TRANSMISSION AND TRANSFER CASE

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44RE AUTOMATIC TRANSMISSION

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DESCRIPTION AND OPERATION

44 RE TRANSMISSION

Vehicles equipped with the 3.1L turbo diesel engine use the 44RE automatic transmission.

The 44RE is a four speed fully automatic transmission (Fig. 1) with an electronic governor. First through third gear ranges are provided by the clutches, bands, overrunning clutch, and planetary gear sets in the transmission. Fourth gear range is provided by the overdrive unit that contains an overdrive clutch, direct clutch, planetary gear set, and overrunning clutch. The overdrive clutch is applied in fourth gear only. The direct clutch is applied in all ranges except fourth gear. The torque converter clutch is controlled by the Powertrain Control Module (PCM). 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 engages in fourth gear, and in third gear when the O/D switch is OFF. Engagement occurs when the vehicle is moving at a steady speed after the vehicle has warmed up. The torque converter clutch disengages when the accelerator is applied. The 44 RE transmission is cooled by an integral fluid cooler inside the radiator.

DESCRIPTION AND OPERATION (Continued)

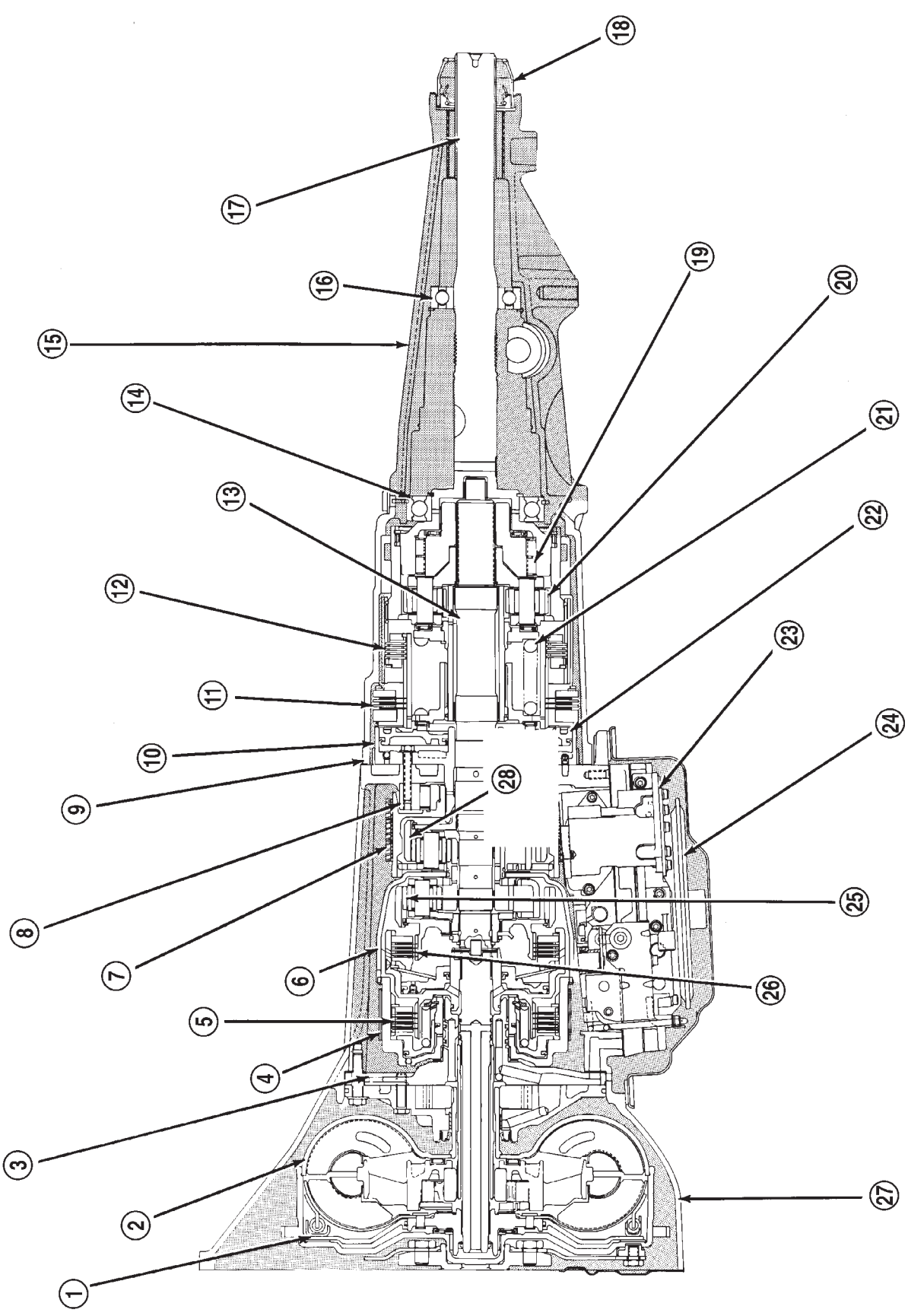

Fig. 1 44 RE Transmission

DESCRIPTION AND OPERATION (Continued)

1 – CONVERTER CLUTCH
2 – TORQUE CONVERTER
3 – OIL PUMP AND REACTION SHAFT SUPPORT ASSEMBLY
4 – FRONT BAND
5 – FRONT CLUTCH
6 – DRIVING SHELL
7 – REAR BAND
8 – TRANSMISSION OVERRUNNING CLUTCH
9 – OVERDRIVE UNIT
10 – PISTON RETAINER
11 – OVERDRIVE CLUTCH
12 – DIRECT CLUTCH
13 – INTERMEDIATE SHAFT
14 – FRONT BEARING
15 – HOUSING
16 – REAR BEARING
17 – OUTPUT SHAFT
18 – SEAL
19 – OVERDRIVE OVERRUNNING CLUTCH
20 – OVERDRIVE PLANETARY GEAR
21 – DIRECT CLUTCH SPRING
22 – OVERDRIVE CLUTCH PISTON
23 – VALVE BODY ASSEMBLY
24 – FILTER
25 – FRONT PLANETARY GEAR
26 – REAR CLUTCH
27 – TRANSMISSION
28 – REAR PLANETARY GEAR

TRANSMISSION IDENTIFICATION

Transmission identification numbers are stamped on the left side of the case just above the oil pan gasket surface (Fig. 2). Refer to this information when ordering replacement parts.

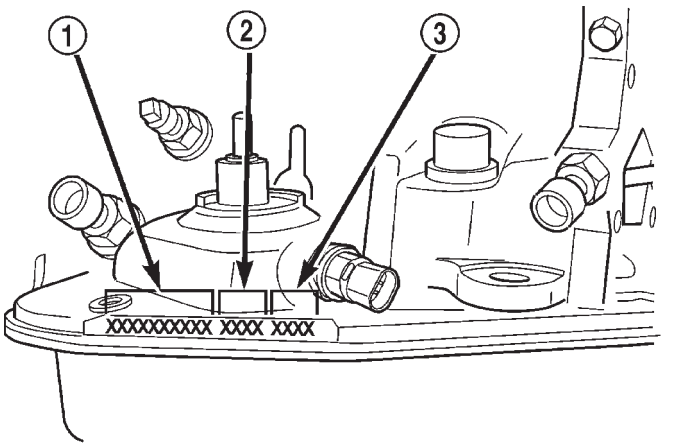

Fig. 2 Transmission Part And Serial Number Location

1 – PART NUMBER
2 – BUILD DATE
3 – SERIAL NUMBER

RECOMMENDED FLUID

NOTE: Refer to the Service Procedures section of this Group for fluid level checking procedures.

FLUID TYPE

Mopar® ATF Plus 3, Type 7176 automatic transmission fluid is the recommended fluid for Chrysler automatic transmissions.

Dexron II fluid IS NOT recommended. Clutch chatter can result from the use of improper fluid.

FLUID ADDITIVES

Fluid additives other than Mopar® approved fluorescent leak detection dyes are not to be used in this transmission.

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, clutch and servo 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.

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 faulty or improperly installed drainback valve, 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.

FLUID CONTAMINATION

Transmission fluid contamination is generally a result of:

DESCRIPTION AND OPERATION (Continued)

- 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 reverse flush cooler and lines after repair
- 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 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 for some time, an overhaul may also be necessary; especially if shift problems had developed.

The transmission cooler and lines should be reverse flushed whenever a malfunction generates sludge and/or debris. The torque converter should also be replaced at the same time.

Failure to flush the cooler and lines will result in recontamination. Flushing applies to auxiliary coolers as well. The torque converter should also be replaced whenever a failure generates sludge and debris. This is necessary because normal converter flushing procedures will not remove all contaminants.

ELECTRONIC LOCK-UP TORQUE CONVERTER

The torque converter 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. Torque multiplication is created when the stator directs the hydraulic flow from the turbine to rotate the impeller in the direction the engine crankshaft is turning. The turbine transfers power to the planetary gear sets in the transmission. The transfer of power into the impeller assists torque multiplication. At low vehicle-speed, the overrunning clutch holds the stator stationary (during torque multiplication) and allows the stator to freewheel at high vehicle speed. The converter clutch engagement reduces engine speed. 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 results in large amounts of metal or fiber contamination in the fluid.

TRANSMISSION GEAR RATIOS

Gear ratios are:

- **1st** 2.74:1
- **2nd** 1.54:1
- **3rd** 1.00:1
- **4th** 0.69:1
- **Rev.** 2.21

GEARSHIFT MECHANISM

The shift mechanism is cable operated and provides six shift positions. The shift positions are:

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

Manual low (1) range provides first gear only. Overrun braking is also provided in this range. Manual second (2) range provides first and second gear only. Drive range provides first, second, third, and overdrive fourth gear ranges. The shift into overdrive fourth gear range occurs only after the transmission has completed the shift into (D) third gear range. No further movement of the shift mechanism is required to complete the 3-4 shift.

ELECTRONIC GOVERNOR

Governor pressure is controlled electronically. Components used for governor pressure control include:

- Governor body
- Valve body transfer plate
- Governor pressure solenoid valve
- Governor pressure sensor
- Fluid temperature thermistor
- Throttle position sensor (TPS)
- Transmission speed sensor
- Powertrain control module (PCM)

DESCRIPTION AND OPERATION (Continued)

GOVERNOR PRESSURE SOLENOID VALVE

The solenoid valve is a duty-cycle solenoid which regulates the governor pressure needed for upshifts and downshifts. It is an electro-hydraulic device located in the governor body on the valve body transfer plate (Fig. 3).

The inlet side of the solenoid valve is exposed to normal transmission line pressure. The outlet side of the valve leads to the valve body governor circuit.

The solenoid valve regulates line pressure to produce governor pressure. The average current supplied to the solenoid controls governor pressure. One amp current produces zero kPa/psi governor pressure. Zero amps sets the maximum governor pressure.

The powertrain control module (PCM) turns on the trans control relay which supplies electrical power to the solenoid valve. Operating voltage is 12 volts (DC). The PCM controls the ground side of the solenoid using the governor pressure solenoid control circuit.

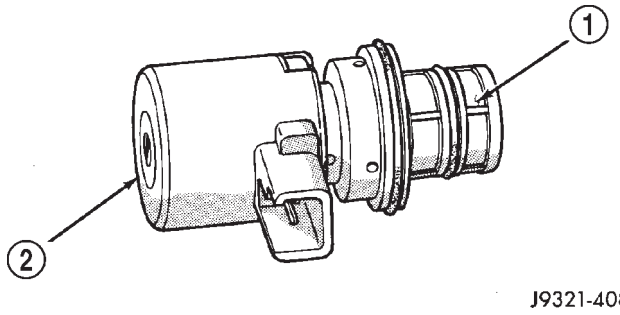

Fig. 3 Governor Pressure Solenoid Valve

1 – SOLENOID FILTER
2 – GOVERNOR PRESSURE SOLENOID

GOVERNOR PRESSURE SENSOR

The governor pressure sensor measures output pressure of the governor pressure solenoid valve (Fig. 4).

The sensor output signal provides the necessary feedback to the PCM. This feedback is needed to adequately control governor pressure.

GOVERNOR BODY AND TRANSFER PLATE

The transfer plate is designed to supply transmission line pressure to the governor pressure solenoid valve and to return governor pressure.

The governor pressure solenoid valve is mounted in the governor body. The body is bolted to the lower side of the transfer plate (Fig. 4). The transfer plate channels line pressure to the solenoid valve through the governor body. It also channels governor pressure from the solenoid valve to the governor circuit. It is the solenoid valve that develops the necessary governor pressure.

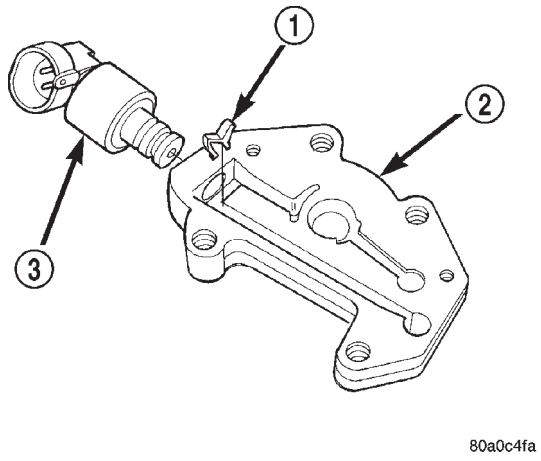

Fig. 4 Governor Pressure Sensor

1 – RETAINING CLIP
2 – GOVERNOR BODY
3 – GOVERNOR PRESSURE SENSOR/TRANSMISSION FLUID TEMPERATURE THERMISTOR

TRANSMISSION FLUID TEMPERATURE THERMISTOR

Transmission fluid temperature readings are supplied to the transmission control module by the thermistor. The temperature readings are used to control engagement of the fourth gear overdrive clutch, the converter clutch, and governor pressure. Normal resistance value for the thermistor at room temperature is approximately 1000 ohms.

The PCM prevents engagement of the converter clutch and overdrive clutch, when fluid temperature is below approximately 10°C (50°F).

If fluid temperature exceeds 126°C (260°F), the PCM causes a 4-3 downshift and engage the converter clutch. Engagement is according to the third gear converter clutch engagement schedule.

The overdrive OFF lamp in the instrument panel illuminates when the shift back to third occurs. The transmission will not allow fourth gear operation until fluid temperature decreases to approximately 110°C (230°F).

The thermistor is part of the governor pressure sensor assembly and is immersed in transmission fluid at all times.

TRANSMISSION SPEED SENSOR

The speed sensor (Fig. 5) is located in the overdrive gear case. The sensor is positioned over the park gear and monitors transmission output shaft rotating speed. Speed sensor signals are triggered by the park gear lugs as they rotate past the sensor pickup face. Input signals from the sensor are sent to the transmission control module for processing. The vehicle speed sensor also serves as a backup for the

DESCRIPTION AND OPERATION (Continued)

transmission speed sensor. Signals from this sensor are shared with the powertrain control module.

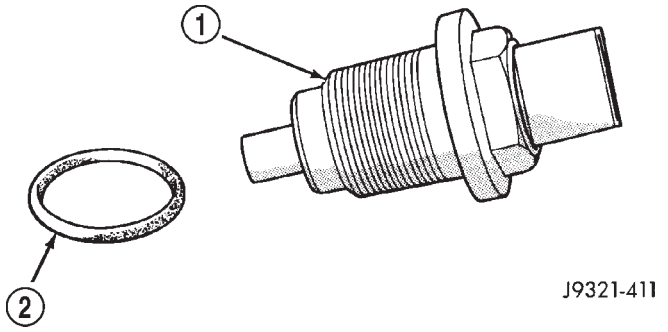

Fig. 5 Transmission Output Speed Sensor

1 – TRANSMISSION OUTPUT SHAFT SPEED SENSOR
2 – SEAL

THROTTLE POSITION SENSOR (TPS)

The TPS provides throttle position input signals to the PCM. This input signal is used to determine overdrive and converter clutch shift schedule and to select the proper governor curve.

POWERTRAIN CONTROL MODULE (PCM)

The PCM controls operation of the converter clutch, overdrive clutch, and governor pressure solenoid.

The control module determines transmission shift points based on input signals from the transmission thermistor, transmission output shaft speed sensor, crankshaft position sensor, vehicle speed sensor, throttle position sensor, and battery temperature sensor.

GOVERNOR PRESSURE CURVES

There are four governor pressure curves programmed into the transmission control module. The different curves allow the control module to adjust governor pressure for varying conditions. One curve is used for operation when fluid temperature is at, or below, 1°C (30°F). A second curve is used when fluid temperature is at, or above, 10°C (50°F) during normal city or highway driving. A third curve is used during wide-open throttle operation. The fourth curve is used when driving with the transfer case in low range.

SHIFT VALVE OPERATION

The shift valves are moved by a combination of throttle and governor pressure. The governor pressure is generated by electrical components.

The conditions under which a shift to fourth will not occur are:

- Overdrive switch is Off
- Transmission fluid temperature is below 10° C (50° F) or above 121° C (250° F)
- Shift to third not yet completed
- Vehicle speed too low for 3-4 shift to occur
- Battery temperature below –5° F.

HYDRAULIC CONTROL SYSTEM

The hydraulic control system provides fully automatic operation. The system performs five basic functions which are: pressure supply, pressure regulation, flow control, clutch/band application, and lubrication.

PRESSURE REGULATION

The pressure regulator valve maintains line pressure. The amount of pressure developed is controlled by throttle pressure which is dependent on the degree of throttle opening. The regulator valve is located in the valve body.

The throttle valve determines line pressure and shift speed. Governor pressure increases in proportion to vehicle speed. The throttle valve controls upshift and downshift speeds by regulating pressure according to throttle position.

Shift Valve Flow Control

The manual valve is operated by the gearshift linkage and provides the operating range selected by the driver.

The 1-2 shift valve provides 1-2 or 2-1 shifts and the 2-3 shift valve provides 2-3 or 3-2 shifts.

The kickdown valve provides forced 3-2 or 3-1 downshifts depending on vehicle speed. Downshifts occur when the throttle is opened beyond downshift detent position. Detent is reached just before wide open throttle position.

The 2-3 valve throttle pressure plug provides 3-2 downshifts at varying throttle openings depending on vehicle speed.

The 1-2 shift control valve transmits 1-2 shift pressure to the accumulator piston. This controls kickdown band capacity on 1-2 upshifts and 3-2 downshifts.

The 3-4 shift, quick fill, and timing valves plus the 3-4 accumulator, are only actuated when the overdrive solenoid is energized. The solenoid contains a check ball that controls a vent port to the 3-4 valves. The check ball either diverts line pressure away from or directly to the 3-4 valves.

The limit valve determines maximum speed at which a 3-2 part throttle kickdown can be made. On transmissions without a limit valve, maximum speed for a 3-2 kickdown is at detent position.

The 2-3 shuttle valve has two functions. The first is fast front band release and smooth engagement during lift-foot 2-3 upshifts. The second is to regulate front clutch and band application during 3-2 downshifts.

DESCRIPTION AND OPERATION (Continued)

The 3-4 timing valve is moved by line pressure coming through the 3-4 shift valve. The timing valve holds the 2-3 shift valve in an upshift position. The purpose is to prevent the 2-3 valve from up or downshifting before the 3-4 valve.

The 3-4 accumulator is mounted on the overdrive housing and performs the same function as the 2-3 accumulator; it is used to smooth engagement during a 3-4 shift.

The switch valve directs fluid apply pressure to the converter clutch in one position and releases it in the opposite position. It also directs oil to the cooling and lube circuits. The switch valve regulates oil pressure to the torque converter by limiting maximum oil pressure to 130 psi.

OVERDRIVE OFF SWITCH

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

3-4 SHIFT SEQUENCE

The overdrive clutch is applied in fourth gear only. The direct clutch is applied in all ranges except fourth gear. Fourth gear overdrive range is electronically controlled and hydraulically activated. Various sensor inputs are supplied to the powertrain control module to operate the overdrive solenoid on the valve body. The solenoid contains a check ball that opens and closes a vent port in the 3-4 shift valve feed passage. The overdrive solenoid (and check ball) are not energized in first, second, third, or reverse gear. The vent port remains open, diverting line pressure from the 2-3 shift valve away from the 3-4 shift valve. The overdrive control switch must be in the ON position to transmit overdrive status to the PCM. A 3-4 upshift occurs only when the overdrive solenoid is energized by the PCM. The PCM energizes the overdrive solenoid during the 3-4 upshift. This causes the solenoid check ball to close the vent port allowing line pressure from the 2-3 shift valve to act directly on the 3-4 upshift valve. Line pressure on the 3-4 shift valve overcomes valve spring pressure moving the valve to the upshift position. This action exposes the feed passages to the 3-4 timing valve, 3-4 quick fill valve, 3-4 accumulator, and ultimately to the overdrive piston. Line pressure through the timing valve moves the overdrive piston into contact with the overdrive clutch. The direct clutch is disengaged before the overdrive clutch is engaged. The boost valve provides increased fluid for lubrication and torque convertor clutch capacity. The 3-4 accumulator cushions overdrive clutch engagement to smooth 3-4 upshifts. The accumulator is charged at the same time as apply pressure acts against the overdrive piston.

CONVERTER CLUTCH ENGAGEMENT

Converter clutch engagement in third or fourth gear range is controlled by sensor inputs to the powertrain control module. Inputs that determine clutch engagement are: coolant temperature, engine rpm, vehicle speed, throttle position, and manifold vacuum. The torque converter clutch is engaged by the clutch solenoid on the valve body. The clutch can be engaged in third and fourth gear ranges depending on overdrive control switch position. If the overdrive control switch is in the normal ON position, the clutch will engage after the shift to fourth gear, and above approximately 72 km/h (45 mph). If the control switch is in the OFF position, the clutch will engage after the shift to third gear, at approximately 56 km/h (35 mph) at light throttle.

QUICK FILL VALVE

The 3-4 quick fill valve provides faster engagement of the overdrive clutch during 3-4 upshifts. The valve temporarily bypasses the clutch piston feed orifice at the start of a 3-4 upshift. This exposes a larger passage into the piston retainer resulting in a much faster clutch fill and apply sequence. The quick fill valve does not bypass the regular clutch feed orifice throughout the 3-4 upshift. Instead, once a predetermined pressure develops within the clutch, the valve closes the bypass. Clutch fill is then completed through the regular feed orifice.

CONVERTER DRAINBACK VALVE

DESCRIPTION

The drainback valve is located in the transmission cooler outlet (pressure) line.

OPERATION

The valve prevents fluid from draining from the converter into the cooler and lines when the vehicle is shut down for lengthy periods. Production valves have a hose nipple at one end, while the opposite end

DESCRIPTION AND OPERATION (Continued)

is threaded for a flare fitting. All valves have an arrow (or similar mark) to indicate direction of flow through the valve.

BRAKE TRANSMISSION SHIFT INTERLOCK MECHANISM

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. 6). 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 lock 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. 6), unless the shifter is fully locked into the PARK position.

DIAGNOSIS AND TESTING

AUTOMATIC TRANSMISSION DIAGNOSIS

Automatic transmission problems can be a result of poor engine performance, incorrect fluid level, incorrect linkage or cable adjustment, band or hydraulic control pressure adjustments, hydraulic system malfunctions or electrical/mechanical component malfunctions. Begin diagnosis by checking the easily accessible items such as: fluid level and condition, linkage adjustments and electrical connections. A road test will determine if further diagnosis is necessary.

PRELIMINARY DIAGNOSIS

Two basic procedures are required. One procedure for vehicles that are drivable and an alternate procedure for disabled vehicles (will not back up or move forward).

VEHICLE IS DRIVEABLE

(1) Check for transmission fault codes using DRB scan tool.

(2) Check fluid level and condition.

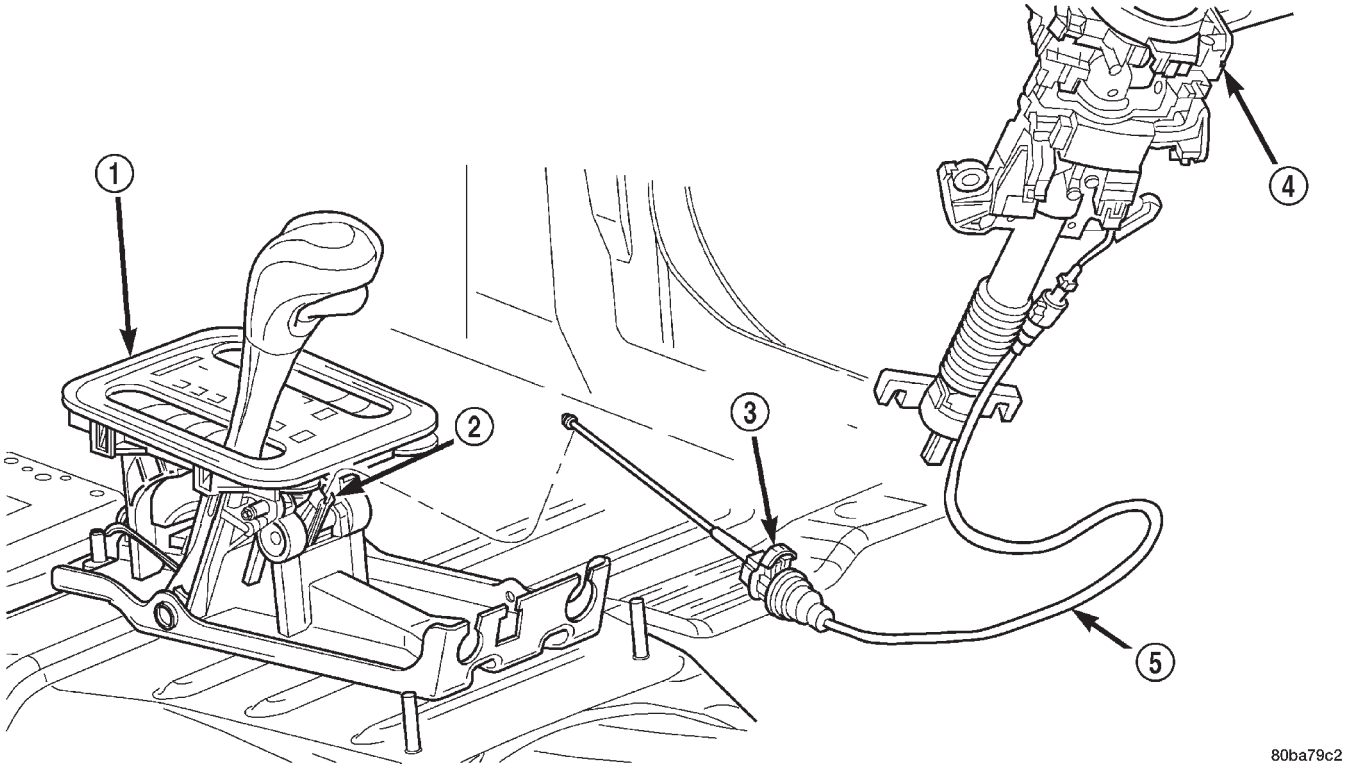

Fig. 6 Ignition Interlock Cable

1 – SHIFT MECHANISM
2 – SHIFTER BTSI LEVER
3 – ADJUSTMENT CLIP
4 – STEERING COLUMN ASSEMBLY
5 – INTERLOCK CABLE

DIAGNOSIS AND TESTING (Continued)

(3) Adjust throttle and gearshift linkage if complaint was based on delayed, erratic, or harsh shifts.

(4) Road test and note how transmission upshifts, downshifts, and engages.

(5) Perform stall test if complaint is based on sluggish acceleration. Or, if abnormal throttle opening is needed to maintain normal speeds with a properly tuned engine.

(6) Perform hydraulic pressure test if shift problems were noted during road test.

(7) Perform air-pressure test to check clutch-band operation.

VEHICLE IS DISABLED

(1) Check fluid level and condition.

(2) Check for broken or disconnected gearshift or throttle linkage.

(3) Check for cracked, leaking cooler lines, or loose or missing pressure-port plugs.

(4) Raise and support vehicle on safety stands, start engine, shift transmission into gear, and note following:

(a) If propeller shaft turns but wheels do not, problem is with differential or axle shafts.

(b) If propeller shaft does not turn and transmission is noisy, stop engine. Remove oil pan, and check for debris. If pan is clear, remove transmission and check for damaged drive plate, converter, oil pump, or input shaft.

(c) If propeller shaft does not turn and transmission is not noisy, perform hydraulic-pressure test to determine if problem is hydraulic or mechanical.

PARK/NEUTRAL POSITION SWITCH

The center terminal of the park/neutral position switch is the sense/starter-circuit terminal. It provides the ground for the starter solenoid circuit when the transmission selector lever is in PARK or NEUTRAL positions only. The outer terminals on the switch are for the backup lamp circuit.

SWITCH TEST

To test the switch, remove the wiring connector. Test for continuity between the center terminal and the transmission case. Continuity should exist when the transmission is in PARK or NEUTRAL only. Continuity should not exist any other time or with the transmission in any other gear.

Shift the transmission into REVERSE and test continuity at the switch outer terminals. Continuity should exist when the transmission is in REVERSE only. Continuity should not exist between the outer terminals and the case.

Check gearshift linkage adjustment before replacing a switch that tests faulty.

OVERDRIVE ELECTRICAL CONTROLS

The overdrive off switch, valve body solenoid, case connectors and related wiring can all be tested with a 12 volt test lamp or a volt/ohmmeter. Check continuity of each component when diagnosis indicates this is necessary. Refer to Group 8W, Wiring Diagrams, for component locations and circuit information.

Switch and solenoid continuity should be checked whenever the transmission fails to shift into fourth gear range.

BRAKE TRANSMISSION SHIFT INTERLOCK

(1) Verify that the key can only be removed in the PARK position

(2) When the shift lever is in PARK And the shift handle pushbutton is in the “OUT” position, the ignition key cylinder should rotate freely from OFF to LOCK. When the shifter is in any other gear or neutral position, the ignition key cylinder should not rotate to the LOCK position.

(3) Shifting out of PARK should be possible when the ignition key cylinder is in the OFF position.

(4) Shifting out of PARK should not be possible while applying 25 lb. maximum handle pushbutton force and ignition key cylinder is in the RUN or START positions unless the foot brake pedal is depressed approximately 1/2 inch (12mm).

(5) Shifting out of PARK should not be possible when the ignition key cylinder is in the ACCESSORY or LOCK positions.

(6) Shifting between any gears, NEUTRAL or into PARK may be done without depressing foot brake pedal with ignition switch in RUN or START positions and vehicle stationary or in motion.

GEARSHIFT CABLE

(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:

(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.

DIAGNOSIS AND TESTING (Continued)

THROTTLE VALVE CABLE

Transmission throttle valve cable adjustment is extremely important to proper operation. This adjustment positions the throttle valve, which controls shift speed, quality, and part-throttle downshift sensitivity.

If cable setting is too loose, early shifts and slippage between shifts may occur. If the setting is too tight, shifts may be delayed and part throttle downshifts may be very sensitive. Refer to the Adjustments section for the proper adjustment procedure.

ROAD TESTING

Before road testing, be sure the fluid level and control cable adjustments have been checked and adjusted if necessary. Verify that diagnostic trouble codes have been resolved.

Observe engine performance during the road test. A poorly tuned engine will not allow accurate analysis of transmission operation.

Operate the transmission in all gear ranges. Check for shift variations and engine flare which indicates slippage. Note if shifts are harsh, spongy, delayed, early, or if part throttle downshifts are sensitive.

Slippage indicated by engine flare, usually means clutch, band or overrunning clutch problems. If the condition is advanced, an overhaul will be necessary to restore normal operation.

A slipping clutch or band can often be determined by comparing which internal units are applied in the various gear ranges. The Clutch and Band Application chart provides a basis for analyzing road test results.

SHIFT LEVER POSITION	TRANSMISSION CLUTCHES AND BANDS					OVERDRIVE CLUTCHES		
	FRONT CLUTCH	FRONT BAND	REAR CLUTCH	REAR BAND	OVERRUN. CLUTCH	OVERDRIVE CLUTCH	DIRECT CLUTCH	OVERRUN. CLUTCH
Reverse	X			X			X	
Drive Range								
First			X		X		X	X
Second		X	X				X	X
Third	X		X				X	X
Fourth	X		X			X		
2-Range (Manual Second)		X	X		X		X	X
1-Range (Manual Low)			X	X	X		X	X

CLUTCH AND BAND APPLICATION CHART

ANALYZING ROAD TEST

Refer to the Clutch and Band Application chart and note which elements are in use in the various gear ranges.

Note that the rear clutch is applied in all forward ranges (D, 2, 1). The transmission overrunning clutch is applied in first gear (D, 2 and 1 ranges) only. The rear band is applied in 1 and R range only.

Note that the overdrive clutch is applied only in fourth gear and the overdrive direct clutch and overrunning clutch are applied in all ranges except fourth gear.

For example: If slippage occurs in first gear in D and 2 range but not in 1 range, the transmission overrunning clutch is faulty. Similarly, if slippage occurs in any two forward gears, the rear clutch is slipping.

Applying the same method of analysis, note that the front and rear clutches are applied simultaneously only in D range third and fourth gear. If the transmission slips in third gear, either the front clutch or the rear clutch is slipping.

If the transmission slips in fourth gear but not in third gear, the overdrive clutch is slipping. By selecting another gear which does not use these clutches, the slipping unit can be determined. For example, if the transmission also slips in Reverse, the front clutch is slipping. If the transmission does not slip in Reverse, the rear clutch is slipping.

If slippage occurs during the 3-4 shift or only in fourth gear, the overdrive clutch is slipping. Similarly, if the direct clutch were to fail, the transmission would lose both reverse gear and overrun braking in 2 position (manual second gear).

If the transmission will not shift to fourth gear, the control switch, overdrive solenoid or related wiring may also be the problem cause.

DIAGNOSIS AND TESTING (Continued)

This process of elimination can be used to identify a slipping unit and check operation. Proper use of the Clutch and Band Application Chart is the key.

Although road test analysis will help determine the slipping unit, the actual cause of a malfunction usually cannot be determined until hydraulic and air pressure tests are performed. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

Unless a malfunction is obvious, such as no drive in D range first gear, do not disassemble the transmission. Perform the hydraulic and air pressure tests to help determine the probable cause.

HYDRAULIC PRESSURE TEST

Hydraulic test pressures range from a low of one psi (6.895 kPa) governor pressure, to 300 psi (2068 kPa) at the rear servo pressure port in reverse.

An accurate tachometer and pressure test gauges are required. Test Gauge C-3292 has a 100 psi range. Test Gauge C-3293-SP has a 300 psi range and is used where pressures exceed 100 psi.

Pressure Test Port Locations

Test ports are located at both sides of the transmission case (Fig. 7).

Line pressure is checked at the accumulator port on the right side of the case. The front servo pressure port is at the right side of the case just behind the filler tube opening.

The rear servo and governor pressure ports are at the right rear of the transmission case. The overdrive clutch pressure port is at the left rear of the case.

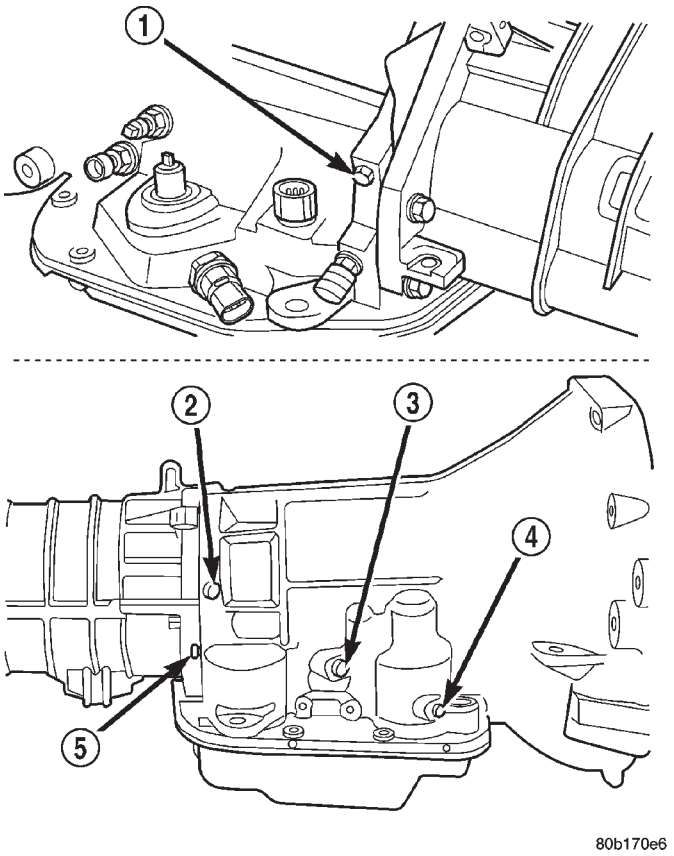

Fig. 7 Pressure Test Port Locations

1 – OVERDRIVE CLUTCH TEST PORT
2 – GOVERNOR TEST PORT
3 – ACCUMULATOR TEST PORT
4 – FRONT SERVO TEST PORT
5 – REAR SERVO TEST PORT

Test One - Transmission In Manual Low

NOTE: This test checks pump output, pressure regulation, and condition of the rear clutch and servo circuit. Both test gauges are required for this test.

(1) Connect tachometer to engine. Position tachometer so it can be observed from driver seat if helper will be operating engine. Raise vehicle on hoist that will allow rear wheels to rotate freely.

(2) Connect 100 psi Gauge C-3292 to accumulator port. Then connect 300 psi Gauge C-3293-SP to rear servo port.

(3) Disconnect throttle and gearshift cables from levers on transmission valve body manual shaft.

(4) Have helper start and run engine at 1000 rpm.

(5) Move transmission shift lever fully forward into 1 range.

(6) Gradually move transmission throttle lever from full forward to full rearward position and note pressures on both gauges:

- Line pressure at accumulator port should be 54-60 psi (372-414 kPa) with throttle lever forward and gradually increase to 90-96 psi (621-662 kPa) as throttle lever is moved rearward.
- Rear servo pressure should be same as line pressure within 3 psi (20.68 kPa).

Test Two—Transmission In 2 Range

NOTE: This test checks pump output, line pressure and pressure regulation. Use 100 psi Test Gauge C-3292 for this test.

(1) Leave vehicle in place on hoist and leave Test Gauge C-3292 connected to accumulator port.

(2) Have helper start and run engine at 1000 rpm.

(3) Move transmission shift lever one detent rearward from full forward position. This is 2 range.

(4) Move transmission throttle lever from full forward to full rearward position and read pressure on gauge.

DIAGNOSIS AND TESTING (Continued)

(5) Line pressure should be 54-60 psi (372-414 kPa) with throttle lever forward and gradually increase to 90-96 psi (621-662 kPa) as lever is moved rearward.

Test Three—Transmission In D Range Third Gear

NOTE: This test checks pressure regulation and condition of the clutch circuits. Both test gauges are required for this test.

(1) Turn OD switch off.
(2) Leave vehicle on hoist and leave Gauge C-3292 in place at accumulator port.
(3) Move Gauge C-3293-SP over to front servo port for this test.
(4) Have helper start and run engine at 1600 rpm for this test.
(5) Move transmission shift lever two detents rearward from full forward position. This is D range.
(6) Read pressures on both gauges as transmission throttle lever is gradually moved from full forward to full rearward position:

- Line pressure at accumulator in D range third gear, should be 54-60 psi (372-414 kPa) with throttle lever forward and increase as lever is moved rearward. If the torque convertor is allowed to lock up pressure can rise to 130 psi (900 kPa). Be certain to maintain the correct RPM during testing.
- Front servo pressure in D range third gear, should be within 3 psi (21 kPa) of line pressure up to kickdown point.

Test Four—Transmission In Reverse

NOTE: This test checks pump output, pressure regulation and the front clutch and rear servo circuits. Use 300 psi Test Gauge C-3293-SP for this test.

(1) Leave vehicle on hoist and leave gauge C3292 in place at accumulator port.
(2) Move 300 psi Gauge C-3293-SP back to rear servo port.
(3) Have helper start and run engine at 1600 rpm for test.
(4) Move transmission shift lever four detents rearward from full forward position. This is Reverse range.
(5) Move transmission throttle lever fully forward then fully rearward and note reading at Gauge C-3293-SP.
(6) Pressure should be 145 - 175 psi (1000-1207 kPa) with throttle lever forward and increase to 230 - 280 psi (1586-1931 kPa) as lever is gradually moved rearward.

Test Five—Governor Pressure

NOTE: This test checks governor operation by measuring governor pressure response to changes in vehicle speed. It is usually not necessary to check governor operation unless shift speeds are incorrect or if the transmission will not downshift. The test should be performed on the road or on a hoist that will allow the rear wheels to rotate freely.

(1) Move 100 psi Test Gauge C-3292 to governor pressure port.
(2) Move transmission shift lever two detents rearward from full forward position. This is D range.
(3) Have helper start and run engine at curb idle speed. Then firmly apply service brakes so wheels will not rotate.
(4) Note governor pressure:

- Governor pressure should be no more than 20.6 kPa (3 psi) at curb idle speed and wheels not rotating.
- If pressure exceeds 20.6 kPa (3 psi), a fault exists in governor pressure control system.

(5) Release brakes, slowly increase engine speed, and observe speedometer and pressure test gauge (do not exceed 30 mph on speedometer). Governor pressure should increase in proportion to vehicle speed. Or approximately 6.89 kPa (1 psi) for every 1 mph.
(6) Governor pressure rise should be smooth and drop back to no more than 20.6 kPa (3 psi), after engine returns to curb idle and brakes are applied to prevent wheels from rotating.
(7) Compare results of pressure test with analysis chart.

Test Six—Transmission In Overdrive Fourth Gear

NOTE: This test checks line pressure at the overdrive clutch in fourth gear range. Use 300 psi Test Gauge C-3292 for this test. The test should be performed on the road or on a chassis dyno.

(1) Remove tachometer; it is not needed for this test.
(2) Move 300 psi Gauge to overdrive clutch pressure test port. Then remove other gauge and reinstall test port plug.
(3) Lower vehicle.
(4) Turn OD switch on.
(5) Secure test gauge so it can be viewed from drivers seat.
(6) Start engine and shift into D range.
(7) Increase vehicle speed gradually until 3-4 shift occurs and note gauge pressure.
(8) Pressure should be 469-496 kPa (68-72 psi) with closed throttle and increase to 620-827 kPa (90-120 psi) at 1/2 to 3/4 throttle. Note that pressure can increase to around 896 kPa (130 psi) at full throttle.

DIAGNOSIS AND TESTING (Continued)

(9) Return to shop or move vehicle off chassis dyno.

PRESSURE TEST ANALYSIS CHART

TEST CONDITION	INDICATION
Line pressure OK during any one test	Pump and regulator valve OK
Line pressure OK in R but low in D, 2, 1	Leakage in rear clutch area (seal rings, clutch seals)
Pressure low in D Fourth Gear Range	Overdrive clutch piston seal, or check ball problem
Pressure OK in 1, 2 but low in D3 and R	Leakage in front clutch area
Pressure OK in 2 but low in R and 1	Leakage in rear servo
Front servo pressure low in 2	Leakage in servo; broken servo ring or cracked servo piston
Pressure low in all positions	Clogged filter, stuck regulator valve, worn or faulty pump, low oil level
Governor pressure too high at idle speed	Governor pressure solenoid valve system fault. Refer to diagnostic book.
Governor pressure low at all mph figures	Faulty governor pressure solenoid, transmission control module, or governor pressure sensor
Lubrication pressure low at all throttle positions	Clogged fluid cooler or lines, seal rings leaking, worn pump bushings, pump, clutch retainer, or clogged filter.
Line pressure high	Output shaft plugged, sticky regulator valve
Line pressure low	Sticky regulator valve, clogged filter, worn pump

AIR TESTING TRANSMISSION CLUTCH AND BAND OPERATION

Air-pressure testing can be used to check transmission front/rear clutch and band operation. The test can be conducted with the transmission either in the vehicle or on the work bench, as a final check, after overhaul.

Air-pressure testing requires that the oil pan and valve body be removed from the transmission. The servo and clutch apply passages are shown (Fig. 8).

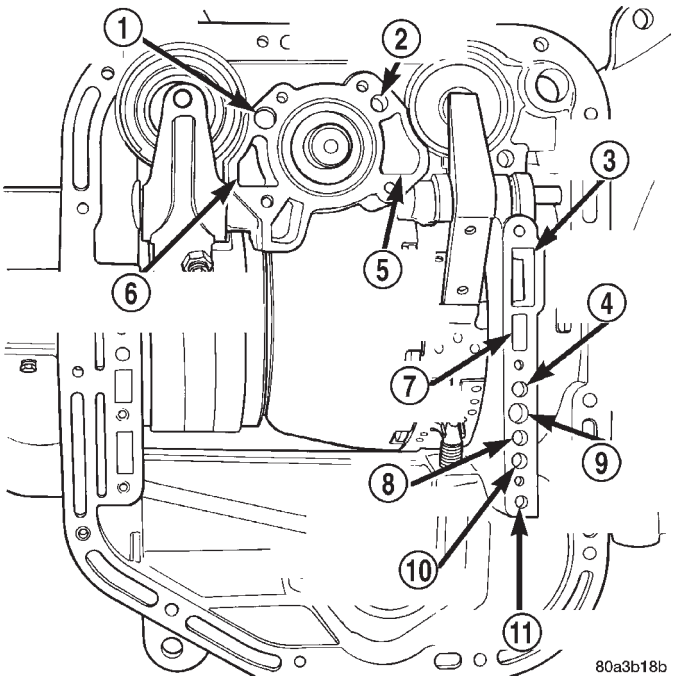

Fig. 8 Air Pressure Test Passages

1 – REAR SERVO APPLY
2 – FRONT SERVO APPLY
3 – PUMP SUCTION
4 – FRONT CLUTCH APPLY
5 – FRONT SERVO RELEASE
6 – LINE PRESSURE TO ACCUMULATOR
7 – PUMP PRESSURE
8 – TO CONVERTER
9 – REAR CLUTCH APPLY
10 – FROM CONVERTER
11 – TO COOLER

Front Clutch Air Test

Place one or two fingers on the clutch housing and apply air pressure through front clutch apply passage. Piston movement can be felt and a soft thump heard as the clutch applies.

Rear Clutch Air Test

Place one or two fingers on the clutch housing and apply air pressure through rear clutch apply passage. Piston movement can be felt and a soft thump heard as the clutch applies.

Front Servo Apply Air Test

Apply air pressure to the front servo apply passage. The servo rod should extend and cause the band to tighten around the drum. Spring pressure should release the servo when air pressure is removed.

DIAGNOSIS AND TESTING (Continued)

Rear Servo Air Test

Apply air pressure to the rear servo apply passage. The servo rod should extend and cause the band to tighten around the drum. Spring pressure should release the servo when air pressure is removed.

CONVERTER HOUSING FLUID LEAK DIAGNOSIS

When diagnosing converter housing fluid leaks, three items must be established before repair.

(1) Verify the correct fluid level in the transmission.

(2) Verify that a leak condition actually exists.

(3) Determined the true source of the leak.

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, excessive fluid fill 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 and onto the rear of the converter. Pump O-ring or pump body leaks follow the same path as a seal leak (Fig. 9). Pump vent or pump attaching bolt leaks are generally deposited on the inside of the converter housing and not on the converter itself (Fig. 9). Pump seal or gasket leaks usually travel down the inside of the converter housing. Front band lever pin plug leaks are generally deposited on the housing and not on the converter.

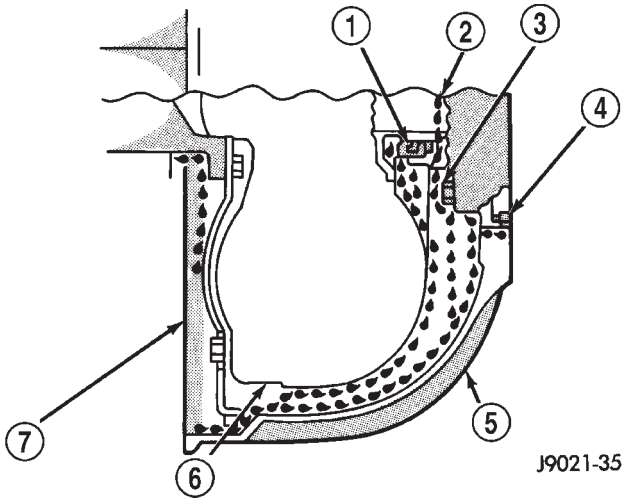

Fig. 9 Converter Housing Leak Paths

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

TORQUE CONVERTER LEAK POINTS

Possible sources of converter leaks are:

(1) Leaks at the weld joint around the outside diameter weld (Fig. 10).

(2) Leaks at the converter hub weld (Fig. 10).

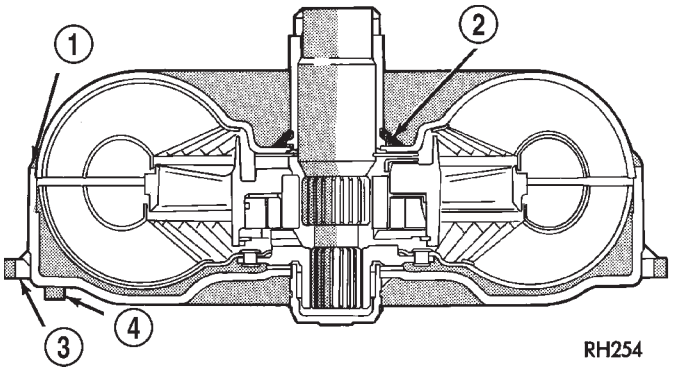

Fig. 10 Converter Leak Points—Typical

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

CONVERTER HOUSING AREA LEAK CORRECTION

(1) Remove the transmission and torque converter. Refer to the procedure in this group.

(2) Tighten front band adjusting screw until band is tight around front clutch retainer. This prevents front/rear clutches from coming out when oil pump is removed.

(3) Remove oil pump and remove pump seal. Inspect pump housing drainback and vent holes for obstructions. Clear holes with solvent and wire.

(4) Inspect pump bushing and converter hub. If bushing is scored, replace it. If converter hub is scored, either polish it with crocus cloth or replace converter.

(5) Install new pump seal, O-ring, and gasket. Replace oil pump if cracked, porous or damaged in any way. Be sure to loosen the front band before installing the oil pump, damage to the oil pump seal rings may occur if the band is still tightened to the front clutch retainer.

(6) Loosen kickdown lever pin access plug three turns. Apply Loctite 592, or Permatex No. 2 to plug threads and tighten plug to 17 N·m (150 in. lbs.) torque.

(7) Adjust front band.

(8) Lubricate pump seal and converter hub with transmission fluid or petroleum jelly and install converter.

(9) Install transmission and converter housing dust shield.

(10) Lower vehicle.

DIAGNOSIS AND TESTING (Continued)

DIAGNOSIS TABLES AND CHARTS—RE TRANSMISSION

The diagnosis charts provide additional reference when diagnosing a transmission fault. The charts provide general information on a variety of transmission, overdrive unit and converter clutch fault conditions.

The hydraulic flow charts in the Schematics and Diagrams section of this group, outline fluid flow and hydraulic circuitry. Circuit operation is provided for neutral, third, fourth and reverse gear ranges. Normal working pressures are also supplied for each of the gear ranges.

DIAGNOSIS CHARTS

CONDITION	POSSIBLE CAUSES	CORRECTION
HARSH ENGAGEMENT (FROM NEUTRAL TO DRIVE OR REVERSE)	1. Fluid Level Low	1. Add Fluid
	2. Throttle Linkage Misadjusted	2. Adjust linkage - setting may be too long.
	3. Mount and Driveline Bolts Loose	3. Check engine mount, transmission mount, propeller shaft, rear spring to body bolts, rear control arms, crossmember and axle bolt torque. Tighten loose bolts and replace missing bolts.
	4. U-Joint Worn/Broken	4. Remove propeller shaft and replace U-Joint.
	5. Axle Backlash Incorrect	5. Check per Service Manual. Correct as needed.
	6. Hydraulic Pressure Incorrect	6. Check pressure. Remove, overhaul or adjust valve body as needed.
	7. Band Misadjusted.	7. Adjust rear band.
	8. Valve Body Check Balls Missing.	8. Inspect valve body for proper check ball installation.
	9. Axle Pinion Flange Loose.	9. Replace nut and check pinion threads before installing new nut. Replace pinion gear if threads are damaged.
	10. Clutch, band or planetary component damaged.	10. Remove, disassemble and repair transmission as necessary.
	11. Converter Clutch Faulty.	11. Replace converter and flush cooler and line before installing new converter.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
DELAYED ENGAGEMENT (FROM NEUTRAL TO DRIVE OR REVERSE)	1. Fluid Level Low.	1. Correct level and check for leaks.
	2. Filter Clogged.	2. Change filter.
	3. Gearshift Linkage Misadjusted.	3. Adjust linkage and repair linkage if worn or damaged.
	4. Torque Converter Drain Back (Oil drains from torque converter into transmission sump)	4. If vehicle moves normally after 5 seconds after shifting into gear, no repair is necessary. If longer, inspect pump bushing for wear. Replace pump house.
	5. Rear Band Misadjusted.	5. Adjust band.
	6. Valve Body Filter Plugged.	6. Replace fluid and filter. If oil pan and old fluid were full of clutch disc material and/or metal particles, overhaul will be necessary.
	7. Oil Pump Gears Worn/ Damaged.	7. Remove transmission and replace oil pump.
	8. Governor Circuit and Solenoid Valve Electrical Fault.	8. Test with DRB scan tool and repair as required.
	9. Hydraulic Pressure Incorrect.	9. Perform pressure test, remove transmission and repair as needed.
	10. Reaction Shaft Seal Rings Worn/Broken.	10. Remove transmission, remove oil pump and replace seal rings.
	11. Rear Clutch/Input Shaft, Rear Clutch Seal Rings Damaged.	11. Remove and disassemble transmission and repair as necessary.
	12. Regulator Valve Stuck.	12. Clean.
	13. Cooler Plugged.	13. Transfer case failure can plug cooler.
NO DRIVE RANGE (REVERSE OK)	1. Fluid Level Low.	1. Add fluid and check for leaks if drive is restored.
	2. Gearshift Linkage/Cable Loose/Misadjusted.	2. Repair or replace linkage components.
	3. Rear Clutch Burnt.	3. Remove and disassemble transmission and rear clutch and seals. Repair/replace worn or damaged parts as needed.
	4. Valve Body Malfunction.	4. Remove and disassemble valve body. Replace assembly if any valves or bores are damaged.
	5. Transmission Overrunning Clutch Broken.	5. Remove and disassemble transmission. Replace overrunning clutch.
	6. Input Shaft Seal Rings Worn/Damaged.	6. Remove and disassemble transmission. Replace seal rings and any other worn or damaged parts.
	7. Front Planetary Failed Broken.	7. Remove and repair.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO DRIVE OR REVERSE (VEHICLE WILL NOT MOVE)	1. Fluid Level Low.	1. Add fluid and check for leaks if drive is restored.
	2. Gearshift Linkage/Cable Loose/Misadjusted.	2. Inspect, adjust and reassemble linkage as needed. Replace worn/damaged parts.
	3. U-Joint/Axle/Transfer Case Broken.	3. Perform preliminary inspection procedure for vehicle that will not move. Refer to procedure in diagnosis section.
	4. Filter Plugged.	4. Remove and disassemble transmission. Repair or replace failed components as needed. Replace filter. If filter and fluid contained clutch material or metal particles, an overhaul may be necessary. Perform lube flow test. Flush oil. Replace cooler as necessary.
	5. Oil Pump Damaged.	5. Perform pressure test to confirm low pressure. Replace pump body assembly if necessary.
	6. Valve Body Malfunctioned.	6. Check and inspect valve body. Replace valve body (as assembly) if any valve or bore is damaged. Clean and reassemble correctly if all parts are in good condition.
	7. Transmission Internal Component Damaged.	7. Remove and disassemble transmission. Repair or replace failed components as needed.
	8. Park Sprag not Releasing - Check Stall Speed, Worn/ Damaged/Stuck.	8. Remove, disassemble, repair.
	9. Torque Converter Damage.	9. Inspect and replace as required.
SHIFTS DELAYED OR ERRATIC (SHIFTS ALSO HARSH AT TIMES)	1. Fluid Level Low/High.	1. Correct fluid level and check for leaks if low.
	2. Fluid Filter Clogged.	2. Replace filter. If filter and fluid contained clutch material or metal particles, an overhaul may be necessary. Perform lube flow test.
	3. Throttle Linkage Misadjusted.	3. Adjust linkage as described in service section.
	4. Throttle Linkage Binding.	4. Check cable for binding. Check for return to closed throttle at transmission.
	5. Gearshift Linkage/Cable Misadjusted.	5. Adjust linkage/cable as described in service section.
	6. Clutch or Servo Failure.	6. Remove valve body and air test clutch, and band servo operation. Disassemble and repair transmission as needed.
	7. Governor Circuit Electrical Fault.	7. Test using DRB scan tool and repair as required.
	8. Front Band Misadjusted.	8. Adjust band.
	9. Pump Suction Passage Leak.	9. Check for excessive foam on dipstick after normal driving. Check for loose pump bolts, defective gasket. Replace pump assembly if needed.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO REVERSE (D RANGES OK)	1. Gearshift Linkage/Cable Misadjusted/Damaged.	1. Repair or replace linkage parts as needed.
	2. Park Sprag Sticking.	2. Replace overdrive annulus gear.
	3. Rear Band Misadjusted/Worn.	3. Adjust band; replace.
	4. Valve Body Malfunction.	4. Remove and service valve body. Replace valve body if any valves or valve bores are worn or damaged.
	5. Rear Servo Malfunction.	5. Remove and disassemble transmission. Replace worn/damaged servo parts as necessary.
	6. Direct Clutch in Overdrive Worn	6. Disassemble overdrive. Replace worn or damaged parts.
	7. Front Clutch Burnt.	7. Remove and disassemble transmission. Replace worn, damaged clutch parts as required.
HAS FIRST/REVERSE ONLY (NO 1-2 OR 2-3 UPSHIFT)	1. Governor Circuit Electrical Fault.	1. Test using DRB scan tool and repair as required.
	2. Valve Body Malfunction.	2. Repair stuck 1-2 shift valve or governor plug.
	3. Front Servo/Kickdown Band Damaged/Burned.	3. Repair/replace.
MOVES IN 2ND OR 3RD GEAR, ABRUPTLY DOWNSHIFTS TO LOW	1. Valve Body Malfunction.	1. Remove, clean and inspect. Look for stuck 1-2 valve or governor plug.
	2. Governor Components Sticking.	2. Remove, clean and inspect. Replace faulty parts.
NO LOW GEAR (MOVES IN 2ND OR 3RD GEAR ONLY)	1. Governor Components Sticking.	1. Remove clean, inspect and repair as required.
	2. Governor Circuit Electrical Fault.	2. Test with DRB scan tool and repair as required.
	3. Valve Body Malfunction.	3. Remove, clean and inspect. Look for sticking 1-2 shift valve, 2-3 shift valve, governor plug or broken springs.
	4. Front Servo Piston Cocked in Bore.	4. Inspect servo and repair as required.
	5. Front Band Linkage Malfunction	5. Inspect linkage and look for bind in linkage.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO KICKDOWN OR NORMAL DOWNSHIFT	1. Throttle Linkage Misadjusted.	1. Adjust linkage.
	2. Accelerator Pedal Travel Restricted.	2. Verify floor mat is not under pedal, repair worn accelerator cable or bent brackets.
	3. Valve Body Hydraulic Pressures Too High or Too Low Due to Valve Body Malfunction or Incorrect Hydraulic Control Pressure Adjustments.	3. Perform hydraulic pressure tests to determine cause and repair as required. Correct valve body pressure adjustments as required.
	4. Governor Circuit Electrical Fault.	4. Test with DRB scan tool and repair as required.
	5. Valve Body Malfunction.	5. Perform hydraulic pressure tests to determine cause and repair as required. Correct valve body pressure adjustments as required.
	6. TPS Malfunction.	6. Replace sensor, check with DRB scan tool.
	7. PCM Malfunction.	7. Check with DRB scan tool and replace if required.
	8. Valve Body Malfunction.	8. Repair sticking 1-2, 2-3 shift valves, governor plugs, 3-4 solenoid, 3-4 shift valve, 3-4 timing valve.
STUCK IN LOW GEAR (WILL NOT UPSHIFT)	1. Throttle Linkage Misadjusted/ Stuck.	1. Adjust linkage and repair linkage if worn or damaged. Check for binding cable or missing return spring.
	2. Gearshift Linkage Misadjusted.	2. Adjust linkage and repair linkage if worn or damaged.
	3. Governor Component Electrical Fault.	3. Check operating pressures and test with DRB scan tool, repair faulty component.
	4. Front Band Out of Adjustment.	4. Adjust Band.
	5. Clutch or Servo Malfunction.	5. Air pressure check operation of clutches and bands. Repair faulty component.
CREEPS IN NEUTRAL	1. Gearshift Linkage Misadjusted.	1. Adjust linkage.
	2. Rear Clutch Dragging/Warped.	2. Disassemble and repair.
	3. Valve Body Malfunction.	3. Perform hydraulic pressure test to determine cause and repair as required.
BUZZING NOISE	1. Fluid Level Low	1. Add fluid and check for leaks.
	2. Shift Cable Misassembled.	2. Route cable away from engine and bell housing.
	3. Valve Body Misassembled.	3. Remove, disassemble, inspect valve body. Reassemble correctly if necessary. Replace assembly if valves or springs are damaged. Check for loose bolts or screws.
	4. Pump Passages Leaking	4. Check pump for porous casting, scores on mating surfaces and excess rotor clearance. Repair as required. Loose pump bolts.
	5. Cooling System Cooler Plugged.	5. Flow check cooler circuit. Repair as needed.
	6. Overrunning Clutch Damaged.	6. Replace clutch.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
SLIPS IN REVERSE ONLY	1. Fluid Level Low.	1. Add fluid and check for leaks.
	2. Gearshift Linkage Misadjusted.	2. Adjust linkage.
	3. Rear Band Misadjusted.	3. Adjust band.
	4. Rear Band Worn.	4. Replace as required.
	5. Overdrive Direct Clutch Worn.	5. Disassemble overdrive. Repair as needed.
	6. Hydraulic Pressure Too Low.	6. Perform hydraulic pressure tests to determine cause.
	7. Rear Servo Leaking.	7. Air pressure check clutch-servo operation and repair as required.
	8. Band Linkage Binding.	8. Inspect and repair as required.
SLIPS IN FORWARD DRIVE RANGES	1. Fluid Level Low.	1. Add fluid and check for leaks.
	2. Fluid Foaming.	2. Check for high oil level, bad pump gasket or seals, dirt between pump halves and loose pump bolts. Replace pump if necessary.
	3. Throttle Linkage Misadjusted.	3. Adjust linkage.
	4. Gearshift Linkage Misadjusted.	4. Adjust linkage.
	5. Rear Clutch Worn.	5. Inspect and replace as needed.
	6. Low Hydraulic Pressure Due to Worn Pump, Incorrect Control Pressure Adjustments, Valve Body Warpage or Malfunction, Sticking, Leaking Seal Rings, Clutch Seals Leaking, Servo Leaks, Clogged Filter or Cooler Lines	6. Perform hydraulic and air pressure tests to determine cause.
	7. Rear Clutch Malfunction, Leaking Seals or Worn Plates.	7. Air pressure check clutch-servo operation and repair as required.
	8. Overrunning Clutch Worn, Not Holding (Slips in 1 Only).	8. Replace Clutch.
SLIPS IN LOW GEAR “D” ONLY, BUT NO IN 1 POSITION	Overrunning Clutch Faulty.	Replace overrunning clutch.
GROWLING, GRATING OR SCRAPING NOISES	1. Drive Plate Broken.	1. Replace.
	2. Torque Converter Bolts Hitting Dust Shield.	2. Dust shield bent. Replace or repair.
	3. Planetary Gear Set Broken/ Seized.	3. Check for debris in oil pan and repair as required.
	4. Overrunning Clutch Worn/ Broken.	4. Inspect and check for debris in oil pan. Repair as required.
	5. Oil Pump Components Scored/Binding.	5. Remove, inspect and repair as required.
	6. Output Shaft Bearing or Bushing Damaged.	6. Remove, inspect and repair as required.
	7. Clutch Operation Faulty.	7. Perform air pressure check and repair as required.
	8. Front and Rear Bands Misadjusted.	8. Adjust bands.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
DRAGS OR LOCKS UP	1. Fluid Level Low.	1. Check and adjust level.
	2. Clutch Dragging/Failed	2. Air pressure check clutch operation and repair as required.
	3. Front or Rear Band Misadjusted.	3. Adjust bands.
	4. Case Leaks Internally.	4. Check for leakage between passages in case.
	5. Servo Band or Linkage Malfunction.	5. Air pressure check servo operation and repair as required.
	6. Overrunning Clutch Worn.	6. Remove and inspect clutch. Repair as required.
	7. Planetary Gears Broken.	7. Remove, inspect and repair as required (look for debris in oil pan).
NO 4-3 DOWNSHIFT	1. Circuit Wiring and/or Connectors Shorted.	1. Test wiring and connectors with test lamp and volt/ohmmeter. Repair wiring as necessary. Replace connectors and/or harnesses as required.
	2. PCM Malfunction.	2. Check PCM operation with DRB scan tool. Replace PCM only if faulty.
	3. TPS Malfunction	3. Check TPS with DRB scan tool at PCM.
	4. Lockup Solenoid Not Venting.	4. Remove valve body and replace solenoid assembly if plugged or shorted.
	5. Overdrive Solenoid Not Venting.	5. Remove valve body and replace solenoid if plugged or shorted.
	6. Valve Body Valve Sticking.	6. Repair stuck 3-4 shift valve or lockup timing valve.
NO 4-3 DOWNSHIFT WHEN CONTROL SWITCH IS TURNED OFF	1. Control Switch Open/Shorted.	1. Test and replace switch if faulty.
	2. Overdrive Solenoid Connector Shorted.	2. Test solenoids and replace if seized or shorted.
	3. PCM Malfunction.	3. Test with DRB scan tool. Replace PCM if faulty.
	4. Valve Body Stuck Valves.	4. Repair stuck 3-4, lockup or lockup timing valve.
CLUNK NOISE FROM DRIVELINE ON CLOSED THROTTLE 4-3 DOWNSHIFT	1. Transmission Fluid Low.	1. Add Fluid.
	2. Throttle Cable Misadjusted.	2. Adjust cable.
	3. Overdrive Clutch Select Spacer Wrong Spacer.	3. Replace overdrive piston thrust plate spacer.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
3-4 UPSHIFT OCCURS IMMEDIATELY AFTER 2-3 SHIFT	1. Overdrive Solenoid Connector or Wiring Shorted.	1. Test connector and wiring for loose connections, shorts or ground and repair as needed.
	2. TPS Malfunction.	2. Test TPS and replace as necessary. Check with DRB scan tool.
	3. PCM Malfunction.	3. Test PCM with DRB scan tool and replace controller if faulty.
	4. Overdrive Solenoid Malfunction.	4. Replace solenoid.
	5. Valve Body Malfunction.	5. Remove, disassemble, clean and inspect valve body components. Make sure all valves and plugs slide freely in bores. Polish valves with crocus cloth if needed.
WHINE/NOISE RELATED TO ENGINE SPEED	1. Fluid Level Low.	1. Add fluid and check for leaks.
	2. Shift Cable Incorrect Routing.	2. Check shift cable for correct routing. Should not touch engine or bell housing.
NO 3-4 UPSHIFT	1. O/D Switch In OFF Position.	1. Turn control switch to ON position.
	2. Overdrive Circuit Fuse Blown.	2. Replace fuse. Determine why fuse failed and repair as necessary (i.e., shorts or grounds in circuit).
	3. O/D Switch Wire Shorted/Open Cut.	3. Check wires/connections with 12V test lamp and voltmeter. Repair damaged or loose wire/connection as necessary.
	4. Distance or Coolant Sensor Malfunction.	4. Test both sensors with test lamp or volt/ohmmeter and replace faulty sensor.
	5. TPS Malfunction.	5. Check with DRB scan tool and replace if necessary.
	6. Neutral Switch to PCM Wire Shorted/Cut.	6. Test switch as described in service section and replace if necessary. Engine no start.
	7. PCM Malfunction.	7. Check with DRB scan tool and replace if necessary.
	8. Overdrive Solenoid Shorted/ Open.	8. Replace solenoid if shorted or open and repair loose or damaged wires (DRB scan tool).
	9. Solenoid Feed Orifice in Valve Body Blocked.	9. Remove, disassemble, and clean valve body thoroughly. Check feed orifice.
	10. Overdrive Clutch Failed.	10. Disassemble overdrive and repair as needed.
	11. Hydraulic Pressure Low.	11. Pressure test transmission to determine cause.
	12. Valve Body Valve Stuck.	12. Repair stuck 3-4 shift valve, 3-4 timing valve.
	13. O/D Piston Incorrect Spacer.	13. Remove unit, check end play and install correct spacer.
	14. Overdrive Piston Seal Failure.	14. Replace both seals.
	15. O/D Check Valve/Orifice Failed.	15. Check for free movement and secure assembly (in piston retainer). Check ball bleed orifice.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
SLIPS IN OVERDRIVE FOURTH GEAR	1. Fluid Level Low.	1. Add fluid and check for leaks.
	2. Overdrive Clutch Pack Worn.	2. Remove overdrive unit and rebuild clutch pack.
	3. Overdrive Piston Retainer Bleed Orifice Blown Out.	3. Disassemble transmission, remove retainer and replace orifice.
	4. Overdrive Piston or Seal Malfunction.	4. Remove overdrive unit. Replace seals if worn. Replace piston if damaged. If piston retainer is damaged, remove and disassemble the transmission.
	5. 3-4 Shift Valve, Timing Valve or Accumulator Malfunction.	5. Remove and overhaul valve body. Replace accumulator seals. Make sure all valves operate freely in bores and do not bind or stick. Make sure valve body screws are correctly tightened and separator plates are properly positioned.
	6. Overdrive Unit Thrust Bearing Failure.	6. Disassemble overdrive unit and replace thrust bearing (NO. 1 thrust bearing is between overdrive piston and clutch hub; NO. 2 thrust bearing is between the planetary gear and the direct clutch spring plate; NO. 3 thrust bearing is between overrunning clutch hub and output shaft).
	7. O/D Check Valve/Bleed Orifice Failure.	7. Check for function/secure orifice insert in O/D piston retainer.
DELAYED 3-4 UPSHIFT (SLOW TO ENGAGE)	1. Fluid Level Low.	1. Add fluid and check for leaks.
	2. Throttle Valve Cable Misadjusted.	2. Adjust throttle valve cable.
	3. Overdrive Clutch Pack Worn/Burnt.	3. Remove unit and rebuild clutch pack.
	4. TPS Faulty.	4. Test with DRB scan tool and replace TPS.
	5. Overdrive Clutch Bleed Orifice Plugged.	5. Disassemble transmission and replace orifice.
	6. Overdrive Solenoid or Wiring Shorted/Open.	6. Test solenoid and check wiring for loose/corroded connections or shorts/grounds. Replace solenoid if faulty and repair wiring if necessary.
	7. Overdrive Excess Clearance	7. Remove unit. Measure end play and select proper spacer.
	8. O/D Check Valve Missing or Stuck.	8. Check for presence of check valve. Repair or replace as required.
TORQUE CONVERTER LOCKS UP IN SECOND AND/OR THIRD GEAR	Lockup Solenoid, Relay or Wiring Shorted/Open.	Test solenoid, relay and wiring for continuity, shorts or grounds. Replace solenoid and relay if faulty. Repair wiring and connectors as necessary.
HARSH 1-2, 2-3, 3-4 OR 3-2 SHIFTS	Lockup Solenoid Malfunction.	Remove valve body and replace solenoid assembly.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NO START IN PARK OR NEUTRAL	1. Gearshift Linkage/Cable Misadjusted.	1. Adjust linkage/cable.
	2. Neutral Switch Wire Open/Cut.	2. Check continuity with test lamp. Repair as required.
	3. Neutral Switch Faulty.	3. Refer to service section for test and replacement procedure.
	4. Neutral Switch Connect Faulty.	4. Connectors spread open. Repair.
	5. Valve Body Manual Lever Assembly Bent/Worn/Broken.	5. Inspect lever assembly and replace if damaged.
NO REVERSE (OR SLIPS IN REVERSE)	1. Direct Clutch Pack (front clutch) Worn.	1. Disassemble unit and rebuild clutch pack.
	2. Rear Band Misadjusted.	2. Adjust band.
	3. Front Clutch Malfunctioned/ Burned.	3. Air-pressure test clutch operation. Remove and rebuild if necessary.
	4. Overdrive Thrust Bearing Failure.	4. Disassemble geartrain and replace bearings.
	5. Direct Clutch Spring Collapsed/ Broken.	5. Remove and disassemble unit. Check clutch position and replace spring.
OIL LEAKS.	1. Fluid Lines and Fittings Loose/Leaks/Damaged.	1. Tighten fittings. If leaks persist, replace fittings and lines if necessary.
	2. Fill Tube (where tube enters case) Leaks/Damaged.	2. Replace O-ring seal. Inspect tube for cracks in fill tube.
	3. Pressure Port Plug Loose Loose/Damaged.	3. Tighten to correct torque. Replace plug or reseal if leak persists.
	4. Pan Gasket Leaks.	4. Tighten pan screws (150 in. lbs.). If leaks persist, replace gasket.
	5. Valve Body Manual Lever Shaft Seal Leaks/Worn.	5. Replace shaft seal.
	6. Rear Bearing Access Plate Leaks.	6. Replace gasket. Tighten screws.
	7. Gasket Damaged or Bolts are Loose.	7. Replace bolts or gasket or tighten both.
	8. Adapter/Extension Gasket Damaged Leaks/Damaged.	8. Replace gasket.
	9. Neutral Switch Leaks/Damaged.	9. Replace switch and gasket.
	10. Converter Housing Area Leaks.	10. Check for leaks at seal caused by worn seal or burr on converter hub (cutting seal), worn bushing, missing oil return hole in front pump housing or hole plugged. Check for leaks past O-ring seal on pump or past pump-to-case bolts; pump housing porous, oil coming out vent due to overfill or leak past front band shaft access plug.
	11. Pump Seal Leaks/Worn/ Damaged.	11. Replace seal.
	12. Torque Converter Weld Leak/Cracked Hub.	12. Replace converter.
	13. Case Porosity Leaks.	13. Replace case.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
NOISY OPERATION IN FOURTH GEAR ONLY	1. Overdrive Clutch Discs, Plates or Snap Rings Damaged.	1. Remove unit and rebuild clutch pack.
	2. Overdrive Piston or Planetary Thrust Bearing Damaged.	2. Remove and disassemble unit. Replace either thrust bearing if damaged.
	3. Output Shaft Bearings Scored/Damaged.	3. Remove and disassemble unit. Replace either bearing if damaged.
	4. Planetary Gears Worn/Chipped.	4. Remove and overhaul overdrive unit.
	5. Overdrive Unit Overrunning Clutch Rollers Worn/Scored.	5. Remove and overhaul overdrive unit.

SERVICE PROCEDURES

FLUID LEVEL CHECK

Transmission fluid level should be checked monthly under normal operation. If the vehicle is used for trailer towing or similar heavy load hauling, check fluid level and condition weekly. Fluid level is checked with the engine running at curb idle speed, the transmission in NEUTRAL and the transmission fluid at normal operating temperature.

FLUID LEVEL CHECK PROCEDURE

(1) Transmission fluid must be at normal operating temperature for accurate fluid level check. Drive vehicle if necessary to bring fluid temperature up to normal hot operating temperature of 82°C (180°F).

(2) Position vehicle on level surface.

(3) Start and run engine at curb idle speed.

(4) Apply parking brakes.

(5) Shift transmission momentarily into all gear ranges. Then shift transmission back to Neutral.

(6) Clean top of filler tube and dipstick to keep dirt from entering tube.

(7) Remove dipstick (Fig. 11) and check fluid level as follows:

(a) Correct acceptable level is in crosshatch area.

(b) Correct maximum level is to MAX arrow mark.

(c) Incorrect level is at or below MIN line.

(d) If fluid is low, add only enough Mopar® ATF Plus 3 to restore correct level. Do not overfill.

CAUTION: Do not overfill the transmission. Overfilling may cause leakage out the pump vent which can be mistaken for a pump seal leak. Overfilling will also cause fluid aeration and foaming as the excess fluid is picked up and churned by the gear train. This will significantly reduce fluid life.

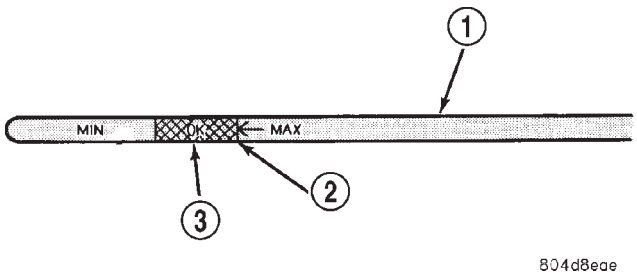

Fig. 11 Dipstick Fluid Level Marks—Typical

1 – DIPSTICK
2 – MAXIMUM CORRECT FLUID LEVEL
3 – ACCEPTABLE FLUID LEVEL

FLUID AND FILTER REPLACEMENT

Refer to the Maintenance Schedules in Group 0, Lubrication and Maintenance, for proper service intervals. The service fluid fill after a filter change is approximately 3.8 liters (4.0 quarts).

REMOVAL

(1) Hoist and support vehicle on safety stands.

(2) Place a large diameter shallow drain pan beneath the transmission pan.

(3) Remove bolts holding front and sides of pan to transmission (Fig. 12).

(4) Loosen bolts holding rear of pan to transmission.

(5) Slowly separate front of pan away from transmission allowing the fluid to drain into drain pan.

(6) Hold up pan and remove remaining bolt holding pan to transmission.

(7) While holding pan level, lower pan away from transmission.

(8) Pour remaining fluid in pan into drain pan.

(9) Remove screws holding filter to valve body (Fig. 13).

(10) Separate filter from valve body and pour fluid in filter into drain pan.

(11) Dispose of used trans fluid and filter properly.

SERVICE PROCEDURES (Continued)

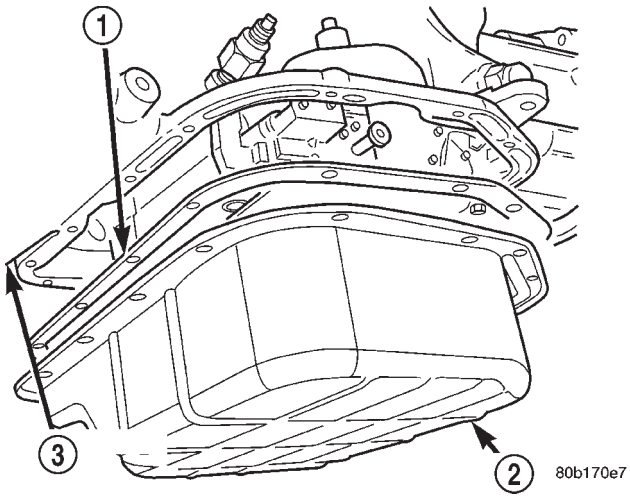

Fig. 12 Transmission Pan—Typical

1 – GASKET
2 – PAN
3 – TRANSMISSION

INSPECTION

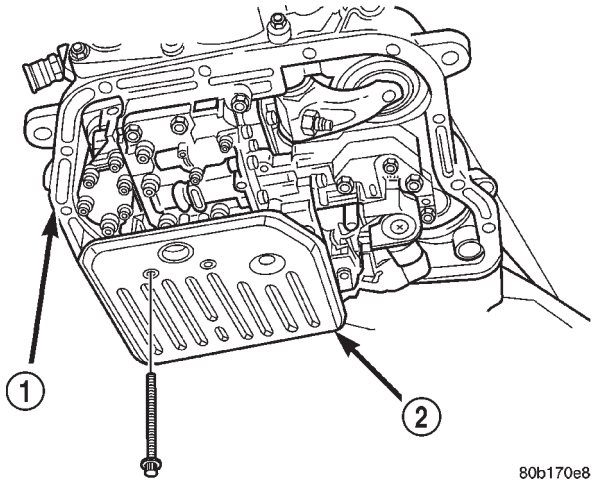

Fig. 13 Transmission Filter—Typical

1 – TRANSMISSION
2 – FILTER

Inspect bottom of pan and magnet for excessive amounts of metal. A light coating of clutch or band material on the bottom of the pan does not indicate a problem unless accompanied by slipping condition or shift lag. If fluid and pan are contaminated with excessive amounts or debris, refer to the diagnosis section of this group.

