted to the top of the valve body inside the transmission and can only be serviced by removing the valve body assembly. The electrical connector extends through the transmission case.

The Transmission Range Sensor (TRS) has four switch contacts that monitor shift lever position and send the information to the PCM.

OPERATION

The Transmission Range Sensor (TRS) communicates shift lever position (SLP) to the TCM as a combination of open and closed switches. Each shift lever position has an assigned combination of switch states (open/closed) that the TCM receives from four sense circuits. The TCM interprets this information and determines the appropriate transmission gear position and shift schedule.

Since there are four switches, there are 16 possible combinations of open and closed switches (codes). Seven of these codes are related to gear position and three are recognized as "between gear" codes. This results in six codes which should never occur. These are called "invalid" codes. An invalid code will result in a DTC, and the TCM will then determine the shift lever position based on pressure switch data. This allows reasonably normal transmission operation with a TRS failure.

TRS SWITCH STATES

SLP	T42	T41	T3	T1
P	CL	CL	CL	OP
R	CL	OP	OP	OP
N	CL	CL	OP	CL
D	OP	OP	OP	CL
2	OP	OP	CL	OP
1	CL	OP	CL	CL

TRANSMISSION RANGE SENSOR (Continued)

REMOVAL

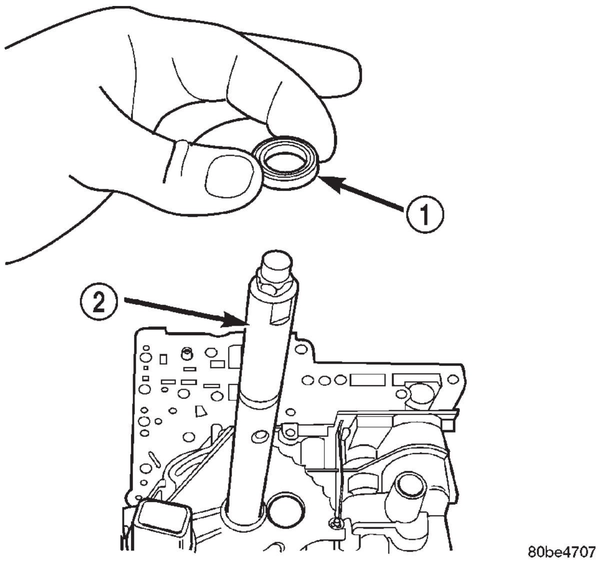


Fig. 253 Manual Shaft Seal - Typical

1 - SEAL
2 - MANUAL SHAFT

(1) Remove valve body assembly from vehicle. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/VALVE BODY - REMOVAL)

(2) Remove the manual shaft seal (1) (Fig. 253).

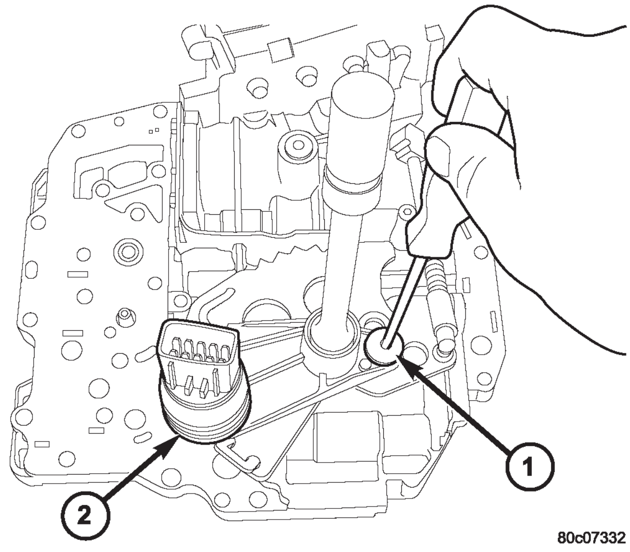


Fig. 254 Manual Shaft Retaining Screw

1 - SCREW
2 - TRS

(3) Remove manual shaft/TRS retaining screw (1) (Fig. 254).

(4) Slide TRS off of manual valve shaft.

INSTALLATION

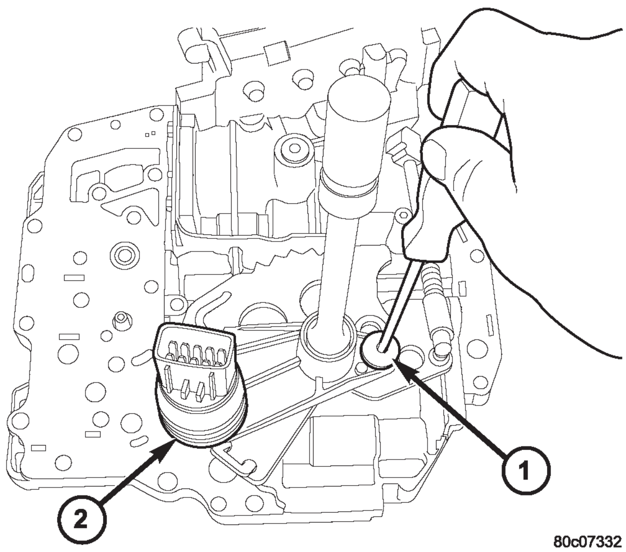


Fig. 255 Manual Shaft Retaining Screw

1 - SCREW
2 - TRS

(1) Install the TRS (2) to the manual shaft. Make sure TRS locating pin rests in manual valve bore slot.

(2) Install the TRS/manual shaft retaining screw (1) (Fig. 255) and torque to 5 N·m (45 in. lbs.) torque.

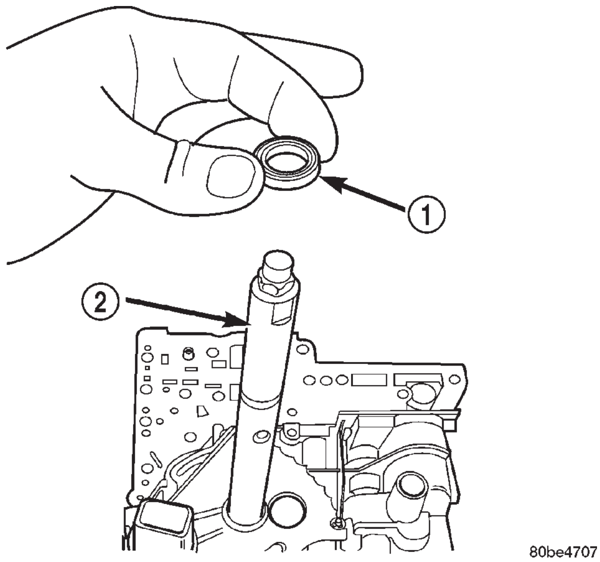


Fig. 256 Manual Shaft Seal - Typical

1 - SEAL
2 - MANUAL SHAFT

(3) Install the manual shaft seal (1) (Fig. 256).

(4) Install valve body to the transmission. (Refer to 21 - TRANSMISSION//AUTOMATIC - 42RLE/VALVE BODY - INSTALLATION)

TRANSMISSION TEMPERATURE SENSOR

DESCRIPTION

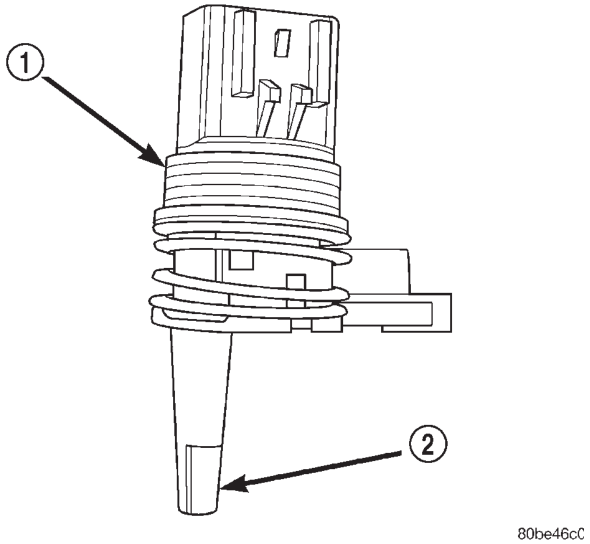


Fig. 257 Transmission Temperature Sensor

1 - TRANSMISSION RANGE SENSOR
2 - TEMPERATURE SENSOR

The transmission temperature sensor (2) (Fig. 257) is located in the transmission range sensor (1) and communicates transmission sump temperature to the TCM.

OPERATION

The transmission range sensor (TRS) has an integrated thermistor that the TCM uses to monitor the transmission's sump temperature. Since fluid temperature can affect transmission shift quality and convertor lock up, the TCM requires this information to determine which shift schedule to operate in. The TCM also monitors this temperature data so it can energize the vehicle cooling fan(s) when a transmission "overheat" condition exists. If the thermistor circuit fails, the TCM will revert to calculated oil temperature usage.

CALCULATED TEMPERATURE

A failure in the temperature sensor or circuit will result in calculated temperature being substituted for actual temperature. Calculated temperature is a predicted fluid temperature which is calculated from a combination of inputs:

- Battery (ambient) temperature
- Engine coolant temperature
- In-gear run time since start-up

VALVE BODY

DESCRIPTION

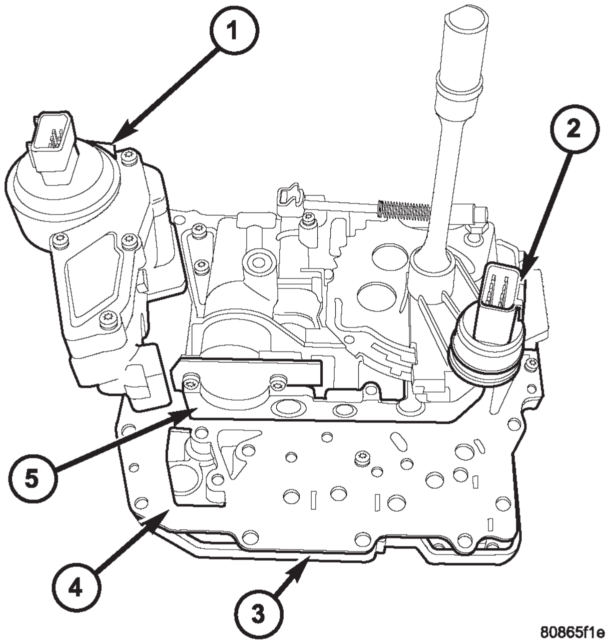


Fig. 258 Valve Body Assembly

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - TRS
3 - TRANSFER PLATE
4 - SEPARATOR PLATE
5 - VALVE BODY

The valve body assembly (Fig. 258) consists of a cast aluminum valve body (5),separator plate (4), and transfer plate (3). The valve body contains valves and check balls that control fluid delivery to the torque converter clutch, solenoid/pressure switch assembly, and frictional clutches.

Also mounted to the valve body assembly are the solenoid/pressure switch assembly and the transmission range sensor (2) (Fig. 258).

The valves contained within the valve body (1) include the following (Fig. 259):

- Regulator valve(2)
- Solenoid switch valve(7)
- Manual valve(5)
- Converter clutch switch valve(6)
- Converter clutch control valve(4)
- Torque converter regulator valve(2)
- Low/Reverse switch valve(3)

In addition, the valve body also contains the thermal valve, #2, 3, 4 & 5 check balls and the 2/4 accumulator assembly.

