GROVE®

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85% OF
75% O

RATED LIFTING CAPA

ON OUTRIGGERS FULLY EXTENDED - 360°

Radius in Feet	Main Boom Length in Feet (Power Pinned Fly Retracted)									Power Pin. Fly Ext. & 141ft.
	46	58	70	82	94	106	118	130	141	173
10	330,000 (74.5)									See Warning Note 17
12	300,000 (71.5)	143,500 (76)	142,000 (78.5)							
15	249,000 (67.5)	143,500 (73)	141,500 (76)	130,000 (78)						
20	180,500 (60)	143,500 (67.5)	123,500 (71.5)	112,000 (74.5)	102,000 (76.5)	90,300 (77.5)				
25	140,000 (52)	131,500 (61.5)	110,500 (67)	98,650 (71)	89,250 (73.5)	78,550 (75)	73,700 (77)	69,300 (78.5)		
30	113,000 (42)	111,000 (55.5)	98,000 (62.5)	88,350 (67)	78,750 (70)	69,250 (72)	65,100 (74.5)	61,000 (76)	60,000 (77.5)	
35	93,000 (29.5)	93,000 (48.5)	88,200 (57.5)	80,150 (63)	69,000 (67)	60,750 (69.5)	57,150 (72)	54,000 (74)	52,150 (75.5)	
40		79,100 (41)	76,950 (52)	73,500 (59)	61,300 (63.5)	54,000 (66.5)	50,600 (69.5)	48,300 (72)	45,850 (73.5)	38,000 (78)
45	See Warning Note 16	67,500 (31.5)	67,500 (46.5)	64,850 (54.5)	55,000 (60)	48,500 (63.5)	45,200 (67)	43,050 (69.5)	40,400 (71.5)	35,750 (76)
50			58,100 (40)	57,700 (49.5)	48,750 (56)	43,050 (60.5)	40,700 (64)	38,250 (67)	35,750 (69.5)	32,100 (74.5)
60				46,650 (39)	39,100 (48)	34,300 (54)	33,600 (59)	30,750 (62.5)	28,500 (65.5)	26,350 (71)
70				35,200 (23.5)	31,950 (38.5)	27,750 (47)	27,200 (53)	24,750 (57.5)	23,100 (61)	22,000 (68)
80					26,400 (25.5)	22,750 (38.5)	22,300 (46.5)	20,150 (52)	18,700 (56)	18,500 (64.5)
90						18,750 (27.5)	18,350 (38.5)	16,450 (46)	15,150 (51)	15,250 (60.5)
100							15,150 (29)	13,450 (39)	12,300 (45.5)	12,600 (57)
110								10,950 (30.5)	9,920 (39)	10,400 (52.5)
120									7,900 (31)	8,570 (48)
130									4,500 (19.5)	6,980 (43.5)
140										5,600 (38)
150										4,400 (31)
160										3,340 (21.5)
Minimum boom angle (deg.) for indicated length (no load)									0	0
Maximum boom length (ft.) at 0 deg. boom angle (no load)									141	173

NOTE: Boom angles are in degrees.

A6-829-006879 & -006887

Main Boom Angle	33 2° OFFS Rad. Ref.ft.	C lb
80°	40.8	22
75	58.1	16
70	75.0	13
65	91.3	11
60	107.0	10
55	121.8	8
50	135.8	6
45	148.7	4
40	160.4	3

1. All capacities a of boom exten in accordance w
2. 33 ft. (10.0m extension lengt
3. Rated load is b horizontal, reg fully extended (52.8m) boom an accurate radi WARNING: Op the capacities boom extensior

NOTES FOR LI

GENERAL:

1. Rated loads as shown on capacity chart pertain to this crane as originally manufactured and equipped. Modifications to the crane or use of optional equipment other than that specified can result in a reduction of capacity. Use only the jib or boom extension supplied with this crane, do not substitute jibs or boom extensions without the written approval of Grove Mfg. Co.
2. Construction equipment can be hazardous if improperly operated or maintained. Operation and maintenance shall be in compliance with the information in the Operator's and Safety Handbooks, Service and Parts Manuals supplied with this crane. If these manuals are missing, order replacements from the manufacturer.
3. The operator and other personnel associated with this crane shall fully acquaint themselves with the latest applicable American National Standards Institute (ANSI) Safety Standards for cranes.

