หอสมุดกลาง
จุฬาลงกรณมหาวิทยาลัย

CHAPTER IV

CONCLUSION AND SUGGESTION FOR FUTURE WORK

4.1 Conclusion

This experiment concentrates mainly on the effects of using commercial butane gas in combination with diesel oil and comparing the results obtained with normal diesel operation, at constant speed condition. The results of this experimental work may be concluded as follows:

Engine thermal efficiency with gas addition at light load is seriously reduced because of impared combustion efficiency. The use of gas is most beneficial at heavy load, and especially at low speed.

Smoke density is reduced effectively at maximum load and again at light load, as against normal diesel which experiences problem at high load.

Carbon monoxide is reduced at high load, and especially at low speed with optimum gas quantity. Hydrocarbon seems to increase in all conditions and becoming more as gas is being added.

The maximum amount of gas that can be admitted in both engines is limited by inflamability limit of gas which will cause pre-ignition and consequently serious knocking. The maximum gas concentration is found to be abount 50 % in total fuel. However, taking into account both the engine thermal

efficiency and exhaust emissions, the optimum concentration of gas to give the best result falls between 20 to 30 % gas in total fuel by weight.

In view of using gas to replace diesel oil (which is now cost incentive) for high speed engine it is not most appropriate as the gas is restricted for use only at high load and not greater than 30 %. Hence, it is seen that automotive diesel engines which requires load and speed variations to a large degree are not economical to operate on gas and diesel fuel combination. On the other hand, marine diesel engines and diesel engines used in generating plants which usually run at constant low speed and load will benefit most from this dual fuel system.

4.2 Suggestion for future work

Future work that is recommended is to replace the present commercial gas with natural gas from gulf of Thailand, when it is cheap and readily available in B.E. 2524 as forecasted by the Ministry of Industry.