

ANALYSIS OF BATTERY CAPACITY AND PERFORMANCE USING SIMULINK MODELING ON THE LAKSAMANA V.2 ELECTRIC CAR

Name : M.Ai Kafaj

Register Number : 2204212295

Advisor : Reinaldi Teguh Setyawan, S.T.,M.T

ABSTRACT

This research aims to evaluate the battery performance of the Laksamana V.2 electric vehicle through MATLAB/Simulink simulation, covering parameters such as current, voltage, power, energy, speed, torque, and efficiency. The model was designed in an integrated manner to represent the relationships between variables under real operating conditions. Simulation results show that power consumption increases at higher speeds and on uphill slopes, while the highest efficiency of 76% is achieved at a speed of 40 km/h. Downhill slopes generate negative power, indicating the potential for energy regeneration. Additionally, the battery discharge simulation shows a gradual decrease in total energy over time as a result of varying current consumption, providing a clear picture of usage duration and actual battery capacity. Motor torque is higher at low speeds and decreases as speed increases. This integrated model is effective for analyzing the efficiency and overall performance of electric vehicle systems and can serve as a reference for developing control strategies and optimizing energy use.

Keywords: *Electric Vehicle, Battery, Energy Discharge, Efficiency, MATLAB/Simulink Simulation.*