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Auto cases

Not long ago, devices to measure crash data in vehicles were considered futuristic technology. Now, event data recorders are here to stay.

Black box technology in the courtroom

Dennis Donnelly

Event data recorders (EDRs)—commonly called 'black boxes' in an analogy to the flight and voice data recorders used on commercial airplanes—are the hottest thing in vehicle safety technology.1 They are installed in many vehicles on the road now, and there is little doubt that more will follow.2

In one sense, this is good news for consumers, who can expect the data collected on the boxes to be used to improve the safety of future vehicles. But it can also be used against consumers who are injured in traffic accidents when it is unclear from the data collected whether a defect—including one of design—or driver error caused a crash.

As EDR technology becomes more widespread, plaintiff lawyers will find the data it generates showing up in their cases. Adapting to its impact on litigation may not be easy, but it is necessary. In some cases, lawyers will have to know enough about the limits of the technology to be able to effectively challenge EDR data. In others, lawyers may want to use the data to screen out bad cases or to bolster allegations that a component malfunctioned or that a vehicle is not crashworthy.

For plaintiff attorneys, EDRs are like the Almighty: They both giveth and taketh away the advantage in litigation. The secret to knowing how much and how often the technology helps or hurts a case will depend on how well attorneys are prepared to understand and address its strengths and weaknesses.

Research and development

To fully understand EDR technology and its journey from concept to stream of commerce, it is helpful to review a little of its history. Early efforts to equip vehicles with event data recorders began in 1974, when primitive devices were installed in 1,000 vehicles as part of a National Highway Traffic Safety Administration (NHTSA) project that ultimately analyzed only 26 crashes at fairly low speeds.3

EDRs would not take hold until 1990, when General Motors (GM) began a full-fledged development effort and widespread installation of the recorders in its vehicles. By that time, many vehicles had air-bag sensors that measured deceleration data. Adding devices with computer memory to store and save the sensed data was a matter of simple engineering.

In the next decade, GM increased the amount of data its EDRs stored. The list of what was added is useful to lawyers representing plaintiffs in crashworthiness cases, who must reconstruct real-world crashes and debate the design-safety issues arising out of them. Now, instead of attempting to reconstruct the forces involved in an accident using general data from barrier crashes, plaintiff lawyers and their experts can use exact data collected from the specific crash.

In 1994, the boxes were modified to sense and save

• the maximum delta V (change in velocity) in near-deployment events

• the delta V in frontal collisions in which air bags deployed

• the time between the moment of vehicle impact and the moment of maximum delta V

• the state of the driver's seat-belt switch, which indicates whether the belt was fastened

• the time between an event in which air bags nearly deployed and a later event that caused them to deploy (if within five seconds).

In 1999, GM modified its EDRs to record whether a passenger's air bag was enabled, as well as vehicle speed, engine speed, brake status, and throttle position.4

Because EDRs offer a vast and relatively inexpensive opportunity for research, experts predict that someday every vehicle on the road will be equipped with one.5 Consider the amount of data these devices could record annually, compared with the amount of data gleaned from crash tests. Each day, about 18,000 crashes occur in the United States from which vehicles must be towed away. To get the same amount of data that would result from EDR recordings of those crashes, re searchers would have to conduct 1,000 times as many crash tests per year as they currently do.6

Moreover, the information gathered from EDRs is more useful than crash-test results because it includes real-world crash pulses. (A crash pulse is a graph showing the energy created by the rapid deceleration of the vehicle and its occupants). These can be correlated with real- world injuries and fatalities.

Such data obtained from actual crashes would help researchers improve vehicle safety. This information could make crash reconstruction more objective and provide a basis for regulatory and consumer information initiatives. It could also be compiled in a driver-behavior database.

The usefulness of this technology has not gone unnoticed. Soon, all General Motors cars will be equipped with EDRs. NHTSA and Ford Motor Co. recently agreed to a joint study of advanced restraints that will use the technology in that manufacturer's cars.7 And NHTSA is considering rules that would require including the devices in all new vehicles.8

Possession and preservation

Given the growing use of EDRs, an attorney who is asked to represent a person injured in a vehicle crash should find out as soon as possible whether the vehicle involved was equipped with one. If so, the attorney should make every effort to get the data quickly and have them interpreted by a qualified expert. This can provide enough information to conduct comparatively quick and inexpensive case screening.

Plaintiff lawyers need to know as much as they can as early as they can about what happened in a crash in order to make intelligent case-selection decisions. For example, if there is EDR evidence that a severely injured client was not wearing a seat belt, and if the jurisdiction where the claim is to be filed allows the defendant to use that fact as a defense, the plaintiff's attorney may be inclined to reject the case.

On the other hand, if there is also evidence that an independent defect such as brake failure caused the accident, or im proper air-bag deployment caused the injury, the lawyer might be more willing to take the case. Such evidence would allow a judge or jury to find that the plaintiff's failure to buckle up was legally or factually irrelevant—or at most only a partial cause of the injury. In a best-case scenario, it might make the plaintiff's conduct irrelevant, since the plaintiff could not have anticipated the defect that caused the crash.

Of course, getting the recorder first carries some burdens. Most experts seem to agree that recordings of deployment events cannot be erased. Nevertheless, to avoid possible spoliation claims, plaintiff lawyers should make sure that the expert hired to read the data makes a photographic or videographic record of the evidence. This is especially true when reading so-called near-deployment data, where the interpretation may be more problematic.

Insurance representatives and police officers sometimes get into the race for data, increasing the risk of the information's loss or corruption. I have searched vehicles shortly after accidents only to find that an insurance company's expert already had read, and in one case removed, the EDR.

