Investigation of Pneumatic Vehicles
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Abstract:
This paper presents the air driven Engine is an eco-friendly engine which operates with compressed air. Which can be used in automobile and industrial sectors? In our country two-stroke engine have in nonworking condition in high quantity if that engine used in pneumatic engine and no need any modifications and engine is usable. The depends on petroleum reserves, and volatile price, it is imperative to explore possible opportunities in unconventional alternative fuel technology and pneumatic engine. With In this paper we are discussing about the introduction of compressor, flywheel, solenoid valve, relay drive, proximity sensor, and two stroke engine as to represent the output. An Air driven engine use the expansion of compressed air to drive piston of an engine An air driven Engine is a pneumatic actuator that create useful work by expending compressed air. There is no mixing of fuel with air as there is no combustion. The cost and pollution with petrol and diesel are leading vehicles manufacturing to develop by alternative energy, in a compressed air engine, air alone can be used as fuel, or it can be used in amalgamation with traditional fuels or electricity. Just using air is the most suitable option because it drastically reduced weight of the vehicle and improves the efficiency [1].

Developing a whole vehicles to run on pneumatic system will prove an outright tedious and without modification of two stroke internal combustion engine [2].

INTRODUCTION

Pneumatic vehicles are known as eco-friendly engine in mechanical field. one if the major problem most developing countries facing today is air pollution and then major source of which is automobile running on road. one possible alternative fuel is the compressed air. If we on use air as fuel, why think about using anything else? Air is all round us. Air never run out, and no emission an air driven engine makes use of compressed air technology for its operation, compressed air technology is now widely performed for research by different industries for developing different drives for different purpose.
The compressed air technology is quite simple, if we compress normal air into a cylinder the air would hold some energy within it. This energy can be utilized for useful purposes, when this compressed air expand, the energy is release to do work and it can now reportedly travel as much as 175 km, before needing to be recharged. Very efficient and cheap to run, and it is top speed of 75 km/h.

The objectives of the project include:

- Pollution free and fuel less device of pneumatic vehicles
- Air is chiefly available and volatile price
- To introduce a simple way of power produced
- To eliminate the factor of wear and irritating sound that occurs in other drives i.e. chain drive.

LITERATURE REVIEW

1). Mihani siman, 10\textsuperscript{th} International Conference. Interdisciplinary in Engineering, TNTER - ENG 2016, pneumatic vehicles, Research and Design
2) Deep Patel. EXPERIMENTAL ANALYSIS & IMPROVEMENT OF COMPRESSED AIR VEHICLES
3) The PARSEY'S COMPRESSED-AIR LOCOMOTIVE OF 1847. COMPRESSOR

WORKING

Air can be compressed into small volumes and can be stored in suitable containers at high pressure. Such air compressed in to containers is associated with an amount of energy. When the stored compressed air is released freely it expands thereby releasing the energy associated with it. This energy released can be utilized to provide useful work.

Figure 1. line diagram of pneumatic vehicle

Pneumatic vehicles arrangement: - solenoid valve, proximity sensor, really. This is main part of the project as whole system.
depends on it, rectangular frame and air tank is mounted on a metal frame looked bottom and air pipe is provide air tank through engine but centrally attaché the solenoid valve to the air pipe, and solenoid valves attached on a metal body and solenoid electrically connect with rely and proximity sensor.

Two-stroke engine: Two stroke engines is a very important IC engine, it is a internal combustion engines that completes the two movements of the piston, one stroke is a compression stroke and other is a combustion stroke to perform simultaneously the intake and exhaust. Compression stages when air incoming with force fully and strike on a piston the piston move to top dead centre to bottom dead centre. When piston move bottom dead centre to top dead centre that time valve is closed and air is no incoming

Air tank: It is a most important device that converts air into kinetic energy by a compressing air, and it is air storage tank, compressed air is produced electrical power through. The air compressor general uses, such air compressed into containers is associated with an amount of energy. When the stored compressed air is released freely it expands thereby releasing the energy associated with it. This energy released can be utilized to provide useful work.

