

TRANSAXLE

NV T350 (A-578) MANUAL TRANSAXLE

TABLE OF CONTENTS

	page		page
DESCRIPTION AND OPERATION		SHIFT SHAFT SEALS	8
NV T350 MANUAL TRANSAXLE	1	MANUAL TRANSAXLE	8
GEARSHIFT LEVERS	3	DISASSEMBLY AND ASSEMBLY	
AXLE SEALS	3	TRANSAXLE	12
DIAGNOSIS AND TESTING		INPUT SHAFT	24
COMMON PROBLEM CAUSES	3	OUTPUT SHAFT	28
HARD SHIFTING	3	DIFFERENTIAL	29
NOISY OPERATION	3	SYNCHRONIZER	35
SLIPS OUT OF GEAR	3	SHIFT RAILS OVERHAUL	35
LOW LUBRICANT LEVEL	3	TRANSAXLE CASE OVERHAUL	36
CLUTCH PROBLEMS	4	CLEANING AND INSPECTION	
SERVICE PROCEDURES		TRANSAXLE	42
FLUID DRAIN AND FILL	4	SYNCHRONIZER	42
REMOVAL AND INSTALLATION		ADJUSTMENTS	
GEARSHIFT KNOB	4	GEARSHIFT CROSSOVER CABLE	
GEARSHIFT BOOT	5	ADJUSTMENT	42
GEARSHIFT CABLES	5	BEARING ADJUSTMENT PROCEDURE	42
GEARSHIFT MECHANISM REPLACEMENT	6	DIFFERENTIAL BEARING PRELOAD	
VEHICLE SPEED SENSOR DRIVE GEAR	6	ADJUSTMENT	43
BACK-UP LAMP SWITCH	7	SPECIFICATIONS	
CROSSOVER LEVER	7	NV T350 (A-578)	44
SELECTOR LEVER	8	SPECIAL TOOLS	
AXLE SEALS	8	NV T350 (A-578) MANUAL TRANSAXLE	44

DESCRIPTION AND OPERATION

NV T350 MANUAL TRANSAXLE

DESCRIPTION

This five speed is a constant-mesh manual transaxle. All gear ranges, except reverse, are synchronized. The reverse gear utilizes a brake and blocking ring for shifting ease. The reverse idler gear is supported on a sliding spindle idler shaft. The transaxle case is aluminum with a steel end-plate bearing cover. It is housed in a die-cast aluminum case featuring a two-piece, middle split design (Fig. 1).

The NV T350 (A-578) transaxle internal components can be serviced only by separating the gear case from the bellhousing case.

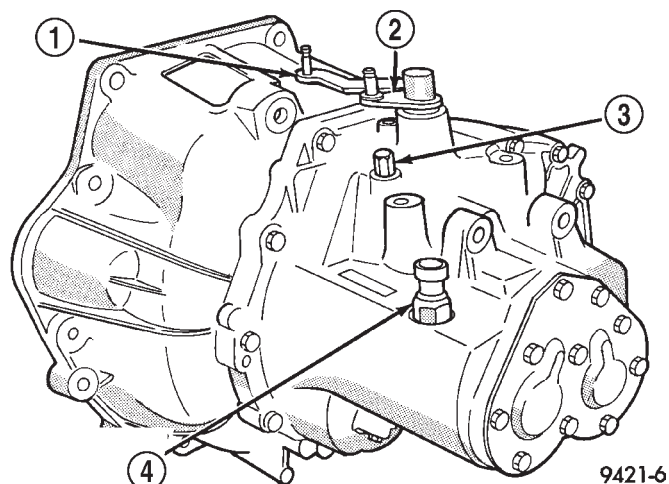
CAUTION: The transaxle output shaft is serviced as a unit. No disassembly and reassembly is possible. Damage to the transaxle may result.

TRANSAXLE IDENTIFICATION

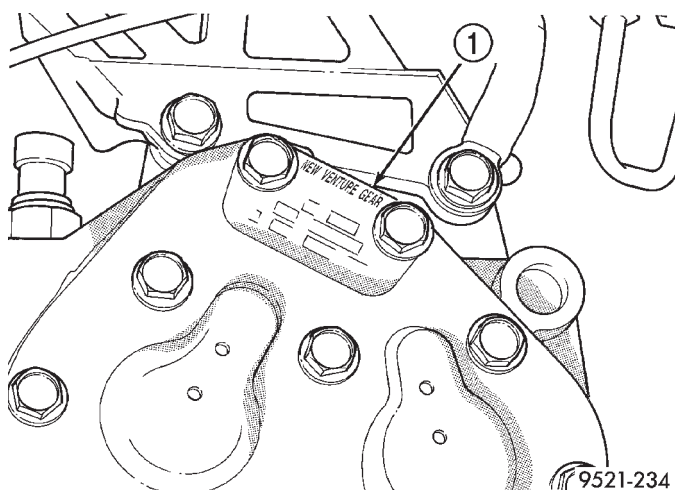
The transaxle model, assembly number, and build date are on a metal I. D. tag that is attached to the end cover of the transaxle (Fig. 2). This information is also shown on a bar code label that is attached to the front of the transaxle (Fig. 3).

NOTE: Transaxles use various final drive gear ratios in different vehicle applications. Therefore, it is necessary that the correct transaxle assembly number is used when ordering service parts.

DESCRIPTION AND OPERATION (Continued)

**Fig. 1 External Transaxle Components**

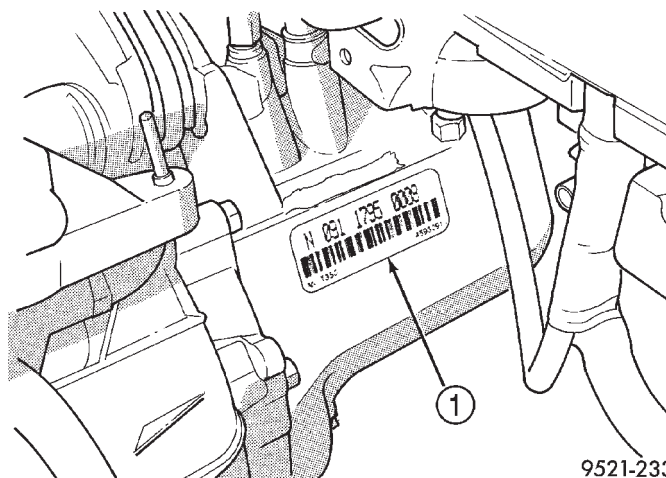
- 1 - SHIFT LEVER
- 2 - CROSSOVER LEVER
- 3 - VENT
- 4 - REVERSE LAMP SWITCH

**Fig. 2 Metal I. D. Tag**

- 1 - METAL I. D. TAG

The last eight digits of the Vehicle Identification Number (V. I. N.) are stamped on the case, below the back-up lamp switch.

NOTE: There are four different versions of this transaxle. There are no external differences between the models. Refer to the identification tag on the transaxle to determine which transaxle the vehicle is equipped with.

**Fig. 3 Bar Code Label**

- 1 - BAR CODE LABEL

GEAR RATIOS

CAUTION: All gears and shafts must not be interchanged with other transaxles; they will not function correctly.

The differential is a conventional arrangement of gears that is supported by tapered roller bearings. The final output gear turns the ring gear and differential assembly, thereby turning the drive axle shafts.

All JA transaxles have a torque capacity of 136 lb. ft. The gear ratios of each transaxle are shown in the following chart. The chart also shows which transaxles are available with the reverse-input shaft brake. This brake allows easier shifting into reverse and helps eliminate reverse gear clash.

GEAR	STANDARD TRANS	HEAVY DUTY TRANS
1st	3.50	3.50
2nd	1.95	1.95
3rd	1.36	1.36
4th	0.97	0.97
5th	0.72	0.81
FINAL DRIVE	3.94	3.94
REVERSE BRAKE	YES	YES
CLUTCH RELEASE SYSTEM	CABLE	CABLE

DESCRIPTION AND OPERATION (Continued)

GEARSHIFT PATTERN

The NV T350 (A-578) transaxle shift pattern is a modified H-pattern (Fig. 4). Overdrive fifth and reverse gears are in-line and outboard of the first through fourth gear positions.

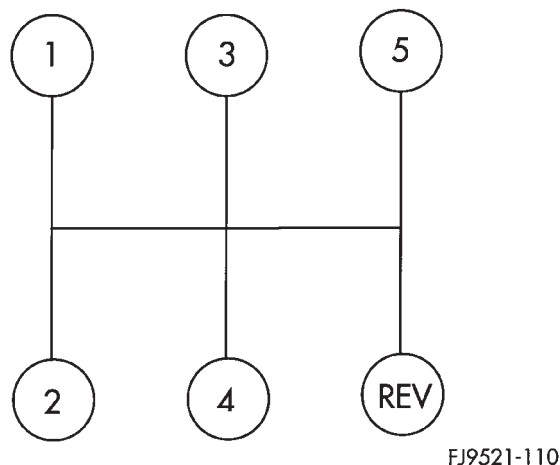


Fig. 4 NV T350 (A-578) Shift Pattern

LUBRICANT/ADDITIVES

NV T350 (A-578) transaxles use Mopar® Type M. S. 9417 Manual Transaxle Fluid. **Hypoid gear lube, engine oil, and/or automatic transmission fluid should not be used in this transaxle.** Hard shifting effort, bearing, gear, and/or synchronizer failure may occur if incorrect fluid is used.

The addition of any fluids to the transaxle, other than the fluid listed above, is not recommended. 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.

SEALANTS

The sealant used to seal the transaxle case halves and input bearing is Mopar® Gasket Maker, Loctite® 518, or equivalent. The sealant used for the bearing end plate cover is Mopar® RTV.

GEARSHIFT LEVERS

DESCRIPTION

The shift levers are serviceable in the vehicle. The shift levers are different from each other and do not interchange.

AXLE SEALS

DESCRIPTION

The axle shaft seals are identical for both sides of the differential and will interchange.

DIAGNOSIS AND TESTING

COMMON PROBLEM CAUSES

The majority of transaxle malfunctions are a result of:

- Insufficient lubrication
- Incorrect lubricant
- Misassembled or damaged internal components
- Improper operation

HARD SHIFTING

Hard shifting may be caused by a misadjusted crossover cable. If hard shifting is accompanied by gear clash, synchronizer clutch and stop rings or gear teeth may be worn or damaged.

Misassembled synchronizer components also cause shifting problems. Incorrectly installed synchronizer sleeves, struts, or springs can cause shift problems.

NOISY OPERATION

Transaxle noise is most often a result of worn or damaged components. Chipped, broken gear or synchronizer teeth, and brinnelled, spalled bearings all cause noise.

Abnormal wear and damage to the internal components is frequently the end result of insufficient lubricant.

SLIPS OUT OF GEAR

Transaxle disengagement may be caused by misaligned or damaged shift components, or worn teeth on the drive gears or synchronizer components. Incorrect assembly also causes gear disengagement.

LOW LUBRICANT LEVEL

Insufficient transaxle lubricant is usually the result of leaks, or inaccurate fluid level check or refill method. Leakage is evident by the presence of oil around the leak point. If leakage is not evident, the condition is probably the result of an underfill.

If air-powered lubrication equipment is used to fill a transaxle, be sure the equipment is properly calibrated. Equipment out of calibration can lead to an underfill condition.

DIAGNOSIS AND TESTING (Continued)

CLUTCH PROBLEMS

Worn, damaged, or misaligned clutch components can cause difficult shifting, gear clash, and noise.

A worn or damaged clutch disc, pressure plate, or release bearing can cause hard shifting and gear clash.

SERVICE PROCEDURES**FLUID DRAIN AND FILL**

All NV T350 (A-578) transaxles are equipped with a fill plug. The fill plug is located on the left side of the transaxle differential area (Fig. 5). The fluid level should be within 3/16 inch from the bottom of the transaxle fill hole (vehicle must be level when checking).

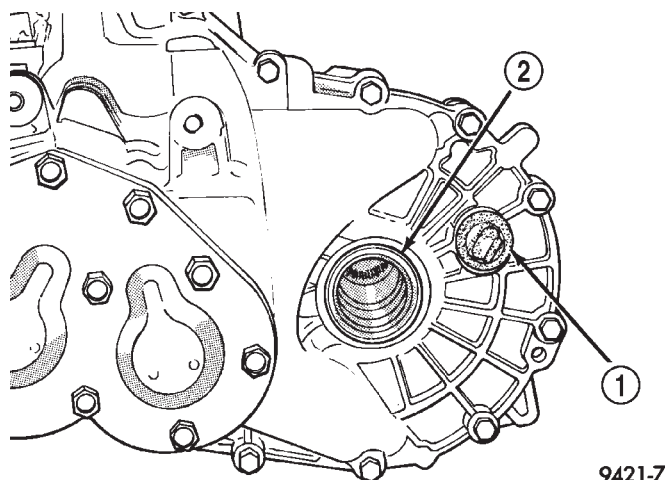


Fig. 5 Fill Plug Location

- 1 - RUBBER FILL PLUG
2 - LEFT DRIVESHAFT SEAL

All NV T350 (A-578) transaxles are equipped with a drain plug. The drain plug is located on the lower right side of the transaxle differential housing (Fig. 6). Tighten drain plug to 28 N·m (250 in. lbs.)

Fill transaxle to capacity. Refer to following chart. Wipe the outside of the transaxle if any lubricant spills.

REMOVAL AND INSTALLATION**GEARSHIFT KNOB****REMOVAL**

(1) Pull shifter boot down and away from shifter roll pin.

(2) Pry legs of shift knob away from shift lever roll pin using a flat blade pry tool (Fig. 7).

(3) Remove knob from shifter handle (Fig. 8).

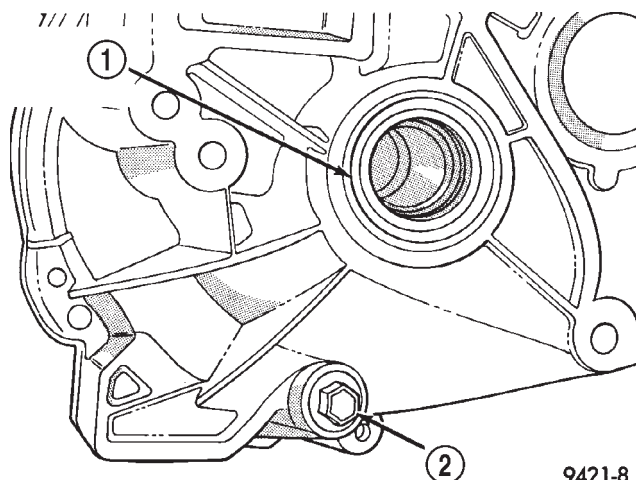


Fig. 6 Drain Plug Location

- 1 - RIGHT DRIVESHAFT SEAL
2 - DRAIN PLUG

NV T350 (A-578) MANUAL TRANSAXLE FLUID FILL

TRANSAXLE	METRIC MEASURE	U. S. MEASURE
NV T350	1.9-2.2 Liters	2.0-2.3 Quarts
NV T350HD	2.4-2.7 Liters	2.5-2.8 Quarts

NOTE: Two 5 speed transaxles are available. Refer to capacity label on case near left driveshaft for identification.

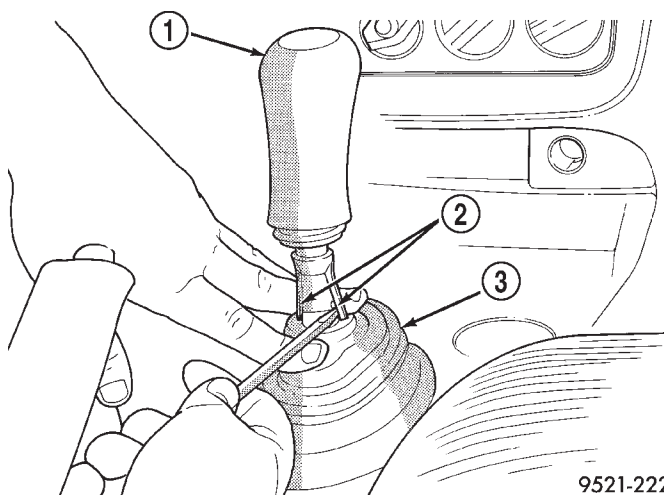


Fig. 7 Gearshift Knob

- 1 - KNOB
2 - CLIPS
3 - BOOT

REMOVAL AND INSTALLATION (Continued)

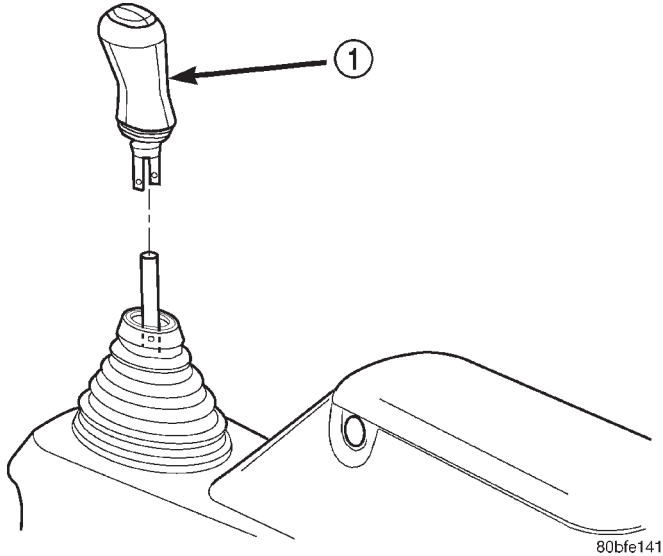


Fig. 8 Shifter Knob Removal/Installation

1 – SHIFTER KNOB

INSTALLATION

(1) Install shifter knob to shifter mechanism until legs snap over roll pin.

(2) Pull shifter boot up to seat around shifter knob.

GEARSHIFT BOOT

REMOVAL

(1) Remove shifter knob. Refer to gearshift knob removal and installation.

(2) Remove shifter boot/bezel assembly from console. (Fig. 9).

INSTALLATION

(1) Install boot/bezel assembly to console. Apply hand pressure until retaining clips are seated to the console assembly.

(2) Install shifter knob. Refer to gearshift knob removal and installation.

GEARSHIFT CABLES

REMOVAL

(1) Disconnect battery negative cable at shock tower.

(2) Remove air cleaner assembly.

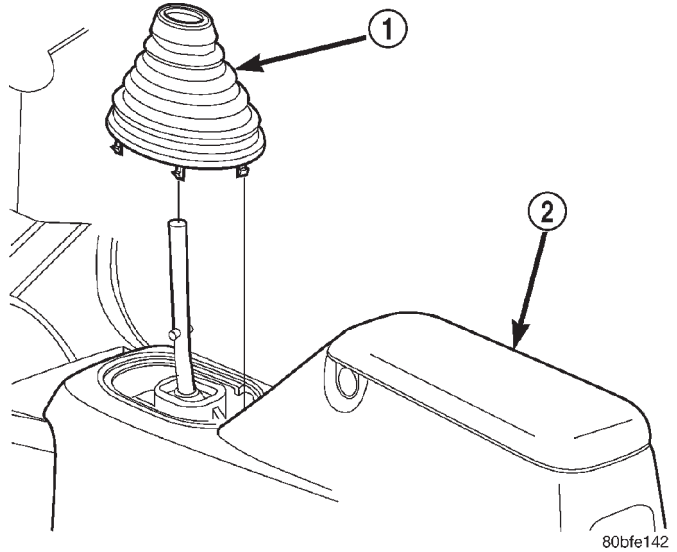


Fig. 9 Boot Removal

1 – SHIFTER BOOT/BEZEL
2 – CONSOLE

(3) Disconnect gear shift cable ends from transaxle shift levers (Fig. 10).

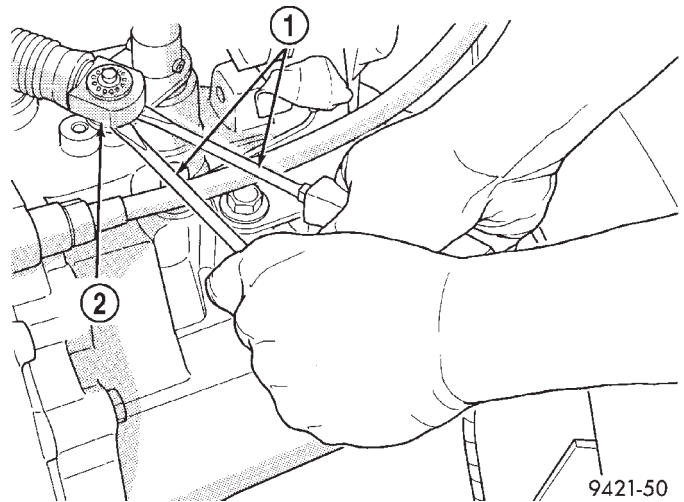


Fig. 10 Shift Cable Removal

1 – SCREWDRIVERS
2 – SHIFT CABLE

CAUTION: Pry up with equal force on both sides of shifter cable isolator bushings to avoid damaging cable isolator bushings.

REMOVAL AND INSTALLATION (Continued)

(4) Remove cable to bracket retaining clips at transaxle.

CAUTION: It is recommended that new cable retaining clips be used for reinstallation.

- (5) Pull cables up out of transaxle bracket.
- (6) Remove gearshift knob and boot. Refer to Knob and Boot Removal in this section.
- (7) Remove forward and rear console assemblies. Refer to Group 23, Body for the proper procedures.
- (8) Remove floor pan grommet from floor pan.
- (9) Remove cable retaining clips at shifter (Fig. 11).

CAUTION: It is recommended that new cable retaining clips be used for reinstallation.

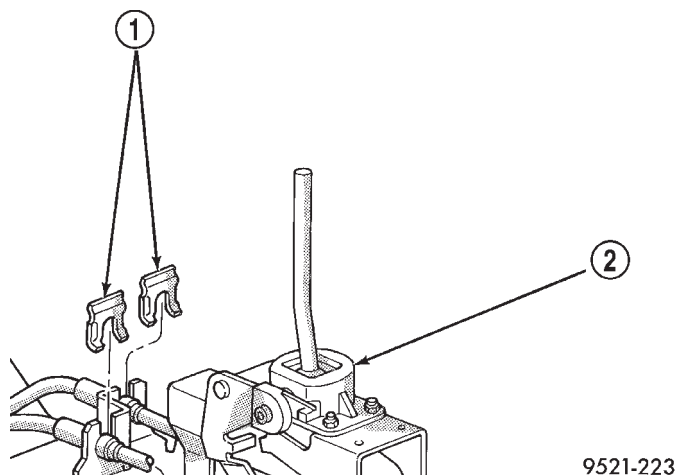


Fig. 11 Cable Retaining Clips

- 1 - CABLE CLIPS
2 - SHIFTER

(10) Disconnect shift cables from shifter. Pry with equal force on both sides of shifter cable isolator bushings to avoid damaging bushings.

(11) Lift vehicle on hoist. Pry shift cable grommet from floor pan.

(12) Detach cables from cable support clips.

(13) Remove shift cables from vehicle.

INSTALLATION

(1) To install, reverse removal procedure. After cables have been replaced, cable adjustment should be checked. Refer to cable adjustment procedure in this section.

CAUTION: Gearshift cable bushings must not be lubricated or the bushings will swell and split.

CAUTION: Only the crossover cable is adjustable. The selector cable does not have any adjustment capabilities.

GEARSHIFT MECHANISM REPLACEMENT

REMOVAL

(1) Remove shifter knob and boot. refer to Shifter Knob And Boot Removal procedure in this section.

(2) Remove forward and rear console assemblies. Refer to Group 23, Body for the proper procedures.

(3) Disconnect gearshift cables at shifter end. Refer to Gearshift Cable Removal in this section

(4) Remove retaining nuts at the base of the gearshift mechanism (Fig. 12). Remove shifter.

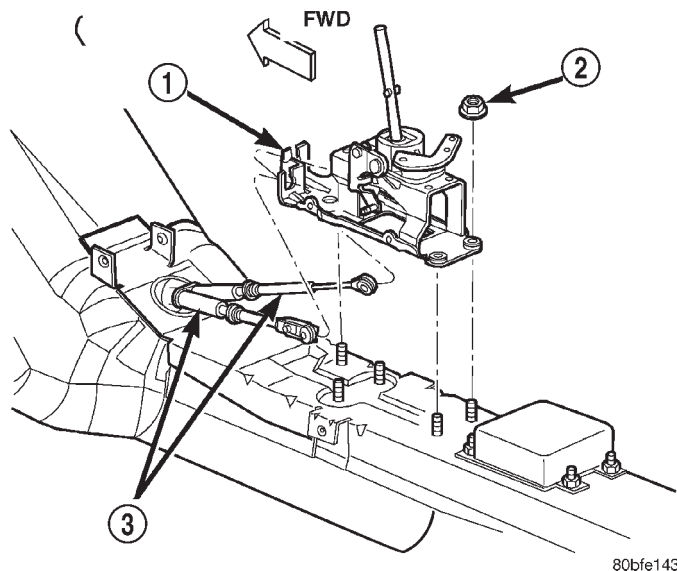


Fig. 12 Gearshift Mechanism

- 1 - GEARSHIFT MECHANISM
2 - NUT (5)
3 - GEARSHIFT CABLES

INSTALLATION

(1) For installation, reverse removal procedure.

(2) Torque gearshift mechanism nuts to 17 N·m (150 in. lbs.).

VEHICLE SPEED SENSOR DRIVE GEAR

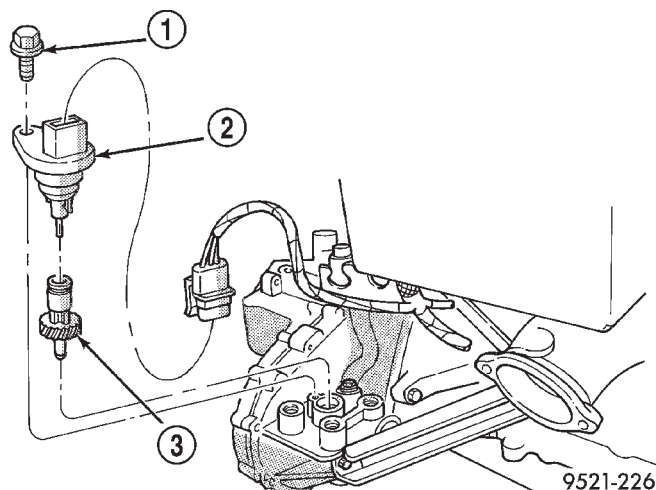
REMOVAL

(1) Raise vehicle on hoist.

(2) Remove wiring connector from speed sensor (Fig. 13).

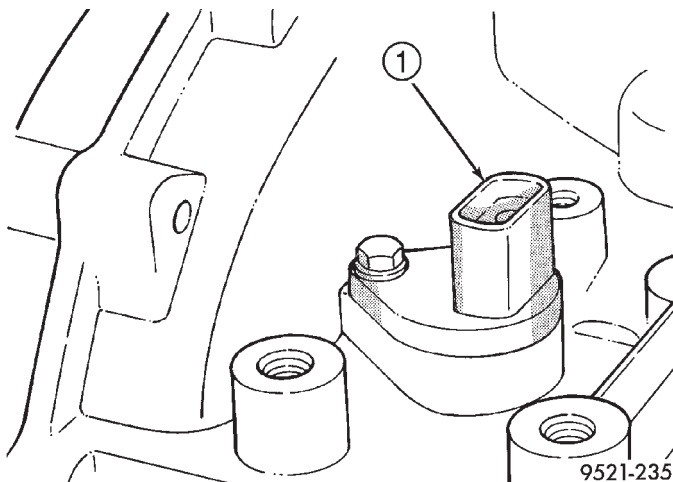
CAUTION: Clean area around speed sensor before removing. This will prevent the possibility of dirt from entering the transaxle during speed sensor removal.

REMOVAL AND INSTALLATION (Continued)

**Fig. 13 Vehicle Speed Sensor**

- 1 - RETAINING BOLT
- 2 - VEHICLE SPEED SENSOR
- 3 - SPEED SENSOR PINION

(3) Remove speed sensor retaining bolt (Fig. 14).

**Fig. 14 Vehicle Speed Sensor Retaining Bolt**

- 1 - VEHICLE SPEED SENSOR

(4) Remove speed sensor from transaxle.

CAUTION: Carefully remove vehicle speed sensor so that sensor drive gear does not fall into transaxle. Should sensor drive gear fall into the transaxle during sensor removal, drive gear must be reattached to sensor.

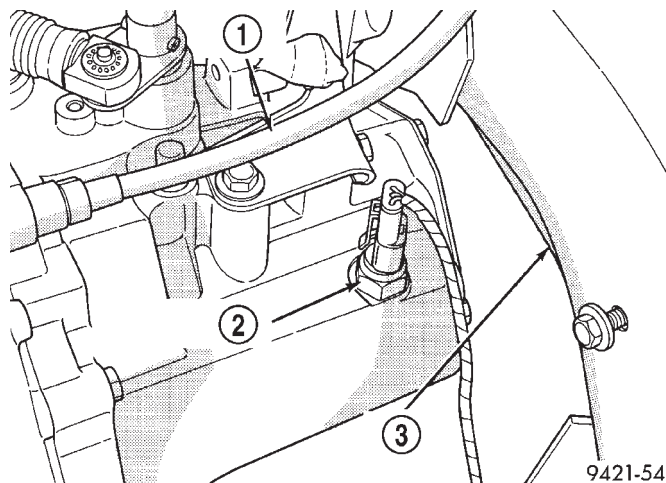
(5) Remove speed sensor drive gear from speed sensor.

INSTALLATION

- (1) To install, reverse removal procedure.
- (2) Confirm vehicle speedometer is functioning properly following installation.