SETUP:

1. The crane shall be leveled on a firm supporting surface. Depending on the nature of the supporting surface, it may be necessary to have structural supports of sufficient strength under the outrigger floats or tires to spread the load to a larger bearing surface.
2. For outrigger operation, outriggers shall be fully extended with tires raised free of crane weight before operating the boom or lifting loads.
3. When equipped with front jack cylinder, the front jack cylinder shall be set in accordance with the written procedure.
4. When equipped with extendable counterweight, the counterweight shall be fully extended before operation.
5. Tires shall be inflated to the recommended pressure before lifting on rubber.
6. With certain boom and hoist tackle combinations, maximum capacities may not be obtainable with standard cable lengths.
7. Rotation resistant wire rope is best suited for single line lifting operations. Consult the wire rope manufacturer for specific recommendations concerning multiple part reeving.
8. Do not transport crane with boom extension or jib erected.

OPERATION:

1. Rated loads at rated radius shall not be exceeded. Do not tip the machine to determine allowable loads. For clamshell operation, weight of load must not exceed 80% of rated lifting capacities.
2. All rated loads have been tested to and meet minimum requirements of SAE J-1063 - Cantilevered Boom Crane Structures - Method of Test, and do not exceed 85% of the tipping load as determined by SAE J-765a Crane Stability Test Code.
3. Rated loads include the weight of hook block, slings and auxiliary lifting devices and their combined weights shall be subtracted from the listed ratings to obtain the net load which may be lifted.
4. Load ratings are based on freely suspended loads. No attempt shall be made to move a load horizontally on the ground in any direction.

Courtesy of Crane.Market

RT1650

165 TON CAPACITY
46 ft. - 173 ft. BOOM
(POWER PINNED)
PCSA CLASS 10-791
85% OF TIPPING - ON OUTRIGGERS
75% OF TIPPING - ON RUBBER

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SELF-PROPELL

ING CAPACITIES IN POUNDS

33 ft. BOOM EXTENSION AND 33 ft. TELE. BOOM EXTENSION ON OUTRIGGERS - 360°

Main Boom Angle	33 ft. BOOM EXTENSION						48 ft. BOOM EXTENSION						58 ft. BOOM EXTENSION					
	2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET	
	Rad. Ref.ft.	Cap. lbs.	Rad. Ref.ft.	Cap. lbs.	Rad. Ref. ft	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.
80°	40.8	22,300	47.0	19,650	53.2	14,200	43.6	14,800	54.7	12,700	65.8	9,040	46.2	9,600	60.2	8,300	74.4	7,000
75	58.1	16,850	63.9	15,550	69.7	12,200	62.0	13,700	72.5	10,900	82.9	8,320	65.3	9,150	78.7	7,950	92.0	6,440
70	75.0	13,450	80.3	12,400	85.7	10,150	80.0	11,600	89.8	8,840	99.4	7,110	84.0	8,550	96.4	7,200	108.8	5,760
65	91.3	11,300	96.2	10,200	101.0	8,670	97.4	9,230	106.3	7,330	115.2	6,120	102.1	7,630	113.5	6,000	124.9	4,970
60	107.0	10,200	111.2	8,600	115.6	7,510	114.1	7,550	122.1	6,210	130.2	5,340	119.4	6,260	129.8	5,100	140.1	4,360
55	121.8	8,530	125.5	7,380	129.2	6,600	129.9	6,330	137.0	5,360	144.1	4,730	135.8	5,260	145.0	4,410	154.2	3,870
50	135.8	6,530	138.8	6,200	141.9	5,890	144.8	5,410	150.8	4,690	156.9	4,240	151.2	4,490	159.2	3,860	167.1	3,470
45	148.7	4,760	151.1	4,540	153.5	4,380	158.4	3,980	163.5	3,740	168.5	3,580	165.4	3,460	172.1	3,230	178.8	3,070
40	160.4	3,390	162.2	3,240	163.9	3,150	170.9	2,780	174.9	2,630	178.8	2,540	178.3	2,380	183.7	2,230	189.0	2,150

