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Study of the influence on gas emissions by using hydrogen in a diesel engine

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Abstract

This research studies the possibility of the reduction of the emission values emitted by a diesel engine, by adding hydrogen to the fuel mixture. Due to the higher pollution restrictions implemented globally on the internal combustion engines, for new but also older vehicles, suitable solutions must be found, even for diesel engines, towards major incriminations concerning pollution are attested. The water electrolytic conversion for hydrogen production is achieved by using a special device, in symbioses with the internal combustion engine. The hydrogen quantity, as resulted from the process and fuelled into the engine, represents 10% of the total volume of the intake capacity. Being directly correlated to the stoichiometric ratio, the intake of hydrogen is finally controlled; therefore the total calorific power of the fuel mixture is increasing. The calorific value of Diesel is 44.8 MJ/kg, while that of hydrogen is 141.8 MJ/kg. Since the addition of hydrogen represents 10% of the total intake capacity, the addition of total calorific value of the mixture fuelled raises by approximate 30%. All the measurements have been done in a lab using a certified and approved gas analyser.

Keywords: diesel engine emissions, hydrogen, fuel mixture, internal combustion engines

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