

## Numerical Investigation of Aerodynamic Analysis on Passenger Vehicle

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**Abstract :** In this study, it was numerically investigated that a 1:1 scale model of the Renault Clio MK4 SW brand vehicle aerodynamic analysis was performed in the commercial computational fluid dynamics (CFD) package program of ANSYS CFX 2021 R1 under steady, subsonic, and 3-D conditions. The model of vehicle used for the analysis was made independent of the number of mesh elements, and the k-epsilon turbulence model was applied during the analysis. Results were interpreted as streamlines, pressure gradient, and turbulent kinetic energy contours around the vehicle at 50 km/h and 100 km/h speeds. In addition, the validity of the analysis was decided by comparing the drag coefficient of the vehicle with the values in the literature. As a result, the pressure gradient contours of the taillight of the Renault Clio MK4 SW vehicle were examined, and the behavior of the total force at speeds of 50 km/h and 100 km/h was interpreted.

**Keywords :** CFD, k-epsilon, aerodynamics, drag coefficient, taillight

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