

Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The control valve is a tool which directs the fluid to the actuator. This device would consist of steel or cast iron spool which is positioned within a housing. The spool slides to various locations inside the housing. Intersecting grooves and channels direct the fluid based on the spool's position.

The spool has a central or neutral position that is maintained by springs. In this location, the supply fluid is returned to the tank or blocked. 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 moved 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 place, the actuator fluid paths become blocked, locking it into place.

The directional control is normally designed to be stackable. They generally have a valve per hydraulic cylinder and one fluid input that supplies all the valves inside the stack.

Tolerances are maintained very tightly, to be able to deal with the higher pressures and to be able to prevent leaking. The spools will often have a clearance within the housing no less than 25 μm or a thousandth of an inch. In order 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 could actuate or push the spool left or right. A seal allows a part of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is normally a stack of off the shelf directional control valves chosen by capacity and flow performance. Some valves are designed to be on-off, while others are designed to be proportional, like in valve position to flow rate proportional. The control valve is among the most sensitive and expensive components of a hydraulic circuit.