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Address: - Dr. Ashak Hussain Malik House No. 221 Gangoo, Pulwama, Jammu and Kashmir, India - 192301, Cell: 09086405302, 09906662570, Ph. No: 01933-212815,
Email: nairjc5@gmail.com, nairjc@nairjc.com, info@nairjc.com Website: www.nairjc.com

SUSPENSION OPERATED AIR CONDITIONING SYSTEM

KISHOR PATIL 1
Student Department of Mechanical Engineering, P.K College Chakan, Pune, India

PRAKASH PARDESHI 2
Student Department of Mechanical Engineering, P.K College Chakan, Pune, India

VISHAL PATIL 3
Student Department of Mechanical Engineering, P.K College Chakan, Pune, India

HASAN SHAIKH 4
Student Department of Mechanical Engineering, P.K College Chakan,Pune,India

PROJECT GUIDE 5
PROF. ANIL KATARKAR

ABSTRACT—

In this paper, designing a Suspension operated AC system in automobile cars. This idea comes out as efficiency of vehicle reduces because of compressor. After implementing this idea the efficiency of vehicle will increase by reducing compressor specification. The main concept is that the air conditioning effect will get on the basis of suspension system in vehicle. As a team, we designed the suspension operated AC system. This system runs on the suspension of vehicle and will make the air is compress that store in receiver. We began to the project by first attempting to come up with an original idea to fit the problem. After coming up with an idea, to increase the efficiency of vehicle. We followed the various design process to finalize our project. Vehicle air-conditioning can significantly impact fuel economy and tailpipe emissions of conventional and hybrid electric vehicles (HEV) and reduce electric vehicle (EV) range. In addition current air-conditioning systems can reduce the fuel economy of high fuel-economy vehicles by about 50% and reduce the fuel economy of today is mid-sized vehicles by more than 20% while increasing NOx by nearly 80% and CO by 70%.

Keywords: Suspension system, compressor, fuel economy

INTRODUCTION

In the past around 4000 years from now, people in India and Egypt are known porous pots outside the home during the night period. The evaporation of water in almost cool dry air and radioactive heat to produce ice by keeping water in the transfer between the water and the deep sky that is at a very low temperature (much below the freezing point of ice) caused the formation of ice even though the surrounding air was at a higher temperature than the freezing point of water. There are a few accounts in China about the use of ice around 1000 BC for cooling the beverages. In 4th century A.D., East Indians were producing ice by dissolving salt in water. For specific applications, efficiencies of living and non- living beings depend to a great extent on the physical

environment. The nature keeps conditions in the physical environment in the dynamic state ranging from one extreme to the other. Temperature, humidity, pressure and air motion are some of the important environment variables that at any location keep changing throughout the year. Adaptation to these many a times unpredictable variations are not possible and thus working efficiently is not feasible either for the living beings or the non-living ones. Thus for any specific purpose, control of the environment is essential. Refrigeration and air-conditioning is the subject who deals with the techniques to control the environments of the living and non-living subjects and thus provide them comforts to enable them to perform better and have longer lives. [1 & 2]

LITERATURE REVIEW:

Ancient military engineers used leaf springs in the form of bows to power their siege engines, with little success at first. The use of leaf springs in catapults was later refined and made to work years later. Springs were not only made of metal, a sturdy tree branch could be used as a spring, such as with a bow. Suspension is the term given to the system of springs, shock absorbers and linkages that connects a vehicle to its wheels. Suspension systems serve a dual purpose — contributing to the car's road holding/handling and braking for good active safety and driving pleasure, and keeping vehicle occupants comfortable and reasonably well isolated from road noise, bumps, and vibrations, etc.

These goals are generally at odds, so the tuning of suspensions involves finding the right compromise. It is important for the suspension to keep the road wheel in contact with the road surface as much as possible, because all the forces acting on the vehicle do so through the contact patches of the tires. The suspension also protects the vehicle itself and any cargo or luggage from damage.

1) LIST OF COMPONENT

1) Shell and tube type Heat exchanger
2) Air tank
3) NRV
4) Single acting cylinder
5) nylon pipes
6) Rectangular plates.

2) METHODOLOGY:

1) Pneumatic cylinder: -

It is a mechanical device which used the power of compressed gas to produce a force in reciprocating linear motion. In project single acting cylinder is used.

2) Pressure vessel:-

It is known as air receiver it is closed container design to hold gasses or liquid at a pressure substantially different from the ambient pressure.

3) Pressure gauge:-

It is device used to measure the pressure at point of closed vessel. In this project the mechanical type bourdon tube Pressure gauge is used.

4) Condenser:-

When saturated vapour comes in contact with a surface having a temperature below the saturation temperature, Condensation is occurs.

5) Pneumatic non-return valve: -

Multiple check valves can be connected in series. For example, a double check valve is often used as a backflow prevention device to keep potentially contaminated water from siphoning back into municipal water supply lines. There are also double ball check valves in which there are two ball/seat combinations sequentially in the same body to ensure positive leak-tight shutoff when blocking reverse flow; and piston check valves, wafer check valves, and ball-and-cone check valves.

6) Water tank: -

In this project the water tank is used to storage this water for supplying to the condenser for the purpose of cooling of air.

7) T- connector: -

In our project the T-Connector that connect three port together. it is usually shape of capital T. tee connectors can be used to transfer of fluid from one port from into two port.

8) Hoses: -

Hose is a flexible hollow tube design to carry fluid from one location to another. Hoses are also sometimes called pipes.