BACK-UP LAMP SWITCH

The back-up lamp switch is located on the top left front side of the transaxle case (Fig. 15).

**Fig. 15 Back-up Lamp Switch**

- 1 - CLUTCH CABLE
- 2 - BACK-UP LAMP SWITCH
- 3 - LEFT FRAME RAIL

REMOVAL

- (1) Lift vehicle on hoist.
- (2) From bottom side of vehicle, remove wiring connector from switch.
- (3) Unscrew switch from transaxle.

INSTALLATION

(1) To install, reverse removal procedure. Teflon tape or equivalent must be used on switch threads.

CAUTION: Do not overtighten switch.

(2) Confirm back-up lamps are functioning properly following installation.

CROSSOVER LEVER**REMOVAL**

- (1) Remove crossover cable. Refer to Gearshift Cable removal.
- (2) Using a pin punch, remove the crossover roll pin from lever.
- (3) Pull up and remove the crossover lever from the transaxle crossover shaft.

INSTALLATION

(1) For installation, reverse removal procedure. Replace the roll pin that was removed with a new one.

REMOVAL AND INSTALLATION (Continued)

SELECTOR LEVER**REMOVAL**

- (1) Remove the selector cable. Refer to Gearshift Cable removal.
- (2) Using a pin punch, remove the roll pin from the lever.
- (3) Pull up and remove the selector lever from the transaxle selector shaft

INSTALLATION

- (1) For installation, reverse removal procedure. Replace the roll pin with a new one.

AXLE SEALS

The axle shaft seals are identical for both sides of the differential and will interchange.

REMOVAL

- (1) Remove axle shaft. Refer to Group 2, Suspension and Driveshafts for service procedures.
- (2) Insert a flat-blade pry tool at outer edge of axle shaft seal (Fig. 16).
- (3) Tap on the pry tool with a small hammer and remove axle shaft seal.

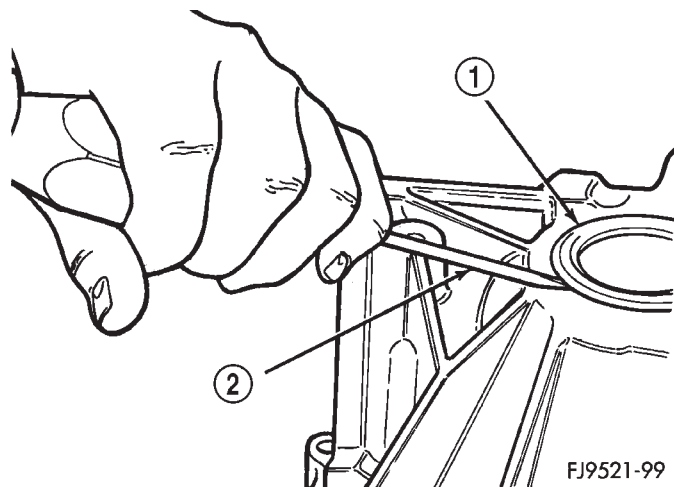


Fig. 16 Axle Shaft Seal Removal

- 1 - AXLE SEAL
2 - PRY TOOL

INSTALLATION

- (1) Clean axle shaft seal bore of any excess sealant.
- (2) Align axle shaft seal with axle shaft seal bore.
- (3) Install axle seal on tool #6709 and C-4171 and insert into axle shaft seal bore.
- (4) Tap seal into position.

SHIFT SHAFT SEALS

It is **not** necessary to remove the shift shafts from the transaxle to service the shift shaft seals.

REMOVAL

- (1) Using a pick tool, pry up on the shift shaft seal and remove seal from bore.

INSTALLATION

- (1) Position new shift shaft seal in bore.
- (2) Install shift shaft seal into bore using an appropriate size deep-well socket.

MANUAL TRANSAXLE**REMOVAL**

- (1) Disconnect the negative battery cable at the remote terminal, located on the left strut tower.
- (2) Disconnect the breather hose from the air intake hose.
- (3) Unclip the air filter cover and remove the air intake hose from the throttle body. Remove the assembly from the vehicle.
- (4)
- (5) Remove the accelerator and speed control cables cover.
- (6) Disconnect the accelerator and speed control cables from the throttle body.
- (7) Remove the (2) accelerator cable bracket retaining bolts from the throttle body (Fig. 17). Position the bracket and cable assembly out of the way.

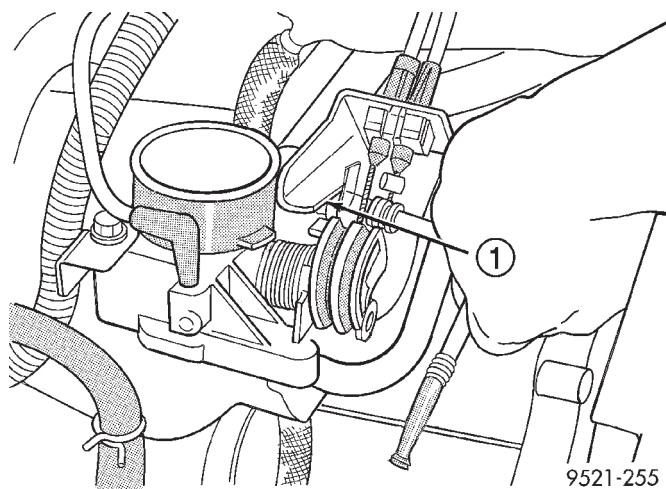


Fig. 17 Accelerator Cable Bracket

- 1 - ACCELERATOR CABLE BRACKET

- (8) Remove the aluminum throttle body support bracket retaining nut and bolt. Remove bracket.

REMOVAL AND INSTALLATION (Continued)

(9) Disconnect the clutch cable (Fig. 18). Remove the black plastic cover from the top of the bellhousing. Pull the cable toward the left side of the vehicle and up to disengage from the bellhousing and clutch arm.

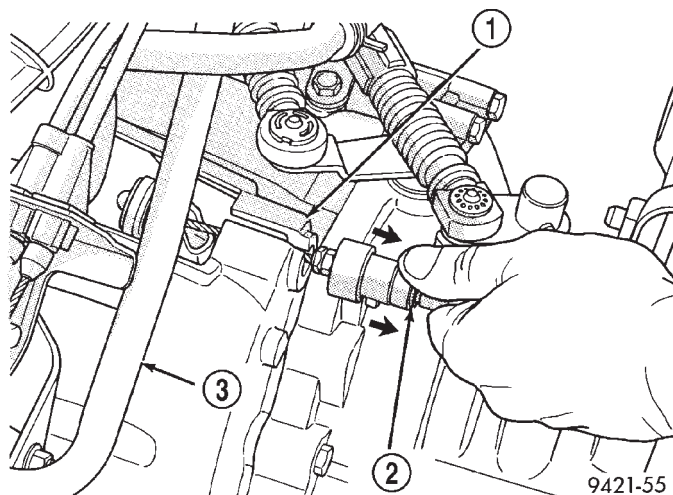


Fig. 18 Clutch Cable Removal

- 1 - BELLHOUSING
- 2 - CLUTCH CABLE
- 3 - EGR TUBE

(10) Disconnect the gearshift cables from the transaxle. Using a pushpin removal tool pry the cables straight up and off of the shift lever studs.

(11) Remove the (2) EGR valve retaining bolts from the cylinder head.

(12) Remove the (2) EGR tube retaining bolts from the intake manifold. Remove the EGR valve and tube assembly.

(13) Remove the (3) gearshift cable bracket retaining bolts from the transaxle (Fig. 19). Position the cables and bracket assembly out of the way.

(14) Disconnect the vehicle speed sensor and the back up lamp switch electrical connectors.

(15) Remove the lower starter motor retaining bolt.

(16) Remove the (2) upper bellhousing bolts from the engine block.

(17) Remove the (2) vertical bolts from the transaxle support bracket. Located at the rear of the transaxle.

(18) Install the engine bridge fixture and support the engine assembly (Fig. 20).

(19) Raise the vehicle on the hoist.

(20) Remove the (3) lower bolts retaining the inspection shield on the transaxle. Remove the shield. It may be necessary to loosen and / or remove the other collar retaining bolts to allow enough clearance for removal.

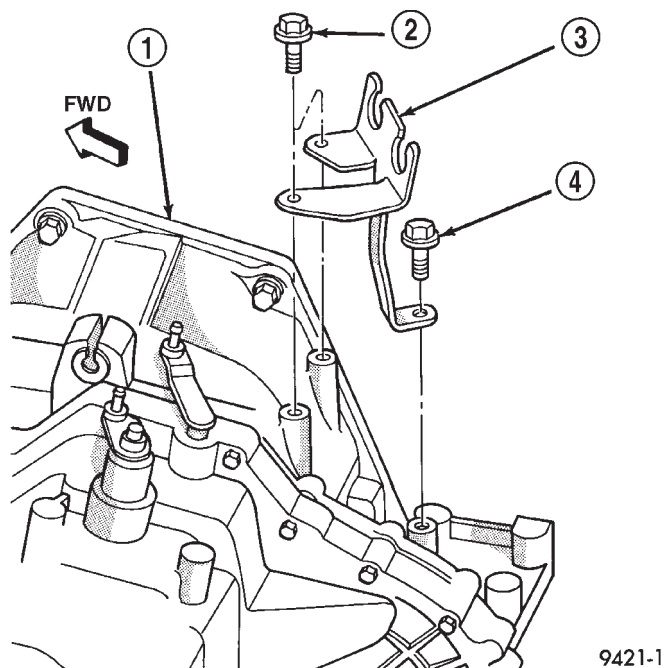


Fig. 19 Gearshift Cable Bracket

- 1 - TRANSAXLE
- 2 - BOLT
- 3 - LINKAGE BRACKET
- 4 - BOLT

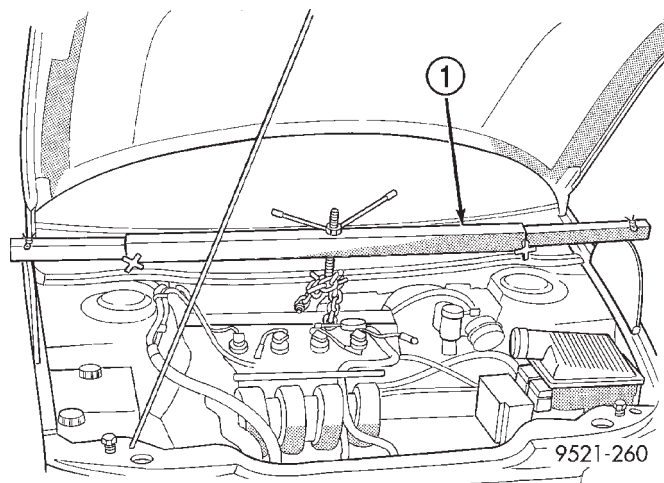


Fig. 20 Engine Support Fixture

- 1 - ENGINE BRIDGE FIXTURE

(21) Drain the transaxle fluid. Refer to Fluid Drain and Fill under Service Procedures in this group.

(22) Remove both front driveshafts. Refer to Group 3, Differential and Driveline for the procedure.

(23) Remove the right and left front wheel and tire assemblies.

(24) Remove the right and left front splash shields.

REMOVAL AND INSTALLATION (Continued)

(25) Remove the remaining (2) horizontal bolts from the transaxle support bracket (Fig. 21).

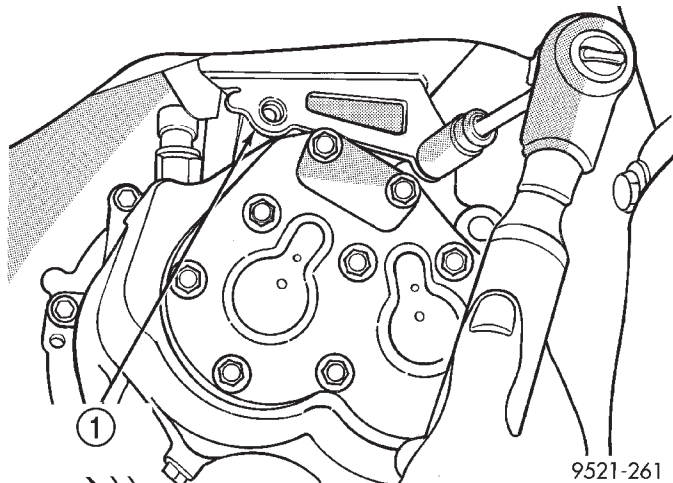


Fig. 21 Left Engine / Transmission Mount

1 - LEFT TRANSAXLE MOUNT

(26) Rotate the engine clockwise to gain access to the clutch module bolts (Fig. 22). Remove all the clutch module retaining bolts (Fig. 23).

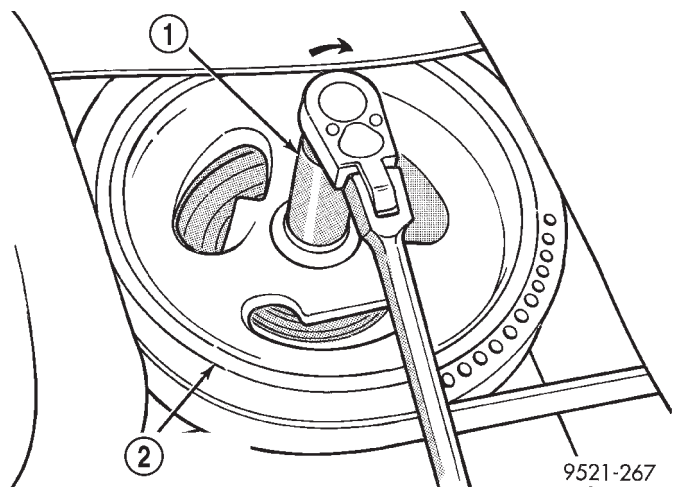


Fig. 22 Rotate Engine Clockwise

1 - TURN CLOCKWISE

2 - LOWER ENGINE PULLEY

(27) Support the transaxle with a transmission jack.

(28) Remove the remaining (2) right and left side transaxle to engine block retaining bolts (Fig. 24). Remove the transaxle from the vehicle.

INSTALLATION

(1) Position transaxle assembly on the dowel pins and torque the (2) right and left side transaxle to engine block retaining bolts to 95 N·m (70 ft. lbs.).

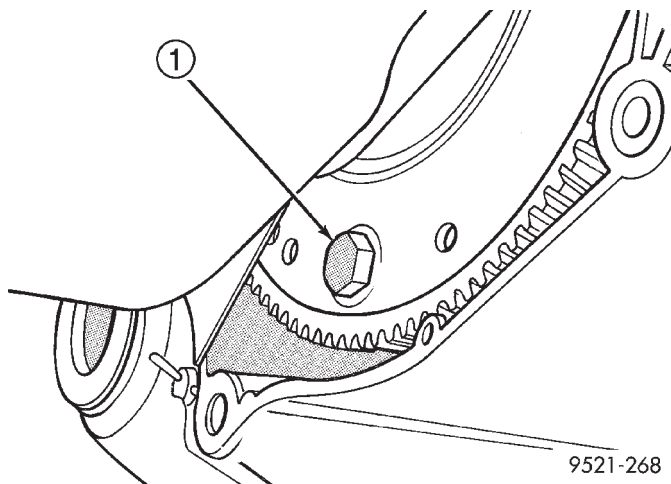


Fig. 23 Clutch Module Bolts

1 - DRIVE PLATE TO CLUTCH BOLTS

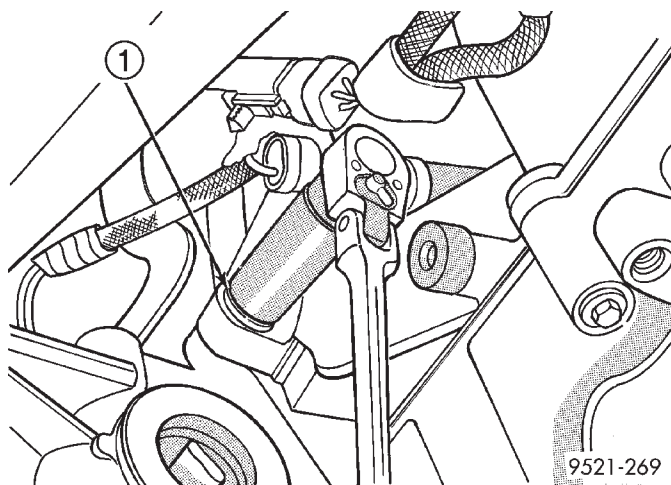


Fig. 24 Side Bellhousing Bolts

1 - LOWER BELL HOUSING BOLTS

(2) Rotate the engine clockwise to gain access to the clutch module bolts (Fig. 25). Install all the clutch module bolts and torque to 75 N·m (55 ft. lbs.) (Fig. 26).

(3) Install the (2) horizontal bolts on the transaxle support bracket and torque to 54 N·m (40 ft. lbs.) (Fig. 27).

(4) Install the right and left front splash shields.

(5) Install the right and left front wheel and tire assemblies.

(6) Install both front driveshafts. Refer to Group 3, Differential and Driveline for the procedure.

(7) Install the (3) lower bolts retaining the inspection shield on the transaxle. Torque the larger bellhousing bolts to 95 N·m (70 ft. lbs.). Torque the 10mm inspection shield bolt to 11N·m (96 in. lbs.).

(8) Fill the transaxle fluid. Refer to Fluid Drain and Fill under Service Procedures in this group.

REMOVAL AND INSTALLATION (Continued)

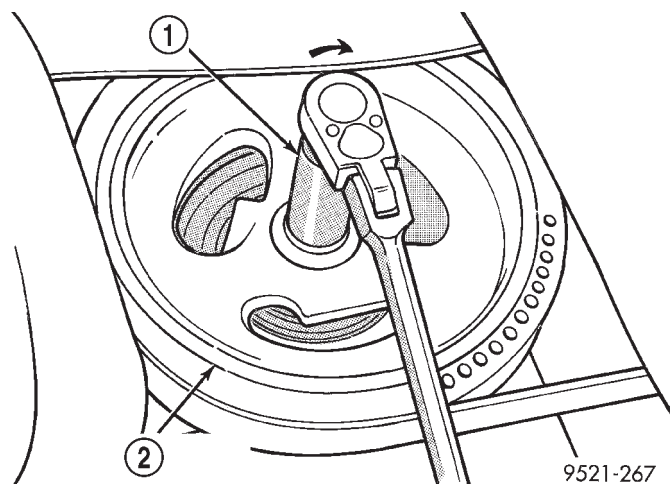


Fig. 25 Rotate Engine Clockwise

- 1 - TURN CLOCKWISE
- 2 - LOWER ENGINE PULLEY

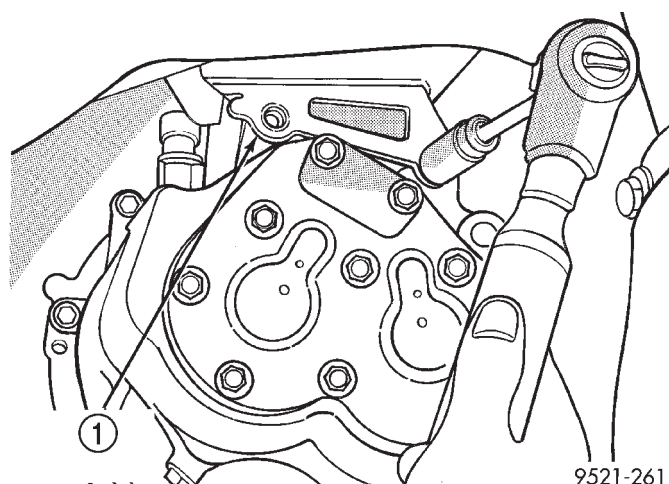


Fig. 27 Left Engine / Transmission Mount

- 1 - LEFT TRANSAXLE MOUNT

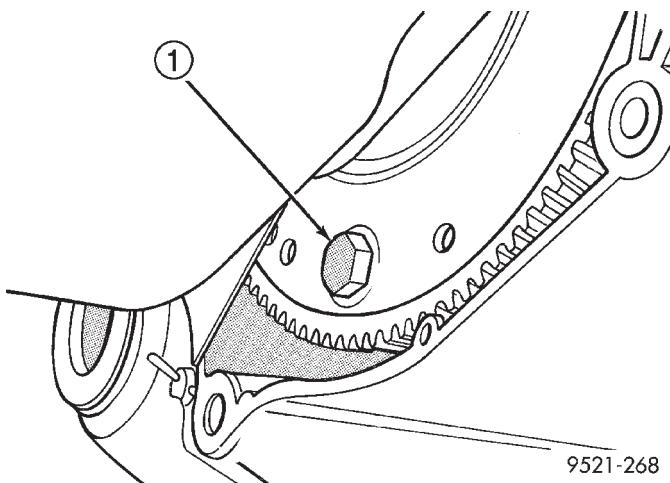


Fig. 26 Clutch Module Bolts

- 1 - DRIVE PLATE TO CLUTCH BOLTS

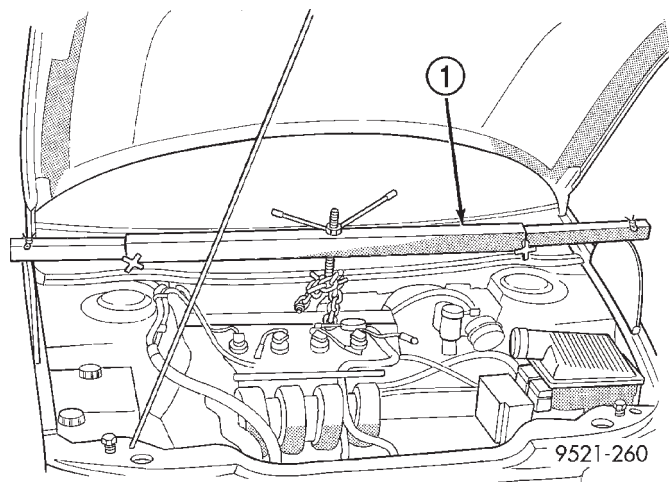


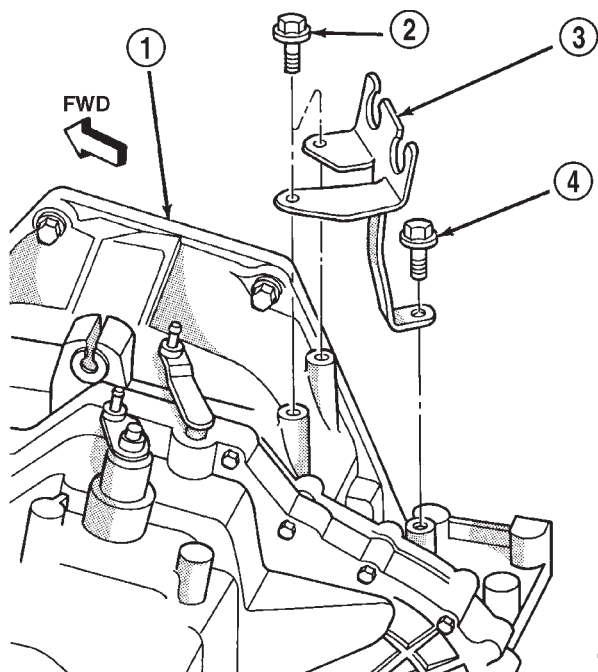
Fig. 28 Engine Support Fixture

- 1 - ENGINE BRIDGE FIXTURE

- (9) Lower the vehicle on the hoist.
- (10) Remove the engine bridge fixture (Fig. 28).
- (11) Install the (2) vertical bolts in the transaxle support bracket. Located at the rear of the transaxle and torque to 54 N·m (40 ft. lbs.).
- (12) Install the (2) upper bellhousing bolts in the engine block and torque to 95 N·m (70 ft. lbs.).
- (13) Install the lower starter motor retaining bolt and torque to 54 N·m (40 ft. lbs.).
- (14) Connect the vehicle speed sensor and the back up lamp switch electrical connectors.
- (15) Install the (3) gearshift cable bracket retaining bolts in the transaxle and torque to 54 N·m (40 ft. lbs.) (Fig. 29).
- (16) Position and install the EGR valve and tube assembly. Torque the EGR tube retaining bolts on the intake manifold to 35N·m (26 ft. lbs.).

- (17) Torque the EGR valve retaining bolts in the cylinder head to 35N·m (26 ft. lbs.).
- (18) Connect the gearshift cables on the transaxle by snapping them straight down over the shift lever studs.
- (19) Install the clutch cable and install the black plastic cover on the top of the bellhousing (Fig. 30).
- (20) Install the aluminum throttle body support bracket retaining nut and bolt and torque to 54 N·m (40 ft. lbs.).
- (21) Install the (2) accelerator cable bracket retaining bolts on the throttle body and torque to 11N·m (96 in. lbs.) (Fig. 31).
- (22) Connect the accelerator and speed control cables on the throttle body.
- (23) Install the accelerator and speed control cables cover.

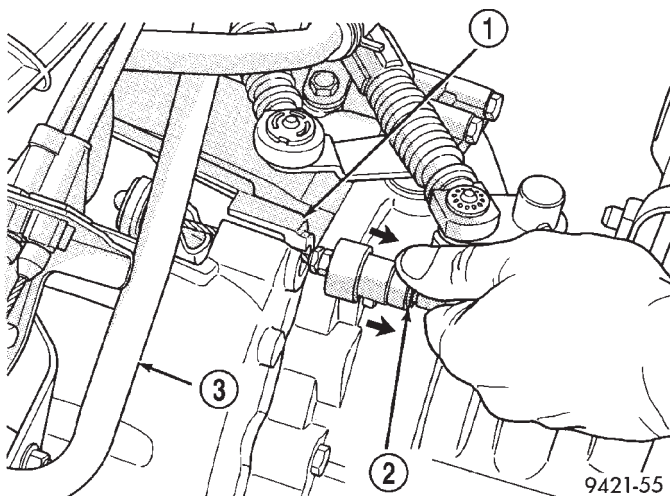
REMOVAL AND INSTALLATION (Continued)



9421-1

Fig. 29 Gearshift Bracket Bolts

- 1 - TRANSAXLE
- 2 - BOLT
- 3 - LINKAGE BRACKET
- 4 - BOLT



9421-55

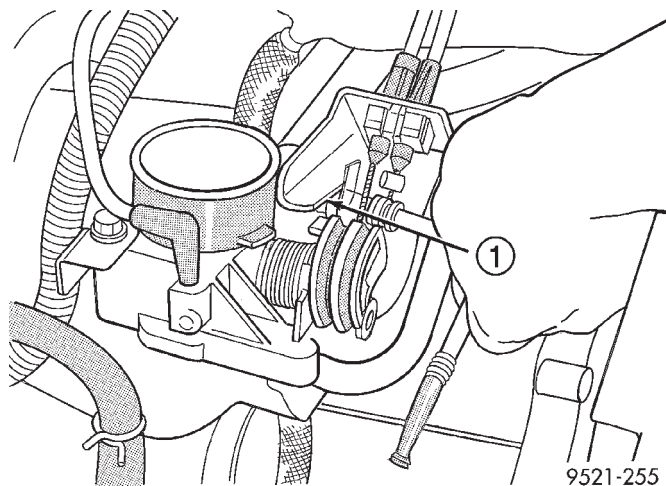
Fig. 30 Clutch Cable Installation

- 1 - BELLHOUSING
- 2 - CLUTCH CABLE
- 3 - EGR TUBE

(24) Install the air filter cover and air intake hose as an assembly.

(25) Connect the breather hose from the air intake hose.

(26) Connect the negative battery cable.



9521-255

Fig. 31 Accelerator Cable Bracket

- 1 - ACCELERATOR CABLE BRACKET

DISASSEMBLY AND ASSEMBLY

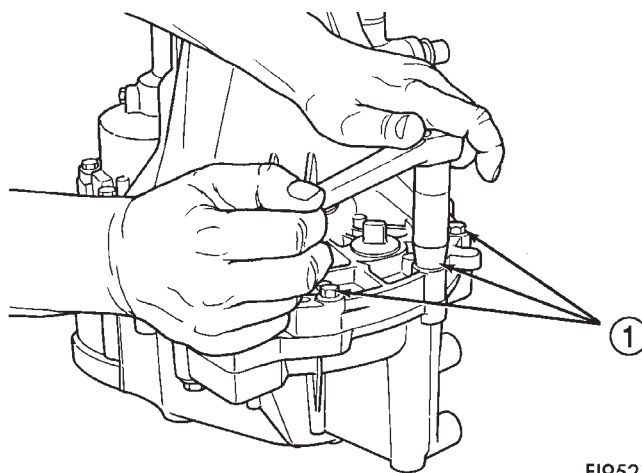
TRANSAXLE

The NV T350 (A-578) transaxle internal components can be serviced only by separating the gear case from the bellhousing case.

CAUTION: The transaxle output shaft is serviced as a unit. No disassembly and reassembly is possible. Damage to the transaxle may result.

DISASSEMBLY

- (1) Place transaxle on bench.
- (2) Remove shift levers. Remove transaxle case half bolts (Fig. 32).



FJ9521-1

Fig. 32 Case Bolts

- 1 - CASE BOLTS

DISASSEMBLY AND ASSEMBLY (Continued)

(3) Place two screwdrivers into the slots provided in the case halves near the dowels (Fig. 33). Separate the case halves (Fig. 34).

