

Hydraulic Control Valves for Forklift

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

The spool is centrally positioned, held in place by springs. In this particular location, the supply fluid could be blocked and returned to the tank. When 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. If the spool is moved to the opposite direction, the return and supply paths are switched. When the spool is allowed to return to the center or neutral place, the actuator fluid paths become blocked, locking it into place.

Normally, directional control valves are built so as to be stackable. They generally have one valve for each and every hydraulic cylinder and a fluid input that supplies all the valves inside the stack.

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

Mechanical levers, solenoids or a hydraulic pilot pressure may actuate or push the spool left or right. A seal allows a portion of the spool to stick out 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, as a proportional flow rate to the valve position, whereas some valves are designed to be on-off. The control valve is one of the most sensitive and expensive components of a hydraulic circuit.