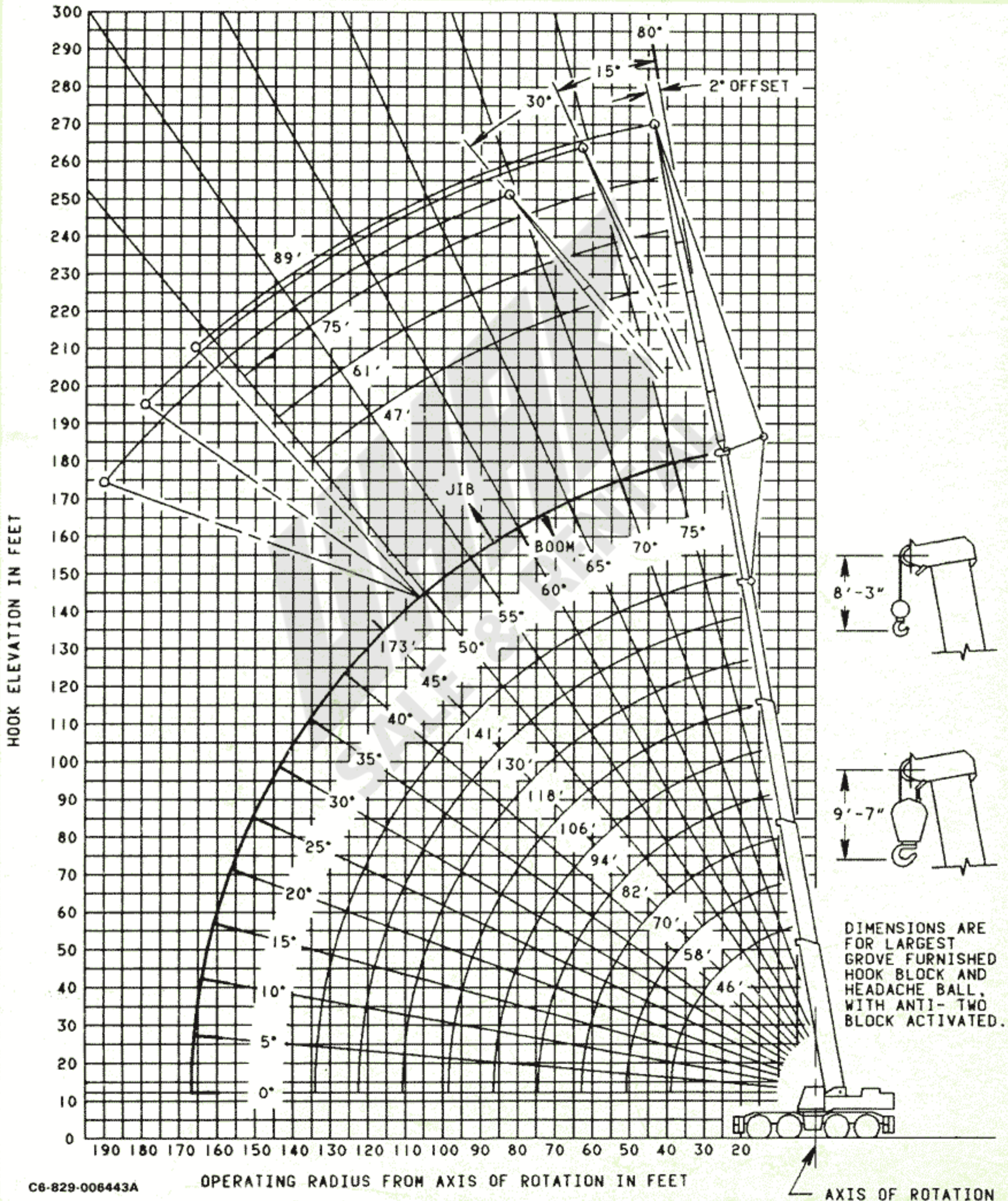


# RT1650

89 ft. (27.0m)  
JIB CAPACITIES

## ENGLISH



# 650

(27.0m)  
CAPACITIES

# GROVE®

FULL HYDRAULIC

# SELF-PROPELLED CRANE

CAPACITIES  
360°

DS

75 ft. JIB						89 ft. JIB					
2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET	
Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.
48.2	9,470	64.4	5,760	79.8	3,280	53.7	7,300	72.6	3,970	90.7	1,790
59.2	8,790	74.8	5,310	89.6	3,090	65.2	6,560	83.6	3,590	101.2	1,400
70.2	7,880	85.1	4,920	99.2	2,920	76.7	5,950	94.5	2,970	111.5	1,270
81.0	7,110	95.2	4,580	108.8	2,780	88.0	5,380	105.2	2,690	121.6	1,160
91.6	6,470	105.1	4,280	117.8	2,640	99.1	4,700	115.7	2,450		
102.1	5,930	114.8	4,000	126.8	2,370	110.1	4,210	125.9	2,240		
112.3	5,460	124.3	3,620	135.6	2,130	120.8	3,780	136.0	2,050		
122.4	4,310	133.6	3,270	144.1	1,340	131.4	3,430	145.8	1,790		
132.3	3,300	142.6	2,960			141.7	2,480				
151.2	1,670	159.8	1,510								

A6-829-006692

AMS

22.8 m JIB						27.0 m JIB					
2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET	
Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg
14.7	4,295	19.6	2,610	24.3	1,485	16.4	3,310	22.1	1,800	27.6	810
18.1	3,985	22.8	2,405	27.3	1,400	19.9	2,975	25.5	1,625	30.8	635
21.4	3,570	25.9	2,230	30.2	1,320	23.4	2,695	28.8	1,345	34.0	575
24.7	3,225	29.0	2,075	33.1	1,260	26.8	2,440	32.1	1,220	37.1	525
27.9	2,930	32.0	1,940	35.9	1,195	30.2	2,130	35.3	1,110		
31.1	2,685	35.0	1,810	38.7	1,075	33.6	1,905	38.4	1,015		
34.2	2,475	37.9	1,640	41.3	965	36.8	1,710	41.5	925		
37.3	1,950	40.7	1,480	43.9	605	40.1	1,555	44.4	810		
40.3	1,495	43.5	1,340			43.2	1,120				
46.1	755	48.7	680								

A6-829-006693

**WEIGHT REDUCTION FOR LOAD HANDLING DEVICES**

main boom  
loss of

purpose of

as part of  
(27.0 m)

ing/rigging  
nose when  
accessories

mm] wire

46 - 173 ft. Boom with:	lbs.	kg
47 ft. (14.2m) Jib Erected -	9,425	4,270
61 ft. (18.5m) Jib Erected -	13,611	6,167
75 ft. (22.8m) Jib Erected -	18,416	8,344
89 ft. (27.0m) Jib Erected -	24,085	10,925

HOOKBLOCK	lbs.	kg
30 Ton (27.2 MT) 1 Sheave . . . . .	1,022	464
15 Ton (13.6 MT) Headache Ball . . . . .	803	364
10 Ton (9.1 MT) Headache Ball . . . . .	560	254
Auxiliary Boom Head . . . . .	261	118

† Reduction of main boom capacities.

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.



