

Forklift Hydraulic Control Valve

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

The spool has a neutral or central location which is maintained with springs. In this location, the supply fluid is blocked or 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. If the spool is moved to the opposite side, the supply and return paths are switched. As soon as the spool is enabled to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

The directional control is normally intended to be stackable. They usually have a valve per hydraulic cylinder and one fluid input which supplies all the valves in the stack.

So as to avoid leaking and handle the high pressure, tolerances are maintained really tight. Typically, the spools have a clearance with the housing of less than a thousandth of an inch or 25 μm . So as to avoid distorting the valve block and jamming the valve's extremely sensitive parts, the valve block would be mounted to the machine's frame with a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers could actuate or push the spool right or left. A seal enables a part of the spool to stick out the housing where it is easy to get to 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 some are designed to be proportional, like in flow rate proportional to valve position. The control valve is among the most sensitive and pricey parts of a hydraulic circuit.