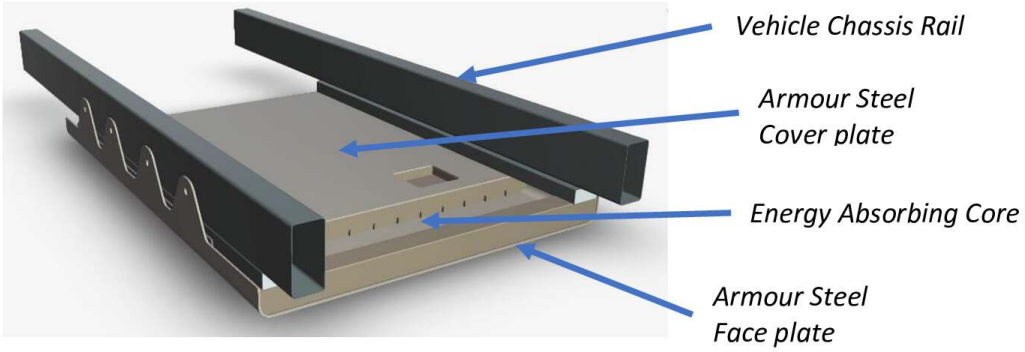
Advanced Blast & Ballistic Systems Ltd

Shockwave Mitigating, Energy Absorbing Composite Reinforced Sandwich Belly Plates for Land Vehicles

Leading Edge Technologies for Vehicle Protection from Mines and IED's



Landmines and IED's present a real and present threat to land vehicles driven both in active and legacy theatres of operation.

The Standard Solution.
The use of a "V" shaped belly plate to help deflect the blast and increase the stiffness of the design to prevent it deforming upwards and impacting the vehicle floor has become standard in armoured vehicle design. The element of increased stiffness is important in spreading the blast loads along the belly plate and minimising deformation, but the very rigid design attached directly to the main vehicle structure also ensures that shock transmission into the vehicle is maximised with potentially negative effects on the crew and vehicle equipment.

Furthermore, the V design raises the centre of mass of the vehicle leading to reduced manoeuvrability and increasing vulnerability to rollover when subjected to side blasts or when driven on sloping or unstable ground.

The ABBS Solution.
ABBS has developed a new design based on a flat sandwich structure which ensures that the whole volume of the belly plate is involved in absorbing energy, reducing peak deformation levels and enabling fitting the design to lightweight commercial vehicles with low ground clearance whilst also avoiding the negative effects of raised centre of mass on military types.

- Up to 40% lighter than a standard armoured steel belly plate for the same peak deformation level.
- Space between the belly plate and the vehicle floor can be reduced due to lower peak deformation.

The technology has been demonstrated in full scale vehicle firings in the UK:

- a Snatch Land Rover subjected to a 6kg mine.
- a Toyota Hilux™ tested with a 4kg mine fully to the Dstl/WP53308 1.0 standard, equivalent to NATO AEP-55 STANAG 4569.

Hence the technology is judged to be at TRL6.

Further Options to improve performance and provide protection against larger threats and reduce injury:

- ABBS Vehicle Global Acceleration Mitigation (VGAM™)
- ABBS Vehicle Active Floor System (VAFS™)
- ABBS Blast Seats (provided in partnership with a leading blast seat supplier)

	Panel thickness (mm)	Panel Mass (kg)	Peak intrusion (mm)	Total intrusion (mm)
18.8mm Armox 440T	18.8	385.0	233.0	252.0
210302-hilux-v001	82.3	385.0	121.0	203.3

Note: a further development of the 210302-hilux-v001 belly plate design is expected to weigh about 325kg with similar peak deformation

Advanced Blast & Ballistic Systems Limited
Unit 1, Hazelhurst Farm, Mercaston, Ashbourne, Derbyshire,
United Kingdom DE6 3BH
www.advanced-blast.com

Contact Roger M. Sloman (Managing Director)
r.sloman@abbs-usa.com
Tel. +44 7989 381057