

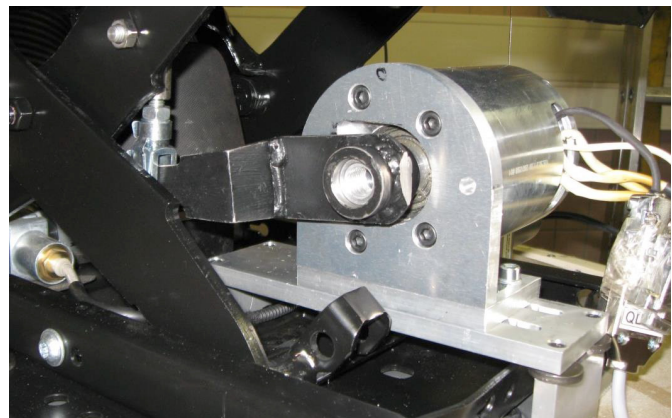
› Active damped driver seat

The Institute of System Reliability and Machine Acoustics SzM of the Technical University of Darmstadt developed an actively damped driver seat for agricultural machines in cooperation with the project partner Ovalo in the course of the „Central Innovation Program for SMEs“ (ZIM). The active damping minimizes the physical stress by uneven ground and thus increases the driver's performance. For the development a standard driver seat has been equipped with an electromechanical actuator, which operates as an active damper.

The actively damped seat consists of the commercial shear kinematics with spring, which is adjusted to the driver's weight. For the test set-up the driver's weight can be produced by appropriate equivalent masses. An electric motor operates via a rigid joint connection as an active damper and is controlled by the integrated power stages of the PUMA-MPI. The commutation sensor of the electric motor, two acceleration sensors and a draw-wire sensor are read and evaluated by corresponding standard inputs of PUMA, so that no additional hardware components are required.



Test set-up of the active driver seat on the shaker



Actuator with bracket and joint connection to the driver seat

On test bench highly dynamic excitations can be generated by a shaker. Thereby the seating position is detected by the draw-wire sensor. A control algorithm based on the so-called skyhook principle allows optimum damping of the driver seat at each excitation. In this, both the damper control and the underlying motor control are executed on the PUMA-MPI ECU. Because of the easy connection and evaluation of the sensors and the control of the electric motor with PUMA-MPI, it was possible to put the focus on the development of the active damper control and thus achieved an optimal result in a short time..