Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The control valve is actually a tool which routes the fluid to the actuator. This tool will comprise cast iron or steel spool that is positioned within a housing. The spool slides to various locations within 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 by 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 directed to an actuator and provides a return path from the actuator to tank. When the spool is transferred to the opposite direction, the supply and return paths are switched. When the spool is enabled to return to the center or neutral position, the actuator fluid paths become blocked, locking it into position.

Usually, directional control valves are made in order to be stackable. They generally have one valve for each hydraulic cylinder and a fluid input which supplies all the valves in the stack.

So as to avoid leaking and deal with the high pressure, tolerances are maintained extremely tight. Typically, the spools have a clearance with the housing of less than a thousandth of an inch or 25 Ã‚Âµm. To be able to avoid jamming the valve's extremely sensitive components and distorting the valve, the valve block will be mounted to the machine' frame by a 3-point pattern.

The location of the spool may be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool right or left. A seal allows a part of the spool to protrude outside the housing where it is accessible to the actuator.

The main valve block is usually a stack of off the shelf directional control valves chosen by flow performance and capacity. Several valves are designed to be on-off, while others are designed to be proportional, as in valve position to flow rate proportional. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.