

Forklift Hydraulic Control Valves

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

The spool is centrally positioned, held in place by springs. In this particular position, the supply fluid could be blocked and returned to the tank. If 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. When the spool is transferred to the other direction, the supply and return paths are switched. As soon as the spool is allowed to return to the center or neutral position, the actuator fluid paths become blocked, locking it into place.

Typically, directional control valves are built so as to be stackable. They usually have one valve for every hydraulic cylinder and one fluid input which supplies all the valves inside the stack.

Tolerances are maintained really tightly, in order to tackle the higher pressures and to prevent leaking. The spools will usually 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 will be mounted to the machine's frame by a 3-point pattern.

The position of the spool could be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool right or left. A seal allows a portion of the spool to stick out 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. Several of these valves are designed to be proportional, as 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 components of a hydraulic circuit.