

Hydraulic Control Valves for Forklift

Forklift Hydraulic Control Valve - The control valve is a tool which routes the fluid to the actuator. This tool would comprise steel or cast iron spool which is situated in a housing. The spool slides to different locations within the housing. Intersecting grooves and channels direct the fluid based on the spool's location.

The spool is centrally positioned, held in place by springs. In this particular position, the supply fluid could be blocked and returned to the tank. If 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. If the spool is moved to the other direction, the supply and return paths are switched. As soon as the spool is enabled to return to the center or neutral place, the actuator fluid paths become blocked, locking it into position.

The directional control is typically intended to be stackable. They usually have a valve per hydraulic cylinder and a fluid input that supplies all the valves inside the stack.

So as to prevent leaking and tackle the high pressure, tolerances are maintained really tight. Normally, the spools have a clearance with the housing of less than a thousandth of an inch or $25\text{ }\mu\text{m}$. So as to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block will be mounted to the machine's frame by a 3-point pattern.

The location of the spool can be actuated by hydraulic pilot pressure, mechanical levers, or solenoids that push the spool right or left. A seal enables a part of the spool to protrude outside the housing where it is easy to get to the actuator.

The main valve block is usually a stack of off the shelf directional control valves chosen by flow performance and capacity. Some valves are designed to be on-off, while some are designed to be proportional, like in flow rate proportional to valve position. The control valve is one of the most sensitive and expensive parts of a hydraulic circuit.