

THE DETERMINATION OF KINEMATICAL PARAMETERS OF THE AUTOMOBILE – OCCUPANT SYSTEM BY USING A DYNAMIC MODEL BASED ON D’ALEMBERT PRINCIPLE

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Abstract

The paperwork presents a dynamic model of the automobile – occupant system, with the help of this it is possible to determine the kinematical parameters of this system at the frontal impact of the automobile with a rigid barrier. The model is a complex one, which takes into consideration a series of the automobile’s characteristics (the mass, the stiffness of the frontal structure, the stiffness of the safety belts, the seat position setting, the friction coefficient of the seat, etc.), a series of the occupant’s characteristics (anthropometric data, the stiffness of the hip and neck joints, etc.), as well as some conditions of running the event (the initial impact velocity, the position of the occupant on the seat, etc.).

Keywords

Impact, dynamic model, kinematical parameters, *D’Alembert Principle*, numerical solving