



NATIONAL CRANE

Series 1400

Hydraulic Crane 33 Ton

Load Ratings

⚠ DANGER

**AN UNTRAINED OPERATOR
SUBJECTS HIMSELF AND
OTHERS TO**

DEATH OR SERIOUS INJURY

**YOU MUST NOT OPERATE
THIS CRANE UNLESS**

- You have been trained in the safe operation of this crane.
- You read, understand and follow the safety and operating recommendations contained in the crane manufacturer's manuals, your employers work rules and applicable government regulations.
- You are sure that all safety signs, guards and other safety features are in place and in proper condition.

DANGER

GENERAL

1. This equipment can be hazardous if improperly maintained or operated. Read and comply with the Operator's Manual supplied with this machine for information on safety, operation and maintenance before operating this machine. If these manuals are missing, order replacements from National Crane through the distributor.
2. Rated loads shown on the capacity chart pertain to this machine as originally manufactured and equipped. Modifications to the machine or use of equipment that is not factory specified or approved can be hazardous. Refer to capacity deduction chart for weights which must be deducted from rated loads when accessories are attached to boom or loadline.

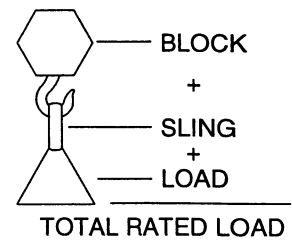
SET-UP

1. Inspect vehicle and crane including crane operation prior to use each day.
2. Load ratings shown on the appropriate charts are maximum allowable loads with the crane mounted on a factory approved truck and all outriggers at either full span or at mid span range and set on a firm level surface so the crane is level and the tires are suspended. This machine is not rated for use without outriggers. All outriggers must be extended equally - Mid span must be pinned. This machine is not rated for use with outriggers retracted.
3. Depending on the nature of the supporting surface, structural supports under the outrigger floats may be necessary to spread the load to a larger bearing surface.
4. Always level the crane with the level indicator located at each outrigger control station.

OPERATION

1. Operation of this equipment in excess of maximum load rating and disregard of instructions is hazardous. Always refer to the capacity chart for load and area limits before operating the crane. Rated loads at rated radius shall not be exceeded. Overloading this crane may cause structural collapse or instability.
2. Use the LMI/angle indicator as a reference only. When lifting maximum loads, measure radius and be certain of load weight.
3. Full extended outrigger rated loads do not exceed 85% of the tipping load as determined by SAE Crane Stability Test Code J765a when mounted on a factory recommended truck. Mid span outrigger stability loads are determined per ISO 4305, 1991. Structurally limited ratings on the capacity chart are shaded. Stability limited loads are not shaded. Machine will not always tip before structural damage occurs.

