Improvement on Aerodynamic Characteristics and Drag Reduction for Supermileage Cars with Wide View Field

Pey-Shey Wu, Min-Jho Young, Jun-Yun Wu, Chia-Chian Wang, CHANG, CHIH-FEI
E-mail: youngmj@mail.dyu.edu.tw

ABSTRACT
Aerodynamic characteristics of three supermileage car chassis with new design concept for improving driver's view field and driving comfort is investigated and compared with that of one with traditional low-height design. New car shapes with shorter axle distance and higher center of gravity are created. Feasibility of the new design is verified from the aspects of rollover safety, due to the maximum crosswind speed of 40 km/h, and the drag coefficient at straight driving up to 40 km/h. The analytical verification is conducted with commercial CFD software. Comparing to traditional design, the analysis shows that it is possible to obtain lower drag coefficient and lower total drag, while rollover safety is still guaranteed, for a supermileage car with wider view field and taller appearance. Reduction of the form drag is intimately related to the decrease of velocity curl in the flow direction and the size of the vortices in the wake. Results of this study can provide new concepts that are different from those used in the past for the development of supermileage cars.

Keywords: supermileage car, aerodynamic, rollover safety, drag, vortices.

REFERENCES