

AERO HARRIER SHIFTING TOOL

Hydraulically actuated shifting tool



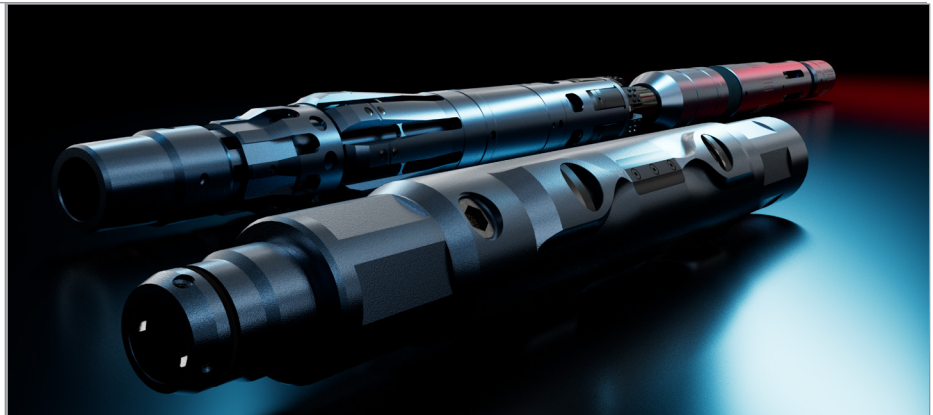
Rated up to 5,000 psi
[35 MPa]



Rated up to 285 degF
[141 degC]

FEATURES

- Lowest water usage of any intervention frac method available
- Proprietary configurations for fracturing down the annulus (coil/casing) or down the coil
- Extensively tested, cycled over 2000 times
- Fully compartmentalized, and hydraulically balanced, multiple solid control mechanisms prevent any solids from impeding the Harrier's performance.
- Capable of 35,000 lbs. of over pull without disengaging the valve
- Fail-safe opening and closing, the Harrier will only release if the operator stops pumping or valve shifts.
- POSI-lock™ technology provides a positive force indication at surface of valve shifting.
- Configurable for thermal environments



Designed for in-place hydraulic fracturing while eliminating entry points for solids to enter the tool, the Harrier in combination with the PremiumPort effectively eliminates the need for isolation, packer cups, and slips.

Operation

The Aero Harrier shifting tool is a revolutionary coil or tubing conveyed hydraulically actuated shifting tool designed to manipulate the complete line of PremiumPort 2 and 3 position valves, while providing maximum reliability and simple operation in open/close and re-open operations.

Measuring less than 2 feet in it's 3.5" configuration, it is currently the shortest profile shifting tool available. It features a unique self-centralizing design, a 10,000 psi pressure rating and individual hydraulically controlled keys which allows up to 35,000 lbs of over-pull during actuation, without releasing the valve until desired.

The Harrier has been engineered as a frac in place solution with no requirement for isolation or related service tools. The Harrier's fully compartmentalized and hydraulically balanced design ensures no solids will interfere with the Harrier's operation, even after stimulation of hundreds of stages.

Field Proven, Fail Safe Reliability

The Harrier, in combination with the PremiumPort's adjustable POSI-lock mechanism, provides operators with a reliable surface indication of shift via the weight indicator, combined with the release of the shifting tool. The Harrier is designed to release the valve while actuated only once the valve has shifted, or when the operator ceases pumping.

Pumping across the Harrier creates a differential over the shifting keys allowing them to extend to the 'shift position'. It is not necessary to circulate during shifting operations. If desired, a field adjustable pre-circulation rate may be configured so circulation can be performed without the keys extending up to variable pressure differentials.

Aero Harrier shifting tool

Nominal Size, in [mm]	Outside Diameter, in [mm]	Length, in [mm]	Standard Connection	Temperature Rating, degF [degC]
3.5 [88.9]	2.75 [69.8]	20.5 [520.7]	2 3/8 PAC DSI Pin	285 [141]
4.0 [101.6]	3.25 [82.5]	21.8 [553.7]	2 3/8 PAC DSI Pin	285 [141]
4.5 [114.3]	3.75 [95.2]	24.5 [622.3]	2 3/8 PAC DSI Pin	285 [141]
5.5 [139.7]	4.64 [117.8]	27.5 [698.5]	2 3/8 PAC DSI Pin	285 [141]
7.0 [177.8]	6.0 [152.4]	27.5 [698.5]	2 3/8 PAC DSI Pin	285 [141]

