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## Take a Look Inside the Tesla Electric Car Factory

Last week Tesla revealed its Model S electric sedan. But just as interesting as the futuristic car is the retro-turned-high-tech factory where it's made. We got a tour of this secondhand wonder.

BY JOHN RETTIE



Established automakers often spend more than \$1 billion just to build a new factory to produce a car that's already designed. No wonder starting a new car company is such a mammoth undertaking, and why so many have scoffed at auto startups like Tesla.

The fledging car company founded by Elon Musk of PayPal and SpaceX delivered the first Tesla Model S all-electric sedans, which start from \$57,400, to customers last week. Its employees celebrated the milestone at the Tesla factory that makes

the car—a factory that also shows now Musk managed to get around some of the huge hurdles of starting a car company from scratch.

The Tesla factory fronts the 880 Freeway in Fremont on the east side of the San Francisco Bay. Instead of building a brand-new factory, Tesla purchased the old Nummi factory that had been producing GM and Toyota vehicles since 1984 before closing in 2010. Tesla paid only \$42 million for the plant, which sits on 380 acres and was originally constructed in 1962.

Apart from new signage, the 5.4 million-square-foot plant does not look much different externally. Currently Tesla is making only one Model S each day as it ramps up production, to make sure every procedure is in order. It plans to be producing 80 cars a day by the end of the year, during an 8-hour shift with 1200 to 1500 employees at work. However, compared with a grimy factory spitting out up to 500,000 cars per year, the repainted, refurbished Tesla factory, with its clean floor covered in white epoxy paint and flexible layout, has quite a different air to it.

We got to visit the plant during the celebration last week. Take a look inside.



Currently Tesla is using only about one-quarter of the old factory. The renovated part features new skylights and has been painted in light colors. The rest sits in darkness behind temporary walls.



There's no elaborate showroom at this factory. Instead, one prototype Model S electric sedan sits beside a giant photograph. The wall, which is covered with sketches and photographs of prototype parts, leads to the assembly floor.



Tesla removed all the old assembly equipment and installed new robots that can perform several different functions, such as assembling the chassis. Some robots are true multitaskers that can weld, rivet, glue, and laser-cut.



A completed floor pan shows how aluminum castings, aluminum stampings, and high-strength steel are bonded, welded, and riveted together to make a strong but lightweight structure.



Tesla produces 95 percent of the parts in-house. Huge stamping presses produce aluminum body panels. Resin injection molding machines and die casting create aluminum components. The imported AA-size battery cells—more than 7000 are used in each battery pack—are assembled into the battery packs on the second floor.



Gilbert Passin, Tesla's vice president of manufacturing (who formerly worked for Toyota), demonstrates the low weight of the Model S aluminum doorframe.



The paint shop uses robots to spray the colored base layer first. This is then covered with a clear top layer for protection and gloss. For premium colors, Tesla uses a three-stage process incorporating a colored base layer, a pearlescent middle layer, and clear top layer. After painting, employees inspect the work in this brightly lit chamber.



Smart Carts, rather than a fixed assembly line, carry the Model S bodies around the factory during final assembly. The body can be raised or lowered to make it easier for Tesla workers.



Magnetic strips laid onto the floor guide the Smart Carts. This gives Tesla great flexibility to reconfigure the layout for other models in the future.



Robots install the Model S seats.



This robot uses high-definition 3D cameras to pick up the sunroof, put glue on it, and then align it correctly on the body.



This array of hoses and tubes puts the fluids into the cars near the end of the production line, just before they go through a final quality-control check on an indoor test track.



On the day we visited the totally refurbished factory, the associates gathered to cheer on founder Elon Musk as he handed keys to the first customers, who drove away over part of the test track in the first production cars. Meanwhile, in the background it seemed as if the robots continued silently practicing their craft in order to impress the human visitors, even though no cars were made that day.

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