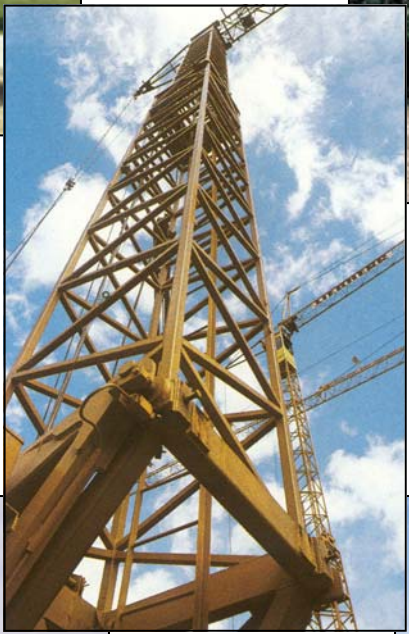




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RT990

Rough-terrain hydraulic crane

- Maximum on-board tip height 180 ft. (54.9m)
- 58 ft. (17.7m) telescopic swingaway offsets to 30°
- 46 tons (42 MT) on rubber pick and carry capacity
- 4x4 wheel drive with four wheel steer



Superstructure specifications

Boom	36 ft. to 114 ft. (11.0m - 34.7m) total length four section Trapezoidal† full power boom. Telescoping sections slide on adjustable and replaceable Nylatron wear pads. Maximum Tip Height: 124 ft. (37.7m).
Swingaway Extension	33 ft. (10.0m) lattice swingaway boom extension stows alongside base boom section when not in use, offsettable at 2°, 15° or 30°. Maximum Tip Height: 155 ft. (47.2m).
Optional Telescopic Swingaway	33 ft.-58 ft. (10m-17.7m) telescopic lattice swingaway extension with offset links, offsettable at 2°, 15° or 30°. Stows alongside base boom section when not in use. Maximum Tip Height - 180 ft. (54.8m).
Optional Jib	14 ft. (4.3m) lattice sections combine with a 32 ft. (9.8m) tip section to provide 46 ft. (14m), 60 ft. (18.2m), 74 ft. (22.5m) and 88 ft. (26.8m) jib lengths. Jib is cable suspended and can be offset at 5°, 17° and 30°. Maximum Tip Height - 208 ft. (63.4m).
Boom Nose	Seven 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 valves provides elevation from -4° to 80°.
Anti-Two Device	Standard audio-visual warning device to alert operator of impending two-block condition with control lever lockout system. Also includes selective electronic display of boom angle and length with high and low angle presets.
Optional LMI	*Optional Load Moment Indicator provides display of boom angle, length, radius, tip height, relative load moment, permissible load and actual load with control lever lockout.
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, circulating air fan, fire extinguisher, seat belt. *Optional items: manual skylight wiper, propane heater/defroster.
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 hand operated 360° mechanical house lock operated from cab. Maximum speed: 2 RPM.

Counterweight Removable, bolted to turntable mast.

HYDRAULIC SYSTEM

Pumps	Six main gear pumps, combined capacity 254.9 GPM (964 LPM) driven by carrier engine through P.T.O. with pump disconnect.
Valves	Precision four way double acting control valves, 6 individual valve banks permit simultaneous control of multiple crane functions.
Filter	Return line type, full flow with bypass protection and service indicator. Replaceable cartridge, with micron filtration of 7/17/22.
Reservoir	375 gallon (1,419 L) with spin-on breather filter, external sight gauge, clean out access, strap mounted to frame.
Oil Cooler	Remote mounted with thermostatically controlled hydraulic motor driven fan.
Pressure Check Panel	System pressure test panel permits easy verification of circuit pressures.

HOIST SPECIFICATIONS

Power up and down equal speed, planetary reduction with automatic spring applied multi-disc brake and electronic drum rotation indicator.

