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TRANSFER CASE (FRONT AXLE DECLUTCH)

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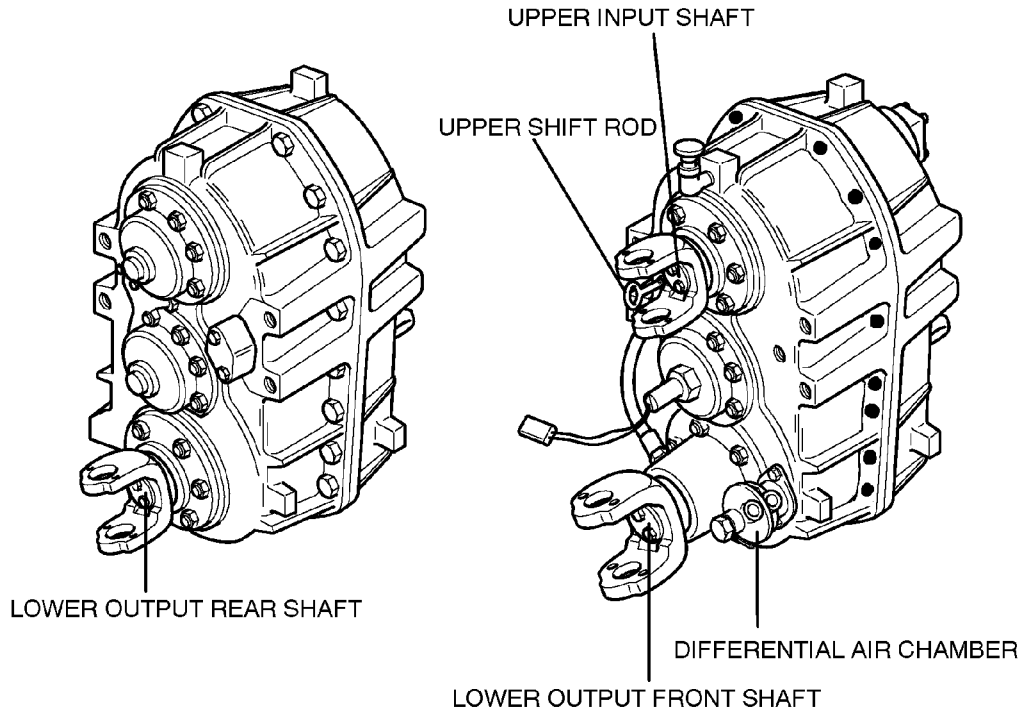


Figure 1. Transfer Case Components

1. INTRODUCTION.

This transfer case is a three shaft 2-speed unit. This transfer case also has a front axle declutch feature for engaging the front axle. The top shaft receives engine power from the transmission through the use of a driven shaft. The power is then transferred to the center shaft and bottom shaft in turn. The bottom shaft provides power full time to the rear axles via a drive shaft and to the front axle on demand through use of a sliding clutch. The engaging or disengaging of the front axle is accomplished by introducing air from a control valve in the cab to an air shift chamber on the bottom end of the transfer case. This shift chamber pushes a rod and fork assembly rearward meshing gears to propel the front axle. Releasing the air from the chamber allows the spring inside the case and chamber to move the rod and fork forward, to disengage the axle.

Selection of either speed is accomplished by a shift lever and connecting rod to the transfer case. The rod connects to the transfer case shift rod.

2. SPECIFICATIONS.

Make . . . Oshkosh
 Model . . . 55000-Series
 Speeds . 2
 Shafts . . 3
 Type of Gear . . . Helical
 Method of Speed Selection: Operator Controlled Lever

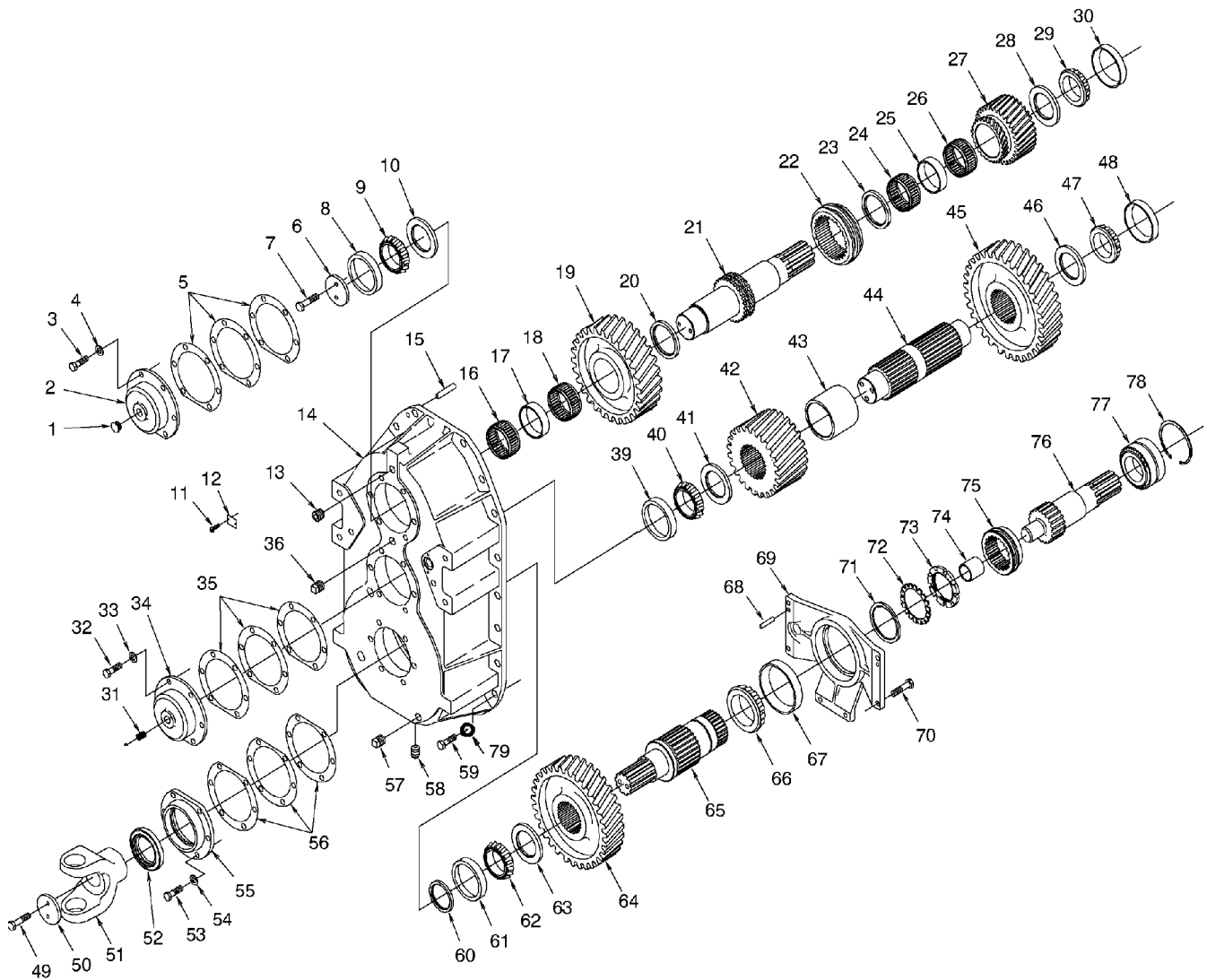


Figure 2. Transfer Case Assembly.

