

Generation of Electricity by using Exhaust of Car

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Abstract: Energy is known as capacity to do work. Various types of energy available in the environment which is made by conventional and non-conventional energy sources. The all forms of energies are required for doing various mechanical operations. But as we know now there is large problem of electricity due to low availability energy resources. There are many innovative methods for generating electricity. This project defines how we can generate electricity using exhaust gas. Nowadays in automobile field many new innovating concepts are being developed. We are using the power from vehicle exhaust to generate the electricity which can be stored in battery for the later consumption. The turbine is connected to a dynamo, which is used to generate power. Depending upon the airflow the turbine will start rotating, and then the dynamo will also start to rotate. A dynamo is a device which is used to convert the kinetic energy into electrical energy. The generated power is stored to the battery. By taking above factors we made the model which can produces electric power by using kinetic energy of exhaust gas of vehicle specially by two wheelers.

Keywords: Electricity Generation, Exhaust Gas, Kinetic Energy.

I. INTRODUCTION

Now-a-days technology is moving at a very faster rate. The conventional energy sources like Petrol, Diesel etc. are on a verge of extinction. So scientists are moving towards the use of non-conventional energy resources. But it also requires some kind of energy to convert it into another form. In this project we are utilizing the kinetic energy of exhaust gases of vehicle which is of no use. Energy means capacity to do work. There are various types of energy available in the environment which is made by conventional and non-conventional energy sources. The all forms of energies are required to doing various mechanical operations. In recent the years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies particularly in highly efficient internal combustion engines. Viewing from the socio-economic perspective, as the level of energy consumption is directly proportional to the economic development and total number of population in a country, the growing rate of population in the world today indicates that the energy demand is likely to increase. Internal Combustion engines have been utilized for transportation and other needs for a long time. These engines have proven to be an effective source of energy. However, a lot of the energy produced by these engines goes wasted and unutilized. In today's age of fuel crisis, wastage of energy produced through engines cannot be tolerated. We can use the pressure energy of hot gases and we can convert the kinematic energy in to mechanical work and by mechanical work we can generate electricity.

II. METHODOLOGY

The turbine is fixed to the shaft of the generator. It will be a mechanism of axial high pressure turbine and backward curved fan blades with an electrical generator. The air will strike on high pressure reaction turbine and the pressure energy will convert into mechanical energy. This shaft will also be rotate fan blade that will increase the discharge rate. The improvement in discharge rate will increase the engine power because high pressure discharge means low pressure drop in exhaust system. If the pressure drop will be low the power will increase of the engine. The electrical generator will have rotated by the same shaft and the electricity will be produced by generator. This generator converts the mechanical work into electrical energy This generator is also a DC motor of 12 volts 0.5 MA current This DC motor will give maximum output on 1500 rpm.

III. OBJECTIVES

To install a mechanism with axial high pressure reaction turbines with a backward curved reaction turbine (Exhaust Fan Blade) in a single shaft with an electrical generator.

In this project, a serious attempt is made to convert the energy available through the exhaust gases of the two-wheeler into electric energy, which is an innovative and useful method of productively utilizing waste gases.

This setup requires no additional input fuel to generate the electrical power because the energy of the exhaust gases is utilized as input energy without letting it out as waste.

The output electrical energy thus produced can be stored in a rechargeable battery and the energy can be used for various purposes like powering the headlight, indicator, parking lamps.