Make/Model	Main and *Auxiliary Hoist Grove HO30B-26		
	High Range	Low Range	
Maximum single line speed	Bottom layer	426 FPM (130m/min)	213 FPM (65m/min)
	Intermediate layer	496 FPM (151m/min)	248 FPM (75m/min)
	Top layer	564 FPM (172m/min)	282 FPM (86m/min)
Maximum single line pull	Bottom layer	8,161 lbs. (3701 kg)	16,322 lbs. (7403 kg)
	Intermediate layer	7,028 lbs. (3187 kg)	14,056 lbs. (6375 kg)
	Top layer	6,172 lbs. (2799 kg)	12,344 lbs. (5596 kg)
Maximum permissible line pull w/5:1 F.O.S.	12,920 lbs. (5860 kg)		
Maximum rope stowage	832 ft. (254m) 3/4 in. (19mm) Note: 800 ft. (244m) length of wire rope supplied with basic standard unit.		
Hoist option	Hoist drum cable followers.		

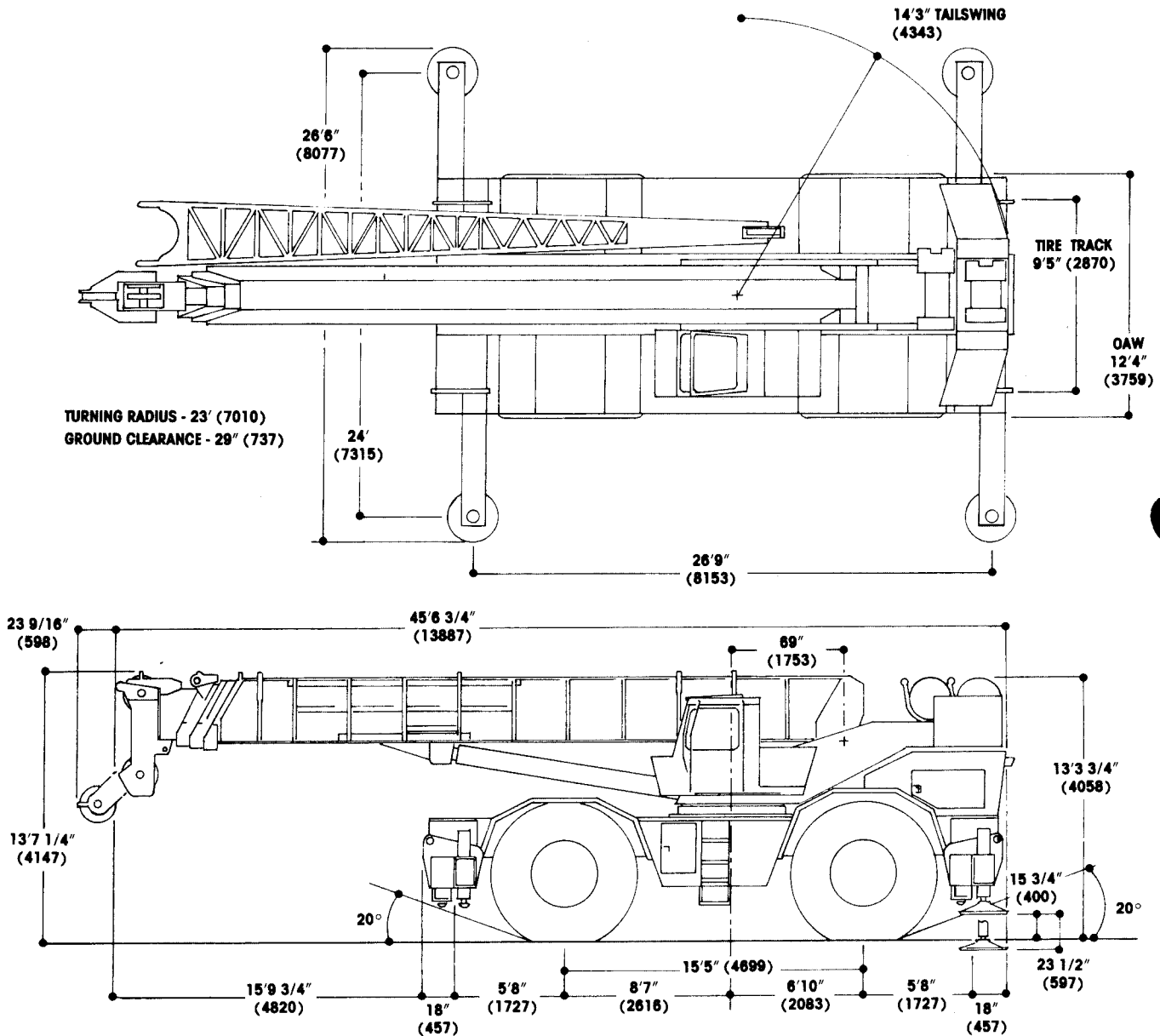
†Patented Grove feature or patent pending.
*Denotes optional equipment.