Legend for Figure 2.

- | | | | |
|-----------------------|-------------------|---------------------|----------------------|
| 1. Plug | 21. Upper Shaft | 41. Spacer | 61. Bearing Cup |
| 2. End Cap | 22. Clutch Collar | 42. Gear, 40T | 62. Bearing Cone |
| 3. Capscrew | 23. Spacer | 43. Spacer | 63. Spacer |
| 4. Lockwasher | 24. Cage Roller | 44. Center Shaft | 64. Gear, 54T |
| 5. Shims | 25. Spacer | 45. Gear, 63T | 65. Shaft |
| 6. Capscrew | 26. Cage Roller | 46. Spacer | 66. Bearing Cone |
| 7. End Plate | 27. Gear, 32T | 47. Bearing Cone | 67. Bearing Cup |
| 8. Bearing Cup | 28. Spacer | 48. Bearing Cup | 68. Dowel Pin |
| 9. Bearing Cone | 29. Bearing Cone | 49. Capscrew | 69. Bearing Support |
| 10. Spacer | 30. Bearing Cup | 50. Retainer Washer | 70. Capscrew |
| 11. Metal Tack | 31. Plug | 51. Yoke | 71. Spacer |
| 12. Instruction Plate | 32. Capscrew | 52. Oil Seal | 72. Lockwasher |
| 13. Plug | 33. Lockwasher | 53. Capscrew | 73. Bearing Lock Nut |
| 14. Rear Housing | 34. End Cap | 54. Lockwasher | 74. Bushing |
| 15. Dowel Pin | 35. Shims | 55. End Cap | 75. Clutch Collar |
| 16. Caged Roller | 36. Plug | 56. Shims | 76. Shaft |
| 17. Spacer | 37. Deleted | 57. Plug | 77. Bearing Assembly |
| 18. Caged Roller | 38. Deleted | 58. Magnetic Plug | 78. Retainer Ring |
| 19. Gear 55T | 39. Bearing Cup | 59. Capscrew | 79. Flatwasher |
| 20. Spacer | 40. Bearing Cone | 60. Spacer | |

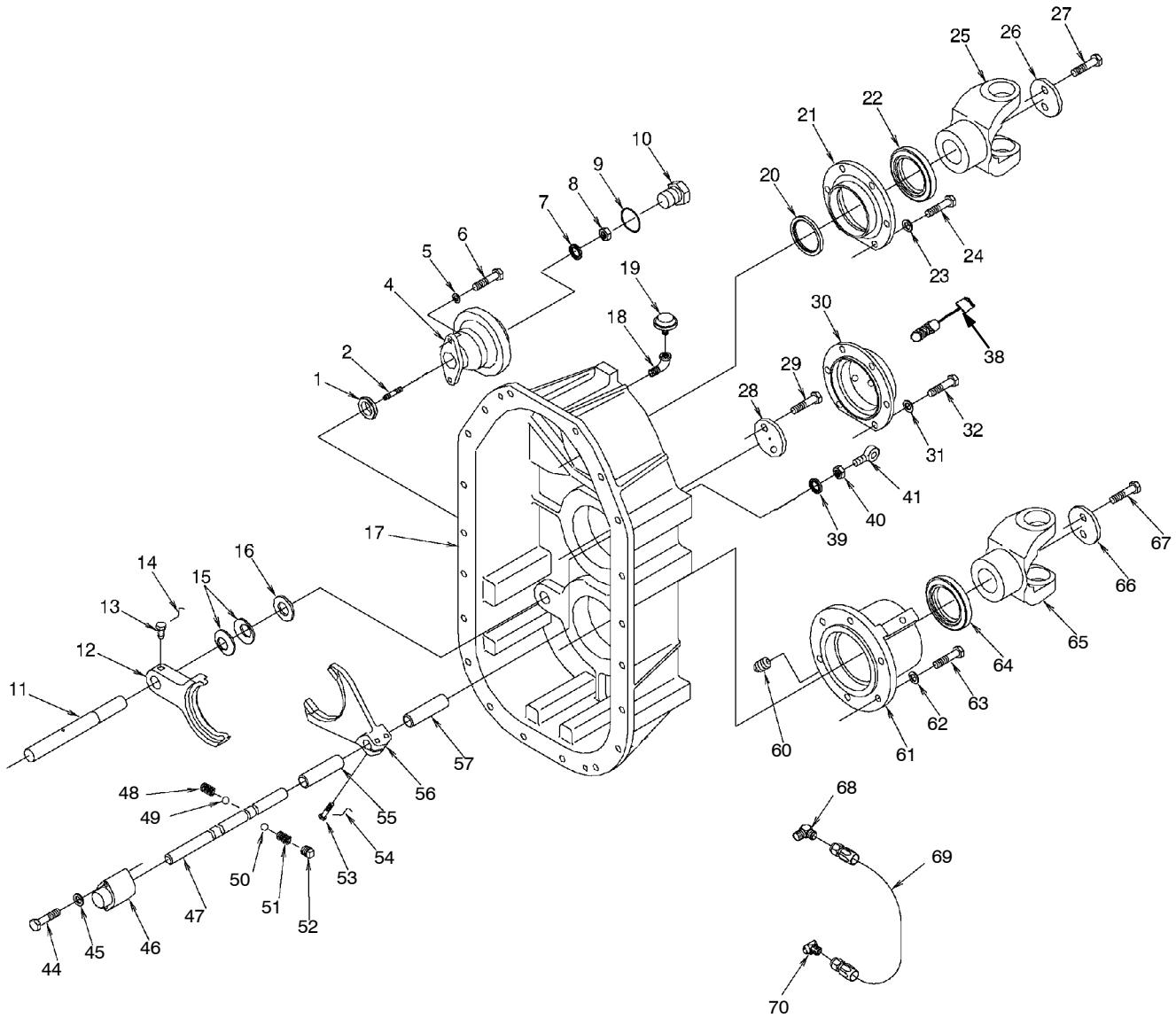


Figure 3. Transfer Case Assembly.

