

Abstract Details

Title: Experimental Analysis of Waste Energy from Exhaust of an Internal Combustion Engine

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Abstract: Exhaust gas occurs as a result of the combustion of fuels such as natural gas, gasoline/petrol, diesel, fuel oil or coal. It is discharged into the atmosphere through an exhaust pipe or flue gas stack. The exhaust gas from an internal combustion engine carries away about 30% of the heat of combustion. The energy available in the exit stream of many energy conversion devices goes as waste, if not utilized properly. The main objective of the proposed project is to utilize heat from the exhaust gases of a diesel engine and convert heat to useful work. In the present work, a shell and finned tube heat exchanger integrated with an setup to extract heat from the exhaust gas and a thermal energy storage tank used to store the excess energy available is investigated in detail. Energy supplied to an engine is the heat value of the fuel consumed. But only a part of this energy is transferred into useful work. From heat balance sheet of a typical CI engine I find out that the total heat loss is around 33-45%, of which 33% is due to exhaust gases and the rest is lost to the surroundings. If we can reduce this figure by 10% also then it will be a substantial contribution. So as according to the aim I used the heat exchanger at the exhaust of twin cylinder diesel engine and a low boiling fluid ie. Diethyl ether which used the heat from the exhaust pipe of the engine and vaporize the low boiling fluid which is further used to rotate the turbine which is basically other working unit attached to the engine. The heat used by the heat exchanger is used to vaporize the working fluid and this working fluid is used to rotate the small blade just like turbine ,this blade coupled with another side with compressor .This compressor compress the fresh atmospheric air and supplied to the inlet of the engine .This compressed air increased the power efficiency of the engine by using waste energy. There is reduction in the loss of exhaust heat. The performance parameters pertaining to the heat exchanger and such as amount of heat recovered, heat lost, and increased efficiency are evaluated.

Keywords: Exhaust gas, Energy, Diethyl ether, heat exchanger, IC engine,