Petition for Amendment of FMVSS Rear Impact Guards, Rear Impact Protection (2127-AL58; Docket No. NHTSA-2022-0053)

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Pete Buttigieg, Secretary
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Dear Secretary Buttigieg:

In accordance with 49 U.S.C. 30162 and 49 CFR § 552.3 - General, we hereby petition the National Highway Traffic Safety Administration (NHTSA) to promptly initiate rulemaking to amend the FMVSS Rear Impact Guards, Rear Impact Protection (2127-AL58; Docket No. NHTSA-2022-0053) to require that Rear Impact Guards on van-type or box semitrailers are able to prevent underride by passenger vehicles at 35 mph in 30% offset crashes. This type of crash is known to result in death and significant injuries, including collisions with Rear Impact Guards designed to meet the July 15, 2022 FMVSS.

An "underride" collision occurs when a semitrailer collides with a passenger vehicle causing the passenger vehicle to slide under the body of a semitrailer, often crushing the vehicle and passengers within, or dragging the vehicle causing it to burn with passengers inside. Due to the height difference between passenger vehicles and semitrailers (in addition to single unit trucks; see NHTSA 2013), a collision bypasses the car's safety features because the point of impact is the passenger compartment, not the front bumper of the car (Kiefer as cited by Zasky 2018a).

The bottom edge of a semitrailer is between forty-two and forty-five inches high, which is about eye height for passengers of a motor vehicle. Effective Rear Impact Guards work by engaging safety accessories like airbags, crash avoidance sensors, and other features of cars as well as

preventing vehicles from going under the truck and encountering the semitrailer body, increasing the chance of survival with these types of collisions, many of which would be minor collisions if not for the "underride" (Zasky 2018). Without engaging a car's safety features which would otherwise absorb the force of the collision, the passenger compartment can be crushed when it contacts the semitrailer, resulting in death or severe injuries for the occupants.

The National Highway Traffic Safety Administration is directed by Congress to protect the safety of the driving public against unreasonable risk of death or injury that may occur because of the design, construction, or performance of a motor vehicle or motor vehicle equipment and, is charged with reducing deaths, injuries, and economic losses resulting from motor vehicle crashes (49 U.S.C. § 30102). The concerns raised in this petition are well exemplified by the May 4, 2013, crash into a Great Dane semitrailer involving the Karth family Crown Vic in Georgia, in which the Rear Impact Guard failed leading to the deaths of AnnaLeah and Mary Karth. This semitrailer lacked an effective Rear Impact Guard. (***Rear underride accidents explained***) This case represents 2 tragic deaths; however, there are similarly hundreds of underride deaths and serious injuries annually from collisions with semitrailers according to NHTSA Fatality Analysis Reporting System (FARS), which is known to underreport these deaths. In fact, the FARS Georgia Report for 2013 only showed 1 rear underride death.

These known deaths indicate that semitrailers without effective Rear Impact Guards contain a defect that presents an unreasonable risk to the public from "…a "significant number of failures" in "normal operation" that is "reasonably foreseeable" (United States v. General Motors Corporation ("Wheels"), 518 F.2d 420 (D.C. Cir. 1975)). As NHTSA recognizes, a "significant number of failures" is merely a "non-de minimus" quantity; it need not be a "substantial percentage of the total" (Wheels, 518 F.2d at 438). In fact, hundreds of deaths and thousands of injuries occurring annually from vehicles colliding with semitrailers that lack effective Rear Impact Guards demonstrates a defect because there is no dispute that this hazard "…can definitely be expected to occur in the future" (United States v. Gen. Motors Corp., 565 F.2d 754, 758 (D.C. Cir. 1977)).

