

Hydraulic Control Valves for Forklift

Forklift Hydraulic Control Valve - The function of directional control valves is to direct the fluid to the desired actuator. Generally, these control valves comprise a spool positioned in a housing made either from cast iron or steel. 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 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. When the spool is transferred to the opposite direction, the return and supply 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.

Normally, directional control valves are made so as to be stackable. They usually have one valve per hydraulic cylinder and one fluid input which supplies all the valves within the stack.

Tolerances are maintained very tightly, so as to deal with the higher pressures and to prevent leaking. The spools will often have a clearance in the housing no less than 25 μm or a thousandth of an inch. So as to prevent jamming the valve's extremely sensitive parts and distorting the valve, the valve block would be mounted to the machine's frame with a 3-point pattern.

Mechanical levers, solenoids or a hydraulic pilot pressure 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 the actuator.

The main valve block controls the stack of directional control valves by capacity and flow performance. 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 costly components of a hydraulic circuit.