



Watch Tesla's 90-second electric vehicle battery swap demonstration



Tesla is planning to introduce battery-swapping at electric vehicle Supercharger stations as early as this year.

Demonstrated in Los Angeles on Thursday, Tesla CEO Elon Musk revealed how the firm's battery-swapping stations give consumers the option of swapping flat lithium-ion batteries for fully-charged ones in less time than it takes to fill a car with gas.

Swapping a depleted battery on a Model S sedan in just over 90 seconds, the Tesla chief showed it is possible for EVs to be back on the road more quickly than traditional, fossil-fuel cars. During the demo, a Model S was pulled over a hole while the driver remained in the vehicle while a machine set to work disconnecting the battery and replacing it with a battery on full charge.

Two models were given fresh sets of batteries in the time it took a Tesla employee to fill up an empty gas tank.

The CEO commented:

"I think it's important for us to address the reasons people are not buying electric cars. People need to feel they have the same level of freedom they have with gasoline cars. If they need to get somewhere in a hurry, they can do that. In fact, they can get there faster."

Before a packed house of hundreds of owners of the company's electric vehicles, Tesla Motors TSLA +3.42% demonstrated the ability to restore an electric vehicle to a full charge in less than half the time it takes to refill a gas tank. Swapping a depleted battery on a Model S sedan in just over 90 seconds,



Tesla showed it's possible for electric vehicles to get back on the road faster than their fossil-fuel counterparts. CEO Elon Musk said the company would make battery swapping available as soon as the end of 2013, starting in California, with the Boston-D.C. corridor to follow.

The demo was nothing short of impressive as Franz von Holzhausen, Tesla's design chief, introduced Musk to the partisan crowd. When the demo began, a Model S pulled over a hole in the stage reminiscent of what you might find at your local Jiffy Lube. With the driver remaining in the car, an automated machine disconnected the battery, removed it, and replaced it with a fully charged one. Simultaneously — on video — a Tesla employee was filling a gas tank at what Musk claimed was “the fastest gas station in L.A.”

At the 1:33 mark, the Tesla pulled away, while the gas-powered car continued filling. Musk apologized for making folks wait and then the crowd roared as a second Tesla drove out from behind a curtain and *also* had its battery swapped (this time it took about 96 seconds). That car also drove off before the gas fill-up was completed, which occurred after about 4 minutes.

Musk said battery-swapping services may be introduced as early as this year in California, Boston and Washington DC at each Supercharger station. In the beginning, each station will have approximately 50 batteries on hand.

Musk said the service would be offered for the price of about 15 gallons of gas at the going local rate, but of course “it will be more convenient.” And really, that's true since aside from the time savings, you don't need to leave the car. The company will bill a credit card on file for the cost. If you're making a return trip, you can pick up your pack on the way back — again fully charged — for the same “pack swap” price. That's currently about \$60-80, Musk figured. If you don't want to make another swap, you'll have options:

1. Keep the pack you received on the first swap. If it's newer, Tesla will bill you for the difference, though the amount is to be determined. The warranty is the balance of the standard 8-year term, dependent on the age of the pack you received.
2. Return home on your borrowed pack and receive your original back from Tesla for a “transport fee,” which is also to be determined.

The swap packs will initially all be brand new, but Musk admitted that they will age over time so whether you get a new one or an older one will vary. You'll always be able to get yours back one way or another.

Clearly, all of this will be costly and time consuming. Musk says the cost will be \$500,000 per location and that they'll be co-located with the Supercharger stations. Each will have about 50 batteries on hand, and reservations won't be required. Tesla will add more batteries to stations as demand increases and will recharge them using the already-installed charging infrastructure at those stations, including solar power over time.



The Superchargers — which can restore much of a depleted battery’s charge in about half an hour - will continue to be available without cost to cars equipped to use them. “Do you prefer faster or free?” Musk asked, in explaining the choice people will be able to make.

He was asked why Tesla was going to so much trouble building these after committing to the Supercharger rollout. And in fairness, it’s a lot of non-car-building activity for an automaker. But clearly, electric vehicles aren’t going to become mainstream unless people feel like they can get where they want to go. “I think it’s important for us to address the reasons people are not buying electrical cars. People need to feel they have the same level of freedom they have with gasoline cars. If they need to get somewhere in a hurry, they can do that. In fact, they can get there faster.”

First installations will be along Interstate-5 in California, where a large number of Model S sedans are making the San Francisco-Los Angeles run regularly already. After that’s complete, the Boston-to-D.C. corridor will be next, where the infamous New York Times vs. Tesla controversy erupted over Times’ reporter John Broder’s report of battery struggles with the car.

Musk echoed a moment at the company’s recent shareholders meeting where someone questioned him about the challenges of owning a Tesla in an urban area where it’s hard to find charging. He noted that eventually battery swapping might be the answer in such places, citing the tight quarters of London as an example. Of course, if one is constantly paying for battery swaps, the cost advantage of electric-vehicle ownership is negated, so perhaps the thought there was that it would be complementary to at least *some* ability to charge.

And looking ahead to the company’s third-generation vehicle, Musk wasn’t certain battery swapping would remain relevant. Tesla keeps working on improving charging technology, making it faster. So it’s possible that the demand for this kind of service might not be very strong by the time that vehicle rolls out in 2016 or 2017. That said, he didn’t rule out an alternative possibility: That third parties might be licensed to provide battery swapping to Tesla owners, so long as they can provide the same level of service. Presumably the idea here would be that in urban areas, this could allow for a new kind of “filling station” and it might even mean competitive pricing at some future date.

For the moment, though, pack swapping seems to doom range anxiety to the technology graveyard, along with other concerns of yesteryear like running out of hard-drive space or not having enough space for contacts on your cell phone.

I’ll follow up tomorrow with a comparison between Tesla’s endeavor and now-defunct Better Place’s \$800 million failure trying to do something similar..¹

¹ The source: <http://www.smartplanet.com> / <http://www.forbes.com>