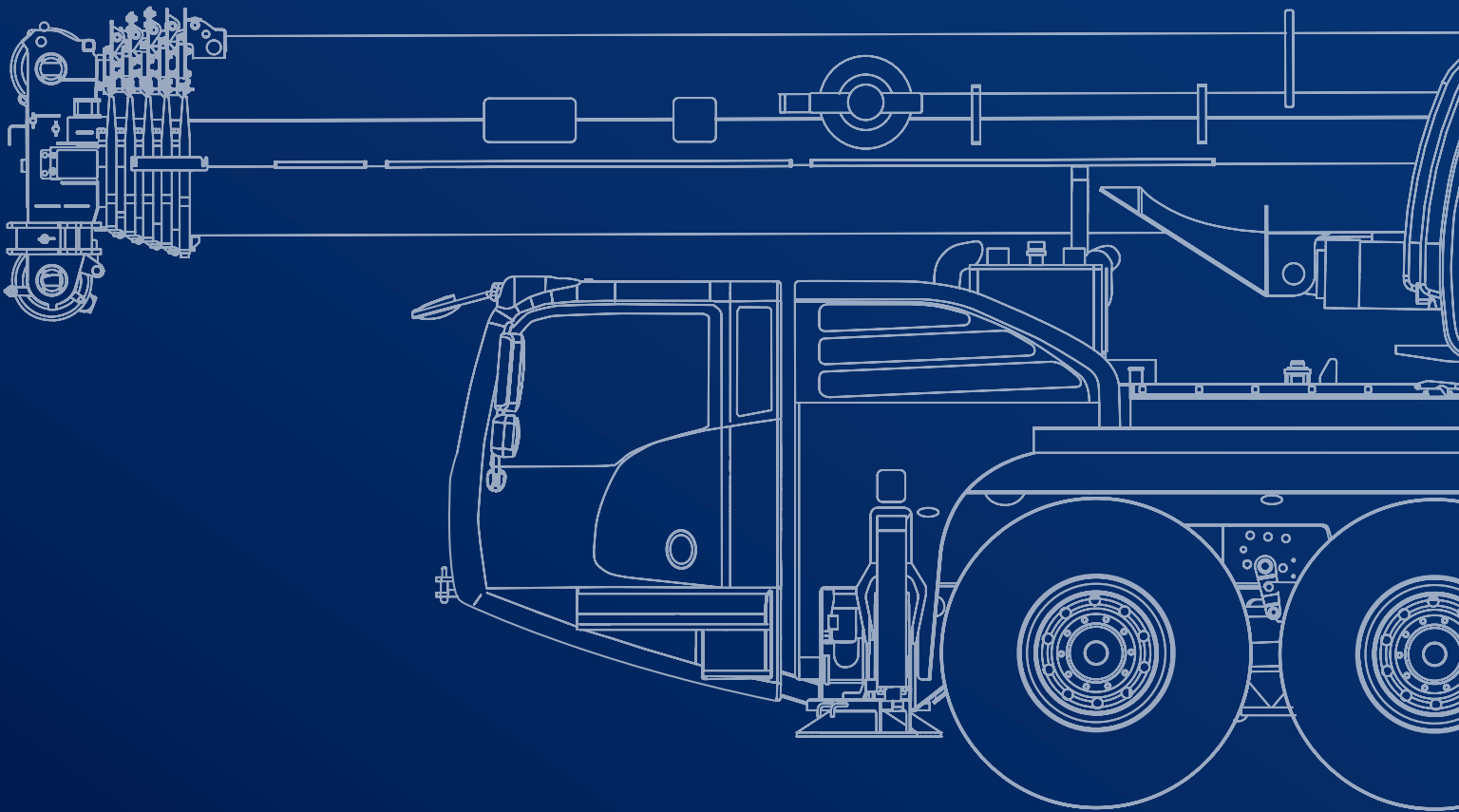


AC 4.100L-1

120 US TON MAX. CRANE CAPACITY



October 2021. Unless otherwise specified, all information in this brochure refers to a standard crane equipment, and it is intended as general information only. No liability is assumed. Errors reserved. Product specifications and prices are subject to changes without notice. The photographs and/or drawings in this brochure are for illustrative purposes only. For correct and safe crane operation, the original operating manual and lifting capacity charts are essential. Failure to follow the corresponding Operator's Manual when using our equipment or failure to otherwise act responsibly may result in property damage, serious injury or death. The sole warranty applicable with respect to our equipment is the standard warranty as per general terms and conditions of sales and service (ask your local Tadano dealer for details), and Tadano makes no other warranty, express or implied. All rights reserved. Any use of the trademarks, logos, brand names and model names used herein is prohibited.

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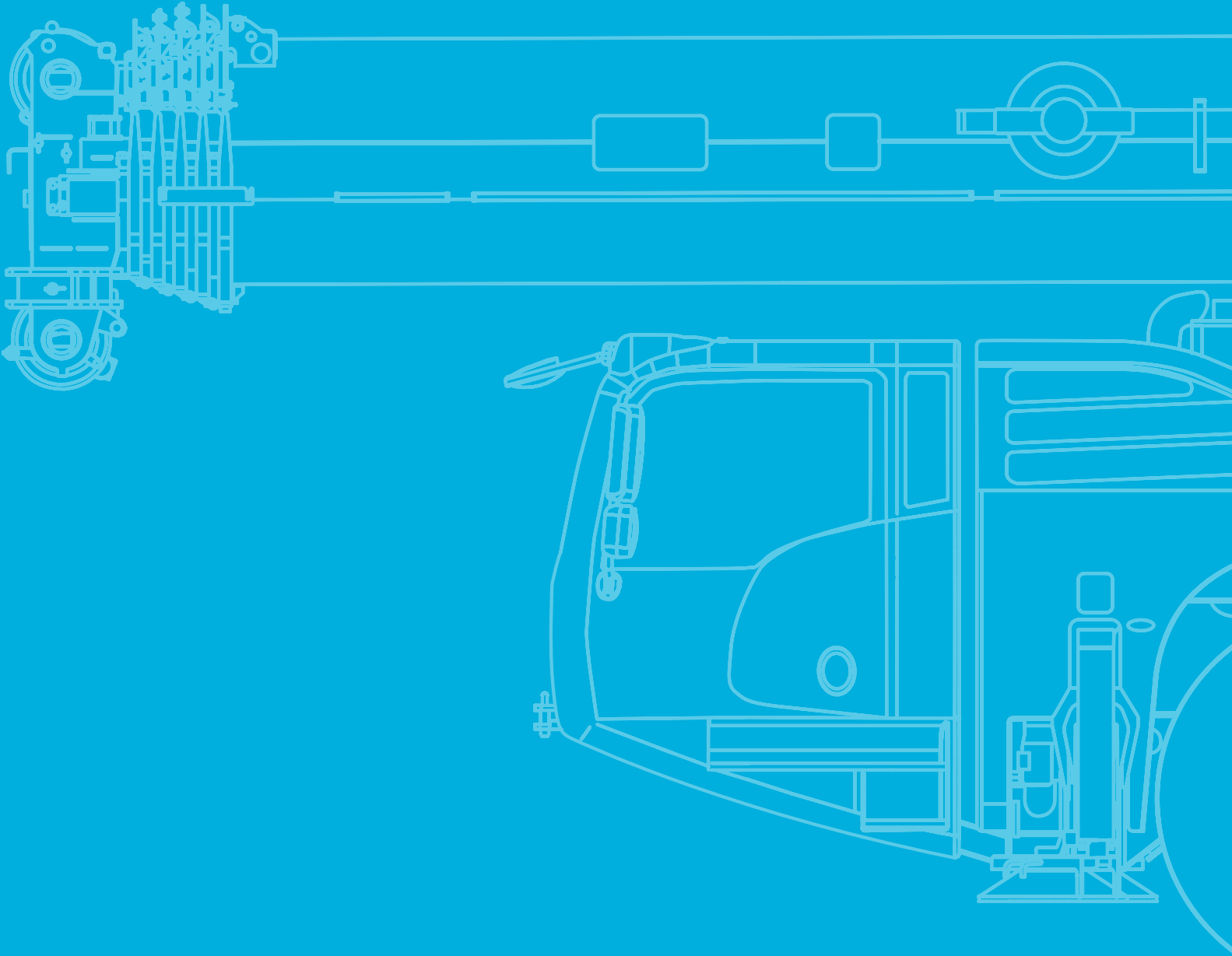
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Key



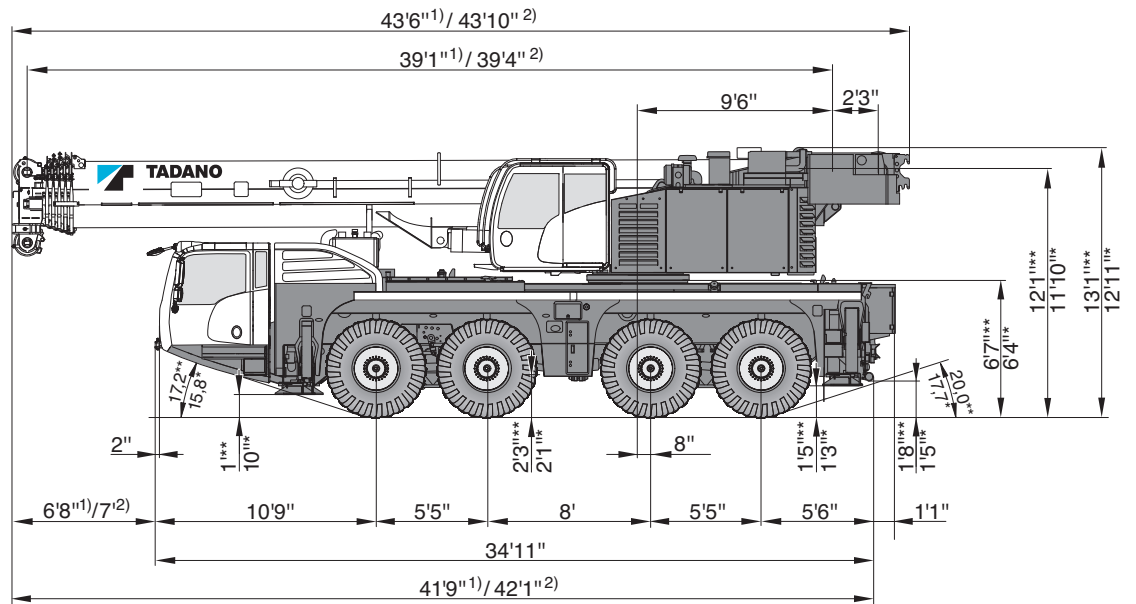
	Counterweight		Transport storage HAV at main boom
	Lifting capacities on outriggers · 360°		Dolly
	Radius		Working speeds
	Main boom		Slewing
	Folding swing-away jib		Max. line pull
	Runner		Rope diameter
	Adapter		Rope length
	Max. axle loads		Hook block
	Mechanism		Number of lines
	Tires		Possible load of hook block
	Hook block		Weight of hook block
	Hoist		Distance head sheave axle – hook ground
	Travel speed		Number of sheaves in boom head
	Gradeability		Max. outrigger load
	Off road / On road		Length of stroke (support cylinders)
	Boom telescoping		Additional parts for hydraulic system
	Boom elevation		Payload incl. rear storage box

GENERAL TECHNICAL DATA



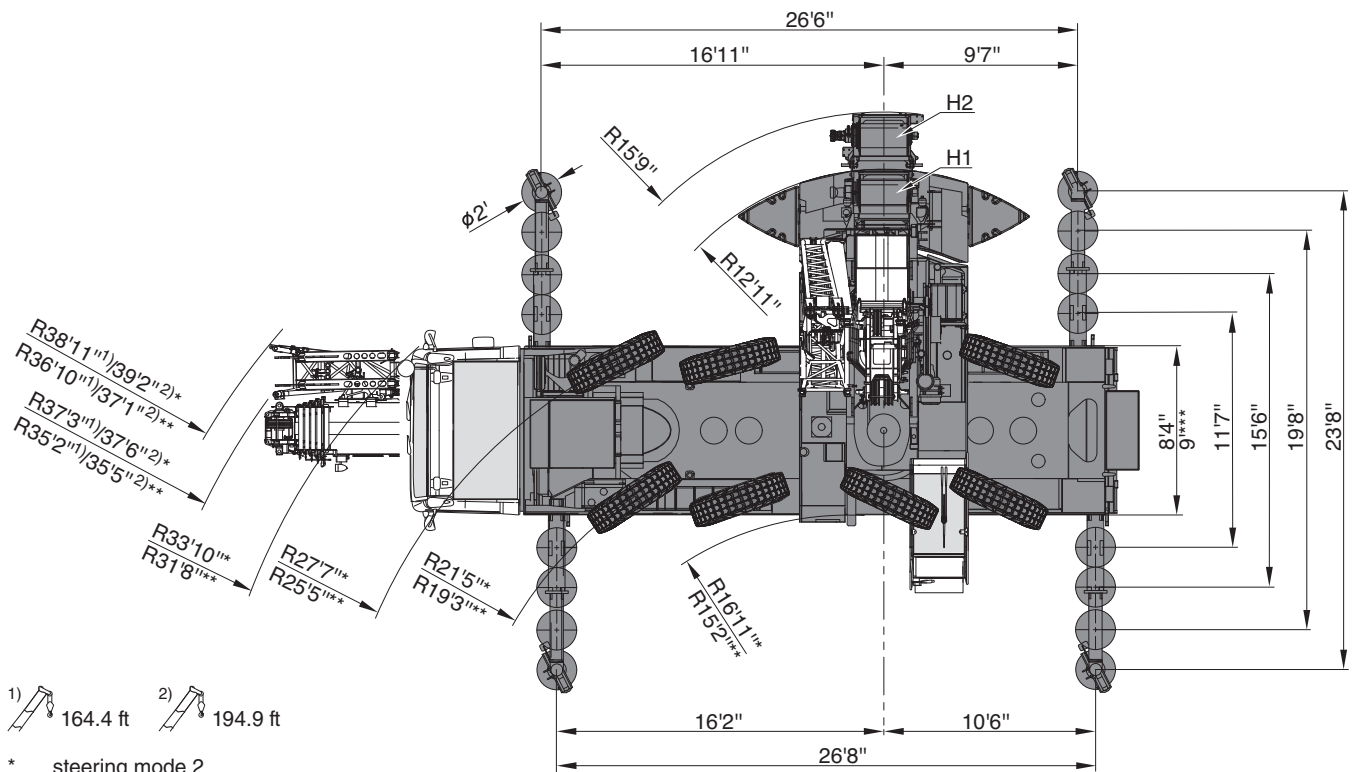
General

Vehicle dimensions



1) 164.4 ft 2) 194.9 ft

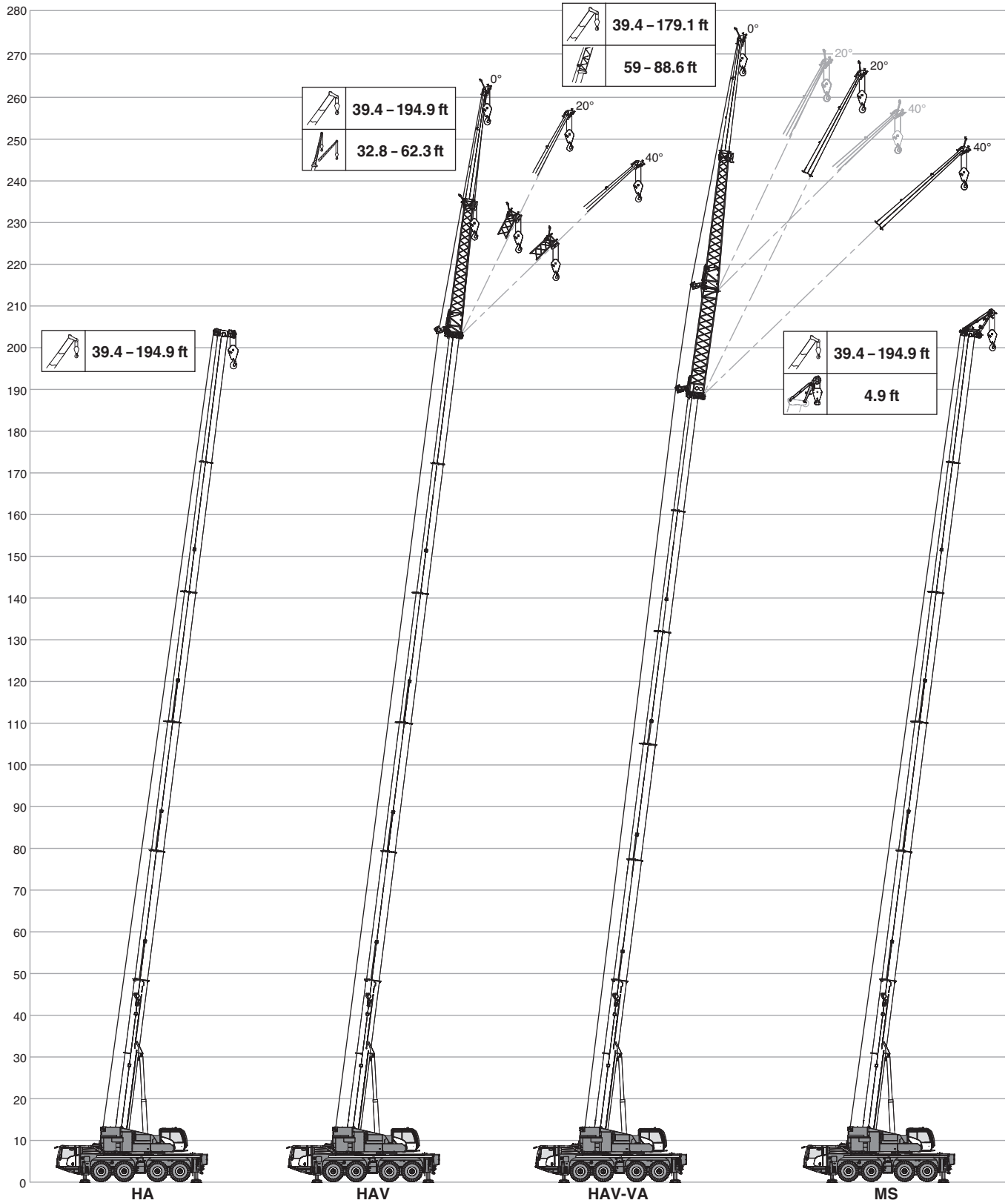
- * 385/95 R25
- ** 445/95 R25 / 525/80 R25



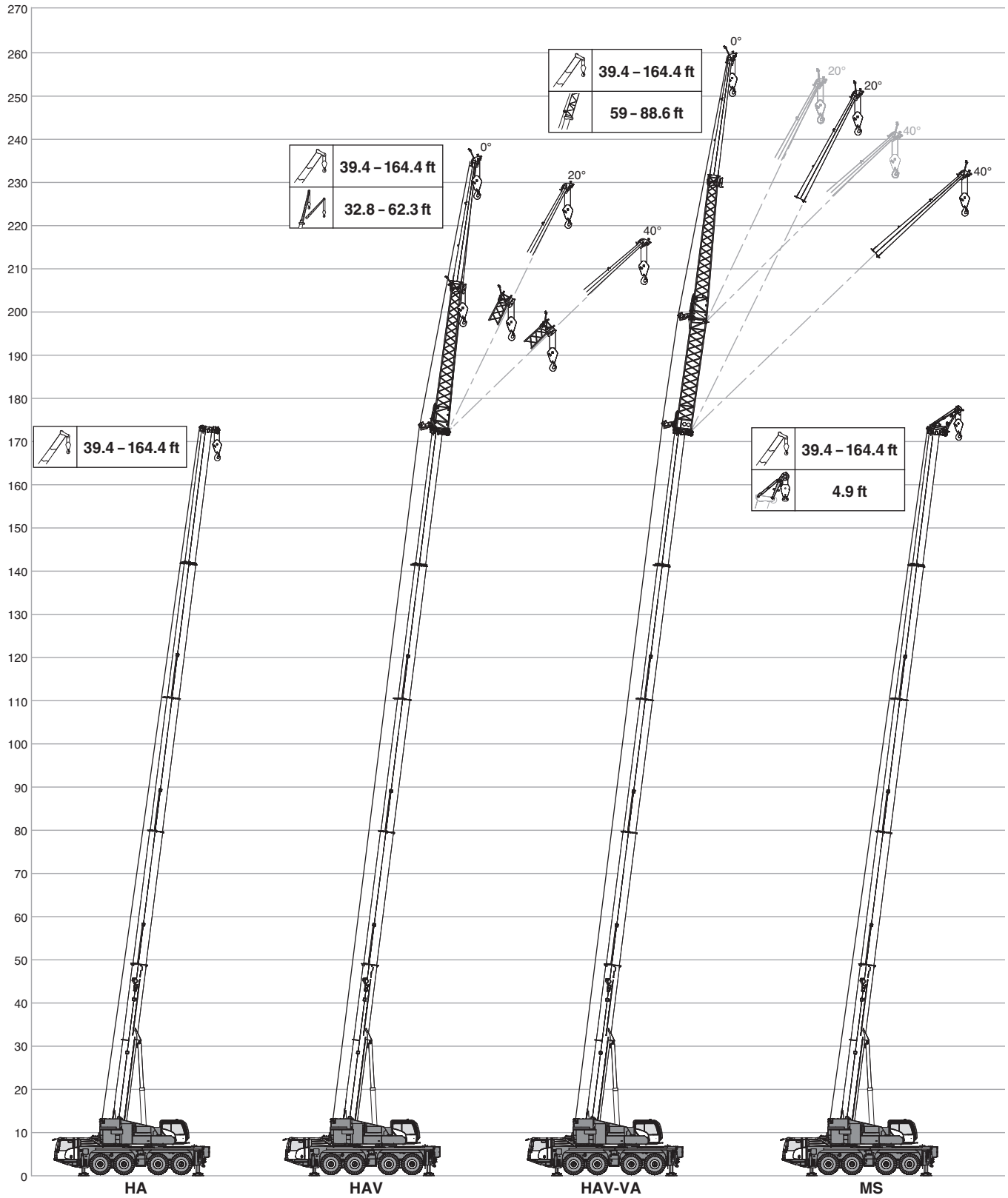
1) 164.4 ft 2) 194.9 ft

- * steering mode 2
- ** steering mode 3
- *** 525/80 R25

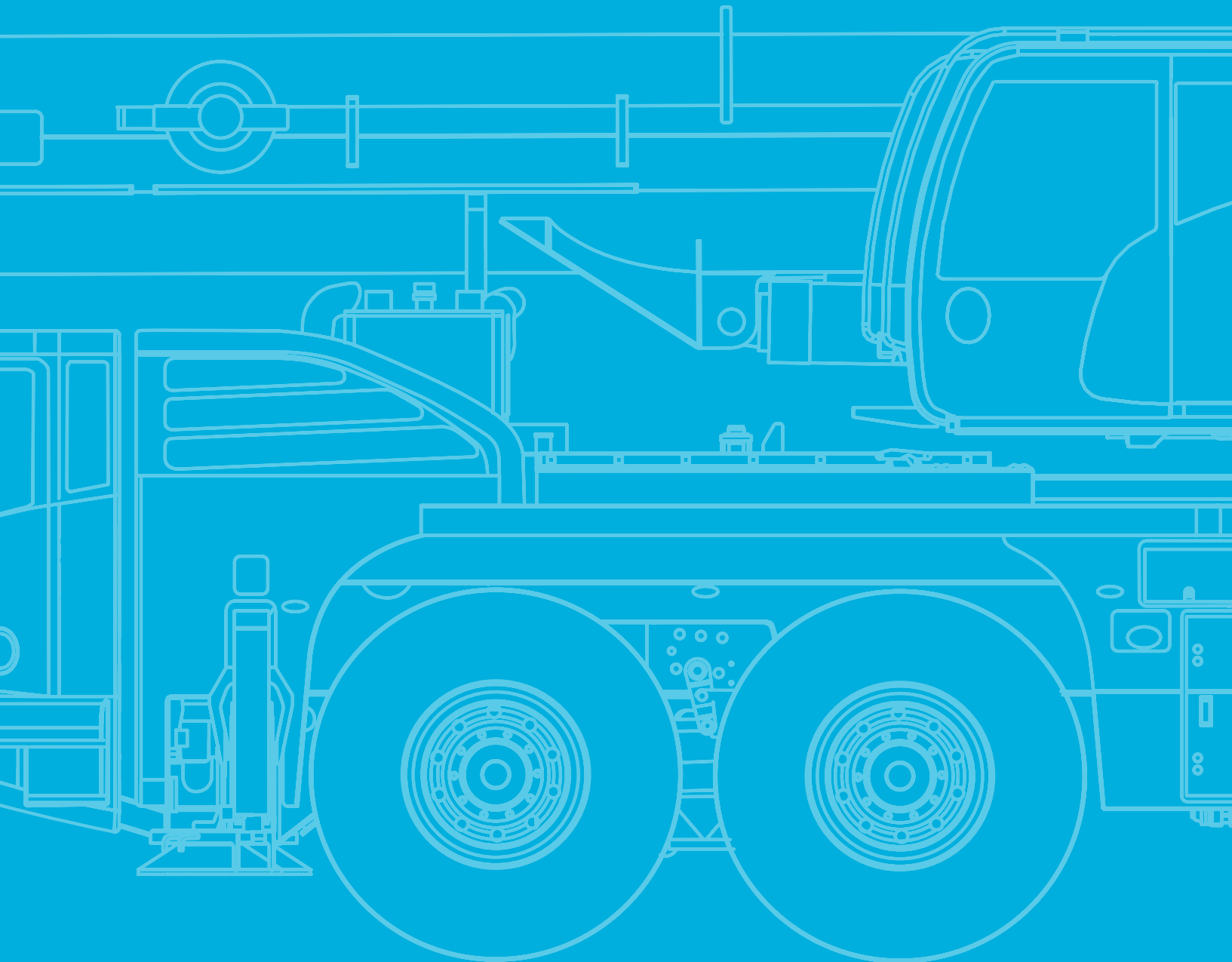
Boom Combinations













Boom Combinations





TECHNICAL DATA FOR ON-ROAD AND OFF-ROAD DRIVING



On-road and off-road driving

Axle loads														
	Total			TELMA							HA 50	HA 60		
< 22,100 lb	On request!												X	
< 26,500 lb	< 106,000 lb	8 x 6 x 8	445/95R25	X	17,600 lb	13,400 lb	–	X	–	X	–	–	–	–
< 26,500 lb	< 106,000 lb	8 x 6 x 8	445/95R25	X	17,600 lb	9,500 lb	62.3 ft	X	–	X	–	–	–	–
< 36,400 lb	< 143,300 lb	8 x 6 x 8	445/95R25	X	110,200 lb	42,500 lb	62.3 ft*	X	X	X	–	1,320 lb	–	–
< 26,500 lb	< 106,000 lb	8 x 6 x 8	445/95R25	X	110,200 lb	9,500 lb	–	X	X	–	X	1,320 lb	–	–
< 26,500 lb	< 106,000 lb	8 x 6 x 8	445/95R25	–	17,600 lb	9,500 lb	32.8 ft	X	–	–	X	660 lb	–	–
< 26,500 lb	< 106,000 lb	8 x 4 x 8	445/95R25	X	17,600 lb	9,500 lb	32.8 ft	X	–	–	X	880 lb	–	–
< 36,400 lb	< 145,500 lb	8 x 6 x 8	445/95R25	X	110,200 lb	42,500 lb	62.3 ft*	X	X	–	X	1,320 lb	–	–