Legend for Figure 3.

- | | | | |
|-----------------------|------------------------|---------------------------|------------------------|
| 1. Pilot Plug | 20. Spacer | 39. Oil Seal | 58. Not Currently Used |
| 2. Stud | 21. End Cap | 40. Jam Nut | 59. Not Currently Used |
| 3. Deleted | 22. Oil Seal | 41. Rod End | 60. Plug |
| 4. Air Shift Chamber | 23. Lockwasher | 42. Not Currently Used | 61. Bearing Cap |
| 5. Lockwasher | 24. Capscrew | 43. Not Currently Used | 62. Lockwasher |
| 6. Capscrew | 25. Yoke | 44. Capscrew | 63. Capscrew |
| 7. Copper Washer | 26. Retainer Washer | 45. Lockwasher | 64. Oil Seal |
| 8. Locknut | 27. Capscrew | 46. Upper Shift Rod Cover | 65. Yoke |
| 9. Pre-formed Packing | 28. Pulse Wheel | 47. Upper Shift Rod | 66. Lock Plate |
| 10. Plug | 29. Capscrew | 48. Spring | 67. Capscrew |
| 11. Lower Shift Rod | 30. End Cap | 49. Ball | 68. Adapter |
| 12. Fork | 31. Lockwasher | 50. Ball | 69. Hose |
| 13. Bolt Tapered | 32. Capscrew | 51. Spring | 70. Adapter |
| 14. Lockwire | 33. Not Currently Used | 52. Plug | |
| 15. Spring Disk | 34. Not Currently Used | 53. Capscrew | |
| 16. Spacer | 35. Not Currently Used | 54. Lockwire | |
| 17. Front Housing | 36. Not Currently Used | 55. Spacer | |
| 18. Elbow | 37. Not Currently Used | 56. Upper Shaft Fork | |
| 19. Breather | 38. Sending Unit | 57. Spacer | |

3. TRANSFER CASE REMOVAL.

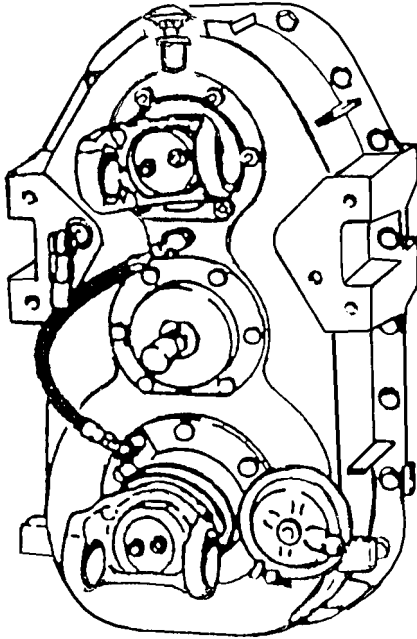


Figure 4.

⚠ WARNING

Stay clear of transfer case when supported by lifting device. Transfer case may fall and cause serious injury to personnel.

- (1) Remove drain plug at bottom of transfer case. Drain oil. Disconnect air lines and prop shafts. Unfasten mounting bolts and biscuits from mounting brackets. Remove transfer case from truck using suitable lifting equipment. Remove mounting brackets from transfer case.

4. TRANSFER CASE DISASSEMBLY.

- (1) Position transfer case in suitable maintenance stand, with front housing facing up.
- (2) Remove speedometer sending unit (Figure 3, Item 38) from front housing (17).
- (3) Tag and disconnect hose (Figure 3, Item 69) from two adapters (68 and 70).
- (4) Remove two capscrews (Figure 3, Item 27) and retaining washer (26) from upper shaft (Figure 2, Item 21).

- (5) With the use of a puller, remove yoke (Figure 3, Item 25) from upper shaft (Figure 2, Item 21).
- (6) Remove two capscrews (Figure 3, Item 67) and lock plate (66) from shaft (Figure 2, Item 76).
- (7) With the use of a puller, remove yoke (Figure 3, Item 65) from shaft (Figure 2, Item 76).
- (8) Loosen jam nut (Figure 3, Item 40), and remove rod end (41), jam nut (40), and oil seal (39) from upper shift rod (47).
- (9) Remove breather (Figure 3, Item 19), elbow (18), and two adapters (68 and 70) from front housing (17) and bearing cap (61).

⚠ CAUTION

Diaphragm is spring loaded. Use caution when removing air chamber from transfer case. Failure to follow this procedure can result in serious injury.

- (10) Remove plug (Figure 3, Item 10), pre-formed packing (9), locknut (8), and copper washer (7) from air shift chamber (4).

NOTE

Gently strike lockout air shift chamber with soft-faced mallet to unseat from transfer case.

- (11) Remove two capscrews (Figure 3, Item 6), lockwashers (5), air shift chamber (4), and pilot ring (1) from front housing (17).
- (12) Remove six capscrews (Figure 3, Item 63), lockwashers (62), bearing cap (61), and lower front output shaft assembly from front housing (17).

NOTE

Note location of groove on declutch collar when removed.

- (13) Remove declutch collar (Figure 2, Item 75) from fork (Figure 3, Item 12) and lower rear output shaft (Figure 2, Item 65) through the front housing (Figure 3, Item 17) cover opening.
- (14) Remove outer detent plug (Figure 3, Item 52), spring (51), and ball (50) from rear housing (Figure 2, Item 14).
- (15) Remove six capscrews (Figure 3, Item 32), lockwashers (31), and end cap (30) from front housing (17).

- (16) Remove six capscrews (Figure 3, Item 24), lockwashers (23), and end cap (21) from front housing (17).
- (17) Remove oil seal (Figure 3, item 22) from end cap (21).
- (18) Rotate transfer case so that the rear housing (Figure 2, Item 14) is facing up.
- (19) Remove two capscrews (Figure 2, Item 49) and retainer washer (50) from shaft (65).
- (20) With the use of a puller, remove yoke (Figure 2, Item 51) from shaft (65).
- (21) Remove six capscrews (Figure 2, Item 53), lockwashers (54), end cap (55), and three shims (56) from rear housing (14).
- (22) Remove oil seal (Figure 2, Item 52) from end cap (55).
- (23) Remove six capscrews (Figure 2, Item 32), lockwashers (33), end cap (34), and three shims (35) from rear housing (14).
- (24) Remove six capscrews (Figure 2, Item 3), lockwashers (4), end cap (2), and three shims (5) from rear housing (14).
- (25) Remove magnetic plug (Figure 2, Item 58) from rear housing (14).
- (26) Remove two capscrews (Figure 3, Item 44), lockwashers (45), and upper shift rod cover (46) from rear housing (Figure 2, Item 14).
- (27) Rotate transfer case so the front housing (Figure 3, Item 17) is facing up.
- (28) Remove 20 capscrews (Figure 2, Item 59), and flatwashers (Figure 2, Item 79) from transfer case halves.
- (29) Separate transfer case halves using jack bolts at locations provided at top and bottom.

