Hand Control and Rockshaft at Rest, Oil Circulating at Low Pressure

In this schematic drawing, the spool type control valve (1) is in its "home" or neutral position, the valve ports "D" and "E" being covered by the valve. This position prevents movement of oil to or from either side of the rockshaft piston (2).

The output from the hydraulic pump is creating pressure against the closed ports "D" and "E" and the closed high pressure safety valve (3), and passes through the orifice plug (4) to actuate the pressure regulator piston (5). The area of this piston being larger than the check valve (6), results in the piston forcing the check valve (6) off its seat against the oil and spring (7) pressure. This pressure regulating system balances to maintain a pressure of approximately 30 pounds per square inch in the system. Oil thus released by the valve passes out port "X" into the reservoir and back to the pump through the strainer screen.

A small movement of the control valve (1) in either direction from its "home" position by use of the hand lever, would open one of the lines opposite port "A" or "B" allowing more oil to escape than could be supplied through the small orifice plug (4), thus reducing the pressure on the piston (5) allowing the spring (7) to return the check valve (6) to its seat. Seating of the pressure regulator check valve (6) allows the system to build up pressure to the load requirement, or the opening point of the high pressure safety valve (3) which is approximately 1100 to 1500 psi.

The high pressure safety valve piston (3) has three small holes in it near the closed end. As high pressure develops from the operating loads or interference with the rockshaft movement, the piston is forced back against the pressure of the spring (8), uncovering one, two or all of the valve wall holes. Oil thus released by the valve passes out through port "X" into the reservoir and back to the pump through the strainer screen.