

Advance Notice Of Proposed Rulemaking, Docket No. NHTSA-2015-0070 / 2015-17973

A Proposed Rule by the National Highway Traffic Safety Administration

Re: Rear Impact Protection, Lamps, Reflective Devices, and Associated Equipment, Single Unit Trucks

<https://www.federalregister.gov/articles/2015/07/23/2015-17973/rear-impact-protection-lamps-reflective-devices-and-associated-equipment-single-unit-trucks>

Submitted via internet: <http://www.regulations.gov/#!submitComment;D=NHTSA-2015-0070-0001>

21st September 2015 by Stephen Hadley Coordinator of the Underride Network

First and most important point must be adopting as the U.S. claims a Vision Zero philosophy and method to promoting and regulating traffic safety. A complete denouncement of 30 years of ineffective guards and increased deaths due to cost benefit analysis to excuse industry's refusal to use guards or use of low speed cheap guards that were designed to fool the public into complacency while large numbers of deaths and injuries continued to occur.

We must move to the crash testing and rating system for cars that has drastically reduced fatality rates and increased customer demand for high end safety systems in their vehicles. If you are buying a high end expensive truck or trailer then you would demand the best in all categories including a five star rating in crash performance and eventually crash compatibility.

We must end the "James Bondian Right to Kill" that has been extended to the billionaire captains of industry, to the so-called 1%, to the American auto and truck and trailer manufacturers. A different set of rules for the privileged than the common man, one bumper for you and none for me. Liability for death and destruction legally placed on only one party while others are officially removed from any legal and moral responsibility resulting in increased death and destruction for decades. We have seen an increase in legal inequality that has been part of an income inequality due to an unequal system of influence that favors the influence of the rich and powerful over the general population and even devalues accepted scientific consensus.

We support a modern crash testing standard for single-unit trucks as submitted by TARS Research Centre, UNSW, Sydney Australia as enclosed supporting document but would support the old MUARC force recommendations if the U.S. chooses to adopt that form of standard over our new recommendations. We include data to support that most crashes occur at high speeds above 30 mph and guards should perform for real world speeds on single-unit trucks, trailers and all heavy vehicles.

RECOMMENDATIONS

1. Barrier test Forces:

P1 (outer edge)	P2 (off centre)	P3 (centre)
200 kN	200 kN	150 kN

2. Barrier height: 400mm

3. Barrier width: Within 100mm of the outer frame of the rear of the truck

4. Energy absorption: 50kJ minimum

We would support equal regulation of reflective tape with trailers and heavy trucks for single-unit trucks to include fluorescent colors as more effective in reducing both day and night crashes.

Supporting facts for consideration below:

NTSB: "Although single-unit truck crashes are neither as lethal nor as likely to cause the most severe injuries as compared with tractor-trailer crashes, available data show that they are involved in at least 37 percent of the fatalities, 49 percent of inpatient hospitalizations, and 61 percent of emergency department visits from large truck crashes."

NTSB: "Twice as many pedestrians and cyclists received non-fatal injuries in single-unit truck crashes as in tractor-trailer crashes, although the numbers of fatally injured pedestrians and cyclists were 19 percent lower in single-unit truck crashes than in tractor-trailer crashes."

NTSB: "The fatalities and serious injuries that are caused by rear underrides, which occur in most collisions resulting in injury between passenger vehicles and the rears of single-unit trucks, could be mitigated by well-designed rear underride protection systems."

TIP: Wheels back trailers are now exempt from guard standards but modern cars require a flat surface to interact with their safety systems. Tires are hard surfaces and present an uneven surface hazard that can be mitigated with the flat surface and proper height and energy absorbing features of a properly designed underride guard. NHTSA Study: "Wide-base singles may become more widespread to improve the fuel economy of the truck population. Wide-base singles present a larger gap for smaller, narrower light vehicles, which in turn brings the wheels-back exemption into question."

TIP: Guards can break off of trailers during a crash due to the massive force involved. Attachment hardware such as bolts must be extra thick and strong, attachment points such as the trailer frame must also withstand tremendous forces and if not strong enough the trailer frame should be required to be reinforced in the standard. Guards should be tested on the trailer so attachment failure which is

common can be decreased.

