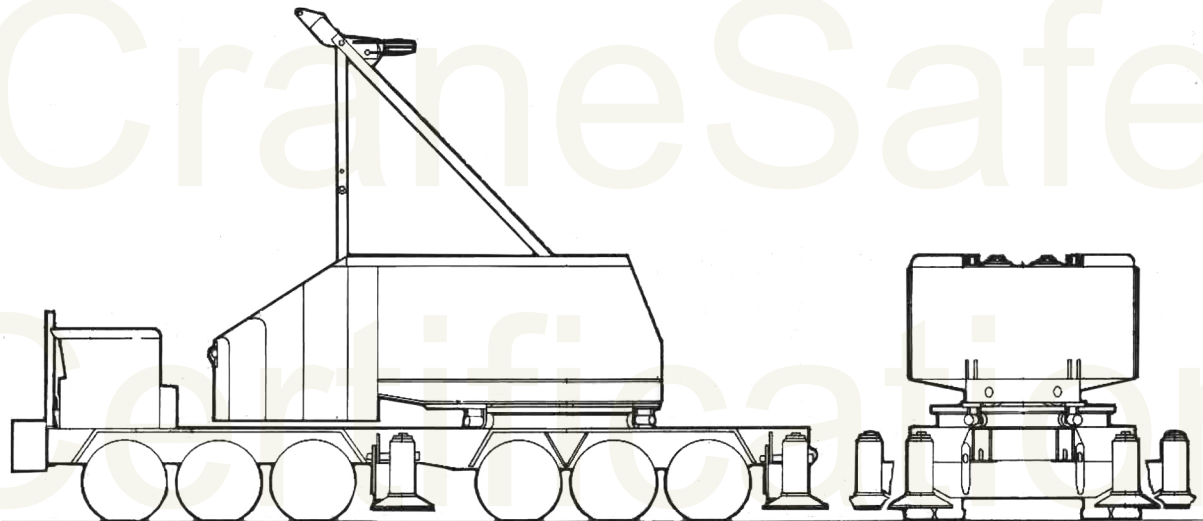


LOAD CHART & RIGGING PRACTICE EXERCISE

LATTICE FRICTION CRANE

Manitowoc 3900T



CraneSafe Certification

Lattice Friction Crane PRACTICE EXERCISE

LCR.LFC.MW3900T.PEX1

9 March 2010

CraneSafe 
CERTIFICATION

CraneSafe Certification + Fulford Harbour Group

Tel: 604.952.6033 | www.fulford.ca

Introduction

These 12 questions are for you to use to help get ready for the Load Chart & Rigging part of the CraneSafe Certification assessment for Friction Lattice Crane.

The questions on your assessment will be different from these but will be presented in the same format as these questions.

Following the questions are the load charts and rigging tables and then the answers. The answers explain how we arrived at the correct answer and you can use this to help work through any questions you may have gotten incorrect. We have not included all of the charts for this crane—but everything you need to answer the questions is included. You do not need the crane manual or full load chart package to answer the questions.

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Specifications

Manitowoc 3900T

Boom #9A with open throat top

74,000 lb counterweight

Jib #123 with 12' 6" strut

Weights of Load Handling Devices

- 125 Ton Block3,150 lbs
- 15 Ton Overhaul Ball.....900 lbs
- One Sheave Upper Boom Point.....1,200 lbs
- Weight per running foot of hoist lines.....1.88 lbs
- 1 Inch Load Line on Main and Auxiliary Drums

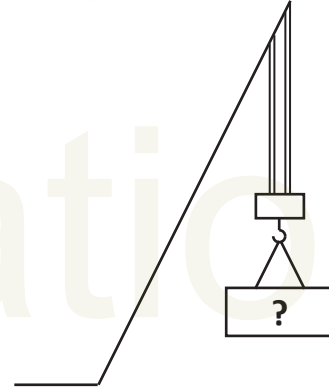
NOTE:

Line weights to be deducted from boom point elevation

Load Chart & Rigging Questions

1. What is the crane's net capacity based on the following configuration?

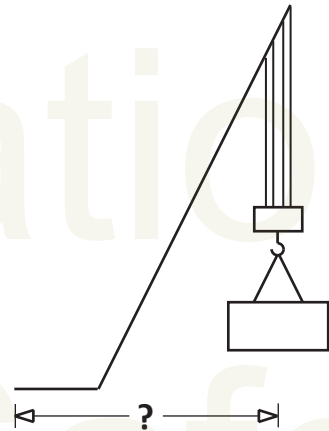
- Outriggers fully extended and set
- 130 feet of main boom
- 125 ton block 4 parts of line
- Rigging 250 lbs
- Radius 50 feet



Answer: _____ pounds

2. What is the crane's maximum radius based on the following configuration?

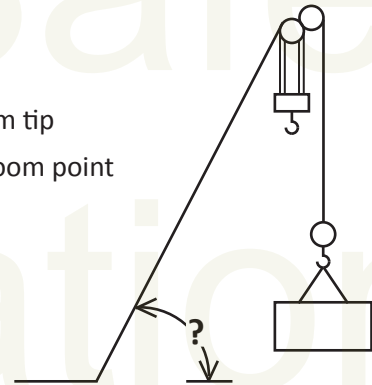
- Outriggers fully extended and set
- 160 feet of main boom
- 125 ton block 4 parts of line
- Rigging 120 lbs
- Load weight 82,000 lbs



Answer: _____ feet

3. What is the lowest main boom angle the load can be placed based on the following configuration?

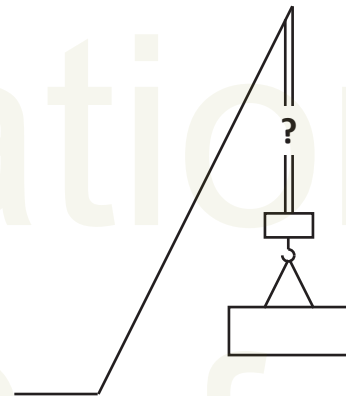
- Outriggers fully extended and set
- 180 feet of main boom
- 125 ton block 4 parts of line hanging 15 feet below boom tip
- Lift from 15 ton overhaul ball, over one sheave upper boom point
- Rigging 60 lbs
- Load weight 15,300 lbs



Answer: _____ degrees

4. What is the minimum parts of line required to lift the following load based on the crane's configuration?

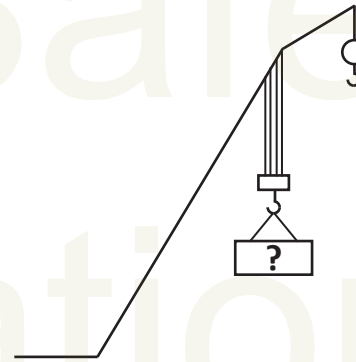
- 125 ton block
- Rigging 280 lbs
- Load weight 65,000 lbs



Answer: _____ parts

5. What is the net capacity based on the following crane configuration?

- Outriggers fully extended and set
- 170 feet of main boom
- 40 foot jib erected 10 degree offset
- 125 ton block 4 parts of line
- 15 ton overhaul ball hanging 20 feet below jib tip
- Rigging 125 lbs
- Main boom angle 66 degrees



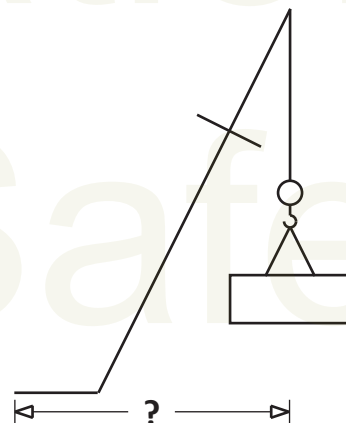
Answer: _____ pounds

*** NOTE:**

To determine approximate jib tip height, use the crane's Range Diagram.