Carrier specifications

Frame	High strength alloy steel all welded box-type construction with integral outrigger housings and front/rear lifting, towing and tie down lugs.
Outrigger System	Hydraulic single stage double box telescopic beam and jack outriggers with integral holding valves. All steel fabricated quick release type outrigger floats, 30.5" (775mm) diameter.
Outrigger Controls	Located in cab on right side console requires two hand operation. Crane level indicator located in cab.
Engine	Detroit Diesel 6-71T six cylinder turbo-charged water cooled diesel, 280 bhp (209 kw) (Gross) @ 2,100 RPM. Maximum torque 757 ft. lbs. (105 kg/m) @ 1,400 RPM.
Optional Engine	CAT 3306TA six cylinder turbo-charged water cooled diesel, 262 bhp (195 kw) (Gross) @ 2,100 RPM. Maximum torque 740 ft. lbs. (102 kg/m) @ 1,400 RPM.
Optional Engine	Cummins NT-855 six cylinder turbo-charged water cooled diesel, 250 bhp (186 kw) (Gross) @ 2,100 RPM. Maximum torque 750 ft. lbs. (104 kg/m) @ 1,500 RPM.
Fuel Tank Capacity	100 gallons (379 L)
Electrical System	Four 12 volt - maintenance free batteries, 475 CCA @ 0 degree F. 24 volt starting.
Drive	4 x 4
Steering	Fully independent power steering: Front: Full hydraulic controlled by steering wheel. Rear: Full hydraulic hand lever controlled. Provides infinite variations of 4 main steering modes - front only, rear only, crab and coordinated. Rear wheel steer indicator.
Transmission	Remote mounted powershift with 6 speeds forward and 6 reverse, 3 in high range, 3 in low range. Rear axle disconnect for 4x2 travel.
Axles	Front: Drive-steer with differential and planetary reduction hubs (rigid mounted to the chassis). Rear: Drive-steer with differential and planetary reduction hubs, pivot mounted at the center of chassis frame, providing up to 12" oscillation (305mm). Optional: *No-spin differential on rear axle.

Oscillation Lockouts	Automatic full hydraulic lockouts on rear axle permits oscillation only with boom centered over the front. Oscillation lockout override control.
Tires	33.25 x 35 - 32 PR (E-3) Earthmover type, tubeless.
Brakes	Dual braking system, full air operating on all wheels. Spring-applied, air released parking brake operating on all wheels.
Lights	Full lighting package including turn indicators, head, tail, brake and hazard warning lights.
Maximum Speed	16.2 MPH (26.0 kph)
Maximum Gradeability	77.2% (Theoretical based on 140,000 lbs. (63,492 kg) GVW. 33.25 x 25 tires, pump disengaged.
Gross Vehicle Weight & Axle Loads	BASIC STANDARD MACHINE Front 70,050 lbs. (31,775 kgs) Rear 66,350 lbs. (30,046 kgs) G.V.W. 136,400 lbs. (61,871 kgs)
Miscellaneous Standard Equipment	Full width steel fenders, dual rear view mirrors, hookblock tiedown sling, electronic back-up alarm, light package, air dryer, tire inflation kit, hydraulic oil temperature gauge.
Optional Equipment	* Hookblocks * Spare wheel assembly * Pintle hook front/rear * Tow winch - front mounted * Worklights * Cab spotlight * Low oil pressure, high water temp. A/V warning system * Mechanical outrigger spinlocks * 360° rotating beacon * Engine block heater * Tool kit * Dual base boom mounted floodlights

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



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 standard equipment.

GROVE MANUFACTURING COMPANY

Division of Kidde, Inc.

