Forklift Hydraulic Control Valves

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

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

Normally, directional control valves are made to be able to be stackable. They normally have a valve per hydraulic cylinder and a fluid input which supplies all the valves in the stack.

Tolerances are maintained very tightly, so as to handle the higher pressures and to prevent leaking. The spools will usually have a clearance within the housing no less than 25 Ã‚Âµm or a thousandth of an inch. So as to avoid jamming the valve's extremely sensitive parts and distorting the valve, the valve block would be mounted to the machine' frame by a 3-point pattern.

Mechanical levers, solenoids or a hydraulic pilot pressure can actuate or push the spool right or left. A seal enables a portion 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, while some are designed to be proportional, like in flow rate proportional to valve position. The control valve is one of the most sensitive and costly parts of a hydraulic circuit.