



**NATIONAL
CRANE**

Series 1800

**Hydraulic
Crane
40 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.

Assembly No. 877874

⚠ 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

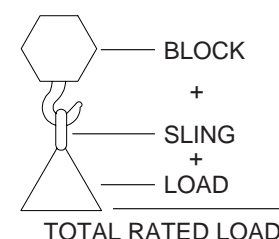
1. Inspect vehicle and crane including crane operation prior to use each day.
2. Load ratings shown on the appropriate charts are maximum allowable loads with the crane mounted on a factory approved truck and all outriggers at either full span or at mid span range and set on a firm level surface so the 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 or in cab.

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.

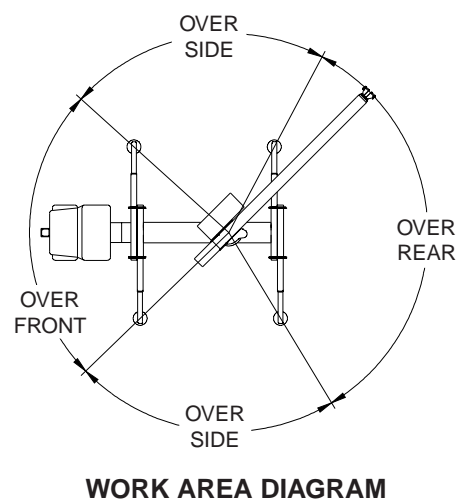
15. Do not operate the boom over personnel or allow them to walk or stand beneath the boom or load.

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. If equipped with 31' offset jib, do not use personnel basket with jib deployed at 30° offset.
19. Operate controls slowly and smoothly to avoid damage to crane or personnel.
20. Boom must be in carrying rack and outriggers fully retracted for travel.
21. 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

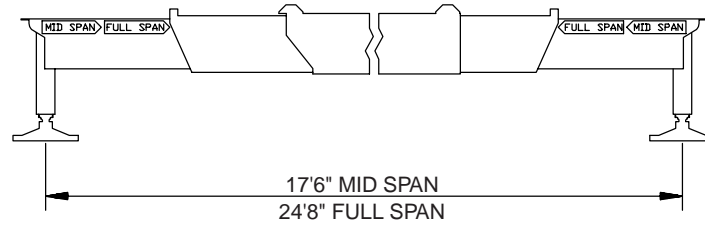
1. **Load radius**—Horizontal distance from the center line of rotation before loading to the center of the vertical loadline or block with load applied.
2. **Load boom angle**—Loaded boom angle is the angle between the first section boom and the horizontal, after lifting the rated load at the rated 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.



INFORMATIONAL DATA

OUTRIGGERS

1. Outrigger spread from center to center of the outrigger floats at mid span is 17'6" and at full span is 24'8"
2. No outrigger pad load exceeds 63,000 pounds maximum at full span or 74,000 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
40 Ton	4 Sheave Block	970 lb

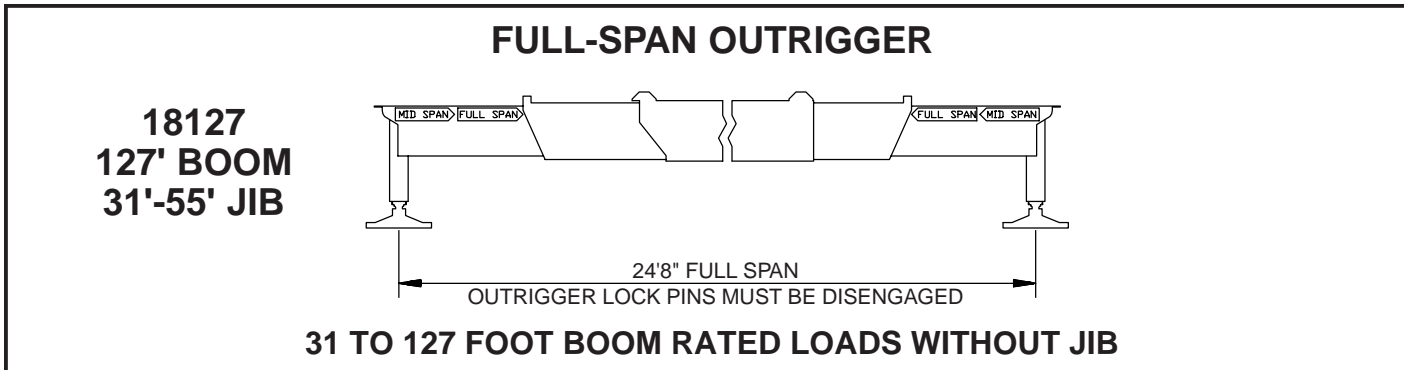
NOTICE

- 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 56,400 pounds breaking strength on this machine.

