

TRANSMISSION AND TRANSFER CASE

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MANUAL TRANSMISSION - NSG370

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MANUAL TRANSMISSION - NSG370

DIAGNOSIS AND TESTING

MANUAL TRANSMISSION - NSG370

LOW LUBRICANT LEVEL

A low transmission lubricant level is generally the result of a leak, inadequate lubricant fill or incorrect lubricant level check.

Rear transmission leaks will be from the oil seals or component mating surfaces.

Front transmission leaks will be from the front input shaft retainer seal. Lubricant may drip from the clutch housing after extended operation. If leak is severe, it may contaminate the clutch disc.

Lubricant level check can only be made when the vehicle is level and allowing the lubricant to settle for a minute before checking. This will ensure an accurate check and avoid an underfill or overfill condition.

HARD SHIFTING

Hard shifting is usually caused by low lubricant level, improper or contaminated lubricants. This will cause noise, excessive wear, internal bind, and hard

shifting. Substantial lubricant leaks can result in gear, shift rail, synchro, and bearing damage. The first indications of component damage is usually hard shifting and noise.

Shift component damage, clutch adjustment, worn pressure plate or disc are also causes of increased shift effort. If clutch problem is advanced, gear clash during shifts can result. Worn or damaged synchronizer rings can cause gear clash when shifting into any forward gear. In some new or rebuilt transmissions, new synchro rings may tend to stick slightly causing hard or noisy shifts. In most cases, this condition will decline as the rings wear-in.

TRANSMISSION NOISE

Most manual transmissions make some noise during normal operation. Rotating gears generate a mild whine that is audible, but generally only at extreme speeds.

Severe, highly audible transmission noise is generally the initial indicator of a lubricant problem. Insufficient, improper or contaminated lubricant will promote rapid wear of gears, synchros, shift rails, forks and bearings. The overheating caused by a lubricant problem, can also lead to gear and bearing damage.

MANUAL TRANSMISSION - NSG370 (Continued)

STANDARD PROCEDURE - DRAIN AND FILL

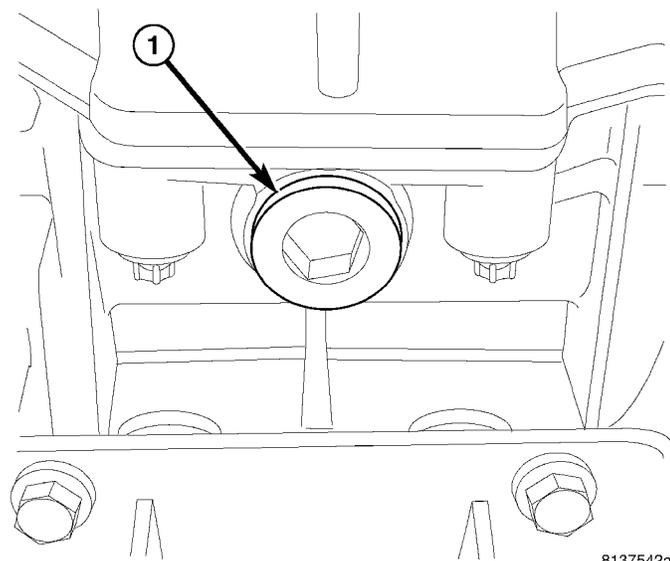


Fig. 1 DRAIN PLUG

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1 - DRAIN PLUG

- (1) With vehicle in neutral, position vehicle on hoist.
- (2) Remove drain plug (1) (Fig. 1) and drain fluid.

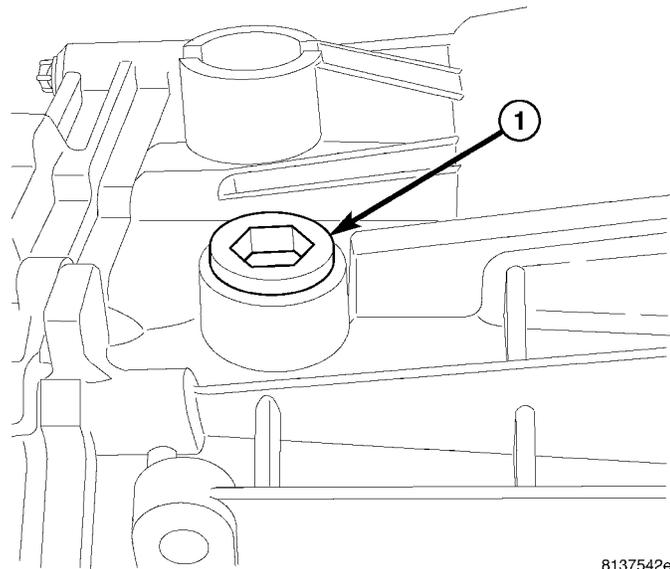


Fig. 2 FILL PLUG

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1 - FILL PLUG

- (3) Install drain plug and remove fill plug (1) (Fig. 2).
- (4) Fill transmission with 1.5L (3.17 pts.) of Mopar® Manual Transmission Lubricant MS-9224 or to the bottom of the fill plug (1) hole.

REMOVAL

- (1) Disconnect negative battery cable.
- (2) With vehicle in neutral, position vehicle on hoist.
- (3) Remove drain plug (1) (Fig. 3) and drain fluid.

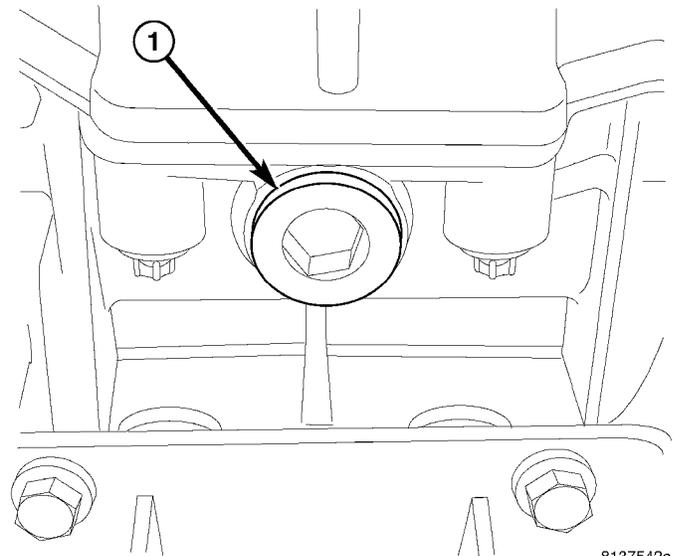


Fig. 3 DRAIN PLUG

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1. DRAIN PLUG

- (4) Mark installation reference marks on propeller shaft/shafts and remove shafts.
- (5) Remove transfer case shift linkage, wiring connector, and vent hose, if equipped.
- (6) Remove transfer case, if equipped.
- (7) Support transmission with jack.
- (8) Remove transmission mount (1) and crossmember (2).

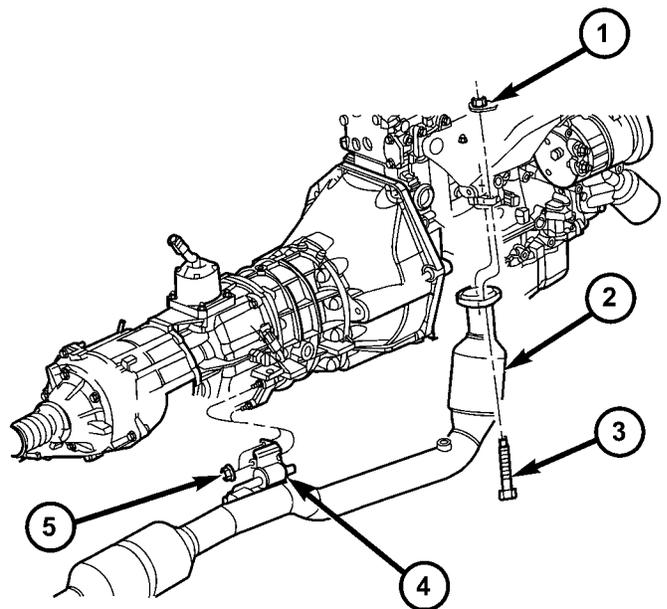


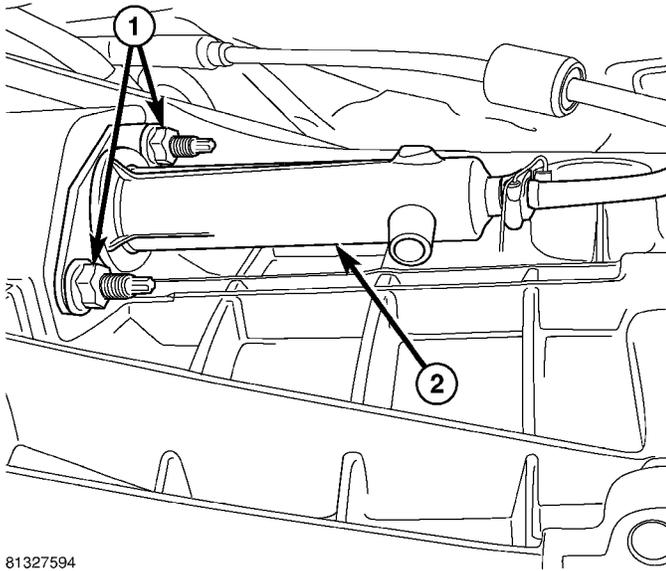
Fig. 4 2.4L CATALYST ASSEMBLY - 4x4

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- 1- FLANGED NUT
- 2- CATALYST ASSEMBLY
- 3- BOLT
- 4- HANGER
- 5- NUT

MANUAL TRANSMISSION - NSG370 (Continued)

(9) Remove catalyst assembly (2) (Fig. 4).

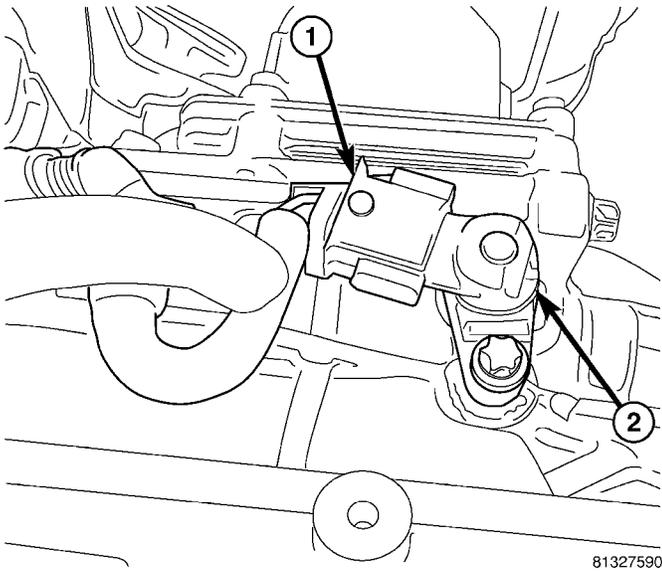


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Fig. 5 CLUTCH SLAVE CYLINDER

- 1. NUTS
- 2. SLAVE CYLINDER

(10) Remove clutch slave cylinder nuts (1) and remove cylinder (2) (Fig. 5).

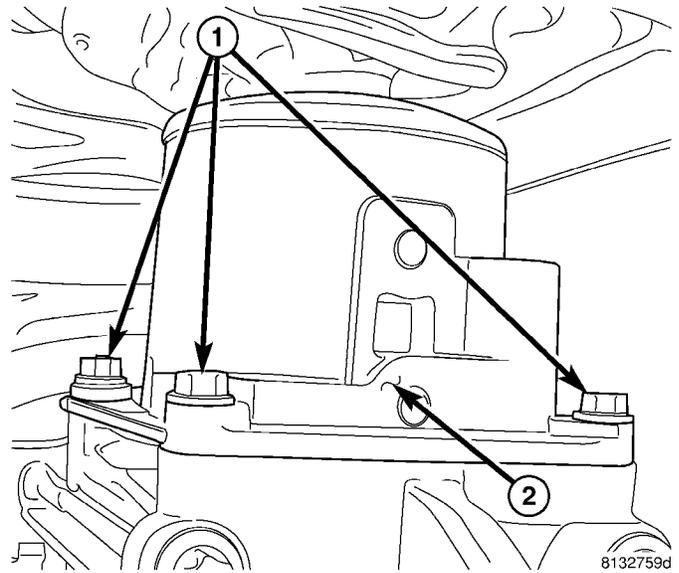


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Fig. 6 BACKUP LAMP SWITCH

- 1. BACKUP LAMP SWITCH
- 2. SWITCH

(11) Remove backup lamp switch (2) wiring connector (1) (Fig. 6).



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Fig. 7 SHIFT LEVER

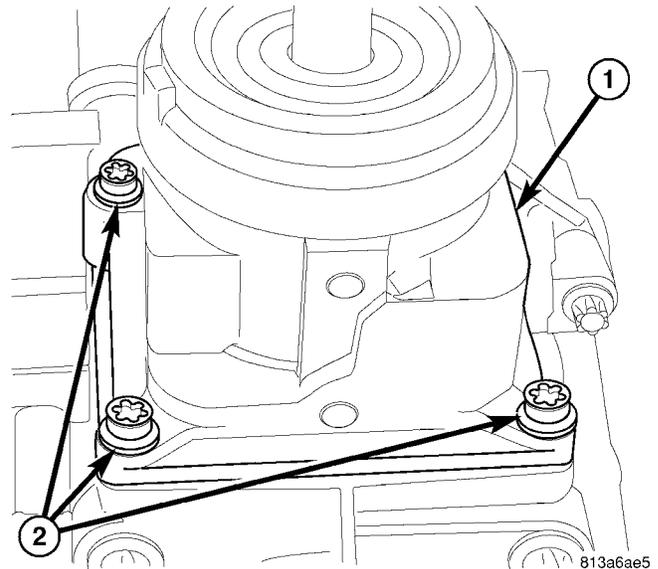
- 1. BOLTS
- 2. SHIFT TOWER

(12) Remove shift lever tower bolts (1) and remove shift lever tower (2) (Fig. 7).

(13) Remove starter bolts and remove starter.

(14) Remove transmission bolt and remove transmission.

DISASSEMBLY



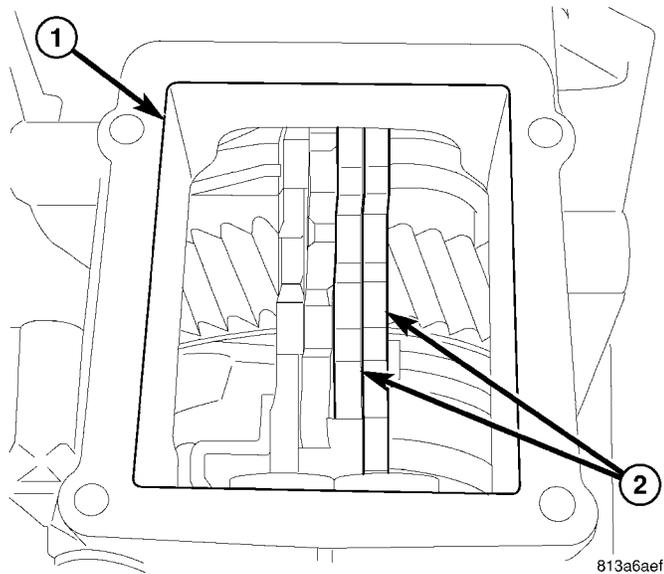
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Fig. 8 SHIFT TOWER

- 1 - SHIFT TOWER
- 2 - BOLTS

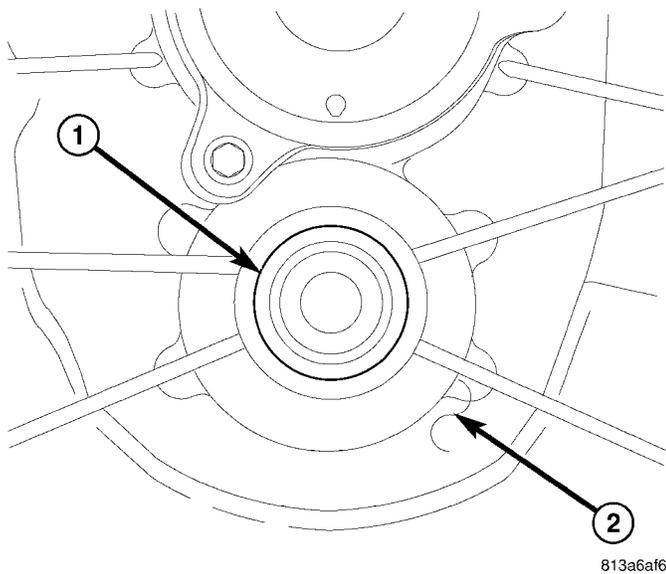
(1) Remove shift tower (1) (Fig. 8) bolts (2) and remove tower.

MANUAL TRANSMISSION - NSG370 (Continued)

**Fig. 9 SHIFT TOWER OPENING**

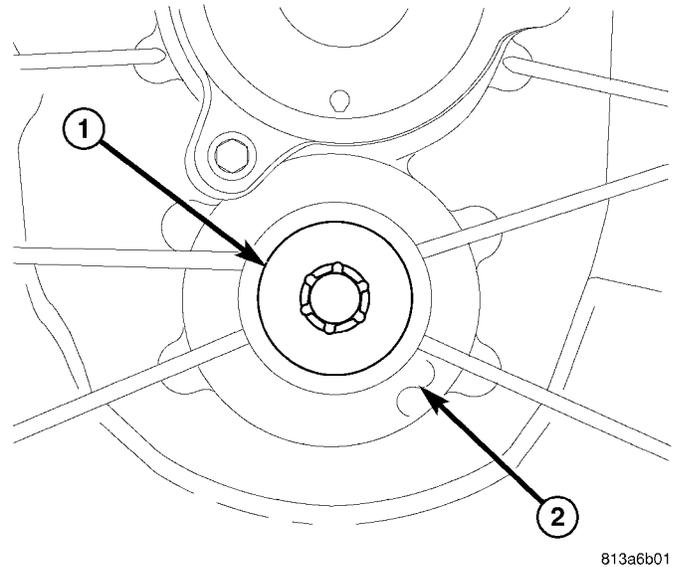
- 1 - SHIFT TOWER OPENING
2 - SHIFT RAILS

(2) Through shift tower opening (1) (Fig. 9) shift two shift rails (2) forward to engage two gears.

**Fig. 10 COUNTERSHAFT PLUG**

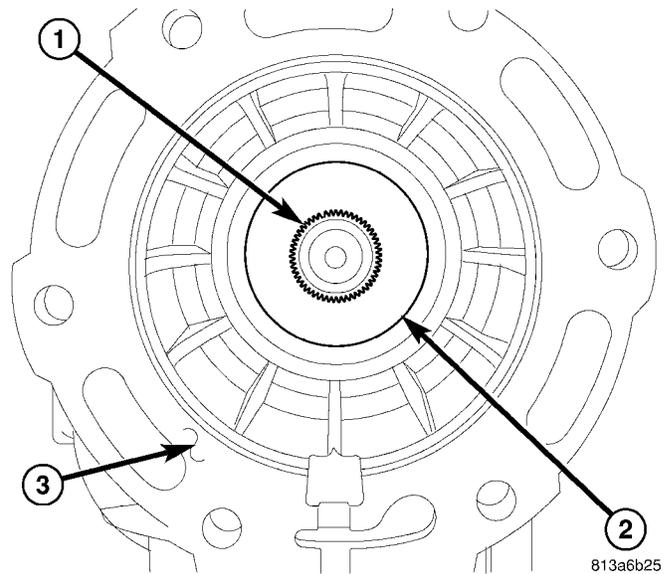
- 1 - COUNTERSHAFT PLUG
2 - FRONT HOUSING

(3) Remove countershaft plug (1) (Fig. 10) from the front housing (2) with a seal pick.

**Fig. 11 COUNTERSHAFT BOLT**

- 1 - COUNTERSHAFT BOLT
2 - FRONT HOUSING

(4) Remove countershaft bolt (1) (Fig. 11) from the front housing (2).

**Fig. 12 OUTPUT SHAFT SEAL**

- 1 - OUTPUT SHAFT
2 - SEAL
3 - REAR HOUSING

(5) Remove output shaft (1) (Fig. 12) seal (2) from rear housing (3) with a seal pick.

MANUAL TRANSMISSION - NSG370 (Continued)

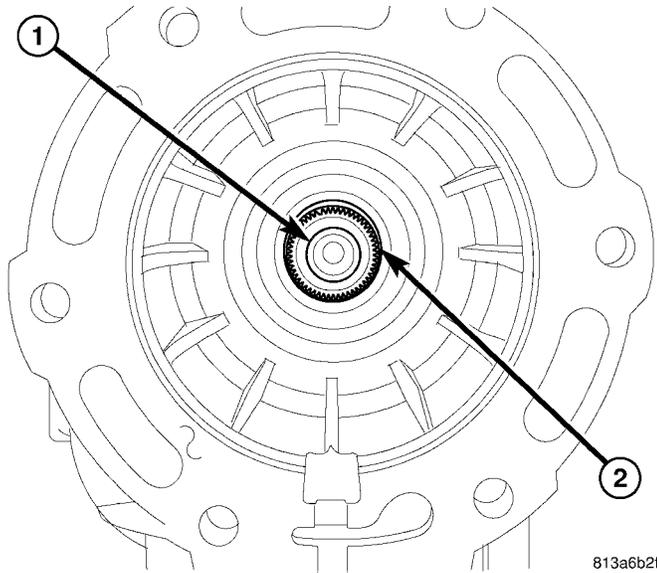


Fig. 13 OUTPUT SHAFT SNAP RING

- 1 - OUTPUT SHAFT
- 2 - SNAP RING

(6) Remove output shaft (1) (Fig. 13) snap ring (2) 4x4 only.

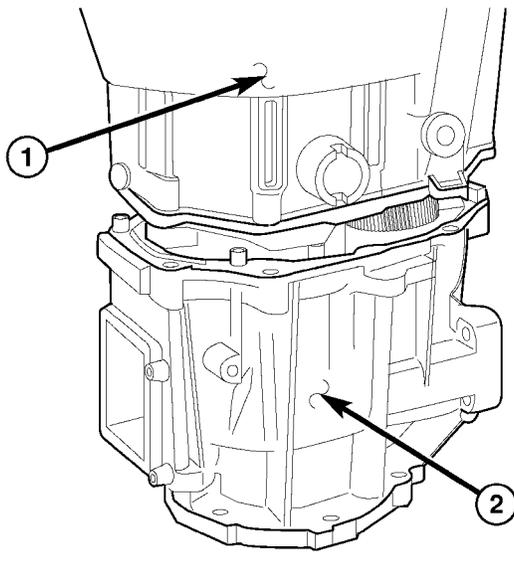


Fig. 14 SPLIT HOUSING

- 1 - FRONT HOUSING
- 2 - REAR HOUSING

(7) Stand transmission on the rear housing and remove the housing bolts.

(8) Remove front housing (1) (Fig. 14) from the rear housing (2).

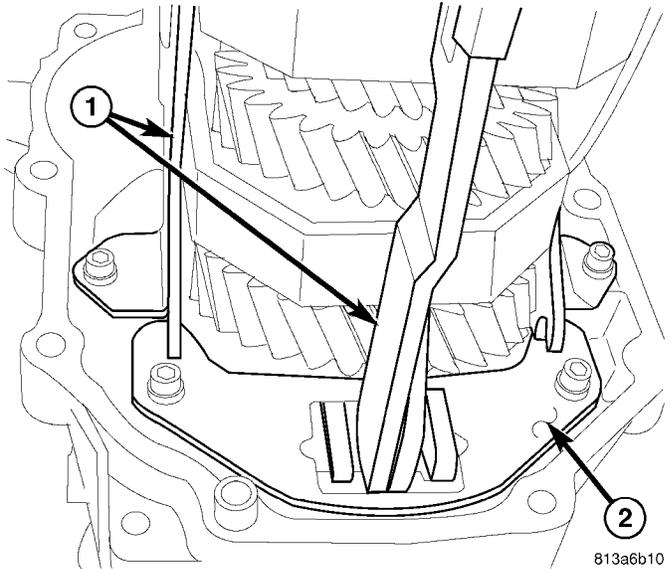


Fig. 15 SHIFT RAIL SUPPORT PLATE

- 1 - SHIFT RAILS
- 2 - SUPPORT PLATE

(9) Remove shift rails (1) (Fig. 15) support plate (2) bolts.

