



**44-70 Series  
Transfer Case  
Service Manual**



**BorgWarner  
Automotive**

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# Section 1

## Introduction and Description

### 1-1. INTRODUCTION

**1-2. PURPOSE.** This manual contains maintenance, service and parts information for the 44-70 Four-Wheel Drive Transfer Case manufactured by Borg-Warner Automotive, Inc.

**1-3. SCOPE.** As you will see in the Table of Contents, this manual provides information for maintenance, troubleshooting, installation, removal, disassembly, cleaning, inspection, repair or replacement, and assembly of the transfer case.

**1-4.** Section P of the manual contains an illustrated parts list. The arrangement of the exploded view illustrations is described in the introduction to Section P. Each detail part shown in the exploded views is assigned an index number. This same index number is used to identify the part throughout this manual. For example, index number 43 (in parentheses in the text) refers to the drive chain regardless of the manual section or the specific model transfer case being serviced.

**1-5.** The exploded view illustrations in Section P make it possible to view the complete assembly in addition to the illustrations in the service sections relating to a specific service procedure.

**1-6.** Section T lists special tools. These tools, or equivalent, are required for proper disassembly and assembly of the transfer case.

**1-7. ABBREVIATIONS.** Abbreviations, other than those in common use, found in this manual are identified in Table 1-1.

Table 1-1. Abbreviations

AB	As Required
Assy	Assembly
ID	Inside Diameter
NP	Not Procurable
OD	Outside Diameter
PN	Part Number
Pr	Per
Qty or QY	Quantity
Ref	Reference
TIR	Total Indicator Reading

### 1-8. DESCRIPTION

**1-9. TRANSFER CASE DESCRIPTION.** The Borg-Warner Automotive 44-70 is a two-speed, part time transfer case. A planetary gear set is used to provide gear reduction. Power is transferred to the front wheel drive through a Morse Hy-Vin chain drive. The unit operates in an oil bath with an oil pump that provides positive lubrication to the planetary gear set and other upper shaft components. Four selector positions are provided:

**2H** — In two high position, only the two rear wheels are driven and the transfer case operates at a 1.00 to 1.00 speed ratio.

**4H** — In four high, all four wheels are driven at a 1.00 to 1.00 speed ratio.

**N** — In the neutral position, the output shaft is disconnected from the input shaft and no power is transmitted to the wheels.

**4L** — In four low, all four wheels are driven and the transfer case operates at a 2.69 to 1.00 speed reduction ratio.

**1-10. SHIFTING.** The 44-70 mechanical shift transfer case is controlled by a single shift lever that operates a shift cam within the transfer case. Additional components are an electric clutch, and a speed sensor. The electric clutch (activated by an external control) is used to spin up the front drive system and permit shifting from 2H to 4H at any speed. The speed sensor provides a signal of 10 positive voltage pulses per revolution to the speedometer.

**1-11. APPLICATION.** The 44-70 transfer case is used for light truck applications.

**1-12. IDENTIFICATION.** The identification tag is installed on the transfer case at the location shown in figure 1-1, looking at the rear of the case. Figure 1-1 also illustrates the information to be found on the tag, some of which may be necessary for specifying correct replacement parts.

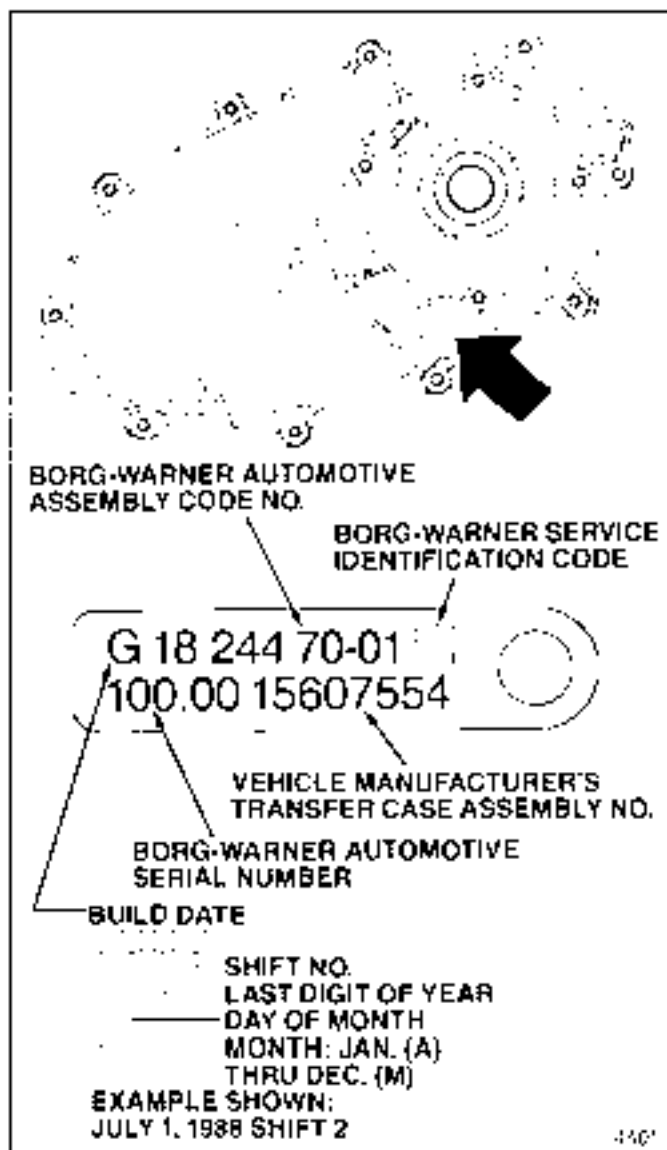


Figure 1-1. Identification Tag

# Section 2

## On-Vehicle Service and Troubleshooting

### 2-1. MAINTENANCE

**2-2. GENERAL.** The only periodic maintenance required for the Borg-Warner Automotive 14-70 transfer case is to maintain proper lubrication.

**2-3. LUBRICATION SCHEDULE.** Refer to Table 2-1.

**2-4. APPROVED LUBRICANT.** Use only automatic transmission fluid, Dexron<sup>®</sup> II, or equivalent in the transfer case.

#### NOTE:

To check or drain the lubricant, the transfer case should be warm. This is best done shortly after shutdown.

g. Add approved lubricant (paragraph 2-1) approximately 4.0 US pints) through fluid level plug opening until lubricant just begins to drip back out of opening.

h. Install fluid level plug and torque to 14-22 lb-ft (19-30 Nm).

### 2-7. TROUBLESHOOTING

**2-8. GENERAL.** Before removing and repairing a suspected transfer case, make sure it is the source of the problem. Check all other drive-line components. There are five major component groups that can cause or are related to vibration and noise. Keep these groups in mind when road testing for vibration or noise:

Table 2-1. Lubrication Schedule

FREQUENCY	PROCEDURE
With each engine oil change Yearly or after every 30,000 miles, whichever comes first	Check transfer case lubricant level Change transfer case lubricant

### 2-5. CHECKING LUBRICANT LEVEL

#### CAUTION

Do not use an impact wrench to remove or install fill or drain plugs since this will damage female threads in transfer case cover.

a. Wipe fluid level plug (see figure 2-1) and surrounding area clean.

b. Remove fluid level plug (7L).

c. When transfer case is full, lubricant will just drip out fluid level plug opening.

d. Add approved lubricant (refer to paragraph 2-1 if required).

e. Install fluid level plug and torque to 14-22 lb-ft (19-30 Nm).

### 2-6. CHANGING LUBRICANT

a. Wipe fluid level and drain plugs (see figure 2-1) and surrounding areas clean.

b. Place suitable container under transfer case. Transfer case holds approximately 4.0 US pints when full.

c. Remove drain plug (7D).

d. Remove fluid level plug (7L).

e. Allow all lubricant to drain.

f. Install drain plug and torque to 14-22 lb-ft (19-30 Nm).

1. Engine and mounts.
2. Clutch, transmission and transfer case.
3. Tires, wheels and drum brakes.
4. Propeller shafts and universal joints.
5. Axles and half shafts.

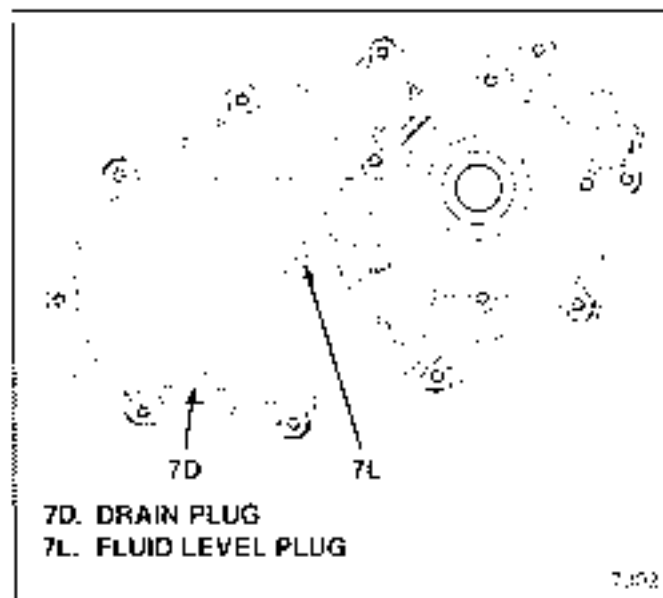


Figure 2-1. Drain and Fluid Level Plugs

2-9. After initial road testing to verify the complaint, check the following. If any are found to be out of specifications, make the necessary corrections and repeat the road test:

- a. In or out phase of propeller shaft.
- b. All fasteners for proper torque at universal joints, wheel lugs, engine and transmission mounts.
- c. Tire air pressure.
- d. Load conditions.
- e. Lubricant levels in transfer case, transmission and axles.

2-10. **ROAD TESTING.** Road test the vehicle to confirm the complaint and make the proper diagnosis. Record the speed and RPM at which the problem occurs. Take along a passenger to help locate the source of noise or vibration. Operate the vehicle on paved road when applicable. Operate the vehicle in both the drive and coast throttle positions.

2-11. **TROUBLESHOOTING CHART.** When the operating difficulty has been isolated to the transfer case, the Troubleshooting Chart, Table 2-2, will help in making the proper diagnosis.

**Table 2-2. Troubleshooting Chart**

<b>TROUBLE</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Transfer case difficult to shift or will not shift into desired range	Transmission in incorrect gear selection	Range shift; High to low: Automatic transmission must be in neutral and vehicle stopped. Manual transmission must have clutch disengaged and vehicle stopped
	Shift linkage binding	Inspect linkage area and remove any obstructions. Replace linkage or grommets if damaged or worn
	Transfer case or axle in torque lock condition	If disengagement does not occur from 4WH to 2WH with one or two quick throttle reversals, torque lock is likely. Check tire pressure to be to specifications. Aftermarket tires may cause problems if improperly sized.
	Improper or low transfer case lubricant level	Add or drain and replace with proper lubricant (refer to paragraph 2-4)
	Binding, worn or damaged transfer case internal parts	Disassemble, inspect and replace worn or damaged parts
	Front axle clashing	Check relay, front axle switch and transfer case synchronizer function
	Axle light does not illuminate	Check current to front actuator and its function
Transfer case experiences clash when shifting ranges	Transfer case experiences clash when shifting ranges	Automatic transmission: excessive drag (torque) (refer to transmission or vehicle service manual). Manual transmission: Adjust clutch mechanism (refer to vehicle service manual)
	Transfer case misis in all driving modes	Add or drain and replace with proper lubricant (refer to paragraph 2-4)
	Incorrect tire pressure	Inflate tires to specifications
Transfer case misis in all driving modes	Aftermarket tires	Replace with proper tires (improperly sized tires cause continuous binding condition)
	Worn tires	Replace with proper tires (tires must be in good condition to evaluate transfer case misis)

**Table 2-2. Troubleshooting Chart (Cont)**

TROUBLE	POSSIBLE CAUSE	REMEDY
Transfer case jumps out of 4WD	Transfer case not fully engaged  Shift linkage binding  Worn body, engine or transmission mounts  Worn shift lever  Worn or damaged transfer case internal parts  Loose transfer case mounting bolts causing case movement  Front or rear propeller shaft parts dry or loose	Check shift linkage. Replace damaged parts.  Inspect linkage area and remove any obstructions. Replace linkage or grommets if damaged or worn.  Replace mounts (worn mounts cause excessive motion of body or components relative to chassis).  Replace shift lever.  Disassemble, inspect and replace worn or damaged parts.  Torque bolts to specifications.  Lubricate universal joints and sliding splines with proper lubricant (refer to vehicle service manual).
Lubricant leakage	False report  Transfer case overfill  Vent restricted  Damaged or improperly install seals  Loose fill or drain plug	Wash vehicle underside and verify leakage is from transfer case and not transmission or other components.  Partially drain or drain and replace with proper lubricant (refer to paragraph 2-4).  Clean breather and hose. Make sure case is properly vented.  Inspect seals and replace if necessary. Replace propeller shaft if needed.  Torque to specifications.
Abnormal tire wear	Extended operation on hard surface while in 4WD	Make sure 2WD operational on dry pavement

## 2-10. REMOVAL AND INSTALLATION

**2-11. REMOVAL OF TRANSFER CASE.** Refer to the vehicle service manual for specific instructions regarding supports, skid plates, shift linkage, wiring harnesses, power take-off and other components related to the transfer case installation. These may need to be removed to provide access to the transfer case. A suitable hoist for the vehicle and a jack or stand for the transfer case will be required. The jack or stand must be capable of completely and independently supporting the transfer case. It also must be able to lower, raise and move the transfer case laterally. Proceed as follows (see figure 2-2):

- a. Position vehicle over suitable hoist.
- b. Shift transmission into park or neutral. Shift transfer case into 2 H and shut off engine.
- c. Disconnect negative battery terminal.

- d. Lift vehicle.
- e. Place drain pan under transfer case and remove transfer case drain and fluid level plugs (see figure 2-1). Drain all fluid from transfer case and re-install plugs.
- f. Disconnect all electrical wiring and/or wiring harnesses from transfer case speed sensor (9), clutch terminal connector (27) and 4WD indicator switch (70).
- g. Disconnect shift linkage from transfer case shift lever assembly (73).
- h. Disconnect breather hose from transfer case breather barb (94).
- i. Disconnect front drive shaft from transfer case front yoke (91).
- j. Disconnect rear drive shaft from transfer case rear yoke (8) or slip rear output.
- k. Support transfer case with suitable jack or stand.

### CAUTION

Make sure transfer case is completely supported by jack or stand before removing bolts (201) attaching transfer case to transmission. Do not allow transfer case to "hang" from transmission through splined shafts or damage may result.

l. Remove six bolts (201) attaching transfer case to transmission adapter (202).

m. Move transfer case straight back to completely disengage spline of transfer case input shaft (82) from transmission.

n. Carefully lower transfer case on jack or stand.

o. Remove gasket (203) used between transmission and transfer case.

**2-12. INSTALLATION OF TRANSFER CASE.** Refer to the vehicle service manual for specific instructions regarding supports, skid plates, shift linkage, wiring harnesses, power take-off and other components which were removed to provide access to transfer case. With vehicle on hoist and transfer case on a suitable jack or stand, proceed as follows (see figure 2-2):

a. Apply thin coat of high temperature grease to spline of transmission output shaft.

b. Install new gasket (203) on mounting face of transfer case.

c. Raise transfer case on jack or stand and align with transmission.

### CAUTION

Make sure transfer case is in exact alignment with transmission before engaging splines. Do not force transfer case onto transmission. Otherwise, damage may result. If necessary, turn rear output shaft of transfer case to align input shaft (82) spline with that on transmission.

d. Carefully move transfer case forward, engaging spline on transmission, until mounting face of transfer case (102), gasket (203) and transmission adapter (202) are in contact.

e. Make sure mounting holes in transfer case (102), gasket (203) and transmission adapter (202) are aligned and install six mounting bolts (201). Torque mounting bolts to 25-43 lb-ft (34-58 Nm).

f. Connect rear drive shaft to transfer case rear yoke (6) or slip rear output.

g. Connect front drive shaft to transfer case front yoke (91).

h. Connect breather hose to transfer case breather barb (93).

i. Connect shift linkage to transfer case shift lever assembly (72).

j. Connect all wiring and/or wiring harnesses to transfer case speed sensor (9), clutch terminal connector (27) and 4WD indicator switch (70).

k. Fill transfer case with approved lubricant as described in paragraph 2-6.

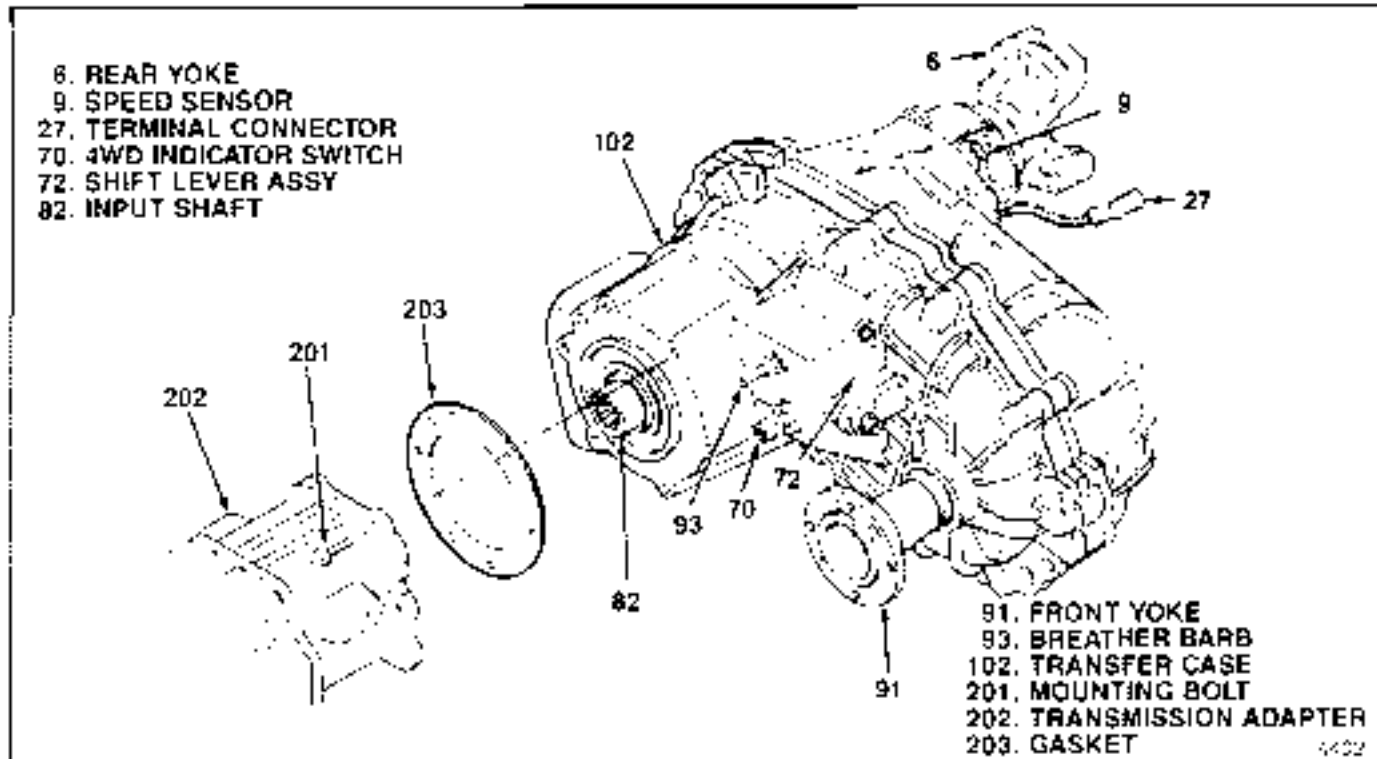


Figure 2-2. Transfer Case Installation

### **CAUTION**

Failure to fill transfer case to proper level with approved lubricant will result in damage when engine is started.

