

# Road Power Generation using Speed Breaker

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**Abstract-** Energy must have an essential resource that used in our daily life. In the modern period, there are different types of methods & concepts of energy developed and modified for a better future. Heat measures the efficiency of a generator & power plant that converts fuel into heat and into electricity. In this project, we are going to talk about road power generation. How can power utilize from a road (breaker)? It is a mechanical process which converts kinetic energy into electrical energy. When automobiles (vehicles) pass over the highway or a speed breaker which is produced kinetic energy by the rotary motion then converts into electrical energy.

**Keywords-** flip board; rack & pinion; Wasted energy; spring; Dynamo; Speed Breaker (Highway)

## I. INTRODUCTION

In the modern period, there are many sources present in the environment that is important in our daily life.

In the world, every human being era depends on the sources like air, water & food etc. We cannot imagine surviving without power or electricity as like water.

A Demand for energy is going on to show the rapid growth in industrialization & civilization areas etc. The relative value of energy (electricity) is not equivalent to the demand.

India is one of the fastest growing countries to produce power in the world. Electricity can be used by people around 84/50% in India till 2016. The access of energy (used in rural areas 77%, urban areas 98.4%) till 2016.

In recent years, the energy can generate in two ways like as conventional and nonconventional energy sources.

The conventional energy is produced, which emits the gasses in one of its carbon dioxides, pollutes the environment so we can use non-conventional energy sources a reduction in carbon dioxide emission. Renewable & Non-renewable is a source of energy produce & generate energy. Generally, non-renewable source of energy produces power. The non-renewable sources of energy are not infinite to generate energy on the other way there are many sources used in renewable sources as like wind, geothermal, tidal & sunlight(solar energy) etc. It is a type of eco-friendly

sources. The non-renewable energy sources are more expensive than renewable sources of energy, converting property such as technical sources & limitations of financial need to generate power. Road power generation (RPG) is the most essential sources to generate electric power. India is the seventh largest country to produce energy from road power generation in the world. Road power generation is a new concept for generating power. Road power generation is a type of system generates electricity at a low cost. The road power generation is a mechanism to generate power except for renewable energy sources. This device may be used to produce the power for supplies the street light, road light & building light then the energy is stored in the battery from Road power generation, can be used for emergency power & other electric applicants. The Road Power Generation is a type of source (device) which converts kinetic into electrical energy. It can be utilized the wastes energy from a vehicle.

When the vehicle passes over the breaker, the breaker moves upward and downward direction by the gears then it is connected to the dynamo then converts into electricity. The dynamo is an electrical power conversion device.

## II. PROCEDURE OF RPG

Plan of actions: - the working principle of road power generation was tried to understand & designed the system according to its advantages & implementation in the system

Road power generation (RPG): - Road power generation is a new concept of producing energy. The flip plate installed on the road when the vehicles passé through the flip plate (speed breaker) then generate rotary motion and converts kinetic energy into electrical energy. Roller, rack & pinion connects to the shaft than mounted to the dynamo, produce the electrical energy. The electricity generates from the vehicles. The system is designed clearly explain in the principle of road power generation in the paper. The component has given the standard procedure, the components organized. The wasted energy utilized for the growth of the nation.

Construction details: - The various elements machine used in the construction of power generation are

- Rack & Pinion
- Shaft

- Spring
- Electro dynamo

The speed breaker mounts on a spring. The rack consists of contact with teeth which lock with the pinion (gear) teeth then pinion rotates in one direction, they mount on the shaft now a shaft is connected by dynamo and output terminal of dynamo connected to the input of the battery thus mechanical energy converts into electrical.

•Rack & Pinion: - rack and pinion is a type of linear motion. It is also called gear which converts rotational motion into linear motion. A circular gear called pinion and linear gear bar called the rack.

•Shafts: - A shaft is an element of the rotating machine. The power is transmitted from one part to another by the shaft. The gears are connected to the shaft.

•Spring: - spring is a type of device which stores the mechanical energy. It is also called the elastic object. The force is applied in the spring which will change but after some time came into its initial position.

