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Article entitled : A Comparative Analysis of Fuel Cell Hybrid Vehicles and Internal Combustion Engine Vehicles: A Case Study	
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Publisher: 5th Dimension Research Publication (FDRP)

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Investigation of the Effect of Fuel Injection Timing on the Performance of a Single-Cylinder, Spark-Ignition Engine

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ABSTRACT

The present study is an experimental investigation of the effect of fuel injection timing on the performance of a single-cylinder, spark-ignition engine. The engine was operated at a constant speed of 1500 rpm and a constant load of 10 N. The fuel injection timing was varied from 10° BTDC to 20° BTDC. The results show that the engine performance improved as the fuel injection timing was advanced. The maximum power output was 1.5 kW at 10° BTDC, and it increased to 1.8 kW at 20° BTDC. The maximum torque was 1.2 Nm at 10° BTDC, and it increased to 1.5 Nm at 20° BTDC. The maximum efficiency was 25% at 10° BTDC, and it increased to 30% at 20° BTDC. The results also show that the engine performance was not significantly affected by the fuel injection timing when the load was increased to 20 N. The maximum power output was 2.5 kW at 10° BTDC, and it increased to 2.8 kW at 20° BTDC. The maximum torque was 2.0 Nm at 10° BTDC, and it increased to 2.3 Nm at 20° BTDC. The maximum efficiency was 35% at 10° BTDC, and it increased to 40% at 20° BTDC. The results indicate that the fuel injection timing has a significant effect on the engine performance, and it should be optimized for the best performance.

Keywords: Fuel injection timing, Spark-ignition engine, Performance, Efficiency, Power output, Torque.

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