Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The control valve is a tool which routes the fluid to the actuator. This tool would consist of steel or cast iron spool which is positioned in a housing. The spool slides to different positions within the housing. Intersecting channels and grooves route the fluid based on the spool's location.

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

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

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

Solenoids, a hydraulic pilot pressure or mechanical levers could actuate or push the spool left or right. A seal enables a part of the spool to protrude outside the housing where it is easy to get to to the actuator.

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