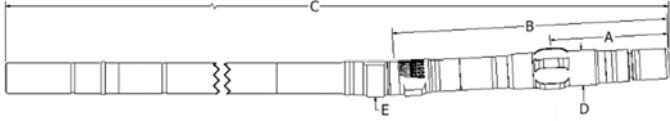


RVPP-96: 7/8 Lobe 4.8 Stage



Dimensions

Bit to Stabilizer Center	A	25 in
Bit to Bend, ABH	B	93 in
Bit to Top Sub	C	411 in
Body OD, Slick	D	9.63 in
Body OD, Stabilizer	D	11.0 in
Pad Radius, ABH	E	4.94 in
Bottom Connection	6-5/8 REG Box 6-5/8 REG Pin 7-5/8 REG Box	
Top Connection	6-5/8 REG Box 7/58 REG Box	
Top Sub Float Bore	5F-6R	

Recommended Operating Limits

Max WOB	168,000 lbf
Max Overpull, Backream	220,000 lbf
Max Overpull, Re-Run	220,000 lbf
Max Overpull, POOH	972,000 lbf

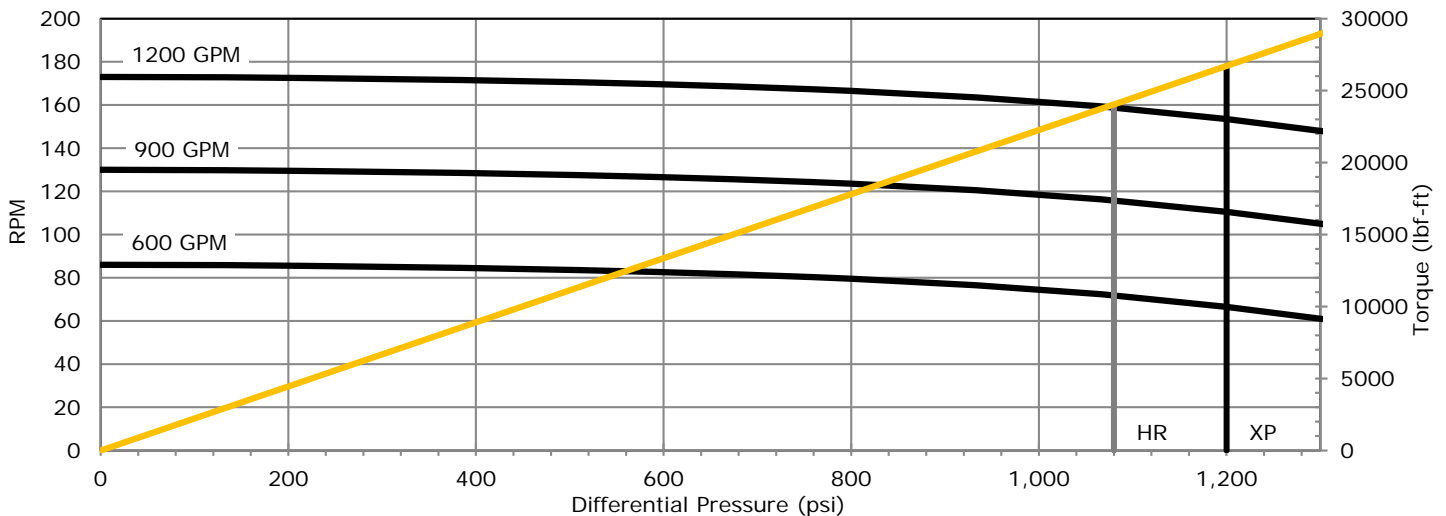
Performance Details	HR	XP
Max Diff Pressure	1080	1190 psi
Max Torque	24,050	26,460 lbf-ft
Stall Torque	36,070	39,680 lbf-ft
Rotation	0.144	0.144 rev/gal
Flow Range	600-1,200	600-1,200 gpm
Speed Range	86-180	86-180 rpm