Check the adjustment of the front and rear bands, adjust if necessary.

CLEANING

(1) Using a suitable solvent, clean pan and magnet.

(2) Using a suitable gasket scraper, clean gasket material from gasket surface of transmission case and the gasket flange around the pan.

INSTALLATION

(1) Place replacement filter in position on valve body.

(2) Install screws to hold filter to valve body (Fig. 13). Tighten screws to 4 N·m (35 in. lbs.) torque.

(3) Place new gasket in position on pan and install pan on transmission.

(4) Place pan in position on transmission.

(5) Install screws to hold pan to transmission (Fig. 12). Tighten bolts to 17 N·m (150 in. lbs.) torque.

(6) Lower vehicle and fill transmission with Mopar® ATF Plus 3, type 7176 fluid.

TRANSMISSION FILL PROCEDURE

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 Plus 3 to transmission:

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

(b) If transmission was completely overhauled, torque converter was replaced or drained, and cooler was flushed, add **16 pints (8 quarts)** of ATF Plus 3 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 noticeable 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 leaks, foaming and shifting problems can result.

SERVICE PROCEDURES (Continued)

(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.

CONVERTER DRAINBACK CHECK VALVE SERVICE

The converter drainback check valve is located in the cooler outlet (pressure) line near the radiator tank. The valve prevents fluid drainback when the vehicle is parked for lengthy periods. The valve check ball is spring loaded and has an opening pressure of approximately 2 psi.

The valve is serviced as an assembly; it is not repairable. Do not clean the valve if restricted, or contaminated by sludge, or debris. If the valve fails, or if a transmission malfunction occurs that generates significant amounts of sludge and/or clutch particles and metal shavings, the valve must be replaced.

The valve must be removed whenever the cooler and lines are reverse flushed. The valve can be flow tested when necessary. The procedure is exactly the same as for flow testing a cooler.

If the valve is restricted, installed backwards, or in the wrong line, it will cause an overheating condition and possible transmission failure.

CAUTION: The drainback valve is a one-way flow device. It must be properly oriented in terms of flow direction for the cooler to function properly. The valve must be installed in the pressure line. Otherwise flow will be blocked and would cause an overheating condition and eventual transmission failure.

OIL PUMP VOLUME CHECK

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

(1) Disconnect the **cooler outlet** line at the rear of the transmission and place a drainpan under the disconnected line.

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

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

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

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

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

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

FLUSHING COOLERS AND TUBES

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

The only recommended procedure for flushing coolers and lines is to use Tool 6906 Cooler Flusher.

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

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

KEEP THE AREA WELL VENTILATED.

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

COOLER FLUSH USING TOOL 6906

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

(2) Reinstall filler plug on Tool 6906.

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

(4) Disconnect the cooler lines at the transmission.

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

SERVICE PROCEDURES (Continued)

NOTE: The converter drainback valve must be removed and an appropriate replacement hose installed to bridge the space between the transmission cooler line and the cooler fitting. Failure to remove the drainback valve will prevent reverse flushing the system.

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

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

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

(8) Turn pump OFF.

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

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

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

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

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

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.

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

REMOVAL AND INSTALLATION

TRANSMISSION

CAUTION: The transmission and torque converter must be removed as an assembly to avoid component damage. The converter drive plate, pump bushing, or oil seal can be damaged if the converter is left attached to the driveplate during removal. Be sure to remove the transmission and torque converter as an assembly.

REMOVAL

(1) Open the hood and disconnect the negative battery cable.

(2) Remove the (2) upper fan shroud retaining bolts.

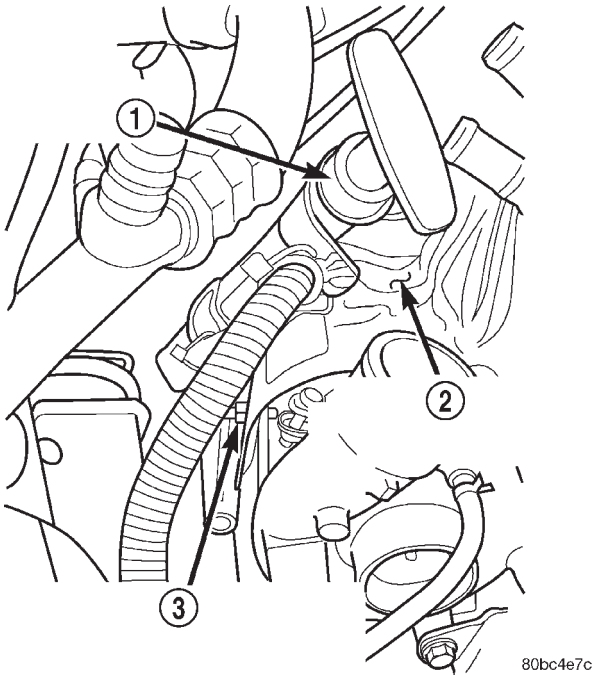

Fig. 14 Transmission Dipstick Tube Support Bracket Position & Orientation

1 – TRANSMISSION DIPSTICK TUBE
2 – TURBOCHARGER EXHAUST MANIFOLD HEATSHIELD
3 – TRANSMISSION DIPSTICK TUBE SUPPORT BRACKET RETAINING NUT

(3) Remove the transmission dipstick tube support bracket nut from the turbocharger heatshield (Fig. 14).

(4) Position a drainpan under the transmission.

(5) Pull the transmission dipstick tube from the transmission housing.

(6) Raise the vehicle on a hoist.

(7) Remove the (2) lower fan shroud retaining bolts.

REMOVAL AND INSTALLATION (Continued)

CAUTION: Mark the position of the driveshaft in relation to its companion flange prior to disassembly. Driveshaft must be reinstalled in the same position it was in prior to disassembly.

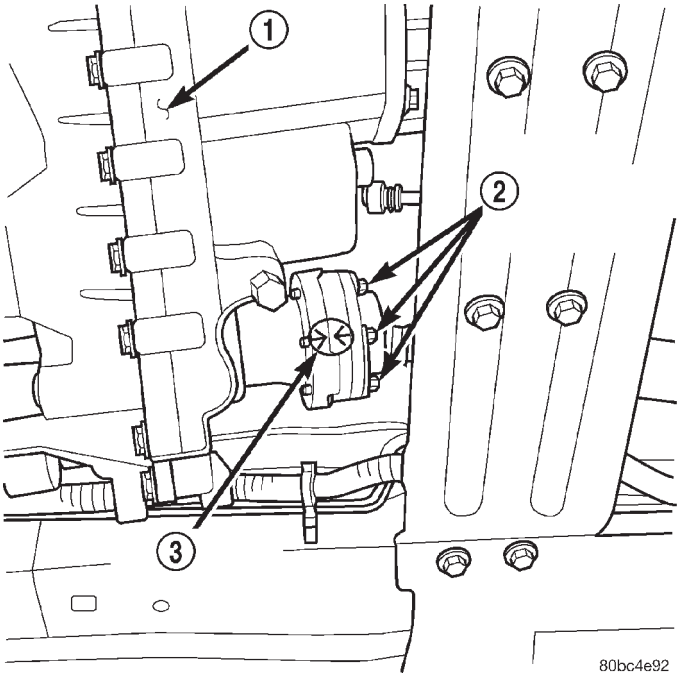

Fig. 15 Front Driveshaft Retaining Bolts

1 – TRANSFER CASE
2 – FRONT DRIVESHAFT RETAINING BOLTS
3 – REFERENCE MARK

(8) Remove the front driveshaft retaining bolts (Fig. 15) and remove the driveshaft from the transfer case companion flange. Support the driveshaft with mechanics wire.

(9) Remove the rear driveshaft retaining bolts and remove the driveshaft from the transfer case companion flange. Support the driveshaft with mechanics wire (Fig. 16).

(10) Disconnect the transfer case shift cable from the shifter arm (Fig. 17).

(11) Disconnect the vent tube from the transfer case (Fig. 17).

(12) Remove the transmission oil pan and drain the transmission fluid. Reinstall the transmission oil pan.

(13) Remove the drainpan.

(14) Remove the (4) exhaust system support bracket retaining bolts from the transmission support crossmember (Fig. 18).

(15) Unclip the wire harness from the transmission support crossmember.

(16) Position a jack under the transmission support crossmember.

(17) Remove the (8) transmission support crossmember retaining bolts (Fig. 18).

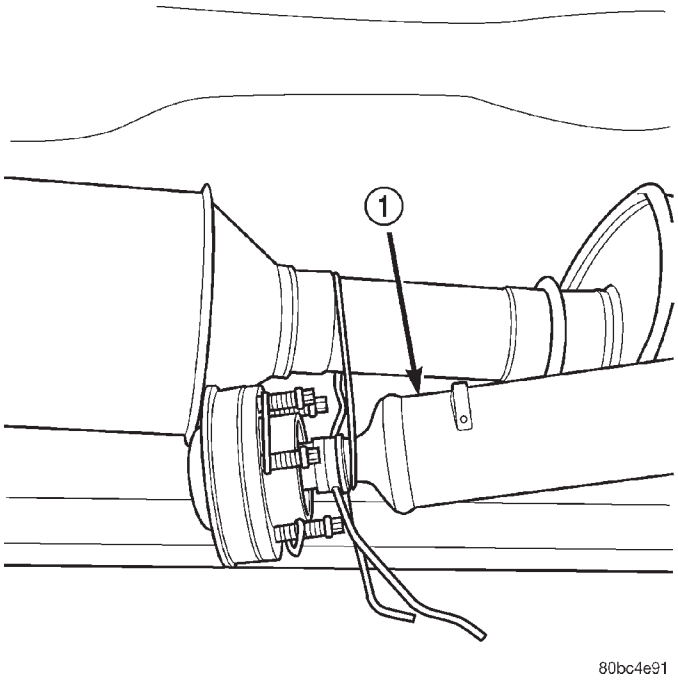

Fig. 16 Rear Driveshaft - Supported

1 – REAR DRIVESHAFT

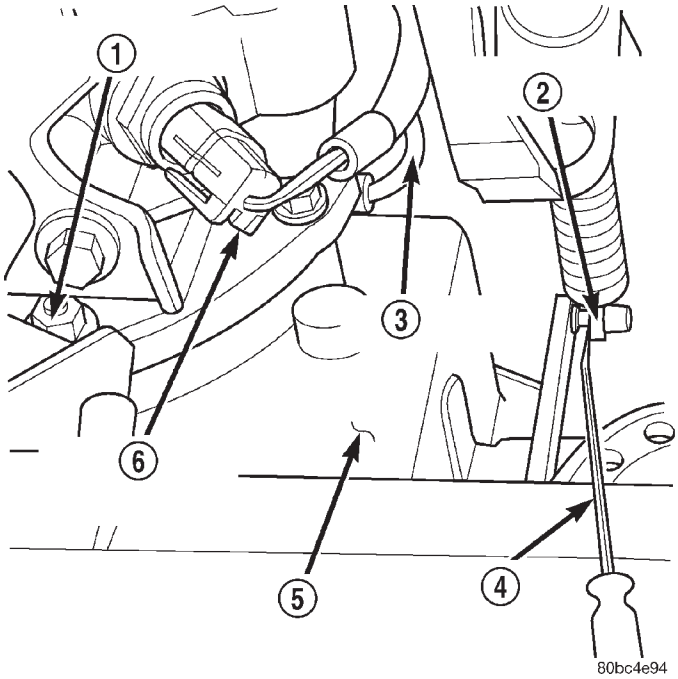

Fig. 17 Disconnecting Transfer Case Shift Linkage

1 – TRANSFER CASE RETAINING NUTS
2 – TRANSFER CASE SHIFTER CABLE
3 – TRANSFER CASE VENT HOSE
4 – FLAT BLADED TOOL
5 – TRANSFER CASE
6 – TRANSMISSION ELECTRICAL CONNECTOR

REMOVAL AND INSTALLATION (Continued)

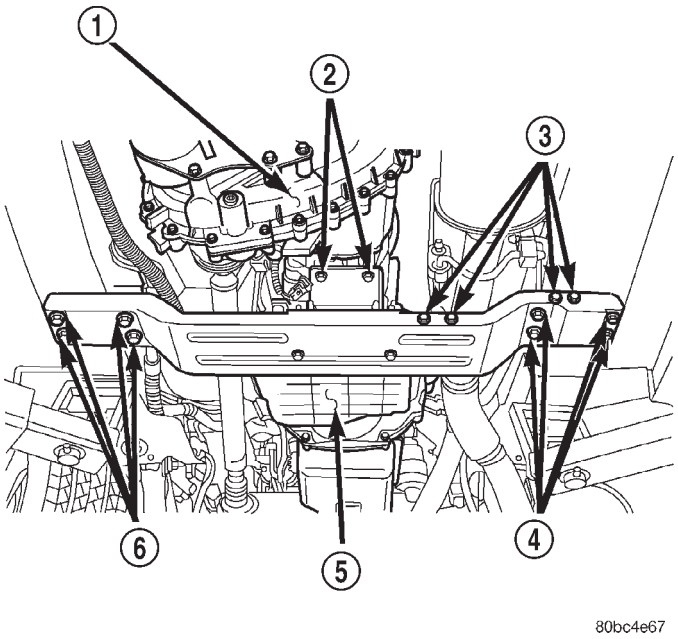

Fig. 18 Transmission Support Crossmember Position & Orientation

1 – TRANSFER CASE
2 – TRANSMISSION MOUNT RETAINING BOLTS (2 OF 4)
3 – EXHAUST SYSTEM SUPPORT BRACKET RETAINING BOLTS
4 – CROSSMEMBER RETAINING BOLTS
5 – TRANSMISSION
6 – CROSSMEMBER RETAINING BOLTS

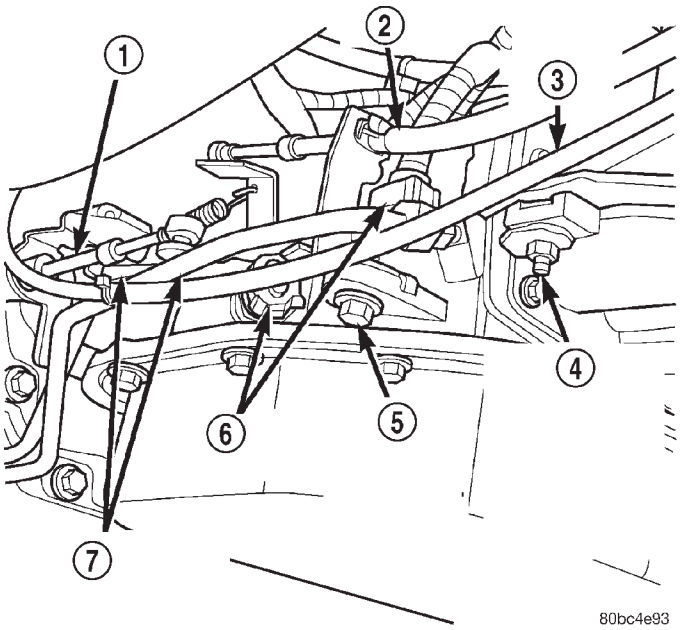

Fig. 19 Transmission Control Cables & Fluid Lines

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

(18) Position a transmission jack under the transfer case.

(19) Lower the transmission assembly enough to gain access and remove the transfer case to transmission retaining nuts.

(20) Remove the transfer case from the vehicle.

(21) Remove the jack from the transmission support crossmember.

(22) Remove the (4) transmission mount retaining bolts (Fig. 18) and remove the transmission support crossmember and mount from the vehicle.

(23) Remove the transfer case shift cable bracket from the transmission housing (Fig. 19).

(24) Disconnect the throttle valve cable at the ball and socket connection by gently pulling straight apart (Fig. 19).

(25) Remove the throttle valve cable bracket retaining fasteners and position the cable assembly out of the way (Fig. 19).

(26) Remove the spring from the shift lever arm (Fig. 19).

(27) Disconnect the shifter cable at the ball and socket connection by gently pulling straight apart (Fig. 19).

(28) Remove the shifter cable bracket retaining bolt from the transmission housing (Fig. 19).

(29) Remove the transmission fluid cooler lines from the transmission (Fig. 19).

(30) Disconnect all the transmission electrical connectors and unclip the wire harness from the transmission housing (Fig. 19).

(31) Remove the exhaust system inlet pipe retaining bolts from the turbocharger down pipe (Fig. 20). Support the front portion of the exhaust system with mechanics wire. Be certain to position the pipe out of the way of the torque converter bolt access hole. Located in the transmission bellhousing.

(32) Disconnect the engine speed sensor. Located on the upper right side of the transmission bellhousing.

(33) Remove the starter motor from the vehicle. Refer to Group 8B, Starting Systems for the procedure.

NOTE: Mark the position of the torque convertor in relation to the driveplate so they can be reassembled in there original position.

(34) Working through the torque convertor bolt access hole (Fig. 21), remove the (4) torque convertor to driveplate retaining bolts. Rotate the engine in a clockwise direction to access the converter bolts.

(35) Place a jack under the transmission.

REMOVAL AND INSTALLATION (Continued)

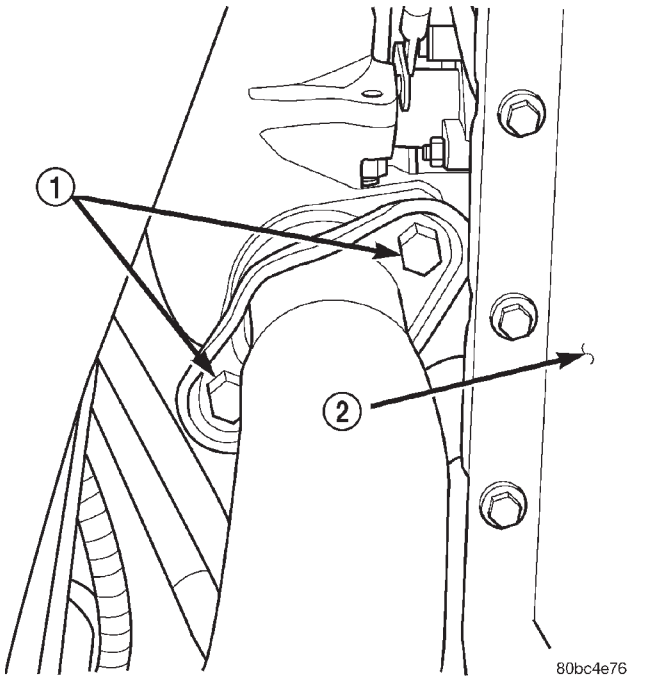

Fig. 20 Exhaust System Inlet Pipe Retaining Bolts

1 – EXHAUST SYSTEM INLET PIPE RETAINING BOLTS
2 – ENGINE OIL PAN

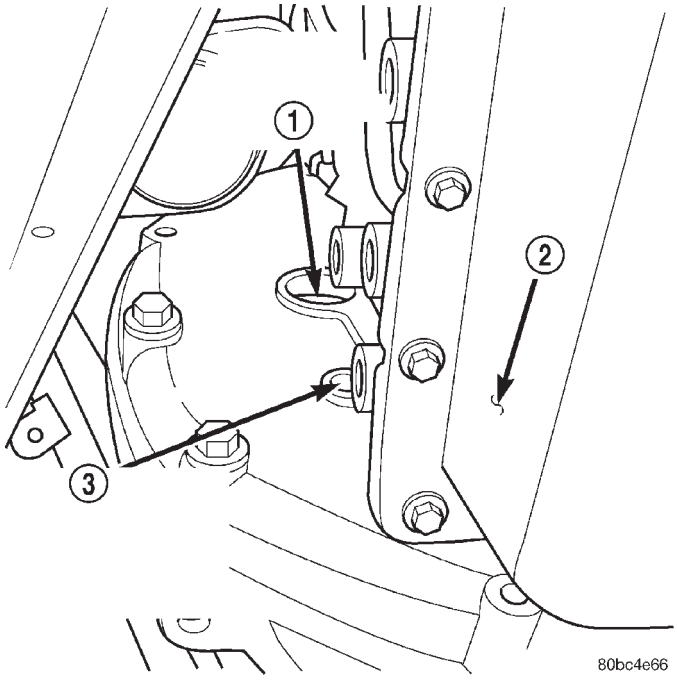

Fig. 21 Torque Converter Bolt Access Hole

1 – TORQUE CONVERTER BOLT ACCESS HOLE
2 – ENGINE OIL PAN
3 – TOP DEAD CENTER ALIGNMENT TOOL ACCESS HOLE

CAUTION: Be certain the engine speed sensor has been disconnected before proceeding.

(36) Remove the (10) engine to transmission bellhousing retaining bolts.

(37) Remove the transmission and torque converter from the vehicle.

INSTALLATION

CAUTION: This engine is equipped with a engine speed sensor. Located in the top of the bellhousing. Care must be taken not to damage the sensor or corresponding wires during transmission removal and installation.

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

CAUTION: Lubricate the front pump seal and install at least one quart of the approved transmission fluid directly into the torque converter prior to its installation.

(1) Install the torque converter in the transmission. Refer to the procedure in this group for detailed instructions.

(2) Lubricate the rear of the crankshaft or the converter pilot hub with lithium grease.

(3) Position the transmission / converter assembly on a transmission jack and secure with chains.

NOTE: Be sure the engine block mounted dowel pins are installed and protrude far enough to hold the transmission in alignment.

(4) Using the transmission jack, position the transmission assembly so the engine block mounted dowel pins are perfectly aligned with the corresponding holes in the transmission bellhousing.

CAUTION: Be certain the torque convertor is properly installed in the transmission. If the torque convertor is not installed correctly the engine will not rotate upon installation. Refer to the Torque Converter removal and installation procedure in this group for the procedure.

(5) Install the (10) engine to transmission bellhousing retaining bolts. Torque the bolts to 102 N·m (75 ft. lbs.).

(6) Connect the engine speed sensor. Located on the upper right side of the transmission bellhousing.

REMOVAL AND INSTALLATION (Continued)

NOTE: When installing the torque convertor to driveplate retaining bolts, the torque convertor can be rotated into position with a flat-bladed screwdriver through the starter motor access hole. Then working through the torque convertor bolt access hole, thread a longer than original bolt into the convertor and pull the convertor up against the driveplate by hand. Remove the longer bolt and install the original bolts one by one until all bolts are installed. Then go back and torque all bolts to specification.

(7) Rotate the converter so the previously scribed alignment mark is aligned with the mark on the driveplate.

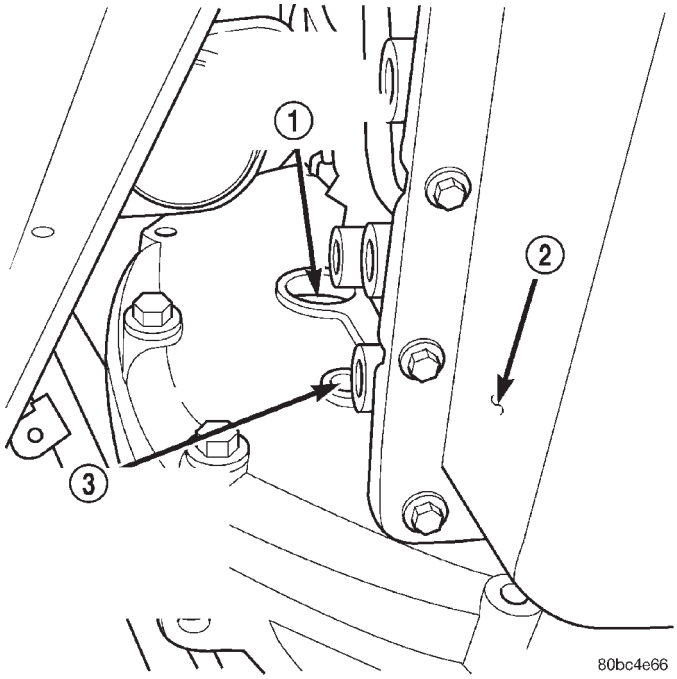

Fig. 22 Torque Converter Bolt Access Hole

1 – TORQUE CONVERTER BOLT ACCESS HOLE
2 – ENGINE OIL PAN
3 – TOP DEAD CENTER ALIGNMENT TOOL ACCESS HOLE

(8) Working through the torque convertor bolt access hole (Fig. 22), install the (4) torque convertor to driveplate retaining bolts. Torque the bolts to 32 N·m (24 ft. lbs.) after all bolts are installed.

(9) Install the starter motor in the vehicle. Refer to Group 8B, Starting Systems for the procedure.

(10) Install the exhaust system inlet pipe and retaining bolts (Fig. 23). Torque the bolts to 41 N·m (30 ft. lbs.).

(11) Connect the transmission electrical connectors and clip the wire harness on the transmission housing.

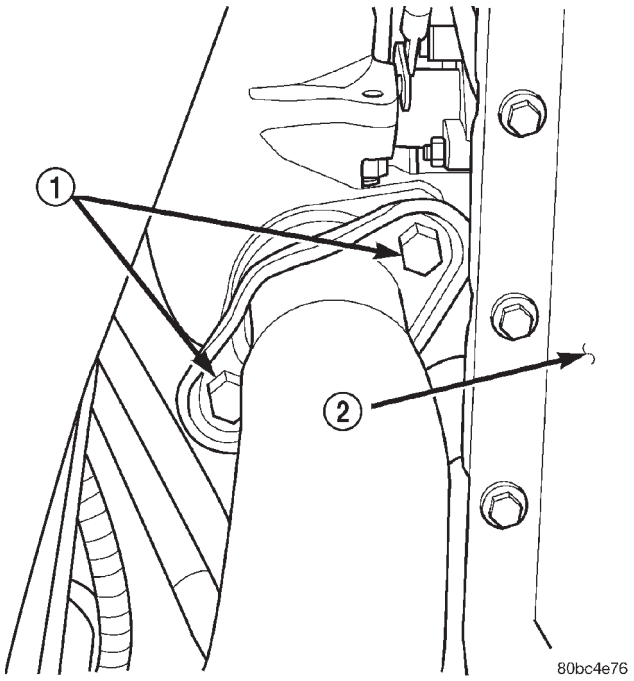

Fig. 23 Exhaust System Inlet Pipe Retaining Bolts

1 – EXHAUST SYSTEM INLET PIPE RETAINING BOLTS
2 – ENGINE OIL PAN

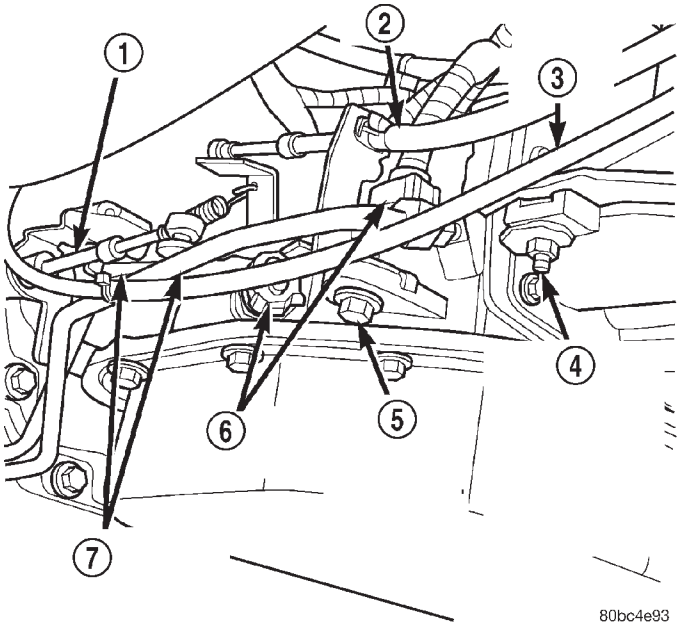

Fig. 24 Transmission Control Cables & Fluid Lines

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OR 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

REMOVAL AND INSTALLATION (Continued)

(12) Install the transmission fluid cooler lines on the transmission (Fig. 24). Torque the nuts to 18 N·m (13 ft. lbs.).

(13) Install the shifter cable bracket and retaining bolt (Fig. 24).

(14) Connect the shifter cable (Fig. 24).

(15) Install the spring on the shift lever arm (Fig. 24).

(16) Install the throttle valve cable bracket and retaining fasteners (Fig. 24).

(17) Connect the throttle valve cable (Fig. 24).

(18) Install the transfer case shift cable bracket on the transmission housing (Fig. 24).

(19) Position the transmission support crossmember/mount assembly and install the (4) transmission mount retaining bolts (Fig. 25). Torque the bolts to 75 N·m (55 ft. lbs.).

(20) Install a jack under the transmission support crossmember and raise slightly.

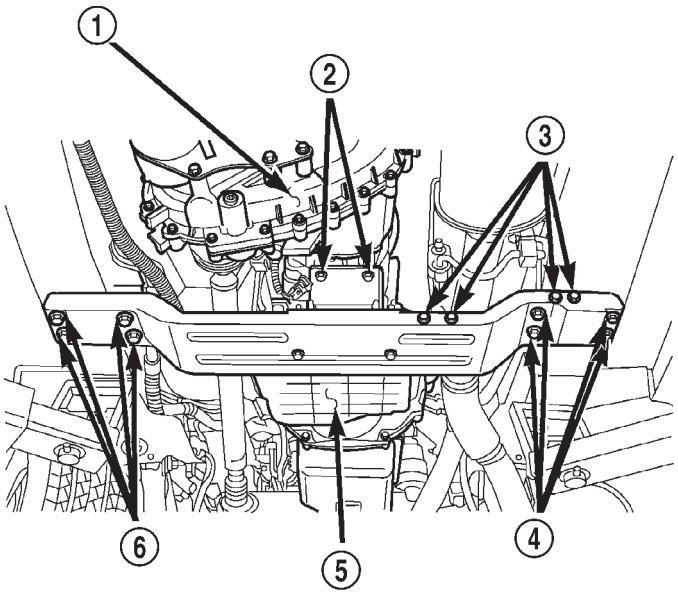

Fig. 25 Transmission Support Crossmember Position & Orientation

1 – TRANSFER CASE
2 – TRANSMISSION MOUNT RETAINING BOLTS (2 OF 4)
3 – EXHAUST SYSTEM SUPPORT BRACKET RETAINING BOLTS
4 – CROSSMEMBER RETAINING BOLTS
5 – TRANSMISSION
6 – CROSSMEMBER RETAINING BOLTS

(21) Install the transfer case on the transmission. Torque the transfer case retaining nuts to 75 N·m (55 ft. lbs.).

(22) Using the jack, raise the transmission assembly into position and install the (8) transmission support crossmember retaining bolts (Fig. 25). Torque the bolts to 41 N·m (30 ft. lbs.).

(23) Unclip the wire harness from the transmission support crossmember.

(24) Position the exhaust system support brackets and install the retaining bolts. Torque the bolts to 41 N·m (30 ft. lbs.) (Fig. 25).

(25) Install the vent tube on the transfer case.

(26) Connect the transfer case shift cable on the shifter arm.

(27) Install the rear driveshaft. Torque the bolts to 32 N·m (24 ft. lbs.). Be certain to install the driveshaft in the same position as before removal.

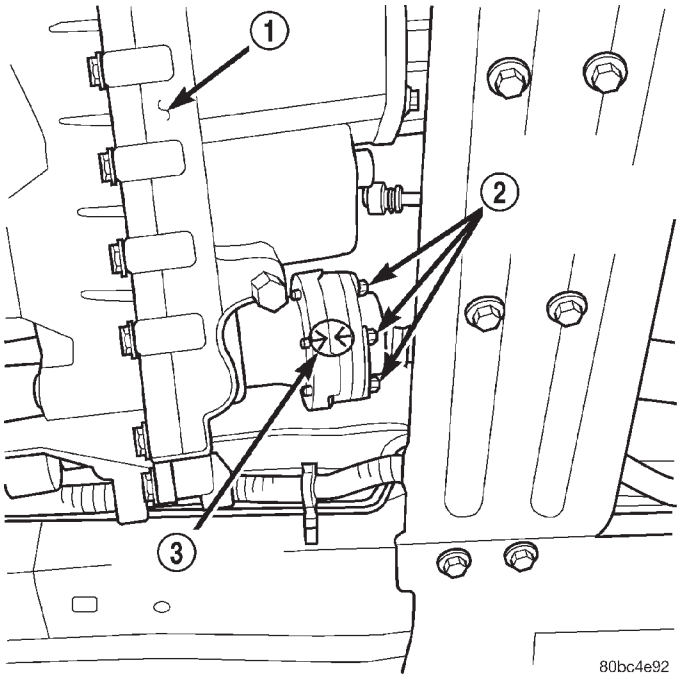

Fig. 26 Front Driveshaft Retaining Bolts

1 – TRANSFER CASE
2 – FRONT DRIVESHAFT RETAINING BOLTS
3 – REFERENCE MARK

(28) Install the front driveshaft. Torque the bolts to 32 N·m (24 ft. lbs.) (Fig. 26). Be certain to install the driveshaft in the same position as before removal.

(29) Install the (2) lower fan shroud retaining bolts. Torque the bolts to 15 N·m (132 in. lbs.).

(30) Lower the vehicle on the hoist.

(31) Install the transmission dipstick tube in the transmission housing.

(32) Install the transmission dipstick tube support bracket retaining nut (Fig. 27). Torque the nut to 25 N·m (221 in. lbs.).

(33) Install the (2) upper fan shroud retaining bolts. Torque the bolts to 15 N·m (132 in. lbs.).

(34) Connect the negative battery cable.

REMOVAL AND INSTALLATION (Continued)

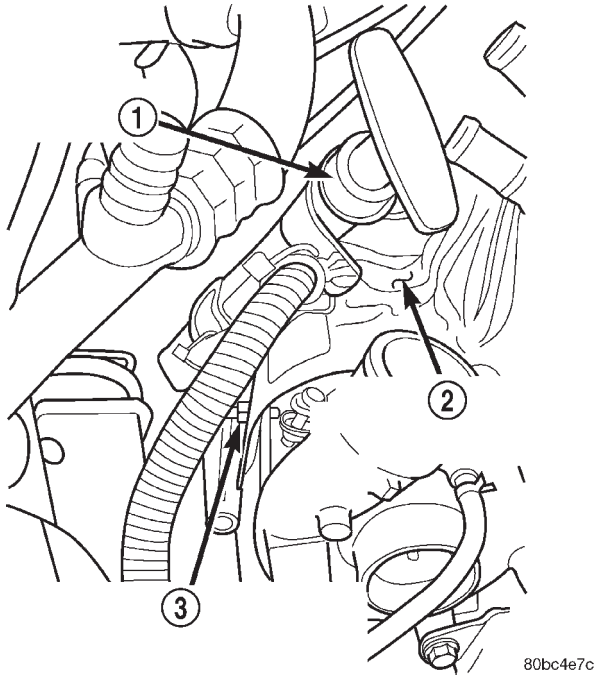

Fig. 27 Transmission Dipstick Tube Support Bracket Position & Orientation

1 – TRANSMISSION DIPSTICK TUBE
2 – TURBOCHARGER EXHAUST MANIFOLD HEATSHIELD
3 – TRANSMISSION DIPSTICK TUBE SUPPORT BRACKET RETAINING NUT

TORQUE CONVERTER

REMOVAL

(1) Remove transmission and torque converter from vehicle.

(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

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 converter hub and oil pump seal lip with transmission fluid.

(2) Place torque converter in position on transmission.

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 and straightedge (Fig. 28). 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.

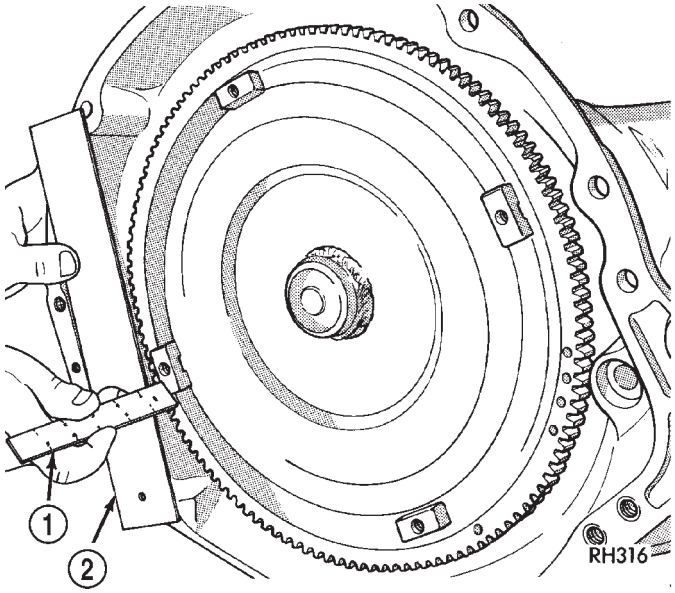

Fig. 28 Checking Torque Converter Seating

1 – SCALE
2 – STRAIGHTEDGE

REMOVAL AND INSTALLATION (Continued)

YOKE SEAL REPLACEMENT

REMOVAL

(1) Raise vehicle.
(2) Mark propeller shaft and axle yoke for alignment reference.
(3) Disconnect and remove propeller shaft.
(4) Remove old seal with Seal Remover C-3985-B (Fig. 29) from overdrive housing.

INSTALLATION

(1) Place seal in position on overdrive housing.
(2) Drive seal into overdrive housing with Seal Installer C-3995-A (Fig. 30).
(3) Carefully guide propeller shaft slip yoke into housing and onto output shaft splines. Align marks made at removal and connect propeller shaft to rear axle pinion yoke.

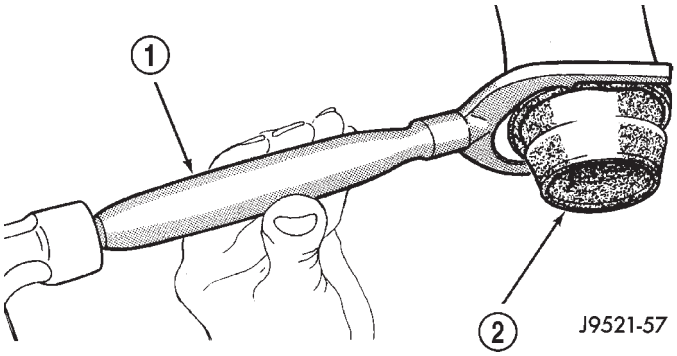

Fig. 29 Removing Overdrive Housing Yoke Seal

1 – SPECIAL TOOL C-3985–B
2 – SEAL

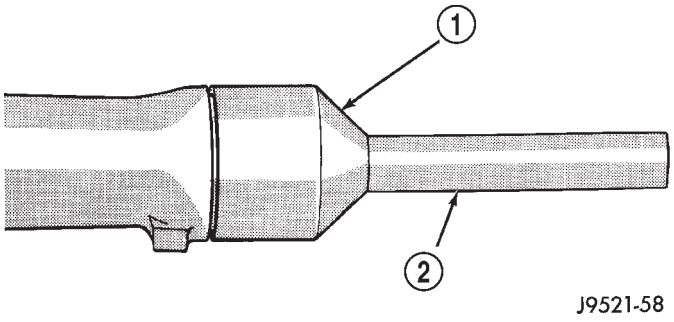

Fig. 30 Installing Overdrive Housing Yoke Seal

1 – SPECIAL TOOL C-3995–A OR C-3972–A
2 – SPECIAL TOOL C-4471

PARK/NEUTRAL POSITION SWITCH

REMOVAL

(1) Raise vehicle and position drain pan under switch.
(2) Disconnect switch wires.
(3) Remove switch from case.

INSTALLATION

(1) Move shift lever to Park and Neutral positions. Verify that switch operating lever fingers are centered in switch opening in case (Fig. 31).

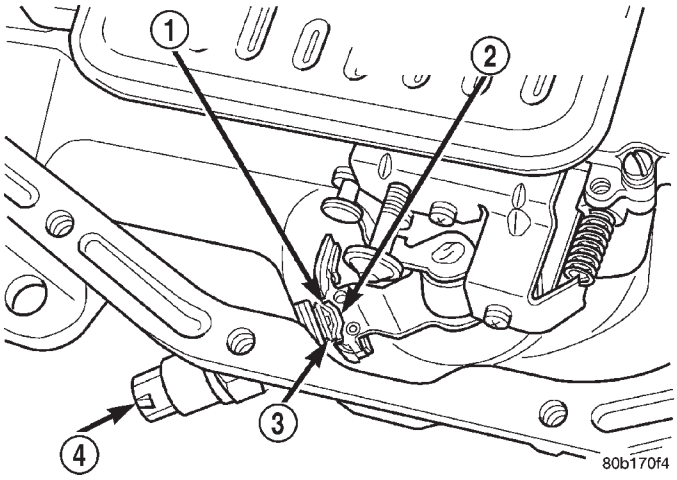

Fig. 31 Park/Neutral Position Switch

1 – NEUTRAL CONTACT
2 – MANUAL LEVER AND SWITCH PLUNGER IN REVERSE POSITION
3 – PARK CONTACT
4 – SWITCH

(2) Install new seal on switch and install switch in case. Tighten switch to 34 N·m (25 ft. lbs.) torque.
(3) Test continuity of new switch with 12V test lamp.
(4) Connect switch wires and lower vehicle.
(5) Top off transmission fluid level.

GEARSHIFT CABLE

REMOVAL

(1) Place the transmission gear selector in the “PARK” position.
(2) Raise the vehicle on a hoist.
(3) Disconnect the shift cable eyelet from the transmission shift lever (Fig. 32).

REMOVAL AND INSTALLATION (Continued)

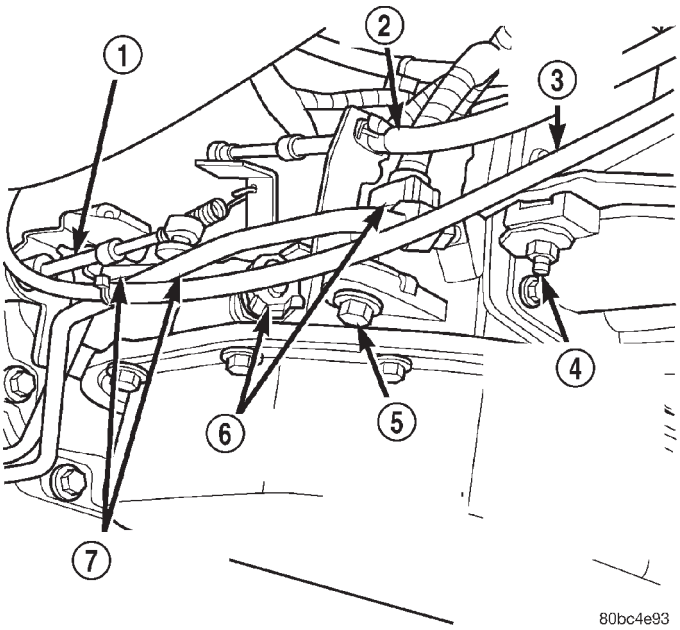

Fig. 32 Shift Cable at Transmission

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

(4) Remove the shift cable from the shift cable support bracket.

(5) Lower the vehicle from the hoist.

(6) Remove shift lever bezel and necessary console parts for access to shifter and cable assembly.

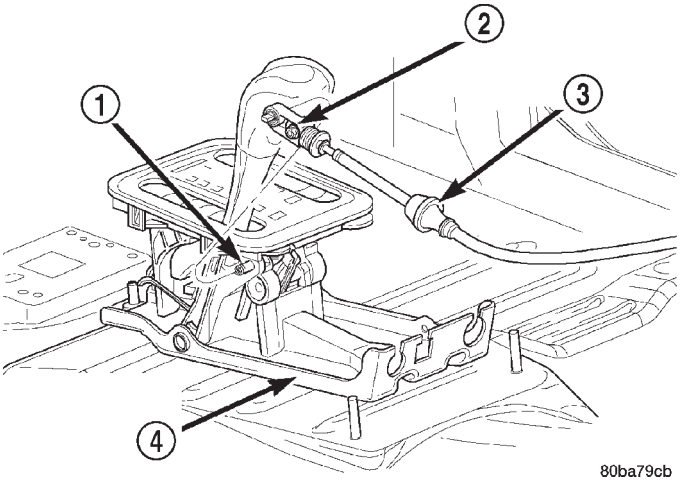

Fig. 33 Transmission Shift Cable at Shifter

1 – SHIFT LEVER PIN
2 – ADJUSTMENT SCREW
3 – SHIFT CABLE
4 – SHIFTER ASSEMBLY BRACKET

(7) Disconnect the shift cable from the shifter assembly (Fig. 33).

(8) Remove the shift cable seal plate retaining nuts from the floor pan studs (Fig. 34).

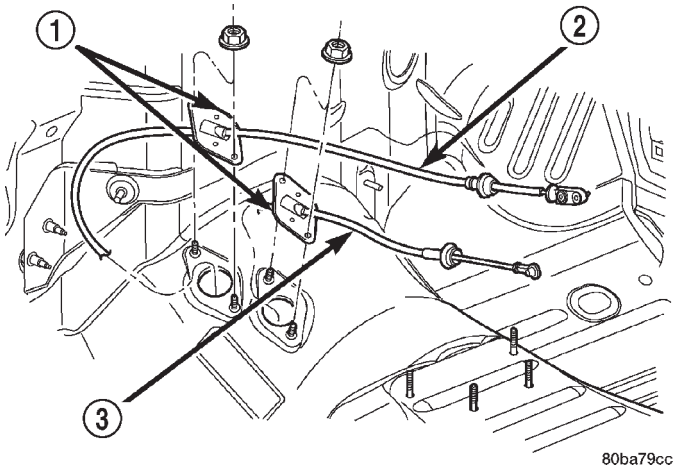

Fig. 34 Shift Cables at Floor Pan

1 – SEAL PLATES
2 – TRANSMISSION SHIFT CABLE
3 – TRANSFER CASE SHIFT CABLE

(9) Remove the shifter cable through the floor pan opening.

INSTALLATION

(1) Route the shift cable through hole in floor pan.

(2) Install the shift cable seal plate retaining nuts on the floor pan studs. (Fig. 35). Torque the nuts to 7 N·m (65 in. lbs.).

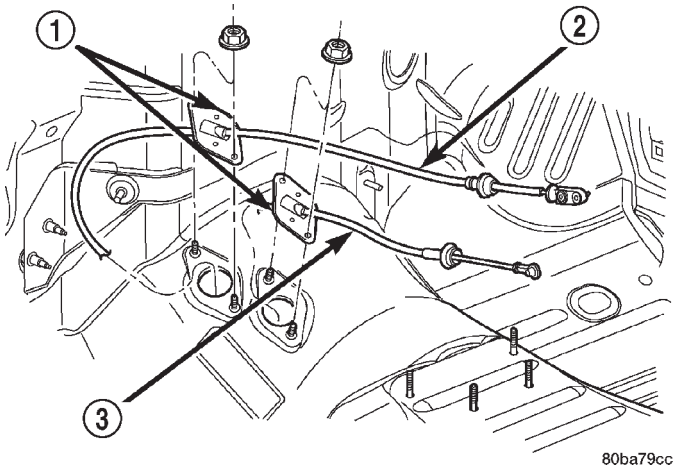

Fig. 35 Shift Cables at Floor Pan

1 – SEAL PLATES
2 – TRANSMISSION SHIFT CABLE
3 – TRANSFER CASE SHIFT CABLE

(3) Install the shift cable in the shifter bracket assembly.

REMOVAL AND INSTALLATION (Continued)

(4) Place the floor shifter in the “PARK” position.

(5) Loosen the adjustment screw on the shifter cable (Fig. 36).

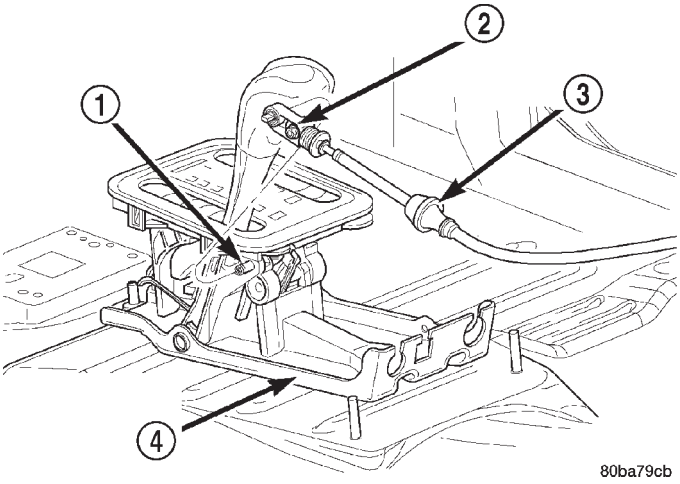

Fig. 36 Transmission Shift Cable at Shifter

1 – SHIFT LEVER PIN
2 – ADJUSTMENT SCREW
3 – SHIFT CABLE
4 – SHIFTER ASSEMBLY BRACKET

(6) Snap the shift cable onto the shift lever pin. Located on the shifter assembly (Fig. 36).

(7) Raise the vehicle on a hoist.

(8) Install the shift cable on the shift cable support bracket (Fig. 37).

(9) Place the transmission shift lever in the “PARK” position. Park is the rearmost detent position on the transmission manual shift lever (Fig. 37).

(10) Snap the shifter cable on the shift control lever (Fig. 37).

CAUTION: Be certain shift cable is routed correctly, free of binding, sharp edges and hot exhaust system components.

(11) Lower the vehicle from the hoist.

(12) Verify the transmission and shifter are in the “PARK” position.

(13) Torque the adjustment screw to 7 N·m (65 in. lbs.) (Fig. 36).

(14) Verify correct shifter operation.

(15) Install the shift lever bezel and any console parts removed to access the shift control cable

FLOOR SHIFTER

REMOVAL

(1) Shift the transmission into the “PARK” position.

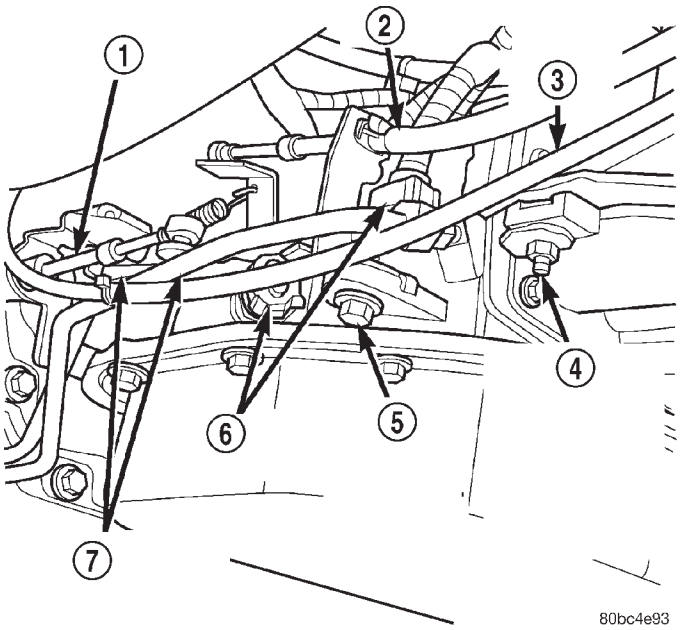

Fig. 37 Shift Cable at Transmission

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

(2) Remove the shift lever bezel and any necessary console parts for access to the shift lever assembly and shift cables.

(3) Disconnect the shift cable from the shifter and support bracket assembly (Fig. 38).

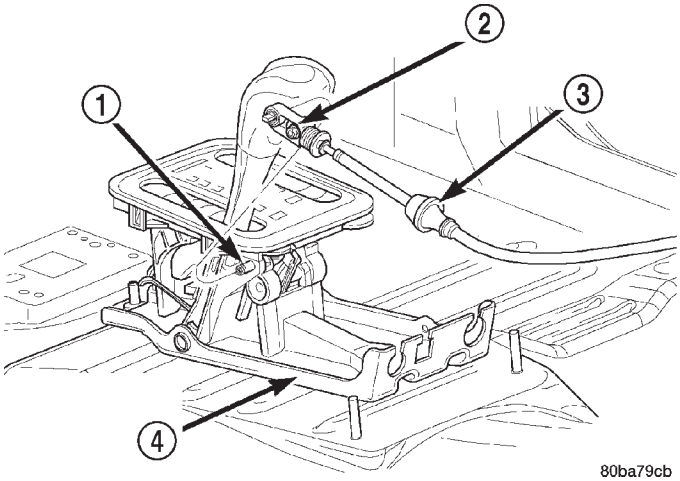

Fig. 38 Shift Cable at Shifter

1 – SHIFT LEVER PIN
2 – ADJUSTMENT SCREW
3 – SHIFT CABLE
4 – SHIFTER ASSEMBLY BRACKET

REMOVAL AND INSTALLATION (Continued)

(4) Disconnect the brake transmission shift interlock cable from the shifter BTSI lever and the shifter bracket assembly.

(5) Disconnect the transfer case shift cable from the transfer case shift lever pin (Fig. 39).

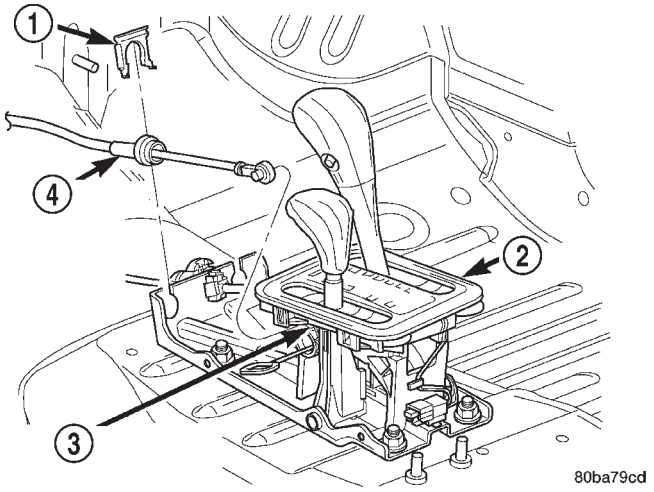

Fig. 39 Transfer Case Shift Cable

1 – CLIP
2 – SHIFTER
3 – TRANSFER CASE SHIFT LEVER PIN
4 – TRANSFER CASE SHIFT CABLE

(6) Remove the clip retaining the transfer case shift cable to the shifter bracket assembly.

(7) Remove the transfer case shift cable from the shifter assembly.

(8) Disconnect all wiring connectors from the shifter assembly.

(9) Remove the shifter assembly retaining nuts from the floor pan (Fig. 40).

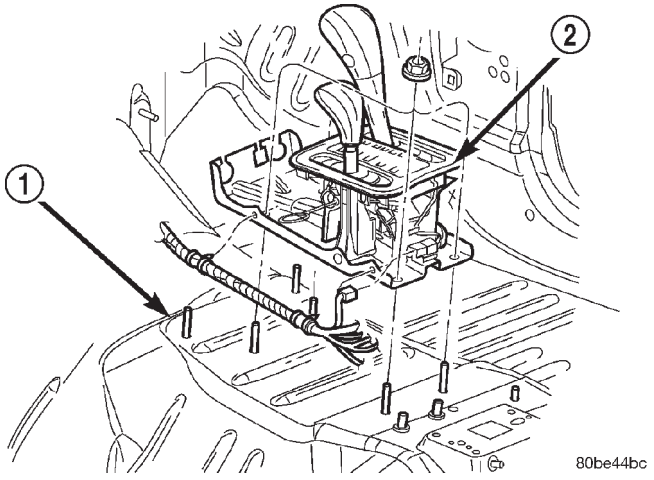

Fig. 40 Shifter Assembly

1 – FLOOR PAN
2 – SHIFTER ASSEMBLY

(10) the shifter from the vehicle.

INSTALLATION

(1) Install the shifter in the vehicle.

(2) Install the shifter assembly retaining nuts on the floor pan mounted studs (Fig. 41). Torque to 28 N·m (250 in. lbs.).

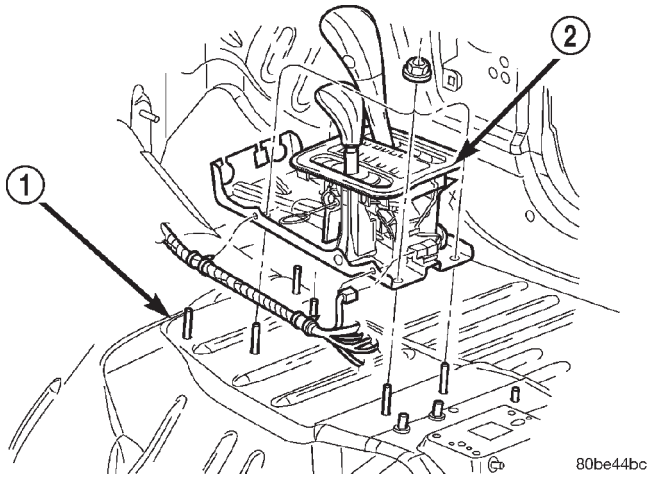

Fig. 41 Shifter Assembly

1 – FLOOR PAN
2 – SHIFTER ASSEMBLY

(3) Connect all wiring on the shifter assembly.

(4) Install the transfer case shift cable on the shifter bracket assembly and secure with clip (Fig. 42).

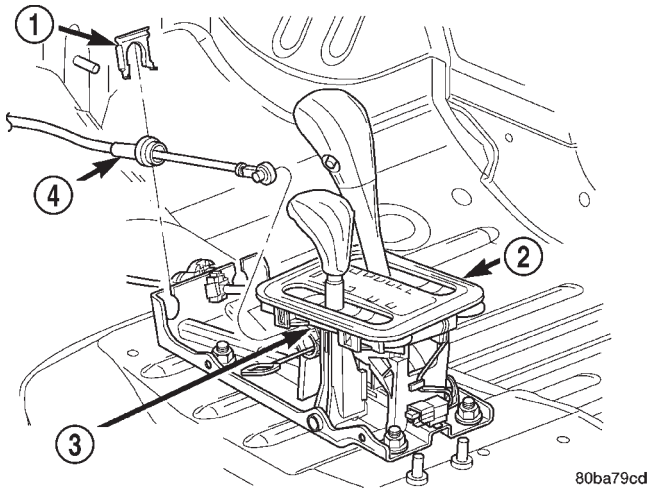

Fig. 42 Transfer Case Shift Cable

1 – CLIP
2 – SHIFTER
3 – TRANSFER CASE SHIFT LEVER PIN
4 – TRANSFER CASE SHIFT CABLE

REMOVAL AND INSTALLATION (Continued)

(5) Snap the transfer case shift cable onto the shift lever pin (Fig. 42).

(6) Install the brake transmission interlock cable into the shifter assembly bracket and connect on the BTSI lever.

(7) Install the shift cable on the shifter bracket and snap in place (Fig. 43).

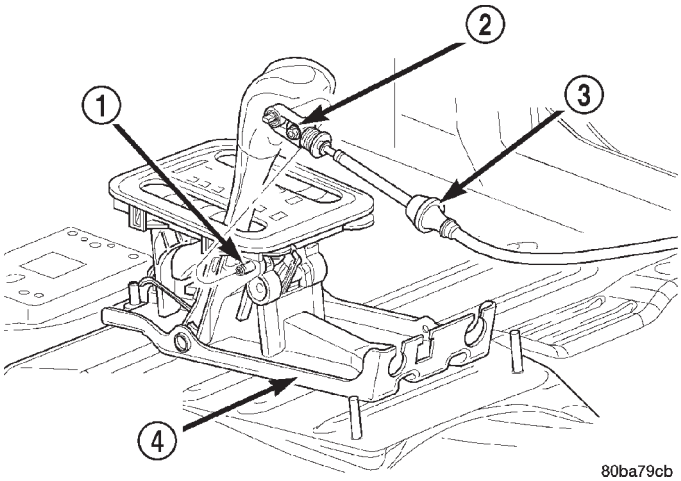

Fig. 43 Transmission Shift Cable at Shifter

1 – SHIFT LEVER PIN
2 – ADJUSTMENT SCREW
3 – SHIFT CABLE
4 – SHIFTER ASSEMBLY BRACKET

(8) With the shifter in the "PARK" position, loosen the shift cable adjustment screw.

(9) Snap the shift cable on the shift lever pin (Fig. 43).

(10) Torque the adjustment screw to 7 N·m (65 in. lbs.).

(11) Verify correct shifter operation.

(12) Install the shift lever bezel and any console parts removed for access to the shift lever assembly and shift cables.

BRAKE TRANSMISSION SHIFT INTERLOCK CABLE

REMOVAL

(1) Remove the steering column opening cover. Refer to Group 8E, Instrument Panel Systems for the procedure.

(2) Remove the lower steering column shroud from the vehicle.

(3) Disconnect the brake transmission shift interlock (B. T. S. I.) cable solenoid electrical connector (Fig. 44).

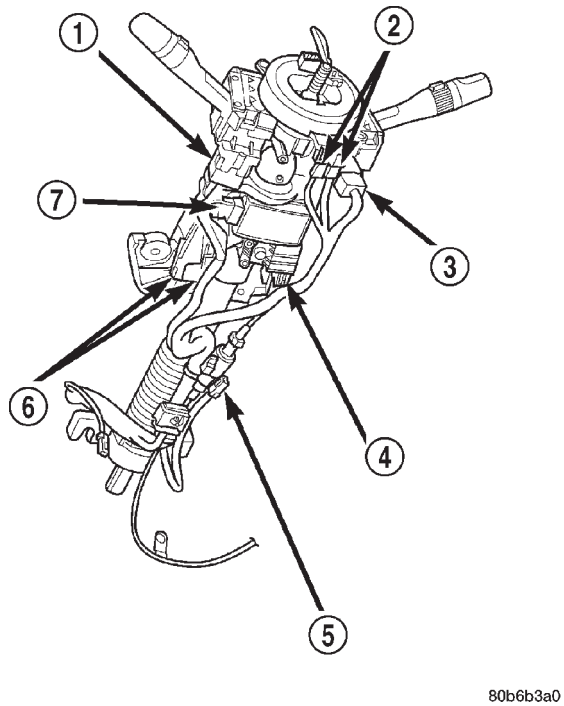

Fig. 44 B. T. S. I. Solenoid Connector Location

1 – LEFT MULTIFUNCTION SWITCH CONNECTOR
2 – LOWER CLOCKSPRING CONNECTORS
3 – RIGHT MULTIFUNCTION SWITCH CONNECTOR
4 – SHIFTER INTERLOCK CABLE CONNECTOR
5 – SHIFTER INTERLOCK SOLENOID CONNECTOR
6 – IGNITION SWITCH CONNECTOR RECEPTACLES
7 – SKIM CONNECTOR

(4) With the ignition switch in the "RUN" position depress the B. T. S. I. cable locking tab, located on top of the cable connector (Fig. 44) at the steering column and pull the B. T. S. I. cable straight out.

(5) Remove the center console from the vehicle. Refer to Group 23, Body for the procedure.

(6) Disconnect the B. T. S. I. cable from the shifter B. T. S. I. lever and remove the cable from the shifter bracket (Fig. 45).

(7) Disconnect the B. T. S. I. cable from any routing clips.

(8) Remove the B. T. S. I. cable from the vehicle.

REMOVAL AND INSTALLATION (Continued)

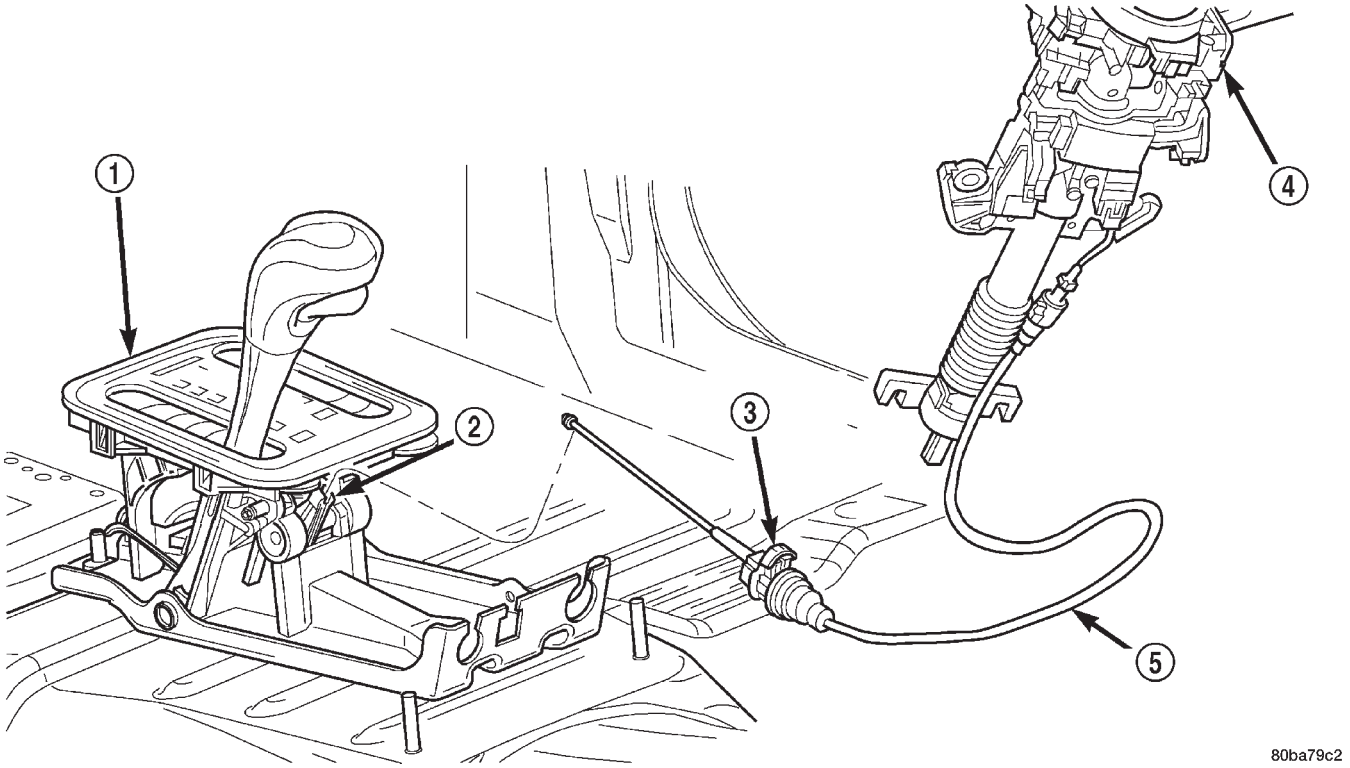

Fig. 45 Brake Transmission Interlock Cable

1 – SHIFT MECHANISM
2 – SHIFTER BTSI LEVER
3 – ADJUSTMENT CLIP
4 – STEERING COLUMN ASSEMBLY
5 – INTERLOCK CABLE

REMOVAL AND INSTALLATION (Continued)

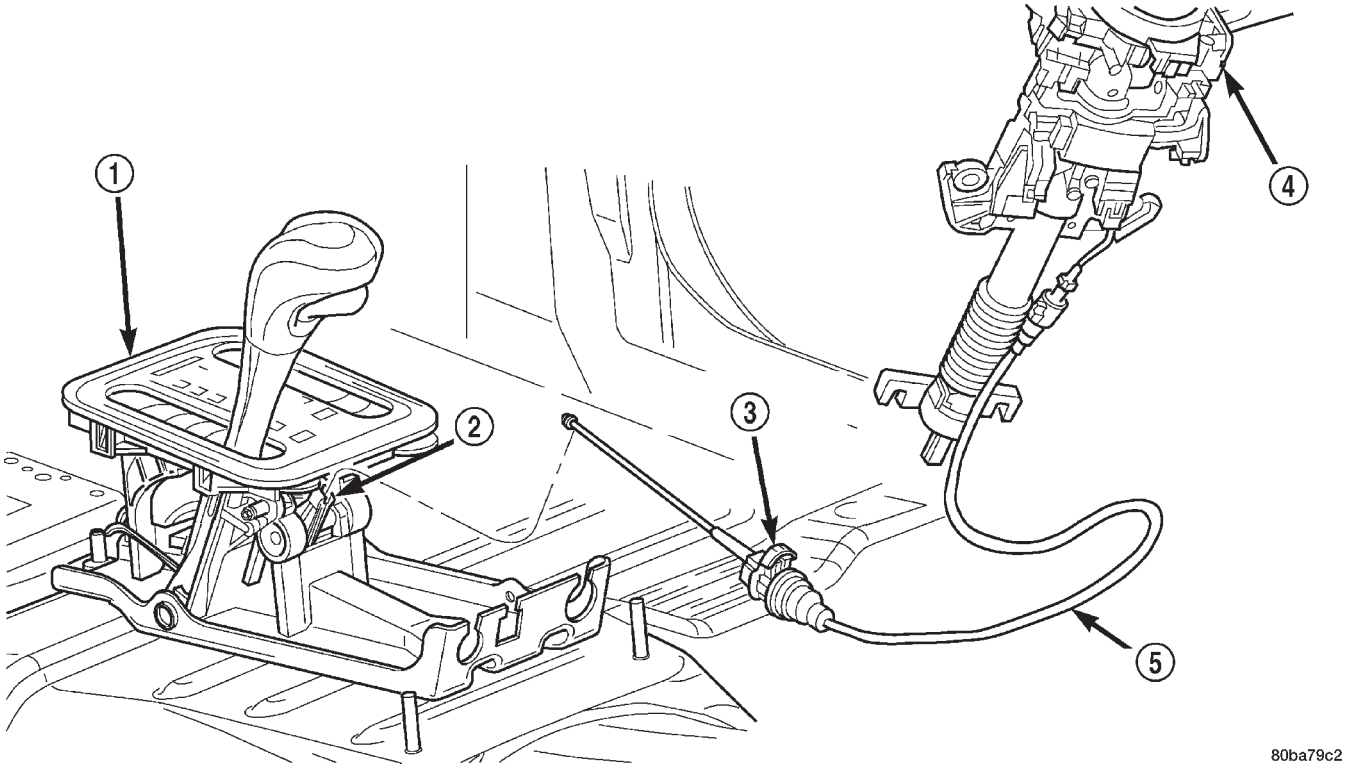

Fig. 46 Brake Transmission Shift Interlock

1 – SHIFT MECHANISM
2 – SHIFTER BTSI LEVER
3 – ADJUSTMENT CLIP
4 – STEERING COLUMN ASSEMBLY
5 – INTERLOCK CABLE

INSTALLATION

(1) Position the cable in the vehicle and secure in the original position with appropriate retaining clips.

(2) Install the B. T. S. I. cable on the shifter bracket and connect at the shifter B. T. S. I. lever (Fig. 46).

(3) Install the center console in the vehicle. Refer to Group 23, Body for the procedure.

(4) Push the B. T. S. I. cable straight into the square mounting hole in the steering column until cable snaps in place (Fig. 47).

(5) Connect the brake transmission shift interlock (B. T. S. I.) cable solenoid electrical connector (Fig. 47).

(6) Install the lower steering column shroud in the vehicle.

(7) Install the steering column opening cover. Refer to Group 8E, Instrument Panel Systems for the procedure.

(8) Verify correct B. T. S. I. cable operation.

GOVERNOR SOLENOID AND PRESSURE SENSOR

REMOVAL

(1) Hoist and support vehicle on safety stands.

(2) Remove transmission fluid pan and filter.

(3) Disengage wire connectors from pressure sensor and solenoid (Fig. 48).

(4) Remove screws holding pressure solenoid retainer to governor body.

(5) Separate solenoid retainer from governor (Fig. 49).

(6) Pull solenoid from governor body (Fig. 50).

(7) Remove bolts holding governor body to valve body.

(8) Separate governor body from valve body (Fig. 51).

(9) Remove governor body gasket.

(10) Remove retainer holding pressure sensor to governor body.

(11) Pull pressure sensor from governor body (Fig. 52).

REMOVAL AND INSTALLATION (Continued)

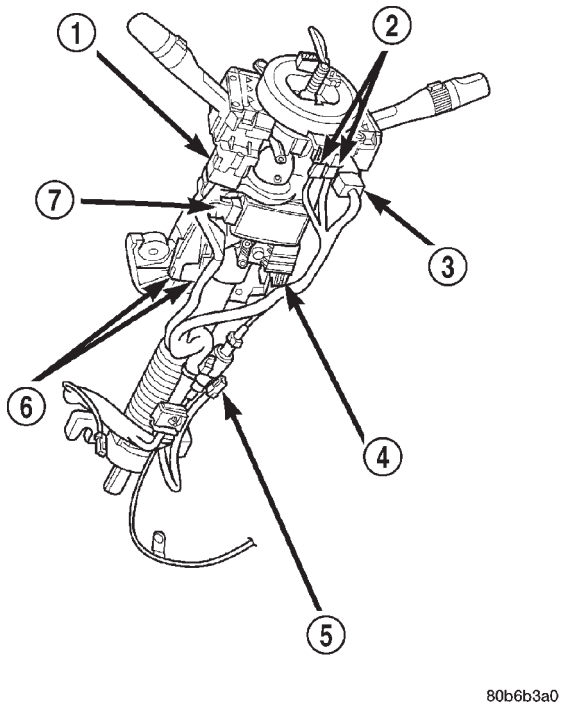

Fig. 47 B. T. S. I. Solenoid Connector Location

1 – LEFT MULTIFUNCTION SWITCH CONNECTOR
2 – LOWER CLOCKSPRING CONNECTORS
3 – RIGHT MULTIFUNCTION SWITCH CONNECTOR
4 – SHIFTER INTERLOCK CABLE CONNECTOR
5 – SHIFTER INTERLOCK SOLENOID CONNECTOR
6 – IGNITION SWITCH CONNECTOR RECEPTACLES
7 – SKIM CONNECTOR

INSTALLATION

Before installing the pressure sensor and solenoid in the governor body, replace O-ring seals, clean the gasket surfaces and replace gasket.

(1) Lubricate O-ring on pressure sensor with transmission fluid.

(2) Align pressure sensor to bore in governor body (Fig. 52).

(3) Push pressure sensor into governor body.

(4) Install retainer to hold pressure sensor to governor body.

(5) Place gasket in position on back of governor body (Fig. 51).

(6) Place governor body in position on valve body.

(7) Install bolts to hold governor body to valve body.

(8) Lubricate O-ring, on pressure solenoid, with transmission fluid.

(9) Align pressure solenoid to bore in governor body (Fig. 50).

(10) Push solenoid into governor body.

(11) Place solenoid retainer in position on governor (Fig. 49).

(12) Install screws to hold pressure solenoid retainer to governor body.

(13) Engage wire connectors into pressure sensor and solenoid (Fig. 48).

(14) Install transmission fluid pan and (new) filter.

(15) Lower vehicle and road test to verify repair.

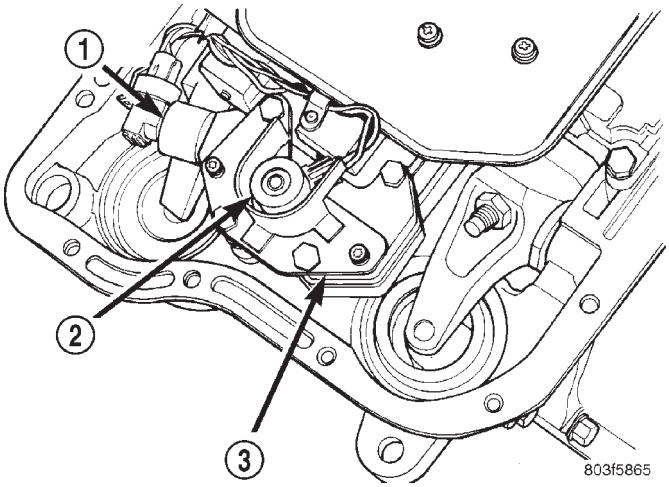

Fig. 48 Governor Solenoid And Pressure Sensor

1 – PRESSURE SENSOR
2 – PRESSURE SOLENOID
3 – GOVERNOR

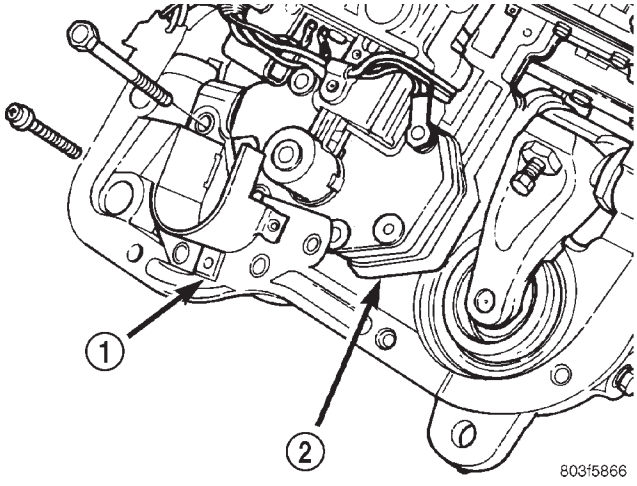

Fig. 49 Pressure Solenoid Retainer

1 – PRESSURE SOLENOID RETAINER
2 – GOVERNOR

REMOVAL AND INSTALLATION (Continued)

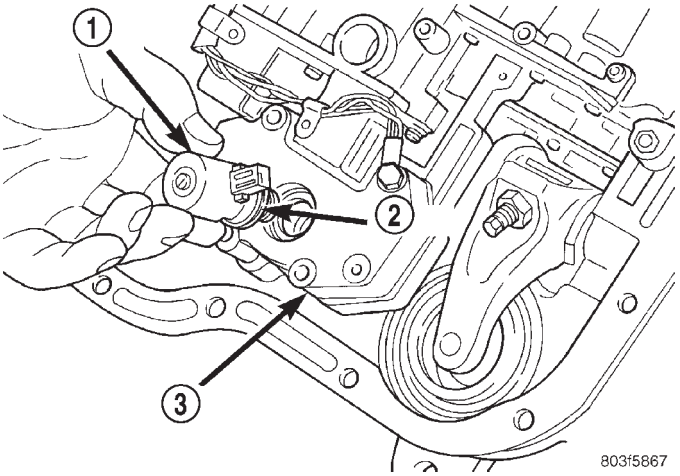

Fig. 50 Pressure Solenoid and O-ring

1 – PRESSURE SOLENOID
2 – O-RING
3 – GOVERNOR

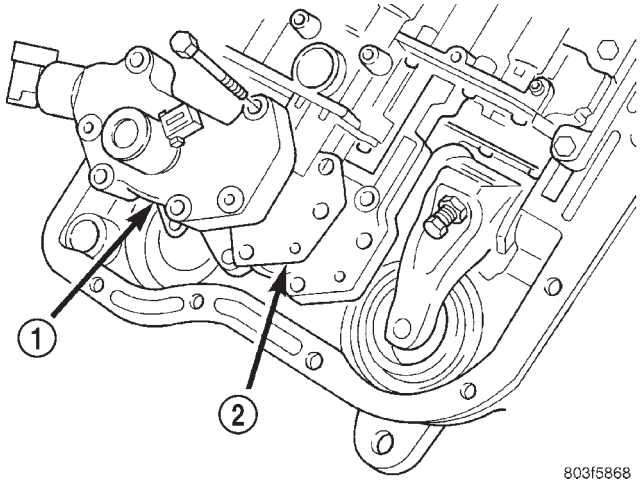

Fig. 51 Governor Body and Gasket

1 – GOVERNOR BODY
2 – GASKET

VALVE BODY

The valve body can be removed for service without having to remove the transmission assembly.

The valve body can be disassembled for cleaning and inspection of the individual components. Refer to Disassembly and Assembly section for proper procedures.

The only replaceable valve body components are:

- Manual lever.
- Manual lever washer, seal, E-clip, and shaft seal.
- Manual lever detent ball.
- Throttle lever.
- Fluid filter.
- Pressure adjusting screw bracket.

