Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Shock initiation sensitivity and Hugoniot-based equation of state of Composition-B obtained using *in situ* electromagnetic gauging L. LEE GIBSON, DANA DATTELBAUM, BRIAN BARTRAM, STEPHEN SHEFFIELD, RICHARD GUSTAVSEN, Los Alamos National Laboratory, CAROLINE HANDLEY, Atomic Weapons Establishment, SHOCK AND DETONATION PHYSICS TEAM, EXPLOSIVES MODELLING TEAM — Composition-B (Comp-B) is a solid cast explosive comprised of 59.5 wt % cyclotrimethylene-trinitramine (RDX), 39.5 wt% 2,4,6-trinitrotoluene (TNT), and 1 wt% wax. Its initial density depends on formulation method and as a result, the detonation properties of Comp-B have generally been studied at densities of 1.69 g/cm^3 and 1.72 g/cm^3. The shock initiation sensitivity (Pop-plot) of Comp-B has been reported previously; obtained using both explosively-driven wedge tests and embedded manganin gauge techniques. We describe the results of a series of gas-gun-driven plate-impact initiation experiments on Comp-B (ρ_0 =1.72 g/cm^3) using embedded electromagnetic gauges to obtain *in situ* particle velocity wave profiles at 10 Lagrangian positions in each experiment. From the wave profiles, an unreacted Hugoniot locus, the run-distance-to-detonation, and initiation waveforms are obtained in each experiment. The results indicate that Comp-B at ρ_0 =1.72 g/cm^3 is more sensitive than reported previously. Comparisons are made of the new Hugoniot states with an earlier Hugoniot-based EOS. Measurements of the detonation wave profile using photonic Doppler velocimetry are also presented and discussed in the context of ZND detonation theory.

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Date submitted: 22 Feb 2013 Electronic form version 1.4