Predicted Build Rates (Adj.) – Degrees/100ft

Bend Setting Deg	Slick Hole Size			Stabilized Hole Size		
	12 1/4	14 3/4	17 1/2	12 1/4	14 3/4	17 1/2
0.39	-	-	-	2.4	3.4	4.6
0.78	-	-	-	4.2	5.2	6.4
1.15	3.2	-	-	5.9	6.9	8.1
1.50	5.1	1.5	-	7.5	8.5	9.7
1.83	7.0	3.4	-	9.0	10.1	11.2
2.12	8.6	5.0	-	10.4	11.4	12.6
2.38*	10.1	6.5	2.5	11.6	12.6	13.7
2.60*	11.3	7.7	3.7	12.6	13.6	14.8
2.77*	12.3	8.7	4.7	13.4	14.4	15.5
2.90*	13.0	9.4	5.4	14.0	15.0	16.1
2.97*	13.4	9.8	5.8	14.3	15.3	16.5
3.00*	13.6	10.0	6.0	14.4	15.5	16.6

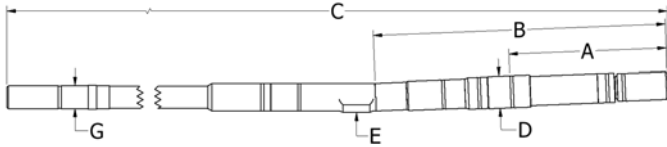
*Bend Setting not recommended for Rotary Drilling

Theoretical Performance Curve



Performance curves based on testing at 70°F. Actual field performance may vary with field operation conditions.

RVPP-96 Combo: 7/8 Lobe 5.9 Stage



Dimensions

Bit to Stabilizer Center	A	25 in
Bit to Bend, ABH	B	93 in
Bit to Top Sub	C	455 in
Body OD, Slick	D	9.63 in
Body OD, Stabilizer	D	11.0 in
Pad Radius, ABH	E	4.94 in
Power Section OD	G	8.0 in
Bottom Connection	6-5/8 REG Box 6-5/8 REG Pin 7-5/8 REG Box	
Top Connection	6-5/8 REG Box	
Top Sub Float Bore	5F-6R	

Recommended Operating Limits

Max WOB	168,000 lbf
Max Overpull, Backream	220,000 lbf
Max Overpull, Re-Run	220,000 lbf
Max Overpull, POOH	938,000 lbf

Performance Details

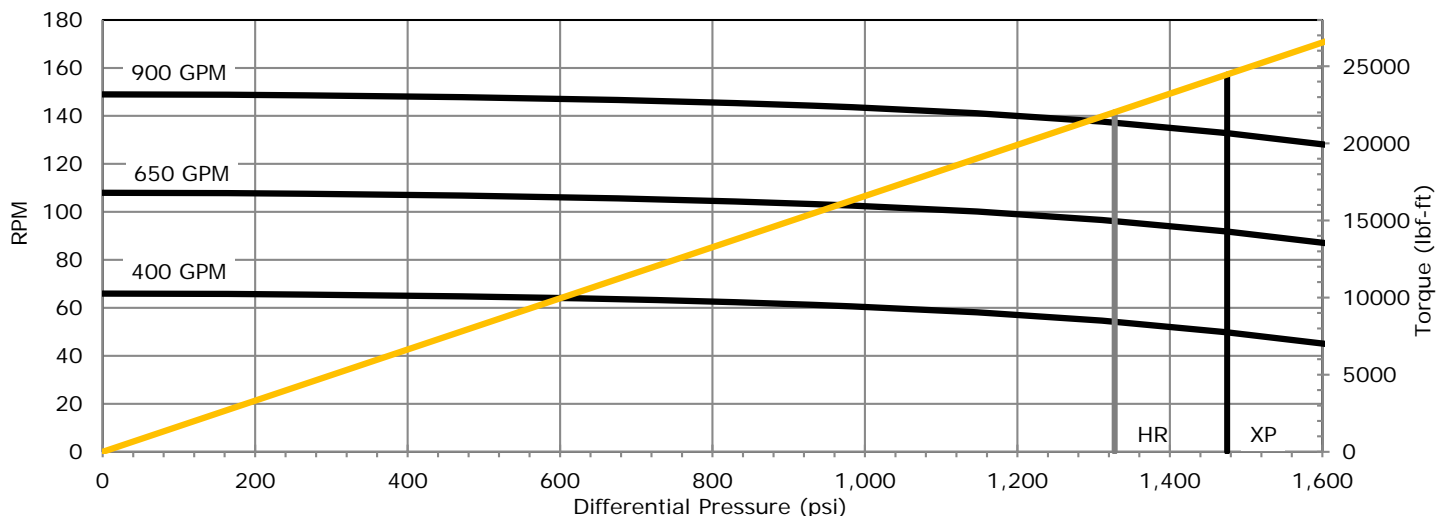
	HR	XP
Max Diff Pressure	1,330	1,460 psi
Max Torque	22,020	24,220 lbf-ft
Stall Torque	33,030	36,330 lbf-ft
Rotation	0.166	0.166 rev/gal
Flow Range	400-900	400-900 gpm
Speed Range	66-150	66-150 rpm

