

# **EXPERIMENTAL INVESTIGATION OF CI ENGINE USING DIESEL FUEL WITH ADDITIVES.**

**The project "Experimental Investigation of CI Engine using Diesel Fuel with Additives" focuses on studying the effects of various additives on the performance and emissions characteristics of a compression ignition (CI) engine running on diesel fuel. The aim is to explore the potential of these additives in improving engine efficiency and reducing emissions.**

**Here are some details about the project:**

- 1.Objective: The main objective is to investigate the impact of different additives when added to diesel fuel on the performance and emissions of a CI engine. The additives can include fuel additives, combustion improvers, cetane improvers, lubricity enhancers, or any other substance that may influence engine performance.**
- 2.Experimental Setup: The project involves conducting experiments on a CI engine in a controlled environment. The engine is typically mounted on an engine test bed or dynamometer, which allows precise measurement and control of various parameters such as speed, load, and fuel flow rate. The engine is connected to a range of sensors and data acquisition systems to gather real-time data during the experiments.**
- 3.Additive Selection: Different additives are selected based on their properties and potential benefits. Common additives used in diesel fuel include cetane improvers (such as cetane boosters), lubricity enhancers, corrosion inhibitors, antioxidants, detergents, and deposit modifiers. The specific additives chosen for the study depend on the research objectives and available resources.**
- 4.Performance Parameters: The project investigates several performance parameters of the CI engine, such as brake power,**

specific fuel consumption (SFC), brake thermal efficiency (BTE), combustion characteristics, and exhaust gas temperature. These parameters provide insights into the engine's efficiency and power output under different additive conditions.

**5.Emission Analysis:** The project also focuses on analyzing the emissions produced by the engine when using diesel fuel with additives. This includes measuring the levels of nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), carbon monoxide (CO), unburned hydrocarbons (HC), and other pollutants. The goal is to assess the impact of additives on emissions and evaluate their potential for emissions reduction.

**6.Experimental Methodology:** The experiments typically involve running the engine under various operating conditions, such as different engine speeds, loads, and fuel compositions. The engine is tested with different concentrations of additives added to the diesel fuel, and the performance and emissions parameters are measured and compared against a baseline (pure diesel fuel) to assess the additive effects.

**7.Data Analysis:** The collected data is analyzed using statistical techniques and graphical representations. The results are compared, and conclusions are drawn based on the observed trends and changes in engine performance and emissions characteristics.

**8.Conclusion and Recommendations:** Based on the experimental findings, the project concludes with a summary of the effects of the tested additives on the CI engine's performance and emissions. Recommendations may be provided for the effective use of additives in diesel fuel to improve engine efficiency and reduce emissions.

Overall, the project aims to contribute to the understanding of the potential benefits of using additives in diesel fuel for CI engines, providing

**valuable insights for the automotive and fuel industries in optimizing engine performance and reducing environmental impacts.**