IV. MODELING

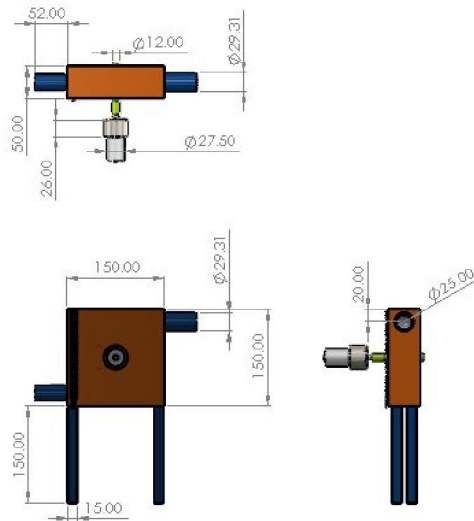


Fig 1: Drafting

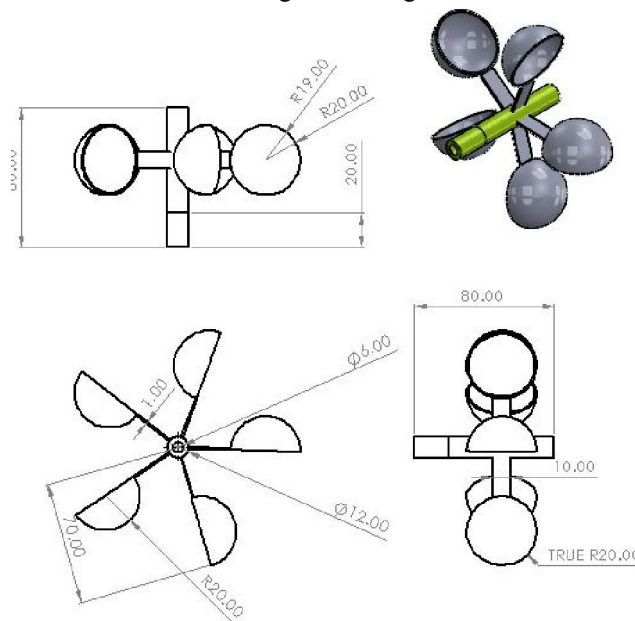


Fig 2: Turbine Drafting

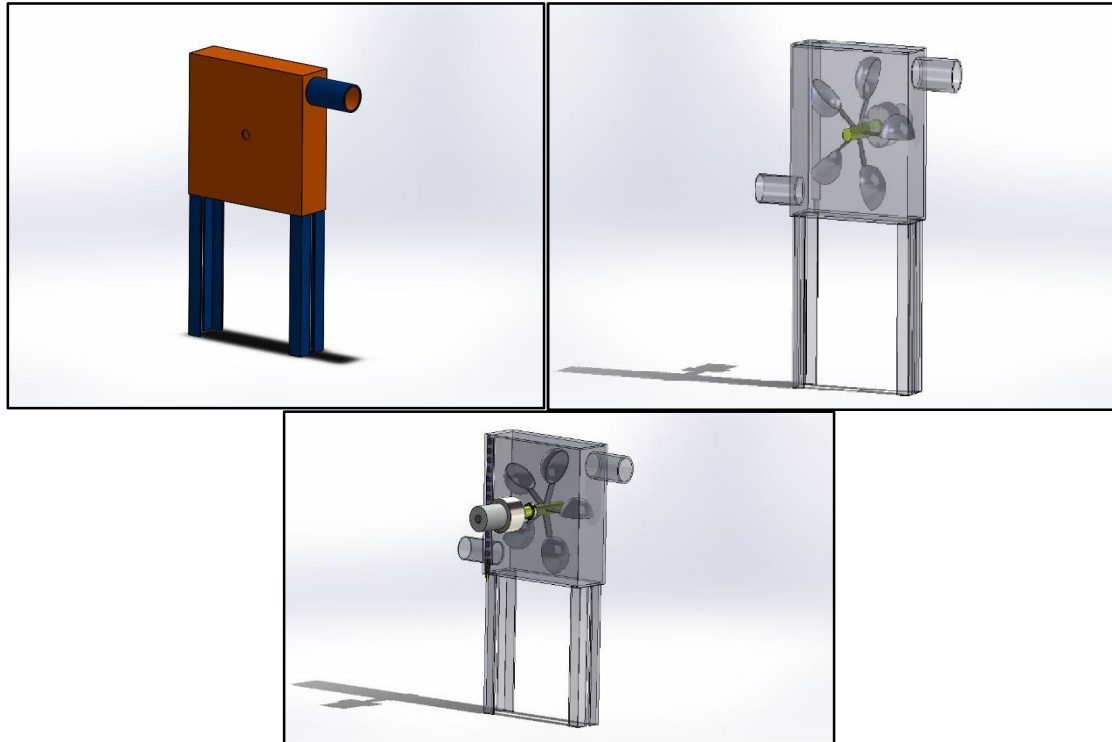


Fig 3: Frame

V. RESULTS

S. no	Engine speed (rpm)	Turbine speed (rpm)	Turbine velocity (m/s)	Voltage (V)	Turbine Power (W)
1	3000	245	1.28	3.69	7.91
2	4000	313	1.64	4.03	17.88
3	5000	390	2.04	5.22	32.02

Table 1: Result Table

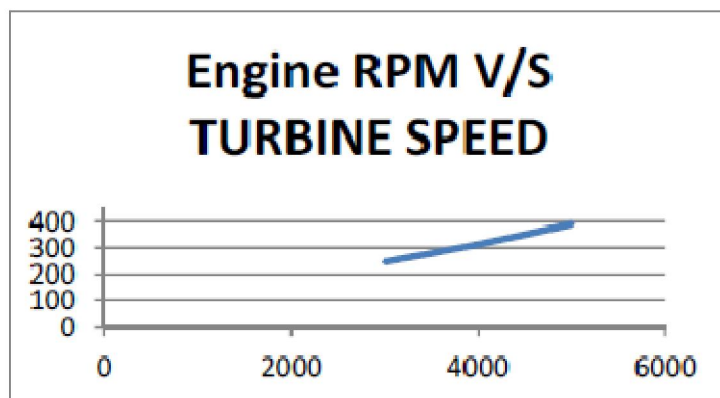


Fig 4: Engine RPM vs Turbine Speed Graph

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VI. CONCLUSION

The experimentation model of power generation using two-wheeler silencer by converting the energy of the exhaust gases of the two-wheeler into electric energy will be designed, test and successfully implement on a two-wheeler. This method of energy conversion was found to be easy and cost-effective.

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