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Thesis : Comparative Performance Studies of the  
Gasoline Engine Using Compressed Natural  
Gas and Gasoline Fuel Oil as Fuels

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Academic year : 1991

### Abstract

This study is done to verify the optimum performance of 1600 cc. gasoline engine using compressed natural gas (CNG) as fuel. The study is divided into two parts: the size of a gas mixer and the degree spark advance. The test has been done by varying gas mixer diameter in the range of 17-21 mm. and setting degree spark advance at 24,26,28,30 and 32 degree before top dead center(BTDC). It is found that the optimum performance of the engine can be obtained when using gas mixer diameter size of 17.5 mm. and the degree spark advance setting at 26 degree BTDC. The throttle valve opening tested were 30,45,60,75, and 90 degree compared to horizontal line. The result of engine performance for the brake power is 34 kW at 4200 rpm. The minimum specific fuel consumption is 0.2682 kg/kW-hr at 2600 rpm. Comparing the test with those when using gasoline as fuel, the engine optimum performance has been obtained when static spark advance is at 12 degree BTDC. The brake power is 47 kW at

4200 rpm. The minimum specific fuel consumption is 0.2989 kg/kW-hr at 2600 rpm. Using CNG as fuel, the energy consumption reduced by 14 % compared to that of using gasoline. The decrease of air pollution when using CNG is remarkable; 52 % for carbonmonoxide and 13 % hydrocarbon content in the exhaust gas when compared to that when using gasoline.