



**A STUDY INTO WATER PUMP PERFORMANCE IN CAR COOLING  
SYSTEM**

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## **ABSTRACT**

This project is to study of a cooling water pump in a car cooling system. A water pump is the heart of a car cooling system. It provides circulation of the engine coolant (antifreeze) through the cooling system. This projects looks into various aspects of the design of a water pump. The first part was to reverse engineer the product in order to understand the basic design, functions and produce a 3-D model of the cooling water pump. The data obtained were used to investigate the performance of the pump. Analysis of the performance was done using different software such as CATIA, STAR Design and STAR CCM. In this project, CATIA software was used to design the 3-D model of the actual pump and later imported to STAR Design for flow analysis. The STAR Design was used to define the boundary condition and meshing. Finally the STAR CCM was used to run the analysis. In the analysis, different values of inlet mass flow rate with a constant value of pump rotation were used. The other parameter has been change was the pump impeller, by used different number of impeller blades in different simulation. By so doing, the effect of varying the inlet velocity, inlet pressure, mass flow rate, outlet velocity and outlet pressure could be observed and studied. The performance of pump could be identified by using these parameters, which were obtained when the simulation completes.

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