

Study of Vehicle Crash Pulses

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ABSTRACT

The vehicle crash pulse is an important measured data which can represent a time history response of a vehicle during an impact test. To investigate the crash pulse not only can realize the dynamic response and energy change of the impact process, but also able to assess the severity of occupant injury during a crash. The frontal and side vehicle crash pulse was investigated in this study. The characteristics of the measured crash pulse of vehicle impact test can be analyzed to discuss the effect of the crash pulse shape on the occupant injury. The shape, amplitude and duration characteristics of pulse were discussed herein. Furthermore, a better pulse shape to effectively reduce occupant injury was proposed. The pulse shape discussed above has been applied to the vehicle structural design for crashworthiness, including the frontal bumper, engine mounting frame and side door beam. The assessment of structural efficiency and safety was discussed based on the crash pulse. The pulse shape obtained in this study could help evaluate vehicle crash safety and guide the future development of safety technologies.

Keywords : Crash Pulse, Crashworthy Structure, Impact Test, Injury Analysis, LS-DYNA

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