

## Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The control valve is a device which directs the fluid to the actuator. This device will comprise steel or cast iron spool that is situated within a housing. The spool slides to different places within the housing. Intersecting channels and grooves route the fluid based on the spool's location.

The spool is centrally located, held in place by springs. In this particular position, the supply fluid could be blocked and returned to the tank. When 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 other side, the supply and return 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.

Typically, directional control valves are built so as to be stackable. They usually have a valve per hydraulic cylinder and a fluid input which supplies all the valves inside the stack.

To be able to avoid leaking and deal with 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  $25\text{ }\mu\text{m}$ . In order to avoid distorting the valve block and jamming the valve's extremely sensitive components, the valve block will be mounted to the machine's frame by a 3-point pattern.

A hydraulic pilot pressure, mechanical levers, or solenoids can actuate or push the spool left or right. A seal enables a part of the spool to protrude outside 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, while some are designed to be proportional, like in flow rate proportional to valve position. The control valve is amongst the most pricey and sensitive components of a hydraulic circuit.