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Development of a flyer design to perform plate impact shock-release-shock experiments on explosives SIMON FINNEGAN, JAMES FERGUSON, JEREMY MILLETT, MICHAEL GOFF, AWE — A flyer design to generate a shock-release-shock loading history within a gas gun target was developed before being used to study the response of an HMX based explosive. The flyer consisted of two flyer plates separated by a vacuum gap. This created a rear free surface that, with correct material choice, allowed the target to release to close to ambient pressure between the initial shock and subsequent re-shock. The design was validated by impacting piezoelectric pin arrays to record the front flyer deformation. Shots were performed on PCTFE targets to record the shock states generated in an inert material prior to subjecting an HMX based explosive to the same loading. The response of the explosive to this loading history was recorded using magnetic particle velocity (PV) gauges embedded within the targets. The behavior during the run to detonation is compared with the response to sustained shocks at similar input pressures.

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