Mach E Charger Systems

DIS January 9-14, 2022
rev.6.20.2022

Ford EV Charger Systems Installation Overview

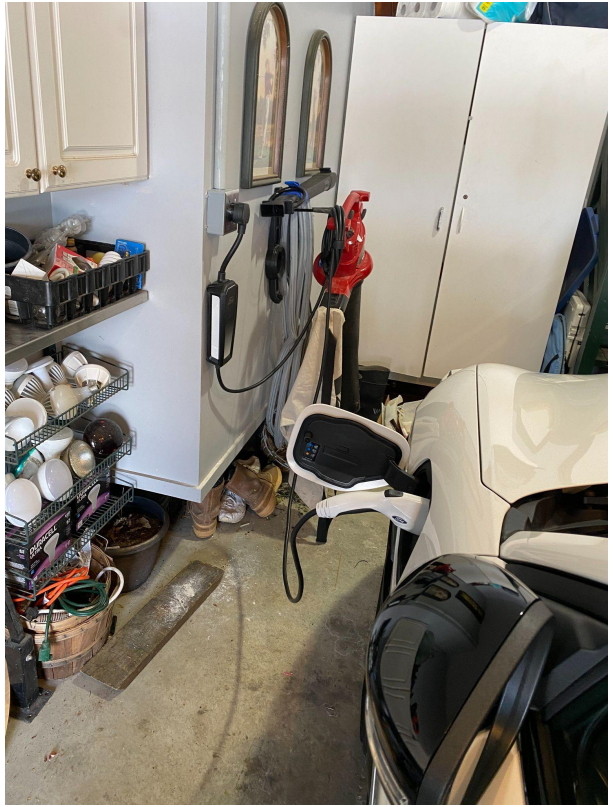
Overview of this document.

The vehicle was delivered on 1/9/2022. The NEMA 1450 receptacle was installed in my garage at least 1 week before vehicle delivered. We used the Mobile Charger, exclusively for about 1 week, then I installed the Ford Connected Charger Station. This document details the installation/use of the Mobile Charging unit and the transition/installation of the Ford Connected Charger Station.

Mobile Charger Installation/Test

DIS 1/9/2022

Installed NEMA 1450 Receptacle, 50A Circuit breaker with 50ft of 3/6 gauge wire.



NEMA 1450 Receptacle Detail

Installed box, conduit, receptacle. Decided to not hardwire the new Connected Charger Station in order to create a more convenient back up system if that unit failed.

Ford Connected Charger Station

Purchased unit from Waconia Ford, $800, my dealer, Apple, did not have any in stock.

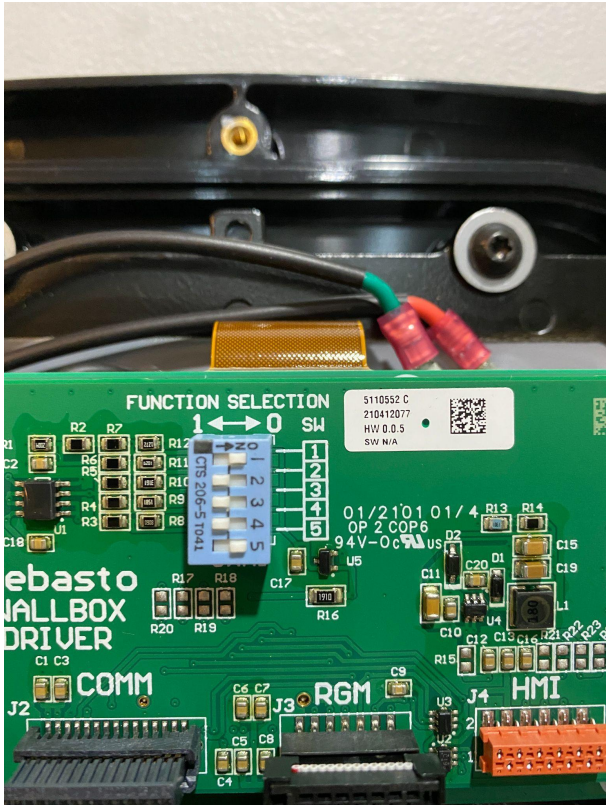
Installed unit after about 1 week of driving, testing the Mobile Charger system.

