

Liftcrane Boom Capacities

Boom No. B60:680

with Mast No. M10:684 or Mast No. M11:684

881,800 lb VPC (Variable Position Counterweight)

360 Degree Rating

**MLC650
VPC-MAX
SERIES 3**



LIFTING CAPACITIES: Lifting capacities for various boom lengths and operating radii are for freely suspended loads and may be based on percent of static tipping or strength of structural components. Capacities must be reduced by applicable deducts.

Upper boom point capacity for liftcrane service with single part whip line from Drum 3 is 30,000 lb or 60,000 lb with two part whip line. When Drum 1 or Drum 2 is used, capacity with single part whip line is 48,800 lb, or 73,500 lb with two part whip line. In all cases, upper boom point capacities cannot exceed those listed for main boom capacity.

Weight of all load blocks, hooks, weight ball, slings, hoist lines, etc., beneath boom and jib point sheaves is considered part of load. Boom is not to be lowered beyond radii where combined weights are greater than rated capacity. Where no capacity is shown, operation is not intended or approved.

BOOM BACKWARD STABILITY: Capacities indicated by (b) require 8,200 lb minimum weight and (c) require 15,500 lb minimum weight. **Caution: Do not operate in areas indicated by (b) or (c) without required minimum weight.** Boom may not lower and boom hoist wire rope may go slack causing wire rope damage or failure.

OPERATING CONDITIONS: Machine to operate on a firm, level, and uniformly supporting surface. Refer to Boom Rigging **No. 81022686**, Mast Rigging **No. 81025005** or **No. 84050187**, Wire Rope Specifications chart **No. 9387-A**, Counterweight Arrangements chart **No. 9349-A**, and Wind Conditions chart **No. 9388-A**. Crane operator judgment must be used to allow for dynamic load effects of swinging, hoisting or lowering, travel, wind conditions, as well as adverse operating conditions and physical machine depreciation. Refer to the Operator Manual for operating guidelines.

MACHINE TRAVEL: Machine to travel on a firm, level, and uniformly supporting surface. Boom must be within boom angle range shown in capacity chart. Refer to Maximum Allowable Travel Specification chart **No. 9389-A**.

OPERATING RADIUS: Operating radius is horizontal distance from axis of rotation to center of vertical hoist line or load block.



BOOM ANGLE: Boom angle in degrees (°) is angle between horizontal and centerline of boom butt and inserts, and is an indication of operating radius. In all cases, operating radius shall govern capacity.



BOOM POINT ELEVATION: Boom point elevation is vertical distance from ground level to centerline of boom point shaft.



MACHINE EQUIPMENT: Machine equipped with VPC-MAX, 36 ft 6 in. crawlers, 60 in. or 80 in. treads, 36 ft 1 in. live mast, 118.1 ft mast, 16 part boom hoist reeving, boom support straps, and 881,800 lb VPC.

Consult chart **No. 9674-A** when jib No. 148 is attached.

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Luffing Jib Backstay Deduct	
Boom Length (ft)	Deduct (lb)
144.4	6,000
164.0	7,500
183.7	8,500
203.4	10,000
223.1	10,000
242.8	10,000
262.5	11,000
282.2	12,500
301.8	13,500
321.5	14,800
341.2	16,000
360.9	17,300
380.6	17,300
400.3	17,300
419.9	17,300
439.6	17,300
Deduct the appropriate value from capacities when luffing jib backstays are stored on boom.	

Deduct From Capacities When Jib No. 148 Is Attached	
Jib Length (ft)	Deduct (lb)
39.4	19,200
59.1	28,400
78.7	36,900
98.4	45,000
118.1	56,000
137.8	63,300
Weight of jib and 6,500 lb suspended beneath jib point have been included in determination of deduct.	

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Refer to Table 1 (with luffing jib backstays stored) and Table 2 (without luffing jib backstays stored) for raising ability with the maximum weight of all load blocks, hooks, weight ball, slings, and hoist lines beneath boom point sheaves. For block weights shown with #, load blocks, hooks, weight ball, and slings must remain on ground until combined weights are within rated capacity of chart. Raising is not permitted in shaded areas of table.

Select counterweight position from Tables 1 or 2 that will allow raising and lowering of boom length. Counterweight position selection may be changed with boom on ground or while boom is within operating range of capacity chart.

Combined weight beneath boom point sheaves must not exceed block weight shown.