6. What is the maximum radius the load can be placed based on the following crane configuration?

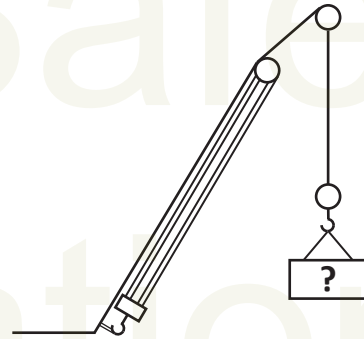
- Outriggers fully extended and set
- 160 feet of main boom
- 40 foot jib erected 0 degree offset
- 15 ton overhaul ball on jib
- Rigging 60 lbs
- Load weight 6,500 lbs



Answer: _____ feet

7. What is the maximum load that can be hoisted based on the following crane configuration?

- Outriggers fully extended and set
- 180 feet of main boom
- 40 foot jib 20 degree offset
- 125 ton block tied off at boom foot 4 parts of line
- 15 ton overhaul ball on jib
- Rigging 125 lbs
- Radius 125 feet



Answer: _____ pounds

Refer to the crane's Specification Drawing for questions #8, 9 and 10.

8. How far from the lower boom point should the pendant spreader be placed for 180 feet of main boom?

Answer: _____ feet _____ inches

9. What width should the pendant spreader be set for 180 feet of main boom?

Answer: _____ feet _____ inches

10. What is the correct sequence for boom inserts for 200 feet of main boom?

Answer: Butt
_____ feet
_____ feet
_____ feet
_____ feet

Tip

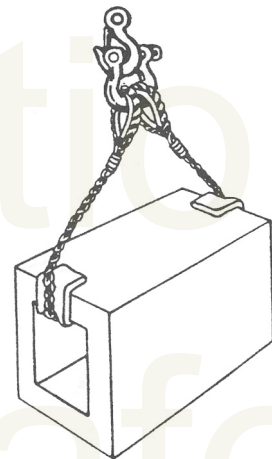
11. What is the minimum size of nylon web slings required to lift a load of 4,350 pounds?
The slings are in a double basket hitch configuration at a 35 degree angle.

Answer: _____ inch



12. What is the minimum size of wire rope sling required to lift a load of 5,000 pounds?
The sling is in a single basket hitch configuration at a 60 degree angle.

