1.0 Capacity Charts

Combination	*Notes*	*Counterweight [kip]*	*Identity No.*	*Page*
HA	over rear	152.1, 132.1, 95.7, 88.6	221 363 12	1
HA	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 364 12	1-150
HA	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 365 12	1-150
HA	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 366 12	1-109
HA	Stb 27.7 x 9.2 ft	0.0	221 367 12	1-6
HAV 29.5 ft	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 368 12	1-126
HAV 29.5 ft	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 369 12	1-126
HAV 29.5 ft	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 370 12	1-90
HAV 55.8 ft	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 371 12	1-126
HAV 55.8 ft	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 372 12	1-126
HAV 55.8 ft	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 373 12	1-88
HAV 82.0 ft	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 374 12	1-126
HAV 82.0 ft	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 375 12	1-126
HAV 82.0 ft	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7	221 376 12	1-72
HAV 108.3 ft	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6	221 377 12	1-98
HAV 108.3 ft	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7	221 378 12	1-84
HAV 108.3 ft	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7	221 379 12	1-35
MS	Stb 27.7 x 26.9 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 380 12	1-150
MS	Stb 27.7 x 22.5 ft	152.1, 132.1, 95.7, 88.6, 75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 381 12	1-149
MS	Stb 27.7 x 18.7 ft	75.8, 68.6, 55.8, 48.7, 39.7, 35.9, 32.6, 28.7, 19.6, 12.6, 0.0	221 382 12	1-107

Abbreviations:
HA: main boom
HAV: main boom extension
MS: runner
Stb.: outrigger base

2.0 Instructions for Crane Operation

2.1 General instructions

- ☞ The crane driver must be certain that the values for load and radius which are given in the load capacity table are in no way exceeded.
- ☞ The loads are given in kip (1000 lb).
- ☞ The radius of the crane is measured from the slewing centre.
- ☞ Two hook operation is not monitored by the load limit device.
  Two hook operation can lead to overloading and tipping of the crane.
- ☞ Before operations are commenced, the load limit device must be set to the current configuration of the crane.
- ☞ Before the crane is supported on outriggers, the suspension on all axles must be locked.
- ☞ When the crane is supported on outriggers, all wheels must be lifted from the ground completely.
- ☞ Only the values given in the capacity chart are permissible for the outrigger support area.
- ☞ The loads apply to the crane when it is supported on outriggers in a horizontal position. Before commencing work, position the crane horizontally and monitor constantly during operation.
- ☞ Even without load, the boom may only be moved within the areas for which load values are specified.
- ☞ The supporting surface shall be sufficiently firm
  max. outrigger load: front 834 kN (187.4 kip)
  rear: 981 kN (220.5 kip)
- ☞ All capacities are valid for pinned telescopes.

2.2 Temperature operating limits

Following the instructions given in the operating or lubrication and maintenance instructions, the crane can be operated at ambient temperatures of between -20° C and + 40° C.

2.3 In case of operation with main boom extension 82.0 / 108.3 ft, offset by 20° and 40° , observe the following chart:

total Length of Jib	straight Part	offsettable Part
82.0 ft	26.2 ft	55.8 ft
108.3 ft	52.5 ft	55.8 ft

3.0 Weights of Hook Blocks

Weights of hook blocks and lifting tackles shall be substracted from the listed ratings

Type	possible Capacity [kip]	No. of Sheaves	**Weight [lb]**	max. No. of Hoist Lines
200	324.5	9	**3858**	17
160	298.1	7	**3307**	15
125	218.5	5	**2480**	11
80	139,1	3	**1874**	7
32	59.5	1	**1323**	3
12.5	19.8	(hook suspension)	**772**	1

4.0 Reeving

4.1 Max. permissible capacity of pulley:

No. of Hoist Lines	permissible Capacity (kN)	permissible Capacity (kip)
1	88	19.8
2	177	39.6
3	265	59.5
4	354	79.4
5	442	99.4
6	530	119.3
7	619	139.1
8	707	159.0
9	796	178.8
10	884	198.6
11	972	218.5
12	1061	238.3
13*	1149	258.2
14*	1238	278.2
15*	1326	298.1
16*	1414	317.9
17*	1444	324.5

*only with heavy duty attachment

For operating with rooster sheave, shift rope reeving to 1, max. load see above.