TIP: Offset crashes can kill in even a few inches of overlap with the trailer. It is common to have guards not extend to the outside edges of the trailer, when the car hits just a few inches from the outside edge it can completely miss the outside edge of the guard and at a slight angle can underride the trailer up to five feet until it contacts tires with catastrophic results. These offset from center crashes are quite common and the force of the impact can be concentrated in the outside inches of the guard away from the reinforcing struts that hold the guard bar to the trailer. It is important to have the guard extend all of the way to the edge of the trailer with angled high strength reinforcing struts close to the ends of the guard, probably not more than 6 to 8 inches from the trailer edge. Moving the P1 force test location further out to the edge of the guard such as IIHS recommends will help to guarantee the ends of the guard are strong for these offset crashes. We must require better bracing than vertical struts provide!

TIP: The guard bottom must be close to the road to align at the height of most car bumpers, around 400 mm or 16 inches. The bumper must be engaged to properly interact with car safety features such as crush zones which are designed to absorb crash energy. If the guard is not low enough the car can penetrate below the guard and create the wedge effect (See Below) lifting the trailer causing crush zone features of the car to not engage and sending the hard bottom edge of the trailer towards the windshield and car occupants.

TIP: We can only have a new rear guard rulemaking every twenty years or so, if a thousand extra people die a year that can add up to twenty thousand lost lives. NHTSA: About 32 percent of the impacts occurred at relative velocities less than 35 mph, and in 43 percent, the relative velocity was 40 mph or less. Do we only deal with 43% of the crashes with a 40 mph standard or do we use 20 plus year old technology (MUARC tested guards to 75 km/h or 47mph in the early 1990's.) and try for an higher speed standard and save many more lives? I think we know what we must do!

TIP: Truck and trailer manufacturers must only meet the minimum requirements when building guards, there is no longer a strong strict liability legal deterrent to using old technology that is proven to kill. Errant victims and their passengers are even losing the right to sue, there is no shared legal liability for a company that knowingly uses guards that kill at 25mph. If a large trailer manufacturer uses technology that year after year kills an extra 100 people there is no cost, they only profit by using the nominally cheaper technology. There is no moral or financial impetus to exceed the minimum standards, we must understand the minimum standard will be the highest standard that will occur in society and act with this knowledge in mind. Law enforcement spends millions to educate errant drivers but nothing to encourage using better safety technology when it comes to underride guards.

TIP: Heavy trucks and trailers are industrial equipment that is operated in the public domain. You would not place a table saw without blade guards where children would have exposure to it, yet we operate industrial trucks and trailers without guards or working guards in public exposing families to daily danger of death and disability.

TIP: Underride guards placed even with the back of the truck or trailer will impact the front of short or no-nosed vehicles at the same time as the stiff rear metal tray of the trailer. Extending guards out from

the back of the trailer is the only way to provide protection for Euro-styled trucks, vans, and minivans, and ultra mini cars.

TIP: In 2012, large trucks were more than three times more likely than other vehicles to be struck in the rear in two-vehicle fatal crashes. 19% of all fatal two vehicle truck crashes occurred to the rear of the truck.

TIP: In Europe folding rear guards for single-unit and trailer dump trucks are available, they automatically tilt or fold when dumping and can even be smart phone controlled. There is no excuse to allow government and industry in the U.S. to refuse to require modern style rear underride guards on dangerous dump trucks and coal trucks.

NHTSA Study: " A study by Minahan and O'Day of fatal car-truck accidents in Michigan and Texas found evidence of underride in 90 percent of rear-end impacts and 70 percent of side impacts. Underride was found typically to occur at night on straight rural roads. Impact speeds were generally greater than 30 mph. The authors characterized this type of crash as a "surprise event" in which a passenger vehicle came upon a slower or stopped truck unexpectedly."

Years ago, the Underride Network participated in an national news story on underride guards. The report looked at the issue of dump trucks and specifically single-unit coal trucks which were exempted from the regulation. These heavy several ton trucks must only use the 1953 ICC bumper we call guillotine guards, 30 inches from the road and firmly attached. The reporter from the news story walked to the rear of one of the coal trucks and gave the guard a swing. It swung back and forth like a child's swing. He asked the truck driver if the underride guard should behave that way? The truck driver asked "What is an underride guard"?

Single-unit trucks such as dump trucks can be extremely heavy due to hauling heavier loads than most big rigs do. This can slow them down when climbing hills or getting up to speed. They usually due to dirt and road film have poor conspicuity or visibility and combined with useless underride guards this can all add up to disaster. We need public education campaigns on guards and conspicuity safety such as proper care and cleaning of tape and reflectors. We need government testing and design of specialty guards, such as high speed rounded ends to deflect cars and guard designs to work with specialty rear ends like dump trucks. Automatic articulating guards with smart phone control as an example, government can promote technology that improves safety and encourage economic growth as an added benefit. Truck drivers and companies can learn the benefits of guard technology, learn about victims, and understand cost savings from accidents and insurance savings. Insurance companies can be encouraged to pass along cost savings. We can save an estimated \$1.76 for every dollar spent on guard technology by regulating guards on single-unit trucks using UGPTI cost and benefit estimates.

