

PROJECT REPORT

ON

**Power Generation through Speed
breaker**

Submitted by

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1. ABSTRACT

In the present scenario power becomes major need for human life. Due to day-to-day increase in population and lessen of the conventional sources, it becomes necessary that we must depend on non-conventional sources for power generation. While moving, the vehicles possess some kinetic energy and it is being wasted. This kinetic energy can be utilized to produce power by using a special arrangement called “POWER HUMPS”.

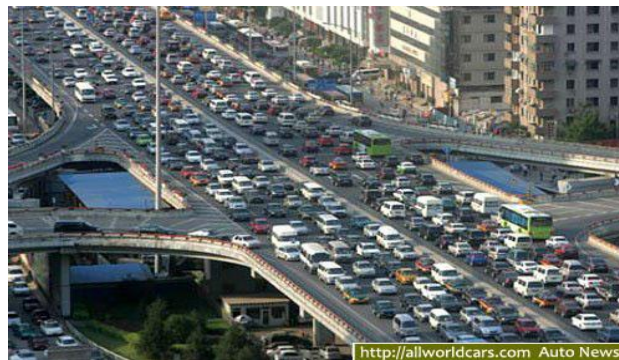


The Kinetic energy of moving vehicles can be converted into mechanical energy of the shaft through rack and pinion mechanism. This shaft is connected to the electric dynamo and it produces electrical energy proportional to traffic density. This generated power can be regulated by using Zener diode for continuous supply. All this mechanism can be housed under the dome like speed breaker, which is called hump.

The generated power can be used for general purpose like streetlights, traffic signals. The electrical output can be improved by arranging these power humps in series this generated power can be amplified and stored by using different electric devices. The maintenance cost of hump is almost nullified. By adopting this arrangement, we can satisfy the future demands to some extent.

2. INTRODUCTION

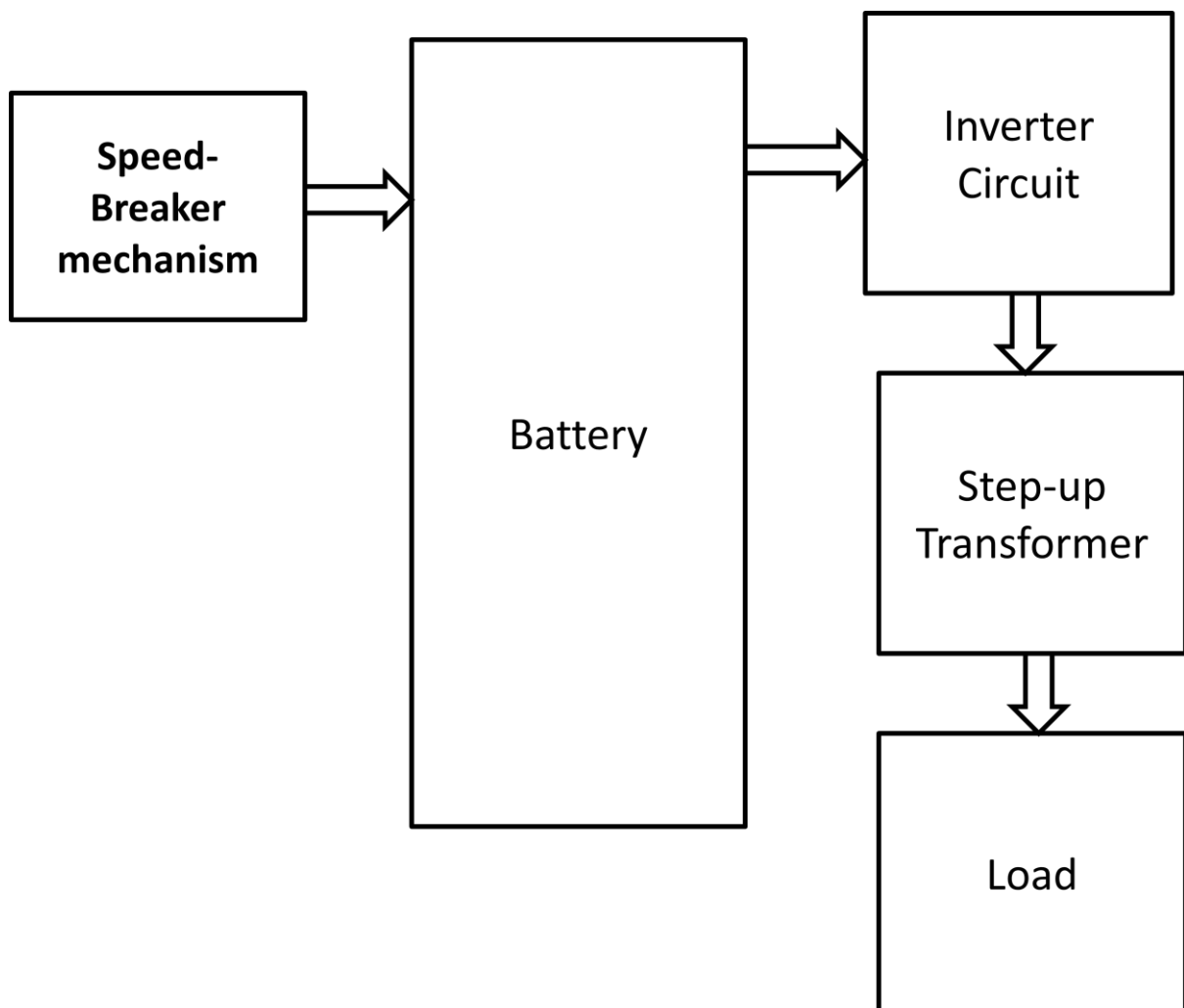
In the present scenario power becomes the major need for human life .The availability and its per capita consumptions are regarded as the index of national standard of living in the present day civilization. Energy is an important input in all the sectors of any countries economy. Energy crisis is due to two reasons, firstly the population of the world has been increased rapidly and secondly standard of living of human beings has increased. India is the country, which majorly suffers with lack of sufficient power generation.



