

# Road beat: 'Four-wheel drive doesn't negate laws of physics'

By Larry Weitzman

"Seventy-five percent of the accidents in snowy conditions are four-wheel drive vehicles" said Lee Aderlee, retired California Highway Patrol officer. That's a telling statistic that all drivers of four-wheel drive vehicles should be aware of.

Aderlee went on to say, "Four-wheel drives don't negate the laws of physics."

"Many people who drive four-wheel drive vehicles develop a false sense of security and get themselves into trouble ... four-wheel drives will not stop any faster than a two-wheel drive car," Aderlee said. "Four-wheel drive cars accelerate better, but very few accidents occur when accelerating, they occur when they are going too fast for the conditions and are unable to slow down, steer and/or stop."

Aderlee is absolutely correct.

A four-wheel drive is just what it says. With limited slip differentials, it can put torque or power to any or all of your vehicle's wheels. Most cars today are front-wheel drives which means the drive wheels are only on the front axles. There is no power to the rear wheels. Rear-wheel drive is the opposite.

In four-wheel drives, if the rear wheels cannot obtain sufficient traction to accelerate the vehicle, then power is transferred to the front wheels or spreads the power to all wheels to obtain the necessary traction. With front wheel

biased four-wheel drives, most power goes to the front wheels unless slippage is detected.

But four-wheel drive only helps in making you go in a straight line, it does nothing to help you stop and once front traction is lost, you have no effective steering. The only device that helps you stop and maintain directional control are antilock brakes. In addition to ABS are electronic black boxes called stability control, which through throttle retardation, individual wheel braking, accelerometers, yaw sensors and steering input sensors attempt to keep the vehicle going in the intended direction. All of these new things should never lull you into as put by Aderlee "a false sense of security."

Aderlee says there are two things to keep in mind when driving in snowy conditions, speed and anticipation. Any speed beyond the ability to react safely to a problem, such as another vehicle out of control, an animal or a road obstruction is too fast. Four-wheel drive will not help you in such a situation.

Aderlee says chains offer the most effective stopping action as well as significantly improved traction.

Four-wheel drive will help keep you going in mud or in slippery conditions, but it doesn't remove the common sense necessary when driving in snowy or icy conditions.

When you see all those advertisements of four-wheel drive vehicles doing amazing things, there is a captioned which usually reads: "Professional driver on a closed course." But even more important is that those professional drivers are in perfect conditions with the knowledge of anticipation. And as the advertisement says, they are professional drivers, drivers highly skilled and experienced in negotiating difficult conditions and who understand and can feel what the vehicle is doing. How successful would an off the street driver be in a NASCAR race? Most of the time all you do is turn left. How hard can that be? At the speeds they travel, extremely hard.

It's fairly easy to go straight during snowy conditions. It's when you need to slow down or alter your direction when you get into trouble. When that happens, and that can happen at any time, a four-wheel drive has no advantage over a comparably equipped two-wheel drive. Drive within your limits, the weather's limits, the road condition's limits and your vehicle's limits. The braking ability of a four-wheel drive vehicle is no better than a two-wheel drive vehicle. A two-wheel drive vehicle with ABS and/or chains will outperform a 4 x 4 in braking during snowy conditions without ABS and/or chains.

When the CHP posts speed limits of 25 mph with chains, it's a maximum safe speed. They are not kidding. The laws of physics are not repealed by four-wheel drive. When traction between the rubber and the road is reduced, so must the speed, as stopping distances are increase by the approximate square of the speed under the best of conditions.

*Larry Weitzman has been into cars since he was 5 years old. At 8 he could recite from memory the hp of every car made in the U.S. He has put in thousands of laps on racetracks all over the Western United States.*