

Hydraulic Control Valves for Forklift

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

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 side, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. When the spool is moved to the other direction, the return and supply 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 intended to be stackable. They generally have one valve per hydraulic cylinder and one fluid input which supplies all the valves within the stack.

So as to avoid leaking and tackle the high pressure, tolerances are maintained really tight. Typically, the spools have a clearance with the housing of less than a thousandth of an inch or 25 μm . In order 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.

Mechanical levers, solenoids or a hydraulic pilot pressure might actuate or push the spool right or left. A seal enables a part 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 capacity and flow performance. Some of these valves are designed to be proportional, like a proportional flow rate to the valve position, while some valves are designed to be on-off. The control valve is one of the most sensitive and pricey parts of a hydraulic circuit.