The Facts Are In: You Shouldn't Worry About EV Battery Replacements

New research shows that it's extremely uncommon to have to replace a modern electric car's battery.

From: insideevs.com, by: Tim Levin
Nov 18, at 12:59pm ET

- Lots of car buyers are worried about how long EV batteries last.
- Research shows that modern EV batteries rarely fail.
- Only 0.3% of batteries in EVs sold after 2022 have had to be replaced, outside of major recalls, Recurrent says.

One of the biggest pain points worrying potential electric car buyers: How long will this battery last? And it makes some sense. Most peoples' experience with lithium-ion batteries comes from smartphones and laptops, many of which can barely hold a charge after a few years. And who wants to buy a $40,000 or $50,000 car whose single most expensive component might crap out in a few years?

But electric cars aren't like iPhones. New research from the EV battery-tracking startup Recurrent shows that modern EV batteries are extremely unlikely to fail. Moreover, the technology has only gotten more reliable over time, and it'll likely keep getting better.

"It's very rare that you will need to get a battery replaced," Liz Najman, Recurrent's director of market insights, told me in an interview. Of course, freak defects can happen. "But generally, once cars are on the road and operating well, once you're sort of in business, no, there's not really a major concern about it."

The numbers should help put your mind at ease. Recurrent uses telematics data from thousands of participating electric cars to estimate battery health. To approximate the frequency of battery replacements, it zeroed in on vehicles with unusual jumps in vehicle range as well as self-reported repairs.

Across Recurrent's community of owners, fewer than 4% have had a battery replaced. That excludes replacements due to major recalls like those concerning the Chevy Bolt and Hyundai Kona, so it only encompasses replacements from random defects, aging and physical damage.

The firm broke the data down further by generation, and the numbers followed a predictable pattern. Older EVs are far more likely to need battery replacements—both because they've been put through the ringer and because they use more rudimentary EV technology that's more prone to age-related issues.

EVs sold from 2011-2016, like the original Nissan Leaf, had a replacement rate of 8.5%. That trusty Nissan, for example, didn't have active battery cooling, which accelerated degradation. Plus,

automakers and suppliers were still learning advanced pack designs with sophisticated cooling systems. That's why the next era of EVs has performed considerably better.

"When you start to get into the generation-two EVs, which are your Chevy Bolts, your early Tesla Model 3s, the technology had really improved a ton. And you see that in the replacement rate dropping," Najman said. Just 2% of EVs sold from 2017-2021 have had their batteries replaced, Recurrent says. (Again, this is all outside of major recalls.)

With a replacement rate of just 0.3%, EVs sold in 2022 or later have barely any issues at all. Importantly, Najman says, from "Gen 2" onwards, replacements are almost exclusively happening because of manufacturer defects—not capacity loss from piling on miles, which is what most people are afraid of.

In part, newer EVs are performing the best because they've been on the road for the shortest amount of time. But it's also because they have the best EV technology yet, Najman said.

They have better and more efficient thermal management, so they keep the battery from damage from extreme temperatures without cycling the battery excessively. Another example: Most EVs now automatically precondition the battery to the right temperature when the driver plots a route to a charging station.

"I think that OEMs have really figured out how to keep lithium-ion batteries safe and happy," she said, referring to original equipment manufacturers, which is industry lingo for car companies.

All told, Recurrent expects new EVs to not have any issues for 15 years at least. And remember that when these cars do have issues, you're not always on the hook to pay for them. Sure, if you buy the wrong high-mileage, older Tesla, you may need to fork over $10,000 or $20,000 for a battery replacement. But that's a worst-case scenario.

Any early defects will be covered by the manufacturer. And it's standard for warranties to cover replacements for batteries that lose 30% or more of their capacity. Those warranties are required to last for eight years or 100,000 miles, though some automakers offer even longer warranty windows.

Plus, battery prices have plummeted over the last decade, and they continue to drop as the supply chain scales up. In five or 10 years, replacing a battery pack might be less of a nightmare—and more like any other repair.

Got an EV ownership story to share? Contact the author: Tim.Levin@InsideEVs.com