Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Shock Initiation Experiments Plus Ignition and Growth Modeling of Damaged LX-04 Charges STEVEN CHIDESTER, FRANK GARCIA, KEVIN VANDERSALL, CRAIG TARVER, LLNL — Shock initiation experiments were performed on mechanically or thermally damaged LX-04 (85% LX-04, 15% Viton by weight) to obtain in-situ manganin pressure gauge data and run distances to detonation at various shock pressures. The LX-04 charges were damaged mechanically by applying a compressive load of 600 psi for 20,000 cycles, thus creating many small narrow cracks, or by cutting wedge shaped parts that were then loosely reassembled, thus creating a few large cracks. The thermally damaged LX-04 charges were heated to 190°C for long enough for the beta to delta phase transition to occur, and then cooled to ambient temperature. The densities of the damaged LX-04 charges were measured before shock initiation. Mechanically damaged LX-04 exhibited only slightly increased shock sensitivity, while thermally damaged LX-04 was much more shock sensitive. The Ignition and Growth model calculated this increased sensitivity by igniting more damaged LX-04 near the shock front. This work was performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344.

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Date submitted: 12 Feb 2009 Electronic form version 1.4