Similarly, where a defect "is systematic and prevalent in a particular class [of motor vehicles or equipment], . . . this is prima facie an unreasonable risk" (United States v. General Motors Corp., 561 F.2d 923, 928–29 (D.C. Cir. 1977) ("Pitman Arms"). In the context of the National Traffic and Motor Vehicle Safety Act of 1966, (Safety Act), "motor vehicle safety" refers to an "unreasonable risk of accidents" and an "unreasonable risk of death or injury in an accident" (49 U.S.C. § 30102(a)(8))

As the Insurance Institute for Highway Safety has demonstrated with their crash testing research, Rear Impact Guards (RIGs) produced by the eight largest trailer manufacturers to meet the 1996 federal standard are not effective at preventing offset underride crashes. Subsequently, the manufacturers developed stronger, more effective RIGs, which the majority of them are installing as Standard on new trailers -- earning them recognition by the IIHS for meeting a TOUGHGuard level of strength at 100%, 50%, and 30% offset. Congress recognized the importance of this improved level of protection in the 2022 THUD Appropriations Bill:

> ***Truck underrides.***—*The Committee highlights that DOT has been researching underrides for more than 50 years and that NHTSA's proposed rulemaking in December 2015 to update truck*

> *rear impact guard requirements cited 362 annual fatalities associated with light vehicle crashes into the rear of trucks. The Committee directs NHTSA to prioritize working with relevant experts and stakeholders, including researchers, engineers, safety advocates, and the trucking industry, to facilitate the deployment and adoption of rear and side underride protection devices. Last year,* ***the Committee directed NHTSA to implement GAO recommendations on underrides and to complete a rulemaking to improve rear guards to meet the Insurance Institute for Highway Safety standards for Toughguard awards****. The Committee repeats such direction, and requires NHTSA to brief the Committee within 30 days of enactment of this Act on the agency's progress on such requirements.*

Although the NHTSA declined to follow this Congressional directive in the release of the July 15, 2022, Rear Impact Guard Rule, they acknowledge that it is a *minimum* standard as indicated here:

> *However, while NHTSA cannot conclude that the data and science currently available for agency decision-making support mandating installation of a rear impact guard that prevents PCI in all three overlap conditions (full, 50 percent, and 30 percent overlap) on all vehicles, the Federal standards act as a floor, not a ceiling, to establish the minimum level of performance that meet the safety needs presented by the data. FMVSS are written in terms of minimum performance requirements for motor vehicles or motor vehicle equipment to protect the public against unreasonable risk of injury and death in crashes. Manufacturers have flexibility in design as long as their products comply with applicable FMVSS.*
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> *There are rear impact guard designs in the current trailer and semitrailer market that prevent PCI in all three crash conditions described in Section 23011(b)(1)(A) of BIL: (1) full overlap crash, (2) 50 percent overlap crash, and (3) 30 percent overlap crash at 56km/h impact speed. This final rule does not preclude these designs from the trailer and semitrailer market, as long as they meet all requirements of the FMVSS to ensure adequate protection in (1) and (2), above. Federal Motor Vehicle Safety Standards; Rear Impact Guards, Rear Impact Protection*

The 2022 Rear Impact Guard Rule lacks a genuine commitment to the USDOT's ***National Roadway Safety Strategy***, particularly as it disregards the statement that "no death is acceptable" and overlooks the need for redundancy. This is exhibited throughout the Regulatory Analysis, as seen below:

1. *This finding was of key concern because full and 50 percent overlap crashes are more frequent than low overlap (30 percent or less) crashes. NHTSA seeks not to amend FMVSS No. 223 in a manner that could reduce safety in the more frequent crash conditions.*
2. First of all, there is much debate about the frequency of underride crashes, including those at 30% offset. Second, those crashes that do occur at the 30% overlap with the current guards more often result in more severe injuries due to the failure of the guard and the Passenger Compartment Intrusion.
3. NHTSA's own data and conclusions on "corner impacts," elsewhere, are at odds with the information presented in the rear impact guard final rule: *Passenger compartment*

intrusion is more prevalent in corner impacts than in center impacts for any type of underride guard. For trailers with FMVSS-compliant guards that were impacted in the corner, there were 13 cases of severe or major intrusion, out of 66 total crashes where this information was recorded (13 of 66 = 19.7%). By comparison, there were seven center impacts with severe or major intrusion, out of 115 total crashes where this information was recorded (7 of 115 = 6.1%). The difference in the two proportions can be tested according to a binomial test. The statistical test is highly significant (p-value < 0.01), meaning that the result is not likely to be a chance occurrence owing to a small amount of data. It can be said that the center portion of the underride guard resists passenger compartment intrusion better than do the edge portions of the underride guard. FMVSS 223 requires a greater amount of force to be resisted near the center of the guard (locations P3 in Figure 2), compared to the edges (locations P1 in Figure 2). (NHTSA 2010, The Effectiveness of Underride Guards for Heavy Trailers. Report Number: DOT HS 811 375. Washington, DC, p. 29). In simple layman terms, whether or not the 30% offset crashes are less frequent than at the other locations, they are certainly more severe and likely to lead to debilitating injuries and deadly tragedies. In fact, the severity of low overlap can be substantial even in low energy/low closing velocity collisions (aka, minor crashes can result in major injury when they are low overlap into a trailer's rear guard). Certainly the Department's National Roadway Safety Strategy would take these facts into account and ensure that these unacceptable deaths are appropriately addressed with available and proven technology.

