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## Studies on Port Injected Hydrogen in a Dual Fuel D.I. Diesel Engine

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### Abstract

*Hydrogen is expected to be one of the most important fuels in the near future for solving not only the problem of greenhouse emissions but also carbon monoxide and unburnt hydrocarbon thereby protecting the environment in addition to, saving conventional fuels. In the present experimental work hydrogen was used in the dual fuel mode with diesel as an ignition source. Hydrogen was injected in the intake port and diesel was injected directly into the combustion chamber. The injection timing and injection duration for hydrogen injection was controlled by an Electronic Control Unit (ECU). An hydrogen injector fitted on the intake port was used to inject the hydrogen fuel during the intake stroke. For experiments a single cylinder, AV1 Kirloskar, DI Diesel engine was used. The hydrogen injection timing was fixed at suction TDC and injection duration was fixed at 30°, 60°, and 90° crank angles. The injection timing of diesel was kept constant at 23° BTDC. Results show that, the NO<sub>x</sub> emission decreases from 1806 ppm for diesel to 1690 ppm at full load for 30° injection duration for hydrogen and 1606 ppm for 90° injection duration in the dual fuel mode. The smoke reduces significantly from 4.06 BSN for diesel operation at full loads compared to 2.1 BSN for hydrogen operation with 90° injection duration with a further reduction in smoke to 1.2 BSN with 30° and 60° injection duration.*

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