Schlumberger

CoilShift Precision

CT frac sleeve

Rated to 10,000 psi [69 MPa]

Rated to 285 degF [141 degC]

APPLICATIONS

- Cemented multistage stimulation with single-entry fracture placement
- Openhole multistage stimulation, using openhole packers
- Gas or water shutoff

BENEFITS

- Simplifies multistage stimulation operations
- Enables rigless zonal shutoff later in the life of the well

FEATURES

- Reclosable sleeve that is opened and closed with CT
- Premium coatings and scraping mechanisms that are proven in harsh thermal environments
- Large frac port area that ensures access to fracture planes
- Fullbore access, enabling cementing and reentry for subsequent stimulation or workovers
- Reliable shifting tool technology with positive indication of sleeve actuation
- Fail-safe opening and closing
- Short sleeve length to facilitate handling and installation

Selective stimulation and shutoff

CoilShift Precision* CT frac sleeve enables selective single-point multistage stimulation and adds flexibility for rigless zonal shutoff later in the life of the well.

The two-position fullbore sleeve is designed for the most common high-pressure and high-rate fracturing operations. The inner sleeve is run in a pinned configuration. The pin is sheared when required, providing positive indication that the specified port has opened before fracturing.

CoilShift Precision sleeves can be opened, closed, reopened for production, and reclosed for zonal shutoff, enabling operators to tailor production over the life of the well using the shifting tool. This is accomplished using premium sealing technology, advanced coatings, and inner-bore scraping mechanisms, all proven in harsh thermal environments.

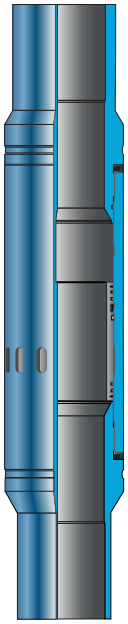
Reliable shifting tool

The compact shifting tool is designed to self-centralize and is rated to 10,000-psi [69-MPa] differential pressure. Individual hydraulically controlled keys ensure maximum performance during actuation. Each key is engineered to withstand as much as 45,000 lbf [20,017 daN] of overpull without tool damage.

The shifting tool is a fracture-in-place solution with no requirements for isolation or related service tools, even after hundreds of stages are fractured. The fully compartmentalized and hydraulically balanced design with multiple layers of solids control ensures that no solids will interfere with the tool's operation.

Fail-safe operation

The shifting tool works with the sleeve's adjustable detent locking system, which locks the sheared sleeve to prevent accidental manipulation. A clear change on the weight indicator accompanies release of the shifting tool, providing operators with a reliable surface indication that the sleeve has shifted. The tool is designed to release only when the sleeve is fully actuated (100% open or 100% closed). If required, the shifting tool keys can also be retracted by releasing hydraulic pressure from the tool (when the operator stops pumping through the tool).



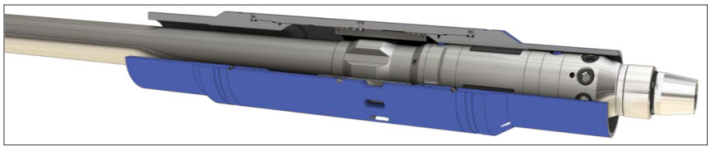
CoilShift Precision CT frac sleeve.

Shifting tool.

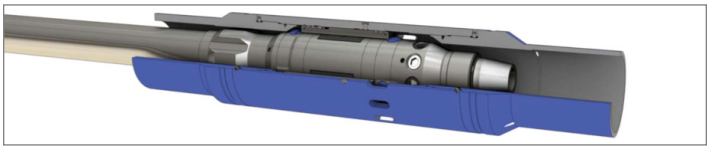
CoilShift Precision

4.5-in. CoilShift Precision CT Frac Sleeve	
Sleeve Specifications	
Max. OD	5.47 in [138.9 mm]
Min. ID in casing weight of	
11.6 lbm/ft [17.3 kg/m]	3.92 in [99.6 mm]
13.5 lbm/ft [20.1 kg/m]	3.92 in [99.6 mm]
15.1 lbm/ft [22.5 kg/m]	3.80 in [96.5 mm]
Sleeve weight	70 lbm [32 kg]
Total length	29.86 in [758.4 mm]
Up position/lower position	Stimulation/closed
Fracture port area	11.2 in^2 [72.3 cm^2]
Casing Specifications	
Size	4.5 in [114.3 mm]
Weight	11.6–15.1 lbm/ft [17.3–22.5 kg/m]
Sleeve Operating Data	
Tensile	260,000 lbf [115,654 daN]
Max. pressure	15,000 psi [103 MPa]
Temperature rating	285 degF [141 degC]
Up shifting weight	3,000–5,000 lbf [1,334–2,224 daN]
Down shifting weight	3,000–5,000 lbf [1,334–2,224 daN]
Torque	12,000 lbf.ft [16,270 N.m]