### **NOTE**

Use of pump type filler may be necessary when filling transfer case installed on vehicle.

### **NOTE**

If transfer case has been removed for repair or overhaul, there will be no lubricant in upper cavities served by transfer case pump. Lubricant level at fluid level plug opening will not be accurate until pump is operated and these cavities are filled. This can be done on hoist if wheels are free or by driving. Recheck lubricant level after operating pump.

1. After final check of lubricant level, lower vehicle and connect negative battery terminal.

# Section 3 Disassembly

## 3-1. GENERAL INFORMATION

3-2. During disassembly, refer to the illustrations provided with the text. In addition, an exploded view of the complete assembly can be seen in Section 1, Parts.

3-3. This section provides instructions for complete disassembly of the transfer case as would be required for overhaul. If the transfer case is not due for overhaul, and repair affecting specific parts is required, disassemble only to the extent necessary to gain access to those parts. Parts removed from the transfer case as subassemblies or groups need not be disassembled for repair unless they contain the affected parts.

## 3-4. REMOVAL AND INSTALLATION OF TRANSFER CASE

3-5. Refer to paragraph 2-10.

## 3-6. TRANSFER CASE DISASSEMBLY

3-7. **REMOVAL OF REAR YOKE GROUP.** Position transfer case on work bench with rear or cover side up. Use wooden blocks under front to keep assembly level. Proceed as follows to remove rear yoke group from units so equipped (see figure 3-1).

- a. Remove nut (1) and washer (2).
- b. Pull yoke assembly (4) and remove oil seal (3).
- c. Press shield (5) from yoke (6) only if replacement is required.

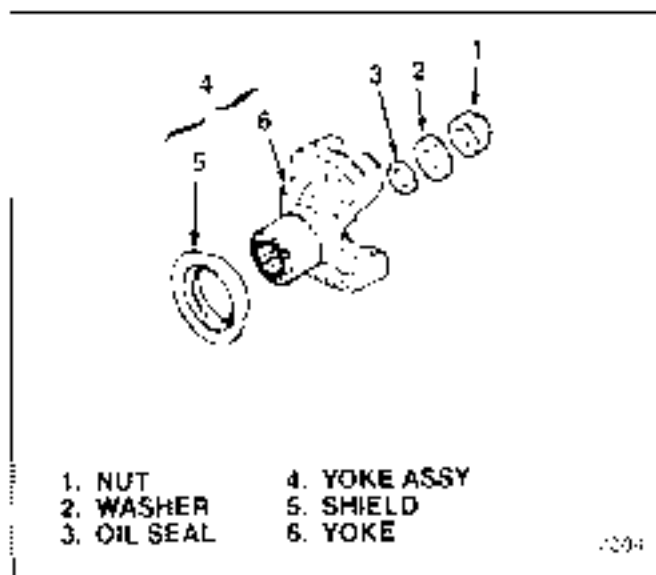


Figure 3-1. Rear Yoke Group

3-8. **REMOVAL OF BEARING CAP OR EXTENSION GROUP** (See figure 3-2 for transfer case with bearing cap; figure 3-3 for transfer case with extension assembly):

- a. If installed, remove two plugs (7).
- b. Remove bolt (8) and speed sensor (9).

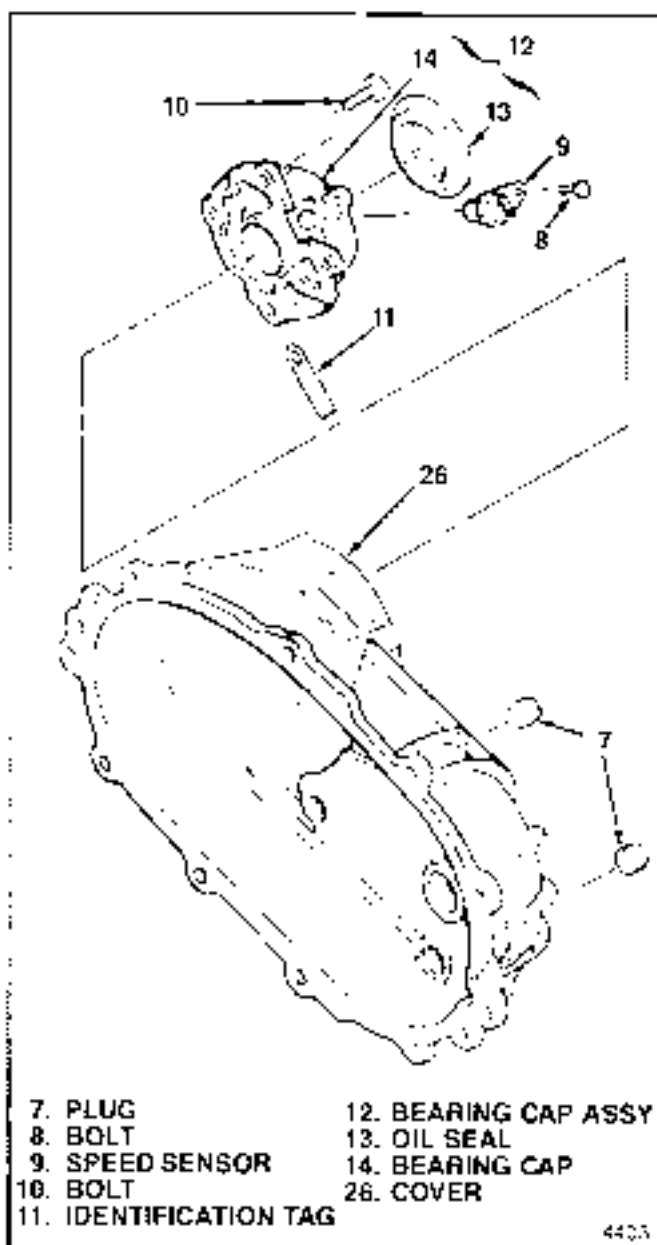


Figure 3-2. Bearing Cap Group

e. Remove four bolts (10) attaching bearing cap or extension assembly (12) to cover (26). This will free identification tag (11). Use care not to lose identification 3-tag. It contains information that may be required for ordering replacement parts.

d. Pull oil seal (13) from bearing cap or extension and bushing assembly (14).

e. For units with extension and bushing assembly (14) do not attempt to remove bushing. It is not replaceable separately.

f. Scrape sealant from mating face of bearing cap or extension and bushing assembly (14). Use care not to damage metal face.

### 3-9. REMOVAL AND DISASSEMBLY OF COVER ASSEMBLY.

Proceed as follows (see figure 3-4):

a. Pull speedo rotor (15) from output shaft (61).

b. Remove two retaining rings (16) from output shaft (61).

c. Remove ten bolts (17). Pry at bosses provided on cover (20) and transfer case (106) to break sealant bond loose. Then, lift the cover assembly (18) straight up to remove.

d. Pull ball bearing (19) from cover (26).

e. Remove retaining ring (20) and pull needle bearing (21) from cover (26).

f. If clutch coil is to be removed, remove terminal connector (27) from end of clutch coil wire.

g. Remove three nuts (22) and clutch coil assembly (23). Remove O-ring (24) from clutch coil (25).

h. Scrape and clean sealant from mating faces of cover (26). Use care not to damage metal faces.

i. Remove magnet (28) from slot in case (106).

j. Remove return spring (29) from rail shaft (38).

k. Remove snap ring (30) from output shaft (61).

l. Remove clutch housing (31).

### 3-10. REMOVAL OF LOCKUP SHIFT PARTS.

From remaining transfer case assembly 32 through 106, remove the following (see figure 3-5):

a. Remove shift collar hub (32) from output shaft (61).

b. Together, slide 2W-4W lockup assembly (33) and 2W-4W shift fork assembly (39) from output shaft (61) and rail shaft (38). Separate assemblies, remove rail shaft (38) and remove two fork facings (40) from fork assembly (39).

c. To disassemble 2W-4W lockup assembly, remove retaining ring (34), lockup hub (35) and spring (36) from lockup collar (37).

### 3-11. REMOVAL OF CHAIN DRIVE.

From remaining transfer case assembly 61 through 106, remove the following (see figure 3-6):

a. Remove retaining ring (41) and washer (42) from output shaft (92).

b. Together, slide drive sprocket (43), driven sprocket (44) and drive chain (45) from output shafts (61 and 92). Separate sprockets and chain when out of assembly.

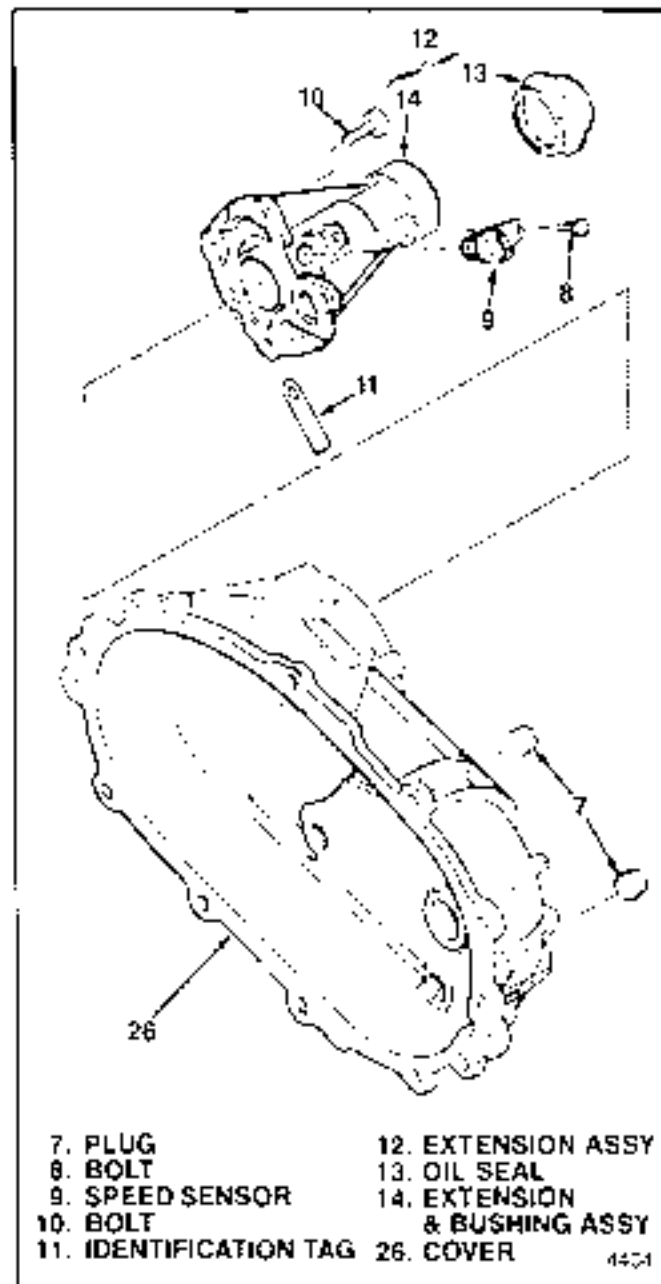
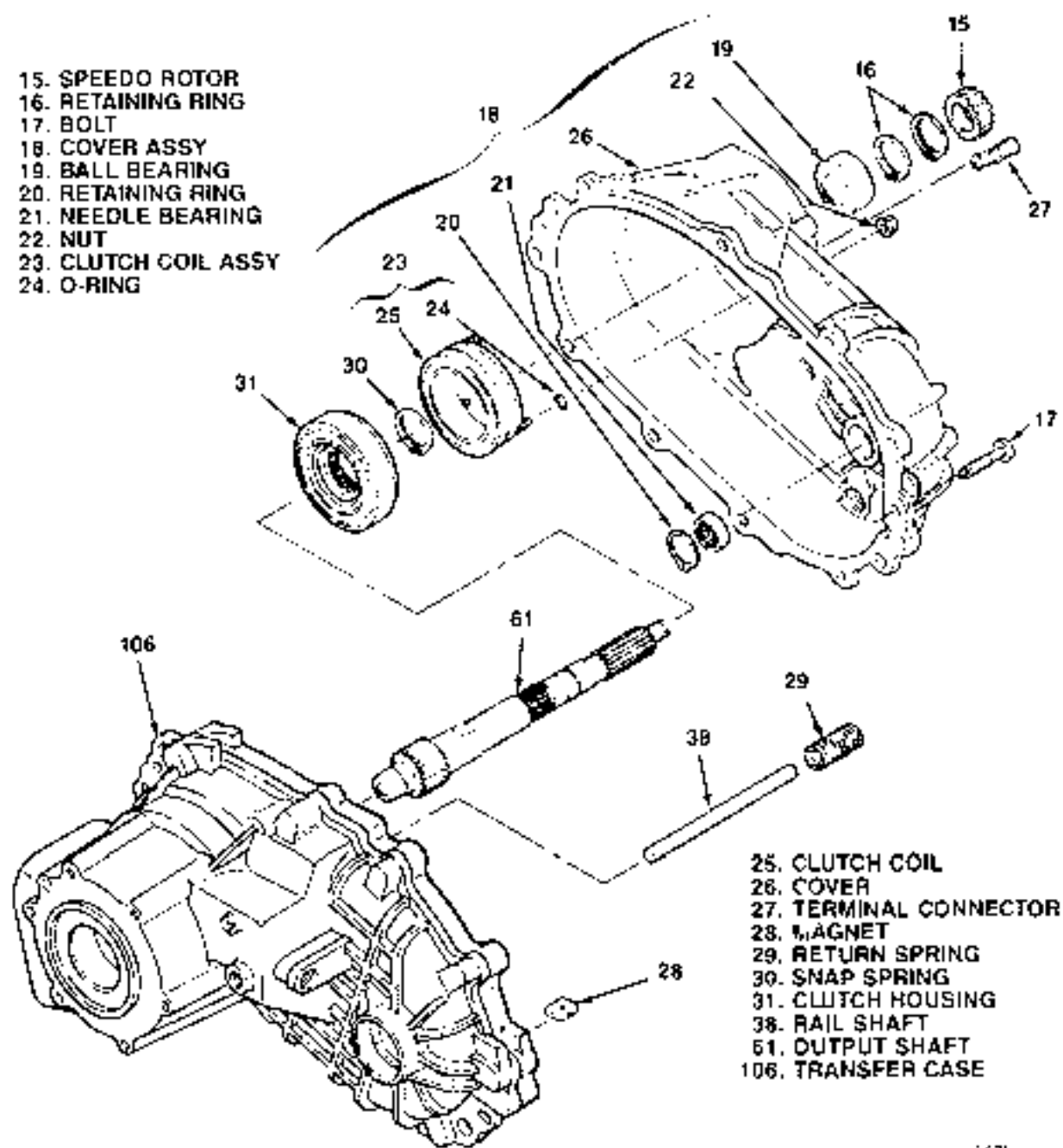


Figure 3-3. Extension Group

- 15. SPEEDO ROTOR
- 16. RETAINING RING
- 17. BOLT
- 18. COVER ASSY
- 19. BALL BEARING
- 20. RETAINING RING
- 21. NEEDLE BEARING
- 22. NUT
- 23. CLUTCH COIL ASSY
- 24. O-RING



- 25. CLUTCH COIL
- 26. COVER
- 27. TERMINAL CONNECTOR
- 28. MAGNET
- 29. RETURN SPRING
- 30. SNAP SPRING
- 31. CLUTCH HOUSING
- 38. RAIL SHAFT
- 61. OUTPUT SHAFT
- 106. TRANSFER CASE

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Figure 3-4. Cover Assembly

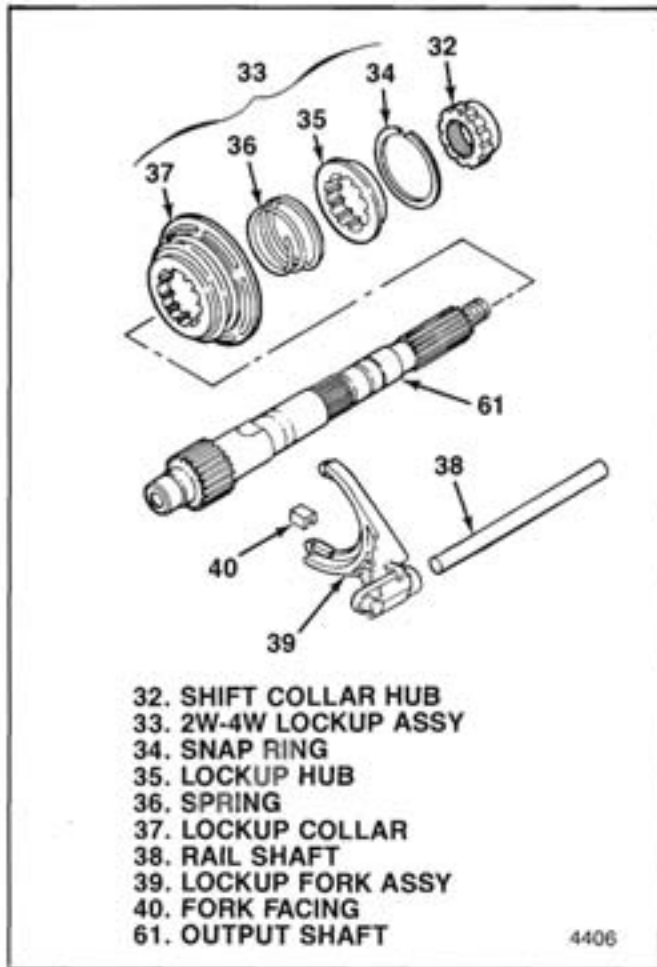


Figure 3-5. Lockup Shift Parts

**3-12. REMOVAL AND DISASSEMBLY OF SPACER AND OIL PUMP ASSEMBLY.** From remaining transfer case assembly (46 through 106) remove the following (see figure 3-7):

- Pry at bosses provided on spacer (60) and transfer case (106) to break sealant bond loose. Then, holding output shaft (61) down, lift spacer and pump assembly (46) straight up to remove.
- Remove hose clamp (47), pump hose (48) and oil strainer (49) from spacer (60).
- Remove five screws (50) and pump cover (51).
- Carefully remove pump gear assembly (52) consisting of inner and outer pump gears (53 and 54). Protect pump gears from damage and keep them together. They are a matched set.
- Remove plug (55), spring (56) and check ball (57).
- Remove retaining ring (58) and pull needle bearing (59) from spacer (60).
- Remove output shaft (61) from transmission.

