

Electric Vehicle Drive Specification Modelling for Three Wheels Scooter Configuration



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Abstract An electric vehicle is a vehicle that uses an electric motor for propulsion. Electric vehicles use fewer components that make electric vehicles low cost, easier for maintaining and very environmentally friendly as electric vehicles use no fuel. In east Asia, three wheels electric scooters have always become their choice because of their low cost and ease to perform maintenance. A major problem for three wheels electric scooter is the vehicle cannot reach the desired distance travelled because there is a problem when selecting motor and battery for three wheels electric scooters. This research study aims to construct the electric vehicle specifications design tools for motor and battery sizing, simulate and analyze the electric motor performance, and simulate and analyze drive system performance for three wheels electric scooter. For the electric vehicle specification design tool, DC motor sizing calculation is used to obtain the motor's power, speed, and torque based on some parameters required by user limitation. Simulation is performed using MATLAB R2020b Simulink to model and analyze the three wheels electric scooter's performance. BLDC motor with 800 W power, 1000 rpm speed and 12 Nm torque is chosen to simulate three wheels electric scooters. A lead-acid battery with 60 V, 12 Ah is chosen to simulate three wheels electric scooters. The effect of parameters such as motor's rated torque and power vehicle performance has been analyzed.

Keywords Electric vehicle · BLDC motor specification and motor torque

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