A103 ENGR

Design of Regenerative Braking Control and Optimizing Battery Recharging in Electric Vehicles

Abstract

In electric vehicles, regenerative braking is an effective and emerging technology that can serve the purpose of capturing and reusing energy lost while braking. In a traditional braking system, brake pads produce friction with the brake rotors to slow or stop the vehicle. The kinetic energy that was propelling the car is dissipated as heat due to friction. With Regenerative braking the kinetic energy is turned into electricity. These types of brakes use the vehicle electric motor in reverse to slow the vehicle's wheels. While running in reverse, the motor acts as an electric generator, producing electricity that is fed back into the battery. When the regenerative braking system is engaged, the recovery of energy is slower than the dissipation of energy from the battery. In other words, the battery is draining at a faster rate than the rate at which the regenerative braking system is recharging the battery. Because of this, modifications are needed to make the system more efficient. If the regenerative braking system is optimized to its full potential, more than half of the wasted energy is captured and reused as electricity to recharge the battery. The proposed solution is to utilize Simulink model to anticipate the energy dissipated and recovered while in motion, analyze the data using a variety of scenarios and design a component that will aid in the energy recovery of the Regenerative Braking System and optimize the battery recharge in an electric vehicle. The expected results are to improve the battery recharge in an electric vehicle. By improving the battery recharge, you are also enhancing the efficiency of the vehicle. When the battery is recharging through the regenerative braking system, it optimizes the range of the vehicle or distance driven. By utilizing methods of energy recovery from the regenerative braking system to recharge the battery. We plan to optimize the battery recharge and improve the efficiency of an electric vehicle.