# RT1

## 89 ft. (27.0 m) JIB CAPACITY

### RATED LIFTING CAPACITIES ON OUTRIGGERS

#### POUNDS

Loaded Main Boom Angle	47 ft. JIB						61 ft. JIB					
	2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET	
	Ref.* Rad.	Load lbs.**	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.	Ref. Rad.	Load lbs.
80°	42.8	14,900	52.5	12,600	61.4	8,120	44.7	12,500	58.3	8,530	70.7	5,350
77.5	52.2	14,450	61.8	11,650	70.4	7,750	54.9	11,650	68.1	7,440	80.2	5,070
75	61.6	14,000	71.1	10,850	79.3	7,410	65.1	10,700	77.8	6,940	89.4	4,830
72.5	70.8	13,600	80.2	10,150	88.0	7,120	75.1	9,740	87.4	6,510	98.5	4,610
70	79.9	12,450	89.2	9,550	96.6	6,860	85.0	8,910	96.8	6,130	107.4	4,420
67.5	88.8	11,350	98.0	8,980	104.9	6,630	94.8	8,220	106.0	5,810	116.2	4,250
65	97.6	9,990	106.6	7,940	113.1	6,430	104.3	7,620	115.0	5,520	124.7	3,900
62.5	106.2	8,900	115.0	7,490	121.1	6,210	113.7	6,390	123.8	4,440	132.9	2,990
60	114.6	7,640	123.2	7,050	128.9	5,560	122.8	5,240	132.4	3,490	140.9	2,180
55	130.8	5,540	138.9	5,180	143.5	4,920	140.4	3,380	148.8	1,940		
50	145.9	3,900	153.6	3,670	157.2	3,510	157.0	1,960				

\* Reference radius (feet) refers to fully extended boom and appropriate jib length  
 \*\* Capacities at loaded main boom angle

#### KILOGRAMS

Loaded Main Boom Angle	14.2 m JIB						18.5 m JIB					
	2° OFFSET		15° OFFSET		30° OFFSET		2° OFFSET		15° OFFSET		30° OFFSET	
	Ref.* Rad.	Load kg**	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg	Ref. Rad.	Load kg
80°	13.1	6,755	16.0	5,715	18.7	3,680	13.6	5,665	17.8	3,865	21.5	2,425
77.5	15.9	6,550	18.8	5,280	21.5	3,515	16.7	5,280	20.8	3,370	24.4	2,295
75	18.8	6,350	21.7	4,920	24.2	3,360	19.8	4,850	23.7	3,145	27.3	2,190
72.5	21.6	6,165	24.4	4,600	26.8	3,225	22.9	4,415	26.6	2,950	30.0	2,090
70	24.4	5,645	27.2	4,330	29.4	3,110	25.9	4,040	29.5	2,780	32.7	2,000
67.5	27.1	5,145	29.9	4,070	32.0	3,005	28.9	3,725	32.3	2,635	35.4	1,925
65	29.7	4,530	32.5	3,600	34.5	2,915	31.8	3,455	35.1	2,500	38.0	1,765
62.5	32.4	4,035	35.1	3,395	36.9	2,815	34.6	2,895	37.7	2,010	40.5	1,355
60	34.9	3,465	37.5	3,195	39.3	2,520	37.4	2,375	40.4	1,580	43.0	985
55	39.9	2,510	42.3	2,345	43.7	2,230	42.8	1,530	45.3	875		
50	44.5	1,765	46.8	1,660	47.9	1,590	47.9	885				

\* Reference radius (m) refers to fully extended boom and appropriate jib length  
 \*\* Capacities at loaded main boom angle

#### JIB CAPACITY NOTES

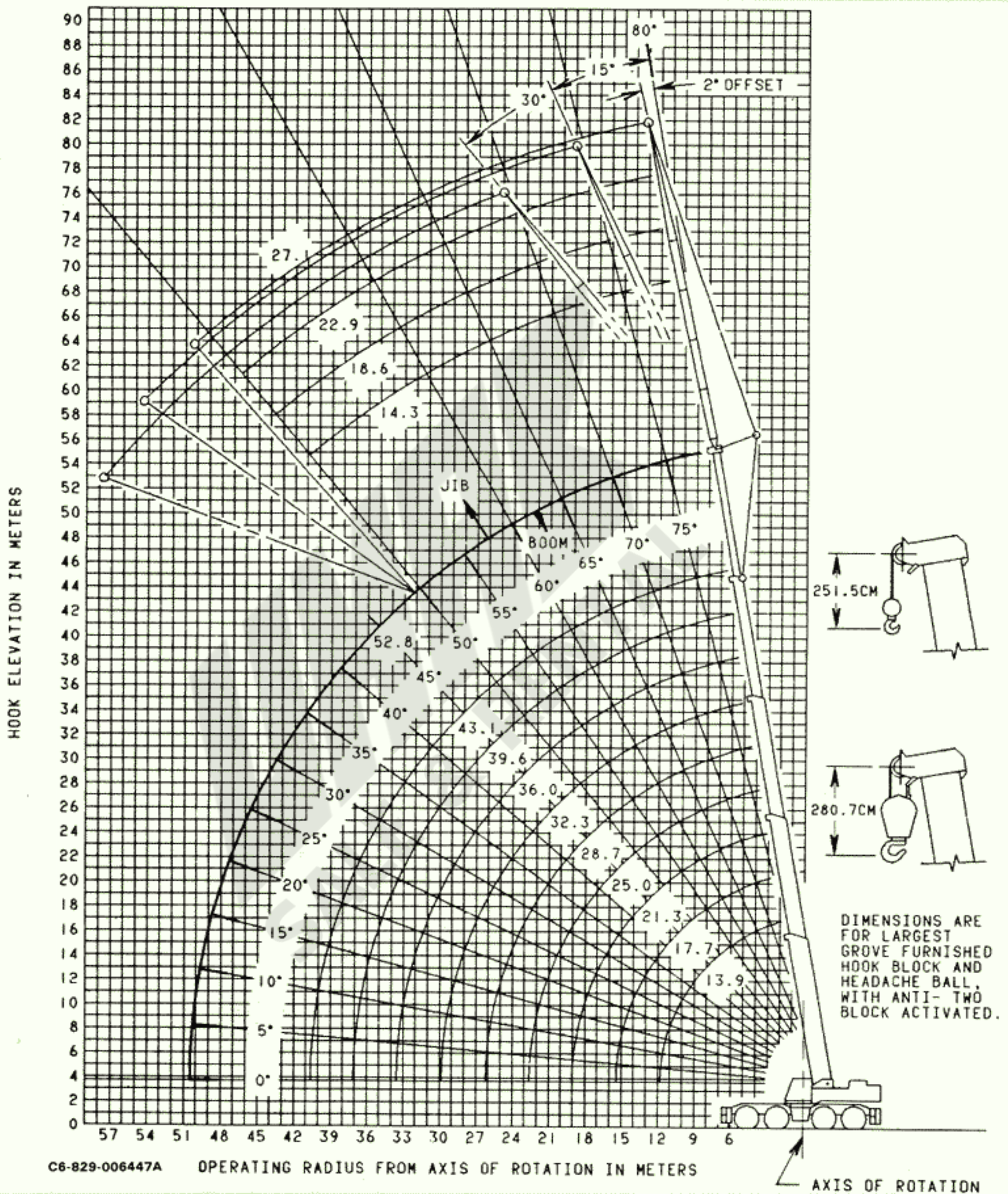
- All capacities above the bold line are based on structural strength of jib and do not exceed 85% of tipping load, in accordance with SAE J-765.
- 47 ft. (14.2 m), 61 ft. (18.5 m), 75 ft. (22.8 m) & 89 ft. (27.0 m) jibs may be used for two-part line lifting service only.
- Rated load is based on loaded main boom angle with reference to horizontal, regardless of main boom length. (Ref. radius is for fully extended boom 173 ft. (52.8 m). 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 every jib occurs rapidly and without advance warning.
- 47 ft. (14.2 m) JIB **WARNING:** With 47 ft. (14.2 m) jib and main boom fully extended, the boom angle must not be less than 45° since loss of stability will occur causing a tipping condition.  
 61 ft. (18.5 m) JIB **WARNING:** With 61 ft. (18.5 m) jib and main boom fully extended, the boom angle must not be less than 45° since loss of stability will occur causing a tipping condition.  
 75 ft. (22.8 m) JIB **WARNING:** With 75 ft. (22.8 m) jib and main boom fully extended, the boom angle must not be less than 50° since loss of stability will occur causing a tipping condition.
- 89 ft. (27.0 m) JIB **WARNING:** With 89 ft. (27.0 m) jib and main boom fully extended, the boom angle must not be less than 55° since loss of stability will occur causing a tipping condition.
- JIB ERECTION NOTES:  
 Maximum length of main boom including extended fly for erecting jib below 30° main boom angle is:  
 47 ft. (14.2 m) Jib - 136 ft. (41.5 m)  
 61 ft. (18.5 m) Jib - 129 ft. (39.3 m)  
 75 ft. (22.8 m) Jib - 122 ft. (37.2 m)  
 89 ft. (27.0 m) Jib - 115 ft. (35.3 m)
- Capacities listed are with fully extended outriggers only.
- Use of the 33 ft.-58 ft. (10.0 m-17.7 m) tele. boom extension on the 47 ft. (14.2 m), 61 ft. (18.5 m), 75 ft. (22.8 m) or 89 ft. (27.0 m) jib assemblies is strictly prohibited.
- WARNING:** The Krueger L.M.I. will not compensate for reeving accessories on the main boom nose or auxiliary boom nose. The system is programmed to monitor the jib. Remove all reeving/rigging from main boom when using jib.
- Jib lifting capacities with auxiliary hoist only (3/4 in. [19 mm] rope).

