Scientific Books of Abstracts
Vol. 2, pp 71-71

Online: 2023-11-21

A Review of Aerodynamic Analysis of Commercial Automotive-Materials and Methods

Barhm Mohamad[1,a*], Mohammed Qasim Ali[2,b], Shantanu Dutta[3,c], Falah Zarda[4,d]

[1]Department of Petroleum Technology, Koya Technical Institute, Erbil Polytechnic University, 44001 Erbil, Iraq

[2]Vocational Education Department, Ministry of Education, 51001 Babel, Iraq

[3]Elitte College of Engineering (MAKA University of Technology Kolkata) KARNAMADHAVPUR, GHOLA, SODEPUR, Kolkata, West Bengal 700113, India

[4]Department of Medical Device Technologies Engineering, Al Qalam University College, 36001 Kirkuk, Iraq

[a*]barhm.mohamad@epu.edu.iq, [b]mmm18926@gmail.com, [c]shantanudut@gmail.com, [d]falahzardaoa@alqalam.edu.iq

Keywords: Drag Force, Lift Force, Computational Fluid Dynamics (CFD), Wind Tunnel, Vortex, Wake

Abstract. This paper explores the role of the computational fluid dynamics (CFD) modeling technique in the aerodynamic design and propulsion system of the formula 1 car. It provides a study of Reynolds number influences on the state of the boundary layer, unstable and steady flow, time-dependent wake structure, interacting shear layer and separate flows through literature review. As pointed out in is paper, the aerodynamics analysis is conducted to decrease the drag force. Using the computational fluid dynamics (CFD) tools, the analysis was carried out. The major objective of this review article will be to increase the car stability and reduce drag. The efficiency of the track would also increase the air resistance of the vehicle. The ideas of dimensional analysis and uniformity of flows are used to demonstrate that commercial ground cars' aerodynamics are only dependent on the transitional and trans-critical flow regimes.

References

[1] B. A. Mohamad, M. Q. Ali, K. Galoyan, Analisi aerodinamica di un treno ad alta velocità utilizzando la tecnica fluidodinamica computazionale, Ingegneria Ferroviaria, Settembre 2023, DOI: 10.57597/IF.09.2023.ART.1.

[2] H. T. Diep, G. B. Nguyen, B. Mohamad, Remapping and simulation of EFI system for SI engine using piggyback ECU, Acta Polytechnica 63(2), p. 89-102, 2023. DOI: 10.14311/AP.2023.63.0089.

[3] B. Mohamad, A. Zelentsov, METHODE HYBRIDE POUR LA CONCEPTION ET L'OPTIMISATION D'UN ECHAPPEMENT SILENCIEUX DE VOITURES DE COURSE FORMULA, Acoustique Canadienne, 50(4), Consulté à l'adresse https://jcaa.caa-aca.ca/index.php/jcaa/article/view/3469, 2023.

[4] A. Berkache, S. Amroune, A. Golbaf, B. Mohamad, Experimental and numerical investigations of a turbulent boundary layer under variable temperature gradients, Journal of the Serbian Society for Computational Mechanics, 16(1), pp. 1-15, 2022, DOI: 10.24874/jsscm.2022.16.01.01.

[5] Б Мохамед, Я Кароли, АА Зеленцов, Трехмерное моделирование течения газа во впускной системе автомобиля «Формулы Студент» Журнал Сибирского федерального университета, 13(5), pp. 597-610, 2020. DOI: 10.17516/1999-494X-0249.