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Compressed Air Production Using Vehicle Suspensor

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Abstract

In this project we are collecting air from the cylinder and store this energy to the compressor tank as non-conventional method by simply driving the vehicle. Non- conventional energy system is very essential at this time to our nation .So we are focusing on pneumatic type of energy for this project. "Compressed Air Production Using Vehicle Suspensor" needs no fuel input power to produce the output of the air .This energy is readily available and low cost energy. This system gives smooth operation and smooth movement for vehicle. Suspension system during the time of vehicles running the rack slide up and down. Then this compressed air can be used for further applications.

Keywords: Compressed air, Pneumatic, Non-conventional.

1. INTRODUCTION

In front-engine rear-drive vehicles, the front beam axle was replaced by independently mounted steerable wheels. The wheels were supported by short the Contains. The will be upper and lower hinged arms holding them perpendicular to the road as did the previous axle beam designs. A coil spring was used to support either the upper or the lower arm to provide dampening. Shock absorbers began to be used to dampen shock loads and also to provide resistance to spring oscillations .The suspension systems are used in vehicle to support weight of vehicle body and to isolate the vehicle chassis from road disturbances. In this method air is collected and stored in the compressor tank as non-conventional method. Compressed air production needs no fuel input power to produce the output of the air. In this project the conversion of force energy in to air is done. Vehicle is run on different type road conditions such as even, uneven, rough etc. The automobile frame and body are mounted on front and rear axle through springs and shock absorbers. In this project the conversion of force energy in to air is done. The output air from the pneumatic cylinder is collected through quick exhaust valve and non-return valve and inside spring arrangement the suspension system used for the regeneration of vibration energy is called regenerative suspension. The air tank is used to stored pressure air and energy supply pressure air for various. Hinged arms holding them perpendicular to the road as did the previous axle beam designs. A coil spring was used to support either the upper or the lower arm to provide dampening. Shock absorbers began to be used to dampen shock loads and also to provide resistance to spring oscillations .The suspension systems are used in vehicle to support weight of vehicle body and to isolate the vehicle chassis from road disturbances. In this method air is collected and stored in the compressor tank as non-conventional method. Compressed air production needs no fuel input power to produce the output of the air. In this project the conversion of force energy in to air is done. Vehicle is run on different type road conditions such as even, uneven, rough etc. The automobile frame and body are mounted on front and rear axle through springs and shock absorbers. In this project the conversion of force energy in to air is done. The output air from the pneumatic cylinder is collected through quick exhaust valve and non-return valve and inside spring arrangement the suspension system used for the regeneration of vibration energy is called regenerative suspension. The air tank is used to stored pressure air and energy supply pressure air for various.

2. SCOPE AND OBJECTIVE:

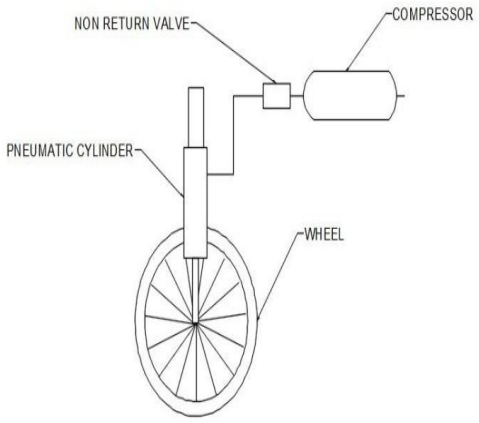
Every vehicle should contain suspension system due to irregular road condition. There is no energy saved so we focused on that area to get compressed air which can be used for other application including braking .This setup working as a suspension system as well as compressed air storing system .To secure vehicle from damage. This system is applicable for

all the four wheelers. Suspension system works while turning, waviness of road, while applying brakes, speed breakers, on terrain roads etc. To show proper utilization of suspension system into compressed air, which is use in various purpose. To obtain 18 to 22-degree Celsius temperature in the cabinet for the human comfort .To save fuel this is burn for working of Air conditioning system .To reduce the emission of hazardous gases like Nitrogen oxide, carbon monoxide, Hydro carbon. . To improve mileage of vehicle.

