

***THE EFFECT OF VARIATIONS IN PROPELLER DIAMETER AND FUEL
MIXTURE ON ENGINE ROTATION, THRUST AND TEMPERATURE
IN THE OS 15 LA ENGINE***

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ABSTRACK

This study aims to analyze the effect of variations in propeller diameter and the mixture of methanol fuel with castor oil on the performance of the OS 15 LA engine which includes engine rotation (rpm), thrust (N), and engine working temperature (°C). The method used is an experimental method with the taguchi design approach to identify the dominant factors and optimal parameter combinations. Testing variations included the use of 6-inch, 7-inch, and 8-inch APC propellers with a pitch of 4 inches, as well as variations in castor oil content in the fuel mixture with weight percentages of 14%, 17%, and 20%. The results of the analysis using signal-to-noise (S/N) ratio values and main effects graphs show that propeller diameter is the most dominant factor in influencing engine rotation (rpm) and thrust (N), while the variation in the distance oil content in the fuel mixture has a significant effect on the engine working temperature (°C). The optimal combination was obtained by using a 7-inch diameter (4-inch pitch) APC propeller with a 17% variation in the fuel mixture of 17%, resulting in the best performance balance in the form of relatively high and stable engine rotation (rpm), maximum thrust (N) compared to other combinations, and lower engine operating temperature (°C) and within safe operating limits. The results of this study can be a reference in optimizing the engine propulsion system of two-stroke engine-based aircraft, especially in the F2 speed control line category.

Keywords: OS 15 LA engine, propeller diameter, fuel mixture, methanol, castor oil, engine rotation (rpm), thrust (N), temperature, taguchi.