

Hydraulic Control Valve for Forklift

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

The spool has a central or neutral location which is maintained with springs. In this particular position, the supply fluid is returned to the tank or blocked. When the spool is slid to a side, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. If the spool is transferred to the opposite direction, the supply and return paths are switched. As soon as the spool is enabled to return to the neutral or center position, the actuator fluid paths become blocked, locking it into place.

The directional control is typically made to be stackable. They normally have one valve per hydraulic cylinder and a fluid input that supplies all the valves in the stack.

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

A hydraulic pilot pressure, mechanical levers, or solenoids can actuate or push the spool left or right. A seal allows a portion of the spool to protrude outside 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. Several valves are designed to be on-off, whereas some are designed to be proportional, as in flow rate proportional to valve position. The control valve is amongst the most pricey and sensitive components of a hydraulic circuit.