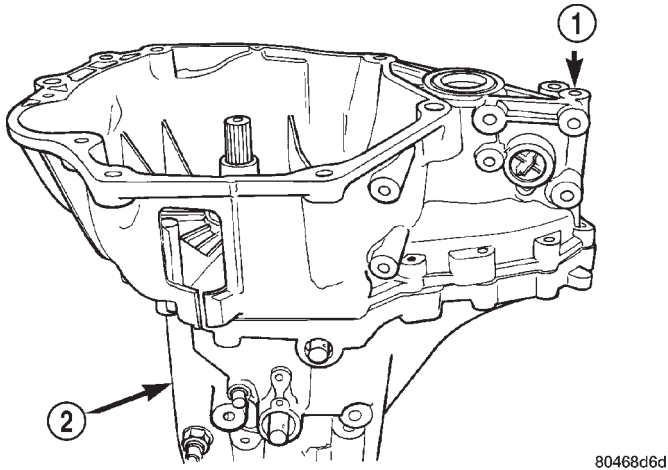


Fig. 33 Transaxle Case Halves

- 1 - BELLHOUSING HALF
- 2 - GEAR CASE HALF

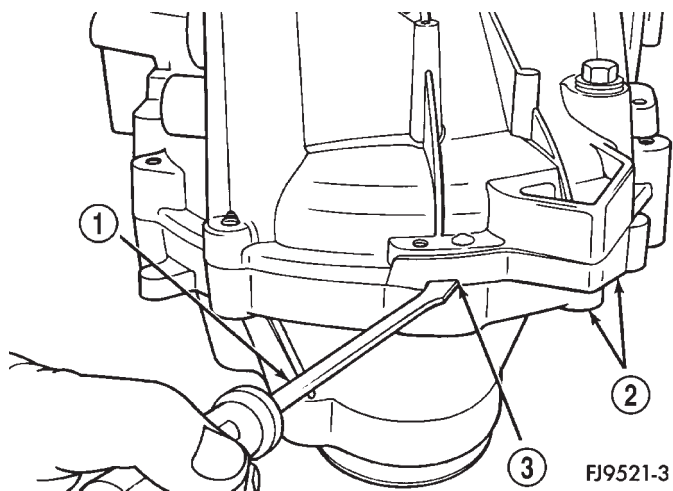


Fig. 34 Separate Case Halves

- 1 - PRY TOOL
- 2 - CASE HALVES
- 3 - PRY SLOT

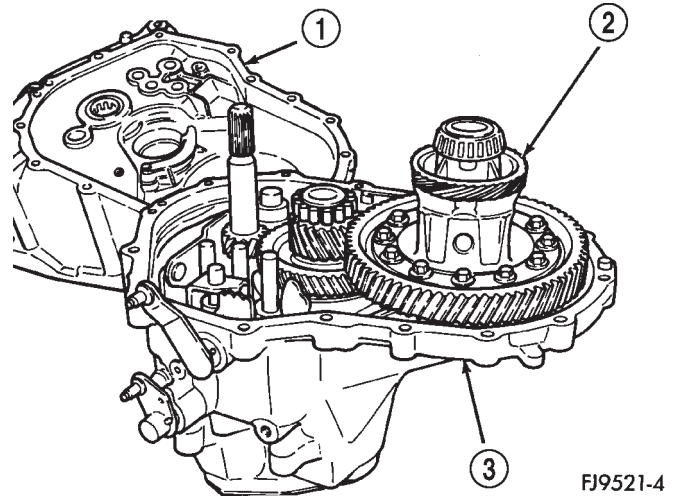


Fig. 35 Bellhousing Case Half Removal

- 1 - BELLHOUSING CASE HALF
- 2 - DIFFERENTIAL
- 3 - GEAR CASE HALF

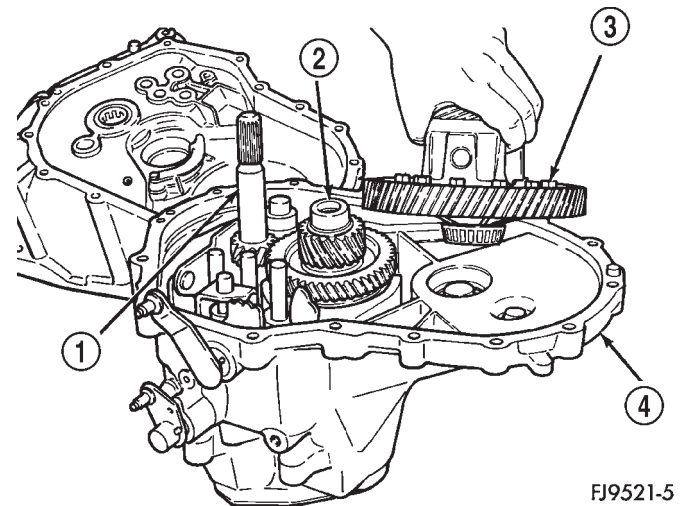


Fig. 36 Differential Assembly Removal

- 1 - INPUT SHAFT
- 2 - OUTPUT SHAFT
- 3 - DIFFERENTIAL
- 4 - CASE

(4) Remove bellhousing half from gear case half (Fig. 35).

(5) Remove output shaft roller bearing from output shaft.

(6) Remove differential assembly (Fig. 36).

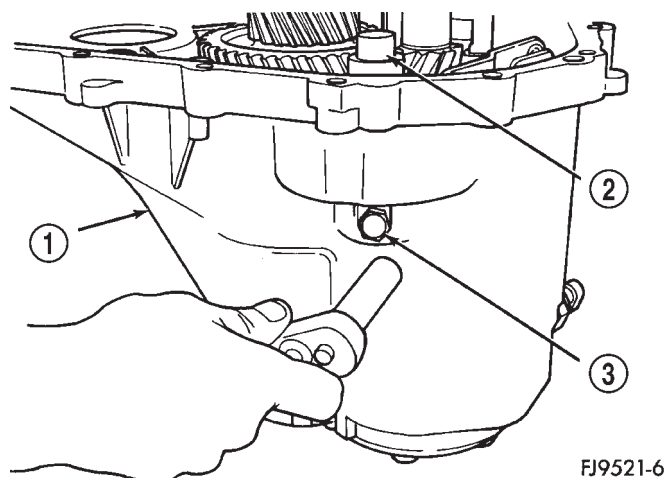
(7) Remove reverse idler shaft bolt (Fig. 37).

(8) Remove reverse idler shaft (Fig. 38).

(9) Remove reverse idler gear and spacer (Fig. 39).

(10) Remove two screws retaining reverse fork bracket (Fig. 40). Remove reverse fork bracket and reverse cam blockout assembly (Fig. 41).

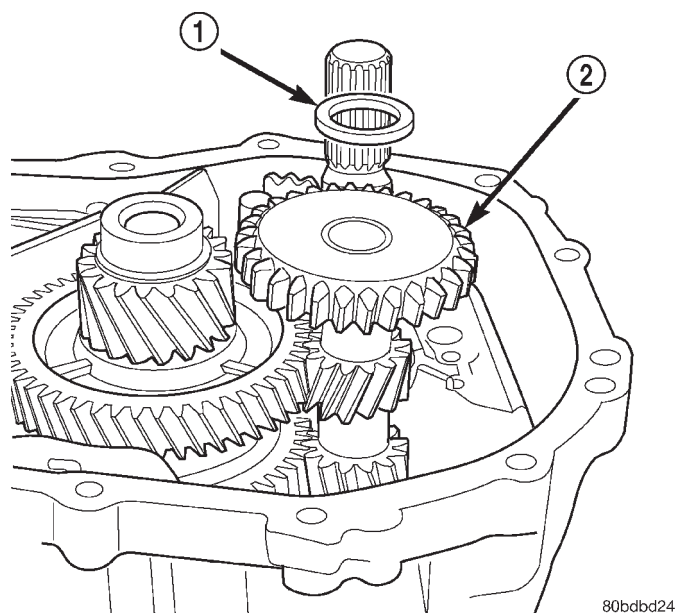
DISASSEMBLY AND ASSEMBLY (Continued)



FJ9521-6

Fig. 37 Reverse Idler Shaft Bolt Removal

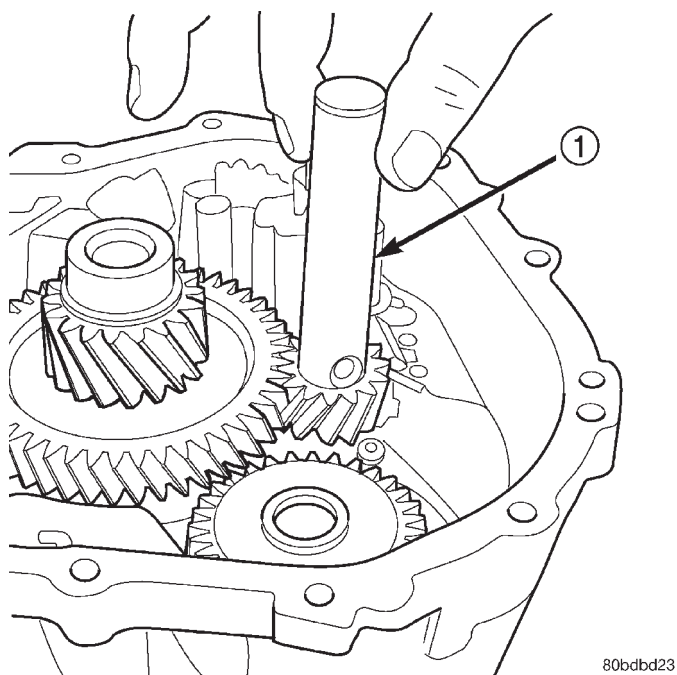
- 1 - CASE
- 2 - REVERSE IDLER SHAFT
- 3 - REVERSE IDLER SHAFT BOLT



80bdbd24

Fig. 39 Reverse Idler Gear and Spacer

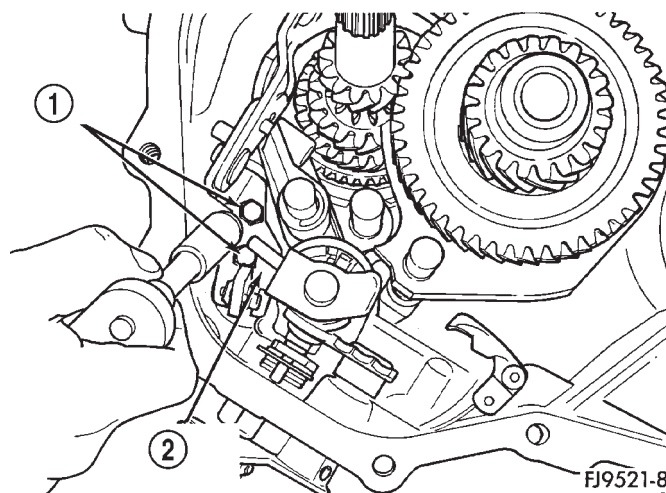
- 1 - SPACER
- 2 - REVERSE IDLER GEAR



80bdbd23

Fig. 38 Reverse Idler Shaft Removal

- 1 - REVERSE IDLER SHAFT



FJ9521-8

Fig. 40 Screws Retaining Reverse Fork Bracket

- 1 - SCREWS (2)
- 2 - REVERSE FORK BRACKET

DISASSEMBLY AND ASSEMBLY (Continued)

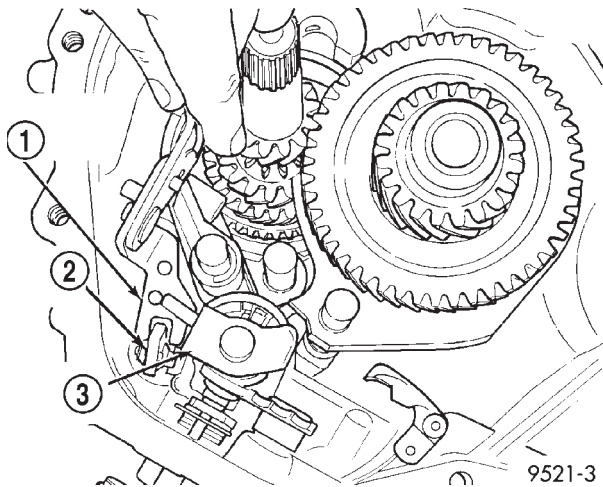


Fig. 41 Remove Reverse Fork Bracket

- 1 - REVERSE FORK BRACKET
- 2 - REVERSE CAM BLOCKOUT
- 3 - SHIFT BLOCKER ASSEMBLY

(11) Using snap-ring pliers, remove selector shaft spacer (Fig. 42).

(12) Pull the selector shaft shift pin out of the slot in the blocker assembly. Turn selector shaft up and out of the way (Fig. 43).

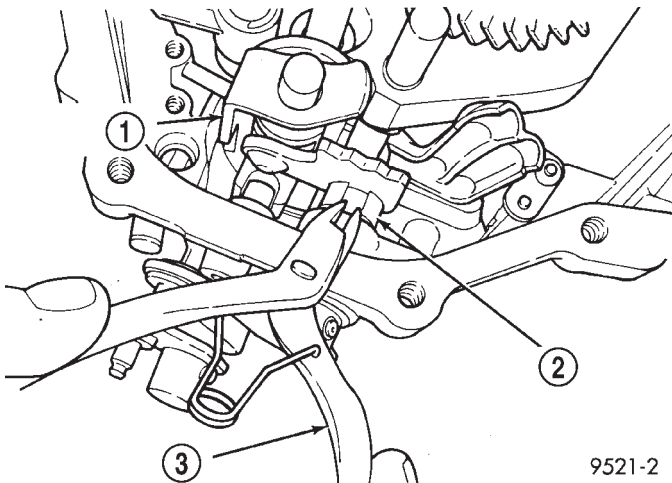


Fig. 42 Remove Selector Shaft Spacer

- 1 - SHIFT BLOCKER ASSEMBLY
- 2 - SELECTOR SHAFT SPACER (PLASTIC)
- 3 - SNAP RING PLIERS

(13) Remove transaxle end cover (Fig. 44) (Fig. 45).

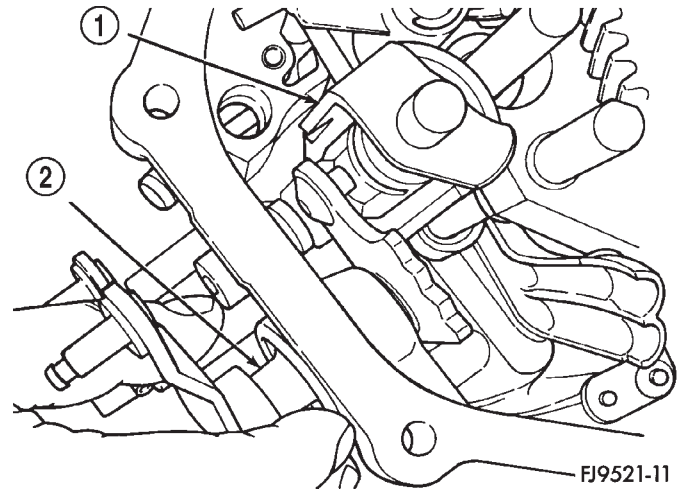


Fig. 43 Selector Shaft

- 1 - SHIFT ASSEMBLY
- 2 - SELECTOR SHAFT

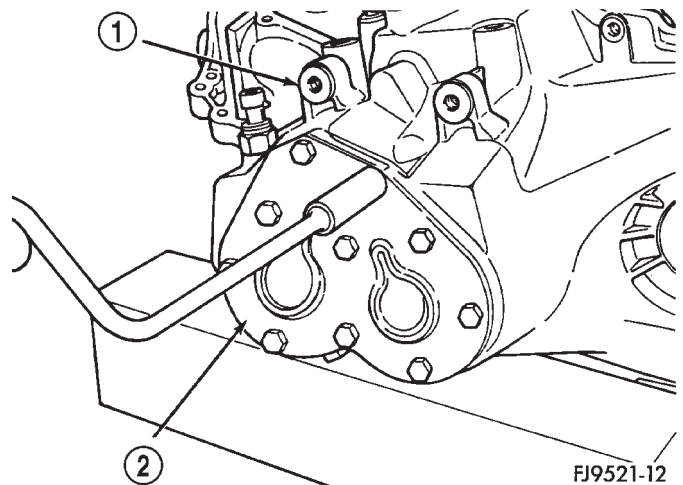
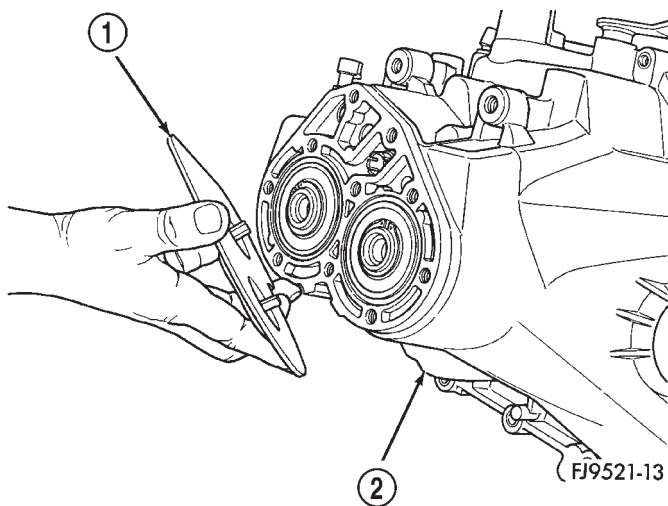


Fig. 44 Transaxle Cover Removal

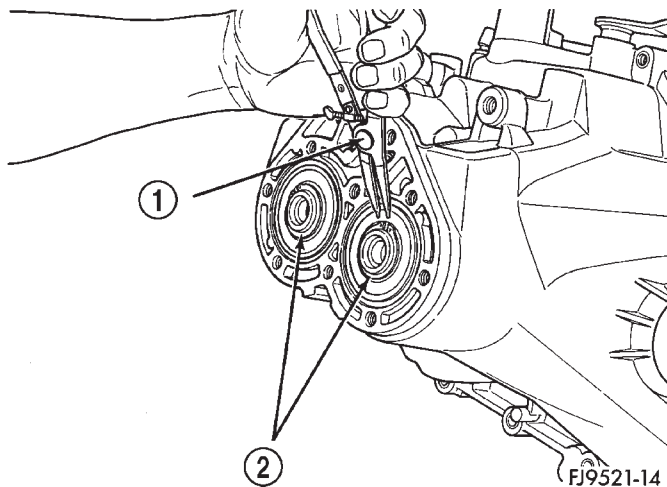
- 1 - TRANSAXLE CASE
- 2 - END COVER

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 45 End Cover**

- 1 - END COVER
2 - CASE

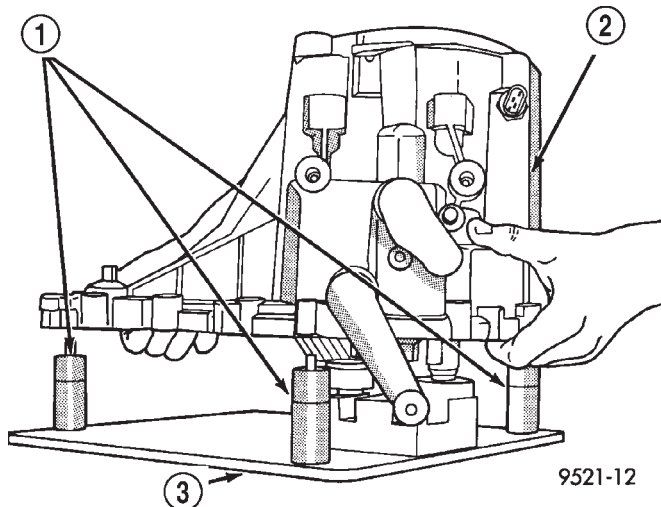
(14) Remove two snap rings retaining the output shaft and the input shaft to the bearings (Fig. 46).

**Fig. 46 Snap Rings Retaining Bearings**

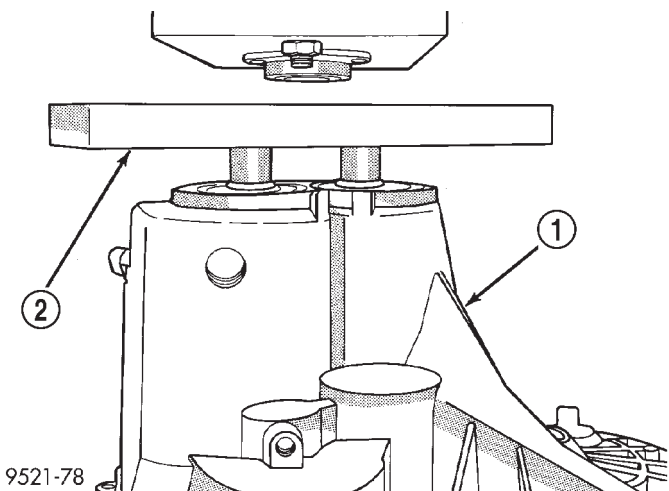
- 1 - SNAP RING PLIERS
2 - SNAP RINGS

(15) Using bench fixture and shims provided (Miller tools # 6785, 6785-1, and 6785-2), turn transaxle over. Install transaxle onto bench fixture (Fig. 47). Verify shim spacers are in position on bench fixture. Install transaxle into shop press.

(16) Install bearing fixture Miller tool #6768 onto transaxle end bearings (Fig. 48). Verify tool is properly aligned to input and output shafts.

**Fig. 47 Bench Fixture**

- 1 - SHIMS
2 - TRANSAXLE
3 - 6785 BENCH FIXTURE

**Fig. 48 Bearing Fixture**

- 1 - TRANSAXLE CASE
2 - BEARING FIXTURE

CAUTION: The oil dams in the input and output shafts can be damaged while pressing on the shafts if the bearing fixture is not used properly.

(17) Install transaxle gear case into shop press. Press output and input shaft assemblies out of case (Fig. 49).

(18) Remove transaxle from press.

(19) Carefully remove transaxle case from the shaft assemblies and bench fixture (Fig. 50). Be sure the oil-feed trough to the end bearings is not damaged (Fig. 51).

DISASSEMBLY AND ASSEMBLY (Continued)

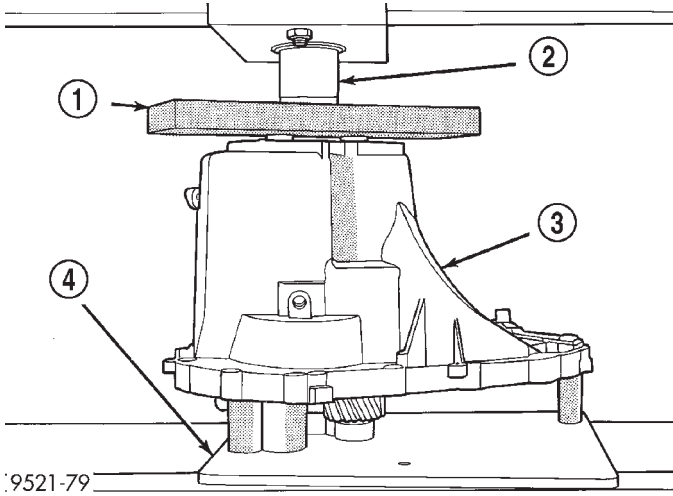


Fig. 49 Pressing Gears Out of Case

- 1 - BEARING FIXTURE
- 2 - PRESS RAM
- 3 - TRANSAXLE CASE
- 4 - BENCH FIXTURE

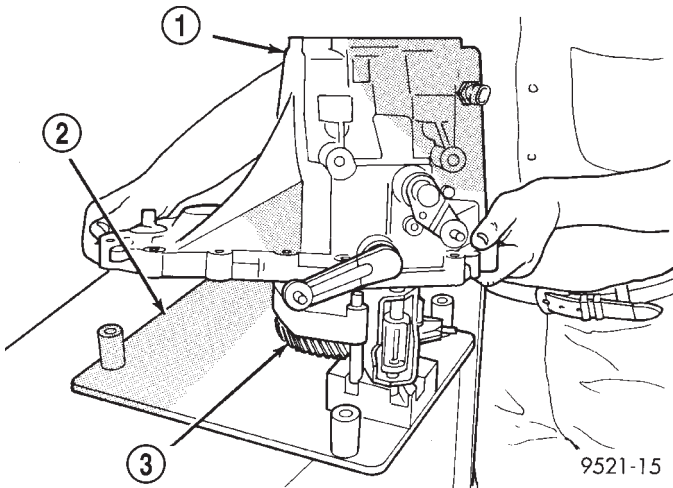


Fig. 50 Transaxle Case Removal

- 1 - TRANSAXLE CASE
- 2 - BENCH FIXTURE
- 3 - GEARTRAIN

(20) **TRANSAXLE W/REVERSE BRAKE:** Remove the reverse brake blocking ring, shim, reverse brake friction cone, bearing and race from the input shaft assembly (Fig. 52) (Fig. 53) (Fig. 54) (Fig. 55) (Fig. 56). **TRANSAXLE W/O REVERSE BRAKE:** Remove plastic spacer from the input shaft assembly.

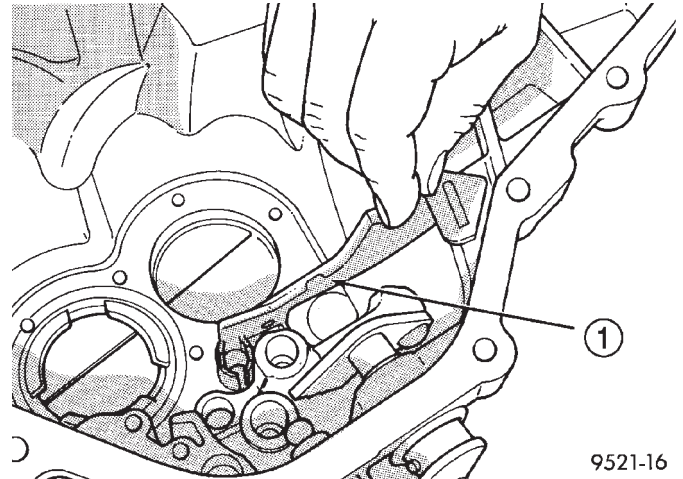


Fig. 51 Oil Feed Trough

- 1 - OIL FEED TROUGH

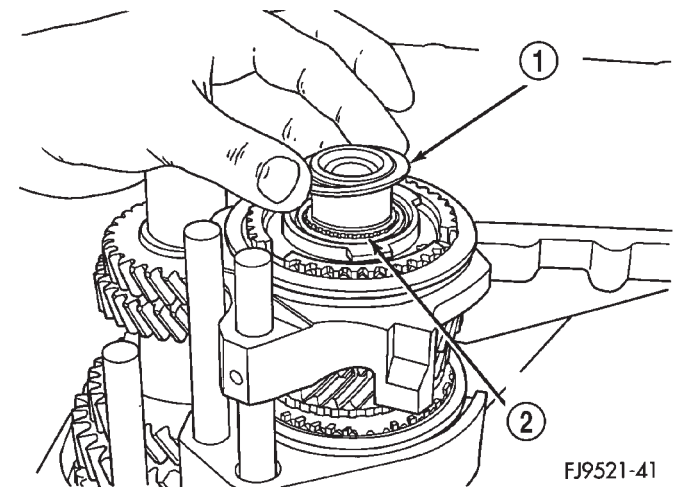
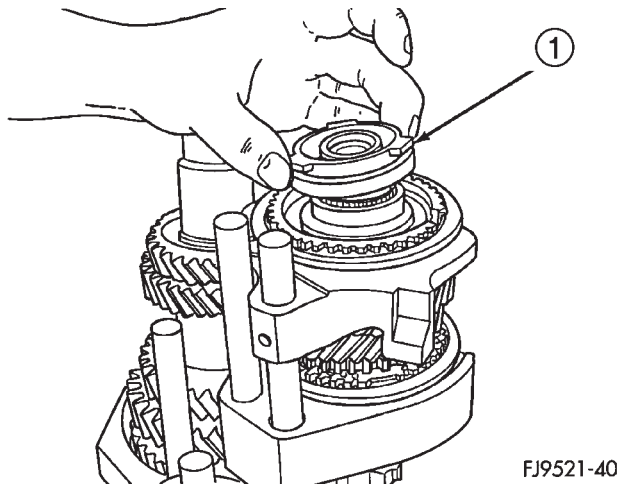


Fig. 52 Reverse Brake Shim

- 1 - REVERSE BRAKE SHIM
- 2 - REVERSE BRAKE FRICTION CONE

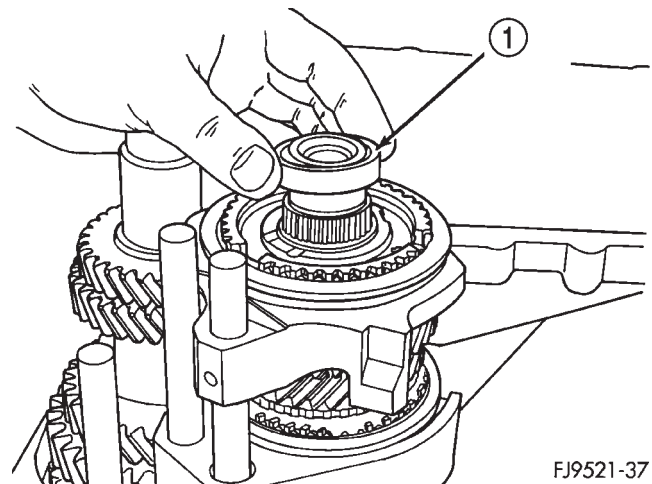
DISASSEMBLY AND ASSEMBLY (Continued)



FJ9521-40

Fig. 53 Reverse Brake Friction Cone

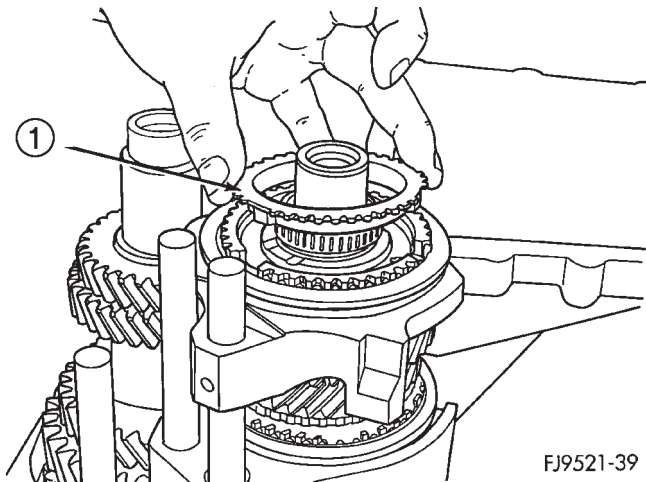
1 - REVERSE BRAKE FRICTION CONE



FJ9521-37

Fig. 56 Reverse Brake Race

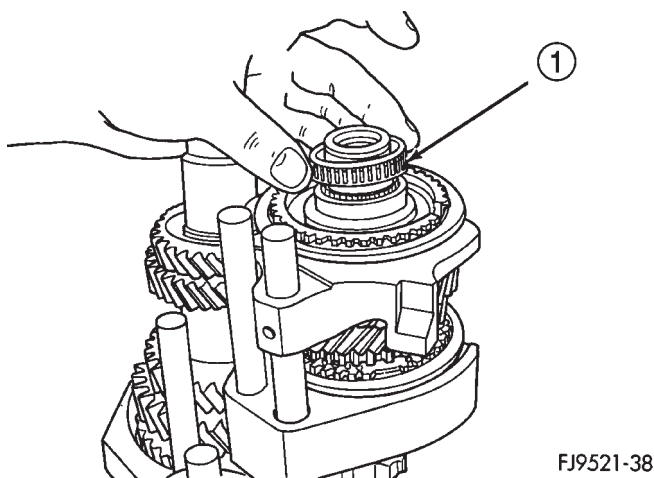
1 - REVERSE BRAKE RACE



FJ9521-39

Fig. 54 Reverse Brake Blocking Ring

1 - REVERSE BRAKE BLOCKING RING

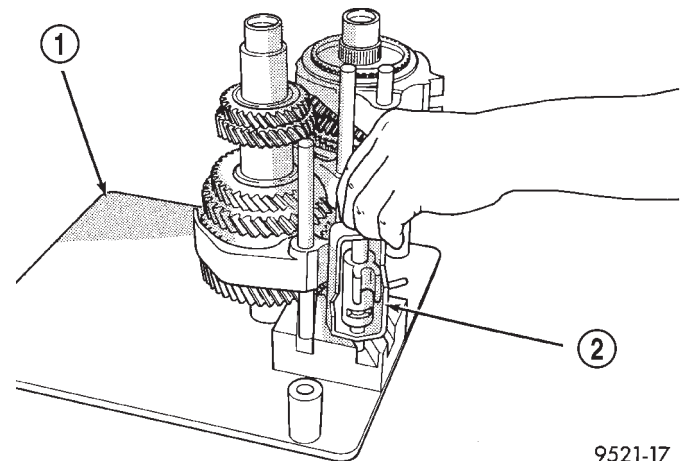


FJ9521-38

Fig. 55 Reverse Brake Needle Bearing

1 - REVERSE BRAKE NEEDLE BEARING

(21) Remove the shift blocker assembly from the bench fixture (Fig. 57).