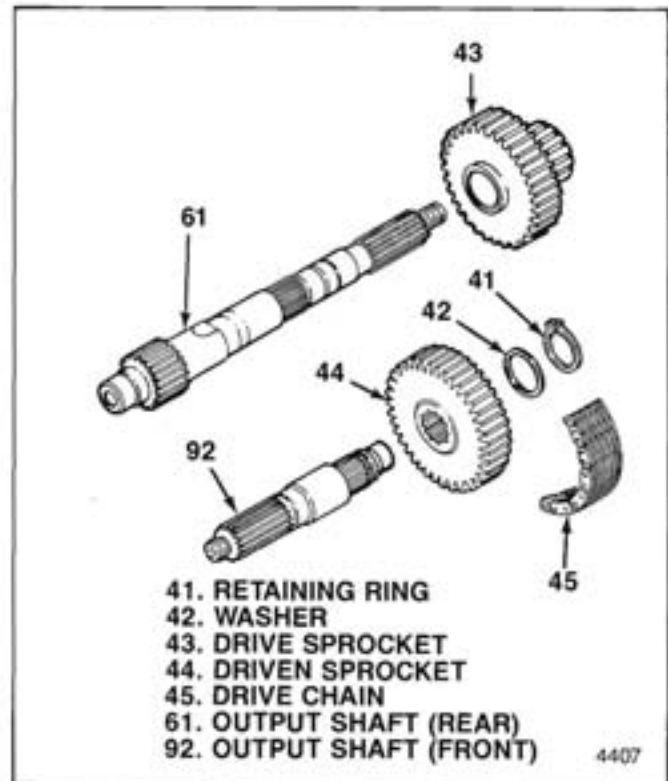


Figure 3-6. Chain Drive

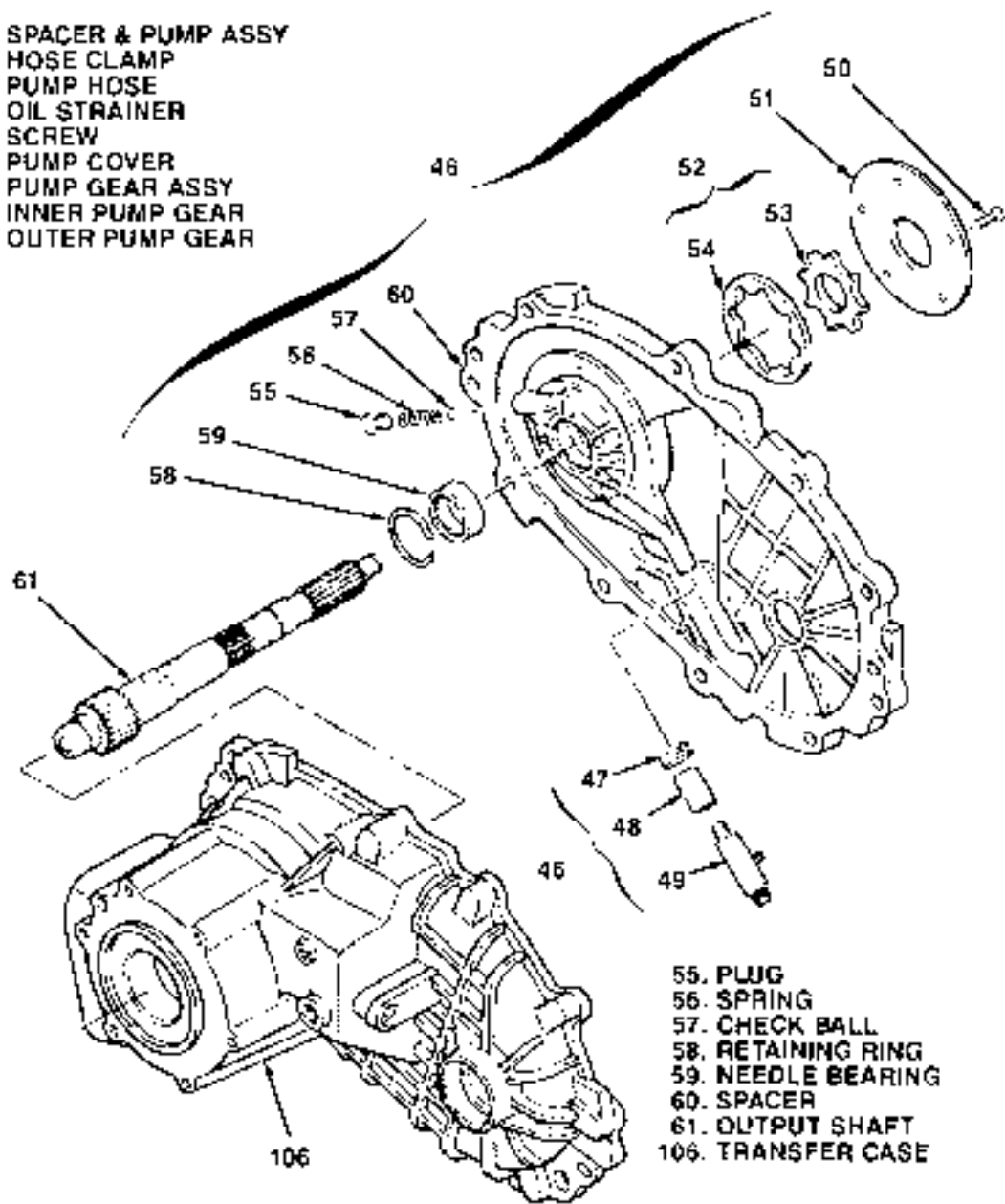
**3-13. REMOVAL OF REDUCTION SHIFT PARTS.** From remaining transfer case assembly (62 through 106), remove the following (see figure 3-8):

- Remove reduction hub (62) and reduction shift fork assembly (63) from transfer case.
- Remove two facings (64) from shift fork assembly (63).
- Remove pin, roller and retainer assembly (65) from reduction fork (69) only if damaged. Then, cut off lip of plastic retainer (66) that projects through fork (69). Remove and discard roller (67) and pin (68) as well as retainer.

**3-14. REMOVAL OF SHIFT CAM PARTS.** Remove the following (see figure 3-9):

- Remove 4WD indicator switch (70).
- Remove klip ring (71) and shift lever assembly (72).
- Remove grommet (73) from shift lever assembly (72).
- If necessary for parts replacement, remove nut (74) and shift lever (75) from shift shaft (76).

- 46. SPACER & PUMP ASSY
- 47. HOSE CLAMP
- 48. PUMP HOSE
- 49. OIL STRAINER
- 50. SCREW
- 51. PUMP COVER
- 52. PUMP GEAR ASSY
- 53. INNER PUMP GEAR
- 54. OUTER PUMP GEAR



- 55. PLUG
- 56. SPRING
- 57. CHECK BALL
- 58. RETAINING RING
- 59. NEEDLE BEARING
- 60. SPACER
- 61. OUTPUT SHAFT
- 106. TRANSFER CASE

Figure 3.7. Spacer and Oil Pump Assembly

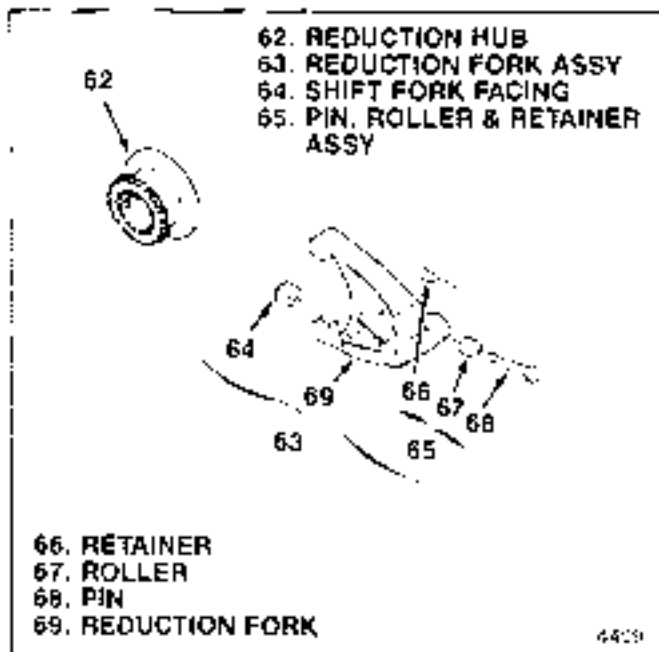


Figure 3-8. Reduction Shift Parts

- e. Remove assist spring (77) and assist bushing (78).
- f. Remove shift cam (79) from transfer case (106).

**3-15. REMOVAL OF CARRIER ASSEMBLY AND RING GEAR.** From remaining transfer case assembly (80 through 106), remove the following (see figure 3-10):

- a. Pull oil seal (80) from transfer case (106).
- b. Remove retaining ring (81) from input shaft of carrier assembly (82).
- c. Remove carrier assembly (82) from transfer case (106).
- d. Remove snap ring (83) and pull ring gear (84) from transfer case (106).
- e. Remove 1<sup>st</sup> gear (85).

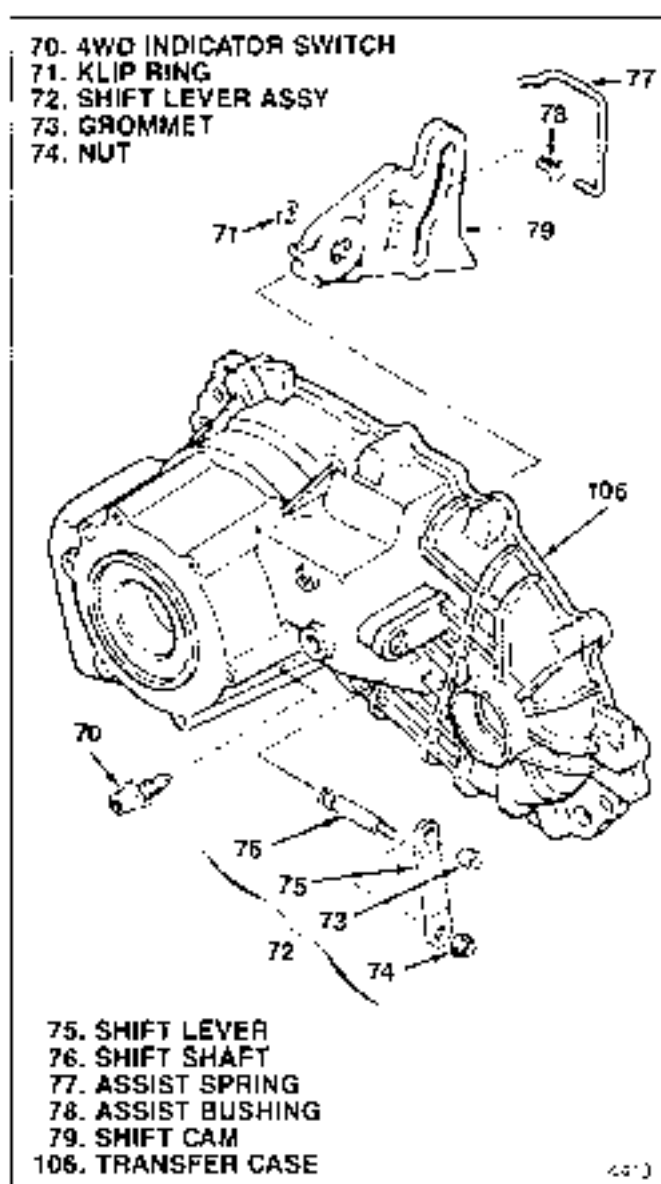


Figure 3-9. Shift Cam Parts

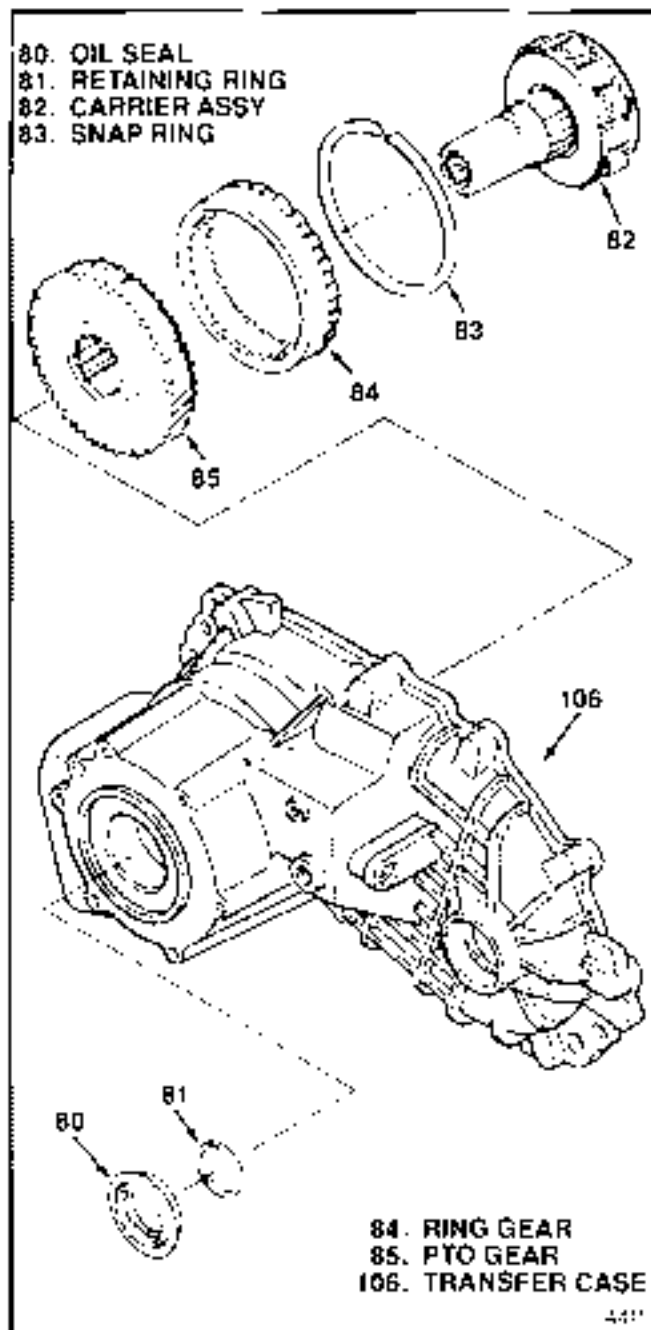


Figure 3-10. Carrier Assembly and Ring Gear

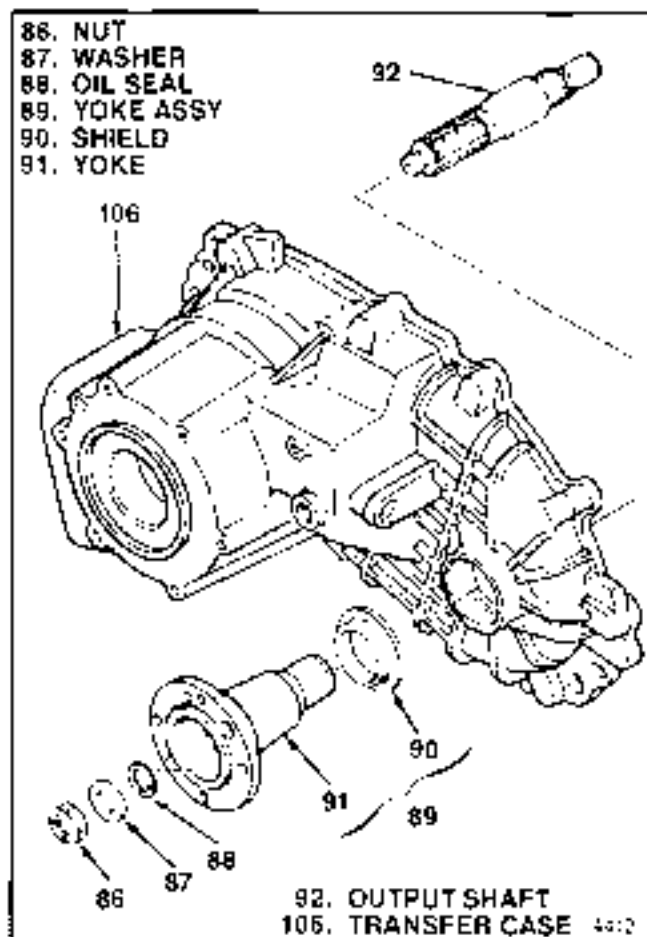


Figure 3-11. Front Output Shaft Group

**3-16. REMOVAL OF FRONT OUTPUT SHAFT GROUP.** From remaining transfer case assembly (86) through (106), remove the following (see figure 3-11):

- Remove nut (86) and washer (87).
- Pull yoke assembly (89) and remove oil seal (88).
- Press shield (90) from yoke (91) only if replacement is required.
- Remove output shaft (92) from transfer case (106).

**3-17. DISASSEMBLY OF TRANSFER CASE ASSEMBLY.** Disassemble as follows (see figure 3-12):

- Remove breather barb (93).
- Pull oil seal (95).
- Remove retaining ring (96) and pull ball bearing (97).
- Remove snap ring (98) and pull ball bearing (99).
- Pull oil seal (100).
- Remove two dowel pins (101) from transfer case (106) only if they are loose or damaged.
- Remove bolts (103), PTO cover (104) and gasket (105).
- Scrape sealant from mating face of transfer case (106). Use care not to damage metal face.

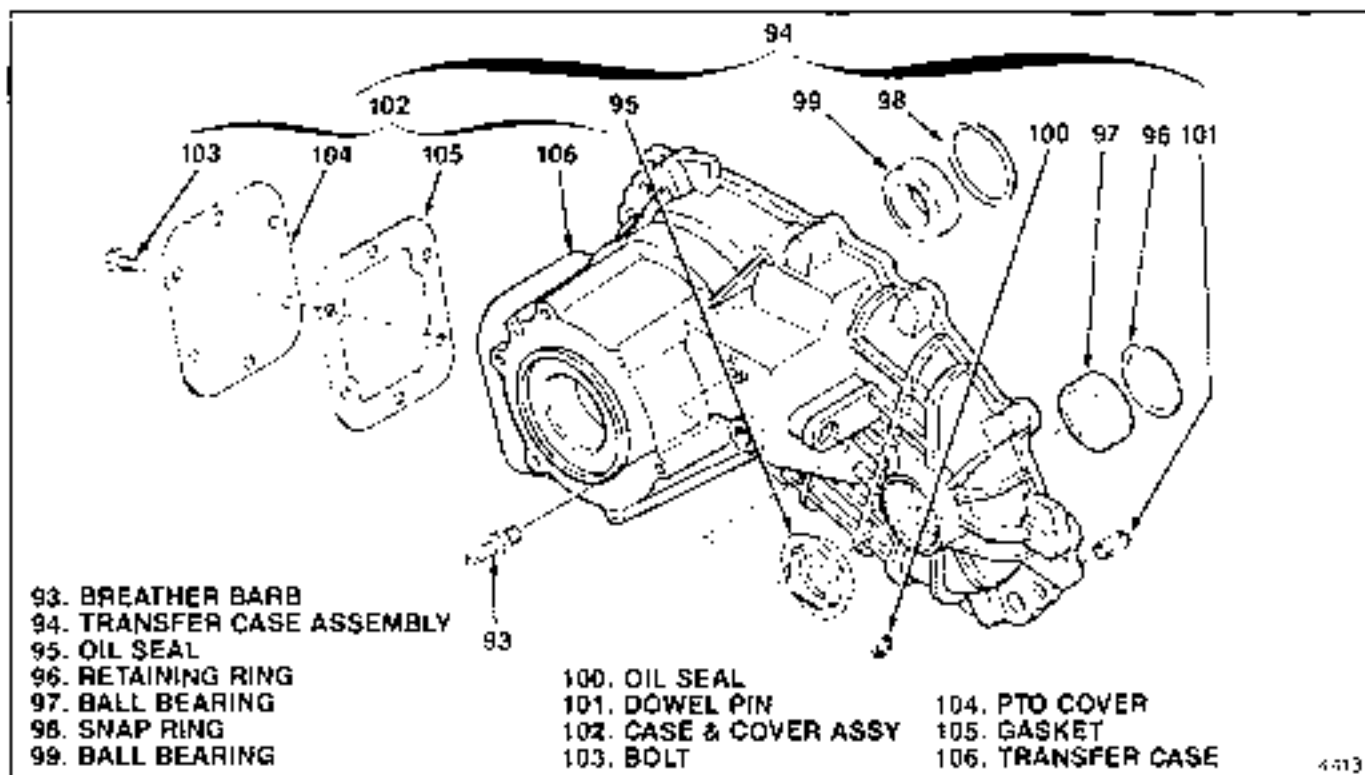


Figure 3-12. Transfer Case Assembly

# Section 4

## Cleaning, Inspection, Repair or Replacement

### 4-1. CLEANING

#### NOTE:

Prior to cleaning, check magnet (28) for presence of metal particles. Larger, granular or irregular shaped particles indicate chipping or similar damage. Smaller, powder-like particles indicate uneven or excessive wear. If metal particles are detected, be on the lookout for damage or wear when inspecting rotating parts and those with which they mate.

