FAKULTAS TEKNOLOGI INDUSTRI
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Performance Test Analysis Engine Volvo D16C5 550HP After Process Overhaul

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Abstract

Volvo trucks are widely used in the mining world in Indonesia where the performance of these trucks is maximized by using them for almost 24 hours every day. Therefore, many problems are found on the part engine, so the engine must be corrected through overhaul. Next, after the overhaul process is completed, it is necessary to do a performance test analysis to ensure that the performance and efficiency of the produced engine remain in optimal condition and in accordance with the standards.
This research was conducted at PT. EKA DHARMA JAYA SAKTI KM. 13 Balikpapan on one engine belongs to the customer by model engine Volvo D16C5 550HP. This research was conducted after process the engine has been completed and overhauled and then checked the performance using the tool dyno test. The independent variable in this study is the power engine (25 – 550 HP). The dependent variable in this study is the rotation engine (rpm), torque (N.m), BMEP (psi), and efficiency thermal (%). The control variable in this study is temperature room (°C) and Pertamina standard B35 biodiesel fuel.
The results of this study are performance results of the engine Volvo D16C5 550 HP uses B35 biodiesel fuel and data is obtained, which are a maximum power of 535 HP and a maximum torque of 2,188 Nm (1,614 lb-ft) at rotation engine 1,606 rpm. In addition, the results are also obtained efficiency thermal of the engine Volvo D16C5 550HP by 37%.

Keywords: Engine Volvo D16C5 550 HP, Overhaul, Dyno test, Performance

Introduction & Objective

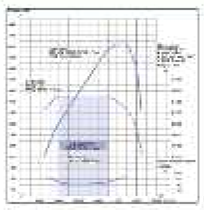
The engine overhaul process is the process of an engine disassembly activity with the aim of inspecting and repairing components in the engine if there are damaged components. Through this process, it is expected to restore the engine's performance as before and in accordance with the standards of the engine.
The objectives of this research are described as follow:
a. To determine the performance of the Volvo D16C5 550 HP engine after the overhaul process.
b. To find out how much the thermal efficiency of the Volvo D16C5 550HP engine after the overhaul process.

Methods

The research and data collection were conducted from March to April 2023 at PT EKA DHARMA JAYA SAKTI, located at Jl. Pulau Balang Approach KM13, Karang Joang Village, North Balikpapan District.

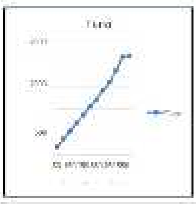
Tools used in this research, including:
a. Volvo D16C5 550 HP Engine
b. Dynamometer
c. Heat gun

Results



Graph 1. Volvo D16C5 550HP Engine Specification

Graph 2. Relationship between Power and Engine Speed



Graph 3. Relationship between Power and Engine Torque

Resume Conclusions

From the analysis and discussion of the test data, the following conclusions are obtained:

a. Performance testing with dyno test equipment and by using B35 biodiesel fuel on the Volvo D16C5 550 HP engine obtained results, which are maximum power of 535 HP and maximum torque of 2,188 Nm (1,614 lb-ft) at engine speed of 1,606 rpm.
b. The test results obtained are the thermal efficiency of the Volvo D16C5 550 HP engine at 25% valve opening by 30% and at 50% valve opening by 37%.

Acknowledgment or contact

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