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MEC299

**THERMAL ANALYSIS ON EXHAUST PIPE OF LPG
COMBUSTOR**

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ABSTRACT

Exhaust pipe may damage due to high temperature. Thus, many researchers have run many experiments to prevent the exhaust pipe from getting to the melting point. The common method that had been used to nowadays is cooling system where the cooling water will absorb the heat in exhaust pipe. This experiment will be conducted to identify and analyse the effect of high temperature on exhaust pipe. The exhaust pipe is made of from stainless steel and connected to the LPG combustor. Then, the temperature data will be taken by computer using thermocouple and thermal imager. This experiment will determine whether the cooling water flowrate 10 L/min is better than the cooling water flowrate 2 L/min. The result of the experiment will be recorded in average table and graph. The result may contribute to improvement of combustor.

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1.0 INTRODUCTION

1.1 Background of Study

The modern world makes extensive use of advanced technology. The same may be said about today's automobile, which has a complex technical system with subsystems that execute specialized design duties. Thousands of component parts have been created as a result of recent technological developments. For coolant fluid (primarily water), lubricating oil, and fuel, the automobile has equivalent circulatory systems. The engine, also known as the "heart" of the vehicle, is made up of pistons, cylinders, fuel delivery tubes, and other components. A car is a good example. Exhaust pipe is a part of car's component that help to run the system in the vehicle. The gasoline-fueled reciprocating-piston internal-combustion engine, which operates on a four-stroke cycle, has been the most successful for automobiles, while diesel engines are commonly employed for trucks and buses (Britannica, 2021). The gasoline engine was originally chosen for autos because it could function more flexibly over a wide range of speeds and produced reasonable power for a given weight. Due to a malfunctioning and older engine with some technical issues, performance may suffer and overheating may occur. Temperatures can also rise as a result of poor gas combustion. This indicates that the temperature has risen at the moment. When metal is heated, it expands in length, volume, and surface area as the temperature rises. Thermal expansion is the term used to describe this phenomenon. When the vibrations of the metal's atoms are amplified by heat, thermal expansion occurs. It has the potential to color the exhaust cherry red and melt it.

Liquefied Petroleum Gas is known as (LPG) is a clean and safe fuel with qualities that are similar to gasoline (Aiteo Gas, 2020). It is a by-product of the refining of petroleum and the generation of natural gas. LPG becomes liquid at slight pressure and can then be stored in tanks. Before being used in the engine, LPG is converted back to gas. This can lead to many benefits in many ways. It gave us a low price than other fuel. LPG reaches the engine as a pure gas, resulting in better combustion and avoiding the problem of unburned petrol dilution in the engine oil. The oil stays cleaned for a longer period of time. This extends the life of the engine and allows for longer service intervals. In addition, engines run more smoothly and silently than on petrol.