VALVE BODY (Continued)

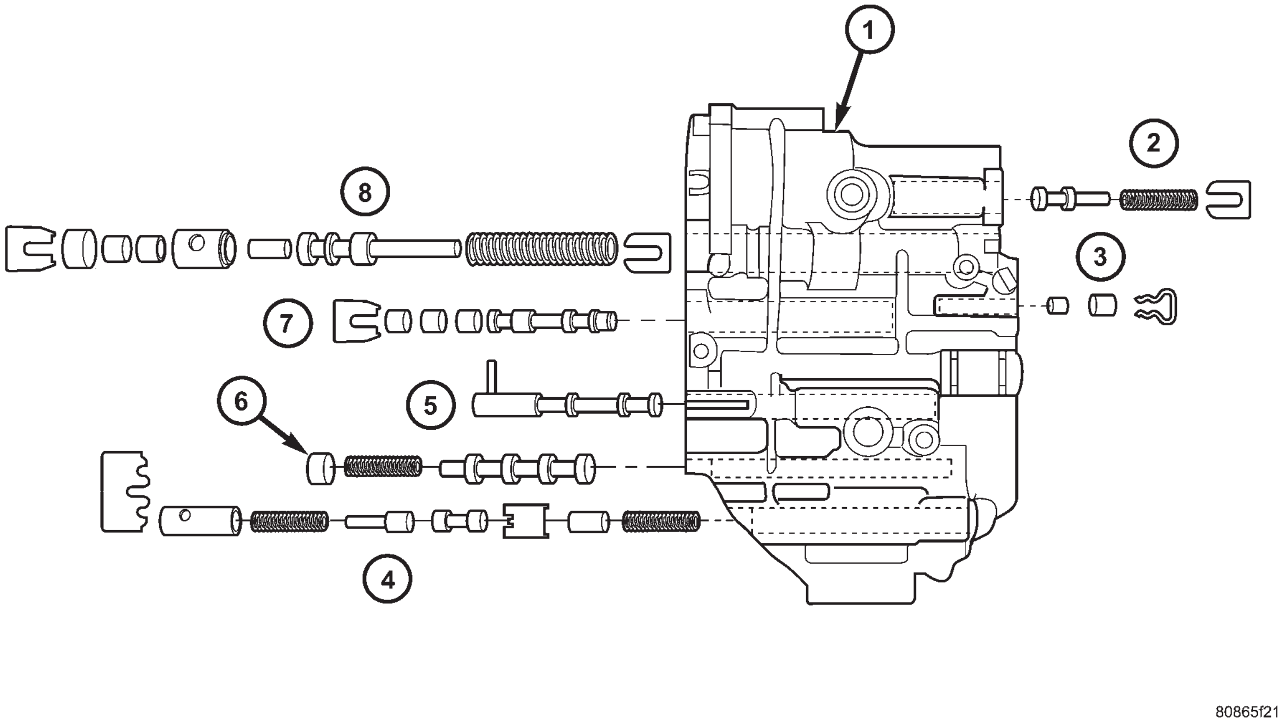


Fig. 259 Valve Body - Exploded

1 - VALVE BODY
2 - T/C REGULATOR VALVE
3 - L/R SWITCH VALVE
4 - CONVERTER CLUTCH CONTROL VALVE
5 - MANUAL VALVE
6 - CONVERTER CLUTCH SWITCH VALVE
7 - SOLENOID SWITCH VALVE
8 - REGULATOR VALVE

OPERATION

NOTE: (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE - SCHEMATICS AND DIAGRAMS) for a visual aid in determining valve location, operation and design.

THERMAL VALVE

The thermal valve (1) (Fig. 260) is a bi-metallic shudder valve that helps control the venting rate of oil pressure in the underdrive clutch passage during release of the clutch. When the oil temperature is approximately 20 degrees Fahrenheit or less, the valve is fully open to assist in venting oil past the U1 orifice (2). At temperatures above 20 degrees, the valve starts to close and becomes fully closed at approximately 140 degrees. The thermal valve is located in the transfer plate of the valve body.

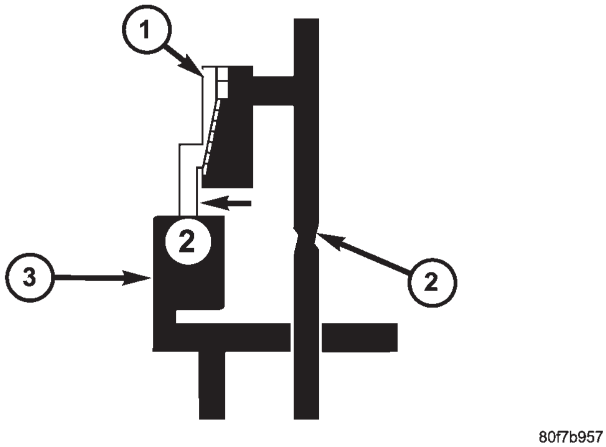


Fig. 260 Thermal Valve

1 - THERMAL VALVE
2 - U1 ORIFICE
3 - NUMBER 2 CHECK BALL

VALVE BODY (Continued)

REGULATOR VALVE

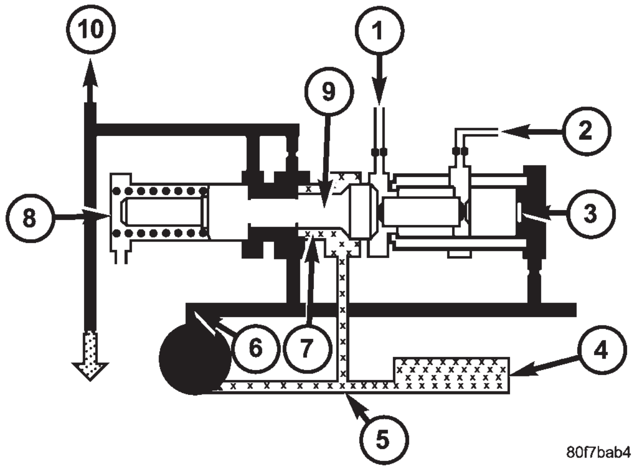


Fig. 261 Regulator Valve

1 - FROM OVERDRIVE CLUTCH CIRCUIT
2 - FROM MANUAL VALVE
3 - HYDRAULIC PRESSURE
4 - FILTER
5 - PUMP INLET
6 - PUMP OUTLET
7 - OIL PRESSURE REGULATED AT THIS POINT
8 - SPRING TENSION
9 - REGULATOR VALVE
10 - TORQUE CONVERTER CONTROL VALVE

The regulator valve (9) (Fig. 261) controls hydraulic pressure in the transmission. It receives unregulated pressure from the pump (6), which works against spring tension (8) to maintain oil at specific pressures. A system of sleeves and ports allows the regulator valve to work at one of three predetermined pressure levels. Regulated oil pressure is also referred to as “line pressure.”

SOLENOID SWITCH VALVE

The solenoid switch valve (Fig. 262) controls line pressure from the LR/CC solenoid (4). In one position, it allows the low/reverse clutch to be pressurized. In the other, it directs line pressure to the converter control and converter clutch valves (7).

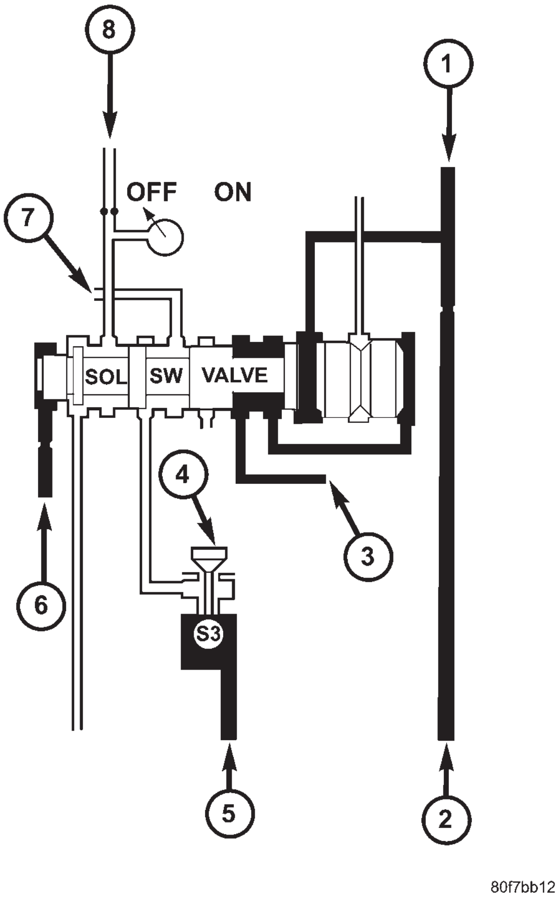


Fig. 262 Solenoid Switch Valve De-Energized

1 - 2/4 CLUTCH
2 - MANUAL VALVE
3 - UD CLUTCH
4 - LR/CC SOLENOID DE-ENERGIZED
5 - MANUAL VALVE
6 - LINE PRESSURE
7 - CONVERTER CLUTCH SWITCH AND CONTROL VALVES
8 - LR CLUTCH

VALVE BODY (Continued)

MANUAL VALVE

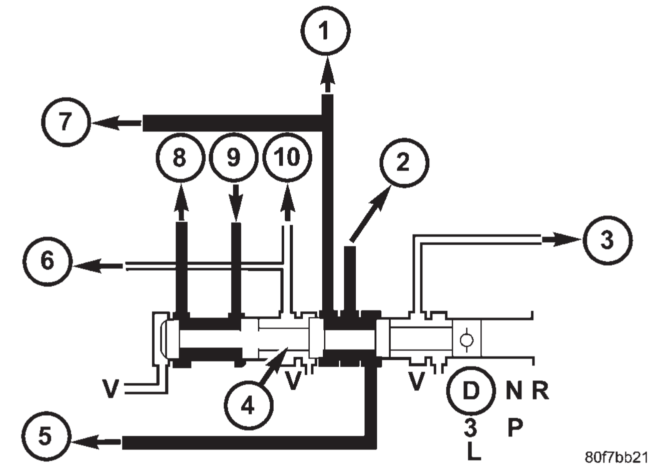


Fig. 263 Manual Valve

1 - UD CLUTCH
2 - LR/CC CLUTCH
3 - REVERSE CLUTCH
4 - MANUAL VALVE
5 - REGULATOR VALVE
6 - REGULATOR VALVE
7 - CONVERTER CLUTCH CONTROL VALVE
8 - 2/4 CLUTCH
9 - 2/4 - L/R SOLENOID
10 - L/R CLUTCH

The manual valve (4) (Fig. 263) is operated by the mechanical shift linkage. Its primary responsibility is to send line pressure to the appropriate hydraulic circuits and solenoids. The valve has three operating ranges or positions.

CONVERTER CLUTCH SWITCH VALVE

The main responsibility of the converter clutch switch valve (10) (Fig. 264) is to control hydraulic pressure applied to the front (off) side of the converter clutch piston. Line pressure from the regulator valve (5) is fed to the torque converter regulator valve (8). The pressure is then directed to the converter clutch switch valve (10) and to the front side of the converter clutch piston. This pressure pushes the piston back and disengages the converter clutch.

CONVERTER CLUTCH CONTROL VALVE

The converter clutch control valve (5) (Fig. 265) controls the back (on) side of the torque converter clutch (1). When the controller energizes or modulates the LR/CC solenoid to apply the converter clutch piston, both the converter clutch control valve (5) and the converter control valve move, allowing pressure to be applied to the back side of the clutch.

