

# Self-Powering Vehicle

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## ABSTRACT

*This Paper deals with the concept of free energy and its generation using flywheel system. In developing countries like India, with rapid growth in the economy, the demand for electricity is also increasing. With the rising demand for reliable, Cost-effective, and environmentally friendly energy storage, the Flywheel Energy Storage System (FESS) is quickly coming into its own. The main motor of one horsepower is used to drive the belt and pulley arrangement which rotates the generator. When the generator reaches at its peak rpm and starts to produce electricity. This is done with the help of flywheel (Gravity wheel). The flywheel is coupled with the generator with the help of suitable belt and pulley arrangement. The extra amount of energy is used to run a vehicle.*

**Keyword:** -Free energy, flywheel, Gravity, generator.

## 1. INTRODUCTION

Flywheels are devices that store kinetic energy on their rotating masses. These devices are considered to be among the alternatives of electrochemical batteries. Flywheel or gravity wheel is used in automobile vehicles to stopping engines from going dead. The flywheels store the energy within them due to their specific design and use it whenever necessary. Conventional automobile use petrol, diesel to power themselves. Using these fuels result in the emission of hazardous carbon-monoxide and carbon-dioxide, which harm the environment. It raise global warming issue. It harms humans and all living animals and plants. So to reduce the use of petrol, diesel is the main agenda of today's. To overcome this situation flywheel can be used to power the vehicle. When the flywheel is rotated it stores some amount of energy inside it. Utilization of this energy is one solution of this problem. It can also be used to run the home electric appliances. This project propose an idea to use the free energy in day-to-day life. Nikola Tesla once said that free energy is the right of every human being, everyone should get free energy. As Indian automobile industry is one of the largest in the world and lots of vehicle run daily in India, use of flywheel energy to run the vehicle can make tremendous impact on the world. The use of this energy is kind of using green energy, the mechanism is very simple, and it would occupy less space. The maintenance is easy. It is environment friendly.

## 2. WORKING PRINCIPLE: -

The objective of this project is to recover energy of flywheel by using principle of energy recovery system from flywheel and produce sufficient energy to run the project set up. First the ac motor is connected to the mains power supply, the motor is connected to the flywheel shaft with the help of belt a pulley arrangement, the arrangement is such that it will increase the rotating speed of flywheel. The flywheel shaft is then coupled with A C generator with the help of belt and pulley arrangement which further increases the rotating speed of A C generator. The flywheel shaft is coupled with the rear axle.

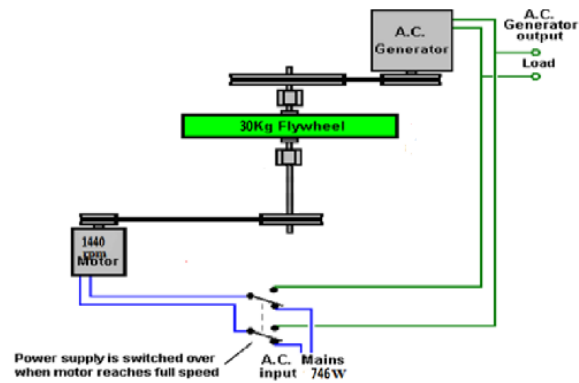


Fig: - Working of free energy generator.

### 3. LITERATURE REVIEW:-

#### A. Referring the Book by Perry I-Pei TSAO

It introduces the key system design issues for flywheel energy storage systems. First, the energy storage requirements in hybrid electric vehicles are presented. Then integrated flywheel energy storage systems and their advantages are described. The motor requirements for flywheel systems and homopolar motors are discussed. This work describes the design of a combined gravity wheel energy storage system along with motor or generator of homopolar & a drive at high frequency for high power applications. A system level design method for integration, design detail & its analysis of the flywheel system motor/generator are shown. This thesis presents a brief information on application, competing energy storage of flywheel and its different technologies.

#### B. Self-Excited Induction Generator (SEIG) - A.K. Tandon et al., and Malik et al., [2][1987]:

In recent years, squirrel cage asynchronous motors are used as the electromechanical energy converter. The principle of self-excitation applied to the asynchronous motors to generate self-excited induction generator (SEIG), when a suitable capacitance is connected across the stator winding of an induction machine and self-excitation occurs under favorable conditions. SEIG is a suitable candidate for electric generation applications, because they do not need an external power supply to produce the magnetic field. According to D. Seyoum et al. (2000) permanent magnet generator can also be used for energy applications but they pass from a non-controllable magnetic field, which decays over a period due to the weakening of the magnets, and the generated voltage tends to decrease steeply with load. The advantages of SEIG over asynchronous induction machines are very small size and weight, simple construction, absence of a separate source for excitation, cheap and low maintenance cost.

C. Bedier B. EL-Naggar and Ismail A. Kholeif [5] suggest the disk-rim flywheel for light weight. The mass of the flywheel is reduced subject to restraints of demanded moment of inertia and admissible stresses. The theory of the rotating disks of unvarying thickness and density is applied to every disk and the rim independently with suitable parallel conditions at the junction. Suitable boundary conditions on the centrifugal stresses are applicable and the dimensional ratios are obtained for less weight. It is proved that the required design is very close to the disk with uniform thickness.

