2007 MANUAL TRANSMISSION

NSG370 - Diagnosis & Overhaul - Nitro

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 under filled or over filled 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, synchronizers, shift rails, forks and bearings. The overheating caused by a lubricant problem, can also lead to gear and bearing damage.

STANDARD PROCEDURE

STANDARD PROCEDURE-DRAIN & FILL

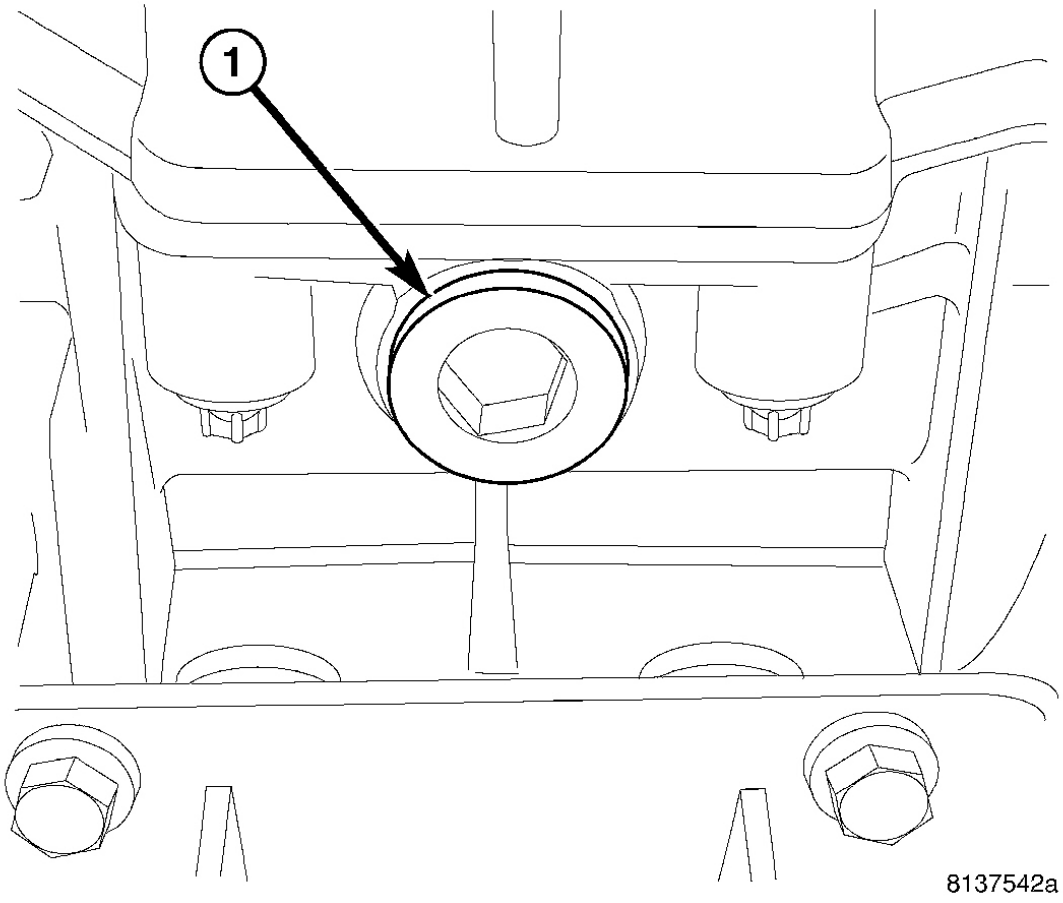

Fig. 1: Drain Plug
Courtesy of CHRYSLER LLC

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

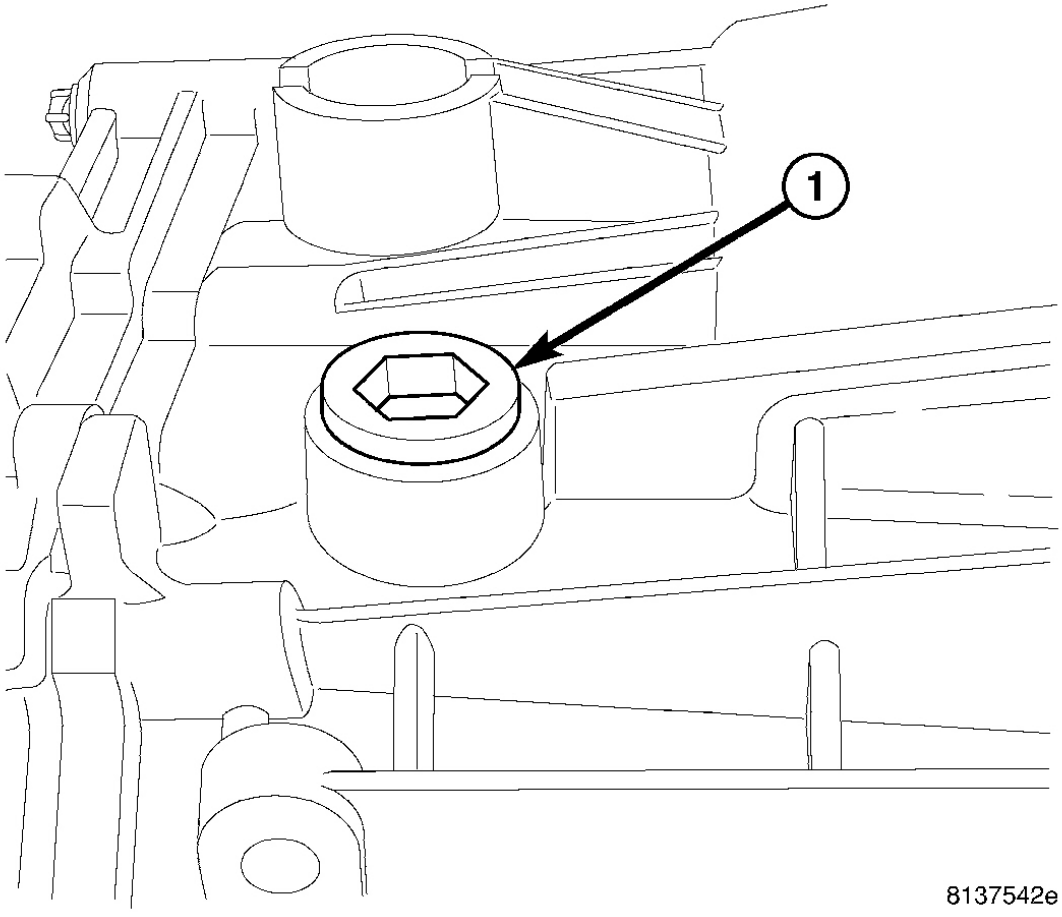

Fig. 2: Fill Plug
Courtesy of CHRYSLER LLC

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

REMOVAL

NSG370

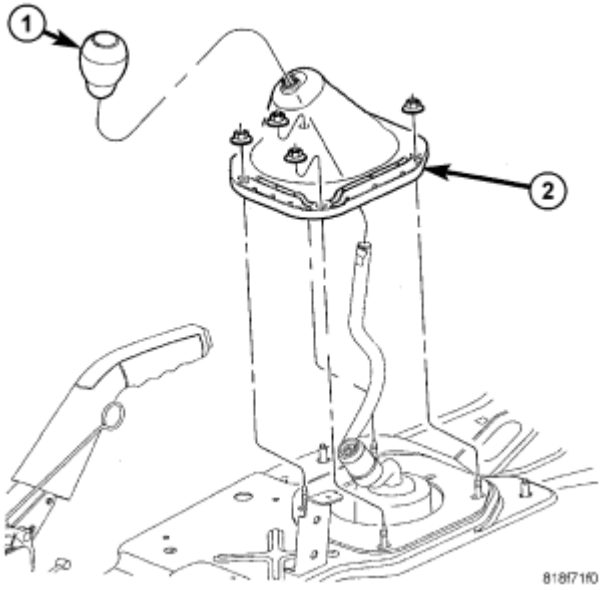

Fig. 3: Identifying Shift Knob & Boot
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove counsel, shift knob (1) and boot (2).

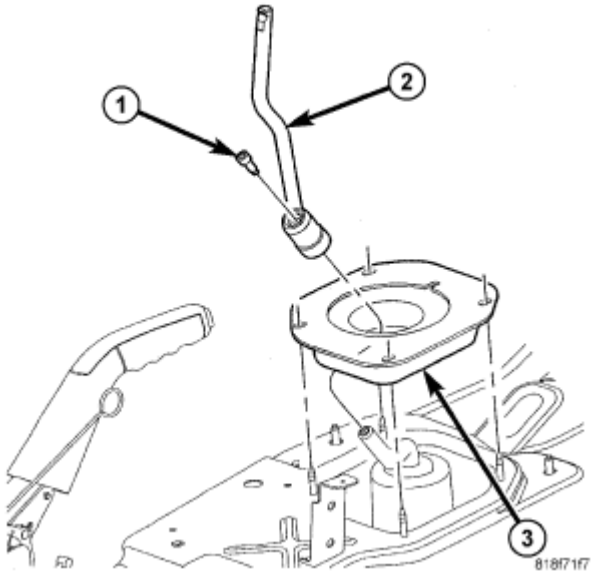

Fig. 4: Removing/Installing Shift Lever Screw, Lever And Inner Boot
Courtesy of CHRYSLER LLC

3. Remove shift lever screw (1), lever (2) and inner boot (3).

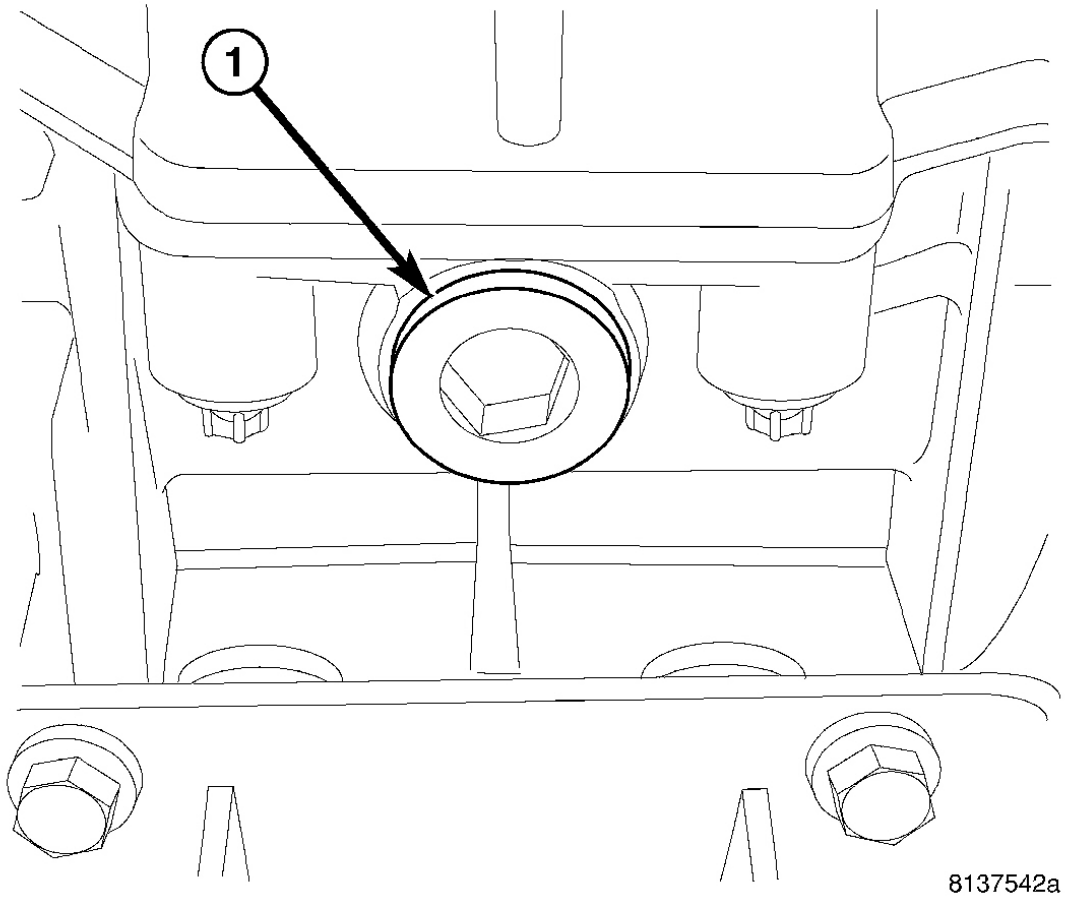

Fig. 5: Drain Plug
Courtesy of CHRYSLER LLC

4. With vehicle in neutral, position vehicle on hoist.
5. Remove drain plug (1) and drain fluid.

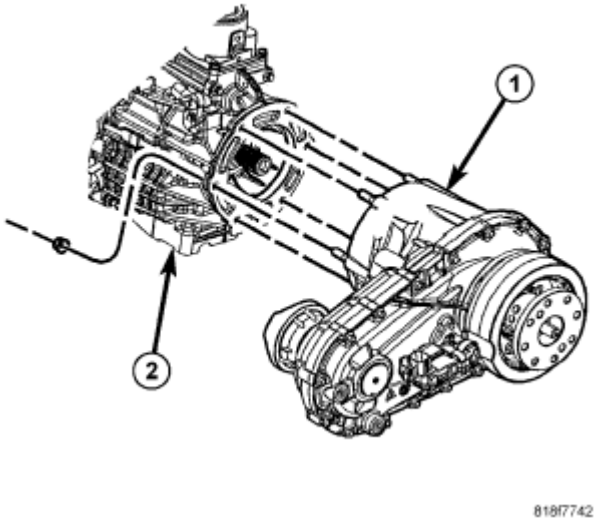

Fig. 6: Identifying Transfer Case & Transmission
Courtesy of CHRYSLER LLC

6. Mark installation reference marks on propeller shaft/shafts and remove shafts.
7. Remove transfer case shift cable, wiring connector and vent hose, if equipped.
8. Remove transfer case (1) from transmission (2), if equipped.

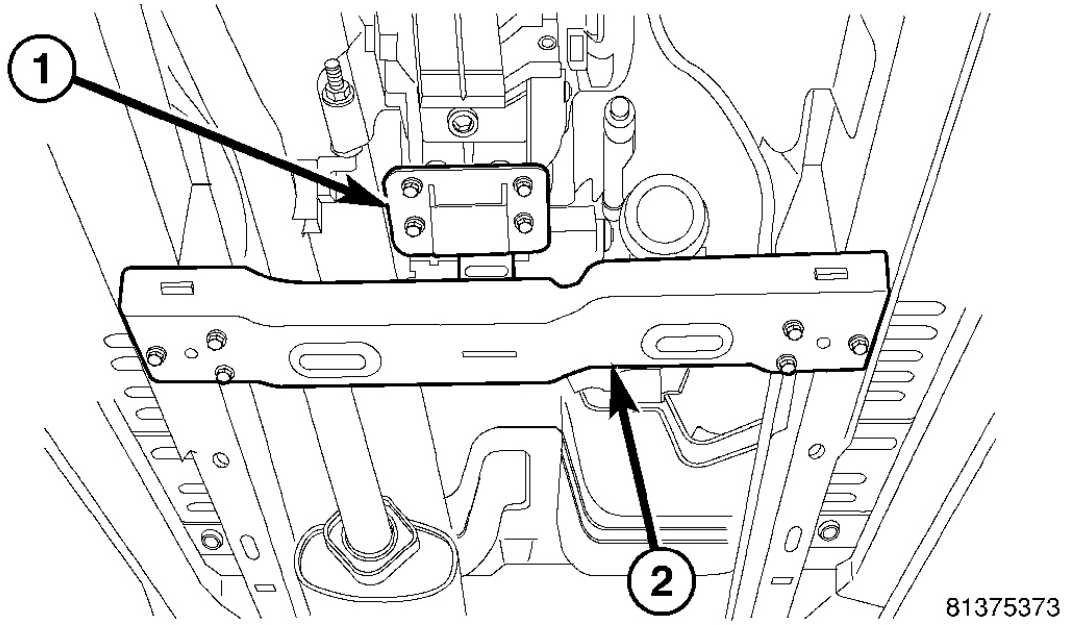

Fig. 7: Transmission Mount & Crossmember

Courtesy of CHRYSLER LLC

9. Support transmission with jack.
10. Remove transmission mount (1) bolts and crossmember (2) bolts. Remove transmission mount (1) with crossmember (2).

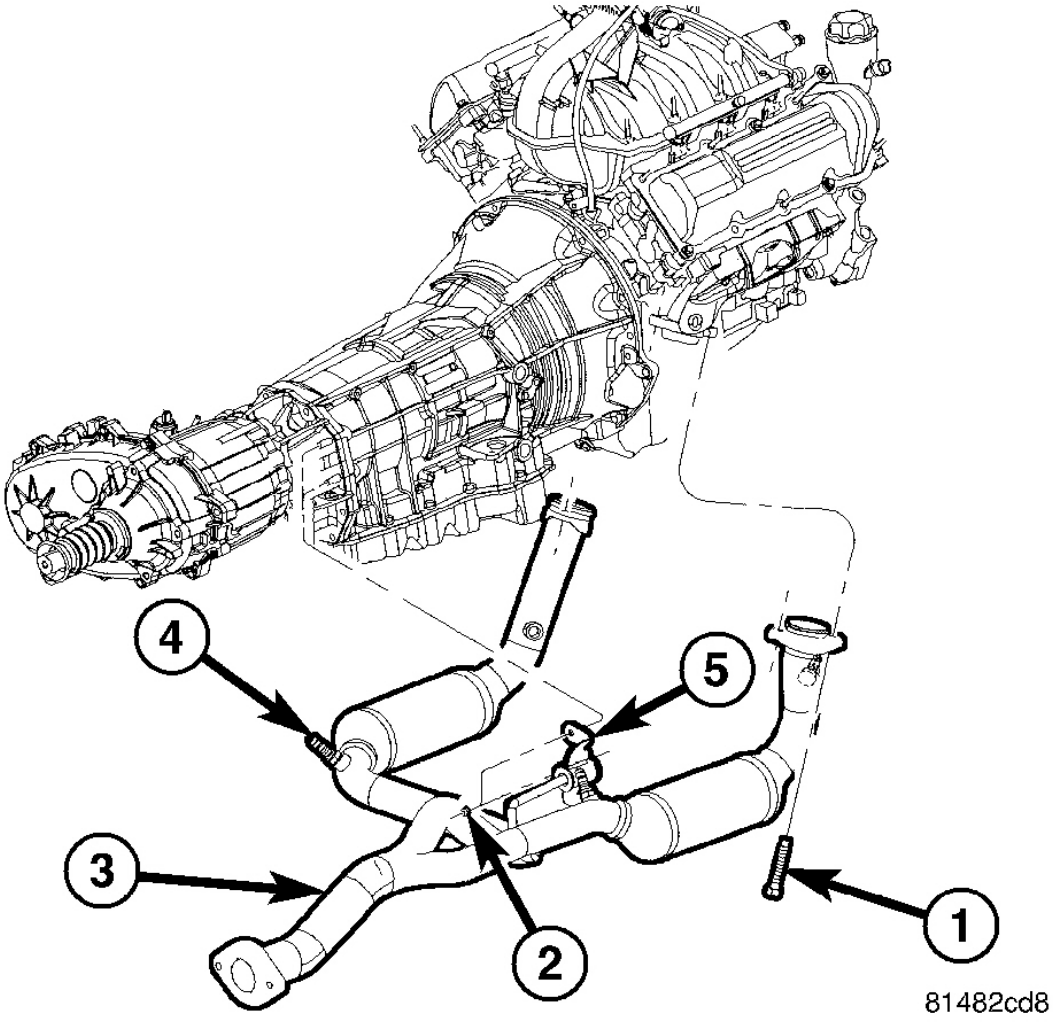

Fig. 8: 3.7L Catalytic Converter
Courtesy of CHRYSLER LLC

11. Vehicles with 3.7L engine, remove exhaust pipe with converters (3).

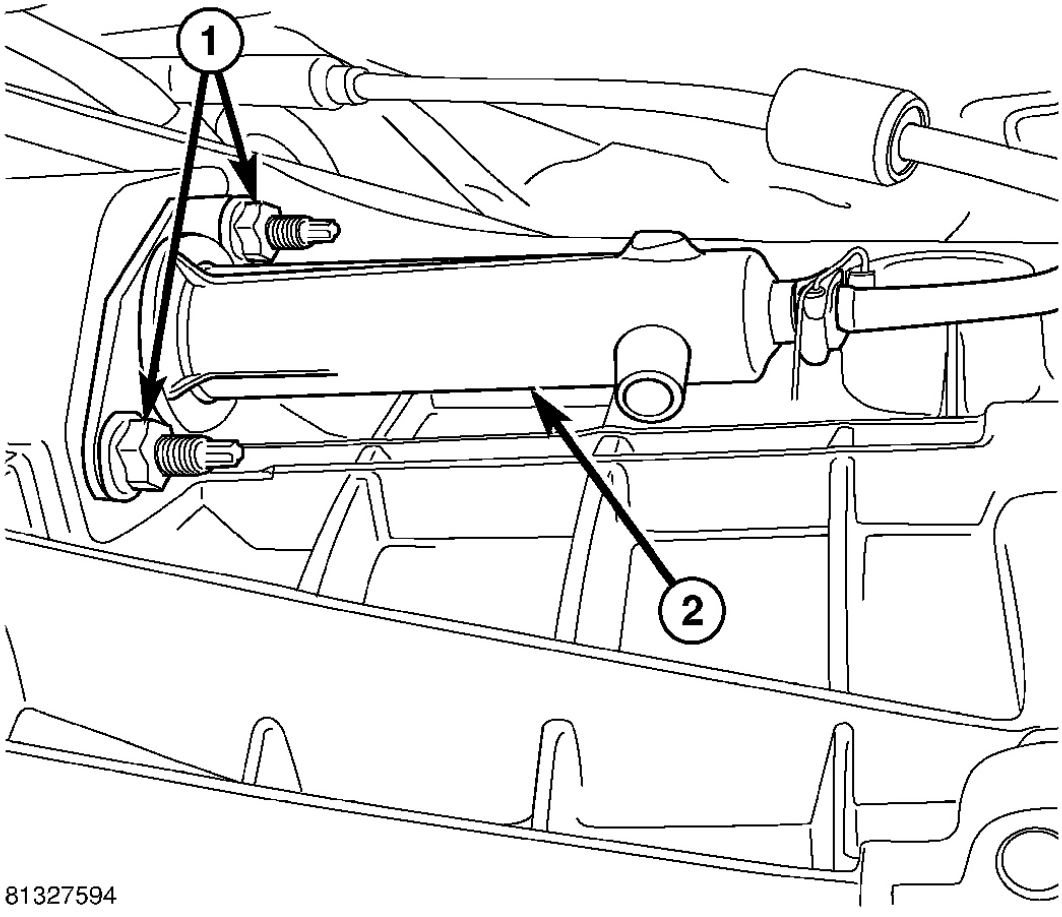

Fig. 9: Identifying Clutch Slave Cylinder Nuts & Cylinder
Courtesy of CHRYSLER LLC

12. Remove clutch slave cylinder nuts (1) and remove cylinder (2).

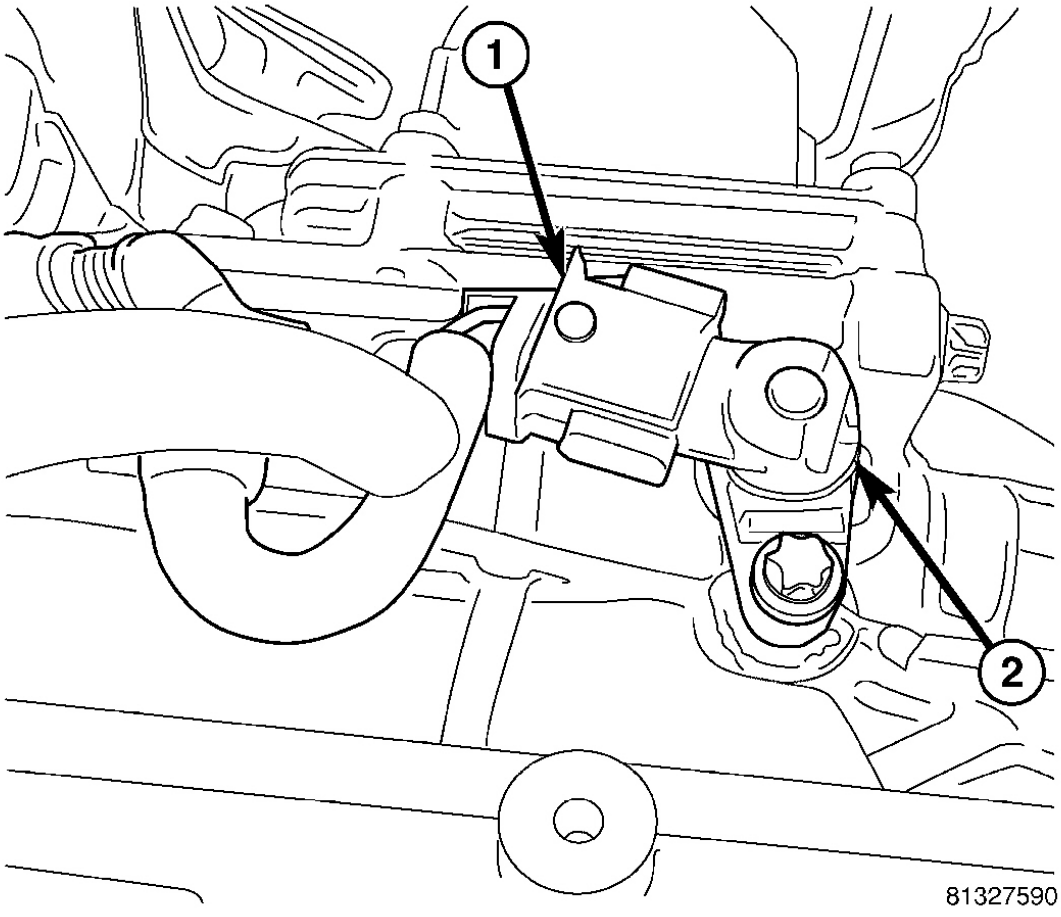

Fig. 10: Backup Lamp Switch & Wiring Connector
Courtesy of CHRYSLER LLC

13. Remove backup lamp switch (1) wiring connector (2).

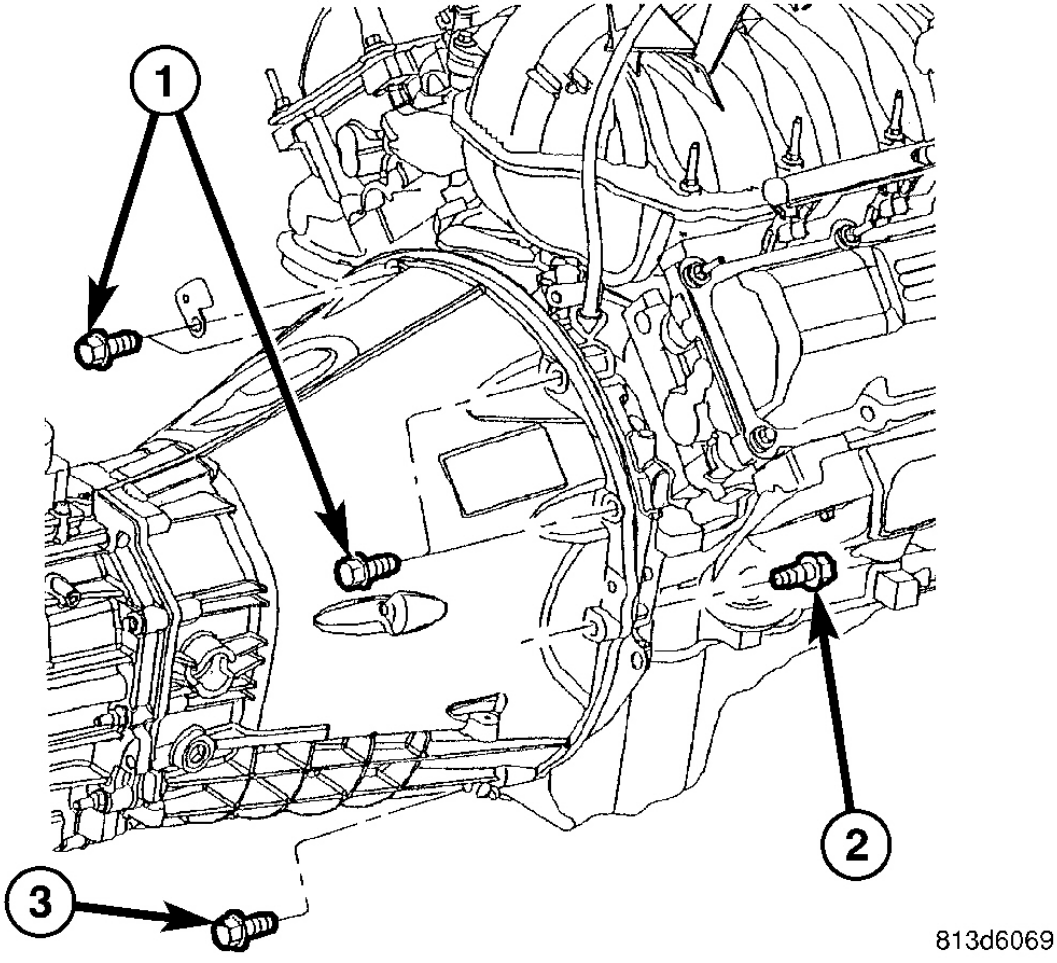

Fig. 11: Identifying Transmission Bolts (3.7L Engine)
Courtesy of CHRYSLER LLC

14. Remove starter bolts and remove starter.
15. Remove transmission bolts (1,2,3) on 3.7L engine and remove transmission.

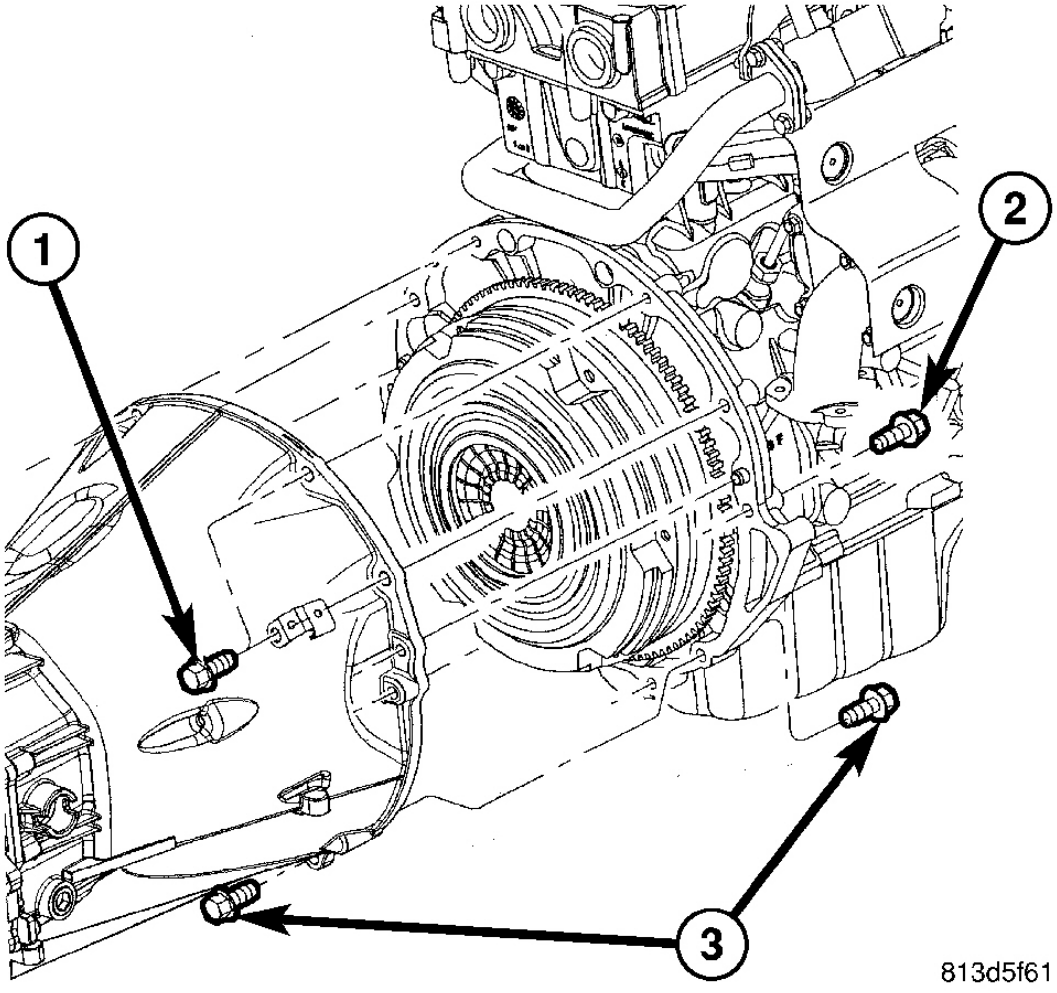

Fig. 12: Identifying Transmission Bolts (2.8L Diesel)
Courtesy of CHRYSLER LLC

16. Remove transmission bolts (1,2,3) on 2.8L diesel engine and remove transmission.

DISASSEMBLY

MANUAL TRANSMISSION - NSG370

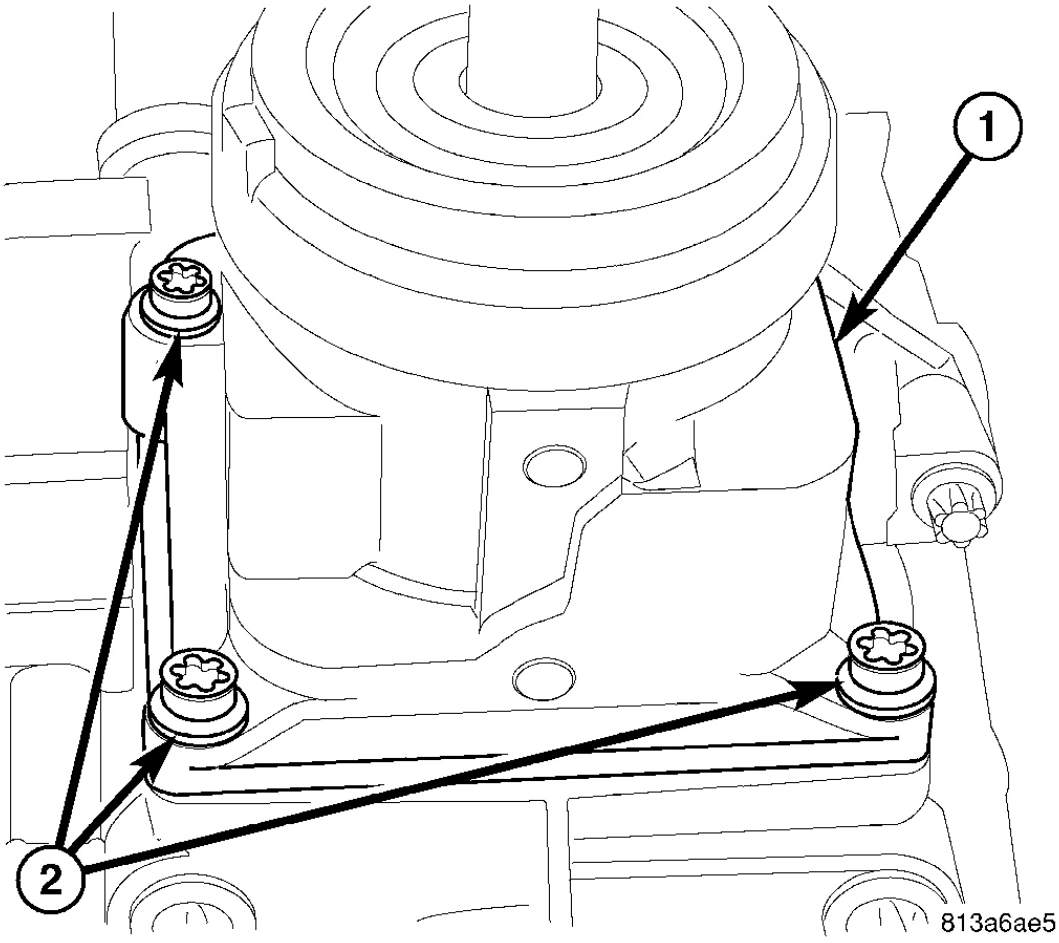

Fig. 13: Identifying Shift Tower & Bolts
Courtesy of CHRYSLER LLC

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

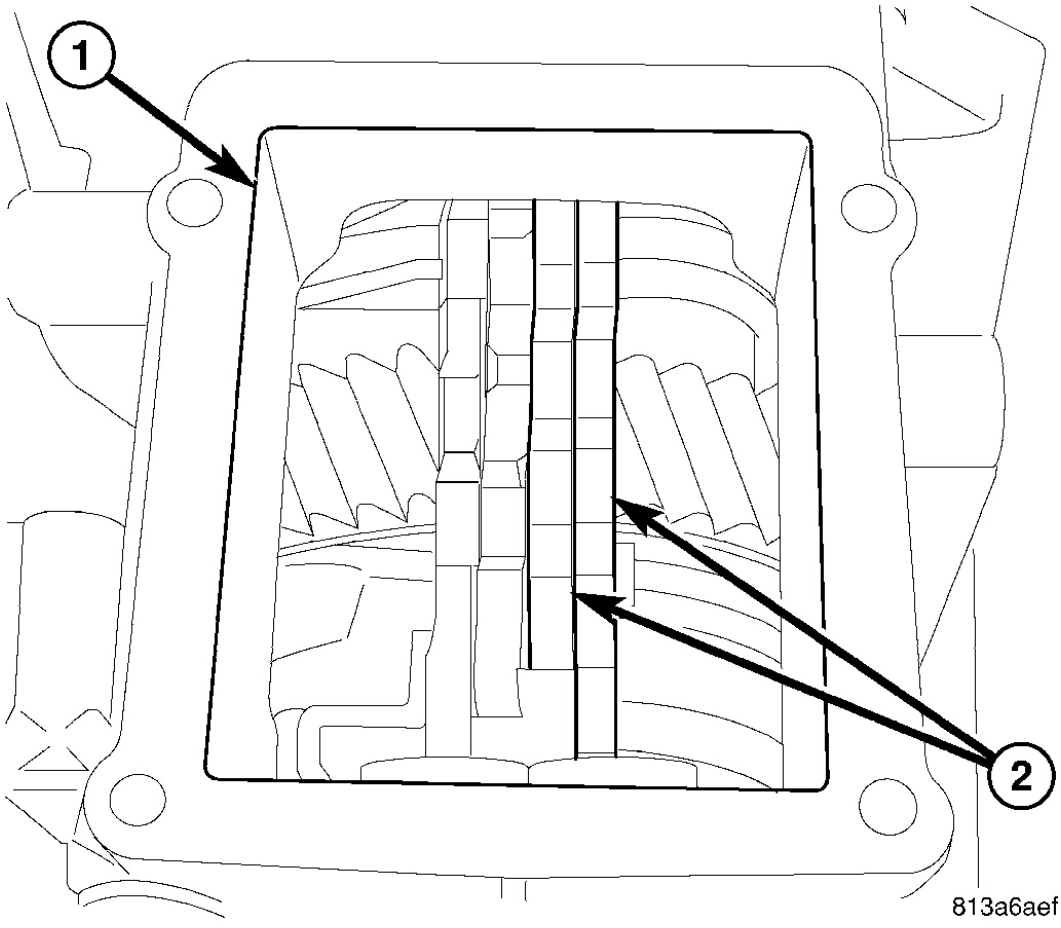

Fig. 14: Identifying Shift Tower Opening & Shift Two Shift Rails
Courtesy of CHRYSLER LLC

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

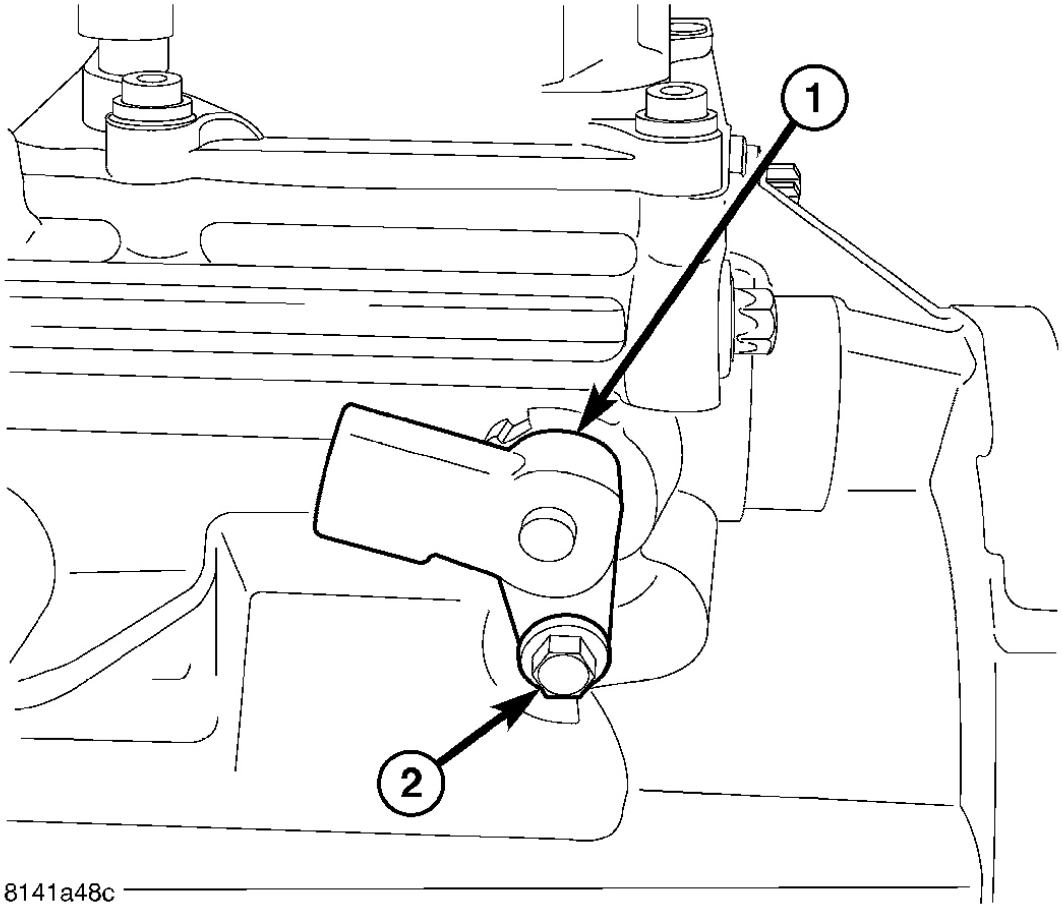

Fig. 15: Identifying Back-Up Lamp Switch & Bolt
Courtesy of CHRYSLER LLC

3. Remove back-up lamp switch (1) bolt (2) and remove switch.

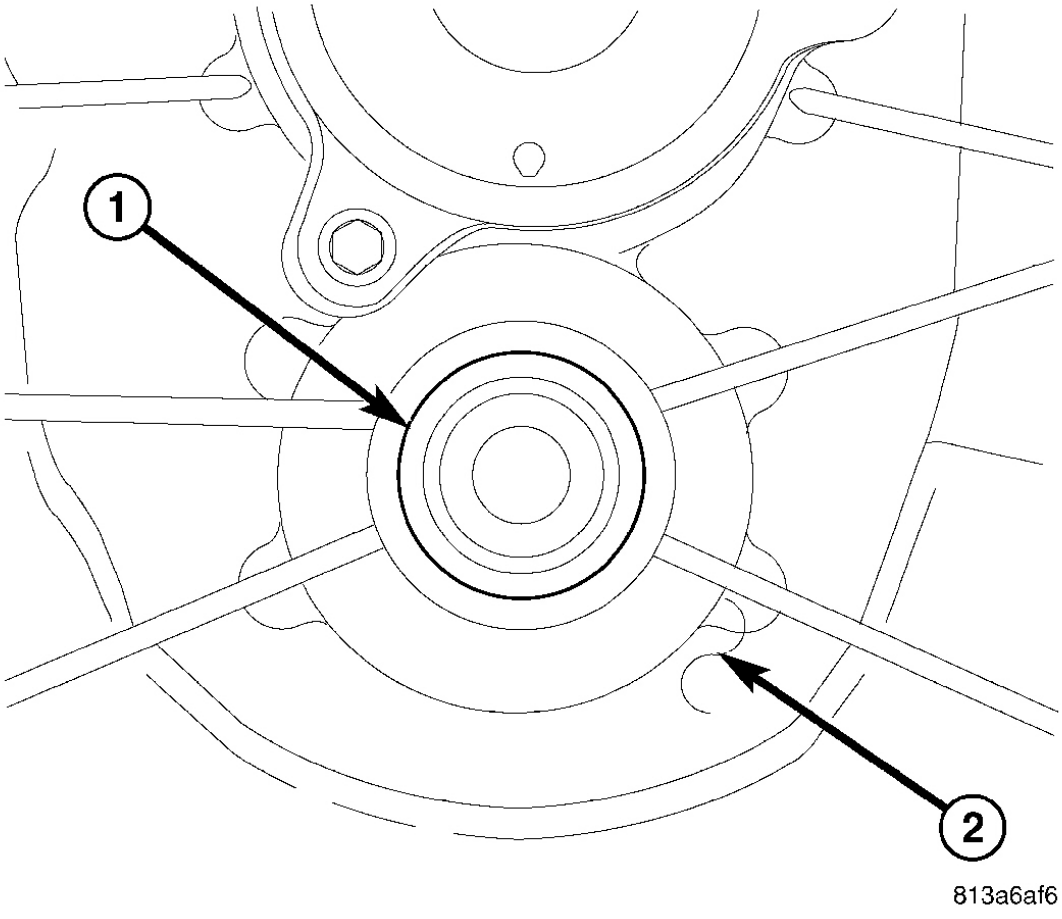

Fig. 16: Identifying Countershaft Plug & Front Housing
Courtesy of CHRYSLER LLC

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

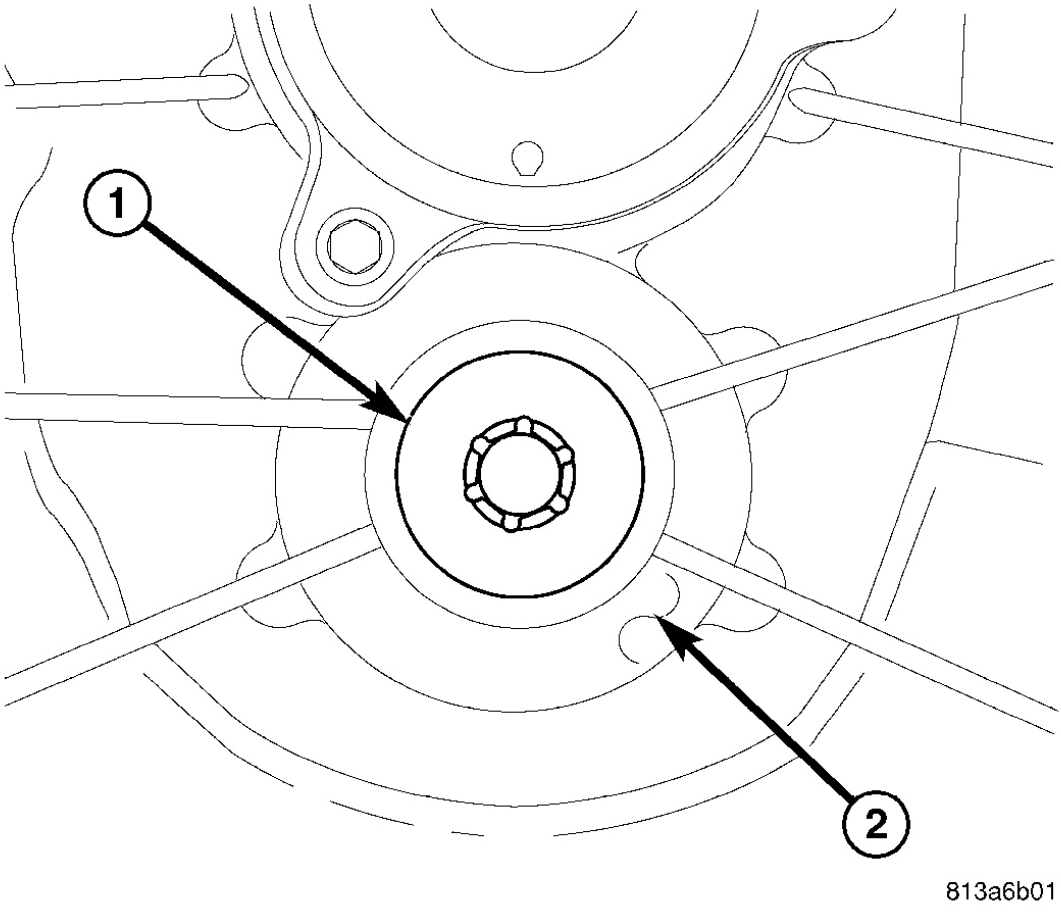

Fig. 17: Identifying Countershaft Bolt & Front Housing
Courtesy of CHRYSLER LLC

5. Remove countershaft bolt (1) from the front housing (2).

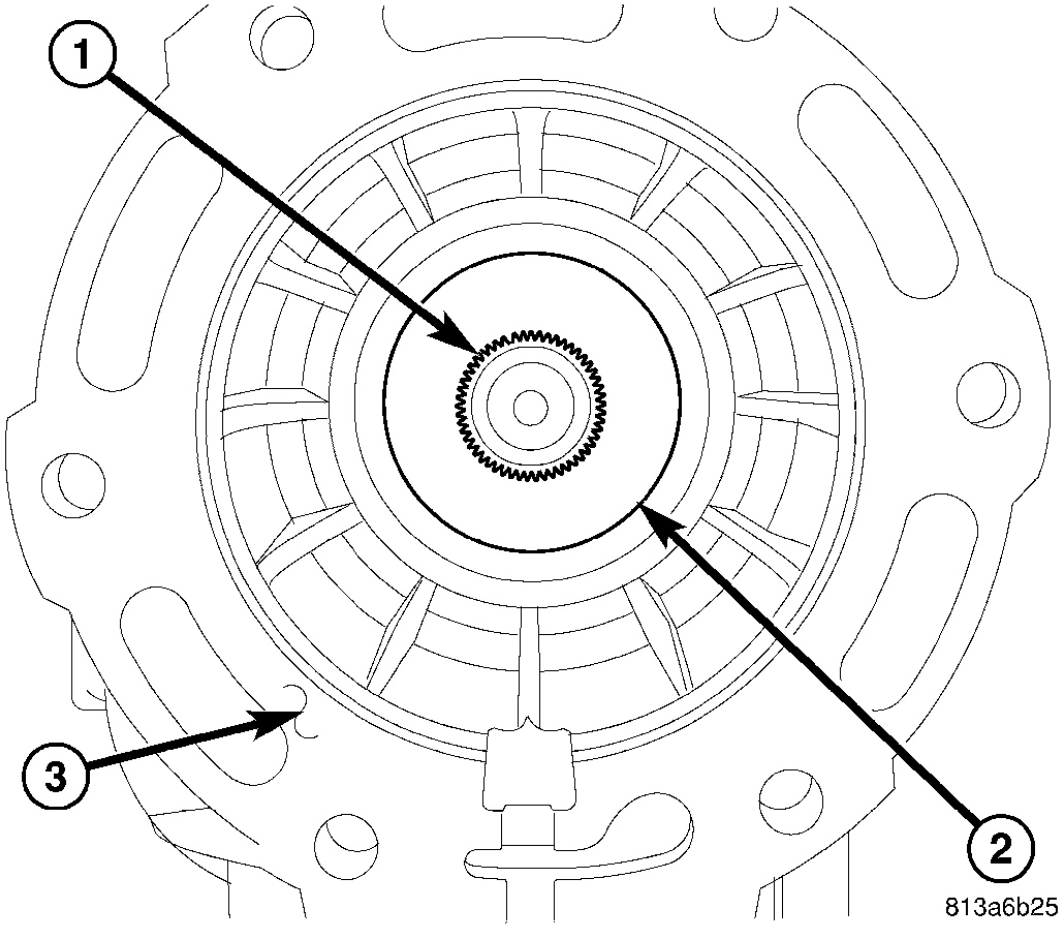

Fig. 18: Identifying Output Shaft, Seal & Rear Housing
Courtesy of CHRYSLER LLC

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

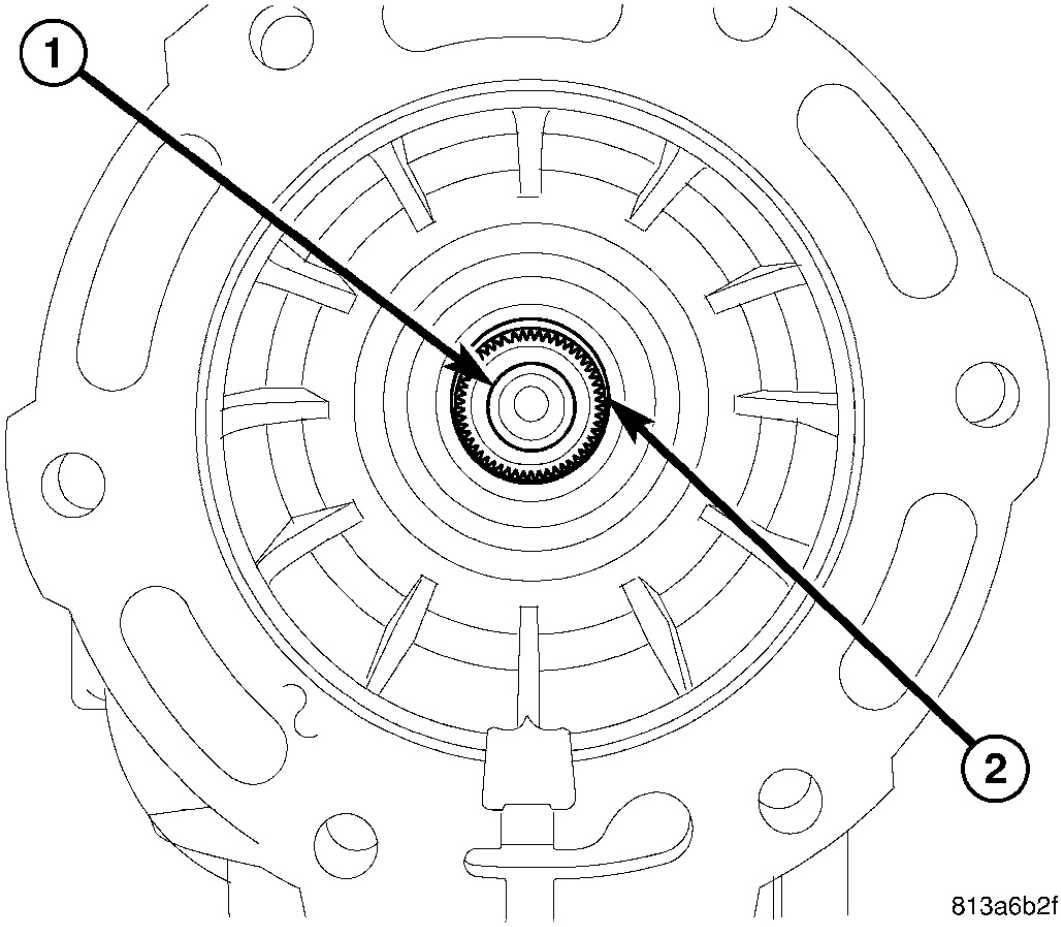

Fig. 19: Identifying Output Shaft & Snap Ring
Courtesy of CHRYSLER LLC

7. Remove output shaft (1) snap ring (2) 4x4 only.

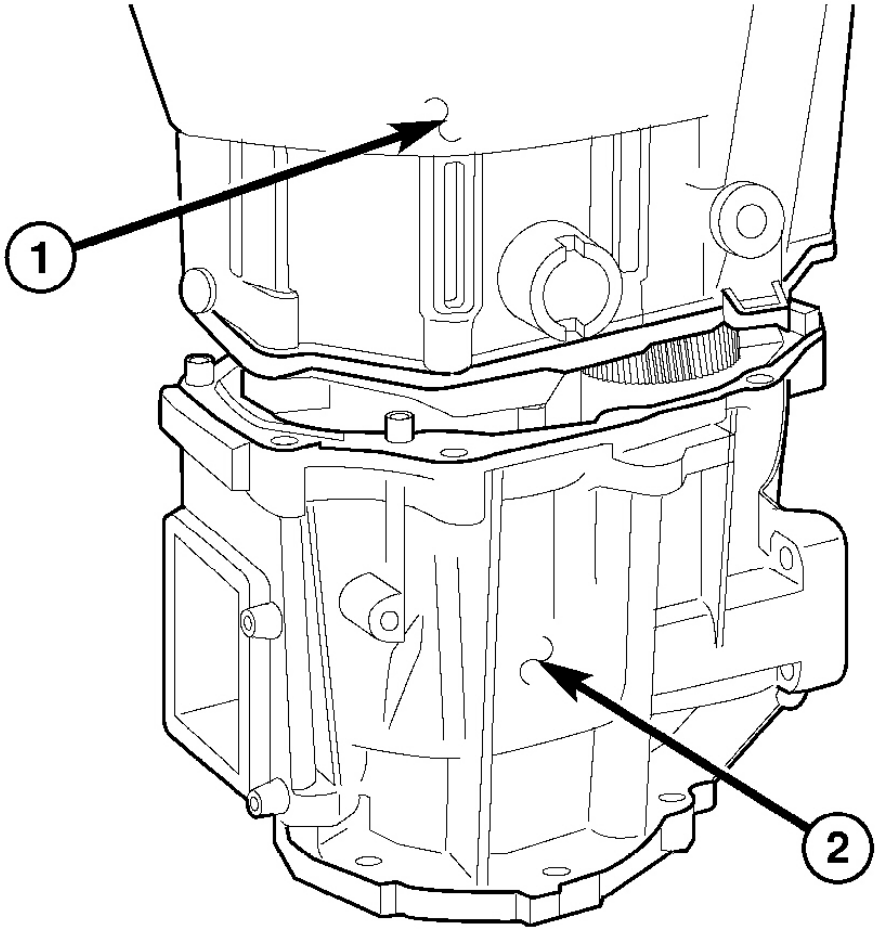

Fig. 20: Identifying Front Housing & Rear Housing
Courtesy of CHRYSLER LLC

8. Stand transmission on the rear housing and remove the housing bolts.
9. Remove front housing (1) from the rear housing (2).

