

Utilization of Multibody Simulations at the Trolleybus Development

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ŠKODA VÝZKUM s.r.o. (now Výzkumný a zkušební ústav Plzeň s.r.o.) cooperated on the development of the NEOPLAN DMA low-floor articulated trolleybus intended for the Boston city (the United States). Multibody models and finite element models of the trolleybus were utilized in the stage of the vehicle design. The multibody models of the trolleybus were created in the Alaska simulation tool and the simulations (running over a large road unevenness, start, braking and driving through a bend) were aimed at determining forces acting in the trolleybus suspension elements and radius rods. Time histories of the forces calculated using multibody models were used as the input data of the trolleybus finite element models. Utilizing the finite element models the critical places of the trolleybus body structure from the point of view of high stresses were determined. At the measurement with the real trolleybus prototype these places were provided with strain gauges.

Keywords: trolleybus, multibody model, dynamics, constructional design

Acknowledgement

The paper has originated in the framework of institutional support for the long-time conception development of the research institution provided by Ministry of Industry and Trade of the Czech Republic.

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