

## 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. Generally, these control valves include a spool situated in a housing created either of cast iron or steel. The spool slides to different positions in the housing. Intersecting channels and grooves route the fluid based on the spool's position.

The spool is centrally situated, held in place with springs. In this particular position, the supply fluid could be blocked and returned to the tank. 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. When the spool is transferred to the opposite side, the supply and return paths are switched. When the spool is allowed to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

Normally, directional control valves are built to be able to be stackable. They usually have one valve for every hydraulic cylinder and one fluid input that supplies all the valves in the stack.

To be able to avoid leaking and handle the high pressure, tolerances are maintained extremely tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or 25  $\mu\text{m}$ . To be able 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.

Mechanical levers, solenoids or a hydraulic pilot pressure might actuate or push the spool right or left. A seal allows a part of the spool to protrude outside the housing where it is accessible to the actuator.

The main valve block controls the stack of directional control valves by capacity and flow performance. Some of these valves are designed to be proportional, as a valve position to the proportional flow rate, while other valves are designed to be on-off. The control valve is amongst the most sensitive and costly parts of a hydraulic circuit.