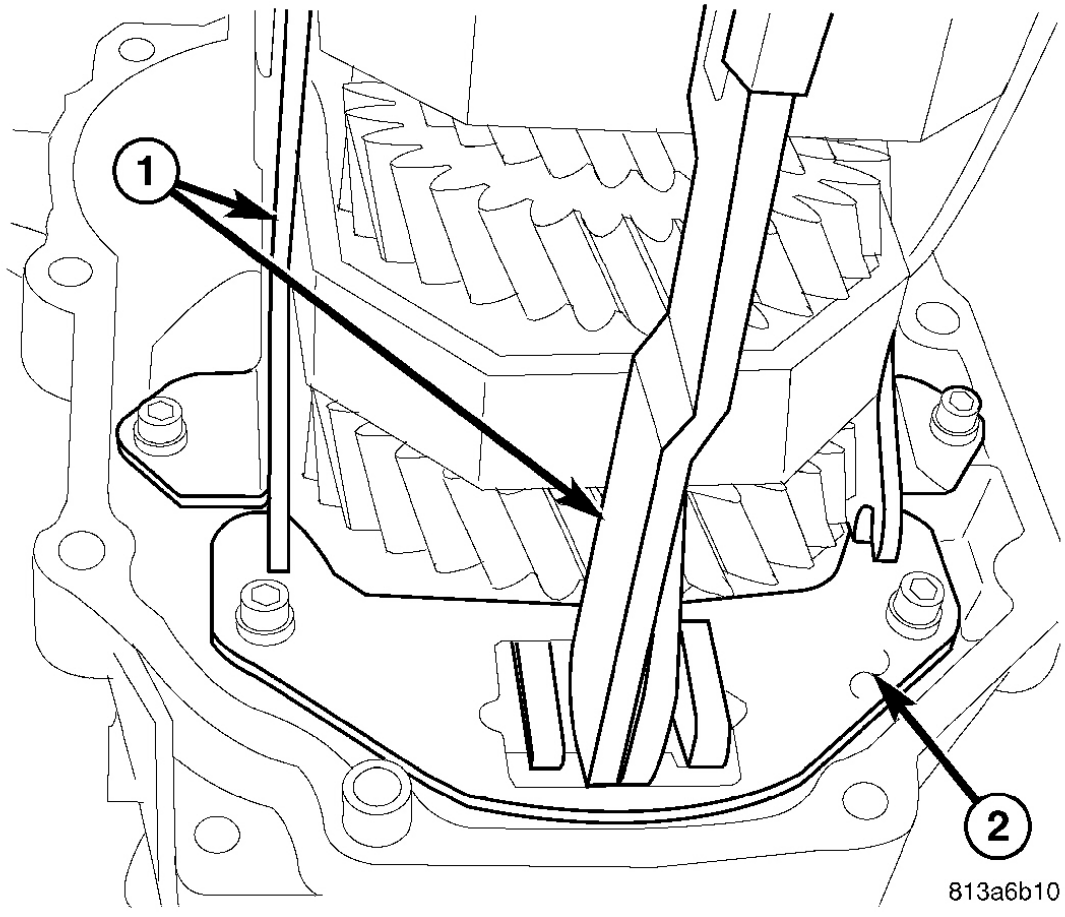

Fig. 21: Identifying Shift Rails & Support Plate
Courtesy of CHRYSLER LLC

10. Remove shift rails (1) support plate (2) bolts.

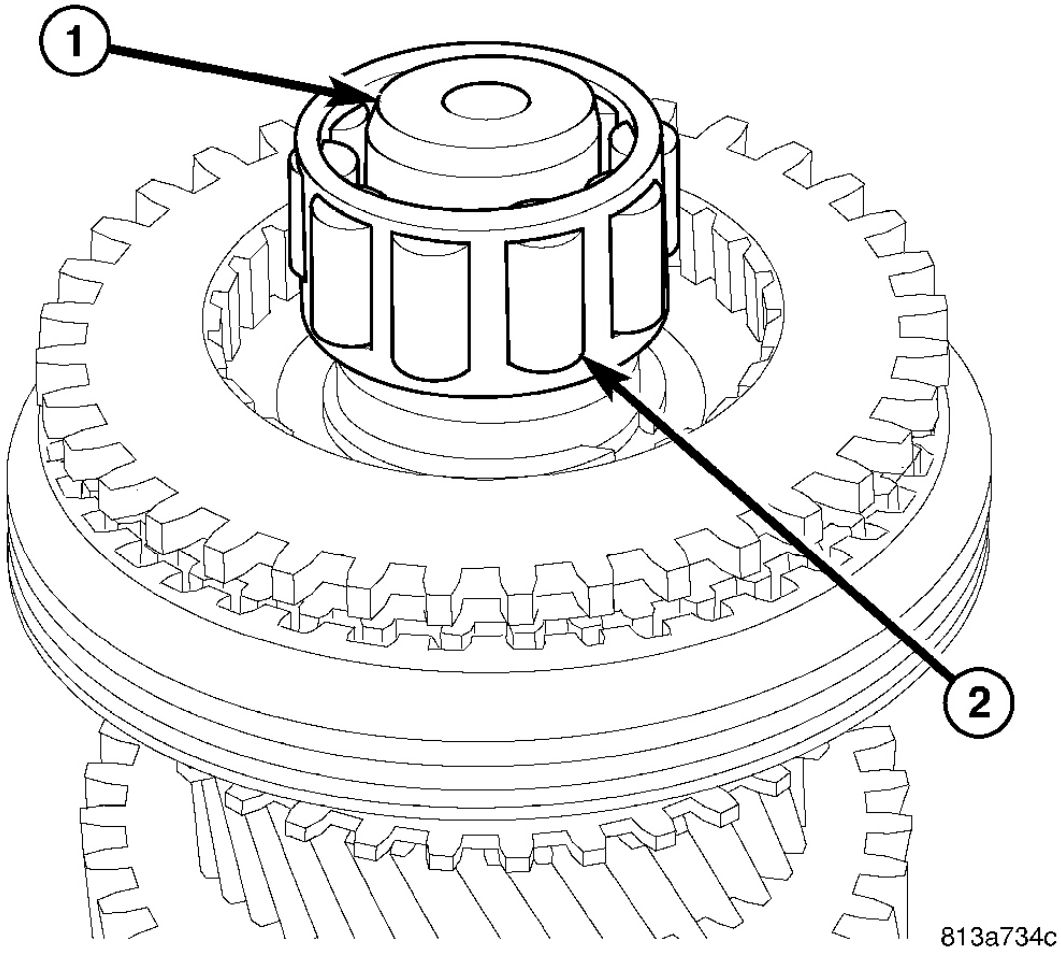

Fig. 22: Identifying Input Shaft & Roller Bearing
Courtesy of CHRYSLER LLC

11. Remove input shaft (1) roller bearing (2).

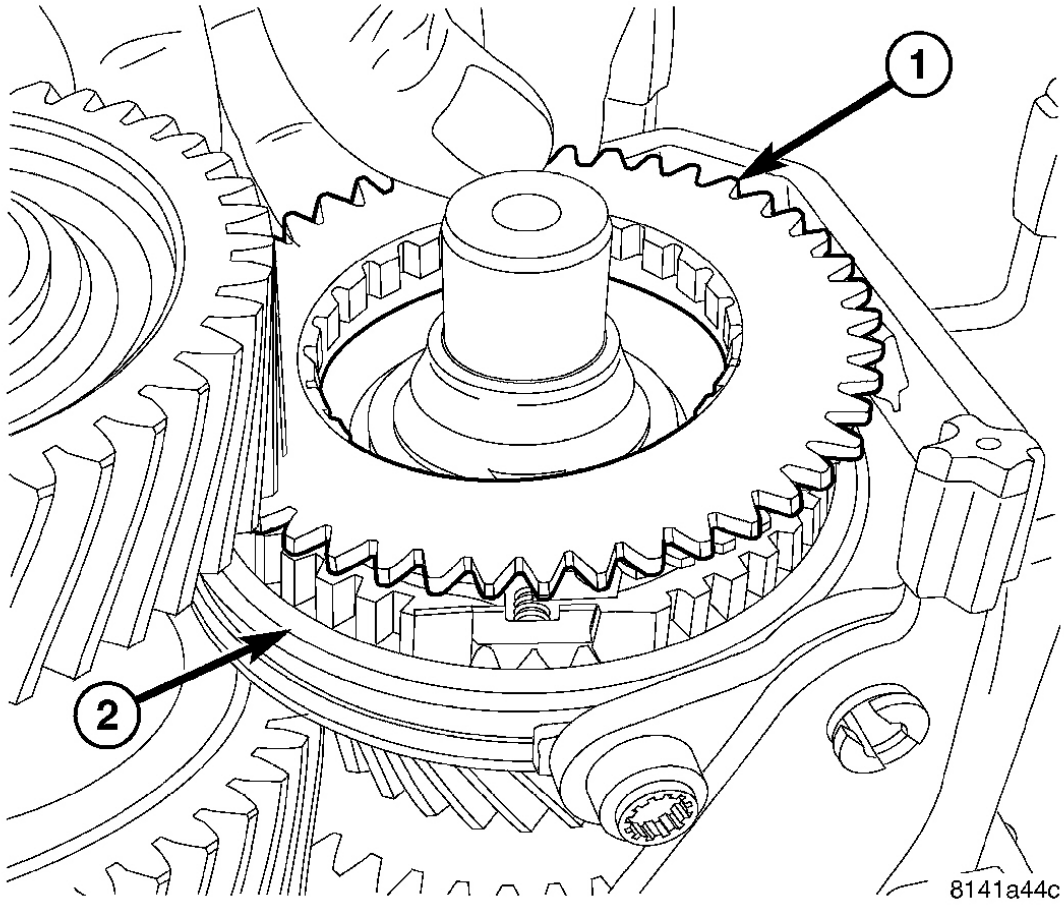

Fig. 23: Identifying Fifth Gear Synchronizer Blocker Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

12. Remove fifth gear synchronizer blocker ring (1) from 5-6 synchronizer hub (2).

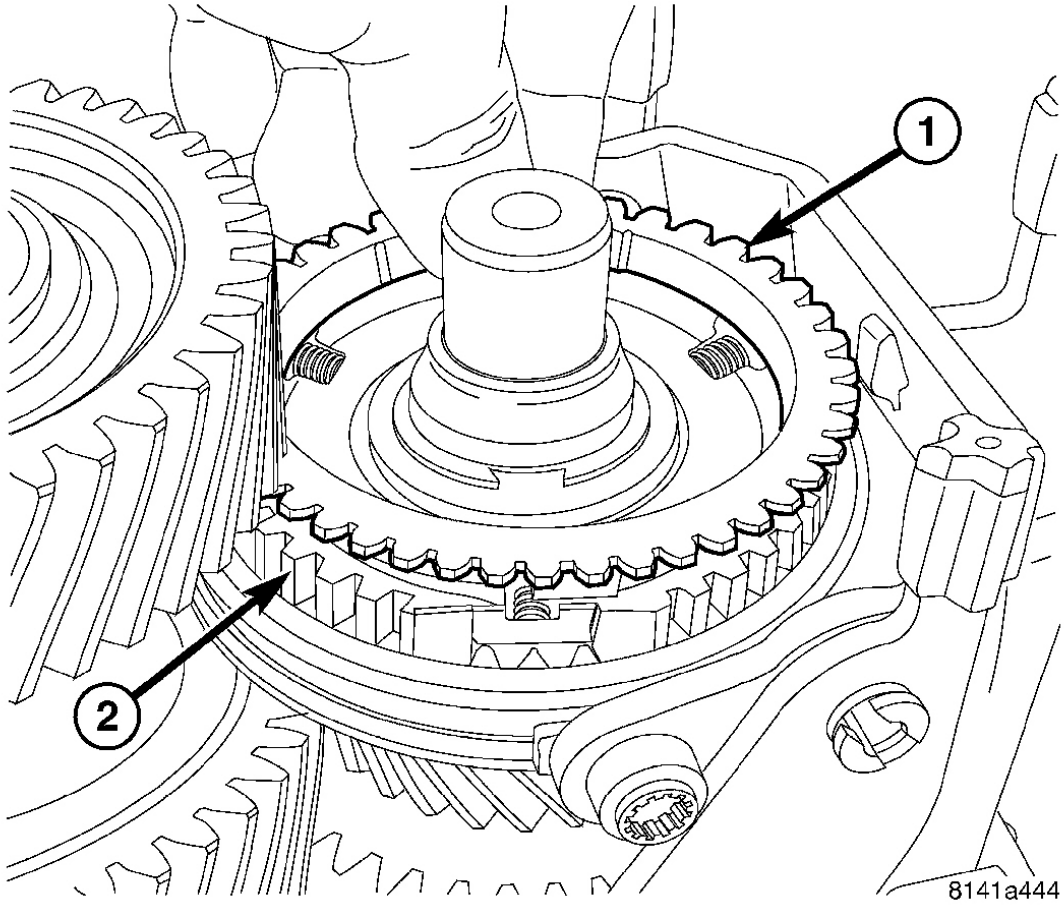

Fig. 24: Identifying Fifth Gear Synchronizer Friction Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

13. Remove fifth gear synchronizer friction ring (1) from 5-6 synchronizer hub (2).

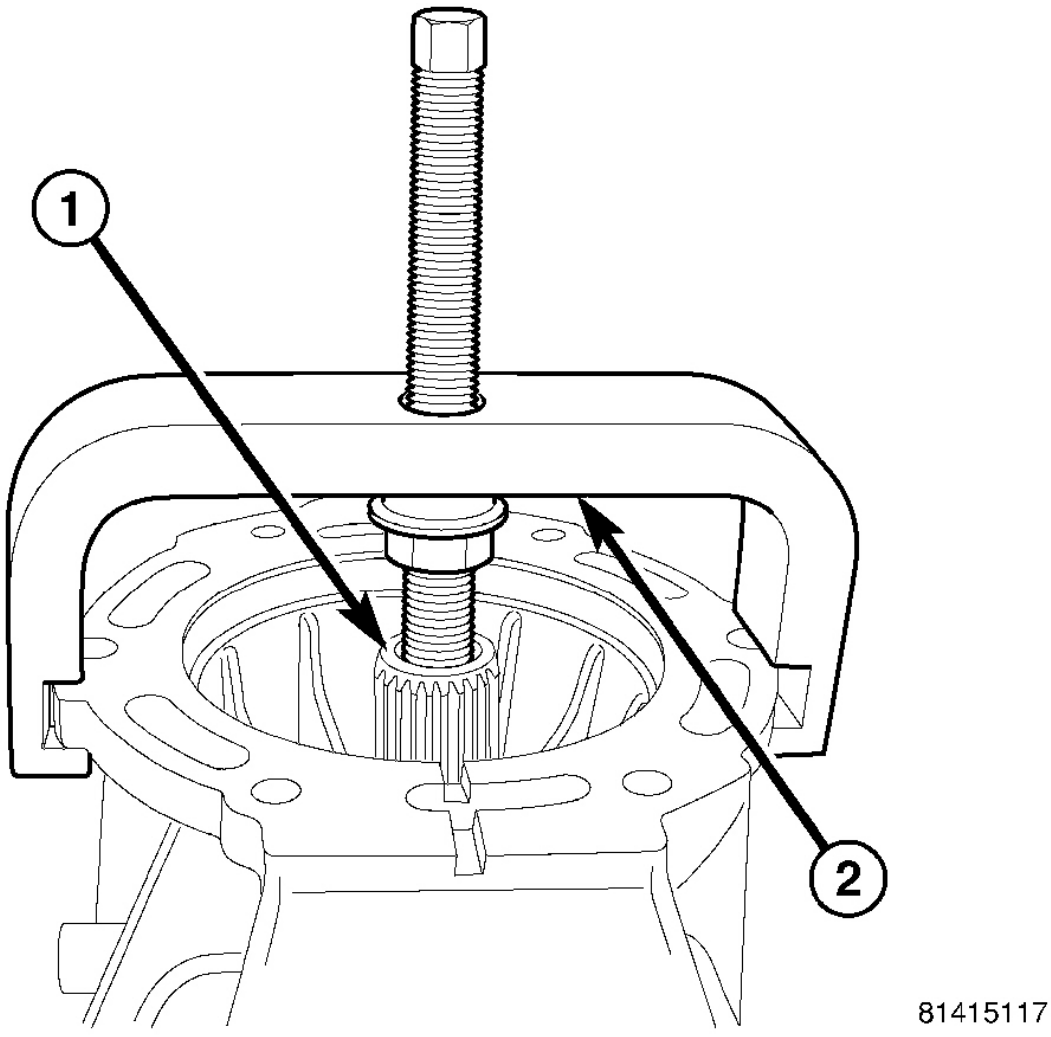

Fig. 25: Identifying Mainshaft & Remover/Installer 9636
Courtesy of CHRYSLER LLC

14. Set geartrain and shift rails with rear housing into Fixture 9633.
15. Remove mainshaft (1) from rear housing bearing with Remover/Installer 9636 (2).

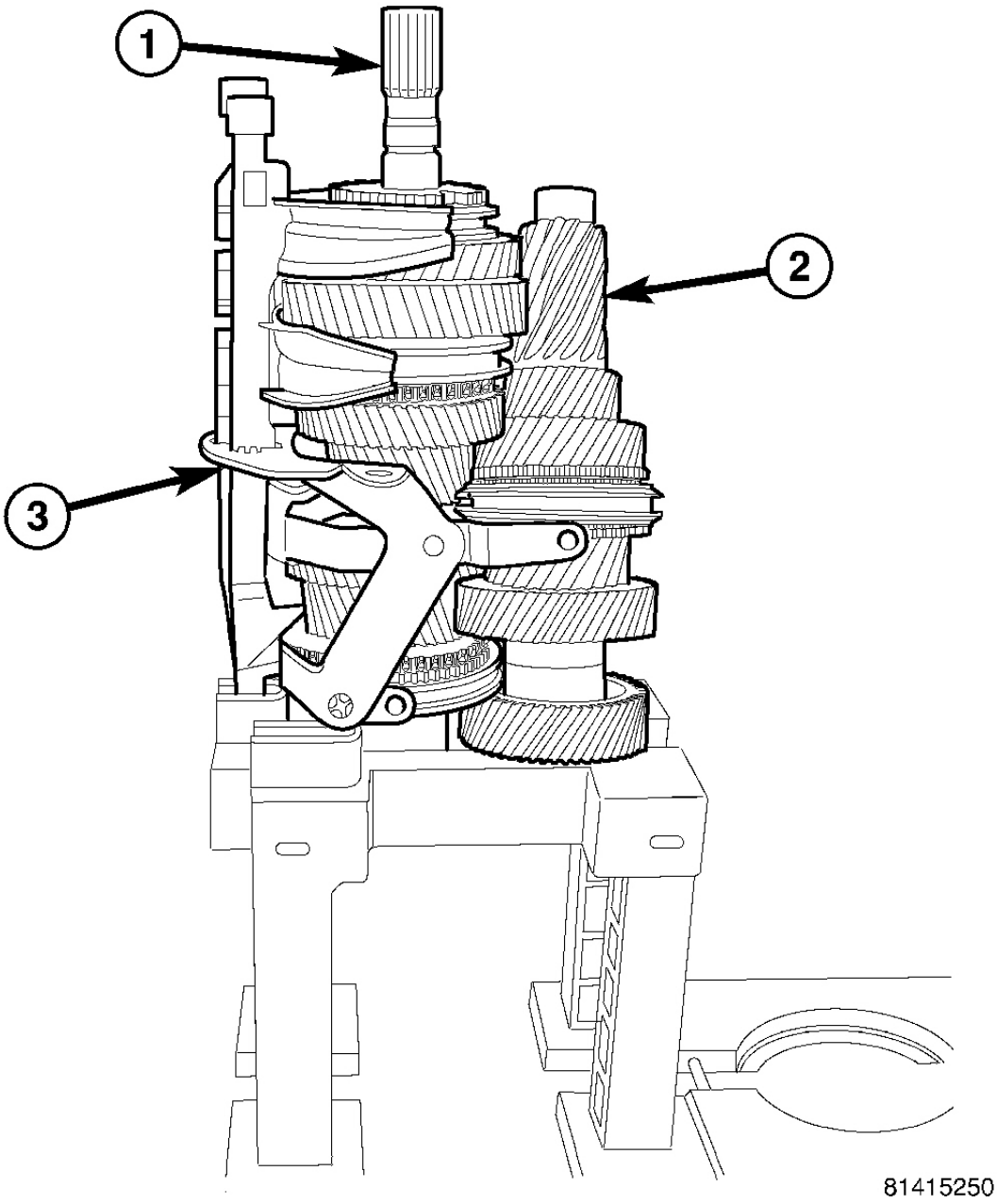

Fig. 26: Identifying Mainshaft, Countershaft & Shift Rails/Forks
Courtesy of CHRYSLER LLC

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

MAINSHAFT

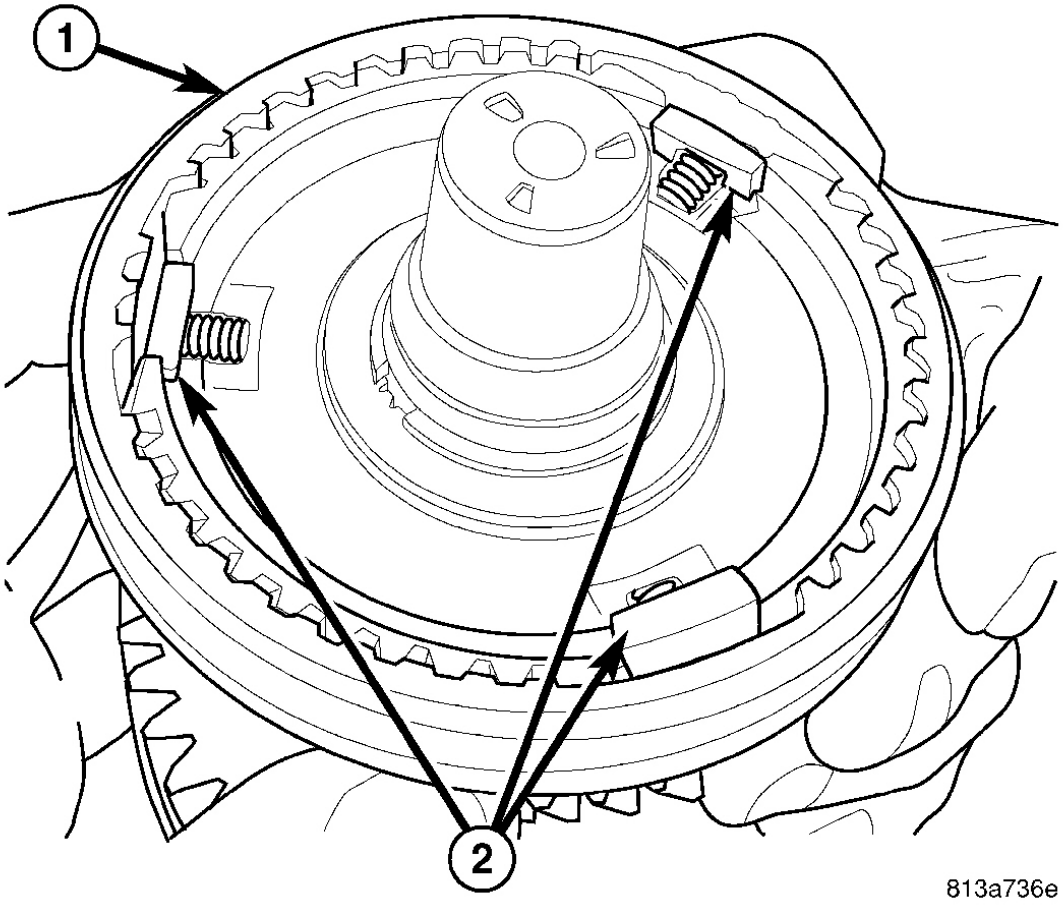

Fig. 27: Identifying 5-6 Synchronizer Sleeve & Detents
Courtesy of CHRYSLER LLC

1. Clamp build Fixture 9648 in a vise. Install mainshaft with 5-6 synchronizer facing up in build Fixture 9648.
2. Push 5-6 synchronizer sleeve (1) down on hub and remove detents (2) springs and balls.

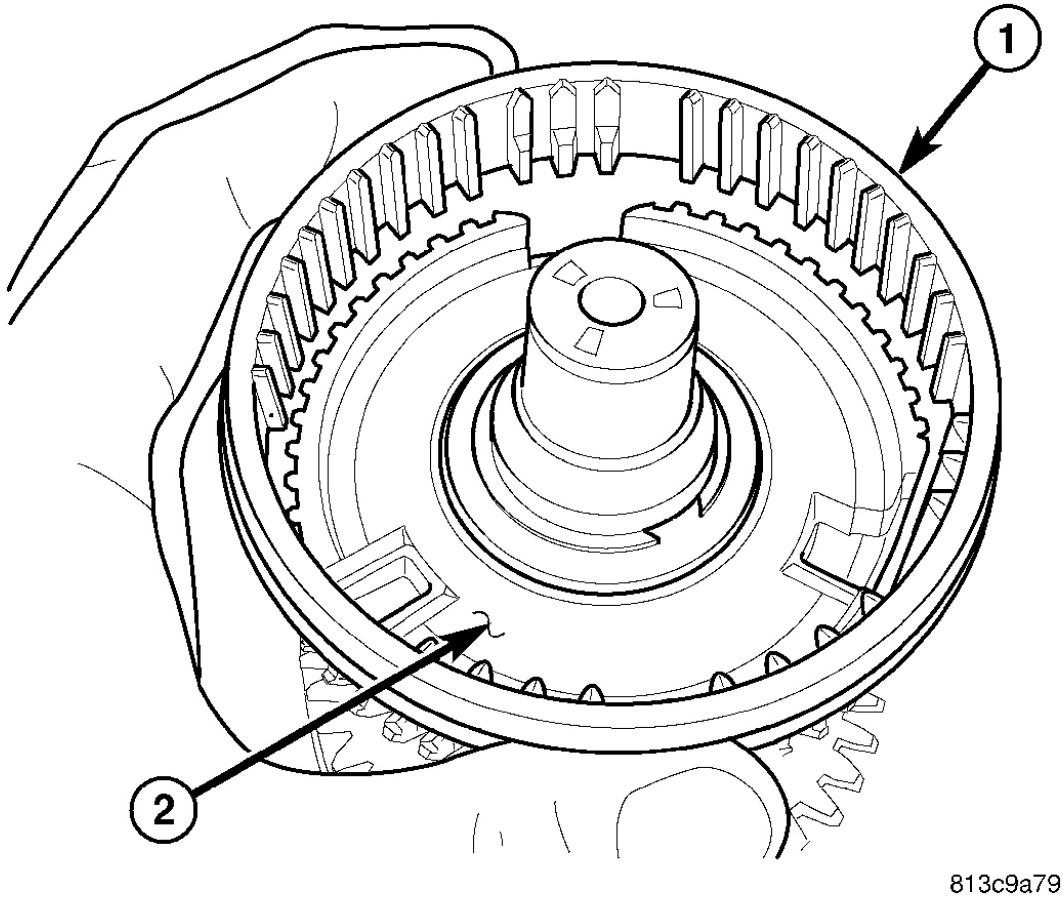

Fig. 28: Identifying 5-6 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

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

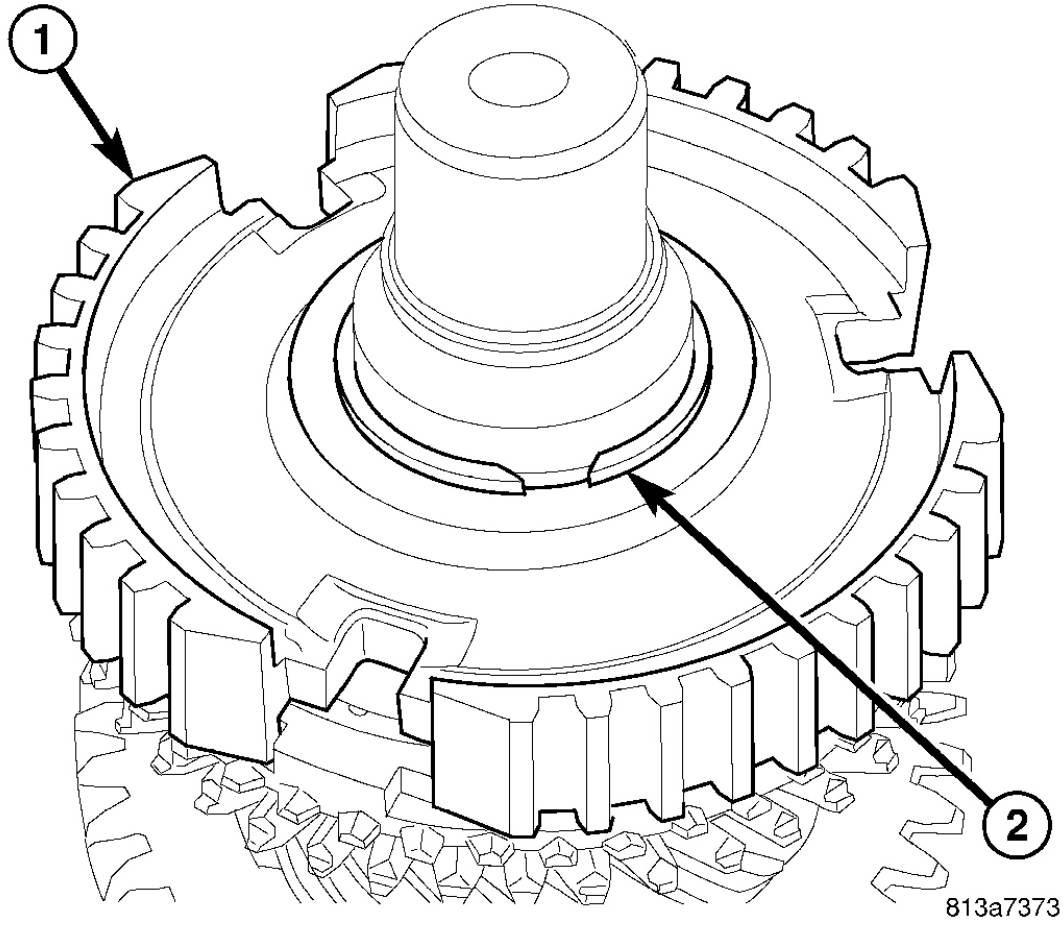

Fig. 29: Identifying 5-6 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

4. Remove 5-6 synchronizer hub (1) snap ring (2) and record location.

NOTE: All snap rings are select fit from the factory, and must be installed in their original location.

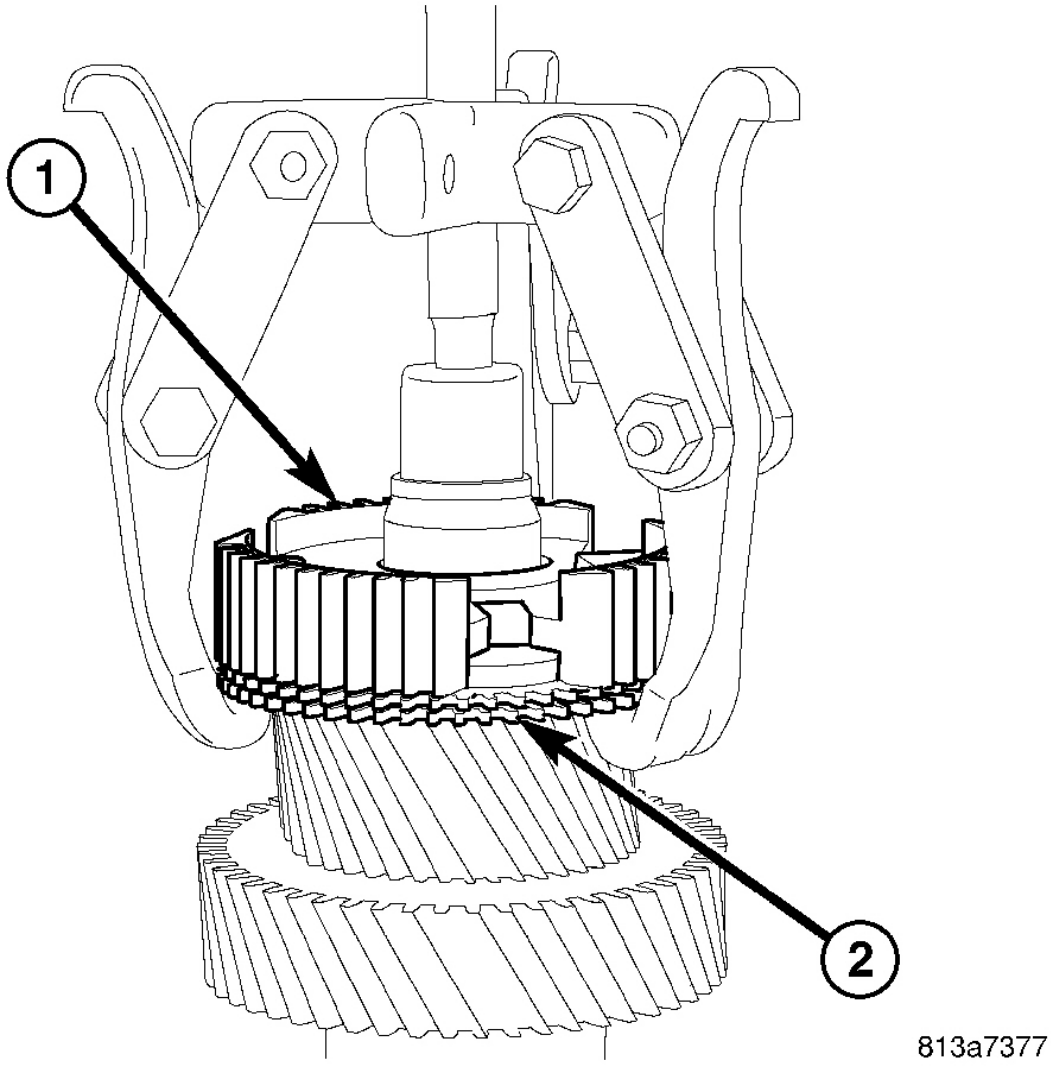

Fig. 30: Identifying 5-6 Synchronizer Hub & Sixth Gear Synchronizer Rings
Courtesy of CHRYSLER LLC

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

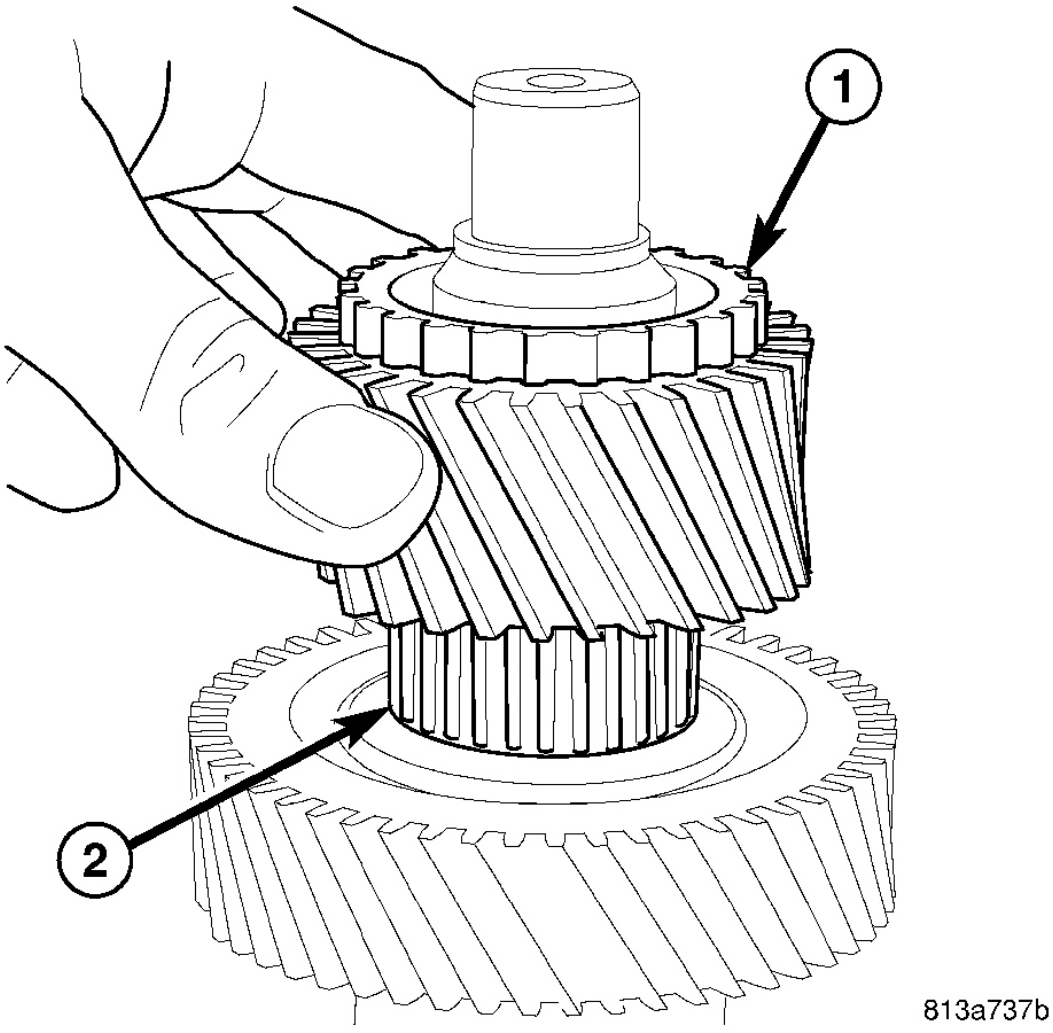

Fig. 31: Sixth Gear & Bearing
Courtesy of CHRYSLER LLC

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

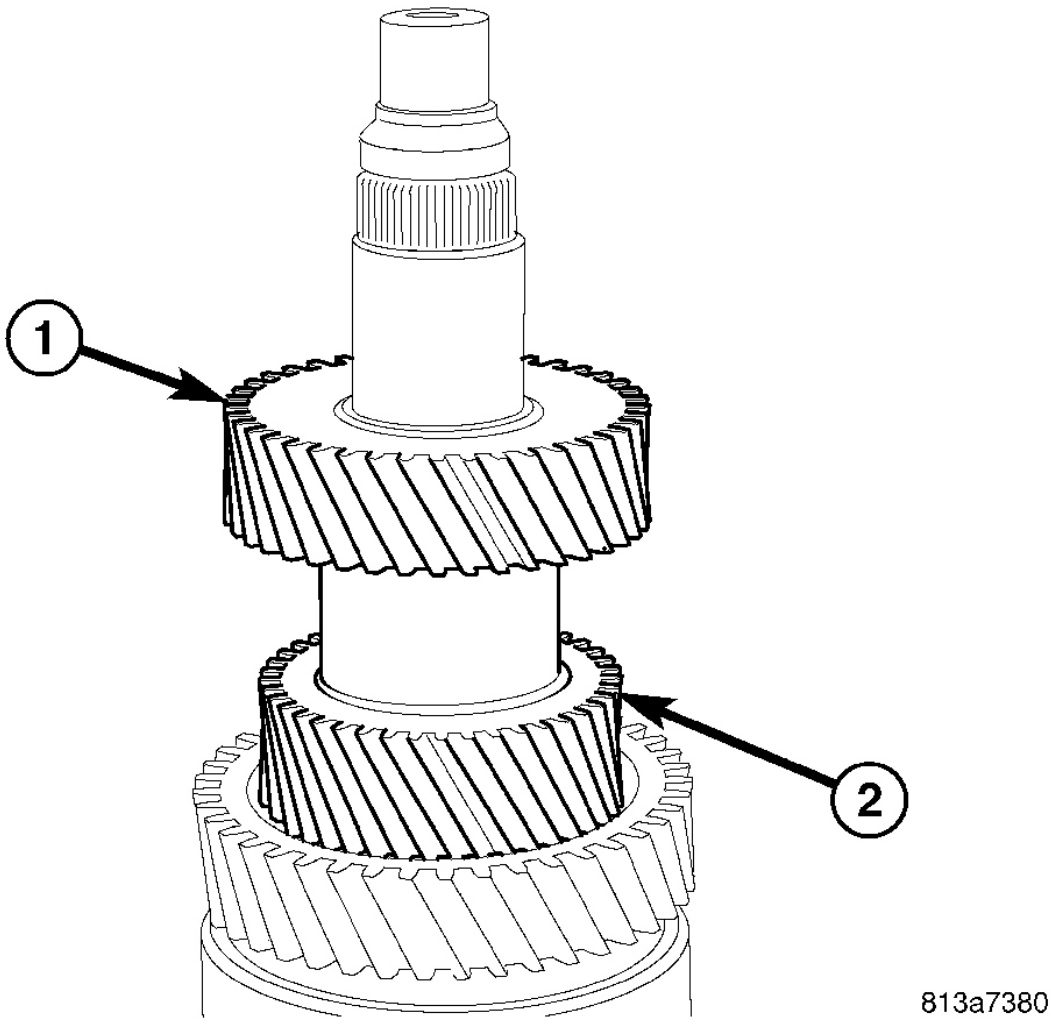

Fig. 32: 3 & 4 Gear
Courtesy of CHRYSLER LLC

7. Third gear (1) 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 into the fixture.

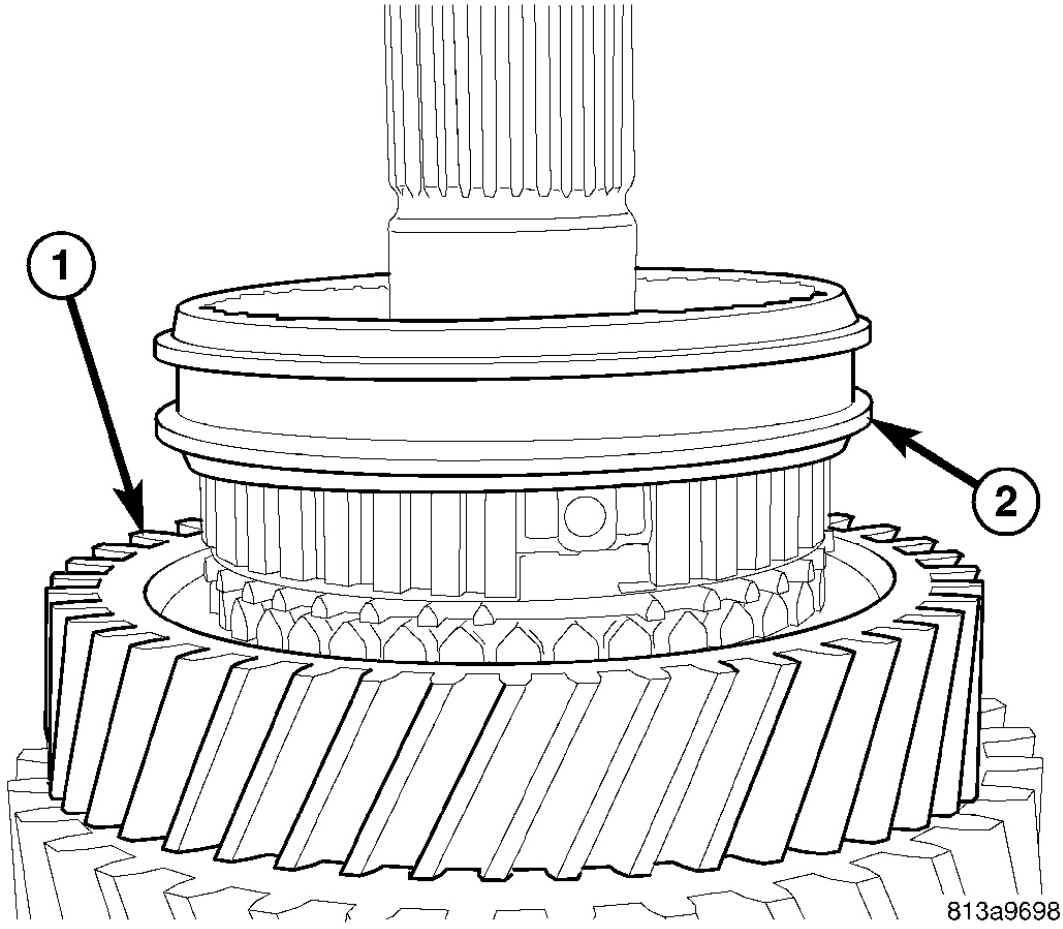

Fig. 33: Identifying Reverse Gear & Synchronizer Sleeve
Courtesy of CHRYSLER LLC

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

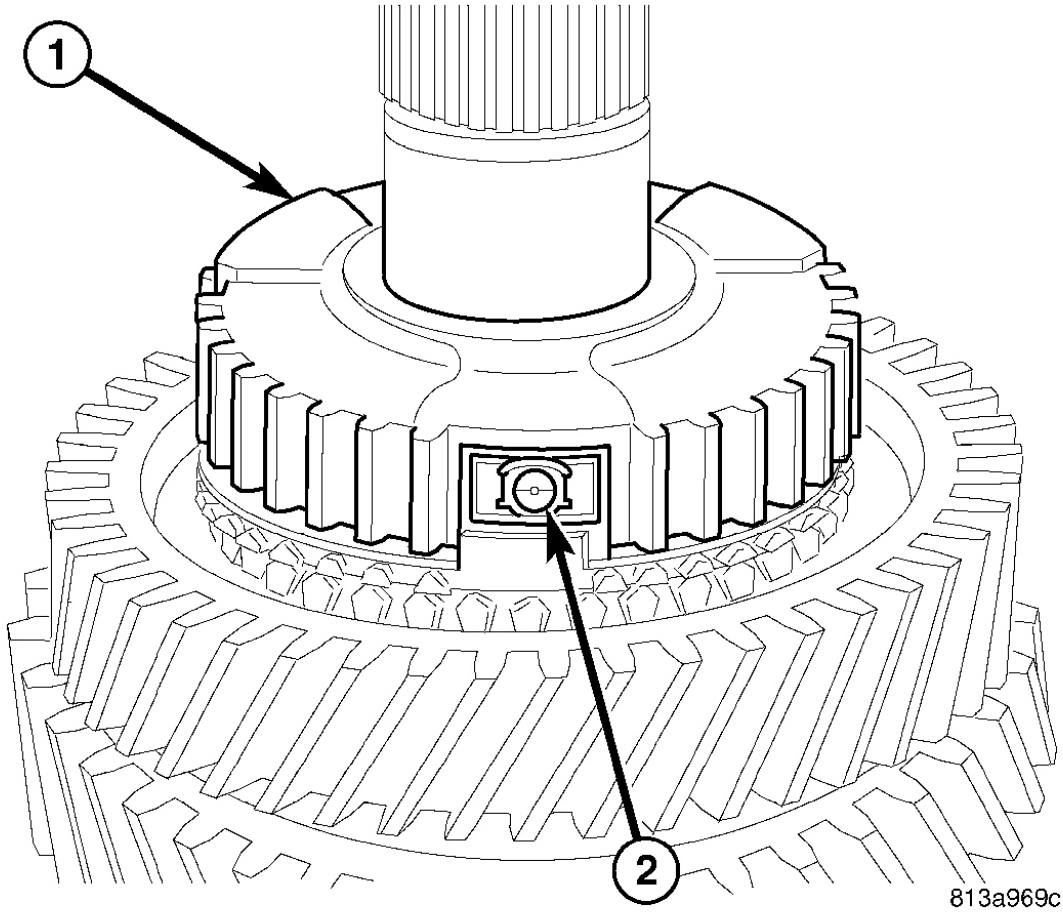

Fig. 34: Identifying Reverse Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

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

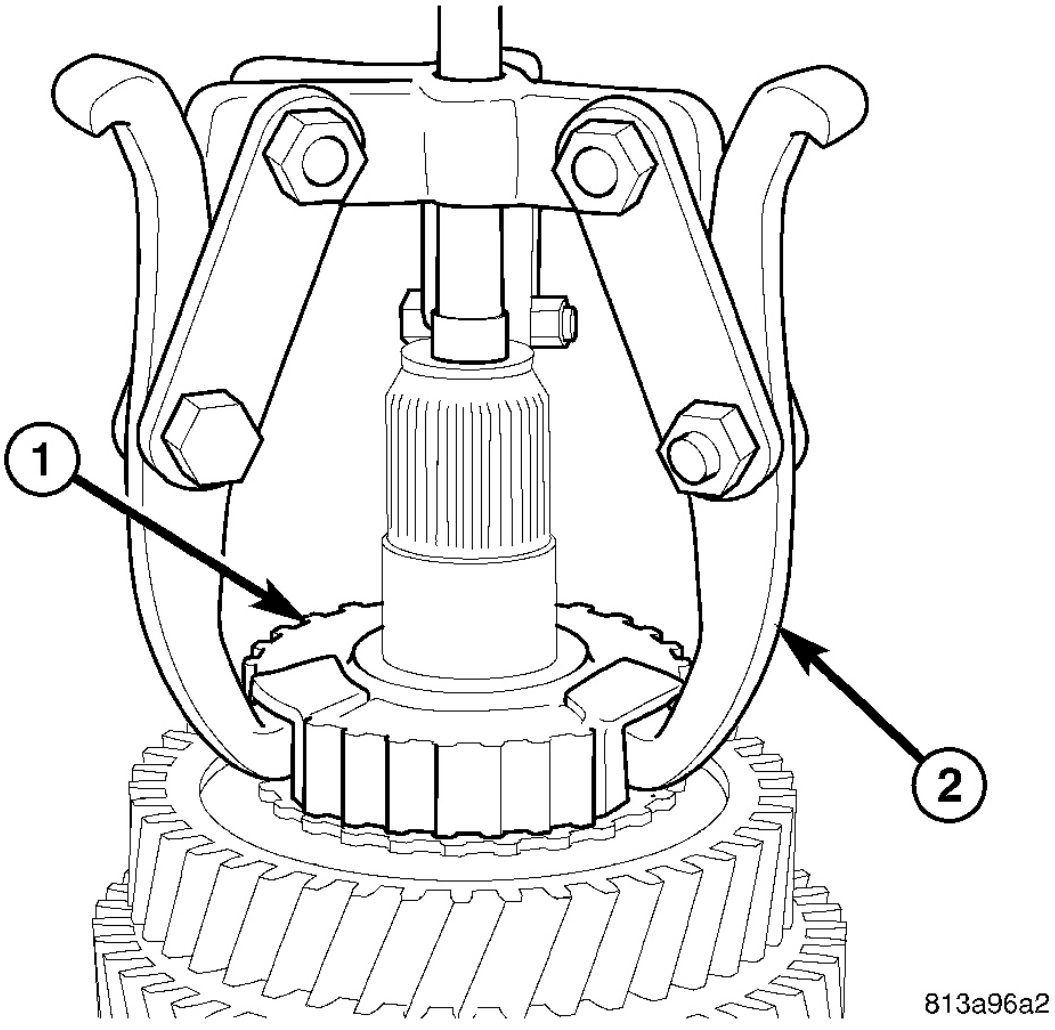

Fig. 35: Identifying Reverse Synchronizer Hub & Three Jaw Puller
Courtesy of CHRYSLER LLC

