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ECE 438

1/23/19

Project 1

Note: I was originally assigned the 2016 Mercedes-Benz Smart Fortwo, but the unusual vehicle characteristics did not graph well. Dr. Cao said I could switch cars when I talked to him in class, so I switched to the 2016 Tesla Model S 60D.

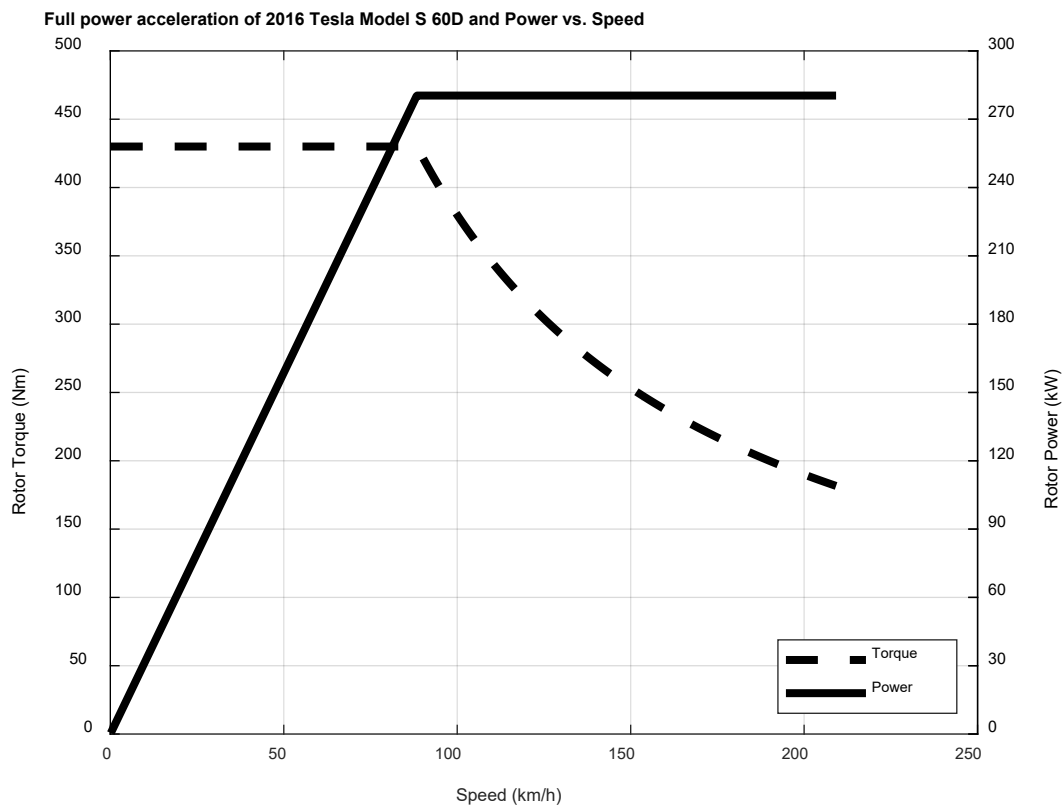


Figure 1: 2016 Tesla Model S 60D Torque and Power vs Speed

Figure 1 above shows the Rotor Torque and Power vs Speed graph for the 2016 Tesla Model S 60D. This graph is meant to give the Rated Torque, Power, and Speed. The Rated Torque is shown at the beginning where the torque value is constant at around 430 Nm. While the torque is constant and the speed is increasing, the power increases as well. The point at which the torque begins to drop, and the power flattens out to a constant value is the rated speed which is shown to be around 88 km/h. The constant value of the power after this point is the Rated Power which is around 280 kW.

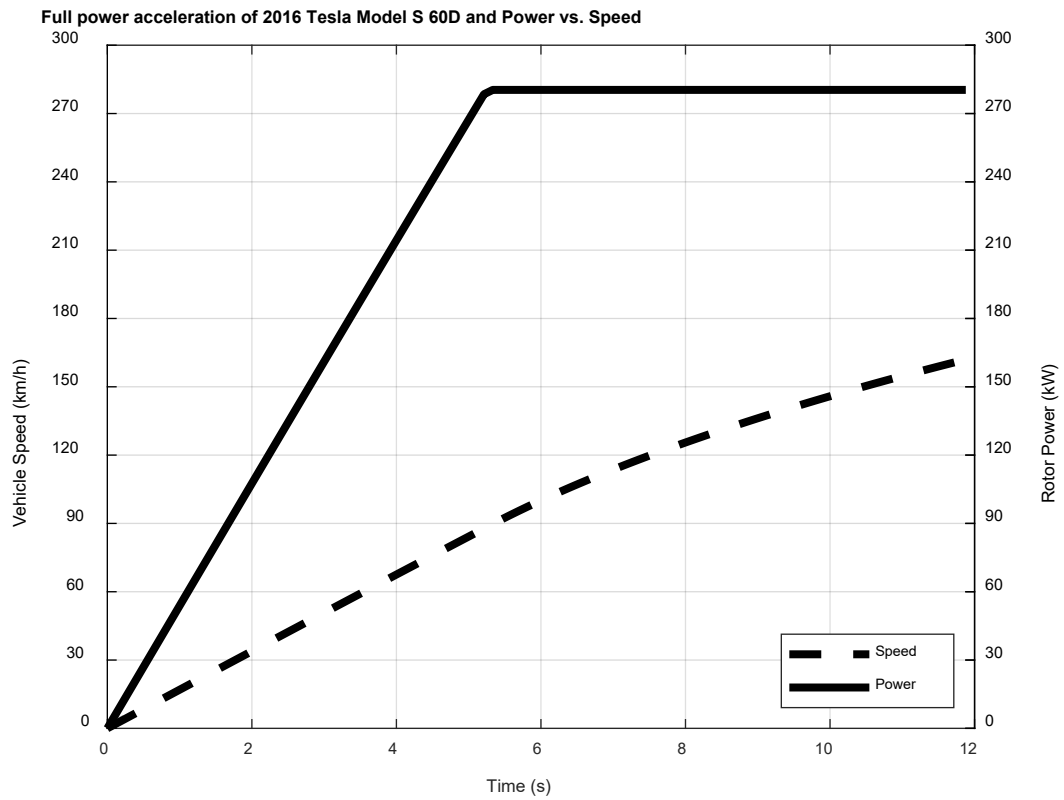


Figure 2: 2016 Tesla Model S 60D Speed and Power vs Time

Figure 2 above shows the Vehicle Speed and Rotor Power vs Time for the 2016 Tesla Model S 60D. This graph is meant to give the acceleration profile of the Model S. The speed increases at a constant rate while the power is increasing. Once the rotor power flattens out at the Rated Power, the speed then continues to increase but at a slowing rate, meaning the acceleration slows.