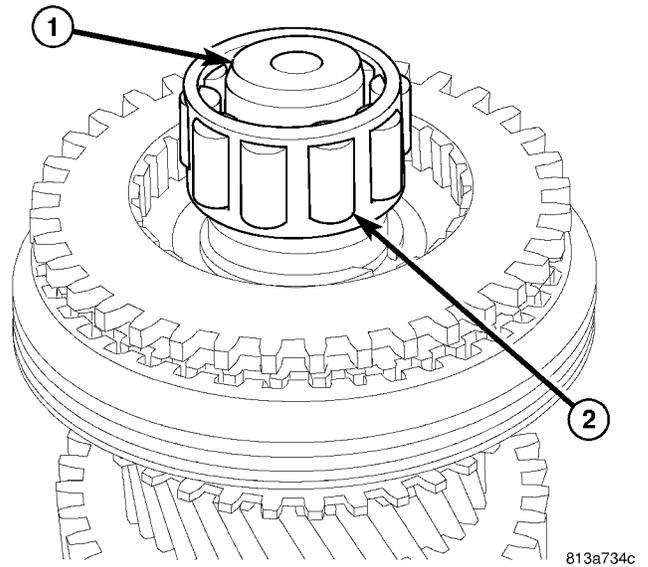


Fig. 16 INPUT SHAFT ROLLER BEARING

- 1 - INPUT SHAFT
- 2 - ROLLER BEARING

(10) Remove input shaft (1) (Fig. 16) roller bearing (2).

MANUAL TRANSMISSION - NSG370 (Continued)

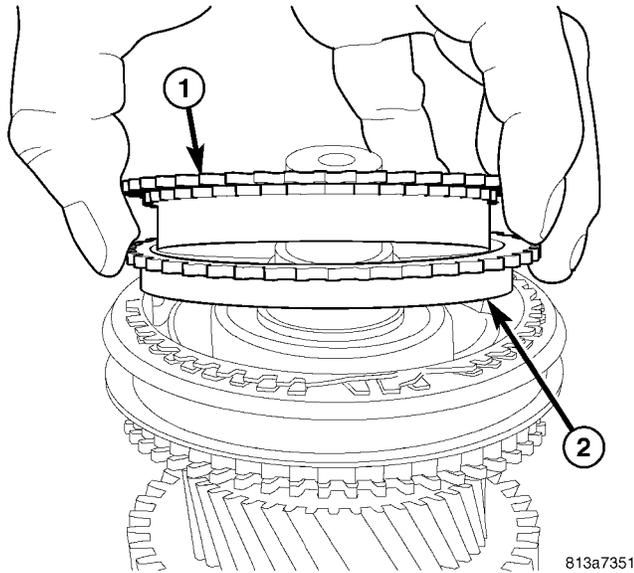


Fig. 17 FIFTH GEAR SYNCHRO

- 1 - FIFTH GEAR BLOCKER RING
- 2 - FRICTION RING

(11) Remove fifth gear synchronizer blocker ring (1) (Fig. 17) and friction ring (2).

(12) Set geartrain and shift rails with rear housing into Build Fixture 9633.

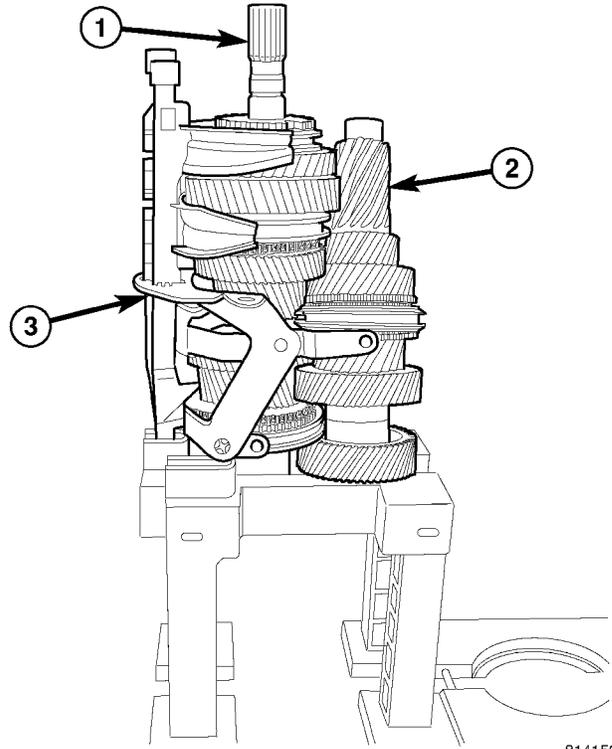


Fig. 19 MAIN/COUNTERSHAFT

- 1 - MAINSHAFT
- 2 - COUNTERSHAFT
- 3 - SHIFT RAILS AND FORKS

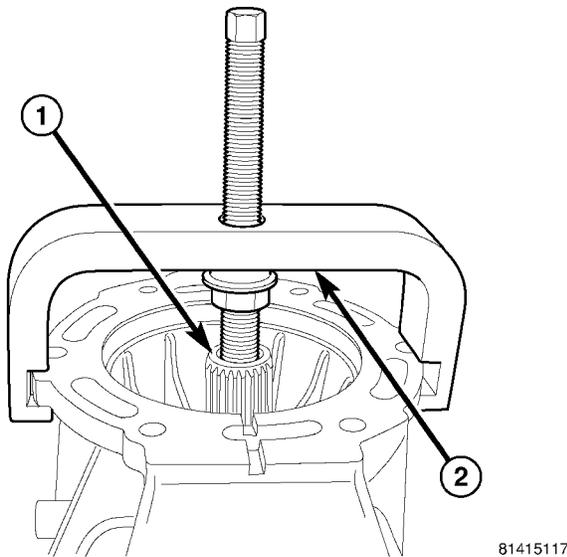


Fig. 18 MAINSHAFT REMOVER

- 1 - MAINSHAFT
- 2 - REMOVER/INSTALLER

(13) Remove mainshaft shaft (1) (Fig. 18) from rear housing bearing with Remover 9637 (2).

(14) Remove mainshaft (1), countershaft (2) and shift rails/forks (3) from fixture (Fig. 19).

MAINSHAFT

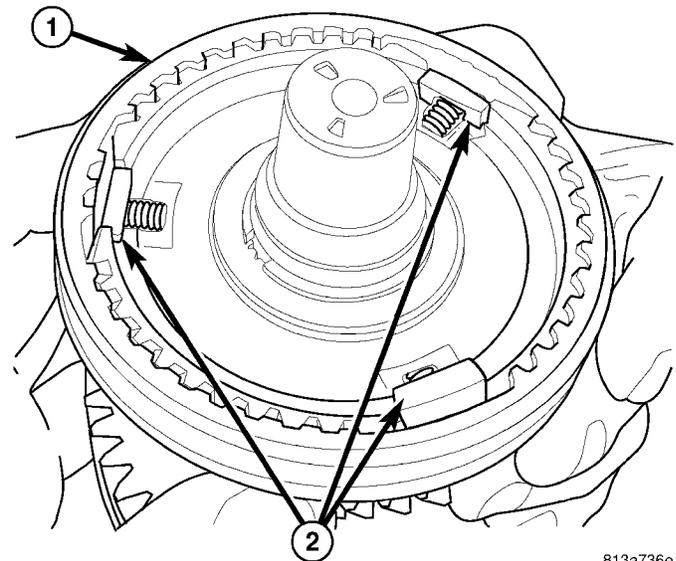


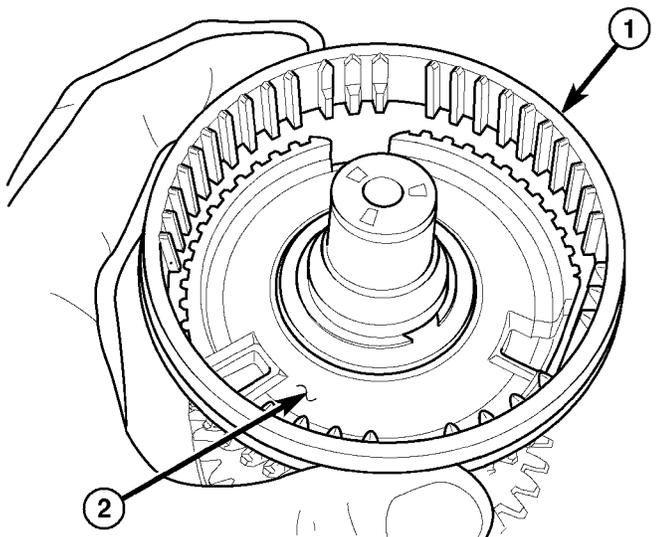
Fig. 20 5-6 SYNCHRO SLEEVE DETENTS

- 1 - SYNCHRONIZER SLEEVE
- 2 - DETENTS

(1) Place mainshaft with 5-6 synchronizer facing up in build Fixture 9648 and place in a vise.

MANUAL TRANSMISSION - NSG370 (Continued)

(2) Push 5-6 synchronizer sleeve (1) (Fig. 20) down on hub and remove detents (2) springs and balls.

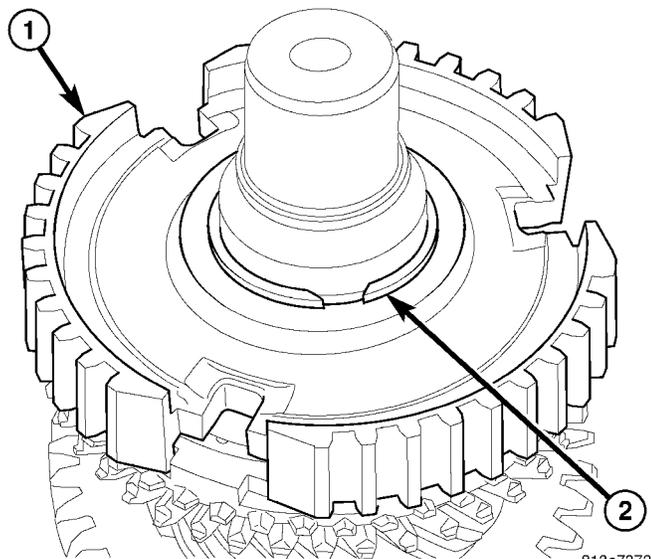


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Fig. 21 5-6 SYNCHRONIZER SLEEVE

- 1 - SYNCHRONIZER SLEEVE
- 2 - HUB

(3) Remove 5-6 synchronizer sleeve (1) (Fig. 21) from hub (2).



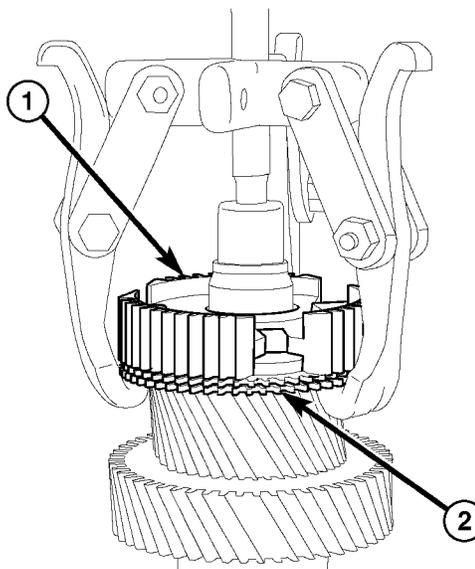
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Fig. 22 5-6 SYNCHRO HUB SNAP RING

- 1 - SYNCHRONIZER HUB
- 2 - SNAP RING

(4) Remove 5-6 synchronizer hub (1) (Fig. 22) snap ring (2).

NOTE: All snap rings are select fit from the factory.

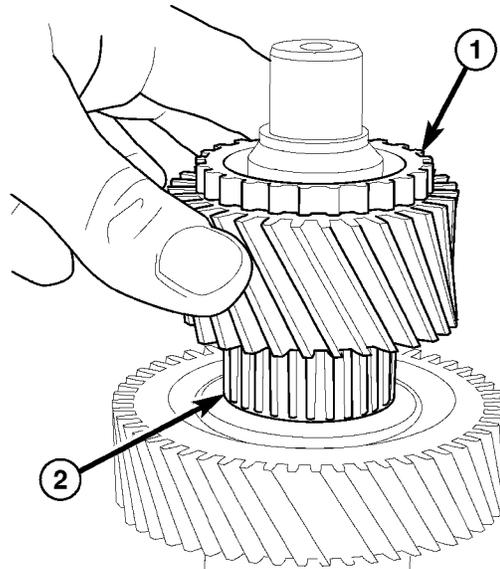


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Fig. 23 5-6 SYNCHRO HUB

- 1 - 5-6 SYNCHRONIZER HUB
- 2 - SIXTH GEAR SYNCHRONIZER RINGS

(5) Remove 5-6 synchronizer hub (1) (Fig. 23) and sixth gear synchronizer rings (2) with a three jaw puller. Place puller jaws under sixth gear synchronizer rings (2).



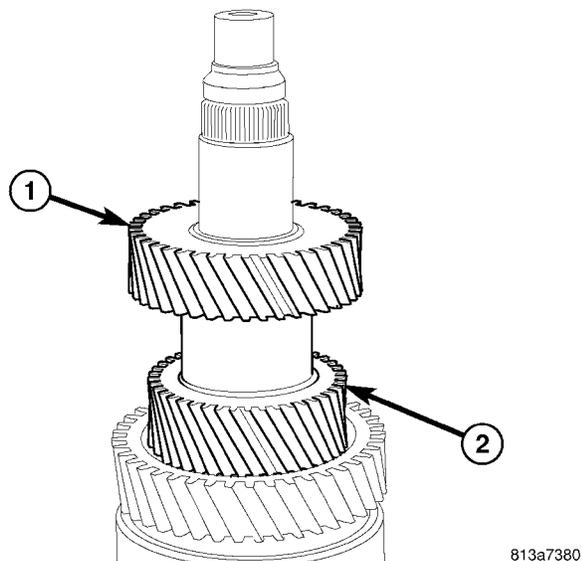
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Fig. 24 SIXTH GEAR & BEARING

- 1 - SIXTH GEAR
- 2 - BEARING

(6) Remove sixth gear (1) (Fig. 24) and bearing (2).

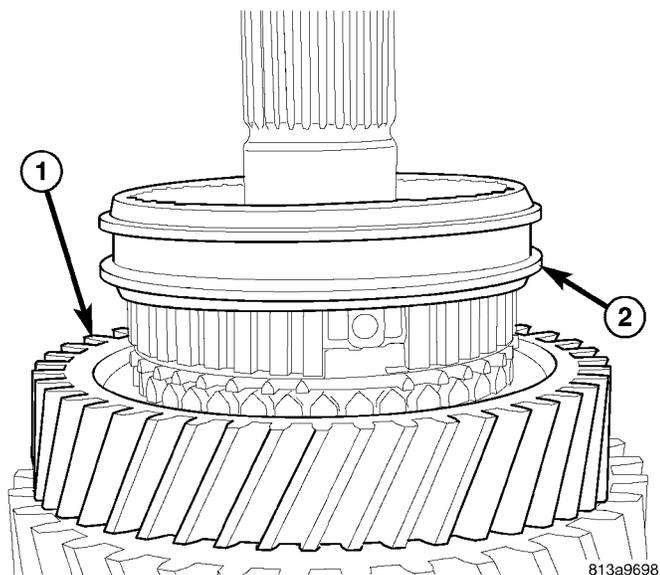
MANUAL TRANSMISSION - NSG370 (Continued)

**Fig. 25 3-4 GEAR**

- 1 - THIRD GEAR
2 - FOURTH GEAR

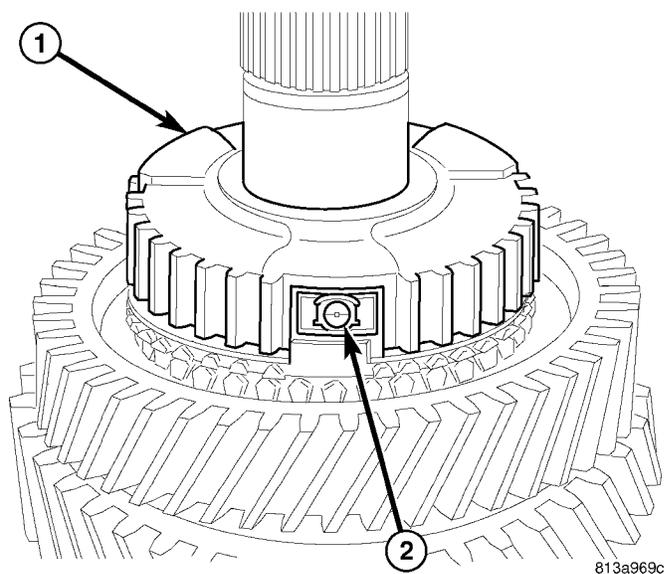
(7) Third gear (1) (Fig. 25) and fourth gear (2) are serviced with the mainshaft only.

(8) Remove mainshaft from Fixture 9648. Turn fixture over in vise and set opposite end of mainshaft in the fixture.

**Fig. 26 REVERSE GEAR SYNCHRO SLEEVE**

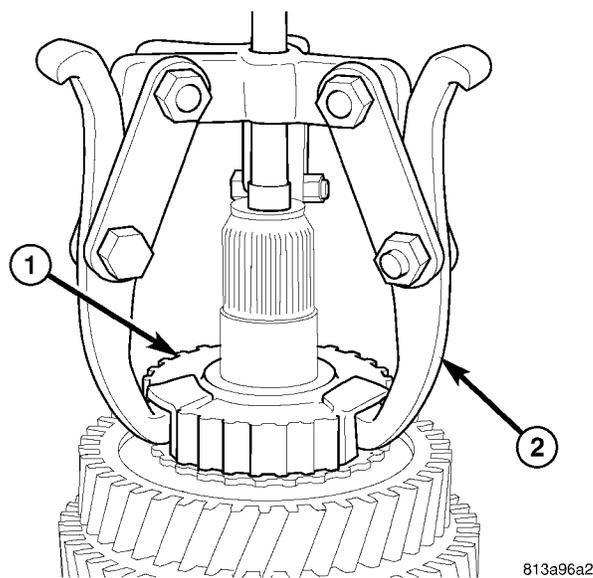
- 1 - REVERSE GEAR
2 - SYNCHRONIZER SLEEVE

(9) Remove reverse gear (1) (Fig. 26) synchronizer sleeve (2) off synchronizer hub.

**Fig. 27 REVERSE SYNCHRO HUB DETENT**

- 1 - SYNCHRONIZER HUB
2 - DETENTS

(10) Remove reverse synchronizer hub (1) (Fig. 27) detents (2).

**Fig. 28 REVERSE SYNCHRO HUB**

- 1 - SYNCHRONIZER HUB
2 - THREE JAW PULLER

(11) Remove reverse synchronizer hub (1) (Fig. 28) with three jaw puller (2). Place puller jaws in hub detent openings.

MANUAL TRANSMISSION - NSG370 (Continued)

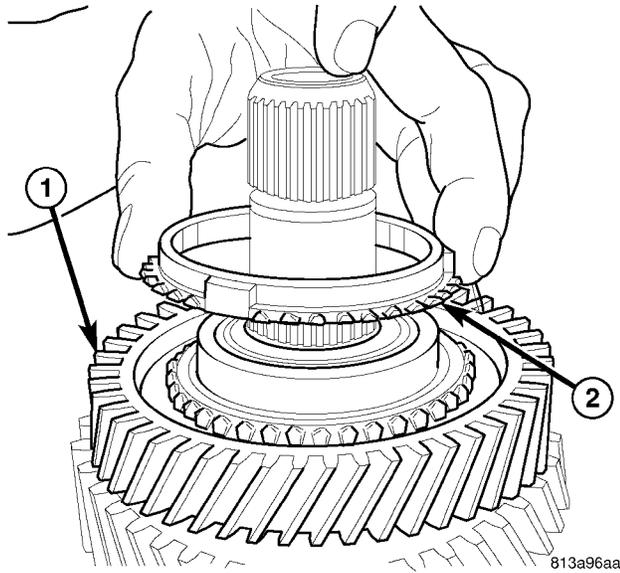


Fig. 29 REVERSE SYNCHRONIZER

- 1 - REVERSE GEAR
- 2 - SYNCHRONIZER FRICTION RING

(12) Remove reverse gear (1) (Fig. 29) synchronizer ring (2).

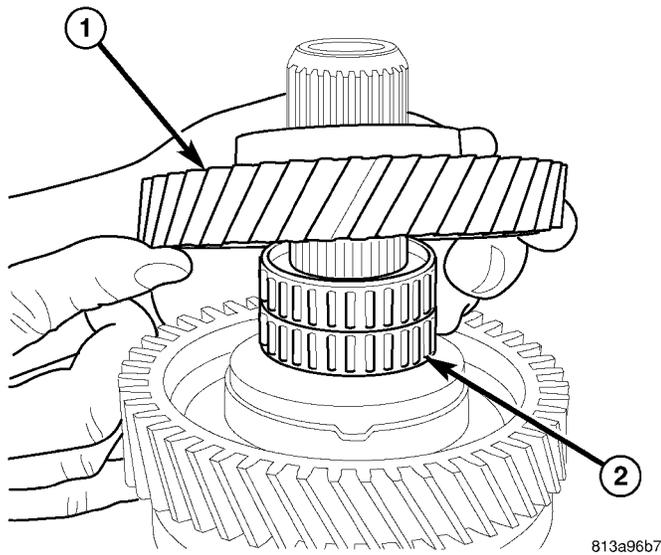


Fig. 30 REVERSE GEAR

- 1 - REVERSE GEAR
- 2 - BEARING

(13) Remove reverse gear (1) (Fig. 30) and bearing (2).

(14) Remove reverse gear bearing race (1) (Fig. 31), thrust washer (2) and first gear (3) with puller (4). Place puller jaws under first gear (3).

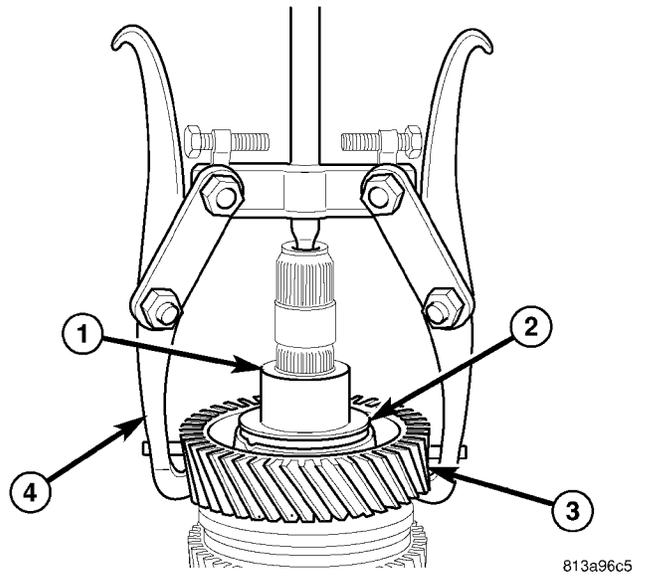


Fig. 31 FIRST GEAR

- 1 - BEARING RACE
- 2 - THRUST WASHER
- 3 - FIRST GEAR
- 4 - PULLER

(15) Remove first gear bearing.

