Tesla Factory Tour with Elon Musk!

15 MIN · YOUTUBE · HTTPS://WWW.YOUTUBE.COM/WATCH?V=MR9KK0_7X08
https://www.youtube.com/watch?v=mr9kK0_7x08

SUMMARY

In this video, Elon Musk provides a mini tour of the Tesla Factory, focusing on the assembly process of the Model S and Model X. The tour showcases the complexity of the manufacturing process, the integration of human labor with robotics, and the challenges faced in production efficiency.

- *The factory is extremely loud and busy, making video production challenging.*
- *Elon emphasizes the importance of human involvement in assembly due to the complexity of tasks that robots struggle with.*
- *The assembly line operates slowly, allowing workers to manage intricate tasks effectively.*
- *Robots are used for repetitive tasks, but many processes still require human dexterity and problem-solving.*
- *The factory employs around 10,000 people, doubling its workforce over time.*
- *Elon discusses the efficiency of simpler robots that follow magnetic stripes, highlighting their reliability compared to more complex systems.*
- *The paint shop processes multiple models simultaneously, while other assembly lines remain separate for different models.*
- *Continuous improvement is a focus, with efforts to eliminate unnecessary steps and enhance production efficiency.*

[Music] hey what is up guys I'm kbd here and welcome to the sequel to the previous video so the part two which is the mini factory tour with Elon I want to preface it just with the intro by saying first of all it is really difficult to shoot good video in that factory as you'll both see in here it's Extremely Loud and extremely busy so this is more of just like a walking around and having fun and

checking things out uh it's it's actually probably just like 15 or 20% of the actual model snx Factory process it's not the whole thing it's mostly just Elon showing us around and uh in fact I didn't even really say much during this interview it was more just like a I was kind of like a kid in the Matrix just kind of absorbing everything and then it also kind of cuts abruptly at the end when Elon basically gets

pulled into his next meeting but I still thought it was a ton of fun and worth sharing and also I should mention this entire video shoot this production would not be possible without my buddy John from the TLD Channel and his crew who helped with audio who wear the muscle with the steady cam he has an entire behind the-scenes video of this process on his channel I'll link that right below so if you want to check that out

after watching this in part one feel free but until the next one this is your mini tour of the Tesla Factory with Elon enjoy one that Loops back and like I said just gives gives us access to the central caror yeah um so it's really

just like lifting it up and over so the the car that ends up here came all the way way down this previous yeah yeah exactly so these robots are really just to give us uh like through through

access okay yeah so so it's going to pick it up and transfer it to the other robot yeah um but I I think like you know like a design Improvement we should do is like really just the one robot you just pass it to the other robot um just pick it up oh there's a third one above us yeah it's like it puts it on a table the table rotates it's like like if we do if we did this overa we would just

have that giant robot pass it to that giant robot Fair yeah hand off yeah there like a thousands of like little things like that that help improve production General Sly kind of operates in kind of a u so it goes cars coming over there go all the way down here and then all the way that way um and uh you can see the car get progressively more complex as it goes down the general assembly line what does it look like

when it starts this side of the assembly line oh we can go there we go there should we start there start at the beginning or might as well but here you can get a good sense for there's like like general assembly is what I was spoken about as being really well suited to people okay uh because you got a lot of weird things that you got to put together like you like look at some of these um you know

assemblies that like like it's pretty hard for a robot to like connect this on that makes sense yeah it's you know like depending upon how it comes out of the box it could be like in a little different position but it's pretty easy for somebody like oh it's it's like I just need to move it like an inch you know bolt it in it's probably really hard to write software to alls yeah you try to if you try to have

the robot do this you got have like a complicated Vision system and then like Vision system fols out it's like it's not quite right that's the hard part we we have a robot in our studio that moves the camera around and the hardest part is when it faults yeah you need a person there to know what to do exactly so hopefully that doesn't happen much um like for for parts that are that are complicated and fiddly like like wiring

