Rhino

Hydraulic underreamer

Single-run underreaming while drilling accelerates production and reduces drillout trips and NPT

Applications

- Hole enlargement while drilling
- Onshore or offshore wells
- Swelling or unstable formations

Features

- Moving parts placed farther from critical flow ports
- Three drilling fluid ports to facilitate cuttings removal
- Compatible with rotary or rotary steerable BHA components
- Locking mechanism for shoe-track drillout applications
- Undergauge diameter to optimize annular flow
- Optional stabilizer sleeve for improved stability
- Maximum lost circulation material: 50 lbm/bbl [142.65 kg/m3]

Rhino hydraulic "stab" underreamer (top).
Rhino hydraulic "slick" underreamer (bottom).

The Rhino™ hydraulic underreamer is part of the Rhino integrated borehole enlargement system—a family of hydraulically actuated reamers that save rig time and bring production online faster by underreaming while drilling in a single run. The Rhino hydraulic underreamer reduces trip-out time, especially in swelling or unstable formations.

How it improves performance

The single-piece body of the Rhino hydraulic underreamer enables a higher tensile- and torque-load capacity. It can be configured for a wide range of borehole sizes depending on the well requirements. The reamer features a symmetrical, concentric arrangement of PDC cutter blocks that are selected for extreme durability against the specific lithological application.

How it works

The rugged, precision-engineered Rhino hydraulic underreamer features moving parts positioned farther from critical flow ports on the undergage body for optimal flow. Hole enlargement results from cutter block actuation by drilling fluid flow. The fluid then exits the reamer through three fluid ports to improve cuttings removal. An optional integral stabilized body enables use during high ROP in high lateral-vibration applications.

PIM23-WCDR-1778437 PS

Rhino

Rhino Specifications

Specifications	5000 Slick	5500 Slick	5625 Slick
Tool overall length	5.17 ft [1.57 m]	11.46 ft [3.49 m]	11.46 ft [3.49 m]
Minimum neck length	1.18 ft [0.35 m]	1.50 ft [0.46 m]	1.50 ft [0.46 m]
Body and stabilizer diameter	5 in	5 1/2 in	5 5/8 in
Minimum flow-by area for entire tool, pilot hole	2.01 in2 [12.96 cm2]	2.77 in2 [17.87cm2]	3.17 in2 [20.45 cm2]
Minimum inside diameter	1 1/4 in	1 3/8 in	1 3/8 in
Weight	234 lbm	594 lbm	589 lbm
Hole opening size	5 1/4-6 1/4 in	6 1/2-7 in	6 1/2-7 in
Pilot hole size	5 1/4 in	5 3/4 in	5 7/8 in
Minimum collapsed diameter	5 in	5 1/2 in	5 5/8 in
Maximum flow rate	230 galUS/min [0.87 m3/min]	350 galUS/min [1.35 m3/min]	350 galUS/min [1.35 m3/min]
Minimum operating pressure	500 psi [3.45 MPa]	500 psi [20.68 MPa]	500 psi [3.45 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3,000 psi [190 MPa]	3,000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	3 1/2 Reg box	NC 38 box	NC 38 box
Fishing neck outside diameter	5 in	5 1/4 in	5 1/4 in
Bottom end connection	3 1/2 Reg pin	4 1/2 Reg pin	4 1/2 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

All specifications are subject to change without notice.

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Rhino

Rhino Specifications

Specifications	5800 Slick	6125 Slick	6375 Slick
Tool overall length	11.46 ft [3.49 m]	11.46 ft [3.49 m]	11.46 ft [3.49 m]
Minimum neck length	1.50 ft [0.46 m]	1.50 ft [0.46 m]	1.50 ft [0.46 m]
Body and stabilizer diameter	5 13/16 in	6 1/8 in	6 3/8 in
Minimum flow-by area for entire tool, pilot hole	4.23 in2 [27.29 cm2]	4.9 in2 [31.61 cm2]	7.4 in2 [47.74 cm2]
Minimum inside diameter	1 3/8 in	1 3/8 in	1 3/8 in
Weight	607 lbm	623 lbm	629 lbm
Hole opening size	6 1/2-7 3/8 in	7-7 1/2 in	7-8 in
Pilot hole size	6 1/8 in	6 3/8 in	6 3/4 in
Minimum collapsed diameter	5 13/16 in	6 1/8 in	6 3/8 in
Maximum flow rate	350 galUS/min [1.35 m3/min]	350 galUS/min [1.35 m3/min]	350 galUS/min [1.35 m3/min]
Minimum operating pressure	500 psi [3.45 MPa]	500 psi [3.45 MPa]	650 psi [4.48 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	NC 38 box	NC 38 box	NC 38 box
Fishing neck outside diameter	5 1/4 in	5 3/8 in	5 3/8 in
Bottom end connection	4 1/2 Reg pin	4 1/2 Reg pin	4 1/2 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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PM23-WCDR-1778437 PS