Predicted Build Rates (Adj.) – Degrees/100ft

Bend Setting Deg	Slick Hole Size			Stabilized Hole Size		
	12 1/4	14 3/4	17 1/2	12 1/4	14 3/4	17 1/2
0.39	-	-	-	2.6	3.5	4.4
0.78	1.6	-	-	4.3	5.2	6.1
1.15	3.5	-	-	5.9	6.7	7.7
1.50	5.3	2.0	-	7.4	8.2	9.2
1.83	7.0	3.7	-	8.8	9.6	10.6
2.12	8.5	5.2	1.6	10.0	10.9	11.8
2.38*	9.8	6.5	2.9	11.1	12.0	12.9
2.60*	10.9	7.6	4.0	12.1	12.9	13.9
2.77*	11.8	8.5	4.9	12.8	13.7	14.6
2.90*	12.4	9.2	5.6	13.4	14.2	15.1
2.97*	12.8	9.5	5.9	13.7	14.5	15.4
3.00*	12.9	9.7	6.1	13.8	14.6	15.6

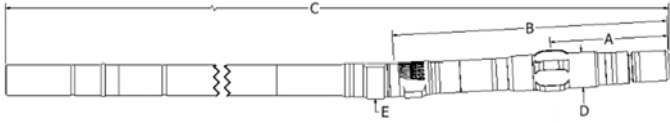
*Bend Setting not recommended for Rotary Drilling

Theoretical Performance Curve



Performance curves based on testing at 70°F. Actual field performance may vary with field operation conditions.

RVPP-96: 5/6 Lobe 4.0 Stage



Dimensions

Bit to Stabilizer Center	A	25 in
Bit to Bend, ABH	B	93 in
Bit to Top Sub	C	392 in
Body OD, Slick	D	9.63 in
Body OD, Stabilizer	D	11.0 in
Pad Radius, ABH	E	4.94 in
Bottom Connection	6-5/8 REG Box 6-5/8 REG Pin 7-5/8 REG Box	
Top Connection	6-5/8 REG Box 7/58 REG Box	
Top Sub Float Bore	5F-6R	

Recommended Operating Limits

Max WOB	168,000 lbf
Max Overpull, Backream	220,000 lbf
Max Overpull, Re-Run	220,000 lbf
Max Overpull, POOH	972,000 lbf

