

Thesis Title	Analysis of Engine Cylinder Pressure Data Using Higher Octane Rating Gasoline than Engine Requirement
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Candidate	Mr. Wichian Aiemarceerat
Supervisor	Assoc. Prof. Dr. Somchai Chanchaona
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Abstract

Several motorists in Thailand believe that using higher octane rating gasoline than the engine required can help improving power, fuel economy and acceleration. This research work did comparison in engine performance, fuel consumption and combustion behavior when two gasoline grades were used. The test runs involved two commercial engines i.e. TOYOTA 4A-GE TVIS 1600 cc and HONDA B18B4 1800 cc. Both engines were not equipped with knock sensors and they required 91 RON gasoline. The experimental results show that for both engines 91 RON gasoline promotes slightly higher power than that of 95 RON gasoline. The fuel consumption rates for both fuel types are almost the same. Levels of oxides of nitrogen are increased with 95 RON gasoline, while carbon monoxide and hydrocarbons are decreased. From the analysis of cylinder pressure data, it is shown that coefficients of variation in imep and P_{max} are similar.

Further analysis of pressure data using the two-zone thermodynamic model shows that in the Toyota engine, the burning rate of 91 RON gasoline seems to be faster while in the Honda engine the burning rates are almost the same.

In conclusion, for non-knock sensor engines like the engine used in this study using higher octane rating gasoline than engine required does not help in improving power, fuel economy and burning rate. So it is not necessary to use gasoline with higher octane rating than engine required.