⚠ WARNING

Stay clear of front housing when supported by lifting device. Front housing may fall and cause serious injury to personnel.

⚠ WARNING

Lift transfer case front housing straight up to prevent possible damage to shift rod.

- (30) With a suitable lifting device, lift front housing (Figure 3, Item 17) from rear housing (Figure 2, Item 14).

⚠ WARNING

Stay clear of center shaft assembly and upper input shaft and shift rod assembly when supported by lifting device. The assemblies may fall and cause serious injury to personnel.

- (31) With a suitable lifting device remove center shaft assembly from rear housing (Figure 2, Item 14).
- (32) Remove lower shift rod (Figure 3, item 11) spacer (16) eight spring discs (15) and shift fork (12) from rear housing (Figure 2, Item 14).

⚠ WARNING

Stay clear of upper shaft assembly when supported by lifting device. Upper shaft assembly may fall and cause serious injury to personnel.

NOTE

Inner detent ball will fall out of bottom of transfer case rear half when upper shift rod is removed.

Fork assembly and shaft assembly must be removed simultaneously to prevent binding.

Spacers are different in length. Mark for proper assembly.

- (33) With a suitable lifting device remove upper shaft assembly and upper shift rod assembly and two spacers (Figure 3, Items 55 and 57) from rear housing (Figure 2, Item 14).
- (34) Remove inner detent spring (Figure 3, Item 48) and ball (49) from rear housing (Figure 2, Item 14).
- (35) Remove six capscrews (Figure 2, Item 70) and bearing support (69) from rear housing (14).

⚠ WARNING

Stay clear of rear output shaft assembly when supported by lifting device. Rear output shaft assembly may fall and cause serious injury to personnel.

- (36) With a suitable lifting device, remove rear output shaft assembly from rear housing (Figure 2, Item 14).

NOTE**Do step (40) if bearing or race fail inspection.**

- (37) Using a soft-face hammer remove bearing cup (Figure 2, Item 67) from bearing support (69).
- (38) Rotate rear housing (Figure 2, Item 14) so that the bottom is facing up.

NOTE**Do step (42) if bearing or race fail inspection.**

- (39) Remove bearing cups (Figure 2, Items 8, 39, and 61) from rear housing (14).
- (40) Position front housing (Figure 3, Item 17) on work bench so the bearing cups can be removed.

NOTE**Do step (44) if bearing or race fail inspection.**

- (41) Remove bearing cups (Figure 2, Items 30 and 48) from front housing (Figure 3, Item 17).

NOTE**Do steps (45) and (46) if dowel pins fail inspection.**

- (42) Remove two dowel pins (Figure 2, Item 15) from rear housing (14).
- (43) Remove dowel pin (Figure 2, Item 68) from bearing support (69).

4.1 Lower Shift Rod Disassembly.

- (1) Remove spacer (Figure 3, Item 16) and eight spring disks (15) from shift rod (11).
- (2) Cut lockwire (Figure 3, Item 14) from tapered bolt (13) and remove tapered bolt (13) from shift fork (12).
- (3) Slide shift rod (Figure 3, Item 11) from shift fork (12).

4.2 Upper Shift Rod Disassembly.

- (1) Remove two spacers (Figure 3, Items 55 and 56) from shift rod (47).
- (2) Cut lockwire (Figure 3, Item 54) holding two capscrews (53).

- (3) Remove two capscrews (Figure 3, Item 53) from shift fork (56).
- (4) Remove shift rod (Figure 3, Item 47) from upper shift fork (56).

4.3 Lower Front Output Shaft Disassembly.** WARNING**

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Remove plug (Figure 3, Item 60).
- (2) Place bearing cap (Figure 3, Item 61) in suitable press and press out output shaft (Figure 2, item 76).
- (3) Remove oil seal (Figure 3, Item 64) from bearing cap (61).
- (4) Remove two bearing cones, and one bearing cup part of bearing assembly (Figure 2, Item 77) from bearing cap (Figure 3, Item 61).
- (5) With the use of a puller, remove bearing cup, part of bearing assembly (Figure 2, Item 77) from bearing cap (Figure 3, Item 61).

 WARNING

Use care when removing snap and retaining rings. Snap and retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

- (6) Remove retaining ring (Figure 2, Item 78) from bearing cap (Figure 2, Item 77).

4.4 Lower Rear Output Shaft Disassembly.** WARNING**

Use proper lifting procedures and precautions to avoid personal injury.

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Straighten tangs of lockwasher (Figure 2, Item 72), and remove bearing locknut (73) and lockwasher (72) from lower rear output shaft (65).
- (2) Remove spacer (Figure 2, Item 71).

- (3) Place lower rear output shaft assembly in press with supports under gear (Figure 2, Item 64).
- (4) Press lower rear output shaft (Figure 2, Item 65) out of bearing cone (66) and gear (64).
- (5) With the use of a puller, remove bushing (Figure 2, Item 74) from lower rear output shaft (65).
- (6) Turn lower rear output shaft (Figure 2, Item 65) over and pull or press off bearing cone (62) and spacers (60 and 63).

4.5 Center Shaft Disassembly.

WARNING

Use proper lifting procedures and precautions to avoid personal injury.

WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Place center shaft assembly in suitable press with large gear (Figure 2, Item 45) up.
- (2) Press center shaft (Figure 2, Item 44) out of bearing cone (47) spacer (46) and large gear (45).
- (3) Remove spacer (Figure 2, Item 43) from center shaft (44).
- (4) Turn center shaft (Figure 2, Item 44) over in press.
- (5) Remove two capscrews (Figure 3, Item 29) and pulse wheel (28) from center shaft (Figure 2, Item 44).
- (6) Press center shaft (Figure 2, Item 44) out of bearing cone (40), spacer (41), and small gear (42).

