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VIA FAX 1-202-493-2251

National Highway Traffic Safety Administration  
Room W53-312,  
1200 New Jersey Avenue, SE  
Washington, DC 20590

Re: Docket Number NHTSA-2015-0118 – (Slight Correction)

To Whom It May Concern:

**CMVSS 223 for US Trailers**

The results from Transport Canada that showed minimally compliant FMVSS 223 guards failed at speeds (35mph) equal to that which occupant protection was expected from the vehicles tested was published by SAE in 2000. The agency must ask itself why 15 years passed before this deficiency was addressed.

**Now NHTSA Ignoring Offset Collisions**

Unfortunately, the agency has chosen to categorize the 41% of fatal “offset” underride collisions as a “small” portion of the underride problem (Pg. 78431), and quote, “believes the performance of rear impact guards in the fleet in non-offset crashes should be enhanced before turning to the issue of improving the performance of guards in offset crashes” (Pg. 78432). If the TTMA (Truck Trailer Manufacturers Association) information that 93% of trailers already comply with CMVSS 223 is correct (Pg. 78420), no substantial real world “performance enhancement” is being achieved by simple adoption of CMVSS 223. Given that consideration of heavy truck and trailer safety enhancement - particularly in the area of underride - is at best a decennial endeavor by NHTSA the current NPRM should go further.

Rather weak justification for ignoring offset car/trailer underride accidents in the current NPRM is given in part because the guard damage is characterized as less severe in fatal accidents. First of all, a fatal collision is fatal collision - particularly, in this context, a fatality with underride and PCI. Therefore, I fail to see the extent of guard damage as a barometer of the relative importance of offset collision fatalities. Actually, having investigated a number fatal offset collision underrides myself, very often only the horizontal bar is bent with little damage to the uprights. In reality, minimal guard damage is an expected result in those instances and in fact points squarely at the problem: lack of adequate guard strength on the outside edges of trailers.

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Furthermore, quote, “that there was virtually no difference in the percentage of light vehicle (fatal) crashes with PCI in offset crashes and in non-offset crashes” (Pg. 78432) seems more to suggest the significance of the problem of the rather than its insignificance. The real question should be: “Is PCI with injury or fatality occurring in offset collisions at otherwise non-injurious speed differences?” IIHS has clearly demonstrated this risk in its offset crash testing into trailers and NHTSA itself cites this partial overlap condition as justification for low guard effective rates in the ANPRM for underride guards for SUT’s (Docket No. NHTSA-2015-0070, Pg. 23).

**Repositioning “P1” Test Location**

Regarding the possibility of moving test location P1 closer to the trailer side extremities, it is misleading for NHTSA to cite the extent of non-PCI underride in the IIHS Manac “full overlap” test as an indication of greater PCI risk. Only in a precisely centered crash such as this IIHS test on the Manac will the car fit just between both uprights contacting only the horizontal bar, a situation which clearly contributed to the underride extent. Nonetheless, the Manac successfully prevented PCI by engaging the longitudinal strength of both uprights. A distinction should be made between a “full overlap” and a “centered crash” in which the trailer and car’s longitudinal axes are aligned. The two are not synonymous. The Manac test is exactly centered and represents an extremely small fraction of possible crash scenarios on the back of semi-trailers. Since trailers are wider than cars “full overlap” crashes are most likely off center, and frequently contact only one upright which allows the horizontal bar to twist or bend at the other upright. Moving P1 outbound increases the chances either both or at least one vertical brace is engaged all potential collisions across the width of the trailer.

**Obvious Improvements in Offset Collision Performance**

Regardless, false is the assumption that improvement of the standard in offset collisions lies only in the movement of a guard’s two vertical supports, or repositioning the “P1” test location. Going to 3 or 4-vertical support configurations is an obvious solution to be sure that at least one or more vertical supports of the horizontal bar are engaged in potential collisions. The Manac guard design proves that design modifications to accommodate alternate upright locations are indeed feasible.

**Underride Prevention Should Match Occupant Protection Capabilities of Passenger Vehicles**

The NPRM for a new rear impact guard performance criteria should be based on the guard having the strength and dimensions to prevent PCI up to collision speed differences that can effectively utilize the occupant protection capabilities of modern vehicles in any overlap including “off-center” from the trailer perspective and “partial overlap” from the car perspective. Preventing passenger compartment intrusion from the truck and trailer perspective is a minuscule technical endeavor compared to what has existed in our passenger vehicles for decades.

I can clearly see by its wording that the “new” NPRM is more centered on the perpetually lagging status quo for the trailer industry.

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Continuing to allow truck and trailer induced PCI to occur at otherwise survivable crash speeds (delta-V's of 45mph and beyond) discards years of crashworthiness efforts and wastes the safety benefits we have come to expect and pay for in our cars. From an engineering perspective the need for vehicle crash compatibility in the form of adequate heavy truck underride guarding is apparent in order to protect against the hazard of PCI which exposes the vulnerable head and neck region to severe, potentially fatal or crippling injury. This hazard - easily remedied by readily available materials and simple structural analysis - is present also on the sides of heavy trailers and trucks. The FMVSS standard should be broadened to include guarding for the sides of heavy trailers. This was the original intent of NHTSA rulemakers in the 1969 NPRM, Docket No. 1-11; Notice 2.

Yours very truly,

**SEVEN HILLS ENGINEERING, LLC.**

Perry L. Ponder, P.E.,  
President, Consulting Engineer