Single-Action Diverter Tool

Reduces surge and simplifies the planning and execution of running and cementing liners and long strings in deepwater wells

Applications

- Running and cementing liners or long strings in weak formations
- Running liners or long strings through tight annular clearances

Features and Benefits

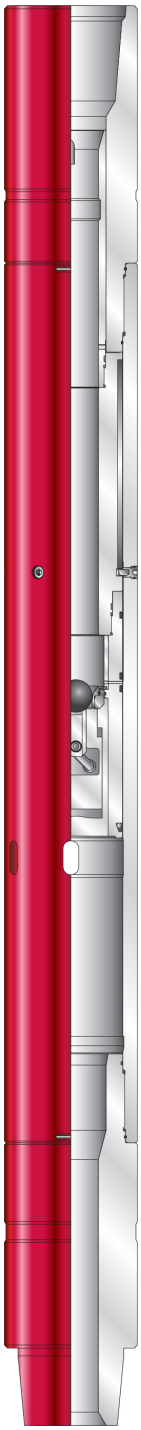
- An integrated verification test port confirms that the tool is closed, which eliminates the need to run an additional test device.
- A mechanical ball seat (MBS) is used to close and pressure test the tool.
- Large bypass ports divert fluid into the annulus, which reduces the risk of exceeding the formation fracture gradient and increases run-in-hole speeds.
- SurgeMOD* software optimizes tripping speeds to reduce liner-running time and maintain surge pressure below the formation fracture gradient.
- After conversion, the drop ball and seat are moved from the flow path and retained in the tool to provide a full-bore ID, eliminating compatibility issues with liner-setting balls while reducing the number of hydraulic events during displacement of the cement job and preventing damage to drillpipe darts.

Tool Description

The Weatherford single-action diverter tool is installed in the landing string above the liner hanger to direct wellbore fluid from the drillpipe into the annulus as the liner is run in the hole.

The deactivation ball is either run on the mechanical ball seat (MBS) or dropped from surface at the time of deactivation. When the liner has reached the target depth, pressure may be applied to deactivate the tool. At 500 psi, the tool will shift closed, which isolates the circulation ports and locks the internal sleeve to the body. With the industry's first verification test port, 1,000 psi surface pressure is applied above and below the circulation ports to confirm that the tool has closed.

To proceed with the liner job, pressure is increased to 1,500 psi, which shears the ball seat and locks it in the bypass position. The deactivation ball is then trapped by the MBS to provide a full-bore ID that enables damage-free passage of the drillpipe darts. When circulation is reestablished, the circulation pressure may be compared to pre-job models to confirm functionality.



The Weatherford single-action diverter tool directs wellbore fluid from the drillpipe into the annulus as the liner is run in the hole.

* SurgeMOD is a trademark of Pegasus Vertex, Inc.

Weatherford®

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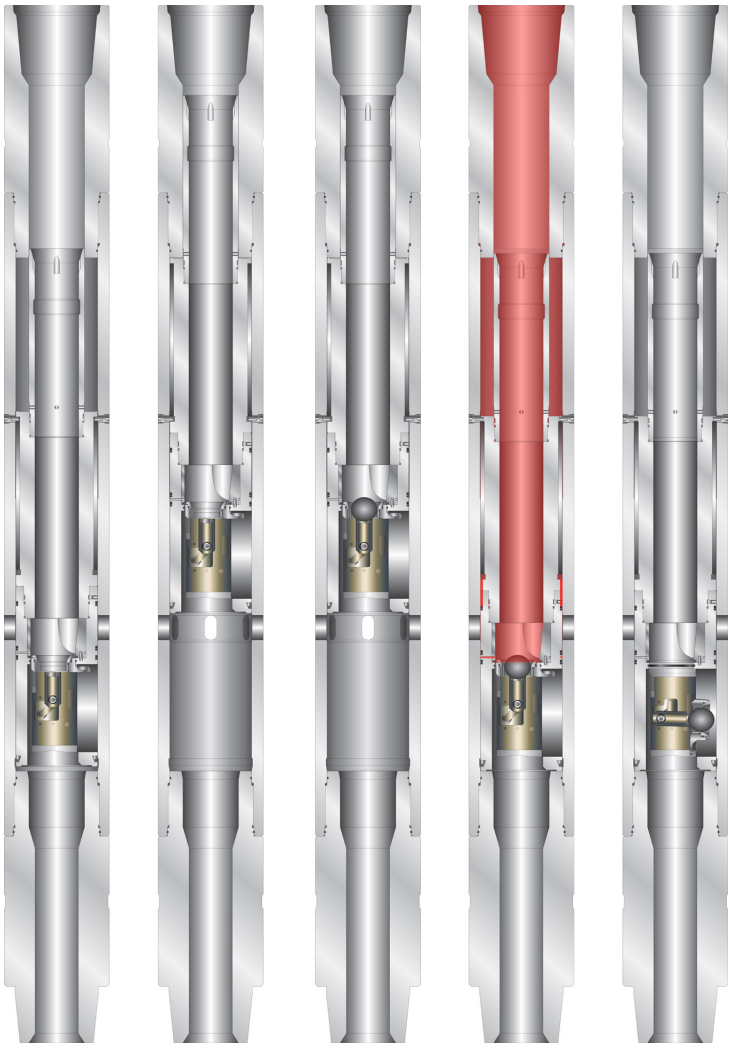
Installation Sequence

The single-action diverter tool activation sequence can be broadly divided into five stages, as shown below, from left to right:

1) Pre-job pressure-test position of the diverter tool internals
2) Diverter tool assembled and ready for operation
3) The 2.125-in. drop ball lands in the ball seat
4) Shear pins sheared, bypass closed and pressure test of the S seals, with ball seat unsheared
5) Diverter tool locked in the closed position, with the ball retracted and ball seat sheared, ready for the liner/cementation process



Single-action diverter tool activation sequence, with gold highlighter to emphasize position of the circulation ports, and red to emphasize pressure against the ball.