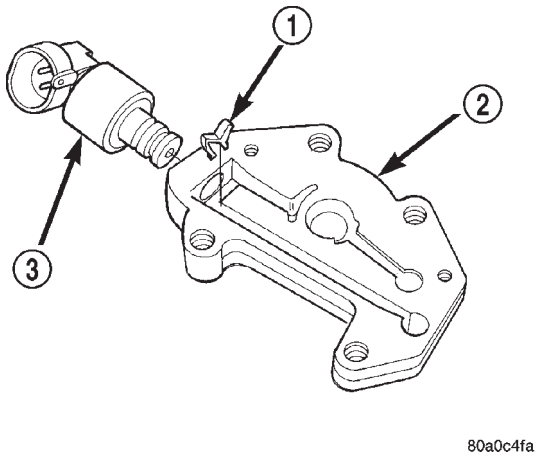

Fig. 52 Pressure Sensor and Retainer

1 – RETAINING CLIP
2 – GOVERNOR BODY
3 – GOVERNOR PRESSURE SENSOR/TRANSMISSION FLUID TEMPERATURE THERMISTOR

- Governor pressure solenoid.
- Governor pressure sensor.
- Converter clutch/overdrive solenoid assembly and harness (includes sump temperature thermistor).
- Governor housing gasket.
- Solenoid case connector O-rings.

The remaining valve body components are serviced only as part of a complete valve body assembly.

REMOVAL

(1) Shift transmission into NEUTRAL.
(2) Raise vehicle.
(3) Remove gearshift and throttle levers from shaft of valve body manual lever.
(4) Disconnect wires at solenoid case connector (Fig. 53).
(5) Position drain pan under transmission oil pan.
(6) Remove transmission oil pan and gasket.
(7) Remove fluid filter from valve body.
(8) Remove bolts attaching valve body to transmission case.
(9) Lower valve body enough to remove accumulator piston and springs.
(10) Work manual lever shaft and electrical connector out of transmission case.
(11) Lower valve body, rotate valve body away from case, pull park rod out of sprag, and remove valve body (Fig. 54).

INSTALLATION

(1) Check condition of O-ring seals on valve body harness connector (Fig. 55). Replace seals on connector body if cut or worn.
(2) Check condition of manual lever shaft seal in transmission case. Replace seal if lip is cut or worn. Install new seal with 15/16 deep well socket (Fig. 56).

REMOVAL AND INSTALLATION (Continued)

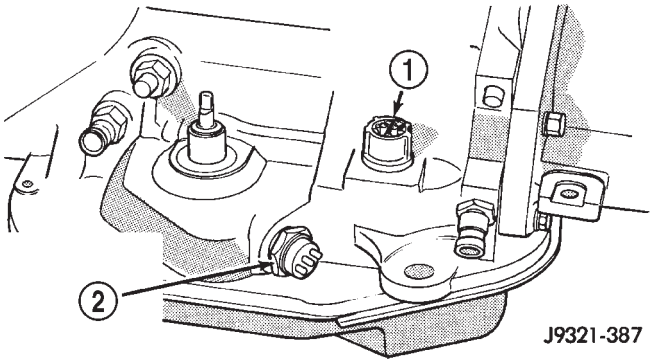

Fig. 53 Transmission Case Connector

1 – SOLENOID CASE CONNECTOR
2 – PARK/NEUTRAL POSITION SWITCH CONNECTOR TERMINAL

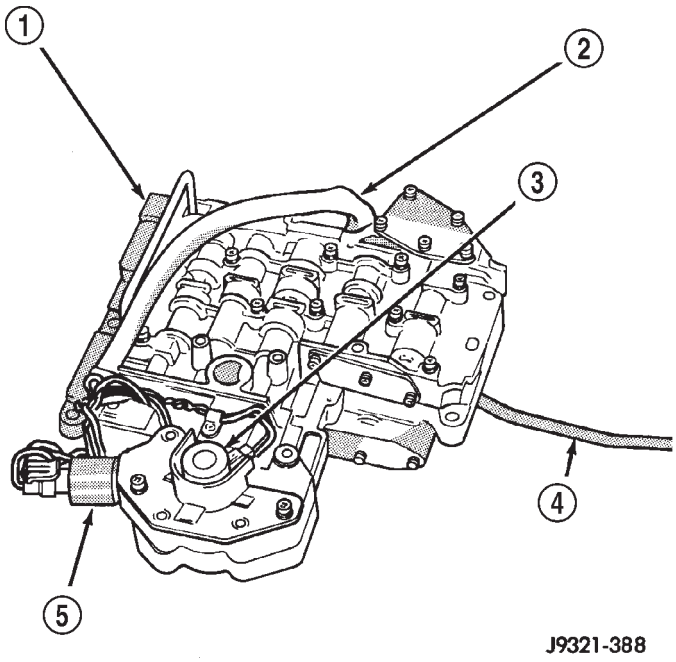

Fig. 54 Valve Body

1 – VALVE BODY
2 – WIRE HARNESS
3 – GOVERNOR PRESSURE SOLENOID
4 – PARK ROD
5 – GOVERNOR PRESSURE SENSOR

(3) Check condition of seals on accumulator piston (Fig. 57). Install new piston seals, if necessary.

(4) Place valve body manual lever in low (1 position) so ball on park lock rod will be easier to install in sprag.

(5) Lubricate shaft of manual lever with petroleum jelly. This will ease inserting shaft through seal in case.

(6) Lubricate seal rings on valve body harness connector with petroleum jelly.

(7) Position valve body in case and work end of park lock rod into and through pawl sprag. Turn propeller shaft to align sprag and park lock teeth if necessary. The rod will click as it enters pawl. Move rod to check engagement.

CAUTION: It is possible for the park rod to displace into a cavity just above the pawl sprag during installation. Make sure the rod is actually engaged in the pawl and has not displaced into this cavity.

(8) Install accumulator springs and piston into case. Then swing valve body over piston and outer spring to hold it in place.

(9) Align accumulator piston and outer spring, manual lever shaft and electrical connector in case.

(10) Then seat valve body in case and install one or two bolts to hold valve body in place.

(11) Tighten valve body bolts alternately and evenly to 11 N·m (100 in. lbs.) torque.

(12) Install new fluid filter on valve body. Tighten filter screws to 4 N·m (35 in. lbs.) torque.

(13) Install throttle and gearshift levers on valve body manual lever shaft.

(14) Check and adjust front and rear bands if necessary.

(15) Connect solenoid case connector wires.

(16) Install oil pan and new gasket. Tighten pan bolts to 17 N·m (13 ft. lbs.) torque.

(17) Lower vehicle and fill transmission with Mopar® ATF Plus 3, type 7176 fluid.

(18) Check and adjust gearshift and throttle valve cables, if necessary.

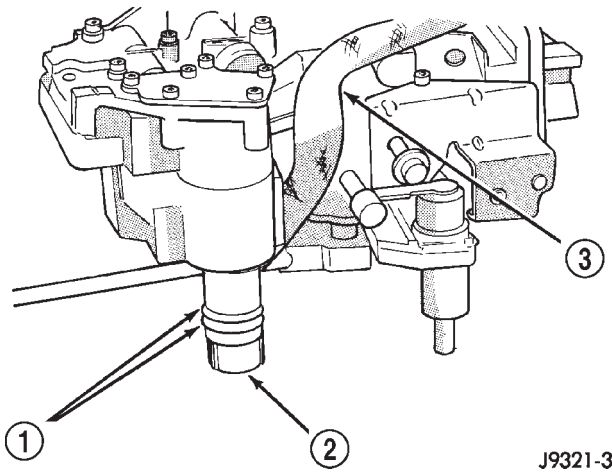

Fig. 55 Valve Body Harness Connector O-Ring Seal

1 – CONNECTOR O-RINGS
2 – VALVE BODY HARNESS CONNECTOR
3 – HARNESS

REMOVAL AND INSTALLATION (Continued)

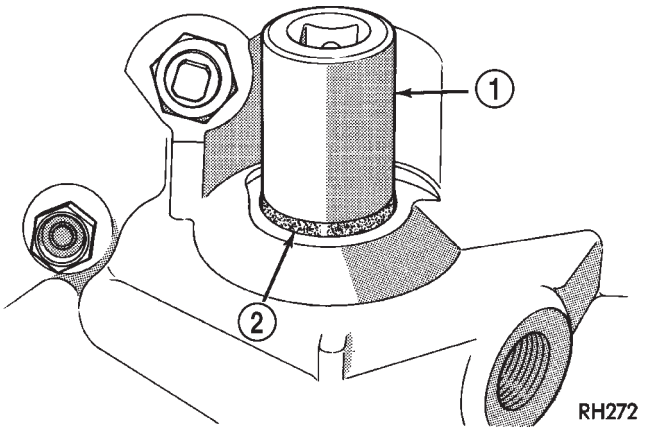

Fig. 56 Manual Lever Shaft Seal

1 – 15/16'' SOCKET
2 – SEAL

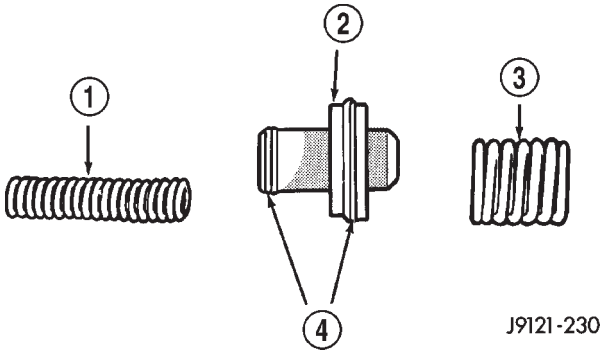

Fig. 57 Accumulator Piston Components

1 – INNER SPRING
2 – ACCUMULATOR PISTON
3 – OUTER SPRING
4 – SEAL RINGS

OVERDRIVE UNIT

REMOVAL

(1) Shift transmission into Park.
(2) Raise vehicle.
(3) Mark propeller shaft universal joint(s) and axle pinion yoke for alignment reference at installation.
(4) Disconnect and remove propeller shaft(s).
(5) Remove transmission oil pan, remove gasket, drain oil and reinstall pan.
(6) If overdrive unit had malfunctioned, or if fluid is contaminated, remove entire transmission. If diagnosis indicated overdrive problems only, remove just the overdrive unit.
(7) Support transmission with transmission jack.
(8) Remove vehicle speed sensor.
(9) Remove bolts attaching overdrive unit to transmission (Fig. 58).

CAUTION: Support the overdrive unit with a jack before moving it rearward. This is necessary to prevent damaging the intermediate shaft. Do not allow the shaft to support the entire weight of the overdrive unit.

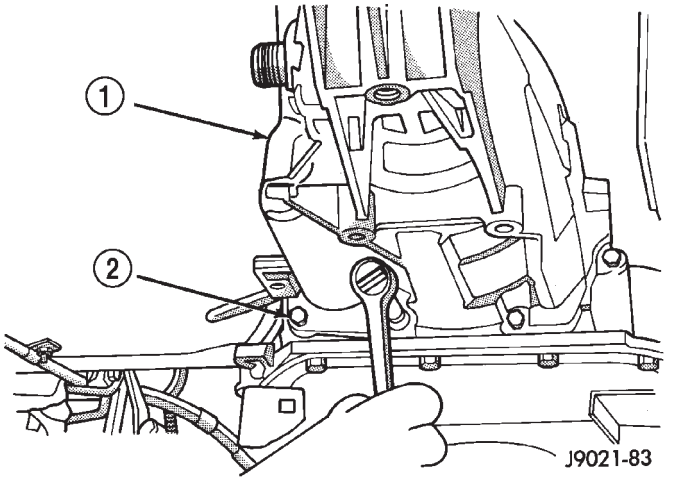

Fig. 58 Overdrive Unit Bolts

1 – OVERDRIVE UNIT
2 – ATTACHING BOLTS (7)

(10) Carefully work overdrive unit off intermediate shaft. Do not tilt unit during removal. Keep it as level as possible.
(11) If overdrive unit does not require service, immediately insert Alignment Tool 6227-2 in splines of planetary gear and overrunning clutch to prevent splines from rotating out of alignment. If misalignment occurs, overdrive unit will have to be disassembled in order to realign splines.
(12) Remove and retain overdrive piston thrust bearing. Bearing may remain on piston or in clutch hub during removal.
(13) Position drain pan on workbench.
(14) Place overdrive unit over drain pan. Tilt unit to drain residual fluid from case.
(15) Examine fluid for clutch material or metal fragments. If fluid contains these items, overhaul will be necessary.
(16) If overdrive unit does not require any service, leave alignment tool in position. Tool will prevent accidental misalignment of planetary gear and overrunning clutch splines.

INSTALLATION

(1) Be sure overdrive unit Alignment Tool 6227-2 is fully seated before moving unit. If tool is not seated and gear splines rotate out of alignment, overdrive unit will have to be disassembled in order to realign splines.

REMOVAL AND INSTALLATION (Continued)

(2) If overdrive piston retainer was not removed during service and original case gasket is no longer reusable, prepare new gasket by trimming it.

(3) Cut out old case gasket around piston retainer with razor knife (Fig. 59).

(4) Use old gasket as template and trim new gasket to fit.

(5) Position new gasket over piston retainer and on transmission case. Use petroleum jelly to hold gasket in place if necessary. Do not use any type of sealer to secure gasket. Use petroleum jelly only.

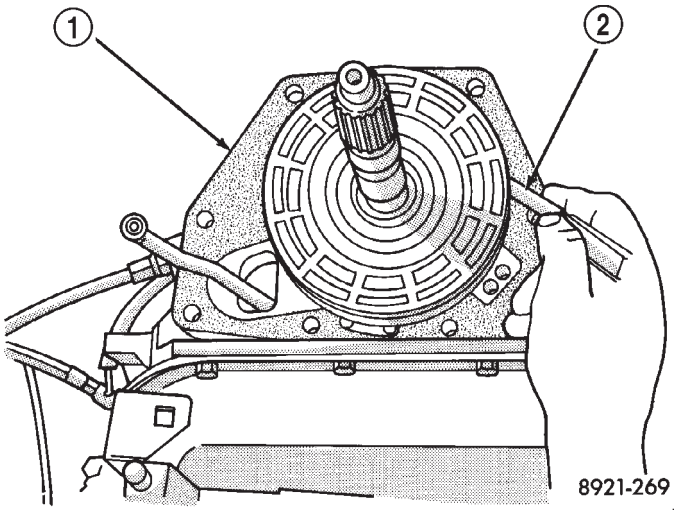

Fig. 59 Trimming Overdrive Case Gasket

1 – GASKET
2 – SHARP KNIFE

(6) Install selective spacer on intermediate shaft, if removed. Spacer goes in groove just rearward of shaft rear splines (Fig. 60).

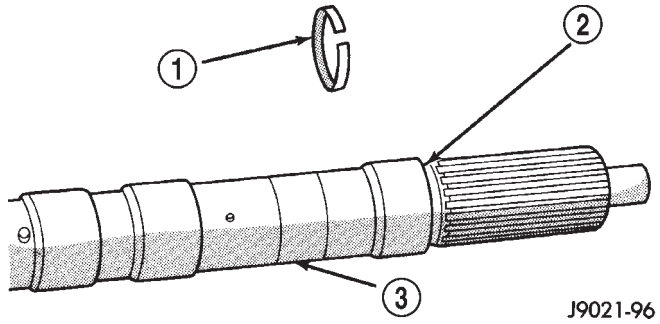

Fig. 60 Intermediate Shaft Selective Spacer Location

1 – SELECTIVE SPACER
2 – SPACER GROOVE
3 – INTERMEDIATE SHAFT

(7) Install thrust bearing in overdrive unit sliding hub. Use petroleum jelly to hold bearing in position.

CAUTION: Be sure the shoulder on the inside diameter of the bearing is facing forward.

(8) Verify that splines in overdrive planetary gear and overrunning clutch hub are aligned with Alignment Tool 6227-2. Overdrive unit cannot be installed if splines are not aligned. If splines have rotated out of alignment, unit will have to be disassembled to realign splines.

(9) Carefully slide Alignment Tool 6227-2 out of overdrive planetary gear and overrunning clutch splines.

(10) Raise overdrive unit and carefully slide it straight onto intermediate shaft. Insert park rod into park lock reaction plug at same time. Avoid tilting overdrive during installation as this could cause planetary gear and overrunning clutch splines to rotate out of alignment. If this occurs, it will be necessary to remove and disassemble overdrive unit to realign splines.

(11) Work overdrive unit forward on intermediate shaft until seated against transmission case.

(12) Install bolts attaching overdrive unit to transmission unit. Tighten bolts in diagonal pattern to 34 N·m (25 ft-lbs).

(13) Install speed sensor.

(14) Connect speed sensor and overdrive wires.

(15) Align and install propeller shaft.

OVERDRIVE HOUSING BUSHING

REMOVAL

(1) Remove overdrive housing yoke seal.

(2) Insert Remover 6957 into overdrive housing. Tighten tool to bushing and remove bushing (Fig. 61).

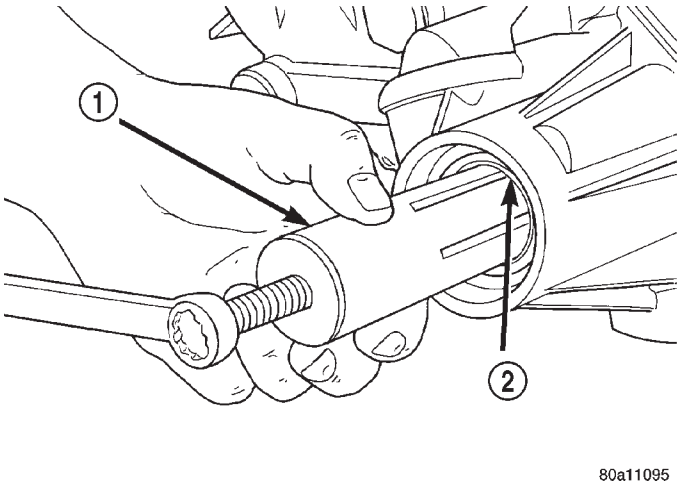

Fig. 61 Bushing Removal—Typical

1 – REMOVER 6957
2 – EXTENSION HOUSING BUSHING

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Align bushing oil hole with oil slot in overdrive housing.

(2) Tap bushing into place with Installer 6951 and Handle C-4171.

(3) Install new oil seal in housing using Seal Installer C-3995–A (Fig. 62).

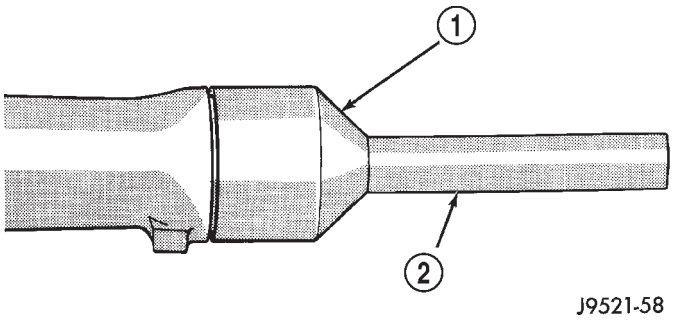

Fig. 62 Overdrive Housing Seal Installation

1 – SPECIAL TOOL C-3995–A OR C-3972–A
2 – SPECIAL TOOL C-4471

OUTPUT SHAFT REAR BEARING

REMOVAL

(1) Remove overdrive unit from the vehicle.

(2) Remove overdrive geartrain from housing.

(3) Remove snap ring holding output shaft rear bearing into overdrive housing (Fig. 63).

(4) Using a suitable driver inserted through the rear end of housing, drive bearing from housing.

INSTALLATION

(1) Place replacement bearing in position in housing.

(2) Using a suitable driver, drive bearing into housing until the snap ring groove is visible.

(3) Install snap ring to hold bearing into housing (Fig. 63).

(4) Install overdrive geartrain into housing.

(5) Install overdrive unit in vehicle.

OUTPUT SHAFT FRONT BEARING

REMOVAL

(1) Remove overdrive unit from the vehicle.

(2) Remove overdrive geartrain from housing.

(3) Remove snap ring holding output shaft front bearing to overdrive geartrain. (Fig. 64).

(4) Pull bearing from output shaft.

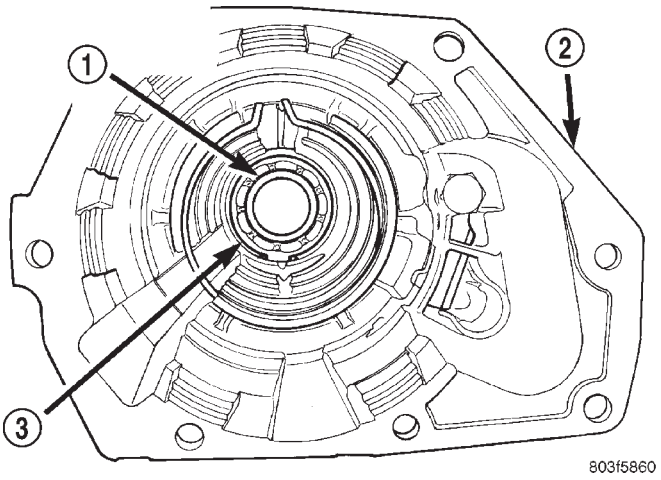

Fig. 63 Output Shaft Rear Bearing

1 – OUTPUT SHAFT REAR BEARING
2 – OVERDRIVE HOUSING
3 – SNAP RING

INSTALLATION

(1) Place replacement bearing in position on geartrain with locating retainer groove toward the rear.

(2) Push bearing onto shaft until the snap ring groove is visible.

(3) Install snap ring to hold bearing onto output shaft (Fig. 64).

(4) Install overdrive geartrain into housing.

(5) Install overdrive unit in vehicle.

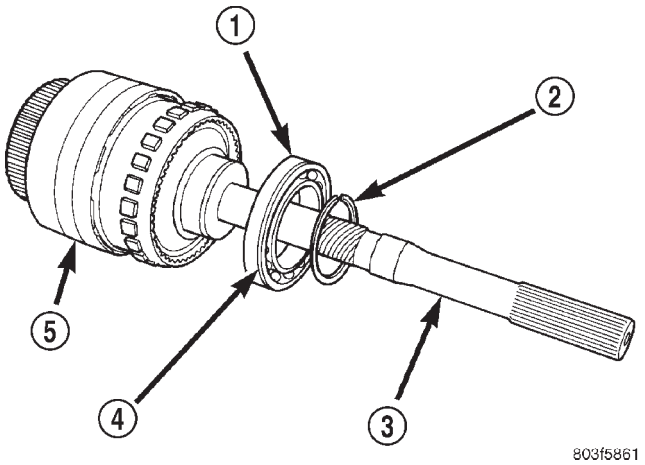

Fig. 64 Output Shaft Front Bearing

1 – OUTPUT SHAFT FRONT BEARING
2 – SNAP RING
3 – OUTPUT SHAFT
4 – GROOVE TO REAR
5 – OVERDRIVE GEARTRAIN

DISASSEMBLY AND ASSEMBLY

VALVE BODY

Remove the valve body from the transmission, refer to Removal and Installation procedures section in this group.

DISASSEMBLY

CAUTION: Do not clamp any valve body component in a vise. This practice can damage the component resulting in unsatisfactory operation after assembly and installation. Do not use pliers to remove any of the valves, plugs or springs and do not force any of the components out or into place. The valves and valve body housings will be damaged if force is used. Tag or mark the valve body springs for reference as they are removed. Do not allow them to become intermixed.

(1) Remove fluid filter.
(2) Disconnect wires from governor pressure sensor and solenoid.
(3) Remove screws attaching governor body and retainer plate to transfer plate.
(4) Remove retainer plate, governor body and gasket from transfer plate.
(5) Disconnect wires from governor pressure sensor, if not done previously.
(6) Remove governor pressure sensor from governor body. Sensor is retained in body with M-shaped spring clip. Remove clip with small pointed tool and slide sensor out of body.
(7) Remove governor pressure solenoid by pulling it straight out of bore in governor body. Remove and discard solenoid O-rings if worn, cut, or torn.
(8) Remove small shoulder bolt that secures solenoid harness case connector to 3-4 accumulator housing (Fig. 65). **Retain shoulder bolt. Either tape it to harness or thread it back into accumulator housing after connector removal.**
(9) Unhook overdrive/converter solenoid harness from 3-4 accumulator cover plate (Fig. 66).
(10) Turn valve body over and remove screws that attach overdrive/converter solenoid assembly to valve body (Fig. 67).
(11) Remove solenoid and harness assembly from valve body (Fig. 68).
(12) Remove boost valve cover (Fig. 69).
(13) Remove boost valve retainer, valve spring and boost valve (Fig. 70).

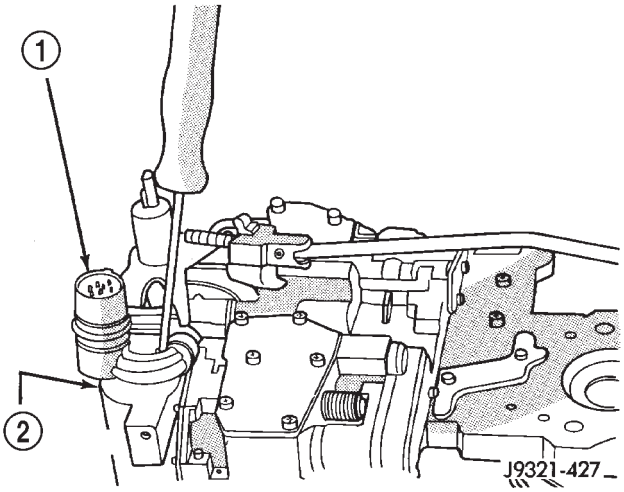

Fig. 65 Solenoid Harness Case Connector Shoulder Bolt

1 – SOLENOID HARNESS CASE CONNECTOR
2 – 3–4 ACCUMULATOR HOUSING

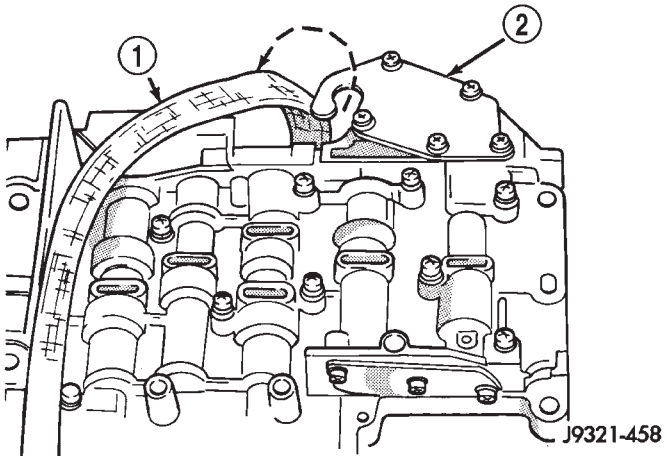

Fig. 66 Unhooking Solenoid Harness From Accumulator Cover Plate

1 – OVERDRIVE/CONVERTER SOLENOID WIRE HARNESS
2 – 3–4 ACCUMULATOR COVER PLATE

DISASSEMBLY AND ASSEMBLY (Continued)

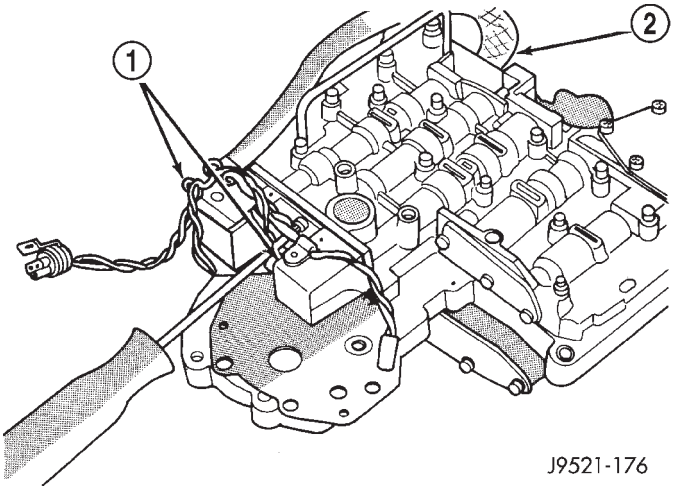

Fig. 67 Solenoid Assembly Screws

1 – OVERDRIVE/CONVERTER CLUTCH SOLENOID ASSEMBLY
2 – HARNESS

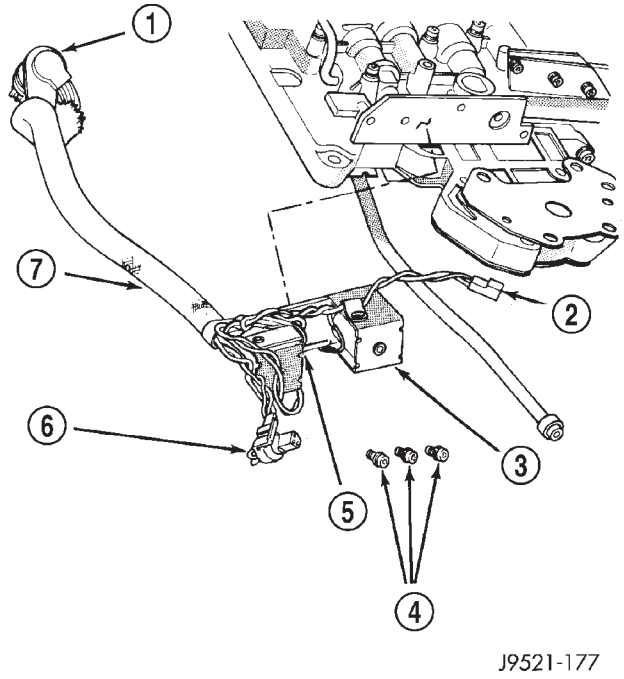

Fig. 68 Solenoid Assembly

1 – CASE CONNECTOR
2 – GOVERNOR SOLENOID WIRES
3 – CONVERTER CLUTCH SOLENOID
4 – SOLENOID SCREWS
5 – OVERDRIVE SOLENOID
6 – GOVERNOR SENSOR WIRES
7 – HARNESS

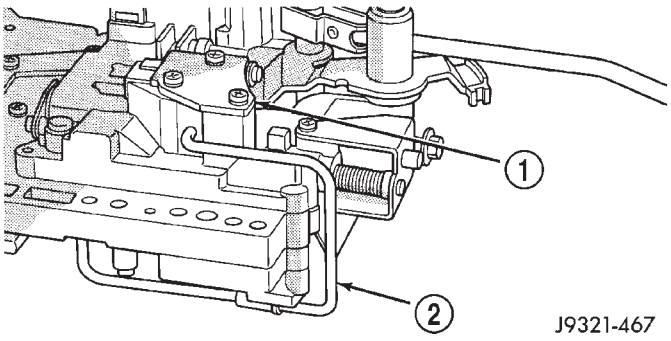

Fig. 69 Boost Valve Cover Location

1 – BOOST VALVE HOUSING AND COVER
2 – BOOST VALVE TUBE

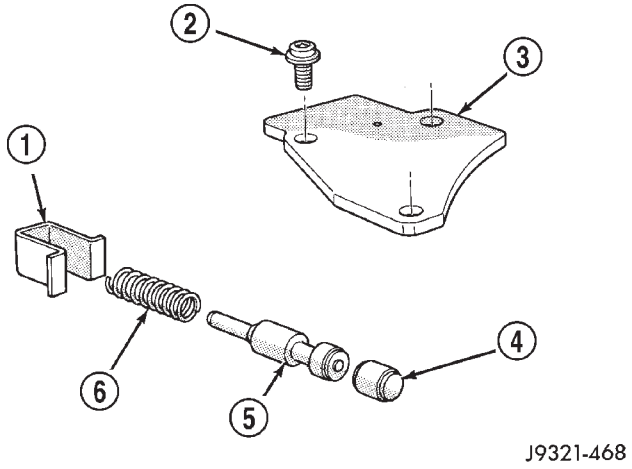

Fig. 70 Boost Valve Components

1 – SPRING AND VALVE RETAINER
2 – COVER SCREWS
3 – BOOST VALVE COVER
4 – BOOST VALVE PLUG
5 – BOOST VALVE
6 – BOOST VALVE SPRING

(14) Secure detent ball and spring with Retainer Tool 6583 (Fig. 71).

(15) Remove park rod E-clip and separate rod from manual lever (Fig. 72).

(16) Remove E-clip and washer that retains throttle lever shaft in manual lever (Fig. 73).

(17) Remove manual lever and throttle lever (Fig. 74). Rotate and lift manual lever off valve body and throttle lever shaft. Then slide throttle lever out of valve body.

(18) Position pencil magnet next to detent housing to catch detent ball and spring. Then carefully remove Retainer Tool 6583 and remove detent ball and spring (Fig. 75).

DISASSEMBLY AND ASSEMBLY (Continued)

(19) Remove screws attaching pressure adjusting screw bracket to valve body and transfer plate (Fig. 76). Hold bracket firmly against spring tension while removing last screw.

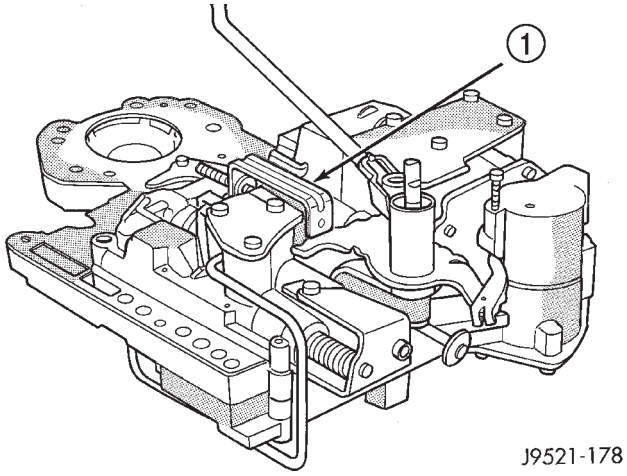

Fig. 71 Detent Ball And Spring

1 – SPECIAL TOOL 6583 POSITIONED ON DETENT HOUSING

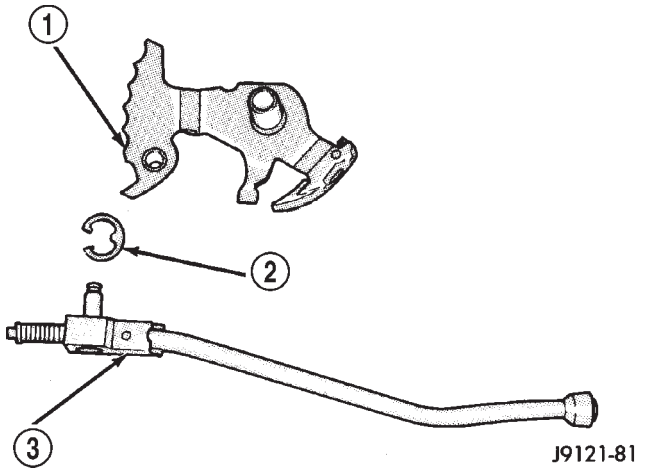

Fig. 72 Park Rod

1 – MANUAL LEVER
2 – E-CLIP
3 – PARK ROD

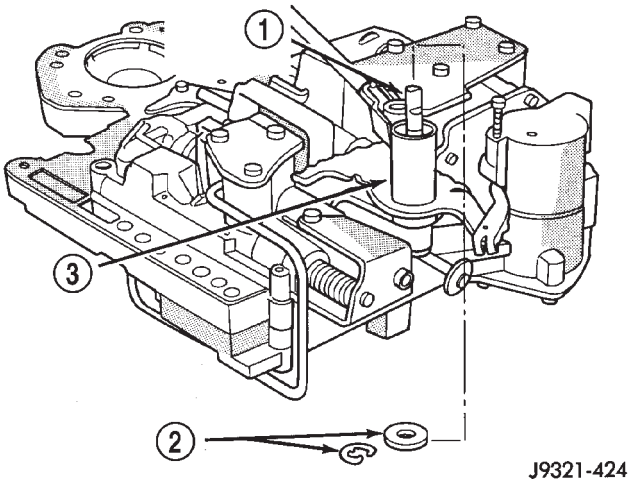

Fig. 73 Throttle Lever E-Clip And Washer

1 – THROTTLE LEVER SHAFT
2 – E-CLIP AND WASHER
3 – MANUAL SHAFT

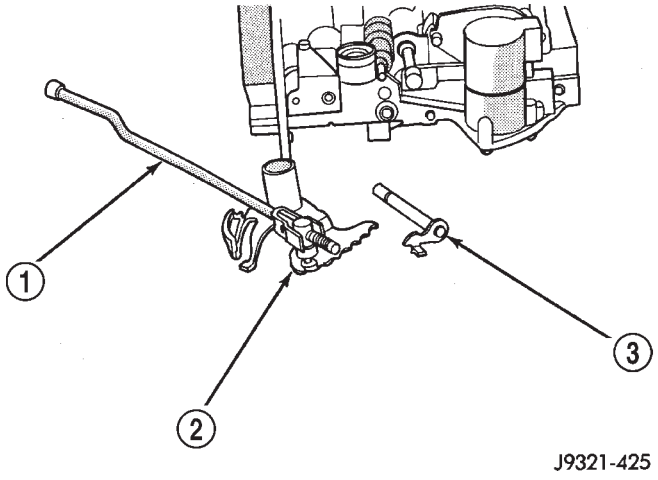

Fig. 74 Manual And Throttle Lever

1 – PARK ROD
2 – MANUAL LEVER ASSEMBLY
3 – THROTTLE LEVER

DISASSEMBLY AND ASSEMBLY (Continued)

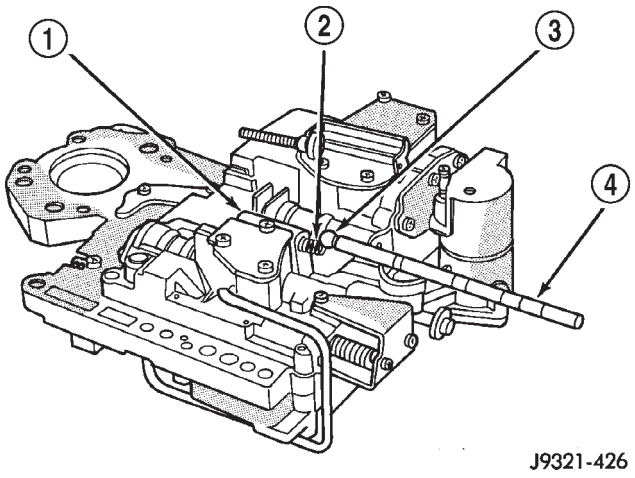

Fig. 75 Detent Ball And Spring

1 – DETENT HOUSING
2 – DETENT SPRING
3 – DETENT BALL
4 – PENCIL MAGNET

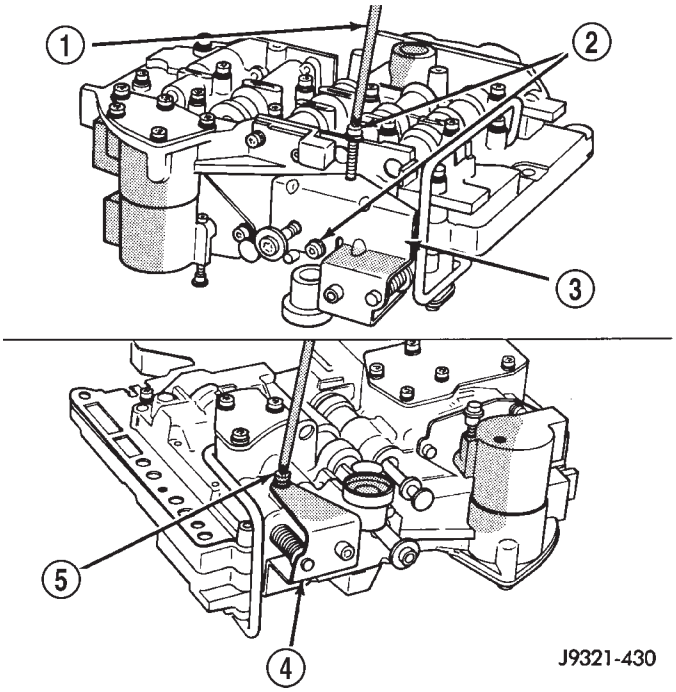

Fig. 76 Adjusting Screw Bracket Fastener

1 – T25 TORX BIT
2 – REMOVE THESE SCREWS FIRST
3 – BRACKET
4 – BRACKET
5 – REMOVE THIS SCREW LAST

(20) Remove adjusting screw bracket, line pressure adjusting screw, pressure regulator valve spring and switch valve spring (Fig. 77). **Do not remove throttle pressure adjusting screw from bracket and do not disturb setting of either adjusting screw during removal.**

(21) Turn upper housing over and remove switch valve, regulator valve and spring, and manual valve (Fig. 78).

(22) Remove kickdown detent, kickdown valve, and throttle valve and spring (Fig. 78).

(23) Loosen left-side 3-4 accumulator housing attaching screw about 2-3 threads. Then remove center and right-side housing attaching screws (Fig. 79).

(24) Carefully rotate 3-4 accumulator housing upward and remove 3-4 shift valve spring and converter clutch valve plug and spring (Fig. 80).

(25) Remove left-side screw and remove 3-4 accumulator housing from valve body (Fig. 81).

(26) Bend back tabs on boost valve tube brace (Fig. 82).

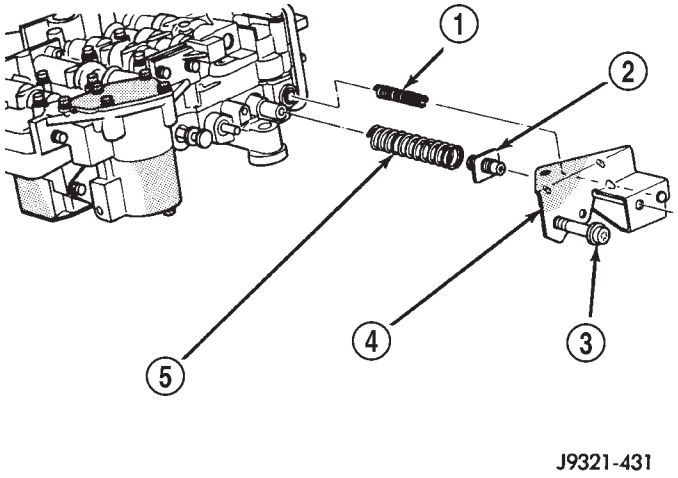

Fig. 77 Adjusting Screw Bracket And Spring

1 – SWITCH VALVE SPRING
2 – LINE PRESSURE SCREW
3 – THROTTLE PRESSURE ADJUSTING SCREW
4 – ADJUSTING SCREW BRACKET
5 – PRESSURE REGULATOR VALVE SPRING

DISASSEMBLY AND ASSEMBLY (Continued)

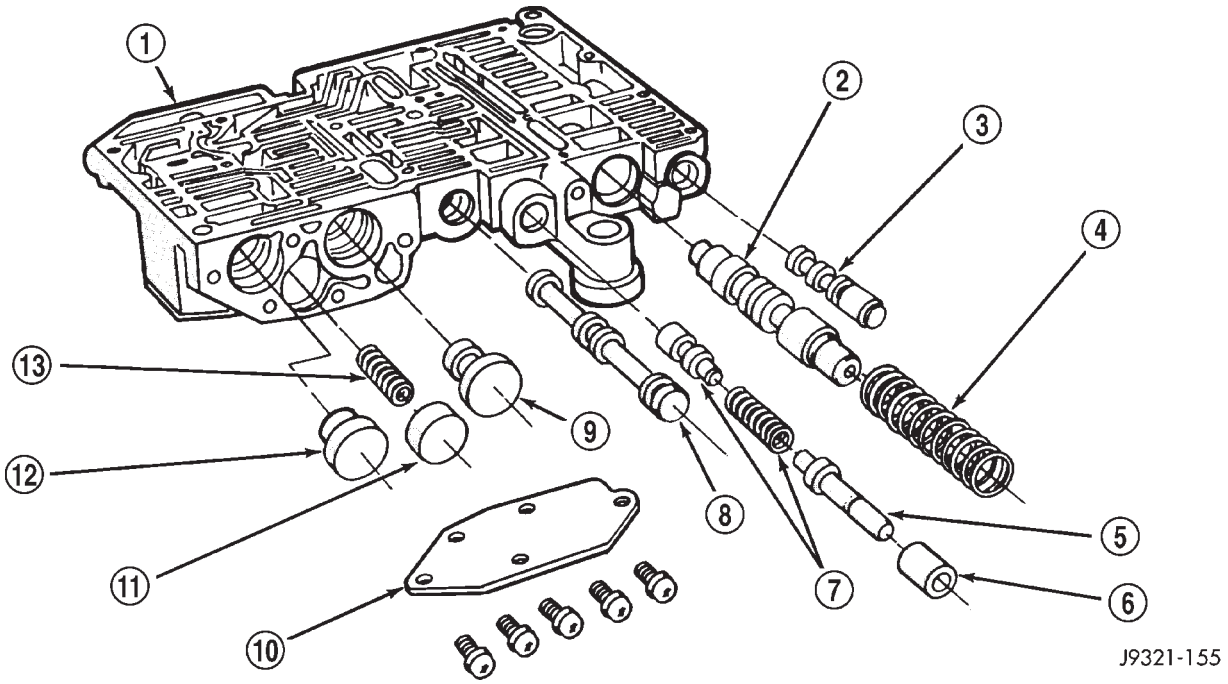

Fig. 78 Upper Housing Control Valve Locations

1 – UPPER HOUSING
2 – REGULATOR VALVE
3 – SWITCH VALVE
4 – REGULATOR VALVE SPRING
5 – KICKDOWN VALVE
6 – KICKDOWN DETENT
7 – THROTTLE VALVE AND SPRING
8 – MANUAL VALVE
9 – 1–2 GOVERNOR PLUG
10 – GOVERNOR PLUG COVER
11 – THROTTLE PLUG
12 – 2–3 GOVERNOR PLUG
13 – SHUTTLE VALVE PRIMARY SPRING

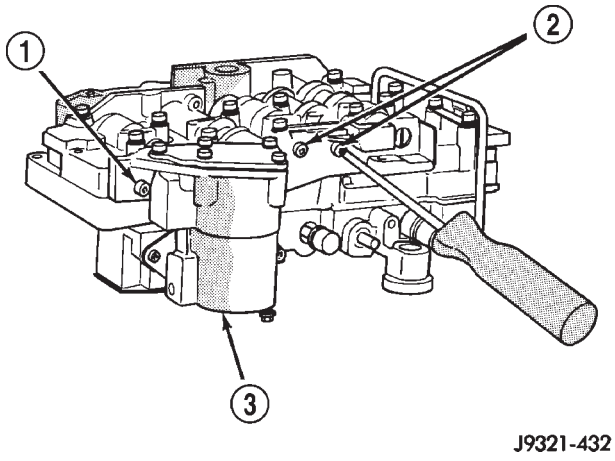

Fig. 79 Accumulator Housing Screw Locations

1 – LOOSEN THIS SCREW
2 – REMOVE THESE SCREWS
3 – 3–4 ACCUMULATOR HOUSING

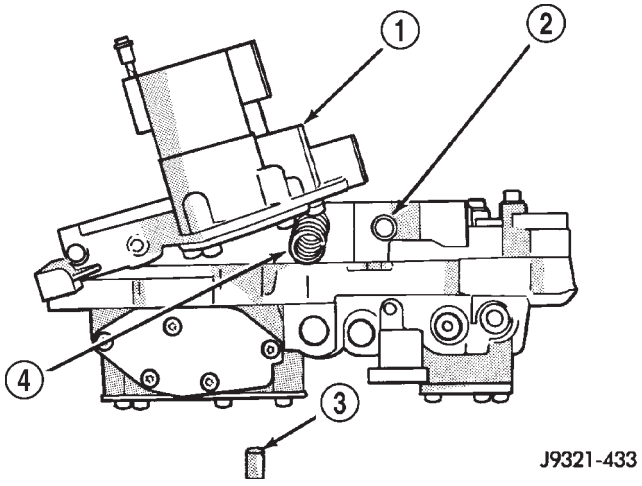

Fig. 80 3-4 Shift And Converter Clutch Valve Springs And Plug

1 – ACCUMULATOR HOUSING
2 – CONVERTER CLUTCH VALVE SPRING
3 – CLUTCH VALVE PLUG
4 – 3–4 SHIFT VALVE SPRING

DISASSEMBLY AND ASSEMBLY (Continued)

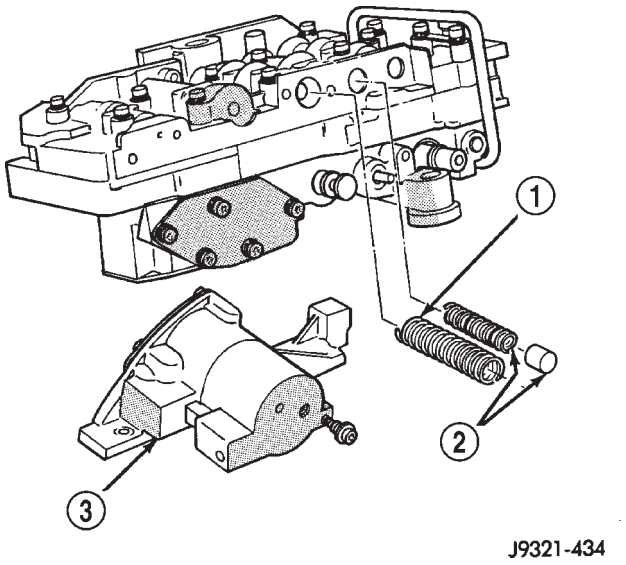

Fig. 81 Accumulator Housing, Valve Springs And Plug

1 – 3–4 SHIFT VALVE SPRING
2 – CONVERTER CLUTCH VALVE SPRING AND PLUG
3 – 3–4 ACCUMULATOR HOUSING

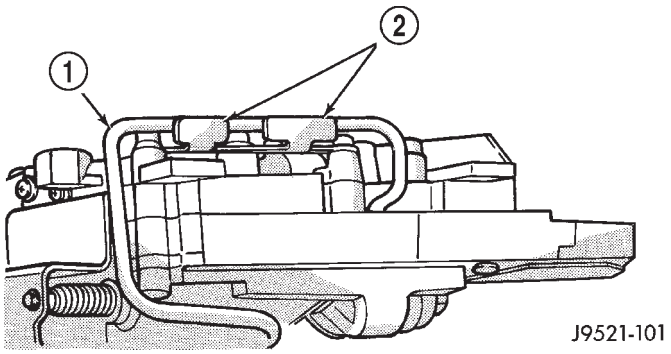

Fig. 82 Boost Valve Tube Brace

1 – BOOST VALVE TUBE
2 – TUBE BRACE (DOUBLE TAB)

(27) Remove boost valve connecting tube (Fig. 83). Disengage tube from upper housing port first. Then rock opposite end of tube back and forth to work it out of lower housing.

CAUTION: Do not use tools to loosen or pry the connecting tube out of the valve body housings. Loosen and remove the tube by hand only.

(28) Turn valve body over so lower housing is facing upward (Fig. 84). In this position, the two check balls in upper housing will remain in place and not fall out when lower housing and separator plate are removed.

(29) Remove screws attaching valve body lower housing to upper housing and transfer plate (Fig. 84). **Note position of boost valve tube brace for assembly reference.**

(30) Remove lower housing and overdrive separator plate from transfer plate (Fig. 84).

(31) Remove the ECE check ball from the transfer plate (Fig. 85). The ECE check ball is approximately 4.8 mm (3/16 in.) in diameter.

(32) Remove transfer plate from upper housing (Fig. 86).

(33) Turn transfer plate over so upper housing separator plate is facing upward.

(34) Remove upper housing separator plate from transfer plate (Fig. 87). Note position of filter in separator plate for assembly reference.

(35) Remove rear clutch and rear servo check balls from transfer plate. Note check ball location for assembly reference (Fig. 88).

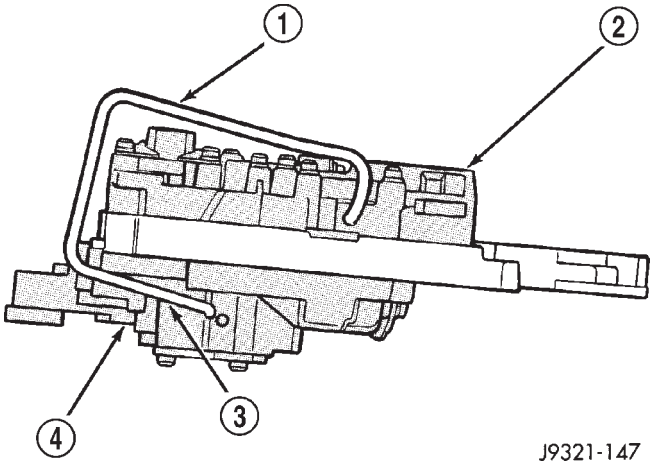

Fig. 83 Boost Valve Tube

1 – BOOST VALVE TUBE
2 – LOWER HOUSING
3 – DISENGAGE THIS END OF TUBE FIRST
4 – UPPER HOUSING

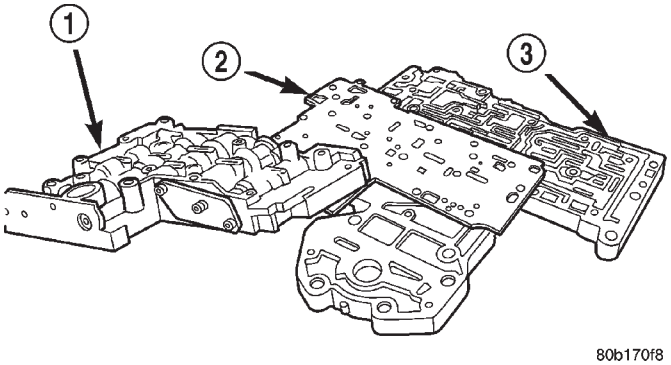

Fig. 84 Lower Housing

1 – LOWER HOUSING
2 – OVERDRIVE SEPARATOR PLATE
3 – TRANSFER PLATE AND UPPER HOUSING

DISASSEMBLY AND ASSEMBLY (Continued)

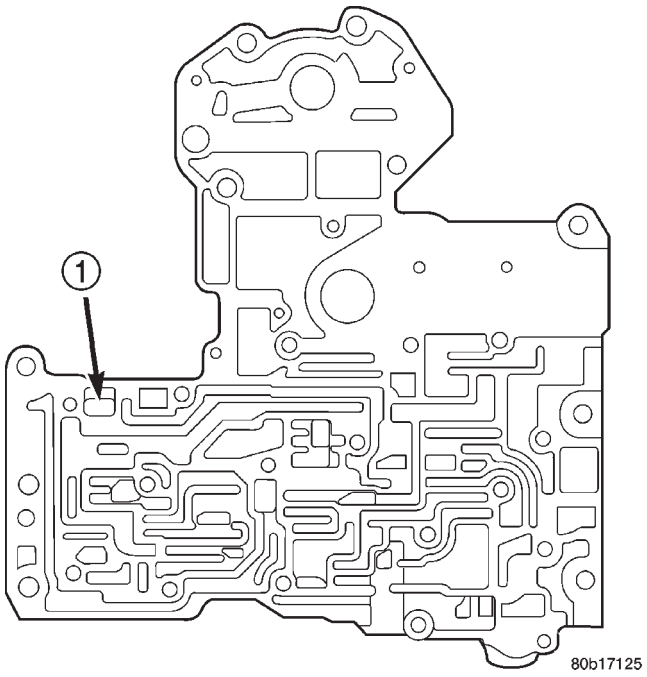

Fig. 85 ECE Check Ball

1 – ECE CHECK BALL (3/16")

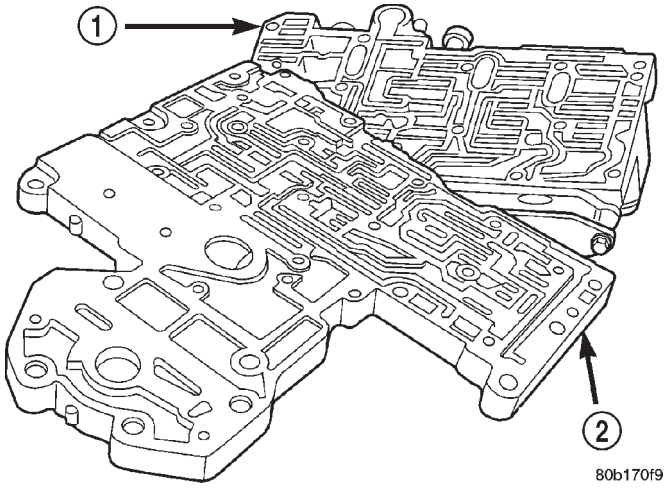

Fig. 86 Transfer Plate

1 – UPPER HOUSING
2 – TRANSFER PLATE

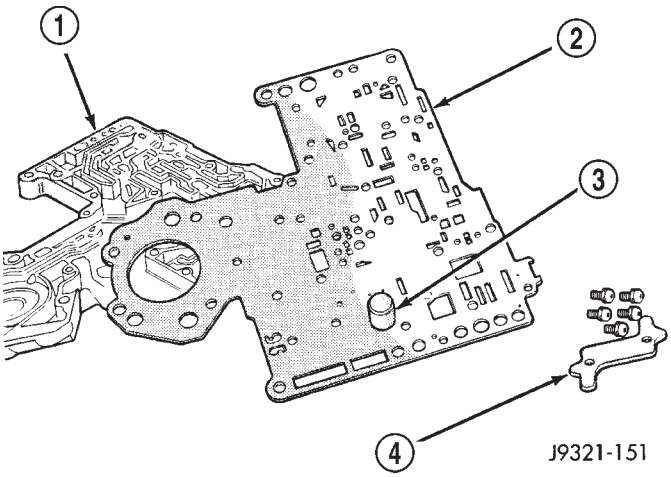

Fig. 87 Upper Housing Separator Plate

1 – TRANSFER PLATE
2 – UPPER HOUSING SEPARATOR PLATE
3 – FILTER SCREEN
4 – BRACE

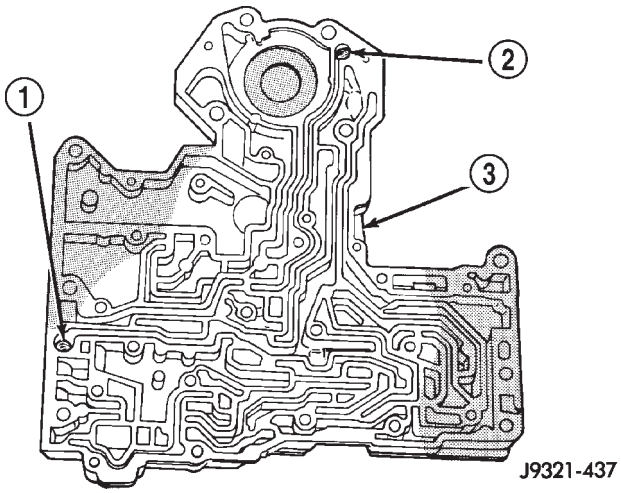

Fig. 88 Rear Clutch And Rear Servo Check Ball Locations

1 – REAR CLUTCH CHECK BALL
2 – REAR SERVO CHECK BALL
3 – TRANSFER PLATE

DISASSEMBLY AND ASSEMBLY (Continued)

VALVE BODY UPPER HOUSING

(1) Note location of check balls in valve body upper housing (Fig. 89). Then remove the one large diameter and the six smaller diameter check balls.

(2) Remove governor plug and shuttle valve covers (Fig. 91).

(3) Remove E-clip that secures shuttle valve secondary spring on valve stem (Fig. 90).

(4) Remove throttle plug, primary spring, shuttle valve, secondary spring, and spring guides (Fig. 91).

(5) Remove boost valve retainer, spring and valve if not previously removed.

(6) Remove throttle plug and 1-2 and 2-3 governor plugs (Fig. 78).

(7) Turn upper housing around and remove limit valve and shift valve covers (Fig. 92).

(8) Remove limit valve housing. Then remove retainer, spring, limit valve, and 2-3 throttle plug from limit valve housing (Fig. 92).

(9) Remove 1-2 shift control valve and spring (Fig. 92).

(10) Remove 1-2 shift valve and spring (Fig. 92).

(11) Remove 2-3 shift valve and spring from valve body (Fig. 92).

(12) Remove pressure plug cover (Fig. 92).

(13) Remove line pressure plug, sleeve, throttle pressure plug and spring (Fig. 92).

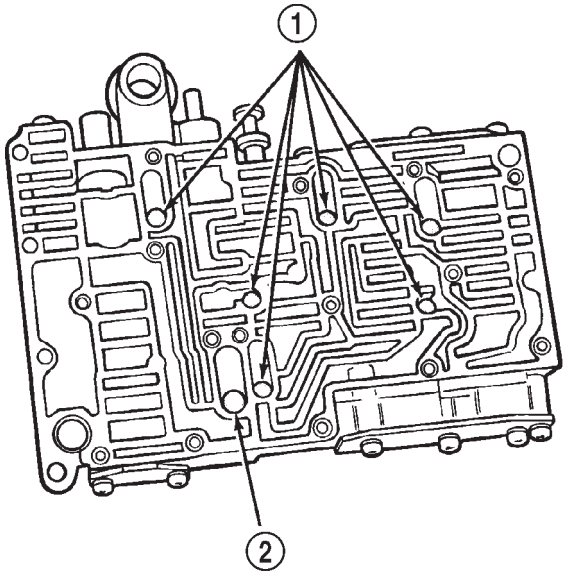

Fig. 89 Check Ball Locations In Upper Housing

1 – SMALL DIAMETER CHECK BALLS (6)
2 – LARGE DIAMETER CHECK BALL (1)

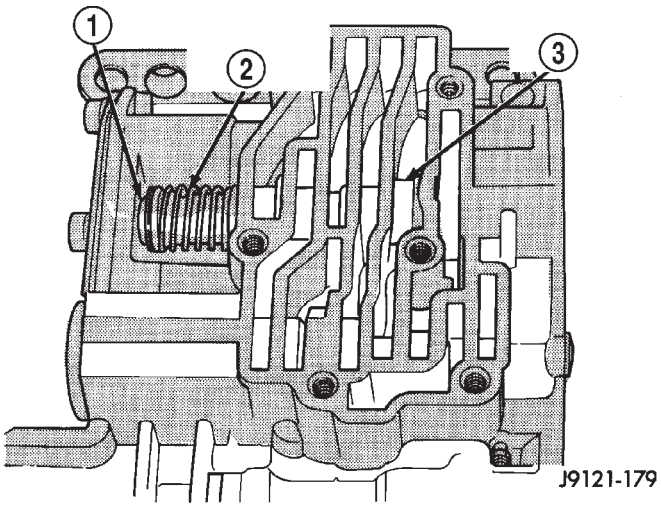

Fig. 90 Shuttle Valve E-Clip And Secondary Spring Location

1 – E-CLIP
2 – SECONDARY SPRING AND GUIDES
3 – SHUTTLE VALVE

DISASSEMBLY AND ASSEMBLY (Continued)

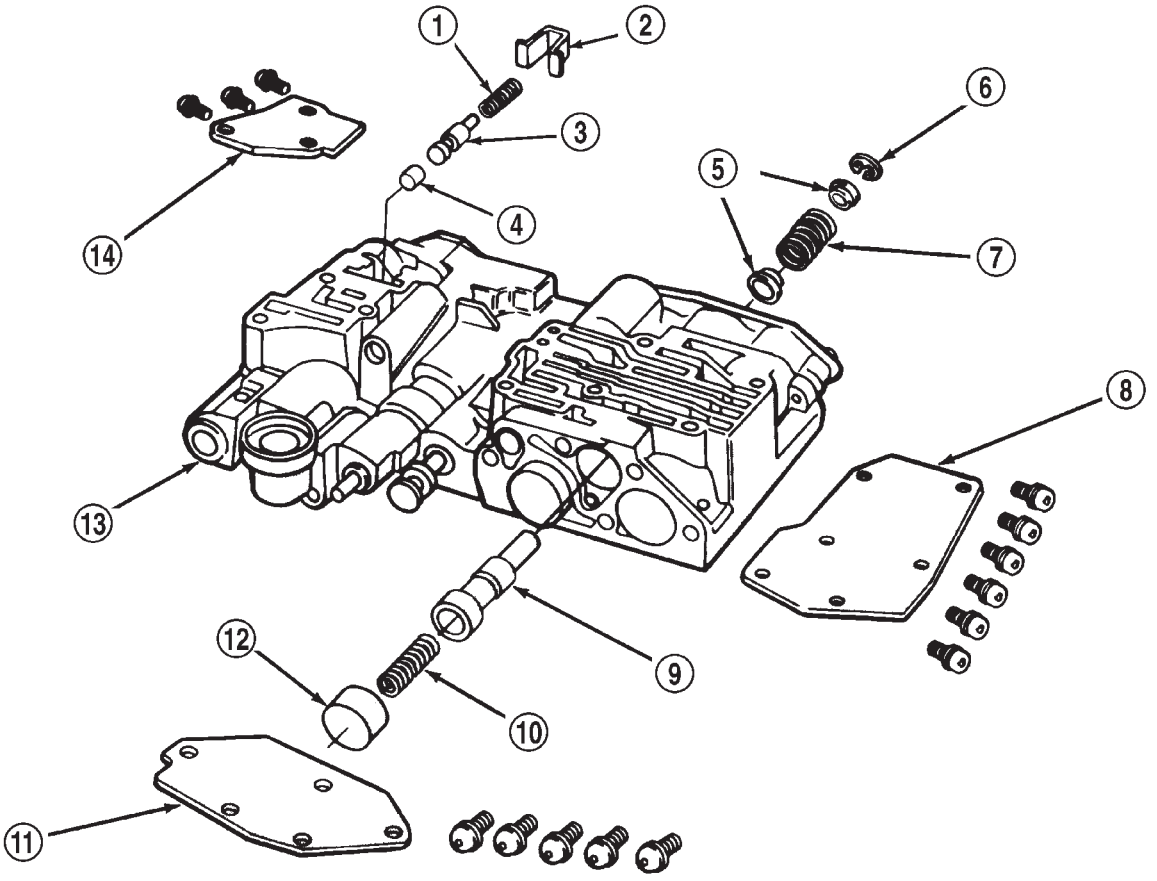

Fig. 91 Shuttle And Boost Valve Components

1 – SPRING
2 – RETAINER
3 – BOOST VALVE
4 – BOOST VALVE PLUG
5 – SPRING GUIDES
6 – E-CLIP
7 – SHUTTLE VALVE SECONDARY SPRING
8 – SHUTTLE VALVE COVER
9 – SHUTTLE VALVE
10 – SHUTTLE VALVE PRIMARY SPRING
11 – GOVERNOR PLUG COVER
12 – THROTTLE PLUG
13 – UPPER HOUSING
14 – BOOST VALVE COVER

DISASSEMBLY AND ASSEMBLY (Continued)

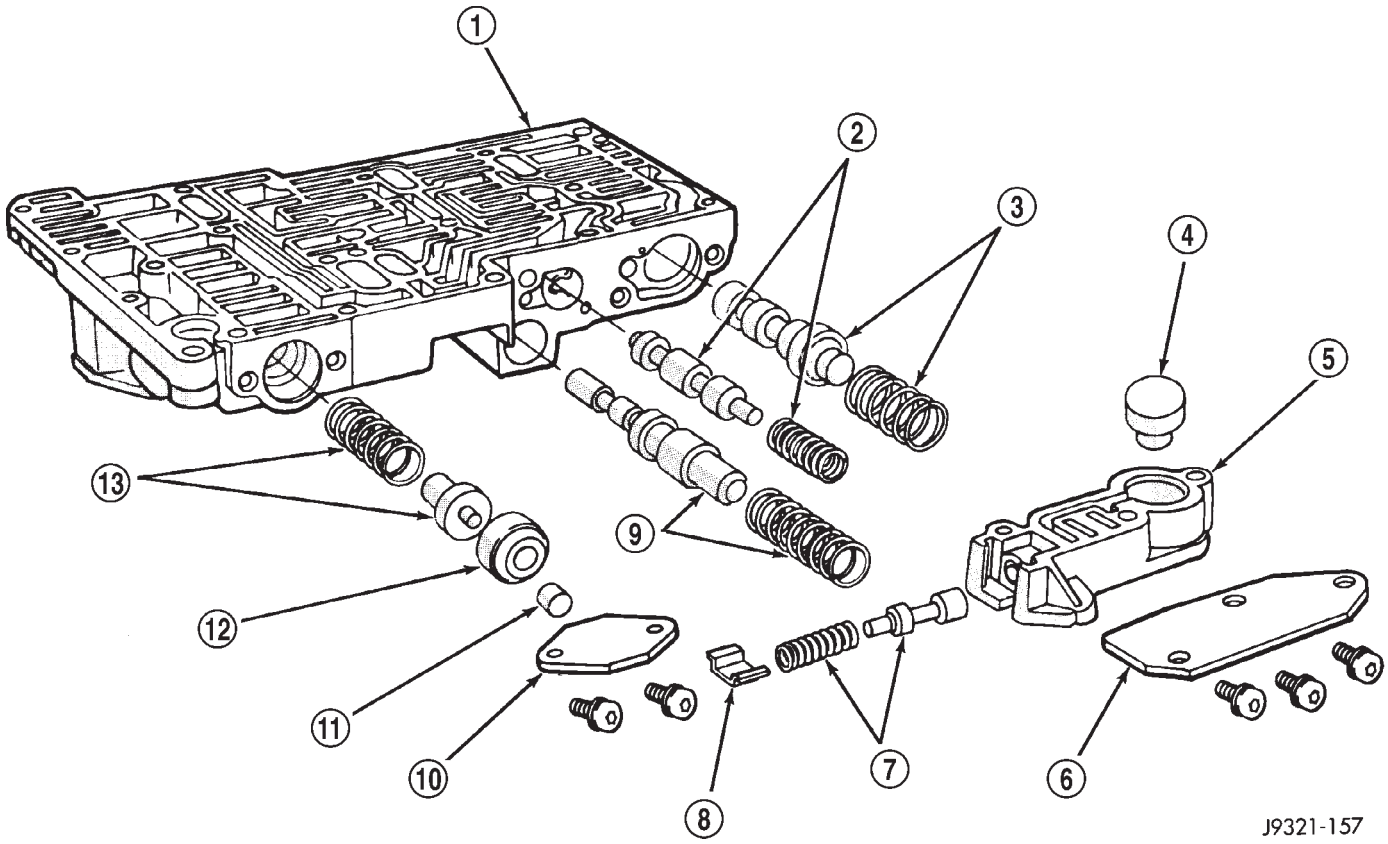

Fig. 92 Upper Housing Shift Valve And Pressure Plug Locations

1 – UPPER HOUSING
2 – 1–2 SHIFT VALVE AND SPRING
3 – 2–3 SHIFT VALVE AND SPRING
4 – 2–3 THROTTLE PLUG
5 – LIMIT VALVE HOUSING
6 – LIMIT VALVE COVER
7 – LIMIT VALVE AND SPRING
8 – RETAINER
9 – 1–2 SHIFT CONTROL VALVE AND SPRING
10 – PRESSURE PLUG COVER
11 – LINE PRESSURE PLUG
12 – PLUG SLEEVE
13 – THROTTLE PRESSURE SPRING AND PLUG

DISASSEMBLY AND ASSEMBLY (Continued)

VALVE BODY LOWER HOUSING

(1) Remove timing valve cover.
(2) Remove 3-4 timing valve and spring.
(3) Remove 3-4 quick fill valve, spring and plug.
(4) Remove 3-4 shift valve and spring.
(5) Remove converter clutch valve, spring and plug (Fig. 93).
(6) Remove converter clutch timing valve, retainer and valve spring.

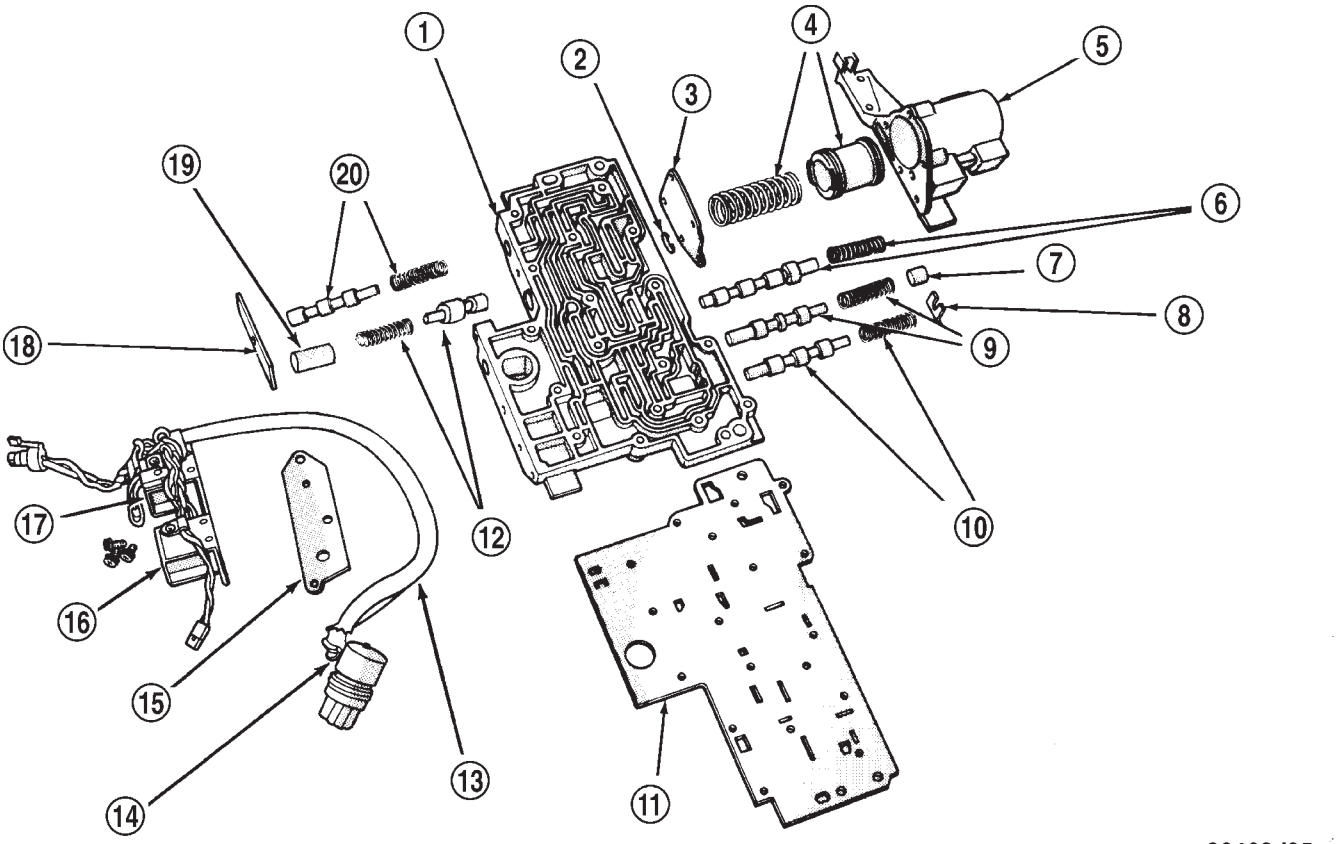

Fig. 93 Lower Housing Shift Valves And Springs

1 – LOWER HOUSING
2 – E-CLIP
3 – ACCUMULATOR END PLATE
4 – 3–4 ACCUMULATOR PISTON AND SPRING
5 – 3–4 ACCUMULATOR HOUSING
6 – 3–4 SHIFT VALVE AND SPRING
7 – PLUG
8 – SPRING RETAINER
9 – CONVERTER CLUTCH VALVE AND SPRING
10 – CONVERTER CLUTCH TIMING VALVE AND SPRING
11 – OVERDRIVE SEPARATOR PLATE
12 – 3–4 QUICK FILL SPRING AND VALVE
13 – HARNESS
14 – CASE CONNECTOR
15 – SOLENOID GASKET
16 – CONVERTER CLUTCH SOLENOID
17 – OVERDRIVE SOLENOID
18 – TIMING VALVE COVER
19 – PLUG
20 – 3–4 TIMING VALVE AND SPRING

DISASSEMBLY AND ASSEMBLY (Continued)

3-4 ACCUMULATOR HOUSING

(1) Remove end plate from housing.
(2) Remove piston spring.
(3) Remove piston. Remove and discard piston seals (Fig. 94).

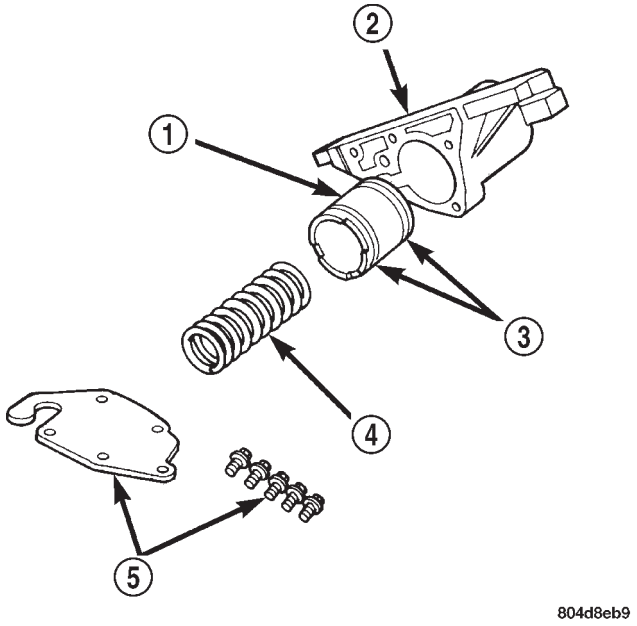

Fig. 94 Accumulator Housing Components

1 – ACCUMULATOR PISTON
2 – 3–4 ACCUMULATOR HOUSING
3 – TEFLON SEALS
4 – PISTON SPRING
5 – COVER PLATE AND SCREWS

ASSEMBLY

CAUTION: Do not force valves or plugs into place during reassembly. If the valve body bores, valves and plugs are free of distortion or burrs, the valve body components should all slide into place easily. In addition, do not overtighten the transfer plate and valve body screws during reassembly. Overtightening can distort the housings resulting in valve sticking, cross leakage and unsatisfactory operation. Tighten valve body screws to recommended torque only.

LOWER HOUSING

(1) Lubricate valves, springs, and the housing valve and plug bores with clean transmission fluid (Fig. 93).
(2) Install 3-4 timing valve spring and valve in lower housing.
(3) Install 3-4 quick fill valve in lower housing.
(4) Install 3-4 quick fill valve spring and plug in housing.
(5) Install timing valve end plate. Tighten end plate screws to 4 N·m (35 in. lbs.) torque.

3-4 ACCUMULATOR

(1) Lubricate accumulator piston, seals and housing piston bore with clean transmission fluid (Fig. 94).
(2) Install new seal rings on accumulator piston.
(3) Install piston and spring in housing.
(4) Install end plate on housing.

TRANSFER PLATE

(1) Install rear clutch and rear servo check balls in transfer plate (Fig. 95).
(2) Install filter screen in upper housing separator plate (Fig. 96).
(3) Align and position upper housing separator plate on transfer plate (Fig. 97).
(4) Install brace plate (Fig. 97). Tighten brace attaching screws to 4 N·m (35 in. lbs.) torque.
(5) Install remaining separator plate attaching screws. Tighten screws to 4 N·m (35 in. lbs.) torque.

