Análisis numérico del comportamiento térmico de un freno de disco automotriz tipo naca [

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text (article)

Analítica

Introduction: The braking system of a car must work safely and predictably in any circumstance, which implies having a stable level of friction, in any condition of temperature, humidity, and salinity of the environment. For the correct design and operation of the brake discs, it is necessary to consider different aspects, such as geometry, type of material, mechanical resistance, maximum temperature, thermal deformation, resistance to cracking, among others. Objective: The objective of this study was to analyze the behavior of temperature and velocity of heat flow in the disc brake ventilation duct with ventilation pillars type NACA 66-29 using computational fluid dynamics (CFD). Methodology: This is the design software SolidWorks simulations for analyzing the behavior of the fluid (air) in terms of speed and heat dissipation capacity. Results: The numerical results for the heat flow through the ventilation channels are compared with the results mathematically. The numerical results that the discs performed well under severe operating conditions (80 km/h and an ambient temperature of 12C). It is very important in the design of the brake disc to select the appropriate geometry, particularly the number and cross section of the ducts, and the type of material. Conclusions: The numerical methods offer advantages to select the geometry and the material and the flow mode of the fluid to optimize the heat dissipation to provide the maximum performance for the maintained components
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