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BOOM EXTENSION CAPACITY NOTES

1. All capacities above the bold line are based on structural strength of boom extension and do not exceed 85% of tipping load, in accordance with SAE J-765a.
2. 33 ft. (10.0m), 48 ft. (14.6m), and 58 ft. (17.7m) boom extension lengths may be used for double line lifting service only.
3. Rated load is based on loaded main boom angle with reference to horizontal, regardless of main boom length. (ref. radius is for fully extended boom and power pinned fly extended 173 ft. (52.8m) boom length only. The Krueger L.M.I. system will give an accurate radius indication for this condition only).
   WARNING: Operation of this machine with heavier loads than the capacities listed is strictly prohibited. Machine tipping with boom extension occurs rapidly and without advance warning.
4. WARNING: The Krueger L.M.I. will not compensate for reeving/rigging accessories on the main boom nose or auxiliary boom nose when programmed to monitor the boom extension. Remove all reeving/rigging accessories from main boom when using boom extension.
5. Capacities listed are with fully extended outriggers only.
6. BOOM EXTENSION WARNING: For main boom length greater than 170 ft. (51.8m) with 33 ft. (10.0m) fixed length boom extension or 33 ft. - 58 ft. (10.0m - 17.7m) tele. boom extension in working position, the boom angle must not be less than 35° since loss of stability will occur causing a tipping condition. The boom angle is not restricted for main boom length equal to or less than 170 ft. (51.8m). This warning applies for boom extension erection purposes also.

NOTES FOR LIFTING CAPACITIES

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combined weights

horizontally on the

5. Rated loads do not account for wind on lifted load or boom. It is recommended when wind velocity is above 20 MPH (32 km/h), rated loads and boom lengths be appropriately reduced.
6. Rated loads are for lift crane service only.
7. Do not operate at a radius or boom length where capacities are not listed. At these positions, the crane may overturn without any load on the hook.
8. The maximum load which can be telescoped is not definable because of variations in loadings and crane maintenance, but it is safe to attempt retraction and extension within the limits of the capacity chart.
9. When either boom length or radius or both are between values listed, the smallest load shown at either the next larger radius or boom length shall be used.
10. For safe operation, the user shall make due allowances for his particular job conditions, such as: soft or uneven ground, out of level conditions, high winds, side loads, pendulum action, jerking or sudden stopping of loads, hazardous conditions, experience of personnel, two machine lifts, traveling with loads, electric wires, etc. Side pull on boom or jib is extremely dangerous.
11. Power telescoping boom sections must be extended equally at all times.
12. Handling of personnel from the boom is not authorized except with equipment furnished and installed by Grove Manufacturing Company.
13. Keep load handling devices a minimum of 18 inches (45.7 cm) below boom head at all times.
14. The boom angle before loading should be greater than the loaded boom angle to account for deflection.
15. Capacities appearing above the bold line are based on structural strength and tipping should not be relied upon as a capacity limitation. Capacities do not exceed 85% of tipping loads as determined by test in accordance with SAE J-765.
16. Capacities for the 46 ft. (13.9 m) boom length shall be lifted with boom fully retracted. If boom is not fully retracted, capacities shall not exceed those shown for the 58 ft. (17.7m) boom length.
17. For boom lengths less than 173 ft. (52.8m) with power pinned fly extended, the rated loads are determined by boom angle in the column headed by 173 ft. (52.8m) boom (power pinned fly extended). For boom angles not shown, use rating of next lower boom angle. For this load column, the extended power pinned operational mode is to be selected on the Krueger L.M.I. WARNING: The Krueger L.M.I. calibration will only apply when all powered boom sections are fully extended.

DEFINITIONS:

1. Operating Radius: Horizontal distance from a projection of the axis of rotation to the supporting surface before loading to the center of the vertical hoist line or tackle with load applied.
2. Loaded Boom Angle (Shown in Parenthesis on Main Boom Capacity Chart): is the angle between the boom base section and the horizontal, after lifting the rated load at the rated radius with the rated boom length.
3. Working Area: Areas measured in a circular arc about 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 lift cable.
5. Side Load: Horizontal force applied to the lifted load either on the ground or in the air.

