Deviations of these two data points from the line are within experimental error; discussion will be deferred to Section 6.2.

4.2. Transmission Data for a 25.4-mm-Thick Sample

A single experiment was performed to obtain stress behind the plastic I shock on a thick sample. Results are used as a reference for thin sample results. A stress of 131.4 ± 3.3 kbar was inferred from measured free surface velocity of 0.653 ± 0.0117 mm/μsec and an average measured shock velocity of 5.082 ± 0.090 mm/μsec. A Hugoniot elastic limit (HEL) of 8.3 kbar was used for the plastic I stress calculation.[36] This result agrees well with Bancroft, Peterson, and Minshall's[2] value of 131.0 kbar for a 24.7-mm-thick Armco iron sample.

4.3. Transmission Data for Thin Samples

Eight transmission experiments were performed at approximately 201-kbar driving stress. Sample thicknesses ranged from 0.94 to 6.31 mm. Free surface motion and average shock velocities for the iron samples were measured.

4.3.1. Plastic I Data

Table 4.2 summarizes results for the plastic I shock. The table includes sample thicknesses, free surface velocities, average shock velocities, and shock wave transit times. Dependence of free surface velocity, stress, and stress jump, $P_3 - P_2$, on sample thickness is shown in Figs. 4.2 to 4.4. These plots show small dependence of free surface velocity and stress on

TABLE 4.2.--Plastic I data

Sample Thickness (mm)	Elastic Wave Stress[a] (kbar)	Plastic I Wave Velocity (mm/μsec)	Plastic I Free Surface Velocity (mm/μsec)	Plastic I Stress (kbar)	Transmissio Time (μsec)
0.941	18.0	5.224 ± 0.117	0.679 ± 0.029	142.6 ± 6.7	0.180 ± 0.(
0.998	17.7	5.081 ± 0.243	0.673 ± 0.024	137.3 ± 8.7	0.209 ± 0.(
1.556	16.1	5.275 ± 0.139	0.652 ± 0.020	137.6 ± 5.4	0.296 ± 0.(
2.022	15.0	5.267 ± 0.093	0.676 ± 0.020	142.2 ± 4.9	0.384 ± 0.(
2.609	13.9	5.106 ± 0.085	0.660 ± 0.022	134.8 ± 4.9	0.510 ± 0.(
3.132	13.1	5.030 ± 0.106	0.668 ± 0.058	134.5 ± 11.8	0.624 ± 0.(
4.690	11.6	5.085 ± 0.054	0.666 ± 0.015	135.0 ± 3.4	0.926 ± 0.(
6.350	10.7	5.157 ± 0.083	0.663 ± 0.013	136.2 ± 3.5	1.231 ± 0.(

[a]These data are from Taylor and Rice.[36]