



HEAVY DUTY DATA: EVENT DATA RECORDERS 101

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THE “BLACK BOX” OF HEAVY VEHICLES

The black box—the mysterious treasure chest of data that helps explain why a crash took place. While planes and cars each have a single location for data, heavy machinery, such as commercial vehicles and construction equipment, have multiple “black boxes” called Event Data Recorders, or EDRs. And what they can tell you about an accident or event is astounding. >>>

EDR 101

In 2012, the National Highway Traffic Safety Administration (NHTSA) proposed a rule that would see EDRs in all cars, light trucks and SUVs manufactured after 2015; however, most car makers started to equip their vehicles with EDRs in 2005.¹

Most transport trucks, buses, bulldozers, forklifts, diesel powered generators and farm equipment already have multiple HVEDRs (Heavy Vehicle Event Data Recorders) that collect data from different parts of the vehicle or machinery. Basically, if it runs on a diesel engine and has an electronic interface, HVEDRs are onboard. These sensors and systems collect and store data pertaining to:

- Trip/event details
- Cruise-control management
- Transmission shifting
- Maintenance
- Fault codes
- Antilock brake system activation

When a crash or fault occurs, a trained forensic investigator can extract data from these recorders to find out exactly what happened.

ACCIDENT RECONSTRUCTION

Most often, authorities, lawyers and insurers turn to accident reconstructionists to perform an in-depth analysis of an accident. These professionals rely on research to form their conclusions, which is heavily reliant on the expert's depth of technical expertise and credentials to be reliable in court. In an accident, the age, sex, and weight of the driver, as well as the load, air pressure, brakes and condition of the vehicle may all

play a part.² Furthermore, there is no databank containing information on, or damage benchmarks for, heavy truck accidents. For these reasons, traditional reconstruction investigations are an easy target for opposing counsel; they can dissect the logic and professional assumptions made in a report in an attempt to discredit opinions.

EDRs do not need benchmarks to tell the story. They are the story. HVEDRS can tell an insurance adjuster or lawyer just how fast the vehicle was going, if the driver tried to slow down right before the event or if any system failed. The raw data is all there. However, you need an expert to extract and interpret it.

THE COMPLEXITY OF HVEDR DATA

There are many benefits to having multiple HVEDRs—each recorder has unique data to provide the most complete account of what happened leading up to an event. However, every type of engine has a different data retrieval process. Each HVEDR is distinct as well. Think of it this way: You have several witnesses, each with unique information about a crash, but they all speak different languages. You need a highly-specialized interpreter to not only get the information, but translate it as well.

Most automotive technicians can retrieve HVEDR data, however when it comes to using the information as evidence, it is best to have an expert perform the extraction in a forensic manner. Only a trained professional has the ability to “translate” the information relative to the crash. Without the interpretation, all you have are numbers and codes. If you want the information to hold up in court, the ability of the interpreter and the quality of his or her interpretation matters greatly.

The other challenge is the software. Since all components are unique, you need different software to analyze each module's

data. For example, every engine make—Caterpillar, Cummins, Mack, Mercedes, etc.—has its own extraction program. Not only does the interpreter need to have all of the software, which is expensive, they also need to know how to use each version.

“When a diesel generator’s engine failed, our analysis of the HVEDR data from the engine controller was key in determining what went wrong. This data was missed by other firms and provided an edge to our client during mediation.”

FINDING THE TRUTH

How does HVEDR data impact cases? Our investigators may be able to prove or disprove a claim and even uncover fraudulent behaviour:

“A highway tractor collided with a passenger vehicle that was travelling the wrong way on a major highway. After examining the truck for defects and downloading the HVEDR data, we provided our client with information proving that their driver attempted to avoid the collision. This helped them defend against the car owner’s claim.”

“A large coach bus drove into a cement barrier. The driver claimed that the steering and brake systems failed. We examined the bus and extracted the HVEDR data. No defects were found and the data proved that the driver made no attempt to slow down or avoid the barrier. In fact, the information showed he was gaining speed. Armed with this information, our client talked to the driver who confessed that he was texting while driving.”

“A collision between a coach bus and multiple vehicles occurred on a major Ontario highway. At first glance, the HVEDR data showed that the bus was only travelling 85 km/h on the snow covered road. However, upon further investigation, we uncovered historic HVEDR information which showed that a mechanic installed a false differential gear ratio into the bus. It allowed the bus to travel faster than its mandated governed speed. Our client was able to settle this case and avoid trial.”



“Our client suspected their driver of arson. After examining the tractor’s cab and downloading the engine’s surviving HVEDR, the driver’s statement did not hold up. He quickly confessed his guilt.”

EDR AS EVIDENCE

Expert skills and knowledge are key when it comes to testifying in court. EDR information can be misleading if interpreted by someone without training. In some cases, before you invest in an accident reconstruction, you may want to consider commissioning a data extraction as your first step in an investigation. This data can be used to corroborate physical evidence that is under scrutiny. When interpreted properly, it can easily and efficiently discount or reinforce driver or witness testimony.

It is also important to retrieve event information as soon as possible to avoid data loss. Origin and Cause has the expertise, ability and software to extract data from EDRs at any time. We have the training to interpret the data accurately, even if it was previously obtained by a technician or other party.

If you have a case involving heavy machinery or vehicles and want to use EDR to uncover the truth, call us. Even if the data indicates your client's liability, you will know the weaknesses in your case and be able to develop a mitigation strategy.



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With over 20 years' experience, Russ specializes in mechanical and fire forensic investigations involving heavy vehicles, trucks and large diesel engines, including vehicle failure analysis and electronic data extraction. Russ also served as a firefighter with Thorold Fire Department for seven years.



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REFERENCES:

¹ <http://www.iihs.org/iihs/topics/t/event-data-recorders/qanda>

² <http://www.accidentreconstruction.com/research/suv/suv071101.asp>