

Four Habits of Highly Successful Drivers

September 25, 2023

Nathan Moody did not get home safely on June 11, 2023. To get home safely at the end of a day, a truck driver must wear a lot of hats. The first hat - a driver is a safety inspector doing pre-trip inspections of the tractor, trailer, and load. The next hat - a driver is a document maker. Then a driver may have to be a route planner. Almost always, a driver wears a techie hat working with multiple applications during the journey. Finally, a driver often supervises or executes loading and unloading.

Although those tasks are important, the best drivers know that wearing the **force limiting hat** and **energy manager hats** are critical to a successful day's journey. Nathan forgot his force limiting hat for just a few minutes as he exited I95 that Sunday morning in Philadelphia. It cost him his life.

Habit #1 – being a Force Limiter:

What do we mean when we say the best drivers are force limiters? A top driver knows that the trailer and load have lower stability limits than the tractor. For example, a typical tractor can withstand about 0.85g of side force whereas a fully loaded dry van can only withstand about 0.25g. The driver also knows that the least stable loads are those that can slosh or sway with the side force exerted as the trailer moves through a curve. Livestock loads are among the most unstable loads. Thus, a top driver knows that one of the critical tasks to complete a trip safely is to select speeds in difficult geometries that limit the side forces on the trailer keeping it within the stability envelope.



With these thoughts in mind, top drivers anticipate upcoming road geometries that will exert side forces on the tractor and critically on the trailer / load. The top drivers also use speeds that have a safety margin in case they encounter a hazard on the roadway while transiting a curve.

The best drivers observe the upcoming road curvature and

Tanker Fire Causes I95 Collapse

Rollover Parameters

Radius of Curve - **265'**

Approx Side Force limit for a tank trailer - **0.35g**

Calculated Tip Over threshold speed - **37 mph** (with sloshing 31 mph)

Recommended Safe Speed - **26 mph**

Approach ramp - 750' and 4% down slope

slow the vehicle to limit the side force on the trailer so that it moves through the curve in stable fashion. This example illustrates a case where a driver forgot to slow the rig before the left-hand curve at the bottom of the exit ramp. The tip over threshold speed calculated by **Road-Aware*** for a loaded tanker is 37 mph for that curve. A safe speed would have been 26 mph.

Habit #2 – being an Energy Manager:

What do we mean when we say that the best drivers must be energy managers? A top driver knows that the potential energy of a loaded semi-truck at the top of a long descent can be twenty times as great as the kinetic energy of the same rig at 60 mph. The driver remembers how quickly a roller coaster can accelerate to 60 mph after being released from the top of the first incline. In fact, the gravitational force can accelerate the coaster cars to 60 mph with a vertical descent of just less than 100 ft.



With that image in mind the best driver approaches a mountain descent of a thousand feet or more with extreme care. The best drivers know that the potential energy of the vehicle must be converted to speed (kinetic energy), or heat if the service brakes are actuated, or compressed air if the engine brake is selected on. The best driver also knows that **the only safe alternative** is to convert the potential energy to compressed air using the engine brake. The best driver also knows that the engine brake is most efficient at high rpm, so a descent speed and gear ratio are selected that allows the truck to descend the grade without use of the service brakes.

Safe descent speeds allow the release of potential energy to be absorbed by the engine which means the service brakes remain cool and can be used for unanticipated stops for traffic congestion on the roadway or at an exit. Rogel Lazaro Aguilera-Mederos, age 23 did not put on his energy management hat on April 25, 2019, and is now serving 10 years in prison. He did not descend on engine brake only. Thus, when he needed his service brakes to stop for a traffic tailback they were overheated and ineffective.



Top drivers are also careful to manage the vehicle energy in rolling terrain using the engine brake. Overuse of the service brakes can result in heat buildup which leads to wheel fires and can result in the loss of the entire vehicle. Randall McDougal forgot his energy management hat and tragically died in the explosion.



Habit #3 – Practicing speed management in sensitive areas.

A top driver recognizes that vehicle speeds must be carefully limited when traveling through sensitive areas. For example, a crash in some areas could result in a shutdown of an entire mining or other plant operation or a crash could result in huge economic losses.

A top driver is constantly changing hats. Drivers of heavy trucks know that their job is more than just keeping the truck

between the lines and clear of other vehicles. A top driver wears multiple hats transitioning between driver, force limiter, and energy manager multiple times on each journey as upcoming road geometries are encountered.



Habit #4 – Seeking Constant Improvement

Once a driver settles in and learns the routes, the driving task can become routine. Often complacency will set in and speeds will begin to creep up. If not kept in check, even experienced drivers will be using speeds in difficult geometries that put their vehicles on the edge of stability.

Thus, the best drivers review their performance on each journey with particular attention to speed management in the segments of the road with difficult geometries. They note areas where their speeds may have been higher than recommended safe speeds and resolve to slow down at the next encounter with a similar geometry.

Conclusion

By practicing these four habits, truck drivers can maintain control of their vehicles and never put their rig or load at risk through loss of control. No longer does a driver have to fear injury or death in a runaway or rollover crash. Rather, every driver that employs these habits without exception during each journey maximizes their chances of getting home safely at the end of the day.

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***Road-Aware** is an app that provides truck drivers with alerts and safe speeds for each upcoming road geometry where curvature or slope could threaten the safety of the vehicle. For additional information visit www.road-aware.com

Other Examples:

Roundabouts

WICKENBURG, AZ (3TV/CBS 5) Aug 26, 2022- U.S. 93 is closed in both directions as hazmat crews are clearing the scene of an overturned trailer hauling copper concentrate.



Curves

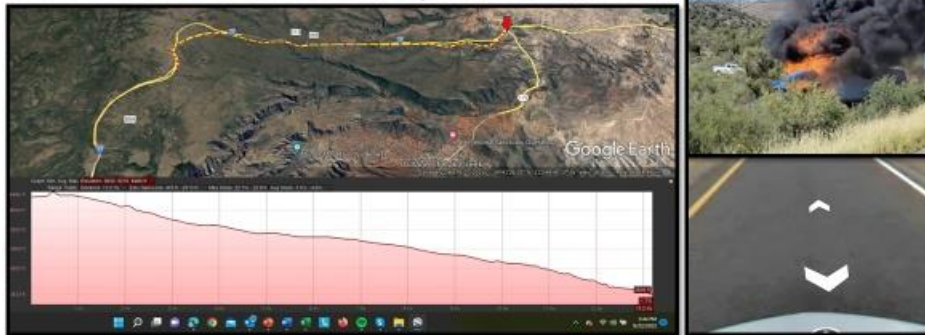


Exits

Sept. 18, 2022: A family of four were killed when a semi-truck blows through a stop sign and crushes a sedan carrying the family on an outing to Sedona.

[Car, semi collide on I-17 near Flagstaff | 12news.com](https://www.12news.com/story/news/crime/2022/09/18/car-semi-collide-on-i-17-near-flagstaff/7041117002)

The southbound descent on I17 is 2,558 ft. over 13 miles



Connector Ramps

