

Forklift Hydraulic Control Valve

Hydraulic Control Valve for Forklift - The job of directional control valves is to route the fluid to the desired actuator. Normally, these control valves include a spool situated within a housing created either from steel or cast iron. The spool slides to various places inside the housing. Intersecting channels and grooves route the fluid based on the spool's location.

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

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

Tolerances are maintained really tightly, to be able to deal with the higher pressures and to prevent leaking. The spools would usually have a clearance inside the housing no less than 25 μm or a thousandth of an inch. In order 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 could be actuated by hydraulic pilot pressure, mechanical levers, or solenoids which push the spool left or right. A seal allows a portion of the spool to protrude outside 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. Some valves are designed to be on-off, while some are designed to be proportional, like in valve position to flow rate proportional. The control valve is amongst the most costly and sensitive components of a hydraulic circuit.