

Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The control valve is actually a tool which routes the fluid to the actuator. This device would comprise cast iron or steel spool that is situated within a housing. The spool slides to various places within the housing. Intersecting grooves and channels route the fluid based on the spool's position.

The spool is centrally situated, held in place with springs. In this particular position, the supply fluid can be blocked and returned to the tank. If the spool is slid to one side, 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 enabled to return to the center or neutral location, the actuator fluid paths become blocked, locking it into place.

Usually, directional control valves are built in order to be stackable. They generally have a valve for every hydraulic cylinder and a fluid input that supplies all the valves inside the stack.

Tolerances are maintained really tightly, in order to handle 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 avoid distorting the valve block and jamming the valve's extremely sensitive parts, the valve block will be mounted to the machine's frame with a 3-point pattern.

The position of the spool may be actuated by hydraulic pilot pressure, mechanical levers, or solenoids which push the spool left or right. A seal enables a portion of the spool to stick out the housing where it is easy to get 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, like a proportional flow rate to the valve position, while some valves are designed to be on-off. The control valve is one of the most expensive and sensitive parts of a hydraulic circuit.