

Forklift Hydraulic Control Valves

Hydraulic Control Valve for Forklift - The function of directional control valves is to direct the fluid to the desired actuator. Usually, these control valves consist of a spool situated within a housing created either from cast iron or steel. The spool slides to different positions in the housing. Intersecting channels and grooves direct the fluid based on the spool's location.

The spool is centrally positioned, held in place by springs. In this particular location, the supply fluid can be blocked and returned to the tank. When the spool is slid to one direction, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. When the spool is transferred to the opposite direction, the supply and return paths are switched. Once the spool is allowed to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are designed so as to be stackable. They generally have one valve for each hydraulic cylinder and one fluid input that supplies all the valves within the stack.

Tolerances are maintained very tightly, so as to handle the higher pressures and so as to avoid leaking. The spools would usually have a clearance inside the housing no less than 25 μm or a thousandth of an inch. In order to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block would be mounted to the machine's frame by a 3-point pattern.

A hydraulic pilot pressure, mechanical levers, or solenoids may actuate or push the spool right or left. A seal allows a portion of the spool to stick out the housing where it is easy to get to the actuator.

The main valve block controls the stack of directional control valves by capacity and flow performance. Several of these valves are designed to be proportional, as a valve position to the proportional flow rate, whereas some valves are designed to be on-off. The control valve is among the most sensitive and pricey components of a hydraulic circuit.