

TRANSAXLE

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GENERAL INFORMATION

42LE TRANSAXLE

The 42LE Four Speed Transaxle uses fully-adaptive controls. Adaptive controls are those which perform their functions based on real-time feedback sensor information. The transaxle is conventional in the use of hydraulically applied clutches to shift a planetary gear train. It uses electronics to control virtually all other functions.

42LE TRANSAXLE IDENTIFICATION

The 42LE transaxle identification code is printed on a bar code label. The label is located on the transaxle case (Fig. 1).

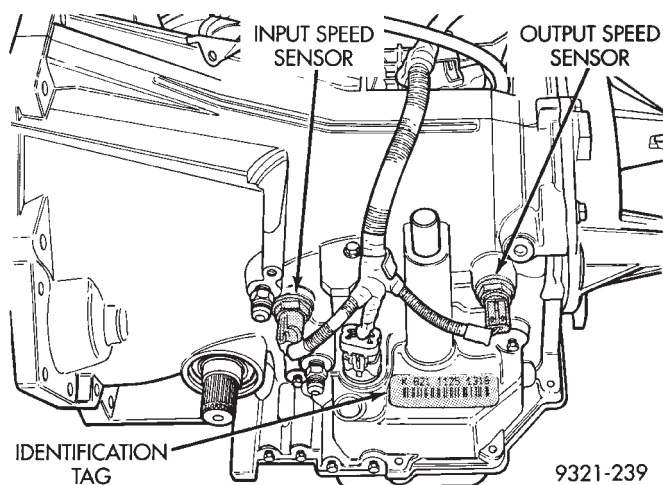


Fig. 1 Identification Tag Location

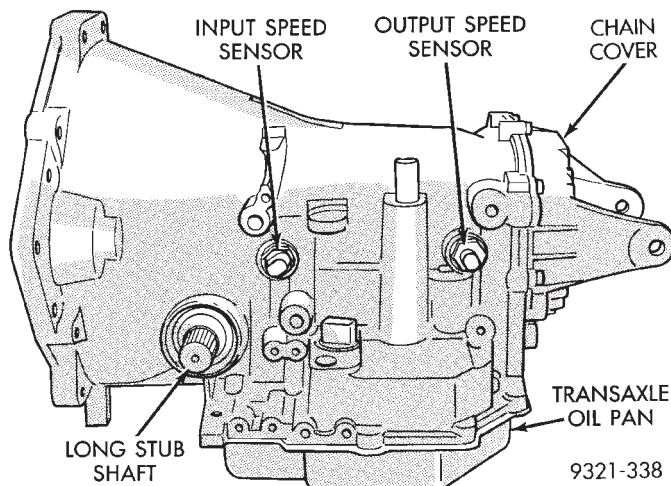


Fig. 2 Left Side View of Transaxle

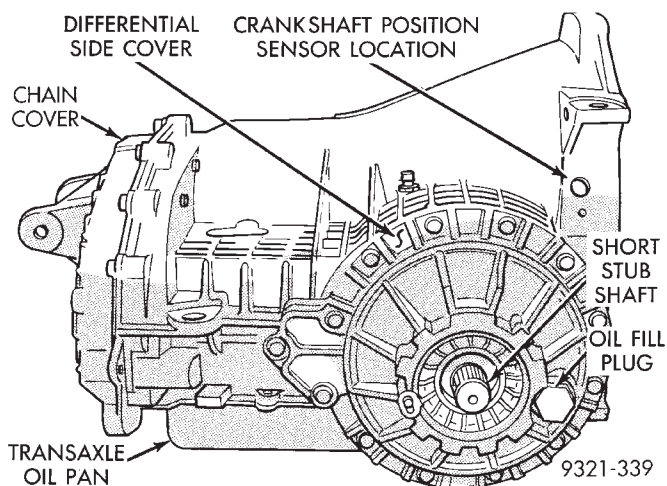


Fig. 3 Right Side View of Transaxle

IN-VEHICLE SERVICE

The following is a list of transaxle components that are serviceable in the vehicle:

- Valve Body Assembly
- Solenoid Pack
- Manual Valve Lever Position Sensor (MVLPS)
- Input Speed Sensor
- Output Speed Sensor
- Transfer Chain
- Chain Sprockets
- Short (Right) Stub Shaft Seal
- Long (left) Stub Shaft and Ball Bearing

OPERATION

The 42LE transaxle provides forward ratios of 2.84, 1.57, 1.00, and 0.69. The torque converter clutch is available in 2nd, direct, or overdrive gear. The Reverse ratio is 2.21. The shift lever is conventional (except autostick) with six positions (P, R, N, OD, 3, and L). When OD is selected the transaxle shifts normally through all four speeds with the torque converter clutch operational in third and overdrive; this position is recommended for most driving. The 3 position is tailored for use in hilly, mountainous driving or trailer towing. When 3 is selected, the transmission uses only 1st, 2nd, and direct gears with 2nd-direct shift delayed to 40 mph or greater. When operating in 3 or L positions torque converter clutch application occurs in direct gear. This improves transmission cooling when towing trailers and/or driving on steep grades. If high transmission oil or engine coolant temperature occurs, the torque converter clutch will also engage in 2nd gear. The L position provides maximum engine braking for descending steep grades. Unlike most current transaxles, upshifts are provided to 2nd or direct gear at peak engine speeds if the accelerator is depressed. This provides engine over-speed protection and maximum performance.

GENERAL INFORMATION (Continued)

FLUID LEVEL AND CONDITION

NOTE: The transmission and differential have separate oil sumps. The transmission sump requires automatic transmission fluid. The differential sump requires petroleum based hypoid gear lube.

TRANSMISSION SUMP

FLUID LEVEL CHECK

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

The torque converter fills in both the P Park and N Neutral positions. Place the selector lever in P Park to be sure that the fluid level check is accurate. **The engine should be running at idle speed for at least one minute, with the vehicle on level ground.** At normal operating temperature (approximately 82 C. or 180 F.), the fluid level is correct if it is in the HOT region (cross-hatched area) on the oil level indicator (Fig. 4). The fluid level will be approximately one-quarter inch above the lower hole of the dipstick at 70° F fluid temperature.

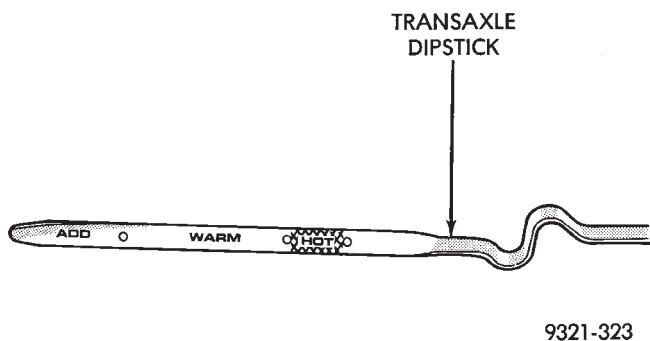


Fig. 4 Dipstick Markings

FLUID LEVEL CHECK USING DRB

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

- (1) Start engine and apply parking brake.
- (2) Hook up DRBIII scan tool and select transmission.
- (3) Select sensors.
- (4) Read the transmission temperature value.
- (5) Compare the fluid temperature value with the chart.
- (6) Adjust transmission fluid level shown on the dipstick according to the chart.
- (7) Check transmission for leaks.

Low fluid level can cause a variety of conditions because it allows the pump to take in air along with

the fluid. As in any hydraulic system, air bubbles make the fluid spongy, therefore, pressures will be low and build up slowly.

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

In either case, air bubbles can cause overheating and/or fluid oxidation, and varnishing. This can interfere with normal valve, clutch, and accumulator operation. Foaming can also result in fluid escaping from the transaxle vent where it may be mistaken for a leak.

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

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

The transmission fluid level should be inspected at least every six months.

DIFFERENTIAL SUMP

The differential sump is checked separately from the transmission. A fill plug located on the side of the transaxle must be removed to check fluid level (Fig. 5). The fluid should be level with the bottom of the fill hole. The differential capacity is .946 liters (32 ounces).

Inspect the differential area during engine oil changes for any leaks. If leakage is present, determine the source of the leak and repair as required. Remove the fill plug and verify the proper level. Adjust if needed.

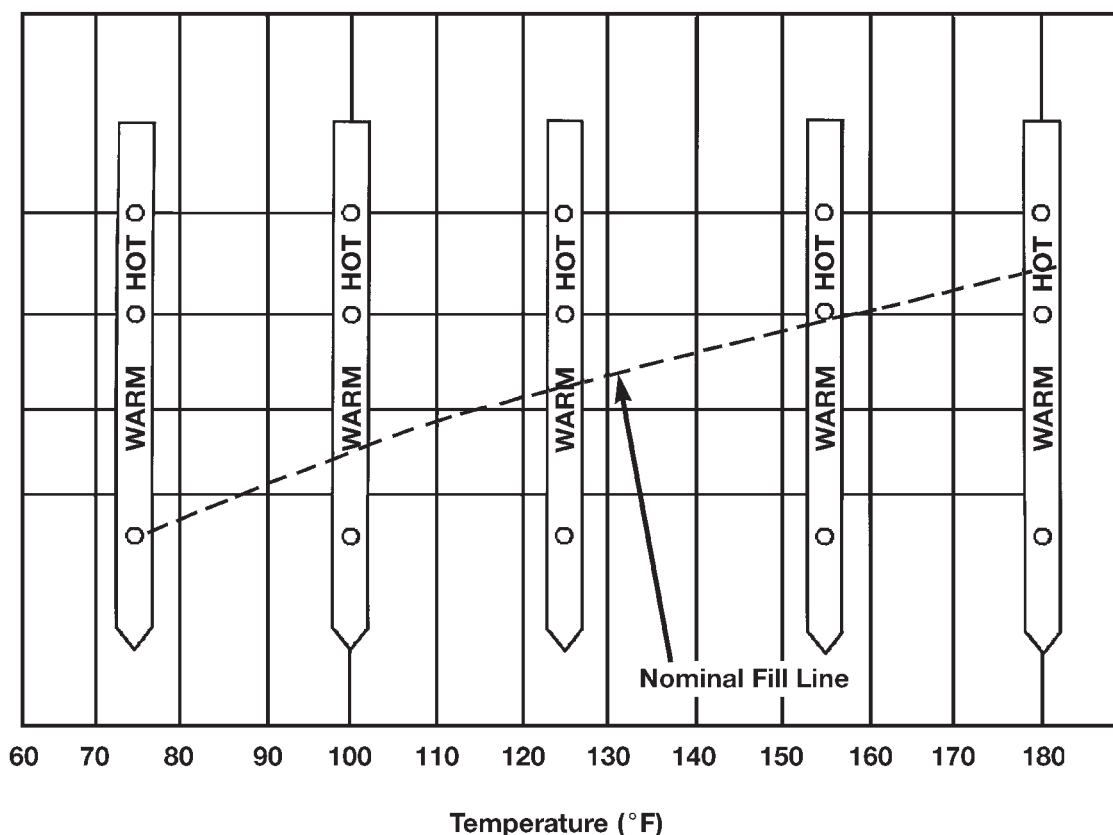
SELECTION OF LUBRICANTS

It is important that the proper lubricants be used in the 42LE transaxle. Mopar ATF Plus (Automatic Transmission Fluid-Type 7176) should be used in the transmission side of the transaxle. Substitute fluids can induce torque converter clutch shudder.

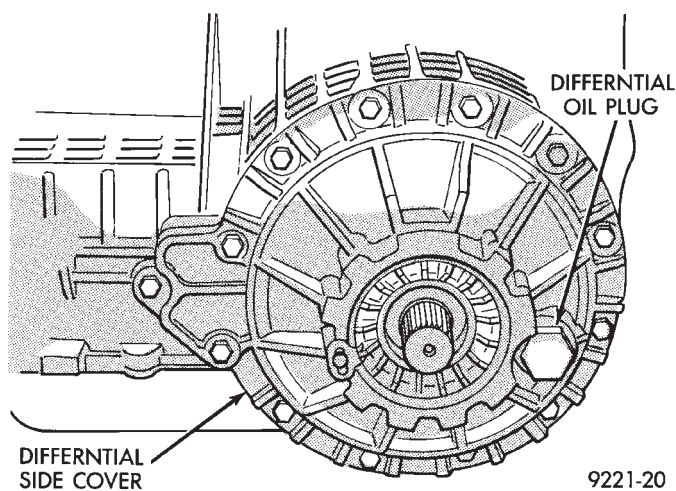
The differential side of the transaxle should be filled with Mopar petroleum based hypoid gear lubricant 80W-90. Synthetic gear lubricants should not be used.

SPECIAL ADDITIVES

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



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Transmission Fluid Temperature Chart**Fig. 5 Differential Oil Fill Plug Location****DESCRIPTION AND OPERATION****CLUTCH AND GEAR**

The 42LE transaxle consists of:

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

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

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

HYDRAULICS

The hydraulics of the transaxle provide:

- Manual shift lever select function
- Main line pressure regulation
- Torque converter flow control
- Transaxle oil cooler flow control

Oil flow to the friction elements is controlled directly by four solenoid valves. The hydraulics also include a logic-controlled solenoid switch valve. It locks out the 1st gear reaction element with the application of 2nd, direct, or overdrive gear elements. It also redirects the 1st gear solenoid output so that it can control torque converter clutch operation. To regain access to 1st gear, a special sequence of solenoid commands must be used to unlock and move the solenoid switch valve. This precludes any application

DESCRIPTION AND OPERATION (Continued)

of the 1st gear reaction element with other elements applied. It also allows one solenoid to control two friction elements.

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

SOLENOIDS

Since the solenoid valves perform all control functions, these valves must be durable and tolerant of dirt particles. For that reason hardened- steel poppet and ball valves are used. These are free from any close operating clearances, and the solenoids operate the valves directly. Direct operation means that these units must have very high output. They must close against the sizeable flow areas and high line pressures. Fast response is also required to meet the control requirements.

Two of the solenoids are normally-venting and two are normally-applying; this was done to provide a default mode of operation. With no electrical power, the transmission provides 2nd gear in OD, 3, or L shift lever positions. All other shift lever positions will function normally. The choice of 2nd gear was made to provide adequate performance while still accommodating highway speeds.

SENSORS

There are three pressure switches which identify solenoid application. The pressure switches are incorporated in an assembly with the solenoids. Two speed sensors read input (torque converter turbine) and output (parking sprag) speeds. There is also a manual valve lever position sensor (MVLPS) which senses manual valve position.

Engine speed, throttle position, temperature, etc., are also observed. Some of these signals are read directly from the engine control sensors; others are read from a multiplex circuit with the engine controller.

ADAPTIVE CONTROLS

These controls function by reading the input and output speeds over 140 times a second and responding to each new reading. This provides the friction element control needed to make smooth clutch-to-clutch shifts for all gear changes without the use of overrunning clutches. As with most automatic transaxles, all shifts involve releasing one element and applying a different element. In simplified terms, the upshift logic allows the releasing element to slip backwards slightly to ensure that it does not have excess capacity; the apply element is filled until it begins to make the speed change to the higher gear; its apply pressure is then controlled to maintain the

desired rate of speed change until the shift is complete. The key to providing excellent shift quality is precision; for example, as mentioned, the release element for upshifts is allowed to slip backwards slightly; the amount of that slip is typically less than a total of 20 degrees. To achieve that precision, the transmission control module learns the characteristics of the particular transaxle that it is controlling. It learns:

- The release rate of the releasing element.
- The apply time of the applying element.
- The rate the apply element builds pressure.

This method achieves more precision than would be possible with exacting tolerances. It can also adapt to any changes that occur with age or environment.

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

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

DIAGNOSTICS

These controls also provide comprehensive, on-board transaxle diagnostics. The information available can aid in transaxle diagnosis. For example, apply element buildup rate indicates solenoid performance. Also included are self-diagnostic functions which allow the technician to test the electronic controls. The transmission control module monitors its critical functions, records any malfunctions, and the number of engine starts since the last malfunction. The technician can use this information in the event of a customer complaint. Refer to the 42LE Transaxle Diagnostic Procedure Manual for specifics.

TRANSMISSION CONTROL MODULE

The transmission control module is located in the engine compartment between the left front fender and the battery. It is held in place by four mounting screws. The battery must be moved to gain access to the transmission control module.

NOTE: If the transmission control module has been replaced, refer to Quick Learn Procedure. This program will allow the transmission control module to learn the characteristics of the vehicle.

DESCRIPTION AND OPERATION (Continued)

TRANSMISSION CONTROL RELAY

The transmission control module controls power to the solenoid pack through the transmission control relay. The relay is located in the power distribution center on the left strut tower.

Refer to the 42LE Transaxle Diagnostic Procedures Manual for test procedures.

SOLENOID ASSEMBLY

The transaxle solenoid pack is located on the top side of the valve body. The valve body must be removed from the transaxle in order to service the solenoid pack.

The solenoid pack contains four solenoids. If any one of the solenoids fail, all of the solenoids must be replaced. There are no serviceable parts for the solenoid pack.

Refer to the 42LE Transaxle Diagnostic Procedures Manual for diagnostic test procedures.

SHIFTER/IGNITION INTERLOCK

The ignition interlock system connects the automatic transmission shifter and the lock system. With the ignition key in the OFF or ACCESSORY position, the interlock system holds the transmission shifter in park. When the key is in the UNLOCK or RUN position the shifter unlocks and can be moved to any position. Also, if the shifter is not in PARK, the system prevents the operator from turning the ignition switch to the OFF or ACCESSORY positions.

NOTE: If the vehicle has column shift, install a new interlock cassette (column shift) when replacing the ignition lock cylinder. Adjust the system after replacing the cassette.

NOTE: If the vehicle has floor shift, adjust the interlock cable after replacing the lock cylinder.

MANUAL VALVE LEVER POSITION SENSOR

The Manual Valve Lever Position Sensor (MVLPS) interprets the position of the manual valve. This information is sent to the transmission control module. Also the MVLPS provides for Park/Neutral only starter operation and back-up lamp operation.

The MVLPS connector extends outside the transaxle on the left side, next to the fill tube. The MVLPS is mounted to the top of the valve body. The MVLPS and valve body must be removed from the transaxle as an assembly.

Refer to the 42LE Transaxle Diagnostic Procedures Manual for MVLPS diagnostic test procedures.

TRANSMISSION TEMPERATURE SENSOR

Located within the MVLPS is a transmission temperature sensor. This sensor is used to measure the transmission fluid sump temperature. The transmission temperature sensor is serviced with the MVLPS as a unit.

AUTOSTICK**OPERATION**

Autostick is a driver-interactive transaxle feature that offers manual gear shifting capability. When the shifter is moved into the Autostick position, the transaxle remains in whatever gear it was using before Autostick was activated. Moving the shifter to the left (towards the driver) causes a downshift and moving to the right (towards the passenger) causes an upshift. The instrument cluster will illuminate the selected gear. The vehicle can be launched in 1st, 2nd, or 3rd gear while in the Autostick mode. The speed control is operable in 3rd and 4th gear Autostick mode. Speed control will be deactivated if the transaxle is shifted to 2nd gear. Shifting into OD position cancels the Autostick mode, and the transaxle resumes the OD shift schedule.

AUTOMATIC OVERRIDES

For safety, durability, and driveability, some shifts are executed automatically or prevented.

AUTOMATIC SHIFTS WILL OCCUR UNDER THE FOLLOWING CONDITIONS

TYPE OF SHIFT	APPROXIMATE SPEED
4-3 coast downshift	13 mph
3-2 coast downshift	9 mph
2-1 coast downshift	5 mph
1-2 upshift	6300 engine rpm
2-3 upshift	6300 engine rpm
4-3 kickdown shift	13-47 mph w/sufficient throttle

MANUAL SHIFTS ARE NOT PERMITTED UNDER THE FOLLOWING CONDITIONS

TYPE OF SHIFT	APPROXIMATE SPEED
3-4 upshift	Below 15 mph
3-2 downshift	Above 74 mph @ closed throttle or 70 mph otherwise
2-1 downshift	Above 41 mph @ closed throttle or 38 mph otherwise

DESCRIPTION AND OPERATION (Continued)

SHIFT POSITION INDICATOR

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

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

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

DIAGNOSIS AND TESTING**42LE GENERAL DIAGNOSIS**

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

42LE automatic transaxle malfunctions may be caused by these general conditions:

- Poor engine performance
- Improper adjustments
- Hydraulic malfunctions
- Mechanical malfunctions
- Electronic malfunctions

When diagnosing a problem always begin with recording the complaint. The complaint should be defined as specific as possible. Include the following checks:

- Temperature at occurrence (cold, hot, both)
- Dynamic conditions (acceleration, deceleration, upshift, cornering)
- Elements in use when condition occurs (what gear is transaxle in during condition)
- Road and weather conditions
- Any other useful diagnostic information.

After noting all conditions, check the easily accessible variables:

- Fluid level and condition
- Shift linkage adjustment
- Diagnostic trouble code inspection

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

ROAD TEST

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

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

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

An engine miss could be attributed to a cracked drive plate. A cracked drive plate could cause the camshaft position sensor and crankshaft position sensor signals to be out of synchronization. This could cause a no-start condition.

A slipping clutch will set a DTC 50–54 only and can be determined by operating the transaxle in all selector positions. Then comparing which internal units are applied in those positions. The Elements in Use Chart provides a basis for road test analysis.

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

HYDRAULIC PRESSURE TESTS

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

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

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

Using special adapters (L-4559), attach 300 psi gauges to ports required for test being conducted.

Test port locations are shown in (Fig. 7).

TEST ONE-SELECTOR IN L

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

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

DIAGNOSIS AND TESTING (Continued)

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

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

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Fig. 6 ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

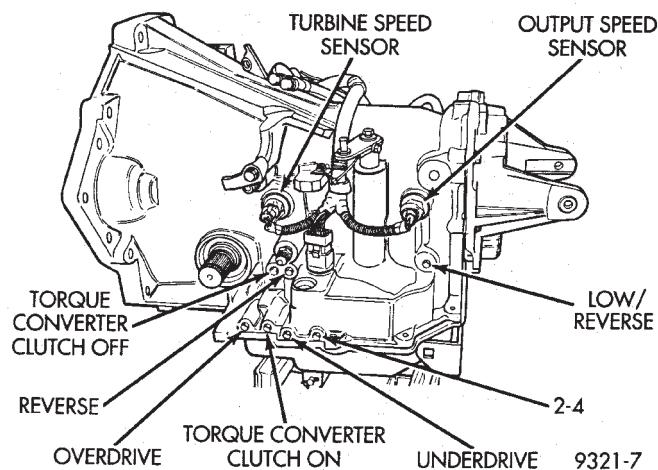


Fig. 7 Pressure Taps

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

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

TEST TWO-SELECTOR IN 3

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

- (1) Attach gauge to the underdrive clutch tap.
- (2) Move selector lever to the 3 position.

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

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

TEST 2A-SELECTOR IN OD

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

- (1) Attach gauge to the UD clutch tap.
- (2) Move selector lever to the OD position.
- (3) Allow wheels to rotate freely and increase throttle opening to achieve an indicated speed of 40 mph.

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

TEST THREE-SELECTOR IN OD

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

- (1) Attach gauge to the overdrive clutch tap.
- (2) Move selector lever to the OD position.
- (3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 20 mph.
- (4) Overdrive clutch pressure should read 74 to 95 psi.

DIAGNOSIS AND TESTING (Continued)

(5) Move selector lever to the 3 position and increase indicated vehicle speed to 30 mph.

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

TEST FOUR-SELECTOR IN OD

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

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

TEST FIVE-SELECTOR IN OD

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

- (1) Attach gauge to the torque converter clutch off pressure tap.
- (2) Move selector lever to the OD position.
- (3) Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 50 mph.

CAUTION: Both wheels must turn at the same speed.

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

TEST SIX-SELECTOR IN R

NOTE: This test checks the reverse clutch hydraulic circuit.

- (1) Attach gauge to the reverse and LR clutch tap.
- (2) Move selector lever to the R position.
- (3) Read reverse clutch pressure with output stationary (foot on brake) and throttle opened to achieve 1500 rpm.
- (4) Reverse and LR clutch pressure should read 165 to 235 psi.

TEST RESULT INDICATIONS

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

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

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

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

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

CLUTCH AIR PRESSURE TESTS

Inoperative clutches can be located by substituting air pressure for fluid pressure. The clutches may be tested by applying air pressure to their respective passages after the valve body has been removed. Use Special Tool 6599-1 and 6599-2 to perform test (Fig. 8).

To make air pressure tests, proceed as follows:

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

Remove oil pan and valve body. See Valve body recondition.

Apply air pressure to the holes in the special tool, one at a time.

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

OVERDRIVE CLUTCH

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

UNDERDRIVE CLUTCH

Because this clutch piston cannot be seen, its operation is checked by function. Air pressure is applied to the low/reverse or the 2/4 clutches. This locks the output shaft. Use a piece of rubber hose wrapped around the input shaft and a pair of clamp-on pliers to turn the input shaft. Next apply air pressure to the underdrive clutch (Fig. 9). The input shaft should not rotate with hand torque. Release the air pressure and confirm that the input shaft will rotate.

DIAGNOSIS AND TESTING (Continued)

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

Gear Selector Position		Actual Gear	PRESSURE TAPS					
			Underdrive Clutch	Overdrive Clutch	Reverse Clutch	Torque Converter Clutch Off	2/4CLUTCH	Low/Reverse Clutch
PARK 0 mph	*	PARK	0-2	0-5	0-2	60-110	0-2	X 115-145
REVERSE 0 mph	*	REVERSE	0-2	0-7	165-235	50-100	0-2	165-235
NEUTRAL 0 mph	*	NEUTRAL	0-2	0-5	0-2	60-110	0-2	115-145
L 20 mph	#	FIRST	110-145	0-5	0-2	60-110	0-2	115-145
3 30 mph	#	SECOND	110-145	0-5	0-2	60-110	115-145	0-2
3 45 mph	#	DIRECT	75-95	75-95	0-2	60-90	0-2	0-2
OD 30 mph	#	OVERDRIVE	0-2	75-95	0-2	60-90	75-95	0-2
OD 50 mph	#	OVERDRIVE WITH TCC	0-2	75-95	0-2	0-5	75-95	0-2

* Engine speed at 1500 rpm

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

42LE PRESSURE CHECK SPECIFICATIONS

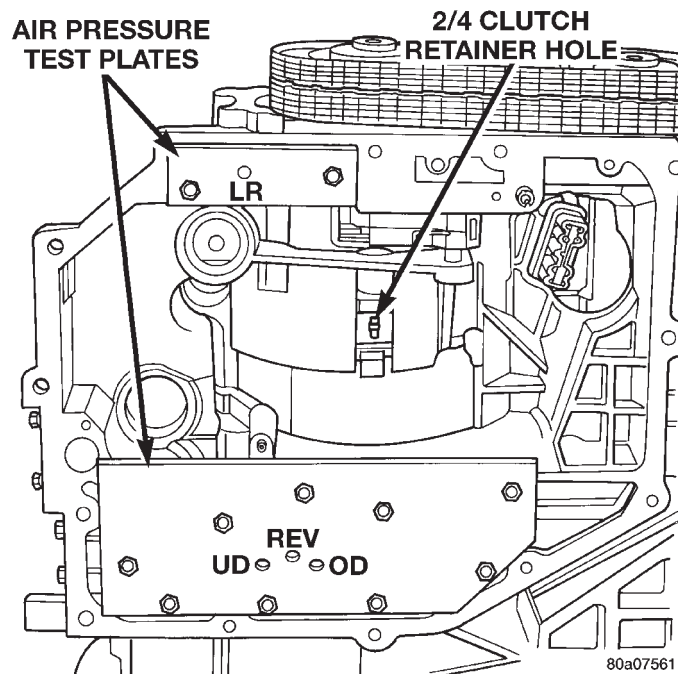


Fig. 8 Air Pressure Test Plate

REVERSE CLUTCH

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

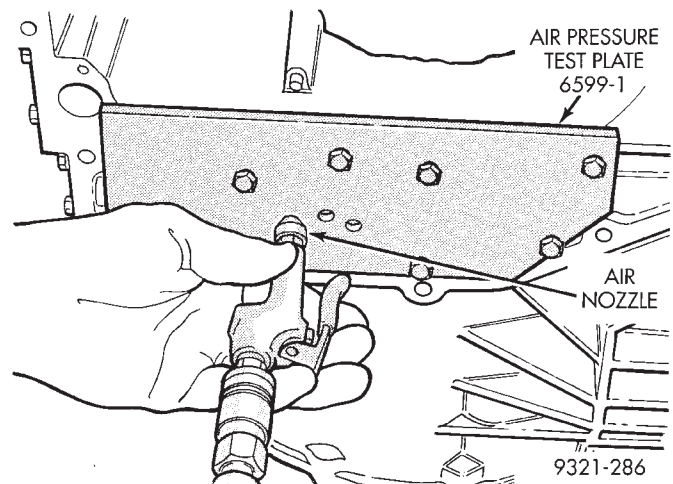


Fig. 9 Testing Underdrive Clutch

2/4 CLUTCH

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

LOW/REVERSE CLUTCH

Apply air pressure to the low/reverse clutch feed hole passage. Look in the area where the low/reverse

DIAGNOSIS AND TESTING (Continued)

piston contacts the first separator plate. Watch carefully for the piston to move forward. The piston should return to its original position after the air pressure is removed.

FLUID LEAKAGE

The 42LE is a dual sump transaxle. The transaxle uses both automatic transaxle fluid (ATF) for the main sump and hypoid gear lube for the differential sump. When diagnosing a leak, it is important to distinguish which type of fluid is leaking. Factory fill ATF is dyed red, while differential hypoid oil is brown in color and has a distinctive odor.

There are two seals at the boundary of the two sumps. There is a weep hole in the right side of the transaxle case (Fig. 10) which vents the area between the two seals. If oil is leaking from the weep hole, there is at least one seal leaking. Never plug the weep hole to correct a leaking condition. Plugging the weep hole could result in contaminating one or both transaxle sumps, low oil level, poor transaxle performance or transaxle failure. In order to correctly repair this type of leak the transaxle must be removed from the vehicle and both transfer shaft seals replaced. Refer to Transfer Shaft Seal Replacement procedure in this section.

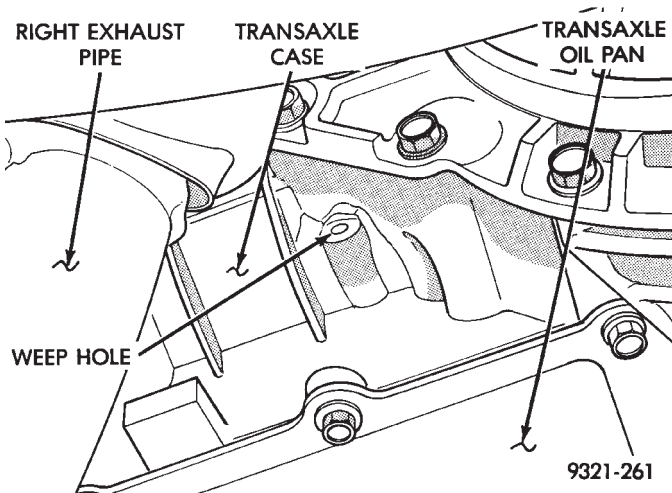


Fig. 10 Weep Hole Location

FLUID LEAKAGE-TORQUE CONVERTER HOUSING AREA

(1) Check for source of leakage. Fluid leakage from the torque converter area may originate from an engine oil leak, a differential oil leak or an ATF oil leak. The area should be examined closely.

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

- When leakage is determined to be automatic transmission fluid, check fluid level prior to removal of the transaxle and torque converter.

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

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

TORQUE CONVERTER LEAKAGE

Possible sources of torque converter leakage are:

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

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

FLUID LEAKAGE—DIFFERENTIAL HOUSING AREA

The differential uses 80w-90 petroleum based hypoid gear lube. It can be distinguished from ATF by its brown color (ATF is dyed red). Also gear lube has a distinctive odor (hypoid smell).

(1) If it is suspected that the leakage is gear lube, check the differential for proper fluid level. High oil level can result in leakage from the differential vent.

CAUTION: A crushed vent baffle will cause oil to leak from vent hose.

(2) If fluid level is correct, add 1/4 to 1/2 ounce of leak detecting florescent dye to the differential.

(3) Clean the suspect area of the transaxle with solvent.

(4) Road test the vehicle until the leak reoccurs.

(5) Using a black light determine the source of the leak and repair as required.

(6) Do not add oil dye to both the ATF sump and the differential sump at the same time. This can cause confusion when trying to pinpoint a leak source.

SHIFTER/IGNITION INTERLOCK

COLUMN SHIFT

If the interlock cable breaks while the shifter is in the park position, the shifter will remain in park. Should the interlock cable break when the shifter is in neutral, the operator won't be able to shift to park. In either case, replace and adjust the interlock cassette or interlock cable.

FLOOR SHIFT

(1) With the floor shifter in Park, place the ignition key in the Lock (Off) position. The operator should not be able to remove the shifter from Park (button on shifter won't depress) when the ignition key is in the Lock position.

DIAGNOSIS AND TESTING (Continued)

(2) Turn the ignition key to the On position. With the ignition key in the Unlock or On position, the shifter should move to any gear position. With the shifter in a gear selection, the operator should not be able to remove the ignition key.

(3) Return the shifter to the Park position. The operator should be able to remove the key after placing it in the Lock (Off) position.

(4) If the interlock system does not work as described in the above steps, check the system for incorrect adjustment or a binding cable. Refer to the Adjustment procedure or the Removal procedure as necessary.

SHIFT POSITION INDICATOR

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

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

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

AUTOSTICK

The autostick feature will be deactivated if one of the following conditions occur:

- **DIAGNOSTIC TROUBLE CODE 28-PRNDL Error**—usually accompanied by all PRNDL lights turning on in Park and Neutral. This will result in a trouble code 28 if three such errors are detected after any one “key-on”.

- **DIAGNOSTIC TROUBLE CODE 70-Autostick Switch Error**

- **DIAGNOSTIC TROUBLE CODE 71-High Powertrain Temperature**—(Transmission oil temperature >275° F) or (Engine coolant temperature >255° F).

Autostick will be reactivated when the condition that caused deactivation no longer exists (The Diagnostic Trouble Codes may remain in memory up to 75 starts after the fault was initially set). The following conditions must be met to reactivate Autostick after a high temperature fault:

- Acceptable Powertrain Temperature=(Transmission Oil Temperature <255° F) and (Engine Coolant Temperature <240° F).

CONDITION	POSSIBLE CAUSE
ALL PRNO3L DISPLAY LIGHTS “ON” IN P&N GEAR POSITIONS	Check wiring and connectors
	Faulty MVLPS
	Faulty manual lever
ALL DISPLAY LIGHTS “ON” IN ALL GEAR POSITIONS	Check wiring & connectors
	Faulty MVLPS
	Faulty manual lever
	CCD communication malfunction
ALL DISPLAY LIGHTS “OFF”	Normal transient condition between P&R and R&N gear positions
	Check shift lever linkage
	Body controller malfunction
	Check wiring and connectors
	Faulty cluster
ALL DISPLAY LIGHTS “OFF” ACCOMPANIED BY A “NO BUS” MESSAGE	CCD communication malfunction
DISPLAY LIGHTS OUT OF SEQUENCE WITH SHIFT LEVER	Check wiring and connectors
	Faulty MVLPS
	Faulty manual lever
	CCD communication malfunction

42LE FOUR SPEED TRANSAXLE ON-BOARD DIAGNOSTICS**GENERAL INFORMATION**

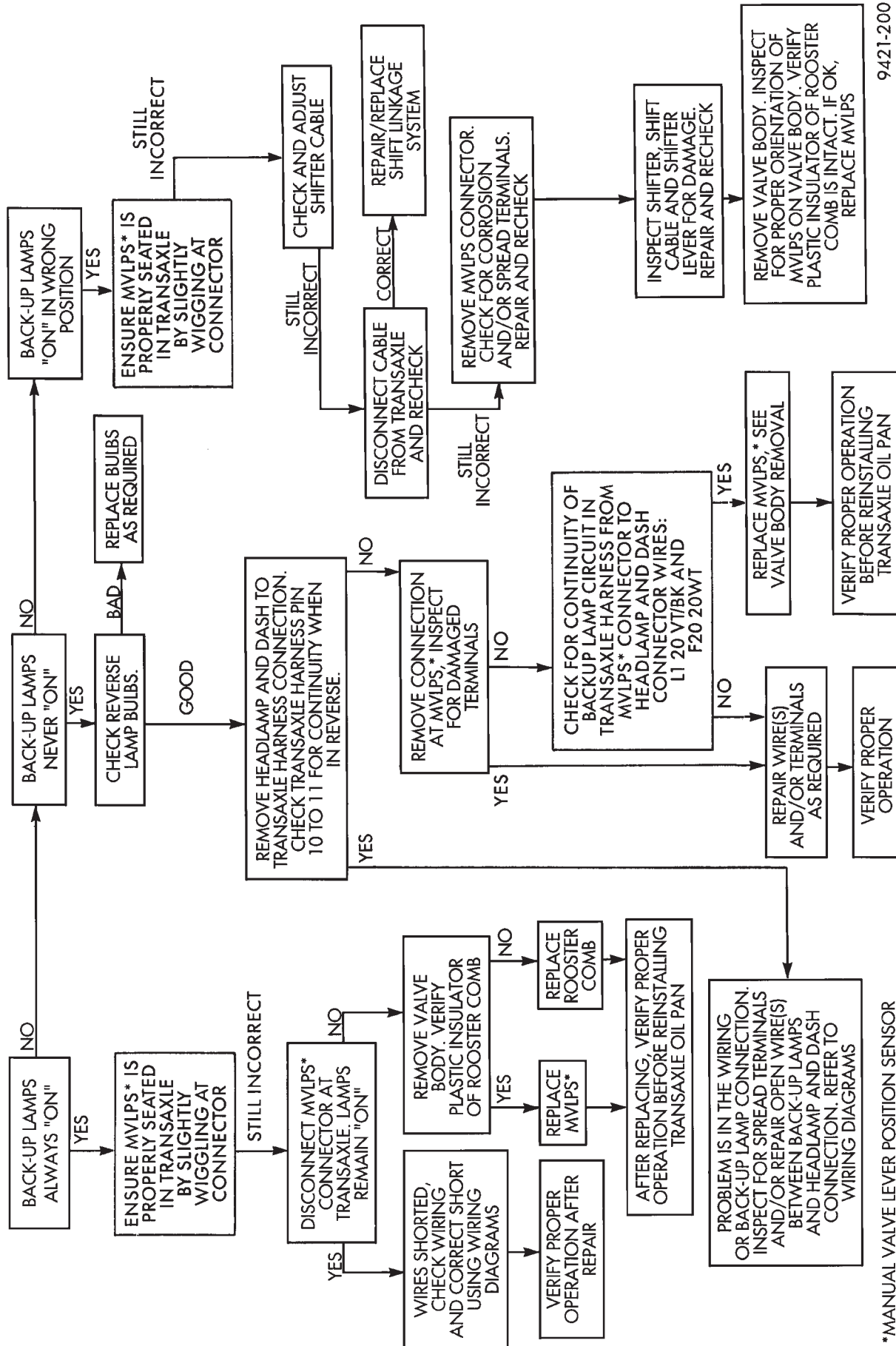
This manual is designed to help the technician repair a 42LE four speed transaxle with the use of on-board diagnostics.

NOTE: Chrysler Corporation has developed a complete set of diagnostic manuals. These manuals cover the diagnosis of a 42LE transaxle. They have been designed to make transaxle diagnosis accurate and simple. Use these manuals with the DRB scan tool and the latest cartridge, when diagnosing transaxle problems.

BACK UP LAMP DIAGNOSIS

The back-up lamps are controlled by the Manual Valve Lever Position Sensor (MVLPS). The following flow chart will assist in diagnosing the back-up lamp system. Refer to Manual Valve Lever Position Sensor in this section for removal procedure.

PERFORM ALL TESTS WITH IGNITION IN THE "ON" POSITION AND PARKING BRAKE APPLIED.



***MANUAL VALVE LEVER POSITION SENSOR**

9421-200

Back-up Lamp Diagnostic Chart

SERVICE PROCEDURES

FLUID AND FILTER CHANGE-TRANSMISSION SUMP

NOTE: Only fluids of the type labeled Mopar ATF Plus (Automatic Transmission fluid) Type 7176 should be used. A filter change should be made at the time of the oil change. The magnet (on the inside of the oil pan) should also be cleaned with a clean, dry cloth.

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

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

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

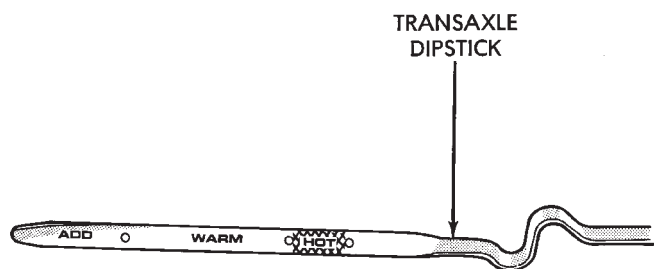
(3) Install a new filter and o-ring on bottom of the valve body and tighten retaining screws to 5 N·m (40 in. lbs.).

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

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

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

(7) Add sufficient fluid to bring the level 1/4 inch above the bottom hole of the dipstick. Room temperature oil (70°F.) set at this level will expand (when heated to 180°F.) to a level within the hot range (Fig. 11).



9321-323

Fig. 11 Dipstick Markings

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

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

FLUID LEVEL CHECK USING DRB

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

- (1) Start engine and apply parking brake.
- (2) Hook up DRBIII scan tool and select transmission.
- (3) Select sensors.
- (4) Read the transmission temperature value.
- (5) Compare the fluid temperature value with the chart.
- (6) Adjust transmission fluid level shown on the dipstick according to the chart.
- (7) Check transmission for leaks.

FLUID DRAIN AND REFILL-DIFFERENTIAL SUMP

The differential fluid can be drained and filled without having to remove the transaxle from the vehicle. Use only Mopar 80W-90 petroleum based hypoid gear lubricant when replacing fluid.

REMOVAL

- (1) Raise vehicle on hoist.
- (2) Remove differential drain plug located on the bottom of the differential housing. Allow the fluid to drain into an oil drain pan.
- (3) Remove differential fill plug located on the differential side cover. This will assist the flow of fluid from the drain plug hole.

INSTALLATION

- (1) Install drain plug into differential housing. Tighten drain plug to 7 N·m (60 in. lbs.).
- (2) Fill differential with Mopar 80W-90 or equivalent petroleum based hypoid gear lubricant. The fluid should be level with the bottom of the fill hole. The differential capacity is .946 liters (32 ounces).

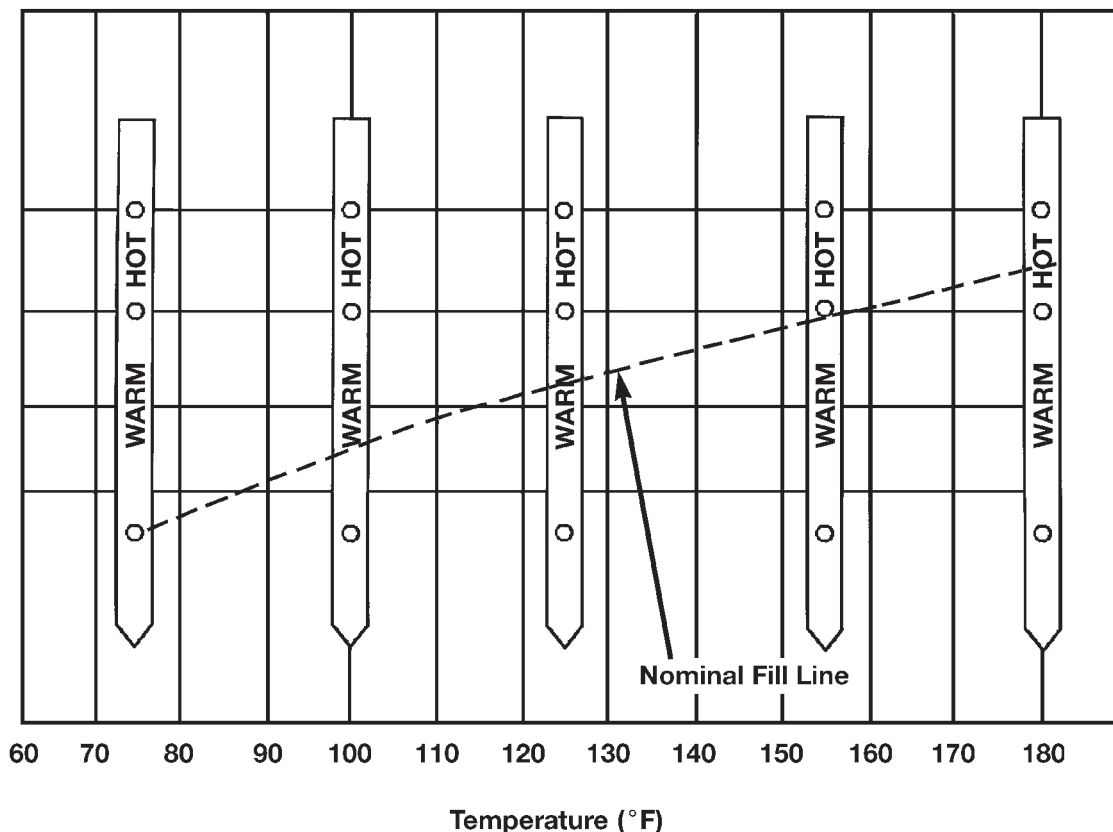
CAUTION: Overfilling the differential can result in oil foaming and/or oil loss from the differential vent.

- (3) Install differential fill plug. Tighten fill plug to 47 N·m (35 ft. lbs.).

ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transaxle case and valve body can be repaired by the use of Heli-Coils, or equivalent. 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

SERVICE PROCEDURES (Continued)



80a0141b

Transmission Fluid Temperature Chart

the hole. This brings the hole back to its original thread size.

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

FLUSHING COOLERS AND TUBES

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

There are two different procedures for flushing coolers and lines. The recommended procedure is to use Tool 6906 Cooler Flusher. The other procedure is to use a hand suction gun and mineral spirits.

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 (Fig. 12).

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

SERVICE PROCEDURES (Continued)

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

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

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

(8) Turn pump OFF.

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

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

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

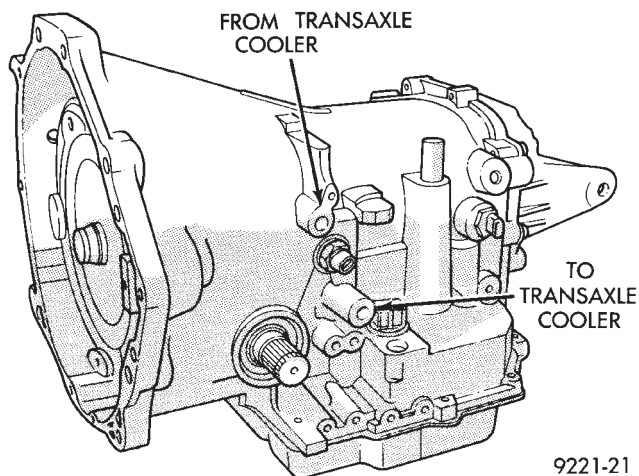
(12) Turn pump ON until all transmission fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transmission cooler and lines. Turn pump OFF.

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

COOLER FLUSH USING SUCTION GUN AND MINERAL SPIRITS

(1) Disconnect the cooler lines at the transmission.

(2) Using a hand suction gun filled with mineral spirits, reverse flush the cooler. Force mineral spirits into the **From Cooler** line of the cooler (Fig. 12) and catch the exiting spirits from the **To Cooler** line. Observe for the presence of debris in the exiting fluid. Continue until fluid exiting is clear and free from debris.



9221-21

Fig. 12 Cooler Line Location

(3) Using compressed air (under 40 psi.) in intermittent spurts, blow any remaining mineral spirits from the cooler, again in the reverse direction.

(4) Pump one (1) quart of automatic transmission fluid through the cooler before reconnecting.

(5) If at any stage of the cleaning process, the cooler does not freely pass fluid, the cooler must be replaced.

OIL COOLER FLOW CHECK

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

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

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

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

(3) If fluid flow is intermittent or it takes more than 20 seconds to collect one quart of ATF, replace the cooler.

(4) If flow is found to be within acceptable limits, reconnect the cooler line. Then fill transmission to the proper level, using the approved type of automatic transmission fluid.

TRANSAXLE QUICK LEARN PROCEDURE

The quick learn procedure requires the use of the DRB scan tool and the DRB scan tool cartridge.

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

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

To perform the Quick Learn Procedure, follow the instructions from the DRB scan tool.

REMOVAL AND INSTALLATION

GEARSHIFT CABLE-COLUMN SHIFT

REMOVAL

(1) Remove under panel silencer/duct assembly (Fig. 13).

(2) Remove column cover screws (Fig. 14).

REMOVAL AND INSTALLATION (Continued)

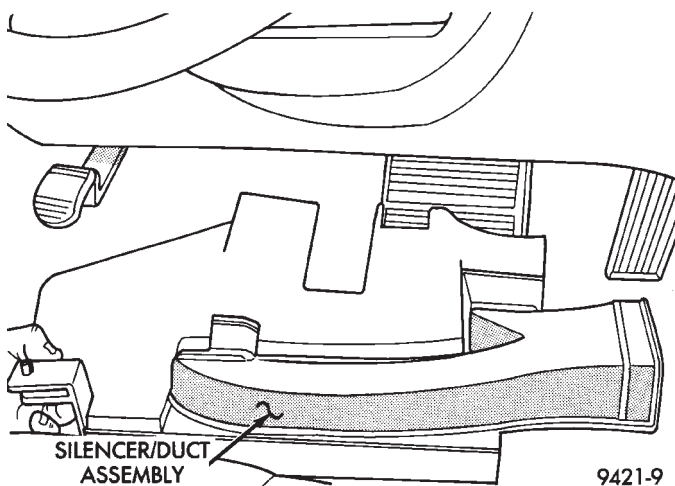


Fig. 13 Panel Removal

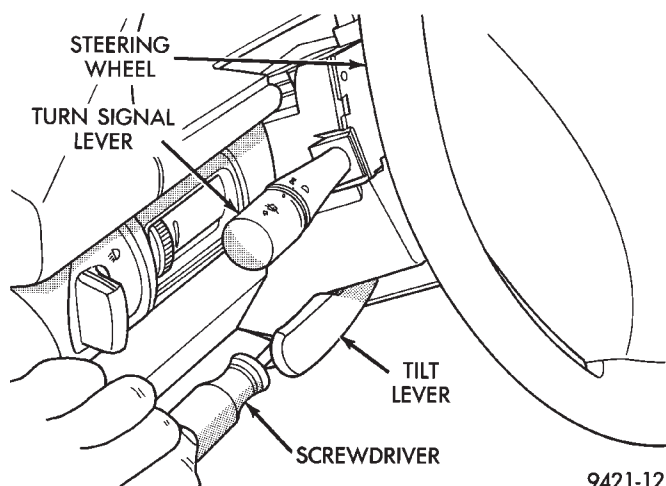


Fig. 16 Tilt Lever Screw Removal

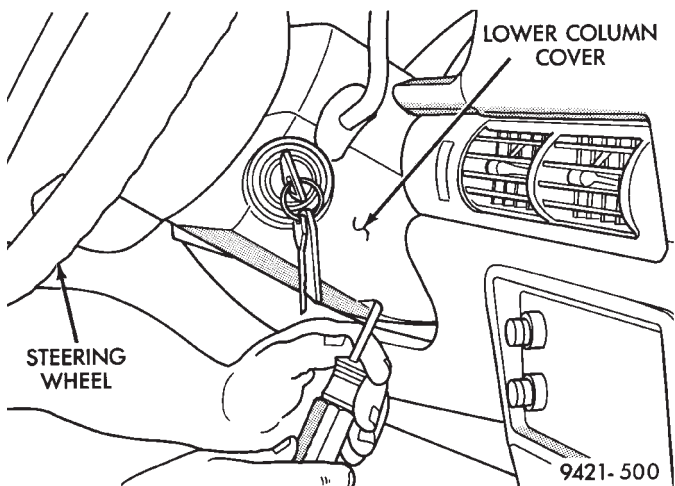


Fig. 14 Lower Column Cover Screw Removal

(3) Tilt column down and remove upper half of column cover (Fig. 15).

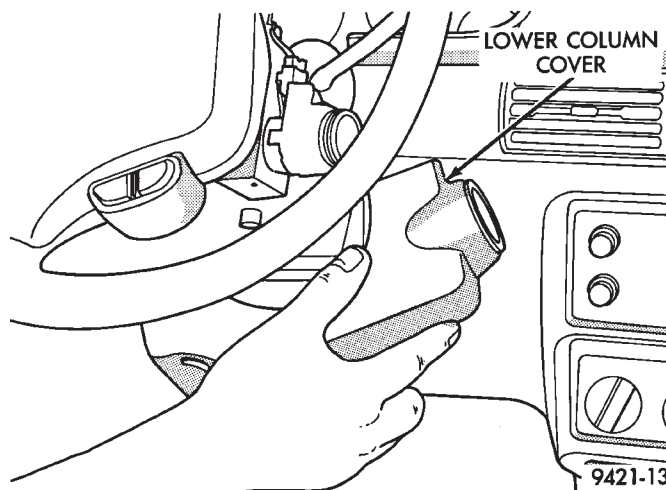


Fig. 17 Lower Column Cover Removal

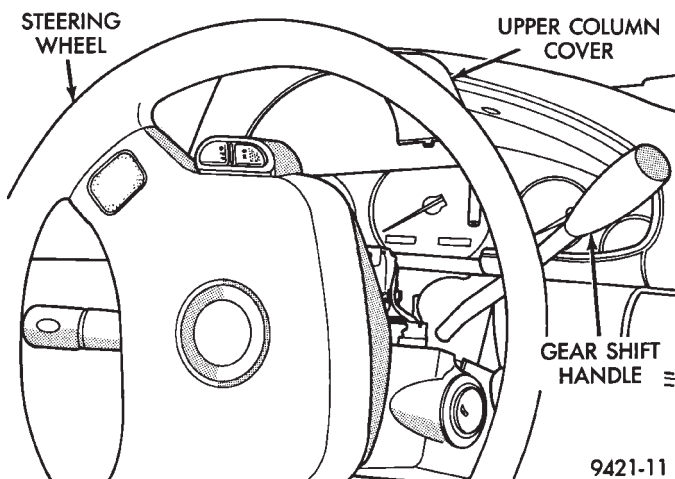


Fig. 15 Upper Column Removal

(4) Raise column up and remove tilt lever (Fig. 16).

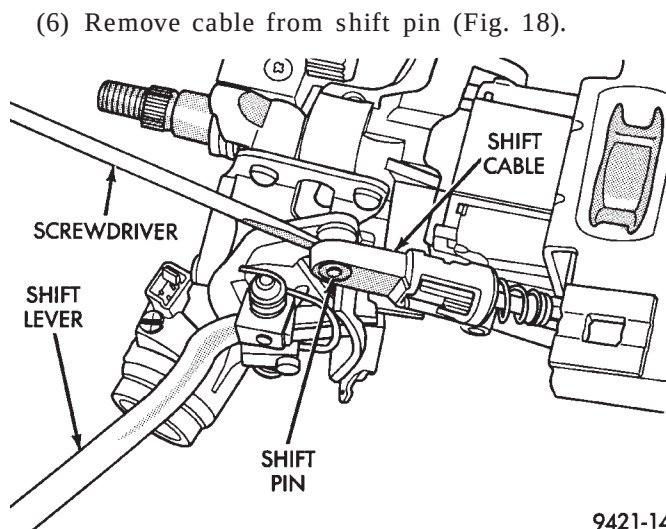


Fig. 18 Cable Removal From Shift Pin

REMOVAL AND INSTALLATION (Continued)

(7) Remove cable retainer clip from shift cable conduit bracket (Fig. 19).

CAUTION: Column must be tilted fully upward to remove cable retainer clip.

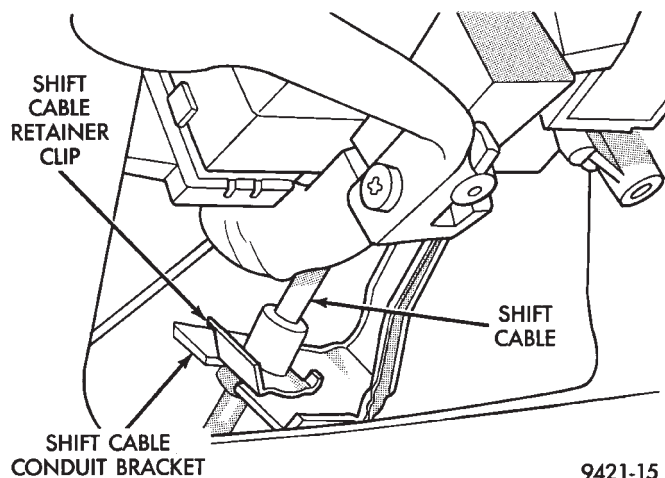


Fig. 19 Shift Cable Retainer Clip Removal

(8) From underhood side of dash panel, unseat grommet and pull cable from interior of vehicle.

(9) Raise vehicle on hoist and unbolt fill tube bracket. Rotate fill tube to gain access to shift cable clamp (Fig. 20).

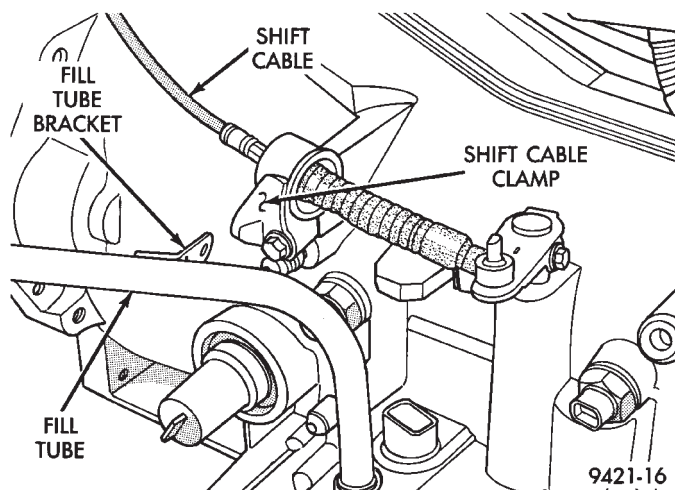


Fig. 20 Fill Tube Bracket Bolt Removal

- (10) Loosen shift cable clamp on transaxle.
- (11) Disconnect shifter cable from shift lever assembly at transaxle (Fig. 21).
- (12) Remove cable from underneath vehicle.

INSTALLATION

(1) Route new cable from underside of vehicle. The cable must be routed between the engine block and the heater return tube (Fig. 22).

(2) Snap new transaxle cable on to transaxle shift lever assembly.

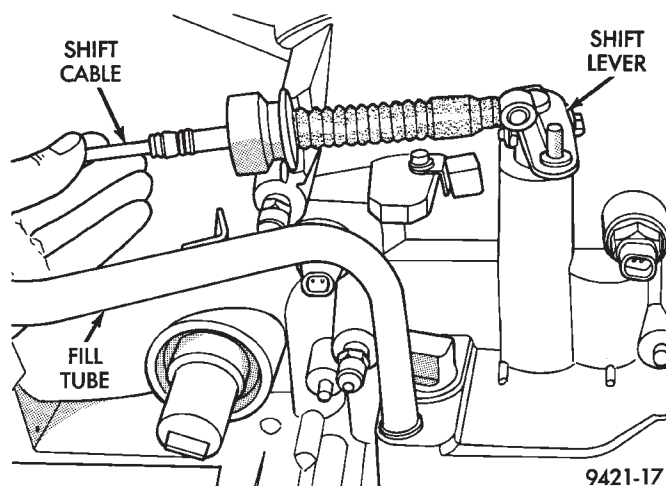


Fig. 21 Cable Removal

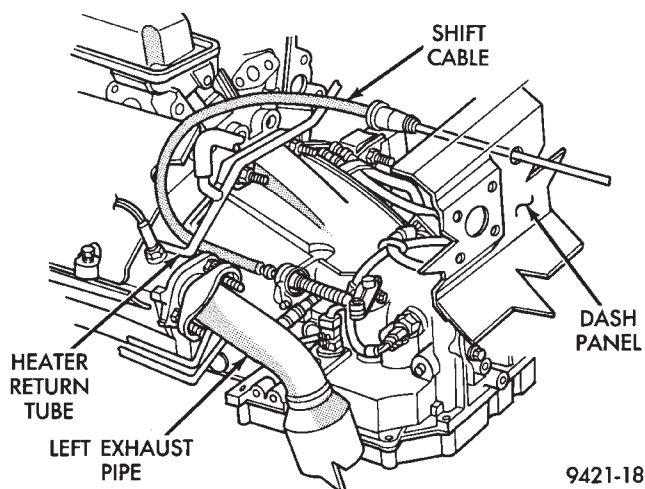


Fig. 22 Shift Cable Routing

(3) Set shift lever assembly in park position at transaxle. This is the most rearward position.

CAUTION: Park sprag must be engaged when adjusting linkage. Rock vehicle back and forth to ensure that park sprag is fully engaged.

(4) Place conduit end fitting in clamp and tighten mounting bolt.

(5) Rotate fill tube to original location. Install and tighten fill tube bracket bolt.

(6) Route transaxle shift cable through hole in dash panel.

(7) Install cable grommet in dash panel.

(8) Route transaxle shift cable along steering column (Fig. 23).

(9) Connect transaxle shift cable to shift cable conduit bracket and secure with new clip.

(10) Attach shift cable (with shift lever in park position) to attaching stud (pin) by snapping into place.

REMOVAL AND INSTALLATION (Continued)

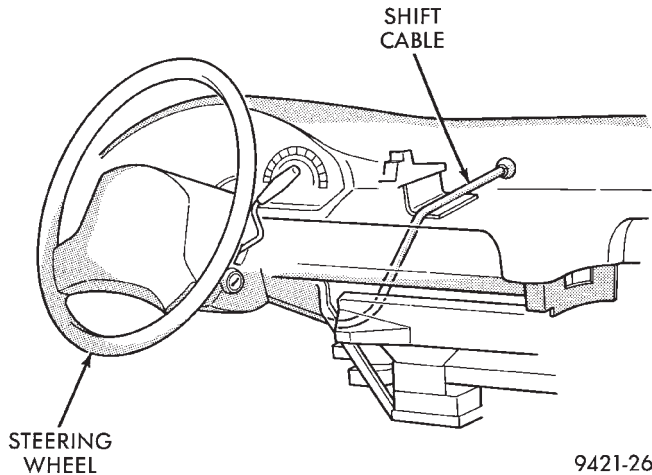


Fig. 23 Shift Cable Routing

(11) Engage the park sprag. Shift the transaxle lever to park. Move the steering column to full tilt downward. Put the column shifter in park with key removed.

(12) Adjust cable by rotating the adjuster into lock position (Fig. 24). The adjuster will click when lock is fully adjusted.

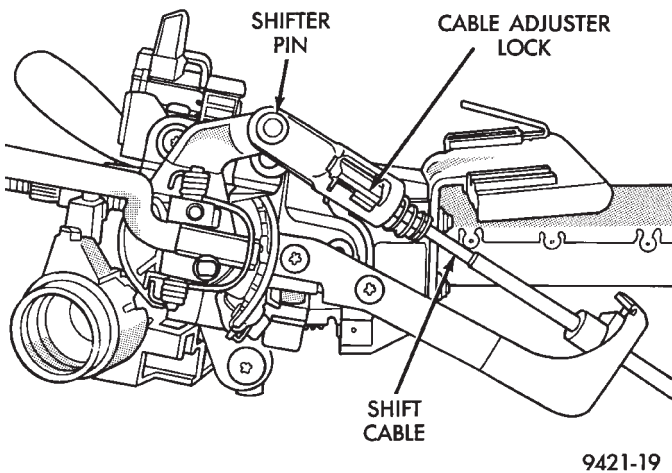


Fig. 24 Shift Cable Adjuster Lock

(13) Reinstall upper and lower steering column shrouds. Then install underpanel silencer/duct.

(14) Check shifter for proper operation. It should operate smoothly without binding. The engine starter should crank in Park or Neutral positions only.

GEARSHIFT CABLE-FLOOR SHIFT

REMOVAL

- (1) Remove shift handle (Fig. 25).
- (2) Remove console bezel from vehicle (Fig. 26).
- (3) Loosen nut on shift cable adjust lever (Fig. 27).
- (4) Remove retaining clip from shift cable conduit bracket.

