

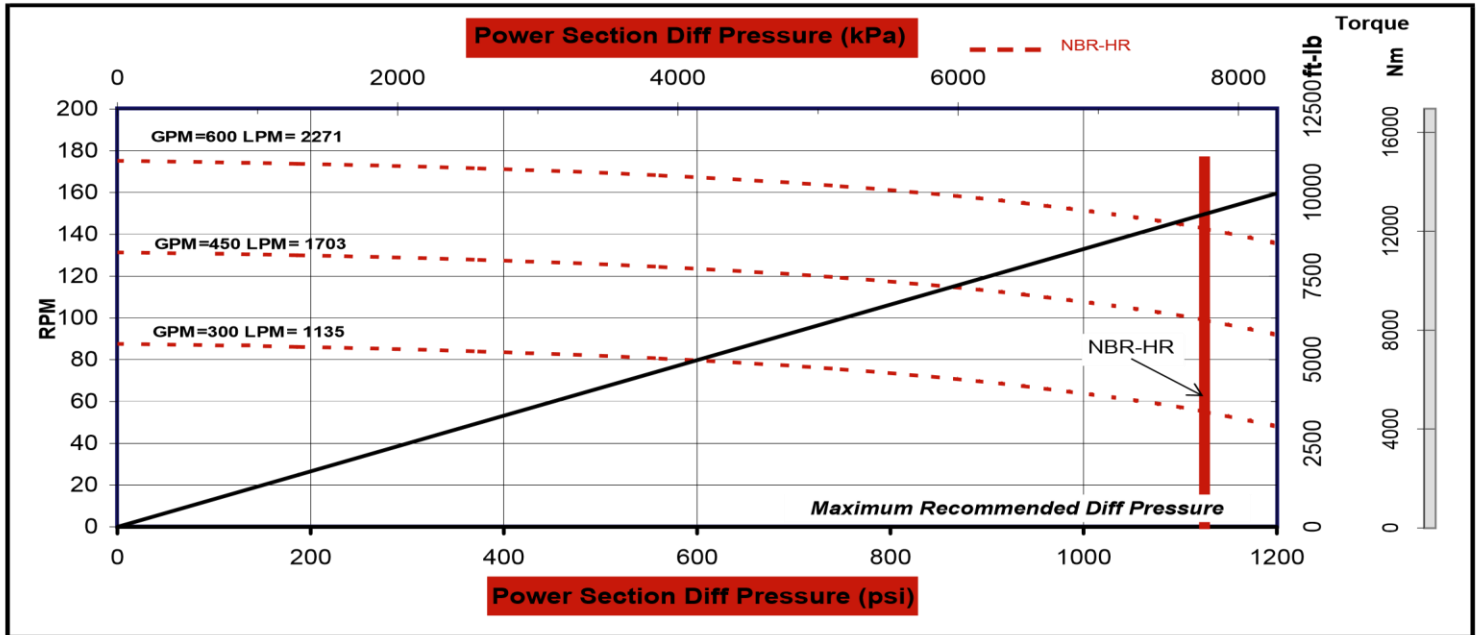


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## SHORT SUPERHAWK 650 – 6:7 Profile 5.0 Stage HR - 6 1/2" O.D.

GENERAL DATA			
<b>BIT SIZES</b>	7 7/8" thru 9 7/8"	<b>MAX. WOB – (w/flow)</b>	70,000 lbs
<b>BIT CONNECTION</b>	4 1/2 REG	<b>OPTIMUM WOB - (w/flow)</b>	35,000 Lbs
<b>TOP CONNECTION</b>	4 1/2 IF	<b>MAX. WOB – (w/o flow)</b>	140,000 lbs
<b>TORQUE - CONNECTIONS</b>	18,500 ft-lb	<b>MAX. BIT PULL – (w/damage)</b>	180,000 lbs
<b>TORQUE - ABH</b>	26,500 ft-lb	<b>MAX BODY PULL – (w/damage)</b>	625,000 lbs

PHYSICAL PROPERTIES	
<b>BIT TO BEND LENGTH (ABH)</b>	65.32 in.
<b>BIT TO BEND LENGTH (FIXED)</b>	43 in.
<b>NOMINAL LENGTH</b>	303 in.
<b>WEIGHT</b>	1,850 lbs
PERFORMANCE DATA	
<b>FLOW RANGE</b>	300 - 600 gpm
<b>SPEED RANGE</b>	87 - 180 rpm
<b>SPEED RATIO</b>	.292 rev/gal
<b>MAX. DIFFERENTIAL PRESSURE</b>	1,130 psi
<b>TORQUE RATIO</b>	8.313 ft-lb/psi
<b>TORQUE AT MAX DIFFERENTIAL</b>	9,350 ft-lbs
<b>STALL TORQUE</b>	14,030 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	2.6	1.6	1.2		2.2	2.7	3.0	4.0
0.50	4.1	3.1	2.7		4.1	4.6	4.8	5.9
0.75	5.6	4.6	4.2	2.3	5.9	6.5	6.7	7.7
1.00	7.1	6.0	5.6	3.8	7.8	8.4	8.6	9.6
1.25	8.5	7.5	7.1	5.3	9.7	10.3	10.5	11.5
1.50	10.0	9.0	8.6	6.8	11.6	12.1	12.4	13.4
1.75	11.5	10.5	10.1	8.2	13.5	14.0	14.2	15.2
2.00	13.0	11.9	11.5	9.7	15.3	15.9	16.1	17.1
2.25	14.4	13.4	13.0	11.2	17.2	17.8	18.0	19.0
2.50	15.9	14.9	14.5	12.6	19.1	19.7	19.9	20.9
2.75	17.4	16.4	15.9	14.1	21.0	21.5	21.8	22.8
3.00	18.8	17.8	17.4	15.6	22.9	23.4	23.6	24.6

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	1.4	0.9	0.8		1.8	2.3	2.5	3.4
0.50	2.9	2.4	2.2		3.5	4.0	4.1	5.0
0.75	4.4	3.9	3.7	2.9	5.1	5.6	5.8	6.7
1.00	5.8	5.4	5.2	4.4	6.7	7.2	7.4	8.3
1.25	7.3	6.9	6.7	5.9	8.3	8.8	9.0	9.9
1.50	8.8	8.4	8.2	7.4	10.0	10.4	10.6	11.5
1.75	10.3	9.9	9.7	8.9	11.6	12.1	12.3	13.1
2.00	11.8	11.3	11.2	10.3	13.2	13.7	13.9	14.8
2.25	13.3	12.8	12.6	11.8	14.8	15.3	15.5	16.4
2.50	14.8	14.3	14.1	13.3	16.4	16.9	17.1	18.0
2.75	16.2	15.8	15.6	14.8	18.1	18.6	18.8	19.6
3.00	17.7	17.3	17.1	16.3	19.7	20.2	20.4	21.3

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