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Deadly Convenience: Keyless Cars and Their Carbon Monoxide Toll

Weaned from using a key, drivers have left cars running in garages, spewing

exhaust into homes. Despite years of deaths, regulatory action has lagged.

Without having to turn and remove a key to shut off the motor, drivers can be lulled into mistakenly thinking that the car has stopped running.

By David Jeans and Majlie De Puy Kamp

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It seems like a common convenience in a digital age: a car that can be powered on and off with the push of a button, rather than the mechanical turning of a key. But it is a convenience that can have a deadly effect.

On a summer morning last year, Fred Schaub drove his Toyota RAV4 into the garage attached to his Florida home and went into the house with the wireless key fob, evidently believing the car was shut off. Twenty-nine hours later, he was found dead, overcome with carbon monoxide that flooded his home while he slept.

“After 75 years of driving, my father thought that when he took the key with him when he left the car, the car would be off,” said Mr. Schaub’s son Doug.

Mr. Schaub is among more than two dozen people killed by carbon monoxide nationwide since 2006 after a keyless-ignition vehicle was inadvertently left running in a garage. Dozens of others have been injured, some left with brain damage.

Keyless ignitions are now standard in over half of the 17 million new vehicles sold annually in the United States, according to the auto information website Edmunds. Rather than a physical key, drivers carry a fob that transmits a radio signal, and as long as the fob is present, a car can be started with the touch of a button. But weaned from the habit of turning and removing a key to shut off the motor, drivers — particularly older ones — can be lulled by newer, quieter engines into mistakenly thinking that it has stopped running.

Seven years ago, the world’s leading automotive standards group, the Society of Automotive Engineers, called for features like a series of beeps to alert drivers that cars were still running without the key fob in or near the car, and in some cases to shut the engine off automatically.

“After 75 years of driving, my father thought that when he took the key with him when he left the car, the car would be off,” said Doug Schaub, whose father, Fred, died of carbon monoxide poisoning last year.
Andrea Morales for The New York Times

The gas level in Fred Schaub’s home was at least 30 times the level that humans can tolerate.

The National Highway Traffic Safety Administration proposed a federal regulation based on that idea, a software change that it said could be accomplished for pennies per vehicle. In the face of auto industry opposition, the agency let the plan languish, though it says a rule is still under consideration.

For now, regulators say they are relying on carmakers to incorporate such warning features voluntarily. But a survey of 17 car companies by The New York Times found that while some automakers go beyond the features recommended by the standards group, others fall short.

Safety measures have been a matter of contention among automakers, sometimes even internally. Toyota, for example, has a system of three audible signals outside the car, and one inside, to alert drivers getting out of a vehicle that the motor is still running. But when Toyota engineers determined that more effective warning signals were needed — like flashing lights or a unique tone — the company rejected the recommendation, according to testimony in a wrongful-death suit.

Toyota models, including Lexus, have figured in almost half of the carbon monoxide fatalities and injuries identified by The Times. Toyota says its keyless ignition system “meets or exceeds all relevant federal safety standards.”

Some automakers have designed newer models that alert drivers more insistently when the engine is left running — or that shut it off after a certain period. Ford’s keyless vehicles now have a feature that automatically turns off the engine after 30 minutes of idling if the key fob is not in the vehicle, the company said recently. (According to a federal lawsuit, Ford began introducing the feature in 2013.)

But many older vehicles have not been retrofitted to reduce the hazard, despite the modest expense of doing so. It cost General Motors $5 per car to install the automatic shutoff in a 2015 recall, according to a G.M. report to the safety agency.

Regulations require automakers to address other hazards associated with keyless vehicles — theft and rollaways — and those measures might also reduce the carbon monoxide danger. But the safety agency has found shortcomings and inconsistencies by automakers in meeting those rules.

As the number of carbon monoxide deaths grows, the hazard is no secret. A Florida fire chief saw so many cases that he took to handing out carbon monoxide detectors. And litigation against the companies is mounting.

