Hydraulic Control Valve for Forklift

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

The spool has a central or neutral location which is maintained by springs. In this position, the supply fluid is returned to the tank or blocked. If the spool is slid to a side, the hydraulic fluid is directed to an actuator and provides a return path from the actuator to tank. When the spool is moved to the opposite direction, the supply and return paths are switched. When the spool is enabled to return to the neutral or center place, the actuator fluid paths become blocked, locking it into position.

The directional control is normally designed to be stackable. They usually have one 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 very tight. Usually, the spools have a clearance with the housing of less than a thousandth of an inch or 25 µm. So as to avoid distorting the valve block and jamming the valve's extremely sensitive parts, the valve block will be mounted to the machine' frame with a 3-point pattern.

The position of the spool can be actuated by mechanical levers, hydraulic pilot pressure, or solenoids which push the spool right or left. A seal enables a part of the spool to stick out the housing where it is easy to get to to the actuator.

The main valve block is normally 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, like in valve position to flow rate proportional. The control valve is among the most expensive and sensitive components of a hydraulic circuit.