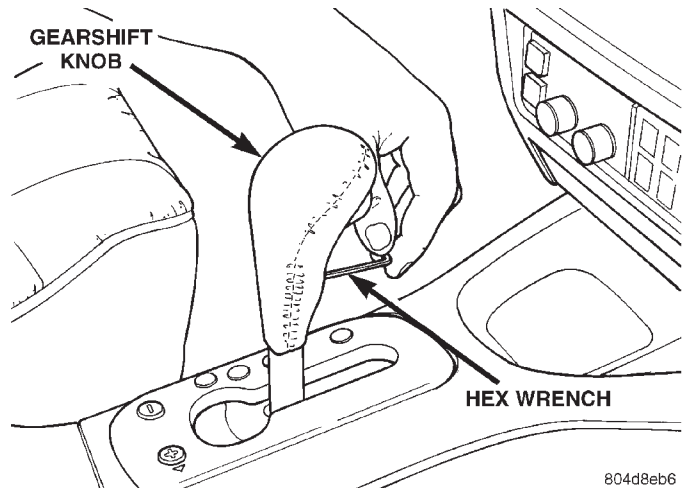


Fig. 25 Shift Handle Retaining Screw

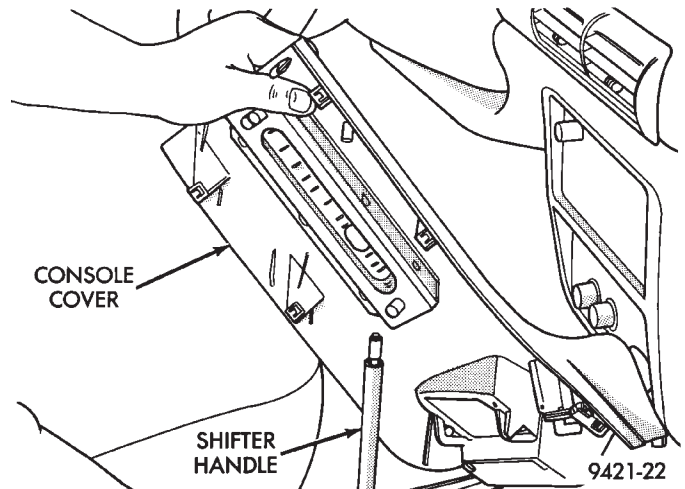


Fig. 26 Console Bezel Removal

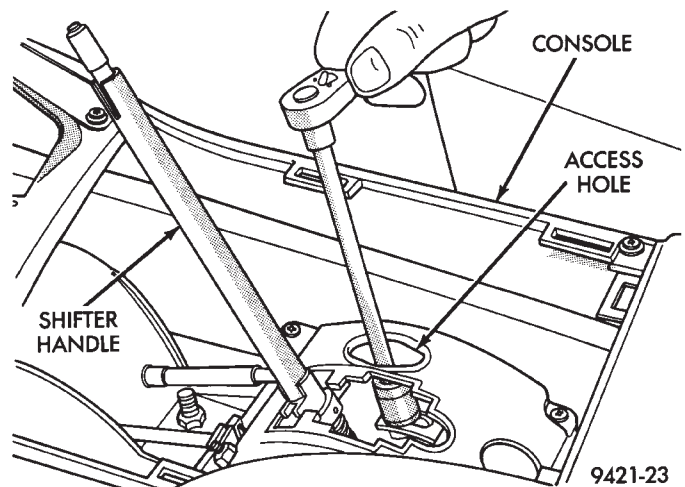


Fig. 27 Shift Cable Adjust Lever Nut

- (5) Disconnect shifter cable from cable attach stud (pin).
- (6) Remove cable from center console routing. Leave flat on floor for ease of removal.

REMOVAL AND INSTALLATION (Continued)

(7) From underhood side of dash panel unseat grommet and remove cable from interior of vehicle.

(8) Raise vehicle on hoist and disconnect fill tube bracket from transaxle (Fig. 28). Rotate fill tube to gain access to shift cable clamp.

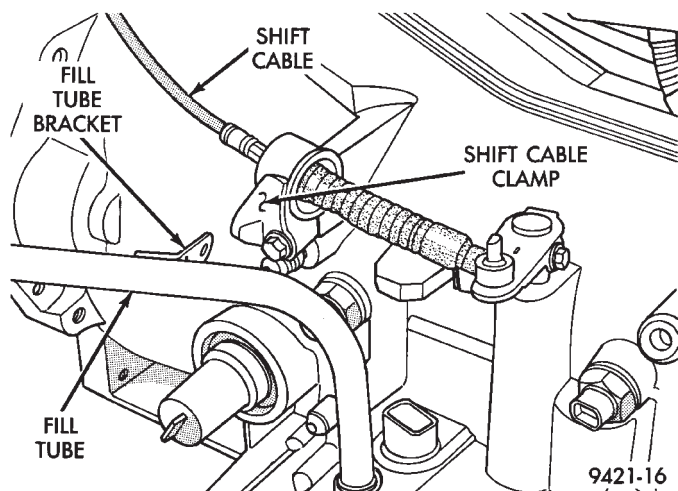


Fig. 28 Fill Tube Bracket Bolt Removal

(9) Loosen bolt that clamps shift cable to transaxle.

(10) Disconnect shifter cable from shift lever assembly at transaxle.

(11) Remove cable from underneath vehicle.

INSTALLATION

(1) Reroute new cable from underside of vehicle. The cable must be routed between the engine block and the heater return tube (Fig. 29).

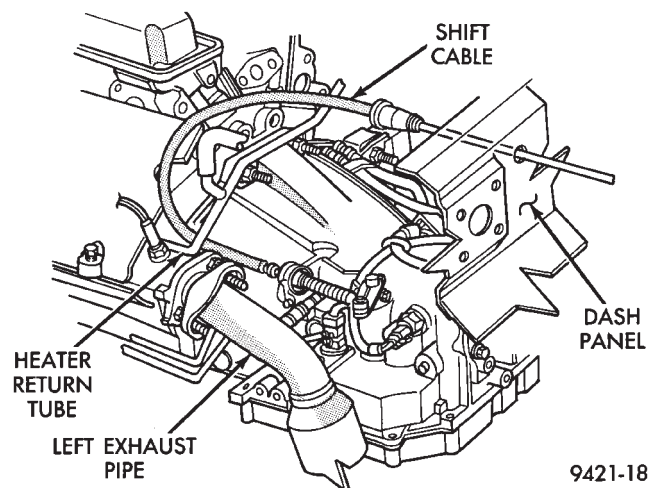


Fig. 29 Shift Cable Routing

(2) Snap new transaxle cable on to shift lever assembly.

(3) Set shift lever assembly in park position at transaxle. This is the most rearward position.

CAUTION: Park sprag must be engaged when adjusting linkage. Rock vehicle back and forth to ensure that park sprag is fully engaged.

(4) Place conduit end fitting in clamp and tighten mounting bolt.

(5) Rotate fill tube to original location. Install and tighten fill tube bracket bolt.

(6) Route transaxle shift cable through hole in dash panel.

(7) Install cable grommet in dash panel.

(8) Route transaxle shift cable under A/C duct, over central distribution duct, through support strut and air bag mounting bracket. Then route over carpeting and down to the shifter bracket (Fig. 30).

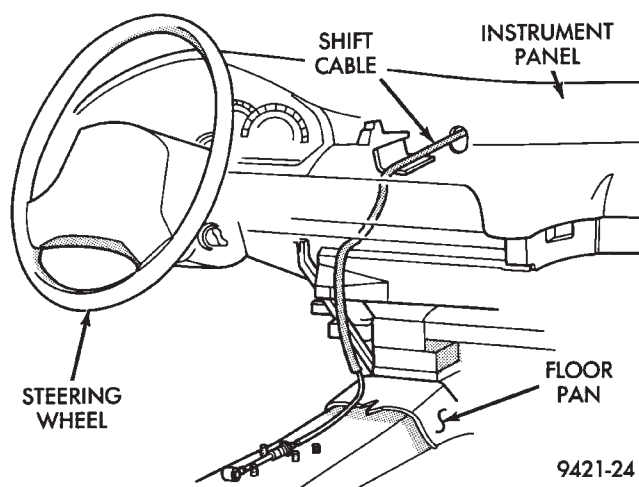


Fig. 30 Interior Cable Routing

(9) Place shifter in the Park position.

(10) Route cable through hole in shifter bracket and attach to cable attaching stud (pin) by snapping into place.

(11) Install a new clip onto the cable at the shifter bracket.

(12) Tighten the adjuster nut.

(13) Reinstall console bezel and shifter handle. Hold shifter button in while tightening handle. This will locate handle properly.

(14) Check shifter for proper operation. It should operate smoothly without binding. The vehicle should crank in Park or Neutral only.

FLOOR SHIFTER

REMOVAL

(1) Remove shifter handle and console bezel.

(2) Loosen adjuster nuts on interlock adjuster and shifter adjuster.

(3) Disconnect shifter cable from cable attaching stud (pin).

REMOVAL AND INSTALLATION (Continued)

(4) Disconnect interlock cable from shifter base slot. Be careful not to break tab on interlock cable conduit end fitting (Fig. 31).

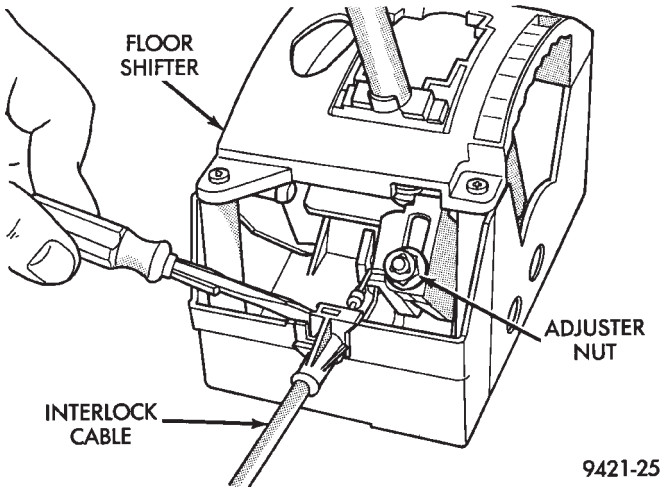


Fig. 31 Interlock Cable Removal

(5) Remove the four floor pan attaching nuts from the interior of the shifter base.

(6) Remove shifter assembly from vehicle.

INSTALLATION

(1) Install new shifter. Make sure eyelet of shifter cable is inside of shifter housing.

(2) Install four floor pan attaching nuts to hold shifter base.

(3) Place shift lever and transaxle in park.

CAUTION: Park sprag must be engaged when adjusting linkage. Rock vehicle back and forth to ensure that park sprag is fully engaged.

(4) With the ignition in the lock position, attach shift cable eyelet to cable attaching stud (pin).

(5) Slip interlock cable core wire into interlock adjustment lever groove. Make sure the interlock cable slug is seated in the groove.

(6) Slip interlock cable conduit end fitting into base and snap into place.

CAUTION: Both the shift cable and the interlock cable must be adjusted. Refer to the cable adjustment procedures in this manual.

AUTOSTICK SHIFTER

The autostick shifter has the same service procedures as the standard floor shifter. Refer to the applicable floor shifter section for service procedures.

The autostick shifter incorporates a switch that interacts with the transmission control module. Refer to the Diagnosis and Testing section for diagnostic procedures.

The switch is serviceable only as part of the floor shifter assembly. Therefore the shifter should be replaced, and adjustments made to the cables, if switch replacement is necessary.

COLUMN SHIFT INTERLOCK SERVICE

The interlock cassette slides into the housing behind the lock cylinder (Fig. 32). The cable at the rear of the cassette attaches to a locking arm on the shifter mechanism. **The column shift interlock system is only adjusted after installing a new cassette. It can't be adjusted more than once. If the system operates incorrectly, install and adjust a new interlock cassette.**

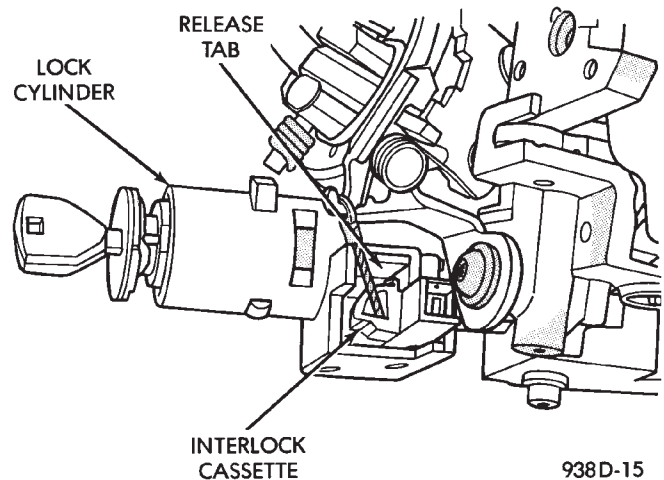


Fig. 32 Ignition Interlock Cassette-ColumnShift

REMOVAL

(1) Depress the tab on the top of the cassette.

(2) Slide the interlock cassette out of the housing.

(3) Remove the cable from the locking arm on the shifter mechanism.

INSTALLATION

(1) Ensure the latch rotates freely on the shifter gate (Fig. 33).

(2) With the shifter in Park and the key removed, install the cable over the hook on locking arm of the shifter mechanism.

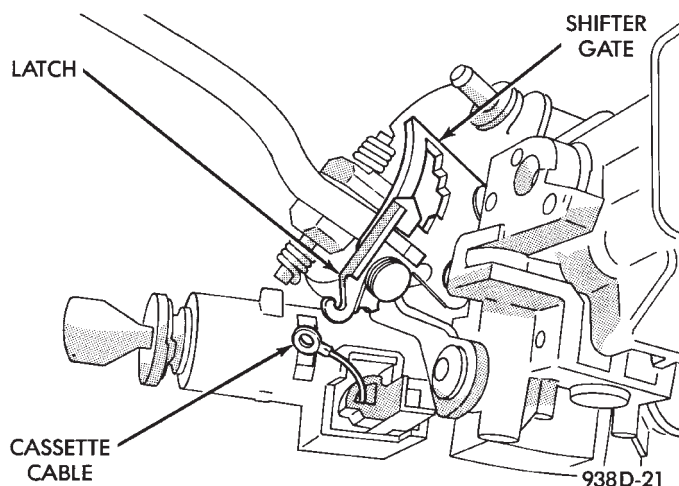
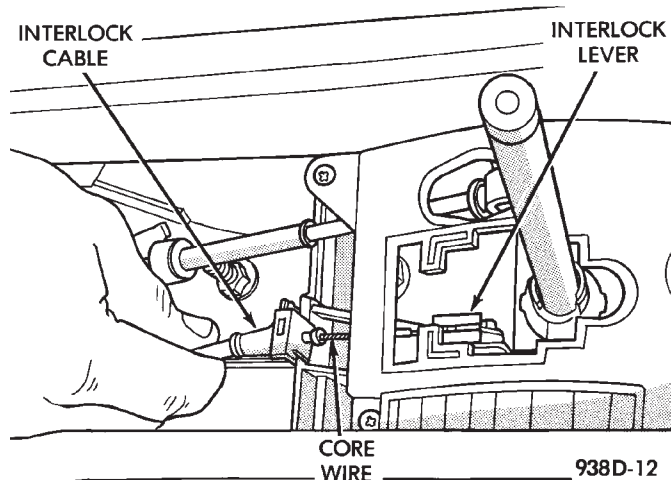
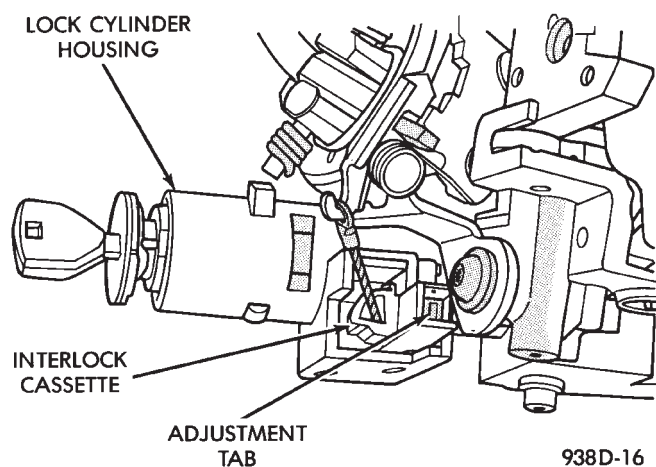
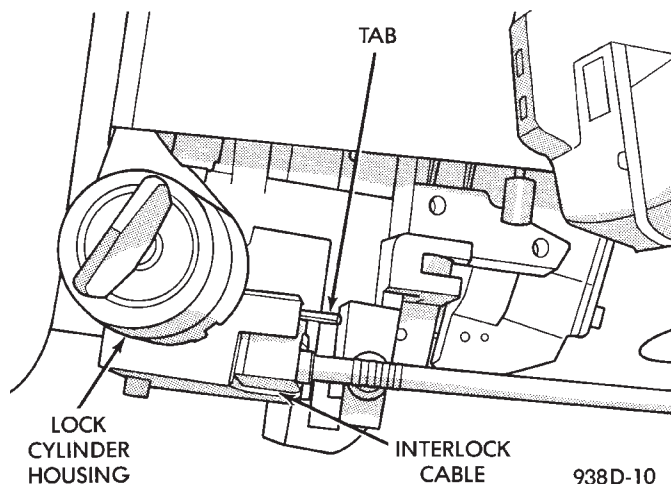
(3) Slide the cassette into the housing until it locks in place.

(4) To adjust the interlock system, push the adjustment tab in until it stops (Fig. 34). The adjustment tab will click as it moves into position. Ensure the tab is fully depressed.

FLOOR SHIFT INTERLOCK SERVICE

The interlock cable slides into the housing behind the lock cylinder and attaches to the floor mounted shifter. The floor shift interlock system is adjusted by a nut at the shifter. If the system requires adjustment and not replacement, refer to the Floor Shift Interlock Adjustment procedure in this section.

REMOVAL AND INSTALLATION (Continued)

**Fig. 33 Latch and Shifter Gate****Fig. 35 Interlock Cable at Floor Shifter****Fig. 34 Ignition Interlock Adjustment
Tab-ColumnShift****Fig. 36 Interlock Cable at Ignition Switch****REMOVAL**

- (1) Remove shifter handle.
- (2) Remove the bezel from the shifter console.
- (3) Remove the drivers side under panel silencer.
- (4) Remove the tilt lever attaching screw. Remove lever.
- (5) Remove upper and lower covers from the steering column.
- (6) Loosen the nut on the interlock adjustment lever in the floor shifter.
- (7) Move ignition key to the Run position.
- (8) Remove the interlock cable from the shifter housing (Fig. 35). Slide the cable out of the groove in the interlock lever.
- (9) Depress the lock tab on the interlock cable and pull the cable out of the lock cylinder housing (Fig. 36).
- (10) Remove interlock cable.

INSTALLATION

- (1) Ensure ignition switch is in the ON position.
- (2) Route the interlock cable down the steering column and above the air distribution center duct. Route the cable between the support strut and air bag module mounting bracket and down to the shifter housing.
- (3) Slide the steering column end of the interlock cable into the lock cylinder housing until it snaps into place.
- (4) Turn the ignition key to the OFF/LOCK position.
- (5) Put the shifter in the PARK position.
- (6) Slide the interlock cable core wire into the groove on the adjustment lever. Ensure the cable end seats in the groove.
- (7) Slip the cable into the housing until it snaps into place.
- (8) Ensure the shift lever remains in PARK. Remove the ignition key from the lock cylinder (switch in OFF position).

REMOVAL AND INSTALLATION (Continued)

(9) When the adjustment nut on the interlock lever is loosened, the cable indexes itself to the correct position (Fig. 37).

(10) Loosen the adjustment nut. Allow the cable to adjust itself to the correct position. Tighten the adjustment nut.

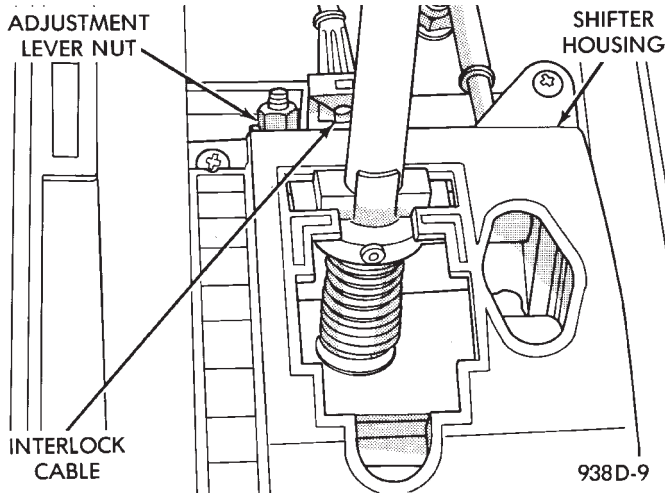


Fig. 37 Interlock Cable at Floor Shifter

(11) Check the interlock adjustment:

- With the ignition key in the OFF (lock) position, the shifter should be locked in the PARK position. If not, inspect the system for binding and repeat the adjustment procedure.

- **Without starting the engine**, place the ignition switch in the run position. Move the shifter to the reverse position. You should be unable to remove the ignition key from the lock cylinder. If you can remove the key at this point, inspect the system for binding and repeat the adjustment procedure.

- Place the shifter in the PARK position. Turn the ignition key to the OFF (lock) position. You should be able to remove the ignition key from the lock cylinder. If not, inspect the system for binding and repeat the adjustment procedure.

(12) Install the bezel on the shifter console.

(13) Install shifter handle.

(14) Install the lower silencer panel.

(15) Install upper and lower covers from the steering column.

(16) Install tilt lever.

MANUAL VALVE LEVER

REMOVAL

(1) Disconnect the shift cable from the shift lever (at the transaxle).

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

(3) Remove the shift lever.

INSTALLATION

(1) For installation, reverse removal procedure.

MANUAL VALVE LEVER POSITION SENSOR

REMOVAL

(1) Disconnect the MVLPS connector.

(2) Remove valve body assembly from vehicle. Refer to Valve Body in this section for procedure.

(3) Remove manual shaft retaining screw (Fig. 38).

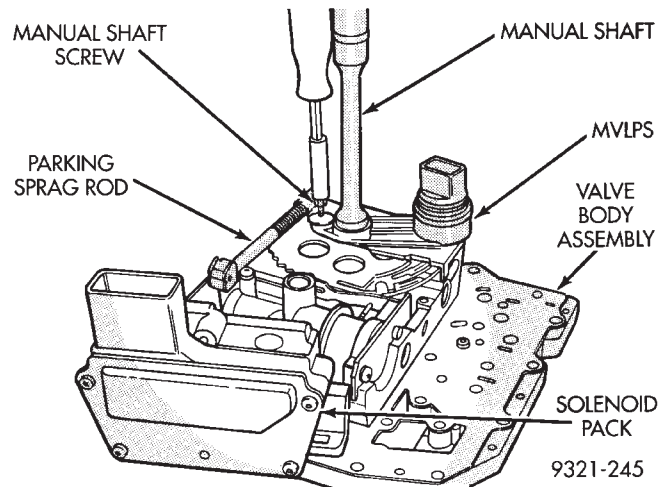


Fig. 38 Manual Shaft Retaining Screw

(4) Slide MVLPS off of manual valve shaft.

INSTALLATION

(1) To install, reverse removal procedure.

SPEED SENSOR-INPUT

The input speed sensor can be serviced without having to remove the transaxle from the vehicle.

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

NOTE: The input speed sensor is not interchangeable with the output speed sensor.

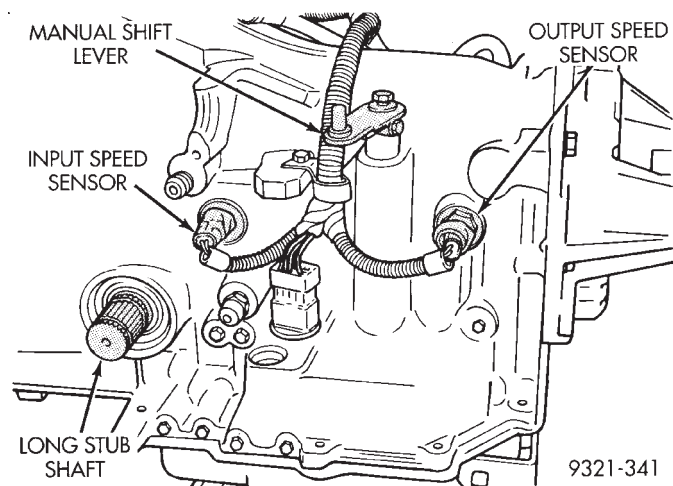
The input speed sensor is located on the left side of the transaxle case (Fig. 39). The sensor threads into the transaxle case. Tighten input speed sensor to 20-34 N·m (180-300 in. lbs.).

SPEED SENSOR-OUTPUT

The output speed sensor can be serviced without having to remove the transaxle from the vehicle.

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

REMOVAL AND INSTALLATION (Continued)

**Fig. 39 Speed Sensor Location**

NOTE: The output speed sensor is not interchangeable with the input speed sensor.

The output speed sensor is located on the left side of the transaxle case. The sensor threads into the transaxle case. Tighten output speed sensor to 20-34 N·m (180-300 in. lbs.).

TRANSMISSION CONTROL MODULE**REMOVAL**

- (1) Loosen battery hold-down clamp and slide the battery to the right.
- (2) Loosen 60 way retaining screw, located in the center of the 60 way connector. Then disconnect the 60 way connector on transmission control module.
- (3) Remove transmission control module mounting screws and lift module from vehicle.

INSTALLATION

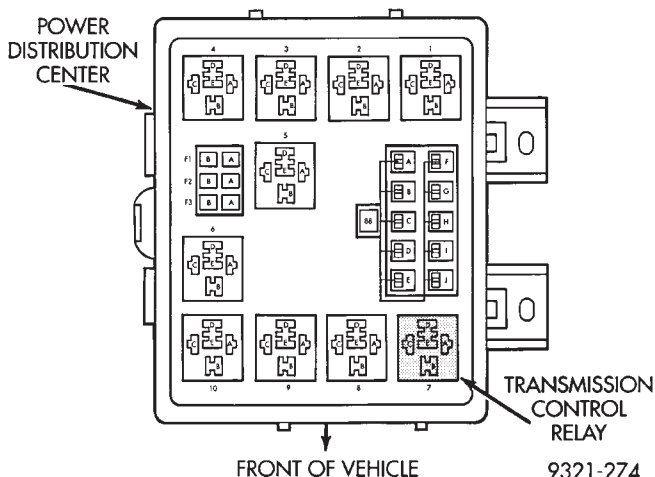
- (1) Install transmission control module and tighten mounting screws.
- (2) Install 60 way connector. Tighten 60 way retaining screw to 4 N·m (35 in. lbs.).
- (3) Place battery back in its original location and tighten battery hold-down clamp.

TRANSMISSION CONTROL RELAY**REMOVAL**

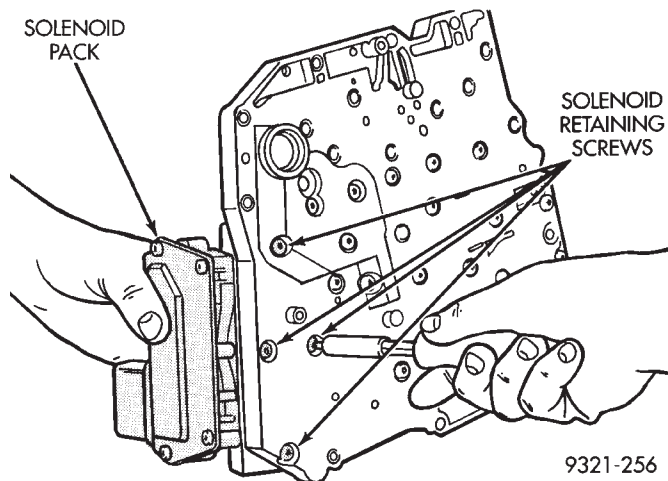
- (1) Open hood and locate power distribution center in the engine compartment.
- (2) Remove power distribution center plastic cover.
- (3) Pull relay out of power distribution center (Fig. 40).

INSTALLATION

- (1) To install, reverse removal procedure.

**Fig. 40 Transmission Control Relay Location****SOLENOID ASSEMBLY****REMOVAL**

- (1) Raise vehicle on hoist.
- (2) Remove valve body assembly from transaxle. Refer to Valve Body in this section for removal procedure.
- (3) Remove solenoid retaining screws from solenoid (Fig. 41).

**Fig. 41 Solenoid Retaining Screws**

- (4) Remove solenoid and screen from valve body (Fig. 42).

INSTALLATION

- (1) To install, reverse removal procedure.

VALVE BODY

The valve body can be removed with the transaxle remaining in the vehicle, or with the transaxle removed. The illustrations in this procedure shows the transaxle removed from the vehicle for clarity.

REMOVAL AND INSTALLATION (Continued)

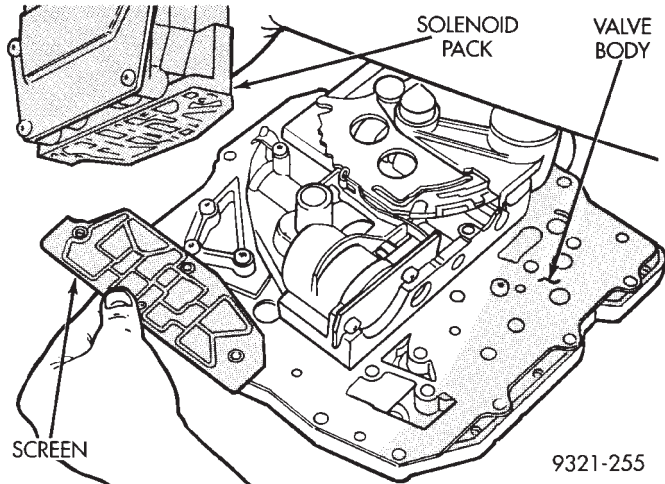


Fig. 42 Solenoid and Screen Removal

The solenoid pack and Manual Valve Lever Position Sensor (MVLPS) are mounted on top side of the valve body. They will remain attached to the valve body when the valve body is removed from the transaxle. The solenoid pack and MVLPS can only be removed from the valve body after the valve body is removed from the transaxle.

REMOVAL

- (1) Disconnect the MVLPS wiring connector. The solenoid wiring connector can remain attached to the case.
- (2) Disconnect the shift cable from the shift lever (at the transaxle).
- (3) Move the shift lever clockwise as far as it will go. This should be one position past the L position. Then remove the shift lever.
- (4) Remove transaxle pan bolts (Fig. 43).

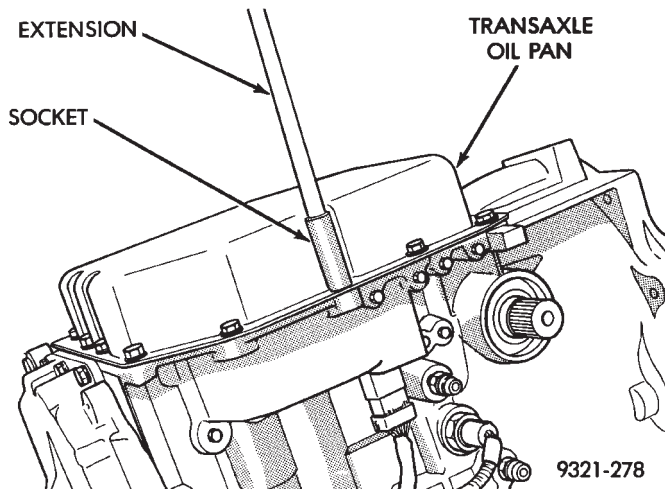


Fig. 43 Remove Transaxle Oil Pan Bolts

- (5) Remove transaxle oil pan (Fig. 44). When reinstalling oil pan be sure that pan flange is clean and oil free. Apply a 1/8 inch bead of Mopar Silicone Sealer onto oil pan flange before installing.

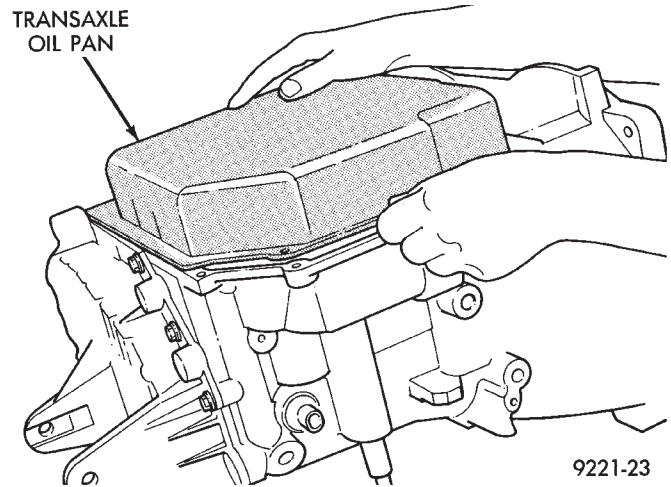


Fig. 44 Remove Transaxle Oil Pan

- (6) Remove oil filter from valve body (Fig. 45). It is held in place by two clips.

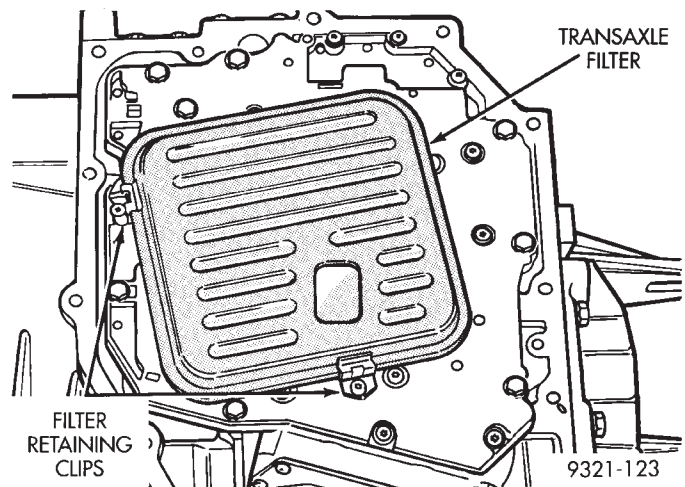


Fig. 45 Remove Transaxle Oil Filter

CAUTION: The 42LE transaxle oil filter is not interchangeable with the 41TE transaxle filter. Installation of a 41TE oil filter in a 42LE may cause transaxle damage.

- (7) Remove valve body bolts (Fig. 46).
- (8) Carefully remove valve body assembly from transaxle (Fig. 47).

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

REMOVAL AND INSTALLATION (Continued)

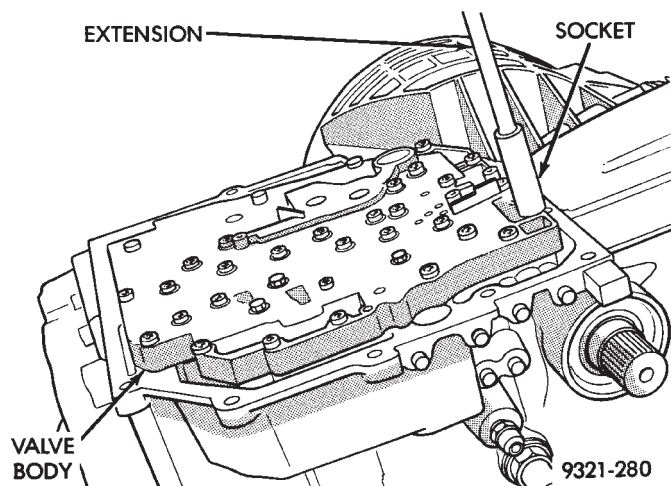


Fig. 46 Remove Valve Body Bolts

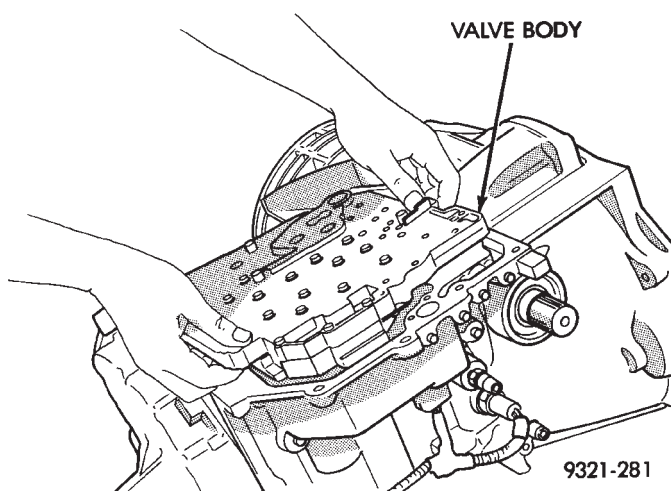


Fig. 47 Remove Valve Body From Transaxle

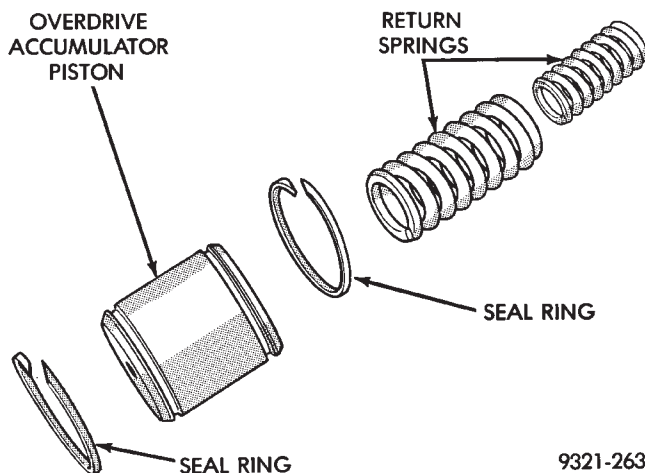


Fig. 49 Overdrive Accumulator and Springs

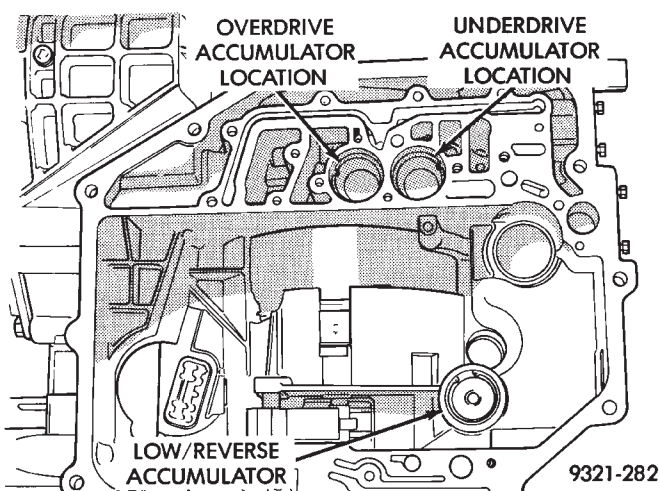


Fig. 50 Accumulator Locations

TRANSAXLE REMOVAL AND INSTALLATION

REMOVAL

The transaxle can be removed **without** having to remove the engine.

- (1) Disconnect battery.
- (2) Remove engine air inlet tube.
- (3) Disconnect crankshaft position sensor connector and remove sensor (Fig. 51). The sensor is located on the upper right side of the transaxle bell housing.
- (4) Disconnect inboard transaxle wiring connector block located on the right shock tower. Remove wire ties to free connector from harness (Fig. 52).
- (5) Lift vehicle on hoist.
- (6) Remove front wheels.
- (7) Remove strut to steering knuckle bolts on both sides of the vehicle. Bolts are splined to knuckles (Fig. 53).
- (8) Remove Anti-lock Brake System (ABS) wheel speed sensor (if equipped).

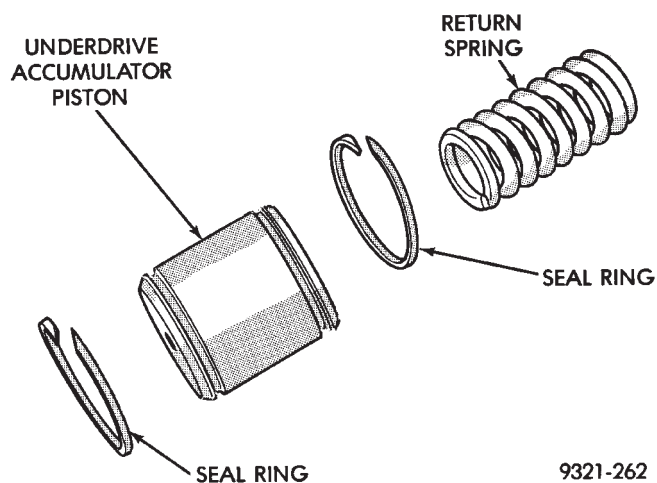
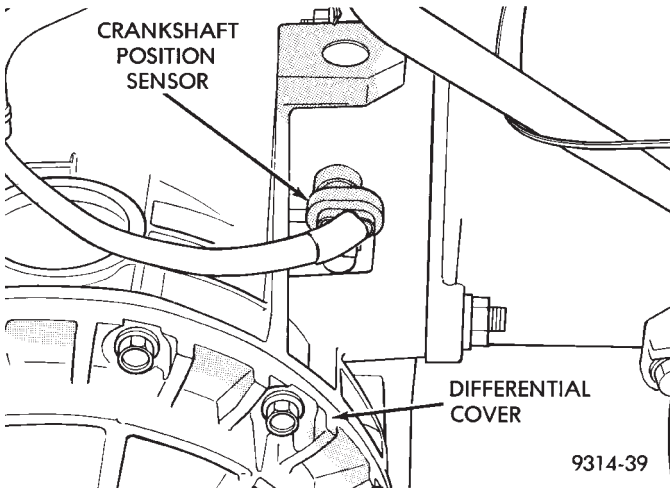
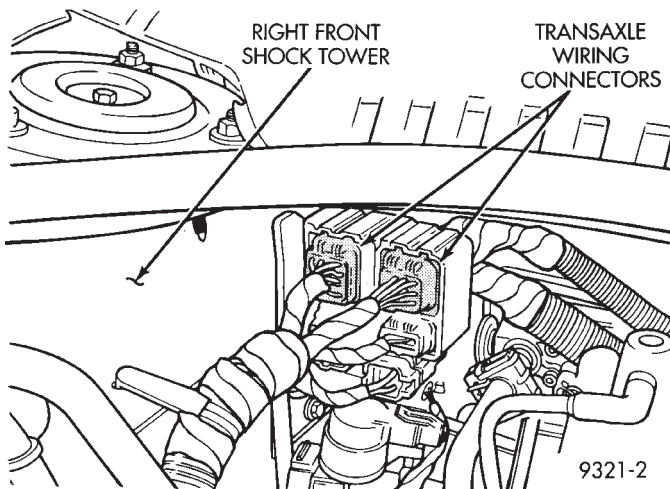
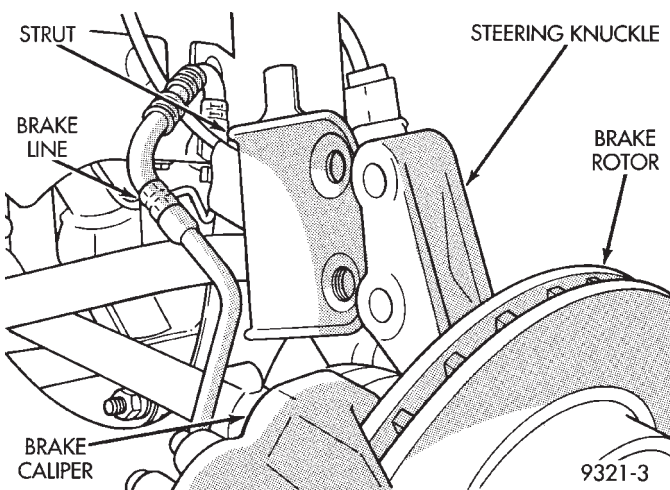


Fig. 48 Underdrive Accumulator and Spring

INSTALLATION

- (1) To reinstall valve body, reverse removal procedure.

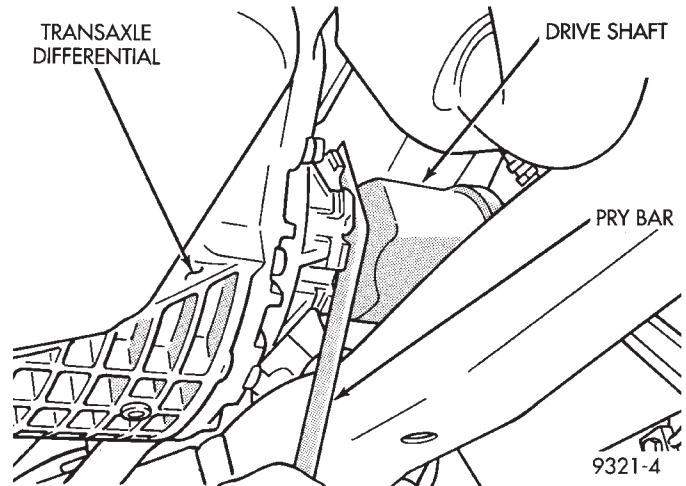
REMOVAL AND INSTALLATION (Continued)

**Fig. 51 Crankshaft Position Sensor Location****Fig. 52 Wiring Connector Location****Fig. 53 Strut to Steering Knuckle Bolts**

CAUTION: Do not allow drive shaft or CV joint to hang freely. Internal joint damage may occur if allowed to hang freely.

CAUTION: Drive shaft retainer clips and seals located on the stub shafts must be replaced before reinstalling drive shafts.

(9) Using a pry bar, disconnect the inner CV joint from the transaxle (Fig. 54).

**Fig. 54 Drive Shaft Removal**

(10) Pull top of knuckle and drive shaft outward to allow clearance during transaxle removal. The drive shafts do not have to be completely removed from the vehicle. **Do not allow the inner CV joint to hang unsupported or joint damage may occur.**

(11) Remove engine to transaxle brackets.

(12) Remove transaxle bellhousing cover.

(13) Remove torque converter bolts. The torque converter is indexed to the flex plate. Mark the torque converter location to ensure that the torque converter is reinstalled correctly.

CAUTION: The drive plate to torque converter bolts and the drive plate to crankshaft bolts must not be reused. Install new bolts whenever these bolts are removed.

(14) Unbolt starter assembly. Do not disconnect wiring or completely remove the starter from the vehicle. Allow the starter to sit between the engine and the frame.

(15) Disconnect transaxle cooler lines at the transaxle.

(16) Remove dipstick. Disconnect the gear selector cable from the transaxle.

(17) Disconnect the exhaust system at the exhaust manifolds and remove the exhaust system from the vehicle.

(18) Place a transmission jack under the transaxle. Secure the transaxle to the jack.

(19) Raise transaxle slightly to relieve the weight on the rear transaxle mount.

(20) Remove the transaxle mount through-bolt.

REMOVAL AND INSTALLATION (Continued)

- (21) Remove rear crossmember mounting bolts.
- (22) Pry the transaxle mount rearward to separate the mount from the transaxle.
- (23) Remove the rear crossmember.
- (24) Lower the rear of the transaxle to gain access to the bell housing bolts.
- (25) Remove bell housing bolts.
- (26) Remove dipstick tube from transaxle. Be prepared to plug the dipstick hole when removing dipstick to prevent fluid from spilling out of the transaxle.
- (27) Remove engine to transaxle bolts.
- (28) The transaxle can now be lowered from the vehicle.

INSTALLATION

- (1) When installing transaxle, reverse the above procedure. Verify that the starter ground strap is installed correctly.
- (2) If the torque converter is being replaced, apply a light coating of grease to the crankshaft pilot hole.
- (3) Inspect the drive plate for cracks before reinstalling transaxle. If any cracks are found replace the drive plate. Do not attempt to repair a cracked drive plate.
- (4) Always use new torque converter to drive plate bolts.

NOTE: If the transaxle assembly, TCM, solenoid pack or clutch plates have been replaced, refer to Quick Learn Procedure. This program will allow the transmission control module to compensate for any parts replaced in the electronic transaxle system.

- (5) Check and/or adjust gearshift cable. Refer to Shift Linkage in this section for procedure.

- (6) When installing the transaxle, ensure the fuel tubes at the rear of the engine do not contact the following:

- Tie rod attachment plate at the power steering rack
- Exhaust Gas Recirculation (EGR) Tube
- Transaxle wiring harness

- (7) Refill transaxle with Mopar ATF Plus (Automatic Transmission Fluid) Type 7176.

OIL PUMP SEAL REPLACEMENT

The transaxle must be removed from the vehicle to replace this oil seal.

REMOVAL

- (1) Remove the transaxle from the vehicle.
- (2) Remove the torque converter from the transaxle bellhousing.
- (3) Use special tool C-3981B to remove oil pump seal (Fig. 55).

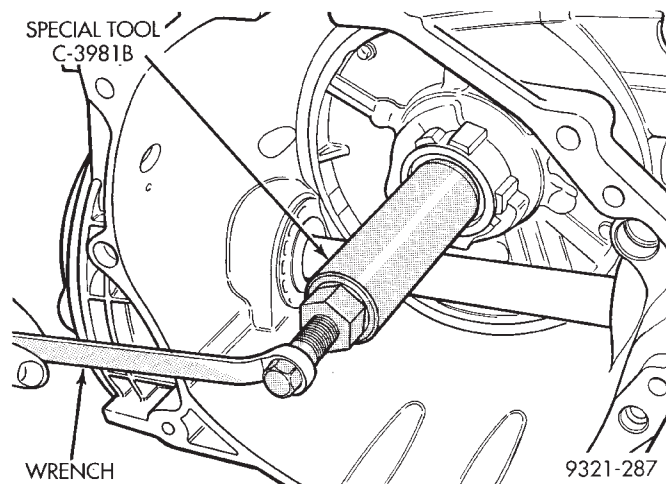


Fig. 55 Oil Seal Removal

INSTALLATION

- (1) Clean and inspect oil pump seal seat. Then install seal using special tool C-4193A (Fig. 56).

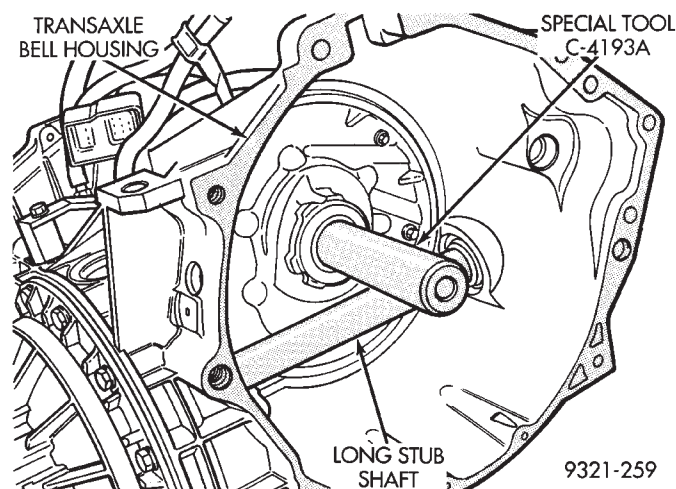


Fig. 56 Oil Seal Installation

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

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

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

REMOVAL AND INSTALLATION (Continued)

TRANSFER SHAFT SEAL REPLACEMENT

If it has been diagnosed that one or both of the transfer shaft seals are leaking, the following procedure can be used to replace failed seals. This procedure will allow the technician to replace the seals without having to set backlash and measure differential bearing turning torque.

CAUTION: The transfer shaft rear shim, bearing cups and cones, differential bearings and the differential adjusters must be reused to use this procedure. If any of the items listed above require replacement, refer to Differential Recondition section of this manual.

- (1) Remove transaxle from vehicle. Refer to Transaxle Removal and Installation procedure in this section.
- (2) Remove valve body from transaxle.
- (3) Remove solenoid connector from transaxle case.
- (4) Remove long stub shaft from transaxle (Fig. 57).

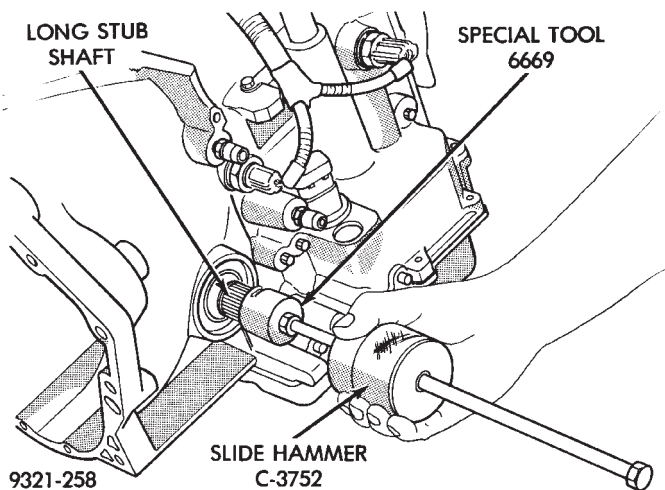


Fig. 57 Long Stub Shaft Removal

- (5) Index the inner differential adjuster with a cross hair as shown in (Fig. 58).

CAUTION: If short stub shaft has corrosion, use caution when removing differential cover. Inspect seal and shaft for damage after removal of cover. Replace shaft and/or seal as required.

- (6) Index outer adjuster (Fig. 59). Remove lock bracket and back out adjuster exactly one revolution. Then remove differential cover.

- (7) Remove The inner adjuster lock bracket. Then remove the inner adjuster.

CAUTION: Keep the inner adjuster for reinstallation.

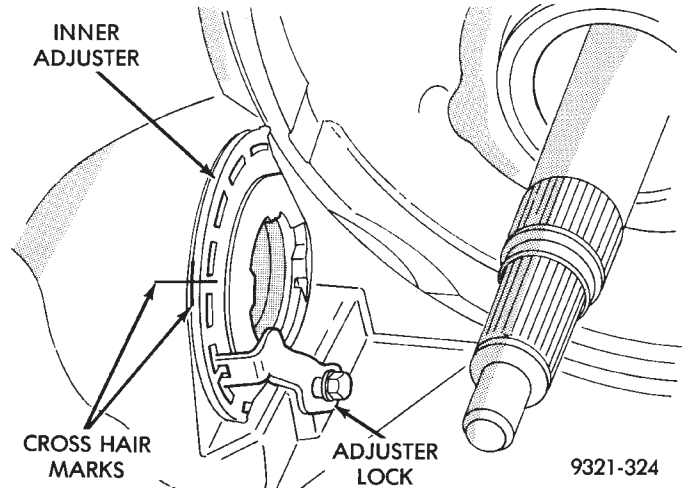


Fig. 58 Indexing Inner Adjuster

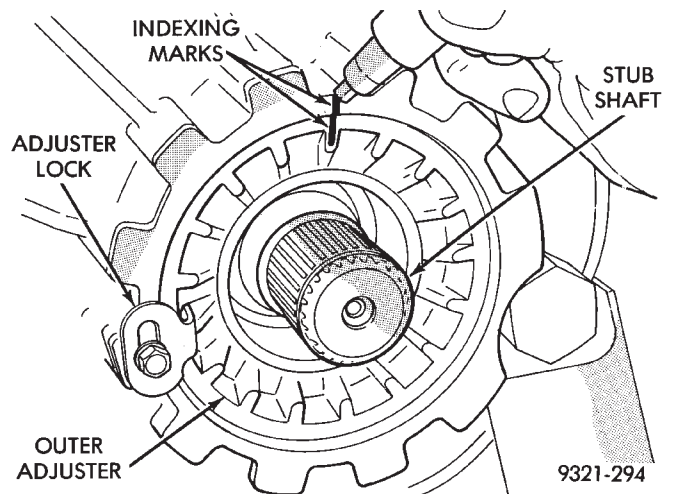


Fig. 59 Indexing Outer Adjuster

- (8) Remove the transfer shaft nut, rear cone, rear cup, oil baffle, rear shim, transfer shaft and transfer shaft seals. Refer to appropriate procedures within this section for detailed removal and installation procedures if required.

CAUTION: Keep rear shim and rear bearing cup cone for reinstallation.

- (9) Install transfer shaft, transfer shaft seals, oil baffle, rear cup, rear shim, rear cone and a new nut. Refer to appropriate procedures within this section for detailed removal and installation procedures if required.

- (10) Install a new o-ring onto the inner adjuster.

- (11) Lube inner adjuster threads and o-ring with gear oil and reinstall to the cross haired index marks.

- (12) Reinstall the inner adjuster locking bracket.

- (13) Install the differential carrier. Install stub shaft seal protector.

REMOVAL AND INSTALLATION (Continued)

(14) Install the differential cover/outer adjuster assembly with Mopar Silicone Sealant applied. Install and tighten differential cover bolts.

(15) Tighten the outer adjuster 3/4 of a turn. Seat bearings by turning differential carrier three or four turns in both directions. Finish tightening the adjuster 1/4 turn to its index mark (original location).

(16) Reinstall the outer adjuster locking bracket.

LONG STUB SHAFT SEAL REPLACEMENT

If it has been diagnosed that the long stub shaft seal is leaking, the following procedure can be used to replace failed seal. This procedure will allow the replacement of the seals without having to set backlash and measure differential bearing turning torque.

CAUTION: The differential bearings and the differential adjusters must be reused in order to use this procedure. If any of the items listed above require replacement, this procedure cannot be used. Refer to Differential Recondition section of this manual.

(1) Remove transaxle from vehicle. Refer to Transaxle Removal and Installation procedure in this section.

(2) Remove long stub shaft from transaxle (Fig. 60).

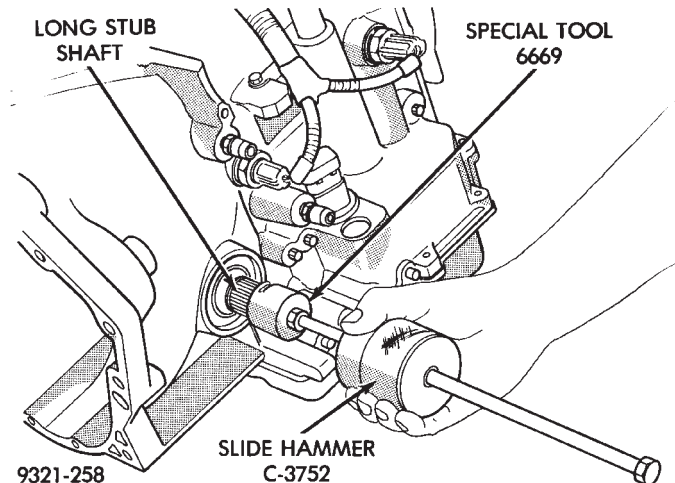


Fig. 60 Long Stub Shaft Removal

(3) Index the inner differential adjuster with a cross hair as shown in (Fig. 61).

CAUTION: If short stub shaft has corrosion, use caution when removing differential cover. Inspect seal and shaft for damage after removal of cover. Replace shaft and/or seal as required.

(4) Index outer adjuster (Fig. 62). Remove lock bracket and back out adjuster exactly one revolution. Then remove differential cover.

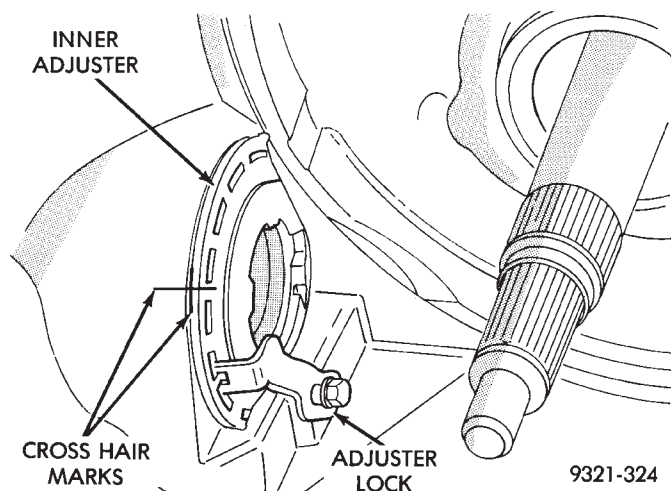


Fig. 61 Indexing Inner Adjuster

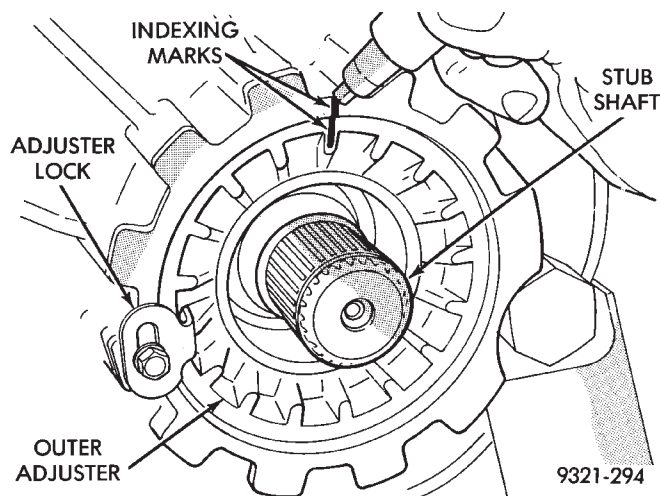


Fig. 62 Indexing Outer Adjuster

(5) Remove The inner adjuster lock bracket. Then remove the inner adjuster.

CAUTION: Keep the inner adjuster for reinstallation.

(6) Lube inner adjuster threads with gear oil and reinstall to the cross haired index marks.

(7) Install the differential carrier. Then install stub shaft seal protector.

(8) Install the differential cover/outer adjuster assembly with sealant applied. Install and tighten differential cover bolts.

(9) Tighten the outer adjuster 3/4 of a turn. Seat bearings by turning differential carrier three or four turns in both directions. Finish tightening the adjuster 1/4 turn to its index mark (original location).

(10) Reinstall long stub shaft, fill differential with fluid and reinstall transaxle.

(11) After installing transaxle check transmission side fluid level.

REMOVAL AND INSTALLATION (Continued)

SHORT STUB SHAFT SEAL REPLACEMENT

The following procedure can be used to replace the short stub shaft seal without having to remove the transaxle from the vehicle. If the adjuster or bearing located behind the adjuster require replacement, do not use this procedure. Refer to Differential Recondition section of this manual.

- (1) Place vehicle in neutral and lift vehicle on hoist.
- (2) Remove short driveshaft.
- (3) Index the outer adjuster (Fig. 63).

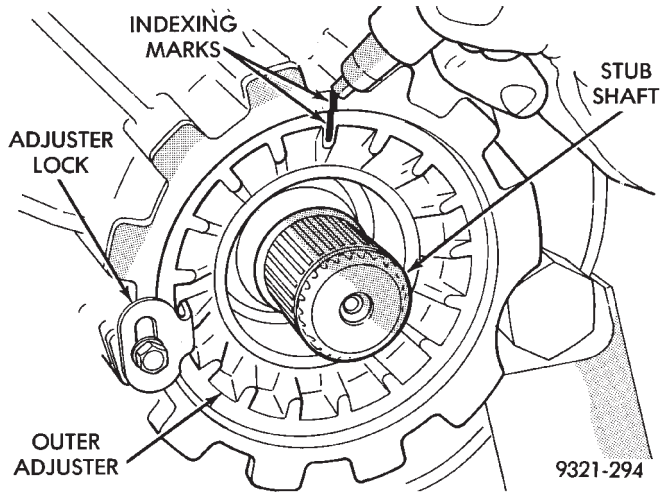


Fig. 63 Indexing Outer Adjuster

- (4) Remove Outer adjuster lock (Fig. 64).

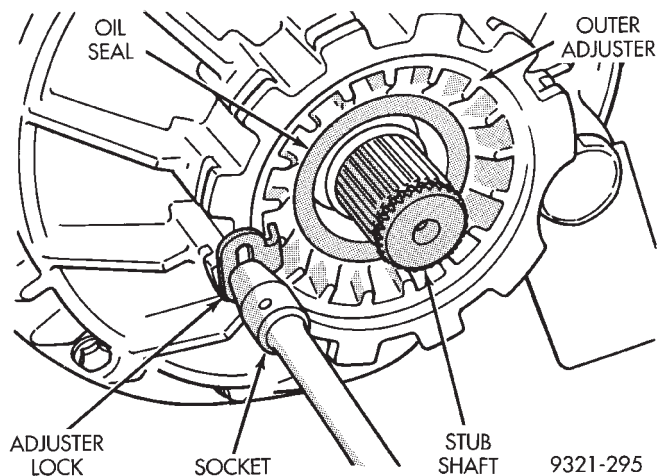


Fig. 64 Outer Adjuster Lock Removal

(5) Using special tool 6503 loosen outer adjuster, then retighten to the index mark using a torque wrench. Record the amount of torque required to return the index marks to their original location. Remove the adjuster.

(6) Use special tool 6558 to remove old seal and install new seal (Fig. 65).

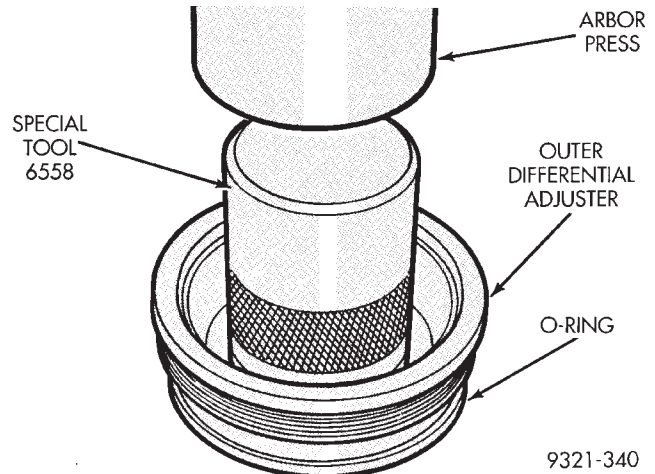


Fig. 65 Seal Removal and Installation

(7) Inspect stub shaft for corrosion (Fig. 66). If corrosion exists, wrap stub shaft with wax paper and install seal protector over wax paper.

