

Numerical Study of Effects of Air Dam on the Flow Field and Pressure Distribution of a Passenger Car

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Abstract : Everything that is attached to the outside of the vehicle to improve the driving performance of the vehicle by changing the flow characteristics of the surrounding air or to pursue the external personality is called a tuning part. Typical tuning components include front or rear air dam, also known as spoilers, splitter, and side air dam. Particularly, the front air dam prevents the airflow flowing into the lower portion of the vehicle and increases the amount of air flow to the side and front of the vehicle body, thereby reducing lift force generation that lifts the vehicle body, and thus, improving the steering and driving performance of the vehicle. The purpose of this study was to investigate the role of anterior air dam in the flow around a sedan passenger car using computational fluid dynamics. The effects of flow velocity, trajectory of fluid particles on static pressure distribution and pressure distribution on body surface were investigated by varying flow velocity and size of air dam. As a result, it has been confirmed that the front air dam improves the flow characteristics, thereby reducing the generation of lift force of the vehicle, so it helps in steering and driving characteristics.

Keywords : numerical study, air dam, flow field, pressure distribution

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