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2127-AK98

Auto Innovators Presentation on NHTSA Pedestrian Safety Global Technical Regulation

December 4, 2023





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Agenda

- **Introduction**
- **Importance of Harmonization**
- **Interpretation of GTR No. 9**
 - Defining test areas
 - Defining head impact point
 - Impacts outside test zones
- **Rulemaking Significance**
- **Conclusion**



Introduction

- The purpose of this briefing is to provide an overview of the comments Auto Innovators submitted comments to NHTSA on July 7, 2022.
- Comments focus on several key issues identified in August 2018 NHTSA GTR report entitled *“Vehicle Hood Testing to Evaluate Pedestrian Head Form Reproducibility, GTR No. 9 Test Procedural Issues, And U.S. Fleet Performance.”*

Rulemaking Significance

- Given the potential for NHTSA to propose rulemaking that is inconsistent with the spirit, intent, and implementation of GTR No. 9, Auto Innovators is concerned that this could result in a situation where regulation may require U.S.-specific hood and front-end designs.
 - Need to address repeatability and reproducibility concerns.
- Downstream impacts on the design of other systems that may be closely integrated with the hood (e.g., fender, bumper system), adding substantial burden to manufacturers, notwithstanding any fuel economy related impacts. These should be considered as part of the agency's regulatory analysis.
- The association has noted in previous comments to NHTSA that, given the potential for regulatory misalignment and the likelihood that proposed changes will have a significant impact on motor vehicle design, this rulemaking has been **incorrectly classified as “nonsignificant.”**
- It should instead be considered a “major” rulemaking, which requires additional review by OMB.

NHTSA Interpretation of GTR No. 9

- It is critical that the agency ensure its regulations are closely harmonized with GTR No. 9.
- As noted in the NHTSA report, “The **current language could be interpreted in more than one way**, and a proposed amendment to the GTR supported by the European industry consortium OICA has been introduced to revise the GTR language to reflect one interpretation.”
- The issue of potential multiple interpretations remains unresolved, despite strong international support for a clear path forward.
- Auto Innovators has significant concerns that this lack of resolution, coupled with a potentially unique NHTSA interpretation, could lead to an indefinite state of regulatory misalignment between regions
- No clear path forward for resolving this issue through a clarifying amendment

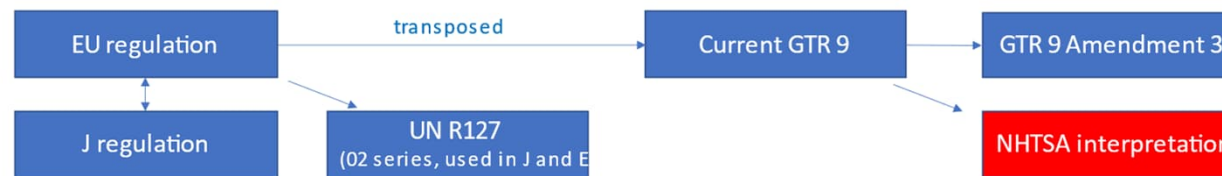
Concerns with Anticipated NHTSA Approach

Auto Innovators has three (3) primary issues of concern:

1. Process for defining the test areas (and corresponding HIC zones);
2. Method for defining the head impact point; and
3. Consideration for Impacts Outside the Defined HIC 1000/1700 Test Zones

#1 - Defining the Test Area and Corresponding Test Zones

- The current requirements *as written* in GTR. No 9 are potentially open to interpretation with respect to the methodology (or mark-up procedure) for defining the corresponding head impact zones.
- However, there is clear alignment *in practice* for how the regulation is being applied through the test procedures that have been implemented in regions that have adopted the GTR. **The NHTSA interpretation is different.**



Note: Dates below are entry into force for EU Reg and UNR; date of publication for Japan Reg and GTR



