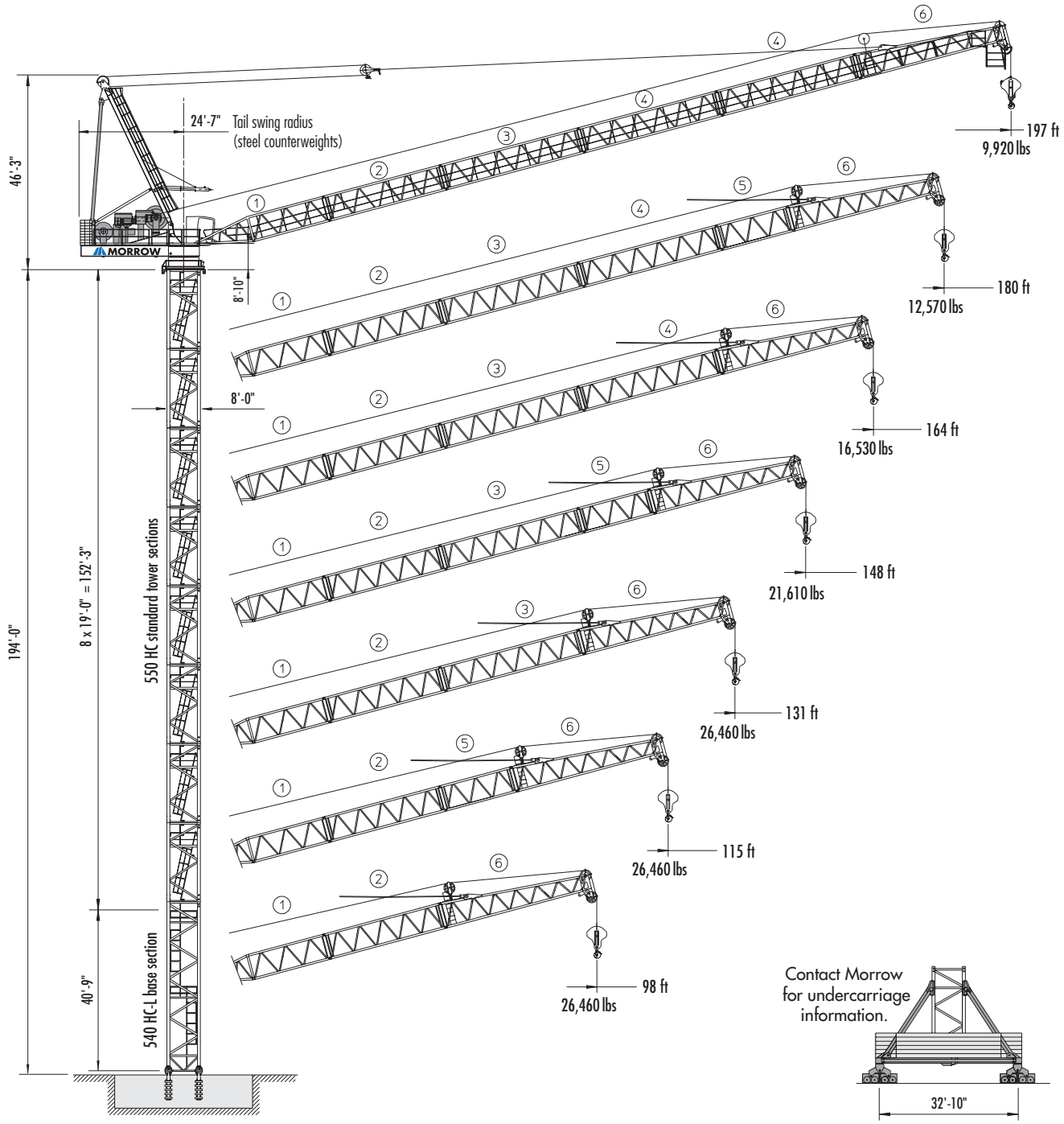
357 HC-L 12/24 Litronic®

LIEBHERR Luffing Boom Tower Crane