# GROVE®

# RT1650

RANGE DIAGRAMS 89 ft. (27.0m) JIB

METRIC



C6-829-006447A

OPERATING RADIUS FROM AXIS OF ROTATION IN METERS

AXIS OF ROTATION



**GROVE MANUFACTURING COMPANY**

Division of Kidde, Inc.

**KIDDE**

Box 21, Shady Grove, Pennsylvania 17256

Phone: (717) 597-8121 Telex: 842308 Cable: GROVE MFG

DATE: 883-15M  
Printed in U.S.A.

Distributed by:



# R

16  
46

85% OF  
75% C

## 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 14	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 ft.
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 extens 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: O the capacities l boom extensio

### 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.

# 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

# GRO

FULL HYDR

# SELF-PROPELL

## LIFTING 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

A6-829-006898A

## 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.

# 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	Stationary Capacity	Pick & Carry Cap. Up to 2.5 MPH
	Defined Arc (3) Over Front	360° Arc	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:

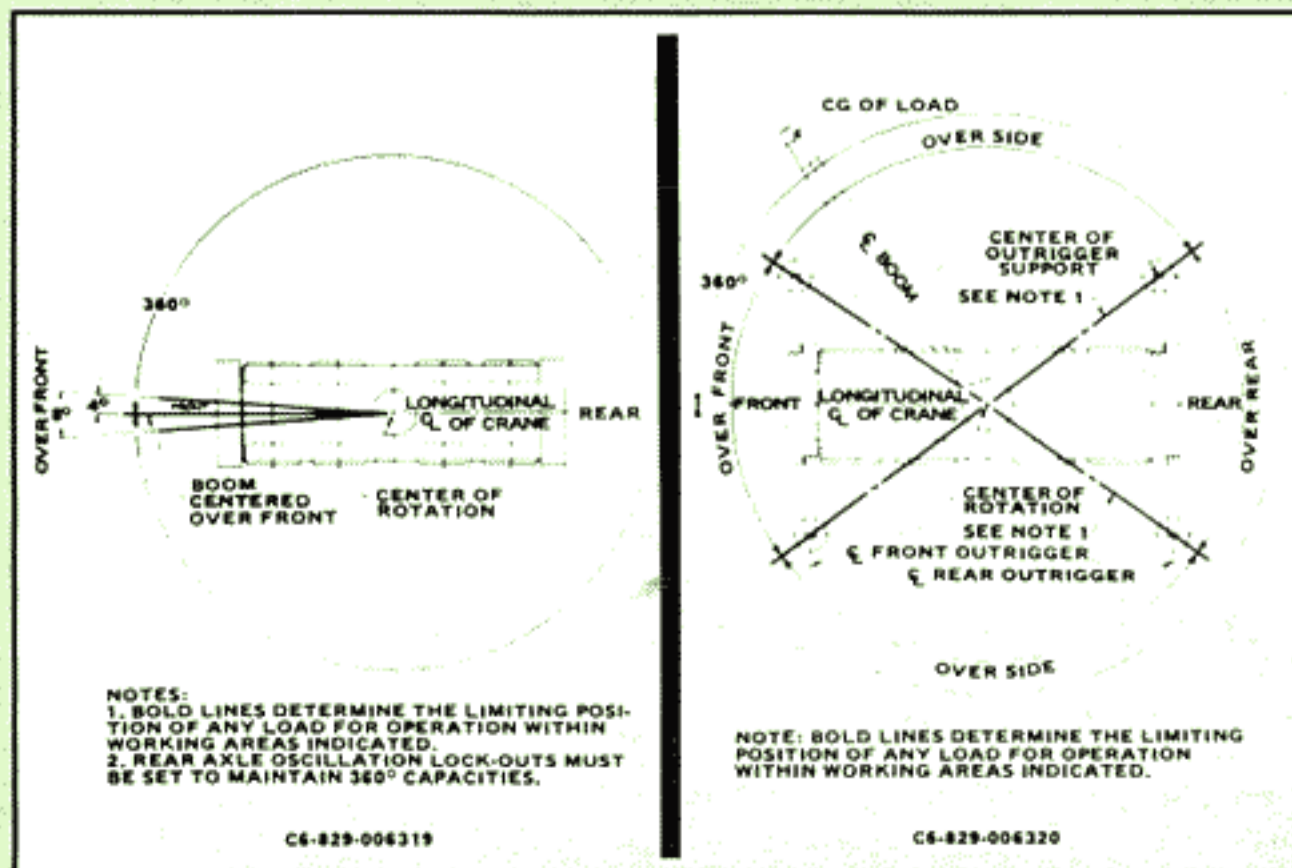
(Power Pinned Fly Retracted)

(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

- Capacities are in pounds and do not exceed 75% of tipping loads as determined by test in accordance with SAE J-765.
- 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).
- Defined arc - Over front includes  $\pm 4^\circ$  on either side on longitudinal centerline of machine.
- Capacities are applicable only with machine on firm level surface.
- 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).
- 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.
- 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.
- On rubber lifting with power pinned fly extended, boom extension or jib is not permitted.
- Creep - not over 200 ft. (61 m) of movement in any 30 min. period, and not exceeding 1 mph (1.6 kph).