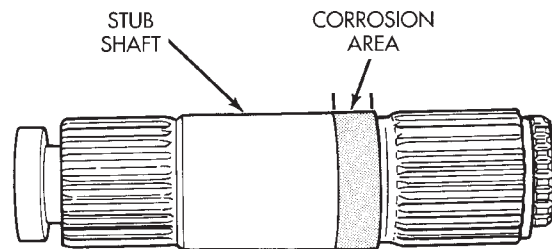


Fig. 66 Stub Shaft Corrosion

(8) Lube O-ring, threads on adjuster, seal protector and seal lips with gear oil before installing.

(9) Install outer adjuster into transaxle case and tighten adjuster within 10 ft. lbs. of the torque reading recorded in step five.

(10) Rotate ring gear three or four revolutions in both directions to seat differential bearings.

(11) Continue tightening outer adjuster until index marks line up (original location).

(12) Install adjuster lock.

(13) Install new driveshaft retaining circlip and O-ring on stub shaft. Then reinstall driveshaft.

(14) Check fluid level in differential and adjust as required.

(15) Road test and recheck for leaks as required.

DISASSEMBLY AND ASSEMBLY

VALVE BODY

RECONDITION

- (1) Remove manual shaft screw (Fig. 67).

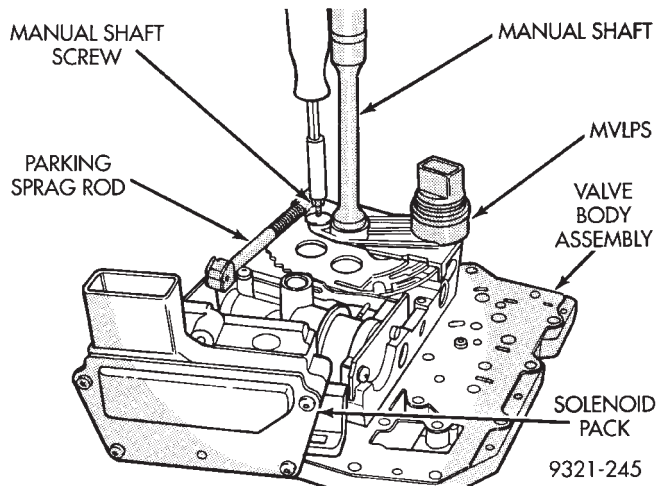


Fig. 67 Manual Shaft Screw

- (2) Remove Manual Valve Lever Position Sensor (MVLPS) and manual shift lever.

- (3) Remove solenoid pack from valve body (Fig. 68).

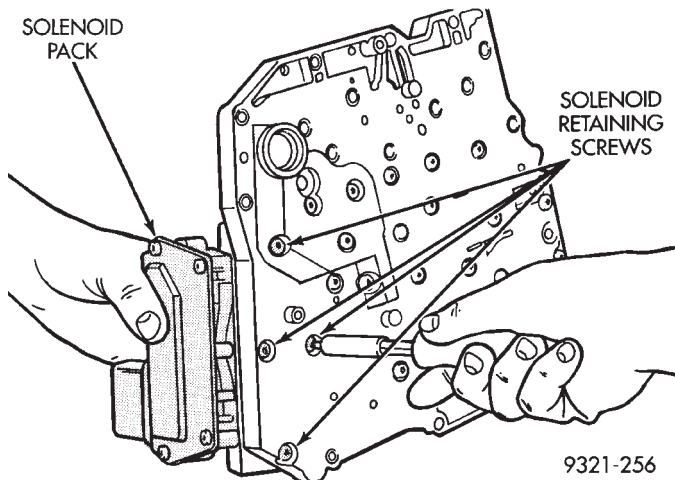


Fig. 68 Solenoid Pack Location

- (4) Remove valve body stiffener plate (Fig. 69).

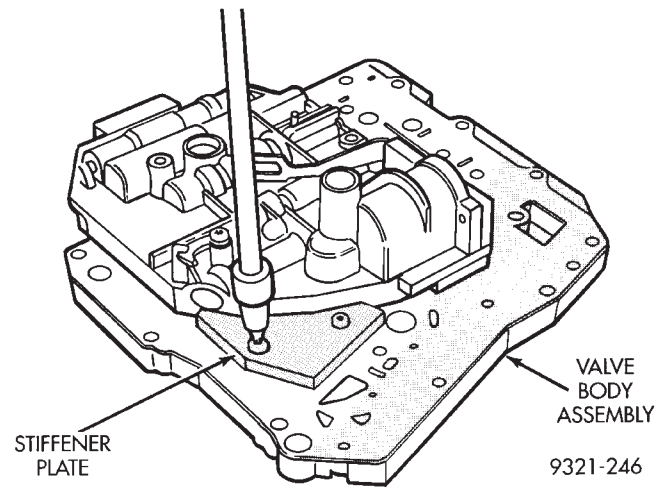


Fig. 69 Stiffener Plate Location

- (5) Remove 2/4 accumulator retaining plate screws.

- (6) Remove thermal valve (Fig. 70).

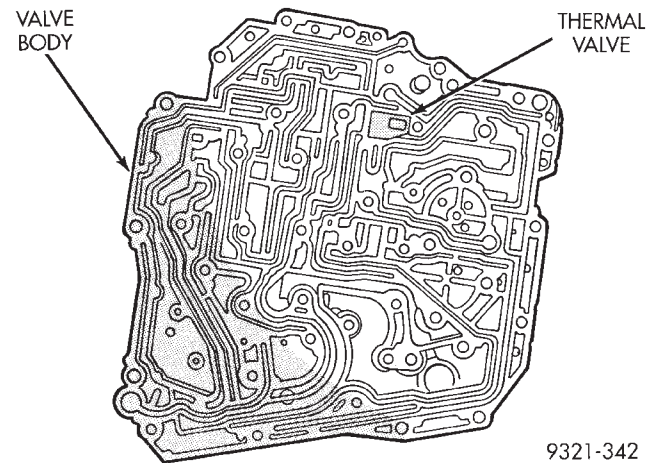
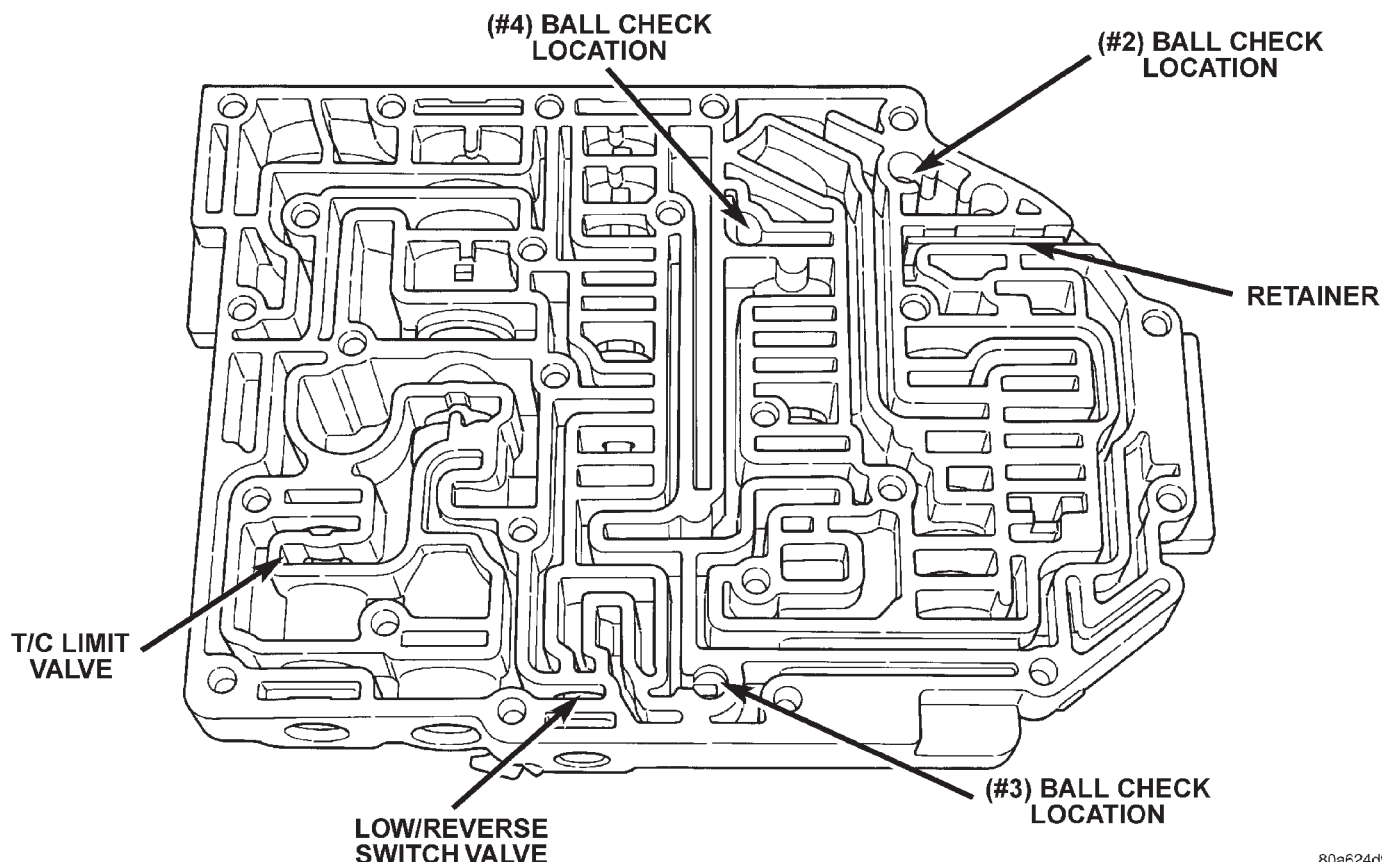


Fig. 70 Thermal Valve Location

- (7) Remove valve body check balls. Note the location of valve body check balls (Fig. 71).

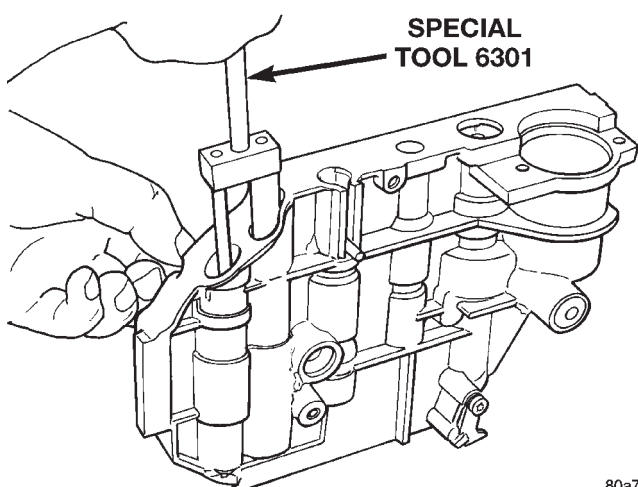
DISASSEMBLY AND ASSEMBLY (Continued)



80a624d9

Fig. 71 Ball Check Location

(8) Remove dual retainer plate from valve body. Use special tool 6301 to remove plate (Fig. 72).



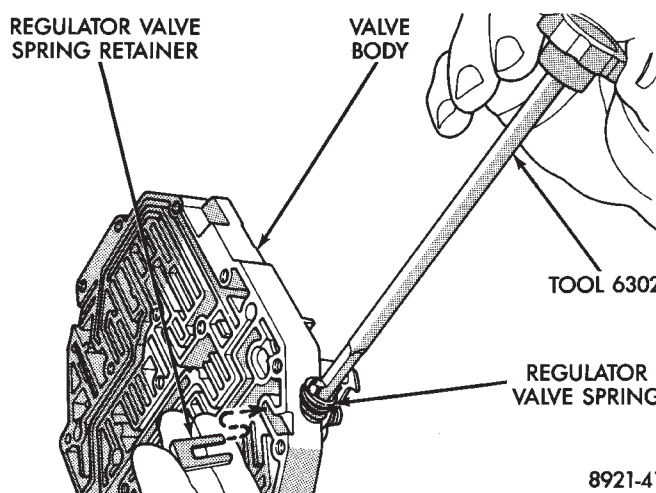
80a7738d

Fig. 72 Remove or Install Dual Retainer Plate

(9) Remove retainer plate from valve body using special tool 6302 (Fig. 73).

(10) Tag all springs, as they are removed, for reassembly identification (Fig. 74).

(11) Cleanliness through entire disassembly and assembly of the valve body cannot be overemphasized. When disassembling, each part should be



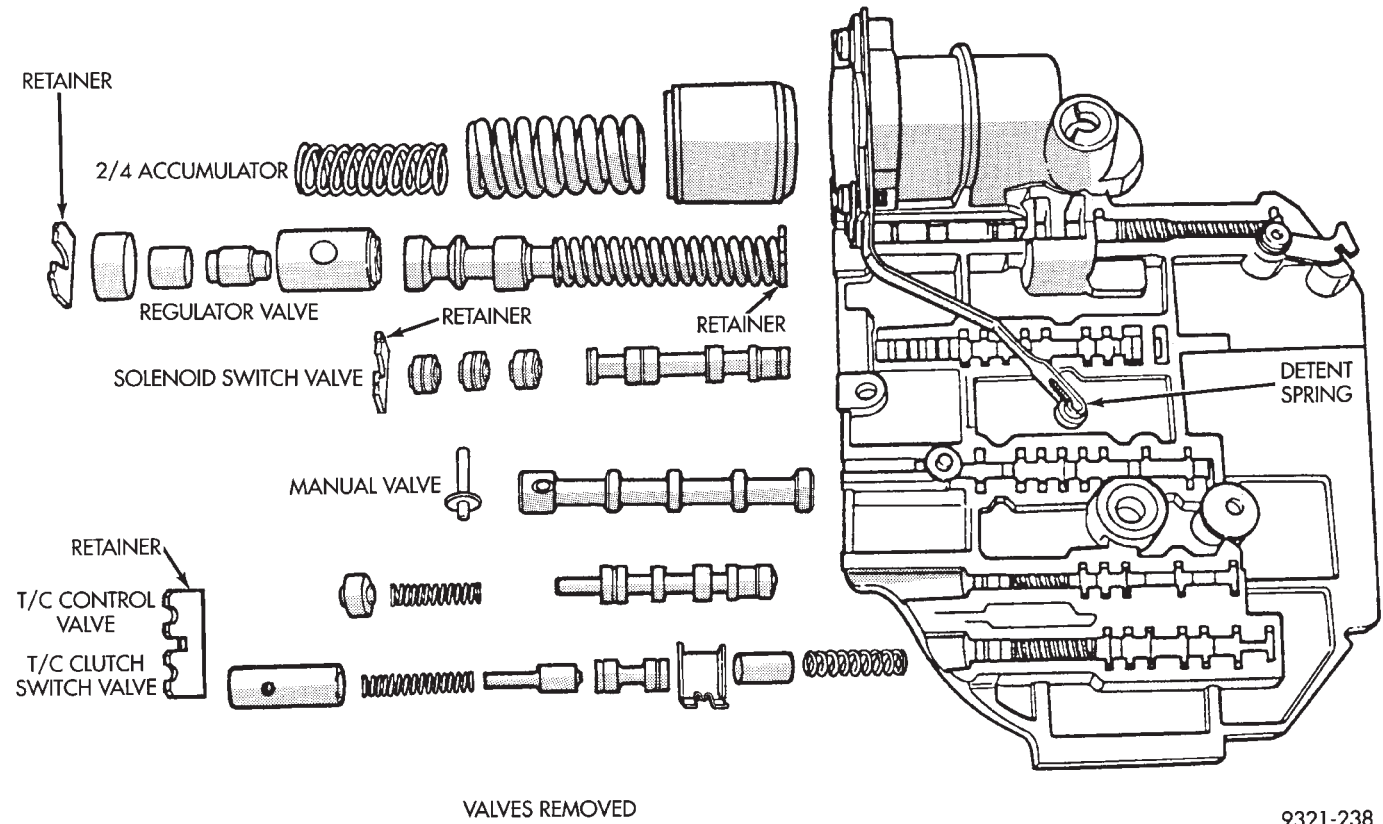
8921-41

Fig. 73 Remove or Install Retainer Plate

washed in a suitable solvent, then dried by compressed air. **Do not wipe parts with shop towels.** All mating surfaces in the valve body are accurately machined; therefore, careful handling of all parts must be exercised to avoid nicks or burrs.

(12) To reassemble, reverse recondition procedure.

DISASSEMBLY AND ASSEMBLY (Continued)

*Fig. 74 Valve Body Components***TRANSAXLE DISASSEMBLE/REASSEMBLE**

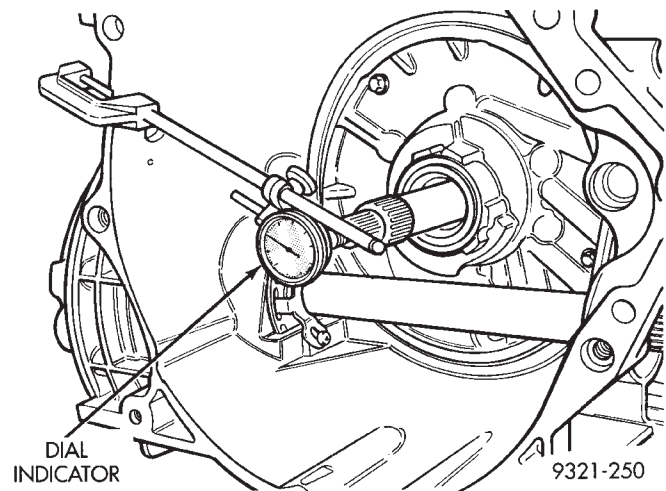
Before disassembling transaxle, move the shift lever clockwise as far as it will go. This should be one position past the L position. Then remove the shift lever.

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

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

Measuring input shaft end play before disassembly will usually indicate when a #4 thrust plate change is required. The number 4 thrust plate is located behind the overdrive clutch hub. Attach a dial indicator to transaxle bell housing with its plunger seated against end of input shaft (Fig. 75). Move input shaft in and out to obtain end play reading. End play specifications are .13 to .64 mm (.005 to .025 inch). Record indicator reading for reference when reassembling the transaxle.

Remove both speed sensors from transaxle case (Fig. 76).

*Fig. 75 Measure Input Shaft End Play*

DISASSEMBLY AND ASSEMBLY (Continued)

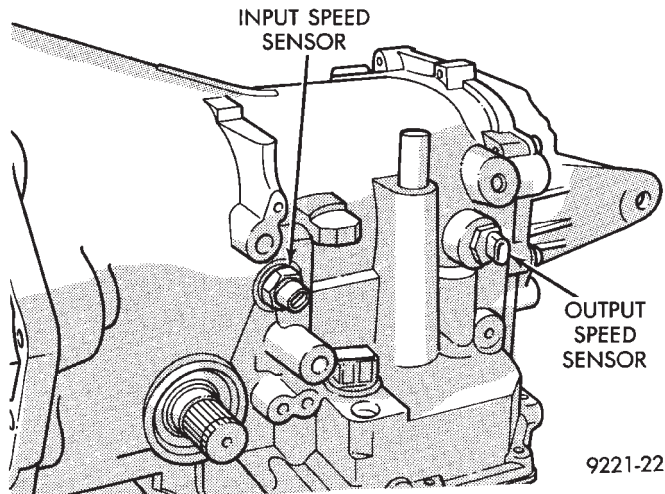


Fig. 76 Remove Input and Output Speed Sensor

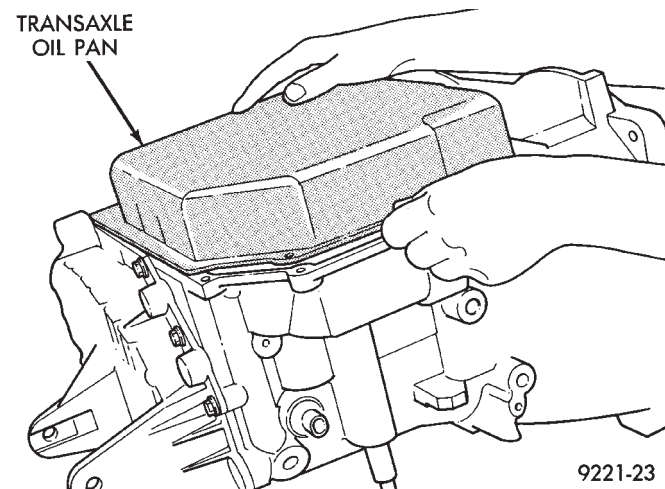


Fig. 77 Remove Transaxle Oil Pan

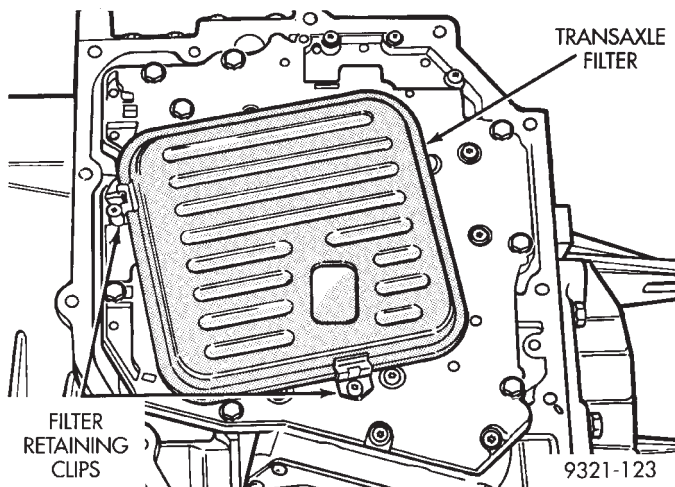


Fig. 78 Remove Transaxle Oil Filter

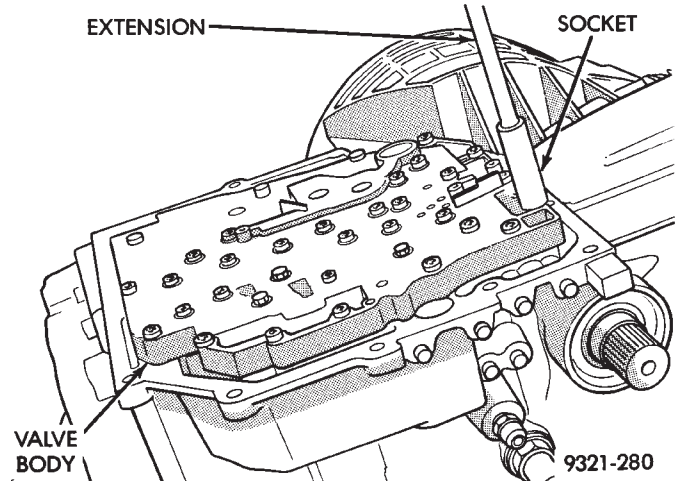


Fig. 79 Remove Valve Body Bolts

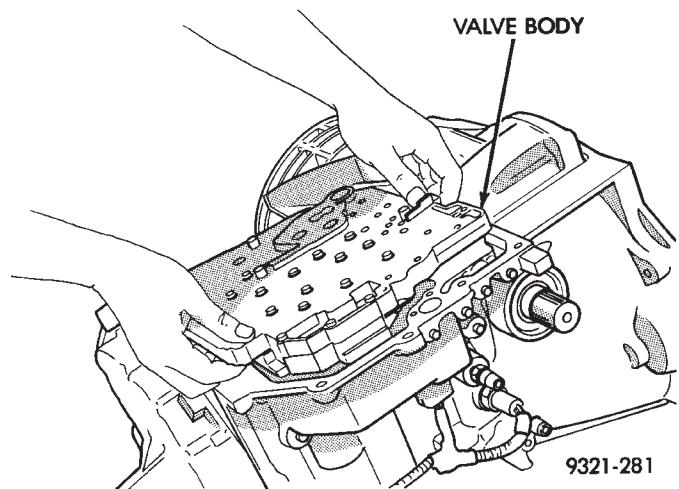


Fig. 80 Remove Valve Body From Transaxle

NOTE: For valve body recondition procedure, refer to Valve Body in this section.

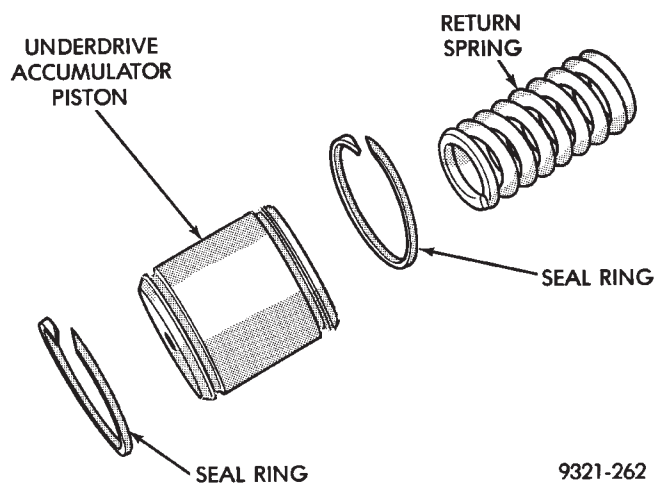


Fig. 81 Remove Underdrive Accumulator and Spring

DISASSEMBLY AND ASSEMBLY (Continued)

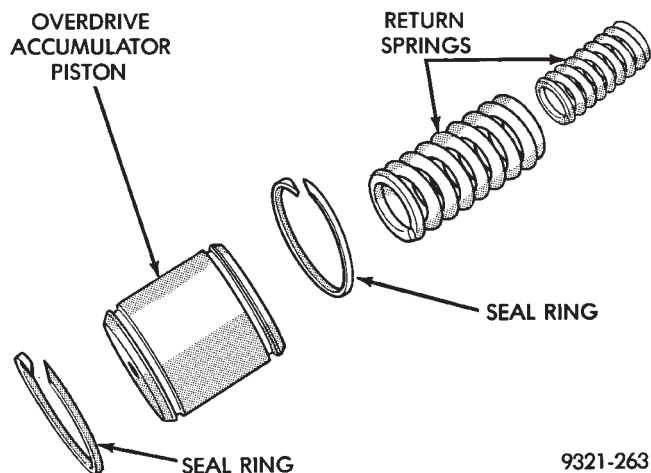


Fig. 82 Remove Overdrive Accumulator and Springs

CAUTION: Tag the springs for the Overdrive Accumulator so that they are not confused with the springs in the Low/Reverse Accumulator.

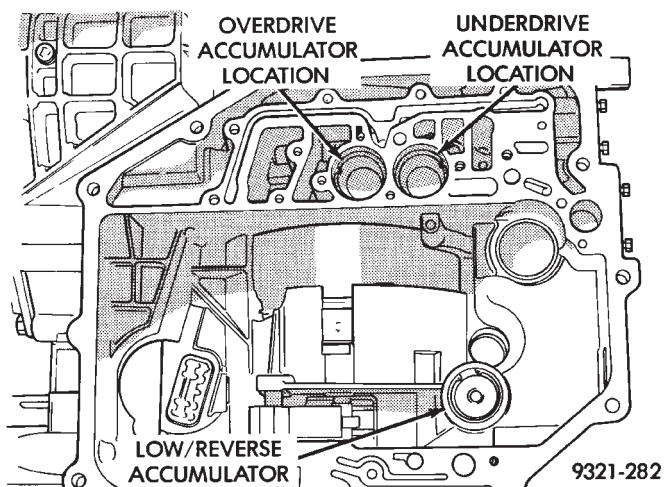


Fig. 83 Accumulator Locations

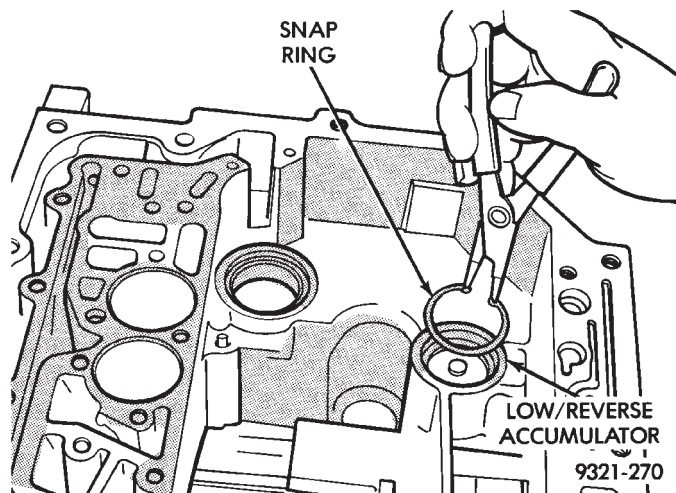


Fig. 84 Remove Low/Reverse Accumulator

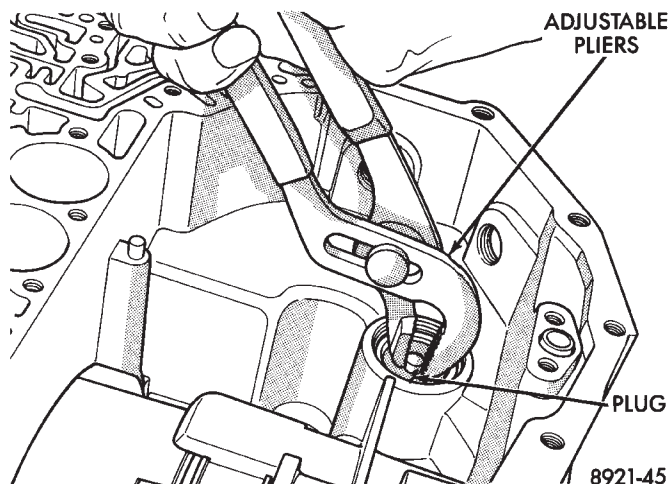


Fig. 85 Low/Reverse Accumulator Plug (Cover)

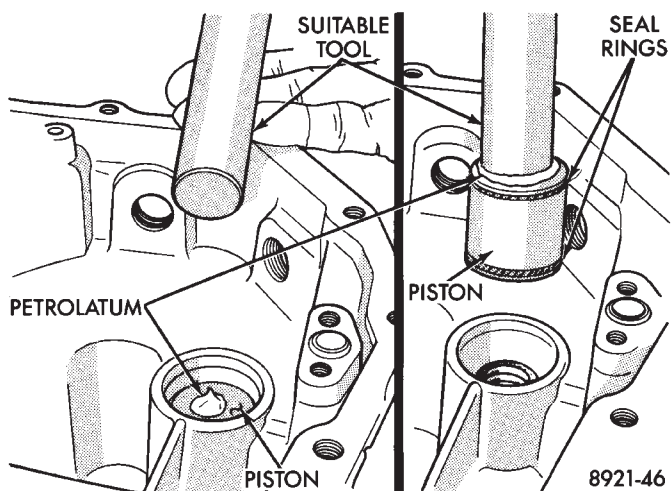


Fig. 86 Low/Reverse Accumulator Piston

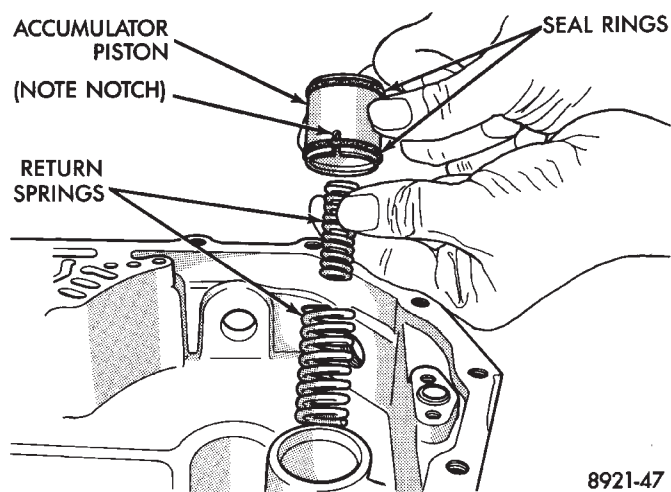


Fig. 87 Low/Reverse Accumulator

DISASSEMBLY AND ASSEMBLY (Continued)

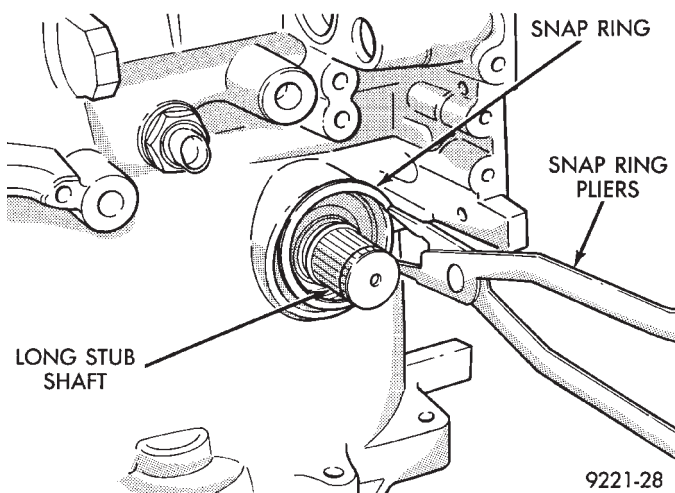


Fig. 88 Remove Long Stub Shaft Snap Ring

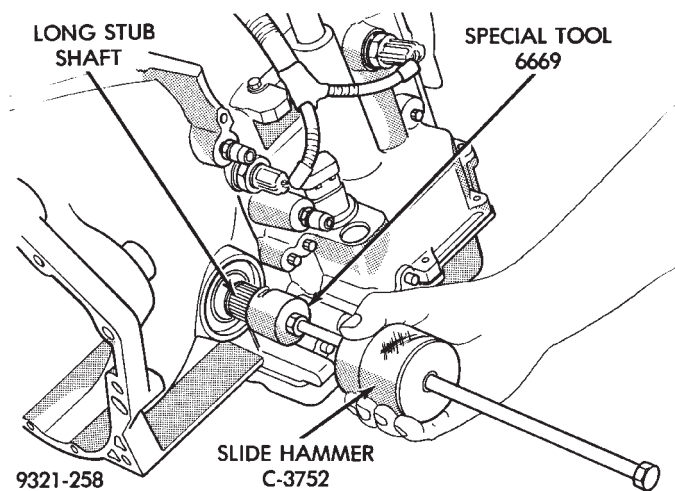


Fig. 89 Remove Long Stub Shaft From Bellhousing

CAUTION: Driveshaft retainer clips and seals located on the stub shafts must be replaced before reinstalling driveshafts.

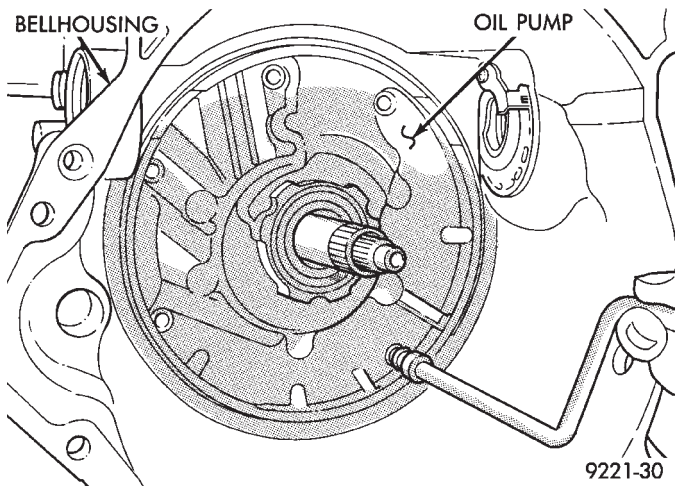


Fig. 90 Remove Oil Pump Attaching Bolts

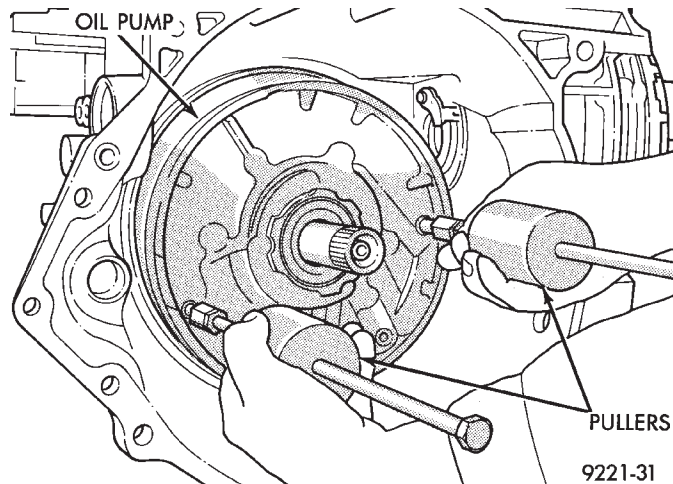


Fig. 91 Oil Pump Pullers

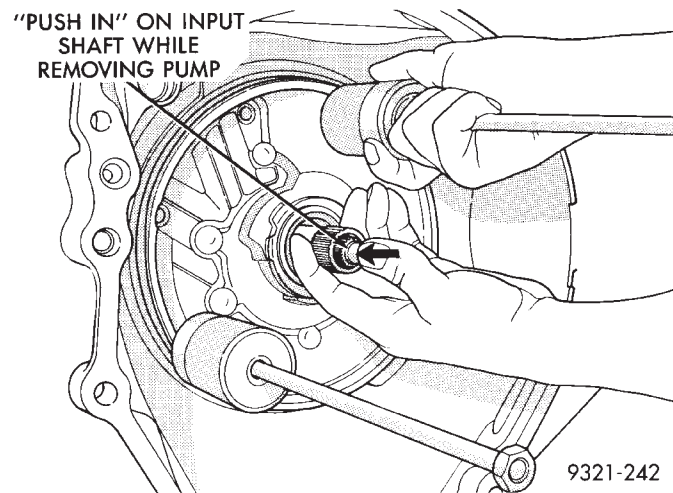


Fig. 92 Remove Oil Pump

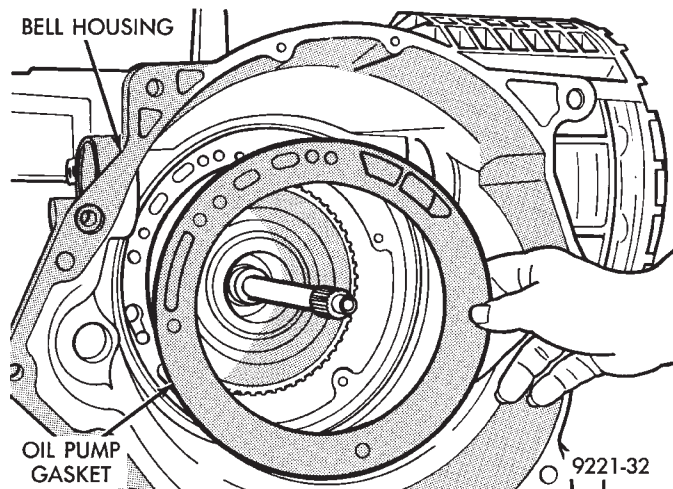


Fig. 93 Remove Oil Pump Gasket

DISASSEMBLY AND ASSEMBLY (Continued)

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

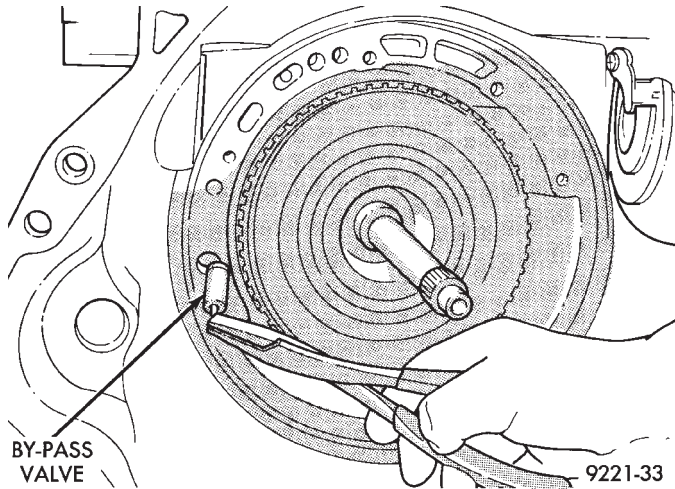


Fig. 94 Remove By-Pass Valve

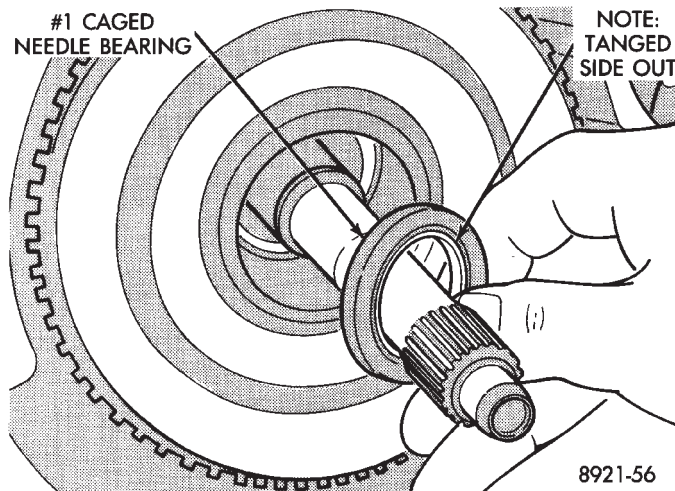


Fig. 95 Remove No. 1 Caged Needle Bearing

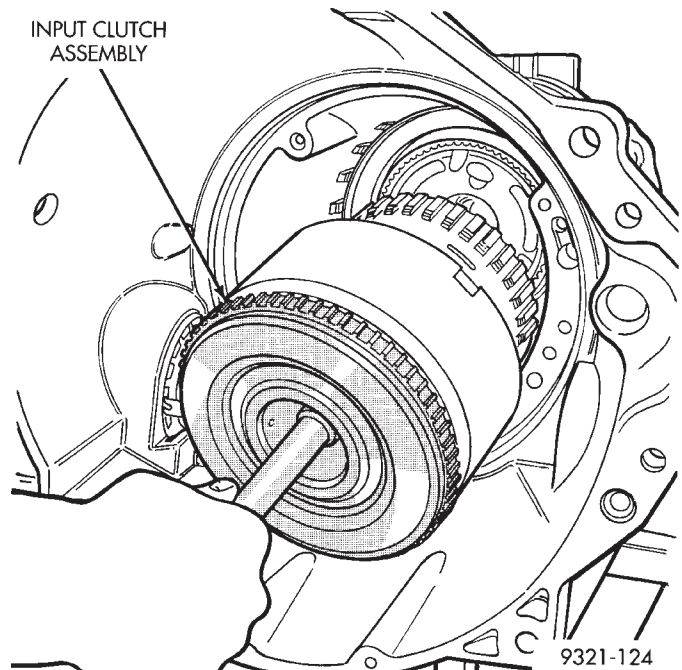


Fig. 96 Remove Input Clutch Assembly

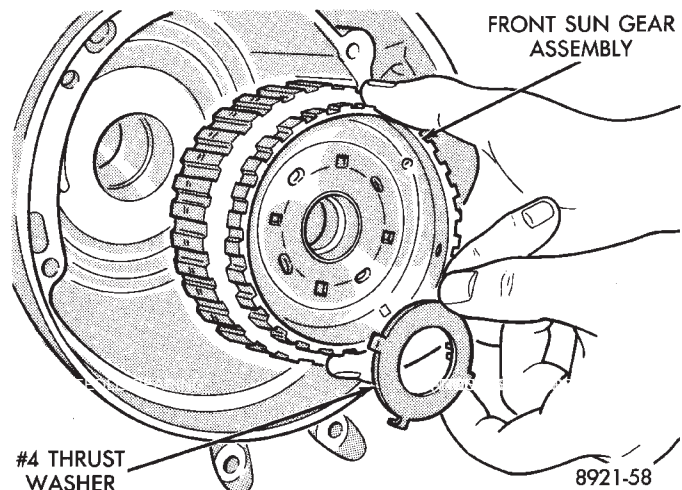


Fig. 97 Remove Front Sun Gear Assembly

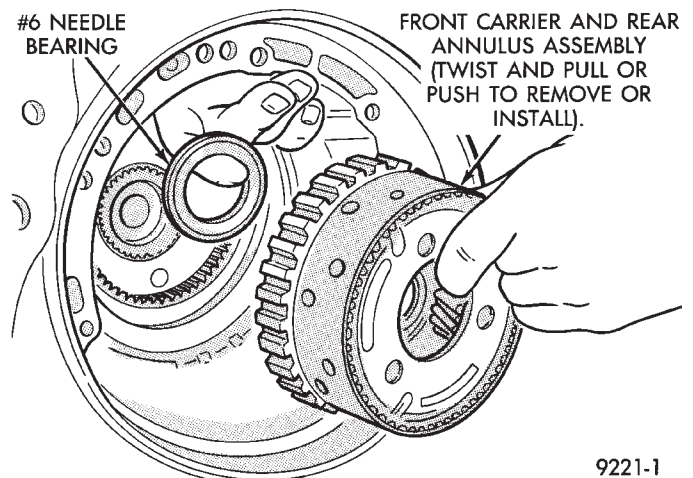


Fig. 98 Remove Front Carrier and Rear Annulus Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

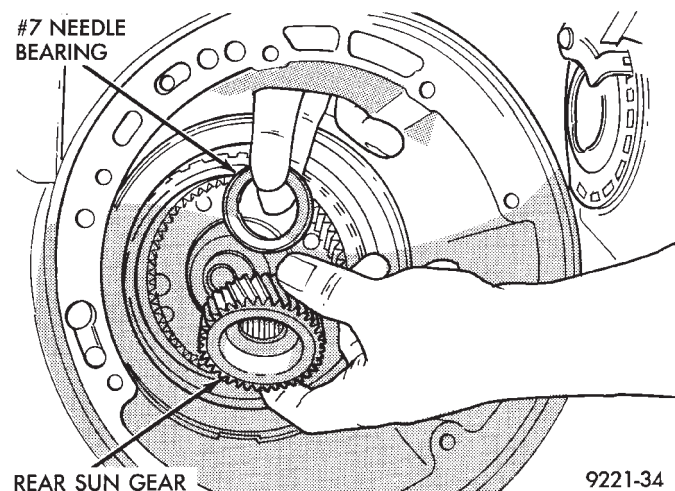


Fig. 99 Remove Rear Sun Gear

The number 7 needle bearing has antireversal tabs and is common with the number 5 and number 2 position. The orientation should allow the bearing to seat flat against the rear sun gear (Fig. 100). A small amount of petrolatum can be used to hold the bearing to the rear sun gear.

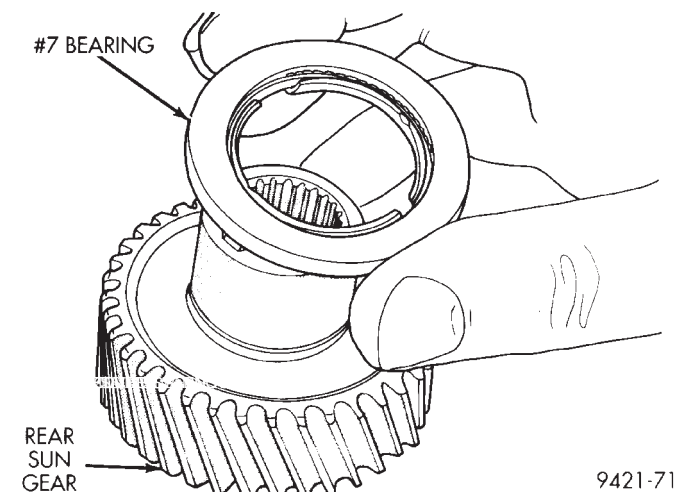


Fig. 100 Number 7 Bearing

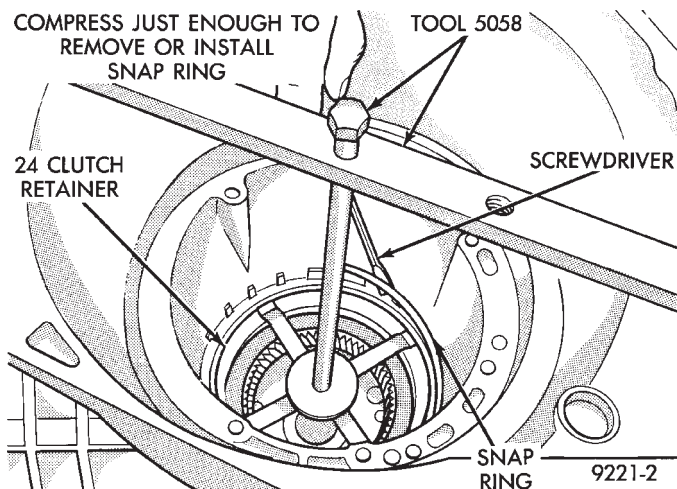


Fig. 101 Remove 2/4 Clutch Retainer Snap Ring

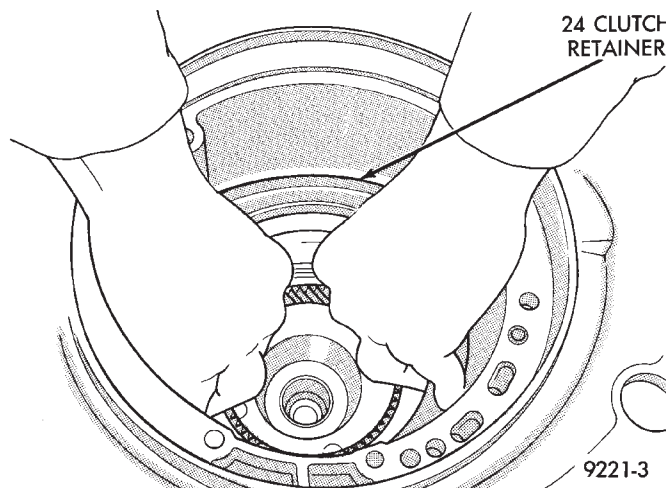


Fig. 102 Remove 2/4 Clutch Retainer

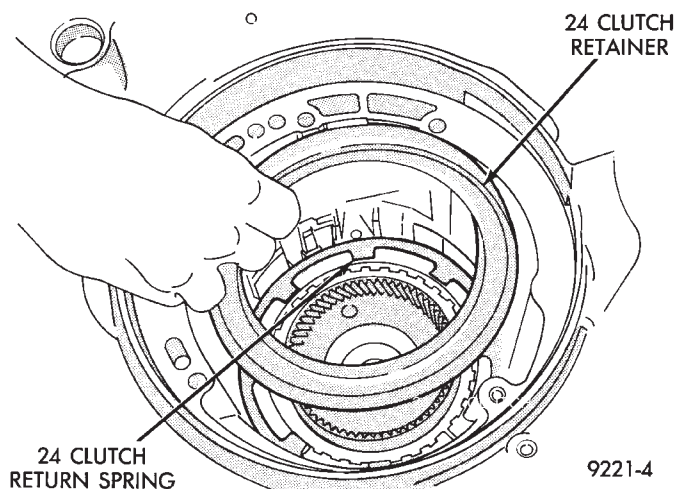


Fig. 103 Remove 2/4 Clutch Retainer

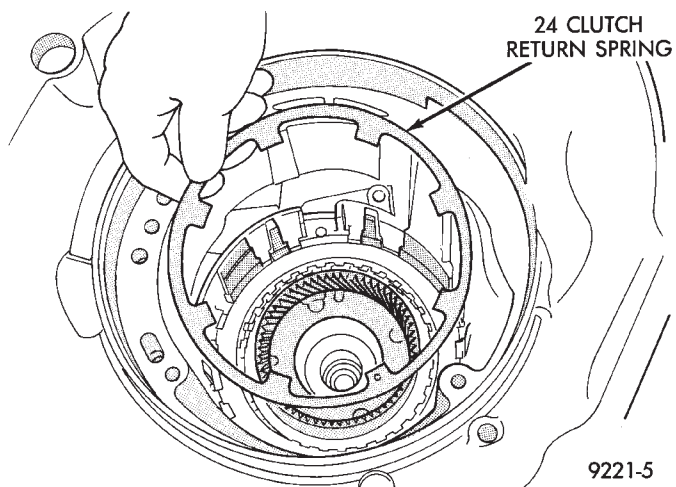
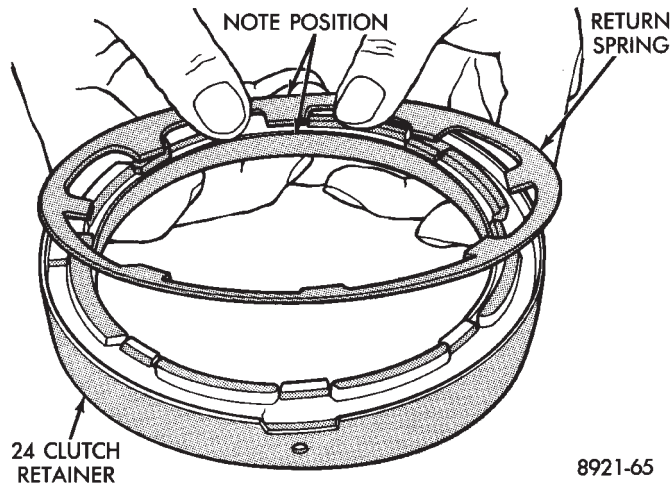
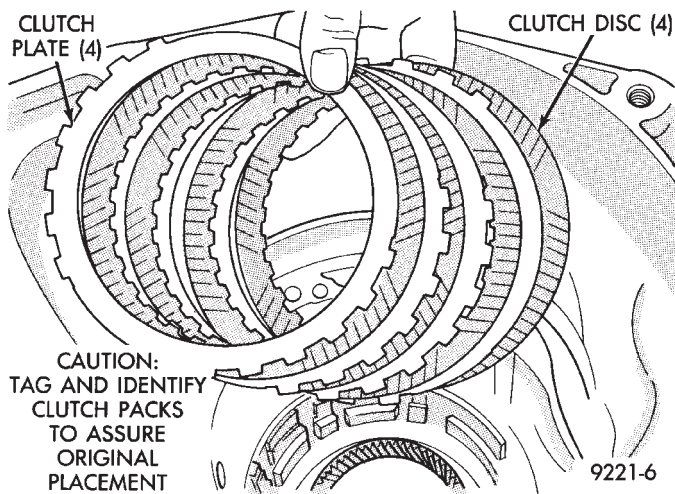
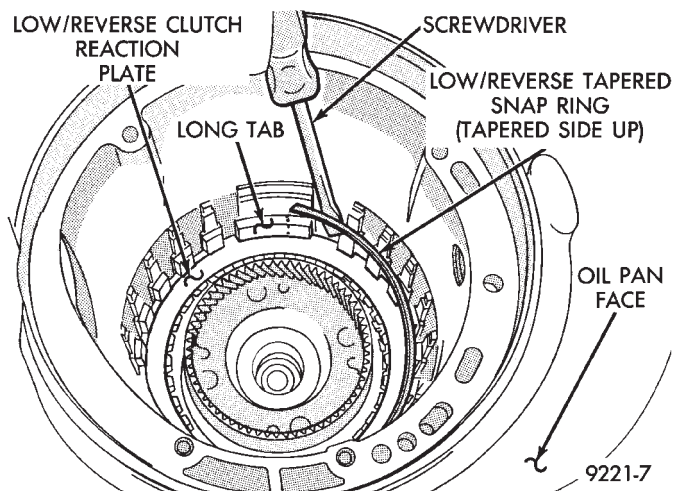
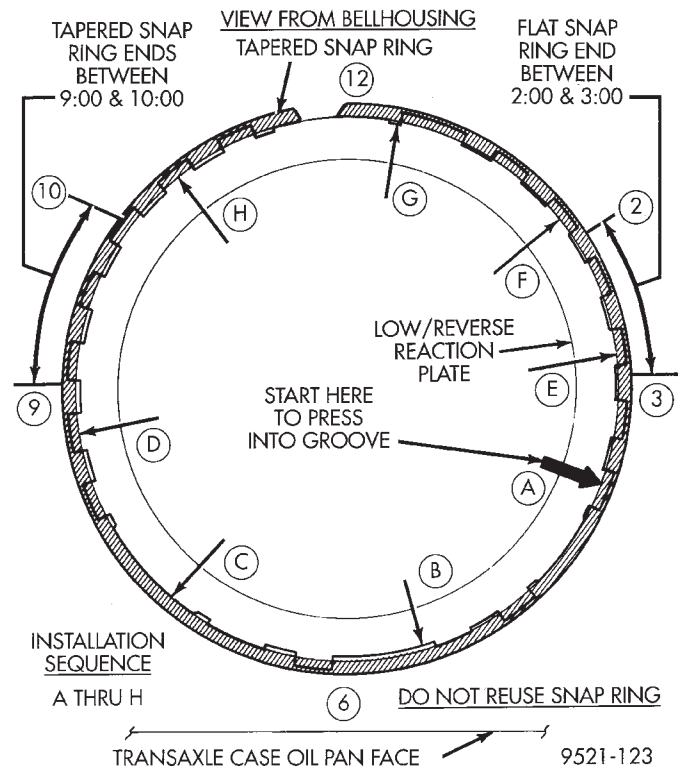
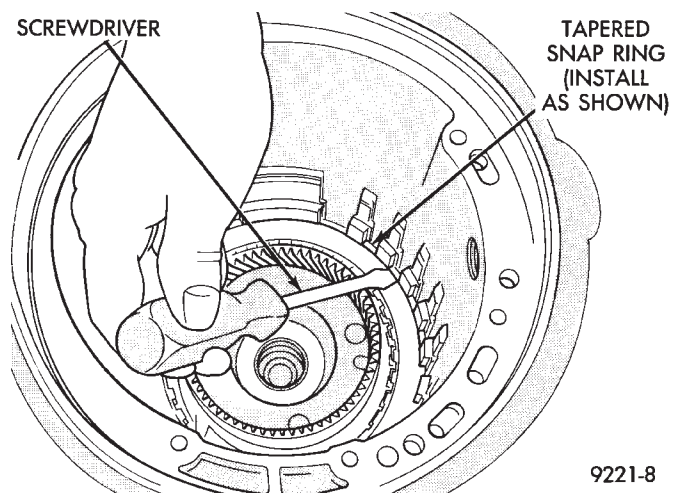


Fig. 104 Remove 2/4 Clutch Return Spring

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 105 2 1/4 Retainer and Spring Indexed****Fig. 106 Remove 2 1/4 Clutch Pack****Fig. 107 Remove Tapered Snap Ring****Fig. 108 Tapered Snap Ring Instructions****Fig. 109 Snap Ring Installed**

DISASSEMBLY AND ASSEMBLY (Continued)

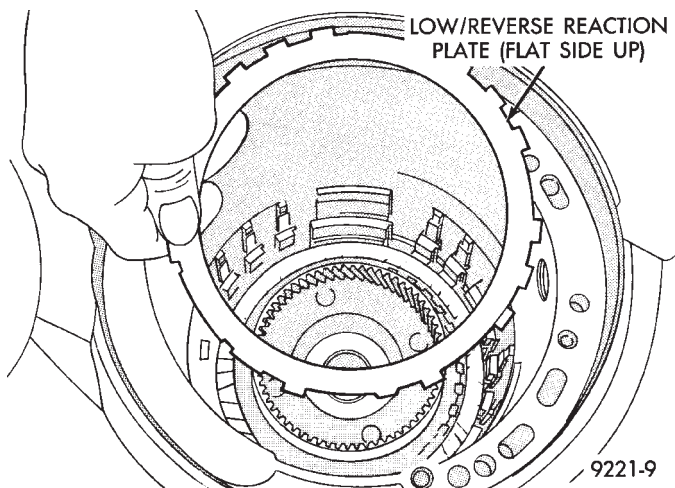


Fig. 110 Low/Reverse Reaction Plate

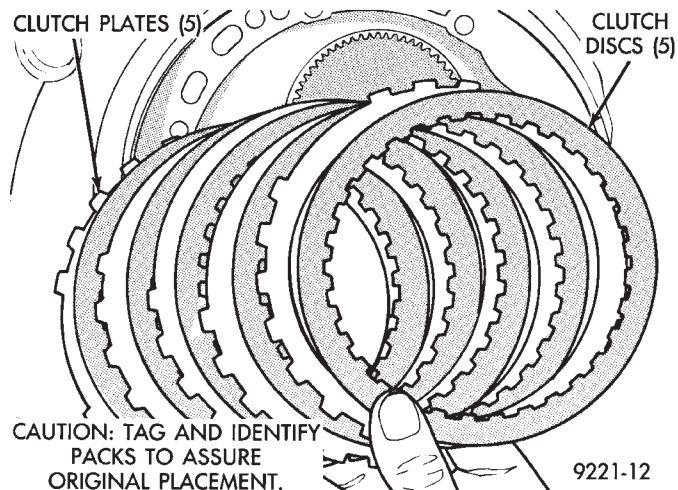


Fig. 113 Remove Low/Reverse Clutch Pack

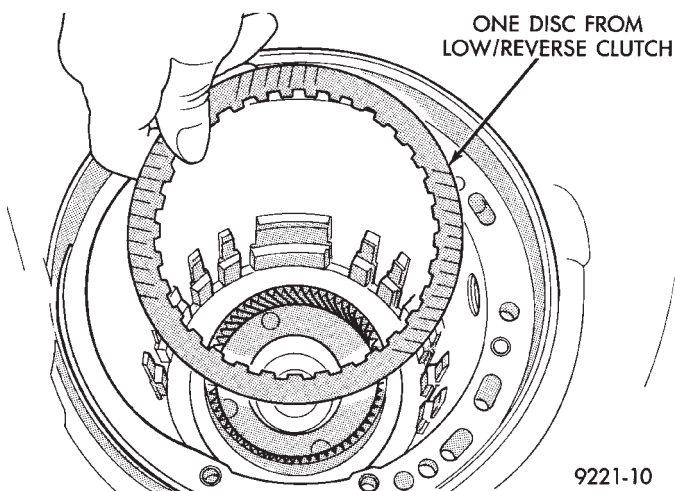


Fig. 111 Remove One Disc

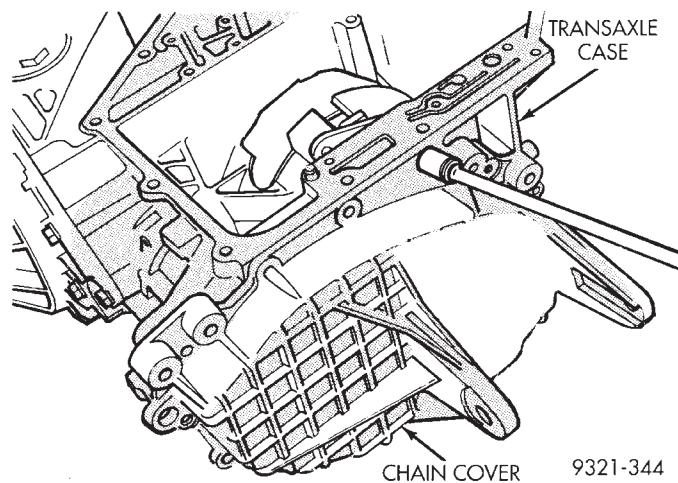


Fig. 114 Remove Chain Cover

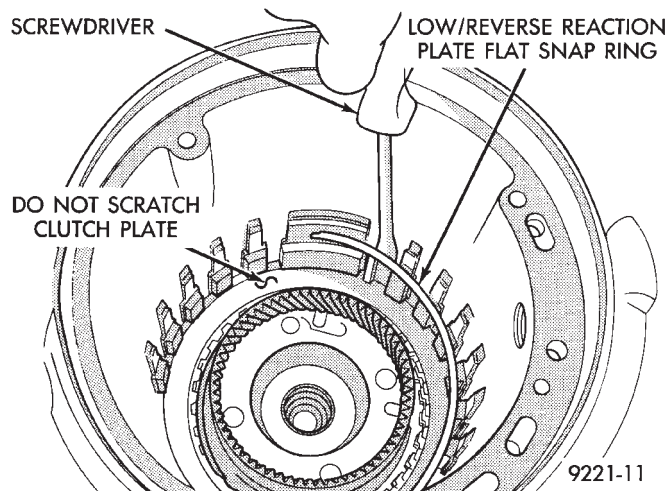


Fig. 112 Remove Low/Reverse Reaction Plate Snap Ring

Stand trans upright on bellhousing
Chain cover must be free of old sealant, dirt and oil before applying new sealant. Apply a 1/8 inch bead of sealant to flange of cover.