KIDDE

Shady Grove, Pennsylvania 17256-0021

load chart (2280x3251x2 bmp)

RT990

90 TON CAPACITY
36 ft. - 114 ft. BOOM

(FULL POWER)

PCSA CLASS 10-402

85% OF TIPPING - ON OUTRIGGERS

75% OF TIPPING - ON RUBBER

LIFTING CAPACITIES FOR 33' FIXED OFFSET EXTENSION

Main Boom Angle	2° OFFSET		15° OFFSET		30° OFFSET	
	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.	Rad. Ref. ft.	Cap. lbs.
80°	27.3	25,000	33.2	17,150	39.9	12,550
75	39.2	20,100	45.0	13,300	51.2	10,350
70	50.9	17,200	56.4	10,750	62.2	8,760
65	62.2	13,300	67.5	8,970	72.7	7,560
60	73.0	10,650	78.0	7,640	82.7	6,630
55	83.2	8,830	87.9	6,630	92.0	5,890
50	92.9	7,480	97.1	5,850	100.6	5,310
45	101.8	6,440	105.6	5,220	108.3	4,850
40	109.9	5,160	113.2	4,600	115.2	4,280
35	117.2	4,010	120.0	3,600	121.3	3,420

A6-829-007752

NOTES FOR LIFTING WITH THE 33' FIXED OFFSET EXTENSION OR 33'-58' TELE. BOOM EXTENSION

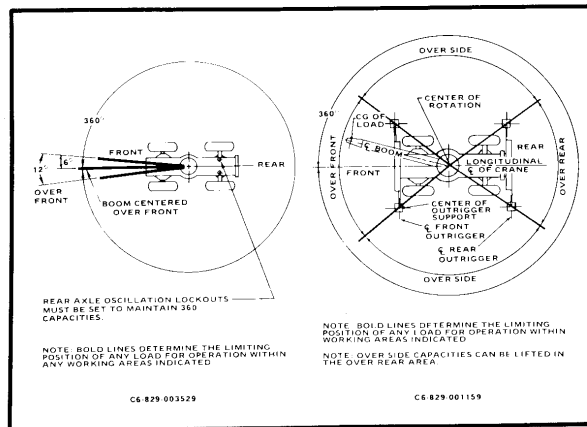
- All capacities above the bold line are based on structural strength of boom extension and do not exceed 85% of tipping load, in accordance with SAE J-765a.
- 33 ft. (10.0 m), 48 ft. (14.6 m) & 58 ft. (17.7 m) boom extension lengths may be used for double line lifting service only.
- Rated load is based on loaded main boom angle with reference to horizontal, regardless of main boom length. (Ref. radius is for fully extended boom and power pinned fly extended 114 ft. (34.6 m) boom length 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.
- 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.
- Capacities listed are with fully extended outriggers.
- BOOM EXTENSION WARNING: For main boom length greater than 96 ft. (29.3 m) with 33 ft. (10.0 m) fixed length boom extension or 33 ft. - 58 ft. (10.0 m - 17.7 m) tele. boom extension in working position, the boom angle must not be less than 30° 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 96 ft. (29.3 m). This warning also applies for boom extension erection purposes.

