



SURFACE VEHICLE RECOMMENDED PRACTICE

J2728™-1

JUN2020

Issued

2020-06

Heavy Vehicle Event Data Recorder (HVEDR) - Data and Triggers

RATIONALE

This document contains information that was previously part of SAE J2728 (June 2010) and specifically focuses on outlining: (1) a minimum set of data elements and their format, and (2) definitions for heavy vehicle-specific triggers for event data recording.

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Full document details: SAE J2728-1_202006

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Documents

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1. SCOPE

This document provides a list of data elements and event triggers for recording of event data relevant to crash investigations for heavy vehicles. The list of data elements includes recommended source(s) and formatting.

1.1 Purpose

This document provides design and performance recommendations needed to develop an HVEDR with minimum capabilities. It is not intended to prevent, constrain, or limit additional capabilities, which could be combined or contained in any current or future HVEDR as long as the minimum design and performance capabilities described herein are maintained.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1939-71	Vehicle Application Layer
SAE J2728	Heavy Vehicle Event Data Recorders (HVEDR)

2.1.2 Other Applicable Publications

IETF RFC 4180, Common Format and MIME Type for Comma-Separated Values (CSV) Files, Internet Engineering Task Force (IETF) Request for Comments (RFC) 4180, <http://tools.ietf.org/html/rfc4180>, October, 2005, accessed December 2007.

TMC RP1210 A/B Windows Communication API

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1698	Event Data Recorder
SAE J1698-1	Event Data Recorder - Output Data Definition
SAE J1698-1A	Pedestrian Protection EDR Output Data Definition, Appendix to SAE J1698-1 Event Data Recorder - Output Data Definition
SAE J1698-2	Event Data Recorder - Retrieval Tool Protocol
SAE J1698-3	Event Data Recorder - Compliance Assessment

2.2.2 Other Related Publications

TMC RP1214 Guidelines for Event Data Collection, Storage and Retrieval

3. TECHNICAL REQUIREMENTS

3.1 Event Trigger

The event trigger is a set of criteria, which, if met, cause an HVEDR event record to be saved to non-volatile memory. The HVEDR should save an event record if any of the following sets of conditions occur:

- **Acceleration trigger:** Vehicle speed changes at a rate higher than the programmable threshold set between 8.0 km/h/s (5.0 mph/s) and 22.5 km/h/s (14.0 mph/s). The vehicle speed change can be either positive or negative, and persists beyond that threshold for at least 0.5 second. The acceleration event start will be the time that the threshold is crossed. A common threshold setting is 11.3 km/h/s (7.0 mph/s).
- **Last stop trigger:** The intent of this trigger is to capture an event when the vehicle has come to a complete stop for a period of time. The last stop event start will be the time the threshold is crossed. A suggested threshold is when the vehicle speed falls below 3.0 km/h (1.9 mph) for 15 seconds or more. To prevent last stop events from being overwritten due to the movement of the vehicle after an incident of interest, the last stop trigger cannot reoccur until the vehicle speed reaches a speed of 24.0 km/h (14.9 mph) or more for a minimum of 6 seconds. The act of turning the ignition off will not directly trigger a last stop event. See also the discussion in 3.2.2 regarding the last stop event buffer.
- **Safety system trigger:** Systems that are installed for control or driver alerts from safety systems should trigger an event record. Recommended trigger signals from known systems are listed in Table 1:

Table 1 - Safety systems triggers

System	Message	Trigger
Safety restraint system	PGN 61483/SPN 4973 CN.Crash Type	Non-zero crash type
ABS system	PGN 61441/SPN 563 EBC1.ABSActive	ABS active
Adaptive cruise control/automated braking	PGN 64964/SPN 2918 EBC5.XBR Active Control Mode	External brake request
Electronic stability control	PGN 65103/SPN 1819 VDC1.YCBrakeControl = 1 PGN 65103/SPN 1818 VDC1.ROPBrakeControl = 1	Yaw control or roll over brake control

NOTES:

1. The recommended default 11.3 km/h/s (7.0 mph/s) acceleration trigger is specified for typical on-highway heavy truck applications. Recognizing that other vehicle configurations, applications, or vocations may require adjustment to the event trigger vehicle speed rate of change, the rate may be programmable within the range per the above specifications. The 0.5 second persistence requirement remains in effect over the allowable range of the programmable event trigger and is intended to reduce "false" events from noise in the VSS signal. The HVEDR should include appropriate filtering to avoid triggering extraneous events due to ABS cycling.
2. The VSS is not always an accurate representation of the velocity of the chassis relative to the ground.
3. The suggested threshold persistence of 15 seconds for the last stop trigger is to reduce the number of write cycles to non-volatile memory for stops that are very short duration. It is not intended to prohibit the recording of shorter duration stops.