

Wind Turbine Powered Car Uses 3 Single Big C-Section Blades

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Abstract : The blades of a wind turbine have the most important job of any wind turbine component; they must capture the wind and convert it into usable mechanical energy. The objective of this work is to determine the mechanical power of single big C-section of vertical wind turbine for wind car in a two-dimensional model. The wind car has a vertical axis with 3 single big C-section blades mounted at an angle of 120° . Moreover, the three single big C-section blades are directly connected to wheels by using various kinds of links. Gears are used to convert the wind energy to mechanical energy to overcome the load exercised on the main shaft under low speed. This work allowed a comparison of drag characteristics and the mechanical power between the single big C-section blades with the previous work on 3 C-section and 3 double C-section blades for wind car. As a result obtained from the flow chart the torque and power curves of each case study are illustrated and compared with each other. In particular, drag force and torque acting on each types of blade was taken at an airflow speed of 4 m/s, and an angular velocity of 13.056 rad/s.

Keywords : blade, vertical wind turbine, drag characteristics, mechanical power

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