**4-2. GENERAL CLEANING PROCEDURE.** Wash parts in cleaning solvent to remove old lubricant and dirt deposits. Use a bristle brush to remove caked-on deposits. Parts that cannot be cleaned by brushing may be scraped but use care not to damage metal surfaces. Be sure to thoroughly clean all old sealant from mating faces of case (106), spacer (60), ringer (26) and bearing cap or extension assembly (14).

**4-3. DRYING CLEANED PARTS.** Dry parts with low pressure (20 psi max) compressed air. Wiping parts dry could leave lint deposits. Hold bearings to prevent them from spinning when drying.

**4-4. LUBRICATING BEARINGS.** Immediately after cleaning, lubricate ball bearings (19, 97 and 99), roller bearing (21) and needle bearing (53) and carrier assembly (82) (which contains needle bearings) with transfer case lubricant (refer to paragraph 2-4). Rotating or spinning dry, unlubricated bearings could result in damage. Cover lubricated bearings to protect from dust.

### 4-5. INSPECTION

**4-6. GENERAL INSPECTION PROCEDURES.** Visually inspect all parts (except hose coupling and rubber oil seals, which should be replaced with new parts) for damage or excessive or uneven wear. Reject parts with damage or wear that would affect serviceability of the part. Inspection terms used in this section are as follows:

**Burr:** Local rise of material forming protruding sharp edge.

**Chip:** An area from which a small fragment has been broken off or cut.

**Crack:** Surface break of line nature indicating partial or complete separation of material.

**Excessive wear:** Heavy or obvious wear beyond expectations considering conditions of operation.

**Indentation:** Displacement of material caused by localized heavy contact.

**Galling:** Breakdown or build-up of metal surface due to excessive friction between parts. Particles of the softer material are torn loose and welded to the harder material.

**Notch:** Local break or notch. Usually displacement of material rather than loss.

**Scoring:** Tear or break in metal surface from contact under pressure. May show discoloration from heat produced by friction.

**Step wear:** Heavy wear that produces a step that can be seen or felt between adjacent contact and non-contact surfaces.

**Uneven wear:** Condition of localized, unevenly distributed wear. Includes hollows, shiny spots, uneven polish and other visual indications.

**4-7. SPECIFIC INSPECTION PROCEDURES.** Inspect parts in accordance with Table 4-1 and as specified in the following paragraphs. Index numbers used in Table 4-1 are those assigned to the exploded view in Section 1. Parts:

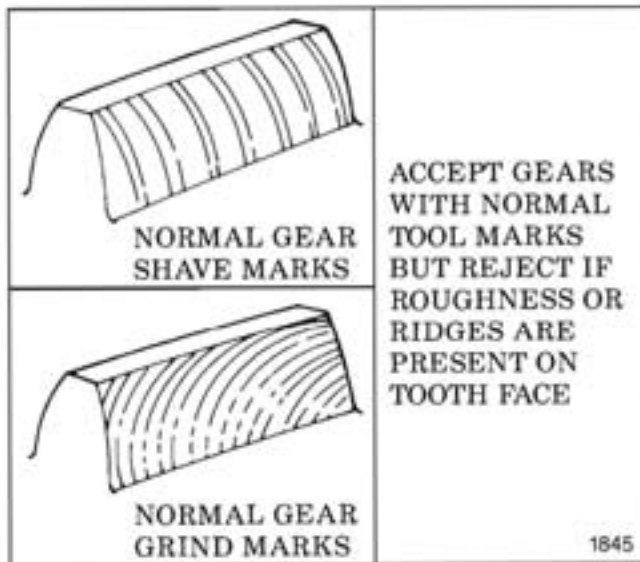
**4-8. GEAR OR SPROCKET TEETH INSPECTION.** When specified in Table 4-1, inspect gear or sprocket teeth as follows:

#### NOTE:

Do not confuse contact patterns with normal tool marks that are a result of manufacture. Typical tool marks are shown in figure 4-1.

a. Check gear or sprocket tooth contact patterns. Contact patterns likely to be encountered are shown in figure 4-2. Parts with contact patterns shown in the ACCEPT column are OK for further service provided they meet all other inspection requirements. Parts with contact patterns shown in REJECT column are unacceptable and must be rejected—no repairs are authorized.

b. Check gear or sprocket teeth for chips. Compare tooth chips or nicks with those shown in figure 4-3. Parts with small chips as shown in REPAIR column may be blend-repaired (refer to paragraph 4-12) and reused. Chips or broken teeth as shown in REJECT column are not repairable and the part must be rejected.



**4-9. SPLINE TEETH INSPECTION.** Check for broken or chipped spline teeth. Small chips may be blend-repaired in same manner as gear teeth (see figure 4-3 and refer to paragraph 4-12). If any spline tooth is broken, the part must be rejected. Spline teeth will not show contact patterns as gear teeth do. However, they may show evidence of step wear which is cause for rejection.

Figure 4.1. Normal Gear Tooth Tool Marks



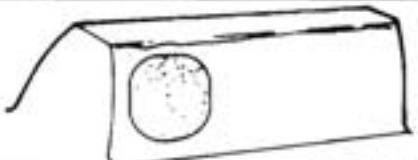
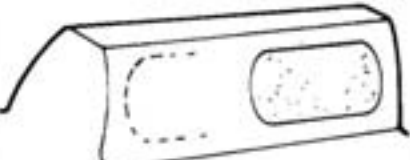
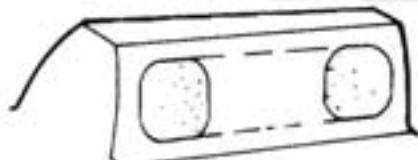




DESCRIPTION	ACCEPT	REJECT
DESIRED CONTACT PATTERN		
END CONTACT PATTERN		
TRAVELING CONTACT PATTERN (MOVES FROM SIDE TO SIDE)		
HIGH CONTACT PATTERN		
LOW CONTACT PATTERN		

Figure 4-2. Gear Tooth Contact Patterns




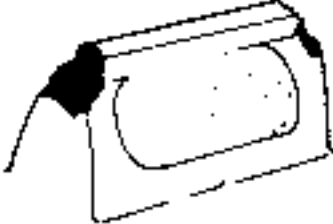
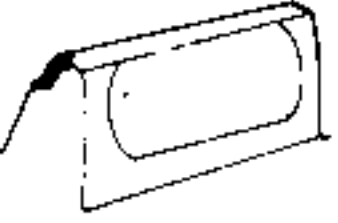
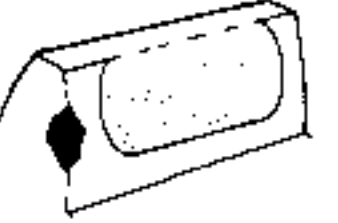
	REPAIR		REJECT
CORNER CHIP AT DRIVE FACE		CHIP WITHIN CONTACT PATTERN	
OD. EDGE CHIP AT DRIVE FACE. MAY EXTEND SLIGHTLY INTO CONTACT PATTERN		CHIP COMPLETELY THROUGH TOOTH (CONSIDERED TO BE BROKEN)	
CORNER CHIP AT COAST FACE			
SIDE EDGE CHIP AT DRIVE FACE			

Figure 4-3. Gear Tooth Chips

**Table 4-1. Inspection**

<b>PART (INDEX NO.)</b>	<b>INSPECTION</b>	<b>ACCEPT/REJECT</b>
All parts (including all springs)	Check for cracks Check for distortion Check for corrosion	Reject parts with cracks Reject parts that are bent, distorted or out of round Reject parts that are pitted or badly corroded
All threaded parts	Check for stripped, crossed or otherwise damaged threads	Reject parts with threads that cannot be cleaned up using a suitable tap or die
Yoke (6 or 91)	Check splines per paragraph 4-9	Paragraph 4-9
Electric clutch parts (23, 27 and 31)	Functionally check on vehicle per vehicle service manual	Replace components as required
Extension assy (14) bushing	Check ID bearing surface	Reject assembly if scored or damaged
Ball bearings (19, 97 and 99)	Visually check balls and races for chipping galling, scoring or other damage Make sure bearing is lubricated. Slowly rotate outer race while holding inner race. Feel for binding, roughness or flat spots. Bearing must rotate smoothly without side or end play	Reject damaged bearings Reject damaged or loose bearings, or if end play exceeds 0.009 inch (0.23 mm)
Roller and needle bearings (21 and 59)	Visually check rollers and race for chipping, galling, scoring or other damage	Reject damaged bearings
Bearing cap or extension (15) assy, cover (26), spacer (60), PTO cover (105) and transfer case (106)	Check mating faces for burrs or other damage that would prevent proper seating and sealing	Remove small burrs per paragraph 4-13. Otherwise replace damaged parts
Cover (26)	Check bore for bearings (19 and 21)	Reject if scored
Speedo rotor (15)	Check gear teeth per paragraph 4-8	Paragraph 4-8
Clutch housing (31) shift collar hub (32) and lockup hub (35)	Check splines per paragraph 4-9	Paragraph 4-9

**Table 4-1. Inspection**

<b>PART (INDEX NO.)</b>	<b>INSPECTION</b>	<b>ACCEPT/REJECT</b>
All parts (including all springs)	Check for cracks Check for distortion Check for corrosion	Reject parts with cracks Reject parts that are bent, distorted or out of round Reject parts that are pitted or badly corroded
All threaded parts	Check for stripped, crossed or otherwise damaged threads	Reject parts with threads that cannot be cleaned up using a suitable tap or die
Yoke (6 or 91)	Check splines per paragraph 4-9	Paragraph 4-9
Electric clutch parts (23, 27 and 31)	Functionally check on vehicle per vehicle service manual	Replace components as required
Extension assy (14) bushing	Check ID bearing surface	Reject assembly if scored or damaged
Hall bearings (18, 97 and 99)	Visually check balls and races for chipping, galling, scoring or other damage Make sure bearing is lubricated Slowly rotate outer race while holding inner race. Feel for binding, roughness or flat spots. Bearing must rotate smoothly without side or end play	Reject damaged bearings Reject damaged or loose bearings, or if end play exceeds 0.002 inch (0.23 mm)
Roller and needle bearings (21 and 59)	Visually check rollers and race for chipping, galling, scoring or other damage	Reject damaged bearings
Bearing cap or extension (15) assy, cover (26), spacer (60), PTO cover (105) and transfer case (106)	Check mating faces for burrs or other damage that would prevent proper seating and sealing	Remove small burrs per paragraph 1-13. Otherwise replace damaged parts
Cover (26)	Check bore for bearings (18 and 21)	Reject if scored
Speedo rotor (15)	Check gear teeth per paragraph 4-8	Paragraph 4-8
Clutch housing (31) shift collar hub (32) and lockup hub (35)	Check splines per paragraph 4-9	Paragraph 4-9

**Table 4-1. Inspection (Cont)**

<b>PART (INDEX NO.)</b>	<b>INSPECTION</b>	<b>ACCEPT/REJECT</b>
Lockup collar (47)	Check fork groove for wear or damage Check spline per paragraph 4-9	Reject if step wear or damage found Paragraph 4-9
Mail shaft (48)	Check for distortion Check OD for burrs or other damage Check OD for wear	Reject if bent Remove small burrs per paragraph 4-1.3. Otherwise reject damaged rail Reject if step wear found
Shift fork assy (39 and 63)	Check facings (40 and 64) that engage shift hubs for wear or damage	Reject if damaged or if step wear found
Drive and driven sprockets (43 and 44)	Check sprocket teeth per paragraph 4-8 Check splines per paragraph 4-9	Paragraph 4-8 Paragraph 4-9
Drive sprocket (43)	Check ID for output shaft (57)	Reject if scored or damaged
Drive chain (45)	Check for step wear, loose or damaged pins or links	Reject worn or damaged drive chain
Strainer (49)	Check that strainer screen is clean and free from punctures or damage	Reclean if necessary; reject if damaged
Pump gear assy (52)	Check for scoring, chipped teeth or other damage	If either gear (53 or 54) is damaged, replace gear assy (52)
Spacer (60) and pump cover (51)	Check pump cavity for scoring, step wear or other damage	Reject scored or damaged parts
Check ball (57) and mating seat in spacer (60)	Check for nicks, burrs or other damage	Reject damaged parts
Spacer (60)	Check bore for bearing (55)	Reject if scored or damaged
Output shaft (61)	Check splines per paragraph 4-9 Check OD bearing surfaces Check for distortion	Paragraph 4-9 Reject if scored or damaged Reject if bent or out of round
Reduction hub (62)	Check splines per paragraph 4-9 Check fork groove for wear or damage	Paragraph 4-9 Reject if step wear or damage found

**Table 4-1. Inspection (Cont)**

<b>PART (INDEX NO.)</b>	<b>INSPECTION</b>	<b>ACCEPT/REJECT</b>
Front output shaft (92)	Check spline per paragraph 4-9 Check OD bearing surfaces Check for distortion	Paragraph 4-9 Reject if scored or damaged Reject if bent or out of round
Carrier assy (82)	Check visible gear teeth per paragraph 4-8 Check visible splines per paragraph 4-9 Check for loose or worn pins or worn thrust washers Make sure carrier assy is lubricated. Slowly rotate planetary cage while holding input shaft. Feel for binding, roughness or flat spots. Cage must rotate smoothly without side or end play	Paragraph 4-8 Paragraph 4-9 Reject if any pin loose or any gear has excessive slide or end play Reject carrier assembly if operation binds or feels rough
Ring Gear (84)	Check fit in transfer case (106) Check gear teeth per paragraph 4-8	Reject ring gear, transfer case, or both if ring gear is loose in case or if retention lugs are cracked or broken Paragraph 4-8
PTO Gear (85)	Check rear teeth per paragraph 4-8	Paragraph 4-8
Shift shaft (76) and shift cam (79)	Check splines per paragraph 4-9 Check for scoring or step wear	Paragraph 4-9 Reject if scoring or step wear noted
Shift shaft (76)	Check for scoring or step wear Check for distortion	Reject if scoring or step wear noted Reject shaft if bent
Transfer case (106)	Check bore for bearings (97 and 99)	Reject if scored or damaged

**4-10. REPAIR OR REPLACEMENT**

4-11. Parts which are rejected at inspection shall be replaced unless repair procedures specified in the following paragraphs, or other obvious minor repair, will restore the part to complete serviceability.

**4-12. GEAR AND SPROCKET TOOTH REPAIR.** Repair shall be limited to blend-repair of chips within the limits shown in figure 4-3.

a. Blend-repair chips using a suitable hand-held, high speed grinding tool.

b. Blend chip into surrounding base metal, but do not remove any more metal than necessary.

c. Blend all sharp edges into smooth contour. Sharp edges may chip again or develop cracks.

**4-13. REMOVING SMALL BURRS.** Use a suitable abrasive stone to remove burrs. Be careful to remove only raised material, not base metal.

**4-14. PARTS REPLACEMENT.** Replace rejected parts that are not repairable. If there is any doubt about the serviceability of a part, replace it.

**415. SERVICE KIT.** Service kit part number 44 70 410-001 is recommended when servicing the transfer case. This kit contains bearings, snap rings and other small parts that normally require replacement.

Table 4-2. Service Kit Part Number 44-70-410-001

QTY	PART NUMBER	DESCRIPTION
2	19-00-149-002	Nut, yoke
2	10-00-047-015	Washer, yoke
1	13-00-193-004	Washer, lower output shaft
2	10-00-044-045	Seal, Oil, yoke
2	13-00-044-009	Seal, Oil, bearing cap and input shaft
1	13-00-016-001	Seal, Oil, shift shaft
1	13-00-044-009	Seal, Oil, front output shaft
1	10-00-141-007	O Ring, clutch coil
3	13-00-139-030	Ring, Retaining, output shaft bearing
1	10-00-139-041	Ring, Retaining, lockup assembly
1	10-00-139-030	Ring, Retaining, driven sprocket
1	13-00-139-009	Ring, Retaining, corner assembly
1	Te6-7-1-2	Ring, Retaining, lower shaft bearing
1	13-00-139-010	Ring, Retaining, input shaft bearing
1	13-00-139-012	Ring Retaining, ring gear
1	3208A	Bearing, Ball, rear output shaft
1	13-45-130-001	Bearing, Ball, front output shaft
1	13-00-130-001	Bearing, Ball, input shaft
1	13-00-144-004	Bearing, Roller, front output shaft
1	10-00-132-044	Bearing, Needle, spacer
1	13-00-193-004	Washer, Thrust, driven sprocket
2	13-56-295-001	Facing, shift fork
1	13-00-056-066	Clamp, Hose, oil pump
1	19-00-034-003	Hose, Pump
1	13-45-056-002	Klip, Ring, shift cam
1	13-00-045-001	Gasket, PTO cover
1	13-00-102-001	Grommet, Shift lever

# Section 5 Assembly

## 5-1. GENERAL INFORMATION

5-2. During assembly, refer to the illustrations specified in the text. In addition, an exploded view of the complete assembly can be viewed on the applicable illustration in Section B, Parts. The exploded view illustrations are listed at the beginning of Section B. Note the following during assembly:

a. When a torque value is specified, use a torque wrench to tighten the threaded part. Torque values are specified in the text and also in Table 5-1 at the end of this section.

b. Liberally coat small parts with petrolatum to help hold them in place during assembly.

c. Press in oil seals and bearings using universal drift T-43-70-001. Do not use a hammer to drive in oil seals and bearings.

5-3. LUBRICATION DURING ASSEMBLY. Lubricate all internal parts, not coated with petrolatum, with approved transfer case lubricant (refer to paragraph 2-1) just prior to assembly. This will ease assembly and provide initial lubrication.

a. O-rings or shaft seals may be damaged if not lubricated prior to assembly.

b. Make sure bearings, bushings and pump gears are thoroughly lubricated before assembly. Running bearings, bushings or pump gears dry, even for a brief period, will cause damage.

c. Lubricate sealing lips of oil seals and mating metal parts prior to assembly together.

## 5-4. ASSEMBLY OF TRANSFER CASE

5-3. ASSEMBLY OF CASE ASSEMBLY. Assemble parts which were removed from transfer case as follows (see figure 5-1):

a. Install gasket (105), PTO cover (104) and four bolts (103). Torque bolts to 15-30 lb-ft (20.3-40.7 Nm).

b. If removed, press two new dowel pins (101) into transfer case to dimension shown in figure 5-2.

c. Press in new oil seal (100) to dimension shown in figure 5-2.

d. Press in ball bearing (99) to bottom in transfer case (5-1106) and install snap ring (98).

e. Press in ball bearing (97) to bottom in transfer case (106) and install retaining ring (96).

f. Position new oil seal (95) as shown in figure 5-2 and press in to seat seal flange against transfer case (106).