4. *Further, data indicate that most fatal light vehicle crashes into the rear of trailers are at speeds much higher than 56 km/h (35 mph). The agency is concerned that adopting requirements to mitigate PCI in 30 percent low overlap crashes could result in rear impact guard designs that may reduce protection against PCI in higher speed crashes. NHTSA remains concerned about potential negative safety consequences if a final rule were to adopt requirements that result in moving the vertical members of rear impact guards more outward laterally to prevent underride in a 56 km/h (35 mph) 30 percent low overlap crash, at the expense of protection against higher speed crashes. The agency believes this issue should be more fully explored before possibly adopting a 30 percent low overlap requirement. https://www.federalregister.gov/d/2022-14330/p-83*
5. *NHTSA has considered the factors in Section 30111(b) and concludes that available data do not show that a standard for a 30 percent overlap crash at 35 mph would be reasonable, practicable, or appropriate for all the vehicles subject to FMVSS No. 223 and FMVSS No. 224. https://www.federalregister.gov/d/2022-14330/p-80*
6. *In response to the research mandate in Section 23011(b)(2) of BIL, NHTSA is conducting additional research on the design and development of rear impact guards that can prevent underride and protect passengers in crashes into the rear of trailers at crash speeds up to 104.5 km/h (65 mph). As part of this research effort, NHTSA will also evaluate potential cost-effective rear impact guard designs that could improve protection in the less-frequent 30 percent low overlap crashes while enhancing protection in full and 50 percent overlap crashes at higher speeds. https://www.federalregister.gov/d/2022-14330/p-95*
7. *To summarize, data indicated that: (a) full and 50 percent overlap crashes are more frequent than 30 percent overlap crashes; (b) most fatal light vehicle impacts into the rear of trailers are at speeds greater than 56 km/h (35 mph); and, (c) improving performance against low overlap crashes could reduce performance of the guard in full and 50 percent overlap crashes. Given*

those factors, we decided not to take an approach in this rulemaking that would improve guard performance in a 30 percent overlap crash but that could lessen protection in 50 and 100 percent overlap crashes at higher speeds (speeds higher than the 35 mph speed on which the amended FMVSS No. 223 would be based). https://www.federalregister.gov/d/2022-14330/p-235

