

Review on Air Conditioning System by Using Vehicle Suspension

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ABSTRACT

Air Conditioning effect by the use of vehicle suspension system shows the effective use of suspension system of vehicle for air conditioning. This also deals with the conditioning of air for automobile purpose. Nowadays we required fuel efficient vehicles. The engine of the vehicle should be much efficient on the various road conditions and various load conditions in India, the road conditions are bad in village and city, due to which there is much engine power needed for AC. In this paper we have reviewed the use of the suspension system for producing compressed air and AC effect. Instead of using engine power for the same purpose. It has been observed that there is an increment in fuel efficiency of vehicle and reduce the NO_x nearly about 80% and CO by 70%.

Keywords : Suspension, Air Conditioning, Compressed Air, Fuel Efficient System

I. INTRODUCTION

To support the weight of the vehicle body vehicle suspension system is important, to isolate the vehicle chassis from road disturbances, to enable the wheels to hold the road surface. Two main components of suspension systems are spring and damper. The function of damper is to dissipate vibration energy into the heat to reduce the vibration transmitted from road excitation. However, the dissipated heat is from fuel or electrical power. In hybrid vehicle some energy is recaptured which is usually lost in braking system but in the suspension system dissipation of vibration energy by shock absorbers remains untapped. In the past, we pay little attention to energy loss of vehicle suspension. But how much energy get lost by the shock absorber of vehicle suspension? only 10-20% the fuel energy is used for vehicle mobility.

The linear motion of suspension system is used to compress the air by using piston and cylinder arrangement. We can run A.C. By using this compress

air in the car so that we can save fuel. According to Newton's 3rd law of motion for every action there is an equal and opposite reaction. Utilisation of this reaction is the basic reason of selection of this project work.

We are collecting air into the cylinder and this energy is stored to the compressor tank as non-conventional method by driving the vehicle. Non-conventional energy system is very important at this stage to our country. Fuel input power is not needed for compressed air production using suspension system to produce the output of the air. For this project, the conversion of the force energy into air. The control mechanism contains the quick exhaust valve, air cylinder, Non-return valve and spring arrangement. The initial cost of this arrangement is also high.

Problem statement

Suspension of vehicle dissipates mechanical energy in form of kinetic and potential energy. The springs save the potential energy but kinetic energy is

wasted. This project aims at using this wasted energy with proper arrangement of single acting cylinder. Ultimately compressed air is produced and stored from the vehicle suspension. Linear motion of pushing is converted into compressed air using proper components.

II. LITERATURE REVIEW

AkshayGadekar, Prof.M.R.Jagdale, Prasad Khilari, SumitKatkar,PritamKeram in their study on “Compressed air production through vehicle suspension”focused on converting kinetic energy into compressed air withuse of piston and single acting cylinder. Compressed air is produced byvehicle suspension and supplied to AC system. This paper describes theconstruction and working of regenerative suspension system which savesfuel. Design consist of angle welded joints and springs designing was thecritical part. A little focus was given on the energy losses on various type of roads of suspension system. [2]

Tajane Sunil Triambak,Kothule Ganesh Bhausahab, SonwaneManojGanapatrao, KawadeVikasBalasaheb, Prof. Salunke Ganesh Bhagwat studied on suspension operated air conditioning system and found that project does not involve the use of engine power to run the AC system. Instead of engine power the power from the suspension system is used. This is a new and revolutionary concept. VCS and VAS cycle are two cycles used in this air conditioning They are expensive methods but it increases the efficiency and reduces global warming. We are using for this project concept of pneumatic type energy in this project. [2]

Pradip K. Ingale,Anant R. Akshyaet al. found suspension operated air conditioning system and their paper is about study of suspension operated AC system in automobile cars.since part of engine power is used by compressor thus efficiency of vehicle decreases to avoid this problem this idea is introduced. The team designed suspension operated AC system. The air is compressed with piston and stored in

receiver. This paper also describes the construction, working, components, applications, merits, demerits. They also stated the disadvantages which is high initial cost and increase in weight.

We can say that all the energy requirements on humankind is fulfilled by sundirectly or indirectly and we are still using renewable sources of energy. [3]. Swapnilkamthe, Rahul Kadam, AniketDhore, Shivkumar et al. in their paper “evelopment of mechanism for recovery of energy of suspension system” Air-conditioning working and Electricity generation are the two systems on which this project is based. While driving lot of fuel burns only to run AC if we provide any other system to run the AC a lot of fuel can be saved. Also the tailpipe emissions of hybrid electric vehicles (HEV) and electric vehicles (EV) can be reduced. Using this system will increase efficiency of the vehicle. In hybrid vehicles the energy lost in braking is recaptured but vibration energy absorbed by shock absorbers remains unused. This paper focus on saving the energy from suspension system. We can analyse better energy management strategy by carrying simulation studies using simulation tools developed by the Ls-dyna. This project can be very much useful for Indian conditions. Thus the paper further seems promising. This concept will sure be polite one and can be used everywhere if cost of the device is kept within everybody’s reach[4].

III. CONCLUSION

1. The design of the project is such that it saves energy as much as possible along with developing a supporting and efficient cost system.
2. From the literature review we can conclude that the kinetic energy developed in suspension system can be used to run the air conditioning system thus generating electricity from linear motion of suspension system.
3. Waste energy of suspension system can be make into use

IV. REFERENCES

- [1]. AkshayGadekar,Prof.M.R.Jagdale,Prasad Khilari,SumitKatkar,PritamKeram "compressed air production through vehicle suspension" 7th international conference on recent trends in engineering,science and management
- [2]. Tajane Sunil Triambak ,Kothule Ganesh Bhausahab, SonwaneManojGanapatrao, KawadeVikasBalasaheb,"suspension operated air conditioning system"IJSRD - International Journal for Scientific Research & Development| Vol. 4,Issue 01,2016 | ISSN (online): 2321-0613
- [3]. Pradip K. Ingale,Anant R. Chavan,Akshya V. Chaudhari,KadushahaShaha. "suspension operated air conditioning system" International Journal on Recent technologies in mechanical and electrical engineering (ijrmee) volume: 2 issue: 7, issn: 2349-7947
- [4]. Swapnil kamthe, Rahul kadam, Aniketdhore, Shivkumar Falmari,"development of mechanism for recovery of energy of suspension system." International journal of pure and Applied research in engineering andTechnology IJPRET,2014; Volume 2 (9): 169-178