Forklift Hydraulic Control Valve

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

The spool has a neutral or central position which is maintained with springs. In this position, the supply fluid is blocked or returned to the tank. If the spool is slid to a direction, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. When the spool is transferred to the other direction, the return and supply paths are switched. When the spool is allowed to return to the neutral or center location, the actuator fluid paths become blocked, locking it into place.

The directional control is typically made to be stackable. They generally have one valve per hydraulic cylinder and a fluid input which supplies all the valves in the stack.

So as to avoid leaking and handle 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. In order 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 location of the spool can be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool right or left. A seal enables a portion of the spool to stick out the housing where it is accessible to the actuator.

The main valve block controls the stack of directional control valves by capacity and flow performance. Some of these valves are designed to be proportional, as a proportional flow rate to the valve position, while other valves are designed to be on-off. The control valve is among the most sensitive and expensive parts of a hydraulic circuit.