The Research and Development of Optimal Electrical Management System of Hybrid Battery for the Parallel Hybrid Electric

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ABSTRACT

There are still some bottleneck problems, which exit for the electric vehicles such as: mileage, charging… ect. All these problems seem not easily to be solved during the short time. Hybrid Electric Vehicle (HEV) becomes a transient solution. The HEV can use energy resources efficiency and reduce the pollution of the environment. But most HEV use lead-acid Battery on the world. We know lead-acid Battery has low output efficiency on heavy load immediately and easily causes power carry output delay. The purpose of this study is to solve this problem by hybrid battery systems. The main structure is that Li-ion Battery as secondary system and lead-acid battery as prime system to improve efficiency of output power under large-current discharge. We estimate the state of charge (SOC) of lead-acid battery and Li-ion battery in charge and discharge. By the experimental data, such as load voltage, discharge current, battery temperature, and the curve fitting technique, the equation of estimable state of charge of battery can be obtained. Through a series of experimental test, the simulations are demonstrated well efficiency and the feasibility of the proposed equations of SOC. Finally, we use LabVIEW to program manage system of Hybrid ElectricVehicle (HEV). Not only show state of charge of batteries to driver but also optimalcontrol between Li-ion battery and Lead-acid Battery.

Keywords: Li-ion Battery, Hybrid Battery, State of Charge, Hybrid Electric Motorcycle

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