3) WORKING MECHANISM

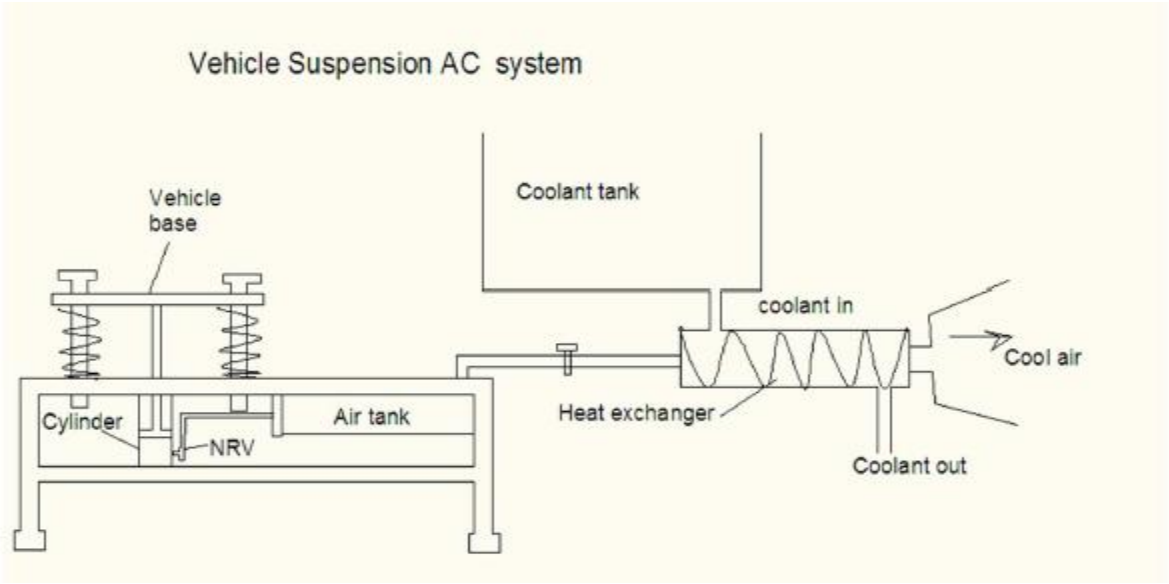

Figure -Vehicle suspension system

The complete diagram of vehicle suspension AC system is shown in fig. When vehicle is run on bumpy road or uneven road then suspension spring move continuously up and down. The pneumatic cylinder is installed below this spring arrangement. This pushing power is supplied to pneumatic piston and cylinder arrangement which compresses the air. This compressed air is supplied to air tank through non return valve. By the placement of non-return valve stops the back flow of pressurized air into cylinder again. That high pressurized compressed air is stored in air tank. When we want to turn on A.C. system the pressurized compressed air is supplied to parallel flow heat exchanger through nylon pipe by using knob. Storage tank is mounted at the top of the heat exchanger.

1. To reduce the specification of compressor.
2. To increase the efficiency of vehicle.
3. To utilize the suspension energy into compressed air, which can be utilize

   Various purposes.

The pushing power is converted into compressed. Air energy by proper driving arrangement. The pneumatic single acting Cylinder is used for this project. The spring arrangement is fixed at the outside of the pneumatic cylinder. The spring is used to return the inclined L-angle window in same position by releasing the load. The output air from the pneumatic cylinder is collected through quick exhaust valve and non-return valve and inside spring arrangement.

4) MERIT/DEMERITS

- **Merit:**

1) Air is available free of cost.
2) No. external supply is required.
3) Low Cost
4) No pollution & less Noisy system.
5) Efficiency is high.
6) No supervision is required.
7) High Portability.
8) No high leakage & reliable.

- **Demerit**

1) Leakage problems;
2) Clogging may occurs.
3) System may affect by Thermal stresses.
4) Due to working burring of material occurs.
5) Initial cost of this arrangement is high.

5) APPLICATION

1) Applicable in light duty vehicle.
2) Applicable in heavy duty vehicle.
3) Applicable in trains.
4) Applicable in dancing floor.
5) Applicable in heavy bridge.

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 ―USING VEHICLE SUSPENSON AC SYSTEM‖ is designed with the hope that it is very much economical and help full to all vehicles to produce the compressed air. This project helped us to know the periodic steps in completing a project work. Thus we have completed the project successfully. It has been a great experience while competing our project we come across lot many practical knowledge as well as experience. We had an opportunity to learn how project are been done. We received a lot of practical experience while working on this project as well as got enough freedom to our ideas for the improvement in our assigned project and check whether ideas are fruitful. Therefore the design must be as perfect as possible and special attention is given during each manufacturing activity. Special attention during each & every manufacturing process that was carried out. In the manufacturing we come to know how theoretical aspects are implemented in actual practice, we got to learn about different manufacturing processes, welding, gear, cutting etc.

REFERENCES:-

- Shipper, Low Compressed air vehicles: Drive-cycle analysis of vehicle performance, environmental impacts, and economic costs. Transpires. Rec. J. Transp. Res. Board 2010, 2191, 67–74.s
- Atkinson, J., and Postle O., ―The Effect of Vehicle Maintenance on Fuel Economy, in Fuel Economy of the Gasoline Engine edited by Blackmore D. R. and Thomas A., Shell Research Limited, Thornton Research Center, Chester, United Kingdom, 1977.
- (1)Noritsugu T. ―Energy Saving of a Pneumatic System (2). Energy regenerative -Control of a Pneumatic Drive System. Application to Active Air Suspension ‖ , Hydraulics & Pneumatics, 1999, 38(4), pp.1-4.

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Address:- Dr. Ashak Hussain Malik House No-221, Gangoo Pulwama - 192301 Jammu & Kashmir, India
Cell: 09086405302, 09906662570,
Ph No: 01933212815
Email:- nairjc5@gmail.com, nairjc@nairjc.com , info@nairjc.com
Website: www.nairjc.com