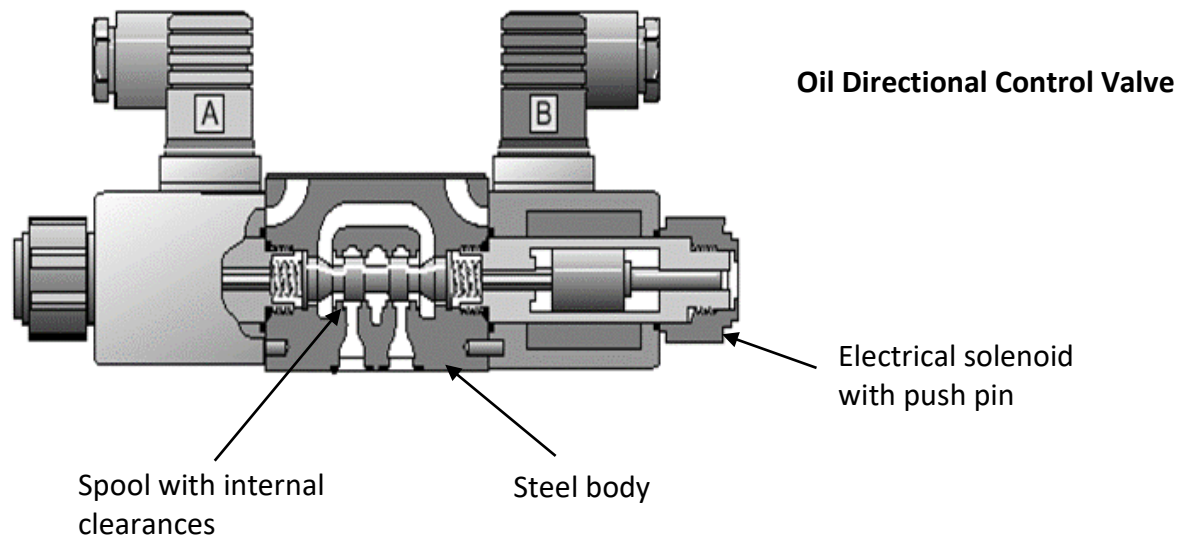


What is the difference between Oil Hydraulic Valves & Water Hydraulic Valves?

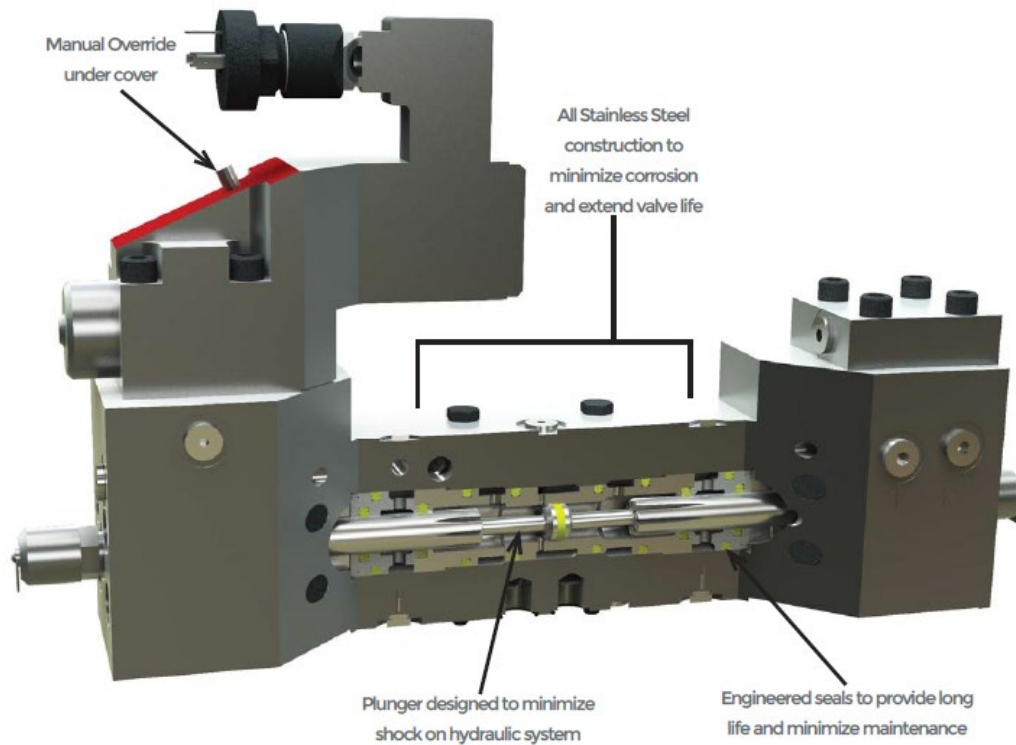
Water has been used in hydraulics since the first principles were invented in the 1700's. London had water hydraulic pipes under its roads until the 1940's. Only in comparatively recent history has oil overtaken water as the power transfer medium in hydraulics. Oil has one basic property that is better than water, for use in hydraulics, and that is it has lubricating properties that can lubricate internal parts. Oil then is the preferred medium and valves are made in vast quantities and are much less expensive than water hydraulic valves.