LIFTING CAPACITIES FOR THE 33'-58' TELE. BOOM EXTENSION

Main Boom Angle	33 ft. LENGTH						48 ft. LENGTH						58 ft. LENGTH					
	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°	27.3	24,500	33.2	16,600	39.9	12,000	31.5	16,900	40.7	11,000	50.1	7,890	33.6	11,000	46.1	8,580	57.7	6,140
75	39.2	19,550	45.0	12,750	51.2	9,820	44.7	12,400	53.6	8,670	62.4	6,550	47.7	9,770	59.7	6,820	70.4	5,140
70	50.9	16,650	56.4	10,200	62.2	8,220	57.6	9,460	66.0	7,030	74.2	5,550	61.6	7,530	72.8	5,570	82.7	4,370
65	62.2	12,750	67.5	8,430	72.7	7,020	70.0	7,510	77.9	5,830	85.5	4,770	74.9	6,020	85.5	4,640	94.3	3,770
60	73.0	10,100	78.0	7,100	82.7	6,090	81.9	6,130	89.2	4,930	96.1	4,160	87.7	4,930	97.5	3,930	105.2	3,290
55	83.2	8,290	87.9	6,090	92.0	5,350	93.2	5,120	99.9	4,240	106.0	3,670	99.8	4,120	108.7	3,380	115.4	2,910
50	92.9	6,940	97.1	5,310	100.6	4,770	103.7	4,360	109.8	3,700	115.0	3,280	111.2	3,500	119.2	2,950	124.6	2,610
45	101.8	5,880	105.6	4,680	108.3	4,310	113.6	3,770	118.8	3,270	123.2	2,980	121.7	3,030	128.6	2,610	132.8	2,370
40	109.8	4,380	113.2	3,840	115.2	3,520	122.5	3,310	126.9	2,930	130.3	2,730	131.3	2,650	137.1	2,340	140.1	2,180
35	117.2	3,230	120.0	2,830	121.3	2,650	130.4	2,790	134.1	2,370	136.4	2,120	140.0	2,330	144.6	1,860	146.2	1,700

A6-829-007744

LIFTING AREA DIAGRAM





ON OUTRIGGERS FULLY EXTENDED - 360°

Radius in Feet	Main Boom Length in Feet									
	36	42	51	60	69	78	87	96	105	114
10	180,000 (67)	121,500 (70.5)	114,000 (74)	107,500 (77)	103,000 (79)					
12	158,000 (63)	120,000 (67.5)	110,000 (71.5)	101,500 (75)	99,300 (77.5)	93,650 (79.5)				
15	136,000 (57.5)	115,000 (63)	102,000 (68)	92,100 (72)	90,250 (75)	84,500 (77)	73,350 (79)			
20	103,500 (47)	99,800 (54.5)	90,050 (61.5)	78,650 (67)	76,850 (70.5)	70,500 (73)	62,750 (75.5)	60,000 (77.5)	56,100 (79)	43,850 (80)
25	82,600 (34)	80,100 (45.5)	73,850 (55)	68,900 (61.5)	66,250 (66)	60,150 (69.5)	54,250 (72)	52,250 (74.5)	48,650 (76)	40,950 (77.5)
30		65,650 (34)	61,400 (47.5)	57,650 (55.5)	55,400 (61)	52,400 (65)	46,900 (68.5)	44,900 (71)	42,900 (73)	35,100 (75)
35	See Warning Note 16	51,250 (16.5)	51,250 (38.5)	49,700 (49.5)	46,600 (56)	44,950 (61)	41,150 (65)	39,200 (68)	37,300 (70)	30,400 (72)
40			40,250 (28.5)	40,250 (42.5)	40,250 (51)	38,550 (56.5)	36,550 (61)	34,650 (64.5)	32,800 (67)	26,650 (69.5)
45				32,600 (34.5)	32,600 (45)	32,600 (52)	32,400 (57)	30,950 (61)	29,150 (64)	23,600 (66.5)
50				26,950 (24)	26,950 (38.5)	26,950 (47)	26,950 (53)	26,950 (57.5)	26,150 (61)	21,350 (63.5)
60					19,200 (20)	19,200 (35)	19,200 (43.5)	19,200 (49.5)	19,200 (54.5)	17,300 (57.5)
70						14,100 (16.5)	14,100 (32)	14,100 (41)	14,100 (47)	14,100 (51.5)
80							10,550 (12.5)	10,550 (29.5)	10,550 (38.5)	10,550 (44)
90								7,890 (27.5)	7,890 (35.5)	5,830 (24.5)
100										
Minimum boom angle (deg.) for indicated length (no load)										0
Maximum boom length (ft.) at 0 deg. boom angle (no load)										114

