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Initial observations relating to impact performance assessment of Point Two Equine Air Jacket (size 10A)

TRL has completed drop tests using a Hybrid III, 6 year old Anthropomorphic Test Dummy (ATD) to simulate falls from a horse. The 26kg ATD was dropped onto a rigid flat anvil at a range of drop heights to achieve approximately 40mm chest compression. The average chest compression recorded for a 25cm drop was 43.4mm.

At this impact severity and chest compression, the risk of severe chest injury of severity AIS \geq 4 would be approximately 70%. Injuries could be life threatening and include a severe heart contusions, lung bruising and multiple rib fractures¹ with a haemo-/pneumothorax.

The tests, completed in controlled laboratory conditions, could represent a typical rider fall from a horse resulting in a substantial chest impact. Tests were completed with no protective clothing, a size 10A Point Two Air Jacket and a typical Level 3 Body Protector. Additional tests were made with the AirJacket at increasing drop heights to investigate safety capacity in more severe impact situations.

Based on this study, the following statements summarise TRL's main observations.

- 1. The Point Two air jacket reduced levels of chest compression seen in a severe chest impact by more than 55% of those seen during an unprotected fall resulting in a chest impact.**
- 2. The Point Two Air Jacket reduces chest compression² to half the National Highway Traffic Safety Administration's³ recommended limit of 40mm chest compression, as used in the automotive industry as a measure of dangerous chest loading.**
- 3. In an equivalent impact, a Level 3 body protector shows only a 9% improvement on chest compression measures compared to no protective clothing.**
- 4. The Point Two air jacket almost eliminates the risk of severe and life threatening chest injury for a horse fall resulting in a severe chest impact⁴**
- 5. A rider wearing a Point Two Air Jacket could sustain a four times more severe impact than a rider with no chest protection with approximately the same predicted injury outcome.**



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¹ Younger children will generally sustain heart injuries before rib fracture due to the ability of children's ribs to sustain large compressions before fracture.

² Based on an unprotected chest impact from 25cm onto a rigid plate resulting in approximately 40mm chest compression.

³ National Highway Traffic Safety Administration (NHTSA) - <http://www.nhtsa.gov/>

⁴ Based on an unprotected chest impact from 25cm onto a rigid plate with approximately 70% risk of AIS4+ chest injury.

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