

DESIGN AND DEVELOPMENT OF SUCKING FAN TO REDUCE THE TEMPERATURE INSIDE THE CAR

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APPROVAL AND DECLARATION SHEET

This project report titled Design and Development of Sucking Fan to Reduce the Temperature Inside the Car was prepared and submitted by Azwandi Bin Suib (Matrix Number: 071050096) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Manufacturing Engineering) in Universiti Malaysia Perlis (UniMAP).

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ABSTRAK

“Sucking Fan” ialah projek dimana ia direka untuk menyelesaikan masalah haba panas di dalam kereta. Objektif projek ini ialah mereka bentuk “Sucking Fan” untuk mengurangkan haba didalam kereta melalui program CAD CATIA atau Solidwork dan disamping menghasilkannya. Selain itu juga objektifnya ialah untuk belajar dan analisa haba didalam kereta menggunakan Teori Pemindahan haba. Selain itu untuk menghasilkan sistem reka bentuk “Sucking Fan”. Dengan menggunakannya, haba panas di dalam kereta dapat dikurangkan secara automatik. “Sucking Fan” berfungsi untuk menyedut keluar udara panas di dalam kereta apabila pengesan haba mengesan suhu yang tinggi di dalam kereta. Apabila suhu sampai ditahap yang telah dilaraskan, litar kawalan akan berfungsi dan “Sucking Fan” akan berfungsi untuk mengeluarkan udara panas keluar dari dalam kereta melalui paip yang terletak di bawah bahagian belakang kereta. Berdasarkan pemilihan yang telah dilakukan, antara keputusan yang telah dapat ialah bentuk kipas dan kotak badan “Sucking Fan” yang sesuai. Bentuk kipas yang dipilih ialah konsep C dimana kipas tersebut mempunyai 6 bilah kipas yang lebih membengkok dan menjadikan ianya lebih menyedut haba. Bagi kotak badan kipas yang dipilih kerana bentuknya yang lebih ergonomik dan lebih menarik daripada yang lain. Eksperimen untuk menguji “Sucking Fan” dilakukan selama 3 hari dengan menggunakan 2 buah kereta, kereta tersebut dijadikan sebagai tetap untuk mendapatkan suhu didalamnya. Eksperimen hari pertama untuk mendapatkan data haba didalam kereta tanpa kipas di kedua-dua kereta, eksperimen hari kedua untuk mendapatkan perbezaan data haba didalam kereta tanpa kipas dengan satu kipas dan eksperimen hari ketiga untuk mendapatkan perbezaan data haba didalam kereta tanpa kipas dengan dua kipas. Keputusan yang diperolehi hasil daripada eksperimen ialah penggunaan “Sucking Fan” memang dapat mengurangkan haba didalam kereta, dimana eksperimen hari ketiga dengan menggunakan 2 kipas yg beroperasi lebih menunjukkan pengurangan haba yang banyak didalam kereta berbanding dengan eksperimen 1 kipas. Purata perbezaan haba didalam kereta diantara tanpa kipas dengan 1 kipas ialah 2.05°C dan purata perbezaan haba didalam kereta diantara tanpa kipas dengan 2 kipas ialah 4.2°C . Dengan ini terbukti penggunaan “Sucking Fan” dapat mengurangkan haba didalam kereta.

ABSTRACT

Sucking Fan is a project that is made for solving heat problems in a vehicle. Objective of this project is to design and development Sucking Fan to reduce the temperature inside the car with CAD software, CATIA or Solidwork. Another objective is to study and analysis the temperature inside the car by using Heat Transfer Theory. Besides that to fabricate the prototype system of Sucking Fan. By using this device, heat in the vehicle can be reducing automatically. Sucking fan is function to inhale the warm air in the car when heat sensor detected the high temperature. When the temperature reaches the setting point, the control circuit will activate and the cooling fan will operate to remove the warm air out of the car through a hose that is located below the bonnet of a car. Based on selection have to be done, the good obtained result for design of fan and box body. The design selection for fan is design concept C, the fan have 6 of blades more curve and make it to more sucking heat. For box body of Sucking Fan has been selected because look more ergonomic to located in car cabin. Experiment for testing Sucking Fan to do in 3 days with 2 cars, the cars as a constant to get the heat in car cabin. For the first experiment is to get the heat data inside car without fan for the both car. The second experiment is to get the differences heat data inside car without fan and with 1 fan, for the third experiment is to get the differences heat data inside car without fan and with 2 fans. The result have to be get from the experiment is Sucking Fan can get reduce heat inside car cabin, where in third experiment with use 2 fan operate is more reduce heat inside car compared with 1 fan experiment. The average of differences temperature in car cabin between without Sucking Fan and with one Sucking Fan is 2.05°C . The average of differences temperature in car cabin between without Sucking Fan and with two Sucking Fans is 4.2°C . This average is proving the Sucking Fan function to reduce temperature in car cabin.

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