

Hydraulic Control Valves for Forklift

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

The spool has a central or neutral position that is maintained with springs. In this particular position, the supply fluid is blocked or 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 supply and return paths are switched. Once the spool is allowed to return to the neutral or center place, the actuator fluid paths become blocked, locking it into position.

The directional control is typically intended to be stackable. They generally have a valve for each and every hydraulic cylinder and one fluid input which supplies all the valves within the stack.

To be able to avoid leaking and deal with 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 $25\text{ }\mu\text{m}$. In order to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block will be mounted to the machine's frame by a 3-point pattern.

The location of the spool may be actuated by hydraulic pilot pressure, mechanical levers, or solenoids that push the spool right or left. A seal enables a portion of the spool to stick out the housing where it is easy to get to the actuator.

The main valve block is generally a stack of off the shelf directional control valves chosen by flow performance and capacity. Several valves are designed to be on-off, while some are designed to be proportional, as in flow rate proportional to valve position. The control valve is one of the most expensive and sensitive components of a hydraulic circuit.