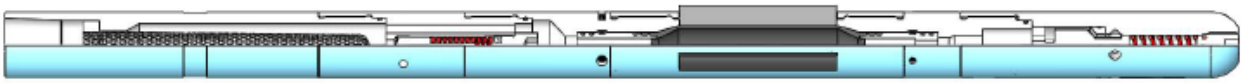
Hydraulic Shifting Tool



The Hydraulic Shifting Tool (HST) is a custom manufactured hydraulic tool used to specifically shift the position of the sliding sleeve within the Flow Control Devices (FCH) by pumping fluids. The design of the HST allows passage through the sliding sleeve when the internal pressure of the HST is set to zero. When the internal pressure is increased, passage is not allowed. The outside diameter of the HST is 3.000" deflated and 3.565" inflated. The HST will connect to the bottom of a work string of a 2 ⅜" EUE tubing or coiled tubing.

The HST can either push the sliding sleeve down within the FCDs to change positions, or it can pull the sliding sleeve up to change positions. To shift to one of the different settings in the FCDs, place the HST above (to push) or below (to pull). Inflate the bladder of the HST to extend the dogs to a larger diameter using pump pressure. Move the work string until the dogs move into contact with the sliding sleeve of the FCDs and push or pull the sleeve to its next nozzle setting position. After the desired setting is achieved, release the fluid pressure to deflate the dogs to a smaller diameter and remove the HST from the FCD.

The HST is equipped with a Flow Control Valve (FCV) and a Pressure Relief Valve (PRV). The FCV is in the open position. As fluid is pumped by the FCV, increased velocity will overcome a set value and close the FCV. Once the FCV is closed, pressure will build within the HST and inflate the bladder, which extends the dogs outward to increase the outside diameter of the tool. As pressure continues to build, it will reach a set pressure of the PRV and open this PRV. The PRV will open when it sees the maximum set pressure and will close when it sees a minimum set pressure. The PRV will continually hold a minimum pressure required to hold the dogs opened for shifting and contain a maximum pressure to protect from damaging the HST bladder. These set pressures for both flow and pressure can easily be reset to other values in the field by replacing springs that are easy to install.

The FCV will automatically open once the pressure reaches a minimum value. This allows the pipe to drain when tripping the work string in and out of the well. After a shifting procedure has been completed, open the pipe to atmosphere on the rig floor. This will equalize the hydrostatic pressures between pipe and annulus and will open the FCV for pipe drainage.

APPLICATION

- HST is used to function sliding sleeves on FCD tools.
- Can be run with work string tubing and coiled tubing strings.

FEATURES

- Operates using hydraulics and mechanical up/down movement only. No rotation of the work string is required. Coiled tubing rigs can be used.
- Contains safety pressure relief and Flow Control Valves for safe and easy operation.
- Field adjustable pressure and flow settings on HST valves.

BENEFITS

- The HST allows steam/production nozzle settings within the FCD to be changed down hole, eliminating the need to remove the completion casing from the wellbore.

CORE DESIGN

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