



Borg-Warner's 4472 All-Wheel-Drive Transfer Case

**By Mike Weinberg
Contributing Editor**

For the past decade America has had a love affair with sport/utility vehicles. In the ferocious battle for market share, every car maker has brought out sport/utility vehicles and other varieties of all-wheel-drive and four-wheel-drive models. The promise of safety in all weather conditions and making a passenger vehicle more versatile obviously has appealed to the consumer, with the huge numbers of the cars and trucks on the road.

Many vehicles sold today are all-wheel-drive as opposed to four-wheel-drive. The distinction between the two is driver control. All-wheel drive is

defined as ALL-time four-wheel drive with power being provided to both axles at all times and no provision for the driver to control the system. If the driver has the control to shift from two-wheel drive to four-wheel drive, this is considered to be four-wheel drive.

General Motors has answered its competition by producing an all-wheel-drive minivan using a Borg-Warner 4472 all-wheel-drive transfer case. This unit will be found in the Astro, Bravada, Safari and Typhoon models. The 4472 is a chain-driven unit using a 3-piece aluminum case. This unit uses a viscous coupling to distribute torque between the front and rear axles. Torque is divided 33% to the front and 66% to the rear for better drivability.

Cover Assembly

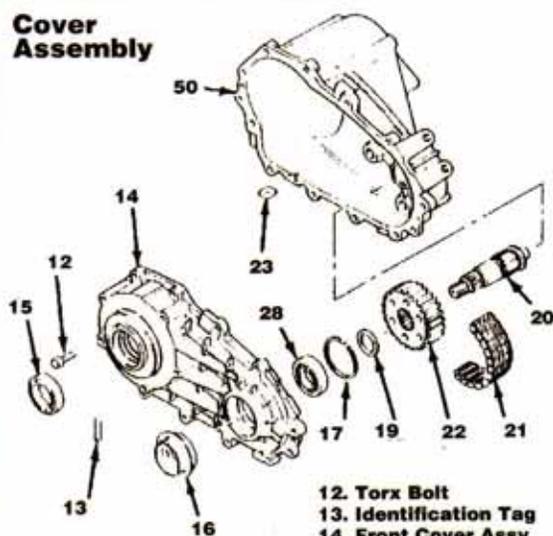


Figure 1

- 12. Torx Bolt
- 13. Identification Tag
- 14. Front Cover Assy
- 15. Oil Seal
- 16. Oil Seal
- 17. Retaining Ring
- 18. Ball Bearing
- 19. Spacer
- 20. Front Output Shaft
- 21. Chain
- 22. Driven Sprocket
- 23. Magnet
- 50. Transfer Case

Input Shaft Group

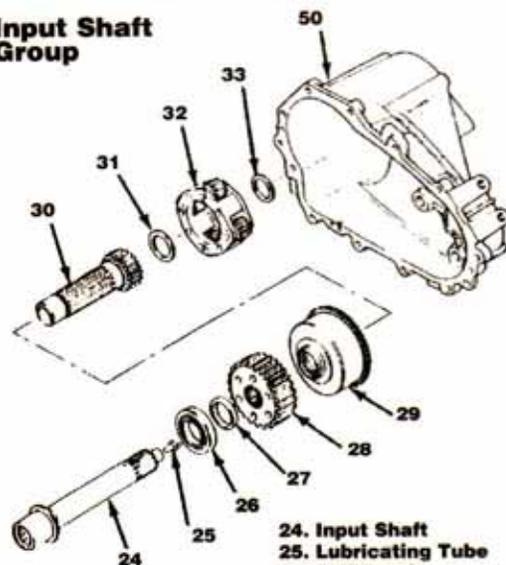


Figure 2

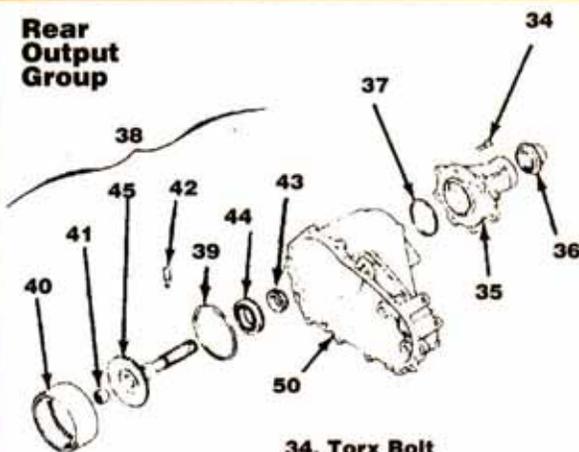
- 24. Input Shaft
- 25. Lubricating Tube
- 26. Ball Bearing
- 27. Spacer
- 28. Drive Sprocket
- 29. Clutch Assy
- 30. Sun Gear Assy
- 31. Thrust Washer
- 32. Carrier Assy
- 33. Thrust Washer
- 50. Transfer Case

POWERFLOW

Torque passes through the input shaft to the planetary and through the annulus gear (ring gear) to the rear output shaft. Power passes through the planetary to the sun gear, which is connected to the drive sprocket. This in turn drives the driven sprocket through the chain and puts power to the front output shaft. The ring gear is connected to the sun gear through the viscous coupling. The bias or split is 33/66 front to rear to ensure smooth turns with a minimum of wheel hop and vibration.

