

# Plug it In



I drive a plug-in hybrid electric vehicle, which my wife and I bought two years ago. At the time, we weren't quite ready to go full electric. We definitely wanted the smooth, quiet ride that an electric vehicle can provide. We wanted the convenience and ease of being able to "fill up" by simply plugging in at home. But like many American consumers, we also had range anxiety and doubts about the infrastructure's ability to provide charging on a road trip, for example.

So we bought the hybrid. It only has about 30-35 miles of range on a full electric charge. But for day-to-day driving, that's enough. When we need it, we've got the gas, which has allowed us to take the car on multiple long-range road trips. We even towed a boat across country. For us, the plug-in electric hybrid has been the right choice.

Of course, it hasn't been without its hiccups. We got a nice letter from the NTSB telling us not to plug it in, because it could blow up, or start a fire, or stop suddenly while driving. There was a safety recall on the charging port that required a software update, which, by the way, wasn't available yet.

During the couple of months we had to wait for the fix to become available, we had to drive on gas. While it was a blessing our car could just switch functions without missing a beat, it was also a curse, because every time we got into the car, we could hear it. And we missed that smooth, quiet ride.

Thankfully, we're back to normal now.

My experience gives me good perspective on the overall EV market, and a solid understanding on why the automotive manufacturers have stepped back from "all-in" on EVs to a hybrid strategy. But also, why electric vehicles are here to stay.

Because no matter the current political climate or the debate over whether EVs are environmentally better or worse, car manufacturers are still extremely busy converting factories and production lines over to build these new styles of vehicles.

Which brings us to this issue of *Gear Technology*. We have four significant articles this issue that touch on the EV space. Liebherr's automation systems have helped Ford convert a factory from internal combustion to EV production (p. 20). Romax and Hexagon present an article about NVH analysis and prediction in EV drivetrains (p. 22). Senior Editor Matt Jaster dives into the trends surrounding e-mobility and electrification with Drive System Design (p. 26). And the engineering team from Eaton Mobility have provided a technical overview of the differences in transmission design between internal combustion and electric vehicles (p. 34).

Transmissions for electric vehicles will continue to be a significant part of the discussion in the gear industry for the foreseeable future. If you read through this issue and decide you still need more, you should consider attending the upcoming AGMA class on "EV Automotive Transmission Design." This is a newly developed course offered by the Motion + Power Manufacturers Alliance, drawing on resources from the AGMA, ABMA and the AGMA Foundation to bring you the most up-to-date developments in EV transmission design. The course takes place August 19-21 in Rosemont, IL. For more information, visit [www.agma.org/events-education/](http://www.agma.org/events-education/).

Hopefully all this information will keep you "plugged in" to the current trends and technologies revolving around electric vehicles.



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