Roll Stability Systems: Pending Federal Regulations and Tractor Trailer Accident Litigation

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A roll stability system, or RSS, is a technological advancement for motor vehicles that mitigates or prevents crashes by limiting rollovers, skidding and jackknifing in tractor trailers. The two forms of commercially available RSSs for large trucks are roll stability control and electronic stability control systems.

RSC systems are designed to prevent “untripped” rollover crashes (untripped rollovers usually occur during high-speed collision avoidance maneuvers) and work by decelerating the vehicle using braking and engine torque controls.1 ESC systems mirror the functions of RSC systems, while also mitigating severe oversteer or understeer. These can result in jackknifing by automatically applying brake force at selected wheel-ends to help maintain directional control of a vehicle.2

RSC and ESC systems are increasingly offered as standard or optional equipment in newer model year truck tractors and large buses,3 and ESC systems will be mandated for certain commercial vehicles in 2014.

Because ESC systems are able to prevent both rollover and loss of control crashes, the National Highway Traffic Safety Administration proposed requiring truck tractors and buses with a gross vehicle weight rating greater than 26,000 pounds to be equipped with an ESC system that meets the functional and performance requirements specified in proposed Federal Motor Vehicle Safety Standard 136, covering electronic stability control systems for heavy vehicles.4 NHTSA estimates that once all buses and large truck tractors are equipped with the required technology, a significant number of rollover and loss of control crashes will be avoided.

ROOLLOVER AND LOSS-OF-CONTROL CRASHES

The U.S. Department of Transportation reports that tractor trailer combination vehicles are involved in about 72 percent of all large truck fatal crashes annually.5 Overall, these types of vehicles are involved in approximately 150,000 accidents, with 29,000 of those accidents involving injury.5

The number of fatal crashes for truck tractors was 2,334 in 2009.7 In light of these figures, NHTSA studied the impact an RSS has on large truck accidents. It concluded the installation of an RSC system could prevent 3,500 annual crashes, and an onboard ESC system could prevent 4,700 crashes.8

The study estimated the decrease in the number of annual heavy truck crashes that occurred with trucks having ESC equipment installed would result in the prevention of 126 fatalities and 5,909 injuries.
In comparison, the installation of RSC systems could prevent 106 fatalities and 4,384 injuries.\textsuperscript{9} Since 2006, NHTSA has been testing truck tractors and large buses with stability control systems and sponsoring studies that analyzed related crash data. These efforts led NHTSA tentatively to determine that ESC systems can be 28 to 36 percent effective in reducing first-event untripped rollovers, and 14 percent effective in eliminating loss-of-control crashes caused by severe oversteer or understeer.\textsuperscript{10}

According to NHTSA, the installation of an ESC system is estimated to reduce the amount of rollover and loss-of-control crashes by 1,807 to 2,329 crashes annually. This figure includes the elimination of an estimated 1,332 to 1,854 rollover crashes and 475 loss-of-control crashes once all truck tractors and large buses are equipped with ESC.\textsuperscript{11}

Roll stability systems are a fairly recent technological advancement in the trucking industry. RSC systems became commercially available in the United States in 2002, and ESC systems in 2005.\textsuperscript{12} The RSC system is designed to mitigate on-road, untripped truck rollovers by automatically decelerating the vehicle.\textsuperscript{13} These systems operate by applying the foundation brakes and reducing engine torque output.

Tractor-based RSC systems (as contrasted with RSC systems installed on the trailer) consist of an electronic control unit that continually monitors the vehicle’s speed and lateral acceleration. The ECU also estimates the vehicle’s mass based on engine torque information it receives from the vehicle itself.

Using this data, the ECU continuously estimates the roll stability threshold of the vehicle, which is the lateral acceleration above which the tractor truck will roll over. Once the vehicle’s lateral acceleration approaches this threshold, the RSC system engages to prevent any potential rollover by decreasing engine power, applying the tractor’s drive-axle brakes or applying the trailer’s brakes.\textsuperscript{14}

RSC systems are designed to reduce the occurrence of rollover crashes, but they are not designed to maintain directional control.

In comparison, ESC systems include all of an RSC system’s abilities, yet also help maintain directional control. ESC works in much the same way as RSC to prevent rollover crashes, but ESC systems also are capable of estimating when the truck’s driver is oversteering or understeering.

The ESC system restores directional control by decreasing the engine’s power, using engine braking, selectively applying brakes on the truck tractor, or applying the trailer’s brakes.\textsuperscript{15} Not only does the ESC system offer additional functions, it also improves the RSC functions because it processes additional data when determining whether the vehicle is close to a rollover.