Table 1a: With Luffing Jib Backstays

Over End or Side of Crawlers		
Boom Length (ft)	38.7 ft Counterweight Position	60.0 ft Counterweight Position
	Block Weight (lb)	
144.4 - 262.5	46,500	46,500
282.2 - 301.8	22,600	46,500
321.5 - 360.9	#	46,500
380.6 - 400.3	#	22,600
419.9	Raising Not Permitted	16,200
439.6		#
459.3		
479.0		

Table 1b: With Luffing Jib Backstays

Over End of Blocked Crawlers		
Boom Length (ft)	38.7 ft Counterweight Position	60.0 ft Counterweight Position
	Block Weight (lb)	
144.4 - 262.5	46,500	46,500
282.2 - 301.8	22,600	46,500
321.5 - 360.9	#	46,500
380.6 - 400.3	#	22,600
419.9	#	16,200
439.6	Raising Not Permitted	#
459.3		
479.0		
Warning: Crane must remain in-line with crawlers when raising over end of blocked crawlers until operating radius is within 360 degree chart. <i>Crane tipping or structural damage can occur.</i>		

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Table 2a: Without Luffing Jib Backstays

Over End or Side of Crawlers		
Boom Length (ft)	38.7 ft Counterweight Position	60.0 ft Counterweight Position
	Block Weight (lb)	
144.4 - 282.2	46,500	46,500
301.8	22,600	46,500
321.5	16,200	46,500
341.2 - 380.6	#	46,500
400.3 - 419.9	#	22,600
439.6	Raising Not Permitted	16,200
459.3		#
479.0		#
		#

Table 2b: Without Luffing Jib Backstays

Over End of Blocked Crawlers		
Boom Length (ft)	38.7 ft Counterweight Position	60.0 ft Counterweight Position
	Block Weight (lb)	
144.4 - 282.2	46,500	46,500
301.8	22,600	46,500
321.5	16,200	46,500
341.2 - 380.6	#	46,500
400.3 - 419.9	#	22,600
439.6	#	16,200
459.3	Raising Not Permitted	#
479.0		#
Warning: Crane must remain in-line with crawlers when raising over end of blocked crawlers until operating radius is within 360 degree chart. Crane tipping or structural damage can occur.		

Explanation of Symbols



Boom No. B60:680



VPC (Variable Position Counterweight)



360 Degree Rating



Boom Length



Operating Radius
(see page 1)



Boom Angle
(see page 1)



Boom Point Elevation
(see page 1)



Counterweight Position
from Axis of Rotation



Lifting Capacities
(see page 1)

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144.4 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
28	82.7	152.8	1,543,200 c	1,543,200c
30	81.9	152.5	1,462,800 c	1,462,800c
32	81.1	152.1	1,424,000 c	1,424,000c
34	80.3	151.7	1,387,200 c	1,387,200c
36	79.4	151.3	1,316,400 b	1,387,200b
38	78.6	150.8	1,231,100 b	1,387,200b
40	77.8	150.3	1,155,600 b	1,387,200b
45	75.8	149.0	999,800	1,387,200
50	73.7	147.5	878,600	1,317,000
55	71.6	145.7	781,600	1,199,300
60	69.5	143.8	702,300	1,093,700
65	67.3	141.6	636,100	1,007,000
70	65.1	139.2	580,100	932,300
75	62.9	136.6	532,000	867,300
80	60.6	133.7	490,300	810,100
85	58.2	130.5	453,900	759,600
90	55.8	127.0	421,600	714,400
95	53.3	123.2	392,900	674,000
100	50.7	119.0	367,200	634,800
105	48.0	114.4	344,100	596,400
110	45.2	109.4	323,000	561,900
115	42.2	103.8	303,900	530,800
120	39.1	97.6	286,300	502,700
125	35.7	90.6	270,200	477,000
130	31.9	82.6	255,200	453,400
135	27.7	73.2	241,300	431,800
140	22.7	61.6	228,200	411,800
145	16.1	45.7	215,700	390,900

164.0 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
30	82.9	172.4	1,385,900 b	1,385,900b
32	82.2	172.1	1,350,900 b	1,350,900b
34	81.4	171.7	1,317,400 b	1,317,400b
36	80.7	171.4	1,285,500	1,285,500
38	80.0	171.0	1,232,800	1,281,900
40	79.3	170.6	1,156,900	1,281,900
45	77.5	169.4	1,000,300	1,281,900
50	75.7	168.0	878,400	1,281,900
55	73.9	166.5	781,000	1,191,400
60	72.0	164.8	701,200	1,089,600
65	70.2	163.0	634,800	1,002,900
70	68.3	160.9	578,500	928,300
75	66.4	158.6	530,300	863,300
80	64.4	156.2	488,400	806,200
85	62.4	153.5	451,800	755,700
90	60.4	150.6	419,500	710,600
95	58.4	147.4	390,700	670,200
100	56.3	144.0	365,000	632,200
105	54.1	140.3	341,800	593,800
110	51.8	136.3	320,700	559,400
115	49.5	132.0	301,600	528,300
120	47.1	127.3	284,100	500,200
125	44.6	122.2	268,000	474,500
130	42.0	116.6	253,200	451,000
135	39.2	110.4	239,500	429,500
140	36.3	103.5	226,700	409,600
145	33.1	95.8	214,800	391,200
150	29.5	87.1	203,600	374,100
160	20.8	64.1	183,100	343,300

