

RESPONSE OF THE HYBRID III DUMMY SUBJECTED TO FREE-FIELD BLASTS - FOCUSING ON TERTIARY BLAST INJURIES

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A 50th percentile male standing Hybrid III mannequin was used to evaluate tertiary blast injuries during the Northern Lights – II trials, hosted by DRDC Suffield in July 2005. The current study focused on the Hybrid III head and neck responses during the first three tests involving charges of 20 kg of C4. Injury criteria developed for the automotive industry, the Head Injury Criterion (HIC) and the neck shear force (Fx), were used to assess tertiary injury risk. Based on these criteria, impact with the ground represented a very high risk of life-threatening head injuries and a considerable risk of serious neck injuries. Although these high head and neck loadings were observed, overpressure measurements indicated a very low risk of primary blast (lung) injuries. Even though the Hybrid III mannequin and the injury criteria used in the current work were not validated for blast applications, this study suggests that for some cases, tertiary might be more important than primary blast injuries and thus, should always be considered in blast personal vulnerability assessment.