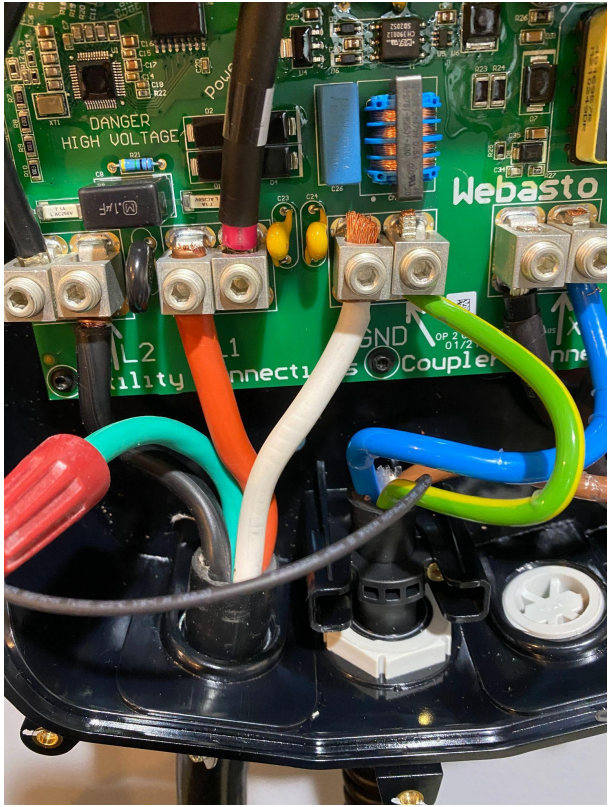
Part # ML9Z10C823A

Ford Connected Charger Set Up

Some confusion regarding set up. Did finally get it resolved, DIP switch setting instructions were backwards. 0 is on, 1 is off.

Added 4ft NEMA 1450 power cord pigtail,purchased on Amazon, no instructions on what to do with the safety ground so I just terminated with wire nut.

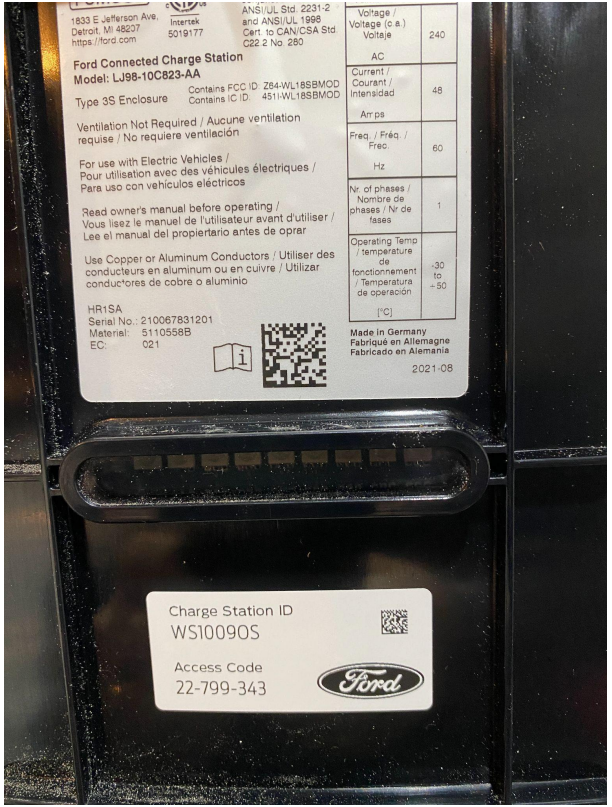




Ford Connected Charger Station Detail

Inside a cover views of charger. After set up, very slow system response. Poor product management coordination regarding set up instructions, i.e. FordPass for vehicle vs. Connected Charger Station.

