

SURFACE VEHICLE RECOMMENDED PRACTICE

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(R) Early Acquisition and Preservation of Information in a Motor Vehicle Crash

RATIONALE

This document has been revised with editorial changes suggested by a review by the Data Collection and Archiving Standards Committee. This document has been revised to include technological advancements within the field of accident investigation.

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1. SCOPE

The purpose of this SAE Recommended Practice is to offer simplified and prioritized guidelines for collecting and preserving on-scene data related to motor vehicle crashes. It is intended that these guidelines improve the effectiveness of data collection, which will assist subsequent analysis and reconstruction of a particular crash.

This document is intended to guide early data collectors whose objectives include documenting information related to the crash. It may be used by law enforcement personnel, safety officials, insurance adjusters and other interested parties.

This document identifies categories of scene physical features that deteriorate relatively quickly and recommends documentation task priorities. Detailed methods of collecting data are not part of this document. However, some widely used methods are described in the references in Section 2.

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

Tumbas, N., Gilberg, A., and Fricke, L., "Minimum Guidelines for Efficiently Acquiring or Preserving Basic Information in a Motor Vehicle Accident," SAE Technical Paper 880067, 1988, <https://doi.org/10.4271/880067>.

2.1.2 Other Publications

Baker, J. S. and Fricke, L. B., Traffic Accident Investigation, 11th Edition, Northwestern University Center for Public Safety, 2014.

Rivers, R. W., Training and Reference Material for Traffic Crash Investigation, 3rd Edition, Revised, Institute for Police Technology and Management, 2010.

3. IDENTIFYING EVIDENCE

Types of evidence ordinarily found at the scene of a motor vehicle crash may be classified as follows:

3.1 Positions of Vehicles

Which includes cars, trucks, trailers, bicycles, motorcycles, etc.

3.2 Places where Dead or Injured Persons Lie

After the crash, particularly if they are outside of vehicles.

3.3 Gouges

Deep displaced road or other surface material often caused by contact by a substantial interaction with vehicle components.

3.4 Scratches and Scrapes

Evidence of contact between the pavement or other surface material and vehicle components that has not been significantly displaced.

3.5 Tire Marks

Evidence deposited onto the pavement or other surface by a tire on a vehicle. These marks may include tire friction mark(s), tire imprint(s), scrub mark(s), skid mark(s), yaw mark(s) acceleration scuff(s) and flat tire mark(s).

3.6 Scars

Evidence that the pavement or other surface has been damaged by a crash. Scars may include furrows, ruts and burn scars from a vehicle fire.

3.7 Debris

Various materials not originally at the scene; such as underbody dirt or snow, loose vehicle glass and parts, vehicle fluids, personal belongings, blood, body tissues, etc.

3.8 Objects

Objects originally on or near the road, which were broken or contacted as a result of the crash.

3.9 Seat Belts

In order to preserve evidence of use, it is recommended that the occupant seat belts not be cut except where necessary to extricate accident victims. Recovery personnel should not be allowed to use seat belts to restrain ajar or damaged doors.

3.10 Electronic Vehicle Evidence

Many modern vehicles are equipped with an event data recorder (EDR) which may store vehicle operation information leading up to and after a crash. These EDRs are typically found in passenger vehicles in the infotainment system, supplemental restraint (airbag) system, powertrain control system and/or rollover sensing system. These EDRs are typically found in commercial vehicles in the anti-lock braking system, collision avoidance system and/or engine control system. Many aftermarket electronic on-board recorders may also contain EDR functionality. Care should be taken to image this information or preserve it in such a way that it can be downloaded at a later date. This data should only be imaged by someone with the appropriate forensic training to do so.

3.10.1 Volatile EDR Data

The engine Electronic Control Unit (ECU) in some commercial vehicles contain an HVEDR (Heavy Vehicle Event Data Recorder as defined by SAE J2728) that record event data that may be related to the crash. The ECUs in certain vehicles equipped with Detroit Diesel, Cummins and Mack engines may only transfer this data to non-volatile memory after the ignition key has been placed in the 'off' position. For some engine ECUs, like those found in vehicles equipped with Detroit Diesel or Caterpillar engines, turning the ignition key into the 'on' position after the crash can introduce new diagnostic trouble codes (DTCs) and snapshots. These new DTCs and snapshot events may overwrite existing pre-crash data. For crashes involving heavy vehicles, the key should be placed into the 'off' position and not turned back on.

