The Investigation of Vehicle Dynamic Behaviour During Braking at Different Speed

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Abstract.
Globally, vehicle accident is one of major causes of injuries and death. To minimise the number of accident, safety features were introduced to the vehicle. The safety features of the vehicle can be divided into two categories; passive safety such as seat belt and active safety like anti-lock brake system (ABS). In this study, the effect of ABS during panic braking is analysed to determine the vehicle dynamic behaviour. The vehicle modelling is developed in the Matlab-Simulink, and the numerical analysis was done in the three initial speeds, low, medium and high speed. The braking force for panic braking is set to 400N, and the effect of ABS to the vehicle dynamic behaviour is observed. From the simulation results, without ABS, the front tires were lock-up and the vehicle become skidding. However, when ABS is applied, the front and rear tires were not lock-up, and the vehicle is stable. This result shows that ABS can prevent the tire to lock-up and improve the safety of the vehicle.

Keywords: *anti-lock braking system (ABS), hydraulic braking system, skid, vehicle dynamic behaviour, vehicle safety*