The viscous coupling is a sealed, self-contained unit that cannot be rebuilt. Inside the viscous coupling are a set of steel discs that are splined alternately to the front and rear output shafts much like clutch plates and steels in an automatic transmission. The plates are immersed in a high-viscosity silicone fluid that is temperature sensitive. As the plates shear through the fluid, resistance increases and the fluid expands, and power is transmitted from plate to plate. Because the silicone fluid is not available to us in small quantities and you need very expensive precision measuring equipment to fill the coupling, don't open one up. We have been working with viscous couplings since the arrival of the NP229 transfer case. If you observe a viscous coupling that is discolored or leaking fluid, replace it. None of the manuals gives

Rear Output Group



- 34. Torx Bolt
- 35. Extension Assy
- 36. Oil Seal
- 37. Retaining Ring
- 38. Output Assy
- 39. Retaining Ring
- 40. Ring Gear
- 41. Needle Bearing
- 42. Oil Scoop
- 43. Speedo Rotor
- 44. Ball Bearing
- 45. Rear Output Shaft
- 50. Transfer Case

Figure 3

Sell The BEST Remanufactured Transfer Cases & Transmissions in the Business...

Switch To

ROCKLAND STANDARD GEAR!

Higher Quality, Service & Profits • Custom Units Our Specialty!

Put an End to Transfer Case Failures FOR GOOD!

• Extreme HD • AWD-To-Part-Time Conversions • Slip-Yoke Eliminator Kits • AWD Low-Range Lockups • AWD Viscous Eliminators



Jeep Transfer Cases



- 231J Command Trac
- 242J Select Trac
- 247J Pump Coupler AWD
- 249 J AWD

Rockland Standard Gear can custom fit all of these transfer cases to any TJ, YJ, ZJ, WJ, XJ & KJ model!

Ford Transfer Cases



All Ford Transfer Cases are Remanufactured with the Latest O.E. Borg Warner Components

*Includes New Morse Chain
Models Available: 1350, 1354, 1356, 4404, 4405, 4406, 4407, 4410, 4411, 4416

GM Transfer Cases



All GM Transfer Cases are Remanufactured with the Latest O.E. Components with Updated Clutch Packs to Eliminate Chatter Problems

* Includes New Morse Chain
Models Available: 136GM, 226GM, 246GM, non-clutch style 231C-263GMXHD

Dodge Transfer Cases



All Dodge Transfer Cases are Remanufactured with O.E. Components

• Durango RT – Converts Full Time AWD to Select Trac or Command Trac
* Includes New Morse Chain
Models Available: 231D, 231DHD, 241DL, 241DHD, 242 Select Trac

RSG Has A Full Line Of Remanufactured Transmissions IN STOCK – READY TO SHIP!



- Ford M5R1 & M5R2
- ZF 5 & 6-Speeds (Ford Full-Series)
- AX5 & AX15 (Dodge & Jeep)
- New Venture 4500 (GM & Dodge)
- Call for other models!
- 3-Day Delivery – Same Price as Ground
- We Drop Ship & Handle Core Returns

CALL THE TC SPECIALISTS FOR LOWEST PRICES!

Call **1-800-227-1528**

Fax **1-877-774-3294** (TOLL FREE)

ONLINE AT www.regear.com

Largest Inventory of Stock & Custom Applications

any specs or method for torque-testing a viscous coupling to tell whether it is good. Based on our experience with other couplings it is possible to clamp the input shaft in a soft-jawed vise with the viscous coupling and output components in place. By turning the output with a torque wrench we can read breakaway torque. As neither GM nor Borg-Warner provides a torque figure, I have to go by experience with other couplings. It usually takes 20-25 ft/lbs of torque to turn a good viscous. A coupling that turns too easily probably will slip in the vehicle. A coupling that is seized and will not turn will be incapable of splitting torque and will create a binding wheel-hop condition in turns.

When diagnosing a problem with the 4472 make sure you check all external components before tearing down the unit. It is critical that all

DO NOT BUY from Rockland Standard Gear

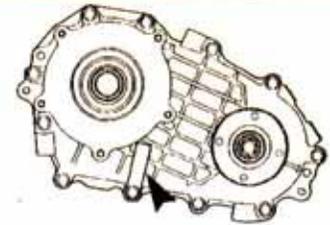


If you think perfection is unattainable.



New and Remanufactured Standard Transmissions, Transfer Cases, and OEM Parts.

Toll Free (877) RSG-GEAR Toll Free Fax (877) RSG-FAXIT www.rsgear.com



**Borg-Warner Automotive
Assembly Code No.**

**Borg-Warner Service
Identification Code**

G19 2 4472-01 □
100.001 15648651 ○

**Vehicle Manufacturer's
Transfer Case Assembly No.**

**Borg-Warner Automotive
Serial Number**

Build Date

□□□□ Shift No.
□□□□ Last Digit Of Year
□□□□ Day Of Month
□□□□ Month: Jan (A)
□□□□ Thru Dec. (M)

**Example Shown:
July 1, 1984 Shift 2**

Figure 4

tire pressures are equal and correct for the vehicle. Also measure tire circumference (stagger) to make sure all tires are the same. Be suspicious of mismatched tires or one or two excessively worn tires. Make sure both differentials are of the same ratio and that no axle or driveshaft splines are stripped. If you find one of these units being driven for any length of time without one of the drive shafts, you probably can kiss the viscous coupling goodbye.

As you can see by looking at the parts breakdown, these are not complicated units. Sometimes the simplest things are the most difficult to analyze. This is where knowledge of powerflow and the theory of operation will give you the understanding to solve the riddle. Just replacing parts is an expensive hit-or-miss proposition. You won't fix it unless you know how it works. **TD**

THE BOTTOM LINE:

Tell us your opinion of this article:

Circle the corresponding number on the free information card.

87 Useful information.

88 Not useful information.

89 We need more information.