



Rear End Trends

The rear end is invariably the last component of the automobile to receive an upgrade or model change. But recently we have seen changes, and many for the good.

“Generic gears”, sometimes referred to as “Hog Cut”, are a new generation of crown and pinion gear. In these crown and pinion sets, the gear tooth angle is changed and curved more in shape, giving the gears a larger contact area for a given crown gear diameter. The generic gears started showing up in GM cars in 1993 and are now used almost industry wide. Difficulty can be experienced setting up these gears for quiet operation. Excessive backlash is usually required to achieve a good gear contact pattern.

Spider gears are changing also. Many makers are adding a tooth and size to the spider gear and reducing the size of the side gear, consequently evening up the gears' wear rate. The tooth angle has a more generic cut, too. Some makers' spider and side gears appear to be pressed or stamped out, instead of being machined. These gears, seen in Chrysler and Mazda products, appear crude in manufacture, but the advantage is a flange formed around the outer end of the tooth adding strength and integrity to the gears.

With the demand for ABS, we must monitor the speed of the rear wheels. Most makers install a tone ring to the crown gear flange or to the pinion shaft with a sensor on the banjo housing or in the cover plate. Toyota sometimes uses the crown gear teeth themselves as a tone ring. Quite resourceful, but lacking some flexibility. These methods only record both or one wheel locking, so the good guys install a tone ring on each axle shaft with its own left or right sensor to record wheel lock-ups individually.

Traditionally, almost all 4x4 front differentials were a rear unit turned through 180 degrees and driven in reverse. This practice, though economical, had major disadvantages, specifically poor ground clearance and poor gear life as they were not designed to be loaded constantly in reverse.

The oil flow was also disrupted, and the remedy was to raise the filler plug location, thereby increasing the oil capacity. Now, almost all front drives are a reverse spiral design (high pinion) where the pinion enters the differential above the center line of the front axles. The reverse spiral pinion turns anti-clockwise, applying pressure on the large pinion bearing instead of pulling on the small bearing as on the previous design.

Independent front suspension and shift on the fly are just about standard on all 4x4 fronts. One ton and up vehicles have retained a solid axle front, as high performance, car-like ride is not of primary concern.

GM has an oil change schedule which requires under warranty that the rear end oil be changed at 5,000 km and every 30,000 km, thereafter, whether or not it has a posi-trac. It's popular knowledge that GM gov-nr-lok units are sensitive to aged oil, but this measure seems extreme for a regular differential.

Posi-tracs of many styles are finding their way into the majority of rear wheel vehicles these days. This helps traction immensely and enhances braking efficiency.

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