



CONVERSION OF HUMAN WORK ENERGY TO GENERATE ELECTRICITY

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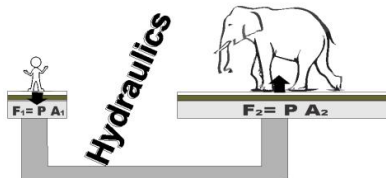


ABSTRACT

There are number of experiments and efforts done so far to produce Electricity through Human Power but none of them stand to provide High wattage requirement. Failure is mainly because the Generator demands huge and constant Human energy. We propose peddling electricity generator using Hydraulic breaks which will amplify Human Peddling Force or torque to generate Electricity. Our goal is to cascade such units to build a Human work energy Power Station which can empower rural school through their own energy.

KEYWORDS: produce Electricity , Human Power , generate Electricity.

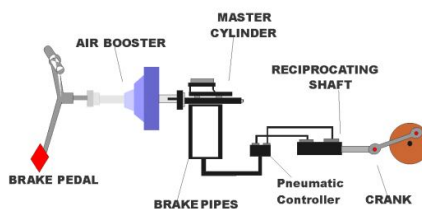
INTRODUCTION



Hydraulic breaks make it possible to amplify force. Fundamental Principal behind the Hydraulic Breaks is $F = PA$ where F, P and A stand for Force, Pressure and area of cross-section at each limb of a 'U' shaped tubes Piston system as shown in above figure. If P is constant at both the limbs, Force depends on Cross section area of a piston.

Pedal Power Electric Generator (PPEG) converts human energy through the use of a foot pedal and crank system. This PPEG now days widely used in transportation. A very few efforts has been taken so far to use the concept of PPEG in rural area, agricultural and in all domestic use eg. Alternative to water pump, domestic electric appliances etc. PPEG can't be utilized to high wattage devices due to the constrain of Human Power. Incorporating Hydraulic breaks in PPEG will make it possible to amplify the Human Power consequently will enhance the efficiency of the generator.

PERIPHERALS:



In Above Figure we have connected Hydraulic Breaks system to the crank. In the working model, Length of a Crank Shaft will fix the device RPM (Revolution per minute). The Crank wheel will drive an Alternator which will generate an alternating current (AC). We can use 1 kW to 100 kW rated Alternators. Voltage and Current required for the domestic appliances is about 210V to 230V (Single Phase), 440V (For 3 Phase) and 43A for 10 kW alternator of single phase. RPM required for this is in Between 1490 to 1510.

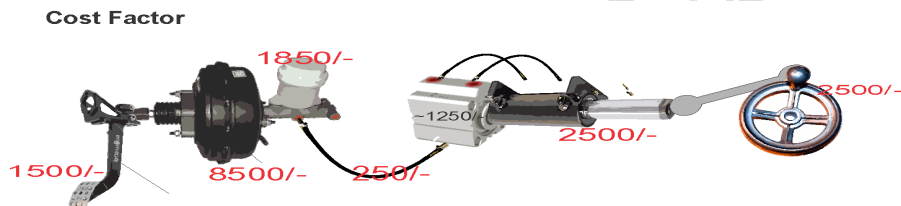
Formula for RPM calculation

$$\text{RPM} = 120 * \text{frequency} / \text{no. of pole}$$



Alternator with Gear Box- RPM needed-1490-1510,

We worked out on unit costing aiming for the domestic appliances power requirement. As shown in following figure, the total cost for Hydraulic Breaks system + Crank + Alternator is about Rs. 50000.



CONCLUSION:

If you have inverter and battery at home, in just Rs. 50000 + daily 30 min work out will give you day electricity forever. Cascading such a Unit can build a First Human work Power Station.