

Forklift Hydraulic Control Valves

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

The spool is centrally situated, held in place with springs. In this particular position, the supply fluid could be blocked and returned to the tank. 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. When the spool is transferred to the opposite direction, the return and supply 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 position.

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

Tolerances are maintained very tightly, in order to tackle the higher pressures and in order to avoid leaking. The spools would normally have a clearance within 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 with a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers might actuate or push the spool right or left. A seal enables a portion of the spool to protrude outside the housing where it is easy to get to the actuator.

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