

# **THE PERFORMANCE AND EMISSIONS ANALYSIS OF A MULTI CYLINDER SI ENGINE WITH GASOLINE , CNG AND LPG**

A major thesis submitted in partial fulfillment  
of the requirements for the award of the degree of

**Master of Engineering  
In  
Thermal Engineering**

By

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Under the able guidance of  
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## CANDIDATE'S DECLARATION

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I hereby declare that the work which is being presented in this project report entitled, **“THE PERFORMANCE AND EMISSIONS ANALYSIS OF A MULTI CYLINDER SI ENGINE WITH GASOLINE, CNG & LPG”** submitted as major project towards the fulfillment of the requirements for the award of the degree of Master of Engineering with specialization in Thermal Engineering, D.C.E. Delhi, is an authentic record of my own work carried out under the supervision of **Prof. Amit Pal, Senior Lecturer**, Mechanical Engineering Department, at Delhi College of Engineering, Delhi.

The matter embodied in this dissertation report has not been submitted by me for the award of any other degree.

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## CERTIFICATE

This is to certify that the above statement made by the candidate is correct to the best of knowledge.

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## ACKNOWLEDGEMENT

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## ABSTRACT

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The ever rising cost of fossil fuels has brought the attention of the world back to the fact that the stock of fossil fuels diminishing throughout the world and demand for energy based comforts and mobility is increasing and making mankind even more dependent on it. Therefore it becomes imperative to search for alternative fuels to cater to our needs and to optimally utilize the existing sources of energy. Moreover Environmental issues regarding emissions from conventional fuels such as gasoline and diesel are of serious concern. The emissions from conventional fuel driven vehicles are in the form of hydrocarbons (HC), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and particulate matter (PM) and are harmful gases which not only have an adverse impact on the human body but also destroy the environment by causing the greenhouse effect, acid rain and global warming.

In the Indian context CNG and LPG are two such fuels which have been used as alternatives to conventional fuels in some Major Cities. These fuels have not only helped in reducing air pollution levels in these cities but also have reduced their dependence on conventional fuels. These fuels have emerged as a cost effective alternatives to both gasoline and diesel. The constraining factors in India remain building the requisite infrastructure for large scale implementation of these fuels and Safety Aspects which are of utmost importance while handling these fuels. In this project, the performance and emission characteristics of a multi cylinder automotive gasoline driven engine is compared vis-à-vis the same engine driven by CNG and LPG.

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