

Power Hump the New Source of Power Generation

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Abstract: *In the current scenario energy has become the major need of human life. The availability of regular conventional fossil fuels will be the main source of power generation, but they will ultimately get devoid within next few decades. Therefore there is a need to develop non conventional sources of power which be fulfilling our needs for the next decades. Also our population is increasing rapidly and conventional sources are limited. Therefore we need to develop smart techniques for the optimum utilization of conventional sources for energy conservation. The new source of energy is created by converting one form of energy into another form. My paper emphasis the idea to use kinetic energy of vehicles when it is passing over the speed breaker. Lots of energy is generated when vehicle passes over a speed breaker. So we can utilize this energy and produce power by using speed breaker as power generating unit. The main aim is to convert kinetic energy of moving vehicles into mechanical energy. Therefore this kinetic energy can be utilized to produce power by using a special unit called as "POWER HUMPS". The generated power can be utilized for application like streetlights, traffic signals, highway lights etc.*

Keywords: *Power Hump, Non Conventional energy, Kinetic Energy, Mechanical Energy.*

1. Introduction

The review shows us the mechanism of electricity generation from speed breakers. Increasing demand for energy adds the need for identifying a way to use the non-conventional sources of energy[3]. Here in this paper we are looking forward to conserve the kinetic energy that is wasted. Beneath the speed breaker we setup an electro-mechanical unit through which the mechanism will operate. The electrical power generation can be improved or multiplied by arranging this power humps in series[1,2,3]. Energy crisis is due to two reasons, firstly the population of the world has been increased rapidly and secondly the standard of living of human beings has increased. India is the country, which is majorly suffers with lack of sufficient power generation. The capital energy consumption of U.S.A. is about 8000 KWh, whereas as per India is using only 150 KWh U.S.A.

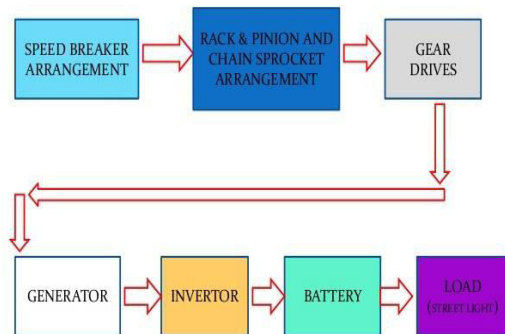
With 7% of world population consumes 32% of total power generation where as India as developing country with 20% of world population consumes only 1% of total energy consumed in the world. Therefore, we have to investigate some approximate, alternatives, new sources for the power generation, which is not depleted by the very few years. So there for it becomes necessary that we depend on non-conventional energy sources for power generation[2]. While moving must the vehicles posses 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". Before starting I have one question to you who all are really very happy with the current situation of the electricity in India? We suppose no one. So this is our step to improve the situation of electricity with an innovative and useful concept, like Generating electricity from a speed breaker. First of all what is electricity means to us? Electricity is the form of energy, It is the flow of electrical power, It is a basic part of nature and it is one of our most widely used forms of energy. We get electricity, which is a secondary energy source, from the conversion of other source of energy, like coal, natural gas, oil, nuclear power and other natural sources, which are called primary sources. Therefore with this mechanism we can generate high source of energy which will be a great source of power in the rural areas, villages, small towns and developing countries.

2. Literature Review

The studies led to the idea of generating power using speed breaker called power hump. Vicky Vyas one of the students of Ahmedabad displayed the project at GTU Central Techfest 2015. He gave the idea by his project how by using an electro-mechanical unit we can conserve the energy beneath the speed breaker. The idea of basic physics was adopted by him to convert kinetic energy into mechanical energy. An amateur innovator, Kanak Gogoi in Guwahati has developed an idea to generate power when a vehicle moves over a speed breaker. The idea has caught the eye of IIT-Guwahati, which funded the pilot project related to generate electricity from power humps. They have evaluated the project and recommended to the Assam government. Their

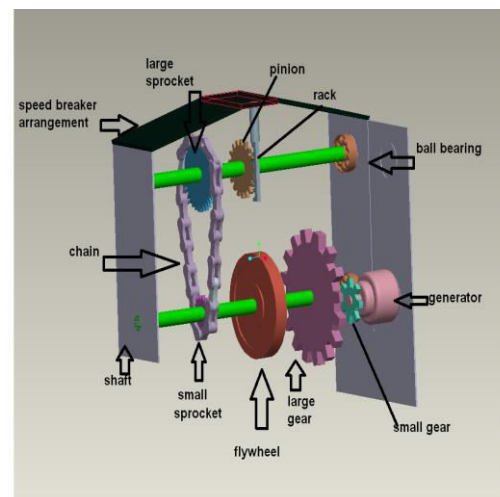
work has provided a need to think on this alternative to generate electricity on large scale, as it proves to be a boon to the economy of the country.

3. Block Diagram



4. Proposed System

So the system basically uses rack and pinion arrangement for transferring power. In this system kinetic energy is converted in mechanical energy it uses electro-mechanical unit consisting of electrical and mechanical parts. So this kinetic energy can be utilized to generate power by using a special arrangement called as power hump. The mechanism is housed in a dome like speed breaker which is called hump. Thus whenever is allowed to passover the hump the dome gets pressed downwards the springs that are attached to the dome are compressed and the rack which is attached to the bottom side of the dome gets reciprocating motion. Thus the reciprocating motion is converted into rotary motion as the teeth of the rack are connected to the gears but the two gears rotate in opposite direction. A flywheel is mounted on the shaft whose function is to regulate the speed and to make it uniform. Shaft is connected through a belt drive to the dynamos which convert mechanical energy into electrical energy. Emf is generated whenever the armature rotates in the magnetic field between the poles. So to induce this emf armature coil has to rotate and for rotating this armature it is connected to the shaft. For this rotation kinetic energy of the moving wheel is utilized. The power is generated in both directions to convert it in one direction zener diode is used for continuous supply. More power can be generated by connecting power humps in series.



5. Equipments Required

5.1 Rack and Pinion Arrangement

It is the positive transmission device having definite velocity ratio which converts rotary motion into tranlatory motion or linear to rotary motion. It has goog shock-absorbing capacity.

5.2 Flywheel

It is used to regulate speed and to make it uniform it acts as an accumulator. Reduces fluctions in speed.

5.3 Shaft

It is the rotating member used for transmitting power from one place to another place. It must have high torsional and lateral rigidity.

5.4 Generator

Used for converting mechanical energy into electrical energy they work on farady laws of electro magnetic induction. It consists of stator armature coil and magnetic field

6. Observations

When I studied various papers I came to know that when the vehicle moves at slow speed over the speed breakers the voltage generated will be maximum at that moment because the weight of the vehicle is more at that time. While at high speed less voltage is produced.

7. Advantages

- Power generation with low cost and using non-conventional energy sources which will help us to conserve the conventional energy sources to meet the future demand.
- By using this method, electricity will be generated throughout the year without depending on other factors.

- Easy for maintenance and no fuel transportation problem.
- Pollution free power generation.
- Less floor area required and no obstruction to traffic.
- No need of manpower during power generation.

8. Conclusion

From the above study I like to conclude by saying that waste energy to moving vehicles can also be utilized by using electromechanical arrangement and in the coming days it will prove a great boon to the world. Vehicular traffic in big cities is proving to be a great deal to handle so why not to utilize this traffic and generate some power that can be utilized to light up street lights and traffic signals and thus reducing the use of conventional sources of energy.

9. References

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