Courtesy of Crane.Market

RT1650

165 TON CAPACITY
46 ft. - 173 ft. BOOM
(POWER PINNED)
PCSA CLASS 10-791
85% OF TIPPING - ON OUTRIGGERS
75% OF TIPPING - ON RUBBER

ON RUBBER CAPACITIES
33.25 x 29 TIRES

Radius in Feet	Stationary Capacity Defined Arc (3) Over Front	Stationary Capacity 360° Arc	Pick&Carry Cap. Up to 2.5 MPH Boom Centered (7) Over Front
15	200,000 (a)	113,000 (a)	200,000 (a)
20	160,000 (a)	69,550 (a)	156,500 (a)
25	132,000 (a)	47,650 (b)	130,500 (a)
30	106,500 (a)	34,600 (b)	106,500 (a)
35	80,250 (a)	26,000 (c)	80,250 (a)
40	65,300 (b)	19,850 (d)	57,950 (b)
45	53,050 (c)	15,500 (e)	48,800 (b)
50	44,150 (d)	11,600 (f)	43,850 (c)
60	30,850 (e)		30,850 (c)
70	23,250 (f)		23,250 (d)
80	17,300 (g)		17,300 (e)
90	13,100 (h)		13,100 (f)
100	9,040 (i)		9,040 (g)

A6-829-006603

		Main Boom 141 ft.
Front (No Load)	Min. boom angle (deg.) for indicated length	0
	Max. boom length (ft.) at 0 deg. boom angle	141
360° (No Load)	Min. boom angle (deg.) for indicated length	56
	Max. boom length (ft.) at 0 deg. boom angle	82

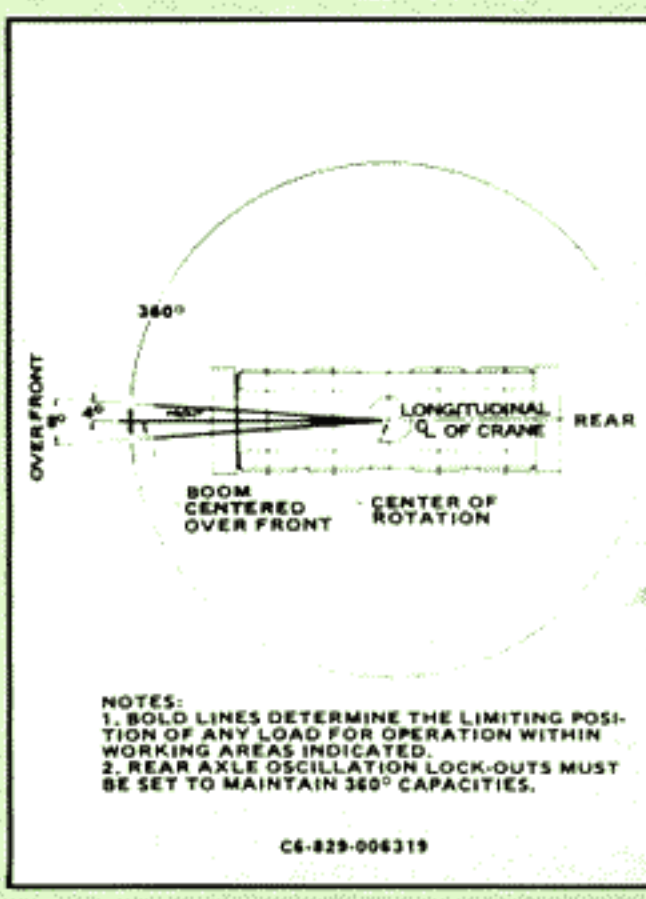
Maximum Permissible Boom Length:
(Power Pinned Fly Retracted)