NOTE: Boom angles are in degrees. A6-829-007736 & -007780

ON RUBBER CAPACITIES

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
10	105,000 (a)	81,000 (a)	93,200 (a)
12	100,000 (a)	68,000 (a)	82,300 (a)
15	87,950 (a)	49,750 (a)	69,650 (a)
20	65,550 (a)	30,600 (a)	54,850 (a)
25	51,100 (b)	20,900 (b)	44,700 (a)
30	37,450 (b)	15,050 (c)	37,300 (b)
35	28,500 (b)	10,950 (d)	28,500 (b)
40	22,350 (c)	8,020 (e)	22,350 (c)
45	17,900 (d)	5,820 (e)	16,700 (d)
50	14,550 (d)	4,100 (f)	14,050 (d)
60	9,780 (e)	1,590 (g)	9,780 (e)
70	6,550 (f)		6,550 (f)
80	4,230 (g)		4,230 (g)
90	2,480 (h)		
100	1,110 (i)		

A6-829-007766

Maxir
Bd
(a) 36
(b) 42
(c) 51
(d) 60
(e) 69

1. Capa
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load chart p3 (1704x3251x2 bmp)

RT990

90 TON CAPACITY
36 ft. - 114 ft. BOOM

(FULL POWER)

PCSA CLASS 10-402

85% OF TIPPING - ON OUTRIGGERS

75% OF TIPPING - ON RUBBER

RATED LIFTING CAPACITIES IN POUNDS

ON OUTRIGGERS FULLY EXTENDED - OVER FRONT

Radius in Feet	Main Boom Length in Feet										
	36	42	51	60	69	73	87	96	105	114	
10	180,000 (67)	121,500 (70.5)	114,000 (74)	107,500 (77)	103,000 (79)						
12	158,000 (63)	120,000 (67.5)	110,000 (71.5)	101,500 (75)	99,300 (77.5)	93,550 (79.5)					
15	136,000 (57.5)	115,000 (63)	102,000 (68)	92,100 (72)	90,250 (75)	84,300 (77)	73,350 (79)				
20	103,500 (47)	99,800 (54.5)	90,050 (61.5)	78,650 (67)	76,850 (70.5)	70,300 (73)	62,750 (75.5)	60,000 (77.5)	56,100 (79)	43,850 (80)	
25	82,600 (34)	80,100 (45.5)	73,850 (55)	68,900 (61.5)	66,250 (66)	60,150 (69.5)	54,250 (72)	52,250 (74.5)	48,650 (76)	40,950 (77.5)	
30		65,650 (34)	61,400 (47.5)	57,650 (55.5)	55,400 (61)	52,300 (65)	46,900 (68.5)	44,900 (71)	42,900 (73)	35,100 (75)	
35	See Warning Note 16	53,200 (16.5)	53,200 (38.5)	49,700 (49.5)	46,600 (56)	44,350 (61)	41,150 (65)	39,200 (68)	37,300 (70)	30,400 (72)	
40			46,750 (28.5)	43,300 (42.5)	40,300 (51)	38,350 (56.5)	36,550 (61)	34,650 (64.5)	32,800 (67)	26,650 (69.5)	
45				39,600 (34.5)	35,800 (45)	33,750 (52)	32,400 (57)	30,950 (61)	29,150 (64)	23,600 (66.5)	
50				34,750 (24)	32,750 (38.5)	30,150 (47)	28,650 (53)	27,600 (57.5)	26,150 (61)	21,350 (63.5)	
60					25,950 (20)	25,350 (35)	23,500 (43.5)	22,100 (49.5)	21,200 (54.5)	17,300 (57.5)	
70						19,300 (16.5)	19,400 (32)	18,750 (41)	17,500 (47)	14,150 (51.5)	
80							14,850 (12.5)	14,850 (29.5)	14,850 (38.5)	11,700 (44)	
90								11,500 (27.5)	9,810 (35.5)	8,230 (24.5)	
100											
Minimum boom angle (deg.) for indicated length (no load)											0
Maximum boom length (ft.) at 0 deg. boom angle (no load)											114

NOTE: Boom angles are in degrees.

