Black boxes face car-crash test

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When an Ontario Provincial Police crash-site reconstructionist wanted to know the exact speed of a car in the seconds before it crashed on the Skyway Bridge, he found that information--and more--inside the car's event data recorder, a feature likely to become standard on all cars in the near future.

The recorder, a four-inch square box that sits beneath the front seat, is installed in about half of General Motors' 1999 car models and almost all its 2000 and 2001 cars, said Ellie Martin, a spokeswoman for the U.S. National Highway Safety Traffic Administration.

Similar to the black boxes used to record data in airplanes, pipelines, ships and trains, the car's recorder springs into action as part of the air bag deployment system.

Originally designed to improve air bag performance based on the severity of the collision, the event data recorder can tell accident investigators about: the car's velocity; its engine RPMs; how far down the accelerator pedal was pressed; if the brakes were applied; whether the seatbelts were buckled; and what warning lights were on - all from five seconds before impact, said O.P.P. Constable Vince Gircys, a reconstructionist on the force.

When a collision occurs, the information is stored in the recorder's memory for 250 engine cycles (each time the car is turned on is a new cycle), "which is about 60 days for the average car," Gircys said - unless a newer accident overrides it.

While the event data recorder is also in some Ford cars, so far only General Motors has licensed a company--Vetronix of Santa Barbara, Calif.--to market a retrieval system able to decode the information.

James Kerr, Vetronix' program coordinator for the crash data retrieval system, said the product has been on the market for about a year, with one for Ford likely to be released later this year.

Law enforcement tool?
Kerr said the company's $2,495 decoder has been used by police forces around the U.S., including the Massachusetts, Georgia and New Jersey state troopers and local police departments in San Jose and Thousand Oaks, Calif. and Boon County, Ky., to name just a few.

The Massachusetts State Police won't official comment on its use of the retrieval system, but one officer who spoke off the record said the troopers haven't yet used it in a "case or criminal prosecution," but every police force in the U.S. "is looking to see what it can do."

In Ontario - the only Canadian jurisdiction with a retrieval system - Gircys used its information during an inquest into the death of one of the drivers in the bridge accident.

"It's a computer, separate from the car's computer," he said. The most important data investigators get from the black box is the delta V, or the car's change in velocity, he explained, because that information will show the force of the impact by how dramatically the car went from traveling speed to a stop.

"If you're going 60 mph and strike a concrete wall, within milliseconds the car will go from 60 mph to 0 producing a high delta V," he said. Eyewitnesses are notorious inaccurate and officers can't always tell from looking at a crash scene what took place, and "often we have to reconstruct a scene without anybody left alive," he added.

Teamster opposition

The U.S. NHSTA currently has no regulations regarding black boxes, but Martin said there is a 25-member working group of their technical and legal staff looking into whether the data it records is useful as an accident-reducing tool.

While the government and car makers consider how much more effective real world crash data is from laboratory and computer models, the Teamsters Union, in its efforts to design safer vehicles and roadways, is lobbying to restrict its use.

Rob Black, a spokesman for the National Brotherhood of Teamsters, the union representing U.S. truckers, said the Teamsters has no problem with the device itself.

"The Teamsters are concerned about how it's used and what kind of data is collected," he said.

A U.S. Senate committee has already looked into how the black boxes might be used to enforce "hours of service" rules that regulate the number of consecutive hours a truck driver can remain behind the wheel, he said.

What most concerns the union is if employers will use data like the number of times a driver accelerated his vehicle and use that information to discipline the trucker without considering the conditions that led to the spike in RPMs, he added.

It's a concern, he said, "that's not as pie in the sky as you think." Before Gircys can download a car's information for use in legal proceedings, Canadian law requires officers to get a warrant. The same is also true in most - but not all - U.S. jurisdictions, he said. "Some people put a Big Brother spin on (the data recorder), but to get access to it we need a criminal code warrant, much as if we wanted to get medical records," he said, meaning "the vehicle has to be in a high-profile crash resulting in serious injury or death." Vetronix president Jim Zaleski said the retrieval system can be a boon to vehicle owners, professional accident reconstructionists, vehicle safety engineers, insurance adjusters, fleet managers, law enforcement, car rental agencies, or any other authorized individual" who needs to collect objective, accurate data and "understand what occurred in a crash."