



LOAD CHARTS for Use in CCO Written Examinations

GROVE

TELESCOPIC BOOM CRANE—SWING CAB (TLL)

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NOTES FOR LIFTING CAPACITIES

GENERAL:

1. Rated loads as shown on lift chart pertain to this machine as originally manufactured and equipped. Modifications to the machine or use of optional equipment other than that specified can result in a reduction of capacity.
2. Construction equipment can be hazardous if improperly operated or maintained. Operation and maintenance of this machine shall be in compliance with the information in the Operator's and Safety Handbook, Service Manual, and Parts Manual supplied with this machine. If these manuals are missing, order replacements from the manufacturer through the distributor.
3. The operator and other personnel associated with machine shall fully acquaint themselves with the latest American National Standards Institute (ANSI) Safety Standards for cranes.

SETUP:

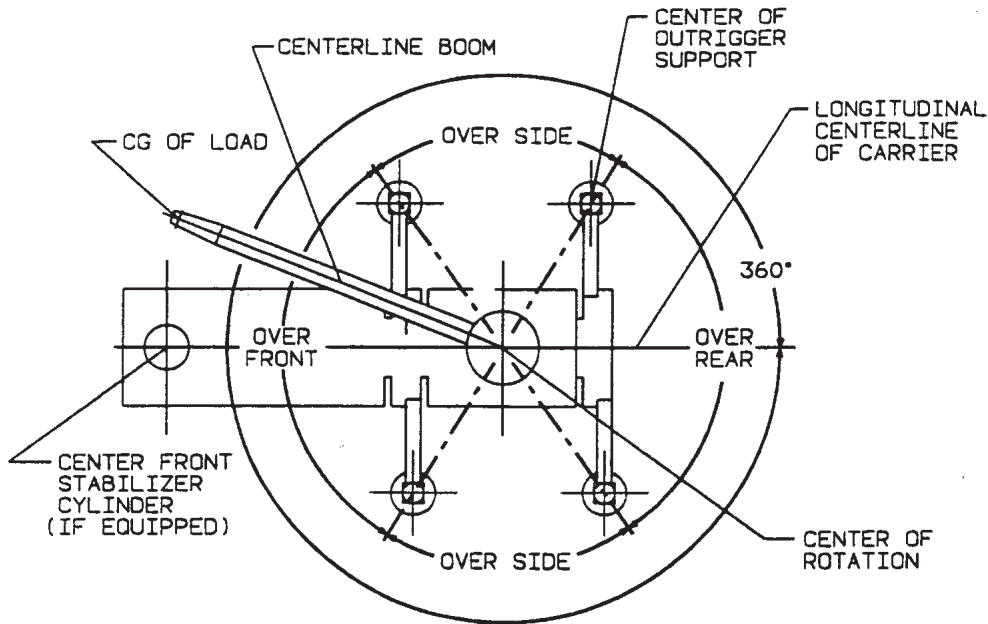
1. The machine shall be leveled on a firm supporting surface. Depending on the nature of the supporting surface, it may be necessary to have structural supports under the outrigger floats or tires to spread the load to a larger bearing surface.
2. For outrigger operation, outriggers shall be properly extended with tires raised free of crane weight before operating the boom or lifting loads.
3. If machine is equipped with front jack cylinder, the front jack cylinder shall be set in accordance with 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. Do not travel with crane 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 or concrete bucket operation, weight of bucket and load must not exceed 80% of rated lifting capacities.
2. All rated loads have been tested to and meet minimum requirements of SAE J1063 OCT80 – Cantilevered Boom Crane Structures – Method of Test, and do not exceed 85% of the tipping load on outriggers fully and 50% extended, and 75% of the tipping load on outriggers 0% extended (fully retracted) as determined by SAE J765 OCT80 Crane Stability Test Code.
3. Rated loads include the weight of hookblock, slings and auxiliary lifting devices and their weights shall be subtracted from the listed rating to obtain the net load to be lifted. When more than the minimum required hoist reeving is used, the additional rope weight shall be considered part of the load to be handled.
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.
5. Rated loads do not account for wind on lifted load or boom. It is recommended when wind velocity is above 20 m.p.h. (32km/h), rated loads and boom lengths shall 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 machine 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 next longer or shorter 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. If machine is equipped with individually controlled powered boom sections, the boom sections must be extended equally at all times.
12. Never handle personnel with this machine without written approval from Grove North America.
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.
16. Capacities for the 35 ft. (10.6 m.) boom length shall be lifted with boom fully retracted. If boom is not fully retracted, capacities shall not exceed those shown for the 40 ft. (12.2m) boom length.
17. When lifting over front of machine, radii less than 35 ft. (12m.) not recommended.
18. When operating the machine in the "On Outriggers 50% Extended (13' 10" spread)" mode, the outrigger beam pins must be engaged. When operating the machine in the "On Outriggers 0% Extended (7' 8" spread)" mode, the outrigger beams must be fully retracted. Failure to follow these precautions could result in structural damage or loss of stability of the machine.
19. The maximum outrigger pad load is 59,044 pounds (26,782 kg).