Despite the effectiveness of these systems, not all rollover and loss-of-control crashes are preventable merely by having an RSC or ESC system installed. For example, a truck can roll over if it collides with another motor vehicle or is tripped by a curb or other roadside obstacle or barrier.\textsuperscript{16}

**PROPOSED FMVSS 136**

The proposed Federal Motor Vehicle Safety Standard 136 requires truck tractors and buses with a GVWR greater than 26,000 pounds to have an ESC system that meets the requirements of the standard.\textsuperscript{17}

Based on extensive research, including the statistics discussed above, NHTSA proposes requiring qualifying vehicles to be installed with ESC systems rather than RSC systems.\textsuperscript{18} The proposed rule would also impose two compliance tests and four performance criteria that the ESC systems must meet or exceed.

The compliance tests are the “slowly increasing steer” characterization test and the “sine with dwell” test.

*Electronic stability control systems will be mandated for certain commercial vehicles in 2014.*
The SIS test is used to determine the relationship between the steering wheel angle and lateral acceleration for a vehicle, which varies depending on the vehicle’s steering gear ratios, suspension system, and wheelbase dimension, among other things. The information gathered in the SIS test is then used to normalize the severity of the “sine with dwell” maneuver that follows.

The SWD test is designed to subject a vehicle to a maneuver that will cause both roll and yaw instabilities in order to verify that the ESC system activates to mitigate those instabilities. NHTSA says the maneuvers done as part of the SWD test are severe enough to produce rollover or loss of control without a functioning ESC system on the vehicle.

The data gathering during these maneuvers is then used to evaluate the lateral acceleration ratio, yaw rate ratio and lateral displacement. Under the proposed rule, these performance criteria must be met by trucks equipped with an ESC system.

**INDUSTRY RESPONSE**

The American Trucking Association offered a mixed response when commenting on the proposed rule.

Although the ATA supports the proposal to require RSS on truck tractors with a GVWR of more than 26,000 pounds, it said the rule should be more flexible and not mandate the use of an ESC system over an RSC system.

The trucking industry is too diverse to have only one mandatory system, according to the ATA. Also, the estimated differences in effectiveness between the two systems are not significant enough to warrant the mandate that only the ESC system is appropriate for the entire industry.

Another comment to the proposed rule was submitted by the Regulatory Studies Program of the Mercatus Center at George Mason University, which echoed the ATA’s position.

The RSP’s comment critiques NHTSA’s failure to consider economic factors in determining that ESC is the proper choice for the proposed rule. While the program concedes that ESC systems performed better in safety tests, it also notes RSC systems are less costly to fit to a vehicle.

Moreover, the program explains that NHTSA based its decision to mandate ESC systems on several assumptions, one of which is that ESC is the safer choice, and thus the more beneficial choice.

The comment points to the system of liability law as one incentive that would encourage the adoption of cost-effective safety measures without a federal regulation.

The American Transportation Research Institute also commented on the proposed rule.

To develop its response, ATRI collected crash data from 14 large and mid-sized motor carriers. It also analyzed data from 68,647 trucks equipped with RSC systems, 39,520 equipped with ESC systems, and 27,536 equipped with no stability control system.

The data demonstrated that the presence of RSS technology lowered the crash rates for the types of crashes directly addressed by that technology. In general, the tractors equipped with some type of RSS had considerably lower crash rates than those without a stability control system installed. ATRI also commented that when NHTSA conducted a cost-benefit analysis of the two systems in 2012, the analysis found RSC systems were slightly less effective at preventing rollover crashes than an ESC system. The effective rate was 37 percent to 53 percent, compared with the ESC systems’ 40 percent to 56 percent effectiveness.

However, ESC systems were much more effective at preventing loss-of-control crashes, with an effective rate of 14 percent compared with RSC’s 3 percent effective rate.

In short, there is considerable industry opposition to the proposed rule as it now stands. The public comment period for the proposed rule ended in August 2012, and the final rule is expected to be published in March 2014.

It will be interesting to gauge NHTSA’s response to this industry feedback.
LEGAL CONSIDERATIONS

If the proposed rule becomes final as drafted, it could have implications in trucking-related litigation.

For example, the presence of these systems may give rise to new product liability lawsuits against their manufacturers and truck tractors’ manufacturers. Additionally, new claims against trucking companies, shippers and brokers relating to the presence or absence of the technology, or the maintenance and upkeep of the systems may find their way into courts.

In general, the transportation industry has benefited from much technological advancement such as anti-lock brake systems, air bags and passive restraint systems, many of which are regulated by NHTSA, and all of which have spawned litigation.