Some heavy truck engine ECUs record 'Last Stop' data, data pertaining to the last time the vehicle was driven. The HVEDRs that record Last Stop data are typically found in Detroit Diesel, International, Mack, Mercedes and Volvo engines. If a commercial vehicle is moved or driven from the scene, crash related data may be overwritten.

The powertrain control module (PCM) in some Ford, Lincoln and Mercury vehicles contain an EDR that records data in a continuous data buffer. This data may or may not be locked during a crash event. If electrical power is supplied to the PCM after a crash, this data may be overwritten. These PCMs may be found in model year 2003 to 2011 vehicles, including:

- Ford – 500, Crown Victoria, Econoline vans, Edge, Expedition, Explorer, F-Series pickup trucks, Freestyle, Fusion, Mustang, and Thunderbird.
- Lincoln – LS, Navigator, Mark LT, MKX, MKZ and Zephyr.
- Mercury – Grand Marquis, Milan, Montego and Mountaineer.

3.11 Video

Video captured by red light cameras, traffic cameras, vehicle mounted cameras (dash type cameras in private vehicles, fleet management systems, responding police vehicles), investigating officers body cameras, security cameras from nearby buildings and businesses, news/media, mobile devices of witnesses, etc.

3.12 Photographs

Photographs captured by police, witnesses, involved parties, EMS/Fire, tow personnel, etc.

4. PHOTOGRAPHING EVIDENCE

Photography (film or electronic/digital) and/or video should be used in the documentation of vehicle crashes. Photography is one of the least expensive items involved in the investigation of a crash, so, a simple guideline is, "When in doubt, photograph."

4.1 Photographic Priorities

When policy decisions or cost considerations limit the number of photographs, the photographic resources should be metered according to the following priorities:

- a. The Crash Scene, before traffic units, involved vehicles and people are moved.
- b. Evidence on and off the road (the crash site).
- c. Exterior of all involved vehicles. The order in which the vehicles are photographed is not crucial, as long as all of the vehicles are thoroughly documented photographically. If there is a possibility that the least damaged vehicle(s) could be moved or driven from the scene prior to the conclusion of the on-scene investigation, it has been suggested that the investigator begins photographing the least damaged vehicle and progress to the most damaged vehicles. The least damaged vehicles are also the most likely to be repaired or placed back into service.
- d. Interior of all involved vehicles. This includes the vehicle identification, certification and regular production option placards usually found in the driver's door jamb or inside the glovebox. This also includes the restraint system within the vehicle, any evidence of occupant contact with the interior of the vehicle, and any cargo within the vehicle.
- e. Other objects associated with the crash (e.g., child restraint seat).

These priorities are based upon the following considerations. The crash scene changes the moment the vehicles and victims are moved from their final rest positions. Because this information has a life span of minutes and is often critical to any reconstruction; the relationships of the vehicles to each other, to the roadway evidence and to fixed reference objects should be photographed first. Often, photographs taken for the purpose of documenting relationship of vehicles to each other and fixed references may be usable for documentation of the damage; but, unlike damage photographs, the scene photographs cannot be made at a later time.

It is often helpful to include a reference object (such as a yard stick or other item of known dimension) in the photographs to establish scale.

It is important to realize that the top priority is to record the relationship of vehicles to each other and fixed references (curbs, roadway edges, roadway striping, permanent roadway features such as signs, pavement features, nearby buildings and structures, etc.) and not to detail specific damages. Often, photographs taken for this purpose will be usable for documentation of the damage; but, unlike damage photographs, the scene photographs cannot be made at a later time.

Tire markings, fluid spills, and debris remaining on and off the road are usually the next items of evidence to be lost and are therefore listed as the second priority. Sometimes, the arrival of other vehicles disturbs or obliterates evidence. On other occasions, this information may last for days or weeks or, with some marking enhancements, months. Photographing these items along with the identification markings, discussed later, will enhance their visibility in the photographs and provide additional references for any follow-on investigation.