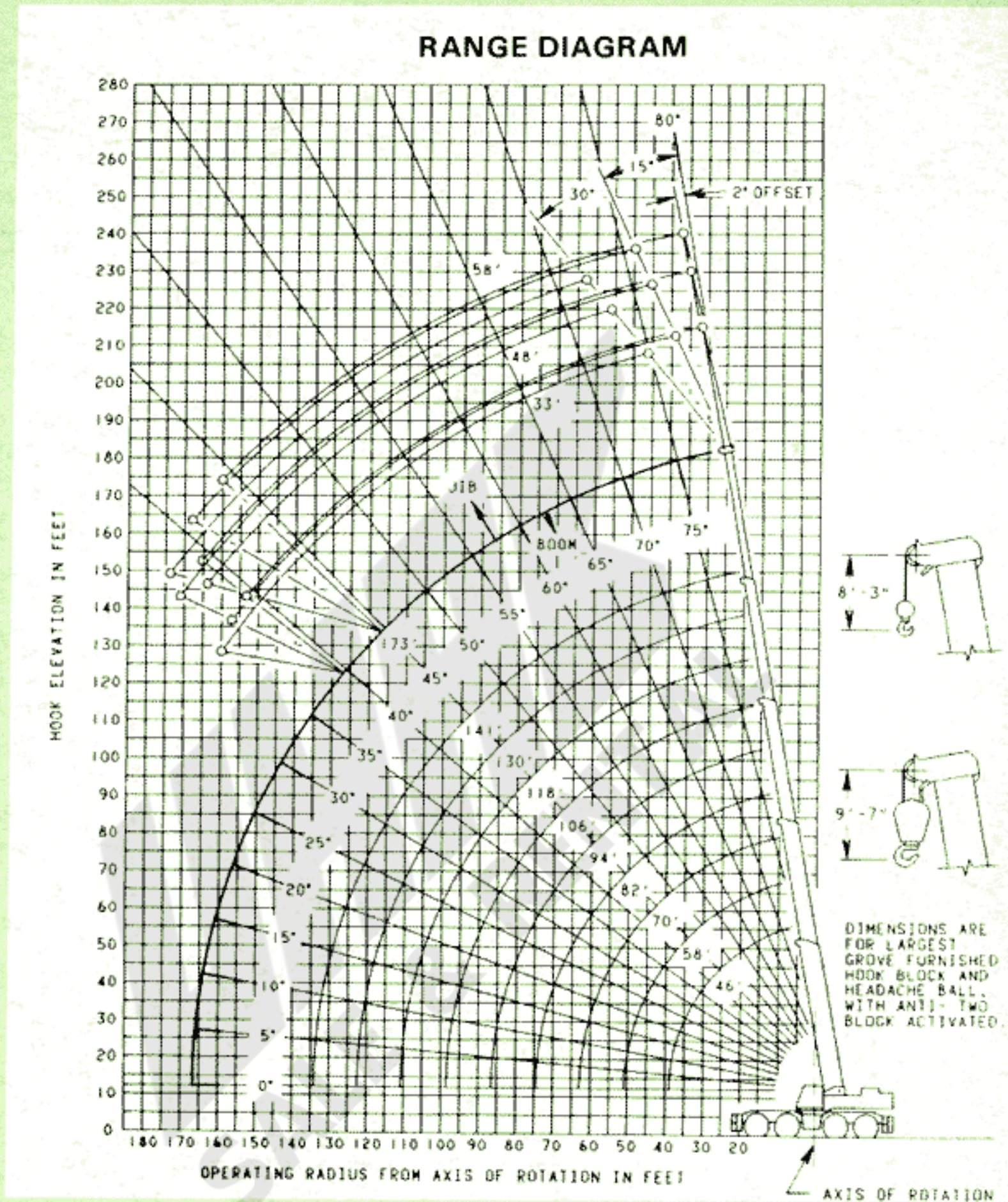
## LIFTING AREA DIAGRAMS



C6-829-006319

C6-829-006320

# GROVE® RT1650



### 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 MANUFACTURING COMPANY**

Division of Kidde, Inc.

**KIDDE**

Box 21, Shady Grove, Pennsylvania 17256

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DATE: 186-12M  
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# GROVE



WORLD  
LEADER  
IN

**HYDRAULIC  
CRANES**



# RT1650

**165 TONS CAPACITY**

(150 TONNES METRIC)

# Convenience & PERFORMANCE

At last, crane users seeking greater equipment utilization have a better choice!

The Grove RT1650 rough terrain crane offers big advantages over conventional crane equipment - the convenience of self-contained mobility . . . and superior lifting, carrying, and placing capabilities!

Enter a new giant into the lifting arena: an off highway hydraulic crane engineered to pick-and-carry the really tough and unweildy objects; designed to quickly handle the "must be positioned today" loads; and ready to roll into action where it's needed.

With a maximum on-outriggers capacity of 165 tons (150 mt) and an on-rubber capacity of 100 tons (90 mt), the Grove RT1650 is the ideal heavy-duty lifting tool for a variety of work applications requiring prompt, dependable and precise crane performance.

Its quick response, self-contained boom is ideal for off highway operations such as mining equipment assembly and service, shipyard material handling, offshore platform fabrication, petrochemical refineries, and dockside freight handling. Also, for rigging, loading, offloading and placing operations, and many other demanding applications where time and labor saving factors are critical.

The RT1650 with 80" (2032mm) diameter high flotation, earthmover type tires, reduces the need for site preparation, and maneuvers with remarkable agility thanks to its 8-wheel hydraulic full power coordinated steering.

## ADDITIONAL FEATURES

Other noteworthy features and their related benefits include:

- Operator's control cab can be elevated hydraulically 45 inches (1143mm) to a height of 17.5 feet (5.3m) above ground for increased operator visibility.
- Outer (fly) section is remotely pinned and latched aerially from the control cab by the operator alone, thus eliminating extra manpower, and reducing total set-up time.
- High performance, high pressure hydraulic system enhances overall lifting efficiency.
- Cummins 600 horsepower 4-cycle turbo-charged diesel engine drives two power-shift transmissions for rugged off-highway traction and mobility.
- Triple box frame design provides extremely rigid support during both travel and lifting operations.