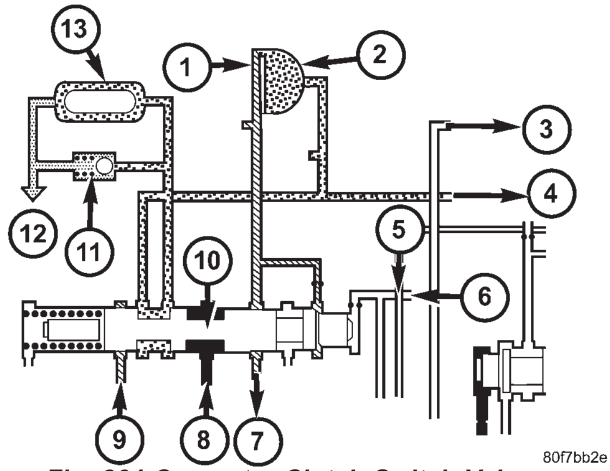


Fig. 264 Converter Clutch Switch Valve

1 - CONVERTER CLUTCH
2 - TORQUE CONVERTER
3 - LR CLUTCH
4 - DRIBBLERS
5 - REGULATOR VALVE
6 - SOLENOID SWITCH VALVE
7 - CONVERTER CLUTCH CONTROL VALVE
8 - TORQUE CONVERTER REGULATOR VALVE
9 - CONVERTER CLUTCH CONTROL VALVE
10 - CONVERTER CLUTCH SWITCH VALVE
11 - BYPASS VALVE
12 - LUBE
13 - COOLER

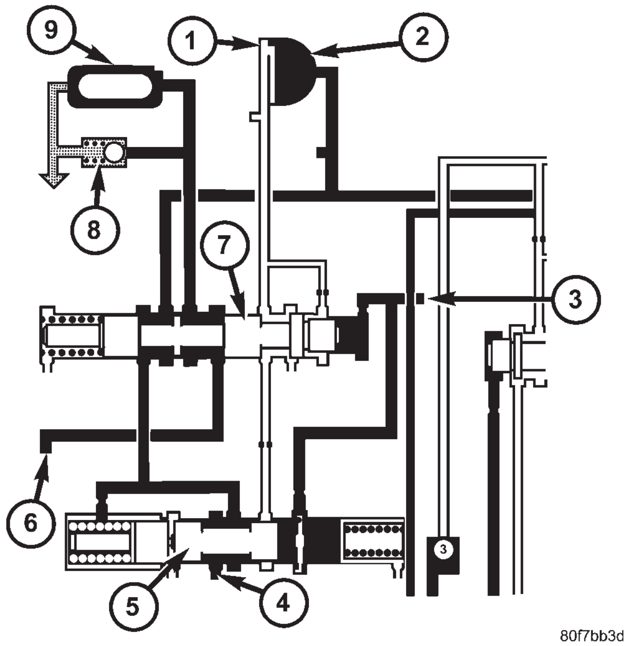


Fig. 265 Converter Clutch Control Valve

1 - CONVERTER CLUTCH
2 - TORQUE CONVERTER
3 - LR/CC SOLENOID
4 - FROM MANUAL VALVE
5 - CONVERTER CLUTCH CONTROL VALVE
6 - TORQUE CONVERTER REGULATOR VALVE
7 - CONVERTER CLUTCH SWITCH VALVE
8 - BYPASS VALVE
9 - COOLER

VALVE BODY (Continued)

T/C REGULATOR VALVE

The torque converter regulator valve slightly regulates the flow of fluid to the torque converter.

LOW/REVERSE SWITCH VALVE

The low/reverse clutch is applied from different sources, depending on whether low (1st) gear or reverse is selected. The low/reverse switch valve alternates positions depending on from which direction fluid pressure is applied. By design, when the valve is shifted by fluid pressure from one channel, the opposing channel is blocked. The switch valve alienates the possibility of a sticking ball check, thus providing consistent application of the low/reverse clutch under these operating conditions.

REMOVAL

NOTE: If valve body is being reconditioned or replaced, it is necessary to perform the Quick Learn Procedure. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)

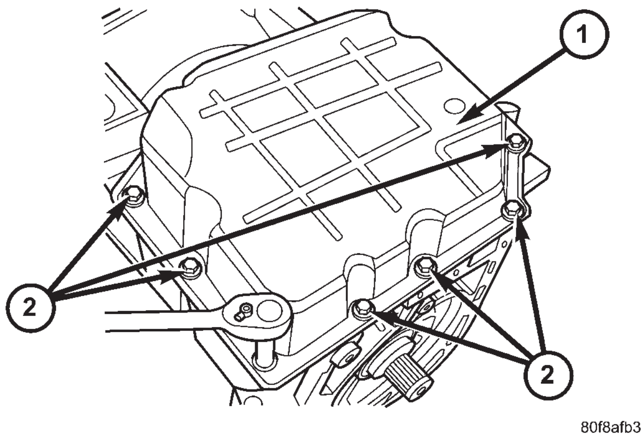


Fig. 266 Remove Transmission Oil Pan Bolts

1 - TRANSMISSION OIL PAN
2 - BOLTS

(1) Disconnect the TRS and solenoid wiring connectors.

(2) Disconnect the shift cable from the shift lever (at the transmission).

(3) Move the manual shift lever clockwise as far as it will go. This should be one position past the L position. Then remove the manual shift lever.

NOTE: One of the oil pan bolts has a sealing patch applied from the factory. Separate this bolts for reuse.

(4) Remove transmission pan bolts (2) (Fig. 266).

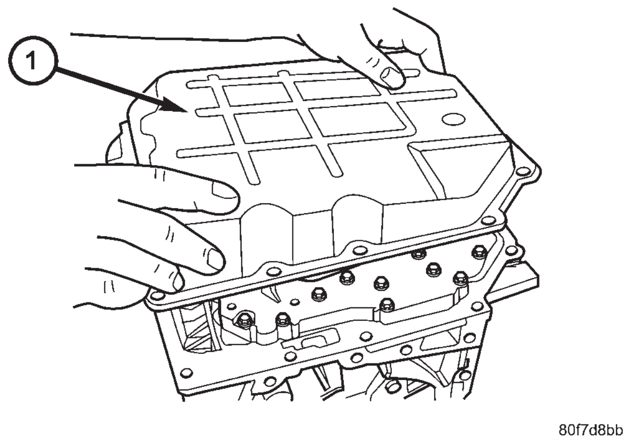


Fig. 267 Remove Transmission Oil Pan

1 - TRANSMISSION OIL PAN

(5) Remove transmission oil pan (1) (Fig. 267).

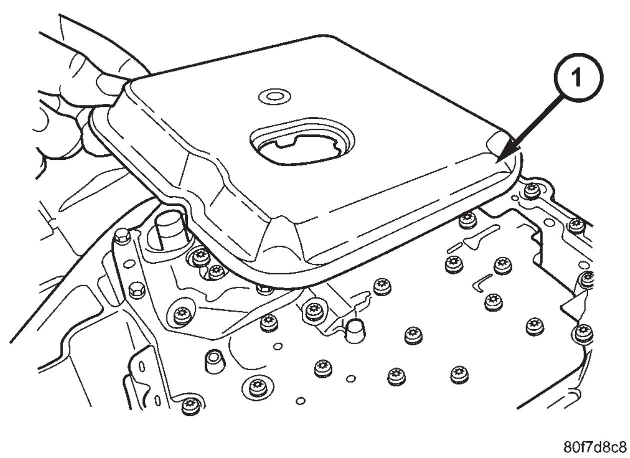


Fig. 268 Remove Transmission Filter

1 - TRANSMISSION FILTER

(6) Remove oil filter (1) (Fig. 268) from valve body. It is held in place by two screws.

VALVE BODY (Continued)

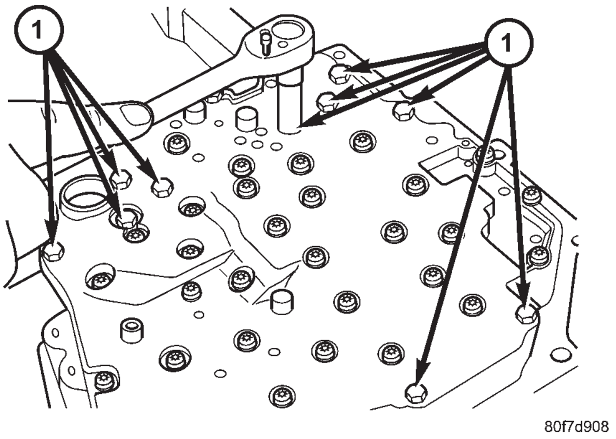


Fig. 269 Remove Valve Body Bolts

1 - BOLTS

(7) Remove valve body bolts-to-case (1) (Fig. 269).

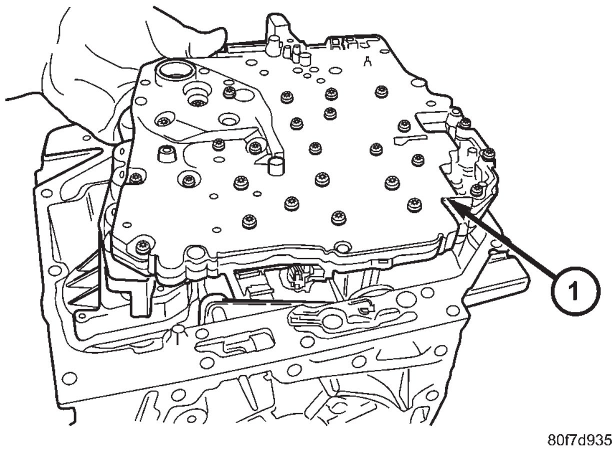


Fig. 270 Remove Valve Body From Transmission

1 - VALVE BODY

CAUTION: The overdrive and underdrive accumulators and springs may fall out when removing the valve body.

(8) Carefully remove valve body assembly (1) from the transmission (Fig. 270).

DISASSEMBLY

NOTE: If the valve body is being reconditioned or replaced, it is necessary to perform the Quick Learn Procedure using the DRBIII® Scan Tool (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)

(1) Remove manual shaft seal.

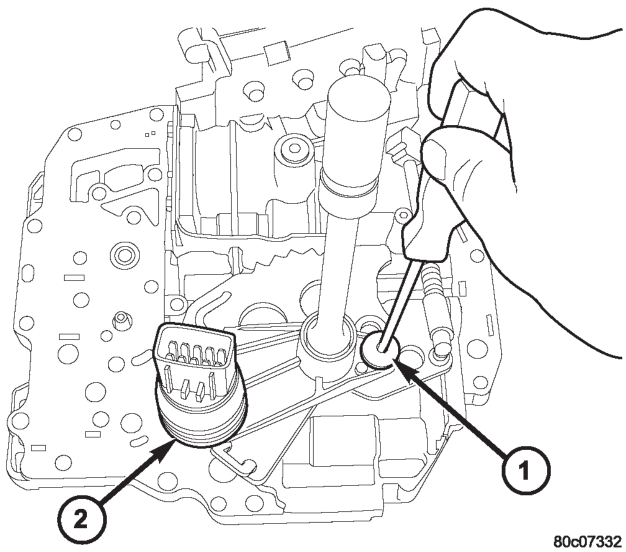


Fig. 271 Manual Shaft Retaining Screw

1 - SCREW
2 - TRS

(2) Remove manual shaft screw (1) (Fig. 271).

