

Hyster Hydraulic Control Valve

The job of directional control valves is to route the fluid to the desired actuator. Normally, these control valves consist of a spool positioned in a housing created either of steel or cast iron. The spool slides to various positions inside the housing. Intersecting grooves and channels route the fluid based on the spool's location.

The spool is centrally located, held 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 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 opposite side, the return and supply 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 typically intended to be stackable. They usually have one valve per hydraulic cylinder and one fluid input which supplies all the valves in the stack.

To be able to prevent 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 μm . So as to prevent distorting the valve block and jamming the valve's extremely sensitive components, the valve block will be mounted to the machine's frame by a 3-point pattern.

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

The main valve block controls the stack of directional control valves by capacity and flow performance. Some of these valves are designed to be proportional, as a valve position to the proportional flow rate, whereas some valves are designed to be on-off. The control valve is one of the most pricey and sensitive components of a hydraulic circuit.