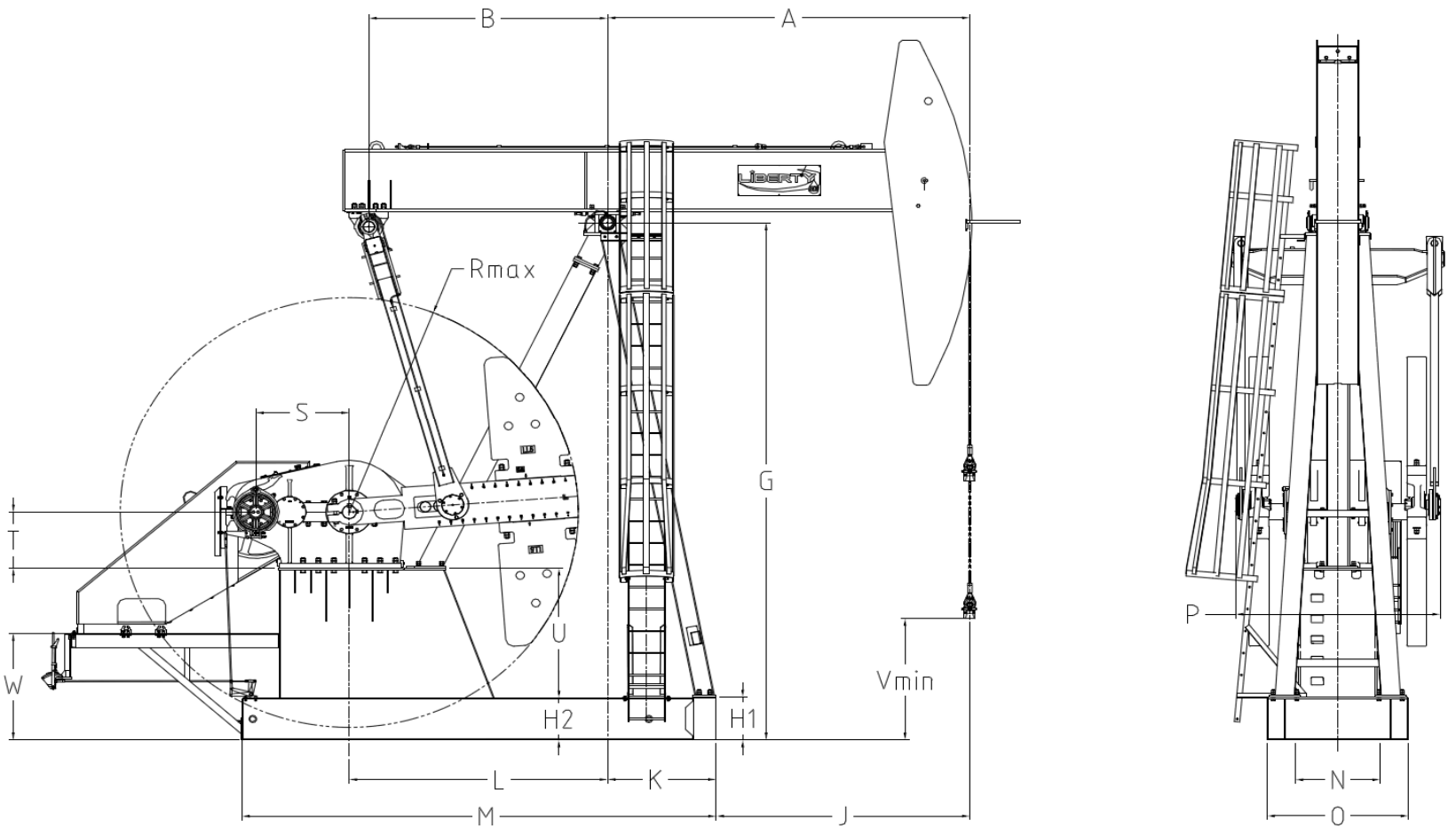
LIBERTY LIFT HE PUMPING UNIT



UNIT	A	B	G	H1	H2	J	K	L	M	N	O	P	R	S	T	U	Vmin	W
1280-427-240	19'-7 3/8"	10'-2"	29'-2 7/8"	27 1/2"	27 1/2"	14'-7"	5'-3/8"	11'-1 1/2"	20'-0"	3'-10 7/8"	6'-11 3/8"	9'-8 5/8"	125"	54.917"	32.874"	5'-7 3/4"	5'-4"	4'-11 7/8"