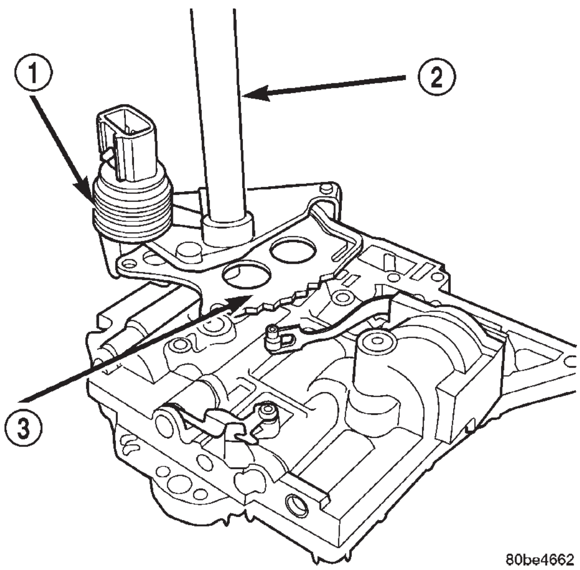


Fig. 272 Manual Shaft/Rooster Comb and Transmission Range Sensor

1 - TRANSMISSION RANGE SENSOR
2 - MANUAL SHAFT
3 - ROOSTER COMB

(3) Remove Transmission Range Sensor (TRS) (1) and manual shaft (2) (Fig. 272).

VALVE BODY (Continued)

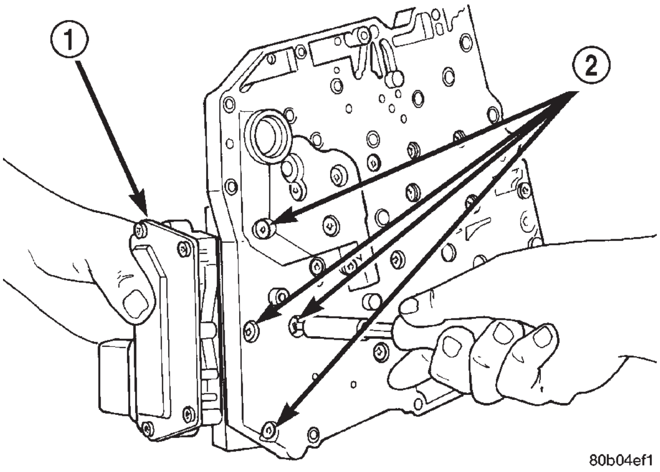


Fig. 273 Solenoid Retaining Screws

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - RETAINING SCREWS

(4) Remove Solenoid/Pressure Switch Assembly (1) from valve body (Fig. 273).

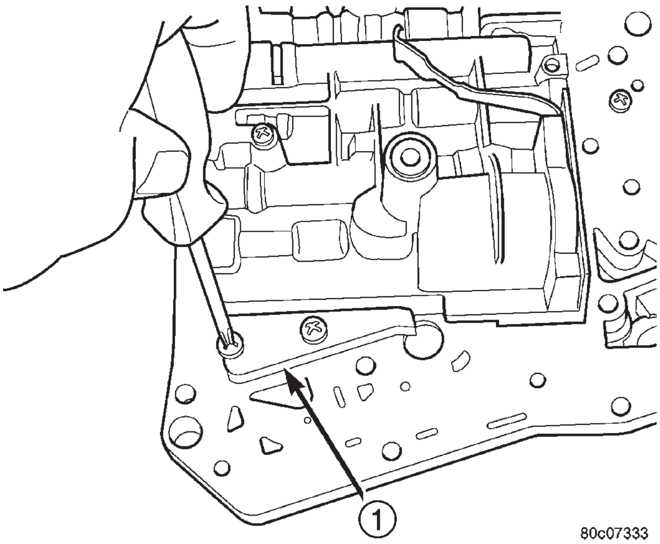


Fig. 274 Remove Stiffener Plate

1 - STIFFENER PLATE

(5) Remove valve body stiffener plate (1) (Fig. 274).

(6) Invert valve body assembly and remove transfer plate-to-valve body screws (1) (Fig. 275).

(7) Remove transfer/separator plate (1) from valve body (2) (Fig. 276)

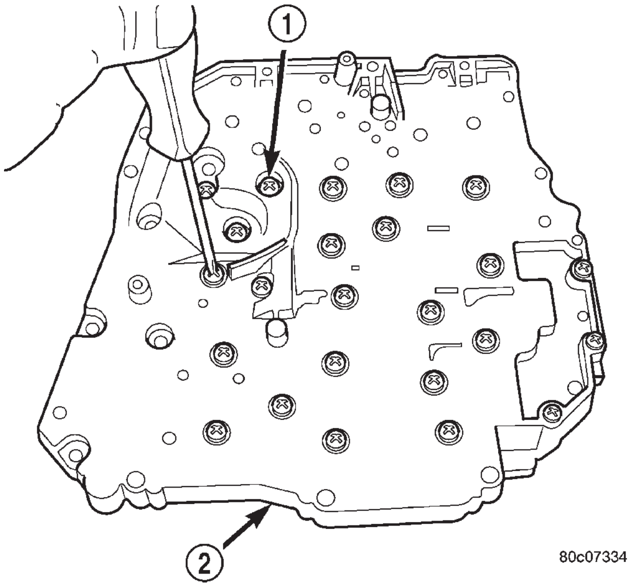


Fig. 275 Remove Transfer Plate-to-Valve Body Screws

1 - SCREW (24)
2 - TRANSFER PLATE

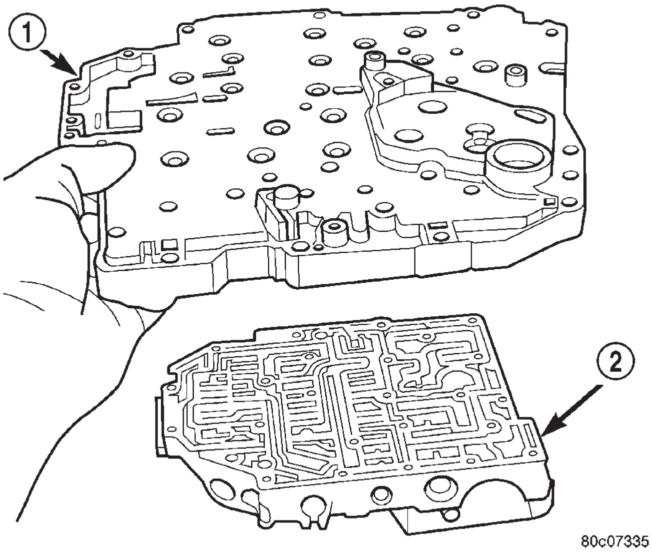


Fig. 276 Remove Transfer Plate to Valve Body

1 - TRANSFER PLATE
2 - VALVE BODY

VALVE BODY (Continued)

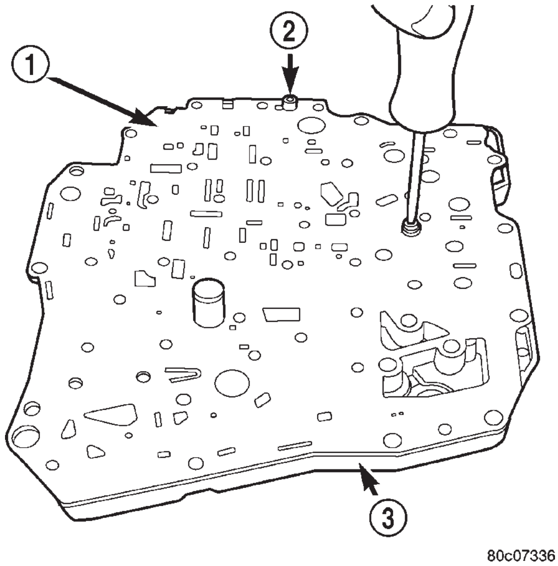


Fig. 277 Remove Separator Plate-to-Transfer Plate Screws

1 - SEPARATOR PLATE
2 - SCREW (2)
3 - TRANSFER PLATE

(8) Remove separator plate-to-transfer plate screws (2) (Fig. 277).

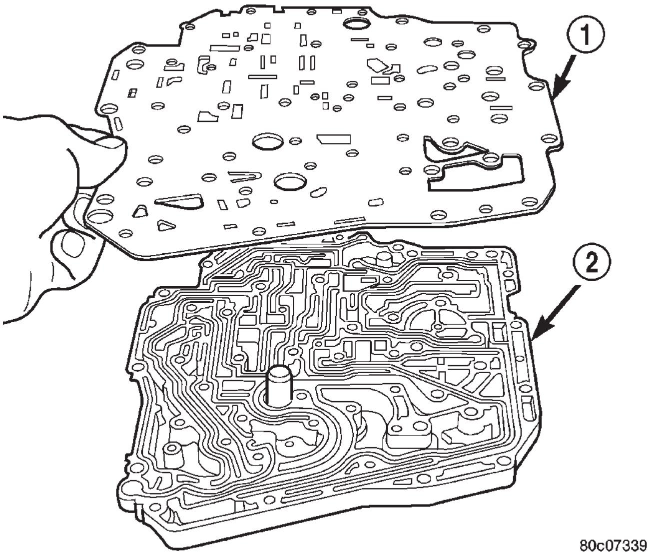


Fig. 278 Remove Separator Plate to Transfer Plate

1 - SEPARATOR PLATE
2 - TRANSFER PLATE

(9) Remove separator plate (1) from transfer plate (2) (Fig. 278).

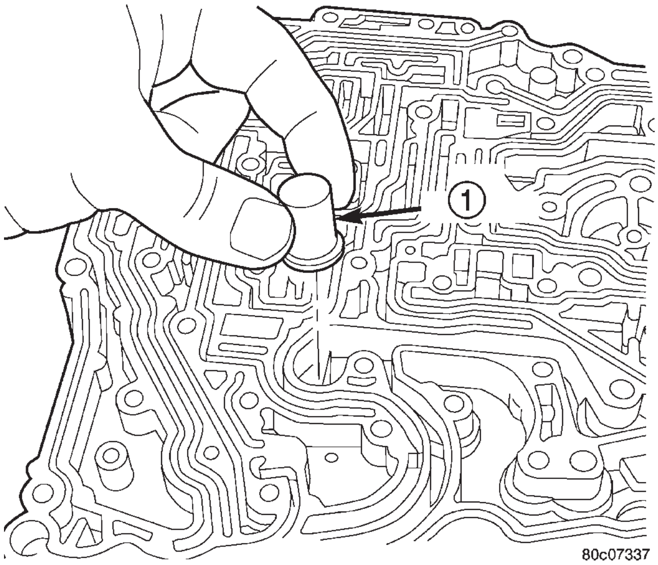


Fig. 279 Remove Oil Screen to Transfer Plate

1 - OIL SCREEN

(10) Remove the oil screen (1) from the transfer plate (Fig. 279).