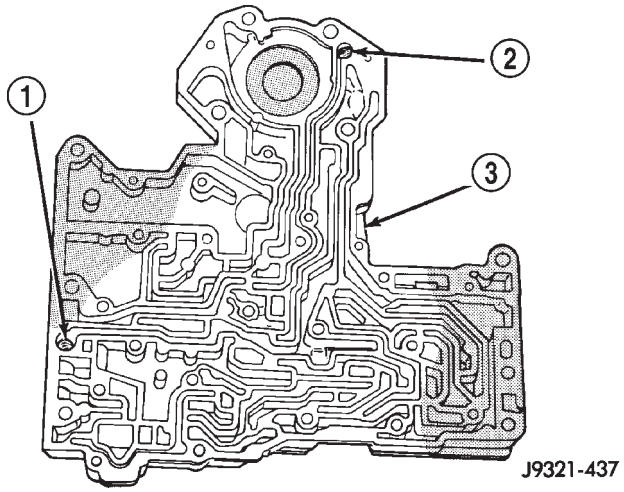

Fig. 95 Rear Clutch And Rear Servo Check Ball Locations

1 – REAR CLUTCH CHECK BALL
2 – REAR SERVO CHECK BALL
3 – TRANSFER PLATE

DISASSEMBLY AND ASSEMBLY (Continued)

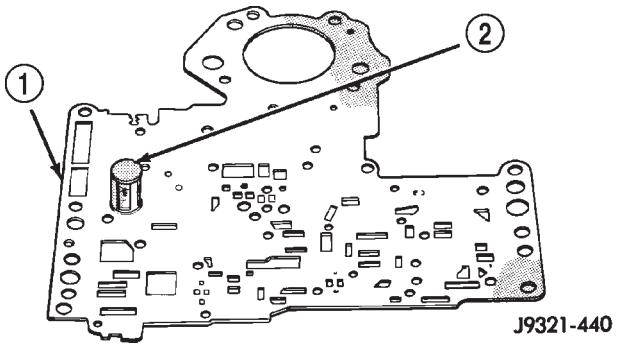

Fig. 96 Separator Plate Filter Screen Installation

1 – UPPER HOUSING SEPARATOR PLATE
2 – FILTER SCREEN

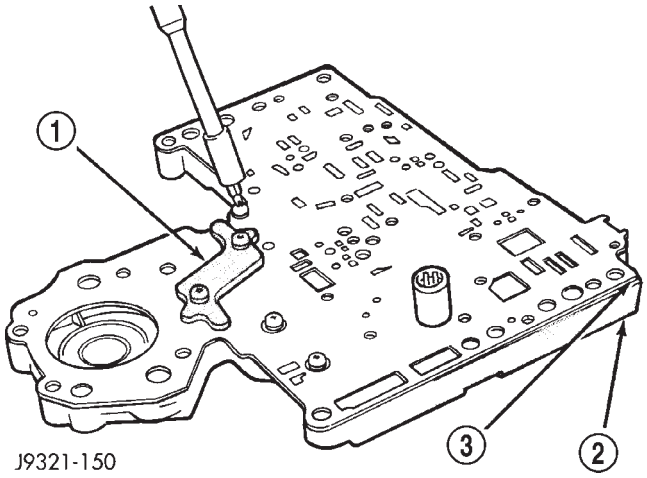

Fig. 97 Brace Plate

1 – BRACE
2 – TRANSFER PLATE
3 – SEPARATOR PLATE

UPPER AND LOWER HOUSING

(1) Position upper housing so internal passages and check ball seats are facing upward. Then install check balls in housing (Fig. 98). Seven check balls are used. The single large check ball is approximately 8.7 mm (11/32 in.) diameter. The single small check ball is approximately 4.8 mm (3/16 in.) in diameter. The remaining 6 check balls are approximately 6.3 mm (1/4 in.) in diameter.

(2) Position assembled transfer plate and upper housing separator plate on upper housing (Fig. 99). Be sure filter screen is seated in proper housing recess.

(3) Install the ECE check ball into the transfer plate (Fig. 85). The ECE check ball is approximately 4.8 mm (3/16 in.) in diameter.

(4) Position lower housing separator plate on transfer plate (Fig. 100).

(5) Install lower housing on assembled transfer plate and upper housing (Fig. 101).

(6) Install and start all valve body screws by hand except for the screws to hold the boost valve tube brace. Save those screws for later installation. Then tighten screws evenly to 4 N·m (35 in. lbs.) torque. Start at center and work out to sides when tightening screws (Fig. 101).

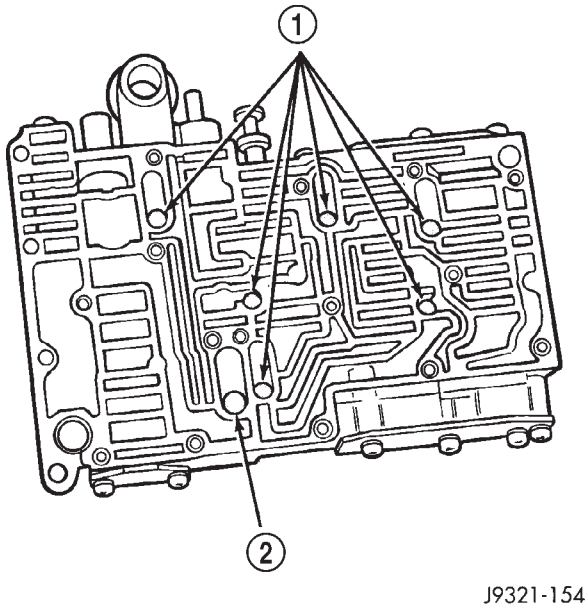

Fig. 98 Check Ball Locations In Upper Housing

1 – SMALL DIAMETER CHECK BALLS (6)
2 – LARGE DIAMETER CHECK BALL (1)

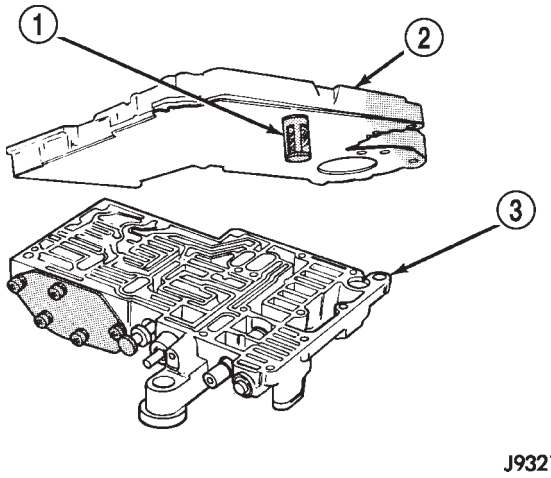

Fig. 99 Installing Transfer Plate On Upper Housing

1 – FILTER SCREEN
2 – TRANSFER PLATE/SEPARATOR PLATE ASSEMBLY
3 – UPPER HOUSING

DISASSEMBLY AND ASSEMBLY (Continued)

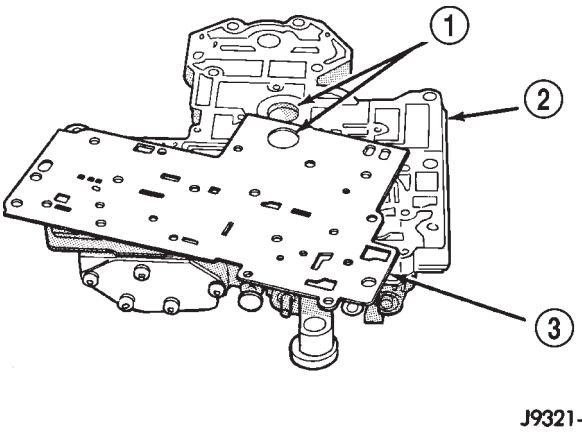

Fig. 100 Lower Housing Separator Plate

1 – BE SURE TO ALIGN BORES
2 – TRANSFER PLATE
3 – LOWER HOUSING (OVERDRIVE) SEPARATOR PLATE

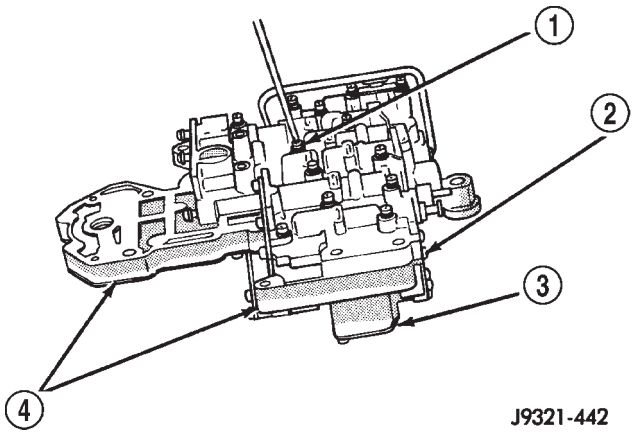

Fig. 101 Installing Lower Housing On Transfer Plate And Upper Housing

1 – VALVE BODY SCREWS (13)
2 – LOWER HOUSING
3 – UPPER HOUSING
4 – TRANSFER PLATE

UPPER HOUSING VALVE AND PLUG

Refer to (Fig. 102), (Fig. 103) and (Fig. 104) to perform the following steps.

(1) Lubricate valves, plugs, springs with clean transmission fluid.

(2) Assemble regulator valve line pressure plug, sleeve, throttle plug and spring. Insert assembly in upper housing and install cover plate. Tighten cover plate screws to 4 N·m (35 in. lbs.) torque.

(3) Install 1-2 and 2-3 shift valves and springs.

(4) Install 1-2 shift control valve and spring.

(5) Install retainer, spring, limit valve, and 2-3 throttle plug from limit valve housing.

(6) Install limit valve housing and cover plate. Tighten screws to 4 N·m (35 in. lbs.).

(7) Install shuttle valve as follows:

(a) Insert plastic guides in shuttle valve secondary spring and install spring on end of valve.

(b) Install shuttle valve into housing.

(c) Hold shuttle valve in place.

(d) Compress secondary spring and install E-clip in groove at end of shuttle valve.

(e) Verify that spring and E-clip are properly seated before proceeding.

(8) Install shuttle valve cover plate. Tighten cover plate screws to 4 N·m (35 in. lbs.) torque.

(9) Install 1-2 and 2-3 valve governor plugs in valve body.

(10) Install shuttle valve primary spring and throttle plug.

(11) Align and install governor plug cover. Tighten cover screws to 4 N·m (35 in. lbs.) torque.

DISASSEMBLY AND ASSEMBLY (Continued)

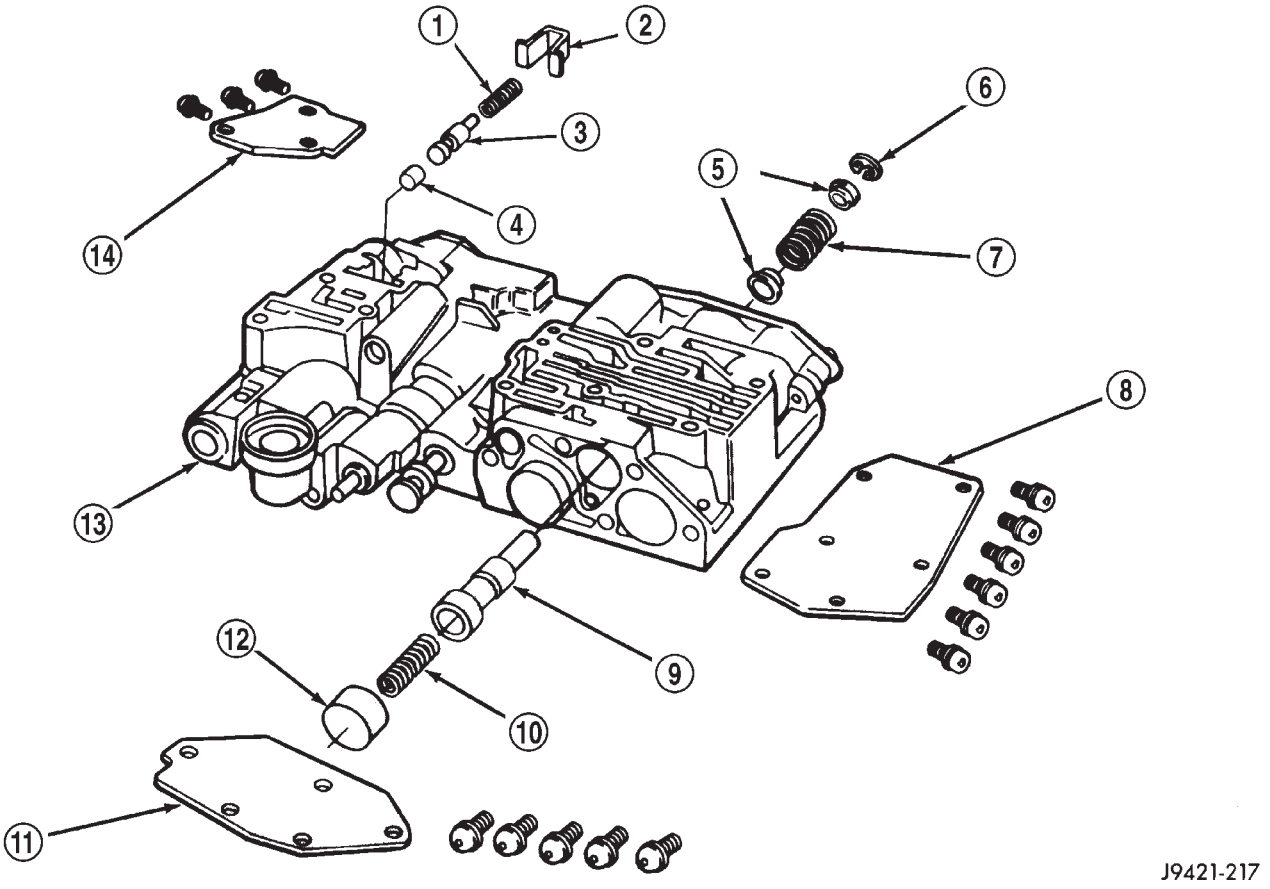

Fig. 102 Shuttle And Boost Valve Components

1 – SPRING
2 – RETAINER
3 – BOOST VALVE
4 – BOOST VALVE PLUG
5 – SPRING GUIDES
6 – E-CLIP
7 – SHUTTLE VALVE SECONDARY SPRING
8 – SHUTTLE VALVE COVER
9 – SHUTTLE VALVE
10 – SHUTTLE VALVE PRIMARY SPRING
11 – GOVERNOR PLUG COVER
12 – THROTTLE PLUG
13 – UPPER HOUSING
14 – BOOST VALVE COVER

DISASSEMBLY AND ASSEMBLY (Continued)

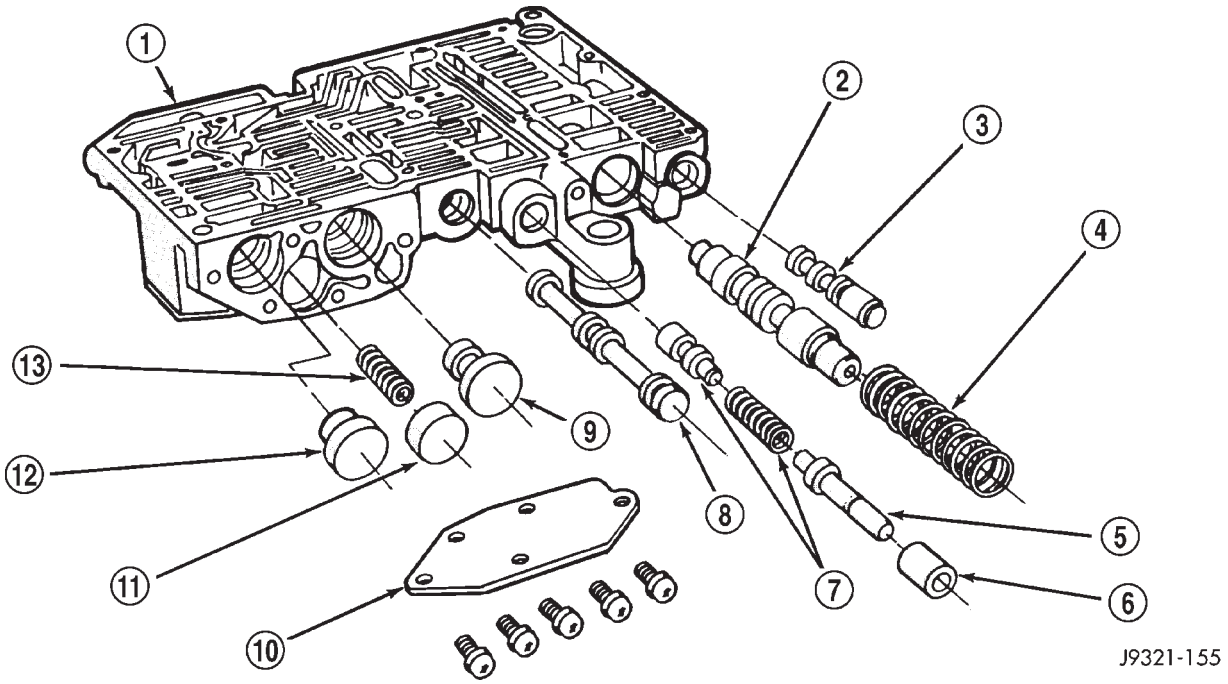

Fig. 103 Upper Housing Control Valve Locations

1 – UPPER HOUSING
2 – REGULATOR VALVE
3 – SWITCH VALVE
4 – REGULATOR VALVE SPRING
5 – KICKDOWN VALVE
6 – KICKDOWN DETENT
7 – THROTTLE VALVE AND SPRING
8 – MANUAL VALVE
9 – 1–2 GOVERNOR PLUG
10 – GOVERNOR PLUG COVER
11 – THROTTLE PLUG
12 – 2–3 GOVERNOR PLUG
13 – SHUTTLE VALVE PRIMARY SPRING

DISASSEMBLY AND ASSEMBLY (Continued)

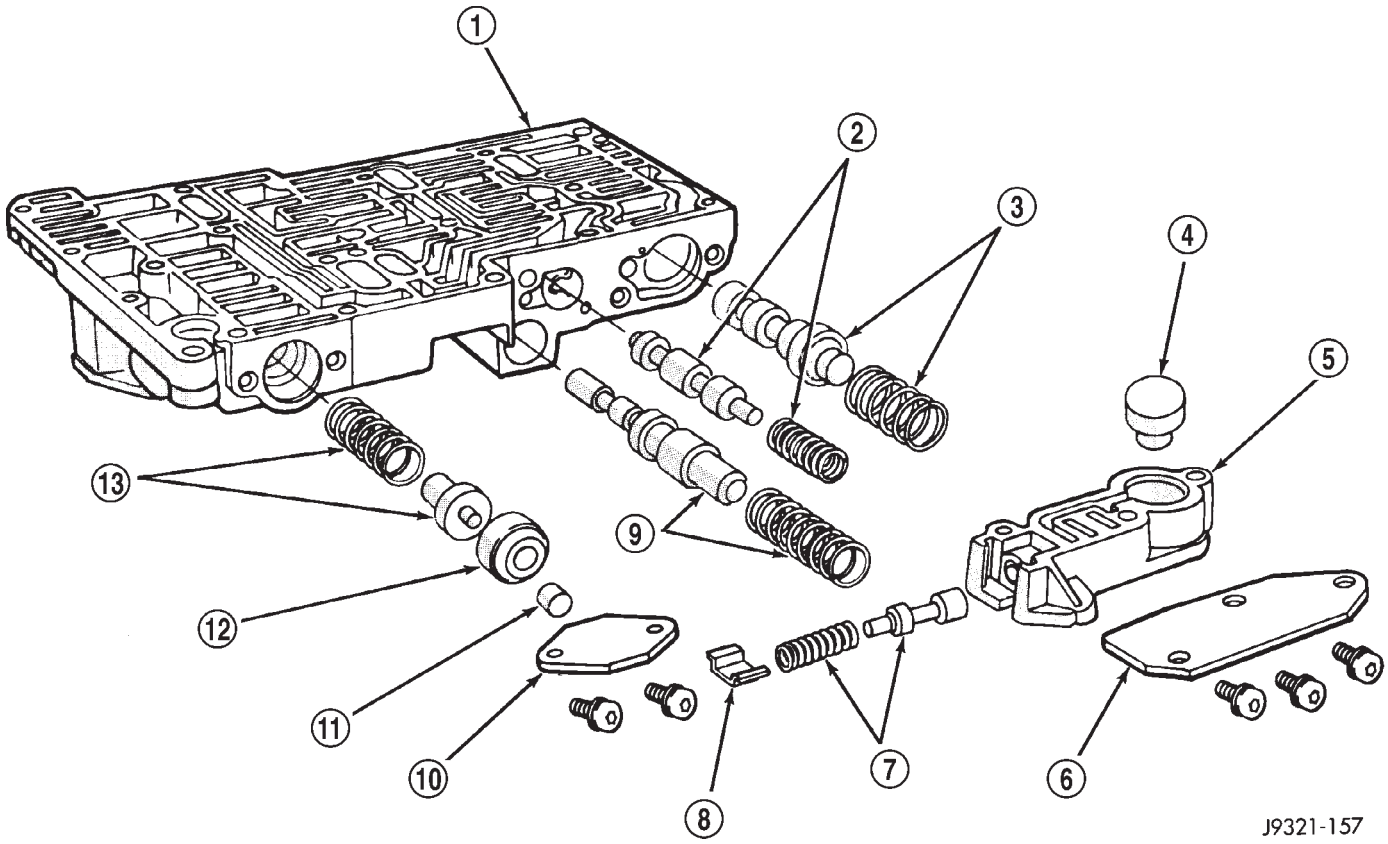

Fig. 104 Upper Housing Shift Valve And Pressure Plug Locations

1 – UPPER HOUSING
2 – 1–2 SHIFT VALVE AND SPRING
3 – 2–3 SHIFT VALVE AND SPRING
4 – 2–3 THROTTLE PLUG
5 – LIMIT VALVE HOUSING
6 – LIMIT VALVE COVER
7 – LIMIT VALVE AND SPRING
8 – RETAINER
9 – 1–2 SHIFT CONTROL VALVE AND SPRING
10 – PRESSURE PLUG COVER
11 – LINE PRESSURE PLUG
12 – PLUG SLEEVE
13 – THROTTLE PRESSURE SPRING AND PLUG

DISASSEMBLY AND ASSEMBLY (Continued)

BOOST VALVE TUBE AND BRACE

(1) Position valve body assembly so lower housing is facing upward (Fig. 105).

(2) Lubricate tube ends and housing ports with transmission fluid or petroleum jelly.

(3) Start tube in lower housing port first. Then swing tube downward and work opposite end of tube into upper housing port (Fig. 105).

(4) Insert and seat each end of tube in housings.

(5) Slide tube brace under tube and into alignment with valve body screw holes (Fig. 106).

(6) Install and finger tighten three screws that secure tube brace to valve body housings (Fig. 106).

(7) Bend tube brace tabs up and against tube to hold it in position (Fig. 107).

(8) Tighten all valve body housing screws to 4 N·m (35 in. lbs.) torque after tube and brace are installed. Tighten screws in diagonal pattern starting at center and working outward.

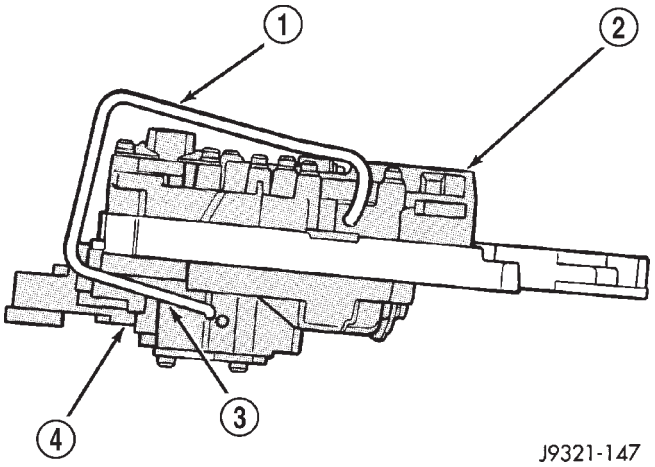

Fig. 105 Boost Valve Tube

1 – BOOST VALVE TUBE
2 – LOWER HOUSING
3 – DISENGAGE THIS END OF TUBE FIRST
4 – UPPER HOUSING

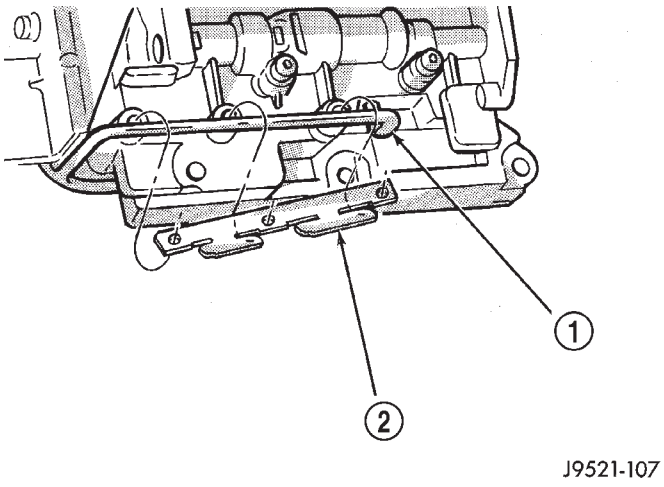

Fig. 106 Boost Valve Tube And Brace

1 – BOOST VALVE TUBE
2 – TUBE BRACE

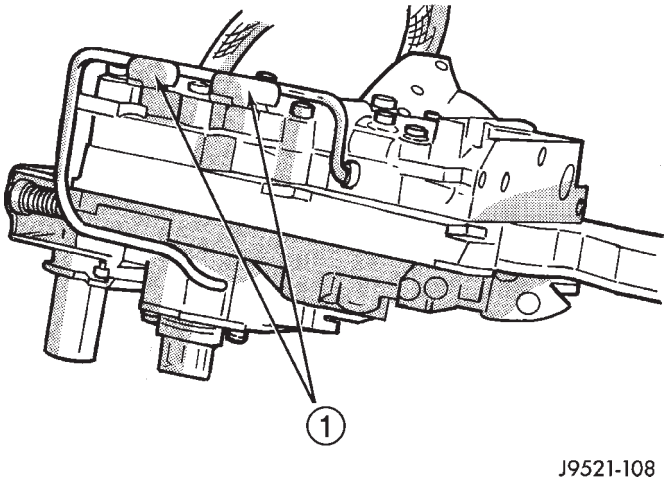

Fig. 107 Securing Boost Valve Tube With Brace Tabs

1 – BEND TABS UP AGAINST TUBE AS SHOWN

3-4 ACCUMULATOR

(1) Position converter clutch valve and 3-4 shift valve springs in housing (Fig. 108).

(2) Loosely attach accumulator housing with right-side screw (Fig. 108). Install only one screw at this time as accumulator must be free to pivot upward for ease of installation.

(3) Install 3-4 shift valve and spring.

(4) Install converter clutch timing valve and spring.

(5) Position plug on end of converter clutch valve spring. Then compress and hold springs and plug in place with fingers of one hand.

(6) Swing accumulator housing upward over valve springs and plug.

(7) Hold accumulator housing firmly in place and install remaining two attaching screws. Be sure springs and clutch valve plug are properly seated (Fig. 109). Tighten screws to 4 N·m (35 in. lbs.).

VALVE BODY FINAL

(1) Install boost valve, valve spring, retainer and cover plate. Tighten cover plate screws to 4 N·m (35 in. lbs.) torque.

(2) Insert manual lever detent spring in upper housing.

(3) Position detent ball on end of spring. Then hold detent ball and spring in detent housing with Retainer Tool 6583 (Fig. 110).

DISASSEMBLY AND ASSEMBLY (Continued)

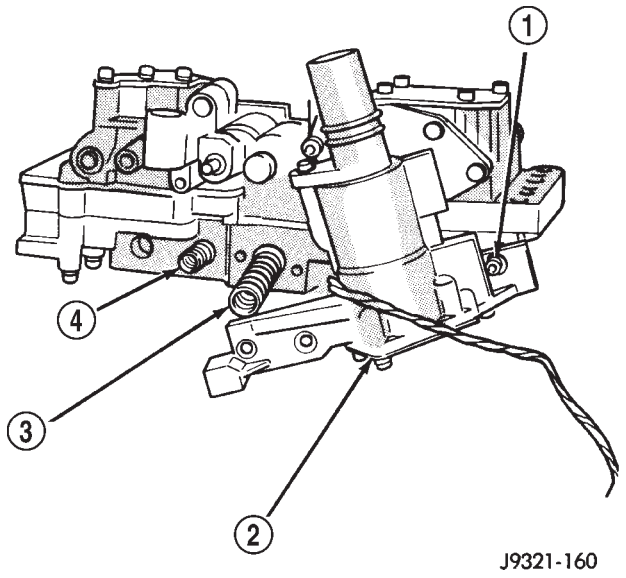

Fig. 108 Converter Clutch And 3-4 Shift Valve Springs

1 – RIGHT-SIDE SCREW
2 – 3–4 ACCUMULATOR
3 – 3–4 SHIFT VALVE SPRING
4 – CONVERTER CLUTCH VALVE SPRING

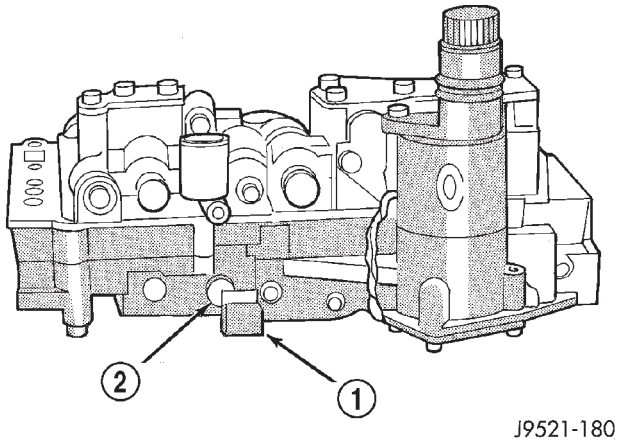

Fig. 109 Seating 3-4 Accumulator On Lower Housing

1 – ACCUMULATOR BOX
2 – CONVERTER CLUTCH VALVE PLUG

(4) Install throttle lever in upper housing. Then install manual lever over throttle lever and start manual lever into housing.

(5) Align manual lever with detent ball and manual valve. Hold throttle lever upward. Then press down on manual lever until fully seated. Remove detent ball retainer tool after lever is seated.

(6) Then install manual lever seal, washer and E-clip.

(7) Verify that throttle lever is aligned with end of kickdown valve stem and that manual lever arm is engaged in manual valve (Fig. 111).

(8) Position line pressure adjusting screw in adjusting screw bracket.

(9) Install spring on end of line pressure regulator valve.

(10) Install switch valve spring on tang at end of adjusting screw bracket.

(11) Install manual valve.

(12) Install throttle valve and spring.

(13) Install kickdown valve and detent.

(14) Install pressure regulator valve.

(15) Install switch valve.

(16) Position adjusting screw bracket on valve body. Align valve springs and press bracket into place. Install short, upper bracket screws first and long bottom screw last. Verify that valve springs and bracket are properly aligned. Then tighten all three bracket screws to 4 N·m (35 in. lbs.) torque.

(17) Lubricate solenoid case connector O-rings and shaft of manual lever with light coat of petroleum jelly.

(18) Obtain new fluid filter for valve body but do not install filter at this time.

(19) If line pressure and/or throttle pressure adjustment screw settings were not disturbed, continue with overhaul or reassembly. However, if adjustment screw settings **were** moved or changed, readjust as described in Valve Body Control Pressure Adjustment procedure.

(20) Attach solenoid case connector to 3-4 accumulator with shoulder-type screw. Connector has small locating tang that fits in dimple at top of accumulator housing (Fig. 112). Seat tang in dimple before tightening connector screw.

(21) Install solenoid assembly and gasket. Tighten solenoid attaching screws to 8 N·m (72 in. lbs.) torque.

(22) Verify that solenoid wire harness is properly routed (Fig. 113). **Solenoid harness must be clear of manual lever and park rod and not be pinched between accumulator housing and cover.**

GOVERNOR BODY, SENSOR AND SOLENOID

(1) Turn valve body assembly over so accumulator side of transfer plate is facing down.

(2) Install new O-rings on governor pressure solenoid and sensor.

(3) Lubricate solenoid and sensor O-rings with clean transmission fluid.

(4) Install governor pressure sensor in governor body. Then secure sensor with M-shaped retaining clip.

DISASSEMBLY AND ASSEMBLY (Continued)

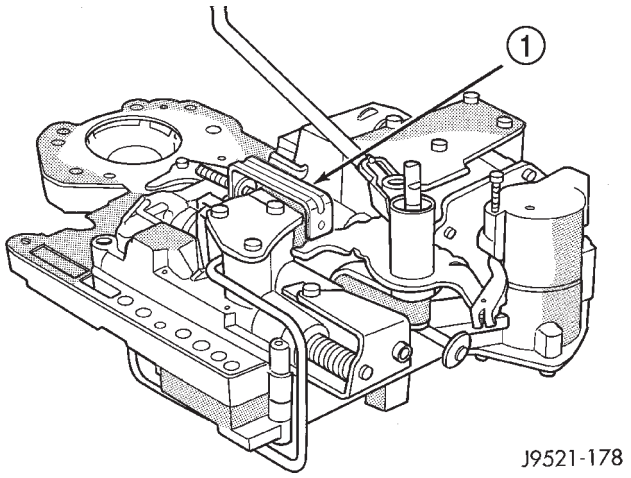

Fig. 110 Detent Ball Spring

1 – SPECIAL TOOL 6583 POSITIONED ON DETENT HOUSING

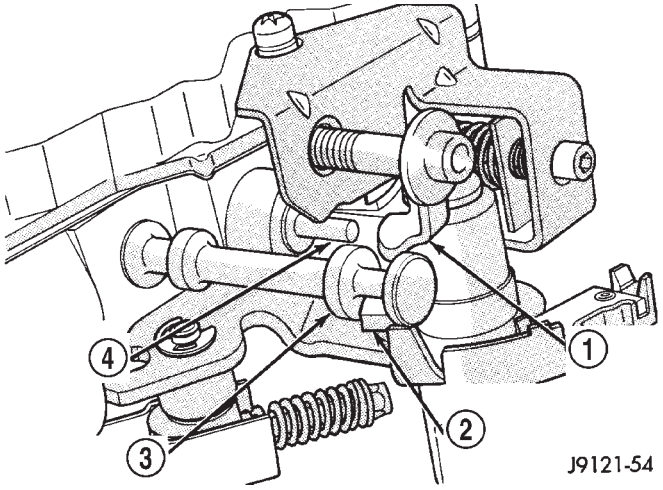

Fig. 111 Manual And Throttle Lever Alignment

1 – THROTTLE LEVER
2 – MANUAL LEVER VALVE ARM
3 – MANUAL VALVE
4 – KICKDOWN VALVE

(5) Install governor pressure solenoid in governor body. Push solenoid in until it snaps into place in body.

(6) Position governor body gasket on transfer plate.

(7) Install retainer plate on governor body and around solenoid. Be sure solenoid connector is positioned in retainer cutout.

(8) Align screw holes in governor body and transfer plate. Then install and tighten governor body screws to 4 N·m (35 in. lbs.) torque.

(9) Connect harness wires to governor pressure solenoid and governor pressure sensor.

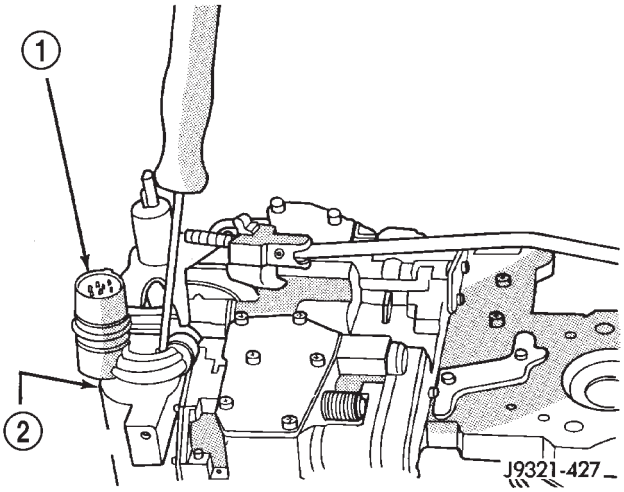

Fig. 112 Solenoid Harness Case Connector Shoulder Bolt

1 – SOLENOID HARNESS CASE CONNECTOR
2 – 3–4 ACCUMULATOR HOUSING

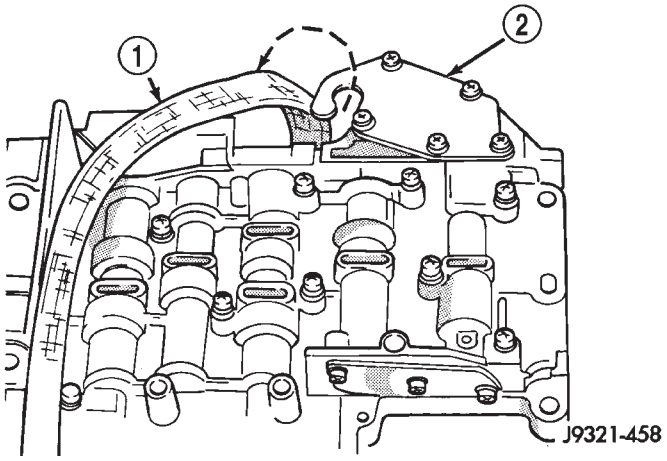

Fig. 113 Solenoid Harness Routing

1 – OVERDRIVE/CONVERTER SOLENOID WIRE HARNESS
2 – 3–4 ACCUMULATOR COVER PLATE

(10) Perform Line Pressure and Throttle Pressure adjustments. Refer to adjustment section of this group for proper procedures.

(11) Install fluid filter and pan.

(12) Lower vehicle.

(13) Fill transmission with recommended fluid and road test vehicle to verify repair.

DISASSEMBLY AND ASSEMBLY (Continued)

TRANSMISSION

DISASSEMBLY

(1) Clean transmission exterior with steam gun or with solvent. Wear eye protection during cleaning operations.

(2) Place transmission in a vertical position.

(3) Measure and record input shaft end play readings.

(4) Remove shift and throttle levers from valve body manual lever shaft.

(5) Place transmission in horizontal position.

(6) Remove transmission oil pan and gasket.

(7) Remove filter from valve body (Fig. 114). Keep filter screws separate from other valve body screws. Filter screws are longer and should be kept with filter.

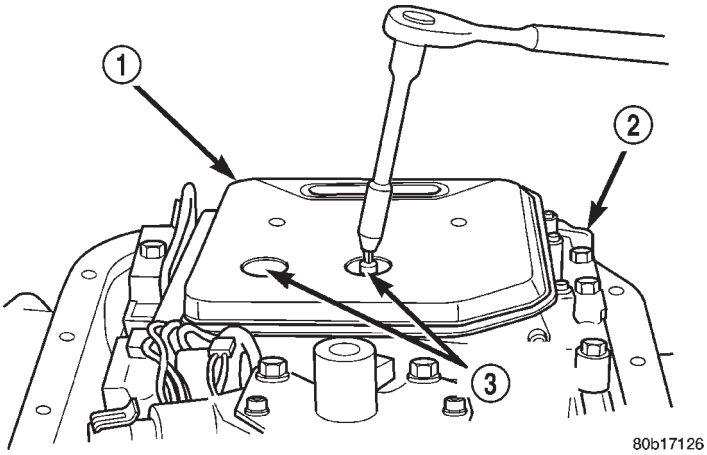

Fig. 114 Oil Filter Removal

1 – OIL FILTER
2 – VALVE BODY
3 – FILTER SCREWS (2)

(8) Remove park/neutral position switch.

(9) Remove hex head bolts attaching valve body to transmission case (Fig. 115). A total of 10 bolts are used. Note different bolt lengths for assembly reference.

(10) Remove valve body assembly. Push valve body harness connector out of case. Then work park rod and valve body out of case (Fig. 116).

(11) Remove accumulator piston and inner and outer springs (Fig. 117).

(12) Remove pump oil seal with suitable pry tool or slide-hammer mounted screw.

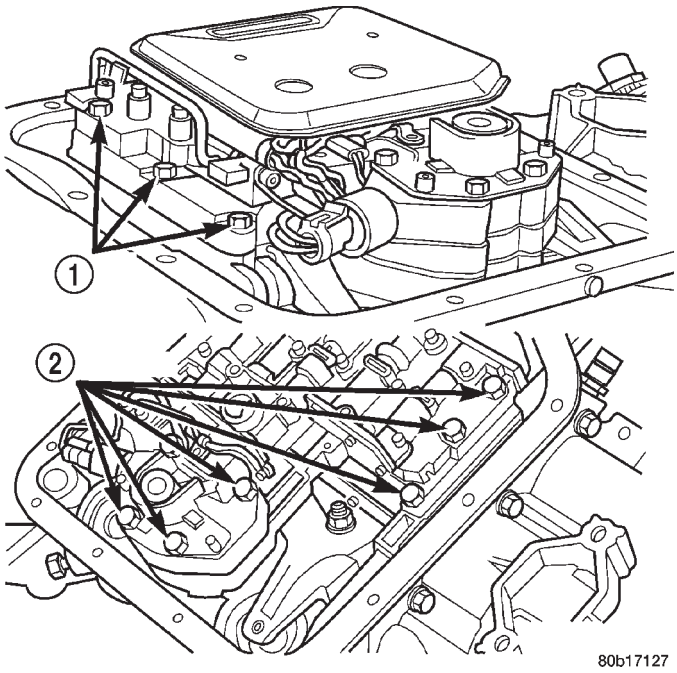

Fig. 115 Valve Body Bolt Locations

1 – VALVE BODY BOLTS
2 – VALVE BODY BOLTS

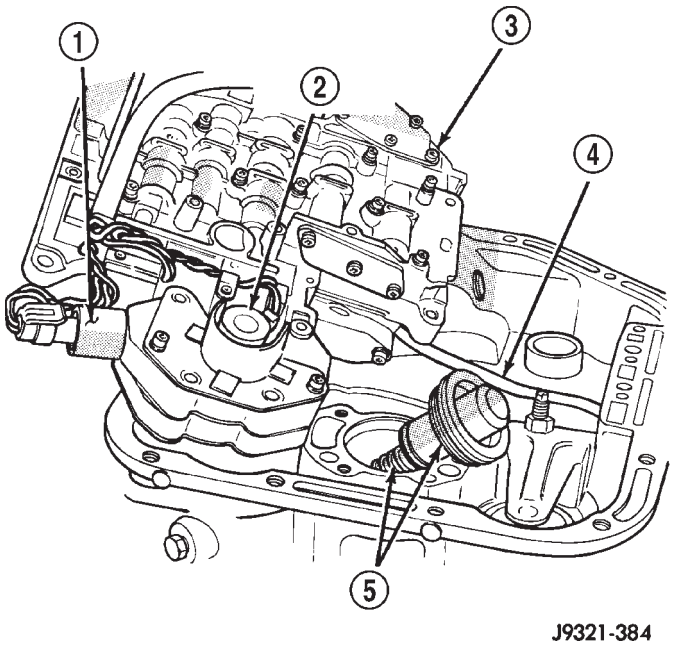

Fig. 116 Valve Body Removal

1 – GOVERNOR PRESSURE SENSOR
2 – GOVERNOR PRESSURE SOLENOID
3 – VALVE BODY
4 – PARK ROD
5 – ACCUMULATOR PISTON

DISASSEMBLY AND ASSEMBLY (Continued)

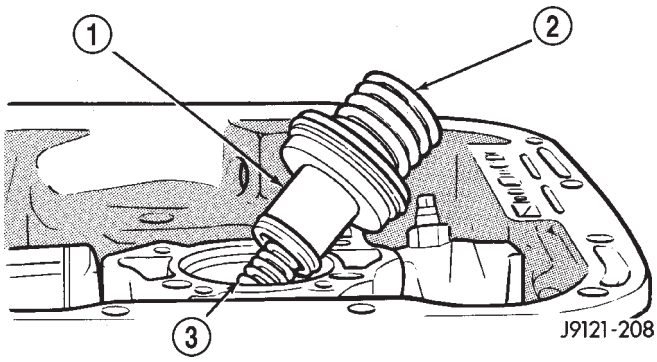

Fig. 117 Accumulator Piston And Springs

1 – ACCUMULATOR PISTON
2 – OUTER SPRING
3 – INNER SPRING

(13) Loosen front band adjusting screw locknut 4-5 turns. Then tighten band adjusting screw until band is tight around front clutch retainer. This prevents front/rear clutches from coming out with pump and possibly damaging clutch or pump components.

(14) Remove oil pump bolts.

(15) Thread bolts of Slide Hammer Tools C-3752 into threaded holes in pump body flange (Fig. 118).

(16) Bump slide hammer weights outward to remove pump and reaction shaft support assembly from case (Fig. 118).

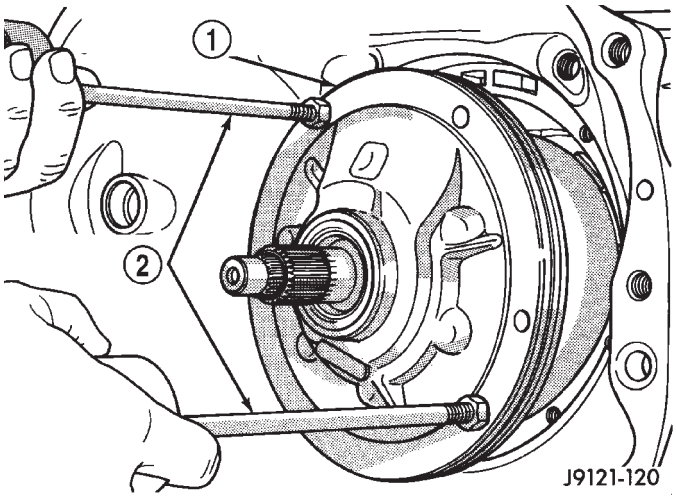

Fig. 118 Removing Oil Pump And Reaction Shaft Support Assembly

1 – OIL PUMP AND REACTION SHAFT SUPPORT ASSEMBLY
2 – SLIDE HAMMER TOOLS C-3752

(17) Loosen front band adjusting screw until band is completely loose.

(18) Squeeze front band together and remove band strut (Fig. 119).

(19) Remove front band lever (Fig. 120).

(20) Remove front band lever shaft plug, if necessary, from converter housing.

(21) Remove front band lever shaft.

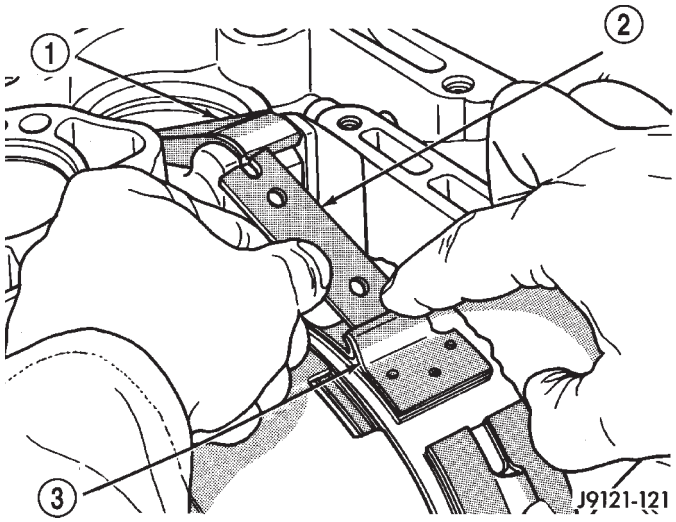

Fig. 119 Removing/Installing Front Band Strut

1 – BAND LEVER
2 – BAND STRUT
3 – FRONT BAND

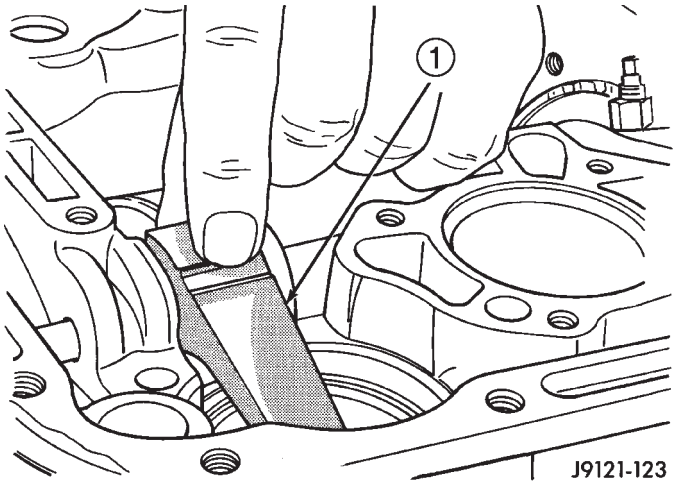

Fig. 120 Removing/Installing Front Band Lever

1 – FRONT BAND LEVER

DISASSEMBLY AND ASSEMBLY (Continued)

(22) Remove front and rear clutch units as assembly. Grasp input shaft, hold clutch units together and remove them from case (Fig. 121).

(23) Lift front clutch off rear clutch (Fig. 122). Set clutch units aside for overhaul.

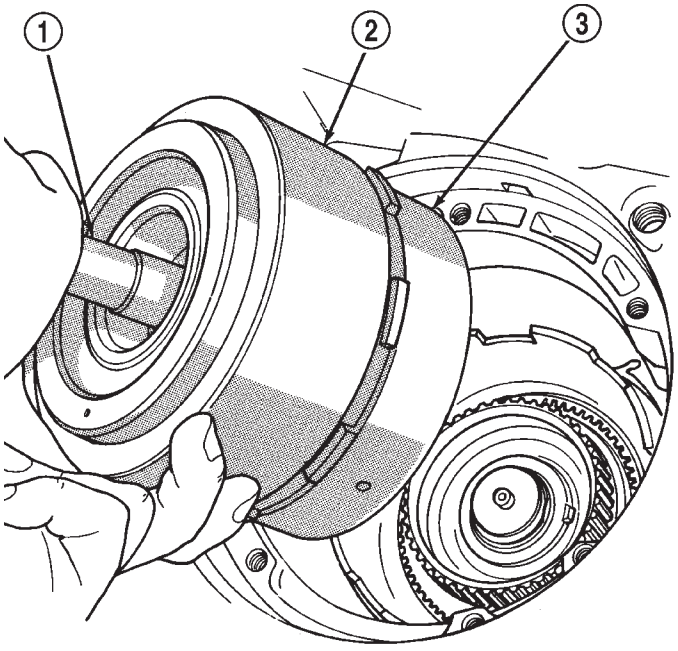

Fig. 121 Removing Front/Rear Clutch Assemblies

1 – INPUT SHAFT
2 – FRONT CLUTCH
3 – REAR CLUTCH

(24) Remove intermediate shaft thrust washer from front end of shaft or from rear clutch hub (Fig. 123).

(25) Remove output shaft thrust plate from intermediate shaft hub (Fig. 124).

(26) Slide front band off driving shell (Fig. 125) and remove band from case.

(27) Remove planetary geartrain as assembly (Fig. 126). Support geartrain with both hands during removal. Do not allow machined surfaces on intermediate shaft or overdrive piston retainer to become nicked or scratched.

(28) If overdrive unit is not to be serviced, install Alignment Shaft 6227-2 into the overdrive unit to prevent misalignment of the overdrive clutches during service of main transmission components.

(29) Loosen rear band adjusting screw 4-5 turns.

(30) Remove low-reverse drum snap ring (Fig. 127).

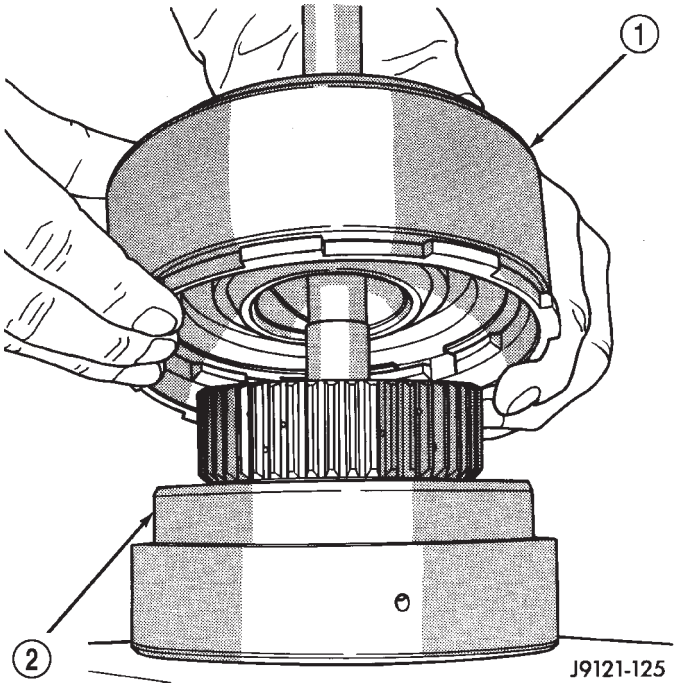

Fig. 122 Separating Front/Rear Clutch Assemblies

1 – FRONT CLUTCH
2 – REAR CLUTCH

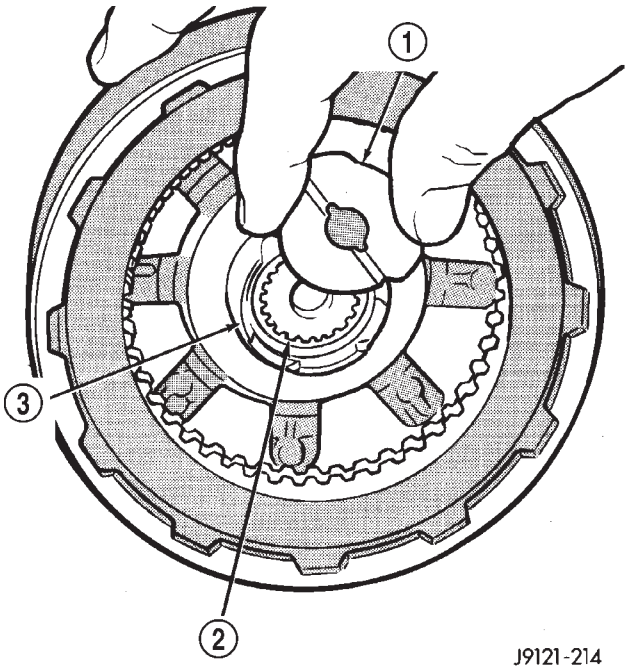

Fig. 123 Removing Intermediate Shaft Thrust Washer

1 – INTERMEDIATE SHAFT THRUST WASHER
2 – INPUT SHAFT
3 – REAR CLUTCH RETAINER HUB

DISASSEMBLY AND ASSEMBLY (Continued)

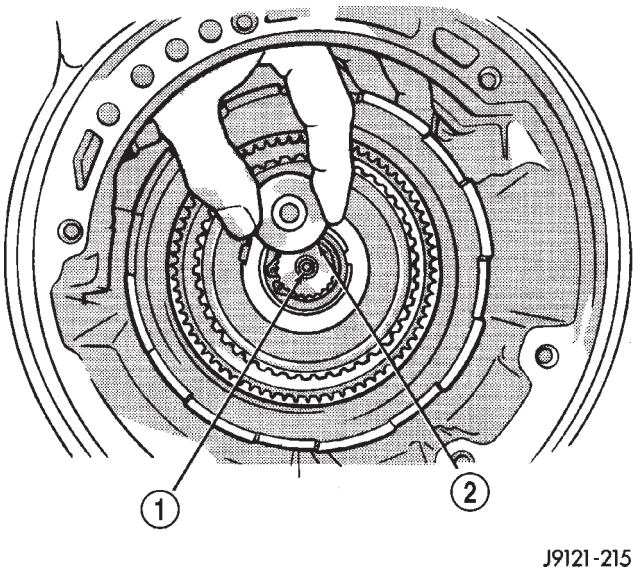

Fig. 124 Removing Intermediate Shaft Thrust Plate

1 – INTERMEDIATE SHAFT HUB
2 – INTERMEDIATE SHAFT THRUST PLATE

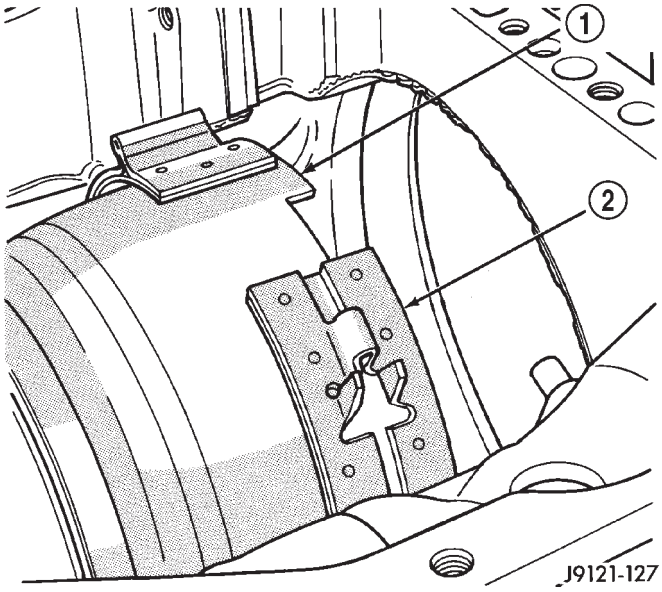

Fig. 125 Front Band Removal/Installation

1 – DRIVING SHELL
2 – FRONT BAND

(31) Remove low-reverse drum and reverse band.

(32) Remove overrunning clutch roller and spring assembly as a unit (Fig. 128).

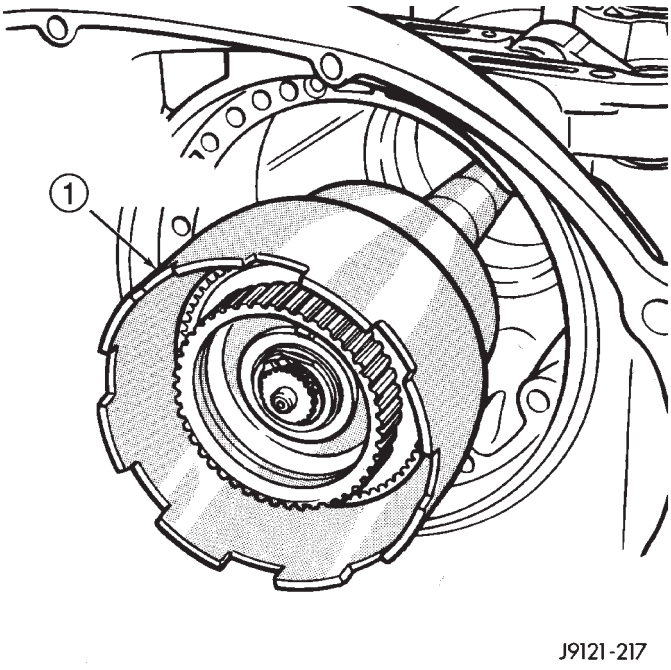

Fig. 126 Removing Planetary Geartrain And Intermediate Shaft Assembly

1 – PLANETARY GEARTRAIN AND INTERMEDIATE SHAFT ASSEMBLY

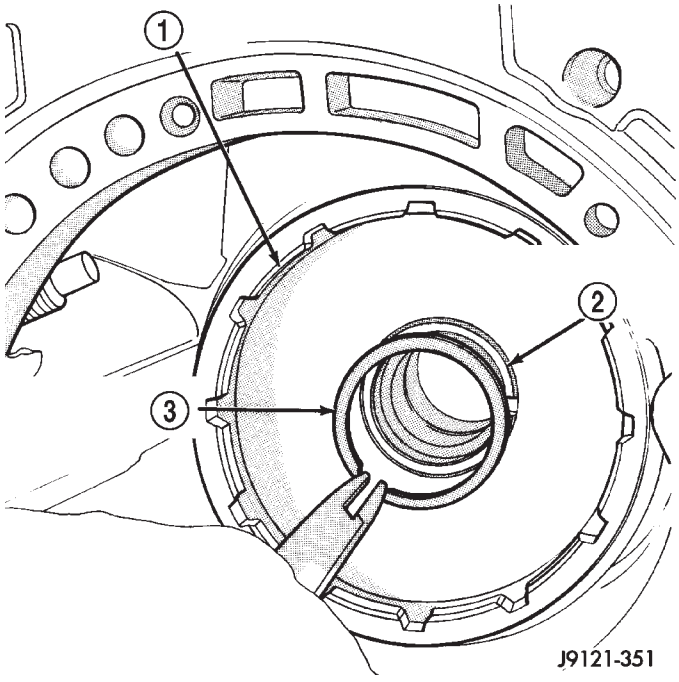

Fig. 127 Removing Low-Reverse Drum Snap Ring

1 – LOW-REVERSE DRUM
2 – HUB OF OVERDRIVE PISTON RETAINER
3 – LOW-REVERSE DRUM SNAP RING

DISASSEMBLY AND ASSEMBLY (Continued)

(33) Compress front servo rod guide about 1/8 inch with Valve Spring Compressor C-3422-B (Fig. 129).

(34) Remove front servo rod guide snap ring. **Exercise caution when removing snap ring. Servo bore can be scratched or nicked if care is not exercised.**

(35) Remove compressor tools and remove front servo rod guide, spring and servo piston.

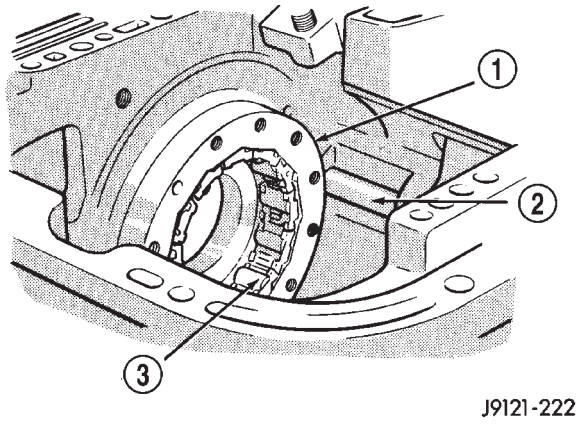

Fig. 128 Overrunning Clutch Assembly Removal

1 – OVERRUNNING CLUTCH CAM
2 – REAR BAND REACTION PIN
3 – OVERRUNNING CLUTCH ASSEMBLY

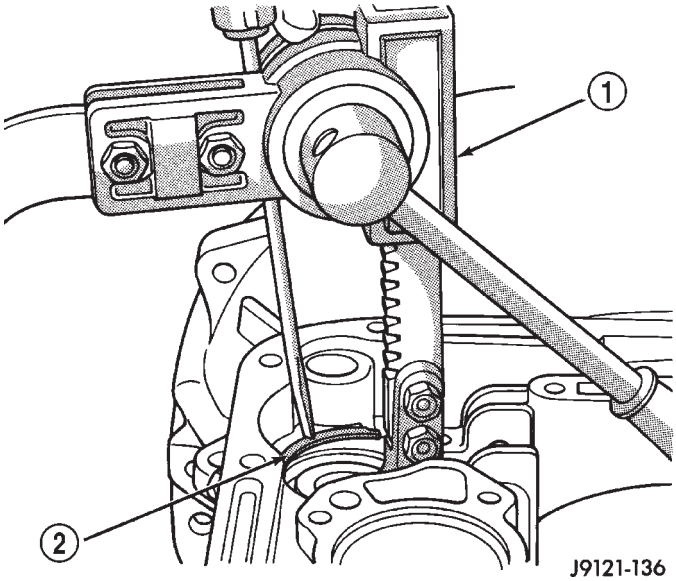

Fig. 129 Compressing Front Servo Rod Guide

1 – SPRING COMPRESSOR TOOL C-3422–B
2 – ROD GUIDE SNAP RING

(36) Compress rear servo spring retainer about 1/16 inch with Valve Spring Compressor C-3422-B (Fig. 130).

(37) Remove rear servo spring retainer snap ring. Then remove compressor tools and remove rear servo spring and piston.

(38) Inspect transmission components.

NOTE: TO SERVICE THE OVERRUNNING CLUTCH CAM OR OVERDRIVE PISTON RETAINER, REFER TO OVERRUNNING CLUTCH CAM SERVICE IN THIS SECTION.

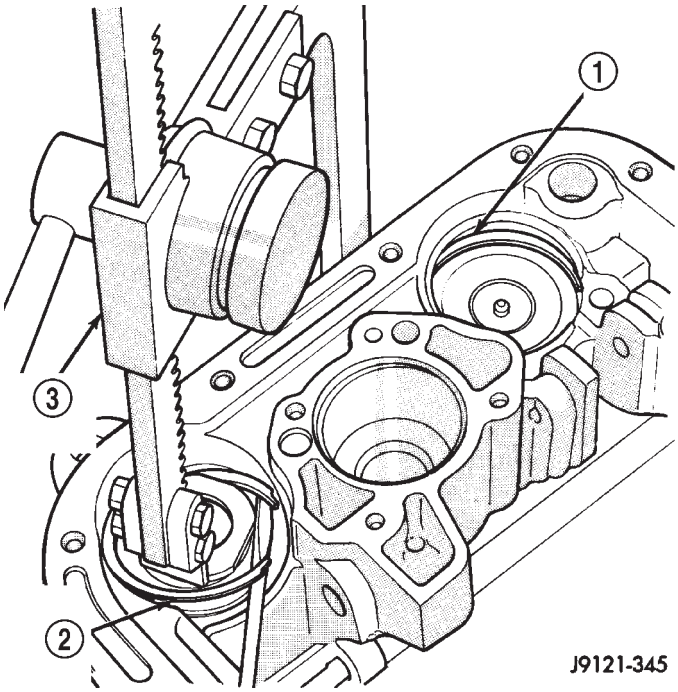

Fig. 130 Compressing Rear Servo Spring

1 – FRONT SERVO SNAP RING
2 – REAR SERVO SNAP RING
3 – SPECIAL TOOL

ASSEMBLY

Do not allow dirt, grease, or foreign material to enter the case or transmission components during assembly. Keep the transmission case and components clean. Also make sure the tools and workbench area used for assembly operations are equally clean.

Shop towels used for wiping off tools and hands must be made from **lint free** material. Lint will stick to transmission parts and could interfere with valve operation, or even restrict fluid passages.

DISASSEMBLY AND ASSEMBLY (Continued)

Lubricate the transmission components with Mopar® transmission fluid during reassembly. Use Mopar® Door Ease, or Ru-Glyde on seals and O-rings to ease installation.

Petroleum jelly can also be used to hold thrust washers, thrust plates and gaskets in position during assembly. However, **do not** use chassis grease, bearing grease, white grease, or similar lubricants on any transmission part. These types of lubricants can eventually block or restrict fluid passages and interfere with valve operation. Use petroleum jelly only.

Do not force parts into place. The transmission components and subassemblies are easily installed by hand when properly aligned.

If a part seems extremely difficult to install, it is either misaligned or incorrectly assembled. Also verify that thrust washers, thrust plates and seal rings are correctly positioned before assembly. These parts can interfere with proper assembly if mis-positioned.

The planetary geartrain, front/rear clutch assemblies and oil pump are all much easier to install when the transmission case is upright.

(1) Install rear servo piston, spring and retainer (Fig. 131). Install spring on top of servo piston and install retainer on top of spring.

(2) Install front servo piston assembly, servo spring and rod guide (Fig. 132).

(3) Compress front/rear servo springs with Valve Spring Compressor C-3422-B and install each servo snap ring (Fig. 133).

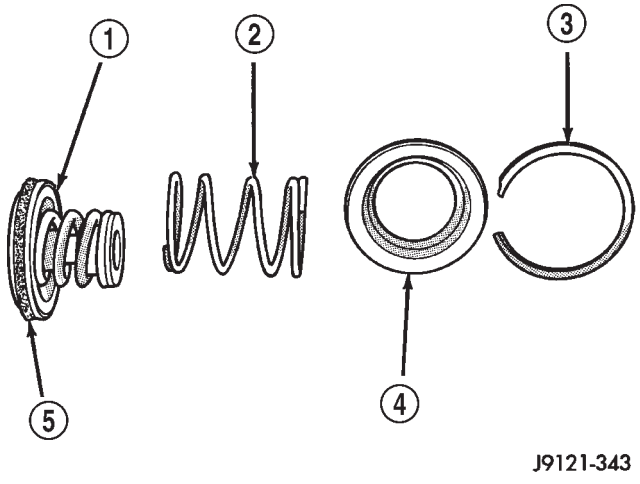

Fig. 131 Rear Servo Components

1 – SERVO PISTON
2 – PISTON SPRING
3 – SNAP RING
4 – RETAINER
5 – PISTON SEAL

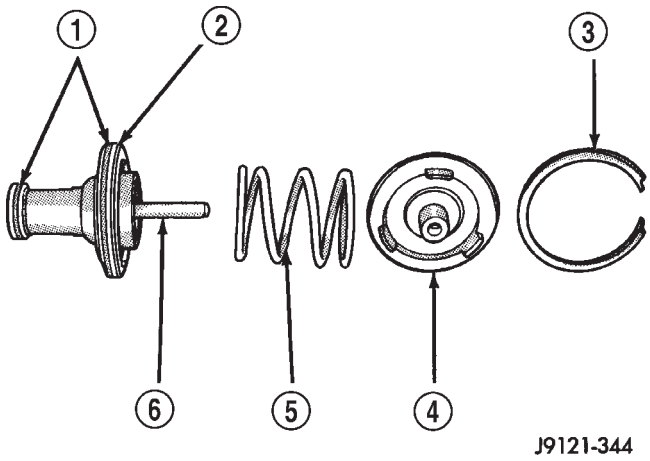

Fig. 132 Front Servo Components

1 – PISTON SEAL RINGS
2 – SERVO PISTON
3 – SNAP RING
4 – ROD GUIDE
5 – SPRING
6 – ROD

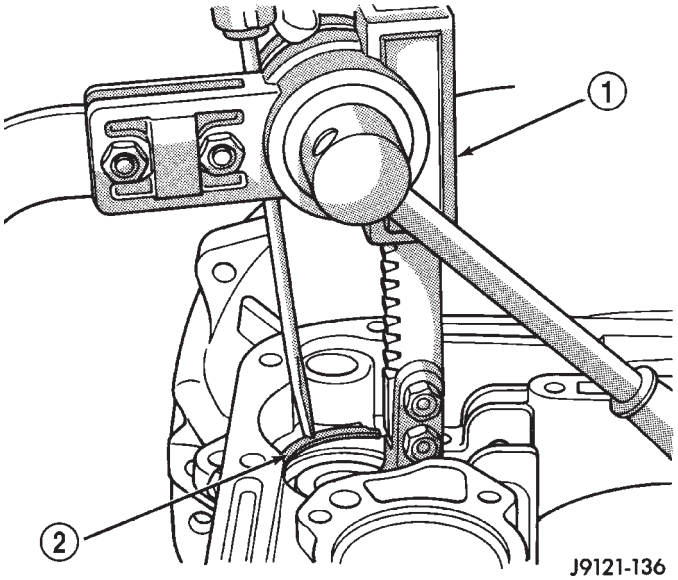

Fig. 133 Compressing Front/Rear Servo Springs

1 – SPRING COMPRESSOR TOOL C-3422–B
2 – ROD GUIDE SNAP RING

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Lubricate clutch cam rollers with transmission fluid.

(5) Install rear band in case (Fig. 134). Be sure twin lugs on band are seated against reaction pin.

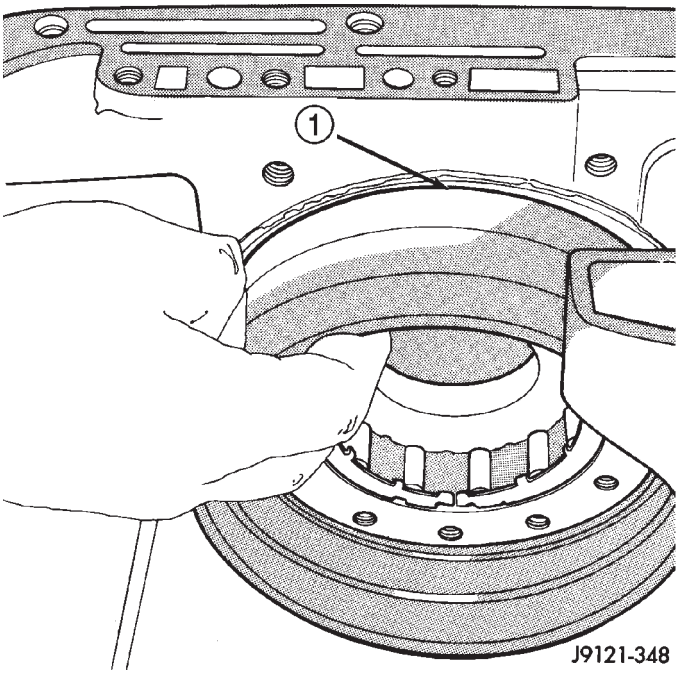

Fig. 134 Rear Band Installation

1 – REAR BAND

(6) Install low-reverse drum and check overrunning clutch operation as follows:

(a) Lubricate overrunning clutch race (on drum hub) with transmission fluid.

(b) Guide drum through rear band.

(c) Tilt drum slightly and start race (on drum hub) into overrunning clutch rollers.

(d) Press drum rearward and turn it in clockwise direction until drum seats in overrunning clutch (Fig. 135).

(e) Turn drum back and forth. **Drum should rotate freely in clockwise direction and lock in counterclockwise direction (as viewed from front of case).**

(7) Install snap ring that secures low-reverse drum to hub of overdrive piston retainer (Fig. 136).

(8) Install rear band lever and pivot pin (Fig. 137). Align lever with pin bores in case and push pivot pin into place.

(9) Install planetary geartrain assembly (Fig. 138).

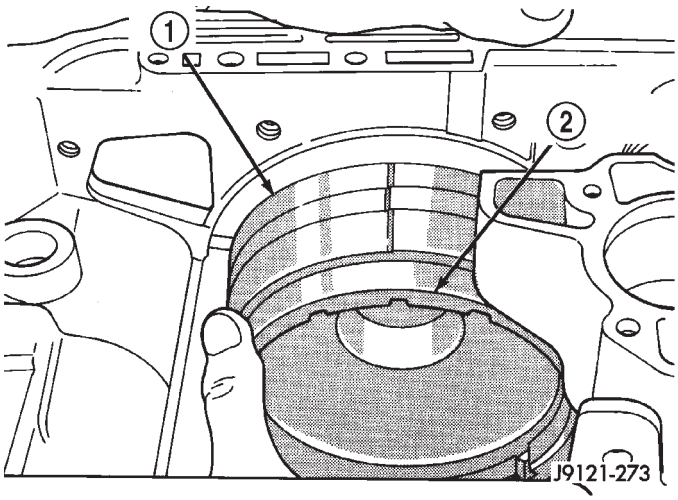

Fig. 135 Installing Low-Reverse Drum

1 – REAR BAND
2 – LOW-REVERSE DRUM

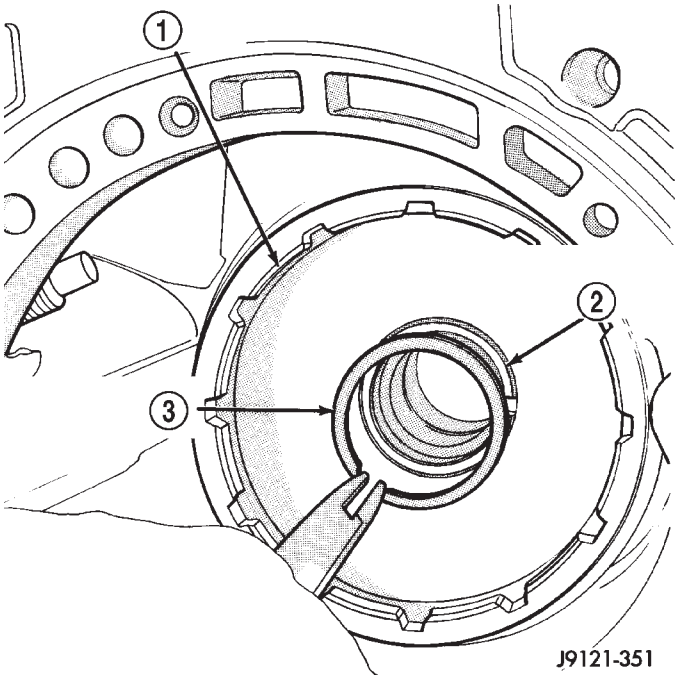

Fig. 136 Installing Low-Reverse Drum Retaining Snap Ring

1 – LOW-REVERSE DRUM
2 – HUB OF OVERDRIVE PISTON RETAINER
3 – LOW-REVERSE DRUM SNAP RING

DISASSEMBLY AND ASSEMBLY (Continued)

(10) Install thrust plate on intermediate shaft hub

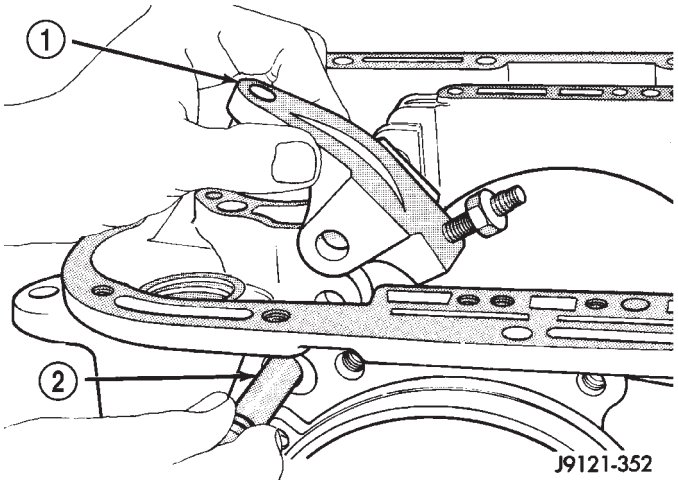

Fig. 137 Rear Band Lever And Pivot Pin Installation

1 – REAR BAND LEVER
2 – LEVER PIVOT PIN

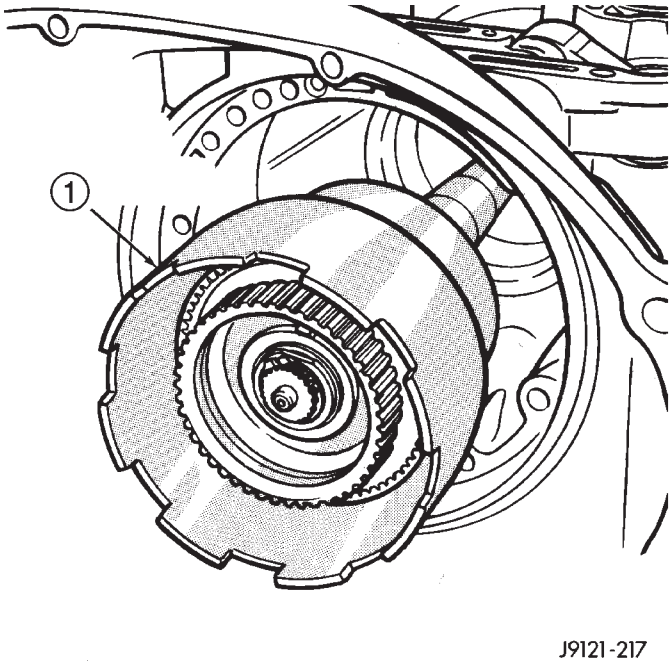

Fig. 138 Installing Planetary Geartrain

1 – PLANETARY GEARTRAIN AND INTERMEDIATE SHAFT ASSEMBLY

(Fig. 139). Use petroleum jelly to hold thrust plate in place.

(11) Check seal ring on rear clutch retainer hub and seal rings on input shaft (Fig. 140). Also verify that shaft seal rings are installed in sequence shown.

(12) Install rear clutch thrust washer (Fig. 141). Use additional petroleum jelly to hold washer in place if necessary.

