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CFD ANALYSIS OF RADIATOR

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ABSTRACT: Radiators are miniature version of heat exchangers used for cooling internal combustion engines and other engines like stationary generating plant, railway locomotives, piston engine aircrafts, motorcycles etc. It transfers the heat from the fluid inside to the air outside, thereby cooling the fluid, which in turn cools the engine. Many researches are carried out in order to improve its performance and for having high degree of surface compactness. These heat exchangers have fins, and tubes called compact heat exchangers. In this project we have designed a radiator model with fins. We modified it by changing the tube in tubes. For this purpose a 3D model of radiator was designed using CATIA. After modeling of the geometry the computational analysis tool ANSYS was used to perform a CFD analysis on radiator. The results were verified for Heat transfer rate and Pressure drop, Outlet air temperature, Heat carried by air, Velocity. After the analysis we found that circular tube radiator was the best design on the basis of its heat transfer rate

Keywords: Radiator, Temperature, CFD

1. INTRODUCTION

In today's world, leading automotive companies are manufacturing more powerful and efficient engines. As the engines become more powerful, the energy created by the engine is increases and so does the heat load of the engine. Together with the increase in the heat load, the required cooling capacity of a radiator also increases. Engine manufacturers specify the required cooling capacity according to their engine design parameters. For this reason, in general cooling capacity is a known input quantity. In addition to this, automotive companies also specify the fundamental size limitations of the required cooling system. An appropriate cooling system which fulfills the engine cooling capacity needs to be designed according to