

“ROAD POWER GENERATION BY SPEED BREAKER”

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1. ABSTRACT - As we know the demand of electric energy increase day by day result is an energy crisis and therefore to overcome this problem we found alternative source of electrical energy

The principle of energy conservation states that energy is neither created nor destroyed. It may transform from one type to another. With help of concept we get an idea that speed breakers generating electrical energy for us,

Basically the Vehicle kinetic energy may be transformed to mechanical energy, which can then be converted to electrical energy using a shaft to rack and pinion system with simply coupling stepper motor as a generator then we can store the energy and utilize for several purposes.

Key words: road power generation, wasted kinetic energy, rack and pinion, used of stepper motor instead of generator

2. INTRODUCTION

Electrical energy is the common form of energy in world the advantage of these energy it can be covert in one form to another form of energy it can be safely transits one grid to another grid. As a result, it is used in our everyday life more than any other electrical energy source. It supplies home appliances And trains also supplies to the machines ,but in India where Cole based power station are nearly 70 percent where electricity is generated .the worst situation seem today as per ndtv reports 104 thermal power plan monitored every day the 15 have own generation capacity is 14875 mw had zero days of coal stokes. But in future we found the alternative power source to overcome this situation by finding the alternative source of energy, we have seen that one type of energy is wasted daily on the road .When vehicle is passed through the speed breaker then the kinetic energy is produced .Then by using the technique of road power generation (speed breaker) .in this we used mechanism of rack-pinion arrangement to convert kinetic energy to electrical energy .In this mechanism we used the rack pinion assembly due to some advantages over crank shaft and roller mechanism.

3. BLOCK DIAGRAM

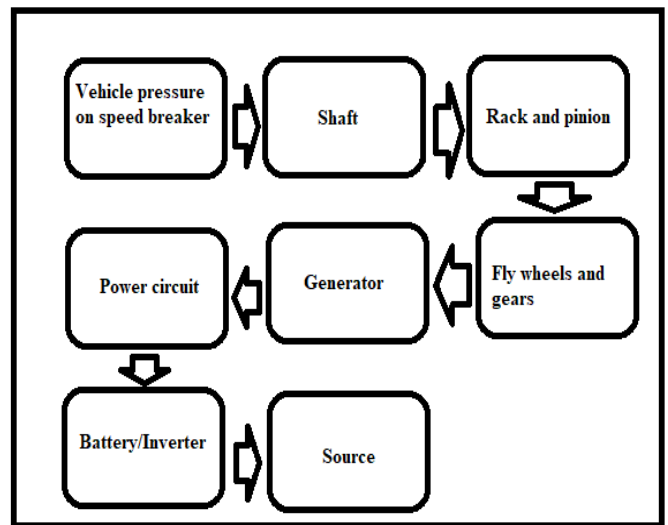


Fig 1:block diagram of road power generation using method of speed breaker



Fig 2:prototype model picture of road power generation using method of speed breaker

LITERATURE SURVEY

Name of Researcher's	Research and idea's	Conclusion and profound
Iyo Amaize Peter	Permanent Magnet Direct Current (PMDC) generator, through springs, ball bearings, rack, and pinion gear.	Working module present
Ajay sin, Rishabh, Ronak and group	The horizontal plate is connected to a rack and in turn a pinion that's connected to gear mechanisms.	They assumed that a 500 kg vehicle produces 11.34 volts of EMF.
Prof. Sandhya	Vertical deflection is it which results in the release of thermal energy.	Piezoelectric sensors they employed here to generate electricity
Noor Fatima, Jiyaul Mustafa (Efficient Method on Energy Regeneration through Speed Breakers)	the circular motion delivered by the crank mechanism, which is achieve by adding a moving plate on Shaft	.SOP has been employed in the design of components
RD Sharma	when vehicle passes over rack pinion its moving down and pinion starts rotating which is later converted	The instantaneous power is 2,000 watts at five miles-per-hour, but it's st will be need of storage

The generate energy every day when the vehicle runs over speed-breaker.

Iyo Amaize Peter has created a VERSION employing a permanent magnet direct current (PMDC) generator, springs, ball bearings, a rack and pinion gear, and other innovative components

Ajay sin, Rishabh, Ronak & Chintan Innovative rack and pinion speed breaker that generates electricity and uses a horizontal surface plate to absorb loads of potential energy from moving vehicles. The rack and pinion that connect to the gear mechanisms are connected to the horizontal plate through a pinion. The generator's shaft, which produces electricity, is rotated by the gears. A 500 kilogramme vehicle is predicted to create 11.34 volts of EMF. It is discovered that the rack and pinion approach is more necessary, logical, and simple to put together.

Prof. Sandhya Decide that an approaching vehicle causes a vertical deflection in the speed breaker, causing thermal energy to be released. They used piezoelectric sensors to create power in this instance.

