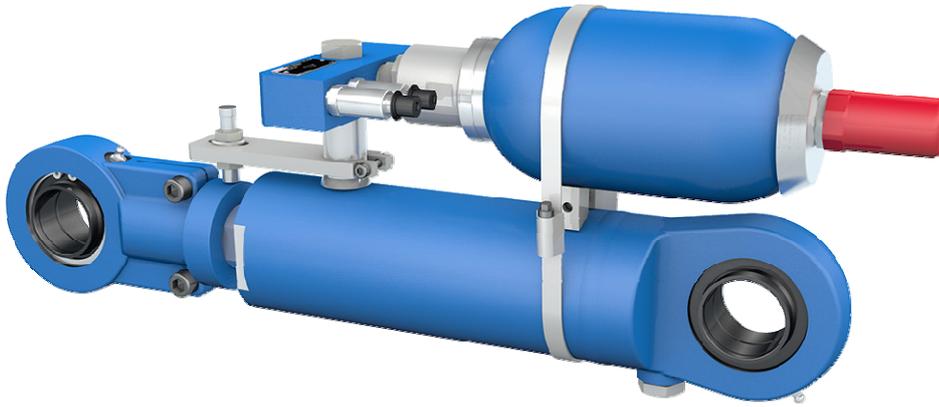


## Press Release

### High-performance winches in the upper machinery: Mechanical load often underestimated

Mobile measuring device shows actual force developments in case of emergency stop – retrofitting often necessary and possible

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Load Limiter: Autonomic, hydraulic unit reduces abrupt loads to values below the standard specification.

**Current measurements at installed upper machinery drives prove that in case of a category 0 emergency stops, the load on the mechanics is much higher than previously assumed. In reality, the design criterion of twice the rated load prescribed by DIN 56950-1:2012-05 is often critically exceeded by the simple accident load. This may result in considerable risks for human beings working under the hovering loads. Using a new mobile measuring device, stage operators are now able to measure the actual loads and to economically retrofit the high-performance winches that are affected.**

Rexroth has systematically measured the real force developments which act on the structures in case of a hard emergency stop in extensive tests on test stands and in two theaters. In case of a category zero emergency stop, the real values exceed two times the rated load by up to 75 percent. The usual design limit of two times the rated load for installed winches was already exceeded from half the rated velocity; and the exceedance was so clear that for safety reasons, the engineers refrained from completing tests at full velocity. Not visible from the outside, the high loads may cause structural changes in the construction and finally a load crash due to an abrupt brittle fracture.

#### **Mobile measuring device reveals need for action**

The measurements were completed using Rexroth's newly developed, mobile measuring device Stage Guard. The heart of this device is a highly sensitive

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acceleration sensor providing for wireless transmission of the test values. Based on these values, validated software calculates the influencing factors force, velocity, path and impact. If the measurements show that the real loads are clearly larger than the calculated and documented ones, stage operators are obliged to react. They must either extensively adjust the mechanical design to the actual loads, retrofit the winches or reduce the admissible velocities and loads according to the measurement results.

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In this connection, Rexroth offers two possibilities: The autonomic, hydraulic Load Limiter damping unit ensures that in case of emergency stop, two times the rated load and the maximum acceleration of 2g will not be exceeded at any time. With hydraulically driven winches, operators can replace the usually used passive logic circuits by new valves with active logics. In this connection, adjustable braking ramps provide for considerably softer deceleration. They prevent abrupt loads in case of emergency stop and thus protect the mechanics.

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