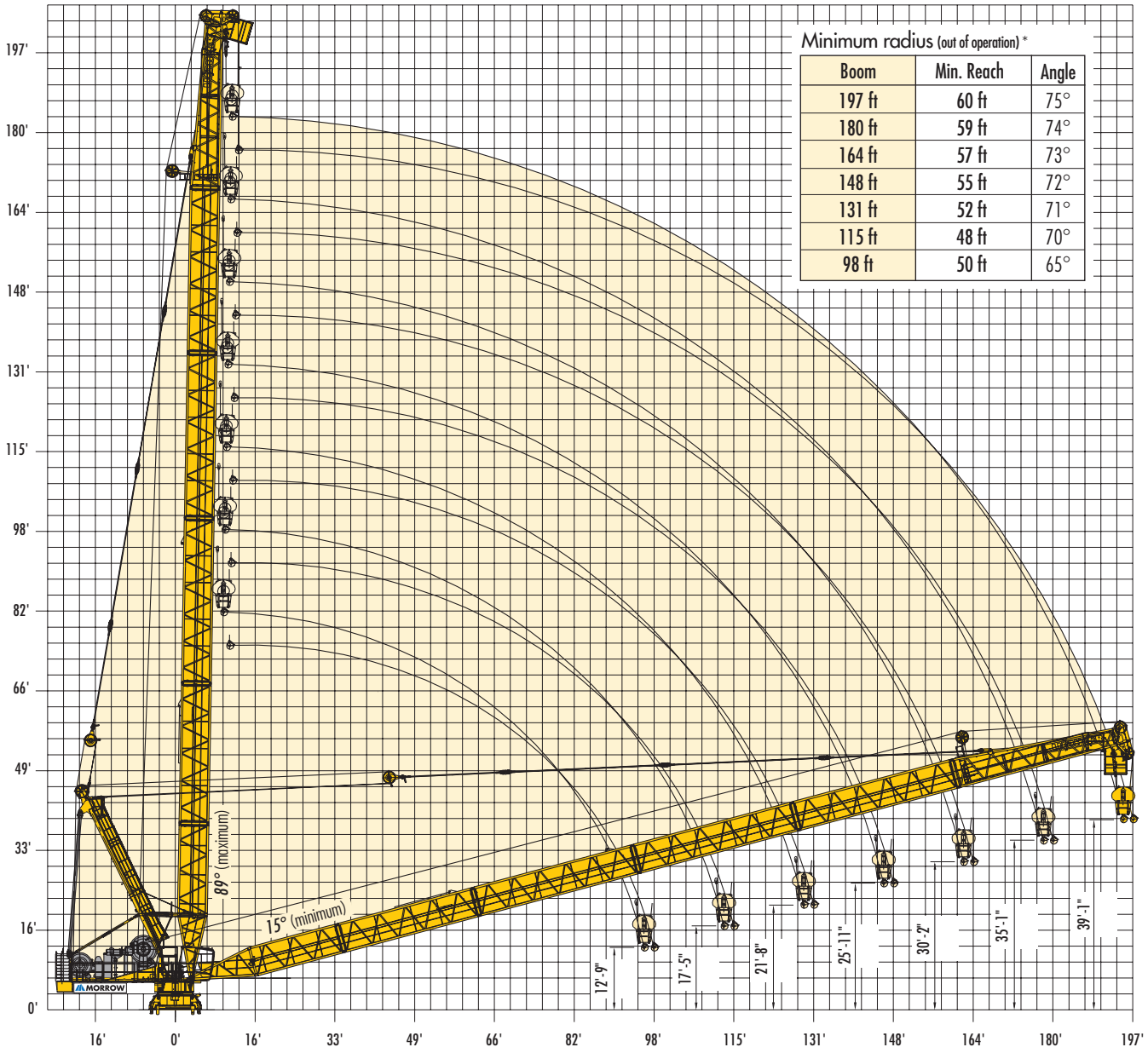


Configuration I
550 HC/540 HC-L Tower
194 ft max. hook height
on concrete footing

