

## Dynamics of Linear Hydraulic Cylinder with Mass Load

Adam Bureček, Lumír Hružík, Martin Vašina

Faculty of Mechanical Engineering, VSB-Technical University of Ostrava. 17. listopadu 15/2172, 708 33 Ostrava-Poruba. Czech Republic. E-mail: adam.burecek@vsb.cz, lumir.hruzik@vsb.cz, martin.vasina@vsb.cz

The paper deals with examination of dynamics of linear hydraulic cylinder with mass load. The hydraulic cylinder is placed in vertical position. There is experimentally simulated a system state. In this case a higher piston velocity is achieved due to the mass load compared to the piston velocity that corresponds to a supplied flow. A piston oscillation of the hydraulic cylinder is caused by rapid stop of movement in a desired position. There are experimentally evaluated eigenfrequencies of the linear hydraulic cylinder depending on the piston position and the mass load. Mineral oil was used as the working liquid. Time dependencies of pressures are measured on sides of the piston and the piston rod. Furthermore there are measured time dependencies of the piston position and the oil temperature. A mathematical model is created for this hydraulic system. This model is realized by Matlab SimHydraulics software. There are simulated time dependencies of the piston position and the pressure on the side of the piston rod. The mathematically simulated time dependencies of the pressure and the piston position are compared with the experiment.

**Keywords:** Eigenfrequency, Hydraulic Cylinder, Simulation, Measurement, Piston Position.

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