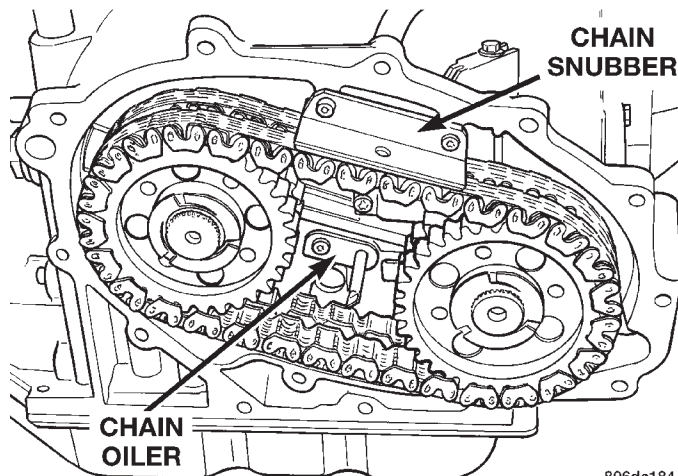


Fig. 115 Remove Chain Oiler

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Be sure to reinstall the chain snubber and chain oiler when reassembling.

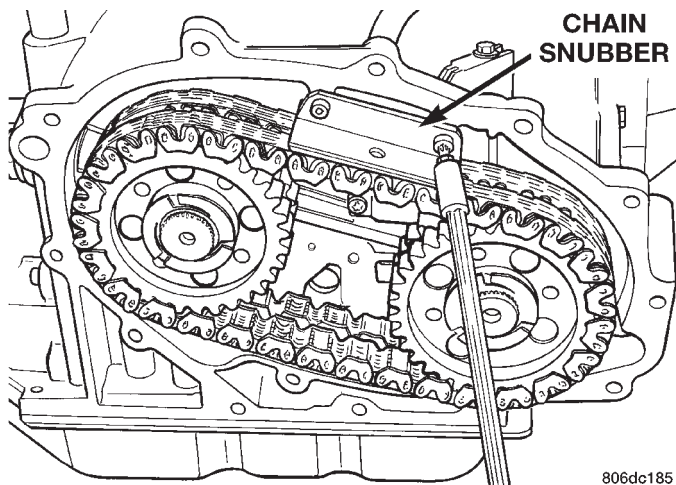


Fig. 116 Remove Chain Snubber

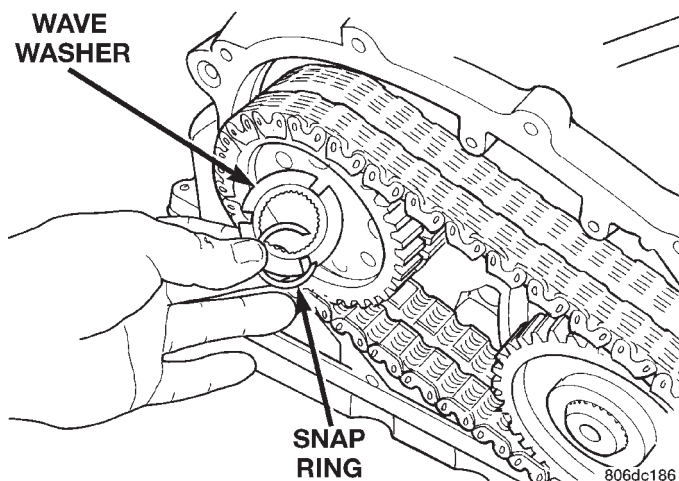


Fig. 117 Remove Output Shaft Sprocket SnapRing and Wave Washer

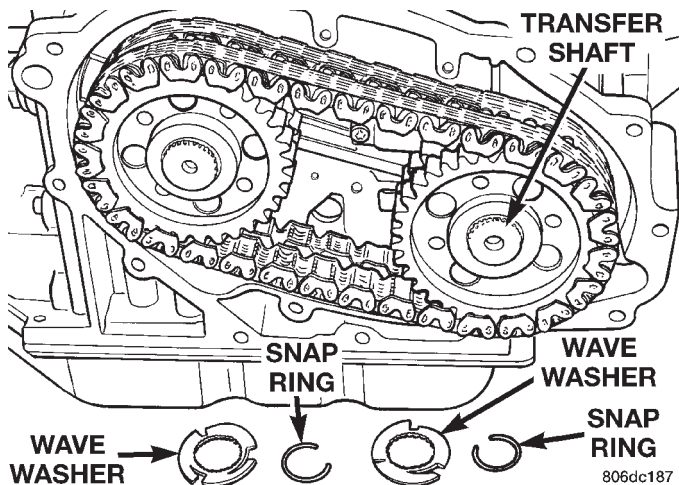


Fig. 118 Remove Transfer Shaft Sprocket SnapRing and Wave Washer

CAUTION: The chain sprockets have a slip fit onto the shafts. Apply only a slight amount of pressure to the chain spreader to release the chain pressure. If chain sprockets are not spread slightly, removal or installation will be difficult. Overspreading of the chain sprocket will also make sprocket removal difficult.

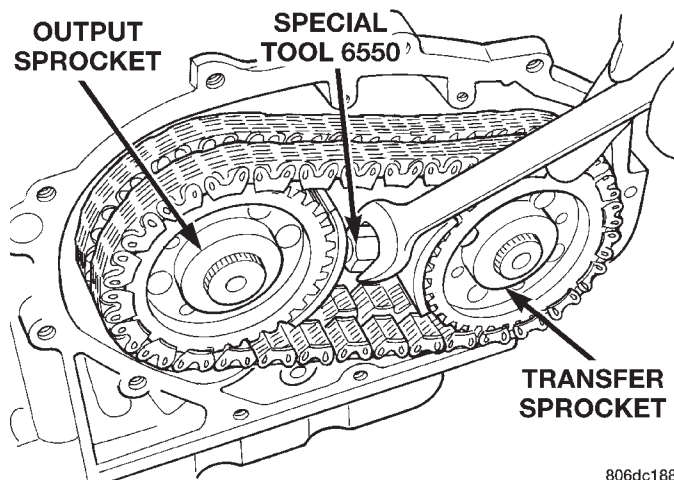


Fig. 119 Install Chain Spreader

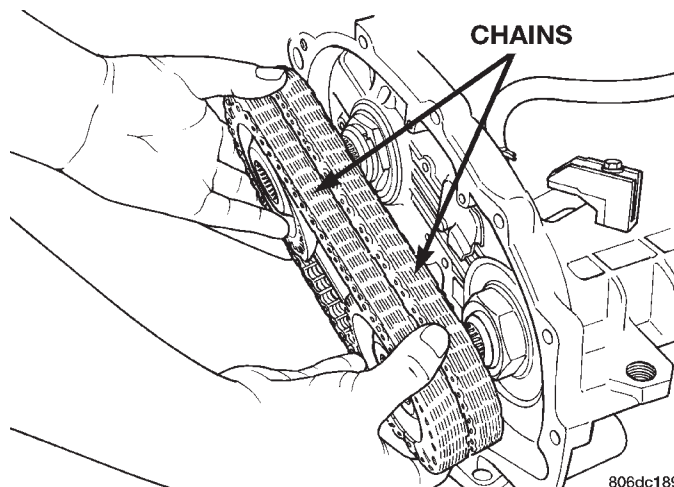


Fig. 120 Remove Chains and Both Sprockets as an Assembly

CAUTION: When reinstalling drive chains, the blue link must face outward.

DISASSEMBLY AND ASSEMBLY (Continued)

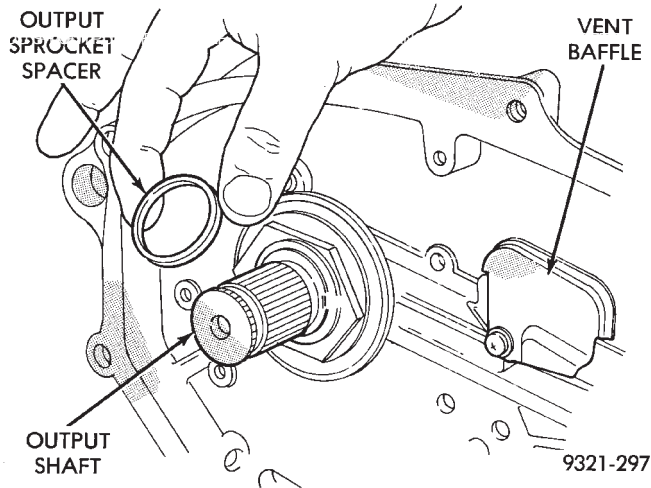


Fig. 121 Output Sprocket Spacer

When reinstalling transaxle drive chains and sprockets, sprocket height must be checked. Refer to Drive Sprocket Height Adjustment Procedure in this group.

Remove main sump baffle from transaxle case (Fig. 122).

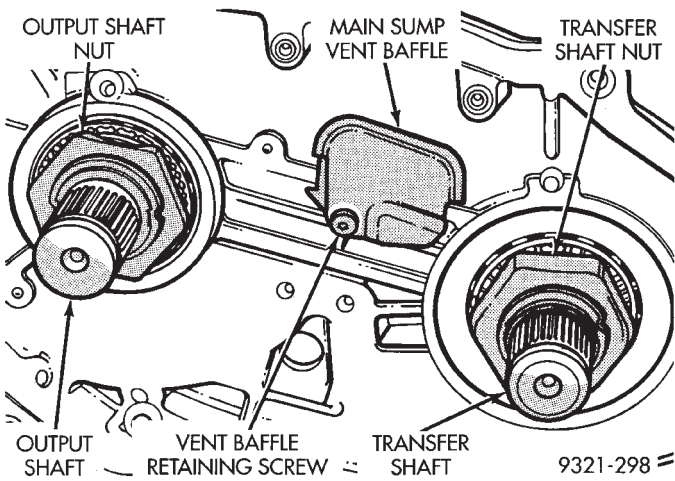


Fig. 122 Main Sump Vent Baffle Location

When reinstalling main sump baffle apply Mopar Silicone Sealant as shown in (Fig. 123).

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

WARNING: WEAR SAFETY GOGGLES WHILE GRINDING STAKE NUTS.

Using a die grinder or equivalent, grind the stakes in the shoulder of the shaft nuts as shown in (Fig. 124) and (Fig. 125). Do not grind all the way through

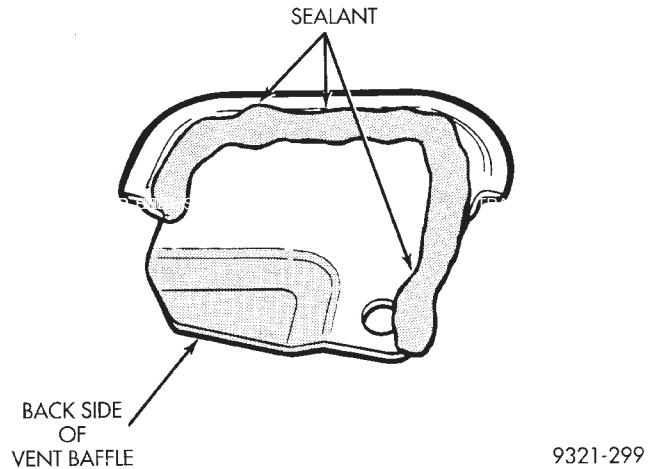


Fig. 123 Correctly Applied Sealant

the nut and into the shaft. There are two stakes on each nut.

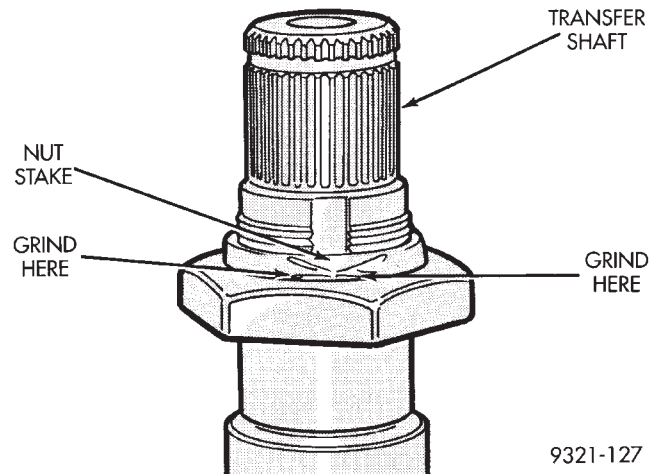


Fig. 124 Grinding Stakes

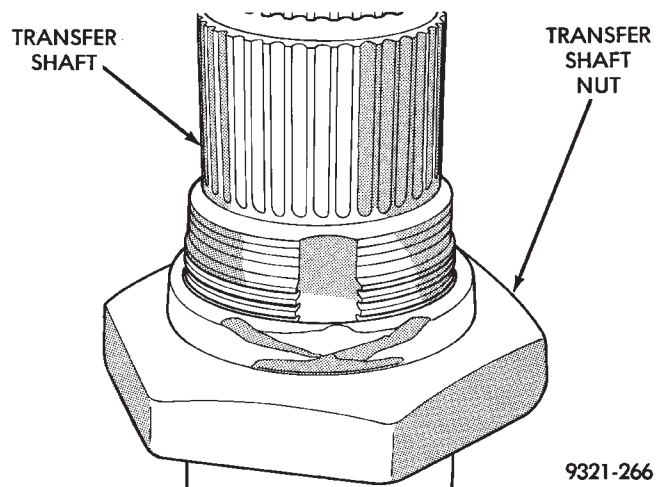


Fig. 125 Stake Grinding Pattern

DISASSEMBLY AND ASSEMBLY (Continued)

Using a small chisel, carefully open stakes on nut (Fig. 126).

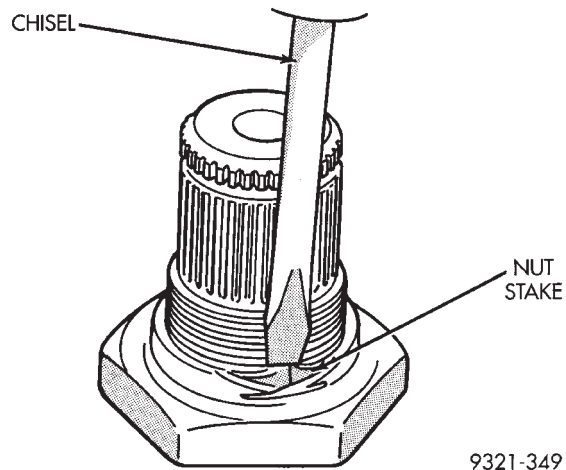


Fig. 126 Opening Nut Stakes

Use special tool 6497 and 6498 to remove the transfer shaft nut or the output shaft nut (Fig. 127). Note that your breaker bar will turn clockwise to remove the nut and counter clockwise to install the nut.

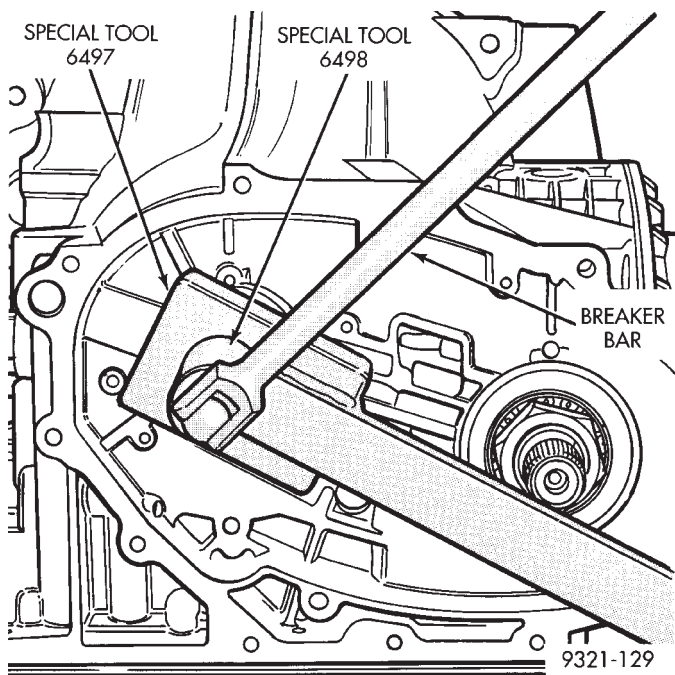


Fig. 127 Remove Output Shaft Nut

CAUTION: Do not reuse old transfer shaft nut or output shaft nut because the removed stake weakens the nut flange.

When installing new nuts use special tool 6639 to stake output shaft nut and special tool 6589 to stake transfer shaft nut (Fig. 128).

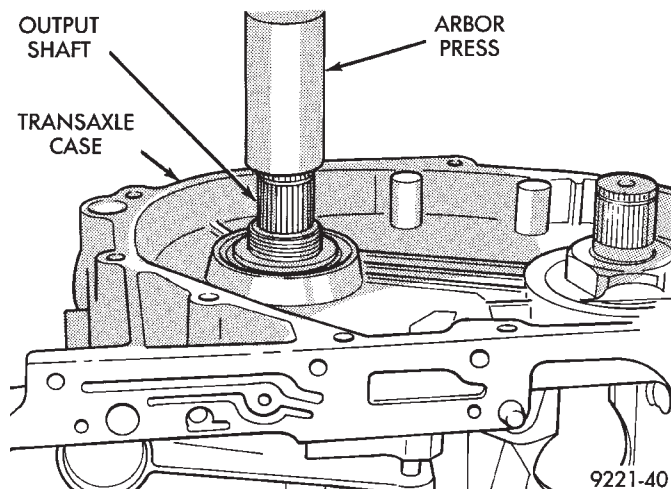


Fig. 128 Use Arbor Press to Remove Output Shaft from Case

Use special tool 6596 to remove front output shaft bearing cup (Fig. 129).

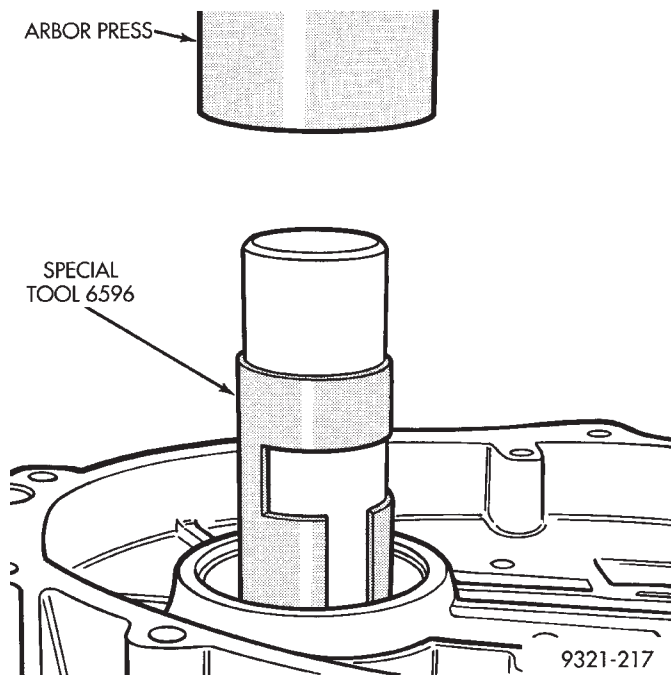


Fig. 129 Remove Front Bearing Cup

DISASSEMBLY AND ASSEMBLY (Continued)

Use special tool 6597 and handle C-4171 and C-4171-2 to press rear output shaft bearing cup rearward (Fig. 130).

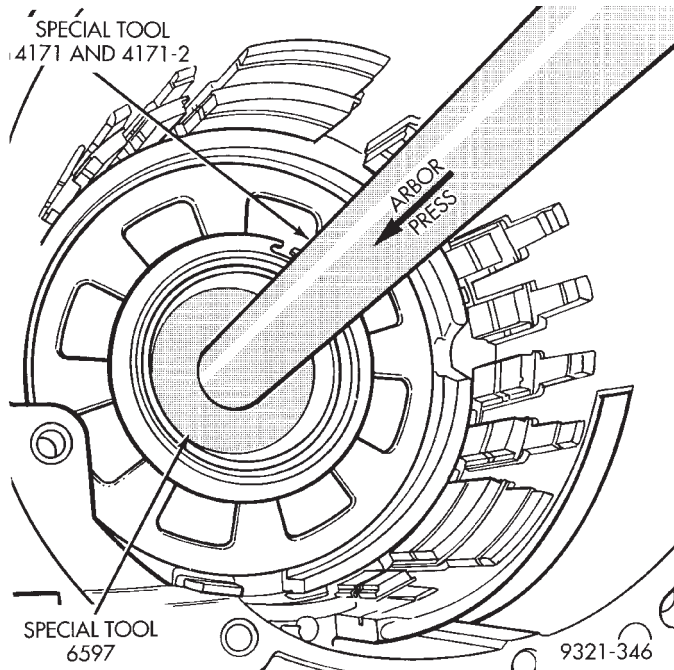


Fig. 130 Remove Rear Bearing Cup

Use special tool 5050A to install both front and rear bearing cups (Fig. 131).

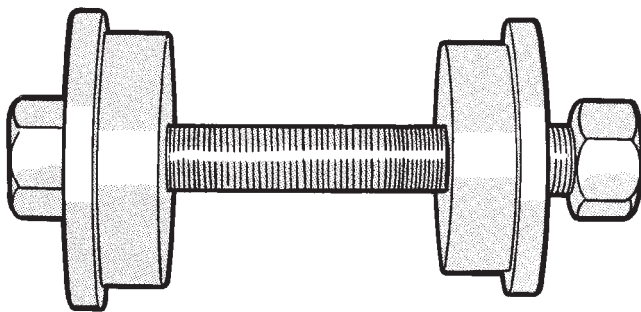


Fig. 131 Bearing Cup Installation SpecialTool 5050A

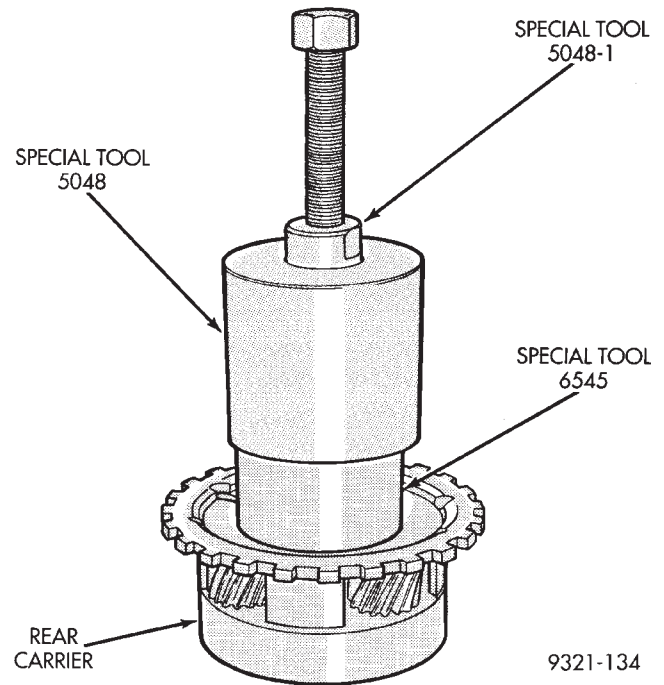


Fig. 132 Remove Rear Carrier Front Bearing Cone

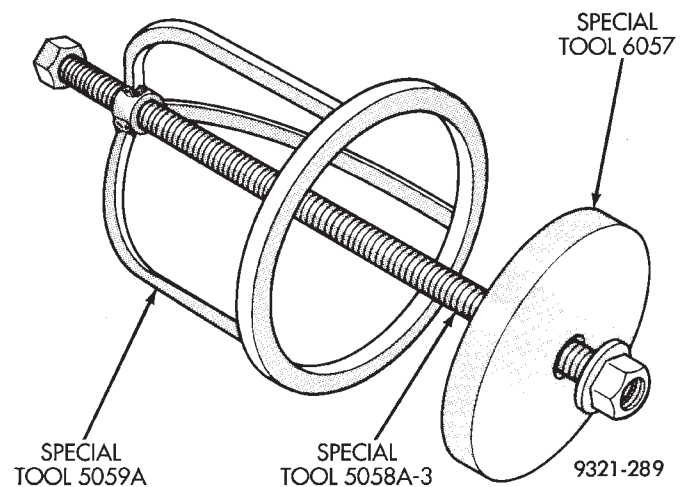
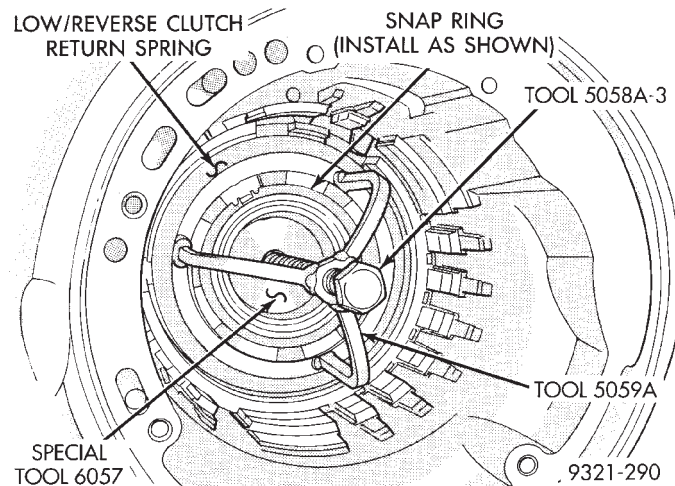
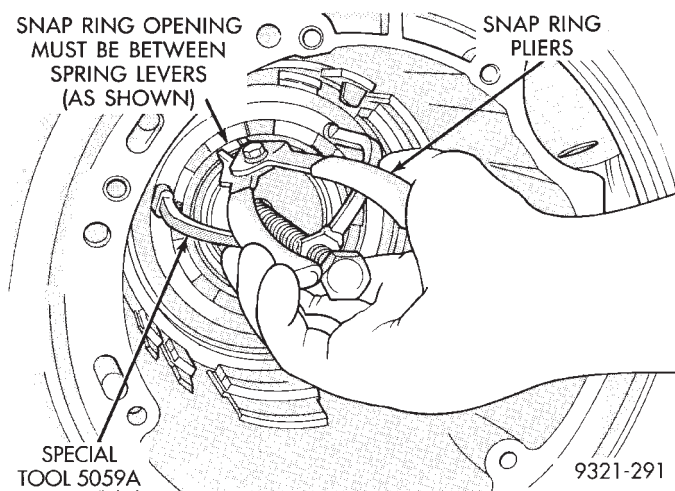
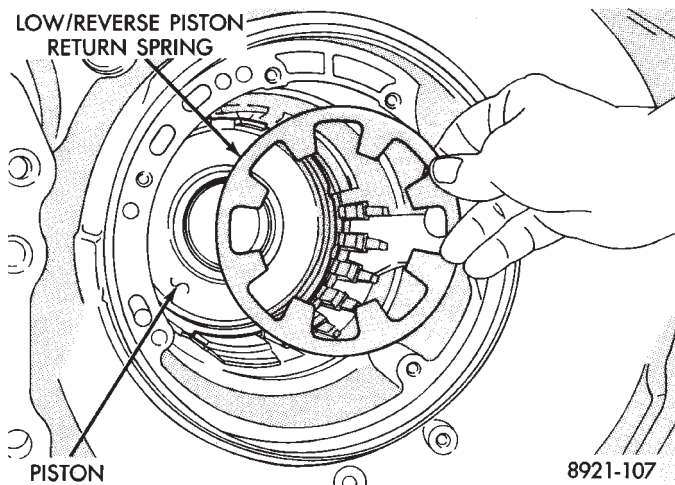
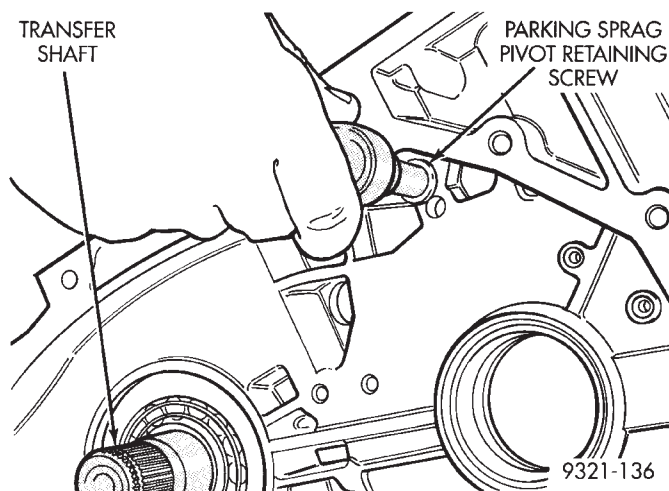
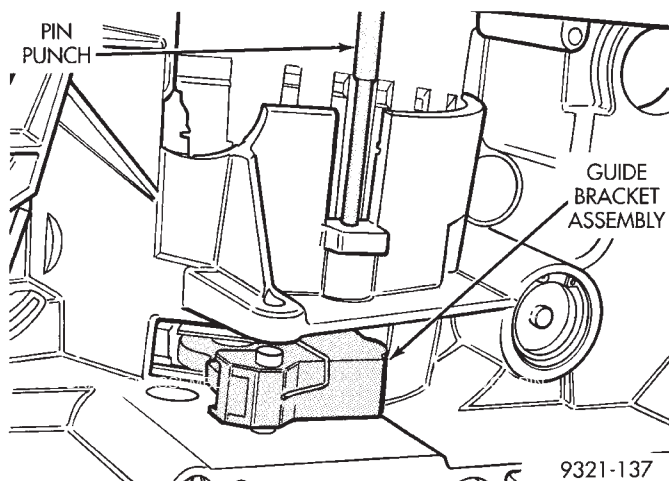
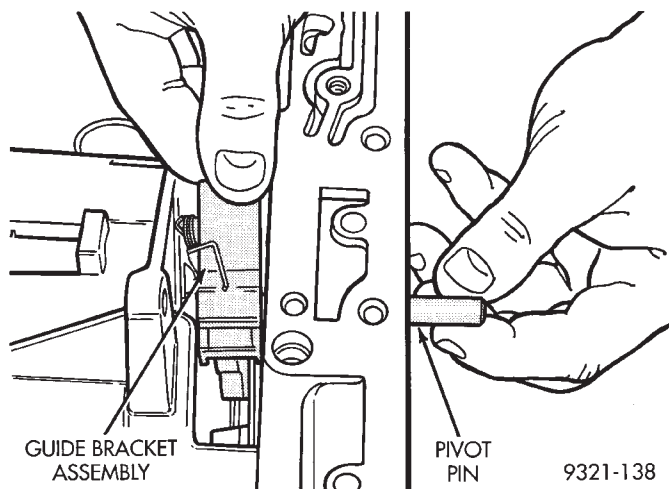


Fig. 133 Low/Reverse Spring Compressor Tool

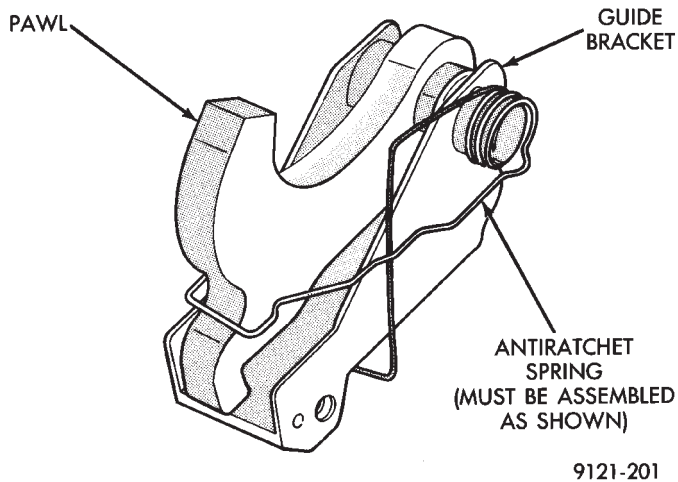
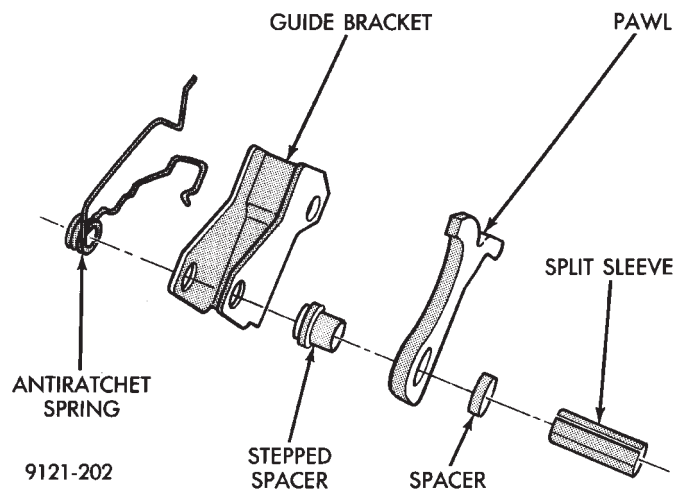
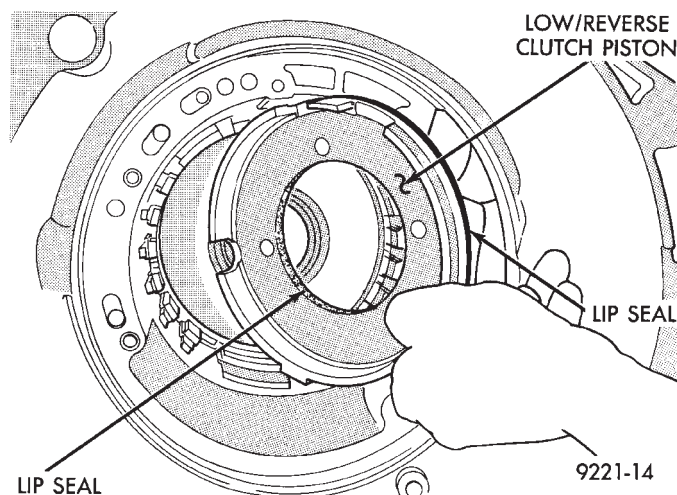
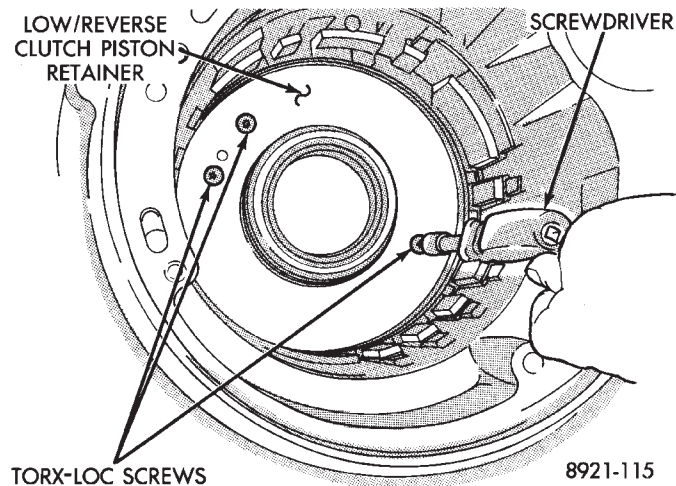
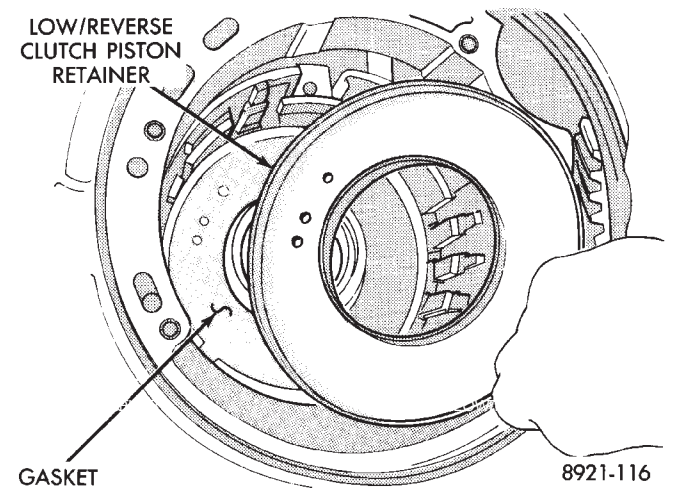
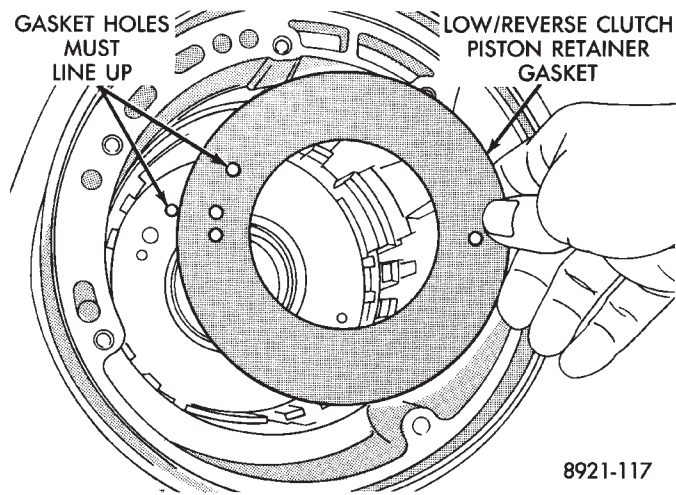
DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 134 Compressor Tool in Use****Fig. 135 Remove Snap Ring****Fig. 136 Low/Reverse Piston Return Spring****Fig. 137 Remove Parking Sprag Pivot Retaining Screw**

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

**Fig. 138 Anchor Shaft Removal****Fig. 139 Guide Bracket Pivot Shaft**

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 140 Guide Bracket Assembled****Fig. 141 Guide Bracket Disassembled****Fig. 142 Low/Reverse Clutch Piston****Fig. 143 Piston Retainer Attaching Screws****Fig. 144 Piston Retainer****Fig. 145 Piston Retainer Gasket**

DISASSEMBLY AND ASSEMBLY (Continued)

At this point the Centerline of the transaxle has been removed. If the condition for disassembly did not pertain to the differential, its disassembly may not be required. Inspect the rear transfer shaft area and the transfer shaft seal area for contamination. If evidence of contamination is present, replace the rear transfer shaft bearing and/or the transfer shaft seal. Refer to the Transfer Shaft Seal Removal Section and the Differential Disassembly/Assembly section.

To assemble transaxle, reverse the above procedure. Be sure to check both grounded clutch clearances. Before installing the input clutches retainer, follow the instructions in **Determining No. 4 Thrust Plate Thickness**.

OUTPUT SHAFT BEARING PRELOAD SHIM SELECTION

When assembling, the output bearing preload must be checked and/or adjusted if any of the following items have been replaced:

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

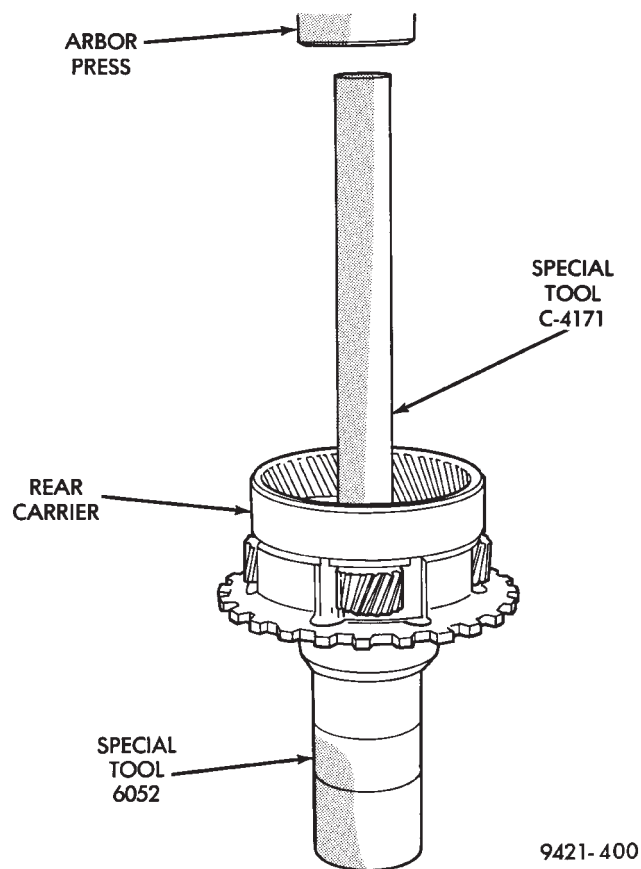


Fig. 146 Install Rear Carrier Front Bearing Cone

SHIM SELECTION

(1) Install rear output shaft bearing cone and special tool 6618A (Fig. 147).

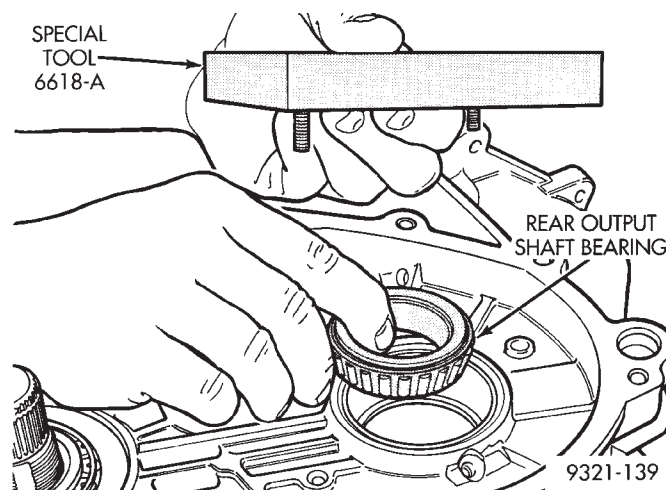


Fig. 147 Bearing Installation

(2) Install special tool 6618A (Fig. 148). Lightly tighten retaining screws. Screws should be below the plate surface, but do not snug screws.

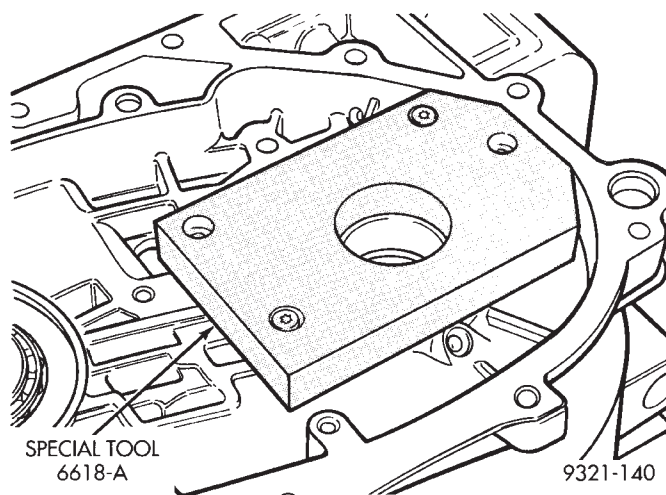


Fig. 148 Special Tool Installed

(3) Turn case over on arbor press so that the plate is resting on the press base

CAUTION: The output shaft will extend through the hole of tool 6618A. Ensure your press table has clearance for the output shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Install shim on output shaft (Fig. 149). Apply small amount of petrolatum onto the shim to hold it in place. Use the original shim as a starting point. If original shim is not available, use the thickest shim available. Refer to Output Shaft Rear Shim Chart for available sizes.

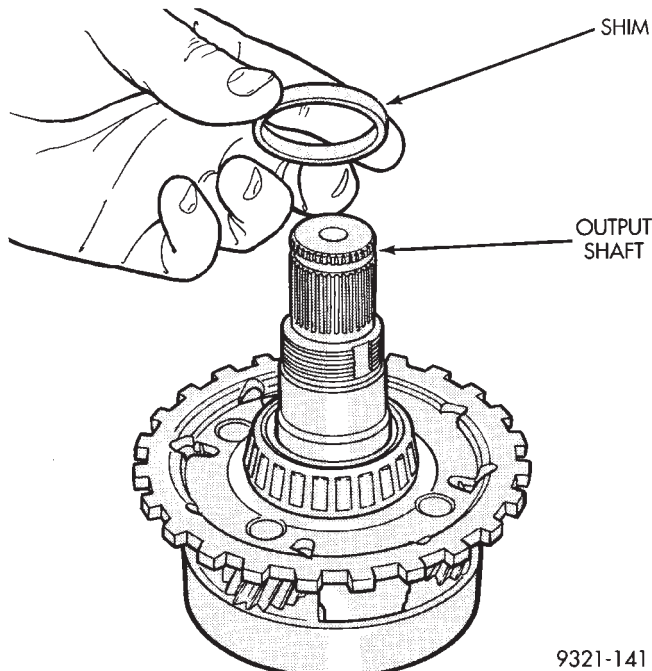


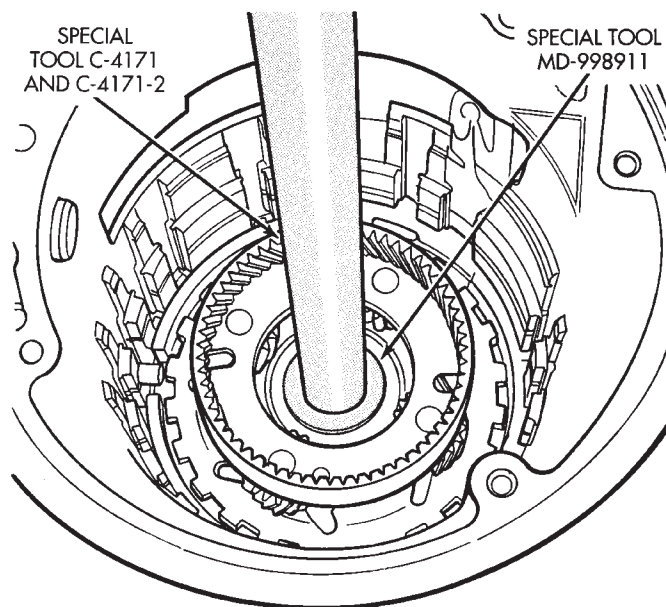
Fig. 149 Shim Installation

5.17 - 5.19 mm	5.62 - 5.64 mm
5.20 - 5.22 mm	5.65 - 5.67 mm
5.23 - 5.25 mm	5.68 - 5.70 mm
5.26 - 5.28 mm	5.71 - 5.73 mm
5.29 - 5.31 mm	5.74 - 5.76 mm
5.32 - 5.34 mm	5.77 - 5.79 mm
5.35 - 5.37 mm	5.80 - 5.82 mm
5.38 - 5.40 mm	5.83 - 5.85 mm
5.41 - 5.43 mm	5.86 - 5.88 mm
5.44 - 5.46 mm	5.89 - 5.91 mm
5.47 - 5.49 mm	5.92 - 5.94 mm
5.50 - 5.52 mm	5.95 - 5.97 mm
5.53 - 5.55 mm	5.98 - 6.00 mm
5.56 - 5.58 mm	6.01 - 6.03 mm
5.59 - 5.61 mm	6.04 - 6.06 mm

9421-70

Output Shaft Rear Shim Chart

(5) Install output shaft/rear carrier into rear bearing. The shaft must be pressed into position. Use special tool MD-998911 (Disc) and C- 4171 and C4171-2 (Handle) to press shaft into rear bearing (Fig. 150).

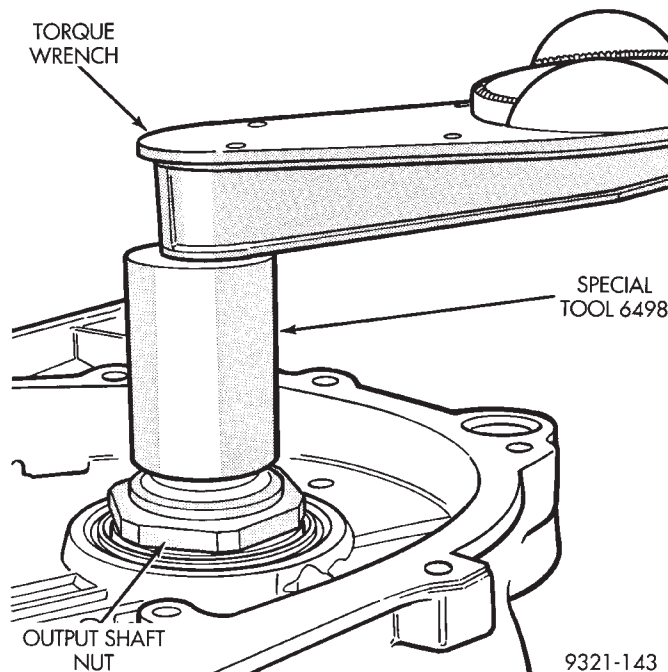


9321-142

Fig. 150 Press Shaft Into Case

(6) Using special tools 6497 and 6498, install new output shaft nut. Do not reuse old output shaft nut. Tighten new output shaft nut to 271 N·m (200 ft. lbs.).

(7) Check the turning torque of the output shaft (Fig. 151). The shaft should have 1 to 8 in. lbs. of turning torque. If the turning torque is **higher than** 8 in. lbs., install a thicker shim. If the turning torque is **less than** 1 in. lb., install a thinner shim. Make sure there is no end play.



9321-143

Fig. 151 Checking Turning Torque

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Failure to stake shaft nuts could allow the nuts to back-off during use.

(8) The new nut must be staked after the correct turning torque is obtained (Fig. 152). Use special tool 6639 to stake output shaft nut and special tool 6589 to stake transfer shaft.

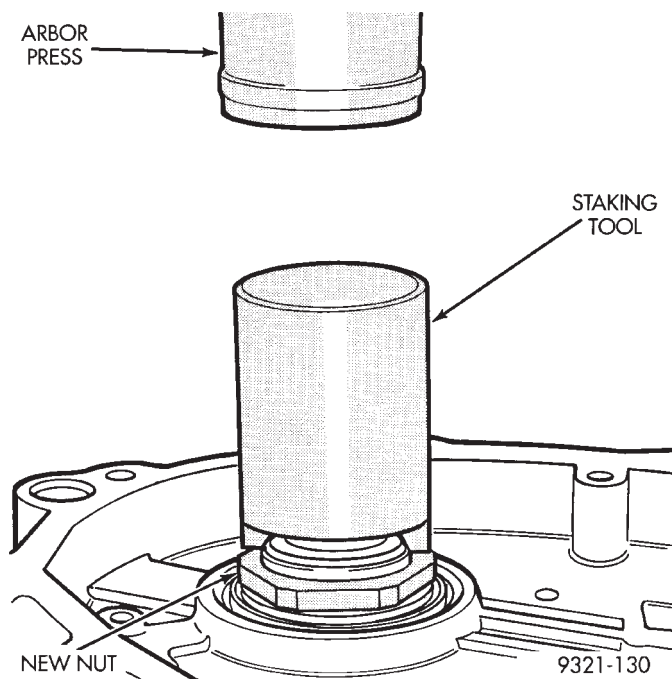


Fig. 152 Staking Output Shaft Nut

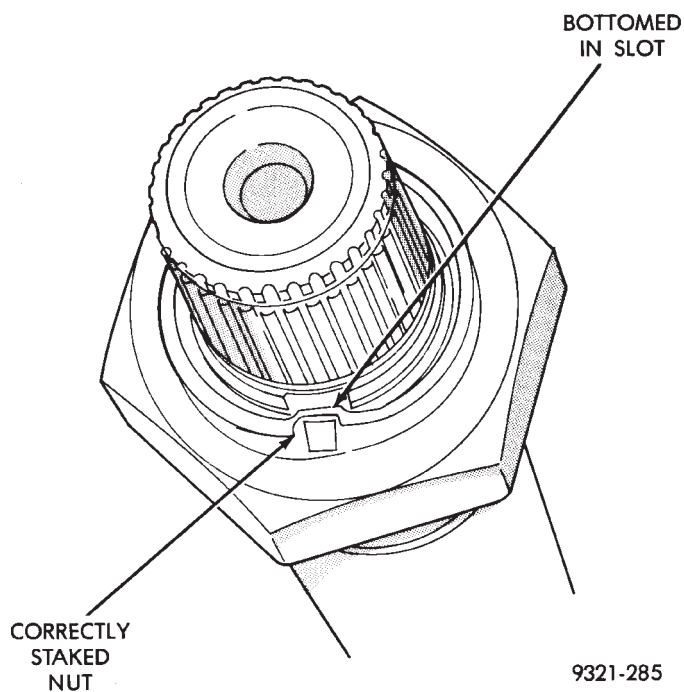


Fig. 153 Correctly Staked Nut

LOW/REVERSE CLUTCH CLEARANCE

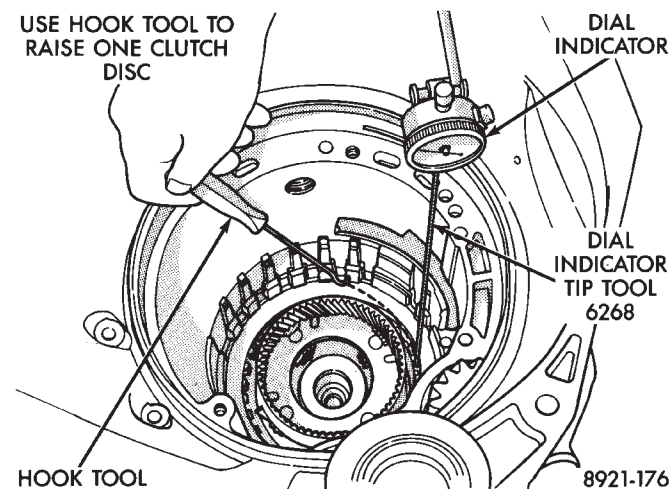


Fig. 154 Check Low/Reverse Clutch Clearance

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

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

THICKNESS
6.92 mm (.273 in.)
6.66 mm (.262 in.)
6.40 mm (.252 in.)
6.14 mm (.242 in.)
5.88 mm (.232 in.)
5.62 mm (.221 in.)
5.36 mm (.211 in.)

9121-4

LOW/REVERSE REACTION PLATE CHART

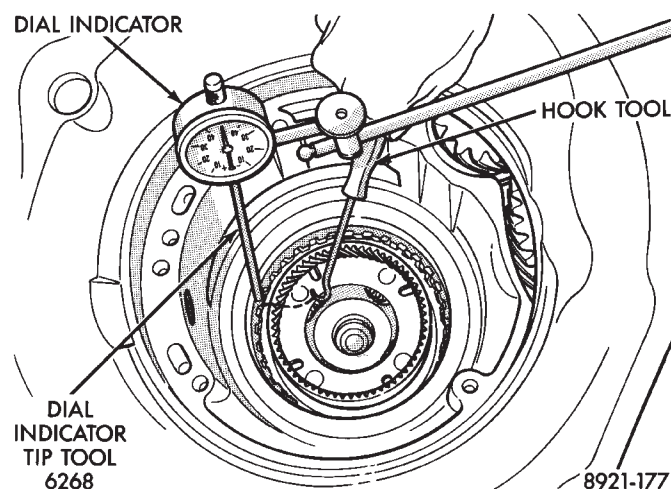


Fig. 155 Check 2/4 Clutch Clearance

DISASSEMBLY AND ASSEMBLY (Continued)

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

INPUT CLUTCHES-RECONDITION

DISASSEMBLY

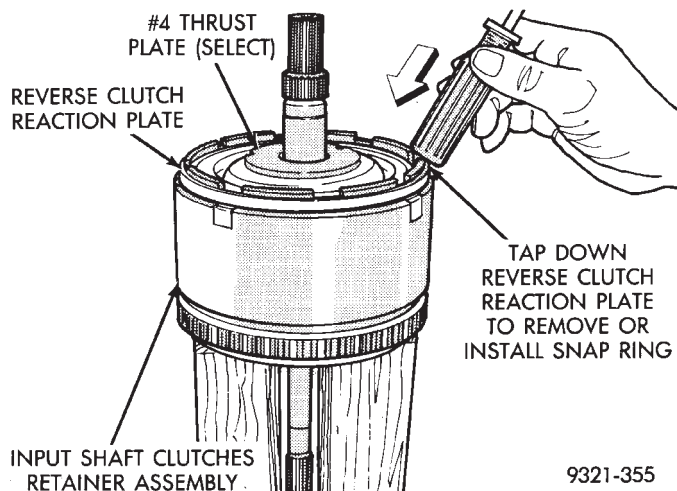


Fig. 156 Tapping Reaction Plate

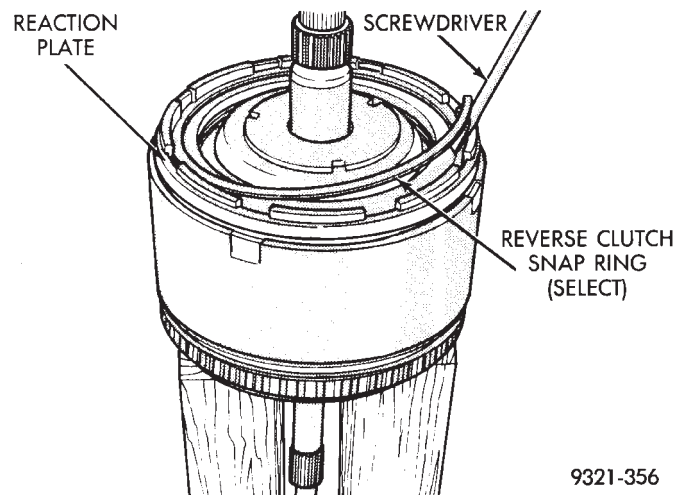


Fig. 157 Reverse Clutch Snap Ring

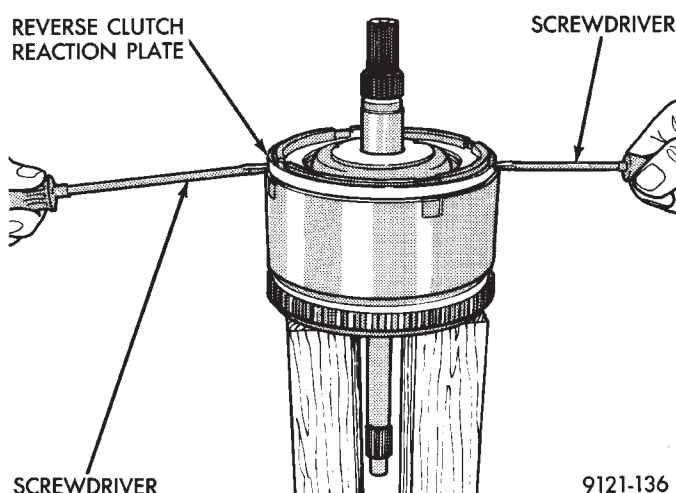


Fig. 158 Pry Reverse Clutch Reaction Plate

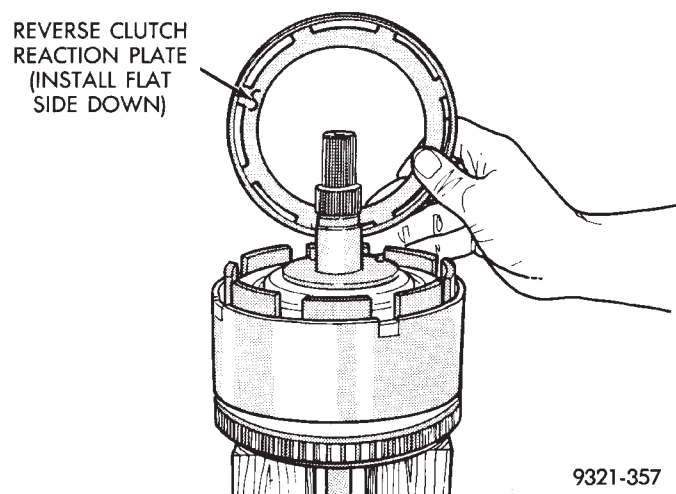


Fig. 159 Reverse Clutch Reaction Plate

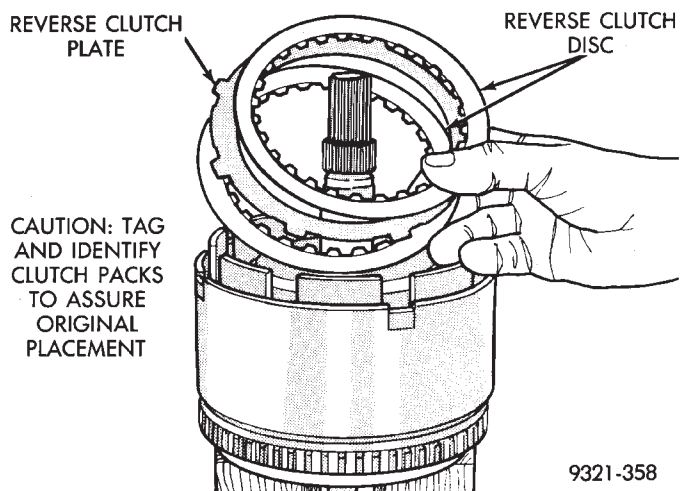


Fig. 160 Reverse Clutch Pack

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: Tag reverse clutch pack for reassembly identification.

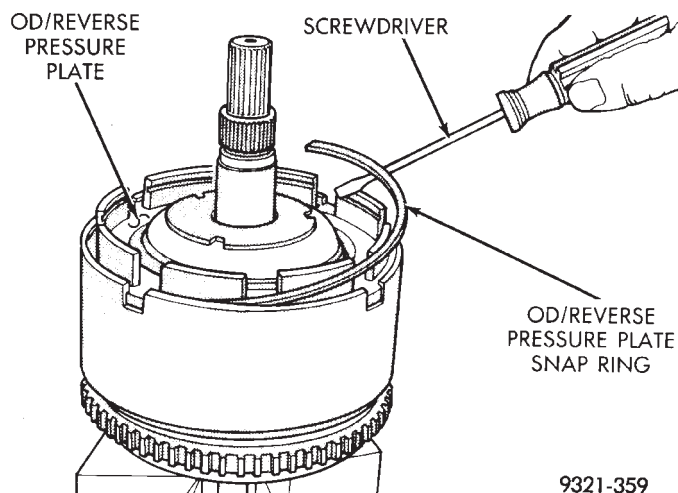


Fig. 161 OD/Reverse Pressure Plate Snap Ring

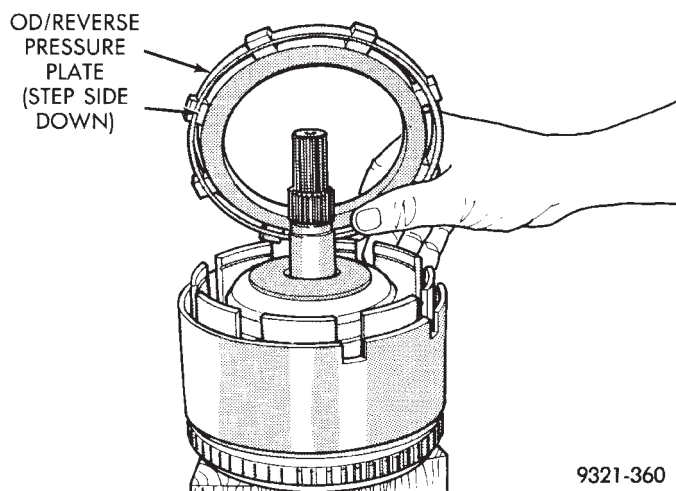


Fig. 162 OD/Reverse Pressure Plate

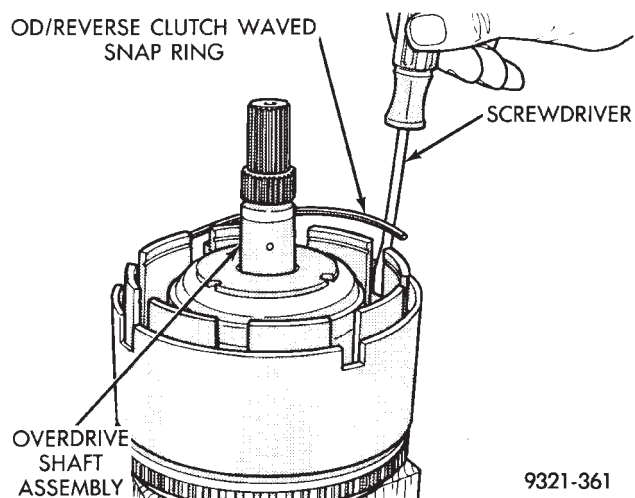


Fig. 163 Waved Snap Ring

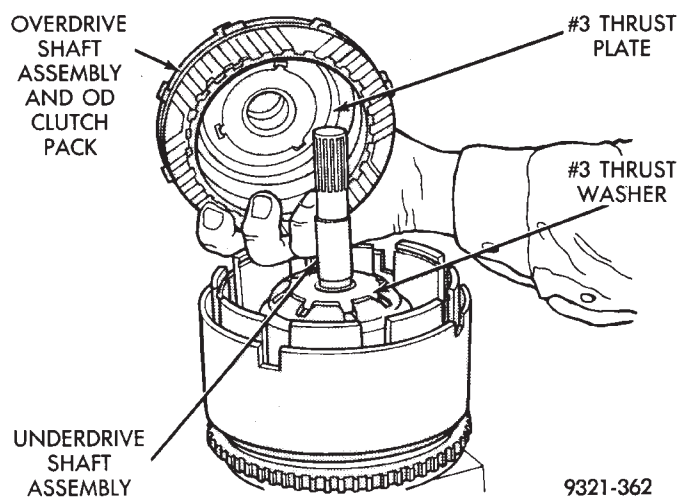


Fig. 164 Remove OD Clutch Pack

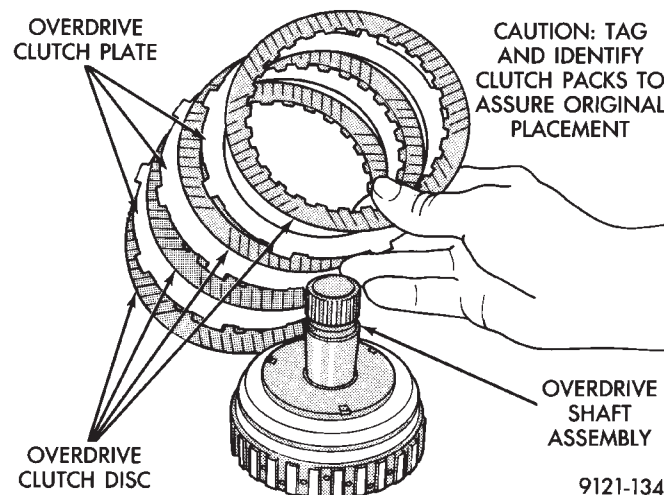


Fig. 165 Overdrive Clutch Pack

NOTE: Tag overdrive clutch pack for reassembly identification.