Rail-mounted Undercarriage
32'-10" Gauge

Radius and Hoisting Heights

Grid: 1 meter x 1 meter



Minimum radius (out of operation) *

Boom	Min. Reach	Angle
197 ft	60 ft	75°
180 ft	59 ft	74°
164 ft	57 ft	73°
148 ft	55 ft	72°
131 ft	52 ft	71°
115 ft	48 ft	70°
98 ft	50 ft	65°

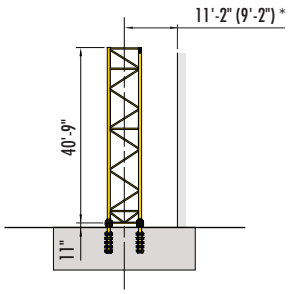
*** NOTE:** Out of operation boom position from 15° to 70°. Out of operation boom position dependent on boom length and number of tower sections installed. See Operations Manual for information or contact MORROW.

Tower Heights

Configuration I

Tower Base Components

540 HC-L
on 40'-9"
base section

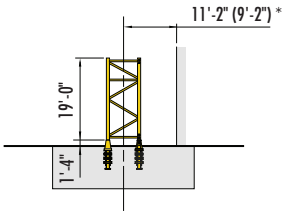


No. of Tower Sections	Boom Length		
	98 ft →131 ft	148 ft →164 ft	180 ft →197 ft
0	41.7 ft	41.7 ft	41.7 ft
1	60.7 ft	60.7 ft	60.7 ft
2	79.7 ft	79.7 ft	79.7 ft
3	98.8 ft	98.8 ft	98.8 ft
4	117.8 ft	117.8 ft	117.8 ft
5	136.8 ft	136.8 ft	136.8 ft
6	155.8 ft	155.8 ft	155.8 ft
7	174.9 ft	174.9 ft	174.9 ft[1]
8	193.9 ft	193.9 ft[1]	193.9 ft[1]
9	212.9 ft	212.9 ft[1]	—
10	231.9 ft[1]	—	—

Configuration II

Tower Base Components

Std. 550 HC Tower section



No. of Tower Sections	Boom Length			
	98 ft → 115 ft	131 ft → 148 ft	164 ft → 180 ft	197 ft
0	1.3 ft	1.3 ft	1.3 ft	1.3 ft
1	20.3 ft	20.3 ft	20.3 ft	20.3 ft
2	39.4 ft	39.4 ft	39.4 ft	39.4 ft
3	58.4 ft	58.4 ft	58.4 ft	58.4 ft
4	77.4 ft	77.4 ft	77.4 ft	77.4 ft
5	96.5 ft	96.5 ft	96.5 ft	96.5 ft
6	115.5 ft	115.5 ft	115.5 ft	115.5 ft
7	134.5 ft	134.5 ft	134.5 ft	134.5 ft
8	153.5 ft	153.5 ft	153.5 ft	153.5[1] ft
9	172.6 ft	172.6 ft	172.6[1] ft	—
10	191.6 ft	191.6 ft[1]	—	—
11	210.6 ft[1]	—	—	—

NOTE: [1]Lower top climbing unit to base of tower prior to operating crane.