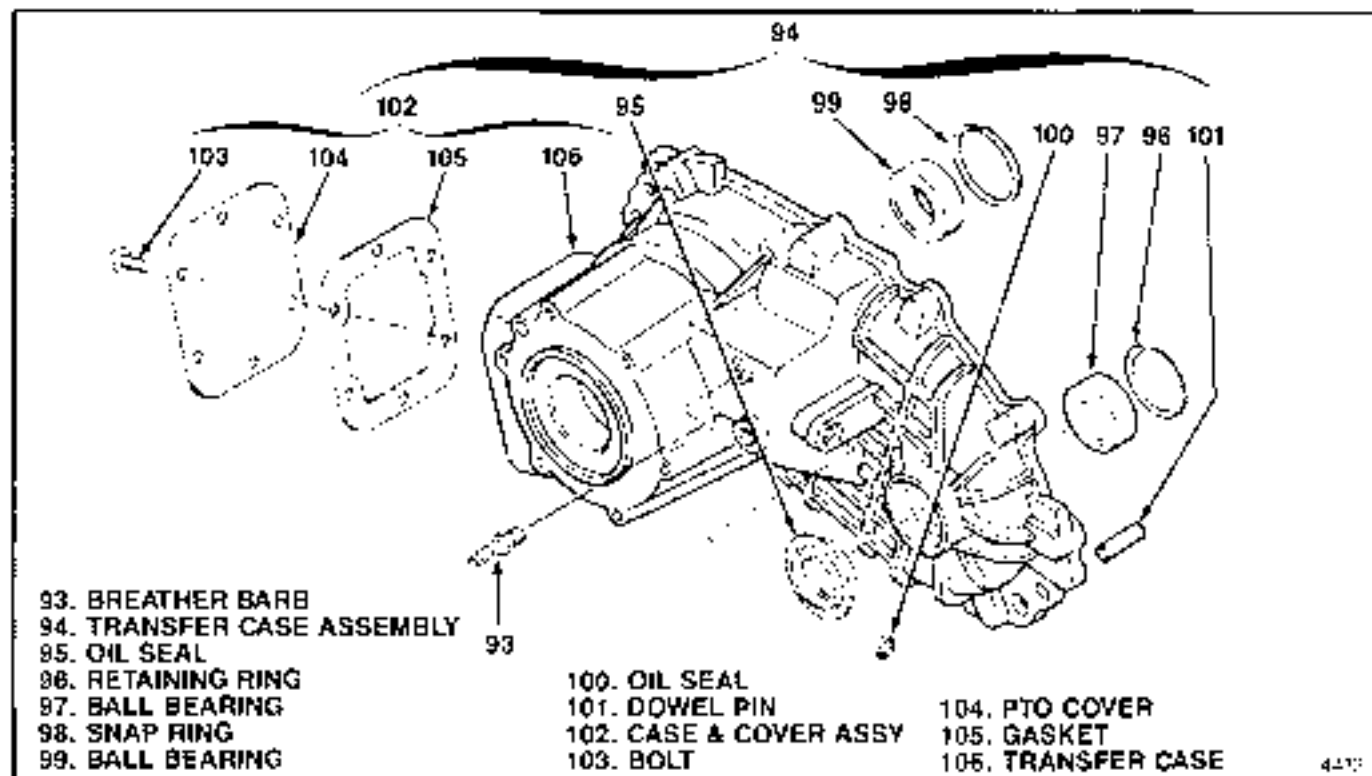


Figure 5-1. Transfer Case Assembly

j. Install bracket barb (83) and torque to 6-14 lb-ft (8-19 Nm).

#### 5-6. ASSEMBLY OF FRONT OUTPUT SHAFT GROUP

To assembly as completed thus far (93 through 106), assemble the following (see figure 5-4):

- If removed, press shield (90) onto yoke (91).
- Position output shaft (92) in transfer case (106) and install yoke assembly (89), oil seal (88), washer (87) and nut (86) on output shaft. Hold yoke with torque bar T-13-70-002 and torque nut to 150-180 lb-ft (203-244 Nm).

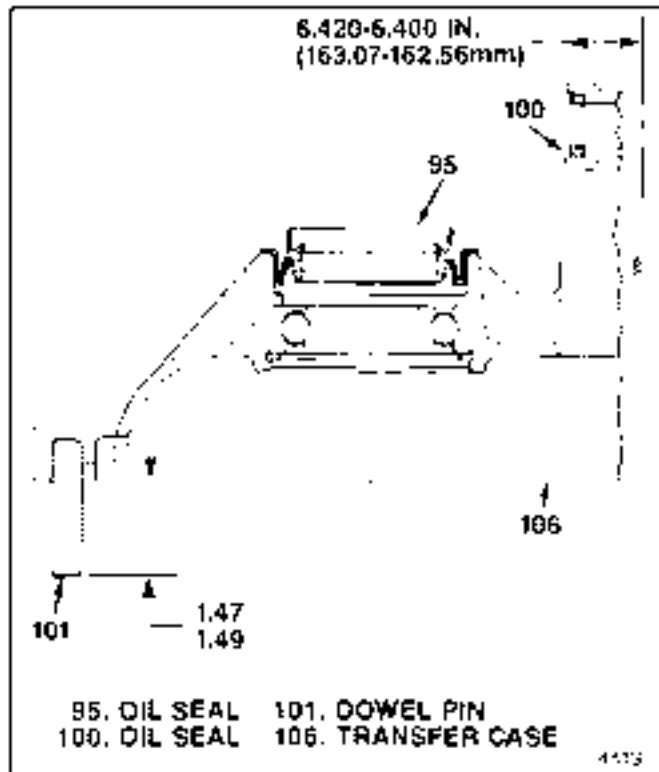


Figure 5-2. Installing Parts in Transfer Case

#### 5-7. INSTALLATION OF CARRIER ASSEMBLY AND RING GEAR

To assembly as completed thus far (92 through 108), assemble parts as follows (see figure 5-4):

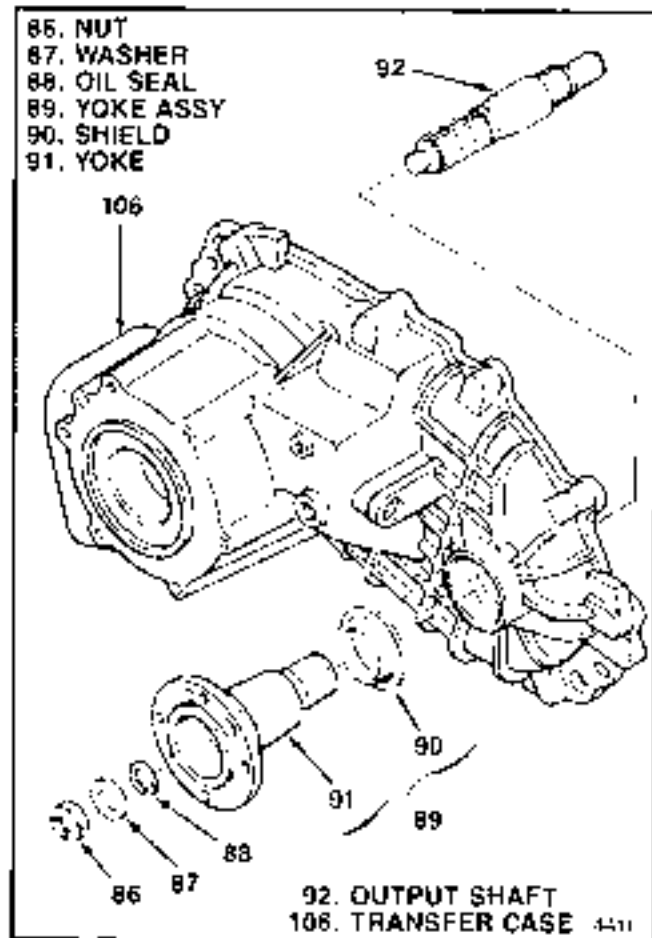


Figure 5-3. Front Output Shaft Group

a. Align splines and install PTO gear (85) on input shaft of carrier assembly (82). Position gear with respect to carrier assembly as shown in figure 5-5.

b. Position carrier assembly (82), with installed PTO gear (85) in transfer case (106) and install retaining ring (81) in groove in input shaft of carrier assembly.

c. Position oil seal (80) as shown in figure 5-5 and press into transfer case (106) until seal flange seats on case.

d. Install ring gear (84) in transfer case (106), lug end of gear last. Engage gear lugs with case notches and install snap ring (83).

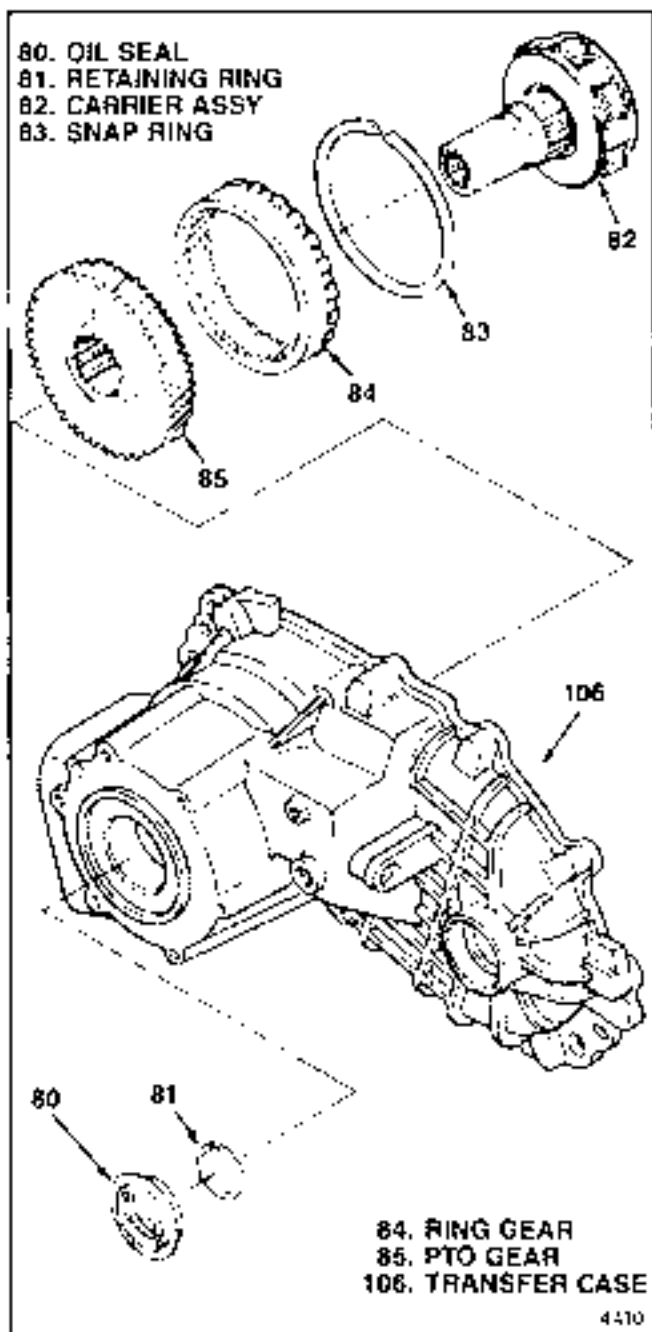


Figure 5-4. Carrier Assembly and Ring Gear

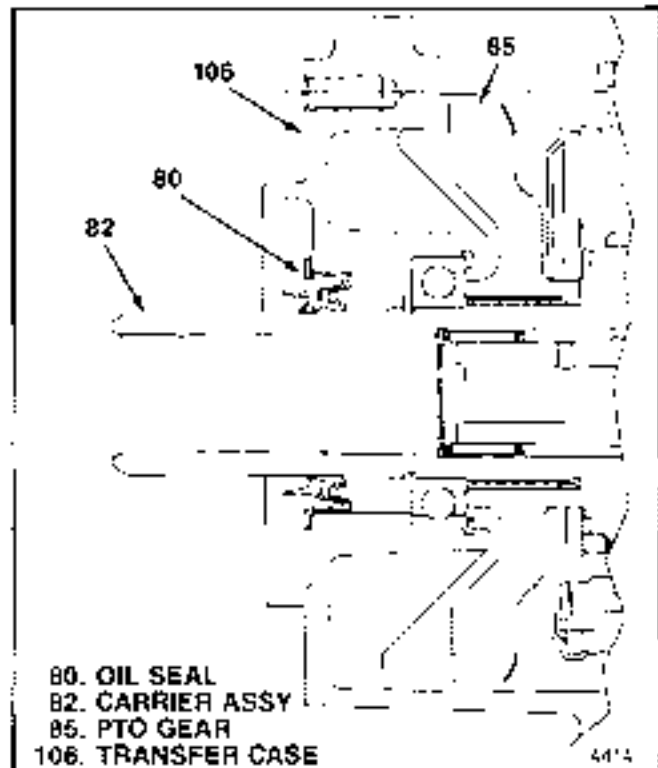


Figure 5-5. Oil Seal and PTO Gear Position

5-8. ASSEMBLY OF SHIFT CAM PARTS. Install parts as follows (see figure 5-6):

a. If disassembled, install shift lever (75) on shift shaft (76). Install nut (74) but before tightening, align lever with flat tooth on shaft spline as shown in figure 5-7. Torque nut to 19-26 lb-ft (26-35 Nm).

b. Lubricate grommet (73) and install in shift lever (75) so that grommet flange seats in lever counterbore as shown in figure 5-7.

c. Lubricate shaft and install shift lever assembly (72). Start splined end of shaft into transfer case (106) until end is flush with inside of case.

d. Install assist bushing (78) on end of assist spring (77) and install in groove in shift cam (79) closest to shift lever assembly (72). Install other end of spring through case bracket notch and into hole in transfer case (106).

e. Insert shift cam (79) into transfer case. Position both cam and shift lever assembly (72) so that flat spline teeth are aligned. Splines will go together in one position only. Install shift lever assembly fully into cam.

f. Install clip ring (71) in groove near inside end of shift lever assembly (72) to retain shift cam (79).

g. Install 4WD indicator switch (70) and torque to 8.0-12.0 lb-ft (10.8-16.3 Nm).

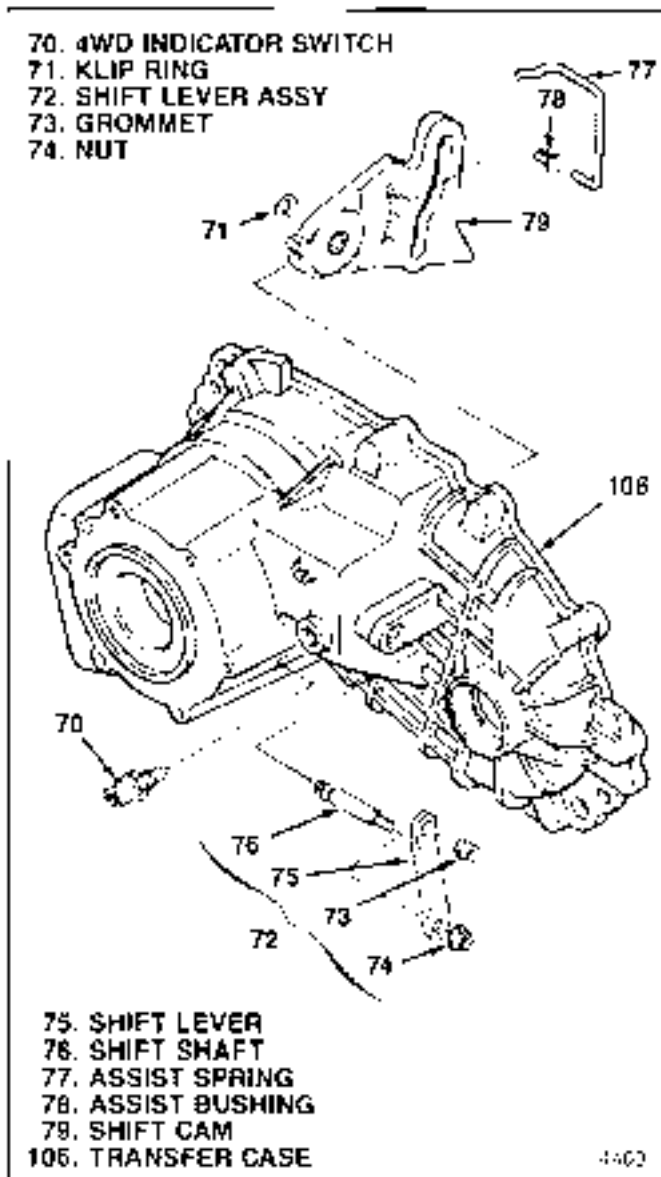


Figure 5-6. Shift Cam Parts

#### 5-9. ASSEMBLY OF REDUCTION SHIFT PARTS

Assemble and install parts as follows (see figure 5-8):

a. If removed, install new pin, roller and retainer assembly (65). Press pin, roller and retainer assembly into hole in reduction fork (69) until retainer passes completely through and snaps in place. Make sure that roller turns freely.

b. Install two fork facings (64) on reduction fork (69).

c. Engage reduction shift fork assembly (63) with reduction hub (62) and position in transfer case, reduction hub in carrier assembly (82) previously installed. Engage fork roller in cam slot in shift cam (79) previously installed.

d. Install rail shaft (38) through reduction fork assembly (63) and into blind hole in case to hold fork in place.

