

Performance and Emission Characteristics of a Compressed Natural Gas Fuelled Spark Ignition Engine

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Abstract

Among alternative fuels for internal combustion engine, natural gas can be considered as the single largest alternative fuel. Natural gas can substitute totally or partially the liquid fossil fuels (gasoline and diesel). This research work was intended to study the performance characteristics of a two-cylinder diesel engine converted to spark ignition (SI) engine to run on 100 percent compressed natural gas (CNG). In this study the test emissions were measured with the advancement in ignition timing, which is very uncommon with other available test reports, and this gives new relation of emissions level with ignition timing change. From the experimental result, it is seen that a converted natural gas fuelled SI engine can deliver approximately equal output to its diesel counterpart. The combustion of natural gas in CNG fuelled SI engine is found to be more efficient at the equivalence ratio of 0.9. The exhaust gas temperature of natural gas fuelled SI engine is found to be 120°C to 180°C above that of diesel and petrol engines of similar type. The exhaust gas emissions (CO and HC) of natural gas fuelled SI engines are found to be much lower than their respective admissible limits. Natural gas fuelled engine is friendly to environments for its lower level of air pollution and lower level of green house gas emission.

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