Hydraulic Control Valves for Forklift

Forklift Hydraulic Control Valve - The function of directional control valves is to be able to direct the fluid to the desired actuator. Usually, these control valves include a spool positioned inside of a housing made either from steel or cast iron. The spool slides to various locations in the housing. Intersecting grooves and channels direct the fluid based on the spool's position.

The spool has a neutral or central location that is maintained by springs. In this position, the supply fluid is blocked or 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 other direction, the supply and return paths are switched. Once the spool is allowed to return to the center or neutral location, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are designed in order to be stackable. They usually have a valve per hydraulic cylinder and a fluid input which supplies all the valves inside the stack.

Tolerances are maintained extremely tightly, so as to deal with the higher pressures and so as to avoid leaking. The spools will normally have a clearance within the housing no less than 25 Âµm or a thousandth of an inch. To be able 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.

A hydraulic pilot pressure, mechanical levers, or solenoids can actuate or push the spool left or right. A seal allows a portion of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is usually a stack of off the shelf directional control valves chosen by capacity and flow performance. Several valves are designed to be on-off, whereas some are designed to be proportional, like in flow rate proportional to valve position. The control valve is amongst the most sensitive and costly parts of a hydraulic circuit.