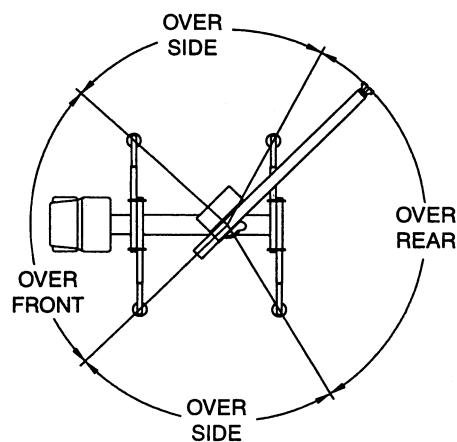
4. Rated loads include the weight of the hook block, slings, and other lifting devices. Their weights must be subtracted from the listed rated load to determine the net load that can be lifted.
5. Rated loads must be reduced when lifting at the boom tip with a jib stowed or erected. Refer to the chart labeled "Rated Load Reductions with Jib" for the reduction at each boom length.
6. Rated loads are based on freely suspended loads. Always position the boom tip directly over the load before lifting. No attempt shall be made to push down with the boom or move the load sideways in any direction by pulling or dragging the load.
7. The user shall operate at reduced ratings to allow for adverse job conditions such as soft or uneven ground, high winds or erratic operation which produce swinging (side) loads, experience of personnel, two machine lifts, or other hazardous conditions for safe operation.
8. Rated loads account for wind to 20 MPH on the boom capacities and to 15 MPH on jib capacities. Above these wind velocities, loads and/or boom lengths must be appropriately reduced for safe operation.
9. Do not operate at any radii beyond stability limit line on range chart. At these positions, the machine can overturn without any load on the hook.
10. When boom length or radius or both are between points listed on capacity chart, the smallest load shown at either the next larger radius or boom length shall be used.
11. Do not exceed jib capacities at any reduced boom length.
12. It is safe to telescope or retract any load listed if rating is not exceeded. Boom must be fully retracted against boom stops at all times when lifting minimum boom length capacity loads.
13. Always pay out loadline before extending boom to avoid damaging loadline or crane structure.
14. Loads lifted must be within safe winch capacity as well as safe crane capacity. Multiple part rope reeving must be used on loads exceeding winch single part rated pull. Auxiliary boom head and jibs are rated for single part use only.
15. Do not operate the boom over personnel or allow them to walk or stand beneath the boom or load.
16. Do not allow personnel on carrier deck, or crane frame area when rotating crane.



17. Do not allow personnel to ride on hook, hook block, load or any device attached to the loadline. Handling of personnel is only permitted with full extension of all outrigger beams. Use only National Crane approved baskets.
18. Operate controls slowly and smoothly to avoid damage to crane or personnel.
19. Boom must be in carrying rack and outriggers fully retracted for travel.
20. Maintain a clearance of at least 10 feet between any part of the crane, loadline or load and any electrical line carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less.

DEFINITIONS

1. **Load radius**—Horizontal distance from the center line of rotation before loading to the center of the vertical loadline or block with load applied.
2. **Load boom angle**—Loaded boom angle is the angle between the first section boom and the horizontal, after lifting the rated load at the rated radius. The boom angle before loading should be greater to account for deflections. The loaded boom angle combined with the boom length give only an approximation of the operating radius.
3. **Working area**—Area measured in a circular arc above the center line of rotation as shown on the Working Area diagram.
4. **Freely suspended load**—Load hanging free with no direct external force applied except by the loadline.
5. **Side load**—Horizontal side force applied to the lifted load either on the ground or in the air.
6. **No load stability limit**—The stability limit radius shown on the range diagrams is the radius beyond which it is not permitted to position the boom plus block configuration because machine can overturn without any load on the hook.
7. **Structural length limit**—An area where the boom or the boom with jib deployed cannot be extended because of structural limitations.
8. **PCSA**—Power Crane and Shovel Association.

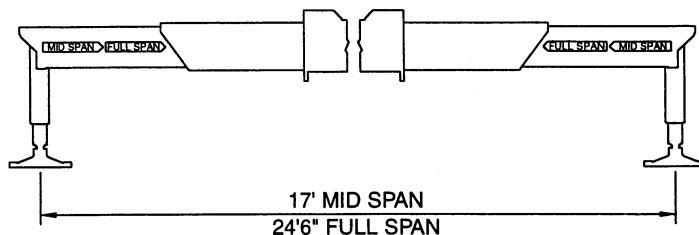


WORK AREA DIAGRAM

INFORMATIONAL DATA

OUTRIGGERS

1. Outrigger spread from center to center of the outrigger floats at mid span is 17' and at full span is 24'6".
2. No outrigger pad load exceeds 55,000 pounds maximum at full span or 65,000 pounds maximum at mid span.



