

Hydraulic Control Valve for Forklift

Hydraulic Control Valves for Forklift - The control valve is actually a device that directs the fluid to the actuator. This tool would consist of cast iron or steel spool that is located 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 neutral or central position which is maintained with springs. In this position, the supply fluid is blocked or returned to the tank. If the spool is slid to a side, the hydraulic fluid is routed 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. Once the spool is enabled to return to the neutral or center location, the actuator fluid paths become blocked, locking it into place.

Usually, directional control valves are designed to be able to be stackable. They generally have a valve per hydraulic cylinder and one fluid input which supplies all the valves within the stack.

To be able to prevent leaking and tackle the high pressure, tolerances are maintained very tight. Typically, 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 avoid jamming the valve's extremely sensitive components and distorting the valve, the valve block would be mounted to the machine's frame by a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers could actuate or push the spool right or left. A seal allows a part of the spool to stick out the housing where it is easy to get to 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, whereas others are designed to be proportional, like in valve position to flow rate proportional. The control valve is amongst the most expensive and sensitive components of a hydraulic circuit.