Vehicles

Dual Stage Energy Absorbing Mechanism for Vehicle Occupant Protection

In FY16, the Research, Development and Engineering Command (RDECOM), Army Research Laboratory (ARL) successfully demonstrated a dual stage energy absorbing mechanism that provided extra protection for vehicle occupants from an under-body blast (UBB). The design utilizes a novel shock absorbing floor and seat mechanism to mitigate energy and force transmission to mounted Service Members. The protection scheme was integrated into a 30 ton surrogate ground vehicle structure, and tested under elevated threat conditions (5X). Live-fire test results proved the concept highly effective at reducing injury to the lower legs and spinal column of seated occupants at a high level of blast threat. The results confirm performance predictions obtained through computational modeling and simulated blast testing, in a controlled laboratory environment. Findings can be applied to enhance vehicle protection and reduce probability of injury during UBB events.