Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The control valve is a tool which routes the fluid to the actuator. This device would comprise steel or cast iron spool which is located within a housing. The spool slides to various locations in the housing. Intersecting channels and grooves direct the fluid based on the spool's position.

The spool has a central or neutral location that is maintained by springs. In this position, the supply fluid is returned to the tank or blocked. 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 side, the supply and return paths are switched. As soon as the spool is allowed to return to the center or neutral place, the actuator fluid paths become blocked, locking it into place.

Typically, directional control valves are made to be able to be stackable. They usually have a valve per hydraulic cylinder and one fluid input which supplies all the valves in the stack.

So as to avoid leaking and deal with the high pressure, tolerances are maintained very tight. Normally, the spools have a clearance with the housing of less than a thousandth of an inch or 25 Âµm. So as to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block would be mounted to the machine' frame with a 3-point pattern.

The position of the spool may be actuated by mechanical levers, hydraulic pilot pressure, or solenoids that push the spool left or right. A seal enables a portion of the spool to protrude outside the housing where it is accessible to the actuator.

The main valve block is generally a stack of off the shelf directional control valves chosen by flow performance and capacity. Several valves are designed to be on-off, whereas others are designed to be proportional, as in flow rate proportional to valve position. The control valve is amongst the most sensitive and pricey components of a hydraulic circuit.