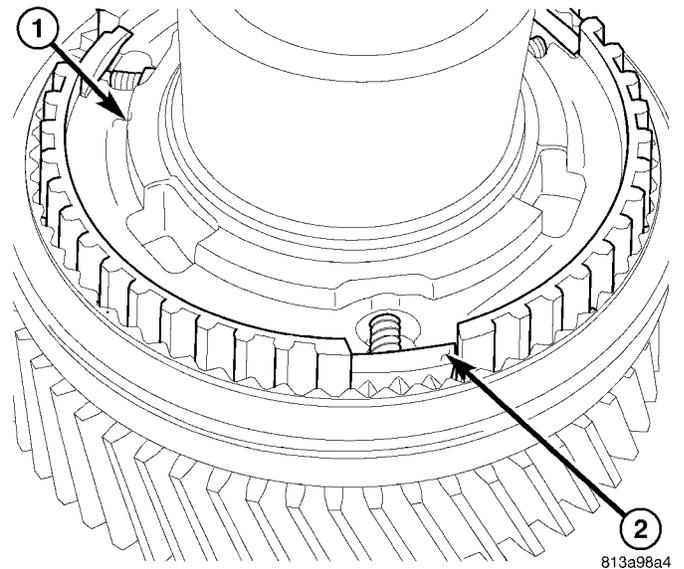


Fig. 32 1-2 SYNCHRO DETENT

- 1 - 1-2 SYNCHRONIZER HUB
- 2 - DETENTS

(16) Remove first gear synchronizer rings.

(17) Push 1-2 synchronizer sleeve down on hub. Remove 1-2 synchronizer hub (1) (Fig. 32) detents (2), balls and springs.

MANUAL TRANSMISSION - NSG370 (Continued)

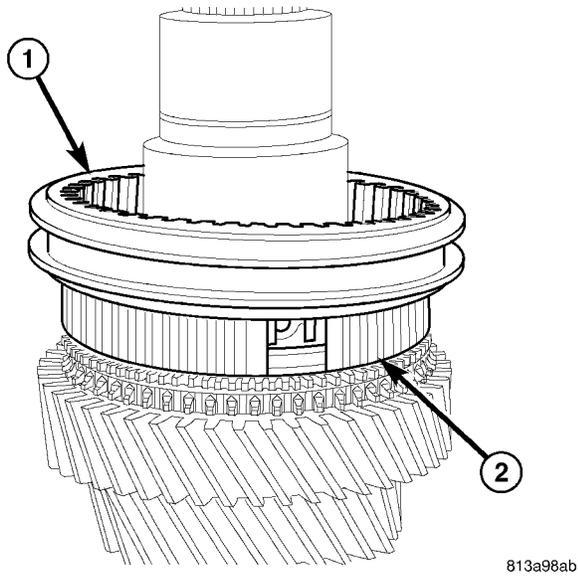


Fig. 33 1-2 SYNCHRO SLEEVE

- 1 - 1-2 SYNCHRONIZER SLEEVE
- 2 - SYNCHRONIZER HUB

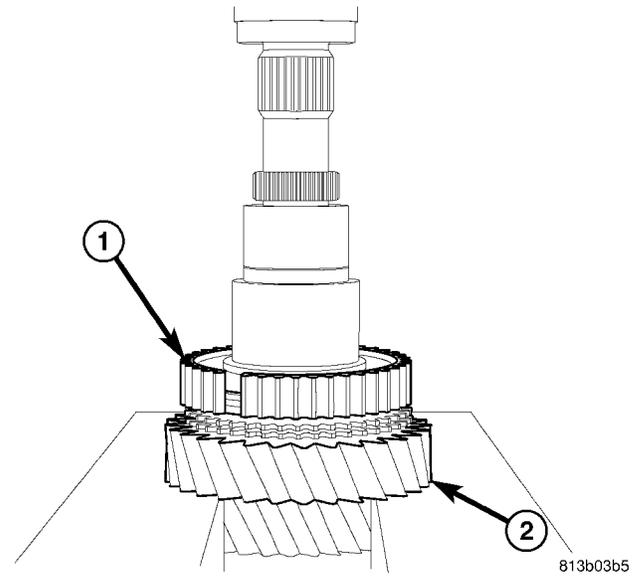


Fig. 35 SECOND GEAR

- 1 - SYNCHRONIZER HUB
- 2 - SECOND GEAR

(18) Remove 1-2 synchronizer sleeve (1) (Fig. 33) from synchronizer hub (2).

COUNTERSHAFT

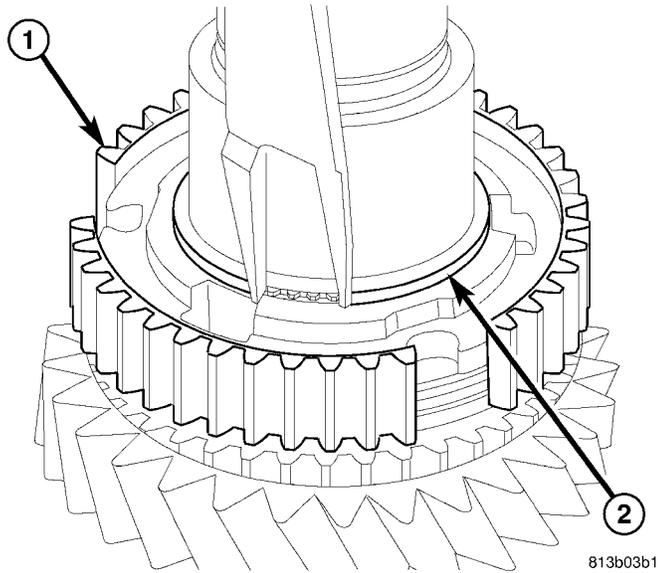


Fig. 34 1-2 SYNCHRO HUB SNAP RING

- 1 - SYNCHRONIZER HUB
- 2 - SNAP RING

(19) Remove 1-2 synchronizer hub (1) (Fig. 34) snap ring (2).

(20) Remove 1-2 synchronizer hub (1) (Fig. 35), synchronizer rings and second gear (2) off shaft with a press. Place second gear (2) on press plates and press shaft through 1-2 synchronizer hub (1), synchronizer rings and second gear (2)

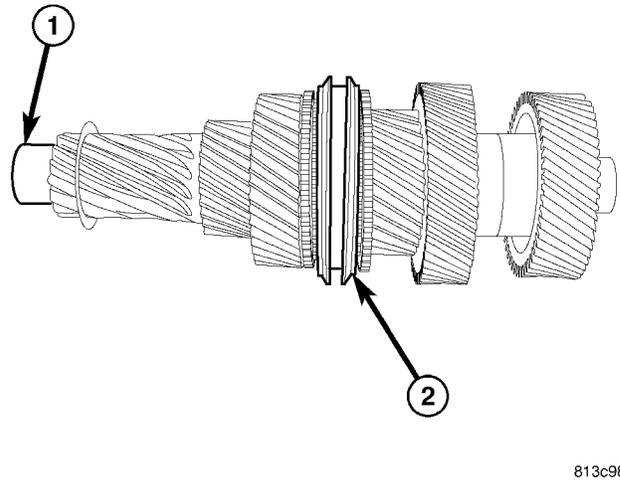


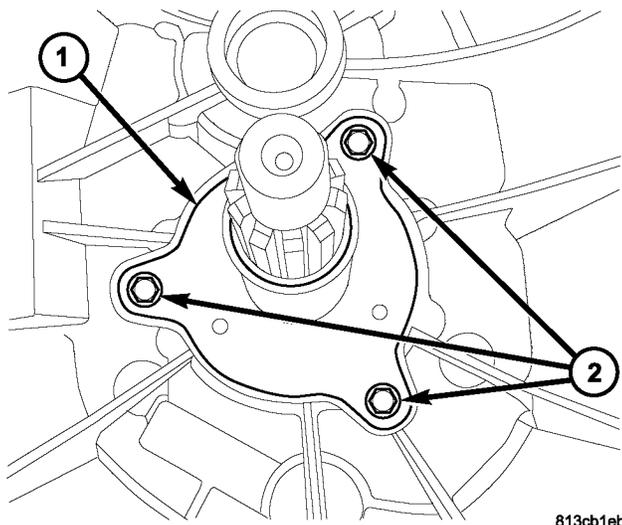
Fig. 36 COUNTERSHAFT

- 1 - BEARING SURFACES
- 2 - 3-4 SYNCHRONIZER ASSEMBLY

The countershaft (1) and 3-4 synchronizer (2) are serviced as an assembly only (Fig. 36).

MANUAL TRANSMISSION - NSG370 (Continued)

FRONT HOUSING

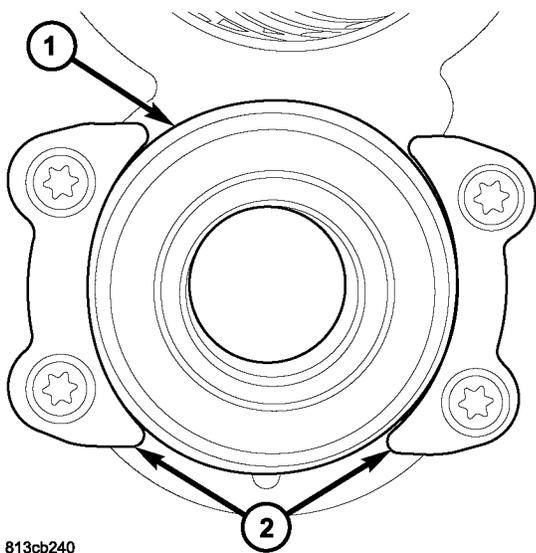


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Fig. 37 INPUT SHAFT RETAINER

- 1 - INPUT SHAFT RETAINER
- 2 - BOLTS

(1) Remove input shaft retainer (1) (Fig. 37) bolts (2) and remove retainer.

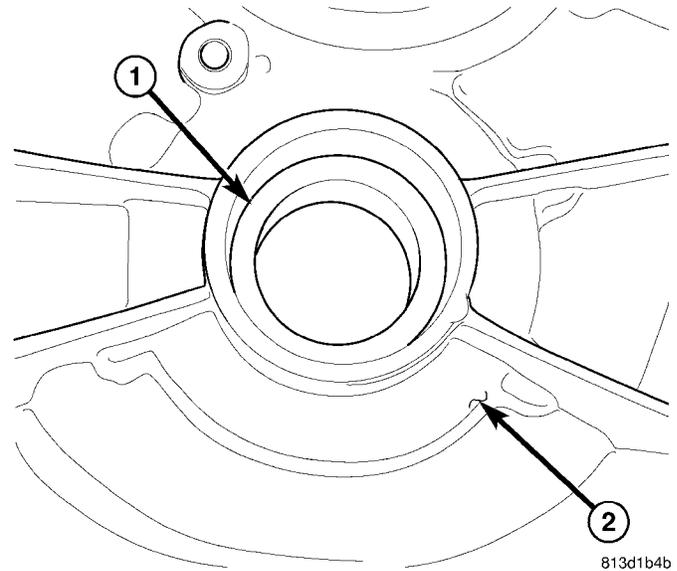


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Fig. 38 COUNTERSHAFT BEARING RETAINER

- 1 - COUNTERSHAFT BEARING
- 2 - RETAINERS

(2) Remove countershaft bearing (1) (Fig. 38) retainer (2) bolts and remove retainers.

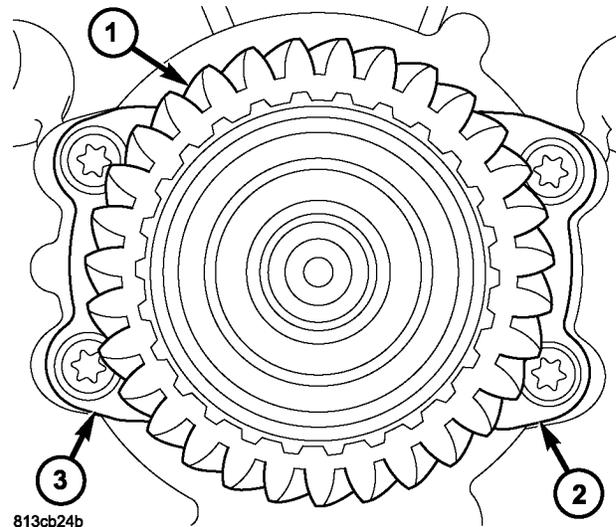


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Fig. 39 COUNTERSHAFT BEARING FRONT HOUSING

- 1 - COUNTERSHAFT BEARING
- 2 - HOUSING

(3) Remove countershaft bearing (1) (Fig. 39) from housing (2) with a hammer and driver.



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Fig. 40 INPUT SHAFT BEARING RETAINER

- 1 - INPUT SHAFT
- 2 - BEARING RETAINER
- 3 - BEARING RETAINER

(4) Remove input shaft (1) (Fig. 40) bearing retainer (2) bolts and remove retainers.

MANUAL TRANSMISSION - NSG370 (Continued)

(5) Remove input shaft and bearing from housing with a dead blow hammer.

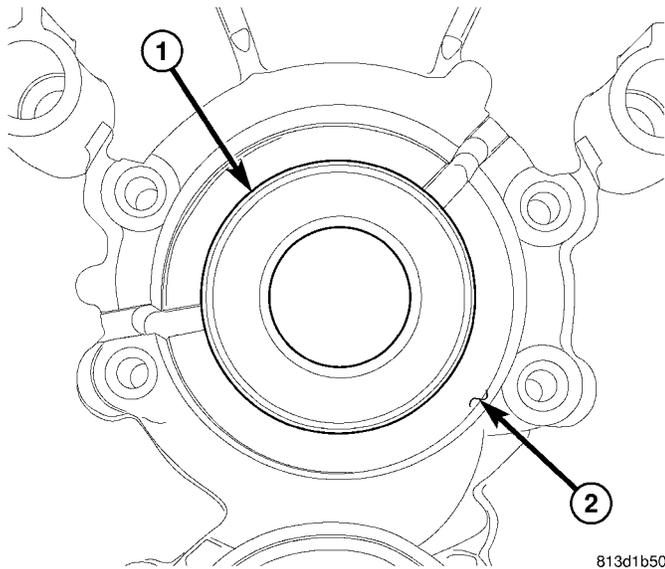


Fig. 41 INPUT SHAFT SEAL

- 1 - INPUT SHAFT SEAL
- 2 - HOUSING

(6) Remove input shaft seal (1) (Fig. 41) from housing (2) with a hammer and driver.

INPUT SHAFT

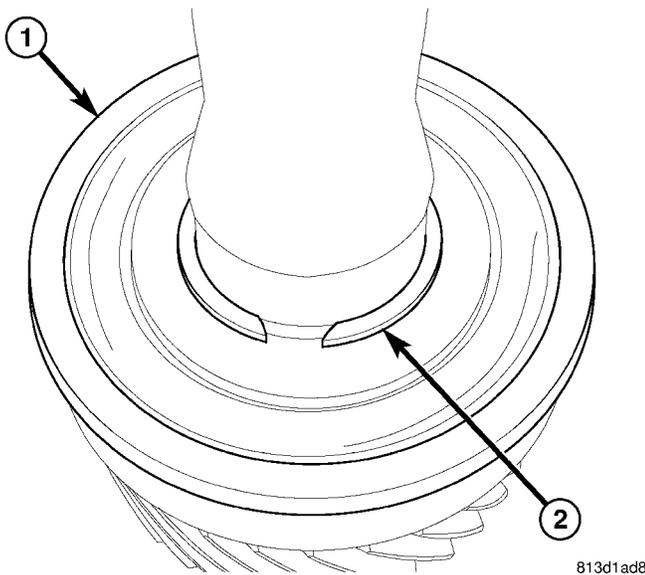


Fig. 42 INPUT SHAFT BEARING SNAP RING

- 1 - INPUT SHAFT BEARING
- 2 - SNAP RING

(1) Remove input shaft bearing (1) (Fig. 42) snap ring (2).

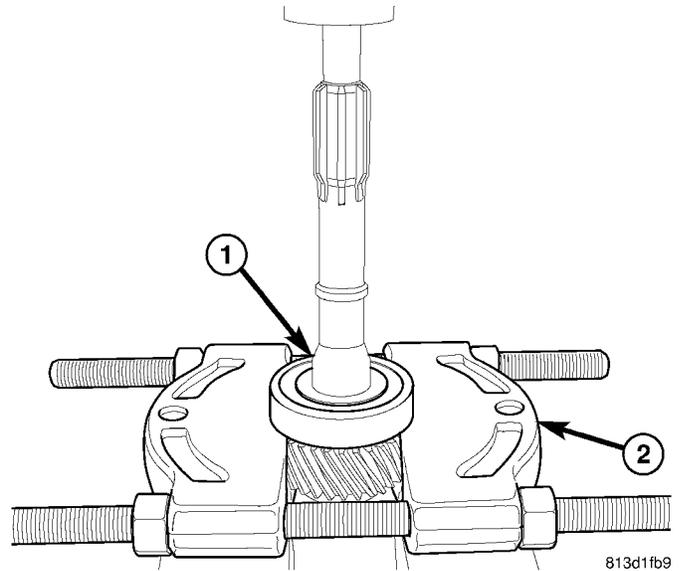


Fig. 43 INPUT SHAFT BEARING REMOVAL

- 1 - INPUT SHAFT BEARING
- 2 - BEARING SPLITTER 1130

(2) Remove input shaft bearing (1) (Fig. 43) with Splitter 1130 (2) and press. Place splitter around bearing retainer lip.

REAR HOUSING

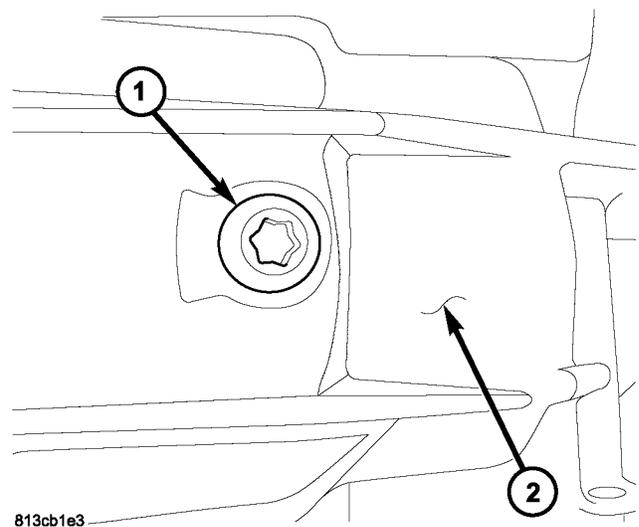


Fig. 44 IDLER SHAFT BOLT

- 1 - IDLER GEAR SHAFT BOLT
- 2 - HOUSING

(1) Remove reverse idler gear shaft bolt (1) (Fig. 44) from housing (2).

MANUAL TRANSMISSION - NSG370 (Continued)

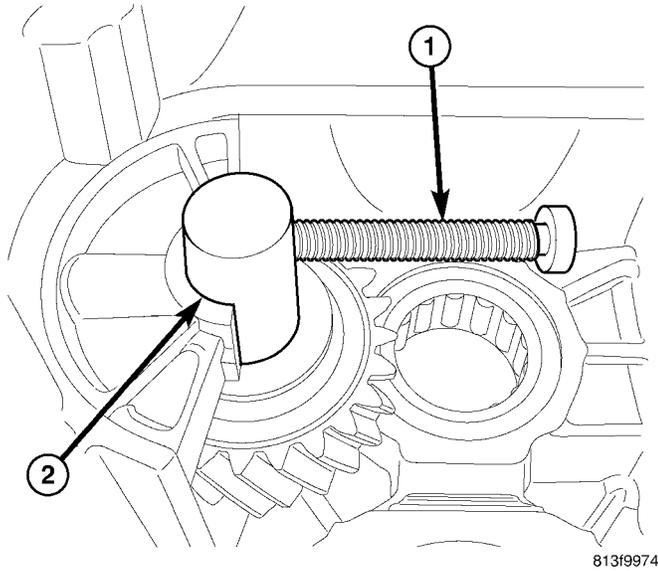


Fig. 45 PULL IDLER SHAFT

- 1 - IDLER GEAR SHAFT BOLT
- 2 - IDLER GEAR SHAFT

(2) Thread idler gear shaft bolt (1) (Fig. 45) into the shaft (2). Then work shaft (2) out of the idler gear.

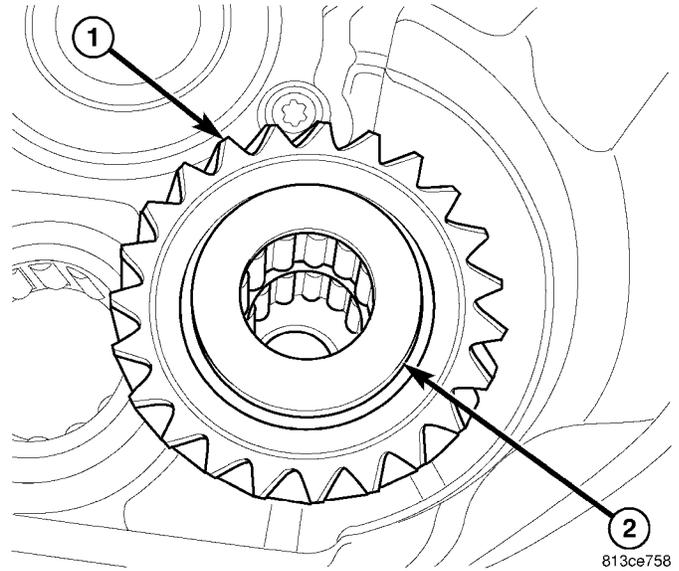


Fig. 47 IDLER GEAR THRUST WASHER

- 1 - REVERSE IDLER GEAR
- 2 - THRUST WASHER

(4) Remove reverse idler gear (1) (Fig. 47) thrust washer (2).

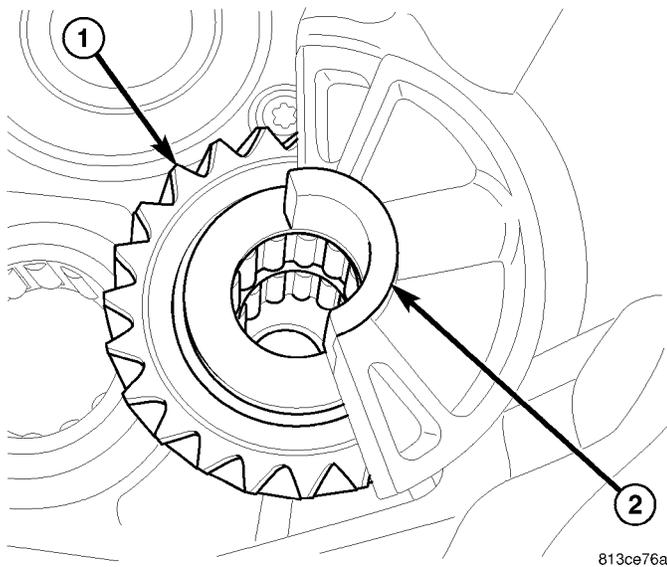


Fig. 46 IDLER SHAFT SUPPORT

- 1 - REVERSE IDLER GEAR
- 2 - SHAFT SUPPORT

(3) Remove reverse idler gear (1) (Fig. 46) shaft support (2).