			1 Part Line	2 Part Line	3 Part Line	4 Part Line	5 Part Line	6 Part Line	7 Part Line	8 Part Line
MAXIMUM BOOM LENGTH AT MAXIMUM ELEVATION WITH RIGGING SHOWN WITH LOAD BLOCK AT GROUND LEVEL			158' BOOM & JIB	114'	83'	64'	52'	43'	36'	31'
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 IWRC	56,400 lb	10,000 lb 205 fpm	20,000 lb 103 fpm	30,000 lb 68 fpm	40,000 lb 51 fpm	50,000 lb 41 fpm	60,000 lb 34 fpm	70,000 lb 29 fpm	80,000 lb 26 fpm
Standard Planetary Winch High Speed	5/8" diameter rotation resistant IWRC	56,400 lb	5,000 lb 410 fpm	10,000 lb 205 fpm	15,000 lb 137 fpm	20,000 lb 103 fpm	25,000 lb 82 fpm	30,000 lb 68 fpm	35,000 lb 59 fpm	40,000 lb 51 fpm

All winch pulls and speeds are shown on the fifth layer. Winch line pulls would increase on the first, second, third and fourth layers. Winch line speed would decrease on the first, second, third and fourth 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	5,000 pounds (high speed) 10,000 pounds (low speed)	11,280 pounds



LOAD RADIUS (FEET)	LOADED BOOM ANGLE	31 FT BOOM (lb)	LOADED BOOM ANGLE	55 FT BOOM (lb)	LOADED BOOM ANGLE	79 FT BOOM (lb)	LOADED BOOM ANGLE	103 FT BOOM (lb)	LOADED BOOM ANGLE	127 FT BOOM (lb)
7	74.5	80,000								
8	72.4	74,000								
10	68.2	64,000								
12	63.8	56,000	76.9	40,000						
15	56.9	43,000	73.8	38,000	79.8	29,000				
20	44.2	30,000	68.1	31,000	76.2	25,000	80	16,000		
25	27.4	22,500	62	23,400	72.5	21,500	77.2	14,500	80	10,000
30			55.5	18,300	68.5	18,700	74.4	13,000	78	9,500
35			48.6	14,800	64.3	15,100	71.5	11,500	75.9	9,000
40			40.7	12,100	59.9	12,500	68.6	10,500	73.6	8,100
45			31.3	10,100	55.3	10,400	65.9	9,500	71.2	7,200
50			19.4	8,500	50.9	8,800	62.7	8,500	68.8	6,500
55					45.8	7,500	59.3	7,500	66.3	5,800
60					40.1	6,400	55.7	6,500	63.7	5,300
65					33.6	5,400	52	5,600	61.1	4,800
70					25.6	4,600	48.1	4,700	58.4	4,300
75					13.5	3,850	43.9	3,950	55.6	3,900
80							39.3	3,350	52.6	3,400
85							34.3	2,800	49.4	2,850
90							28.4	2,300	46	2,350
95							21	1,850	42.5	1,900
100							8.2	1,500	38.8	1,550
105									34.6	1,200
110									30	900
115									24.6	650
	0	19,000	0	7,700	0	3,600	0	1,450		

31' JIB RATED LOADS

RADIUS FULLY EXTENDED	LOADED BOOM ANGLE	RATED LOADS ALL BOOM LENGTHS
30	80	3,400
46	75	3,200
60	70	2,700
73	65	2,100
85	60	1,700
96	55	1,200
106	50	650