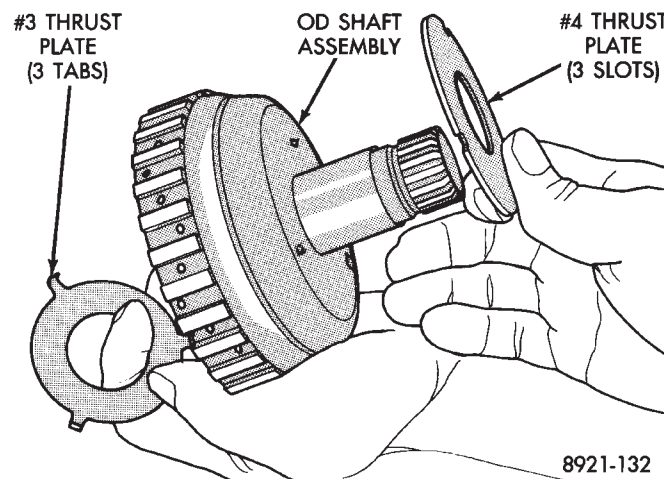


Fig. 166 Overdrive Shaft Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

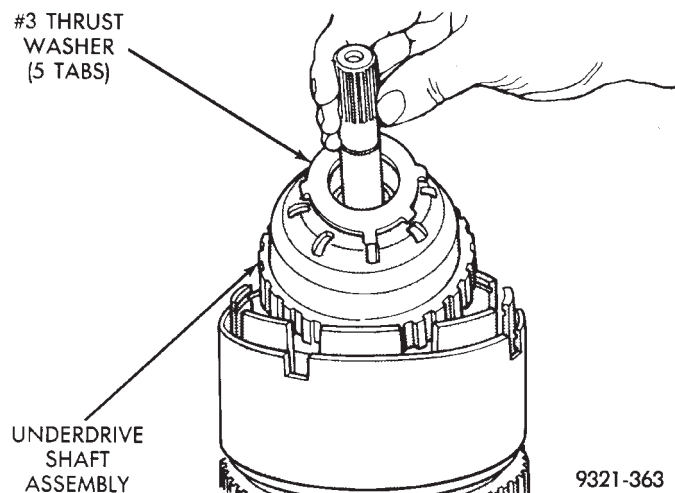


Fig. 167 Underdrive Shaft Assembly

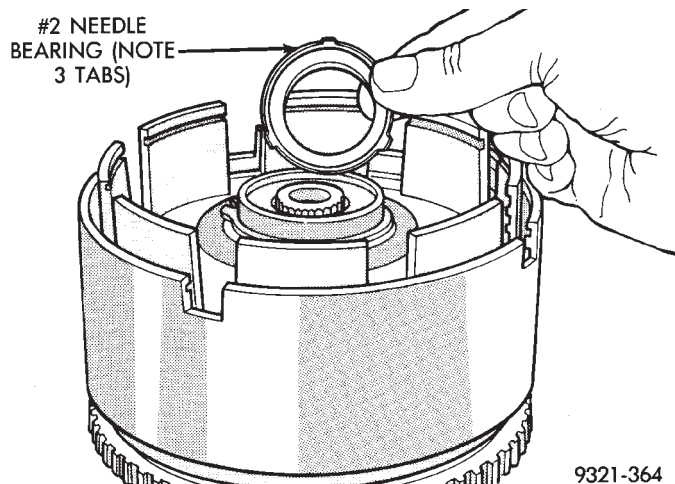


Fig. 168 No. 2 Needle Bearing

NOTE: The OD/UD Reaction Plate, Snap Rings, and Input Clutches Retainer is not interchangeable with previous year 42LE components. The snap rings are thicker and the position of the ring lands have changed.

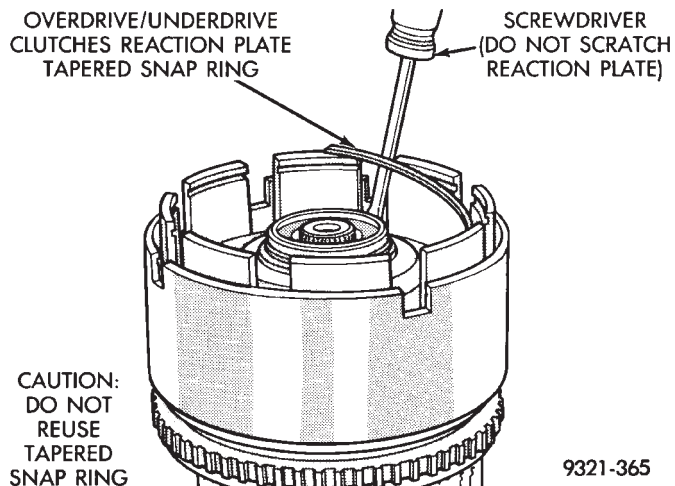


Fig. 169 OD/UD Reaction Plate Tapered Snap Ring

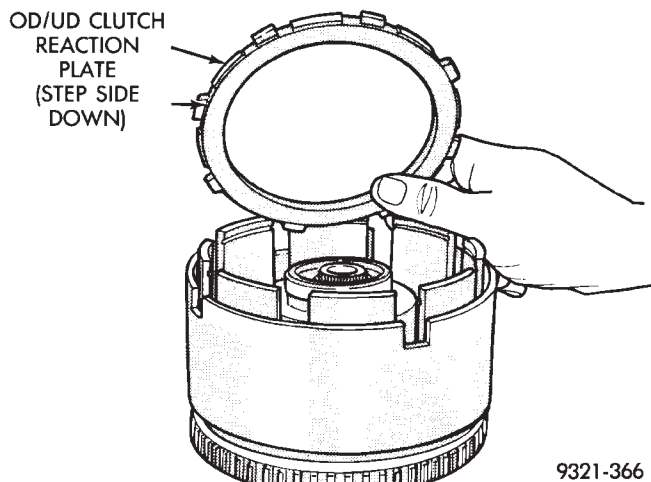


Fig. 170 OD/UD Reaction Plate

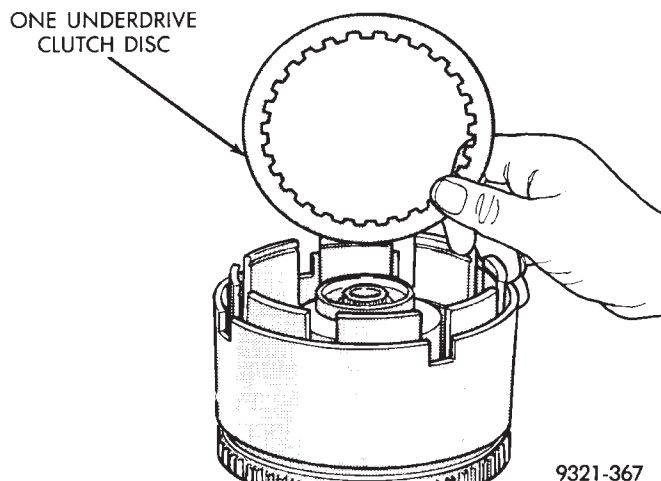


Fig. 171 Remove One UD Clutch Disc

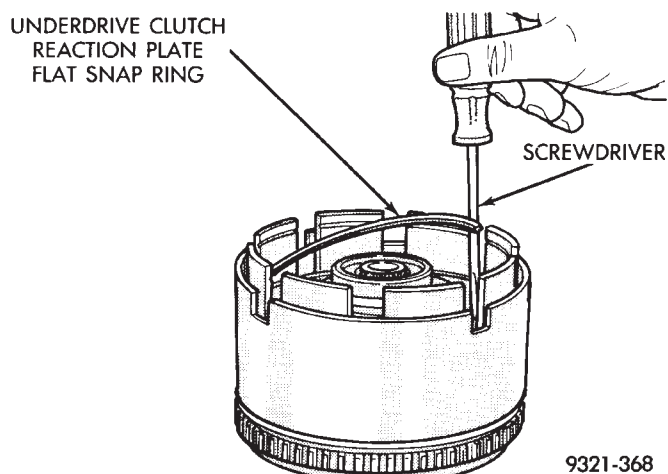


Fig. 172 UD Clutch Flat Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

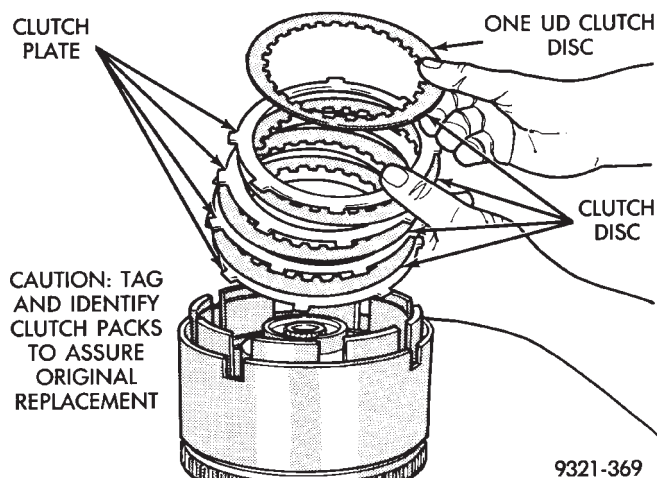


Fig. 173 Underdrive Clutch Pack

NOTE: Tag underdrive clutch pack for reassembly identification.

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

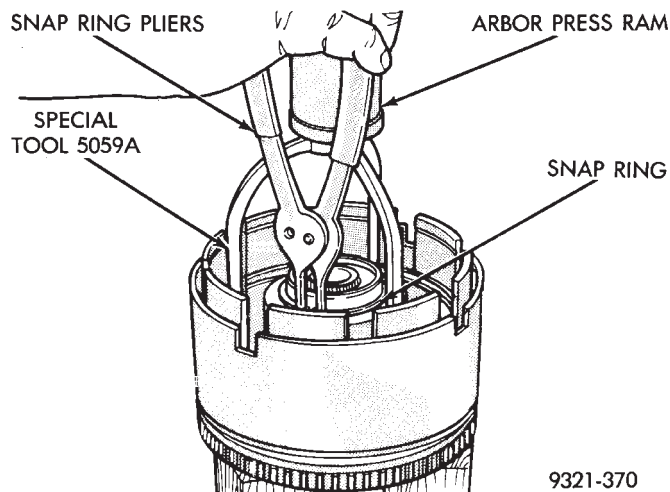


Fig. 174 UD Spring Retainer Snap Ring

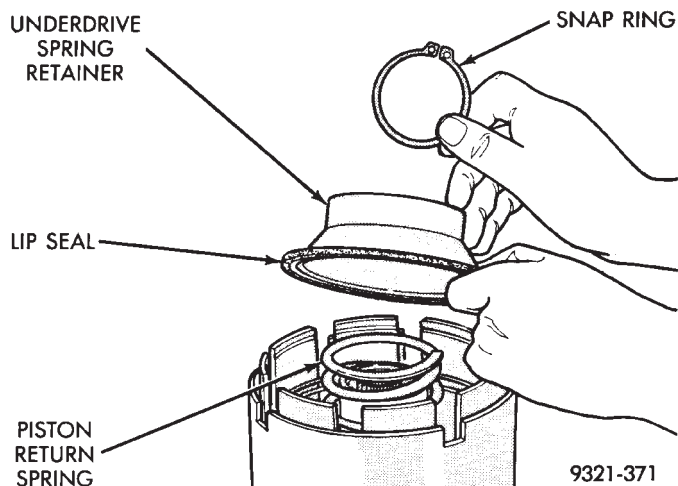


Fig. 175 UD Return Spring and Retainer

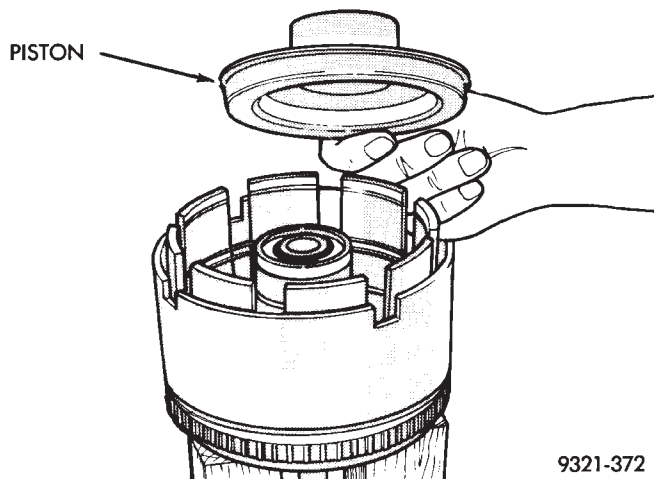


Fig. 176 Underdrive Clutch Piston

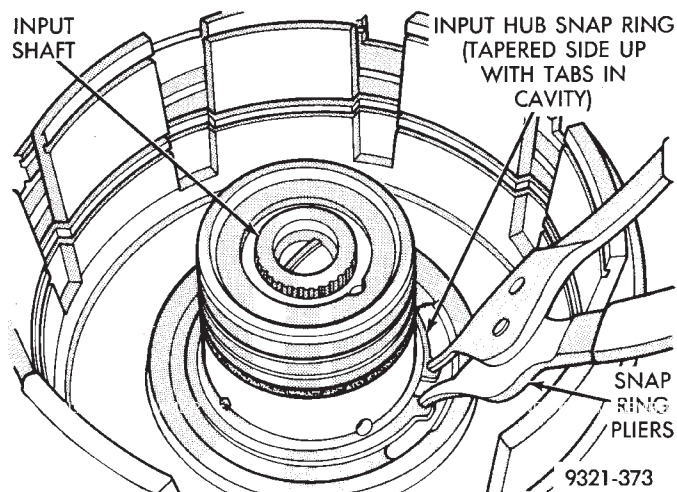


Fig. 177 Input Hub Tapered Snap Ring

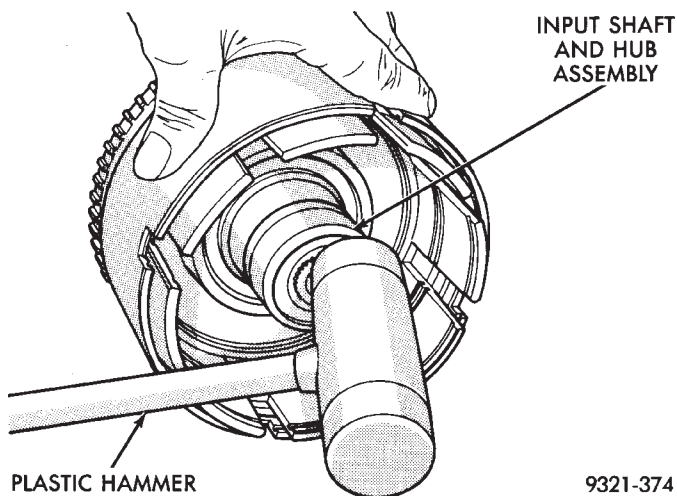


Fig. 178 Tap on Input Hub

DISASSEMBLY AND ASSEMBLY (Continued)

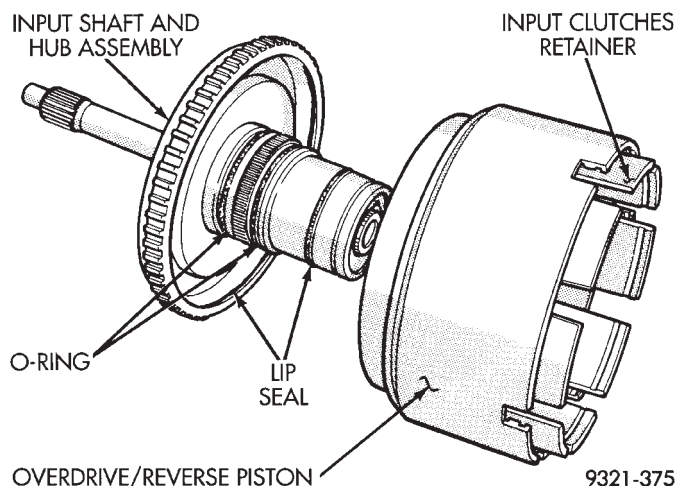


Fig. 179 Input Hub Removed

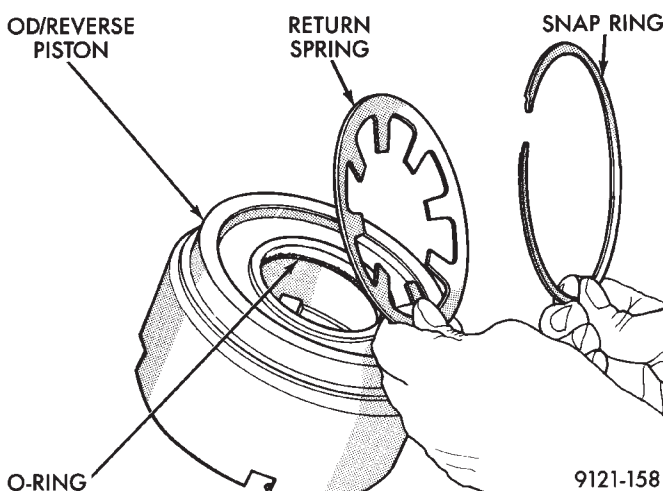


Fig. 182 Snap Ring and Return Spring

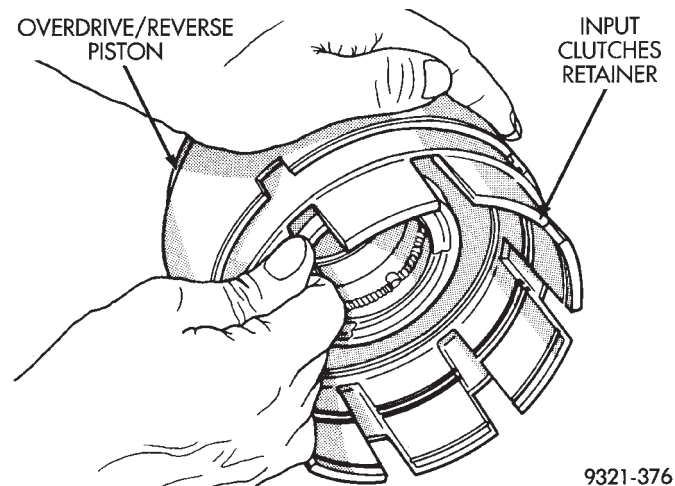


Fig. 180 Pull Retainer from Piston

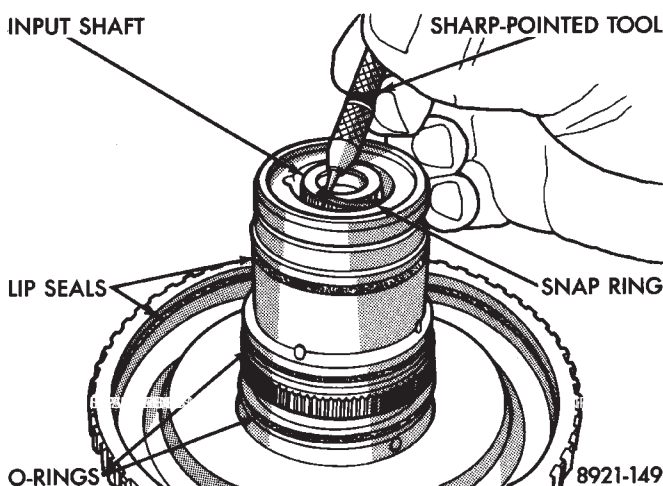


Fig. 183 Remove Input Shaft Snap Ring

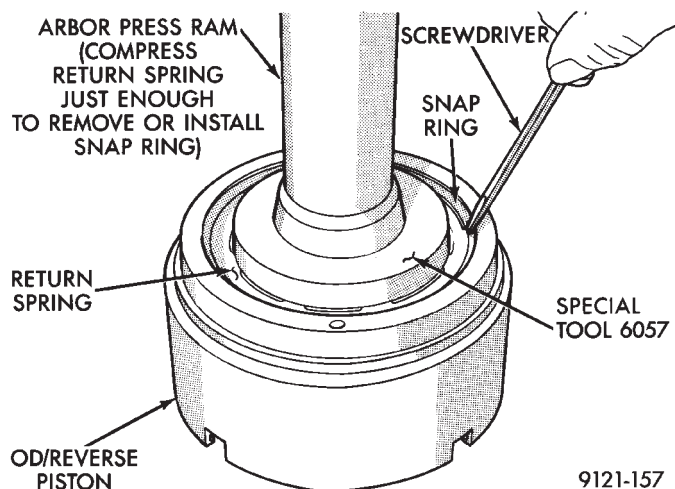


Fig. 181 Install Snap Ring

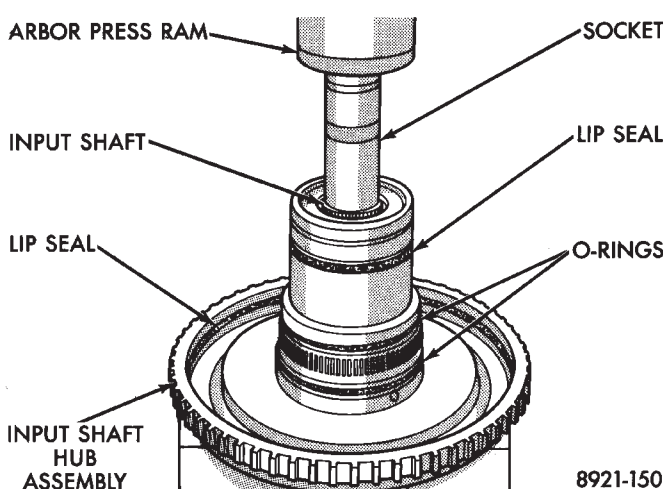


Fig. 184 Remove Input Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLY

Use petrolatum on all seals to ease assembly of components.

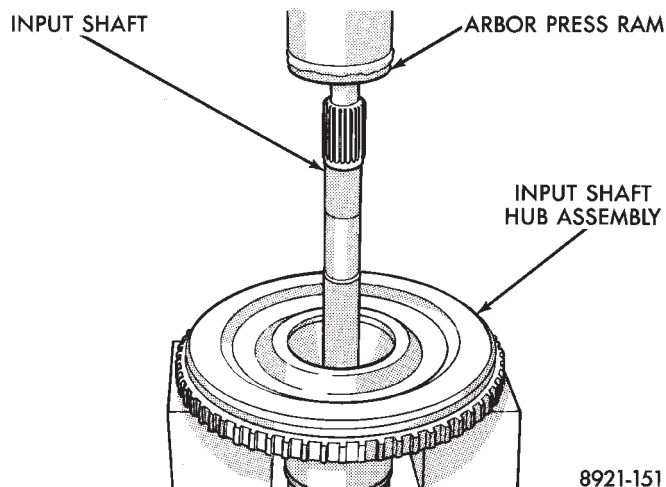


Fig. 185 Install Input Shaft

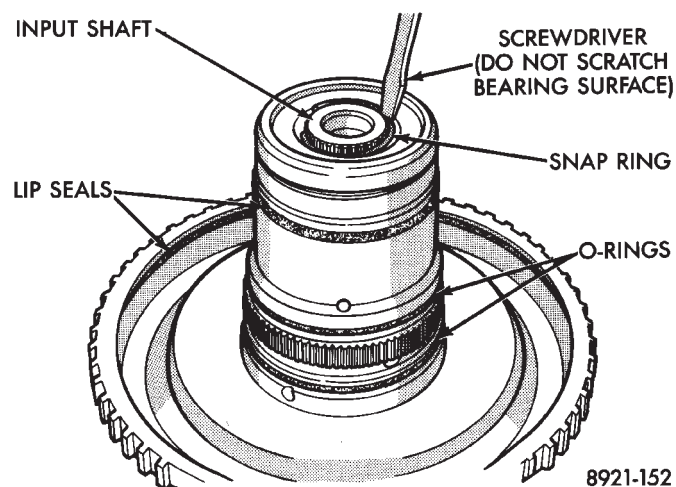


Fig. 186 Install Input Shaft Snap Ring

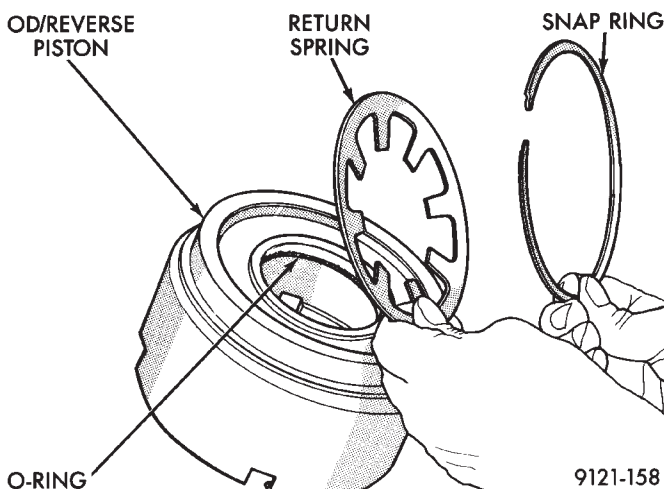


Fig. 187 Return Spring and Snap Ring

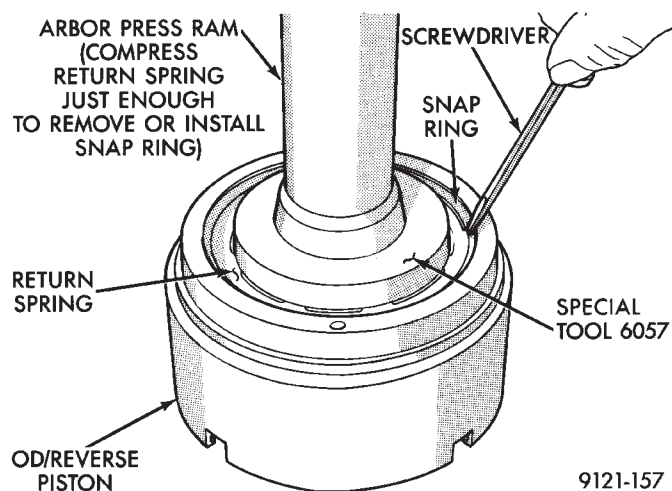


Fig. 188 Install Snap Ring

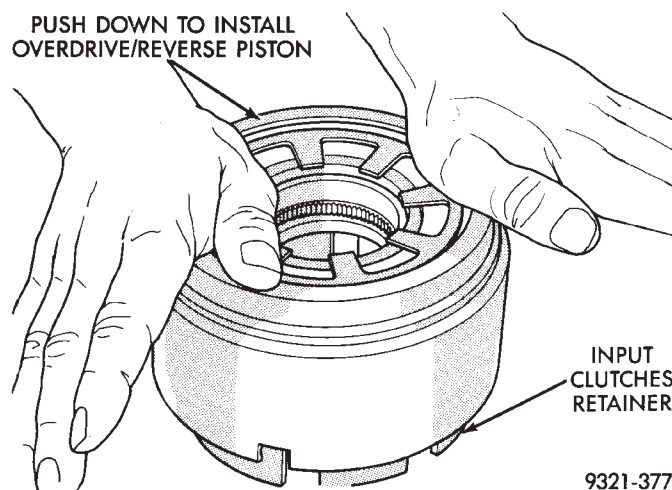


Fig. 189 Install OD/Reverse Piston

DISASSEMBLY AND ASSEMBLY (Continued)

NOTE: The OD/UD Reaction Plate, Snap Rings, and Input Clutches Retainer is not interchangeable with previous year 42LE components. The snap rings are thicker and the position of the ring lands have changed.

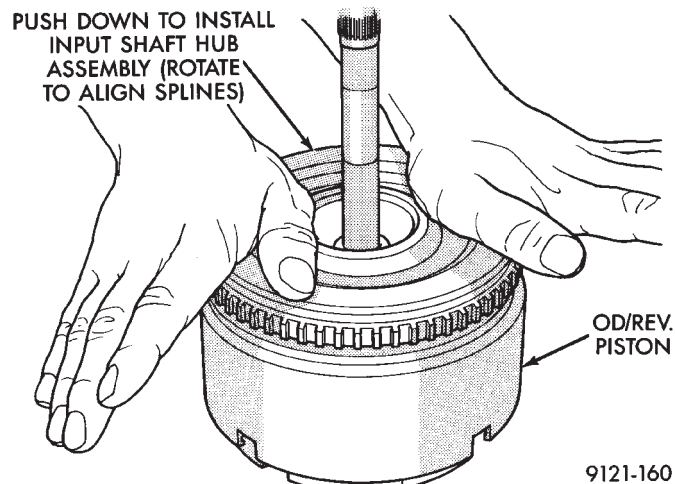


Fig. 190 Install Input Shaft Hub Assembly

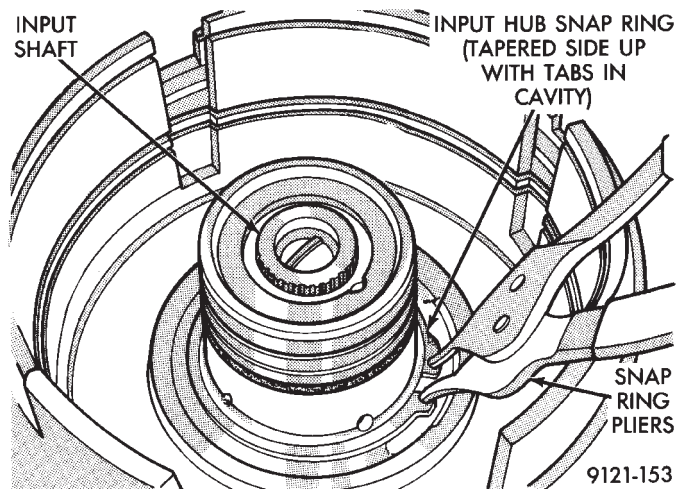


Fig. 191 Input Hub Tapered Snap Ring

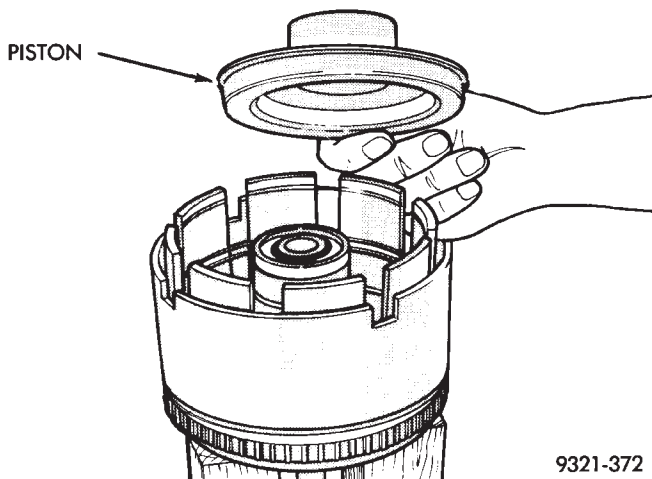


Fig. 192 Underdrive Clutch Piston

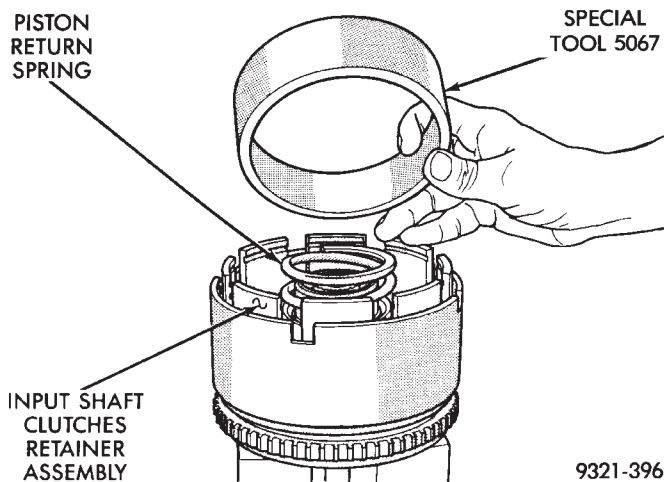


Fig. 193 Seal Compressor Special Tool 5067

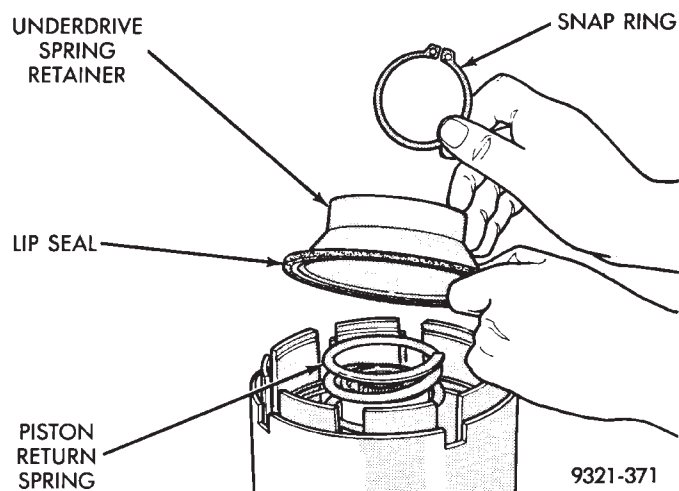
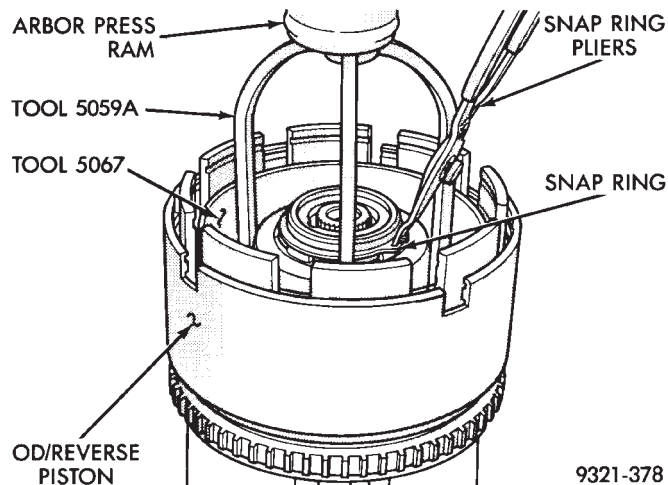


Fig. 194 UD Return Spring and Retainer

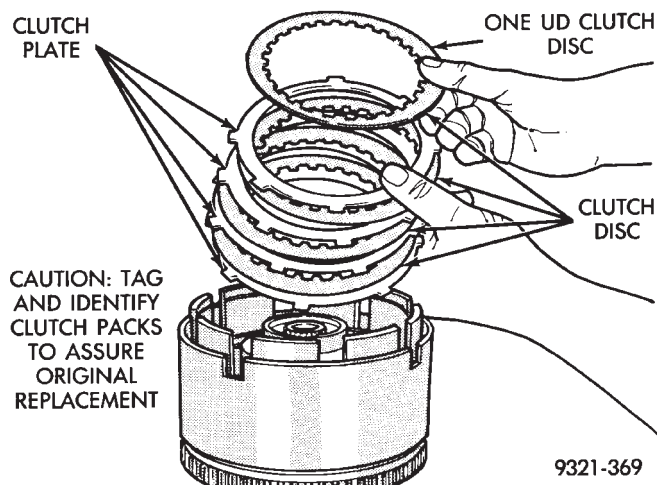
DISASSEMBLY AND ASSEMBLY (Continued)

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



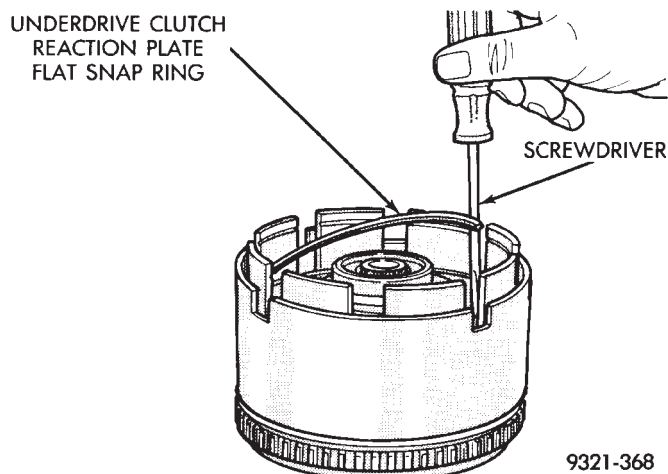
9321-378

Fig. 195 Install UD Spring Retainer and Snap Ring



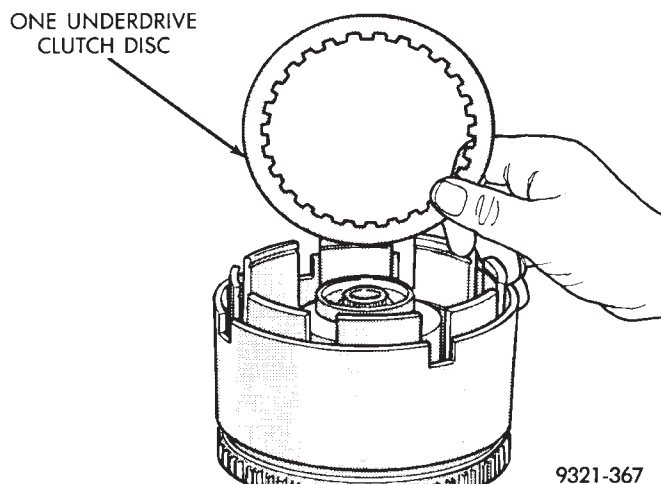
9321-369

Fig. 196 Underdrive Clutch Pack



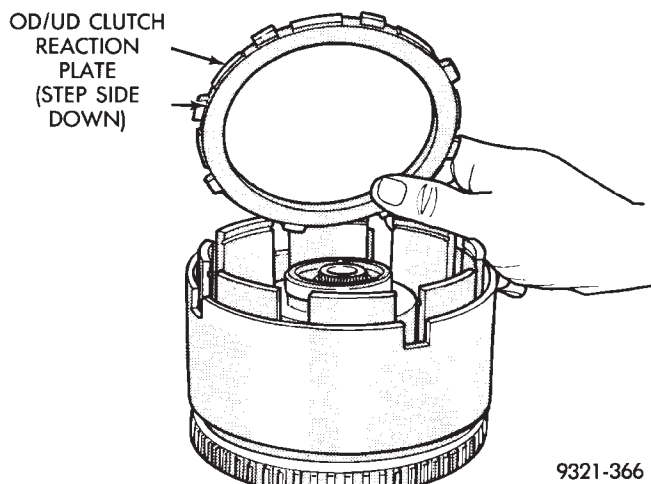
9321-368

Fig. 197 UD Clutch Flat Snap Ring



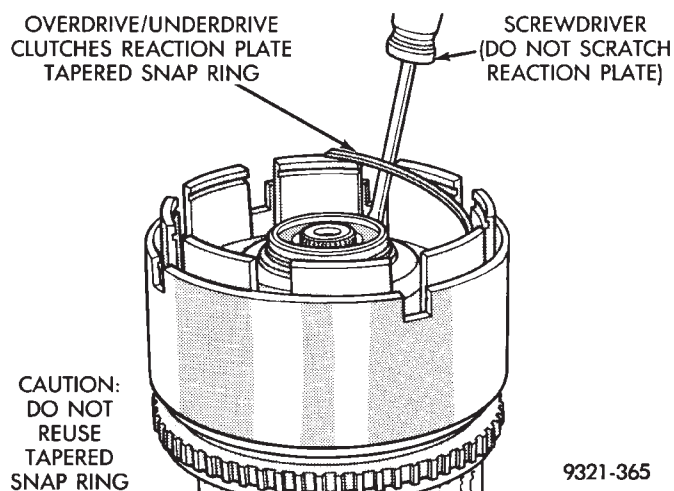
9321-367

Fig. 198 Install Last UD Clutch Disc



9321-366

Fig. 199 OD/UD Reaction Plate



9321-365

Fig. 200 Tapered Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

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

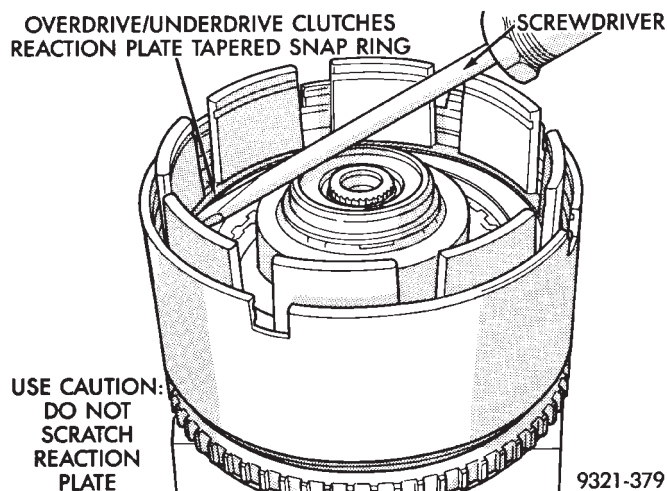


Fig. 201 Seating Tapered Snap Ring

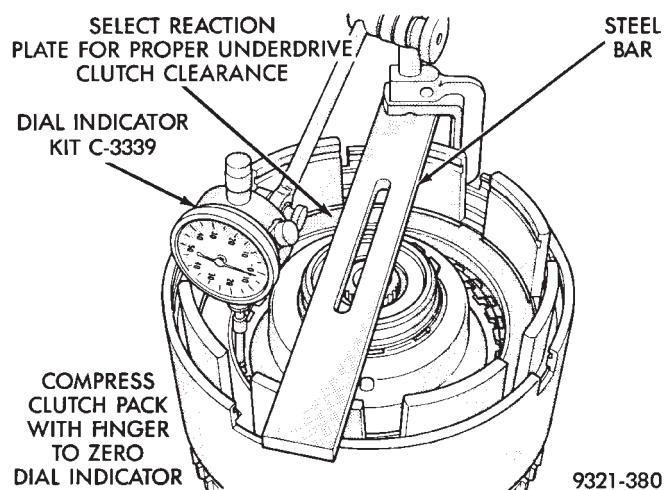


Fig. 202 Set Up Dial Indicator for Clutch Clearance

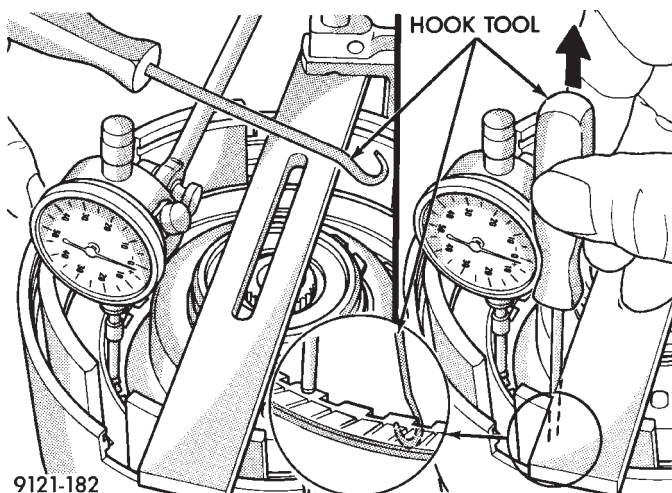


Fig. 203 Use Hook Tool to Raise One Clutch Disc

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

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

9121-5

UNDERDRIVE REACTION PLATE CHART

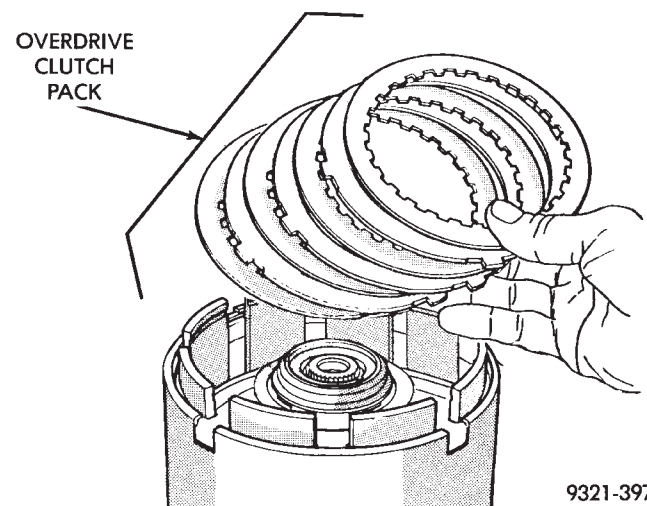


Fig. 204 Install OD Clutch Pack

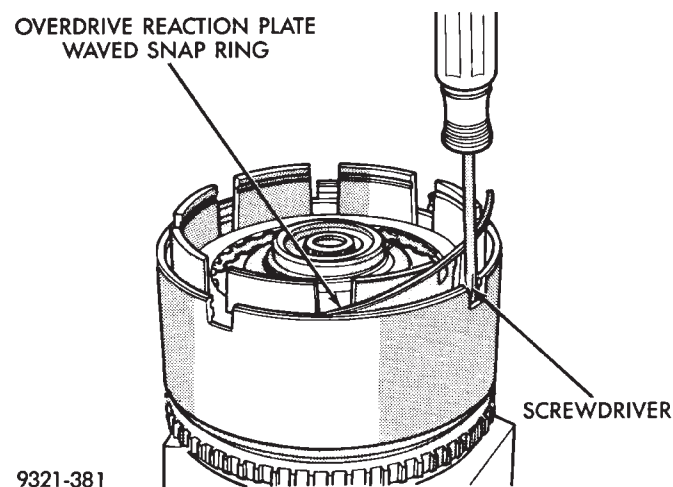


Fig. 205 Install Waved Snap Ring

DISASSEMBLY AND ASSEMBLY (Continued)

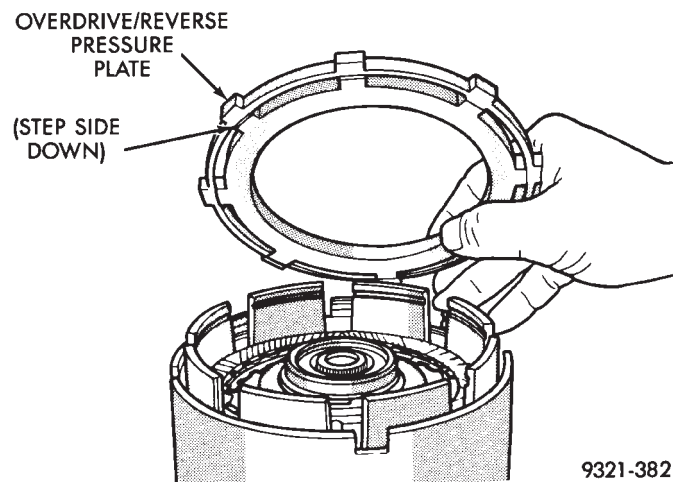


Fig. 206 OD/Reverse Pressure Plate

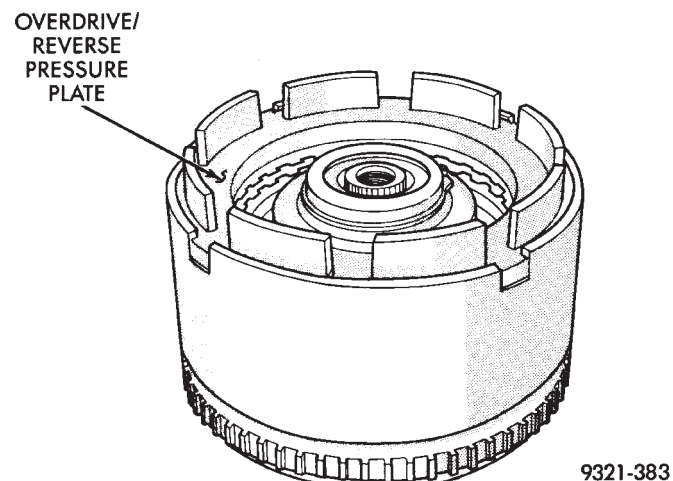


Fig. 207 Pressure Plate Installed

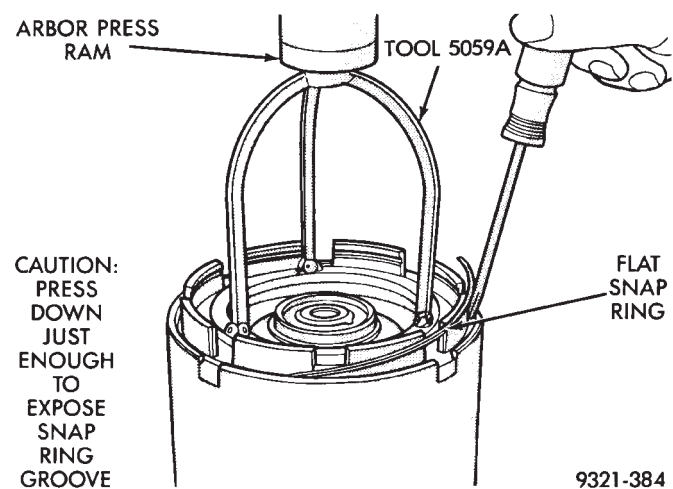


Fig. 208 Install Flat Snap Ring

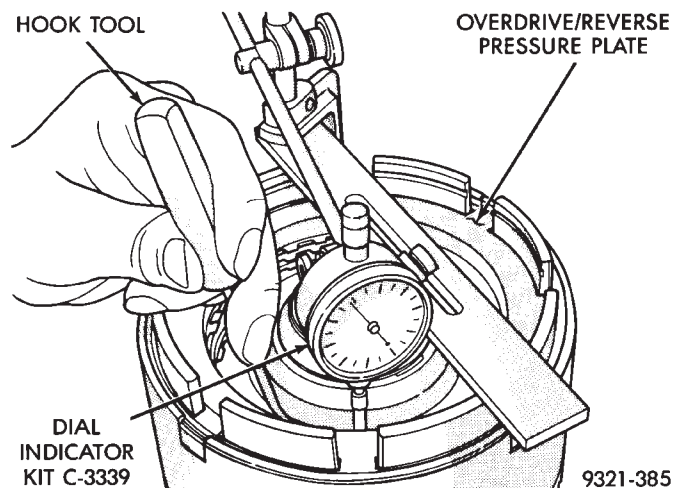


Fig. 209 Check OD Clutch Pack Clearance

The overdrive (OD) clutch pack clearance is .965 to 2.26 mm (.038 to .089 inch). If not within specifications, the clutch is not assembled properly. There is no adjustment for the OD clutch clearance.

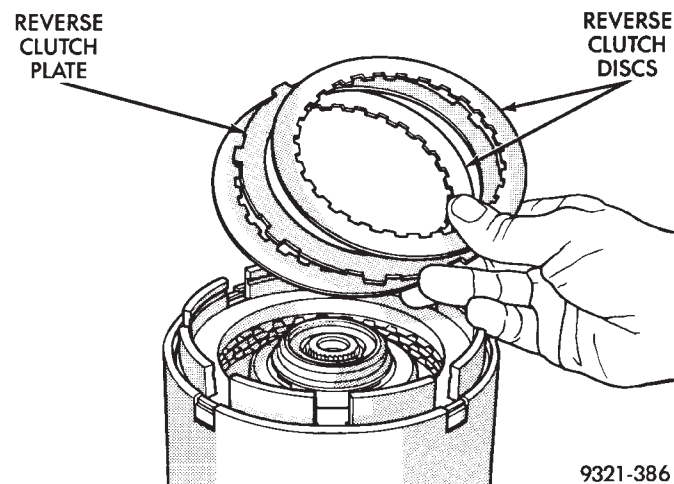


Fig. 210 Install Reverse Clutch Pack

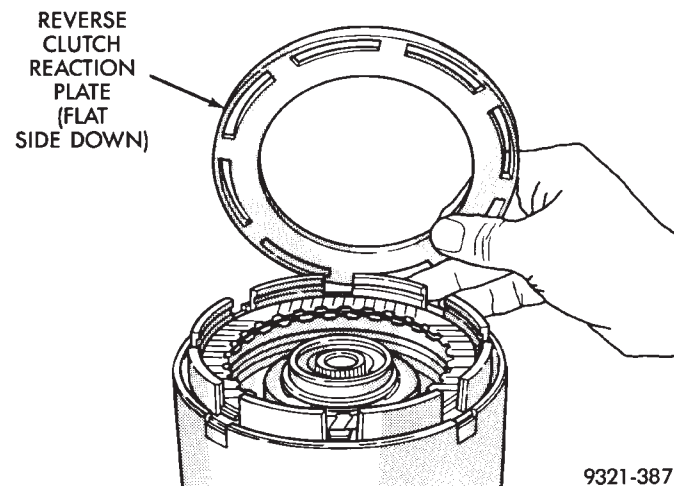


Fig. 211 Install Reaction Plate

DISASSEMBLY AND ASSEMBLY (Continued)

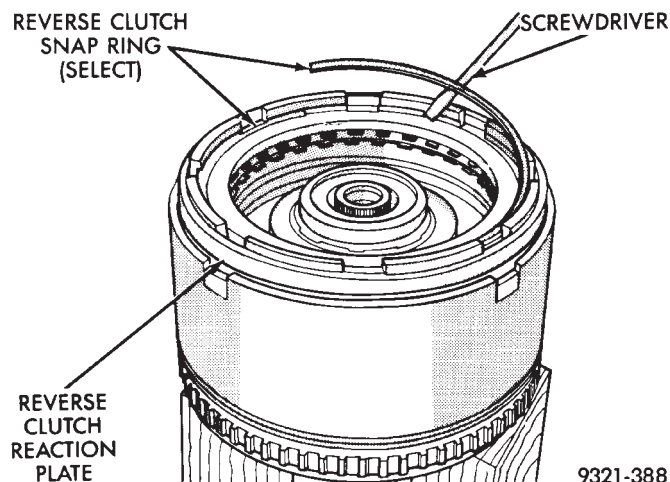


Fig. 212 Install Reverse Clutch Snap Ring

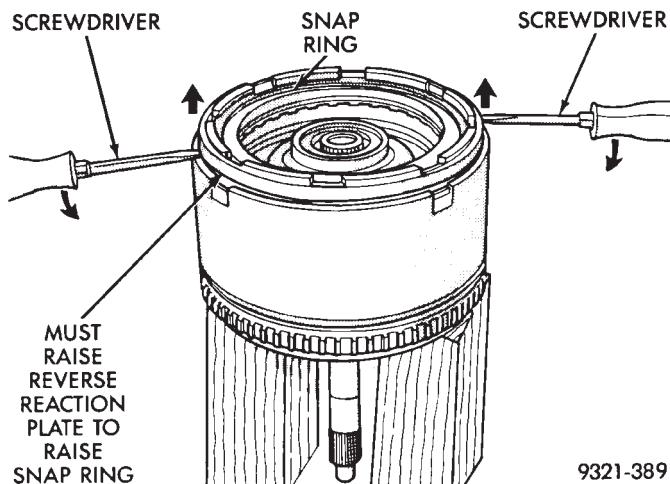


Fig. 213 Seating Snap Ring to Determine ReverseClutch Clearance

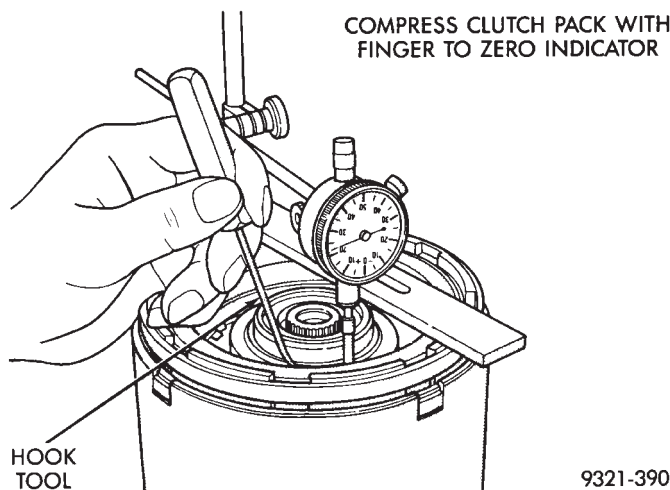


Fig. 214 Check Reverse Clutch Pack Clearance

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

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

9121-6

REVERSE CLUTCH SNAP RING CHART

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

To complete the assembly of the input clutch retainer, the reverse clutch and the overdrive clutch must be removed from the retainer.

CAUTION: Do not intermix clutch parts. Keep in exact same order.

Now proceed with the next phase of the assembly:

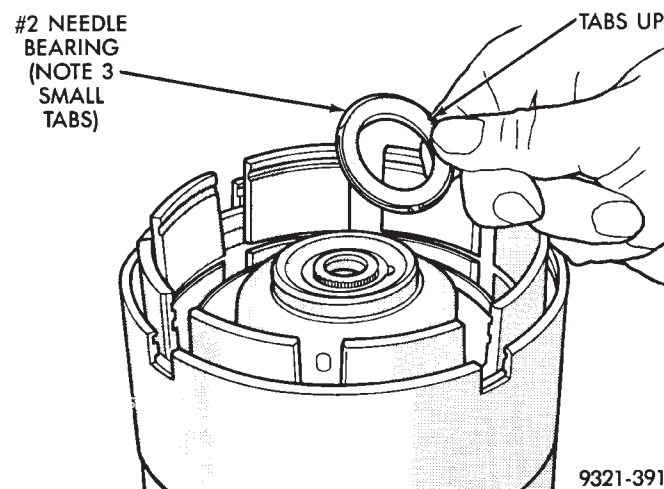


Fig. 215 Install No. 2 Needle Bearing

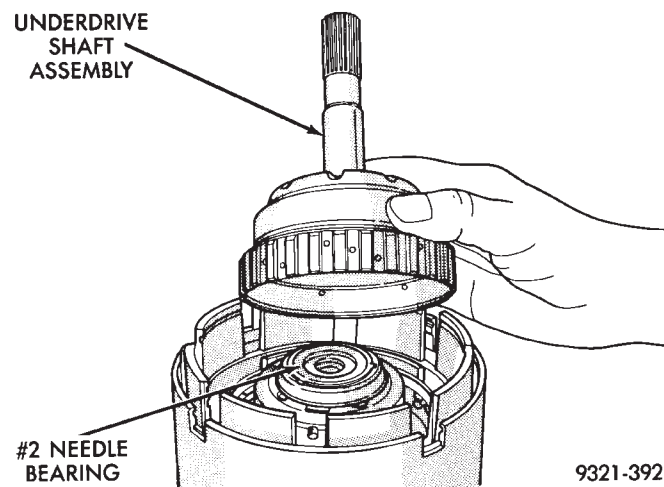


Fig. 216 Install Underdrive Shaft Assembly

DISASSEMBLY AND ASSEMBLY (Continued)

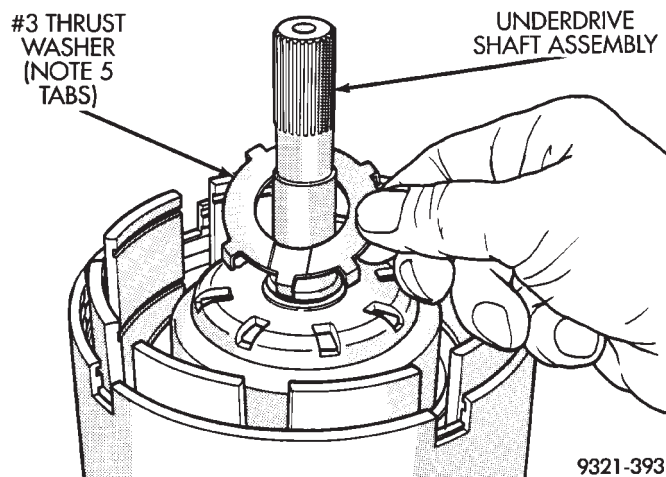


Fig. 217 Install No. 3 Thrust Washer

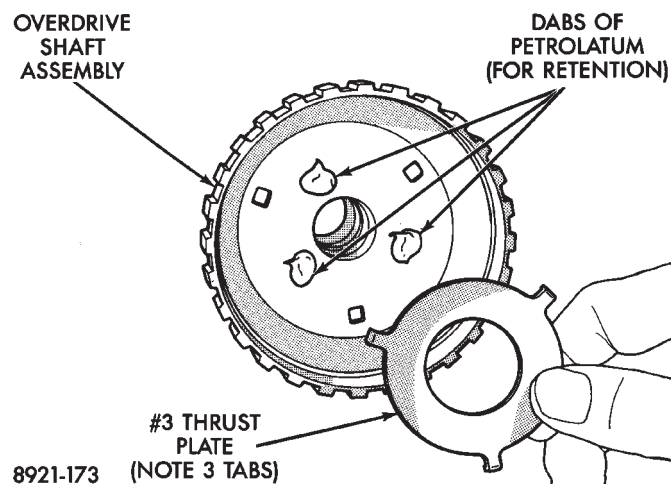


Fig. 218 Install No. 3 Thrust Plate

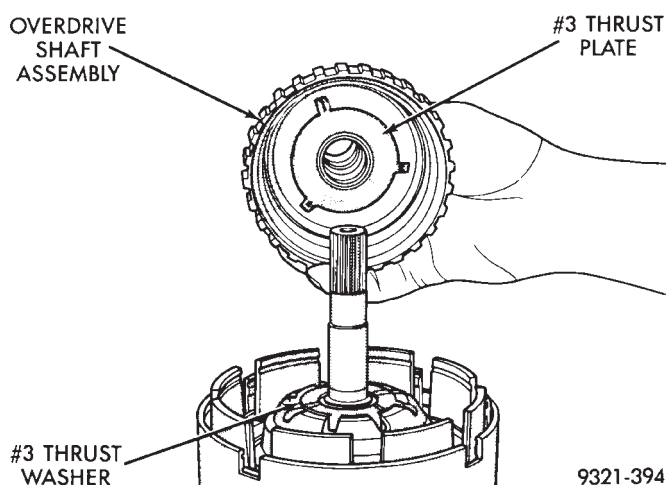


Fig. 219 Install Overdrive Shaft Assembly

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

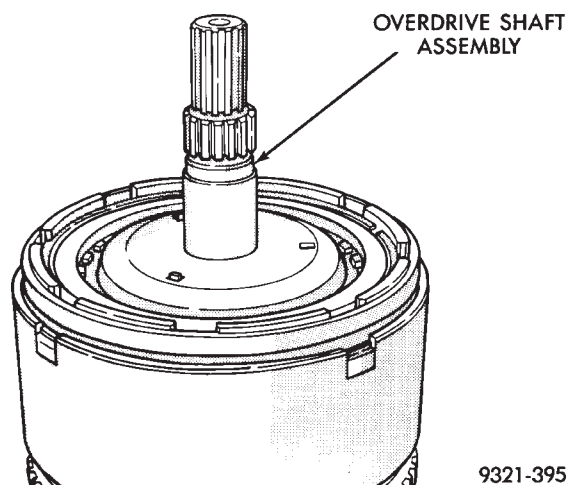


Fig. 220 Input Clutch Assembly

DETERMINING No. 4 THRUST PLATE THICKNESS (Input Shaft End Play)

The input clutch assembly must be completed prior to performing this step.

To determine the proper thickness of the No. 4 thrust plate, select the thinnest No. 4 thrust plate (Fig. 221). Using petrolatum to hold thrust plate in position, install input clutch assembly.

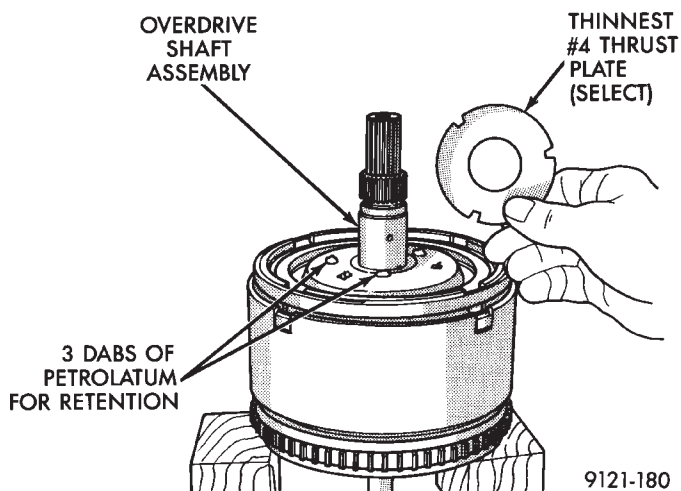


Fig. 221 Select Thinnest No. 4 Thrust Plate

DISASSEMBLY AND ASSEMBLY (Continued)

Be sure the input clutch assembly is completely seated. This can be verified by looking into the turbine speed sensor hole (Fig. 222).

