



Published on *CD-adapco* (<http://www.cd-adapco.com>)

[Home](#) > Further Analysis of Pickup Trucks Aerodynamics

Further Analysis of Pickup Trucks Aerodynamics

SAE International

Date:

Monday, April 20, 2009

DOI:

<http://dx.doi.org/10.4271/2009-01-1161>

Aerodynamics plays an important role in marketing vehicles especially with the recent increases in gas prices. The aerodynamics of one of the widely used vehicle classes (pickup trucks) is examined. The focus is to investigate the effect of the pickup truck configuration on the structure of the airflow around the vehicle and ultimately on the generated aerodynamic drag. The study includes CFD simulations performed using STAR-CCM+ developed by CD-adapco Inc. and full-scale wind tunnel testing conducted in the Langley Full Scale Tunnel (LFST) located at the NASA Langley Research Center but operated by Old Dominion University. The studied pickup truck configurations include a simplified model (no sidewalls or tailgate) and tailgate-off, tailgate-down, and tailgate-up. In all the CFD simulations a generic geometry of an extended cab pickup truck is used. The results indicate that there is a large separation region downstream of the cab and that it controls the aerodynamic drag. The size and the strength of the circulating internal flow of this separation region are sensitive to the pickup configuration. Aerodynamic drag increases with increasing the vehicle speed and yaw angle. Sensitivity to yaw angle is limited to a certain maximum angle and depends on the pickup truck configuration.

Rights:

2009 SAE

Author Name:

W. A. Mokhtar

C. Britcher

R. Camp

Industries:

Products:

CD-adapco is the world's largest independent CFD focused provider of engineering simulation software, support and services. We have over 30 years of experience in delivering industrial strength engineering simulation.

Source URL: <http://www.cd-adapco.com/journal/further-analysis-pickup-trucks-aerodynamics>