



S/N: 10101

Manitowoc Cranes, Inc.
Manitowoc, Wisconsin 54220 U.S.A.



Liftcrane Boom Capacities

4600 SERIES 3
RINGER SERIES 2

Boom No. 35
80 ft Mast No. 7B
60 ft Ringer Attachment on Blocking or Pedestals
112,000 lb Crane Counterweight
760,000 lb Auxiliary Counterweight
RINGER on Barge - 360 Degree Rating
0 Degree thru 1 Degree Machine List

LIFTING CAPACITIES: Lifting capacities are for a RINGER when operating on a barge. Machine shall be positively secured to prevent shifting. Lifting capacities for various boom lengths and operating radii are for freely suspended loads and do not exceed 75% of a static tipping load. Capacities based on structural competence are denoted by an asterisk (*).

Upper boom point capacities for liftcrane service with single part whip line are 40,000 lb for 1-1/4 in. wire rope, 45,000 lb for 1-3/8 in. wire rope and 50,000 lb for 1-1/2 in. or 1-5/8 in. wire rope. Capacities for two part line are 80,000 lb for 1-1/4 in. wire rope, 90,000 lb for 1-3/8 in. wire rope and 100,000 lb for 1-1/2 in. 1-5/8 in. wire rope cannot be used for two part line. In all cases, upper boom point capacities cannot exceed those listed for the main boom capacity.

Weight of all load blocks, hooks, weight ball, slings, hoist lines, etc., beneath boom point sheaves, is considered part of main boom 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.

OPERATING CONDITIONS: Machine to operate on a firm uniformly supporting surface with roller path properly supported and machine list not to exceed degrees noted

with exception of 0 degree machine list which must not exceed 1-1/4 in. in 60 ft. Refer to boom rigging No. 50860 and wire rope specification chart No. 6429 or No. 6431. Crane operator judgment must be used to allow for dynamic load effects of swinging, hoisting or lowering, wind conditions, as well as adverse operating conditions and physical machine depreciation.

OPERATING RADIUS: Operating radius is horizontal distance from axis of rotation at top of roller path to center of vertical hoist line or load block. Boom angle is angle between horizontal and a line through the boom hinge that is parallel to lower chords of inserts and boom top, 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 top of roller path to centerline of boom point shaft.

MACHINE EQUIPMENT: Machine equipped with 60 ft RINGER attachment, 26 ft 1 in. crawlers, 60 in. treads, 30 ft heavy duty mast, 30 part independent boom hoist reeving, eight 1-3/4 in. galvanized boom support strand pendants, 80 ft fixed auxiliary mast, 112,000 lb crane counterweight, and 760,000 lb auxiliary counterweight.

Maximum Boom Lengths Lifted Unassisted	
List	Boom Length
0 Degree	280 ft
1/2 Degree	250 ft
1 Degree	220 ft
Load block, hook and weight ball on barge deck at start. Jib is not to be used on machine while operating on a barge.	

Warning: Check amount of auxiliary counterweight on machine before use of this chart.

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	1 Degree List Boom Capacity Pounds	Oper. Radius Feet
100 ft						
48	79.8	102.0	1,200,000 *			48
50	78.6	101.6	1,200,000 *	641,400 *		50
55	75.7	100.4	1,200,000 *	582,000 *	543,300 *	55
60	72.7	98.9	1,188,400 *	532,500 *	496,500 *	60
65	69.7	97.2	1,164,500 *	490,600 *	456,900 *	65
70	66.6	95.1	1,141,400 *	454,700 *	422,900 *	70
75	63.4	92.7	1,056,900	423,600 *	393,500 *	75
80	60.1	89.9	951,100	396,400 *	367,700 *	80
85	56.7	86.7	864,100	372,300 *	345,000 *	85
90	53.2	83.1	791,300	351,000 *	324,800 *	90
95	49.5	79.0	715,600 *	331,900 *	306,800 *	95
100	45.5	74.3	645,300 *	314,700 *	290,500 *	100
105	41.3	68.8	583,300 *	299,100 *	275,800 *	105
110	36.7	62.5	527,400 *	285,000 *	262,400 *	110
115	31.4	54.9	475,800 *	272,000 *	250,200 *	115
120	25.3	45.3	426,200 *	260,200 *	239,000 *	120