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.



BOLD LINES DETERMINE THE LIMITING POSITION OF ANY LOAD FOR OPERATION WITHIN WORKING AREAS INDICATED

WORKING AREA DIAGRAM

LINE PULLS AND REEVING INFORMATION

HOISTS	CABLE SPECS.	PERMISSIBLE LINE PULLS
Main & Aux. Model 30	3/4" (19 mm) 18x19 Class or 35x7 Rotation Resistant Min. Breaking Str. 64,600 lbs.	12,920 lbs.

WEIGHT REDUCTIONS FOR LOAD HANDLING DEVICES

32 FT. FIXED BOOM EXTENSION WITH 35 FT. - 110 FT. BOOM	
*Stowed –	267 lbs.
*Erected –	4,250 lbs.
32 - 56 FT. TELE BOOM EXTENSION WITH 35 FT. - 110 FT. BOOM	
*Stowed –	293 lbs.
*Erected (RETRACTED) –	6,368 lbs.
*Erected (EXTENDED) –	8,460 lbs.

*Reduction of main boom capacities

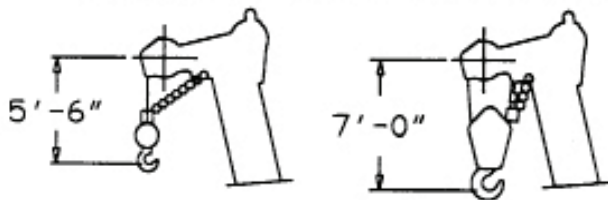
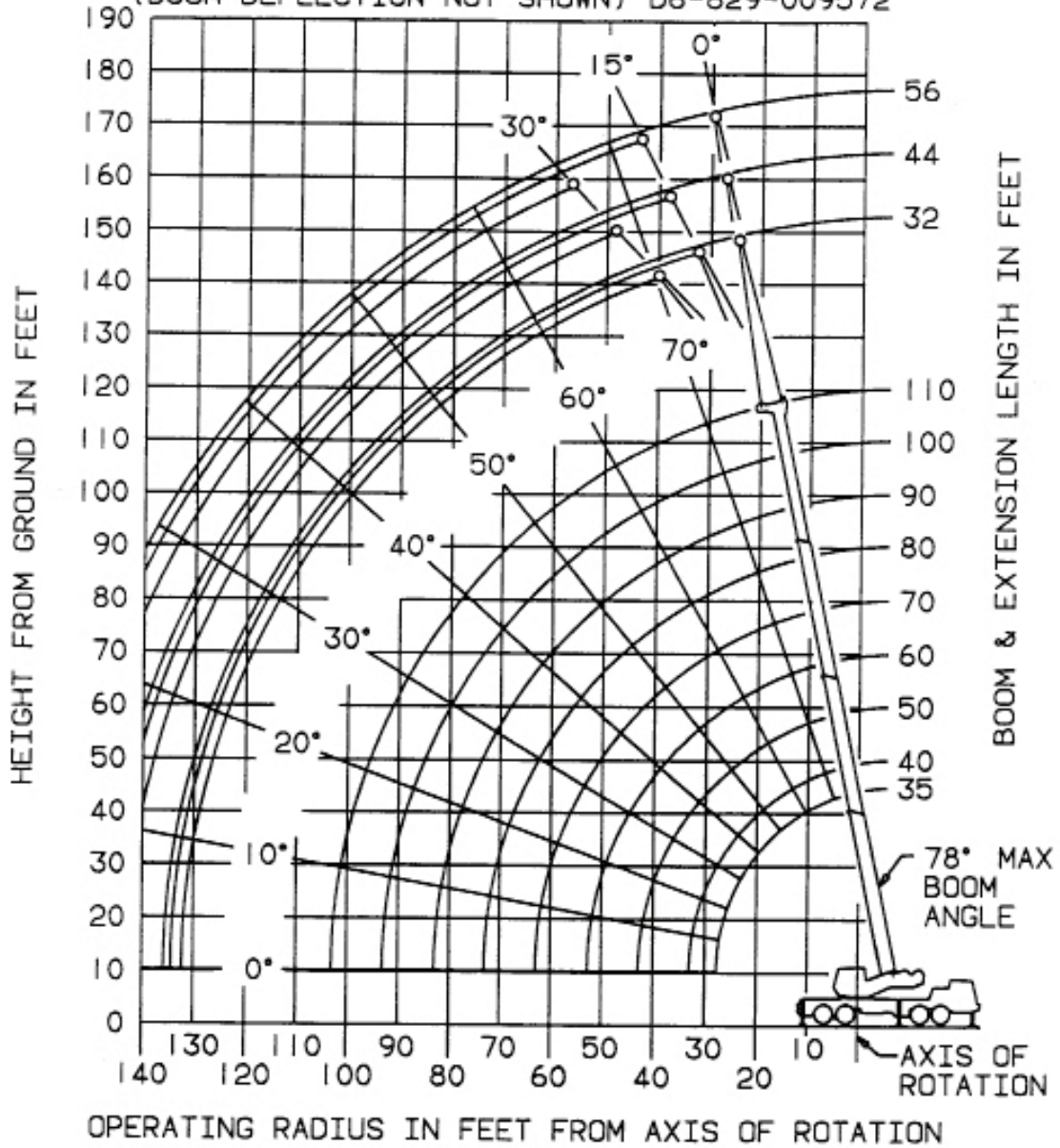
When lifting over swingaway and / or jib combinations, deduct total weight of all load handling devices reeved over main boom nose directly from swingaway or jib capacity.

