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EFFECT OF JATROPHA BIODIESEL BLEND TO EFFICIENCY VOLUMETRIC OF DIRECT INJECTION DIESEL ENGINE

PENGARUH CAMPURAN BIODIESEL JATROPHA TERHADAP EFISIENSI VOLUMETRIK MESIN DIESEL DIRECT INJECTION

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ABSTRACT

Problems oil reserves are dwindling caused the crisis, the effects of the crisis has been felt in the last few years. It encourages researchers to participate in developing renewable fuels. This study, try blend Biosolar Pertamina with jatropha biodiesel. The purpose of this study was to determine the effect of the composition of jatropha into Pertamina Biosolar to volumetric efficiency of direct injection diesel engine 4- stroke, 4-cylinder with a cylinder volume is 2.8 liters. The composition of the fuel for the experiment is D100 (Biosolar Pertamina 100%) ; D90J10 (Biosolar 90% Jatropha 10%) ; D80J20 (Biosolar Pertamina 80% Jatropha 20%) dan D70J30 (Biosolar 70% Jatropha 30%). The method used is experiment. Results of the study are (1) Effect increase the percentage of biodiesel jatropha to engine diesel power is the power at all loads to be decreased. Values drop in brake power at each of the largest load variation occurs in the mixture D70J30 with a value decline of 0.75%, 5.28%, 10.37% and 9.85% of the power with fuel D100. (2) Effects of jatropha biodiesel percentage increase also resulted in torque at all loads going down. the lowest decline in every variation is incurred on fuel D70J30 brake power is calculated from the value D100, with a value decline of 0.74%, 5.02%, 9.40%, and 8.96%. (3) Effect throughout the fuel mixture of the volumetric efficiency of diesel engines is causing decreased volumetric efficiency, the biggest decline was 6.33%, 6.61%, 6.33%, and 6.19% in the fuel D80J20 volumetric efficiency is calculated from the value D100. Suggested solutions to overcome the problems of a decrease in volumetric efficiency is by placing the intake valve settings, so that when air intake into the cylinders could be longer and with the modification that with the addition of a supercharger or turbocharger, more preferably also added intercooler.

Key words: Biosolar, Biodiesel Jatropha, *volumetric efficiency.*

ABSTRAK

Permasalahan cadangan minyak bumi yang semakin menipis, telah terjadi di seluruh penjuru dunia, efek krisis sudah terasa dalam beberapa tahun terakhir ini. Hal ini mendorong peneliti untuk turut serta mengembangkan bahan bakar yang dapat diperbaharui. Penelitian ini, mencoba mencampur Biosolar Pertamina dengan jatropha biodiesel. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh penambahan komposisi jatropha ke dalam Biosolar Pertamina terhadap efisiensi volumetric motor diesel injeksi langsung 4 langkah, 4 silinder dengan volume 2,8 liter. Komposisi bahan bakar yang diteliti adalah D100 (Biosolar Pertamina 100%) ; D90J10 (Biosolar 90% Jatropha 10%) ; D80J20 (Biosolar Pertamina 80% Jatropha 20%) dan D70J30 (Biosolar 70% Jatropha 30%). Metode yang digunakan adalah eksperimen. Hasil penelitian adalah (1) Efek pertambahan persentase biodiesel jatropha terhadap daya adalah daya pada semua beban jadi menurun. Nilai penurunan *brake power* pada setiap variasi beban terbesar terjadi pada campuran D70J30, sebesar 0.75%, 5.28%, 10.37% dan 9.85% terhadap daya dengan bahan bakar D100. (2) Efek pertambahan persentase jatropha biodiesel juga mengakibatkan torque di semua beban akan turun, penurunan terendah di setiap variasi beban terjadi pada bahan bakar D70J30 dihitung dari nilai *brake power* D100, sebesar 0.74%, 5.02%, 9.40%, dan 8.96% (3) Efek seluruh campuran bahan bakar terhadap *volumetric efficiency* mesin diesel adalah menyebabkan volumetric efficiency menurun, penurunan terbesar , sebesar 6.33%, 6.61%, 6.33%, dan 6.19% terjadi pada D80J20 dari bahan