TABLE I. Shock wave data for benzene.

Initial density (g/cc)	Shock velocity (km/sec)	Particle velocity (km/sec)	Pressure (kbar)	Relative volume (V/V_0)	Dural shock velocity (km/sec)
0.877	2.78±0.01	0.77±0.09	19±2	0.722±0.031	5.93±0.07
0.869	2.72±0.01	0.89±0.04	21±1	0.671±0.016	6.02±0.03
0.870	2.96±0.02	0.89±0.05	23±1	0.700±0.016	6.02±0.04
0.870	3.31±0.01	1.05±0.03	30±1	0.684±0.009	6.16±0.02
0.875	3.44±0.01	1.12±0.03	34±1	0.676±0.009	6.22±0.03
0.879	3.47±0.01	1.12±0.04	34±1	0.676±0.011	6.23±0.03
0.880	3.85±0.01	1.36±0.03	46±1	0.647±0.008	6.43±0.02
0.866	3.89±0.00	1.45±0.02	49±1	0.627±0.006	6.50±0.02
0.885	4.05±0.01	1.45±0.03	52±1	0.642±0.007	6.52±0.02
0.877	4.05±0.01	1.48±0.03	53±1	0.635±0.006	6.54±0.02
0.881	4.09±0.01	1.59±0.09	57±3	0.612±0.021	6.62±0.07
0.869	4.38±0.01	1.77±0.03	67±1	0.597±0.006	6.78±0.02
0.869	4.52±0.01	1.85±0.01	73±1	0.591±0.003	6.86±0.01
0.885	4.79±0.02	1.90±0.05	81±2	0.603±0.010	6.92±0.04
0.871	4.77±0.02	1.94±0.02	81±1	0.593±0.004	6.95±0.02
0.870	5.00±0.02	2.16±0.10	94±4	0.567±0.019	7.14±0.08
0.870	5.28±0.01	2.29±0.02	105±1	0.567±0.003	7.26±0.01
0.875	5.46±0.01	2.33±0.02	111±1	0.575±0.004	7.31±0.02
0.880	5.52±0.02	2.37±0.04	115±2	0.570±0.007	7.35±0.03
0.868	5.71±0.01	2.61±0.03	129±2	0.542±0.005	7.56±0.03
0.887	6.00±0.03	2.86±0.03	152±2	0.523±0.006	7.80±0.03
0.871	5.93±0.02	2.92±0.02	151±1	0.507±0.004	7.83±0.02
0.876	6.17±0.02	3.34±0.08	180±4	0.458±0.013	8.20±0.06
0.870	6.22±0.04	3.44±0.06	186±3	0.446±0.010	8.29±0.05
0.870	6.43±0.03	3.66±0.03	205±2	0.430±0.005	8.48±0.03
0.874	6.82±0.06	3.92±0.09	234±6	0.425±0.015	8.74±0.08
0.881	7.23±0.01	4.15±0.04	264±3	0.426±0.006	8.97±0.04
0.872	7.16±0.03	4.20±0.07	262±5	0.413±0.011	9.00±0.06
0.871	7.25±0.03	4.29±0.09	271±6	0.409±0.013	9.08±0.08
0.875	7.66±0.05	4.61±0.06	309±4	0.398±0.009	9.39±0.05
0.876	8.24±0.05	4.99±0.07	360±5	0.395±0.009	9.77±0.06
0.876	8.61±0.04	5.21±0.07	393±6	0.395±0.009	10.00±0.06
0.881	8.91±0.07	5.38±0.14	422±12	0.396±0.017	10.17±0.12
0.871	8.82±0.08	5.42±0.12	416±10	0.386±0.015	10.18±0.10
0.874	8.97±0.06	5.51±0.11	432±9	0.386±0.013	10.28±0.09

locities in the liquids were determined from the times at which the shock front arrives at the coaxial electrical contactors[16] located in the liquids at accurately measured distances from the 2024 dural plate–liquid interface. Other electrical contactors are placed in holes of accurately measured depths in the 2024 dural plate to determine the arrival time of the shock front at these levels. The shock velocity in each material was computed from a plot of the corresponding time–distance data.

The methods and techniques used for the liquid nitrogen experiments are similar. Figure 3 is a diagram of the shot assembly showing the double-walled construction for keeping the liquid nitrogen in a non-boiling state. A few seconds before detonating the explosive the styrofoam slab was removed remotely. This ensures that the cold apparatus is in contact with the warm explosive for a minimal period of time.

The observation of a transition occurring in benzene and carbon disulfide and the character of their U_s-U_p plots led to some experiments to determine if a double shock wave structure[17,18] was present. The apparatus consisted of a 2024 dural driver plate 0.64 cm thick backed by the appropriate explosive system, a liquid layer 1.27 or 2.54 cm thick, and a 0.64 cm thick 2024 dural cover plate. The free surface motion of the cover plate was determined from the times at which the electrical contactor pins positioned above the plate are shorted. If at the transition pressure the original shock wave is unstable two shock waves with different velocities are formed, one with the pressure of the transition and the other with the remainder of the pressure pulse. A separation in time occurs as the two shock waves traverse the liquid layer and cover plate. By doubling the thickness of the liquid the time separation is also doubled, neglecting attenuation. The free surface motion of the cover plate results from the two impulses received from the two shock waves. Care was