

**“INSTRUMENTATION FOR CI ENGINE TEST RIG AND
PERFORMANCE EVALUATION WITH AND WITHOUT
PREHEATING DIESEL”**

PROJECT REPORT

**In partial fulfilment of the requirement for the
award of the degree of**

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING

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**KARNATAKA STATE COUNCIL FOR SCIENCE AND
TECHNOLOGY**

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ABSTRACT

Waste heat which is generated in a process of fuel combustion or chemical reaction is “dumped” into the environment even though it could be still re-used for some useful and economic purpose. The essential quality of heat is not the amount but rather its “value”. The strategy of how to recover this heat depends on the temperature of the waste heat gases and the economics involved. The energy lost by waste gases cannot be fully recovered. However, much of the heat could be recovered and loss can be minimized. Waste heat which is escaping from the exhaust is re-used for some useful and economic purpose. If some of this waste heat could be recovered, a considerable amount of primary fuel could be recovered. In this project we have tried to increase the efficiency of the engine and reduce the emission level using the method of fuel pre-heating, and also we have studied the effect of injection pressure variation on fuel pre-heating. Heat exchangers contribute significantly to waste heat recovery process. The feasibility of using heat exchangers for heating fuel using automotive exhaust gas is studied. Practical heat exchanger is set up for heating the fuel. Simple experiments are carried out to examine the performance of the engine for heated fuel. It is shown that the experimental results indicate the benefit of fuel pre-heating. Large quantity of hot flue gases is generated from Boilers, Kilns, Ovens and Furnaces. If some of this waste heat could be recovered, a considerable amount of primary fuel could be saved.

Keywords: Pre-heating, Injection pressure