LIBERTY LIFT SOLUTIONS

TORQUE FACTOR TABLE

UNIT DESIGNATION 1280-427-240 High Efficiency

Cranks : CR016

Position of Crank degrees	Polished Rod Position Length of Stroke, inches			Torque Factor Length of Stroke, inches		
	240.035	208.779	178.801	240.035	208.779	178.801
0	0.0029	0.0023	0.0018	-14.685	-11.097	-8.256
15	0.0092	0.0100	0.0107	26.688	23.704	20.524
30	0.0608	0.0612	0.0612	67.071	57.171	47.896
45	0.1522	0.1504	0.1482	98.426	83.553	69.799
60	0.2703	0.2661	0.2615	115.659	99.121	83.528
75	0.3995	0.3944	0.3886	119.268	103.810	88.722
90	0.5270	0.5230	0.5179	113.358	100.192	86.874
105	0.6449	0.6435	0.6406	102.249	91.358	80.072
120	0.7492	0.7509	0.7508	88.749	79.562	70.034
135	0.8381	0.8423	0.8446	73.996	65.892	57.743
150	0.9101	0.9154	0.9190	57.840	50.452	43.493
165	0.9633	0.9678	0.9710	39.222	32.694	27.146
180	0.9942	0.9961	0.9973	16.629	11.897	8.517
195	0.9978	0.9963	0.9949	-10.850	-12.054	-12.107
210	0.9693	0.9652	0.9615	-41.709	-37.744	-33.513
225	0.9073	0.9022	0.8974	-71.365	-62.147	-53.625
240	0.8159	0.8112	0.8062	-94.909	-82.052	-70.259
255	0.7033	0.6991	0.6941	-110.182	-95.627	-81.942
270	0.5784	0.5742	0.5689	-117.490	-102.532	-88.083
285	0.4495	0.4446	0.4389	-117.794	-103.079	-88.621
300	0.3238	0.3182	0.3121	-111.642	-97.520	-83.600
315	0.2084	0.2026	0.1968	-98.899	-85.764	-72.969
330	0.1107	0.1059	0.1012	-78.870	-67.451	-56.630
345	0.0393	0.0363	0.0337	-50.760	-42.342	-34.743

1.) The position of the crank is the angular displacement measured clockwise from the 12 o'clock position View with the well head to the right.

2.) Position is expressed as a fraction of stroke above lowermost position

3.) Torque factor = T/P_R, where T = torque on pumping unit reducer due to polished rod load P_R.

Strctural Unbalance = -2933

A =	235.394
C =	122.008
G =	128.110
H =	350.858
K =	259.672
I =	133.464
P =	224.500
R1 =	59.094
R2 =	52.087
R3 =	45.079

LIBERTY LIFT SOLUTIONS

EFFECTIVE COUNTERBALANCE TABLE

Unit Designation 1280-427-240 High Efficiency

CRANK : CR016

Stroke Length, inches	240.035		208.779		178.801	
Cranks Only, pounds	1949		2590		3437	
Description	Max	Min	Max	Min	Max	Min
Cranks and 4 each LL5	19531	9453	22483	11080	26380	13229
Cranks w/2-LL5 & 2-LL6	21607	10972	24832	12798	29089	15210
Cranks and 4 each LL6	23683	12490	27181	14516	31797	17191
Cranks w/2-LL6 & 2-LL7	25156	13844	28847	16048	33718	18958
Cranks and 4 each LL7	26628	15197	30512	17579	35639	20724
Cranks w/2-LL7 & 2-LL8	28603	16030	32747	18521	38216	21811
Cranks and 4 each LL8	30577	16862	34981	19463	40793	22897
Cranks w/2-LL8 & 2-LL9	33177	19172	37923	22076	44186	25911
*Cranks and 4 each LL9	35777	21481	40864	24689	47579	28924

