

## Forklift Hydraulic Control Valves

Hydraulic Control Valves for Forklift - The control valve is actually a device which routes the fluid to the actuator. This device would include steel or cast iron spool that is situated within a housing. The spool slides to different positions within the housing. Intersecting channels and grooves direct the fluid based on the spool's location.

The spool has a central or neutral location that is maintained by springs. In this location, the supply fluid is blocked or returned to the tank. If the spool is slid to one 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 direction, the supply and return 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 position.

Usually, directional control valves are designed to be able to be stackable. They usually have one valve per hydraulic cylinder and one fluid input that supplies all the valves inside the stack.

To be able to prevent leaking and tackle the high pressure, tolerances are maintained extremely tight. Normally, the spools have a clearance with the housing of less than a thousandth of an inch or  $25\text{ }\mu\text{m}$ . 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' frame by a 3-point pattern.

The position of the spool can be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool left or right. A seal allows a portion of the spool to protrude outside the housing where it is easy to get to the actuator.

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