The availability of regular conventional fossil fuels will be the main sources for power generation, but there is a fear that they will get exhausted eventually by the next few decades. Therefore, we have to investigate some approximate, alternative, new sources for the power generation, which is not depleted by the very few years. Another major problem, which is becoming the exiting topic for today is the pollution. It suffers all the living organisms of all kinds as on the land, in aqua and in air. Power stations and automobiles are the major pollution producing places.

Therefore, we have to investigate other types of renewable sources, which produce electricity without using any commercial fossil fuels, which is not producing any harmful products. There are already is existing such systems using renewable energy such as solar wind), OTEC (ocean thermal energy conversions) etc...for power generation. The latest technology which is used to generate the power by such renewable energy” POWER HUMP”.

3. BLOCK DIAGRAM



4. BASIC PRINCIPLE

While moving, the vehicles possess some kinetic energy and it is being wasted. This kinetic energy can be utilized to produce power by using a special arrangement called POWER HUMP. It is an Electro-Mechanical unit. It utilizes both mechanical technologies and electrical techniques for the power generation and its storage. POWER HUMP is a dome like device likely to be speed breaker. Whenever the vehicle is allowed to pass over the dome it gets pressed downwards then the springs are attached to the dome is compressed and the rack which is attached to the bottom of the dome moves downward in reciprocating motion. Since the rack has teeth connected to gears, there exists conversion of reciprocating motion of rack into rotary motion of gears but the two gears rotate in opposite direction. A flywheel is mounted on the shaft whose function is to regulate the fluctuation in the energy and to make the energy uniform. So that the shafts will rotate with certain R.P.M. these shafts are connected through a belt drive to the dynamos, which converts the mechanical energy into electrical energy. The conversion will be proportional to traffic density.