9521-17

Fig. 57 Shift Blocker Removal

1 - 6785 BENCH FIXTURE

2 - SHIFT BLOCKER ASSEMBLY

(22) Remove the 1-2 shift fork from the output shaft (Fig. 58).

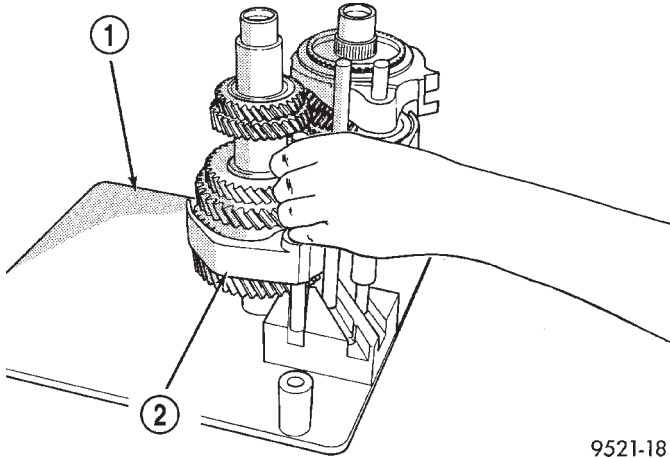
(23) Remove input and output shaft assemblies from bench fixture (Fig. 59).

CAUTION: The output shaft assembly is serviced as an assembly. Do not try to repair any component on the output shaft. If the 1-2 synchronizer or gear fails, it is necessary to replace the complete output shaft assembly.

ASSEMBLY

The sealant used to seal the transaxle case halves is Mopar® Gasket Maker, Loctite® 518, or equivalent.

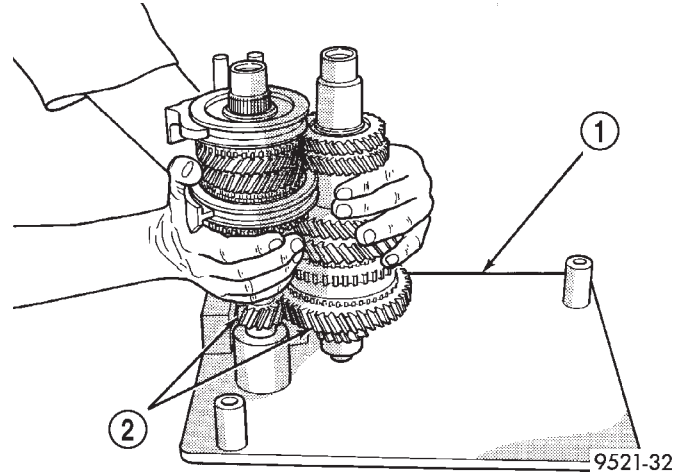
DISASSEMBLY AND ASSEMBLY (Continued)



9521-18

Fig. 58 1-2 Shift Fork Removal

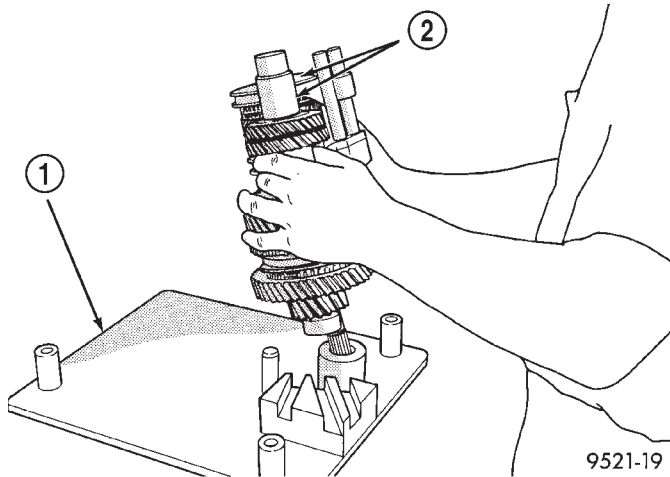
- 1 - 6785 BENCH FIXTURE
2 - 1-2 SHIFT FORK



9521-32

Fig. 60 Bench Fixture

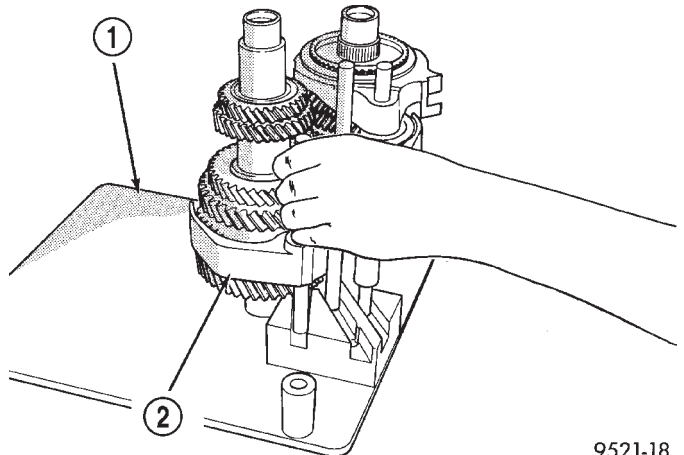
- 1 - BENCH FIXTURE
2 - GEARTRAIN



9521-19

Fig. 59 Gear Train Removal

- 1 - 6785 BENCH FIXTURE
2 - INPUT AND OUTPUT SHAFTS



9521-18

Fig. 61 Shift Rail Installation

- 1 - 6785 BENCH FIXTURE
2 - 1-2 SHIFT FORK

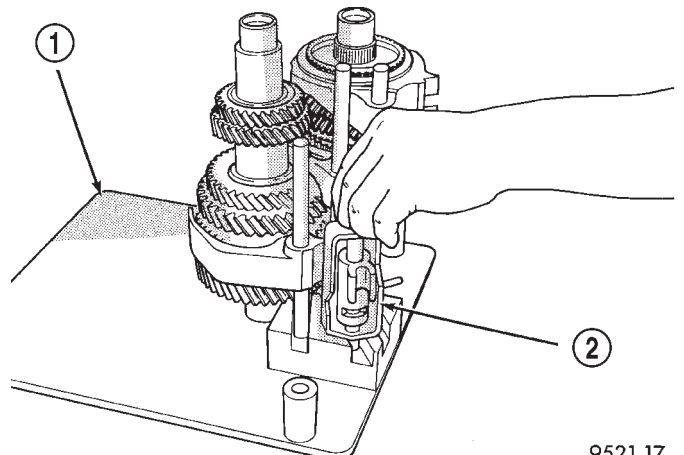
The sealant used for the bearing end plate cover is Mopar® RTV.

(1) Verify bench fixture shims are removed from bench fixture. Install output and input shafts into bench fixture (Miller tool #6785) (Fig. 60).

(2) Install shift rails and forks into bench fixture (Fig. 61).

(3) Install shift blocker assembly into bench fixture (Fig. 62).

(4) Install reverse brake race onto input shaft (Fig. 63).

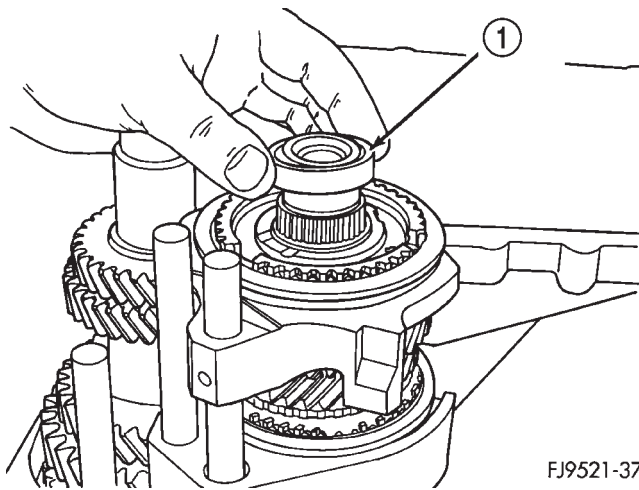


9521-17

Fig. 62 Shift Blocker Installation

- 1 - 6785 BENCH FIXTURE
2 - SHIFT BLOCKER ASSEMBLY

DISASSEMBLY AND ASSEMBLY (Continued)

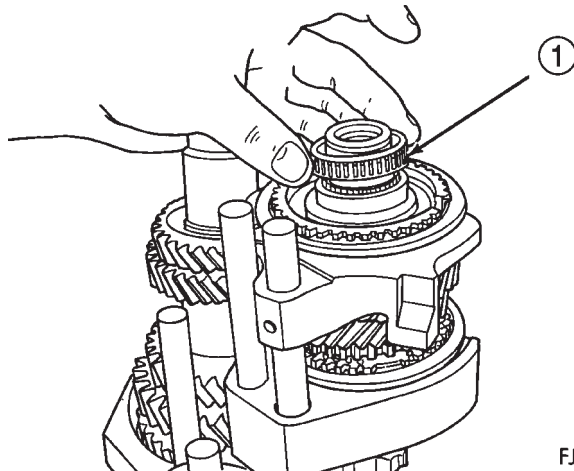


FJ9521-37

Fig. 63 Reverse Brake Race Installation

1 - REVERSE BRAKE RACE

(5) Install reverse brake needle bearing (Fig. 64).

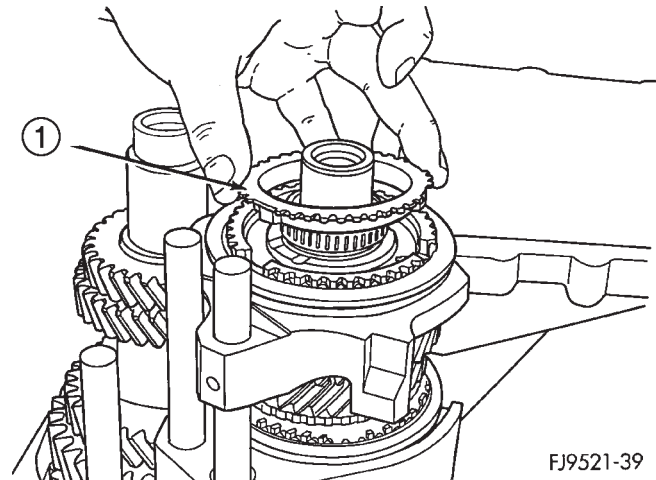


FJ9521-38

Fig. 64 Reverse Brake Needle Bearing

1 - REVERSE BRAKE NEEDLE BEARING

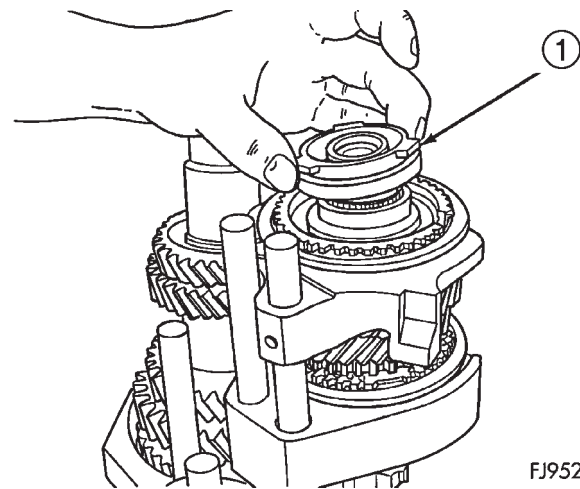
- (6) Install reverse brake blocking ring (Fig. 65).
- (7) Install reverse brake friction cone (Fig. 66).
- (8) Install reverse brake shim (Fig. 67). Apply petroleum jelly to shim to hold in place.
- (9) Install gear-case half over bench fixture (Fig. 68). Line up shift finger over 3-4 lug.



FJ9521-39

Fig. 65 Reverse Brake Blocking Ring Installation

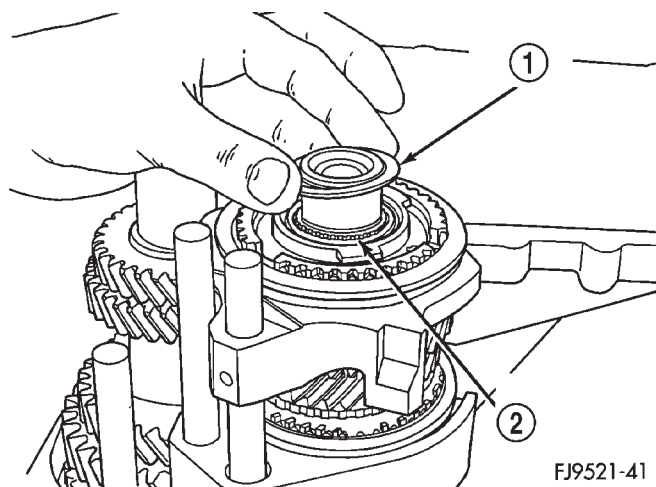
1 - REVERSE BRAKE BLOCKING RING



FJ9521-40

Fig. 66 Reverse Brake Friction Cone Installation

1 - REVERSE BRAKE FRICTION CONE



FJ9521-41

Fig. 67 Reverse Brake Shim

1 - REVERSE BRAKE SHIM

2 - REVERSE BRAKE FRICTION CONE

DISASSEMBLY AND ASSEMBLY (Continued)

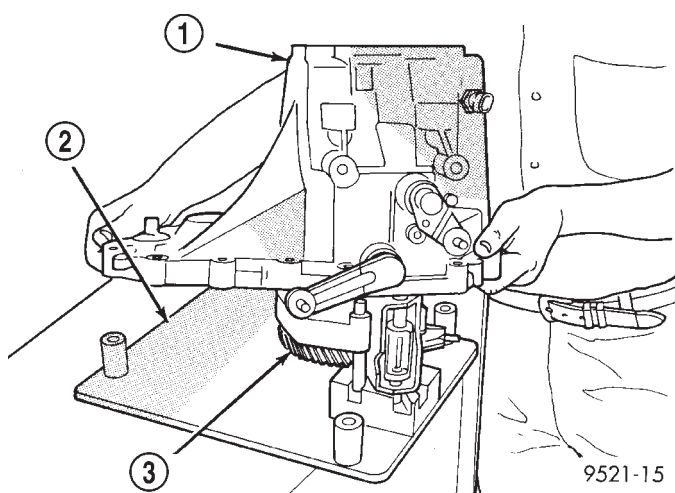


Fig. 68 Gear Case Half

- 1 - TRANSAXLE CASE
- 2 - BENCH FIXTURE
- 3 - GEARTRAIN

(10) Line up reverse brake friction cone lugs to the slots in the gear case (Fig. 69). Verify reverse brake shim is in position.

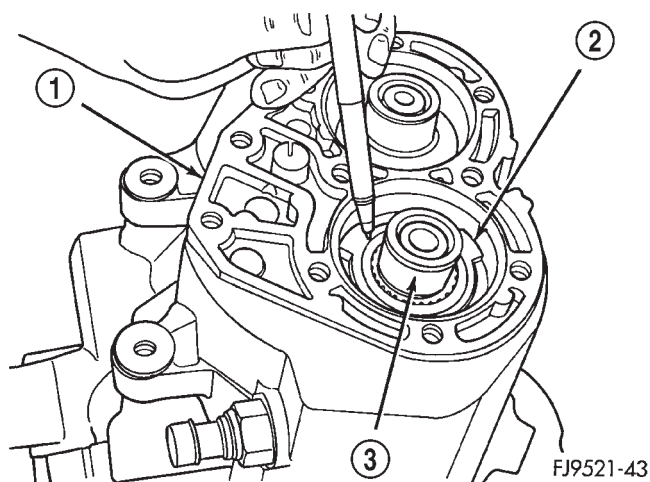


Fig. 69 Friction Cone Lugs

- 1 - CASE
- 2 - FRICTION CONE LUGS
- 3 - INPUT SHAFT

(11) Position input and output bearings on the shafts. Using Miller tool C-4992-1, press on input and output shaft bearings until they bottom into the case and against the shafts (Fig. 70).

(12) Install shaft snap rings at input and output bearings (Fig. 71).

(13) Apply Mopar® RTV sealant to end-cover outer edge and around bolt holes. Install end-cover onto

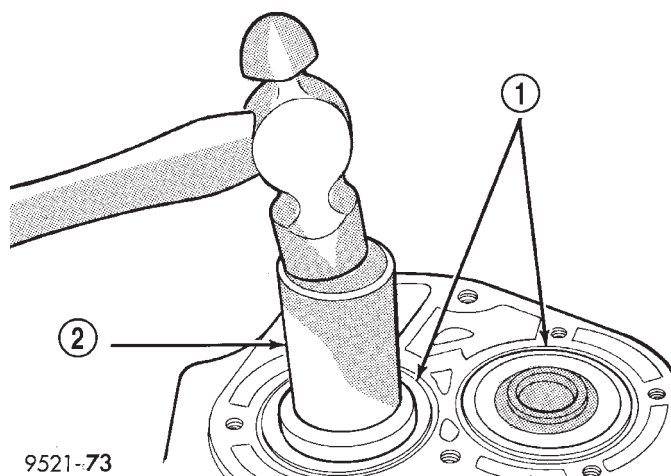


Fig. 70 Installing Input and Output Bearings

- 1 - INPUT AND OUTPUT BEARINGS
- 2 - SPECIAL TOOL C-4992-1

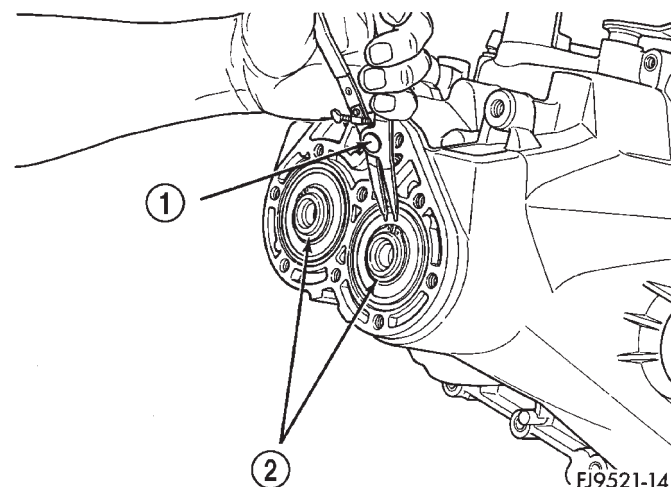


Fig. 71 Snap Rings Retaining Bearings

- 1 - SNAP RING PLIERS
- 2 - SNAP RINGS

gear case. Tighten end cover bolts to 29 N·m (21 ft. lbs.) torque (Fig. 72).

(14) Remove gear case from bench fixture.

(15) Install gear case in a holding fixture with end cover facing down.

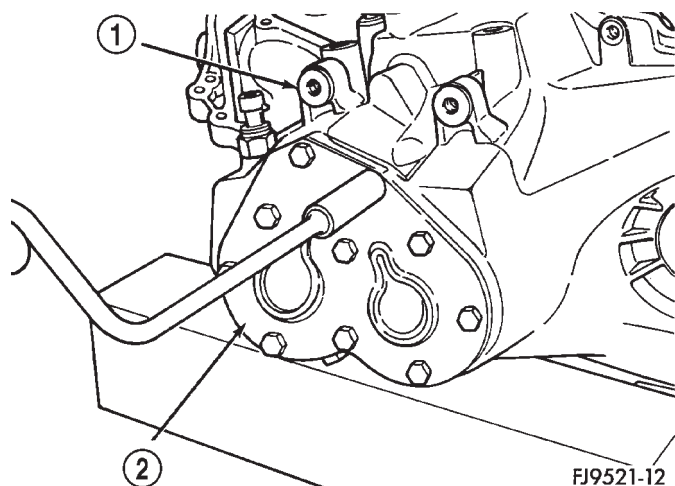
(16) Turn selector shaft into slot on blocker assembly (Fig. 73).

(17) Push selector shaft spacer clip onto selector shaft. Install shift levers.

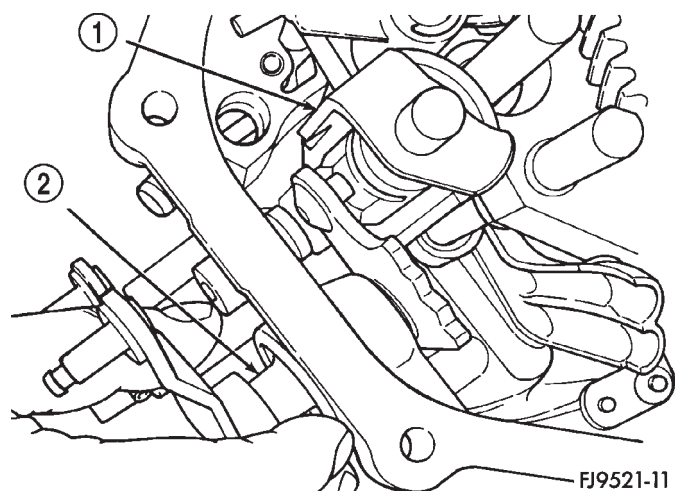
(18) Install reverse idler gear and spacer (Fig. 74).

(19) Install reverse idler shaft (Fig. 75).

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 72 Transaxle End Cover**

- 1 - TRANSAXLE CASE
2 - END COVER

**Fig. 73 Selector Shaft**

- 1 - SHIFT ASSEMBLY
2 - SELECTOR SHAFT

(20) Install bolt into shaft. Tighten bolt on shaft to 26 N·m (19 ft. lbs.) torque (Fig. 76).

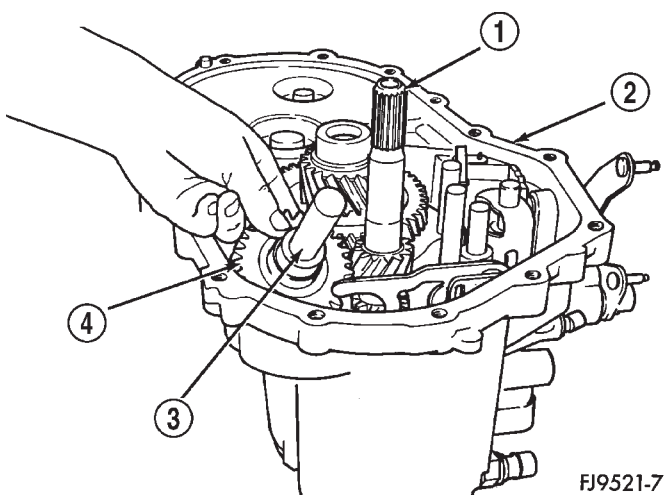
(21) Install reverse fork bracket and reverse lock-out. Tighten screws to 11 N·m (96 in. lbs.) torque (Fig. 77) (Fig. 78).

(22) Install differential into gear case (Fig. 79).

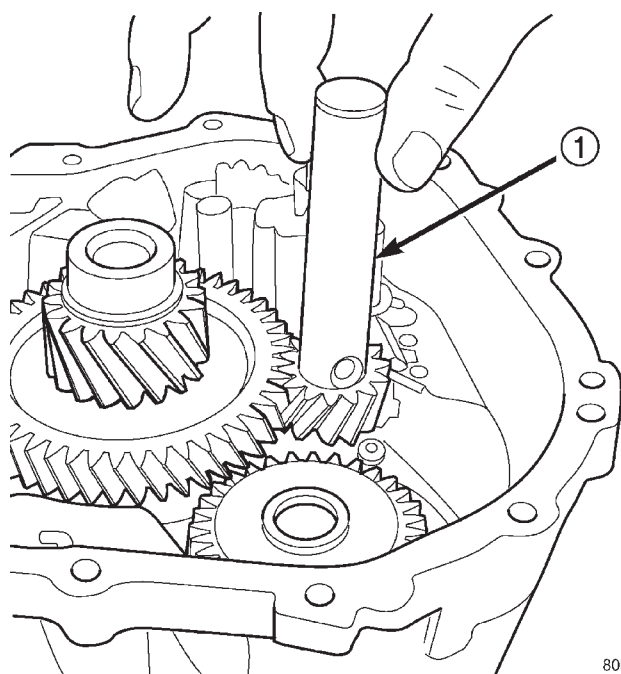
BEARING ADJUSTMENT PROCEDURE

(1) Use 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 gives a false end-play reading while gauging for proper shims. Improperly seated bearing cups and cones are subject to low-mileage failure.

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

**Fig. 74 Reverse Idler Gear and Spacer**

- 1 - INPUT SHAFT
2 - CASE
3 - REVERSE IDLER GEAR SHAFT
4 - REVERSE IDLER GEAR

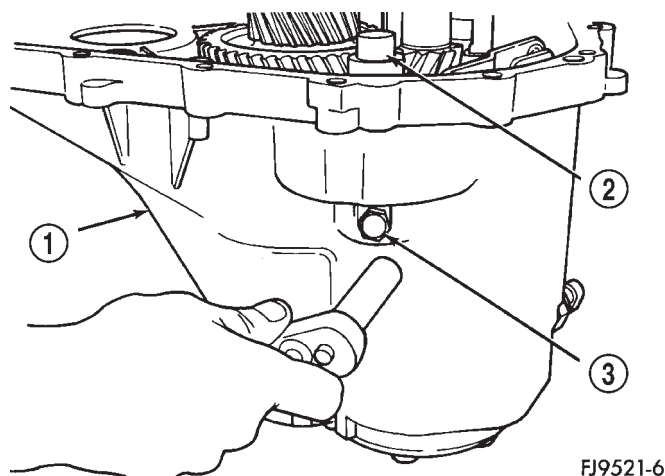
**Fig. 75 Reverse Idler Shaft**

- 1 - REVERSE IDLER SHAFT

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

(3) Bearing preload and drag torque specifications must be maintained to avoid premature bearing failures. Used (original) bearings may lose up to 50% of the original drag torque after break-in. All bearing adjustments must be made with no other component interference or gear intermesh.

