A Technical Review on 3 In 1 Air Engine Machine With Cushioning Effect.

Apurv Raval[1], Fakhruddin Kachwala[2], Dipen Lad[3], Amit Singh[4]

[1] *Assistant Professor, Mechanical Department, Vadodara Institute Of Engineering, Gujarat, India*
[2] *Student, Mechanical Department, Vadodara Institute Of Engineering, Gujarat, India*
[3] *Student, Mechanical Department, Vadodara Institute Of Engineering, Gujarat, India*
[4] *Student, Mechanical Department, Vadodara Institute Of Engineering, Gujarat, India*

ABSTRACT

The latest trend in the automotive industry is to develop light weight vehicles. Every automotive industry is looking to reduce the weight of the vehicle as it helps in the better handling of the vehicle and increases the efficiency of the vehicle. Today, the heavy vehicles are known for producing a large amount of harmful gases like CO_2, SO_2 etc. which act as the major source for global warming. So research is going on to find a light weight vehicle which does not pollute the environment. The present study focuses on engine it is modified from a 4-stroke to a 2-stroke engine using a cam system driven by a crankshaft and the intake and exhaust valves have a small lift due to this modification. The electricity requirement for compressing air has to be considered while computing overall efficiency. Nevertheless the compressed air vehicle will contribute to reducing air pollution and tend to zero pollution level. Main advantage of this engine is that no hydrocarbon fuel required means no combustion process is take place. The design and experimental test result presented here can be used for further research and modification of the technique. We are deal with the compressed air so we have to focus first on the properties of the compressed air. Compressed air energy stored is the way to store energy generated for one time for the use of another time. The power output is simply the inlet enthalpy minus the discharge enthalpy times your mass flow rate. The inlet enthalpy is known state which we can calculate using the inlet temperature and pressure. Inlet energy gives the energy contained in the compressed air and idea about the how much work thus extracted from it. The modern world is facing the various problem regarding the vehicle, such problems are pollution which can considered as the drastic problem of today's scenario which is emitted from vehicle. In order to reduce this many invention are made on the vehicle around the world.

Keyword: - *Compressed air, Engine, Cushioning effect, Inlet, Outlet.*

1. Introduction

In world already the vehicles are working on the gas such as CNG but there is also some problem related with it.

This vehicles are not getting the proper power as compared with conventional fuel vehicles, not getting speed and the big problem related with the pneumatic system is not getting the constant pressure in the vehicle

We are also dealing with pneumatic system but our engine is automated with 3 inlet 1outlet. 3 inlet is provided in order to maintain the constant pressure, better power generation as compared with CNGs and due to involvement of cushioning effect the impact force is reduced form the engine which increases the life of the engine and less fuel waste.

Fuel will be stored for the future generation.

2. Review Papers

2.1

S.S. Verma talked about Compressed air as a wellspring of vitality in various uses as a rule and as a non dirtying fuel in packed air vehicles has pulled in researchers and designers for a considerable length of time. Endeavors are

being made by numerous designers and producers to ace the packed air vehicle innovation in all regards for its most punctual use by the humankind. The present paper gives a concise prologue to the most recent improvements of a compacted air vehicle alongside a prologue to different issues related with the innovation and their answer. While creating of compacted air vehicle, control of packed air parameters like temperature, vitality thickness, prerequisite of info control, vitality discharge and emanation control must be aced for the improvement of a protected, light and practical compacted air vehicle in close future.[1]

2.2

This printed material of Swadhin Patnaik manages the Compressed-air motor as a pneumatic actuator that believers one type of vitality into another. The Air Driven Engine is an eco-accommodating motor which works with compacted air. This Engine utilizes the development of compacted air to drive the cylinders of the motor. An Air Driven Engine is a pneumatic actuator that makes valuable work by extending packed air. There is no blending of fuel with air as there is no burning. An Air Driven Engine makes utilization of Compressed Air Technology for its task The Compressed Air Technology is very basic. In the event that we pack typical air into a barrel the air would hold some vitality inside it. This vitality can be used for valuable purposes. At the point when this compacted air grows, the vitality is discharged to do work. So this vitality in packed air can likewise be used to dislodge a cylinder. Packed air impetus may likewise be joined in half breed frameworks, e.g., battery electric drive and fuel tanks to energize the batteries. This sort of framework is called crossover pneumatic electric drive. Furthermore, regenerative braking can likewise be utilized as a part of conjunction with this system.[2]