AUXILIARY BOOM HEAD	143 lbs.
HOOKBLOCKS and HEADACHE BALLS:	
50 Ton, 4 Sheave	1,285 lbs.+
45 Ton, 3 Sheave w/cheekplates	1,095 lbs.+
45 Ton, 3 Sheave w/o cheekplates	895 lbs.+
15 Ton, 1 Sheave	380 lbs.+
7.5 Ton Headache Ball	338 lbs.+
10 Ton Headache Ball	560 lbs.+

+Refer to rating plate for actual weight.

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.

WORKING RANGE DIAGRAM
 (BOOM DEFLECTION NOT SHOWN) D6-829-009572



DIMENSIONS ARE FOR LARGEST GROVE FURNISHED HOOK BLOCK AND HEADACHE BALL, WITH ANTI-TWO BLOCK ACTIVATED.

**RATED LIFTING CAPACITIES IN POUNDS
WITH 7800 LB. REMOVABLE COUNTERWEIGHT
35 FT. - 110 FT. BOOM**

ON OUTRIGGERS FULLY EXTENDED - 360°

Radius in Feet	#0001								
	Main Boom Length in Feet								
	35	40	50	*60	70	80	90	100	110
9	90,000 (67.5)								
10	80,000 (66)	68,000 (69.5)	58,150 (74)						
12	67,400 (62)	63,800 (66)	55,450 (71.5)	44,600 (75)					
15	58,050 (56)	54,700 (61)	48,050 (67.5)	42,250 (71.5)	35,600 (74.5)	33,000 (77)			
20	44,950 (44.5)	43,000 (52)	39,400 (61)	33,600 (66.5)	30,500 (70.5)	28,000 (73.5)	25,500 (75.5)	23,300 (77.5)	
25	35,200 (28.5)	35,050 (41.5)	32,400 (54)	27,750 (61)	25,200 (66)	23,800 (69.5)	22,000 (72)	20,400 (74.5)	18,500 (76)
30		28,400 (27)	27,150 (46)	23,350 (55)	21,100 (61)	20,400 (65.5)	19,300 (68.5)	17,550 (71.5)	15,750 (73.5)
35			21,650 (36.5)	20,000 (49)	18,050 (56)	17,400 (61.5)	16,400 (65)	15,200 (68)	13,650 (70.5)
40	See Note 16		17,200 (24)	16,850 (41.5)	15,650 (50.5)	15,050 (57)	14,150 (61.5)	13,300 (65)	12,000 (68)
45				13,350 (33)	13,600 (45)	13,200 (52.5)	12,350 (57.5)	11,550 (61.5)	10,600 (65)
50				10,650 (21.5)	11,450 (38.5)	11,600 (47.5)	10,850 (53.5)	10,100 (58.5)	9,500 (62)
55					9,400 (31)	10,000 (42)	9,630 (49.5)	8,950 (54.5)	8,470 (58.5)
60					7,760 (20)	8,300 (36)	8,570 (45)	7,950 (51)	7,500 (55.5)
65						6,900 (29)	7,340 (40)	7,080 (47)	6,670 (52)
70						5,740 (19)	6,190 (34)	6,330 (42.5)	5,940 (48.5)
75							5,220 (27.5)	5,550 (38)	5,300 (45)
80							4,380 (18)	4,720 (32.5)	4,740 (40.5)
85								4,000 (26)	4,230 (36)
90								3,380 (17)	3,625 (31)
95									3,060 (25)
100									2,570 (16)
Minimum boom angle (deg.) for indicated length (no load)									
Maximum boom length (ft.) at 0 degree boom angle (no load)									
									0
									110

