



Can An EV Be Charge With A Generator?

All right so here is the thing guys this right here is our Boreas XD camper and we're taking it on a thousand mile road trip with our Tesla Model X and if everything goes to plan we won't need this generator at all we're just gonna be plugging into superchargers but what if things go wrong what if we actually do run out of power we've got the trailer we're in the middle of a desert how are we gonna get the next supercharger well that's where the generator comes in think of it kind of as a [temporary backup](#) just to get us where we need to go so this is gonna be the foundation of our project today the mobile connector and typically how this works is well it works just like anything else is like plugging in your phone or your computer so you take your standard 120 volt us plug plug it into the wall like this.

and here on the connector we see some green light so it's well grounded Tesla connector is accepting the power coming out of the wall we're good to go then we take the other end here and plug it into the Tesla it starts to blink and it flashes green and we're starting to charge let's see what that looks like on the inside all righty then so we are all plugged in here and we can see the car is charging at a rate of 3 miles per hour 12 amps and 122 volts which probably sounds like gobbledygook if you're not into v's or electricity in general let's see if our trailer lights are working yep it's not coming on plug this guy in put our chains on now in order to show you what's exactly is in this box I'm gonna go ahead and introduce Alex Lightman alex is our gear guy over at TFL offroad he is our number one leading expert in everything tech.

and unboxing we're gonna get to that right now all right so let's find out what's inside the box and this Generac GP 2200 i so first things first on top looks like we have our documentation so owner's manual all the stuff the lawyers make you put in right there we do have oil so 10w30 right

there good to go the only thing we're probably going to need to get is gasoline and got this accessory bag right here it's open it up and see what we get.

so funnel for filling our oil that's handy right there don't need to be messing with paper homemade funnels they give you everything you need this seems to be some kind of tool kit so we've got a screwdriver that is reversed end so flathead and Phillips and then this looks like probably a spark plug socket so they're really giving you everything you need to maintain it as well and it looks like we have some wires in this bag so let's see what kind of wires they give us looks like a set of jumper cables so 12-volt right there that'll go into the generator some pretty small battery clamps.

but looks like they'll work just fine and it [looks like the generator should be](#) right under here toss the box on the floor and here we go so here it is pretty simple design this is our gas fill right here looks like just a regular cap there and then there's a vent for gas venting so on and off right there control panel is all up on the front so here is the off run and choke position you have three LED lights for showing how the engines running it also gives you a low oil warning if you're running low on oil 12-volt right there that's where those jumper cables would go into you've got a fuse.

right here single USB port right there and then you have some parallel controls right here so you can pair two of these generators together and double your power we're not going to be doing that but they give you the option right there if you need to right there is our 220 volt us plugs and then we have an economy mode so it's just a rocker switch under this rubber panel and that will basically lower the RPMs make it a bit quieter and over on this side here's our engine start so pull that and it'll get you going a little bit of instructions up top here in case you forget how to operate the unit you can go through step by step and get it running.

oil fill is behind this panel here and you can access the spark plug right through that top door right there [Music] right here is the oil fill and I'm gonna fill it with the included bottle of oil my one complaint is that they actually give you too much oil I've seen other small motor appliances like power washers come with a pouch that had exactly the amount of oil you need to fill up they give you extra here so if you start to burn through some you do have a little bit extra but takes a little bit more effort to actually fill it up so I'm gonna have to check the level every once in a blue will take a little bit longer than if they just included the right size pouch [Music] all right I'm gonna fill up the tank I'll take off the vented cap this has a 1.2 gallon tank I'm not gonna fill it up all the way just in case things don't go how we want them to go but we'll just throw a little bit of gasoline in here so we can fire it up okay so let's start the generator up the first thing we have to make sure that this is in the choke position.