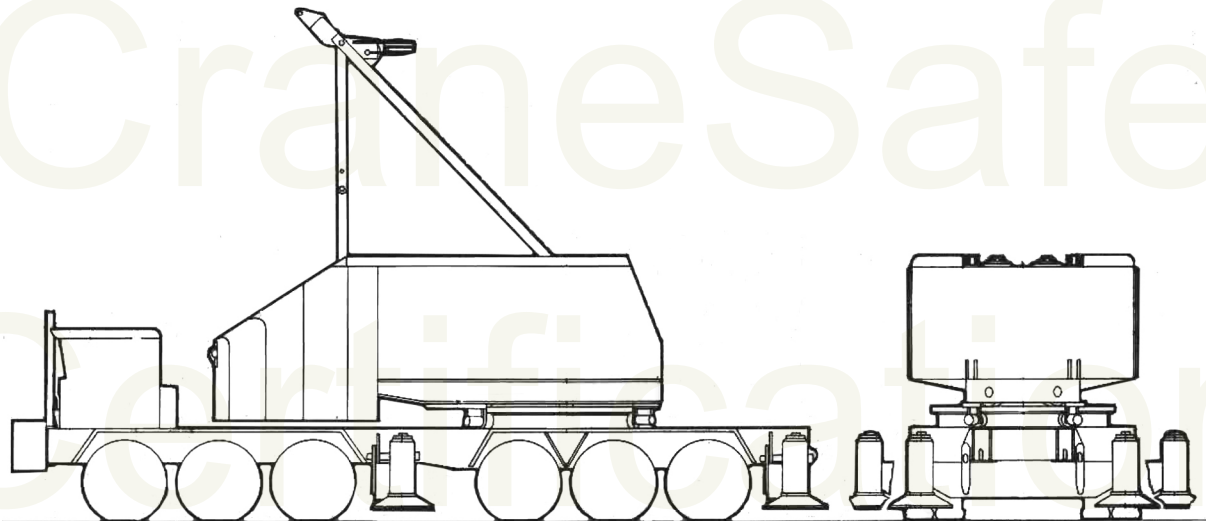
Answer: _____ inch



LOAD CHART & RIGGING TABLES

LATTICE FRICTION CRANE

Manitowoc 3900T



CraneSafe Certification

Lattice Friction Crane TABLES

LCR.LFC.MW3900T.PEX

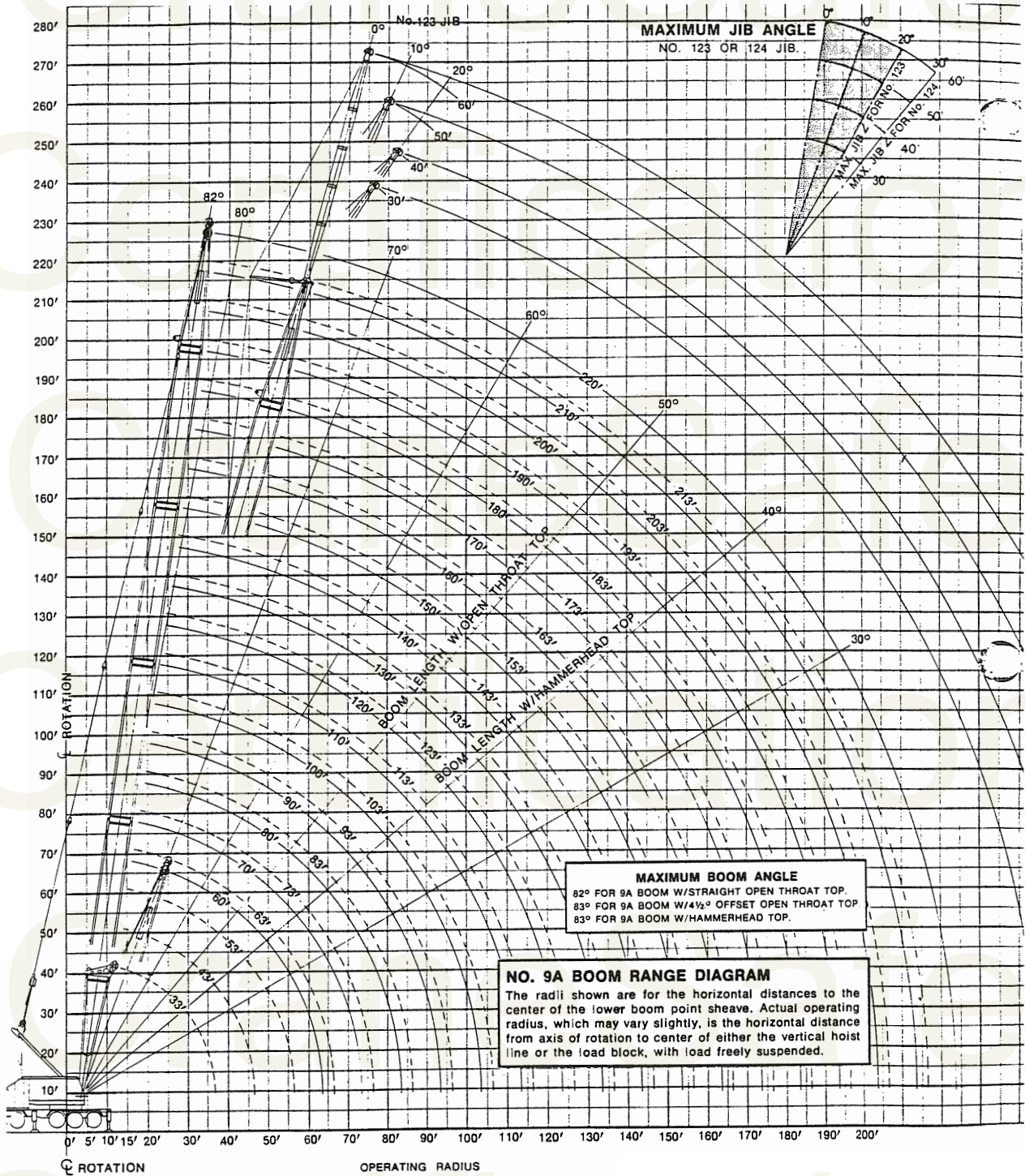
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Load Charts — Boom Angle Diagram



These charts are for assessment purposes only and should not be used to operate a crane.
 The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Lift Ratings

LIFT CRANE CAPACITIES

MEETS
ANSI B30.5
REQUIREMENTS

3900T
SERIES-2

BOOM NO. 9A WITH OPEN THROAT TOP USING 10', 20' AND 40' INSERTS 74,000 LB. CRANE COUNTERWEIGHT CAPACITIES OVER SIDE OR REAR ON EXTENDED OUTRIGGERS

TRUCK CRANE

LIFTING CAPACITIES: Capacities for various boom lengths and operating radii may be based on per cent of tipping, strength of structural components, operating speeds or other factors.

Capacities are for freely suspended loads and do not exceed 85% of a static load required to tip machine over side with outriggers fully extended. Capacities based on structural competence are shown by shaded areas.

Capacities are shown in pounds. Weight of jib, (see chart A), all load blocks, hooks, weight ball, slings, hoist lines, etc. beneath jib boom and jib point sheaves, is to be considered part of the 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.

OPERATING CONDITIONS: Machine to operate in level position on firm surface with outriggers fully extended, tires free of ground, gantry in working position and under conditions referred to in rigging drawing No. 49447, wire rope specification chart No. 6435 and operating range diagram chart No. 6423-A.

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

OPERATING RADIUS: Operating radius is the horizontal distance from the axis of rotation to the center of vertical hoist line or load block with the load freely suspended. Add 11" to boom point radius for radius of sheave when using single part hoist line.

Boom angle is the 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, in feet, is the vertical distance from ground level to centerline of boom point shaft.

MACHINE EQUIPMENT: Machine equipped with Manitowoc-Hendrickson 12x6 carrier, 14:00x20 tires, 112" outriggers, 15'

retractable gantry, 10 or 12 part boom hoist reeving, four 1 1/2" boom pendants, 74,000 lb. 3 piece crane counterweight, 10,500 lb. front bumper counterweight.

HOIST REEVING FOR MAIN LOAD BLOCK						
No. Parts of Line	1	2	3	4	5	6
Max. Load - Lbs.	25,800	51,600	77,400	103,200	129,000	154,800
No. Parts of Line	7	8	9	10	11	
Max. Load - Lbs.	180,600	206,400	232,200	258,000	280,000	

LOAD AND WHIP LINE SPECIFICATIONS	
LOAD LINE: 1" - 6x25 Filler Wire, Extra Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 51.7 Ton.	
WHIP LINE: 1" - 6x25 Filler Wire, Improved Plow Steel, Regular Lay, IWRC. Minimum Breaking Strength 44.9 Ton. Maximum Load - 22,500 lbs. per Line.	

MAXIMUM BOOM AND JIB LENGTHS LIFTED UNASSISTED					
OVER REAR ON EXTENDED OUTRIGGERS			OVER SIDE ON EXTENDED OUTRIGGERS		
Boom Lgth.	Jib No. 123	Jib No. 124	Boom Lgth.	Jib No. 123	Jib No. 124
220'	—	—	220'	—	—
220'	50'	60'	210'	—	—
210'	60'	60'	200'	40'	60'
			190'	60'	60'

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

(A) DEDUCT FROM CAPACITIES WHEN JIB IS ATTACHED		
Jib Lgth.	Jib No. 123	Jib No. 124
30'	2,500 Lb.	1,800 Lb.
40'	3,100 Lb.	2,050 Lb.
50'	3,700 Lb.	2,300 Lb.
60'	4,400 Lb.	2,500 Lb.

For Jib Capacities, Consult Jib Chart.

Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended	Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended	Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended
60	12	82.0	67.2	280,000	70	28	69.9	73.4	146,100	100	19	81.2	106.6	185,200
	13	81.0	67.1	277,700		30	67.9	72.7	131,300		20	80.6	106.5	181,900
	14	80.0	66.9	271,100		32	66.1	71.8	119,100		22	79.4	106.1	175,700
	15	79.1	66.7	260,700		34	64.3	70.9	109,000		24	78.2	105.7	169,900
	16	78.1	66.5	250,600		36	62.5	69.9	100,300		26	77.1	105.3	159,000
	17	77.1	66.3	241,300		38	60.6	68.8	92,800		28	75.9	104.8	145,300
	18	76.1	66.1	232,600		40	58.7	67.6	86,300		30	74.7	104.3	130,500
	19	75.2	65.8	224,500		45	53.8	64.3	73,300		32	73.5	103.7	118,300
	20	74.2	65.5	216,900		50	48.5	60.2	63,500		34	72.3	103.1	108,100
	22	72.2	64.9	203,200		55	42.8	55.4	55,800		36	71.1	102.4	99,400
	24	70.1	64.2	188,100		60	36.4	49.3	49,700		26	76.9	95.5	177,600
	26	68.1	63.5	164,800		65	28.7	41.5	44,600		28	75.6	95.0	162,300
	28	66.0	62.6	146,500		70	18.5	30.0	39,900		30	74.3	94.4	145,300
	30	63.9	61.7	131,700		15	81.8	87.0	238,800		32	73.0	93.9	130,400
	32	61.8	60.7	119,600		16	81.1	86.8	233,500		34	71.6	93.2	118,200
	34	59.6	59.6	109,400		17	80.4	86.7	228,500		36	70.3	92.5	108,000
36	57.3	58.3	100,800	18	79.6	86.5	223,700	38	68.9	91.8	99,300			
38	55.0	57.0	93,300	19	78.9	86.3	219,100	40	67.5	91.0	91,900			
40	52.7	55.5	86,800	20	78.2	86.1	214,700	45	65.2	90.1	85,300			
45	46.4	51.3	73,800	22	76.7	85.7	209,000	40	62.6	87.8	72,300			
50	39.4	45.9	64,000	24	75.2	85.2	201,800	50	59.0	84.9	62,400			
55	31.1	38.8	56,400	26	73.8	85.6	164,000	55	55.2	81.7	54,700			
60	20.0	28.4	48,300	28	72.3	84.0	145,700	60	51.2	78.0	48,600			
14	81.5	77.0	262,000	30	70.8	83.3	130,900	65	47.0	73.6	43,500			
15	80.6	76.9	255,800	32	69.7	82.8	123,000	70	42.5	68.6	39,300			
16	79.8	76.7	249,600	34	67.7	81.8	108,500	75	37.5	62.6	35,700			
17	79.0	76.5	240,300	36	66.1	81.0	99,800	80	31.9	55.4	32,600			
18	78.1	76.3	231,600	38	64.6	80.1	92,300	85	25.3	46.3	29,900			
19	77.3	76.1	223,500	40	63.0	79.1	85,900	90	16.3	33.1	27,600			
20	76.5	75.9	216,000	45	58.9	76.3	72,800							
22	74.8	75.4	202,300	50	54.6	73.0	63,000							
24	73.1	74.8	186,000	55	50.0	69.1	55,300							
26	71.4	74.1	164,400	60	45.2	64.6	49,100							

