



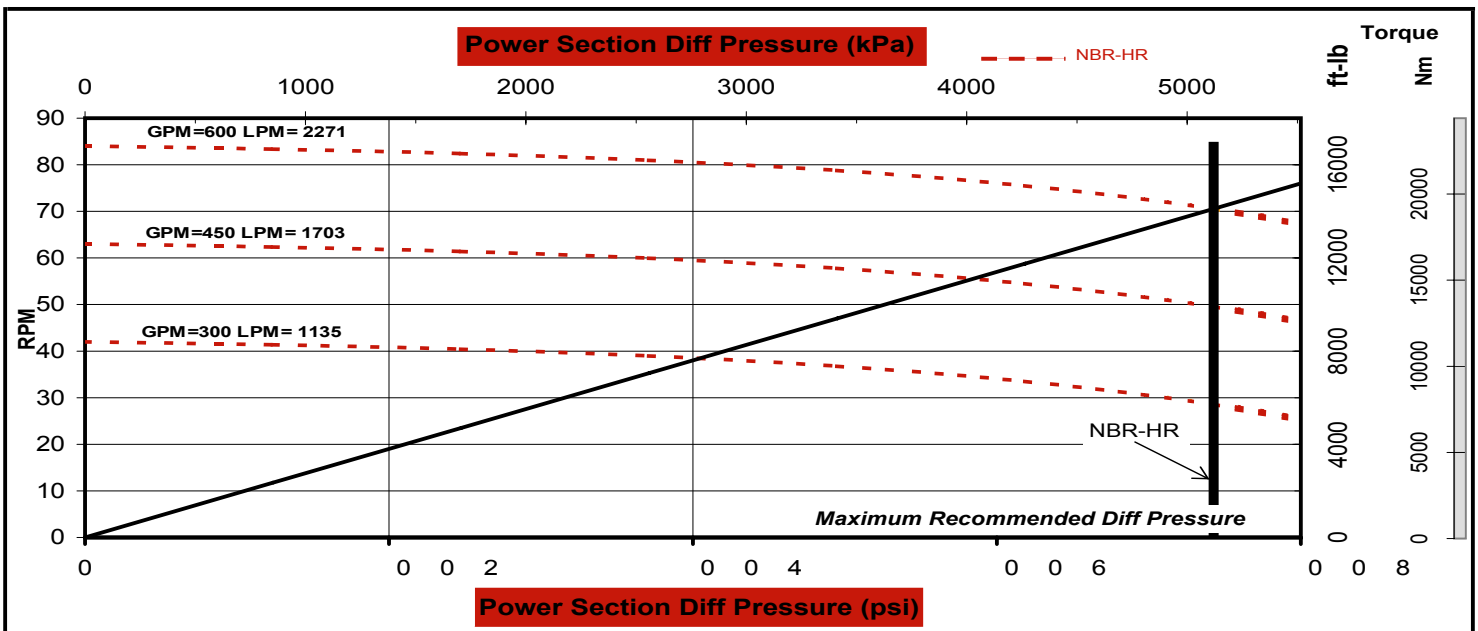
# Discovery Downhole Services, Inc.

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## SUPERHAWK 650 – 7:8 Profile 3.3 Stage HR - 6 1/2" O.D.

GENERAL DATA			
BIT SIZES	7 7/8" thru 9 7/8"	MAX. WOB – (w/flow)	110,000 lbs
BIT CONNECTION	4 1/2 REG	OPTIMUM WOB - (w/flow)	55,000 Lbs
TOP CONNECTION	4 1/2 XH	MAX. WOB – (w/o flow)	275,000 lbs
TORQUE - CONNECTIONS	18,500 ft-lb	MAX. BIT PULL – (w/damage)	380,000 lbs
TORQUE - ABH	26,500 ft-lb	MAX BODY PULL – (w/damage)	832,000 lbs

PHYSICAL PROPERTIES	
BIT TO BEND LENGTH (ABH)	82.50 in.
BIT TO BEND LENGTH (FIXED)	64.25 in.
NOMINAL LENGTH	365 in.
WEIGHT	2,875 lbs
PERFORMANCE DATA	
FLOW RANGE	300 - 600 gpm
SPEED RANGE	42 - 84 rpm
SPEED RATIO	.140 rev/gal
MAX. DIFFERENTIAL PRESSURE	740 psi
TORQUE RATIO	19.0 ft-lb/psi
TORQUE AT MAX DIFFERENTIAL	14,110 ft-lbs
STALL TORQUE	21,160 ft-lbs



CALCULATED BUILD UP RATES – DEGREES / 100 ft.* (FIXED)								
Angle (Deg)	Hole Size (in) – Slick Sleeve				Hole Size (in) - Stabilized			
	7 7/8"	8 1/2"	8 3/4"	9 7/8"	7 7/8"	8 1/2"	8 3/4"	9 7/8"
0.25	2.3	1.7	1.5		1.3	1.6	1.8	2.4
0.50	3.5	3.0	2.8		2.7	3.0	3.2	3.8
0.75	4.7	4.2	4.0	3.0	4.1	4.4	4.6	5.2
1.00	6.0	5.4	5.2	4.3	5.5	5.9	6.0	6.6
1.25	7.2	6.7	6.5	5.5	6.9	7.3	7.4	8.0
1.50	8.5	7.9	7.7	6.7	8.3	8.7	8.8	9.4
1.75	9.7	9.2	8.9	8.0	9.7	10.1	10.2	10.8
2.00	10.9	10.4	10.2	9.2	11.1	11.5	11.6	12.2
2.25	12.2	11.6	11.4	10.5	12.5	12.9	13.0	13.6
2.50	13.4	12.9	12.7	11.7	13.9	14.3	14.4	15.0
2.75	14.7	14.1	13.9	12.9	15.3	15.7	15.8	16.4
3.00	15.9	15.4	15.1	14.2	16.7	17.1	17.2	17.8

CALCULATED BUILD UP RATES – DEGREES / 100 ft.* (ABH)								
Angle (Deg)	Hole Size (in) – Slick Sleeve				Hole Size (in) - Stabilized			
	7 7/8"	8 1/2"	8 3/4"	9 7/8"	7 7/8"	8 1/2"	8 3/4"	9 7/8"
0.25	1.3	1.0			1.2	1.6	1.7	2.3
0.50	2.6	2.3	2.2		2.5	2.9	3.0	3.6
0.75	3.8	3.5	3.4	2.9	3.9	4.2	4.3	4.9
1.00	5.1	4.8	4.6	4.1	5.2	5.5	5.6	6.2
1.25	6.3	6.0	5.9	5.4	6.5	6.8	7.0	7.6
1.50	7.6	7.3	7.1	6.6	7.8	8.1	8.3	8.9
1.75	8.8	8.5	8.4	7.8	9.1	9.5	9.6	10.2
2.00	10.0	9.7	9.6	9.1	10.5	10.8	10.9	11.5
2.25	11.3	11.0	10.9	10.3	11.8	12.1	12.2	12.8
2.50	12.5	12.2	12.1	11.6	13.1	13.4	13.6	14.2
2.75	13.8	13.5	13.4	12.8	14.4	14.7	14.9	15.5
3.00	15.0	14.7	14.6	14.1	15.7	16.1	16.2	16.8

\* Actual Build Up Rates subject to varying factors; including formation, weight on bit.