55' JIB RATED LOADS

RADIUS FULLY EXTENDED	LOADED BOOM ANGLE	RATED LOADS ALL BOOM LENGTHS
36	80	2,200
54	75	2,200
70	70	1,600
85	65	1,000

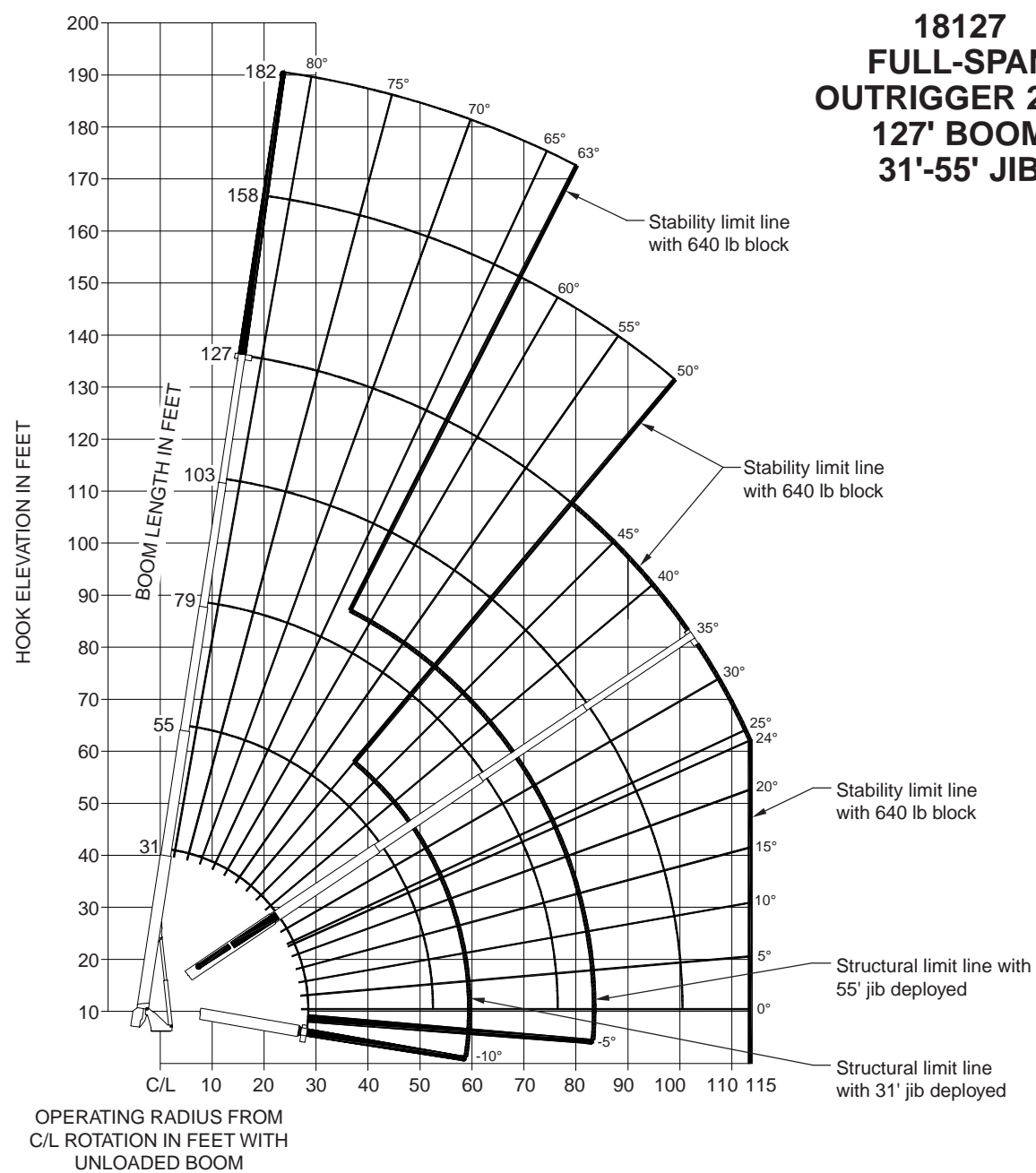
RATED LOAD REDUCTIONS WITH JIB

BOOM LENGTH	31' JIB STOWED	31' - 55' JIB ERRECTED AT 31' LENGTH
31'		
31'	Reduce load 800 lb	Reduce load 2,300 lb
55'	Reduce load 450 lb	Reduce load 2,000 lb
79'	Reduce load 350 lb	Reduce load 1,900 lb
103'	Reduce load 250 lb	Reduce load 1,800 lb
127'	Reduce load 200 lb	Reduce load 1,700 lb

NOTE

- All capacities are in pounds, angles in degrees, radius in feet.
- Loaded boom angles are given as reference only.
- Shaded areas are structurally limited capacities.



