

Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The control valve is a tool that directs the fluid to the actuator. This tool will include steel or cast iron spool which is situated inside of housing. The spool slides to various positions in the housing. Intersecting grooves and channels direct the fluid based on the spool's location.

The spool is centrally located, held in place with springs. In this particular location, the supply fluid could be blocked and returned to the tank. When the spool is slid to a 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 side, the return and supply paths are switched. As soon as the spool is enabled to return to the center or neutral position, the actuator fluid paths become blocked, locking it into position.

Normally, directional control valves are built so as to be stackable. They generally have one valve for each hydraulic cylinder and one fluid input which supplies all the valves inside the stack.

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

Mechanical levers, solenoids or a hydraulic pilot pressure can actuate or push the spool right or left. A seal allows a part of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is generally a stack of off the shelf directional control valves chosen by flow performance and capacity. Some valves are designed to be on-off, whereas others are designed to be proportional, as in flow rate proportional to valve position. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.