



International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Air Vehicle Engine

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ABSTRACT

Performance of Pressure Air Engine Considered Fourth Most Used After Electricity, Natural Gas And Water. Global Climate Change Is a Big Challenge Today. One of the Key Features of Vehicle Release I.E. Our Cars Are A Great Cause For Global Warming. When Outbound Decreases Global Warming Slows. There is therefore a need to move from the use of Ordinary Fuel to the Extra-Fuel Fuel. One such fuel is the Depressed Air. Compressed Air Is Pure Oil. Easy and Safe Behavior That Does Not Cause Any Negative Impact on The Environment. This paper is about Compressed Air Surveillance as a 3-Wheel Car Driver When Compressed Air Is Stored In A Tank And Given To The Air Towel From The Receiving Moving Movement. In This Project An Investigation Is Performed Run The Car In Compressed Air.

Keywords: Pressurized Air, Air Vehicle, Air Vehicle, Air Tank, etc.

1. Introduction

At first glance the idea that using an air engine seems too divine to be true. In fact, if we can use the air as an aid in using the engine it is a very good idea. As we all know, the air around us, never ceases, as is pure and free. The wind turbine engine uses now-compressed air technology that is highly preferred to research different industries to develop different drives for different purposes. Compressed air technology is very simple. If we can be strong in it. This force can be used to compress ordinary air into a cylinder air that can hold certain energies in it. This power can be used or for useful purposes. When this compressed air increases, energy is released to perform the function. So, this force in compressed air can be used to remove the piston. This is the basic principle of operation of an air-driven engine. It uses the pressure of air pressure to drive the pistons of the pneumatic actuator which creates a useful function by increasing the compressed air. Driven Engine, no burns occur inside the engine. It is therefore less polluting and less harmful. It only needs light metal as it does not withstand high temperatures. Since no burns occur, there is no need to mix gasoline and air.

1.1. Objective

- Due to excessive use of non-renewable energy sources a high amount of fuel burns, Air is one of the renewable energy sources that can be used instead of oil. Compress Air can be used as a source of energy / fuel. Compress Air can be stored in a tank and used to drive the engine.

- Today fossil fuels are widely used as a source of energy in various fields such as internal and external combustion engines, as a heat source in the manufacturing industry, etc. But its stock is very small and because of this overuse, fossil fuels are depleted. fast rate. So, in this world of energy problems.
- It is inevitable to develop other technologies for the use of renewable energy sources, in order to conserve mineral oil. One of the major oil fields is the Internal Combustion Engine.
- The alternative to IC Engine is “Compressed Air Powered Vehicle”. It is a vehicle that uses compressed air to drive the engine.

2. Literature Review

N.a.todkar et. Al. The technology of compressed air vehicles does not start. In fact, it has been around for years. Compressed air technology allows both engines / engines to be clean and economical. We built 3-wheel-drive vehicles to lose weight. Unlike conventional transmission systems that include clutch, counter shaft, fly wheel, propeller shaft, separate, pneumatic engine is connected and connected to the rear wheel using an intermediate gearbox which reduces vehicle loss and vehicle weight. It also takes up less space than four-wheel drive. But extensive research is needed to fully validate these technologies for their commercial and technological performance.

Franco antony et. Al. To operate a wind turbine you need two stroke engine technologies. But now the market is full of four-stroke engines. So, in our project we took a four-stroke petrol engine and with some modifications we turned it into a two-sided air engine. The engine camshaft rotates once on both sides of the flywheel. In both strokes it requires a single rotation of the camshaft to rotate the flywheel and as a result there must be an opening for both inlet and outlet valves.

Present to the latest developments of air compressed vehicles and an introduction to various technological problems and their solutions. Compressed air as a source of energy for various uses in general and as a non-polluting fuel in compressed air vehicles has attracted scientists and engineers for centuries.

