Forklift Hydraulic Control Valves

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

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

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

To be able to prevent leaking and deal with the high pressure, tolerances are maintained really tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or 25 Âµm. So as 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 could actuate or push the spool right or left. 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 controls the stack of directional control valves by capacity and flow performance. Several of these valves are designed to be proportional, as a proportional flow rate to the valve position, whereas other valves are designed to be on-off. The control valve is among the most sensitive and costly components of a hydraulic circuit.