4.6 Upper Shaft Disassembly.

- (1) Remove two capscrews (Figure 2, Item 6) and end plate (7) from upper shaft (21).
- (2) With the use of a puller, remove bearing cone (Figure 2, Item 9), spacer (10), and large gear (19) from upper shaft (21).

- (3) Remove two caged rollers (Figure 2, Items 16 and 18), and spacers (17 and 20) from upper shaft (21).
- (4) Remove shift collar (Figure 2, Item 22) from upper shaft (21).

WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (5) Position upper shaft (Figure 2, Item 21) in press and support by small gear (27).

CAUTION

Properly support shaft during removal. Shaft may drop suddenly. Failure to comply may result in damage to equipment.

- (6) Press upper shaft (Figure 2, Item 21) out of spacer (20), bearing cone (29), spacer (28), and gear (27).
- (7) Remove two caged rollers (Figure 2, Items 24 and 26) and spacer (25) from upper shaft (21).
- (8) Remove spacer (Figure 2, Item 23) from upper shaft (21).

5. CLEANING, INSPECTION & REPAIR.

CAUTION

Exercise care to avoid skin rashes, fire hazards, and inhalation of vapors when using solvent type cleaners.

WARNING

GASOLINE SHOULD BE AVOIDED! DO NOT clean these parts in a hot solution tank or with water and alkaline solutions, such as sodium hydroxide, orthosilicates or phosphates.

5.1 Cleaning ground & polished surfaces. Parts having ground and polished surfaces, such as gears, bearings, shafts, and collars, should be cleaned in a suitable solvent, such as kerosene, diesel fuel oil, or dry cleaning solvent.

5.1.1 Gasket removal. Clean all mating surfaces where fiber or liquid gasket material is used. It may be necessary to use a scraper to completely remove gasket materials. Be careful not to damage mating surfaces.

5.1.2 Steam cleaning. Steam cleaning is not recommended for assembled drive units after they have been removed from the housing. When this method of cleaning is used, water is trapped in cored passages of castings and in close clearances between parts, as well as on parts. This can lead to corrosion (rust) of critical parts of the assembly, and possibility of circulating rust particles in the lubricant. Premature failure of bearings, gears, and other parts can be caused by this practice. Assembled drive units cannot be properly cleaned by steam cleaning, dipping, or slushing. Complete drive unit disassembly is a necessary prerequisite to thorough cleaning.

5.2 Cleaning rough parts.

CAUTION

Exercise care to avoid skin rashes and inhalation of vapors when using alkali cleaners.

Rough parts, such as differential carrier castings, cast brackets, and some brake parts may be cleaned in hot solution tanks with mild alkali solutions providing these parts are not ground or polished. The parts should remain in the tank long enough to be thoroughly cleaned and heated through. This will aid the evaporation of the rinse water. The parts should be thoroughly rinsed after cleaning to remove all traces of alkali.

5.2.1 Complete assemblies. Completely assembled axles, torque dividers, and transfer cases may be steam cleaned on the outside only to facilitate initial removal and disassembly, providing all openings are closed. Breathers, vented shift units, and all other openings should be tightly covered or closed to prevent the possibility of water entering the assembly.

5.2.2 Drying. Parts should be completely dried immediately after cleaning. Use soft, clean, lintless absorbent paper towels, or cloth free of abrasive material such as lapping compound, metal fillings, or contaminated oil. Bearings should never be dried by spinning with compressed air.

5.2.3 Corrosion prevention. Parts that have been cleaned, dried, inspected, and are to be immediately reassembled should be coated with light oil to prevent corrosion. If these parts are to be stored for any length of time, they should be treated with a good rust preventive, and wrapped in special paper, or other material designed to prevent corrosion.

5.3 Inspection. Inspect all bearings, cup, and cones, including those not removed from parts of the drive unit, and replace if rollers or cups are worn, pitted, or damaged in any way. Remove parts needing replacement with a suitable puller or in a press with sleeves. Avoid use of drifts and hammers. They may easily mutilate or distort components parts.

If any of the following bearing conditions exist, bearings must be replaced:

- (1) Large ends of rollers worn flush to the recess, or the radii at the large ends of the rollers worn sharp. Refer to Figure 5.

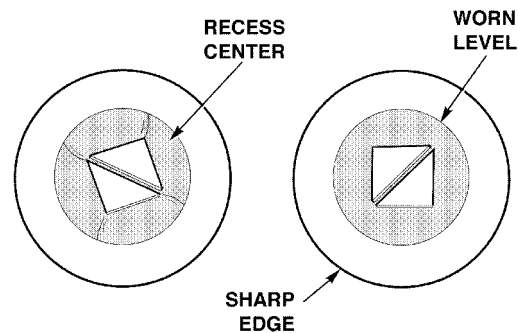


Figure 5.

- (2) Visible step wear, particularly at the small end of the roller track or deep indentations, cracks or breaks in the bearing cup and/or cone surfaces. Refer to Figure 6.

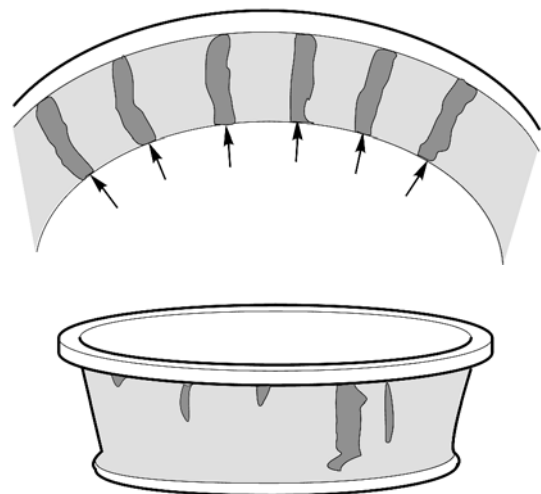


Figure 6.

- (3) Bright rubbing marks on the dark phosphate surface of the bearing cage. Refer to Figure 7.

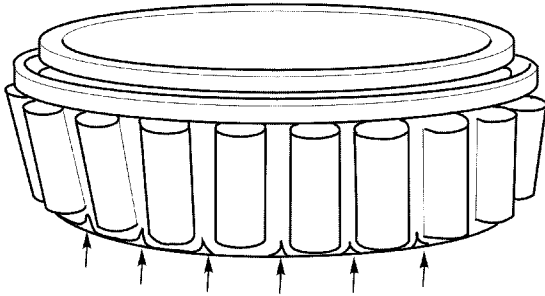


Figure 7.

- (4) Etching or pitting on functioning surface. Refer to Figure 8.

