

## Modeling and Optimization of Performance of Four Stroke Spark Ignition Injector Engine

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**Abstract :** The performance of an engine whose basic design parameters are known can be predicted with the assistance of simulation programs into the less time, cost and near value of actual. This paper presents a comprehensive mathematical model of the performance parameters of four stroke spark ignition engine. The essence of this research work is to develop a mathematical model for the analysis of engine performance parameters of four stroke spark ignition engine before embarking on full scale construction, this will ensure that only optimal parameters are in the design and development of an engine and also allow to check and develop the design of the engine and it's operation alternatives in an inexpensive way and less time, instead of using experimental method which requires costly research test beds. To achieve this, equations were derived which describe the performance parameters (sfc, thermal efficiency, mep and A/F). The equations were used to simulate and optimize the engine performance of the model for various engine speeds. The optimal values obtained for the developed bivariate mathematical models are: sfc is 0.2833kg/kwh, efficiency is 28.77% and a/f is 20.75.

**Keywords :** bivariate models, engine performance, injector engine, optimization, performance parameters, simulation, spark ignition

**Conference Title :** ICPME 2015 : International Conference on Power and Mechanical Engineering

**Conference Location :** San Francisco, United States

**Conference Dates :** June 07-08, 2015