Whenever an armature rotates between the magnetic fields of south and north poles, an E.M.F is induced in it. So, for inducing the E.M.F. armature coil has to rotate, for rotating this armature it is connected to a long shaft. By rotating same e.m.f is induced, for this rotation kinetic energy of moving vehicles is utilized. The power is generated in both the directions; to convert this power into one way, a special component is used called zener diode for continuous supply. All this mechanism can be housed under the dome, like speed breaker, which is called HUMP. The electrical output can be improved by arranging these POWER HUMPS in series. This generated power can be amplified and stored by using different electrical devices.

4.1. Possible using different Mechanisms :-

- Spring coil mechanism
- Rack- Pinion mechanism
- Crank-shaft mechanism
- Roller mechanism

4.2. RACK AND PINION MECHANISM

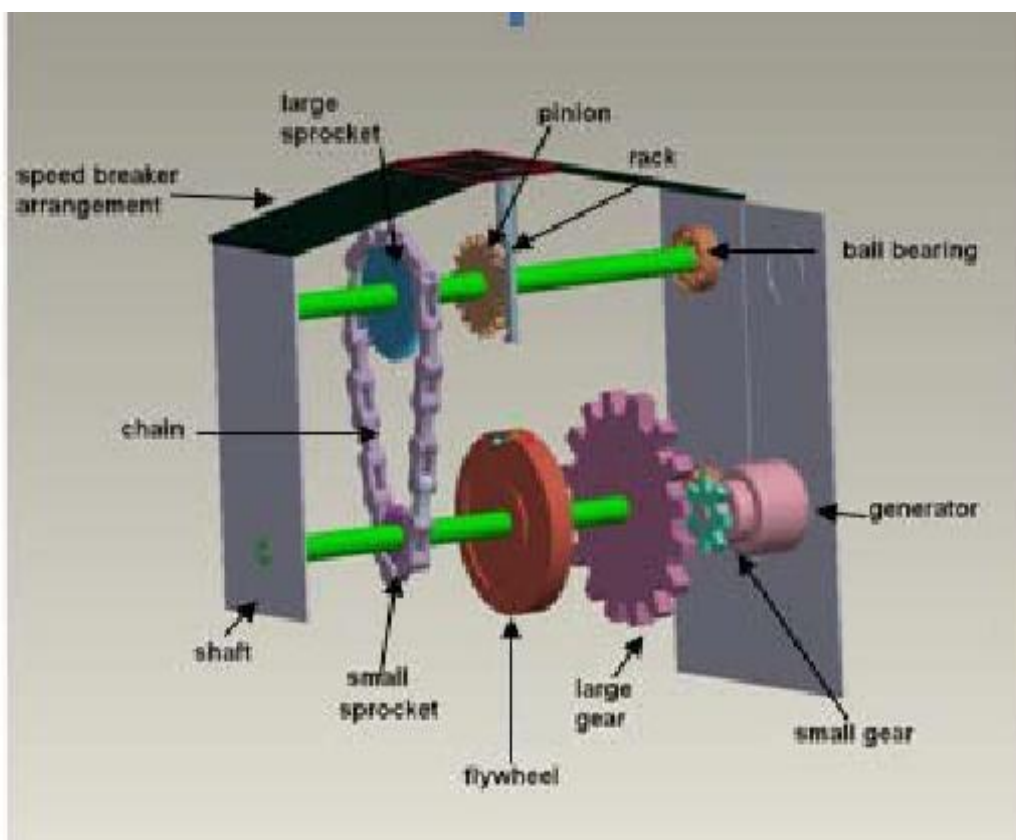


Figure: Rack and pinion mechanism

4.3. RACK AND PINION MECHANISM

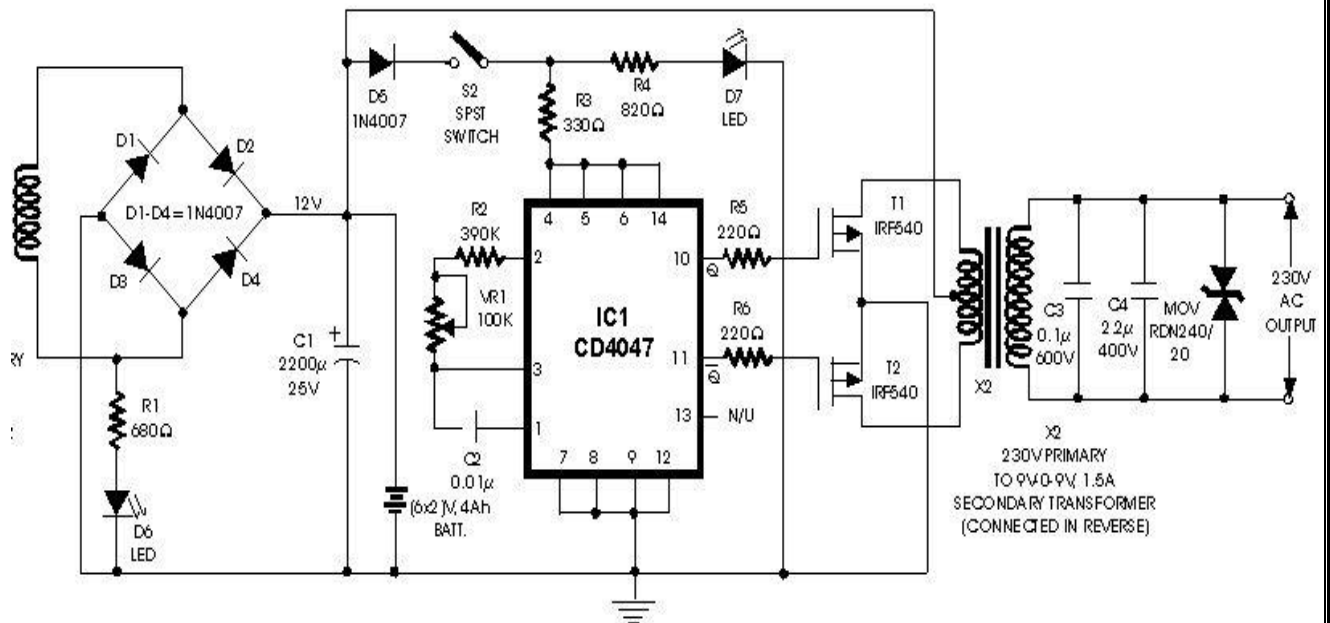
Speed breaker POWER GENERATOR Converters basically new concept of non-conventional energy generation. It is electro-mechanical energy generating machine. This machine converts reciprocating motion in to rotary motion. The rotational power is stored in flywheel & flywheel rotates dynamo, which generates electricity.

Here first important point is how we get reciprocating motion, which is prime input in the system. For that we use weight of Moving vehicle on the Speed breaker. We put our machine underneath the Speed breaker installing different units. All the units are connected to the common shaft using chain and sprocket drive.