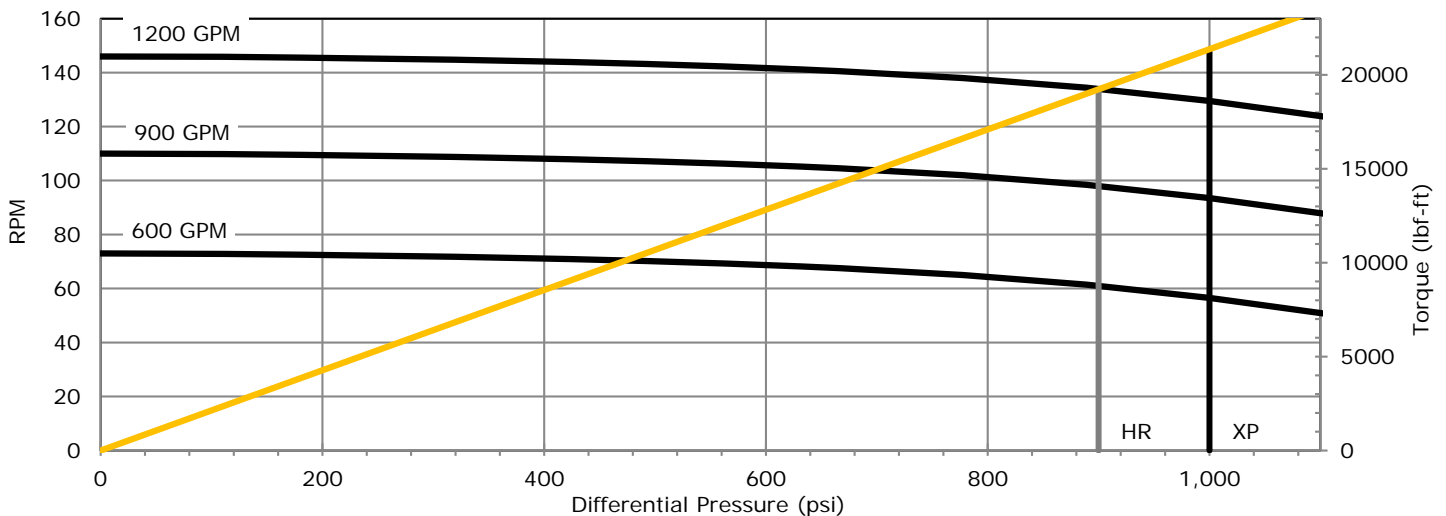
Performance Details	HR	XP
Max Diff Pressure	900	990 psi
Max Torque	19,240	21,160 lbf-ft
Stall Torque	28,850	31,740 lbf-ft
Rotation	0.122	0.122 rev/gal
Flow Range	600-1,200	600-1,200 gpm
Speed Range	73-150	73-150 rpm

Predicted Build Rates (Adj.) – Degrees/100ft

Bend Setting Deg	Slick Hole Size			Stabilized Hole Size		
	12 1/4	14 3/4	17 1/2	12 1/4	14 3/4	17 1/2
0.39	-	-	-	2.5	3.7	4.9
0.78	-	-	-	4.4	5.5	6.8
1.15	3.3	-	-	6.1	7.3	8.6
1.50	5.4	1.6	-	7.8	9.0	10.2
1.83	7.3	3.5	-	9.4	10.5	11.8
2.12	9.0	5.2	-	10.8	11.9	13.2
2.38*	10.6	6.8	2.6	12.0	13.2	14.4
2.60*	11.8	8.1	3.9	13.1	14.2	15.5
2.77*	12.8	9.1	4.9	13.9	15.0	16.3
2.90*	13.6	9.8	5.7	14.5	15.6	16.9
2.97*	14.0	10.2	6.1	14.8	16.0	17.2
3.00*	14.2	10.4	6.3	15.0	16.1	17.4

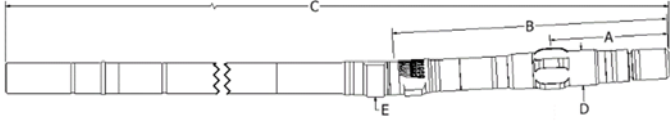
*Bend Setting not recommended for Rotary Drilling

Theoretical Performance Curve



Performance curves based on testing at 70°F. Actual field performance may vary with field operation conditions.

RVPP-96: 7/8 Lobe 3.9 Stage



Dimensions

Bit to Stabilizer Center	A	25 in
Bit to Bend, ABH	B	93 in
Bit to Top Sub	C	464 in
Body OD, Slick	D	9.63 in
Body OD, Stabilizer	D	11.0 in
Pad Radius, ABH	E	4.94 in
Bottom Connection	6-5/8 REG Box 6-5/8 REG Pin 7-5/8 REG Box	
Top Connection	6-5/8 REG Box 7/58 REG Box	
Top Sub Float Bore	5F-6R	

Recommended Operating Limits

Max WOB	168,000 lbf
Max Overpull, Backream	220,000 lbf
Max Overpull, Re-Run	220,000 lbf
Max Overpull, POOH	972,000 lbf