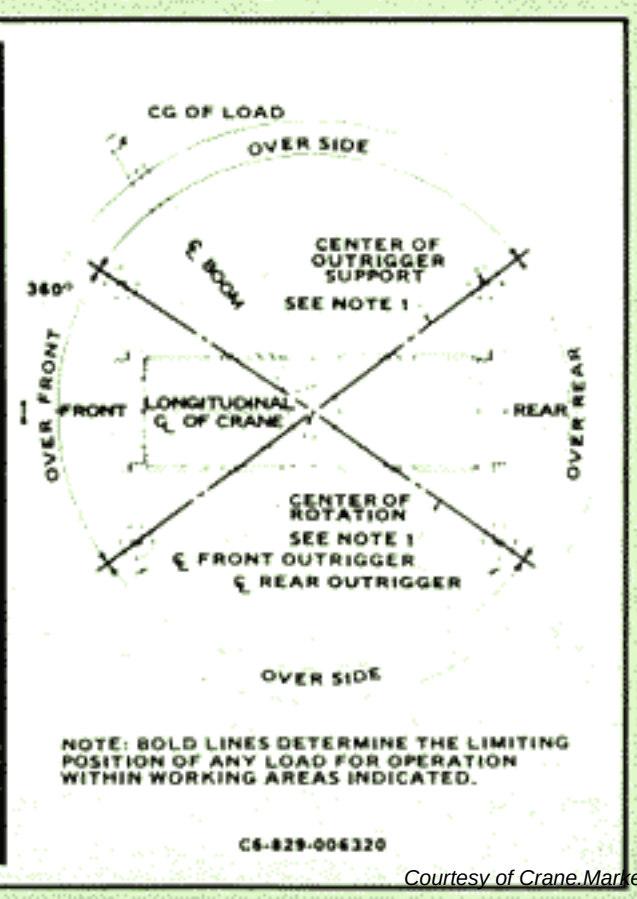
(a)	46.0 ft.	(f)	106.0 ft.
(b)	58.0 ft.	(g)	118.0 ft.
(c)	70.0 ft.	(h)	130.0 ft.
(d)	82.0 ft.	(i)	141.0 ft.
(e)	94.0 ft.		

NOTES FOR RUBBER CAPACITIES

1. Capacities are in pounds and do not exceed 75% of tipping loads as determined by test in accordance with SAE J-765.
2. Capacities are applicable to machines equipped with 33.25x29 (32 ply) bias ply tires, at 80 psi cold inflation pressure (65 psi for 2.5 mph pick & carry capacities).
3. Defined arc - Over front includes ±4° on either side on longitudinal centerline of machine.
4. Capacities are applicable only with machine on firm level surface.
5. Axle lockouts must be functioning before lifting on rubber. (Check automatic lockout system for proper functioning: refer to "Operation and Maintenance Manual" for description of a proper functioning axle lockout system).
6. All rubber lifting depends on proper tire inflation, capacity and condition. Capacities must be reduced for lower tire inflation pressures. See lifting capacity chart for tire used. Damaged tires are hazardous to safe operation of crane.
7. For pick and carry operation, boom must be centered over front of machine, mechanical swing lock engaged, and load restrained from swinging. When handling loads in the structural range with capacities close to maximum ratings, travel should be reduced to creep speeds.
8. On rubber lifting with power pinned fly extended, boom extension or jib is not permitted.
9. Creep - not over 200 ft. (61 m) of movement in any 30 min. period, and not exceeding 1 mph (1.6 kph).

