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OPTIMIZATION OF DIESEL ENGINE PARAMETERS WITH BLEND OF PONGAMIA BIODIESEL AND DIESEL USING TAGUCHI METHOD

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ABSTRACT

Biodiesel is an alternative to conventional diesel fuel made from renewable resources, such as non-edible vegetable oils. The oil from seeds (Ex. Jatropa, Neem, Pongamia, etc,) can be converted to a fuel commonly referred to as "Biodiesel." No engine modifications are required to use biodiesel in place of petroleum based diesel. Biodiesel can be mixed with petroleum-based diesel in any proportion. This interest is based on a number of properties of biodiesel including the fact that it is produced from a renewable domestic source, its biodegradability, and its potential to reduce exhaust emissions.

In this project work, optimization of diesel engine parameters is carried out experimentally. The biodiesel used is Pongamia and its blends with diesel, injection opening pressure, number of nozzle holes, and compression ratio is varied to study the effects on diesel engine performance. Brake thermal efficiency is optimized using Taguchi methodology to analyze the experimental data. The optimum operating parameters which gives maximum brake thermal efficiency is B80, injection opening pressure 200 bar, 3 hole nozzle and 18 compression ratio. The confirmatory test has been made and the brake thermal efficiency is obtained matches with the theoretical calculation using Taguchi optimal method.

KEYWORDS: Bio-Diesel, Pongamia, Taguchi Method, Response Curves, Operating Pressure, Nozzle Holes, Compression Ratio, Brake Thermal Efficiency