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B60



881,800 lb



360°

183.7 ft				
ft	°	ft	lb	lb
32	83.0	192.0	1,285,500	1,285,500
34	82.4	191.7	1,254,900	1,254,900
36	81.7	191.4	1,225,600	1,225,600
38	81.1	191.0	1,197,500	1,197,500
40	80.5	190.6	1,156,500	1,187,100
45	78.9	189.6	999,200	1,187,100
50	77.3	188.4	876,900	1,187,100
55	75.7	187.1	779,000	1,186,500
60	74.0	185.6	698,900	1,084,700
65	72.4	183.9	632,200	998,200
70	70.7	182.1	575,700	923,600
75	69.1	180.2	527,300	858,600
80	67.4	178.0	485,300	801,600
85	65.6	175.7	448,600	751,100
90	63.9	173.2	416,200	706,100
95	62.1	170.5	387,300	665,700
100	60.3	167.5	361,500	629,000
105	58.5	164.4	338,300	590,600
110	56.6	161.1	317,200	556,100
115	54.7	157.5	298,000	525,100
120	52.7	153.6	280,500	496,900
125	50.7	149.4	264,500	471,200
130	48.6	145.0	249,700	447,800
135	46.4	140.1	236,000	426,200
140	44.2	134.9	223,300	406,400
145	41.8	129.3	211,400	388,000
150	39.4	123.1	200,400	371,000
160	34.0	109.0	180,300	340,300
170	27.6	91.2	162,500	313,500
180	19.2	66.4	146,300	289,800

203.4 ft				
ft	°	ft	lb	lb
36	82.5	211.3	1,163,400	1,163,400
38	82.0	211.0	1,138,000	1,138,000
40	81.4	210.7	1,113,600	1,113,600
45	80.0	209.7	1,000,000	1,113,600
50	78.5	208.6	877,000	1,113,600
55	77.1	207.4	778,700	1,113,600
60	75.6	206.1	698,200	1,076,400
65	74.2	204.6	631,200	994,900
70	72.7	203.0	574,400	920,300
75	71.2	201.3	525,800	855,400
80	69.7	199.4	483,600	798,400
85	68.2	197.3	446,700	747,900
90	66.6	195.1	414,200	702,900
95	65.1	192.7	385,200	662,500
100	63.5	190.1	359,300	626,000
105	61.9	187.4	335,900	588,500
110	60.2	184.5	314,800	554,000
115	58.6	181.4	295,600	522,900
120	56.9	178.1	278,000	494,700
125	55.2	174.5	261,900	469,000
130	53.4	170.8	247,100	445,500
135	51.6	166.7	233,400	424,000
140	49.7	162.4	220,700	404,100
145	47.8	157.9	208,800	385,700
150	45.9	153.0	197,800	368,700
160	41.7	142.0	177,800	338,100
170	37.1	129.3	160,200	311,300
180	32.0	114.0	144,400	287,700
190	25.9	94.9	130,100	266,700
200	17.9	68.3	117,000	247,700

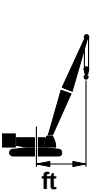
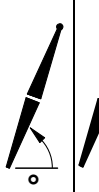
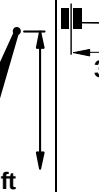
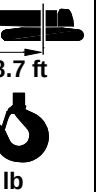
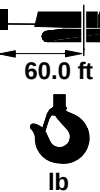
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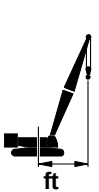
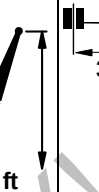
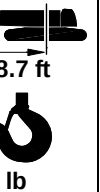
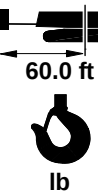
ASME B30.5



B60



223.1 ft				
				
ft	°	ft	lb	lb
38	82.7	230.9	1,081,000	1,081,000
40	82.2	230.6	1,059,000	1,059,000
45	80.9	229.8	1,003,400	1,011,800
50	79.6	228.8	879,900	1,011,800
55	78.2	227.7	781,200	1,011,800
60	76.9	226.5	700,400	1,011,800
65	75.6	225.1	633,100	983,900
70	74.3	223.7	576,100	918,100
75	72.9	222.1	527,300	854,900
80	71.6	220.4	485,000	797,800
85	70.2	218.5	447,900	747,300
90	68.8	216.5	415,300	702,300
95	67.4	214.4	386,200	661,900
100	66.0	212.1	360,200	625,400
105	64.6	209.7	336,800	588,800
110	63.1	207.1	315,600	554,300
115	61.7	204.4	296,300	523,200
120	60.2	201.5	278,700	494,900
125	58.7	198.4	262,500	469,200
130	57.1	195.1	247,700	445,700
135	55.6	191.6	233,900	424,100
140	54.0	187.9	221,200	404,200
145	52.3	184.0	209,300	385,800
150	50.7	179.8	198,300	368,800
160	47.2	170.7	178,300	338,200
170	43.5	160.5	160,700	311,400
180	39.5	148.7	145,000	287,800
190	35.2	135.0	131,000	266,800
200	30.3	118.7	118,200	248,100
210	24.5	98.4	106,500	231,100
220	16.7	70.0	95,600	215,700