Q. What do you do with the Charger Setup app on your phone after setup is complete? There are no instructions on what to do with it. It is now just another “junk” app on my Smart phone.



Nominal Operation Temperatures

W/50 amp circuit breaker & 40 Amp load

After properly setting the DIP switch system to 01110, 40 Amps Max w/50 amp Circuit Breaker, I measured temps of various power components.

These photos illustrate the circuit breaker temp at 40 Amps draw(78.9 deg.F) vs ambient (57.5 deg. F) Temperature Differential of 21.4 degrees F.

Nominal Operation Temperatures

NEMA 1450 plug/receptacle @ 40 Amp load

The maximum temperature rise @ the NEMA1450 plug was 70.5 degrees F with an ambient (air and wall temp) of 55.9 degrees F.

Temperature differential , rise, of 14.6 degrees F.

Nominal Operation Temperatures

Connected Charger Supplied Power Cord temp @ 40 Amp load

The maximum temperature of the 20ft power cord was 92.4 degrees F with an ambient (wall temp) of 55.9 degrees F.

Temperature differential, rise, of 36.5 degrees F.

Nominal Operation Temperatures

Connected Charger Station Waste, rejected heat

The temperature drywall wall board was 84 degrees F with an ambient (wall temp) of 55.9 degrees.

Temperature differential , rise, of 28.1 degrees F.

Charger Nominal Operation Temperatures

Conclusions/Observations

The measure temps were all within the published range limit of 140F. However, when summer arrives, and the ambient temperatures in my garage hits the + 90 degree F. levels it is entirely possible the Charger may reach high temperature limits and reduce the charging rates in order to operate within the nominal design temperature limits.

The component with the highest temperature rise was the Charger power cord. It reached the 92 deg. with a 55 degree ambient, a TD of 36 degrees. It is entirely possible this cord may reach 140 degrees, with a 40 Amp max charging rate on a 90+ degree ambient temperature day.

***June 2022 update: Over time, the molded plug reached temps of +150 degrees and it was replaced. The new 1450 plug operates with a temp rise over ambient temp of less than 10 degrees at 40 amp full load. Problem solved*.**

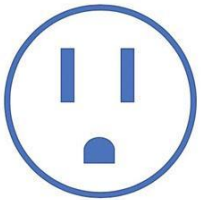
NEMA 1450 Plug Replacement

Connected Charger Station, June 2022

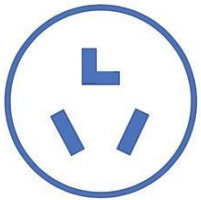
The molded 1450 plug pigtail temperatures continued to rise over time. Up to over 150 Degrees F. I replaced it with an RV NEMA 1450 plug and the overheating problem stopped.

Conclusion: The Chinese built molded plug product had a defective connection which caused the heat build up.

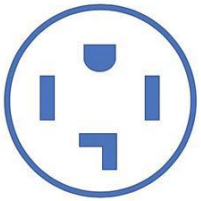
NEMA Power Plug Configurations



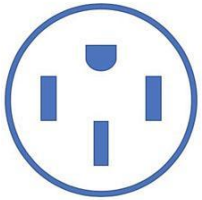
NEMA 5-15 Socket



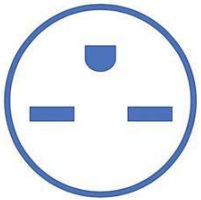
NEMA 10-30 Socket



NEMA 14-30 Socket

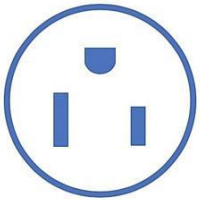


NEMA 14-50 Socket

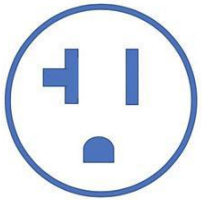


NEMA 6-30 Socket

NEMA 10-50 Socket



NEMA 6-50 Socket



NEMA 5-20 Socket