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	1 Degree List Boom Capacity Pounds	Oper. Radius Feet
130 ft						
55	79.0	131.2	1,028,600 *			55
60	76.8	130.1	1,007,500 *	530,200 *		60
65	74.5	128.8	987,800 *	488,400 *	453,400 *	65
70	72.2	127.2	969,200 *	452,500 *	419,500 *	70
75	69.9	125.4	951,400 *	421,400 *	390,200 *	75
80	67.5	123.4	934,400 *	394,300 *	364,500 *	80
85	65.1	121.2	860,500	370,300 *	341,900 *	85
90	62.6	118.7	787,600	349,000 *	321,700 *	90
95	60.1	115.9	725,800	329,900 *	303,700 *	95
100	57.5	112.8	672,600	312,700 *	287,500 *	100
105	54.8	109.3	626,400	297,200 *	272,800 *	105
110	52.0	105.5	585,800	283,100 *	259,500 *	110
115	49.2	101.3	550,000	270,200 *	247,300 *	115
120	46.2	96.7	518,100	258,300 *	236,100 *	120
125	43.0	91.5	489,500	247,500 *	225,800 *	125
130	39.6	85.7	456,700 *	237,400 *	216,400 *	130
135	36.0	79.1	420,700 *	228,100 *	207,600 *	135
140	32.0	71.5	387,000 *	219,500 *	199,400 *	140
145	27.4	62.5	354,700 *	211,500 *	191,800 *	145

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	1 Degree List Boom Capacity Pounds	Oper. Radius Feet
160 ft						
60	79.3	160.8	884,600 *			60
65	77.5	159.7	868,200 *	486,100 *		65
70	75.6	158.5	852,800 *	450,300 *	416,100 *	70
75	73.8	157.1	838,200 *	419,200 *	386,800 *	75
80	71.9	155.5	824,400 *	392,100 *	361,200 *	80
85	70.0	153.7	811,300 *	368,200 *	338,600 *	85
90	68.1	151.8	783,800	346,900 *	318,500 *	90
95	66.1	149.6	721,900	327,800 *	300,600 *	95
100	64.1	147.2	668,700	310,700 *	284,400 *	100
105	62.1	144.6	622,500	295,200 *	269,700 *	105
110	60.1	141.8	582,000	281,100 *	256,400 *	110
115	58.0	138.8	546,100	268,200 *	244,300 *	115
120	55.8	135.5	514,200	256,400 *	233,100 *	120
125	53.6	131.9	485,600	245,500 *	222,900 *	125
130	51.3	127.9	459,800	235,500 *	213,400 *	130
135	49.0	123.7	436,500	226,200 *	204,700 *	135
140	46.5	119.1	415,200	217,600 *	196,500 *	140
145	44.0	114.1	395,800	209,600 *	189,000 *	145
150	41.3	108.5	378,000	202,100 *	181,900 *	150
155	38.5	102.5	361,500	195,100 *	175,300 *	155
160	35.5	95.7	344,900 *	188,500 *	169,100 *	160
165	32.3	88.1	321,200 *	182,400 *	163,300 *	165
170	28.7	79.5	298,300 *	176,500 *	157,800 *	170