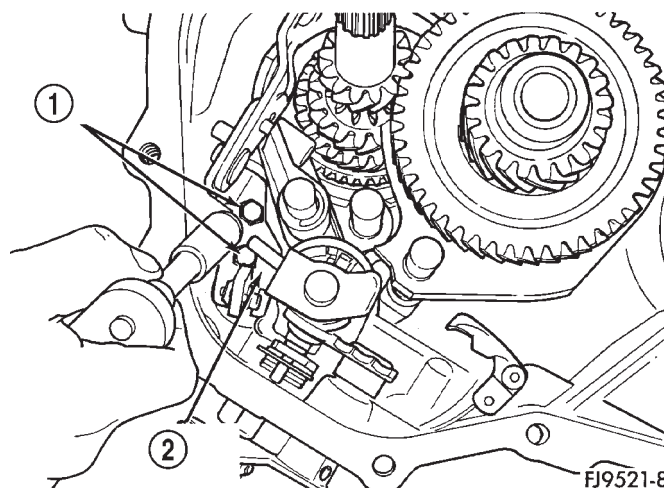
DISASSEMBLY AND ASSEMBLY (Continued)



FJ9521-6

Fig. 76 Reverse Idler Shaft Bolt

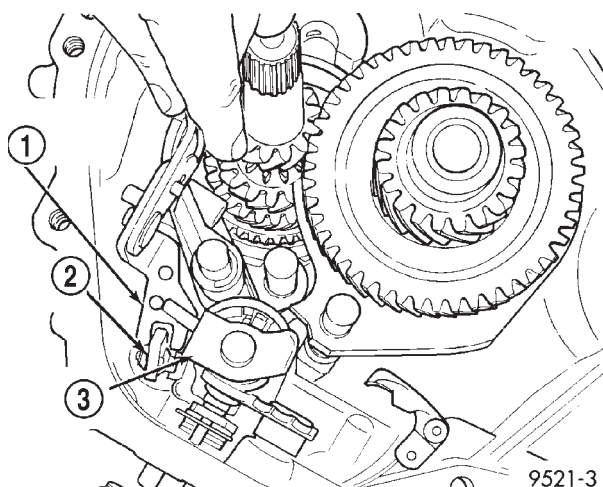
- 1 - CASE
- 2 - REVERSE IDLER SHAFT
- 3 - REVERSE IDLER SHAFT BOLT



FJ9521-8

Fig. 78 Reverse Fork Screws

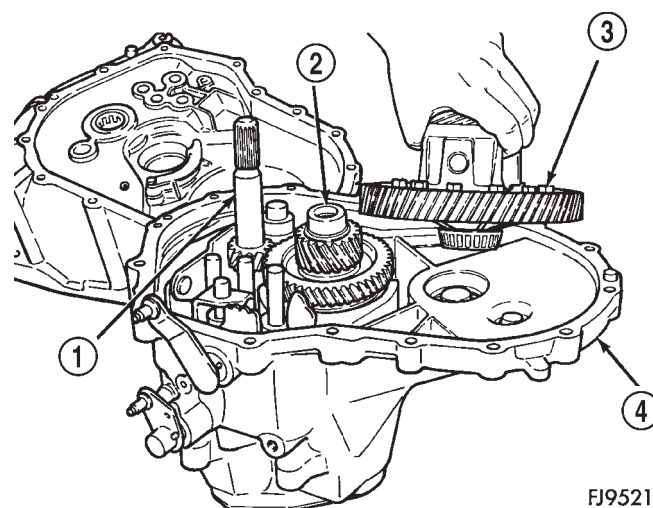
- 1 - SCREWS (2)
- 2 - REVERSE FORK BRACKET



9521-3

Fig. 77 Reverse Fork Bracket

- 1 - REVERSE FORK BRACKET
- 2 - REVERSE CAM BLOCKOUT
- 3 - SHIFT BLOCKER ASSEMBLY



FJ9521-5

Fig. 79 Differential Assembly

- 1 - INPUT SHAFT
- 2 - OUTPUT SHAFT
- 3 - DIFFERENTIAL
- 4 - CASE

(4) Replace bearings as a pair: If one differential bearing is defective, replace both differential bearings, if one input shaft bearing is defective, replace both input shaft bearings.

(5) Bearing cones must not be reused if removed.

(6) Turning-torque readings should be obtained while smoothly rotating in either direction.

DIFFERENTIAL BEARING PRELOAD ADJUSTMENT

NOTE: True bearing turning-torque readings can be obtained only with the geartrain removed from the case.

(1) Remove bearing cup and existing shim from clutch bellhousing case.

(2) Press in new bearing cup into bellhousing case (or use a cup that has been ground down on the outer edge for ease of measurement).

(3) Press in new bearing cup into gear case side.

(4) Oil differential bearings with Mopar® type M. S. 9417 Manual Transaxle Fluid. Install differential assembly in transaxle gear case. Install clutch bellhousing over gear case. Install and torque case bolts to 29 N·m (21 ft. lbs.).

DISASSEMBLY AND ASSEMBLY (Continued)

(5) Position transaxle with bellhousing facing down on workbench with C-clamps. Position dial indicator.

(6) Apply a medium load to differential with Tool C-4995 and a T-handle, in the downward direction. Roll differential assembly back and forth a number of times. This will settle the bearings. Zero the dial indicator. To obtain end play readings, apply a medium load in an upward direction while rolling differential assembly back and forth (Fig. 80). Record end play.

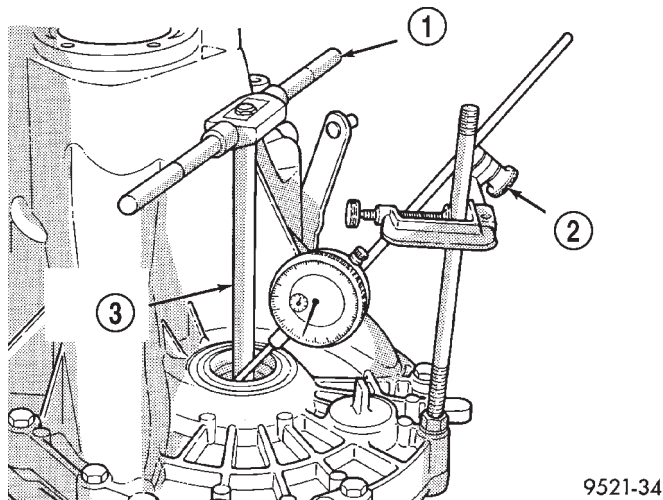


Fig. 80 Checking Differential Bearing End Play To Determine Shim Thickness

- 1 - T-HANDLE
- 2 - DIAL INDICATOR SET
- 3 - SPECIAL TOOL C-4995

(7) The shim required for proper bearing preload is the **total of end play, plus (constant) preload of 0.18mm (0.007 in.)**. Never combine shims to obtain the required preload.

(8) Remove case bolts. Remove clutch bellhousing differential bearing cup. Install shim(s) selected in Step 7. Then press the bearing cup into clutch bellhousing.

(9) Install clutch bellhousing. Install and torque case bolts to 26 N·m (19 ft. lbs.).

(10) Using Special Tool C-4995 and an inch-pound torque wrench, check turning torque of the differential assembly (Fig. 81). **The turning torque should be 6 to 12 in. lbs. If the turning torque is too high, install a 0.05mm (0.002 inch) thinner shim. If the turning torque is too low, install a 0.05mm (0.002 inch) thicker shim.**

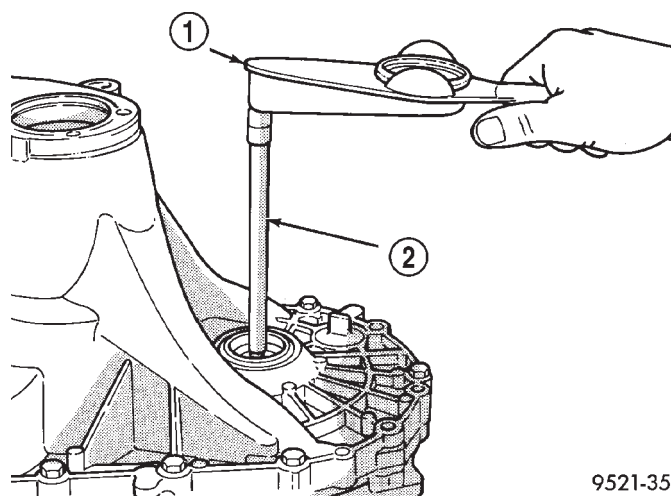


Fig. 81 Checking Differential Bearing Turning Torque

- 1 - INCH-POUND TORQUE WRENCH
- 2 - SPECIAL TOOL C-4995

(11) Recheck turning torque. Repeat Step Step 10 until the proper turning torque is obtained.

Once proper turning torque has been established, place gear case on the end plate. Draw a bead of Mopar® Gasket Maker, Loctite® 518, or equivalent, on the flat surface of the case mating flange. Install clutch bellhousing onto gear case. Install and tighten case bolts to 29 N·m (21 ft. lbs.).

INPUT SHAFT

DISASSEMBLY

Before disassembly of the input shaft, it is necessary to check the synchronizer stop ring gap. Use a feeler gauge to measure the gaps between the stop rings and the speed gears. The correct gaps are listed below:

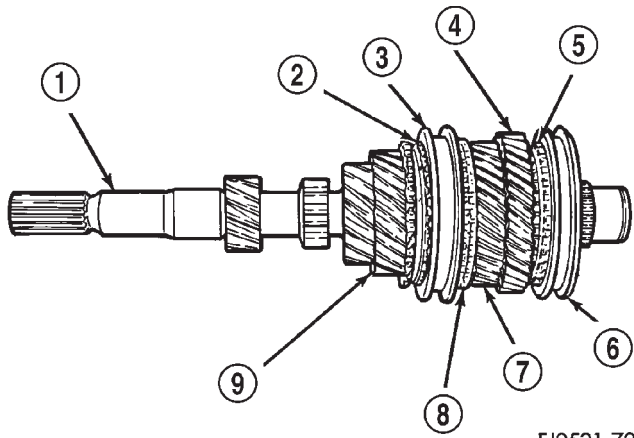
- 1st—1.04-1.72 mm (0.041-0.069 in).
- 2nd—0.94-1.72 mm (0.038-0.069 in).
- 3rd—1.37-1.93 mm (0.054-0.076 in).
- 4th—1.41-1.97 mm (0.056-0.078 in).
- 5th—1.37-1.93 mm (0.054-0.076 in).

If a stop ring gap does not fall within the specifications, it must be inspected for wear and replaced. If the 1st or 2nd synchronizer stop ring is worn beyond specifications, the complete output shaft assembly must be replaced.

The input shaft incorporates the 3rd, 4th, and 5th speed gears and synchronizers on the assembly (Fig. 82).

(1) Install bearing splitter behind 5th speed gear. Remove snap ring at 5th synchronizer hub on input shaft (Fig. 83).

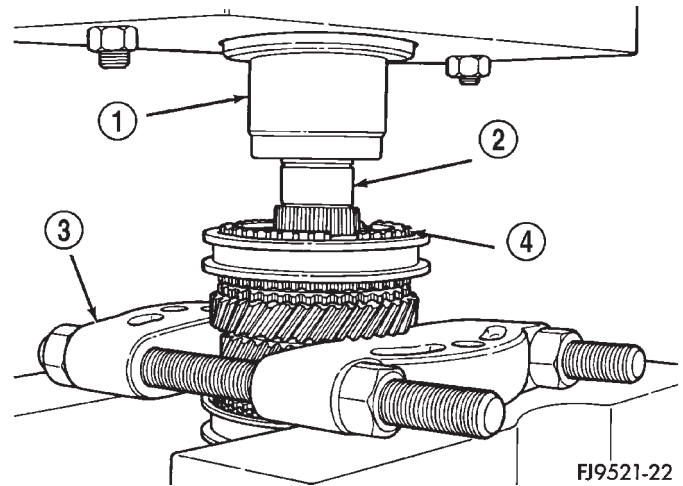
DISASSEMBLY AND ASSEMBLY (Continued)



FJ9521-79

Fig. 82 Input Shaft

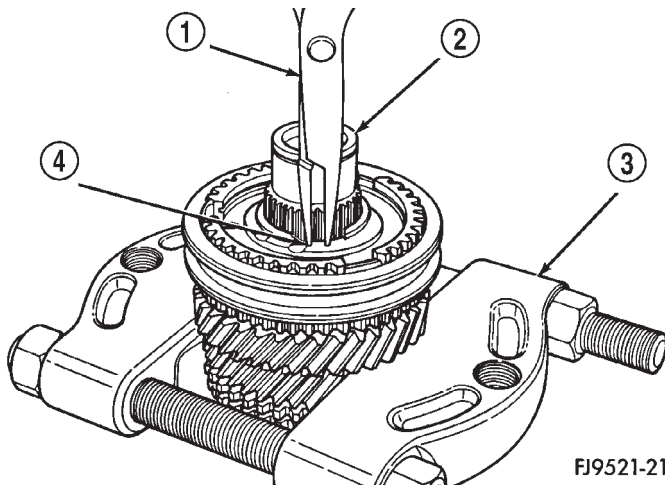
- 1 - INPUT SHAFT
- 2 - STOP RING
- 3 - SLEEVE
- 4 - 5TH SPEED GEAR
- 5 - STOP RING
- 6 - SLEEVE
- 7 - 4TH SPEED GEAR
- 8 - STOP RING
- 9 - 3RD SPEED GEAR



FJ9521-22

Fig. 84 Remove Synchronizer Using Shop Press

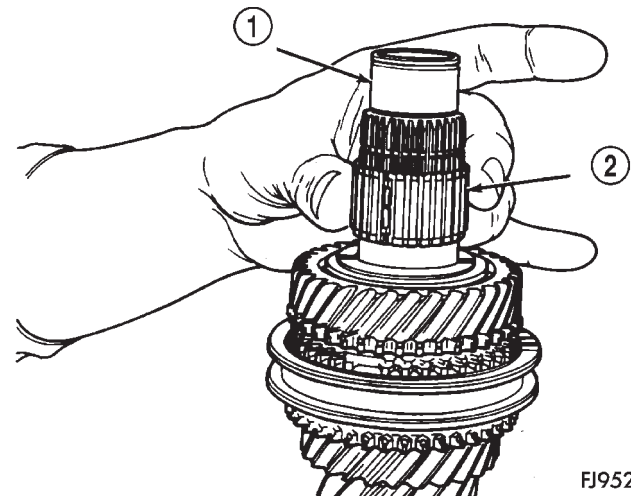
- 1 - PRESS RAM
- 2 - INPUT SHAFT
- 3 - BEARING SPLITTER
- 4 - SYNCHRONIZER ASSEMBLY



FJ9521-21

Fig. 83 5th Synchro and Hub Snap Ring Removal

- 1 - SNAP RING PLIERS
- 2 - INPUT SHAFT
- 3 - BEARING SPLITTER
- 4 - SNAP RING



FJ9521-23

Fig. 85 Caged Needle Bearing Removal

- 1 - INPUT SHAFT
- 2 - CAGED NEEDLE BEARING

(2) Remove synchronizer and gear using shop press (Fig. 84).

(3) Remove caged needle bearing (Fig. 85).

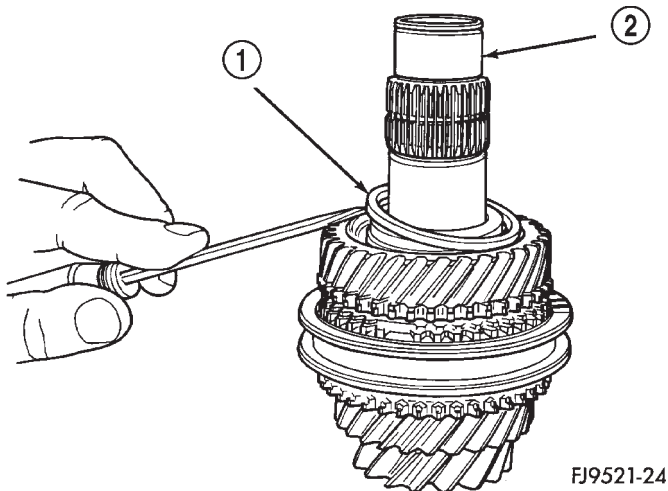
(4) Remove 4-5 gears split thrust washer ring (Fig. 86).

(5) Remove split thrust washer (Fig. 87).

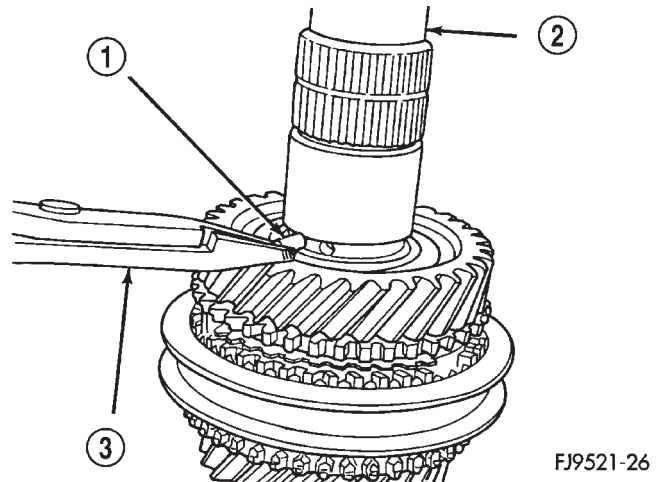
(6) Remove split thrust washer separation pin (Fig. 88).

(7) Remove 4th gear (Fig. 89).

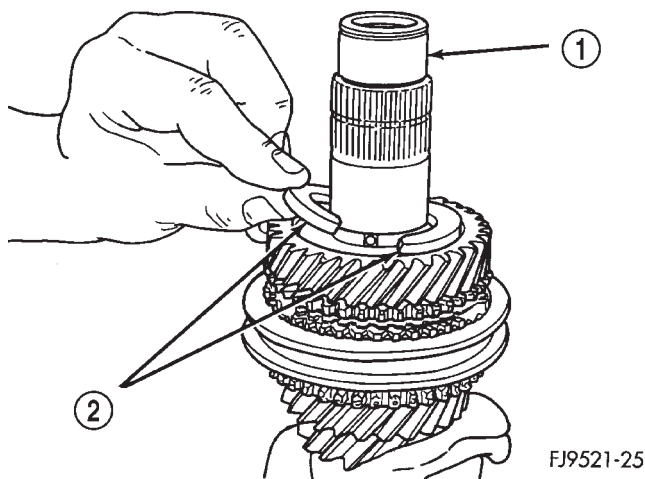
DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 86 Split Thrust Washer Ring Removal**

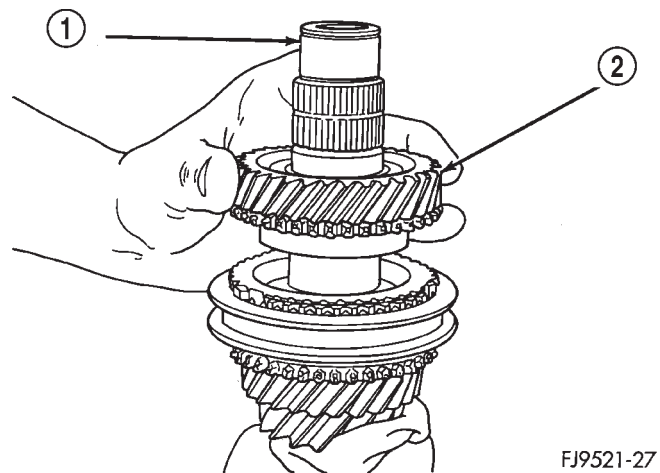
- 1 - SPLIT THRUST WASHER RING
2 - INPUT SHAFT

**Fig. 88 Split Thrust Washer Separation Pin**

- 1 - SEPARATION PIN
2 - INPUT SHAFT
3 - PLIERS

**Fig. 87 Split Thrust Washer Removal**

- 1 - INPUT SHAFT
2 - SPLIT THRUST WASHER

**Fig. 89 4th Gear Removal**

- 1 - INPUT SHAFT
2 - 4TH GEAR

(8) Remove 4th gear caged needle bearing (Fig. 90). Check the caged needle bearing for a broken retention spring.

(9) Remove blocking ring. Remove 3-4 synchronizer hub retaining snap ring (Fig. 91).

(10) Install input shaft in shop press. Using bearing splitter, remove 3-4 synchronizer and 3rd gear (Fig. 92).

(11) Inspect the input shaft for worn or damaged bearing races or chipped gear teeth. Replace as necessary.

DISASSEMBLY AND ASSEMBLY (Continued)

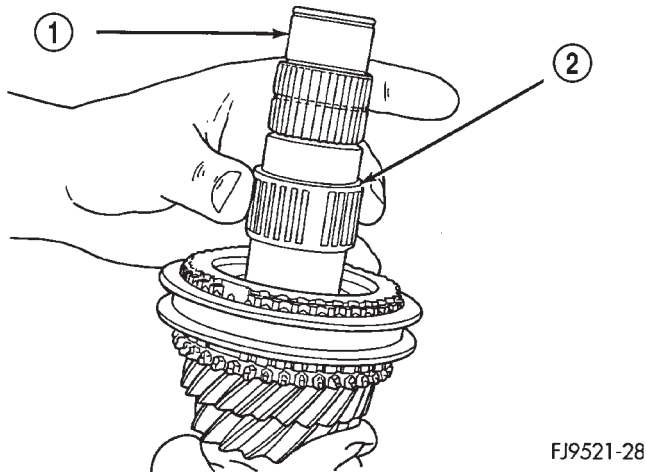


Fig. 90 Caged Needle Bearing Removal

- 1 - INPUT SHAFT
2 - CAGED NEEDLE BEARING

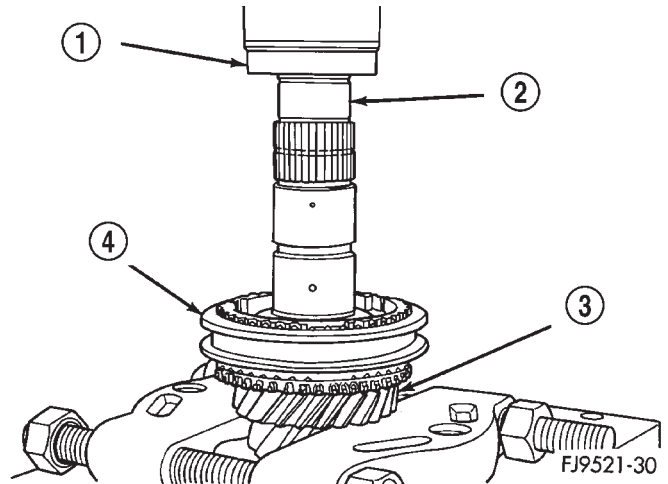


Fig. 92 3rd Gear Removal

- 1 - PRESS RAM
2 - INPUT SHAFT
3 - 3RD GEAR
4 - SYNCHRONIZER ASSEMBLY

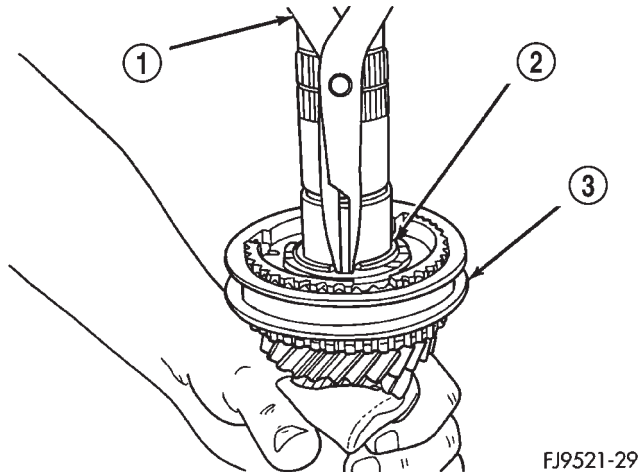


Fig. 91 3-4 Synchronizer Hub Snap Ring

- 1 - SNAP RING PLIERS
2 - SYNCHRO SNAP RING
3 - SYNCHRONIZER ASSEMBLY

ASSEMBLY

The snap rings that are used on the input shaft are available in select fit sizes. Use the thickest snap ring that fits in each snap ring groove.

(1) Place input shaft into shop press.

(2) Install 3rd gear and 3-4 synchronizer onto input shaft. Install Tool #C-3717 over input shaft and press on synchronizer hub and 3rd gear (Fig. 93). The synchronizer hub has the letter **U** stamped on the top face of the hub. This designates that the hub must be installed with the **U** facing upward.

(3) Install 3-4 synchronizer snap ring into slot on

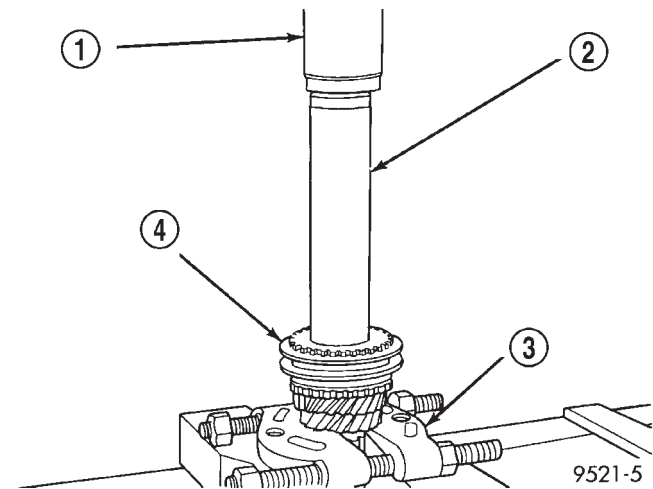


Fig. 93 Press On 3rd Gear Synchronizer Hub

- 1 - PRESS RAM
2 - SPECIAL TOOL C-3717
3 - BEARING SPLITTER
4 - 3RD GEAR SYNCHRONIZER ASSEMBLY

input shaft.

(4) Install blocking ring into 3-4 synchronizer. Install 4th gear caged needle bearing.

(5) Install 4th gear onto input shaft.

(6) Install 4-5 split thrust washer separation pin (Fig. 94).

(7) Install split thrust washer onto input shaft (Fig. 95).

(8) Install split thrust washer retaining ring (Fig. 96).

(9) Install 5th gear caged needle bearing (Fig. 97).

DISASSEMBLY AND ASSEMBLY (Continued)

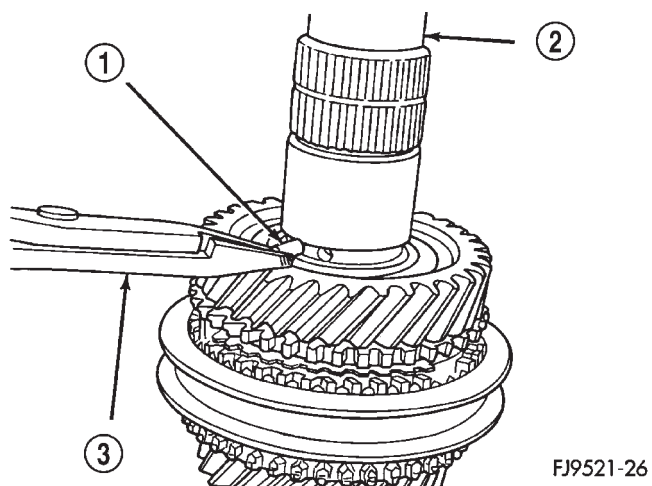


Fig. 94 Split Thrust Washer Separation Pin Installation

- 1 - SEPARATION PIN
2 - INPUT SHAFT
3 - PLIERS

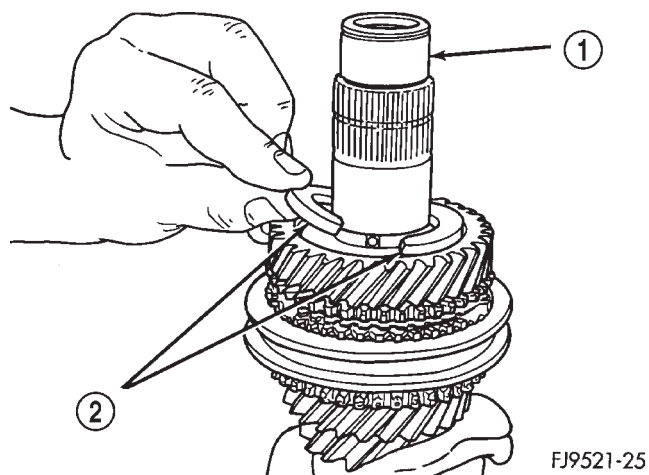


Fig. 95 Split Thrust Washer Installation

- 1 - INPUT SHAFT
2 - SPLIT THRUST WASHER

(10) Using special tool #C-3717, install 5th speed gear and synchronizer (Fig. 98). The 5th gear synchronizer hub has the letter **S** stamped on the top face of the hub. This designates that the hub must be installed with the **S** facing upward.

(11) Install 5th gear synchronizer snap ring (Fig. 99).

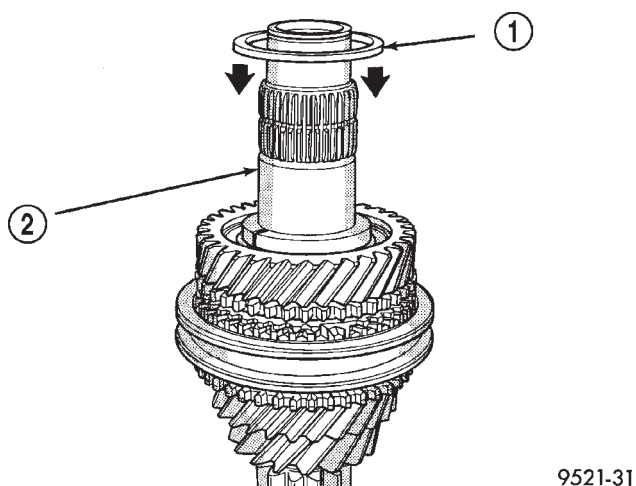


Fig. 96 Retaining Ring Installation

- 1 - SPLIT THRUST WASHER RING
2 - INPUT SHAFT

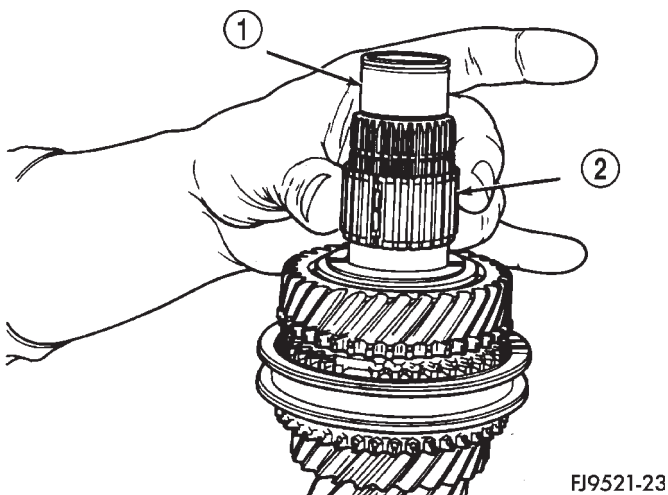


Fig. 97 Caged Needle Bearing Installation

- 1 - INPUT SHAFT
2 - CAGED NEEDLE BEARING

OUTPUT SHAFT

CAUTION: The output shaft is serviced as an assembly. Do not try to repair any component on the output shaft. If the 1-2 synchronizer or gear fails, it is necessary to replace the output shaft assembly.

