

Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The job of directional control valves is to direct the fluid to the desired actuator. Generally, these control valves consist of a spool situated in a housing created either from cast iron or steel. The spool slides to different places within the housing. Intersecting channels and grooves direct the fluid based on the spool's position.

The spool has a neutral or central 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. When the spool is moved to the opposite side, the return and supply paths are switched. When the spool is enabled to return to the center or neutral place, the actuator fluid paths become blocked, locking it into position.

Typically, directional control valves are made in order to be stackable. They usually have a valve per hydraulic cylinder and a fluid input that supplies all the valves inside the stack.

Tolerances are maintained really tightly, so as to handle the higher pressures and in order to prevent leaking. The spools will normally have a clearance inside the housing no less than 25 μm or a thousandth of an inch. So as to prevent 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.

A hydraulic pilot pressure, mechanical levers, or solenoids can actuate or push the spool left or right. 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 controls the stack of directional control valves by flow performance and capacity. Some of these valves are designed to be proportional, like a proportional flow rate to the valve position, while some valves are designed to be on-off. The control valve is amongst the most costly and sensitive parts of a hydraulic circuit.