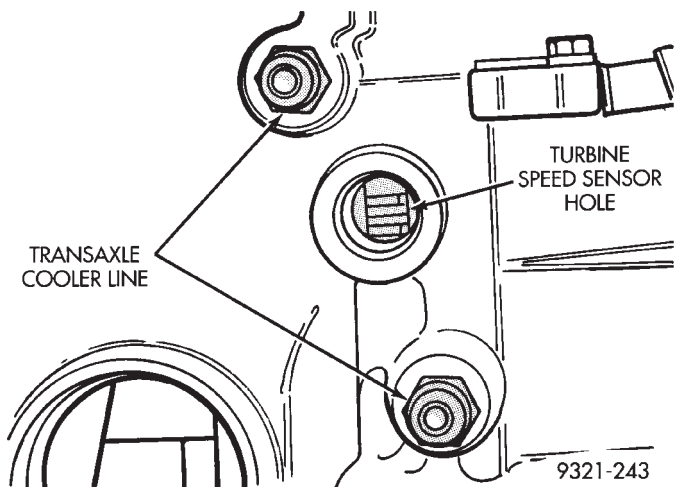


Fig. 222 View Through Turbine Speed Sensor Hole

CAUTION: If view through input speed sensor hole is not as shown in (Fig. 222), the input clutch assembly is not seated properly.

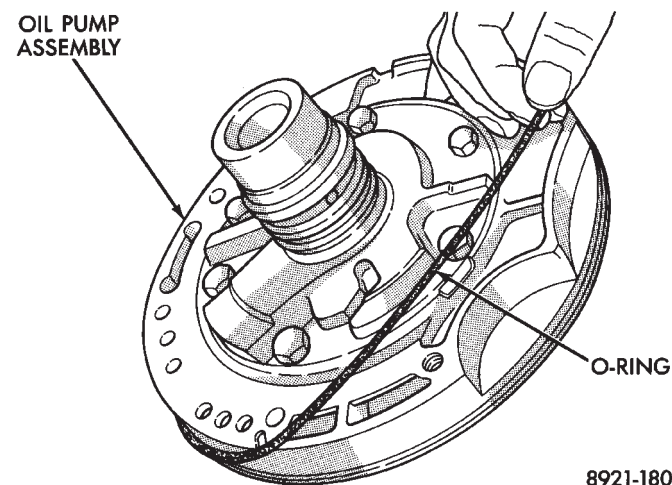


Fig. 223 Remove Oil Pump O-Ring

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

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

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

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

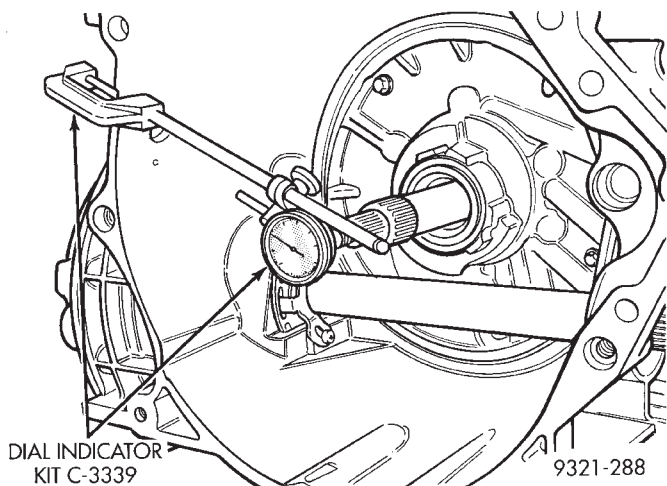


Fig. 224 Measure Input Shaft End Play

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

SHIM THICKNESS	
mm	inch
0.93–1.00	.037–.039
1.15–1.22	.045–.048
1.37–1.44	.054–.057
1.59–1.66	.063–.066
1.81–1.88	.071–.074
2.03–2.10	.080–.083
2.25–2.32	.089–.091
2.47–2.54	.097–.100
2.69–2.76	.106–.109
2.91–2.98	.114–.117
3.13–3.20	.123–.126
3.35–3.42	.132–.135

9121-3

THRUST PLATE CHART

DIFFERENTIAL RECONDITION

The valve body and solenoid wiring connector must be removed from the transaxle in order to recondition the transaxle differential. The transfer shaft cannot be removed with the valve body in place. Refer to Valve Body Recondition for removal procedure.

If any bearings in the differential require replacement, all the bearings on the differential carrier and transfer shaft must be replaced. The differential adjusters must also be replaced when differential bearings are replaced.

DISASSEMBLY AND ASSEMBLY (Continued)

DISASSEMBLY

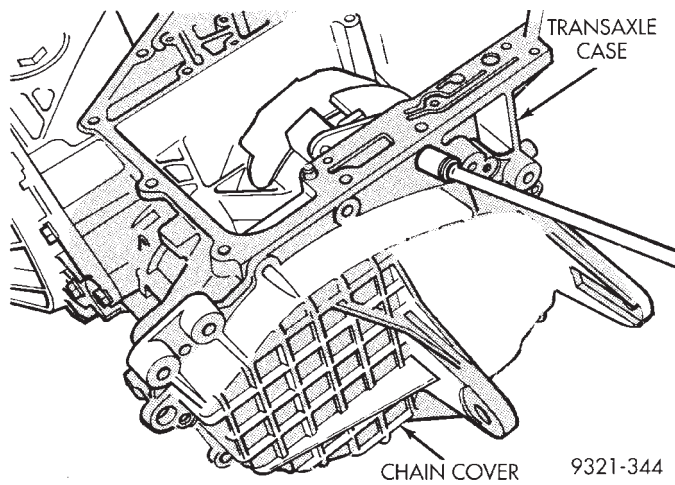


Fig. 225 Remove Chain Cover

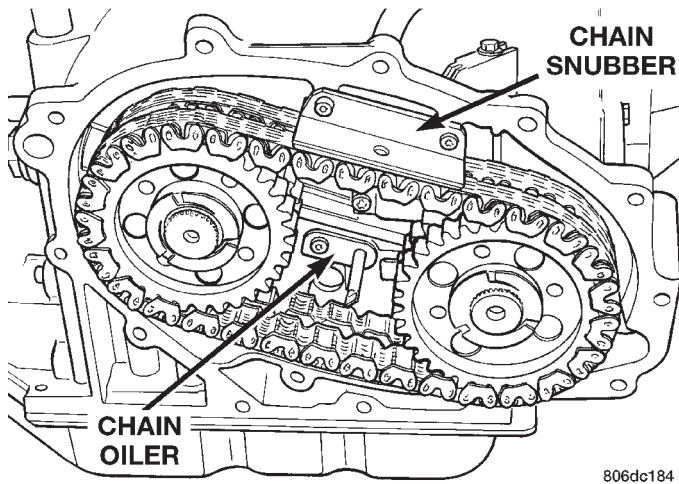


Fig. 226 Remove Chain Oiler

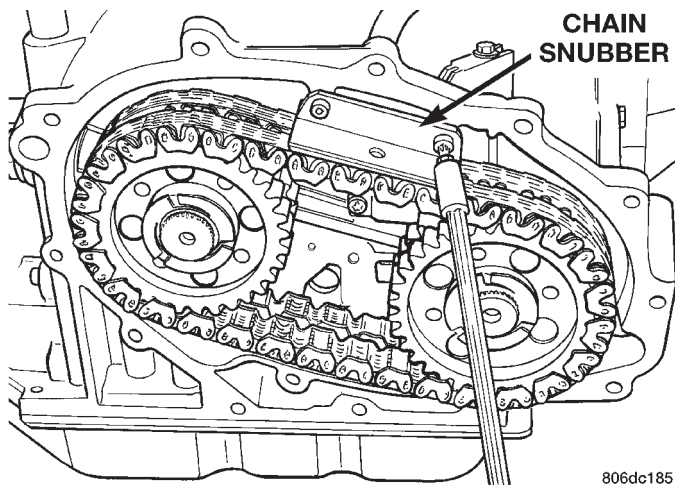


Fig. 227 Remove Chain Snubber

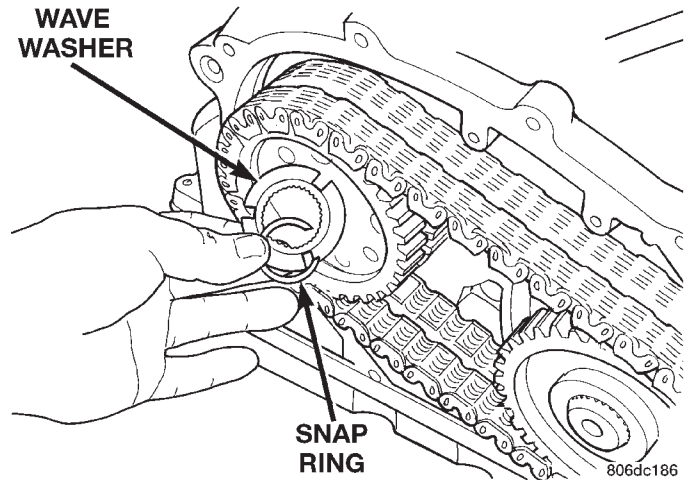


Fig. 228 Remove Output Shaft Sprocket SnapRing and Wave Washer

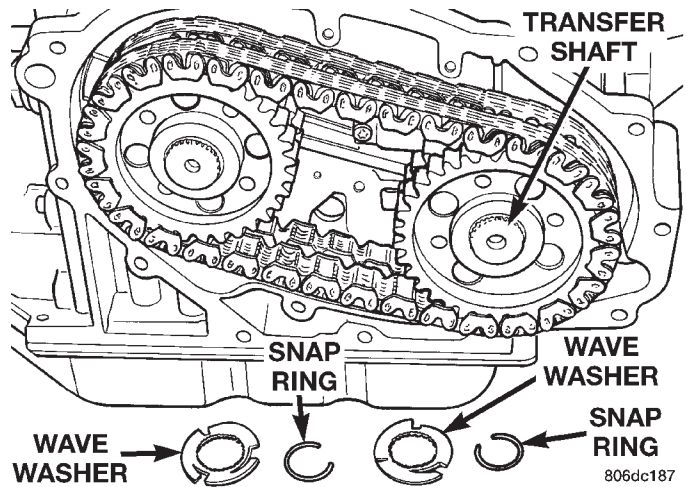


Fig. 229 Remove Transfer Shaft Sprocket SnapRing and Wave Washer

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: The chain sprockets have a slip fit onto their shafts. Apply only a slight amount of pressure to the chain spreader to release the chain pressure. If chain sprockets are not spread slightly removal or installation will be difficult. Overspreading of the chain sprocket will also make sprocket removal difficult.

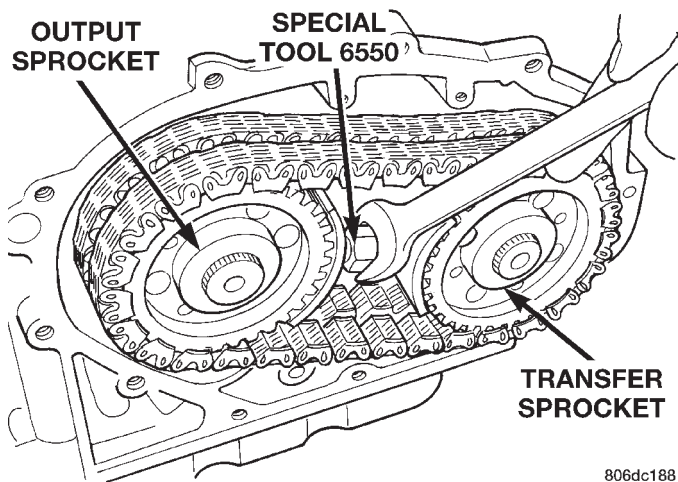


Fig. 230 Install Chain Spreader

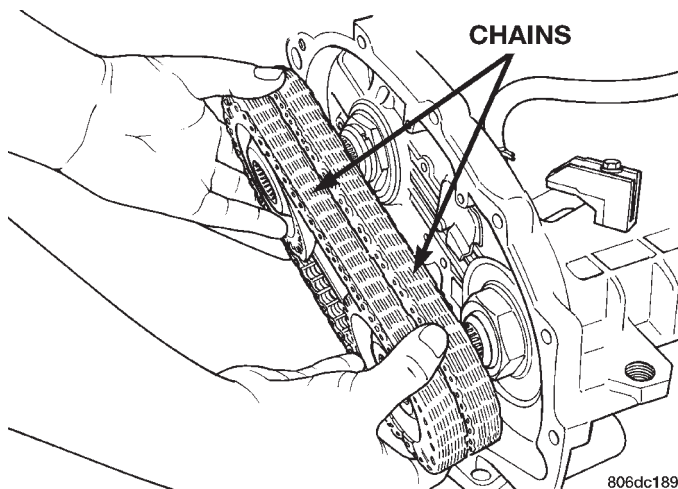


Fig. 231 Remove Chains and Sprockets as an Assembly

CAUTION: When reinstalling drive chains, the blue link must face outward.

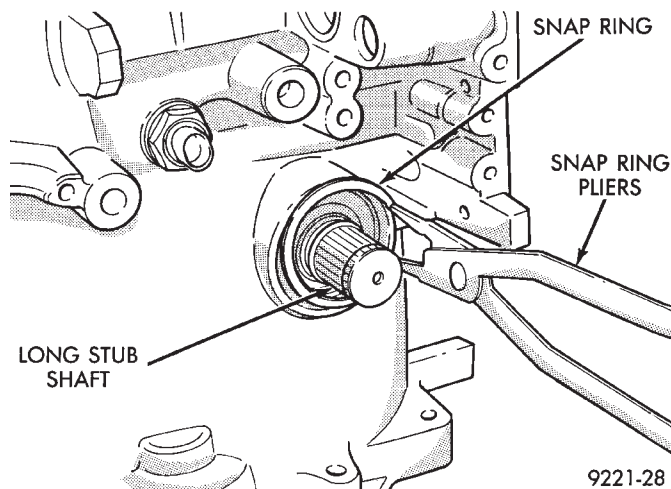


Fig. 232 Remove Long Stub Shaft Snap Ring

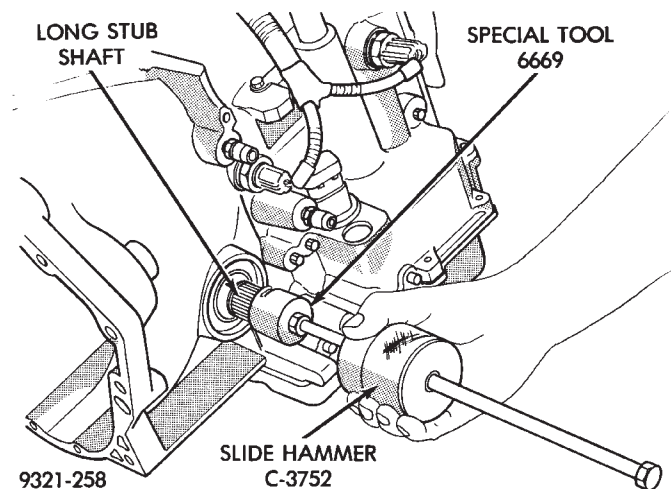


Fig. 233 Remove Long Stub Shaft

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Driveshaft retainer clips and seals located on the stub shafts must be replaced before reinstalling driveshafts.

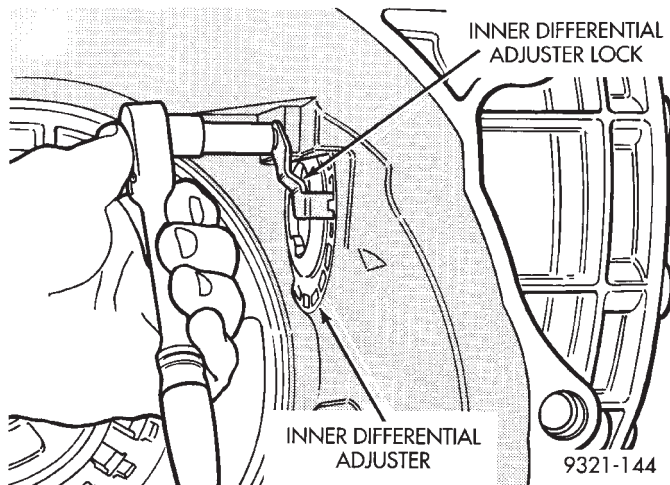


Fig. 234 Remove Inner Differential Adjuster Lock

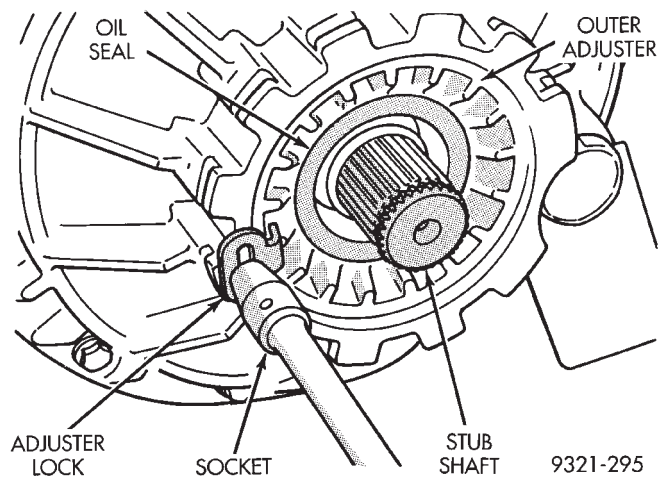


Fig. 235 Remove Outer Adjuster

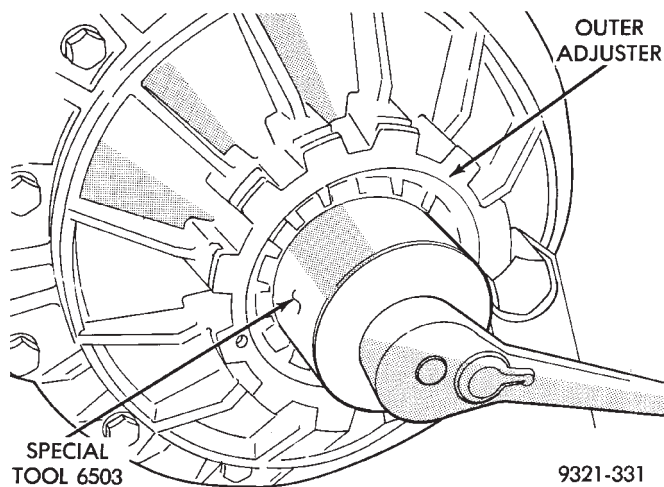


Fig. 236 Loosen Outer Adjuster

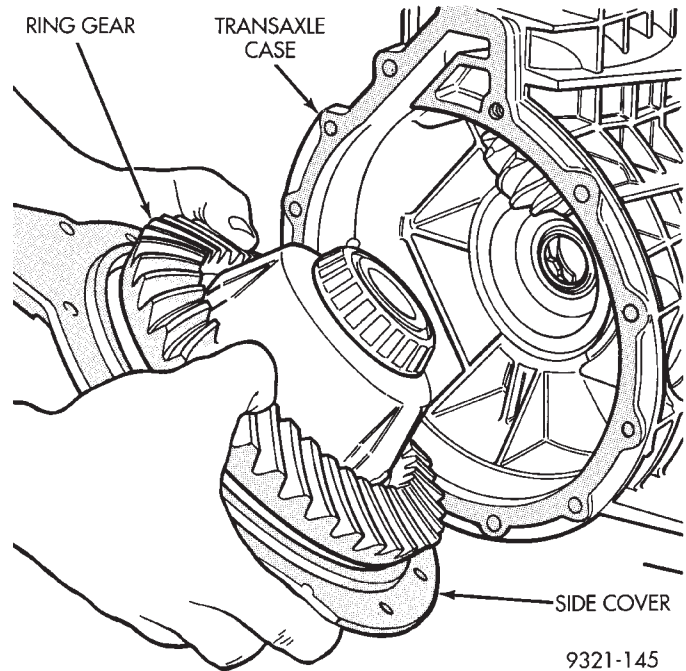


Fig. 237 Remove Differential Side Cover, Carrier and Ring Gear Assembly

If the carrier requires reconditioning, refer to Differential Carrier Recondition.

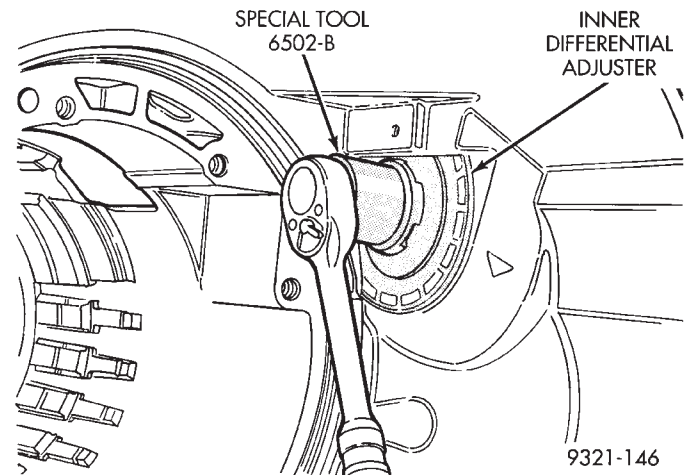


Fig. 238 Remove Inner Adjuster By Turning Clockwise

DISASSEMBLY AND ASSEMBLY (Continued)

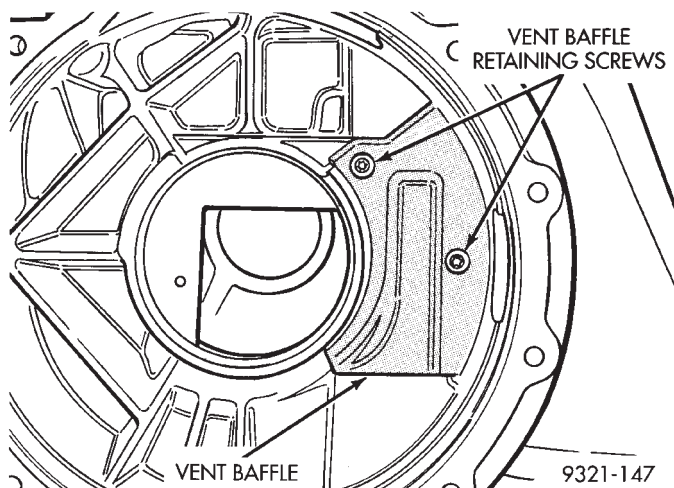


Fig. 239 Remove Differential Vent Baffle

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

WARNING: WEAR SAFETY GOGGLES WHILE GRINDING STAKE NUTS.

Using a die grinder or equivalent, grind the stakes in the shoulder of the shaft nut as shown in (Fig. 240) and (Fig. 241). Do not grind through the transfer shaft nut into the shaft. There are two stakes on the nut.

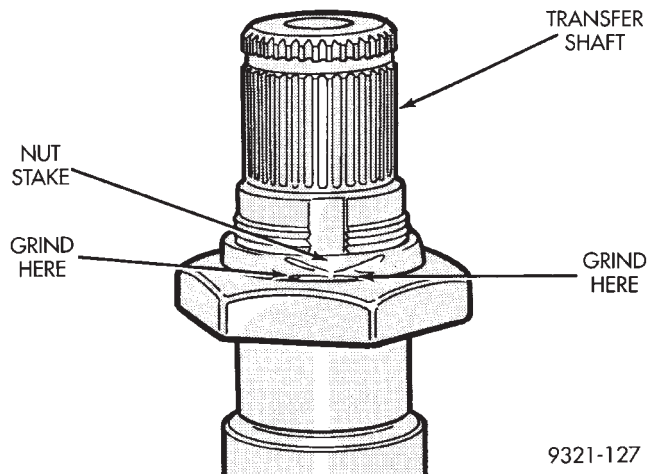


Fig. 240 Grinding Stakes

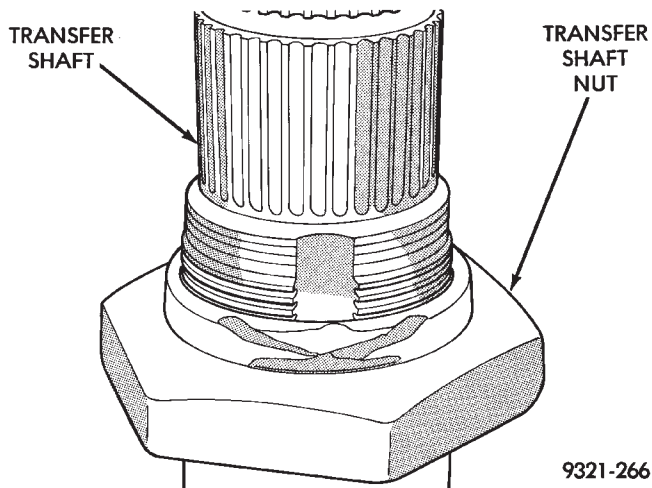


Fig. 241 Stake Grinding Pattern

Using a small chisel, carefully open stakes on nut (Fig. 242)

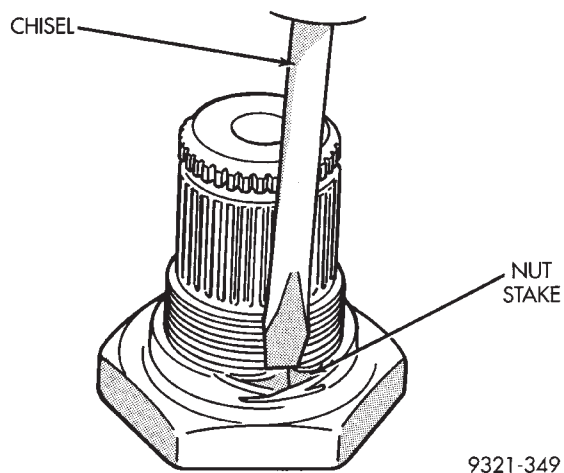


Fig. 242 Opening Nut Stakes

Remove the transfer shaft nut.

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: Do not reuse old transfer shaft nut because the removed stake weakens the nut flange.

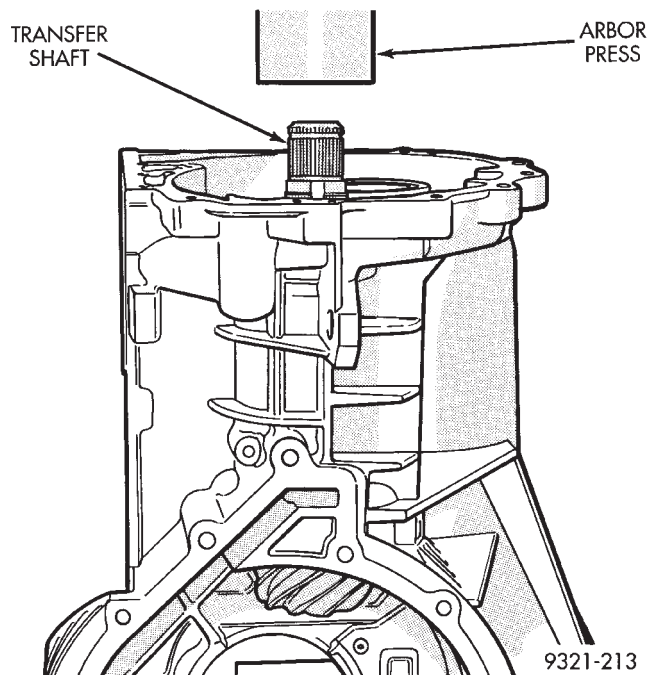


Fig. 243 Press Transfer Shaft Downward to Remove Rear Cone

CAUTION: The transfer shaft cannot be removed from the case at this time.

Install special tool 6577 to remove rear transfer bearing cup (Fig. 244).

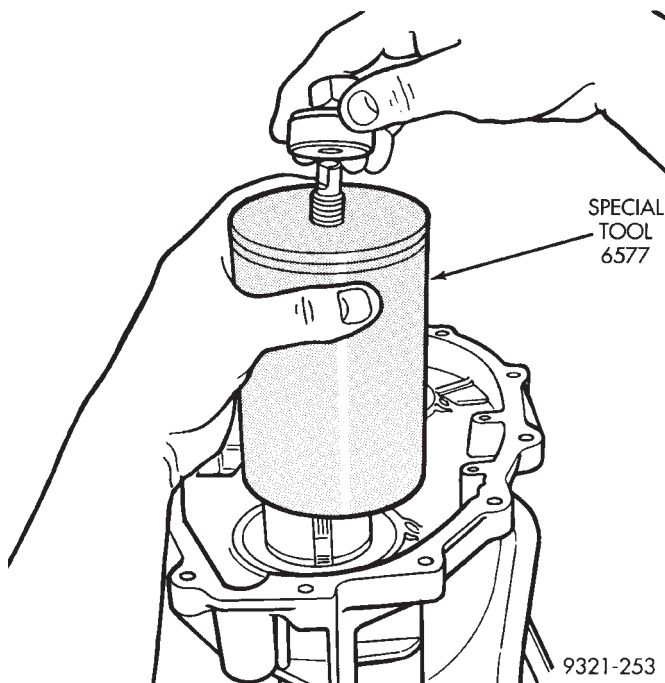


Fig. 244 Transfer Bearing Cup Removal

Remove transfer shaft preload shim (Fig. 245). If transfer shaft bearings are to be reused, the original shim must also be reused.

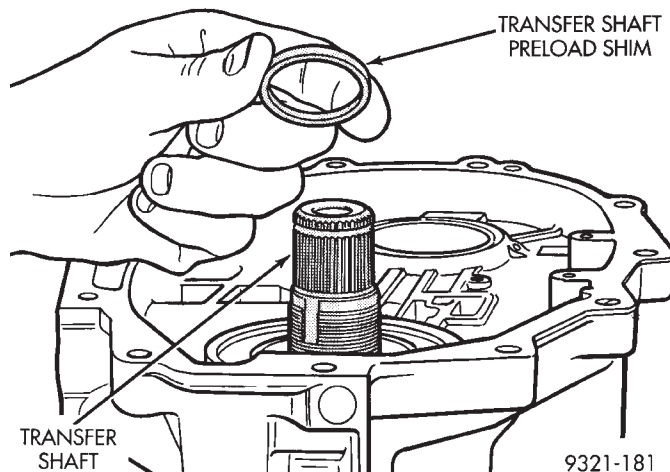


Fig. 245 Preload Shim Removal

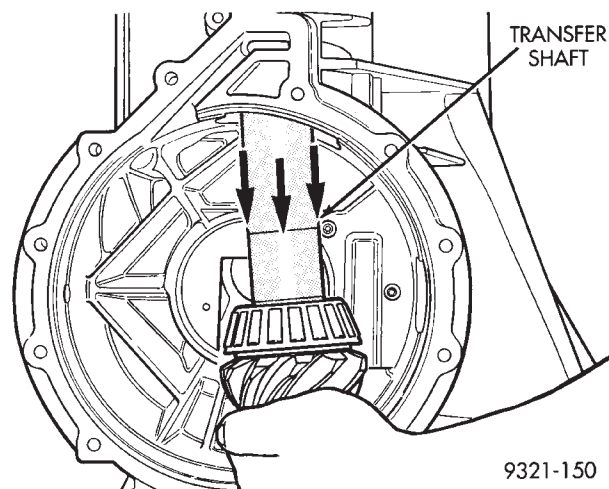


Fig. 246 Remove Transfer Shaft Assembly From Case

CAUTION: If the transfer shaft is removed from the transaxle case for any reason, both seals must be replaced.

Remove transfer shaft seals (Fig. 247) using special tool 6310 and foot 6310-9 (Tar 960). Do not reuse old seals. The seals will be pulled out the rear of the case.

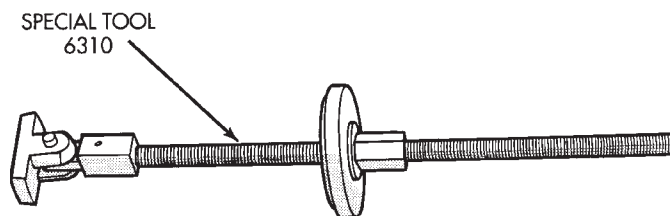


Fig. 247 Transfer Shaft Seal Remover

DISASSEMBLY AND ASSEMBLY (Continued)

Remove the front transfer shaft bearing cup using special tool 6495 and handle C-4171 (Fig. 248). Use a press with special tools to remove cup.

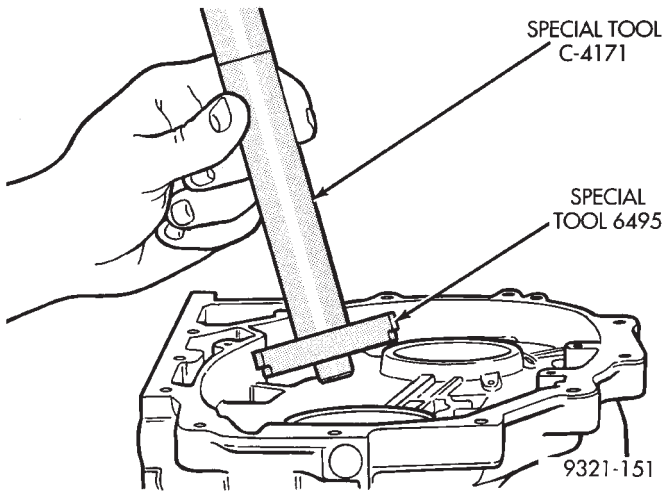


Fig. 248 Front Transfer Shaft Cup Removal

Support special tool P-334 on press table so that pinion head of transfer shaft can be pressed through table (Fig. 249).

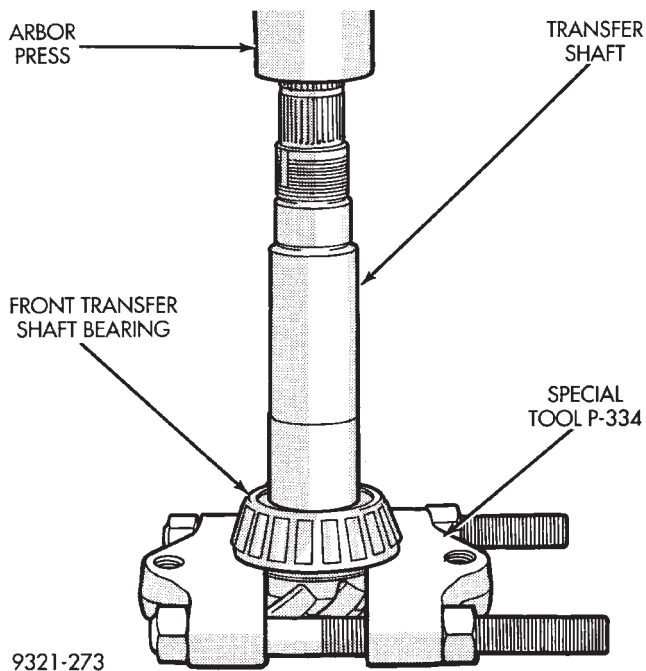


Fig. 249 Remove Front Transfer Shaft Bearing And Pinion Depth Shim

ASSEMBLE AND BEARING ADJUSTMENT PROCEDURE

The following steps will determine the correct shim thickness required to obtain proper pinion depth. All special tools described in this procedure must be used to obtain correct results.

CAUTION: Failure to adjust pinion depth correctly could cause gear noise or transaxle failure.

(1) Install front transfer shaft bearing cup (Fig. 250). The transfer shaft bearing cup must be installed before making pinion depth measurement. Use special tool 6494 to install bearing cup. There are no shims located behind this bearing cup.

CAUTION: The bearing cup is seated in the case correctly if there is no clearance between the bottom of the bearing cup and case. If a 0.001" or 0.002" feeler gauge does not fit, the bearing cup is completely seated into transaxle case.

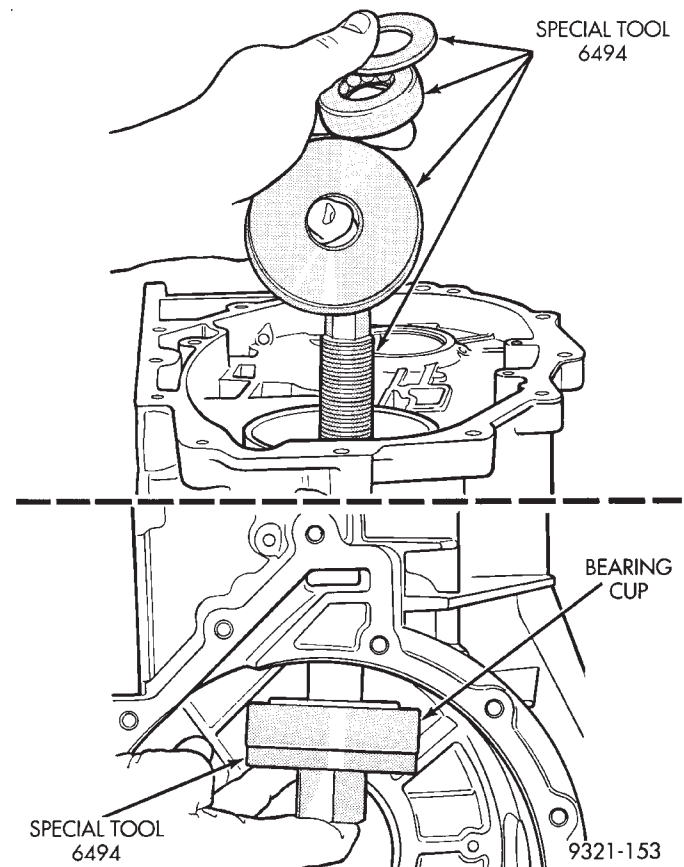


Fig. 250 Install Front Transfer Shaft Cup

(2) Install centering block (special tool 6549-2) into the transaxle case (Fig. 251). Screw centering block into inner adjuster hole of case until it bottoms. The pegs on the special tool are only used for installation. Orientation with in the case is not required.

(3) Install new front bearing (actual bearing to be used during reassembly) onto gauge disc (special tool 6549-3) (Fig. 252).

(4) Install gauge disc and bearing into case using gauge disc rod (Fig. 253).

(5) Install centering disc (special tool 6494-2) onto gauge disc rod (Fig. 254).

(6) Install centering nut as shown in (Fig. 255).

DISASSEMBLY AND ASSEMBLY (Continued)

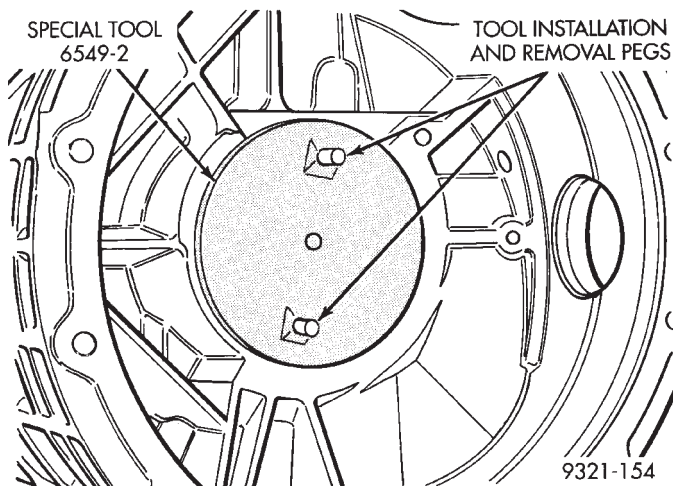


Fig. 251 Installing Centering Block

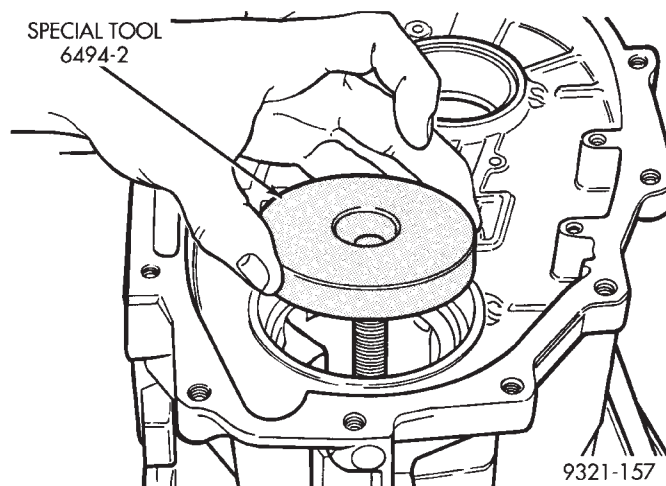


Fig. 254 Disc Installation

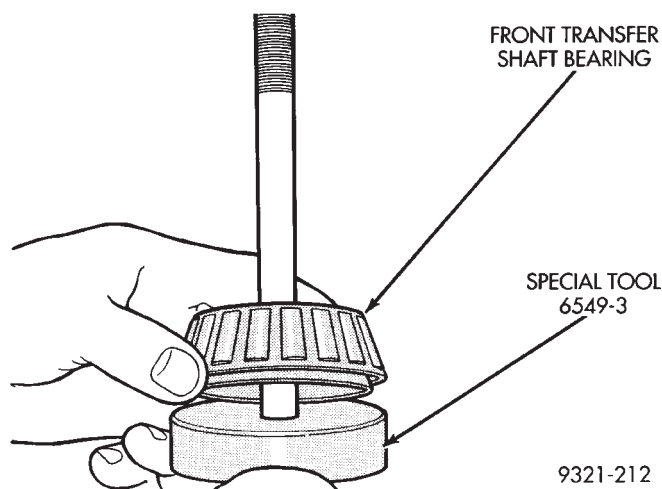


Fig. 252 Gauge Disc and Bearing

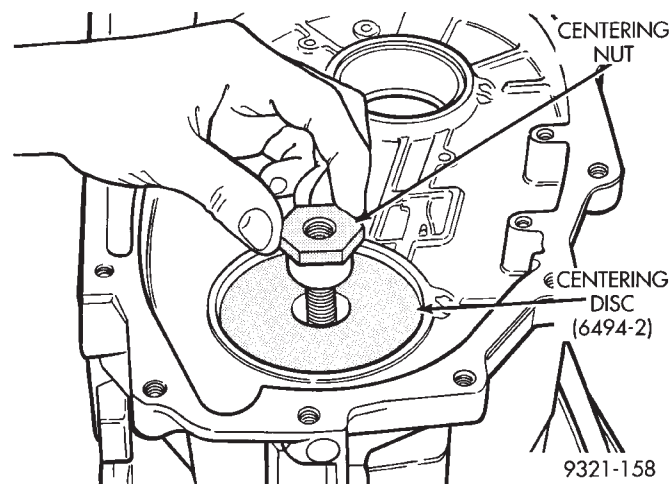


Fig. 255 Installing Centering Nut

(8) Install dial indicator into locating block. Then screw extension rod onto dial indicator.

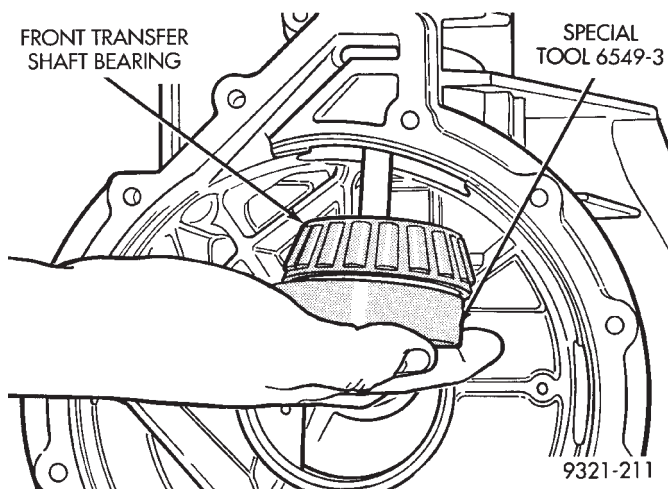


Fig. 253 Installing Gauge Disc with Front Transfer Shaft Bearing

(7) Hand tighten centering nut until all play in the tool has been removed.

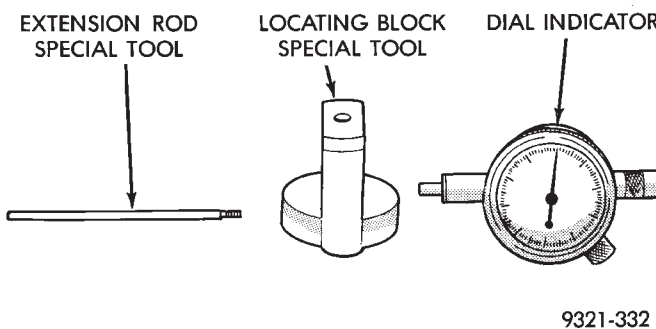
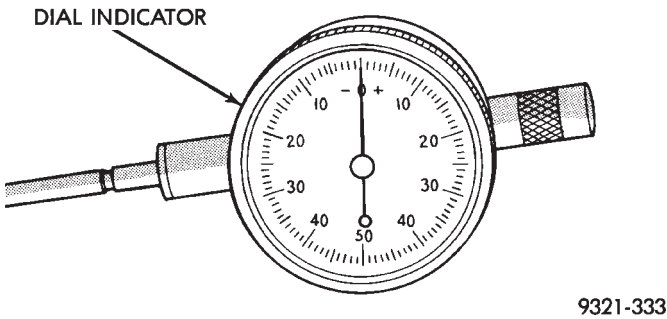


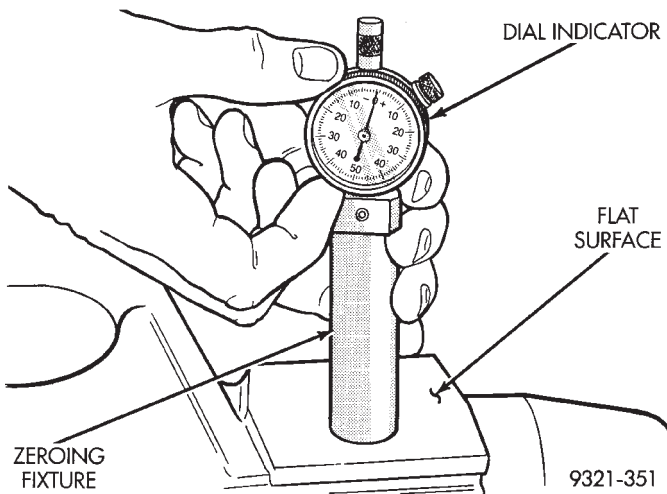
Fig. 256 Dial indicator, Locating Block and Extension Rod

NOTE: The dial indicator used to make this measurement must have a face that shows 0-50-0 (Special Tool C-3339) readings (Fig. 257). All steps from this point forward will reflect this assumption. This will give you proper shim thickness.

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 257 0-50-0 Dial Indicator**

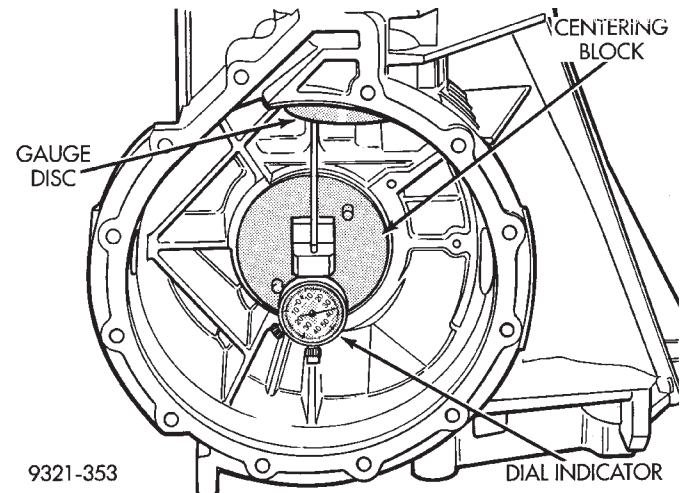
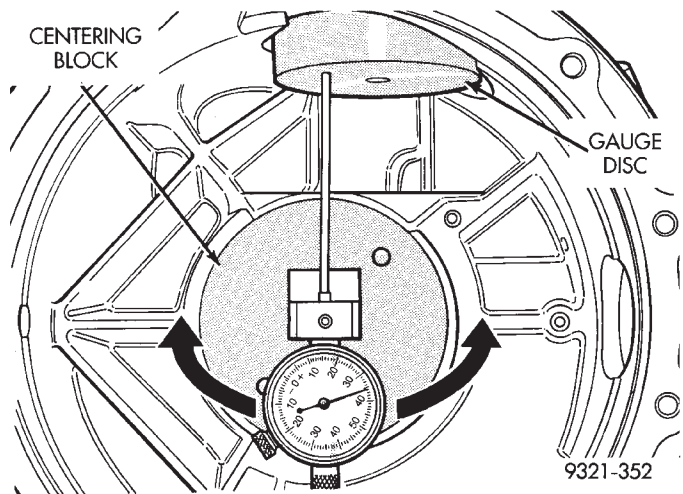
(9) Before making a pinion depth measurement the dial indicator must be zeroed. This is done by placing the dial indicator in the zeroing fixture (special tool 6549-6). Then place the zeroing fixture on a flat surface. Adjust the dial face so the pointer on the dial indicator lines up with the zero (Fig. 258).

**Fig. 258 Zero Dial Indicator**

(10) Compress the dial indicator slightly and insert dial indicator pin into centering block (Fig. 259).

(11) Pivot dial indicator back and forth (Fig. 260) on centering pin to obtain the shortest distance measurement. **This will be the lowest number reading on dial indicator.** Record the number obtained. Now rotate the gauge disc clockwise 1/3 of a turn and recheck readings. Record number obtained. Rotate the gauge disc another 1/3 of a turn clockwise and take another reading. Average the three readings. Record this pinion depth measurement. If the readings differ by more than two thousandths recheck gauge disc installation, it may have been installed slightly cocked.

(12) To determine the required shim thickness, the pinion depth measurement must be adjusted. The pinion shim adjustment number is the first of seven digits ink stamped on the shank of the transfer shaft

**Fig. 259 Mounting Dial Indicator to Centering Block****Fig. 260 Pivot Dial Indicator**

(Fig. 261). Using the adjustment factor chart, convert the adjustment number to the corresponding adjustment factor. Utilizing the pinion depth measurement obtained in Step 11, add or subtract the adjustment factor to calculate the required shim thickness. Refer to pinion head shim chart for shim selections. This is the shim that will be installed between the transfer shaft pinion head and the front transfer shaft bearing. Refer to the following examples for further explanation:

(13) Example 1 in (MM):

- Measured pinion shim depth: 0.789mm
- Adjustment number on transfer shaft: +2
- Adjustment factor (mm): -0.051mm
- Shim size needed: $0.789 - 0.051 = \mathbf{0.738mm}$

(14) Example 2 in (IN):

- Measured pinion shim depth: 0.032in
- Adjustment number on transfer shaft: -1
- Adjustment factor (in): +0.001
- Shim size needed: $0.032 + 0.001 = \mathbf{0.033in}$

DISASSEMBLY AND ASSEMBLY (Continued)

ADJUSTMENT NUMBER	ADJUSTMENT FACTOR mm	ADJUSTMENT FACTOR in
3	-0.076	-0.003
2	-0.051	-0.002
1	-0.025	-0.001
0	0.000	0.000
-1	0.025	0.001
-2	0.051	0.002
-3	0.076	0.003

9421-72

ADJUSTMENT FACTOR CHART

SHIM THICKNESS	
MM	INCH
0.681 - 0.707	0.0265 - 0.0275
0.708 - 0.734	0.0276 - 0.0286
0.735 - 0.761	0.0286 - 0.0296
0.762 - 0.788	0.0297 - 0.0307
0.789 - 0.815	0.0307 - 0.0317
0.816 - 0.842	0.0318 - 0.0328
0.843 - 0.869	0.0328 - 0.0338
0.871 - 0.896	0.0339 - 0.0349
0.897 - 0.923	0.0349 - 0.0359
0.924 - 0.951	0.0360 - 0.0370
0.951 - 0.977	0.0370 - 0.0381
0.978 - 1.004	0.0381 - 0.0391
1.005 - 1.031	0.0391 - 0.0402
1.032 - 1.058	0.0402 - 0.0412
1.059 - 1.085	0.0413 - 0.0423
1.086 - 1.112	0.0423 - 0.0433
1.113 - 1.139	0.0434 - 0.0444

9421-67

PINION HEAD SHIM CHART

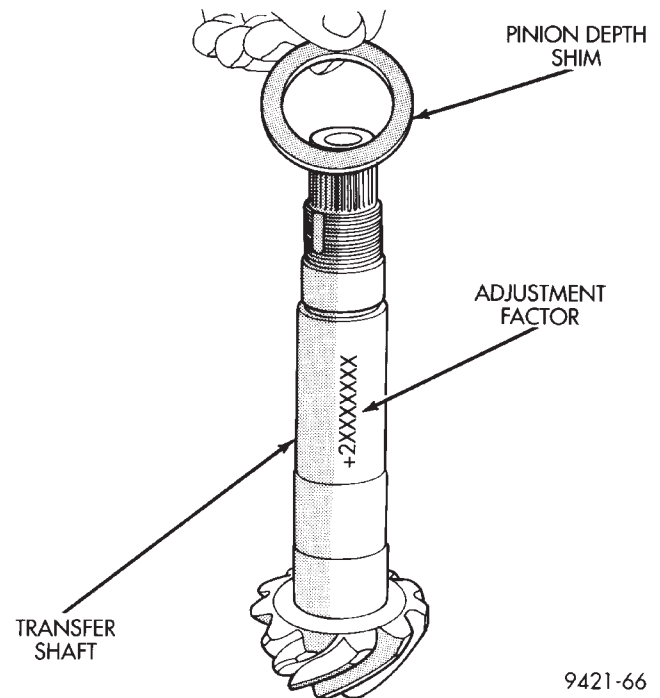
(15) Remove dial indicator, gauge disc and centering block from transaxle.

(16) Install shim selected in Step 12 of this procedure onto the transfer shaft (Fig. 261).

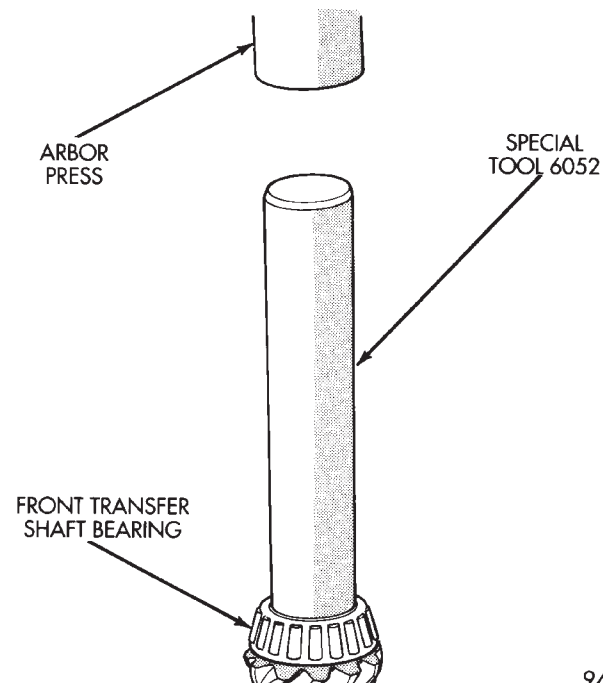
(17) Press front transfer shaft bearing onto transfer shaft (special tool 6052). The shim must be in place before pressing on bearing (Fig. 262).

(18) At this point the pinion depth has been determined and the shim has been installed onto the transfer shaft. Before the pinion is installed into the transaxle case, bearing preload must be determined for the differential bearings. The following steps must be performed before the pinion is installed.

(19) The following steps will determine how many foot pounds are required on the outer differential adjuster to obtain the correct turning torque.



9421-66

Fig. 261 Shim Installation

9421-65

Fig. 262 Bearing Installation

CAUTION: Failure to set differential bearing preload correctly may cause bearing failure, gear noise and/or axle shaft seal failure.

(20) Remove outer adjuster with special tool 6503 (Fig. 263).

DISASSEMBLY AND ASSEMBLY (Continued)

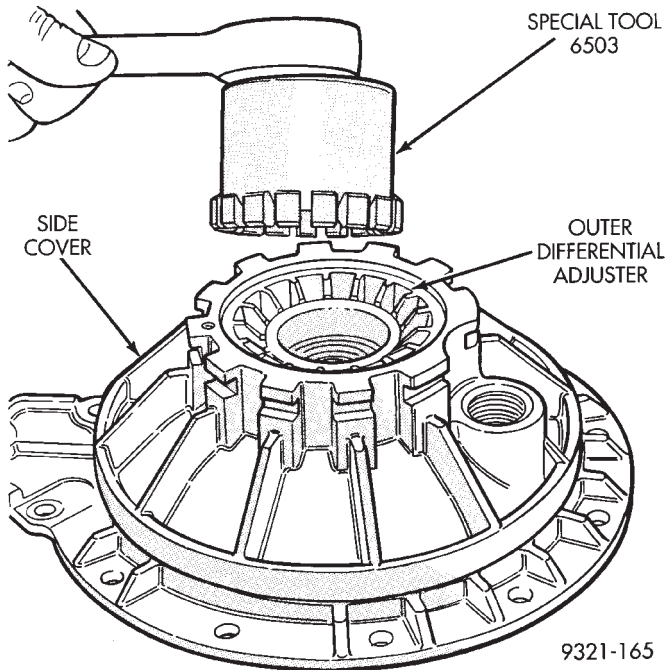


Fig. 263 Outer Adjuster Removal

(21) Remove old stub shaft seals. Press inner adjuster seal out with special tool 6502B. Press outer adjuster seal out with special tool 6558.

(22) Install new stub shaft seals in both adjusters using special tool 6558 (Fig. 264).

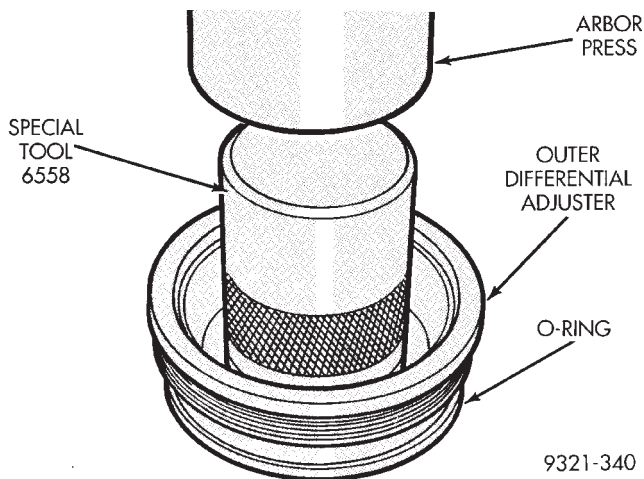


Fig. 264 Axle Shaft Seal Installation

(23) Lube adjuster threads and O-ring with gear oil before installing. Failure to lube threads will result in thread damage to the adjuster and transaxle case.

(24) Screw in the inner adjuster using special tool 6502B (Fig. 265). The inner adjuster should be screwed in until under-flush with inside of the case (viewed from differential side).

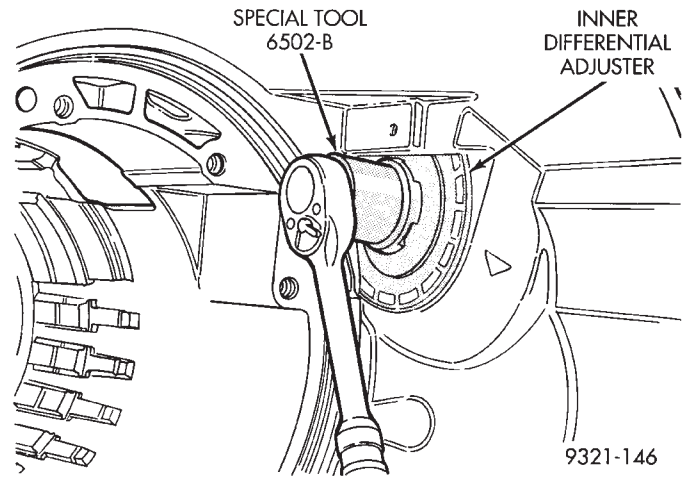


Fig. 265 Inner Adjuster Installation

(25) Install differential assembly into the transaxle case (Fig. 266).

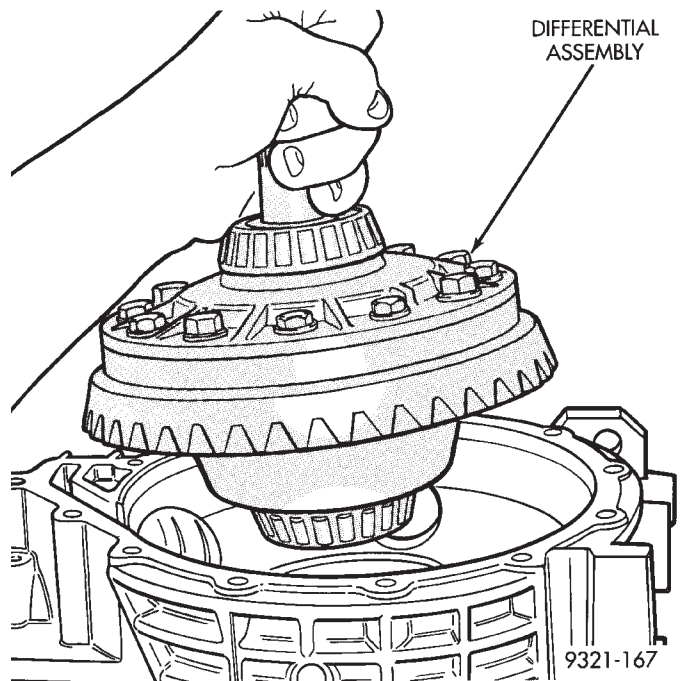


Fig. 266 Differential Assembly Installation

DISASSEMBLY AND ASSEMBLY (Continued)

(26) Install differential cover (Fig. 267). Do not apply silicone sealant at this time. All bolts should be installed and tightened.

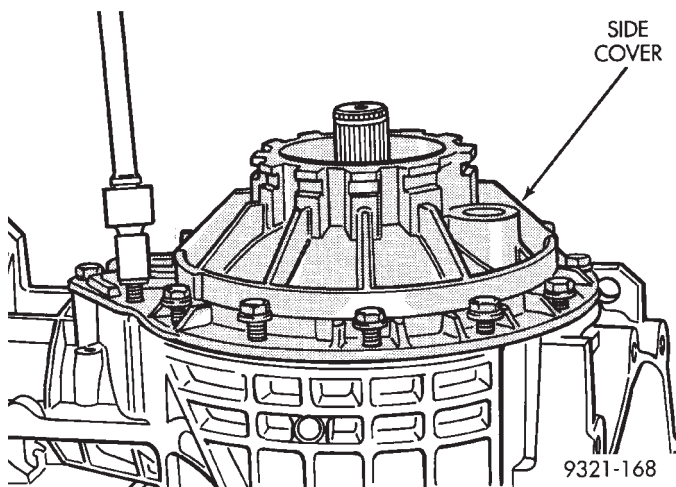


Fig. 267 Differential Cover Installation

(27) Install seal protector (special tool 6591) as shown in (Fig. 268). Apply a thin film of gear oil on the protector.

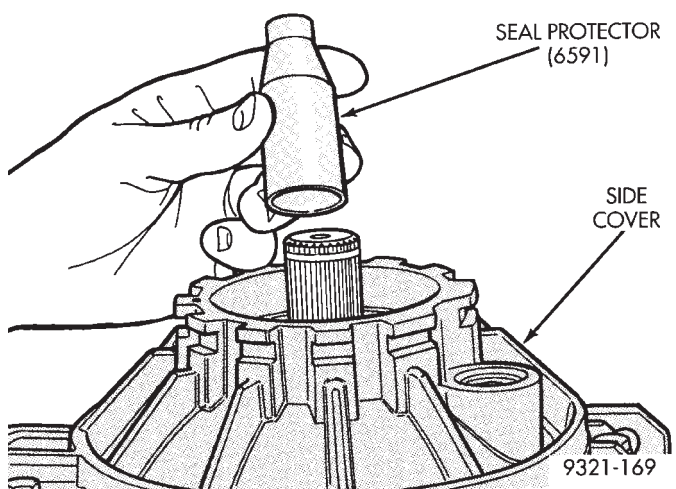


Fig. 268 Seal Protector

CAUTION: Lube threads and O-ring on adjuster before installing. Failure to do so will result in thread damage to the adjuster and transaxle case.

(28) Screw on outer adjuster and tighten adjuster down finger tight (Fig. 269).