2.3

This paper of Kalpesh Chavda, Patel Mansih, Suthar Umang, Patel Krunal investigates the survey of packed air motor for the outline and advancement of single barrel motor which can be controlled by the compacted air. Current four strokes single barrel motor (bicycles/moped) can be keep running on the compacted air with a couple of adjustments that are the primary goal of the examination. Compacted air filled by power utilizing a compressor. The power prerequisite for packing air must be considered while processing general effectiveness. In any case the compacted air vehicle will add to diminishing air contamination and tend to zero contamination level and advancing incredible condition. Primary favorable position of this motor is that no hydrocarbon fuel required means no ignition procedure is take place.[3]

2.4

This paper of Kripal Raj Mishra and Gaurang Sudhan portrays the working of a four-stroke single chamber Engine which can keep running on pneumatic power as by packed air. Since it is an old system which can pulled in numerous researcher and additionally Engineer's for a long time. This paper portrays on the same with some new alteration which is primary goal of this exploration paper . Since motor is worked by Compressed air which add to diminish the air contamination and tend to zero contamination level of climate and making an awesome a situation. While creating it a few parameters as like temperature, thickness, input control, outflow control have be aced for advancement of wellbeing. Since the Gasoline is a thing of past so the primary favorable position of CAE is no hydrocarbon fuel is required i.e. No burning procedure is happen there.[4]

2.5

In this paper by Mahesh Pralhad Nirbhawane, Vishal Rajendra Bhadane, Sunil Sheshrao Raut an exertion is made to ponder the degree of research done and the potential favorable circumstances and detriments of the compacted air innovation. We propose the Air Driven Engine which is an eco-accommodating motor that works with compacted air. An Air Driven Engine utilizes the extension of compacted air to drive the cylinders of a motor An Air Driven Engine is a pneumatic actuator that makes valuable work by growing packed air. There is no blending of fuel with air as there is no ignition. An Air Driven Engine makes utilization of Compressed Air Technology for its activity The Compressed Air Technology is very straightforward. On the off chance that we pack ordinary air into a chamber the air would hold some vitality inside it. This vitality can be used for valuable purposes. At the point when this packed air extends, the vitality is discharged to do work. So this vitality in compacted air can likewise be used to uproot a cylinder. Biggest auto makes everywhere throughout the world have taken up the lead toward the path in light of the pioneer the French organization engine development(MDI) in the field. Packed air is positive in view of high vitality thickness, low harmfulness, quick filling easily and long administrations life.[5]

2.6
This examination by Yuan-Wei Wang, Jhih-Jie You, Cheng-Kuo Sung, and Chih-Yung Huang presents the utilizations of cylinder write compacted air motor on a little size engine vehicle. A regular 100cc four-stroke interior ignition engine(IC motor) was changed to a two-stroke compacted air motor and the power yield has been analyzed with various admission valve timing and supply pneumatic stresses on a test seat. The packed air motor was introduced on a cruiser for the show of vehicle application. The achievement of this application shows the idea of efficient power vitality vehicle with zero emanation utilizing compacted air energy.[6]

2.7
This paper by K.M. Jagadale, Prof V. R. Gambhire talks about idea of Quasi turbine (QT) motors and its application in modern frameworks and new advancements which are enhancing their execution. The essential focal points of air motor utilize originate from applications where current innovations are either not fitting or can't be downsized in estimate, rather there are not such sort of frameworks grew yet. A standout amongst the most imperative things is squander vitality recuperation in modern field. As the normal assets will debilitate, vitality recuperation has extraordinary significance. This paper speaks to a semi turbine rotating air motor having low rpm and deals with low weight and recoups squander vitality might be as any gas or steam.[7]