270' (82.5m)  
w/89' (27m)  
Fixed Offset Jib

# TIP HEIGHT

183' (55.9m)  
Main Boom



## EXCLUSIVE TRAPEZOIDAL† BOOM

The best keeps getting better! For more than a decade, the exclusive world acclaimed Grove Trapezoidal Boom design has been delivering superior jobsite performance. Grove engineers are constantly incorporating finely tuned improvements on each succeeding new Grove Crane model. Now, the powerful RT1650, equipped with a five section 46' - 173' (13.9 - 52.8m) boom introduces a new standard for lifting performance. The RT1650's exclusive boom will not only lift a maximum load of 165 tons (150mt) on outriggers, and 100 tons (90mt) in pick-and-carry operation, but it also has a main boom tip height of 183 feet (55.9m). Carried on board is a Swingaway extension for extra offsettable reach to a tip height of 215 feet (65.7m) with the standard fixed-length extension, or 240 feet (73.3m) with an optional stowable telescoping Swingaway. Offset can be up to 30° by merely pinning -- no hassle with turnbuckles, pendants and hardware!

With an available 89' (27m) five section lattice offsettable jib, the RT1650 achieves a working tip height of 270 feet (82.5m) - reaching to the top of a 24-story building!

## AERIAL LATCHING SYSTEM

To save time and manpower the RT1650 introduces a new Grove aerial fly pinning system that is remotely controlled by the operator from within the cab - increasing productivity!

## LOAD-MOMENT INDICATOR SYSTEM

Provided as standard equipment on the RT1650 is a Krueger electronic load-moment indicator. Included are boom angle, length and radius display capabilities, coupled with an anti-two-block warning system and control function deactivation.

† Patented Grove Feature

# GROVE

# RTH510



## **Aerial Latching Fly Section**

Permits 1-man set-up for more convenience and productivity

## **GROVE Trapezoidal† Boom**

5 Sections, plus stowable lattice Swingaway extension

## **Operator-Oriented Control Cab**

Can be elevated up to 45 in. (1143mm) for increased visibility

## **High-Pressure Hydraulics**

Load-sensing, pressure compensating system enhances performance efficiency



# 165 TON ROUGH TERRAIN CRANE

(150 Tonnes Metric)

## **600-HP Turbocharged Diesel**

6-Cylinder 4-Cycle Cummins drives two powershift transmissions

## **2-Speed Hydraulic Hoists**

Both Main and Auxiliary units deliver impressive hoist power

## **8-Wheel Hydrostatic Power Drive**

Plus 8-wheel full power coordinated steering

## **Hydraulically-Suspended Axles**

Provide smooth mobility and positive rough terrain traction

# GROVE RT1650

## Heavy Duty HYDRAULIC SYSTEM

The advanced technology RT1650 is equipped with a special load-sensing, high pressure hydraulic system. By using a combination of heavy-duty gear pumps and open loop axial piston pumps with variable displacement, teamed with pressure compensated directional hydraulic valves, crane performance and efficiency is maximized.

## HYDRAULIC SUSPENSION 8 Wheel/Drive – 8 Wheel/Steer

The RT1650's welded triple box frame and removable box beam outriggers with an extended stance of 29 feet (8.8m) provide a rigid lifting base for 360° operation. The rugged four axle chassis features eight-wheel planetary drive through two Powershift transmissions . . . 8-wheel air brakes . . . hydraulic suspension - all engineered for the demands of tough off highway travel and load handling.

## 200,000 lbs. PICK & CARRY CAPACITY

(90 Tonnes Metric)



WORLD  
LEADER  
IN

**HYDRAULIC  
CRANES**



# RT1650

## WEIGHT REMOVAL DIAGRAM

33 ft. (10.1m) SWINGAWAY  
2,601 lbs.  
(1180 kg)

BOOM  
45,549 lbs.  
(20,661 kg)

HOISTS  
Aux. hoist w/rope  
2,280 lbs.  
(1034 kg)

Main hoist w/rope  
5,143 lbs.  
(2332 kg)

COUNTERWEIGHT  
20,000 lbs.  
(9072 kg)

LIFT CYLINDERS AND PINS  
9,490 lbs.  
(4305 kg)

REAR OUTRIGGER  
ASSEMBLY  
12,885 lbs.  
(5845 kg)

106,348 lbs.  
(48,239 kg)

EIGHT TIRES & WHEELS  
17,784 lbs.  
(8066 kg)

FRONT OUTRIGGER ASSEMBLY  
13,018 lbs.  
(5905 kg)

NOTE: WEIGHTS SHOWN ARE  
SUBJECT TO CHANGE

# RT1650

## AXLE WEIGHT DISTRIBUTION FOR COMPONENT PARTS

ITEM	POUNDS			KILOGRAMS		
	GROSS	FRONT	REAR	GROSS	FRONT	REAR
Chassis Complete	104,136	52,008	52,128	47,236	23,591	23,645
Superstructure Complete	130,960	64,655	66,305	59,403	29,328	30,075
Complete Basic Standard Crane	235,096	116,663	118,433	106,639	52,919	53,720
Component Reduction Weights						
Chassis:						
Remove:						
-Front Outrigger Boxes, Beams and Pads	-13,018	-18,846	+5,828	-5,905	-8,549	+2,644
-Rear Outrigger Boxes, Beams and Pads	-12,885	+5,714	-18,599	-5,845	+2,592	-8,437
-Tires and Wheels (8)	-17,784	-8,892	-8,892	-8,066	-4,033	-4,033
Superstructure:						
Remove:						
-Boom (46 ft.-173 ft. [14m-52.7m])						
5 Section	-45,288	-53,584	+8,296	-20,543	-24,306	+3,763
-Lift Cylinders and Pins	-9,490	-9,745	+255	-4,305	-4,420	+115
-Gearmatic 36 Auxiliary Hoist With Rope	-2,280	+237	-2,517	-1,034	+107	-1,141
-Gearmatic 46 Main Hoist With Rope	-5,143	+79	-5,222	-2,333	+36	-2,369
-33 ft. (10m) Swingaway	-2,601	-3,840	+1,240	-1,180	-1,742	+562
-20,000 lbs. Std. Counterweight	-20,000	+9,373	-29,373	-9,072	+4,252	-13,324
-Auxiliary Boom Nose	-261	-609	+348	-118	-276	+158
Optional Equipment						
Add:						
-50 Ton Hookblock	+1,024	+2,303	-1,279	+464	+1,044	-580
-165 Ton Hookblock	+5,272	+9,379	-4,107	+2,391	+4,254	-1,863
Substitute:						
-33 ft.-58 ft. (10.1m-17.7m)						
Tele. Swingaway and Brackets	+1,055	+1,545	-490	+478	+700	-222

THIS CHART IS DEVELOPED TO DETERMINE AXLE WEIGHT DISTRIBUTION FOR VARIOUS CRANE CONFIGURATIONS AND ROAD REGULATIONS.



### GROVE MANUFACTURING COMPANY

Division of Kidde, Inc.

### KIDDE

Shady Grove, Pennsylvania 17256-0021

Constant improvement and engineering progress makes it necessary that we reserve the right to make specification, equipment, and price changes without notice. Illustrations shown may include optional equipment and accessories and may not include all standard equipment.