Further configurations on request!
* hydraulic

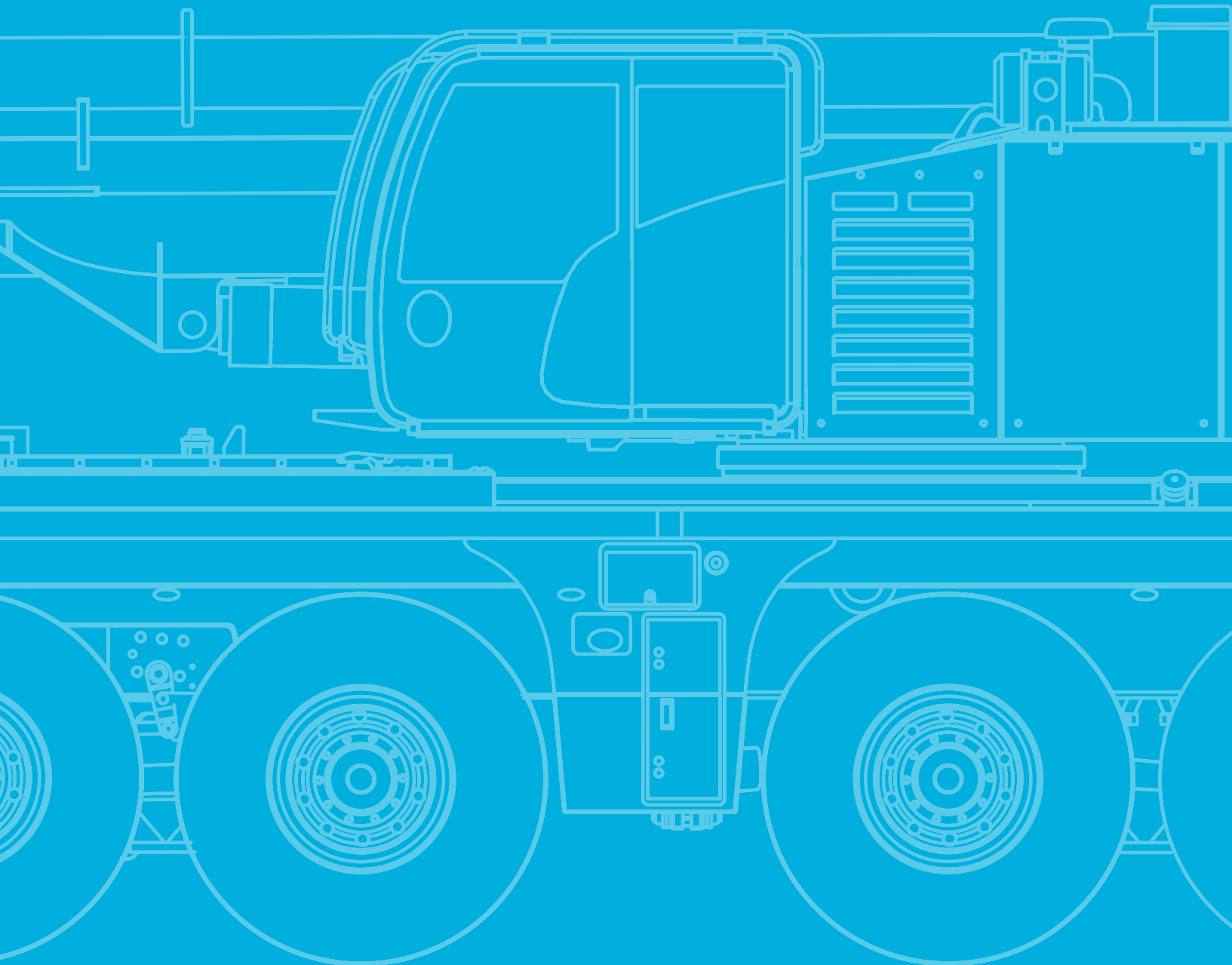
Speeds and gradeability			
	385/95 R 25 14.00 R 25	445/95 R 25 16.00 R 25	525/80 R 25 20.50 R 25
	46 %	42 %	42 %
	> 70 %	> 60 %	> 60 %
	max. 52.8 mph ¹⁾		

¹⁾ Depending on tire type, size and country specific legislation

Steering	
	1 Highway > 28 mph
	2 City < 28 mph
	3* Minimum turning radius < 3 mph
	4* Off-wall
	5* Crab steer mode
	6* All wheel steering

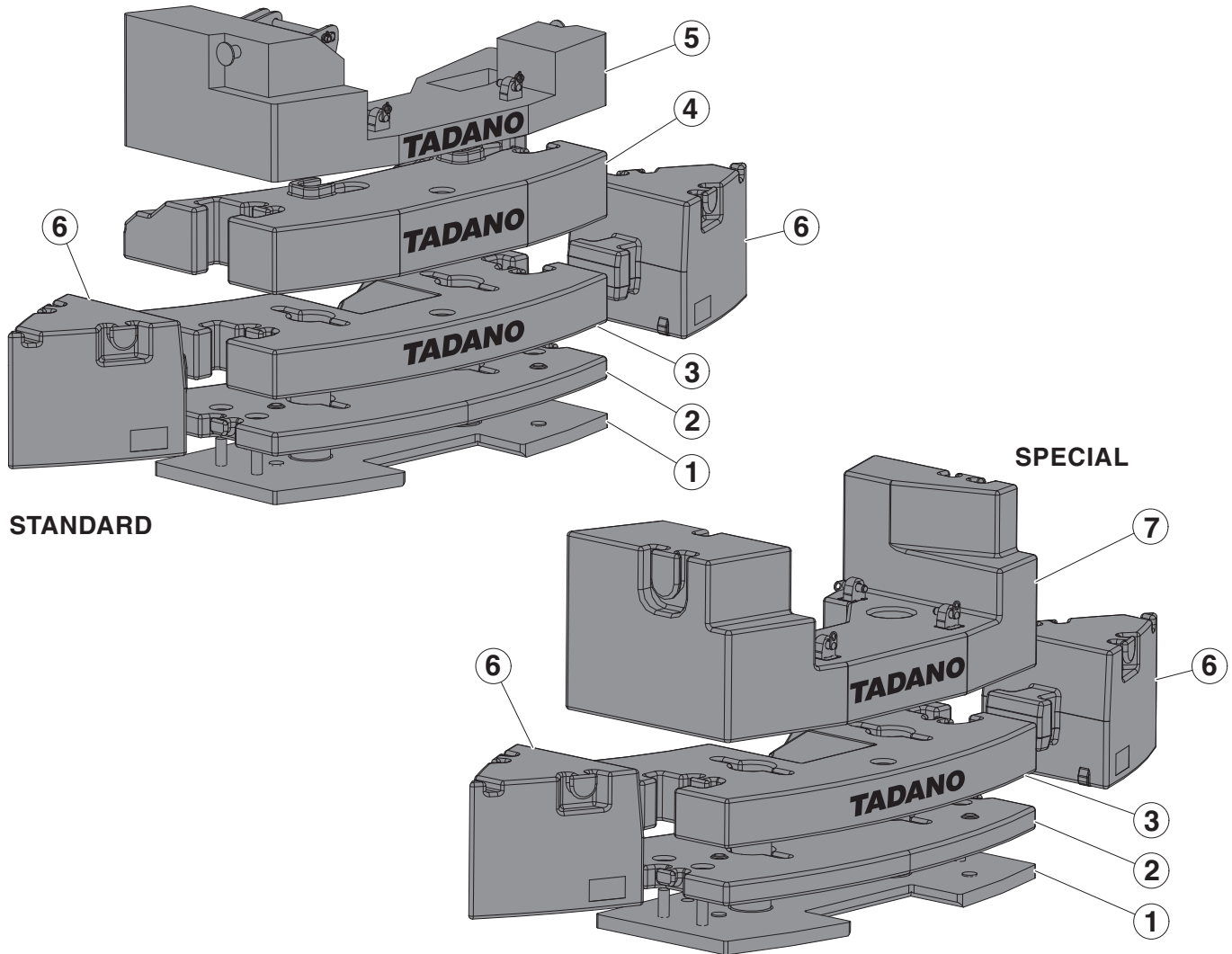
* must be activated

TECHNICAL DATA FOR TRANSPORT



Transportation

Counterweight

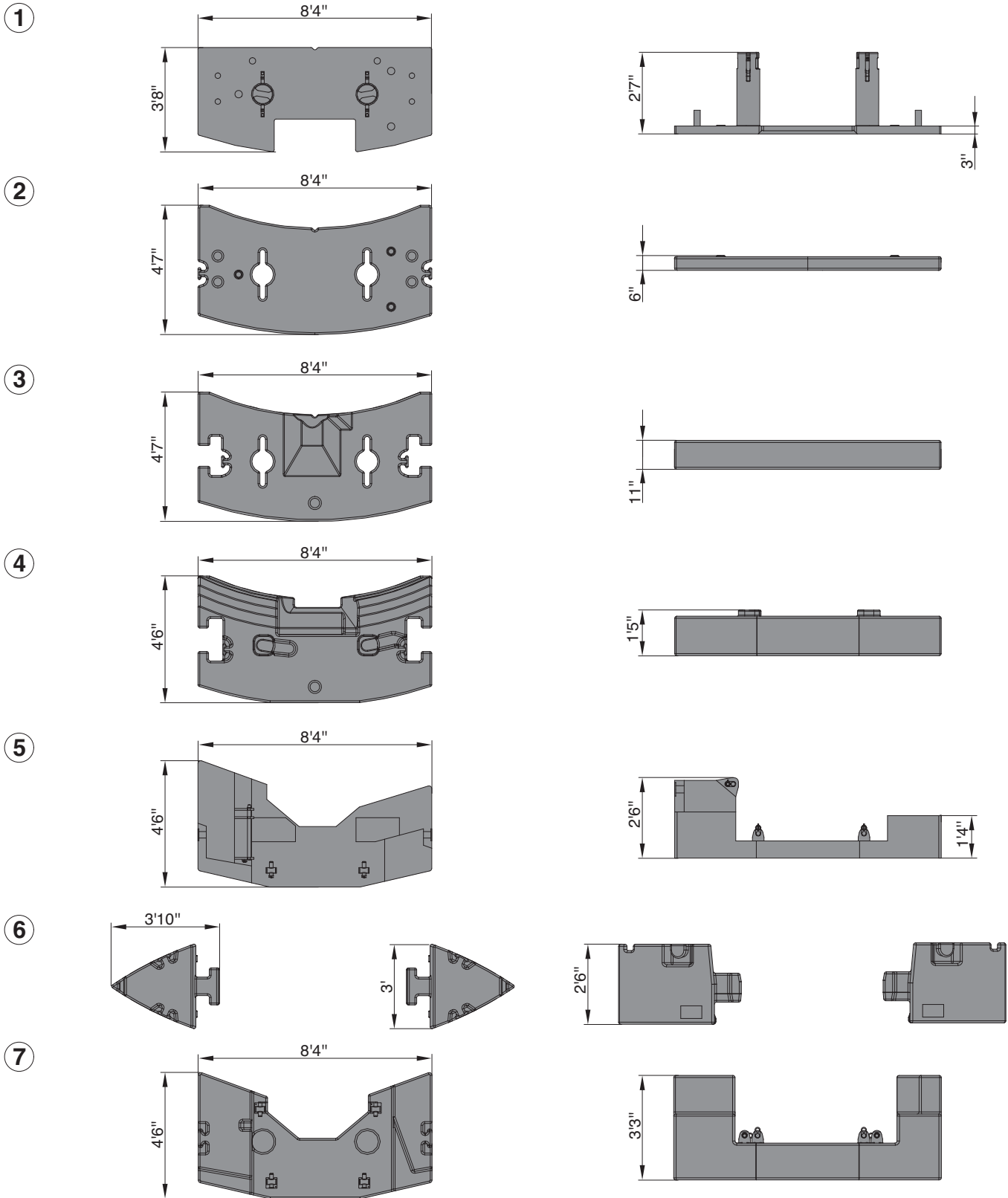


Configurations

lb	STANDARD											SPECIAL				
	4,000	9,500	9,500	13,400	19,000	20,000	29,500	33,000	42,500	44,500	54,000	22,500	26,500	32,000	42,500	54,000
① 4,000 lb	1		1	1	1	1	1	1	1	1	1		1	1	1	1
② 5,500 lb			1		1	1	1	1	1	1	1			1	1	1
③ 10,600 lb						1	1	1	1	1	1				1	1
④ 13,000 lb								1	1	1	1					
⑤ 9,500 lb		1		1	1		1		1		1					
⑥ 5,700 lb										1	1					1
⑥ 5,700 lb										1	1					1
⑦ 22,500 lb												1	1	1	1	1

Transportation

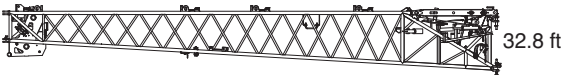
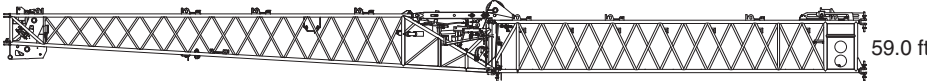
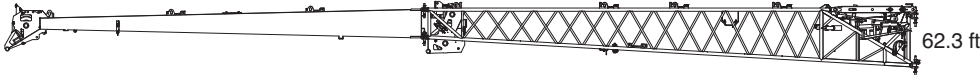
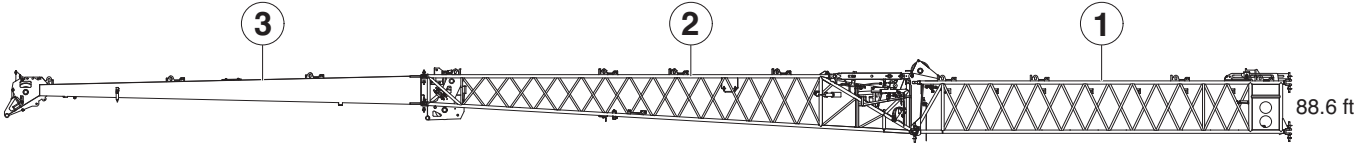
Counterweight



Transportation

Jib

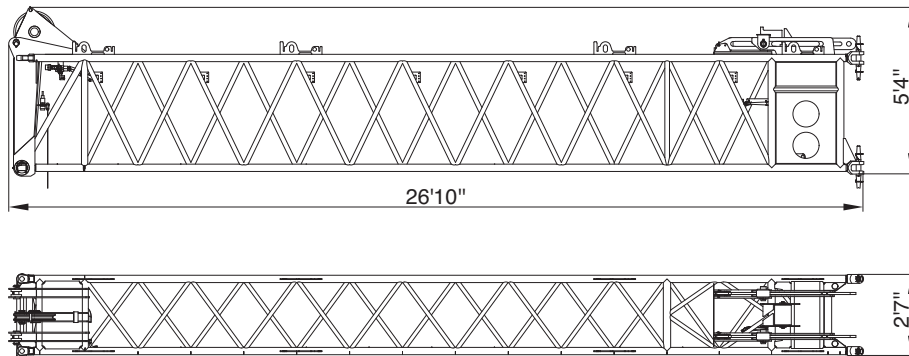
HAV / HAV-VA




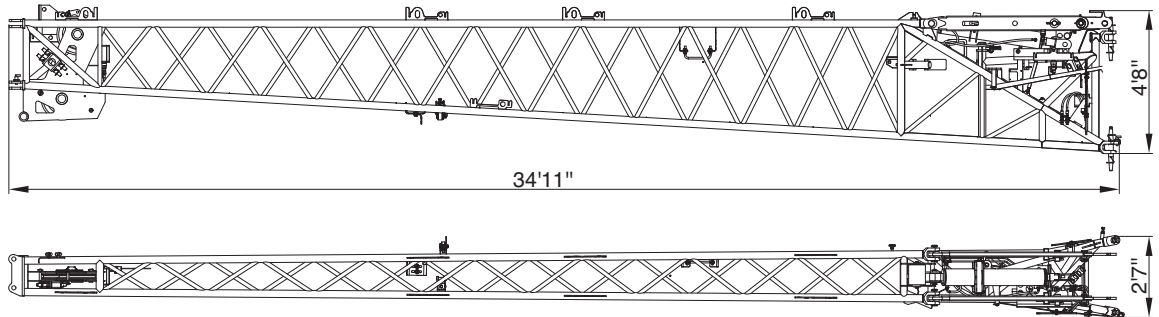
Transportation

Jib

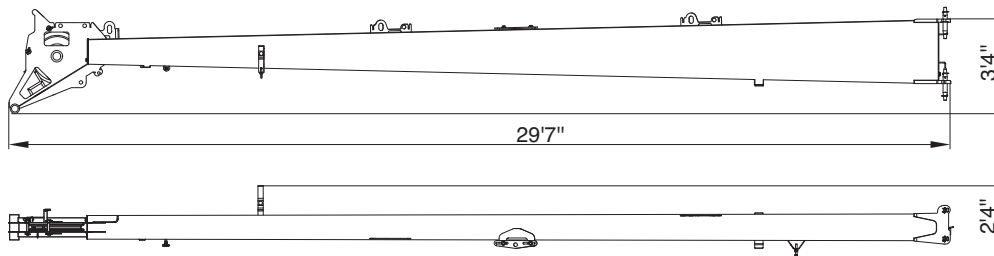
1  2,650



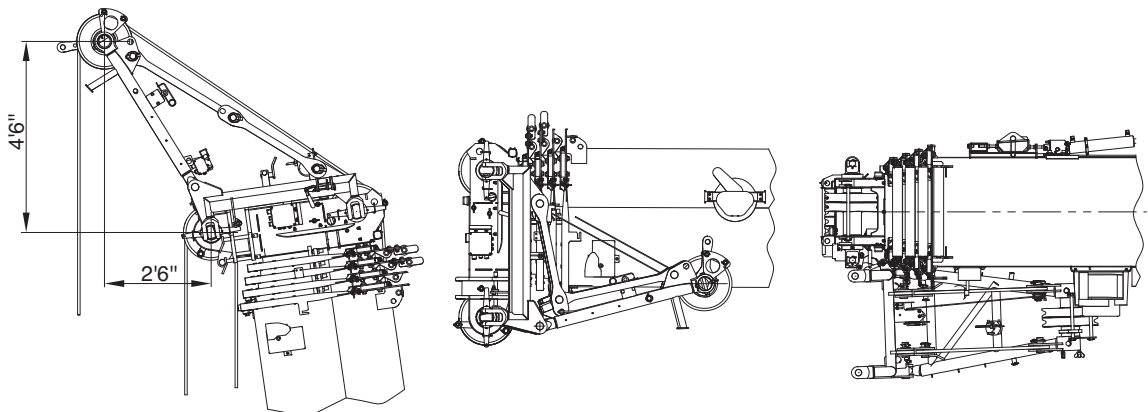
2  2,540 / 2,870 (HY)



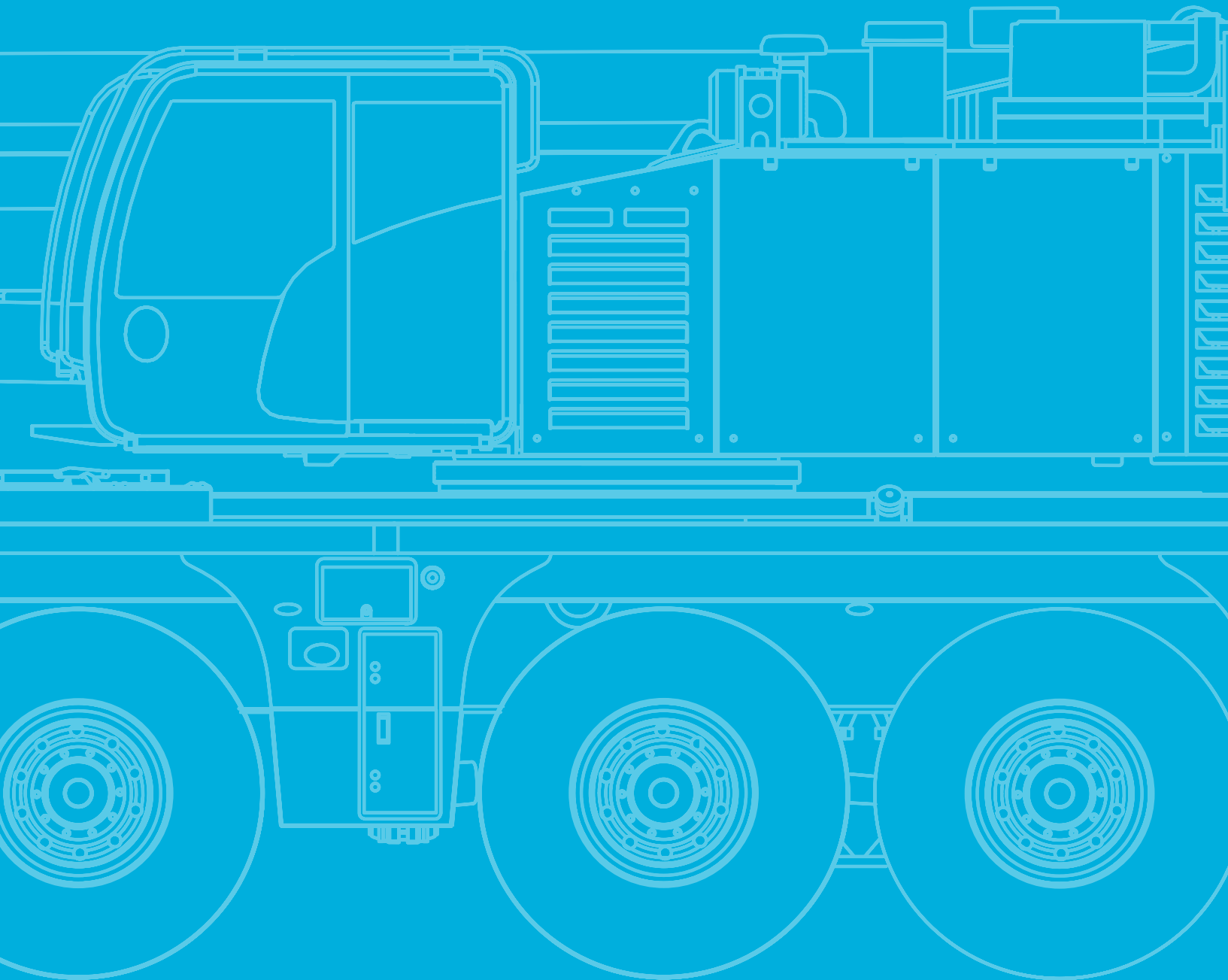
3  1,320



 770



TECHNICAL DATA FOR OPERATION



Operation

Main boom



HA50	approx. 490 s (39.4 – 164.4 ft)		approx. 60 s (0° - 82°)
HA60	approx. 590 s (39.4 – 194.9 ft)		approx. 60 s (0° - 82°)

Slewing

	1,9 min ⁻¹
--	-----------------------

Hoist

1	361 ft/min	14,500 lbf	0.72"	870 ft
2	361 ft/min	14,500 lbf	0.72"	870 ft

Outrigger cylinders

Max.	94,800 lb	134,500 lb
	22.4"	25.2"

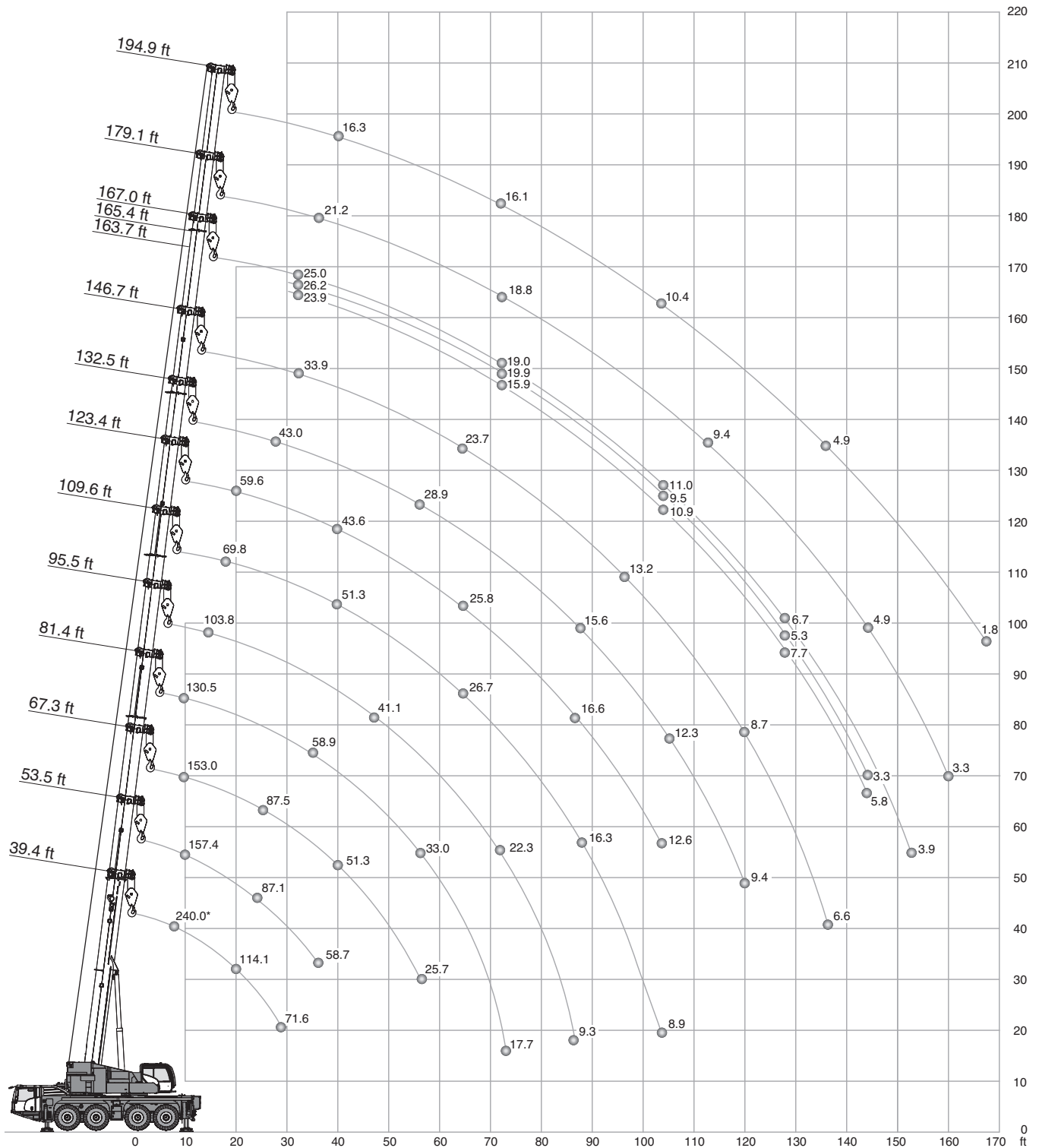
Hook Blocks



17,600 lb	15,000 lb	5	1	375 lb	3.3 ft
44,100 lb	29,500 lb	5	2	660 lb	5.9 ft
44,100 lb	44,100 lb	5	3	660 lb	5.9 ft
110,200 lb	58,600 lb	5	4	1,320 lb	5.9 ft
110,200 lb	73,000 lb	5	5	1,320 lb	5.9 ft
110,200 lb	87,100 lb	5	6	1,320 lb	5.9 ft
110,200 lb	101,200 lb	5	7	1,320 lb	5.9 ft
176,400 lb	114,900 lb	5	8	2,360 lb	6.6 ft
176,400 lb	128,800 lb	5	9	2,360 lb	6.6 ft
176,400 lb	142,200 lb	5	10	2,360 lb	6.6 ft
176,400 lb	155,700 lb	5 + 2	11	2,360 lb	6.6 ft
220,500 lb	169,100 lb	5 + 2	12	2,320 lb	6.6 ft
220,500 lb	176,400 lb	5 + 2	13	2,320 lb	6.6 ft

