

Watching your driving

A proposed law in America would require cars to have "black box" data recorders. Many already have them



When investigators try to discover what caused an airliner to crash, the first thing they hope to find are the flight data recorders, popularly known as "black boxes". These devices, usually painted bright orange, record how the aircraft was flying and the last 30 minutes or so of conversation in the cockpit. The information extracted from them has helped to determine the cause of air crashes and to improve aviation safety. Similar recording systems are fitted to some trains, ships and lorries. Now a bill in America's Congress seeks to make it compulsory for data recorders to be fitted to all cars by 2015.

The idea is that data captured by the recorders would give investigators and road-safety officials a better understanding of how certain crashes come about. It would also help police and insurance companies to apportion blame. What many drivers may not realise, however, is that most cars already record data if they are involved in an accident, and that this information can be read by anyone with the right kit.

The technology that America's lawmakers want to be made compulsory was originally intended for another purpose. With the widespread adoption of airbags, which began in the late 1980s, General Motors (GM), an airbag pioneer, wanted better analysis of how airbags were deployed, to improve their reliability and effectiveness. To obtain the data it required, GM began fitting a small memory unit to the electronic module that triggers the airbags. Ford, Chrysler and other carmakers followed suit. Around 80% of the cars sold in America now have these devices, called event data recorders (EDRs).

The quickest way to find out if a new car is fitted with an EDR is to check the small print in the owner's manual. The National Highway Traffic Safety Administration in America made disclosure compulsory for cars built from late 2010. It also ruled that, if fitted, the EDRs had to be made more durable to protect data in the event of a crash, and the agency defined standards for the type of information being recorded. The European Union, too, has been looking into the widespread deployment of EDRs in cars.

Typically an EDR will record data from sensors contained in the airbag module itself and from other vehicle systems. As cars have deployed more electronics, the amount of recordable data has grown. It can include forward and sideways acceleration and deceleration, vehicle speed, engine speed and steering inputs. The data can also show if the accelerator was being pressed,

if the brakes were being applied and if the seat belts were being worn. If there is a crash and the airbags are fired, the data covering the preceding five seconds or so are stored in memory.

To interrogate the EDR, an investigator uses a laptop connected to a data-retrieval device, which in turn is plugged into the vehicle's diagnostics socket or, if the car is badly damaged, directly into the EDR itself. Bosch, a German manufacturer of car parts, claims to be the world leader in this field but declined to be interviewed for this report. It supplies data-retrieval equipment to police forces, accident investigators, insurance companies and various government agencies.

Five seconds of data may not seem much, but they can amount to several pages of information. Matthew Brach, a crash investigator with Brach Engineering, in Indiana, says the data can be compared with physical evidence, such as tyre marks on the road, the position the vehicles came to rest and the extent of crushing, to produce a highly accurate reconstruction of the events leading up to a collision.

A number of prosecutions have already been brought against drivers in America and Europe using information extracted from EDRs, mostly to establish a vehicle's speed at the time of an accident. Data from EDRs were also used by America's Department of Transportation in an investigation into the possibility of electronic interference causing unintended acceleration of Toyota cars. Although two mechanical causes (sticky accelerators and a problem with floor mats) had been identified, electromagnetic interference was ruled out.

The data monitored by an EDR are stored only if the airbags go off. But some may also record up to three previous "events", such as heavy braking, in which the system thought a crash might be imminent. There are also third-party recording systems available for cars and commercial vehicles, which are often used by fleet operators, including police forces. Some insurance companies offer "black-box policies". Britain's Automobile Association, a motoring-services organisation, offers one to inexperienced drivers who agree to have a system fitted to their cars. Using cellphone networks and GPS navigation, it compiles regular reports to show drivers if they are breaking speed limits, braking too hard or taking corners too quickly. Good drivers get reduced premiums.

GM's OnStar motoring-assistance service taps directly into EDRs. It automatically alerts emergency services if the airbags are deployed. As well as providing the location of the crash and its potential severity, GM is working with the University of Michigan to develop algorithms to predict the types of injuries sustained.

One thing the American legislation will try to clear up is who owns EDR data. One version of the bill, already passed by the Senate, states that they are not owned by carmakers but the car owner, or in the case of a leased vehicle, the lessee. This means ownership of the data (along with the car) could pass to an insurance company in the event of a car being written off. The bill, however, does say data may be retrieved by another person, such as a police officer, with the permission of the owner or with a court order. Privacy advocates will be watching closely. Two years after implementation, the bill says Congress should consider its impact on road safety and individual privacy. If lives are saved and privacy respected, then data recorders in cars will be here to stay.

Fonte: The Economist, London, v. 403, n. 8790, p. 80, June 23th-29th, 2012.