

Hydraulic Control Valve for Forklift

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

The spool is centrally positioned, held in place with springs. In this particular location, the supply fluid could be blocked and returned to the tank. If the spool is slid to one direction, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. When the spool is moved to the other side, the return and supply paths are switched. Once the spool is allowed to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

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

Tolerances are maintained extremely tightly, in order to deal with the higher pressures and in order to avoid leaking. The spools would often have a clearance inside the housing no less than 25 μm or a thousandth of an inch. So as to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block will be mounted to the machine's frame with a 3-point pattern.

The location of the spool may be actuated by hydraulic pilot pressure, mechanical levers, 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 controls the stack of directional control valves by flow performance and capacity. Some of these valves are designed to be proportional, like a valve position to the proportional flow rate, while other valves are designed to be on-off. The control valve is one of the most sensitive and pricey components of a hydraulic circuit.