* Not Recommended

** Maximum recommended ECB for this unit is 34160 in maximum stroke position.

LIBERTY LIFT SOLUTIONS

COUNTERBALANCE MOMENT TABLE

Unit Designation 1280-427-240 High Efficiency

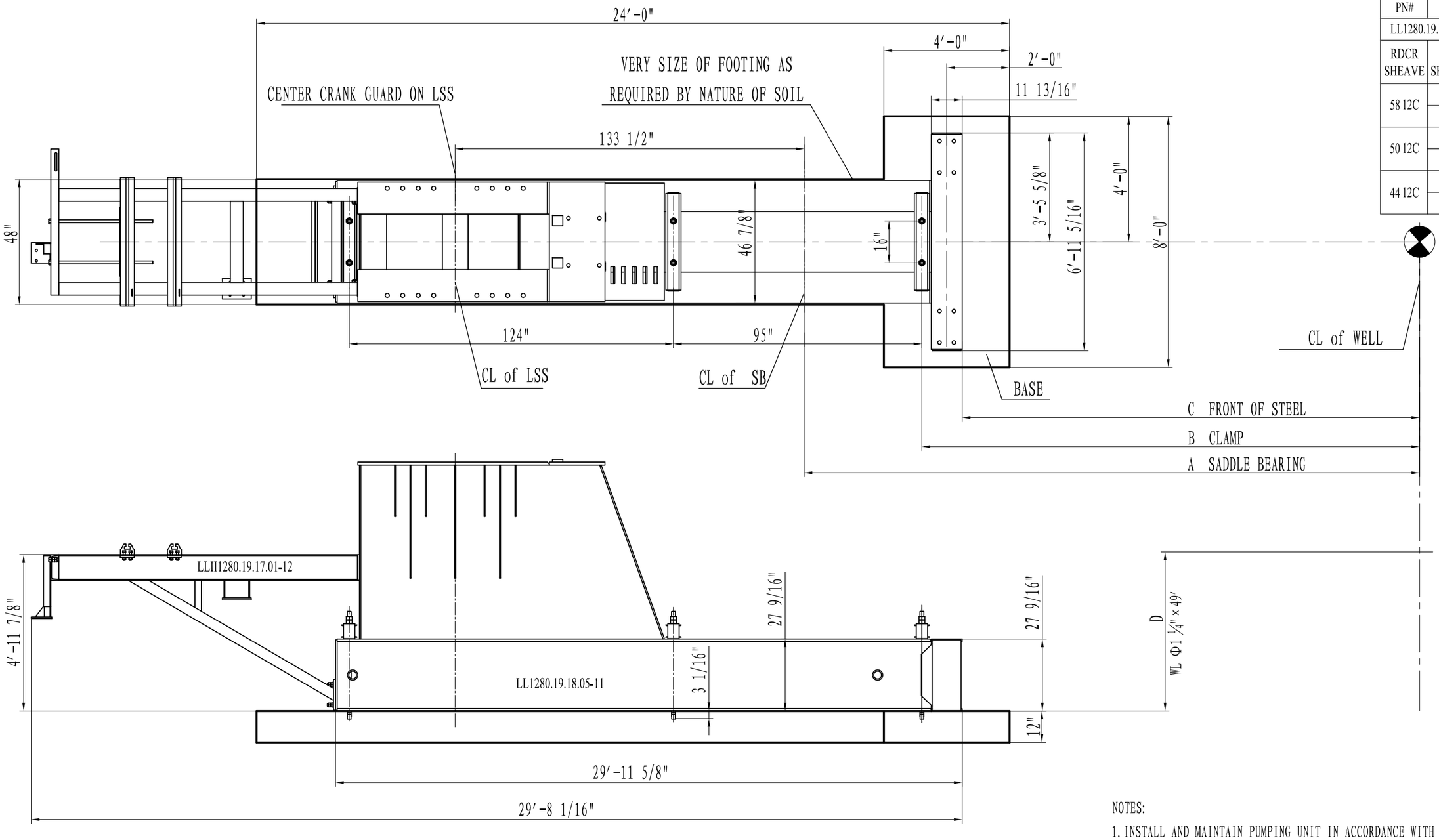
CRANK : CR016

Cranks Only, inch pounds	553359	
Description	Max	Min
Cranks and 4 each LL5	2546555	1404088
Cranks w/2-LL5 & 2-LL6	2781877	1576204
Cranks and 4 each LL6	3017198	1748320
Cranks w/2-LL6 & 2-LL7	3184092	1901768
Cranks and 4 each LL7	3350985	2055216
Cranks w/2-LL7 & 2-LL8	3574848	2149585
Cranks and 4 each LL8	3798710	2243954
Cranks w/2-LL8 & 2-LL9	4093448	2505776
*Cranks and 4 each LL9	4388185	2767597

* Not Recommended

** Maximum recommended Moment for this unit is 4204778 inch pounds.

1280 B/G				
DN#	LL1280.19.16.05-14			
PN#	LL14795			
LL1280.19.18.05-14 (78.55"-88.22")				
RDCR SHEAVE	PM SHEAVE	OVERALL RATIO	SPM @1160	V-BELT
58 12C	7	244.2	4.8	C285
	11	155.4	7.5	C285
50 12C	7	210.5	5.5	C270
	9.5	155.1	7.5	C270
44 12C	7	185.2	6.3	C255
	8	162.1	7.2	C255



NOTES:

1. INSTALL AND MAINTAIN PUMPING UNIT IN ACCORDANCE WITH API RP 11G. DO NOT USE WOOD OR COMPOSITION MATERIALS BETWEEN UNIT FRAME AND CONCRETE FOUNDATION.
2. USE WITH FOUNDATION CLAMP DN# LLII1280.19.17.01-1601, PN# LL16151.

