

## Studi pengaruh CNG-ratio pada motor diesel berbahan bakar ganda solar-CNG

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### Abstrak

Telah dilakukan penelitian awal konversi motor diesel dengan menggunakan bahan bakar gas. Untuk itu, sebuah motor diesel stasioner satu silinder berpendingin udara dikonversi untuk beroperasi dengan bahan bakar ganda solar-BBG. Untuk menimbulkan penyalaaan, sejumlah kecil bahan bakar solar (pilot fuel) diinjeksikan pada beberapa derajat sebelum titik mati atas. Pengujian dilakukan pada mode daya maksimum (3000 rpm), torsi maksimum (2000 rpm), dan putaran 2500 rpm. Pada masing-masing putaran dilakukan variasi beban dan variasi jumlah BBG pada beban tertinggi. Pengamatan dilakukan pada tekanan ruang bakar, laju pelepasan panas (rate of heat release/ROHR), pemakaian udara, pemakaian BBG dan pemakaian bahan bakar. Dari hasil percobaan terlihat bahwa pada putaran 2000 rpm, kenaikan CNG-ratio sampai 40% akan meningkatkan tekanan maksimum rata-rata. Pada putaran 2500 rpm, kenaikan tekanan maksimum rata-rata dicapai untuk CNG-ratio di bawah 10%, sedangkan pada putaran 3000 rpm kenaikan CNG-ratio akan menurunkan tekanan maksimum rata-rata.

Kata kunci: diesel, BBG, bahan bakar ganda

### Abstract

Preliminary research to convert diesel engine to utilize natural gas as main fuel has been conducted. For that purpose, an air-cooled single cylinder stationary diesel engine was converted to operate in a dual fuel combustion with CNG as the main fuel and diesel fuel as a pilot fuel. Diesel fuel was injected a few degree before TDC. The test was running in three modes, i.e. rated power mode (3000 rpm), maximum torque mode (2000 rpm), and medium speed mode (2500 rpm). Cylinder pressure, rate of heat release, air consumption, CNG consumption and fuel consumption were investigated. The results show that the replacement of diesel fuel with CNG give a different effect on combustion for the three modes. Increased CNG-ratio up to 40% and 10% resulted in increasing average maximum cylinder pressure for maximum torque mode (2000 rpm) and medium speed mode (2500 rpm) respectively. On the other hand, increased CNG-ratio resulted in decreasing average maximum cylinder pressure for rated power mode (3000 rpm).

Keywords: diesel, CNG, dual fuel

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