**SET-UP**

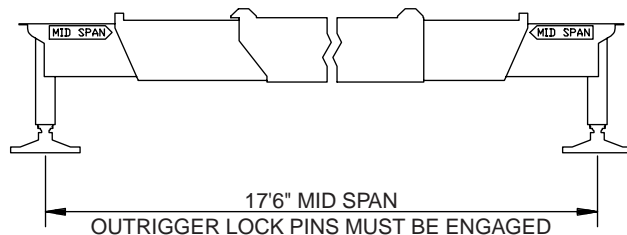
1. Fully extend and set outriggers to full-span location, level crane and set front stabilizer.

OPERATION

1. The 31 ft. boom length capacities are based on boom fully retracted. If not fully retracted, do not exceed 55 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.

MID-SPAN OUTRIGGER

**18127
127' BOOM
31' JIB**



31 TO 127 FOOT BOOM RATED LOADS WITHOUT JIB

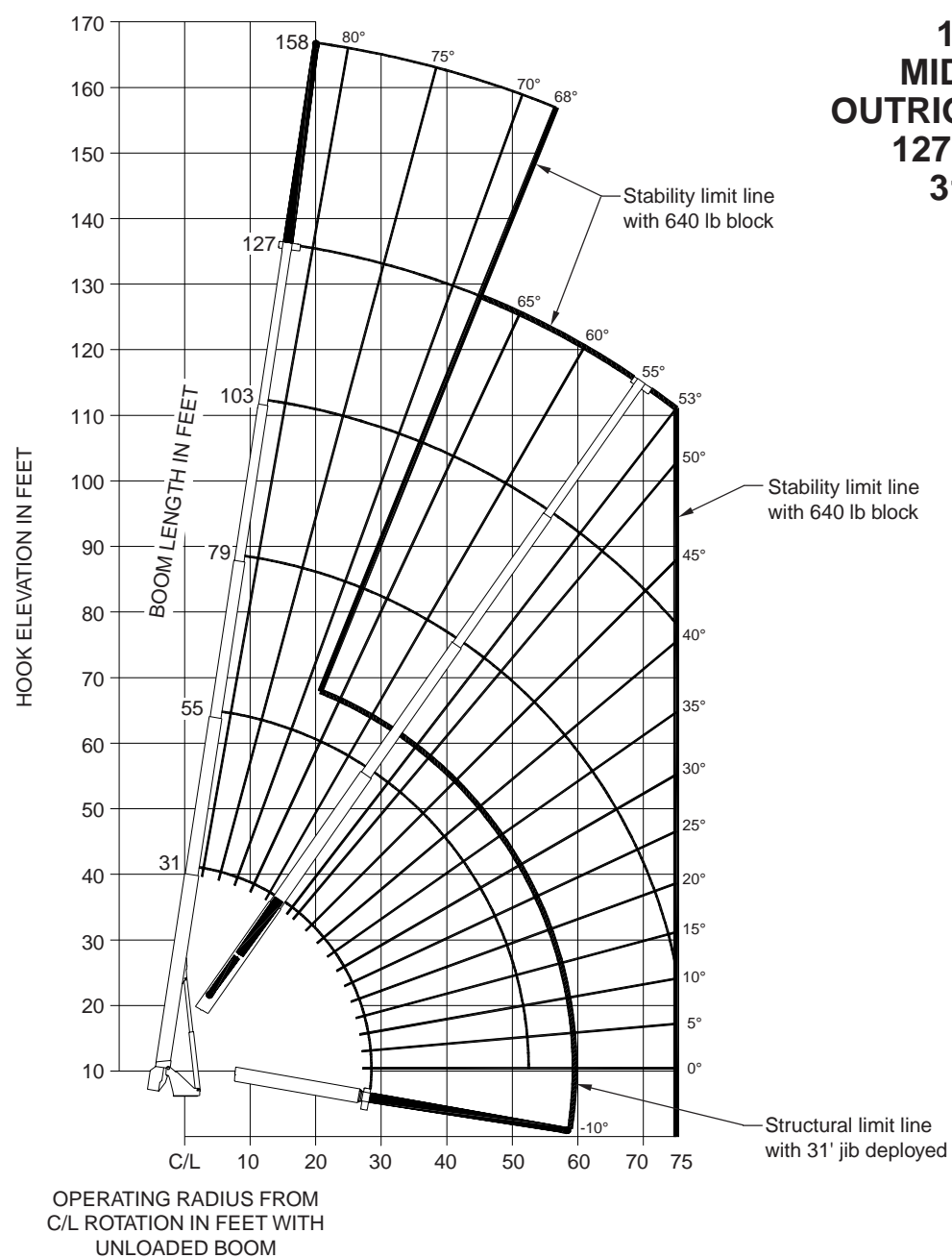
LOAD RADIUS (FEET)	LOADED BOOM ANGLE	31 FT BOOM (lb)	LOADED BOOM ANGLE	55 FT BOOM (lb)	LOADED BOOM ANGLE	79 FT BOOM (lb)	LOADED BOOM ANGLE	103 FT BOOM (lb)	LOADED BOOM ANGLE	127 FT BOOM (lb)
7	74.5	80,000								
8	72.4	74,000								
10	68.2	64,000								
12	63.9	56,000	76.9	40,000						
15	57	43,000	73.8	38,000	79.8	29,000				
20	44.2	27,700	67.8	27,000	76.2	25,000	80	16,000		
25	27.4	17,500	61.6	17,200	71.9	17,600	77.2	14,500	80	10,000
30			55	12,000	67.7	12,300	74.3	12,400	78	9,500
35			48.7	8,700	63.7	9,100	71.3	9,200	75.9	9,000
40			41	6,500	59.4	6,900	68	7,000	73.2	7,100
45			31.8	4,900	54.8	5,200	64.7	5,300	70.5	5,400
50			18.7	3,700	50	4,000	61.3	4,100	67.8	4,150
55					44.8	3,050	57.9	3,150	65.1	3,200
60					39.1	2,250	54.4	2,350	62.4	2,400
65					32.7	1,600	50.7	1,700	59.7	1,750
70					24.6	1,050	46.8	1,150	56.9	1,200
	0	12,400	0	3,150						