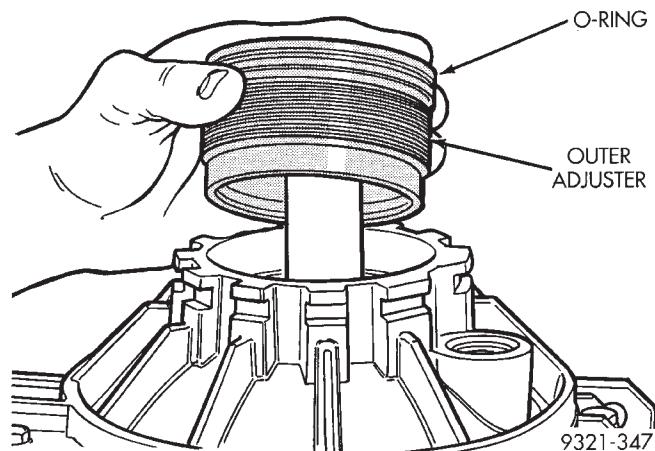


Fig. 269 Outer Adjuster Installation

(29) Insert special tool 6548 (Fig. 270). This tool will be used to check turning torque of the differential assembly.

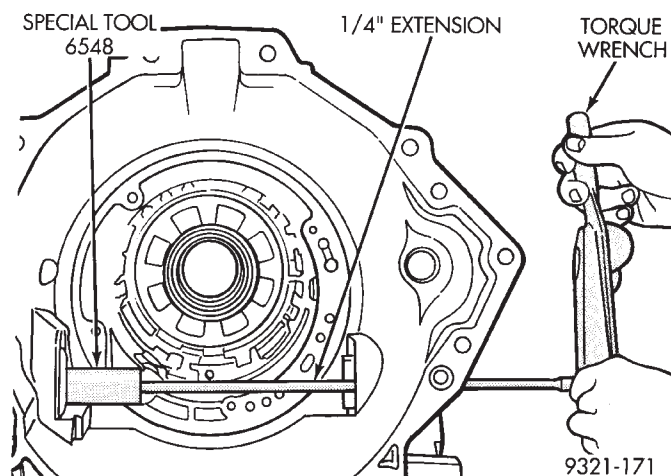
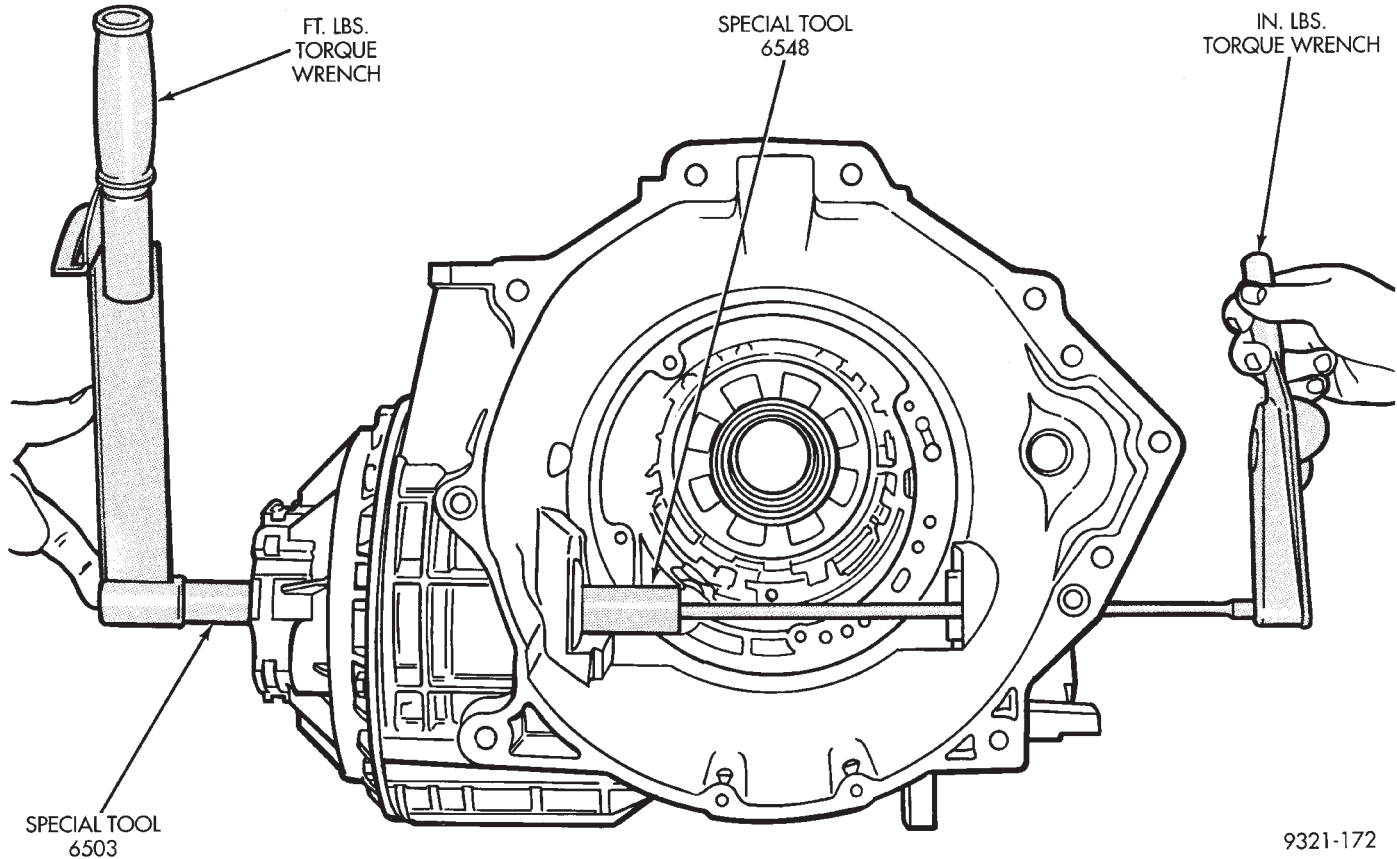


Fig. 270 Special Tool 6548

CAUTION: Differential bearings must be seated before taking turning torque readings. This is done by rotating the differential three or four turns in both directions.

CAUTION: Turning torque of 19 to 23 in. lbs. can only be obtained when using new bearings. Do not attempt to obtain this turning torque with used bearings.

DISASSEMBLY AND ASSEMBLY (Continued)

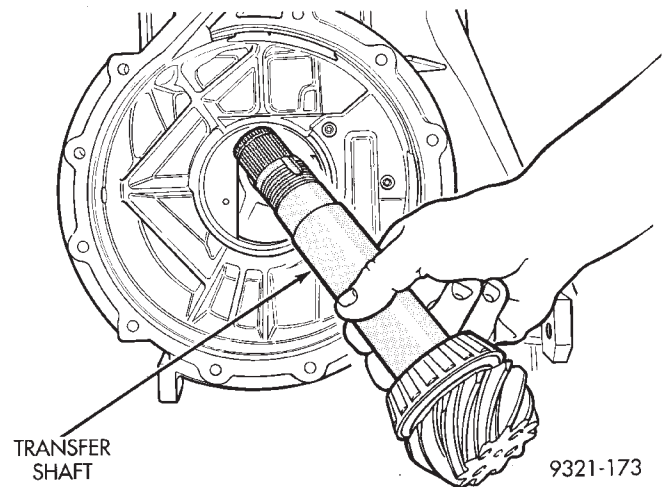
**Fig. 271 Determining Turning Torque**

(30) Tighten outer adjuster with tool 6503 until 19 to 23 in. lbs. of turning torque is obtained on tool 6548. **Record how many foot pounds were required on the outer adjuster to obtain the correct turning torque** (Fig. 271). Record the foot pound reading. The reading that you are recording will be used in Step 55 of this procedure.

(31) Remove the differential cover, differential carrier assembly and inner adjuster.

(32) At this point the amount of torque required on the outer differential adjuster has been determined. The transfer shaft can now be installed into the transaxle case. Perform the following steps to install transfer shaft into transaxle case.

(33) Install transfer shaft into transaxle case (Fig. 272).

**Fig. 272 Transfer Shaft Installation**

CAUTION: Bottom of support fixture must be flush with face of bell housing. If the support fixture is not flush, the seals and rear transfer shaft bearing cup will be pressed in cocked.

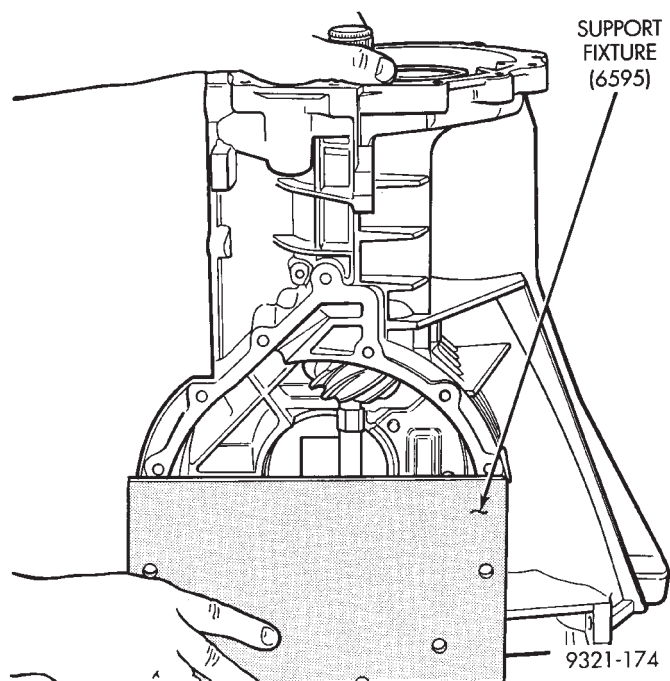
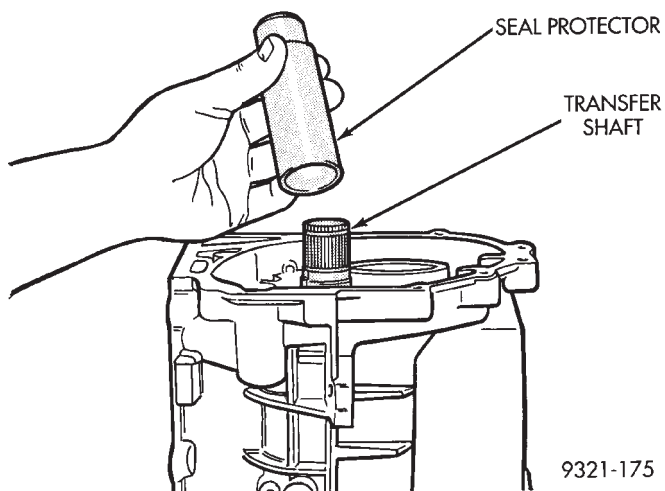
(34) Install transfer shaft support fixture (special tool 6595) (Fig. 273).

(35) Install transfer shaft seal protector (special tool 6592) (Fig. 274). Apply thin film of gear oil to protector.

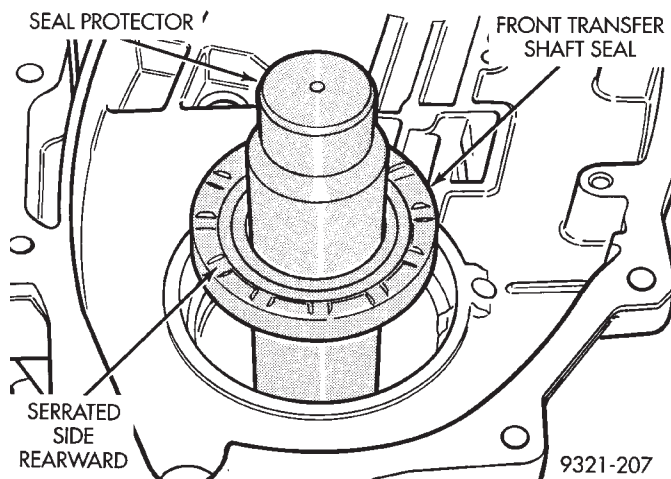
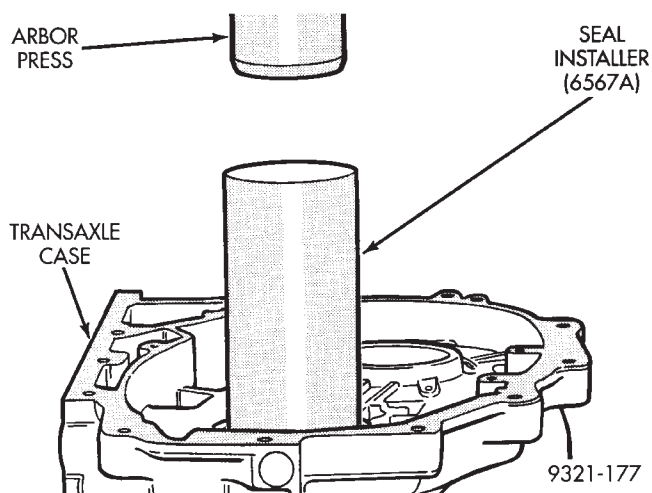
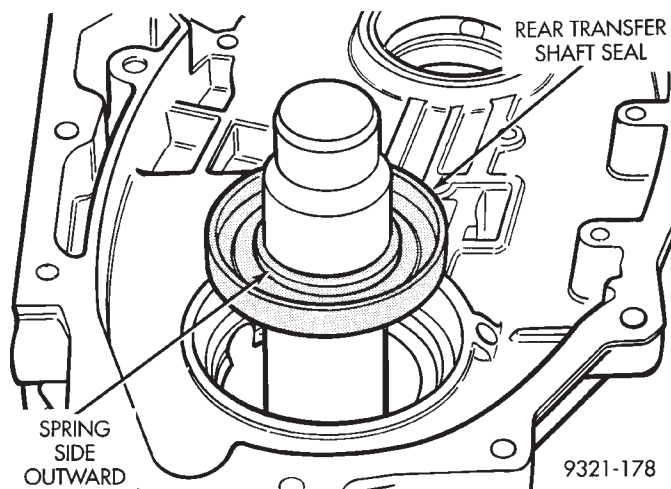
(36) Apply a small amount of lube to seal lips and install front transfer shaft seal. The serrated edges must face toward the rear of the transaxle (Fig. 275).

(37) Install seal with special tool 6567A (Fig. 276). Use a press to install seal. The installation tool will set the seal depth. Do not use a hammer to install seal. The seal may be damaged if installed with a hammer.

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 273 Transfer Shaft Support Fixture****Fig. 274 Seal Protector Installation**

(38) Install rear transfer shaft seal. The seal must be installed so that the spring side of the seal faces the installation tool (Fig. 277). Use the same special tool (6567A) to install the seal. The installation tool will set the seal depth. Use a press to install this seal. Do not use a hammer.

**Fig. 275 Correct Seal Orientation****Fig. 276 Seal Installation****Fig. 277 Correct Seal Orientation**

DISASSEMBLY AND ASSEMBLY (Continued)

(39) Install rear transfer shaft cup into case (Fig. 278).

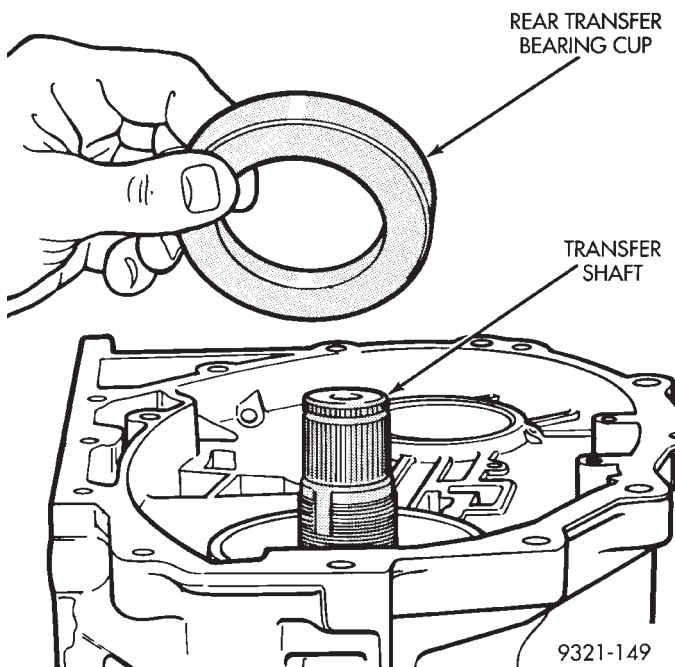


Fig. 278 Rear Transfer Bearing Cup

CAUTION: Properly seated cups are essential in correctly setting bearing preload.

(40) Use special tool 6560 to press cup into case (Fig. 279).

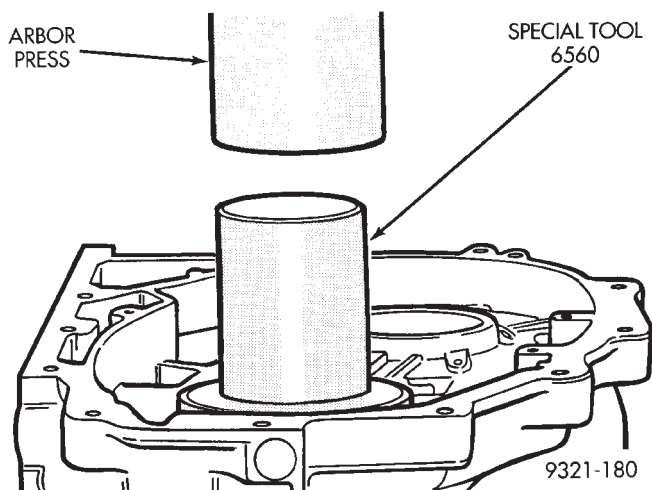


Fig. 279 Rear Transfer Shaft Cup Installation

(41) Install Transfer shaft preload shim (Fig. 280). Use the original shim that was taken out of transaxle if possible. If original shim is not available, use the thickest shim as a starting point. Refer to Transfer Shaft Rear Shim Chart for available sizes.

(42) Install rear transfer shaft cone (Fig. 281). Press cone on transfer shaft using special tool 6560.

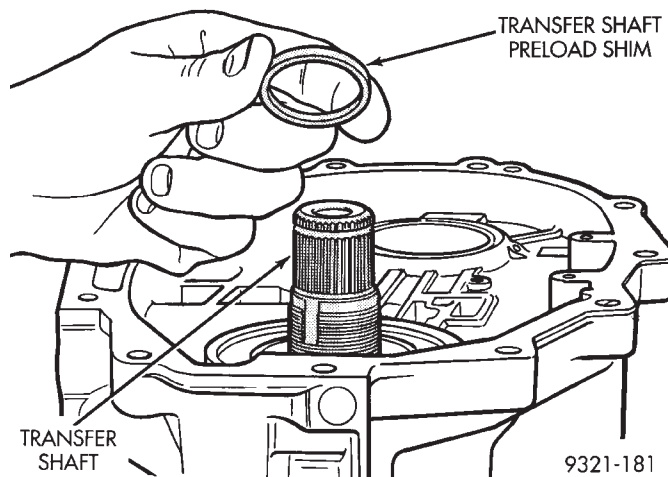


Fig. 280 Transfer Preload Shim Installation

3.53 - 3.55 mm	4.13 - 4.15 mm
3.56 - 3.58 mm	4.16 - 4.18 mm
3.59 - 3.61 mm	4.19 - 4.21 mm
3.62 - 3.64 mm	4.22 - 4.24 mm
3.65 - 3.67 mm	4.25 - 4.27 mm
3.68 - 3.70 mm	4.28 - 4.30 mm
3.71 - 3.73 mm	4.31 - 4.33 mm
3.74 - 3.76 mm	4.34 - 4.36 mm
3.77 - 3.79 mm	4.37 - 4.39 mm
3.80 - 3.82 mm	4.40 - 4.42 mm
3.83 - 3.85 mm	4.43 - 4.45 mm
3.86 - 3.88 mm	4.46 - 4.48 mm
3.89 - 3.91 mm	4.49 - 4.51 mm
3.92 - 3.94 mm	4.52 - 4.54 mm
3.95 - 3.97 mm	4.55 - 4.57 mm
3.98 - 4.00 mm	4.58 - 4.60 mm
4.01 - 4.03 mm	4.61 - 4.63 mm
4.04 - 4.06 mm	4.64 - 4.66 mm
4.07 - 4.09 mm	4.67 - 4.69 mm
4.10 - 4.12 mm	

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Transfer Shaft Rear Shim Chart

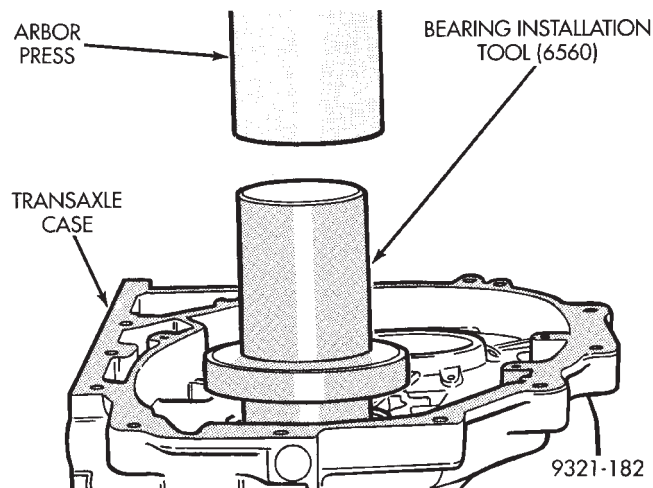
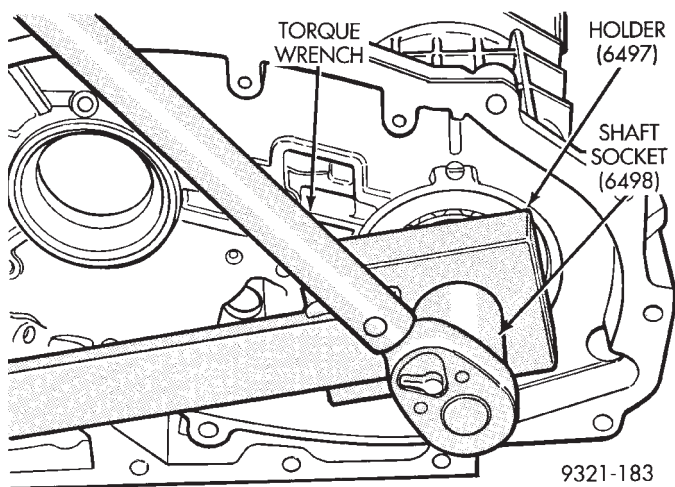
(43) Remove transfer shaft support fixture (special tool 6595).

CAUTION: Always use a new transfer shaft nut. Do not reuse old transfer shaft nut.

(44) Install a new transfer shaft nut (Fig. 282). Tighten nut to 271 N·m (200 ft. lbs.). Use special tools 6497 holder and 6498 shaft socket to tighten nut.

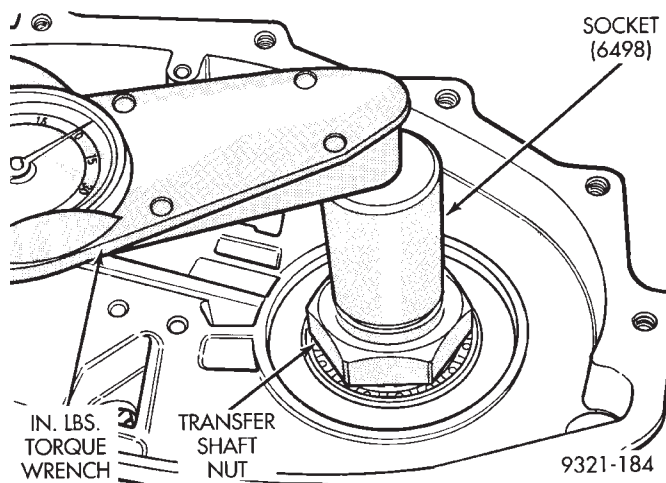
CAUTION: Failure to set the transfer shaft turning torque correctly may cause transfer shaft bearings or seals to fail. Be sure transfer shaft does not have end play. If end play exists, install a thinner preload shim.

DISASSEMBLY AND ASSEMBLY (Continued)

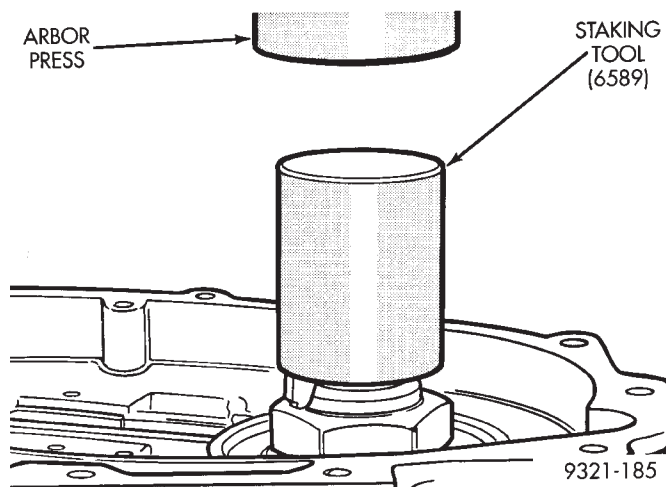
**Fig. 281 Transfer Shaft Cone Installation****Fig. 282 Transfer Shaft Nut Installation**

(45) Check the turning torque of the transfer shaft using a torque wrench (Fig. 283). The turning torque should be 0.5 to 1.3 N·m (5 to 12 in. lbs.). If the turning torque is too high, install a thicker transfer shaft preload shim. If the turning torque is too low, install a thinner transfer shaft preload shim.

CAUTION: A press and special tool 6589 must be used when staking the transfer shaft nut. Do not use a hammer and the special tool to stake nut. If a hammer is used; seal, bearing, and/or tool damage may result. Also the stake will not be seated against the shaft correctly. This will allow the nut to loosen.

**Fig. 283 Checking Turning Torque**

(46) After the correct turning torque is obtained, use special tool 6589 to stake the new transfer shaft nut (Fig. 284). Be sure that the tool arms line up with slots in the transfer shaft. Use a press with the special tool to make the stakes in the nut.

**Fig. 284 Staking New Nuts**

CAUTION: Failure to stake the transfer shaft nut correctly may allow the nut to loosen during transaxle operation. This will cause transaxle failure.

(47) At this point the transfer shaft, new oil seals, pinion depth and transfer shaft preload have been set. The following steps will set the backlash between the transfer shaft and the ring gear.

DISASSEMBLY AND ASSEMBLY (Continued)

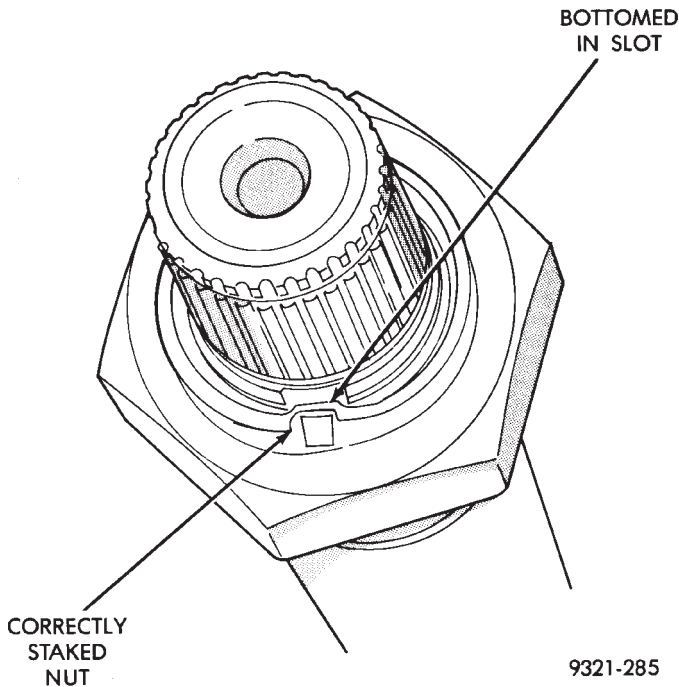


Fig. 285 Correctly Staked Nut

(48) If the carrier requires reconditioning, refer to Differential Carrier Recondition.

(49) Install vent baffle. Apply sealer as shown in (Fig. 286).

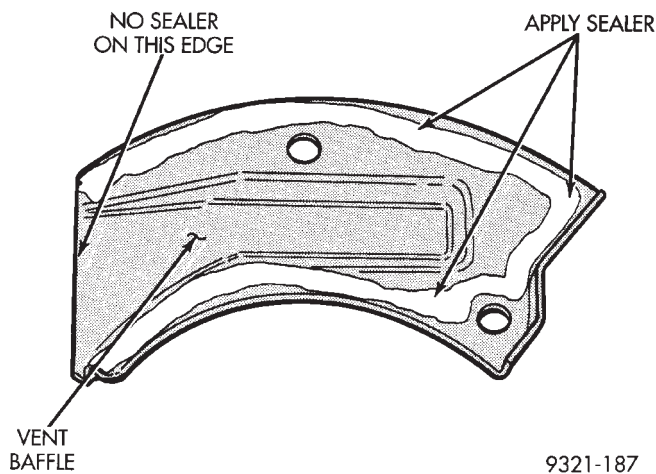


Fig. 286 Baffle Installation

(50) Install new inner adjuster O-ring. Lube inner adjuster threads and O-ring. Then install inner adjuster flush with differential side of case.

(51) Install differential assembly (with ring gear attached) into transaxle case (Fig. 287).

(52) Transfer shaft to ring gear backlash should be 0.006" to 0.009" thousands of an inch. To get the backlash close enough to measure, perform the following steps. Hold the transfer shaft with one hand and rock the ring gear back and forth (Fig. 288). You

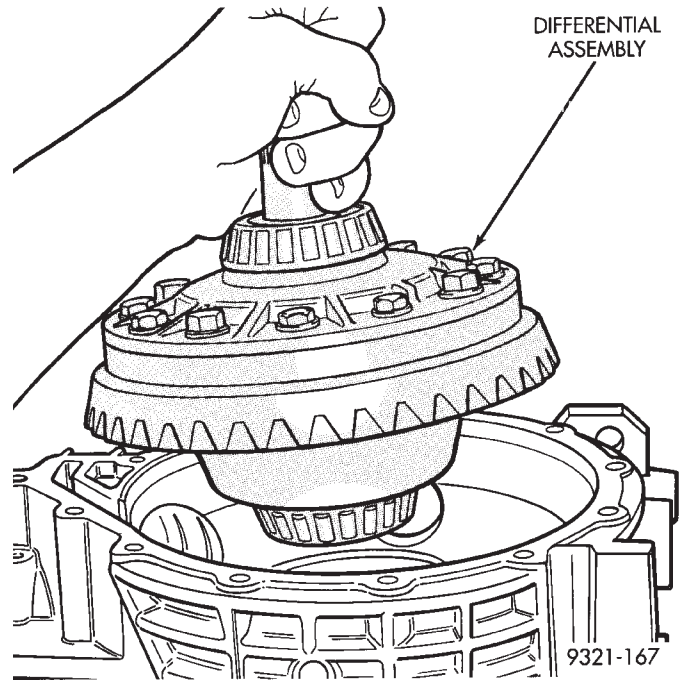


Fig. 287 Differential Assembly Installation

should feel some backlash between the gears. If no backlash is felt use special tool 6502B to turn the inner adjuster so that it raises the differential assembly. This will increase backlash. If there is too much backlash, use special tool 6502B to turn the inner adjuster so that it lowers the differential assembly. This will decrease backlash. Recheck the backlash after each adjustment.

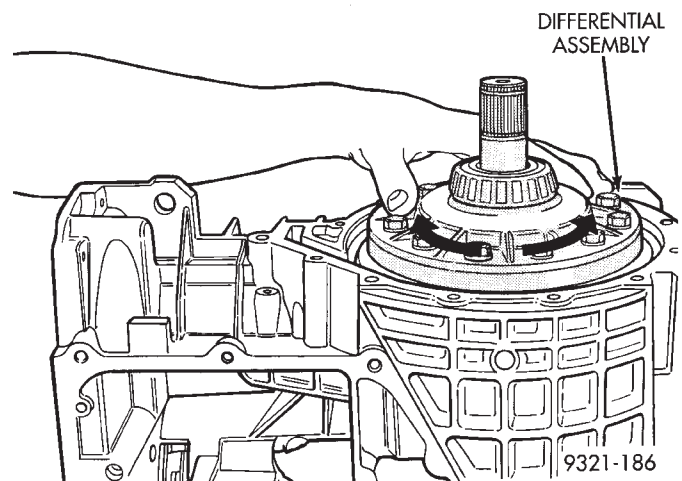


Fig. 288 Rocking Ring Gear Back and Forth

(53) Apply a 1/8 inch bead of sealant to differential cover flange. Then install differential cover with sealant (Fig. 289) and tighten cover bolts.

(54) Install seal protector (special tool 6591) on shaft (Fig. 290).

DISASSEMBLY AND ASSEMBLY (Continued)

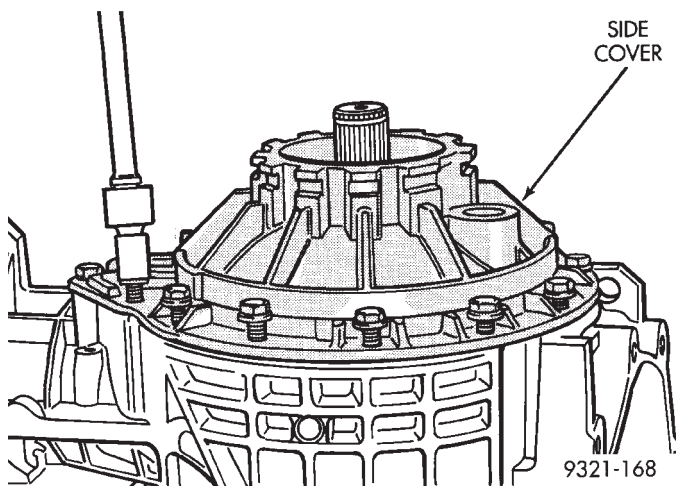


Fig. 289 Differential Cover Installation

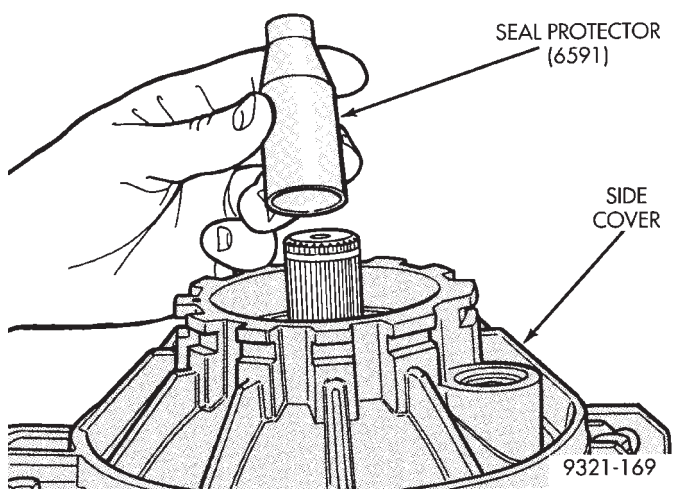


Fig. 290 Seal Protector

CAUTION: Lube threads and O-ring on adjuster before installing. Failure to do so will result in thread damage to the adjuster and differential cover.

(55) Install outer adjuster with new O-ring (Fig. 291). Torque the outer adjuster (special tool 6503) to the torque reading recorded in Step 30. Then seat bearings by turning differential three or four revolutions in both directions. Tighten adjuster a second time to same torque recorded in Step 30. Again reseat bearings. Repeat this sequence until correct adjuster torque is maintained.

(56) To check and/or adjust backlash, remove the inspection plug from the top of the differential. Install dial indicator as shown in (Fig. 292). The tip of the dial indicator must be perpendicular against one of the ring gear teeth. Hold transfer shaft with locking pliers. Move ring gear back and forth with special tool 6548. Read the amount of backlash with

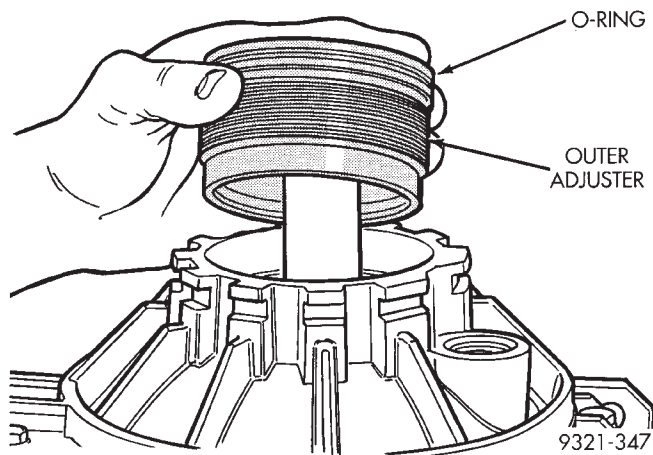


Fig. 291 Outer Adjuster Installation

dial indicator. Backlash should be 0.006" to 0.009" thousands of an inch.

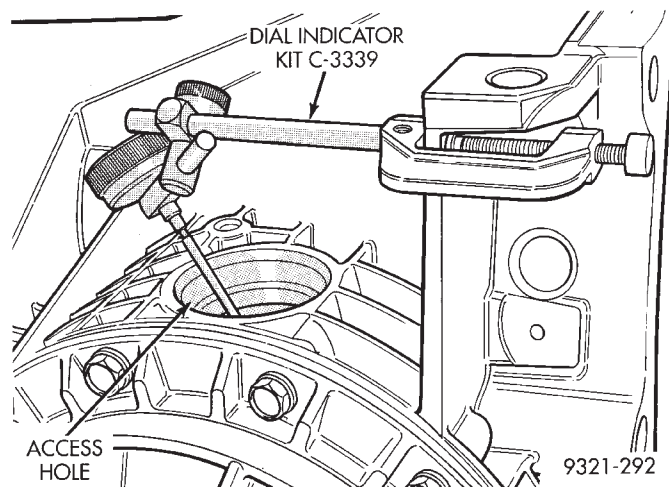


Fig. 292 Dial Indicator Installation

(57) If there is too much backlash, loosen the outer adjuster with special tool 6503. Then turn the inner adjuster so that it **moves away from the ring gear**. After adjusting the inner adjuster, retighten the outer adjuster to the torque recorded in Step 30. The inner adjuster should be turned in small increments.

(58) If there is not enough backlash, loosen the outer adjuster with special tool 6503. Then turn the inner adjuster so that it **moves towards the ring gear**. After adjusting the inner adjuster, retighten the outer adjuster to the torque recorded in Step 30. The inner adjuster should be turned in small increments.

(59) Once backlash is within specifications, recheck backlash in four spots on the ring gear 90 degrees apart. All four readings should be within specifications.

(60) Install inner and outer adjuster locking brackets.

DISASSEMBLY AND ASSEMBLY (Continued)

(61) Install new inspection plug. Use a wooden block to tap inspection plug into place.

(62) It is easier to fill the differential prior to installing the transaxle back into the vehicle. The differential holds 32 ounces of fluid.

DIFFERENTIAL CARRIER-RECONDITION

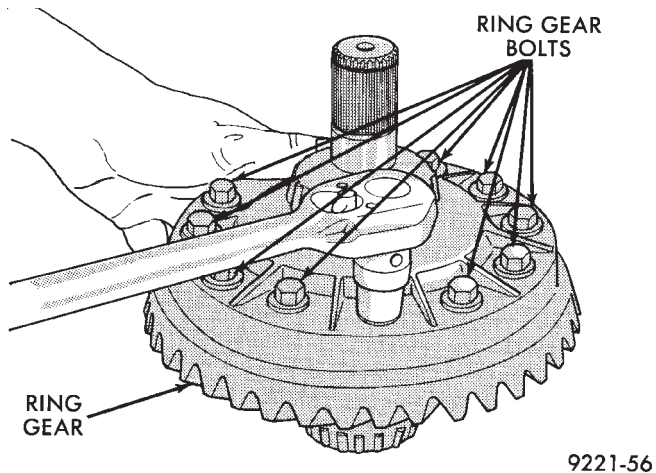


Fig. 293 Remove Ring Gear Bolts

CAUTION: Ring gear bolts are not reusable. When reassembling use new bolts.

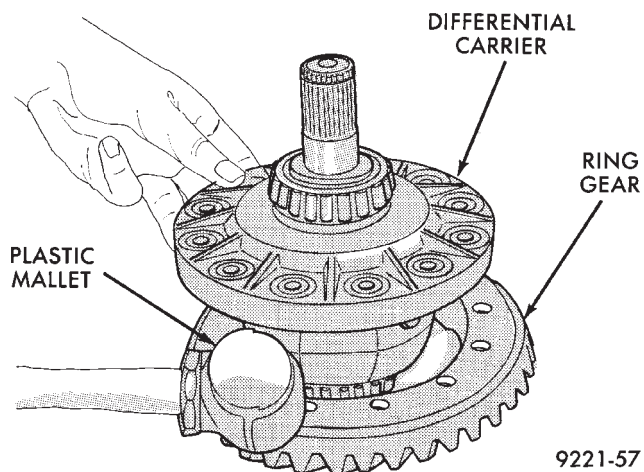


Fig. 294 Tap Off Ring Gear

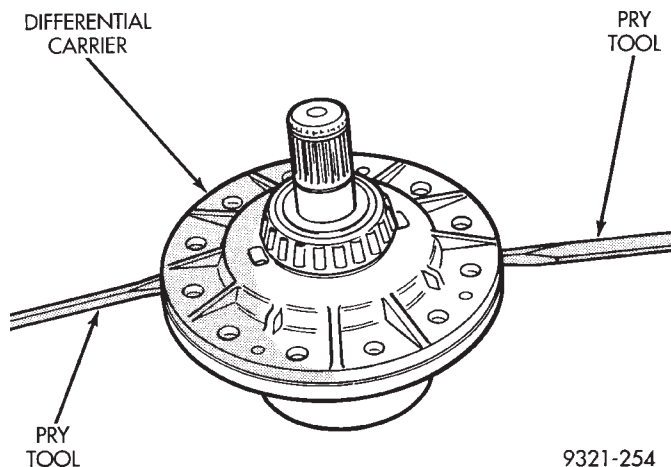


Fig. 295 Pry Differential Carrier Apart

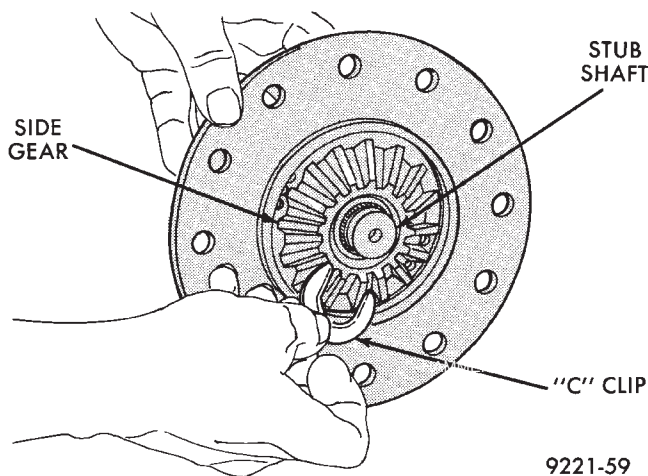


Fig. 296 Remove C-Clip

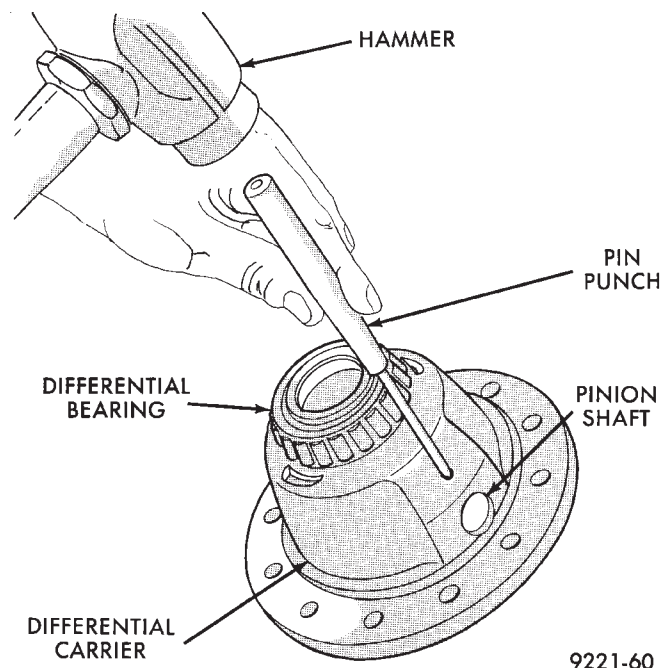


Fig. 297 Remove Pinion Shaft Roll Pin

DISASSEMBLY AND ASSEMBLY (Continued)

CAUTION: When reassembling use a new roll pin.

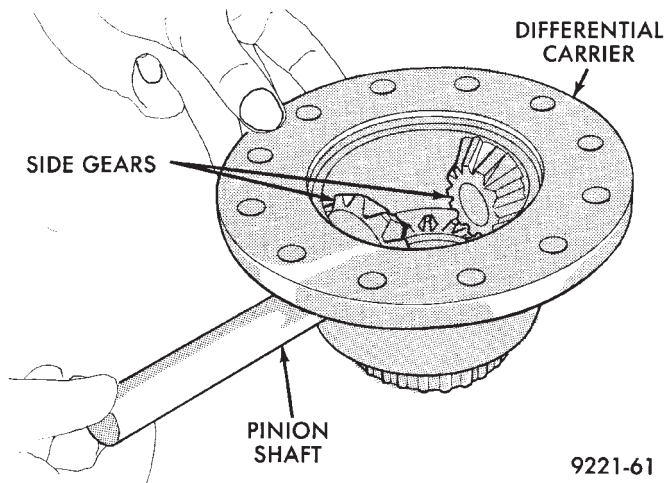


Fig. 298 Slide Out Differential Pinion Shaft and Remove Pinion Gears and Side Gears

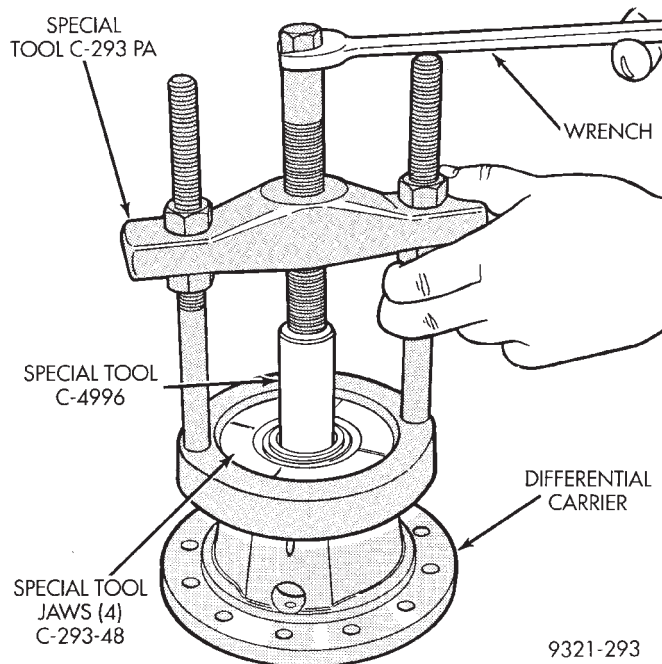


Fig. 299 Carrier Bearing Removal

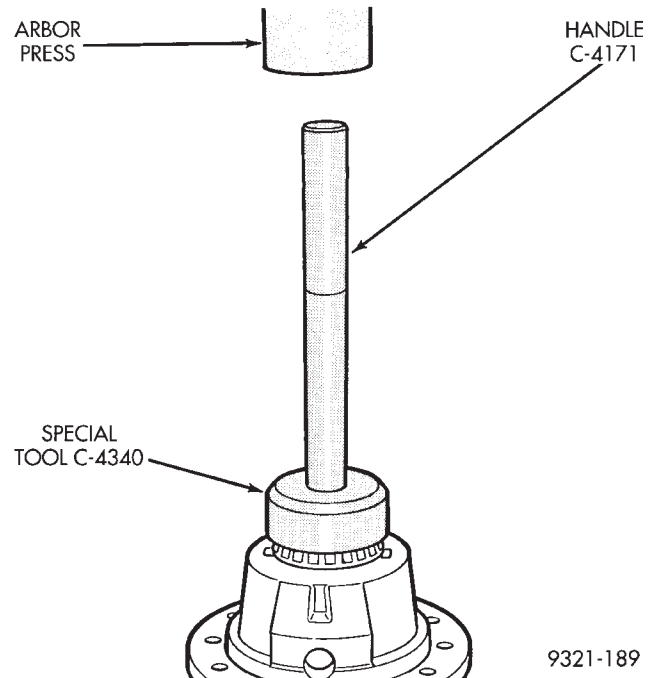


Fig. 300 Carrier Bearing Installation

CLEANING AND INSPECTION

TRANSFER CHAINS LENGTH MEASUREMENT

The need to replace the transfer chains because of excessive wear is unlikely. If chain length is suspected to be long, perform the following procedure to measure the chain length:

(1) Insert a screwdriver into the 18 mm hole with the screwdriver **ABOVE** the chains (Fig. 301).

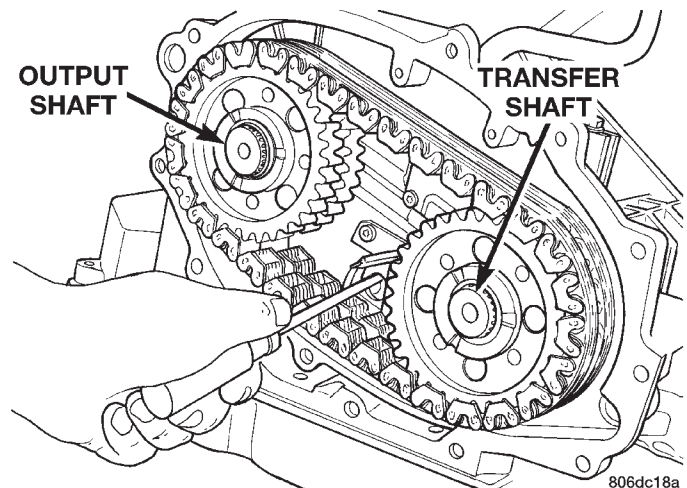


Fig. 301 Screwdriver Placement

(2) Pry the chains down at the center of the chains.

CLEANING AND INSPECTION (Continued)

(3) Butt a scale against the snubber and mark the scale at the bottom of the chains (Fig. 302).

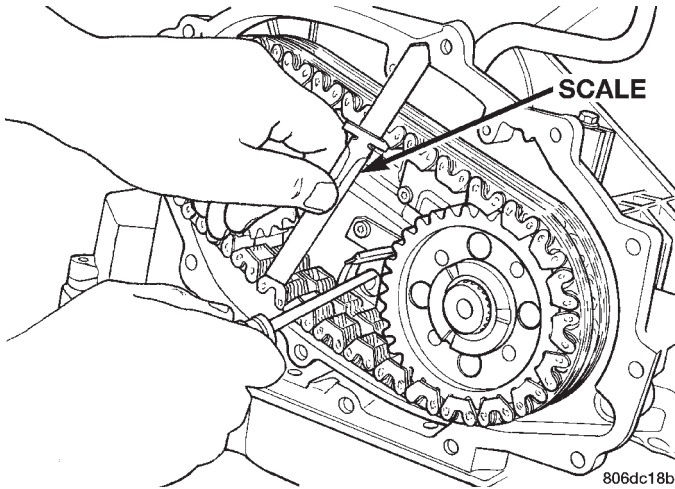


Fig. 302 Chain Measurement

(4) Insert a screwdriver into the 18 mm hole with the screwdriver **BELOW** the chains (Fig. 303). An assistant may be needed to perform this step.

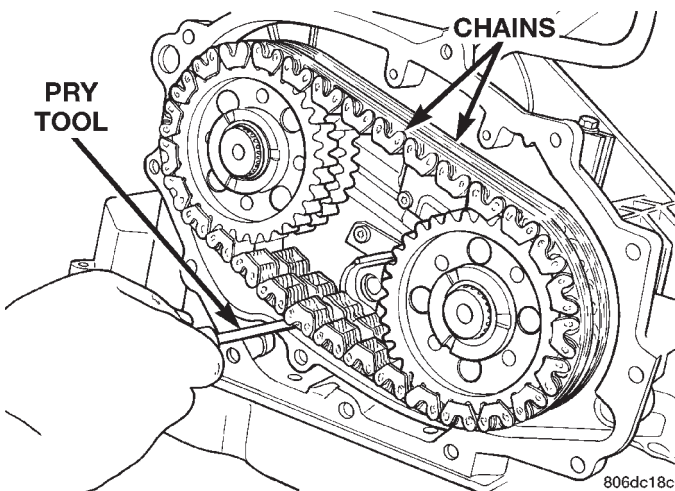


Fig. 303 Screwdriver Placement

(5) Pry the chains up at the center of the chain.

(6) Butt a scale against the snubber and place a second mark on the scale at the bottom of the chains (Fig. 304).

(7) Measure the distance between the two marks placed on the scale (Fig. 305). If the two marks on the scale are more than one inch apart, replace the drive chains.

(8) If the transfer chains were replaced, refer to Snubber Gap Measurement in this section to verify correct snubber clearance.

SNUBBER GAP MEASUREMENT

The gap between the snubber face and the top of the chain should be 0.0" to 0.030" inch with chain slack removed. The gap can be adjusted by installing

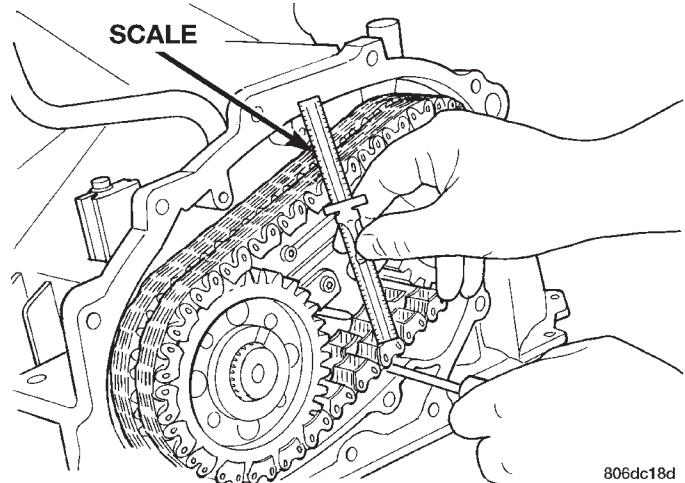


Fig. 304 Chains Measurement

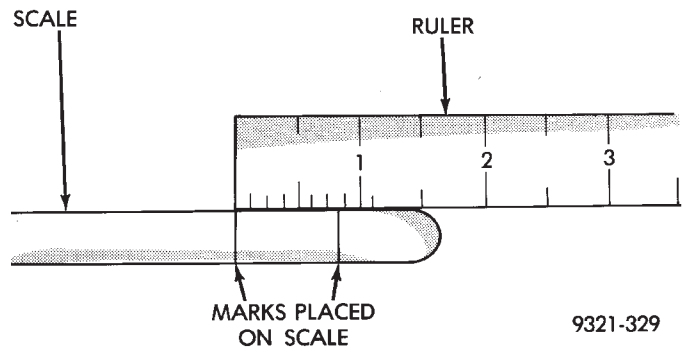


Fig. 305 Measuring Marks on Scale

snubbers with different off-set mounting holes. The amount of off-set the mounting holes has, will determine the position of the chain snubber.

The snubbers can be identified by their color. There are three different snubber colors available (black, green and tan). The black snubber will give the most clearance between the chain and the snubber face. The green snubber will give the least clearance between the chain and the snubber face. The tan snubber is the nominal snubber.

(1) Insert screwdriver into the 18 mm hole below the chain and pry up on chain to remove slack in chain.

(2) Using a feeler gauge, measure the gap between the snubber face and the top of the chain (Fig. 306).

(3) If the measurement is not within specifications, install the correct snubber as required.

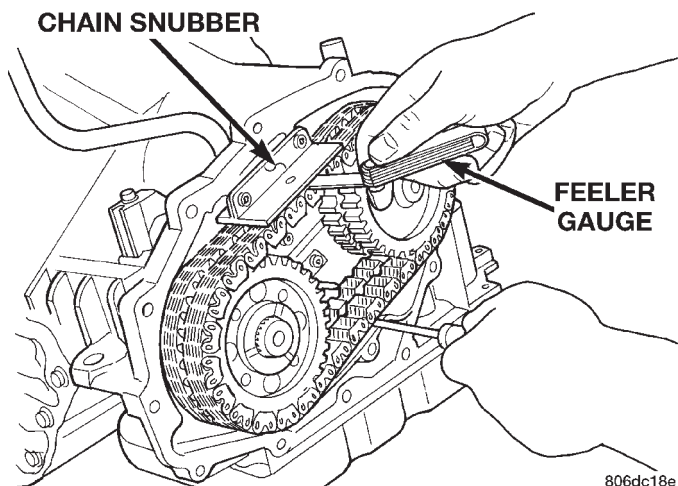
ADJUSTMENTS

GEARSHIFT CABLE-COLUMN SHIFT

The gearshift cable should be adjusted if any of the following repairs or situations are encountered:

- Transaxle replacement.
- Valve body repair.

ADJUSTMENTS (Continued)

**Fig. 306 Chain to Snubber Gap**

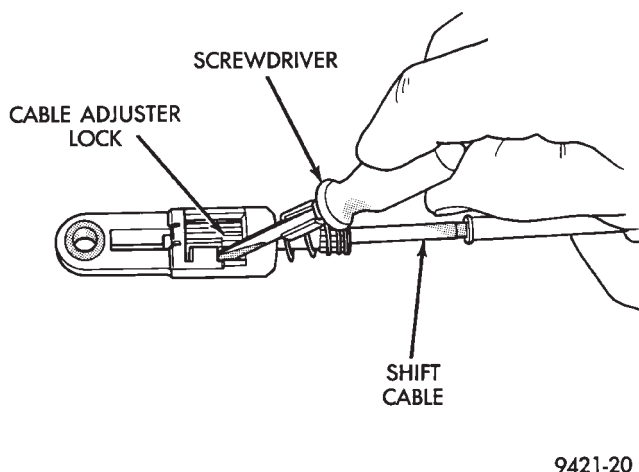
- Shift cable replacement.
- Column shifter replacement.
- Interlock cable replacement.
- When there is no cranking in Park or Neutral.

If the following conditions are encountered, the interlock cable is out of adjustment. Refer to Interlock Cable Adjustment procedure.

- When the transaxle can be shifted without the key in the ignition.
- If the key can be removed with the shifter in reverse.
- When the key cannot be removed with the shifter in the park position.

ADJUSTMENT

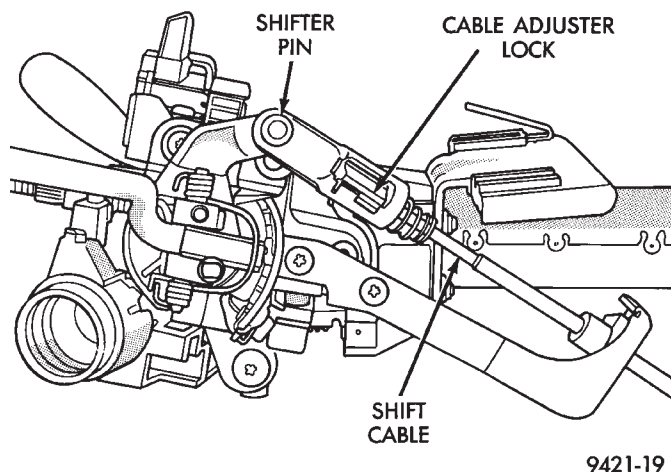
- (1) Remove upper steering column shroud.
- (2) Rotate cable adjuster into unlock position. Use a straight blade screwdriver to unlock adjuster (Fig. 307).

**Fig. 307 Cable Lock Mechanism**

- (3) Make sure that the transaxle shift lever (at transaxle) is in the Park position. This is the most rearward position. Verify park sprag is fully engaged.

CAUTION: Park sprag must be engaged when adjusting linkage. Rock vehicle back and forth to ensure that park sprag is fully engaged.

- (4) Tilt the steering column to the full down position.
- (5) Place shifter in the park position with the key removed.
- (6) Adjust by rotating adjuster into lock position (Fig. 308).

**Fig. 308 Shift Cable Adjuster Lock**

- (7) Reinstall upper steering column shroud.
- (8) Check shifter for proper operation. It should operate smoothly without binding. The vehicle should crank in Park or Neutral only.

GEARSHIFT CABLE-FLOOR SHIFT

The gearshift cable should be adjusted if any of the following repairs or situations are encountered:

- Transaxle replacement.
- Valve body repair.
- Shift cable replacement.
- Floor Shifter Replacement
- Interlock cable replacement.
- When there is no cranking in park or neutral.

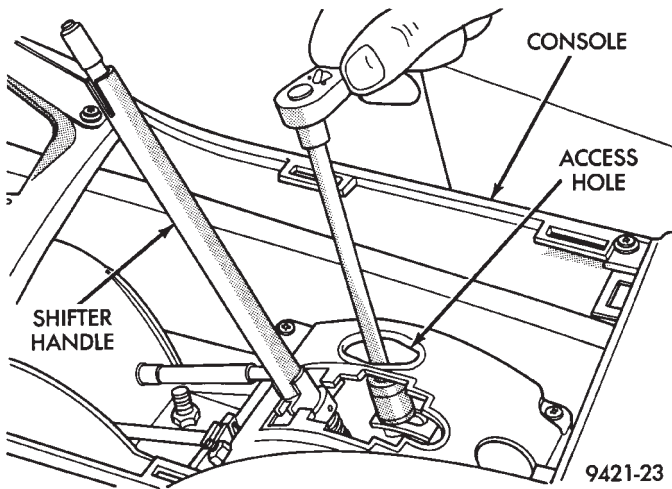
If the following conditions are encountered, the interlock cable is out of adjustment. Refer to Interlock Cable Adjustment procedure.

- When the transaxle can be shifted without the key in the ignition.
- If the key can be removed with the shifter in reverse.
- When the key cannot be removed with the shifter in the park position.

ADJUSTMENTS (Continued)

ADJUSTMENT

- (1) Remove shifter handle and console bezel.
- (2) Loosen nut on shifter cable adjuster (Fig. 309).

**Fig. 309 Shift Cable Adjust Lever Nut**

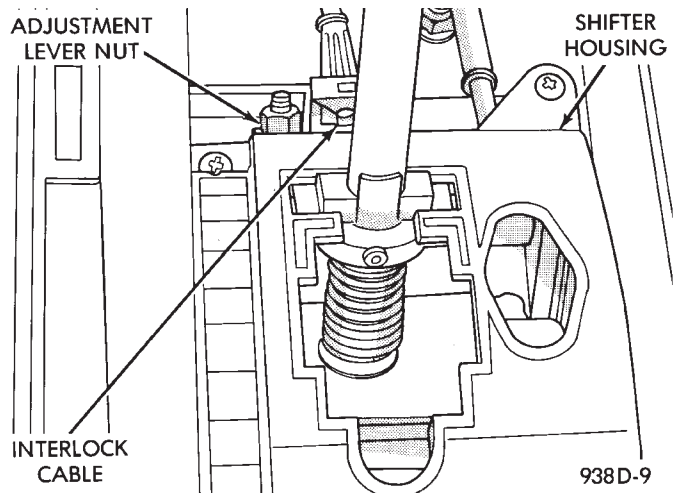
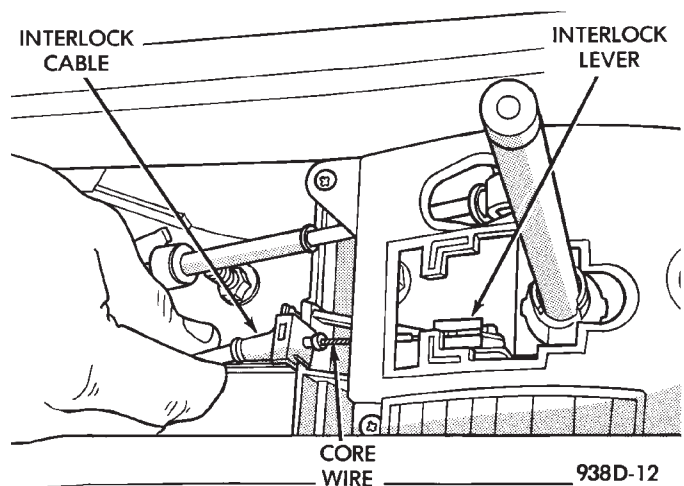
- (3) Make sure that the transaxle shift lever (at transaxle) is in the Park position. This is the most rearward position. Verify park sprag is fully engaged.

CAUTION: Park sprag must be engaged when adjusting linkage. Rock vehicle back and forth to ensure that park sprag is fully engaged.