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	1 Degree List Boom Capacity Pounds	Oper. Radius Feet
190 ft						
65	79.5	190.4	763,000 *			65
70	77.9	189.4	750,700 *	448,000 *		70
75	76.4	188.2	739,100 *	417,000 *	383,400 *	75
80	74.8	186.9	728,100 *	389,900 *	357,900 *	80
85	73.3	185.4	717,600 *	366,000 *	335,300 *	85
90	71.7	183.8	707,600 *	344,800 *	315,300 *	90
95	70.1	182.0	698,100 *	325,700 *	297,400 *	95
100	68.5	180.1	664,800	308,600 *	281,200 *	100
105	66.8	178.0	618,600	293,100 *	266,600 *	105
110	65.2	175.7	578,000	279,100 *	253,300 *	110
115	63.5	173.3	542,200	266,200 *	241,200 *	115
120	61.8	170.6	510,300	254,400 *	230,100 *	120
125	60.1	167.8	481,700	243,600 *	219,900 *	125
130	58.3	164.8	455,900	233,600 *	210,400 *	130
135	56.5	161.5	432,600	224,300 *	201,700 *	135
140	54.7	158.1	411,300	215,700 *	193,600 *	140
145	52.8	154.3	391,900	207,700 *	186,000 *	145
150	50.8	150.3	374,000	200,200 *	179,000 *	150
155	48.9	146.1	357,600	193,200 *	172,400 *	155
160	46.8	141.5	342,400	186,700 *	166,200 *	160
165	44.7	136.5	328,400	180,500 *	160,400 *	165
170	42.5	131.2	315,300	174,700 *	154,900 *	170
175	40.2	125.4	303,200	169,200 *	149,800 *	175
180	37.8	119.2	291,800	164,100 *	144,900 *	180
185	35.2	112.3	281,200	159,200 *	140,300 *	185
190	32.5	104.7	270,000 *	154,500 *	135,900 *	190
195	29.5	96.3	253,000 *	150,200 *	131,800 *	195
200	26.2	86.7	236,300 *	146,000 *	127,800 *	200

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	1 Degree List Boom Capacity Pounds	Oper. Radius Feet
220 ft						
70	79.6	220.0	659,400 *			70
75	78.3	219.0	650,600 *			75
80	76.9	217.9	642,100 *	387,700 *		80
85	75.6	216.6	634,100 *	363,800 *		85
90	74.2	215.2	626,500 *	342,600 *	312,000 *	90
95	72.9	213.7	619,200 *	323,600 *	294,100 *	95
100	71.5	212.1	612,200 *	306,500 *	278,000 *	100
105	70.1	210.3	605,500 *	291,100 *	263,500 *	105
110	68.7	208.4	574,000	277,000 *	250,200 *	110
115	67.3	206.4	538,200	264,200 *	238,100 *	115
120	65.9	204.1	506,300	252,400 *	227,000 *	120
125	64.5	201.8	477,700	241,600 *	216,800 *	125
130	63.0	199.3	451,900	231,600 *	207,400 *	130
135	61.5	196.6	428,500	222,300 *	198,700 *	135
140	60.0	193.8	407,300	213,800 *	190,600 *	140
145	58.5	190.8	387,900	205,800 *	183,100 *	145
150	57.0	187.6	370,000	198,300 *	176,000 *	150
155	55.4	184.2	353,600	191,300 *	169,500 *	155
160	53.8	180.6	338,400	184,800 *	163,300 *	160
165	52.2	176.8	324,400	178,600 *	157,500 *	165
170	50.5	172.7	311,300	172,800 *	152,000 *	170
175	48.8	168.4	299,200	167,400 *	146,900 *	175
180	47.0	163.9	287,800	162,200 *	142,000 *	180
185	45.2	159.0	277,200	157,300 *	137,400 *	185
190	43.3	153.8	267,200	152,700 *	133,100 *	190
195	41.4	148.2	257,800	148,300 *	129,000 *	195
200	39.3	142.3	236,800 *	144,100 *	125,000 *	200
205	37.2	135.9	215,400 *	140,200 *	121,300 *	205
210	35.0	128.9	195,300 *	130,600 *	117,700 *	210
215	32.6	121.3	176,200 *	118,200 *	114,300 *	215
220	30.1	113.0	158,100 *	106,100 *	102,100 *	220
225	27.4	103.8	140,700 *	94,100 *	91,200 *	225