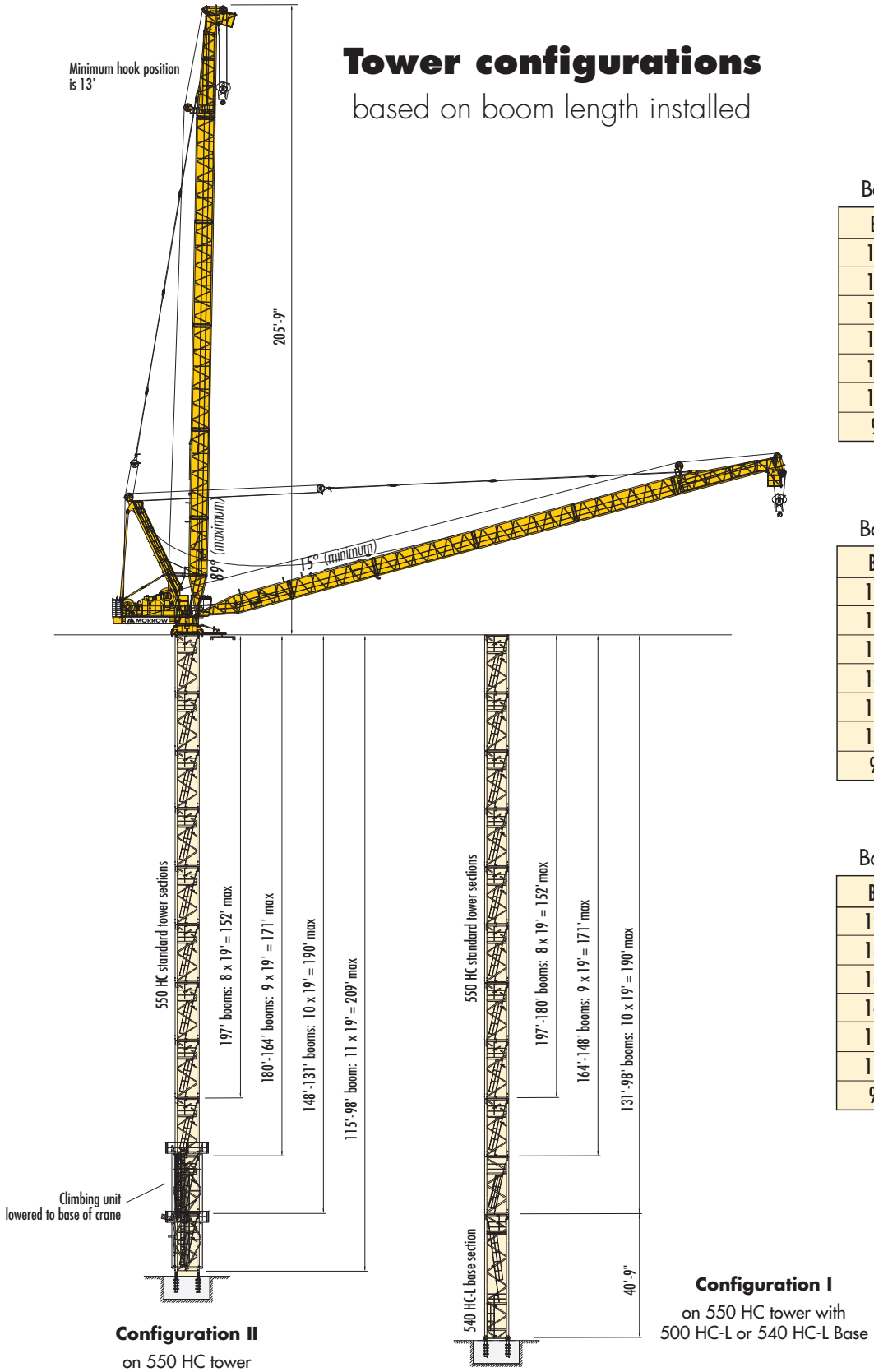
Alternate tower combinations are possible. Refer to Operation manual or contact MORROW for information.

Consult crane Operation Manual before erecting, operating, servicing, climbing or dismantling crane.

Specifications subject to change without prior notice. For additional information, contact MORROW.

Tower configurations

based on boom length installed



Configuration II
on 550 HC tower

Configuration I
on 550 HC tower with 500 HC-L or 540 HC-L Base

Boom at 15° (1-part operation)

Boom	Hook Reach	Hoisting Height
197 ft	197 ft	39 ft
180 ft	180 ft	35 ft
164 ft	164 ft	30 ft
148 ft	148 ft	26 ft
131 ft	131 ft	22 ft
115 ft	115 ft	17 ft
98 ft	98 ft	13 ft

Boom at 75° (1-part operation)

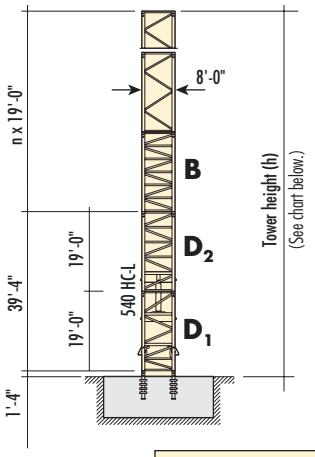
Boom	Hook Reach	Hoisting Height
197 ft	48 ft	174 ft
180 ft	44 ft	157 ft
164 ft	39 ft	141 ft
148 ft	35 ft	125 ft
131 ft	30 ft	108 ft
115 ft	26 ft	91 ft
98 ft	21 ft	75 ft