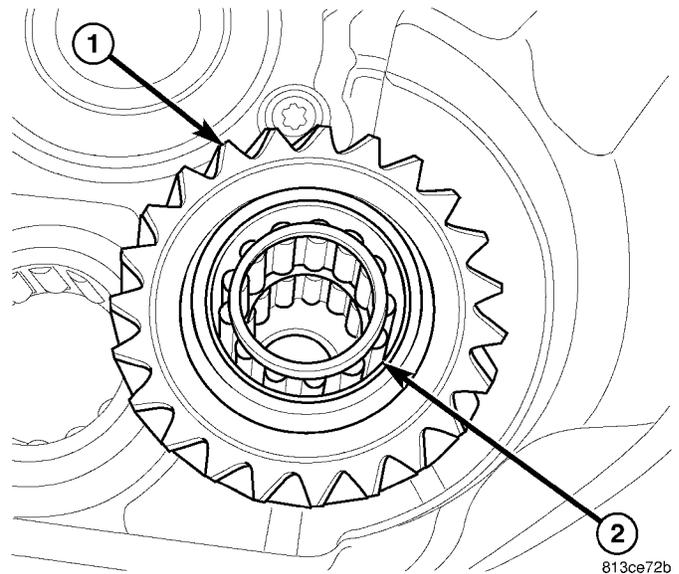
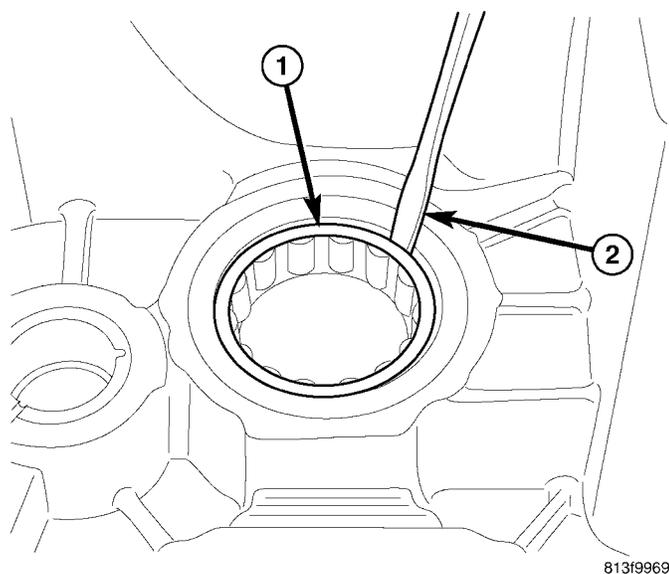


Fig. 48 IDLER GEAR BEARING

- 1 - REVERSE IDLER GEAR
- 2 - BEARING

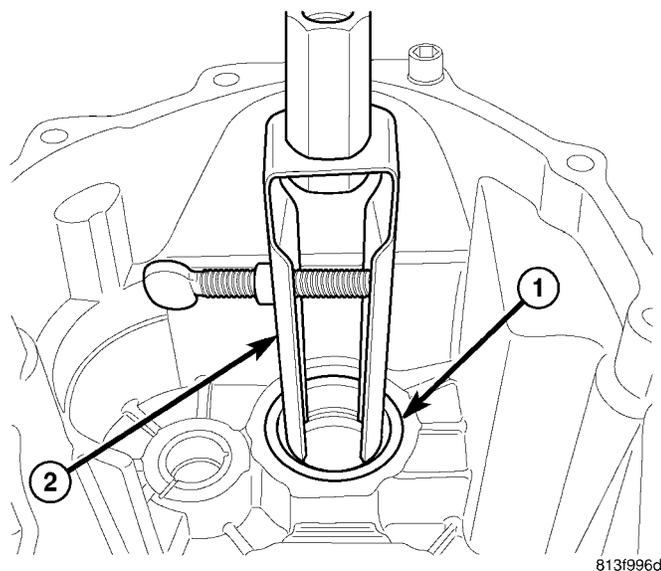
(5) Remove reverse idler gear (1) (Fig. 48) and bearing (2).

MANUAL TRANSMISSION - NSG370 (Continued)

**Fig. 49 BEARING CAGE**

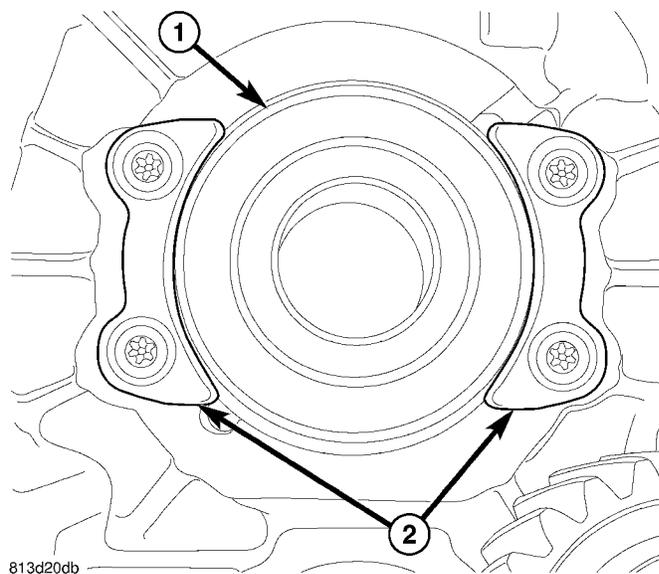
- 1 - ROLLER BEARING CAGE
2 - SCREWDRIVER

(6) Break plastic countershaft roller bearing cage (1) (Fig. 49) with a screw driver (2). Then remove cage and roller bearing.

**Fig. 50 BEARING SHELL PULLER**

- 1 - ROLLER BEARING CAGE
2 - REMOVER

(7) Remove countershaft roller bearing shell (1) (Fig. 50) from the rear housing with Remover 7794-A (2) and Slide Hammer C-637.

**Fig. 51 REAR MAINSHAFT BEARING RETAINER**

- 1 - MAINSHAFT BEARING
2 - RETAINERS

(8) Remove mainshaft bearing (1) (Fig. 51) retainer (2) bolts and remove retainers.

(9) Remove bearing from housing with a hammer and driver.

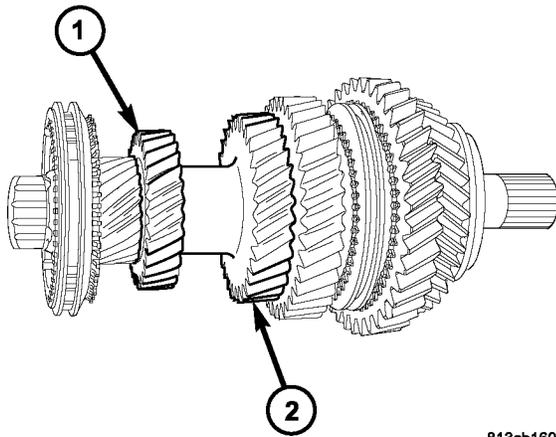
CLEANING

Clean gears, shafts, shift components and transmission housings with a standard parts cleaning solvent. Do not use acid or corrosive base solvents. Dry all parts except bearings with compressed air.

Clean shaft bearings with a mild solvent such as Mopar degreasing solvent, Gunk or similar solvents. Do not dry the bearings with compressed air. Allow the bearings to either air dry or wipe them dry with clean shop towels.

MANUAL TRANSMISSION - NSG370 (Continued)

INSPECTION



813cb160

Fig. 52 MAINSHAFT

- 1 - THIRD GEAR
- 2 - FOURTH GEAR

NOTE: Minor corrosion, nicks, or pitting can be smoothed with 400 grit emery and polished out with crocus cloth.

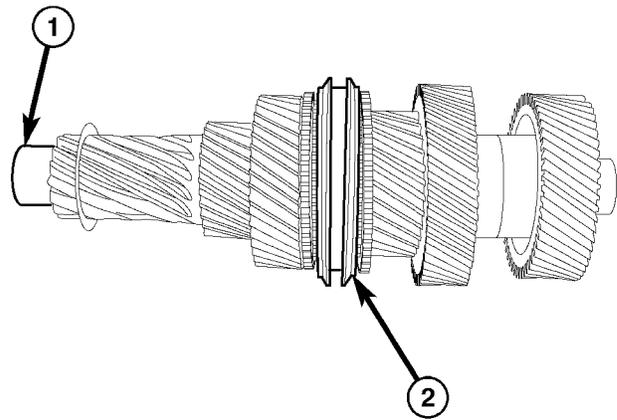
Bearings: Inspect for worn, cracked, flat-spotted or brinnelled.

Gears: Inspect for worn, chipped or cracked teeth. Inspect bearing surfaces for wear or flat-spotted.

Mainshaft: Inspect for worn splines, snap ring grooves and threads. Inspect bearing surfaces for wear or flat-spotted. **Third gear (1) (Fig. 52) and fourth gear (2) are serviced with mainshaft only.**

Countershaft: Inspect for worn, chipped or cracked teeth. Inspect bearing surfaces (1) (Fig. 53) for wear or flat-spots. Inspect 3-4 synchronizer assembly (2). **The countershaft is serviced as an assembly.**

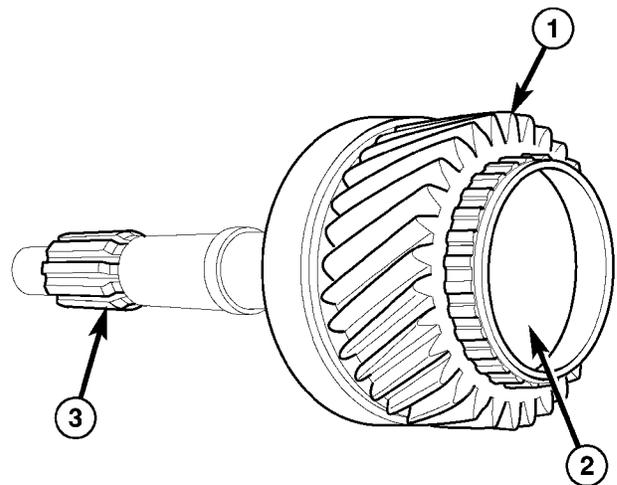
Input Shaft: Inspect for worn, chipped or cracked teeth (1). Inspect bearing surface (2) for wear or flat-spots. Inspect for worn splines (3) (Fig. 54).



813c9828

Fig. 53 COUNTERSHAFT

- 1 - BEARING SURFACES
- 2 - 3-4 SYNCHRONIZER ASSEMBLY

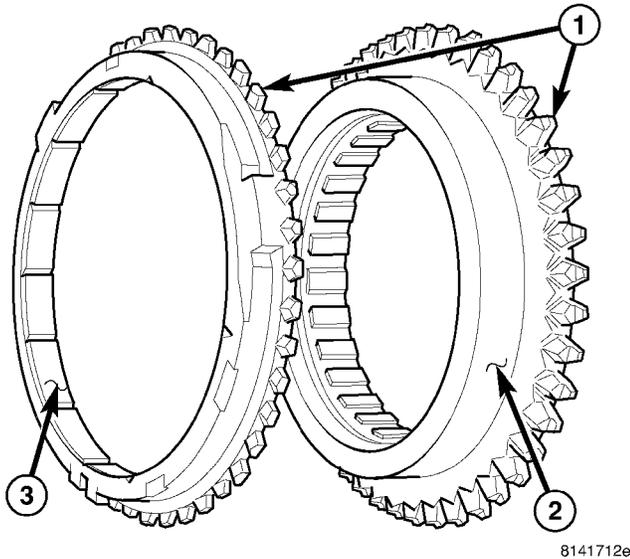


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Fig. 54 INPUT SHAFT

- 1 - TEETH
- 2 - BEARING SURFACE
- 3 - SPLINE

MANUAL TRANSMISSION - NSG370 (Continued)

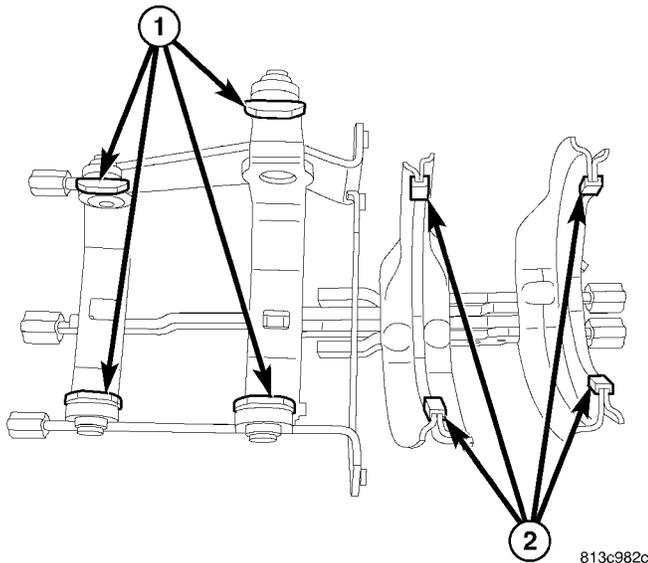


8141712e

Fig. 55 SYNCHRONIZER RINGS

- 1 - TEETH
- 2 - FRICTION SURFACE
- 3 - FRICTION MATERIAL

Synchronizer components: Inspect for worn, chipped or cracked teeth (1) and burned friction surface (2) or flaking off friction material (3) (Fig. 55). **Synchronizers are serviced as an assembly. 3-4 synchronizer assembly (2) is serviced with countershaft.**



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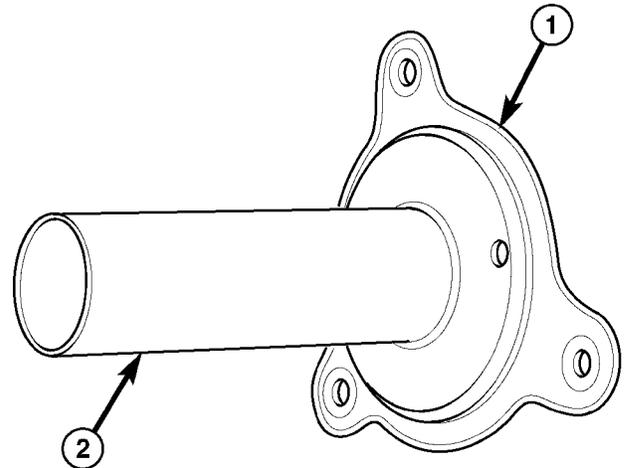
Fig. 56 SHIFT FORKS

- 1 - SHIFT FORK SHOES
- 2 - SHIFT FORK PADS

Shift forks: Inspect shift forks and shoes (1) (Fig. 56) for wear and distortion. Check fit of fork shoes in synchronizer sleeve to ensure parts fit and work

smoothly, replace if necessary. If shift fork pads (2) are worn, the shift fork must be replaced.

Housing/Tail housing: Inspect sealing and mating surfaces are free of burrs and nicks. Inspect alignment dowels are tight and in good condition.



81416ff3

Fig. 57 RETAINER INPUT SHAFT

- 1 - RETAINER
- 2 - SLIDE SURFACE

Input Shaft Retainer: Inspect retainer (1) release bearing slide surface (2) (Fig. 57).

ASSEMBLY

WARNING: Use welding gloves when handling heated components. Failure to follow these instructions will result in personal injury.

CAUTION: A bearing heater is used to assembly some components. Use only a bearing heater/hot plate and follow manufactures instructions. Heat components to 100 - 177 Celsius (212° Min - 350° Max Fahrenheit). Never use an open flame to heat components. Never leave components on heater for and extended amount of time. If component is discolored after heating the component has been overheated and must not be used. Failure to follow these instructions will result in component damage.

MAINSHAFT

NOTE: Reuse snap rings in there original locations. Or thickest snap ring that will fit.

(1) Place mainshaft in Fixture 9648 mounted in a vise.

MANUAL TRANSMISSION - NSG370 (Continued)

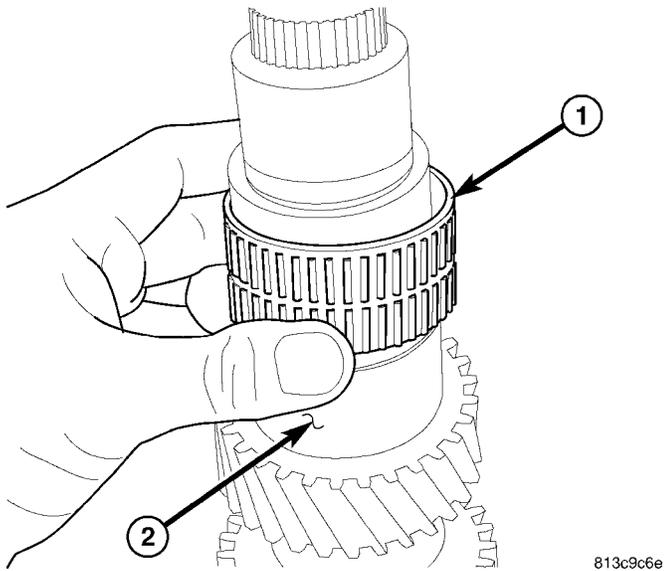


Fig. 58 SECOND GEAR BEARING

- 1 - SECOND GEAR BEARING
- 2 - MAINSHAFT

(2) Install second gear bearing (1) (Fig. 58) on mainshaft (2).

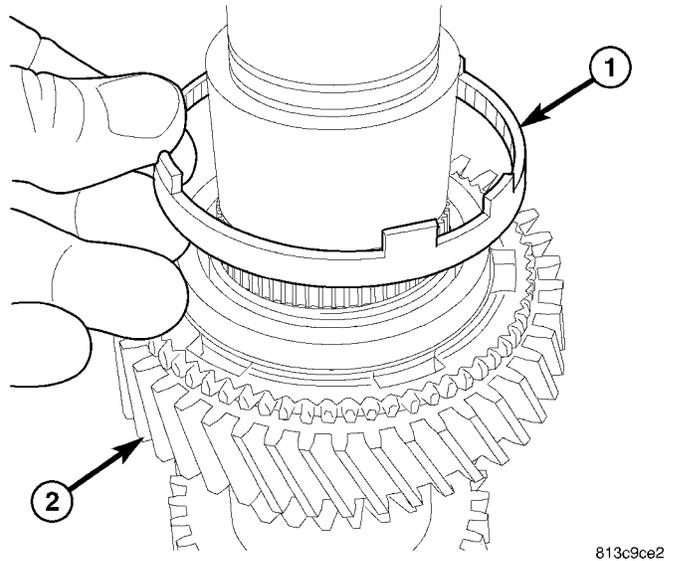


Fig. 60 2ND INNER FRICTION RING

- 1 - SYNCHRONIZER FRICTION RING
- 2 - SECOND GEAR

(4) Install inner synchronizer friction ring (1) (Fig. 60) on second gear (2).

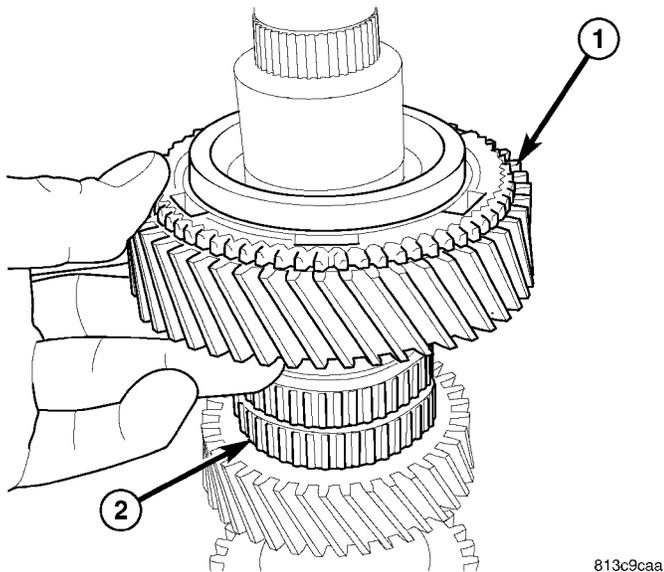


Fig. 59 SECOND GEAR

- 1 - SECOND GEAR
- 2 - BEARING

(3) Install second gear (1) (Fig. 59) on bearing (2).

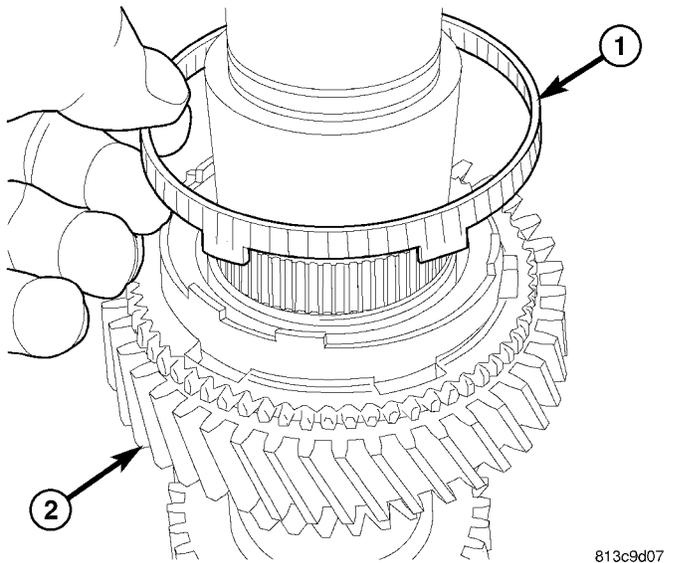
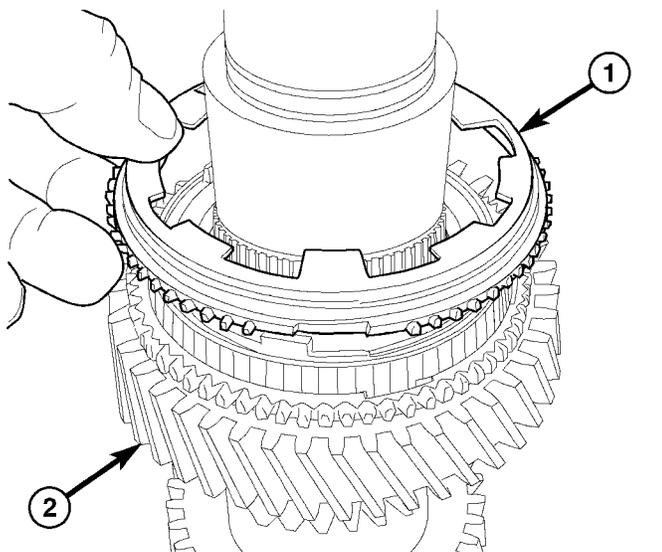


Fig. 61 2ND OUTER FRICTION RING

- 1 - OUTER SYNCHRONIZER FRICTION RING
- 2 - SECOND GEAR

(5) Install outer synchronizer friction ring (1) (Fig. 61) on second gear (2).

MANUAL TRANSMISSION - NSG370 (Continued)

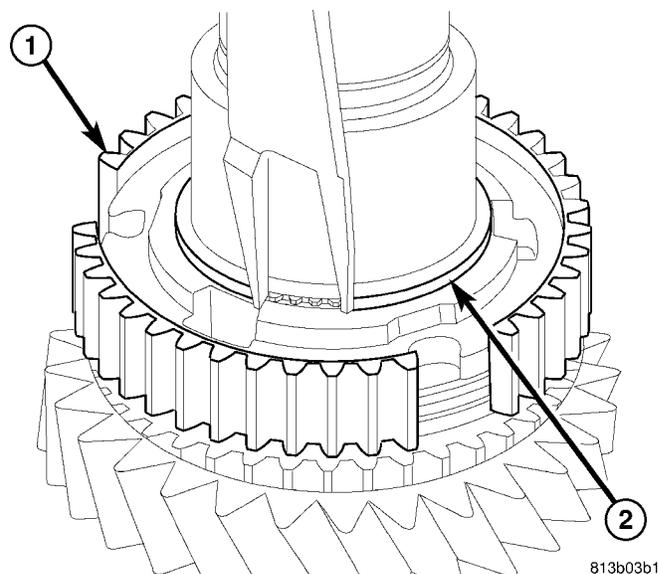


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Fig. 62 2ND BLOCKER RING

- 1 - SYNCHRONIZER BLOCKER RING
2 - SECOND GEAR

(6) Install synchronizer blocker ring (1) (Fig. 62) on second gear (2).

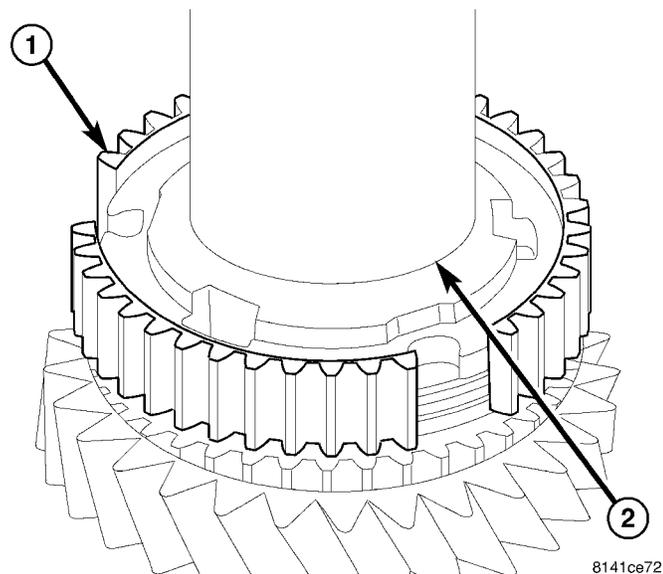


813b03b1

Fig. 64 1-2 SYNCHRO HUB SNAP RING

- 1 - SYNCHRONIZER HUB
2 - SNAP RING

(8) Install 1-2 synchronizer hub (1) (Fig. 64) snap ring (2).

