Forklift Hydraulic Control Valve

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

The spool has a neutral or central position which is maintained by springs. In this position, the supply fluid is returned to the tank or blocked. When the spool is slid to one direction, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. When the spool is moved to the opposite direction, the supply and return paths are switched. When the spool is enabled to return to the center or neutral location, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are built to be able to be stackable. They normally have a valve for every hydraulic cylinder and a fluid input which supplies all the valves in the stack.

So as to prevent leaking and tackle 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 Âµm. So as to avoid jamming the valve's extremely sensitive components and distorting the valve, the valve block will be mounted to the machine' frame by a 3-point pattern.

The location of the spool may be actuated by hydraulic pilot pressure, mechanical levers, or solenoids that push the spool right or left. A seal enables a part 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 flow performance and capacity. Several valves are designed to be on-off, whereas others are designed to be proportional, like in flow rate proportional to valve position. The control valve is among the most pricey and sensitive parts of a hydraulic circuit.