

Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valves - The control valve is actually a device that routes the fluid to the actuator. This tool would include cast iron or steel spool which is positioned in a housing. The spool slides to different places inside the housing. Intersecting channels and grooves route the fluid based on the spool's location.

The spool is centrally located, held in place with 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 routed to an actuator and provides a return path from the actuator to tank. If the spool is moved 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.

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

So as to avoid leaking and handle the high pressure, tolerances are maintained extremely 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 jamming the valve's extremely sensitive components and distorting the valve, the valve block will be mounted to the machine's frame by a 3-point pattern.

The position of the spool can be actuated by hydraulic pilot pressure, mechanical levers, or solenoids that push the spool left or right. A seal enables a part of the spool to protrude outside the housing where it is accessible 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 proportional flow rate to the valve position, whereas other valves are designed to be on-off. The control valve is amongst the most pricey and sensitive components of a hydraulic circuit.