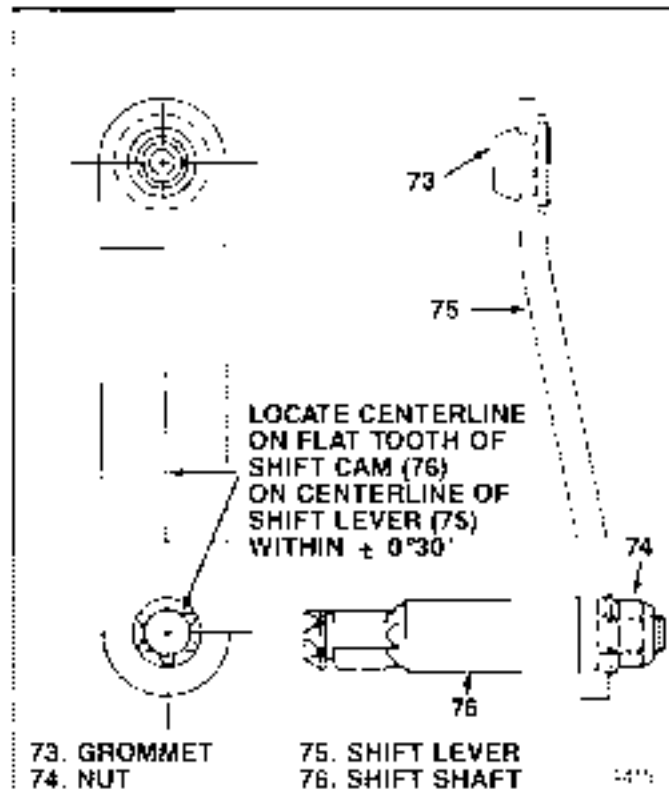


Figure 5-7. Shift Lever Assembly

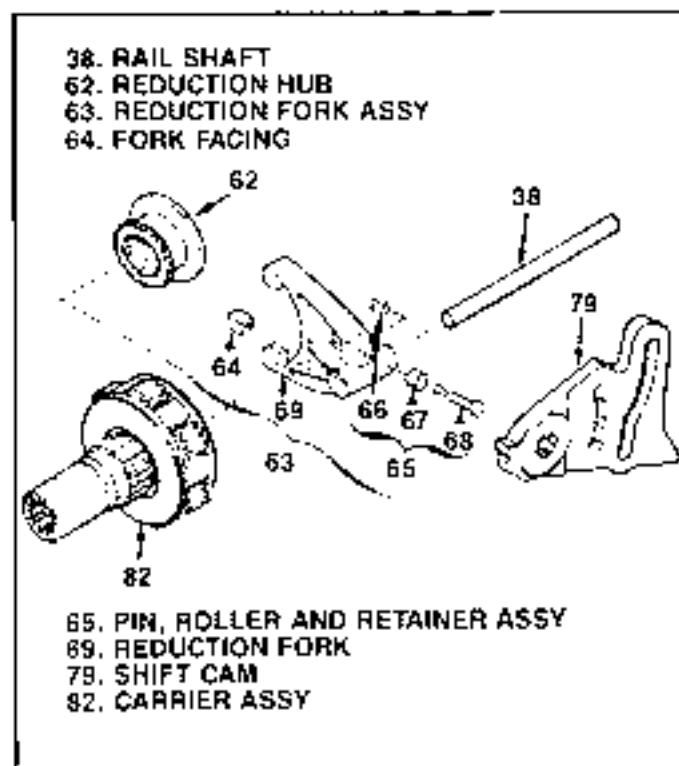


Figure 5-8. Reduction Shift Parts

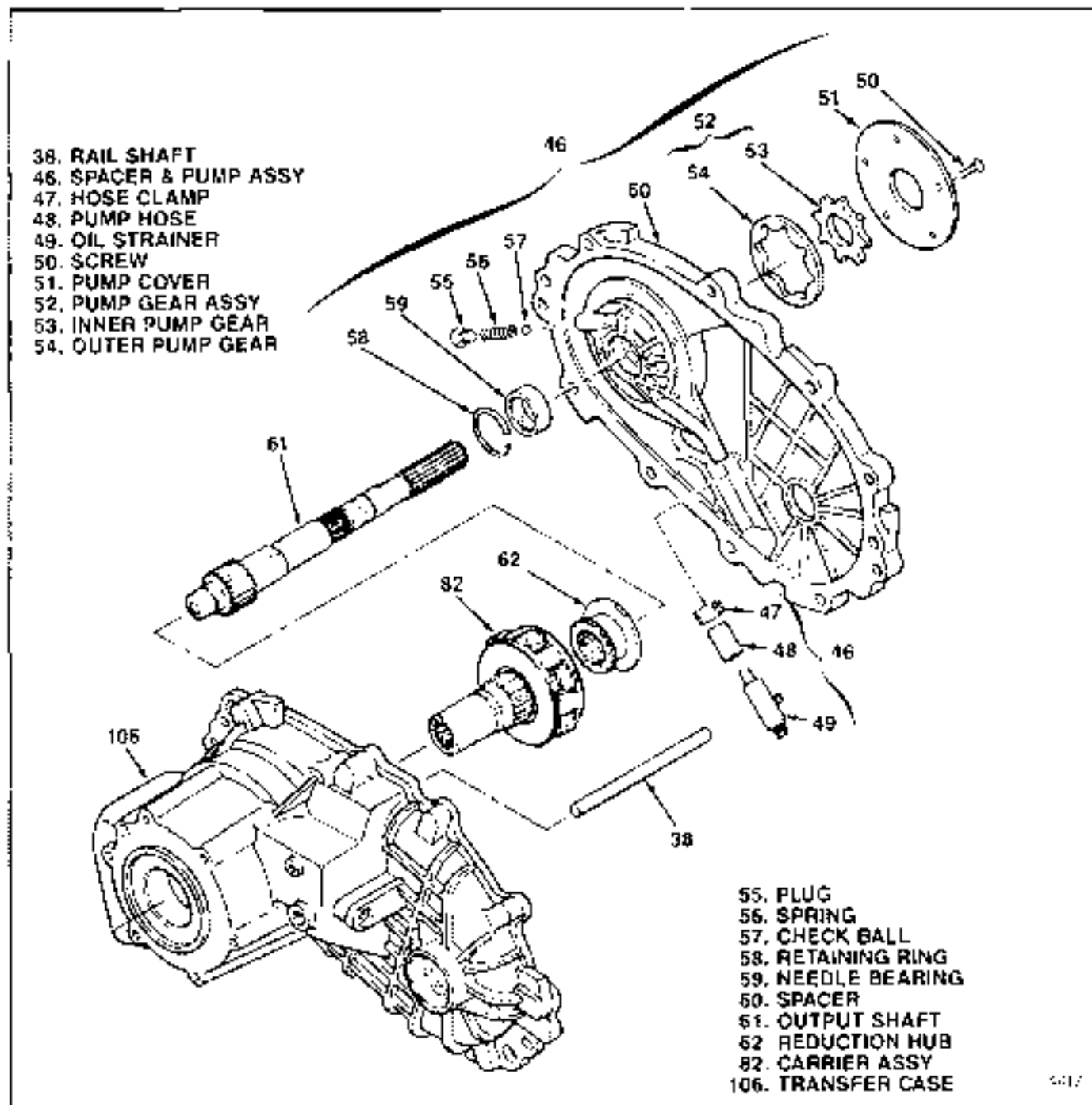


Figure 5-9. Spacer and Oil Pump Assembly

**5-10. ASSEMBLY AND INSTALLATION OF SPACER AND PUMP ASSEMBLY.** Proceed as follows (see figure 5-9):

a. Install output shaft (61) in induction hub (62) and carrier assembly (82) previously installed in transfer case.

b. Install needle bearing (59) in spacer (60) and secure with retaining ring (58).

c. Apply Loctite No. 222 to threads of plug (55). Install check ball (57), spring (56) and plug (55) in spacer (60). Torque plug to 11-22 lb-ft. (13-30 Nm).

d. Liberally lubricate inner and outer pump gears (53 and 54) with transmission case lubricant and install pump gear assembly (52) in spacer (60).

e. Align holes in inner pump gear (53) spacer (60) and pump cover (51) and install pump cover. Attach cover with five screws (50). Torque screws to 1.7-7.9 lb-ft (20-95 lbm) (12.3-11.7 Nm).

f. Install hose clamp (47) over pump hose (48). Install one end of hose on oil strainer (49). Position strainer in cavity in spacer (60), at same time installing free end of pump hose over spacer part. Move hose clamp (47) to secure hose to spacer part, positioning clamp tangs as shown in figure 5-10.

g. Apply continuous 1/16 in. (1.6 mm) bead of sealant (Neutral Cure RTV, Loctite 598) all around transfer case (106) mounting face for spacer and pump assembly (46). Center sealant bead between edges of face. Circle bolt holes.

h. Install pump and spacer assembly (46) on transfer case (106), guiding spacer over output shaft (61) and rail shaft (38) previously installed. Turn output shaft as required to align flat with that on inner pump gear (53).

#### NOTE

Assembly of transfer case, at least through assembly of cover assembly (19, figure 5-14) and bolts (15) must be completed promptly, before sealant applied at step g above cures.

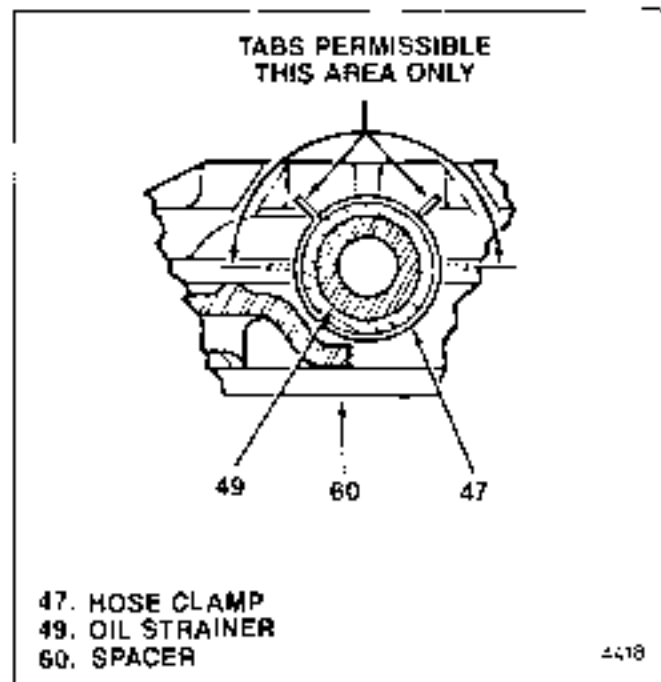


Figure 5-10. Hose Clamp Installation

**5-11. INSTALLATION OF CHAIN DRIVE.** To assembly as completed thus far (46 through 106) assemble parts as follows (see figure 5-11):

a. On work bench, next to transfer case assembly, position driven sprocket (44) with internal spline at front output shaft (92) end of case and drive sprocket (43) with smooth bore at output shaft (61) end.

b. Assemble drive chain (45) around sprockets (43) and (44).

c. Grasp each sprocket (43 and 44), held drive chain (45) tight and parallel with transfer case, and install chain drive assembly (43 through 45) over output shafts (92 and 61). It may be necessary to rotate driven sprocket (44) slightly to engage splines on front output shaft (92).

d. Install washer (42) on front output shaft (61). Install retaining ring (41) in shaft groove over washer.

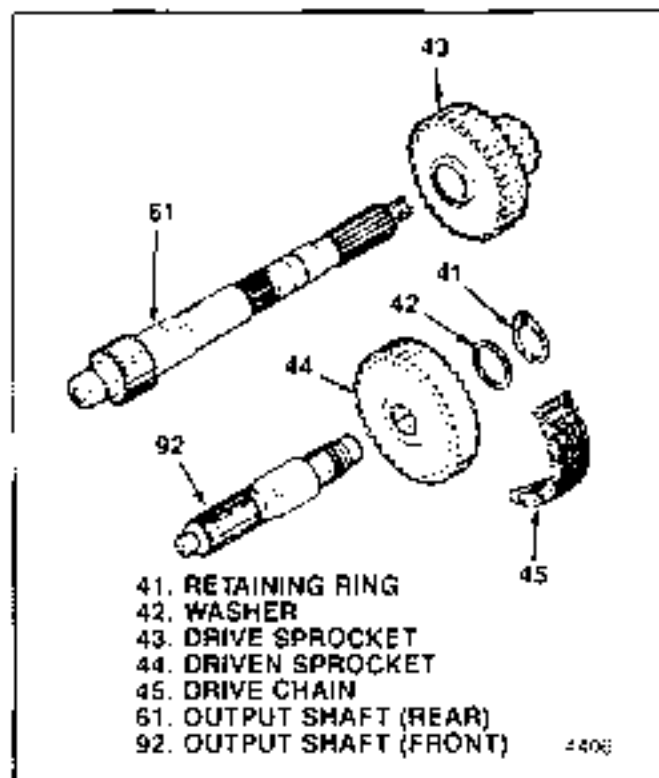


Figure 5-11. Chain Drive

**5-12. INSTALLING LOCKUP SHIFT PARTS.** To assembly as completed thus far (41 through 106) install parts as follows (see figure 5-12):

a. Install two fork facings (40) on lockup fork assembly (39).

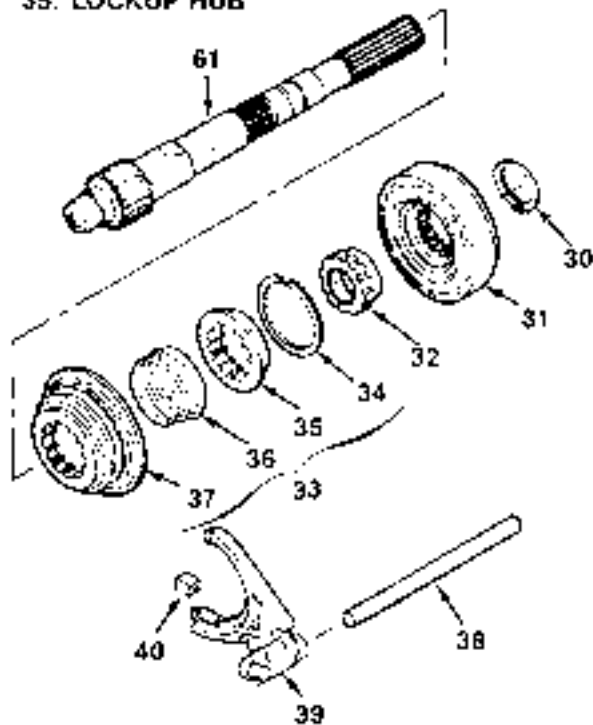
b. Assemble return spring (36) and lockup hub (35) to lockup collar (37) and retain with snap ring (34), completing 2W-4W lockup assembly (33).

c. Engage lockup fork assembly (39) in groove in 2W-4W lockup assembly (33) and slide this group down over output shaft (61) and rail shaft (38) previously installed.

d. Install shift collar hub (32), engaging splines on output shaft (61) and in 2W-4W lockup assembly (33).

e. Install clutch housing (31) over end of output shaft (61) and install snap ring (30) in groove in output shaft.

- 30. SNAP RING
- 31. CLUTCH HOUSING
- 32. SHIFT COLLAR HUB
- 33. 2W-4W LOCKUP ASSY
- 34. SNAP RING
- 35. LOCKUP HUB



- 36. SPRING
- 37. LOCKUP COLLAR
- 38. RAIL SHAFT
- 39. LOCKUP FORK ASSY
- 40. FORK FACING
- 61. OUTPUT SHAFT

4419

Figure 5-12. Lockup Shift Parts

**5-13. COVER ASSEMBLY.** Assemble parts into cover as follows (see figure 5-13):

a. If removed, install o-ring (24) over wire on clutch coil (25). Install clutch coil assembly in inside of case cover, with electrical wire and studs extending through cover. Use care not to kink or trap electrical wire under clutch coil assembly. Attach three with nuts (22) and torque to 6-8 lb-ft (8.1-10.8 Nm).

b. Position cover (26) on bed of suitable press so that open face of cover is up and parallel with press bed.

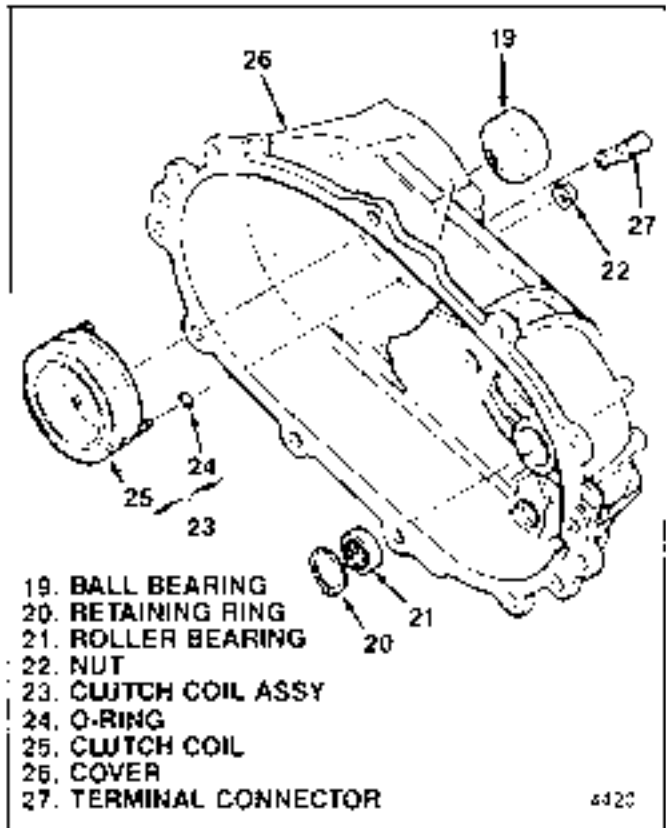
c. Install roller bearing (21) and secure with retaining ring (20).

d. Press in ball bearing (19) to bottom in cover (26).

e. Connect terminal connector (27) to end of wire on clutch coil assembly (23).

**5-14. INSTALLING COVER ASSEMBLY.** Install cover assembly as completed in paragraph 5-13 on transfer case as follows (see figure 5-14):

a. Install return spring (29) over rail shaft (38) in transfer case to rest on shift fork.



- 19. BALL BEARING
- 20. RETAINING RING
- 21. ROLLER BEARING
- 22. NUT
- 23. CLUTCH COIL ASSY
- 24. O-RING
- 25. CLUTCH COIL
- 26. COVER
- 27. TERMINAL CONNECTOR

4420

Figure 5-13. Cover Assembly

b. Install magnet (28) in slot in transfer case (106).  
 c. Apply continuous 1/16 in. (1.6 mm) bead of sealant (Neutral Cure RTV, Loctite 599) all around spacer (60) mounting face for cover assembly (19). Center sealant bead between edges of race. Circle bolt holes.

### CAUTION

In the following step do not use excessive force in an attempt to seat cover on transfer case. When all of the alignment conditions specified are met, the cover will seat without using undue force. If not, remove cover assembly and check alignment conditions.

d. Install cover assembly (19) on spacer (60) and transfer case (106). All of the following alignment conditions must be met for the cover assembly to seat on transfer case properly (see figure 5-15):

1. Cover holes with transfer case dowel pins (101).
2. Cover bearings with output shafts (61) and (62).
3. Blind hole in cover with rail shaft (38) (make sure spring is not coked).

e. Install ten bolts (17) and torque to 23-30 lb-ft (31-41 Nm).

f. Install two snap rings (16) in separate grooves in output shaft (67).

g. Press speedo rotor (14) onto output shaft (61) to seat against snap ring (16).

