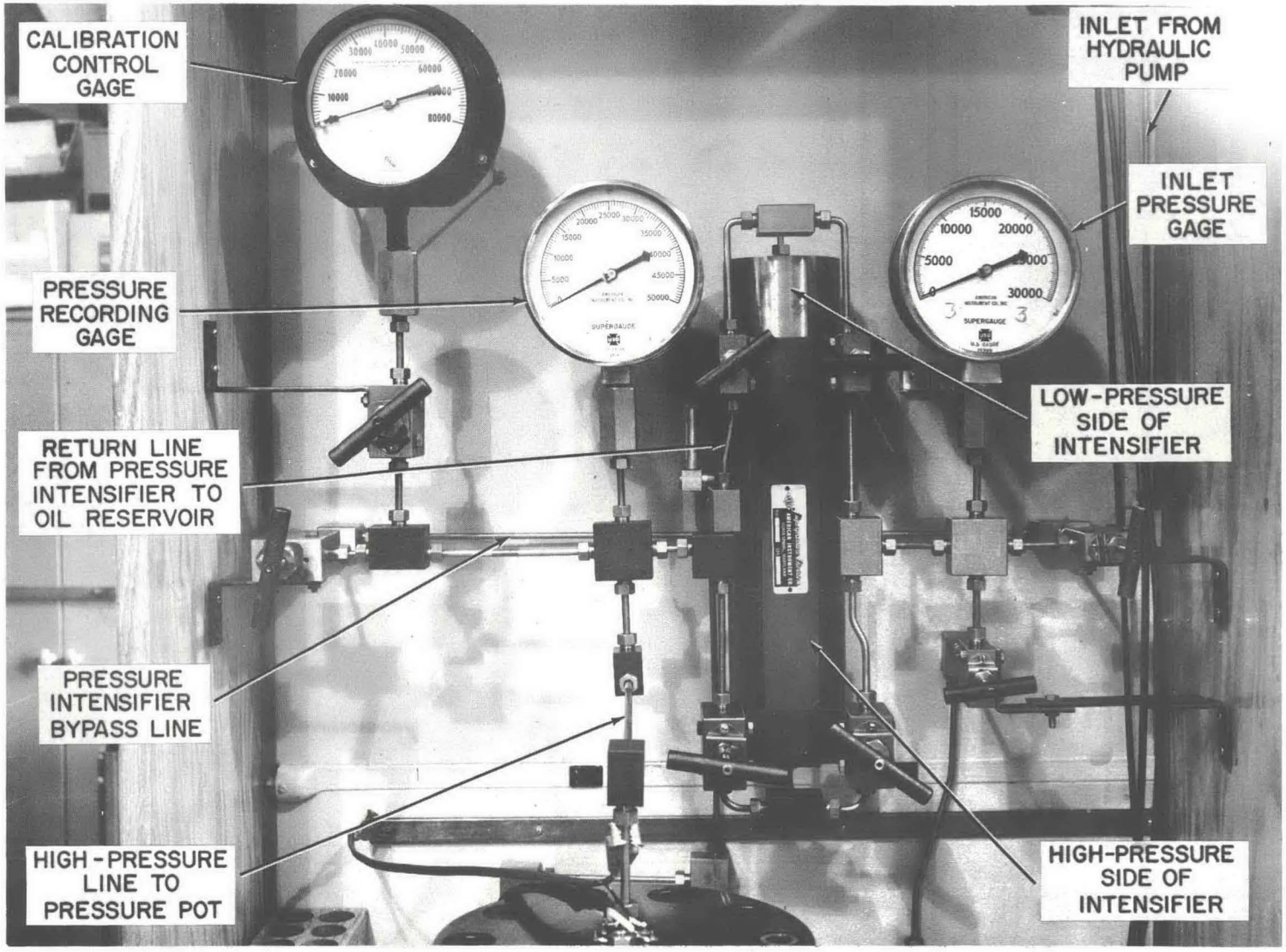

FIG. 11 HIGH-PRESSURE CONTROL SYSTEM

The two pressure pots used in this program were identical, except for the size of the bores from the compression chambers. Pressure Pot No. 1 had a 1/8-inch diameter bore (L = 5.00 inches) that was adapted to the 3/8-inch O.D. (1/8-inch I.D.) knock-off tube. Pressure Pot No. 2 had 1/16-inch and 3/16-inch diameter bores (L = 5.00 inches) that were adapted to the 1/4-inch O.D. (1/16-inch I.D.) and 9/16-inch O.D. (3/16-inch I.D.) knock-off tubes, respectively.

A view of the knock-off tubes appears in Figure 12. The dark area in the vicinity of the notch is the region that has been casehardened to a prescribed depth. The purpose of the casehardening was to provide insight as to its effect on the rupture strength of the knock-off tubes when subjected to static and dynamic loads. The casehardening process was carried out in an automatic Ipsen heat-treating unit. Further information on this process can be found in reference (h). The notch-wall thickness, defined as the wall thickness of the tube at the apex of the notch, was varied from a minimum of 0.005-inch to a maximum of 0.045-inch to evaluate its effect on the rupture-load characteristics. All of the knock-off tubes were made from AISI No. 4340 cold drawn, annealed, aircraft-quality, steel tubing having an approximate Brinell hardness number of 225.

The purpose of the loading mechanism, shown in Figure 13, was to provide means for applying static or dynamic loads to the end of the knock-off tubes. The loading mechanism consisted of the following parts: (1) a switch-release bar that permitted application of a vertical load to the end of the knock-off tube and that operated a micro-switch that initiated a trigger pulse to the recording oscilloscope, (2) a loading rod located in the vertical plane for transmitting loads from the source to the switch-release bar, and (3) a weight block that served as the