"It's just been so hard," said Kimberlin Nickles, whose daughter, Chasity Glisson, died after she left her Lexus running in her Florida garage.
Scott McIntyre for The New York Times

"We're going to continue to see deaths and injuries," said Sean Kane, founder of Safety Research and Strategies, an auto safety research group. "And the manufacturers will continue to settle cases."

The exact number of deaths related to carbon monoxide from keyless-ignition vehicles left running is unknown, as no federal agency keeps comprehensive records. Through 2016, the most recent year for which data is available, the safety agency had investigated only four fatal incidents. From news reports, lawsuits, police and fire records and incidents tracked by advocacy groups, The Times has identified 28 deaths and 45 injuries since 2006, but the figures could be higher.

Carbon monoxide is odorless and colorless, depriving the heart, brain and other vital organs of oxygen. Victims are sometimes found with a cherry red rash, a symptom of carbon monoxide molecules attaching to red blood cells. Some who survive live with irreversible brain damage. One couple described a life where they now struggle with severe memory loss and are dependent on hired assistants.

The gas level in Fred Schaub's home was at least 30 times the level that humans can tolerate. His body was found in his bed, with a rash on his head and chest.

"The plants inside the house lost their leaves," said Doug Schaub, his son.

A Risk Detected Early

The keyless ignition was introduced as a luxury feature in Mercedes-Benz vehicles in Germany in 1998, a year after Daimler-Benz filed for a German patent, and entered the American market in 2002. Some carmakers called it the "smart key," a wireless device sending a code to the car's computer so the driver can start the engine with a button, instead of a mechanical key. It was meant as an additional selling point for luxury cars: no more fumbling for keys.

The risk identified initially was theft, because drivers might leave the key fob in the vehicle by accident. (In conventional ignitions, under regulations adopted in the 1990s, the key cannot be removed unless the car is in park.) The National Highway Traffic Safety Administration's general counsel warned automakers in 2002 that keyless ignitions would be prone to mishaps arising from human error. In 2006, the agency updated its regulations to state that with keyless ignitions, "a warning must be sufficient to catch a driver's attention before he or she exits the vehicle without the keys."

Two weeks later, a 70-year-old Florida woman, Jeanette Colter, failed to notice that she had left her keyless Toyota Avalon running in the garage. The home filled with carbon monoxide and she collapsed and died between the bedroom and the kitchen, according to her daughter Vickie. Her 89-year-old husband, David, died in the bedroom. They appear to have been the first victims of carbon monoxide poisoning linked to keyless vehicles.

By 2009, a number of such incidents had come to the attention of the Society of Automotive Engineers, which formed a panel to develop recommended practices to address keyless ignition hazards. The objectives included minimizing "user-instigated errors" like "exiting the vehicle while the propulsion system is enabled."

The engineering group's recommendations, issued in January 2011, called on carmakers to install an "externally audible or visual alert" — implying an unspecified number of beeps, or a warning light — when all doors are closed, the key fob is not present and the engine is still running. If the engine automatically shuts off, the alerts are not necessary.

The same year, the traffic safety administration proposed a key fob rule that would require car manufacturers to provide additional internal and external warning beeps. In addition to protecting against rollaways, it said this would reduce "incidents of carbon monoxide poisoning." Although it made no provision for an auto-shutoff function — an option that the Society of Automotive Engineers cited — the agency said its own proposal would be "more enforceable."

Compliance would cost the industry less than $500,000 a year in software coding for millions of keyless vehicles, the traffic safety administration said, adding, "Preventing even one serious injury over three years would make the proposed rule cost-beneficial."

The auto industry opposed the proposal, and a trade group asserted that the regulator's use of vehicle owners' questionnaires to compile a database of defects did not meet the evidence standards of federal vehicle-safety law.

