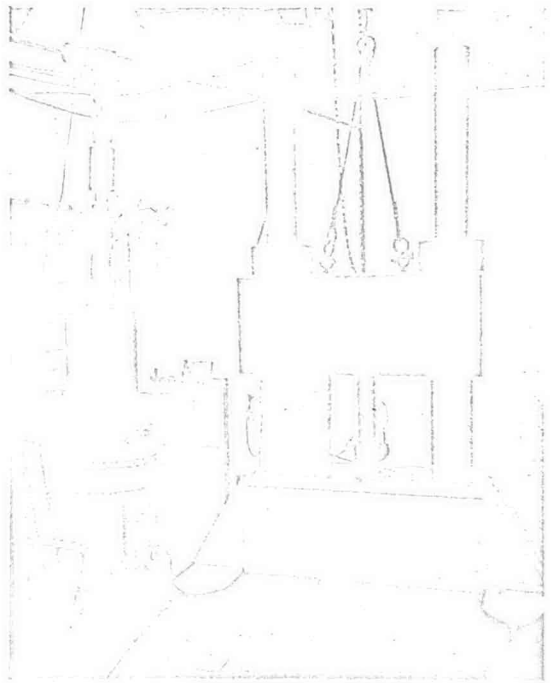

FIG. 3. 200,000 psi testing system.

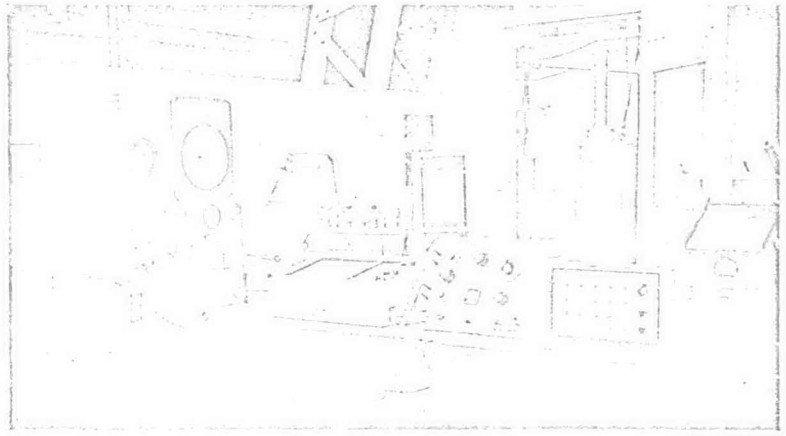

FIG. 4. Pressure and strain measurement equipment.

element, was approximately 1 percent in the pressure measuring system and 4 per cent in the strain measurement circuit.

Test Procedure

As previously stated, all the data in this study was obtained from cylinders laterally supported by restraining containers during autofrettage. The predicted percent bore enlargement was controlled by the outside diameter of the specimen, thus controlling the subsequent expansion of each specimen. In order to determine when the desired percent overstrain was obtained, the container was strain gaged using SR-4 type, A-7 gages tangentially directed and diametrically opposed at intervals along the length of the container. When a small, but substantial reading (generally between 100 and 200 μin./in.), was obtained on all container gages, it was assumed that the specimen had uniformly contacted the container and uniform plastic flow achieved.

Strain readings from the 2 tangential gages on the midsection of the specimen were recorded at appropriate intervals of induced internal pressure. From these data, plots of internal pressure vs. outside surface strain from both tangential strain gages were made for increasing and decreasing pressure. On a few tests, longitudinal strain was measured by cementing longitudinally oriented strain gages.

Physical dimensions of the bore, external diameter, and length were measured, before and after autofrettage, utilizing screw micrometers and dial bore gages to an accuracy of $\pm$ 0.0002 in.

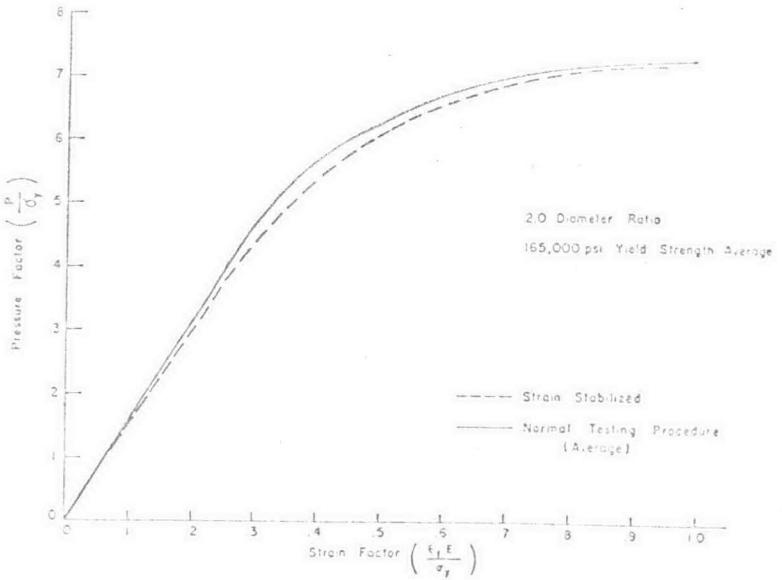

FIG. 5. Pressure factor vs. strain factor showing effect of strain stabilization.