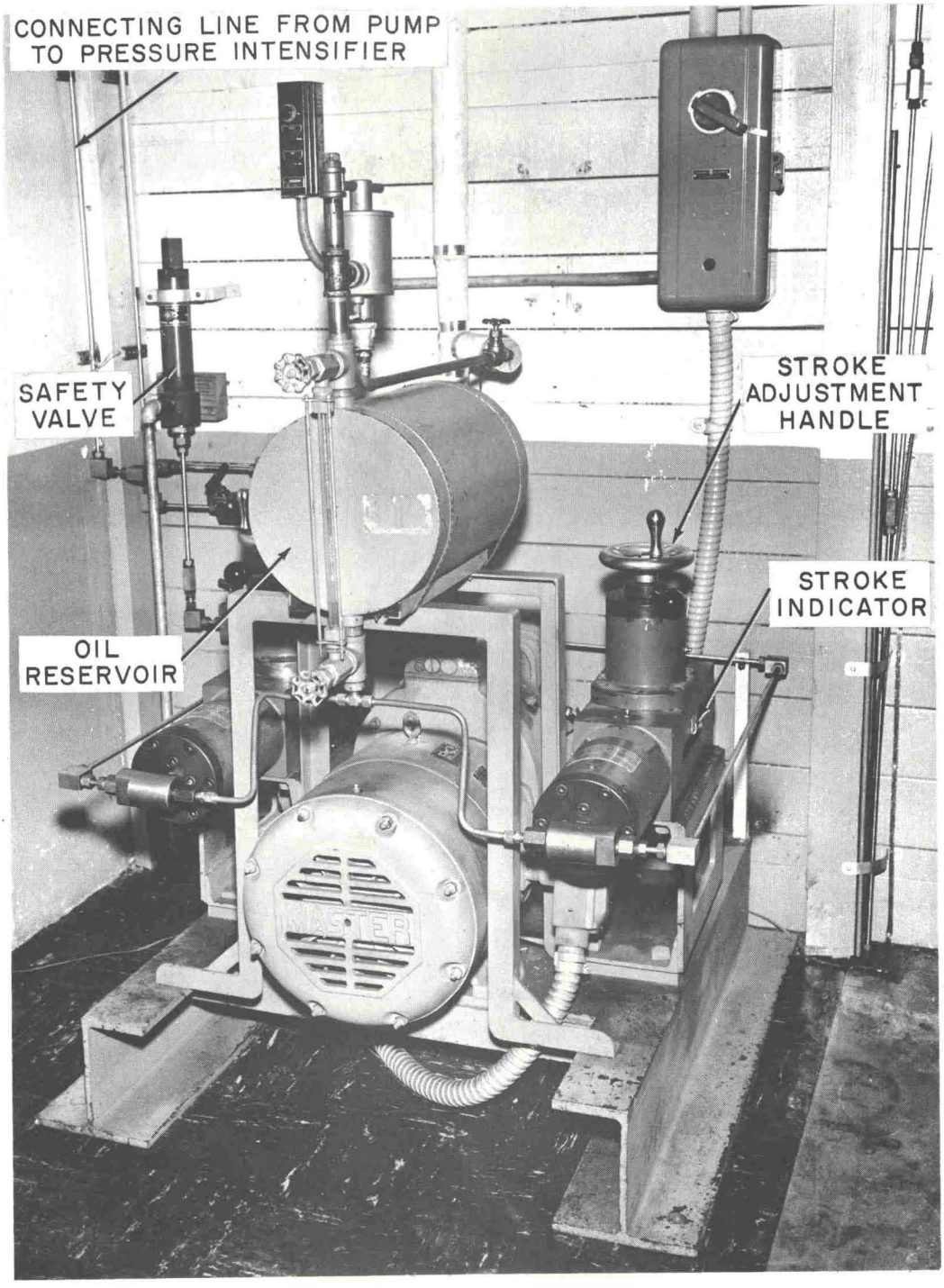

FIG. 10 DUAL-ACTION, VARIABLE-STROKE, HYDRAULIC-PRESSURE PUMP

and a suitable valve arrangement to permit delivery of pressures up to 100,000 psi to the pressure pot. A detailed description of the pressure intensifier and its mode of operation is presented in the section Experimental Procedures and Results. Figure 11 is a close-up view of the high-pressure control system.

A cross-sectional view of the pressure pot was shown previously in Figure 8. From this view it is seen that the pressure pot is essentially a two-pieced, thick-walled vessel that forms a 12.80 cubic-inch compression chamber. The top plate is secured to the base of the pressure pot with ten one-inch diameter, hardened, stainless-steel bolts. A standard, metal "C" ring provides a high-pressure seal between the top plate and the base of the pressure pot. The piezoelectric gages are suspended within the fluid-filled compression chamber, and electrical contact is made via specially designed, self-sealing electrical conductors. An important observation made during the testing program was that the electrical conductors would not function properly if the cylindrical insert was removed. This was a consequence of the sealing cone extruding from its intended position to the annular space between the stem of the conductor and the walls of the pressure pot left void by the removal of the insert. There are 12 electrical conductors in the pressure pot to provide for the simultaneous calibration of 6 piezoelectric gages.

A bore, corresponding to the bore of the knock-off tube, passes from the lower portion of the compression chamber through the wall of the pressure pot. The knock-off tube is secured to the pressure pot in a manner such that its longitudinal axis is colinear with the bore through the compression chamber. Once the knock-off tube has been severed, the high-pressure fluid within the compression chamber is free to exit through a constant diameter bore of length L.