Operation

HA
(HA60)



* Max. crane capacity – with additional special equipment

Operation




HA
(HA60)




54,000 lb		26.6 ft x 23.6 ft														360°		ASME B30.5	
(0°)		(ft)																	
39.4		39.4	53.5	67.3	81.4	95.5	109.6	123.4	132.5	146.7	163.7	165.4	167.0	179.1	194.9				
ft	1,000 lb															ft			
8	240.0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8		
10	175.1	161.2	157.4	153.0	130.5	-	-	-	-	-	-	-	-	-	-	-	10		
12	160.1	145.0	143.8	139.6	127.0	-	-	-	-	-	-	-	-	-	-	-	12		
14	147.3	130.8	131.4	128.3	121.9	103.8	-	-	-	-	-	-	-	-	-	-	14		
16	135.8	118.5	119.4	118.5	116.1	97.8	-	-	-	-	-	-	-	-	-	-	16		
18	125.0	108.6	109.5	110.1	108.8	92.3	69.8	-	-	-	-	-	-	-	-	-	18		
20	114.1	99.4	101.3	101.6	101.1	87.2	68.4	59.6	-	-	-	-	-	-	-	-	20		
24	92.3	85.3	87.1	87.5	86.9	81.2	65.6	55.1	-	-	-	-	-	-	-	-	24		
28	71.6	67.1	76.1	76.5	75.9	74.8	62.3	51.9	43.0	-	-	-	-	-	-	-	28		
32	-	-	67.0	67.3	66.8	65.7	58.7	49.5	41.2	33.9	23.9	26.2	25.0	-	-	-	32		
36	-	-	58.7	59.0	58.9	59.0	55.2	46.6	39.6	33.0	23.6	26.2	24.9	21.2	-	-	36		
40	-	-	-	51.3	53.1	52.4	51.3	43.6	37.8	32.2	23.3	26.2	24.9	21.2	16.3	-	40		
48	-	-	-	41.8	41.7	41.1	39.6	37.0	33.3	29.8	21.9	25.9	24.3	21.2	16.3	-	48		
56	-	-	-	25.7	33.0	32.3	31.0	31.5	28.9	26.7	19.7	24.3	22.9	20.9	16.3	-	56		
64	-	-	-	-	26.9	26.1	26.7	25.8	24.5	23.7	17.7	22.1	20.9	20.1	16.3	-	64		
72	-	-	-	-	17.7	22.3	22.6	21.3	21.9	20.3	15.9	19.9	19.0	18.8	16.1	-	72		
80	-	-	-	-	-	19.7	19.2	18.7	18.3	18.0	14.3	16.7	17.2	17.1	15.5	-	80		
88	-	-	-	-	-	9.3	16.3	16.6	15.6	15.6	13.1	13.9	15.3	14.7	14.2	-	88		
96	-	-	-	-	-	-	14.1	14.5	13.8	13.2	12.0	11.5	13.0	12.8	12.3	-	96		
104	-	-	-	-	-	-	8.9	12.6	12.3	11.9	10.9	9.5	11.0	11.0	10.4	-	104		
112	-	-	-	-	-	-	-	-	10.7	10.3	10.1	7.9	9.4	9.4	8.7	-	112		
120	-	-	-	-	-	-	-	-	9.4	8.7	8.9	6.5	7.9	8.1	7.2	-	120		
128	-	-	-	-	-	-	-	-	-	7.7	7.7	5.3	6.7	6.8	5.9	-	128		
136	-	-	-	-	-	-	-	-	-	6.6	6.6	4.2	5.5	5.8	4.9	-	136		
144	-	-	-	-	-	-	-	-	-	-	5.8	3.3	4.7	4.9	4.0	-	144		
152	-	-	-	-	-	-	-	-	-	-	-	-	3.9	3.9	3.2	-	152		
160	-	-	-	-	-	-	-	-	-	-	-	-	-	3.3	2.5	-	160		
168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	-	168		

* Max. crane capacity – with additional special equipment

Operation

HA
(HA60)




42,500 lb		26.6 ft x 23.6 ft								360° / Max.*				ASME B30.5		
		360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	
ft	ft	39.4ft	39.4ft	53.5ft	53.5ft	67.3ft	67.3ft	81.4ft	81.4ft	95.5ft	95.5ft	109.6ft	109.6ft	123.4ft	123.4ft	ft
1,000 lb																
10	160.5	161.2	157.4	157.4	153.0	153.0	130.5	130.5	-	-	-	-	-	-	-	10
12	143.9	145.0	143.6	143.9	139.6	139.6	127.0	127.0	-	-	-	-	-	-	-	12
14	129.4	130.8	130.1	131.4	128.3	128.3	121.9	121.9	103.8	103.8	-	-	-	-	-	14
16	117.2	118.5	118.0	119.4	118.4	118.5	116.1	116.1	97.8	97.8	-	-	-	-	-	16
18	107.4	108.6	109.0	109.5	109.6	110.1	108.2	108.7	92.3	92.3	69.8	69.8	-	-	-	18
20	98.3	99.4	100.2	101.3	100.5	101.6	100.0	101.1	87.2	87.2	68.4	68.4	59.6	59.6	-	20
24	84.2	85.3	86.2	87.1	86.5	87.5	86.0	86.9	81.1	81.2	65.6	65.6	55.1	55.1	-	24
28	66.7	67.1	74.4	74.9	74.7	75.2	74.2	74.7	73.2	73.5	62.3	62.3	51.9	51.9	-	28
32	-	-	63.2	64.0	63.7	64.2	64.3	64.5	63.6	64.0	58.7	58.7	49.5	49.5	-	32
36	-	-	54.2	55.6	54.6	55.8	56.5	57.5	55.7	56.8	52.6	53.6	46.6	46.6	-	36
40	-	-	-	-	48.4	49.5	48.4	50.1	47.5	49.2	46.0	47.9	43.3	43.5	-	40
48	-	-	-	-	36.5	38.1	36.5	38.0	35.6	37.3	34.3	36.1	35.0	35.6	-	48
56	-	-	-	-	23.0	24.5	28.7	30.0	27.8	29.4	28.8	29.4	27.7	29.1	-	56
64	-	-	-	-	-	-	23.1	24.4	24.0	24.6	23.5	24.8	22.6	23.5	-	64
72	-	-	-	-	-	-	17.0	17.0	20.1	21.2	19.3	20.6	19.7	20.3	-	72
80	-	-	-	-	-	-	-	-	17.0	18.1	16.5	17.4	16.6	17.7	-	80
88	-	-	-	-	-	-	-	-	9.3	9.2	14.9	15.2	14.0	15.1	-	88
96	-	-	-	-	-	-	-	-	-	-	12.9	13.7	12.5	13.1	-	96
104	-	-	-	-	-	-	-	-	-	-	8.9	8.9	10.8	11.4	-	104




		360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	
ft	ft	132.5ft	132.5ft	146.7ft	146.7ft	163.7ft	163.7ft	165.4ft	165.4ft	167.0ft	167.0ft	179.1ft	179.1ft	194.9ft	194.9ft	ft
1,000 lb																
28	43.0	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	28
32	41.2	41.2	33.9	33.9	23.9	26.2	26.2	26.2	25.0	25.0	-	-	-	-	-	32
36	39.6	39.6	33.0	33.0	23.6	26.2	26.2	26.2	24.9	24.9	21.2	21.2	-	-	-	36
40	37.8	37.8	32.2	32.2	23.3	26.2	26.2	26.2	24.9	24.9	21.2	21.2	16.3	16.3	-	40
48	32.4	33.0	29.8	29.8	21.9	25.9	25.9	25.9	24.3	24.3	21.2	21.2	16.3	16.3	-	48
56	26.7	27.4	25.5	26.5	19.7	24.3	24.3	24.3	22.9	22.9	20.9	20.9	16.3	16.3	-	56
64	22.7	23.6	21.9	22.6	17.7	22.1	20.9	22.1	20.9	20.9	20.1	20.1	16.3	16.3	-	64
72	18.6	19.9	18.6	19.7	15.9	19.0	17.1	18.4	18.4	19.0	17.7	18.8	16.1	16.1	-	72
80	16.4	16.8	15.9	16.8	14.3	16.6	13.9	15.2	15.2	16.6	15.3	15.9	14.2	15.4	-	80
88	14.0	14.9	13.5	14.4	13.1	14.0	11.2	12.6	12.6	14.0	12.9	13.8	11.8	13.3	-	88
96	12.0	13.1	11.4	12.6	11.6	12.0	9.0	10.5	10.5	11.8	10.7	11.9	9.8	11.2	-	96
104	10.2	11.3	9.8	10.8	9.9	10.9	7.3	8.6	8.8	9.9	8.8	10.1	8.1	9.5	-	104
112	8.7	9.8	9.0	9.2	8.3	9.4	5.9	7.2	7.2	8.5	7.4	8.5	6.5	7.9	-	112
120	7.5	8.6	7.7	8.3	7.0	8.1	4.6	5.9	5.9	7.2	6.1	7.2	5.3	6.6	-	120
128	-	-	6.6	7.6	5.9	7.0	3.5	4.8	4.8	6.2	5.1	6.2	4.2	5.5	-	128
136	-	-	4.8	5.9	5.0	6.1	2.6	3.9	3.9	5.1	4.0	5.3	3.3	4.4	-	136
144	-	-	-	-	4.2	5.1	1.8	3.1	3.1	4.2	3.1	4.4	2.5	3.6	-	144
152	-	-	-	-	-	-	-	-	2.4	-	2.5	3.6	-	3.0	-	152
160	-	-	-	-	-	-	-	-	-	1.8	2.9	-	2.3	-	-	160

* Max. values are valid only for specific superstructure positions

Operation

HA
(HA60)

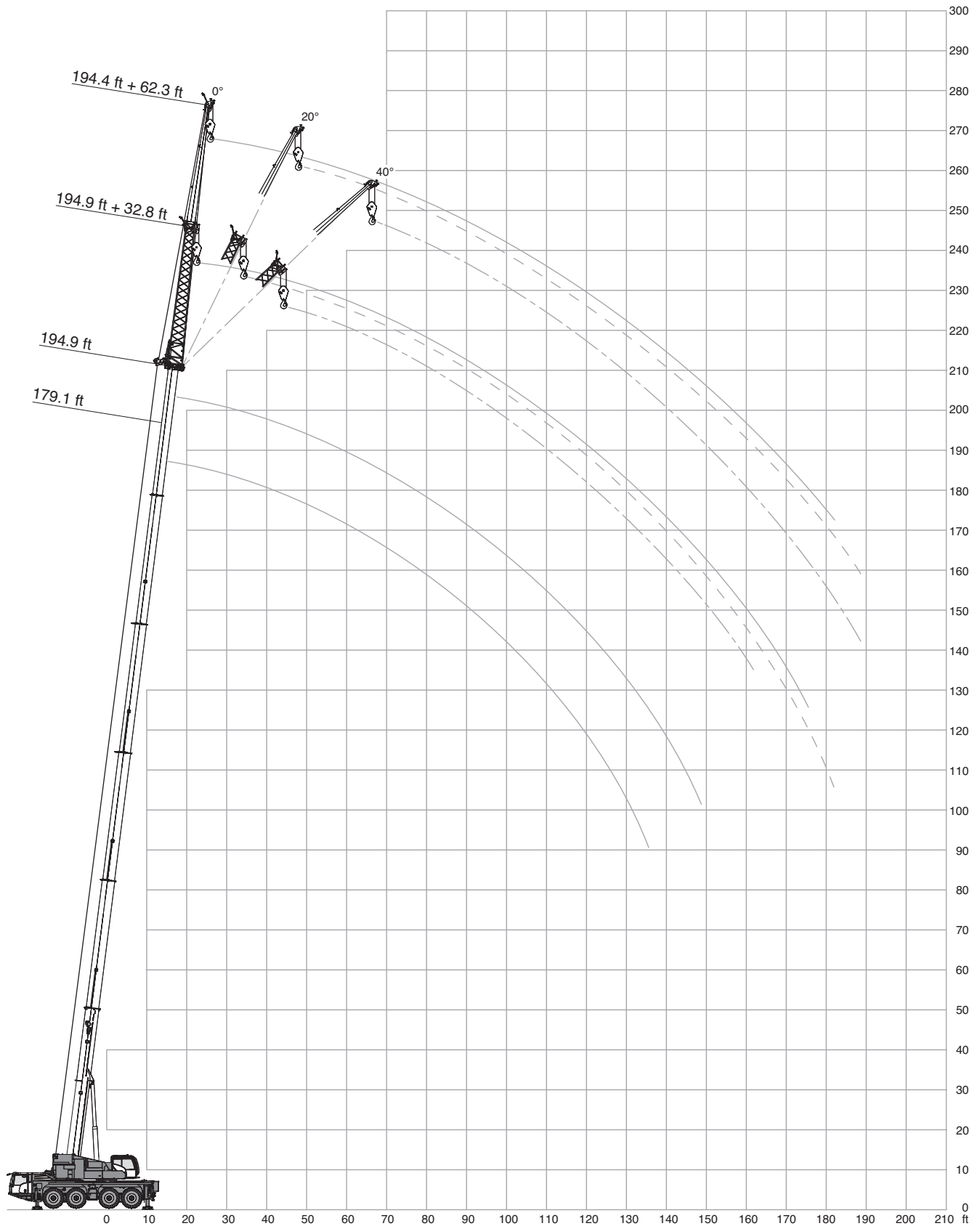
9,500 lb		26.6 ft x 23.6 ft								360° / Max.*				ASME B30.5		
		360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	
ft		39.4ft	39.4ft	53.5ft	53.5ft	67.3ft	67.3ft	81.4ft	81.4ft	95.5ft	95.5ft	109.6ft	109.6ft	123.4ft	123.4ft	ft
1,000 lb																
10	156.5	161.2	157.1	157.4	153.0	153.0	130.5	130.5	-	-	-	-	-	-	-	10
12	139.4	145.0	140.1	143.9	139.1	139.6	127.0	127.0	-	-	-	-	-	-	-	12
14	125.3	130.8	126.0	131.4	125.7	128.3	121.9	121.9	103.8	103.8	-	-	-	-	-	14
16	113.4	118.5	115.1	119.4	115.5	118.5	110.6	116.1	96.8	97.8	-	-	-	-	-	16
18	101.4	105.5	103.7	106.6	102.5	107.3	95.7	105.9	85.2	92.3	69.8	69.8	-	-	-	18
20	89.2	92.6	92.2	95.0	89.3	95.5	81.6	94.8	73.8	86.9	67.7	68.4	59.5	59.6	59.6	20
24	66.3	74.8	70.1	76.8	68.8	77.2	67.0	76.6	61.9	75.4	57.0	65.6	52.0	55.1	55.1	24
28	48.8	61.6	53.2	64.0	55.3	64.2	53.9	65.7	50.4	64.6	48.0	61.7	44.5	51.9	51.9	28
32	-	-	42.0	54.3	43.3	56.2	43.3	56.0	42.5	55.5	41.3	54.4	38.6	49.5	49.5	32
36	-	-	34.5	47.3	35.9	49.2	35.9	49.1	36.1	48.5	35.5	46.9	33.9	44.1	44.1	36
40	-	-	-	-	29.5	42.9	31.1	42.8	30.8	42.1	30.2	40.1	30.0	39.4	39.4	40
48	-	-	-	-	22.4	32.9	23.1	32.9	23.1	32.0	23.3	32.7	23.1	31.3	31.3	48
56	-	-	-	-	17.0	20.4	17.8	25.7	18.1	26.8	17.8	26.3	17.6	25.2	25.2	56
64	-	-	-	-	-	-	13.9	21.6	14.2	22.0	13.9	21.4	13.7	21.7	21.7	64
72	-	-	-	-	-	-	11.1	17.0	11.3	18.2	11.3	18.3	10.6	17.9	17.9	72
80	-	-	-	-	-	-	-	-	9.2	15.5	9.0	15.9	8.5	15.2	15.2	80
88	-	-	-	-	-	-	-	-	7.6	9.2	7.2	13.5	6.7	13.4	13.4	88
96	-	-	-	-	-	-	-	-	-	-	5.8	11.7	5.3	11.5	11.5	96
104	-	-	-	-	-	-	-	-	-	-	4.5	8.9	4.1	10.1	10.1	104

		360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	360°	Max.	
ft		132.5ft	132.5ft	146.7ft	146.7ft	163.7ft	163.7ft	165.4ft	165.4ft	167.0ft	167.0ft	179.1ft	179.1ft	194.9ft	194.9ft	ft
1,000 lb																
28	39.6	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	28
32	35.9	41.2	31.7	33.9	23.9	26.2	26.2	26.2	25.0	25.0	-	-	-	-	-	32
36	31.6	39.6	28.4	33.0	23.6	26.2	24.7	26.2	24.9	24.9	21.2	21.2	-	-	-	36
40	28.8	37.3	27.0	32.2	23.2	26.2	22.6	26.2	24.4	24.9	20.9	21.2	16.3	16.3	16.3	40
48	22.0	29.8	21.1	28.5	20.3	25.9	16.7	25.9	18.6	24.3	18.2	21.2	15.4	16.3	16.3	48
56	17.4	25.2	17.1	24.0	15.5	22.9	12.3	22.9	14.1	22.9	13.7	20.9	11.8	16.3	16.3	56
64	13.9	20.7	13.3	20.4	11.9	19.9	9.0	18.3	10.6	19.9	10.1	18.4	8.5	16.3	16.3	64
72	10.9	17.9	10.4	17.3	9.3	16.4	6.4	14.6	8.0	16.4	7.5	15.9	6.0	14.2	14.2	72
80	8.7	15.2	8.1	14.6	7.2	14.3	4.4	11.6	5.9	13.2	5.7	12.8	4.2	11.1	11.1	80
88	7.0	12.8	6.3	12.4	5.6	12.3	2.9	9.4	4.4	11.0	4.2	10.5	2.9	8.8	8.8	88
96	5.5	11.1	4.9	10.8	4.2	10.3	-	7.5	3.0	8.9	2.9	8.5	-	7.1	7.1	96
104	4.3	9.5	3.7	9.8	3.0	8.6	-	5.9	1.9	7.4	1.9	7.0	-	5.5	5.5	104
112	3.3	8.1	2.6	8.1	2.0	7.2	-	4.8	-	6.1	-	5.7	-	4.3	4.3	112
120	-	6.6	1.9	6.8	-	6.1	-	3.7	-	5.0	-	4.7	-	3.3	3.3	120
128	-	-	-	5.7	-	5.1	-	2.6	-	4.1	-	3.9	-	2.5	2.5	128
136	-	-	-	4.0	-	4.1	-	1.7	-	3.1	-	3.0	-	1.7	1.7	136
144	-	-	-	-	-	3.3	-	-	-	2.2	-	2.4	-	-	-	144

* Max. values are valid only for specific superstructure positions

Operation


HAV
(HA60)





Operation

HAV

(HA60)

54,000 lb		26.6 ft x 23.6 ft		360°			ASME B30.5						
 194.9 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°*		0°	20°	40°	0°	20°	40°
1,000 lb													
48	8.4	-	-	-	-	-	40	11.0	-	-	-	-	-
56	8.4	-	-	4.9	-	-	48	11.0	-	-	6.4	-	-
64	8.4	8.4	-	4.9	-	-	56	11.0	-	-	6.4	-	-
72	8.4	8.4	-	4.9	-	-	64	11.0	11.0	-	6.4	-	-
80	8.4	8.4	8.4	4.9	4.9	-	72	11.0	11.0	11.0	6.4	-	-
88	8.4	8.4	8.4	4.9	4.9	-	80	11.0	11.0	11.0	6.4	6.4	-
96	8.4	8.4	8.2	4.9	4.9	-	88	11.0	11.0	11.0	6.4	6.4	-
104	8.4	8.0	7.8	4.9	4.9	5.1	96	10.7	11.0	10.7	6.4	6.4	6.4
112	7.6	7.7	7.3	4.9	4.9	5.1	104	9.6	10.5	10.4	6.4	6.4	6.4
120	6.4	7.0	6.9	4.9	4.9	4.9	112	8.1	8.9	9.6	6.4	6.4	6.2
128	5.3	5.9	6.3	4.6	4.7	4.5	120	7.1	7.4	8.0	6.1	6.4	6.0
136	4.2	4.9	5.3	3.9	4.5	4.2	128	6.1	6.3	6.5	5.5	6.3	5.8
144	3.1	3.8	4.2	3.1	4.2	4.0	136	5.0	5.5	5.8	4.7	5.7	5.6
152	2.3	3.0	3.2	2.3	3.4	3.7	144	4.0	4.5	4.9	4.2	4.7	5.5
160	-	2.2	2.4	-	2.6	3.4	152	3.2	3.6	3.9	3.2	3.8	4.5
168	-	-	-	-	-	2.7	160	2.5	2.8	3.1	2.6	3.4	3.6
176	-	-	-	-	-	1.9	168	-	-	-	-	2.8	3.0
							176	-	-	-	-	2.1	2.5

 109.6 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°
1,000 lb													
20	29.1	-	-	-	-	-	10	29.1	-	-	21.1	-	-
24	28.7	-	-	14.7	-	-	12	29.1	-	-	20.9	-	-
28	28.2	-	-	14.6	-	-	14	29.1	-	-	20.8	-	-
32	27.7	-	-	14.4	-	-	16	29.1	29.1	-	20.6	-	-
36	27.1	24.4	-	14.2	-	-	18	29.1	29.1	-	20.3	-	-
40	26.6	23.2	19.1	14.1	-	-	20	29.1	28.9	-	20.0	-	-
48	25.4	21.1	18.0	13.8	-	-	24	29.1	26.6	-	19.2	-	-
56	23.9	19.5	16.8	13.4	12.1	-	28	29.1	24.5	20.1	18.5	-	-
64	21.8	18.1	16.0	13.1	11.6	-	32	28.9	22.8	19.2	17.6	-	-
72	19.9	16.8	15.2	12.8	11.0	8.6	36	26.9	21.5	18.4	16.7	13.5	-
80	17.7	15.7	14.5	12.3	10.3	8.3	40	24.6	20.3	17.8	15.7	12.7	-
88	15.0	14.9	13.9	11.6	9.7	8.1	48	21.1	18.3	16.9	13.8	11.6	-
96	13.2	13.4	13.4	10.8	9.2	7.9	56	18.5	17.1	-	12.2	10.4	9.2
104	11.7	11.7	12.0	10.2	8.9	7.7	64	-	-	-	11.0	9.6	8.7
112	10.0	10.5	-	9.4	8.3	7.7	72	-	-	-	9.9	9.1	8.2
120	8.8	8.9	-	8.7	7.9	7.4	80	-	-	-	9.2	8.6	-
128	8.2	4.5	-	7.8	7.6	7.3	88	-	-	-	8.6	-	-
136	4.1	-	-	6.9	7.1	7.3							
144	-	-	-	5.8	6.4	2.9							
152	-	-	-	5.0	4.5	-							
160	-	-	-	2.3	-	-							


 39.4 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°
1,000 lb													
10	29.1	-	-	21.1	-	-	10	29.1	-	-	21.1	-	-
12	29.1	-	-	20.9	-	-	12	29.1	-	-	20.9	-	-
14	29.1	-	-	20.8	-	-	14	29.1	-	-	20.8	-	-
16	29.1	29.1	-	20.6	-	-	16	29.1	29.1	-	20.6	-	-
18	29.1	29.1	-	20.3	-	-	18	29.1	29.1	-	20.3	-	-
20	29.1	28.9	-	20.0	-	-	20	29.1	28.9	-	20.0	-	-
24	29.1	26.6	-	19.2	-	-	24	29.1	26.6	-	19.2	-	-
28	29.1	24.5	20.1	18.5	-	-	28	29.1	24.5	20.1	18.5	-	-
32	28.9	22.8	19.2	17.6	-	-	32	28.9	22.8	19.2	17.6	-	-
36	26.9	21.5	18.4	16.7	13.5	-	36	26.9	21.5	18.4	16.7	13.5	-
40	24.6	20.3	17.8	15.7	12.7	-	40	24.6	20.3	17.8	15.7	12.7	-
48	21.1	18.3	16.9	13.8	11.6	-	48	21.1	18.3	16.9	13.8	11.6	-
56	18.5	17.1	-	12.2	10.4	9.2	56	18.5	17.1	-	12.2	10.4	9.2
64	-	-	-	11.0	9.6	8.7	64	-	-	-	11.0	9.6	8.7
72	-	-	-	9.9	9.1	8.2	72	-	-	-	9.9	9.1	8.2
80	-	-	-	9.2	8.6	-	80	-	-	-	9.2	8.6	-
88	-	-	-	8.6	-	-	88	-	-	-	8.6	-	-


 *191.9 ft


Operation

HAV

(HA60)

42,500 lb		26.6 ft x 23.6 ft		360°			ASME B30.5						
 194.9 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°*		0°	20°	40°	0°	20°	40°
1,000 lb													
48	8.4	-	-	-	-	-	40	11.0	-	-	-	-	-
56	8.4	-	-	4.9	-	-	48	11.0	-	-	6.4	-	-
64	8.4	8.4	-	4.9	-	-	56	11.0	-	-	6.4	-	-
72	8.4	8.4	-	4.9	-	-	64	11.0	11.0	-	6.4	-	-
80	8.4	8.4	8.4	4.9	4.9	-	72	11.0	11.0	11.0	6.4	-	-
88	8.4	8.4	8.4	4.9	4.9	-	80	11.0	11.0	11.0	6.4	6.4	-
96	8.0	8.4	8.2	4.9	4.9	-	88	10.6	11.0	11.0	6.4	6.4	-
104	6.8	7.6	7.8	4.9	4.9	5.1	96	9.1	10.1	10.6	6.4	6.4	6.4
112	5.4	6.3	7.2	4.8	4.9	5.1	104	8.1	8.4	9.2	6.4	6.4	6.4
120	4.2	5.0	5.7	3.7	4.8	4.9	112	6.6	7.2	7.4	5.5	6.4	6.2
128	3.3	4.0	4.6	2.8	4.3	4.5	120	5.4	6.1	6.4	5.0	5.9	6.0
136	2.4	3.0	3.5	1.9	3.3	4.2	128	4.2	4.8	5.4	4.1	4.8	5.7
144	1.6	2.2	2.7	-	2.5	3.8	136	3.3	3.9	4.2	3.3	4.2	5.0
152	-	-	-	-	-	3.0	144	2.5	2.9	3.3	2.5	3.6	4.0
160	-	-	-	-	-	2.2	152	-	2.1	2.3	-	2.8	3.4
							160	-	-	-	-	2.0	2.6