S. S. Verma.i.e.t., Longowal et. Al. It refers to the efficient use of wind power. The wind turbine will replace the battery powered industrial vehicles. An air-conditioned car requires much less fuel filling compared to a battery-operated car. All in all, technology is about turning the engine of any conventional car into an air-conditioned engine.

S.s.verma et.al briefly summarizes the technical principle, recent developments, advantages and disadvantages of using compressed air as a source of motor power. The pressure to drive has been tested and today airborne vehicles are being greatly improved as a fuel-efficient mode of transportation.

Vishwajeetsingh * et al [July-2017] specialist performed a test on a compressed air engine while incorporating a slider crank chain chain i.e., an oscillating cylinder engine (piston area). In addition they have used a multi-channel solenoid valve which is a means of injecting and releasing compressed air.

D.Ravi et.al. analyzing climate change and energy security requires a slight reduction in travel demand, model change and new technological innovations in the transportation sector. . Through a series of press releases and demonstrations, a car that uses energy stored in compressed air produced by its compressor is marked as the future car that is environmentally friendly.

QIHUI YU * et al [JUNE-2015] The researcher performed a test on the CAE (compressed air engine) where they found the output torque, power and efficiency found when the supply pressure was 2mpa, the maximum output power was 1.92 KW , the maximum output torque is 56.55 N-m and the maximum efficiency is 25%.

3. Research Methodology

1) Literature review- Among all the research work done on our project, limited work has been done on Air Vehicle Engine development. It clearly shows that due to the position of Air Engine there will be power loss, power loss which directly reduces the efficiency of the compressed air engine, so we try to maximize this lost efficiency by providing a solid structure in the pneumatic piston with assistance. piston chain arrangement.

2) Problem Detection- The temperature difference between incoming air and active gas is small. When the air is heated, the device is very cold and may freeze in a cool, humid place. Installing fuel in a compressed air container using a home or low-pressure air compressor can take a long time. Tanks are very hot when filled quickly. It is very dangerous if the monitor is not maintained. Only capacity storage tanks. Therefore, we cannot select a longer drive.

3) Troubleshooting- Designing an integrated machine rather than a current machine. Machine upgrade according to current size and cost. It offers the same production rate and takes less input power. at an additional capacity of the air tank.

4) Construction - Contains modified power supply, air cylinder, air compressor, frame, Air Motor,

5) Operation-Compressed air engine is a type of engine in which the function of machinery by increasing compressed air. A pneumatic engine usually converts compressed air energy into mechanical work or direct movement or rotational motion. When compressed air is transferred to the final tank on board, it is released slowly to enable the pistons of the transport vehicle.

6) Conclusion- In this way the research work is complete and should be done.

4. Working

A compressed air engine is a type of engine in which the equipment operates by increasing the compressed air. A wind turbine usually converts compressed air energy into mechanical activity or direct or indirect rotation.

When compressed air is transferred to the final tank on board, it is released slowly to enable the pistons of the transport vehicle. The engine then converts wind power into mechanical power. That energy is then transferred to the wheels and becomes a source of energy for the car. The engine installed in a pressurized transport vehicle uses compressed air stored in the tank of the vehicle at a pressure of up to 4500 psi. The technology used by wind turbine engines is quite different from the technology used in conventional petrol cars. About 90m³ of compressed air is stored in the fiber tanks in the car. The engine is powered by compressed air, stored in a carbon-fiber tank at 30MPa (4500 psi). The tank is made of carbon fiber to reduce its weight. The engine has an injection similar to conventional engines, but it uses crankshafts and special pistons, which stay in place for about 70 degrees of crankshaft cycle; this allows more power to be developed in the engine. The expansion of this air pushes the pistons and causes movement. Engine overheating and increasing the overall road temperature is used. The air conditioning system uses expelled cold air. Due to the absence of fire and the fact that there is no contamination, oil conversion is only required for the corresponding operation of the engine pressed into the air.