If the driver is the car's owner and is a potential defendant, the insurer may have actual or implied permission to access the data. Even if the car's owner is the injured plaintiff or an uninvolved third party, if he or she signs over title to the car to any insurance company as required for payment of a property-damage claim, then that carrier has the right to access EDR data. If the insurer then uses inexperienced or incompetent consultants to read the data, those "experts" may remove the EDR and either misread its data or lose the evidence entirely.

While no court decisions have ad dressed spoliation claims involving EDRs in cars, rulings in cases involving the devices in trains and trucks make it clear that deliberate erasure or failure to retain black box data will support spoliation remedies.9

Acceptance and admissibility

Because this technology is relatively new, judges have been understandably skeptical of it. In one of only two court rulings involving EDRs in cars, a state court in Georgia ordered GM to produce documents and an expert to provide information that a plaintiff's expert would need to translate data from a 1997 Chevy. The plaintiff sought data to help prove that a defect caused the car to accelerate suddenly to 90 mph and crash.10

In the other case, *Harris v. General Motors Corp*., the Sixth Circuit Court of Appeals reversed a decision of summary judgment for the defendant because it had been based solely on a GM engineer's interpretation of crash data collected from one of the company's event data recorders.11

The engineer's interpretation contradicted the driver's and passenger's testimony. They said that the driver was injured because a defective air bag deployed late and broke her arm.

Noting that its research had not revealed a single reported case in which a court addressed black box technology and its interpretation, the Sixth Circuit found that "the [EDR] data *suggests* that the air bag deployed properly; it does not establish beyond factual dispute that the air bag could not have deployed belatedly in the manner" claimed by the plaintiff.12

Finding nothing in the record showing that GM had proved the reliability or validity of its engineer's testimony, the court remanded the case to the trial court for a hearing on admissibility.

Interestingly, if GM succeeds in getting the expert's interpretation of the data admitted in *Harris*, the manufacturer could have difficulty attacking the validity of EDR data, if it needs to, in a future case. If, for example, EDR evidence in a later case shows that improper timing or malfunction of an air bag caused serious injury or death, GM will have gone on record, through its expert, as saying the technology is "reliable."

The only challenge the manufacturer could then make to the EDR evidence would be to question the qualifications of the plaintiff's expert and his or her interpretation of the data.

To combat a manufacturer's selective use of EDR evidence, plaintiff lawyers should compel production of the names of all other cases in which the manufacturer or its experts have relied on or referred to this type of data.13

Liability and limitations

Black boxes can provide information about much more than air bags.14 Data are also electronically sensed and saved regarding engine fuel management, antilock braking systems, automatic traction control, cruise control, and seat-belt tensioners. Any of these data can be used to support or challenge a plaintiff's claim.

But plaintiff attorneys must be careful not to overestimate the extent to which this technology can help or hurt their cases. Traditional expert reconstruction of an accident from crush damage and other crash-scene evidence can still be used to attack EDR data by showing its inaccuracy or limitations in particular cases.

For example, EDR data gathered by air-bag sensors is limited to movements that can be detected by those sensors: those where the principal direction of movement and the principal direction of force is frontal. Therefore, movements relating to rear-end and side-impact crashes often will not be recorded by these devices.

Even in a partially frontal impact—where, for example, a car is rotating, spinning, or skidding sideways—significant information regarding the car's speed and movements cannot be measured by an air bag's sensors and, therefore, will not be recorded.

To accurately determine whether and how much EDR data can help or hurt a potential case, the plaintiff lawyer must first understand the technology. Those who are waiting to do so until the technology "catches on" may be too late. Lawyers who are already well versed in the strengths and limitations of this new evidence understand that the future is now.

Notes

1. *See* Augustus Chidester et al., *Recording Automotive Crash Event Data*, presentation at the National Transportation Safety Board Symposium on Recorders (May 3-5, 1999), *at* www.ntsb.gov/events/symp_rec/proceedings/May_5/SessionIV/Pres_Hinch/index.htm (last visited Feb. 15, 2002); *see also* WILLIAM ROSENBLUTH, INVESTIGATION AND INTERPRETATION OF BLACK BOX DATA IN AUTOMOBILES: A GUIDE TO THE CONCEPTS AND FORMATS OF COMPUTER DATA IN VEHICLE SAFETY AND CONTROL SYSTEMS (Soc'y of Auto. Eng'rs & Am. Soc'y of Testing & Materials 2001).

2. A history of black box technology is available at www-nrd.nhtsa.dot.gov/edr-site/history.html (last visited Feb. 15, 2002).

3. *See id.*

4. See Chidester et al., *supra* note 1.

5. *Id.*

6. Crash tests cost about $35,000 each. That cost multiplied by 18,000 crashes per day amounts to more than $600 million. Researchers currently conduct about 5,000 crash tests per year at a cost of $175 million.

7. Ernie Grush, *Research Opportunities with Automotive Crash Recorders*, presentation at the National Transportation Safety Board Symposium on Transportation Safety and the Law (Apr. 25, 2000), *at* www.ntsb.gov/events/2000/symp_legal/grush/sld001.htm (last visited Feb. 15, 2002).

8. See history of black box technology, *supra* note 2.

9. *See, e.g.*, Stanton v. Nat'l R.R. Passenger Corp., 849 F. Supp. 1524, 1528 (M.D. Ala. 1994).

10. Anderson-Barahona v. Gen. Motors Corp., No. 99A19714 (Ga., Cobb County Cir. Ct. Apr. 7, 2000).

11. 201 F.3d 800 (6th Cir. 2000).

12. *Id*. at 804 (emphasis in original).

13. Information-sharing groups like ATLA and the Attorneys Information Exchange Group can be extremely helpful with these efforts.

14. ROSENBLUTH, *supra* note 1. William Rosenbluth was the plaintiff's expert in *Anderson-Barahona*.

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Your comments welcome

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