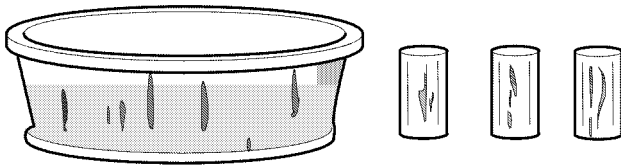


Figure 8.

- (5) Spalling or flaking on the bearing cup and/or cone surfaces. Refer to Figure 9.

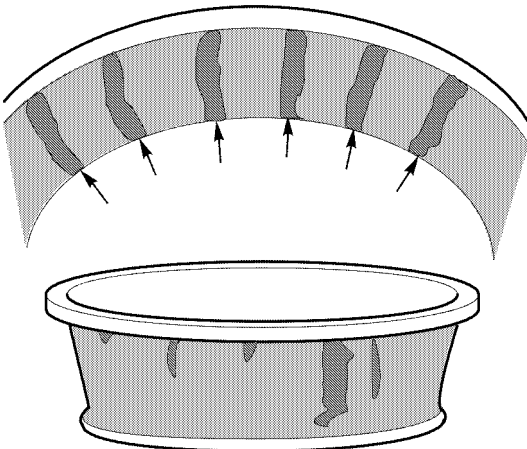


Figure 9.

- (6) Inspect hypoid/generoid gears for wear or damage. Gears which are worn, ridged, pitted or scored should be replaced. When it is necessary to replace either the pinion or gear of a set, the entire gear set must be replaced.

5.4 Repair.

- (1) Replace all worn or damaged parts. Hex nuts with rounded corners, all washers if damaged, oil seals, and gaskets, or silicone

gasket material should be replaced at the time of overhaul.

- (2) Remove nicks and burrs from machined or ground surfaces. Threads must be clean and free to obtain accurate adjustment and correct torque. A fine mill file or India stone is suitable for this purpose. Studs must be tight prior to reassembling the parts.
- (3) When assembling component parts, use a press where possible.
- (4) Tighten all the nuts to specified torque.
- (5) **DO NOT REPAIR WELD.** In the interest of safety and preserving the service life of the transfer case assemblies, we recommend that they NOT be repair welded. Repair welding can detract from the structural integrity of a component, particularly as to heat-treated parts. The benefit of heat-treatment may be nullified by welding.

5.5 Silicone (RTV) 732 and Loctite 515.

5.5.1 Service. Removal of all gaskets including silicone RTV 732 and Loctite 515 is accomplished by peeling or scraping the used gasket off both mating surfaces.

5.5.2 Application. Application of silicone RTV 732 or Loctite 515 gasket material is as follows:

- (1) Remove dirt, grease or moisture from both mating surfaces.
- (2) Dry both surfaces.

CAUTION

Minor concentration of acetic acid vapor may be produced during application. Adequate ventilation should be provided when silicone (RTV) is applied in confined areas.

Further, eye contact with silicone (RTV) gasket materials may cause irritation; if eye contact takes place, flush eyes with water for 15 minutes and have eyes examined by a doctor.

- (3) Apply a continuous thin bead, approximately 3/16" diameter completely around one mating surface and around the edge of all fastener holes to assure complete sealing and to prevent leakage.
- (4) Assemble the components immediately to permit silicone RTV 732 or Loctite 515 gasket material to spread evenly. Wait 20 minutes before refilling with lubricant.

NOTE

Failure to use appropriate gasket material/sealants will cause leaks.

6. RE-ASSEMBLY PROCEDURES.**6.1 Upper Shaft Assembly.****⚠ WARNING**

Stay clear of upper shaft when supported by lifting device. Upper shaft may fall and cause serious injury to personnel.

⚠ WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Place upper shaft (Figure 2, Item 21) in press so spline end is up.
- (2) Coat two caged rollers (Figure 2, Items 24 and 26) with Lubriplate.
- (3) Install spacer (Figure 2, Item 23), caged rollers (24), spacer (25), and caged rollers (26) on upper shaft (21).

⚠ WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (4) Press gear (Figure 2, Item 27) with small teeth down on upper shaft (21) and seat against spacer (23).
- (5) Install spacer (Figure 2, Item 28) on upper shaft (21).
- (6) Press bearing (Figure 2, Item 29) on upper shaft (21) and seat against spacer (28).
- (7) Turn upper shaft (Figure 2, Item 21) over and support gear (27).
- (8) Coat two caged rollers (Figure 2, Item 16 and 18) with Lubriplate.
- (9) Install spacer (Figure 2, Item 20), caged rollers (18), spacer (17), and caged rollers (16) on upper shaft (21).

- (10) Install shift collar (Figure 2, Item 22) with large taper up on upper shaft (21).

⚠ WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (11) Press large gear (Figure 2, Item 19) on upper shaft (21), with collar gears facing down.
- (12) Install spacer (Figure 2, Item 10) on upper shaft (21).
- (13) Press bearing cone (Figure 2, Item 9) on upper shaft and seat against spacer (10).

⚠ WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

- (14) Apply Loctite 242 to threads of two capscrews (Figure 2, Item 7).
- (15) Install end plate (Figure 2, Item 6) on upper shaft (21) with two capscrews (7). Tighten capscrews to 60 ft. lbs. (81 N·m).

6.2 Center Shaft Assembly.**⚠ WARNING**

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Place center shaft (Figure 2, Item 44) on a clean work surface and press large gear (45) over short spline end of center shaft (44).
- (2) Install spacer (Figure 2, Item 46) and seat against large gear (45).
- (3) Press bearing cone (Figure 2, Item 47) on center shaft (44) and seat against spacer (46).
- (4) Turn center shaft (Figure 2, Item 44) over and install spacer (43).

- (5) Press small gear (Figure 2, Item 42) on center shaft (44) and seat against spacer (41).
- (6) Press bearing cone (Figure 2, Item 40) and seat against spacer (41).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

- (7) Apply Loctite 242 to the threads of two capscrews (Figure 3, Item 29).
- (8) Install pulse wheel (Figure 3, Item 28) and two capscrews (29) on shaft (Figure 2, Item 44). Tighten capscrews to 40 ft. lbs. (54 N·m).

6.3 Lower Rear Output Shaft Assembly.

WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

- (1) Place lower rear output shaft (Figure 2, Item 65) on clean work surface and install spacer (63) on lower rear output shaft (65).
- (2) Press bearing cone (Figure 2, Item 62) on lower output rear shaft (65) and seat against spacer (63).
- (3) Turn lower rear output shaft (Figure 2, Item 65) over, and press gear (64) on lower rear output shaft (65).
- (4) Press bearing (Figure 2, Item 66) on lower rear output shaft (65) and seat against gear (64).
- (5) Install spacer (Figure 2, Item 71) on lower rear output shaft (65).
- (6) Install lockwasher (Figure 2, Item 72) and bearing locknut (73) on lower rear output shaft (65).
- (7) Using a hammer and punch, bend down tangs of lockwasher (Figure 2, Item 72).

