

Forklift Hydraulic Control Valves

Hydraulic Control Valve for Forklift - The function of directional control valves is to be able to route the fluid to the desired actuator. Normally, these control valves consist of a spool positioned in a housing made either from cast iron or steel. The spool slides to various places in the housing. Intersecting channels and grooves direct the fluid based on the spool's location.

The spool is centrally situated, held in place with springs. In this particular location, the supply fluid can be blocked and 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 supply and return paths are switched. Once the spool is allowed to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are designed to be able to be stackable. They generally have one valve per hydraulic cylinder and one fluid input that supplies all the valves in the stack.

Tolerances are maintained really tightly, to be able to deal with the higher pressures and so as to prevent leaking. The spools would normally have a clearance inside the housing no less than $25\text{ }\mu\text{m}$ 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.

The position of the spool could be actuated by hydraulic pilot pressure, mechanical levers, or solenoids which push the spool left or right. A seal enables a portion of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is normally a stack of off the shelf directional control valves chosen by capacity and flow performance. Various valves are designed to be on-off, whereas others are designed to be proportional, as in valve position to flow rate proportional. The control valve is one of the most expensive and sensitive components of a hydraulic circuit.