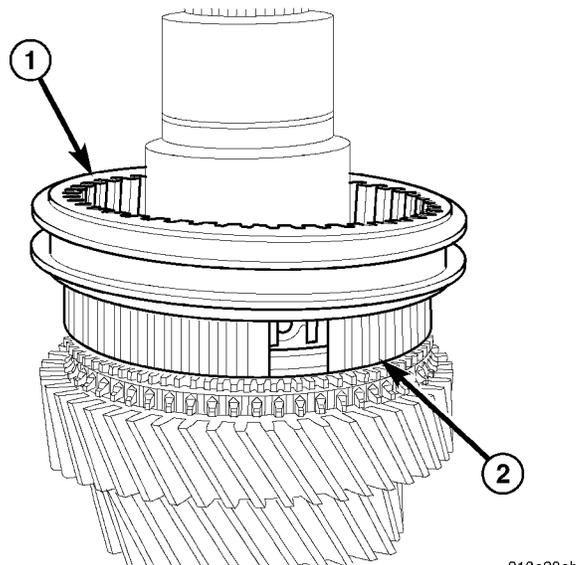


8141ce72

Fig. 63 1-2 SYNCHRO HUB INSTALLER

- 1 - 1-2 SYNCHRONIZER HUB
2 - INSTALLER

(7) Install 1-2 synchronizer hub (1) (Fig. 63) with Installer 8228 (2) and a press. Align hub detent openings with synchronizer rings.



813a98ab

Fig. 65 1-2 SYNCHRO SLEEVE

- 1 - 1-2 SYNCHRONIZER SLEEVE
2 - SYNCHRONIZER HUB

(9) Install 1-2 synchronizer sleeve (1) (Fig. 65) and push to the bottom of the synchronizer hub (2).

MANUAL TRANSMISSION - NSG370 (Continued)

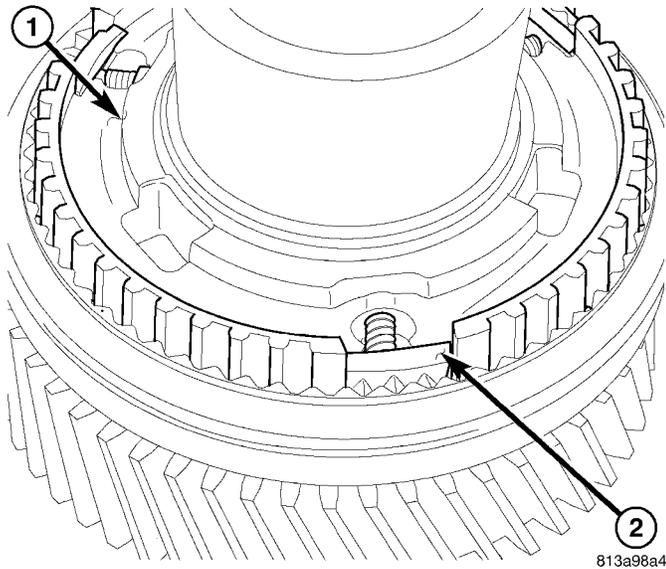


Fig. 66 1-2 SYNCHRO DETENT

- 1 - 1-2 SYNCHRONIZER HUB
- 2 - DETENTS

(10) Install 1-2 synchronizer detents, springs, and balls (2) (Fig. 66).

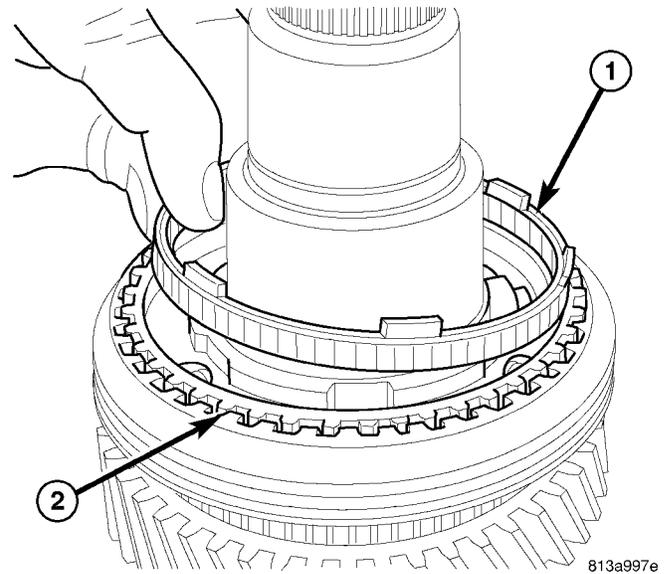


Fig. 68 FIRST GEAR FRICTION RING

- 1 - FIRST GEAR OUTER FRICTION RING
- 2 - SYNCHRONIZER HUB

(12) Install first gear outer friction ring (1) (Fig. 68) into synchronizer hub (2).

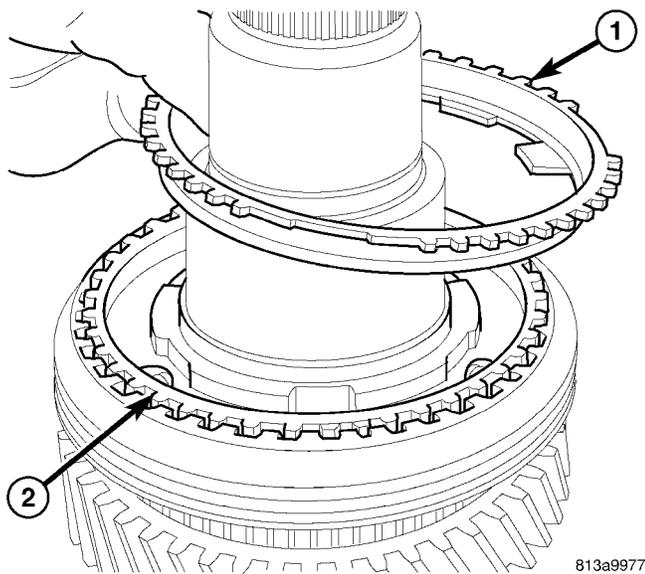


Fig. 67 FIRST GEAR OUTER BLOCKER RING

- 1 - FIRST GEAR BLOCKER RING
- 2 - SYNCHRONIZER HUB

(11) Install first gear blocker ring (1) (Fig. 67) into synchronizer hub (2).

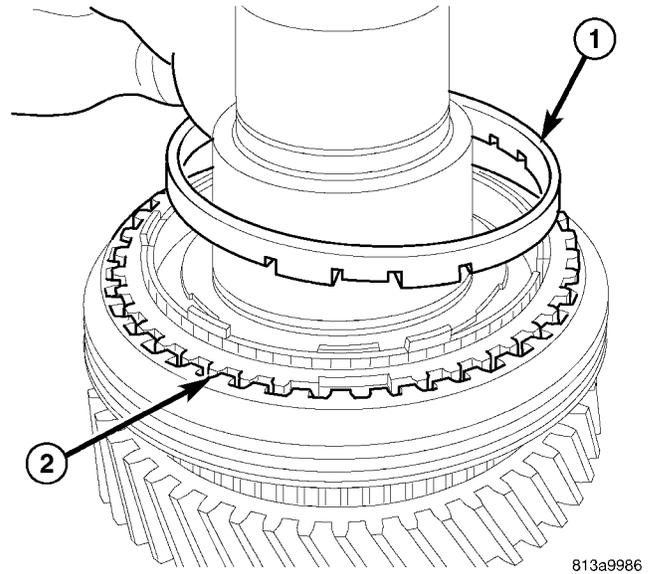
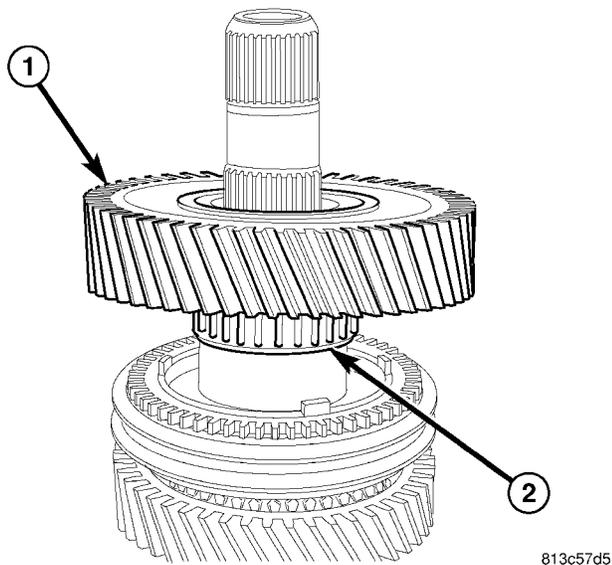


Fig. 69 FIRST GEAR INNER BLOCKER RING

- 1 - FIRST GEAR INNER BLOCKER RING
- 2 - SYNCHRONIZER HUB

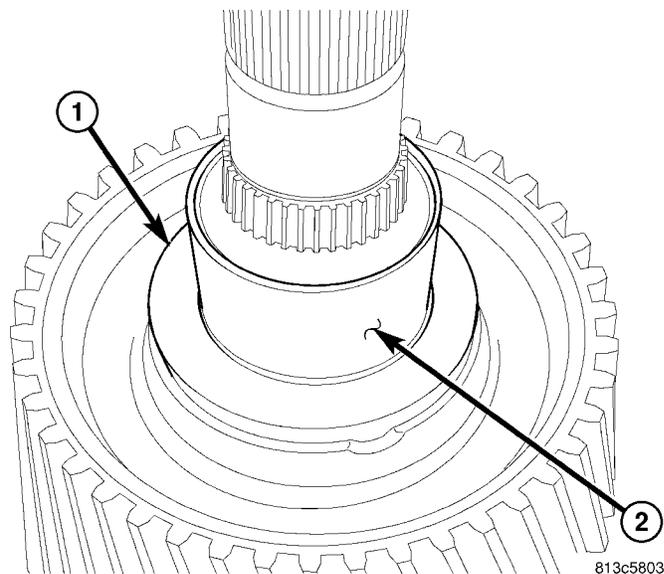
(13) Install first gear inner blocker ring (1) (Fig. 69) into synchronizer hub (2).

MANUAL TRANSMISSION - NSG370 (Continued)

**Fig. 70 1ST GEAR AND BEARING**

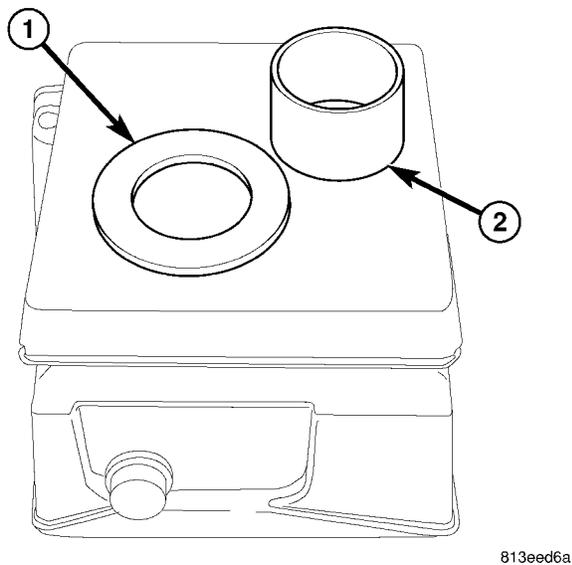
- 1 - FIRST GEAR
2 - BEARING

(14) Install first gear (1) (Fig. 70) and bearing (2). Then center 1-2 synchronizer sleeve on synchronizer hub.

**Fig. 72 THRUST WASHER & RACE**

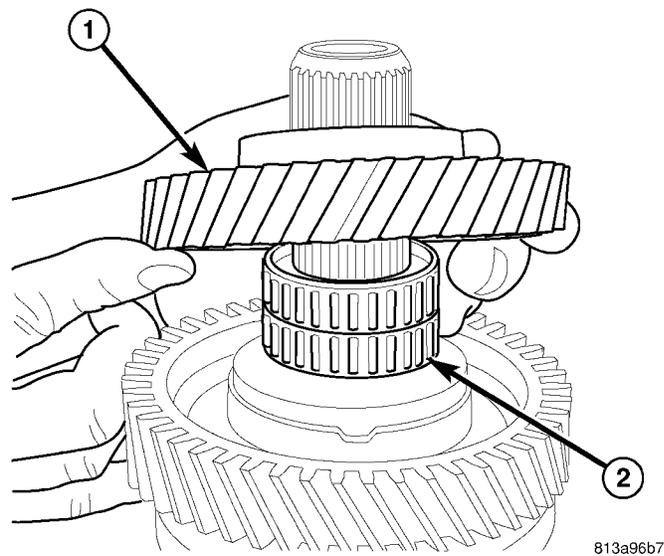
- 1 - FIRST GEAR THRUST WASHER
2 - REVERSE GEAR BEARING RACE

(16) Using welding gloves, install first gear thrust washer (1) (Fig. 72) and reverse gear bearing race (2).

**Fig. 71 WASHER AND RACE**

- 1 - FIRST GEAR THRUST WASHER
2 - REVERSE GEAR BEARING RACE

(15) Heat first gear thrust washer (1) (Fig. 71) and reverse gear bearing race (2) with bearing heater.

**Fig. 73 REVERSE GEAR**

- 1 - REVERSE GEAR
2 - BEARING

(17) Install reverse gear (1) (Fig. 73) and bearing (2).

MANUAL TRANSMISSION - NSG370 (Continued)

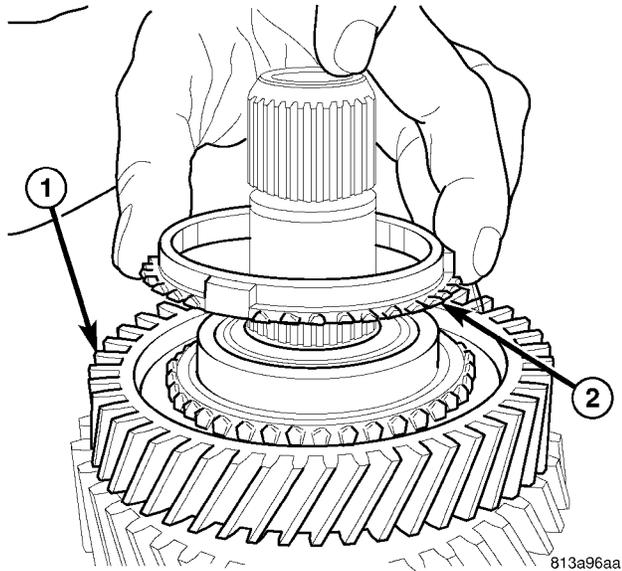


Fig. 74 REVERSE SYNCHRONIZER

- 1 - REVERSE GEAR
- 2 - SYNCHRONIZER FRICTION RING

(18) Install reverse gear (1) (Fig. 74) synchronizer friction ring (2).

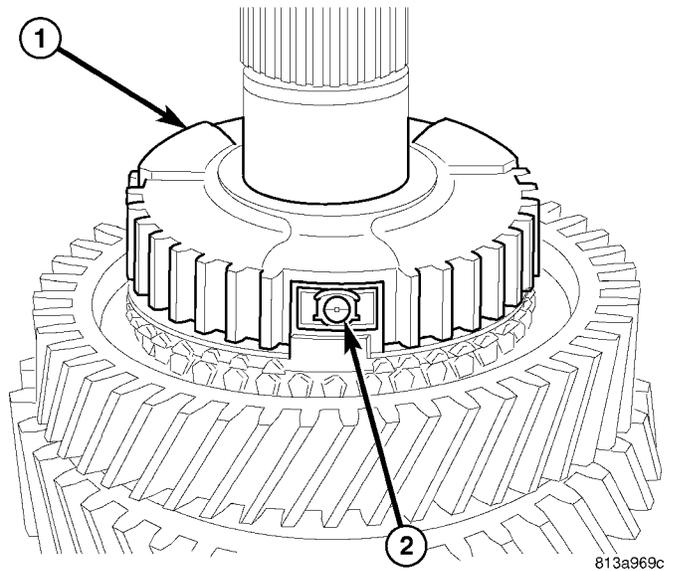


Fig. 76 REVERSE SYNCHRO HUB DETENT

- 1 - SYNCHRONIZER HUB
- 2 - DETENTS

(20) Install reverse gear synchronizer hub (1) (Fig. 76) detents (2).

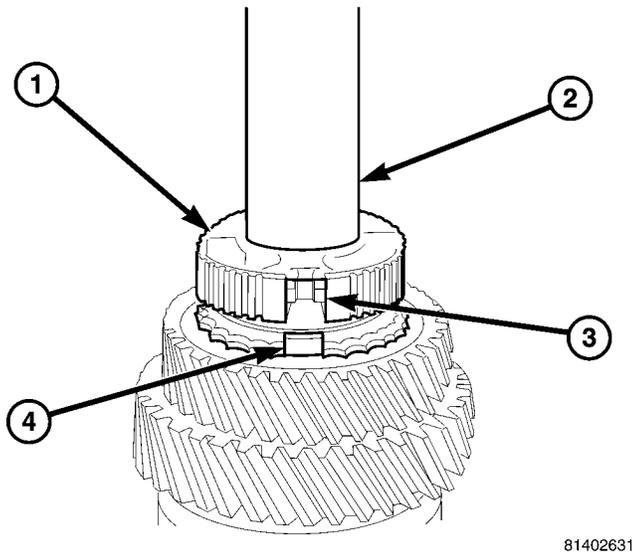


Fig. 75 REVERSE HUB INSTALLER

- 1 - SYNCHRONIZER HUB
- 2 - INSTALLER
- 3 - DETENT OPENING
- 4 - FRICTION RING TAB

(19) Install reverse gear synchronizer hub (1) on mainshaft with Installer W-262 (2) and a press. Align hub detent opening (3) with friction ring (4) lug (Fig. 75).

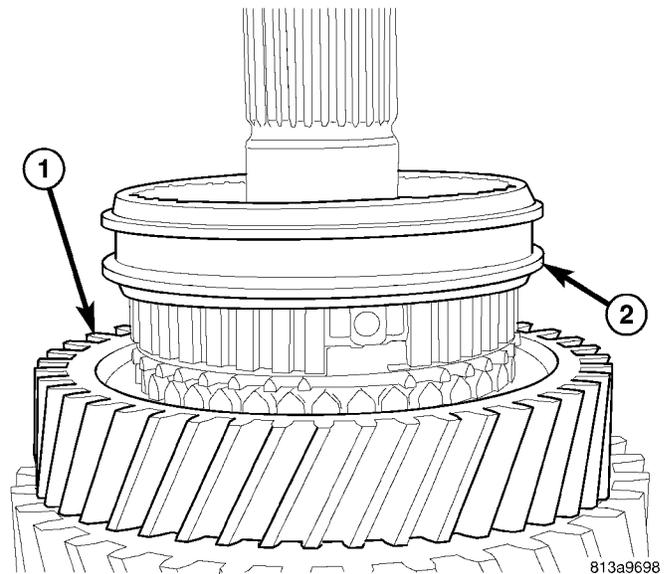


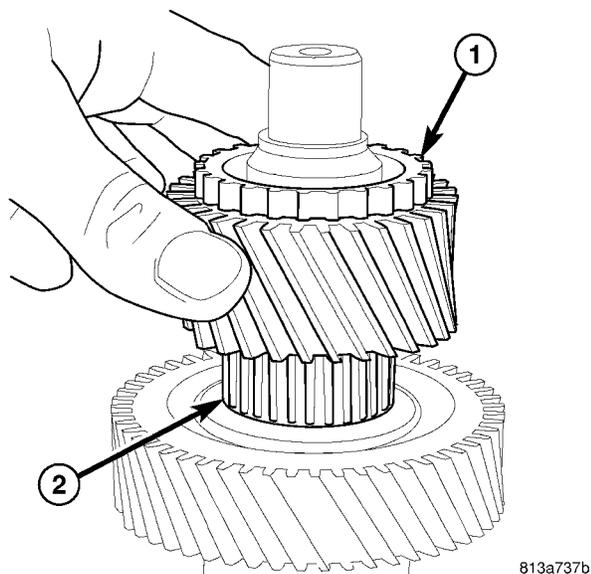
Fig. 77 REVERSE GEAR SYNCHRO SLEEVE

- 1 - REVERSE GEAR
- 2 - SYNCHRONIZER SLEEVE

(21) Install reverse gear (1) (Fig. 77) synchronizer sleeve (2) and center sleeve on synchronizer hub.

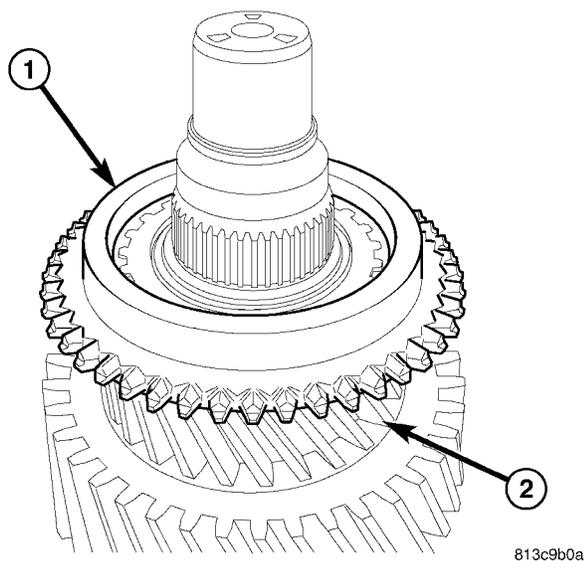
(22) Remove mainshaft from Fixture 9648. Turn fixture over in the vise, then install opposite end of mainshaft in the fixture.

MANUAL TRANSMISSION - NSG370 (Continued)

**Fig. 78 SIXTH GEAR AND BEARING**

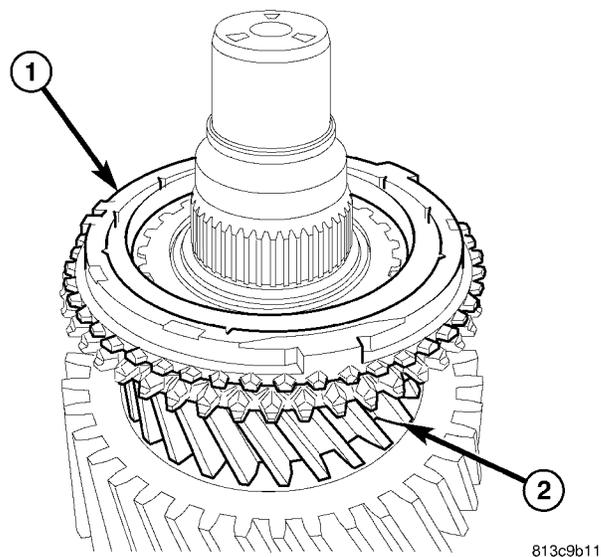
- 1 - SIXTH GEAR
2 - BEARING

(23) Install sixth gear (1) (Fig. 78) and bearing (2).

**Fig. 79 6TH GEAR BLOCKER RING**

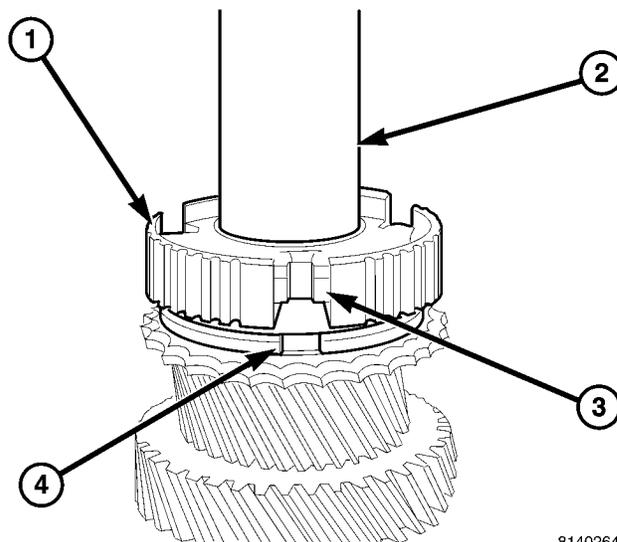
- 1 - SIXTH GEAR BLOCKER RING
2 - SIXTH GEAR

(24) Install sixth gear synchronizer blocker ring (1) (Fig. 79) on sixth gear (2).