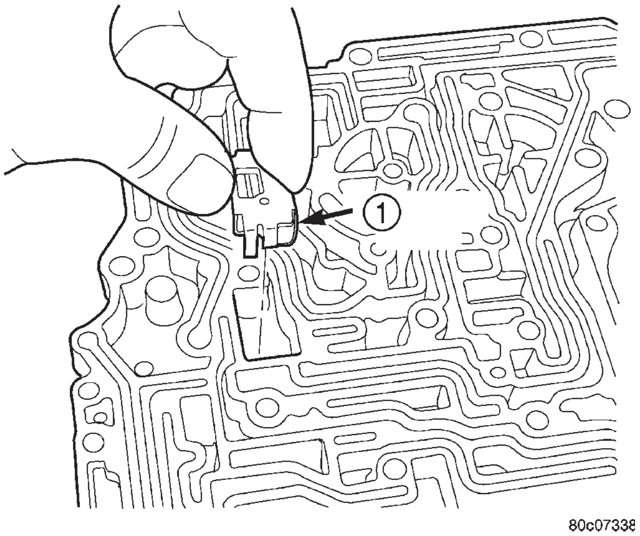


Fig. 280 Remove Thermal Valve to Transfer Plate

1 - THERMAL VALVE

(11) Remove thermal valve (1) (Fig. 280) from transfer plate.

VALVE BODY (Continued)

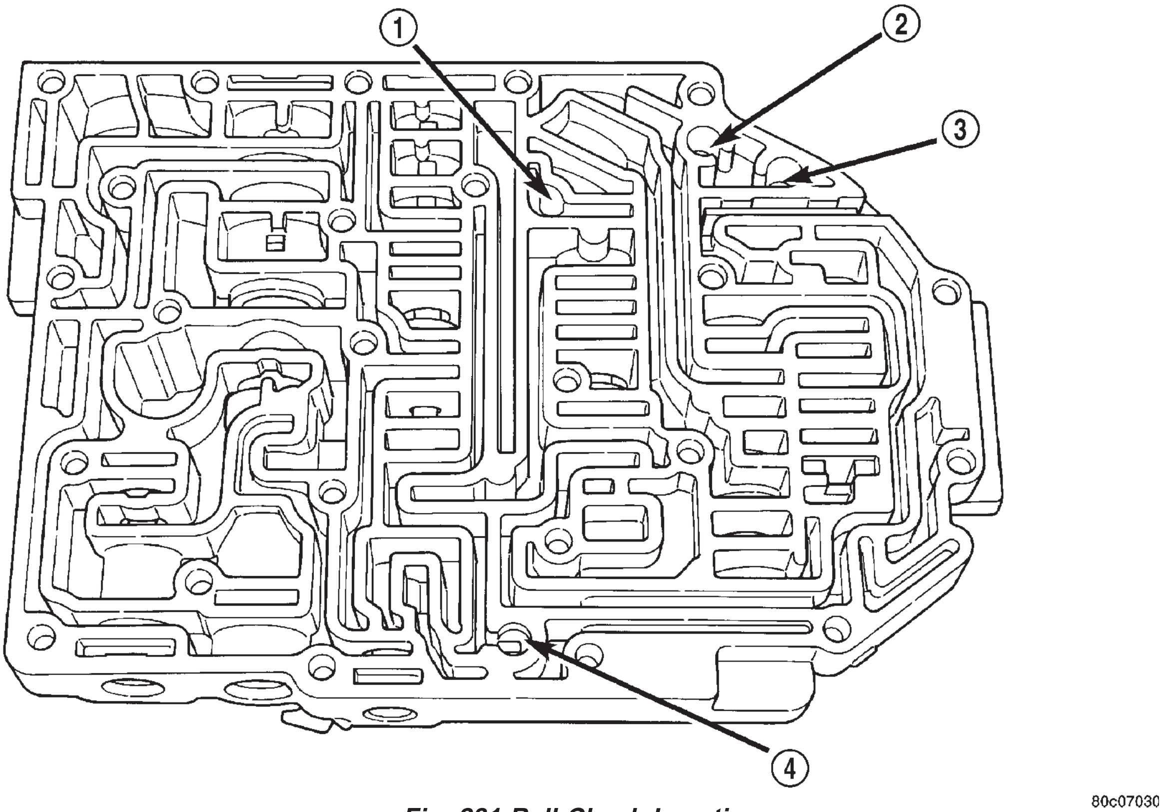


Fig. 281 Ball Check Location

1 - (#4) BALL CHECK LOCATION
2 - (#2) BALL CHECK LOCATION
3 - (#5) BALL CHECK LOCATION
4 - (#3) BALL CHECK LOCATION

(12) Remove valve body check balls (1-4). Note their location for assembly ease (Fig. 281).

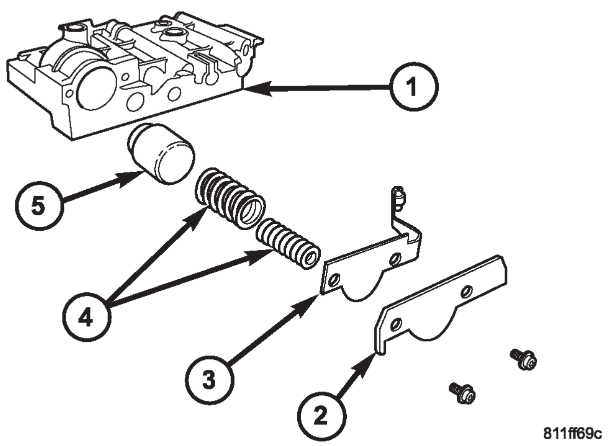


Fig. 282 2/4 Accumulator Assembly

1 - VALVE BODY
2 - RETAINER PLATE
3 - DETENT SPRING
4 - RETURN SPRINGS
5 - PISTON

(13) Remove 2/4 accumulator assembly (1-5) (Fig. 282).

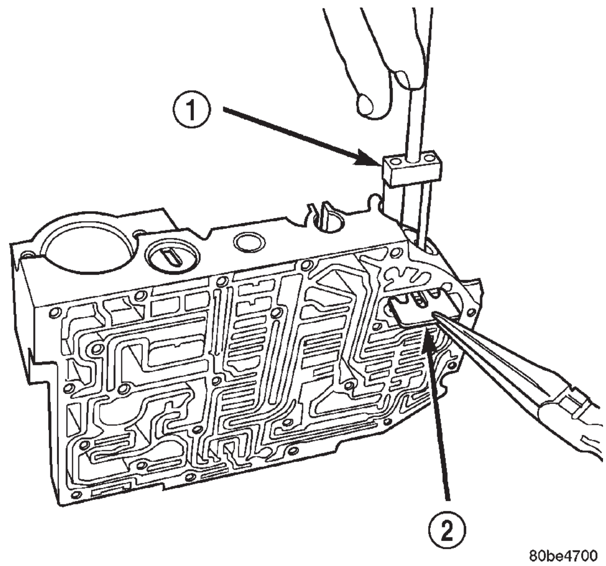


Fig. 283 Remove Dual Retainer Plate using Tool 6301

1 - TOOL 6301
2 - RETAINER

(14) Remove dual retainer plate (2) from valve body. Use special tool 6301 (1) to remove plate (2) (Fig. 283).

VALVE BODY (Continued)

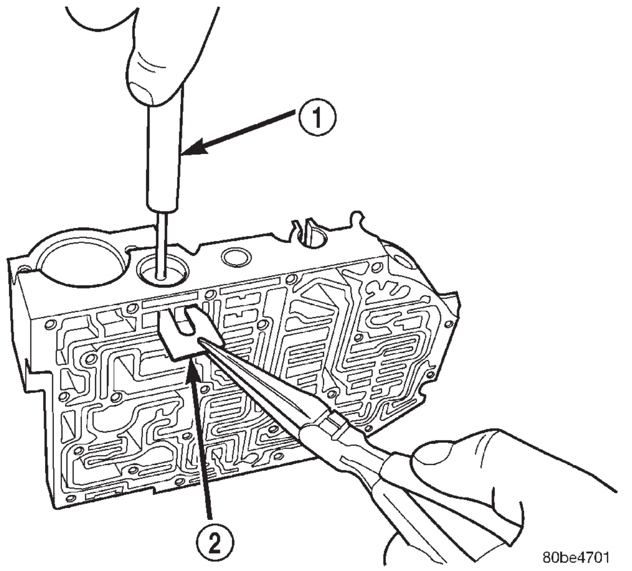


Fig. 284 Remove Regulator Valve Spring Retainer using Tool 6302

1 - TOOL 6302
2 - RETAINER

(15) Remove regulator valve spring retainer (2) (Fig. 284).

(16) Remove remaining retainers (1, 2) (Fig. 285).

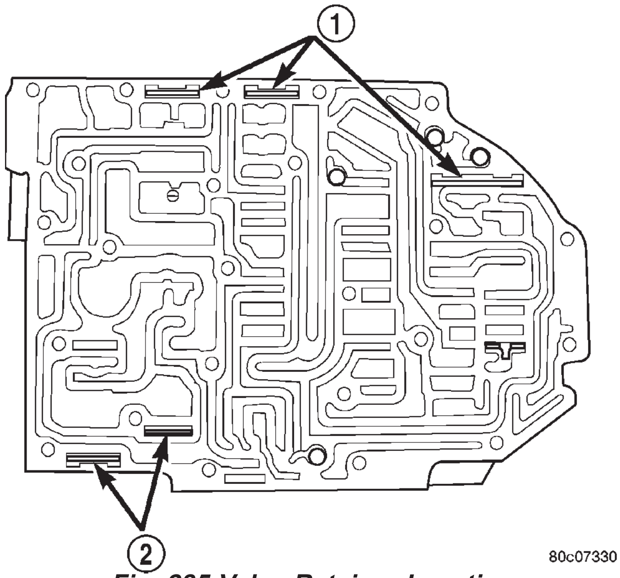


Fig. 285 Valve Retainer Location

1 - RETAINER
2 - RETAINER

(17) Remove all valves and springs (Fig. 286).

(18) Cleanliness through entire disassembly and assembly of the valve body cannot be overemphasized. When disassembling, each part should be washed in a suitable solvent, then dried by com-