#### D. "Kinetic energy recovery system by means of flywheel energy storage system" by Cibulka, J.

This paper deals with the design of Kinetic Energy Recovery Systems (KERS) by means of Flywheel Energy Storage (FES). KERS by means of FES are currently under development both for motorsport and road hybrid vehicles. The aim of the work is the optimization and implementation to the Hybrid and electric road vehicles. Testing Equipment for the experimental analysis of the Simplified FES was designed.

E. Michael Mathew, 2009, "Flywheels serve as kinetic energy storage and retrieval devices with the ability to deliver high output power at high rotational speeds as being one of the emerging energy storage technologies

available today in various stages of development, especially in advanced technological areas, i.e., spacecraft's. Today, most of the research efforts are being spent on improving energy storage capability of flywheels to deliver high power at transfer times, lasting longer than conventional battery powered technologies. Mainly, the performance of a flywheel can be attributed to three factors, i.e., material Strength, geometry (cross-section) and rotational speed. While material Strength directly determines kinetic energy level that could be produced safely Combined (coupled) with rotor speed, this study solely focuses on exploring the effects of flywheel geometry on its energy storage/deliver capability per unit mass, further defined as Specific Energy”.

**F. R. Hebner, 2014,**” A FESS stores energy in the form of kinetic energy of a spinning mass. Energy transformations from electrical into mechanical and back are carried out by an electrical motor/generator. Potentially, a FESS can offer an essentially unlimited number of charge/discharge cycles. Furthermore, if magnetic bearings and a brushless motors/generator are used, the rotor can be suspended without any mechanical contact. This allows very high rotational speeds and energy densities without affecting the system life.”

#### **4. PROBLEM IDENTIFICATION:-**

The increasing carbon level in atmosphere and demand of electricity is raising vary rapidly. The non-conventional energy sources like coal, water, nuclear energy are limited in environment. Thus there is a need of system which can self-reliable to generate its own energy and power itself. So we came up with new idea which can make the automobiles self-powered and reducing the demand of petrol, diesel and thereby reducing the carbon emission percentages.

#### **5. COMPONENTS: -**

##### **1. A C motor –**

The motor that converts the alternating current into mechanical power by using an electromagnetic induction phenomenon is called an AC motor. This motor is driven by an alternating current. The stator and the rotor are the two most important parts of the AC motors. The stator is the stationary part of the motor, and the rotor is the rotating part of the motor. The AC motor may be single phase or three phase.

The three phase AC motors are mostly applied in the industry for bulk power conversion from electrical to mechanical. For small power conversion, the single phase AC motors are mostly used. The single phase AC motor is nearly small in size, and it provides a variety of services in the home, office, business concerns, factories, etc. Almost all the domestic appliances such as refrigerators, fans, washing machine, hair dryers, mixers, etc., use single phase AC motor. The AC motor is mainly classified into two types. They are the synchronous motor and the induction motor.

##### **2. Pulleys-**

A **pulley** is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable or belt, or transfer of power between the shaft and cable or belt. In the case of a pulley supported by a frame or shell that does not transfer power to a shaft, but is used to guide the cable or exert a force, the supporting shell is called a block, and the pulley may be called a sheave.

##### **3. Belts-**

The belt is a mechanical device which is used to transmit power from one shaft to another shaft. The belts are of two types, flat belt and V-belt.

##### **4. Flywheel-**

A **flywheel** is a mechanical device specifically designed to efficiently store rotational energy. Flywheels resist changes in rotational speed by their moment of inertia. The amount of energy stored in a flywheel is proportional to

the square of its rotational speed. The way to change a flywheel's stored energy is by increasing or decreasing its rotational speed by applying a torque aligned with its axis of symmetry.

### **5. A C Generator-**

Generator is a machine that converts mechanical energy into electrical energy. It works based on principle of faraday law of electromagnetic induction. The faradays law states that whenever a conductor is placed in a varying magnetic field, EMF is induced and this induced EMF is equal to the rate of change of flux linkages. This EMF can be generated when there is either relative space or relative time variation between the conductor and magnetic field.

### **6. FUTURE SCOPE: -**

- 1) Changing the Flywheel's weight, size, structure and speed, changes the output of the alternator.
- 2) If higher specifications system is used such as 8HP motor, 150kg flywheel could produce 50% more free energy at the output alternator.
- 3) Such high end system could extend the life of exhaustible nonrenewable resources for more than 50% of its current life.

### **7. CONCLUSION:-**

We have obtained more electrical output which is our free energy. The AC generator have produce extra electricity by using of flywheel from motor. The main advantage of Free energy generator using flywheel is that it can generate energy without used of any extra equipment and this free energy generation is non-hazardous and environmental friendly. Can be used in various applications like electric fuel cars, household, industrial and increase the efficiency of traditional electrical.

### **8. ACKNOWLEDGEMENT:-**

The entire session of project completion has been a great experience providing us with great insight into learning various design concept, software, engineering concepts & benefits of team work. As rightly said, for the successful completion of any project, an effective & timely guidance is the most important asset. Our project would not have been materialized without the co-operation of many of the people involved. At the outset, we consider ourselves fortunate enough to have had the privilege of working under the guidance of Prof. SatishMarkad. He stood by our side for this and his enthusiastic guidance, support & encouragement throughout the project made our work so much easier. Our sincere thanks to our Project Coordinator, Prof. PankajWankhede and Prof. N. Wadaskar, H.O.D of mechanical department for their consistent support. We express our deep gratitude to all the staff members & supporting staff of mechanical department for providing us with the needed help.

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