

## Forklift Hydraulic Control Valves

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

The spool has a central or neutral position that is maintained by springs. In this position, the supply fluid is returned to the tank or blocked. If the spool is slid to a side, 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 opposite direction, the return and supply paths are switched. Once the spool is enabled to return to the center or neutral position, the actuator fluid paths become blocked, locking it into place.

The directional control is typically made to be stackable. They normally have one valve for each hydraulic cylinder and one fluid input which supplies all the valves in the stack.

Tolerances are maintained very tightly, in order to handle the higher pressures and to prevent leaking. The spools will usually have a clearance in the housing no less than 25  $\mu\text{m}$  or a thousandth of an inch. To be able to avoid 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.

Solenoids, a hydraulic pilot pressure or mechanical levers might actuate or push the spool right or left. A seal allows a part of the spool to stick out the housing where it is easy to get to the actuator.

The main valve block controls the stack of directional control valves by capacity and flow performance. Several of these valves are designed to be proportional, like a valve position to the proportional flow rate, whereas other valves are designed to be on-off. The control valve is among the most sensitive and pricey components of a hydraulic circuit.