

## Forklift Hydraulic Control Valves

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

The spool has a neutral or central location that is maintained with springs. In this particular position, the supply fluid is returned to the tank or blocked. 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. When the spool is moved to the other direction, the return and supply paths are switched. Once the spool is allowed to return to the neutral or center place, the actuator fluid paths become blocked, locking it into position.

The directional control is typically made to be stackable. They normally have a valve per hydraulic cylinder and a fluid input that supplies all the valves in the stack.

So as to prevent leaking and deal with the high pressure, tolerances are maintained really tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or 25  $\mu\text{m}$ . 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 by a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers can actuate or push the spool right or left. A seal enables a portion of the spool to protrude outside the housing where it is easy to get to to the actuator.

The main valve block is usually a stack of off the shelf directional control valves chosen by flow performance and capacity. Various 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 among the most sensitive and expensive parts of a hydraulic circuit.