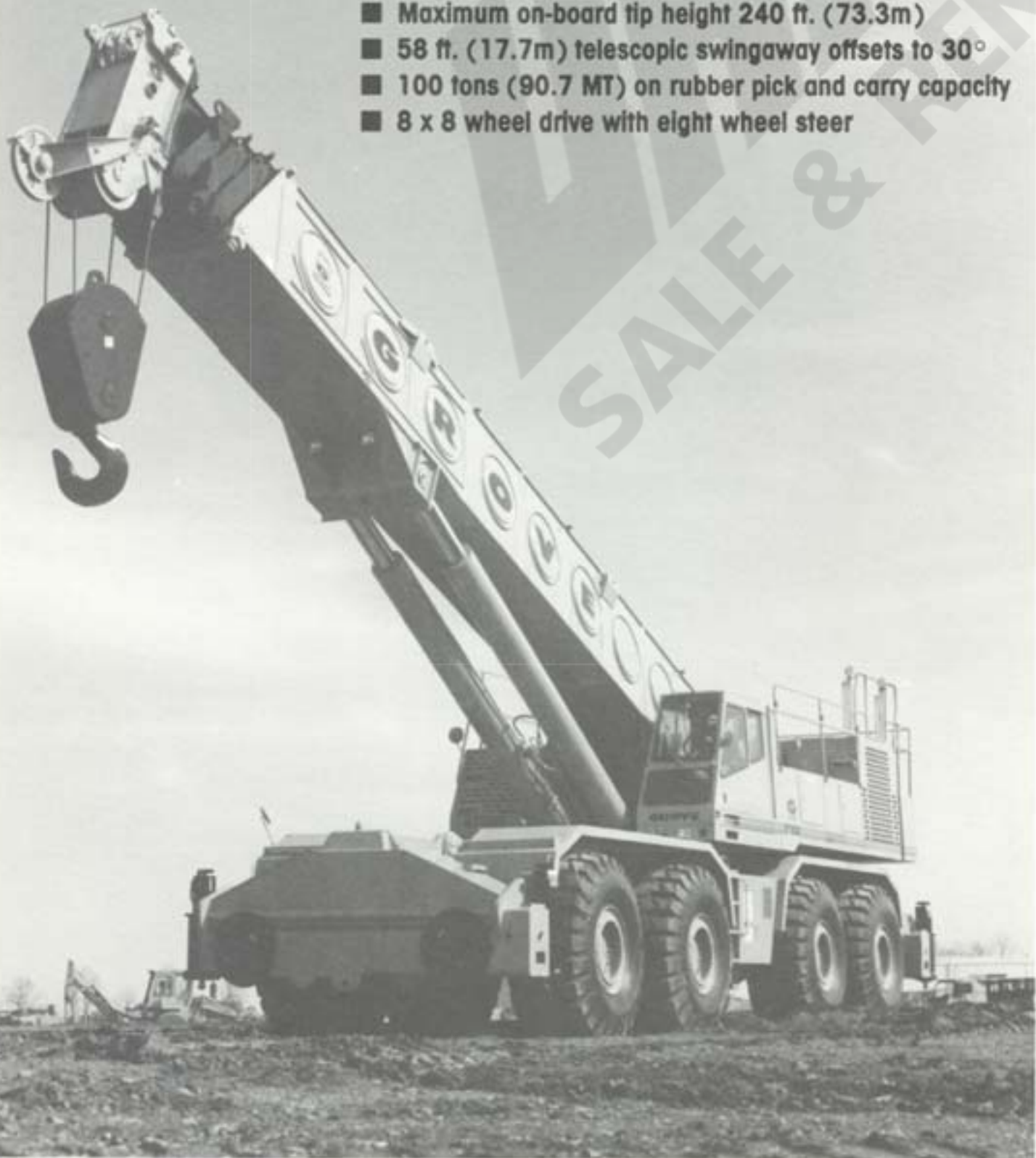




# RT1650

Rough terrain hydraulic crane

- Maximum on-board tip height 240 ft. (73.3m)
- 58 ft. (17.7m) telescopic swingaway offsets to 30°
- 100 tons (90.7 MT) on rubber pick and carry capacity
- 8 x 8 wheel drive with eight wheel steer



# Carrier specifications

<b>Frame</b>	High strength alloy steel all welded triple box-type construction with integral front/rear lifting, towing and tie down lugs.
<b>Outrigger System</b>	Hydraulic single stage double box removable, pinned to main frame. *Optional mechanical outrigger spin locks. All steel fabricated quick release type outrigger floats 30" (76cm) diameter.
<b>Outrigger Controls</b>	Located in cab on right side console requires two hand operation. Crane level indicator located in cab.
<b>Engine</b>	Cummins KTA-1150-C six cylinder turbo-charged water cooled diesel - 600 bhp (447 kw) (Gross) @ 2100 RPM. Maximum torque 1383 ft. lbs. (191 kg/m) @ 1600 RPM.
<b>Fuel Tank Capacity</b>	250 gallons (946 L)
<b>Electrical System</b>	Four 12 volt - maintenance free batteries, 425 CCA @ 0° F. 24 volt starting.
<b>Drive</b>	8 x 8
<b>Steering</b>	All wheel power assist hydraulic; coordinated type; controlled by steering wheel. Electric emergency auxiliary steering system.
<b>Transmission</b>	Twin powershift transmission (hydraulically motor driven) with 4 forward and 4 reverse speeds.
<b>Axles</b>	Four planetary drive steer type mounted in tandem front and rear with hydraulic suspension permitting up to 12" (305mm) of oscillation on the rear tandem axles.

<b>Oscillation Lockouts</b>	Automatic full hydraulic lockouts on rear tandem axles permits oscillation only with boom centered over the front. Standard oscillation lockout override control.
<b>Tires</b>	Standard 33.25 x 29 - 32 PR, earthmover type, tubeless.
<b>Brakes</b>	Dual braking system, full air on all wheels. Spring applied air released emergency/parking brakes on all eight wheels.
<b>Lights</b>	Full lighting package including turn indicators, head, tail, brake and hazard warning lights.
<b>Maximum Speed</b>	15 MPH (24 kph)
<b>Maximum</b>	55% (Theoretical based on 234,010 lbs. (106147) GVW
<b>Gradeability</b>	33.25 x 29 tires, 173 ft. (52.7m) boom plus 33 ft. (10m) swingaway.
<b>Gross Vehicle Weight &amp; Axle Loads</b>	BASIC STANDARD MACHINE Front: 116,140 lbs. ( 52,681 kgs) Rear: 117,870 lbs. ( 53,466 kgs) G.V.W.: 234,010 lbs. (106,147 kgs)
<b>Miscellaneous Standard Equipment</b>	Full width steel fenders, catwalk railing around top of superstructure, dual rear view mirrors, hookblock tie down provisions, electronic backup alarm, light package, stowage compartment, tachometer, cold start aid (less canister), fire inflation kit.

