

# **Velocity Field Measurements in a Pickup Truck Model**

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## SUMMARY

The results of Particle Image Velocimetry (PIV) measurements of the flow over a pickup truck are presented. The main objectives of the study are to gain a better understanding of the flow structure in near wake region, and to obtain a detailed quantitative data set for validation of numerical simulations of this flow. Experiments were conducted at moderate Reynolds numbers ( $\sim 3 \times 10^5$ ) in the open return tunnel at the University of Michigan. The velocity field in six planes has been measured, and a sufficient large number of realizations were obtained to determine mean and turbulent properties in the near wake. The velocity field measurements in the symmetry plane show that shear layers form at the top of the cab and the underbody flow region. The cab shear layer evolves more slowly than the underbody flow shear layer and does not interact strongly with the tailgate for the present geometry. Behind the tailgate there is no recirculating flow region in the symmetry plane due to strong downwash from streamwise vortices. There are small recirculating regions on the sides of the tailgate extending one tailgate height downstream. These PIV data complement earlier steady and unsteady surface pressure measurements reported in reference 1.