Forklift Hydraulic Control Valves

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

The spool is centrally located, help in place with springs. In this particular position, the supply fluid could be blocked and returned to the tank. If the spool is slid to one side, 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 opposite direction, the supply and return paths are switched. Once the spool is enabled to return to the neutral or center location, the actuator fluid paths become blocked, locking it into position.

Typically, directional control valves are designed in order to be stackable. They usually have a valve per hydraulic cylinder and one fluid input that supplies all the valves inside the stack.

To be able to prevent leaking and tackle 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 Âµm. To be able to prevent 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.

Solenoids, a hydraulic pilot pressure or mechanical levers could actuate or push the spool right or left. A seal allows a part of the spool to stick out the housing where it is accessible to the actuator.

The main valve block is generally a stack of off the shelf directional control valves chosen by capacity and flow performance. Various valves are designed to be on-off, while others are designed to be proportional, as in flow rate proportional to valve position. The control valve is amongst the most sensitive and expensive parts of a hydraulic circuit.