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Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended	Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended	Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended	Boom Lgth.: Feet	Oper. Rad.: Feet	Boom Angle: Deg.	Boom Point: Elev.	Capacity: Outriggers Extended
110	20	81.4	116.6	173,900															
110	22	80.4	116.3	168,000															
110	24	79.3	115.9	162,500															
110	26	78.3	115.5	155,500															
110	28	77.2	115.1	143,100															
110	30	76.1	114.6	130,100															
110	32	75.1	114.1	117,900															
110	34	74.0	113.6	107,600															
110	36	72.9	113.0	98,900															
110	38	71.8	112.3	91,500															
110	40	70.7	111.5	84,900															
110	45	67.9	109.7	71,900															
110	50	65.1	107.5	62,000															
110	55	62.2	105.3	54,300															
110	60	59.2	102.3	48,100															
110	65	56.1	99.1	43,000															
110	70	52.9	95.9	38,800															
110	75	49.5	91.5	35,200															
110	80	46.0	87.0	32,100															
110	85	42.3	81.8	29,400															
110	90	38.3	75.9	27,100															
110	95	33.8	69.1	25,000															
110	100	28.8	60.8	23,200															
110	105	22.8	50.5	21,500															
150	22	81.2	126.4	161,700															
150	24	79.3	125.7	151,400															
150	26	78.3	125.3	140,700															
150	30	77.3	124.9	129,800															
150	32	76.3	124.4	117,500															
150	34	75.3	123.9	107,900															
150	36	74.3	123.3	98,500															
150	38	73.4	122.8	91,100															
150	40	72.4	122.2	84,600															
150	45	69.8	120.5	71,500															
150	50	67.3	118.9	61,600															
150	55	64.7	116.3	53,900															
150	60	62.0	113.7	47,000															
150	65	59.2	110.9	42,600															
150	70	56.4	107.8	38,400															
150	75	53.5	104.3	34,800															
150	80	50.5	100.4	31,700															
150	85	47.3	96.0	29,000															
150	90	44.0	91.1	26,600															
150	95	40.4	85.6	24,600															
150	100	36.6	79.3	22,700															
150	105	32.4	72.0	21,100															
150	110	27.6	63.3	19,600															
150	115	21.9	52.5	18,200															
150	24	81.0	136.2	148,800															
150	26	80.1	135.6	144,100															
150	28	79.2	135.5	137,800															
150	30	78.3	135.1	127,600															
150	32	77.4	134.7	117,100															
150	34	76.5	134.2	106,900															
150	36	75.6	133.7	98,100															
150	38	74.7	133.2	90,600															
150	40	73.8	132.6	84,100															
150	45	71.4	131.1	71,000															
150	50	69.1	129.3	61,100															
150	55	66.7	127.2	53,400															
150	60	64.3	125.0	47,200															
150	65	61.9	122.8	42,100															
150	70	59.3	119.6	37,800															
150	75	56.7	116.5	34,200															
150	80	54.0	113.0	31,100															
150	85	51.2	109.2	28,500															
150	90	48.4	105.0	26,100															
150	95	45.3	100.3	24,000															
150	100	42.2	95.1	22,200															
150	105	38.8	89.2	20,500															
150	110	35.1	82.5	19,000															
150	115	31.0	74.9	17,700															
150	120	26.5	65.8	16,500															
150	125	21.0	54.4	15,300															
150	26	80.8	146.0	127,400															
150	28	80.0	145.7	124,200															
150	30	79.1	145.3	121,100															
150	32	78.3	144.9	116,900															
150	34	77.5	144.5	106,700															
150	36	76.6	144.0	98,000															
150	38	75.8	143.5	90,500															
150	40	74.9	143.0	83,900															
150	45	72.8	141.6	70,800															
150	50	70.7	139.9	60,900															
150	55	68.5	138.0	53,200															
150	60	66.3	136.0	47,000															
150	65	64.0	133.6	41,900															
150	70	61.7	131.1	37,000															
150	75	59.3	128.3	34,100															
170	80	56.9	125.1	31,000															
170	85	54.5	121.7	28,300															
170	90	51.9	118.0	26,000															
170	95	49.3	113.9	23,900															
170	100	46.5	109.4	22,000															
170	105	43.6	104.4	20,400															
170	110	40.6	98.8	18,900															
170	115	37.3	92.6	17,500															
170	120	33.8	85.6	16,300															
170	125	29.9	77.6	15,200															
170	130	25.5	68.1	14,200															
170	135	20.2	56.2	13,200															
170	26	81.4	156.1	121,100															
170	28	80.6	155.8	118,100															
170	30	79.9	155.5	115,100															
170	32	79.1	155.1	112,300															
170	34	78.3	154.7	106,400															
170	36	77.5	154.3	97,600															
170	38	76.8	153.8	90,600															
170	40	76.0	153.3	83,600															
170	45	74.0	152.0	70,500															
170	50	72.0	150.5	60,600															
170	55	70.0	148.7	52,800															
170	60	67.9	146.8	46,500															
170	65	65.9	144.7	41,500															
170	70	63.9	142.3	37,300															
170	75	61.6	139.7	33,700															
170	80	59.4	136.9	30,600															
170	85	57.1	133.8	27,900															
170	90	54.8	130.4	25,500															
170	95	52.5	126.8	23,400															
170	100	50.0	122.8	21,600															
170	105	47.5	118.4	19,900															
170	110	44.8	113.6	18,500															
170	115	42.1	108.3	17,100															
170	120	39.1	102.5	15,900															
170	125	36.0	95.9	14,700															
170	130	32.6	88.6	13,700															
170	135	28.9	80.2	12,800															
170	140	24.6	70.3	11,900															
170	145	19.5	57.9	11,100															
170	28	81.2	165.9	112,100															
170	30	80.4	165.3	109,300															
170	32	79.8	165.0	106,700															
170	34	79.1	164.9	104,100															
170	36	78.3	164.5	97,300															
170	38	77.6	164.1	89,700															
170	40	76.9	163.6	83,200															
170	45	73.9	160.9	70,100															
170	50	71.3	159.3	60,100															
170	55	71.3	159.3	52,400															
170	60	69.4	157.6	46,200															
170	65	67.4	155.6	41,100															
170	70	65.5	153.4	36,800															
170	75	63.5	151.0	33,100															
170	80	61.5	148.4	30,100															
170	85	59.4	145.6	27,400															
170	90	57.3	142.5	25,100															
170	95	55.2	139.2	23,000															
170	100	53.0	135.5	21,200															
170	105	50.7	131.6	19,500															
170	110	48.3	127.3	18,000															
170	115	45.9	122.7	16,700															
170	120	43.3	117.6	15,400															
170	125	40.7	112.1	14,300															
170	130	37.8	105.9	13,300															
170	135	34.8	99.1	12,300															
170	140	31.5	91.5	11,500															
170	145	27.9	82.7	10,600															
170	150	23.8	72.4	9,900															
170	155	18.9	59.6	9,200															
170	30	81.1	175.8	102,100															
170	32	80.4	175.4	99,700															
170	34	79.7	175.1	97,300															
170	36	79.0	174.7	95,000															
170	38	78.3	174.3	89,300															
170	40	77.6	173.9	82,800															
170	45	75.9	172.7	69,600															
170	50	74.2	171.4	59,700															
170	55	72.4	169.9	51,900															
170	60	70.6	168.2	45,700															
170	65	68.8	166.3	40,600															
170	70	67.0	164.3	36,400															
170	75	65.2	162.1	32,700															
170	80	63.3	159.7	29,600															
170	85	61.4	157.1	26,900															
170	90	59.5	154.2	24,600															
170	95	57.5	151.2	22,500															
170	100	55.5	147.9	20,600															
170	105	53.4	144.3	19,000															
170	110	51.3	140.4	17,500															
180	115	49.1	136.2	16,100															
180	120	46.8	131.7	14,900															
180	125	44.4	126.8	13,800															
180	130	42.0	121.5	12,800															
180	135	39.4	115.7	11,800															
180	140	36.7	109.3	10,900															
180	145	33.7	102.2	10,100															
180	150	30.6	94.3	9,400															
180	155	27.1	85.2	8,700															
180	160	23.1	74.5	8,000															
180	165	18.3	61.3	7,400															
180	32	80.9	185.6	91,500															
180	34	80.3	185.2	89,700															
180	36	79.6	184.9	87,900															
180	38	79.0	184.5	86,100															
180	40	78.3	184.1	82,500															
180	45	76.7	183.0	69,400															
180	50	75.1	181.7	59,400															
180	55	73.4	180.3	51,700															
180	60	71.7	178.8	45,500															
180	65	70.1	177.0	40,400															
180	70	68.4	175.1	36,100															
180	75	66.6	173.1	32,500															
180	80	64.9	170.8	29,400															
180	85	63.1	168.4	26,700															
180	90	61.3	165.7	24,400															
180	95	59.5	162.9	22,300															
180	100	57.6	159.8	20,400															
180	105	55.7	156.6	18,800															
180	110	53.8	153.0	17,300															
180	115	51.8	149.2	15,900															
180	120	49.7	145.1	14,700															
180	125	47.6	140.7	13,600															
180	130	45.4	136.0	12,500															
180	135	43.1	130.9	11,600															
180	140	40.7	125.3	10,700															
180	145	38.2	119.2	9,900															
180	150	35.6	112.6	9,100															
180	155	32.8	105.2	8,400															
180	160	29.7	97.0	7,800															
180	165	26.3	87.6	7,200															
180	170	22.4	76.5	6,600															
180	175	17.8	62.9	6,100															
180	32	81.4	195.7	85,900															
180	34	80.8	195.4	84,200															
180	36	80.2	195.0	82,500															
180	38	79.6	194.7	80,800															
180	40	79.0	194.3	79,200															
180	45	77.4	193.3	69,000															
180	50	75.9	192.1	59,000															
180	55	74.3	190.7	51,300															
180	60	72.7	189.3	45,000															
180	65	71.2	187.6	39,900															
180	70	69.6	185.8	35,700															
180	75	67.9	183.9	32,000															
180	80	66.3	181.8	28,900															
180	85	64.6	179.5	26,200															
180	90	63.0	177.0	23,900															

Jib Ratings

IB LIFTING CAPACITIES

MEETS
ANSI B30.5
REQUIREMENTS

3900T

**B NO. 123 WITH 12'-6" STRUT – NO. 9A BOOM
WITH OPEN THROAT TOP USING 10', 20' AND 40' INSERTS
LIFTING OVER SIDE AND REAR ON EXTENDED OUTRIGGERS**

SERIES-2

10 DEGREE JIB OFFSET ANGLE

Part supplements boom capacity chart No. 6279-A. Capacities are for freely suspended loads based on tipping, strength of structural components or other factors. Crane operator judgment must be used to allow for dynamic load effects of swinging, hoisting, lowering, as well as adverse operating conditions & physical machine depreciation.