**Fig. 80 6TH GEAR FRICTION RING**

- 1 - SIXTH GEAR FRICTION RING
2 - SIXTH GEAR

(25) Install sixth gear synchronizer friction ring (1) (Fig. 80) on sixth gear (2).

**Fig. 81 5-6 HUB INSTALLER**

- 1 - SYNCHRONIZER HUB
2 - INSTALLER
3 - DETENT OPENING
4 - FRICTION RING TAB

(26) Install 5-6 synchronizer hub (1) with Installer W-262 (2). Align hub detent opening (3) with friction ring lugs (4) and press hub on mainshaft (Fig. 81).

NOTE: 5-6 synchronizer hub center, is offset and must be install large offset down.

MANUAL TRANSMISSION - NSG370 (Continued)

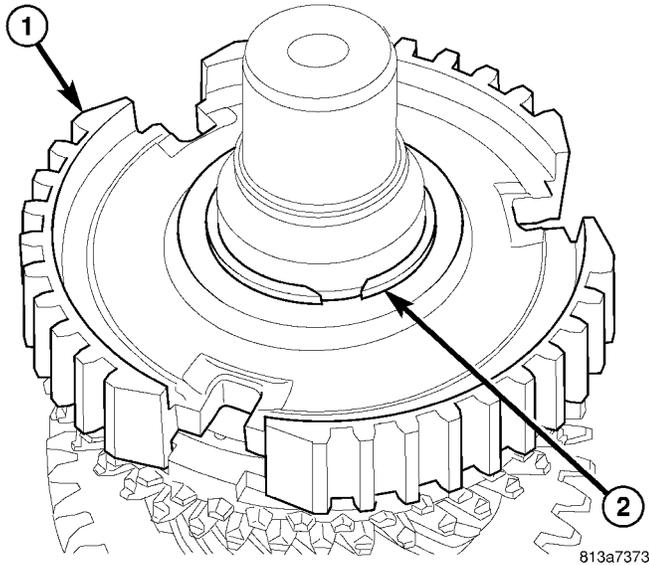


Fig. 82 5-6 SYNCHRO HUB SNAP RING

- 1 - SYNCHRONIZER HUB
- 2 - SNAP RING

(27) Install 5-6 synchronizer hub (1) (Fig. 82) snap ring (2).

(28) Install 5-6 synchronizer sleeve on hub (1).

REAR HOUSING

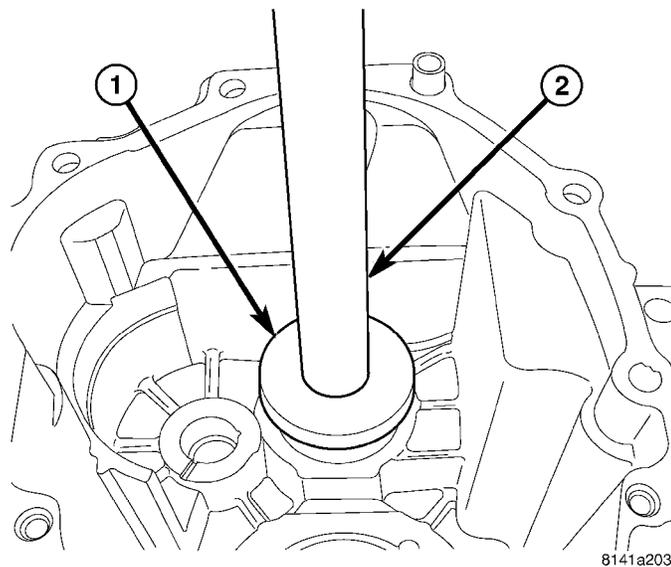


Fig. 83 REAR COUNTERSHAFT BEARING

- 1 - INSTALLER
- 2 - HANDLE

(1) Install countershaft bearing (Fig. 83) into rear housing with Installer 9643 (1) and Handle C-4171.

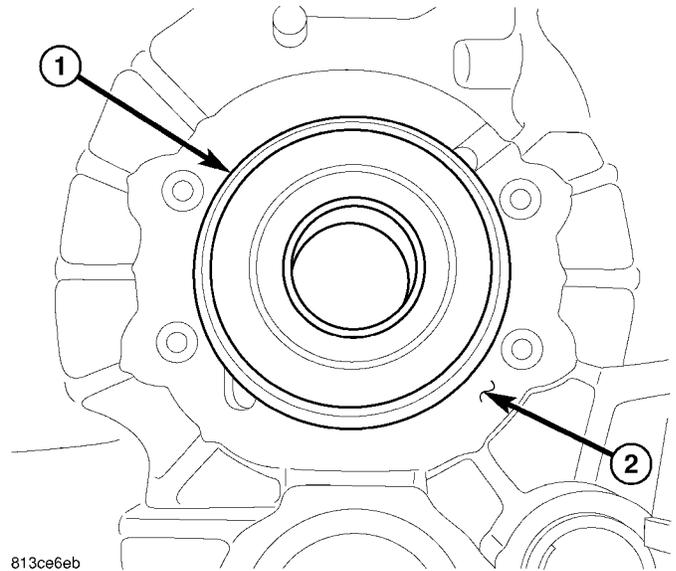


Fig. 84 REAR HOUSING MAINSHAFT BEARING

- 1 - MAINSHAFT BEARING
- 2 - HOUSING

(2) Install mainshaft bearing (1) (Fig. 84) into housing (2).

(3) Install bearing retainer and tighten bolts to 10 N·m (7.3 ft. lbs.).

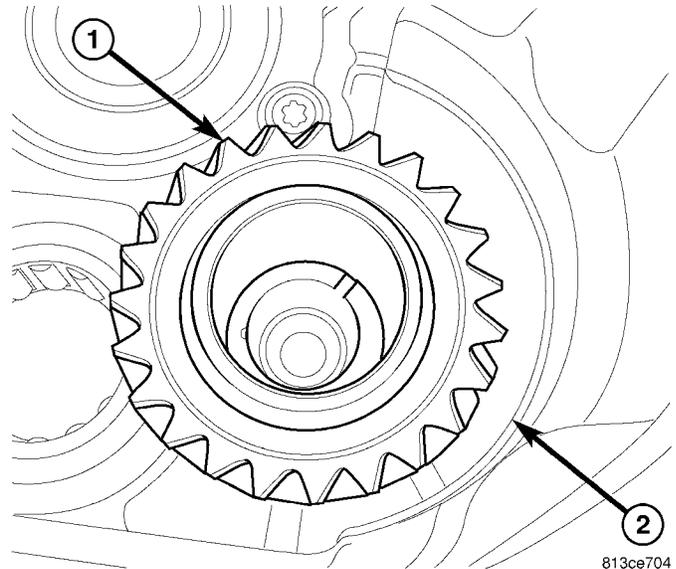


Fig. 85 REVERSE IDLER GEAR

- 1 - REVERSE IDLER GEAR
- 2 - HOUSING

(4) Install reverse idler gear (1) (Fig. 85) into housing (2).

MANUAL TRANSMISSION - NSG370 (Continued)

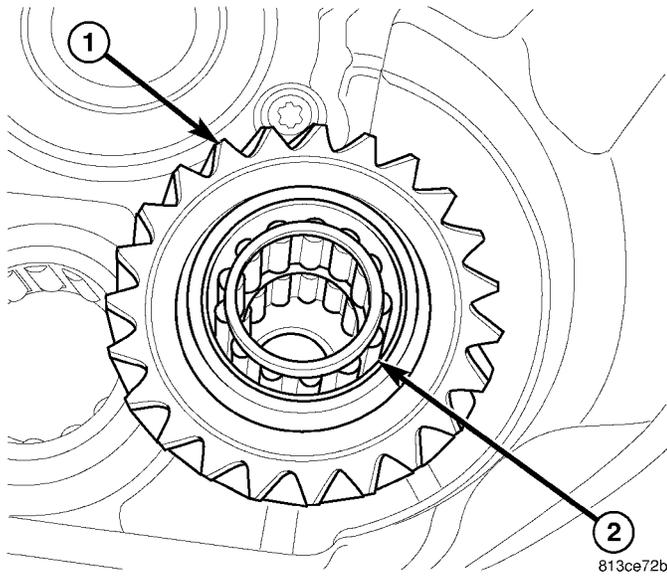


Fig. 86 IDLER GEAR BEARING

- 1 - REVERSE IDLER GEAR
- 2 - BEARING

(5) Install idler gear (1) (Fig. 86) bearing (2) into gear.

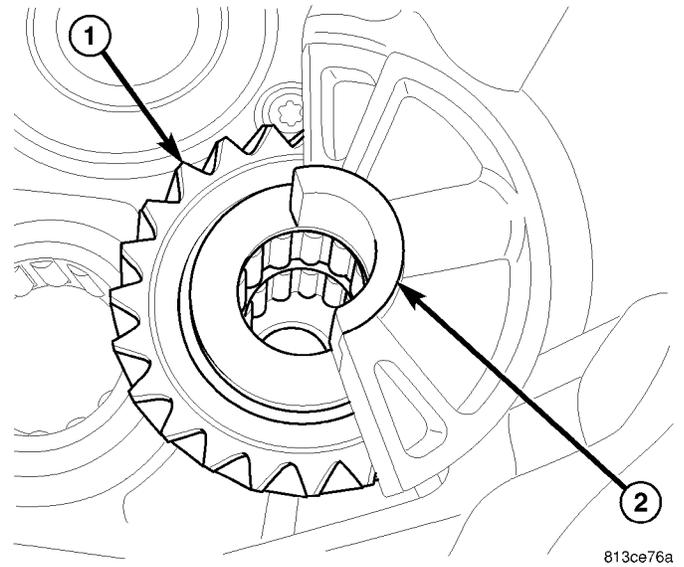


Fig. 88 IDLER SHAFT SUPPORT

- 1 - REVERSE IDLER GEAR
- 2 - SHAFT SUPPORT

(7) Install idler gear (1) (Fig. 88) shaft support (2) into housing.

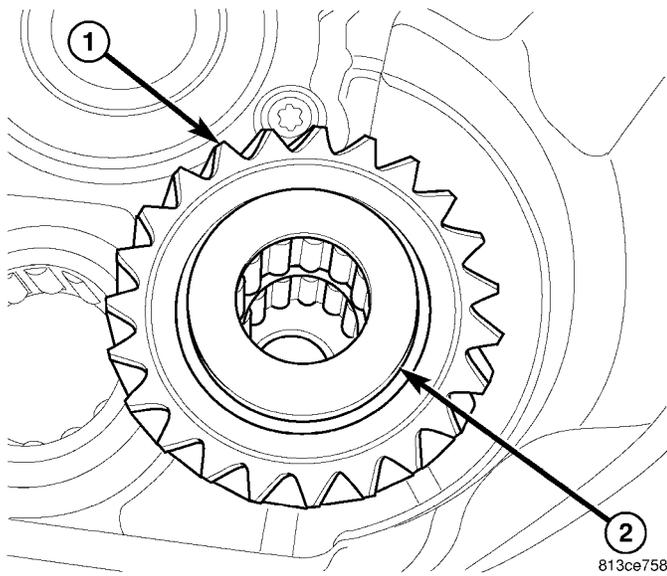


Fig. 87 IDLER GEAR THRUST WASHER

- 1 - REVERSE IDLER GEAR
- 2 - THRUST WASHER

(6) Install idler gear (1) (Fig. 87) thrust washer (2) on idler gear.

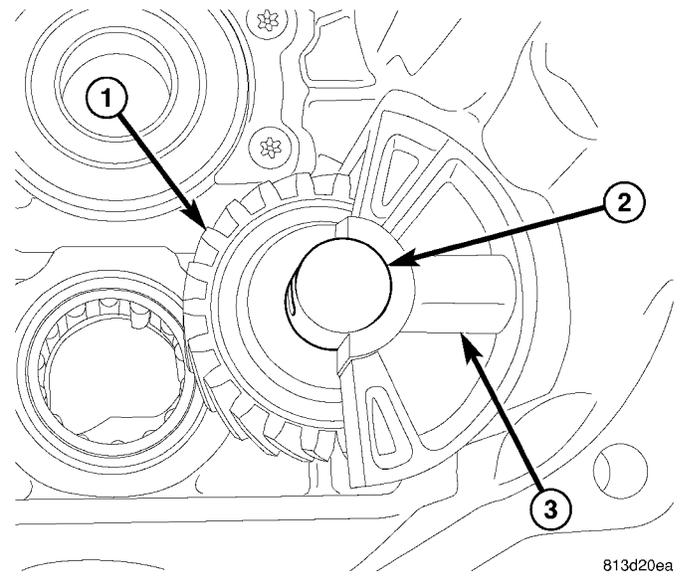


Fig. 89 IDLER GEAR SHAFT

- 1 - IDLER GEAR
- 2 - IDLER GEAR SHAFT
- 3 - SHAFT SUPPORT HOLE

(8) Install idler gear (1) (Fig. 89) shaft (2) with shaft bolt hole aligned with shaft support hole (3).

MANUAL TRANSMISSION - NSG370 (Continued)

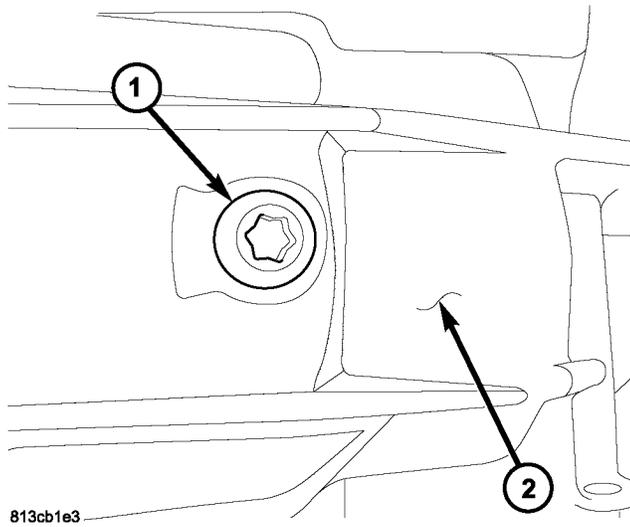


Fig. 90 IDLER SHAFT BOLT

- 1 - IDLER GEAR SHAFT BOLT
- 2 - HOUSING

(9) Install idler gear shaft bolt (1) (Fig. 90) into the housing (2) and tighten to 20 N.m (15 ft. lbs.).

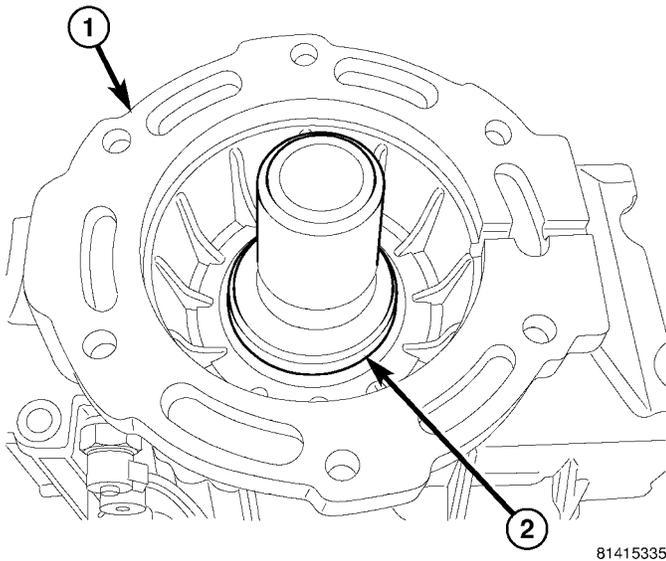


Fig. 91 OUTPUT SHAFT SEAL 4X4

- 1 - HOUSING
- 2 - INSTALLER

(10) Install 4x4 output shaft seal into rear housing (1) with Installer 9638 (2) (Fig. 91). Install 4x2 output shaft seal into rear housing with Installer 9635 and Tube 6448A.

INPUT SHAFT

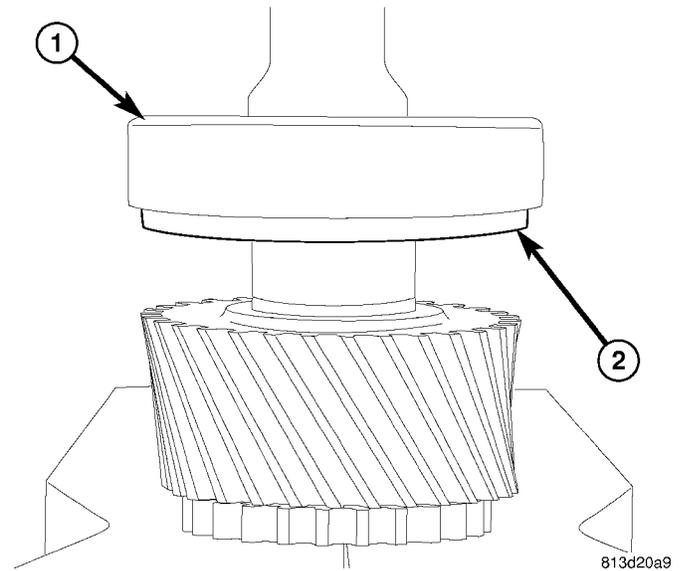


Fig. 92 INPUT SHAFT BEARING LIP

- 1 - INPUT SHAFT BEARING
- 2 - BEARING RETAINER LIP

(1) Install input shaft bearing (1) (Fig. 92) on input shaft with the bearing retainer lip (2) facing fifth gear.

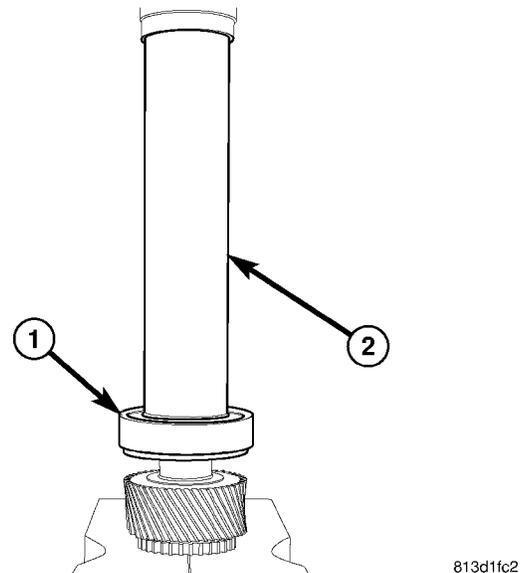


Fig. 93 INPUT SHAFT BEARING INSTALLER

- 1 - BEARING
- 2 - INSTALLER

(2) Install input shaft bearing (1) (Fig. 93) with Installer 6448A (2) and a press.

MANUAL TRANSMISSION - NSG370 (Continued)

FRONT HOUSING

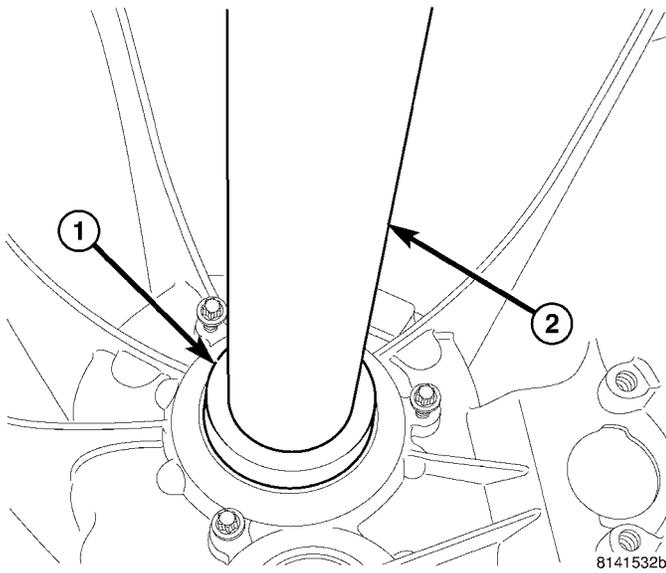


Fig. 94 INPUT SHAFT SEAL INSTALLER

- 1 - INSTALLER
- 2 - TUBE

(1) Install input shaft seal (Fig. 94) with Installer 9635 (1) tube 6448A (2).

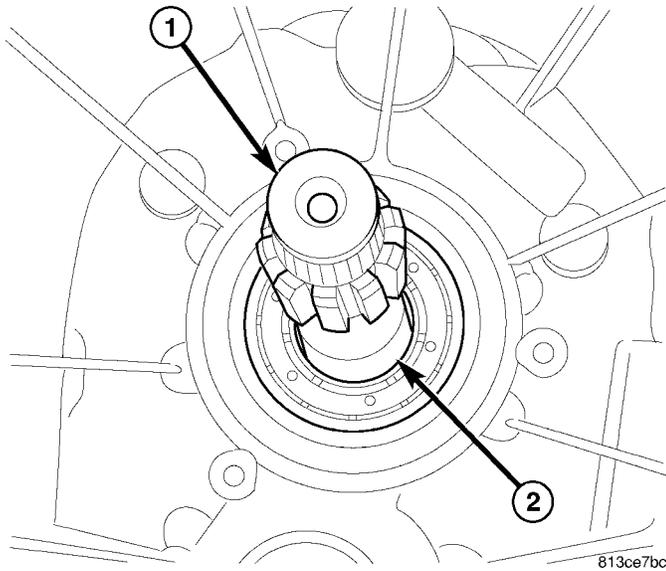


Fig. 95 INPUT SHAFT IN HOUSING

- 1 - INPUT SHAFT
- 2 - BEARING

(2) Install input shaft (1) (Fig. 95) with bearing (2) into housing.

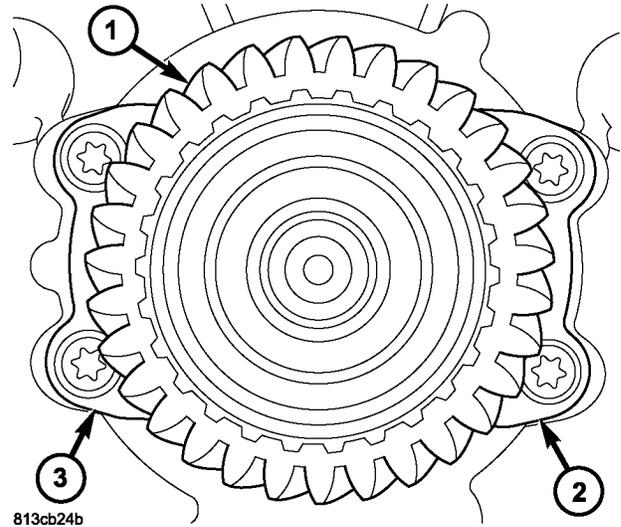


Fig. 96 INPUT SHAFT BEARING RETAINER

- 1 - INPUT SHAFT
- 2 - BEARING RETAINER
- 3 - BEARING RETAINER

(3) Install input shaft (1) (Fig. 96) bearing retainers (2, 3) and tighten bolts to 10 N-m (88 in. lbs.).

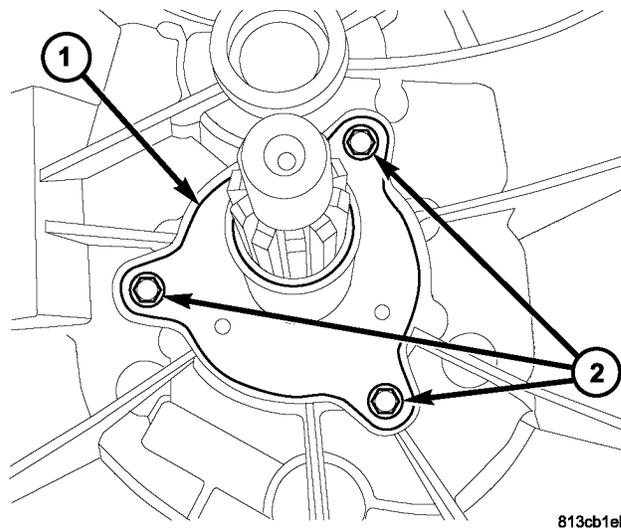
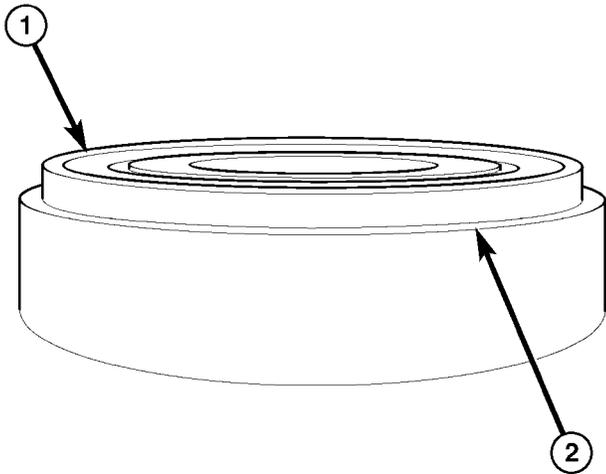


Fig. 97 INPUT SHAFT RETAINER

- 1 - INPUT SHAFT RETAINER
- 2 - BOLTS

(4) Install input shaft retainer (1) (Fig. 97) and tighten bolts (2) to 9 N-m (80 in. lbs.).