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

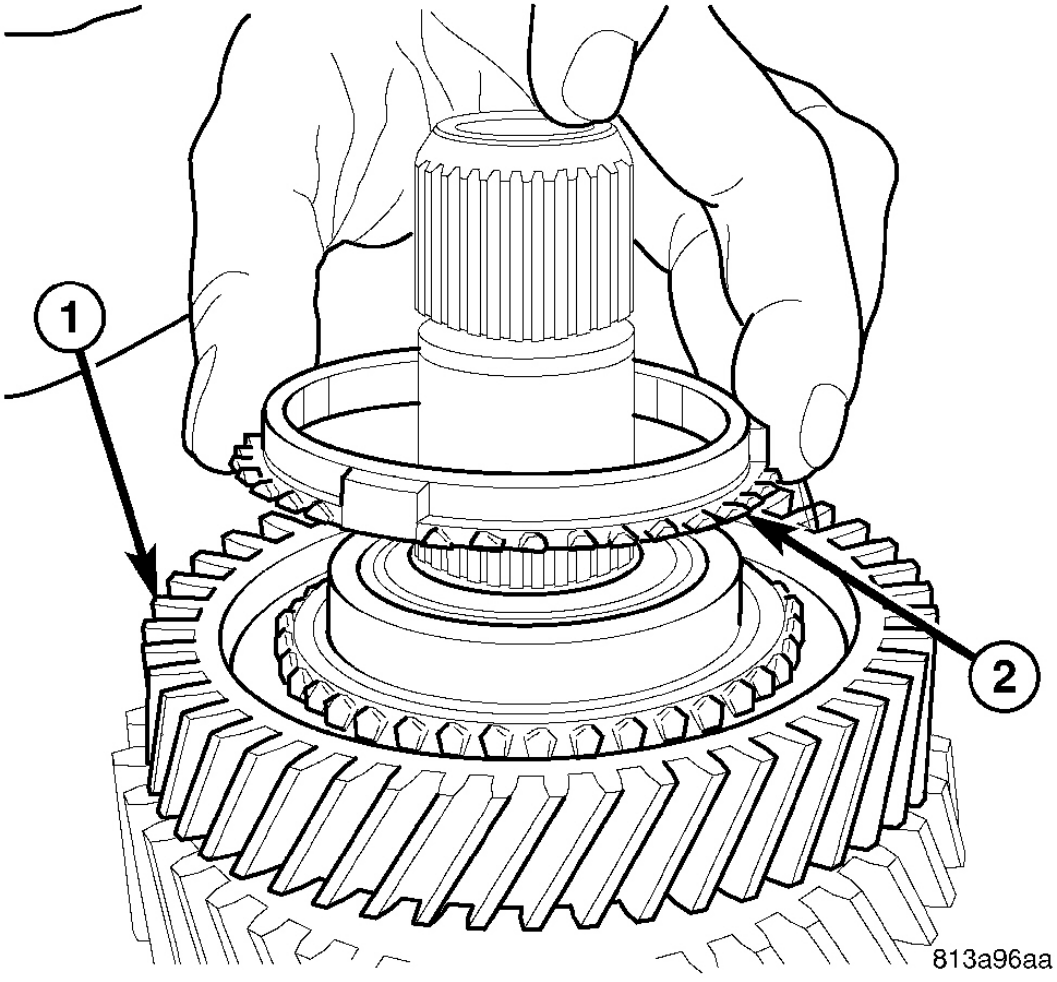

Fig. 36: Identifying Reverse Gear & Synchronizer Ring
Courtesy of CHRYSLER LLC

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

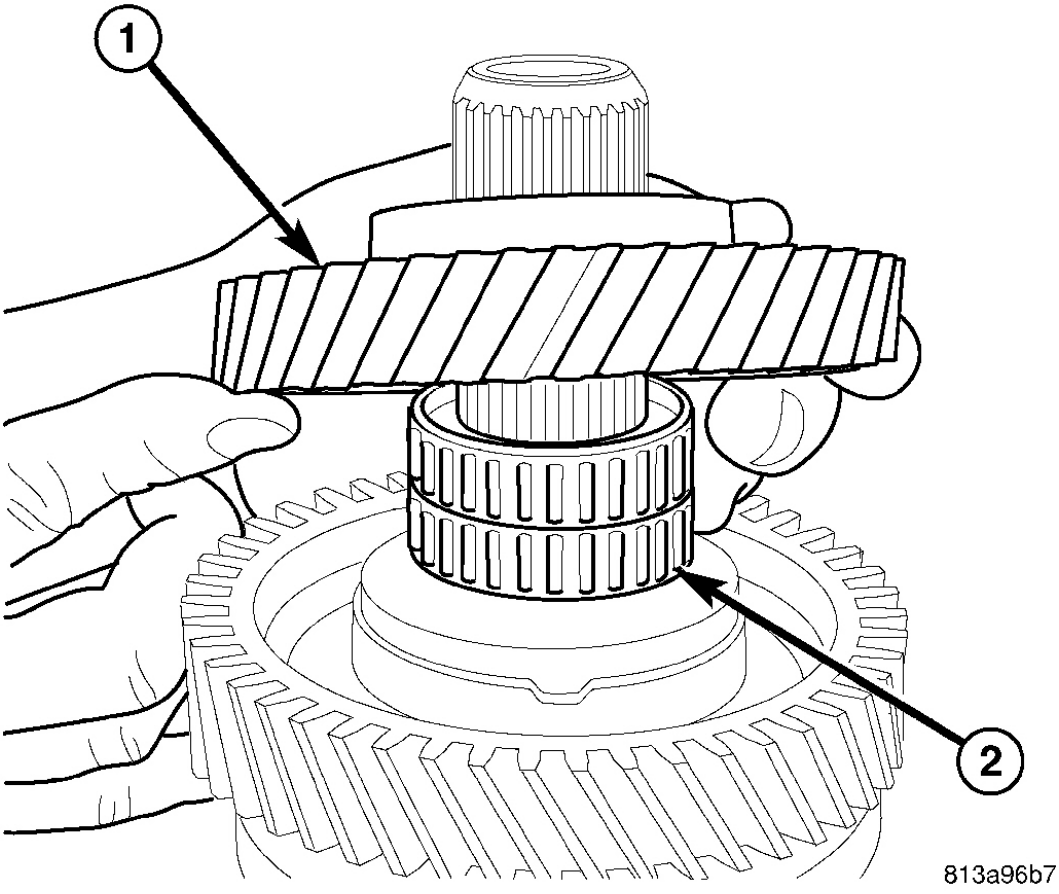

Fig. 37: Identifying Reverse Gear & Bearing
Courtesy of CHRYSLER LLC

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

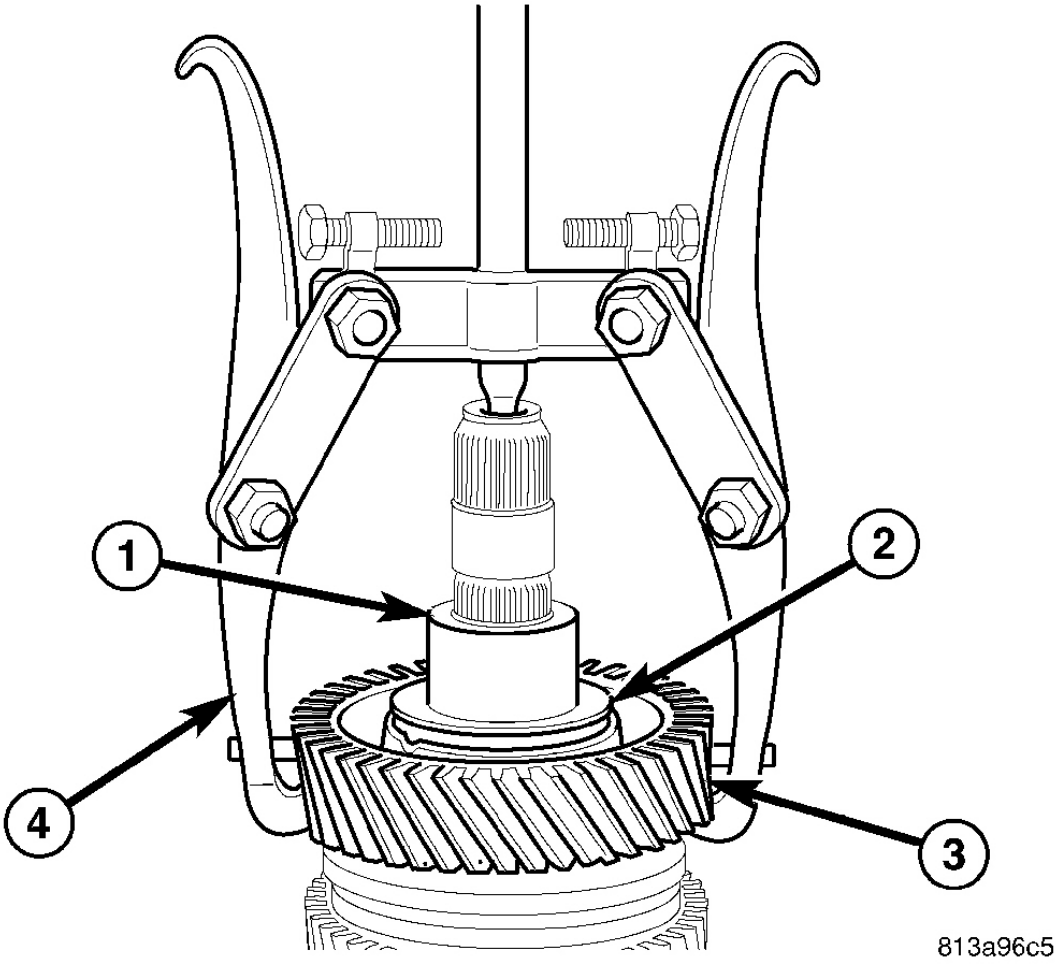

Fig. 38: Identifying Reverse Gear Bearing Race, Thrust Washer, First Gear & Puller
Courtesy of CHRYSLER LLC

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

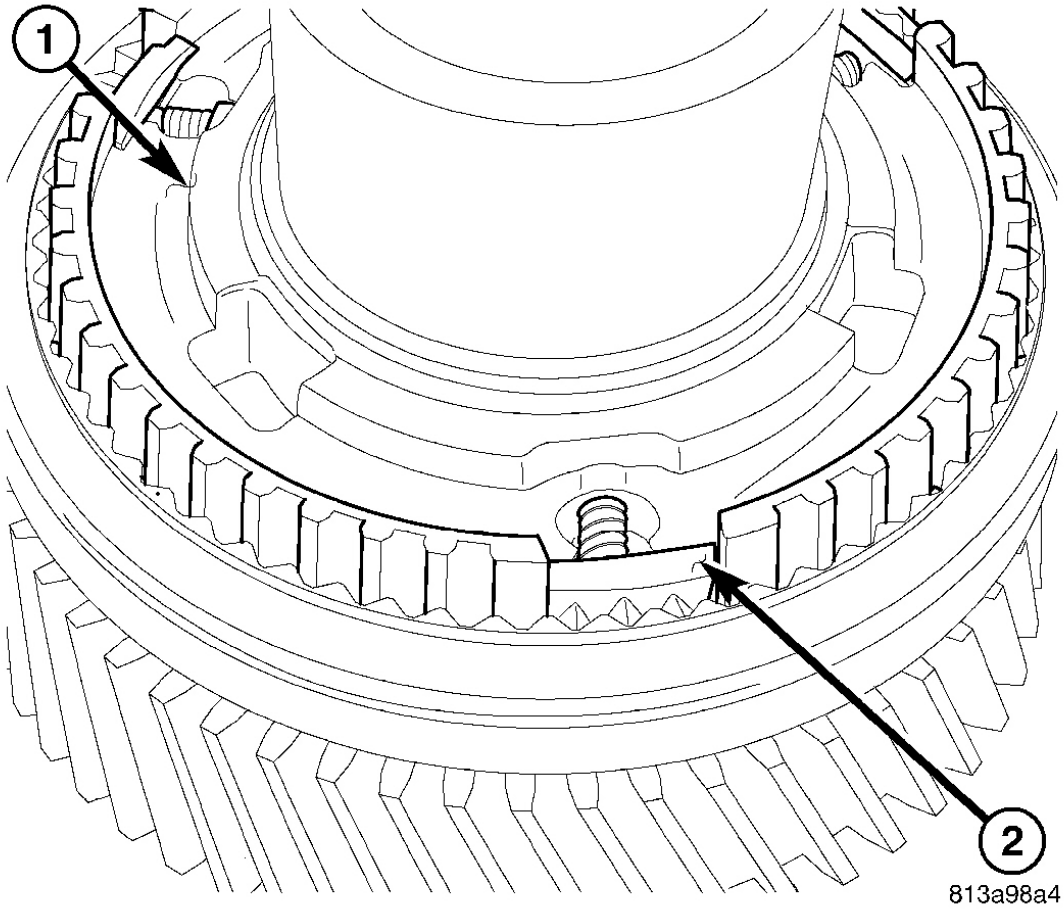

Fig. 39: Identifying Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

16. Remove first gear synchronizer rings.
17. Push 1-2 synchronizer sleeve down on synchronizer hub (1) detents (2), balls and springs.

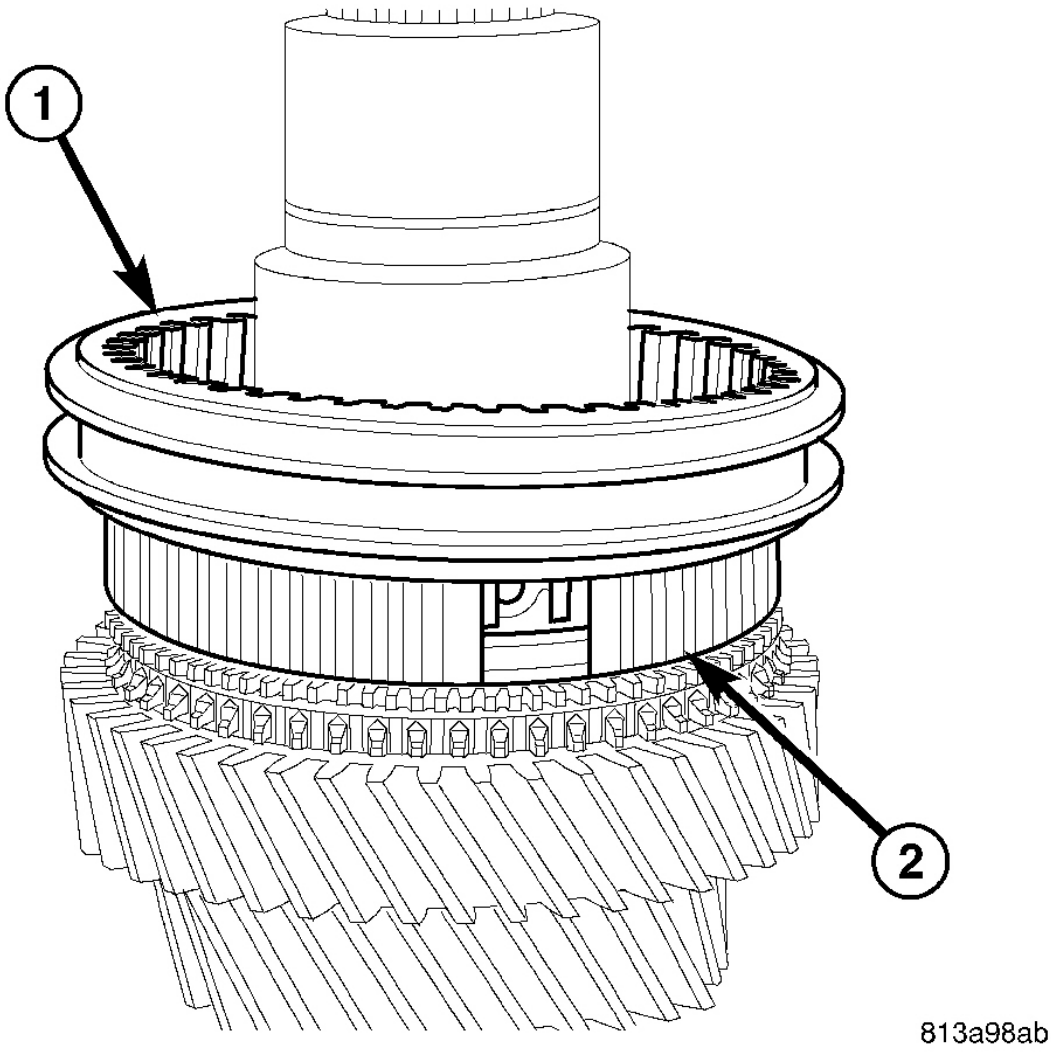

Fig. 40: Identifying 1-2 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

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

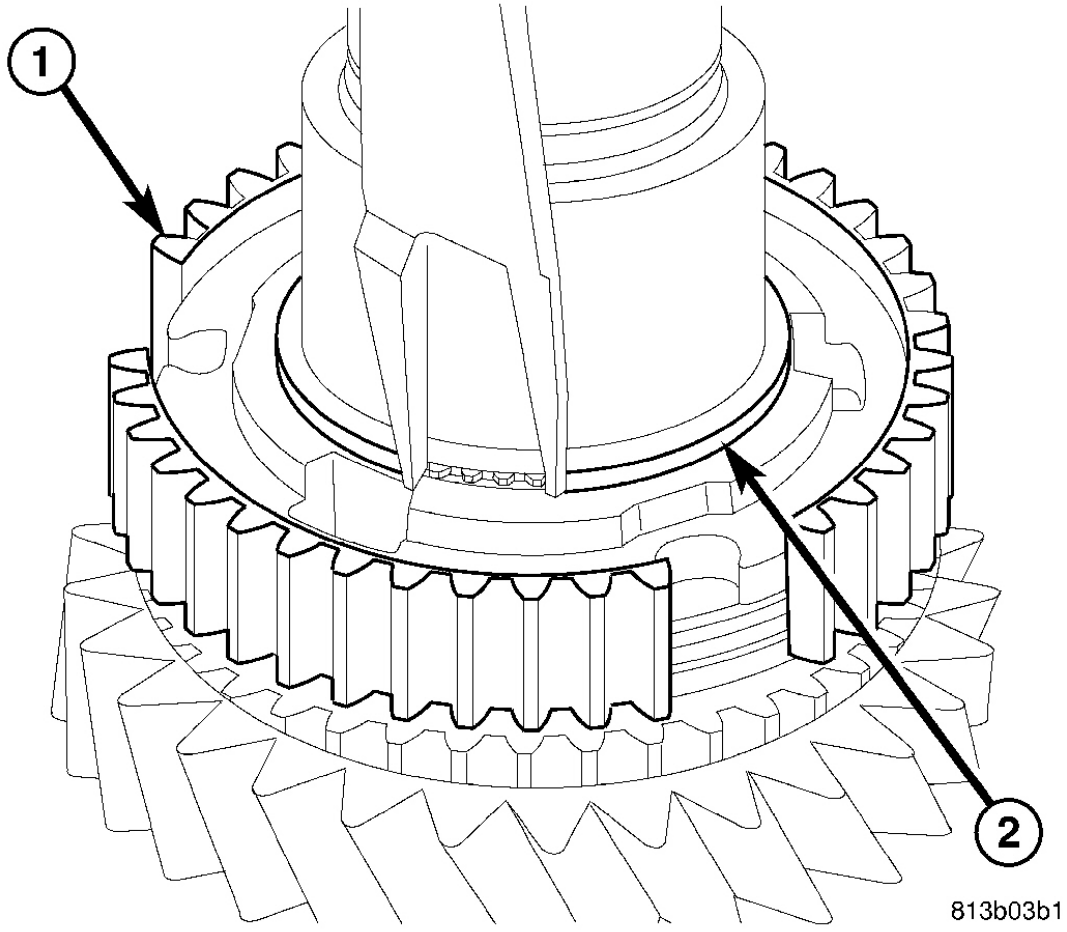

Fig. 41: Identifying 1-2 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

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

NOTE: All snap rings are select fit from the factory, and must be installed in their original location.

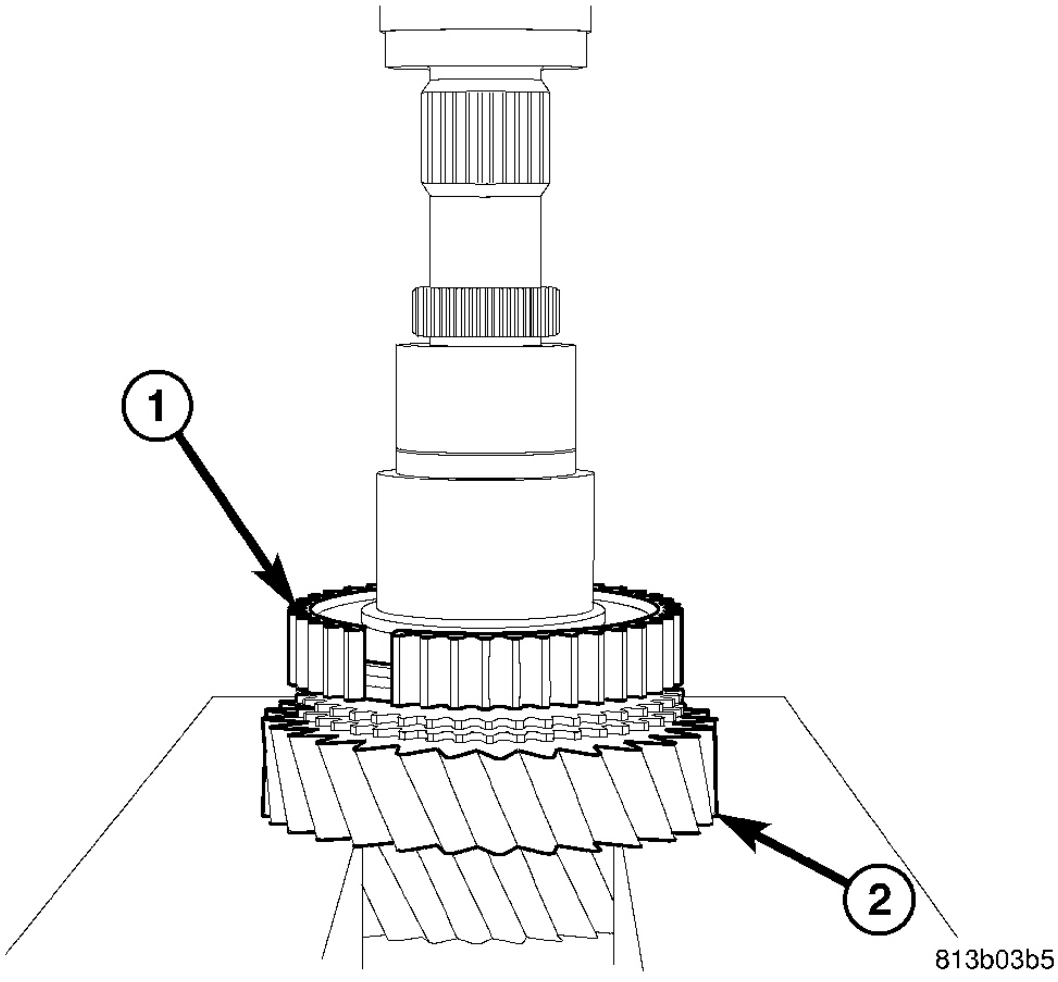

Fig. 42: Identifying 1-2 Synchronizer Hub & Second Gear
Courtesy of CHRYSLER LLC

20. Remove 1-2 synchronizer hub (1), 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)

COUNTERSHAFT

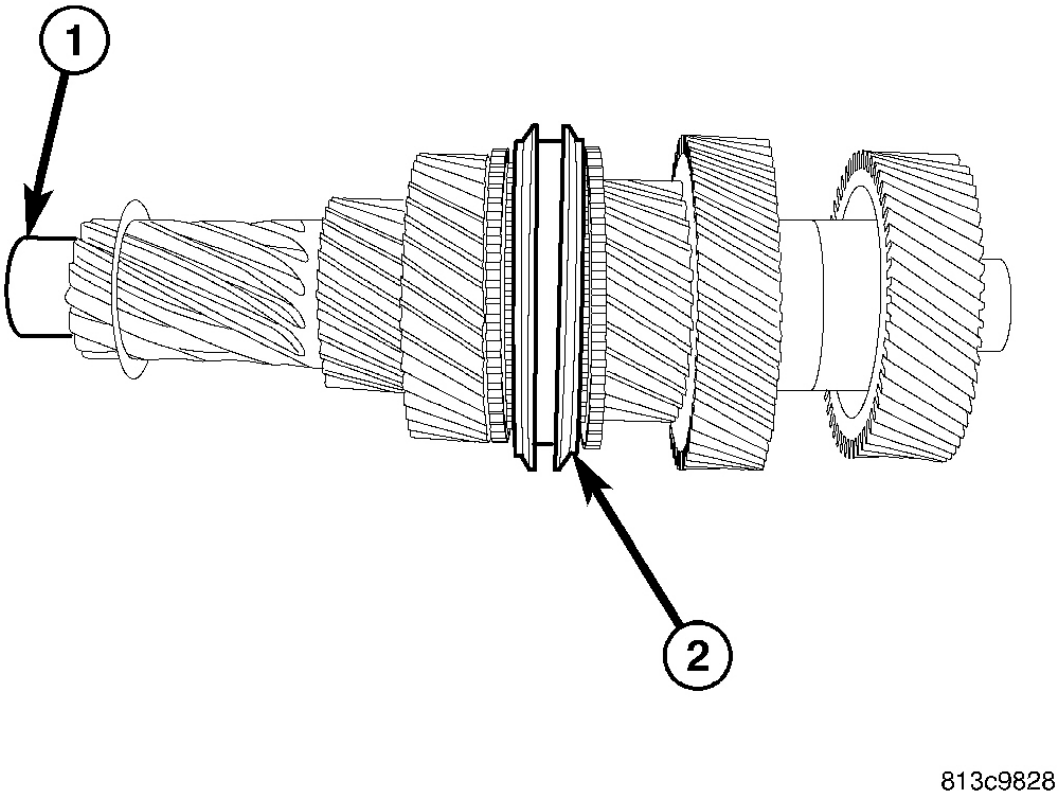

Fig. 43: Identifying Bearing Surfaces & 3-4 Synchronizer Assembly
Courtesy of CHRYSLER LLC

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

FRONT HOUSING

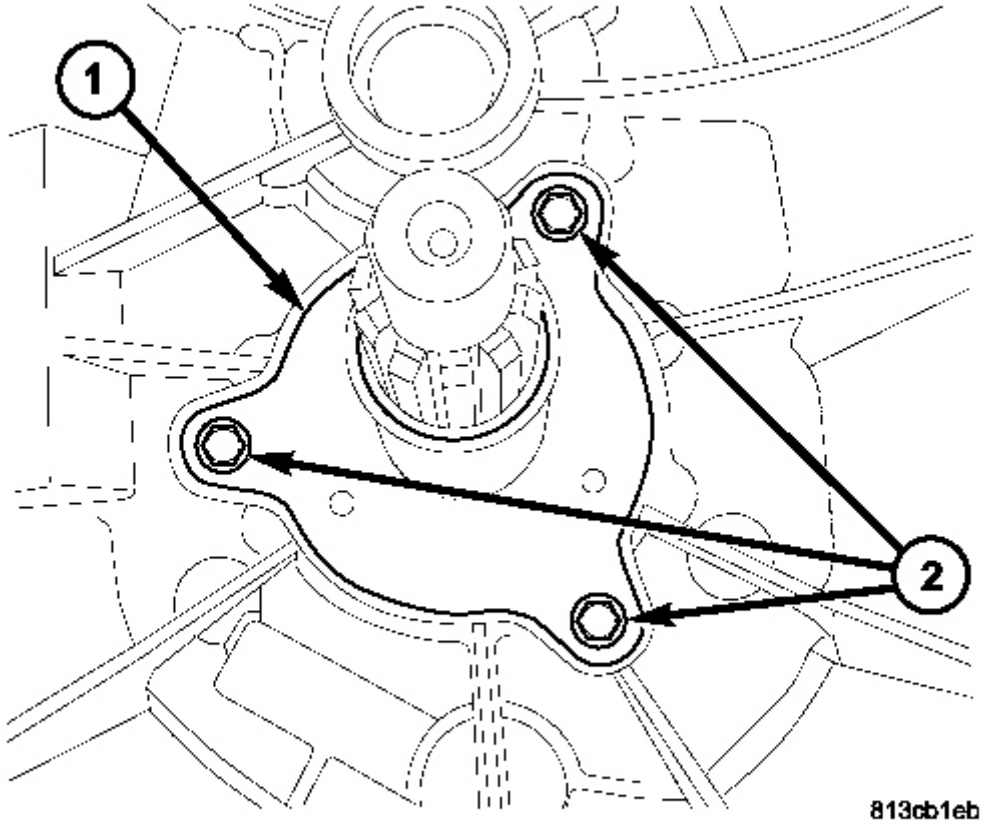

Fig. 44: Identifying Input Shaft Retainer Bolts & Retainer
Courtesy of CHRYSLER LLC

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

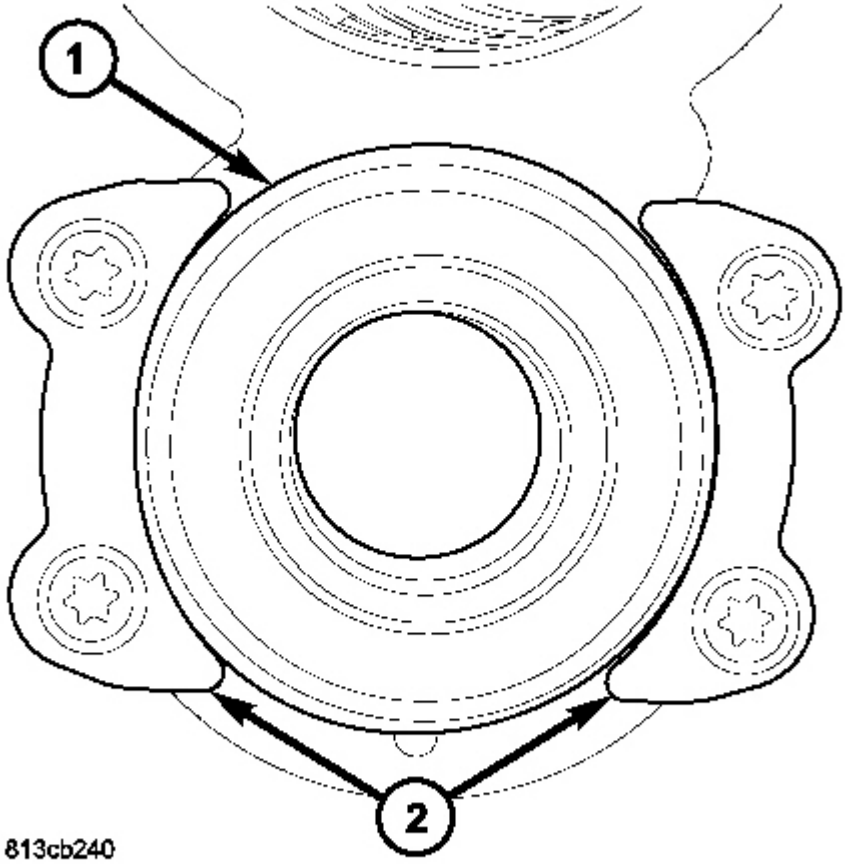

Fig. 45: Identifying Countershaft Bearing & Retainers
Courtesy of CHRYSLER LLC

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

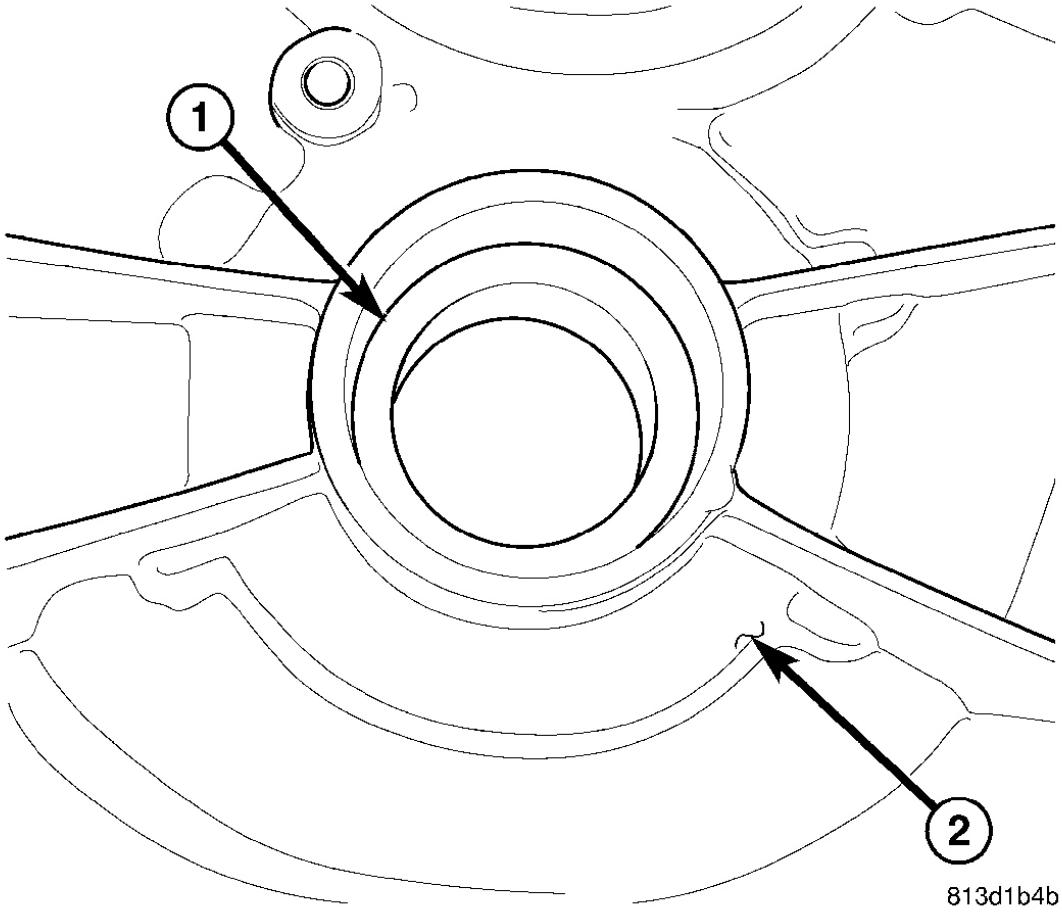

Fig. 46: Identifying Countershaft Bearing & Housing
Courtesy of CHRYSLER LLC

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

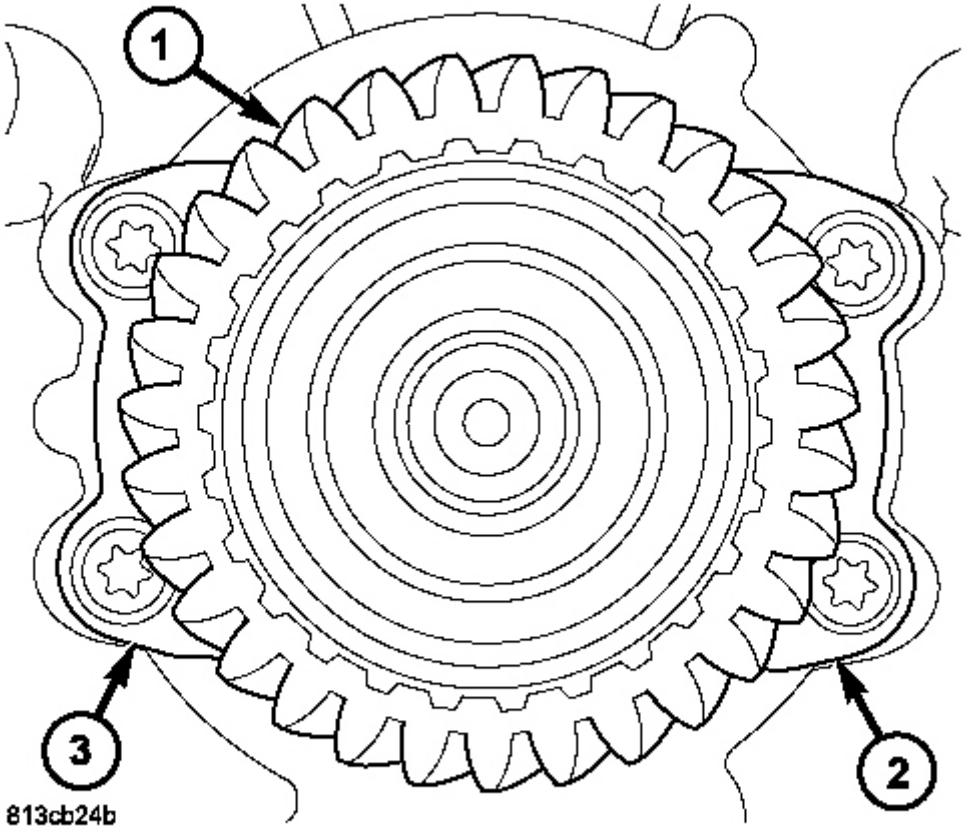

Fig. 47: Identifying Input Shaft & Bearing Retainers
Courtesy of CHRYSLER LLC

4. Remove input shaft (1) bearing retainer bolts and remove retainers (2, 3).
5. Remove input shaft and bearing from housing with a dead blow hammer.

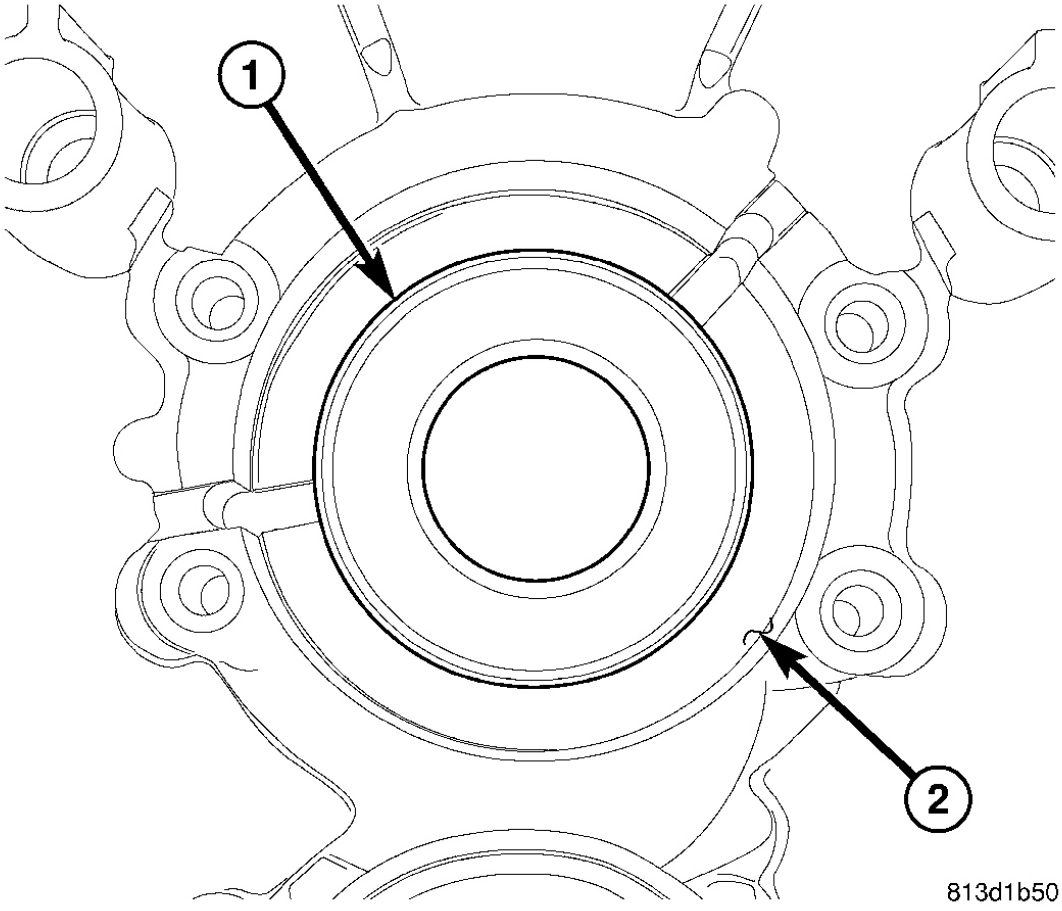

Fig. 48: Identifying Input Shaft Seal & Housing
Courtesy of CHRYSLER LLC

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

INPUT SHAFT

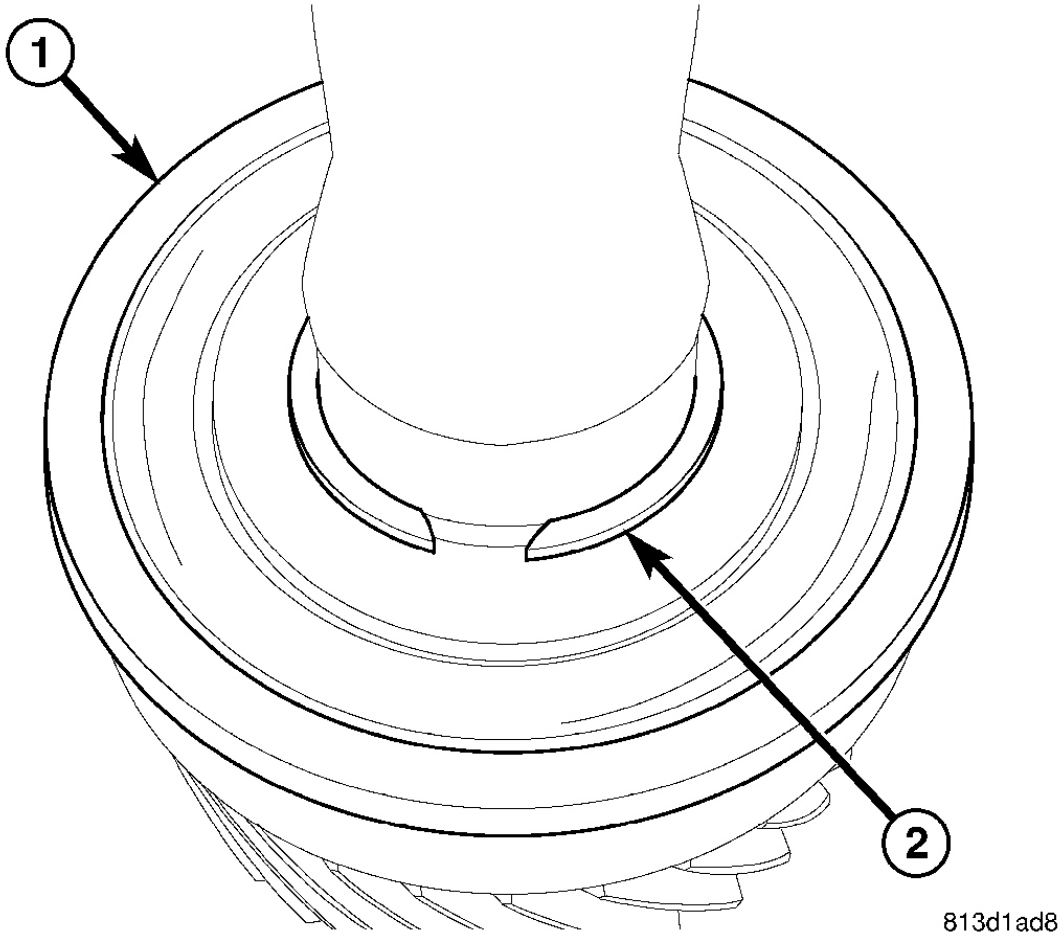

Fig. 49: Identifying Input Shaft Bearing & Snap Ring
Courtesy of CHRYSLER LLC

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

NOTE: All snap rings are select fit from the factory, and must be installed in their original location.

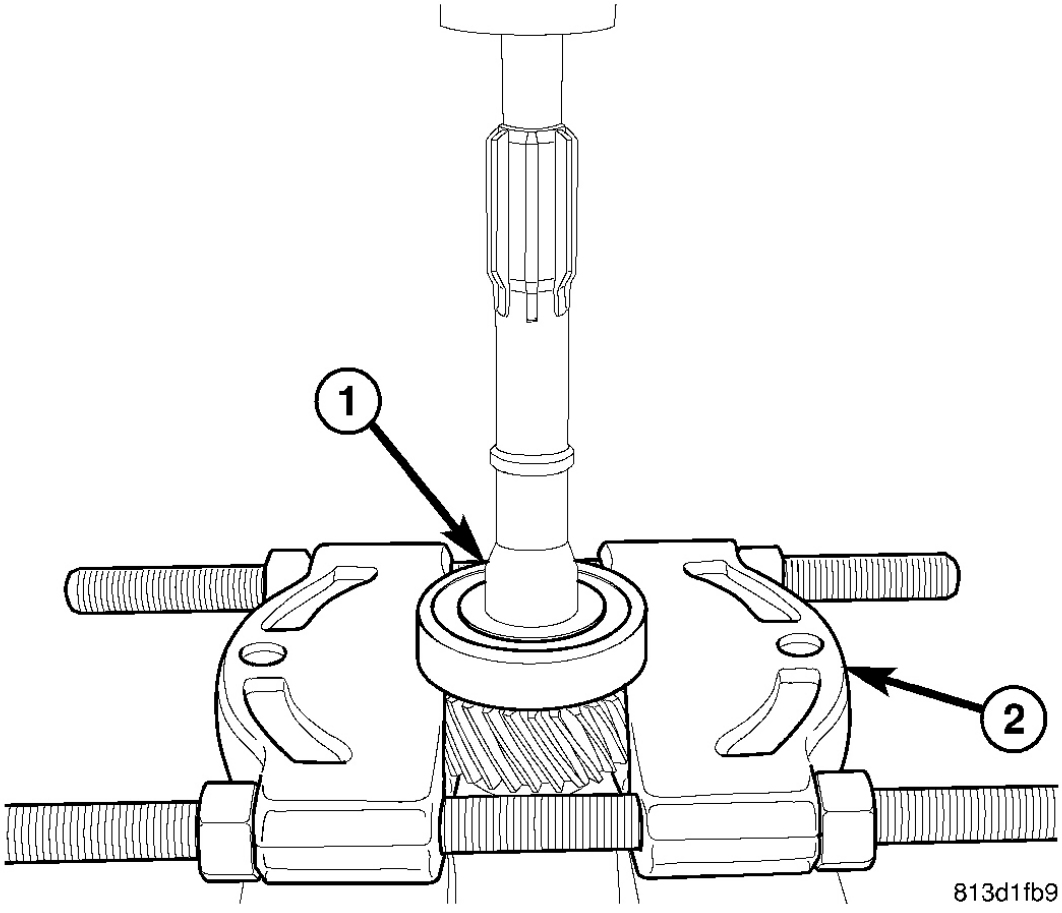

Fig. 50: Identifying Input Shaft Bearing & Splitter 1130
Courtesy of CHRYSLER LLC

2. Remove input shaft bearing (1) from input shaft with a Splitter 1130 (2) and press. Place splitter around bearing retainer lip and press input shaft through the bearing.