4.2 Min. no. of hoist lines

In case there are no different instructions, the no. of hoist lines given in the capacity chart **must not be lower than 2**. Nevertheless, if the situation requires a no. of hoist lines of 1, the capacities given in the capacity chart will have to be reduced by 20 per cent; this also applies to capacities lower than the maximum single line pull of 19.8 kip!

5.0 Wind speeds - dynamic wind pressures

The dynamic wind pressure is calculated by:
$q = v^2 / 383$ v = wind speed [mph]
q = dynamic wind pressure [psf]

The resulting wind force of the load is calculated by:
$F_w = c_w \times q \times A$ A = wind area of the load
c_w = drag coefficient

5.1 Crane in wind, with load

Provided that there are no different instructions given by the capacity charts, the following asssumptions will be taken into account for calculating the capacities:

wind speed	v = 21,9 mph
dynamic wind pressure	$q = 21{,}9^2 / 383 = 1{,}25$ psf
wind area of the load	A = 4,9 ft² per kip of capacity, but at least 9,8 ft²
drag coefficient	$c_w = 1{,}2$

Example : capacity = 50 kip → A = 245 ft²
The resulting wind force of the load is then calculated by :
$F_w = c_w \times q \times A = 1{,}2 \times 1{,}25 \times 245 = 367{,}5$ lb

Attention: The drag coefficient c_w is *not* a constant. The loads can also have differing c_w – values!
c_w – values can be taken from e. g. DIN 1055 / part 4

With the exception of jib, wind speeds up to 33,6 mph (dynamic wind pressure 2,95 psf) will be permitted if the wind area of the load or the capacity is reduced according to the ratings above mentioned.

Example 1: capacity = 50 kip load = 30 kip → A = 147 ft²
the permissible dynamic wind pressure is calculated by converting the formula:
$q = F_w / (c_w \times A) = 367{,}5 / (1{,}2 \times 147) = 2{,}08$ psf
The permissible wind speed is then:
$q = v^2 / 383 \rightarrow v = \sqrt{q \times 383}$ $v = \sqrt{2{,}08 \times 383} = 28{,}2$ mph < 33,6 mph

Example 2: capacity = 50 kip load = 30 kip A = 100 ft² (is known)
c_w – value = 2,0
$q = F_w / (c_w \times A) = 367{,}5 / (2{,}0 \times 100) = 1{,}84$ psf
The permissible wind speed is then:
$q = v^2 / 383 \rightarrow v = \sqrt{q \times 383}$ $v = \sqrt{1{,}84 \times 383} = 26{,}5$ mph < 33,6 mph

5.2 Crane in wind, without load

see operation manual

6.0 Loads to be deducted from the capacities

Loads (kip) to be deducted from the capacities of main boom in case of main boom extension fitted in transport position.

Main Boom [ft]	Main Boom Extension 29.5 ft	Main Boom Extension 55.8 ft
40.7	2,1	3,2
54.5	1,6	2,4
68.6	1,2	1,9
70.2	1,2	1,8
82.3	1,0	1,6
84.0	1,0	1,5
96.5	0,9	1,3
100.4	0,8	1,3
110.2	0,8	1,2
114.5	0,7	1,1
124.3	0,7	1,0
130.9	0,6	1,0
138.1	0,6	0,9
145.0	0,6	0,9
152.2	0,6	0,8
161.4	0,5	0,8
166.0	0,5	0,8
175.5	0,5	0,7
180.1	0,5	0,7
191.9	0,4	0,7
193.9	0,4	0,7
205.7	0,4	0,6
208.0	0,4	0,6
222.4	0,4	0,6

7.0 Outrigger Loadings

see charts on CD