

Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The function of directional control valves is to direct the fluid to the desired actuator. Normally, these control valves comprise a spool located in a housing created either from cast iron or steel. The spool slides to different positions inside the housing. Intersecting grooves and channels direct the fluid based on the spool's position.

The spool has a central or neutral location that is maintained by springs. In this particular position, the supply fluid is returned to the tank or blocked. When the spool is slid to a direction, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. When the spool is transferred to the other direction, the supply and return paths are switched. As soon as the spool is allowed to return to the center or neutral location, the actuator fluid paths become blocked, locking it into position.

The directional control is typically made to be stackable. They generally have one valve for every hydraulic cylinder and a fluid input that supplies all the valves inside the stack.

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

Mechanical levers, solenoids or a hydraulic pilot pressure may actuate or push the spool left or right. A seal enables a part of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is generally a stack of off the shelf directional control valves chosen by capacity and flow performance. Several valves are designed to be on-off, while others are designed to be proportional, like in valve position to flow rate proportional. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.