Arguably, some of the same legal issues can arise with the implementation of RSS technology.

A comparison can be drawn between the ESC mandate and other Federal Motor Vehicle Safety Standards to demonstrate some of the rule’s potential legal implications.

The proposed rule could spark further debate on the pre-emptive effect of state tort law claims under the National Traffic and Motor Vehicle Safety Act of 1966.32

As Supreme Court jurisprudence now stands, where there is a specific federal standard addressing the vehicle performance at issue, the safety standard can potentially preempt claims brought pursuant to state statutes, regulations and common law.33

Assuming FMVSS 136 does not preempt tort claims, accident victims will remain free to pursue state common law and statutory-based actions sounding in strict liability and negligence.

Considering the statistics, tort actions could require a trier of fact to apply a given state’s design defect analysis — whether it is a risk-utility/balancing or other test — to decide whether the absence of an ESC system constitutes a defect.34

Neither NHTSA’s analysis, nor any other studies, indicates any significant risks associated with using these systems. Therefore, the failure to install such a system, even absent the regulatory requirement, could potentially lead to a design defect finding. This exposure could extend to brokers, freight forwarders and other parties for the negligent hiring of trucking companies that fail to use RSS technology.

Potential legal issues also may loom for manufacturers and owners of older power units that have not installed an RSS.

Although NHTSA’s study concluded there would be no current requirement to retrofit older tractors, it is seeking comment on this issue to determine whether a supplemental notice of proposed rulemaking is needed.35

Manufacturers that offer RSC or ESC systems as optional equipment (or do not offer it at all) in certain model years when the technology was available but not yet mandated, run the risk of legal exposure for not including the safety device on all equipment it sold.

It can be argued that a manufacturer of a post-2002 model year tractor should have installed an RSS. Moreover, trucking companies with power units without an RSS, or those that lease drivers whose tractors are not equipped with such a system, may be exposed to tort-based lawsuits.

Following this logic and in keeping with current trends in the plaintiffs’ bar, brokers, shippers and freight forwarders may face similar exposure for the hiring of trucking companies that do not employ RSS technology.

Courts and juries will be left to address several issues: whether failing to install this equipment constitutes a defect, what were the industry standards and availability of the technology at the time the tractor was manufactured, and which is the potential liability of the myriad of parties involved. The outcome of such assessments will invariably be unique to each case.
CONCLUSION

Although NHTSA demonstrated the safety benefits of ESC systems, organizations such as ATRI and the ATA argue that RSC systems are only marginally different, if not better, than ESC systems. The organizations concede that roll stability systems in general are beneficial, but say any standard should not mandate one over the other.

However, all seem to agree both systems can control a vehicle and potentially prevent a hazardous collision and loss of life.

Of course, these benefits also come with some costs.

If and when the proposed rule becomes effective and passes any legal challenges raised by industry members in court, FMVSS 136 could have positive implications on the trucking industry through reduced injuries and accidents. But the standard almost certainly will provide additional fodder for legal claims that can once again change or add to the dynamics of truck accident litigation.

NOTES


7 Id.


9 Id.


11 FMVSS No. 136, supra note 3

12 Id. at I-6.

13 Id. at I-1.


15 Id.

16 For a more complete list of potential situations that could lead to unpreventable rollover or loss-of-control crashes, see Federal Motor Vehicle Safety Standards: Electronic Stability Control Systems for Heavy Vehicles, 77 FR 30765, 30773 (May 23, 2012) (to be codified at 49 CFR pt. 571).

17 FMVSS No. 136, supra note 3, at II-2.


19 Id. at 30794.

20 Id.

21 Id.

22 Id. at 30795.


24 Id.
See Public Comment: Federal Motor Vehicle Safety Standards; Electronic Stability Control Systems for Heavy Vehicles, Mercatus Center, George Mason University, RIN 2127-AK97. The RSP is “dedicated to advancing knowledge of the impact of regulation on society.” Id.

Id. at 4.


Id. at 4.

Id.


Gracia v. Volvo Europa Truck, 112 F.3d 291 (7th Cir. 1997).

See, e.g., Lindsey v. Navistar Int’l Transp. Corp., 150 F.3d 1307 (11th Cir. 1998) (finding a design defect where a tractor did not have a manual limiting valve in its break system, after applying a risk-utility balancing test).

FMVSS No. 136, supra note 3, at E-9. According to NHTSA, retrofitting ESC or RSC does not appear feasible, because of the complexities associated with integrating the new technology into older vehicles’ engines, braking systems, and local communication and electronic control units. Moreover, at the time of the preliminary impact analysis, no ESC or RSC retrofitting tools were available. Id.

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