WEIGHT REDUCTIONS FOR LOAD HANDLING DEVICES (See load chart for jib deductions)

1. Hook blocks are rated at maximum capacity for the block. Do not exceed rated cable pull with any block.

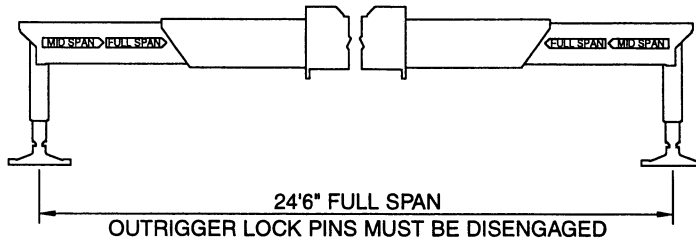
	Aux Boom Head	100 lb
5 Ton	Downhaul Weight	180 lb
15 Ton	1 Sheave Block	375 lb
25 Ton	2 Sheave Block	640 lb
35 Ton	3 Sheave Block	870 lb
36 Ton	4 Sheave Block	970 lb

NOTICE			1 Part Line	2 Part Line	3 Part Line	4 Part Line	5 Part Line	6 Part Line	7 Part Line	8 Part Line
<ul style="list-style-type: none"> • Do not deadhead line block against boom tip when extending boom. • Keep at least 3 wraps of loadline on drum at all times. • Use only 5/8" diameter rotation resistant cable with 45,400 pounds breaking strength on this machine. 										
MAXIMUM BOOM LENGTH AT MAXIMUM ELEVATION WITH RIGGING SHOWN WITH LOAD BLOCK AT GROUND LEVEL.			140' Boom & Jib	110'	83'	64'	52'	43'	36'	33'
Winch	Cable Supplied	Average Breaking Strength	Lift and Speed	Lift and Speed	Lift and Speed	Lift and Speed	Lift and Speed	Lift and Speed	Lift and Speed	Lift and Speed
Standard Planetary Winch Low Speed	5/8" diameter rotation resistant 18 x 19 IWRC	45,400 lb	9,000 lb 170 fpm	18,000 lb 85 fpm	27,000 lb 57 fpm	36,000 lb 43 fpm	45,000 lb 34 fpm	54,000 lb 28 fpm	63,000 lb 24 fpm	66,000 lb 21 fpm
Standard Planetary Winch High Speed	5/8" diameter rotation resistant 18 x 19 IWRC	45,400 lb	4,400 lb 340 fpm	8,800 lb 170 fpm	13,200 lb 113 fpm	17,600 lb 85 fpm	22,000 lb 68 fpm	26,400 lb 57 fpm	30,800 lb 49 fpm	35,200 lb 43 fpm

All winch pulls and speeds are shown on the fourth layer. Winch line pulls would increase on the first, second and third layers. Winch line speed would decrease on the first, second and third layers. Winch line pulls may be limited by the winch capacity or the ANSI 5 to 1 cable safety factor. These are shown below:

Winch	Full Drum Pull	Allowable Cable Pull
Standard planetary & Auxiliary planetary	4,400 pounds (high speed) 9,000 pounds (low speed)	9,080 pounds