8. So, NHTSA decided not to require a level of performance *proven* to improve guard performance at 35 mph -- the speed required in the Final RIG Rule -- based upon speculation of performance at higher speeds not being required but which would be later researched. How does that make any sense?
9. NHTSA deliberately ignored proven success at the price of underride victims -- on the basis of delaying such a requirement until after future research could examine additional crash scenarios for potential revision of the regulation. What about the too-weak guards they are condoning and the lives which could be lost as a result of this negligence?
10. The IIHS had already provided NHTSA feedback on that concern in a 2016 Public Comment to the 2015 NPRM: *NHTSA raised an additional concern that attempting to improve offset protection "would not benefit safety overall." The agency based this on the IIHS crash test results. At the time the NPRM was issued, the 2012 Manac trailer was the only tested design able to prevent underride and passenger compartment intrusion in a 30 percent overlap crash. NHTSA was concerned that the Manac would not perform as well as other designs in center impact crashes at speeds greater than 56 km/h. This point is incompatible with NHTSA's approach to the NPRM as a whole. The Manac trailer complies with the CMVSS 223 force requirements that NHTSA is proposing. In addition, it performed well in all three IIHS crash test configurations (center impact, 50 percent overlap, and 30 percent overlap) with the same 56 km/h impact speed at which NHTSA expects their updated standard to be effective.* ***To claim that the Manac design is deficient at higher impact speeds and, therefore, that its improved offset protection is an overall disbenefit to safety is unfounded and incongruous.*** *It is unfounded because none of the guards were tested at higher speeds, and based on current performance it is difficult to say how the 2013 Strick trailer (Figure 5), for example, would perform better than the 2012 Manac in higher speed center impacts. And the claim is incongruous with the overall rule because if NHTSA's goal is to prevent underride in center impacts at speeds beyond 56 km/h, then the agency needs to propose force levels that go beyond the CMVSS 223 requirements. Additionally, NHTSA's belief that the guard configuration utilized by Manac is inherently less safe than other guard designs even in 50 percent overlap crashes is disputed by the fact that it was the only design tested by IIHS with the vertical member far enough outboard to overlap the transmission or engine of the striking vehicle in the 50 percent overlap condition.* IIHS 2016 Public Comment on 2015 RIG NPRM, p. 5
11. Furthermore, all of the nine Rear Impact Guards which have received the ***TOUGHGuard Award*** from the IIHS passed the crash tests at 100%, 50%, and 30% offset --even the RIG from the referenced Manac, a Canadian manufacturer. Yet NHTSA declined to require that level of strength in its release of an upgraded standard.

We also note the following facts to consider:

1. An effective Rear Impact Guard helps avoid windshield-first crashes and improves the chances that a car's air bags, and other lifesaving built-in occupant protection systems

can function as intended, earning endorsement of a similar safety technology -- side underride guards -- by Consumer Reports (2019).

2. Without a government regulation in the United States, truck and trailer manufacturers and owners are much less likely to voluntarily stop the known unreasonable risk to public safety by designing and implementing safer trucks and trailers with effective rear underride prevention guards (Bloch and Schmutzler 1998; GAO 2019, Transportation Research Circular 2007). Crash tests demonstrate that more effective rear underride guard technology is available, has been well-studied, and would be an easy and inexpensive solution to the known hazard of rear underride collisions to the traveling public. For example, one trailer manufacturer has published the success of its improved Rear Impact Guard in a real-life crash in March 2017, when Terry Rivet survived in a collision with a Stoughton trailer which had an improved Rear Impact Guard -- a collision which otherwise would likely have been fatal. ***N.Y. Man Saved By Stoughton Rear Underride Guard Featured In TV News Story***

3. Manufacturers have a continuing obligation to proactively identify and mitigate such safety risks (Wheels, 518 F.2d 420, 427 (D.C. Cir. 1975). Under the Transportation Recall Enhancement, Accountability, and Documentation Act (TREAD Act, 2000), manufacturers were supposedly required to report information to NHTSA related to defects, especially in cases of injury or death related to their semitrailers (also referred to as Early Warning Reports; e.g., see Safety Research Strategy (2021) detailing NHTSA fines to vehicle manufacturers for untimely recalls and failing to submit Early Warning Reports). However, early warning reporting has been abysmal compared to known occurrences of underride collisions (Karth 2018). This system, mandated by Congress, should have identified rear underride deaths and catalyzed research into ways to prevent them in the future. The truck crash, which killed AnnaLeah & Mary Karth on May 4, 2013, was reported in this system but not as an underride and did not lead to any analysis by the manufacturer or NHTSA to determine what allowed underride or what could be done to improve the Rear Impact Guard to prevent future occurrences. This is clearly another indication that it is past time for getting this unreasonable risk off the road: ***What's the intent of Early Warning Reporting & what's it done to end underride?***

For the reasons discussed above, as well as those which we spelled out in our *Petition for Reconsideration*, we believe that the Final Rear Rule does not go far enough and we urge NHTSA to grant this ***Petition for Amendment of the 2022 Rear Impact Guard Rule***. Rear underride deaths and serious injuries continue to occur every day across our country. Therefore, pursuant to 49 U.S.C. § 30162(d), we formally request that NHTSA respond to this petition within 120 days.

Please act swiftly to strengthen this rule. To let it stand, as is, is nothing less than a reckless disregard for human life.

Respectfully submitted,

Jerry and Marianne Karth

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Lois Durso-Hawkins