 109.6 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°
1,000 lb													
20	29.1	-	-	-	-	-	10	29.1	-	-	21.1	-	-
24	28.7	-	-	14.7	-	-	12	29.1	-	-	20.9	-	-
28	28.2	-	-	14.6	-	-	14	29.1	-	-	20.8	-	-
32	27.7	-	-	14.4	-	-	16	29.1	29.1	-	20.6	-	-
36	27.1	24.4	-	14.2	-	-	18	29.1	29.1	-	20.3	-	-
40	26.6	23.2	19.1	14.1	-	-	20	29.1	28.9	-	20.0	-	-
48	25.4	21.1	18.0	13.8	-	-	24	29.1	26.6	-	19.2	-	-
56	23.9	19.5	16.8	13.4	12.1	-	28	29.1	24.5	20.1	18.5	-	-
64	21.7	18.1	16.0	13.1	11.6	-	32	28.9	22.8	19.2	17.6	-	-
72	18.6	16.8	15.2	12.8	11.0	8.6	36	26.9	21.5	18.4	16.7	13.5	-
80	15.9	15.5	14.5	12.3	10.3	8.3	40	24.6	20.3	17.8	15.7	12.7	-
88	13.3	13.8	13.7	11.6	9.7	8.1	48	21.1	18.3	16.9	13.8	11.6	-
96	11.2	11.9	12.3	10.8	9.2	7.9	56	18.5	17.1	-	12.2	10.4	9.2
104	9.8	9.9	10.4	9.8	8.9	7.7	64	-	-	-	11.0	9.6	8.7
112	8.5	8.8	-	8.5	8.3	7.7	72	-	-	-	9.9	9.1	8.2
120	7.8	7.8	-	7.2	7.8	7.4	80	-	-	-	9.2	8.6	-
128	7.2	4.5	-	6.4	6.9	7.2	88	-	-	-	8.6	-	-
136	4.1	-	-	5.7	5.9	6.3							
144	-	-	-	4.9	5.3	2.9							
152	-	-	-	4.6	3.2	-							
160	-	-	-	2.3	-	-							




 39.4 ft													
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°
1,000 lb													
10	29.1	-	-	21.1	-	-	10	29.1	-	-	21.1	-	-
12	29.1	-	-	20.9	-	-	12	29.1	-	-	20.9	-	-
14	29.1	-	-	20.8	-	-	14	29.1	-	-	20.8	-	-
16	29.1	29.1	-	20.6	-	-	16	29.1	29.1	-	20.6	-	-
18	29.1	29.1	-	20.3	-	-	18	29.1	29.1	-	20.3	-	-
20	29.1	28.9	-	20.0	-	-	20	29.1	28.9	-	20.0	-	-
24	29.1	26.6	-	19.2	-	-	24	29.1	26.6	-	19.2	-	-
28	29.1	24.5	20.1	18.5	-	-	28	29.1	24.5	20.1	18.5	-	-
32	28.9	22.8	19.2	17.6	-	-	32	28.9	22.8	19.2	17.6	-	-
36	26.9	21.5	18.4	16.7	13.5	-	36	26.9	21.5	18.4	16.7	13.5	-
40	24.6	20.3	17.8	15.7	12.7	-	40	24.6	20.3	17.8	15.7	12.7	-
48	21.1	18.3	16.9	13.8	11.6	-	48	21.1	18.3	16.9	13.8	11.6	-
56	18.5	17.1	-	12.2	10.4	9.2	56	18.5	17.1	-	12.2	10.4	9.2
64	-	-	-	11.0	9.6	8.7	64	-	-	-	11.0	9.6	8.7
72	-	-	-	9.9	9.1	8.2	72	-	-	-	9.9	9.1	8.2
80	-	-	-	9.2	8.6	-	80	-	-	-	9.2	8.6	-
88	-	-	-	8.6	-	-	88	-	-	-	8.6	-	-




 *191.9 ft




Operation




HAV

(HA60)

9,500 lb		26.6 ft x 23.6 ft		360°			ASME B30.5		
 194.9 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
0° 20° 40° 0° 20° 40°*									
ft 1,000 lb									
48	8.4	-	-	-	-	-	-	-	-
56	8.4	-	-	4.9	-	-	-	-	-
64	6.7	8.2	-	4.9	-	-	-	-	-
72	4.5	6.2	-	3.6	-	-	-	-	-
80	2.7	4.2	5.7	-	4.6	-	-	-	-
88	-	2.6	3.9	-	3.2	-	-	-	-
96	-	-	2.4	-	-	-	-	-	-
104	-	-	-	-	-	-	2.8	-	-

 179.1 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
0° 20° 40° 0° 20° 40°									
ft 1,000 lb									
40	11.0	-	-	-	-	-	-	-	-
48	11.0	-	-	6.4	-	-	-	-	-
56	10.4	-	-	6.4	-	-	-	-	-
64	8.5	9.9	-	6.4	-	-	-	-	-
72	6.0	7.8	9.1	5.3	-	-	-	-	-
80	4.2	5.7	6.9	3.5	5.8	-	-	-	-
88	2.7	4.0	5.0	2.2	4.5	-	-	-	-
96	-	2.6	3.5	-	3.1	5.0	-	-	-
104	-	-	2.3	-	1.9	3.7	-	-	-
112	-	-	-	-	-	2.4	-	-	-

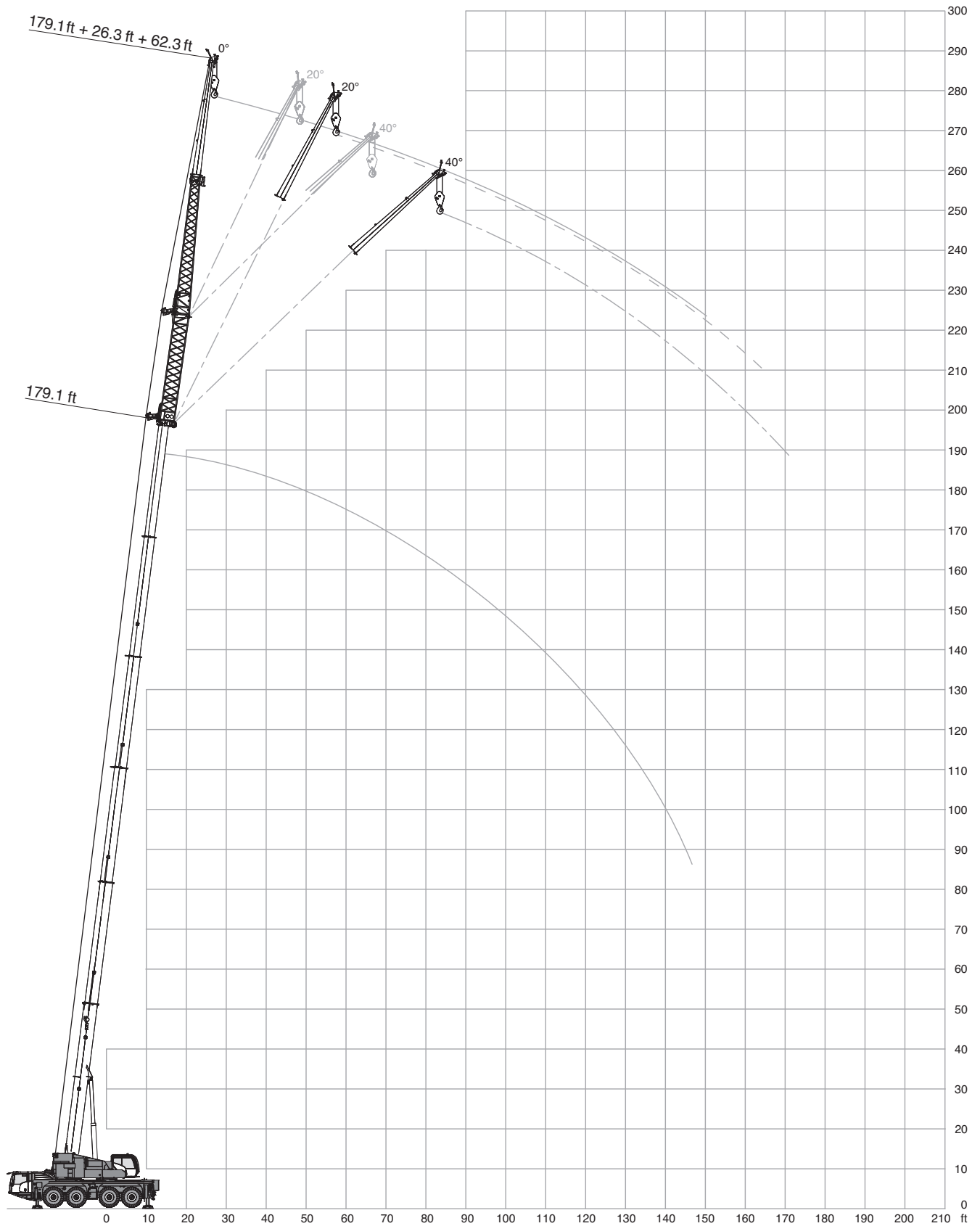
 109.6 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
0° 20° 40° 0° 20° 40°									
ft 1,000 lb									
20	29.1	-	-	-	-	-	-	-	-
24	28.7	-	-	14.7	-	-	-	-	-
28	28.2	-	-	14.6	-	-	-	-	-
32	27.7	-	-	14.4	-	-	-	-	-
36	27.0	24.4	-	14.2	-	-	-	-	-
40	26.2	23.2	19.1	14.1	-	-	-	-	-
48	21.3	20.8	18.0	13.8	-	-	-	-	-
56	17.3	17.8	16.8	13.4	12.1	-	-	-	-
64	14.0	14.6	15.0	12.3	11.6	-	-	-	-
72	11.1	11.9	12.4	10.8	11.0	8.6	-	-	-
80	8.9	9.8	10.3	9.2	9.9	8.3	-	-	-
88	7.2	7.8	8.4	7.5	8.4	8.1	-	-	-
96	5.6	6.2	6.7	5.9	6.9	7.7	-	-	-
104	4.3	5.0	5.2	4.8	5.9	6.4	-	-	-
112	3.3	3.7	-	3.7	4.8	5.5	-	-	-
120	2.5	2.8	-	2.9	3.7	4.4	-	-	-
128	-	2.0	-	2.1	2.8	3.3	-	-	-
136	-	-	-	-	1.9	2.4	-	-	-
144	-	-	-	-	-	1.6	-	-	-

 39.4 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
0° 20° 40° 0° 20° 40°									
ft 1,000 lb									
10	29.1	-	-	21.1	-	-	-	-	-
12	29.1	-	-	20.9	-	-	-	-	-
14	29.1	-	-	20.8	-	-	-	-	-
16	29.1	29.1	-	20.6	-	-	-	-	-
18	29.1	29.1	-	20.3	-	-	-	-	-
20	29.1	28.9	-	20.0	-	-	-	-	-
24	29.1	26.6	-	19.2	-	-	-	-	-
28	29.1	24.5	20.1	18.5	-	-	-	-	-
32	28.9	22.8	19.2	17.6	-	-	-	-	-
36	26.9	21.5	18.4	16.7	13.5	-	-	-	-
40	24.6	20.3	17.8	15.7	12.7	-	-	-	-
48	21.1	18.3	16.9	13.8	11.6	-	-	-	-
56	17.6	16.9	-	12.2	10.4	9.2	-	-	-
64	-	-	-	11.0	9.6	8.7	-	-	-
72	-	-	-	9.9	9.1	8.2	-	-	-
80	-	-	-	9.2	8.6	-	-	-	-
88	-	-	-	8.5	-	-	-	-	-

 *191.9 ft

Operation

HAV-VA
(HA60)



Operation

HAV-VA

(HA60)

54,000 lb		26.3 ft x 23.6 ft					360°		ASME B30.5		
194.9 ft							179.1 ft				
		26.3 ft							26.3 ft		
		0°	0°	0°	20°	40°			0°	0°	
		62.3 ft							62.3 ft		
		0°	20°	40°*	0°	0°			0°	0°	
ft	1,000 lb					ft	1,000 lb				
56	4.6	-	-	-	-	48	6.6	-	-	-	
64	4.6	-	-	-	-	56	6.6	-	-	-	
72	4.6	4.6	-	-	-	64	6.6	-	-	-	
80	4.6	4.6	5.1	-	-	72	6.6	6.6	-	-	
88	4.6	4.6	5.1	-	-	80	6.6	6.6	6.6	6.6	
96	4.6	4.6	5.1	-	-	88	6.5	6.6	6.6	6.6	
104	4.6	4.6	5.1	-	-	96	6.4	6.5	6.6	6.5	
112	4.6	4.6	5.0	-	-	104	6.4	6.4	6.6	6.4	
120	4.4	4.6	4.6	-	-	112	6.1	6.2	6.4	6.2	
128	3.5	4.2	4.2	-	-	120	5.3	6.0	6.3	6.1	
136	2.6	3.5	3.8	-	-	128	4.2	5.1	5.7	5.6	
144	1.8	2.5	3.3	-	-	136	3.8	4.0	4.7	4.7	
152	-	-	2.5	-	-	144	2.9	3.3	3.6	3.6	
						152	2.1	2.8	3.0	2.5	
						160	-	-	2.2	-	

109.6 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°	0°	0°
ft	1,000 lb					
24	18.4	-	-	-	-	
28	18.1	-	-	-	-	
32	17.7	-	-	-	-	
36	17.4	-	-	-	-	
40	17.2	16.9	-	-	-	
48	16.5	16.0	14.5	13.9	-	
56	15.9	15.0	13.5	13.1	-	
64	15.2	13.9	12.6	12.1	-	
72	14.1	12.6	11.7	11.3	9.5	
80	13.0	11.7	10.9	10.5	9.0	
88	11.8	10.8	10.2	9.7	8.5	
96	10.8	9.9	9.6	9.2	8.1	
104	10.0	9.3	9.1	8.7	7.7	
112	9.0	8.8	8.6	8.1	7.5	
120	7.7	8.1	7.9	7.7	7.2	
128	6.8	7.2	7.2	7.1	6.9	
136	5.8	6.0	2.3	6.2	6.5	
144	4.7	4.9	-	5.1	-	
152	4.3	-	-	-	-	



39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°	0°	0°
ft	1,000 lb					
10	29.1	-	-	-	-	
12	29.1	-	-	-	-	
14	29.1	-	-	-	-	
16	29.1	-	-	-	-	
18	28.9	-	-	-	-	
20	28.4	-	-	-	-	
24	25.6	21.9	-	-	-	
28	23.2	20.0	-	-	-	
32	20.9	18.4	16.8	16.3	-	
36	19.2	17.1	15.7	15.2	-	
40	17.6	15.9	14.6	14.2	-	
48	15.2	13.9	13.1	12.7	11.0	
56	13.4	12.4	11.9	11.4	10.0	
64	11.8	11.2	10.8	10.4	9.4	
72	10.6	10.2	10.2	9.5	8.8	
80	9.5	9.4	-	9.0	-	



 *191.9 ft



Operation



HAV-VA

(HA60)

42,500 lb		26.3 ft x 23.6 ft		360°		ASME B30.5	
 194.9 ft							
		26.3 ft		0°		40°	
		62.3 ft		0°		0°	
ft		1,000 lb					
56	4.6	-	-	-	-	-	-
64	4.6	-	-	-	-	-	-
72	4.6	4.6	-	-	-	-	-
80	4.6	4.6	5.1	-	-	-	-
88	4.6	4.6	5.1	-	-	-	-
96	4.6	4.6	5.1	-	-	-	-
104	4.6	4.6	5.1	-	-	-	-
112	3.7	4.6	5.0	-	-	-	-
120	2.6	3.5	4.4	-	-	-	-
128	-	2.5	3.4	-	-	-	-
136	-	-	2.4	-	-	-	-

 179.1 ft							
		26.3 ft		0°		40°	
		62.3 ft		0°		0°	
ft		1,000 lb					
48	6.6	-	-	-	-	-	-
56	6.6	-	-	-	-	-	-
64	6.6	-	-	-	-	-	-
72	6.6	6.6	-	-	-	-	-
80	6.6	6.6	6.6	6.6	-	-	-
88	6.5	6.6	6.6	6.6	6.6	-	-
96	6.4	6.5	6.6	6.5	6.5	6.5	6.5
104	5.6	6.4	6.6	6.4	6.0	-	-
112	5.0	5.4	6.3	6.1	5.7	-	-
120	3.9	4.4	5.0	4.8	5.7	-	-
128	2.9	3.6	4.1	3.7	5.0	-	-
136	1.9	2.7	3.3	2.7	3.8	-	-
144	-	1.8	2.5	1.8	2.7	-	-

 109.6 ft							
		26.3 ft		0°		40°	
		62.3 ft		0°		0°	
ft		1,000 lb					
24	18.4	-	-	-	-	-	-
28	18.1	-	-	-	-	-	-
32	17.7	-	-	-	-	-	-
36	17.4	-	-	-	-	-	-
40	17.2	16.9	-	-	-	-	-
48	16.5	16.0	14.5	13.9	-	-	-
56	15.9	15.0	13.5	13.1	-	-	-
64	15.2	13.9	12.6	12.1	-	-	-
72	14.1	12.6	11.7	11.3	9.5	-	-
80	13.0	11.7	10.9	10.5	9.0	-	-
88	11.6	10.8	10.2	9.7	8.5	-	-
96	10.5	9.9	9.6	9.2	8.1	-	-
104	9.0	9.1	9.1	8.7	7.7	-	-
112	7.4	8.1	8.3	7.9	7.5	-	-
120	6.2	6.7	7.0	7.0	7.1	-	-
128	5.5	5.5	5.6	5.7	6.3	-	-
136	4.7	5.0	2.3	5.0	5.0	-	-
144	4.2	4.2	-	4.2	-	-	-
152	3.7	-	-	-	-	-	-



 39.4 ft							
		26.3 ft		0°		40°	
		62.3 ft		0°		0°	
ft		1,000 lb					
10	29.1	-	-	-	-	-	-
12	29.1	-	-	-	-	-	-
14	29.1	-	-	-	-	-	-
16	29.1	-	-	-	-	-	-
18	28.9	-	-	-	-	-	-
20	28.4	-	-	-	-	-	-
24	25.6	21.9	-	-	-	-	-
28	23.2	20.0	-	-	-	-	-
32	20.9	18.4	16.8	16.3	-	-	-
36	19.2	17.1	15.7	15.2	-	-	-
40	17.6	15.9	14.6	14.2	-	-	-
48	15.2	13.9	13.1	12.7	11.0	-	-
56	13.4	12.4	11.9	11.4	10.0	-	-
64	11.8	11.2	10.8	10.4	9.4	-	-
72	10.6	10.2	10.2	9.5	8.8	-	-
80	9.5	9.4	-	9.0	-	-	-


 *191.9 ft


Operation

HAV-VA

(HA60)

9,500 lb		26.3 ft x 23.6 ft					360°		ASME B30.5				
 194.9 ft							 179.1 ft						
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		62.3 ft							62.3 ft				
		0°	20°	40°*	0°	0°			0°	20°	40°	0°	0°
ft		1,000 lb					ft		1,000 lb				
56	4.6	-	-	-	-	-	48	6.6	-	-	-	-	-
64	4.3	-	-	-	-	-	56	6.6	-	-	-	-	-
72	2.5	4.4	-	-	-	-	64	6.0	-	-	-	-	-
80	-	-	4.3	-	-	-	72	4.2	6.0	-	-	-	-
88	-	-	2.5	-	-	-	80	-	3.9	5.4	4.6	-	-
							88	-	2.4	3.6	3.0	-	-
							96	-	-	2.2	-	3.4	-
							104	-	-	-	-	-	1.9

 109.6 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°*	0°	0°
ft		1,000 lb				
24	18.4	-	-	-	-	-
28	18.1	-	-	-	-	-
32	17.7	-	-	-	-	-
36	17.4	-	-	-	-	-
40	17.2	16.9	-	-	-	-
48	16.4	16.0	14.5	13.9	-	-
56	14.6	14.8	13.5	13.1	-	-
64	12.3	13.2	12.6	12.1	-	-
72	9.9	11.1	11.5	11.0	9.5	-
80	8.3	8.7	9.8	9.6	9.0	-
88	6.5	7.3	7.5	7.5	8.1	-
96	4.9	5.8	6.4	6.1	6.9	-
104	3.7	4.4	4.8	4.8	5.5	-
112	2.6	3.2	3.7	3.5	4.3	-
120	-	2.2	2.6	2.5	3.1	-
128	-	-	-	-	2.1	-



 39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°*	0°	0°
ft		1,000 lb				
10	29.1	-	-	-	-	-
12	29.1	-	-	-	-	-
14	29.1	-	-	-	-	-
16	29.1	-	-	-	-	-
18	28.9	-	-	-	-	-
20	28.4	-	-	-	-	-
24	25.6	21.9	-	-	-	-
28	23.2	20.0	-	-	-	-
32	20.9	18.4	16.8	16.3	-	-
36	19.2	17.1	15.7	15.2	-	-
40	17.6	15.9	14.6	14.2	-	-
48	15.2	13.9	13.1	12.7	11.0	-
56	13.4	12.4	11.9	11.4	10.0	-
64	11.8	11.2	10.8	10.4	9.4	-
72	10.6	10.2	10.2	9.5	8.8	-
80	9.4	9.3	-	9.0	-	-


 *191.9 ft

Operation

HAV-VA

(HA60)

54,000 lb		26.3 ft x 23.6 ft					360°		ASME B30.5				
 179.1 ft							 109.6 ft						
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		32.8 ft							32.8 ft				
		0°	20°	40°*	0°*	0°**			0°	20°	40°	0°	0°
ft		1,000 lb					ft		1,000 lb				
56	3.5	-	-	-	-	-	32	10.1	-	-	-	-	-
64	3.5	-	-	-	-	-	36	10.0	-	-	-	-	-
72	3.5	-	-	-	-	-	40	9.9	-	-	-	-	-
80	3.5	3.5	-	-	-	-	48	9.6	-	-	-	-	-
88	3.5	3.5	-	5.0	-	-	56	9.4	-	-	-	-	-
96	3.5	3.5	-	4.9	-	-	64	9.1	8.9	-	-	-	-
104	3.3	3.5	5.1	4.9	-	-	72	8.8	8.4	-	7.5	-	-
112	3.3	3.3	4.9	4.6	4.6	-	80	8.6	7.9	7.0	7.2	-	-
120	3.3	3.3	4.9	4.6	4.4	-	88	8.3	7.4	6.7	6.7	5.4	-
128	3.3	3.3	4.9	4.6	4.3	-	96	7.9	7.0	6.5	6.3	5.2	-
136	2.8	3.3	4.9	4.5	4.2	-	104	7.3	6.6	6.2	6.0	4.9	-
144	2.0	3.1	4.6	4.0	4.2	-	112	6.8	6.2	5.7	5.7	4.8	-
152	-	2.5	3.6	3.2	3.9	-	120	6.3	5.8	5.4	5.2	4.6	-
160	-	-	2.7	2.2	3.3	-	128	5.9	5.4	5.2	5.0	4.4	-
							136	5.4	5.1	4.9	4.7	4.2	-
							144	4.9	4.9	4.6	4.4	4.2	-
							152	4.3	4.5	4.5	4.2	4.2	-
							160	3.5	4.0	4.2	4.1	4.0	-
							168	2.8	3.3	-	3.6	-	-
							176	2.5	2.5	-	2.8	-	-



 39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		32.8 ft				
		0°	20°	40°	0°	0°
ft		1,000 lb				
14	17.2	-	-	-	-	-
16	17.2	-	-	-	-	-
18	17.1	-	-	-	-	-
20	16.9	-	-	-	-	-
24	16.3	-	-	-	-	-
28	15.5	-	-	-	-	-
32	14.7	-	-	-	-	-
36	13.9	-	-	-	-	-
40	13.1	11.8	-	-	-	-
48	11.6	10.5	-	9.6	-	-
56	10.2	9.2	8.7	8.6	-	-
64	9.0	8.3	7.9	7.7	-	-
72	8.0	7.5	7.1	7.1	-	-
80	7.2	6.7	6.5	6.3	5.6	-
88	6.6	6.2	6.0	5.8	5.2	-
96	5.9	5.7	5.6	5.2	4.8	-
104	5.4	5.3	-	4.9	4.6	-
112	4.8	-	-	-	-	-


 *165.4 ft ** 151.6 ft

Operation

HAV-VA

(HA60)

42,500 lb		26.6 ft x 23.6 ft		360°		ASME B30.5							
 179.1 ft				 109.6 ft									
		26.3 ft		26.3 ft									
		0°	0°	0°	20°	40°							
		32.8 ft		32.8 ft									
		0°	20°	40°*	0°*	0°**							
		32.8 ft		32.8 ft									
		0°	20°	40°	0°	0°							
ft	1,000 lb						ft	1,000 lb					
56	3.5	-	-	-	-	-	32	10.1	-	-	-	-	-
64	3.5	-	-	-	-	-	36	10.0	-	-	-	-	-
72	3.5	-	-	-	-	-	40	9.9	-	-	-	-	-
80	3.5	3.5	-	-	-	-	48	9.6	-	-	-	-	-
88	3.5	3.5	-	5.0	-	-	56	9.4	-	-	-	-	-
96	3.5	3.5	-	4.9	-	-	64	9.1	8.9	-	-	-	-
104	3.3	3.5	5.1	4.9	-	-	72	8.8	8.4	-	7.5	-	-
112	3.3	3.3	4.9	4.6	4.6	-	80	8.6	7.9	7.0	7.2	-	-
120	2.8	3.3	4.9	4.6	4.4	-	88	8.3	7.4	6.7	6.7	5.4	-
128	-	3.2	4.7	4.2	4.3	-	96	7.9	7.0	6.5	6.3	5.2	-
136	-	2.4	4.0	3.1	4.2	-	104	7.3	6.6	6.2	6.0	4.9	-
144	-	1.6	2.9	2.2	4.0	-	112	6.8	6.2	5.7	5.7	4.8	-
152	-	-	-	-	2.9	-	120	6.2	5.8	5.4	5.2	4.6	-



 39.4 ft		26.3 ft		26.3 ft			
		0°	0°	0°	20°	40°	
		32.8 ft		32.8 ft			
		0°	20°	40°	0°	0°	
ft	1,000 lb						
14	17.2	-	-	-	-	-	
16	17.2	-	-	-	-	-	
18	17.1	-	-	-	-	-	
20	16.9	-	-	-	-	-	
24	16.3	-	-	-	-	-	
28	15.5	-	-	-	-	-	
32	14.7	-	-	-	-	-	
36	13.9	-	-	-	-	-	
40	13.1	11.8	-	-	-	-	
48	11.6	10.5	-	9.6	-	-	
56	10.2	9.2	8.7	8.6	-	-	
64	9.0	8.3	7.9	7.7	-	-	
72	8.0	7.5	7.1	7.1	-	-	
80	7.2	6.7	6.5	6.3	5.6	-	
88	6.6	6.2	6.0	5.8	5.2	-	
96	5.9	5.7	5.6	5.2	4.8	-	
104	5.4	5.3	-	4.9	4.6	-	
112	4.8	-	-	-	-	-	


 *165.4 ft **151.6 ft

Operation

HAV-VA

(HA60)