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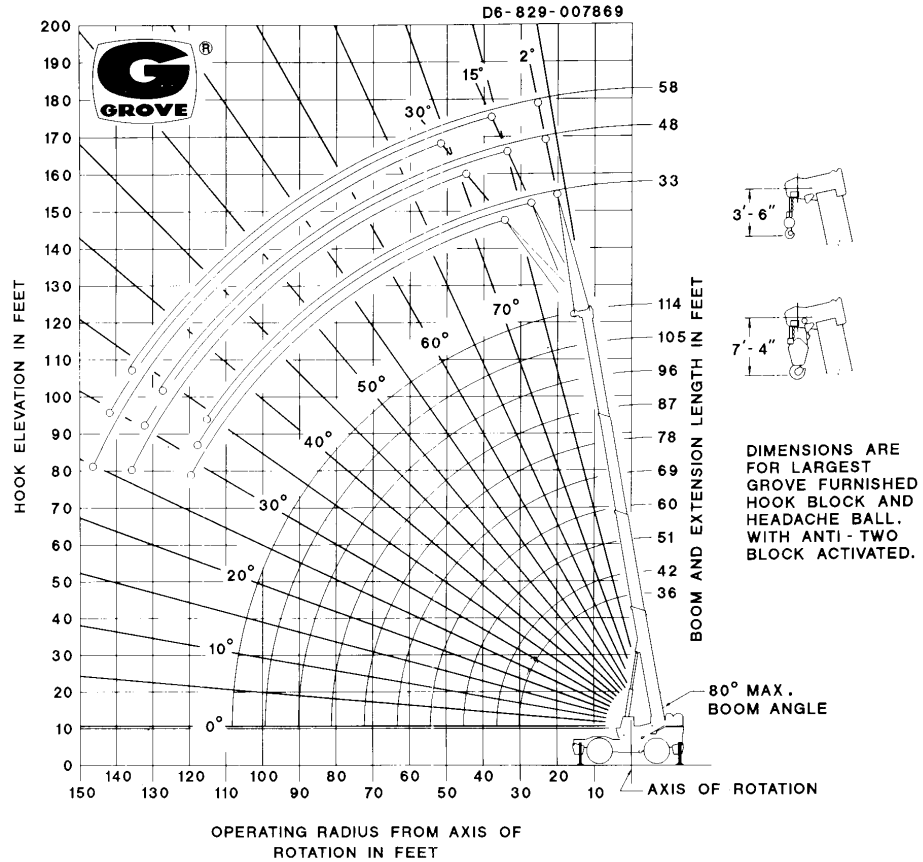
NOTES FOR RUBBER CAPACITIES

Maximum Permissible Boom Length:	Front (No Load)	Min. boom angle (deg.) for indicated length	Max. boom length (ft.) at 0 deg. boom angle	Main Boom 114 ft.
1) 36 ft. (f) 78 ft.				15
2) 42 ft. (g) 87 ft.				105
3) 51 ft. (h) 96 ft.	360°			52
4) 60 ft. (i) 114 ft.	(No Load)			69

Capacities do not exceed 75% of tipping loads as determined by test in accordance with SAE J-765. Capacities are applicable to machines equipped with 33.25x33 (32 PR) bias ply tires, at 80 PSI cold inflation pressure. (Defined Arc) - Over front includes +6° on either side of longitudinal centerline of machine. Capacities appearing above bold line are based on structural strength and tipping should not be relied upon as a capacity limitation. Capacities are applicable only with machine on a firm level surface. On rubber lifting with boom extensions or jibs not permitted. For pick & 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 speed. 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 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. Creep - not over 200 ft. (61 m) of movement in any 30 minute period and not exceeding 1 mph (1.6 kph).

GROVE® RT990

RANGE DIAGRAM



WEIGHT REDUCTION FOR LOAD HANDLING DEVICES

33 ft. Fixed Offset Extension	
†Stowed	- 787 lbs.
†Erected	- 6,267 lbs.
33 ft. - 58 ft. Tele. Boom Extension	
†Stowed	- 1,087 lbs.
†Erected (Retracted)	- 9,322 lbs.
†Erected (Extended)	- 12,860 lbs.

HOOKBLOCK	
90 Ton, 6 Sheave 2,028 lbs.
15 Ton, 1 Sheave 650 lbs.
10 Ton Headache Ball 500 lbs.
7-1/2 Ton Headache Ball 300 lbs.
Auxiliary Boom Head 220 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.

†Reduction of Main Boom Capacities.



PACIFIC LIFT EQUIPMENT

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