The traffic safety administration released a video two years ago that highlighted the risks of keyless vehicles, including carbon monoxide poisoning. But the agency has postponed adoption of the keyless ignition regulation three times, and in the meantime at least 21 people have died.

"Once N.H.T.S.A. has finished its review and determined the best path forward, N.H.T.S.A. will take appropriate action," the agency said in a statement in March.

'I Couldn't Breathe'

A bad dream woke Michael Sobik on Oct. 8, 2015, at his home in Miramar Beach, Fla. The smell of fumes filled his nostrils and he looked over at his wife, Jamie, realizing his motor skills were slow. Car fumes and carbon monoxide emitted from Mrs. Sobik's Lexus had filled the garage overnight and flooded the home.

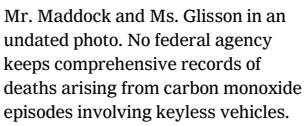
They were overcome by nausea as their blood cells were starved of oxygen. Mr. Sobik stumbled through the house to the garage and was knocked by a rush of fumes. Unable to make sense of what was happening, he opened the garage door and went back into the house.

Mrs. Sobik, in the meantime, had fallen out of bed in an attempt to stand up. "I couldn't breathe, I was gasping," she said, recalling that her husband shouted at her to get outside. "Next thing you know he's dragging me onto the grass."

Disoriented and vomiting, she asked if they were about to die.

"I remember the fear in telling her no because I didn't know," Mr. Sobik said. When fire marshals arrived, the gas reading inside the house was 80 times the tolerable level for humans, and over 100 times inside the Lexus.

Timothy Maddock was left with a brain injury in the carbon monoxide incident that killed his girlfriend, Chasity Glisson. They were found lying motionless on the bathroom floor. Scott McIntyre for The New York Times



Mr. Maddock and Ms. Glisson in an undated photo. No federal agency keeps comprehensive records of deaths arising from carbon monoxide episodes involving keyless vehicles.

Others have experienced similar episodes. One couple, Timothy Maddock and Chasity Glisson, were found motionless on the bathroom floor of Ms. Glisson's Florida home in 2010 after she unwittingly left her Lexus running in the garage. Ms. Glisson died, and was found covered in a rash. Mr. Maddock survived and now lives with a brain injury.

"It's just been so hard," said Ms. Glisson's mother, Kimberlin Nickles. "All I've ever wanted is something to be done for the cars to be safer."

In Palm Beach County, Fla., which has a large number of older residents, the fire department noticed a spike in incidents as keyless ignitions became common.

"They were literally driving their own vehicles into the garage and closing the door," said Doug McGlynn, a veteran firefighter. Mr. McGlynn says such incidents became so numerous in Palm Beach County, where he is a district chief for the Fire Rescue Department, that his unit began handing out carbon monoxide detectors and signs for residents to display in their garages, with a clear message: "Carbon Monoxide Kills. Is Your Car Off?"

The tactic appears to have worked. The department started a public information campaign in 2015, and from March 2016 to October 2017 it recorded a 30 percent decline in carbon monoxide incidents caused by vehicles, most with keyless ignitions. But despite the local progress, deaths and injuries are mounting across the country.

The Sobiks live with severe brain injuries and have hired assistants to help them carry out day-to-day tasks. Mrs. Sobik, a former figure skater, can no longer run. Her husband once prided himself for "running circles around people" as a businessman, but now routinely forgets to return calls.

"Memory loss has been absolutely terrible," he said. "I have to think: 'Have I eaten lunch today? Did I take vitamins this morning?' I find myself doing things and I'm not sure where I'm going. It's a very frightening and very scary aftermath."

'No Adequate Punishment'

With no standard in place for alerts or other features that would address the problems of keyless vehicles left running in confined spaces, the traffic safety administration has said repeatedly that it is convinced that automakers intend to meet the Society of Automotive Engineers' recommended practices. And some do.

But it can be difficult to determine with precision what measures automakers have taken on their own — even when they are asked directly.

