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Why Is My Electric Vehicle Dead? Check the 12-Volt Battery

The relic from gas-engine cars is dying unexpectedly in some newer EVs, causing vehicles to shut down

By Ryan Felton Follow

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After Cadillac rolled out its new Lyriq electric SUV, early customers began complaining in online forums about the 12-volt battery dying. PHOTO: BRITTANY GREESON FOR THE WALL STREET JOURNAL

When David Finkelstein and his wife first got their new Hyundai EV, they drove it for months without a hitch.

Then, the Ioniq 5 SUV started to repeatedly fail, rendering it inoperable. He couldn't even open the door at times.

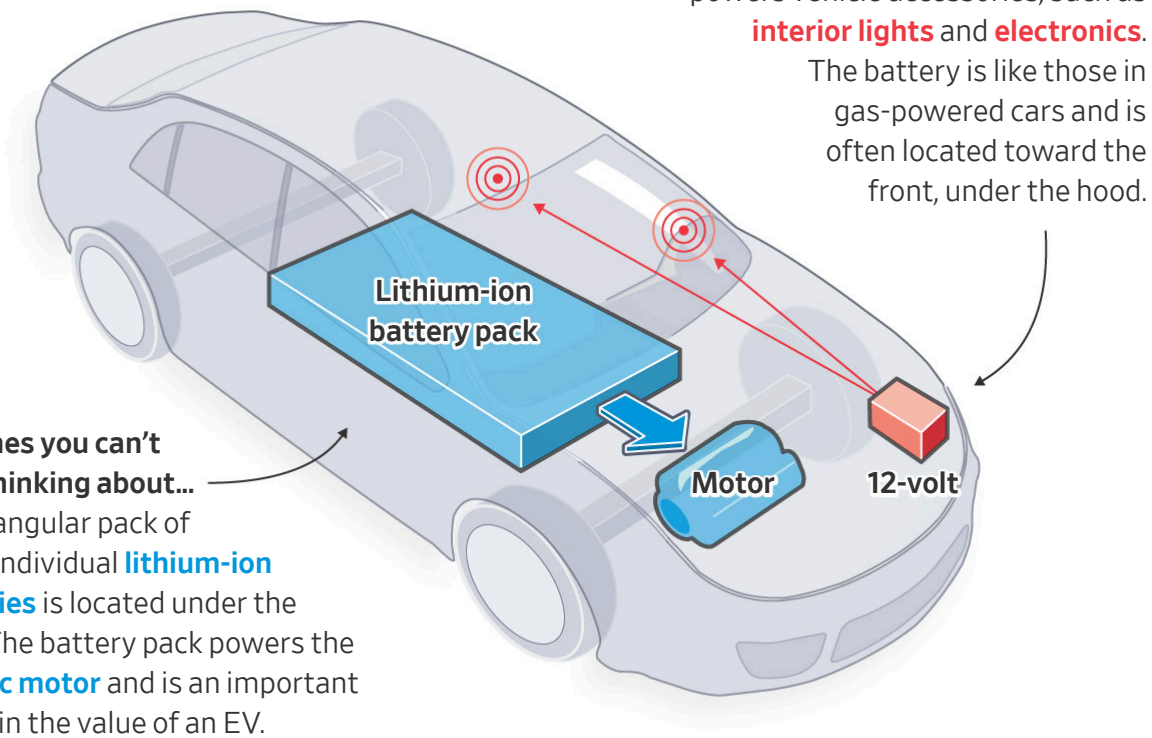
"I had no idea what was going on," said Finkelstein, adding that the electric vehicle's lithium-ion battery had been charged.

Turns out, the problem wasn't with the main battery, but the smaller, low-voltage one—the kind that has been found under the hood for decades.

In some new electric-car models, these 12-volt batteries are dying repeatedly and unexpectedly, leaving drivers stranded and needing a jump to get going

again.

Battery power in a typical all-electric vehicle



The one you don't think of...
A single 12-volt **auxiliary battery** powers vehicle accessories, such as **interior lights** and **electronics**. The battery is like those in gas-powered cars and is often located toward the front, under the hood.

The ones you can't stop thinking about...
A rectangular pack of many individual **lithium-ion batteries** is located under the floor. The battery pack powers the **electric motor** and is an important factor in the value of an EV.