4.1 Construction

Engine - A compressed air engine is a wind actuator that performs a useful function by increasing the compressed air. They have come into existence in many ways over the last two centuries, ranging in size from hand-held turbines to the power of several hundred horses. Some models rely on pistons and cylinders, others use wind turbines. Many pressurized wind turbines improve their performance by heating the incoming air, or the engine itself. Others advanced the stage and burned fuel on a cylinder or turbine, creating a kind of

internal combustion engine. One can buy a car with an engine or buy an engine that will be fitted to a car. Typical wind turbines use one or more expander pistons. In some applications it is advantageous to heat the air, or engine, to increase range or power

Air Compressor - Air Compressor is a tool that converts energy (usually from an electric motor, diesel engine or petrol engine) into kinetic energy by compressing and compressing the air, which, when charged, is released at a rapid blast. There are many types of air pressure, differentiated into positive or negative migration types.

Pneumatic Cylinder - Pneumatic cylinders (sometimes known as wind cylinders) are mechanical devices that use compressed air power to generate power in repeated line movements. Like water cylinders, there is something that forces the piston to go where it wants. The piston is a disk or cylinder, and the piston rod transmits the developing energy to the object to be removed. Engineers sometimes choose to use pneumatics because it is quiet, clean, and does not require much storage space. Because the active fluid is a gas, the leak of the air cylinder will not leak out and pollute the environment, making hygiene very desirable.

Storage Tank: Containers for storing liquids, compressed gases or materials used in dams, and manufactured containers. Storage tanks are usually cylindrical shape, perpendicular to the ground with flat bottoms, and a flat or floating roof. There are usually environmental laws applied in the design and operation of storage tanks, usually depending on the type of liquid contained within

5. Advantages

Compressed air to save energy instead of batteries. Pollution that occurs during the transportation of fuel will be eliminated.Reduce pollution from a single source, compared to millions of vehicles on the road.There is no need to build a cooling system, fuel tank, Ignition Systems or silencers.

6. Applications

The system eliminates the need for fuel, making it more environmentally friendly and less polluting, so it can be used for personal and commercial use.Offices, institutions, factories, etc., can use the car to travel slowly back and forth.No ordinary fuel is needed except for the use of batteries to throw and the initial speed, which is why they are more healthy and less expensive.

7. Result and Analysis

Pressure (psi)	Torque(N-m)	RPM	Power(KW)
85.3164	3.70	200	0.08
106.64	4.62	200	0.13

As we see in the table above and the calculation, the minimum torque required to move an object is approximately 3N-m and the pressure is 61 psi. In our experiment, we observed differences in speed with different pressures, at approx.85 psi and 106 psi respectively the speed is 200 rpm and 250 rpm respectively and the maximum output is 0.08KW and 0.13 respectively. • Outgoing torque falls with increasing rotational speed and increases with increasing supply pressure. High torque can be achieved with low rotational speed and high supply pressure. When the supply pressure is 106 psi, the output torque is 4.7N-m. • Energy efficiency decreases with increasing

rotational speed and supply pressure. When the pressure drop is 106 psi, the maximum efficiency achieved is 27%.

8. Conclusion

From this paper, a CAE was introduced, and thermodynamic features and performance analysis were studied. To obtain CAE performance, a CAE prototype was designed and adopted on a test bench. Output power, torque and efficiency were detected by experimental studies. The conclusion is summarized as follows:

- 1) CAE performance is greatly influenced by rotational speed and supply pressure.
- 2) In the first case, the output power rises sharply with increasing rotational speed and reaches high value. After this peak, the output power decreases significantly.
- 3) The CAE prototype has good economic performance under low speed.
- 4) If the supply pressure is 2 MPa, the maximum output power is 1.92 kW; the maximum output torque is 56.55 N · m; and the maximum efficiency is 25%.

The model I designed is a small working model of a compressed air engine. If rated at a higher level it can be used to drive cars independently or in combination (mixed) with other engines such as I.C. engines. The technology of compressed air vehicles does not start. Compressed air technology allows the engine to be clean and economical. Unlike electric or hydro-gen powered cars, compressed air vehicles are less expensive

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