

Hydraulic Control Valve for Forklift

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

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

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

Tolerances are maintained extremely tightly, in order to deal with the higher pressures and to avoid 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 distorting the valve block and jamming the valve's extremely sensitive parts, the valve block will be mounted to the machine's frame with a 3-point pattern.

The location of the spool can be actuated by mechanical levers, hydraulic pilot pressure, 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 flow performance and capacity. Various valves are designed to be on-off, whereas others are designed to be proportional, like in valve position to flow rate proportional. The control valve is among the most pricey and sensitive parts of a hydraulic circuit.