NOTE: () Boom angles are in degrees.

#LMI operating code. Refer to LMI manual for instructions.

Lifting Capacities On Outriggers Fully Extended - 360° At Zero Degree Boom Angle									
Boom Angle	Main Boom Length in Feet								
	35	40	50	*60	70	80	90	100	110
0*	15,500 (27.8)	12,240 (33)	7,860 (43)	4,970 (52.8)	3,670 (63)	2,710 (73)	1,960 (83)	1,360 (93)	880 (102.8)

NOTE: () Reference radii in feet.

*60 ft. boom length is with inner-mid extended and outer-mid & fly retracted.

RATED LIFTING CAPACITIES IN POUNDS WITH 7800 LB. REMOVABLE COUNTERWEIGHT 35 FT. - 110 FT. BOOM

ON OUTRIGGERS FULLY EXTENDED - OVER REAR

Radius in Feet	#0001								
	Main Boom Length in Feet								
	35	40	50	*60	70	80	90	100	110
9	@ 100,000 (67.5)								
9	90,000 (67.5)								
10	80,000 (66)	68,000 (69.5)	58,150 (74)						
12	67,400 (62)	63,800 (66)	55,450 (71.5)	44,600 (75)					
15	58,050 (56)	54,700 (61)	48,050 (67.5)	42,250 (71.5)	35,600 (74.5)	33,000 (77)			
20	44,950 (44.5)	43,000 (52)	39,400 (61)	33,600 (66.5)	30,500 (70.5)	28,000 (73.5)	25,500 (75.5)	23,300 (77.5)	
25	35,200 (28.5)	35,050 (41.5)	32,400 (54)	27,750 (61)	25,200 (66)	23,800 (69.5)	22,000 (72)	20,400 (74.5)	18,500 (76)
30		28,400 (27)	27,150 (46)	23,350 (55)	21,100 (61)	20,400 (65.5)	19,300 (68.5)	17,550 (71.5)	15,750 (73.5)
35			23,200 (36.5)	20,000 (49)	18,050 (56)	17,400 (61.5)	16,400 (65)	15,200 (68)	13,650 (70.5)
40	See Note 16		18,850 (24)	17,250 (41.5)	15,650 (50.5)	15,050 (57)	14,150 (61.5)	13,300 (65)	12,000 (68)
45				15,000 (33)	13,600 (45)	13,200 (52.5)	12,350 (57.5)	11,550 (61.5)	10,600 (65)
50				12,800 (21.5)	11,950 (38.5)	11,600 (47.5)	10,850 (53.5)	10,100 (58.5)	9,500 (62)
55					10,500 (31)	10,300 (42)	9,630 (49.5)	8,950 (54.5)	8,470 (58.5)
60					9,300 (20)	9,130 (36)	8,570 (45)	7,950 (51)	7,500 (55.5)
65						8,120 (29)	7,640 (40)	7,080 (47)	6,670 (52)
70						7,230 (19)	6,800 (34)	6,330 (42.5)	5,940 (48.5)
75							6,060 (27.5)	5,670 (38)	5,300 (45)
80							5,400 (18)	5,080 (32.5)	4,740 (40.5)
85								4,540 (26)	4,230 (36)
90								4,030 (17)	3,780 (31)
95									3,370 (25)
100									2,990 (16)
Minimum boom angle (deg.) for indicated length (no load)									0
Maximum boom length (ft.) at 0 degree boom angle (no load)									110

NOTE: () Boom angles are in degrees.

