

Hydraulic Control Valve for Forklift

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

The spool has a central or neutral position which is maintained with springs. In this particular location, the supply fluid is blocked or returned to the tank. If the spool is slid to one direction, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. If the spool is transferred to the opposite side, the supply and return paths are switched. As soon as the spool is allowed to return to the center or neutral location, the actuator fluid paths become blocked, locking it into position.

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

To be able to prevent leaking and tackle the high pressure, tolerances are maintained really tight. Normally, the spools have a clearance with the housing of less than a thousandth of an inch or $25\text{ }\mu\text{m}$. To be able to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block would be mounted to the machine's frame by a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers might actuate or push the spool left or right. A seal allows a part of the spool to protrude outside the housing where it is easy to get 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 amongst the most sensitive and expensive parts of a hydraulic circuit.