It is necessary to check the synchronizer stop ring gap. Use a feeler gauge to measure the gaps between the stop rings and the speed gears. The correct gaps are listed below:

- 1st—0.94-2.08 mm (0.038-0.082 in).
- 2nd—0.94-2.08 mm (0.038-0.082 in).
- 3rd—0.73-1.53 mm (0.029-0.060 in).
- 4th—0.77-1.57 mm (0.030-0.062 in).
- 5th—0.73-1.53 mm (0.029-0.060 in).

DISASSEMBLY AND ASSEMBLY (Continued)

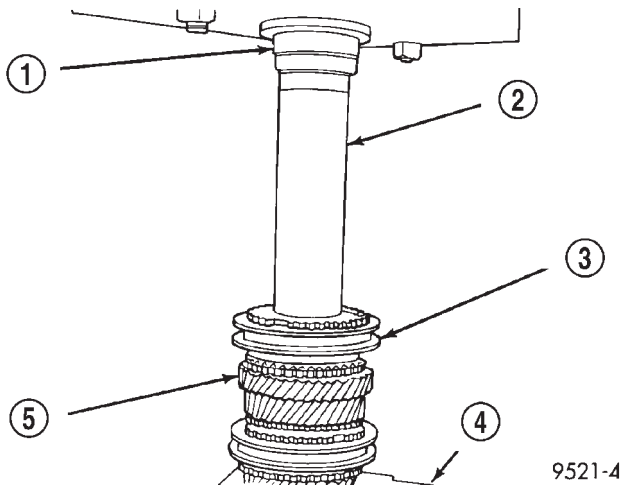


Fig. 98 5th Speed Gear Installation

- 1 - PRESS RAM
- 2 - SPECIAL TOOL C-3717
- 3 - SYNCHRONIZER ASSEMBLY
- 4 - BEARING SPLITTER
- 5 - 5TH SPEED GEAR

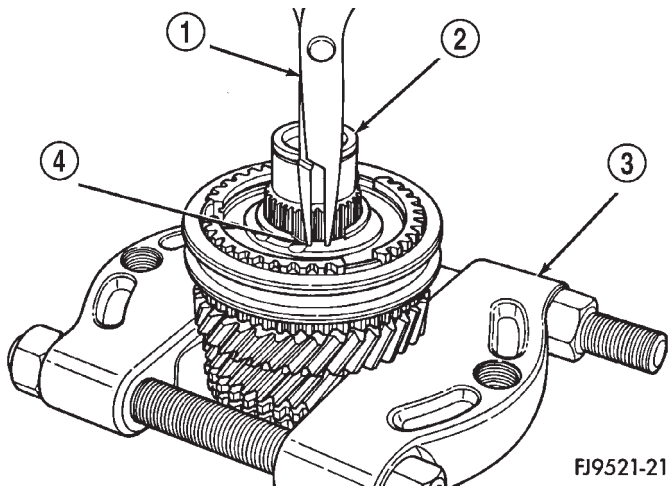


Fig. 99 5th Gear Synchronizer Snap Ring Installation

- 1 - SNAP RING PLIERS
- 2 - INPUT SHAFT
- 3 - BEARING SPLITTER
- 4 - SNAP RING

If a stop ring gap does not fall within the specifications it must be inspected for wear and replaced. If the 1st or 2nd synchronizer stop ring is worn beyond specifications, the complete output shaft assembly must be replaced.

The output shaft incorporates the 1st and 2nd gears and synchronizers on the assembly (Fig. 100).

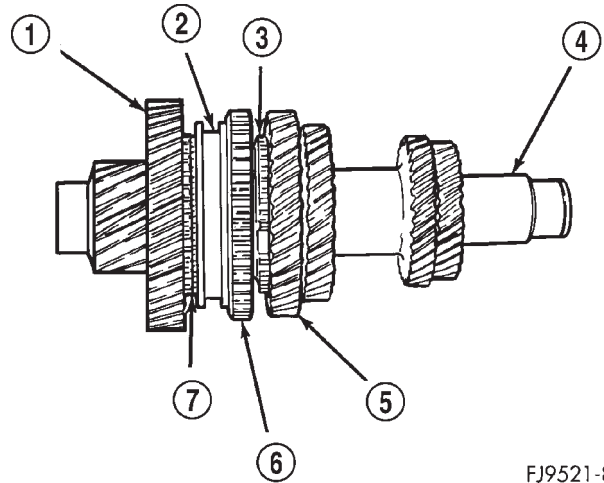


Fig. 100 Output Shaft

- 1 - 1ST GEAR
- 2 - SLEEVE
- 3 - STOP RING
- 4 - OUTPUT SHAFT
- 5 - 2ND SPEED GEAR
- 6 - REVERSE GEAR
- 7 - STOP RING

DIFFERENTIAL

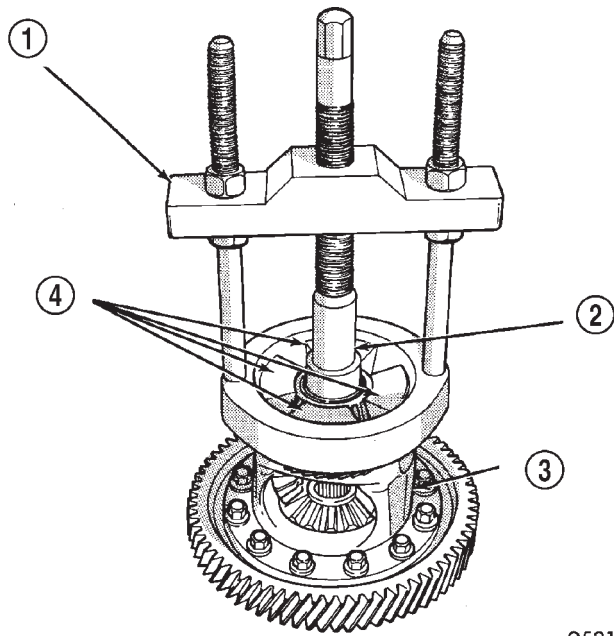
Shim thickness need be determined only if any of the following parts are replaced:

- Transaxle gear case
- Clutch bellhousing case
- Differential case
- Differential bearings

Refer to **Bearing Adjustment Procedure** in the Adjustments section at the end of this section to determine proper shim thickness. This will provide correct bearing preload and proper bearing turning torque.

DISASSEMBLY AND ASSEMBLY (Continued)

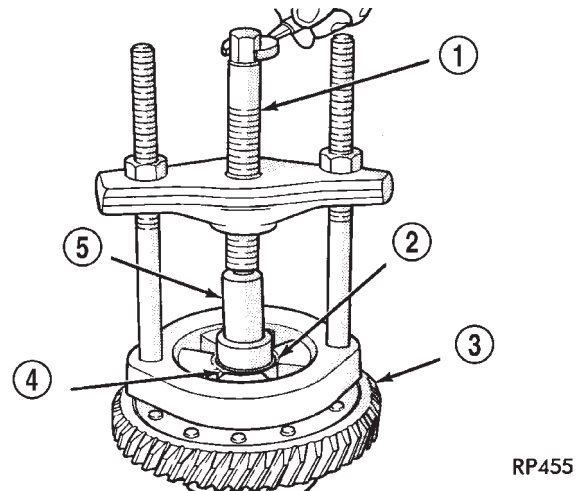
DIFFERENTIAL BEARINGS



9521-20

Fig. 101 Remove Differential Bearing Cone

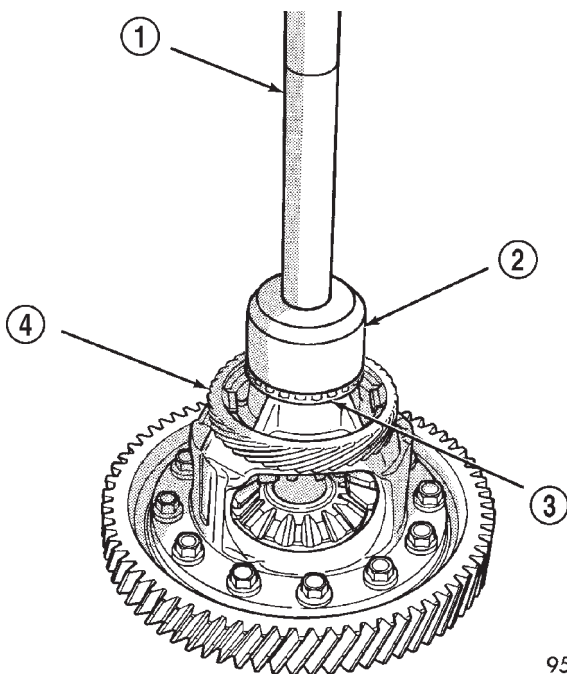
- 1 - SPECIAL TOOL C-293-PA
- 2 - SPECIAL TOOL C-4996
- 3 - DIFFERENTIAL ASSEMBLY
- 4 - SPECIAL TOOL C-293-45



RP455

Fig. 103 Remove Differential Bearing Cone

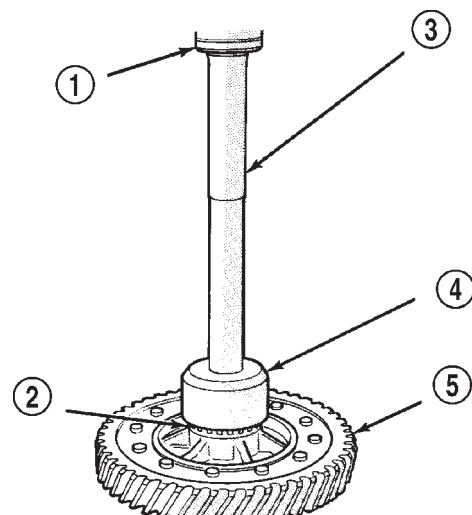
- 1 - SPECIAL TOOL C-293
- 2 - SPECIAL TOOL ADAPTER C-293-45 (USE 4 PIECES)
- 3 - DIFFERENTIAL ASSEMBLY
- 4 - DIFFERENTIAL BEARING CONE
- 5 - SPECIAL TOOL C-4996 (NOTE POSITION)



9521-21

Fig. 102 Install Differential Bearing Cone

- 1 - SPECIAL TOOL C-4171
- 2 - SPECIAL TOOL L-4410
- 3 - BEARING CONE
- 4 - SPEED SENSOR DRIVE GEAR



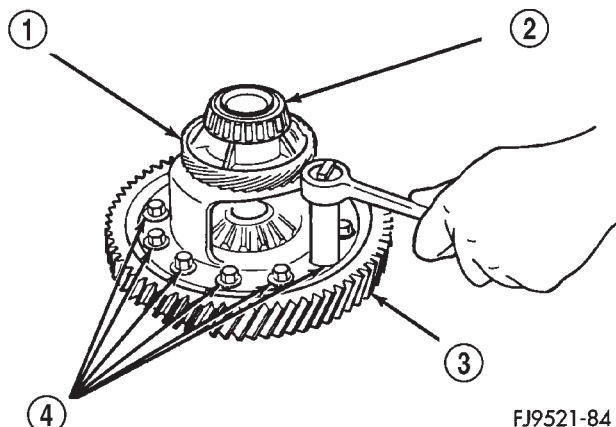
RP456

Fig. 104 Install Differential Bearing Cone

- 1 - ARBOR PRESS RAM
- 2 - BEARING CONE
- 3 - SPECIAL TOOL HANDLE C-4171
- 4 - SPECIAL TOOL L-4410
- 5 - DIFFERENTIAL ASSEMBLY

DISASSEMBLY AND ASSEMBLY (Continued)

RING GEAR



FJ9521-84

Fig. 105 Remove or Install Ring Gear Bolts and Ring Gear

- 1 - SPEEDOMETER DRIVE GEAR
- 2 - BEARING
- 3 - RING GEAR
- 4 - RING GEAR BOLTS

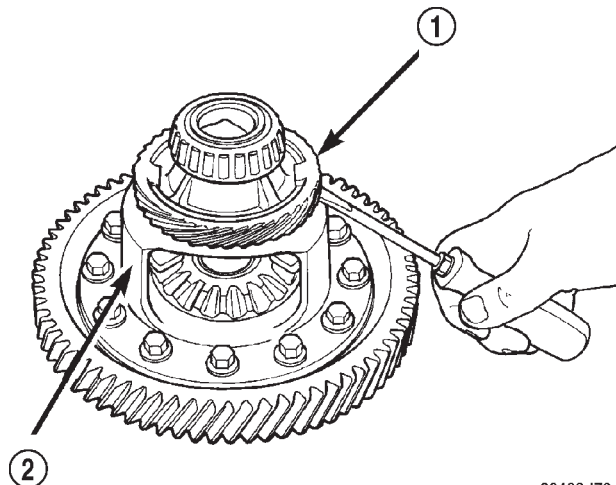
CAUTION: Always install new ring gear bolts. Tighten ring gear bolts to 81 N·m (60 ft. lbs.) torque.

SPEEDOMETER DRIVE GEAR

NOTE: The plastic speedometer drive gear must be removed from the differential case in order to service the differential gears

REMOVAL

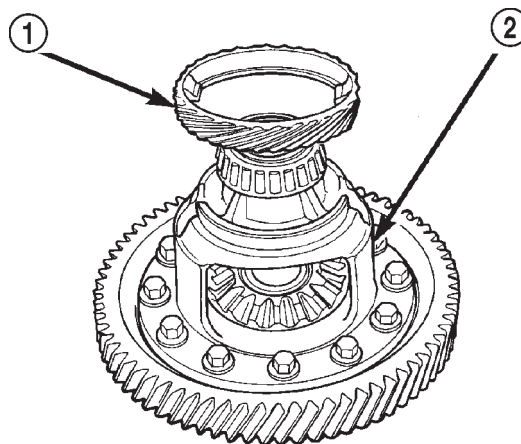
(1) Pry the plastic speedometer drive gear off of the differential case using a flat blade pry tool (Fig. 106) (Fig. 107).



80468d70

Fig. 106 Pry Off Speedometer Drive Gear

- 1 - SPEEDOMETER DRIVE GEAR
- 2 - DIFFERENTIAL ASSEMBLY



80468d71

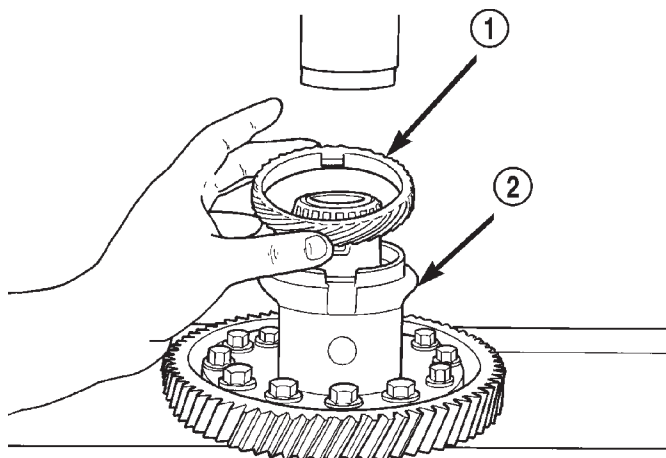
Fig. 107 Speedometer Drive Gear Removed

- 1 - SPEEDOMETER DRIVE GEAR
- 2 - DIFFERENTIAL ASSEMBLY

INSTALLATION

NOTE: A new speedometer drive gear must be installed on differential assembly. The lip on the speedometer drive gear must be positioned downward when installing onto differential assembly.

(1) Position speedometer drive gear onto differential assembly (Fig. 108).



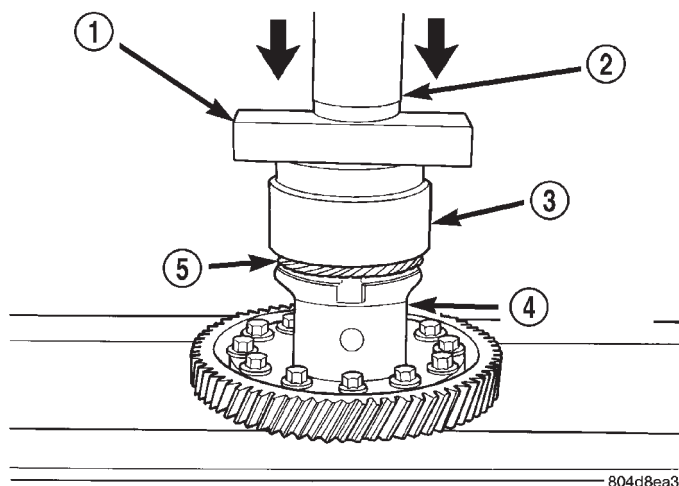
804d8ea0

Fig. 108 Speedometer Drive Gear

- 1 - SPEEDOMETER DRIVE GEAR
- 2 - DIFFERENTIAL ASSEMBLY

(2) Using Miller Tool # L-4440 and steel stock, press speedometer drive gear onto differential (Fig. 109) (Fig. 110). Do not use a hammer.

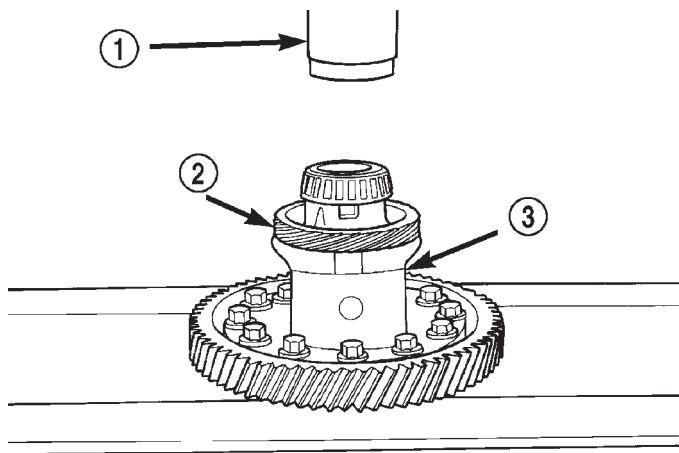
DISASSEMBLY AND ASSEMBLY (Continued)



804d8ea3

Fig. 109 Press Gear onto Differential

- 1 - STEEL STOCK
- 2 - PRESS RAM
- 3 - SPECIAL TOOL L-4440
- 4 - DIFFERENTIAL ASSEMBLY
- 5 - SPEEDOMETER DRIVE GEAR



804d8ea4

Fig. 110 Drive Gear Pressed onto Differential

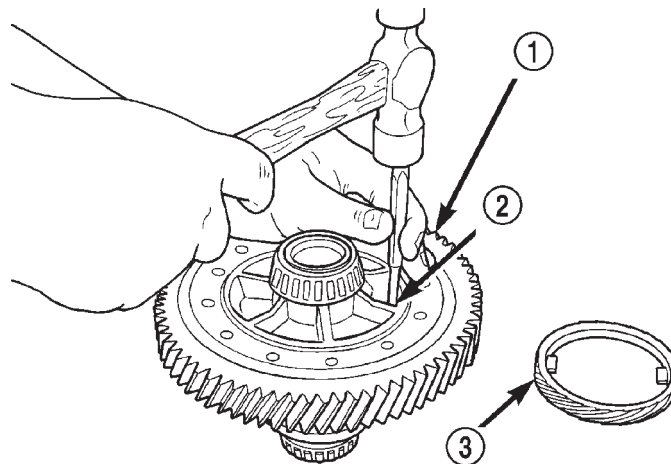
- 1 - PRESS RAM
- 2 - SPEEDOMETER DRIVE GEAR
- 3 - DIFFERENTIAL ASSEMBLY

DIFFERENTIAL GEARS

NOTE: The plastic speedometer drive gear must be removed from the differential case in order to service the differential gears. Refer to Speedometer Drive Gear for service information.

REMOVAL

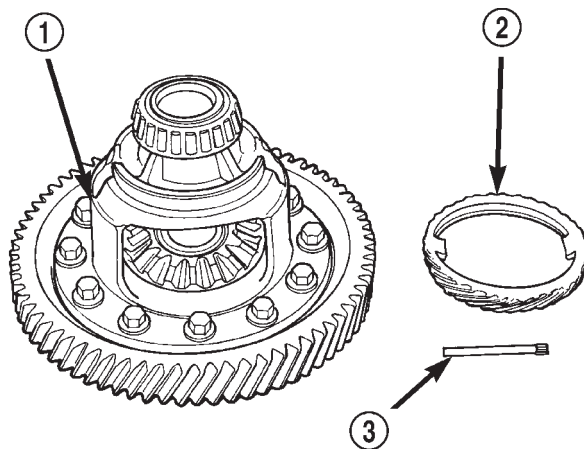
(1) Remove pinion shaft retaining pin (Fig. 111) (Fig. 112).



80468d72

Fig. 111 Remove Pinion Shaft Retaining Pin

- 1 - RING GEAR
- 2 - PINION SHAFT RETAINING PIN
- 3 - SPEEDOMETER DRIVE GEAR



80468d73

Fig. 112 Retaining Pin Removed

- 1 - DIFFERENTIAL ASSEMBLY
- 2 - SPEEDOMETER DRIVE GEAR
- 3 - PINION SHAFT RETAINING PIN

(2) Remove pinion shaft (Fig. 113).

DISASSEMBLY AND ASSEMBLY (Continued)

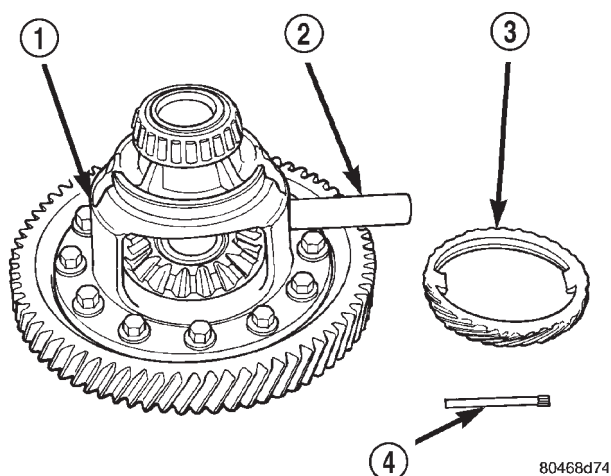


Fig. 113 Pinion Shaft Removal

- 1 - DIFFERENTIAL ASSEMBLY
- 2 - PINION SHAFT
- 3 - SPEEDOMETER DRIVE GEAR
- 4 - PINION SHAFT RETAINING PIN

(3) Rotate side gears to opening in differential (Fig. 114).

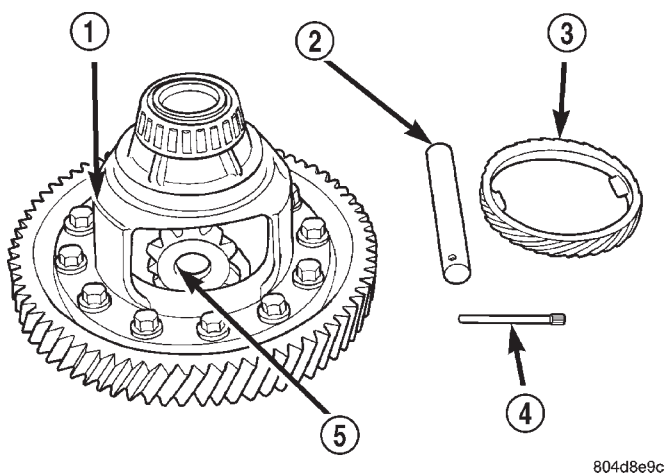


Fig. 114 Remove Pinion Gears, Side Gears, and Thrust Washers by Rotating Side Gears to Opening in Case

- 1 - DIFFERENTIAL ASSEMBLY
- 2 - PINION SHAFT
- 3 - SPEEDOMETER DRIVE GEAR
- 4 - PINION SHAFT RETAINING PIN
- 5 - PINION GEAR (2)

(4) Remove differential gears (Fig. 115).

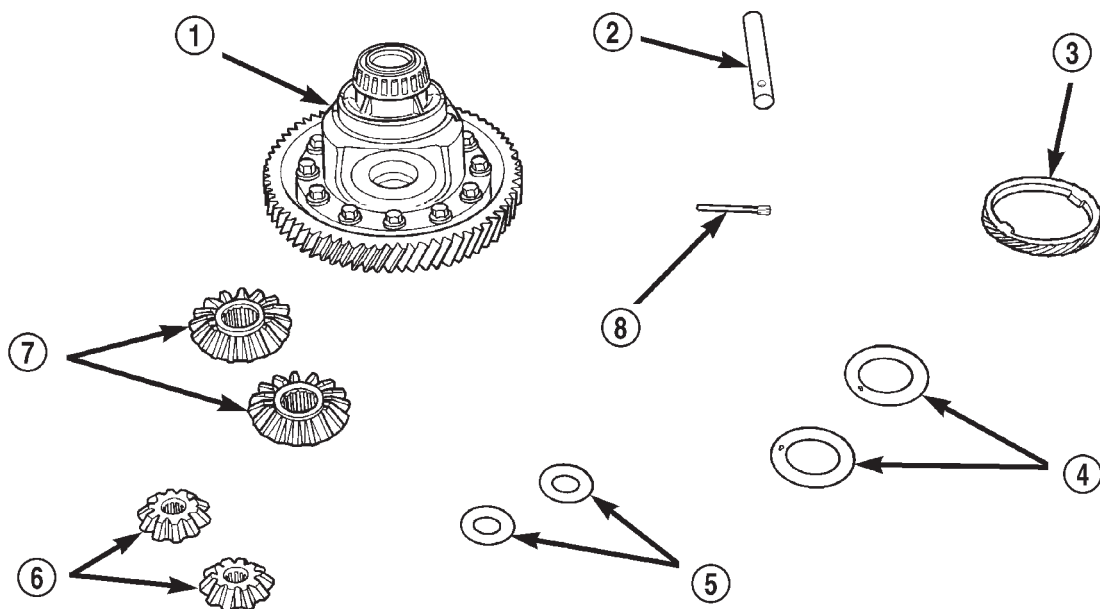


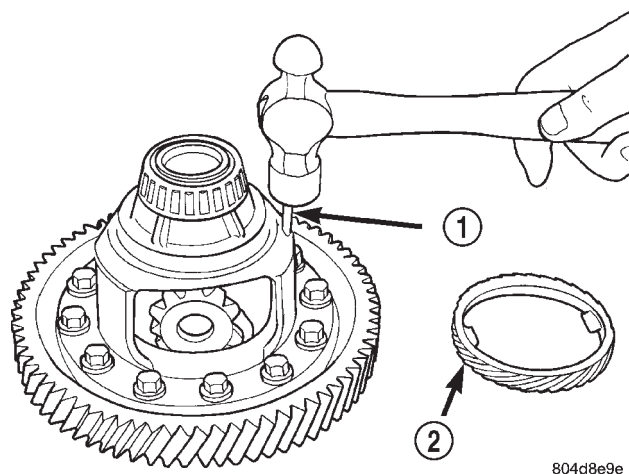
Fig. 115 Differential Gears

- 1 - DIFFERENTIAL ASSEMBLY
- 2 - PINION SHAFT
- 3 - SPEEDOMETER DRIVE GEAR
- 4 - SIDE GEAR THRUST WASHERS (SELECT THICKNESS)
- 5 - PINION GEAR THRUST WASHERS
- 6 - PINION GEARS
- 7 - SIDE GEARS
- 8 - PINION SHAFT RETAINING PIN

DISASSEMBLY AND ASSEMBLY (Continued)

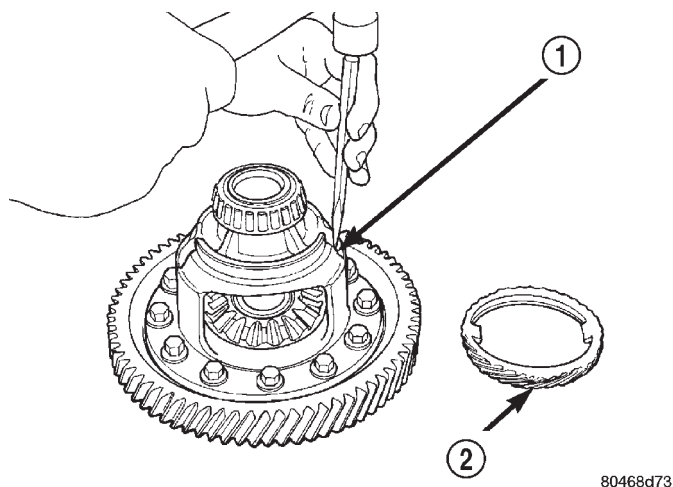
INSTALLATION

- (1) Assemble the differential side gears, pinion gears and pinion gears with the pinion gear washers.
- (2) Install pinion shaft retaining pin (Fig. 116).

