

knowledge of the piston position-pressure relationship for a given volume of pressure transmitting fluid, one can predict the pressure at which contact between the upper piston and tensile yoke will occur, i.e. the pressure at the start of the tensile test.

### Load Cell

The heart of the apparatus is the load cell. Its operation depends upon the measurement of a beam deflection produced by the applied load through use of a linear variable differential transformer (LVDT).

The load cell which is shown in Figures 5 and 6 is constructed almost entirely of Type 303 stainless-steel. The main body (1) contains a recess for the LVDT (2) and provisions for attaching a beam (3) of the required mechanical sensitivity by means of four stainless steel cap screws (4). Two stainless steel set screws (5) fix the LVDT in position. A partially threaded rod (6) with a hexagonal cross-section head is used to adjust the position of the 50-50 iron-nickel alloy magnetic core (7). A hemispherical recess (8) in the beam allows the load to be concentrated at the center of the beam by means of the load concentrator ((6), Figure 1). The six leads necessary to activate the LVDT and measure its output are connected to a seven prong radio plug (9) which fits into a specially designed bottom connection similar to one previously described<sup>(14)</sup>. Leads to this connection are brazed to hardened steel conical pins and lead from the chamber as

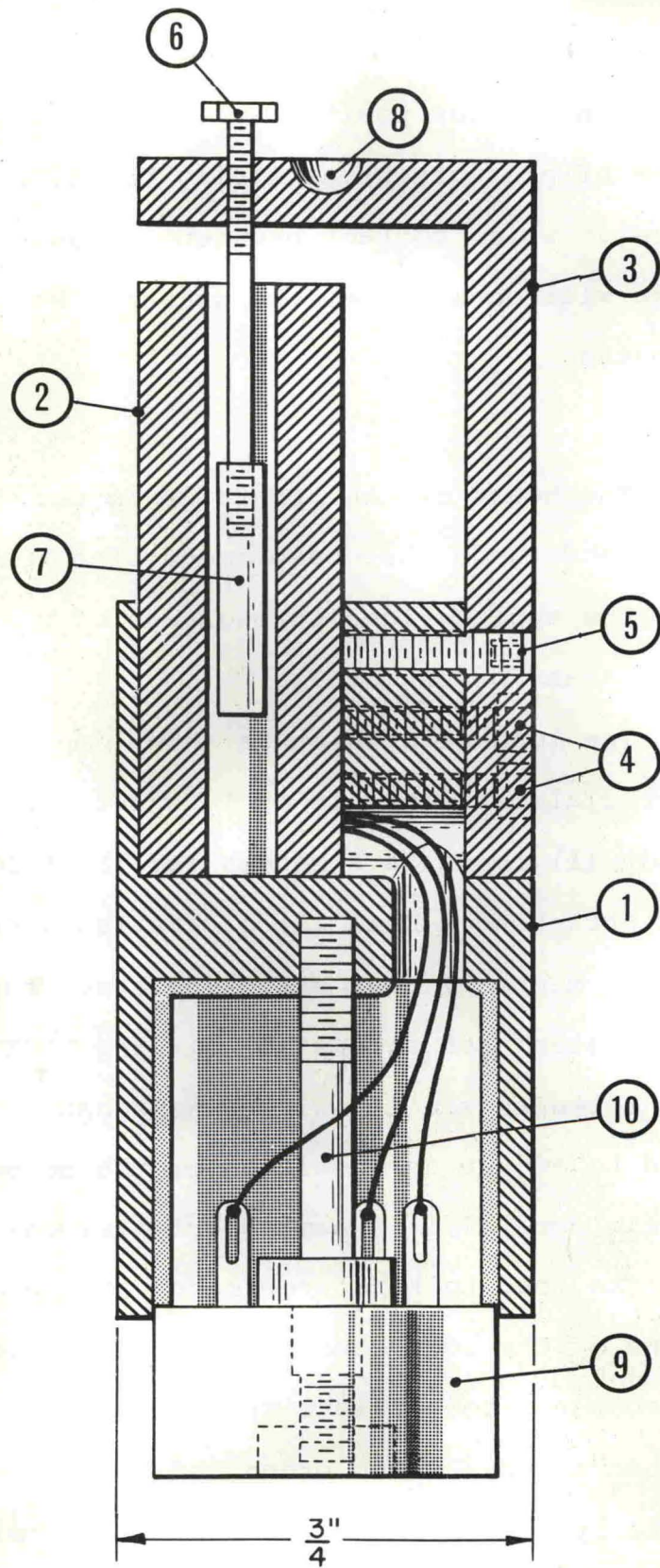


Fig. 5 Sectional drawing of load cell.