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# 교통사고와 사고기록장치



## 급가속 유발 사고 사례분석

김송희\* · 이재형\* · 서민준\* · 한현서\* · 전우정\*\*

### Analysis of Accidents Caused by Sudden Acceleration

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**Key Words** : EDR data(EDR 기록), Driver's behavior(운전자의 운전행태), Dash cam video(차량용 블랙박스 영상), CCTV video(CCTV 영상), Sudden unintended acceleration(급발진)

#### ABSTRACT

Even a vehicle that is temporarily stopped under normal circumstances can experience a sudden acceleration situation due to driver misjudgment or operational errors. In this case study, the accident vehicle was thoroughly examined, and the driving situation of the accident vehicle was meticulously analyzed using dashcam video, CCTV footage from the accident scene, and other sources. This study introduces that the sudden acceleration situation of the accident vehicle can be attributed to driver misjudgment or operational errors rather than any vehicle defects.

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## 모두를 위한 사고기록장치

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### Event Data Recorder for Everyone

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**Key Words :** Electrified vehicle(전동화 차량), Sudden unintended acceleration(급발진), Event data recorder(사고기록장치), Traffic accident investigation(교통사고조사)

#### ABSTRACT

In accordance with statistical data from the Ministry of Land, Infrastructure and Transport for the year 2022, the registration figures for electrified automobiles are experiencing a substantial surge. This trend is particularly discernible in the augmented market presence of hybrid vehicles, totaling 1,170,507 units, and electric vehicles, with 389,855 units registered. Concomitant with this trend is the persistent occurrence of accidents featuring allegations of unintended abrupt acceleration in electric vehicles, colloquially termed "suspected sudden acceleration accidents". These events have resulted in a considerable number of casualties and have become a focal point of contemporary societal discourse.

In the United States, the National Highway Traffic Safety Administration(NHTSA) introduced 49 CFR Part 563 on September 1, 2012. This regulation serves to recommend the incorporation of Event Data Recorders(EDR) within vehicles and to prescribe standardized data formats. In the Korean context, a commensurate enforcement decree mirroring the provisions of Part 563 was instituted on December 19, 2015. Under the purview of this EDR enforcement decree, the retrieval of a driver's operational records antecedent to an event has been made feasible. Consequently, EDR-generated reports are employed for the purposes of scrutinizing driver conduct and evaluating vehicle status, especially in scenarios implicating suspected sudden unintended acceleration(SUA).

Regrettably, divergent from international norms, South Korea lacks dedicated institutions or professional societies tasked with deliberating upon core facets such as the assessment of EDR reliability, the provisioning of specialized training, and the conduction of crash testing related to EDR. This vacuum in expertise has precipitated disputes wherein parties entangled in accidents contend that EDR data are bereft of credibility. Consequently, a pressing exigency arises to institute mechanisms assuring the veracity of EDR data.

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## 자율주행 교통사고 조사체계 수립방안 연구

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### Establishment of Automated Driving Traffic Accident Investigation System

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**Key Words :** Automated driving(자율주행), Traffic accident(교통사고), Investigation item(조사항목), Investigation procedure(조사절차), Investigation system(조사체계)

#### ABSTRACT

Automated driving technology is advancing, and there is a growing trend in the use of automated vehicles. However, along with the increasing demand for automated vehicle usage, there is also a rising trend in automated driving car accidents. In Korea, an accident investigation committee has been established to prepare for automated driving accidents, but it appears to primarily focus on information collection. Additionally, while provisions for actions in the event of automated driving car accidents have been made, there is a lack of provisions regarding investigation items. Therefore, there is a need to establish an automated driving car accident investigation system from a criminal investigation perspective.

In this study, to establish an automated driving car accident investigation system, the following steps were taken: 1)Review of domestic and international traffic accident investigation systems, 2)Identification of limitations and areas for improvement when introducing automated driving, 3)Definition of investigation items and procedures for automated driving car accidents.

Furthermore, in this study, the automated driving car accident investigation system, developed through input from traffic accident investigation professionals and experts, was revised and enhanced. Ultimately, this study identified a total of 5 human-related investigation items, 26 vehicle-related investigation items, and 9 road environment-related investigation items in response to the introduction of automated driving technology.

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## 자율주행기술 발전에 따른 사고기록장치의 현황

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### Accident Recording Device Status with Autonomous Driving Technology Progress

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**Key Words :** Autonomous driving(자율주행), Accident recording device(사고기록장치), EDR, DSSAD, Standard(표준)

#### ABSTRACT

In accordance with Article 55 of the Transportation Safety Act (installation of driving record devices and use of driving records, etc.), electronic driving recorders (DTG: Digital Tacho Graph) have been installed on commercial vehicles such as taxis, buses, and cargo since January 1, 2014. It is mandatory to be installed, and EDR-related regulations have been implemented in accordance with Article 29-3 of the Automobile Management Act (installation of accident recording devices and provision of information) since December 19, 2015, based on the U.S. NHTSA 49 CFR Part 563. Recently, accident recording device regulations are changing, including recording the operational status of ADAS, and in particular, the autonomous driving recorder (DSSAD: Digital Storage System of Automating Driving) is being standardized through UN-ECE. With the development of electrical and electronic technology related to automobiles, data items stored in accident recording devices reflect ADAS technology and include the items necessary for traffic accident investigation. Among these, this study discusses and proposes the storage of data that can estimate brake pedal effort or braking force in an accident recording device by comparing braking force and driving force in relation to whether or not the brake pedal is activated in recent sudden acceleration accidents.

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## V2X 기반 기본 안전 메시지를 활용한 자율주행차 사고재현 및 분석 연구

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### A Study on Autonomous Vehicle Accident Reconstruction and Analysis Using V2X-Based Basic Safety Message

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**Key Words :** Automated Vehicle(자율주행자동차), Accident Reconstruction(교통사고재현), V2X(차량사물통신), BSM(기본안전메시지), EDR(사고기록장치), DSSAD(자율주행기록장치), DTG(디지털 운행기록장치)

#### ABSTRACT

When a car crash occurs, we analyze the traffic accident based on various data and identify the cause of the accident. Currently, we have been using video black boxes, CCTV, EDR, and DTG to reconstruct and analyze traffic accidents. In particular, we are considering using driving record data stored in DSSAD to analyze traffic accidents related to autonomous vehicles. In Republic of Korea, as of 2022, 258 temporary operating licenses of autonomous vehicles for autonomous driving have been issued and are being piloted on the road, and accidents with these autonomous vehicles occur frequently. We think that it will not be easy to reconstruct and analyze the perception, judgment, control, and control transition of an autonomous vehicle using existing accident analysis methods alone. In addition, as recent autonomous driving technology is moving towards convergence autonomous driving based on V2X communication, the need to utilize V2X-based data for analysis has increased. In this study, we studied how to define and utilize the data necessary to reconstruct and analyze accidents using V2X-based BSM. By using BSM, it is expected that it will be possible to increase the precision of investigations in reconstructing and analyzing traffic accidents through DSSAD and image information in the future.

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