Evaluation of the Parameters Affecting Passenger Riding Comfort of a Rail Vehicle

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The effort to increase the rail vehicle ride speed on existing tracks, or more precisely on modernized tracks with a lot of curves with a relatively smaller radius, lead to use of tilting mechanism of the vehicle body. The paper deals with simulation analysis of a rail vehicle with an active tilting system of the vehicle body, design of the rail vehicle in CAD program CATIA and dynamical analysis in program SIMPACK, with the RAIL expansion. Such body mounting on vehicle bogies is significantly more complicated than the design of conventional rail vehicles. The purpose of this type of body mounting is to increase the size of body tilt during ride in a curve and thus reduce the lateral unbalanced acceleration affecting the passengers, or allow higher driving speed in a curve with the same radius while keeping the lateral acceleration value respectively. Eight variants of different velocity, vehicle occupancy and setting of the tilting mechanism were analyzed. We determined the average value of passenger comfort N_{MV} from the simulation results. We have determined the value of passenger comfort during the ride in a curve P_{CT} from the simulation results.

Keywords: Passenger comfort, Dynamical model, Tilting mechanism, SIMPACK

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