3. METHODOLOGY:

In this system, we will use suspension system, heat exchanger, pressure gauge and thermometer which will be an effective way to evaluate the effectiveness and air cooling effect. In this paper, we have to compare the effectiveness and air cooling effect in two seasons i.e. winter and summer by using parallel flow heat exchanger. The results will be based on the readings of the system and even if the system fails to give expected results it can be modified by changing the dimensions of heat exchanger and spring which is to be use for suspension. In this method air is collected and stored in the compressor tank as non-conventional method. Compressed air production needs no fuel input power to produce the output of the air. In this project the conversion of force energy in to air is done. The control mechanism carries the air cylinder, quick exhaust valve, and air tank and gate valve.

4. DIAGRAM:



5. WORKING PRINCIPLE:

The pneumatic cylinder is connected linear to wheel. This pneumatic cylinder is connected with air compressor by using air tubes. The non return valve is connected in between to compressor and pneumatic cylinder. Our vehicle is required suspension system when irregular road condition including speed brakes. At the time vehicle wheel is to push pneumatic cylinder head to compress air inside of the cylinder. This pneumatic is send to non return valve which allows air at one direction after lift up vehicle which goes to downward where cylinder rod is pulled. Here air is not compressed because which is increase the volume. So we are using non return valve which allows air then store in a compressor but cannot allow reverse direction. This process is continuously working to store air in compressor. We can be used it for our required purpose for the example braking system. They have studied generally compressed air is produced using different types of air compressors, which consumes lot of electric energy and is noisy. In this paper, an innovative idea is put forth for production of compressed air movement of vehicle suspension which normal is wasted. The conversion of the force energy into the compressed air is carried out by the return valve, air compressor and air receiver. We are collecting air in the cylinder and store this energy into the tank by simply driving the Contains. Mechanism which consists of the vehicle suspension system, hydraulic cylinder Non.

6. CONTRUCTIONAL:

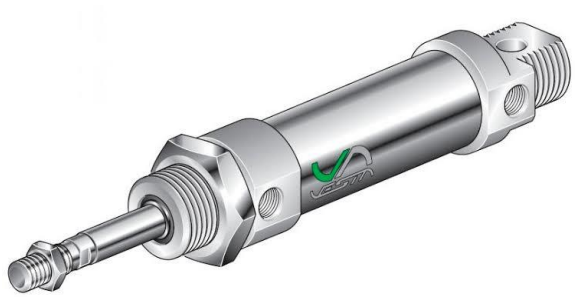
6.1 COMPRESSOR:

An air compressor is a device that converts power into potential energy stored in pressurized air . By one of several methods, an air compressor forces more and more air into a storage tank, increasing the pressure. When tank pressure reaches its upper limit the air compressor shuts off. The compressed air, then, is held in the tank until called into use. The energy contained in the compressed air can be used for a variety of applications, utilizing the kinetic energy of the air as it is released and the tank depressurizes. When tank pressure reaches its lower limit, the air compressor turns on again and re-pressurizes the tank vehicle. This method is non-conventional as no fuel input is required and is least polluting. Consequently, the main objective module was to develop a mechanism for compressed air production using vehicle suspension In this project we are collecting air cylinder and store this energy to the compressor tank as non-conventional method by simply driving the vehicle. Non-conventional energy system is very essential at this time to our nation. Compressed air production

using vehicle suspensor needs no fuel input power to produce the output of the air. For this project the conversion of the force energy in to air. The control mechanism carries the air cylinder (vehicle suspensor), quick exhaust valve, Non-return valve and spring arrangement. We have discussed the various applications and further extension also. The initial cost of this arrangement is high.

