Manufactured Design of Cyclone Separator to Reduce Particulate Matter (PM) Diesel Engine Exhaust Gas

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Abstract

The combustion process of the engine are produce pollutants including Nitrogen Oxide (NOx), Particulate Matter (PM), Carbon Monoxide (CO) and Hydrocarbons (HC). For that reason, a study needs to be done to reduce emissions in diesel exhaust gas with the selection of appropriate technologies and methods. One of method to reducing particulate matter of diesel engine in using cyclone separator. The basic principle of cyclone separator are based of centrifugal force and density differences. Because the density of PM is greater than the density of exhaust gas, the PM will be separated from the exhaust gas. The first step of this research is to design cyclone separator. The second step is to analysis the flow using CFD. On the results of CFD analysis concluded that the method of Perry is more efficient than the other three methods. Having obtained the design of efficient then proceed with the manufacture of prototypes, to test is then performed experiments. Based on the experimental test, the cyclone separator can reduce diesel exhaust PM in 2000 watt load of 8.71%. While the 2500 watt load, cyclone separator can reduce PM by 34.49%.

Keyword: Centrifugal Force, CFD, Cylone Separator, Diesel Engine, PM
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