UNIT	A	B	C	D	E	F	CRANK
1280-427-240	19'-7 3/8"	15'-10 3/8"	174.988"	5'-5 1/4"			CR016

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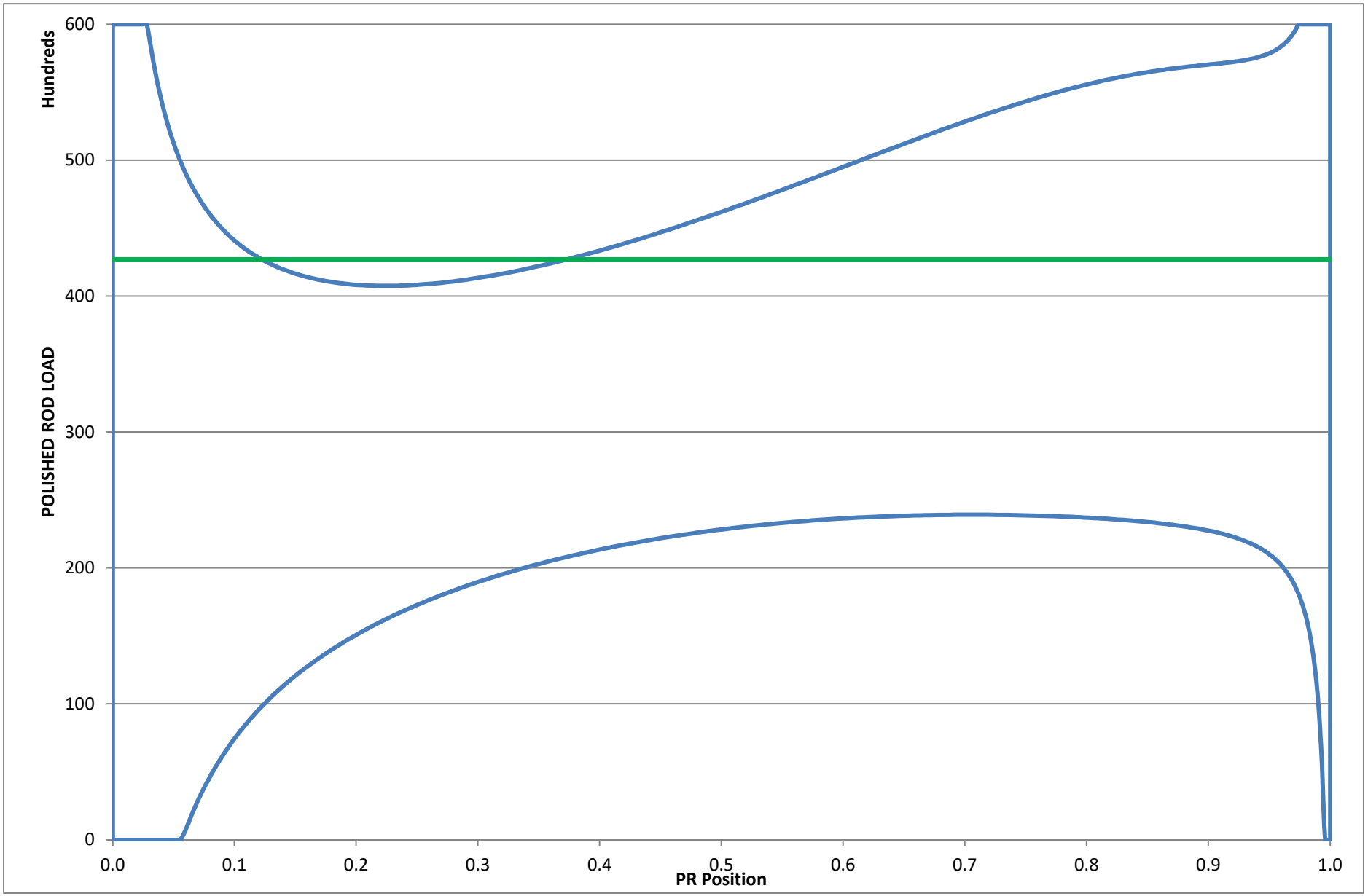
LIBERTY LIFT
1250 Wood Branch Park Dr
Suite 250
Houston, TX 77079

TOLERANCES:
a. X.X: ±3
b. X.XX: ±1
c. X.XXX: ±0.25
d. ANGULAR: ±1°

SURFACE FINISH:
a. X.X: 25
b. X.XX: 6.3
c. X.XXX: 3.2

DRAWN		STANDARD	
CHECKED		APPROVAL	
DATE			

PART NUMBER CHINA	LL50114	DRAWING NUMBER US		REV	
TITLE	FOUNDATION, HE, HP		WEIGHT		
MATERIAL	ASSEMBLY		SCALE	1:38	
	LLB1.64		REV	0	

1280-427-240 High Efficiency

Calculated Permissible Load with 4388185 in-lb Moment