"You can't trust car corporations to police themselves," said John Uustal, a Florida-based lawyer involved in two keyless ignition cases. "There's no adequate punishment."

Doug McGlynn, a veteran firefighter in Palm Beach County, Fla., started handing out carbon monoxide detectors at community meetings after responding to several incidents in which a car was left running in a garage. Scott McIntyre for The New York Times

Mr. McGlynn's fire rescue unit also distributed signs for residents to display in their garages. The county has a large number of older residents. Scott McIntyre for The New York Times

Even among cars from the same automaker, there is inconsistency. Fiat Chrysler said that on its keyless cars, a dashboard warning is displayed if the key fob is removed while the motor is running, and that "on certain 2018 model year vehicles," an internal chime sounds for 30 seconds. (For older models, it said, the chime sounds until the key fob returns to the vehicle.) But a spokesman would not discuss the feature on a model-by-model basis.

At Mazda, keyless ignition is now standard, and some vehicles have an "advanced keyless entry" system that helps alert the driver to a running engine. If the driver gets out, the doors are closed and the engine is running, six repetitions of a double beep sound inside and outside the car, and a warning light activates on the instrument panel. On other Mazda vehicles in the same circumstances, the external warning sounds only if the key fob is still in the vehicle.

And Mazda has not incorporated a system that automatically shuts off the engine after a certain time of idling.

Even when precautions are in place, some safety experts, lawyers and victims say the automakers need to do more. At Toyota, such voices came from inside the company.

According to testimony in a wrongful-death lawsuit, Toyota began an investigation into its keyless technology, conducted by its technical center in Michigan, after an employee drove 250 miles to Chicago in 2007 and realized that the remote key was still in Ann Arbor, Mich. (The witness did not know how this happened — for example, whether the fob was close enough to

send a signal, but not inside the vehicle, when the car started.) Toyota engineers noted that Mazda vehicles beeped externally six times, as opposed to three external beeps in Toyota models. According to a company document cited in a deposition, they concluded that "Toyota vehicles do not have adequate smart-key-absent warning system."

Shaun Austin, a quality control manager for Toyota in North America who testified in a wrongful-death suit, stressed the issue internally. A Toyota team in North America was in touch with corporate headquarters in Japan about adding flashing lights and a unique tone that would alert the driver if the car was still running without the key fob present, he said in a court deposition, but all those suggestions were rejected.

Contacted for this article, Mr. Austin directed questions to Toyota. When asked why the suggestions were rejected, Toyota declined to comment.

Its three external beeps satisfy the engineering society's recommendations.

An Inquiry Without Action

At one point, the traffic safety administration appeared to start taking a keener interest in the hazards. It undertook an investigation of seven automakers in 2013-14, conducting tests and asking for documentation of their safety features for keyless vehicles. But the inquiry was quickly and inconclusively wound down.

In a statement in March, the agency said it was evaluating comments on the proposed rule and the data for carbon monoxide deaths and injuries.

In the meantime, in a society increasingly growing older, the hazard is likely to be compounded by demographics.

At the funeral of Fred Schaub, his family said farewell while he lay in the coffin wearing a New York Police Department hat from his detective years. It partly covered the rash on his head.

"My dad isn't going to be the last one who passes away from this," Doug Schaub said.

Correction: *May 14, 2018*
An earlier version of this article included a quotation from a family member of a carbon-monoxide poisoning victim that referred incorrectly to the cause of an explosion of Pepsi cans in the victim's garage at the time of the fatal episode. (The error was repeated in a caption.) The explosion of the soda cans was most likely caused by heat; a carbon-monoxide buildup would not cause such an explosion.

Correction: *May 15, 2018*
An earlier version of this article referred incorrectly, based on information from a company spokesman, to the availability of an automatic-shutoff feature in Fiat Chrysler cars. One model, the 2018 Chrysler Pacifica hybrid, shuts off the engine after a certain time of idling; it is not the case that no Fiat Chrysler vehicle does so.

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