	EU Regulation 1/Jan/2004	Japan Regulation 20/Apr/2004	UN R127 00 Series 17/Nov/2012	UN R127 01 Series 22/Jan/2015	UN R127 02 Series 18/Jun/2016	UN GTR 9 (Amendment 2) 14/Nov/2018	UN GTR 9 (Amendment 3)	NHTSA Interpretation
Definition of Area Calculation in the Regulation Text	Unclear	Clear	Unclear	Clear	Clear	Unclear	Clear	Caused by Unclear definition
Homologation Practice	Consistent w/ GTR9 Amendment 3	Consistent w/ GTR9 Amendment 3	Consistent w/ GTR9 Amendment 3	Consistent w/ GTR9 Amendment 3	Consistent w/ GTR9 Amendment 3	Consistent w/ GTR9 Amendment 3	(Unpublished)	Inconsistent w/ GTR9 Amendment 3
Note			Transposed from EU Regulation	FlexPLI Introduced, Amendment 3 applied	Modified bumper test area definition	Transposed from EU Regulation. All countries implementing current GTR 9 use the definition of the area consistent with Amendment 3		

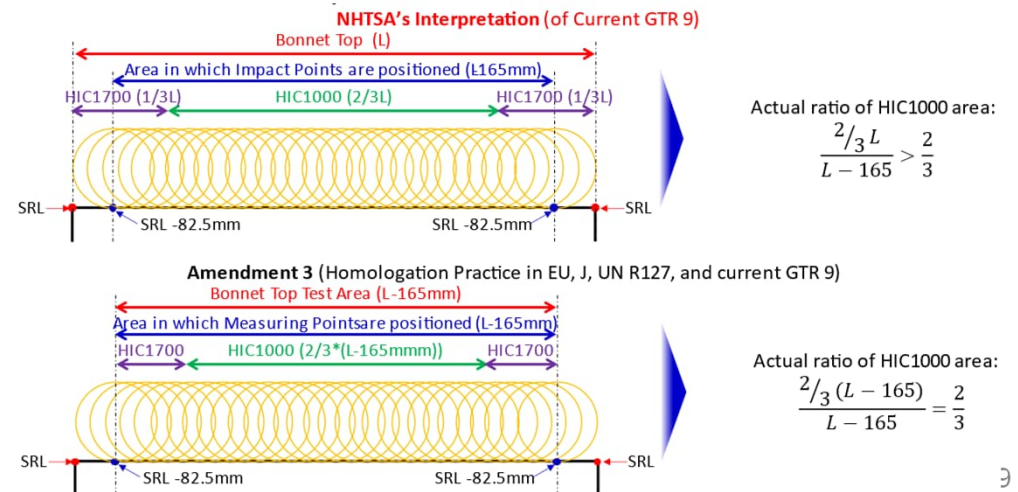
NHTSA's interpretation is not consistent with original EU and J regulations (which match Amendment 3)

#1 - Defining the Test Area and Corresponding Test Zones

- Auto Innovators recommends not pursuing the “mark-up” approach discussed in the agency’s 2018 report.

