

Hydraulic Control Valves for Forklift

Hydraulic Control Valve for Forklift - The control valve is actually a tool that routes the fluid to the actuator. This tool will include cast iron or steel 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 has a neutral or central location which is maintained by springs. In this particular 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. If the spool is transferred to the other direction, the supply and return paths are switched. Once the spool is enabled to return to the center or neutral place, the actuator fluid paths become blocked, locking it into position.

Typically, directional control valves are designed so as to be stackable. They normally have a valve for each hydraulic cylinder and one fluid input which supplies all the valves within the stack.

Tolerances are maintained very tightly, to be able to handle the higher pressures and so as to avoid leaking. The spools would normally have a clearance within the housing no less than 25 μm or a thousandth of an inch. In order 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.

Mechanical levers, solenoids or a hydraulic pilot pressure might actuate or push the spool left or right. A seal allows a portion of the spool to stick out 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 some are designed to be proportional, as in flow rate proportional to valve position. The control valve is among the most costly and sensitive parts of a hydraulic circuit.