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Crash Data Retrieval From Air Bag Modules

***Dwayne Owen**, a certified accident reconstructionist, is experienced in reconstructing crashes involving all types of vehicles ranging from tractor-trailers and agricultural equipment to passenger vehicles, motorcycles and bicycles. Mr. Owen is trained in the extraction of ECM and ACM data and its analysis for forensic use. He has been certified as a Crash Data Retrieval System Operator through Vextronix since January, 2004 and has also trained in the operation and maintenance of heavy vehicle air brake systems and components through Bendix.*

As a retired Deputy Chief of the Freeport Police Department, Mr. Owen's training and twenty years of police experience involved all phases of police work; he has investigated in excess of 6000 motor vehicle crashes. He is co-author of the book, Vehicle Accident Investigation: A Guide for Risk Managers and Claims Personnel and a contributing author to both Truck Accident Litigation, Second and Third Editions published by the American Bar Association.

Mr. Owen has a commercial driver's license and is a graduate of the SOS Big Rig Driving School. He is a board certified forensic examiner, a professional evidence photographer and a former nationally certified Motorcycle Rider Course Instructor.

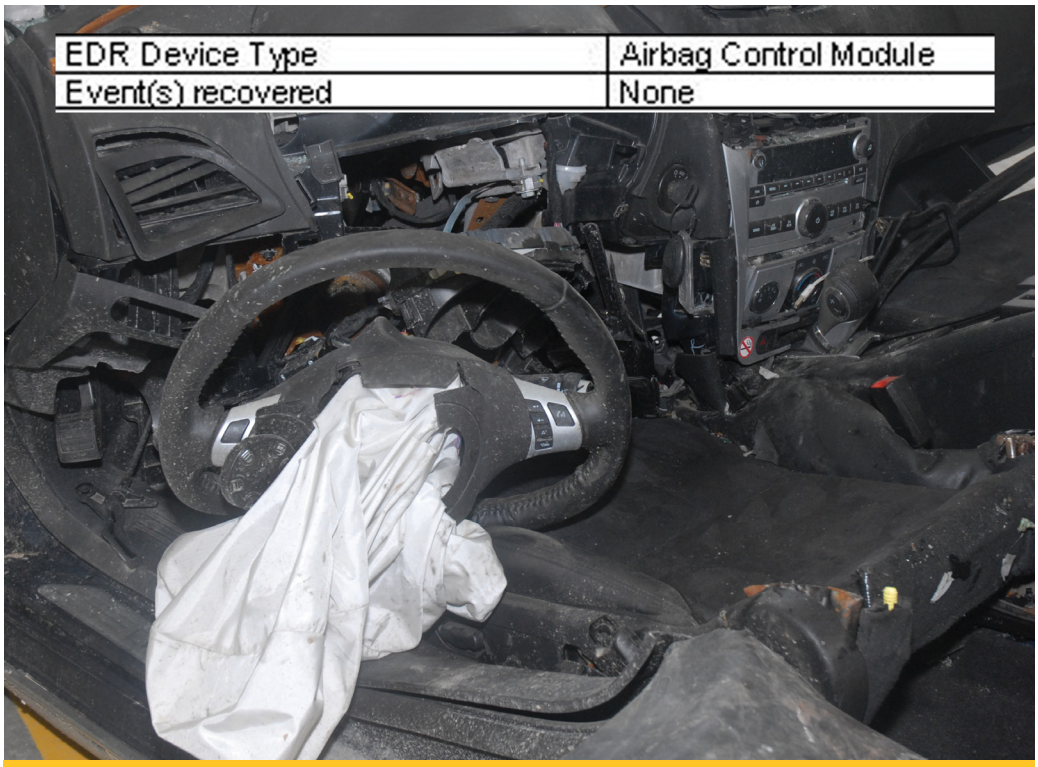
A significant number of cars and light trucks in use today contain some form of Event Data Recorder (EDR). When a crash occurs, it captures significant data about the events leading up to and during the crash. Ruhl Forensic has the capability to extract this data, as well as the knowledge and experience to analyze the data in your case.

