Optimisation of Energy Absorbing Stages in Helicopters

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ABSTRACT

Subfloor and seat are here studied as an integrated set of energy absorbing stages for rotorcraft crashworthiness, especially focusing on their contribution to occupant's lumbar spine load mitigation in vertical crash conditions. The single numerical models are based on multi-body formulations and are validated against experimental tests on each component and on the full assembly.

Proper tuning of the mechanical properties of this set of energy absorbing stages seems to significantly extend the survivable crash speeds; further improvement may be even obtained with the introduction of semi-adaptive devices in the seat attenuators.