•Electro dynamo: - electro dynamo is a type of generator which converts mechanical energy into electrical energy.

#### IV. Working principle of RPG

The Road power generation is a system which captures waste energy production from all the vehicles where all vehicles produce the kinetic energy thus this device converts the kinetic energy into electrical energy. The parameters of the rack and pinion will rotate in the downward direction thus the electricity will generate. The Dynamo will directly connect to the shaft. The shaft will be connected to the pinion (gear) when the wheel of the vehicle will pass over the speed breaker than the rack will move on downward direction. The shaft will be connected to the pinion (gear) when the wheel of the vehicle will pass over the

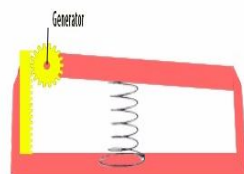


Figure 1: pinion of the System

Speed breaker than the rack will move on the downward direction and generate the torque. The torque will pass on to the shaft than the shaft will couple from dynamo than the rotary motion will be produced by speed breaker so dynamo will rotate & will produce electricity.

#### V. BLOCK DIAGRAM OF THE SYSTEM

The whole system of road power generation Shown in the figure of arrangements of mechanical element. The mechanical energy is converted into electrical energy & energy sores in the battery than provide energy street light and road light.

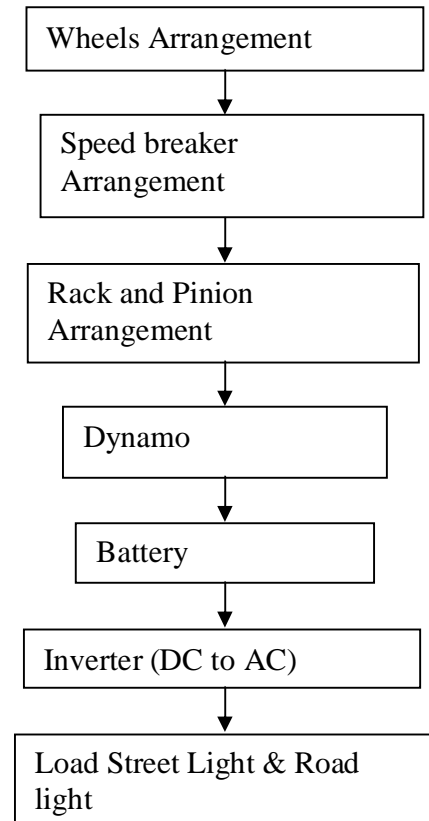


Figure 2 Block diagram of the System

#### VI. CALCULATION

Let, the mass of vehicle = 180kg  
 Height of speed breaker = 20.8cm = .208m  
 Work = force\*Distance  
 Therefore, force = ma = 180kg\*9.81 =1765.8N  
 Output power = Work done/sec = (1765.8\*.208)/60= 6.12 Watts

#### VII. CONCLUSION

Road power generation is a new concept to develop energy. It is a new type of unconventional source of energy. The wasted energy generates from vehicles which convert kinetic energy into electrical energy. The road power generation compares from other technique then the fewer

amounts of current & energy can produce to the road power generation. The advantages of this project are not able to require of any fuel as in input & negligible the maintaining cost then the energy can be stored in the battery; used for a various purpose like as the stored energy use for street light; road light & traffic signal etc.

In the future, this project can use for heavy vehicles to growth in the efficiency & more consent.

#### REFERENCES

- [1] Md. Emran Hossian, Md rokib hasan kazi Tashan Ahmed Design and performance of road power generation.
- [2] Noor Fatima, jiyaul Mustafa production of electricity by road power generation, Lucknow(India),2014.
- [3] Dllip ahju & Marika Tatsutani, "Sustainable energy for developing countries",2009
- [4] Md. Ashraful Alam, "Renewable energy for sustainable energy source and environment, 2012.
- [5] Ashwin Chandwani, Amit N.Patel, Abhay Kothari, Design of road power generation, Ahmedabad, India.