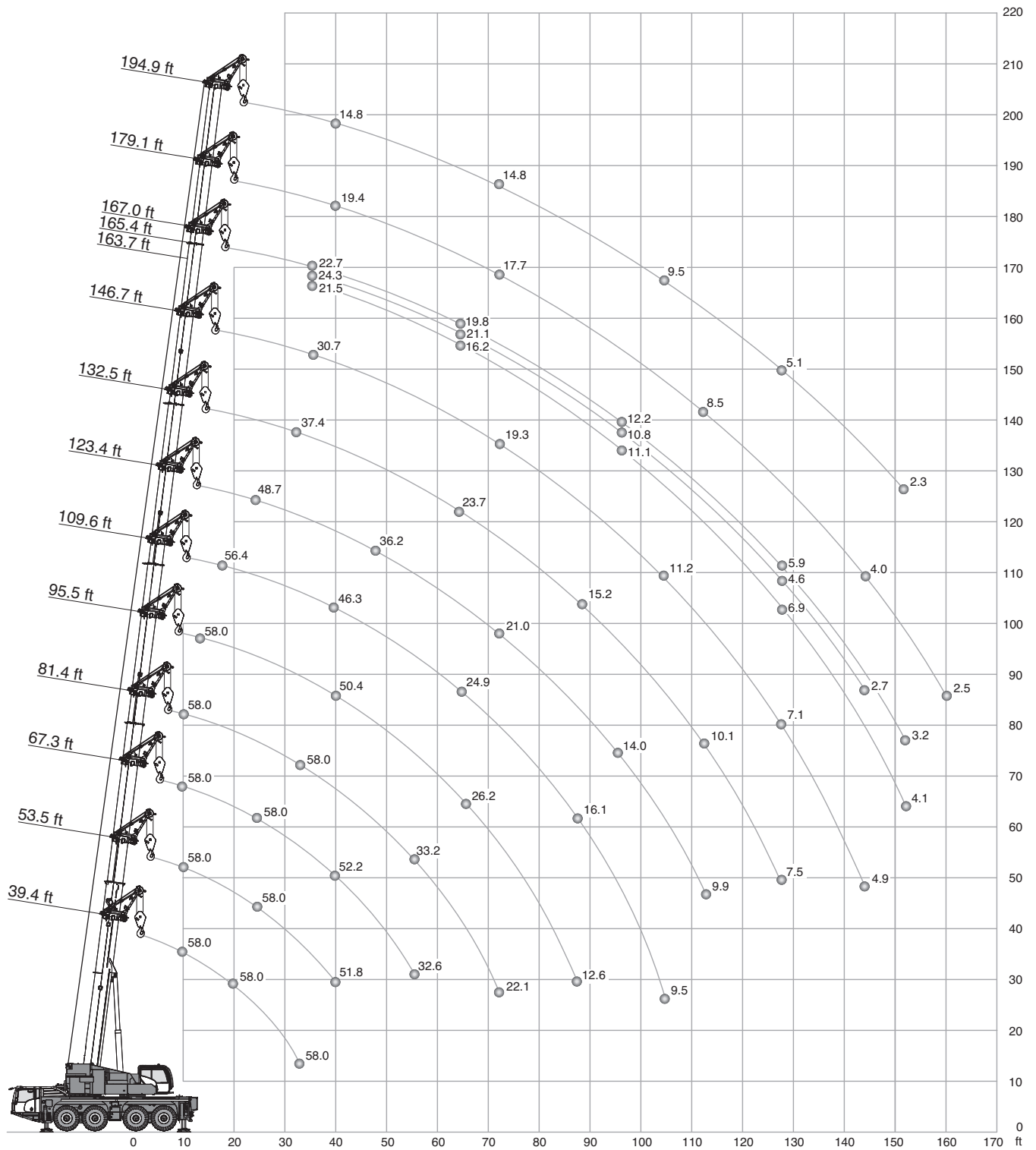
9,500 lb		26.6 ft x 23.6 ft					360°		ASME B30.5					
 179.1 ft							 109.6 ft							
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		32.8 ft							32.8 ft					
		0°	20°	40°*	0°*	0°**			0°	20°	40°	0°	0°	
ft	1,000 lb													
56	3.5	-	-	-	-	-			32	10.1	-	-	-	-
64	3.5	-	-	-	-	-			36	10.0	-	-	-	-
72	2.7	-	-	-	-	-			40	9.9	-	-	-	-
80	-	3.4	-	-	-	-			48	9.6	-	-	-	-
88	-	2.4	-	3.9	-	-			56	9.4	-	-	-	-
96	-	-	-	2.4	-	-			64	9.1	8.9	-	-	-
104	-	-	2.2	-	-	-			72	8.4	8.4	-	7.5	-
112	-	-	-	-	2.8	-			80	7.2	7.8	7.0	7.2	-
									88	6.0	7.1	6.7	6.7	5.4
									96	4.8	6.0	6.5	6.0	5.2
									104	3.7	4.7	6.0	5.2	4.9
									112	2.8	4.1	4.8	3.9	4.8
									120	-	3.1	3.5	2.9	3.9
									128	-	2.1	2.5	2.1	2.6

 39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		32.8 ft				
		0°	20°	40°*	0°*	0°*
ft	1,000 lb					
14	17.2	-	-	-	-	-
16	17.2	-	-	-	-	-
18	17.1	-	-	-	-	-
20	16.9	-	-	-	-	-
24	16.3	-	-	-	-	-
28	15.5	-	-	-	-	-
32	14.7	-	-	-	-	-
36	13.9	-	-	-	-	-
40	13.1	11.8	-	-	-	-
48	11.6	10.5	-	9.6	-	-
56	10.2	9.2	8.7	8.6	-	-
64	9.0	8.3	7.9	7.7	-	-
72	8.0	7.5	7.1	7.1	-	-
80	7.2	6.7	6.5	6.3	5.6	-
88	6.6	6.2	6.0	5.8	5.2	-
96	5.9	5.7	5.6	5.2	4.8	-
104	5.4	5.3	-	4.9	4.6	-
112	4.8	-	-	-	-	-

 *165.4 ft **151.6 ft

Operation

MS
(HA60)



Operation

MS






(HA60)

54,000 lb		26.6 ft x 23.6 ft														360°		ASME B30.5	
		(ft)																	
		39.4	53.5	67.3	81.4	95.5	109.6	123.4	132.5	146.7	163.7	165.4	167.0	179.1	194.9				
ft		1,000 lb														ft			
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	10		
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	12		
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	14		
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	16		
18	58.0	58.0	58.0	58.0	58.0	58.0	56.4	-	-	-	-	-	-	-	-	-	18		
20	58.0	58.0	58.0	58.0	58.0	58.0	56.0	-	-	-	-	-	-	-	-	-	20		
24	58.0	58.0	58.0	58.0	58.0	58.0	53.5	48.7	-	-	-	-	-	-	-	-	24		
28	58.0	58.0	58.0	58.0	58.0	58.0	51.4	46.7	-	-	-	-	-	-	-	-	28		
32	58.0	58.0	58.0	58.0	58.0	58.0	49.7	44.8	37.4	-	-	-	-	-	-	-	32		
36	-	55.4	55.6	55.3	54.8	48.1	43.0	36.5	30.7	21.5	24.3	22.7	-	-	-	-	36		
40	-	51.8	52.2	51.5	50.4	46.3	41.1	35.6	29.7	21.3	24.2	22.7	19.4	14.8	-	-	40		
48	-	-	40.6	40.0	41.3	39.9	36.2	31.9	28.3	19.8	23.9	22.4	19.4	14.8	-	-	48		
56	-	-	32.6	33.2	32.4	31.0	30.1	28.1	25.5	17.9	22.9	21.6	19.4	14.8	-	-	56		
64	-	-	-	26.9	26.2	24.9	24.9	23.7	22.8	16.2	21.1	19.8	18.7	14.8	-	-	64		
72	-	-	-	22.1	21.5	21.6	21.0	19.9	19.3	14.6	19.0	17.9	17.7	14.8	-	-	72		
80	-	-	-	-	18.3	18.9	17.6	18.1	16.7	13.3	16.2	16.3	16.2	14.2	-	-	80		
88	-	-	-	-	12.6	16.1	15.6	15.2	14.8	12.2	13.2	14.5	13.9	13.3	-	-	88		
96	-	-	-	-	-	13.7	14.0	12.9	12.6	11.1	10.8	12.2	11.9	11.5	-	-	96		
104	-	-	-	-	-	9.5	12.1	11.8	11.2	10.2	8.8	10.2	10.4	9.5	-	-	104		
112	-	-	-	-	-	-	9.9	10.1	9.6	9.2	7.2	8.5	8.5	7.8	-	-	112		
120	-	-	-	-	-	-	-	8.7	8.1	8.1	5.9	7.2	7.2	6.3	-	-	120		
128	-	-	-	-	-	-	-	7.5	7.1	6.9	4.6	5.9	5.9	5.1	-	-	128		
136	-	-	-	-	-	-	-	-	6.5	5.9	3.5	4.9	4.9	4.0	-	-	136		
144	-	-	-	-	-	-	-	-	4.9	4.9	2.7	4.0	4.0	3.1	-	-	144		
152	-	-	-	-	-	-	-	-	-	4.1	-	3.2	3.2	2.3	-	-	152		
160	-	-	-	-	-	-	-	-	-	-	-	-	2.5	-	-	-	160		

Operation

MS






(HA60)

 42,500 lb		 26.6 ft x 23.6 ft										360°				ASME B30.5	
 		39.4	53.5	67.3	81.4	95.5	109.6	123.4	132.5	146.7	163.7	165.4	167.0	179.1	194.9		
ft		(ft)														ft	
		1,000 lb															
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	10
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	12
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	14
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	16
18	58.0	58.0	58.0	58.0	58.0	58.0	56.4	-	-	-	-	-	-	-	-	-	18
20	58.0	58.0	58.0	58.0	58.0	58.0	56.0	-	-	-	-	-	-	-	-	-	20
24	58.0	58.0	58.0	58.0	58.0	58.0	53.5	48.7	-	-	-	-	-	-	-	-	24
28	58.0	58.0	58.0	58.0	58.0	58.0	51.4	46.7	-	-	-	-	-	-	-	-	28
32	58.0	58.0	58.0	58.0	58.0	58.0	49.7	44.8	37.4	-	-	-	-	-	-	-	32
36	-	53.2	53.3	52.9	52.2	48.1	43.0	36.5	30.7	21.5	24.3	22.7	-	-	-	-	36
40	-	47.0	47.3	46.6	47.1	45.8	40.9	35.6	29.7	21.3	24.2	22.7	19.4	14.8	-	-	40
48	-	-	35.9	36.9	36.1	34.5	33.8	31.5	28.3	19.8	23.9	22.4	19.4	14.8	-	-	48
56	-	-	29.0	28.8	28.1	27.1	26.6	25.9	24.9	17.9	22.9	21.6	19.4	14.8	-	-	56
64	-	-	-	23.2	22.4	22.9	22.0	21.8	20.8	16.2	20.3	19.8	18.7	14.8	-	-	64
72	-	-	-	19.0	19.7	19.0	18.6	18.2	18.1	14.6	16.4	17.7	17.0	14.8	-	-	72
80	-	-	-	-	16.8	15.9	16.3	15.4	15.1	13.3	13.2	14.6	14.0	13.3	-	-	80
88	-	-	-	-	9.9	14.1	13.7	13.5	13.1	12.2	10.5	12.0	12.0	10.9	-	-	88
96	-	-	-	-	-	12.3	11.7	11.4	10.8	10.7	8.4	9.8	9.8	8.9	-	-	96
104	-	-	-	-	-	8.0	10.3	9.7	9.1	9.0	6.6	7.9	7.9	7.3	-	-	104
112	-	-	-	-	-	-	8.8	8.1	8.1	7.4	5.0	6.5	6.5	5.7	-	-	112
120	-	-	-	-	-	-	-	6.8	7.0	6.1	3.9	5.3	5.3	4.4	-	-	120
128	-	-	-	-	-	-	-	5.7	5.8	5.1	2.8	4.2	4.2	3.3	-	-	128
136	-	-	-	-	-	-	-	-	4.9	4.1	1.8	3.1	3.3	2.4	-	-	136
144	-	-	-	-	-	-	-	-	3.3	3.3	-	2.2	2.5	-	-	-	144
152	-	-	-	-	-	-	-	-	-	2.6	-	-	-	-	-	-	152

Operation

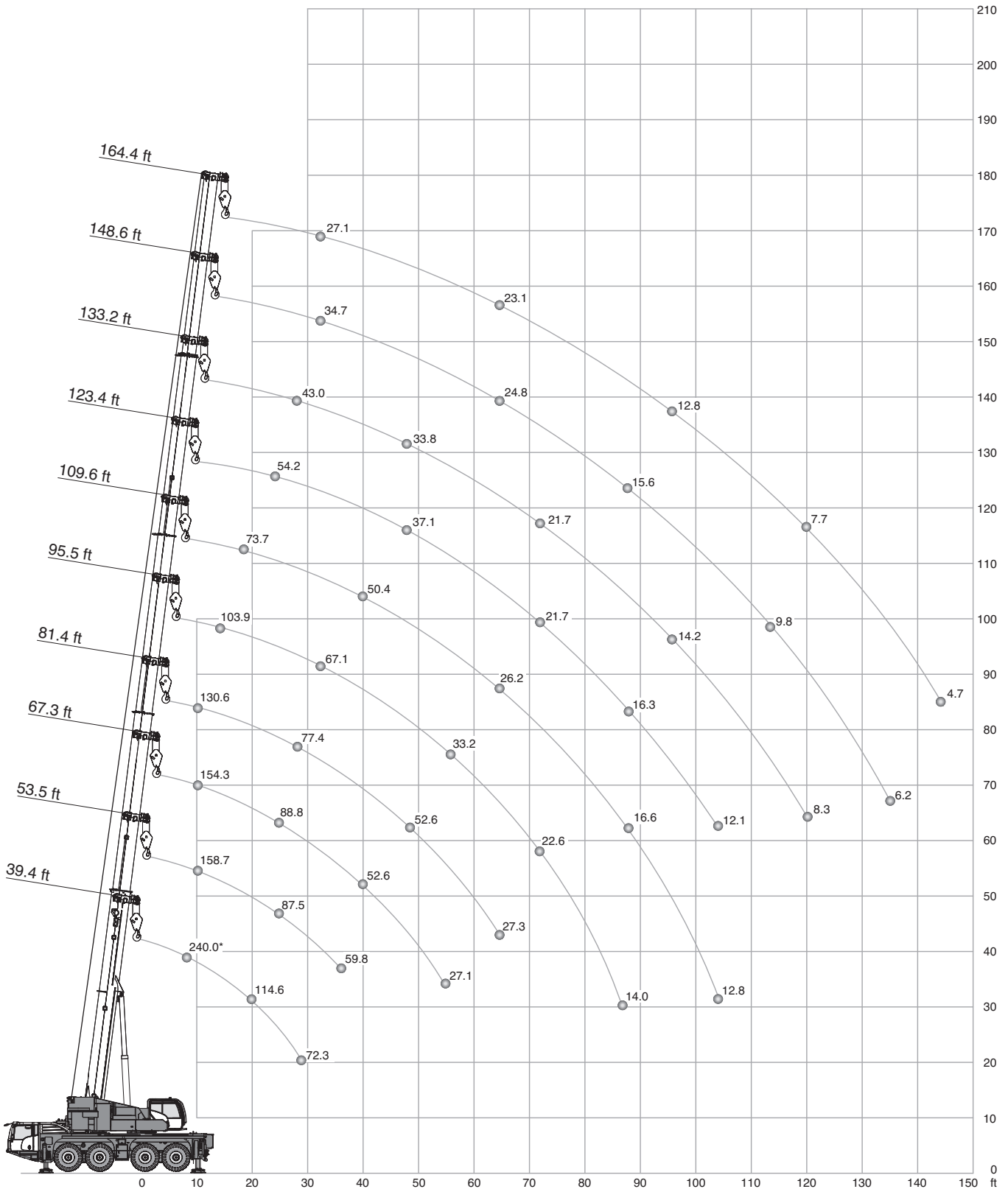
MS

(HA60)

 9,500 lb		 26.6 ft x 23.6 ft												360°		ASME B30.5	
 		39.4	53.5	67.3	81.4	95.5	109.6	123.4	132.5	146.7	163.7	165.4	167.0	179.1	194.9		
ft		(ft)														ft	
		1,000 lb															
10	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	-	10
12	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	-	12
14	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	14
16	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	-	-	-	-	-	16
18	58.0	58.0	58.0	58.0	58.0	56.4	-	-	-	-	-	-	-	-	-	-	18
20	58.0	58.0	58.0	58.0	58.0	56.0	-	-	-	-	-	-	-	-	-	-	20
24	57.9	58.0	58.0	57.2	56.9	52.6	48.1	-	-	-	-	-	-	-	-	-	24
28	51.5	52.9	53.0	52.4	50.2	46.9	42.8	36.0	-	-	-	-	-	-	-	-	28
32	39.8	42.2	43.7	44.0	41.7	39.8	37.3	34.1	27.8	-	-	-	-	-	-	-	32
36	-	35.2	36.8	36.5	35.3	34.1	32.4	30.5	26.6	21.5	23.4	22.7	-	-	-	-	36
40	-	29.1	30.2	29.9	30.6	30.2	28.8	27.5	24.9	21.3	22.0	22.3	19.2	14.8	-	-	40
48	-	-	22.0	23.1	22.9	22.9	22.9	21.3	19.8	19.1	15.9	17.7	17.1	14.1	-	-	48
56	-	-	17.2	17.6	17.9	17.6	17.4	16.5	16.3	14.8	11.6	13.3	12.8	11.0	-	-	56
64	-	-	-	13.8	13.9	13.7	13.3	13.4	12.6	11.2	8.3	9.9	9.4	7.7	-	-	64
72	-	-	-	10.9	10.9	10.9	10.2	10.4	9.8	8.4	5.6	7.1	6.7	5.1	-	-	72
80	-	-	-	-	8.7	8.5	8.1	8.1	7.4	6.4	3.7	5.0	4.8	3.3	-	-	80
88	-	-	-	-	7.0	6.7	6.3	6.3	5.6	4.7	-	3.5	3.3	-	-	-	88
96	-	-	-	-	-	5.3	4.8	4.8	4.2	3.4	-	2.2	2.0	-	-	-	96
104	-	-	-	-	-	3.9	3.5	3.7	3.0	2.3	-	-	-	-	-	-	104
112	-	-	-	-	-	-	2.6	2.6	-	-	-	-	-	-	-	-	112

Operation



HA
(HA50)



* Max. crane capacity – with additional special equipment

Operation

HA
(HA50)

54,000 lb		26.6 ft x 23.6 ft					360°					ASME B30.5		
		(0°)												
39.4		39.4	53.5	67.3	81.4	95.5	109.6	123.4	133.2	148.6	164.4			
ft		1,000 lb											ft	
8	240.0*	-	-	-	-	-	-	-	-	-	-	-	8	
10	175.2	162.1	158.7	154.3	130.6	-	-	-	-	-	-	-	10	
12	160.3	145.9	145.0	140.9	127.1	-	-	-	-	-	-	-	12	
14	147.4	131.7	132.6	129.7	118.3	103.9	-	-	-	-	-	-	14	
16	136.2	119.4	120.5	119.8	113.8	99.1	-	-	-	-	-	-	16	
18	125.5	109.6	110.7	110.4	108.4	93.8	73.7	-	-	-	-	-	18	
20	114.6	100.4	101.6	102.9	102.5	88.7	70.3	-	-	-	-	-	20	
24	93.0	86.2	87.5	88.8	88.4	82.0	66.6	54.2	-	-	-	-	24	
28	72.3	68.2	77.3	77.8	77.4	76.1	62.1	51.8	43.0	-	-	-	28	
32	-	-	68.1	68.6	68.0	67.1	57.6	49.4	41.2	34.7	27.1	-	32	
36	-	-	59.8	60.4	59.8	58.8	54.2	46.3	39.7	33.9	27.1	-	36	
40	-	-	-	52.6	52.2	51.1	50.4	43.2	38.0	33.1	27.1	-	40	
48	-	-	-	41.2	40.5	40.0	40.5	37.1	33.8	30.8	26.8	-	48	
56	-	-	-	27.1	32.0	33.2	31.9	31.8	29.6	27.8	25.2	-	56	
64	-	-	-	-	27.3	27.1	26.2	26.3	25.7	24.8	23.1	-	64	
72	-	-	-	-	19.4	22.6	22.8	21.7	21.7	21.4	20.8	-	72	
80	-	-	-	-	-	19.5	19.4	18.9	18.3	18.3	17.8	-	80	
88	-	-	-	-	-	14.0	16.6	16.3	16.0	15.6	15.1	-	88	
96	-	-	-	-	-	-	14.5	14.1	14.2	13.4	12.8	-	96	
104	-	-	-	-	-	-	12.8	12.1	12.4	11.5	10.8	-	104	
112	-	-	-	-	-	-	-	-	10.7	9.8	9.2	-	112	
120	-	-	-	-	-	-	-	-	8.3	8.3	7.7	-	120	
128	-	-	-	-	-	-	-	-	-	7.3	6.6	-	128	
136	-	-	-	-	-	-	-	-	-	6.2	5.5	-	136	
144	-	-	-	-	-	-	-	-	-	-	4.7	-	144	

* Max. crane capacity – with additional special equipment

Operation

HA
(HA50)

42,500 lb		26.6 ft x 23.6 ft				360° / Max.*				ASME B30.5	
ft	360° 39.4 ft	Max. 39.4 ft	360° 53.5 ft	Max. 53.5 ft	360° 67.3 ft	Max. 67.3 ft	360° 81.4 ft	Max. 81.4 ft	360° 95.5 ft	Max. 95.5 ft	ft
1,000 lb											
10	161.6	162.1	158.7	158.7	154.3	154.3	130.6	130.6	-	-	10
12	144.8	145.9	144.7	145.0	140.9	140.9	127.1	127.1	-	-	12
14	130.3	131.7	131.4	132.6	129.7	129.7	118.3	118.3	103.9	103.9	14
16	118.1	119.4	119.2	120.5	119.0	119.8	113.8	113.8	99.1	99.1	16
18	108.2	109.6	109.5	110.7	109.3	110.4	107.8	108.4	93.8	93.8	18
20	99.2	100.4	100.5	101.6	101.8	102.9	101.4	102.5	88.7	88.7	20
24	85.3	86.1	86.5	87.5	87.8	88.8	87.3	88.4	82.0	82.0	24
28	67.7	68.0	75.4	76.0	76.0	76.5	75.5	76.0	74.6	74.7	28
32	-	-	64.3	64.9	64.9	65.3	64.5	64.8	63.4	64.0	32
36	-	-	55.2	56.5	55.9	56.9	55.3	56.4	54.1	55.4	36
40	-	-	-	-	47.5	49.2	46.8	48.6	46.2	47.5	40
48	-	-	-	-	35.9	37.4	35.8	36.9	36.6	38.1	48
56	-	-	-	-	24.1	25.8	29.4	30.5	28.9	30.2	56
64	-	-	-	-	-	-	23.9	25.1	23.9	24.6	64
72	-	-	-	-	-	-	19.4	19.4	19.9	21.2	72
80	-	-	-	-	-	-	-	-	17.0	18.1	80
88	-	-	-	-	-	-	-	-	14.0	14.0	88

ft	360° 109.6 ft	Max. 109.6 ft	360° 123.4 ft	Max. 123.4 ft	360° 133.2 ft	Max. 133.2 ft	360° 148.6 ft	Max. 148.6 ft	360° 164.4 ft	Max. 164.4 ft	ft
1,000 lb											
18	73.7	73.7	-	-	-	-	-	-	-	-	18
20	70.3	70.3	-	-	-	-	-	-	-	-	20
24	66.6	66.6	54.2	54.2	-	-	-	-	-	-	24
28	62.1	62.1	51.8	51.8	43.0	43.0	-	-	-	-	28
32	57.6	57.6	49.4	49.4	41.2	41.2	34.7	34.7	27.1	27.1	32
36	52.6	53.5	46.3	46.3	39.7	39.7	33.9	33.9	27.1	27.1	36
40	46.8	48.6	42.9	43.1	38.0	38.0	33.1	33.1	27.1	27.1	40
48	35.3	36.9	35.7	36.3	33.0	33.6	30.8	30.8	26.8	26.8	48
56	28.8	29.5	28.0	29.5	27.7	28.5	26.7	27.6	25.2	25.2	56
64	23.5	24.8	23.1	24.0	22.4	23.7	22.6	23.6	21.8	22.8	64
72	19.5	20.6	19.3	20.4	19.5	19.9	18.6	19.7	17.9	19.3	72
80	16.8	17.7	16.1	17.2	16.3	17.4	15.5	16.6	14.8	16.1	80
88	14.3	15.4	13.6	14.7	13.8	14.9	12.9	14.3	12.4	13.6	88
96	12.3	13.4	11.6	12.7	11.8	12.9	10.9	12.1	10.3	11.6	96
104	10.6	11.7	9.9	11.0	10.1	11.2	9.1	10.3	8.6	9.7	104
112	-	-	-	-	8.7	9.8	7.6	9.0	7.0	8.3	112
120	-	-	-	-	6.4	7.5	6.4	7.7	5.9	7.0	120
128	-	-	-	-	-	-	5.4	6.6	4.7	5.9	128
136	-	-	-	-	-	-	4.6	5.7	3.8	5.0	136
144	-	-	-	-	-	-	-	-	2.9	4.2	144

* Max. values are valid only for specific superstructure positions

Operation

HA
(HA50)

13,400 lb		26.6 ft x 23.6 ft				360° / Max.*				ASME B30.5	
ft	360° 39.4 ft	Max. 39.4 ft	360° 53.5 ft	Max. 53.5 ft	360° 67.3 ft	Max. 67.3 ft	360° 81.4 ft	Max. 81.4 ft	360° 95.5 ft	Max. 95.5 ft	ft
1,000 lb											
10	158.0	162.1	158.5	158.7	154.3	154.3	130.6	130.6	-	-	10
12	140.7	145.9	141.8	145.0	140.5	140.9	127.1	127.1	-	-	12
14	126.6	131.7	127.6	132.6	127.5	129.7	118.3	118.3	103.9	103.9	14
16	114.7	119.4	115.9	120.5	115.8	119.8	113.8	113.8	99.1	99.1	16
18	103.4	107.1	105.1	108.4	105.0	108.2	101.6	106.3	89.7	93.8	18
20	92.2	95.0	95.0	96.6	95.8	98.3	88.1	97.9	79.5	88.6	20
24	71.0	76.8	74.8	79.4	73.9	79.8	68.9	79.4	65.1	78.3	24
28	52.8	63.1	56.6	66.3	57.5	66.7	55.6	66.3	54.6	65.2	28
32	-	-	44.4	56.5	45.6	56.9	46.7	56.5	45.7	55.4	32
36	-	-	36.9	49.4	38.7	49.9	39.1	49.4	38.4	49.6	36
40	-	-	-	-	32.1	43.6	32.3	43.1	32.6	44.2	40
48	-	-	-	-	23.8	34.4	24.4	34.9	24.3	34.7	48
56	-	-	-	-	18.6	22.8	18.8	27.9	19.0	27.4	56
64	-	-	-	-	-	-	14.8	22.9	15.0	23.0	64
72	-	-	-	-	-	-	12.0	19.4	12.0	19.5	72
80	-	-	-	-	-	-	-	-	9.6	16.4	80
88	-	-	-	-	-	-	-	-	7.9	14.0	88

ft	360° 109.6 ft	Max. 109.6 ft	360° 123.4 ft	Max. 123.4 ft	360° 133.2 ft	Max. 133.2 ft	360° 148.6 ft	Max. 148.6 ft	360° 164.4 ft	Max. 164.4 ft	ft
1,000 lb											
18	73.7	73.7	-	-	-	-	-	-	-	-	18
20	69.7	70.3	-	-	-	-	-	-	-	-	20
24	60.8	66.6	53.2	54.2	-	-	-	-	-	-	24
28	50.7	62.1	47.0	51.8	42.4	43.0	-	-	-	-	28
32	44.2	55.8	41.6	49.4	38.5	41.2	34.7	34.7	27.1	27.1	32
36	37.8	49.4	36.3	45.0	34.8	39.7	31.0	33.9	26.9	27.1	36
40	32.2	43.1	31.1	41.6	30.7	37.9	28.3	33.1	26.1	27.1	40
48	24.0	33.8	23.3	33.5	23.7	32.1	21.6	30.3	19.9	26.8	48
56	18.5	27.6	17.8	26.9	18.1	26.3	16.9	25.9	15.3	24.5	56
64	14.4	22.5	13.8	22.2	14.2	22.3	13.1	21.5	11.7	20.7	64
72	11.5	19.2	10.9	18.6	11.1	18.8	10.0	17.9	8.9	17.1	72
80	9.2	16.2	8.5	15.5	8.7	15.7	7.6	14.9	6.8	14.3	80
88	7.4	13.8	6.7	13.4	7.0	13.5	5.8	12.6	5.2	11.8	88
96	5.9	12.0	5.3	11.3	5.3	11.5	4.4	10.6	3.7	9.8	96
104	4.8	10.3	4.1	9.9	4.1	9.9	3.2	9.2	2.6	8.3	104
112	-	-	-	-	3.0	8.7	2.1	7.9	-	7.0	112
120	-	-	-	-	-	6.4	-	6.5	-	5.7	120
128	-	-	-	-	-	-	-	5.3	-	4.6	128
136	-	-	-	-	-	-	-	4.4	-	3.7	136
144	-	-	-	-	-	-	-	-	-	2.9	144