Hound is especially difficult you see how like the wiring hus kind of meets the snake uh through the car yeah it's it's literally like like winding like a snake through the car you got to like poke it through holes and and do do various things that's super difficult for a robot see like how they're like putting the uh part of the air conditioning system there right um so you use like a little bit of mechanical assistance with the

winch and whatnot but then it's pretty straightforward for the guys to just like get that in there and they like if they see there an issue with ap part then like they say oh this part's got a problem like we'll put it over here for to you know um to get fixed like this is like sem line is like moving slowly yeah so like moves along um and then if um you know it givs to like time to to get

things done like you can like stand on this and I think you mentioned like the the speed of the car coming out the other side is like 1 mph or something like that yeah super slow you want to speed this up right yeah it's not

it's not even 1 mph it's even slower than that right now but for SX but for but three it's like getting close to a mph okay okay um but walking speed is 3 m

hour so it's like only 1/3 walking speed at 1 mph all right you can see like when you look on the inside of the car you can see like how many little complicated little pieces there are a lot um you know the things that are meant to uh for insulation Corrosion Protection um airbags uh uh road noise like it's all the stuff that gets put in here you can see like these are like the side airbags

here okay um like most people I think it's like pretty cool like most people never see like the inside of the car yeah there's a million things you never see driving the car every day this is like sorry guys start [Music] interrupt you don't mind being on like on like you know the internet and stuff is that cool all right YouTube's cool and I actually don't interrupt your work but um you know it's like you see like

how like there's like a lot of tricky pieces and like if for a person like this is like durable straight yeah you know takes a bit of training get of speed whatever but like once once you like um basically like like a pro human can do this super well and it's like hard for the robots to do that but I when we go to the like the body welding I'll show you like what's like what's a

robot good at and you'll see like there's tons of robots like tons of people here tons of robots there um but there's so much complexity and variation here um you got like thread those wires when it comes through especially here yeah with this so so like this is the car with like less stuff in it and then it goes it's you know and we'll see the beginning of it right and then that then it goes all the way around gets more and

more stuff added and does it end at the end well General Assembly ends probably somewhere down there yeah okay so um but you can it's interesting to see the car get progressively more complex as we add more parts to it you know this place uh used to employ like about 5,000 people and now we got like we got we got 10,000 people just in this location yeah so what we do is we have like tons of

shuttles and like uh we Cars ride sharing yeah uh we got the barer rapid transit station finally like went went up um so just like trying to get people here is is not easy a big challenge what is this oh this is uh actually like this is one of my favorite dumb robots Okay yeah I'm a fan right now it's pretty cool um so like there's a lot of fancy robots uh that like but they have like

lots of issues and they break down a little time cuz these little guys are super great they're like they follow this magnetic stripe uhhuh see basically it's like super easy to program you don't even need to be a programmer cuz you just like lay down the the the mag stripe and it'll follow it yeah it just follows the mag stripe and then it's got uh proximity sensors in the front so if if it sees an obstacle or sees like

something in the way it just stops and then soon as something moves out of the way it just keeps going and it just like does this like a little thing all day long like a little train like you're were talking about robot folting out and

one of the it's like that's like where like actually um doing things manually can can can actually be more um more efficient because if you have like a lot of complicated robots particularly if

you have a 24/7 operation like we have with model 3 uh then if the robot bols out you got to have 24/7 like Advanced robot technicians makes sense and then if the robot like accidentally crashes and like breaks a fixture then it's like man okay now now we've got the line got lined down it's like red alert and then I get pulled on my cell phone at 2: in the morning and it's like like trying to

fly apart from Germany it's like we literally had that two days ago do you have to when you get new robots do you build the robots or do you order them in and program them so uh there's like different classes there's many many different types of robots so the like the giant robot that we still lifting the car it's like that's that that is a catalog item but then we have to program the the motion and then and the end effector is that is

custom so the end effector that picks up the car drops it off that's a custom made thing okay so it's kind of like you kind of like buy this like powerful arm but it's just like having an arm stuck in the ground and then you're like okay what does the arm do you got to tell it everything to do yeah and then you got to put sensors on it and put fixtures but that's like kind of uh like that