REAR HOUSING

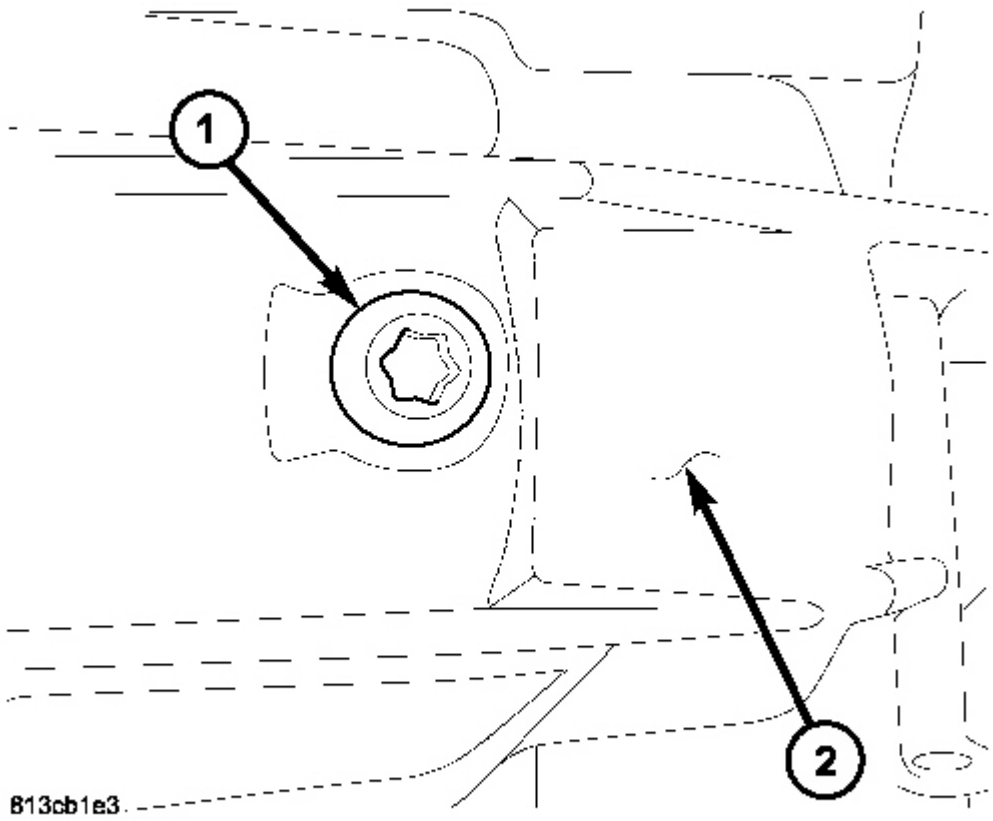

Fig. 51: Identifying Reverse Idler Gear Shaft Bolt & Housing
Courtesy of CHRYSLER LLC

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

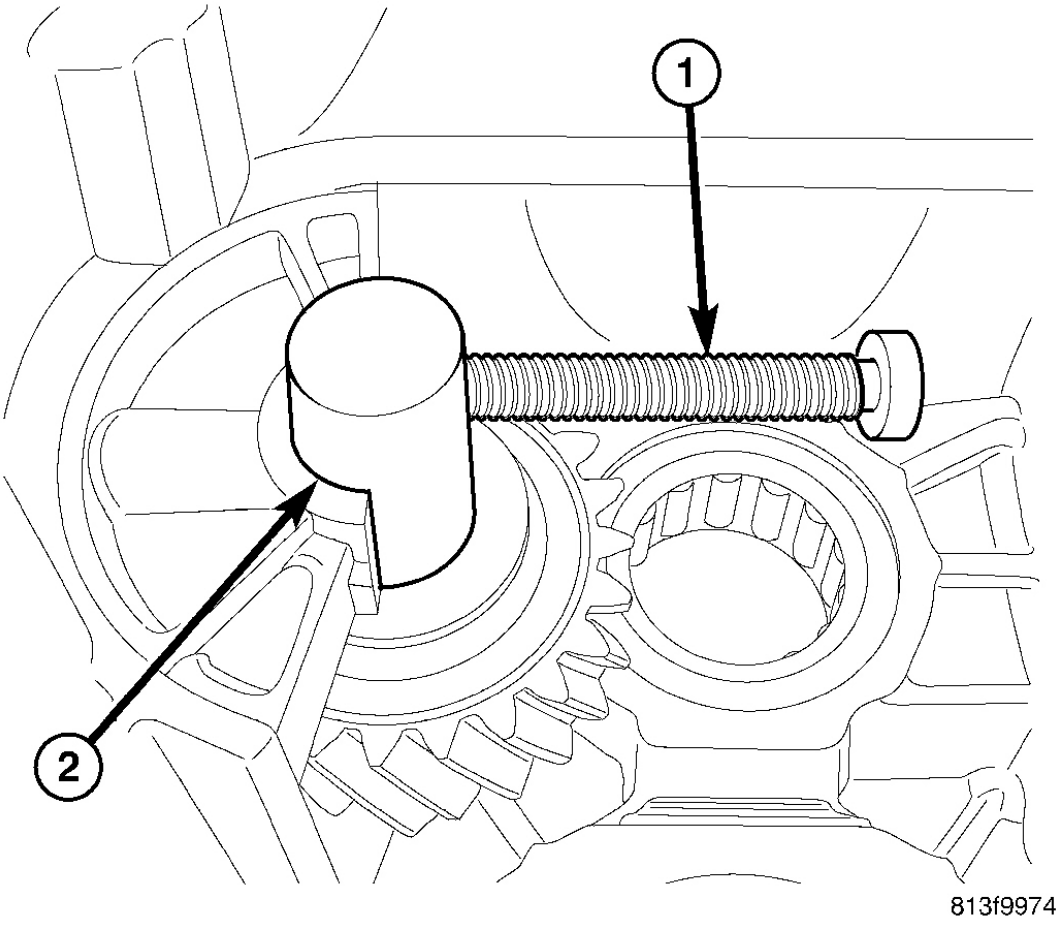

Fig. 52: Identifying Idler Gear Shaft Bolt & Shaft
Courtesy of CHRYSLER LLC

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

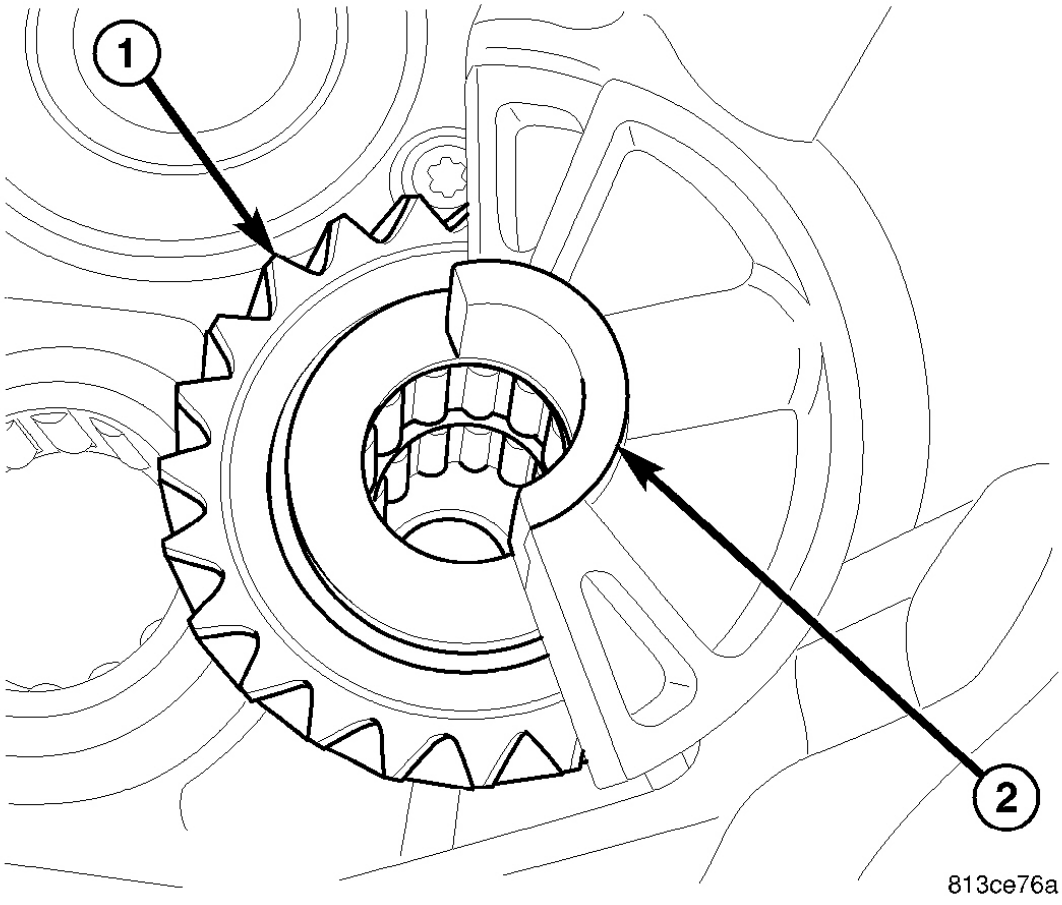

Fig. 53: Identifying Idler Gear & Shaft Support
Courtesy of CHRYSLER LLC

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

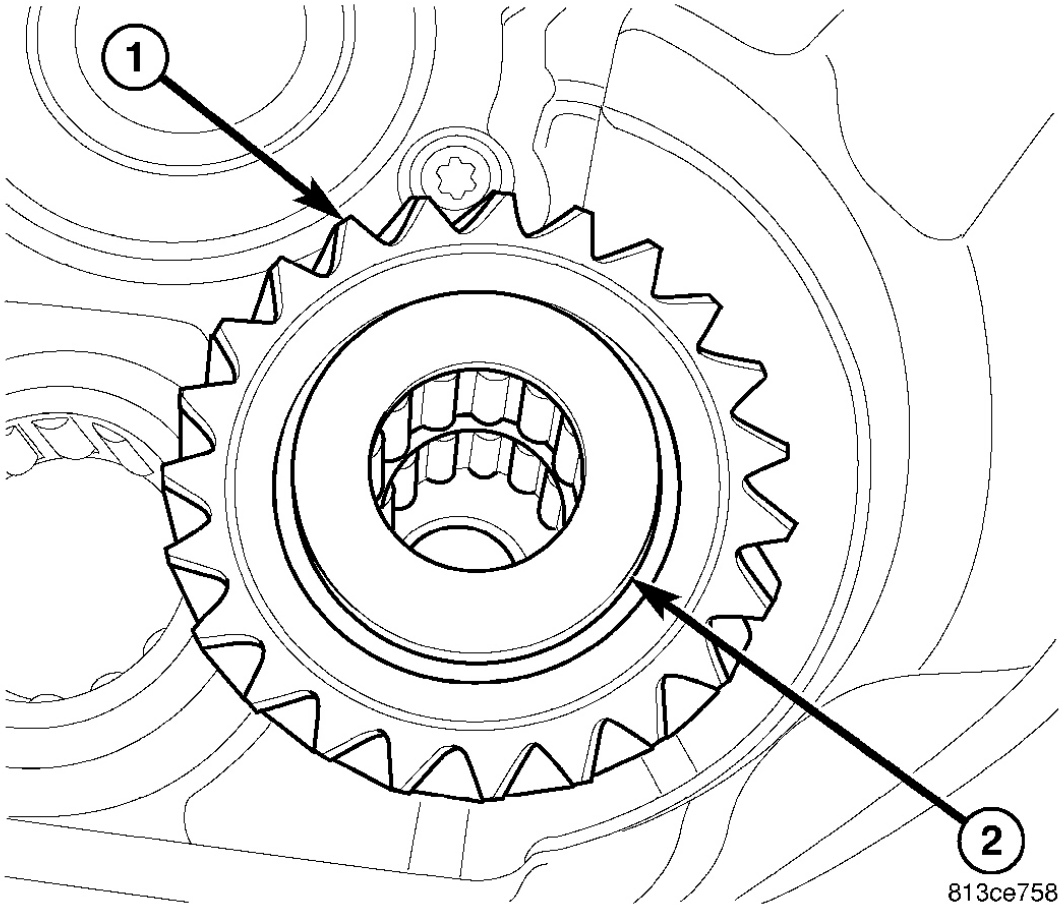

Fig. 54: Identifying Idler Gear & Thrust Washer
Courtesy of CHRYSLER LLC

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

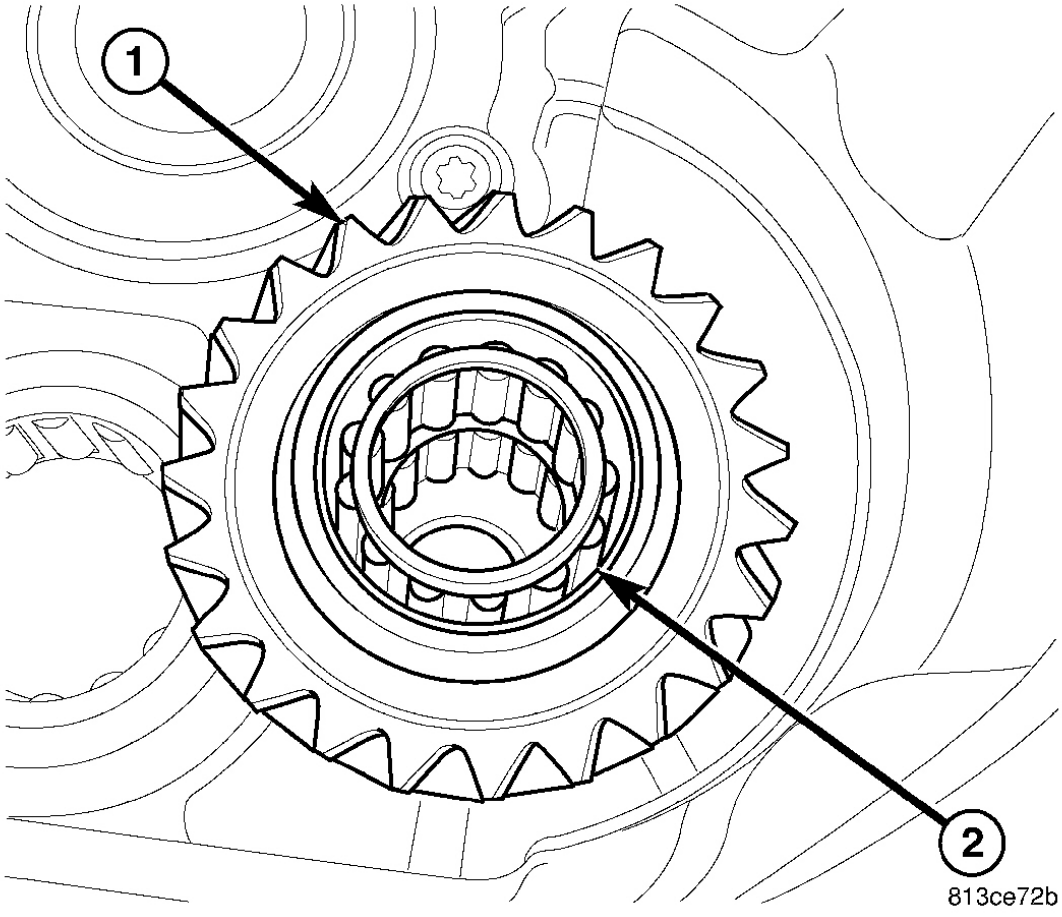

Fig. 55: Identifying Idler Gear & Bearing
Courtesy of CHRYSLER LLC

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

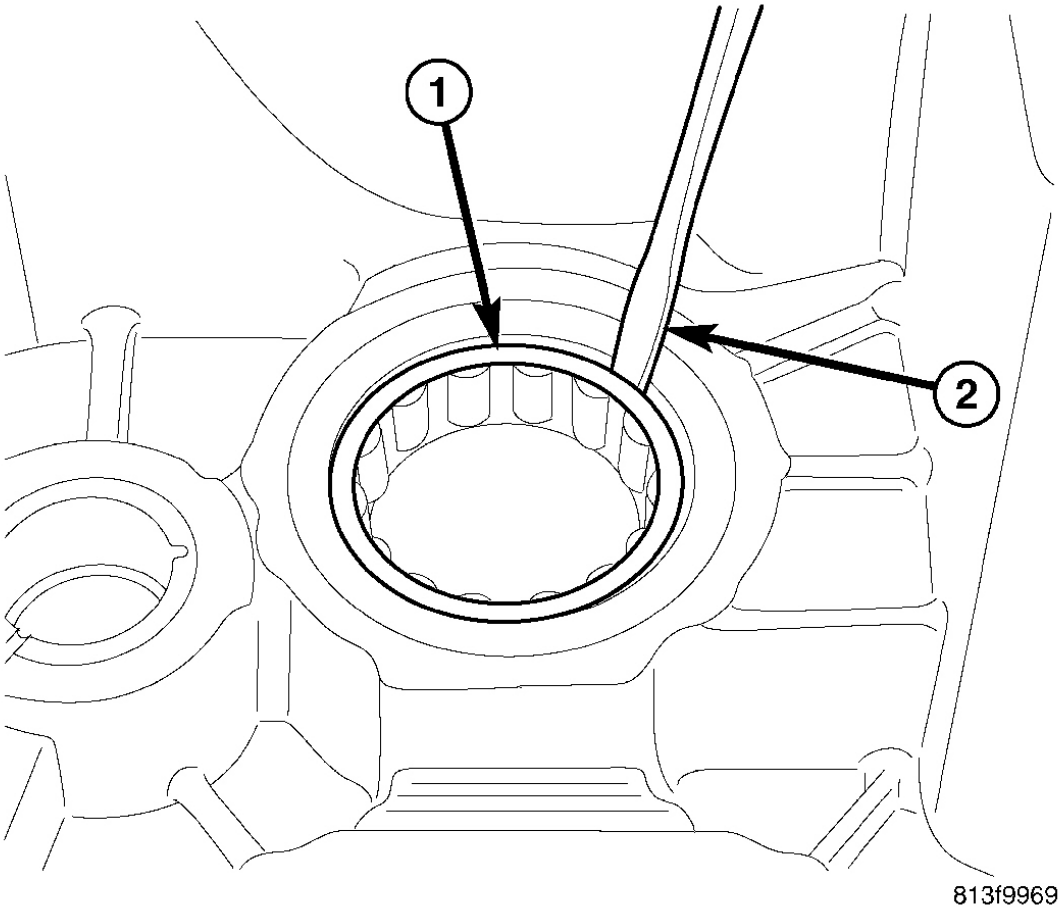

Fig. 56: Identifying Plastic Countershaft Roller Bearing Cage & Screw Driver
Courtesy of CHRYSLER LLC

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

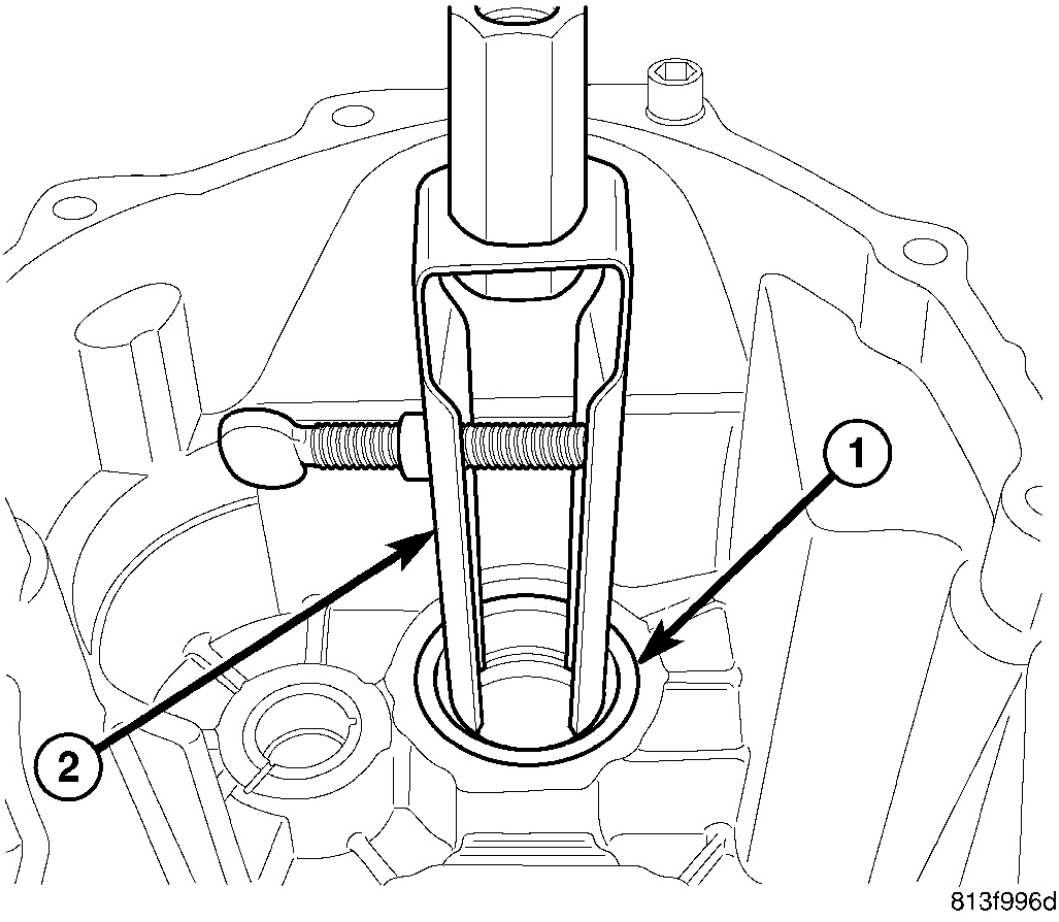

Fig. 57: Identifying Countershaft Roller Bearing Shell & Remover 7794-A
Courtesy of CHRYSLER LLC

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

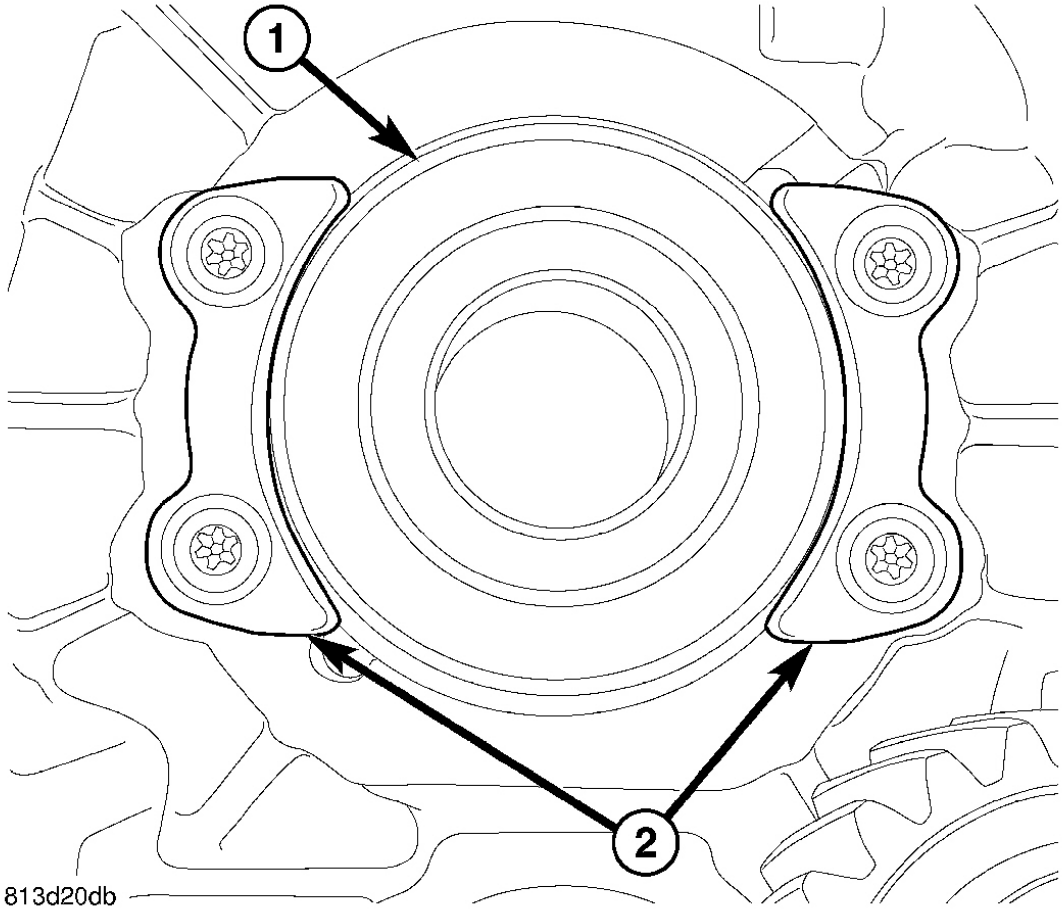

Fig. 58: Identifying Mainshaft Bearing & Retainers
Courtesy of CHRYSLER LLC

8. Remove mainshaft bearing (1) retainer bolts and remove retainers (2).
9. Remove bearing from housing with a hammer and driver.

CLEANING

MANUAL TRANSMISSION - NSG370

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 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.

INSPECTION

MANUAL TRANSMISSION - NSG370

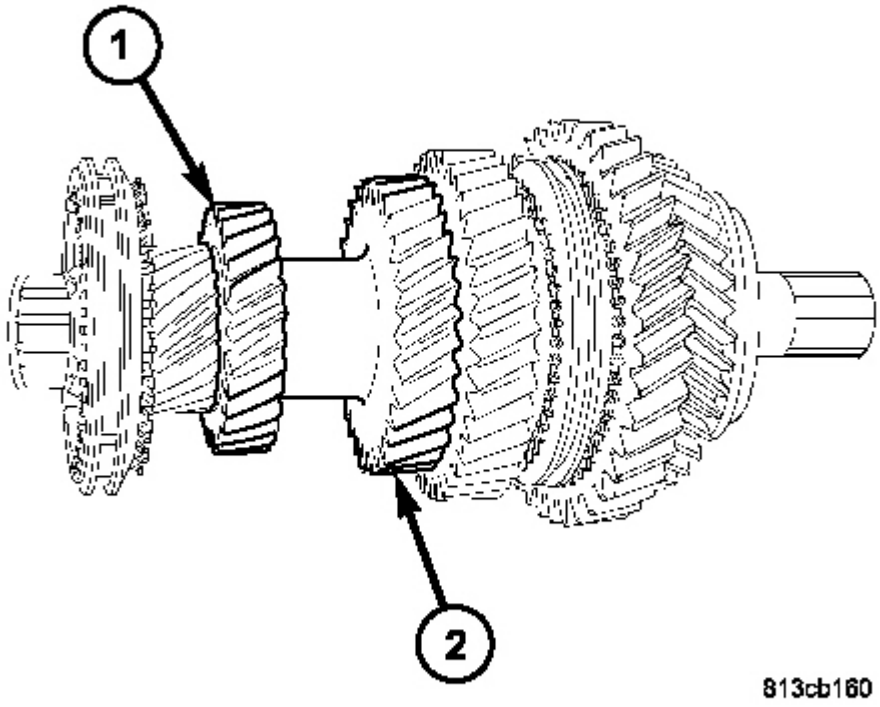

Fig. 59: Identifying Third Gear & Fourth Gear
Courtesy of CHRYSLER LLC

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 ware or flat-spotted.

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

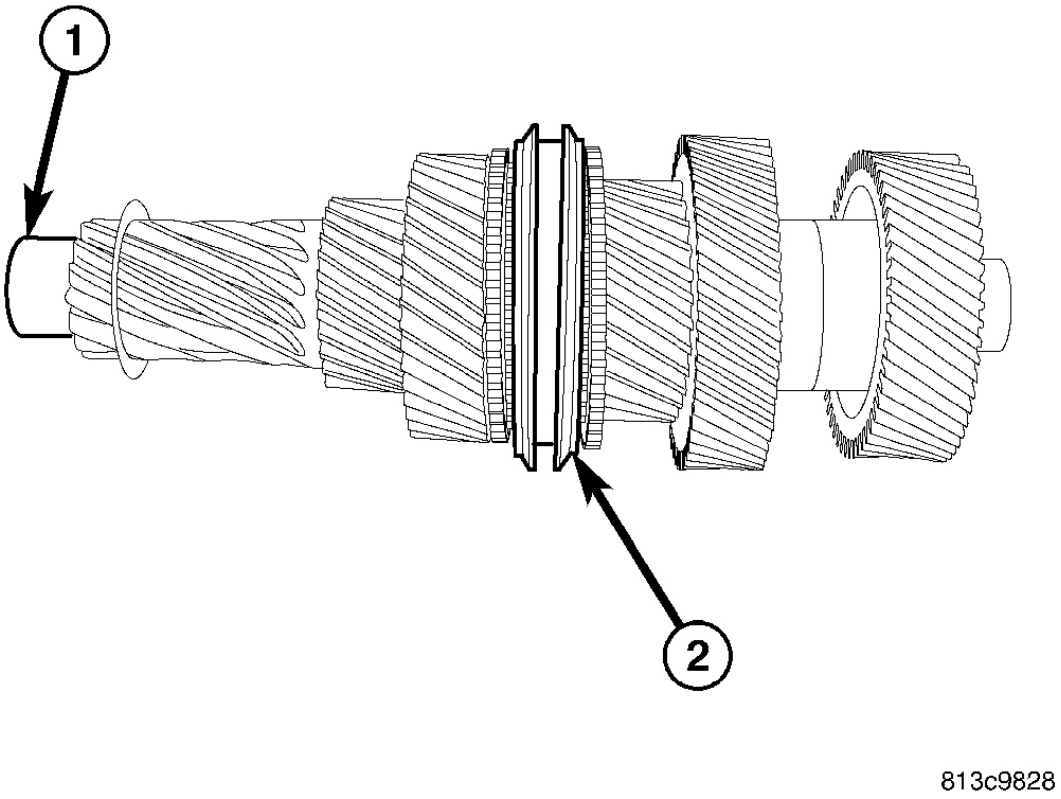

Fig. 60: Inspecting Bearing Surfaces & 3-4 Synchronizer Assembly
Courtesy of CHRYSLER LLC

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

Oil Slinger: Inspect first/reverse oil slinger for cracks.

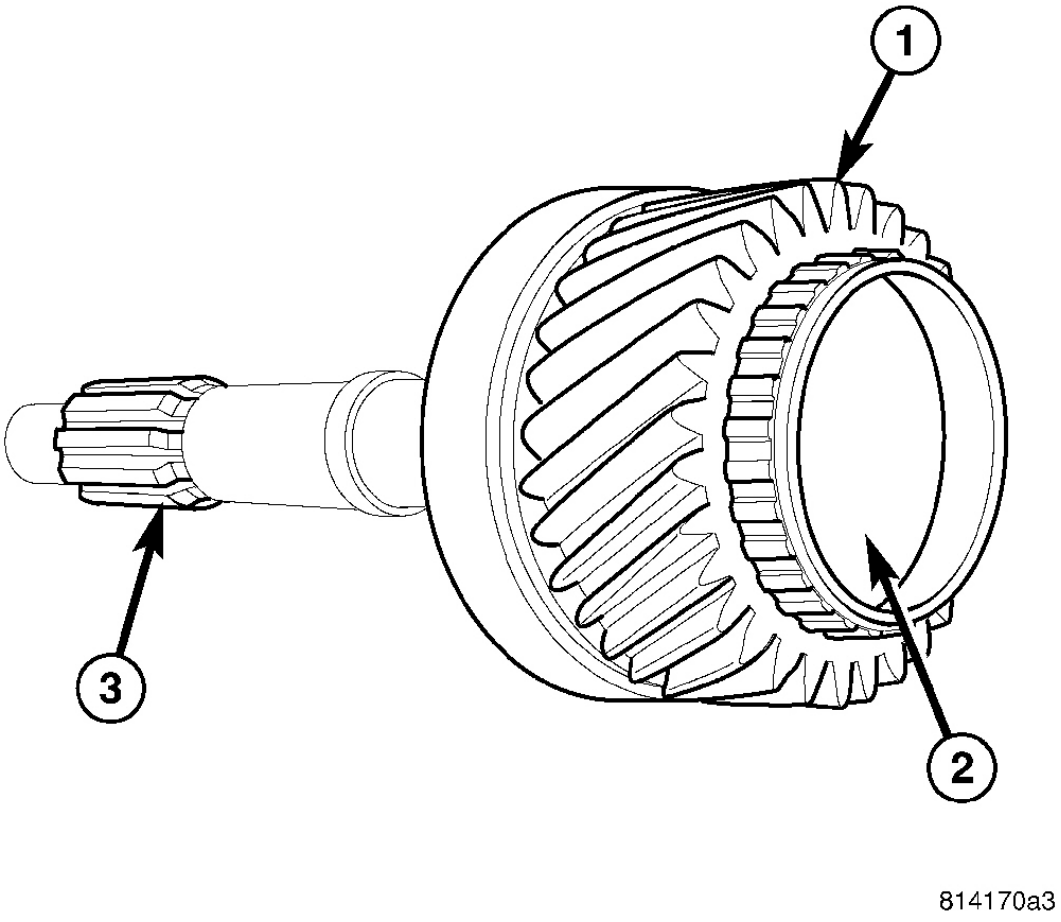

Fig. 61: Inspecting Input Shaft & Bearing Surface For Damage
Courtesy of CHRYSLER LLC

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

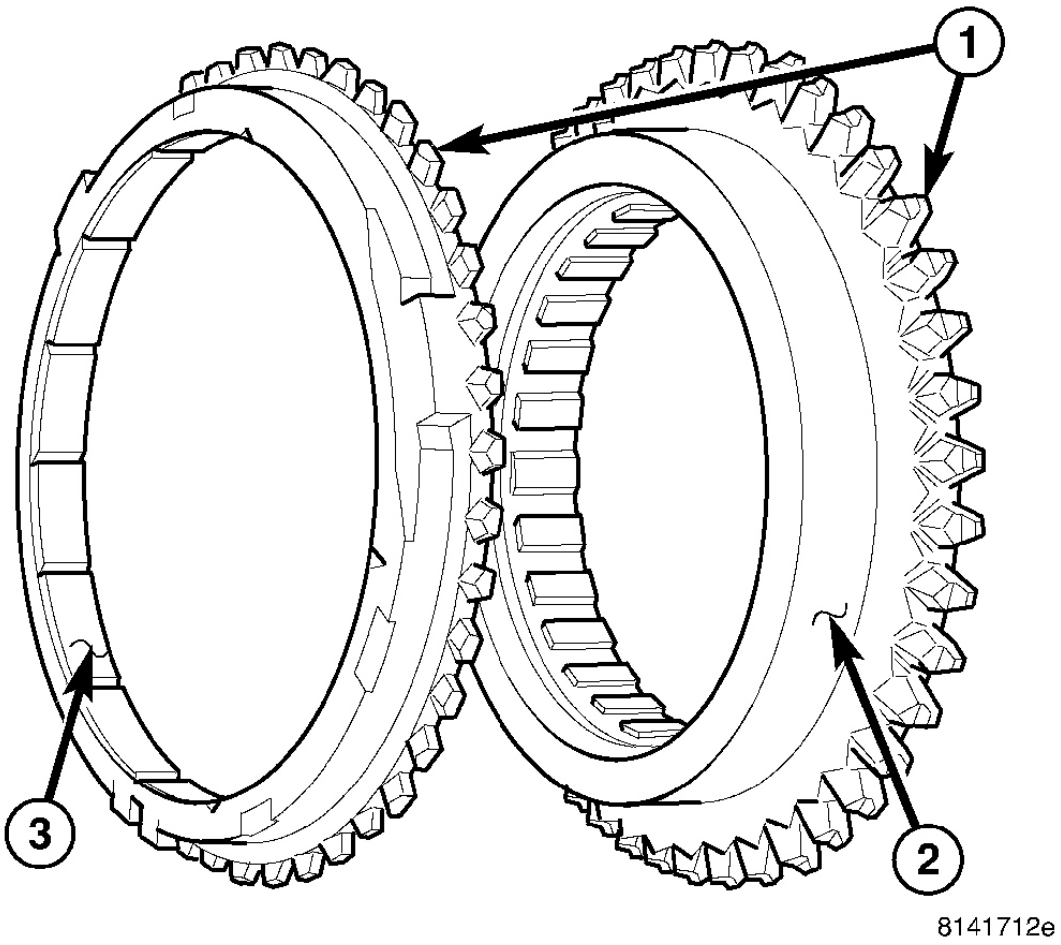

Fig. 62: Inspecting Synchronizer Rings
Courtesy of CHRYSLER LLC

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

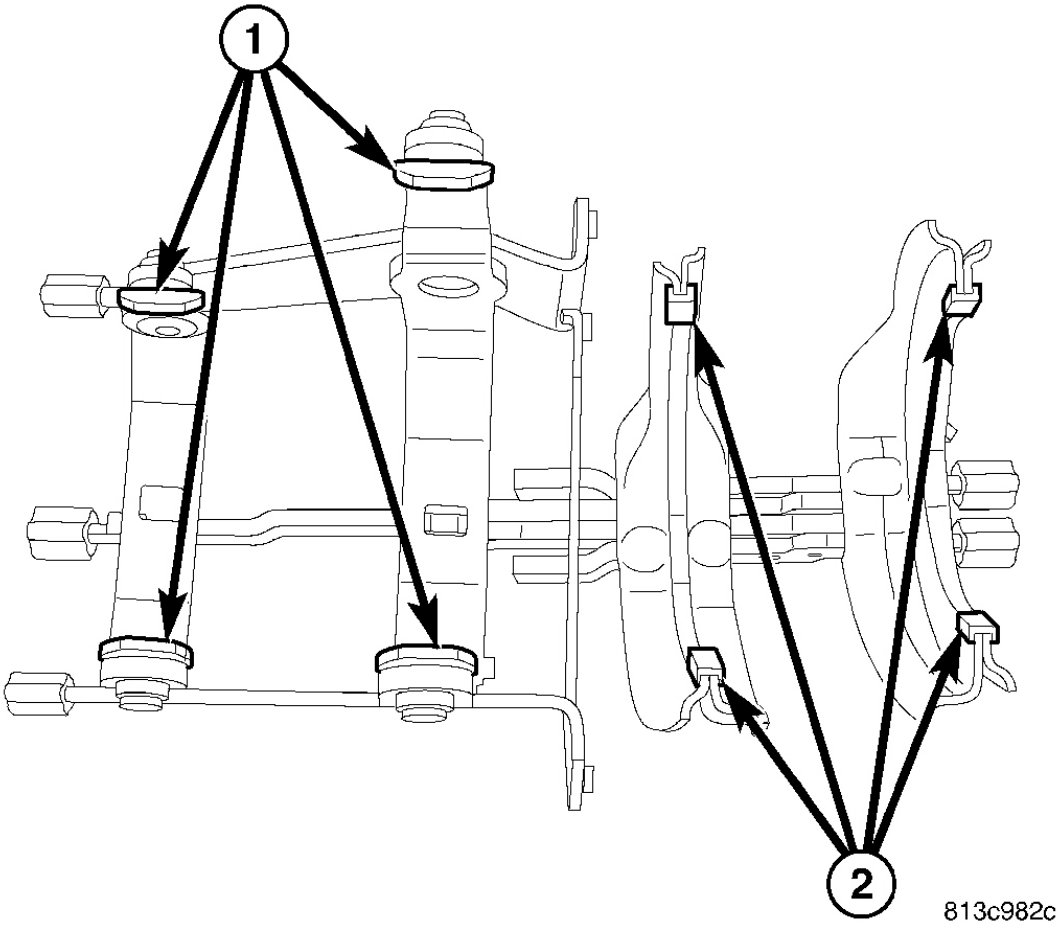

Fig. 63: Inspecting Shift Fork Shoes & Pads
Courtesy of CHRYSLER LLC

Shift forks: Inspect shift forks and shoes (1) 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.

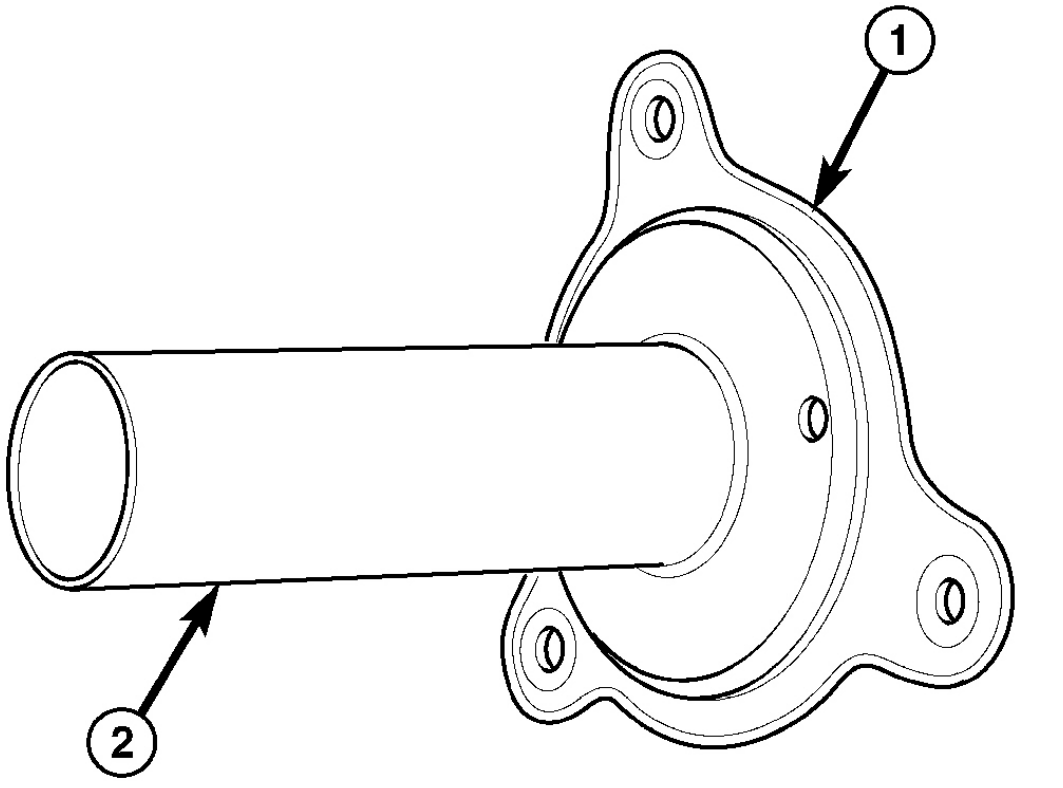

Fig. 64: Inspecting Shaft Retainer & Release Bearing Slide Surface
Courtesy of CHRYSLER LLC

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

ASSEMBLY

MANUAL TRANSMISSION - NSG370

MAINSHAFT

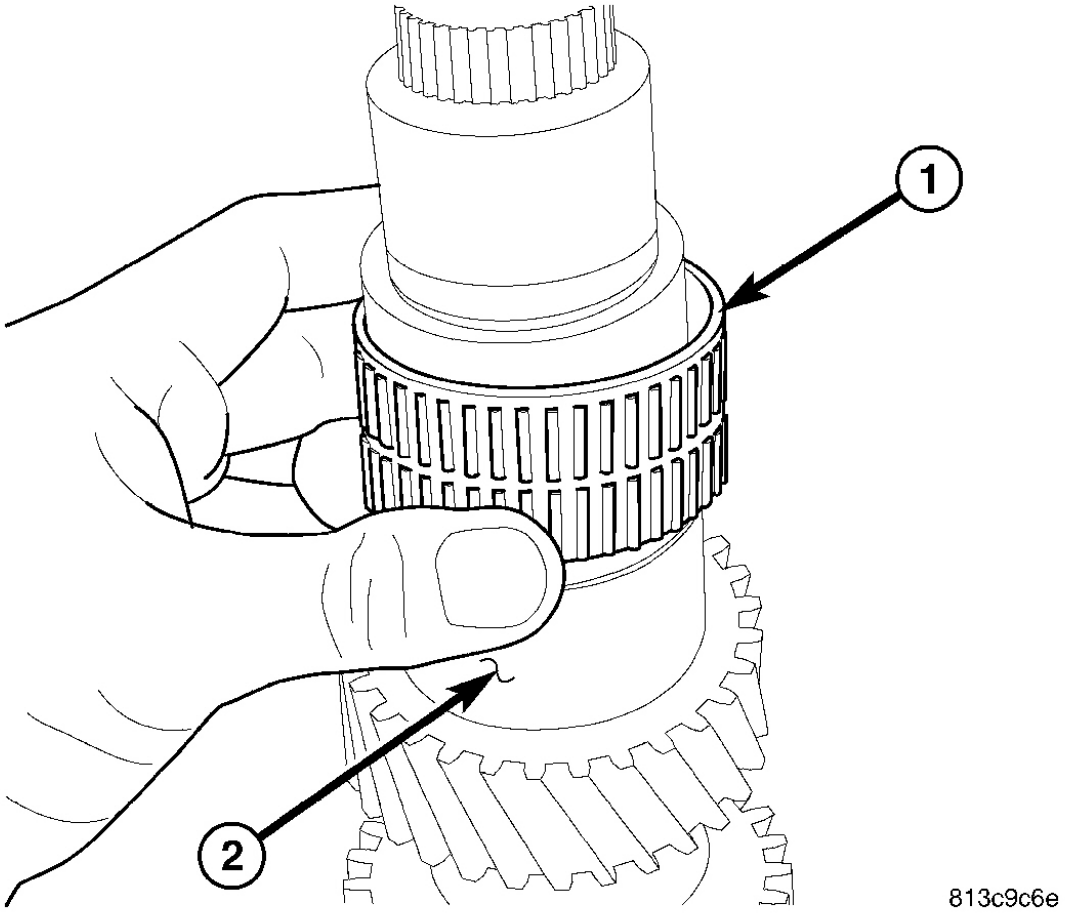

Fig. 65: Installing Second Gear Bearing On Mainshaft
Courtesy of CHRYSLER LLC

1. Place mainshaft in Fixture 9648 mounted in a vise.
2. Install second gear bearing (1) on mainshaft (2).

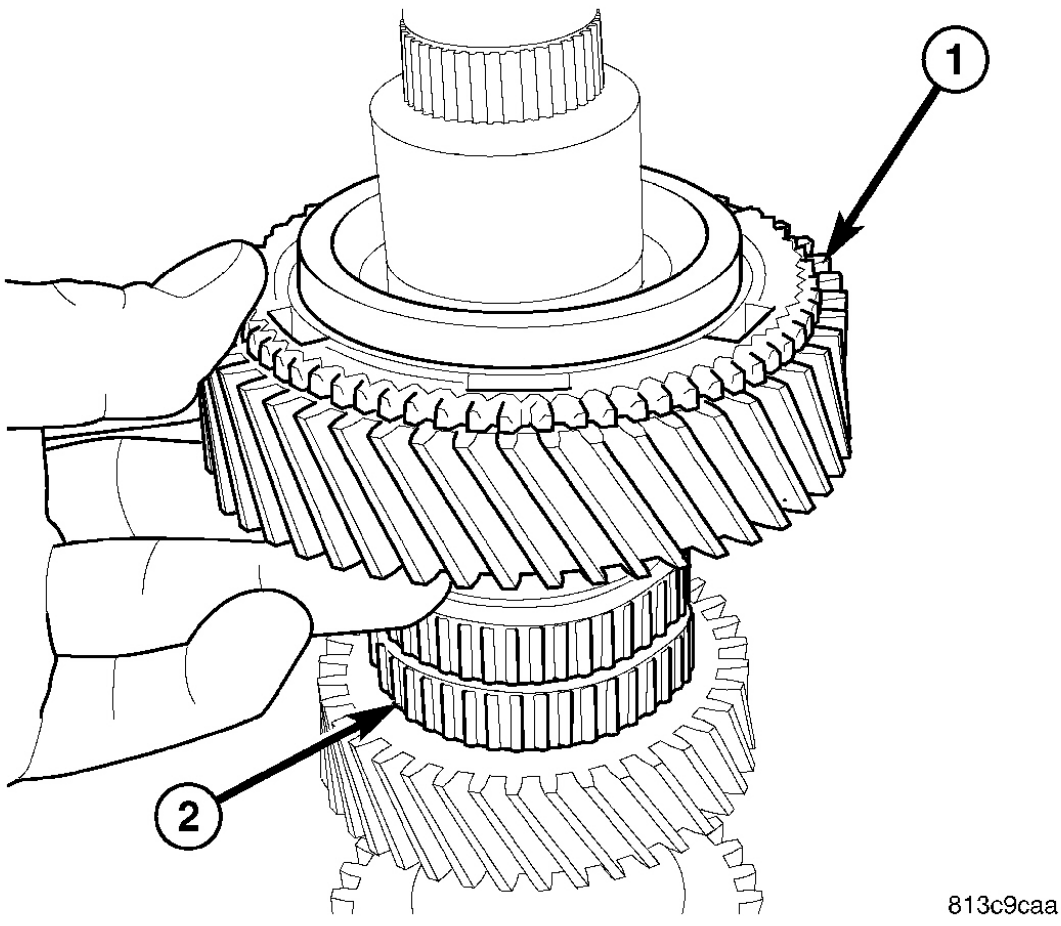

Fig. 66: Installing Second Gear And Bearing On Mainshaft
Courtesy of CHRYSLER LLC

3. Install second gear (1) and bearing (2) on mainshaft.

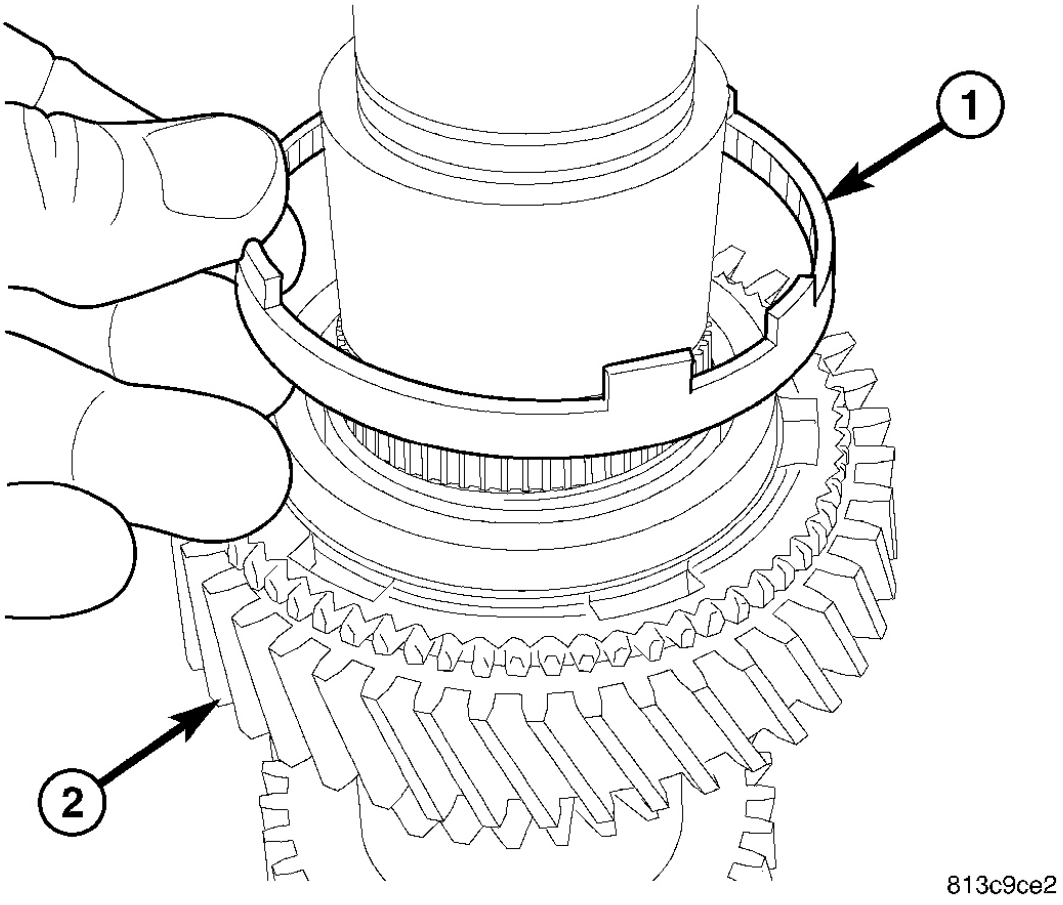

Fig. 67: Installing Inner Synchronizer Friction Ring On Second Gear
Courtesy of CHRYSLER LLC

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

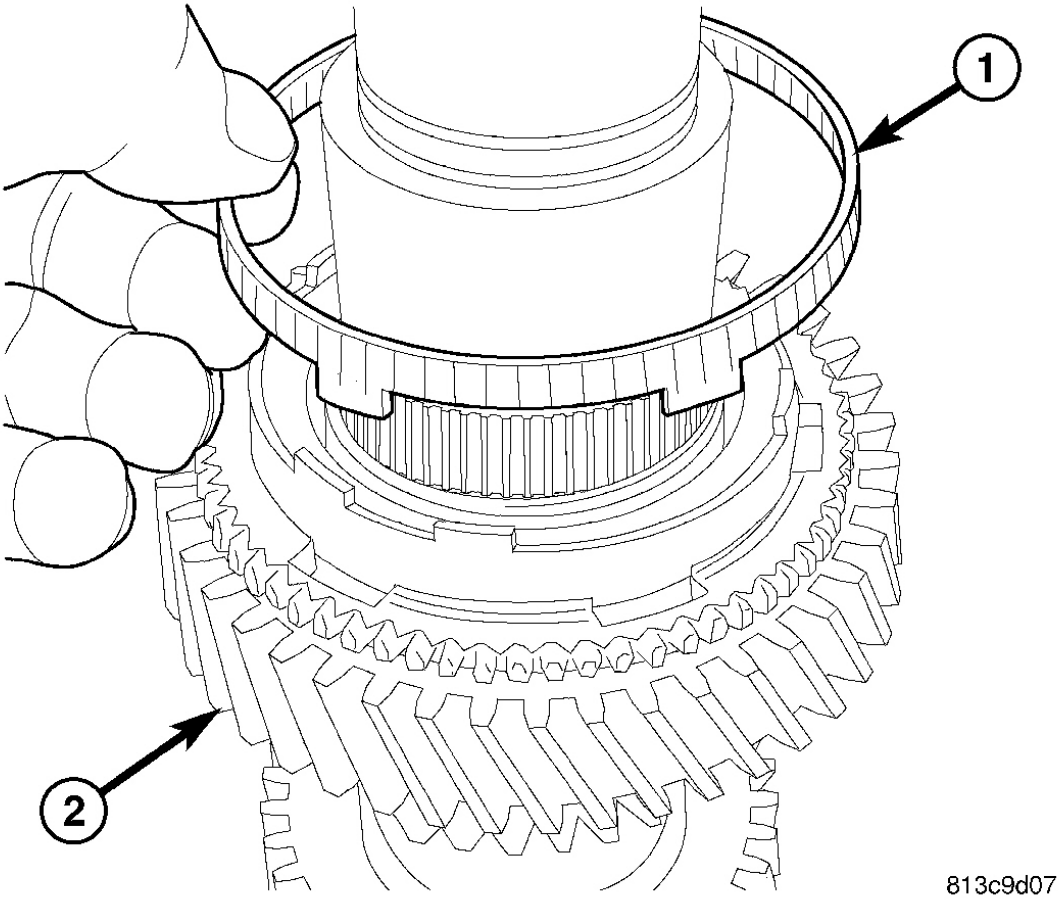

Fig. 68: Installing Outer Synchronizer Friction Ring On Second Gear
Courtesy of CHRYSLER LLC

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

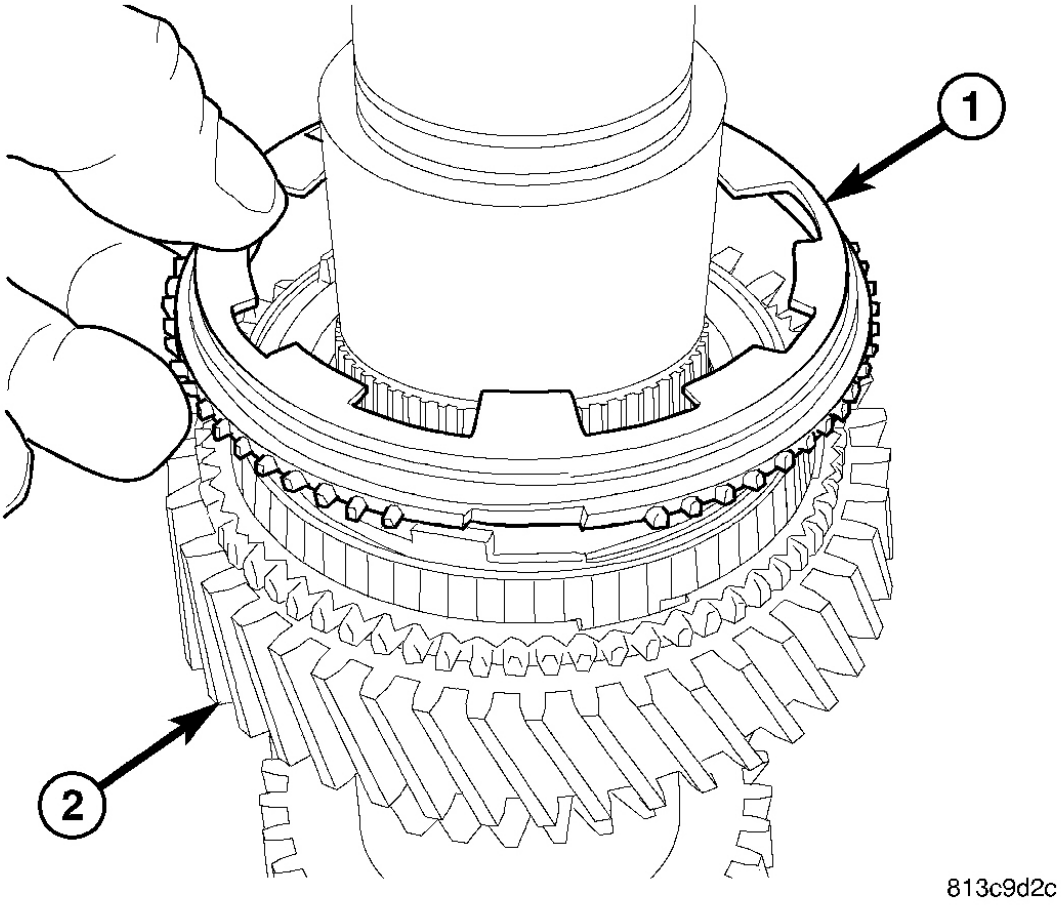

Fig. 69: Installing Synchronizer Blocker Ring On Second Gear
Courtesy of CHRYSLER LLC

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

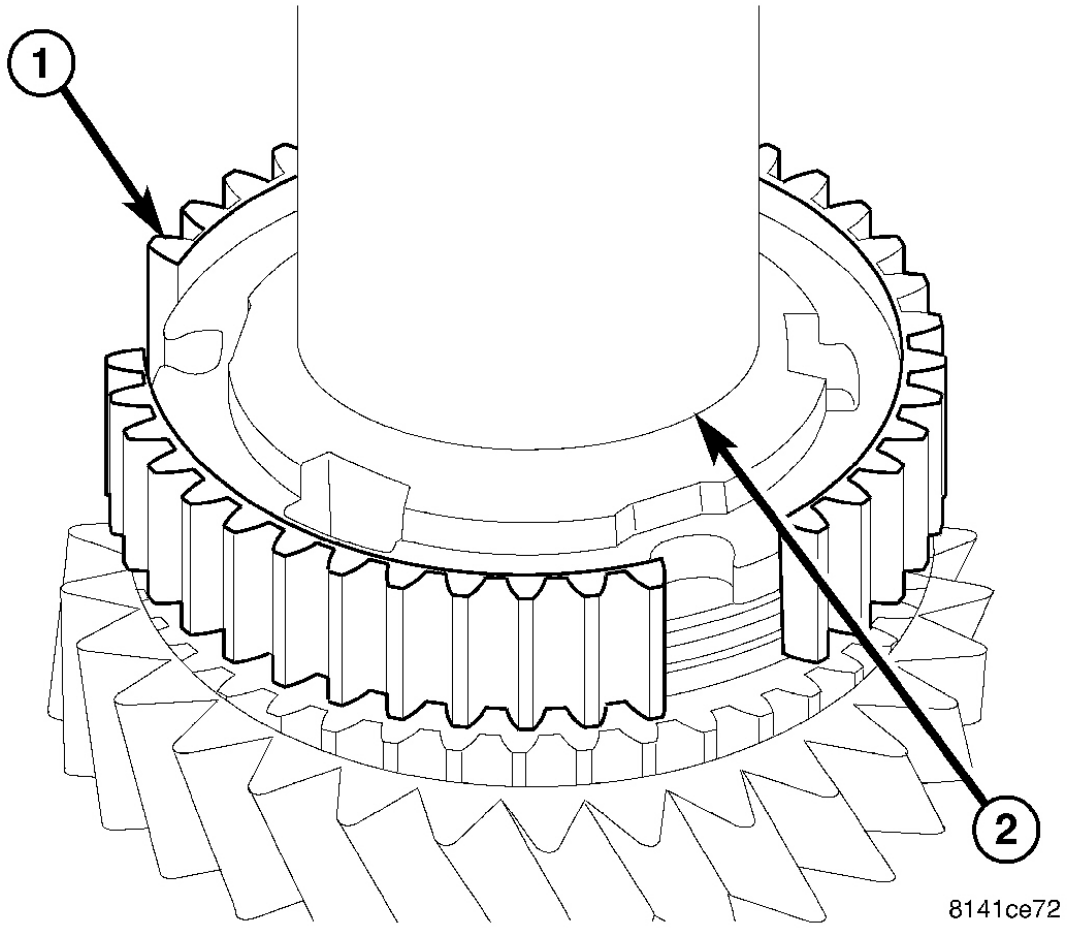

Fig. 70: Installing 1-2 Synchronizer Hub With Installer 8228 And Press
Courtesy of CHRYSLER LLC

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

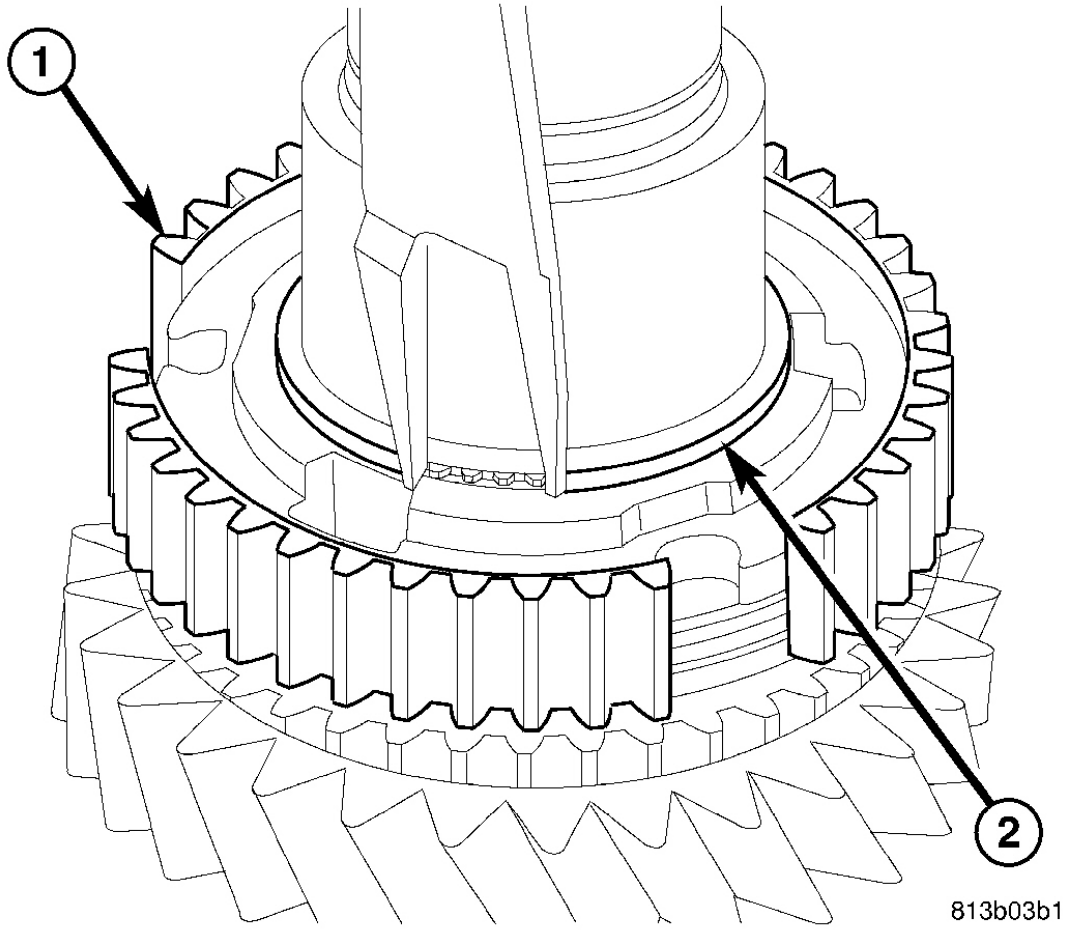

Fig. 71: Identifying 1-2 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

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

NOTE: Reuse original snap ring or thickest ring that will fit.

