

Hydraulic Control Valves for Forklift

Forklift Hydraulic Control Valve - The control valve is actually a device which routes the fluid to the actuator. This device will consist of cast iron or steel spool which is situated in a housing. The spool slides to different positions in the housing. Intersecting grooves and channels direct the fluid based on the spool's position.

The spool is centrally located, held in place with springs. In this particular location, the supply fluid can be blocked and returned to the tank. If the spool is slid to one direction, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. When the spool is transferred to the other side, the supply and return paths are switched. When 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 typically made to be stackable. They normally have a valve for each hydraulic cylinder and a fluid input which supplies all the valves in the stack.

To be able to prevent leaking and tackle the high pressure, tolerances are maintained extremely 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 components, the valve block will be mounted to the machine's frame with a 3-point pattern.

Solenoids, a hydraulic pilot pressure or mechanical levers may actuate or push the spool right or left. A seal enables a part 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. Several valves are designed to be on-off, whereas some are designed to be proportional, as in flow rate proportional to valve position. The control valve is one of the most costly and sensitive components of a hydraulic circuit.