242.8 ft				
				
ft	°	ft	lb	lb
40	82.8	250.5	956,400	956,400
45	81.6	249.7	956,400	956,400
50	80.4	248.8	878,800	954,200
55	79.2	247.8	779,700	954,200
60	78.0	246.7	698,600	954,200
65	76.8	245.5	631,000	954,200
70	75.6	244.2	573,800	900,900
75	74.3	242.7	524,800	844,300
80	73.1	241.2	482,400	793,600
85	71.9	239.5	445,200	743,700
90	70.6	237.7	412,400	698,700
95	69.3	235.8	383,300	658,300
100	68.1	233.7	357,200	621,800
105	66.8	231.5	333,700	586,400
110	65.5	229.2	312,400	551,800
115	64.2	226.7	293,100	520,600
120	62.8	224.1	275,400	492,300
125	61.5	221.3	259,200	466,600
130	60.1	218.4	244,300	443,100
135	58.7	215.3	230,600	421,500
140	57.3	212.1	217,800	401,500
145	55.9	208.6	205,900	383,100
150	54.4	205.0	194,900	366,100
160	51.4	197.1	174,900	335,400
170	48.3	188.4	157,300	308,600
180	45.0	178.6	141,600	285,000
190	41.5	167.5	127,600	264,100
200	37.7	154.9	115,000	245,300
210	33.5	140.4	103,500	228,500
220	28.8	123.1	92,900	213,200
230	23.2	101.5	83,100	199,200
240	15.7	71.4	73,900	186,300

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B60



881,800 lb



360°

262.5 ft				
ft	°	ft	lb	lb
45	82.2	269.7	809,300	809,300
50	81.1	268.8	809,300	809,300
55	80.0	267.9	779,400	809,300
60	78.9	266.9	698,100	809,300
65	77.8	265.8	630,400	809,300
70	76.7	264.6	573,000	809,300
75	75.5	263.2	523,900	809,300
80	74.4	261.8	481,300	781,500
85	73.3	260.2	444,100	737,000
90	72.1	258.6	411,200	696,500
95	71.0	256.8	382,000	656,100
100	69.8	254.9	355,800	619,700
105	68.6	252.9	332,300	585,100
110	67.4	250.8	311,000	550,500
115	66.2	248.6	291,600	519,300
120	65.0	246.2	273,900	491,000
125	63.8	243.7	257,700	465,200
130	62.6	241.1	242,700	441,700
135	61.3	238.3	229,000	420,100
140	60.1	235.4	216,200	400,100
145	58.8	232.3	204,300	381,700
150	57.5	229.0	193,200	364,700
160	54.8	222.1	173,200	334,000
170	52.1	214.4	155,600	307,200
180	49.2	205.9	140,000	283,600
190	46.2	196.5	126,000	262,700
200	43.0	186.0	113,400	244,000
210	39.7	174.2	101,900	227,100
220	36.0	160.8	91,500	211,800
230	32.0	145.4	81,900	197,900
240	27.5	127.2	73,100	185,200
250	22.1	104.5	64,800	173,500

282.2 ft				
ft	°	ft	lb	lb
45	82.8	289.6	686,900	686,900
50	81.8	288.8	686,900	686,900
55	80.7	287.9	686,900	686,900
60	79.7	287.0	686,900	686,900
65	78.7	286.0	659,000	686,900
70	77.6	284.8	599,000	686,900
75	76.6	283.6	547,700	686,900
80	75.5	282.3	503,100	686,900
85	74.5	280.8	464,200	686,900
90	73.4	279.3	429,800	684,200
95	72.3	277.7	399,300	648,300
100	71.3	275.9	371,900	615,400
105	70.2	274.1	347,300	582,100
110	69.1	272.1	325,000	547,500
115	68.0	270.1	304,800	516,300
120	66.9	267.9	286,300	487,900
125	65.8	265.6	269,300	462,200
130	64.7	263.2	253,700	438,600
135	63.5	260.7	239,300	416,900
140	62.4	258.0	226,000	397,000
145	61.2	255.2	213,600	378,600
150	60.0	252.3	202,000	361,500
160	57.6	246.0	181,100	330,800
170	55.2	239.1	162,700	304,000
180	52.6	231.6	146,400	280,400
190	50.0	223.3	131,800	259,400
200	47.2	214.2	118,700	240,700
210	44.4	204.1	106,800	223,800
220	41.3	193.0	96,000	208,600
230	38.1	180.5	86,100	194,700
240	34.6	166.4	77,000	182,000
250	30.7	150.2	68,500	170,400
260	26.3	131.1	60,700	159,700
270	21.0	107.2	53,200	149,700