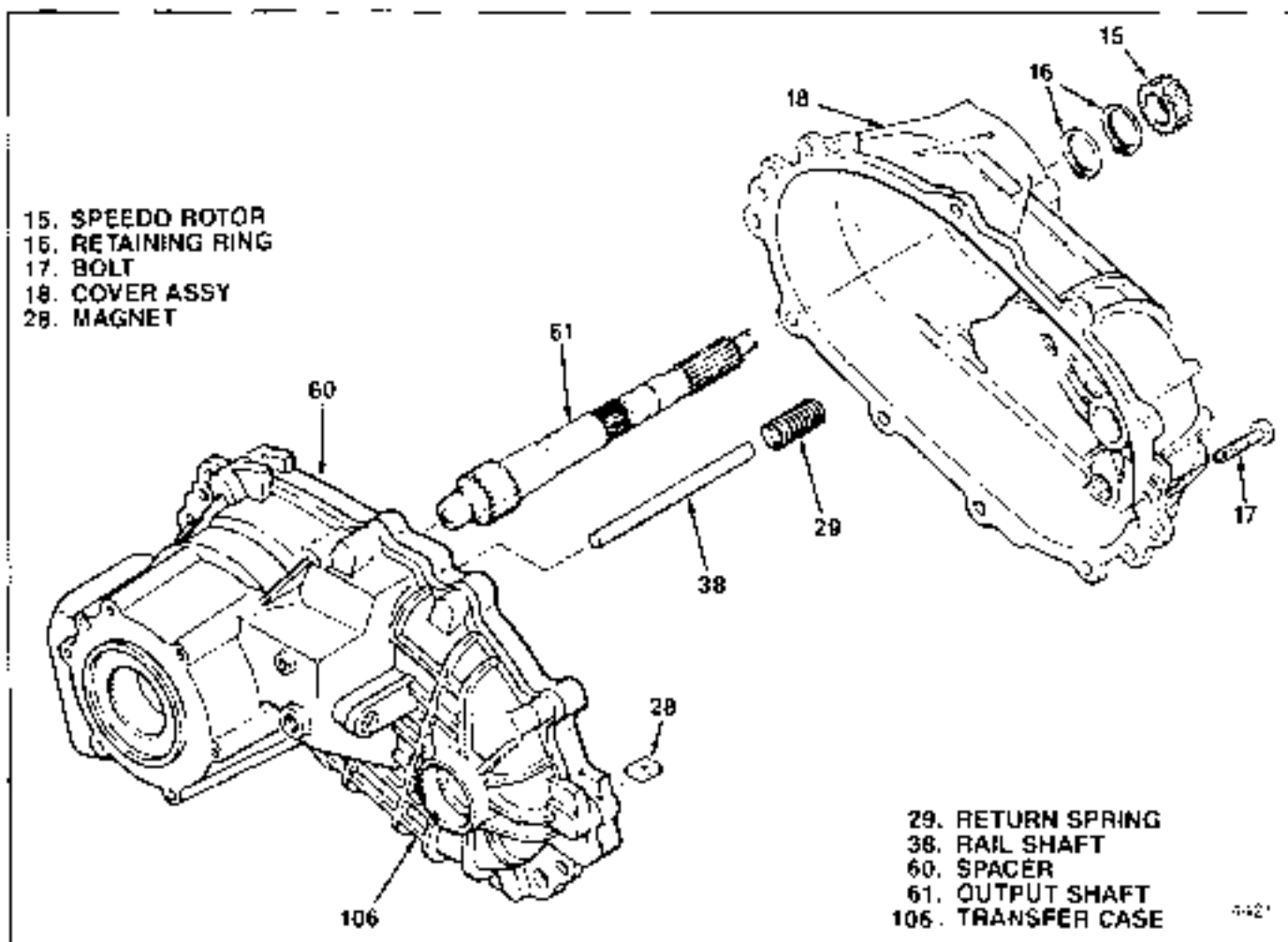


Figure 5-14. Cover Installation

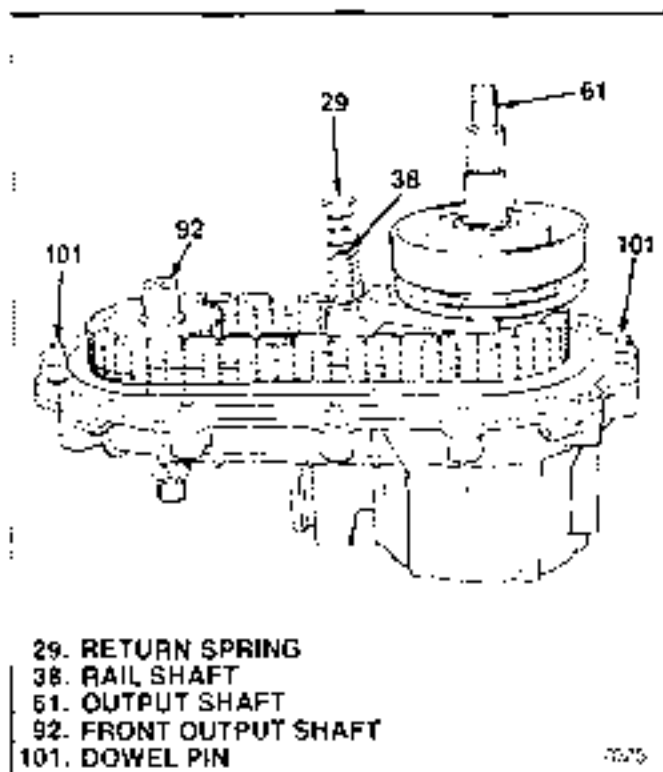


Figure 5-15. Parts To Be Aligned With Cover

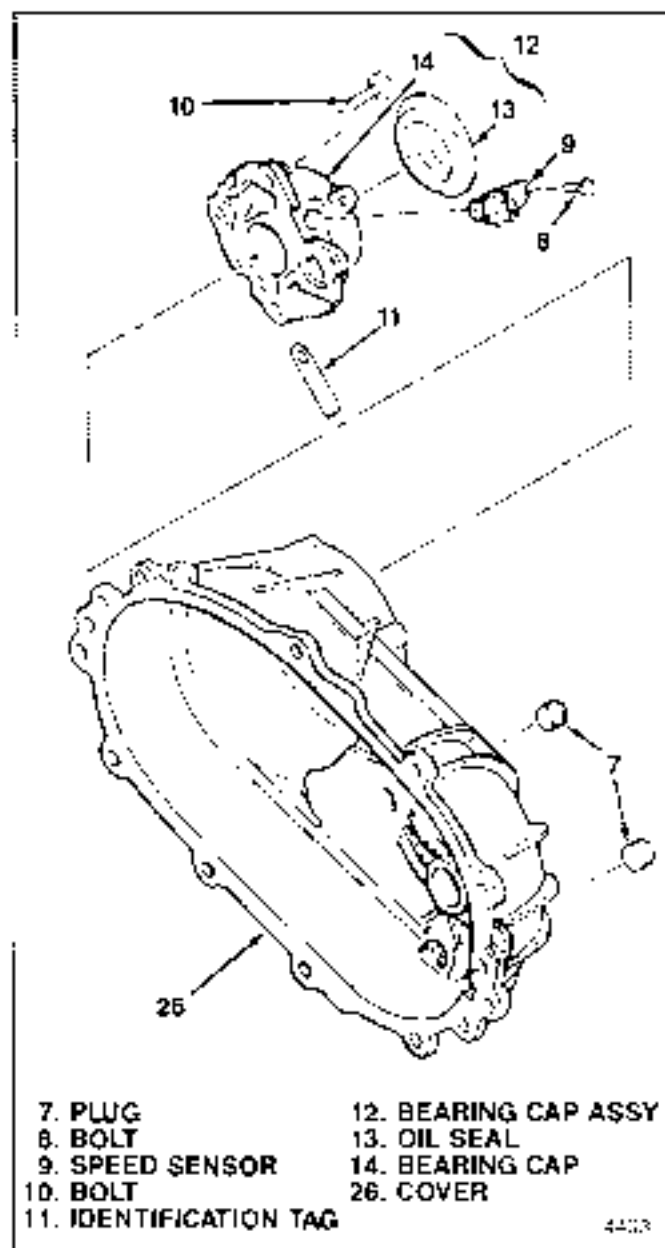


Figure 5-16. Bearing Cap Group

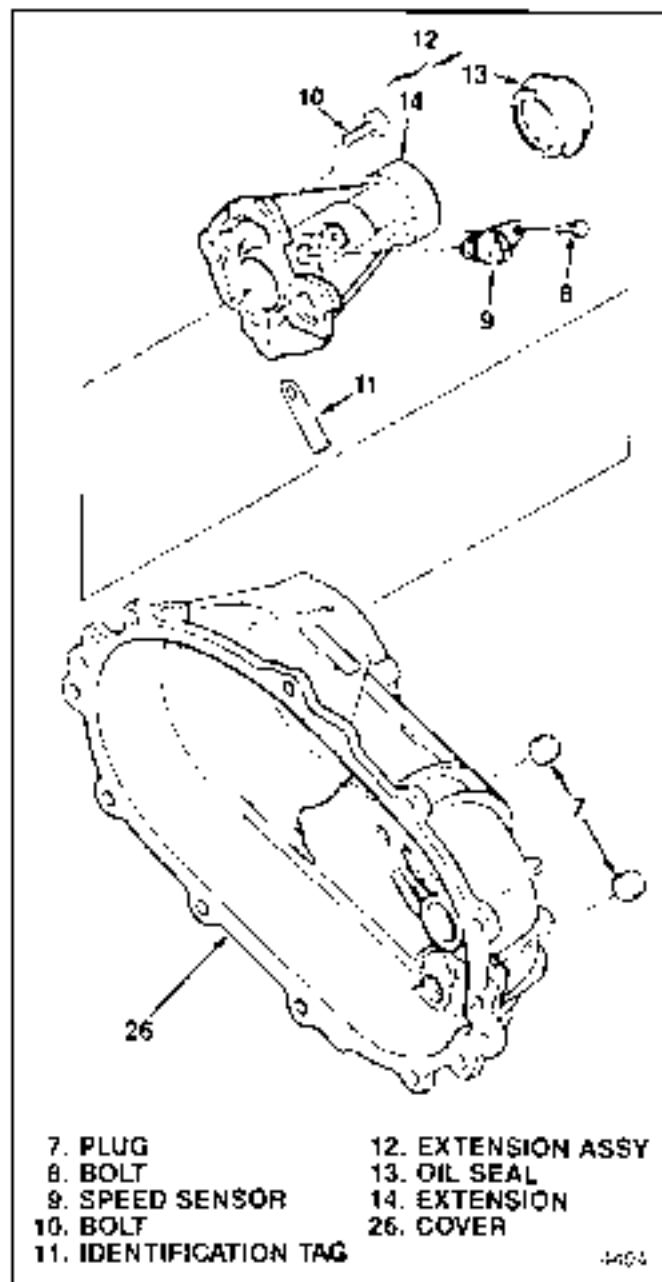


Figure 5-17. Extension Group

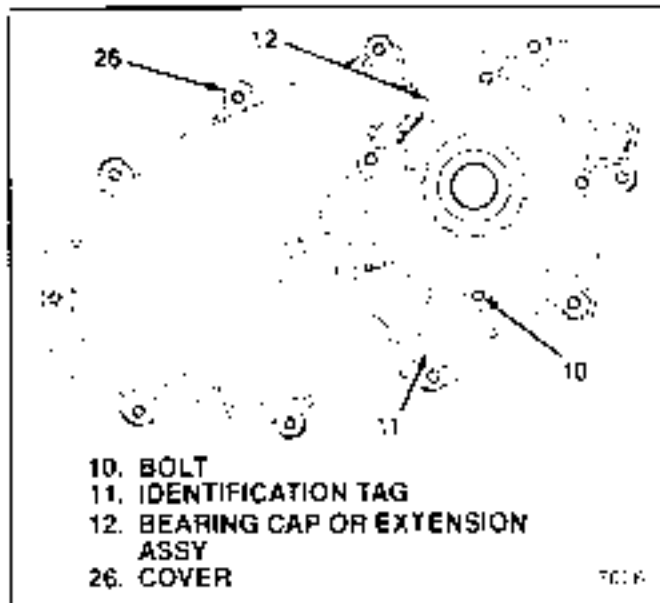


Figure 5-18. Identification Tag Location

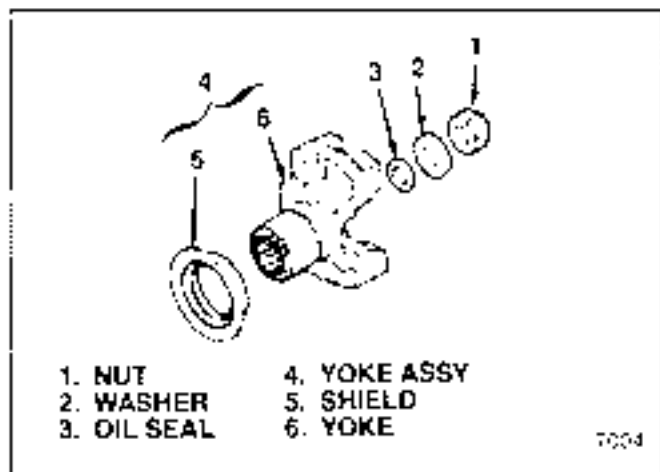


Figure 5-19. Rear Yoke Group

**5-15. ASSEMBLY AND INSTALLATION OF BEARING CAP OR EXTENSION GROUP.** Proceed as follows (see figure 5-16 for bearing cap; figure 5-17 for extension assembly):

a. For units with extension and bushing assembly (14) only, make sure bushing is in place and in serviceable condition.

b. Press new oil seal (13) into bearing cap or extension assembly (14).

c. Apply continuous 1/16 in. (1.6 mm) bead of sealant (Neutral Cure RTV, Loctite 590) all around cover (26) mounting face for bearing cap or extension assembly (12). Center sealant bead between edges of face. Circle hull holes.

d. Install bearing cap or extension assembly (12) on cover (26) and attach with four bolts (10). Install identification tag (11) under head of one bolt at location shown in figure 5-18. Torque bolts to 25-35 lb-ft (33.9-47.3 Nm).

e. Attach speed sensor (9) to bearing cap or extension assembly (12) with bolt (8).

f. Install fill and level plugs (17) (two plugs) and torque to 10-20 lb-ft (13.6-27.1 Nm).

**5-16. INSTALLING REAR YOKE GROUP.** To assembly as completed thus far (7 through 102), install rear yoke group, when used, as follows (see figure 5-19):

a. If removed, press shield (5) onto yoke (6).

b. Install yoke assembly (4), oil seal (3), washer (2) and nut (1). Hold yoke with torque bar T 13 70 002 and torque nut (1) to 150-180 lb-ft (203-244 Nm).

Table 5-1. Torque Values

TORQUES FOR SPECIFIC PARTS		
PART (INDEX NO.)	TORQUE IN LB-FT	TORQUE IN Nm
Nut (1 and 86)	150-180	203-244
4WD Switch (70)	8.0-12.0	10.9-11.3
Plug (71)	10-20	13.6-27.1
Bolt (8)	10-14	14-18
Bolt (10 & 17)	23-30	31-41
Screw (50)	1.7-7.9	2.3-10.7
Plug (55)	14-22	19-30
Bolt (103)	15-30	20.3-40.7
Nut (32)	6-8	8-10
Nut (74)	19-26	26-35
Breather Barb (93)	6-14	8-19
GENERAL TORQUES		
THREAD SIZE	TORQUE IN LB-FT	TORQUE IN Nm
5-16-18 UNC	15.0-25.0	20.3-33.9
3-5-16 UNC	25.0-40.0	33.9-54.5
3-8-24 UNF	25.0-40.0	33.9-54.5
7-16-14 UNC	35.0-55.0	47.5-74.6
1-2-13 UNC	45.0-70.0	61.0-94.9
1-2-30 UNF	45.0-70.0	61.0-94.9
9-16-12 UNC	60.0-90.0	81.3-122.0
1-5-27 NPTF	7.0-15.0	9.5-20.3
1-4-18 NPTF	10.0-20.0	13.6-27.1
3-8-18 NPTF	15.0-25.0	20.3-33.9
1-2-14 NPTF	20.0-30.0	27.1-40.7
3-4-14 NPTF	25.0-40.0	33.9-54.5

# Section P

## Parts

### Contents

Figure No	Description	Application
P-1	Transfer Case Assembly	44-70-003
P-2	Transfer Case Assembly	44-70-002

### P-1, INTRODUCTION.

P-2. This section lists, describes and illustrates replacement parts for the Borg-Warner Automotive 44-70 Transfer Case. Each exploded view illustration, listed in the Contents, has a corresponding parts list. Index numbers are used to key each part in the exploded views to the parts list and service instructions in preceding sections of this manual.

P-3. The PART NUMBER column in the parts list gives the part number which can be used to order replacement parts. Since this section covers more than one model, and not all detail parts are used on a particular model, the words "not used" may appear in

this column. Complete information on the identification tag (1), figure P-1 or P-2 should be included with all parts orders (see figure 1-1).

P-4. The DESCRIPTION column gives the part nomenclature used, not only in the list but also in the service instructions.

P-5. The QTY column designates the number of parts used at the location defined by the index number. Letter symbols may be used in this column to designate specific information. The symbols are as follows:

a. AR—As Required. This is used for selective fit parts, determined as necessary at assembly.

b. NP—Not Procurable. Detail parts so designated are not procurable separately. When replacement is required, order the next higher assembly.

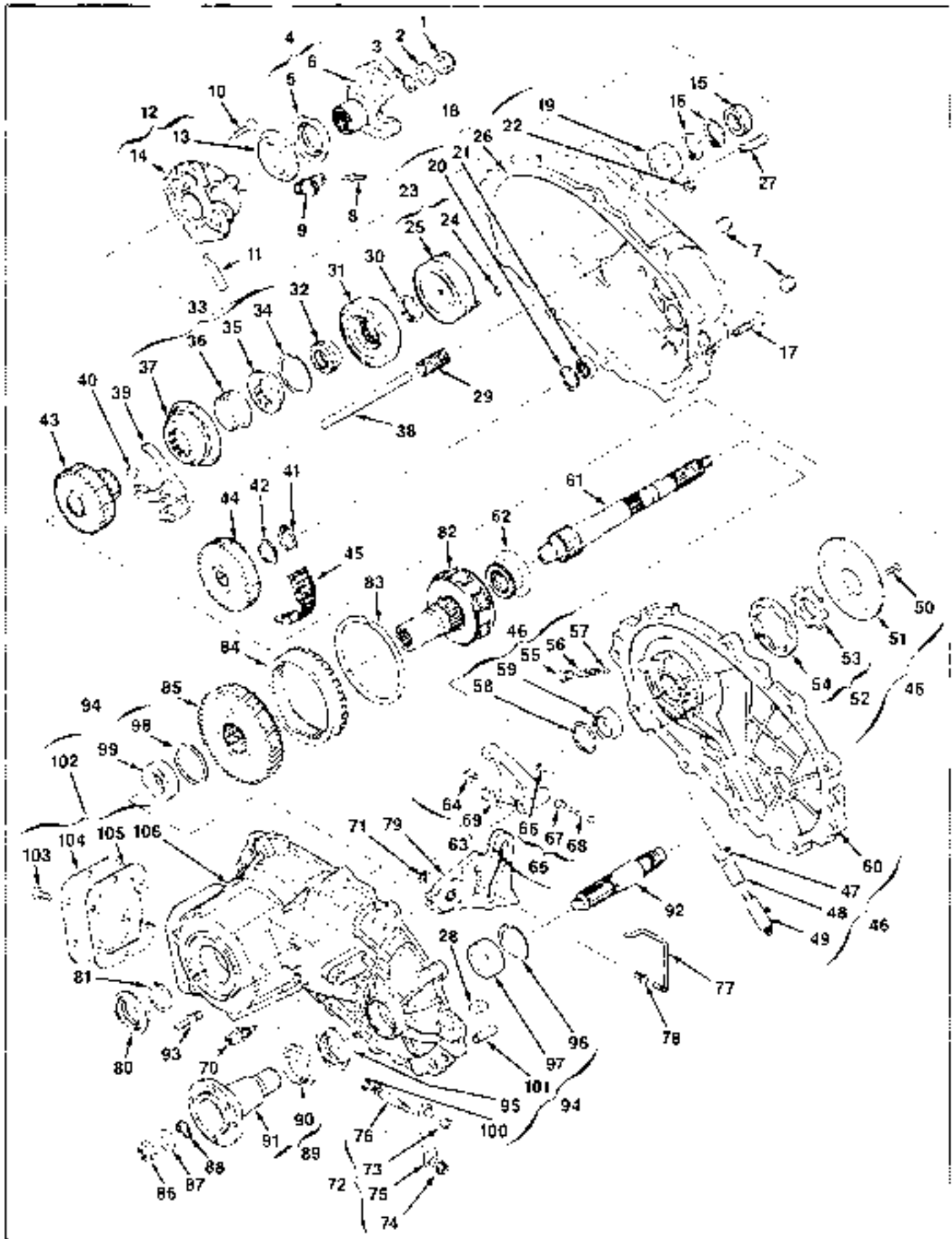


Figure P-1. Transfer Case Assembly PN 11-70-001

**PARTS LIST FOR FIGURE P-1**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
1	19-00-149-002	Nut	1
2	10-00-047-015	Washer	1
3	10-00-014-045	Seal, Oil	1
4	13-70-531-002	Yoke Assy, Rear	1
5	13-00-035-001	* Shield	1
6	13-70-031-002	* Yoke	1
7	0000445751	Plug, Pipe	2
8	0011503080	Bolt	1
9	13-70-640-001	Sensor, Speed	1
10	13-00-183-017	Hub	4
11	44-70-199-001	Tag, Identification	1
12	44-70-527-001	Cap Assy, Bearing	1
13	13-00-044-009	* Seal, Oil	1
14	13-70-107-001	* Cap, Bearing	1
15	13-70-110-002	Rotor, Speedo	1
16	13-00-149-030	Ring, Retaining	2
17	13-00-183-010	Bolt	10
18	13-70-539-005	Cover Assy, Transfer Case	1
19	R295A	* Bearing, Ball	1
20	19-00-139-011	* Ring, Retaining	1
21	13-00-139-011	* Bearing, Roller	1
22	13-00-149-002	* Nut	3
23	13-70-640-004	* Coil Assy, Clutch	1
24	10-00-141-007	** O-Ring	1
25	13-70-140-004	** Coil, Clutch	1
26	13-70-039-005	* Cover, Transfer Case	1
27	13-70-140-003	Connector, Terminal	1
28	10-00-012-002	Magnet	1
29	13-50-156-002	Spring, Return	1
30	13-00-139-030	Ring, Snap	1
31	13-70-312-002	Housing, Clutch	1
32	13-70-090-001	Hub, Shift Collar	1

