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September 18, 2015

The Honorable Mark R. Rosekind, Ph.D.
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Federal Motor Vehicle Safety Standards, Rear Impact Protection, Lamps, Reflective Devices, and Associated Equipment, Single Unit Trucks; Advance Notice of Proposed Rulemaking; Docket No. NHTSA-2015-0070

Dear Administrator Rosekind:

The National Highway Traffic Safety Administration (NHTSA) has issued an Advance Notice of Proposed Rulemaking (ANPRM), asking for comments on possible amendments to Federal Motor Vehicle Safety Standards (FMVSS) 108, 223, and 224 to reduce the likelihood of injury or fatality from crashes involving single unit trucks. FMVSS 108 regulates lamps and reflective devices and currently requires retroreflective devices on semi-trailers that reduce the likelihood of crashes from other vehicles. FMVSS 223 and 224 together specify the installation of underride guards that are intended to reduce the risk of injury and fatality when passenger vehicles impact the rears of large truck trailers. The ANPRM specifically asks for comments on NHTSA's analysis of the costs and benefits that would be associated with expanding these regulations to include single unit trucks in addition to trailers and semi-trailers. Single unit trucks represent about one-third of the large trucks involved in fatal rear impacts, and the Insurance Institute for Highway Safety (IIHS) supports NHTSA's efforts to address this issue.

NHTSA estimates that adding to single unit trucks retroreflective treatments similar to those required on semi-trailers would cost about $52 per truck. Although IIHS has not independently researched the role of conspicuity in the crashes of single unit trucks, we believe drivers of other vehicles need to be able to recognize single unit trucks as easily as they can recognize semi-trailers. IIHS supports the proposed amendment to FMVSS 108.

IIHS is concerned, however, that NHTSA is underestimating the benefits and overestimating the costs of including straight trucks in the underride guard regulations. NHTSA has estimated that requiring single unit trucks to be fitted with underride guards would cost $1,232-$1,958 per truck and save about five lives per year. The agency stated that these estimates "[are] strong indicator[s] that these systems will not be cost effective." For reasons noted below, IIHS believes these estimates are flawed and urges NHTSA to take steps to revise them prior to making a final decision on whether or not to require single unit trucks to be equipped with rear underride guards.

Lives saved estimate

Any estimate of the costs and benefits associated with highway safety regulations is based on several approximations and assumptions. It is important that each of these is as accurate as possible. Table 1

shows the main approximations included in NHTSA's estimate of how many lives could be saved each year by requiring single unit trucks to have underride guards. IIHS is concerned that two of these specific values are unrealistically low.

Table 1
NHTSA estimate of lives saved by requiring rear underride guards on single unit trucks

Description	NHTSA estimate	Remaining relevant fatalities
All passenger vehicle occupants killed in rear single unit truck crashes	N/A	104
Rear single unit truck crashes with severe underride (to windshield or beyond)	30%	31.2
Single unit trucks requiring guards (i.e., no qualifying exemptions)	59%	18.4
Impact speed ≤ 56 km/h	30%	5.5
Belted occupants	85%	4.7

First, IIHS believes that NHTSA's 30 percent estimate for the proportion of fatal rear single unit truck crashes that had severe underride is too small. This figure comes from a report that NHTSA commissioned from the University of Michigan Transportation Research Institute (UMTRI) (Blower and Woodrooffe, 2013). This analysis was an extension of the 2008 and 2009 Trucks in Fatal Accidents (TIFA) surveys conducted by UMTRI. These data were collected during phone interviews with someone who was familiar with each crash but may not have been at the crash scene, such as the truck owner or the truck carrier's safety director. In addition, the interviews can take place up to 2 years after the crash. In their own earlier study using similar methods, Blower and Campbell (2000) stated, "Collecting the data by means of telephone interview with people on the scene well after the fact probably is not sufficient to accurately measure degrees of underride." Nonetheless, NHTSA now is using the specific degree of underride to determine whether passenger compartment intrusion occurred and whether underride guards would be beneficial.

