Forklift Hydraulic Control Valves

Forklift Hydraulic Control Valve - The function of directional control valves is to be able to route the fluid to the desired actuator. Generally, these control valves comprise a spool positioned in a housing made either of cast iron or steel. The spool slides to different positions in the housing. Intersecting channels and grooves direct the fluid based on the spool's position.

The spool is centrally positioned, help in place by springs. In this particular location, the supply fluid can be blocked and returned to the tank. When the spool is slid to a side, the hydraulic fluid is routed to an actuator and provides a return path from the actuator to tank. When the spool is moved to the opposite side, the return and supply paths are switched. As soon as the spool is allowed to return to the neutral or center position, the actuator fluid paths become blocked, locking it into place.

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

Tolerances are maintained extremely tightly, to be able to handle the higher pressures and so as to avoid leaking. The spools will normally have a clearance in the housing no less than 25 Âµm or a thousandth of an inch. So as to avoid jamming the valve's extremely sensitive parts and distorting the valve, the valve block would be mounted to the machine' frame with a 3-point pattern.

The location of the spool can be actuated by hydraulic pilot pressure, mechanical levers, or solenoids which push the spool right or left. A seal enables a portion 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 capacity and flow performance. Some valves are designed to be on-off, while some are designed to be proportional, as in valve position to flow rate proportional. The control valve is amongst the most pricey and sensitive parts of a hydraulic circuit.