Rhino

Rhino Specifications

Specifications	7250 Slick	7300 Slick	8000 Stabilized
Tool overall length	11.46 ft [3.49 m]	11.46 ft [3.49 m]	12.13 ft [3.70 m]
Minimum neck length	1.50 ft [0.46 m]	1.50 ft [0.46 m]	2.96 ft [0.9 m]
Body and stabilizer diameter	7 1/4 in	7 5/16 in	8.375 (with hardfacing coating) in
Minimum flow-by area for entire tool, pilot hole	6.81 in2 [43.93 cm2]	5.43 in2 [35.03 cm2]	5.5 in2 [35.48 cm2]
Minimum inside diameter	1 3/8 in	1 11/16 in	2 in
Weight	1048 lbm	1074 lbm	1285 lbm
Hole opening size	8-9 in	8-9 in	8 3/4-10 1/4 in
Pilot hole size	7 1/2 in	7 1/2 in	8 1/2 in
Minimum collapsed diameter	7 1/4 in	7 5/16 in	8 3/8 in
Maximum flow rate	350 galUS/min [1.35 m3/min]	525 galUS/min [1.99 m3/min]	750 galUS/min [2.84 m3/min]
Minimum operating pressure	650 psi [4.48 MPa]	650 psi [4.48 MPa]	650 psi [4.48 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	4 IF box	4 IF box	NC 50 box
Fishing neck outside diameter	6 1/4 in	6 1/4 in	6 1/2 in
Bottom end connection	4 IF pin	4 IF pin	NC 50 pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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Rhino

Rhino Specifications

Specifications	8000 Slick	9250 Stabilized	9250 Slick
Tool overall length	12.13 ft [3.70 m]	12.46 ft [3.80 m]	12.46 ft [3.80 m]
Minimum neck length	2.96 ft [0.9 m]	2.96 ft [0.9 m]	2.96 ft [0.9 m]
Body and stabilizer diameter	8 in	9.75 (with hardfacing coating) in	9 1/4 in
Minimum flow-by area for entire tool, pilot hole	5.15 in2 [33.22 cm2]	15.62 in2 [100.77 cm2]	13.2 in2 [85.18 cm2]
Minimum inside diameter	2 in	2 in	2 in
Weight	1275 lbm	1410 lbm	1401 lbm
Hole opening size	8 3/4-10 1/4 in	10 1/4-11 3/4 in	10 1/4-11 3/4 in
Pilot hole size	8 1/4 in	9 7/8 in	9 1/2 in
Minimum collapsed diameter	8 in	9 3/4 in	9 1/4 in
Maximum flow rate	750 galUS/min [2.84 m3/min]	750 galUS/min [2.84 m3/min]	750 galUS/min [2.84 m3/min]
Minimum operating pressure	650 psi [4.48 MPa]	800 psi [5.5 MPa]	800 psi [5.5 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.7 MPa]	3000 psi [20.7 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	NC 50 box	NC 50 box	NC 50 box
Fishing neck outside diameter	6 1/2 in	6 1/2 in	6 1/2 in
Bottom end connection	NC 50 pin	NC 50 pin	NC 50 pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50 lbm/bbl [142.65 kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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Rhino

Rhino Specifications

Specifications	10000 Stabilized	10000 Slick	11625 Stabilized
Tool overall length	13.17 ft [4.01 m]	13.17 ft [4.01 m]	14.50 ft [4.42 m]
Minimum neck length	3.98 ft [1.21 m]	3.98 ft [1.21 m]	4.93 ft [1.5 m]
Body and stabilizer diameter	10.5 (with hardfacing coating) in	10 in	12.125 (with hardfacing coating) in
Minimum flow-by area for entire tool, pilot hole	10.73 in2 [69.22 cm2]	13.35 in2 [85.8 cm2]	8.05 in2 [51.93 cm2]
Minimum inside diameter	2 1/2 in	2 1/2 in	3 in
Weight	2219 lbm	2196 lbm	3762 lbm
Hole opening size	11-12 1/4 in	11-12 1/4 in	13 1/2-15 in
Pilot hole size	10 5/8 in	10 1/2 in	12 1/4 in
Minimum collapsed diameter	10 1/2 in	10 in	12 1/8 in
Maximum flow rate	1200 galUS/min [4.54 m3/min]	1200 galUS/min [4.54 m3/min]	1700 galUS/min [6.44 m3/min]
Minimum operating pressure	800 psi [5.5 MPa]	800 psi [5.5 MPa]	800 psi [5.5 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	6 5/8 Reg box	6 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box
Fishing neck outside diameter	8 1/4 in	8 1/4 in	8 1/4 or 9 1/2 in
Bottom end connection	6 5/8 Reg pin	6 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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PIM23-WCDR-1778437 PS