robot over there uh that's also one of like the ones that picks up the car oh uh by the way these are like named after X-Men oh oh yeah I forgot about that um just X-Men mob it's like mob and X-Men like to start to run out of Nam yeah yeah this like actually turns out a lot of X by the way yeah okay so you can see like this is like quite a beast of a robot

you can just buy that robot you know in this case this a Fu robot um and uh you can buy the robot but then the end effector that's carrying the car um is something that's custom and then you got to do the programming and the like wire in the sensors and that kind of thing so the the level of precision of this massive robot is it to like as far as repeatable action is it literally the

same path every s yeah plus or minus an inch oh no it's uh centimeter it's it's better than that for a big robot there's a little less Precision than a smaller robot yeah but say a mediumsized robot will be accurate to 2.3 mm oh okay what is the most popular paint color coming through here that's black black yeah it actually varies by country um oh interesting

like um watch out there's a dumb robot coming through oh yeah this guy's like pretty pretty cool like what all right this could go wrong I don't know you trust them more than I do yeah okay okay all right good job good job robot yeah know I I see a lot of silver and I see a lot of white model X yeah just New Jersey uh black and white are the two most colors two most popular

colors um the white and black are are like black slight is is slightly more popular than white in the US but in like Europe it's way more popular like white is a very rare color in Europe for a car okay um in us it's like it's it's

about even with with black black and white are the two most common colors got it yeah and here you can see battery pack this is like be like a mating

station CL the battery pack oh this is literally connecting the battery to the car here you can see it's like a combination of manual and automatic so it's it's like they're lining it up it's like yeah exactly it's a it's it's done primarily by the robot system by the automated system but then you got a person just making sure that the fine tuning is there gotcha how do you feel about matte matte or satin

colors ask about that a lot I actually like the Aesthetics of mat it's really tricky to to repair a mat so like with you can polish it out with M um if you get like a little ding it's really hard to then rematch the so it looks like an even mat you can't just like you know that's fair point yeah um so it's it's doable it's it's something actually we would like to do that in the future um

but um like right now for example like the paint Shop's really operating at Full Tilt so adding any complexity to the paint shop would not be wise right now but I think it' be a cool thing to do in the future but these are sub assemblies so you can see like the front rear drive units being built up and the sub assemblies then feed the main assembly line these are long assembly lines oh well it's and it's it's integrating

uh snx okay and it's making about 2,000 cars a week it's model 3 entirely completely separate I guess inside the same building but separate whole the only place where model 3 uh and SN X come together is in the paint shop so the paint shop is processing S3 and X um simultaneously down the same line U but otherwise General s separate Bud separate um yeah everything else is different so just the paint shop where they come together you've mentioned

you've slept in the factory to be able to immediately like diagnose problems and Hands-On fix what's not right what type of things happen that you can immediately fix or immediately take action on actually last last three months last year I mostly spent at gigafactory um uh trying to uh help fix the battery production it's a modular production um and it's just it's a lot of little things like looking at at at

each uh at each little little tiny part each process say is the process necessary like because the best part is no part best part process is no process and occasionally at the design level you think something's necessary but then turns out it's not so it's just like making sure connect connecting between design um and Manufacturing uh make sure making sure we're close to loop on that um uh just saying like hey is this if let's say it's a it's like it's a lot of real

simple stuff but it's like times times a thousand so if we have like a automated volt driver going in like watch's the RPM and talk settings for the volt driver um can we make that go faster uh usually usually can unnecessary movements um like like for example actually don't really like the fact that we lift the cars over and and and back um ideally that would be a robot handoff yeah ifting rid of a middle stage yeah

exactly cuz the Middle St what is like putting it on a turntable and then the turntable is rotating and other robots picking it up it's actually problem is like sometimes the tun table breaks down ow and and so okay so it's like okay let's eliminate the turntable and just have robot go to robot um and then you don't have like uh turntable Breakers to consider so it's a lot of minimizing things that can go wrong and maximizing

the efficiency of the simple things that go right it's like um like design necessity of of every part of and every process uh the speed at which um especially the robots are going um are there um are there any is is there any unnecessary movement in the production line that that isn't value added like we're actually doing something yeah um like replacing elements of the production system that are not um not needed or

redundant exactly