There is no handbook or key to accompany an EDR report. Every EDR can record and output different information, and the investigator needs to evaluate the information in the context of a crash reconstruction. While the technology used to record and extract EDR data has been proven reliable, it is up to the expert reviewing the report to ensure its validity. Simply scanning the report and looking for pre-crash speeds sometimes doesn't tell the whole story.

Most passenger car and light truck EDR units are an integral part of the vehicle's airbag control module. They can record information about 3 types of events: a deployment event, a non-deployment event, and a deployment level event. Each one of these events can log similar sets of data. In many situations, a single crash can trigger any combination of these events.

On some vehicles, pertinent crash data is contained in other modules. Data can be stored in the vehicle's powertrain control module or in a separate roll-over sensor. In some cases, a vehicle may have crash data contained in more than one module.

While the EDR data can provide some information about the order of events, it is necessary for the reconstructionist to use other evidence to determine how each individual event fits into the context of the crash sequence. Only after the EDR data is analyzed in the context of a crash can the pre-crash and crash data be fully interpreted.



A deployed airbag is not confirmation that EDR data is present. An electrical power loss can prevent the EDR from recording crash data, and other evidence must be used to reconstruct the crash.

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Crash Data Retrieval From Air Bag Modules (continued)

Ruhl Forensic, Inc.'s staff *provide expertise in: mechanical and electrical engineering, crash investigation and reconstruction, vehicle dynamics, commercial vehicle driving and mechanical systems, federal regulations and compliance, tire failure, metallurgy, fire cause and origin, OSHA, graphic visualization and other areas.*

Our experts provide a continuum of service from initial on-site investigations through research, testing and reconstruction to courtroom testimony and presentation graphics and visualization.

We offer quick response to your investigation needs 24 hours a day. Contact us by calling 1-800-355-7800 (IL) or 1-800-235-2808 (AZ).

Please feel free to call us with any questions that you may have and we will direct you to the appropriate individual within our firm.

The speeds in an EDR report need to be verified against the vehicle equipment and travel path. Over or under-sized tires can affect the reported speed. A vehicle sliding sideways or under yaw can have erroneous speed readings in the data. Without correlating the EDR data to other evidence, incorrect conclusions can result.

The EDR data also includes information about the restraint system use. It can give indications as to which seat belts were buckled, or which seats were occupied. These data points need to be checked against the physical evidence in the vehicle if there are questions. A heavy bag or other cargo placed on the passenger seat can fool the airbag system into believing there was a second person in the vehicle.

Data downloaded from the airbag control module is analyzed and then incorporated into the reconstruction.

Modern vehicles have multiple airbags and other safety systems. The data separates this information, giving specifics on the deployment of front and side curtain airbags, seat belt pre-tensioners, and other occupant safety components. The EDR can also modify its deployment criteria if it senses a seat too close to the steering wheel, or if it senses a child instead of an adult. All of this information can be recorded and present in the data.

Almost all EDR's record information about the specific crash pulse seen by the control modules. This information is useful to determine the impact severity and velocity change (delta-V) of the vehicle. However, there are certain impact types that are not accurately reported. There are instances where the delta-V is underreported, or in severe instances the recording is clipped. In these cases, crush measurements and calculations can be used to supplement the delta-V information from the EDR.

Many airbag control modules require the vehicle's electrical system to provide power for a short period after the impact in order to finish recording the data. Severe impacts that catastrophically damage the battery or wiring often lead to situations where the airbags deploy, but no information about the crash gets recorded. If an investigator or reconstructionist is relying solely on the EDR data in his casework, these situations can leave him or her with no information on the crash. EDR data should always be used as a supplement to a vehicle crash reconstruction, not in place of one.

For more information, please contact us at the Champaign, IL office at (800) 355-7800, the Scottsdale, AZ office at (800) 235-2808 or by email to dgowen@ruhl.com. Visit us on the web at www.ruhl.com.