Noor Fatima and Jiyaul Mustafa claimed that the circular motion produced by the crank mechanism, which is achieved by putting a moving plate on road, may create energy. The design of components has made use of SOP

R.D. Sharma Et Gerard Lynch, one of the engineers behind the Motion Power system created for New Energy Technologies, a Maryland-based firm, explains how the mass of a car is utilised to throw a lever known as the rack and pinion technique. Basically, when a vehicle passes over the rack pinion, it moves down, and the pinion starts rotating, which is subsequently converted. "The instantaneous power is 2,000 watts at five mph, but since it's instantaneous, some amount of storage will be required."

Energy crises and the constantly increasing price of fuel attracts curiosity of researchers toward new maintainable, and renewable energy sources.

In India where Coal based power station are nearly 70 % of electricity generated the worst situation seem today as per reports 104 thermal power plants monitored every day the 15 have own generation capacity is 14875 mw had zero days of coal stokes.

The idea of producing power using speed breakers has been studied as a solution to the problem of energy crises. They were eager to use this technique to brighten tiny towns and highways after learning about the South African problem first. This is a basic idea of physics, to convert the kinetic energy into mechanical and then electrical energy.

METHODOLOGY

Now a days electrical energy vastly used anywhere. Then we have seen that one type of energy is wasted daily on the road. When vehicle passed on the road then kinetic energy produced. Then by using the technique of road power generation (speed breaker) .in this we used mechanism of rack-pinion arrangement to convert kinetic energy to electrical energy. In this mechanism we used the rack pinion assembly due to some advantages over crank shaft and roller mechanism. Disadvantages of Crank shaft and roller mechanism cannot absorb the mechanical vibrations, failure of bearings, manufacturing cost is high than rack pinion, heating is more than rack pinion due to those things then we used the rack pinion mechanism.

When Vehicle passed over speed breaker then the vertical rack goes downward and upward by the help of springs. The rack forced to rotate the pinion then pinion transfer kinetic motion into the rotational motion. then pinion is connected to small pinion with help of this pinion is directly connect (stepper motor), when the rack pinion is downward and upward in motion our pinion also starts to rotate then small gears are connected beside the stepper motor (generator) to increase the speed. after small gears, is connected to the generator for converting mechanical energy into electrical energy. By using this mechanism kinetic energy is converted into electrical energy. There are no requirements of any fuel for this process. This experiment works for several types of loads. i.e., Street lights, charging points etc.

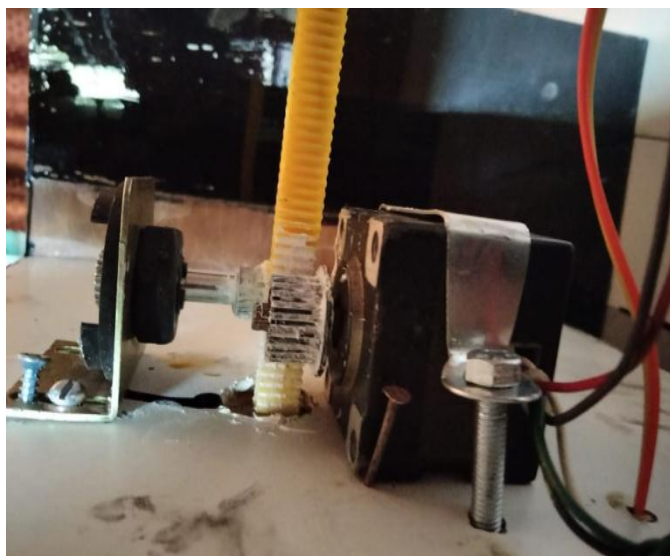


Fig3: Connection of assembly of prototype model

WORKING

This mechanism is based on assembly of following sequence of components: speed breaker (flexible solid hump), spring for repulsion, arrangement-rack pinion -small pinion arrangement-of gear box of stepper motor -rectifier - battery-street light.

The speed breaker which is connected over the rack and pinion works like flexible hump, when heavy object passed over the speed breaker, it will press and released downward and upward vertically by with help of springs. Rack and pinion which are connected between hump and shaft. They convert linear motion into the rotational motion. When pressure given over the hump then rack goes down vertically which forced to pinion for rotate. Then small pinion also rotates and coupled stepper motor gear starts to rotate the different thing of this module we decrees the gear ratio. mechanical energy converted to an electrical energy.

The stepper motor is used as a generator. The advantage of a stepper motor is a large induced voltage even at low rotational speeds also produces voltage during anti clock and clock wise direction. through stepper motor when our rack pinion goes upward it generating energy or also downward cycle also generating energy, this energy in AC form to convert this form of energy into DC we use the rectifier bridge and then this dc output will store in battery and use for several purposes.

ADVANTAGES

- Pollution of this energy is zero
- Maintenance and installation cost is low
- No manual work is required during the process
- Fuel is not required for this system and fully economical
- Area requirement for system is less

External source is not required for power generation

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