

MACHINE DYNAMICS

“Swopper XT” comfortably speeded up

Bigger trucking companies usually use swap bodies for the relocation of containers. For a quick relocation of containers, special vehicles are necessary with a small turning circle and good acceleration values. For this purpose, FIEGE tec developed the “Swopper XT” – based on the previous model.

As driving dynamic and driving comfort along curves and around obstacles of this first prototype turned out as not perfected, KÖTTER Consulting Engineers was asked to carry out a further analysis. Therefore, vibration sensors were applied at the axes, the frame as well as at the cabin and seat of the vehicle. During different courses, obstacle driving and manoeuvres the vehicle was measured with different speeds.

The results showed that sudden direction changes led to extremely heavy shocks in the articulated Swopper. This effect was caused by increased pressure surges of up to 80 bar in the guidance system. As reduction measures a hydro-membrane accumulator (bladder accumulator) was designed for the hydraulic system and installed. Pressure surges and shocks could be effectively reduced (figure 3).

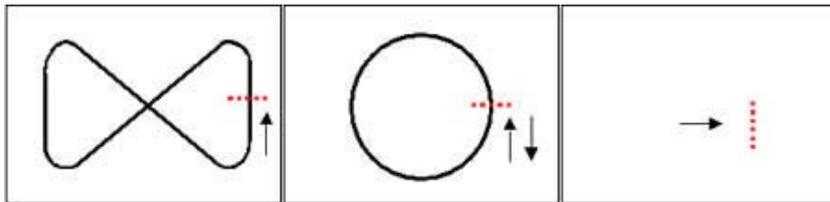
Furthermore, the shocks during the obstacle driving were strongly transferred into the cabin. To avoid this effect, wheels were adjusted, the mechanical cab mounting in the front was replaced by an elastomer swivel joint and the air spring suspension in the back was modified. A comparing measurement of the cab and vehicle acceleration during obstacle driving with a competitor's vehicle showed that the modified Swopper cushioned the shocks much better.

The final inspection was carried out by the CEO who was delighted after a test drive, saying “no comparison to what it was before”. He planned the vehicle for further use in the practice.

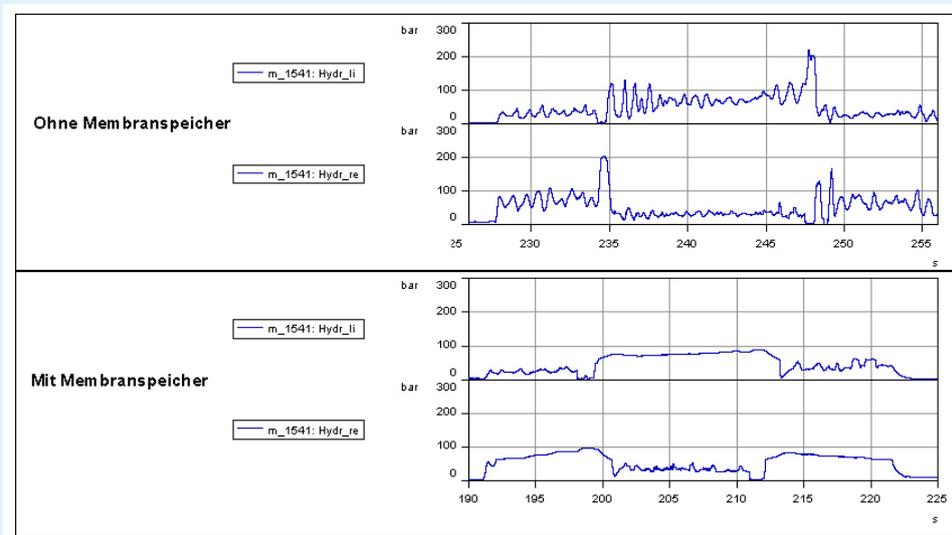


Load carrier Swopper XT for relocation of containers

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Course with obstacle driving



Comparison of the pressure surges in original state (above) and with installed hydraulic system (below)



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