Rhino

Rhino Specifications

Specifications	11625 Slick	13000 Stabilized	13000 Slick
Tool overall length	14.50 ft [4.42 m]	14.50 ft [4.42 m]	14.50 ft [4.42 m]
Minimum neck length	4.93 ft [1.5 m]	4.93 ft [1.5 m]	4.93 ft [1.5 m]
Body and stabilizer diameter	11 5/8 in	14 3/8 in	13 in
Minimum flow-by area for entire tool, pilot hole	12.12 in2 [78.19 cm2]	22.16 in2 [142.96 cm2]	22.16 in2 [142.96 cm2]
Minimum inside diameter	3 in	3 in	3 in
Weight	3723 lbm	4,701 lbm	3910 lbm
Hole opening size	13 1/2-15 in	15-16 1/2 in	15–16 1/2 in
Pilot hole size	12 1/8 in	14 1/2 in for 14 3/8-in stabilizer 14 3/4 in for 14 5/8-in stabilizer	13 1/2 in
Minimum collapsed diameter	11 5/8 in	13 in	13 in
Maximum flow rate	17000 galUS/min [6.44 m3/min]	1,700 galUS/min [6.44 m3/min]	1700 galUS/min [6.44 m3/min]
Minimum operating pressure	800 psi [5.5 MPa]	800 psi [5.5 MPa]	800 psi [5.5 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box
Fishing neck outside diameter	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in
Bottom end connection	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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Rhino

Rhino Specifications

Specifications	14250 Stabilized	14250 Slick	16000×20 Stabilized
Tool overall length	14.50 ft [4.42 m]	14.50 ft [4.42 m]	14.50 ft [4.42 m]
Minimum neck length	4.93 ft [1.5 m]	4.93 ft [1.5 m]	4.93 ft [1.5 m]
Body and stabilizer diameter	14 3/8 in	14 1/4 in	16 3/8 in
Minimum flow-by area for entire tool, pilot hole	29.71 in2 [191.67 cm2]	29.71 in2 [191.67 cm2]	38.94 in2 [251.22 cm2] for 16 3/8-in stabilizer 77.15 in2 [497.74 cm2] for 18-in stabilizer
Minimum inside diameter	3 in	3 in	3 in
Weight	4865 lbm	4193 lbm	6313 lbm
Hole opening size	16-18 in	16-18 in	18–20 in
Pilot hole size	14 1/2 in for 14 3/8-in stabilizer 14 3/4 in for 14 5/8-in stabilizer	14 3/4 in	16 1/2 in for 16 3/8-in stabilizer 18 1/8 in for 18-in stabilizer
Minimum collapsed diameter	14 1/4 in	14 1/4 in	16 in
Maximum flow rate	1700 galUS/min [6.44 m3/min]	1700 galUS/min [6.44 m3/min]	1700 galUS/min [6.44 m3/min]
Minimum operating pressure	800 psi [5.5 MPa]	800 psi [5.5 MPa]	800 psi [5.52 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	375 degF [190 degC]	375 degF [190 degC]
Top end connection	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box
Fishing neck outside diameter	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in
Bottom end connection	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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PIM23-WCDR-1778437PS

Rhino

Rhino Specifications

Specifications	16000×20 Slick	16000×22 Stabilized	16000×22 Slick
Tool overall length	14.50 ft [4.42 m]	14.50 ft [4.42 m]	14.50 ft [4.42 m]
Minimum neck length	4.93 ft [1.5 m]	4.93 ft [1.5 m]	4.93 ft [1.5 m]
Body and stabilizer diameter	16 in	16 3/8 in	16 in
Minimum flow-by area for entire tool, pilot hole	77.15 in2 [497.74 cm2]	38.94 in2 [251.22 cm2] for 16 3/8-in stabilizer 77.15 in2 [497.74 cm2] for 18-in stabilizer	77.15 in2 [497.74 cm2]
Minimum inside diameter	3 in	3 in	3 in
Weight	4864 lbm	6326 lbm	4877 lbm
Hole opening size	18–20 in	20–22 in	20–22 in
Pilot hole size	16 1/2 in	16 1/2 in for 16 3/8-in stabilizer 18 1/8 in for 18-in stabilizer	18 in
Minimum collapsed diameter	16 in	16 in	16 in
Maximum flow rate	1700 galUS/min [6.44 m3/min]	1700 galUS/min [6.44 m3/min]	1700 galUS/min [6.44 m3/min]
Minimum operating pressure	800 psi [5.52 MPa]	800 psi [5.5 MPa]	800 psi [5.5 MPa]
Maximum operating pressure	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]	3000 psi [20.68 MPa]
Maximum operating temperature	375 degF [190 degC]	419 degF [215 degC]	419 degF [215 degC]
Top end connection	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box	Top 6 5/8 or 7 5/8 Reg box
Fishing neck outside diameter	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in	8 1/4 or 9 1/2 in
Bottom end connection	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin	Bottom 6 5/8 or 7 5/8 Reg pin
Maximum lost circulation material (LCM)	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug	50-lbm/bbl [142.65-kg/m3] medium nut plug

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