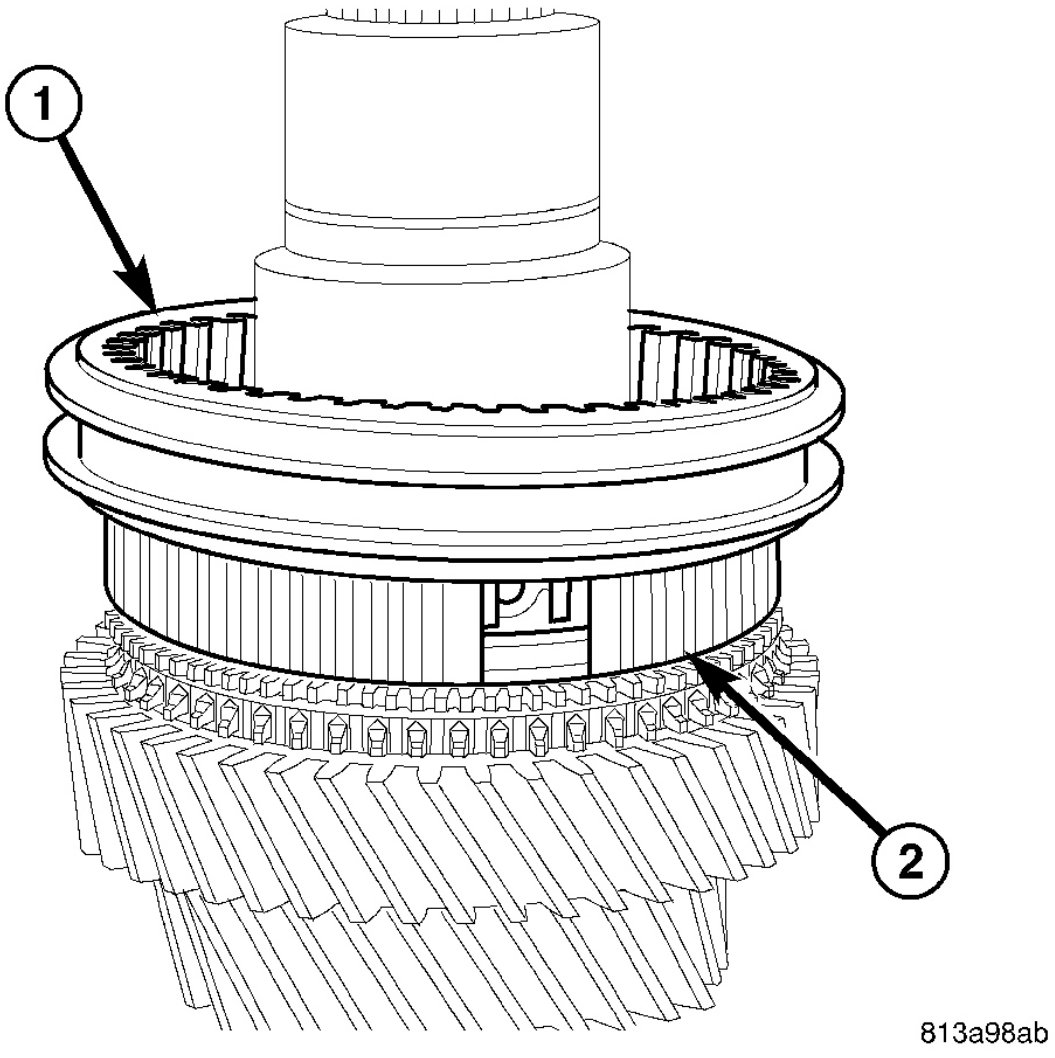

Fig. 72: Identifying 1-2 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

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

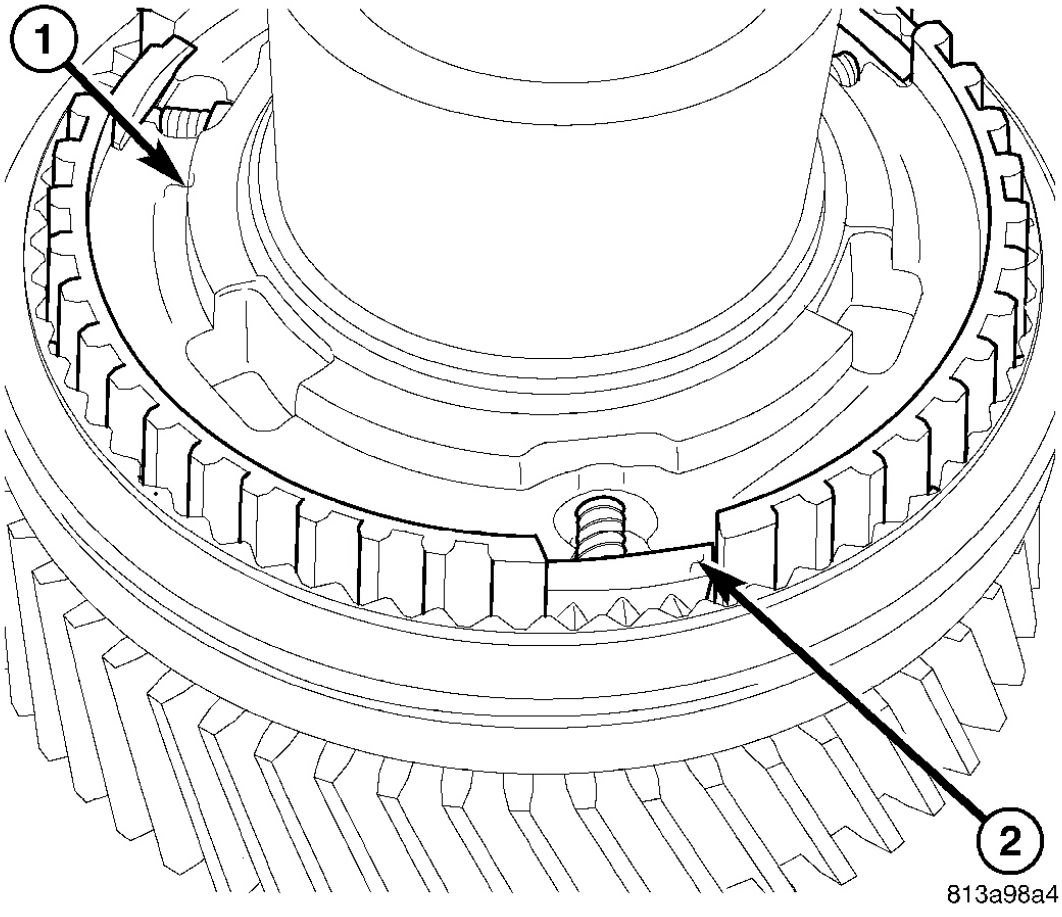

Fig. 73: Identifying Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

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

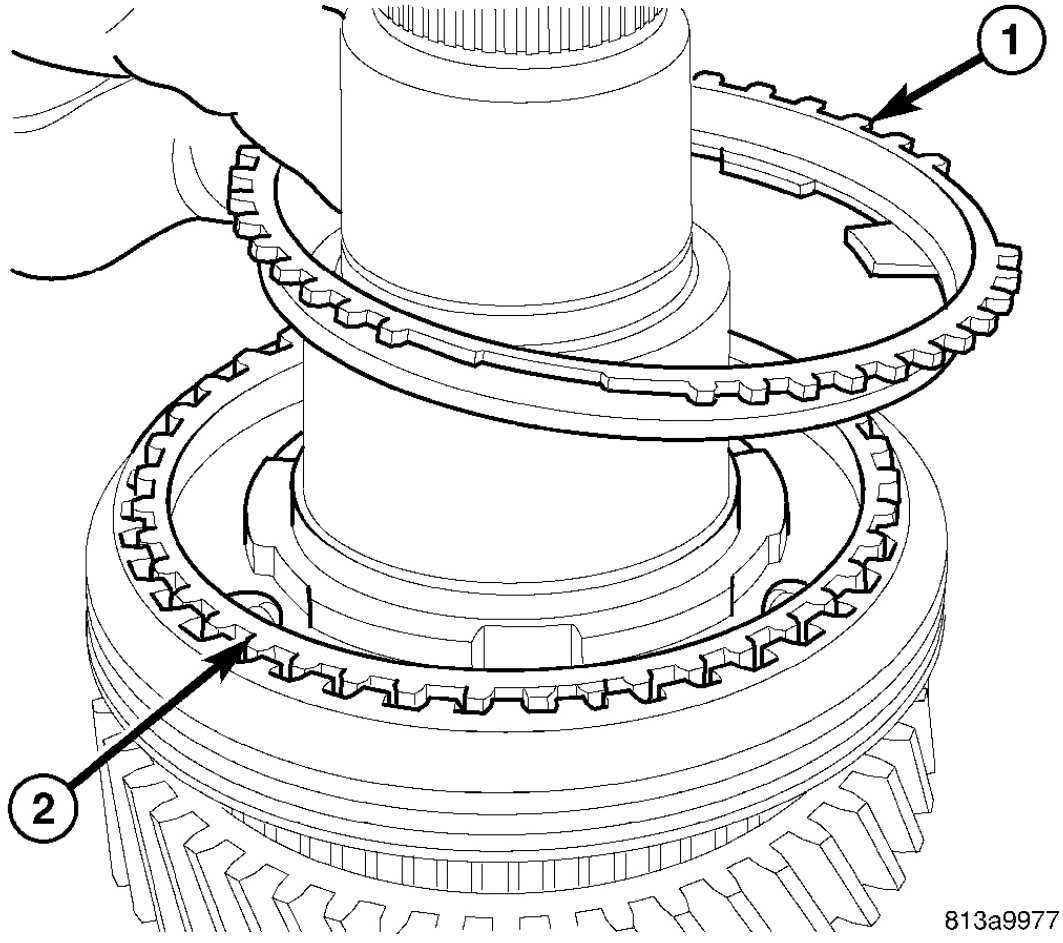

Fig. 74: Installing First Gear Blocker Ring Into Synchronizer Hub
Courtesy of CHRYSLER LLC

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

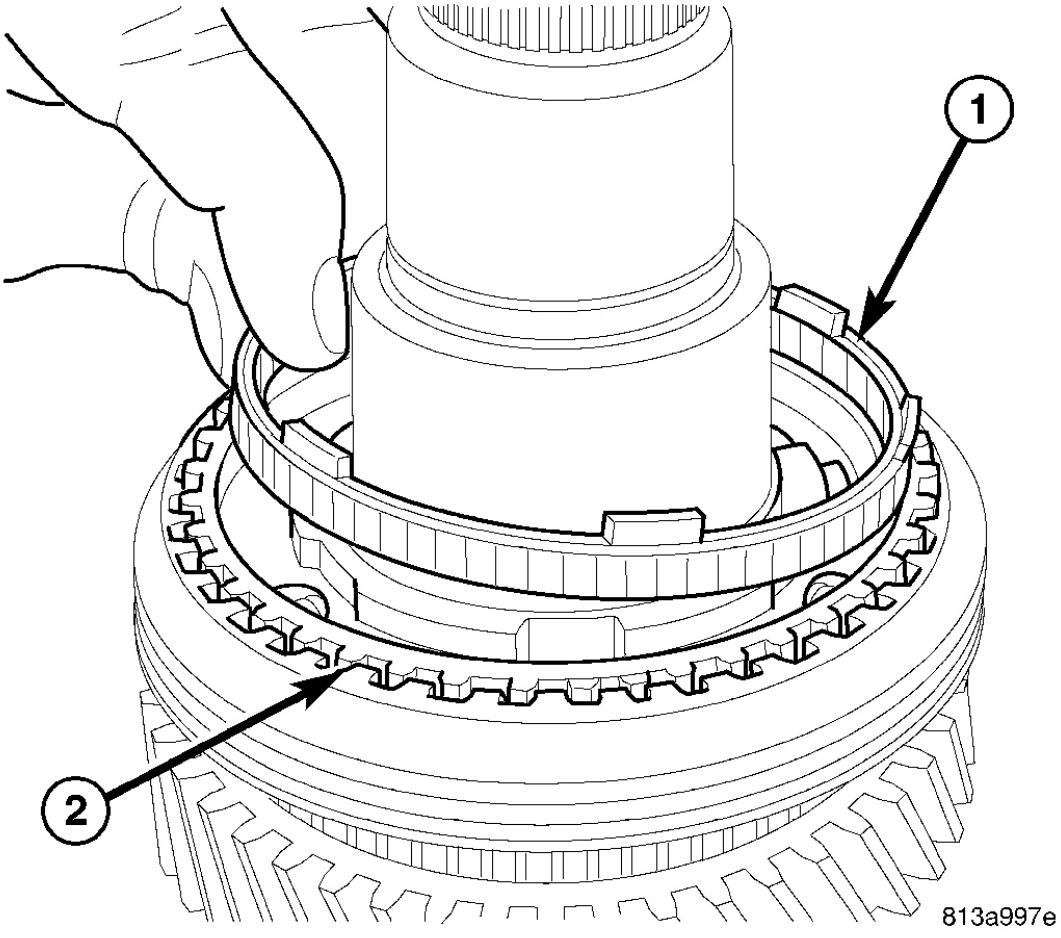

Fig. 75: Installing First Gear Outer Friction Ring Into Synchronizer Hub
Courtesy of CHRYSLER LLC

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

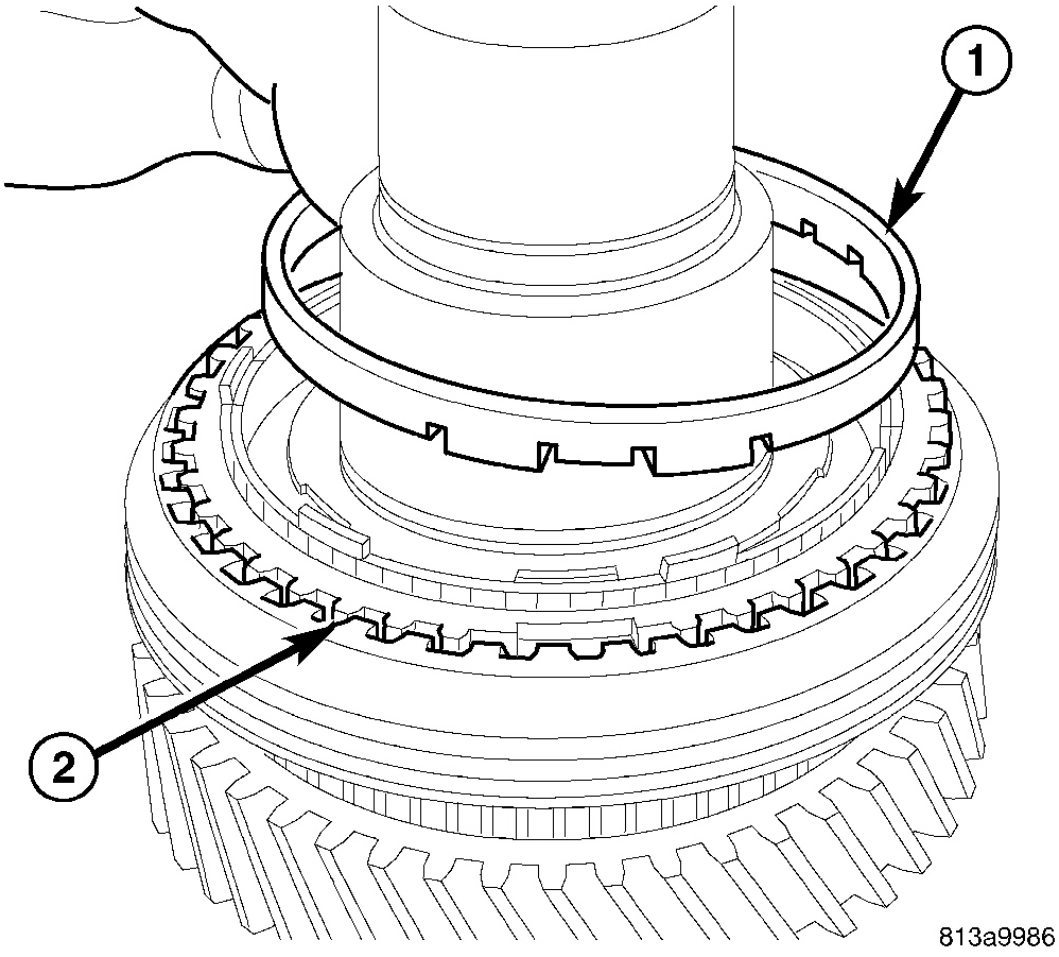

Fig. 76: Installing First Gear Inner Friction Ring Into Synchronizer Hub
Courtesy of CHRYSLER LLC

13. Install first gear inner friction ring (1) into synchronizer hub (2).

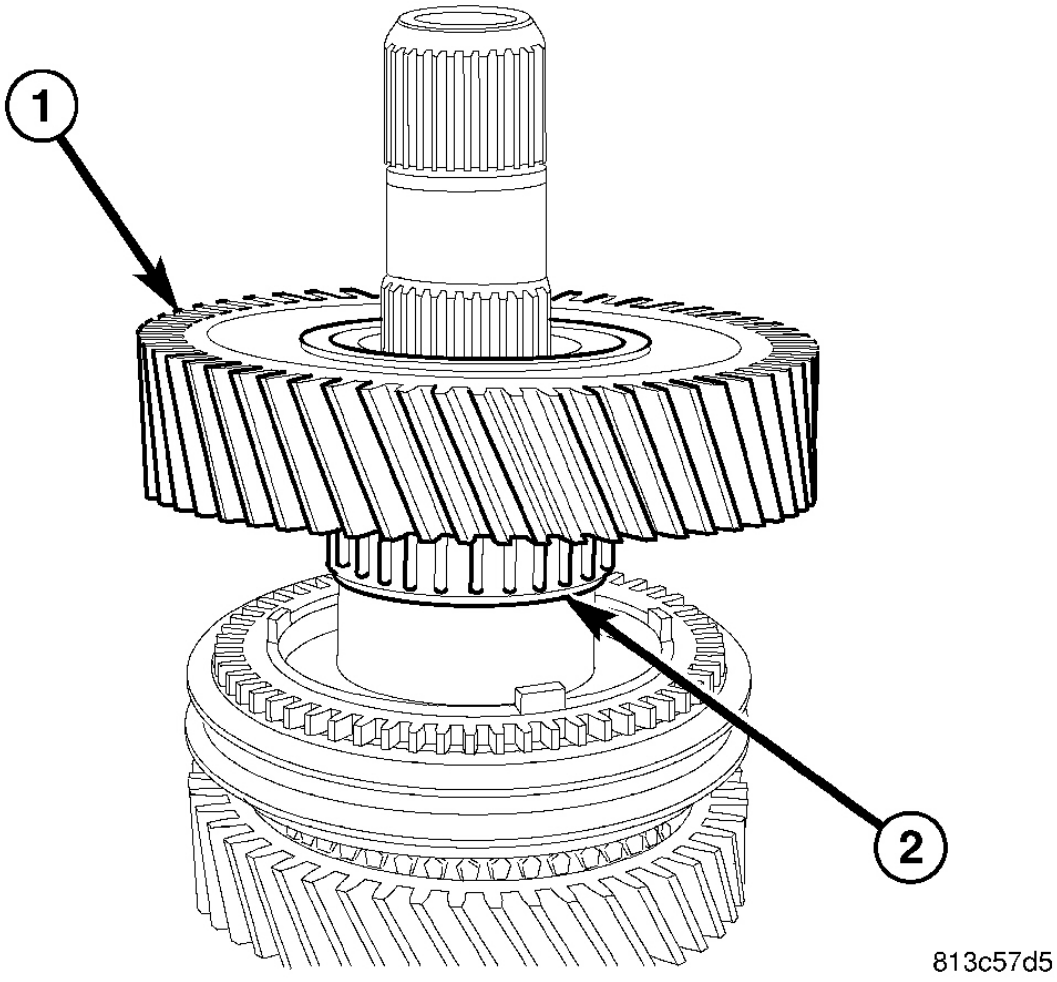

Fig. 77: 1St Gear & Bearing
Courtesy of CHRYSLER LLC

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

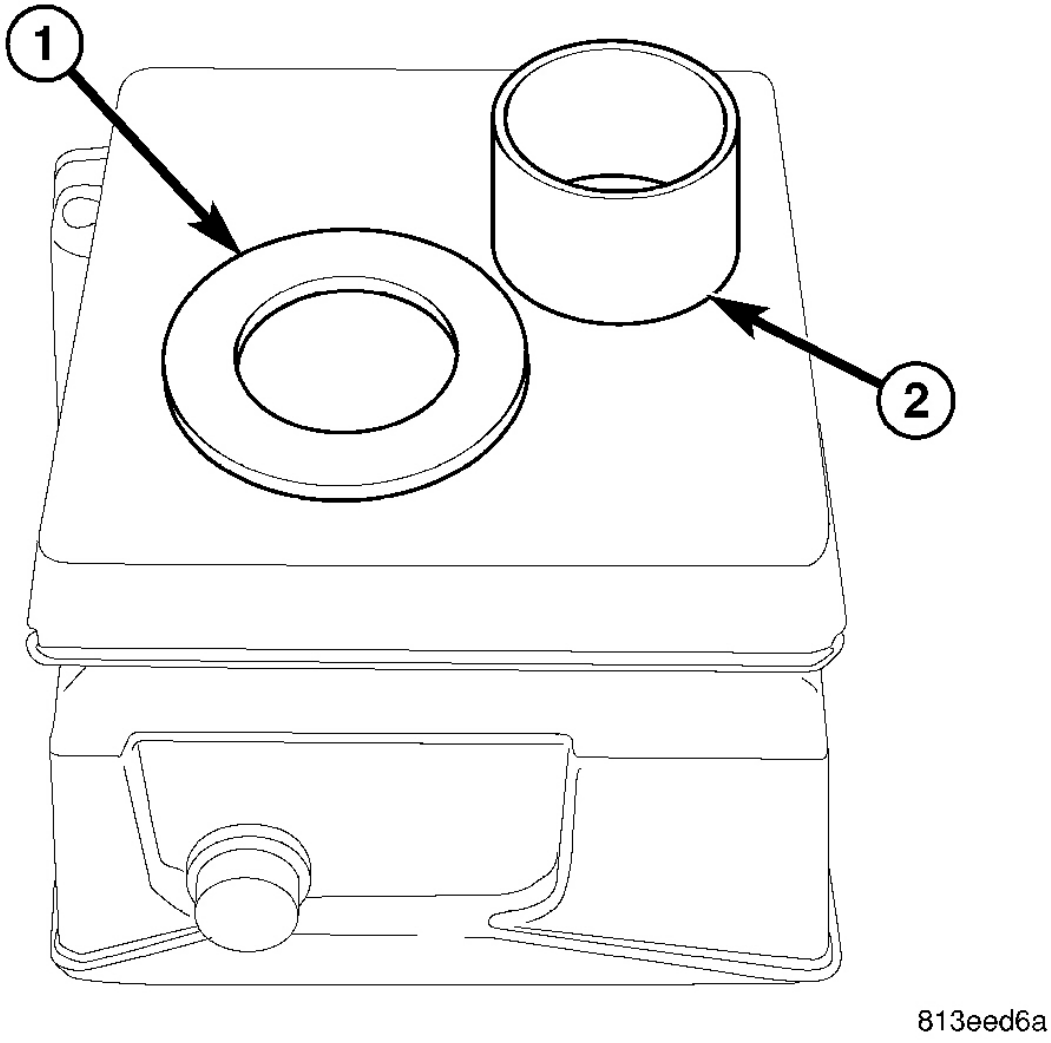

Fig. 78: First Gear Thrust Washer & Reverse Gear Bearing Race
Courtesy of CHRYSLER LLC

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 assemble first gear thrust washer (1) and reverse gear bearing race (2). Use only a bearing heater/hot plate and follow manufacture's 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.

15. Heat first gear thrust washer (1) and reverse gear bearing race (2) with bearing heater to maximum of 177 Celsius (350°).

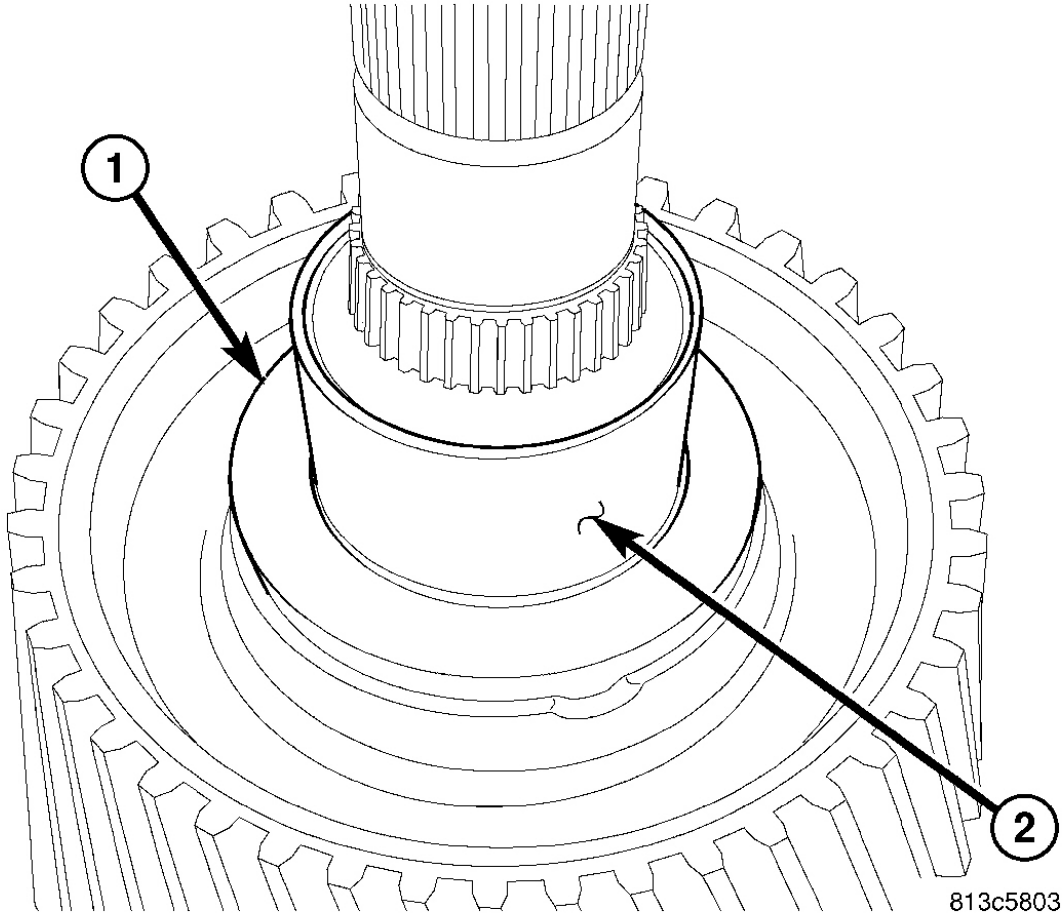

Fig. 79: First Gear Thrust Washer & Reverse Gear Bearing Race
Courtesy of CHRYSLER LLC

16. Using welding gloves or tongs, install first gear thrust washer (1) then reverse gear bearing race (2).

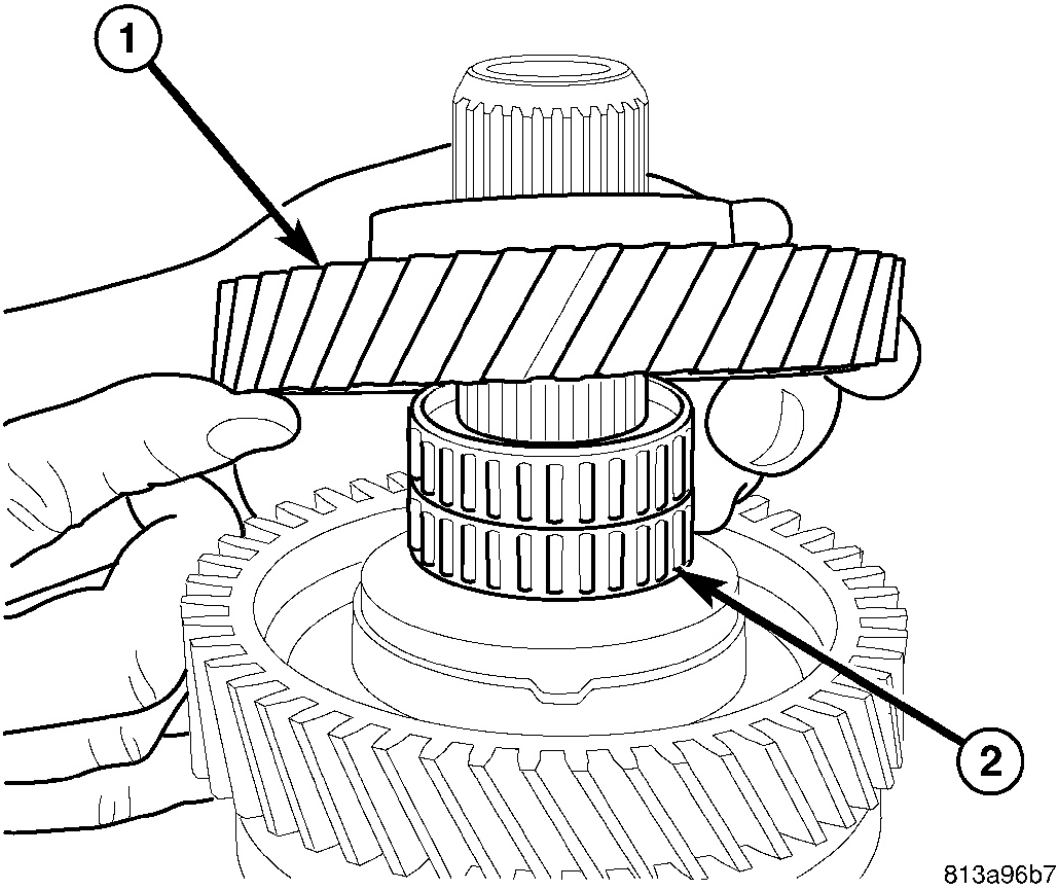

Fig. 80: Identifying Reverse Gear & Bearing
Courtesy of CHRYSLER LLC

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

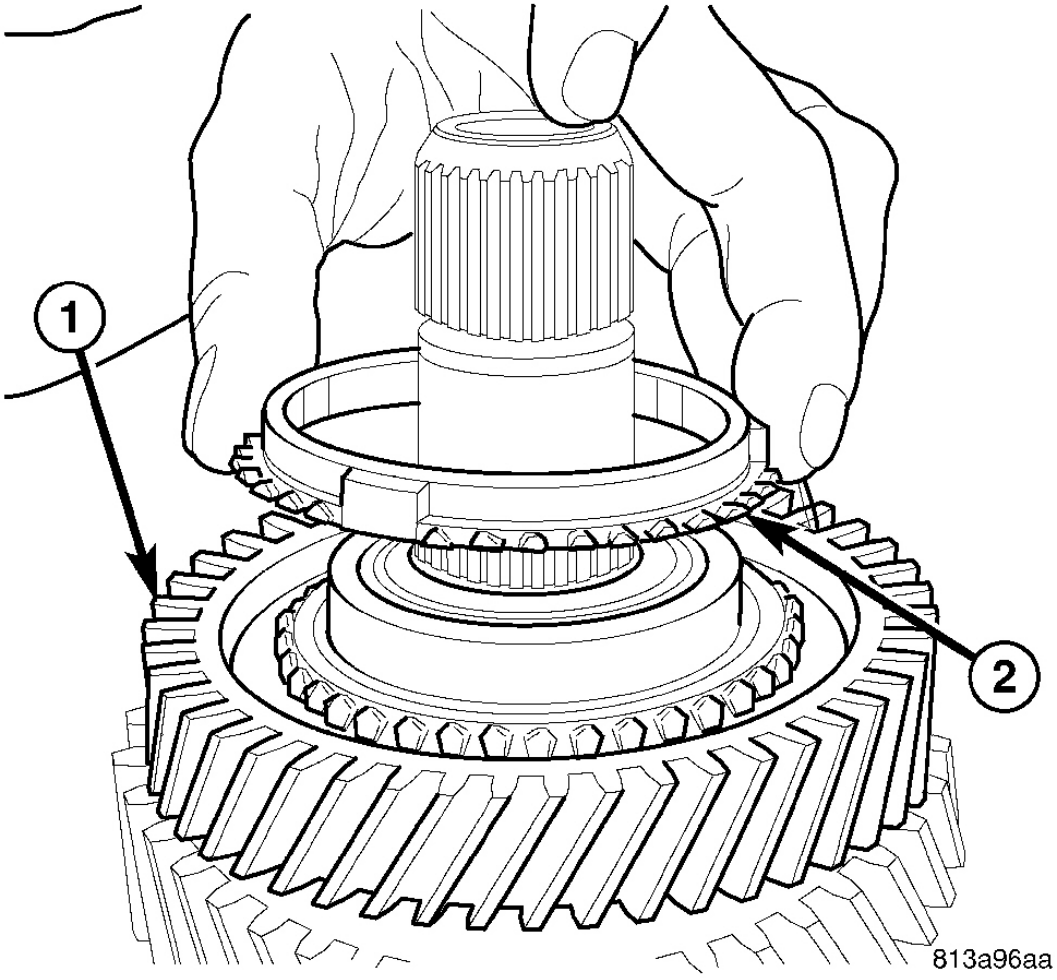

Fig. 81: Identifying Reverse Gear & Synchronizer Ring
Courtesy of CHRYSLER LLC

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

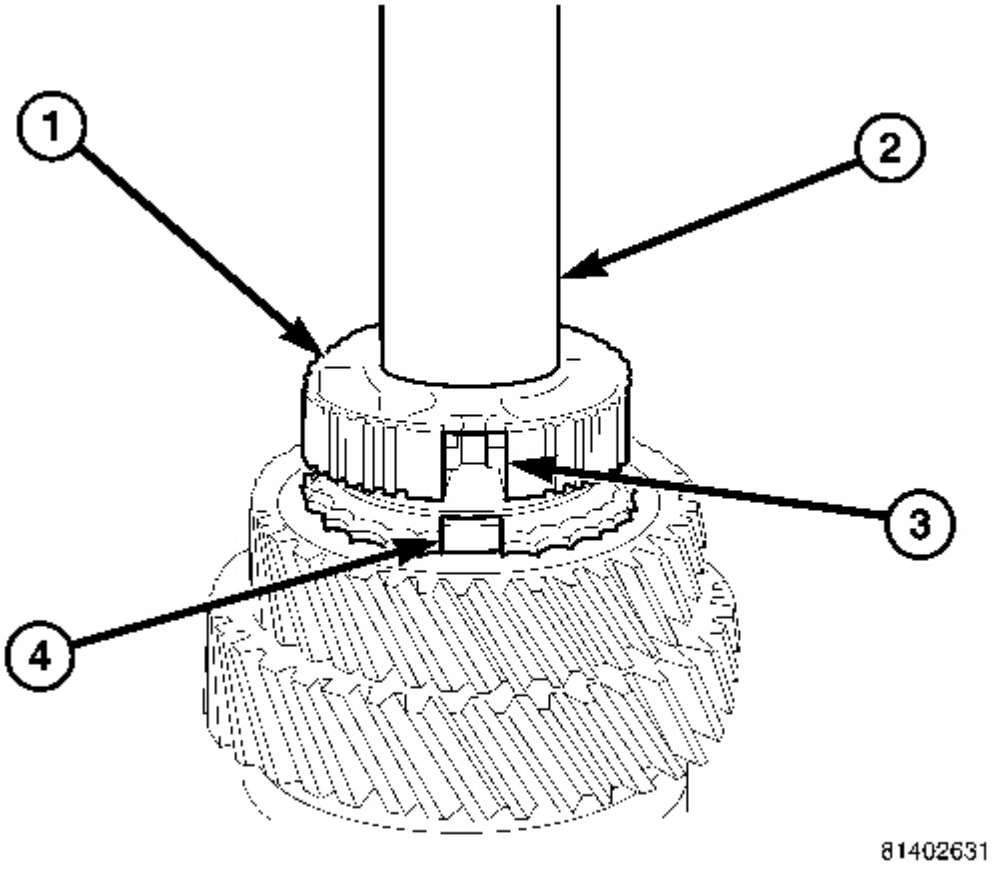

Fig. 82: Identifying Reverse Gear Synchronizer Hub, Installer W-262, Hub Detent Opening & Friction Ring
Courtesy of CHRYSLER LLC

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) lugs.

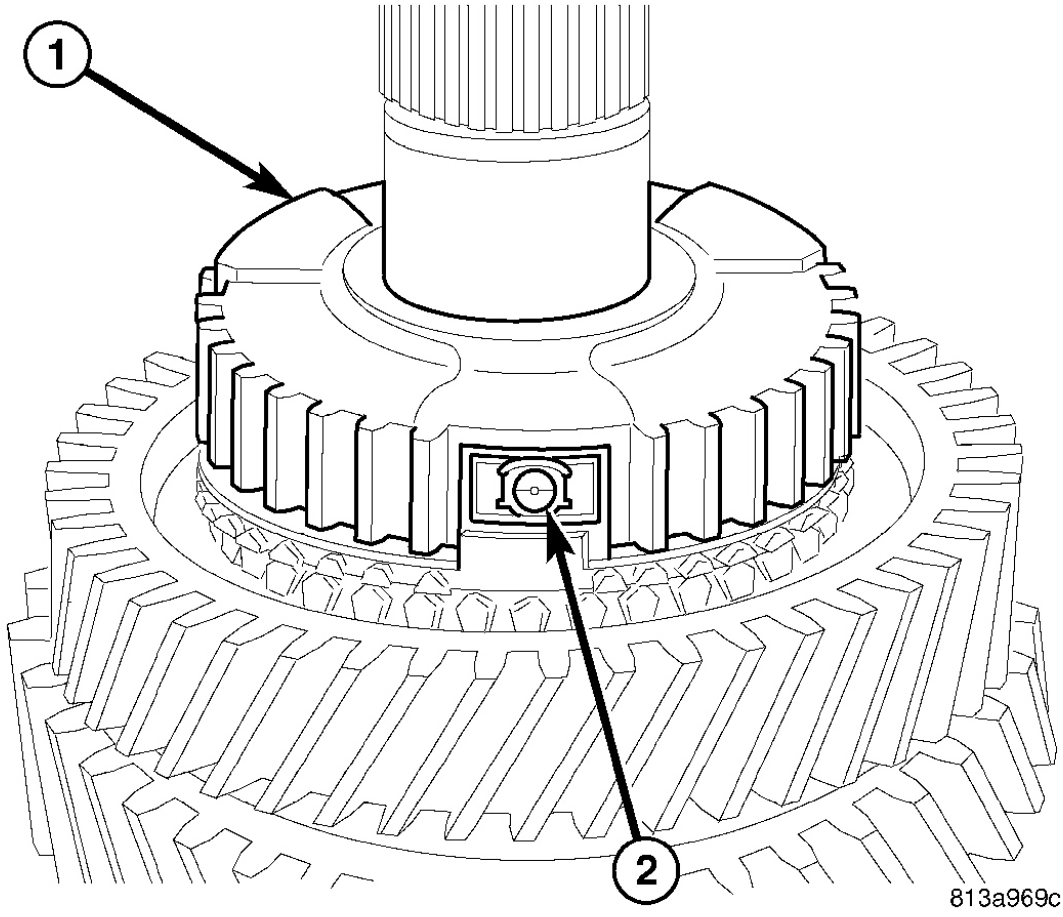

Fig. 83: Identifying Reverse Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

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

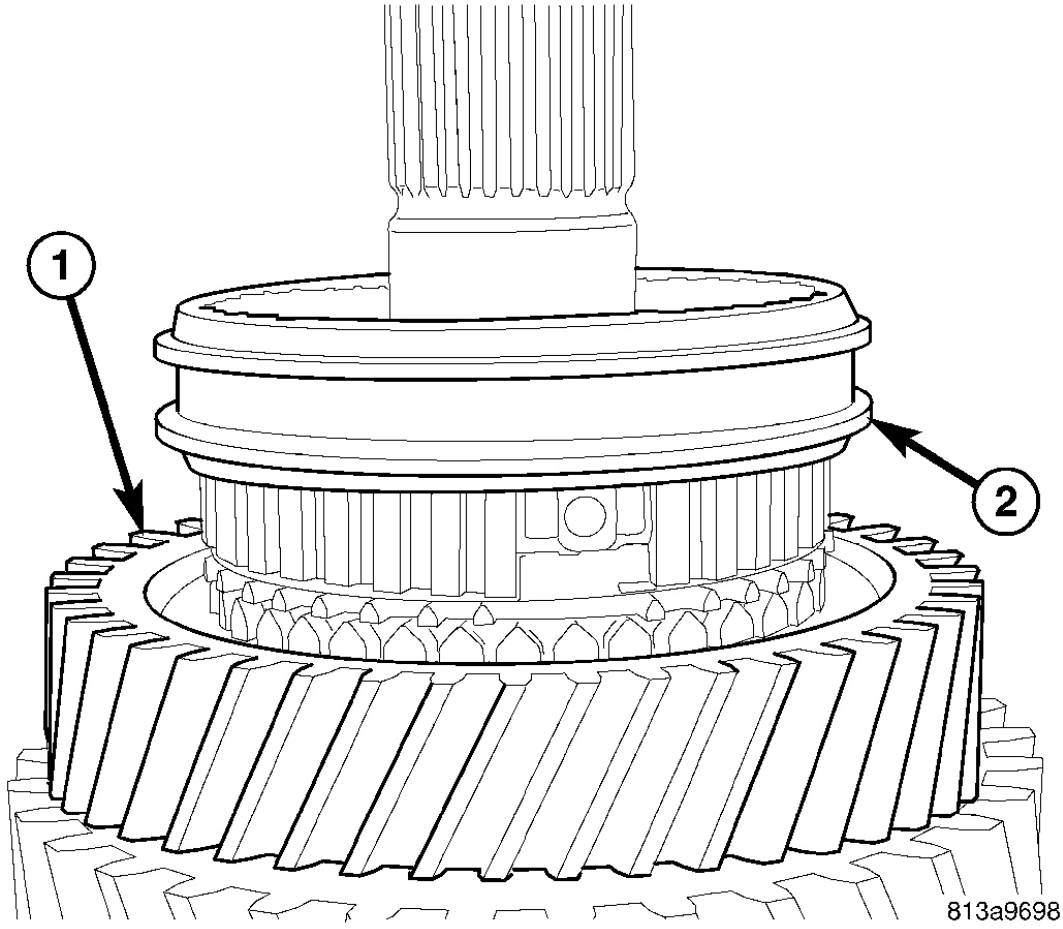

Fig. 84: Identifying Reverse Gear & Synchronizer Sleeve
Courtesy of CHRYSLER LLC

21. Install reverse gear (1) synchronizer sleeve (2) with tooth points pointing down 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.

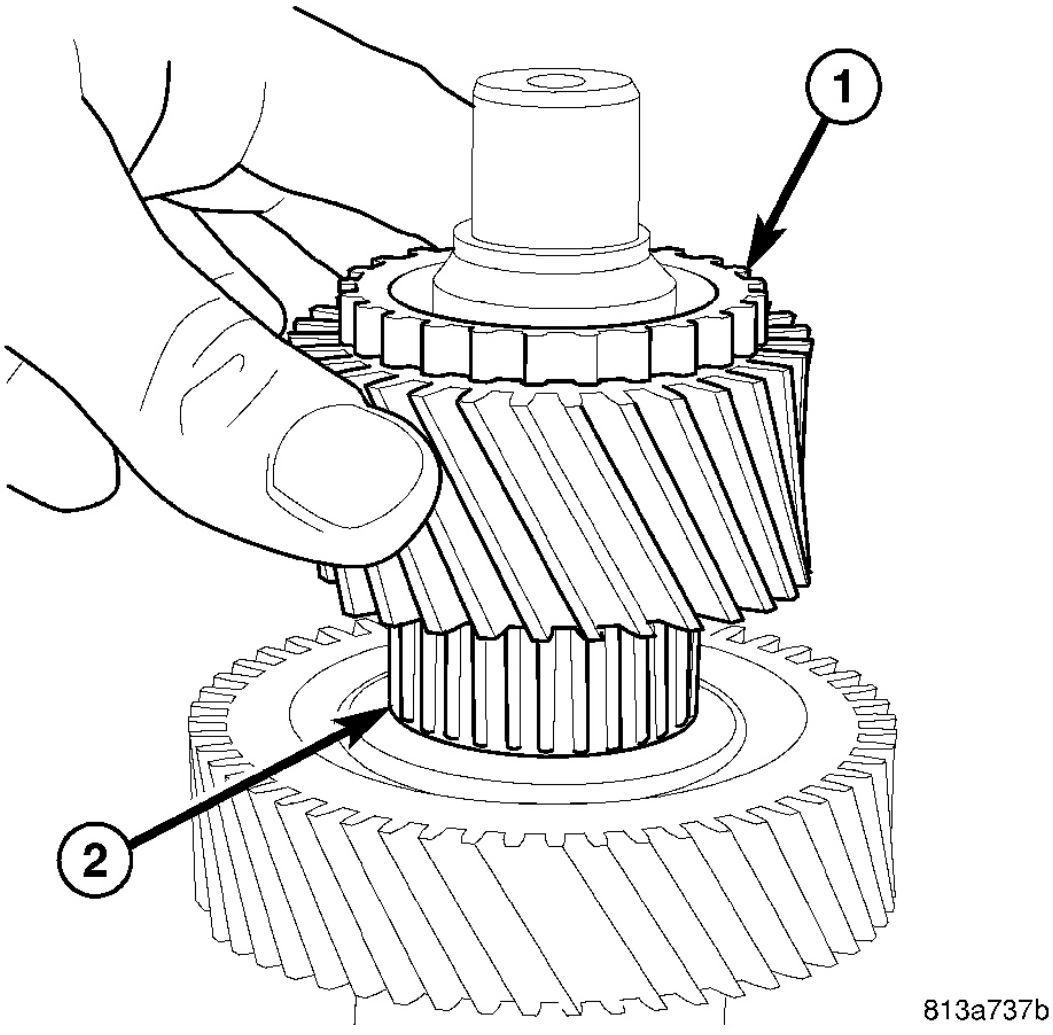

Fig. 85: Sixth Gear & Bearing
Courtesy of CHRYSLER LLC

23. Install sixth gear (1) and bearing (2) on mainshaft.

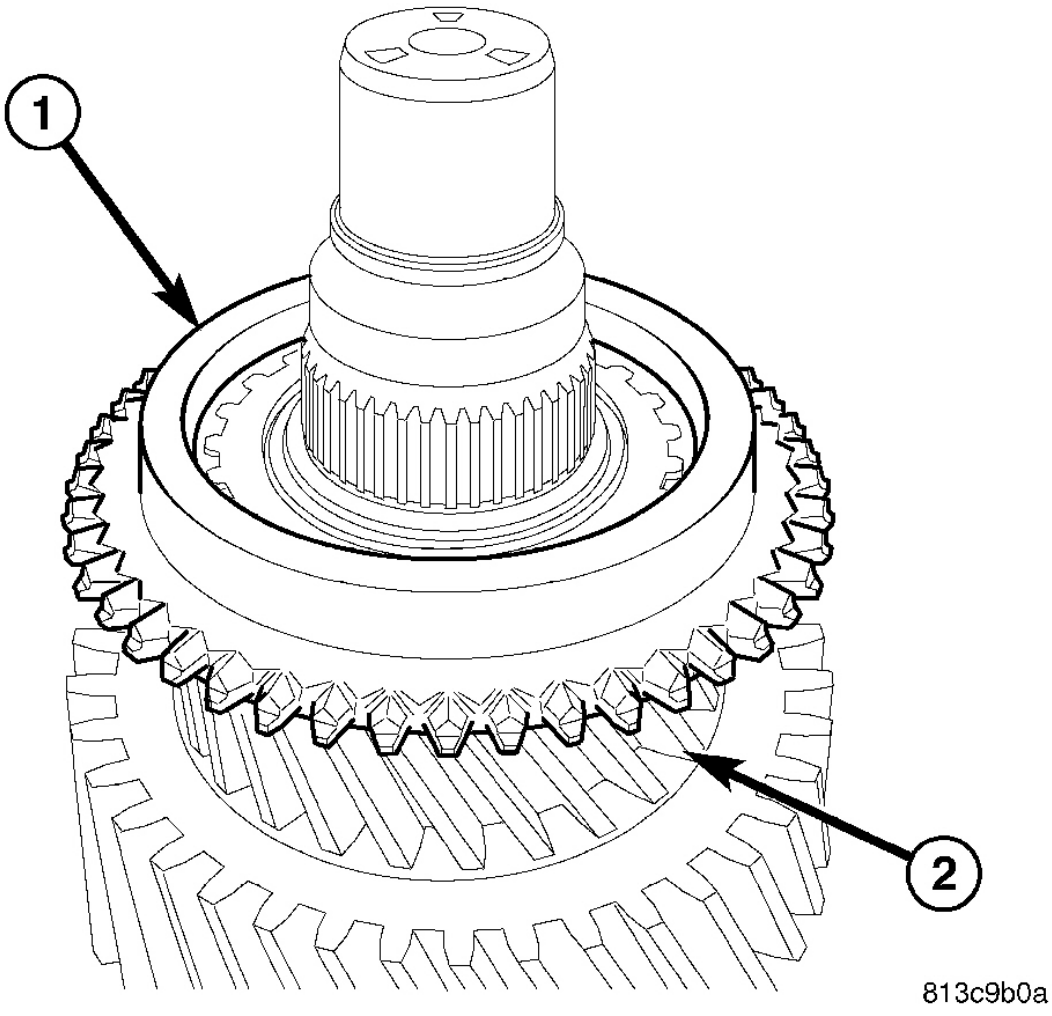

Fig. 86: Sixth Gear Synchronizer Blocker Ring & Sixth Gear
Courtesy of CHRYSLER LLC

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

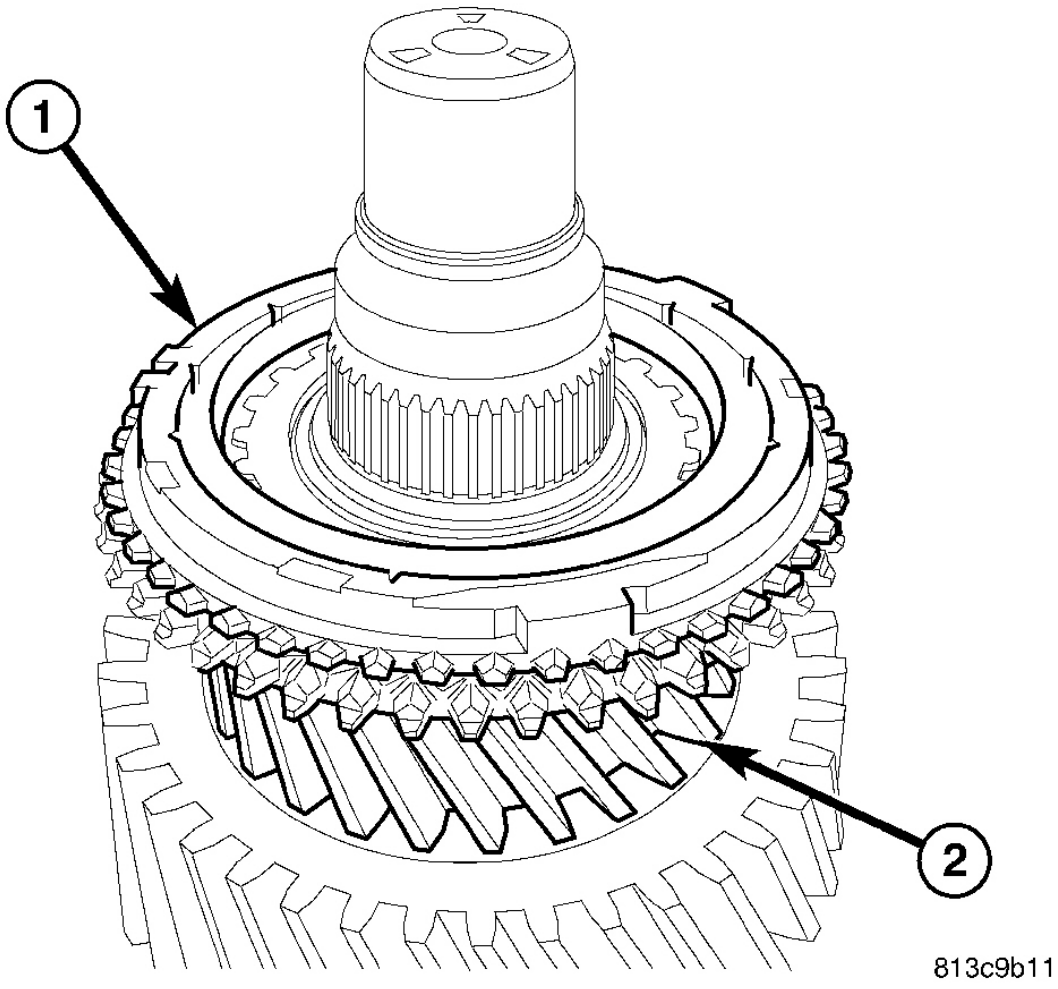

Fig. 87: Sixth Gear Synchronizer Friction Ring & Sixth Gear
Courtesy of CHRYSLER LLC

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

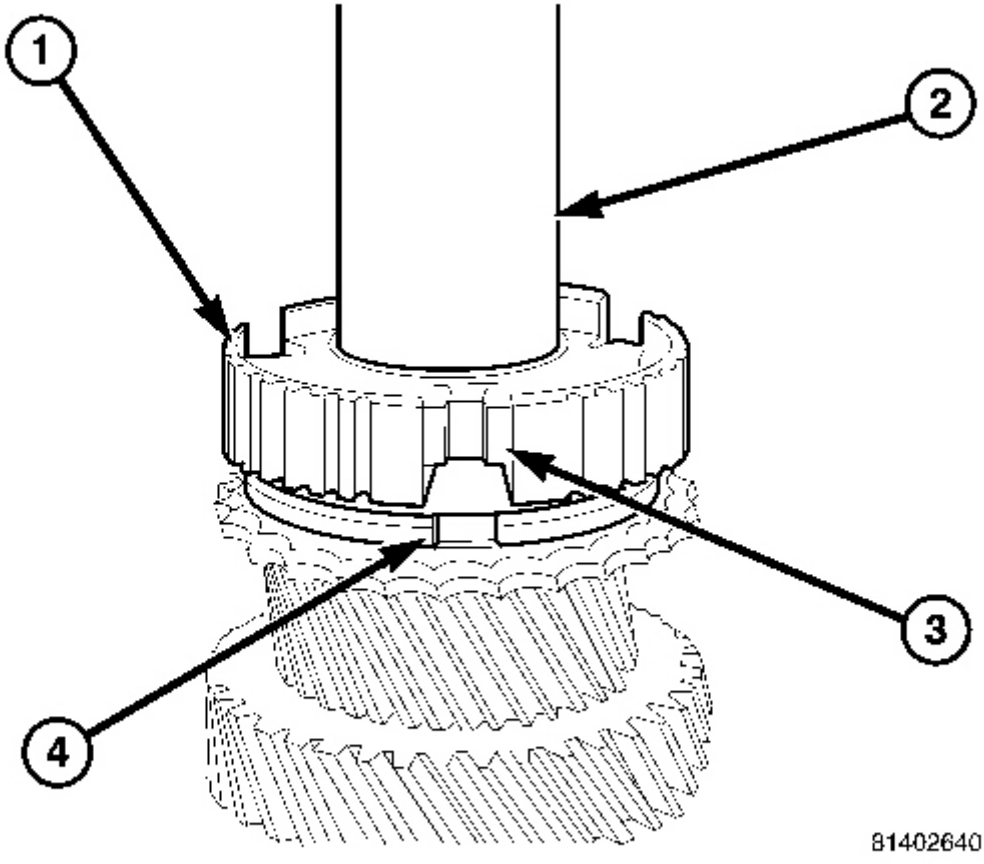

Fig. 88: Identifying 5-6 Synchronizer Hub, Installer W-262, Hub Detent Opening & Friction Ring Lugs
Courtesy of CHRYSLER LLC

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

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

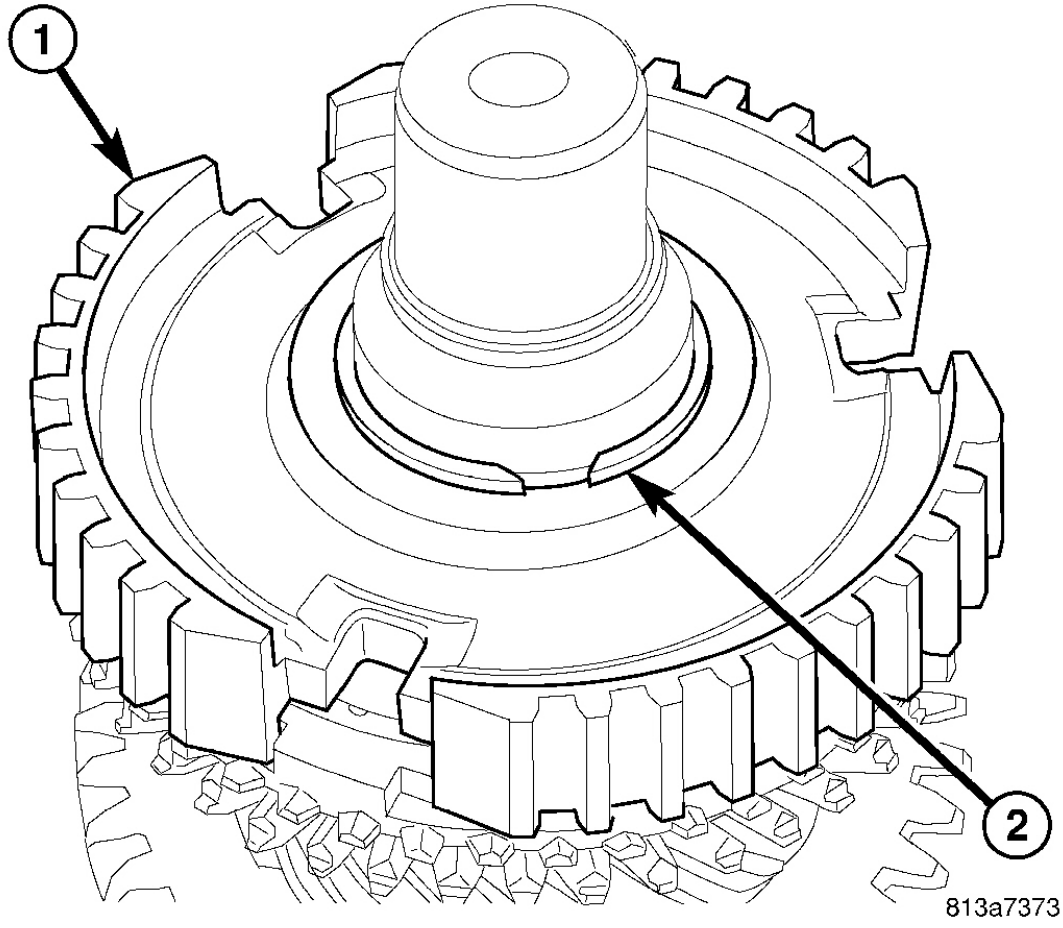

Fig. 89: Identifying 5-6 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

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

NOTE: Reuse original snap ring or thickest ring that will fit.