which it is that's all the way clockwise and we'll take the starter I'm just going to give it a few gentle pulls to get the oil circulating let's do like one or two more and then I'll give it a good yank see if it starts up it's not starting on chowk so we'll just skip that and go right to the run position let's give this a go fired right up might be a little bit hard to hear me right now but flip it into economy mode rpms drop a little bit generator gets really quiet before.

we plug in the Tesla let's make sure it's actually putting out power so I have this little work light should go on as soon as I plug it in there we go we do have power we're gonna try to figure out how many watts the Tesla requires to charge you know what is simply just a measurement of power let me give you some examples a radio may draw 220 watts a coffee maker 600 and then

a hairdryer quite power-hungry 1200 watts now let's see how many watts the Tesla is drawing and we can actually figure that out with just a simple equation here on our board so to calculate watts we simply multiply volts by amps so at 120 volts and at 12 amps which is roughly what the Tesla was charging we'll need one thousand four hundred and forty watts of power.

essentially now watts is just essentially a snapshot it's not over time so what this means is that whatever we charge our Tesla with has to [generate at least fourteen hundred and forty sustained watts](#) and this is kind of where things get a little bit tricky because it's easy to find a generator that will charge at over 12 amps 120 volts and 1440 watts but the generator needs to do a couple of specific things if it's gonna charge it all first of all it needs a clean sine wave and what that means is it needs clean consistent power so a lot of Cheaper generators will have a modified sine and it just won't work the output has to be a clean sine wave and that is constant power and this apparently is a generator that's gonna provide that now in order to get a clean sine wave you essentially need an invert-er generator and that's what this Generac is now there are several invert-er generators on the market.

but you need one other requirement that this Generac is supposed to meet specifically and that is it has to have a ground that works with a Tesla so for example the Honda units you have to run an adapter that bridges the neutral and the ground Prague's the Generac is supposed to do that autumn manically so we've got a in theory a clean sine wave and a ground that the Tesla Charger will accept now these are the lights here turned green we're good to go if they flash orange we've got a ground issue or some other issue with the power supply so open this up here I'm going to go out of economy and plug it in looks like we've got green lights there's only one way to find out let's plug it into the car now if I click this little popup menu and go to charging we see a bunch of different options including the current it's set to 12 amps.

I'm actually going to lower it down right here down to about 5 amps as the lowest so we don't overload the generator straight off the bat we're gonna build up to 12 though and see if we can keep up plugging it in turn blue Oh red so there's a connection error somewhere blue red yeah it's not charging the car so somewhere either the sine-wave is bad or we don't have a positive ground we've got a little warning up on the dash says equipment fault and then it goes ahead and says inadequate equipment grounding which is interesting because we've read that the Generac actually doesn't work with Tesla's we've seen videos of it but maybe not the specific model so I think it's time to go back to the drawing board is behind the camera and we are pulling up to our local hardware store to get something called a bonding plug essentially thanks essentially what it does it uses a little resistor to essentially fool whatever you're plugging in to the device that to make it think that there's a ground there when there really isn't.

which sounds kind of sketchy but it's supposed to work if I can find one so let's see if that happens Hey look I'll park next to this other Model X we'll go figure our local hardware store did not have the bonding plug we needed so naturally next thing you do is drive out the Camping World which is an hour and a half round-trip because they don't answer their phone and they also didn't have a bonding plug so now it's where we get a little bit creative we're gonna make our own not sure this is going to work whatsoever but a bonding plug is just a simple device here we've got the male end of your standard three prong connector and all I did was hot-wire the ground to the neutral hopefully correctly and what this is going to do is hopefully ground our generators to the Tesla will charge so I'm going to seal this plug back up we're going to plug it in and then see what happens.