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760,000 lb Auxiliary Counterweight
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0 Degree thru 1 Degree Machine List

Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds	1/2 Degree List Boom Capacity Pounds	Oper. Radius Feet
250 ft					
75	79.7	249.6	570,500 *		75
80	78.5	248.6	564,400 *		80
85	77.4	247.5	558,600 *	361,700 *	85
90	76.2	246.3	553,000 *	340,500 *	90
95	75.0	245.0	547,800 *	321,500 *	95
100	73.8	243.6	542,800 *	304,400 *	100
105	72.6	242.0	538,100 *	289,000 *	105
110	71.4	240.4	533,700 *	275,000 *	110
115	70.2	238.6	529,400 *	262,100 *	115
120	69.0	236.7	502,200	250,400 *	120
125	67.7	234.7	473,600	239,600 *	125
130	66.5	232.5	447,800	229,600 *	130
135	65.2	230.3	424,500	220,400 *	135
140	63.9	227.9	403,200	211,800 *	140
145	62.7	225.3	383,800	203,800 *	145
150	61.4	222.6	366,000	196,300 *	150
155	60.0	219.8	337,100 *	189,400 *	155
160	58.7	216.8	307,800 *	182,800 *	160
165	57.3	213.6	280,800 *	176,700 *	165
170	56.0	210.3	256,500 *	169,500 *	170
175	54.6	206.8	234,200 *	156,100 *	175
180	53.1	203.1	213,800 *	143,200 *	180
185	51.7	199.2	194,900 *	130,900 *	185
190	50.2	195.1	177,200 *	119,100 *	190
195	48.7	190.8	160,700 *	107,700 *	195
200	47.1	186.2	145,100 *	96,700 *	200
205	45.6	181.4	130,200 *	86,100 *	205
210	43.9	176.3	116,100 *	75,900 *	210
215	42.2	170.9	102,700 *	66,100 *	215
220	40.5	165.2	90,000 *	56,600 *	220
225	38.7	159.1	77,900 *	47,400 *	225
230	36.8	152.5	66,400 *	38,500 *	230

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Oper. Radius Feet	Boom Angle Deg.	Boom Point Elev. Feet	0 Degree List Boom Capacity Pounds
280 ft			
80	79.8	279.2	496,500 *
85	78.7	278.2	492,500 *
90	77.7	277.1	488,800 *
95	76.6	276.0	485,400 *
100	75.6	274.7	482,300 *
105	74.5	273.3	479,500 *
110	73.5	271.9	477,100 *
115	72.4	270.3	475,000 *
120	71.3	268.6	454,700 *
125	70.2	266.9	395,400 *
130	69.1	265.0	352,900 *
135	68.0	263.0	317,500 *
140	66.9	260.9	287,300 *
145	65.8	258.7	260,600 *
150	64.7	256.4	236,800 *
155	63.5	253.9	215,000 *
160	62.4	251.3	194,800 *
165	61.2	248.6	176,200 *
170	60.0	245.8	158,900 *
175	58.8	242.8	142,900 *
180	57.6	239.6	127,900 *
185	56.4	236.4	113,800 *
190	55.2	232.9	100,500 *
195	53.9	229.3	88,000 *
200	52.6	225.6	76,200 *
205	51.3	221.6	65,000 *

MANITOWOC 4600 SERIES 3 - RINGER SERIES 2 - 760,000# AUXILIARY CWT.
RINGER CAPACITIES - 60 FT. RINGER ATTACHMENT - ON BLOCKING.
BOOM #35

