

Hydraulic Control Valves for Forklift

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

The spool has a central or neutral position which is maintained with springs. In this location, the supply fluid is returned to the tank or blocked. If the spool is slid to one direction, 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 other side, the return and supply paths are switched. Once the spool is allowed to return to the neutral or center position, the actuator fluid paths become blocked, locking it into place.

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

Tolerances are maintained very tightly, in order to deal with 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 parts and distorting the valve, the valve block would be mounted to the machine's frame with a 3-point pattern.

A hydraulic pilot pressure, mechanical levers, or solenoids could actuate or push the spool left or right. A seal enables a portion of the spool to protrude outside the housing where it is easy to get to 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, as a valve position to the proportional flow rate, while some valves are designed to be on-off. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.