

Uji Durabilitas Rancang Bangun Sepeda Kayu dengan Motor Listrik *Brushless Direct Current (BLDC)* menggunakan Variasi Baterai A1, Baterai A2 dan Baterai A3 (*Durability Test of Wooden Bike Design with Brushless Direct Current (BLDC) Electric Motor using Variation of A1 Batteries, A2 Batteries and A3 Batteries*) Andik Irawan, S.T., M. Eng. (as a Chief Counselor) Alex Taufiqurrohman Zain, S.Si., MT. (as a Member Counselor)

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ABSTRACT

The use of electric bicycles can reduce air pollution and the use of fossil fuels. The purpose of this study is to determine the ratio of torque, speed, and power produced by a 350 Watt BLDC electric motor, as well as to determine the time required for the process of charging the battery used. The research method used is the experimental method of designing an electric wooden bicycle and variations using 3 types of batteries is A1 battery (Maxstrom 12 V 12 Ah), A2 battery (Chilwee 12 V 12 Ah), and A3 battery (Sinleader 12 V 8 Ah). By testing the electric motor, the durability test includes testing the incoming current, power, speed and torque produced, while the battery is tested for charging time. The results of the durability test obtained data on the A1 battery, the current entering the motor is 10 A and 8 A, the power is 0.6 HP, the speed is 19,1 Km/hour, and the torque is 2.67 N/m and 1.86 N/m. A2 battery and A3 battery have the same power at 0.4 HP, speed 19,1 Km/hour. The difference is in the incoming current and torque, namely the current entering the A2 10 A and 8 A batteries, A3 14 A and 8 A batteries, while the torque for the A2 battery is 1.97 N/m and 1.93 N/m, the A3 battery 1.91 N/m and 1.89 N/m. on the long test charging A1 battery 4 hours 9 minutes, A2 7 hours 48 minutes, A3 5 hours 21 minutes. The difference is in the incoming current and torque, namely the current entering the A2 10 A and 8 A batteries, A3 14 A and 8 A batteries, while the torque for the A2 battery is 1.97 N/m and 1.93 N/m, the A3 battery 1.91 N/m and 1.89 N/m. on the long test charging A1 battery 4 hours 9 minutes, A2 7 hours 48 minutes, A3 5 hours 21 minutes. The difference is in the incoming current and torque, namely the current entering the A2 10 A and 8 A batteries, A3 14 A and 8 A batteries, while the torque for the A2 battery is 1.97 N/m and 1.93 N/m, the A3 battery 1.91 N/m and 1.89 N/m. on the long test charging A1 battery 4 hours 9 minutes, A2 7 hours 48 minutes, A3 5 hours 21 minutes.

Keywords: electric bicycle, design, durability