MANUAL TRANSMISSION - NSG370 (Continued)

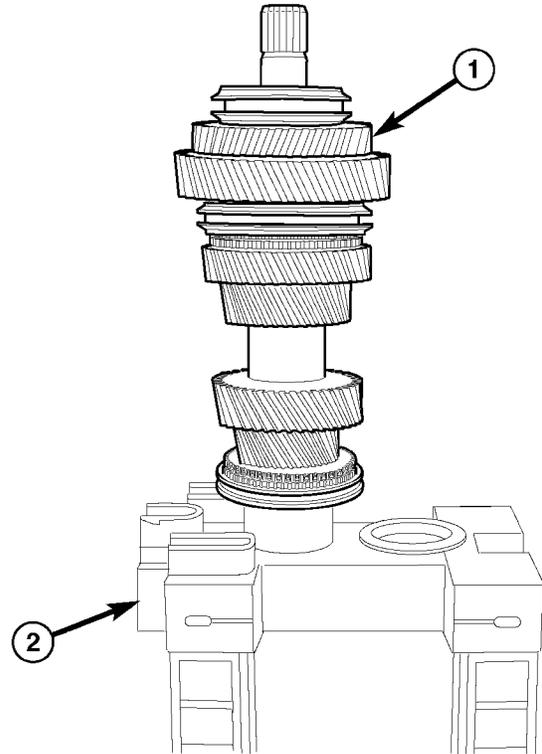


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Fig. 98 BEARING RETAINER LIP

- 1 - COUNTERSHAFT BEARING
- 2 - BEARING RETAINER LIP

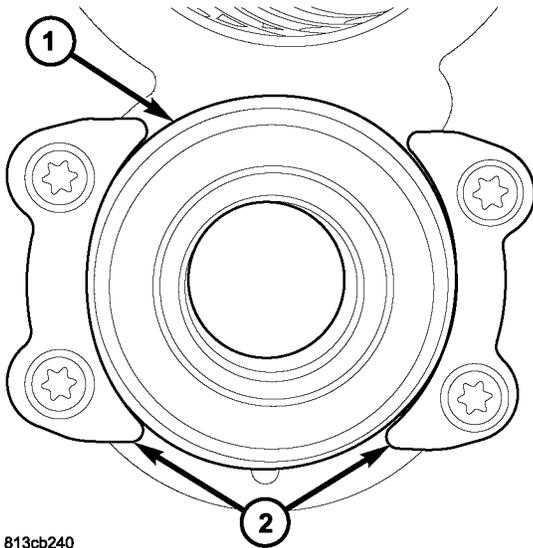
(5) Install countershaft bearing (1) (Fig. 98) into housing with bearing retainer lip (2) facing up.



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Fig. 100 MAINSHAFT IN FIXTURE

- 1 - MAINSHAFT
- 2 - FIXTURE



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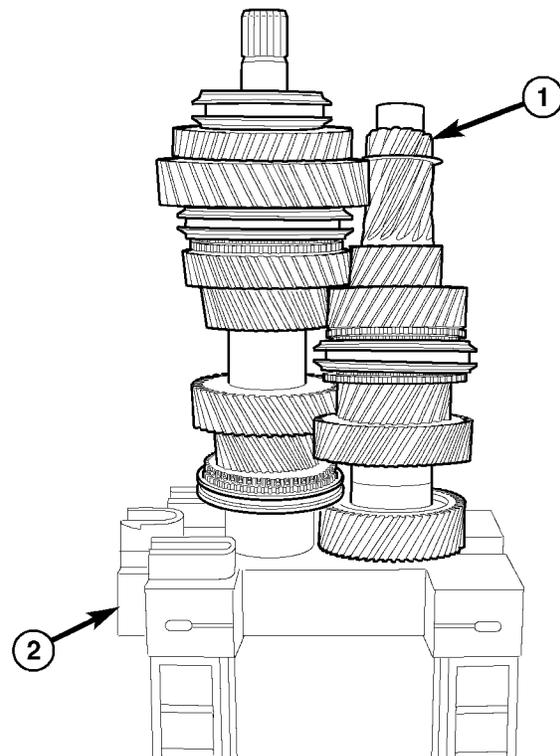
Fig. 99 COUNTERSHAFT BEARING RETAINER

- 1 - COUNTERSHAFT BEARING
- 2 - RETAINERS

(6) Install countershaft bearing (1) (Fig. 99) retainers (2) and tighten bolts to 10 N·m (88 in. lbs.).

FINAL ASSEMBLY

- (1) Install mainshaft (1) onto Build Fixture 9633 (2) (Fig. 100).
- (2) Install countershaft (1) onto Build Fixture 9633 (2) (Fig. 101).

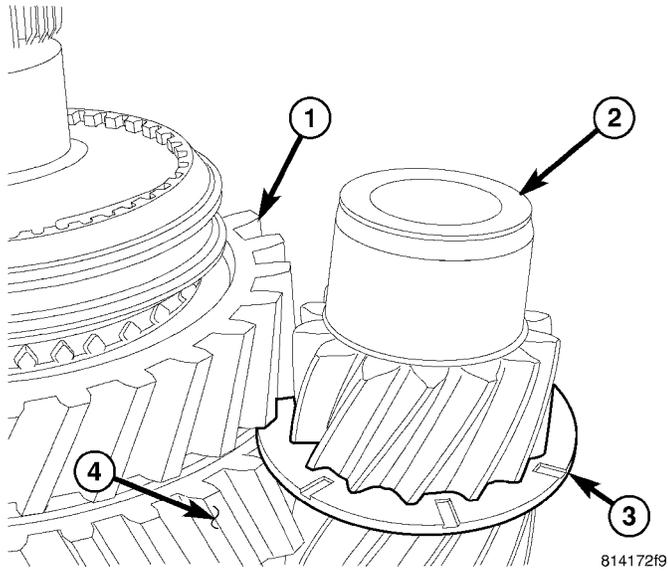


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Fig. 101 COUNTERSHAFT IN FIXTURE

- 1 - COUNTERSHAFT
- 2 - FIXTURE

MANUAL TRANSMISSION - NSG370 (Continued)

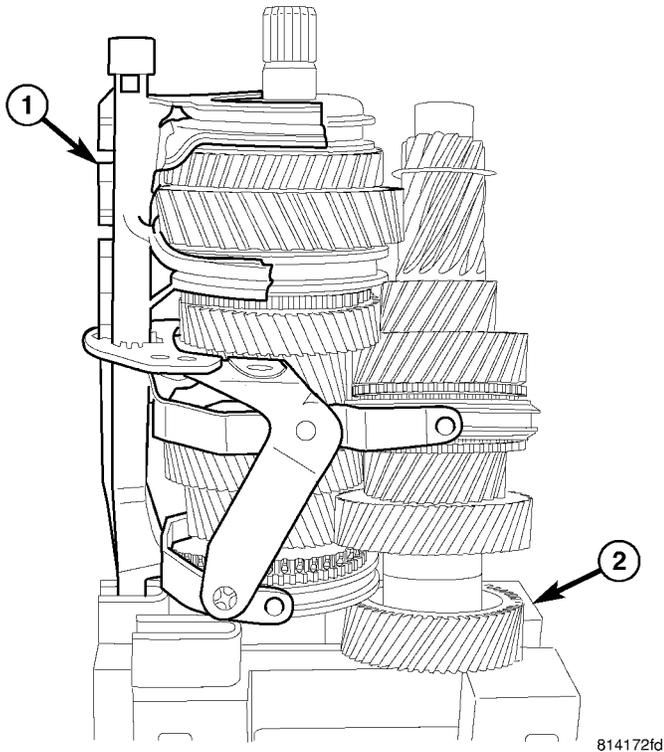


814172f9

Fig. 102 OIL SILINGER

- 1 - REVERSE GEAR
- 2 - COUNTERSHAFT
- 3 - OIL SLINGER
- 4 - FIRST GEAR

(3) Install oil slinger (3) on countershaft (2) between reverse (1) and first gear (4) (Fig. 102).

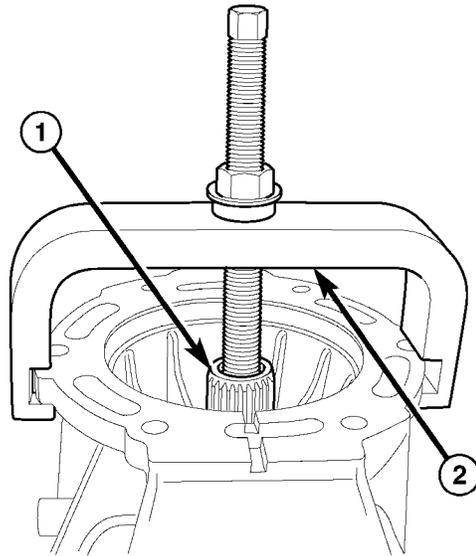


814172fd

Fig. 103 SHIFT RAILS/FORKS IN FIXTURE

- 1 - SHIFT RAILS/FORKS
- 2 - FIXTURE

(4) Install shift rails and forks (1) onto Build Fixture 9633 (2) and countershaft/mainshaft. (Fig. 103).

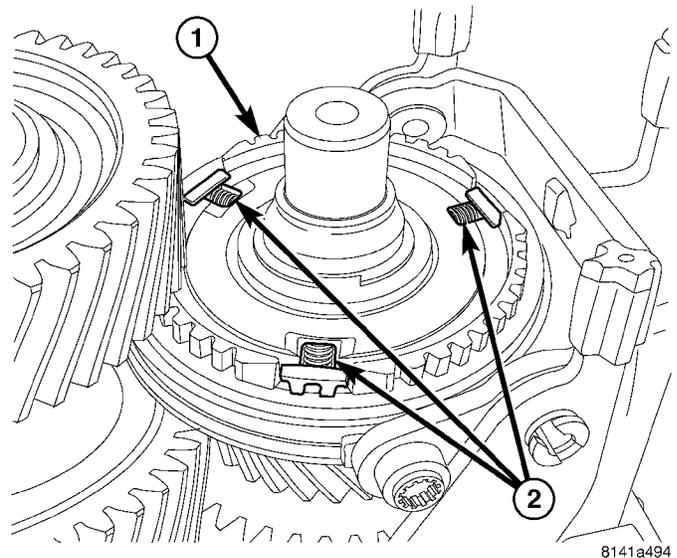


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Fig. 104 MAINSHAFT INSTALLER

- 1 - MAINSHAFT
- 2 - REMOVER/INSTALLER

(5) Install rear housing on mainshaft (1) (Fig. 104) with Installer 9636 (2).



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Fig. 105 5-6 SYNCRO DETENTS

- 1 - HUB
- 2 - DETENTS

(6) Remove rear housing with mainshaft, countershaft and shift rails from fixture. Set assembly on rear housing with shafts pointing up.

(7) Install 5-6 synchronizer hub (1) (Fig. 105) detents, springs, and balls (2).

MANUAL TRANSMISSION - NSG370 (Continued)

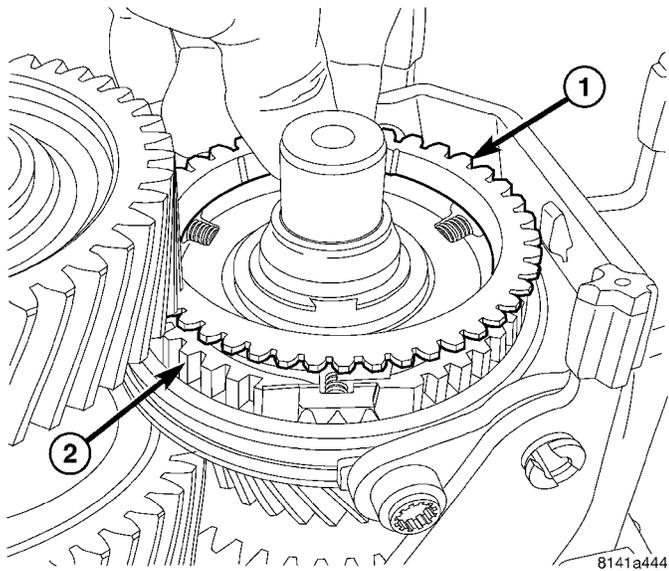


Fig. 106 FIFTH GEAR FRICTION RING

- 1 - FRICTION RING
- 2 - HUB

(8) Install fifth gear synchronizer friction ring (1) (Fig. 106) on 5-6 synchronizer hub (2).

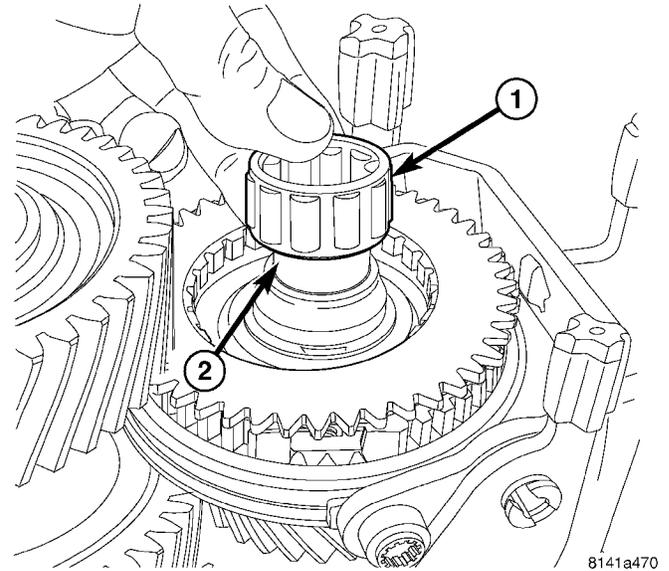


Fig. 108 INPUT SHAFT ROLLER BEARING

- 1 - ROLLER BEARING
- 2 - MAINSHAFT

(10) Install input shaft (Fig. 108) roller bearing (1) on mainshaft (2)..

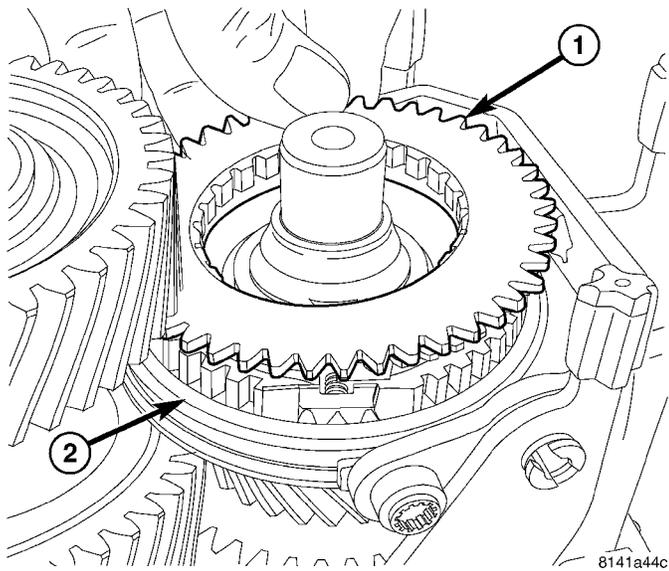


Fig. 107 FIFTH GEAR BLOCKER RING

- 1 - BLOCKER RING
- 2 - HUB

(9) Install fifth gear (Fig. 107) blocker ring (1) on 5-6 synchronizer hub (2). Then hold blocker ring and center synchronizer sleeve.

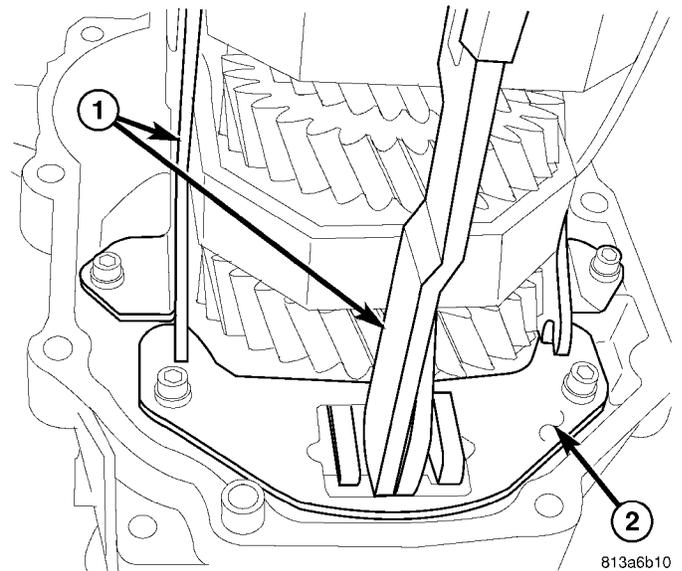
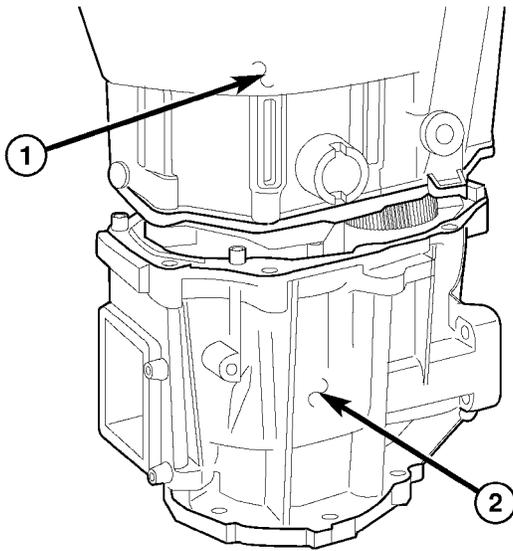


Fig. 109 SHIFT RAIL SUPPORT PLATE

- 1 - SHIFT RAILS
- 2 - SUPPORT PLATE

(11) Install shift rail (1) (Fig. 109) support plate (2) bolts and tighten to 8 N·m (71 in. lbs.).

MANUAL TRANSMISSION - NSG370 (Continued)



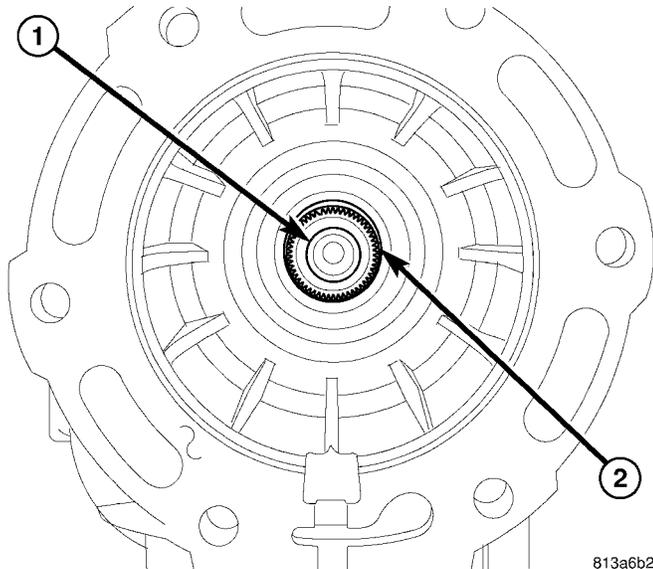
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Fig. 110 SPLIT HOUSING

- 1 - FRONT HOUSING
- 2 - REAR HOUSING

(12) Apply MOPAR® Gasket Maker to front housing.

(13) Install front housing (1) (Fig. 110) on rear housing (2) and tighten bolts to 28 N·m (21 ft. lbs.).

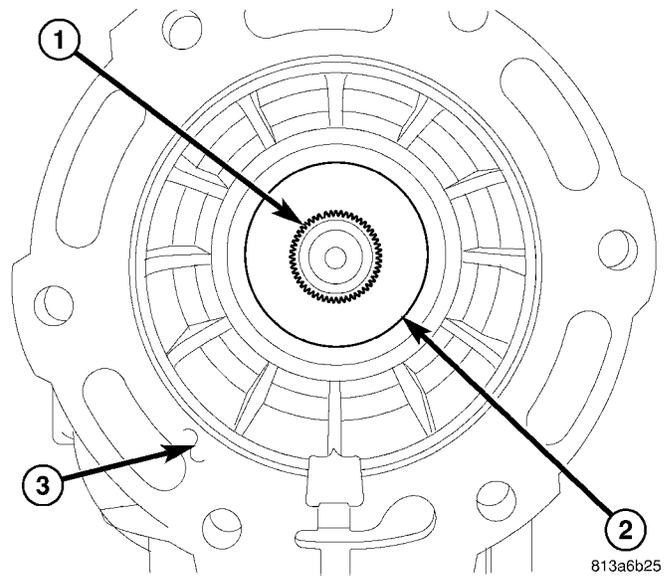


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Fig. 111 OUTPUT SHAFT SNAP RING

- 1 - OUTPUT SHAFT
- 2 - SNAP RING

(14) Install output shaft (1) (Fig. 111) snap ring (2) 4x4 only.

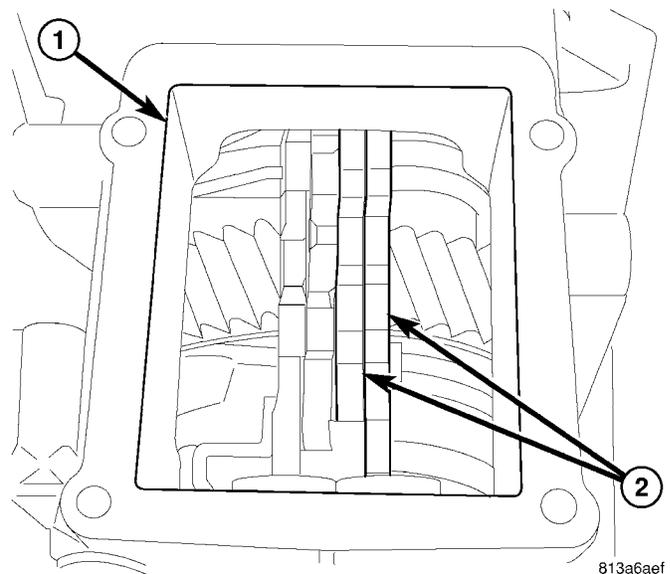


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Fig. 112 OUTPUT SHAFT SEAL

- 1 - OUTPUT SHAFT
- 2 - SEAL
- 3 - REAR HOUSING

(15) Install output shaft (1) (Fig. 112) seal (2) in rear housing with Installer 9638.



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Fig. 113 SHIFT TOWER OPENING

- 1 - SHIFT TOWER OPENING
- 2 - SHIFT RAILS

(16) Through the shift tower opening (1) (Fig. 113) move two shift rails (2) forward to lock the transmission in two gear.

