CHAPTER 5

CONCLUSIONS

In these investigations, effects of three fuel system and purified waste engine oil blended with 30% diesel (PWEO) produced from waste engine oil on engine performance and emissions were investigated. Its characteristics like density, viscosity and flash points were determined. Three fuel systems has significantly improved the brake thermal efficiency, reduction in ignition delay, lower emission of exhaust gases and hence claimed as better fuel system than the conventional diesel.

The main conclusions drawn from the present study are:

1. Three-fuel concept(acetylene aspiration in let manifold up to 3 lpm and mixing of turpentine with diesel fuel up to 40%).

2. The brake thermal efficiency increased by 1-3 % from the standard fuel. It exhibited lower exhaust gas temperature compared with diesel operation.

3. An appreciable reduction in HC, CO and CO2 emissions was observed in Tri fuel concept with increased engine performance without much worsening its emission.

4. A slighter increase in NOx emissions was found and approximately 40% of smoke reduction is achieved with the three-fuel mixture concept operation.

5. There is an increase in the peak cylinder pressure and rate of pressure raise, when acetylene gas is inducted.
6. About 60 ml from 100 ml (or) about 60% of the waste engine oil was converted into PWEO.

7. The physical properties evaluated were matching with conventional diesel.

8. Utilizing PWEO, engine performance tests like torque, brake mean effective pressure and brake thermal efficiency, brake specific fuel consumption were significantly improved and on par with conventional diesel.

9. The tests on the emission of pollutants from engines using PWEO confirmed that there is no marginal changes in percentage of flue gases with diesel.

10. The reuse of PWEO nullifies the pollution to water, soil and air.

11. It is cheaper than the conventional diesel.

Based on the above studies, it is recommended that the consumption of diesel is very much reduced employing three fuel system and PWEO, both fuels are playing vital role for diesel engine as an alternate fuel to fossil fuels have been given an extensive study.