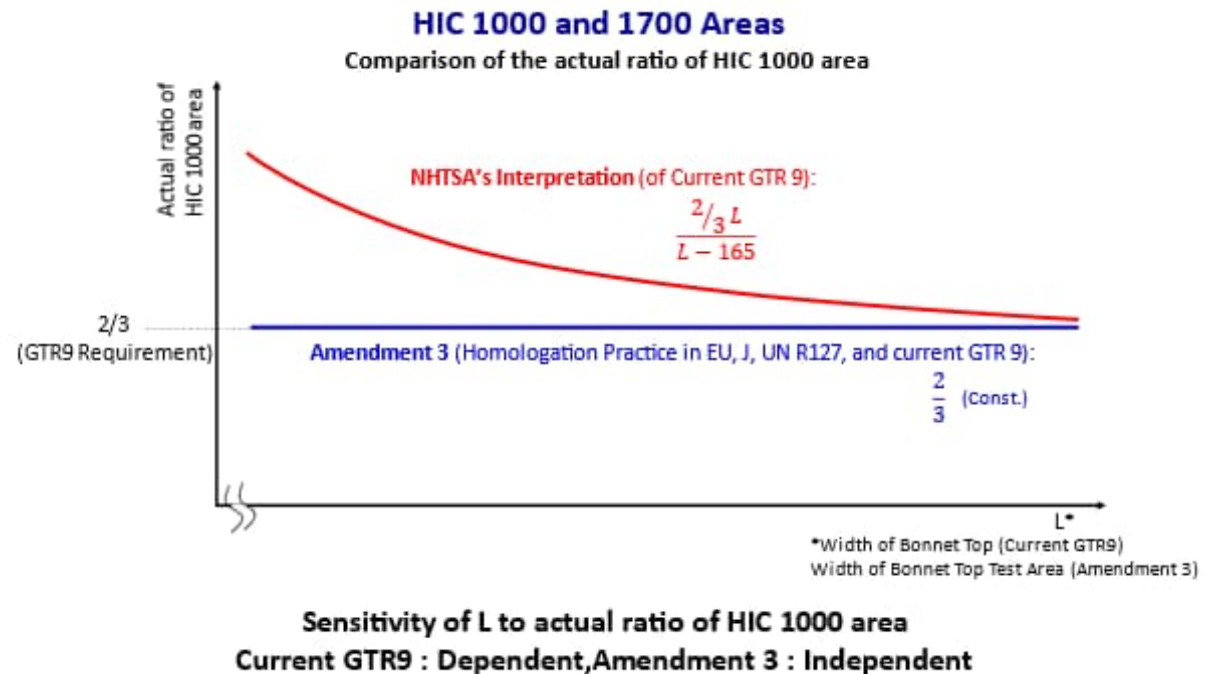
- The areas for controlling head impact injury (1/3 and 2/3 of hood) are not equivalent.
- It could potentially result in undefined HIC 1000 and HIC 1700 zones, or circumstances where the ratio of HIC 1000 zones exceed 2/3 of the testable area.
- Similar issues would also likely arise if the agency were to adopt a hybrid approach that blends requirements from the GTR No. 9 and UN Regulation 127 test procedure.

	Current GTR9 (NHTSA Interpretation)	Amendment 3
Side Reference Line(SRL)	 First contact point of 45deg line	 First contact point of 45deg line
Area in which Impact Points (Current GTR9) / Measuring Points (Amendment 3) are positioned	Side Boundary : SRL -82.5 Inconsistent	Side Boundary : SRL -82.5mm Consistent
Definition of Bonnet Top (current GTR9) / Bonnet Top Test Area (Amendment 3)	Side Boundary : SRL	Side Boundary : SRL -82.5mm
Definition of HIC 1000 and 1700 areas	HIC 1000 : 2/3 of Bonnet Top HIC 1700 : 1/3 of Bonnet Top	HIC 1000 : 2/3 of Bonnet Top Test Area HIC 1700 : 1/3 of Bonnet Top Test Area



#1 - Defining the Test Area and Corresponding Test Zones

- For vehicles with smaller, narrower front ends, the actual ratio of the HIC 1000 area can become substantially larger than the fundamental 2/3 requirement in GTR 9 vehicle front end.
- This inappropriately drives more stringent requirements for smaller vehicles** and would have the counterintuitive effect of encouraging larger vehicles because of the comparatively lower ratio of HIC 1000 to 1700 zones in relation to the overall size of the vehicle front end.

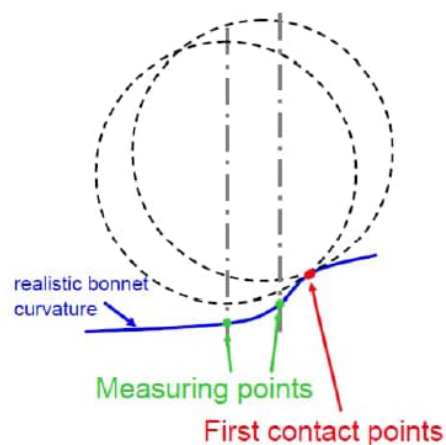


#2 - Defining the Head Impact Point – Concerns with NHTSA Targeting Protocol

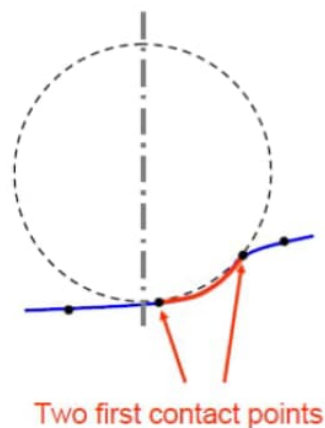
- **As noted in the agency's GTR No. 9 report, three different head impact point definitions have been used by different laboratories:**
 1. 3D point of first contact (POFC) (current NHTSA protocol);
 2. Aiming point (EuroNCAP protocol);
 3. Point of first contact on the vertical-longitudinal plane containing the center of the headform impactor, which is known as "2D measuring point" (OICA protocol)