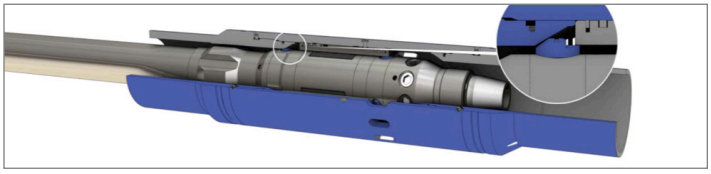
5.5-in. CoilShift Precision CT Frac Sleeve	
Sleeve Specifications	
Max. OD	6.96 in [176.8 mm]
Min. ID in casing weight of	
17.0 lbm/ft [25.3 kg/m]	4.80 in [121.9 mm]
20.0 lbm/ft [29.8 kg/m]	4.70 in [119.4 mm]
23.0 lbm/ft [34.2 kg/m]	4.60 in [116.8 mm]
Sleeve weight	150 lbm [68 kg]
Total length	34.34 in [872.2 mm]
Up position/lower position	Stimulation/closed
Fracture port area	14.8 in^2 [95.5 cm^2]
Casing Specifications	
Size	5.5 in [139.7 mm]
Weight	17.0–23.0 lbm/ft [25.3–34.2 kg/m]
Sleeve Operating Data	
Tensile	600,000 lbf [266,893 daN]
Max. pressure	15,000 psi [103 MPa]
Temperature rating	285 degF [141 degC]
Up shifting weight	3,000–5,000 lbf [1,334–2,224 daN]
Down shifting weight	3,000–5,000 lbf [1,334–2,224 daN]
Torque	18,000 lbf.ft [24,405 N.m]



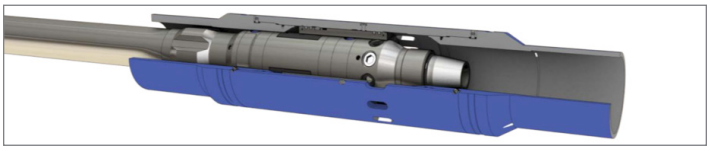
Stage 1. *Pumping through the shifting tool results in a hydraulic differential that extends three sets of paired keys (six keys in all). The keys extend uniformly as the CT string is pulled upward toward the sleeve to be shifted.*



Stage 2. *The leading keys of each pair deflect over the inner sleeve to pass freely. As the CT string continues to pull, the rear keys latch onto the sleeve, creating tension that eventually exceeds the shear pin setting. The sleeve is designed to shift even if only a single key latches, adding redundancy for maximum reliability.*



Stage 3. *When the sleeve is fully actuated (100% open), the leading keys reach a kickoff profile in the upper sleeve cavity, retracting all the keys and releasing the sleeve.*



Stage 4. *The CT string loses tension,indicating that the sleeve has shifted and the tool can be pulled through the sleeve cavity. If a sleeve is partly shifted, the keys will retract only after the operator stops pumping and releases the hydraulic differential pressure.*

4.5-in Shifting Tool Specifications	
Tool Specifications	
Gauge ring max. OD	
for 11.6–13.5 lbm/ft [17.3–20.1 kg/m]	3.75 in [95.3 mm]
for 15.1 lbm/ft [22.5 kg/m]	3.55 in [90.2 mm]
Min. ID (no orifice)	0.63 in [16 mm]
Length	28.62 in [726.9 mm]
Top connection (PAC)	2.375 in [60 mm]
Bottom connection (PAC)	2.375 in [60 mm]
Tool Operating Data	
Max. tensile force (on keys)	37,000 lbf [16,458 daN]
Working pressure	1,000–3,000 psi [6.9–20.7 MPa]

5.5-in Shifting Tool Specifications	
Tool Specifications	
Gauge ring max. OD	
for 17–20 lbm/ft [25.3–29.8 kg/m]	4.57 in [116.1 mm]
for 23 lbm/ft [34.2 kg/m]	4.44 in [112.8 mm]
Min. ID (no orifice)	1.0 in [25.4 mm]
Length	26.37 in [669.8 mm]
Top connection (PAC)	2.375 in [60 mm]
Bottom connection (PAC)	2.375 in [60 mm]
Tool Operating Data	
Max. tensile force (on keys)	45,000 lbf [20,017 daN]
Working pressure	1,000–3,000 psi [6.9–20.7 MPa]

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