**Fig. 116 Install Retaining Pin**

- 1 - PINION SHAFT RETAINING PIN
- 2 - SPEEDOMETER DRIVE GEAR

- (3) Stake pinion shaft retaining pin with a suitable chisel (Fig. 117).

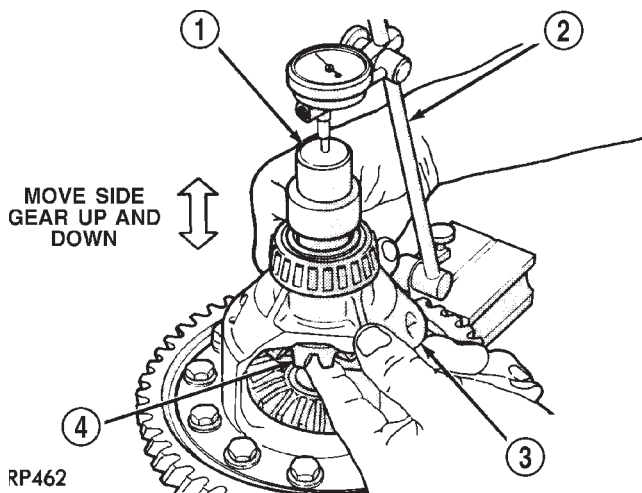
**Fig. 117 Staking Retaining Pin**

- 1 - PINION SHAFT RETAINING PIN
- 2 - SPEEDOMETER DRIVE GEAR

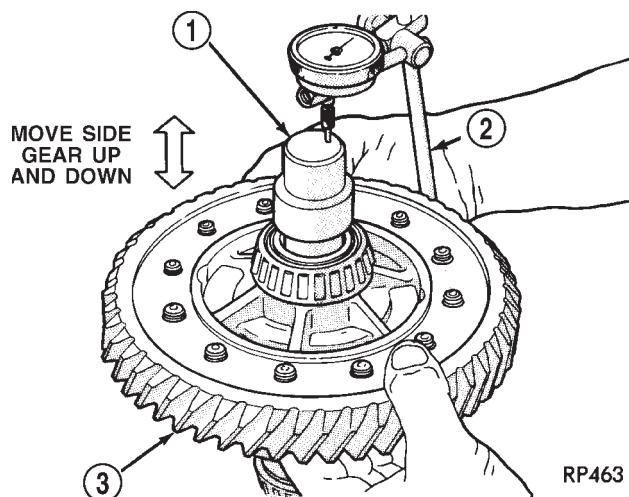
- (4) Rotate the assembly two full revolutions both clockwise and counterclockwise.

- (4) Set up dial indicator as shown and record end play (Fig. 118) (Fig. 119). Rotate side gear 90 degrees and record another end play. Again, rotate side gear 90 degrees and record a final end play.

- (5) Using the smallest end play recorded, shim that side gear to within 0.001 to 0.013 inch. The

**Fig. 118 Checking Side Gear End Play (Typical)**

- 1 - SPECIAL TOOL C-4996 (NOTE POSITION)
- 2 - DIAL INDICATOR SET
- 3 - DIFFERENTIAL ASSEMBLY
- 4 - SIDE GEAR

**Fig. 119 Checking Side Gear End Play (Typical)**

- 1 - SPECIAL TOOL C-4996 (NOTE POSITION)
- 2 - DIAL INDICATOR SET
- 3 - DIFFERENTIAL ASSEMBLY

other side gear should be checked using the same procedure.

CAUTION: Side gear end play must be within 0.001 to 0.013 inch. Five select thrust washers are available: 0.027, 0.032, 0.037, 0.042, and 0.047 inch.

- (6) After the end play is measured and adjusted, replace speedometer drive gear with a new one. Install drive gear lip downward. For service information, refer to Speedometer Drive Gear service in this section.

DISASSEMBLY AND ASSEMBLY (Continued)

SYNCHRONIZER

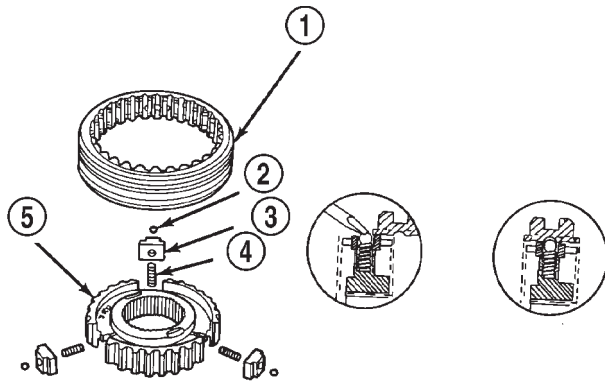
DISASSEMBLY

Place synchronizer in a clean shop towel and wrap. Press on inner hub. Carefully open up shop towel and remove springs, balls, keys, hub, and sleeve.

ASSEMBLY

(1) Position synchronizer hub onto a suitable holding fixture (input shaft). The synchronizer hubs are directional. The hubs must be installed with the **U** facing upward.

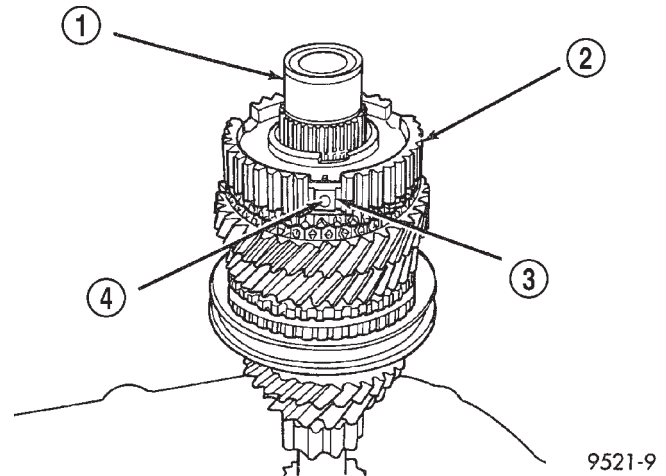
(2) Install springs into hub slot (Fig. 120).



9521-69

Fig. 120 Synchronizer Assembly

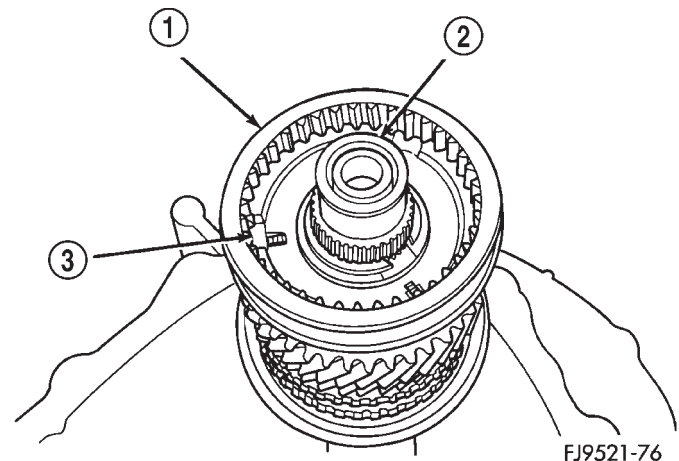
- 1 - SLEEVE
- 2 - BALL
- 3 - KEY
- 4 - SPRING
- 5 - HUB



9521-9

Fig. 121 Synchronizer Balls

- 1 - INPUT SHAFT
- 2 - HUB
- 3 - KEY
- 4 - BALL



FJ9521-76

Fig. 122 Synchronizer Sleeve

- 1 - SLEEVE
- 2 - INPUT SHAFT
- 3 - KEY

(3) Insert key into hub and spring.

(4) Apply petroleum jelly to the hole in the key. Insert balls into each key (Fig. 121).

(5) Slide sleeve over the hub and depress balls as you carefully slip the sleeve into position (Fig. 122).

(6) Line up stop ring tang over the keys in the hub (Fig. 123). Install stop rings. Center the keys and balls by pushing on both stop rings.

SHIFT RAILS OVERHAUL

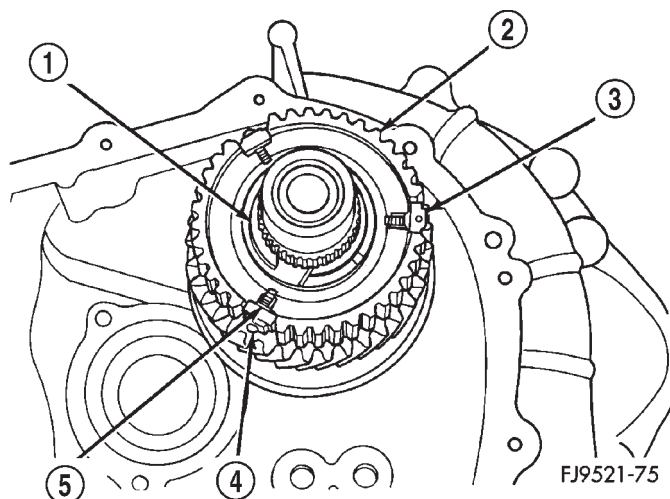
(1) Remove shift rails from the geartrain.

(2) To service the 5-R shift rail, remove the C-clip retaining the reverse shift lever arm. Remove the 5th shift fork roll pin and remove the 5th shift fork. Remove the shift lug roll pin and remove the shift lug. Replace parts as necessary.

(3) To service the 3-4 shift rail, remove the roll pin retaining the 3-4 shift fork. Remove the shift fork. Remove the shift lug roll pin and remove the shift lug. Replace parts as necessary.

(4) To service the 1-2 shift rail, remove the roll pin retaining the 1-2 shift fork. Remove the shift fork and replace parts as necessary.

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 123 Keys in Hub**

- 1 - SNAP RING
- 2 - CLUTCH
- 3 - KEY
- 4 - BALL
- 5 - SPRING

TRANSAXLE CASE OVERHAUL

The sealant used to seal the transaxle case halves is Mopar® Gasket Maker, Loctite® 518, or equivalent. The sealant used for the bearing end-plate cover is Mopar® RTV.

The components that are left in the gear cases when the gear train is pulled out are the:

- Axle shaft seals
- Output bearing race and retainer
- Input bearing and sleeve
- Differential bearing cones
- Shift rail bushings
- Shift shafts
- Shift shaft seals
- Shift shaft bushings
- Rear bearing oil feed trough

AXLE SHAFT SEALS**REMOVAL**

(1) Insert a flat-blade pry tool at outer edge of axle shaft seal (Fig. 124).

(2) Tap on the pry tool with a small hammer and remove axle shaft seal.

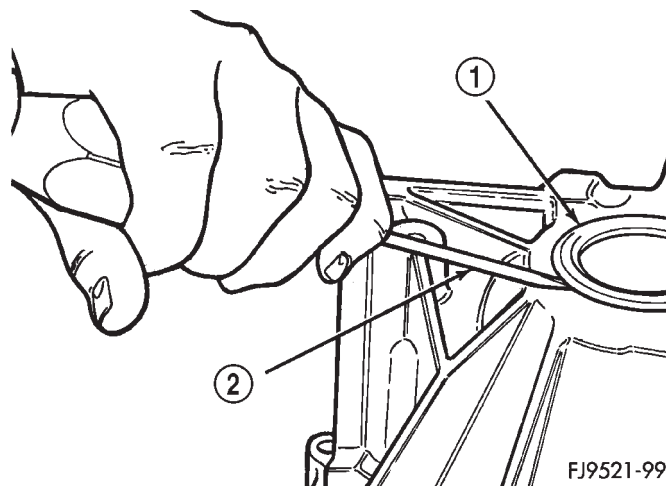
INSTALLATION

(1) Clean axle shaft seal bore of any excess sealant.

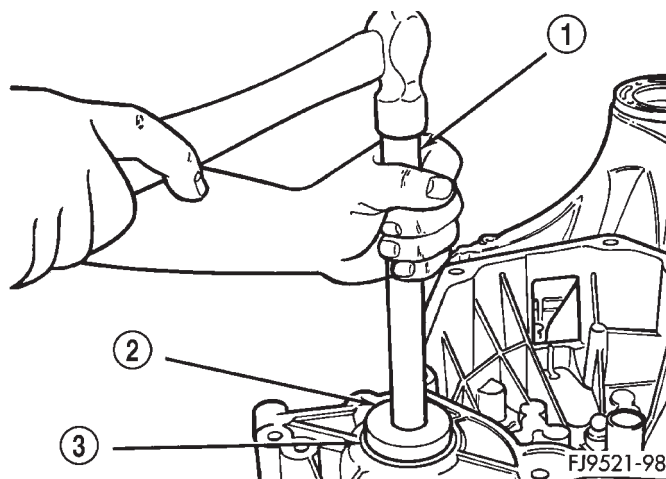
(2) Align axle shaft seal with axle shaft seal bore.

(3) Install axle seal on tool #6709 with C-4171 and insert into axle shaft seal bore.

(4) Tap seal into position (Fig. 125).

**Fig. 124 Axle Shaft Seal Removal**

- 1 - AXLE SEAL
- 2 - PRY TOOL

**Fig. 125 Axle Seal Installation**

- 1 - TOOL C-4171
- 2 - TOOL 6709
- 3 - AXLE SEAL

OUTPUT BEARING**REMOVAL**

CAUTION: THE POSITION OF THE OUTPUT SHAFT BEARING IS CRITICAL. THE BEARING IS NOT IDENTICAL END-TO-END. INSTALL BEARING WITH LARGER DIAMETER CAGE RING FACING OUT.

(1) Remove caged roller bearing from output bearing race (Fig. 126).

(2) Remove screws at output bearing retainer strap (Fig. 127).

(3) Install tool #6787 and slide hammer (Fig. 128). Tighten tool to output bearing race.

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Using slide hammer, remove output bearing race.

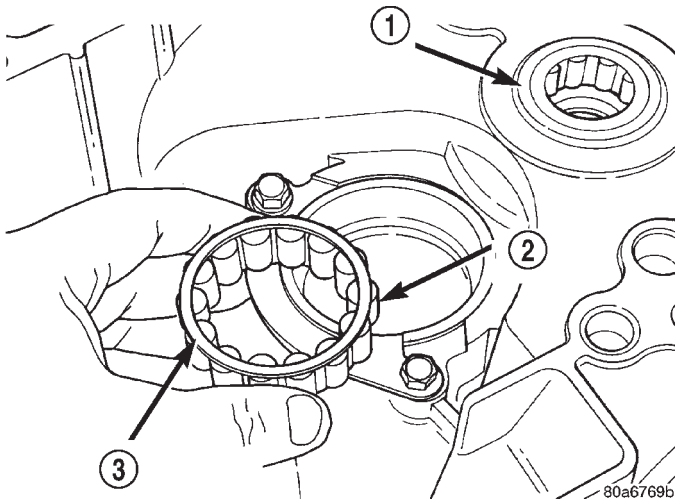


Fig. 126 Output Roller Bearing

- 1 - INPUT BEARING
- 2 - OUTPUT BEARING
- 3 - LARGER DIAMETER CAGE RING

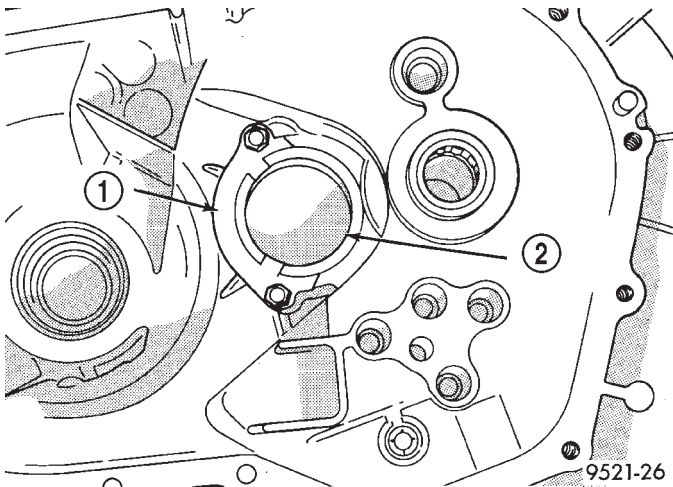


Fig. 127 Output Bearing Strap

- 1 - BEARING RETAINER
- 2 - OUTPUT BEARING RACE

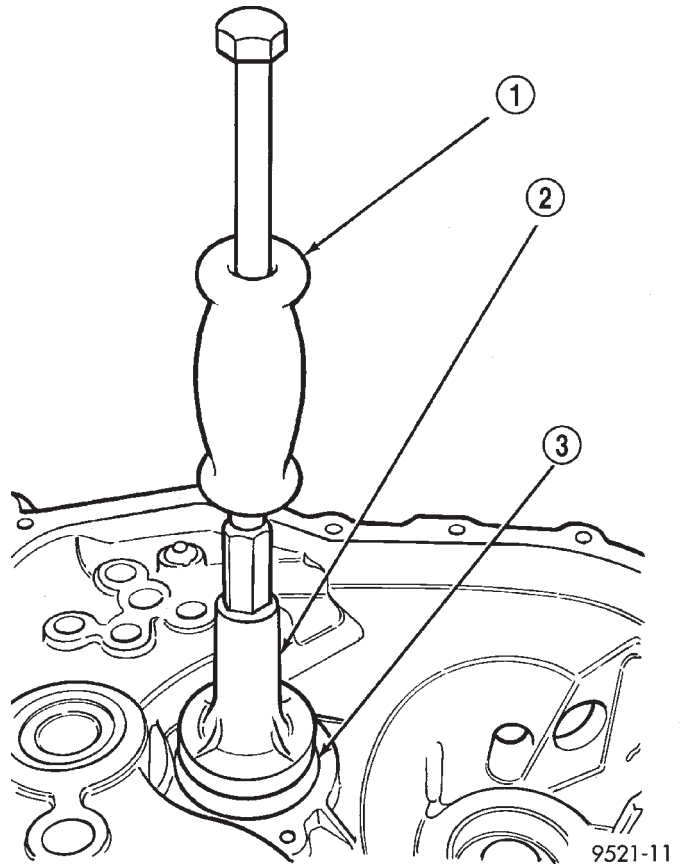


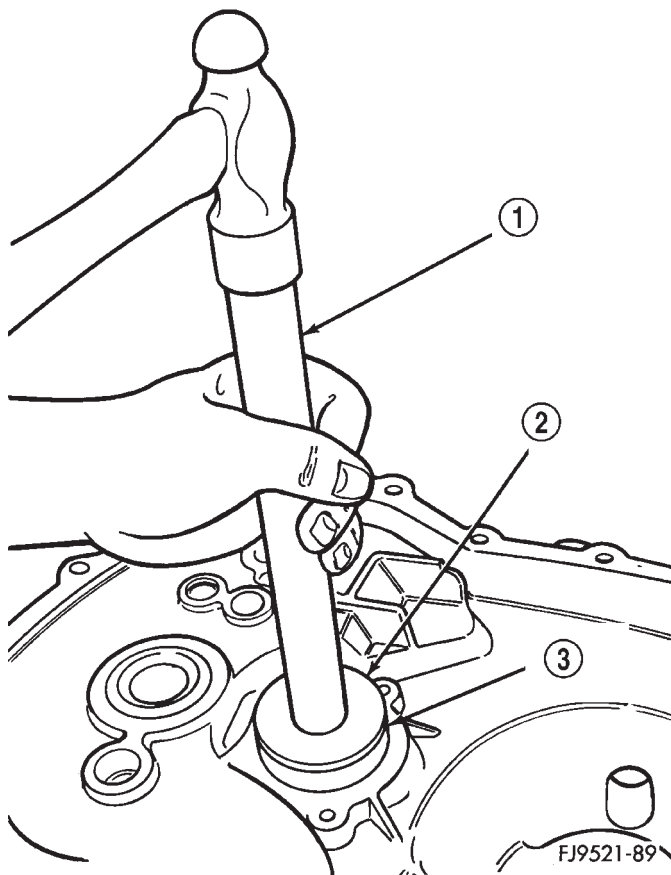
Fig. 128 Output Bearing Race Removal

- 1 - C-3752
- 2 - SPECIAL TOOL 6787
- 3 - OUTPUT SHAFT BEARING RACE

INSTALLATION

- (1) Line up output bearing race to race bore.
- (2) Insert tool #4628 with C-4171 into output bearing race (Fig. 129). Tap race into bore. Install output bearing into race. Verify that the larger diameter cage is facing outward. Position bearing retaining strap. Tighten bolts to 11 N·m (96 in. lbs.).

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 129 Output Bearing Race Installation**

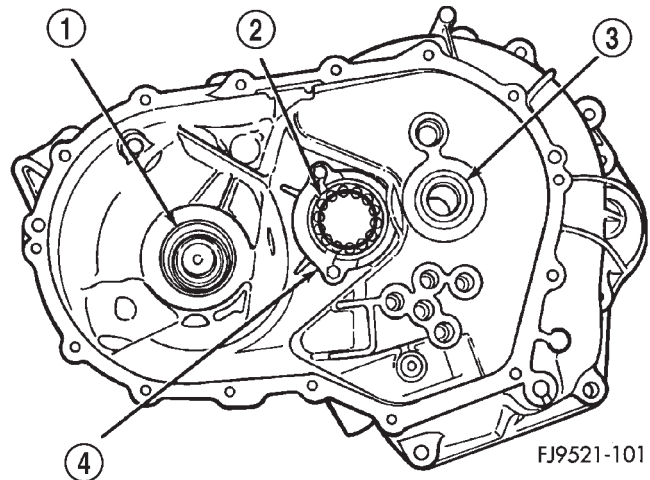
- 1 - TOOL C-4171
- 2 - TOOL C-4628
- 3 - OUTPUT BEARING RACE

INPUT BEARING AND SLEEVE

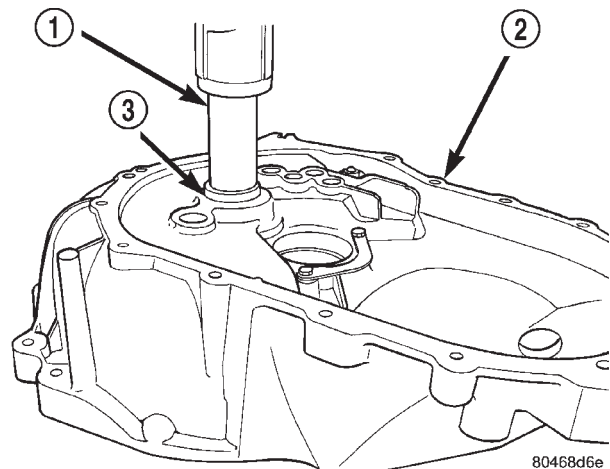
The input bearing is a one-piece bearing and sleeve unit (Fig. 130). The sleeve is the slide point for the clutch-release bearing and lever.

REMOVAL

- (1) Install tool #6342 over input bearing on the gear case side of the transaxle clutch housing.
- (2) Press the input bearing out of the housing (Fig. 131).

**Fig. 130 Input Bearing And Sleeve**

- 1 - DIFFERENTIAL BEARING
- 2 - OUTPUT BEARING
- 3 - INPUT BEARING
- 4 - BEARING RETAINER

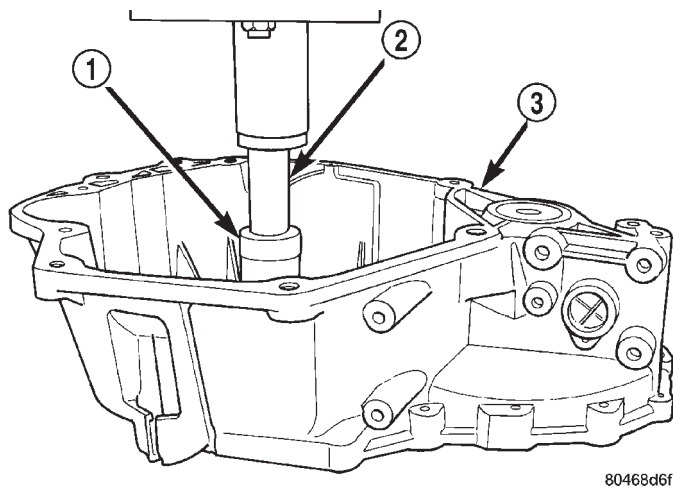
**Fig. 131 Input Bearing Removal**

- 1 - SPECIAL TOOL 6342
- 2 - BELLHOUSING HALF
- 3 - INPUT BEARING AND SLEEVE

INSTALLATION

- (1) Apply coating of Loctite® sealant on bearing outer diameter. Position sleeve and bearing assembly at input bearing bore.
- (2) Install tool #C-4680-1 over input bearing (Fig. 132).
- (3) Using the spacer tool #4894 and shop press, install input bearing into bore until it is fully seated (Fig. 133).

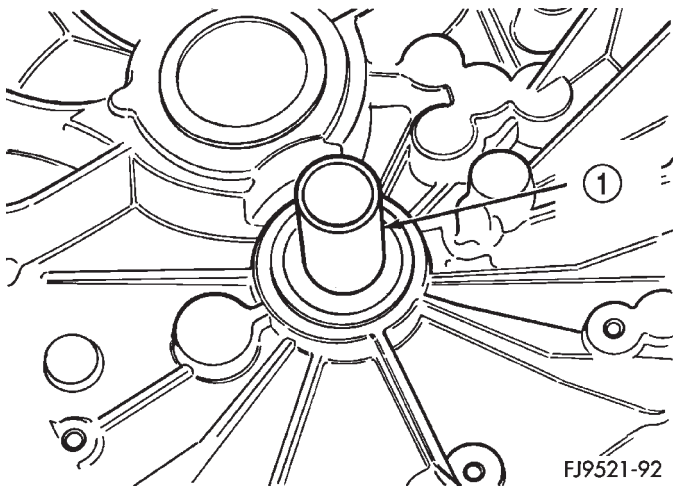
DISASSEMBLY AND ASSEMBLY (Continued)



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Fig. 132 Input Bearing Tool

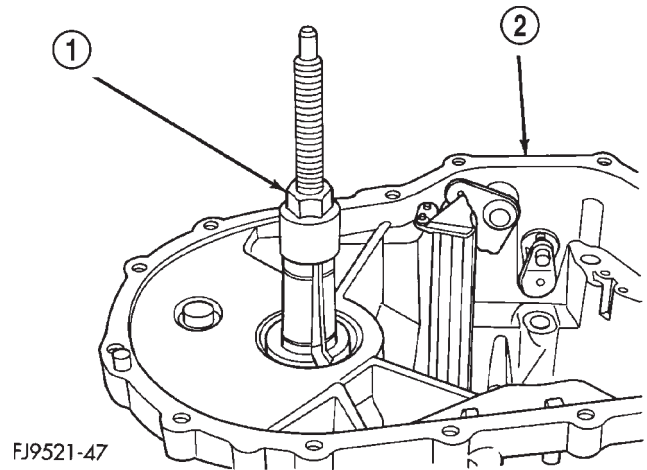
- 1 - SPECIAL TOOL C-4680-1
- 2 - SPECIAL TOOL 4894
- 3 - BELLHOUSING HALF



FJ9521-92

Fig. 133 Input Bearing Installed

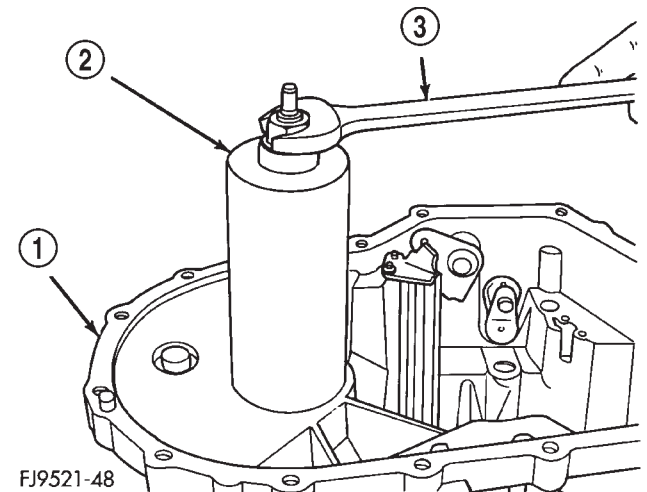
- 1 - SLEEVE AND BEARING ASSEMBLY



FJ9521-47

Fig. 134 Tool Installed in Bearing

- 1 - SPECIAL TOOL L-4518
- 2 - GEAR CASE



FJ9521-48

Fig. 135 Tool Cup Installed

- 1 - GEAR CASE
- 2 - SPECIAL TOOL L-4518
- 3 - WRENCH

DIFFERENTIAL BEARING CUPS

REMOVAL

- (1) Remove differential assembly from gear case using the procedure outlined in this group.
- (2) Install Miller tool #L-4518 into the differential bearing cup (Fig. 134).
- (3) Install the tool cup over the tool (Fig. 135).
- (4) Tighten the tool until the race is removed from the case.

INSTALLATION

- (1) Position the bearing cup into the case.

(2) Install the bearing cup onto Miller tool #L-4520.

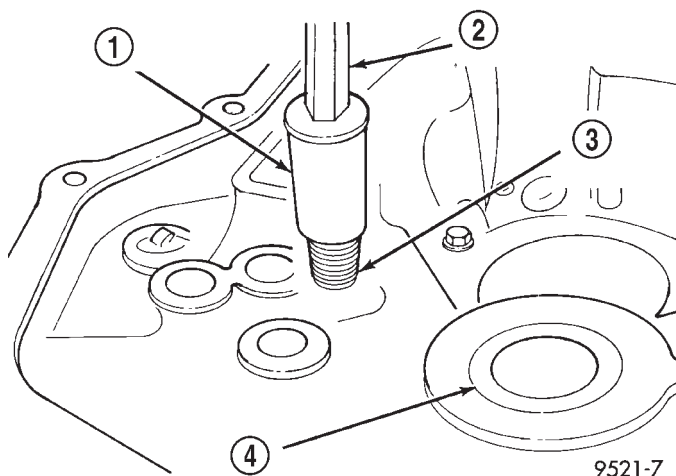
(3) Using Miller tool #L-4520 and C-4171 driver, install differential bearing cup into the transaxle case.

