

Design of Disc brake dynamometer for domestic applications

Dynamometers are specifically designed for the measurement of the engine's brake power. Although several types of them are physically available, the disc brake dynamometers stand out as a more accurate, and easily manipulatable system. This paper aims to develop a highly accurate disc brake dynamometer while establishing the relationships between several process parameters. In the methodology, the initial stage is to measure the force requirements to the accelerator, brake lever, and clutch. A 3D model has been developed using AutoCAD. With the Model development, the necessary accessories were identified. A CG125 engine has been selected for the study. The most associated preliminary design stages were formulated before the experimentation. An interface has been added to display the outcome of the analysis. In the results, a real-time graphical relationship was built for brake power and engine speed. Seven sets of data in the two different circumstances were obtained. The obtained results were validated concerning previous experimental results. Both the results were matched in most situations for the selected engine. The variation is comparatively less. The engine RPM is stipulated between 2000 and 8000 with the maximum power at the upper limit. The developed domestic application provided major benefits such as controlling the system at a single location, automatic generation of relationships between the concerned parameters, presence of a safety switch that can immediately halt the process in emergencies, use of lambda sensors for corrections, and less maintenance. On the limitations, the system is limited to a permanent engine. Thus, the research can be further improved with the use of several engines at a time. Errors concerning the software can be avoided with comparative studies. Indeed, a dynamometer with precision and safety has been improved, more than any other type of disc brake conventional dynamometer.

Keywords: Brake power, Engine speed, Disc brake, domestic, lambda sensor