MANUAL TRANSMISSION - NSG370 (Continued)

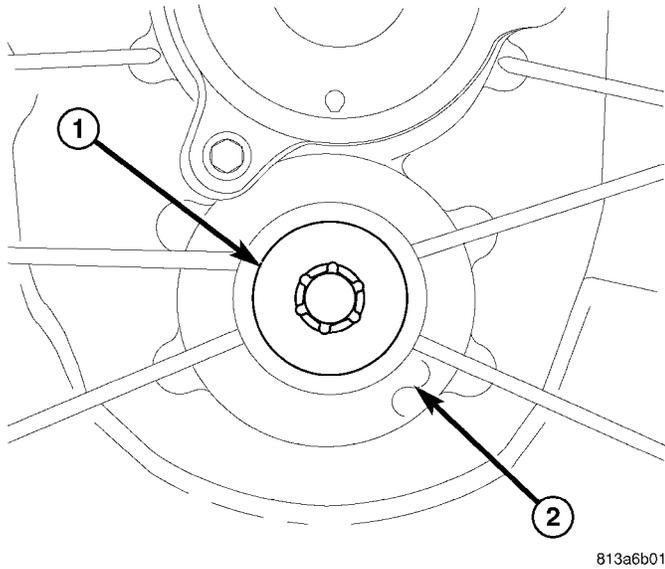


Fig. 114 COUNTERSHAFT BOLT

- 1 - COUNTERSHAFT BOLT
- 2 - FRONT HOUSING

(17) Install countershaft bolt (1) (Fig. 114) into the front housing (2) and tighten to 100 N·m (74 ft. lbs.).

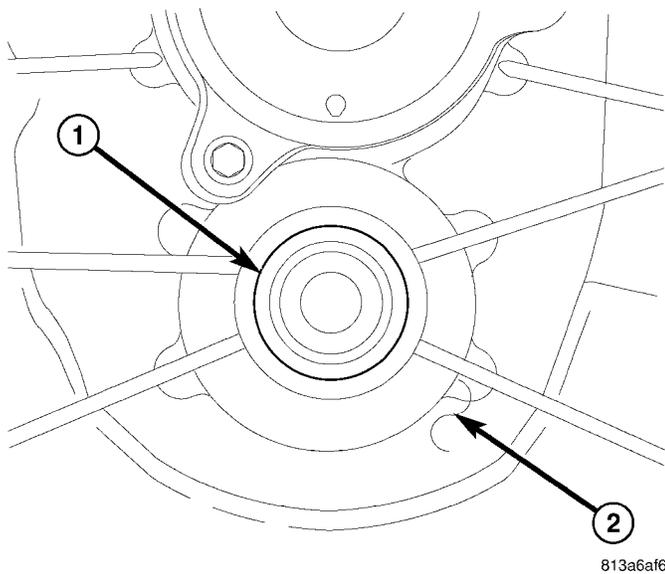


Fig. 115 COUNTERSHAFT PLUG

- 1 - COUNTERSHAFT PLUG
- 2 - FRONT HOUSING

(18) Install countershaft plug (1) (Fig. 115) in front housing (2) with Installer 7829-A and Handle C-4171.
 (19) Move shift rails to neutral.

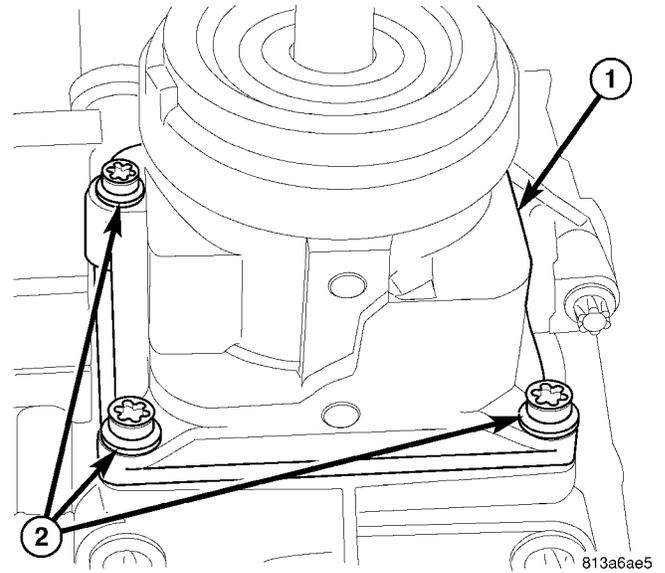


Fig. 116 SHIFT TOWER

- 1 - SHIFT TOWER
- 2 - BOLTS

(20) Apply MOPAR® Gasket Maker to shift tower.
 (21) Install shift tower (1) (Fig. 116) and tighten bolts (2) to 14 N·m (10 ft. lbs.).

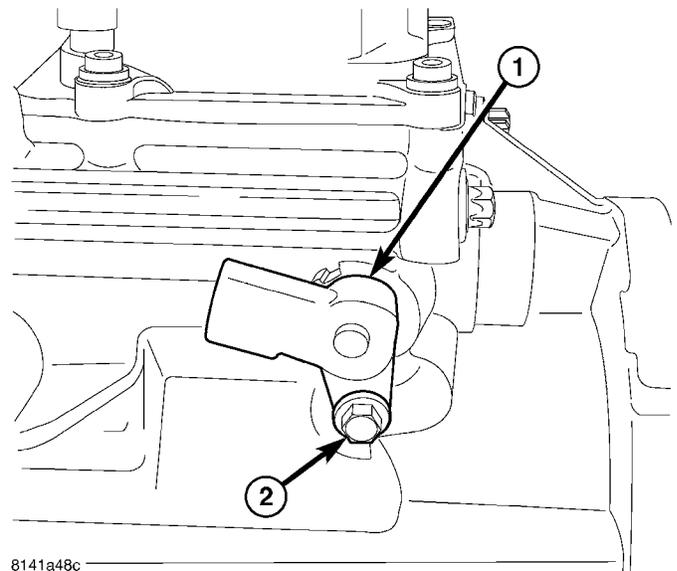


Fig. 117 BACK-UP LAMP SWITCH

- 1 - SWITCH
- 2 - BOLTS

(22) Install back up lamp switch (1) and bolt (2) (Fig. 117).

MANUAL TRANSMISSION - NSG370 (Continued)

INSTALLATION

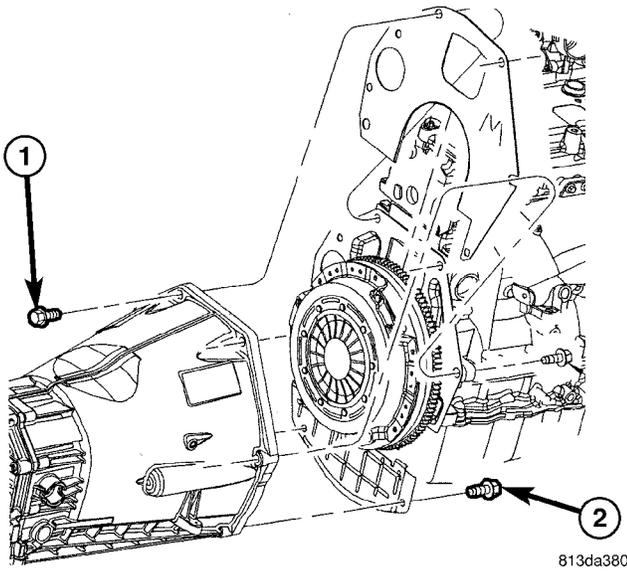


Fig. 118 2.4L ENGINE

- 1. TRANSMISSION BOLT
- 2. DUST SHIELD BOLT

(1) Install transmission on engine.
 (2) On 2.4L engine tighten bolts (1) to 75 N·m (55 ft. lbs.). Install lower dust shield and tighten bolts (2) to 34 N·m (25 ft. lbs.) (Fig. 118).

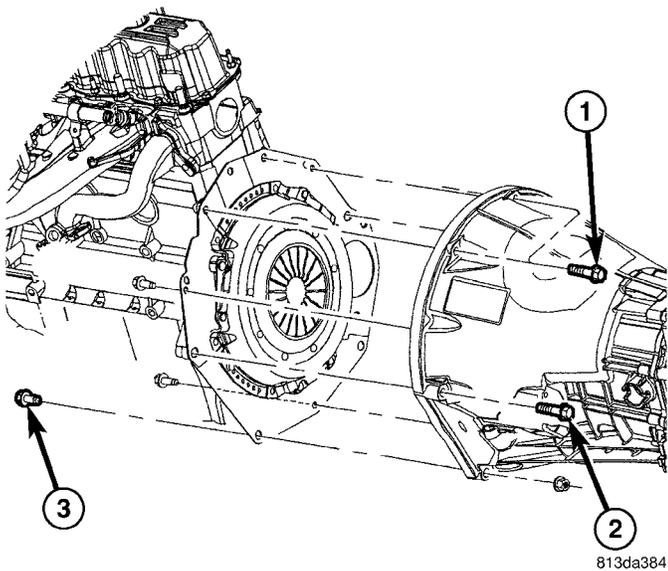


Fig. 119 4.0L ENGINE

- 1. UPPER TRANSMISSION BOLTS
- 2. SIDE DUST COVER BOLTS
- 3. LOWER DUST COVER BOLTS

(3) On 4.0L engine tighten bolts (1) to 37 N·m (27 ft. lbs.). Install side and lower dust shield and tighten bolts (2) (3) to 58 N·m (43 ft. lbs.) (Fig. 119).

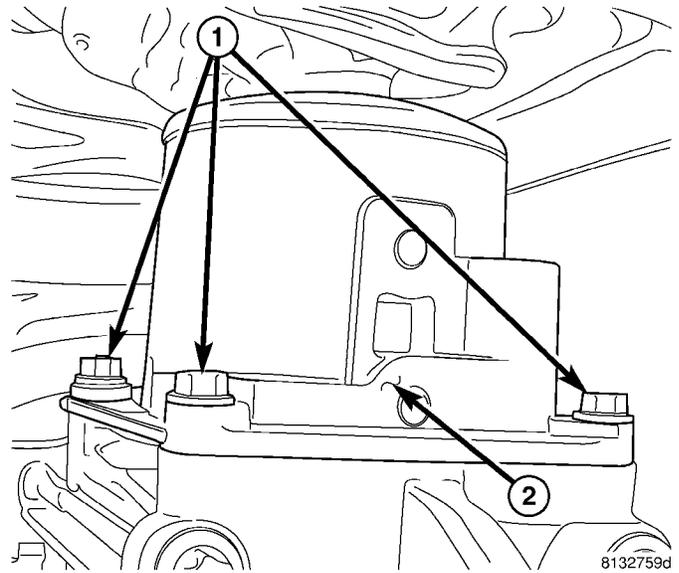


Fig. 120 SHIFT LEVER

- 1. BOLTS
- 2. SHIFT TOWER

(4) Clean shift tower and mating surface then apply Mopar® Gasket Maker to shift tower.

(5) Install shift tower (2) and tighten bolts (1) to 10 N·m (7 ft. lbs.) (Fig. 120).

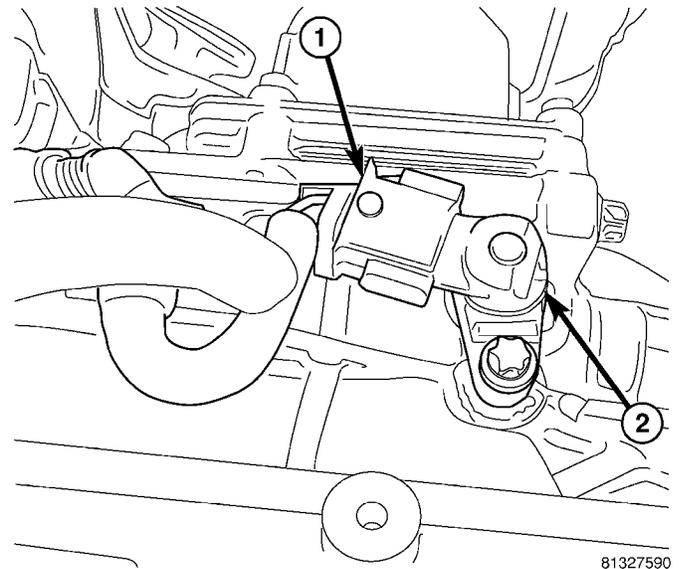
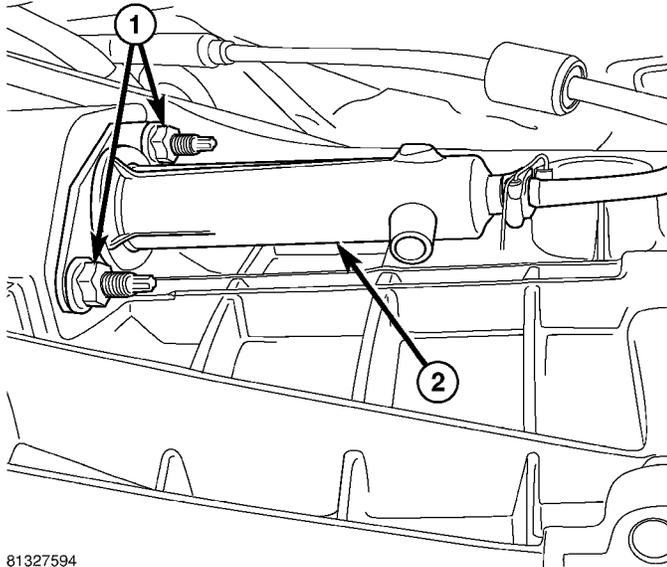


Fig. 121 BACKUP LAMP SWITCH

- 1. CONNECTOR
- 2. BACKUP LAMP SWITCH

(6) Install backup lamp (2) wiring connector (1) (Fig. 121).

MANUAL TRANSMISSION - NSG370 (Continued)

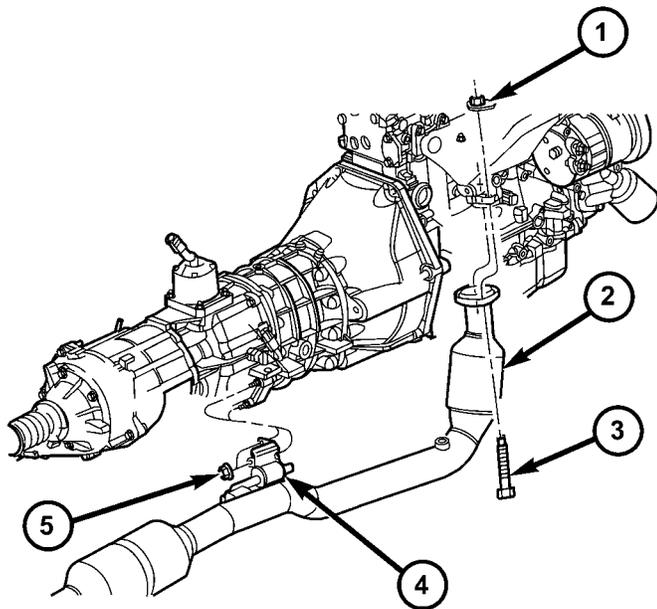


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Fig. 122 CLUTCH SLAVE CYLINDER

- 1. BOLTS
- 2. SLAVE CYLINDER

(7) Install clutch slave cylinder (2) and mounting nuts (1) (Fig. 122).



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Fig. 123 2.4L CATALYST ASSEMBLY - 4x4

- 1- FLANGED NUT
- 2- CATALYST ASSEMBLY
- 3- BOLT
- 4- HANGER
- 5- NUT

(8) Install catalyst assembly (2) on 2.4L engine (Fig. 123).

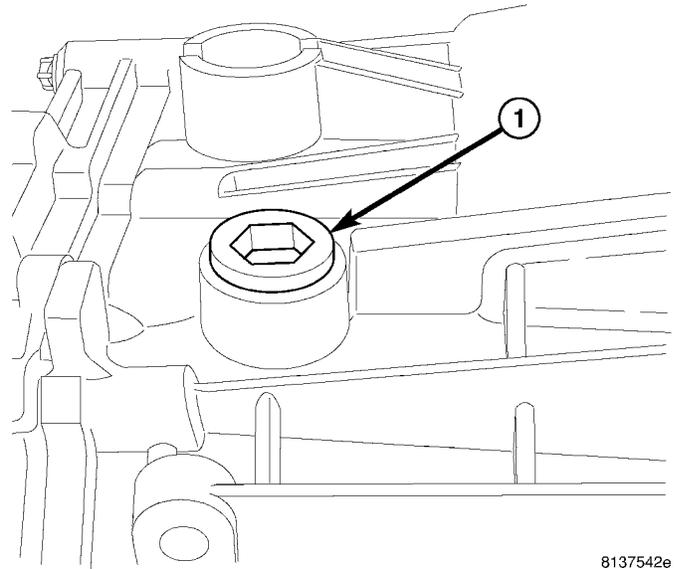
(9) Install transmission crossmember and tighten bolts to 47 N·m (35 ft. lbs.). Install transmission mount bolts and tighten to 47 N·m (35 ft. lbs.).

(10) Install transfer case, if equipped.

(11) Install transfer case shift linkage.

(12) Install transfer case wiring connector and vent hose.

(13) Install propeller shaft/shafts with reference marks aligned.



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Fig. 124 FILL PLUG

- 1. FILL PLUG

(14) Remove fill plug (1) and fill transmission with lubricant (Fig. 124).

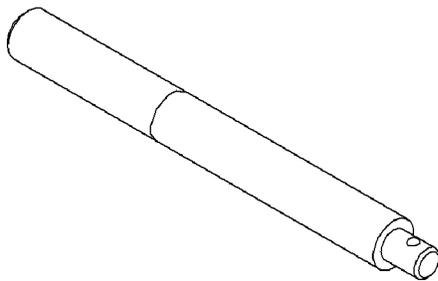
MANUAL TRANSMISSION - NSG370 (Continued)

SPECIFICATIONS - NSG370

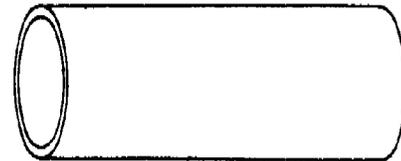
TORQUE SPECIFICATIONS

DESCRIPTION	N-m	Ft. Lbs.	In. Lbs.
Drain Plug	30	22	-
Fill Plug	30	22	-
Shift Tower Bolts	14	10	-
Housing Bolts	28	20	-
Transmission Mounting Bolts	38	28	-
Input Shaft Retainer Bolts	9	-	80
Bearing Retainer Bolts	10	-	88
Shift Rail Support Bolts	8	-	71
Idler Gear Shaft Bolt	20	15	-
Countershaft Bolt	100	74	-

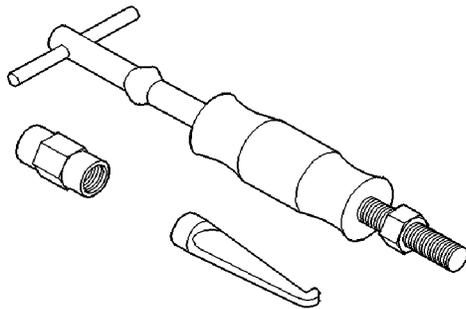
SPECIAL TOOLS



HANDLE C-4171

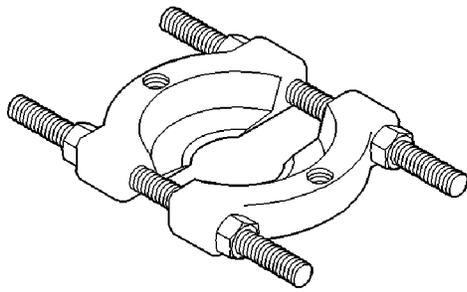


HUB INSTALLER W-262

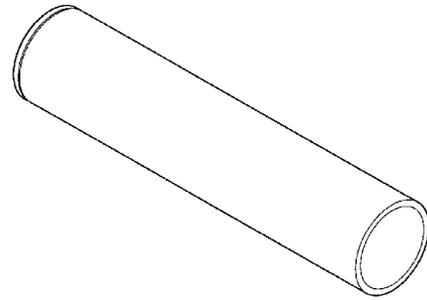


SLIDE HAMMER C-637

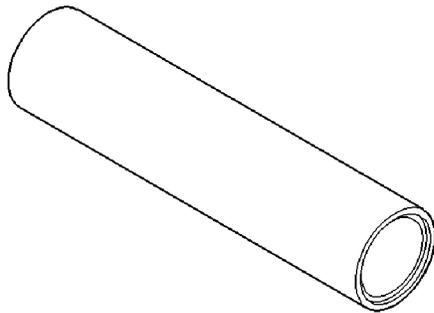
MANUAL TRANSMISSION - NSG370 (Continued)



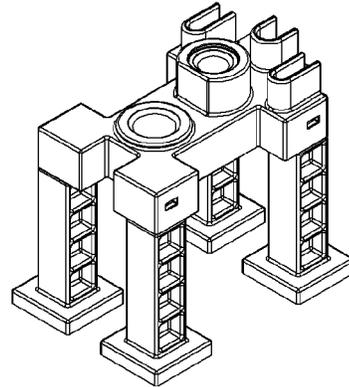
BEARING SPLITTER 1130



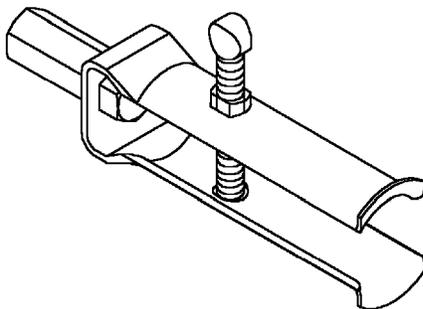
HUB INSTALLER 8228



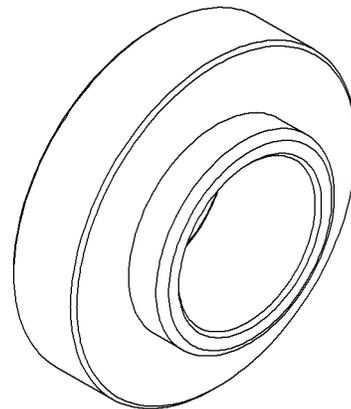
BEARING INSTALLER 6448A



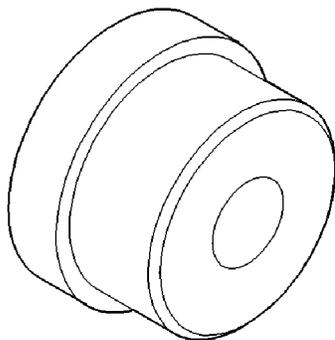
BUILD FIXTURE 9633



BEARING REMOVER 7794-A

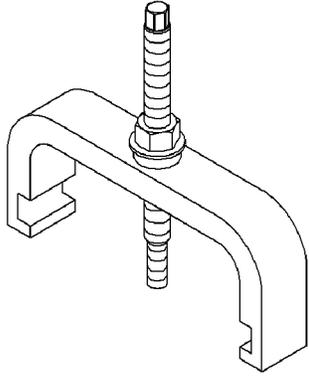


SEAL INSTALLER 9635

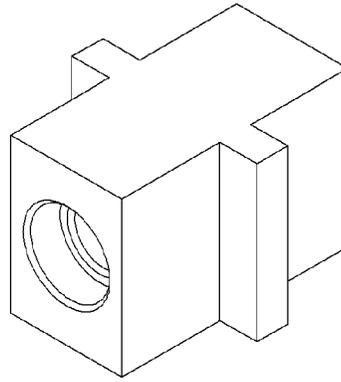


PLUG INSTALLER 7829-A

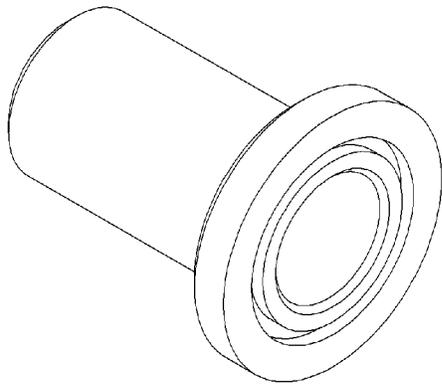
MANUAL TRANSMISSION - NSG370 (Continued)



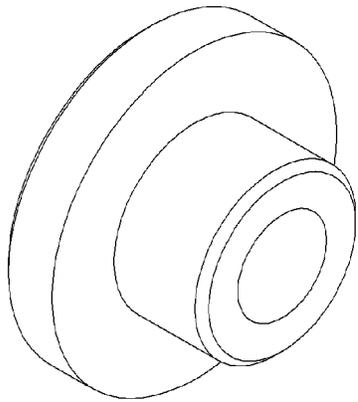
SHAFT REMOVER/INSTALLER 9636



MAINSHAFT BUILD FIXTURE 9648



SEAL INSTALLER 9638



BEARING INSTALLER 9643