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ASME B30.5



B60



881,800 lb



360°

301.8 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
50	82.3	308.7	589,700	589,700
55	81.3	307.9	589,700	589,700
60	80.4	307.0	589,700	589,700
65	79.4	306.1	589,700	589,700
70	78.4	305.0	589,700	589,700
75	77.5	303.9	546,300	589,700
80	76.5	302.6	501,600	589,700
85	75.5	301.3	462,600	589,700
90	74.5	299.9	428,200	589,700
95	73.5	298.4	397,500	589,700
100	72.5	296.8	370,100	589,700
105	71.5	295.0	345,500	576,700
110	70.5	293.2	323,200	546,000
115	69.5	291.3	302,900	514,700
120	68.5	289.3	284,400	486,400
125	67.5	287.2	267,400	460,600
130	66.4	285.0	251,700	437,000
135	65.4	282.7	237,300	415,300
140	64.3	280.2	223,900	395,400
145	63.3	277.7	211,500	376,900
150	62.2	275.0	199,900	359,800
160	60.0	269.3	179,000	329,100
170	57.7	263.0	160,600	302,300
180	55.5	256.2	144,300	278,700
190	53.1	248.8	129,700	257,700
200	50.6	240.7	116,600	239,000
210	48.1	231.8	104,700	222,200
220	45.5	222.1	93,900	206,900
230	42.7	211.5	84,100	193,100
240	39.8	199.7	75,000	180,400
250	36.6	186.6	66,600	168,800
260	33.2	171.8	58,900	158,100
270	29.5	154.8	51,600	148,200
280	25.2	134.7	44,800	139,000
290	20.1	109.7	38,300	130,400

321.5 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
50	82.8	328.6	506,900	506,900
55	81.9	327.9	506,900	506,900
60	81.0	327.0	506,900	506,900
65	80.1	326.1	506,900	506,900
70	79.2	325.1	506,900	506,900
75	78.3	324.1	506,900	506,900
80	77.3	322.9	497,700	506,900
85	76.4	321.7	458,600	506,900
90	75.5	320.3	424,100	506,900
95	74.6	318.9	393,400	506,900
100	73.6	317.4	365,900	506,900
105	72.7	315.8	341,200	506,900
110	71.8	314.1	318,800	506,900
115	70.8	312.4	298,500	506,900
120	69.9	310.5	279,900	483,000
125	68.9	308.5	262,900	457,200
130	68.0	306.5	247,200	433,600
135	67.0	304.3	232,800	411,900
140	66.0	302.1	219,400	391,900
145	65.0	299.7	206,900	373,400
150	64.0	297.2	195,300	356,300
160	62.0	292.0	174,400	325,600
170	60.0	286.2	156,000	298,800
180	57.9	280.0	139,600	275,100
190	55.7	273.2	125,000	254,200
200	53.5	265.9	111,900	235,400
210	51.2	258.0	100,000	218,600
220	48.9	249.3	89,200	203,300
230	46.4	239.9	79,400	189,500
240	43.9	229.7	70,300	176,800
250	41.2	218.5	62,000	165,200
260	38.4	206.1	54,300	154,500
270	35.3	192.4	47,100	144,700
280	32.0	176.9	40,400	135,500
290	28.4	159.1	34,100	126,900
300	24.3	138.2	28,100	119,000
310	19.3	112.1	22,400	111,400

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881,800 lb



360°

341.2 ft				
ft	°	ft	lb	lb
55	82.4	347.8	461,300	461,300
60	81.5	347.0	461,300	461,300
65	80.7	346.1	461,300	461,300
70	79.8	345.2	461,300	461,300
75	78.9	344.2	461,300	461,300
80	78.1	343.1	461,300	461,300
85	77.2	341.9	461,300	461,300
90	76.4	340.7	444,400	461,300
95	75.5	339.4	412,400	461,300
100	74.6	338.0	383,800	461,300
105	73.7	336.5	358,000	461,300
110	72.9	334.9	334,700	461,300
115	72.0	333.2	313,500	461,300
120	71.1	331.5	294,100	461,300
125	70.2	329.7	276,400	455,400
130	69.3	327.7	260,100	431,800
135	68.4	325.7	245,000	410,100
140	67.5	323.6	231,000	390,100
145	66.6	321.4	218,000	371,600
150	65.6	319.1	206,000	354,500
160	63.8	314.2	184,100	323,700
170	61.9	308.9	165,000	296,900
180	59.9	303.2	147,900	273,300
190	58.0	297.0	132,700	252,300
200	55.9	290.3	119,100	233,500
210	53.9	283.0	106,700	216,700
220	51.7	275.2	95,500	201,400
230	49.5	266.8	85,300	187,600
240	47.3	257.6	75,900	174,900
250	44.9	247.7	67,200	163,300
260	42.4	237.0	59,200	152,700
270	39.8	225.2	51,800	142,800
280	37.1	212.3	44,900	133,700
290	34.1	197.9	38,400	125,200
300	31.0	181.7	32,300	117,200
310	27.4	163.3	26,600	109,800
320	23.4	141.4	21,100	102,800
330	18.5	114.2	15,800	96,200

