

Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The function of directional control valves is to be able to direct the fluid to the desired actuator. Normally, these control valves include a spool positioned 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 location.

The spool is centrally positioned, held in place with springs. In this particular location, the supply fluid could be blocked and returned to the tank. When the spool is slid to a side, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. If the spool is moved to the other side, the supply and return paths are switched. Once the spool is enabled to return to the center or neutral position, the actuator fluid paths become blocked, locking it into place.

Typically, directional control valves are built to be able to be stackable. They usually have a valve for every hydraulic cylinder and a fluid input which supplies all the valves in the stack.

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

Mechanical levers, solenoids or a hydraulic pilot pressure can actuate or push the spool left or right. A seal allows a portion of the spool to stick out 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. Several of these valves are designed to be proportional, like 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 expensive and sensitive parts of a hydraulic circuit.