Note: Configurations vary. Scale and positions are generalized.
Source: Energy Department

Peter Santilli/THE WALL STREET JOURNAL

It isn't clear how widespread the issue is. But it has taken many owners by surprise, led to numerous complaints online and affected some high-profile EV launches in recent years from major car brands, such as Hyundai, Rivian and Cadillac. It also has prompted at least two regulatory probes.

While these batteries don't move the vehicles themselves, they do provide juice to the interior lights and electronics, which in EVs tend to be far more sophisticated and power-hungry.

As a result, the 12-volt batteries are "almost always on" and deplete faster than those in gas-powered vehicles, said Amod Kumar, an industry analyst at research firm S&P Global Mobility.

Some car companies have also struggled with software glitches and other hardware problems that have accelerated the drain on the battery, even when the car is in park.

In Finkelstein's case, Hyundai ended up repurchasing his 2022 Ioniq 5 because of the repeated 12-volt battery troubles, he said. A Hyundai spokeswoman declined to comment on his experience.

More frustrating for consumers is that these batteries are dying suddenly in nearly new EVs—some of which have only recently hit the market. The problem also comes as car companies are already confronting greater hesitancy from buyers about making the switch to an electric car.

Prompting regulatory probes

Typically, these smaller, rectangular-shaped batteries, which are about the size of a breadbox and often found tucked under the hood or in the trunk, are supposed to last three to six years before needing to be replaced. Some new EV owners are even surprised to learn their car has one, given it already has a large lithium-ion battery.

Last year, after Cadillac rolled out its new Lyriq electric SUV, early customers began complaining in online forums about the 12-volt battery dying, leaving them unable to start their newly purchased vehicle.

Cadillac traced the problem to a software anomaly that was causing the battery to remain on after the vehicle was shut off. It has since instructed dealers to reprogram the module linked to the error.

Rivian Automotive, a California-based EV maker, had similar problems last fall with some new pickup truck and SUV models. In this case, the 12-volt battery was rapidly depleting because a sensor had failed to signal to the larger battery that it needed to recharge it when the car was on.

The problem affected a small group of customers and was addressed by updating the vehicle's software, a Rivian spokesman said.

The battery difficulties aren't only a hassle for consumers. In some cases, these unexpected failures could pose a safety risk.

U.S. auto-safety regulators have been investigating certain model-year Hyundai Ioniq 5s and Kia EV6s after receiving dozens of complaints of the 12-volt batteries dying while the car is in motion. Drivers have reported hearing a loud "pop" noise, before their vehicles lose power.

U.S. auto-safety regulators have been investigating certain model-year Kia EV6s. PHOTO: BEN HIDER/ASSOCIATED PRESS

A preliminary review shows a control-unit malfunction was interfering with the system's ability to recharge the 12-volt battery, according to regulatory filings.

Hyundai said it has instructed dealers to replace the faulty part if needed. It has also beamed a software update to the affected cars to reduce excess current, and it continues to cooperate with the regulatory investigation.

Kia declined to comment on the federal probe.

Dated technology

The bigger challenge for car companies is that the 12-volt battery is in many ways a dated technology for cars on the road today, which are becoming more like computers on wheels and have greater power needs.

But switching to a higher-voltage system is also difficult because it would essentially mean wholesale changes to the supply chain for these parts, said Bob Galyen, a battery consultant and former chief technology officer of battery-maker Contemporary Amperex Technology.

Right now, most of the interior electronics in the car, such as the overhead lights and the stereo, are designed to work on a 12-volt system. A higher-voltage system would require car companies to find suppliers that make specialized parts, Galyen said.

Hyundai's Ioniq 5 electric sport-utility vehicle. PHOTO: MICHAEL NAGLE/BLOOMBERG NEWS

"Go out and try to source a 48-volt fan or a 48-volt door lifter," Galyen said. "It's hard to find the components that are going to run to the higher voltages."

Executives at electric-car pioneer Tesla have also expressed frustration with the limitations of the traditional 12-volt battery, saying that moving to newer technology would eliminate "a major source of failure in our cars."

Already, the company has designed its newest model, the Cybertruck, with a 48-volt system, a change that has allowed it to reduce the size of the wiring in the pickup and better accommodate its increased power needs.

"Forty-eight volts is the future for low voltage design at Tesla and likely the rest of the industry in due course," Pete Bannon, a director at Tesla, said during its investor day in 2023.

For Finkelstein, the situation with the Ioniq 5 was a hassle, but the 12-volt battery troubles ultimately didn't sour his view on EVs. After moving on from the Hyundai car, he and his wife went with a different model: a Tesla Model 3.

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