* Max. values are valid only for specific superstructure positions

Operation

HA
(HA50)

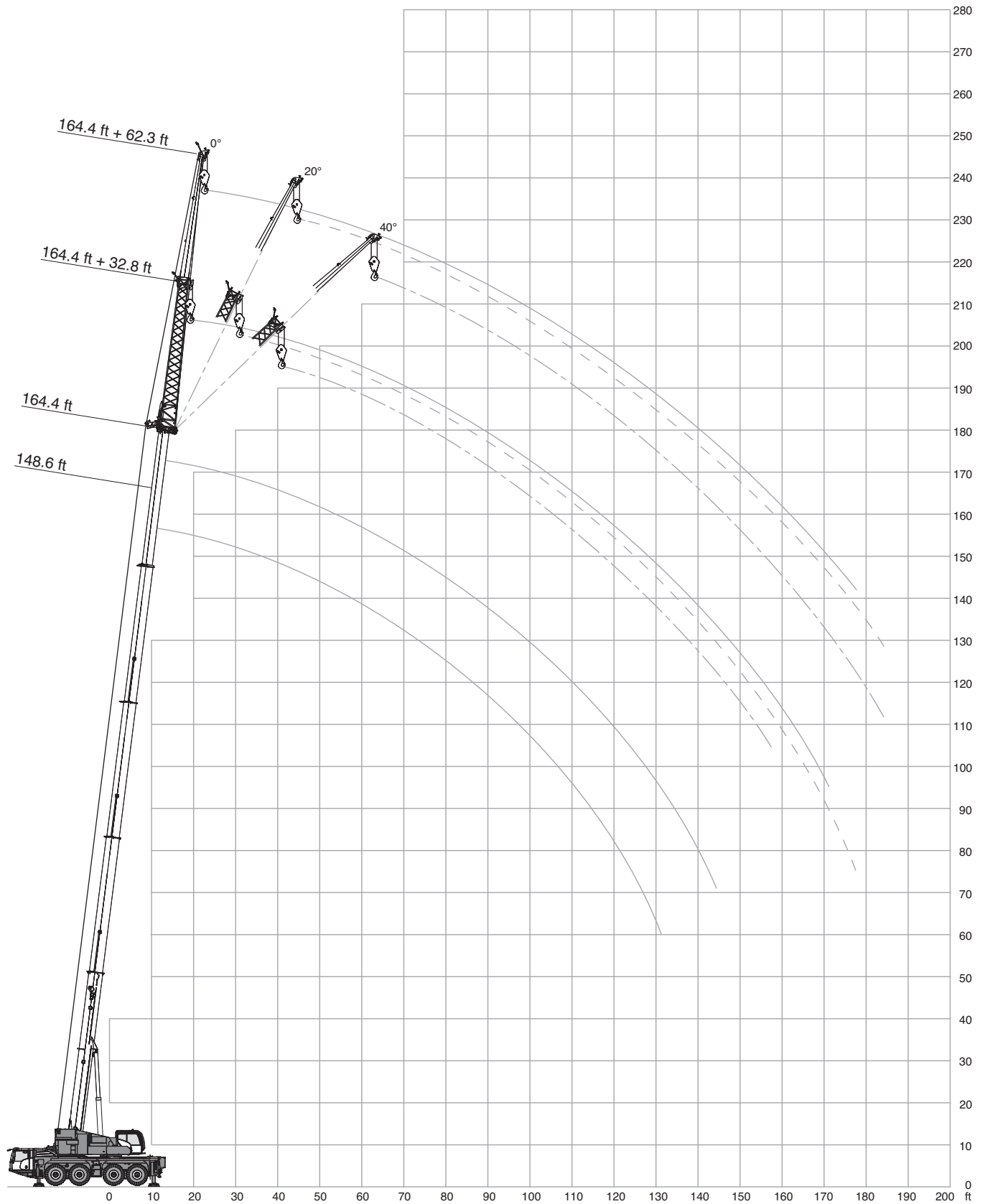
9,500 lb		26.6 ft x 23.6 ft				360° / Max.*				ASME B30.5	
ft	360° 39.4 ft	Max. 39.4 ft	360° 53.5 ft	Max. 53.5 ft	360° 67.3 ft	Max. 67.3 ft	360° 81.4 ft	Max. 81.4 ft	360° 95.5 ft	Max. 95.5 ft	ft
1,000 lb											
10	157.3	162.1	158.4	158.7	154.3	154.3	130.6	130.6	-	-	10
12	140.1	145.9	141.2	145.0	140.4	140.9	127.1	127.1	-	-	12
14	126.1	131.7	127.2	132.6	127.1	129.7	118.3	118.3	103.9	103.9	14
16	114.3	119.4	115.5	120.5	115.3	119.8	110.3	113.8	97.8	99.1	16
18	101.9	106.1	103.6	107.4	102.1	107.2	96.6	105.4	86.3	93.8	18
20	89.3	93.1	92.8	95.1	90.0	96.4	82.7	95.9	74.7	88.4	20
24	66.0	75.2	70.4	77.7	69.3	78.3	64.6	77.7	62.4	76.7	24
28	48.9	62.4	52.6	64.8	53.6	65.3	53.4	64.8	51.1	63.9	28
32	-	-	41.2	55.3	43.5	55.8	43.7	55.3	43.0	55.0	32
36	-	-	34.1	48.4	36.1	48.9	36.3	48.4	36.5	49.1	36
40	-	-	-	-	29.7	42.5	30.4	42.0	30.2	43.0	40
48	-	-	-	-	22.2	33.3	22.4	33.5	22.7	32.9	48
56	-	-	-	-	16.9	21.6	17.1	26.5	17.3	26.5	56
64	-	-	-	-	-	-	13.4	21.8	13.5	22.0	64
72	-	-	-	-	-	-	10.6	18.6	10.6	18.4	72
80	-	-	-	-	-	-	-	-	8.5	15.5	80
88	-	-	-	-	-	-	-	-	6.8	13.7	88

ft	360° 109.6 ft	Max. 109.6 ft	360° 123.4 ft	Max. 123.4 ft	360° 133.2 ft	Max. 133.2 ft	360° 148.6 ft	Max. 148.6 ft	360° 164.4 ft	Max. 164.4 ft	ft
1,000 lb											
18	73.4	73.7	-	-	-	-	-	-	-	-	18
20	68.7	70.3	-	-	-	-	-	-	-	-	20
24	57.0	66.6	51.4	54.2	41.3	-	-	-	-	-	24
28	48.9	61.4	45.3	51.8	40.5	43.0	33.6	-	-	-	28
32	41.1	55.0	38.9	49.4	37.5	41.2	33.2	34.7	27.1	27.1	32
36	35.2	47.7	33.4	44.2	32.8	39.7	29.7	33.9	25.6	27.1	36
40	30.0	40.9	28.5	40.8	28.1	37.7	25.7	33.1	23.5	27.1	40
48	22.2	33.1	21.4	31.6	21.5	31.1	19.4	29.9	17.8	26.8	48
56	16.7	26.3	16.1	26.0	16.3	25.6	14.8	24.9	13.4	23.8	56
64	13.0	21.4	12.3	21.2	12.6	21.4	11.2	20.4	9.9	19.2	64
72	10.0	18.2	9.5	17.7	9.8	17.9	8.7	17.0	7.3	15.5	72
80	7.9	15.3	7.2	14.8	7.5	14.9	6.5	14.0	5.5	12.6	80
88	6.3	13.3	5.6	12.6	5.8	12.8	4.7	11.8	4.0	10.4	88
96	4.8	11.4	4.2	10.7	4.4	10.9	3.4	9.8	2.8	8.5	96
104	3.9	9.7	3.2	9.0	3.2	9.1	2.3	8.1	-	7.0	104
112	-	-	-	-	2.4	7.6	-	6.6	-	5.7	112
120	-	-	-	-	-	5.3	-	5.5	-	4.7	120
128	-	-	-	-	-	-	-	4.4	-	3.7	128
136	-	-	-	-	-	-	-	3.5	-	2.8	136
144	-	-	-	-	-	-	-	-	-	2.0	144

* Max. values are valid only for specific superstructure positions

Operation




HAV
(HA50)









Operation




HAV

(HA50)

54,000 lb		26.6 ft x 23.6 ft		360°			ASME B30.5		
 164.4 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
		0°	20°	40°	0°	20°	40°		
ft		1,000 lb			1,000 lb				
40	14.6	-	-	-	8.4	-	-		
48	14.6	-	-	-	8.4	-	-		
56	14.6	14.6	-	-	8.4	-	-		
64	14.6	14.6	13.4	-	8.4	-	-		
72	14.6	13.9	12.6	-	8.4	-	-		
80	14.5	13.1	12.0	-	8.4	8.4	-		
88	13.9	12.2	11.3	-	8.4	8.4	7.5		
96	12.1	11.5	10.7	-	8.4	8.1	7.1		
104	10.2	10.9	10.2	-	8.4	7.6	6.9		
112	8.5	9.4	9.8	-	7.9	7.0	6.4		
120	7.2	7.8	8.3	-	7.4	6.7	6.1		
128	5.9	6.6	6.9	-	6.2	6.3	5.8		
136	4.9	5.4	5.8	-	5.1	6.0	5.6		
144	4.0	4.4	4.7	-	4.2	5.1	5.3		
152	3.2	3.6	3.6	-	3.4	4.3	4.9		
160	2.5	2.8	-	-	2.6	3.5	3.9		
168	-	-	-	-	-	2.8	3.1		
176	-	-	-	-	-	2.1	2.3		

 148.6 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
		0°	20°	40°	0°	20°	40°		
ft		1,000 lb			1,000 lb				
36	17.9	-	-	-	-	-	-		
40	17.9	-	-	-	10.1	-	-		
48	17.9	-	-	-	10.1	-	-		
56	17.9	17.9	-	-	10.1	-	-		
64	17.9	17.9	16.2	-	10.1	-	-		
72	17.9	17.6	15.9	-	10.1	9.9	-		
80	16.7	16.8	15.6	-	10.1	9.7	8.1		
88	14.7	15.3	15.1	-	10.1	9.4	7.8		
96	12.3	13.3	13.7	-	10.0	9.1	7.6		
104	11.0	11.3	11.7	-	9.7	8.9	7.5		
112	9.4	9.8	9.8	-	9.0	8.6	7.3		
120	7.9	8.5	8.9	-	7.6	8.3	7.3		
128	6.8	7.3	7.6	-	6.8	7.6	7.2		
136	5.8	6.2	6.4	-	6.0	6.4	6.9		
144	4.7	5.1	5.3	-	4.9	5.5	6.0		
152	3.9	4.3	-	-	4.1	5.0	5.0		
160	3.3	3.5	-	-	3.4	4.2	4.5		
168	-	-	-	-	2.8	3.3	3.1		
176	-	-	-	-	2.3	2.5	2.3		
184	-	-	-	-	-	2.0	-		



 95.5 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
		0°	20°	40°	0°	20°	40°		
ft		1,000 lb			1,000 lb				
16	29.1	-	-	-	-	-	-		
18	29.1	-	-	-	-	-	-		
20	29.1	-	-	-	17.4	-	-		
24	29.1	-	-	-	17.1	-	-		
28	29.1	-	-	-	16.9	-	-		
32	29.1	27.6	-	-	16.6	-	-		
36	29.1	26.4	-	-	16.3	-	-		
40	29.1	25.2	19.3	-	16.0	-	-		
48	29.1	23.4	18.5	-	15.3	13.0	-		
56	28.3	21.9	17.8	-	14.8	12.2	-		
64	25.7	20.6	17.3	-	14.1	11.4	9.1		
72	21.5	19.4	17.0	-	13.5	10.8	8.8		
80	18.5	18.4	16.7	-	12.7	10.3	8.3		
88	16.3	16.3	16.0	-	12.1	9.7	8.2		
96	14.5	14.5	14.6	-	11.3	9.3	8.0		
104	12.8	13.1	8.6	-	10.5	9.1	7.7		
112	11.1	7.9	-	-	9.9	8.6	7.7		
120	7.4	-	-	-	9.4	8.4	7.7		
128	-	-	-	-	8.6	8.4	5.1		
136	-	-	-	-	7.9	8.0	-		
144	-	-	-	-	7.1	6.0	-		


 39.4 ft									
  <u>32.8 ft</u> <u>62.3 ft</u>									
		0°	20°	40°	0°	20°	40°		
ft		1,000 lb			1,000 lb				
10	29.1	-	-	-	21.6	-	-		
12	29.1	-	-	-	21.5	-	-		
14	29.1	-	-	-	21.4	-	-		
16	29.1	29.1	-	-	21.1	-	-		
18	29.1	29.1	-	-	20.7	-	-		
20	29.1	28.9	-	-	20.4	-	-		
24	29.1	26.8	-	-	19.6	-	-		
28	29.1	24.7	20.3	-	18.8	-	-		
32	29.1	23.0	19.3	-	17.9	14.5	-		
36	27.2	21.6	18.5	-	16.9	13.7	-		
40	24.8	20.3	17.8	-	15.9	12.9	-		
48	21.2	18.4	16.9	-	13.8	11.6	-		
56	18.5	17.2	-	-	12.2	10.6	9.3		
64	-	-	-	-	11.0	9.6	8.7		
72	-	-	-	-	9.9	9.1	8.2		
80	-	-	-	-	9.2	8.6	-		
88	-	-	-	-	8.6	-	-		


Operation

HAV

(HA50)

42,500 lb				26.6 ft x 23.6 ft				360°				ASME B30.5			
 164.4 ft								 148.6 ft							
		32.8 ft			62.3 ft					32.8 ft			62.3 ft		
		0°	20°	40°	0°	20°	40°			0°	20°	40°	0°	20°	40°
ft		1,000 lb													
40		14.6	-	-	8.4	-	-			17.9	-	-	-	-	-
48		14.6	-	-	8.4	-	-			17.9	-	-	10.1	-	-
56		14.6	14.6	-	8.4	-	-			17.9	-	-	10.1	-	-
64		14.6	14.6	13.4	8.4	-	-			17.9	17.9	-	10.1	-	-
72		14.6	13.9	12.6	8.4	-	-			17.9	17.9	16.2	10.1	-	-
80		14.2	13.1	12.0	8.4	8.4	-			17.6	17.6	15.9	10.1	9.9	-
88		11.8	12.2	11.3	8.4	8.4	7.5			14.6	15.7	15.5	10.1	9.7	8.1
96		9.7	10.8	10.7	8.4	8.1	7.1			12.7	13.1	14.0	10.1	9.4	7.8
104		7.9	8.8	9.5	7.8	7.6	6.9			10.6	11.0	11.5	9.7	9.1	7.6
112		6.5	7.2	7.8	6.5	7.0	6.4			8.8	9.5	10.0	8.4	8.9	7.5
120		5.3	5.9	6.4	5.3	6.6	6.1			7.2	7.9	8.5	7.4	8.3	7.3
128		4.2	4.8	5.2	4.3	5.5	5.8			6.1	6.6	7.0	6.3	7.0	7.3
136		3.3	3.8	4.0	3.3	4.4	5.3			5.0	5.5	5.7	5.2	5.9	6.7
144		2.5	2.9	3.1	2.5	3.6	4.2			4.0	4.4	4.7	4.2	5.1	5.6
152		-	-	2.3	-	2.8	3.4			3.1	3.6	3.8	3.3	4.2	4.9
160		-	-	-	-	2.0	2.6			2.4	2.8	-	2.6	3.4	3.9
		-	-	-	-	-	-			-	2.0	-	2.0	2.6	3.1

 95.5 ft							
		32.8 ft			62.3 ft		
		0°	20°	40°	0°	20°	40°
ft		1,000 lb					
16		29.1	-	-	-	-	-
18		29.1	-	-	-	-	-
20		29.1	-	-	17.4	-	-
24		29.1	-	-	17.1	-	-
28		29.1	-	-	16.9	-	-
32		29.1	27.6	-	16.6	-	-
36		29.1	26.4	-	16.3	-	-
40		29.1	25.2	19.3	16.0	-	-
48		29.1	23.4	18.5	15.3	13.0	-
56		27.2	21.9	17.8	14.8	12.2	-
64		22.9	20.6	17.3	14.1	11.4	9.1
72		19.5	19.2	17.0	13.5	10.8	8.8
80		16.8	17.0	16.4	12.7	10.3	8.3
88		14.4	14.7	15.1	12.1	9.7	8.2
96		12.3	12.8	13.0	11.3	9.3	8.0
104		10.9	11.0	8.6	10.4	9.1	7.7
112		9.6	7.9	-	9.6	8.6	7.7
120		7.4	-	-	8.3	8.4	7.7
128		-	-	-	7.5	7.8	5.1
136		-	-	-	6.8	7.0	-
144		-	-	-	6.0	4.6	-

 39.4 ft							
		32.8 ft			62.3 ft		
		0°	20°	40°	0°	20°	40°
ft		1,000 lb					
10		29.1	-	-	21.6	-	-
12		29.1	-	-	21.5	-	-
14		29.1	-	-	21.4	-	-
16		29.1	29.1	-	21.1	-	-
18		29.1	29.1	-	20.7	-	-
20		29.1	28.9	-	20.4	-	-
24		29.1	26.8	-	19.6	-	-
28		29.1	24.7	20.3	18.8	-	-
32		29.1	23.0	19.3	17.9	14.5	-
36		27.2	21.6	18.5	16.9	13.7	-
40		24.8	20.3	17.8	15.9	12.9	-
48		21.2	18.4	16.9	13.8	11.6	-
56		18.5	17.2	-	12.2	10.6	9.3
64		-	-	-	11.0	9.6	8.7
72		-	-	-	9.9	9.1	8.2
80		-	-	-	9.2	8.6	-
88		-	-	-	8.6	-	-

Operation

HAV

(HA50)

13,400 lb		26.6 ft x 23.6 ft		360°			ASME B30.5						
164.4 ft					148.6 ft								
ft	32.8 ft			62.3 ft			ft	32.8 ft			62.3 ft		
	0°	20°	40°	0°	20°	40°		0°	20°	40°	0°	20°	40°
1,000 lb													
40	14.6	-	-	8.4	-	-	36	17.9	-	-	-	-	-
48	14.6	-	-	8.4	-	-	40	17.9	-	-	10.1	-	-
56	13.4	14.4	-	8.4	-	-	48	17.5	17.3	-	10.1	-	-
64	10.4	12.2	13.3	8.4	-	-	56	15.5	16.2	-	10.1	-	-
72	7.6	9.1	10.6	7.1	-	-	64	12.0	13.4	14.4	9.9	-	-
80	5.5	7.0	8.1	5.0	7.6	-	72	9.1	10.4	11.7	8.6	9.9	-
88	4.0	5.2	6.2	3.5	5.8	7.4	80	7.0	8.3	9.4	6.6	8.7	8.1
96	2.6	3.7	4.6	2.3	4.2	6.0	88	5.3	6.4	7.3	5.0	7.0	7.8
104	-	2.6	3.3	-	3.0	4.6	96	3.9	4.8	5.7	3.6	5.5	6.9
112	-	-	-	-	-	3.5	104	2.8	3.7	4.4	2.6	4.1	5.5
120	-	-	-	-	-	2.4	112	-	2.6	3.0	-	3.0	4.3
							120	-	-	-	-	2.2	3.3
							128	-	-	-	-	-	2.3

95.5 ft		32.8 ft			62.3 ft		
ft	0°	20°	40°	0°	20°	40°	
	1,000 lb						
16	29.1	-	-	-	-	-	
18	29.1	-	-	-	-	-	
20	29.1	-	-	17.4	-	-	
24	29.1	-	-	17.1	-	-	
28	29.1	-	-	16.9	-	-	
32	29.1	27.6	-	16.6	-	-	
36	29.1	26.4	-	16.3	-	-	
40	28.8	25.2	19.3	16.0	-	-	
48	24.4	23.0	18.5	15.3	13.0	-	
56	19.4	19.8	17.8	14.8	12.2	-	
64	15.3	16.4	16.6	14.0	11.4	9.1	
72	12.2	13.1	13.7	12.6	10.8	8.8	
80	10.0	10.7	11.1	10.5	10.2	8.3	
88	8.1	8.7	9.2	8.6	9.4	8.2	
96	6.6	7.1	7.4	7.0	8.2	7.9	
104	5.2	5.7	5.9	5.7	6.8	7.3	
112	4.1	4.6	-	4.6	5.5	6.1	
120	3.3	-	-	3.8	4.4	5.0	
128	-	-	-	3.0	3.5	4.0	
136	-	-	-	2.3	2.6	-	
144	-	-	-	1.8	2.0	-	

39.4 ft		32.8 ft			62.3 ft		
ft	0°	20°	40°	0°	20°	40°	
	1,000 lb						
10	29.1	-	-	21.6	-	-	
12	29.1	-	-	21.5	-	-	
14	29.1	-	-	21.4	-	-	
16	29.1	29.1	-	21.1	-	-	
18	29.1	29.1	-	20.7	-	-	
20	29.1	28.9	-	20.4	-	-	
24	29.1	26.8	-	19.6	-	-	
28	29.1	24.7	20.3	18.8	-	-	
32	29.1	23.0	19.3	17.9	14.5	-	
36	27.2	21.6	18.5	16.9	13.7	-	
40	24.8	20.3	17.8	15.9	12.9	-	
48	21.2	18.4	16.9	13.8	11.6	-	
56	18.5	17.2	-	12.2	10.6	9.3	
64	-	-	-	11.0	9.6	8.7	
72	-	-	-	9.9	9.1	8.2	
80	-	-	-	9.2	8.6	-	
88	-	-	-	8.6	-	-	

Operation

HAV

(HA50)

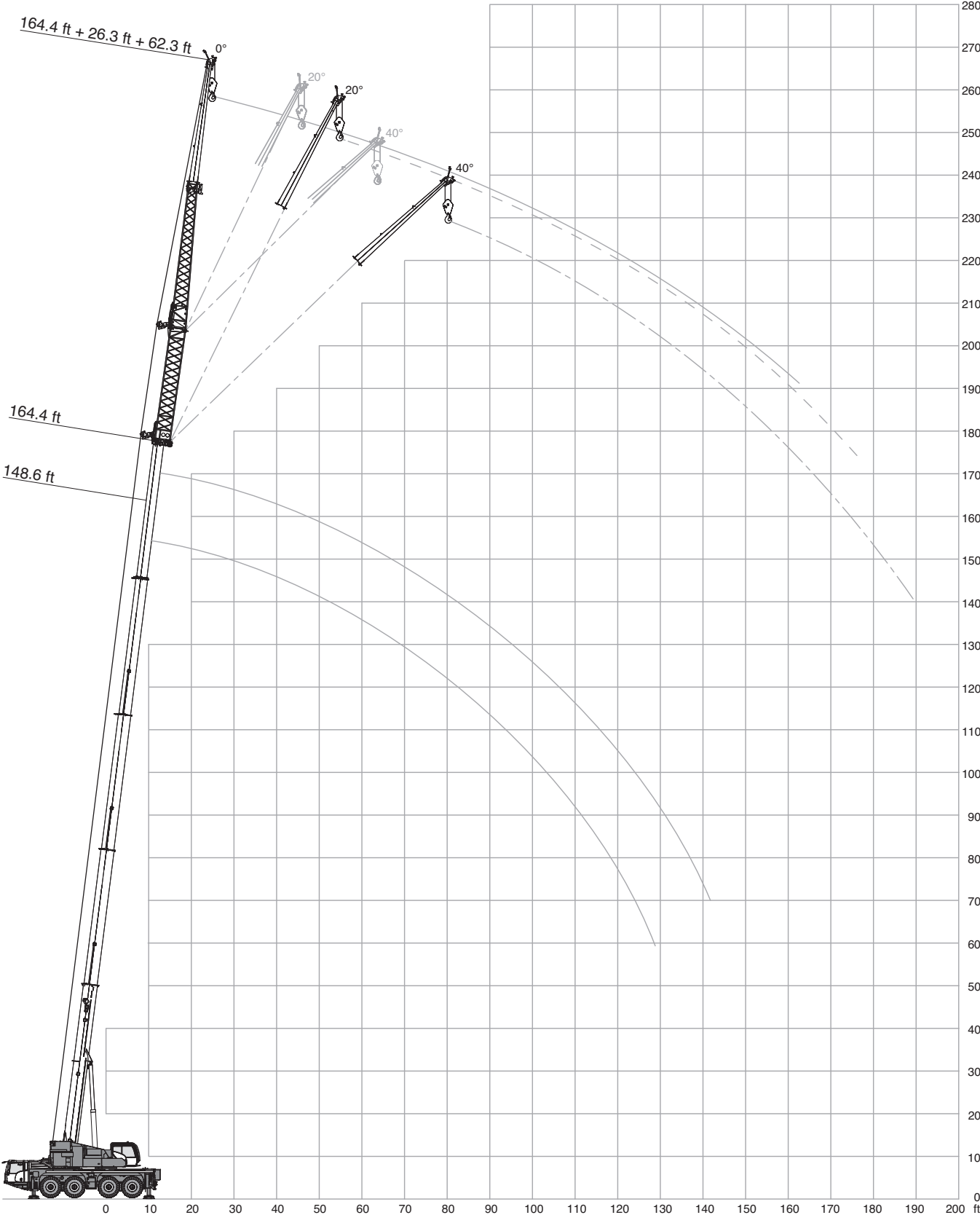
9,500 lb		26.6 ft x 23.6 ft		360°		ASME B30.5	
164.4 ft		32.8 ft		62.3 ft		148.6 ft	
ft	0°	20°	40°	0°	20°	40°	ft
	1,000 lb						
40	14.6	-	-	8.4	-	-	36
48	14.2	-	-	8.4	-	-	40
56	11.8	13.5	-	8.4	-	-	48
64	8.5	10.4	12.1	7.5	-	-	56
72	6.2	7.8	9.1	5.6	-	-	64
80	4.4	5.7	6.8	3.8	6.3	-	72
88	2.9	4.0	5.0	2.4	4.6	6.6	80
96	-	2.6	3.5	-	3.3	5.0	88
104	-	-	2.3	-	2.1	3.7	96
112	-	-	-	-	-	2.4	104
							112
							120

