

source of the loads applied to the knock-off tubes. The loading rod passed through the center-of-gravity of the loading block and was threaded into the switch-release bar. A special fastener was attached to the end of the loading rod and acted as a seat for the loading block. Standard weights were positioned on the loading block in a manner such that the loading rod always passed through its center-of-gravity. A teflon slider bearing was inserted between the loading rod and loading block to provide for frictionless, 1-dimensional motion of the loading block relative to the loading rod. The loading block with the standard weights could be elevated 18 inches or less, with respect to the fastener, and released. When the free-falling loading block made contact with the fastener, a dynamic load was transmitted through the loading rod directly to the end of the knock-off tube. Care was taken to ensure that the free-falling loading block made uniform contact with the fastener and that the contact surface of the fastener was in a plane normal to the axis of the loading rod.

EXPERIMENTAL PROCEDURES AND RESULTS

Eighty-three experiments were conducted in the piezoelectric gage calibration system to assess quantitatively the parameters that significantly affect the pressure-release time and the rupture-load characteristics of the knock-off tubes. The principal parameters examined in conjunction with the pressure-release time were the viscosity of the high-pressure fluid, the pressure within the compression chamber, and the exit-bore diameter (I.D. of the knock-off tube). The outside and inside diameters, notch-wall thickness, casehardened depth, internal pressure (equivalent to the pressure within the compression chamber), and the applied loads represented the chief parameters evaluated in relation to the rupture-load characteristics. Some of the experiments served in a dual capacity, i.e., data obtained from some of the experiments were pertinent to the pressure-release-time study as well as the study of the rupture-load characteristics of the knock-off tubes.

A chronological description of the procedure of a typical experiment is as follows. The piezoelectric gages to be calibrated, and subsequently used for monitoring the pressure-time history within the compression chamber, are secured to electrical connectors and then placed into the oil-filled compression chamber. A "C" ring is properly positioned, and the top plate is bolted to the base of the pressure pot. The knock-off tube is then mounted on the pressure pot. (It is understood that the pressure pot selected has a bore diameter corresponding to the inside diameter of the knock-off tube.) The container box is now positioned such that the end of the knock-off tube, including the notch, is completely enclosed. The switch-release bar is secured to the end of the knock-off tube, and the loading rod is in turn passed through a raised opening in the bottom of the container box and threaded into the switch-release bar.