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

REAR HOUSING

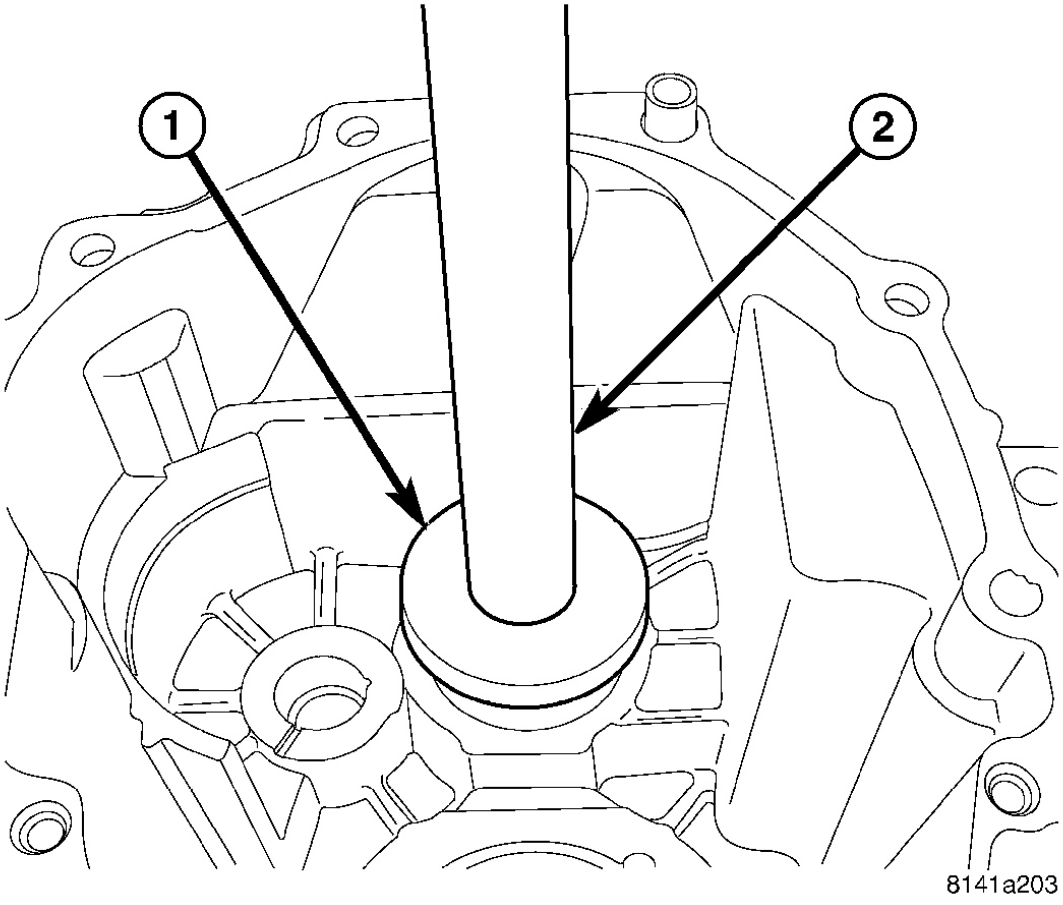

Fig. 90: Identifying Installer 9643 & Handle C-4171
Courtesy of CHRYSLER LLC

1. Install countershaft bearing into rear housing with Installer 9643 (1) and Handle C-4171 (2).

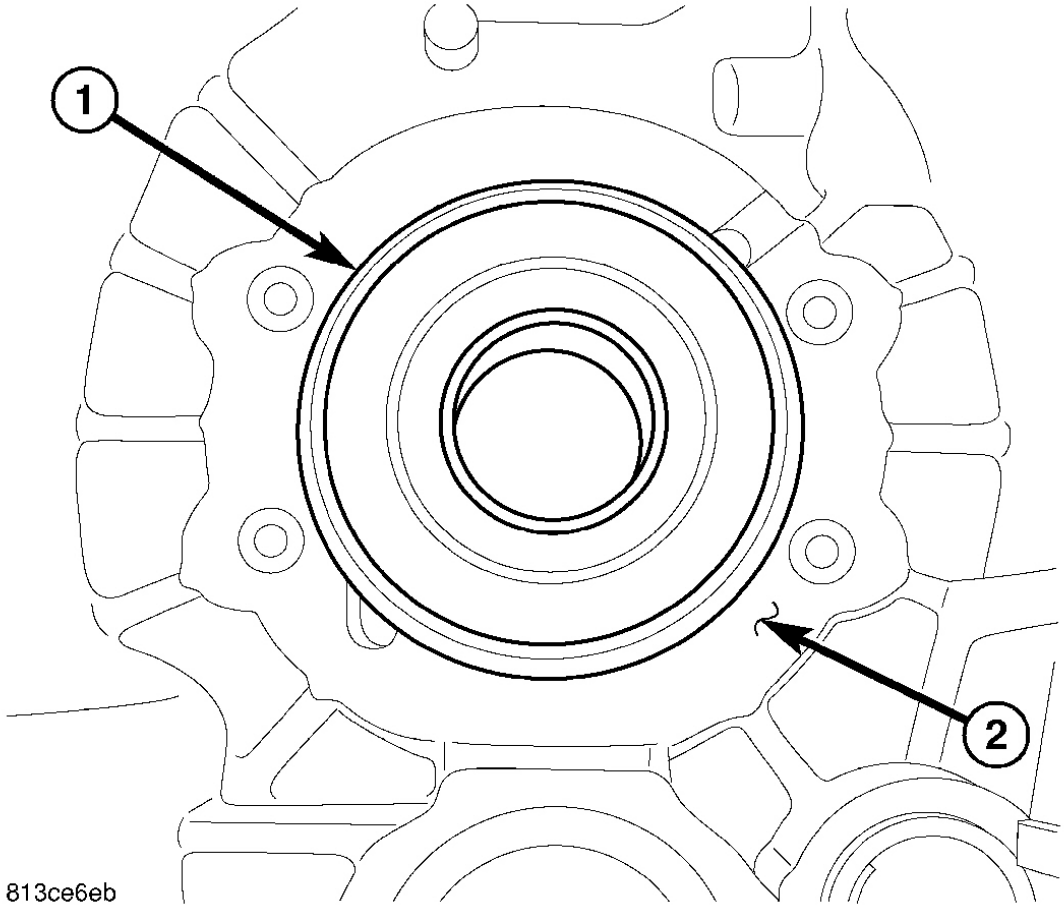

Fig. 91: Identifying Mainshaft Bearing & Housing
Courtesy of CHRYSLER LLC

2. Install mainshaft bearing (1) into housing (2).
3. Install bearing retainer and tighten bolts to 10 N.m (7.3 ft. lbs.).

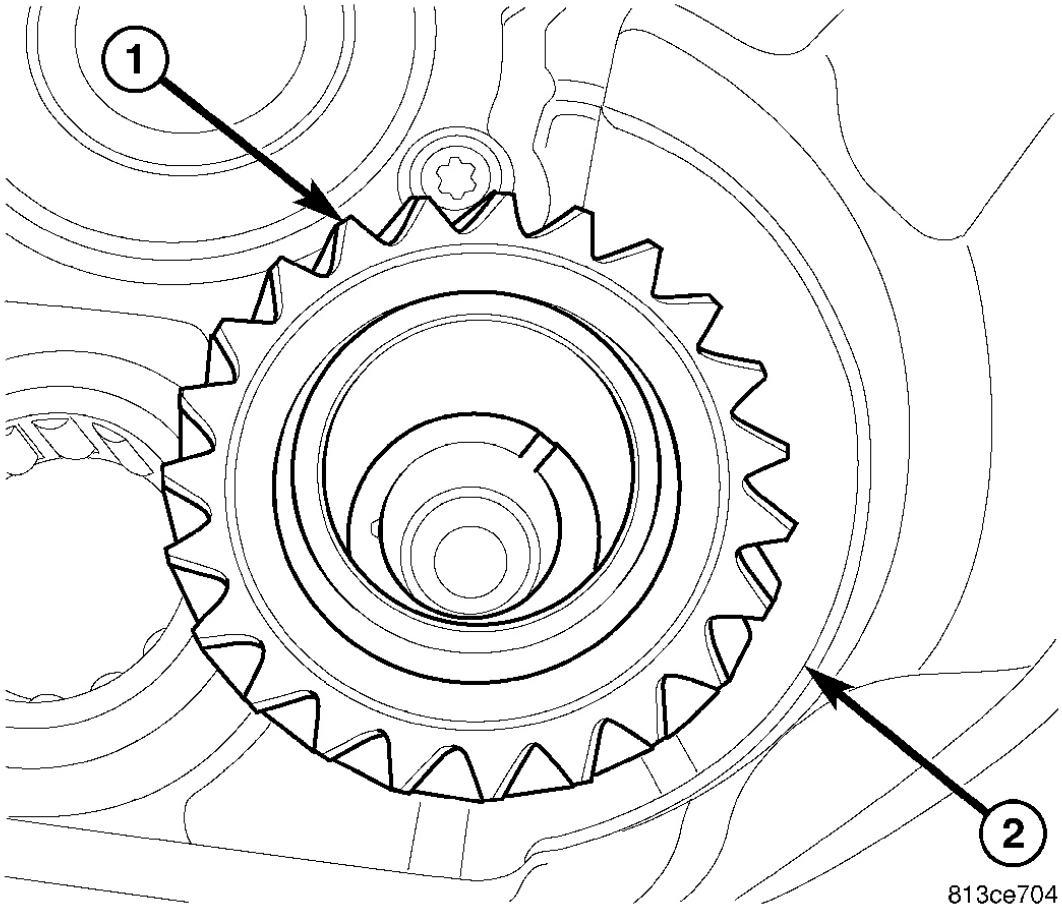

Fig. 92: Identifying Reverse Idler Gear & Housing
Courtesy of CHRYSLER LLC

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

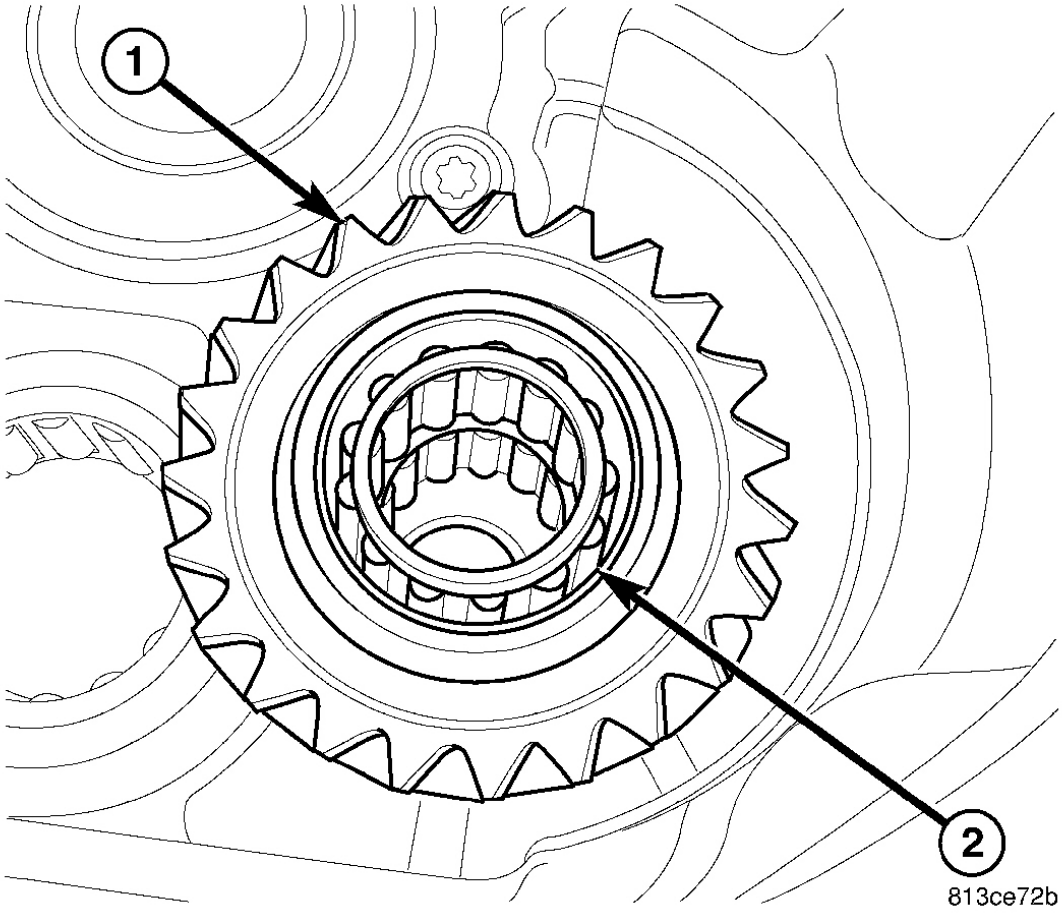

Fig. 93: Identifying Idler Gear & Bearing
Courtesy of CHRYSLER LLC

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

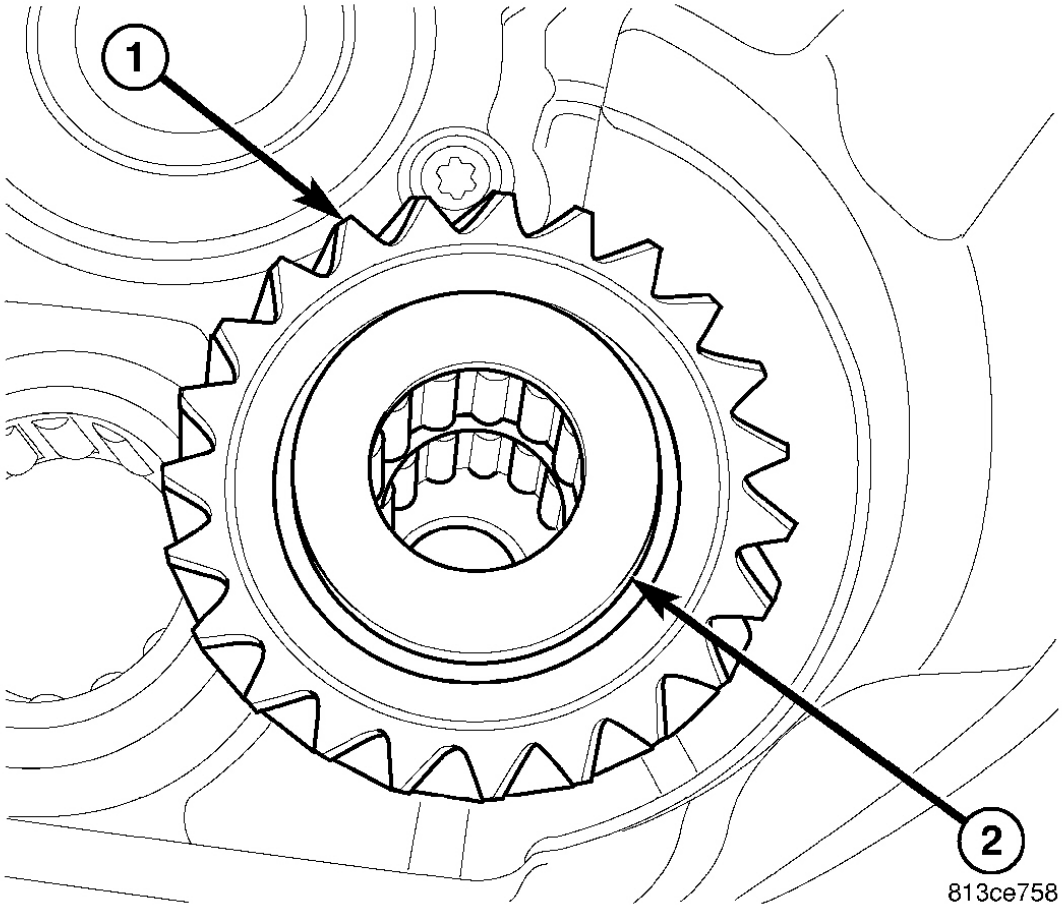

Fig. 94: Identifying Idler Gear & Thrust Washer
Courtesy of CHRYSLER LLC

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

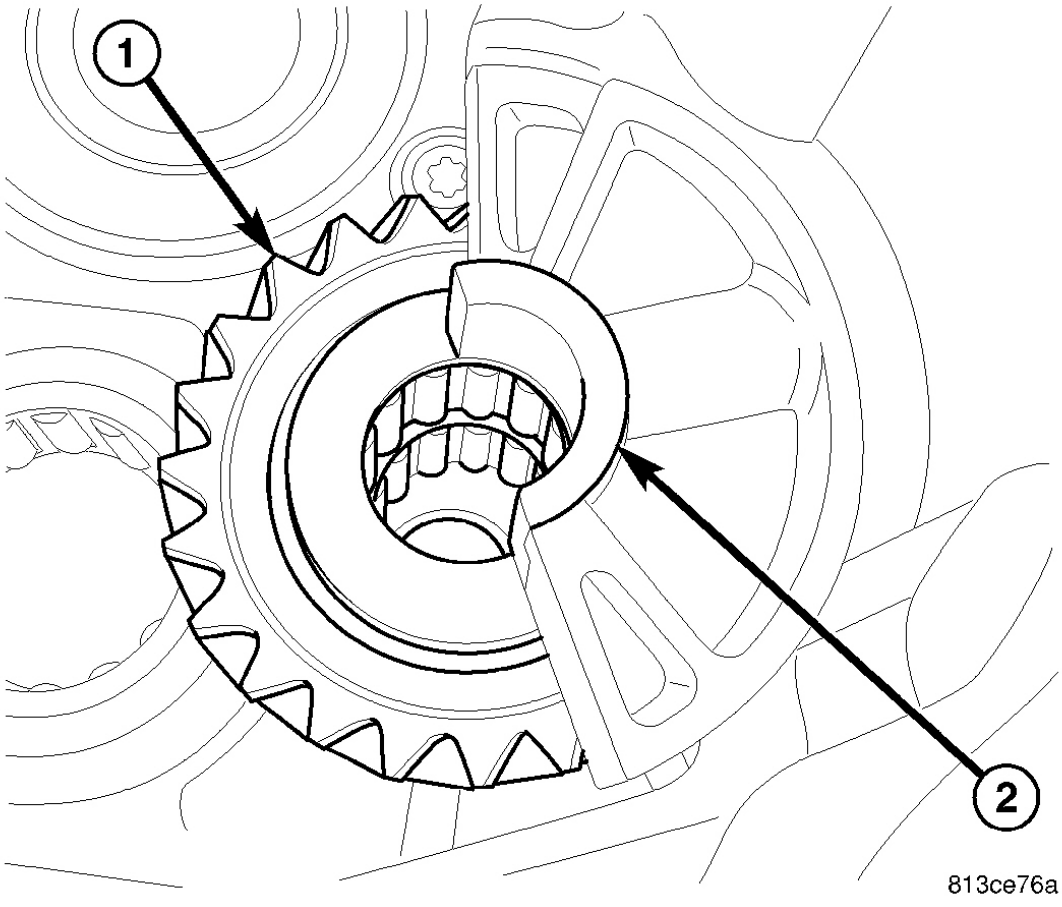

Fig. 95: Identifying Idler Gear & Shaft Support
Courtesy of CHRYSLER LLC

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

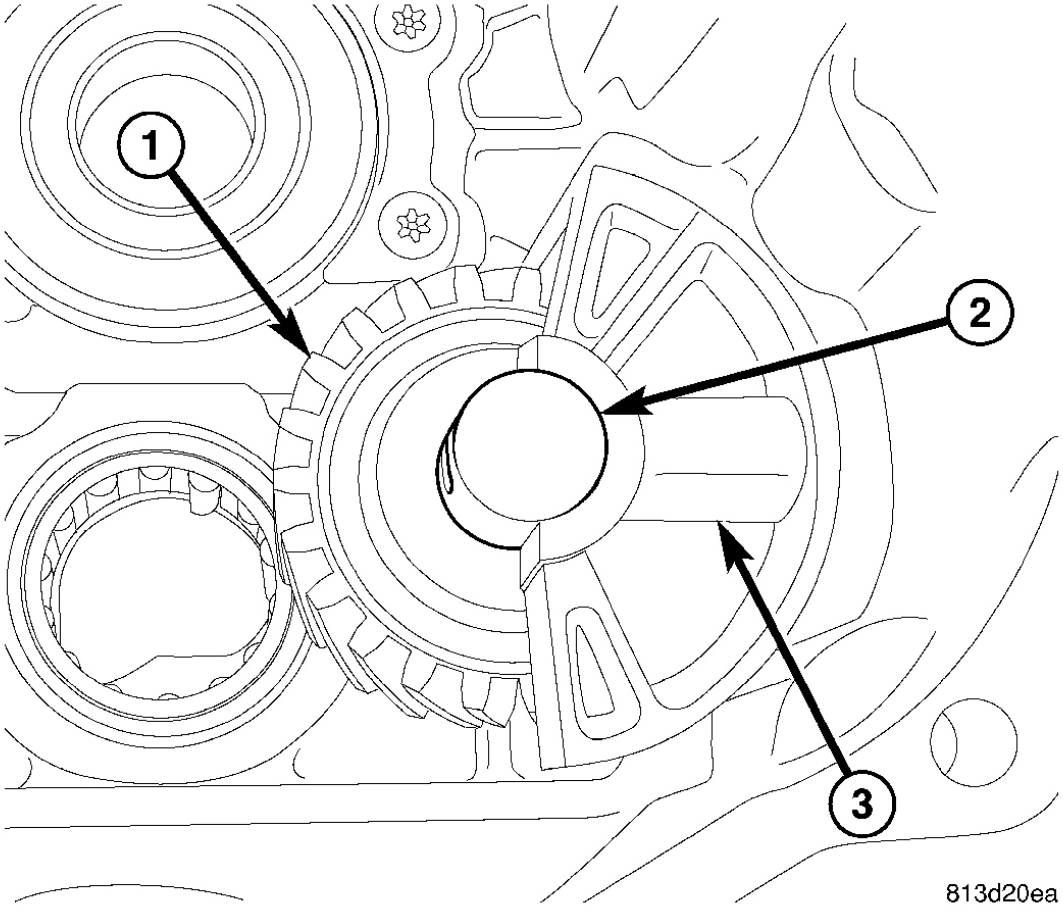

Fig. 96: Identifying Idler Gear, Shaft & Shaft Support Hole
Courtesy of CHRYSLER LLC

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

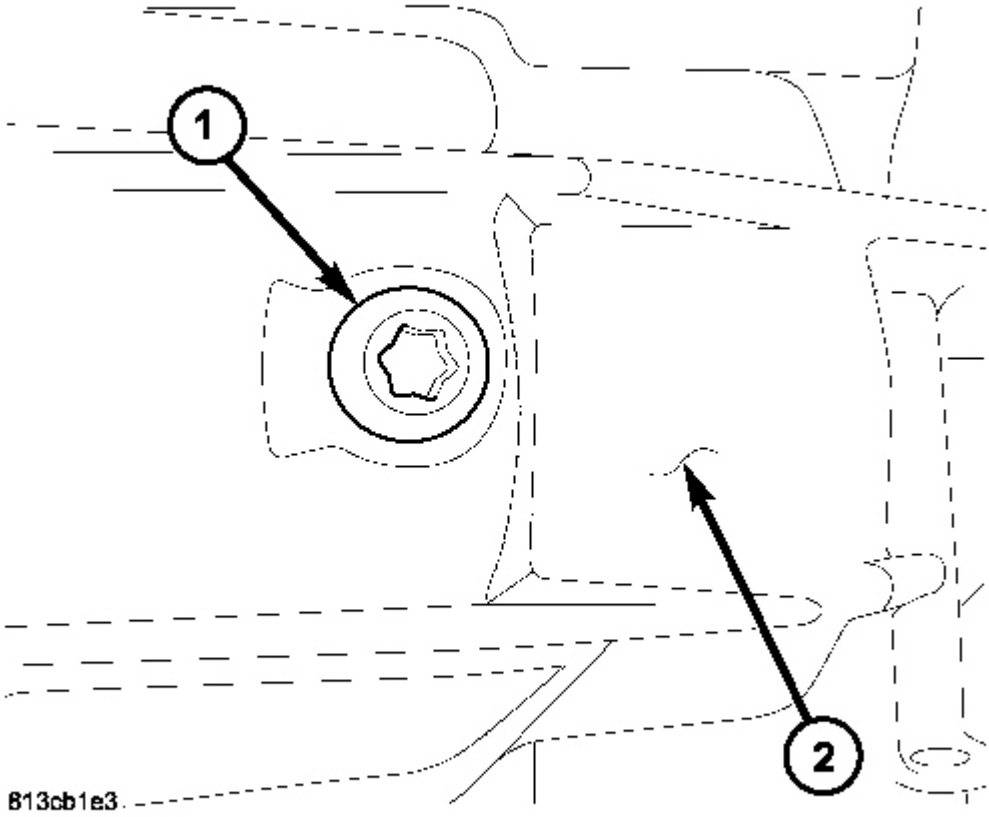

Fig. 97: Identifying Reverse Idler Gear Shaft Bolt & Housing
Courtesy of CHRYSLER LLC

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

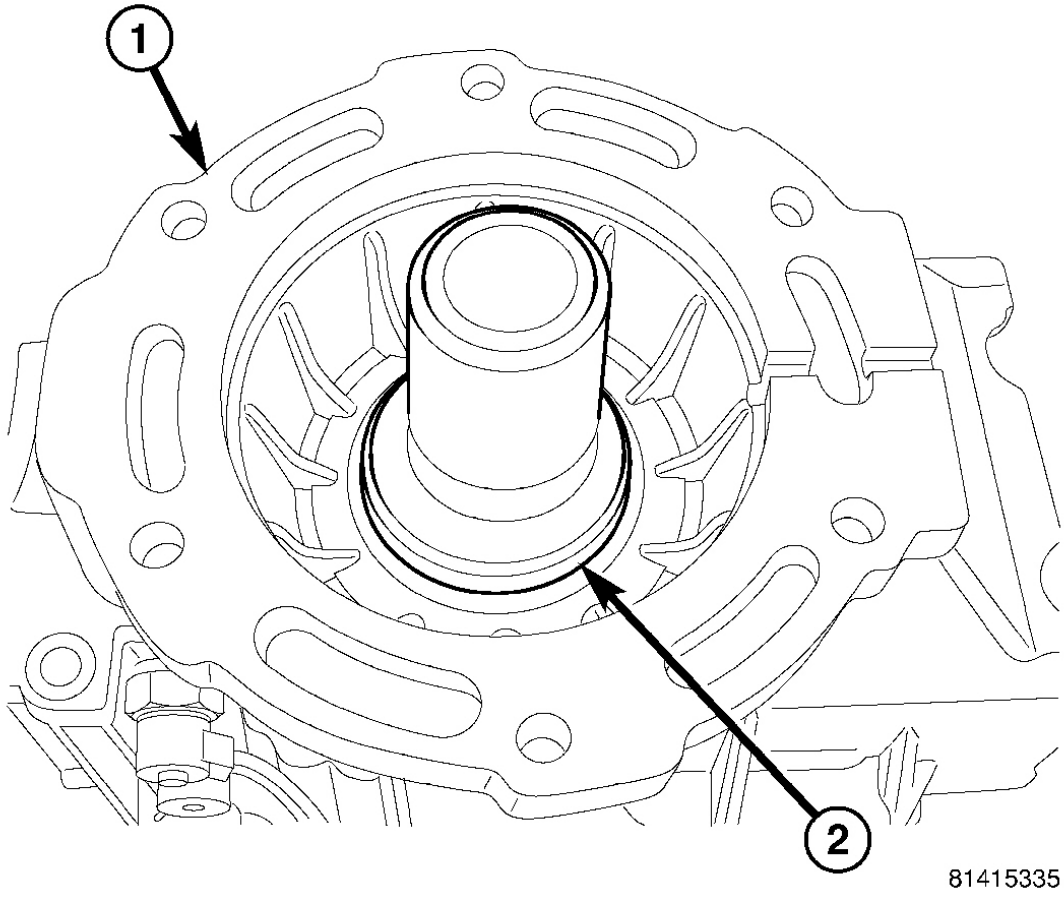

Fig. 98: Identifying Rear Housing & Installer 9638
Courtesy of CHRYSLER LLC

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

INPUT SHAFT

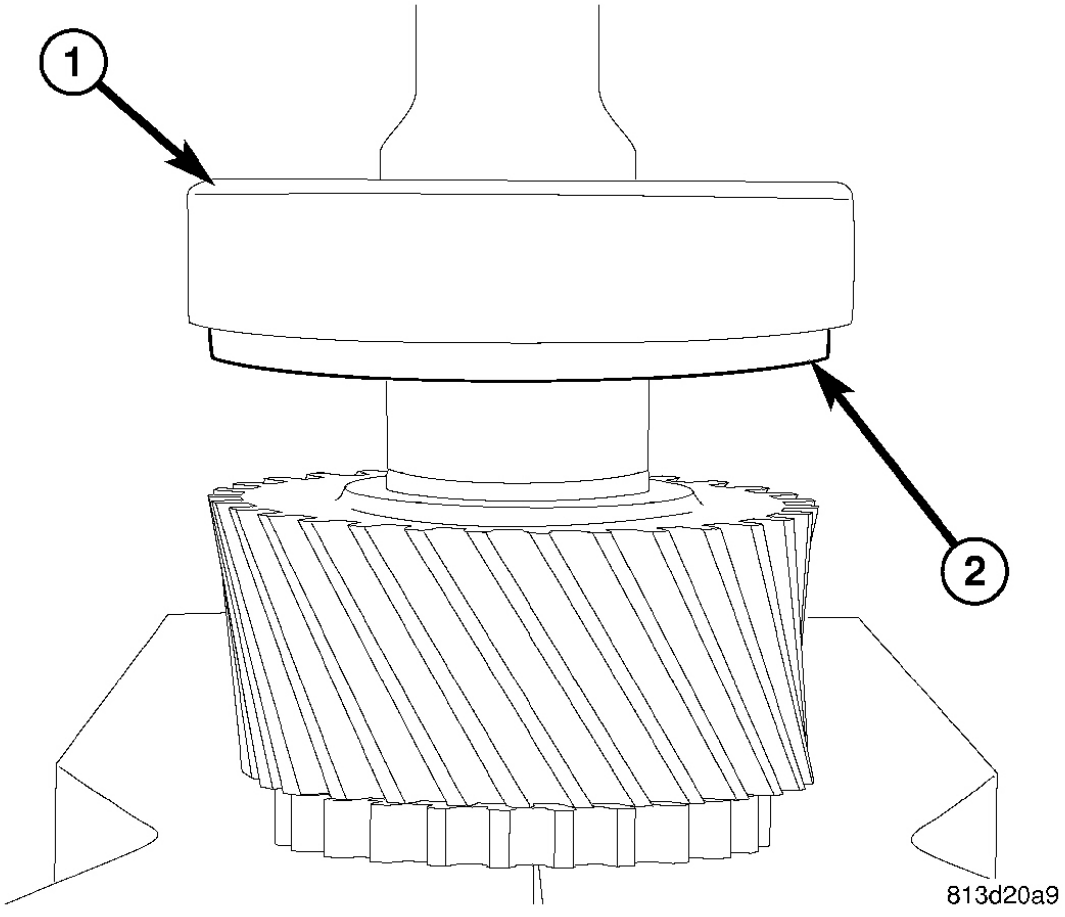

Fig. 99: Identifying Input Shaft Bearing & Bearing Retainer Lip
Courtesy of CHRYSLER LLC

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

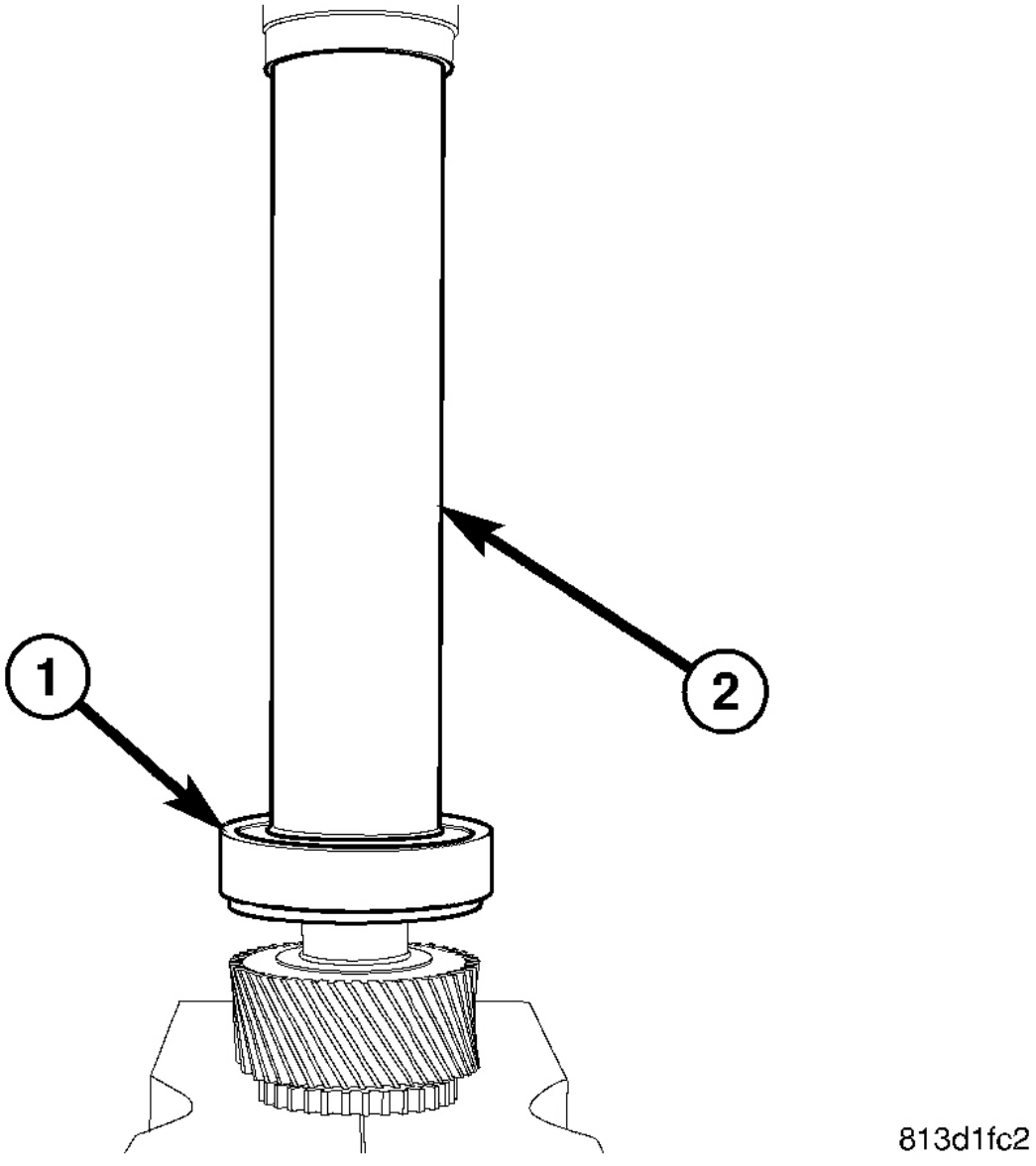

Fig. 100: Identifying Input Shaft Bearing & Installer 6448A
Courtesy of CHRYSLER LLC

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

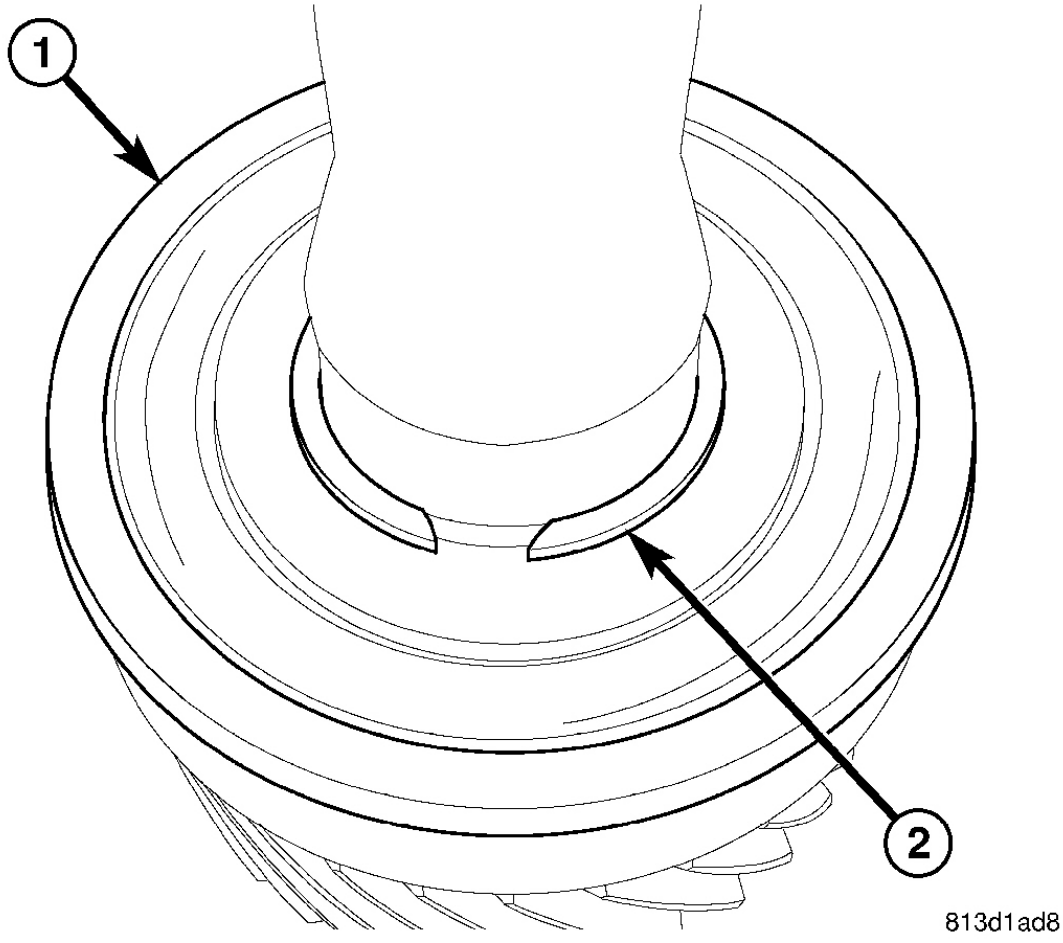

Fig. 101: Identifying Input Shaft Bearing & Snap Ring
Courtesy of CHRYSLER LLC

3. Install input shaft bearing (1) snap ring (2).

NOTE: Reuse original snap ring or thickest ring that will fit.

FRONT HOUSING

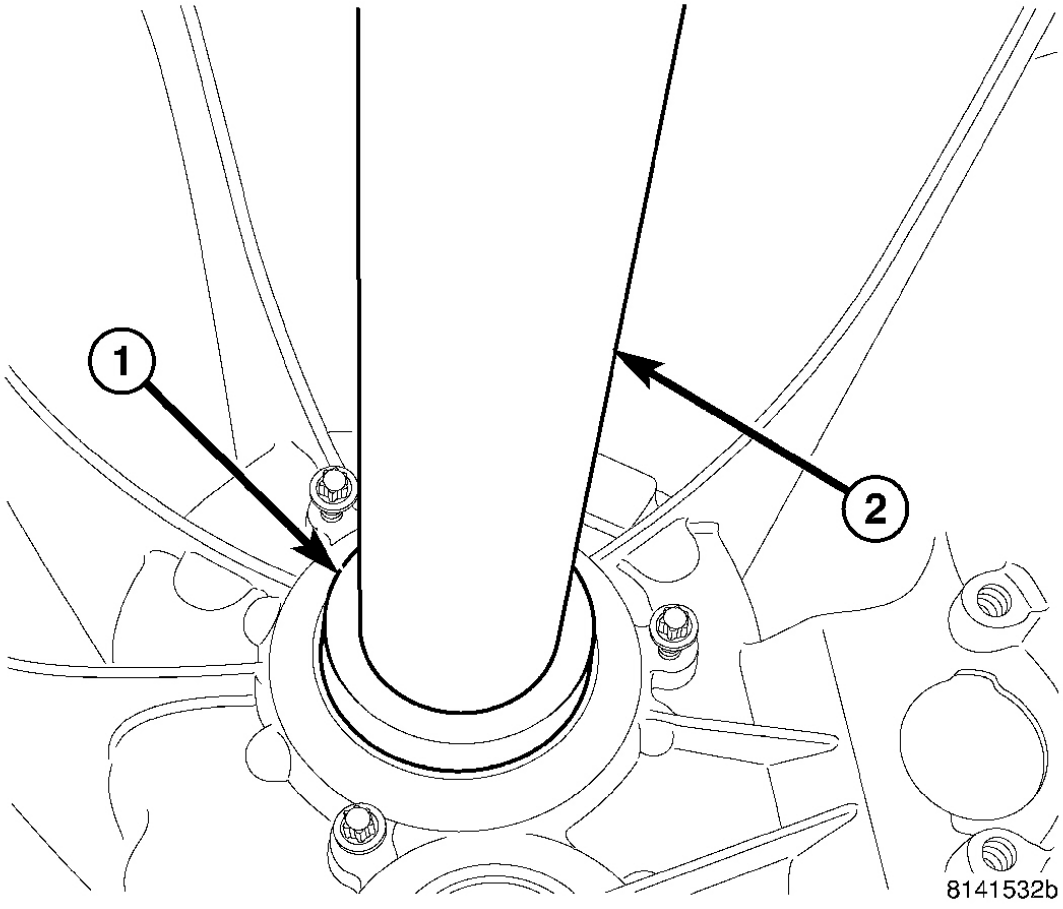

Fig. 102: Identifying Installer 9635 & Installer 6448A
Courtesy of CHRYSLER LLC

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

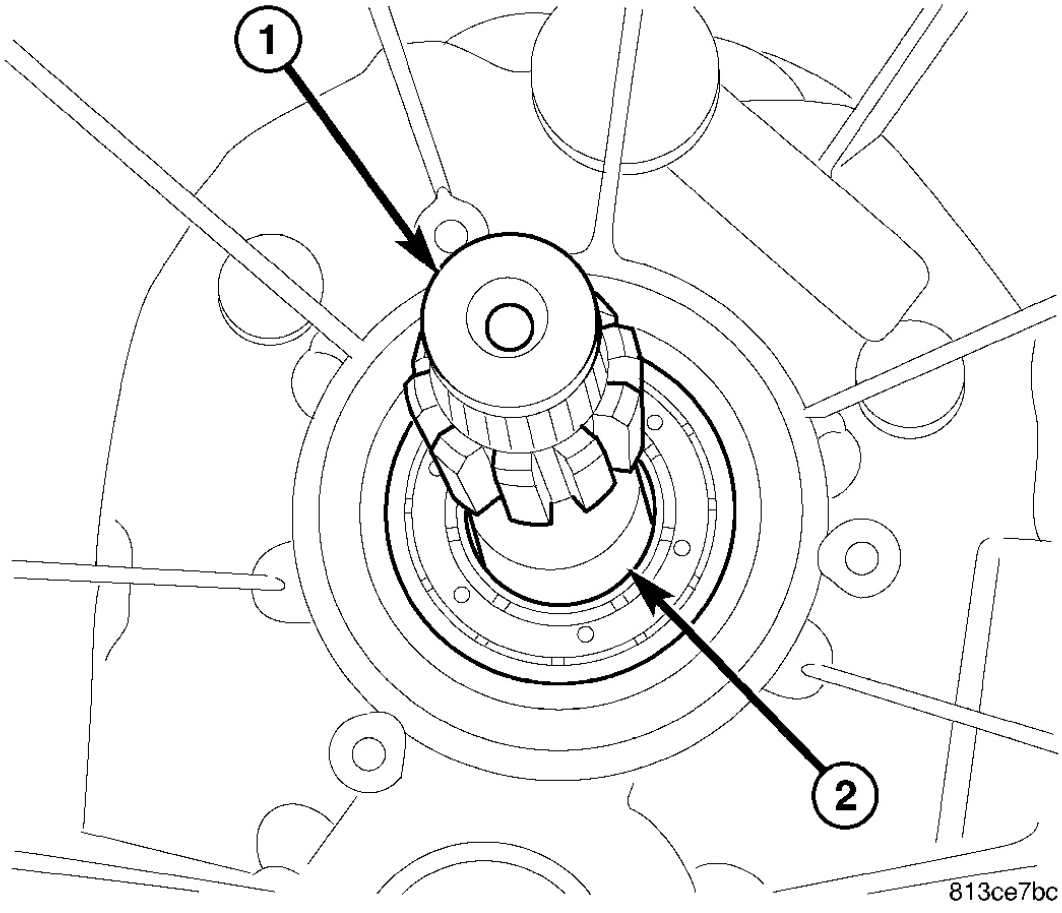

Fig. 103: Identifying Input Shaft & Bearing
Courtesy of CHRYSLER LLC

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

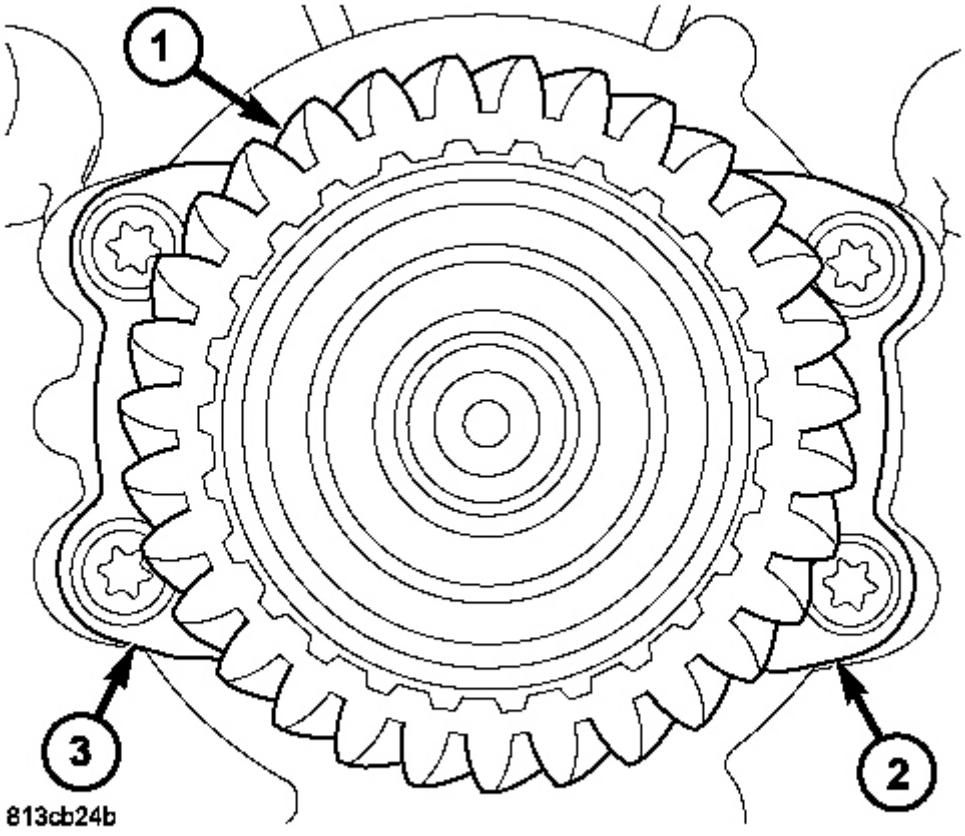

Fig. 104: Identifying Input Shaft & Bearing Retainers
Courtesy of CHRYSLER LLC

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

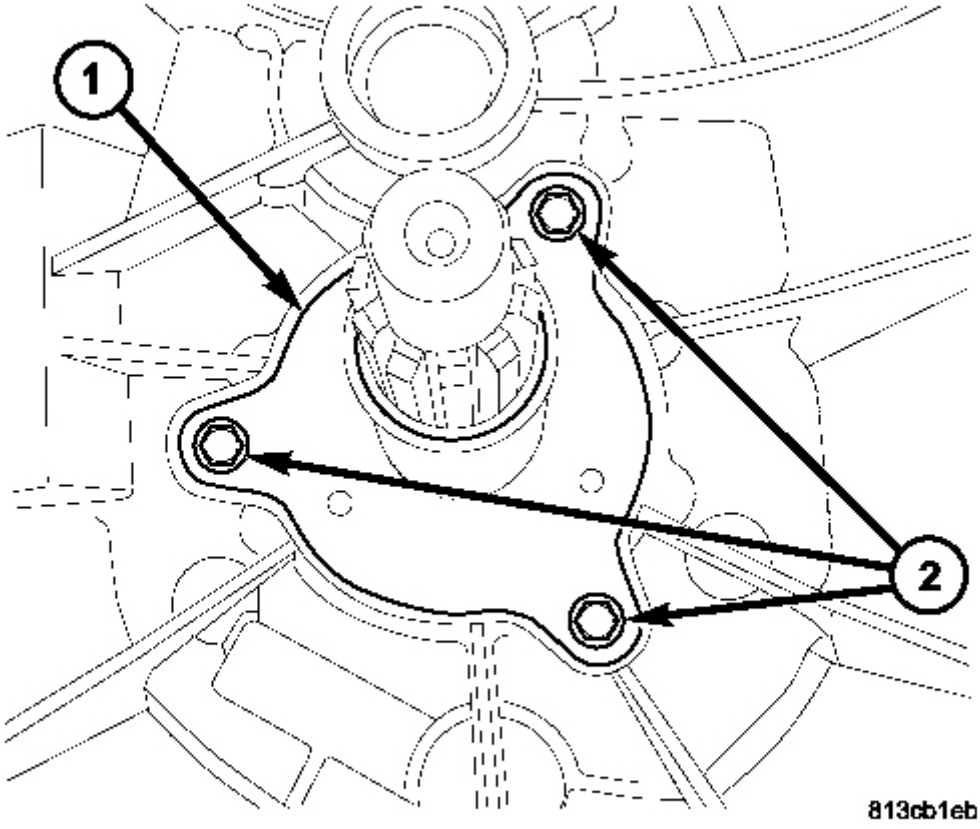

Fig. 105: Identifying Input Shaft Retainer Bolts & Retainer
Courtesy of CHRYSLER LLC