- (4) Place shifter in park position.
- (5) Place ignition in lock with key removed.
- (6) Tighten adjuster nut at shifter to 225 in. lbs.
- (7) Reinstall console bezel and shifter handle.
- (8) Check shifter for proper operation. It should operate smoothly without binding. The vehicle should crank in Park or Neutral only.

FLOOR SHIFT INTERLOCK ADJUSTMENT

- (1) Remove the shifter handle.
- (2) Remove the console bezel.
- (3) Loosen the adjustment nut on the interlock lever (Fig. 310).
- (4) Move ignition key to the RUN position.
- (5) Remove the interlock cable from the shifter housing (Fig. 311). Slide the cable out of the groove in the interlock lever.
- (6) Inspect the interlock cable:
 - With the lock cylinder in OFF (lock) position and the ignition key removed, the cable core wire should not move when pulled. If the cable core wire moves, the cable is improperly installed or kinked.
 - With the ignition key in the RUN position, the cable core wire should slide freely when pulled. Also, the cable should return to the bottomed out position when released. If the cable core wire does not move in the RUN position, the cable is improperly installed or kinked.

**Fig. 310 Interlock Cable****Fig. 311 Interlock Cable at Floor Shifter**

- (7) Put the shifter in the PARK position.
- (8) Slide the interlock cable core wire into the groove on the adjustment lever. Ensure the cable end seats in the groove.
- (9) Slip the cable into the housing until it snaps in place.
- (10) Ensure the shift lever remains in PARK. Remove the ignition key from the lock cylinder (switch in OFF position).
- (11) When the adjustment nut on the interlock lever is loosened, the cable indexes itself to the correct position.
- (12) Loosen the adjustment nut. Allow the cable to adjust itself to the correct position. Tighten the adjustment nut to 50 in. lbs.
- (13) Check the interlock adjustment:
 - With the ignition key in the OFF (lock) position, the shifter should be locked in the PARK position. If not, re-adjust the interlock and tighten the adjustment nut.

ADJUSTMENTS (Continued)

- **Without starting the engine**, place the ignition switch in the run position. Move the shifter to the reverse position. You should not be able to remove the ignition key from the lock cylinder. If the key can be removed at this point, re-adjust the interlock and tighten the adjustment nut.

- Place the shifter in the PARK position. Turn the ignition key to the OFF (lock) position. You should be able to remove the ignition key from the lock cylinder. If not, re-adjust the interlock and tighten the adjustment nut.

(14) Install the bezel on the shifter console.

(15) Install shifter handle.

AUTOSTICK

The autostick switch is serviced as an assembly with the gearshift mechanism. The switch is not adjustable. If a problem occurs with the switch, refer to the Diagnosis and Testing section.

BEARING ADJUSTMENT PROCEDURES

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

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

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

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

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

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

Oil all bearings before checking turning torque.

MASTER SHIM CHART

Use this chart as a reference guide when selecting the shims needed for the:

- Transfer Shaft
- Output Shaft
- Output Sprocket
- Pinion

ADJUSTMENTS (Continued)

TRANSFER SHAFT REAR SHIMS	
3.53 - 3.55	4.13 - 4.15
3.56 - 3.58	4.16 - 4.18
3.59 - 3.61	4.19 - 4.21
3.62 - 3.64	4.22 - 4.24
3.65 - 3.67	4.25 - 4.27
3.68 - 3.70	4.28 - 4.30
3.71 - 3.73	4.31 - 4.33
3.74 - 3.76	4.34 - 4.36
3.77 - 3.79	4.37 - 4.39
3.80 - 3.82	4.40 - 4.42
3.83 - 3.85	4.43 - 4.45
3.86 - 3.88	4.46 - 4.48
3.89 - 3.91	4.49 - 4.51
3.92 - 3.94	4.52 - 4.54
3.95 - 3.97	4.55 - 4.57
3.98 - 4.00	4.58 - 4.60
4.01 - 4.03	4.61 - 4.63
4.04 - 4.06	4.64 - 4.66
4.07 - 4.09	4.67 - 4.69
4.10 - 4.12	

PINION HEAD SHIMS	
0.681 - 0.707	0.924 - 0.950
0.708 - 0.734	0.951 - 0.977
0.735 - 0.761	0.978 - 1.004
0.762 - 0.788	1.005 - 1.031
0.789 - 0.815	1.032 - 1.058
0.816 - 0.842	1.059 - 1.085
0.843 - 0.869	1.086 - 1.112
0.870 - 0.896	1.113 - 1.139
0.897 - 0.923	

OUTPUT SHAFT REAR SHIMS	
5.17 - 5.19	5.62 - 5.64
5.20 - 5.22	5.65 - 5.67
5.23 - 5.25	5.68 - 5.70
5.26 - 5.28	5.71 - 5.73
5.29 - 5.31	5.74 - 5.76
5.32 - 5.34	5.77 - 5.79
5.35 - 5.37	5.80 - 5.82
5.38 - 5.40	5.83 - 5.85
5.41 - 5.43	5.86 - 5.88
5.44 - 5.46	5.89 - 5.91
5.47 - 5.49	5.92 - 5.94
5.50 - 5.52	5.95 - 5.97
5.53 - 5.55	5.98 - 6.00
5.56 - 5.58	6.01 - 6.03
5.59 - 5.61	6.04 - 6.06

OUTPUT SPROCKET SPACER SHIMS	
2.64 - 2.84	3.48 - 3.68
2.85 - 3.05	3.69 - 3.89
3.06 - 3.26	3.90 - 4.10
3.27 - 3.47	4.11 - 4.31

ADJUSTMENTS (Continued)

DRIVE SPROCKET HEIGHT ADJUSTMENT
PROCEDURE

A spacer beneath the output sprocket is used to position the output sprocket in line with the transfer sprocket. The sprocket must be within 0.015” of each other. In order to do this operation, install original spacer over the output shaft. If original spacer is not available, use the thickest available shim as a starting point. Refer to Output Sprocket Spacer Chart for available sizes. Then install the two sprockets without the chain.

The chain sprockets are not reversible. The output sprocket has 32 teeth and the transfer sprocket has 33 teeth. Check the height difference using a straight edge (special tool 6311 or equivalent) and a set of feeler gauges.

If the output sprocket is lower than transfer sprocket, add the amount measured to the shim that was installed (Fig. 312).

If the output sprocket is higher than transfer sprocket, subtract the amount measured to the shim that was installed (Fig. 313).

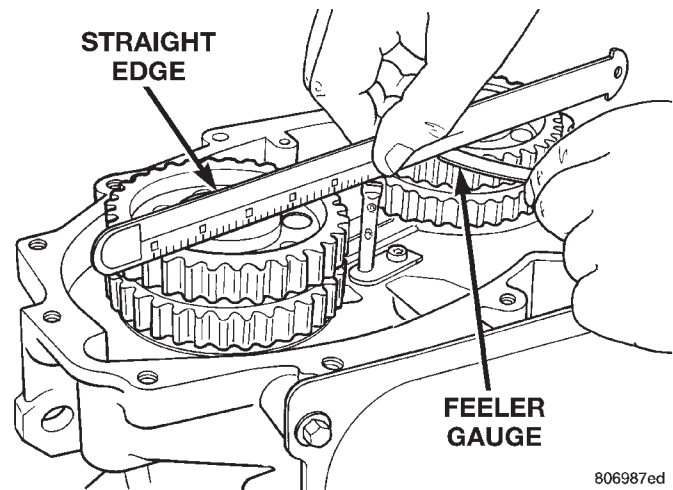


Fig. 313 Checking Sprocket Height

2.64 - 2.84 mm	3.48 - 3.68 mm
2.85 - 3.05 mm	3.69 - 3.89 mm
3.06 - 3.26 mm	3.90 - 4.10 mm
3.27 - 3.47 mm	4.11 - 4.31 mm

9421-68

OUTPUT SPROCKET SPACER CHART
SCHEMATICS AND DIAGRAMS
42LE TRANSAXLE HYDRAULIC SCHEMATICS

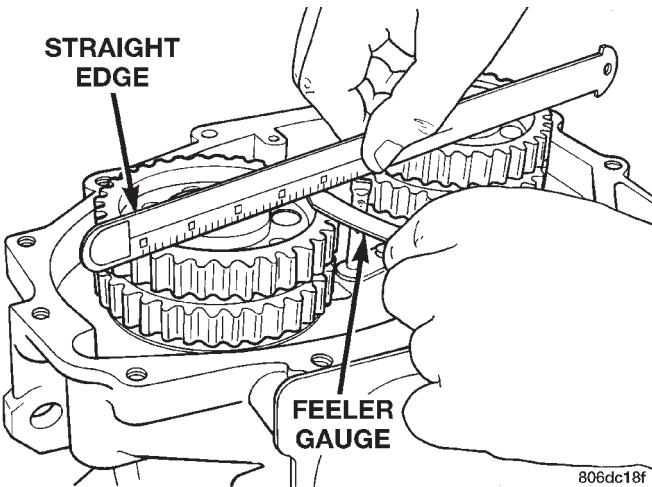
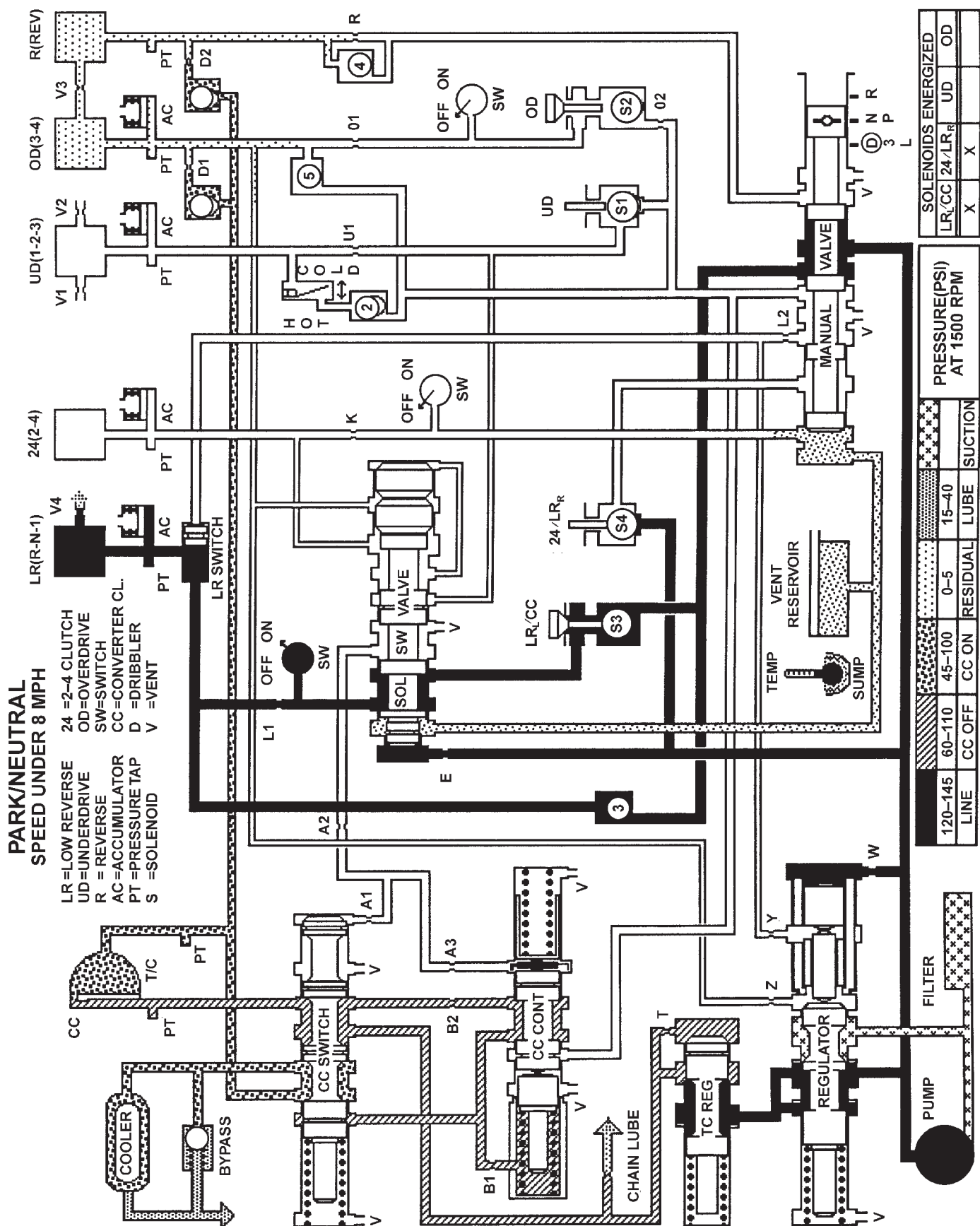
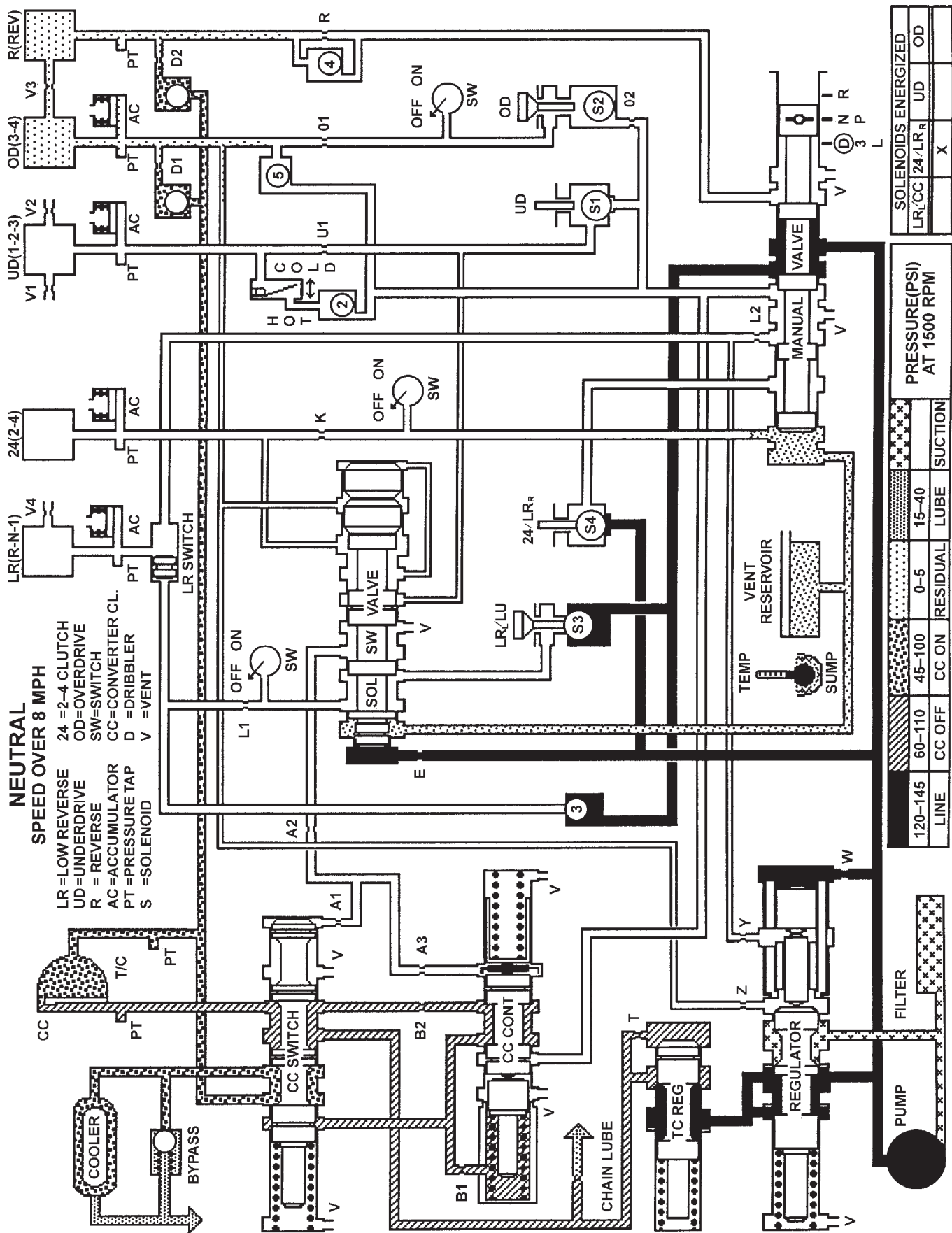


Fig. 312 Checking Sprocket Height

SCHEMATICS AND DIAGRAMS (Continued)

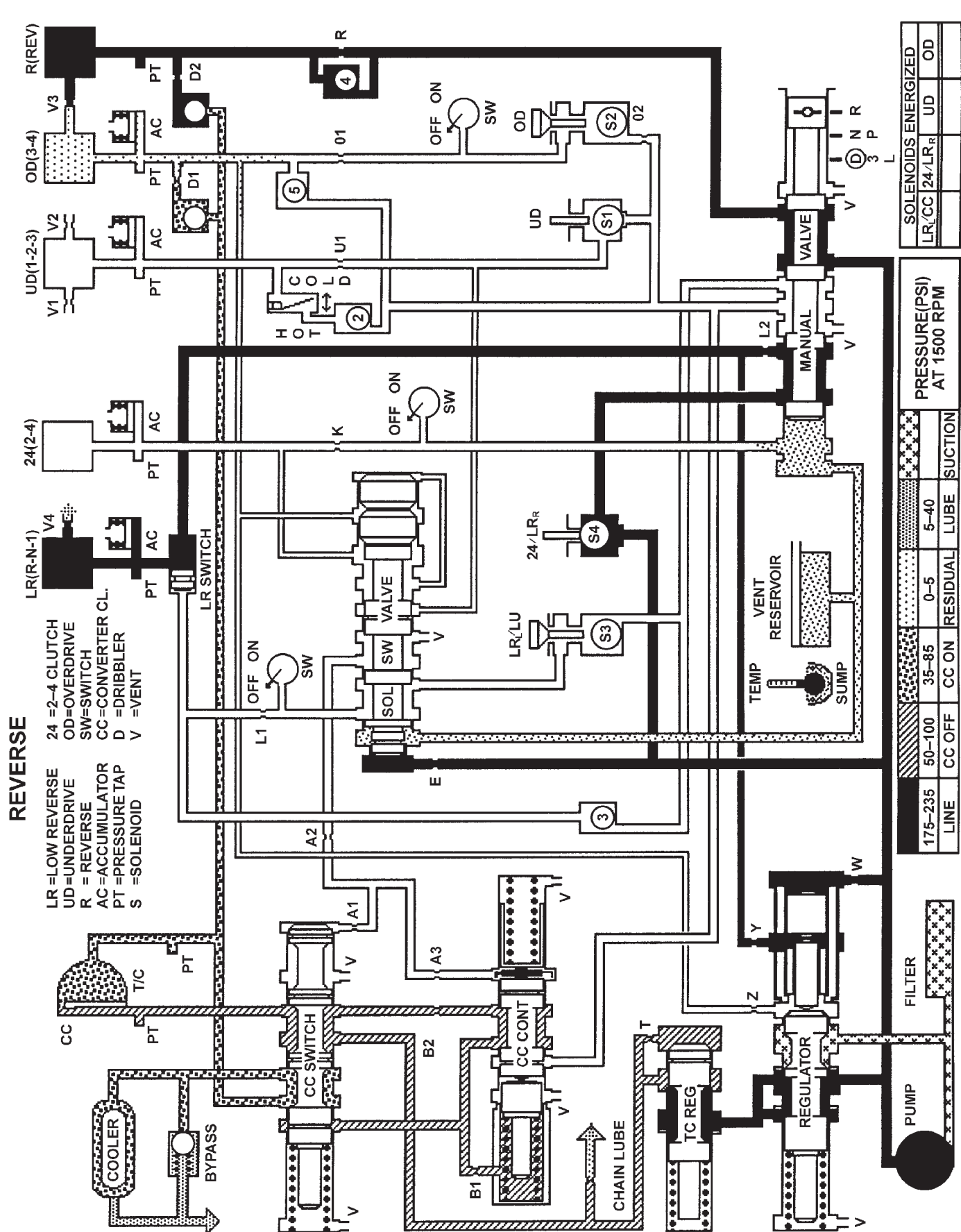


SCHEMATICS AND DIAGRAMS (Continued)



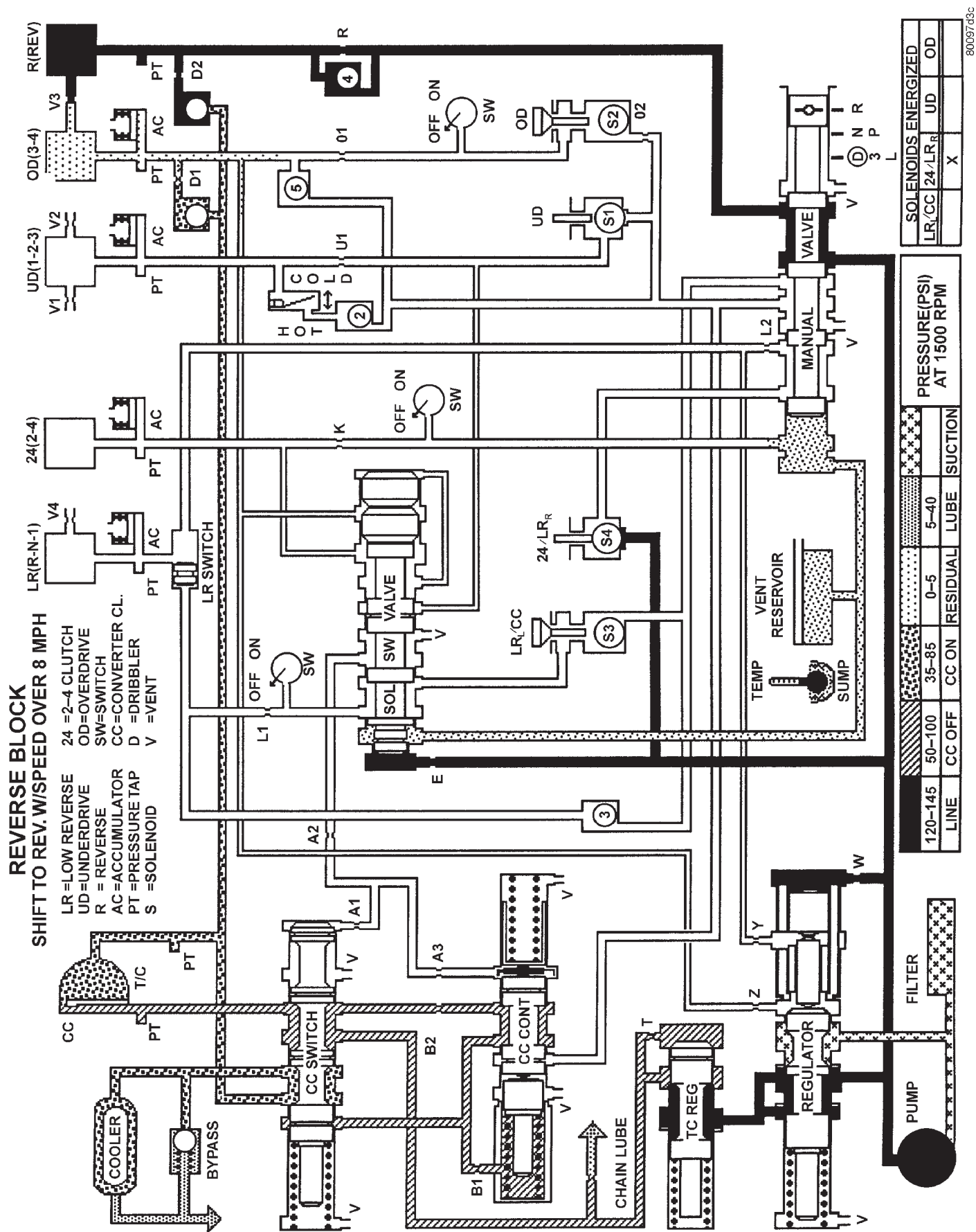
42LE TRANSAXLE HYDRAULIC SCHEMATIC

SCHEMATICS AND DIAGRAMS (Continued)



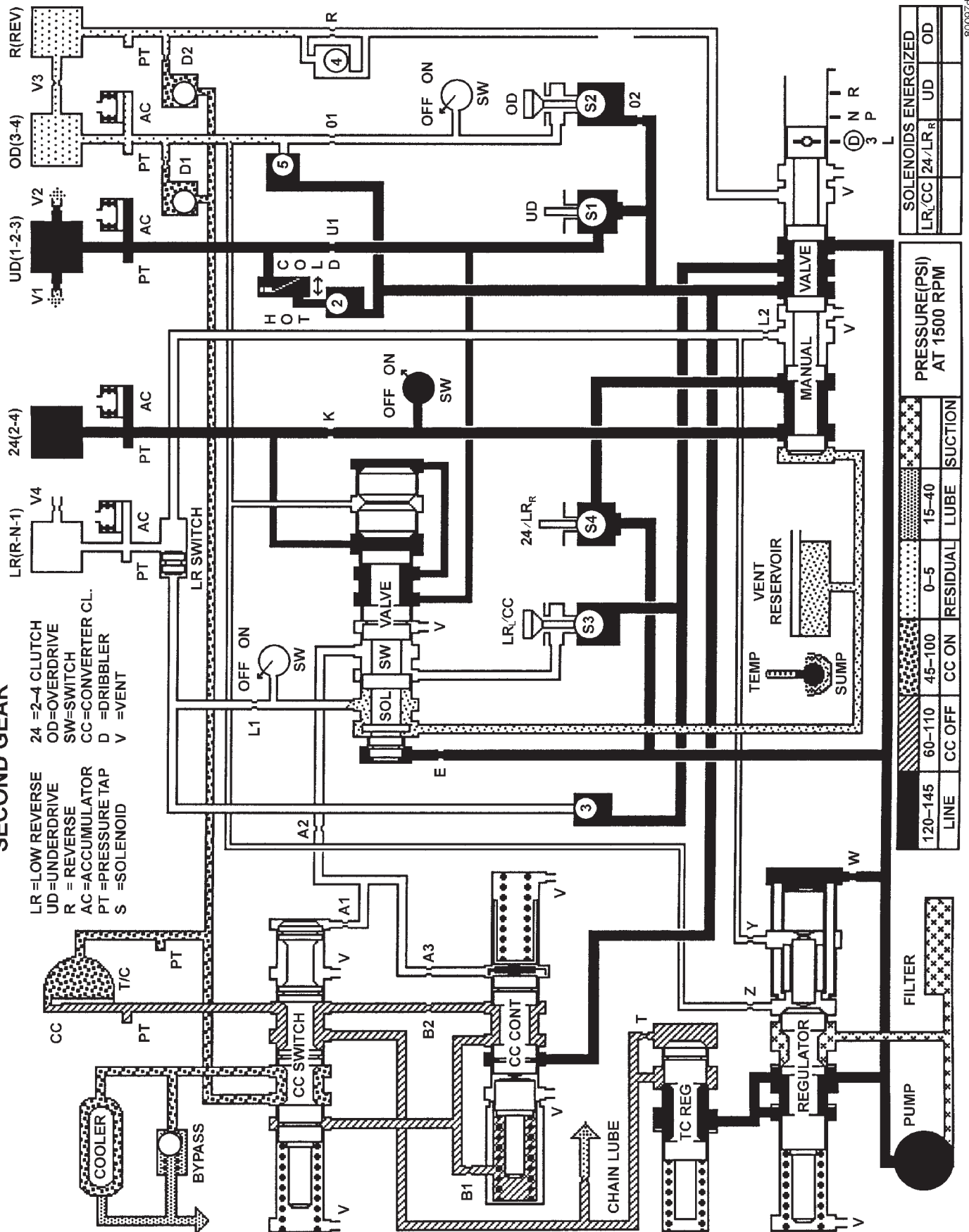
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SCHEMATICS AND DIAGRAMS (Continued)



42LE TRANSAXLE HYDRAULIC SCHEMATIC

SECOND GEAR



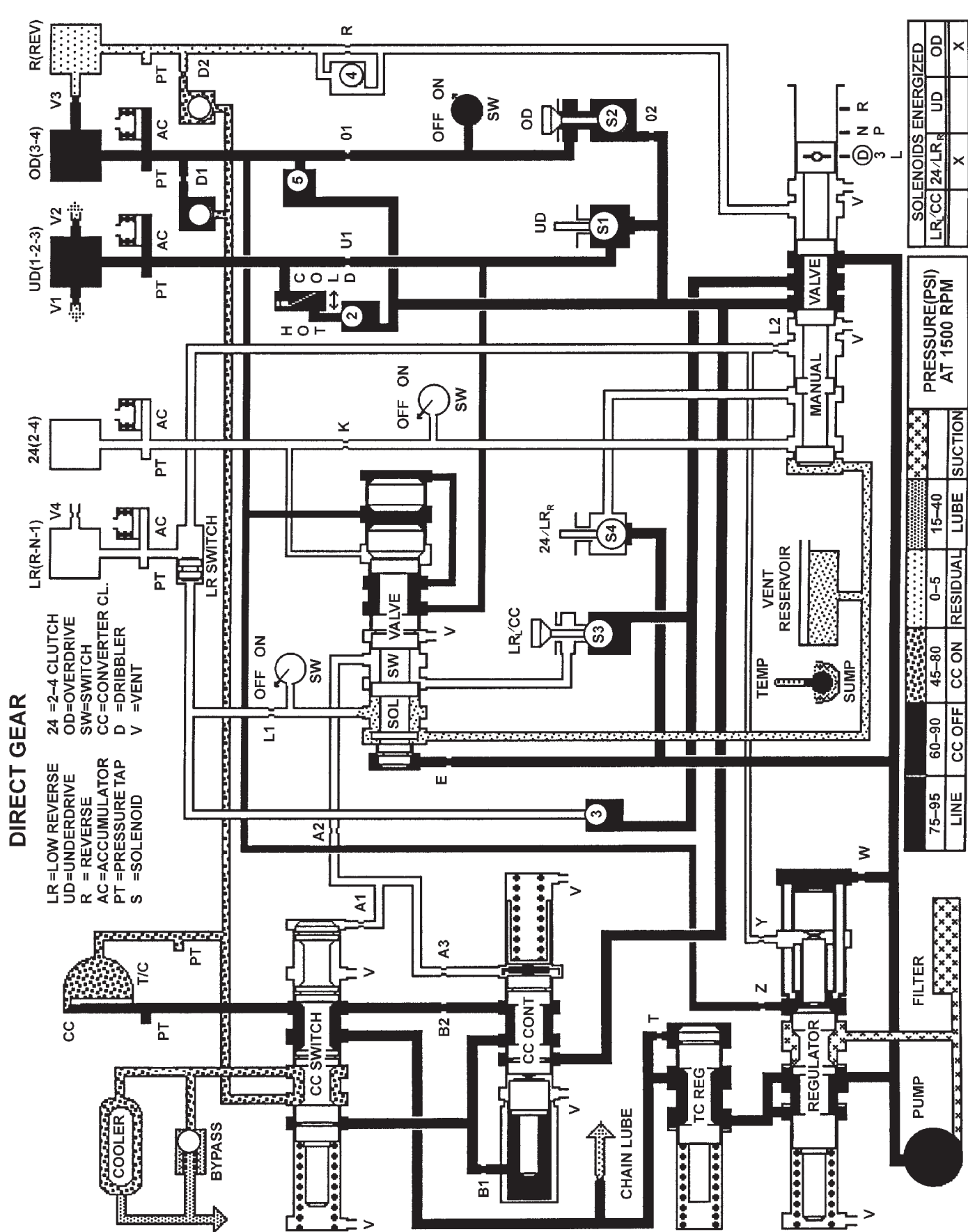
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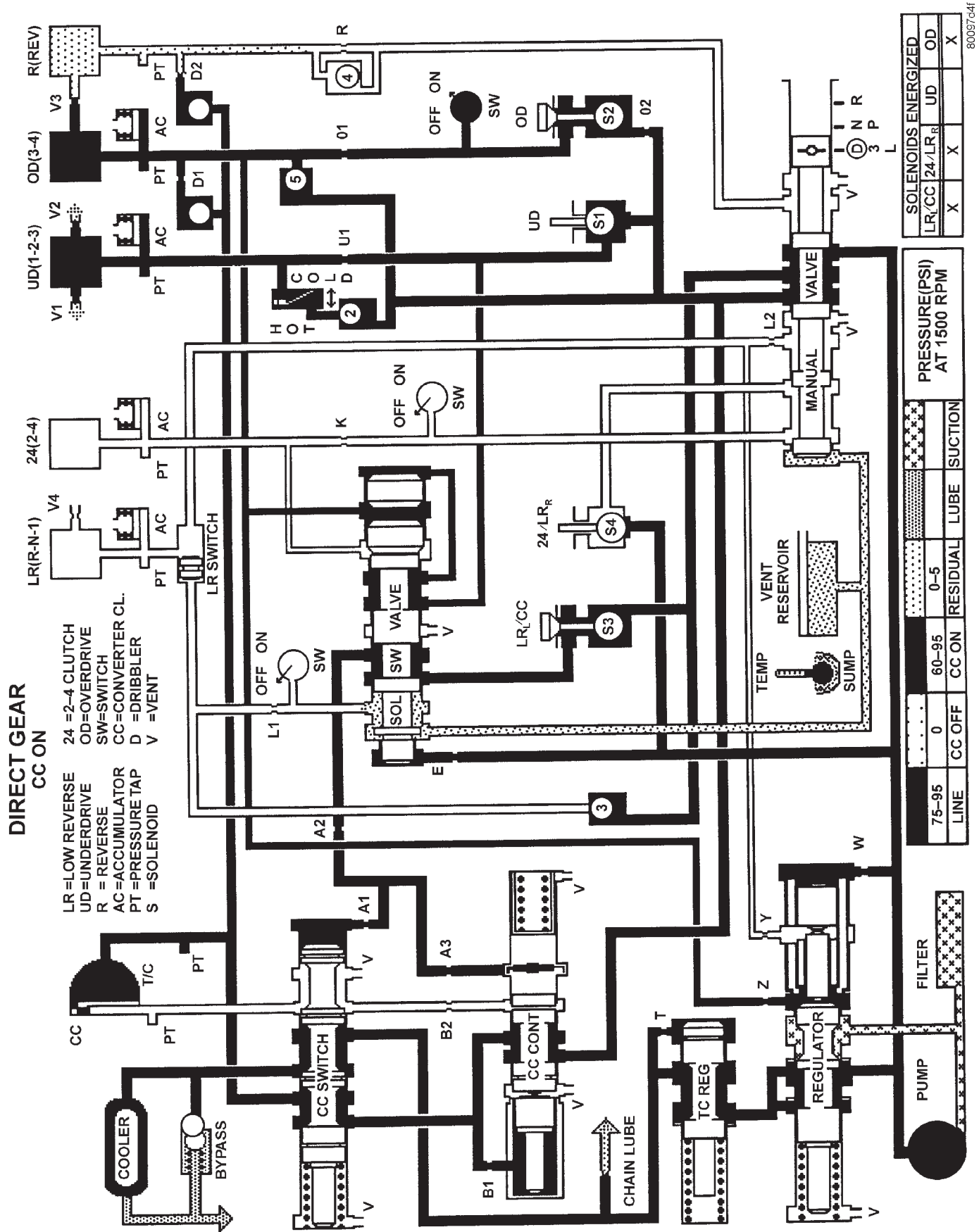
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SCHEMATICS AND DIAGRAMS (Continued)

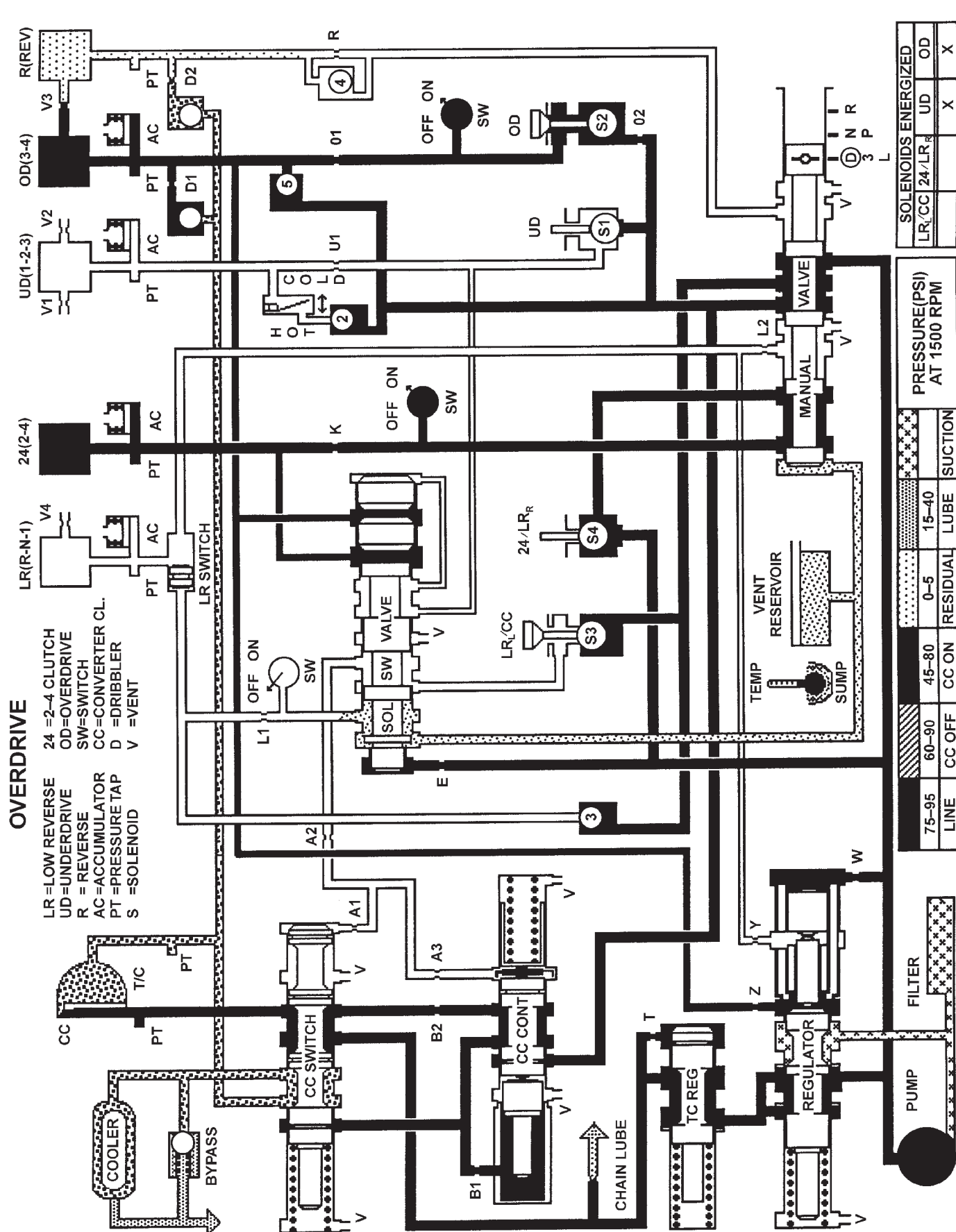


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SCHEMATICS AND DIAGRAMS (Continued)

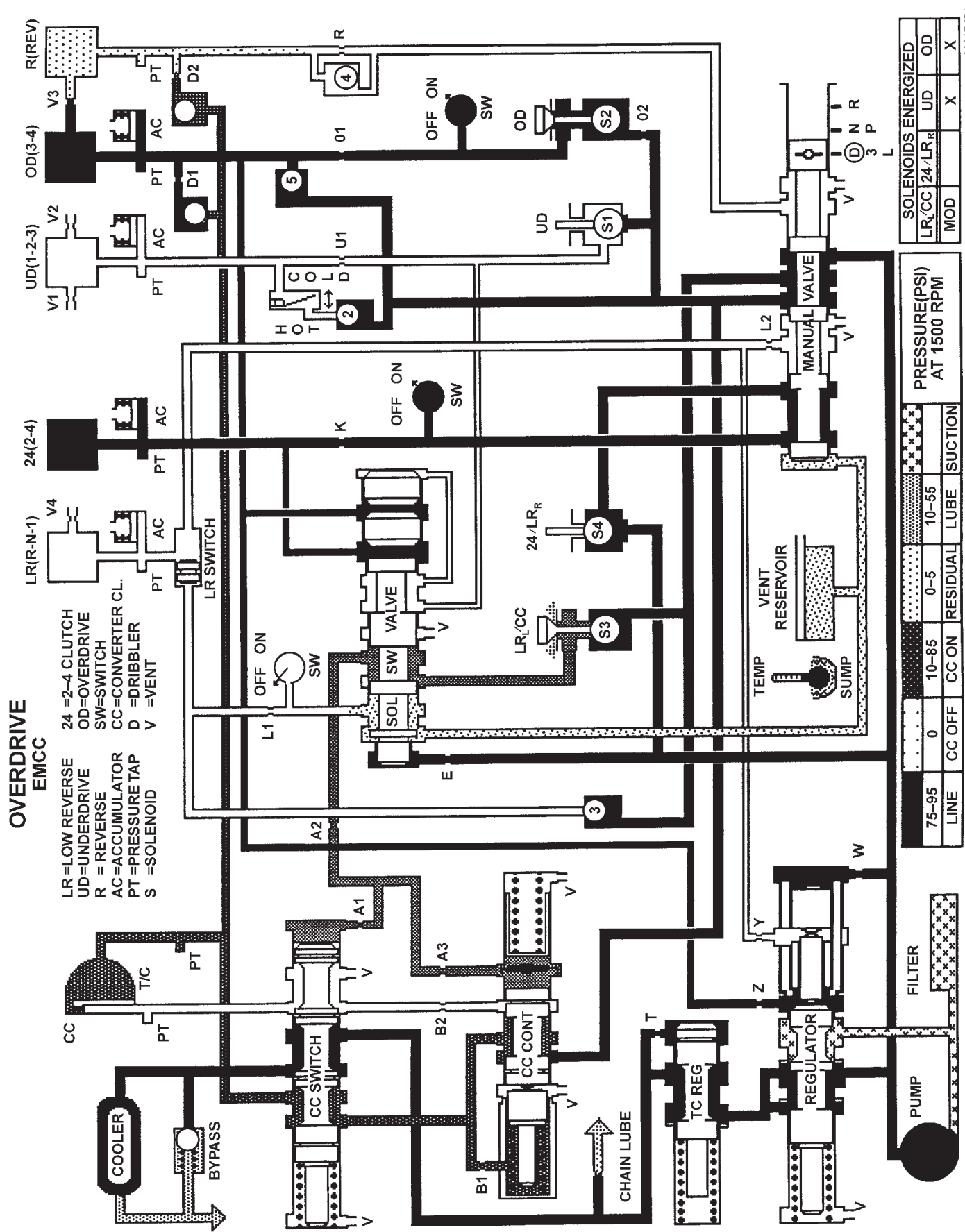


SCHEMATICS AND DIAGRAMS (Continued)



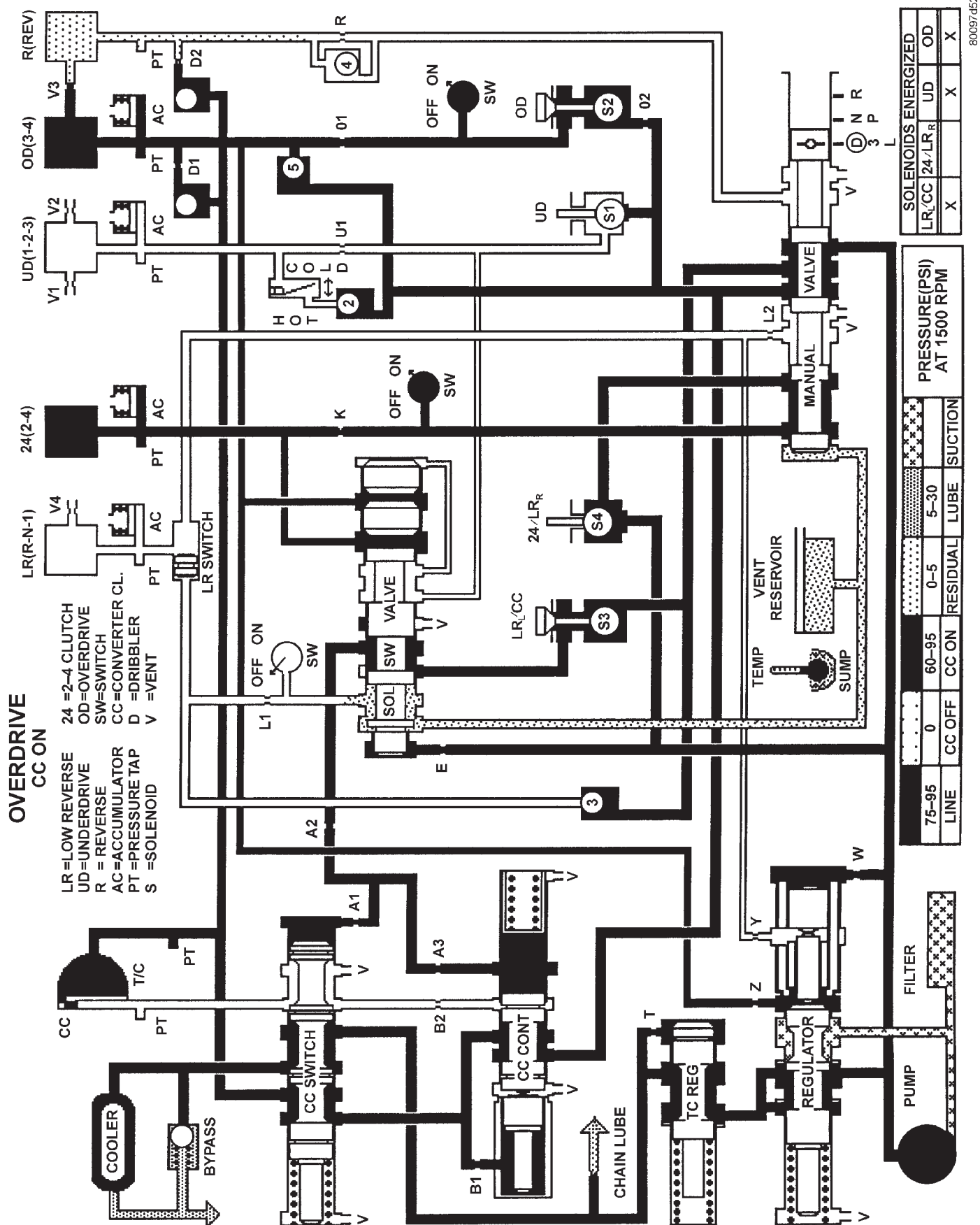
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SCHEMATICS AND DIAGRAMS (Continued)



42LE TRANSAXLE HYDRAULIC SCHEMATIC

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42LE TRANSAXLE HYDRAULICSCHEMATIC

80097d52

SPECIFICATIONS

42LE FOUR SPEED AUTOMATIC TRANSAXLE

Name	42LE	
Type	Longitudinally Mounted, Fully-Adapative, Electronically Controlled, Four Speed Automatic. Electronically Modulated Torque Converter Clutch. Separate Sump Differential.	
Torque Converter Diameter	254 mm (10 inch)	
Oil Capacity	Liters	Quarts
Transmission and Torque		
Converter Sump	9.40	9.9
Differential Sump	0.95	1.0
Oil Type		
Transmission and Torque		
Converter Sump	Mopar ATF Type 7176 <u>ONLY</u>	
Differential Sump	80W-90 Petroleum Based Hypoid Gear Lube	
Cooling Method	Water Heat Exchanger	
Lubrication	Pump (Internal-External Gear Type)	
Gear Ratios:		
Transmission Portion:		
First	2.84	
Second	1.57	
Third	1.00	
Fourth (OD)	0.69	
Reverse	2.21	
Overall Top Gear Ratio:		
(in Overdrive)	2.52	
Teeth Per Gear (Sprocket):		
Front Sun Gear	28	
Front Planetary Gear	17	
Front Annulus Gear	62	
Rear Sun Gear	38	
Rear Planetary Gear	17	
Rear Annulus Gear	70	
Output Shaft Sprocket	32	
Transfer Shaft Sprocket	33	
Transfer Shaft Pinion Head	11	
Ring Gear (Differential)	39	
Side Gear (Differential)	16	
Clutch Clearance:	Millimeters	Inch
Underdrive Clutch	0.091 to 1.47	0.036 to 0.058
Overdrive Clutch	0.965 to 2.26	0.038 to 0.089
Reverse Clutch	0.760 to 1.24	0.030 to 0.049
2/4 Clutch	0.760 to 2.64	0.030 to 0.104
Low/Reverse Clutch	1.040 to 1.65	0.042 to 0.065
Pump Clearances	Millimeters	Inch
Outer Gear to Pocket	0.045 to 0.141	.0018 to .0056
Outer Gear Side Clearance	0.020 to 0.046	.0008 to .0018
Inner Gear Side Clearance	0.020 to 0.046	0.042 to 0.065
Tapered Roller Bearing Settings:		
Output Shaft	1 to 8 in. lbs. of Turning Torque	
Transfer Shaft	6 to 12 in. lbs. of Turning Torque	
Differential	19 to 23 in. lbs. of Turning Torque	
Hypoid Gear Set (Ring and Pinion) Backlash	Millimeters	Inch
	0.152 to 0.229	0.006 to 0.009

42LE FOUR SPEED AUTOMATIC TRANSAXLE

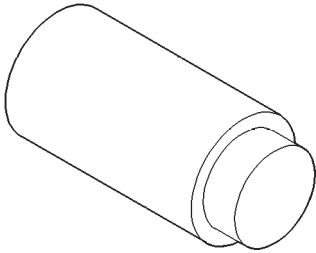
SPECIFICATIONS (Continued)

42LE TRANSAXLE TORQUE SPECIFICATIONS

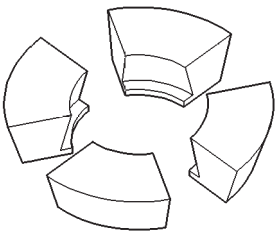
DESCRIPTION	TORQUE
Adj. Lock Bracket	5 N·m (45 in. lbs.)
Cooler Line Conn.	18 N·m (155 in. lbs.)
Diff. Ass. Partial Bolts	8 N·m (71 in. lbs.)
Diff. Cover Case	28 N·m (250 in. lbs.)
Differential Drain Plug	7 N·m (62 in. lbs.)
Differential Fill Plug	47 N·m (35 ft. lbs.)
Diff. Ring Gear Bolts	95 N·m (70 ft. lbs.)
Diff. Vent Baffle Screw	5 N·m (45 in. lbs.)
Differential Vent	11 N·m (100 in. lbs.)
Driveplate To Crank Bolts	101 N·m (75 ft. lbs.)
End Cover To Case	28 N·m (250 in. lbs.)
Fluid Filter Screw	5 N·m (45 in. lbs.)
Input Sensor To Case	27 N·m (240 in. lbs.)
Low/rev. Clutch Ret. To Case	5 N·m (45 in. lbs.)
Main Sump Vent Screw	5 N·m (45 in. lbs.)
Main Sump Vent	11 N·m (100 in. lbs.)
Man. Lev. To Valve Body	5 N·m (45 in. lbs.)
Oil Pan To Trans. Case Screw . .	23 N·m (17 ft. lbs.)
Output Sensor To Case	27 N·m (240 in. lbs.)
Output Shaft Nut	271 N·m (200 ft. lbs.)
Park Sprag Ret. Screw	5 N·m (45 in. lbs.)
Pressure Check Plug	6 N·m (53 in. lbs.)
Pump To Case Bolts	29 N·m (250 in. lbs.)
React. Shaft Ass. Bolt	14 N·m (125 in. lbs.)
Snubber Screws	5 N·m (45 in. lbs.)
Sol. Ass. To Transfer Plate	6 N·m (53 in. lbs.)
Solenoid Wiring Conn. Ret.	6 N·m (53 in. lbs.)
Torque Conv. To Driveplate	81 N·m (60 ft. lbs.)
Transfer Shaft Stake Nuts . . .	271 N·m (200 ft. lbs.)
Valve Body Assy	12 N·m (105 in. lbs.)
Valve Body Screw	5 N·m (45 in. lbs.)
Wiring Harn. Tie Down	6 N·m (53 in. lbs.)

SPECIAL TOOLS

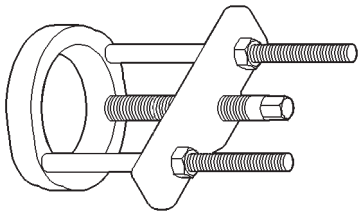
42LE AUTOMATIC TRANSAXLE



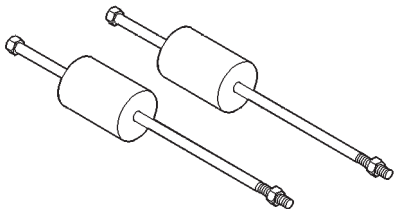
Puller Press Extension C-293-3



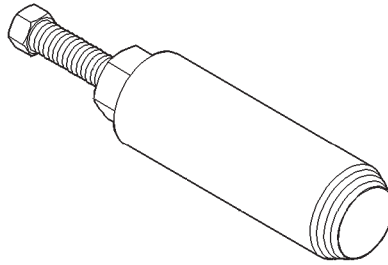
Adapter Blocks C-293-48



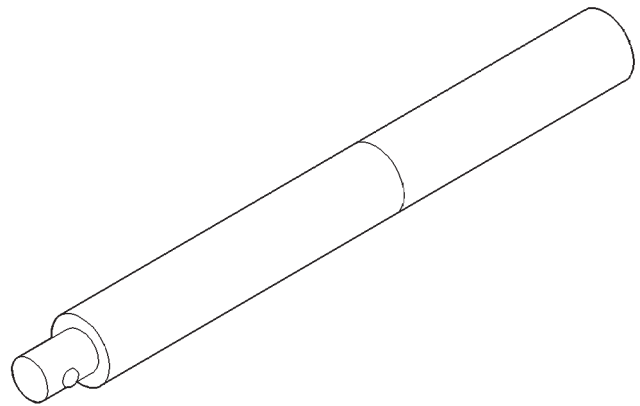
Puller Press C-293-PA



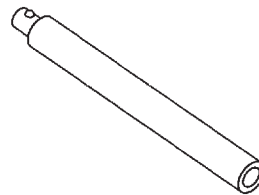
Slide Hammer C-3752



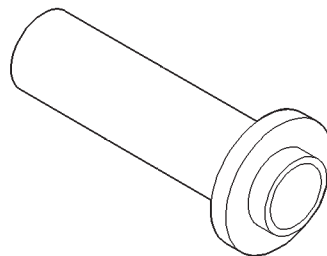
Seal Puller C-3981B



Universal Handle C-4171

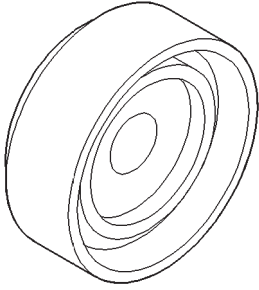


Handle Extension C-4171-2

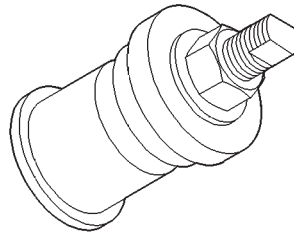


Seal Installer C-4193A

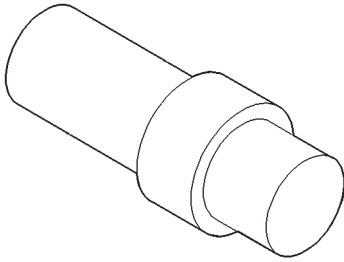
SPECIAL TOOLS (Continued)



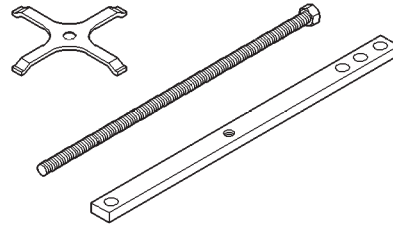
Installer C-4340



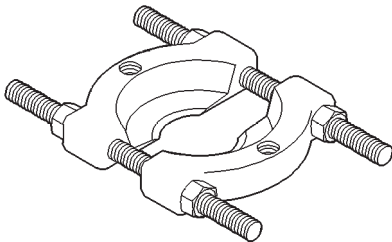
Installer 5050A



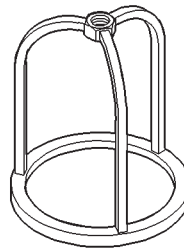
Adapter C-4996



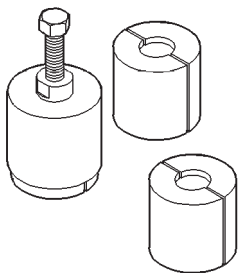
Compressor 5058A



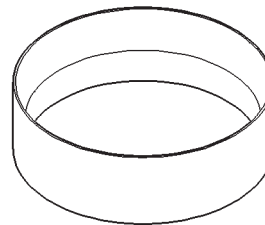
Bearing Splitter P-334



Compressor 5059-A

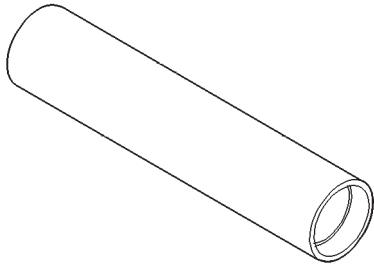


Puller Set 5048

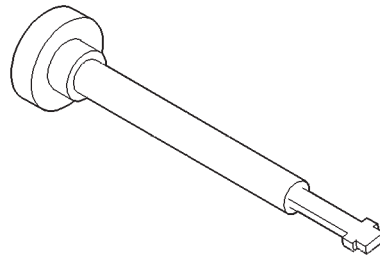


Installer 5067

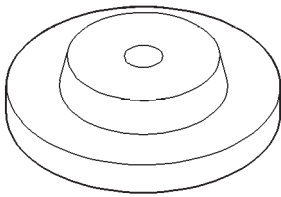
SPECIAL TOOLS (Continued)



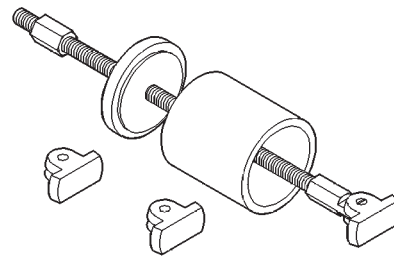
Installer 6052



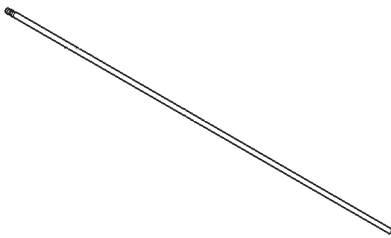
Remover/Installer 6302



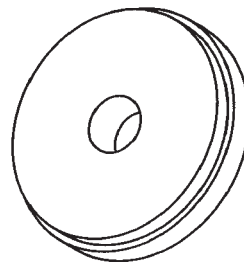
Disk 6057



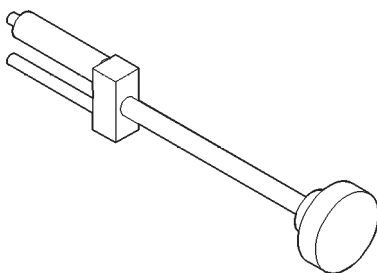
Remover 6310



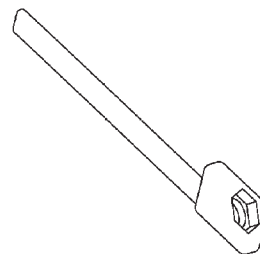
Tip 6268



Remover 6495

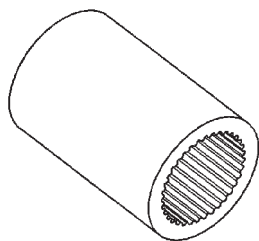


Remover/Installer 6301

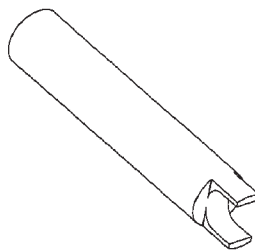


Wrench 6497

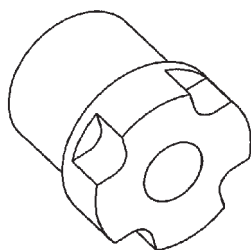
SPECIAL TOOLS (Continued)



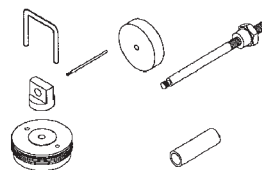
Wrench 6498



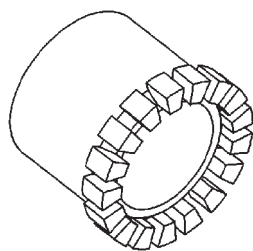
Turning Fork 6548



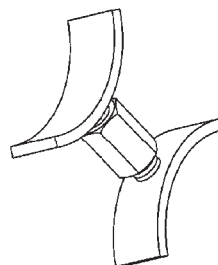
Remover 6502B



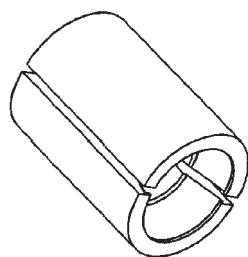
Pinion Gauge Tool Set 6549



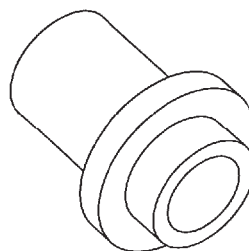
Wrench 6503



Remover 6550

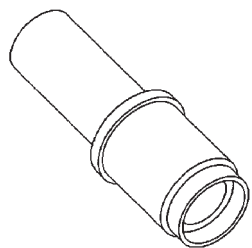


Puller Jaws 6545

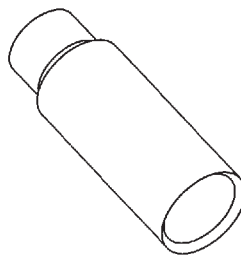


Installer 6560

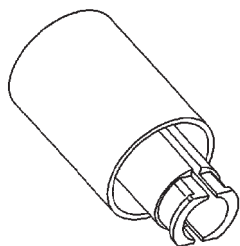
SPECIAL TOOLS (Continued)



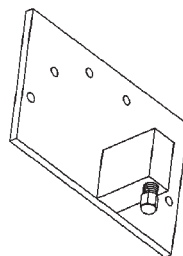
Seal Installer 6567A



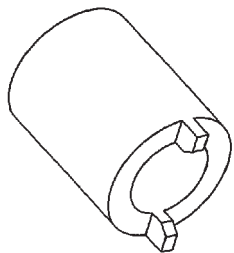
Seal Protector 6592



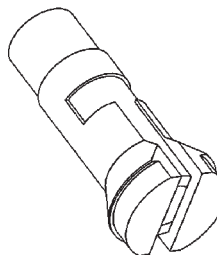
Remover 6577



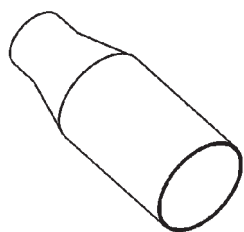
Fixture 6595



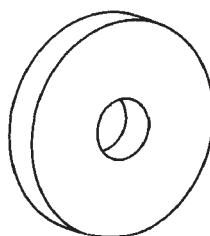
Staking Tool 6589



Remover 6596



Seal Protector 6591



Remover 6597

SPECIAL TOOLS (Continued)

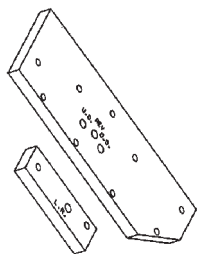
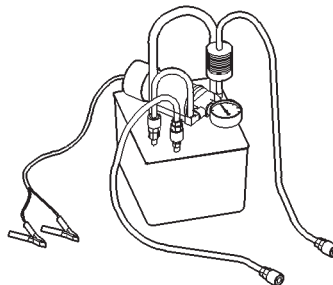
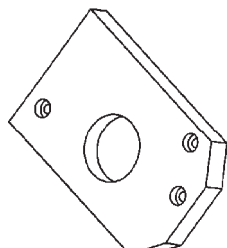


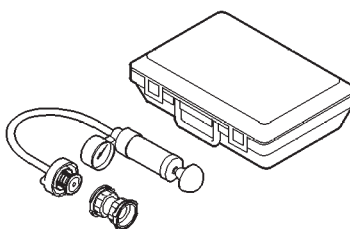
Plate Set 6599



Cooler Flusher 6906

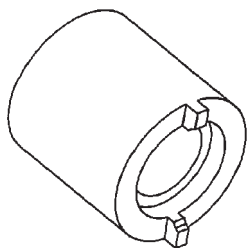


Support Plate 6618A

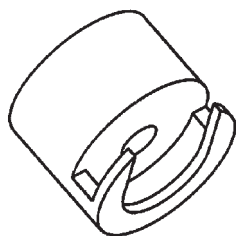


7700-8011c9c4

Cooling System Tester 7700



Staking Tool 6639



Remover 6669

