Impact of Wheelset Steering and Wheel Profile Geometry to the Vehicle Behavior when Passing Curved Track

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Ride of vehicles along curved track is a serious technical problem, which for the long term requires attention of vehicle engineers as well as track designers. It is especially interesting to observe behavior of tram cars passing a curved track, because they should be able to pass arcs up to 17 meter radius. Ride of a vehicle along such strongly curved track is nowadays accompanied by significant wear in rail-wheel contact, increased bogie and track stress and by generation of noise. One of the key causes of this unfavorable phenomenon is an increase of slip velocities in rail-wheel contact. This paper is based on simulation analysis, which compares different ways of minimizing slip velocities and thus mitigating the impacts of passing vehicles on the track as well as on the car itself. Bogies with and without wheelset steer possibility were analyzed. Both bogies were also analyzed with wheel profiles of different delta R function course.

Keywords: wheelset steering mechanism, passing of vehicle trough transition curves, simulation analysis, creep velocities in wheel - rail contact.

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