

Hydraulic Control Valves for Forklift

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

The spool is centrally positioned, held in place by springs. In this particular location, the supply fluid can be blocked and returned to the tank. When the spool is slid to a side, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. If the spool is moved to the opposite direction, the supply and return paths are switched. As soon as the spool is enabled to return to the center or neutral location, the actuator fluid paths become blocked, locking it into position.

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

To be able to avoid leaking and tackle the high pressure, tolerances are maintained extremely tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or $25\text{ }\mu\text{m}$. So as to prevent distorting the valve block and jamming the valve's extremely sensitive parts, the valve block would 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 left or right. A seal allows a part of the spool to stick out the housing where it is easy to get to the actuator.

The main valve block controls the stack of directional control valves by flow performance and capacity. Several of these valves are designed to be proportional, like a valve position to the proportional flow rate, while other valves are designed to be on-off. The control valve is one of the most sensitive and pricey components of a hydraulic circuit.