Capacities do not exceed 85% of tipping loads with machine on firm level surface. Capacities based on structural competence are denoted by shaded areas. Operating radius is horizontal distance from axis of rotation to center of vertical hoist line or load block. Weight of all load blocks, hooks, weight ball, slings, etc., including those on the main boom, is considered part of the jib load. Maximum capacity on 1" – 6 x 25 IPS, IWRC is 22,500 lbs./line.

Refer to chart No. 6423-A for operating range diagram.

30 FOOT JIB	JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET			
		BOOM LENGTH – FEET															
		100	110	120	130	140	150	160	170	180	190	200	210		220		
65 *	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	65 *
70	40,000	39,900	39,500	39,000	38,800	38,400	38,000	37,500	37,300	36,800	36,500	36,000	35,700	35,300	34,900	34,500	70
75	36,700	36,200	35,800	35,300	35,100	34,700	34,300	33,800	33,500	33,100	32,700	32,300	32,000	31,600	31,200	30,800	75
80	33,600	33,100	32,600	32,100	31,900	31,500	31,100	30,600	30,400	29,900	29,500	29,100	28,700	28,300	27,900	27,500	80
85	30,800	30,300	29,900	29,400	29,200	28,800	28,300	27,900	27,600	27,200	26,800	26,300	26,000	25,600	25,200	24,800	85
90	28,400	27,900	27,500	27,000	26,800	26,300	25,900	25,400	25,200	24,700	24,300	23,900	23,600	23,200	22,800	22,400	90
95	26,300	25,800	25,400	24,900	24,600	24,200	23,800	23,300	23,000	22,600	22,200	21,700	21,400	21,000	20,600	20,200	95
100	24,400	23,900	23,500	23,000	22,700	22,300	21,900	21,400	21,100	20,700	20,300	19,800	19,500	19,100	18,700	18,300	100
110		20,700	20,300	19,700	19,500	19,100	18,600	18,100	17,900	17,400	17,000	16,500	16,200	15,800	15,400	15,000	110
120			17,600	17,100	16,900	16,400	16,000	15,500	15,200	14,700	14,300	13,800	13,600	13,200	12,800	12,400	120
130				17,100	16,900	16,400	16,000	15,500	15,200	14,700	14,300	13,800	13,600	13,200	12,800	12,400	130
140					14,600	14,200	13,800	13,300	13,000	12,500	12,100	11,600	11,300	10,900	10,500	10,100	140
150						10,300	9,700	9,300	8,900	8,500	8,100	7,700	7,400	7,000	6,600	6,200	150
160									8,100	7,600	7,200	6,700	6,400	6,000	5,600	5,200	160
170										6,400	5,900	5,400	5,100	4,700	4,300	3,900	170
180											4,800	4,300	3,900	3,500	3,100	2,700	180

40 FOOT JIB	JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET			
		BOOM LENGTH – FEET															
		100	110	120	130	140	150	160	170	180	190	200	210		220		
75 *	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	75 *
80	30,000	30,000	30,000	29,800	29,600	29,200	28,700	28,300	28,000	27,600	27,200	26,800	26,500	26,100	25,700	25,300	80
85	28,800	28,300	27,900	27,400	27,100	26,700	26,300	25,900	25,600	25,200	24,800	24,300	24,000	23,600	23,200	22,800	85
90	26,600	26,100	25,700	25,200	25,000	24,600	24,200	23,700	23,400	23,000	22,600	22,100	21,800	21,400	21,000	20,600	90
95	24,700	24,200	23,800	23,300	23,100	22,700	22,200	21,800	21,500	21,100	20,700	20,200	19,900	19,500	19,100	18,700	95
100	21,500	21,000	20,600	20,100	19,800	19,400	19,000	18,500	18,200	17,800	17,400	16,900	16,600	16,200	15,800	15,400	100
110		18,300	17,900	17,400	17,200	16,700	16,300	15,800	15,500	15,100	14,700	14,200	13,900	13,500	13,100	12,700	110
120				15,200	14,900	14,500	14,000	13,600	13,300	12,800	12,400	11,900	11,600	11,200	10,800	10,400	120
130					13,000	12,600	12,200	11,700	11,400	10,900	10,500	10,000	9,700	9,300	8,900	8,500	130
140						11,000	10,500	10,000	9,600	9,100	8,700	8,200	7,900	7,500	7,100	6,700	140
150								8,600	8,100	7,700	7,200	6,800	6,400	6,000	5,600	5,200	150
160									7,100	6,600	6,200	5,700	5,300	4,900	4,500	4,100	160
170										5,500	5,100	4,600	4,200	3,800	3,400	3,000	170
180																	180

50 FOOT JIB	JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET			
		BOOM LENGTH – FEET															
		100	110	120	130	140	150	160	170	180	190	200	210		220		
100 *	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	100 *
105	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	19,700	19,300	18,900	18,600	18,200	17,800	17,400	105
110	20,000	20,000	20,000	20,000	20,000	19,700	19,300	18,800	18,600	18,100	17,700	17,300	16,900	16,500	16,100	15,700	110
115	20,000	19,900	19,500	19,000	18,700	18,300	17,900	17,400	17,100	16,700	16,300	15,900	15,500	15,100	14,700	14,300	115
120	19,100	18,600	18,200	17,700	17,400	17,000	16,600	16,100	15,900	15,400	15,000	14,600	14,300	13,900	13,500	13,100	120
130		16,400	15,900	15,400	15,200	14,800	14,300	13,900	13,600	13,100	12,700	12,300	12,000	11,600	11,200	10,800	130
140				13,500	13,300	12,900	12,400	11,900	11,700	11,200	10,800	10,300	10,000	9,600	9,200	8,800	140
150					11,600	11,200	10,800	10,300	10,000	9,600	9,100	8,700	8,300	7,900	7,500	7,100	150
160						9,800	9,400	8,900	8,600	8,100	7,700	7,200	6,900	6,500	6,100	5,700	160
170								7,600	7,300	6,800	6,400	6,000	5,600	5,200	4,800	4,400	170
180									6,200	5,800	5,300	4,900	4,500	4,100	3,700	3,300	180
190										4,800	4,300	3,900	3,500	3,100	2,700	2,300	190

60 FOOT JIB	JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET			
		BOOM LENGTH – FEET															
		100	110	120	130	140	150	160	170	180	190	200	210		220		
130 *	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	130 *
135		10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	135
140			10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	140
145				10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	9,600	145
150					10,000	10,000	10,000	10,000	10,000	10,000	9,700	9,300	8,800				150
160						10,000	10,000	10,000	10,000	10,000	9,700	9,300	8,800	8,400			160
170							9,900	9,500	9,000	8,700	8,300	7,800	7,400				170
180								8,700	8,200	7,700	7,300	6,800	6,400				180
190									7,100	6,600	6,200	5,700	5,300				190
200											5,400	4,900	4,500	4,000			200

* These capacities apply for ALL lesser radii obtainable.