COSTS:

Upper Great Plains Transportation Institute at NDSU: "Cost-benefit analysis shows that the rear-guard safety equipment has injury severity benefits that far outweigh equipment cost. Given a 10 percent reduction in injury severity attributed to the rear-guard devices on agricultural trucks, in the relevant

crash population, the benefit is estimated to be \$14.4 million over the seven-year depreciable life of a truck. Total equipment and maintenance cost for the North Dakota agricultural truck fleet is estimated to be \$8.1 million. An estimated safety benefit of \$1.76 is generated from each dollar spent on rear guards for North Dakota's agricultural truck fleet."

VC-Compat Improved Rear Underride Guard Costs in EU

Current RUP devices cost 100 € – 200 € (Approx. \$134 – \$268) per vehicle. Additional costs ranging from 20 € to 100 € (Approx. \$27 to \$134) are estimated for 'low profile' improved RUP, while additional costs for more complex folding devices may exceed 200 € (Approx. \$268) per vehicle.

On a practical note (to emphasis this latter point), small section, lightweight steel struts, such as rolled rectangular steel sections of 75mm*50mm*3mm, are sufficient to resist compression loads of 200kN. These sections only weigh 5.43kg/m.

From the Canadian Rear Guard Standard:

The department's research also indicated that, for compact and sub-compact vehicles, the requirements of FMVSS 223 were unlikely to prevent underride and passenger compartment intrusion in collisions with speed differentials of 48 km/h (30 mph) or more. According to a study cited by the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA), the severity of collisions involving underride shifts from non-fatal to fatal at speed differentials of 40 km/h (25 mph) and more, with no fatalities in collisions at relative speeds below 32 km/h (20 mph) and very few in the 32 km/h (20 mph) to 40 km/h (25 mph) range. Graph 1 indicates that collisions involving underride with speed differentials greater than 40 km/h (25 mph) are invariably fatal.

Furthermore, the data cited by the NHTSA indicate that, of the fatal rear- and side-impact collisions involving underride between passenger vehicles and trailers that were analyzed, only 30 percent occurred when the speed differential was 48 km/h (30 mph) or less. An additional 27 percent occurred when the differential was between 48 km/h (30 mph) and 56 km/h (35 mph), while the remaining 43 percent occurred at speed differentials greater than 56 km/h (35 mph). According to these data, the U.S. requirements governing rear impact guards do not address a significant proportion of the fatal collisions involving rear underride that would be survivable based on vehicle design alone.

VC-COMPAT: "Plans are underway to extend the front of the truck 300mm to 500mm or more to create a crash zone or deformable soft nose that would absorb crash energy and might reduce serious injuries and fatalities another 10% from the current standard on trucks with energy-absorbing guards, and survivable speeds would be increased to 80-90kph."

It is time to adopt modern reflective colors for truck and trailer conspicuity enhancements and require tape on all single-unit trucks (SUTs).

The Underride Network had several member activists receive awards from then President Clinton for their work for reflective tape on big rigs and trailers. We recommended then and now that fluorescent colors replace the poor performing red and white to save lives. A Canadian study found white tape increased driver recognition by over 350 feet from that of red and white tape. Fluorescent colors have similar candlepower to white tape with the added visibility of color for daytime recognition. Lime green and bright orange are commonplace on traffic signs and emergency vehicles because of their superior candlepower. Increasing the amount of reflectors and maintaining cleanliness of reflective material can also increase reaction time for motorists approaching slow moving trucks on hills and in slow moving traffic. Road film can decrease effectiveness of tape and reflectors by 90%.

Color Effectiveness

It is time to consider using a modern color scheme for retro-reflective tape on SUTs, fluorescent yellow-lime green has been shown to be a safer color choice than red on fire trucks and street signage. It has a much higher candlepower than red and is also more effective in daylight, red tape has been ineffective in preventing large numbers of daytime crashes. Red and white can blend in to traffic background colors from headlights and tail lights (Red and white dot confusion). 67% of fatal crashes occurred in daytime during 2004 in the U.S.

Thank You for your attention.

Stephen Hadley

Coordinator, Underride Network

<http://www.underridenetwork.org>

stephenhadley@frontier.com

Edited for typing errors version.