EFFICIENCY ANALYSIS USING FLYWHEEL ENERGY STORAGE TECHNOLOGY FOR REGENERATIVE BRAKE SYSTEMS IN ELECTRIC VEHICLES

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Abstract

The increase in fossil fuel consumption used in conventional vehicles has adversely affected the amount of carbon emissions in the atmosphere. Due to this negativity, many problems such as global warming, noise pollution and cost have emerged. In order to find solutions to these problems, many studies have been carried out to increase the energy storage capacity of Electric Vehicles (EV) since 1835. EVs produced as a result of these studies work more efficiently than traditional tools. However, the driving range problem and charging time are the biggest disadvantages of these vehicles. These disadvantages are a major obstacle for EVs to replace traditional tools. In this study, an experimental study was conducted on flywheel-battery in-vehicle topologies, which are recommended to be used to increase the range in EV and hybrid electric vehicles. In the application, two flywheels with the same rotor radius and different masses were used. Energy was produced from the generator through these flywheels. This energy was employed to charge the batteries. The stored energy and power amounts were investigated depending on the variation of the moment of inertia of both flywheels at the maximum and minimum levels. As a result of this examination, it has been determined which of the flywheels with the same rotor radius but different masses is more suitable for electric vehicles.

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