



K-CRASH 2025



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Key Words : Event data recorder(사고기록장치), Data Storage System for Automated Driving(자율주행 정보 기록장치), Advanced Driver Assistance Systems(첨단 운전자 보조 시스템), Edge Case(극단적 사례)

ABSTRACT

In accordance with the governments mobility innovation roadmap, Level 4 automated buses have been operating at Cheonggye-cheon since the end of last September. However, there is still insufficient research on verifying the reliability of EDR and DSSAD data and on Edge cases, which are crucial for clearly determining liability and analyzing the cause of accidents involving automated vehicles. In particular, there is no programs at all in Korea that are privately-led, publicly verified, mutually share information, and provide professional education on recorded data. To address this, the K-CRASH, which is being jointly promoted by the automotive industry, academia, and research institutes in Korea, has been launched. The first program was a seminar held from July 21-22, 2025, at KART(Korea Automobile Insurance Repair Research & Training Center) on the topic of “ADAS & EDR Accident Analysis and Improving Perception of Intentional Accidents”; it also involved a comparative analysis of FCA(Forward Collision Avoidance) data recorded on the EDR and actual vehicle data in car-to-car collision scenarios. The second program was held from October 20-21, 2025, at KIAPI(Korea Intelligent Automotive Parts Promotion Institute) under the theme “Beyond Compliance-Real World AEB Failure Scenarios”; it aimed to raise public awareness of traffic safety by introducing the superior technologies of ADAS and demonstration ‘edge cases’ where real-world accidents can occur even if regulations are met. The K-CRASH is expected to become a platform for cooperation among industry, academia, research institutes, and government to establish the reliability of automated vehicles and to formulate policies. It is anticipated that it will serve as a foundation for building a safer automated driving environments.

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Performance Evaluation of ADAS for Heavy Goods Vehicles Based on Real-World Accident Data

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Key Words : Heavy Goods Vehicles(화물자동차), Autonomous Emergency Braking(자동비상제동장치), Real-world Crash Analysis(실사고 분석), Performance Evaluation(성능평가)

ABSTRACT

The Autonomous Emergency Braking (AEB) system is a core advanced safety technology that uses sensors and cameras to prevent accidents. An analysis of automobile insurance statistics from 2021 to 2024 revealed that although heavy goods vehicles (HGVs) over 3.5 tons account for a relatively small share of crashes, they represent the highest proportions of severe injuries and fatalities. As of 2024, the AEB installation rate in domestic trucks was only 14.2%, and pedestrian-detection functions were mostly limited to light trucks, with very limited application in HGVs.

This study analyzed 6,255 real-world crash videos to classify accident types and conducted AEB performance tests using an HGV (Hyundai Mighty, 4-ton, 2023 MY). Among 3,696 HGV-to-vehicle crashes, more than half (51%) were rear-end collisions, many of which occurred while the struck vehicle was braking. In 2,559 HGV-to-pedestrian crashes, pedestrian crossing during vehicle turning accounted for 52.9% of corner impacts, indicating a higher frequency than center impacts. Current AEB evaluation protocols assume pedestrian impacts during straight-ahead driving, considering both center and corner contacts. However, this turning situation is not well represented in current protocols, which focus on center impacts.

Performance tests were based on the Euro NCAP stationary target protocol, with additional scenarios including 25% overlap, oblique target conditions (15° and 30°), and inter-vehicle distances of 30m and 80m between the target and the HGV. Results showed that at 30m, only forward collision warning was activated and AEB was not activated, resulting in collisions. At 80m, collision avoidance was possible up to 70km/h with 100% overlap, while AEB was not activated under 50% or 25% overlap or oblique target conditions.

These findings suggest that current AEB systems for HGVs do not adequately reflect real-world crash conditions. Improvements in system performance and expansion of test scenarios are therefore necessary to enhance crash prevention and reduce societal costs.

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K-CRASH EDGE 2025 컨퍼런스 결과 및 향후 추진방향

이태희* · 엄준식** · 하상욱*** · 김기주**** · 이학주*** · 허진***

Outcomes and Future Directions of the K-CRASH EDGE 2025 Conference

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Key Words : Autonomous Emergency Braking(AEB), Advanced Driver Assistance System(ADAS), Crash Reconstruction, Event Data Recorder(EDR), Pedestrian Safety

ABSTRACT

Recent studies indicate that vehicles equipped with pedestrian detection-based Autonomous Emergency Braking (AEB) systems experience 9.5% fewer pedestrian crashes and 33.9% fewer fatalities than those without. These results confirm AEB's preventive effect, yet accidents still occur due to overreliance or system malfunction. Recognizing that compliance with Advanced Driver Assistance System (ADAS) regulations does not ensure safety in real driving conditions, the K-CRASH EDGE 2025 Conference was held to examine and reproduce accident scenarios that meet standards but can still result in collisions. The conference focused on AEB, conducting full-scale crash and reconstruction tests, Event Data Recorder (EDR) analyses, and simulation-based evaluations to assess system limitations. Expert lectures and discussions covered current AEB technologies and future research directions. While similar crash reconstruction conferences have been held abroad for decades, this event marks the first of its kind in Korea. It highlights the need for accident reconstruction training and certification programs and aims to advance pedestrian and occupant safety while improving public trust in autonomous driving safety technologies.

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페달 오조작 방지 기능 소개

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Introduction to Pedal Misapplication Prevention Feature

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Key Words : Pedal Misapplication Accidents(페달 오조작 사고)

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EDR 데이터의 다각적 신뢰성 검증을 통한 급발진 주장사고의 법공학적 분석

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Forensic Engineering Analysis of Alleged SUA Incidents: A Multi-faceted Approach to EDR Data Reliability Verification

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Key Words : SUA(급발진 주장사고), EDR(사고기록장치), Forensic Engineering(법공학), Reliability Verification(신뢰성 검증), Pedal Misapplication(페달 오조작)

ABSTRACT

Sudden Unintended Acceleration (SUA) is a phenomenon in which a vehicle rapidly accelerates at high power, independent of the driver's intent. It has become a significant social concern due to the severe casualties and property damage it causes, often leading to sharp legal disputes between drivers and manufacturers. According to the National Forensic Service (NFS), the number of analyzed SUA-claimed incidents peaked recently, rising sharply to a peak of 133 cases in 2024. However, the numbers have shifted to a downward trend, with 40 cases reported as of August 2025. This change suggests an enhanced public awareness of the importance of objective evidence, such as Event Data Recorder (EDR) data, and a more rational approach to the possibility of driver pedal misapplication. This statistical trend is reinforced by the case-by-case findings: of the 396 cases analyzed by the NFS from 2021 to August 2025, none have been concluded as SUA caused by a vehicle defect, while pedal misapplication was identified in 340 of these cases (86%). The remainder were inconclusive due to severe vehicle damage or the absence of EDR data. Given this statistical background and the ongoing public debate, this presentation introduces the multi-faceted cross-validation methodology that the NFS applies to verify the objective reliability of EDR data. The key validation processes include: (1) comparing RPM change patterns through black box sound spectrogram analysis, (2) cross-validating brake signals from EDR with external footage such as CCTV, (3) conducting accident reconstruction simulations using EDR data, and (4) performing dynamic reliability tests of EDR data through actual vehicle testing. Therefore, by providing a detailed account of the NFS's systematic and scientific analysis process, this presentation seeks to clarify the evidentiary value of EDR data as engineering evidence and to provide a rational solution to the public controversy surrounding the SUA phenomenon.

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