The head of rack is brought up to level beneath the speed breaker surface. When vehicle moves on the speed breaker, the rack it will be pushed down. The rack is attached with free wheel type pinion that rotates in one direction only. The rack & pinion arrangement convert reciprocating motion in to rotary motion.

This rotary motion is further magnified using reciprocating motion in to rotary motion-belt & pulley drive. The output of pulley is attached with flywheel which stores kinetic energy and transfer to dynamo which generate electricity with zero cost. A "generator" and "motor" is essentially the same thing: what you call it depends on whether electricity is going into the unit or coming out of it. A generator produces electricity. In a generator, something causes the shaft and armature to spin. This generated power is used for various application required by different user.

5. CIRCUIT DIAGRAM



6. CONCLUSION & FUTURE SCOPE

➤ CONCLUSION:-

- It can be implemented at metropolitan cities.
- So that more electric power is produced.
- Arrangement of whole setup is easier.
- The stored electricity could satisfy the daily requirement of electric power.

➤ FUTURE SCOPE:-

- Suitable at parking of multiplexes, malls, toll booths, signals, etc.
- Uses: Charging batteries and using them to light up the streets, etc.
- Such speed breakers can be designed for heavy vehicles, thus increasing input torque and ultimately output of generator.
- More suitable and compact mechanisms to enhance efficiency.