**PARTS LIST FOR FIGURE P-1 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
33	13-56-589-002	Lockup Assy, 2W-4W	1
34	10-00-139-041	• Ring, Snap	1
35	13-56-089-002	• Hub, Lockup	1
36	13-59-156-007	• Spring, Sleeve Return	1
37	13-56-056-003	• Collar, Lockup	1
38	13-70-100-001	Shaft, Rail	1
39	44-70-500-001	Fork Assy, Shift, 2W-4W	1
40	13-56-235-001	• Facing, Shift Fork	2
41	13-00-139-030	Ring, Retaining	1
42	13-00-103-004	Washer	1
43	13-70-144-001	Sprocket, Drive	1
44	13-70-144-002	Sprocket, Driver	1
45	13-70-143-002	Chain, Drive	1
46	13-70-607-002	Spacer and Pump Assy	1
47	13-00-056-066	• Clamp, Hose	1
48	19-00-034-003	• Hose, Pump	1
49	13-70-238-001	• Strainer, Oil	1
50	19-00-183-001	• Screw	5
51	13-70-039-006	• Cover, Pump	1
52	13-70-601-101	• Gear Assy, Pump	1
53	13-70-101-002	•• Gear, Pump, Inner	NP
54	13-70-101-001	•• Gear, Pump, Outer	NP
55	19-00-052-002	• Plug	1
56	19-00-156-001	• Spring	1
57	19-00-109-001	• Ball, Check	1
58	19-00-139-010	• Ring, Retaining	1
59	10-00-152-044	• Bearing, Needle	1
60	13-70-107-002	• Spacer, Case to Cover	1
61	13-70-171-004	Shaft, Output	1
62	13-56-089-001	Hub, Reduction	1
63	13-00-596-001	Fork Assy, Reduction	1
64	13-56-235-001	• Facing, Shift Fork	2

**PARTS LIST FOR FIGURE P-1 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
65	13-50-543-001	• Pin, Roller and Retainer Assy	1
66	13-50-040-002	•• Retainer	1
67	13-52-127-001	•• Roller, Cam	1
68	130-50-0113-001	•• Pin	1
69	13-00-096-001	• Fork, Reduction	1
70	13-70-149-002	Switch, 4WD Indicator	1
71	13-45-056-002	Ring, Clip	1
72	13-70-508-002	Lever Assy, Shift	1
73	13-00-102-001	• Grommet	1
74	13-00-145-005	• Nut	1
75	13-70-098-002	• Lever, Shift	1
76	13-70-122-002	• Shaft, Shift	1
77	13-70-136-001	Spring, Assist	1
78	13-00-127-011	Bushing, Assist	1
79	13-70-099-002	Cam, Shift	1
80	13-00-041-009	Seal, Oil	1
81	13-00-139-002	Ring, Retaining	1
82	13-70-659-004	Carrier Assy, Complete	1
83	13-00-139-012	Ring, Snap	1
84	13-56-162-002	Gear, Ring	1
85	13-00-050-001	Gear, PTO	1
86	10-00-148-002	Nut	1
87	10-00-047-015	Washer	1
88	10-00-041-015	Seal, Oil	1
89	13-70-531-001	Yoke Assy, Front	1
90	13-00-035-001	• Shield	1
91	13-70-031-001	• Yoke	1
92	13-70-171-005	Shaft, Output	1
93	13-45-072-001	Bar, Breather	1
94	13-70-565-004	Case Assy, Transfer	1
95	10-00-041-009	• Seal, Oil	1
96	186-7-12	• Ring, Retaining	3

**PARTS LIST FOR FIGURE P-1 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
97	13-45-130-001	• Bearing, Ball	1
98	13-00-139-010	• Ring, Snap	1
99	13-00-130-001	• Bearing, Ball	1
100	13-00-016-001	• Seal, Oil	1
101	13-00-043-007	• Pin Dowel	2
102	13-70-565-006	• Case & Cover Assy	1
103	10-00-183-041	•• Bolt	6
104	13-00-191-010	•• Cover, PTO	1
105	13-00-045-001	•• Gasket	1
106	13-70-065-004	•• Case, Transfer	1

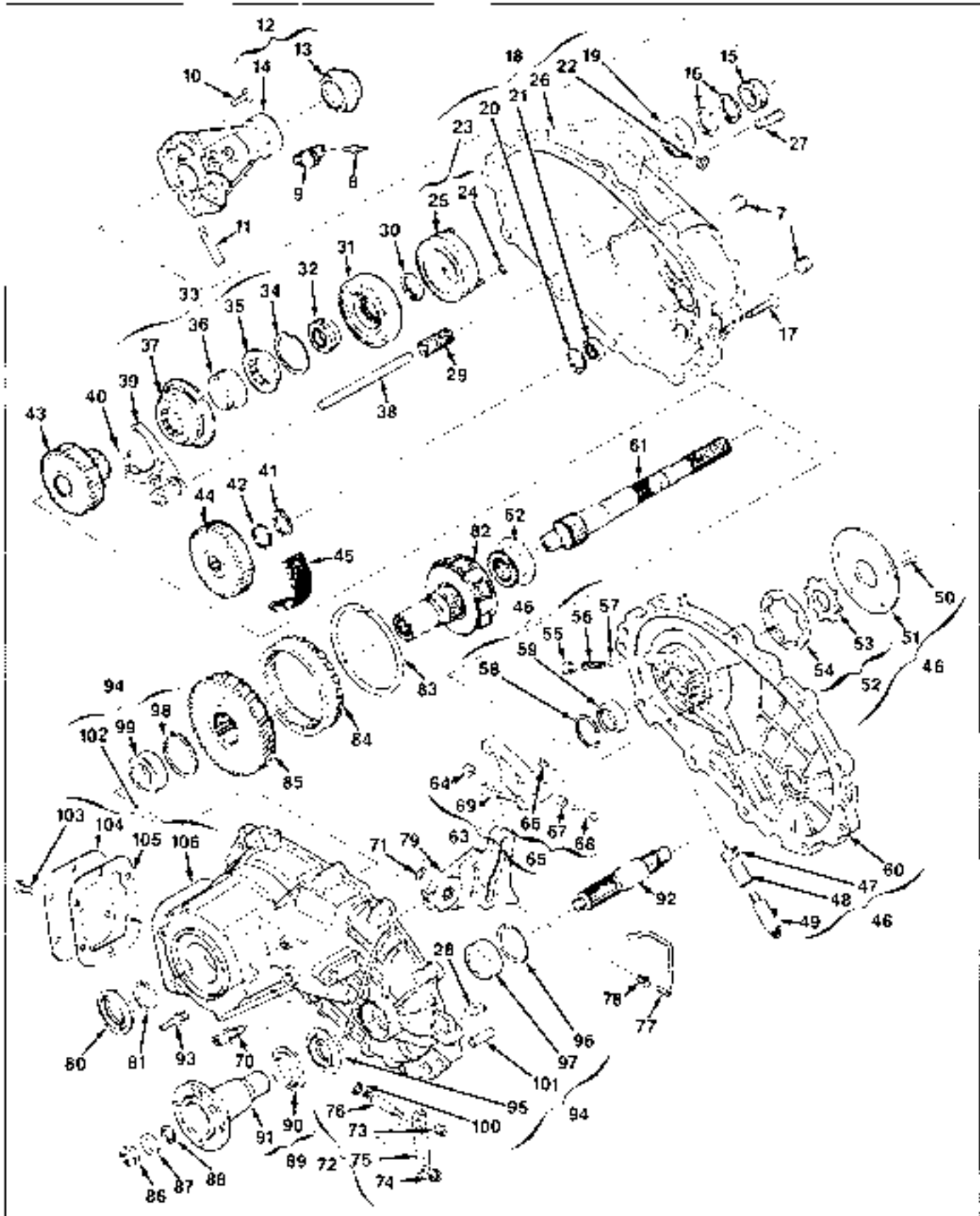


Figure P-2. Transfer Case Assembly PX 44-70-002

**PARTS LIST FOR FIGURE P-2**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
1	Not used		
2	Not used		
3	Not used		
4	Not used		
5	Not used		
6	Not used		
7	0000415751	Plug, Pipe	2
8	0011503080	Bolt	1
9	13-70-640-001	Sensor, Speed	1
10	13-00-183-017	Bolt	4
11	14-70-199-003	Tag, Identification	1
12	14-70-586-001	Extension Assy	1
13	13-00-041-011	* Seal, Oil	1
14	13-70-586-007	* Extension & Bushing Assy	1
15	13-70-110-002	Rotor, Sprocket	1
16	13-00-139-030	Ring, Retaining	2
17	13-00-183-026	Bolt	10
18	13-70-539-005	Cover Assy, Transfer Case	1
19	B206A	* Bearing, Ball	1
20	19-00-139-031	* Ring, Retaining	1
21	19-00-139-011	* Bearing, Roller	1
22	13-00-110-002	* Nut	3
23	13-70-610-004	* Coil Assy, Clutch	1
24	10-00-111-007	** O-Ring	1
25	13-70-110-001	** Coil, Clutch	1
26	13-70-039-005	* Cover, Transfer Case	1
27	13-70-110-003	Connector, Terminal	1
28	10-00-012-007	Magnet	1
29	13-50-136-003	Spring, Return	1
30	13-00-139-030	Ring, Snap	1
31	13-70-212-002	Housing, Clutch	1
32	13-70-090-001	Hub, Shift Collar	1

**PARTS LIST FOR FIGURE P-2 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
33	13-56-589-002	Lockup Assy. 2W-4W	1
34	10-00-139-044	* Ring, Snap	1
35	13-506-089-002	* Hub, Lockup	1
36	13-50-150-007	* Spring, Sleeve Return	1
37	13-06-053-003	* Collar, Lockup	1
38	13-70-100-001	Shaft, Rail	1
39	44-70-596-001	Fork Assy, Shaft, 2W-4W	1
40	13-56-235-001	* Facing, Shift Fork	2
41	13-00-139-030	Ring, Retaining	1
42	13-00-190-004	Washer	1
43	13-70-144-001	Sprocket, Drive	1
44	13-70-144-002	Sprocket, Driven	1
45	13-70-143-002	Chain, Drive	1
46	13-70-607-002	Spacer and Pump Assy	1
47	13-00-058-066	* Clamp, Hose	1
48	19-00-054-003	* Hose, Pump	1
49	13-70-238-001	* Strainer, Oil	1
50	19-00-180-001	* Screw	5
51	13-70-029-006	* Cover, Pump	1
52	13-70-601-101	* Gear Assy, Pump	1
53	13-70-101-002	** Gear, Pump, Inner	NP
54	13-70-101-001	** Gear, Pump, Outer	NP
55	19-00-052-002	* Plug	1
56	19-00-150-001	* Spring	1
57	19-00-109-001	* Ball, Check	1
58	19-00-139-010	* Ring, Retaining	1
59	10-00-132-044	* Bearing, Needle	1
60	13-70-107-002	* Spacer, Case to Cover	1
61	13-70-171-006	Shaft, Output	1
62	13-56-082-001	Hub, Reduction	1
63	13-00-596-001	Fork Assy, Reduction	1
64	13-56-235-001	* Facing, Shaft Fork	2

**PARTS LIST FOR FIGURE P-2 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
65	13-50-543-001	• Pin, Roller and Retainer Assy	1
66	13-50-040-002	•• Retainer	1
67	13-52-127-001	•• Roller, Cam	1
68	130-510-043-001	•• Pin	1
69	13-00-096-001	• Fork, Reduction	1
70	13-70-140-002	Switch, 4WD Indicator	1
71	13-45-356-002	Ring, Key	1
72	13-70-598-002	Lever Assy, Shift	1
73	13-00-102-001	• Grommet	1
74	13-00-149-003	• Nut	1
75	13-70-598-002	• Lever, Shift	1
76	13-70-122-002	• Shaft, Shift	1
77	13-70-156-001	Spring, Assist	1
78	13-00-127-011	Bushing, Assist	1
79	13-70-699-002	Cam, Shift	1
80	13-00-044-009	Seal, Oil	1
81	13-00-139-009	Ring, Retaining	1
82	13-70-659-004	Carrier Assy, Complete	1
83	13-00-139-012	Ring, Snap	1
84	13-55-162-052	Gear, Ring	1
85	13-00-070-001	Gear, PTO	1
86	10-00-149-002	Nut	1
87	10-00-047-015	Washer	1
88	10-00-044-045	Seal, Oil	1
89	13-70-531-051	Yoke Assy, Front	1
90	13-00-035-001	• Shield	1
91	13-70-041-001	• Yoke	1
92	13-70-171-003	Shaft, Output	1
93	13-45-072-001	Barb, Breather	1
94	13-70-565-004	Case Assy, Transfer	1
95	13-00-044-009	• Seal, Oil	1
96	T80-7-1-2	• Ring, Retaining	1

**PARTS LIST FOR FIGURE P-2 (CONT)**

<b>INDEX NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
97	13-45-130-021	• Bearing, Ball	1
98	13-00-130-010	• Ring, Snap	1
99	13-00-130-001	• Bearing, Ball	1
100	13-00-016-000	• Seal, Oil	1
101	13-00-043-007	• Pin, Dowel	2
102	13-70-565-090	• Case & Cover Assy	1
103	10-05-183-041	•• Bolt	4
104	13-00-197-010	•• Cover, P/O	1
105	13-00-045-001	•• Gasket	1
106	13-70-065-004	•• Case, Transfer	1

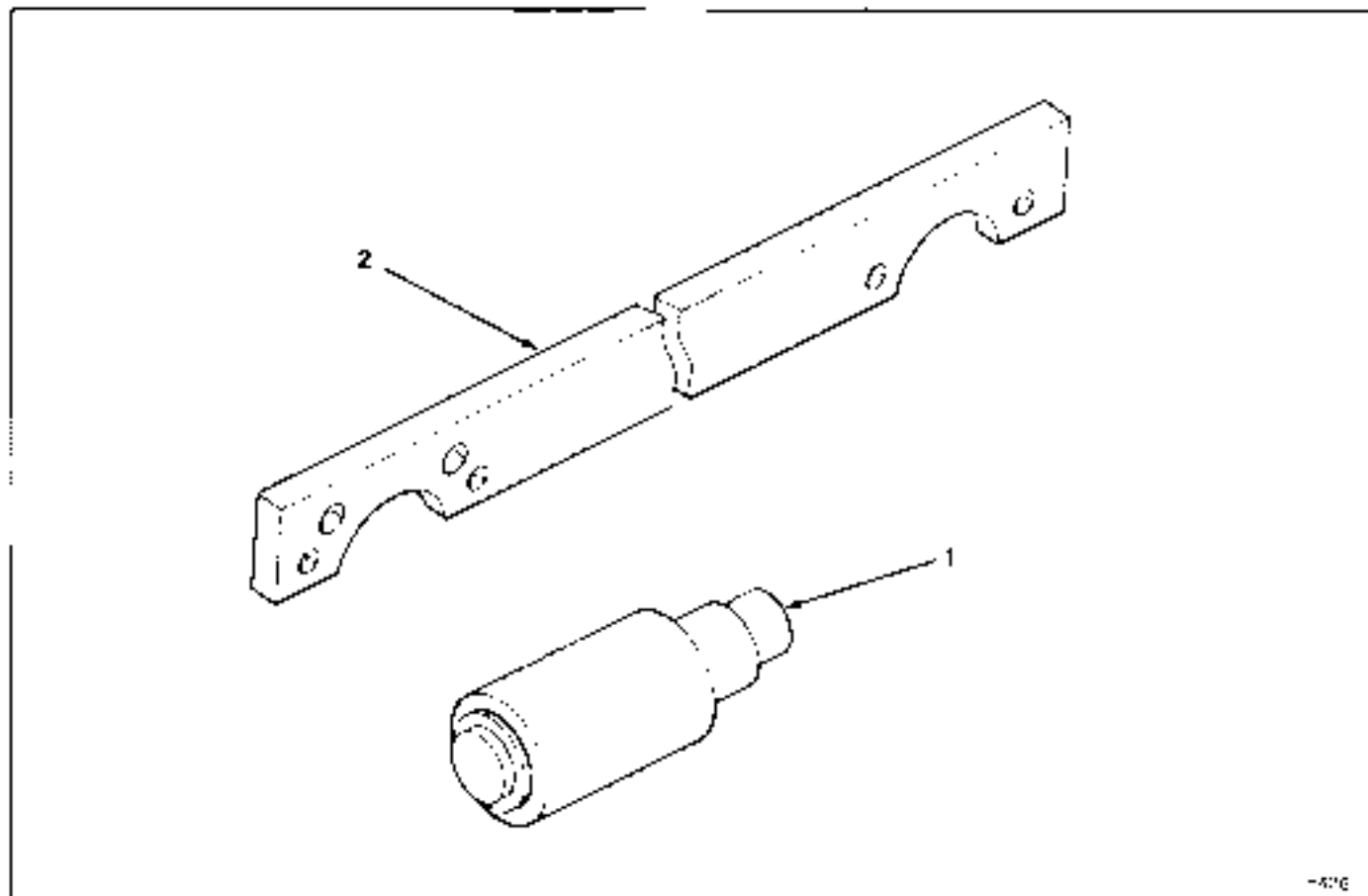


Figure T-1. Special Tools

## Section T Special Tools

This section lists, describes and illustrates special tools required to disassemble and assemble the 44-70 transfer case. Use of these tools is specified in Sections 3 and 5 of the manual. Equivalent tools may be used provided they perform the same function as the tool specified. Failure to use the proper special tool could result in damage to the transfer case.

FIG. T-1 INDEX NO.	TOOL NUMBER	TOOL NAME	APPLICATION
1	T-13-70-001	Universal Drift	Press in oil seals and bearings at assembly
2	T-13-70-002	Torque Bar	Hold yoke when tightening attaching nut



**BorgWarner  
Automotive**

Borg-Warner  
Automotive,  
Inc.

Electronic  
& Mechanical  
Systems

12000  
Tech Center  
Drive

Livonia  
Michigan  
48150

Telephone  
313/458-1000  
Fax:  
313/458-1039

5401  
Kilgore  
Avenue

Muncie  
Indiana  
47304

Telephone  
317/286-6100  
Fax:  
317/286-6638