COMPRESSED AIR PRODUCTION WITH
BUMPER AND POWER GENERATION
USING VEHICLE SUSPENSION

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ABSTRACT:
As far as Indian road transport scenario is concerned, accidents are the major problem. An attempt has been made in this project to reduce such mishaps. In our project a high speed indication is given and automatic bumper is moved front of the vehicle setup with help of pneumatic system when the setup speed is exceeded. In our project, we have used solenoid valve and a control circuit. This project is necessary to be attached to every vehicle. Mainly it is used for night drive. Pneumatic energy is the readily available and low cost energy. Non-conventional energy system is very essential at this time to our nation. So that the pneumatic type of energy is considered for our project. In this project compressed air can be produced with the help of motion of wheel. Then this compressed air can be used for further applications. Compressed air production using vehicle wheel needs no fuel input power to produce the output of the air. And then waste air produced in power generation.

Keywords: pneumatic energy, compressed air, power generation.

INTRODUCTION:
Till this time, it would not be wrong to say that the sun was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy.

An automobile's bumper is the front-most or rear-most part, ostensibly designed to allow the car to sustain an impact without damage to the vehicle's
safety systems. They are not capable of reducing injury to vehicle occupants in high-speed impacts, but are increasingly being designed to mitigate injury to pedestrians struck by cars.

**SCOPE:**

Conventionally, the vibration energy of vehicle suspension is dissipated as heat by shock absorber, which wastes a considerable number of resources. Regenerative suspensions bring hope for recycling the wasted energy. Systems require further research to develop a better system that will capture more energy. All vehicles in motion can benefit from these systems by recapturing energy that would have been lost during compression and expansion of suspension.

**LITERATURE SURVEY:**

In conventional vehicles there is wastage of energy in vehicle suspension that is kinetic energy. This kinetic energy is result of the movements of the suspension of the vehicle wheels. Also in vehicle the AC is essential parameter for human comfort. But for running AC it can create large load on vehicle, which can cause engine power to distribute and efficiency of vehicle to decrease. The AC effect can be produced by linear motion of suspension system. To overcome the power loss on compressor, the air by using piston-cylinder arrangement, by using this compressed air we can run AC system in the car and save fuel. This paper was very much useful for Indian conditions because of geographical sites.

Taking into consideration other manmade sites like road it is well known fact that we have one of the best as well as worst road conditions available. First part is about the Air-conditioning working and second is Electricity generation. The regenerative system can significantly impact fuel economy and hybrid electric vehicles (HEV) and reduce electric vehicle (EV) range. The paper presents an idea about fuel burned for working of A.C. while driving the car and it will lead to inefficiency. The paper also presented the modifications in model to generate electricity by gear-train arrangements.
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DESCRIPTION:

HOSES & CONNECTORS:

Hoses used in this pneumatic system are made up of polyurethane. These hose can withstand at a maximum pressure level of 10 \times 10^5 \text{N/m}^2. In our system there are two types of connectors used. One is the Hose connector and the
other is the reducer. Hoseconnectors normally comprise an adopt hose nipple and cap nut. These types of connectors are made up of brass (or) aluminum.

**FOOTPUMP:**

A bicycle pump is a type of positive-displacement pump. It has a connection or adapter for use with one or both of the two most common types of valves used on bicycles, Schrader or Presta. A third type of valve called the Woods valve exists, but tubes with these valves can be filled using a Presta pump.

**SPRING:**

A Springing device must be a compromise between flexibility and stiffness. If it is more rigid, it will not absorb road shocks efficiently and if it is more flexible it will continue to vibrate even after the bump has passed so we must have sufficient damping of the spring to prevent excessive flexing.

**PNEUMATIC CYLINDER:**

There are only two main kinds of air cylinders: Double acting, and single acting. They come in all variations, shapes and sizes. Both kinds are useful for haunt work. Double acting cylinders are useful when you need to push in both directions, and single acting cylinders are useful when only a push in one direction is needed.

**METHODLOGY:**

When the vehicle runs on the irregular roads then the wheel goes to up and down motion. The cylinder arrangement is attached on the wheel axle. This motion is used to suck the air from the atmosphere. Thus the piston inside the cylinder creates the internal pressure which results in storage of air to the tank at certain pressure. This pressurized air is saved inside the tank. The outlet of tank consists of four valves which are used to supply the air to other pneumatic applications. Here the non-return valve is used to avoid the reversing of air flow to the atmosphere. This air used for emergency time vehicle safety for Pneumatic bumper mechanism.
And then tank waste air move the emergency valve. That air used Turbine rotated in power generation system.

**CONCLUSION:**

This project is made with pre planning, that it provides flexibility in operation. This innovation has made the more desirable and economical. This project “COMPRESSED AIR PRODUCTION WITH BUMPER AND POWER GENERATION USING VEHICLE SUSPENSION” is designed with the hope that it is very much economical and help full to all vehicles to produce the compressed air and power. This project helped us to know the periodic steps in completing a project work. Thus we have completed the project successfully.

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