

## Getting the Towing Force from the Engine To Each Rear Wheel Is the Trick for GMC

DETROIT – Technologies like advanced turbodiesel V8 engines or hydroformed steel frames have advanced the 2013 GMC Sierra to unprecedented levels of capability for fullsize pickups.

In just the decade since the 2003 model debuted, maximum towing capacity for a Sierra HD has risen 43 percent, from 16,100 pounds to an industry-leading 23,100 pounds.

Getting that towing force from the engine to each rear wheel is the task of a set of gears located in the center of the truck's rear axle known as the differential.

The ratio of the sizes of those gears is represented by the diameter of the gear that drives the wheels in relation to the gear from the driveshaft. So, a 3.08:1 ratio indicates the drive gear has 3.08 times as many teeth as the gear on the driveshaft.

Using different diameter gears within the differential affects both towing ability and fuel efficiency.

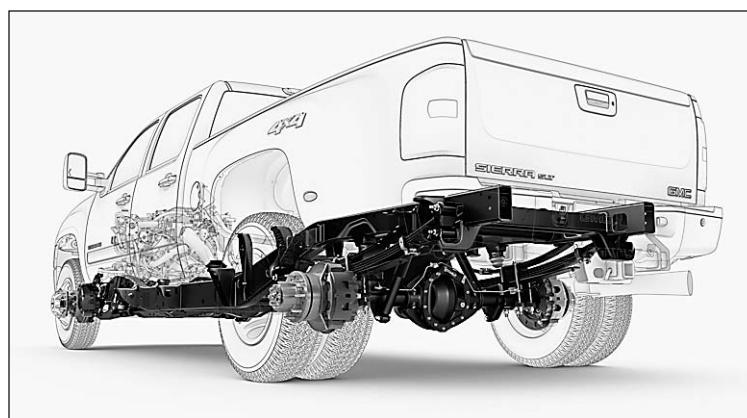
Since pickup owners have varying needs and preferences, GMC addresses different requirements by offering various rear axle gear ratios.

"A numerically lower axle ratio keeps engine speeds lower for better fuel economy, while higher ratios generally yield higher towing capacities and quicker launches from a stop," said Greg Martuch, energy and powertrain engineer for the GMC Sierra.

Four different ratios are available across the Sierra 1500 ½-ton pickup lineup: from 3.08:1 to 3.73:1. Available ratios vary by cab type, engine and drive type.

Sierra HD, including ¾-ton and 1-ton models, uses rear axle ratios of 3.73:1 and 4.10:1.

Each ratio is decided after months and years of testing fac-



2013 GM Sierra and its rear axle, known as the differential.

tors such as acceleration from a stop; performance on a grade; transmission behavior; fuel economy; towing, and thermal management. Keeping engine speeds down allows a vehicle's cooling to be more effective.

How much of a difference does the choice of axle make?

A 2013 Sierra 2500HD with a 6.0L V8 and four-wheel drive can tow a maximum of 9,900 pounds with a 3.73:1 ratio or 14,400 pounds with a 4.10:1 ratio.

Martuch estimates the fuel economy difference at highway speeds would be around 0.2-0.3 mpg between those two ratios, though reduced engine noise is also a benefit of maintaining lower engine speeds with the more-efficient ratio.

Martuch recommends customers consider their everyday needs.

"The higher the combined weight of a truck and trailer," he said, "the harder the vehicle needs to work. If a customer is going to tow a small boat just a few times a year, a Sierra 1500 with a lower ratio would capably handle the occasional towing duty while deliv-

ering better efficiency the other 95 percent of the time."

"But for someone towing construction equipment every day, I would definitely recommend an HD pickup with a 4.10 axle and external engine and transmission oil coolers."

Because towing capacity, safety and agility is such a key factor in the purchase decision of most pickup truck buyers, manufacturers like GMC have to keep ahead of the curve as their competitors reach various technical milestones that can siphon off customers. In other words, towing capacity is more important than you might first think.

## MIS Offers 'Bus Makeover'

BROOKLYN, Mich. – Now is your turn to be the talk of the campgrounds at Michigan International Speedway. Time is running short to submit your winning bid for the 2013 edition of Extreme Bus Makeover.

Be the lucky race fan that has their race weekend bus exterior professionally designed, painted and decaled by the MIS Staff. The owner of the bus will meet with the MIS staff in January of 2013 to mutually agree upon a design that will be a fabulous transition. The bus will need to be delivered to MIS (at the cost of the auction winner) in January and will be stored, made over and unveiled to the owner of the bus in May.

Proceeds benefit MIS Cares, Michigan International Speedway's official charity, and the NASCAR Foundation.

"We are excited to makeover the exterior of a bus for one lucky fan," MIS President Roger Curtis said. "The idea started in 2009 when I was letting campers into the infield and it has grown every year. Our maintenance department enjoys painting the bus during the winter months and it is fun to see the excitement on the fan's face when the bus is returned."

Restrictions and limitations include but are not limited to: designs produced only by the MIS staff, no fabrications of the bus and strictly paint and vinyl will

be added to the exterior. Winner will be required to execute additional releases by MIS and NASCAR Foundation.

This will mark the fourth year MIS has repainted a bus for a lucky fan. What started as a spur-of-the-moment decision to do something cool for a fan has grown into an annual tradition discussed among those very fans every year.

William "Bill" Brown from Cassopolis, Mich., submitted the winning bid with high drama a year ago as his home computer malfunctioned. Instead of growing frustrated, he used his intuition and his very understanding girlfriend to win the auction. His girlfriend allowed him to make the winning bid on her computer at her flower shop.

"We found this bus and put a nice stand on it to make it safe for everybody," Brown said after delivering the bus to the speedway last year. "We have from 12-16 people here at the races. We made a safe bus and now it is time to get some color on it."

Brown was overwhelmed with joy when he saw the redesigned bus for the first time in May. "Came for the party! Stayed for the race!" is now painted across the side of the bus; a list of Brown's favorite drivers is on the back. An 11-year veteran of MIScamping.com in-field camping, Brown witnessed firsthand the work of MIS.

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