**14110
110' BOOM
30' JIB**



**FULL-SPAN
OUTRIGGER**

33 TO 110 FOOT BOOM RATED LOADS WITHOUT JIB

LOAD RADIUS (ft)	LOADED BOOM ANGLE	33 ft BOOM (lb)	LOADED BOOM ANGLE	A 46 ft BOOM (lb)	LOADED BOOM ANGLE	B 62 ft BOOM (lb)	LOADED BOOM ANGLE	C 78 ft BOOM (lb)	LOADED BOOM ANGLE	D 94 ft BOOM (lb)	LOADED BOOM ANGLE	110 ft BOOM (lb)
6	76.7	66,000										
8	72.8	51,700										
10	68.9	42,200	76	37,000								
12	64.9	38,400	73.4	33,400	78.2	26,900						
15	58.6	32,200	69.3	28,000	75.6	24,900	79.4	22,800				
20	48.5	23,900	62.2	21,650	70.2	19,300	74.8	17,900	78.2	14,100		
25	33.3	17,600	54.4	17,800	64.9	16,050	71	14,550	75.1	12,400	77.4	9,200
30			46.2	15,100	59.8	13,600	67	12,300	71.9	11,200	75.1	8,700
35			36.3	12,750	54	12,050	63	10,600	68.5	9,750	72.5	8,000
40			22.9	10,100	47.8	10,450	58.7	9,300	65.5	8,550	69.6	7,200
45					41.6	8,750	54.5	7,800	61.9	7,350	67	6,400
50					33.9	7,200	49.7	6,900	58.2	6,250	63.9	5,700
55					23.6	5,600	44.5	6,000	54.4	5,500	60.8	4,700
60							38.6	4,900	50.5	4,800	57.6	4,000
65							31.9	4,000	46.3	4,200	54.4	3,400
70							23.3	3,250	41.7	3,450	51	2,700
75							8.7	2,500	36.6	2,750	47.4	2,300
80									30.7	2,250	43.6	1,800
85									23.5	1,750	39.3	1,200
90									12.5	1,250	34.7	1,000
95											29.6	800
100											23.3	600
	0	12,000	0	7,500	0	4,500	0	2,100	0	1,000		

30 FOOT JIB RATED LOADS

LOAD RADIUS (ft)	LOADED BOOM ANGLE	30 ft JIB (lb)
30	79.1	5,050
35	77.4	5,000
40	75.6	4,950
45	74.7	4,700
50	71.6	4,300
55	69.5	4,000
60	67.3	3,700
65	65.1	3,400
70	62.9	3,150
75	60.5	2,850
80	58	2,500
85	55.5	2,000
90	52.8	1,600
95	50	1,200
100	47.1	850
105	43.9	500

RATED LOAD REDUCTIONS WITH JIB

BOOM LENGTH	30' JIB STOWED		30' JIB ERECTED	
33'		Reduce load 550 lb		Reduce load 1,200 lb
46'		Reduce load 400 lb		Reduce load 1,100 lb
62'		Reduce load 300 lb		Reduce load 1,050 lb
78'		Reduce load 250 lb		Reduce load 1,000 lb
94'		Reduce load 200 lb		Reduce load 1,000 lb
110'		Reduce load 200 lb		Reduce load 950 lb

Note:

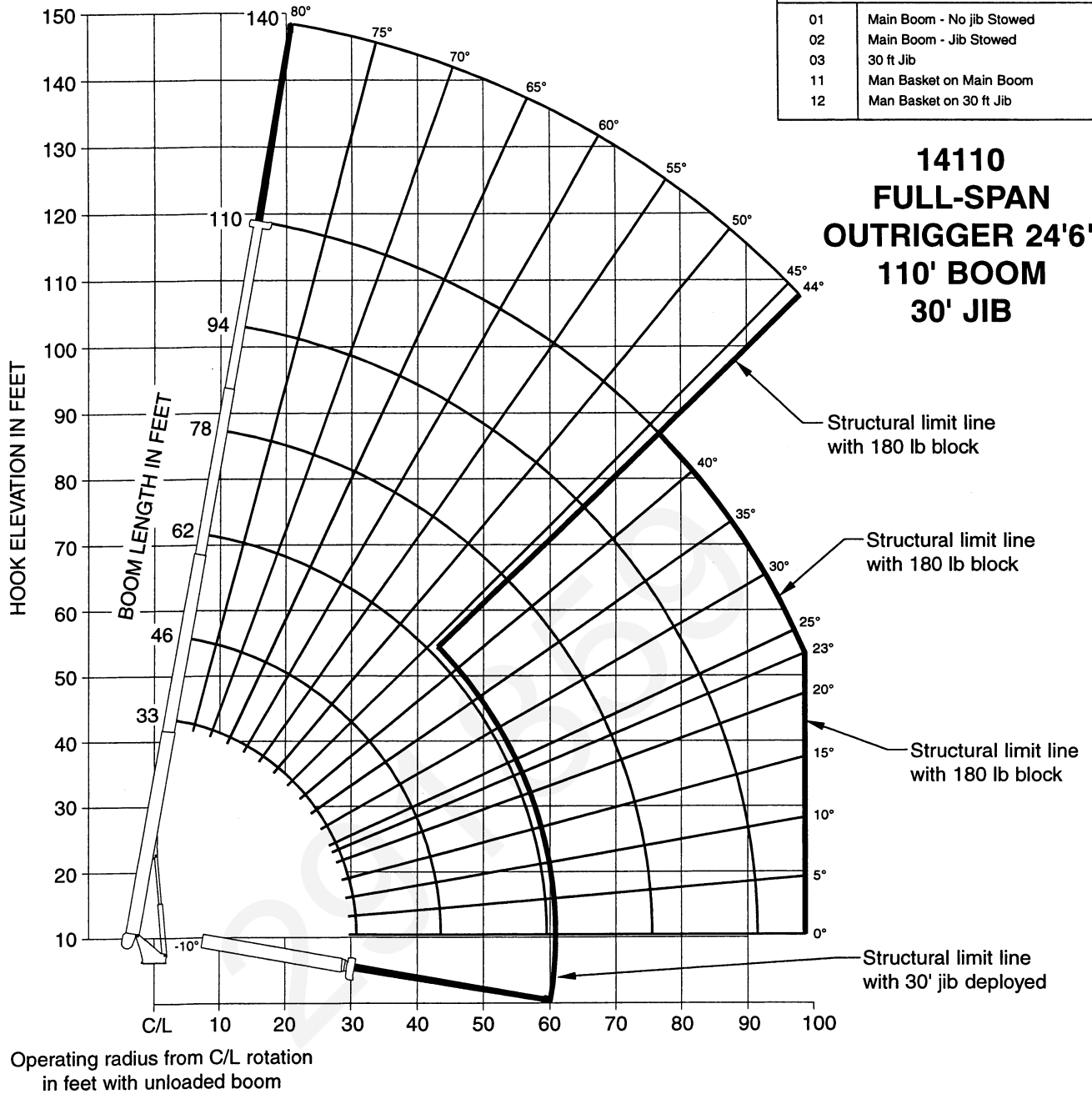
1. All capacities are in pounds, angles in degrees, radius in feet.
2. Loaded boom angles are given as reference only.
3. Shaded areas are structurally limited capacities.
4. Handling of personnel is only permitted with full-span outriggers.

LMI OPERATING CODE

OPERATING MODE

01	Main Boom - No jib Stowed
02	Main Boom - Jib Stowed
03	30 ft Jib
11	Man Basket on Main Boom
12	Man Basket on 30 ft Jib

**14110
FULL-SPAN
OUTRIGGER 24'6"
110' BOOM
30' JIB**



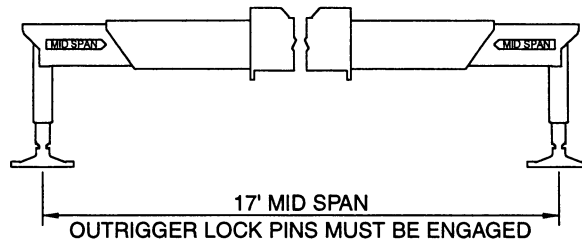
SET-UP

1. Fully extend and set outriggers to full-span location, level crane and set front stabilizer.

OPERATION

1. The 33 ft. boom length capacities are based on boom fully retracted. If not fully retracted, do not exceed 46 ft. boom length capacities.
2. Do not extend unloaded boom or jib beyond stability limit line on range chart as loss of stability may occur.
3. Load blocks and slings are considered to be a part of the load.
4. Operate with jib by radius when main boom is fully extended and by boom angle when main boom is partially extended. Do not exceed jib capacities at any partially extended boom length.
5. All jib loads must be lifted with single part reeving.

