

Hydraulic Control Valves for Forklift

Hydraulic Control Valve for Forklift - The function of directional control valves is to be able to route the fluid to the desired actuator. Normally, these control valves consist of a spool positioned within a housing made either of cast iron or steel. The spool slides to different locations within the housing. Intersecting channels and grooves route the fluid based on the spool's position.

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

The directional control is usually intended to be stackable. They generally have one valve for every hydraulic cylinder and a fluid input which supplies all the valves inside the stack.

In order to prevent leaking and tackle 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 prevent jamming the valve's extremely sensitive components and distorting the valve, 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 left or right. 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 usually a stack of off the shelf directional control valves chosen by capacity and flow performance. Several valves are designed to be on-off, while some are designed to be proportional, like in valve position to flow rate proportional. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.