

June 24, 2024

Ms. Sophie Shulman, Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

Subject: Supplemental Comment
Automatic Emergency Braking (AEB) and Pedestrian Automatic Emergency Braking (PAEB)
FMVSS 127 Final Rule (Docket No. NHTSA-2023-0021, published on May 9, 2024)

Dear Ms. Shulman,

This letter suggests additional considerations for the AEB/PAEB Final Rule that was published on May 9, 2024. The Alliance for Automotive Innovation is petitioning for reconsideration of several aspects of the rule. This letter provides Hyundai Motor Group's (Hyundai) perspective on the performance requirements of the new FMVSS 127.

Two provisions of the rule are interrelated and directly determine the practicability of FMVSS 127. These are: (1) The no-contact performance criterion for the specified AEB/PAEB tests, and (2) The no-fail criterion for an unbounded number of runs for each test. Both are discussed below:

No-Contact Performance Criterion

For each of the AEB and PAEB tests specified in FMVSS 127, the core performance criterion is no-contact with the target vehicle/pedestrian. Clearly no contact is the preferred outcome, particularly as it relates to the pedestrian tests. Nevertheless, it is essential to keep in mind that contact versus no-contact is very much an artifact of the test conditions. The no-contact criterion, combined with the other test parameters of FMVSS 127, exceed the threshold of practicability for AEB/PAEB performance.

Accordingly, allowable contact with the vehicle/pedestrian targets of up to 10 km/h would be appropriate. The basis for this allowable contact speed is found in the standard itself. Namely, FMVSS 127 states that AEB is not required to function at speeds below 10 km/h. This is an appropriate exemption for very low-speed operation and is consistent with the approach for other chassis control features such as electronic stability control. By permitting AEB to be non-operational below 10 km/h, FMVSS 127 already recognizes the possibility that a driver may unintentionally strike another road user at that speed. Allowing for equivalent low-speed contact (up to 10 km/h) during the performance tests will enhance the internal consistency of the standard. More important, allowing very low-speed contact will preserve the safety benefits of the standard since contacts of less than 10 km/h, even with pedestrians, are unlikely to result in serious or fatal injuries.

No-Fail Acceptance Criterion

FMVSS 127 requires that every test run (across an unbounded number of runs) for each test condition must meet the no-contact performance criterion. To satisfy its responsibility, manufacturers must build in substantial margins of compliance beyond the performance specified in FMVSS. The magnitude of the necessary margin directly depends on the sources and magnitude of variability that influence test outcomes. Unlimited test runs are not practicable. FMVSS 135 provides a relevant example and a

practicable solution. That standard specifies stopping distance requirements across a range of test conditions. Importantly, for most of the test conditions, FMVSS 135 specifies six test runs, only one of which is required to meet the applicable stopping distance for purposes of demonstrating compliance. This one-out-of-six provision accounts for the many sources of variability that can affect stopping distance performance. These include vehicle-to-vehicle differences, run-to-run variability, tire, brake and road surface friction variability, environmental conditions, etc. In addition to accounting for variability, the one-of-six provision recognizes that optimizing a vehicle for one braking test condition can involve tradeoffs with other test conditions, such that the whole braking system needs to be balanced across a range of FMVSS test and real-world operating conditions.

The situation with FMVSS 127 is analogous. The essence of AEB/PAEB is braking. In addition to the sources of stopping distance variability, AEB/PAEB involves additional variability that is absent from FMVSS 135. Given these many sources of variability, the manufacturer's responsibility to certify every vehicle to every requirement necessitates substantial margins of compliance. The agency's own testing has demonstrated the significant variability of AEB/PAEB testing, and other comments to the docket have described the statistical implications of this variability on necessary compliance margins for certification.

Accordingly, NHTSA would be justified in adopting the FMVSS 135 precedent for a minimum of one-of-six passing test runs for certifying compliance or essentially limiting the number of tests as IIHS does during their testing of AEB. However, as a practical matter, Hyundai suggests that three-of-five passing runs for each test condition would adequately accommodate the variability of AEB/PAEB performance testing.

Hyundai Supplemental Comments

We believe that the above discussion provides sound logic and justification for both additional considerations regarding FMVSS 127. Accordingly, we ask NHTSA to consider modifying FMVSS 127 by pairing the 10 km/h contact allowance with a three-of-five test run allowance. We strongly believe that doing so will serve the interests of NHTSA, manufacturers, consumers, and motor vehicle safety.

Thank you for your consideration. If you have any questions or if additional information would be helpful, please let me know.

Sincerely,



Brian Latouf
President & Global Chief Safety & Quality Officer
Hyundai Motor Group