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MEC299

THERMAL ANALYSIS ON OUTER SURFACE OF TURBO FOR ZERO LOAD GASOLINE ENGINE

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ABSTRACT

For this study,the use of a turbocharger aids in the production of high power from a gasoline engine. However, it may generate high temperatures surrounding the engine, compromising the materials' longevity. The goals of this project are to locate high temperature profile on different location on turbo in gasoline engine with varying engine rpms using thermo couple and to compare heat localization on different location on turbo using thermal imager and thermo couple. Furthermore, due to heat localization, the effect of high temperature must be assessed. The gasoline engine will be run at various engine rpms ranging from 2000 to 6000 with a 500 rpm interval. The experiment predicts that as engine speed increases, the temperature of a turbocharged engine rises. Heat localisation in a single location can also be measured with suitable cooling.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The automotive sector includes all firms and activities that are involved in the manufacture of automobiles, including the majority of components such as engines and bodywork, but excluding tyres, batteries, and fuel. The sector's mainstays include passenger automobiles and light trucks, such as pickup trucks, vans, and sport utility vehicles. Malaysia's largest problem is the global automotive sector. The emission limits for exhaust gases such as Carbon Dioxide (CO2), Nitrous Oxide (N2O), and Particular Material from autos make this industry difficult (Romagnoli et al., 2019). Aside from that, the automotive sector is experiencing strong demand from both consumers and governments for fuel-efficient vehicles.

Original Equipment Manufacturers (OEMs) and component manufacturers decide to devote resources in developing technologies that lead to the usage of turbochargers in automobiles in order to overcome these problems (Romagnoli et al., 2019). Turbochargers improve fuel economy while also lowering pollutants. In a turbocharged diesel engine, the air is compressed before the fuel is injected, which is a significant difference from a normally aspirated gasoline engine. At this time, the turbocharger is critical to the diesel engine's power production and efficiency (Romagnoli et al., 2019). The turbocharger's job is to compress the air that enters the cylinders of the engine (Chris, 2021). In compressed air, oxygen molecules are packed closer together. More fuel can be delivered to a normally aspirated engine of the same size with more air (Jonathon, 2020). As a result, the combustion process has higher mechanical power and is more efficient overall (Chris, 2021).

A turbocharger, on the other hand, must be precisely suited to the engine. A variety of factors influence turbomachinery performance, some of which are induced by natural laws determining the relationship between pressure, airflow, and turbocharger speed (Eric & Rolando, 2018). Because the exhaust stream has very little