S/N: 1039

RAD. IN FT.	CAPACITIES IN POUNDS							RAD. IN FT.
	BOOM LENGTH - FT.							
	100	130	160	190	220	250	280	
48	1,200,000*							48
50	1,200,000*							50
52	1,200,000*	1,042,000*						52
55	1,200,000*	1,028,600*						55
57	1,200,000*	1,020,000*	895,000*					57
60	1,188,400*	1,007,500*	884,600*					60
65	1,164,500*	987,800*	868,200*	763,000*				65
70	1,141,400*	969,200*	852,800*	750,700*	659,400*			70
75	1,056,900	951,400*	838,200*	739,100*	650,600*	570,500*		75
80	951,100	934,400*	824,400*	728,100*	642,100*	564,400*	496,500*	80
85	864,100	860,500	811,300*	717,600*	634,100*	558,600*	492,500*	85
90	791,300	787,600	783,800	707,600*	626,500*	553,000*	488,800*	90
95	715,600*	725,800	721,900	698,100*	619,200*	547,800*	485,400*	95
100	645,300*	672,600	668,700	664,800	612,200*	542,800*	482,300*	100
105	583,300*	626,400	622,500	618,600	605,500*	538,100*	479,500*	105
110	527,400*	585,800	582,000	578,000	574,000	533,700*	477,100*	110
115	475,800*	550,000	546,100	542,200	538,200	529,400*	475,000*	115
120	426,200*	518,100	514,200	510,300	506,300	502,200	454,700*	120
125		489,500	485,600	481,700	477,700	473,600	395,400*	125
130		456,700*	459,800	455,900	451,900	447,800	352,900*	130
135		420,700*	436,500	432,500	428,500	424,500	317,500*	135
140		387,000*	415,200	411,300	407,300	403,200	287,300*	140
145		354,700*	395,800	391,900	387,900	383,800	260,600*	145
150			378,000	374,000	370,000	366,000	236,800*	150
155			361,500	357,600	353,600	337,100*	215,000*	155
160			344,900*	342,400	338,400	307,800*	194,800*	160
165			321,200*	328,400	324,400	280,800*	176,200*	165
170			298,300*	315,300	311,300	256,500*	158,900*	170
175				303,200	299,200	234,200*	142,900*	175
180				291,800	287,800	213,800*	127,900*	180
185				281,200	277,200	194,900*	113,800*	185
190				270,000*	267,200	177,200*	100,500*	190
195				253,000*	257,800	160,700*	88,000*	195
200				236,300*	236,800*	145,100*	76,200*	200
205					215,400*	130,200*	65,000*	205
210					195,300*	116,100*		210
215					176,200*	102,700*		215
220					158,100*	90,000*		220
225					140,700*	77,900*		225
230						66,400*		230

Capacities for various boom lengths and operating radii are for freely suspended loads and do not exceed 75% of a static tipping load. Capacities based on structural competence are denoted by an asterisk (*).

Weight of jib, all load blocks, hooks, weight ball, slings, etc. is considered part of the main boom load. Boom is not to be lowered beyond radii where combined weights are greater than rated capacity. See boom raising capability chart.

Maximum Boom and Jib Lengths Lifted Unassisted		Deduct From Capacities When Jib is Attached	
Bo. Lgth.	Jib #122	Jib Lgth.	Jib #122
280'	---	40'	9,300#
280'	40'		

Load block, hook & weight ball on ground at start.

Machine to operate with roller path level within a tolerance of 1-1/4" in 60 ft. and properly supported. Refer to rigging #50860, range chart #6529-A and load line specification charts #6429 and #6431.

Crane operator judgment must be used to allow for dynamic load effects of swinging, hoisting or lowering, as well as adverse operating conditions or physical machine depreciation.

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

Machine equipped with 26'-1" crawlers, 60" treads, 30' heavy duty mast, 30 part independent boom hoist reeving, eight 1-3/4" galvanized boom support strand pendants, 80' fixed auxiliary mast, 112,000# crane cwt. and 760,000# auxiliary cwt.

DJK:cg
REV. 3/21/74

DRWG. #6212-A

MANITOWOC ENGINEERING CO.
MANITOWOC, WISCONSIN

S/N: 1039

MANITOWOC ENGINEERING CO.