all right there we go so if I've done this correctly when I plug in our little bonding plug it won't start a fire hopefully that's the goal and plugged in all right moment of truth I've got the mobile connector let's see what happens when I plug it into the BA the bottom plug let's see what we get here now you can see here we've got little Tesla lines there in green and before we were getting a red flash which meant through the grounding issue so actually all right this might work we may have just solved our issue all right so take two I'm gonna do the same thing I'm going to go into the charging settings and dial it back down to 5 amps let's see if we can get this thing to charge okay we got blue come on green oh we got green I think we're charging you can hear this generator strain just a little bit let's check out what it says on the screen okay so we are officially charging one hundred and twenty four volts hundred twenty three volts 5 out of 12 amps so let's see what happens when we dial up the current a little bit let's do seven.

okay so now we actually see some movement so we're charging at two miles per hour they're 7 out of 12 amps let the generator settle we're still holding a constant 123 in the voltage oh the generator seems to be a sputtering and it died bummer so at 70 amps we did have the generator kind of conk out on us but I did have this issue before actually with this generator if you let it run for sustain times when it's not entirely warmed up it seems like it wants to die and it seems to kind of surge a little so we're try it again hopefully get some temperature in it if not we can potentially play with a little bonding plug a little just doesn't sound very healthy okay so we're gonna wait for it to get some heat into it and then we'll try plugging the car and hopefully it'll it'll keep charging we're generator seems to be running a little bit happier.

fouled it back to five amps there we go okay so it's been going for a couple minutes now we are charging steady at five am this up at the seven okay you can hear the generators under a little bit more load there but still charging only between a mile to two miles per hour which is quite slow okay we're gonna let it settle let's try eight seems pretty happy at eight holding a steady 123 on the voltage what nine once again you can hear the generator surge a little bit as it is under more load there but it's running better now I think it's warming up we also have to break this unit in as well still 2 miles an hour about 10 ok we're up to 3 miles an hour there 122 volts so we dropped a little but we're still between 122 and 123 let's go to 11 amps you could just hear it increase in RPMs there and lastly swell so at 12 amps.

at 121 volts let's do a quick bit of math 12 times 122 we should be drawing 1464 watts which is well within the generators capacity but hey it's charging now what if let's see how long it would take to do the minimum daily charge let's let's see let's let it calculate there for a second 17 hours remaining to go to about 50% battery charge from 114 so it's definitely not very fast but in an emergency this could work so may seem kind of counterproductive to be charging our electric car up with good old-fashioned dinosaur oil here but there's actually a reason behind our man is because if you ever get stuck in a remote situation and you're towing a trailer.

like we are for example imagine how much the tow bill would cost how long it would take this could get you the last couple miles to a campsite or to a standard electrical plug but the question is what kind of mpg can we get in our Tesla so that means how much charge can we put into the batteries how many miles of range can we put into the car on one gallon of gas so we're gonna fill up the Generac to one gallon and let it run and see how much range we gain [Music] [Applause] [Music] so we're starting our test here with 35 percent battery or 114 miles let's see how many miles we can add to that 114 with one gallon of gas here we go on our mileage.

test so firing it up economy mode is off so one gallon of gas in the generator let's go ahead and plug in the Tesla just like that we're charging I'm going to up into 12 amps and we're gonna let this thing charge and once the gas runs out entirely on the generator we'll come back and see how much mileage we put back in the car [Music] all right so we've finished our testing and we let it go and after about three hours we came back to the Tesla and it wasn't charging in that three hours we did bump our range up 12 miles that went from 114 to 126 the generator never actually shut off the Tesla just stopped accepting power from it so we're gonna have to do a little bit more research into this.

we're not sure exactly why the Tesla stopped accepting a charge all right Alex so what have we learned is it's like a permanent charging solution definitely not we know that no one's really charging their Tesla with a gas generator but we're about to do a long road trip with the Tesla and hopefully if we need to that will get us out of the pinch yeah so even though we had some kind of fault three are the charges are resulted in 12 miles which probably would get you at least to the nearest charges exactly no well as always this has been Tommy and Alex go back to TFO car.com or next time me and my dad will be towing this Boreas xt travel trailer all the way to Oregon and then you and returning it back yep good luck to both of us yeah really see you next time.