A Study of Go-kart Frame Structure Considering Torsional Stiffness and Collision Strength

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ABSTRACT

Go-kart (also called KARTING) has become a recognized and important part of the automobile racing hierarchy. It is one kind of Formula for designing racing car in the world. Designing every single component or system of the frame must have racing functions. The frame of Go-kart influences road dynamic behavior for competition. To satisfy the philosophy of simplicity, competition Go-kart regulations require the absence of suspension systems and differential gear. Thus elastic frame characteristics are highlighted by the absence of suspension elements and the global dynamic behavior is influenced by chassis shape and stiffness and by tires characteristics. Hence frame stiffness must be carefully evaluated in order to compensate the absence of differential gear by producing loads transfer during a turn. The accidental statistics compiled by 10 state regulatory agencies of America that the majority of reported. It could show that the number of accident reports of Go-kart hit stationary object that 24% of all accidents, the number of accident reports of Go-kart ride collided that 64% of all accidents, two rates that 88% of all accidents. Therefore the design of Go-kart frame is very important subject for collision safety. Therefore, this study investigated both handling and collision of Go-kart frame using LS-DYNA3D software. By added pole or change width of the frame to improve handling and collision's safety. And according to Solazzi frame as a referent prototype model. The design and setup of fourteen various Go-kart frame according to ratification by international authority (CIK/FIA). The discussion that the whole torsional stiffness of Go-kart frame, the front, the lift, the right bumper amount of shrinking, the maximum compression of frame during different direction, the maximum energy absorption of each bumper and frame during different direction, etc. These results may provide a useful reference for designing Go-kart frame.

Keywords: Go-kart frame, torsional stiffness, collision strength, LS-DYNA3D

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