#2 - Defining the Head Impact Point – Concerns with NHTSA Targeting Protocol

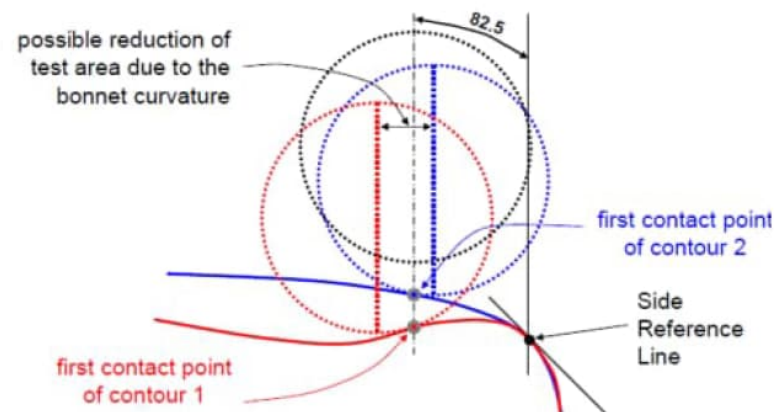
- The 3D POFC method introduces **repeatability and reproducibility concerns** whereby a “Point of First Contact” could be associated with multiple impactor positions.
- 3D POFC introduces **additional complexity in terms of test setup and execution**. For each test, it will be necessary to ensure the launch position/angle are clearly defined (relative to the vehicle) and additional steps may be needed to ensure the impact corresponds to a specific location on the vehicle hood.



Single Point of First Contact with Multiple Measuring Points



Single Measuring Point with Multiple Points of First Contact



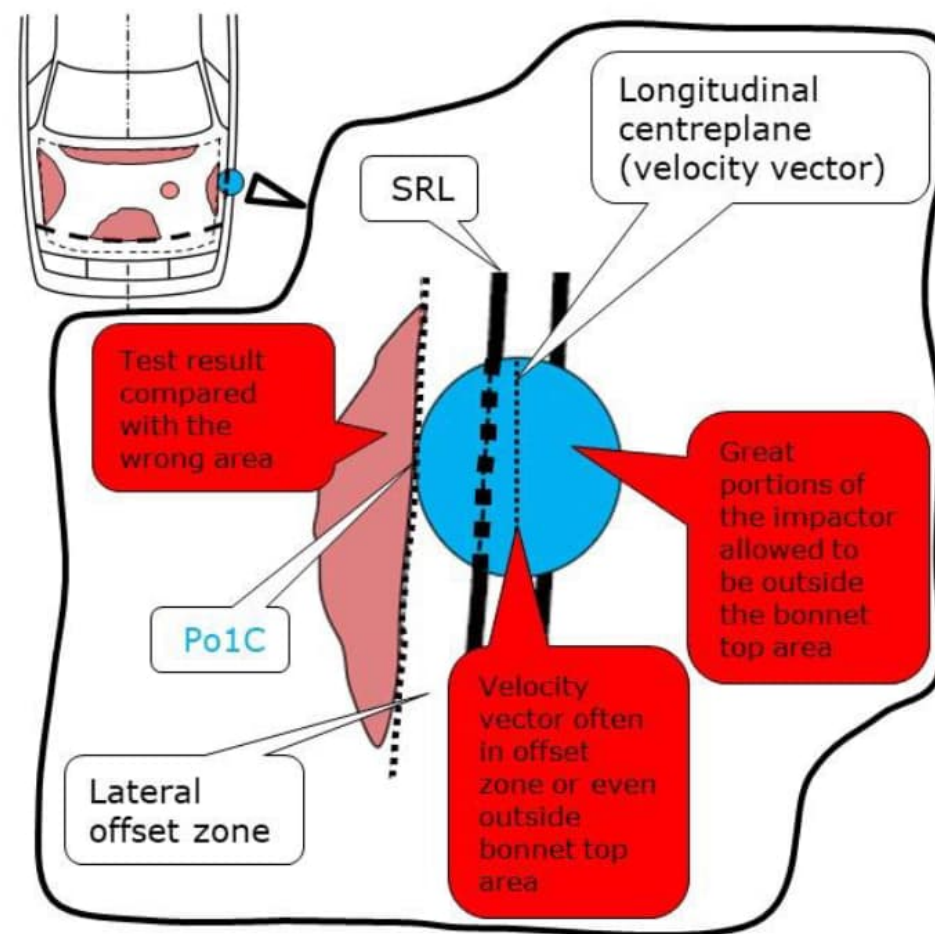
Vehicles with different hood designs can be tested in the same way using the MP method versus 3D POFC

