

Analysis of the Influence of Butterfly Valve Angle Variation on the Performance of a Four-Stroke Diesel Engine Exhaust Manifold

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ABSTRACT

Internal combustion engines are widely used in daily activities, both in transportation and agriculture. The increasing number of motor vehicle users has led to a rise in fuel consumption. Therefore, there is a need for technology that can enhance engine efficiency and performance. One cost-effective method to achieve this is by using a butterfly valve on the exhaust manifold. The functioning of the butterfly valve involves restricting a portion of the exhaust gas from the manifold, reducing the overlapping effect and increasing engine compression, which allows for more complete fuel combustion. This research was conducted at the Automotive Laboratory of P4TK BOE/VEDC Malang. The aim of the study is to analyze the influence of butterfly valve angle variation on the performance of a four-stroke diesel engine. The research focuses on torque and specific fuel consumption (SFC) as the study parameters. The research findings indicate that adding a butterfly valve with a 45° opening angle can increase fuel efficiency and torque by 11% compared to not using a butterfly valve.

Keyword : *diesel, butterfly valve, torque power and sfc*