95.5 ft		32.8 ft		62.3 ft		
ft	0°	20°	40°	0°	20°	40°
	1,000 lb					
16	29.1	-	-	-	-	-
18	29.1	-	-	-	-	-
20	29.1	-	-	17.4	-	-
24	29.1	-	-	17.1	-	-
28	29.1	-	-	16.9	-	-
32	29.1	27.6	-	16.6	-	-
36	29.1	26.4	-	16.3	-	-
40	28.6	25.2	19.3	16.0	-	-
48	23.1	22.4	18.5	15.3	13.0	-
56	17.7	18.9	17.7	14.6	12.2	-
64	13.9	14.9	15.6	13.4	11.4	9.1
72	11.1	12.0	12.4	11.5	10.8	8.8
80	8.7	9.6	10.1	9.4	10.0	8.3
88	7.0	7.6	8.2	7.6	8.8	8.1
96	5.5	6.1	6.4	6.1	7.2	7.8
104	4.3	4.8	5.0	4.8	5.9	6.6
112	3.5	3.7	-	3.9	4.8	5.4
120	2.5	-	-	3.0	3.7	4.2
128	-	-	-	2.3	2.8	3.2
136	-	-	-	-	2.1	-

39.4 ft		32.8 ft		62.3 ft		
ft	0°	20°	40°	0°	20°	40°
	1,000 lb					
10	29.1	-	-	21.6	-	-
12	29.1	-	-	21.5	-	-
14	29.1	-	-	21.4	-	-
16	29.1	29.1	-	21.1	-	-
18	29.1	29.1	-	20.7	-	-
20	29.1	28.9	-	20.4	-	-
24	29.1	26.8	-	19.6	-	-
28	29.1	24.7	20.3	18.8	-	-
32	29.1	23.0	19.3	17.9	14.5	-
36	27.2	21.6	18.5	16.9	13.7	-
40	24.8	20.3	17.8	15.9	12.9	-
48	21.2	18.4	16.9	13.8	11.6	-
56	17.5	16.9	-	12.2	10.6	9.3
64	-	-	-	11.0	9.6	8.7
72	-	-	-	9.9	9.1	8.2
80	-	-	-	9.2	8.6	-
88	-	-	-	8.5	-	-

Operation

HAV-VA (HA50)



Operation

HAV-VA

(HA50)

54,000 lb		26.3 ft x 23.6 ft					360°		ASME B30.5					
164.4 ft							148.6 ft							
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°*			0°	20°	40°	0°	0°	
ft		1,000 lb												
48	9.3	-	-	-	-	-			40	11.7	-	-	-	-
56	9.3	-	-	-	-	-			48	11.7	-	-	-	-
64	9.3	9.3	-	-	-	-			56	11.7	-	-	-	-
72	9.3	9.3	-	-	-	-			64	11.7	11.7	-	-	-
80	9.3	9.3	9.1	8.7	-	-			72	11.7	11.7	11.3	10.8	-
88	9.3	9.0	8.4	8.1	7.1	-			80	11.7	11.4	10.9	10.3	8.8
96	9.0	8.2	7.9	7.4	6.7	-			88	11.5	10.9	10.5	10.0	8.5
104	8.3	7.6	7.3	6.9	6.2	-			96	11.0	10.5	10.2	9.6	8.2
112	7.6	7.0	6.8	6.6	5.9	-			104	9.5	10.0	9.8	9.3	8.2
120	6.3	6.5	6.3	6.1	5.7	-			112	7.9	8.7	9.4	9.0	7.9
128	5.1	5.7	5.9	5.7	5.4	-			120	6.7	7.2	7.8	7.8	7.9
136	4.0	4.7	5.1	5.0	5.1	-			128	5.8	5.9	6.5	6.4	7.2
144	2.9	3.6	4.0	4.0	4.9	-			136	4.8	5.3	5.4	5.2	6.0
152	2.1	2.8	3.0	3.0	3.8	-			144	3.8	4.2	4.7	4.7	4.7
160	-	-	2.2	2.2	2.8	-			152	3.0	3.4	3.6	3.6	4.3
									160	2.3	2.6	2.8	2.8	3.3

95.5 ft														
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°			0°	20°	40°	0°	0°	
ft		1,000 lb												
24	25.4	-	-	-	-	-			10	29.1	-	-	-	-
28	24.6	-	-	-	-	-			12	29.1	-	-	-	-
32	23.6	-	-	-	-	-			14	29.1	-	-	-	-
36	22.5	19.1	-	-	-	-			16	29.1	-	-	-	-
40	21.4	18.2	-	-	-	-			18	29.1	-	-	-	-
48	19.4	16.6	14.7	14.3	-	-			20	28.9	24.3	-	-	-
56	17.7	15.3	13.8	13.2	-	-			24	26.0	22.2	-	-	-
64	16.0	14.1	12.9	12.3	10.0	-			28	23.4	20.2	-	-	-
72	14.6	13.0	12.1	11.5	9.7	-			32	21.2	18.6	16.8	16.4	-
80	13.5	12.2	11.4	10.9	9.2	-			36	19.3	17.3	15.8	15.3	-
88	12.5	11.4	10.8	10.3	8.9	-			40	17.7	16.1	14.9	14.4	-
96	11.7	10.7	10.3	9.9	8.7	-			48	15.3	14.1	13.3	12.8	11.0
104	10.9	10.2	10.0	9.3	8.4	-			56	13.4	12.4	11.9	11.4	10.0
112	9.9	9.7	9.7	8.8	8.4	-			64	12.0	11.2	11.0	10.5	9.4
120	8.8	9.0	5.0	8.5	8.2	-			72	10.6	10.2	10.2	9.5	8.8
128	7.9	7.9	-	7.9	4.5	-			80	9.6	9.4	-	9.0	-
136	6.9	7.1	-	7.2	-	-								
144	5.8	4.0	-	4.0	-	-								

39.4 ft														
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°			0°	20°	40°	0°	0°	
ft		1,000 lb												
10	29.1	-	-	-	-	-			10	29.1	-	-	-	-
12	29.1	-	-	-	-	-			12	29.1	-	-	-	-
14	29.1	-	-	-	-	-			14	29.1	-	-	-	-
16	29.1	-	-	-	-	-			16	29.1	-	-	-	-
18	29.1	-	-	-	-	-			18	29.1	-	-	-	-
20	28.9	24.3	-	-	-	-			20	28.9	24.3	-	-	-
24	26.0	22.2	-	-	-	-			24	26.0	22.2	-	-	-
28	23.4	20.2	-	-	-	-			28	23.4	20.2	-	-	-
32	21.2	18.6	16.8	16.4	-	-			32	21.2	18.6	16.8	16.4	-
36	19.3	17.3	15.8	15.3	-	-			36	19.3	17.3	15.8	15.3	-
40	17.7	16.1	14.9	14.4	-	-			40	17.7	16.1	14.9	14.4	-
48	15.3	14.1	13.3	12.8	11.0	-			48	15.3	14.1	13.3	12.8	11.0
56	13.4	12.4	11.9	11.4	10.0	-			56	13.4	12.4	11.9	11.4	10.0
64	12.0	11.2	11.0	10.5	9.4	-			64	12.0	11.2	11.0	10.5	9.4
72	10.6	10.2	10.2	9.5	8.8	-			72	10.6	10.2	10.2	9.5	8.8
80	9.6	9.4	-	9.0	-	-			80	9.6	9.4	-	9.0	-

 *161.1 ft

Operation

HAV-VA

(HA50)

42,500 lb		26.6 ft x 23.6 ft					360°		ASME B30.5					
164.4 ft							148.6 ft							
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°*			0°	20°	40°	0°	0°	
ft		1,000 lb												
48	9.3	-	-	-	-	-			40	11.7	-	-	-	-
56	9.3	-	-	-	-	-			48	11.7	-	-	-	-
64	9.3	9.3	-	-	-	-			56	11.7	-	-	-	-
72	9.3	9.3	-	-	-	-			64	11.7	11.7	-	-	-
80	9.3	9.3	9.1	8.7	-	-			72	11.7	11.7	11.3	10.8	-
88	9.3	9.0	8.4	8.1	7.1	-			80	11.6	11.4	10.9	10.3	8.8
96	8.3	8.2	7.9	7.4	6.7	-			88	10.7	10.9	10.5	10.0	8.5
104	6.6	7.6	7.3	6.9	6.2	-			96	8.9	10.0	10.2	9.6	8.2
112	5.2	6.1	6.8	6.6	5.9	-			104	7.8	8.2	9.0	8.7	8.2
120	4.2	5.0	5.6	5.6	5.7	-			112	6.3	6.8	7.4	7.2	7.9
128	3.1	4.0	4.4	4.4	5.2	-			120	5.2	5.9	6.0	5.9	6.9
136	2.2	2.9	3.3	3.3	4.2	-			128	4.0	4.6	5.2	5.1	5.4
144	-	2.0	2.5	2.5	3.1	-			136	3.0	3.7	4.0	4.0	4.6
152	-	-	-	-	2.3	-			144	2.2	2.7	3.1	3.1	3.6
									152	-	-	2.1	2.1	2.7

95.5 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°	0°	0°
ft		1,000 lb				
24	25.4	-	-	-	-	-
28	24.6	-	-	-	-	-
32	23.6	-	-	-	-	-
36	22.5	19.1	-	-	-	-
40	21.4	18.2	-	-	-	-
48	19.4	16.6	14.7	14.3	-	-
56	17.7	15.3	13.8	13.2	-	-
64	16.0	14.1	12.9	12.3	10.0	-
72	14.6	13.0	12.1	11.5	9.7	-
80	13.5	12.2	11.4	10.9	9.2	-
88	12.4	11.4	10.8	10.3	8.9	-
96	11.2	10.7	10.3	9.9	8.7	-
104	10.1	10.0	10.0	9.3	8.4	-
112	8.5	9.0	9.0	8.8	8.3	-
120	7.4	7.7	5.0	7.9	8.0	-
128	6.6	6.7	-	6.7	4.5	-
136	5.5	5.8	-	5.9	-	-
144	4.9	4.0	-	4.0	-	-

39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		62.3 ft				
		0°	20°	40°	0°	0°
ft		1,000 lb				
10	29.1	-	-	-	-	-
12	29.1	-	-	-	-	-
14	29.1	-	-	-	-	-
16	29.1	-	-	-	-	-
18	29.1	-	-	-	-	-
20	28.9	24.3	-	-	-	-
24	26.0	22.2	-	-	-	-
28	23.4	20.2	-	-	-	-
32	21.2	18.6	16.8	16.4	-	-
36	19.3	17.3	15.8	15.3	-	-
40	17.7	16.1	14.9	14.4	-	-
48	15.3	14.1	13.3	12.8	11.0	-
56	13.4	12.4	11.9	11.4	10.0	-
64	12.0	11.2	11.0	10.5	9.4	-
72	10.6	10.2	10.2	9.5	8.8	-
80	9.6	9.4	-	9.0	-	-

 *161.1 ft

Operation

HAV-VA

(HA50)

13,400 lb		26.6 ft x 23.6 ft					360°		ASME B30.5				
164.4 ft							148.6 ft						
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		62.3 ft							62.3 ft				
		0°	20°	40°	0°	0°*			0°	20°	40°	0°	0°
ft		1,000 lb					ft		1,000 lb				
48		9.3	-	-	-	-	40		11.7	-	-	-	-
56		9.3	-	-	-	-	48		11.7	-	-	-	-
64		8.1	9.3	-	-	-	56		11.5	11.5	-	-	-
72		5.8	7.5	-	-	-	64		10.0	11.3	-	-	-
80		3.9	5.4	6.8	6.5	-	72		7.5	9.1	10.0	9.7	-
88		2.4	3.6	5.0	4.7	6.7	80		5.4	6.9	8.1	7.9	8.6
96		-	2.3	3.4	3.3	5.1	88		3.7	5.0	6.2	6.0	7.3
104		-	-	2.1	1.9	3.7	96		2.5	3.5	4.5	4.4	6.0
112		-	-	-	-	2.4	104		-	2.3	3.2	3.0	4.4
							112		-	-	-	-	3.2

95.5 ft													
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		62.3 ft							62.3 ft				
		0°	20°	40°	0°	0°			0°	20°	40°	0°	0°
ft		1,000 lb					ft		1,000 lb				
24		25.4	-	-	-	-	10		29.1	-	-	-	-
28		24.6	-	-	-	-	12		29.1	-	-	-	-
32		23.6	-	-	-	-	14		29.1	-	-	-	-
36		22.5	19.1	-	-	-	16		29.1	-	-	-	-
40		21.4	18.2	-	-	-	18		29.1	-	-	-	-
48		19.4	16.6	14.7	14.3	-	20		28.9	24.3	-	-	-
56		17.2	15.3	13.8	13.2	-	24		26.0	22.2	-	-	-
64		14.8	14.1	12.9	12.3	10.0	28		23.4	20.2	-	-	-
72		12.0	12.6	12.1	11.5	9.7	32		21.2	18.6	16.8	16.4	-
80		9.6	10.5	10.9	10.5	9.2	36		19.3	17.3	15.8	15.3	-
88		7.6	8.4	9.1	9.0	8.8	40		17.7	16.1	14.9	14.4	-
96		6.0	6.7	7.2	7.1	7.9	48		15.3	14.1	13.3	12.8	11.0
104		4.6	5.2	5.7	5.7	6.4	56		13.4	12.4	11.9	11.4	10.0
112		3.5	4.1	4.3	4.3	5.0	64		12.0	11.2	11.0	10.5	9.4
120		2.7	3.1	3.3	3.3	3.7	72		10.6	10.2	10.2	9.5	8.8
128		1.9	2.1	-	2.3	2.6	80		9.6	9.4	-	9.0	-

 *161.1 ft

Operation

HAV-VA

(HA50)

9,500 lb		26.3 ft x 23.6 ft					360°		ASME B30.5					
164.4 ft							148.6 ft							
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°*			0°	20°	40°	0°	0°	
ft	1,000 lb													
48	9.3	-	-	-	-	-			40	11.7	-	-	-	-
56	8.9	-	-	-	-	-			48	11.7	-	-	-	-
64	6.8	8.4	-	-	-	-			56	10.9	11.5	-	-	-
72	4.5	6.2	-	-	-	-			64	8.5	10.1	-	-	-
80	2.6	4.2	5.4	5.3	-	-			72	6.0	7.6	9.1	8.8	-
88	-	2.6	3.6	3.6	5.8	-			80	4.2	5.7	6.8	6.5	8.3
96	-	-	2.3	2.2	4.2	-			88	2.6	3.9	5.0	4.7	6.6
104	-	-	-	-	2.8	-			96	-	2.5	3.5	3.3	4.9
									104	-	-	2.2	2.1	3.5

95.5 ft														
		26.3 ft							26.3 ft					
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°	
		62.3 ft							62.3 ft					
		0°	20°	40°	0°	0°			0°	20°	40°	0°	0°	
ft	1,000 lb													
24	25.4	-	-	-	-	-			10	29.1	-	-	-	-
28	24.6	-	-	-	-	-			12	29.1	-	-	-	-
32	23.6	-	-	-	-	-			14	29.1	-	-	-	-
36	22.5	19.1	-	-	-	-			16	29.1	-	-	-	-
40	21.4	18.2	-	-	-	-			18	29.1	-	-	-	-
48	18.9	16.6	14.7	14.3	-	-			20	28.9	24.3	-	-	-
56	16.4	15.3	13.8	13.2	-	-			24	26.0	22.2	-	-	-
64	13.7	13.7	12.9	12.3	10.0	-			28	23.4	20.2	-	-	-
72	10.6	11.7	11.9	11.5	9.7	-			32	21.2	18.6	16.8	16.4	-
80	8.3	9.4	10.2	9.8	9.2	-			36	19.3	17.3	15.8	15.3	-
88	6.5	7.4	8.0	7.8	8.5	-			40	17.7	16.1	14.9	14.4	-
96	5.0	5.8	6.2	6.2	7.1	-			48	15.3	14.1	13.3	12.8	11.0
104	3.7	4.4	4.8	4.8	5.5	-			56	13.4	12.4	11.9	11.4	10.0
112	2.8	3.2	3.5	3.5	4.1	-			64	12.0	11.2	11.0	10.5	9.4
120	-	2.2	2.5	2.6	3.1	-			72	10.6	10.2	10.2	9.5	8.8
128	-	-	-	-	2.0	-			80	9.4	9.3	-	9.0	-

 *161.1 ft

Operation

HAV-VA

(HA50)

54,000 lb		26.6 ft x 23.6 ft					360°		ASME B30.5				
164.4 ft							148.6 ft						
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		32.8 ft							32.8 ft				
		0°	20°*	40°*	0°	0°			0°	20°	40°	0°	0°**
ft	1,000 lb												
56	5.5	-	-	-	-	-	48	6.8	-	-	-	-	-
64	5.5	-	-	-	-	-	56	6.8	-	-	-	-	-
72	5.5	-	-	-	-	-	64	6.8	-	-	-	-	-
80	5.5	5.7	-	-	-	-	72	6.8	-	-	-	-	-
88	5.5	5.7	-	-	-	-	80	6.8	6.8	-	-	-	-
96	5.5	5.7	-	-	-	-	88	6.8	6.7	-	6.0	-	-
104	5.5	5.5	5.1	-	-	-	96	6.8	6.5	6.0	5.8	-	-
112	5.5	5.1	4.8	-	-	-	104	6.6	6.2	5.8	5.5	4.9	-
120	5.2	4.8	4.5	-	-	-	112	6.4	5.9	5.7	5.5	4.8	-
128	4.7	4.4	4.1	-	-	-	120	6.0	5.7	5.4	5.2	4.6	-
136	3.8	4.0	3.8	-	-	-	128	5.3	5.5	5.3	5.0	4.4	-
144	2.9	3.8	3.5	-	-	-	136	4.4	5.4	5.1	4.9	4.2	-
152	2.1	3.4	3.3	-	-	-	144	3.8	4.7	4.9	4.6	4.2	-
160	-	2.6	3.2	-	-	-	152	3.2	3.6	4.5	3.9	4.2	-
168	-	-	2.7	-	-	-	160	2.4	3.0	3.5	3.1	3.9	-
176	-	-	1.9	-	-	-	168	-	2.5	2.7	-	2.9	-
							176	-	1.9	2.3	-	2.1	-

95.5 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		32.8 ft				
		0°	20°	40°	0°	0°
ft	1,000 lb					
28	13.4	-	-	-	-	-
32	13.4	-	-	-	-	-
36	13.2	-	-	-	-	-
40	12.9	-	-	-	-	-
48	12.1	-	-	-	-	-
56	11.3	10.0	-	-	-	-
64	10.5	9.2	-	8.3	-	-
72	9.9	8.6	7.7	7.7	-	-
80	9.1	8.1	7.2	7.2	-	-
88	8.4	7.5	6.9	6.7	5.6	-
96	7.9	7.0	6.5	6.3	5.2	-
104	7.3	6.6	6.2	6.0	4.9	-
112	6.8	6.2	5.9	5.7	4.8	-
120	6.3	5.9	5.7	5.2	4.6	-
128	5.9	5.6	5.4	5.0	4.4	-
136	5.6	5.2	5.1	4.7	4.4	-
144	5.1	5.1	5.1	4.6	4.4	-
152	4.8	4.8	2.6	4.4	-	-
160	4.5	4.6	-	4.4	-	-



39.4 ft						
		26.3 ft				
		0°	0°	0°	20°	40°
		32.8 ft				
		0°	20°	40°	0°	0°
ft	1,000 lb					
14	17.9	-	-	-	-	-
16	17.9	-	-	-	-	-
18	17.8	-	-	-	-	-
20	17.6	-	-	-	-	-
24	16.8	-	-	-	-	-
28	16.0	-	-	-	-	-
32	15.2	-	-	-	-	-
36	14.2	-	-	-	-	-
40	13.3	12.0	-	-	-	-
48	11.7	10.5	-	9.6	-	-
56	10.2	9.4	8.7	8.6	-	-
64	9.0	8.4	7.9	7.7	-	-
72	8.2	7.5	7.1	7.1	-	-
80	7.4	6.7	6.5	6.3	5.6	-
88	6.6	6.2	6.1	5.8	5.2	-
96	5.9	5.7	5.7	5.2	4.9	-
104	5.4	5.3	-	4.9	4.7	-
112	4.8	-	-	-	-	-


 *161.1 ft **137.5 ft


Operation

HAV-VA

(HA50)

42,500 lb		26.3 ft x 23.6 ft					360°		ASME B30.5				
 164.4 ft							 148.6 ft						
		26.3 ft							26.3 ft				
		0° 0° 0° 20° 40°							0° 0° 0° 20° 40°				
		32.8 ft							32.8 ft				
		0° 20°* 40°* 0° 0°							0° 20° 40° 0° 0°**				
ft		1,000 lb					ft		1,000 lb				
56	5.5	-	-	-	-	48	6.8	-	-	-	-		
64	5.5	-	-	-	-	56	6.8	-	-	-	-		
72	5.5	-	-	-	-	64	6.8	-	-	-	-		
80	5.5	5.7	-	-	-	72	6.8	-	-	-	-		
88	5.5	5.7	-	-	-	80	6.8	6.8	-	-	-		
96	5.5	5.7	-	-	-	88	6.8	6.7	-	6.0	-		
104	5.5	5.5	5.1	-	-	96	6.8	6.5	6.0	5.8	-		
112	4.8	5.1	4.8	-	-	104	6.6	6.2	5.8	5.5	4.9		
120	3.7	4.8	4.5	-	-	112	5.5	5.9	5.7	5.5	4.8		
128	2.8	4.3	4.1	-	-	120	4.9	5.6	5.4	5.2	4.6		
136	1.9	3.5	3.8	-	-	128	4.0	4.8	5.3	5.0	4.4		
144	-	2.7	3.5	-	-	136	3.0	3.9	4.8	4.2	4.2		
152	-	-	2.8	-	-	144	2.4	3.5	3.8	3.3	4.2		
160	-	-	2.0	-	-	152	-	2.5	3.2	2.5	3.4		
						160	-	-	2.4	-	2.4		

 95.5 ft						
		26.3 ft				
		0° 0° 0° 20° 40°				
		32.8 ft				
		0° 20° 40° 0° 0°				
ft		1,000 lb				
28	13.4	-	-	-	-	
32	13.4	-	-	-	-	
36	13.2	-	-	-	-	
40	12.9	-	-	-	-	
48	12.1	-	-	-	-	
56	11.3	10.0	-	-	-	
64	10.5	9.2	-	8.3	-	
72	9.9	8.6	7.7	7.7	-	
80	9.1	8.1	7.2	7.2	-	
88	8.4	7.5	6.9	6.7	5.6	
96	7.9	7.0	6.5	6.3	5.2	
104	7.3	6.6	6.2	6.0	4.9	
112	6.8	6.2	5.9	5.7	4.8	
120	6.3	5.9	5.7	5.2	4.6	
128	5.8	5.6	5.4	5.0	4.4	
136	5.4	5.1	5.1	4.7	4.4	
144	4.9	4.9	5.1	4.6	4.4	
152	4.3	4.6	2.6	4.4	-	
160	3.6	3.9	-	4.0	-	

 39.4 ft						
		26.3 ft				
		0° 0° 0° 20° 40°				
		32.8 ft				
		0° 20° 40° 0° 0°				
ft		1,000 lb				
14	17.9	-	-	-	-	
16	17.9	-	-	-	-	
18	17.8	-	-	-	-	
20	17.6	-	-	-	-	
24	16.8	-	-	-	-	
28	16.0	-	-	-	-	
32	15.2	-	-	-	-	
36	14.2	-	-	-	-	
40	13.3	12.0	-	-	-	
48	11.7	10.5	-	9.6	-	
56	10.2	9.4	8.7	8.6	-	
64	9.0	8.4	7.9	7.7	-	
72	8.2	7.5	7.1	7.1	-	
80	7.4	6.7	6.5	6.3	5.6	
88	6.6	6.2	6.1	5.8	5.2	
96	5.9	5.7	5.7	5.2	4.9	
104	5.4	5.3	-	4.9	4.7	
112	4.8	-	-	-	-	

 *161.1 ft **137.5 ft

Operation

HAV-VA

(HA50)

13,400 lb		26.6 ft x 23.6 ft					360°		ASME B30.5				
164.4 ft							148.6 ft						
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		32.8 ft							32.8 ft				
		0°	20°*	40°*	0°	0°			0°	20°	40°	0°	0°**
ft		1,000 lb					ft		1,000 lb				
56	5.5	-	-	-	-	-	48	6.8	-	-	-	-	-
64	5.5	-	-	-	-	-	56	6.8	-	-	-	-	-
72	5.1	-	-	-	-	-	64	6.8	-	-	-	-	-
80	3.3	5.6	-	-	-	-	72	6.6	-	-	-	-	-
88	-	4.5	-	-	-	-	80	4.8	6.6	-	-	-	-
96	-	3.1	-	-	-	-	88	3.3	5.6	-	5.6	-	-
104	-	1.9	3.7	-	-	-	96	2.1	4.2	5.6	4.4	-	-
112	-	-	2.6	-	-	-	104	-	2.8	4.6	3.0	4.9	-
							112	-	-	3.2	-	4.3	-
							120	-	-	2.2	-	3.1	-
							128	-	-	-	-	2.0	-



95.5 ft													
		26.3 ft							26.3 ft				
		0°	0°	0°	20°	40°			0°	0°	0°	20°	40°
		32.8 ft							32.8 ft				
		0°	20°	40°	0°	0°			0°	20°	40°	0°	0°
ft		1,000 lb					ft		1,000 lb				
28	13.4	-	-	-	-	-	14	17.9	-	-	-	-	-
32	13.4	-	-	-	-	-	16	17.9	-	-	-	-	-
36	13.2	-	-	-	-	-	18	17.8	-	-	-	-	-
40	12.9	-	-	-	-	-	20	17.6	-	-	-	-	-
48	12.1	-	-	-	-	-	24	16.8	-	-	-	-	-
56	11.3	10.0	-	-	-	-	28	16.0	-	-	-	-	-
64	10.5	9.2	-	8.3	-	-	32	15.2	-	-	-	-	-
72	9.9	8.6	7.7	7.7	-	-	36	14.2	-	-	-	-	-
80	8.8	8.1	7.2	7.2	-	-	40	13.3	12.0	-	-	-	-
88	7.7	7.5	6.9	6.7	5.6	-	48	11.7	10.5	-	9.6	-	-
96	6.4	6.9	6.5	6.3	5.2	-	56	10.2	9.4	8.7	8.6	-	-
104	5.0	6.2	6.0	5.8	4.9	-	64	9.0	8.4	7.9	7.7	-	-
112	3.9	5.0	5.7	5.2	4.8	-	72	8.2	7.5	7.1	7.1	-	-
120	2.9	3.9	4.8	4.2	4.5	-	80	7.4	6.7	6.5	6.3	5.6	-
128	2.2	3.0	3.7	3.2	3.7	-	88	6.6	6.2	6.1	5.8	5.2	-
136	-	2.2	2.7	2.4	2.7	-	96	5.9	5.7	5.7	5.2	4.9	-
144	-	-	1.8	1.6	1.8	-	104	5.4	5.3	-	4.9	4.7	-
							112	4.8	-	-	-	-	-