360.9 ft				
ft	°	ft	lb	lb
60	82.0	366.9	402,000	402,000
65	81.2	366.1	402,000	402,000
70	80.4	365.2	402,000	402,000
75	79.6	364.3	402,000	402,000
80	78.7	363.3	402,000	402,000
85	77.9	362.2	402,000	402,000
90	77.1	361.0	402,000	402,000
95	76.3	359.7	402,000	402,000
100	75.5	358.4	378,800	402,000
105	74.7	357.0	353,000	402,000
110	73.8	355.5	329,600	402,000
115	73.0	354.0	308,400	402,000
120	72.2	352.3	289,000	402,000
125	71.3	350.6	271,200	402,000
130	70.5	348.8	254,800	402,000
135	69.6	346.9	239,800	402,000
140	68.8	344.9	225,800	386,400
145	67.9	342.9	212,800	367,900
150	67.1	340.7	200,700	350,700
160	65.3	336.2	178,900	319,900
170	63.5	331.2	159,700	293,100
180	61.7	325.9	142,600	269,400
190	59.9	320.1	127,400	248,400
200	58.0	313.9	113,800	229,700
210	56.1	307.3	101,500	212,800
220	54.2	300.1	90,300	197,600
230	52.2	292.4	80,000	183,700
240	50.1	284.2	70,700	171,100
250	48.0	275.2	62,000	159,500
260	45.8	265.6	54,100	148,900
270	43.5	255.3	46,700	139,000
280	41.1	244.0	39,800	129,900
290	38.6	231.7	33,400	121,400
300	35.9	218.2	27,400	113,500
310	33.1	203.2	21,700	106,100
320	30.0	186.4	16,400	99,200
330	26.5	167.2		92,700
340	22.6	144.5		86,500
350	17.8	116.2		80,600

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380.6 ft				
ft	°	ft	lb	lb
60	82.4	386.8	348,100	348,100
65	81.6	386.1	348,100	348,100
70	80.9	385.2	348,100	348,100
75	80.1	384.3	348,100	348,100
80	79.3	383.4	348,100	348,100
85	78.6	382.3	348,100	348,100
90	77.8	381.2	348,100	348,100
95	77.0	380.0	348,100	348,100
100	76.2	378.8	348,100	348,100
105	75.5	377.5	348,100	348,100
110	74.7	376.1	330,200	348,100
115	73.9	374.6	308,900	348,100
120	73.1	373.0	289,500	348,100
125	72.3	371.4	271,700	348,100
130	71.5	369.7	255,300	348,100
135	70.7	367.9	240,200	348,000
140	69.9	366.1	226,200	347,800
145	69.1	364.1	213,200	347,500
150	68.3	362.1	201,100	347,200
160	66.7	357.8	179,300	320,300
170	65.0	353.2	160,100	293,400
180	63.3	348.2	143,000	269,800
190	61.6	342.8	127,800	248,800
200	59.9	337.1	114,200	230,000
210	58.1	330.9	101,900	213,200
220	56.3	324.3	90,700	197,900
230	54.5	317.2	80,500	184,100
240	52.6	309.6	71,100	171,500
250	50.6	301.5	62,500	159,900
260	48.6	292.8	54,600	149,200
270	46.6	283.4	47,200	139,400
280	44.4	273.3	40,400	130,300
290	42.2	262.5	34,000	121,800
300	39.9	250.7	28,000	114,000
310	37.4	237.9	22,400	106,600
320	34.8	223.8	17,100	99,700
330	32.1	208.3		93,200
340	29.0	190.9		87,100
350	25.7	171.0		81,300
360	21.8	147.5		75,800
370	17.2	118.1		70,600