@Maximum lifting capacity of 100,000 lbs. over rear only within defined arc of 6 degrees either side of center line.

Lifting Capacities On Outriggers Fully Extended - 360° At Zero Degree Boom Angle									
Boom Angle	Main Boom Length in Feet								
	35	40	50	*60	70	80	90	100	110
0°	15,500 (27.8)	12,240 (33)	7,860 (43)	4,970 (52.8)	3,670 (63)	2,710 (73)	1,960 (83)	1,360 (93)	880 (102.8)

NOTE: () Reference radii in feet.

*60 ft. boom length is with inner-mid extended and outer-mid & fly retracted.

32 FT. FIXED LENGTH EXTENSION WITH 7800 LB REMOVABLE COUNTERWEIGHT

ON OUTRIGGERS FULLY EXTENDED - 360°

Radius in Feet	#0051 or #51	#0052 or #52	#0053 or #53
	0° OFFSET	15° OFFSET	30° OFFSET
30	9,880 (78)		
35	9,090 (76)	*7,880 (78)	
40	8,380 (74)	7,450 (75.5)	*6,180 (78)
45	7,720 (71.5)	7,140 (73.5)	6,070 (76)
50	7,120 (69.5)	6,850 (71.5)	5,820 (73.5)
55	6,570 (67)	6,590 (69)	5,590 (71.5)
60	5,880 (65)	6,350 (67)	5,390 (69)
65	5,230 (62.5)	5,660 (64.5)	5,200 (67)
70	4,650 (60)	5,050 (62)	5,030 (64.5)
75	4,120 (57.5)	4,490 (59.5)	4,800 (62)
80	3,640 (55)	3,980 (57)	4,260 (59.5)
85	3,190 (52.5)	3,500 (54.5)	3,760 (57)
90	2,790 (49.5)	3,070 (52)	3,300 (54)
95	2,410 (47)	2,670 (49)	2,870 (51)
100	2,070 (43.5)	2,300 (46)	2,480 (48)
105	1,750 (40.5)	1,960 (42.5)	2,110 (45)
110	1,450 (37)	1,630 (39)	1,760 (41.5)

NOTE: () Boom angles are in degrees.

*This capacity is based upon the maximum boom angle.

#LMI operating code. Two or four digit code depends on LMI system. Refer to LMI manual for instructions.

BOOM EXTENSION CAPACITY NOTES:

1. All capacities above the bold line are based on structural strength of boom extension.
2. 32 ft. boom extension lengths may be used for single line lifting service only.
3. Radii listed are for a fully extended boom with the boom extension erected. For main boom lengths less than fully extended, the rated loads are determined by boom angle. Use only the column which corresponds to the boom extension length and offset for which the machine is configured. For boom angles not shown, use the rating of the next lower boom angle.

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. Boom angle is the angle above or below horizontal of the longitudinal axis of the boom base section after lifting rated load.
5. Capacities listed are with outriggers fully extended and vertical jacks set only.
6. **32 FT. FIXED OFFSETTABLE BOOM EXTENSION WARNING:** For main boom length greater than 90 ft. with 32 ft. fixed boom extension in working position, the boom angle must not be less than 31° 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 90 ft. This warning also applies for boom extension erection purposes.