Performance Details

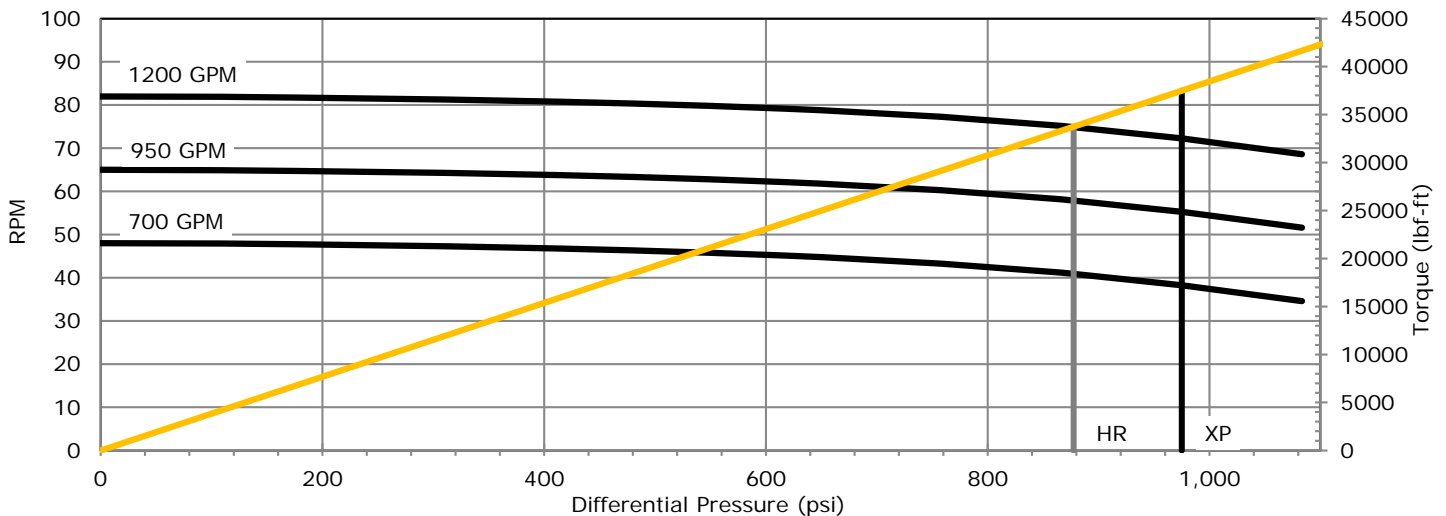
	HR	XP
Max Diff Pressure	880	970 psi
Max Torque	33,750	37,130 lbf-ft
Stall Torque	50,630	55,700 lbf-ft
Rotation	0.068	0.068 rev/gal
Flow Range	700-1,200	700-1,200 gpm
Speed Range	47-82	47-82 rpm

Predicted Build Rates (Adj.) – Degrees/100ft

Bend Setting Deg	Slick Hole Size			Stabilized Hole Size		
	12 1/4	14 3/4	17 1/2	12 1/4	14 3/4	17 1/2
0.39	-	-	-	2.0	2.9	3.8
0.78	-	-	-	3.7	4.5	5.4
1.15	2.8	-	-	5.2	6.1	7.0
1.50	4.5	1.3	-	6.7	7.5	8.4
1.83	6.2	3.0	-	8.1	8.9	9.8
2.12	7.6	4.4	-	9.3	10.1	11.0
2.38*	8.9	5.7	2.2	10.4	11.2	12.1
2.60*	10.0	6.8	3.3	11.3	12.2	13.0
2.77*	10.9	7.7	4.2	12.1	12.9	13.8
2.90*	11.5	8.3	4.8	12.6	13.4	14.3
2.97*	11.9	8.7	5.2	12.9	13.7	14.6
3.00*	12.0	8.8	5.3	13.0	13.8	14.7

*Bend Setting not recommended for Rotary Drilling

Theoretical Performance Curve



Performance curves based on testing at 70°F. Actual field performance may vary with field operation conditions.