400.3 ft				
ft	°	ft	lb	lb
60	82.8	406.7	305,600	305,600
65	82.0	406.0	305,600	305,600
70	81.3	405.2	305,600	305,600
75	80.6	404.3	305,600	305,600
80	79.9	403.4	305,600	305,600
85	79.1	402.4	305,600	305,600
90	78.4	401.4	305,600	305,600
95	77.7	400.3	305,600	305,600
100	76.9	399.1	305,600	305,600
105	76.2	397.8	305,600	305,600
110	75.5	396.5	305,600	305,600
115	74.7	395.1	304,100	305,600
120	74.0	393.6	284,600	305,600
125	73.2	392.1	266,800	305,400
130	72.5	390.5	250,400	305,400
135	71.7	388.8	235,300	305,200
140	71.0	387.1	221,200	304,900
145	70.2	385.2	208,200	304,600
150	69.4	383.3	196,100	304,300
160	67.9	379.3	174,200	303,700
170	66.3	374.9	155,000	289,600
180	64.7	370.2	137,900	265,900
190	63.1	365.2	122,700	244,900
200	61.5	359.8	109,100	226,200
210	59.9	354.0	96,700	209,300
220	58.2	347.9	85,500	194,000
230	56.5	341.3	75,300	180,200
240	54.7	334.3	65,900	167,600
250	52.9	326.8	57,300	156,000
260	51.1	318.8	49,400	145,300
270	49.2	310.2	42,000	135,500
280	47.3	301.1	35,200	126,400
290	45.3	291.3	28,800	117,900
300	43.2	280.8	22,900	110,100
310	41.0	269.5	17,300	102,700
320	38.8	257.2		95,800
330	36.4	243.9		89,300
340	33.9	229.3		83,200
350	31.1	213.2		77,500
360	28.2	195.2		72,100
370	24.9	174.6		66,900
380	21.1	150.3		62,000
390	16.6	119.8		57,300

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881,800 lb



360°

419.9 ft				
ft	°	ft	lb	lb
65	82.4	425.9	264,200	264,200
70	81.7	425.1	264,200	264,200
75	81.0	424.3	264,200	264,200
80	80.3	423.4	264,200	264,200
85	79.7	422.5	264,200	264,200
90	79.0	421.5	264,200	264,200
95	78.3	420.4	264,200	264,200
100	77.6	419.3	264,100	264,100
105	76.9	418.1	263,900	263,900
110	76.2	416.9	263,800	263,800
115	75.4	415.5	263,600	263,600
120	74.7	414.1	263,300	263,300
125	74.0	412.7	263,000	263,000
130	73.3	411.2	250,400	262,900
135	72.6	409.6	235,200	262,700
140	71.9	407.9	221,200	262,400
145	71.2	406.2	208,200	262,100
150	70.4	404.4	196,100	261,800
160	69.0	400.5	174,100	261,200
170	67.5	396.4	154,900	260,500
180	66.0	392.0	137,800	259,800
190	64.5	387.3	122,600	244,700
200	63.0	382.2	108,900	226,000
210	61.4	376.8	96,600	209,100
220	59.8	371.0	85,400	193,900
230	58.2	364.8	75,100	180,000
240	56.6	358.3	65,800	167,400
250	54.9	351.3	57,200	155,800
260	53.2	343.9	49,200	145,100
270	51.5	336.0	41,900	135,300
280	49.7	327.6	35,000	126,200
290	47.9	318.7	28,700	117,800
300	46.0	309.1	22,700	109,900
310	44.1	298.9	17,100	102,500
320	42.0	288.0		95,600
330	39.9	276.2		89,200
340	37.7	263.5		83,100
350	35.4	249.7		77,400
360	32.9	234.6		72,000
370	30.3	218.0		66,800
380	27.4	199.3		62,000
390	24.2	178.0		57,300
400	20.5	152.9		52,900
410	16.0	121.4		48,600

439.6 ft				
ft	°	ft	lb	lb
65	82.8	445.8	247,000	247,000
70	82.1	445.0	247,000	247,000
75	81.4	444.3	247,000	247,000
80	80.8	443.4	247,000	247,000
85	80.1	442.5	247,000	247,000
90	79.5	441.6	246,900	246,900
95	78.8	440.6	246,700	246,700
100	78.1	439.5	246,600	246,600
105	77.5	438.4	246,400	246,400
110	76.8	437.2	246,200	246,200
115	76.1	435.9	246,000	246,000
120	75.4	434.6	245,800	245,800
125	74.8	433.2	245,500	245,500
130	74.1	431.7	245,300	245,300
135	73.4	430.2	230,200	245,000
140	72.7	428.6	216,200	244,500
145	72.0	427.0	203,100	244,200
150	71.3	425.3	191,000	244,000
160	70.0	421.6	169,000	243,300
170	68.6	417.7	149,700	242,600
180	67.1	413.5	132,600	241,800
190	65.7	409.1	117,400	240,900
200	64.3	404.3	103,700	222,100
210	62.8	399.2	91,400	205,200
220	61.3	393.7	80,100	190,000
230	59.8	387.9	69,900	176,100
240	58.3	381.8	60,500	163,500
250	56.7	375.3	51,900	151,900
260	55.2	368.4	44,000	141,200
270	53.5	361.0	36,600	131,400
280	51.9	353.3	29,800	122,300
290	50.2	345.0	23,400	113,800
300	48.5	336.2	17,500	106,000
310	46.7	326.9		98,600
320	44.8	316.9		91,700
330	42.9	306.3		85,300
340	41.0	295.0		79,200
350	38.9	282.8		73,500
360	36.8	269.6		68,100
370	34.5	255.3		63,000
380	32.1	239.7		58,100
390	29.5	222.5		53,500
400	26.7	203.3		49,100
410	23.5	181.3		44,900
420	19.9	155.4		40,900
430	15.4	122.8		37,000