- (8) Install bushing (Figure 2, Item 74) on lower rear output shaft (65).

6.4 Lower Front Output Shaft Assembly.

WARNING

When using a hydraulic press for removal or installation of bearings, bushings, and gears, wear a face shield to prevent possible injury to personnel.

WARNING

Use care when installing snap and retaining rings. Snap and retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

- (1) Install retaining ring (Figure 2, Item 78) on bearing cap (Figure 3, Item 61).

CAUTION

Bearing assemblies are a matched set. Do not mix bearings, cones, or cups.

- (2) Press bearing cup, part of bearing assembly (Figure 2, Item 77), on bearing cap (Figure 3, Item 61) and seat against retaining ring (Figure 2, Item 78).
- (3) Press bearing assembly (Figure 2, Item 77) on bearing cap (Figure 3, item 61) and seat on cup.
- (4) Install bearing cup, part of bearing assembly (Figure 2 item 77), on spline end of output shaft (Figure 2, Item 76) until bearing cup is firmly seated on lower front output shaft (76).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

- (5) Apply Loctite 515 to outside edge of oil seal and install oil seal (Figure 3, Item 64) in bearing cap (61).
- (6) Press bearing cap (Figure 3, item 61) on lower rear output shaft (Figure 2, item 76).

- (7) Apply pipe thread sealer to threads of plug (Figure 3, Item 60).
- (8) Install plug (Figure 3, Item 60) in bearing cap (61).

6.5 Upper Shift Rod Assembly.

- (1) Slide upper shift rod (Figure 3, Item 47) in fork (56).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

- (2) Coat threads of two capscrews (Figure 3, Item 53) with Loctite 242.
- (3) Install two capscrews (Figure 3, Item 53) on fork (56). Tighten capscrews to 40 ft. lbs. (54 N.m).
- (4) Secure two capscrews (Figure 3, Item 53) together with lockwire (54).
- (5) Install two spacers (Figure 3, Items 55 and 57) on shift rod (47).

6.6 Lower Shift Rod Assembly.

- (1) Slide lower shift rod (Figure 3, Item 11) in fork (12).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

- (2) Coat threads of tapered bolt (Figure 3, Item 13) with Loctite 242.
- (3) Align holes and install tapered bolt (Figure 3, Item 13) on fork (12). Tighten tapered bolt to 40 ft. lbs. (54 N.m).
- (4) Secure tapered bolt (Figure 3, Item 13) with lockwire (14).
- (5) Install eight spring disks (Figure 3, Item 15), alternating concaved surfaces, in pairs on lower shift rod (11).
- (6) Install spacer (Figure 3, Item 16) on lower shift rod (11).

7. TRANSFER CASE ASSEMBLY PROCEDURE.

NOTE

Do step (1) through (5) if bearing cups were removed.

- (1) Position front housing (Figure 3, Item 17) on work bench so bearing cups can be installed.
- (2) Install bearing cups (Figure 2, Items 30 and 48) in front housing (Figure 3, Item 17).
- (3) Rotate rear housing (Figure 2, Item 14) in maintenance stand so that inside is facing up.
- (4) Install bearing cups (Figure 2, Items 8, 39, and 61) in rear housing (14).
- (5) Position bearing support on work bench and install bearing cup (Figure 2, Item 67) in bearing support (69).

WARNING

Stay clear of lower rear output shaft assembly when supported by lifting device. Lower rear output shaft assembly may fall and cause serious injury to personnel.

NOTE

Coat all bearing cones with Lubriplate before installing.

- (6) Using a suitable lifting device position lower rear shaft assembly in rear housing (Figure 2, item 14).

⚠ WARNING

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- (7) Coat threads of capscrews (Figure 2, Item 70) with Loctite 242 and install bearing support (69) on rear housing with six capscrews (70). Tighten capscrews to 88 ft. lbs. (119 N.m).
- (8) Install inner detent spring (Figure 3, Item 48) and ball (49) in rear housing (Figure 2, Item 14). Hold ball and spring in place with dummy shaft or a deep well socket of the correct diameter.
- (9) Coat shaft (Figure 3, Item 47) of upper shift rod assembly with Lubriplate.

⚠ WARNING

Stay clear of upper shaft assembly when supported by lifting device. Upper shaft assembly may fall and cause serious injury to personnel.

NOTE

End of fork shift rod with threaded hole must face up.

Shift fork will push socket out during assembly.

The cutoff part of fork faces center shaft.

- (10) With the use of a suitable lifting device, install upper shaft assembly and upper shift rod assembly in rear housing (Figure 2, Item 14).

⚠ WARNING

Stay clear of center shaft assembly when supported by lifting device. Center shaft assembly may fall and cause serious injury to personnel.

- (11) With the use of a suitable lifting device install center shaft assembly in rear housing (Figure 2, Item 14).

NOTE

Lip on clutch collar should face up.

- (12) Install clutch collar (Figure 2, Item 75) on lower shift rod assembly.
- (13) Coat shaft (Figure 3, Item 11) of lower shift rod assembly with Lubriplate and install in bearing support (Figure 2, Item 69).

NOTE

Do step (14) if dowel pins were previously removed.

- (14) Install two dowel pins (Figure 2, Item 15) on front housing (Figure 3, Item 17).

⚠ WARNING

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- (15) Coat inner edge of flange on rear housing (Figure 2, Item 14) just inside holes with Loctite 515.

⚠ WARNING

Stay clear of front housing when supported by lifting device. Front housing may fall and cause serious injury to personnel.

- (16) Using a suitable lifting device lower front housing (Figure 3, Item 17) down on rear housing (Figure 2, Item 14) while aligning dowel pins (Figure 2, Item 15).
- (17) Apply Loctite 242 to 20 capscrews (Figure 2, Item 59).
- (18) Install 20 capscrews (Figure 2, Item 59), and flatwashers (Figure 2, Item 79) in transfer case housing. Tighten capscrews to 88 ft. lbs. (119 N.m).

