
The WellTools Pressure Activated Circulating Sub (PACS) is a flow activated tool which is a replacement for the conventional drop ball Circulating Sub. As it is flow actuated, the Circulating Sub can be opened and closed as many times as required. Put simply, the tool has two positions; flow thru. and circulating. Switching from one position to another is achieved by turning the pumps off and on again.

Tool Function

The PACS tool uses hydraulic pressure to move an internal piston which stops in one of two positions each time the tool is cycled. This hydraulic pressure comes from the pressure created by fluid flowing through either the tools below or an internal nozzle. These two positions allow the fluid to pass through the tool to the BHA below or out of the circulating ports into the annulus.

Uses

- Allows increased flowrate giving higher annular velocities which can assist in hole cleaning.
- Can be used to circulate acid or nitrogen without damage to the PDM.
- If required, the two cycles can be changed to 'split' the flow.

Advantages

- Whilst circulating, increasing the pump rate opens up the flow ports to compensate. This no increase in pressure drop is seen across the BHA.
- Smooth through bore prevents damage to internal parts.
- No restriction through the tool allows the passage of wireline equipment if required.
- 100% sealing through the tool whilst in circulating mode.

Additional Uses

Splitting the Fluid Flow

If required, the two positions can be used to 'split' the fluid flow. For example one mode forces 100% of the fluid to the BHA and when cycled the fluid is split to 60% to the BHA and 40% to the circulating ports. When drilling with a PDM this allows the operator to selectively increase the flowrate for more effective hole cleaning whilst continuing to drill at the same time.

Selective Jetting

The circulating body can be removed from the tool and replaced by a Jetting Body. This flexibility allows the tool to be used as a selective Jetting Nozzle. The nozzles can be used in a variety of combinations allowing forward and or reverse jetting. It can also be used in combination with rotary head jetting tools jetting for maximum cleaning efficiency.