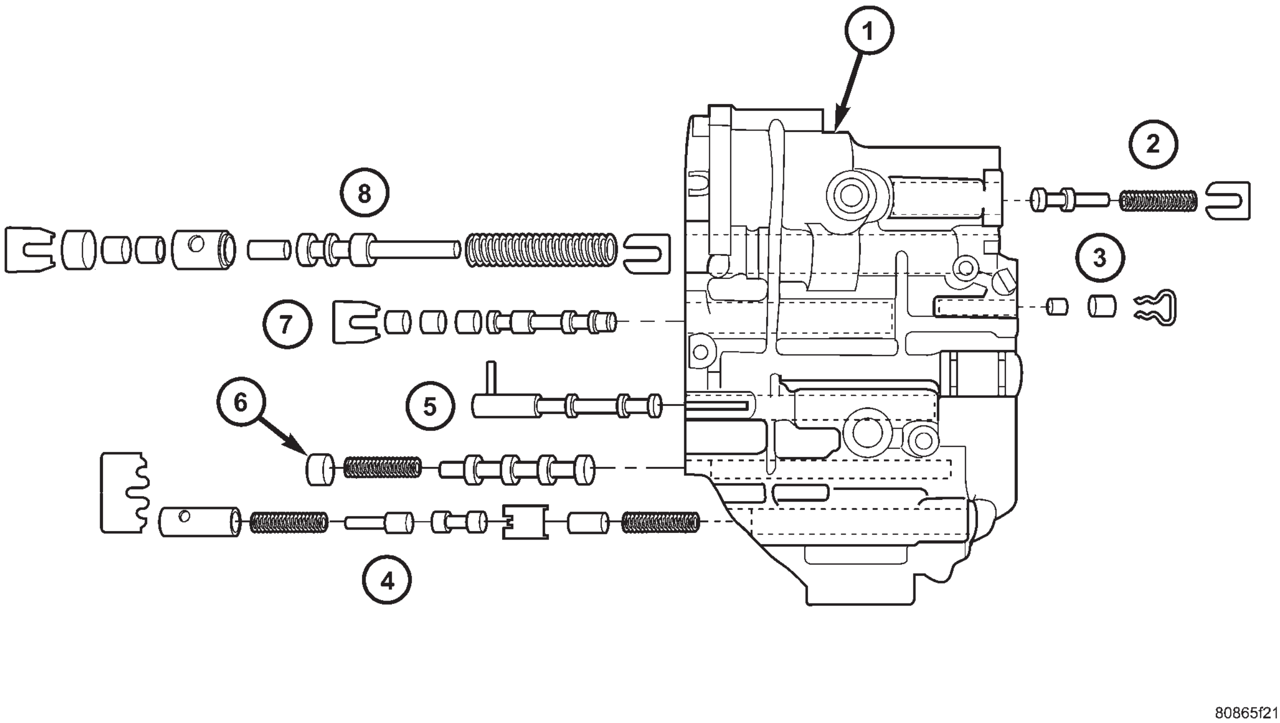


Fig. 286 Valve Body Assembly

1 - VALVE BODY
2 - T/C REGULATOR VALVE
3 - L/R SWITCH VALVE
4 - CONVERTER CLUTCH CONTROL VALVE
5 - MANUAL VALVE
6 - CONVERTER CLUTCH SWITCH VALVE
7 - SOLENOID SWITCH VALVE
8 - REGULATOR VALVE

VALVE BODY (Continued)

pressed air. **Do not wipe parts with shop towels.** All mating surfaces in the valve body are accurately machined; therefore, careful handling of all parts must be exercised to avoid nicks or burrs.

ASSEMBLY

NOTE: If the valve body assembly is being reconditioned or replaced, it is necessary to perform the Quick Learn Procedure using the DRBIII® Scan Tool. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)

(1) Install all valves and springs as shown (Fig. 287).

(2) Install regulator valve spring retainer (2) (Fig. 288).

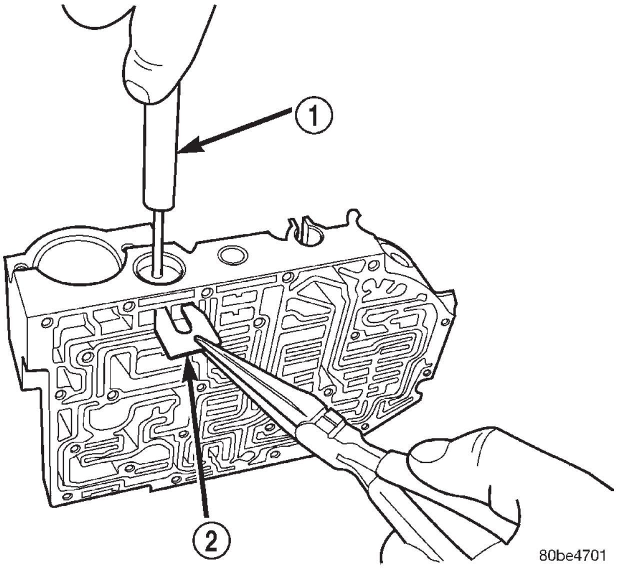


Fig. 288 Install Regulator Valve Spring Retainer using Tool 6302

1 - TOOL 6302
2 - RETAINER

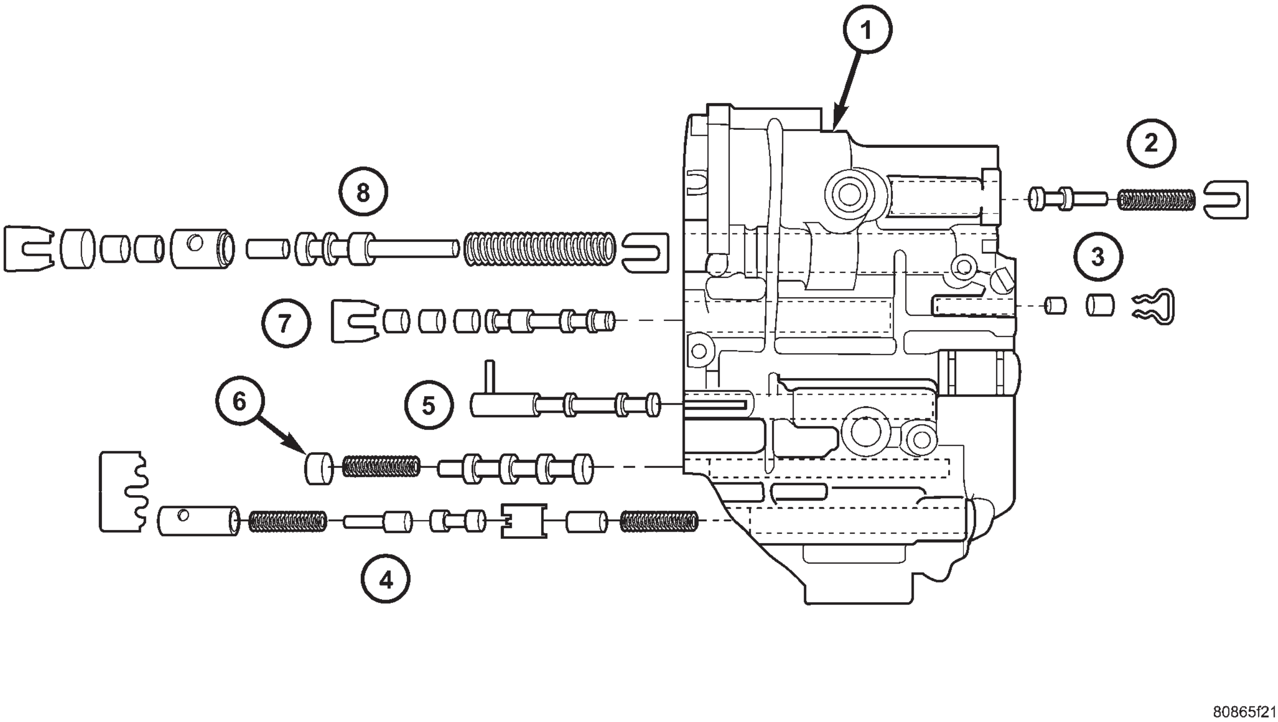


Fig. 287 Valve Body Assembly

1 - VALVE BODY
2 - T/C REGULATOR VALVE
3 - L/R SWITCH VALVE
4 - CONVERTER CLUTCH CONTROL VALVE
5 - MANUAL VALVE
6 - CONVERTER CLUTCH SWITCH VALVE
7 - SOLENOID SWITCH VALVE
8 - REGULATOR VALVE

VALVE BODY (Continued)

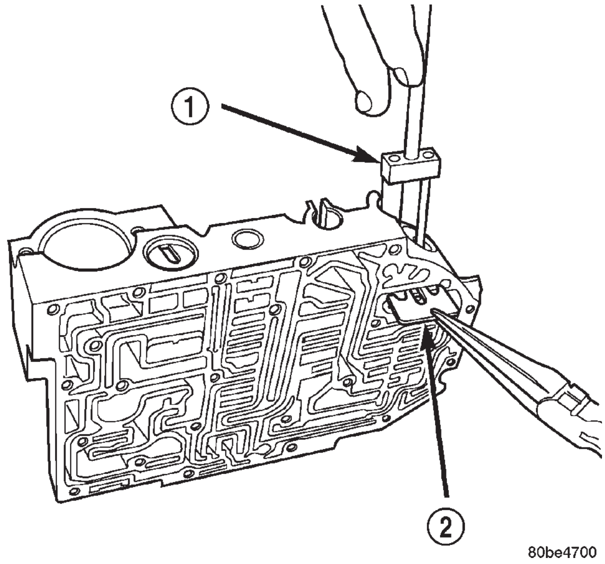


Fig. 289 Install Dual Retainer Plate using Tool 6301

1 - TOOL 6301
2 - RETAINER

(3) Install dual retainer plate (2) using Tool 6301 (1) (Fig. 289).

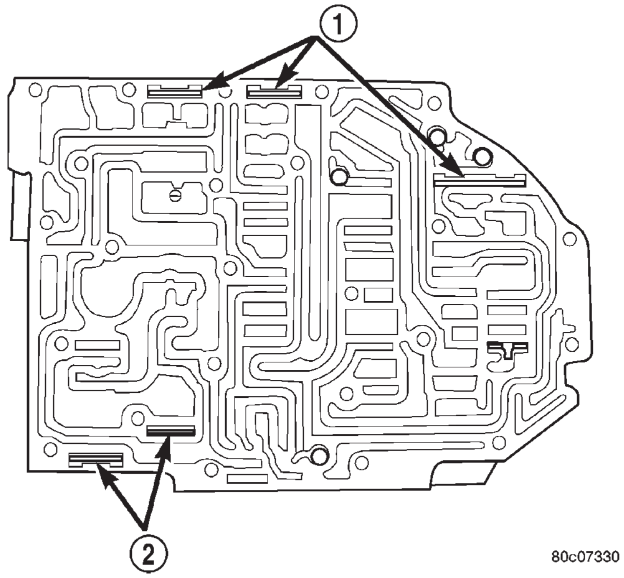


Fig. 290 Valve Retainer Location

1 - RETAINER
2 - RETAINER

(4) Verify that all retainers (1, 2) are installed as shown (Fig. 290). Retainers should be flush or below valve body surface.

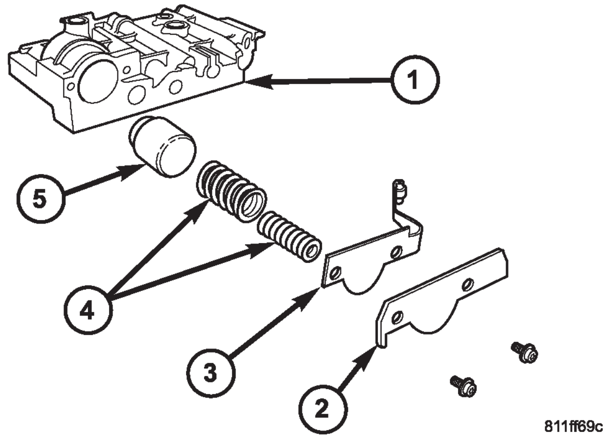


Fig. 291 2/4 Accumulator Assembly

1 - VALVE BODY
2 - RETAINER PLATE
3 - DETENT SPRING
4 - RETURN SPRINGS
5 - PISTON

(5) Install 2/4 Accumulator components (1-5) as shown (Fig. 291). Torque 2/4 Accumulator retainer plate to 5 N·m (45 in. lbs.).

(6) Install check balls into position as shown (Fig. 292). If necessary, secure them with petrolatum or transmission assembly gel for assembly ease.

(7) Install thermal valve (1) to the transfer plate (Fig. 293).

(8) Install the oil screen (1) to the transfer plate (Fig. 294).