 *161.1 ft **137.5 ft


Operation

HAV-VA

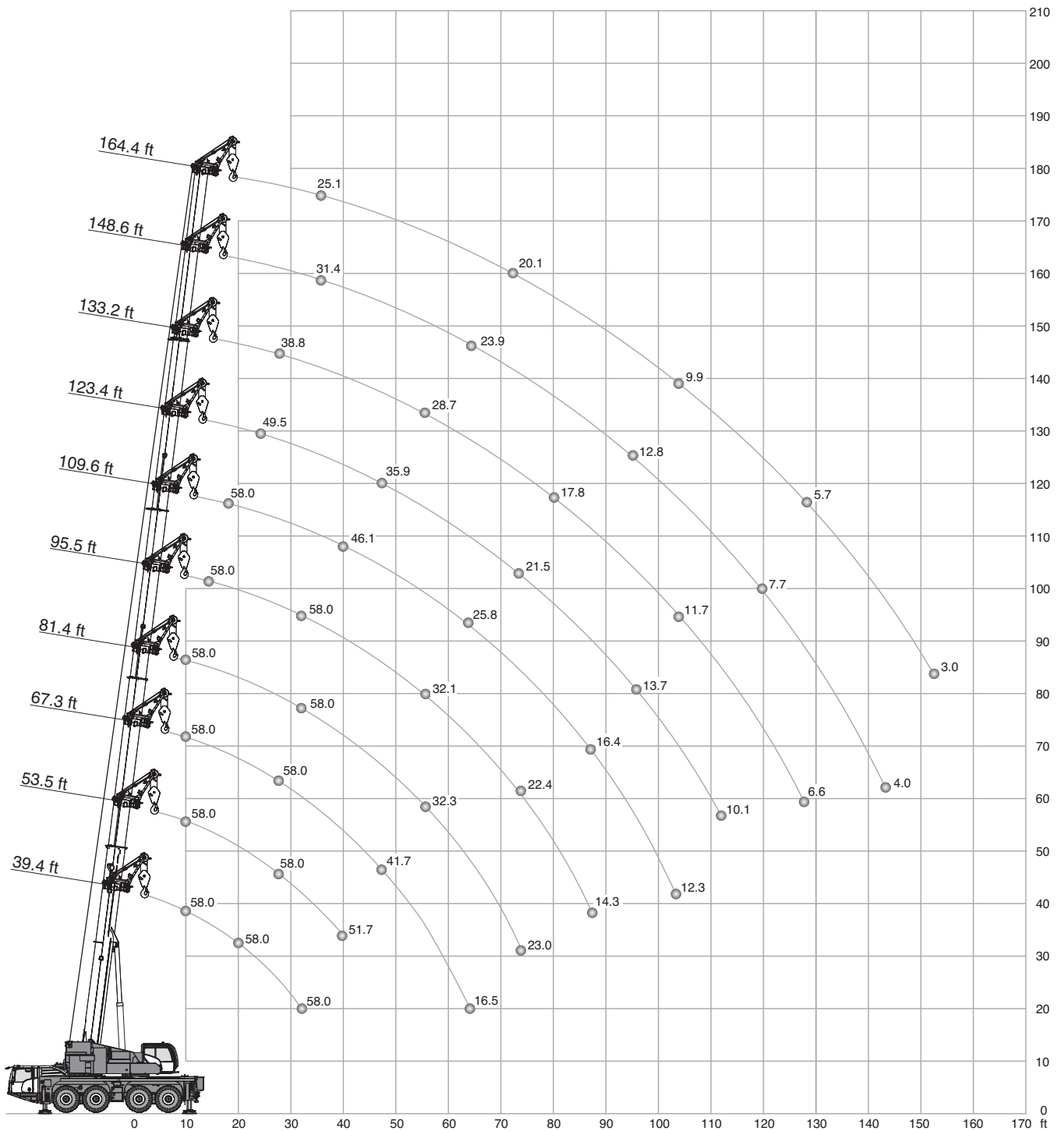
(HA50)

9,500 lb		26.6 ft x 23.6 ft		360°		ASME B30.5		
 164.4 ft				 148.6 ft				
		26.3 ft				26.3 ft		
		0°	0°	0°	20°	40°		
		32.8 ft				32.8 ft		
		0°	20°*	40°*	0°	0°		
ft		1,000 lb					ft	
56	5.5	-	-	-	-	48	6.8	
64	5.3	-	-	-	-	56	6.8	
72	3.8	-	-	-	-	64	6.6	
80	-	5.2	-	-	-	72	5.3	
88	-	3.4	-	-	-	80	3.5	
96	-	2.1	-	-	-	88	2.2	
104	-	-	2.8	-	-	96	-	
						104	1.9	
						112	-	
						120	-	

 95.5 ft		26.3 ft				26.3 ft		
		0°	0°	0°	20°	40°		
		32.8 ft				32.8 ft		
		0°	20°	40°	0°	0°		
ft		1,000 lb					ft	
28	13.4	-	-	-	-	14	17.9	
32	13.4	-	-	-	-	16	17.9	
36	13.2	-	-	-	-	18	17.8	
40	12.9	-	-	-	-	20	17.6	
48	12.1	-	-	-	-	24	16.8	
56	11.3	10.0	-	-	-	28	16.0	
64	10.5	9.2	-	8.3	-	32	15.2	
72	9.5	8.6	7.7	7.7	-	36	14.2	
80	8.3	8.1	7.2	7.2	-	40	13.3	
88	6.7	7.3	6.9	6.7	5.6	48	11.7	
96	5.3	6.6	6.5	6.3	5.2	56	10.2	
104	4.1	5.5	6.0	5.6	4.9	64	9.0	
112	3.0	4.3	5.2	4.6	4.8	72	8.2	
120	2.2	3.3	3.9	3.5	4.2	80	7.4	
128	-	2.3	3.0	2.5	3.1	88	6.6	
136	-	-	2.2	1.7	2.0	96	5.9	
						104	5.4	
						112	4.8	

 39.4 ft		26.3 ft				26.3 ft		
		0°	0°	0°	20°	40°		
		32.8 ft				32.8 ft		
		0°	20°	40°	0°	0°		
ft		1,000 lb					ft	
14	17.9	-	-	-	-	14	17.9	
16	17.9	-	-	-	-	16	17.9	
18	17.8	-	-	-	-	18	17.8	
20	17.6	-	-	-	-	20	17.6	
24	16.8	-	-	-	-	24	16.8	
28	16.0	-	-	-	-	28	16.0	
32	15.2	-	-	-	-	32	15.2	
36	14.2	-	-	-	-	36	14.2	
40	13.3	12.0	-	-	-	40	13.3	
48	11.7	10.5	-	9.6	-	48	11.7	
56	10.2	9.4	8.7	8.6	-	56	10.2	
64	9.0	8.4	7.9	7.7	-	64	9.0	
72	8.2	7.5	7.1	7.1	-	72	8.2	
80	7.4	6.7	6.5	6.3	5.6	80	7.4	
88	6.6	6.2	6.1	5.8	5.2	88	6.6	
96	5.9	5.7	5.7	5.2	4.9	96	5.9	
104	5.4	5.3	-	4.9	4.7	104	5.4	
112	4.8	-	-	-	-	112	4.8	







 *161.1 ft **137.5 ft



Operation

MS







(HA50)

54,000 lb		26.6 ft x 23.6 ft				360°				ASME B30.5	
											
39.4		53.5		67.3		81.4		(ft)		164.4	
ft		ft		ft		ft		1,000 lb		ft	
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	10
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	12
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	14
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	16
18	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	18
20	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	20
24	58.0	58.0	58.0	58.0	58.0	58.0	58.0	49.5	-	-	24
28	58.0	58.0	58.0	58.0	58.0	58.0	57.4	48.5	38.8	-	28
32	58.0	58.0	58.0	58.0	58.0	58.0	54.2	46.5	38.3	-	32
36	-	55.4	56.2	55.9	55.4	50.1	43.9	37.3	31.4	25.1	36
40	-	51.7	53.3	52.8	51.7	46.1	41.2	36.1	30.6	25.1	40
48	-	-	41.7	41.1	39.8	39.0	35.9	32.3	29.1	24.8	48
56	-	-	33.0	32.3	32.1	32.1	30.3	28.7	26.6	24.0	56
64	-	-	16.5	26.2	27.1	25.8	25.9	24.4	23.9	22.2	64
72	-	-	-	23.0	22.4	22.1	21.5	21.2	20.6	20.1	72
80	-	-	-	-	18.9	19.2	18.2	17.8	17.8	17.2	80
88	-	-	-	-	14.3	16.4	15.9	15.3	15.1	14.3	88
96	-	-	-	-	-	14.1	13.7	13.6	12.8	11.9	96
104	-	-	-	-	-	-	12.3	11.7	11.7	10.8	104
112	-	-	-	-	-	-	-	10.1	10.1	9.2	112
120	-	-	-	-	-	-	-	-	8.7	7.7	120
128	-	-	-	-	-	-	-	-	6.6	6.6	128
136	-	-	-	-	-	-	-	-	-	5.5	136
144	-	-	-	-	-	-	-	-	-	4.0	144
152	-	-	-	-	-	-	-	-	-	-	152

Operation

MS

(HA50)

42,500 lb		26.6 ft x 23.6 ft				360°				ASME B30.5			
													
39.4		53.5		67.3		81.4		(ft)		164.4			
ft		1,000 lb										ft	
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	10	
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	12	
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	14	
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	16	
18	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	18	
20	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	20	
24	58.0	58.0	58.0	58.0	58.0	58.0	58.0	49.5	-	-	-	24	
28	58.0	58.0	58.0	58.0	58.0	58.0	57.4	48.5	38.8	-	-	28	
32	58.0	58.0	58.0	58.0	58.0	58.0	54.2	46.5	38.3	-	-	32	
36	-	52.9	53.7	53.5	52.7	49.9	43.9	37.3	31.4	25.1	-	36	
40	-	47.7	48.1	47.7	46.2	45.3	41.1	36.1	30.6	25.1	-	40	
48	-	-	36.3	35.8	35.7	35.4	33.8	32.0	29.1	24.8	-	48	
56	-	-	28.5	28.5	28.9	27.8	27.9	26.8	26.0	24.0	-	56	
64	-	-	16.5	23.9	23.3	23.5	22.7	22.1	21.9	21.2	-	64	
72	-	-	-	19.7	19.7	19.3	18.8	19.0	18.2	17.3	-	72	
80	-	-	-	-	16.8	16.3	15.9	15.9	15.0	14.1	-	80	
88	-	-	-	-	13.1	13.8	13.3	13.4	12.4	11.6	-	88	
96	-	-	-	-	-	11.8	11.2	11.2	10.3	9.5	-	96	
104	-	-	-	-	-	10.1	9.5	9.5	8.6	7.7	-	104	
112	-	-	-	-	-	-	8.1	8.1	7.0	6.3	-	112	
120	-	-	-	-	-	-	-	6.8	5.9	5.0	-	120	
128	-	-	-	-	-	-	-	4.7	4.7	4.0	-	128	
136	-	-	-	-	-	-	-	-	3.9	3.0	-	136	
144	-	-	-	-	-	-	-	-	2.2	2.2	-	144	

Operation

MS

(HA50)

13,400 lb		26.6 ft x 23.6 ft										360°		ASME B30.5	
		(ft)													
		1,000 lb													
ft	ft	39.4	53.5	67.3	81.4	95.5	109.6	123.4	133.2	148.6	164.4	ft	ft		
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	10	10		
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	12	12		
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	14	14		
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	16	16		
18	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	18	18		
20	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	20	20		
24	58.0	58.0	58.0	58.0	58.0	57.6	56.1	49.4	-	-	-	24	24		
28	53.4	54.9	55.3	54.4	52.7	49.6	45.1	38.8	31.0	-	-	28	28		
32	42.9	45.8	46.3	45.7	45.4	42.6	40.5	36.2	30.7	-	-	32	32		
36	-	37.9	38.4	38.8	38.5	37.5	35.7	33.4	29.5	25.1	-	36	36		
40	-	31.0	32.6	32.8	32.8	32.1	30.7	30.1	27.4	24.7	-	40	40		
48	-	-	24.1	24.2	24.3	23.9	23.3	23.0	20.9	19.0	-	48	48		
56	-	-	18.5	18.8	18.8	18.3	17.7	17.7	16.1	14.5	-	56	56		
64	-	-	14.6	14.6	14.8	14.2	13.5	13.7	12.4	10.8	-	64	64		
72	-	-	-	11.7	11.7	11.1	10.4	10.4	9.5	8.0	-	72	72		
80	-	-	-	-	9.4	8.7	8.1	8.3	7.2	6.1	-	80	80		
88	-	-	-	-	7.4	7.0	6.3	6.3	5.4	4.3	-	88	88		
96	-	-	-	-	-	5.3	4.8	4.8	3.8	3.0	-	96	96		
104	-	-	-	-	-	4.1	3.5	3.5	2.6	1.7	-	104	104		
112	-	-	-	-	-	-	-	2.4	2.6	-	-	112	112		

9,500 lb		26.6 ft x 23.6 ft										360°		ASME B30.5	
		(ft)													
		1,000 lb													
ft	ft	39.4	53.5	67.3	81.4	95.5	109.6	123.4	133.2	148.6	164.4	ft	ft		
10	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	10	10		
12	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	-	12	12		
14	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	14	14		
16	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	-	16	16		
18	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	18	18		
20	58.0	58.0	58.0	58.0	58.0	58.0	58.0	-	-	-	-	20	20		
24	57.8	58.0	58.0	57.5	56.7	54.9	48.2	38.0	-	-	-	24	24		
28	51.2	53.0	53.4	52.0	50.2	46.9	43.4	38.0	31.0	-	-	28	28		
32	39.7	42.6	43.1	43.5	42.3	40.6	38.3	36.2	30.7	-	-	32	32		
36	-	35.2	35.6	36.9	35.7	35.1	33.0	32.1	28.2	24.3	-	36	36		
40	-	28.9	30.2	30.4	30.4	30.0	28.1	27.4	25.0	22.9	-	40	40		
48	-	-	22.2	22.6	22.7	22.0	21.2	20.9	18.7	16.9	-	48	48		
56	-	-	17.0	17.1	17.2	16.5	16.0	16.0	14.2	12.7	-	56	56		
64	-	-	13.2	13.3	13.3	12.6	12.2	12.2	10.8	9.3	-	64	64		
72	-	-	-	10.4	10.4	9.8	9.1	9.1	8.0	6.7	-	72	72		
80	-	-	-	-	8.1	7.6	7.0	7.0	5.9	4.6	-	80	80		
88	-	-	-	-	6.4	5.8	5.2	5.2	4.3	3.1	-	88	88		
96	-	-	-	-	-	4.4	3.7	3.9	2.8	1.9	-	96	96		
104	-	-	-	-	-	3.2	2.6	2.6	1.7	-	-	104	104		

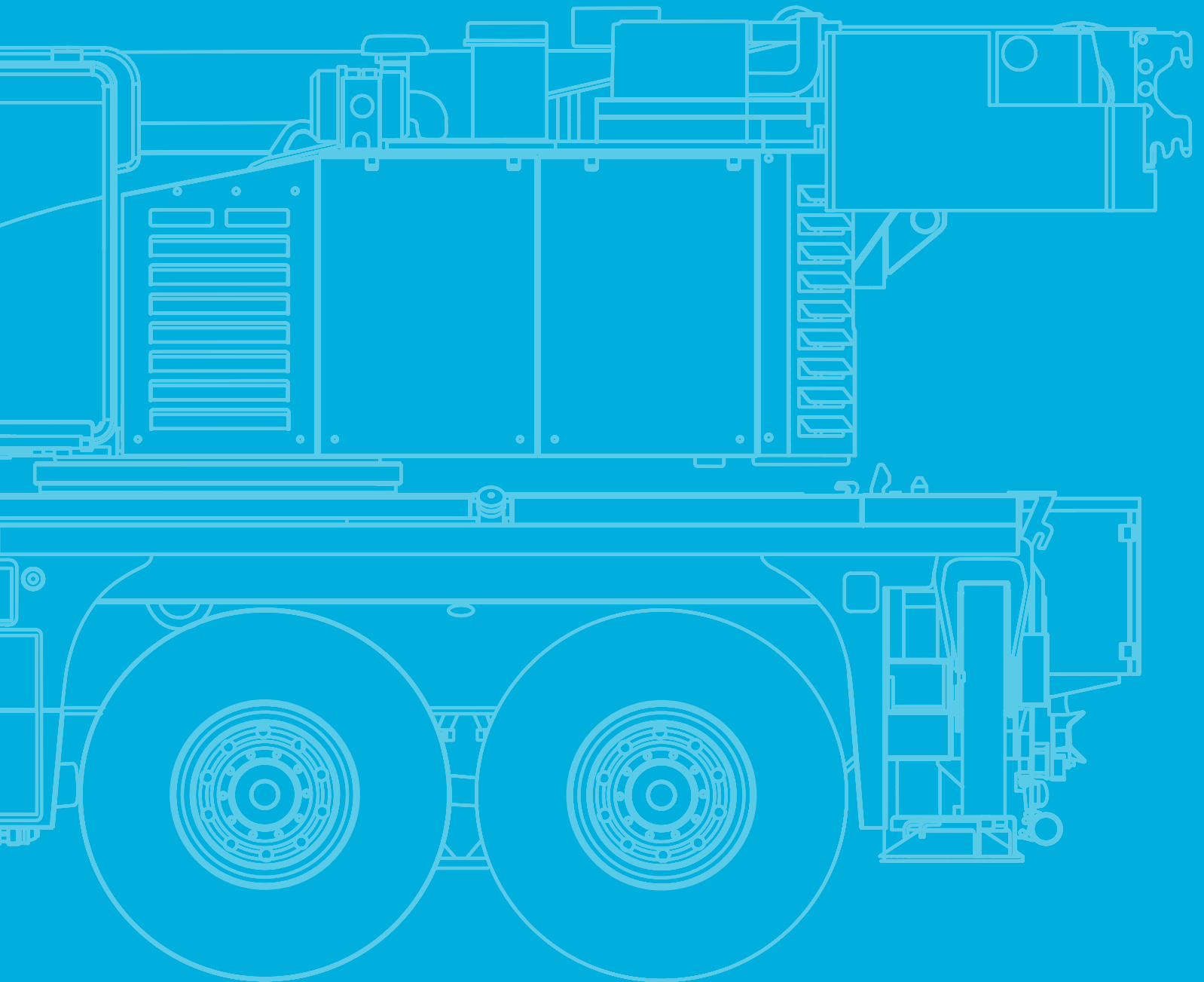
Notes to Lifting Capacity

Ratings are in compliance with ASME B30.5.
Lifting capacities do not exceed 85 % of tipping load.

Weight of hook blocks and slings is part of the load, and is to be deducted from the capacity ratings.
Consult operation manual for further details.

Note: Data published herein is intended as a guide only and shall not be construed to warrant applicability for lifting purposes.
Crane operation is subject to the computer charts and operation manual both supplied with the crane.

TECHNICAL DESCRIPTION



Technical Description

Basic machine

Equipment carrier

Engine 340-5	Mercedes-Benz OM471; Diesel engine; Output 340 kW/1700 1/min (462 HP), torque 2200 Nm/1000 1/min; The engine complies with EU Stage V/Tier 4F; Exhaust system complete stainless steel with SCR catalyzer.
Fuel tank	108 gallons (no RME / biodiesel); 11 gallons AdBlue tank.
Transmission G230-12	Mercedes-Benz G230-12; Automated gearbox; 12 forward speeds and 2 reverse; 2-stage transfer case with switchable longitudinal lock.
Axles 8 x 4 x 8	All 4 axles steered, axles 1 and 4 are driven and equipped with selectable transverse lock.
Suspension	Hydropneumatic suspension with axle load compensation; Hydraulically lockable; Manual or automatic levelling alternatively.
Steering	Dual circuit hydro servocom steering with emergency steering pump; Active rear axle steering (axles 3 and 4) with 6 different steering programs.
Brakes	Pneumatic dual circuit service brake with antilock system, acting on all wheels; Disc brakes; Additional exhaust brake and constant throttle valve; Spring-loaded parking brake; Incl. ABS.
Tires	Tires size 385/95 R25 (14.00R25); Steel rims 9,50-25/1,7“
Cab 2550	Type 8.4ft; Adjustable driver seat, armrests and pneumatic suspension; Steering wheel height and tilt adjustable; Power door windows; Tinted glass; Radio; Seat heating; Heating engine-dependent; Aircondition.
Drive lights	Including low beam, upper beam, daytime running lights, fog lights and cornering lights.
Central lubrication	Automatic central lubrication system for the lubricating points at the carrier.
Outriggers	H-4-Point design; Vertical and horizontal movement fully hydraulic; Manual or automatic levelling alternatively on both sides of carrier; 4 outrigger bases. 4 outrigger pads 0.92 ft ² with transport position at vertical cylinder.
Outrigger basis monitoring	Individual monitoring of horizontal stroke; Deviation warning in cab.
Outrigger load indicator	The outrigger load is indicated in the operator cab and the outrigger control box.
Electronic immobilizer system	Prevents uncontrolled carrier mobilization; Incl. 5 ignition keys.
Pneumatic tire filling plug	For self-inflating of the wheels.

Equipment superstructure

Engine 129-5	Mercedes-Benz OM934; Diesel engine; Output 129 kW/2200 1/min (175 HP), torque 750 Nm/1200 1/min; The engine complies with EU Stage V/Tier 4F; Exhaust system complete stainless steel with SCR catalyzer.
Fuel tank	53 gallons Diesel (no RME/ Biodiesel); 6.6 gallons AdBlue tank.
Telescopic boom HA60	39.4 - 194.9 ft; Single cylinder telescoping system, automatic telescoping; Attachments for all equipment and extensions; 5 sheaves integrated in boom head for max. capacity of 142,200 lb.
Boom luffing	Single luffing cylinder with automatic lowering brake valve.
Rotary drive	Single slewing gear unit with spring-loaded multi-disc brake.
H1	Hoist with spring-loaded multi-disc brake; Resolver (hoist rotation indicator); Incl. hoist monitoring.
Counterweight 42,500 lb	5 pieces ①-⑤ (SPECIAL 4 pieces ①-③+⑦); Automatic rigging system.
Control system	Enabling 4 simultaneous working movements; Electric pilot controls via 2 two-axis joysticks.
Operator aids	IC-1, with integrated load moment indicator acc. EN13000; Colour display; Displaying of current operating conditions, load charts, fault indicator; Signal lights indicating LMI-load; Crane data logger.
IC-1 Plus	Smart crane control system for main boom operation enabling higher lifting capacities especially over outriggers. Enables safe use of the full capacity of the crane even in asymmetric outrigger configurations. Outriggers can be positioned independently. Capacity precalculation for +/- 30° slewing angle and radius area. In-cab lift simulation.
IC-1 Remote	IC-1 Remote, Tadano telematic system.
Working range limiter	Displaying and programmability of the work range limits by IC-1.
Cab 875	Type 2.9 ft; Tilt variable 16°; Fold-out front window; Extendable side, front pedestal; Handrails; Tinted safety glass; Pull-down sun visor; Radio; Seat heating; Heating engine-dependent; Aircondition.
Central lubrication	Automatic central lubrication system for the lubricating points at the superstructure.

Technical Description

Additional equipment

Carrier

Engine 340-3	Mercedes-Benz OM471; Diesel engine; Output 340 kW/1700 1/min (462 HP), torque 2200 Nm/1000 1/min; The engine complies with ECE R96 (equivalent to former European regulation EU Stage IIIA/Tier 3); Exhaust system complete stainless steel incl. spark arrester certificate.
Axles 8 x 6 x 8	All 4 axles steered, axles 1, 3 and 4 are driven and equipped with selectable transverse lock.
Wear-free auxiliary brake	Wear-free auxiliary eddy-current brake at 4th axle.

Superstructure

Engine 129-3	Mercedes-Benz OM934; Diesel engine; Output 129 kW/2200 1/min (175 HP), torque 750 Nm/1200 1/min; The engine complies with ECE R96 (equivalent to former European regulation EU Stage IIIA/Tier 3); Exhaust system complete stainless steel incl. spark arrester certificate.
Telescopic boom HA50	39.4 - 164.4 ft; Single cylinder telescoping system, automatic telescoping; Attachments for all equipment and extensions; 5 sheaves integrated in boom head for max. capacity of 142,200 lb.
Heavy lift attachment	2 additional sheaves; Dis-/connectable; For total 7 sheaves at boom head; Max. capacity 176,400 lb.
2. hoist (H2)	Spring-loaded multi-disc brake; Resolver (hoist rotation indicator); Incl. quick couplings and transport rack; Self-rigging.
Additional counterweight 11,500 lb	2 pieces (Ⓢ); For total 54,000 lb, 7 pieces (SPECIAL 6 pieces).
Load supervision camera	Camera mounted on main boom head to supervise the hook block and load from above; Incl. boom head light on boom head.

Handling

Remote control	Control of superstructure movements via wireless remote control.
Moving out of crane cab	Control of carrier out of crane cab, enables machine moving when rigged, possible even under load.

Extensions

HAV 32.8 ft	Swing-away jib, manual offset 20° / 40°; 1-sheave head; Incl. transport storage.
HAV 62.3 ft	Double folding swing-away jib, manual offset 20° / 40°; 1-sheave head; Incl. transport storage; Includes HAV 32.8 ft.
HAV-VA 59.0 ft	Variable extension with swing-away jib, manual offset 20° / 40°; 1-sheave head; Incl. transport storage; Includes HAV 32.8 ft.
HAV-VA 88.6 ft	Variable extension with double folding swing-away jib, manual offset 20° / 40°; 1-sheave head; Incl. transport storage; Includes HAV 32.8 ft, HAV 62.3 ft and HAV-VA 59.0 ft.
HAV-HY	Hydraulic, stepless offset 0°-40°, instead of the manual offset; Available for HAV 32.8 ft, HAV 62.3 ft, HAV-VA 59.0 ft and HAV-VA 88.6 ft.
MS (runner)	4.9 ft; Fixed assembly jib, 2-sheaves for max. capacity 58,700 lb; Incl. transport storage at boom head.

Hook Blocks

Hook block 220,500 lb, 7-sheaves	Max. capacity 176,400 lb; 2,320 lb; Double hook, white with red signal stripes.
Hook block 176,400 lb, 5-sheaves	Max. capacity 155,700 lb; 2,360 lb; Double hook, white with red signal stripes.
Vario hook block 110,200 lb, 3-sheaves	Max. capacity 101,200 lb; 660-1,320 lb; Adjustable ballast and double hook, variable usage as 1- and 3-sheaves hook block, white with red signal stripes.
Hook block 110,200 lb, 3-sheaves	Max. capacity 101,200 lb; 1,320 lb; Double hook, white with red signal stripes.
Hook block 44,100 lb, 1-sheave	Max. capacity 44,100 lb; 660 lb; Single hook, white with red signal stripes.
Hook 17,600 lb	Max. capacity 15,000 lb; 375 lb; Single hook, red.

Further additional equipment on request!

Weight data may deviate from posted values based on road / travel configuration, equipment configuration, and component weight tolerances.

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