31' JIB RATED LOADS		
RADIUS FULLY EXTENDED	LOADED BOOM ANGLE	RATED LOADS ALL BOOM LENGTHS
30	80	3,400
46	75	3,200
58	70	900

RATED LOAD REDUCTIONS WITH JIB		
BOOM LENGTH	31' JIB STOWED	31' JIB ERECTED
	31'	Reduce load 800 lb
55'	Reduce load 450 lb	Reduce load 2,000 lb
79'	Reduce load 350 lb	Reduce load 1,900 lb
103'	Reduce load 250 lb	Reduce load 1,800 lb
127'	Reduce load 200 lb	Reduce load 1,700 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.

**SET-UP**

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

OPERATION

1. The 31 ft. boom length capacities are based on boom fully retracted. If not fully retracted, do not exceed 55 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.
6. Use of the 55 ft. jib is not allowed with outriggers set to the mid-span location.

LMI OPERATING CODE**OPERATING MODE**

01	Main Boom - No Jib Stowed
02	Main Boom - Jib Stowed
03	31 ft (9.4m) Tele Jib
04	55 ft (16.8m) Tele Jib
11	Man Basket on Main Boom
12	Man Basket on 31 ft (9.4m) Tele Jib
13	Man Basket on 55 ft (16.8m) Tele Jib
21	Mid Span Main Boom - No Jib Stowed
22	Mid Span Main Boom - Jib Stowed
23	Mid Span 31 ft (9.4m) Tele Jib
24	Mid Span 55 ft (16.8m) Tele Jib