

Hydraulic Control Valve for Forklift

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

The spool has a neutral or central position that is maintained by springs. In this position, the supply fluid is blocked or returned to the tank. If the spool is slid to a direction, 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 side, the return and supply paths are switched. As soon as the spool is enabled to return to the neutral or center position, the actuator fluid paths become blocked, locking it into place.

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

Tolerances are maintained extremely tightly, so as to deal with the higher pressures and so as to prevent leaking. The spools will usually have a clearance inside the housing no less than 25 μm or a thousandth of an inch. So as 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.

The position of the spool can be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool left or right. A seal enables a part of the spool to protrude outside the housing where it is easy to get to to the actuator.

The main valve block controls the stack of directional control valves by flow performance and capacity. Some of these valves are designed to be proportional, as a proportional flow rate to the valve position, while other valves are designed to be on-off. The control valve is among the most expensive and sensitive parts of a hydraulic circuit.