

Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The function of directional control valves is to be able to route the fluid to the desired actuator. Normally, these control valves include a spool situated inside of a housing created either from cast iron or steel. The spool slides to different positions in the housing. Intersecting channels and grooves route the fluid based on the spool's location.

The spool is centrally situated, held in place with springs. In this particular position, the supply fluid could be blocked and returned to the tank. When 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. When the spool is transferred to the opposite direction, the return and supply paths are switched. Once the spool is allowed to return to the center or neutral position, the actuator fluid paths become blocked, locking it into position.

The directional control is usually made to be stackable. They normally have one valve per hydraulic cylinder and one fluid input which supplies all the valves inside the stack.

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

Solenoids, a hydraulic pilot pressure or mechanical levers 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 easy to get to the actuator.

The main valve block is normally a stack of off the shelf directional control valves chosen by capacity and flow performance. Some valves are designed to be on-off, while some are designed to be proportional, like in valve position to flow rate proportional. The control valve is amongst the most sensitive and pricey components of a hydraulic circuit.