COMPUTATIONAL FLUID DYNAMICS (CFD) STUDY ON THE EFFECTS OF 2008 AND 2009 WING REGULATION BY FIA ON FORMULA 1 CAR FOR TANDEM CONDITIONS

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ABSTRACT

Formula 1 or commonly known as Fl is the highest class of automotive racing organized by the Federation Internationale de l'Automobile (FIA). The word 'formula' refers to a set of rules to which all competitors must comply including the wing regulation. 2009 wing regulation is a part of the aerodynamic change designed to allow cars to be able to follow each other more closely and hence promote easy overtaking. The 2009 front wing is lower and wider while for the rear wing it is narrower and higher when compared to 2008 regulation. These regulations will be analyzed by using a Computational Fluid Dynamic (CFD) software to understand how Fl cars follow each other closely in tandem for the 2008 and 2009 regulation respectively. The analysis will be done by modeling a 3-Dimensional Fl car without front and rear wing using CATIA V5R17 program and then it will be installed with the wings according to 2008 and 2009 regulation. It will then be analyzed in CFD software to meet the objective of finding the drag coefficient (Co) and lift coefficient (CL). First a single 2008 Fl car is simulated and then two 2008 Fl cars are placed in tandem (leading and following) with a spacing of 1.5L (L is car length), 1.0L, 0.5L and 0.25L respectively. Same steps was repeated for 2009 Fl car and the result will focus on the following car by comparing it with the result obtained from the single car in order to determine whether 2009 Fl car increase the overtaking chances by giving the most reduction percentage in terms of drag coefficient comparing with 2008 Fl car.

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