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

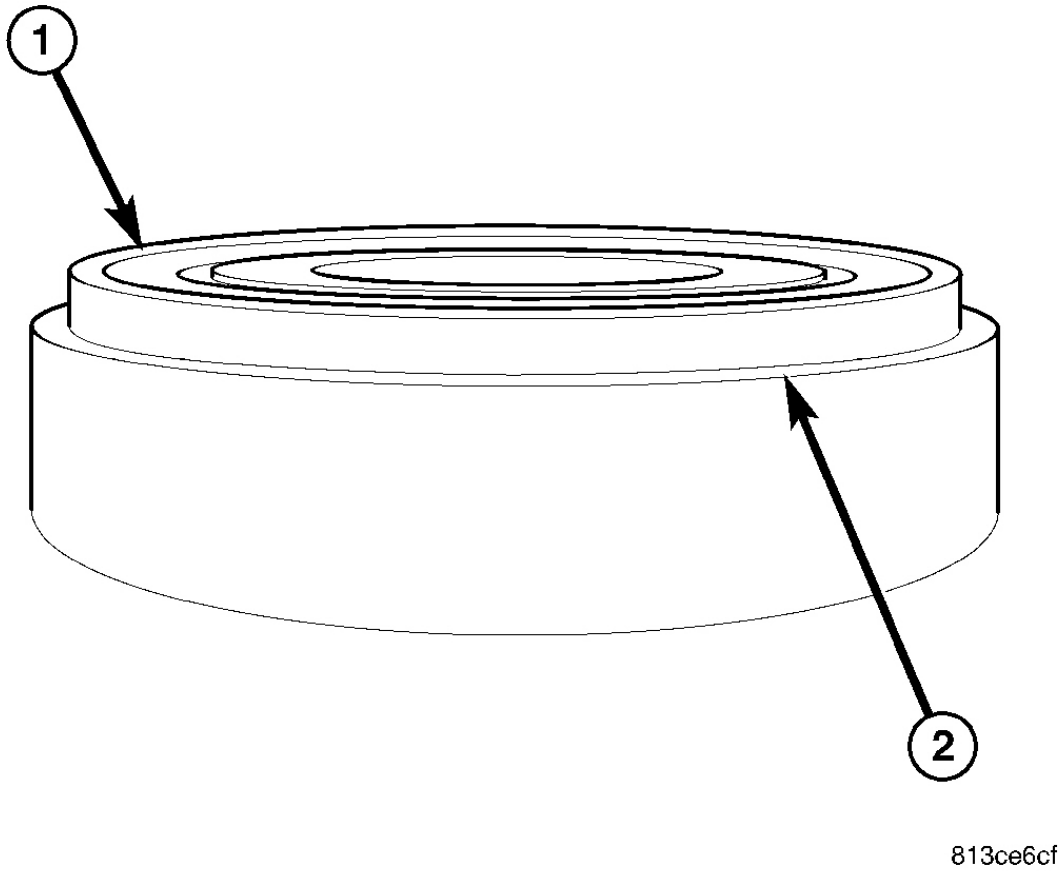

Fig. 106: Identifying Countershaft Bearing & Bearing Retainer Lip
Courtesy of CHRYSLER LLC

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

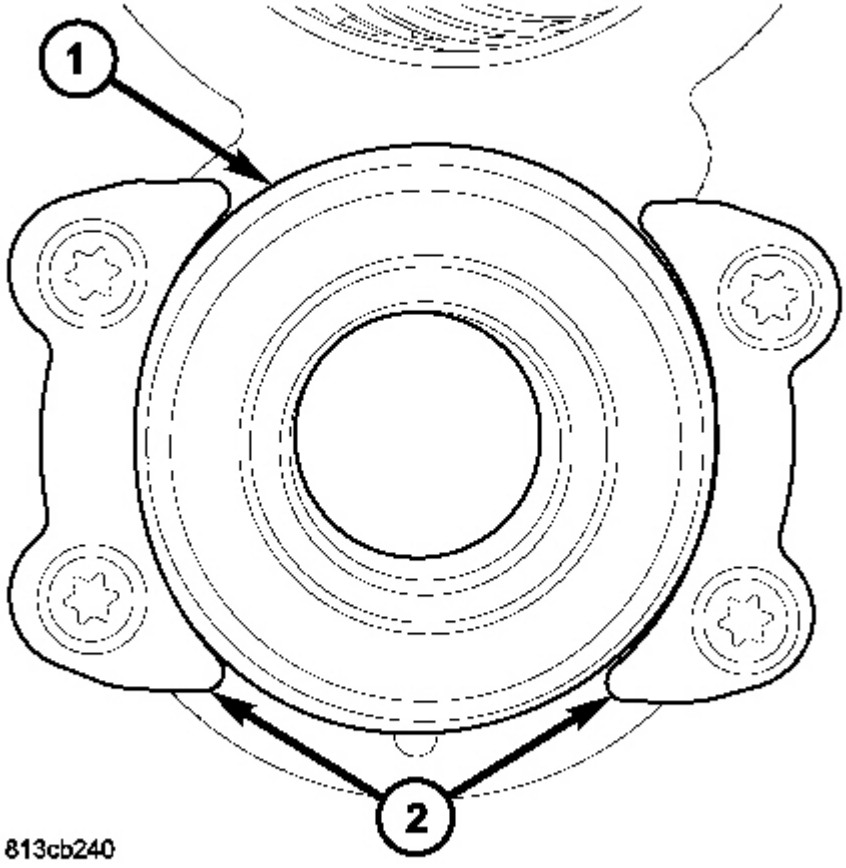

Fig. 107: Identifying Countershaft Bearing & Retainers
Courtesy of CHRYSLER LLC

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

FINAL ASSEMBLY

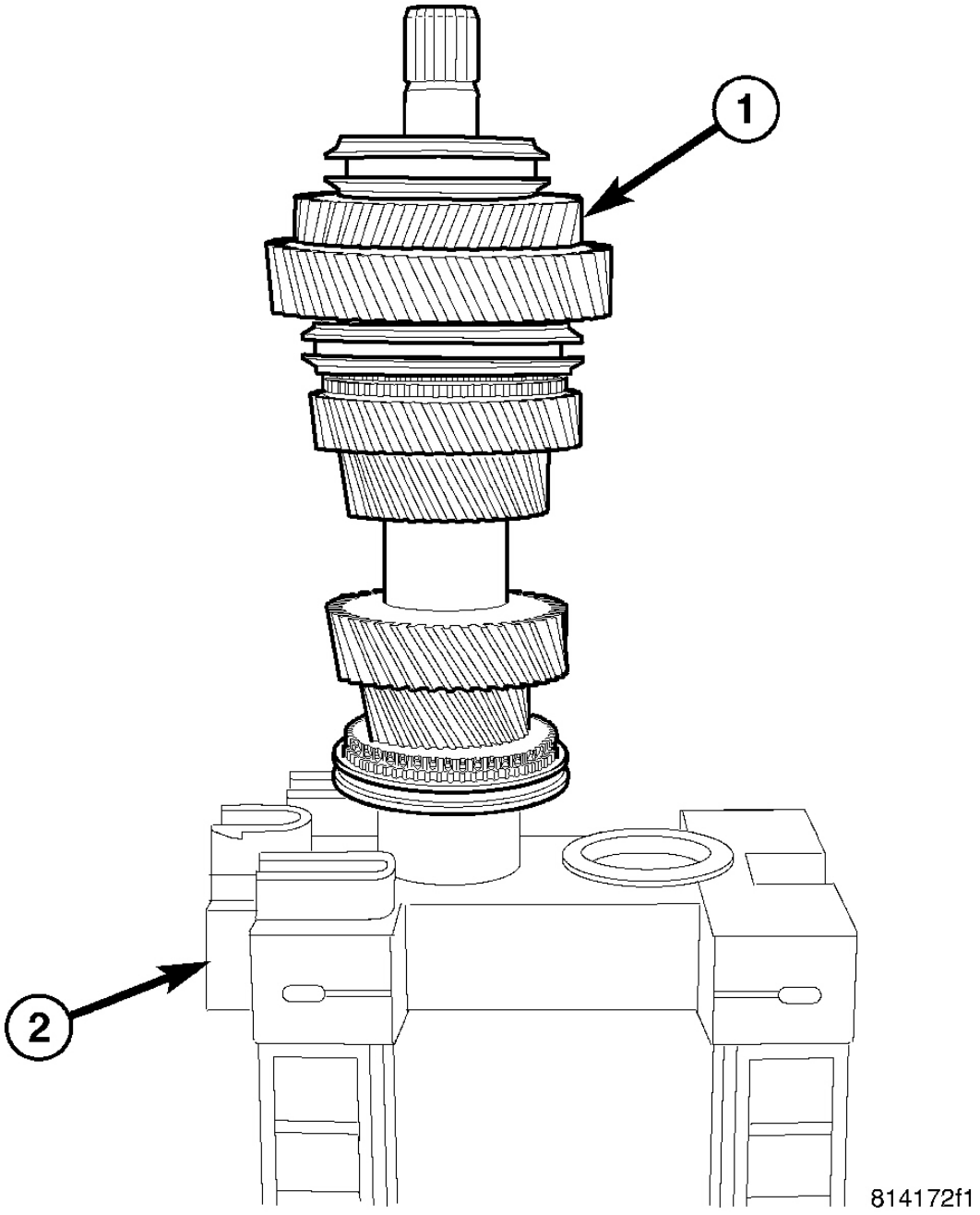

Fig. 108: Installing Mainshaft Onto Build Fixture 9633
Courtesy of CHRYSLER LLC

1. Install mainshaft (1) onto Build Fixture 9633 (2).

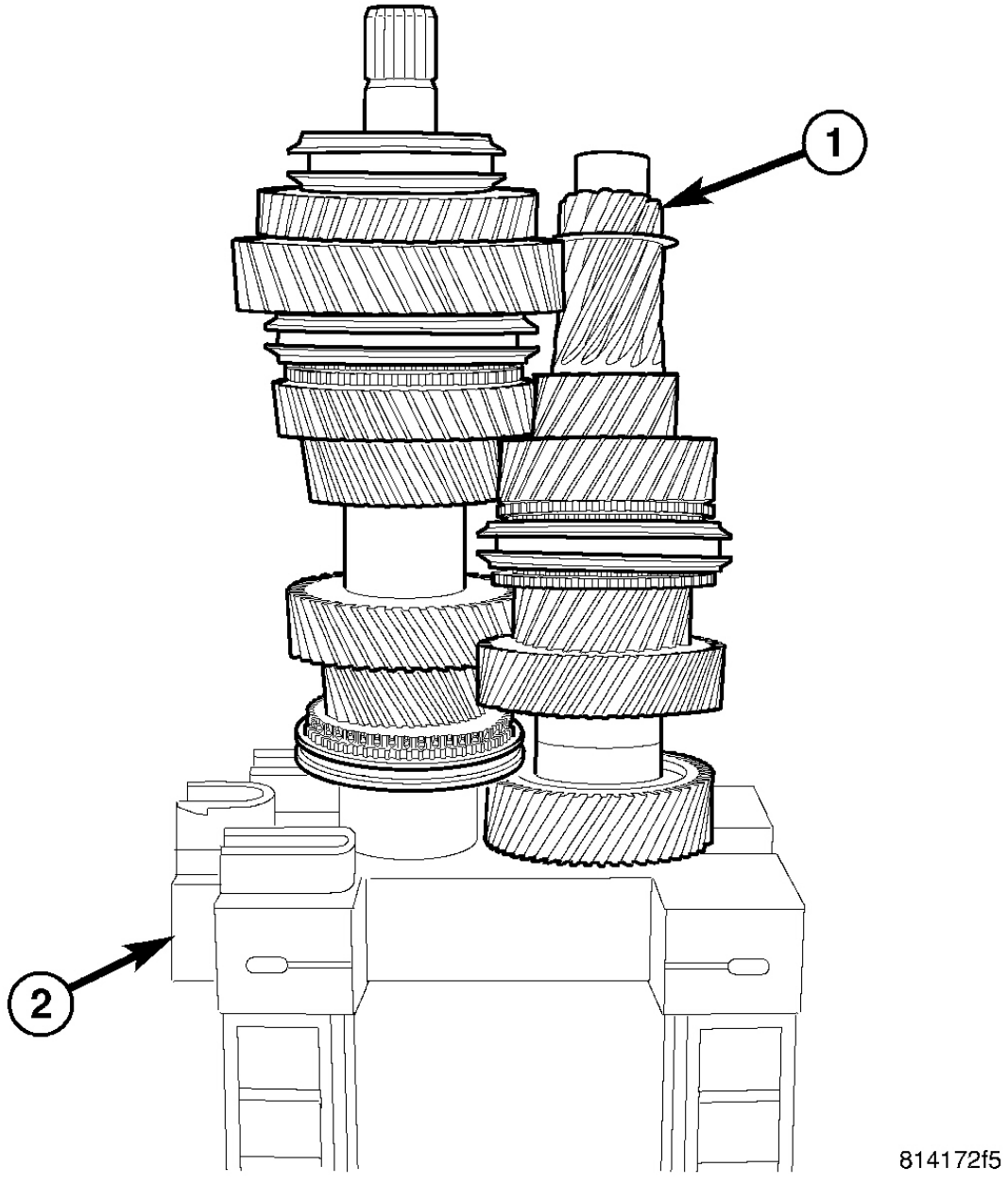

Fig. 109: Installing Countershaft Onto Build Fixture 9633
Courtesy of CHRYSLER LLC

2. Install countershaft (1) onto Build Fixture 9633 (2).

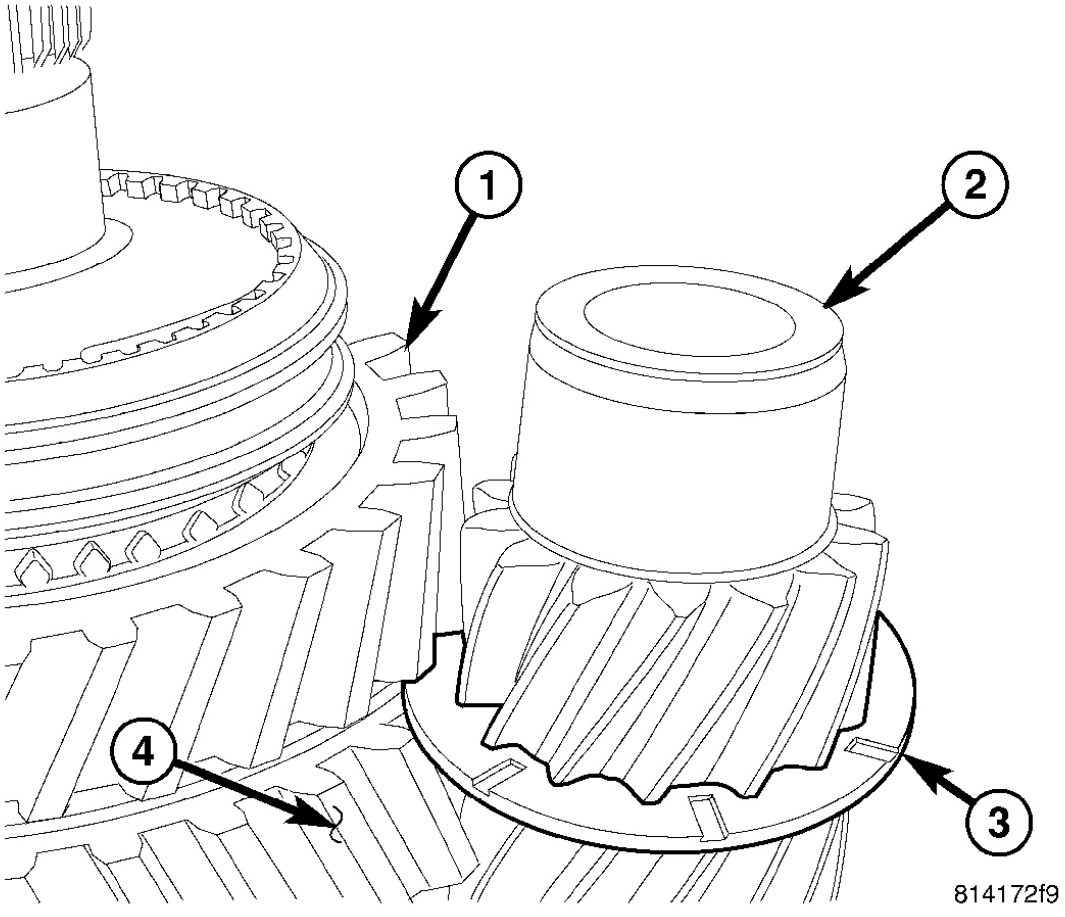

Fig. 110: Installing Oil Slinger On Countershaft Between Reverse And First Gear
Courtesy of CHRYSLER LLC

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

CAUTION: Oil slinger is fragile and can crack during installation. Failure to follow these instructions will result in cracking the oil slinger and lack of oil to first/reverse bearing.

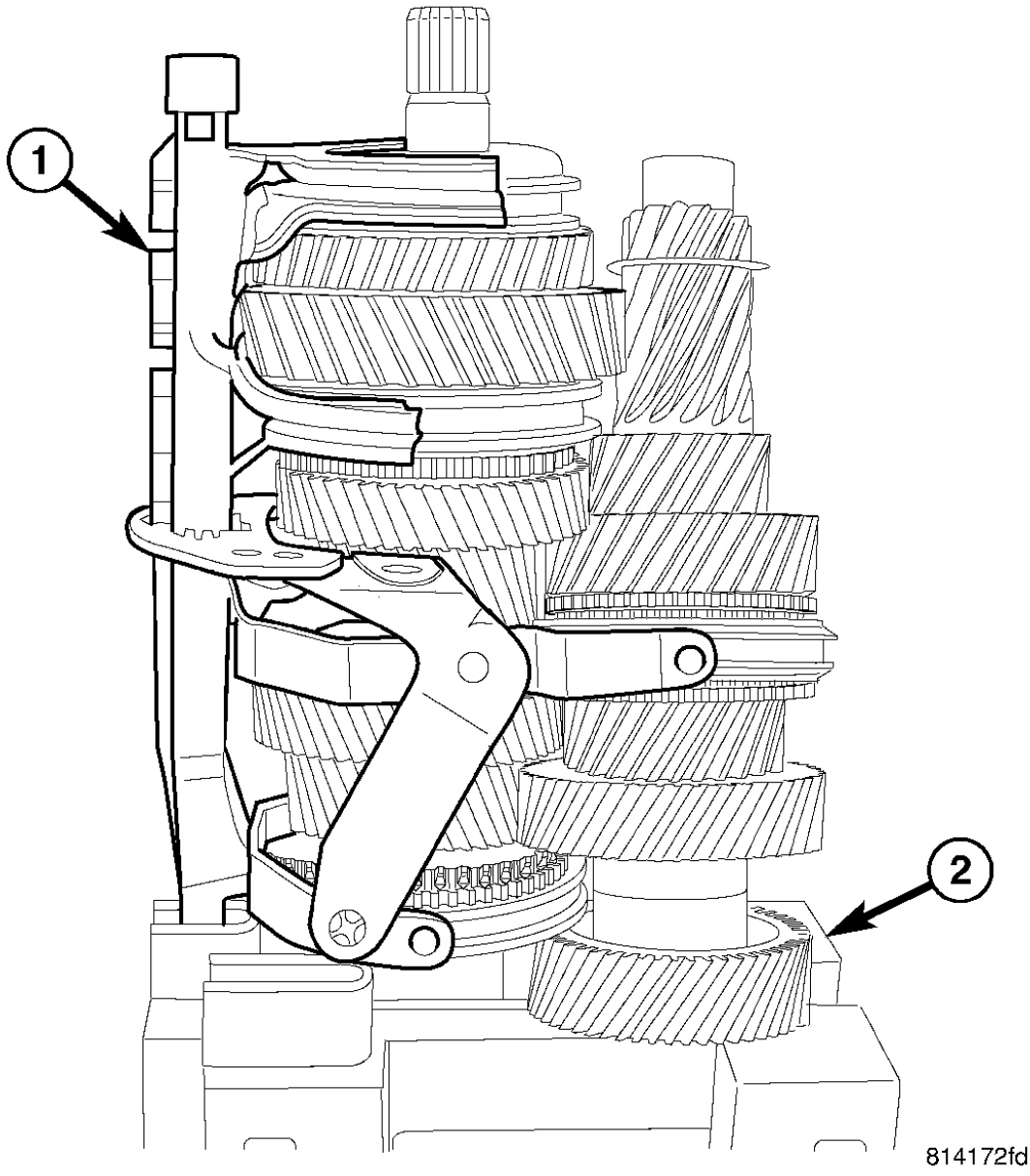

Fig. 111: Installing Shift Rails And Forks Onto Build Fixture 9633 And Countershaft/Mainshaft
Courtesy of CHRYSLER LLC

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

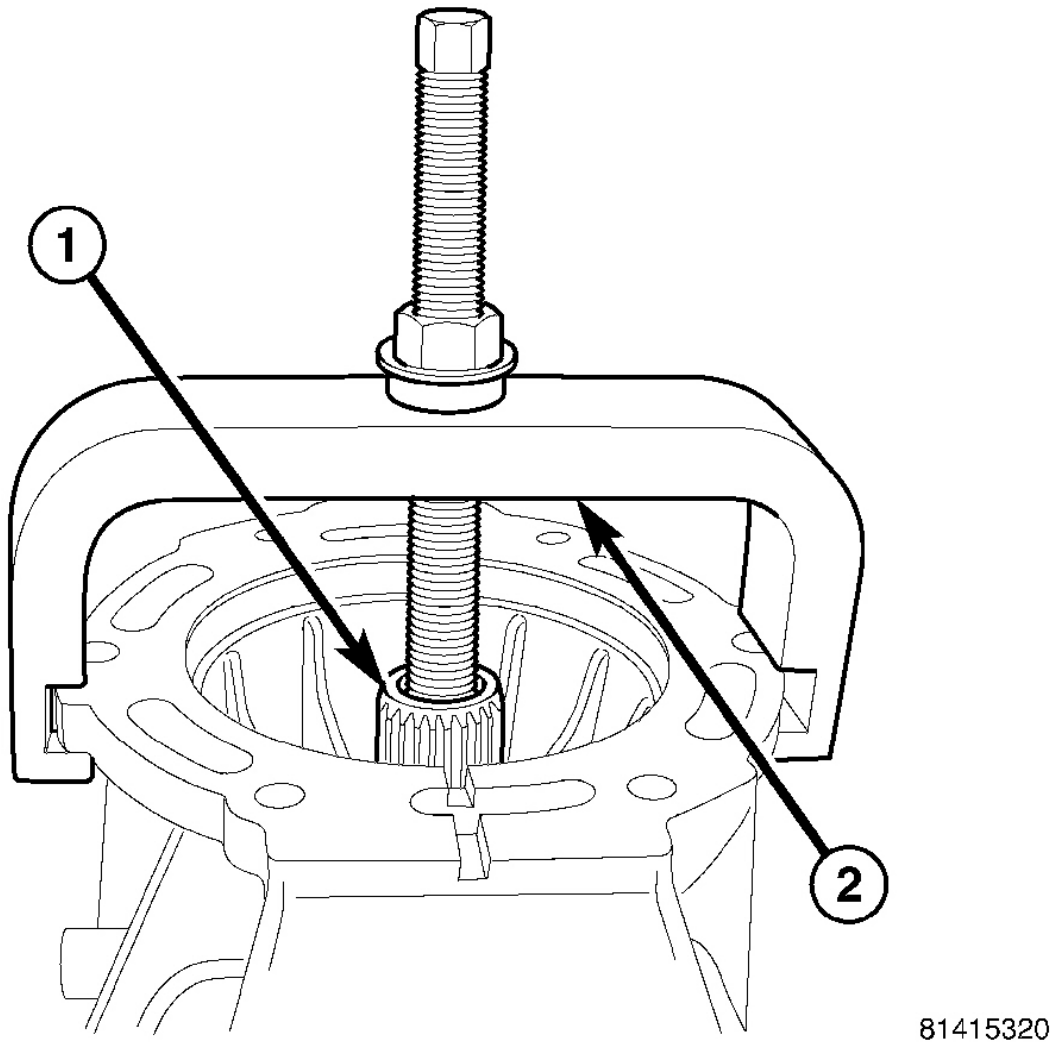

Fig. 112: Installing Rear Housing On Mainshaft With Installer 9636
Courtesy of CHRYSLER LLC

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

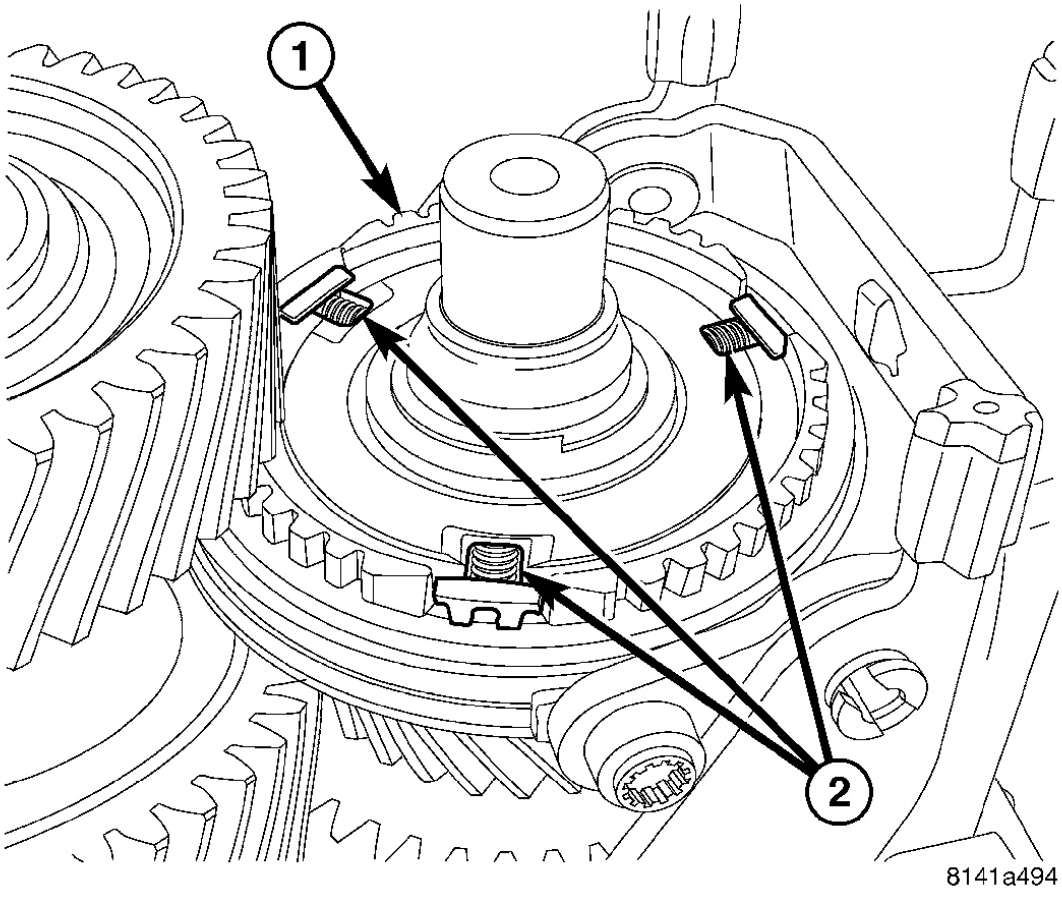

Fig. 113: Installing 5-6 Synchronizer Hub Detents, Springs, And Balls
Courtesy of CHRYSLER LLC

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) detents, springs, and balls (2).

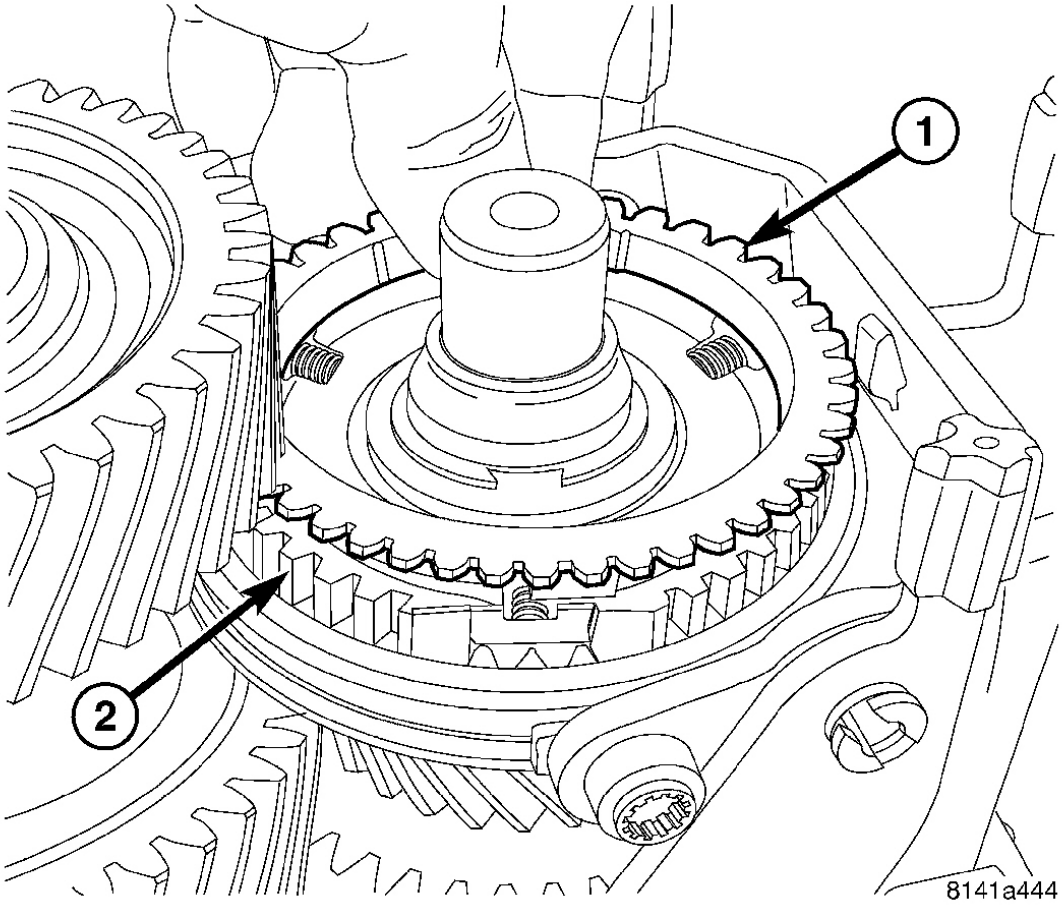

Fig. 114: Identifying Fifth Gear Synchronizer Friction Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

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

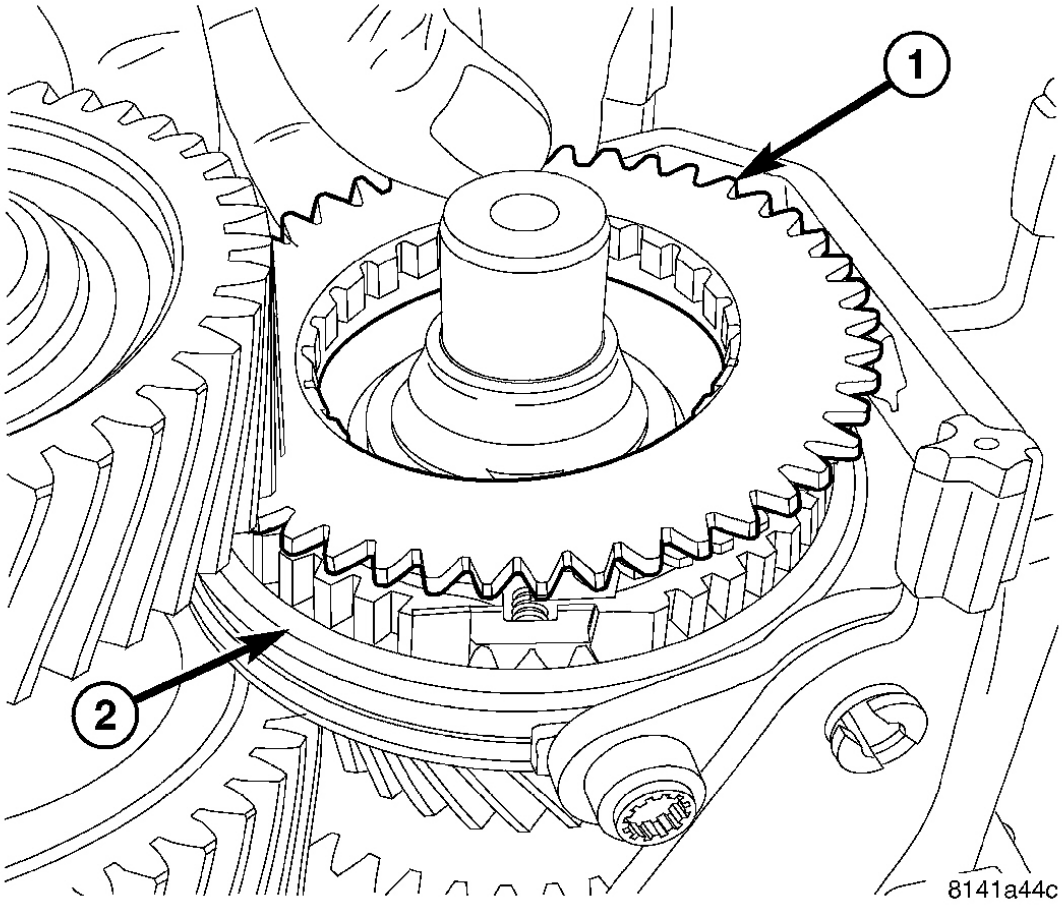

Fig. 115: Identifying Fifth Gear Synchronizer Blocker Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

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

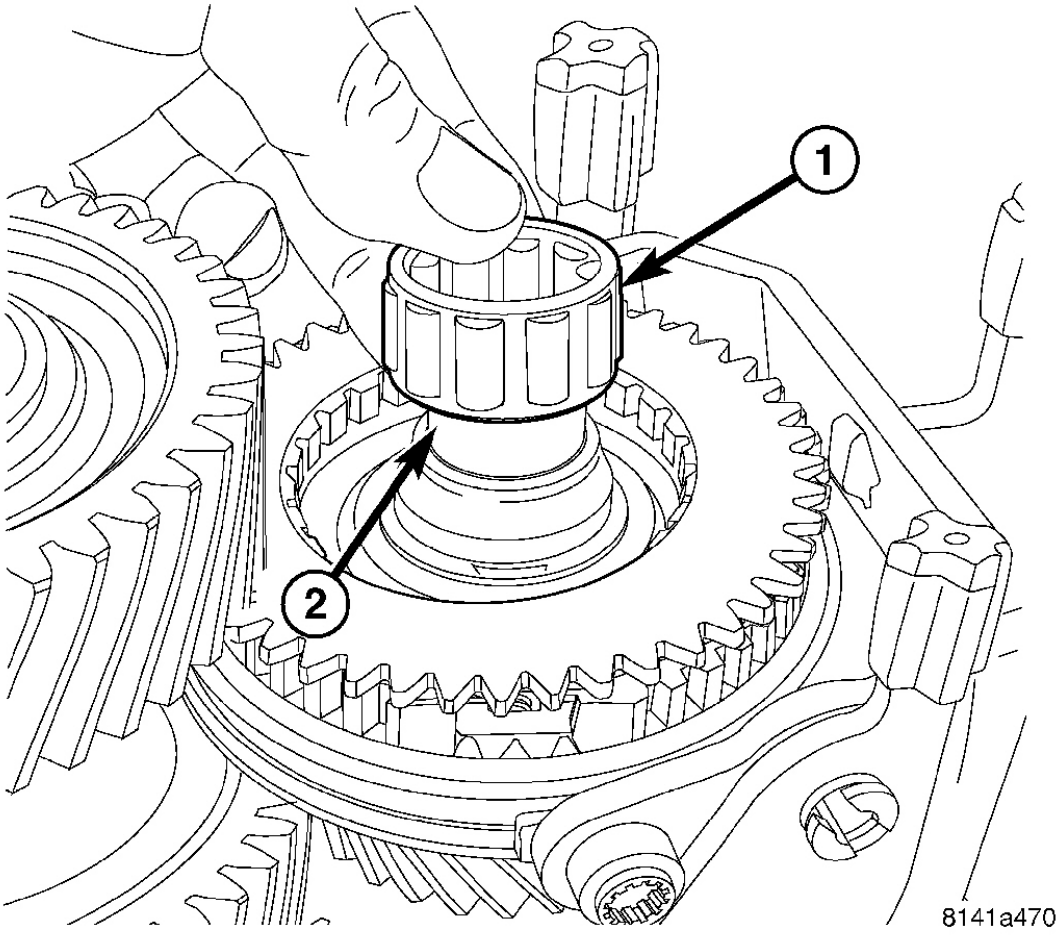

Fig. 116: Installing Input Shaft Roller Bearing On Mainshaft
Courtesy of CHRYSLER LLC

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

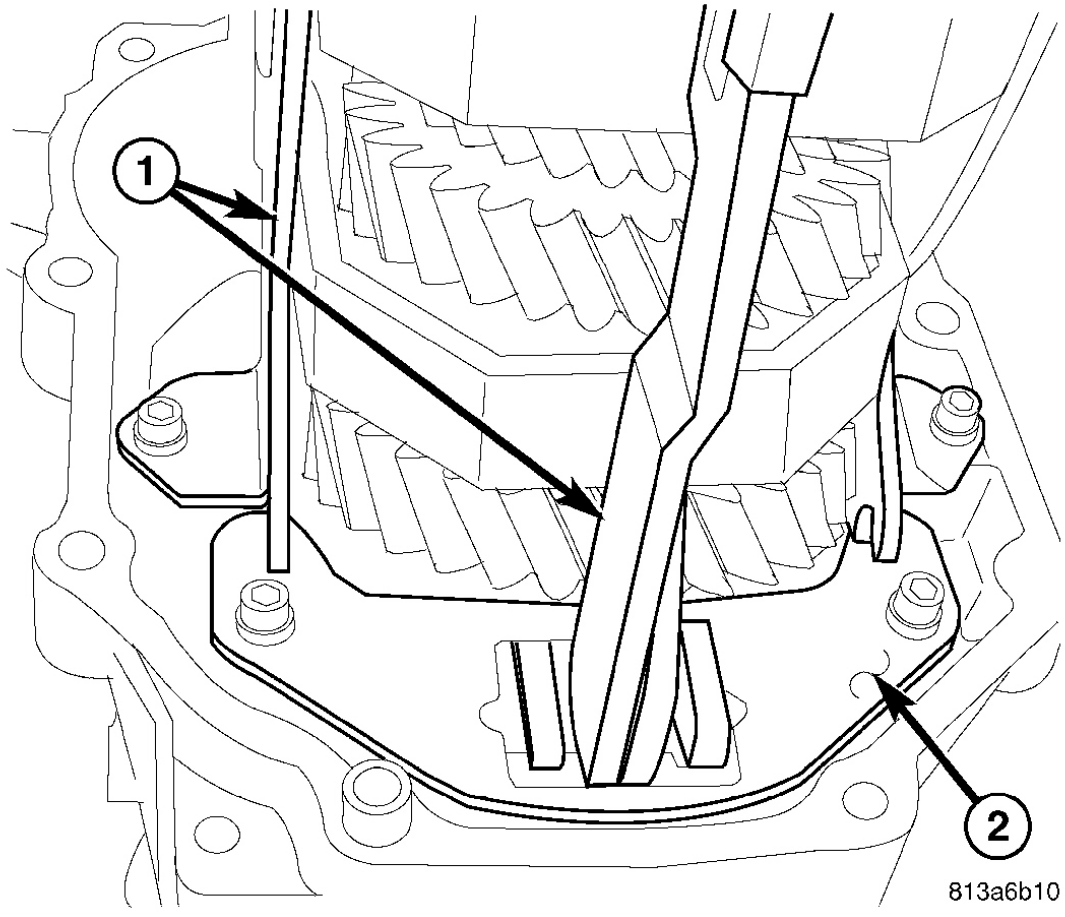

Fig. 117: Identifying Shift Rails & Support Plate
Courtesy of CHRYSLER LLC

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

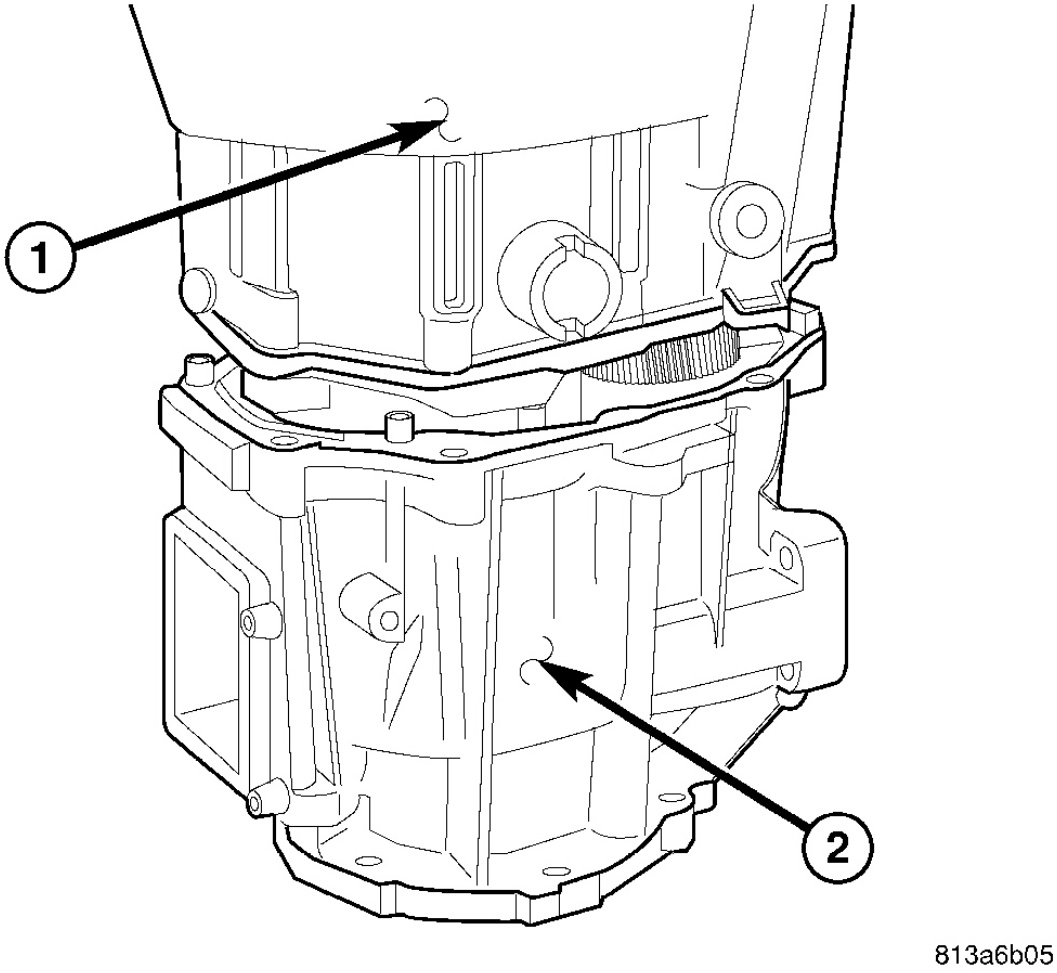

Fig. 118: Identifying Front Housing & Rear Housing
Courtesy of CHRYSLER LLC

12. Apply MOPAR® Gasket Maker to front housing.
13. Install front housing (1) on rear housing (2) and tighten bolts to 28 N.m (21 ft. lbs.).