⚠ WARNING

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- (19) Coat inside flange of bearing cap (Figure 3, Item 61) with Loctite 515.
- (20) Coat threads of six capscrews (Figure 3, Item 63) with Loctite 242.
- (21) Install bearing cap (Figure 3, Item 61) on front housing (17) with six lockwashers (62) and capscrews (63). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (22) Coat inside flange of end cap (Figure 3, Item 30) with Loctite 515.
- (23) Coat threads of six capscrews (Figure 3, Item 32) with Loctite 242.
- (24) Install end cap (Figure 3, Item 30), six lockwashers (31) and capscrews (32) on front housing (17). Tighten capscrews to 60 ft. lbs (81 N.m).
- (25) Coat inside flange of end cap (Figure 3, Item 21) with Loctite 515.
- (26) Coat the threads of six capscrews (Figure 3, Item 24) with Loctite 242.
- (27) Install spacer (Figure 3, Item 20) and end cap (21), on front housing (17) with six lockwashers (23) and capscrews (24). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (28) Rotate transfer case housing so rear housing (Figure 2, Item 14) is facing up.
- (29) Install spacer (Figure 2, Item 60) on lower output shaft (65).
- (30) Install three shims (Figure 2, Item 56), end cap (55), on rear housing (14) with six lockwashers (54) and capscrews (53). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (31) Install dial indicator on output shaft (Figure 2, Item 65) on rear housing (14).

NOTE

End play must be 0.003 - 0.006 in. (0.076 - 0.15 mm). If end play is less than 0.003 in. (0.075 mm), shims must be added. If end play is greater than 0.006 in. (0.15 mm), shims must be removed.

- (32) Check and record end play measured on dial indicator.
- (33) Remove dial indicator from output shaft (Figure 2, Item 65) on rear housing (14).
- (34) Remove six capscrews (Figure 2, Item 53), lockwashers (54), end cap (55), and three shims (56) from rear housing.

⚠ WARNING

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- (35) Coat shims (Figure 2, Item 56) and six capscrews (53) with Loctite 242.

NOTE

The number of shims installed is amount required to obtain correct end play.

- (36) Install shims (Figure 2, Item 56) and end cap (55) on rear housing (14) with six lockwashers (54) and capscrews (53). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (37) Coat outside edge of oil seal (Figure 2, Item 52) with Loctite 515 and install oil seal on end cap (55).
- (38) Install three shims (Figure 2, Item 35), end cap (34), on rear housing (14) with six lockwashers (33) and capscrews (32). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (39) Remove plug (Figure 2, Item 31) from end cap (34) and install indicator through hole in end cap.

NOTE

End play must be 0.003 - 0.006 in. (0.076 - 0.15 mm). If end play is less than 0.003 in. (0.075 mm), shims must be added. If end play is greater than 0.006 in. (0.15 mm), shims must be removed.

- (40) Check and record end play measured on dial indicator.
- (41) Remove dial indicator from end cap (Figure 2, Item 34).
- (42) Remove six capscrews (Figure 2, Item 32), lockwashers (33), end cap (34), and three shims (35) from rear housing (14).

⚠ WARNING

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- (43) Coat shims (Figure 2, Item 35) and six capscrews (32) with Loctite 242.

NOTE

The number of shims installed is amount required to obtain correct end play.

- (44) Install shims (Figure 2, Item 35) and end cap (34) in rear housing (14) with six washers (33) and capscrews (32). Tighten capscrews to 60 ft. lbs. (81 N.m).
- (45) Coat threads of plug (Figure 2, Item 31) with pipe thread sealant.
- (46) Install plug (Figure 2, Item 31) in end cap (34).

NOTE

Repeat steps (38) through (46) for end cap (Figure 2, Item 2) of rear housing.

⚠ WARNING

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- (47) Coat the threads of plug (Figure 3, Item 52) with pipe thread sealant.
- (48) Install outer detent ball (Figure 3, Item 50), spring (51), and plug (52) on rear housing (Figure 2, Item 14).
- (49) Coat spline of shaft (Figure 2, Item 65) and retaining washer (50) with sealant RTV 108.
- (50) Coat the threads of two capscrews (Figure 2, Item 49) with Loctite 271.
- (51) Install yoke (Figure 2, Item 51), retainer washer (50), and two capscrews (49) on shaft (65). Tighten capscrews to 88 ft. lbs. (119 N.m).
- (52) Rotate transfer case so that front housing (Figure 3, Item 17) is facing up.

⚠ WARNING

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⚠ CAUTION

Do not overtighten the speedometer sending unit. Torques over 35 ft. lbs. (47 N.m) will damage the sending unit.

- (53) Coat threads of speedometer sending unit (Figure 3, Item 38) with pipe thread sealant and install in end cap (30). Thread sending unit in until it bottoms out, then back it out one turn. Tighten jam nut to 25 to 35 ft. lbs. (34 to 47 N.m).
- (54) Coat the threads on elbow (Figure 3, Item 18), breather (19), and adapters (70 and 68) with pipe thread sealant.

- (55) Install elbow (Figure 3, Item 18), breather (19), and two adapters (70 and 68) on front housing (17).
- (56) Install oil seal (Figure 3, Item 39) jam nut (40) and rod end (41) on upper shift rod (47).
- (57) Connect hose (Figure 3, Item 69) to two adapters (70 and 68).

⚠ WARNING

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- (58) Coat the splines of shaft (Figure 2, Item 21) and retainer washer (Figure 3, Item 26) with sealant RTV 108.
- (59) Coat the two capscrews (Figure 3, Item 27) with Loctite 271.
- (60) Install yoke (Figure 3, Item 25), retainer washer(26), and two capscrews (27) on shaft (Figure 2, Item 21). Tighten capscrews to 88 ft. lbs. (119 N·m).
- (61) Coat splines of shaft (Figure 2, Item 76) and lock plate (Figure 3, Item 66) with sealant RTV 108.
- (62) Coat the two capscrews (Figure 3, Item 67) with Loctite 271.
- (63) Install yoke (Figure 3, Item 65), lock plate (66), and two capscrews (67) on shaft (75). Tighten capscrews to 88 ft. lbs. (119 N·m).

8. INSTALLATION.

⚠ WARNING

Stay clear of transfer case when supported by lifting device. Transfer case may fall and cause serious injury to personnel.

- (1) Attach mounting brackets to transfer case. Fasten transfer case to vehicle frame with mounting bolts and biscuits. Connect prop shafts, air lines, and shift linkage.
- (2) Refill with motor oil conforming to API service SE-CC, SAE 50, (MIL-L-2104C). Do not use hypoid or E.P. gear lubricants. Avoid mixing different brands. For subzero arctic operation 0° to -65°F use arctic oil MIL-L-46167. Check oil level every 2500 miles or 125 hours of operations. Every 5000 miles or 250 hours drain housing while hot. Refer to group 85.

