

## Event Data Recorder and Data Storage System for Automated Driving (FG – AI4AD) 16 SE 2020



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# Contact Information

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# SAE EDR Committee

- Established in 2003
- Roster contains 96 people with expertise in:
  - Vehicle Manufacturing (13 different companies)
  - Airbag Control Module Design (7 different companies)
  - Accident Reconstruction (13 individuals)
  - Research (8 individuals)
  - EDR Tool Manufacturer (1 individual)
  - Liaison (9 individuals)
  - SAE Staff (9 individuals)
- Over half of committee voting members have been participating for 10+ yrs.

# SAE EDR Committee Standards

- SAE J1698 - Event Data Recorder - Updated May 2014
- SAE J1698-1 - EDR - Output Data Definition - Updated May 2018
  - Added data elements relative to Automated Driving Systems
- SAE J1698-2 - EDR - Retrieval Tool Protocol - Reaffirmed March 2018
- SAE J1698-3 - EDR - Compliance Assessment - Revised December 2015
- SAE J3197 - Automated Driving System Data Logger - Published April 2020
  - Governs data element definitions
  - Provides a minimum data element set
  - Specifies a common ADS data logger record format

# Event Data Recorder J1698\_201703

This recommended practice describes common definitions and operational elements of Event Data Recorders. The SAE J1698 series of documents consists of the following:

- SAE J1698-1 - Event Data Recorder - Output Data Definition; Provides common data output formats and definitions for a variety of data elements that may be useful for analyzing vehicle crash and crash-like events that meet specified trigger criteria.
- SAE J1698-2 - Event Data Recorder - Retrieval Tool Protocol; Utilizes existing industry standards to identify a common physical interface and define the protocols necessary to retrieve records stored by light duty vehicle Event Data Recorders (EDRs).
- SAE J1698-3 - Event Data Recorder - Compliance Assessment; Defines procedures that may be used to validate that relevant EDR output records conform with the reporting requirements specified in Part 563, Table 1 during the course of FMVSS-208, FMVSS-214 and other applicable vehicle level crash testing.

# Truck & Bus EDR Committee

## **Heavy Vehicle Event Data Recorder (HVEDR) Standard – Tier 1** J2728\_201006

### ***WIP:***

This Recommended Practice (RP) document applies to Heavy Vehicle Event Data Recorders (HVEDR) for heavy-duty (HD) ground wheeled vehicles over 4545 kg (10 000 US pounds), commonly referred to as Class 3-8, which are intended to be compliant with current Federal Motor Vehicle Safety Standards (FMVSS) and/or Federal Motor Carrier Safety Regulations (FMCSR). In the context of the J2728 RP, the term heavy vehicle refers to motor vehicles equipped with one or both of the following vehicle communication networks: SAE J1708/J1587 or SAE J1939. This document is focused primarily on wheeled vehicles with standard on-board power supplies (e.g., batteries). It is intended to address the needs of OEM original, OEM modified/additive, and aftermarket systems. It does not specifically exclude trailers and similar non-engine powered vehicles, even though the current lack of standardized methodologies and processes for inter-vehicular communication and power supply interconnections remain unresolved.

# Motivation – *the NHTSA letter*

...Our analysis suggests that the ADS ecosystem would benefit greatly from the development by SAE International of validated Standards establishing:  
1) standard data elements for crash Reconstruction purposes, ...



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration



September 15, 2017

Mr. Pokrzywa:

Thank you for your continued work in furtherance of the safe testing and deployment of Automated Driving Systems (ADS). SAE International has been a key stakeholder in this and other critical highway safety efforts. As NHTSA considers the safe integration of ADS into our transportation system, I am writing to highlight the vital importance of SAE International's role in helping to achieve this common goal.

Over the past year, NHTSA has evaluated public comments to the September 2016 Automated Vehicle Policy. Our analysis suggests that the ADS ecosystem would benefit greatly from the development by SAE International of validated standards establishing: 1) standard data elements for crash reconstruction purposes; 2) clear and concise definitions of parameters regarding operational design domain; and 3) performance tests suitable for variable performance ADS testing. As you know, NHTSA routinely considers and frequently adopts significant portions of SAE International's excellent standards in connection with its promulgation of Federal Motor Vehicle Safety Standards through the equitable and transparent mechanisms provided for in the Administrative Procedures Act.

I have great confidence in your organization's ability to facilitate a diverse group of stakeholders in a productive and transparent manner. I look forward to meeting with you to discuss this matter further. Ms. Debbie Sweet of my staff will contact you shortly for scheduling purposes. If you have any questions in the meantime, please feel free to contact Ms. Sweet or me at 202-366-7179 or 202-366-0938, respectively.

Sincerely,

Nathaniel Beuse  
Associate Administrator for  
Vehicle Safety Research

Cc: Mitch Bainwol, Alliance of Automobile Manufacturers  
John Bozella, Global Automakers  
Jed Mandel, Truck and Engine Manufacturers Association  
Steve Handschuh, Motor and Equipment Manufacturers Association  
Keith Wilson, SAE International

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## ***Surface Vehicle Recommended Practice*** **“Automated Driving System Data Logger”**

- **Scope**
- **References**
- **General Terms and Definitions**
- **ADS Data Logger Specific Definitions**
- **Recommended Minimum ADS Data Logger Data Elements**
- **Data Element Definitions**



# Overview / Purpose

ADS data loggers record the specified data recording elements for the purpose of understanding the salient operating environment of an ADS-operated vehicle (as captured by the ADS), and the subsequent vehicle motion control actions taken by the ADS, leading up to an event that meets the trigger threshold criteria specified in this document. Creating standard definitions for the data elements in the ADS data logger record report supports this purpose.

# Document Intention

This recommended practice provides common data output formats and definitions for a variety of data elements that may be useful for analyzing the performance of automated driving system (ADS) during an event that meets the trigger threshold criteria specified in this document.

The document is intended to govern data element definitions, to provide a minimum data element set, and to specify a common ADS data logger record format as applicable for motor vehicle applications.

# Reference Documents

**SAE J211-1: Instrumentation for Impact Test – Part 1 – Electronic Instrumentation**

**SAE J670: Vehicle Dynamics Terminology**

**SAE J1698: Event Data Recorder**

**SAE J1050: Describing and Measuring the Driver's Field of View**

**SAE J1698-1: Event Data Recorder – Output Data Definition**

**SAE J2331: Operator's Field of View – Engineering Evaluation**

**SAE J3016: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicle**

# Data Elements

The data elements defined in this document are unique to Levels 3, 4, or 5 ADS features, as defined by SAE J3016, and provide additional background of the events leading up to a crash or crash-like event.

The data from sensors such as camera(s), LiDAR(s) etc. will provide information in the absence of a human driver.

The data included in the ADS data logger is expected to be used in conjunction with the SAE J1698 EDR record and traditional accident reconstruction analysis.

The event data recorder (EDR) and ADS data logger will capture information leading up to the triggered event, at a minimum.

# Comments & Questions

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