<b>Optional Equipment</b>	<ul style="list-style-type: none"> <li>* Worklights</li> <li>* 360° rotating beacon</li> <li>* Cab spotlight</li> <li>* Engine block heater</li> <li>* Hookblocks</li> <li>* Spare wheel assembly</li> <li>* Tool kit</li> <li>* Pintle hook front/rear</li> <li>* Low oil pressure, high water temperature A/V warning system</li> </ul>
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Make/Model		Auxiliary Hoist Gearmatic Model 36	
		High Range	Low Range
<b>Maximum single line speed</b>	Bottom layer	496 FPM (151m/min)	248 FPM (76m/min)
	Intermediate layer	592 FPM (180m/min)	296 FPM (90m/min)
	Top layer	688 FPM (210m/min)	344 FPM (105m/min)
<b>Maximum single line pull</b>	Bottom layer	7,198 lbs. (3265 kg)	14,397 lbs. (6530 kg)
	Intermediate layer	6,027 lbs. (2734 kg)	12,054 lbs. (5468 kg)
	Top layer	5,184 lbs. (2351 kg)	10,368 lbs. (4703 kg)
<b>Maximum permissible line pull w/5:1 F.O.S.</b>		11,760 lbs. (5334 kg)	
<b>Maximum rope stowage</b>		850 ft. of 3/4" dia. rope (259m of 19mm)	

†Patented Grove feature or patent pending.  
\*Denotes optional equipment.

# Superstructure specifications

**Boom** 46 ft. to 173 ft. (14m -52.7m) five section Trapezoidal† main boom consisting of a base section, three full power sections and one aerial latched section to 173 ft. (52.7m). Telescopic sections slide on adjustable and replaceable Nylatron wear pads. Maximum tip height: 183 ft. (55.9m).

**Swingaway Extension** Standard 33 ft. (10.0m) lattice "swingaway" boom extension with integral offset mechanism, offsettable at 2°, 15° or 30°. Stows alongside base boom when not in use. Maximum tip height: 215 ft. (65.7m).

**Optional Telescopic Swingaway** 33 ft. to 48 ft. to 58 ft. (10.0m-14.6m-17.7m) telescopic lattice swingaway extension with integral offset mechanism offsettable at 2°, 15° or 30°. Stows alongside base boom when not in use. Maximum tip height: 240 ft. (73.3m).

**Optional Jib** 14 ft. lattice sections combine with standard 33 ft. (10.0m) swingaway boom extension to provide 47 ft. (14.3m), 61 ft. (18.6m), 75 ft. (22.9m) and 89 ft. (27.1m) jib lengths. Jib is cable suspended and can be offset at 5°, 17° and 30°. Maximum tip height: 270 ft. (82.5m).

**Boom Nose** Eight sheaves mounted on heavy duty tapered roller bearings with removable pin-type rope guards. \*Optional removable auxiliary boom nose with removable pin type rope guard.

**Boom Elevation** Two double acting hydraulic cylinders with integral holding valve provides elevation from -3° to 80°.

**LMI** Standard load moment and anti-two block system with audio-visual warning and control lever lockout to alert operator of impending two-block condition. Electronic display of: boom angle, length, radius, tip height, relative load moment, maximum permissible load and actual load indication is provided.

**Cab** Full vision, all steel fabricated with accoustical lining and tinted safety glass throughout. Dash panel incorporates gauges for all engine functions. Other standard features include: hinged skylight, sliding left side door and sliding right side window, electric windshield wash-wipe, skylight wiper, circulating air fan, hot water heater, defroster, fire extinguisher, seat belt, cigar lighter and ashtray. Cab hydraulically elevates 45in.(1143mm) to a height of 17 1/2 ft. (5.3m) for increased visibility.

**Swing** Ball bearing swing circle with 360° continuous rotation. Grove planetary "glide-swing" with foot applied multi-disc brake, spring applied hydraulically released parking brake and 360° position, cab controlled, positive turntable lock. Maximum speed: 1 RPM.

**Counterweight** Removable, pinned to turntable mast.

## HYDRAULIC SYSTEM

**Pumps** Five gear and two open loop axial piston pumps, combined capacity 355 GPM (1344 LPM) driven by superstructure engine through P.T.O. standard pump drive disconnect.

**Valves** Precision four way double acting control valves, 8 individual valve banks permit simultaneous control of multiple crane functions.

**Filter** Two full flow 10 micron remote mounted for both main pumps in super-charge loop. One full-flow 10 micron in tank return line. \*Two inlet strainers - 100 mesh in tank. Five full-flow 10 micron remote mounted pressure filters for gear pumps.

**Reservoir** 550 gallons (2082 L) with spin-on breather filter, external sight gauge and clean out access.

**Oil Cooler** Remote mounted with thermostatically controlled hydraulic motor driven fan.

**Pressure Check Panels** System pressure test panels with quick release type fittings.

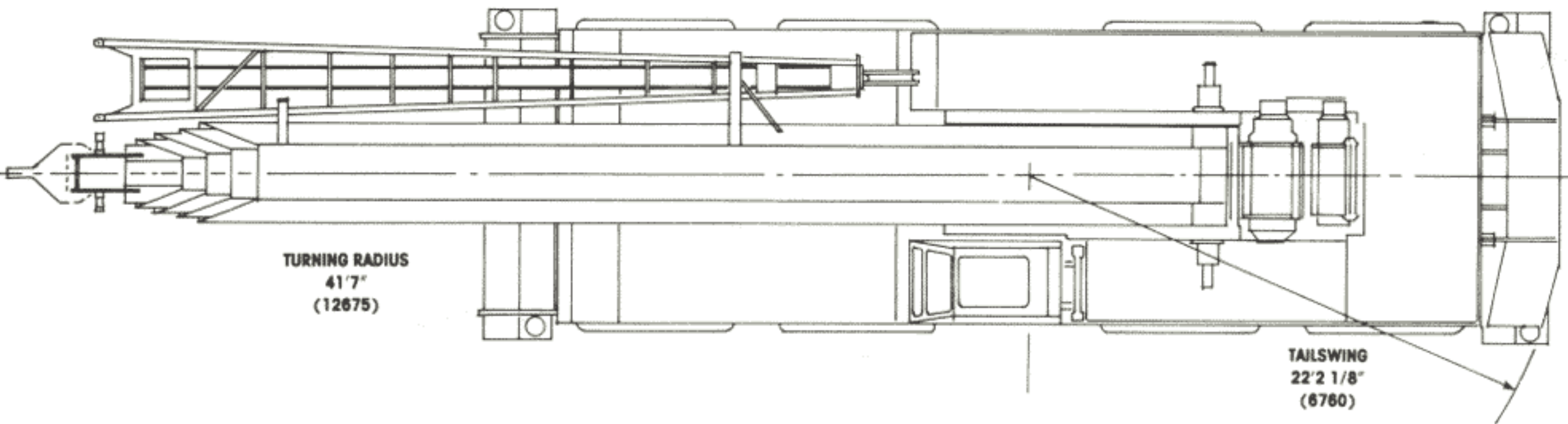
## HOIST SPECIFICATIONS

Power up and down two speed, planetary reduction with integral automatic brake, electronic drum rotation indicators and cable followers.

