Forklift Hydraulic Control Valve

Forklift Hydraulic Control Valve - The job of directional control valves is to direct the fluid to the desired actuator. Generally, these control valves comprise a spool situated in a housing created either of steel or cast iron. The spool slides to different places within the housing. Intersecting grooves and channels route the fluid based on the spool's position.

The spool is centrally positioned, help in place with springs. In this particular position, the supply fluid could be blocked and returned to the tank. If the spool is slid to one side, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. If the spool is moved to the opposite direction, the return and supply paths are switched. As soon as the spool is enabled to return to the center or neutral place, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are designed so as to be stackable. They normally have one valve for each hydraulic cylinder and a fluid input that supplies all the valves in the stack.

In order to prevent leaking and handle 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 Âµm. To be able to avoid distorting the valve block and jamming the valve's extremely sensitive parts, the valve block would 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 that push the spool right or left. A seal enables a part of the spool to protrude outside the housing where it is accessible to the actuator.

The main valve block is normally a stack of off the shelf directional control valves chosen by capacity and flow performance. Several 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 sensitive and expensive components of a hydraulic circuit.