

Torque and power of CNGDI engine with two different piston crown shapes.

ABSTRACT

This paper presents the experimental test results of single cylinder high compression engine fuelled with compressed natural gas. The engine uses central direct injection with high pressure injector system which is known as Compressed Natural Gas Direct Injection (CNGDI) engine. This initial experiment on a single cylinder CNGDI engine is to investigate the feasibility of the CNGDI engine with different piston crown shape. The performance of two piston crown shapes for (i) homogeneous (ii) stratified combustion was investigated. The start of injection (SOI) timing for each piston was varied between 1200 before top dead centre (bTDC) to 2200 bTDC to study its combustion response at various engine speeds. SOI varied between 1200 bTDC to 1800 bTDC, which produced a constant power and torque. The experimental results have shown; (i) ignition timing has to be advanced and (ii) the best injection timing is at 1200 bTDC to 1800 bTDC to achieve a good performance. For homogeneous charge combustion operation engine, the injection timing was set at early of compression stroke to ensure the better fuel/air mixing.

Keyword: CNGDI engine; High compression engine; Single cylinder CNGDI.