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StandardGuide for the Collection of Non-Volatile Memory Data in Evidentiary Vehicle Electronic Control Units[1]

This standard is issued under the fixed designation E2493; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide sets forth recommendations for the collection of non-volatile memory data from vehicle Electronic Control Units (ECUs), or Event Data Recorders (EDRs), that have allegedly been involved in an event or incident that is the subject of litigation.

1.2 The data collection methods used to retrieve data from the subject ECU or EDR include commercially available scan/interrogation/test tools and also include proprietary scan/interrogation/test tools with prior agreement of the parties involved.

1.3 Additional, and potentially applicable, standards promulgated by ASTM Committee E-30 on Forensic Sciences include: Practices E860 and E1188.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E860 Practice for Examining And Preparing Items That Are Or May Become Involved In Criminal or Civil Litigation

E1188 Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator

3. Significance and Use

3.1 This guide sets forth recommendations for the collection of non-volatile memory data from a vehicle ECU or EDR that, to the extent possible, do not alter the data being collected.

3.2 This guide sets forth recommendations for the collection of non-volatile memory data from a vehicle ECU or EDR that, in the case where data may be altered during the collection process, informs the parties involved of the risk and type of alteration that may occur.

4. Procedure

4.1 This section describes the specific guidelines recommended for the collection of non-volatile memory data stored in a vehicle ECU or EDR. Hereafter this will be referenced as "data collection".

4.2 A user of these guidelines who chooses to deviate from these guidelines is advised to obtain prior agreement from the involved parties.

4.3 Data collection is performed using commercially available tools and proprietary tools as agreed upon by the involved parties. It is always preferred to perform the data collection with the ECU or EDR installed and electrically connected to the subject vehicle.

4.4 If external to vehicle power is required, the involved parties should evaluate the vehicle and agree upon the most appropriate method. It is preferred to use all or some of the vehicle's electrical system to supply power to the ECU or EDR. If this is deemed not to be feasible by the involved parties, an external power source may be used.

4.5 Parts of the vehicle that are not in their "as-manufactured" condition that may alter the data during data collection may be replaced with appropriate parts to reduce or eliminate the possibility of data alteration during data collection.

4.6 The use of equipment and procedures to reduce or eliminate the possibility of data alteration during data collection is recommended under circumstances where it is necessary to electrically disconnect the ECU or EDR from the subject vehicle.

4.7 If it is required to mechanically disconnect the ECU or EDR from the subject vehicle, it is required that the integrity of the mechanical mounting be documented before such removal.

4.8 When commercially available tools are used for data collection, the methods and procedures recommended by the manufacturer (or authorized representative) of those commercially available tools should be followed, except that any

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

methods or features of the equipment which alter the ECU or EDR data should not be used.

4.9 When proprietary tools or procedures are used for data collection, those proprietary tools or procedures are to be agreed upon in advance by all parties. It is preferred that any proprietary tools or procedures be read-only, i.e., that the data collection tool will not have the capability of directly altering the data. If a proprietary tool or procedure is used that does have the capability to directly alter the data, the data altering features of the tool are not to be used. The specific protocol to be followed by the user of a proprietary tool should be provided in advance to, and agreed upon by, the involved parties.

4.10 It is important that the involved parties reach prior agreement regarding what data is to be provided and/or shared at the time of the data collection, and what data is to be provided and/or shared at a later time.

4.11 The provided and/or shared data can include all raw data collected, photo/video documentation of data displays on scan tools or laptop computers, hardcopies of raw data (if printing capability is available), and computer files of such data. This can also include any translations of raw data created by commercially available tools.

4.12 Some data translations may require proprietary tools or procedures that are not present at the time of the data collection. In such cases, subject to prior agreements, those translations will be shared when they become available.

4.13 If not automatically recorded by the data retrieval tool, for ECU/EDR units equipped with time/date/ignition counter recording capability, that value should be recorded. For any data collection using a PC, the PC time/date should be recorded.

5. Keywords

5.1 litigation; electronic control unit (ECU); event data recorder (EDR); non-volatile memory; non-volatile memory data; crash data; crash data recorder (CDR); EEPROM; EEPROM data