These charts are for assessment purposes only and should not be used to operate a crane.

The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

JIB LIFTING CAPACITIES

MEETS
ANSI B30.5
REQUIREMENTS

3900T SERIES-2

**JIB NO. 123 WITH 12'-6" STRUT — NO. 9A BOOM
WITH OPEN THROAT TOP USING 10', 20' AND 40' INSERTS
RATING OVER SIDE AND REAR ON EXTENDED OUTRIGGERS**

20 DEGREE JIB OFFSET ANGLE

Chart supplements boom capacity chart No. 6279-A. Capacities are for freely suspended loads based on tipping, strength of structural components or other factors. Crane operator judgment must be used to allow for dynamic load effects of swinging, hoisting or lowering, as well as adverse operating conditions & physical machine depreciation.

Capacities do not exceed 85% of tipping loads with machine on firm level surface. Capacities based on structural competence are denoted by shaded areas. Operating radius is horizontal distance from axis of rotation to center of vertical hoist line or load block. Weight of all load blocks, hooks, weight ball, slings, etc., including those on the main boom, is considered part of the jib load. Maximum capacity on 1" — 6 x 25 IPS, IWRC is 22,500 lbs./line.

Refer to chart No. 6423-A for operating range diagram.

JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET	
	BOOM LENGTH — FEET													
	100	110	120	130	140	150	160	170	180	190	200	210		220
55 *	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	55 *
60	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	60
65	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	65
70	39,000	40,000	40,000	40,000	39,700	39,400	39,100	38,700	38,300	38,100	37,700	37,400	37,000	70
75	37,100	36,700	36,300	35,900	35,700	35,300	35,000	34,600	34,300	33,900	33,600	33,200	32,900	75
80	33,900	33,500	33,100	32,700	32,500	32,100	31,700	31,300	31,100	30,700	30,300	29,900	29,600	80
85	31,200	30,700	30,300	29,900	29,700	29,300	28,900	28,500	28,200	27,800	27,500	27,100	26,800	85
90	28,700	28,300	27,900	27,400	27,200	26,800	26,400	26,000	25,800	25,400	25,000	24,600	24,300	90
95		26,100	25,700	25,200	25,000	24,700	24,300	23,800	23,600	23,200	22,800	22,400	22,100	95
100			23,800	23,300	23,100	22,700	22,300	21,900	21,600	21,200	20,800	20,400	20,100	100
105			22,100	21,600	21,400	21,000	20,600	20,100	19,900	19,500	19,100	18,700	18,400	105
110				20,000	19,800	19,400	19,000	18,600	18,300	17,900	17,500	17,000	16,800	110
120						16,700	16,300	15,800	15,600	15,200	14,700	14,300	14,000	120
130							14,000	13,600	13,300	12,900	12,500	12,000	11,700	130
140									11,400	10,900	10,500	10,100	9,800	140
150											8,900	8,400	8,100	150

JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET	
	BOOM LENGTH — FEET													
	100	110	120	130	140	150	160	170	180	190	200	210		220
70 *	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	70 *
75	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	75
80	28,100	29,000	29,900	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	29,000	80
85	27,000	28,000	28,800	29,600	30,000	29,900	29,500	29,100	28,900	28,500	28,100	27,800	27,500	85
90	26,100	27,000	27,900	27,900	27,700	27,400	27,000	26,600	26,400	26,000	25,600	25,200	25,000	90
95	25,300	26,200	26,200	25,700	25,500	25,200	24,800	24,400	24,100	23,800	23,400	23,000	22,700	95
100	24,500	24,200	24,200	23,800	23,600	23,200	22,800	22,400	22,100	21,800	21,400	21,000	20,700	100
105		22,900	22,500	22,000	21,800	21,400	21,000	20,600	20,400	20,000	19,600	19,200	18,900	105
110			20,900	20,500	20,200	19,900	19,500	19,000	18,800	18,400	18,000	17,600	17,300	110
120					17,500	17,100	16,700	16,300	16,000	15,600	15,200	14,800	14,500	120
130						14,800	14,400	14,000	13,700	13,300	12,900	12,500	12,200	130
140								12,000	11,800	11,300	10,900	10,500	10,200	140
150										9,600	9,200	8,800	8,500	150
160											7,800	7,300	7,000	160

JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET	
	BOOM LENGTH — FEET													
	100	110	120	130	140	150	160	170	180	190	200	210		220
100 *	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	100 *
105	19,800	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	19,800	19,500	105
110	19,200	19,900	20,000	20,000	20,000	20,000	19,900	19,500	19,300	18,900	18,500	18,200	17,900	110
115		19,300	19,900	19,400	19,200	18,900	18,500	18,100	17,800	17,400	17,100	16,700	16,400	115
120			18,600	18,100	17,900	17,500	17,200	16,700	16,500	16,100	15,700	15,300	15,100	120
125				16,900	16,700	16,300	15,900	15,500	15,300	14,900	14,500	14,100	13,800	125
130					15,600	15,200	14,800	14,400	14,100	13,700	13,400	13,000	12,700	130
135					14,600	14,200	13,800	13,400	13,100	12,700	12,300	11,900	11,600	135
140						13,200	12,800	12,400	12,200	11,700	11,400	10,900	10,700	140
150								10,700	10,500	10,000	9,600	9,200	8,900	150
160									9,000	8,500	8,100	7,700	7,400	160
170											6,800	6,400	6,100	170






JIB POINT RADIUS: FEET	CAPACITIES IN POUNDS												JIB POINT RADIUS: FEET	
	BOOM LENGTH — FEET													
	100	110	120	130	140	150	160	170	180	190	200	210		220
120 *	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120 *
125	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	125
130			10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	130
135				10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	135
140					10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	140
145						10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	145
150							10,000	10,000	10,000	10,000	10,000	9,500	9,000	150
160								10,000	10,000	10,000	9,400	8,800	8,000	160
170									7,900	7,500	7,100	6,600	6,100	170
180											5,900	5,500	5,000	180

* These capacities apply for ALL lesser radii obtainable.

These charts are for assessment purposes only and should not be used to operate a crane. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.