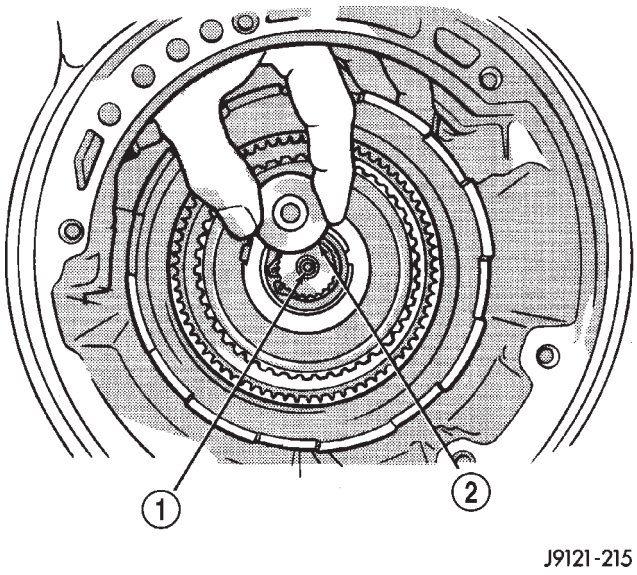

Fig. 139 Installing Intermediate Shaft Thrust Plate

1 – INTERMEDIATE SHAFT HUB
2 – INTERMEDIATE SHAFT THRUST PLATE

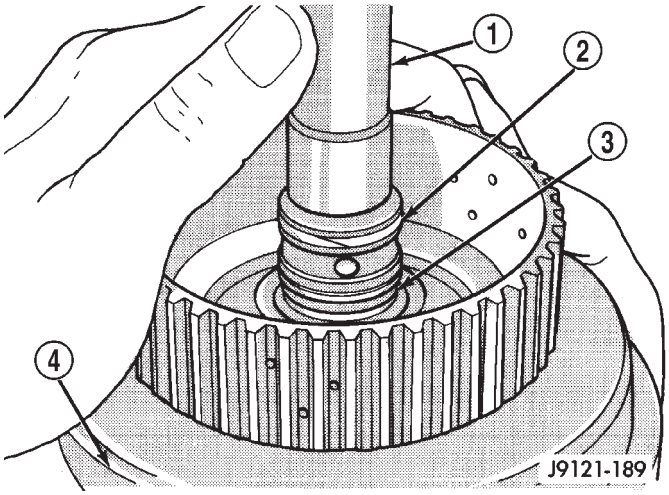

Fig. 140 Input Shaft Seal Ring Location

1 – INPUT SHAFT
2 – TEFLON SEAL RING
3 – METAL SEAL RING
4 – REAR CLUTCH RETAINER

DISASSEMBLY AND ASSEMBLY (Continued)

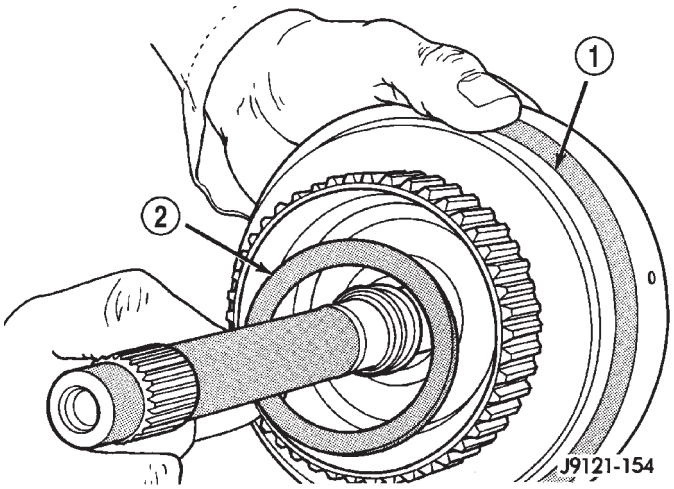

Fig. 141 Installing Rear Clutch Thrust Washer

1 – REAR CLUTCH RETAINER
2 – REAR CLUTCH THRUST WASHER (FIBER)

(13) Align clutch discs in front clutch and install front clutch on rear clutch (Fig. 142). Rotate front clutch retainer back and forth until completely seated on rear clutch retainer.

(14) Coat intermediate shaft thrust washer with petroleum jelly. Then install washer in rear clutch hub (Fig. 143). Use enough petroleum jelly to hold washer in place. **Be sure grooved side of washer faces rearward (toward output shaft) as shown. Also note that washer only fits one way in clutch hub.** Note thickness of this washer. It is a select fit part and is used to control transmission end play.

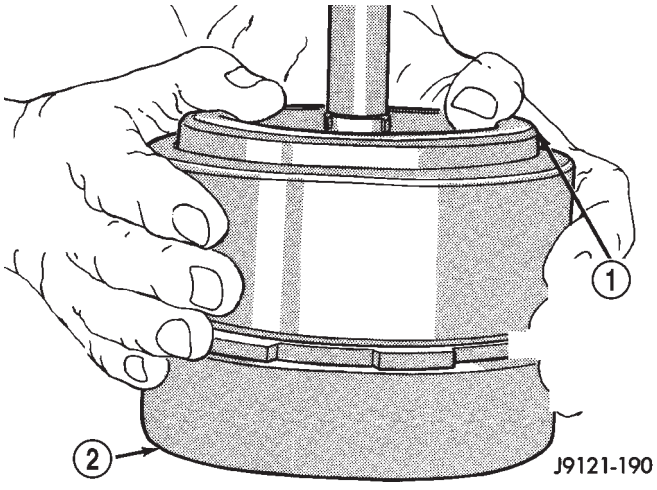

Fig. 142 Assembling Front And Rear Clutch Units

1 – TURN FRONT CLUTCH BACK & FORTH UNTIL SEATED
2 – REAR CLUTCH ASSEMBLY

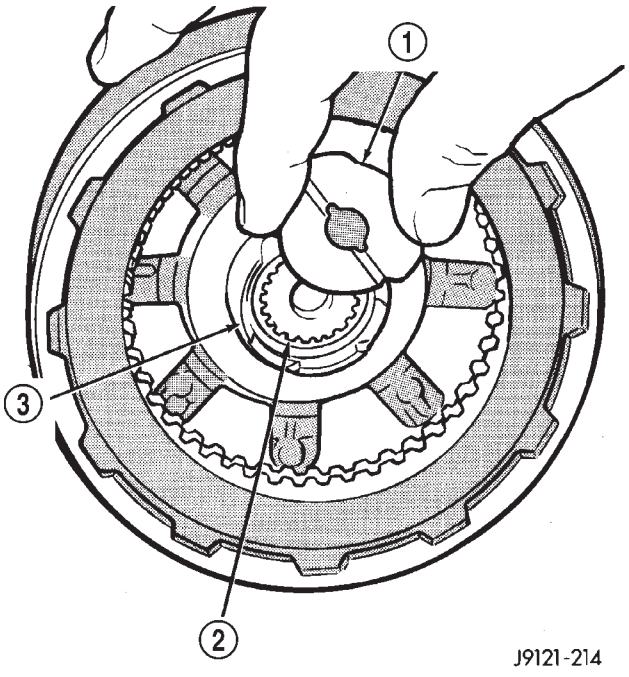

Fig. 143 Installing Intermediate Shaft Thrust Plate

1 – INTERMEDIATE SHAFT THRUST WASHER
2 – INPUT SHAFT
3 – REAR CLUTCH RETAINER HUB

(15) Align drive teeth on rear clutch discs with small screwdriver (Fig. 144). This makes installation on front planetary easier.

(16) Raise front end of transmission upward as far as possible and support case with wood blocks. Front/rear clutch and oil pump assemblies are easier to install if transmission is as close to upright position as possible.

(17) Slide front band into case.

(18) Install front and rear clutch units as assembly (Fig. 145). Align rear clutch with front annulus gear and install assembly in driving shell. **Be sure output shaft thrust washer and thrust plate are not displaced during installation.**

(19) Carefully work assembled clutches back and forth to engage and seat rear clutch discs on front annulus gear. Also be sure front clutch drive lugs are fully engaged in slots of driving shell after installation.

DISASSEMBLY AND ASSEMBLY (Continued)

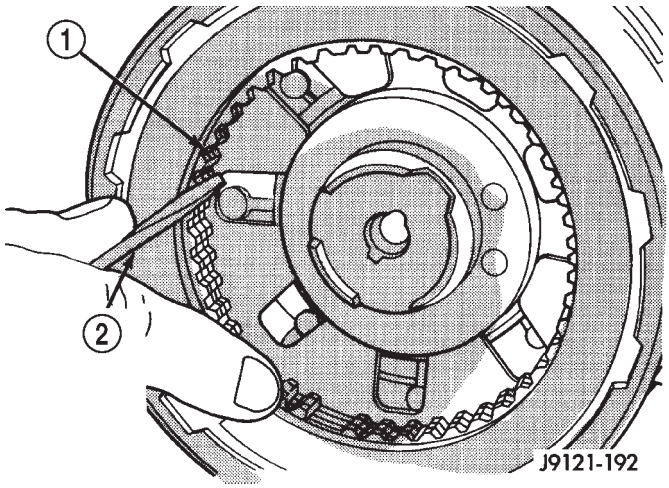

Fig. 144 Aligning Rear Clutch Disc Lugs

1 – REAR CLUTCH DISCS
2 – USE SMALL SCREWDRIVER TO ALIGN CLUTCH DISC TEETH

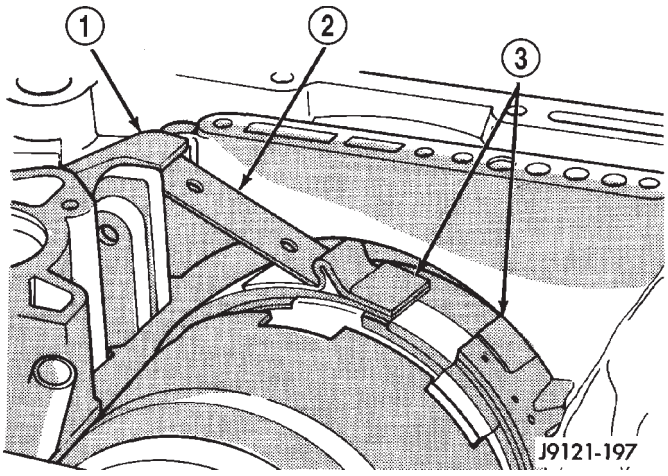

Fig. 146 Front Band Linkage Installation

1 – BAND LEVER
2 – BAND STRUT
3 – FRONT BAND

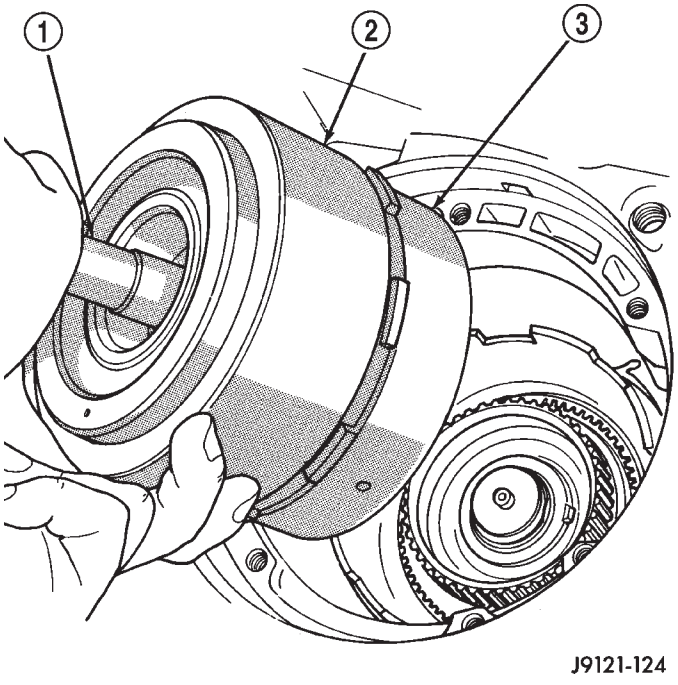

Fig. 145 Installing Front/Rear Clutch Assemblies

1 – INPUT SHAFT
2 – FRONT CLUTCH
3 – REAR CLUTCH

(20) Assemble front band strut.

(21) Install front band adjuster, strut and adjusting screw (Fig. 146).

(22) Tighten band adjusting screw until band just grips clutch retainer. Verify that front/rear clutches are still seated before continuing.

(23) Check seal rings on reaction shaft support hub. Verify that seal rings are hooked together and that front clutch thrust washer is properly positioned (Fig. 147). Use petroleum jelly to hold thrust washer in place if necessary.

(24) Lubricate oil pump body seal with petroleum jelly. Lubricate pump shaft seal lip with petroleum jelly.

(25) Thread two Pilot Stud Tools C-3288-B into bolt holes in oil pump bore flange (Fig. 148).

(26) Align and install oil pump gasket (Fig. 148).

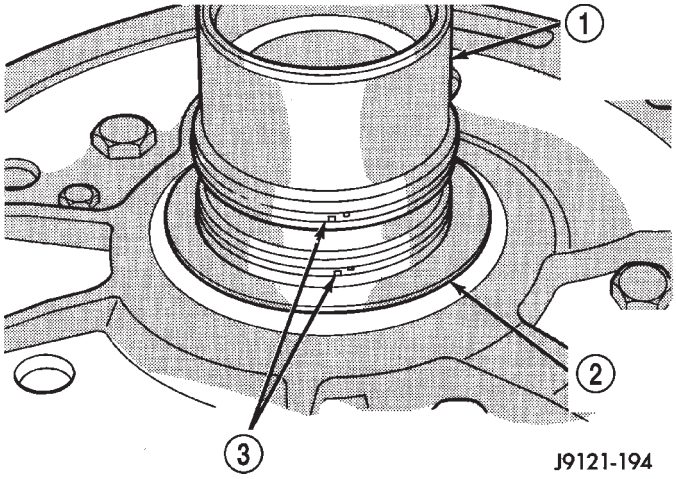

Fig. 147 Reaction Shaft Support Seal Rings And Front Clutch Thrust Washer

1 – REACTION SHAFT SUPPORT HUB
2 – FRONT CLUTCH THRUST WASHER
3 – SEAL RINGS

(27) Install oil pump (Fig. 149). Align and position pump on pilot studs. Slide pump down studs and work it into front clutch hub and case by hand. Then install 2 or 3 pump bolts to hold pump in place.

DISASSEMBLY AND ASSEMBLY (Continued)

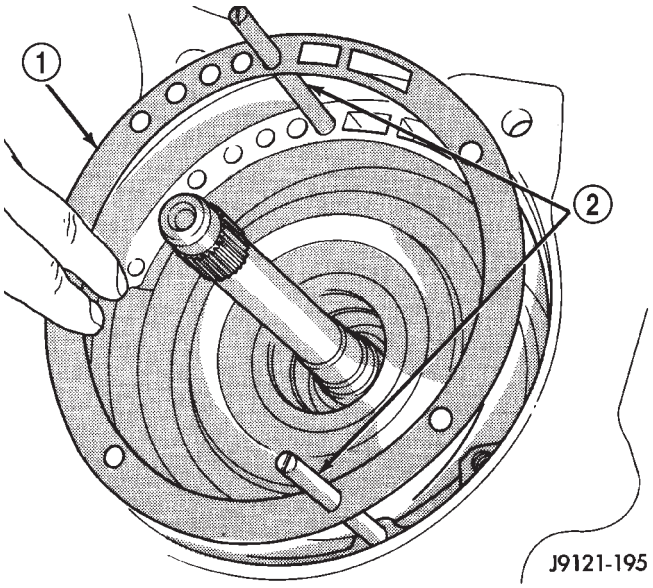

Fig. 148 Installing Pilot Studs And Oil Pump Gasket

1 – OIL PUMP GASKET
2 – PILOT STUD TOOLS C-3288–B

(28) Remove pilot stud tools and install remaining oil pump bolts. Tighten bolts alternately in diagonal pattern to 20 N·m (15 ft. lbs.).

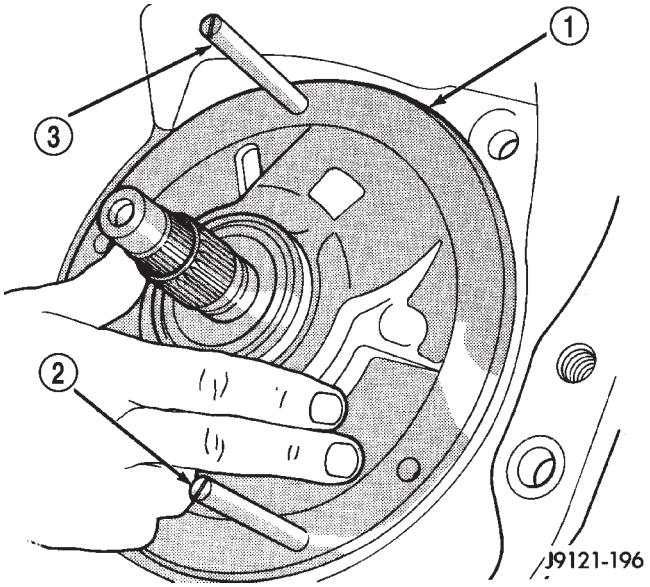

Fig. 149 Installing Oil Pump Assembly In Case

1 – OIL PUMP
2 – PILOT STUD TOOL
3 – PILOT STUD TOOL

(29) Measure input shaft end play (Fig. 150).

NOTE: If end play is incorrect, transmission is incorrectly assembled, or output shaft thrust washer and/or thrust plate are worn and need to be changed.

(a) Attach Adapter 8266–7 to Handle 8266–8.
(b) Attach dial indicator C-3339 to Handle 8266–8.
(c) Install the assembled tool onto the input shaft of the transmission and tighten the retaining screw on Adapter 8266–7 to secure it to the input shaft.
(d) Position the dial indicator plunger against a flat spot on the oil pump and zero the dial indicator.
(e) Move input shaft in and out and record reading. End play should be 0.56 - 2.31 mm (0.022 - 0.091 in.).

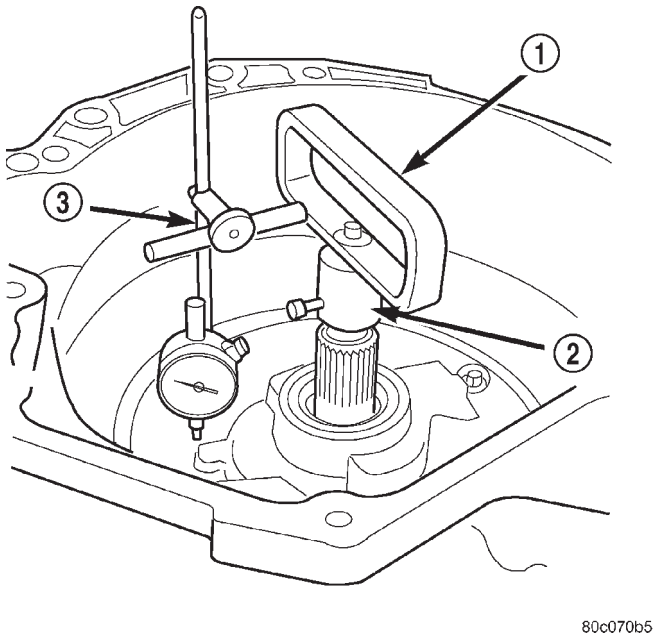

Fig. 150 Checking Input Shaft End Play

1 – TOOL 8266-B
2 – TOOL 8266-6
3 – TOOL C-3339

DISASSEMBLY AND ASSEMBLY (Continued)

(30) Install accumulator piston and inner and outer springs (Fig. 151).

(31) Verify that valve body solenoid harness is secured in 3-4 accumulator housing cover plate.

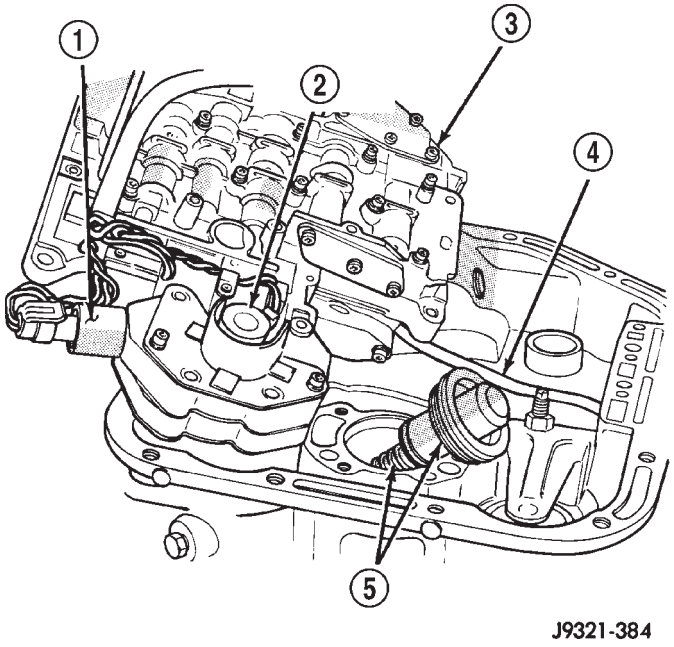

Fig. 151 Accumulator Piston And Springs

1 – GOVERNOR PRESSURE SENSOR
2 – GOVERNOR PRESSURE SOLENOID
3 – VALVE BODY
4 – PARK ROD
5 – ACCUMULATOR PISTON

(32) Install valve body as follows:

(a) Align and carefully insert park rod into pawl. Rod will make click noise as it enters pawl. Move rod slightly to check engagement.

(b) Align and seat valve body on case. Be sure manual lever shaft and overdrive connector are fully seated in case. Also be sure valve body wiring is not pinched or kinked.

(c) Install and start all valve body attaching bolts by hand. Then tighten bolts evenly, in a diagonal pattern to 12 N·m (105 in. lbs.) torque. **Do not overtighten valve body bolts. This could result in distortion and cross leakage after installation.**.

CAUTION: It is possible for the park rod to displace into a cavity just above the pawl sprag during installation. Make sure the rod is actually engaged in the pawl and has not displaced into the cavity.

(33) Install new filter on valve body. Tighten filter screws to 4 N·m (35 in. lbs.).

(34) Adjust front and rear bands.

(35) Install seal on park/neutral position switch (Fig. 152). Then install and tighten switch to 34 N·m (25 ft. lbs.).

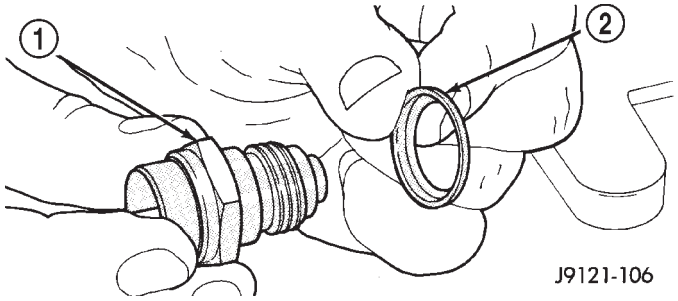

Fig. 152 Park/Neutral Position Switch Seal Position

1 – NEUTRAL SWITCH
2 – SWITCH SEAL

(36) Install magnet in oil pan. Magnet goes on small protrusion at corner of pan.

(37) Position new oil pan gasket on case and install oil pan. Tighten pan bolts to 17 N·m (13 ft. lbs.).

(38) Install new valve body manual shaft seal in case (Fig. 153). Lubricate seal lip and manual shaft with petroleum jelly. Start seal over shaft and into case. Seat seal with 15/16 inch, deep well socket.

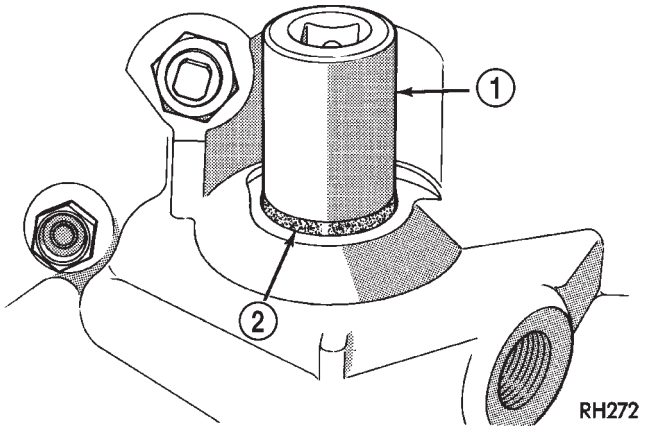

Fig. 153 Installing Manual Lever Shaft Seal

1 – 15/16'' SOCKET
2 – SEAL

(39) Install throttle valve and shift selector levers on valve body manual lever shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

OVERRUNNING CLUTCH CAM/OVERDRIVE PISTON RETAINER

DISASSEMBLY

NOTE: TO SERVICE THE OVERRUNNING CLUTCH CAM AND THE OVERDRIVE PISTON RETAINER, THE TRANSMISSION GEARTRAIN AND OVERDRIVE UNIT MUST BE REMOVED FROM THE TRANSMISSION.

(1) Remove the overdrive piston (Fig. 154).
(2) Remove the overdrive piston retainer bolts.
(3) Remove overdrive piston retainer.
(4) Remove case gasket.
(5) Mark the position of the overrunning clutch cam in the case (Fig. 155).
(6) Remove the overrunning clutch cam bolts.
(7) Remove the overrunning clutch cam.

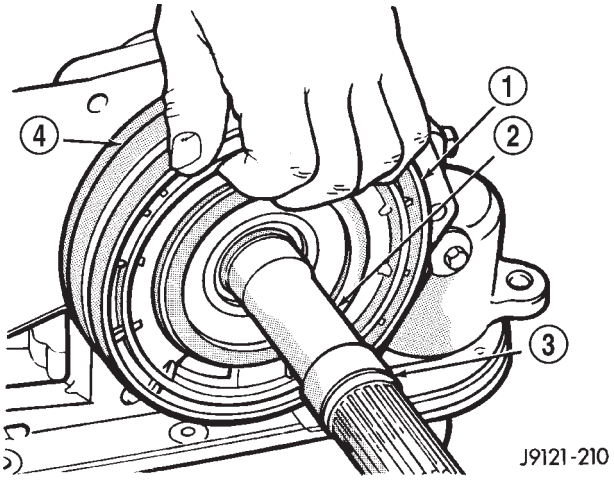

Fig. 154 Overdrive Piston Removal

1 – OVERDRIVE CLUTCH PISTON
2 – INTERMEDIATE SHAFT
3 – SELECTIVE SPACER
4 – PISTON RETAINER

ASSEMBLY

(1) Examine bolt holes in overrunning clutch cam. Note that one hole is **not threaded** (Fig. 156). This hole must align with blank area in clutch cam bolt circle (Fig. 157). Mark hole location on clutch cam and blank area in case with grease pencil, paint stripe, or scribe mark for assembly reference.

(2) Mark location of non-threaded hole in clutch cam and blank area in bolt circle with grease pencil.

(3) Align and install overrunning clutch and cam in case (Fig. 158). **Be sure cam is correctly installed. Bolt holes in cam are slightly countersunk on one side. Be sure this side of cam faces rearward (toward piston retainer).**

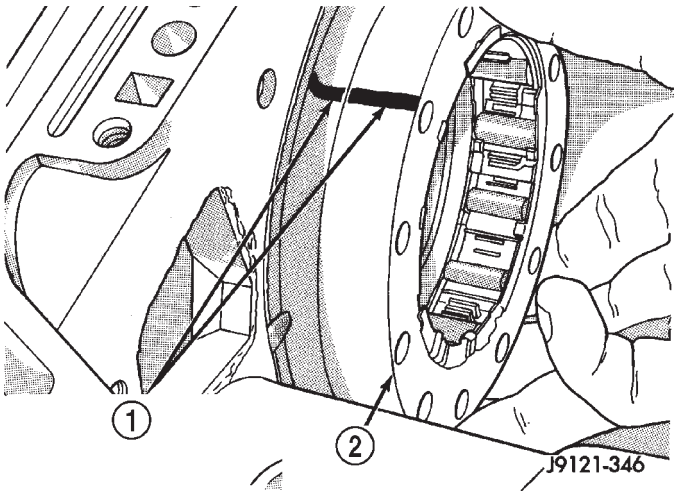

Fig. 155 Overrunning Clutch Cam Removal

1 – ALIGN MARKS IDENTIFYING NON-THREADED HOLE IN CAM AND CASE
2 – OVERRUNNING CLUTCH ASSEMBLY

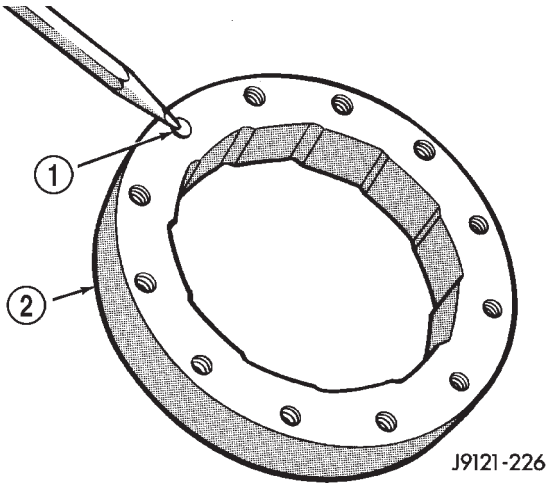

Fig. 156 Location Of Non-Threaded Hole In Clutch Cam

1 – NON-THREADED HOLE
2 – OVERRUNNING CLUTCH CAM

(4) Verify that non-threaded hole in clutch cam is properly aligned. Check alignment by threading a bolt into each bolt hole. Adjust clutch cam position if necessary.

(5) Install and tighten overrunning clutch cam bolts to 17 N·m (13 ft. lbs.) torque. Note that clutch cam bolts are shorter than piston retainer bolts.

(6) Install new gasket at rear of transmission case. Use petroleum jelly to hold gasket in place. Be sure to align governor feed holes in gasket with feed passages in case (Fig. 159). Also install gasket before overdrive piston retainer. Center hole in gasket is smaller than retainer and cannot be installed over retainer.

DISASSEMBLY AND ASSEMBLY (Continued)

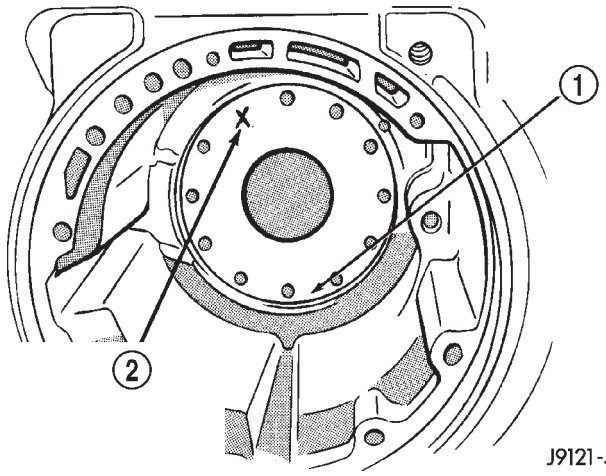

Fig. 157 Location Of Blank Area In Clutch Cam Bolt Circle

1 – OVERRUNNING CLUTCH CAM SEAT IN CASE
2 – NON-THREADED HOLE IN CLUTCH CAM ALIGNS HERE (BLANK AREA) OF SEAT

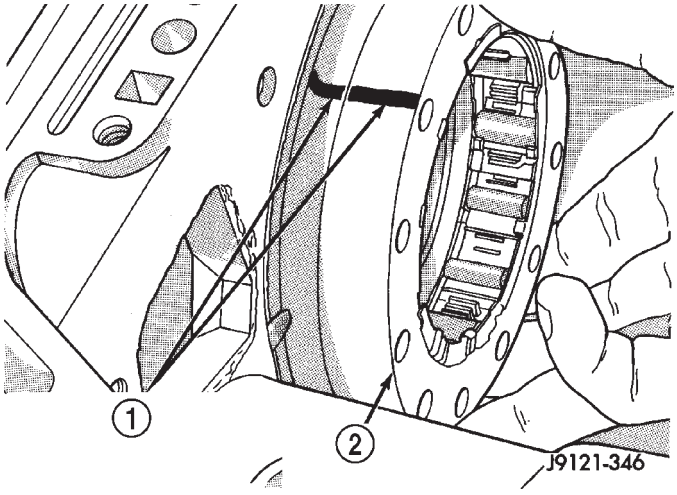

Fig. 158 Overrunning Clutch Installation

1 – ALIGN MARKS IDENTIFYING NON-THREADED HOLE IN CAM AND CASE
2 – OVERRUNNING CLUTCH ASSEMBLY

(7) Position overdrive piston retainer on transmission case and align bolt holes in retainer, gasket and case (Fig. 160). Then install and tighten retainer bolts to 17 N·m (13 ft. lbs.) torque.

(8) Install new seals on over drive piston.

(9) Stand transmission case upright on bellhousing.

(10) Position Guide Ring 8114-1 on outer edge of overdrive piston retainer.

(11) Position Seal Guide 8114-2 on inner edge of overdrive piston retainer.

(12) Install overdrive piston in overdrive piston retainer by: aligning locating lugs on overdrive piston to the two mating holes in retainer.

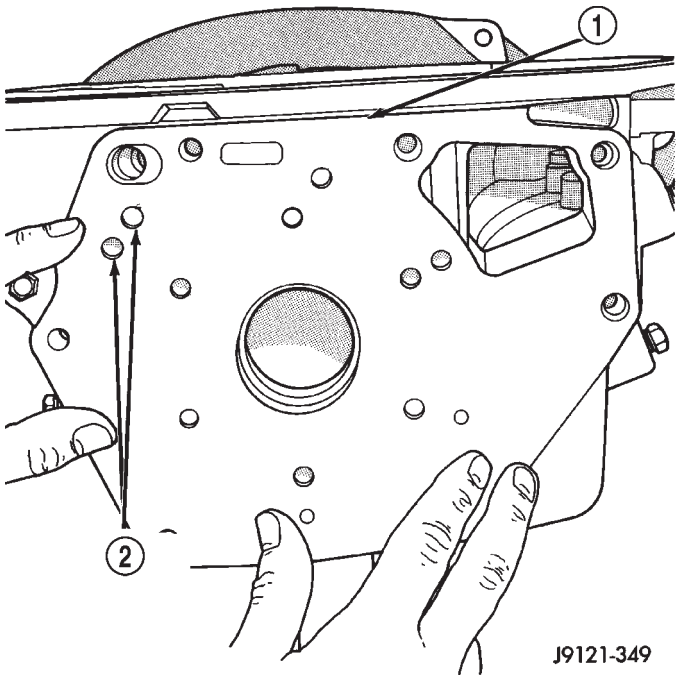

Fig. 159 Installing/Aligning Case Gasket

1 – CASE GASKET
2 – BE SURE GOVERNOR TUBE FEED HOLES IN CASE AND GASKET ARE ALIGNED

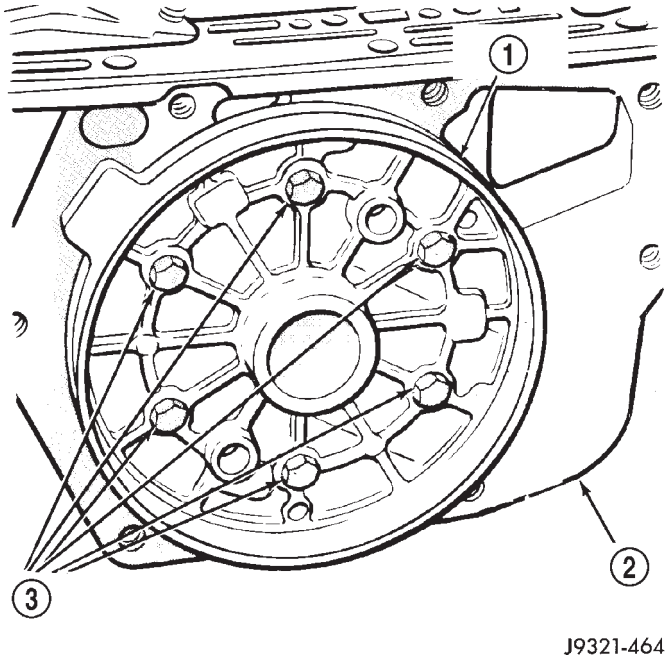

Fig. 160 Aligning Overdrive Piston Retainer

1 – PISTON RETAINER
2 – GASKET
3 – RETAINER BOLTS

(a) Aligning locating lugs on overdrive piston to the two mating holes in retainer.

DISASSEMBLY AND ASSEMBLY (Continued)

(b) Lubricate overdrive piston seals with Mopar® Door Ease, or equivalent.

(c) Install piston over Seal Guide 8114–2 and inside Guide Ring 8114–1.

(d) Push overdrive piston into position in retainer.

(e) Verify that the locating lugs entered the lug bores in the retainer.

NOTE: INSTALL THE REMAINING TRANSMISSION COMPONENTS AND OVERDRIVE UNIT.

FRONT SERVO PISTON

DISASSEMBLY

(1) Remove seal ring from rod guide (Fig. 161).

(2) Remove small snap ring from servo piston rod. Then remove piston rod, spring and washer from piston.

(3) Remove and discard servo component O-ring and seal rings.

ASSEMBLY

Clean and inspect front servo components.

(1) Lubricate new O-ring and seal rings with petroleum jelly and install them on piston, guide and rod.

(2) Install rod in piston. Install spring and washer on rod. Compress spring and install snap ring (Fig. 161).

(3) Set servo components aside for installation during transmission reassembly.

REAR SERVO PISTON

DISASSEMBLY

(1) Remove small snap ring and remove plug and spring from servo piston (Fig. 162).

(2) Remove and discard servo piston seal ring.

ASSEMBLY

(1) Lubricate piston and guide seals with petroleum jelly. Lubricate other servo parts with Mopar® ATF Plus 3, Type 7176, transmission fluid.

(2) Install new seal ring on servo piston.

(3) Assemble piston, plug, spring and new snap ring.

(4) Lubricate piston seal lip with petroleum jelly.

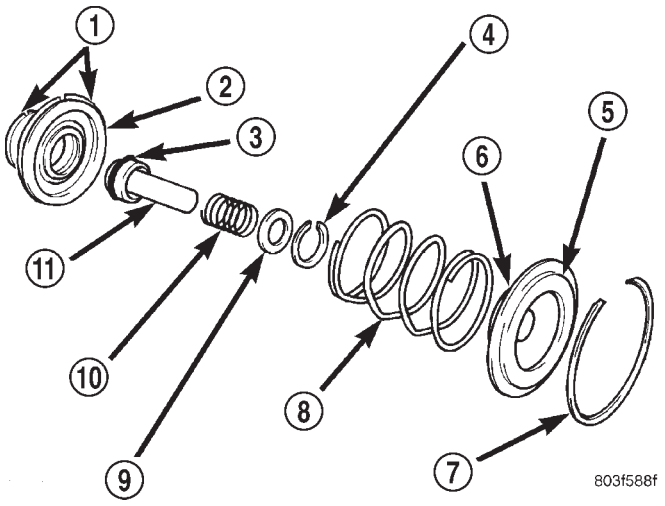

Fig. 161 Front Servo

1 – PISTON RINGS
2 – SERVO PISTON
3 – O-RING
4 – SNAP RING
5 – PISTON ROD GUIDE
6 – SEAL RING
7 – SNAP RING
8 – SERVO SPRING
9 – WASHER
10 – SPRING
11 – PISTON ROD

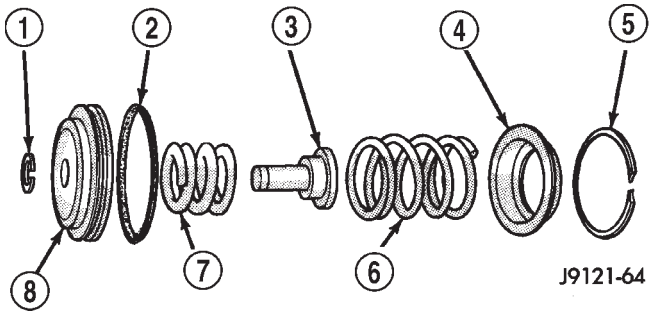

Fig. 162 Rear Servo Components

1 – SNAP RING
2 – PISTON SEAL
3 – PISTON PLUG
4 – SPRING RETAINER
5 – SNAP RING
6 – PISTON SPRING
7 – CUSHION SPRING
8 – PISTON

OIL PUMP AND REACTION SHAFT SUPPORT

DISASSEMBLY

(1) Remove seal ring from housing and reaction shaft support (Fig. 163).

(2) Mark pump housing and support assembly for alignment reference.

DISASSEMBLY AND ASSEMBLY (Continued)

(3) Remove bolts attaching pump body to support (Fig. 164).

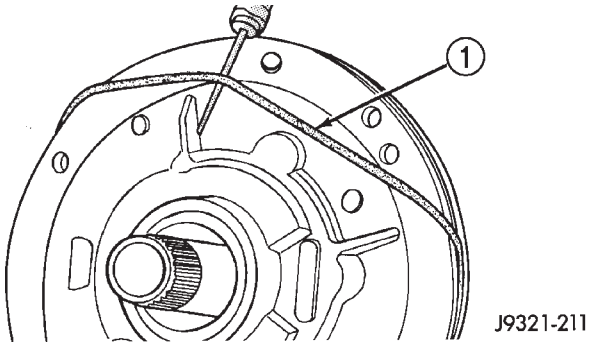

Fig. 163 Removing Pump Seal Ring

1 – PUMP HOUSING SEAL RING

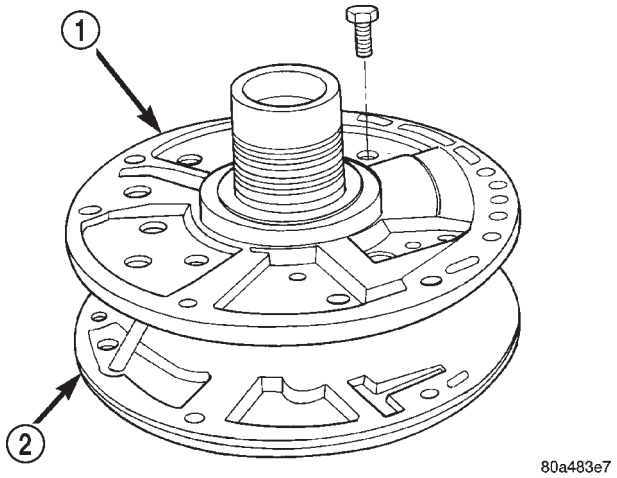

Fig. 164 Pump Support Bolts

1 – REACTION SHAFT SUPPORT
2 – PUMP

(4) Separate support from pump housing (Fig. 165).

(5) Remove inner and outer gears from reaction shaft support (Fig. 166).

(6) If pump seal was not removed during transmission disassembly, remove seal with punch and hammer.

(7) Remove front clutch thrust washer from support hub (Fig. 167).

OIL PUMP BUSHING REPLACEMENT

(1) Remove pump bushing with Tool Handle C-4171 and Bushing Remover SP-3551 from Tool Set C-3887-J (Fig. 168).

(2) Install new pump bushing with Tool Handle C-4171 and Bushing Installer SP-5117 (Fig. 168). Bushing should be flush with pump housing bore.

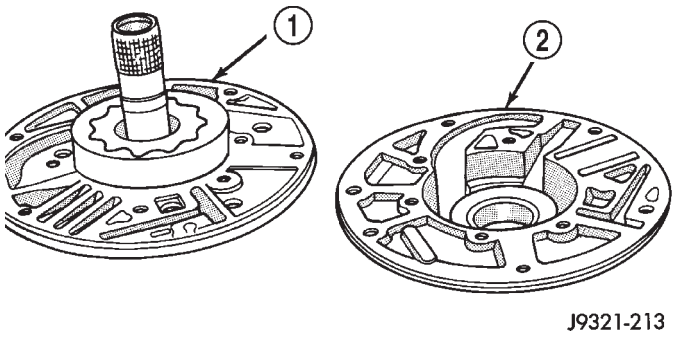

Fig. 165 Separating Pump Housing From Reaction Shaft Support

1 – REACTION SHAFT SUPPORT
2 – PUMP HOUSING

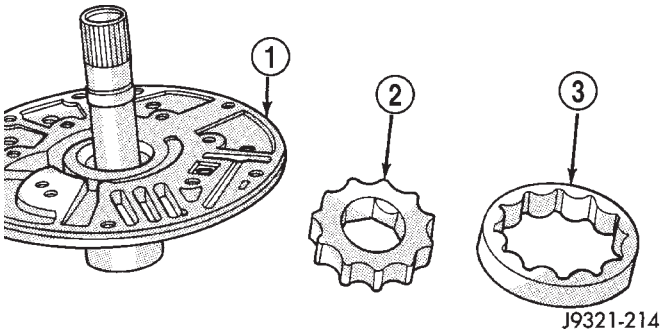

Fig. 166 Pump Gear Removal

1 – REACTION SHAFT SUPPORT
2 – INNER GEAR
3 – OUTER GEAR

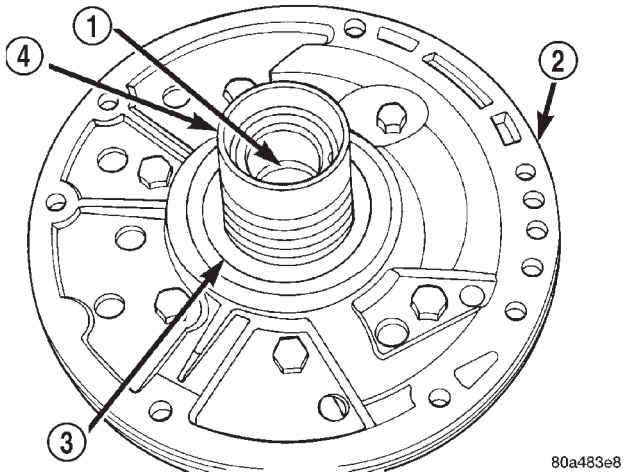

Fig. 167 Support Hub Thrust Washer

1 – BUSHING
2 – REACTION SHAFT SUPPORT
3 – THRUST WASHER
4 – HUB

DISASSEMBLY AND ASSEMBLY (Continued)

(3) Stake new pump bushing in two places with blunt punch (Fig. 169). Remove burrs from stake points with knife blade afterward.

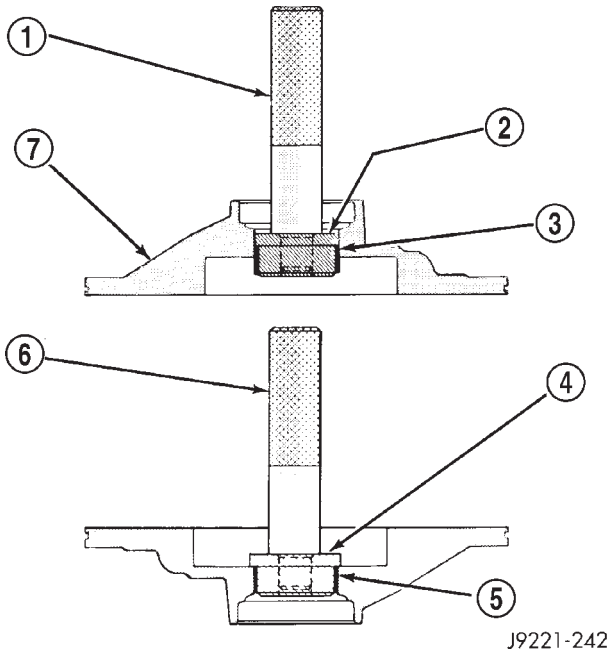

Fig. 168 Removing Oil Pump Bushing

1 – SPECIAL TOOL C-4171
2 – SPECIAL TOOL SP-3551
3 – BUSHING
4 – SPECIAL TOOL SP-5117
5 – BUSHING
6 – SPECIAL TOOL C-4171
7 – PUMP HOUSING

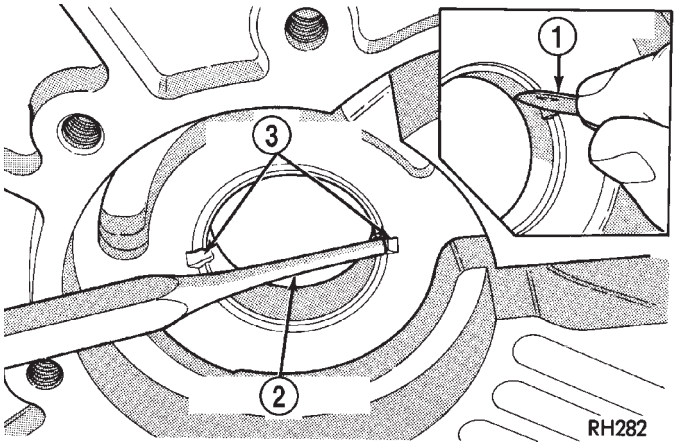

Fig. 169 Staking Oil Pump Bushing

1 – NARROW BLADE
2 – BLUNT PUNCH
3 – TWO STAKES

REACTION SHAFT SUPPORT BUSHING REMOVAL

(1) Assemble Bushing Remover Tools SP-1191, 3633 and 5324 (Fig. 170). **Do not clamp any part of reaction shaft or support in vise.**

(2) Hold Cup Tool SP-3633 firmly against reaction shaft and thread remover SP-5324 into bushing as far as possible by hand. Then thread remover tool 3-4 additional turns into bushing with a wrench.

(3) Turn remover tool hex nut down against remover cup to pull bushing from shaft. Clean all chips from shaft after bushing removal.

(4) Lightly grip old bushing in vise or with pliers and back remover tool out of bushing.

(5) Assemble Bushing Installer Tools C-4171 and SP-5325 (Fig. 170).

(6) Slide new bushing onto Installer Tool SP-5325.

(7) Position reaction shaft support upright on a clean smooth surface.

(8) Align bushing in bore. Then tap bushing into place until Bushing Installer SP-5325 bottoms.

(9) Clean reaction shaft support thoroughly after installing bushing.

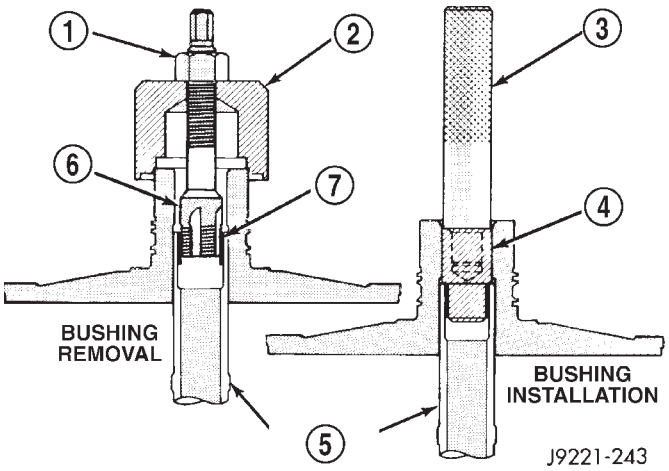

Fig. 170 Replacing Reaction Shaft Support Bushing

1 – SPECIAL TOOL SP-1191
2 – SPECIAL TOOL SP-3633
3 – SPECIAL TOOL C-4171
4 – SPECIAL TOOL SP-5325
5 – REACTION SHAFT
6 – SPECIAL TOOL SP-5324
7 – BUSHING

ASSEMBLY

(1) Lubricate gear bore in pump housing with transmission fluid.

(2) Lubricate pump gears with transmission fluid.

(3) Support pump housing on wood blocks (Fig. 171).

(4) Install outer gear in pump housing (Fig. 171). Gear can be installed either way (it is not a one-way fit).

DISASSEMBLY AND ASSEMBLY (Continued)

(5) Install pump inner gear (Fig. 172).

CAUTION: The pump inner gear is a one way fit. The bore on one side of the gear inside diameter (I. D.) is chamfered. Be sure the chamfered side faces forward (to front of pump).

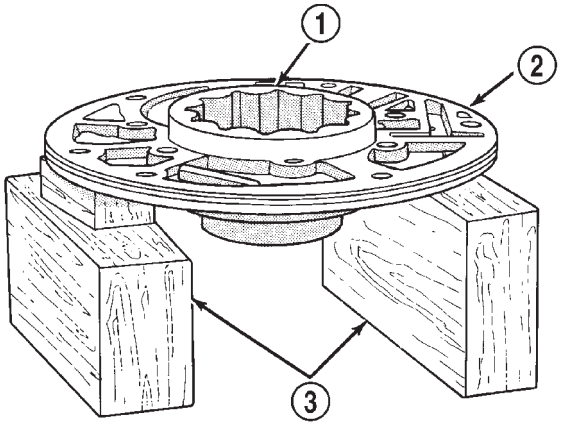

Fig. 171 Supporting Pump And Installing Outer Gear

1 – OUTER GEAR
2 – PUMP HOUSING
3 – WOD BLOCKS

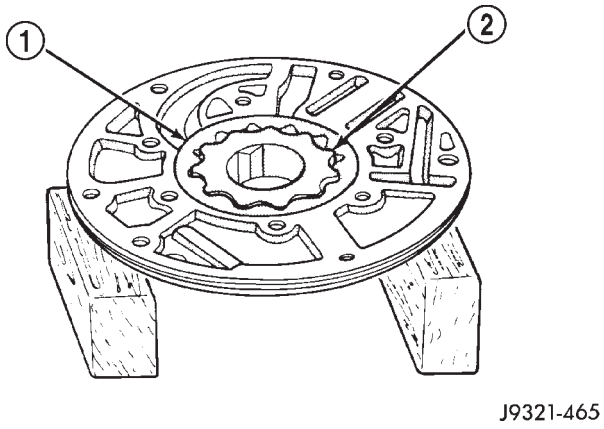

Fig. 172 Pump Inner Gear Installation

1 – OUTER GEAR
2 – INNER GEAR

(6) Install new thrust washer on hub of reaction shaft support. Lubricate washer with transmission fluid or petroleum jelly.

(7) If reaction shaft seal rings are being replaced, install new seal rings on support hub (Fig. 173). Lubricate seal rings with transmission fluid or petroleum jelly after installation. Squeeze each ring until ring ends are securely hooked together.

CAUTION: The reaction shaft support seal rings will break if overspread, or twisted. If new rings are being installed, spread them only enough for installation. Also be very sure the ring ends are securely hooked together after installation. Otherwise, the rings will either prevent pump installation, or break during installation.

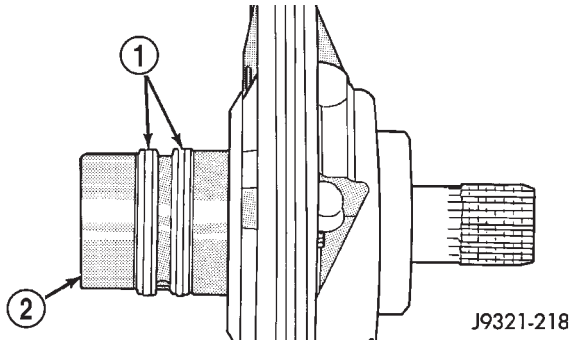

Fig. 173 Hub Seal Ring Position

1 – SEAL RINGS
2 – SUPPORT HUB

(8) Install reaction shaft support on pump housing (Fig. 174).

(9) Align reaction support on pump housing. Use alignment marks made at disassembly. Or, rotate support until bolt holes in support and pump housing are all aligned (holes are offset for one-way fit).

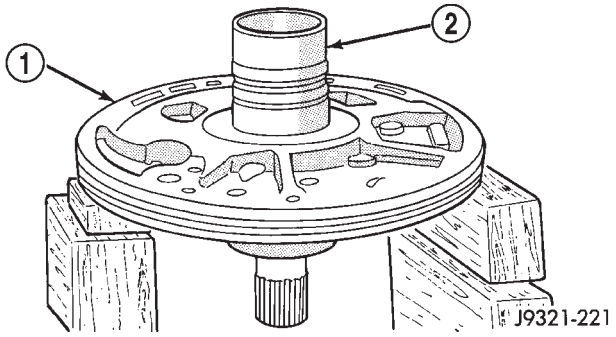

Fig. 174 Assembling Reaction Shaft Support And Pump Housing

1 – PUMP HOUSING
2 – REACTION SHAFT SUPPORT

DISASSEMBLY AND ASSEMBLY (Continued)

(10) Install all bolts that attach support to pump housing. Then tighten bolts finger tight.

(11) Tighten support-to-pump bolts to required torque as follows:

(a) Reverse pump assembly and install it in transmission case. Position pump so bolts are facing out and are accessible.

(b) Secure pump assembly in case with 2 or 3 bolts, or with pilot studs.

(c) Tighten support-to-pump bolts to 20 N·m (15 ft. lbs.).

(d) Remove pump assembly from transmission case.

(12) Install new oil seal in pump with Special Tool C-4193 and Tool Handle C-4171 (Fig. 175). Be sure seal lip faces inward.

(13) Install new seal ring around pump housing. Be sure seal is properly seated in groove.

(14) Lubricate lip of pump oil seal and O-ring seal with transmission fluid.

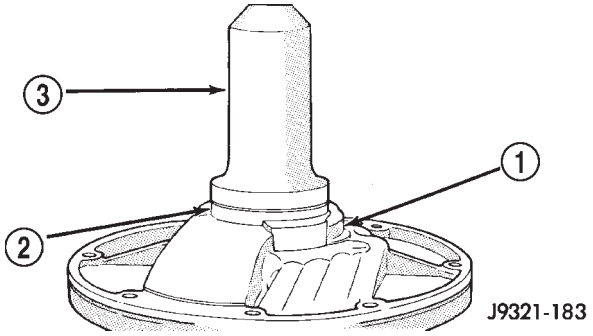

Fig. 175 Pump Oil Seal Installation

1 – PUMP BODY
2 – PUMP SEAL
3 – SPECIAL TOOL C-4193

FRONT CLUTCH

NOTE: The 44RE uses five plates and discs for the front clutch.

DISASSEMBLY

(1) Remove waved snap ring and remove pressure plate, clutch plates and clutch discs.

(2) Compress clutch piston spring with Compressor Tool C-3575-A (Fig. 176). Be sure legs of tool are seated squarely on spring retainer before compressing spring.

(3) Remove retainer snap ring and remove compressor tool.

(4) Remove spring retainer and clutch spring. Note position of retainer on spring for assembly reference.

(5) Remove clutch piston from clutch retainer. Remove piston by rotating it up and out of retainer.

(6) Remove seals from clutch piston and clutch retainer hub. Discard both seals as they are not reusable.

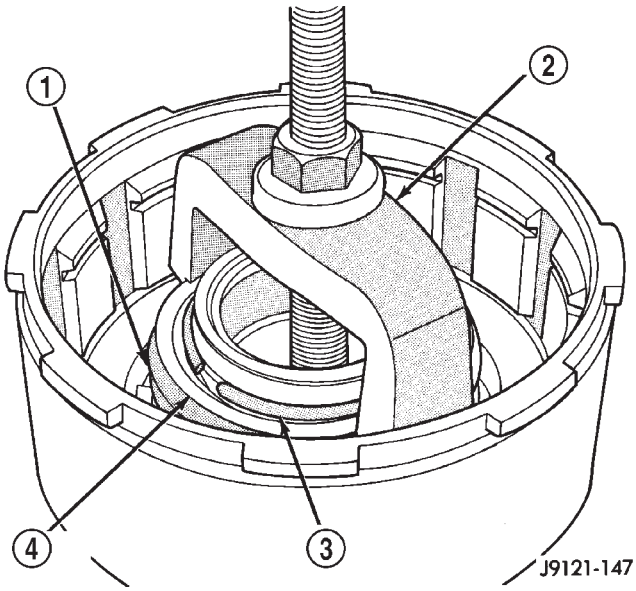

Fig. 176 Compressing Front Clutch Piston Spring

1 – FRONT CLUTCH SPRING
2 – COMPRESSOR TOOL C-3575–A
3 – RETAINER SNAP RING
4 – SPRING RETAINER

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLY

(1) Soak clutch discs in transmission fluid while assembling other clutch parts.

(2) Install new seals on piston and in hub of retainer. Be sure lip of each seal faces interior of clutch retainer.

(3) Lubricate lips of piston and retainer seals with liberal quantity of Mopar® Door Ease. Then lubricate retainer hub, bore and piston with light coat of transmission fluid.

(4) Install clutch piston in retainer (Fig. 177). Use twisting motion to seat piston in bottom of retainer.

CAUTION: Never push the clutch piston straight in. This will fold the seals over causing leakage and clutch slip.

(5) Position spring in clutch piston (Fig. 178).

(6) Position spring retainer on top of piston spring (Fig. 179). **Make sure retainer is properly installed. Small raised tabs should be facing upward. Semicircular lugs on underside of retainer are for positioning retainer in spring.**

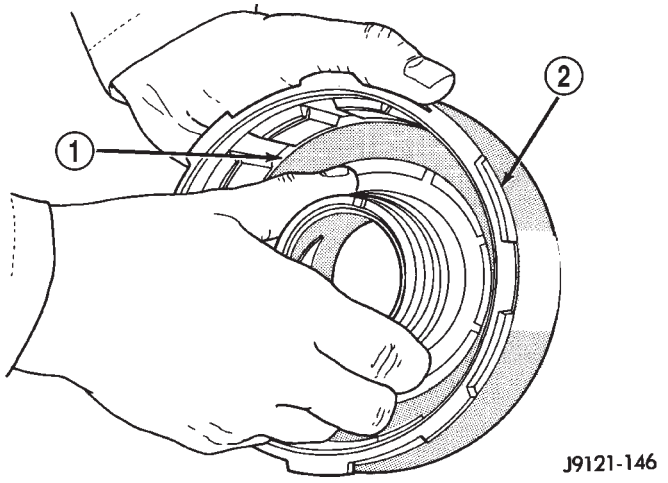

Fig. 177 Front Clutch Piston Installation

1 – CLUTCH PISTON
2 – FRONT CLUTCH RETAINER

(7) Compress piston spring and retainer with Compressor Tool C-3575-A (Fig. 176). Then install new snap ring to secure spring retainer and spring.

(8) Install clutch plates and discs. Install steel plate then disc until all plates and discs are installed. The front clutch uses 5 clutch discs and plates.

(9) Install pressure plate and waved snap ring.

Front clutch clearance should be 1.70 to 3.40 mm (0.067 to 0.134 in.). If clearance is incorrect, clutch discs, plates, pressure plates and snap ring may have to be changed.

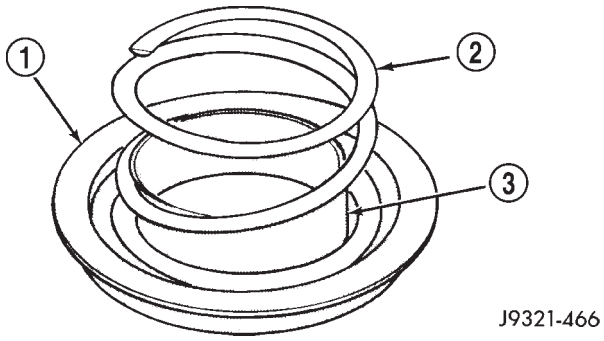

Fig. 178 Clutch Piston Spring Installation

1 – RETAINER
2 – CLUTCH SPRING
3 – PISTON

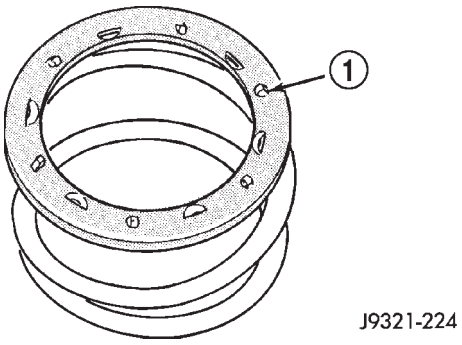

Fig. 179 Correct Spring Retainer Installed Position

1 – SMALL TABS ON RETAINER FACE UPWARD

REAR CLUTCH

DISASSEMBLY

(1) Remove fiber thrust washer from forward side of clutch retainer.

(2) Remove input shaft front/rear seal rings.

(3) Remove selective clutch pack snap ring (Fig. 180).

(4) Remove top pressure plate, clutch discs, steel plates, bottom pressure plate and wave snap ring and wave spring (Fig. 180).

(5) Remove clutch piston with rotating motion.

(6) Remove and discard piston seals.

(7) Remove input shaft snap-ring (Fig. 181). It may be necessary to press the input shaft in slightly to relieve tension on the snap-ring

(8) Press input shaft out of retainer with shop press and suitable size press tool. Use a suitably sized press tool to support the retainer as close to the input shaft as possible.

DISASSEMBLY AND ASSEMBLY (Continued)

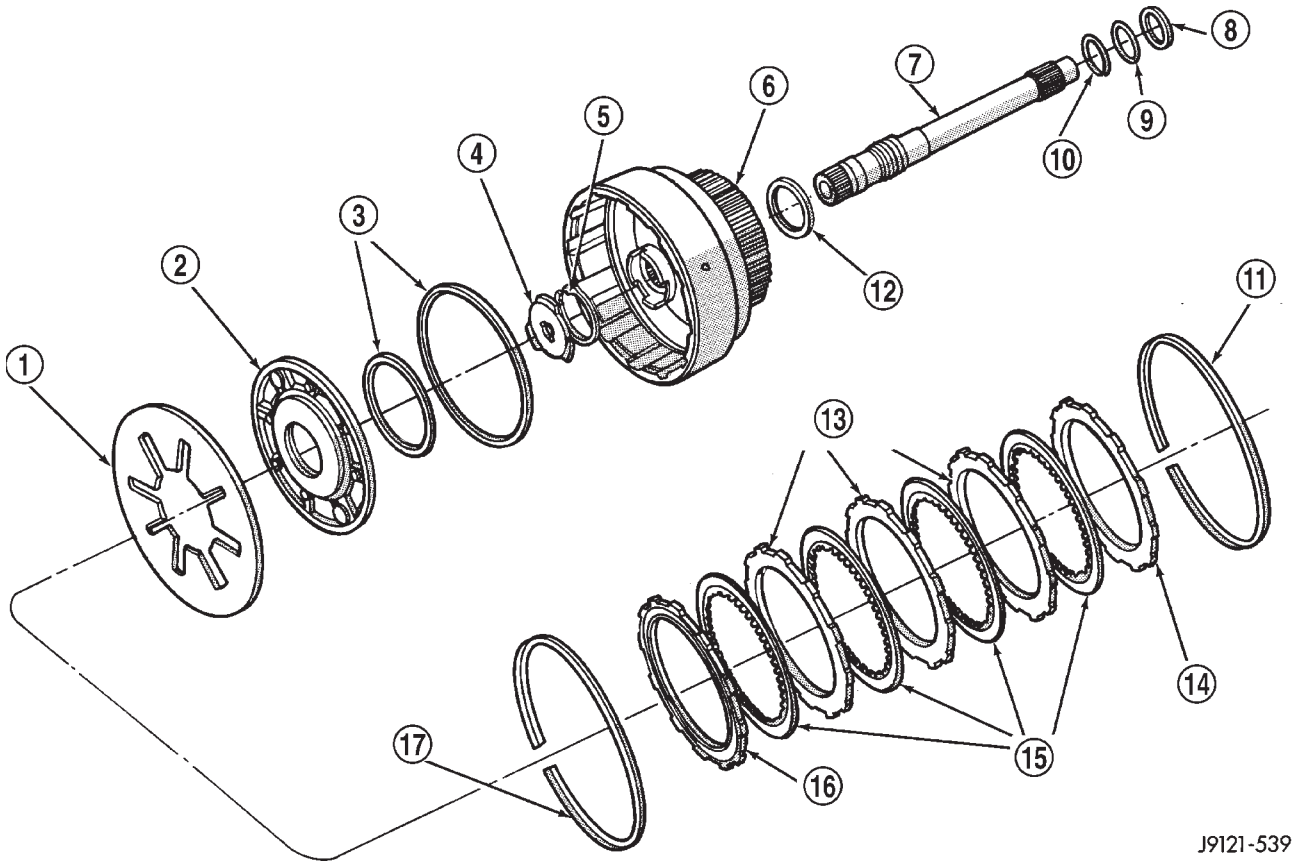

Fig. 180 Rear Clutch Components

1 – PISTON SPRING
2 – REAR CLUTCH PISTON
3 – CLUTCH PISTON SEALS
4 – OUTPUT SHAFT THRUST WASHER (METAL)
5 – INPUT SHAFT SNAP RING
6 – REAR CLUTCH RETAINER
7 – INPUT SHAFT
8 – REAR CLUTCH THRUST WASHER (FIBER)
9 – SHAFT FRONT SEAL RING (TEFLON)
10 – SHAFT REAR SEAL RING (METAL)
11 – CLUTCH PACK SNAP RING (SELECTIVE)
12 – RETAINER SEAL RING
13 – CLUTCH PLATES (3)
14 – TOP PRESSURE PLATE
15 – CLUTCH DISCS (4)
16 – BOTTOM PRESSURE PLATE
17 – WAVE SPRING

DISASSEMBLY AND ASSEMBLY (Continued)

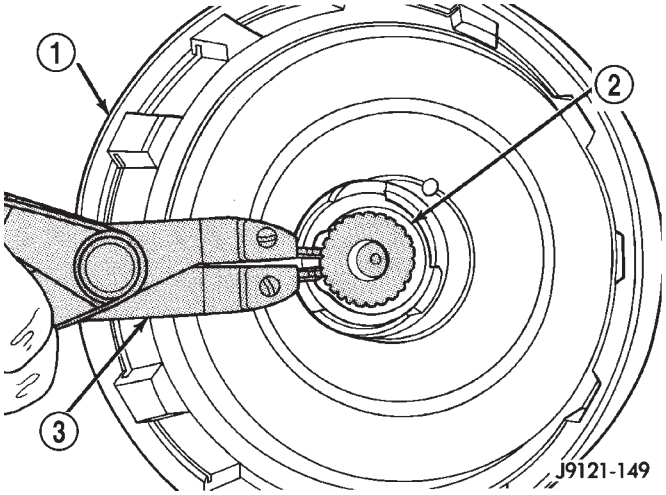

Fig. 181 Removing/Installing Input Shaft Snap-Ring

1 – REAR CLUTCH RETAINER
2 – INPUT SHAFT SNAP RING
3 – SNAP RING PLIERS

ASSEMBLY

(1) Soak clutch discs in transmission fluid while assembling other clutch parts.

(2) Install new seal rings on clutch retainer hub and input shaft if necessary (Fig. 182).

(a) Be sure clutch hub seal ring is fully seated in groove and is not twisted.

(3) Lubricate splined end of input shaft and clutch retainer with transmission fluid. Then press input shaft into retainer. Use a suitably sized press tool to support retainer as close to input shaft as possible.

(4) Install input shaft snap-ring (Fig. 181).

(5) Invert retainer and press input shaft in opposite direction until snap-ring is seated.

(6) Install new seals on clutch piston. Be sure lip of each seal faces interior of clutch retainer.

(7) Lubricate lip of piston seals with generous quantity of Mopar® Door Ease. Then lubricate retainer hub and bore with light coat of transmission fluid.

(8) Install clutch piston in retainer. Use twisting motion to seat piston in bottom of retainer. A thin strip of plastic (about 0.020” thick), can be used to guide seals into place if necessary.

CAUTION: Never push the clutch piston straight in. This will fold the seals over causing leakage and clutch slip. In addition, never use any type of metal tool to help ease the piston seals into place. Metal tools will cut, shave, or score the seals.

(9) Install piston spring in retainer and on top of piston (Fig. 185). Concave side of spring faces downward (toward piston).

(10) Install wave spring in retainer (Fig. 185). Be sure spring is completely seated in retainer groove.

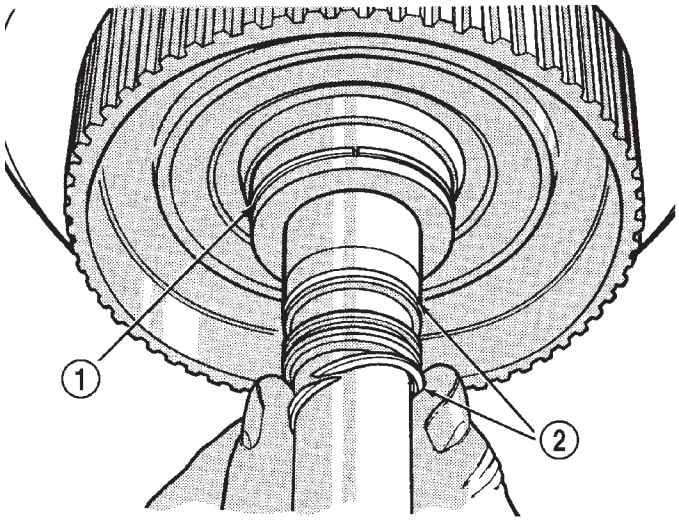

Fig. 182 Rear Clutch Retainer And Input Shaft Seal Ring Installation

1 – REAR CLUTCH RETAINER HUB SEAL RING
2 – INPUT SHAFT SEAL RINGS

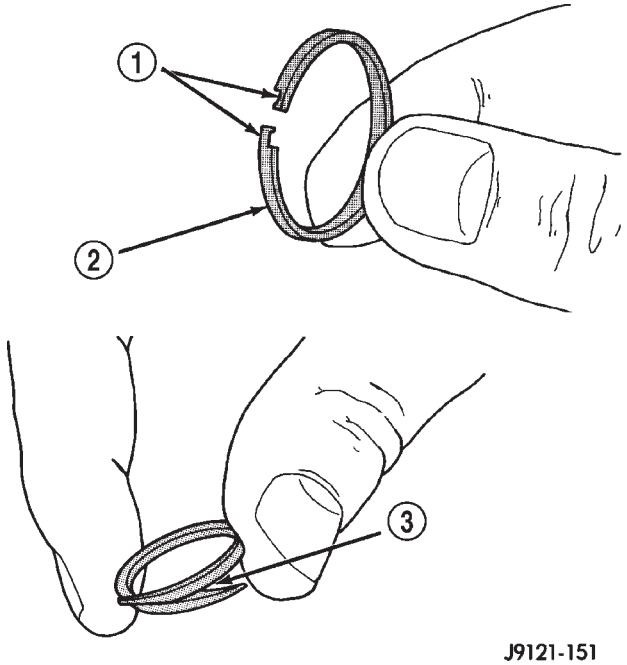

Fig. 183 Input Shaft Seal Ring Identification

1 – BE SURE RING ENDS ARE HOOKED TOGETHER AFTER INSTALLATION
2 – METAL REAR SEAL RING
3 – TEFLON FRONT SEAL RING (SQUEEZE RING TOGETHER SLIGHTLY BEFORE INSTALLATION FOR BETTER FIT)

DISASSEMBLY AND ASSEMBLY (Continued)

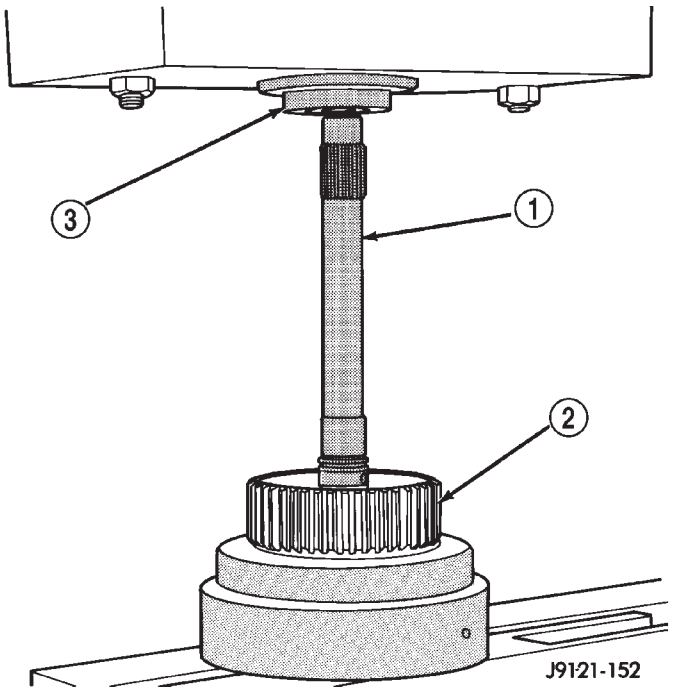

Fig. 184 Pressing Input Shaft Into Rear Clutch Retainer

1 – INPUT SHAFT
2 – REAR CLUTCH RETAINER
3 – PRESS RAM

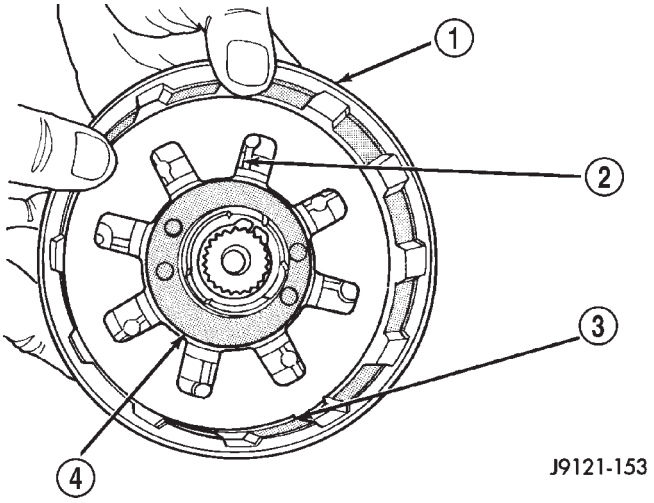

Fig. 185 Piston Spring/Wave Spring Position

1 – REAR CLUTCH RETAINER
2 – PISTON SPRING
3 – WAVE SPRING
4 – CLUTCH PISTON

(11) Install bottom pressure plate (Fig. 180). Ridged side of plate faces downward (toward piston) and flat side toward clutch pack.

(12) Install first clutch disc in retainer on top of bottom pressure plate. Then install a clutch plate followed by a clutch disc until entire clutch pack is installed (4 discs and 3 plates are required) (Fig. 180).

(13) Install top pressure plate.

(14) Install selective snap ring. Be sure snap ring is fully seated in retainer groove.

(15) Using a suitable gauge bar and dial indicator, measure clutch pack clearance (Fig. 186).

(a) Position gauge bar across the clutch drum with the dial indicator pointer on the pressure plate (Fig. 186).

(b) Using two small screw drivers, lift the pressure plate and release it.

(c) Zero the dial indicator.

(d) Lift the pressure plate until it contacts the snap-ring and record the dial indicator reading.

Clearance should be 0.64 - 1.14 mm (0.025 - 0.045 in.). If clearance is incorrect, steel plates, discs, selective snap ring and pressure plates may have to be changed.

The selective snap ring thicknesses are:

- .107–.109 in.
- .098–.100 in.
- .095–.097 in.
- .083–.085 in.
- .076–.078 in.
- .071–.073 in.
- .060–.062 in.

(16) Coat rear clutch thrust washer with petroleum jelly and install washer over input shaft and into clutch retainer (Fig. 187). Use enough petroleum jelly to hold washer in place.

(17) Set rear clutch aside for installation during final assembly.

DISASSEMBLY AND ASSEMBLY (Continued)

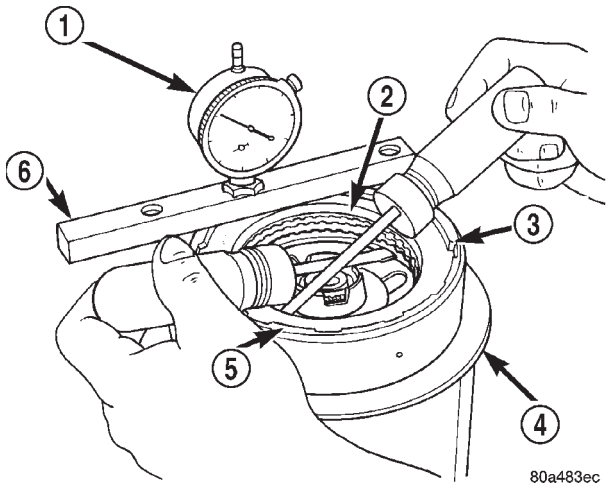

Fig. 186 Checking Rear Clutch Pack Clearance

1 – DIAL INDICATOR
2 – PRESSURE PLATE
3 – SNAP RING
4 – STAND
5 – REAR CLUTCH
6 – GAUGE BAR

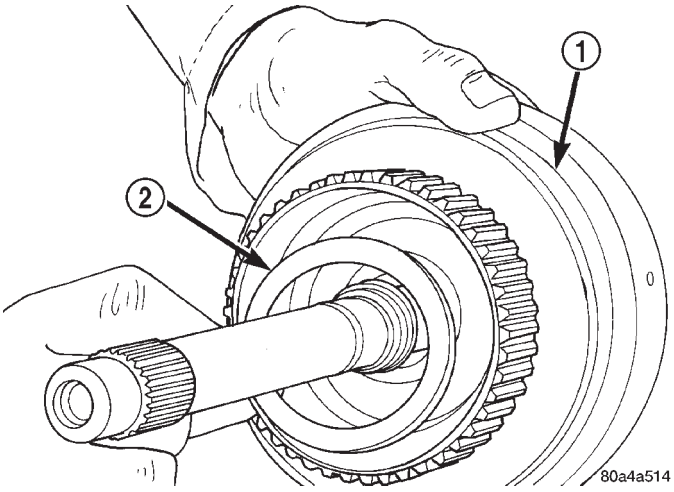

Fig. 187 Installing Rear Clutch Thrust Washer

1 – REAR CLUTCH RETAINER
2 – REAR CLUTCH THRUST WASHER

PLANETARY GEARTRAIN/OUTPUT SHAFT

DISASSEMBLY

(1) Remove planetary snap ring (Fig. 188).

