

Forklift Hydraulic Control Valve

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

The spool has a central or neutral location that is maintained with springs. In this particular location, the supply fluid is returned to the tank or blocked. When the spool is slid to one 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 side, the return and supply paths are switched. As soon as the spool is enabled to return to the neutral or center place, the actuator fluid paths become blocked, locking it into position.

The directional control is typically designed to be stackable. They usually have one valve for each hydraulic cylinder and a fluid input that supplies all the valves within the stack.

So as 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 $25\text{ }\mu\text{m}$. To be able 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 with a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers 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 easy to get to to the actuator.

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