VALVE BODY (Continued)

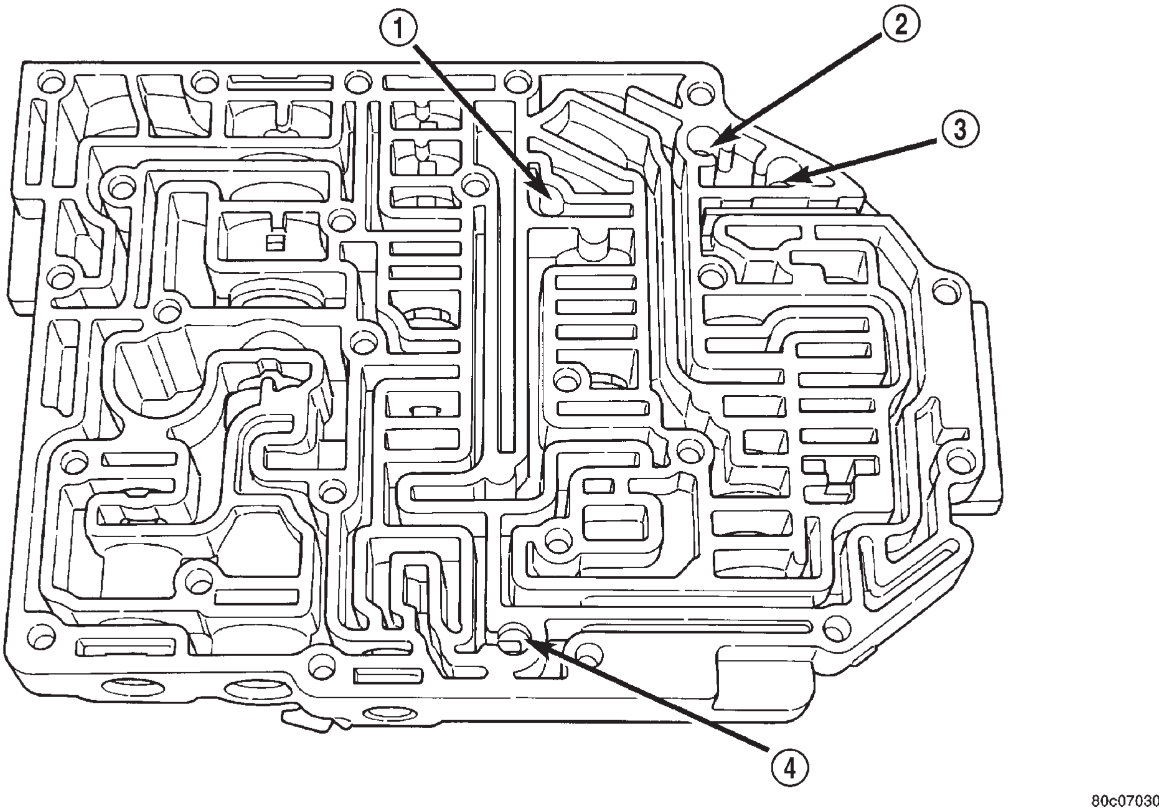


Fig. 292 Ball Check Location

1 - (#4) BALL CHECK LOCATION
2 - (#2) BALL CHECK LOCATION
3 - (#5) BALL CHECK LOCATION
4 - (#3) BALL CHECK LOCATION

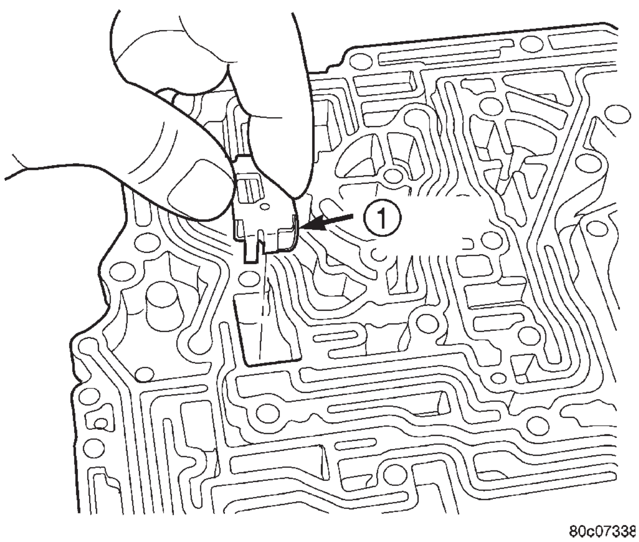


Fig. 293 Install Thermal Valve to Transfer Plate

1 - THERMAL VALVE

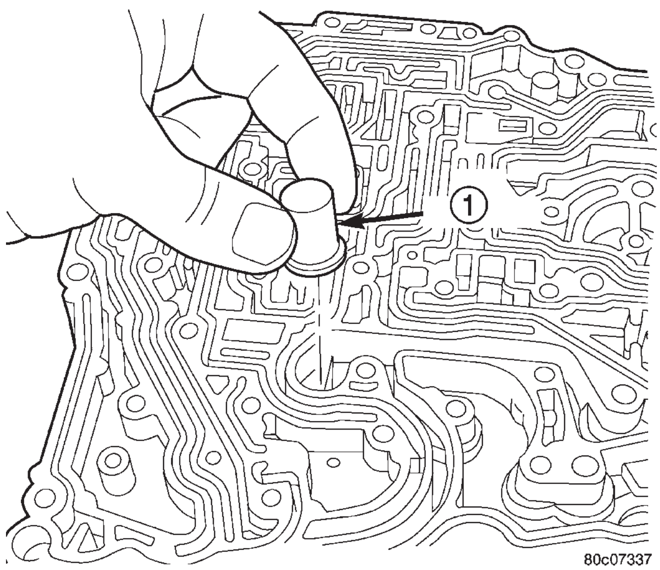


Fig. 294 Install Oil Screen to Transfer Plate

1 - OIL SCREEN

VALVE BODY (Continued)

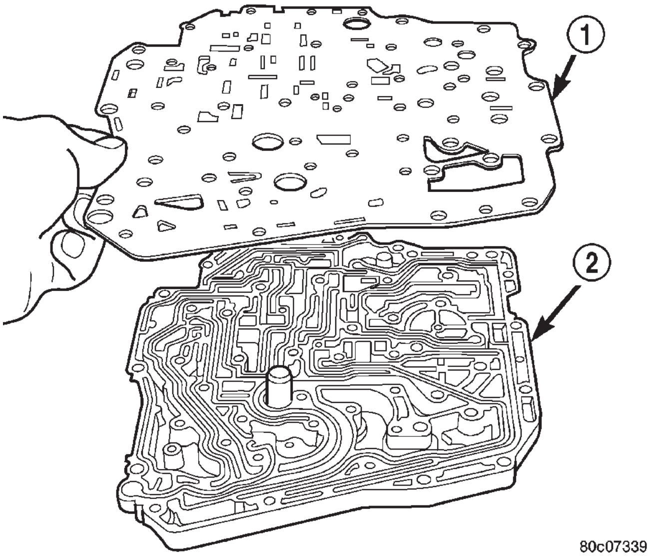


Fig. 295 Install Separator Plate to Transfer Plate

1 - SEPARATOR PLATE
2 - TRANSFER PLATE

(9) Install separator plate (1) to transfer plate (2) (Fig. 295).

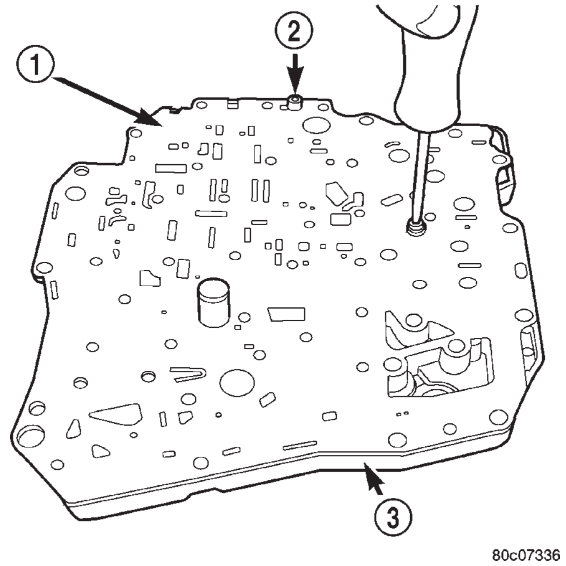


Fig. 296 Install Separator Plate-to-Transfer Plate Screws

1 - SEPARATOR PLATE
2 - SCREW (2)
3 - TRANSFER PLATE

(10) Install the two separator plate-to-transfer plate screws (2) (Fig. 296).

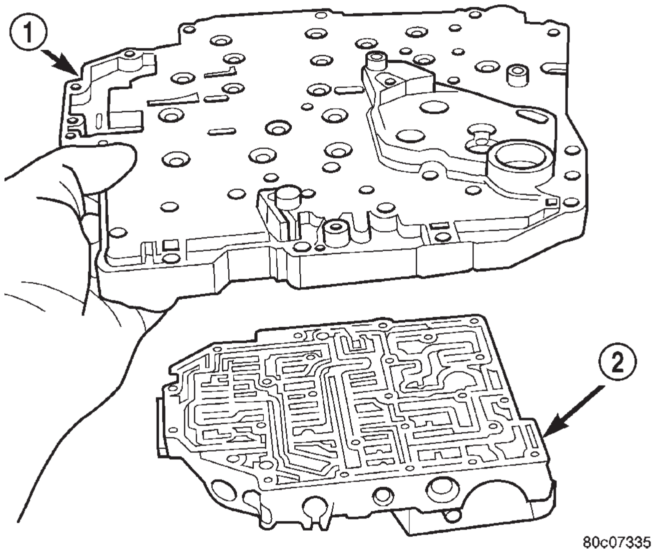


Fig. 297 Install Transfer Plate to Valve Body

1 - TRANSFER PLATE
2 - VALVE BODY

(11) Install the transfer plate (1) to the valve body (2) (Fig. 297).

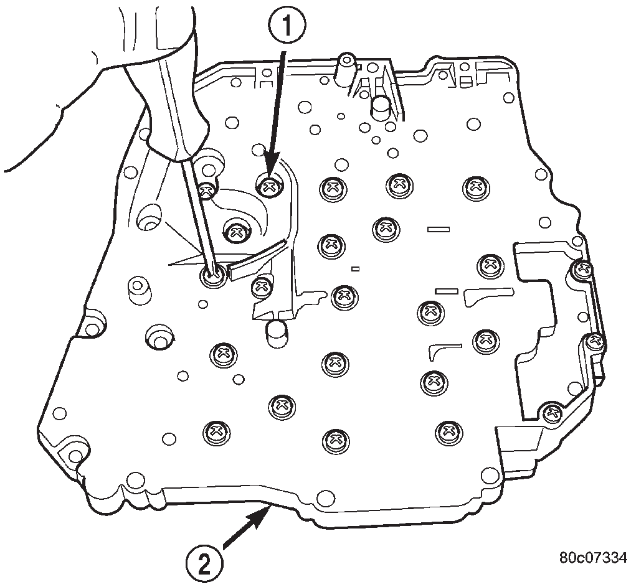


Fig. 298 Install Transfer Plate-to-Valve Body Screws

1 - SCREW (24)
2 - TRANSFER PLATE

(12) Install the transfer plate-to-valve body screws (1) (Fig. 298) and torque to 5 N·m (45 in. lbs.).