(2) Remove front annulus and planetary assembly from driving shell (Fig. 188).

(3) Remove snap ring that retains front planetary gear in annulus gear (Fig. 189).

(4) Remove tabbed thrust washer and tabbed thrust plate from hub of front annulus (Fig. 190).

(5) Separate front annulus and planetary gears (Fig. 190).

(6) Remove front planetary gear front thrust washer from annulus gear hub.

(7) Separate and remove driving shell, rear planetary and rear annulus from output shaft (Fig. 191).

(8) Remove front planetary rear thrust washer from driving shell.

(9) Remove tabbed thrust washers from rear planetary gear.

(10) Remove lock ring that retains sun gear in driving shell. Then remove sun gear, spacer and thrust plates.

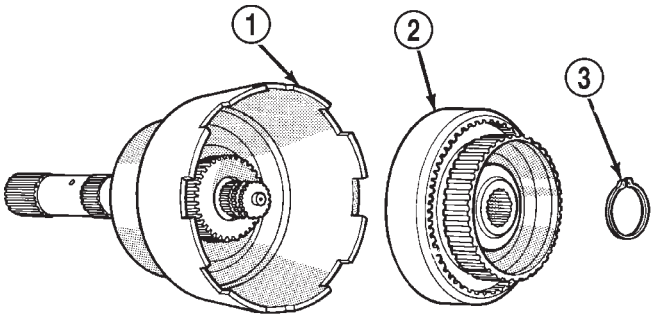

Fig. 188 Front Annulus And Planetary Assembly Removal

1 – DRIVING SHELL
2 – FRONT ANNULUS AND PLANETARY ASSEMBLY
3 – PLANETARY SNAP RING

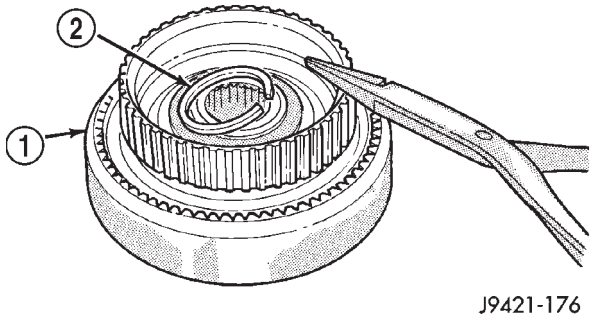

Fig. 189 Front Planetary Snap Ring Removal

1 – FRONT ANNULUS GEAR
2 – PLANETARY SNAP RING

ASSEMBLY

(1) Lubricate output shaft and planetary components with transmission fluid. Use petroleum jelly to lubricate and hold thrust washers and plates in position.

(2) Assemble rear annulus gear and support if disassembled. Be sure support snap ring is seated and that shoulder-side of support faces rearward (Fig. 192).

DISASSEMBLY AND ASSEMBLY (Continued)

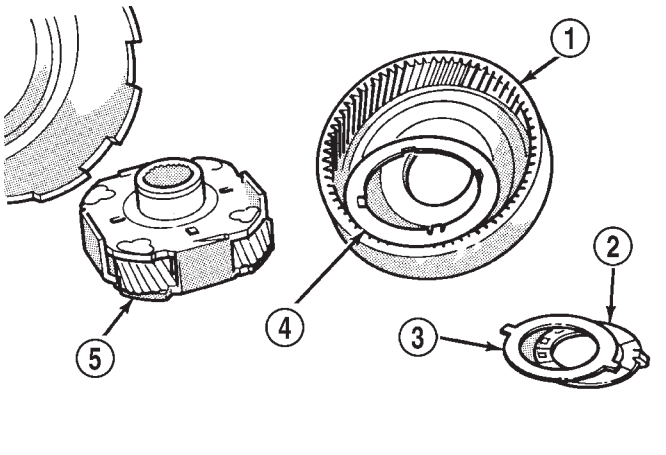

Fig. 190 Front Planetary And Annulus Gear Disassembly

1 – FRONT ANNULUS
2 – THRUST WASHER
3 – THRUST PLATE
4 – FRONT THRUST WASHER
5 – FRONT PLANETARY

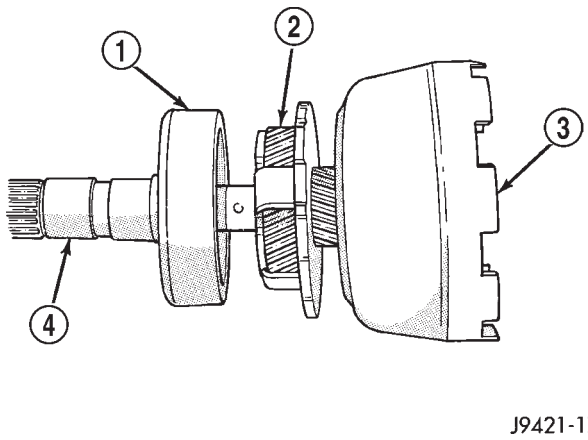

Fig. 191 Removing Driving Shell, Rear Planetary And Rear Annulus

1 – REAR ANNULUS
2 – REAR PLANETARY
3 – DRIVING SHELL
4 – OUTPUT SHAFT

(3) Install rear thrust washer on rear planetary gear. Use enough petroleum jelly to hold washer in place. Also be sure all four washer tabs are properly engaged in gear slots.

(4) Install rear annulus over and onto rear planetary gear (Fig. 192).

(5) Install assembled rear planetary and annulus gear on output shaft (Fig. 193). Verify that assembly is fully seated on shaft.

(6) Install front thrust washer on rear planetary gear (Fig. 194). Use enough petroleum jelly to hold washer on gear. Be sure all four washer tabs are seated in slots.

(7) Install spacer on sun gear (Fig. 195).

(8) Install thrust plate on sun gear (Fig. 196). Note that driving shell thrust plates are interchangeable. Use either plate on sun gear and at front/rear of shell.

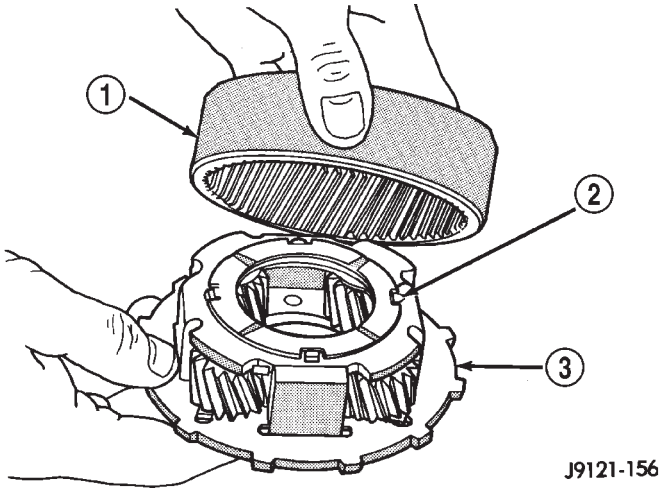

Fig. 192 Assembling Rear Annulus And Planetary Gear

1 – REAR ANNULUS GEAR
2 – TABBED THRUST WASHER
3 – REAR PLANETARY

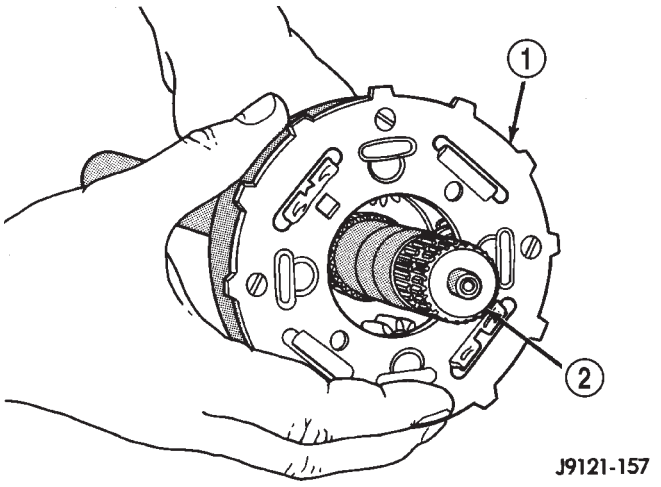

Fig. 193 Installing Rear Annulus And Planetary On Output Shaft

1 – REAR ANNULUS AND PLANETARY GEAR ASSEMBLY
2 – OUTPUT SHAFT

DISASSEMBLY AND ASSEMBLY (Continued)

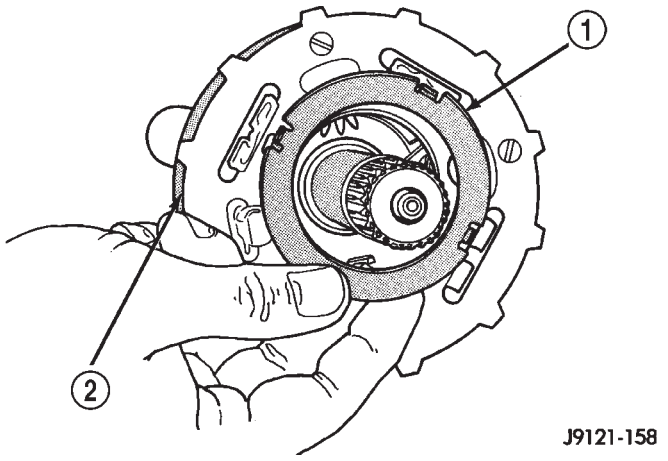

Fig. 194 Installing Rear Planetary Front Thrust Washer

1 – FRONT TABBED THRUST WASHER
2 – REAR PLANETARY GEAR

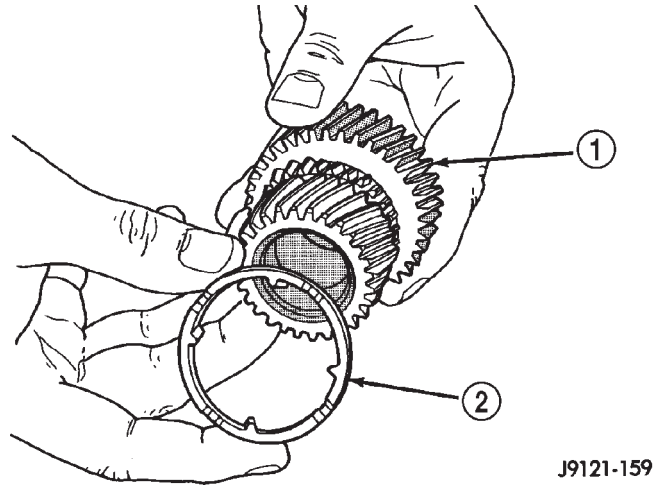

Fig. 195 Installing Spacer On Sun Gear

1 – SUN GEAR
2 – SUN GEAR SPACER

(9) Hold sun gear in place and install thrust plate over sun gear at rear of driving shell (Fig. 197).

(10) Position wood block on bench and support sun gear on block (Fig. 198). This makes it easier to align and install sun gear lock ring. Keep wood block handy as it will also be used for geartrain end play check.

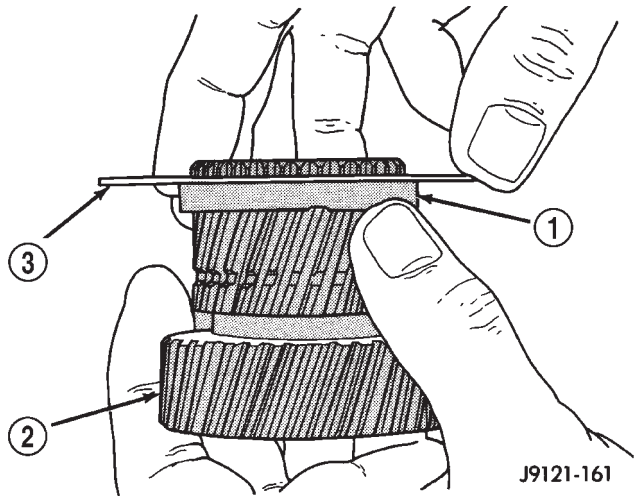

Fig. 196 Installing Driving Shell Front Thrust Plate On Sun Gear

1 – SPACER
2 – SUN GEAR
3 – THRUST PLATE

(11) Align rear thrust plate on driving shell and install sun gear lock ring. Be sure ring is fully seated in sun gear ring groove (Fig. 199).

(12) Install assembled driving shell and sun gear on output shaft (Fig. 200).

(13) Install rear thrust washer on front planetary gear (Fig. 201). Use enough petroleum jelly to hold washer in place and be sure all four washer tabs are seated.

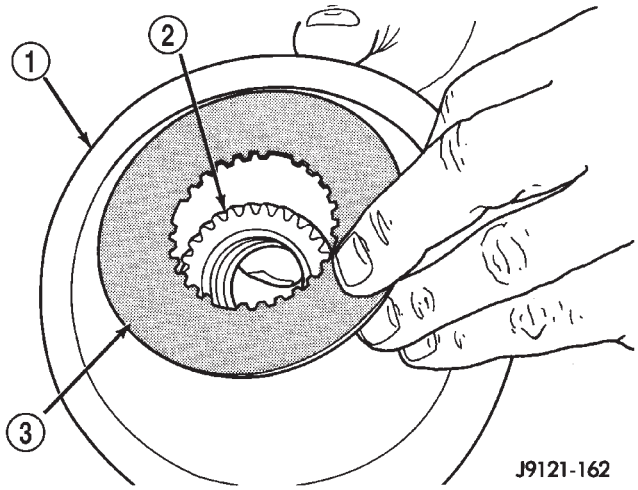

Fig. 197 Installing Driving Shell Rear Thrust Plate

1 – DRIVING SHELL
2 – SUN GEAR
3 – REAR THRUST PLATE

DISASSEMBLY AND ASSEMBLY (Continued)

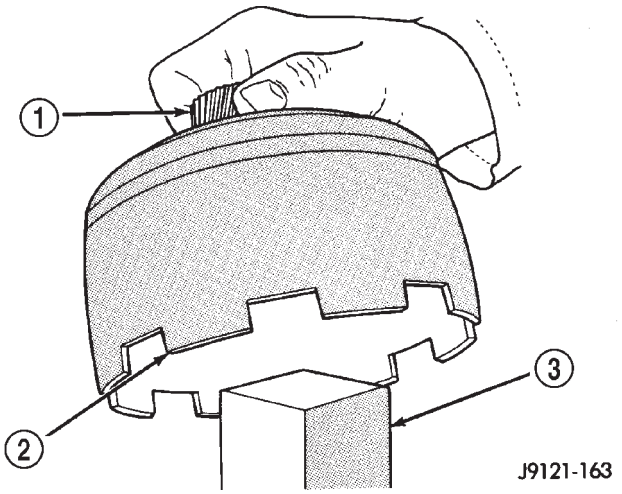

Fig. 198 Supporting Sun Gear On Wood Block

1 – SUN GEAR
2 – DRIVING SHELL
3 – WOOD BLOCK

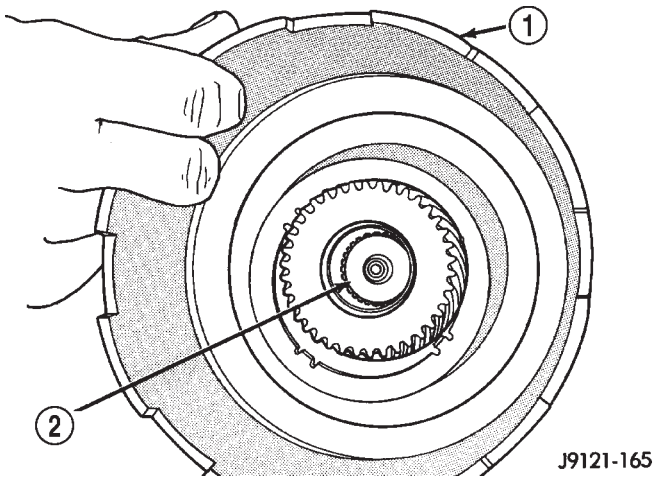

Fig. 200 Installing Assembled Sun Gear And Driving Shell On Output Shaft

1 – SUN GEAR/DRIVING SHELL ASSEMBLY
2 – OUTPUT SHAFT

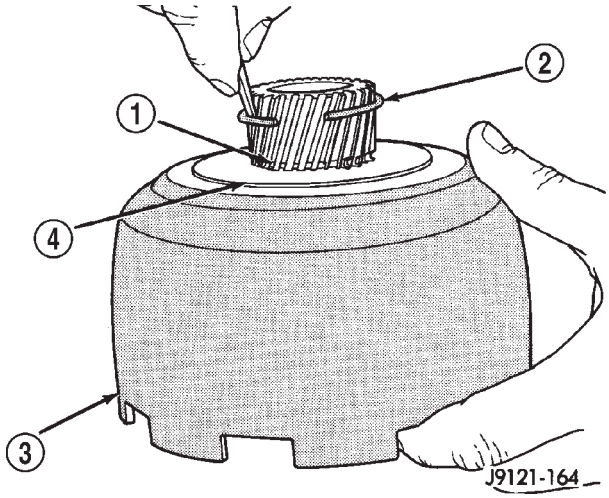

Fig. 199 Installing Sun Gear Lock Ring

1 – LOCK RING GROOVE
2 – SUN GEAR LOCK RING
3 – DRIVING SHELL
4 – REAR THRUST PLATE

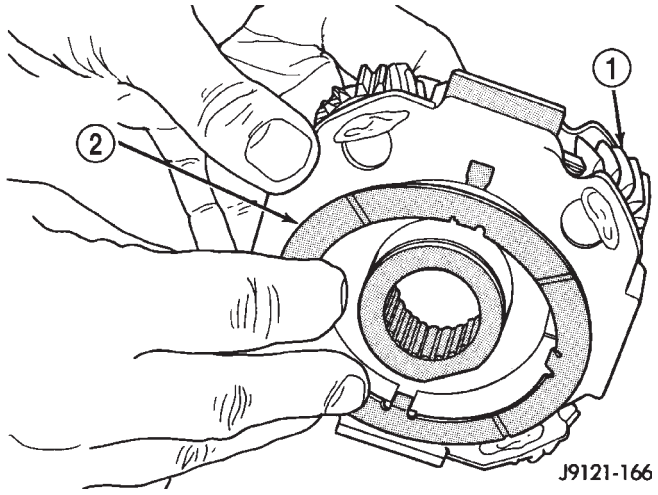

Fig. 201 Installing Rear Thrust Washer On Front Planetary Gear

1 – FRONT PLANETARY GEAR
2 – REAR TABBED THRUST WASHER

(14) Install front planetary gear on output shaft and in driving shell (Fig. 202).

(15) Install front thrust washer on front planetary gear. Use enough petroleum jelly to hold washer in place and be sure all four washer tabs are seated.

(16) Assemble front annulus gear and support, if necessary. Be sure support snap ring is seated.

(17) Install front annulus on front planetary (Fig. 202).

(18) Position thrust plate on front annulus gear support (Fig. 203). **Note that plate has two tabs on it. These tabs fit in notches of annulus hub.**

(19) Install thrust washer in front annulus (Fig. 204). **Align flat on washer with flat on planetary hub. Also be sure washer tab is facing up.**

(20) Install front annulus snap ring (Fig. 205). Use snap ring pliers to avoid distorting ring during installation. Also be sure ring is fully seated.

(21) Install planetary selective snap ring with snap ring pliers (Fig. 206). Be sure ring is fully seated.

(22) Turn planetary geartrain assembly over so driving shell is facing workbench. Then support geartrain on wood block positioned under forward end of output shaft. This allows geartrain components to move forward for accurate end play check.

DISASSEMBLY AND ASSEMBLY (Continued)

(23) Check planetary geartrain end play with feeler gauge (Fig. 207). Gauge goes between shoulder on output shaft and end of rear annulus support.

(24) Geartrain end play should be 0.12 to 1.22 mm (0.005 to 0.048 in.). If end play is incorrect, snap ring (or thrust washers) may have to be replaced. Snap ring is available in three different thicknesses for adjustment purposes.

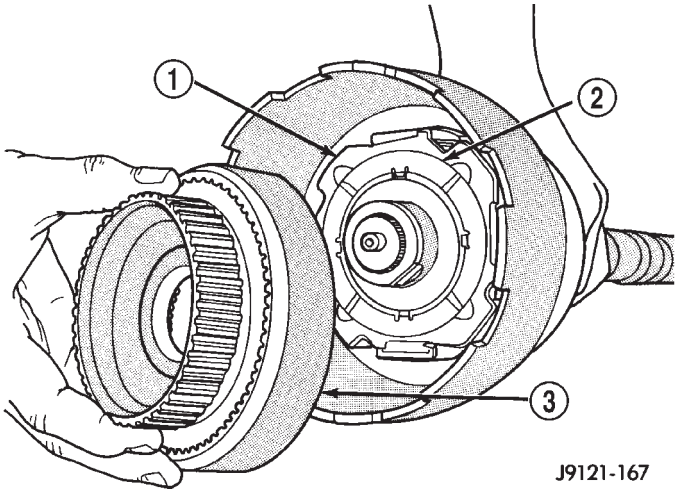

Fig. 202 Installing Front Planetary And Annulus Gears

1 – FRONT PLANETARY GEAR
2 – FRONT THRUST WASHER
3 – FRONT ANNULUS GEAR

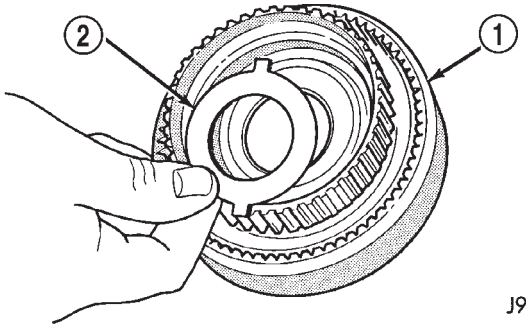

Fig. 203 Positioning Thrust Plate On Front Annulus Support

1 – FRONT ANNULUS
2 – THRUST PLATE

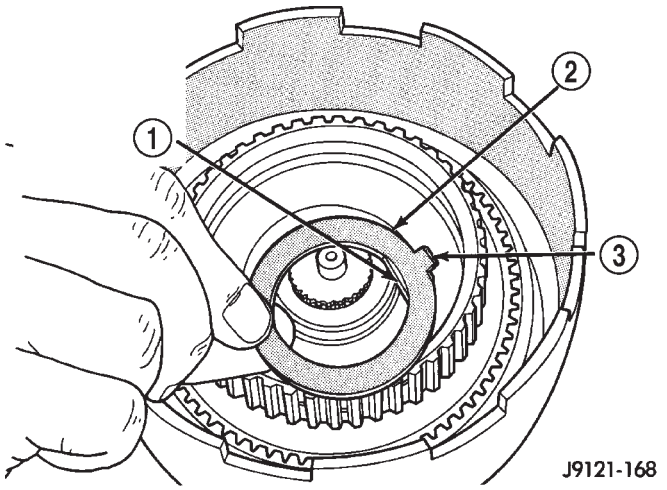

Fig. 204 Installing Front Annulus Thrust Washer

1 – WASHER FLAT ALIGNS WITH FLAT ON PLANETARY HUB
2 – FRONT ANNULUS THRUST WASHER
3 – TAB FACES FRONT

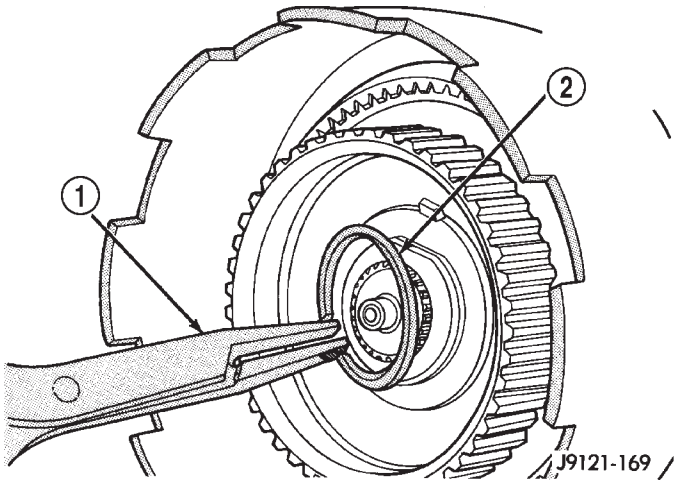

Fig. 205 Installing Front Annulus Snap Ring

1 – SNAP RING PLIERS
2 – FRONT ANNULUS SNAP RING

DISASSEMBLY AND ASSEMBLY (Continued)

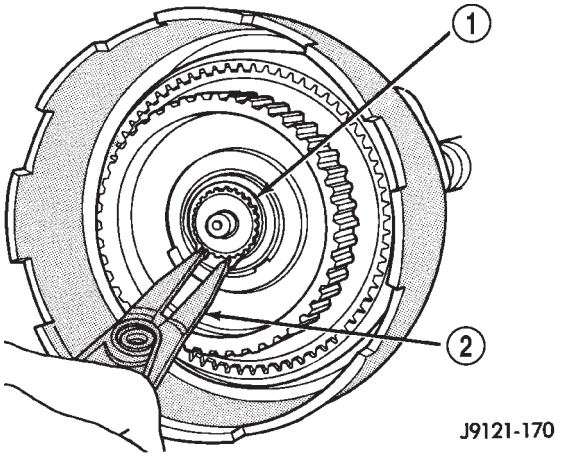

Fig. 206 Installing Planetary Selective Snap Ring

1 – SELECTIVE SNAP RING
2 – SNAP RING PLIERS

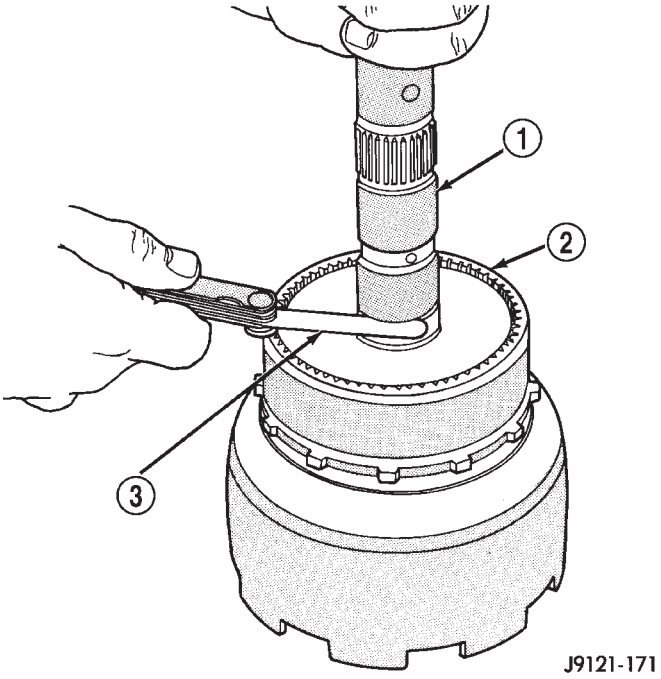

Fig. 207 Checking Planetary Geartrain End Play

1 – OUTPUT SHAFT
2 – REAR ANNULUS GEAR
3 – FEELER GAUGE

OVERDRIVE UNIT

DISASSEMBLY

(1) Remove transmission speed sensor and O-ring seal from overdrive case (Fig. 208).

(2) Remove overdrive piston thrust bearing (Fig. 209).

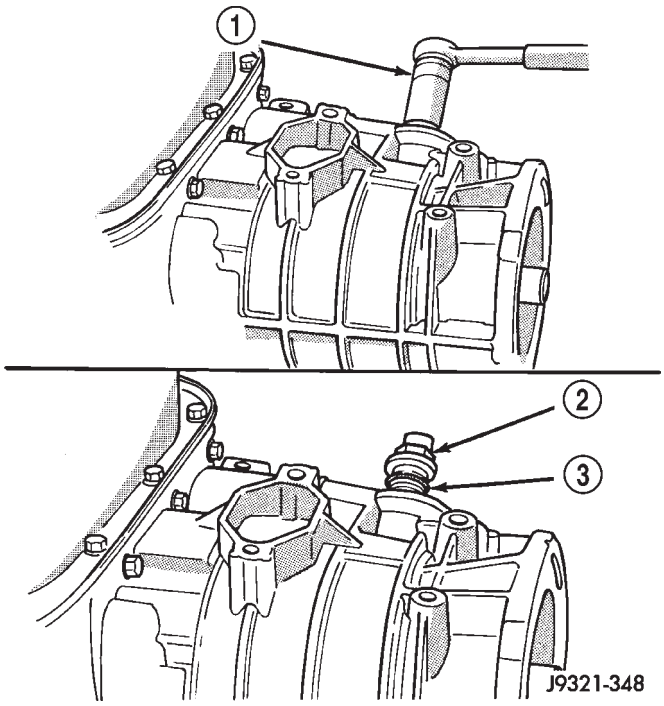

Fig. 208 Transmission Speed Sensor Removal/ Installation

1 – SOCKET AND WRENCH
2 – SPEED SENSOR
3 – O-RING

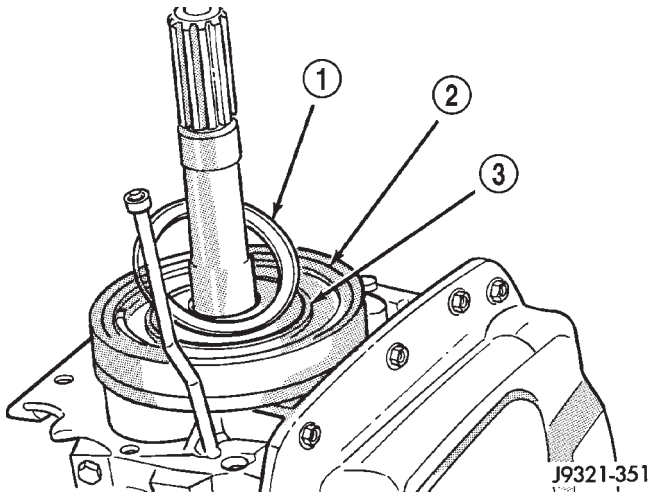

Fig. 209 Overdrive Piston Thrust Bearing Removal/ Installation

1 – THRUST BEARING
2 – OVERDRIVE PISTON
3 – THRUST PLATE

OVERDRIVE PISTON DISASSEMBLY

(1) Remove overdrive piston thrust plate (Fig. 210). Retain thrust plate. It is a select fit part and may possibly be reused.

DISASSEMBLY AND ASSEMBLY (Continued)

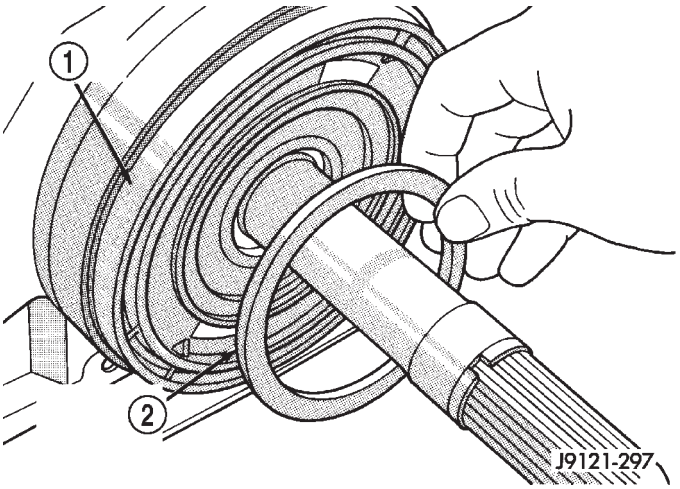

Fig. 210 Overdrive Piston Thrust Plate Removal/ Installation

1 – OVERDRIVE PISTON
2 – OVERDRIVE PISTON SPACER (SELECT FIT)

(2) Remove intermediate shaft spacer (Fig. 211). Retain spacer. It is a select fit part and may possibly be reused.

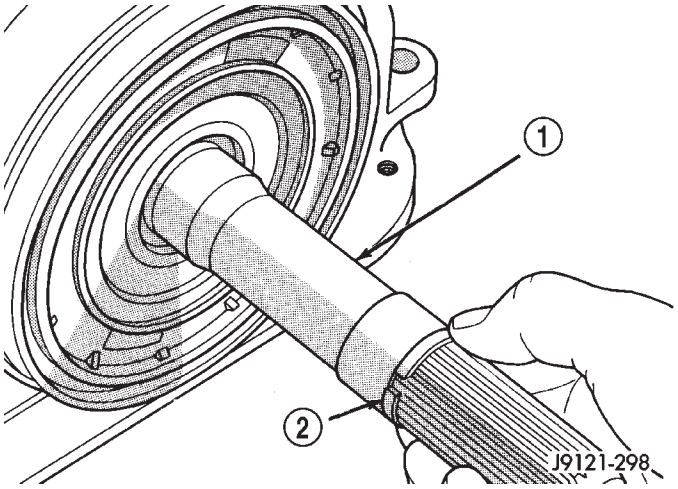

Fig. 211 Intermediate Shaft Spacer Location

1 – INTERMEDIATE SHAFT
2 – INTERMEDIATE SHAFT SPACER (SELECT FIT)

(3) Remove overdrive piston from retainer (Fig. 212).

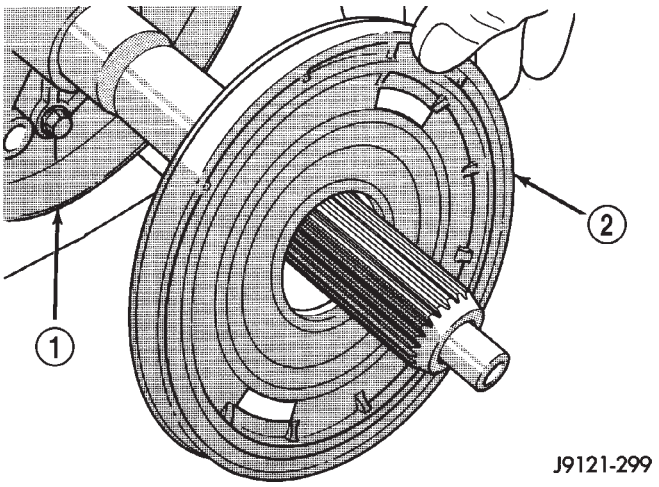

Fig. 212 Overdrive Piston Removal

1 – PISTON RETAINER
2 – OVERDRIVE PISTON

OVERDRIVE CLUTCH PACK DISASSEMBLY

(1) Remove overdrive clutch pack wire retaining ring (Fig. 213).

(2) Remove overdrive clutch pack (Fig. 214).

NOTE: The 44RE transmission utilizes four clutch discs and three clutch plates.

(3) Note position of clutch pack components for assembly reference.

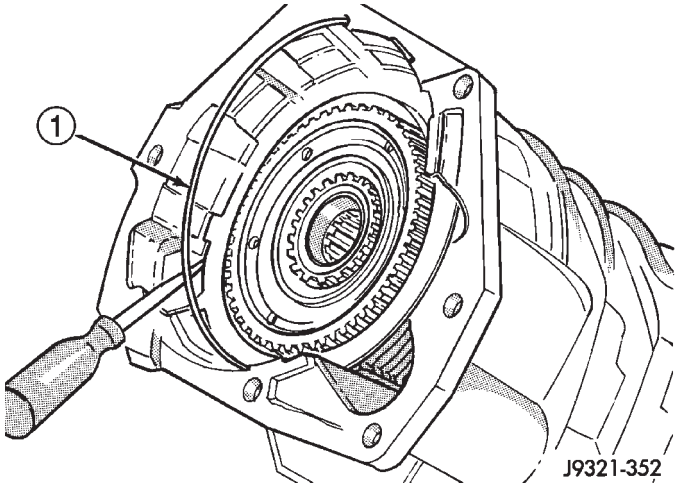

Fig. 213 Removing Overdrive Clutch Pack Retaining Ring

1 – OVERDRIVE CLUTCH PACK RETAINING RING

DISASSEMBLY AND ASSEMBLY (Continued)

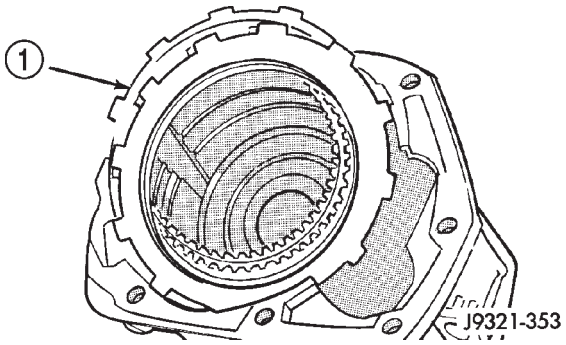

Fig. 214 Overdrive Clutch Pack Removal

1 – OVERDRIVE CLUTCH PACK

OVERDRIVE GEARTRAIN DISASSEMBLY

(1) Remove overdrive clutch wave spring (Fig. 215).

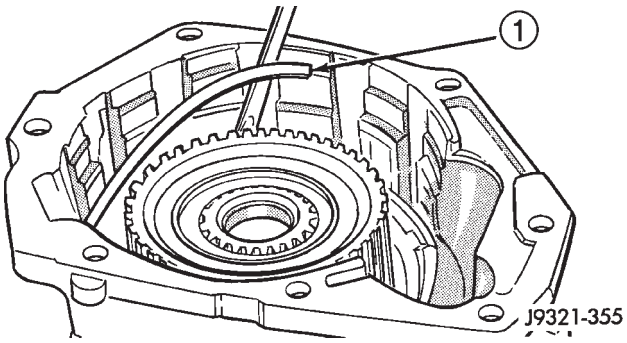

Fig. 215 Overdrive Clutch Wave Spring Removal/ Installation

1 – WAVE SPRING

(2) Remove overdrive clutch reaction snap ring (Fig. 216). Note that snap ring is located in same groove as wave spring.

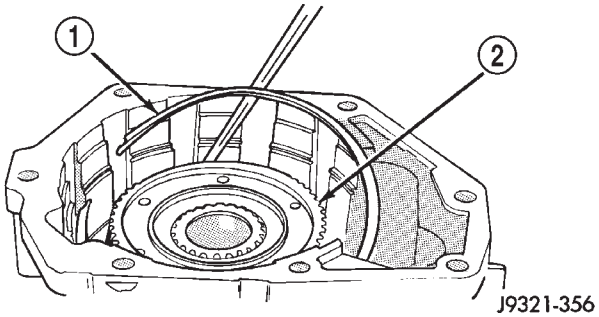

Fig. 216 Overdrive Clutch Reaction Snap Ring Removal/Installation

1 – REACTION RING
2 – CLUTCH HUB

(3) Remove Torx head screws that attach access cover and gasket to overdrive case (Fig. 217).

(4) Remove access cover and gasket (Fig. 218).

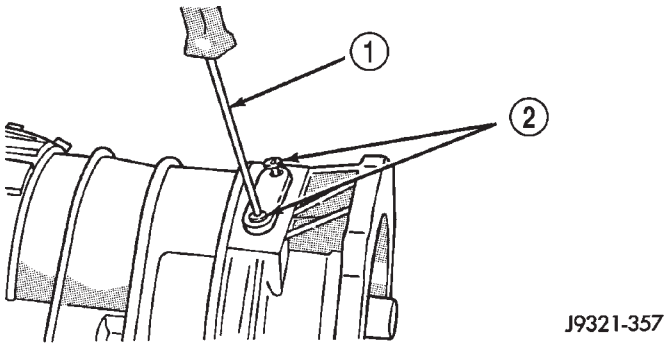

Fig. 217 Access Cover Screw Removal/Installation

1 – TORX SCREWDRIVER (T25)
2 – ACCESS COVER SCREWS

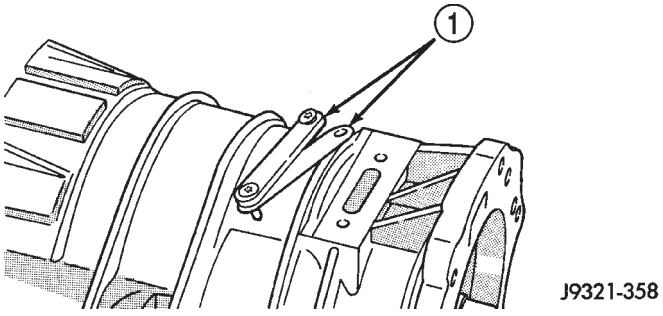

Fig. 218 Access Cover And Gasket Removal/ Installation

1 – ACCESS COVER AND GASKET

(5) Expand output shaft bearing snap ring with expanding-type snap ring pliers. Then push output shaft forward to release shaft bearing from locating ring (Fig. 219).

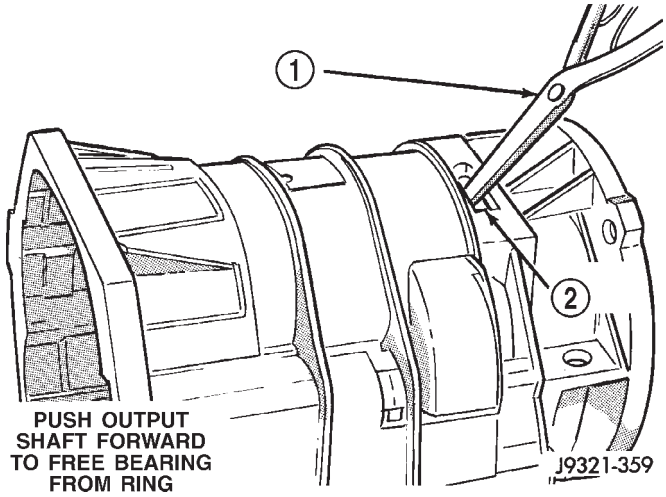

Fig. 219 Releasing Bearing From Locating Ring

1 – EXPAND BEARING LOCATING RING WITH SNAP RING PLIERS
2 – ACCESS HOLE

DISASSEMBLY AND ASSEMBLY (Continued)

(6) Lift gear case up and off geartrain assembly (Fig. 220).

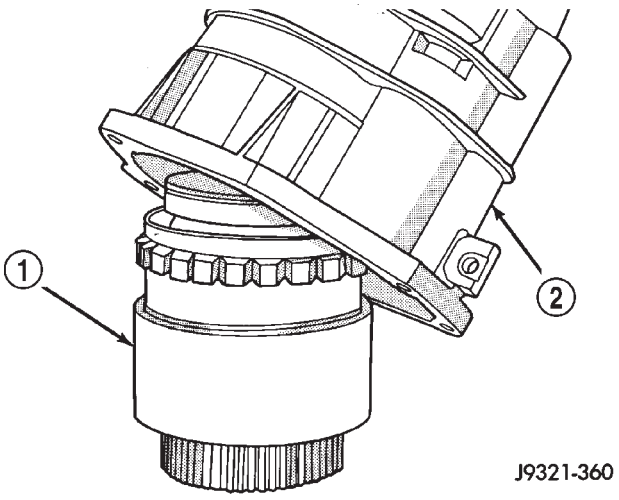

Fig. 220 Removing Gear Case From Geartrain Assembly

1 – GEARTRAIN ASSEMBLY
2 – GEAR CASE

(7) Remove snap ring that retains rear bearing on output shaft.

(8) Remove rear bearing from output shaft (Fig. 221).

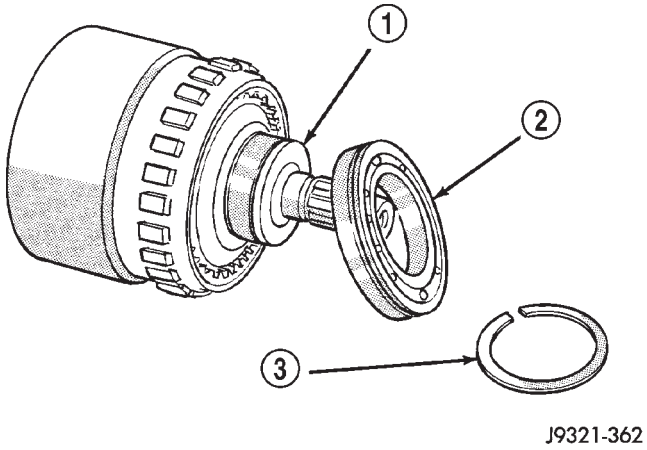

Fig. 221 Rear Bearing Removal

1 – OUTPUT SHAFT
2 – REAR BEARING
3 – SNAP RING

DIRECT CLUTCH, HUB AND SPRING DISASSEMBLY

WARNING: THE NEXT STEP IN DISASSEMBLY INVOLVES COMPRESSING THE DIRECT CLUTCH SPRING. IT IS EXTREMELY IMPORTANT THAT PROPER EQUIPMENT BE USED TO COMPRESS THE SPRING AS SPRING FORCE IS APPROXIMATELY 830 POUNDS. USE SPRING COMPRESSOR TOOL 6227-1 AND A HYDRAULIC SHOP PRESS WITH A MINIMUM RAM TRAVEL OF 5-6 INCHES. THE PRESS MUST ALSO HAVE A BED THAT CAN BE ADJUSTED UP OR DOWN AS REQUIRED. RELEASE CLUTCH SPRING TENSION SLOWLY AND COMPLETELY TO AVOID PERSONAL INJURY.

(1) Mount geartrain assembly in shop press (Fig. 222).

(2) Position Compressor Tool 6227-1 on clutch hub (Fig. 222). Support output shaft flange with steel press plates as shown and center assembly under press ram.

(3) Apply press pressure slowly. Compress hub and spring far enough to expose clutch hub retaining ring and relieve spring pressure on clutch pack snap ring (Fig. 222).

(4) Remove direct clutch pack snap ring (Fig. 223).

(5) Remove direct clutch hub retaining ring (Fig. 224).

(6) Release press load slowly and completely (Fig. 225).

(7) Remove Special Tool 6227-1. Then remove clutch pack from hub (Fig. 225).

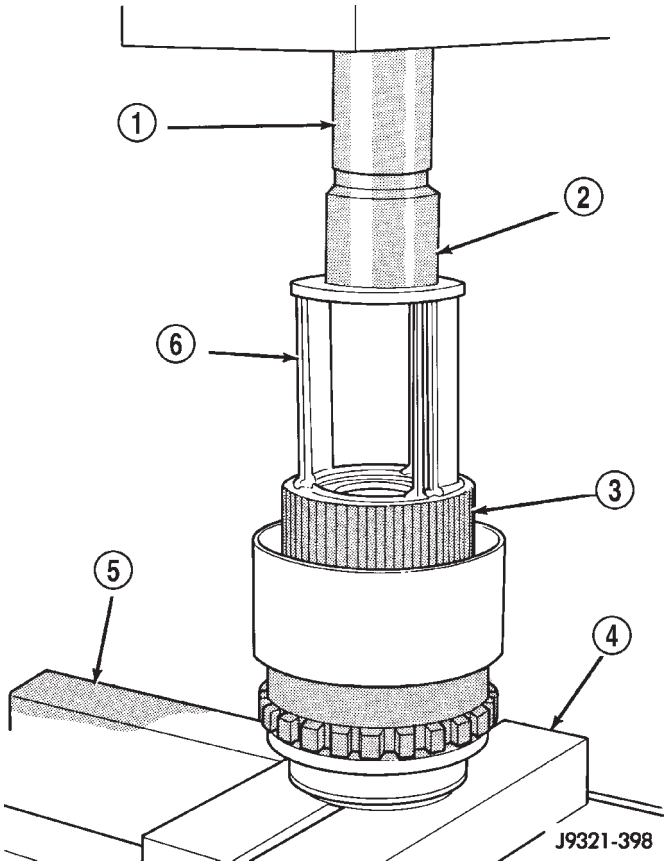

Fig. 222 Geartrain Mounted In Shop Press

1 – PRESS RAM
2 – SPECIAL TOOL C-3995–A (OR SIMILAR TOOL)
3 – CLUTCH HUB
4 – PLATES
5 – PRESS BED
6 – SPECIAL TOOL 6227–1

DISASSEMBLY AND ASSEMBLY (Continued)

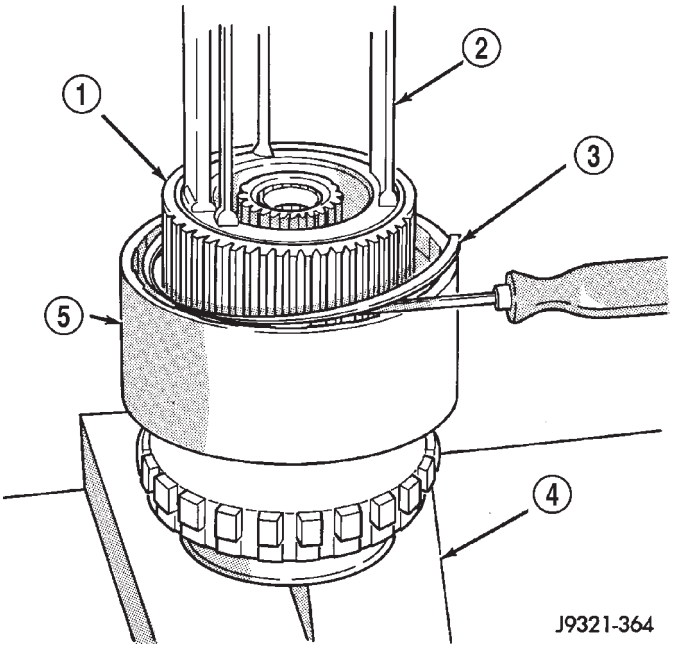

Fig. 223 Direct Clutch Pack Snap Ring Removal

1 – CLUTCH HUB
2 – SPECIAL TOOL 6227–1
3 – DIRECT CLUTCH PACK SNAP RING
4 – PRESS PLATES
5 – CLUTCH DRUM

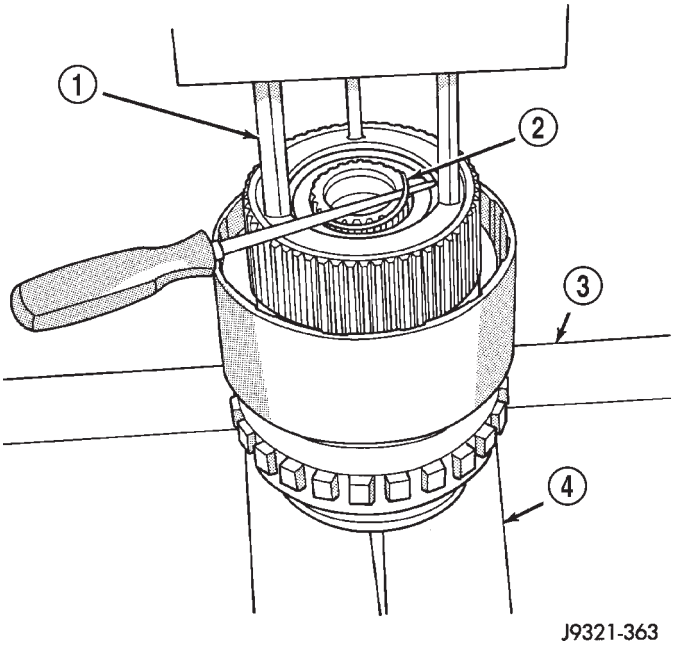

Fig. 224 Direct Clutch Hub Retaining Ring Removal

1 – SPECIAL TOOL 6227–1
2 – CLUTCH HUB RETAINING RING
3 – PRESS BED
4 – PRESS PLATES

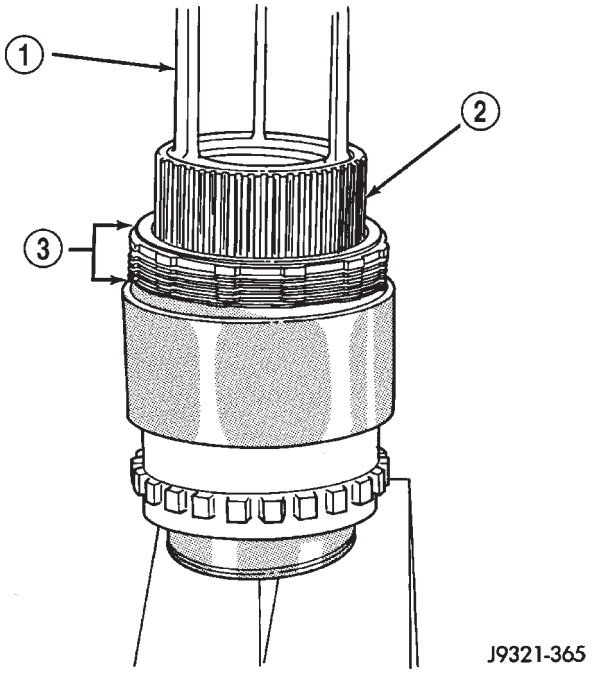

Fig. 225 Direct Clutch Pack Removal

1 – SPECIAL TOOL 6227–1
2 – DIRECT CLUTCH HUB
3 – DIRECT CLUTCH PACK

Geartrain Disassembly

(1) Remove direct clutch hub and spring (Fig. 226).

(2) Remove sun gear and spring plate. Then remove planetary thrust bearing and planetary gear (Fig. 227).

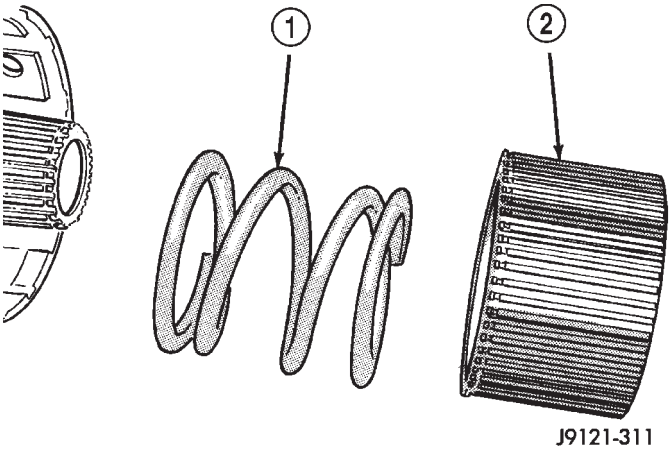

Fig. 226 Direct Clutch Hub And Spring Removal

1 – DIRECT CLUTCH SPRING
2 – DIRECT CLUTCH HUB

(3) Remove overrunning clutch assembly with expanding type snap ring pliers (Fig. 228). Insert pliers into clutch hub. Expand pliers to grip hub splines and remove clutch with counterclockwise, twisting motion.

DISASSEMBLY AND ASSEMBLY (Continued)

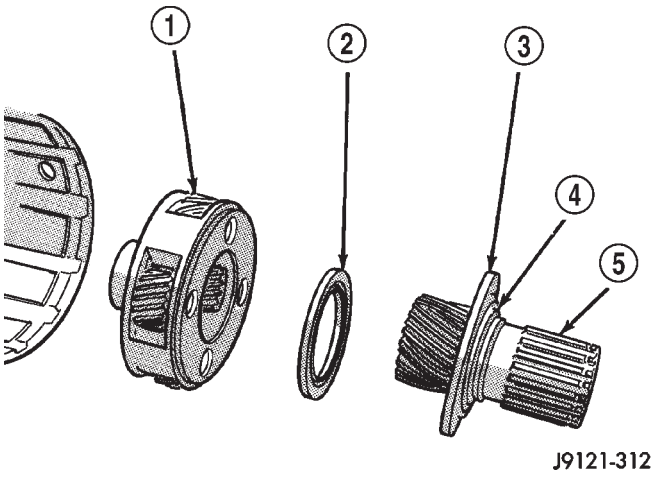

Fig. 227 Removing Sun Gear, Thrust Bearing And Planetary Gear

1 – PLANETARY GEAR
2 – PLANETARY THRUST BEARING
3 – CLUTCH SPRING PLATE
4 – SPRING PLATE SNAP RING
5 – SUN GEAR

(4) Remove thrust bearing from overrunning clutch hub.

(5) Remove overrunning clutch from hub.

(6) Mark position of annulus gear and direct clutch drum for assembly alignment reference (Fig. 229). Use small center punch or scriber to make alignment marks.

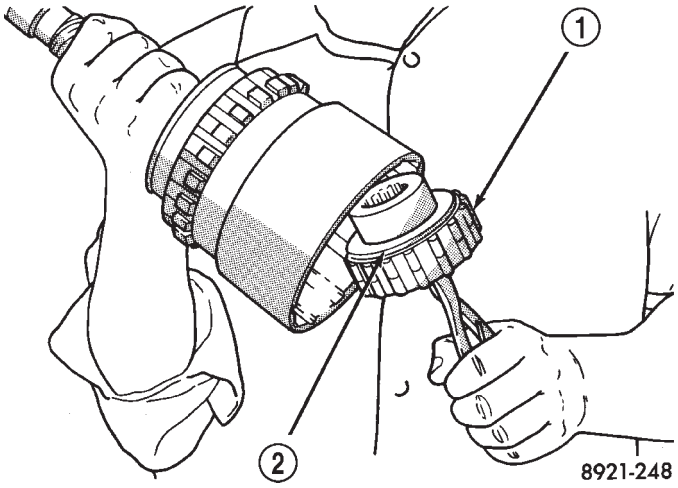

Fig. 228 Overrunning Clutch Assembly Removal/ Installation

1 – OVERRUNNING CLUTCH
2 – NEEDLE BEARING

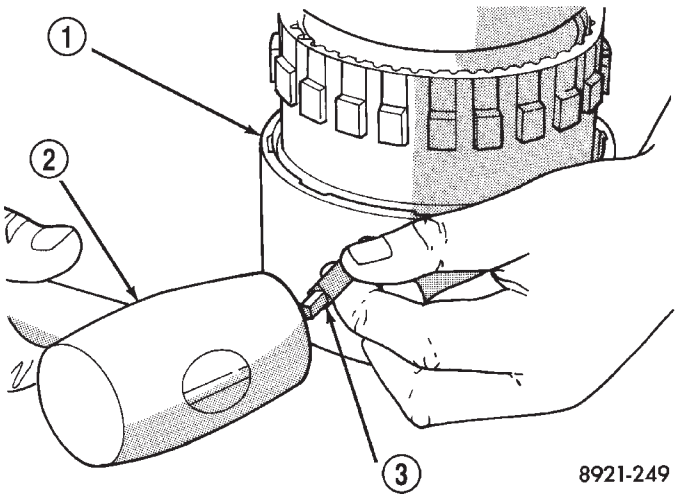

Fig. 229 Marking Direct Clutch Drum And Annulus Gear For Assembly Alignment

1 – DIRECT CLUTCH DRUM
2 – HAMMER
3 – PUNCH

(7) Remove direct clutch drum rear retaining ring (Fig. 230).

(8) Remove direct clutch drum outer retaining ring (Fig. 231).

(9) Mark annulus gear and output shaft for assembly alignment reference (Fig. 232). Use punch or scriber to mark gear and shaft.

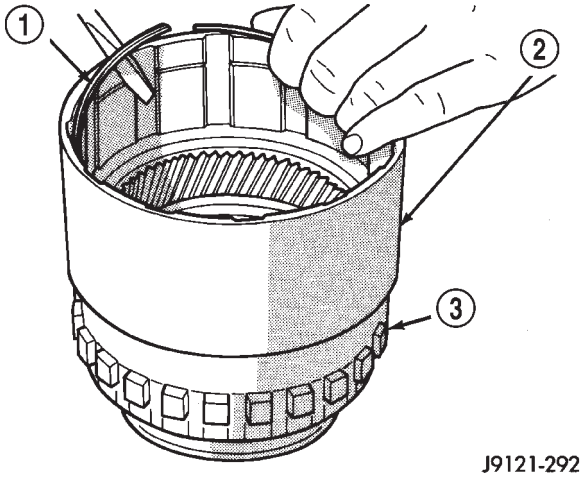

Fig. 230 Clutch Drum Inner Retaining Ring Removal

1 – INNER RETAINING RING
2 – DIRECT CLUTCH DRUM
3 – ANNULUS GEAR

DISASSEMBLY AND ASSEMBLY (Continued)

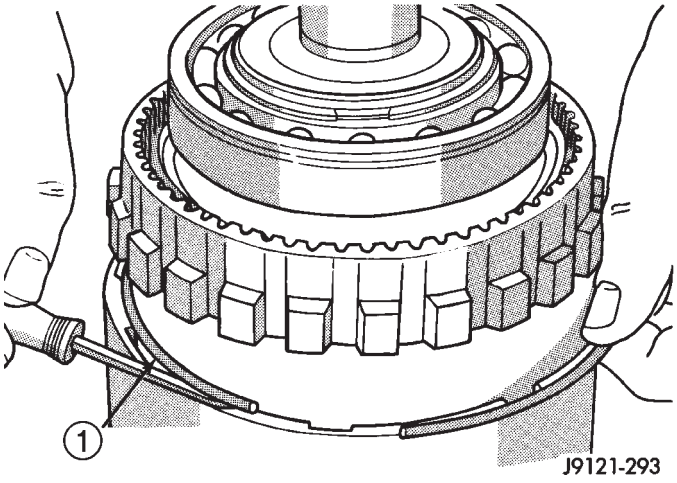

Fig. 231 Clutch Drum Outer Retaining Ring Removal

1 – OUTER RETAINING RING

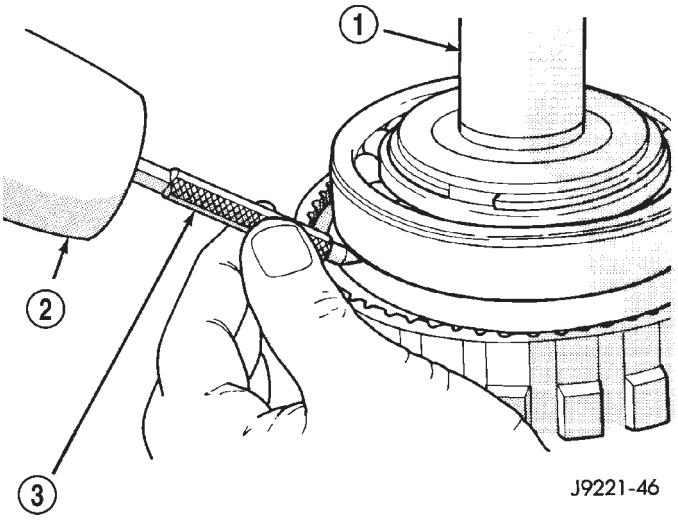

Fig. 232 Marking Annulus Gear And Output Shaft For Assembly Alignment

1 – OUTPUT SHAFT
2 – HAMMER
3 – PUNCH

(10) Remove snap ring that secures annulus gear on output shaft (Fig. 233). Use two screwdrivers to unseat and work snap ring out of groove as shown.

(11) Remove annulus gear from output shaft (Fig. 234). Use rawhide or plastic mallet to tap gear off shaft.

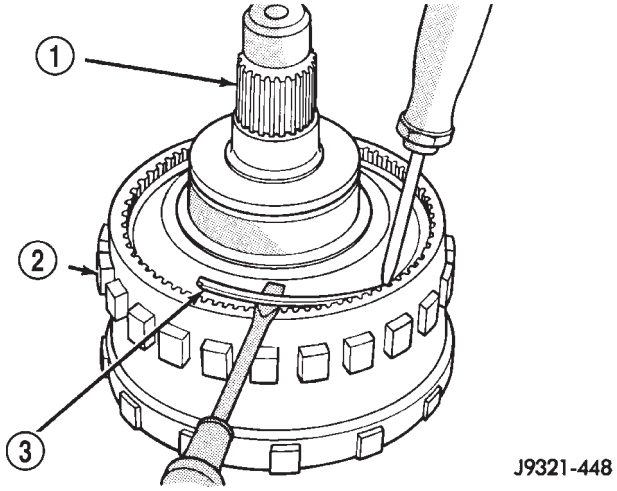

Fig. 233 Annulus Gear Snap Ring Removal

1 – OUTPUT SHAFT
2 – ANNULUS GEAR
3 – SNAP RING

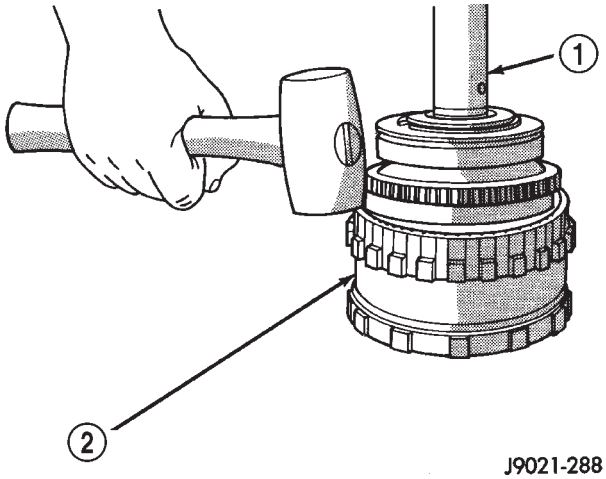

Fig. 234 Annulus Gear Removal

1 – OUTPUT SHAFT
2 – ANNULUS GEAR

GEAR CASE AND PARK LOCK DISASSEMBLY

(1) Remove locating ring from gear case.

(2) Remove park pawl shaft retaining bolt and remove shaft, pawl and spring.

(3) Remove reaction plug snap ring and remove reaction plug.

(4) Remove output shaft seal.

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLY

GEARTRAIN AND DIRECT CLUTCH ASSEMBLY

(1) Soak direct clutch and overdrive clutch discs in Mopar® ATF Plus 3, type 7176, transmission fluid. Allow discs to soak for 10-20 minutes.

(2) Install new pilot bushing and clutch hub bushing in output shaft if necessary (Fig. 235). Lubricate bushings with petroleum jelly, or transmission fluid.

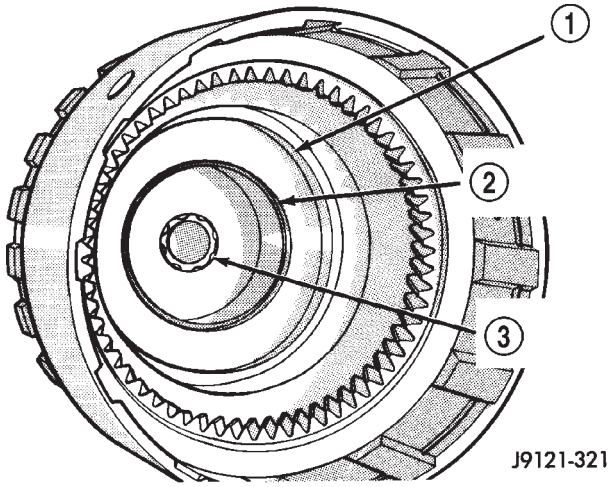

Fig. 235 Output Shaft Pilot Bushing

1 – OUTPUT SHAFT HUB
2 – OVERRUNNING CLUTCH HUB BUSHING
3 – INTERMEDIATE SHAFT PILOT BUSHING

(3) Install annulus gear on output shaft, if removed. Then install annulus gear retaining snap ring (Fig. 236).

(4) Align and install clutch drum on annulus gear (Fig. 237). Be sure drum is engaged in annulus gear lugs.

(5) Install clutch drum outer retaining ring (Fig. 237).

(6) Slide clutch drum forward and install inner retaining ring (Fig. 238).

(7) Install rear bearing and snap ring on output shaft (Fig. 239). Be sure locating ring groove in bearing is toward rear.

(8) Install overrunning clutch on hub (Fig. 240). **Note that clutch only fits one way. Shoulder on clutch should seat in small recess at edge of hub.**

(9) Install thrust bearing on overrunning clutch hub. Use generous amount of petroleum jelly to hold bearing in place for installation. **Bearing fits one way only. Be sure bearing is seated squarely against hub. Reinstall bearing if it does not seat squarely.**

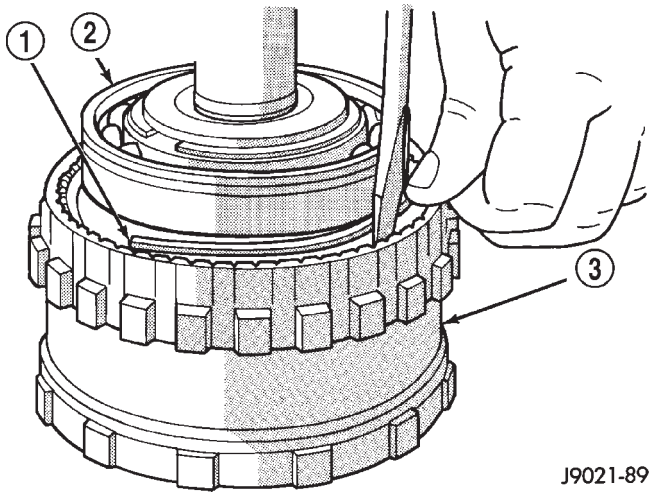

Fig. 236 Annulus Gear Installation

1 – SNAP RING
2 – OUTPUT SHAFT FRONT BEARING
3 – ANNULUS GEAR

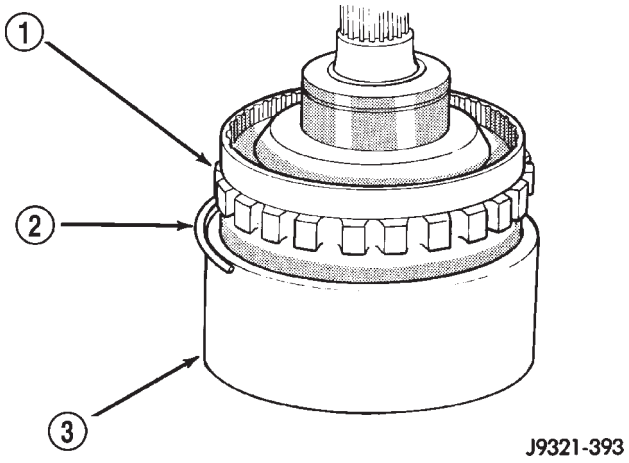

Fig. 237 Clutch Drum And Outer Retaining Ring Installation

1 – ANNULUS GEAR
2 – OUTER SNAP RING
3 – CLUTCH DRUM

(10) Install overrunning clutch in output shaft (Fig. 241). Insert snap ring pliers in hub splines. Expand pliers to grip hub. Then install assembly with counterclockwise, twisting motion.

(11) Install planetary gear in annulus gear (Fig. 242). **Be sure planetary pinions are fully seated in annulus gear before proceeding.**

DISASSEMBLY AND ASSEMBLY (Continued)

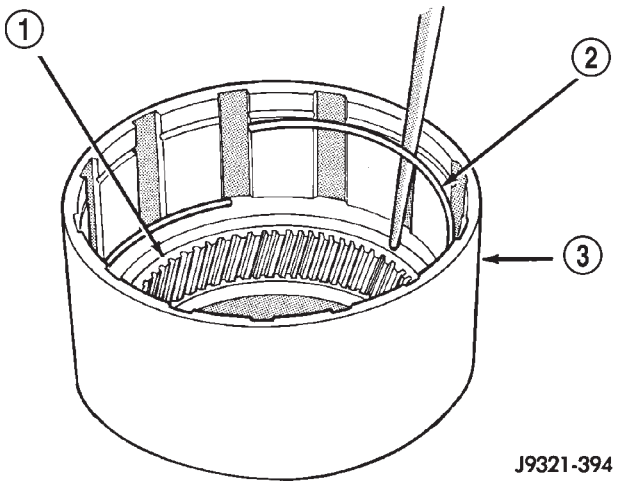

Fig. 238 Clutch Drum Inner Retaining Ring Installation

1 – ANNULUS GEAR
2 – INNER SNAP RING
3 – CLUTCH DRUM

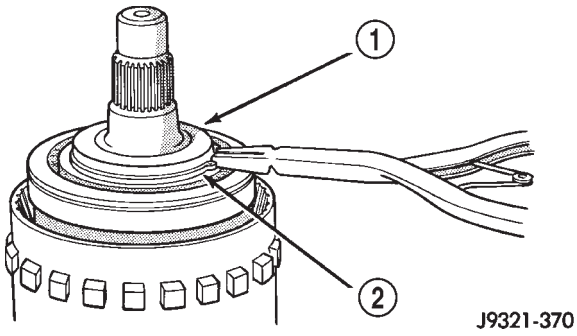

Fig. 239 Rear Bearing And Snap Ring Installation

1 – REAR BEARING
2 – SNAP RING

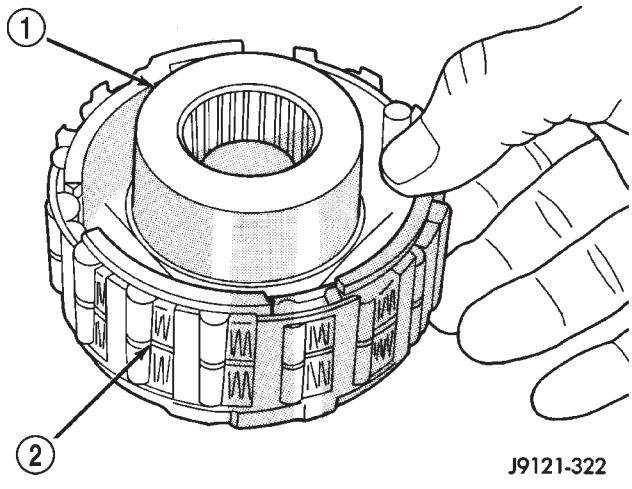

Fig. 240 Assembling Overrunning Clutch And Hub

1 – CLUTCH HUB
2 – OVERRUNNING CLUTCH

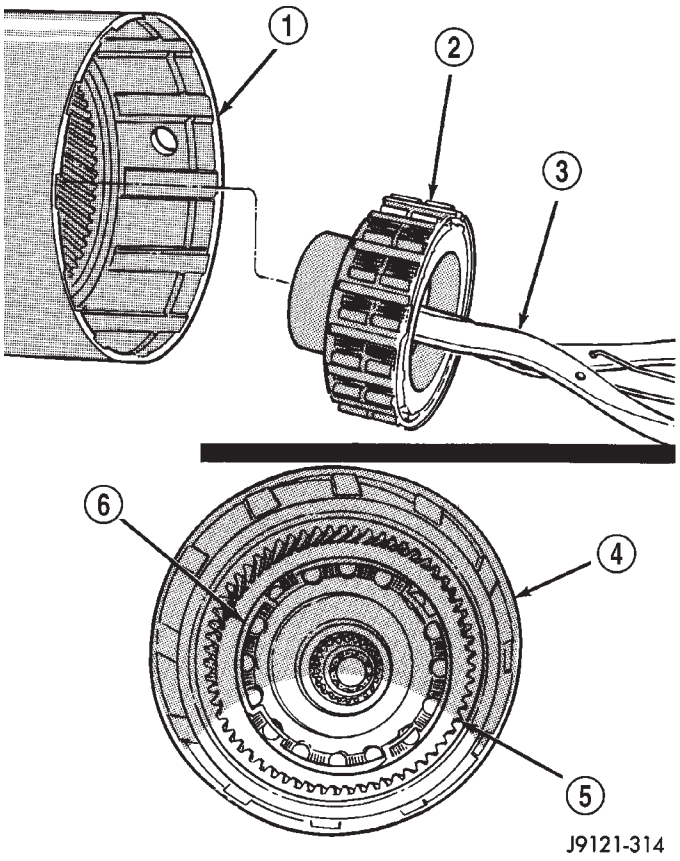

Fig. 241 Overrunning Clutch Installation

1 – CLUTCH DRUM
2 – OVERRUNNING CLUTCH ASSEMBLY
3 – EXPANDING-TYPE SNAP RING PLIERS
4 – CLUTCH DRUM
5 – ANNULUS GEAR
6 – OVERRUNNING CLUTCH ASSEMBLY SEATED IN OUTPUT SHAFT

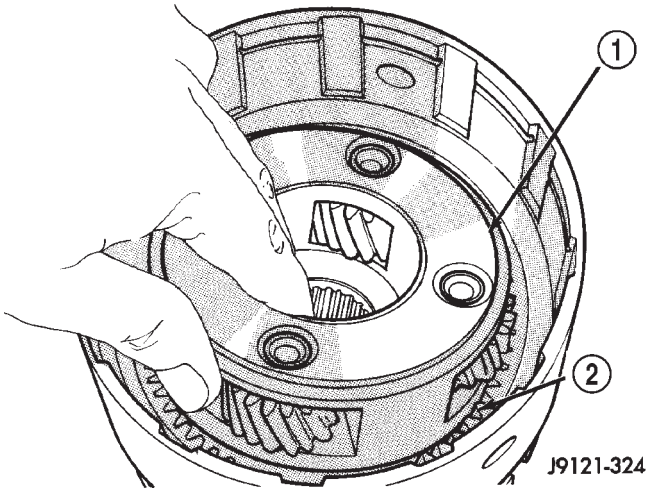

Fig. 242 Planetary Gear Installation

1 – PLANETARY GEAR
2 – ANNULUS GEAR

DISASSEMBLY AND ASSEMBLY (Continued)

(12) Coat planetary thrust bearing and bearing contact surface of spring plate with generous amount of petroleum jelly. This will help hold bearing in place during installation.

(13) Install planetary thrust bearing on sun gear (Fig. 243). Slide bearing onto gear and seat it against spring plate as shown. **Bearing fits one way only. If it does not seat squarely against spring plate, remove and reposition bearing.**

(14) Install assembled sun gear, spring plate and thrust bearing (Fig. 244). Be sure sun gear and thrust bearing are fully seated before proceeding.

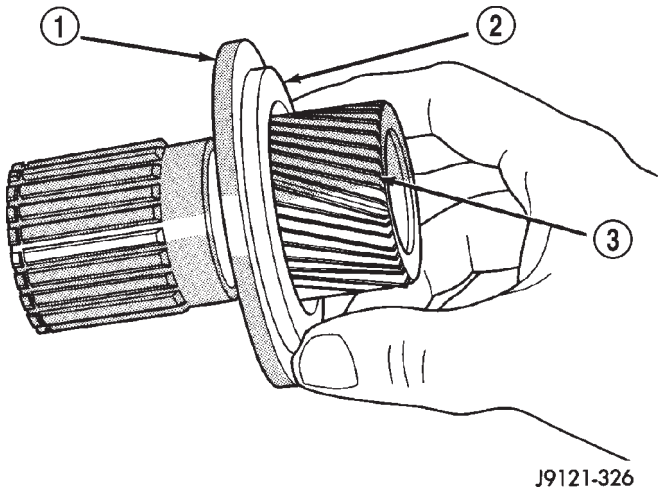

Fig. 243 Planetary Thrust Bearing Installation

1 – SPRING PLATE
2 – PLANETARY THRUST BEARING
3 – SUN GEAR

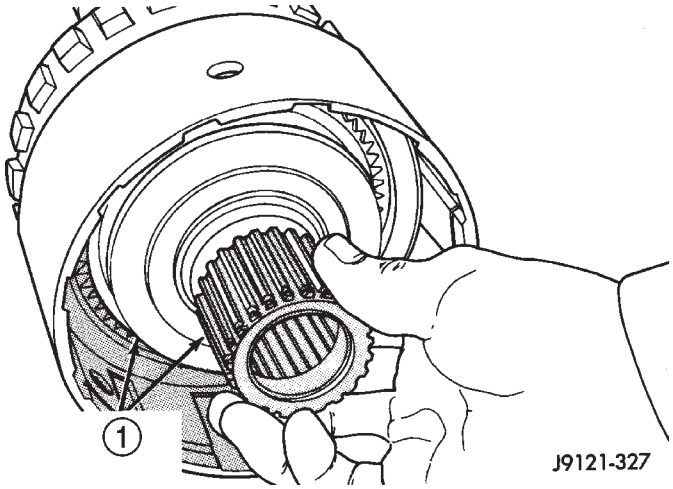

Fig. 244 Sun Gear Installation

1 – SUN GEAR AND SPRING PLATE ASSEMBLY

(15) Mount assembled output shaft, annulus gear, and clutch drum in shop press. Direct clutch spring, hub and clutch pack are easier to install with assembly mounted in press.

