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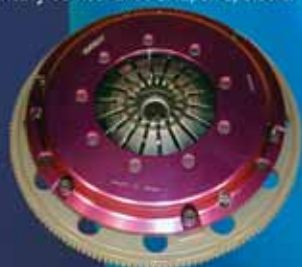
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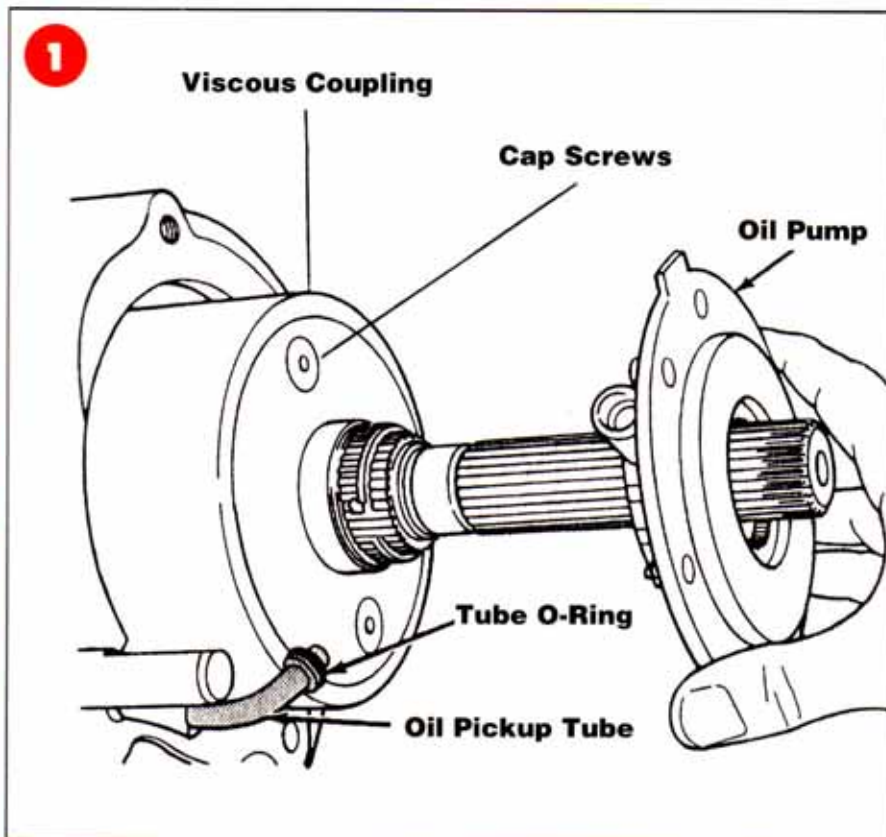
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Understanding the New Venture 249 Transfer Case

By **Mike Weinberg**
Contributing Editor

In the never-ending quest for market share, Chrysler Corp. designed a new transfer case for Jeep Grand Cherokees in 1993. As the cost to the consumer for the popular sport/utility vehicles rose, more refinements were designed in to accommodate a nation of soccer moms who would be using these SUVs.

shifted or used a manual shift lever with simplified ranges. The NV 249 was designed as a manually shifted transfer case with a minimum of driver input. This unit has two operating ranges and a neutral position. For all normal driving the unit is left in the 4 HIGH range. For limited off-road use, a low-range position provides extra gear reduction through a planetary system. Low range should be used only for off-road travel and never



No longer would the driver have to get out of the cab to lock hubs or manipulate shift levers to use four-wheel-drive. This resulted in various new models of transfer cases that either were electrically

on dry, hard pavement.

The NV 249 is a torque-on-demand unit that uses a viscous coupling to divide power between the rear and front axles. The viscous coupling is a sealed, non-

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serviceable unit. In operation, about 95% of the torque from the engine is delivered to the rear wheels. If the rear wheels slip and begin to rotate faster than the front wheels, the silicone fluid inside the sealed coupling expands dramatically and the shearing effort of the alternately splined steel plates inside the coupling sends power to the front axle. When the two axle speeds equalize, the viscous coupling cools and power is returned to the rear axle. This all occurs without any input from the driver, and if things are working correctly this transition is seamless, with the driver not feeling any real difference in the vehicle.

This is as simple a system as you can find, and its very simplicity seems to confuse shops when they try to diagnose or repair these vehicles. You will see transfer cases that have run out of oil, been damaged in accidents or just worn out from high mileage and the repair is obvious. The most-common complaints are subtler and require a thorough understanding of the operation of the viscous coupling and how it operates in order to satisfy your customer.

Whenever you have customer complaint involving a vehicle with an NV 249 transfer case, start with the tires. Always check air pressure to make sure it's the same in all four tires. Next use a stagger gauge if the vehicle is on the ground, or a tape measure if you put the truck on a lift, to measure all the tires to make sure they are the same size. This does not mean to read the tire sizes off the sidewall. Tread wear and manufacturing differences can produce tires of varying sizes.

