

The Study on Steer Handling Dynamic Simulation for Go-Kart

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ABSTRACT

The dynamic behavior of Go-Kart was studied. The numerical models of a whole Go-Kart, a track, and a dummy were constructed. In order to correspond to real situation of weigh distribution, the weight of every component was measured, in the dynamic simulation software ADAMS, the precise mass of each component was assigned, then the dynamic behavior during driving was investigated. The structure of competition Go-Kart must satisfy the philosophy of simplicity, so it is regulated that the differential gear and suspension system cannot be equipped. Therefore, the defects of these two equipments missing were compensated by the special design of chassis and steering system. In the finite element software MSC.FEA, the chassis was defined as a flexible body. Thus, in the dynamic simulation software ADAMS, the deformation, stress, and strain could be calculated. Also, several different motion conditions were set to compare the difference between the flexible chassis and rigid chassis. As for the steering system of Go-Kart, the relationship between the steering angle of steering wheel and right and left stub axle angles was investigated, and the effect of right and left stub axle angles on the dynamic behavior of Go-Kart was discussed. At last, we take several cases with different handling situation to discuss with Go-Kart dynamic behavior during driving. We adopt the non-linear tire of PAC89 form to make the simulation result closer to the true sport situation finally.

Keywords : Go-Kart ; flexible body ; right and left stub axle ; tire

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