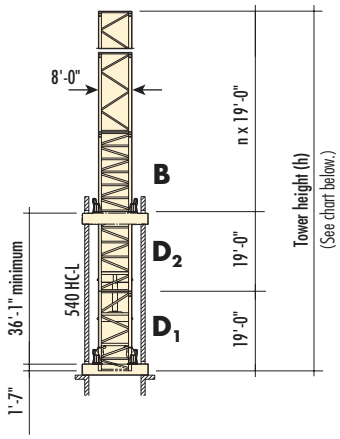
Boom at 89° (1-part operation)

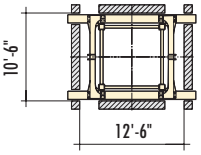
Boom	Hook Reach	Hoisting Height
197 ft	13 ft	177 ft
180 ft	12.8 ft	160 ft
164 ft	12.5 ft	143 ft
148 ft	12.1 ft	126 ft
131 ft	11.8 ft	108 ft
115 ft	11.5 ft	92 ft
98 ft	11.1 ft	75 ft

Climbing Inside Structure

550 HC tower on 540 HC-L climbing elements





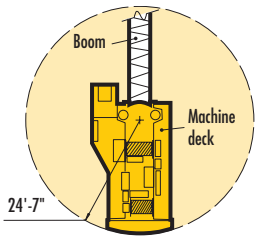


Key: **B** = Reinforced tower section - **D$_1$** = Bottom half of D section with hydraulics - **D$_2$** = Top half of D section

No. of Tower Sections (n)	Boom Length				Boom Length				
	98 ft	115 ft → 131 ft	148 ft → 180 ft	197 ft → 213 ft	98 ft	115 ft → 131 ft	148 ft → 180 ft	197 ft → 213 ft	
0	39.4 ft	39.4 ft	39.4 ft	39.4 ft	38.1 ft	38.1 ft	38.1 ft	38.1 ft	
1	58.4 ft	58.4 ft	58.4 ft	58.4 ft	57.1 ft	57.1 ft	57.1 ft	57.1 ft	
2	77.4 ft	77.4 ft	77.4 ft	77.4 ft	76.1 ft	76.1 ft	76.1 ft	76.1 ft	
3	96.5 ft	96.5 ft	96.5 ft	96.5 ft	95.1 ft	95.1 ft	95.1 ft	95.1 ft	
4	115.5 ft	115.5 ft	115.5 ft	115.5 ft	114.2 ft	114.2 ft	114.2 ft	114.2 ft	
5	135.5 ft	135.5 ft	135.5 ft	135.5 ft	133.2 ft	133.2 ft	133.2 ft	133.2 ft	h
6	153.5 ft	153.5 ft	153.5 ft	153.5 ft	152.2 ft	152.2 ft	152.2 ft	152.2 ft	
7	172.6 ft	172.6 ft	172.6 ft	—	171.3 ft	171.3 ft	171.3 ft	171.3 ft	
8	191.6 ft	191.6 ft	—	—	190.3 ft	190.3 ft	190.3 ft	—	
9	210.6 ft	—	—	—	209.3 ft	209.3 ft	—	—	
10	—	—	—	—	228.3 ft	—	—	—	

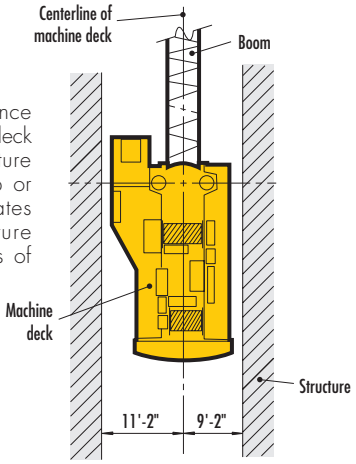
NOTE: The inside climbing views shown above are examples of a typical installation. Please note, however, that factors determining installation may vary due to job site specific conditions. Contact MORROW for information.