Both water and oil hydraulic valves tend to work up to a maximum of 420 bar (6000 psi) and at these pressures, water can erode internal parts of valves, due to high fluid velocities and no lubrication characteristics. Water has a much lower viscosity than oil and it can flow through valve clearances more easily, potentially losing pressure and pressurising other parts of the hydraulic circuit.

If we investigate the construction of oil and water directional control valves, this can help in the understanding of differences.



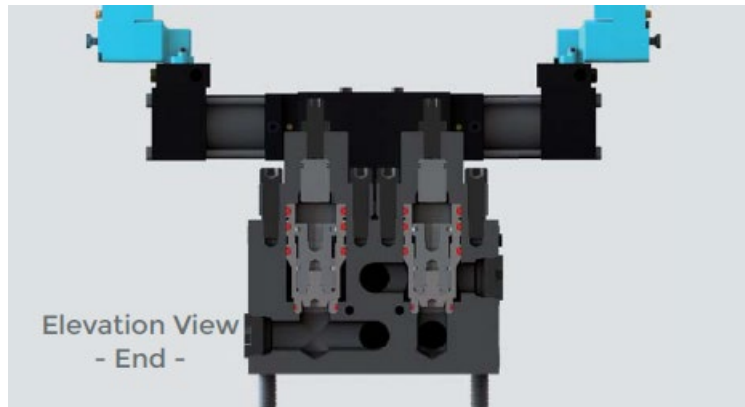
Water Directional Control Valve



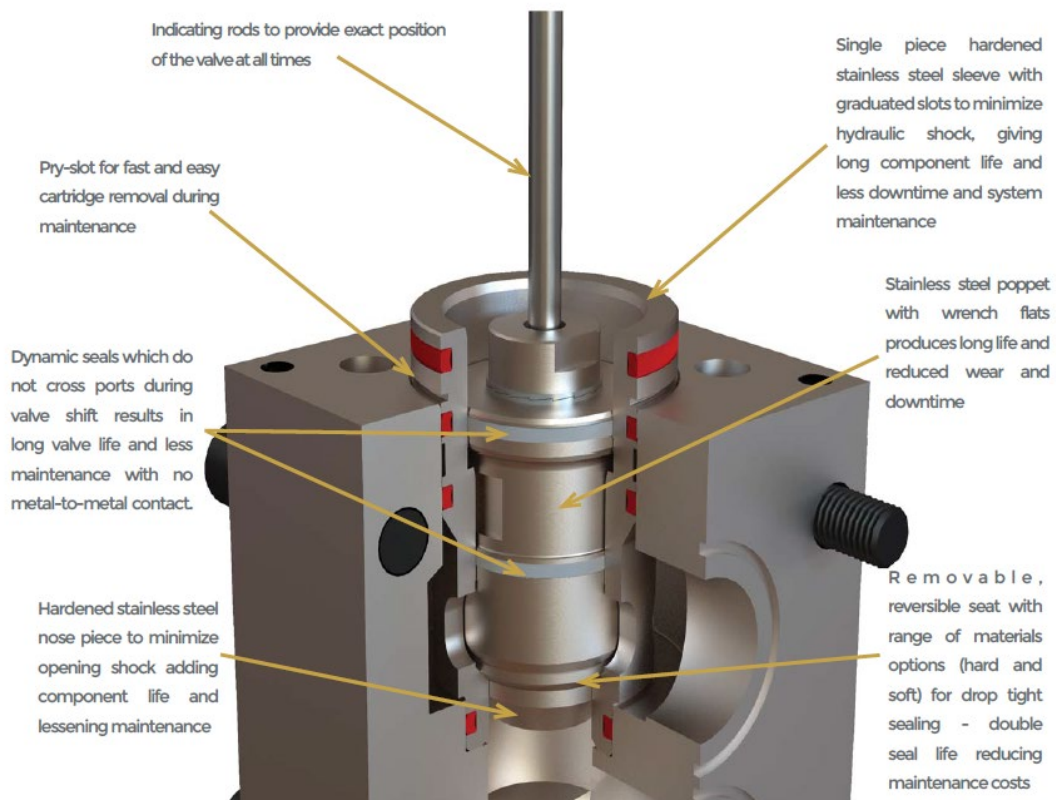
One of the main differences is that the body of the water hydraulics valves has seals to stop leakage across the valve ports. The oil directional valves have a very small amount of cross port leakage, which lubricates the movement of the spool. This makes the required solenoid force required on water hydraulic valves to be significantly higher and Cetop 5 directional control valves have air operated spools to overcome the forces required.

Another of the differences is the main body of water hydraulic valves is stainless steel and is hardened and coated. This is to prevent the erosion and corrosion effects of the water.

For sizes above Cetop 5, water hydraulics tend to use slip in cartridge valves and use the Cetop 5 directional control valve to pilot the cartridges.



Directional control valve with slip in cartridges



Details of the slip cartridge with hardened reversible seat and long lasting dynamic seals. The cartridges can be easily removed for repair.

Water hydraulic valves are specially produced and are designed to be hard wearing and maintainable. They are used on applications where there is a risk of fire or environmental problems.