ABSTRACT

Consumption of oil fuels, especially gasoline, continues to increase is not offset by the availability of the fuel. This resulted in the crisis of oil fuel. Liquefied Petroleum Gas (LPG) had became a big attention as an alternative fuel for 4 stroke spark ignition engine (S.I.E.). There were many researchers around the world conducted the researches about characteristics of LPG on S.I.E compared with gasoline. Most of them using experimental method and just few of them using numerical method in their studies.

This numerical study uses Lotus Engine Simulation (LES) software. The first step was dimensional measurement of some engine components for numerical modelling input. The next step was combustion, performances and heat transfer analysis using LES based on dimensional measurement at the previous step with variation on ignition timing and air-fuel ratio (AFR).

Several conclusions could be obtained. LPG gives performances improvement in the term of brake torque, brake power, BMEP and BSFC with AFR setting of 15,5 and ignition timing setting of 25 BTDC relatively to gasoline at standard operational condition with the value about (in percentage) +4,86 %; +5,06 %; +4,84 % and decreased -19,9 %, respectively. Inner cylinder pressure and combustion gas temperature, at LPG with
AFR setting 15.5 and ignition timing setting 25 BTDC increased +11.38 % and decreased -7 % respectively.