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459.3 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
70	82.4	464.9	215,100	215,100
75	81.8	464.2	215,100	215,100
80	81.2	463.4	215,000	215,000
85	80.5	462.5	214,800	214,800
90	79.9	461.6	214,700	214,700
95	79.3	460.7	214,500	214,500
100	78.6	459.6	214,300	214,300
105	78.0	458.5	214,200	214,200
110	77.4	457.4	213,900	213,900
115	76.7	456.2	213,700	213,700
120	76.1	454.9	213,500	213,500
125	75.4	453.6	213,200	213,200
130	74.8	452.2	213,000	213,000
135	74.1	450.8	212,700	212,700
140	73.5	449.3	212,500	212,500
145	72.8	447.7	202,800	212,000
150	72.2	446.1	190,600	211,700
160	70.9	442.6	168,600	211,100
170	69.5	438.9	149,300	210,600
180	68.2	434.9	132,200	209,900
190	66.8	430.7	116,900	208,400
200	65.5	426.1	103,200	206,400
210	64.1	421.3	90,900	204,300
220	62.7	416.1	79,700	189,600
230	61.2	410.7	69,400	175,700
240	59.8	404.9	60,000	163,100
250	58.3	398.8	51,400	151,500
260	56.9	392.3	43,500	140,900
270	55.3	385.4	36,100	131,000
280	53.8	378.1	29,300	121,900
290	52.2	370.5	23,000	113,500
300	50.6	362.3	17,000	105,600
310	49.0	353.7		98,300
320	47.3	344.5		91,400
330	45.5	334.8		84,900
340	43.8	324.5		78,900
350	41.9	313.5		73,200
360	40.0	301.7		67,800
370	38.0	289.1		62,700
380	35.9	275.5		57,800
390	33.6	260.8		53,300
400	31.3	244.7		48,900
410	28.7	226.9		44,700
420	26.0	207.1		40,800
430	22.9	184.5		36,900
440	19.3	157.8		33,300

479.0 ft				
ft	°	ft	38.7 ft lb	60.0 ft lb
70	82.8	484.8	188,500	188,500
75	82.2	484.1	188,300	188,300
80	81.5	483.3	188,100	188,100
85	80.9	482.5	188,100	188,100
90	80.3	481.6	187,900	187,900
95	79.7	480.7	187,700	187,700
100	79.1	479.7	187,500	187,500
105	78.5	478.7	187,300	187,300
110	77.9	477.6	187,100	187,100
115	77.3	476.4	186,900	186,900
120	76.7	475.2	186,700	186,700
125	76.0	474.0	186,400	186,400
130	75.4	472.6	186,200	186,200
135	74.8	471.3	185,900	185,900
140	74.2	469.8	185,700	185,700
145	73.6	468.3	185,400	185,400
150	72.9	466.8	185,100	185,100
160	71.7	463.5	163,600	184,500
170	70.4	459.9	144,200	184,000
180	69.1	456.1	127,100	182,500
190	67.8	452.1	111,800	180,700
200	66.5	447.8	98,100	179,000
210	65.2	443.2	85,700	177,300
220	63.9	438.3	74,500	175,600
230	62.5	433.1	64,200	171,900
240	61.2	427.6	54,900	159,200
250	59.8	421.9	46,200	147,600
260	58.4	415.7	38,300	137,000
270	57.0	409.3	30,900	127,100
280	55.5	402.4	24,100	118,000
290	54.0	395.2	17,700	109,600
300	52.5	387.6		101,700
310	51.0	379.6		94,400
320	49.4	371.1		87,500
330	47.8	362.1		81,000
340	46.2	352.6		75,000
350	44.5	342.5		69,300
360	42.7	331.8		63,900
370	40.9	320.4		58,800
380	39.0	308.3		54,000
390	37.1	295.2		49,400
400	35.0	281.2		45,000
410	32.8	266.0		40,900
420	30.5	249.5		36,700
430	28.0	231.2		32,300
440	25.3	210.8		28,000
450	22.3	187.5		23,800
460	18.8	160.0		19,800