If the vehicle has been run for any length of time on tires of different diameters, the viscous coupling probably will be damaged and the ring and pinion gears in both differentials will have to be checked. The difference in rolling radius causes the viscous coupling to operate full time in many instances and will punish the front

differential badly. This results in an overheated coupling and usually a failed front differential.

1993-94 Jeep Grand Cherokees were equipped with Dana 30 front differentials and Dana 35 rear differentials. The smaller number means a smaller differential. Late '94 vehicles used Dana 44 rear differentials. You can eyeball the difference between a Dana 35 and Dana 44. The 35 has a diff cover with rounded edges, and the cover on the Dana 44 has squared edges.

The most-common complaint with these vehicles is a large amount of chatter and wheel hop during tight turns with the vehicle warm. When you road-test for this complaint, be prepared to drive the vehicle long enough to get it warm with a series of tight, full-lock turns. If this is the symptom that the customer is concerned with, it will be necessary to disassemble the transfer case and examine the front diff for damage to the ring and pinion. The lighter-duty front diff always collapses before the heavier rear unit.

In the 249 transfer case the viscous coupling is on the transfer-case output shaft under the gerotor-type oil pump. Remove the transfer-case extension housing, the speedometer drive gear, the oil pump and the snap rings that retain the viscous coupling. Slide the viscous coupling off and place it on the bench with the two cap screws on the rear cover upright.

There is no way to test this coupling accurately, but there is a way to confirm that the coupling is bad. Making sure that the coupling is upright with the two cap screws facing the ceiling, open one of the cap screws. If the coupling is bad, a volcano-like stream of ugly brown, tar-like fluid will flow out of the screw hole. This is a sure indication of a coupling that has gone to the great scrap heap in the sky.

Do not open the coupling with it on its side, or you will ruin what

continues next page



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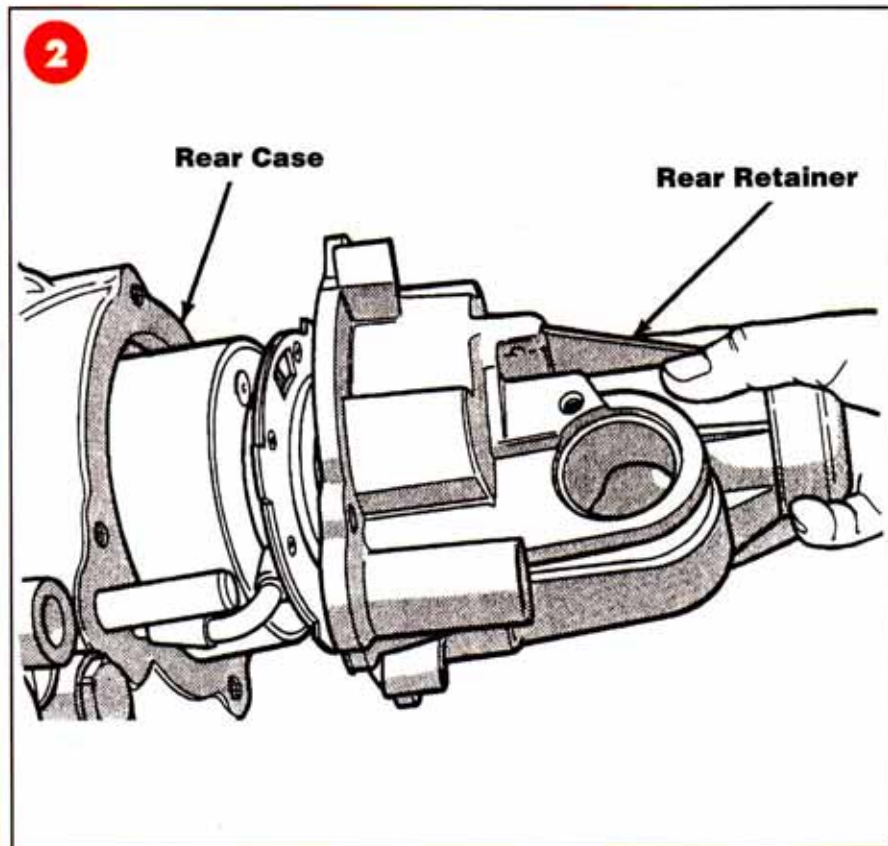
could be a good coupling. The coupling's fluid has a very high viscosity, and if it leaks out on the side, you will not be able to refill

the seals in the coupling; as it cools and the fluid contracts, it siphons the transmission fluid that lubricates the transfer case into the

cap screw in the upright position.

The level of viscous fluid cold is only about one third of the volume of the coupling case. If you take off the cap screw and it pukes out a nasty, brownish-black stream, the coupling must be replaced. We have seen vehicles that have had several front differentials replaced because no one fixed the transfer case.

Make sure the front diff is in good condition, and carefully match the tire sizes and pressures. Just replacing the coupling, which is very expensive, and not curing the external problems will cause a new viscous coupling to fail in short order. Don't get caught with an expensive comeback. **TD**



the unit. The common failure of the viscous coupling comes from continual overheating that damages

the seals in the coupling. Once the silicone fluid is contaminated with ATF, the party is over. This is why you open the

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