SHIFT RAIL BUSHINGS

REMOVAL

- (1) Thread tool #6786 into shift rail bushing.
- (2) Install slide hammer #3752 onto tool.
- (3) Remove bushing using slide hammer and tool assembly (Fig. 136).

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 136 Shift Rail Bushing Removal**

- 1 - SPECIAL TOOL 6786
- 2 - SLIDE HAMMER C-3752
- 3 - SHIFTER RAIL BUSHING
- 4 - INPUT BEARING

INSTALLATION

- (1) Line up replacement bushing in bore.
- (2) Using tool #MD998343, tap bushing into bore until flush with the chamfer in the case.

SHIFT SHAFT SEALS

It is not necessary to remove the shift shafts from the transaxle to service the shift shaft seals.

REMOVAL

- (1) Using a pick tool, pry up on the shift shaft seal and remove seal from bore.

INSTALLATION

- (1) Position new shift shaft seal in bore.
- (2) Install shift shaft seal into bore using an appropriate size deep-well socket.

SHIFT SELECTOR SHAFT**REMOVAL**

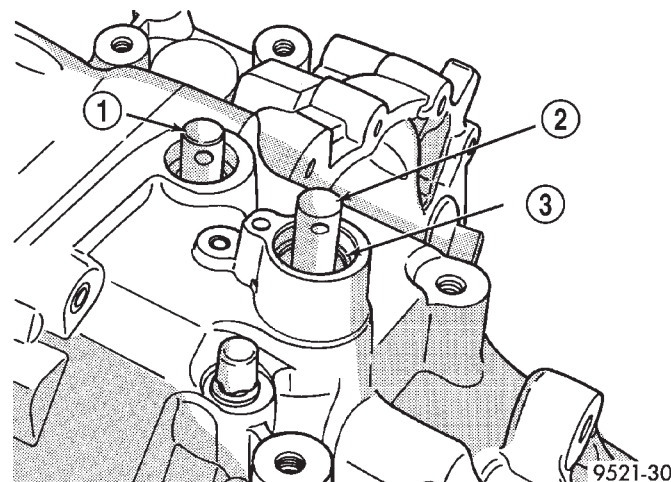
- (1) Disassemble transaxle using the procedure outlined in this group.
- (2) With the transaxle disassembled, remove the selector shaft by pushing on the shaft from the outside. Pull shaft out from the inside.

INSTALLATION

- (1) Reverse removal procedure to install selector shaft.

SHIFT CROSSOVER SHAFT**REMOVAL**

- (1) Disassemble transaxle using the procedure outlined in this group.
- (2) With the transaxle disassembled, remove the crossover shaft seal.
- (3) Using snap-ring pliers, remove the snap ring at the crossover shaft bore (Fig. 137).

**Fig. 137 Crossover Shaft Snap Ring**

- 1 - SELECTOR SHAFT
- 2 - CROSSOVER SHAFT
- 3 - SNAP RING

- (4) Push the crossover shaft in the case and remove the crossover assembly.

INSTALLATION

- (1) Reverse removal procedure to install crossover shaft.

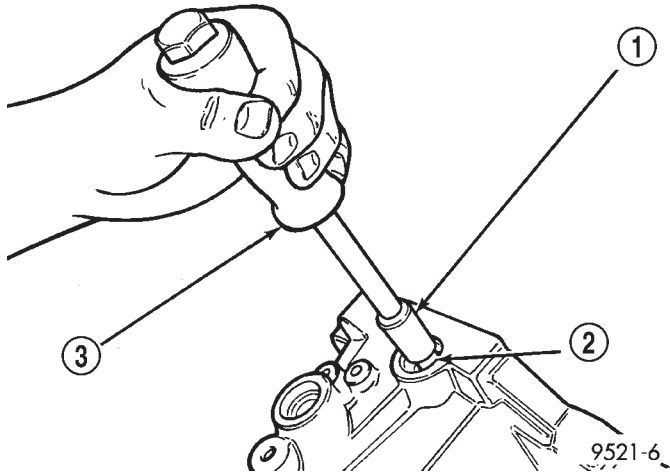
SHIFT SELECTOR SHAFT BUSHING**REMOVAL**

- (1) Remove selector shaft using procedure in this group.
- (2) Thread tool #6786 into bushing.
- (3) Install slide hammer #3752 onto tool and remove bushing using slide hammer (Fig. 138).

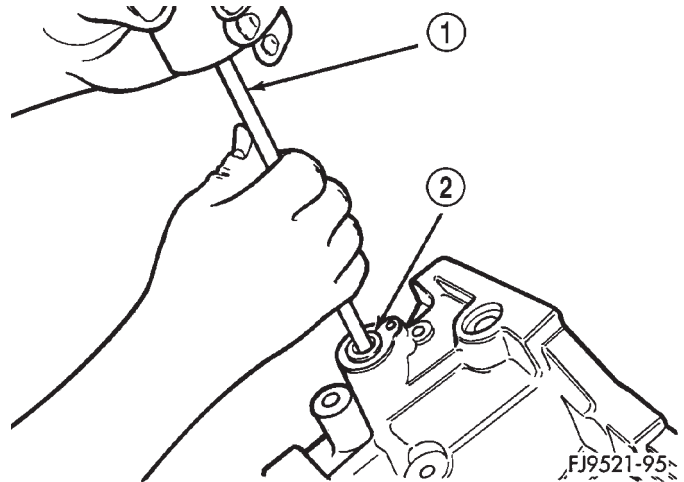
INSTALLATION

- (1) Position replacement bushing over selector shaft bore.
- (2) Using an appropriate size deep-well socket, install bushing in selector shaft bore (Fig. 139).

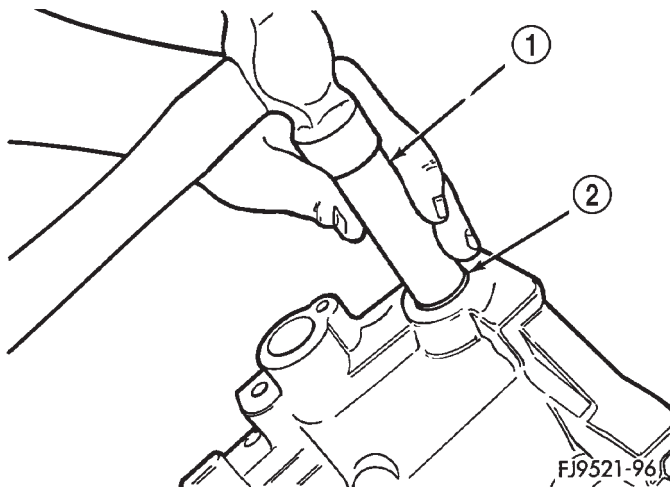
DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 138 Selector Shaft Bushing Removal**

- 1 - SPECIAL TOOL 6786
- 2 - SHIFT SHAFT BUSHING
- 3 - SLIDE HAMMER C-3752

**Fig. 140 Crossover Shaft Bushing Removal**

- 1 - SLIDE HAMMER
- 2 - SHIFTER SHAFT BUSHING

**Fig. 139 Selector Shaft Bushing Installation**

- 1 - DEEP WELL SOCKET
- 2 - SHIFTER SHAFT BUSHING

SHIFT CROSSOVER SHAFT BUSHING**REMOVAL**

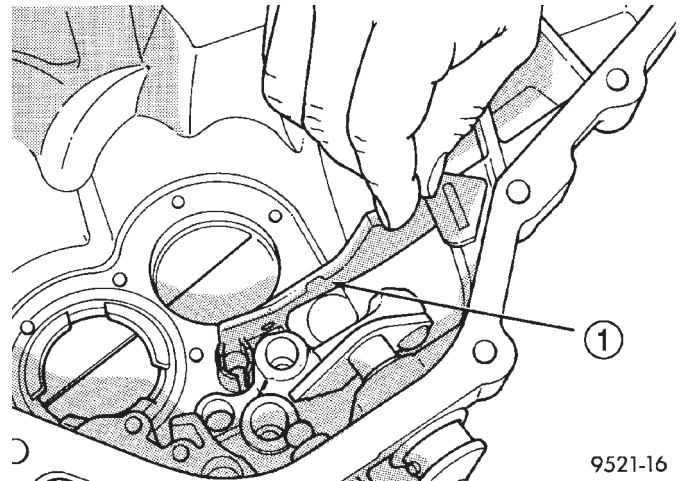
- (1) Install slide hammer #3752 through the crossover bushing.
- (2) Thread nut and washer onto slide hammer.
- (3) Using the slide hammer, remove the crossover shaft bushing (Fig. 140).

INSTALLATION

- (1) Position the replacement crossover shaft bushing over the crossover shaft bushing bore.
- (2) Using an appropriate size deep-well socket, install the crossover shaft bushing into the bushing bore.

REAR BEARING OIL FEED TROUGH

The bearing oil feed trough is retained in the case by a pin that is molded into the case and clips that are part of the trough (Fig. 141).

**Fig. 141 Oil Feed Trough**

- 1 - OIL FEED TROUGH

REMOVAL

- (1) Using light plier pressure, squeeze the clips together at the rear of the trough.
- (2) Slide the trough over the retaining pin that locates the trough in the case.

INSTALLATION

- (1) Reverse removal procedure to install oil feed trough.

CLEANING AND INSPECTION

TRANSAXLE

Clean the gears, bearings, shafts, synchronizers, thrust washers, oil feeder, shift mechanism, gear case, and bellhousing with solvent. Dry all parts except the bearings with compressed air. Allow the bearings to either air dry or wipe them dry with clean shop towels.

Inspect the gears, bearings, shafts and thrust washers. Replace the bearings and cups if the rollers are worn, chipped, cracked, flat spotted, or brinelled, or if the bearing cage is damaged or distorted. Replace the thrust washers if cracked, chipped, or worn. Replace the gears if the teeth are chipped, cracked, or worn thin. Inspect the synchronizers. Replace the sleeve if worn or damaged in any way. Replace the stop rings if the friction material is burned, flaking off, or worn. Check the condition of the synchro keys and springs. Replace these parts if worn, cracked, or distorted.

SYNCHRONIZER

CLEAN

Do not attempt to clean the blocking rings in solvent. The friction material will become contaminated. Place synchronizer components in a suitable holder and clean with solvent. Air dry.

INSPECT

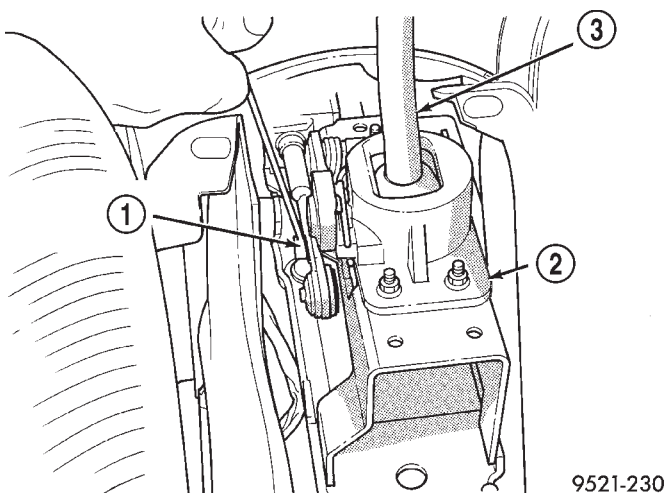
Proper inspection of components involve:

- Teeth, for wear, scuffed, nicked, burred, or broken teeth
 - Keys, for wear or distortion
 - Balls and springs, for distortion, cracks, or wear
- If any of these conditions exist in these components, replace as necessary.

ADJUSTMENTS

GEARSHIFT CROSSOVER CABLE ADJUSTMENT

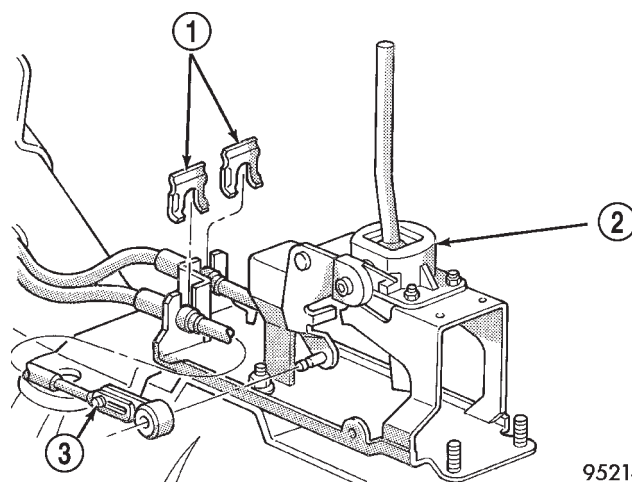
- (1) Remove shift console from vehicle.
- (2) Loosen adjusting screw on crossover cable at shifter (Fig. 142) (Fig. 143).
- (3) Pin transaxle crossover lever in 3-4 neutral position using a 1/4 inch drill bit. Align hole in crossover lever with the hole in the boss on the transaxle case (Fig. 144). Make sure drill bit goes into transaxle case at least one half inch.
- (4) The shifter is spring loaded and self centering. Allow shifter to rest in its neutral position. Torque adjustment screw to 8 N·m (70 in. lbs.). Care must be taken to avoid moving the shift mechanism off-center during screw tightening.



9521-230

Fig. 142 Loosen Crossover Cable Adjustment Screw

- 1 - CROSSOVER CABLE ADJUSTMENT
2 - SHIFTER MECHANISM
3 - SHIFTER HANDLE



9521-224

Fig. 143 Crossover Cable Adjustment Screw

- 1 - CABLE CLIPS
2 - SHIFTER
3 - ADJUSTMENT SCREW

(5) Remove drill bit from transaxle case and perform functional check by shifting transaxle into all gears.

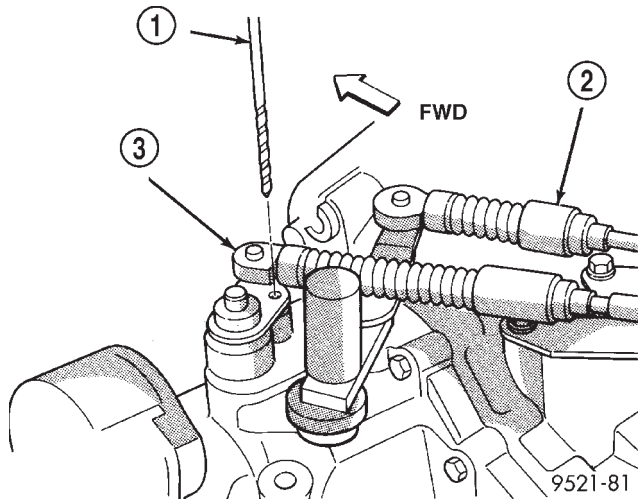
(6) Reinstall console. Reinstall boot and knob.

BEARING ADJUSTMENT PROCEDURE

GENERAL RULES ON SERVICING BEARINGS

(1) Use 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

ADJUSTMENTS (Continued)

**Fig. 144 Crossover Lever Pin Procedure**

- 1 - $\frac{1}{4}$ " DRILL BIT
 2 - SELECTOR CABLE
 3 - CROSSOVER CABLE

gauging for proper shims. Improperly seated bearing cups and cones are subject to low-mileage failure.

(2) Bearing cups and cones should be replaced if they show signs of pitting or heat distress. If distress is seen on either the cup or bearing rollers, both cup and cone must be replaced.

(3) Bearing preload and drag torque specifications must be maintained to avoid premature bearing failures. Used (original) bearings may lose up to 50% of their original drag torque after break in. All bearing adjustments must be made with no other component interference or gear intermesh.

(4) Replace bearings as a pair: If one differential bearing is defective, replace both differential bearings, if one input shaft bearing is defective, replace both input shaft bearings.

(5) Bearing cones must not be reused if removed.

(6) Turning torque readings should be obtained while smoothly rotating in either direction.

DIFFERENTIAL BEARING PRELOAD ADJUSTMENT

NOTE: True bearing turning torque readings can be obtained only with the geartrain removed from the case.

(1) Remove bearing cup and existing shim from clutch bellhousing case.

(2) Press in new bearing cup into bellhousing case (or use a cup that has been ground down on the outer edge for ease of measurement).

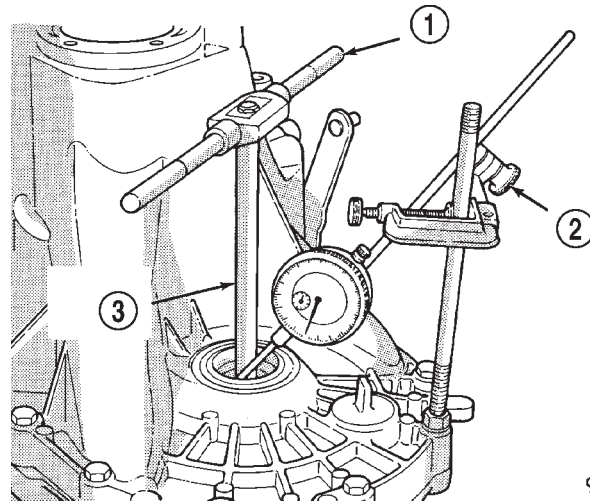
(3) Press in new bearing cup into gear case side.

(4) Oil differential bearings with Mopar® type M. S. 9417 Manual Transaxle Fluid. Install differential

assembly in transaxle gear case. Install clutch bellhousing over gear case. Install and torque case bolts to 29 N·m (21 ft. lbs.).

(5) Position transaxle with bellhousing facing down on workbench with C-clamps. Position dial indicator.

(6) Apply a medium load to differential with Tool C-4995 and a T-handle, in the downward direction. Roll differential assembly back and forth a number of times. This will settle the bearings. Zero the dial indicator. To obtain end play readings, apply a medium load in an upward direction while rolling differential assembly back and forth (Fig. 145). Record end play.

**Fig. 145 Checking Differential Bearing End Play to Determine Shim Thickness**

- 1 - T-HANDLE
 2 - DIAL INDICATOR SET
 3 - SPECIAL TOOL C-4995

(7) The shim required for proper bearing preload is the **total of end play, plus (constant) preload of 0.18mm (0.007 in.)**. Never combine shims to obtain the required preload.

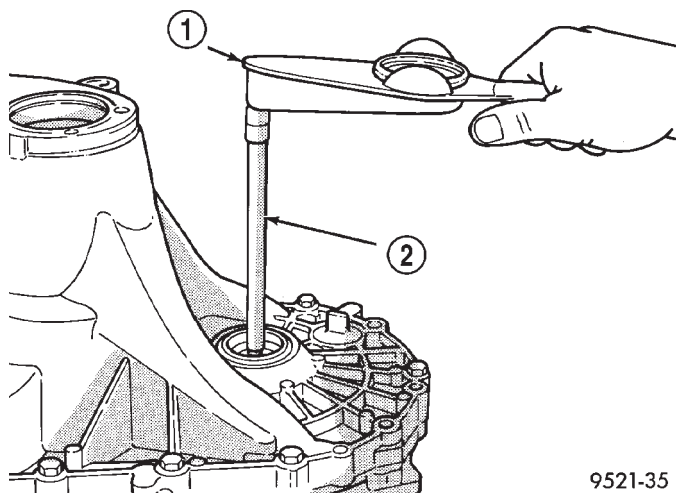
(8) Remove case bolts. Remove clutch bellhousing differential bearing cup. Install shim(s) selected in Step 7. Then press the bearing cup into clutch bellhousing.

(9) Install clutch bellhousing. Install and torque case bolts to 26 N·m (19 ft. lbs.).

(10) Using Special Tool C-4995 and an inch-pound torque wrench, check turning torque of the differential assembly (Fig. 146). **The turning torque should be 6 to 12 in. lbs. If the turning torque is too high, install a 0.05mm (0.002 inch) thinner shim. If the turning torque is too low, install a 0.05mm (0.002 inch) thicker shim.**

(11) Recheck turning torque. Repeat Step 10 until the proper turning torque is obtained.

ADJUSTMENTS (Continued)



9521-35

Fig. 146 Checking Differential Bearing Turning Torque

- 1 - INCH-POUND TORQUE WRENCH
2 - SPECIAL TOOL C-4995

SPECIFICATIONS

NV T350 (A-578)

DESCRIPTION	TORQUE
Back-up Lamp Switch	24 N·m (18 ft. lbs.)
Crossover Cable Adj. Screw	8 N·m (70 in. lbs.)
Drain Plug	30 N·m (267 in. lbs.)
Differential Ring Gear Bolts . . .	81 N·m (60 ft. lbs.)
Dust Shield to Transaxle	12 N·m (105 in. lbs.)
End Plate Cover Bolts	29 N·m (21 ft. lbs.)
Front Engine Mount to Trans .	108 N·m (80 ft. lbs.)
Front Mount Through Bolt	61 N·m (45 ft. lbs.)
Front Mount to Engine Bolt . . .	54 N·m (40 ft. lbs.)
Lateral Bending Strut to Engine	54 N·m (40 ft. lbs.)
Lateral Bending Strut to Trans.	54 N·m (40 ft. lbs.)
Left Mount Through Bolt	108 N·m (80 ft. lbs.)
Left Mount to Transaxle	54 N·m (40 ft. lbs.)
Output Bearing Race Ret. Strap	11 N·m (96 in. lbs.)
Power Hop Damper Bkt. to Trans.	54 N·m (40 ft. lbs.)
Power Hop Damper to Frame Bkt.	54 N·m (40 ft. lbs.)
Power Hop Damper to Trans. Bkt.	54 N·m (40 ft. lbs.)
Reverse Fork Bracket	11 N·m (96 in. lbs.)
Reverse Idler Shaft Bolt	26 N·m (19 ft. lbs.)
Shift Cable Bracket to Transaxle	28 N·m (250 in. lbs.)
Transaxle Case Bolts	29 N·m (21 ft. lbs.)
Transaxle to Engine Bolt	95 N·m (70 ft. lbs.)

DESCRIPTION

TORQUE

Trans. to Eng. Intake Bkt. Bolts	95 N·m (70 ft. lbs.)
Vehicle Speed Sensor	7 N·m (60 in. lbs.)
Vertical Bending Strut to Engine	108 N·m (80 ft. lbs.)
Vertical Bending Strut to Trans.	108 N·m (80 ft. lbs.)

NOTE: Bolts that have thread sealer or torque lock patches should not be reused. Always install new bolts in these applications.

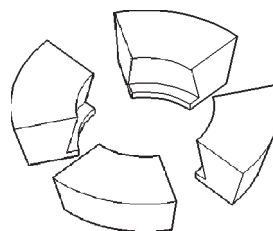
NV T350 (A-578) MANUAL TRANSAXLE FLUID FILL

TRANSAXLE	METRIC MEASURE	U. S. MEASURE
NV T350	1.9-2.2 Liters	2.0-2.3 Quarts
NV T350HD	2.4-2.7 Liters	2.5-2.8 Quarts

NOTE: Two 5 speed transaxles are available. Refer to capacity label on case near left driveshaft for identification.

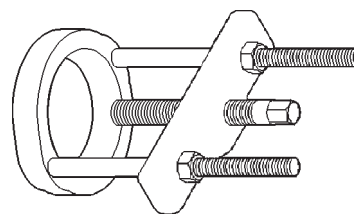
SPECIAL TOOLS

NV T350 (A-578) MANUAL TRANSAXLE



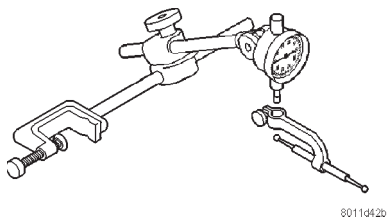
c-293-45-80110408

Adapter Blocks C-293-45

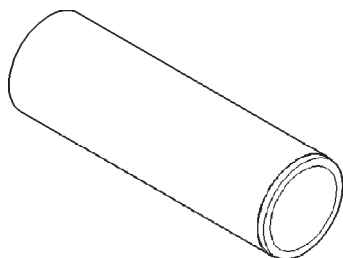


Puller Press C-293-PA

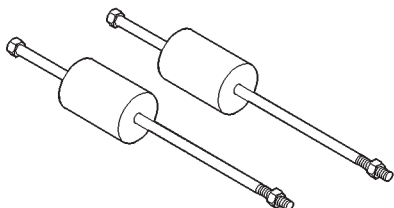
SPECIAL TOOLS (Continued)



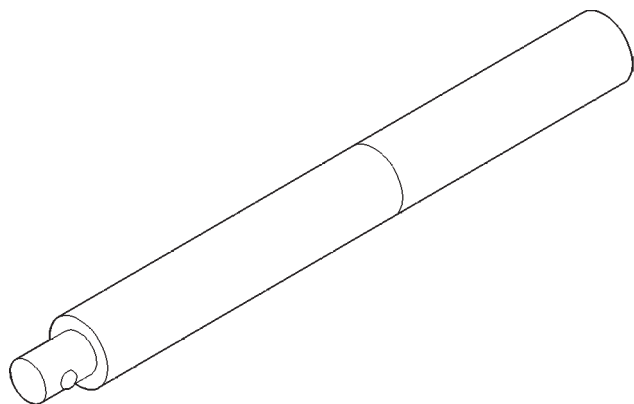
Dial Indicator C-3339



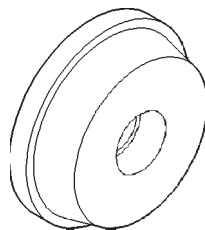
Sleeve C-3717



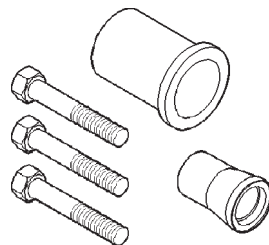
Slide Hammer C-3752



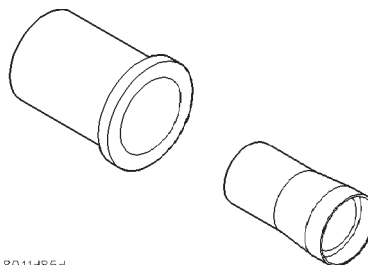
Universal Handle C-4171



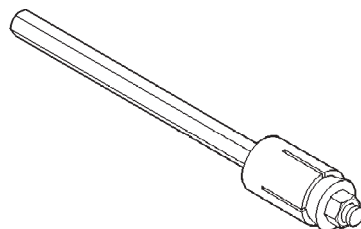
Bearing Installer C-4628



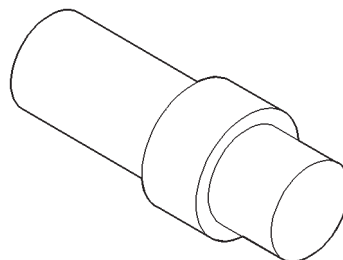
Seal Remover C-4680



Seal Installer C-4992

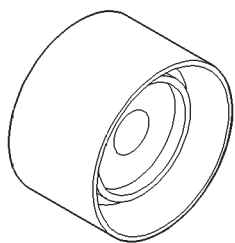
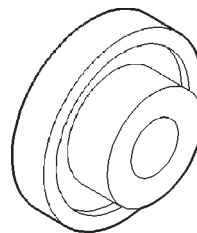
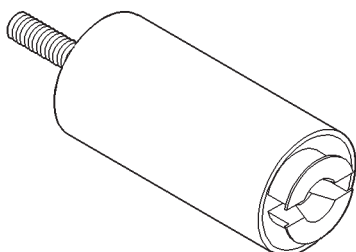
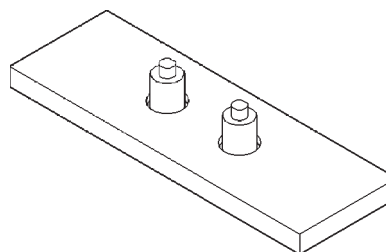
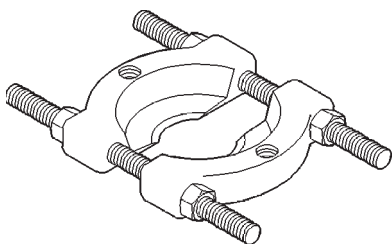


Torque Tool C-4995

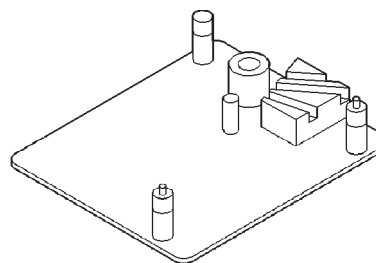
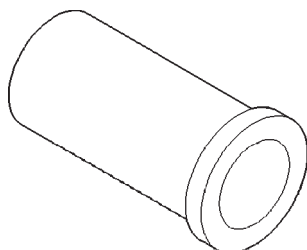
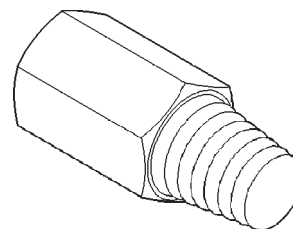
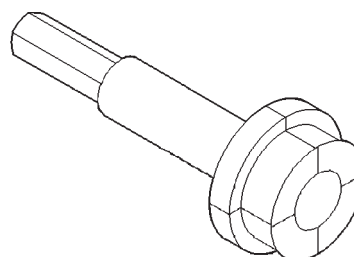


Adapter C-4996

SPECIAL TOOLS (Continued)

**Installer L-4410****Seal Installer 6709****Special Jaw Set L-4518****Bearing Remover 6768**

1130-80109ac3

Bearing Splitter 1130**Bench Fixture 6785****Driver 6342****Remover 6786****Remover 6787**