SM26L_11795

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Experimental and Theoretical Aanalysis of Freight Wagon Link Suspension

Per-Anders Joensson, Sebastian Stichel

Division of Railway Technology, Royal Institute of Technology, Stockholm, Sweden

In an ongoing project at KTH the running behaviour of freight wagons is studied. The background to the project includes plans to increase axle load, loading gauge and speed of freight trains in Sweden to make freight traffic more competitive. Prediction of running behaviour for wagons with link suspension is found to bee very difficult. One cause for that is the strongly non-linear characteristic of the link suspension and the fact that the vehicle behaviour is very sensitive to the horizontal suspension characteristics. Another reason is that the characteristics vary with maintenance status of the link suspension and climate conditions. The present paper covers laboratory measurements and mathematical modelling of a pendulum link. First the laboratory measurement rig is described. Then the influence of normal load, amplitude and frequency of excitation are discussed. Finally a model based on contact mechanics is proposed to describe the observed behaviour.

View the extended summary