**14110
110' BOOM
30' JIB**



**MID-SPAN
OUTRIGGER**

33 TO 110 FOOT BOOM RATED LOADS WITHOUT JIB

LOAD RADIUS (ft)	LOADED BOOM ANGLE	33 ft BOOM (lb)	LOADED BOOM ANGLE	A 46 ft BOOM (lb)	LOADED BOOM ANGLE	B 62 ft BOOM (lb)	LOADED BOOM ANGLE	C 78 ft BOOM (lb)	LOADED BOOM ANGLE	D 94 ft BOOM (lb)	LOADED BOOM ANGLE	110 ft BOOM (lb)
6	76.7	66,000										
8	72.8	51,700										
10	68.9	42,200	76	37,000								
12	64.9	38,400	73.4	33,400	78.2	26,900						
15	58.6	32,200	69.3	28,000	75.6	24,900	79.4	22,800				
20	46.9	18,500	62.2	21,650	70.2	19,300	74.8	17,900	78.2	14,100		
25	32.3	11,000	54.4	14,000	64.7	12,800	70.8	13,200	75.1	12,400	77.4	9,200
30			45.9	9,500	59.8	8,600	67	9,100	71.7	9,200	75.1	8,700
35			36.9	7,000	54	6,200	62.8	6,400	68.2	6,800	72.2	7,000
40			23.9	4,800	47.8	4,500	58.2	4,600	64.7	5,000	69	5,200
45					40.9	3,200	54	3,400	61	3,600	65.9	3,900
50					33.1	2,100	48.8	2,500	57.4	2,600	62.9	2,800
55					22.8	1,300	43.5	1,700	53.4	1,900	59.9	2,000
60							37.7	1,100	49.4	1,300	56.6	1,400
65							31	600	45.1	750	53.3	900
70												
75												
80												
85												
90												
95												
100												
	0	7,000	0	3,600	0	500						

30 FOOT JIB RATED LOADS

LOAD RADIUS (ft)	LOADED BOOM ANGLE	30 ft JIB (lb)
30	79.1	5,050
35	77.4	5,000
40	75.6	4,950
45	73.4	4,300
50	70.9	3,250
55	68.4	2,400
60	65.9	1,750
65	63.4	1,150
70	60.8	700

RATED LOAD REDUCTIONS WITH JIB

BOOM LENGTH	30' JIB STOWED	30' JIB ERECTED
33'	Reduce load 550 lb	Reduce load 1,200 lb
46'	Reduce load 400 lb	Reduce load 1,100 lb
62'	Reduce load 300 lb	Reduce load 1,050 lb
78'	Reduce load 250 lb	Reduce load 1,000 lb
94'	Reduce load 200 lb	Reduce load 1,000 lb
110'	Reduce load 200 lb	Reduce load 950 lb

Note:

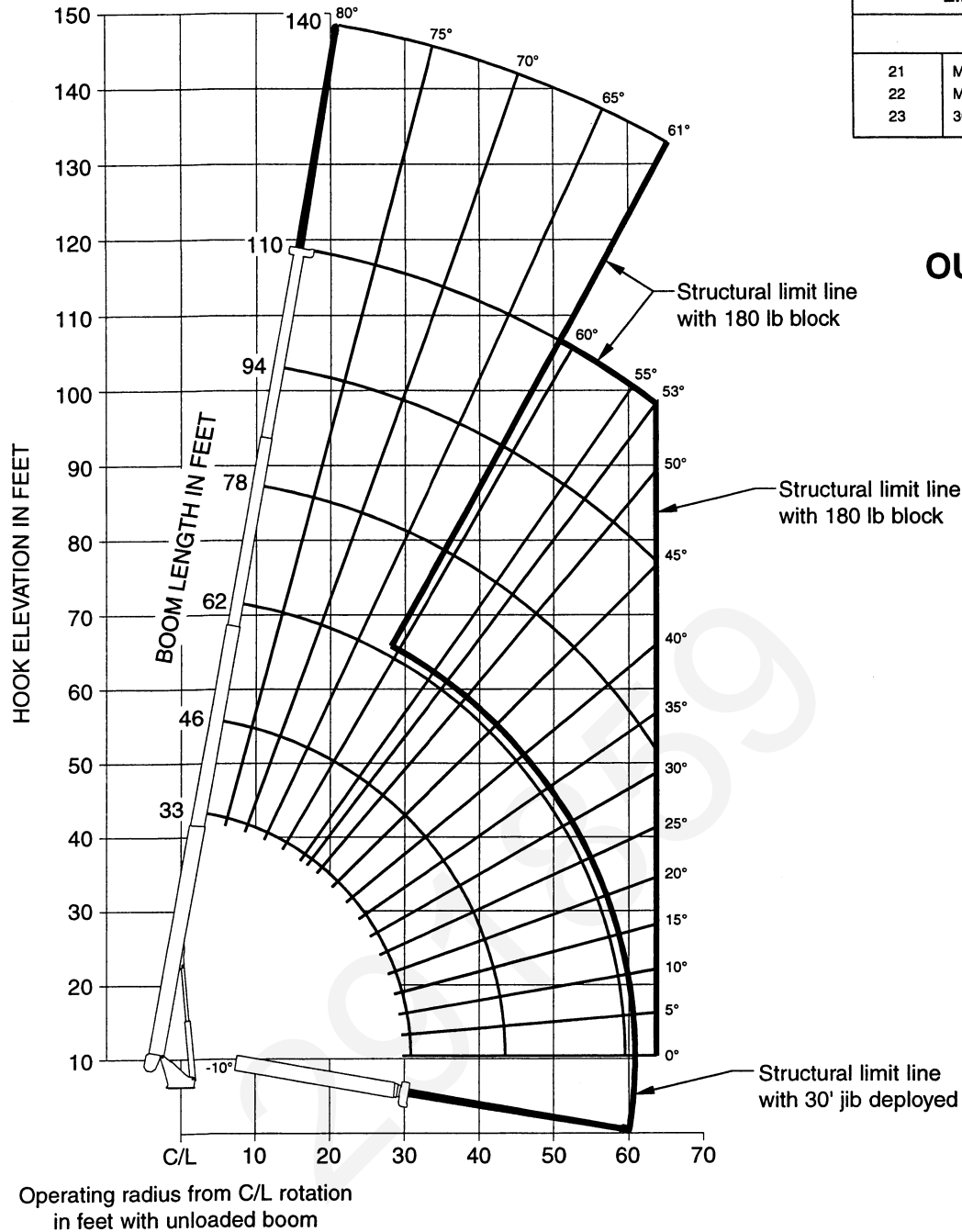
1. All capacities are in pounds, angles in degrees, radius in feet.
2. Loaded boom angles are given as reference only.
3. Shaded areas are structurally limited capacities.
4. Handling of personnel is only permitted with full-span outriggers.

LMI OPERATING CODE

OPERATING MODE

21	Main Boom - No jib Stowed
22	Main Boom - Jib Stowed
23	30 ft Jib

**14110
MID-SPAN
OUTRIGGER 17'
110' BOOM
30' JIB**



SET-UP

1. Engage mid-span outrigger lock pins, extend and set outriggers to mid-span location, level crane and set front stabilizer.

OPERATION

1. The 33 ft. boom length capacities are based on boom fully retracted. If not fully retracted, do not exceed 46 ft. boom length capacities.
2. Do not extend unloaded boom or jib beyond stability limit line on range chart as loss of stability may occur.
3. Load blocks and slings are considered to be a part of the load.
4. Operate with jib by radius when main boom is fully extended and by boom angle when main boom is partially extended. Do not exceed jib capacities at any partially extended boom length.
5. All jib loads must be lifted with single part reeving.

DIMENSIONAL SPECIFICATIONS

NOTE:
DIMENSIONS ARE inches (mm)
UNLESS OTHERWISE SPECIFIED.

