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Pre-compression for Dynamic Gas Gun Loading[1] CHRISTOPHER SEAGLE, Sandia Natl Labs — Equation of state properties for materials off the principal Hugoniot and isentrope are currently poorly constrained. The ability to directly probe regions of phase space between the Hugoniot and isentrope under dynamic loading will greatly improve our ability to constrain equation of state properties under a variety of conditions and study otherwise inaccessible phase transitions. Large diameter (>4 mm) samples are typically required for dynamic loading on gas guns. We are developing the ability to pre-compress large diameter samples to 1+ GPa. Compressible materials (such as liquids and gases) possess a significantly stiffer pre-compressed Hugoniot, allowing access to lower temperature states on shock compression. Challenges and initial static and dynamic testing results of the pre-compression hardware will be discussed.

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Christopher Seagle
Sandia Natl Labs

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