

ELocker Differential Technology

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Electronically locking rear differentials came onboard to the HUMMER line in 2003. During normal street and highway driving they will operate in the conventional "open" mode. This provides good handling characteristics and allows the wheels to travel different speeds and distances as the truck goes around a corner. With the push of a button, however, traction and off-road capabilities can be improved dramatically. When the ELocker is engaged, 100% of the drive torque is provided to both wheels on the axle where the locker is installed. This is critical in the off-road world, where one tire can commonly be lifted off the ground.



Let's take a look at what happens when the button is pushed and the ELocker is engaged. First there are some requirements from the ELocker control module that have to be met before it will allow the mechanism to be engaged. (These are safety requirements that not only protect the equipment, but the handling of the vehicle). The trucks transfer case must be in 4-Low range and vehicle speed must be less than approximately 3 mph. As you push the button, a strong electromagnet is energized in the differential. This creates friction on a drag plate that activates a ball ramping mechanism. This in turn translates its force into a group of lock pins, which are pushed over to engage holes in the back of the side gear. Once engaged, the side gears and the rotation of the differential housing becomes the same. Both wheels on that axle are "locked together" and turn at the same speed.



The driver should engage the ELocker before entering into an obstacle where you know you will need it. Look ahead and learn to read your terrain. After the obstacle is conquered, the ELocker should be disengaged. A driver should also be aware that the ELocker might require a few tire revolutions for the driveline to relax and fully disengage after you turn it off. You want to avoid leaving it on as you turn corners, as this will put unnecessary load on the drivetrain, especially on surfaces with a high coefficient of grip, i.e. rock. A locked differential at higher speeds (above 20 mph) can cause unsafe or undesirable vehicle operation. The H2 will automatically disengage if 20 mph is obtained. The H1 will not automatically disengage, but both trucks allow for disengagement while in motion by simply turning off the switch.

New for the H1 in model year 2004 is the option of having front and rear ELocking differentials. This option is part of an exciting Adventure Package that will provide the ultimate in off-road capabilities. While the rear ELocker remains essentially unchanged, the new front ELocker will have some different operating characteristics that should be indicated. Front engagement will only be allowed if the rear ELocker is already engaged. The front ELocker will disengage if vehicle speed exceeds approximately 10 mph or after 3 minutes of activated time. Prior to the system entering the "time out" mode, there will be a 30 second flash of the front ELocker icon on the dash to

let the driver know that front disengagement is imminent. These rules are required to avoid any undesirable steering characteristics. A locked axle on any vehicle can cause behavior changes in maneuverability, and steering response may be reduced in some cases. Always keep this in mind, to accommodate vehicle speed and reaction times when using the ELocker feature.

Not all Elockers are created equal. While the H2 operates in either open or locked mode, the Elockers in the H1 actually have a clutch pack with force springs between the side gears. This provides the driver with limited slip operation when the Elockers are not engaged, while still having the option to lock the axle 100% at the push of a button.

The HUMMER line of vehicles have systems that make them the most capable off-road wheeled vehicles in the world. Make sure you're getting all you can from your truck by reading your owner's manual, and following the recommended maintenance program.

Matt is a graduate of Ivy Technical State College in Automotive Technology. He spent 15 years at GM Dealerships as technician and shop foreman and 5 years as an instructor at Ivy Technical State College. Matt joined AM General two years ago as a Technician, Sales force and Off-road instructor. This fall, Matt attended his first Club event in Durango and Moab. When he is not conquering Lion's Back, you can find Matt at home in South Bend cranking out H2 tech articles for Azimuth or pursuing his favorite pastime; spending quality time with his wife and 2 children.