Compressed air is regard as the fourth utility, after electricity, natural gas, and water, Compressed air can be used in or for:-

1. To supply large amount of air for power pneumatic and filling tires
2. Air supply to submerged supply diver
3. To supply a high pressure clean air to fill gas cylinder
4. Vehicular transportation using compressed air vehicles
5. To inflate buoyancy device
6. Cooling using a vert tube
7. Air brake (road vehicles) system

Solenoid valve: Solenoid valve it is the electromechanical valve it is used to control the flow of gas or liquid, solenoid valve commonly used in vegetation and air conditioning system. There are multiple design variation, solenoid valve has two main ports the valve and solenoid. The solenoid convert electrical energy into mechanical energy, solenoid valve may use seals or rubber seal.

Flywheel: A Flywheel is a mechanical device specifically store rotational energy. Flywheel is connected to the engine, flywheel resist changes in rotational speed by their moment of energy stored in a flywheel is proportional to the square of its rotational speed energy storage systems.

Block diagram of pneumatics vehicles consist of the nine components just like Solis state relay, control circuit, proximity sensor, flywheel, engine, solenoid valve, pneumatic pipe, control valve, and air tank etc. this is component of the pneumatics block diagram.

Air tank passing the air to the control valve and control valve air provide to the solenoid valve, solenoid valves pneumatic pipe through air enter in engine, solenoid valve working by help solid setae relay and solid setae relay working through control circuit but control circuit taking of input signal through proximity sensor it is inductive type sensor flywheel and engine also connected to the proximity sensor

Figure 2 block diagram of pneumatic vehicles

Proximity sensor: proximity sensor is a able to detect the presence of nearby object without any physical contact. A proximity sensor often emits an electromagnetic radiation and kooks for change in the field or returns signals, in inductive proximity sensor always required a metal target. A high frequency magnetic fields is generate by coil in the oscillation circuit, when a target approach the magnetic field, when proximity sensor since the metal objects that time solenoid valve on or off men’s solenoid valve control through proximity sensors
Relay drive: commonly used of the relay is in the switching of AC load, whether that is to control the AC power for ON/OFF switch, light dimming, motor speed or other such application where power control is needed these AC load can be easily control with a low current DC voltage using a relay.

**TECHNICAL SPECIFICATIONS OF COMPONENT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air tank capacity</td>
<td>:30 litter</td>
</tr>
<tr>
<td>Two-stroke engine</td>
<td>: 65 cc</td>
</tr>
<tr>
<td>Proximity sensor</td>
<td>: inductive types</td>
</tr>
<tr>
<td>Relay drive</td>
<td>: solid state relay</td>
</tr>
</tbody>
</table>

This is project working on pneumatic engine it is the simple working or construction as compare to other become used two stroke engine and without any modifications it is working normally 5-7 bar pressure and obtained power, air is cheaply available and it is pollution less or sound less system.

When air compressed air passing through solenoid valve and the solenoid valve control the air by order proximity sensor.

Piston move to top dead center to bottom dead center, and that time air intake closed the piston move bottom dead center to top dead center. Relay provided the power according to requirements to solenoid valve and proximity sensor.

1. Average speed is 75 km/hr.
2. Air tank 30 litter
3. Required pressure 5-8 bar

**CONCLUSION**

Now days the need for energy continuous, and we are using the conventional resources at an alarming rate chance an alternative fuel is much required and compressed air technology can be one of the best alternative, as the pollution caused is zero and it is also cost efficient, pollution less and it is chiefly as compare to other power produced system.

**REFERENCES**

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[2] Compressed air car by Dr s.s Thipse, compressed air and internal combustion locomotive Cassirer's mag 16363-77.
[5] HE weiet am "performance study an three stage power system of compressed air vehicles based on single scw expander” August 2010 , pp: 2299 - 2303