VALVE BODY (Continued)

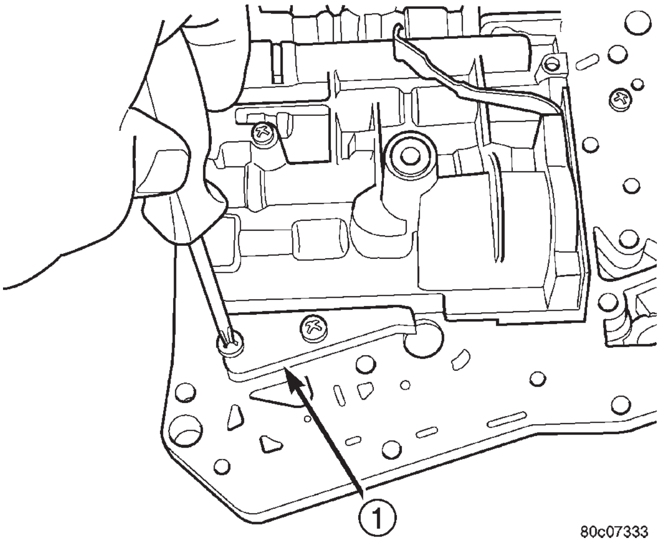


Fig. 299 Install Stiffener Plate

1 - STIFFENER PLATE

(13) Install the stiffener plate (1) (Fig. 299).

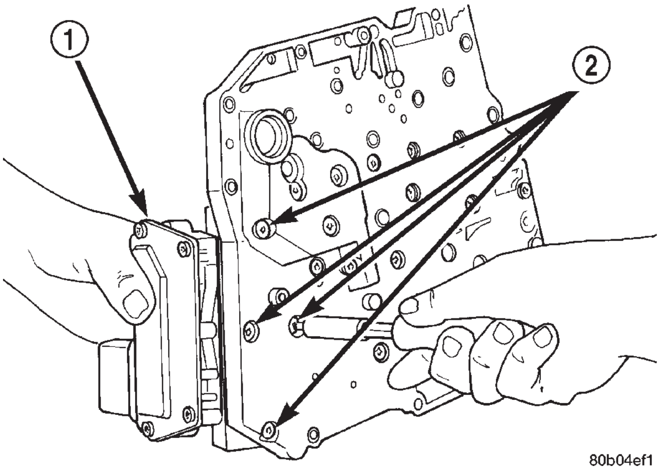


Fig. 300 Solenoid Retaining Screws

1 - SOLENOID/PRESSURE SWITCH ASSEMBLY
2 - RETAINING SCREWS

(14) Install the solenoid/pressure switch assembly (1) and screws to the transfer plate (Fig. 300) and torque to 5.5 N·m (50 in. lbs.).

(15) Install the manual shaft/rooster comb (3) and transmission range sensor (1) to the valve body (Fig. 301).

(16) Install the TRS/manual shaft retaining screw (1) (Fig. 302) and torque to 5 N·m (45 in. lbs.).

(17) Install manual shaft seal.

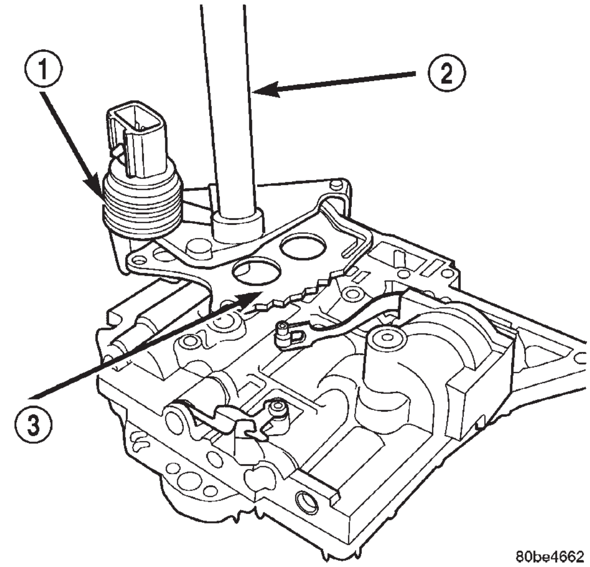


Fig. 301 Manual Shaft/Rooster Comb and Transmission Range Sensor

1 - TRANSMISSION RANGE SENSOR
2 - MANUAL SHAFT
3 - ROOSTER COMB

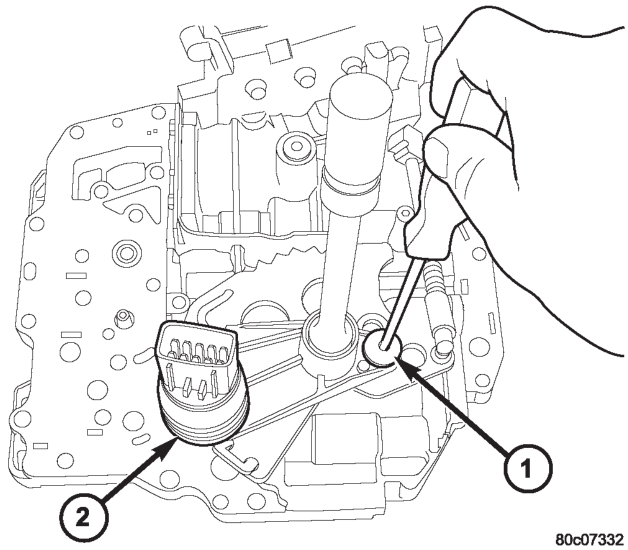


Fig. 302 Manual Shaft Retaining Screw

1 - SCREW
2 - TRS

VALVE BODY (Continued)

INSTALLATION

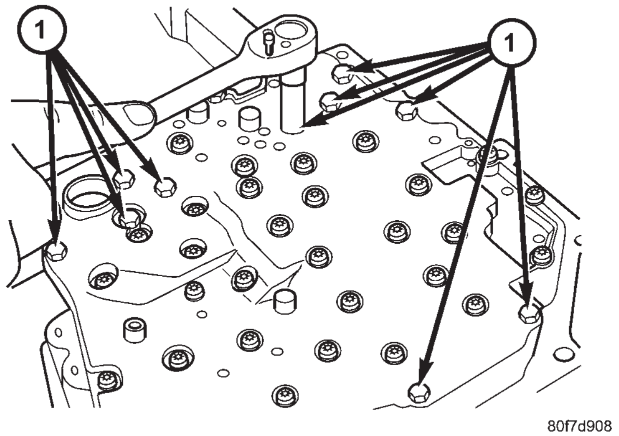


Fig. 303 Install Valve Body Bolts

1 - BOLTS

(1) Install valve body into position and start bolts (1). Torque valve body to transmission case bolts (1) (Fig. 303) to 12 N·m (105 in. lbs.) torque.

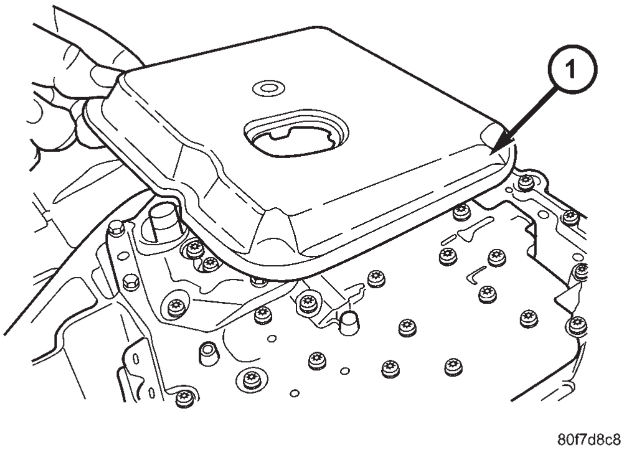


Fig. 304 Install Transmission Filter

1 - TRANSMISSION FILTER

(2) Install transmission oil filter (1) (Fig. 304).

NOTE: Before installing the oil pan bolt in the bolt hole (5) located between the torque converter clutch on and U/D clutch pressure tap circuits (Fig. 305), it will be necessary to replentish the sealing patch on the bolt using Mopar® Lock & Seal Adhesive.

(3) Make sure oil pan (1) and case rail are clean and dry. Install an 1/8" bead of RTV to the transmission oil pan and install to case. Tighten bolts (2) (Fig. 306) to 20 N·m (14.5 ft. lbs.).

(4) Lower vehicle and connect the TRS connector.

(5) Connect solenoid/pressure switch assembly connector.

(6) Lower vehicle.

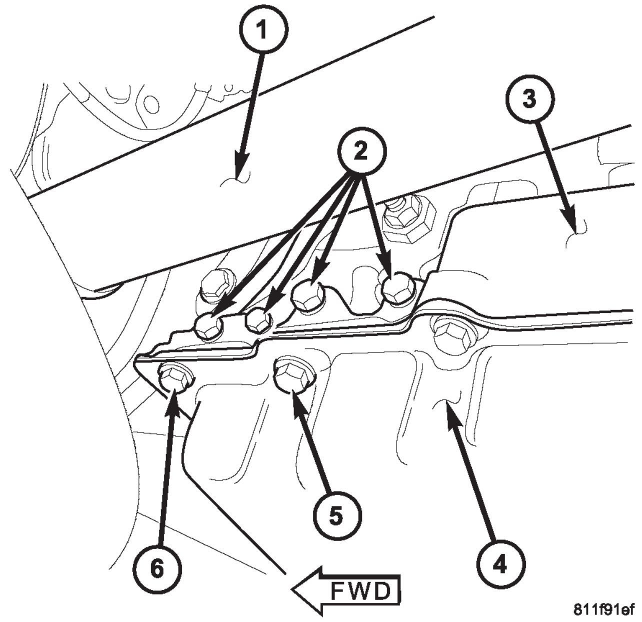


Fig. 305 Pan Fastener Location

1 - FRONT DRIVESHAFT
2 - PRESSURE PORTS
3 - TRANSMISSION CASE
4 - TRANSMISSION OIL PAN
5 - SECOND TRANSMISSION OIL PAN BOLT ON LEFT SIDE
6 - FIRST TRANSMISSION OIL PAN BOLT

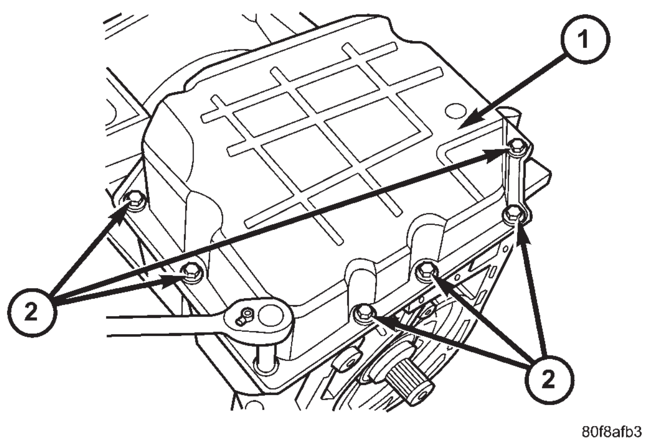


Fig. 306 Install Transmission Oil Pan Bolts

1 - TRANSMISSION OIL PAN
2 - BOLTS

(7) Fill transmission with ATF+4, Automatic Transmission Fluid. Verify proper fluid level. (Refer to 21 - TRANSMISSION/AUTOMATIC - 42RLE/ FLUID - STANDARD PROCEDURE)

NOTE: If the valve body has been reconditioned or replaced, it is necessary to perform the Quick Learn Procedure. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/TRANSMISSION CONTROL MODULE - STANDARD PROCEDURE)