

Performance of a Compressed Air Engine

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Abstract: The environmental pollution in the metropolitan cities is increasing mostly because of the increased number of fossil fuels powered vehicles. Compressed air driven engine is the one of the alternative for the IC engine. Main advantage of these engine is that no hydrocarbon fuel is required which means no combustion process is takes place, pollution is zero as well as it does not effect on global warming. In this project the SI engine is converted in to compressed air vehicle by changing the cam and valves. The performance of the engine is checked at various cylinder pressures and it is varied from 2 bar to 8 bar pressure at various gear ratios. From the results we are developed an application for the farmers and rural area people..

Keywords: CA engine, Performance, Emissions, Application

I. INTRODUCTION

Compressed air engine is an air powered engine using compressed air as a fuel. Instead of air fuel mixture burning in the cylinder to drive the piston by expansion of flue gases, Compressed air vehicle uses expansion of compressed air in the cylinder to drive the piston, CA Engine is nothing but opposite to the air compressor working.

When inlet valve opens pressurized air is entered in to the cylinder (Induction) and pushes the piston in downward motion, this will be the power stroke for the CA Engine. The exhaust valve opened the expanded air is released to the atmosphere it will be the exhaust stroke.

II. DEVELOPING CA ENGINE BY USING TRADITIONAL SI ENGINE

The regular SI Engine which has been utilized for the bikes will be used for the CA Engine. In SI engine cam shaft is designed according to the working process of suction, compression, expansion and exhaust. But in CA Engine combustion process is not required. Just in the suction stroke pressurized air is entered into the cylinder and directly participating in expansion process. Now according to the requirements of the CA Engine cam shaft design has been changed as shown in the diagram.



Fig1. CA Engine and Modified cam shaft

III.WORKING OF A CA ENGINE

the air is a working medium in CA Engine which is free of cost and plenty is available in nature. So no need of any costly and non renewable energy resources like petrol, diesel etc... The compressed air produced by the compressor is temporarily stored in a storage tank and which is utilized in where we required to run the engine. When suction stroke started inlet valve is opened by the designed time of the cam shaft. Now due to pressure difference in storage tank and combustion chamber compressed air is entered into the cylinder and apply the thrust force on the piston head. This is expansion stroke. Now exhaust valve is opened expanded air is released to the atmosphere. The CA Engine does not produce any pollution like convention engines and it doesnot cause for the

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