6.2 PNEUMATIC CYLINDER:

The piston is a disc or cylinder, and the piston rod transfers the force it develops to Pneumatic cylinder is mechanical devices which use the power of compressed gas to produce a force in a reciprocating linear motion. Like hydraulic cylinders, something forces a piston to move in the desired direction the object to be moved. Engineers sometimes prefer to use pneumatics because they are quieter, cleaner, and do not require large amounts of space for fluid storage when the shock absorber is operated the spring get compressed this pushing energy is send to pneumatic piston and cylinder which compresses the air taken from surrounding so the air pressure adjusted in the regulator is indicated in the pneumatic. Simultaneously generate the electrical power using rack and pinion setup. Rack is welded to the foot pump cylinder. If the vehicle runs on the irregular roads, suspension occurs. On that time foot pump cylinder welded with the rack goes up and down, If rack moves attached to the pinion gives rotational motion. Dynamo is coupled to pinion for power generation. That power is stored in the battery. 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 pipe by using knob.



6.3 NON RETURN VALVE:

The swing type check valve is used for supply the air from cylinder to the air tank for the storage purpose. It allows the fluid flow in only one direction. The main advantage of swing type check valve is it operates on minimum upstream pressure. Due to varying conditions of heating, ventilating, cooling and dehumidification in the atmosphere at various places, the air conditioning of automobiles is very essential. To maintain human comfort and improve internal atmosphere in an enclosed space, proper control of freshness, temperature, humidity and cleanliness of the air is required. So, in this project we are using renewable energy of suspension system to produce air conditioning. A check valve, clack valve, non-return valve or one-way valve is a mechanical device, a valve, which normally allows fluid (liquid or gas) to flow through it in only one direction. Check valves are two-port valves, meaning they have two openings in the body, one for fluid to enter and the other for fluid to leave. This cold nitrogen gas refrigerant is supplied to heat exchanger. Low temperature coolant pass through the heat exchanger & also high pressurized air pass through it. Here heat exchange occurs and air temperature becomes 150 C to 300 C which is further send at the required place which is to be cooled.

6.4 FRAME :

When using traditional building materials. The strength and ductility of structural cold-formed steel (CFS) framing, along with the holding power of CFS connections, make it the ideal material for construction in high wind speed and seismic zones such In this system, we will use suspension system, heat exchanger, pressure gauge and thermometer which will be an effective way to evaluate the effectiveness and air cooling effect. In this paper, we have to compare the effectiveness and air cooling effect in two seasons i.e. winter and summer by using parallel flow heat exchanger. The results will be based on the readings of the system and even if the system fails to give expected results it can be modified by changing the dimensions of heat exchanger and spring which is to be use for suspension. Due different conditions of environment like heating, cooling in the atmosphere at different places the air conditioning of automobile is necessary. For maintaining the human comfort within a car freshness and cleanliness of air is important. In this project we are using non-conventional energy to produce air conditioning effect in car. 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. In storage tank the nitrogen gas is used as refrigerant. This cold nitrogen gas refrigerant is supplied to heat exchanger. Low temperature coolant pass through the heat exchanger & also high pressurized air pass through it.

7. MATERIALS REQUIRED:

Equipment name	Number
Compressor	1
Pneumatic cylinder	` 1
Frame	1
Non-Return valve	1

8. ADVANTAGES:

- No pollution occurs
- It also working as a suspension system
- No maintenance
- The compressed air can be used for many purpose especially braking system
- External power supply is not required.
- This is a non-conventional system.
- We are using water as coolant therefore maintenance cost is low.
- Air is used as fuel input which is easily available.
- No moving parts
- No lubricating oil required

9. LIMITATIONS:

- Leakage problems.
- For smooth & even road less compress air produced.
- System is bulky
- High Initial cost
- More space required

10. APPLICATIONS:

- Applicable in all vehicles.
- For cleaning & inflation of tubes.
- Swing machine.
- Compress air can use for pneumatic braking system.
- In stair cases.
- It can be used at every vibration producing area.

- This compressed air is used for Air Conditioning.
- Compressed air can be used for cleaning the vehicle..

11. CONCLUSION:

Pneumatics system occupies major role in industries because which makes no pollution, Safety, less cost, Easy to control and air is available at every places. But to store the pneumatic is critical. Hence our project is implementing the pneumatic storage system in automobiles. Here we collect the air when vehicle using suspension then to store the air in compressor by using non return valve. We can be used it for many purpose especially cleaning, braking system, air filling in tyres . 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 using vehicle suspension and power generation system‖ 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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