#2 - Defining the Head Impact Point – Concerns with NHTSA Targeting Protocol

- **We are supportive of the 2D measuring point method** (proposed by OICA and in GTR No. 9 Amendment 3) to enhance the positioning of the head impactor for assessing pedestrian injury risk.
- **It provides a straightforward, objective, repeatable, and reproducible method for compliance testing and evaluation.** Conversely, the 3D Point of First Contact method (3D POFC and currently in GTR No. 9) does not achieve these goals and likely introduces additional and unnecessary complexity.
- **We therefore strongly urge the agency to adopt the 2D approach:**
 - Significantly more straightforward,
 - Limits unnecessary test burden,
 - Insures repeatability and reproducibility,
 - Better guarantees that impacts occur within defined testable areas
 - More closely aligned with the intent of GTR No. 9.

#3 - Consideration for Impacts Outside the Defined "Child and Adult Test Areas"

- Auto Innovators is concerned that the agency test procedures may not appropriately consider the significant impact on vehicle designs should it propose a test procedure that includes impacts outside of the defined HIC 1000/1700 zones (i.e., where the point of first contact is along the side reference line, but a substantial portion of the head impactor engages with structures outside the established test zone).



#3 - Consideration for Impacts Outside the Defined "Child and Adult Test Areas"

- This interpretation inappropriately expands the testable area beyond the intended scope of GTR No. 9.
- While the agency's rationale is that "this method engages more structural members along the extreme periphery of the prescribed zone and therefore could provide more benefit to pedestrians in harder vehicle areas," it is not reasonable or practicable to adopt such a requirement given that these structures are necessary to support the position of the hood system during normal operation, provide access during maintenance and repair, or maintain reasonable integrity during vehicle crash testing.
- **Any cost-benefit analysis should include a comprehensive assessment of the impact of regulation on existing vehicle designs, compared to if the agency were to simply adopt the requirements of GTR No. 9 as implemented in other regions.**

Conclusion

- We remain supportive of efforts to address pedestrian safety; however, we have significant concerns should the agency seek to implement performance requirements inconsistent with GTR No. 9.
- While we recognize that the exact language used in the GTR is open to interpretation by the agency, the application and implementation of the standard globally, is not.
- Adopting an approach that is inconsistent or based on a unique interpretation of the GTR No. 9 requirements creates the potential for long-term international regulatory misalignment, which is counter to the intent of the GTR process, and the spirit of the directive issued by Congress in the recently passed Bipartisan Infrastructure Law.
- We therefore strongly urge the agency to harmonize any proposed pedestrian protection standard with those already being *implemented* in other regions.

Conclusion

- If the NPRM differs in terms of how GTR No. 9 has been adopted and implemented in other regions, we strongly urge the agency to include a comparative regulatory analysis that evaluates:
 - The comparative cost-benefit of simply adopting the current GTR No. 9 requirements (as implemented in other regions), versus the agency's proposal.
 - The extent to which any differing requirements may introduce new, and potentially significant costs for consumers in terms of the need for US-specific vehicle and hood designs, including the extent to which the NPRM may limit manufacturer's ability to reduce costs to consumers by leveraging global vehicle platforms that already meet GTR 9 requirements in other markets – including those designed to help meet electrification goals by enabling more affordable EV options to reach consumers sooner.
 - The extent to which any anticipated front-end redesign could impact the cost of vehicle compliance with other FMVSS, including both safety and fuel-efficiency requirements that be affected due to changes in the vehicle shape/front end profile.