

Forklift Hydraulic Control Valves

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

The spool has a neutral or central position which is maintained with springs. In this position, the supply fluid is blocked or 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. If the spool is moved to the other side, the supply and return paths are switched. When the spool is allowed to return to the center or neutral location, the actuator fluid paths become blocked, locking it into place.

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

To be able to prevent leaking and deal with the high pressure, tolerances are maintained really 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 jamming the valve's extremely sensitive parts and distorting the valve, the valve block would be mounted to the machine's frame with a 3-point pattern.

The position of the spool could be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool right or left. 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. Several of these valves are designed to be proportional, like a proportional flow rate to the valve position, while other valves are designed to be on-off. The control valve is one of the most expensive and sensitive parts of a hydraulic circuit.