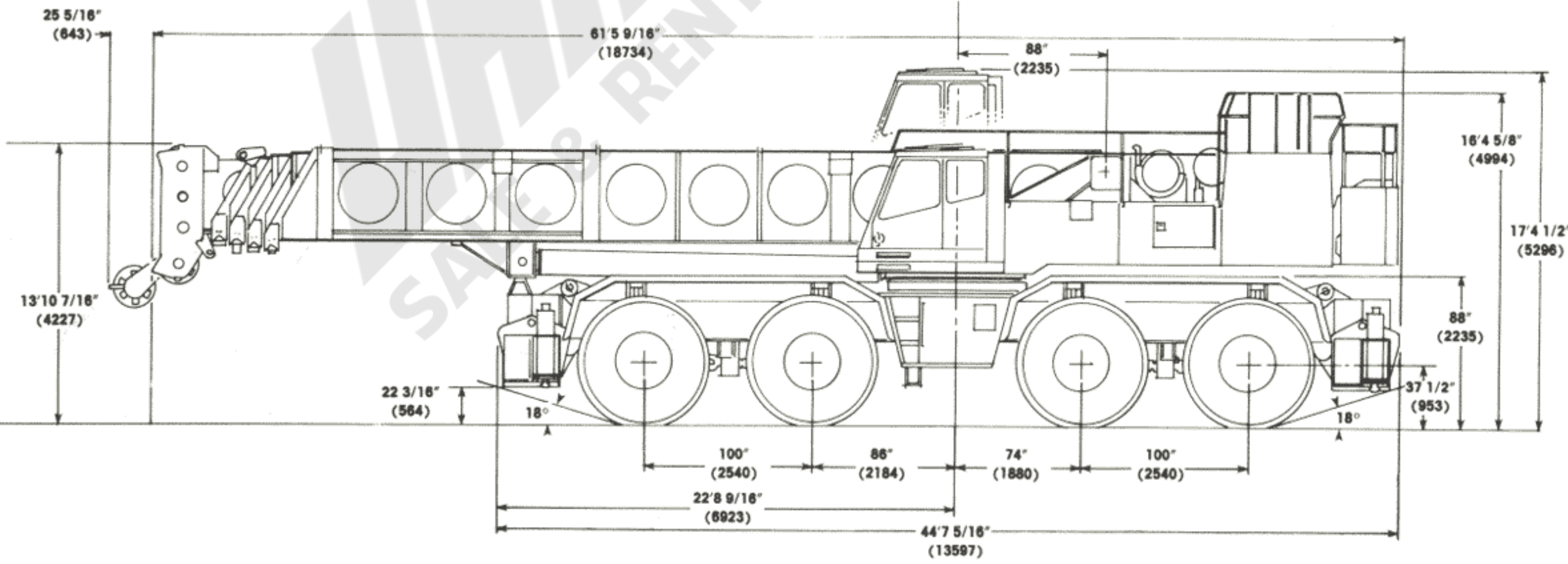
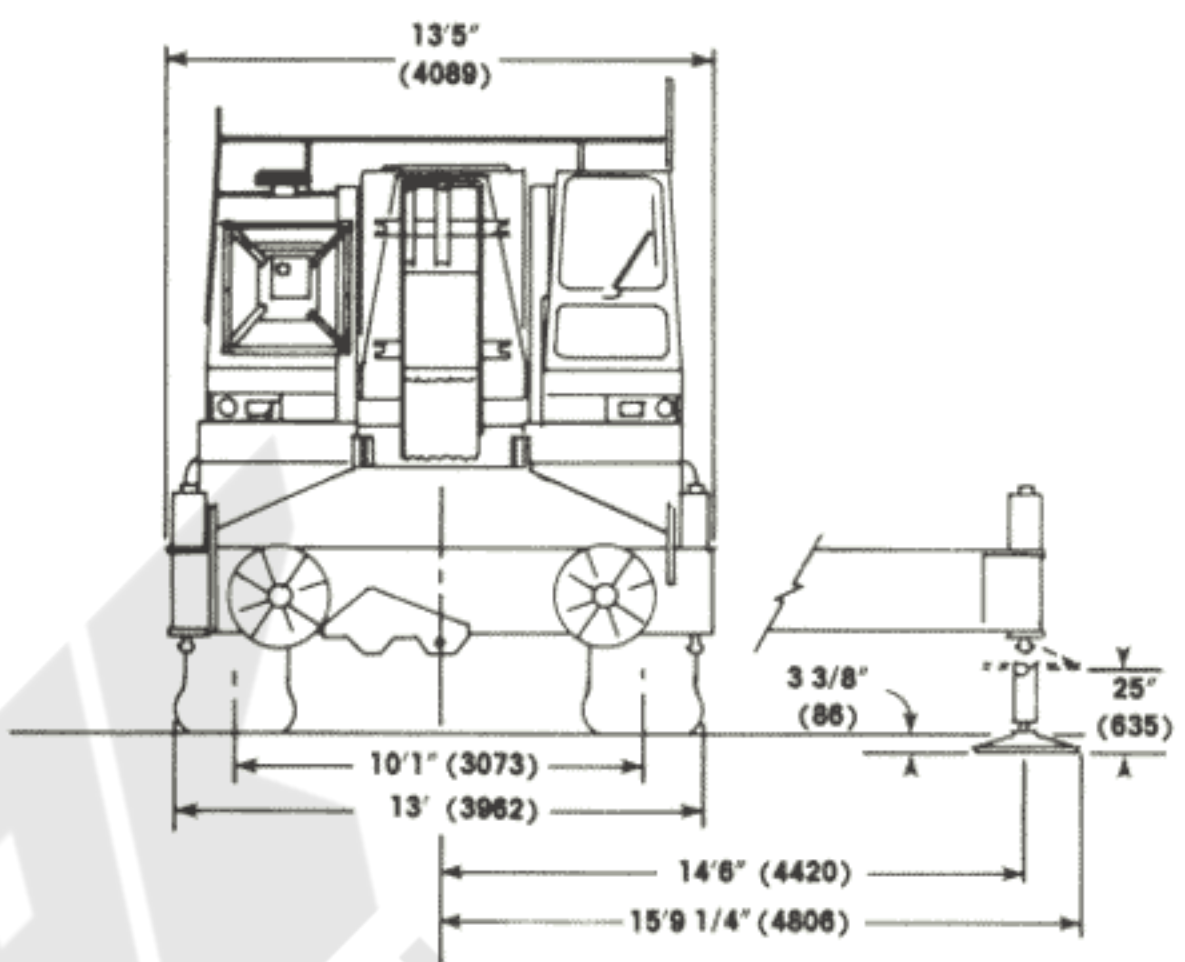
		Main Hoist Gearmatic Model 46	
Make/Model		High Range	Low Range
Maximum single line speed	Bottom layer	274 FPM (84m/min)	137 FPM (42m/min)
	Intermediate layer	324 FPM (99m/min)	162 FPM (49m/min)
	Top layer	374 FPM (114m/min)	187 FPM (57m/min)
Maximum single line pull	Bottom layer	13,000 lbs. (5897 kg)	26,000 lbs. (11794 kg)
	Intermediate layer	11,008 lbs. (4993 kg)	22,016 lbs. (9986 kg)
	Top layer	9,545 lbs. (4330 kg)	19,090 lbs. (8659 kg)
Maximum permissible line pull w/5:1 F.O.S.		20,680 lbs. (9380 kg)	
Maximum rope stowage		1,150 ft. of 1" dia. rope (351m of 25mm)	
		Note: 1,150 ft. (351m) length of wire rope supplied with basic standard unit.	

# Dimensions

# RT1650



\*SHIPPING WIDTH 12' (3658)  
WITH OR'S & TIRES REMOVED



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