IIHS has conducted underride analyses based on the photographic documentation contained within the Large Truck Crash Causation Study (Brumbelow and Blanar, 2010). While based on a smaller number of crashes, these analyses found higher rates of severe underride. Including cases with all injury severities, 46 percent of all 115 striking passenger vehicles had underride to the level of the windshield or beyond (restricting to single unit trucks, this was 55 percent). Among fatal crashes (n=28), this proportion increased to 82 percent, including 7 of 9 single unit trucks. These figures suggest that severe underride in fatal single unit truck crashes is a more common problem than NHTSA has estimated and, consequently, that underride guards could save more lives.

The second concern with the lives saved estimate is the assumption that only 30 percent of crashes would be relevant based on impact speed (Table 1). The 56 km/h threshold for this estimate likely is too low. IIHS has conducted 56 km/h crash tests of underride guards certified to the level proposed by NHTSA in its ANPRM. Seventeen of these have been center impacts or had 50 percent overlap, and in 16 cases the underride guard prevented severe underride. Based on the damage to the guard and striking passenger vehicle in these tests, there is no reason to believe that severe underride would have

occurred at every speed higher than 56 km/h. Even in the worst case where the impact energy is sufficient that the guard deforms and separates from the trailer, it may slow the vehicle sufficiently to prevent severe underride and/or fatal injuries. NHTSA should conduct crash tests at higher speeds to determine the most reasonable threshold for deciding which crashes would have improved outcomes with underride guards.

Even if 56 km/h is the most appropriate impact speed threshold to use in the lives saved calculation, the distribution of real-world fatal crash speeds that produced the 30 percent estimate is not robust. This figure also is based on the recent UMTRI report (Blower and Woodrooffe, 2013). Without vehicle crush measurements (or truck stiffness data), the speed distribution was calculated using a method that relied on the reported pre-skidding travel speeds recorded on police crash reports or during interviews. Reported travel speeds prior to any crash must be considered speculative. This is even more the case for crashes in the UMTRI report because the driver of the striking vehicle often was killed. Relying on such data increases the uncertainty associated with the overall lives saved estimate.

Cost estimate

NHTSA calculated the total cost of equipping single unit trucks with underride guards based on the manufacturing and installation of the equipment as well as increased fuel usage due to the higher truck weight. Fuel costs, which composed about 75 percent of the total, were calculated based on underride guard weights contained in an engineering analysis conducted for NHTSA by Waltonen Engineering (2013). These weights were not obtained by actually weighing the finished guards but by estimates based on the substantially heavier total material volume from which each component of the guard would need to be cut. Table 2 shows a comparison of actual underride guard weights as measured by IIHS and the estimated weights for four guards from the same manufacturers that were included in the Waltonen Engineering report. These differences suggest that NHTSA's total cost estimate (including manufacturing, installation, and fuel) is about 35-40 percent too great.

Table 2
Underride guard weights

Trailer manufacturer	IIHS measured weight (lb)	NHTSA estimated weight (lb)
Manac	169	307
Great Dane	150	193
Stoughton	108	191
Wabash	119	203*
Average	137	224

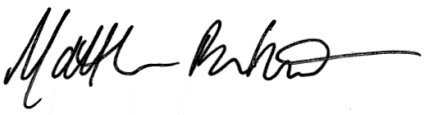
*After removing optional dock lock braces

NHTSA stated in its ANPRM that there are several reasons the agency could be overestimating benefits and underestimating the costs associated with this rulemaking. IIHS agrees that some of these factors could be meaningful. It is true that a proportion of fatal underride crashes are offset to the extent that some compliant guards could not prevent underride, though it should be noted that some trailer manufacturers are working to address this (IIHS, 2014). In addition, the structures of many single unit trucks would need to be modified in order to accommodate underride guards, and this would result in

higher costs. But it is unlikely these additions would approach the magnitude by which the guard weights and fuel costs already have been overestimated. Overall, IIHS believes that the "cost per life saved" in the ANPRM is overstated rather than the opposite.

In conclusion, IIHS is pleased that NHTSA is considering the possibility of rulemaking to address rear single unit truck crashes. The agency's proposal to improve rear single unit truck conspicuity by revising FMVSS 108 is a relatively straightforward way to do this. However, the question of whether to require rear underride guards is more complex. We are confident that when NHTSA addresses the shortcomings of its current cost-benefit analysis, the agency will come to the same conclusion as IIHS that requiring underride guards on single unit trucks will save more lives at a lower cost than currently estimated.

Sincerely,



Matthew Brumbelow
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