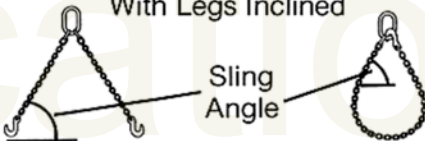
Rigging Tables

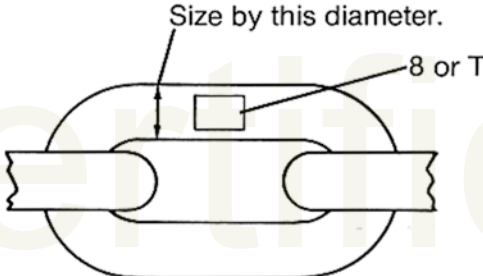
Wire Rope Slings

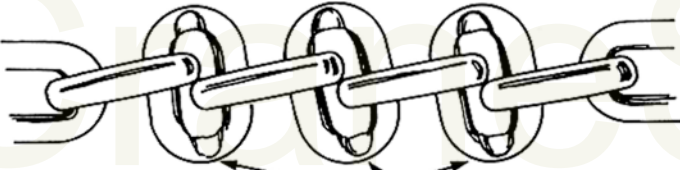
6 x 19 Classification Group, Improved Plow Steel, IWRC						
Rope Diameter (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
						
			60°	45°	30°	
3/16	650	480	1,300	1,100	900	650
1/4	1,150	860	2,300	2,000	1,600	1,150
5/16	1,750	1,300	3,500	3,000	2,500	1,750
3/8	2,550	1,900	5,100	4,400	3,600	2,550
7/16	3,450	2,600	6,900	6,000	4,900	3,450
1/2	4,700	3,500	9,400	8,150	6,650	4,700
9/16	5,700	4,200	11,400	9,900	8,050	5,700
5/8	7,100	5,300	14,200	12,300	10,000	7,100
3/4	10,200	7,650	20,400	17,700	14,400	10,200
7/8	13,750	10,300	27,500	23,800	19,400	13,750
1	17,950	13,450	35,900	31,100	25,400	17,950
1 1/8	22,750	17,000	45,500	39,400	32,200	22,750
1 1/4	28,200	21,200	56,400	48,800	39,900	28,200
1 3/8	34,800	26,100	69,600	60,300	49,200	34,800
1 1/2	41,300	31,000	82,600	71,500	58,400	41,300
<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>						
<p>Note: For training and assessment use only.</p>						

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Chain Slings

GRADE T (8) ALLOY STEEL						
Chain Size (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
					60°	45°
1/4	2,800	2,100	5,600	4,850	3,959	2,800
3/8	5,680	4,260	11,360	9,838	8,032	5,680
1/2	9,600	7,200	19,200	16,627	13,574	9,600
5/8	14,480	10,860	28,960	25,079	20,475	14,480
3/4	22,640	16,980	45,280	39,212	32,013	22,640
7/8	27,360	20,520	54,720	47,388	38,687	27,360
1	38,160	28,620	76,320	66,093	53,958	38,160
1 1/4	57,840	43,380	115,680	100,179	81,786	57,840



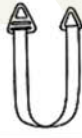
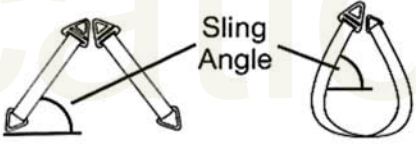
 <p>Size by this diameter.</p> <p>8 or T</p> <p>Use only alloy steel chain. Links will be stamped with 8 or T.</p>	<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>
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 <p>Discard if more than 10% wear at bearing surfaces.</p>

Note: For training and assessment use only.

These charts are for assessment purposes only and should not be used to operate a crane. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Nylon Web Slings

6800 lb/in Material						
Web Width (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch 	Single Choker Hitch 	Single Basket Hitch (Vertical Legs) 	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined 		
				60°	45°	30°
1	1,100	825	2,200	1,905	1,555	1,100
2	2,200	1,650	4,400	3,810	3,110	2,200
3	3,300	2,475	6,600	5,715	4,665	3,300
4	4,400	3,300	8,800	7,620	6,220	4,400
5	5,500	4,125	11,000	9,525	7,775	5,500
6	6,600	4,950	13,200	11,430	9,330	6,600
<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>						
<p>Note: Capacities are for flat eye, twisted eye and triangle fittings. For training and assessment use only.</p>						

These charts are for assessment purposes only and should not be used to operate a crane. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Answer Key

1. Answer: **56,727 pounds**

Deductions from Gross Capacity

125 ton block	3,150 lbs
Rigging	250 lbs
4 parts of line (4 x 129.3 x 1.88)	973 lbs
Total Deductions	4,373 lbs

Gross Capacity is 61,100 lbs.

Net Capacity is $61,100 - 4,373 = 56,727$ lbs

2. Answer: **38 feet**

Load weight	82,000 lbs
125 ton block	3,150 lbs
Rigging	120 lbs
4 parts of line (4 x 164.1 x 1.88)	1,234 lbs
Total Gross Load	86,504 lbs

Maximum radius is 38 feet.

3. Answer: **59.5 degrees**

Load weight	15,300 lbs
One sheave upper boom point	1,200 lbs
Rigging	60 lbs
125 ton block	3,150 lbs
Main line weight (4 x 15 x 1.88)	113 lbs
15 ton overhaul ball	900 lbs
Whipline weight (1.88 x 162.9)	307 lbs
Total gross load	21,030 lbs

The lowest boom angle is 59.5 degrees.

4. Answer: **3 parts**

Load weight	65,000 lbs
125 ton block	3,150 lbs
<u>Rigging</u>	<u>280 lbs</u>
Total load	68,430 lbs

The minimum parts of line required is 3 parts.

5. Answer: **24,151 pounds**

Deductions from Gross Capacity

40 foot jib	3,100 lbs
125 ton block	3,150 lbs
Main line weight (4 x 1.88 x 164.3)	1,236 lbs
15 ton overhaul ball	900 lbs
Whipline weight (1.88 x 20)	38 lbs
<u>Rigging</u>	<u>125 lbs</u>
Total Deductions	8,549 lbs

Gross Capacity is 32,700 lbs.

Net Capacity is $32,700 - 8,549 = 24,151$ lbs

6. Answer: **160 feet**

Load weight	6,500 lbs
150 ton overhaul ball	900 lbs
Rigging	60 lbs
<u>* Whipline weight (1.88 x 120')</u>	<u>226 lbs</u>
Total gross load	7,686 lbs

The maximum radius is 160 feet.

7. Answer: **7,813 pounds**

Deductions from Gross Capacity

125 ton block	3,150 lbs
Main line weight (4 x 1.88 x 180)	1,354 lbs
Whipline weight (1.88 x 190)	358 lbs
15 ton overhaul ball	900 lbs
<u>Rigging</u>	<u>125 lbs</u>
Gross Load on Main Boom	5,887 lbs

Gross Capacity is 13,700 lbs.

Net Capacity is $13,700 - 5,887 = 7,813$ lbs

8. Answer: **71 feet 8 inches**

9. Answer: **132-1/2 inches**

10. Answer: **Butt, 20, 40, 40, 40, Tip**

11. Answer: **2 inch**

The capacity of one 2 inch nylon web sling at a 30 degree angle is 2,200 lbs.

The slings are in a double basket hitch so capacity is doubled.

$$2,200 \times 2 = 4,400 \text{ lbs}$$

12. Answer: **7/16 inch**

The capacity of a 7/16 inch, single basket hitch at a 60 degree angle is 6,000 pounds.

The capacity of a 3/8 inch, single basket hitch at a 60 degree angle is 4,400 lbs (too small).