(16) Align splines in hubs of planetary gear and overrunning clutch with Alignment tool 6227-2 (Fig. 245). Insert tool through sun gear and into splines of both hubs. Be sure alignment tool is fully seated before proceeding.

(17) Install direct clutch spring (Fig. 246). Be sure spring is properly seated on spring plate.

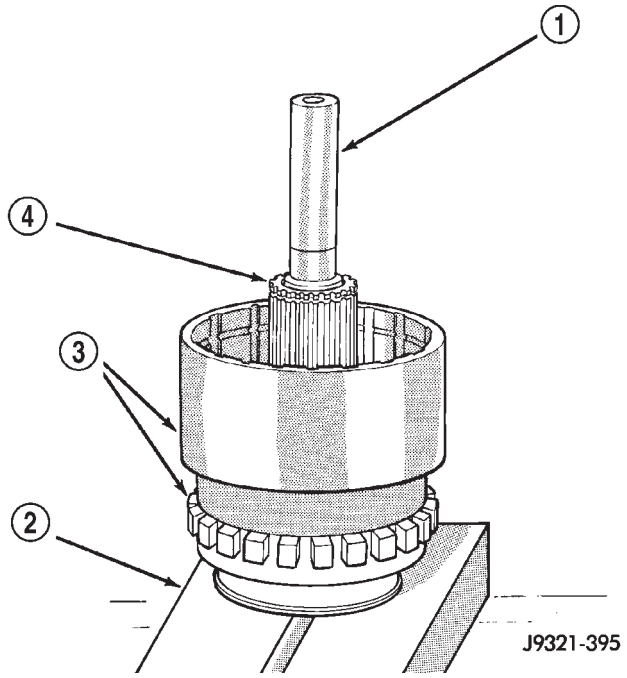

Fig. 245 Alignment Tool Installation

1 – SPECIAL TOOL 6227–2
2 – PRESS PLATES
3 – ASSEMBLED DRUM AND ANNULUS GEAR
4 – SUN GEAR

NOTE: The 44RE transmission has 8 direct clutch discs and 7 clutch plates.

(18) Assemble and install direct clutch pack on hub as follows:

(a) Assemble clutch pack components or (Fig. 247).

(b) Install direct clutch reaction plate on clutch hub first. **Note that one side of reaction plate is counterbored. Be sure this side faces rearward. Splines at rear of hub are raised slightly. Counterbore in plate fits over raised splines. Plate should be flush with this end of hub (Fig. 248).**

(c) Install first clutch disc followed by a steel plate until all discs and plates have been installed.

DISASSEMBLY AND ASSEMBLY (Continued)

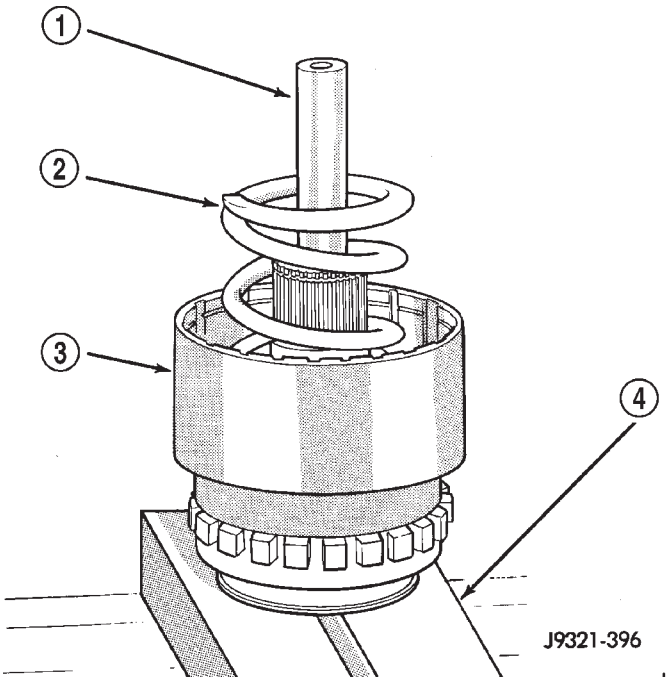

Fig. 246 Direct Clutch Spring Installation

1 – SPECIAL TOOL 6227–2
2 – DIRECT CLUTCH SPRING
3 – CLUTCH HUB
4 – PRESS PLATES

(d) Install pressure plate. This is last clutch pack item to be installed. **Be sure plate is installed with shoulder side facing upward (Fig. 249).**

(19) Install clutch hub and clutch pack on direct clutch spring (Fig. 250). **Be sure hub is started on sun gear splines before proceeding.**

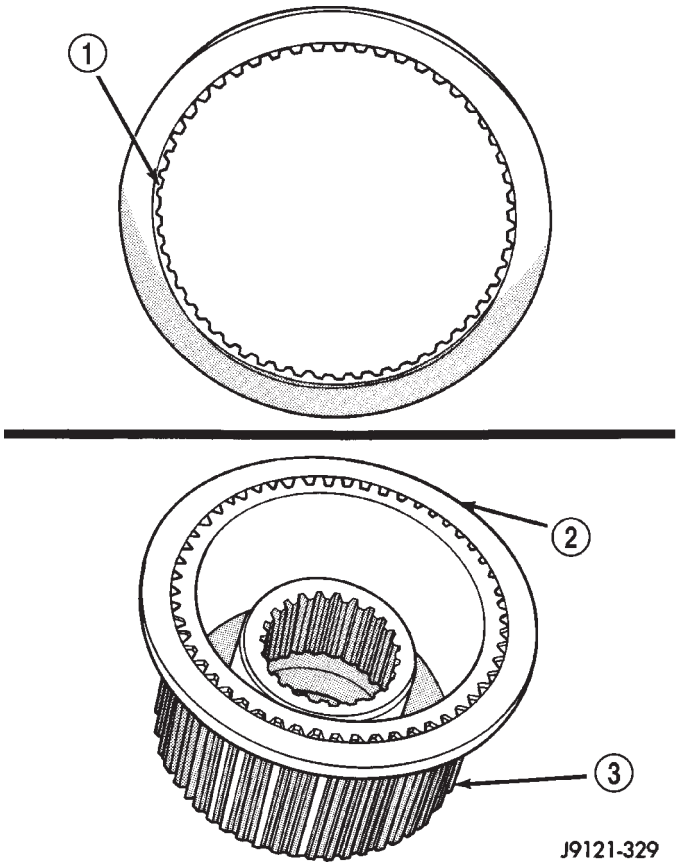

Fig. 248 Correct Position Of Direct Clutch Reaction Plate

1 – REACTION PLATE COUNTERBORE
2 – DIRECT CLUTCH REACTION PLATE (FLUSH WITH END OF HUB)
3 – CLUTCH HUB

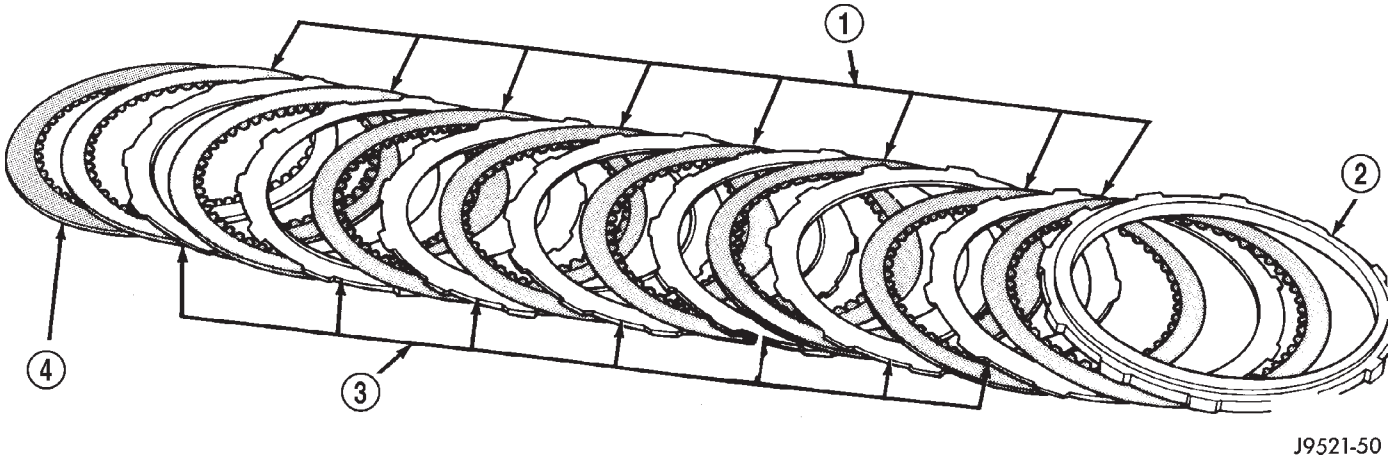

Fig. 247 44RE Direct Clutch Pack Components

1 – CLUTCH DISCS (8)
2 – PRESSURE PLATE
3 – CLUTCH PLATES (7)
4 – REACTION PLATE

DISASSEMBLY AND ASSEMBLY (Continued)

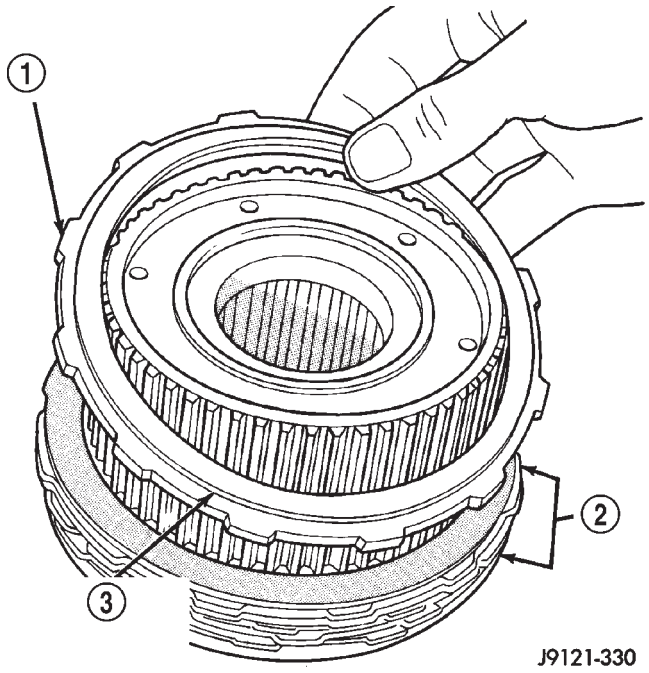

Fig. 249 Correct Position Of Direct Clutch Pressure Plate

1 – DIRECT CLUTCH PRESSURE PLATE
2 – CLUTCH PACK
3 – BE SURE SHOULDER SIDE OF PLATE FACES UPWARD

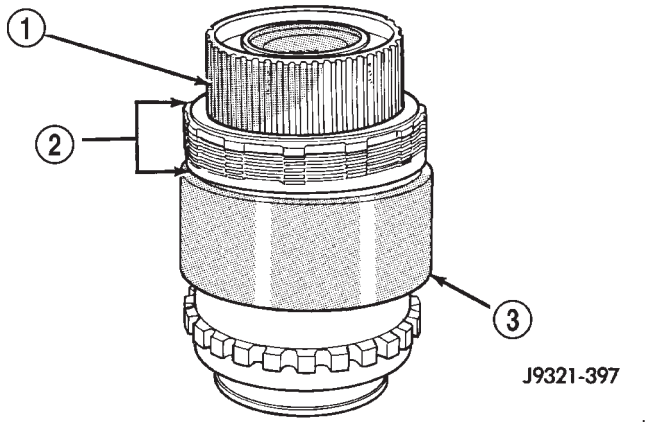

Fig. 250 Direct Clutch Pack And Clutch Hub Installation

1 – CLUTCH HUB
2 – DIRECT CLUTCH PACK
3 – CLUTCH DRUM

WARNING: THE NEXT STEP IN GEARTRAIN ASSEMBLY INVOLVES COMPRESSING THE DIRECT CLUTCH HUB AND SPRING. IT IS EXTREMELY IMPORTANT THAT PROPER EQUIPMENT BE USED TO COMPRESS THE SPRING AS SPRING FORCE IS APPROXIMATELY 830 POUNDS. USE COMPRESSOR TOOL C-6227-1 AND A HYDRAULIC-TYPE SHOP PRESS WITH A MINIMUM RAM TRAVEL OF 6 INCHES. THE PRESS MUST ALSO HAVE A BED THAT CAN BE ADJUSTED UP OR DOWN AS REQUIRED. RELEASE CLUTCH SPRING TENSION SLOWLY AND COMPLETELY TO AVOID PERSONAL INJURY.

(20) Position Compressor Tool 6227-1 on clutch hub.

(21) Compress clutch hub and spring just enough to place tension on hub and hold it in place.

(22) Slowly compress clutch hub and spring. Compress spring and hub only enough to expose ring grooves for clutch pack snap ring and clutch hub retaining ring.

(23) Realign clutch pack on hub and seat clutch discs and plates in clutch drum.

(24) Install direct clutch pack snap ring (Fig. 251). **Be very sure snap ring is fully seated in clutch drum ring groove.**

(25) Install clutch hub retaining ring (Fig. 252). **Be very sure retaining ring is fully seated in sun gear ring groove.**

(26) Slowly release press ram, remove compressor tools and remove geartrain assembly.

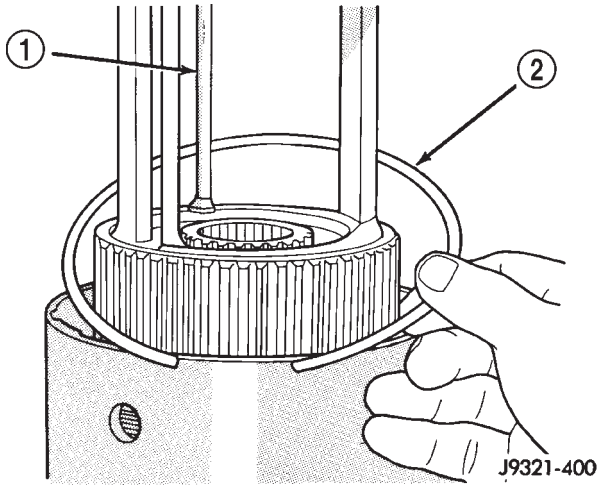

Fig. 251 Direct Clutch Pack Snap Ring Installation

1 – SPECIAL TOOL 6227–1
2 – DIRECT CLUTCH PACK SNAP RING

DISASSEMBLY AND ASSEMBLY (Continued)

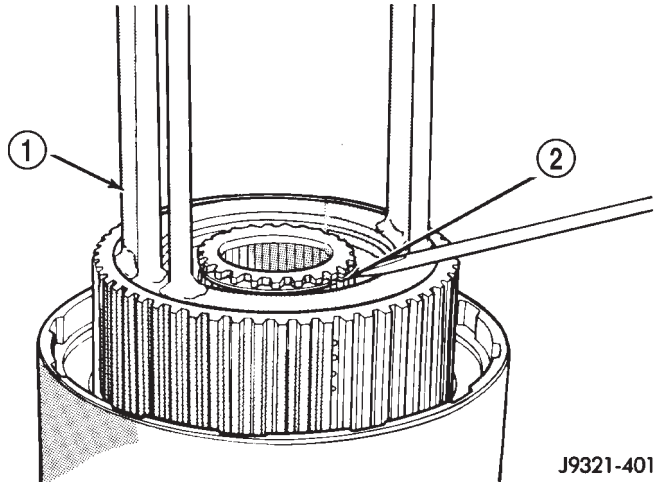

Fig. 252 Clutch Hub Retaining Ring Installation

1 – SPECIAL TOOL 6227–1
2 – CLUTCH HUB RETAINING RING

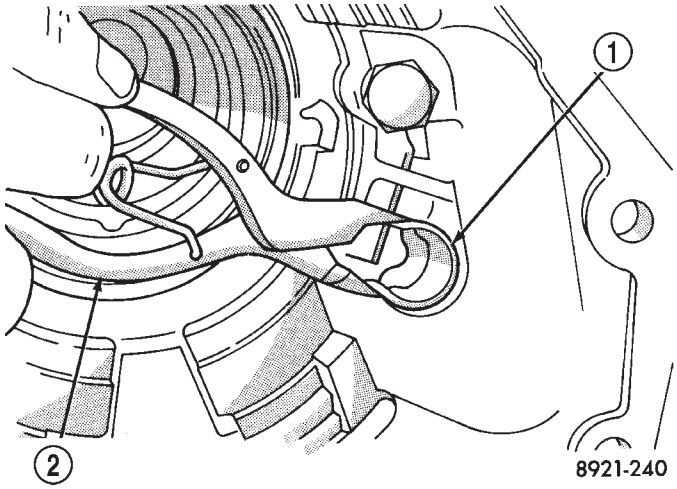

Fig. 254 Reaction Plug And Snap-Ring Installation

1 – REACTION PLUG SNAP RING
2 – SNAP RING PLIERS

GEAR CASE ASSEMBLY

(1) Position park pawl and spring in case and install park pawl shaft. Verify that end of spring with 90° bend is hooked to pawl and straight end of spring is seated against case.

(2) Install pawl shaft retaining bolt. Tighten bolt to 27 N·m (20 ft. lbs.) torque.

(3) Install park lock reaction plug. **Note that plug has locating pin at rear (Fig. 253). Be sure pin is seated in hole in case before installing snap ring.**

(4) Install reaction plug snap-ring (Fig. 254). **Compress snap ring only enough for installation; do not distort it.**

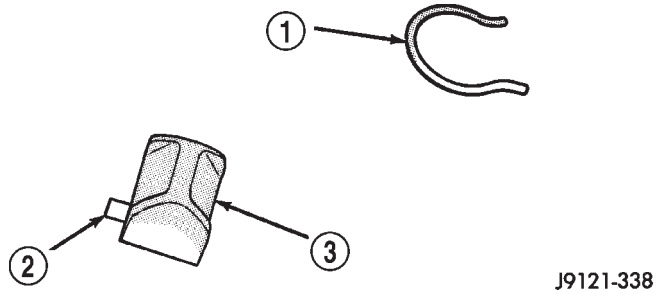

Fig. 253 Reaction Plug Locating Pin And Snap-Ring

1 – REACTION PLUG SNAP RING (DO NOT OVERCOMPRESS TO INSTALL)
2 – LOCATING PIN
3 – PARK LOCK REACTION PLUG

(5) Install new seal in gear case. On 4x4 gear case, use Tool Handle C-4171 and Installer C-3860-A to seat seal in case. On 4 x 2 gear case, use same Handle C-4171 and Installer C-3995-A to seat seal in case.

(6) Verify that tab ends of rear bearing locating ring extend into access hole in gear case (Fig. 255).

(7) Support geartrain on Tool 6227-1 (Fig. 256). Be sure tool is securely seated in clutch hub.

(8) Install overdrive gear case on geartrain (Fig. 256).

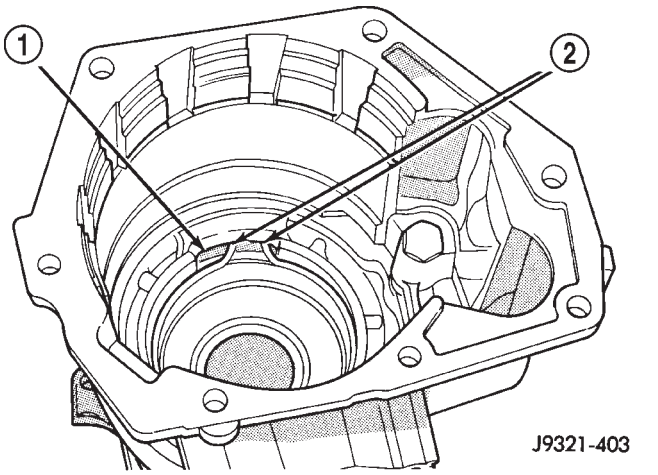

Fig. 255 Correct Rear Bearing Locating Ring Position

1 – CASE ACCESS HOLE
2 – TAB ENDS OF LOCATING RING

(9) Expand front bearing locating ring with snap ring pliers (Fig. 257). Then slide case downward until locating ring locks in bearing groove and release snap ring.

(10) Install locating ring access cover and gasket in overdrive unit case (Fig. 258).

OVERDRIVE CLUTCH ASSEMBLY

(1) Install overdrive clutch reaction ring first. Reaction ring is flat with notched ends (Fig. 259).

DISASSEMBLY AND ASSEMBLY (Continued)

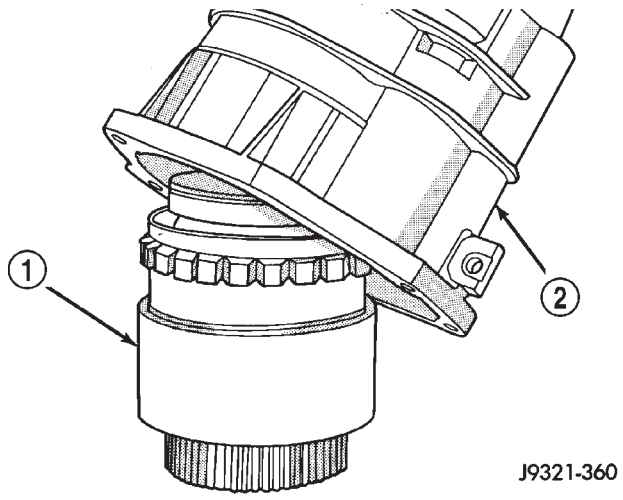

Fig. 256 Overdrive Gear Case Installation

1 – GEARTRAIN ASSEMBLY
2 – GEAR CASE

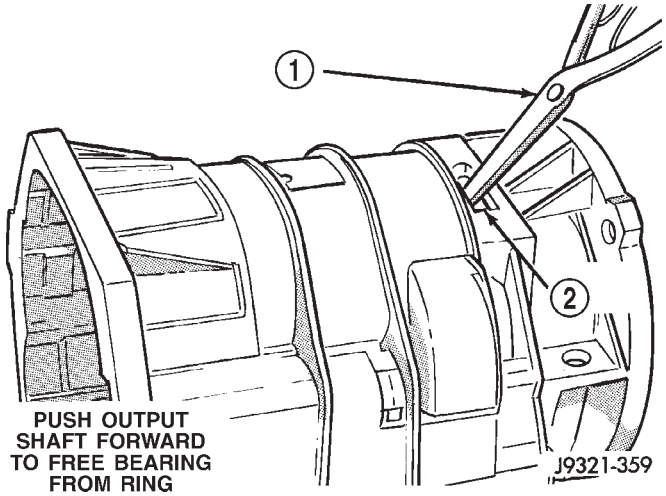

Fig. 257 Seating Locating Ring In Rear Bearing

1 – EXPAND BEARING LOCATING RING WITH SNAP RING PLIERS
2 – ACCESS HOLE

(2) Install wave spring on top of reaction ring (Fig. 260). **Reaction ring and wave ring both fit in same ring groove.** Use screwdriver to seat each ring securely in groove. Also ensure that the ends of the two rings are offset from each other.

NOTE: The 44RE transmission has 4 overdrive clutch discs and 3 plates

(3) Assemble overdrive clutch pack.
(4) Install overdrive clutch reaction plate first.
(5) Install first clutch disc followed by first clutch plate. Then install remaining clutch discs and plates in same order.
(6) Install clutch pack pressure plate.

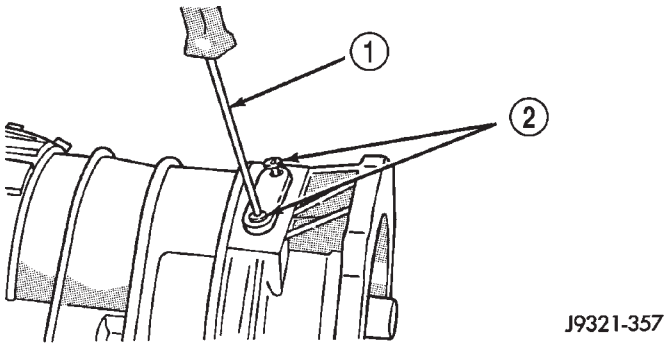

Fig. 258 Locating Ring Access Cover And Gasket Installation

1 – TORX SCREWDRIVER (T25)
2 – ACCESS COVER SCREWS

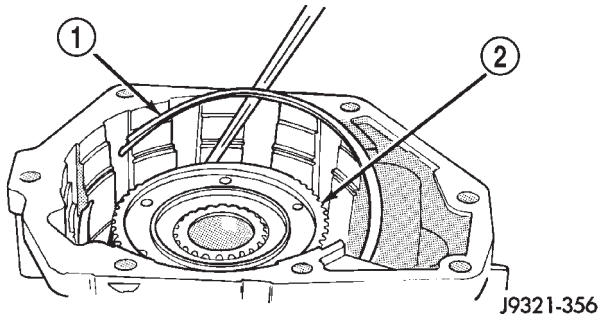

Fig. 259 Overdrive Clutch Reaction Ring Installation

1 – REACTION RING
2 – CLUTCH HUB

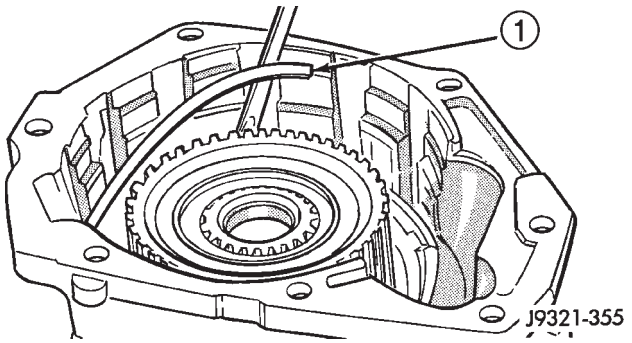

Fig. 260 Overdrive Clutch Wave Spring Installation

1 – WAVE SPRING

(7) Install clutch pack wire-type retaining ring (Fig. 261).

INTERMEDIATE SHAFT SPACER SELECTION

(1) Place overdrive unit in vertical position. Mount it on blocks, or in workbench with appropriate size mounting hole cut into it. Be sure unit is facing upward for access to direct clutch hub. Also be sure output shaft is not loaded and internal components are moved rearward for accurate measurement.

DISASSEMBLY AND ASSEMBLY (Continued)

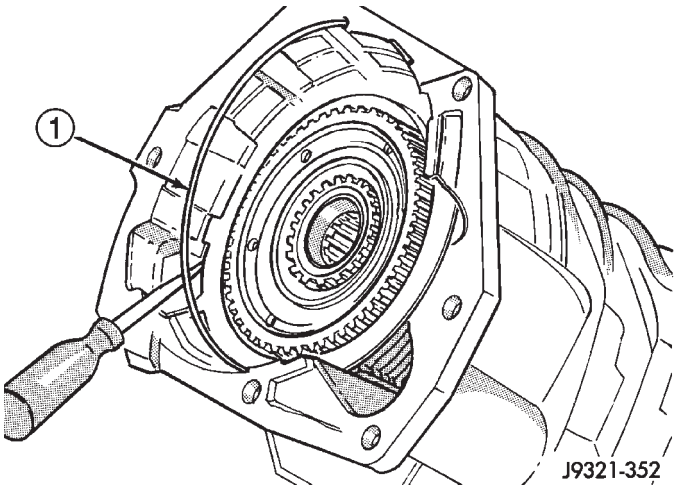

Fig. 261 Overdrive Clutch Pack Retaining Ring Installation

1 – OVERDRIVE CLUTCH PACK RETAINING RING

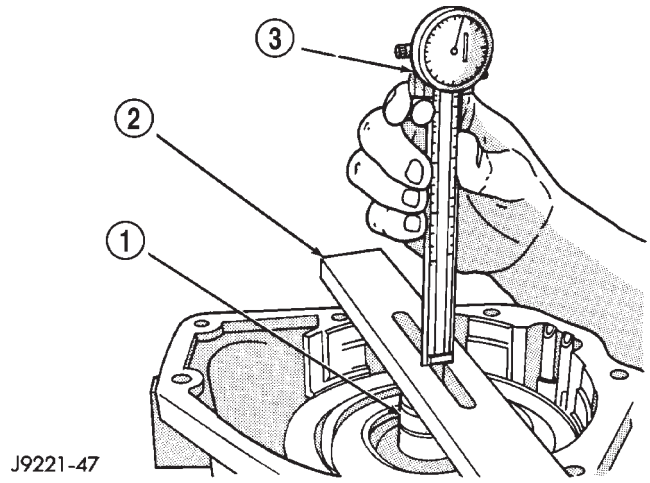

Fig. 262 Shaft End Play Measurement

1 – SPECIAL TOOL 6312
2 – SPECIAL TOOL 6311
3 – SPECIAL TOOL C-4962

(2) Determine correct thickness intermediate shaft spacer as follows:

(a) Insert Special Tool 6312 through sun gear, planetary gear and into pilot bushing in output shaft. Be sure tool bottoms against planetary shoulder.

(b) Position Gauge Tool 6311 across face of overdrive case (Fig. 262). Then position Dial Caliper C-4962 over gauge tool.

(c) Extend sliding scale of dial caliper downward through gauge tool slot until scale contacts end of Gauge Alignment Tool 6312. Lock scale in place. Remove dial caliper tool and note distance measured (Fig. 262).

(d) Select proper thickness end play spacer from spacer chart based on distance measured (Fig. 263).

(e) Remove Gauge Alignment Tool 6312.

End Play Measurement (Inches)	Spacer Thickness (Inches)
.7336 - .7505	.158 - .159
.7506 - .7675	.175 - .176
.7676 - .7855	.193 - .194
.7856 - .8011	.211 - .212

J9121-341

Fig. 263 Intermediate Shaft End Play Spacer Selection

OD THRUST PLATE SELECTION

(1) Place overdrive unit in vertical position. Mount it on blocks, or in workbench with appropriate size mounting hole cut into it. Be sure unit is facing upward for access to direct clutch hub. Also be sure output shaft is not loaded and internal components are moved rearward for accurate measurement.

(2) Determine correct thickness overdrive piston thrust plate as follows:

(a) Position Gauge Tool 6311 across face of overdrive case. Then position Dial Caliper C-4962 over gauge tool (Fig. 264).

(b) Measure distance to clutch hub thrust bearing seat at four points 90° apart. Then average measurements by adding them and dividing by 4.

(c) Select and install required thrust plate from information in thrust plate chart (Fig. 265).

(3) Leave Alignment Tool 6227-2 in place. Tool will keep planetary and clutch hub splines in alignment until overdrive unit is ready for installation on transmission.

(4) Transmission speed sensor can be installed at this time if desired. However, it is recommended that sensor not be installed until after overdrive unit is secured to transmission.

OVERDRIVE PISTON ASSEMBLY

(1) Install new seals on over drive piston.

(2) Stand transmission case upright on bellhousing.

(3) Position Guide Ring 8114-1 on outer edge of overdrive piston retainer.

(4) Position Seal Guide 8114-2 on inner edge of overdrive piston retainer.

(5) Install overdrive piston in overdrive piston retainer by: aligning locating lugs on overdrive piston to the two mating holes in retainer.

(a) Aligning locating lugs on overdrive piston to the two mating holes in retainer.

DISASSEMBLY AND ASSEMBLY (Continued)

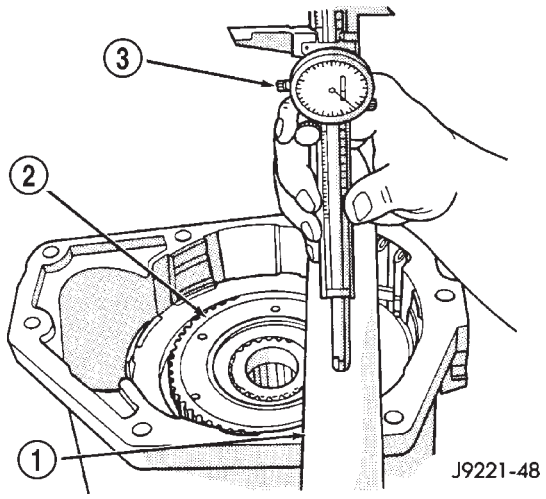

Fig. 264 Overdrive Piston Thrust Plate Measurement

1 – SPECIAL TOOL 6311
2 – DIRECT CLUTCH HUB THRUST BEARING SEAT
3 – SPECIAL TOOL C-4962

End Play Measurement (Inches)	Spacer Thickness (Inches)
1.7500 - 1.7649	.108 - .110
1.7650 - 1.7799	.123 - .125
1.7800 - 1.7949	.138 - .140
1.7950 - 1.8099	.153 - .155
1.8100 - 1.8249	.168 - .170
1.8250 - 1.8399	.183 - .185
1.8400 - 1.8549	.198 - .200
1.8550 - 1.8699	.213 - .215
1.8700 - 1.8849	.228 - .230
1.8850 - 1.8999	.243 - .245

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Fig. 265 Overdrive Piston Thrust Plate Selection

(b) Lubricate overdrive piston seals with Mopar® Door Ease, or equivalent.

(c) Install piston over Seal Guide 8114–2 and inside Guide Ring 8114–1.

(d) Push overdrive piston into position in retainer.

(e) Verify that the locating lugs entered the lug bores in the retainer.

(6) Install intermediate shaft spacer on intermediate shaft.

(7) Install overdrive piston thrust plate on overdrive piston.

(8) Install overdrive piston thrust bearing on overdrive piston.

(9) Install transmission speed sensor and O-ring seal in overdrive case (Fig. 208).

CLEANING AND INSPECTION

VALVE BODY

Clean the valve housings, valves, plugs, springs, and separator plates with a standard parts cleaning solution only. Do not use gasoline, kerosene, or any type of caustic solution.

Do not immerse any of the electrical components in cleaning solution. Clean the governor solenoid and sensor and the dual solenoid and harness assembly by wiping them off with dry shop towels only.

Dry all except the electrical parts with compressed air. Make sure all passages are clean and free from obstructions. **Do not use rags or shop towels to dry or wipe off valve body components. Lint from these materials can stick to valve body parts, interfere with valve operation, and clog filters and fluid passages.**

Wipe the governor pressure sensor and solenoid valve with dry, lint free shop towels only. The O-rings on the sensor and solenoid valve are the only serviceable components. Be sure the vent ports in the solenoid valve are open and not blocked by dirt or debris. Replace the valve and/or sensor only when DRB scan tool diagnosis indicates this is necessary. Or, if either part has sustained physical damage (dented, deformed, broken, etc.).

CAUTION: Do not turn the small screw at the end of the solenoid valve for any reason. Turning the screw in either direction will ruin solenoid calibration and result in solenoid failure. In addition, the filter on the solenoid valve is NOT serviceable. Do not try to remove the filter as this will damage the valve housing.

Inspect the throttle and manual valve levers and shafts. Do not attempt to straighten a bent shaft or correct a loose lever. Replace these components if worn, bent, loose or damaged in any way.

Inspect all of the valve body mating surfaces for scratches, nicks, burrs, or distortion. Use a straightedge to check surface flatness. Minor scratches may be removed with crocus cloth using only very light pressure.

Minor distortion of a valve body mating surface may be corrected by smoothing the surface with a sheet of crocus cloth. Position the crocus cloth on a surface plate, sheet of plate glass or equally flat surface. If distortion is severe or any surfaces are heavily scored, the valve body will have to be replaced.

CLEANING AND INSPECTION (Continued)

CAUTION: Many of the valves and plugs, such as the throttle valve, shuttle valve plug, 1-2 shift valve and 1-2 governor plug, are made of coated aluminum. Aluminum components are identified by the dark color of the special coating applied to the surface (or by testing with a magnet). Do not sand aluminum valves or plugs under any circumstances. This practice could damage the special coating causing the valves/plugs to stick and bind.

Inspect the valves and plugs for scratches, burrs, nicks, or scores. Minor surface scratches on steel valves and plugs can be removed with crocus cloth but **do not round off the edges of the valve or plug lands.** Maintaining sharpness of these edges is vitally important. The edges prevent foreign matter from lodging between the valves and plugs and the bore.

Inspect all the valve and plug bores in the valve body. Use a penlight to view the bore interiors. Replace the valve body if any bores are distorted or scored. Inspect all of the valve body springs. The springs must be free of distortion, warpage or broken coils.

Check the two separator plates for distortion or damage of any kind. Inspect the upper housing, lower housing, 3-4 accumulator housing, and transfer plate carefully. Be sure all fluid passages are clean and clear. Check condition of the upper housing and transfer plate check balls as well. The check balls and ball seats must not be worn or damaged.

Trial fit each valve and plug in its bore to check freedom of operation. When clean and dry, the valves and plugs should drop freely into the bores.

Valve body bores do not change dimensionally with use. If the valve body functioned correctly when new, it will continue to operate properly after cleaning and inspection. It should not be necessary to replace a valve body assembly unless it is damaged in handling.

The only serviceable valve body components are listed below. The remaining valve body components are serviced only as part of a complete valve body assembly. Serviceable parts are:

- dual solenoid and harness assembly
- solenoid gasket
- solenoid case connector O-rings and shoulder bolt
- switch valve and spring
- pressure adjusting screw and bracket assembly
- throttle lever
- manual lever and shaft seal
- throttle lever shaft seal, washer, and E-clip
- fluid filter and screws
- detent ball and spring
- valve body screws
- governor pressure solenoid
- governor pressure sensor and retaining clip
- park lock rod and E-clip

TRANSMISSION

GENERAL INFORMATION

Inspect the transmission bushings during overhaul. Bushing condition is important as worn, scored bushings contribute to low pressures, clutch slip and accelerated wear of other components. However, do not replace bushings as a matter of course. Replace bushings only when they are actually worn, or scored.

Use recommended tools to replace bushings. The tools are sized and designed to remove, install, and seat bushings correctly. The bushing replacement tools are included in Bushing Tool Set C-3887-B.

Pre-sized service bushings are available for replacement purposes. Only the sun gear bushings are not serviced. Low cost of the sun gear assembly makes it easier to simply replace the gear and bushings as an assembly.

Heli-Coil inserts can be used to repair damaged, stripped or worn threads in aluminum parts. These inserts are available from most automotive parts suppliers. Stainless steel inserts are recommended.

The use of crocus cloth is permissible where necessary, providing it is used carefully. When used on shafts, or valves, use extreme care to avoid rounding off sharp edges. Sharp edges are vital as they prevent foreign matter from getting between the valve and valve bore.

Do not reuse oil seals, gaskets, seal rings, or O-rings during overhaul. Replace these parts as a matter of course. Also do not reuse snap rings or E-clips that are bent or distorted. Replace these parts as well.

Lubricate transmission parts with Mopar® ATF Plus 3, Type 7176, transmission fluid during overhaul and assembly. Use petroleum jelly, Mopar® Door Ease, or Ru-Glyde to prelubricate seals, O-rings, and thrust washers. Petroleum jelly can also be used to hold parts in place during reassembly.

TRANSMISSION CASE CLEANING AND INSPECTION

Clean the case in a solvent tank. Flush the case bores and fluid passages thoroughly with solvent. Dry the case and all fluid passages with compressed air. Be sure all solvent is removed from the case and that all fluid passages are clear.

CLEANING AND INSPECTION (Continued)

NOTE: Do not use shop towels or rags to dry the case (or any other transmission component) unless they are made from lint-free materials. Lint will stick to case surfaces and transmission components and circulate throughout the transmission after assembly. A sufficient quantity of lint can block fluid passages and interfere with valve body operation.

Inspect the case for cracks, porous spots, worn bores, or damaged threads. Damaged threads can be repaired with Helicoil thread inserts. However, the case will have to be replaced if it exhibits any type of damage or wear.

Lubricate the front band adjusting screw threads with petroleum jelly and thread the screw part-way into the case. Be sure the screw turns freely.

OVERRUNNING CLUTCH/LOW-REVERSE DRUM/OVERDRIVE PISTON RETAINER

Clean the overrunning clutch assembly, clutch cam, low-reverse drum, and overdrive piston retainer in solvent. Dry them with compressed air after cleaning.

Inspect condition of each clutch part after cleaning. Replace the overrunning clutch roller and spring assembly if any rollers or springs are worn or damaged, or if the roller cage is distorted, or damaged. Replace the cam if worn, cracked or damaged.

Replace the low-reverse drum if the clutch race, roller surface or inside diameter is scored, worn or damaged. **Do not remove the clutch race from the low-reverse drum under any circumstances. Replace the drum and race as an assembly if either component is damaged.**

Examine the overdrive piston retainer carefully for wear, cracks, scoring or other damage. Be sure the retainer hub is a snug fit in the case and drum. Replace the retainer if worn or damaged.

ACCUMULATOR

Inspect the accumulator piston and seal rings (Fig. 266). Replace the seal rings if worn or cut. Replace the piston if chipped or cracked.

Check condition of the accumulator inner and outer springs (Fig. 266). Replace the springs if the coils are cracked, distorted or collapsed.

FRONT SERVO

Clean the servo piston components with solvent and dry them with compressed air. Wipe the band clean with lint free shop towels.

Replace the front band if distorted, lining is burned, flaking off, or worn to the point where the grooves in the lining material are no longer visible.

Inspect the servo components. Replace the springs if collapsed, distorted or broken. Replace the guide, rod and piston if cracked, bent, or worn. Discard the servo snap ring if distorted or warped.

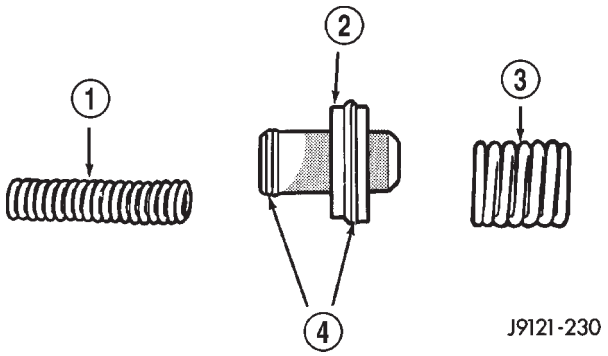


Fig. 266 Accumulator Components

1 – INNER SPRING
2 – ACCUMULATOR PISTON
3 – OUTER SPRING
4 – SEAL RINGS

Check the servo piston bore for wear. If the bore is severely scored, or damaged, it will be necessary to replace the case.

Replace any servo component if doubt exists about condition. Do not reuse suspect parts.

REAR SERVO

Remove and discard the servo piston seal ring (Fig. 267). Then clean the servo components with solvent and dry with compressed air. Replace either spring if collapsed, distorted or broken. Replace the plug and piston if cracked, bent, or worn. Discard the servo snap rings and use a new ones at assembly.

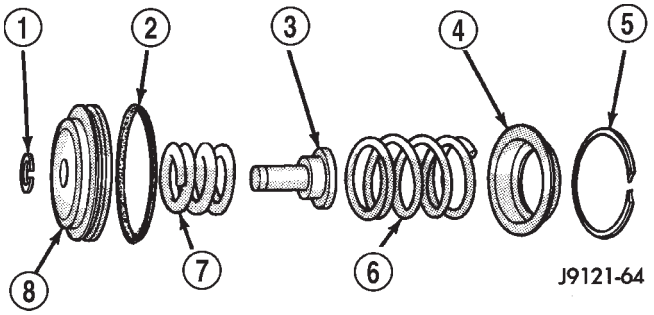


Fig. 267 Rear Servo Components

1 – SNAP RING
2 – PISTON SEAL
3 – PISTON PLUG
4 – SPRING RETAINER
5 – SNAP RING
6 – PISTON SPRING
7 – CUSHION SPRING
8 – PISTON

CLEANING AND INSPECTION (Continued)

OIL PUMP AND REACTION SHAFT SUPPORT

(1) Clean pump and support components with solvent and dry them with compressed air.

(2) Check condition of the seal rings and thrust washer on the reaction shaft support. The seal rings do not need to be replaced unless cracked, broken, or severely worn.

(3) Inspect the pump and support components. Replace the pump or support if the seal ring grooves or machined surfaces are worn, scored, pitted, or damaged. Replace the pump gears if pitted, worn chipped, or damaged.

(4) Inspect the pump bushing. Then check the reaction shaft support bushing. Replace either bushing only if heavily worn, scored or damaged. It is not necessary to replace the bushings unless they are actually damaged.

(5) Install the gears in the pump body and measure pump component clearances as follows:

(a) Clearance between outer gear and reaction shaft housing should be 0.010 to 0.063 mm (0.0004 to 0.0025 in.). Clearance between inner gear and reaction shaft housing should be 0.010 to 0.063 mm (0.0004 to 0.0025 in.). Both clearances can be measured at the same time by:

(I) Installing the pump gears in the pump housing.

(II) Position an appropriate piece of Plastigage™ across both gears.

(III) Align the plastigage to a flat area on the reaction shaft housing.

(IV) Install the reaction shaft to the pump housing.

(V) Separate the reaction shaft housing from the pump housing and measure the Plastigage™ following the instructions supplied with it.

(b) Clearance between inner gear tooth and outer gear should be 0.08 to 0.19 mm (0.0035 to 0.0075 in.). Measure clearance with an appropriate feeler gauge.

(c) Clearance between outer gear and pump housing should also be 0.010 to 0.19 mm (0.0035 to 0.0075 in.). Measure clearance with an appropriate feeler gauge.

FRONT CLUTCH

Clean and inspect the front clutch components. Replace the clutch discs if warped, worn, scored, burned or charred, or if the facing is flaking off. Replace the steel plates if heavily scored, warped, or broken. Be sure the driving lugs on the plates are in good condition. The lugs must not be bent, cracked or damaged in any way.

Replace the clutch spring and spring retainer if either is distorted, warped or broken.

Check the lug grooves in the clutch retainer. The steel plates should slide freely in the slots. Replace the retainer if the grooves are worn or damaged.

Check action of the check ball in the retainer (Fig. 268). The ball must move freely and not stick.

NOTE: Inspect the clutch retainer bushings carefully (Fig. 269). The retainer bushings are NOT serviceable. It will be necessary to replace the retainer if either bushing is scored, or worn.

Inspect the piston and retainer seal surfaces for nicks or scratches. Minor scratches can be removed with crocus cloth. However, replace the piston and/or retainer if the seal surfaces are seriously scored.

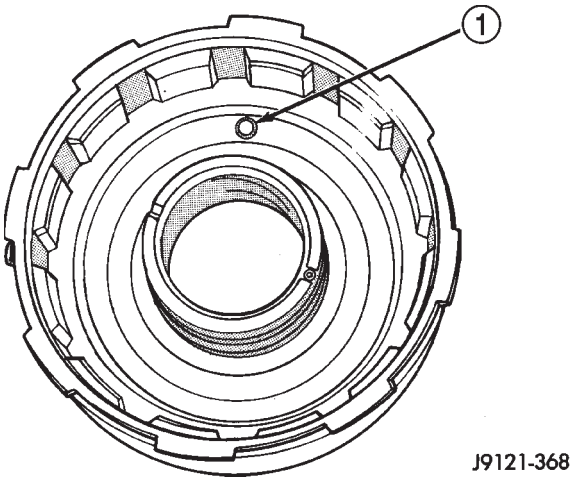


Fig. 268 Front Clutch Piston Retainer Check Ball Location

1 – RETAINER CHECK BALL

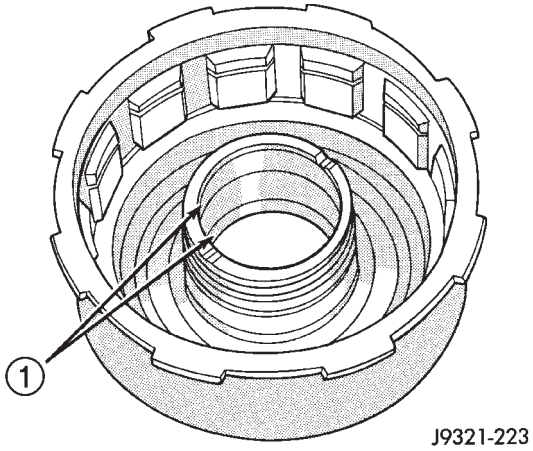


Fig. 269 Retainer Bushing Location/Inspection

1 – FRONT CLUTCH RETAINER BUSHINGS (NON-SERVICEABLE)

CLEANING AND INSPECTION (Continued)

REAR CLUTCH

Clean the clutch components with solvent and dry them with compressed air. Do not use rags or shop towels to dry any of the clutch parts. Lint from such materials will adhere to component surfaces and could restrict or block fluid passages after assembly.

Replace the clutch discs if warped, worn, scored, burned/charred, the lugs are damaged, or if the facing is flaking off. Replace the top and bottom pressure plates if scored, warped, or cracked. Be sure the driving lugs on the pressure and clutch plates are also in good condition. The lugs must not be bent, cracked or damaged in any way.

Replace the piston spring and wave spring if either part is distorted, warped or broken.

Check the lug grooves in the clutch retainer. The clutch and pressure plates should slide freely in the slots. Replace the retainer if the grooves are worn or damaged. Also check action of the check balls in the retainer and piston. Each check ball must move freely and not stick.

Replace the retainer bushing if worn, scored, or doubt exists about bushing condition.

Inspect the piston and retainer seal surfaces for nicks or scratches. Minor scratches can be removed with crocus cloth. However, replace the piston and/or retainer if the seal surfaces are seriously scored.

Check condition of the fiber thrust washer and metal output shaft thrust washer. Replace either washer if worn or damaged.

Check condition of the seal rings on the input shaft and clutch retainer hub. Replace the seal rings only if worn, distorted, or damaged. The input shaft front seal ring is teflon with chamfered ends. The rear ring is metal with interlocking ends.

Check the input shaft for wear, or damage. Replace the shaft if worn, scored or damaged in any way.

PLANETARY GEARTRAIN

Clean the planetary components in solvent and dry them with compressed air.

Check sun gear and driving shell condition. Replace the gear if damaged or if the bushings are scored or worn. The bushings are not serviceable. Replace the driving shell if worn, cracked or damaged.

Replace planetary gear sets if gears, pinion pins, or carrier are damaged in any way. Replace the annulus gears and supports if either component is worn or damaged.

Inspect the geartrain spacers, thrust plates, snap rings, and thrust washers. Replace any of these parts that are worn, distorted or damaged. Do not attempt to reuse these parts.

The planetary gear thrust washers are different sizes. The large diameter washers go on the front planetary and the smaller washers go on the rear planetary. All the washers have four locating tabs on them. These tabs fit in the holes or slots provided in each planetary gear.

Inspect the output shaft carefully. Pay particular attention to the machined bushing/bearing surfaces on the shaft and the governor valve shaft bore at the shaft rear.

Replace the output shaft if the machined surfaces are scored, pitted, or damaged in any way. Also replace the shaft if the splines are damaged, or exhibits cracks at any location (especially at the governor valve shaft bore).

The annulus gears can be removed from their supports if necessary. Just remove the snap rings and separate the two parts when replacement is necessary. In addition, the annulus gear bushings can be replaced if severely worn, or scored. However it is not necessary to replace the bushings if they only exhibit normal wear. Check bushing fit on the output shaft to be sure.

OVERDRIVE UNIT

Clean the geartrain and case components with solvent. Dry all parts except the bearings with compressed air. Allow bearings to air dry.

Do not use shop towels for wiping parts dry unless the towels are made from a lint-free material. A sufficient quantity of lint (from shop towels, cloths, rags, etc.) could plug the transmission filter and fluid passages.

Discard the old case gasket and seals. Do not attempt to salvage these parts. They are not reusable. Replace any of the overdrive unit snap rings if distorted or damaged.

Minor nicks or scratches on components can be smoothed with crocus cloth. However, do not attempt to reduce severe scoring on any components with abrasive materials. Replace severely scored components; do not try to salvage them.

Check condition of the park lock components and the overdrive case.

Replace the case if cracked, scored, or damaged. Replace the park lock pawl, plug, or spring if worn or damaged. Be sure the bullet at the end of the park lock rod is in good condition. Replace the rod if the bullet is worn or the rod itself is bent or distorted. Do not attempt to straighten the rod.

Check the bushings in the overdrive case. Replace the bushings if severely scored or worn. Also replace the case seal if loose, distorted, or damaged.

Examine the overdrive and direct clutch discs and plates. Replace the discs if the facing is worn, severely scored, or burned and flaking off. Replace the clutch plates if worn, heavily scored, or cracked. Check the lugs on the clutch plates for wear. The

CLEANING AND INSPECTION (Continued)

plates should slide freely in the drum. Replace the plates or drum if binding occurs.

Check condition of the annulus gear, direct clutch hub, clutch drum and clutch spring. Replace the gear, hub and drum if worn or damaged. Replace the spring if collapsed, distorted, or cracked.

Be sure the splines and lugs on the gear, drum and hub are in good condition. The clutch plates and discs should slide freely in these components.

Inspect the thrust bearings and spring plate. Replace the plate if worn or scored. Replace the bearings if rough, noisy, brinnelled, or worn.

Inspect the planetary gear assembly and the sun gear and bushings. If either the sun gear or the bushings are damaged, replace the gear and bushings as an assembly. The gear and bushings are not serviced separately.

The planetary carrier and pinions must be in good condition. Also be sure the pinion pins are secure and in good condition. Replace the carrier if worn or damaged.

Inspect the overrunning clutch and race. The race surface should be smooth and free of scores. Replace the overrunning clutch assembly or the race if either assembly is worn or damaged in any way.

Inspect the output shaft and governor components. Replace the shaft pilot bushing and inner bushing if damaged. Replace either shaft bearing if rough or noisy. Replace the bearing snap rings if distorted or cracked.

Check the machined surfaces on the output shaft. These surfaces should clean and smooth. Very minor nicks or scratches can be smoothed with crocus cloth. Replace the shaft if worn, scored or damaged in any way.

Inspect the output shaft bushings. The small bushing is the intermediate shaft pilot bushing. The large bushing is the overrunning clutch hub bushing. Replace either bushing if scored, pitted, cracked, or worn.

ADJUSTMENTS

BRAKE TRANSMISSION SHIFT INTERLOCK

The park interlock cable is part of the brake/shift lever interlock system. Correct cable adjustment is important to proper interlock operation. The gear shift and park interlock cables must both be correctly adjusted in order to shift out of Park.

Park Interlock Cable Adjustment Procedure

(1) Shift the transmission into the Park position.

(2) Rotate the ignition switch to the LOCK position. **Be sure ignition key cylinder is in LOCK position. Cable will not adjust correctly in any other position.**

(3) Remove shift lever bezel and/or console assembly.

(4) Pull the cable lock button up to release cable.

(5) Pull cable rearward. Then release cable and press lock button down until it snaps in place.

BTSI FUNCTION CHECK

(1) Verify removal of ignition key allowed in park position only.

(2) When the shift lever is in park, and the shift handle push-button is in the out position, the ignition key cylinder should rotate freely from off to lock. When the shifter is in any other position, the ignition key should not rotate from off to lock.

(3) Shifting out of park should be possible when the ignition key cylinder is in the off position.

(4) Shifting out of park should not be possible while applying 25 lb. max. handle push-button force, and ignition key cylinder is in the run or start positions, unless the foot brake pedal is depressed approximately 1/2 inch (12mm).

(5) Shifting out of park should not be possible when the ignition key cylinder is in the accessory or lock position.

(6) Shifting between any gears neutral or park may be done without depressing foot brake with ignition switch in run or start positions and vehicle stationary or in motion.

(7) The floor shifter lever and gate positions should be in alignment with all transmission detent positions.

(8) Engine starts must be possible with floor shift lever in park or neutral positions only. Engine starts must not be possible in any other gate positions other than park or neutral.

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

- PARK POSITION- apply forward force on center of handle and remove pressure. Engine start must be possible.
- PARK POSITION- apply rearward force on center of handle and remove pressure. Engine start must be possible.
- NEUTRAL POSITION- engine start must be possible.
- NEUTRAL POSITION, ENGINE RUNNING AND BRAKES APPLIED- Apply forward force on center of shift handle. Transmission should not be able to shift into reverse detent.

TRANSMISSION THROTTLE VALVE CABLE ADJUSTMENT

The transmission throttle valve is controlled by a cable attached to the throttle linkage on one end and the transmission throttle valve control lever on the transmission end (Fig. 271).

ADJUSTMENTS (Continued)

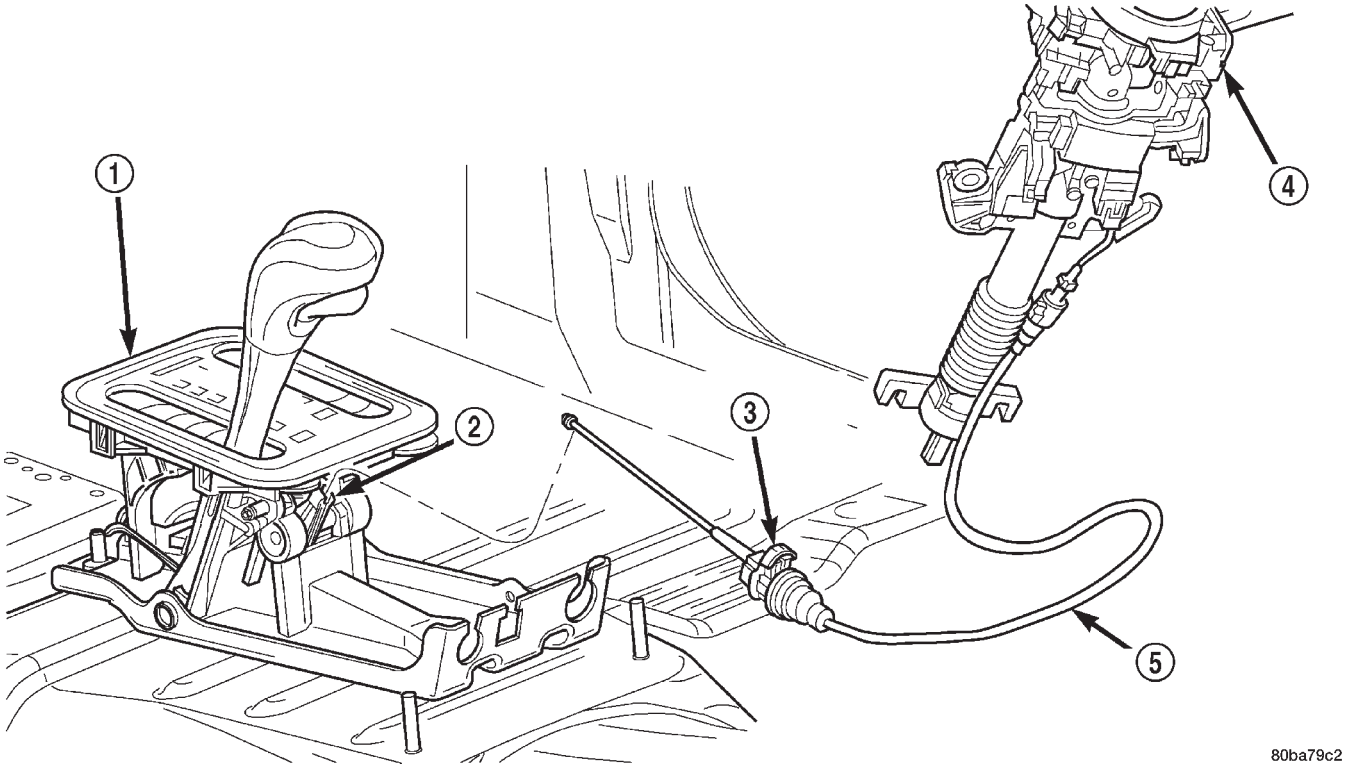


Fig. 270 Brake Transmission Shift Interlock Cable

1 – SHIFT MECHANISM
2 – SHIFTER BTSI LEVER
3 – ADJUSTMENT CLIP
4 – STEERING COLUMN ASSEMBLY
5 – INTERLOCK CABLE

A correctly adjusted throttle valve cable will cause the throttle valve control lever on the transmission to move simultaneously with the throttle linkage from the idle position. Proper adjustment will allow simultaneous movement without causing the transmission throttle valve lever to either move ahead of, or lag behind the throttle linkage bell crank lever.

Checking Throttle Valve Cable Adjustment

(1) Disconnect the negative battery cable.

(2) Remove the intercooler outlet hose from the engine and position it out of the way.

(3) Raise the vehicle on a hoist and verify that the transmission throttle valve control lever is at the idle position (Fig. 272). This position can be verified by observing the throttle valve lever tension spring. Control lever should be at its stop in the direction being pulled by the tension spring.

(4) Lower the vehicle on the hoist.

(5) Disconnect the throttle valve cable end (B) from the throttle bell crank lever (C). **Carefully slide cable off stud. Do not pry or pull cable off.**

(6) Compare the position of cable end (B) to throttle bell crank lever (C) (Fig. 273).

- T. V. cable end (B) and throttle bell crank lever (C) should be aligned (or centered on one another) to within 1 mm (0.039 in.) in either direction (Fig. 273).
- If cable end and attachment stud are misaligned, the cable will have to be adjusted as described in Throttle Valve Cable Adjustment procedure.

(7) Reconnect the cable end (B) on the throttle bell crank lever (C). Then with aid of a helper, observe movement of transmission throttle lever and lever on throttle linkage.

- If the transmission throttle valve lever moves ahead of, or lags behind the throttle lever, cable adjustment will be necessary. Or, if the throttle lever prevents the transmission lever from returning to closed position, cable adjustment will be necessary.

(8) Install the intercooler outlet hose on the engine.

(9) Connect the negative battery cable.

Throttle Valve Cable Adjustment Procedure

(1) Disconnect the negative battery cable.

(2) Remove the intercooler outlet hose from the engine and position it out of the way.

ADJUSTMENTS (Continued)

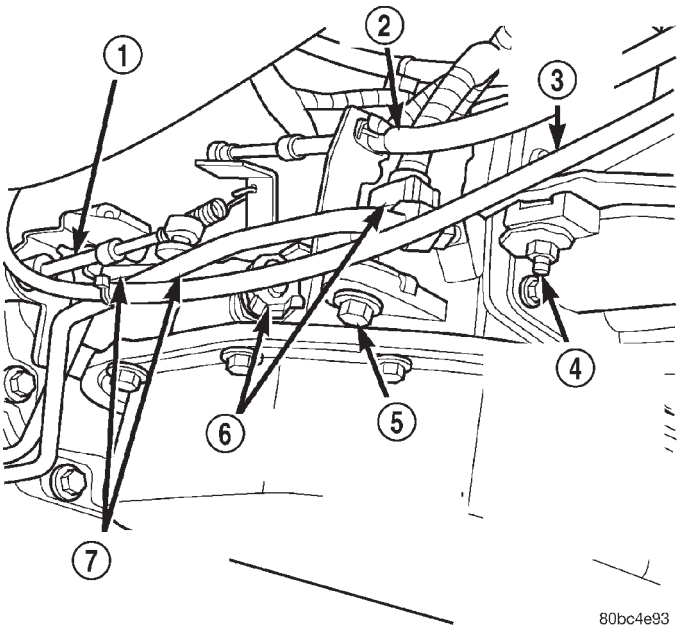


Fig. 271 Throttle Valve Cable at Transmission

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

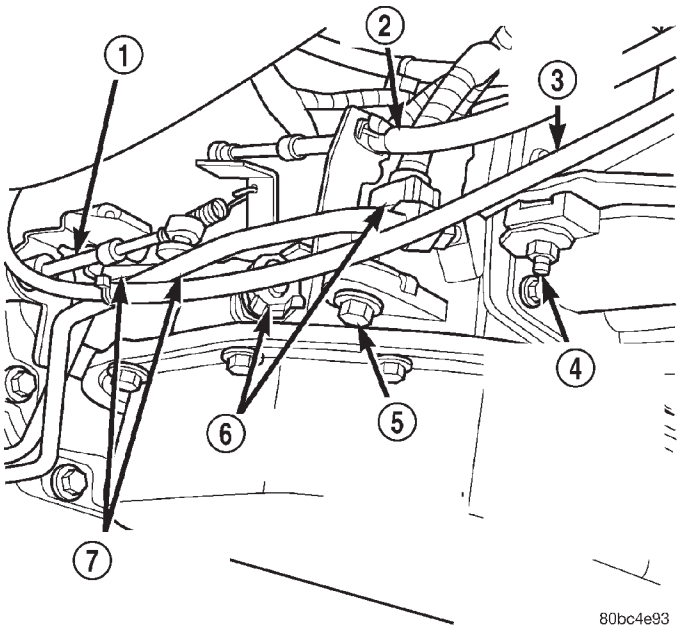


Fig. 272 Throttle Valve Cable at Transmission

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

(3) Disconnect the throttle valve cable end (B) from the throttle bell crank lever (C). **Carefully slide cable off stud. Do not pry or pull cable off.**

(4) Pry the T. V. cable lock (A) into the UP position (Fig. 274). This will unlock the cable and allow for readjustment.

(5) Apply just enough tension on the T. V. cable (B) to remove any slack in the braided cable. **Pulling to tight will cause the T. V. lever on the transmission to move out of its idle position, which will result in an incorrect T. V. cable adjustment.** Slide the sheath of the T. V. cable (D) back and forth until the centerlines of the T. V. cable end (B) and the throttle bell crank lever (C) are aligned within one millimeter (1mm) (Fig. 274).

(6) While holding the T. V. cable in the set position push the T. V. cable lock (A) into the down position (Fig. 274). This will lock the present T. V. cable adjustment.

(7) Reconnect the T. V. cable (B) to the throttle bell crank lever (C) (Fig. 274).

(8) Double check cable operation and adjustment. Verify the transmission throttle valve lever and the throttle bell crank lever move simultaneously.

(9) Install the intercooler outlet hose on the engine.

(10) Connect the negative battery cable.

GEARSHIFT CABLE

Check adjustment by starting the engine in Park and Neutral. Gearshift cable adjustment is CORRECT if the engine starts only in the Park and Neutral 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 park/neutral position switch or transmission range sensor may be faulty.

Gearshift Adjustment Procedure

(1) Shift the transmission into the “Park” position.

(2) Remove the shift lever bezel and floor console as necessary for access to the shift cable adjustment screw (Fig. 275). Located near the shifter assembly.

(3) Loosen the shift cable adjustment screw (Fig. 275).

(4) Raise the vehicle on a hoist.

(5) Unsnap the cable eyelet from the transmission shift lever (Fig. 276).

(6) Verify the transmission shift lever is in Park position by moving lever fully rearward. Last rearward detent is Park position (Fig. 276).

ADJUSTMENTS (Continued)

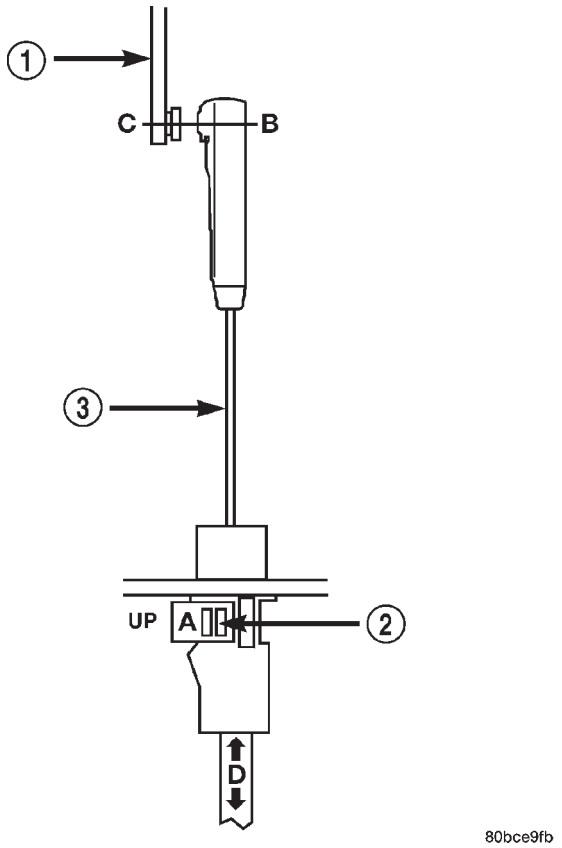


Fig. 273 Throttle Valve Cable at Throttle Linkage

1 – THROTTLE LINKAGE
2 – THROTTLE VALVE CABLE LOCKING CLIP
3 – THROTTLE VALVE CABLE

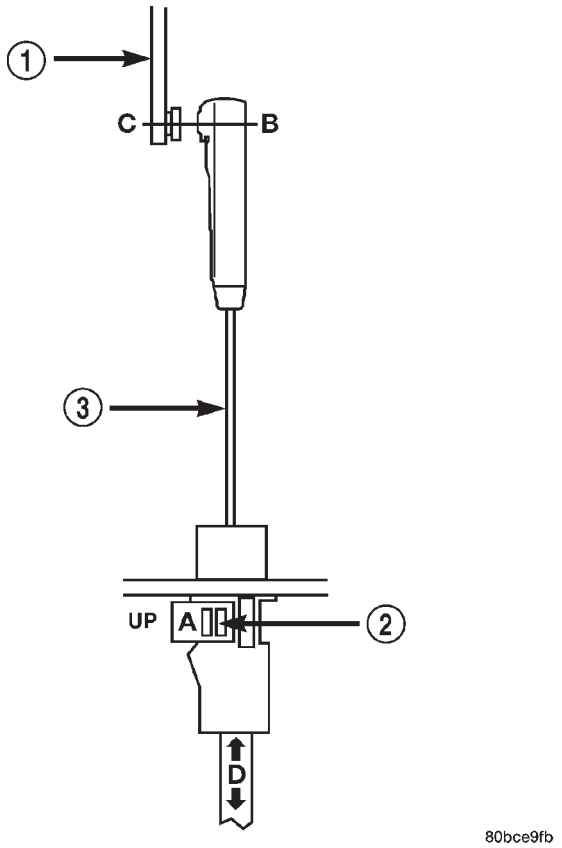


Fig. 274 Throttle Valve Cable at Throttle Linkage

1 – THROTTLE LINKAGE
2 – THROTTLE VALVE CABLE LOCKING CLIP
3 – THROTTLE VALVE CABLE

(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 the shift cable eyelet onto the transmission shift lever (Fig. 276).

(9) Lower the vehicle on the hoist.

(10) Tighten the shift cable adjustment screw to 7 N·m (65 in. lbs.).

(11) Verify correct cable operation. Engine should start only in the Park and Neutral positions.

(12) Install the shifter bezel and floor console components removed for access.

BAND ADJUSTMENTS

FRONT BAND ADJUSTMENT

The front (kickdown) band adjusting screw is located on the left side of the transmission case above the manual valve and throttle valve levers.

(1) Raise vehicle.

(2) Loosen band adjusting screw locknut 3-5 turns (Fig. 277). Be certain the center adjusting screw turns freely in case. Apply lubricant to screw threads if necessary.

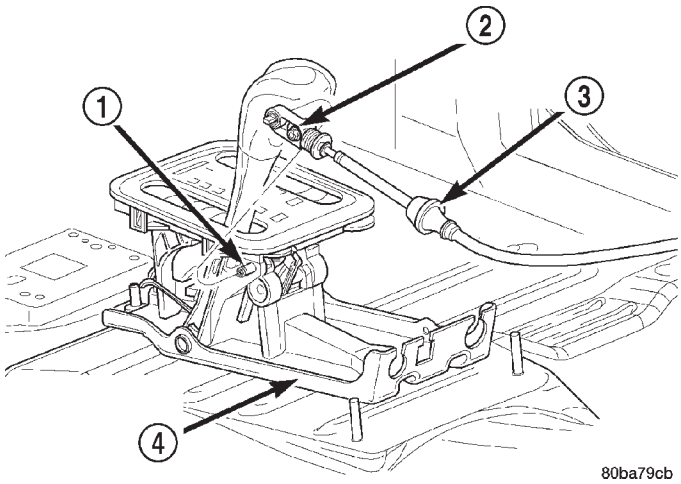


Fig. 275 Shift Cable at Shifter

1 – SHIFT LEVER PIN
2 – ADJUSTMENT SCREW
3 – SHIFT CABLE
4 – SHIFTER ASSEMBLY BRACKET

ADJUSTMENTS (Continued)

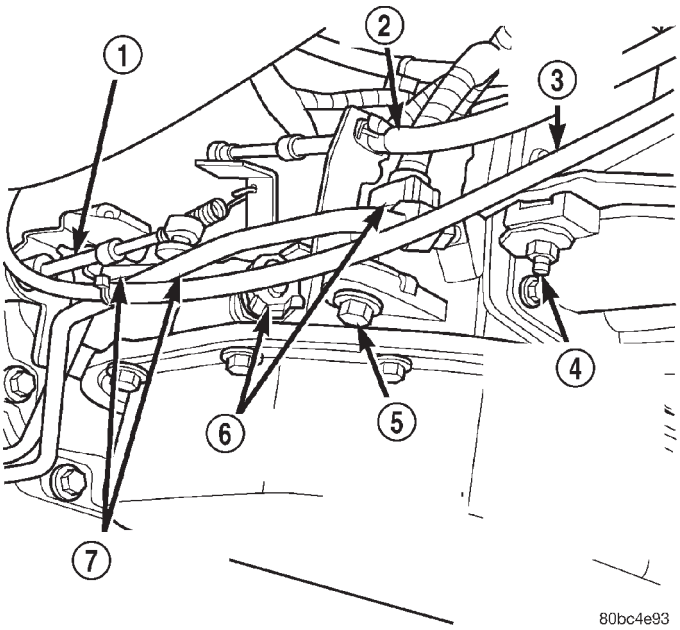


Fig. 276 Transmission Control Cables at Transmission

1 – TRANSMISSION SHIFTER CABLE
2 – THROTTLE VALVE CABLE
3 – TRANSFER CASE SHIFTER CABLE
4 – TRANSFER CASE SHIFTER CABLE BRACKET RETAINING BOLT (1 OF 2)
5 – THROTTLE VALVE CABLE BRACKET RETAINING BOLT
6 – ELECTRICAL CONNECTORS
7 – TRANSMISSION FLUID LINES

(3) Tighten the band adjusting screw to 8 N·m (72 in. lbs.) torque with Inch Pound Torque Wrench C-3380-A, a 3-in. extension and 5/16 socket.

CAUTION: If Adapter C-3705 is needed to reach the adjusting screw (Fig. 278), tighten the screw to only 5 N·m (47-50 in. lbs.) torque.

44RE TRANSMISSION

- Back off front band adjusting screw 1- 7/8 turns.
- Hold the center adjusting screw in position and torque the locknut to 41 N·m (30 ft. lbs.) torque.

(4) Lower vehicle.

REAR BAND ADJUSTMENT

The transmission oil pan must be removed for access to the rear band adjusting screw.

(1) Raise vehicle.

(2) Remove transmission oil pan and drain fluid.

(3) Loosen band adjusting screw locknut 5-6 turns (Fig. 279). Be sure adjusting screw turns freely in lever.

(4) Tighten adjusting screw to 8 N·m (72 in. lbs.) torque.

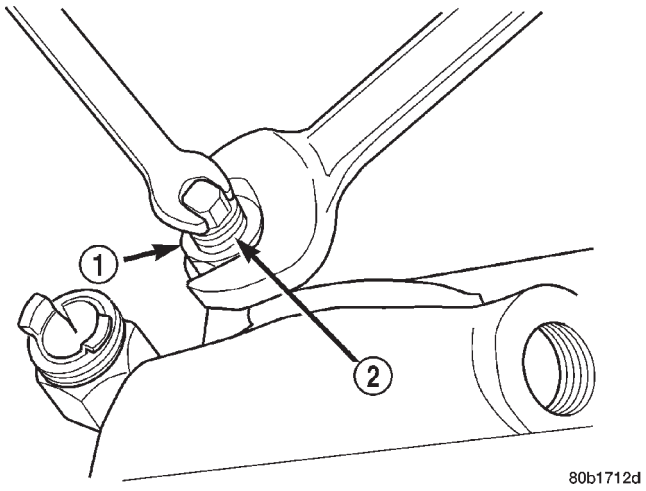


Fig. 277 Front Band Adjustment Screw Location

1 – LOCK-NUT
2 – FRONT BAND ADJUSTER

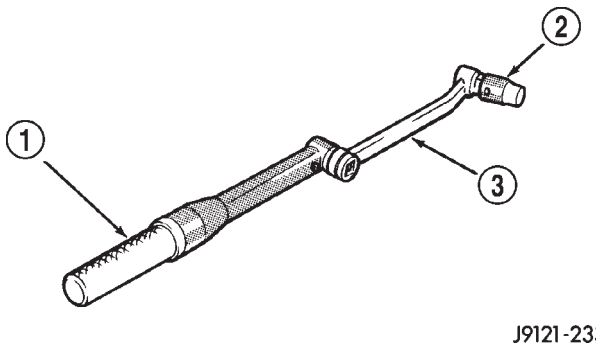


Fig. 278 Band Adjustment Adapter Tool

1 – INCH-POUND TORQUE WRENCH
2 – 5/16 SOCKET
3 – ADAPTER C-3705 (TIGHTEN ADJUSTING SCREW TO ONLY 5 N·m/50 IN-LBS IF ADAPTER IS USED)

44RE TRANSMISSION

- Back off adjusting screw 4 turns.
- Hold adjusting screw in place and tighten locknut to 34 N·m (25 ft. lbs.) torque.

(5) Position new gasket on oil pan and install pan on transmission. Tighten pan bolts to 17 N·m (13 ft. lbs.) torque.

(6) Lower vehicle and refill transmission with Mopar® ATF Plus 3, Type 7176 fluid.

VALVE BODY

CONTROL PRESSURE ADJUSTMENTS

There are two control pressure adjustments on the valve body;

- Line Pressure
- Throttle Pressure

Line and throttle pressures are interdependent because each affects shift quality and timing. As a

ADJUSTMENTS (Continued)

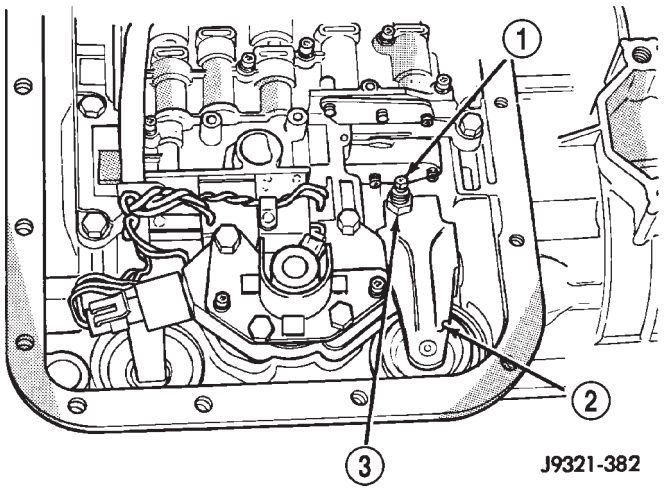


Fig. 279 Rear Band Adjusting Screw Location

1 – ADJUSTING SCREW
2 – REAR BAND LEVER
3 – LOCKNUT

result, both adjustments must be performed properly and in the correct sequence. Adjust line pressure first and throttle pressure last.

LINE PRESSURE ADJUSTMENT

Measure distance from the valve body to the inner edge of the adjusting screw with an accurate steel scale (Fig. 280).

Distance should be 33.4 mm (1-5/16 in.).

If adjustment is required, turn the adjusting screw in, or out, to obtain required distance setting.

NOTE: The 33.4 mm (1-5/16 in.) setting is an approximate setting. Manufacturing tolerances may make it necessary to vary from this dimension to obtain desired pressure.

One complete turn of the adjusting screw changes line pressure approximately 1-2/3 psi (9 kPa).

Turning the adjusting screw counterclockwise increases pressure while turning the screw clockwise decreases pressure.

THROTTLE PRESSURE ADJUSTMENT

Insert Gauge Tool C-3763 between the throttle lever cam and the kickdown valve stem (Fig. 281).

Push the gauge tool inward to compress the kickdown valve against the spring and bottom the throttle valve.

Maintain pressure against kickdown valve spring. Turn throttle lever stop screw until the screw head touches throttle lever tang and the throttle lever cam touches gauge tool.

