

Hydraulic Control Valve for Forklift

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

The spool is centrally located, held in place by springs. In this particular location, the supply fluid could be blocked and returned to the tank. When the spool is slid to one side, 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 other direction, the supply and return paths are switched. When the spool is allowed to return to the center or neutral place, the actuator fluid paths become blocked, locking it into place.

The directional control is usually designed to be stackable. They generally have a valve for every hydraulic cylinder and one fluid input which supplies all the valves inside the stack.

So as to prevent leaking and deal with the high pressure, tolerances are maintained extremely tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or 25 μm . So as to avoid distorting the valve block and jamming the valve's extremely sensitive parts, the valve block would be mounted to the machine's frame by a 3-point pattern.

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

The main valve block controls the stack of directional control valves by capacity and flow performance. Several of these valves are designed to be proportional, as a proportional flow rate to the valve position, whereas some valves are designed to be on-off. The control valve is amongst the most sensitive and expensive components of a hydraulic circuit.