32 FT. - 56 FT. TELE OFFSETTABLE BOOM EXTENSION WITH 7800 LB. REMOVABLE COUNTERWEIGHT

ON OUTRIGGERS FULLY EXTENDED - 360°

Radius in Feet	32 ft. LENGTH			44 ft. LENGTH			56 ft. LENGTH		
	#0021 or #21	#0022 or #22	#0023 or #23	#0031 or #31	#0032 or #32	#0033 or #33	#0041 or #41	#0042 or #42	#0043 or #43
	0° OFFSET	15° OFFSET	30° OFFSET	0° OFFSET	15° OFFSET	30° OFFSET	0° OFFSET	15° OFFSET	30° OFFSET
30	9,500 (78)								
35	8,710 (76)	*7,500 (78)		7,320 (77.5)					
40	8,000 (74)	7,070 (75.5)	*5,800 (78)	6,880 (75.5)			5,560 (77)		
45	7,340 (71.5)	6,760 (73.5)	5,690 (76)	6,490 (74)	5,060 (77.5)		5,250 (75.5)		
50	6,740 (69.5)	6,470 (71.5)	5,440 (73.5)	6,140 (72)	4,840 (75.5)	*3,770 (78)	4,970 (73.5)	3,900 (78)	
55	6,190 (67)	6,210 (69)	5,210 (71.5)	5,820 (69.5)	4,650 (73.5)	3,600 (76)	4,710 (72)	3,740 (76)	
60	5,500 (65)	5,970 (67)	5,010 (69)	5,530 (67.5)	4,460 (71.5)	3,450 (74)	4,480 (70)	3,600 (74.5)	2,650 (78)
65	4,850 (62.5)	5,280 (64.5)	4,820 (67)	5,220 (65.5)	4,300 (69.5)	3,320 (72)	4,270 (68)	3,410 (72.5)	2,540 (76)
70	4,270 (60)	4,670 (62)	4,650 (64.5)	4,640 (63.5)	4,140 (67.5)	3,190 (70)	4,070 (66.5)	3,220 (70.5)	2,430 (74)
75	3,740 (57.5)	4,110 (59.5)	4,420 (62)	4,110 (61.5)	3,940 (65)	3,070 (67.5)	3,890 (64.5)	3,050 (68.5)	2,340 (72.5)
80	3,260 (55)	3,600 (57)	3,880 (59.5)	3,640 (59)	3,750 (63)	2,970 (65.5)	3,720 (62.5)	2,890 (66.5)	2,250 (70)
85	2,810 (52.5)	3,120 (54.5)	3,380 (57)	3,200 (57)	3,570 (61)	2,870 (63)	3,530 (60.5)	2,750 (64.5)	2,170 (68)
90	2,410 (49.5)	2,690 (52)	2,920 (54)	2,800 (54.5)	3,190 (58.5)	2,780 (60.5)	3,130 (58.5)	2,620 (62.5)	2,100 (66)
95	2,030 (47)	2,290 (49)	2,490 (51)	2,430 (52)	2,790 (56)	2,700 (58)	2,760 (56.5)	2,500 (60.5)	2,030 (64)
100	1,690 (43.5)	1,920 (46)	2,100 (48)	2,080 (49.5)	2,420 (53.5)	2,630 (55.5)	2,420 (54.5)	2,390 (58.5)	1,970 (61.5)
105	1,370 (40.5)	1,580 (42.5)	1,730 (45)	1,770 (47)	2,070 (51)	2,320 (52.5)	2,110 (52)	2,290 (56)	1,910 (59.5)
110	1,070 (37)	1,250 (39)	1,380 (41.5)	1,470 (44)	1,750 (48.5)	1,970 (50)	1,820 (49.5)	2,180 (54)	1,860 (57)
115				1,200 (41)	1,450 (45.5)	1,640 (46.5)	1,540 (47.5)	1,880 (51.5)	1,810 (54)
120							1,290 (45)	1,600 (48.5)	1,670 (51.5)

NOTE: () Boom angles are in degrees.

*This capacity is based upon maximum boom angle.

#LMI operating code. Two or four digit code depends on LMI system. Refer to LMI manual for instructions.

- All capacities above the bold line are based on structural strength of boom extension.
- 32 ft., 44 ft. and 56 ft. boom extension lengths may be used for single line lifting service only.
- Radii listed are for a fully extended boom with the boom extension erected. For main boom lengths less than fully extended, the rated loads are determined by boom angle. Use only the column which corresponds to the boom extension length and offset for which the machine is configured. For boom angles not shown, use the rating of the next lower boom angle.
WARNING: Operation of this machine with heavier loads than the capacities listed is strictly prohibited. Machine tipping with boom extension occurs rapidly and without advanced warning.
- Boom angle is the angle above or below horizontal of the longitudinal axis of the boom base section after lifting rated load.
- Capacities listed are with outriggers fully extended and vertical jacks set only.
- 32 ft. - 44 ft. TELE OFFSETTABLE BOOM EXTENSION WARNING:** For main boom length greater than 90 ft. with 32 ft. or 44 ft. tele boom extension in working position, the boom angle must not be less than 31° 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 90 ft. This warning also applies for boom extension erection purposes.
56 ft. TELE OFFSETTABLE BOOM EXTENSION WARNING: For main boom length greater than 80 ft. with 56 ft. tele boom extension in working position, the boom angle must not be less than 34° 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 80 ft. This warning also applies for boom extension erection purposes.

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