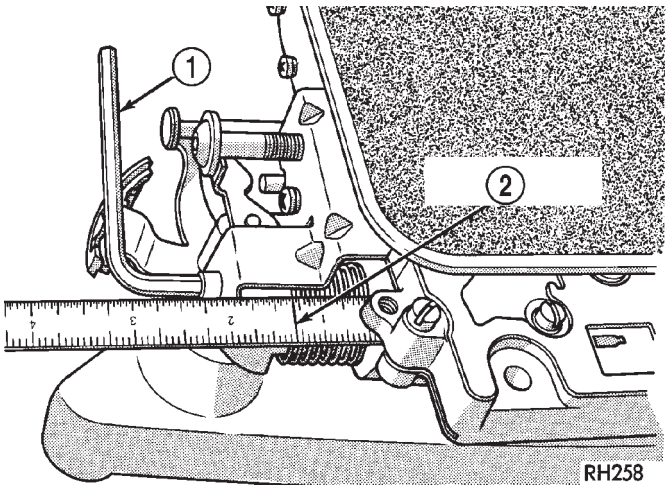


Fig. 280 Line Pressure Adjustment

1 – WRENCH
2 – 1–5/16 INCH

NOTE: The kickdown valve spring must be fully compressed and the kickdown valve completely bottomed to obtain correct adjustment.

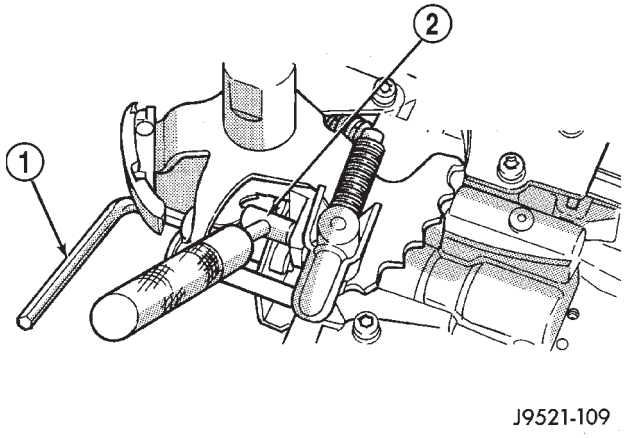


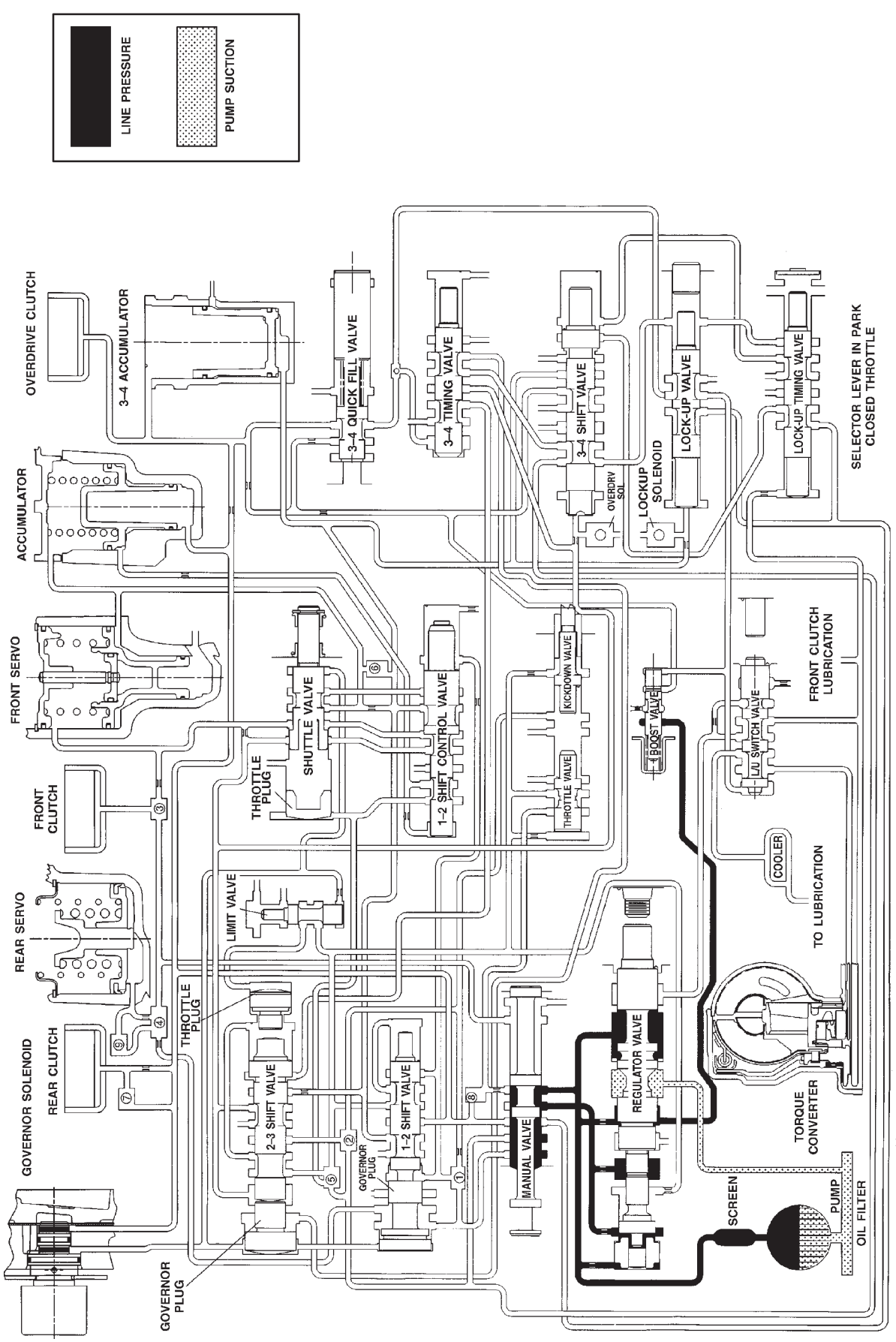
Fig. 281 Throttle Pressure Adjustment

1 – HEX WRENCH (IN THROTTLE LEVER ADJUSTING SCREW)
2 – SPECIAL TOOL C-3763 (POSITIONED BETWEEN THROTTLE LEVER AND KICKDOWN VALVE)

SCHEMATICS AND DIAGRAMS

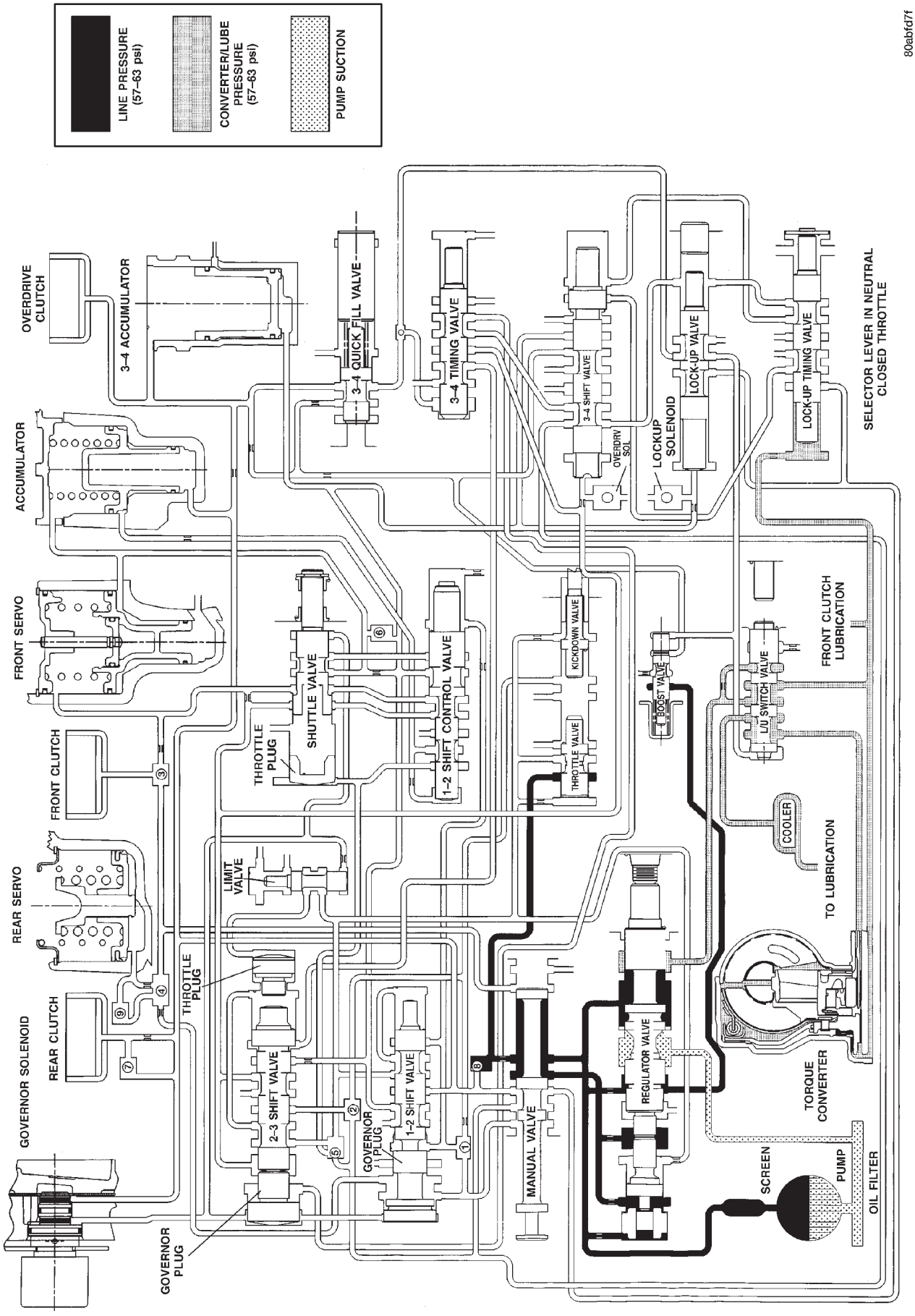
HYDRAULIC SCHEMATICS

SCHEMATICS AND DIAGRAMS (Continued)



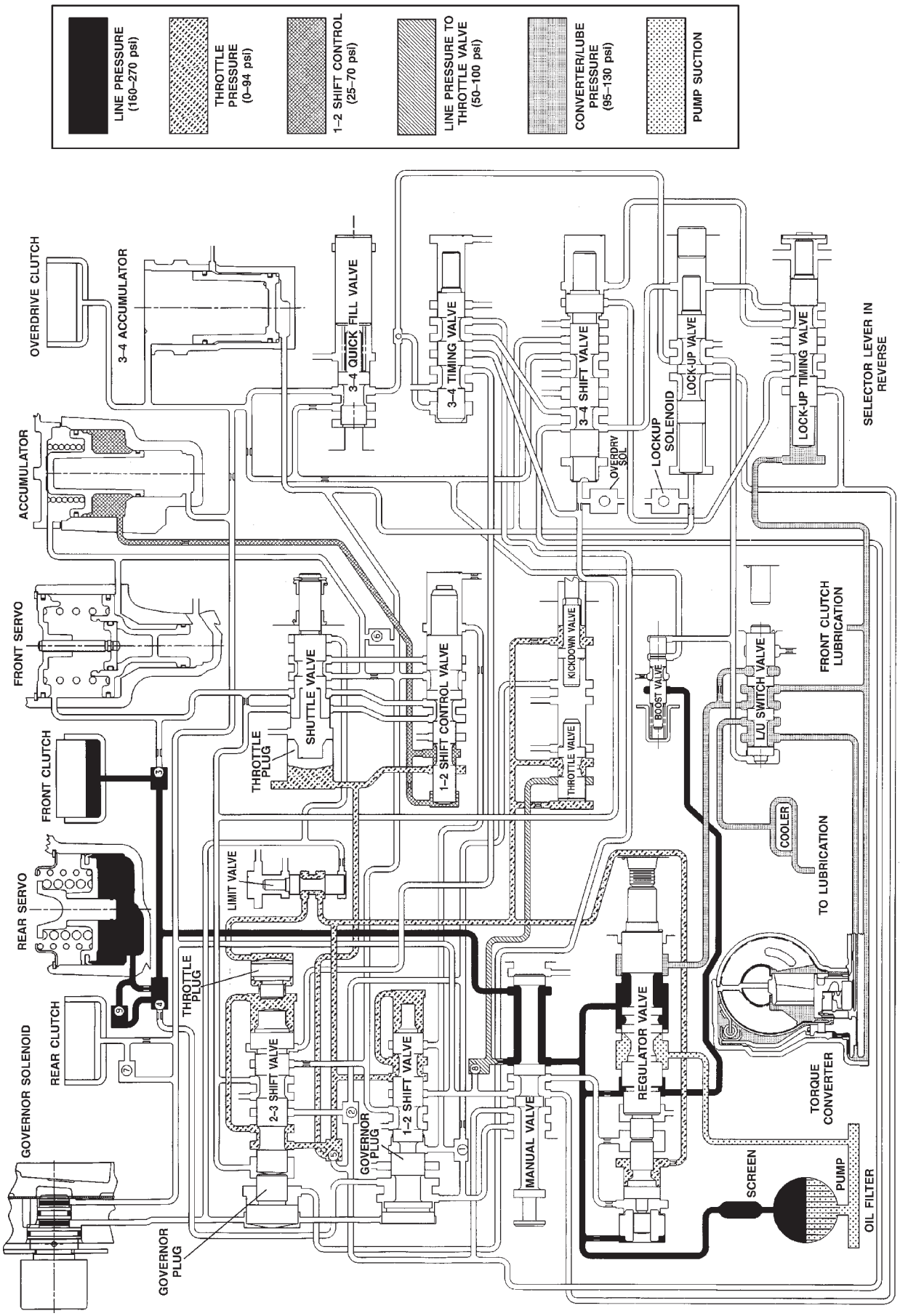
HYDRAULIC FLOW IN PARK

SCHEMATICS AND DIAGRAMS (Continued)



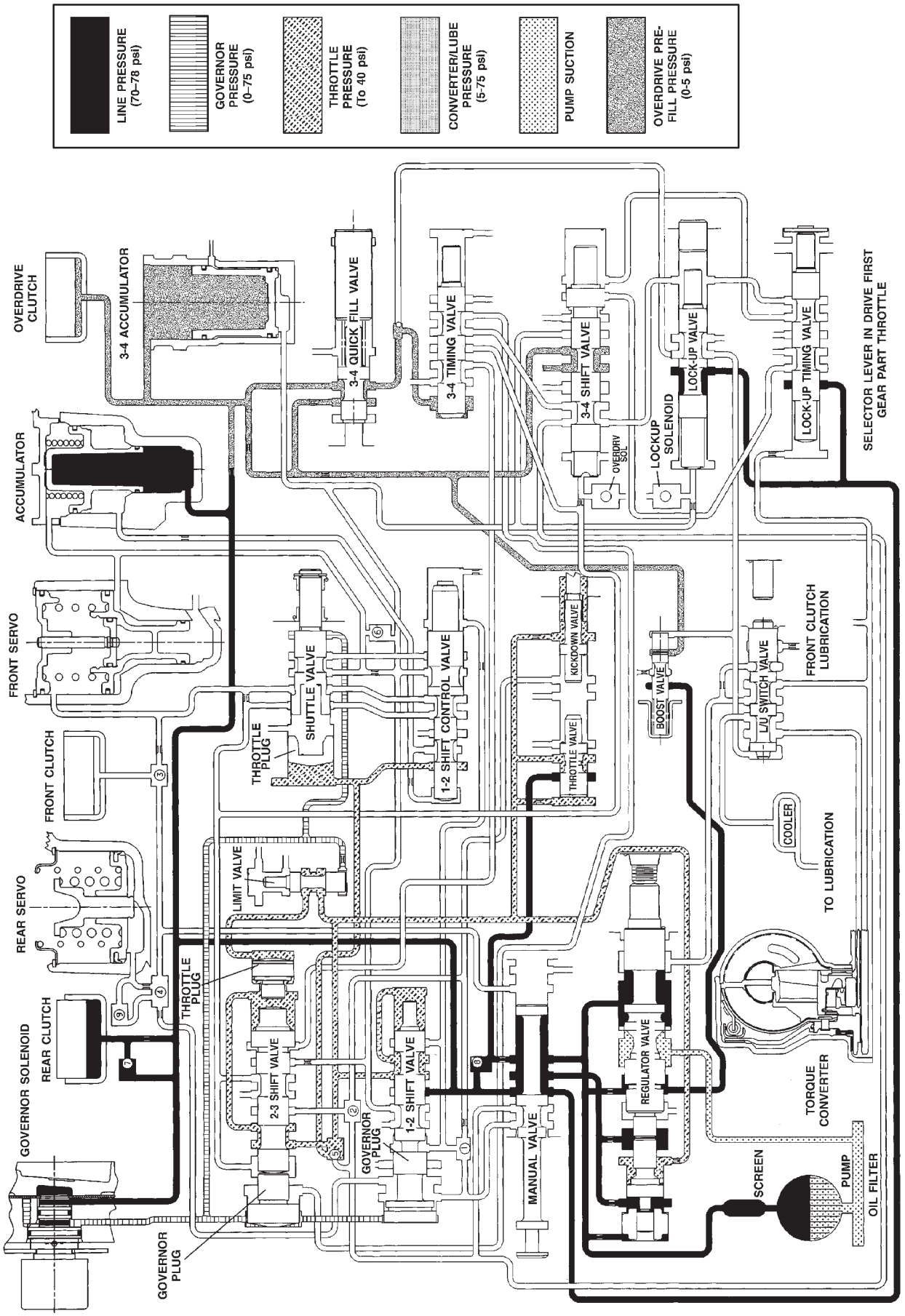
HYDRAULIC FLOW IN NEUTRAL

SCHEMATICS AND DIAGRAMS (Continued)



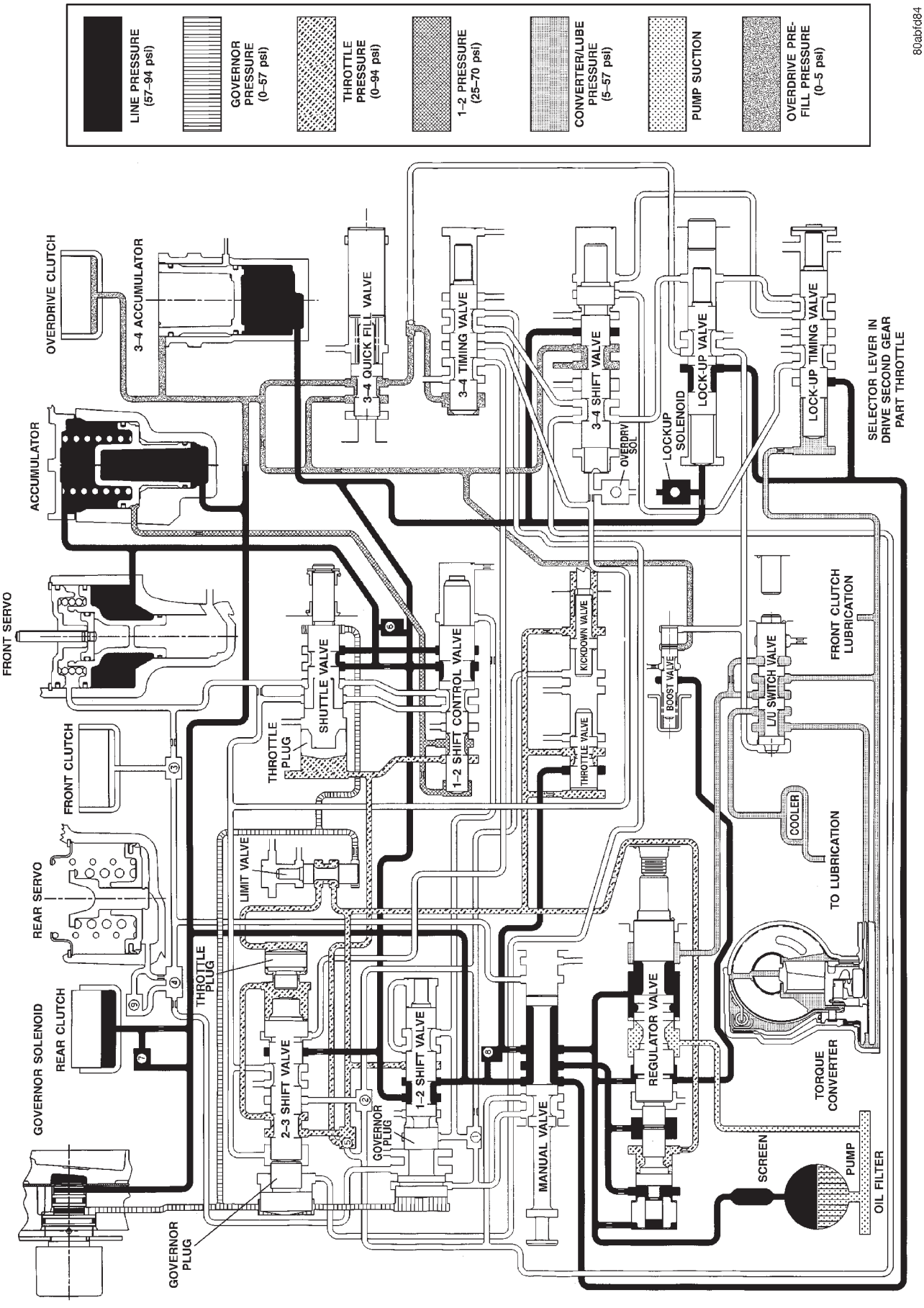
HYDRAULIC FLOW IN REVERSE

SCHEMATICS AND DIAGRAMS (Continued)



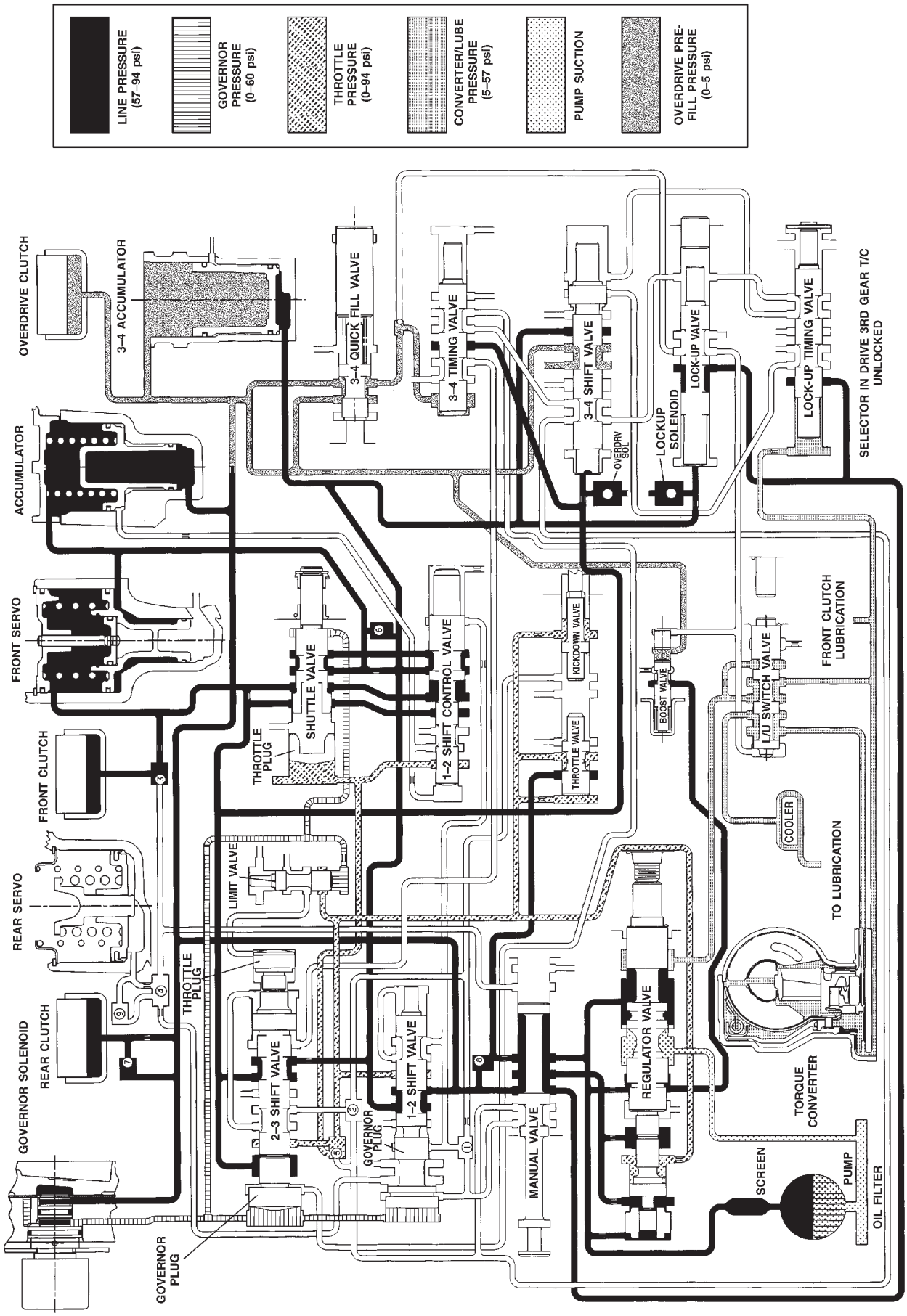
HYDRAULIC FLOW IN DRIVE FIRST GEAR

SCHEMATICS AND DIAGRAMS (Continued)



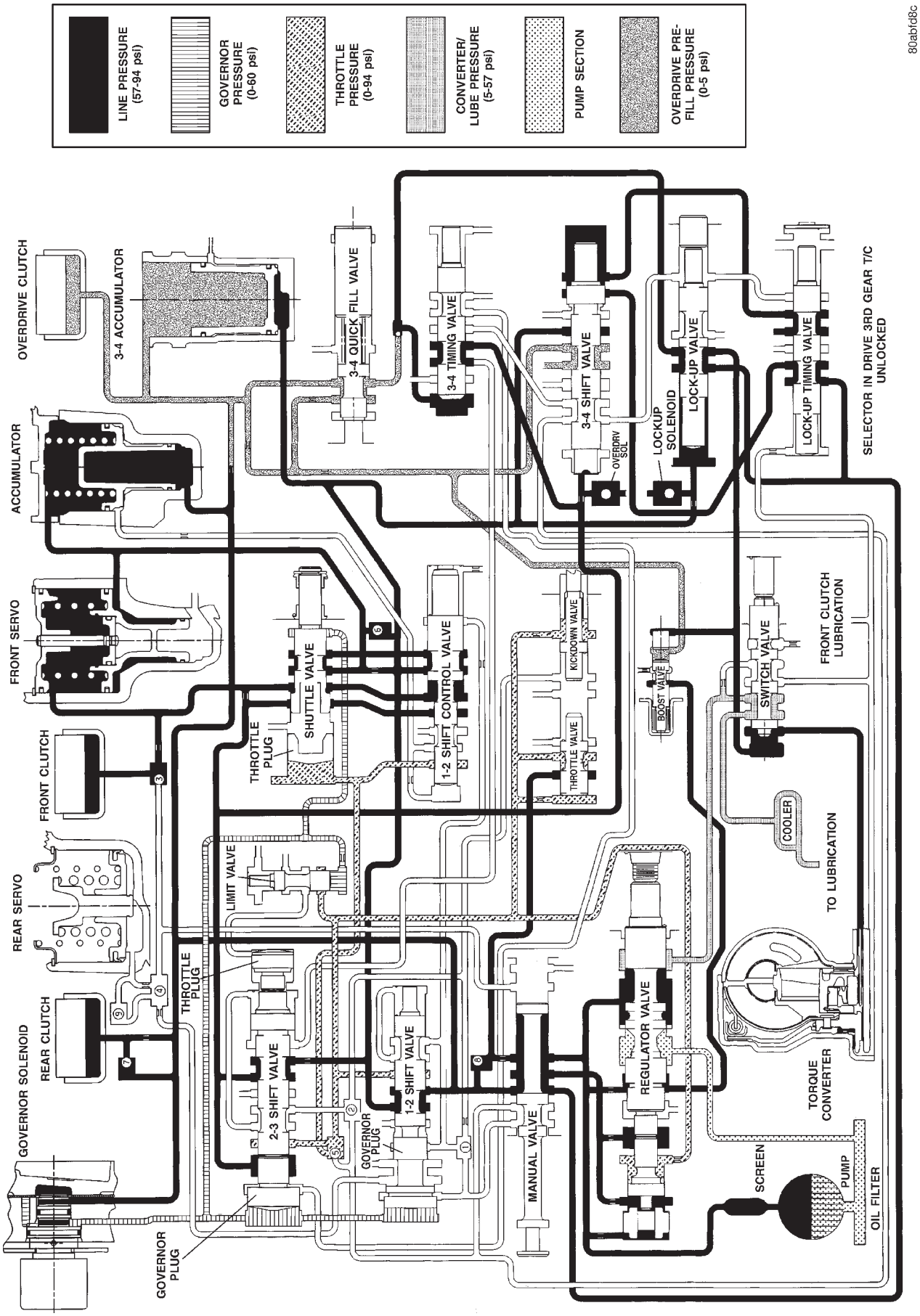
HYDRAULIC FLOW IN DRIVE SECOND GEAR

SCHEMATICS AND DIAGRAMS (Continued)



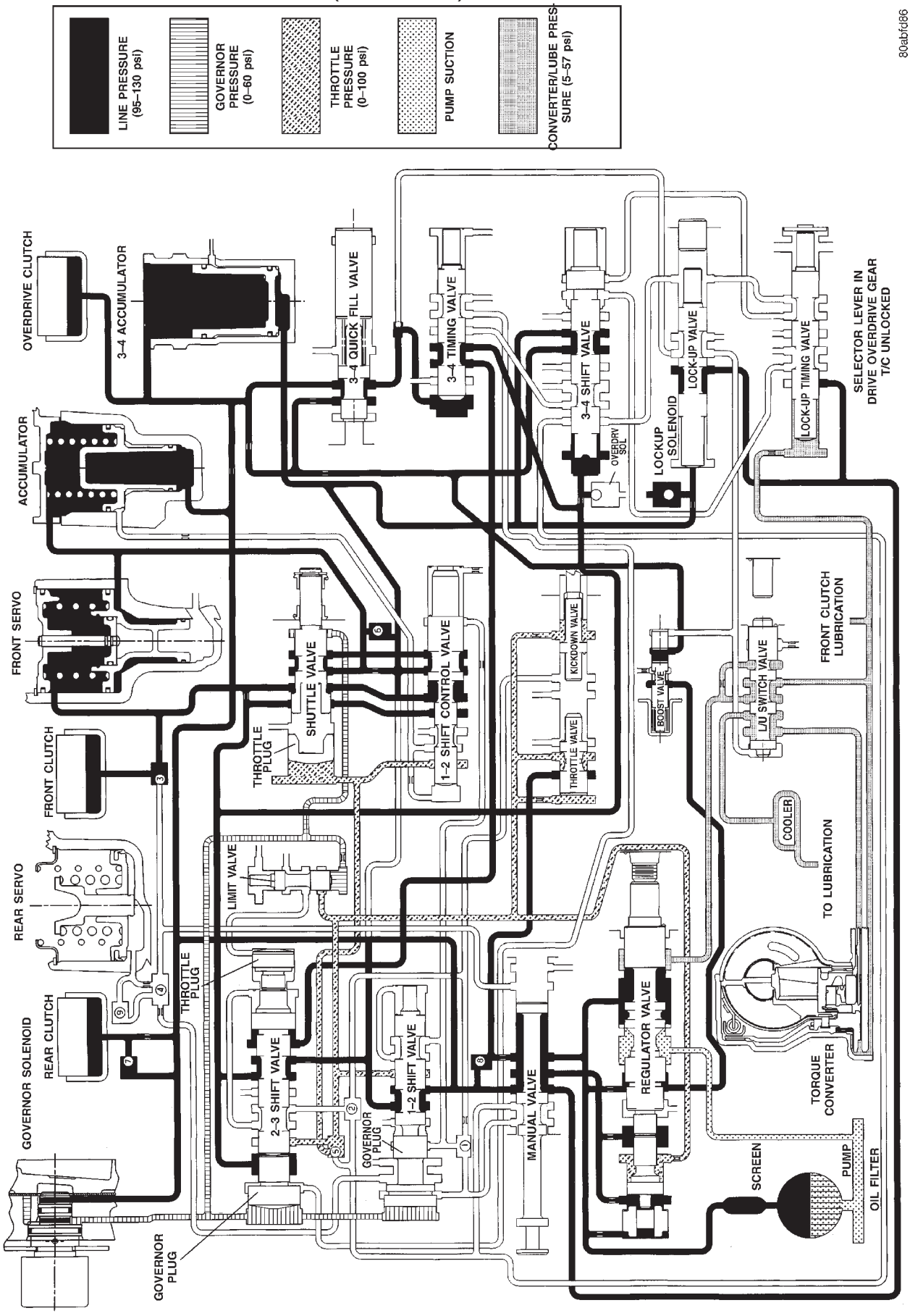
HYDRAULIC FLOW IN DRIVE THIRD GEAR (CONVERTER CLUTCH NOT APPLIED)

SCHEMATICS AND DIAGRAMS (Continued)



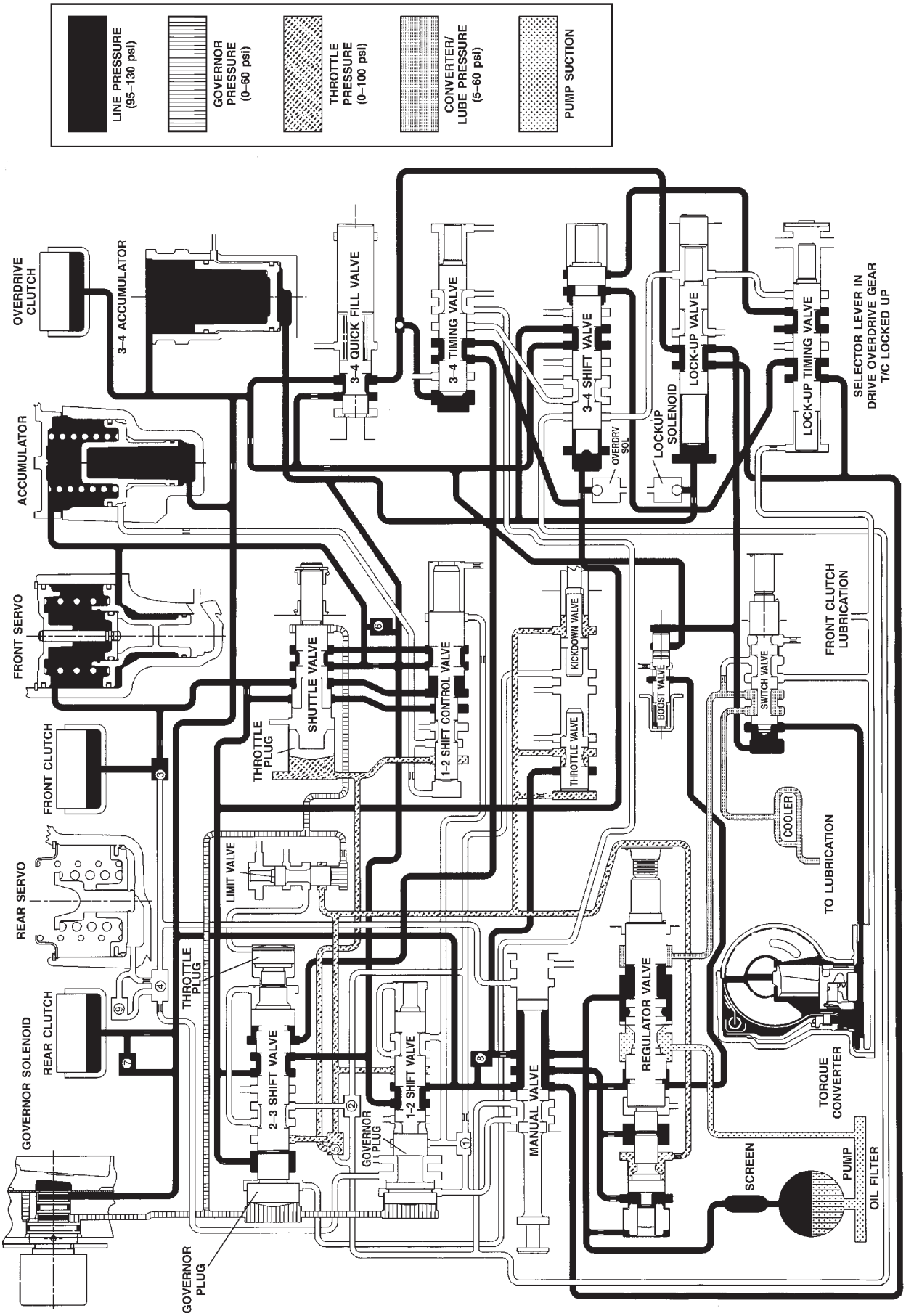
HYDRAULIC FLOW IN DRIVE THIRD GEAR (CONVERTER CLUTCH APPLIED)

SCHEMATICS AND DIAGRAMS (Continued)



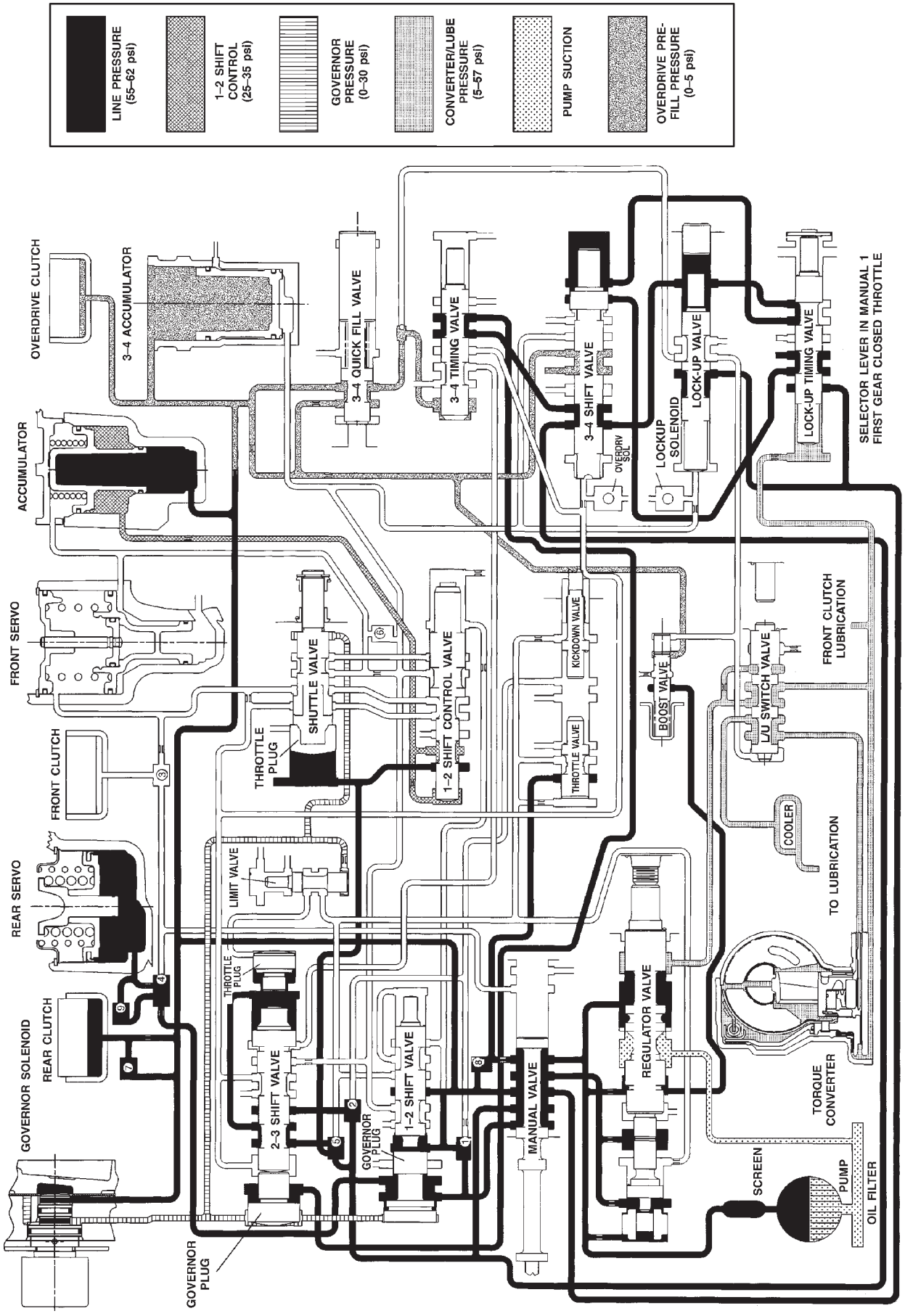
HYDRAULIC FLOW IN DRIVE FOURTH GEAR (CONVERTER CLUTCH NOT APPLIED)

SCHEMATICS AND DIAGRAMS (Continued)



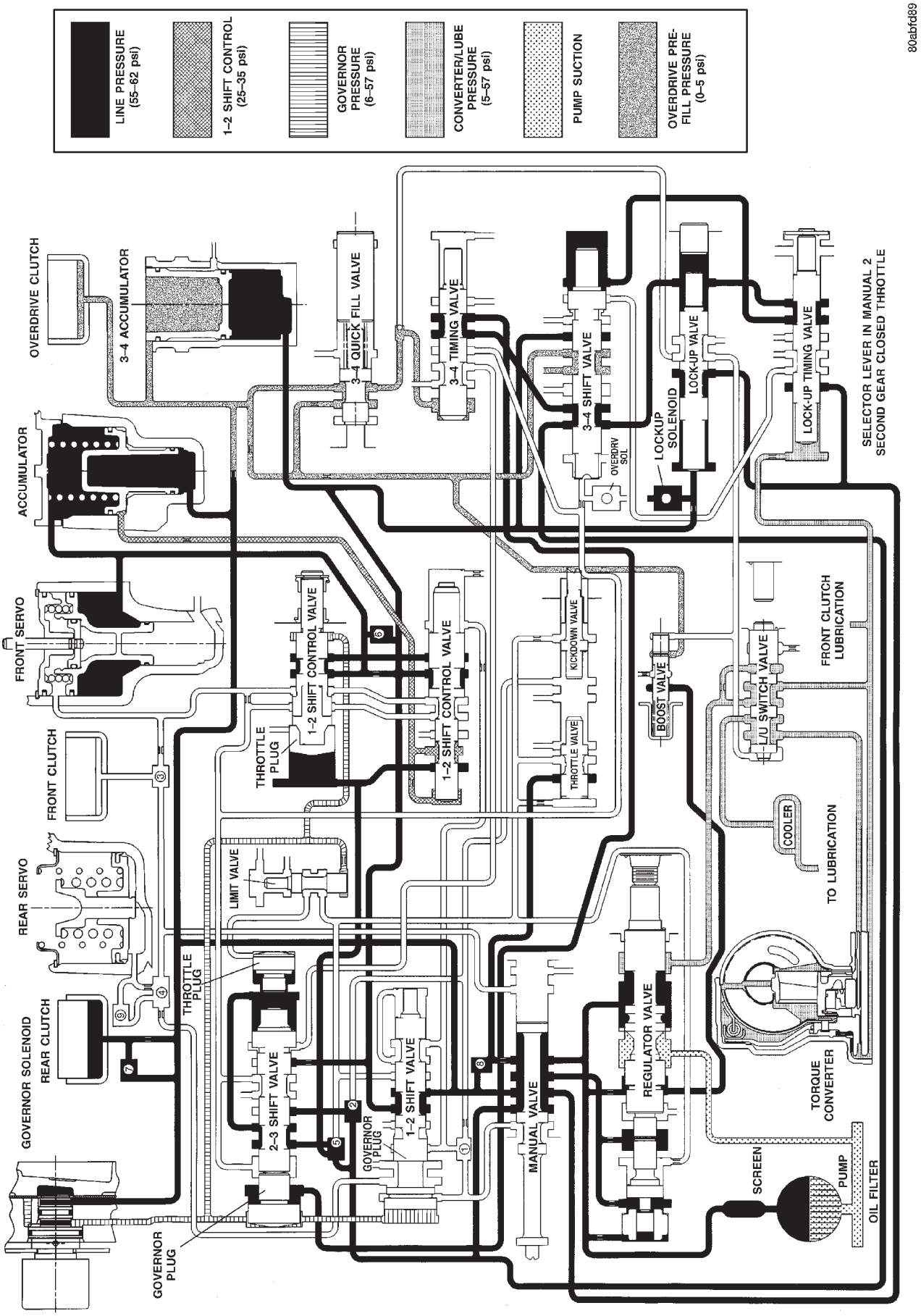
HYDRAULIC FLOW IN DRIVE FOURTH GEAR (CONVERTER CLUTCH APPLIED)

SCHEMATICS AND DIAGRAMS (Continued)



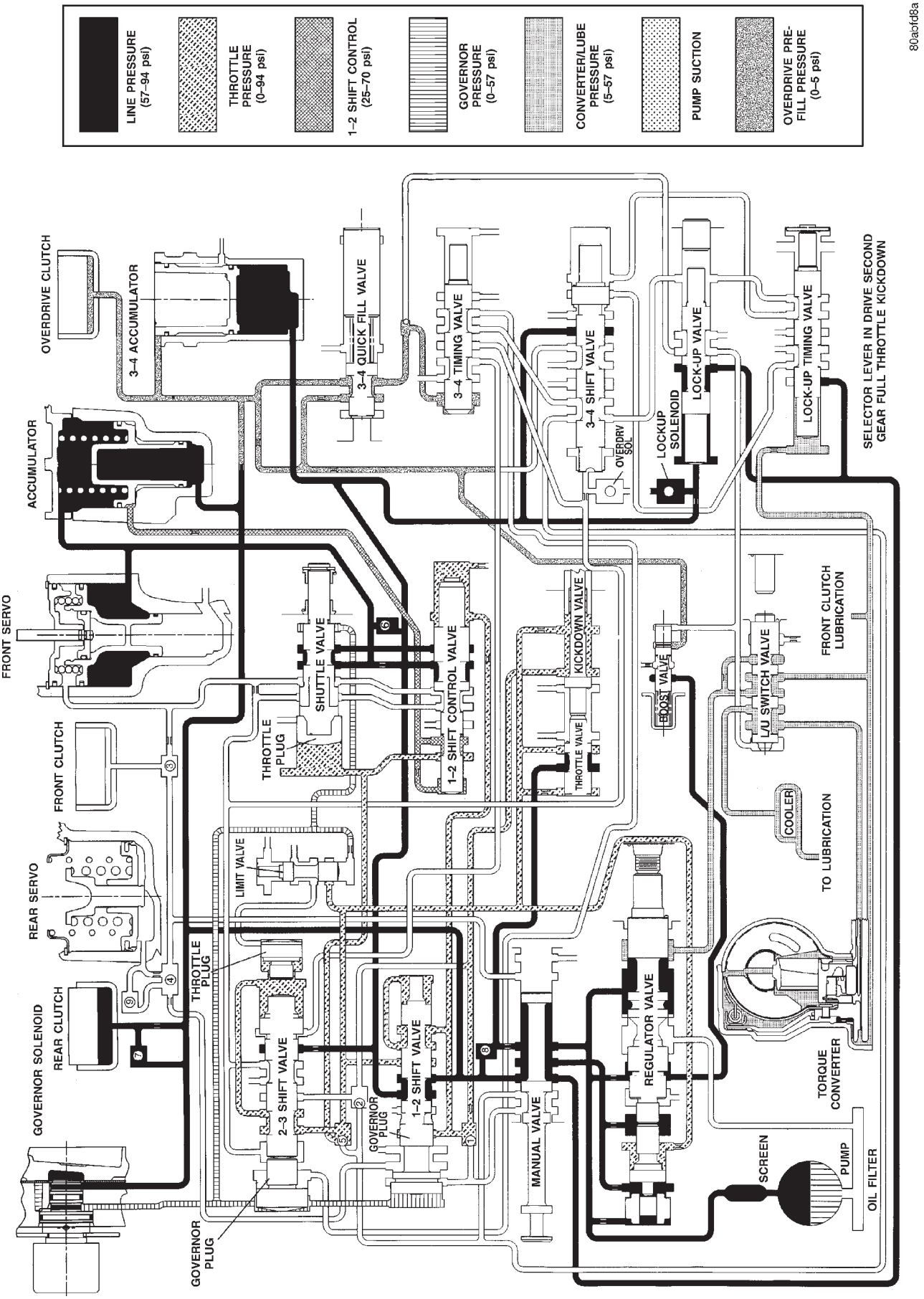
HYDRAULIC FLOW IN MANUAL LOW (1)

SCHEMATICS AND DIAGRAMS (Continued)



HYDRAULIC FLOW IN MANUAL SECOND (2)

SCHEMATICS AND DIAGRAMS (Continued)



HYDRAULIC FLOW DURING FULL THROTTLE 3–2 DOWNSHIFT (PASSING GEAR)

SPECIFICATIONS

TRANSMISSION

GENERAL

Component	Metric	Inch
Planetary end play	0.127-1.22 mm	0.005-0.048 in.
Input shaft end play	0.56-2.31 mm	0.022-0.091 in.
Clutch pack clearance/ Front.	1.70-3.40mm	0.067-0.134 in.
Clutch pack clearance/ Rear.	0.81-1.40 mm	0.022-0.037 in.
Front Clutch	44RE-5 discs	
Rear Clutch	44RE-4 discs	
Overdrive clutch disc usage	44RE-4 discs	
Direct clutch disc usage	44RE-8 discs	
44RE Band adjustment from 72 in. lbs.		
Front band	Back off 1-7/8 turns	
Rear band	Back off 4 turns	
Recommended fluid	Mopar® ATF Plus 3, type 7176	

GEAR RATIOS

- 1ST GEAR-2.74
- 2ND GEAR-1.54
- 3RD GEAR-1.00
- 4TH GEAR-0.69
- REV. GEAR-2.21

TORQUE

DESCRIPTION	TORQUE
Fitting, cooler line at trans	18 N·m (13 ft. lbs.)
Bolt, torque convertor	31 N·m (23 ft. lbs.)
Bolt/nut, crossmember	68 N·m (50 ft. lbs.)
Bolt, driveplate to crankshaft	75 N·m (55 ft. lbs.)
Plug, front band reaction	17 N·m (13 ft. lbs.)
Locknut, front band adj.	34 N·m (25 ft. lbs.)
Switch, park/neutral	34 N·m (25 ft. lbs.)
Bolt, fluid pan	17 N·m (13 ft. lbs.)
Screws, fluid filter	4 N·m (35 in. lbs.)
Bolt, oil pump	20 N·m (15 ft. lbs.)
Bolt, overrunning clutch cam	17 N·m (13 ft. lbs.)
Bolt, O/D to trans.	34 N·m (25 ft. lbs.)
Bolt, O/D piston retainer	17 N·m (13 ft. lbs.)
Plug, pressure test port	14 N·m (10 ft. lbs.)
Bolt, reaction shaft support	20 N·m (15 ft. lbs.)
Locknut, rear band	41 N·m (30 ft. lbs.)
Bolt, valve body to case	12 N·m (100 in. lbs.)
Screw, solenoid wiring connector	4 N·m (35 in. lbs.)
Screw, solenoid to transfer plate	4 N·m (35 in. lbs.)

SPECIFICATIONS (Continued)

THRUST WASHER/SPACER/SNAP RING DIMENSIONS

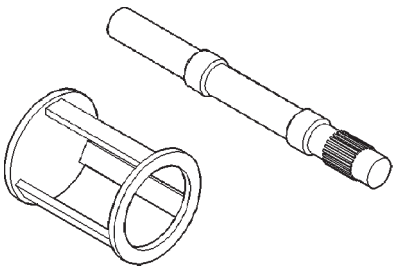
Component	Metric	Inch
Front clutch thrust washer (reaction shaft support hub)	1.55 mm	0.061 in.
Rear clutch thrust washer (clutch retainer)	1.55 mm	0.061 in.
Intermediate shaft thrust plate (shaft hub pilot)	1.5-1.6 mm	0.060-0.063 in.
Output shaft thrust washer (rear clutch hub)	Select fit to set end play	
Rear clutch pack snap ring	1.5 mm 1.95 mm 2.45 mm	0.060 in. 0.076 in. 0.098 in.
Planetary geartrain snap ring (at front of output shaft)	Select fit (three thicknesses available)	
Overdrive piston thrust plate	Thrust plate and spacer are select fit. Refer to size charts and selection procedures in Overdrive Unit D&A procedures	
Intermediate shaft spacer		

PRESSURE TEST

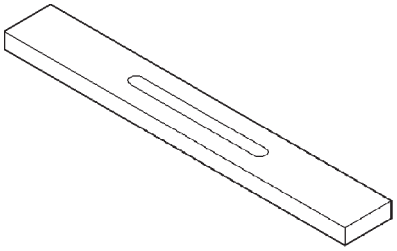
Overdrive clutch	Fourth gear only	Pressure should be 469-496 kPa (68-72 psi) with closed throttle and increase to 620-896 kPa (90-130 psi) at 1/2 to 3/4 throttle.
Line pressure (at accumulator)	Closed throttle	372-414 kPa (54-60 psi).
Front servo	Third gear only	No more than 21 kPa (3 psi) lower than line pressure.
Rear servo	1 range R range	No more than 21 kPa (3 psi) lower than line pressure. 1103 kPa (160 psi) at idle, builds to 1862 kPa (270 psi) at 1600 rpm.
Governor	D range closed throttle	Pressure should respond smoothly to changes in mph and return to 0-7 kPa (0-1.5 psi) when stopped with transmission in D, 1, 2. Pressure above 7 kPa (1.5 psi) at stand still will prevent transmission from downshifting.

SPECIAL TOOLS

RE TRANSMISSIONS

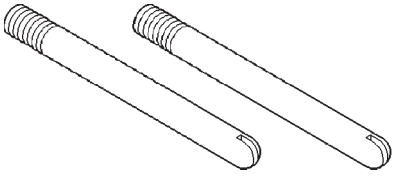


Spring Compressor and Alignment Shaft—6227

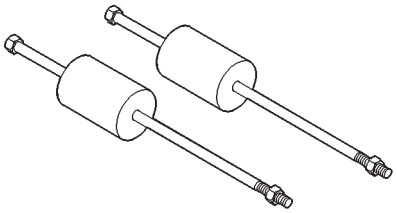


Gauge Bar—6311

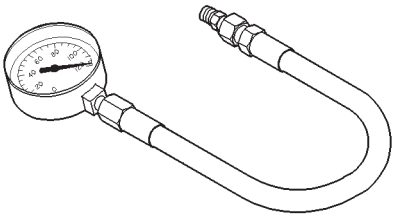
SPECIAL TOOLS (Continued)



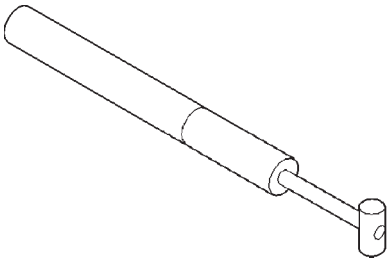
Extension Housing Pilot—C-3288-B



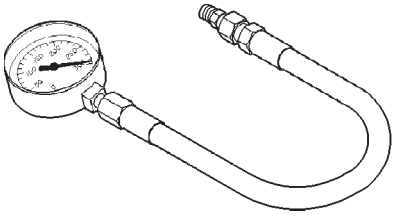
Puller, Slide Hammer—C-3752



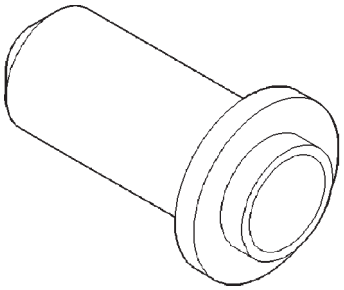
Pressure Gauge—C-3292



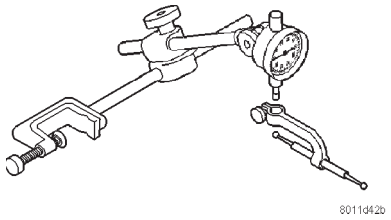
Gauge, Throttle Setting—C-3763



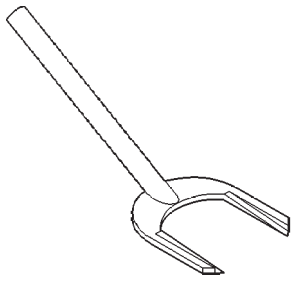
Pressure Gauge—C-3293SP



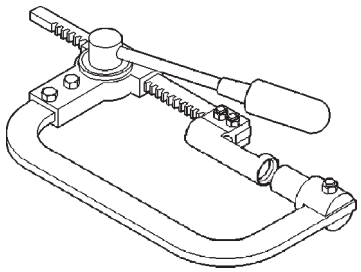
Seal Installer—C-3860–A



Dial Indicator—C-3339

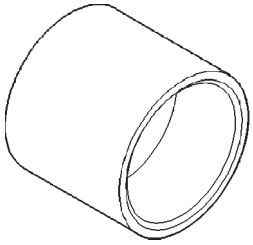


Seal Remover—C-3985-B

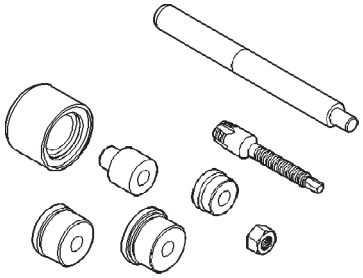


Spring Compressor—C-3422-B

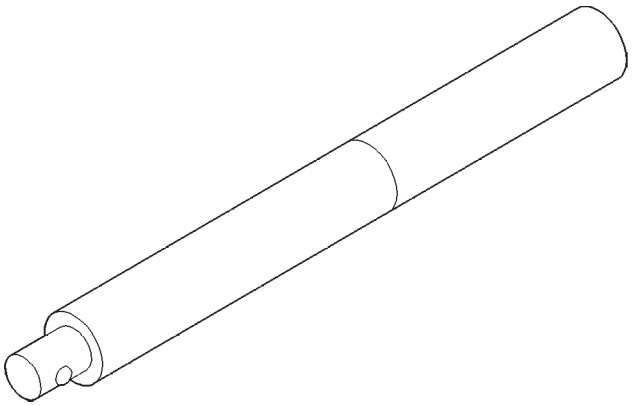
SPECIAL TOOLS (Continued)



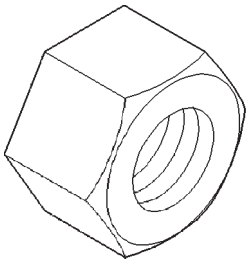
Installer—C-3995-A



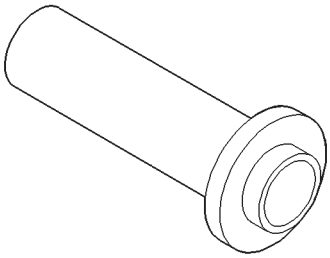
Bushing Remover/Installer Set—C-3887-J



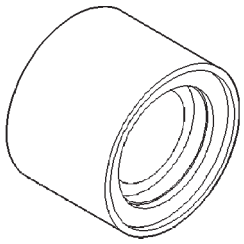
Universal Handle—C-4171



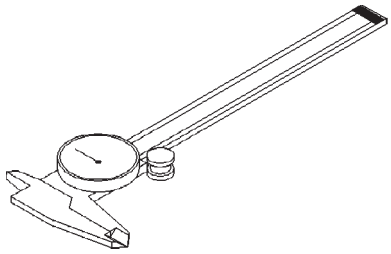
Nut, Bushing Remover—SP-1191, From kit C-3887-J



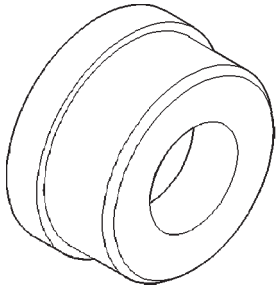
Seal Installer—C-4193-A



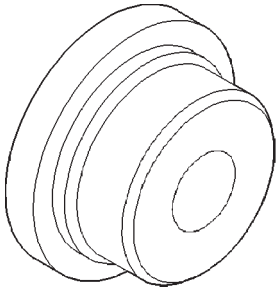
Cup, Bushing Remover—SP-3633, From kit C-3887-J



Dial Caliper—C-4962

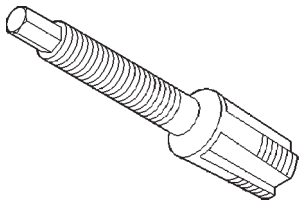


Remover, Bushing—SP-3551

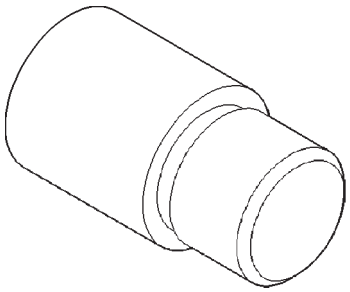


Installer, Bushing—SP-5117

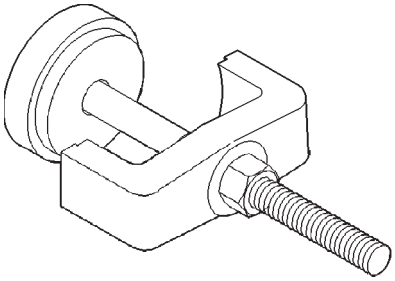
SPECIAL TOOLS (Continued)



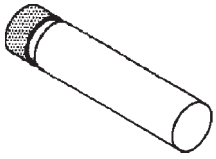
Remover, Bushing—SP-5324



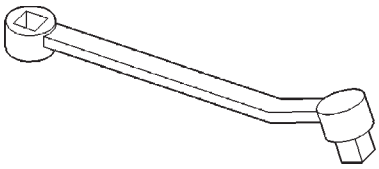
Installer, Bushing—SP-5325



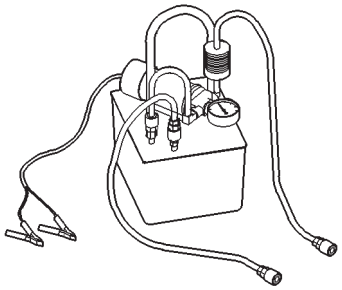
Compressor, Spring—C-3575-A



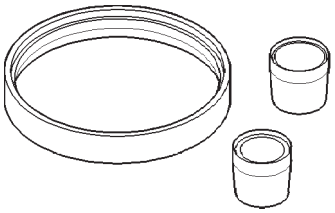
Gauge—6312



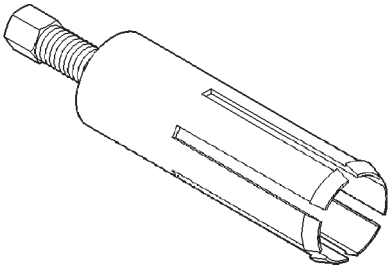
Adapter—C-3705



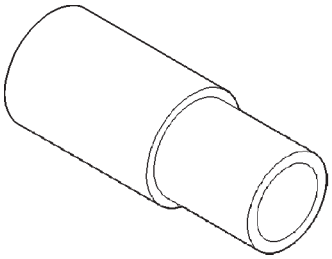
Flusher—6906



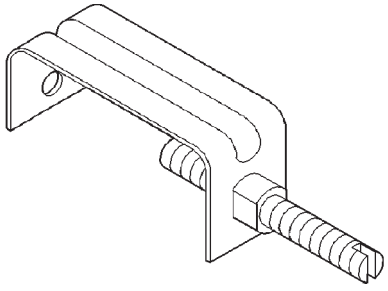
Installer—8114



Remover—6957



Installer—6951



Retainer—6583

NV247 TRANSFER CASE

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DESCRIPTION AND OPERATION

NV247 TRANSFER CASE

The NV247 transfer case is used with the 3.1L turbo diesel engine. Refer to Group 21, Transmission / Transfer Case of the gasoline engine manual for additional information.

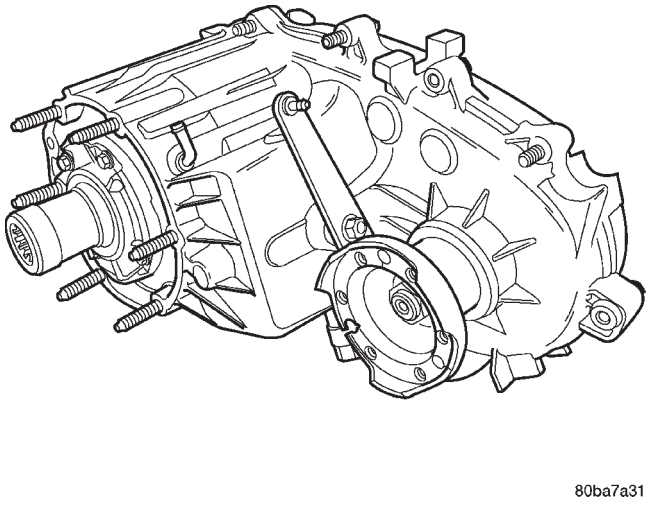

Fig. 1 NV247 Transfer Case

REMOVAL AND INSTALLATION

TRANSFER CASE

REMOVAL

(1) Open the hood and disconnect the negative battery cable.

(2) Remove the (2) upper fan shroud retaining bolts.

(3) Raise the vehicle on a hoist.

(4) Remove the (2) lower fan shroud retaining bolts.

CAUTION: Mark the position of the driveshaft in relation to its companion flange prior to disassembly. Driveshaft must be reinstalled in the same position it was in prior to disassembly.

(5) Remove the front driveshaft retaining bolts (Fig. 2) and remove the driveshaft from the transfer case companion flange. Support the driveshaft with mechanics wire.

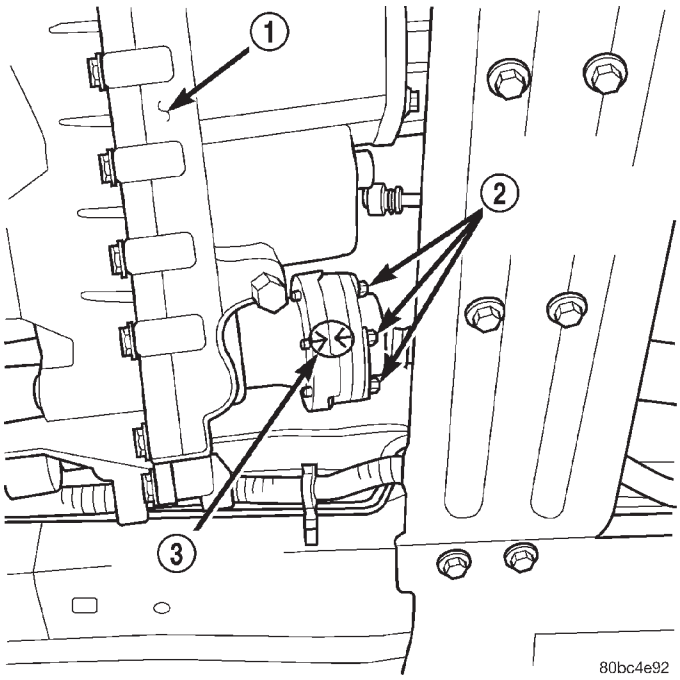

Fig. 2 Front Driveshaft Retaining Bolts

1 – TRANSFER CASE
2 – FRONT DRIVESHAFT RETAINING BOLTS
3 – REFERENCE MARK

(6) Remove the rear driveshaft retaining bolts and remove the driveshaft from the transfer case companion flange. Support the driveshaft with mechanics wire (Fig. 3).

(7) Disconnect the transfer case shift cable from the shifter arm (Fig. 4).

(8) Disconnect the vent tube from the transfer case (Fig. 4).

(9) Remove the transmission oil pan and drain the transmission fluid. Reinstall the transmission oil pan.

(10) Position a jack under the transmission support crossmember and support the transmission and transfer case assembly.

(11) Remove the (8) transmission support crossmember retaining bolts (Fig. 5).

REMOVAL AND INSTALLATION (Continued)

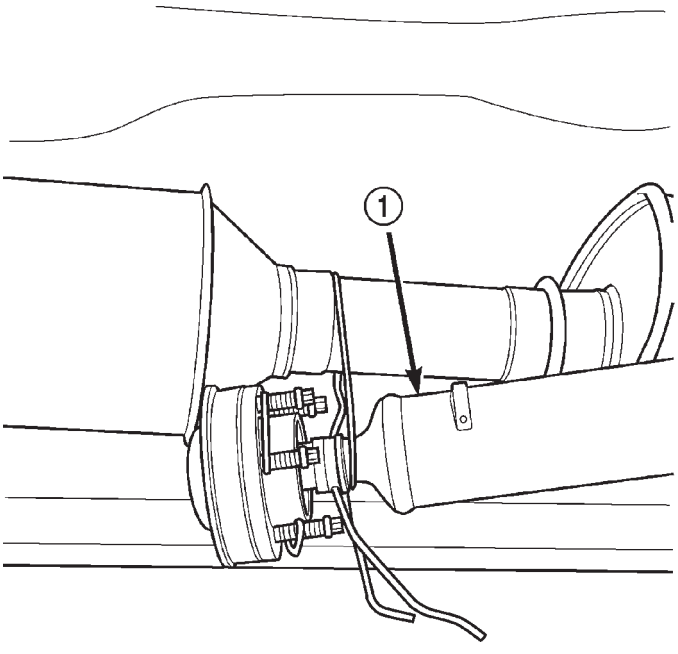

Fig. 3 Rear Driveshaft - Supported

1 – REAR DRIVESHAFT

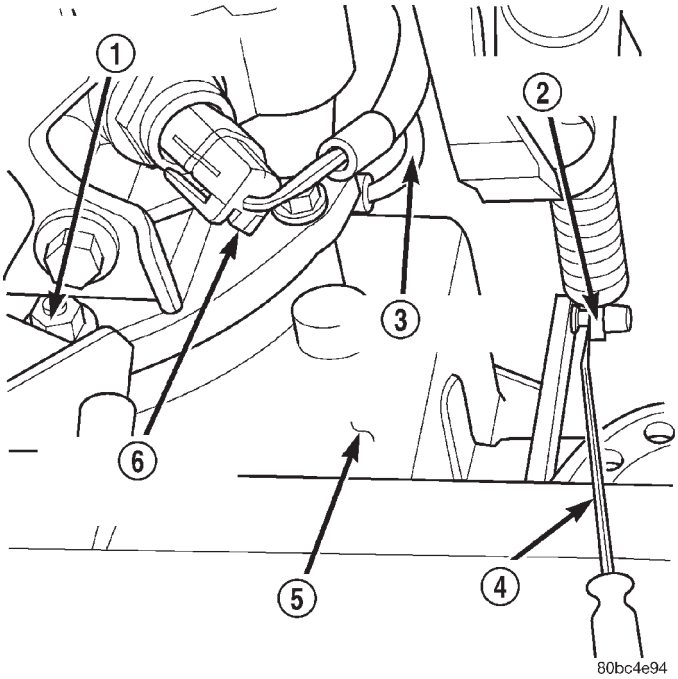

Fig. 4 Disconnecting Transfer Case Shift Linkage

1 – TRANSFER CASE RETRAINING NUTS
2 – TRANSFER CASE SHIFTER CABLE
3 – TRANSFER CASE VENT HOSE
4 – FLAT BLADED TOOL
5 – TRANSFER CASE
6 – TRANSMISSION ELECTRICAL CONNECTOR

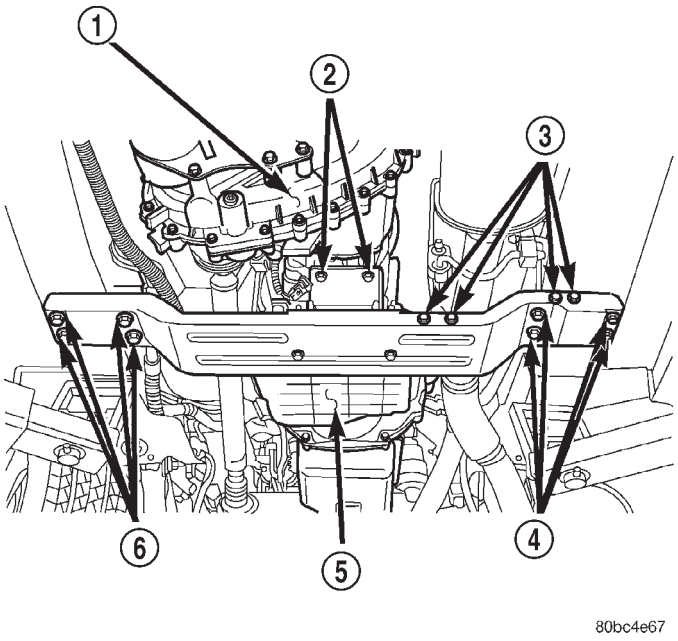

Fig. 5 Transmission Support Crossmember Position & Orientation

1 – TRANSFER CASE
2 – TRANSMISSION MOUNT RETAINING BOLTS (2 OF 4)
3 – EXHAUST SYSTEM SUPPORT BRACKET RETAINING BOLTS
4 – CROSSMEMBER RETAINING BOLTS
5 – TRANSMISSION
6 – CROSSMEMBER RETAINING BOLTS

(12) Position a transmission jack under the transfer case.

(13) Lower the transmission assembly enough to gain access and remove the transfer case to transmission retaining nuts.

(14) Remove the transfer case from the vehicle.

INSTALLATION

NOTE: If a replacement transfer case is being installed, be certain the counter weight is installed on the transfer case housing prior to installation.

(1) Install the transfer case on the transmission. Torque the transfer case retaining nuts to 75 N·m (55 ft. lbs.) (Fig. 6).

(2) Install the vent tube on the transfer case (Fig. 6).

(3) Connect the transfer case shift cable on the shifter arm (Fig. 6).

(4) Using the jack, raise the transmission assembly into position and install the (8) transmission support crossmember retaining bolts (Fig. 7). Torque the bolts to 41 N·m (30 ft. lbs.).

(5) Install the rear driveshaft. Torque the bolts to 32 N·m (24 ft. lbs.). Be certain to install the driveshaft in the same position as before removal.

REMOVAL AND INSTALLATION (Continued)

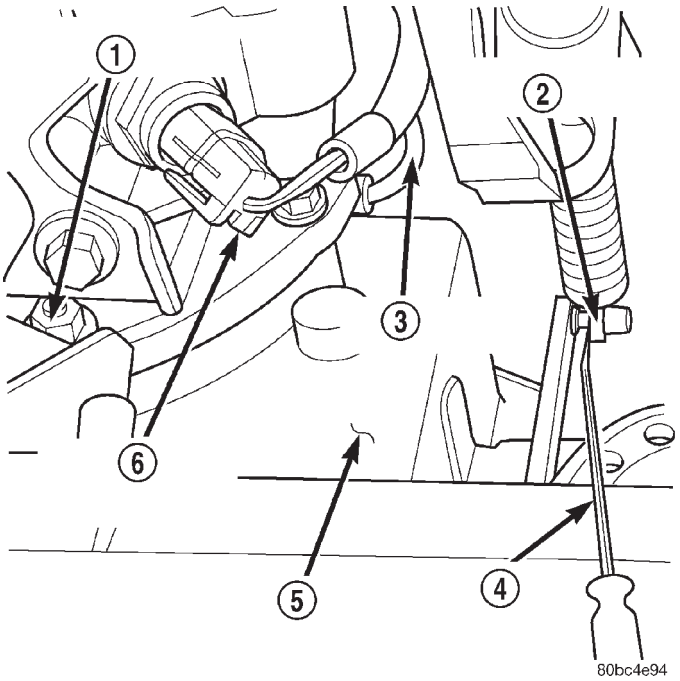

Fig. 6 Transfer Case Position & Orientation

1 – TRANSFER CASE RETRAINING NUTS
2 – TRANSFER CASE SHIFTER CABLE
3 – TRANSFER CASE VENT HOSE
4 – FLAT BLADED TOOL
5 – TRANSFER CASE
6 – TRANSMISSION ELECTRICAL CONNECTOR

(6) Install the front driveshaft. Torque the bolts to 32 N·m (24 ft. lbs.) (Fig. 8). Be certain to install the driveshaft in the same position as before removal.

(7) Install the (2) lower fan shroud retaining bolts. Torque the bolts to 15 N·m (132 in. lbs.).

(8) Lower the vehicle on the hoist.

(9) Install the (2) upper fan shroud retaining bolts. Torque the bolts to 15 N·m (132 in. lbs.).

(10) Fill the transmission fluid to specification.

(11) Connect the negative battery cable.

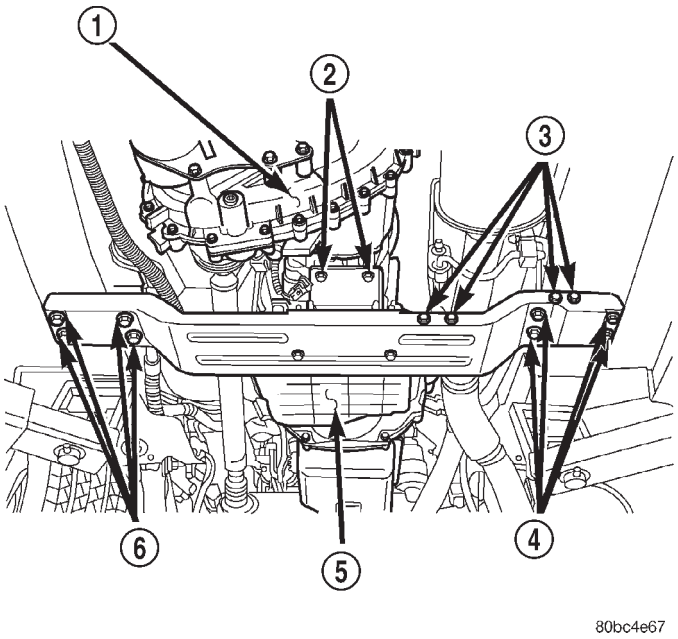

Fig. 7 Transmission Support Crossmember Position & Orientation

1 – TRANSFER CASE
2 – TRANSMISSION MOUNT RETAINING BOLTS (2 OF 4)
3 – EXHAUST SYSTEM SUPPORT BRACKET RETAINING BOLTS
4 – CROSSMEMBER RETAINING BOLTS
5 – TRANSMISSION
6 – CROSSMEMBER RETAINING BOLTS

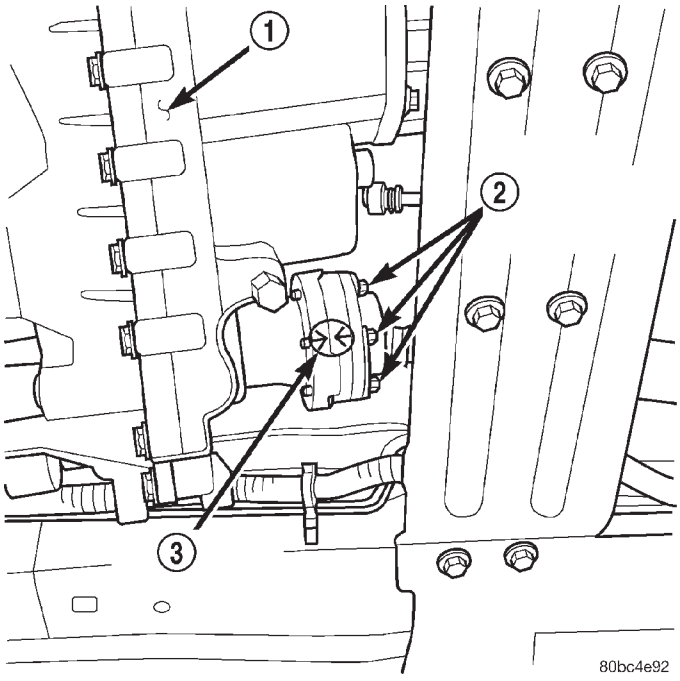

Fig. 8 Front Driveshaft Retaining Bolts

1 – TRANSFER CASE
2 – FRONT DRIVESHAFT RETAINING BOLTS
3 – REFERENCE MARK