

Ford's bold bid for the next big thing

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Ford is reimagining vehicle production with its Universal EV project, introducing innovative manufacturing techniques like 'unicastings' and the assembly tree. As the company targets a younger, eco-conscious audience, it aims to streamline production and stay competitive in the evolving automotive landscape.



How cars are built and the concept of the moving assembly line are culturally ingrained in the automotive industry. Every now and again, the automotive industry goes through phases of trying to do things differently. Ford is the latest in a long line of automakers to try and innovate.

Electrification, the rise of Tesla, the often best-in-class levels set by mainland Chinese original equipment manufacturers for digital vehicle attributes, and ever-increasing and accelerating new vehicle prices look set to bring another era of change. Last week, Ford unveiled some of the details behind its fabled “skunkworks” project. The confluence of factors described above brought the Universal EV concept from Ford. While the reveal was light on the details craved by the automotive media — i.e., give us some pictures of what this truck looks like — it was heavy on the details around the business of building cars.

- **Megacastings:** Despite some misgivings in the industry regarding the trend toward megacastings — centering on investment costs, wastage volume if the casting is not right the first time, and repair costs in the event of a road-traffic accident — Ford has decided to embrace the concept under the name “unicastings.” Ford has calculated that the benefits of fewer parts leading to a simplified manufacturing process outweigh the downsides.
- **Assembly tree:** Those benefits manifest in Ford’s proposed new manufacturing process, which signals a shift away from the single and sequential vehicle manufacturing line that Henry Ford himself popularized in the early 1900s. The process — Ford is dubbing it the assembly tree — is a three-pronged process, whereby the front, middle and rear of the vehicle are assembled in separate areas before marriage in a single area. It is similar to the unboxed process that Tesla has previewed over the past few years and was central to its sub-\$30,000 car strategy at that time. Ford’s assembly tree will save 40% of assembly time compared to the current Escape.
- **Vertical integration:** The 40% savings will translate to a 15% speed improvement as its assembly tree process will bring more component insourcing since the three modules are assembled offline. Increased vertical integration has been a factor in the rise of mainland Chinese OEMs, most famously in the case of BYD, and has regained popularity as it permits the OEMs to have better quality control and more cost transparency.
- **Software-defined vehicle (SDV):** The vehicles planned off the Universal EV architecture will be the first designed by Ford with software at their core. They will be SDVs, updatable via over-the-air updates, with the decoupling of their hardware from their software opening them up to a world of chargeable apps and upgrades.
- **Electrical/electronic (E/E) architecture:** Key to the SDV is the shift to a zonal E/E architecture, which Ford has said results in a 1.3-km shorter wiring harness that is also 10 kg lighter. Not only does it go partway to making a path for the SDV, but it also addresses a bugbear of CEO Jim Farley that dates to benchmarking undertaken when comparing Tesla’s models with the Mustang Mach-E. Early in 2023, he said, “We did not know that our wiring harness for Mach-E was 1.6 kilometers longer than it needed to be ... it was 70 pounds (31 kilograms) heavier ... costing us an extra \$300 in battery.”

- **Lithium iron phosphate (LFP) batteries:** The Universal EV vehicles will utilize (LFP) batteries, which were dismissed by European and US automakers for a long time as not being especially suited for light vehicles. That was until LFPs underpinned the surge in mainland China's thriving electric vehicle industry. To be fair to Ford, its investment in the US manufacture of LFP batteries has been trailing for a while, with its last announcement in February 2023 that a \$3 billion LFP facility would be built in Michigan, US.
- **Appealing to Gen Z:** The \$30,000 target price of the first production of the Universal EV, a midsize pickup for a 2027 launch, has the Slate EV as main competition. The Jeff Bezos-backed Slate has enjoyed a positive media reception, trying to bring affordable, customizable and fun vehicles to the masses. The naysayers may point out that the market for sub-\$30,000 EVs is historically small, but that tends to dismiss the interests of next-generation vehicle buyers. Moreover, that generation itself does not tend to have cars and gasoline coursing in its veins like previous generations. They tend to be more motivated by environmental and sustainability issues and have largely been disenfranchised by the first wave of \$50,000+ EVs in the US market.

Given the above, Ford's Universal EV looks rather like a Supermarket Sweep for this automotive era. Anything that is front and center of industry trends has been thrown into this project. Some quarters will level that the project is little more than a horse designed by committee (or a skunkworks in this case), but the company's refusal to be embroiled in the geopolitics of the current US administration, instead embracing the industry's travel direction outside of the US, should be applauded. That said, while Ford is hitting all the right notes with the Universal EV, only time will tell if they have been played in the correct order.

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