LIFTING AREA DIAGRAMS

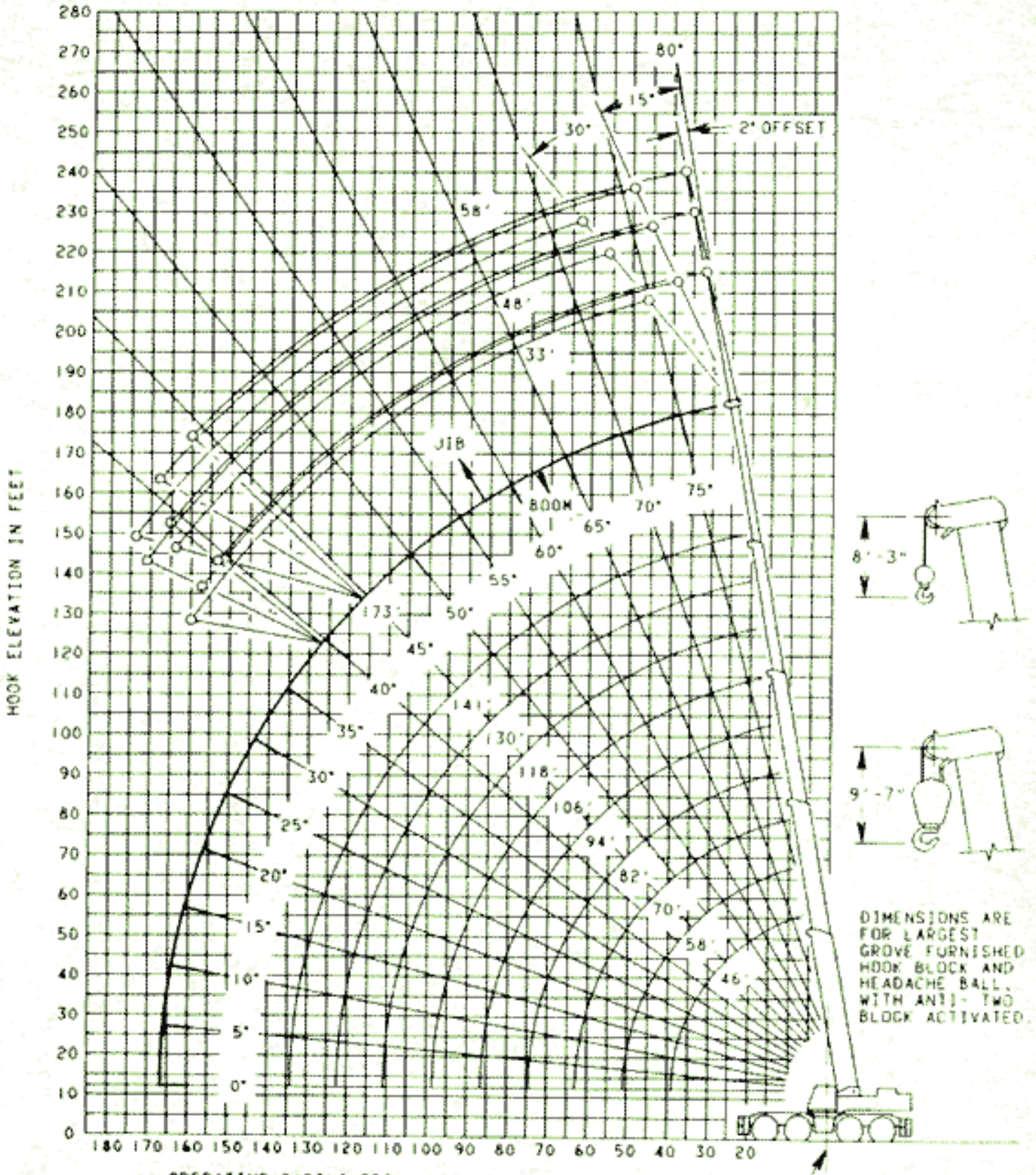




Courtesy of Crane Market

GROVE® RT1650

RANGE DIAGRAM



WEIGHT REDUCTION FOR LOAD HANDLING DEVICES

33 ft. BOOM EXTENSION		
†Stowed	-	873 lbs.
†Erected	-	5,120 lbs.
33 ft. - 58 ft. Tele. Boom Extension		
†Stowed	-	1,356 lbs.
†Erected (Retracted)	-	7,985 lbs.
††Erected (Extended)	-	10,954 lbs.

†Reduction of main boom capacities.
††Reduction of 32 ft. Ext. capacities.

HOOKBLOCKS	
165 Ton, 8 Sheave	5,292 lbs.
50 Ton, 2 Sheave	1,024 lbs.
30 Ton, 1 Sheave	1,022 lbs.
15 Ton Headache Ball	803 lbs.
10 Ton, Headache Ball	560 lbs.
Auxiliary Boom Head	261 lbs.

NOTE: All Load Handling devices and boom Attachments are Considered Part of the Load and Suitable Allowances MUST BE MADE for Their Combined Weights. Weights are for Grove furnished equipment.

GROVE®

GROVE MANUFACTURING COMPANY
Division of Kidde, Inc.
KIDDE
Box 21, Shady Grove, Pennsylvania 17256
Phone: (717) 597-8121 Telex: 842308 Cable: GROVE MFG

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