

Hydraulic Control Valve for Forklift

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

The spool has a neutral or central position that is maintained with springs. In this location, the supply fluid is returned to the tank or blocked. 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 opposite direction, the return and supply paths are switched. Once the spool is enabled to return to the neutral or center position, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are made so as to be stackable. They normally have one valve for each hydraulic cylinder and one fluid input that supplies all the valves within the stack.

Tolerances are maintained extremely tightly, so as to handle the higher pressures and in order to avoid leaking. The spools would often have a clearance within 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 parts, the valve block would be mounted to the machine's frame by a 3-point pattern.

Mechanical levers, solenoids or a hydraulic pilot pressure can actuate or 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 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 some valves are designed to be on-off. The control valve is amongst the most sensitive and pricey components of a hydraulic circuit.