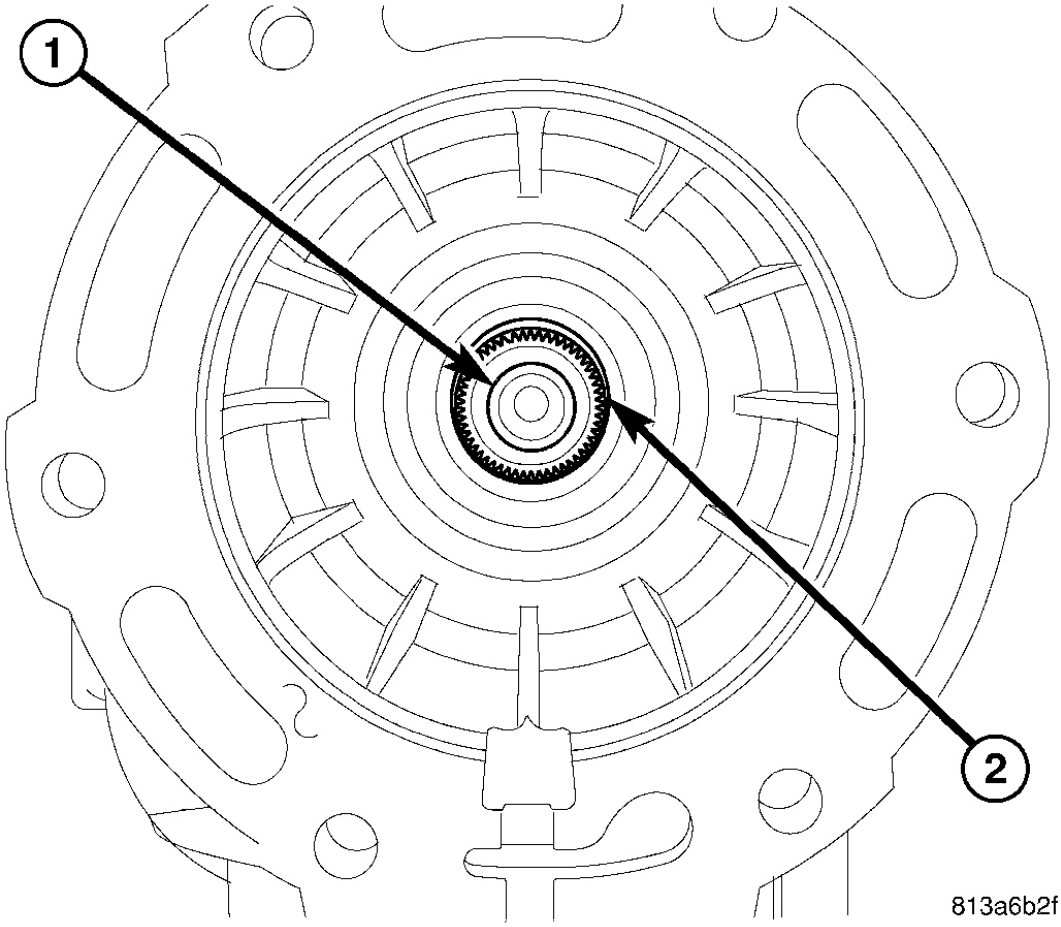

Fig. 119: Identifying Output Shaft & Snap Ring
Courtesy of CHRYSLER LLC

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

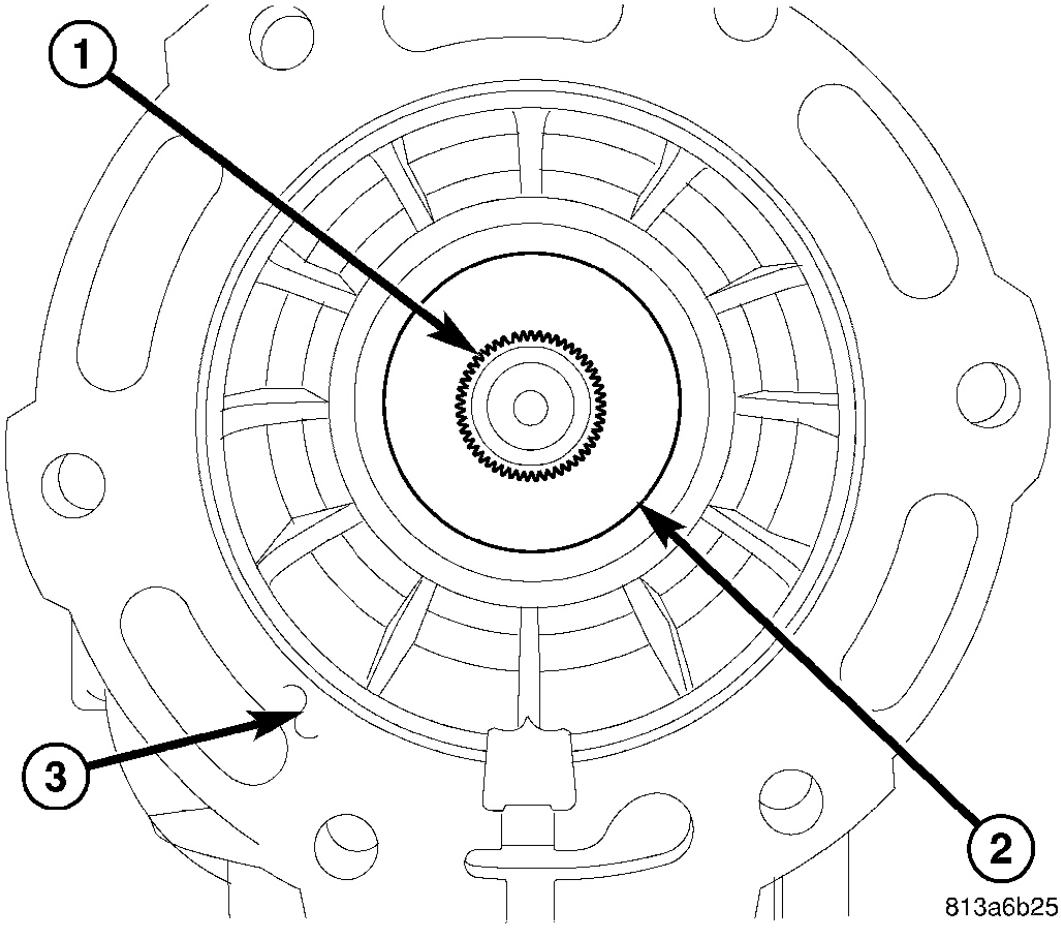

Fig. 120: Identifying Output Shaft, Seal & Rear Housing
Courtesy of CHRYSLER LLC

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

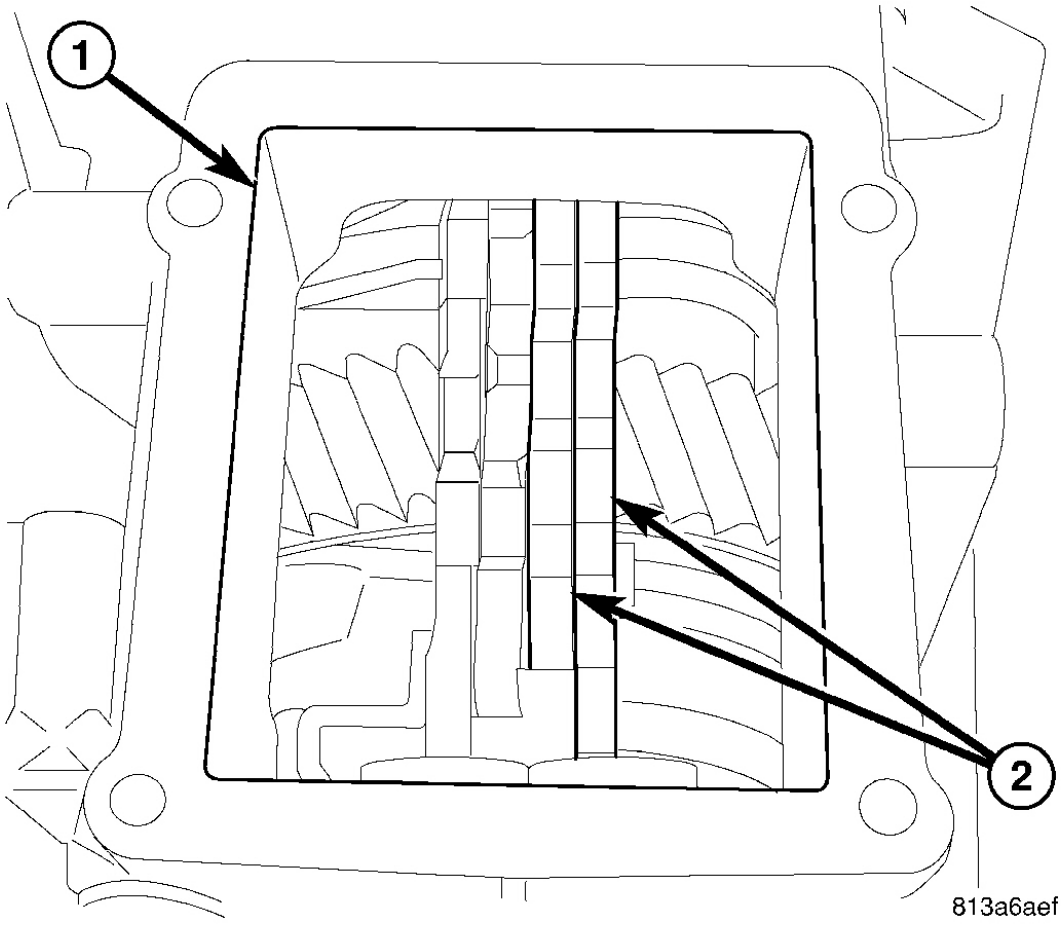

Fig. 121: Identifying Shift Tower Opening & Shift Two Shift Rails
Courtesy of CHRYSLER LLC

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

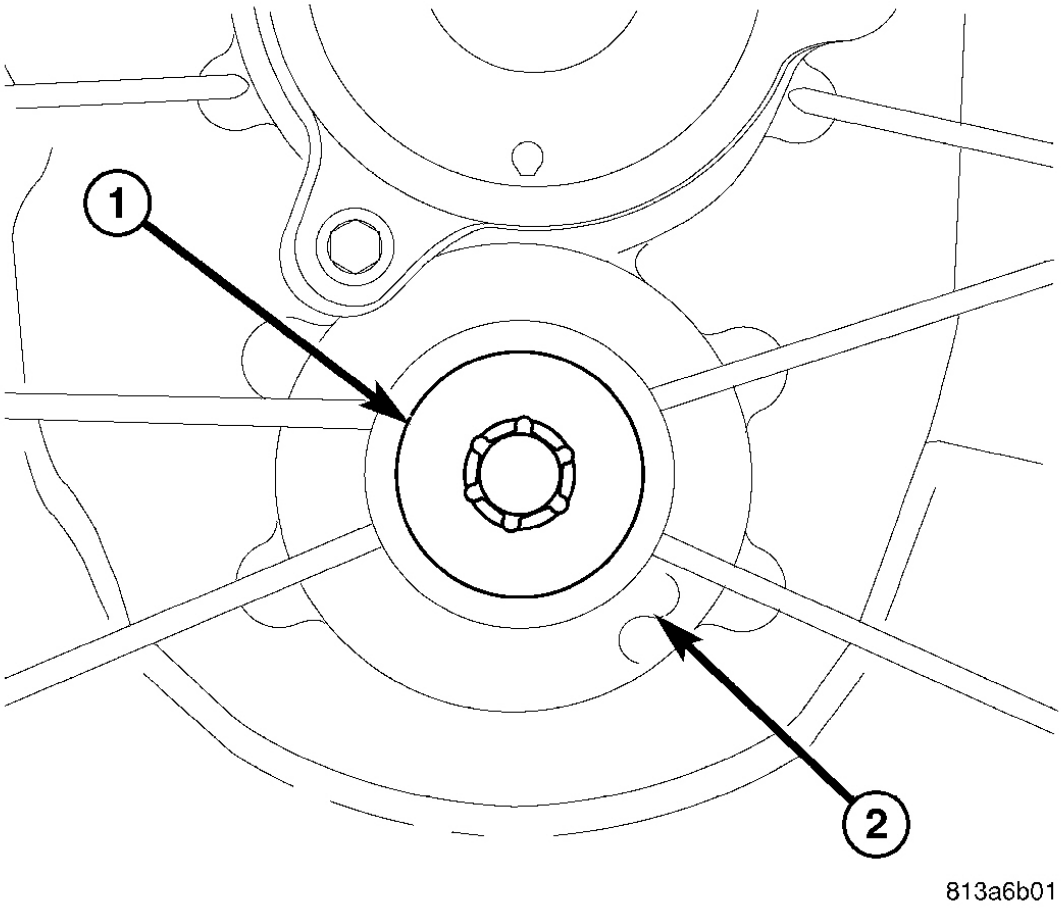

Fig. 122: Identifying Countershaft Bolt & Front Housing
Courtesy of CHRYSLER LLC

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

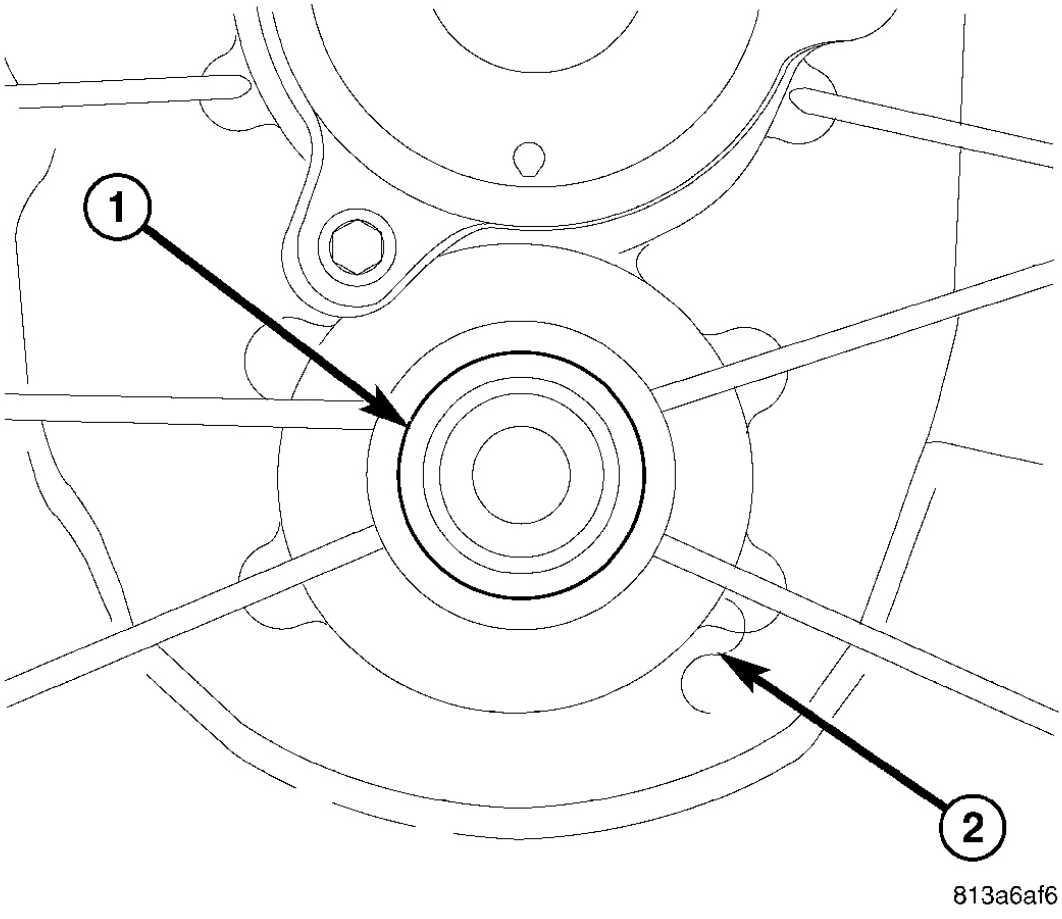

Fig. 123: Identifying Countershaft Plug & Front Housing
Courtesy of CHRYSLER LLC

18. Install countershaft plug (1) in front housing (2) with Installer 7829-A and Handle C-4171.

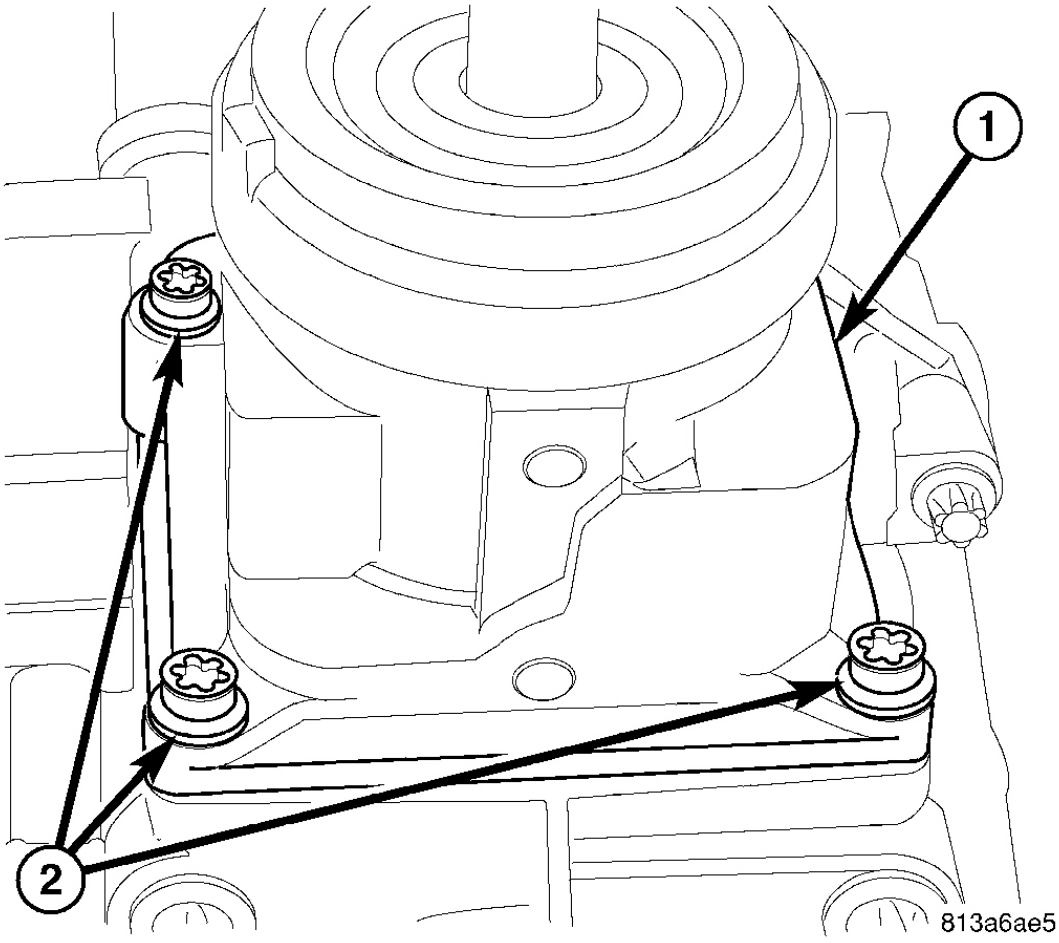

Fig. 124: Identifying Shift Tower & Bolts
Courtesy of CHRYSLER LLC

19. Move shift rails to neutral.
20. To prevent sealant from plugging the transmission vent, apply just a thin film of MOPAR® Gasket Maker to the shift tower (1) mating surface.
21. Install shift tower (1) and tighten bolts (2) to 14 N.m (10 ft. lbs.).

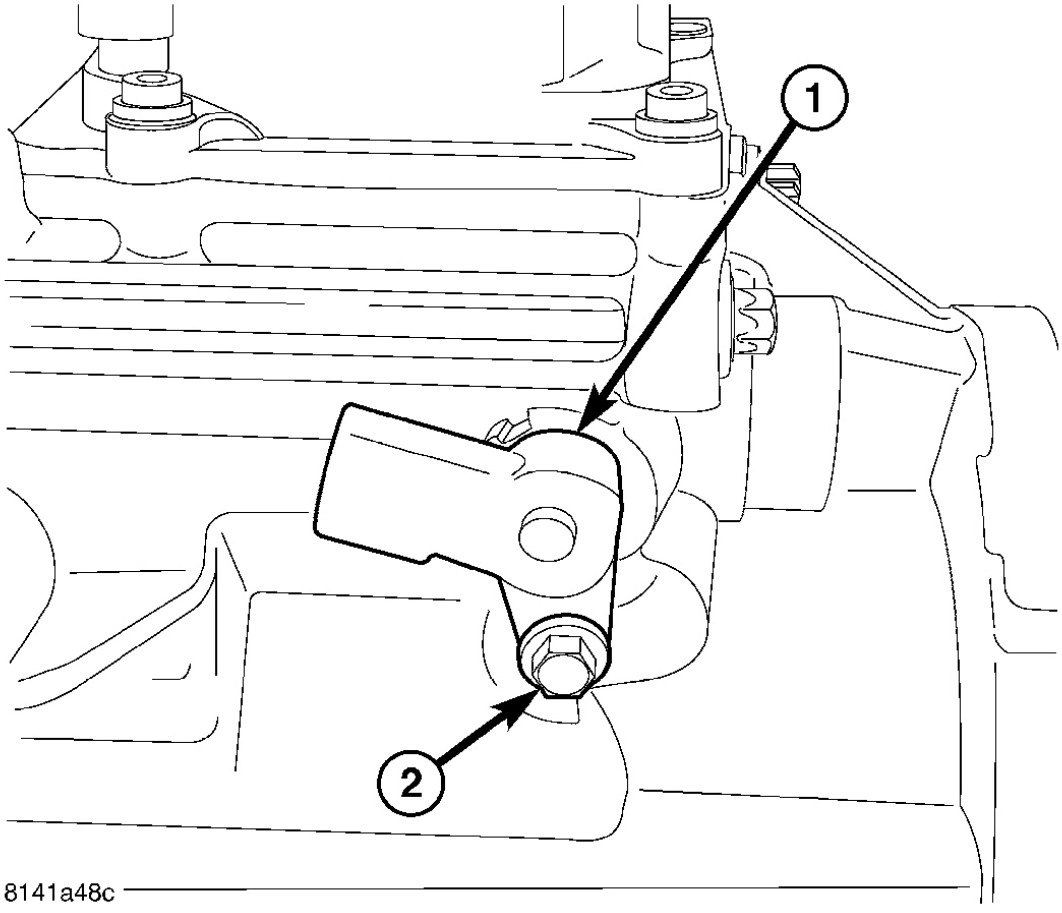

Fig. 125: Identifying Back-Up Lamp Switch & Bolt
Courtesy of CHRYSLER LLC

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

INSTALLATION

MANUAL TRANSMISSION - NSG370

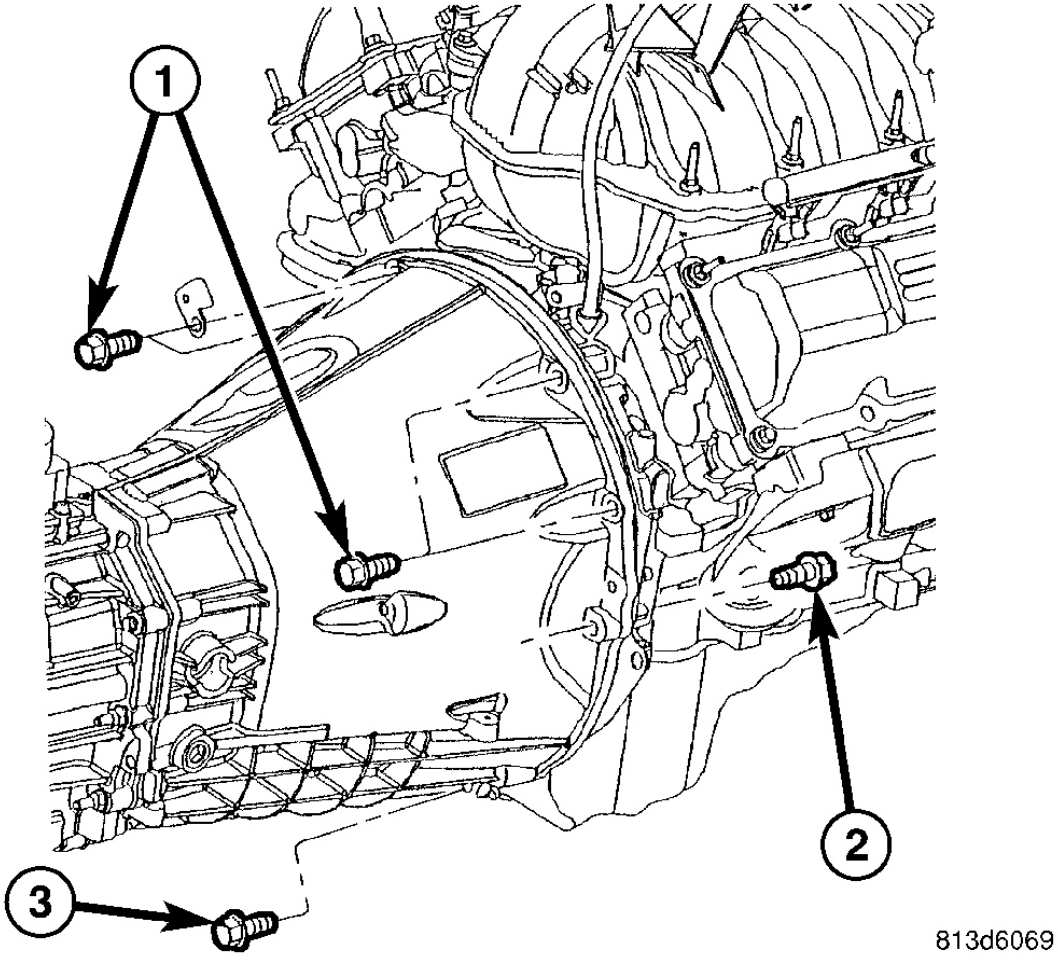

Fig. 126: Identifying Transmission Bolts (3.7L Engine)
Courtesy of CHRYSLER LLC

1. Install transmission on engine.
2. On 3.7L engine tighten bolts (1) to 41 N.m (30 ft. lbs.). Tighten bolts (2) to 67 N.m (50 ft. lbs.). Tighten bolts (3) to 54 N.m (40 ft. lbs.).

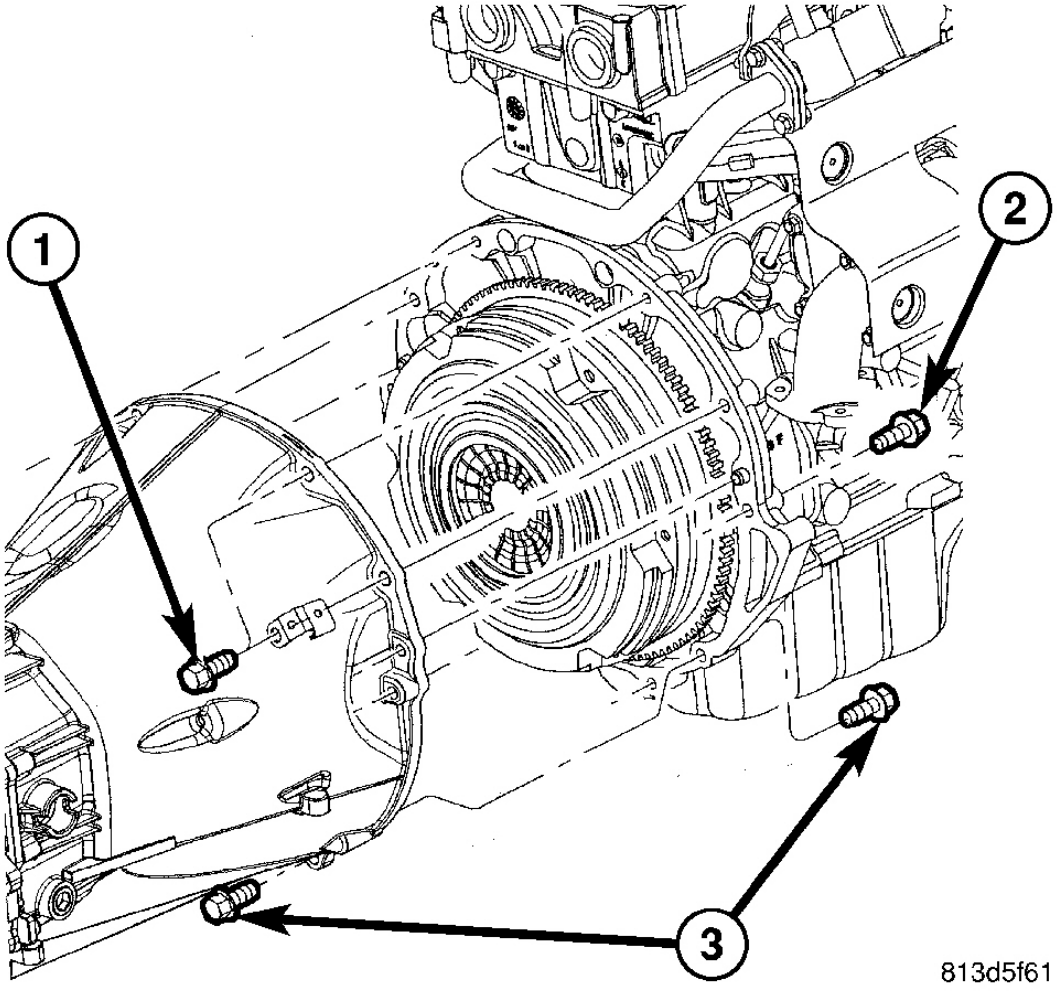

Fig. 127: Identifying Transmission Bolts (2.8L Diesel)
Courtesy of CHRYSLER LLC

3. On 2.8L diesel engine tighten bolts (1) to 41 N.m (30 ft. lbs.). Tighten bolts (2) to 67 N.m (50 ft. lbs.). Tighten bolts (3) to 54 N.m (40 ft. lbs.).

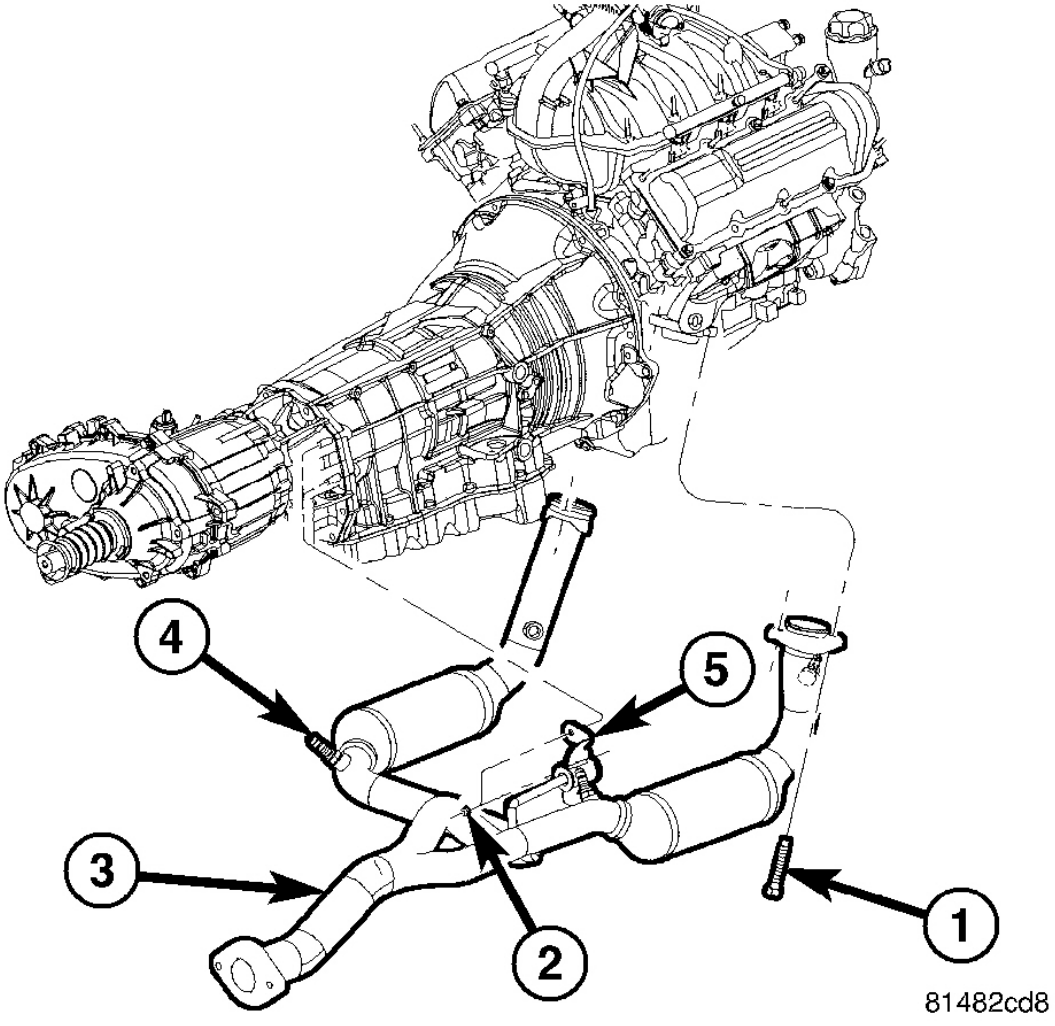

Fig. 128: 3.7L Catalytic Converter
Courtesy of CHRYSLER LLC

4. Vehicles with 3.7L engine install exhaust pipe with converters (3).

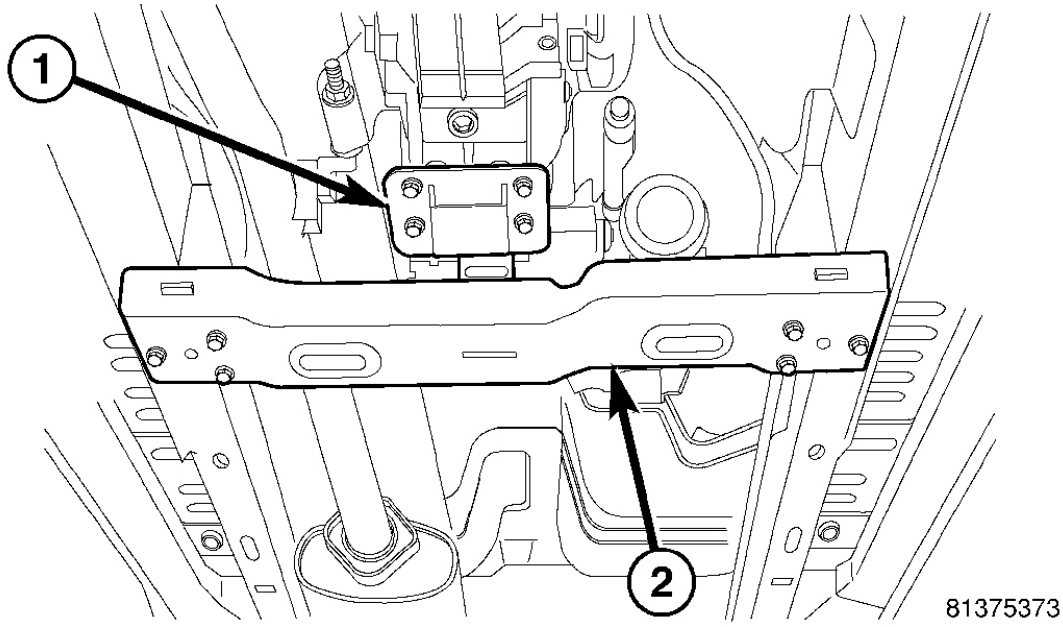

Fig. 129: Transmission Mount & Crossmember
Courtesy of CHRYSLER LLC

5. Install transmission crossmember (2) and tighten bolts to 47 N.m (35 ft. lbs.). Install transmission mount (1) bolts and tighten to 47 N.m (35 ft. lbs.).

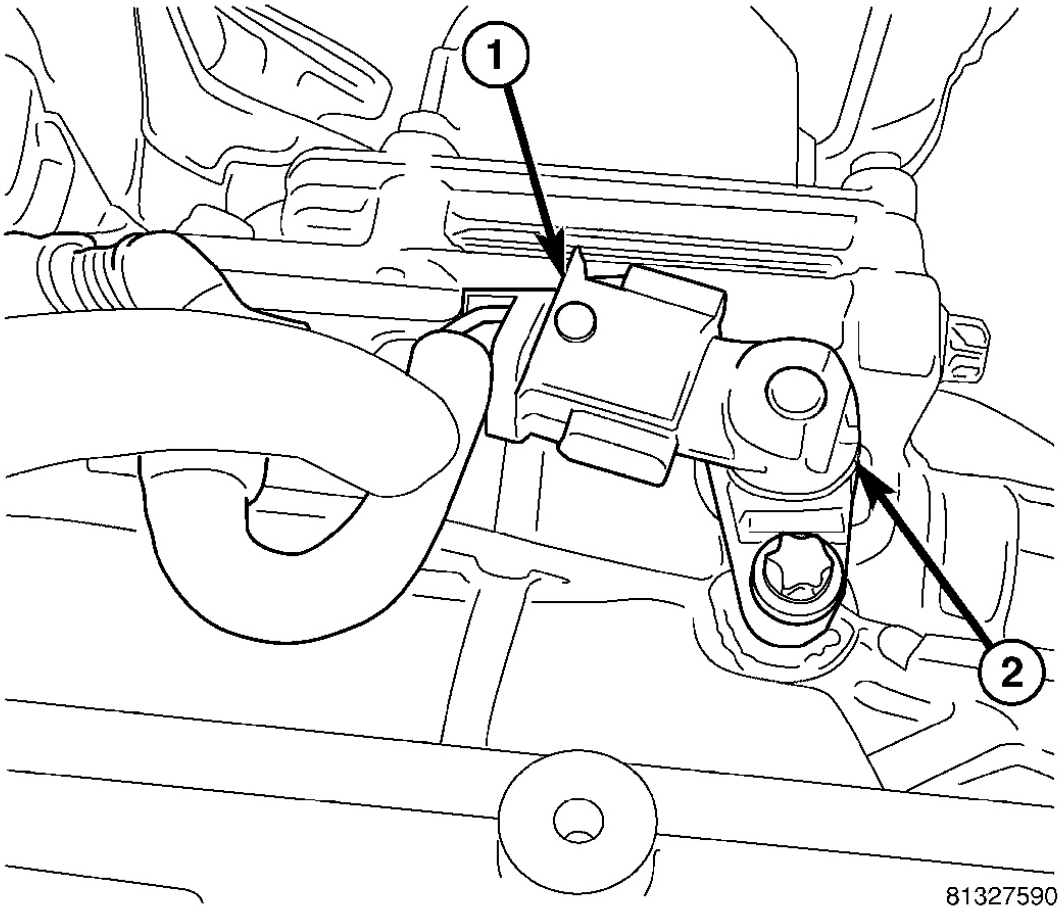

Fig. 130: Backup Lamp Switch & Wiring Connector
Courtesy of CHRYSLER LLC

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

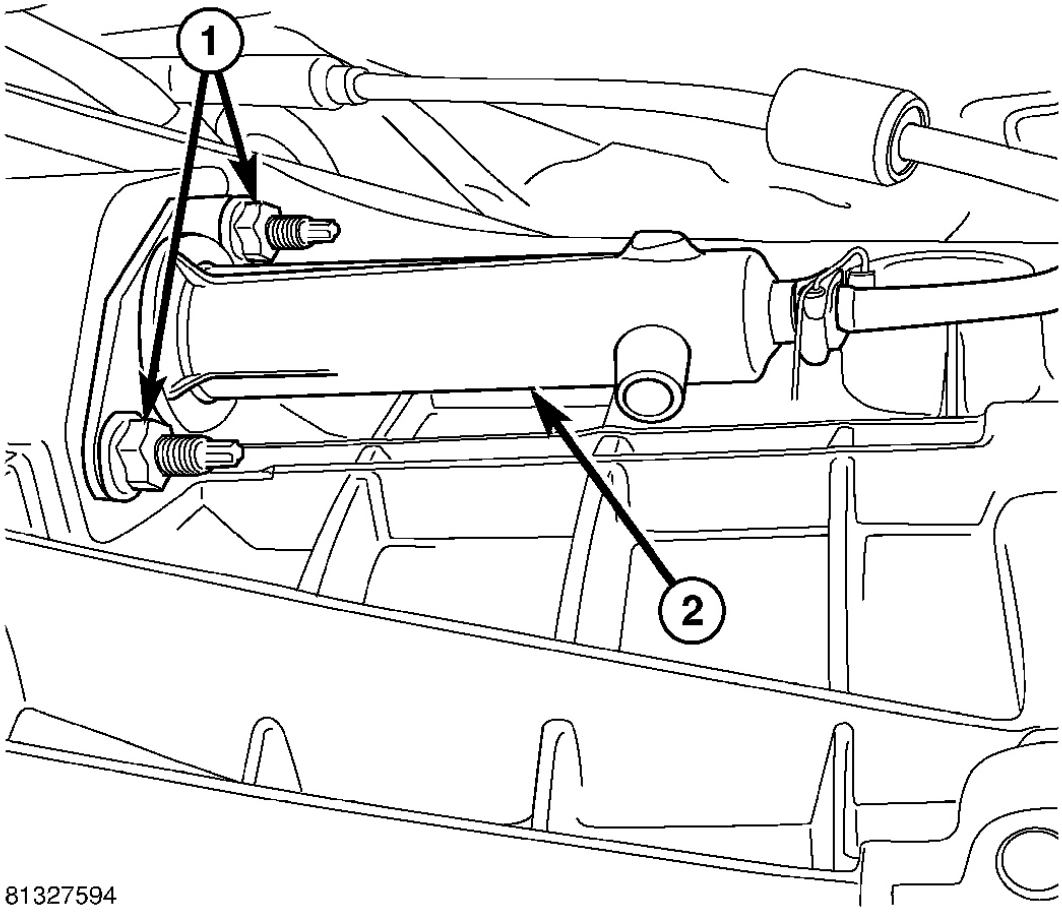

Fig. 131: Identifying Clutch Slave Cylinder Nuts & Cylinder
Courtesy of CHRYSLER LLC

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

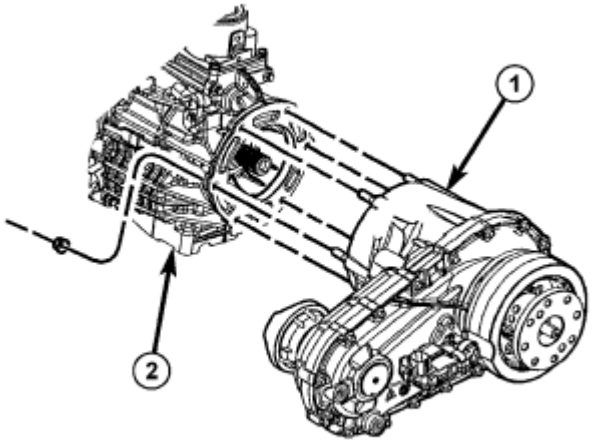

Fig. 132: Identifying Transfer Case & Transmission
Courtesy of CHRYSLER LLC

8. Install transfer case (1) on transmission (2), if equipped.
9. Install propeller shaft/shafts with reference marks aligned.

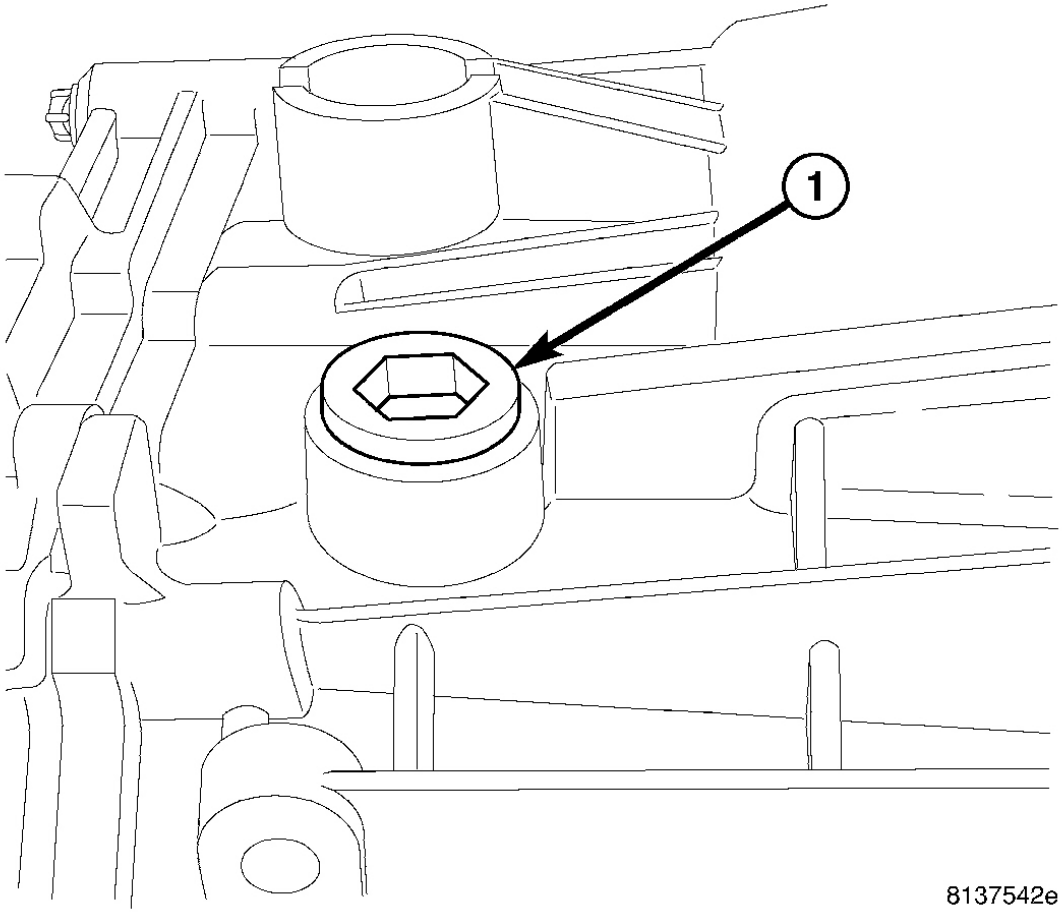

Fig. 133: Fill Plug
Courtesy of CHRYSLER LLC

10. Remove fill plug (1) and fill transmission to specifications.

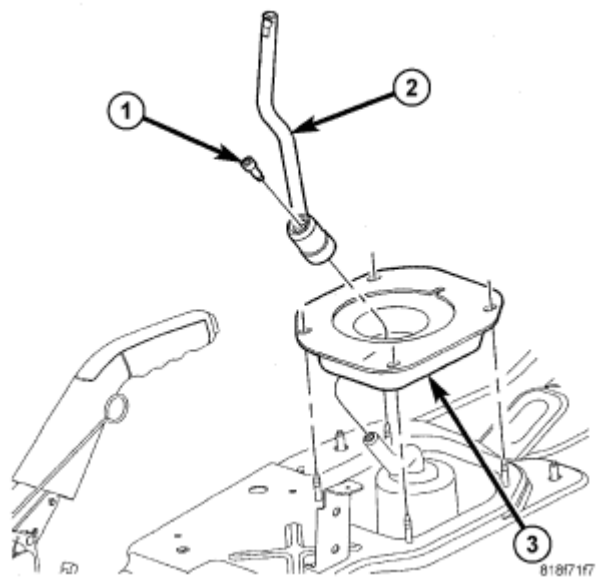

Fig. 134: Removing/Installing Shift Lever Screw, Lever And Inner Boot
Courtesy of CHRYSLER LLC

11. Install inner shift boot (3), shift lever (2) and lever screw (1).

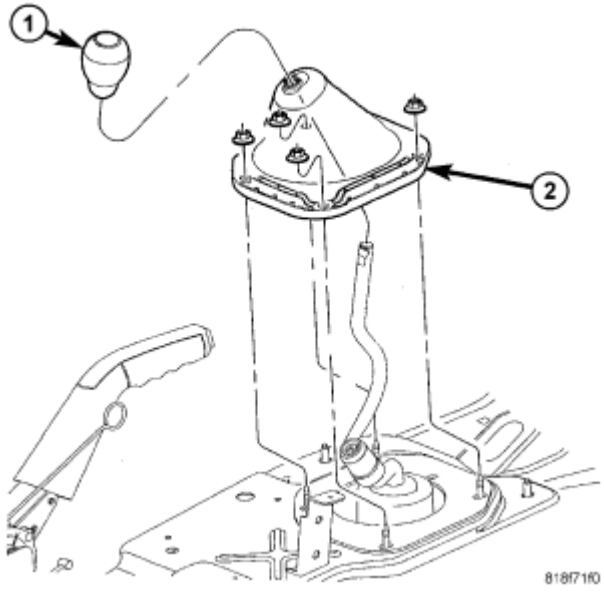

Fig. 135: Identifying Shift Knob & Boot
Courtesy of CHRYSLER LLC

12. Install shift boot (2), shift knob (1) and counsel.
13. Connect battery.

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	21	-
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	-
Transmission Mount to Transmission Bolts	47	35	-
Transmission Top Four Bolts	40	30	-
Transmission Side Two Bolts	68	50	-
Transmission Bottom Four Bolts	54	40	-
2WD Transmission Damper Bolts	175	130	-

GEAR RATIO

GEAR	RATIO
FIRST	4.46
SECOND	2.61
THIRD	1.72
FOURTH	1.25
FIFTH	1.00
SIXTH	0.84
REVERSE	4.06

SPECIAL TOOLS

NSG370

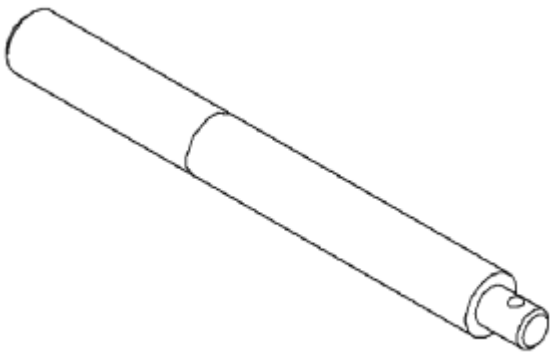

Fig. 136: Handle C-4171
Courtesy of CHRYSLER LLC

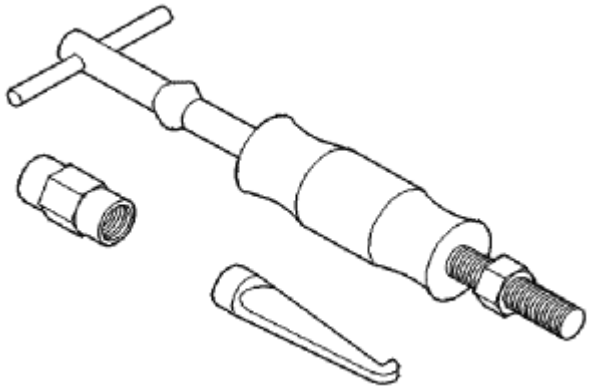

Fig. 137: Slide Hammer C-637
Courtesy of CHRYSLER LLC

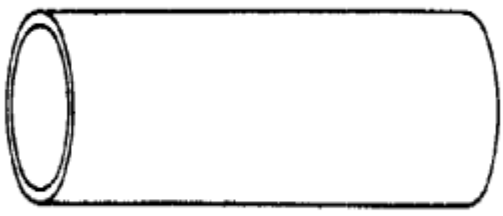

Fig. 138: Hub Installer W-262
Courtesy of CHRYSLER LLC

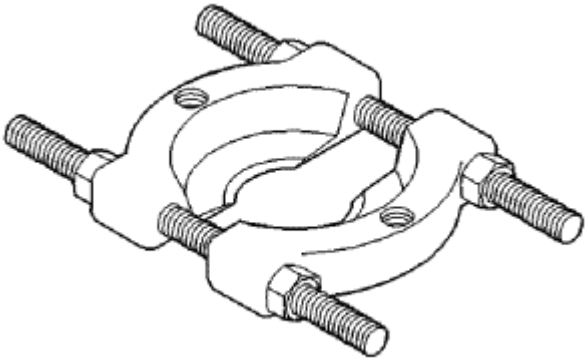

Fig. 139: Bearing Splitter 1130
Courtesy of CHRYSLER LLC

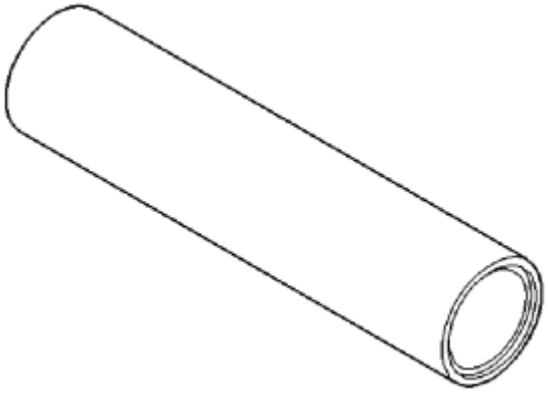

Fig. 140: Bearing Installer 6448A
Courtesy of CHRYSLER LLC

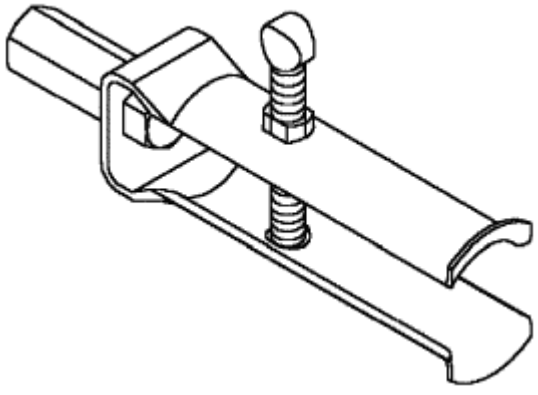

Fig. 141: Bearing Remover 7794-A
Courtesy of CHRYSLER LLC

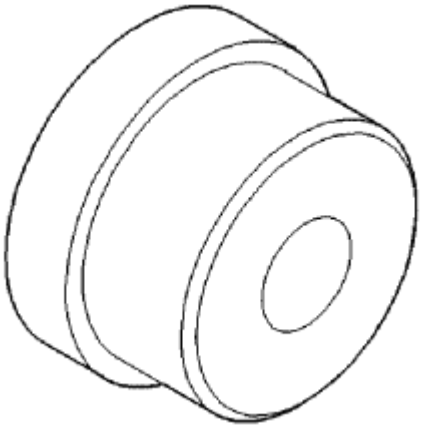

Fig. 142: Plug Installer 7829-A
Courtesy of CHRYSLER LLC

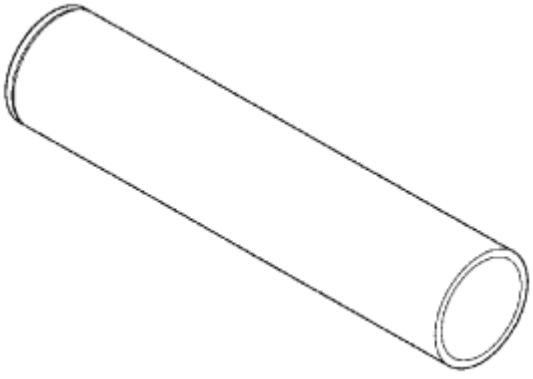

Fig. 143: Hub Installer 8228
Courtesy of CHRYSLER LLC

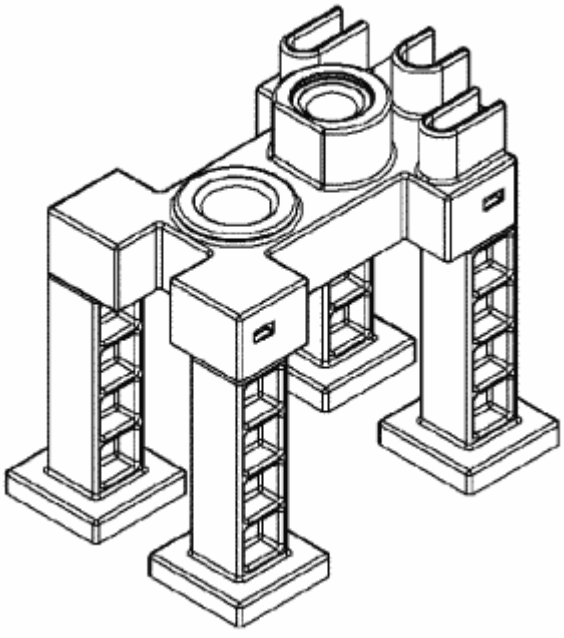

Fig. 144: Build Fixture 9633
Courtesy of CHRYSLER LLC

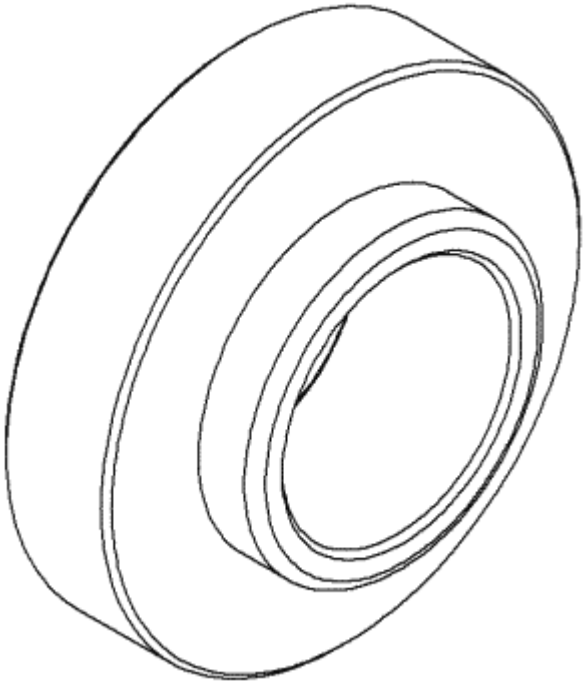

Fig. 145: Seal Installer 9635
Courtesy of CHRYSLER LLC

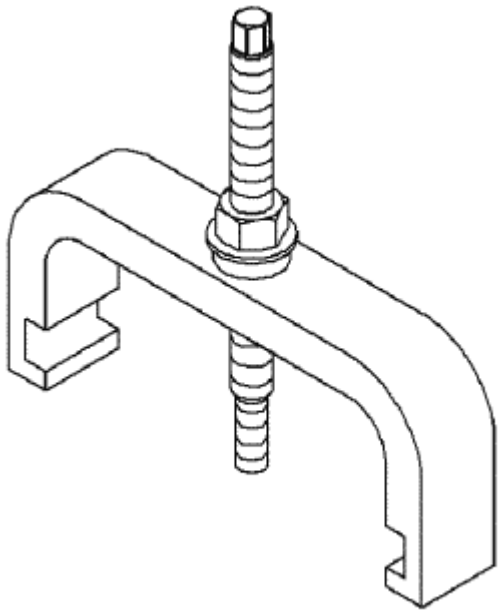

Fig. 146: Shaft Remover/Installer 9636
Courtesy of CHRYSLER LLC

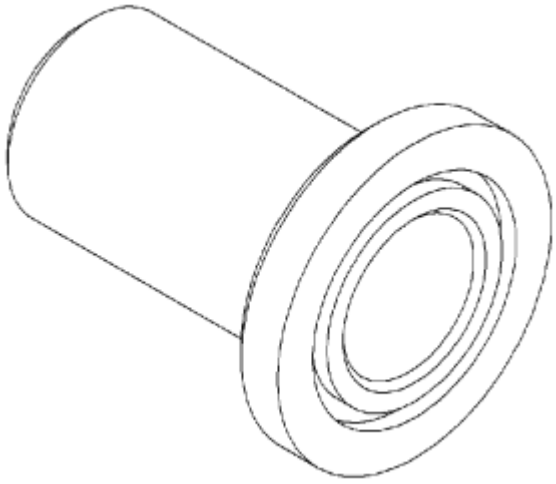

Fig. 147: Seal Installer 9638
Courtesy of CHRYSLER LLC

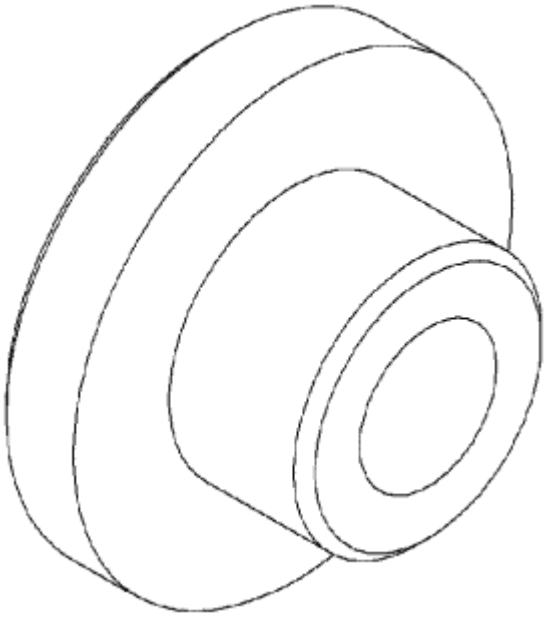

Fig. 148: Bearing Installer 9643
Courtesy of CHRYSLER LLC

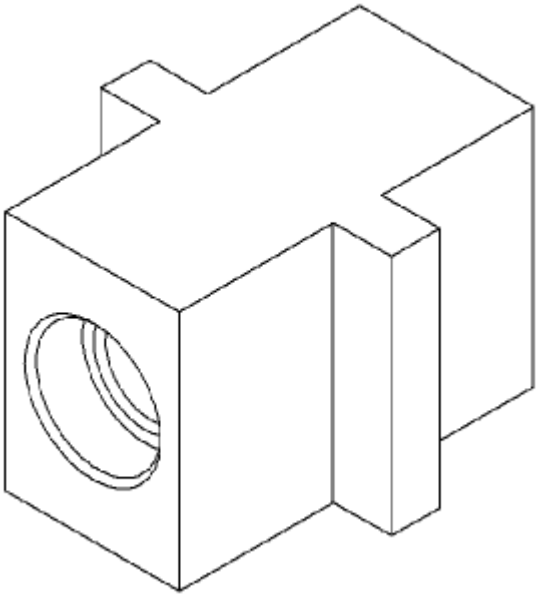

Fig. 149: Mainshaft Build Fixture 9648
Courtesy of CHRYSLER LLC