



HUILA



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**TECH
TIPS:**

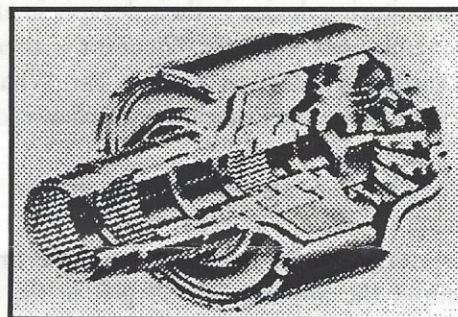
Towing And Oxygen Sensors

By: Scott J. Schulte, with help from Joe Woods of Import Service, & Robert Bosch

4WD/AWD Towing Warning

If You own a 4-wheel-drive, or an all-wheel-drive vehicle be especially careful when having your car or truck towed. To be safe use only a tow-bar, with all four wheels turning on the ground, or a flat-bed truck. On a 4WD with a locked or no center differential, the problem is obvious. As soon as you start to move, the front wheels will turn with whatever force the rears can deliver through the drive-train. On a wheel lift tow truck, either the towed vehicle's rear wheels will slide or the front wheels will try to pull themselves out of the tow truck cradles, depending on where the most weight and traction is. On a 4WD with a center differential, that differential is going to see more action in the first quarter mile, than it would see in 100,000 miles of normal operation—maybe leading to its total destruction!

On an AWD with a center viscous differential, the damage can be far worse. Towing on just two wheels will cause action in the center of the differential viscous clutch. This will cause heat. Ordinary heat build-up is something the designers planned for; there is enough air in the viscous fluid chamber to serve as a pneumatic accumulator when the fluid heats up and expands, protecting the integrity of the clutch and the seals.



The viscous clutch center differential sorts out the torque split with a special silicone fluid in a multidisk clutch pack. At higher speed differences front to rear, the silicone fluid becomes more viscous, and limits the speed differential between the two axles (front and rear). This unit uses X-seals at each shaft because the silicone fluid is incompatible with the surrounding transmission fluid.

However, if somebody pulls the vehicle for just a few miles against this braking force, it will not only overheat the viscous clutch and burn out its friction plates, it will also heat the silicone fluid and the seals enough to let the fluid leak out into the transmission fluid (as they share a common seal). There would be no detectable leak, because all of the fluid would be inside of the transmission. The silicone fluid in the transmission would contaminate the transmission fluid, damaging the transmission, and causing slippage within a short period.

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