2.8
The most recent pattern in the car business is to grow light weight vehicles. Each car industry is hoping to diminish the heaviness of the vehicle as it helps in the better treatment of the vehicle and expands the productivity of the vehicle. Today, the overwhelming vehicles are known for delivering a lot of hurtful gases like CO2, SO2 and so on which go about as the significant hotspot for an unnatural weather change. So inquire about is going ahead to locate a light weight vehicle which does not contaminate the earth. The present investigation centers around motor it is changed from a 4-stroke to a 2-stroke motor utilizing a cam framework driven by a crankshaft and the admission and fumes valves have a little lift because of this modification.[8]

2.9
In this undertaking by Pramod Kumar, a SI motor is changed over into a compacted air motor. A four stroke single barrel SI motor is changed over to two stroke motor which works utilizing compacted air on account of its plan straightforwardness. As we changed over the effectively existing regular motor into an air fueled one, this new innovation is anything but difficult to adjust. Another advantage is that it utilizes air as fuel which is accessible liberally in atmosphere.[9]

2.10
Paper by Vishwajeet Singh manages humanity is continually searching for productive and contamination free method for controlling their machine. Detest advancement in light and solid material has helped us to accomplish those less demanding ways. In exhibit contemplate a 4 stroke motor was altered into 2 stroke motor, and was utilized to keep running on packed air innovation. Some test was performed on the altered motor to contemplate the adequacy of the engine.[10]

2.11
In this paper by Mayuresh Tattu, Akshay Walunj, Pankaj Pawar, C.Srinidhi manages the present days the petroleum product consumed motors deliver gigantic measure of harmful discharge which impact the living and nonliving creatures. These emanations can be controlled however can't be invalidated totally.[11]

2.12
The Authors of this paper say that these days, vehicles expend countless powers. Nonetheless, the utilization of petroleum products has brought numerous genuine ecological issues, for example, an unnatural weather change, ozone layer consumption and fine particulate issue. To stay away from such natural issues, sustainable power source has been connected to vehicles. In this paper, an air-fueled motor of a sustainable power source vehicle is introduced.[12]

2.13
This paper of Sadgir Shreyas, Kasbe Shubham and Waykole C.P. is of single chamber motor which can be controlled by the compacted air. Current four strokes single barrel motor can be keep running on the packed air with

a couple of changes that are the fundamental target of the examination. Packed air is filled by power utilizing a compressor.[13]

3. Overview of Research Papers

- Design and modeling of engine is done with the help of software.
- Design calculation of engine is done using the operating speed range and torque.
- Air Car Factories South Africa is proposing to develop and build a compressed air engine.
- In the case of an Air Driven Engine, there is no combustion taking place within the engine.
- Stresses and forces for different material are checked and compared.
- It is non-polluting and less dangerous.
- Compressed air is the fuel and it is directly fed into the piston cylinder arrangement.
- Optimization of design and modeling is done with the use of INVENTOR and ANSYS.
- The cost is tried to be optimized.
- Theoretical data is compared with the design and analytical data obtained with the help of software.
- A two-stroke engine is an internal combustion engine that completes the thermodynamic in two movements of the piston compared to twice that number for a four-stroke engine.
- Moteur Development International is one company that holds the international patents for compressed air car.

4. CONCLUSIONS

- With the help of software, we can find stresses acting on different materials for Engine. From the data we can select the best material.
- Two technologies have been developed to meet different need, (1)Single energy compressed air engines. (2)Dual energy compressed air plus fuel engines.
- Air cylinder is used for storing the compressed air. This air is passes through air pipe to inlet valve by adjusting flow control valve, we adjust the flow of air to the engine.
- A new generation Compressed Air Engine consist of highly engineered parts to ensure smooth running and high efficiency.
- There is a need of some high strength material to design a container or a compressed air tank, which is light in weight at the same time.

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