A Division of The Manitowoc Company, Inc.

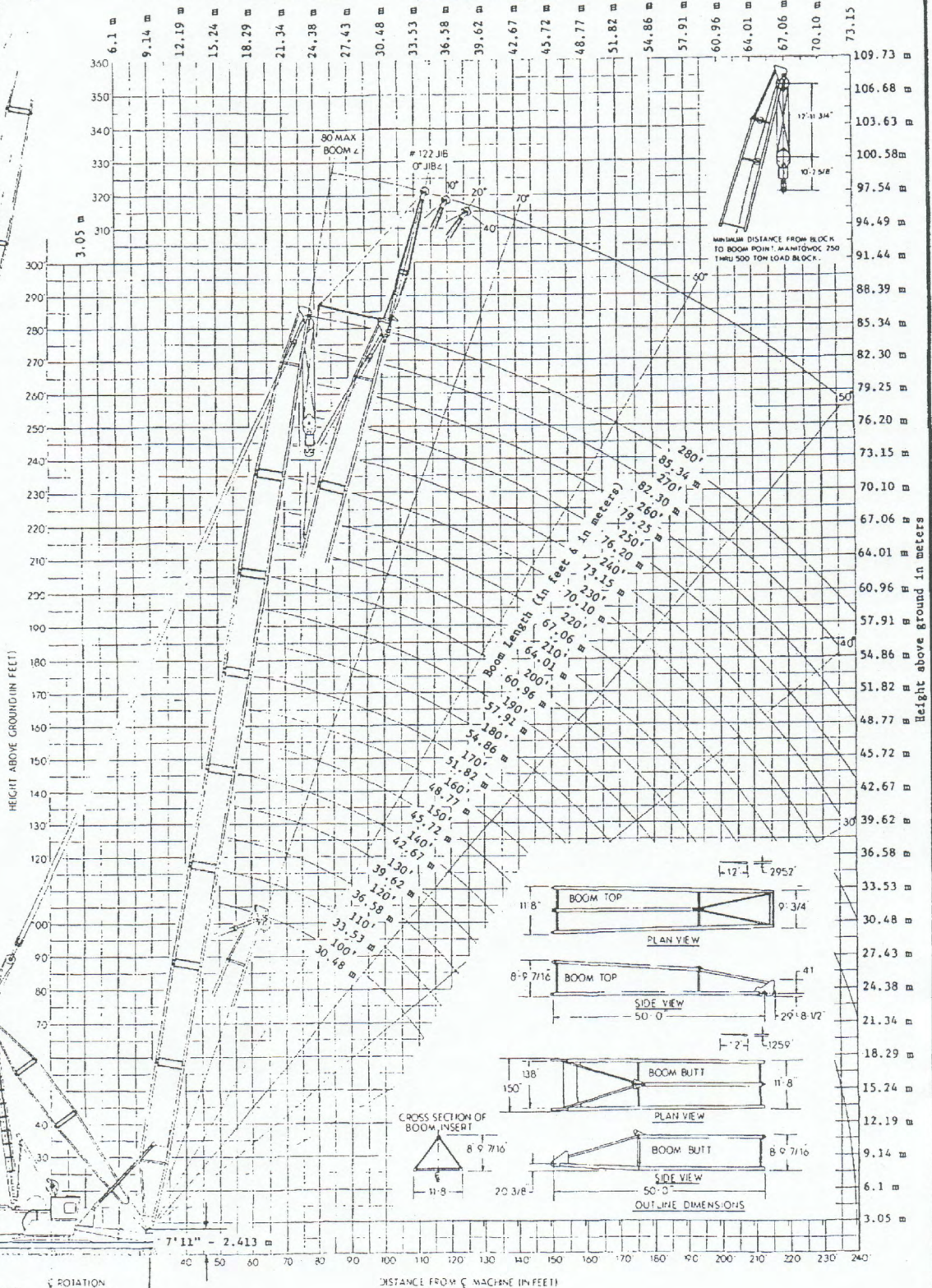
Manitowoc, Wisconsin

NOTE 4: Distance of MANITOWOC load block to boom point based on 3° fleet angle or physical limitations.

MAXIMUM BOOM ANGLE

80° For No. 35 Boom W/Open Throat Top

Distance from C machine in meters



NOTE 1: This drawing is intended only as a guide to assist in job planning.
NOTE 2: For planning a lift, this drawing is to be used in conjunction with appropriate:
A. Capacity Charts. C. Load Line Specifications. E. Outline Dimensions.
B. Range Chart. D. Rigging Drawing.
NOTE 3: For planning lifts where clearances are limited and accuracy is desired, a detailed layout should be prepared.

RANGE DIAGRAM-M4600-No.35 BOOM-60ft.RINGER®SERIES 2

DO NOT SCALE THIS DRAWING

Larger Size Diagrams Available - Contact Dealer.

5-11-73
10-30-72



MANITOWOC 4600 SERIES 3 - RINGER SERIES 2

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RANGE CHART

BOOM #35

RAD. IN FT.	BOOM ANGLE IN DEGREES							RAD. IN FT.
	BOOM LENGTH - FT.							
	100	130	160	190	220	250	280	
48	79.8							48
50	78.6							50
52	77.5	80.4						52
55	75.7	79.0						55
57	74.5	78.1	80.4					57
60	72.7	76.8	79.3					60
65	69.7	74.5	77.5	79.5				65
70	66.6	72.2	75.6	77.9	79.6			70
75	63.4	69.9	73.8	76.4	78.3	79.7		75
80	60.1	67.5	71.9	74.8	76.9	78.5	79.8	80
85	56.7	65.1	70.0	73.3	75.6	77.4	78.7	85
90	53.2	62.6	68.1	71.7	74.2	76.2	77.7	90
95	49.5	60.1	66.1	70.1	72.9	75.0	76.6	95
100	45.5	57.5	64.1	68.5	71.5	73.8	75.6	100
105	41.3	54.8	62.1	66.8	70.1	72.6	74.5	105
110	36.7	52.0	60.1	65.2	68.7	71.4	73.5	110
115	31.4	49.2	58.0	63.5	67.3	70.2	72.4	115
120	25.3	46.2	55.8	61.8	65.9	69.0	71.3	120
125		43.0	53.6	60.1	64.5	67.7	70.2	125
130		39.6	51.3	58.3	63.0	66.5	69.1	130
135		36.0	49.0	56.5	61.5	65.2	68.0	135
140		32.0	46.5	54.7	60.0	63.9	66.9	140
145		27.4	44.0	52.8	58.5	62.7	65.8	145
150			41.3	50.8	57.0	61.4	64.7	150
155			38.5	48.9	55.4	60.0	63.5	155
160			35.5	46.8	53.8	58.7	62.4	160
165			32.3	44.7	52.2	57.3	61.2	165
170			28.7	42.5	50.5	56.0	60.0	170
175				40.2	48.8	54.6	58.8	175
180				37.8	47.0	53.1	57.6	180
185				35.2	45.2	51.7	56.4	185
190				32.5	43.3	50.2	55.2	190
195				29.5	41.4	48.7	53.9	195
200				26.2	39.3	47.1	52.6	200
205					37.2	45.6	51.3	205
210					35.0	43.9		210
215					32.6	42.2		215
220					30.1	40.5		220
225					27.4	38.7		225
230						36.8		230

Boom angle is the angle between horizontal and a line through the boom hinge that is parallel to the lower chords of inserts and boom top. Boom angle is an indication of operating radius, but in all cases, operating radius shall govern capacity.

**NOTE: THIS IS A RANGE CHART
NOT A CAPACITY CHART**

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