PLAN VIEW – showing tail swing radius for crane configuration using steel counterweights. Please consult Morrow for additional information.



TAIL SWING RADIUS
(Steel counterweights)

***NOTE** Allow for clearance between crane machine deck and any adjacent structure when climbing crane up or down. This view illustrates minimum crane-to-structure clearances for both sides of machine deck.

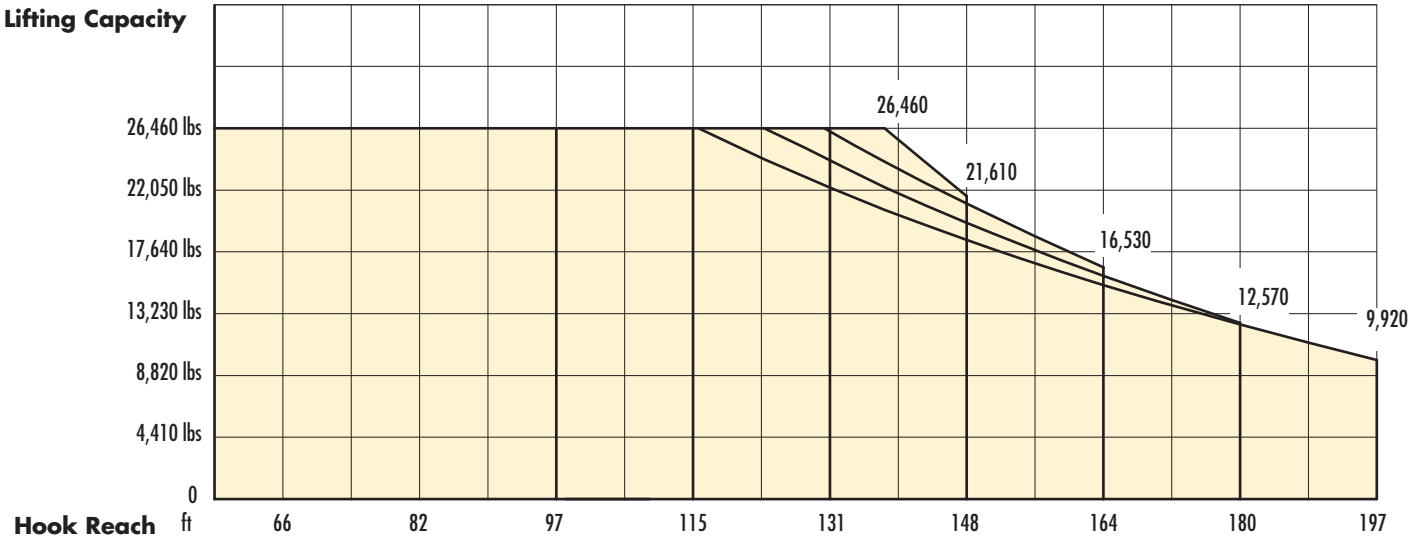


CLEARANCE REQUIREMENTS
Plan view

Radius and capacities one-part operation

Boom Length	Maximum Capacity – Radius	ft	66	74	82	90	98	107	115	123	131	139	148	156	164	172	180	189	197
197 ft	26,460 lbs – 115 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460	24,340	22,200	20,280	18,470	16,820	15,280	13,820	12,460	11,180	9,920
180 ft	26,460 lbs – 123 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,210	24,070	21,760	19,710	17,770	15,940	14,220	12,570		
164 ft	26,460 lbs – 130 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,240	23,550	21,080	18,760	16,530				
148 ft	26,460 lbs – 138 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,460	25,640	21,610						
131 ft	26,460 lbs – 131 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,460	26,460								
115 ft	26,460 lbs – 115 ft	lbs	26,460	26,460	26,460	26,460	26,460	26,460	26,460										
98 ft	26,460 lbs – 98 ft	lbs	26,460	26,460	26,460	26,460	26,460												

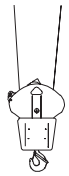




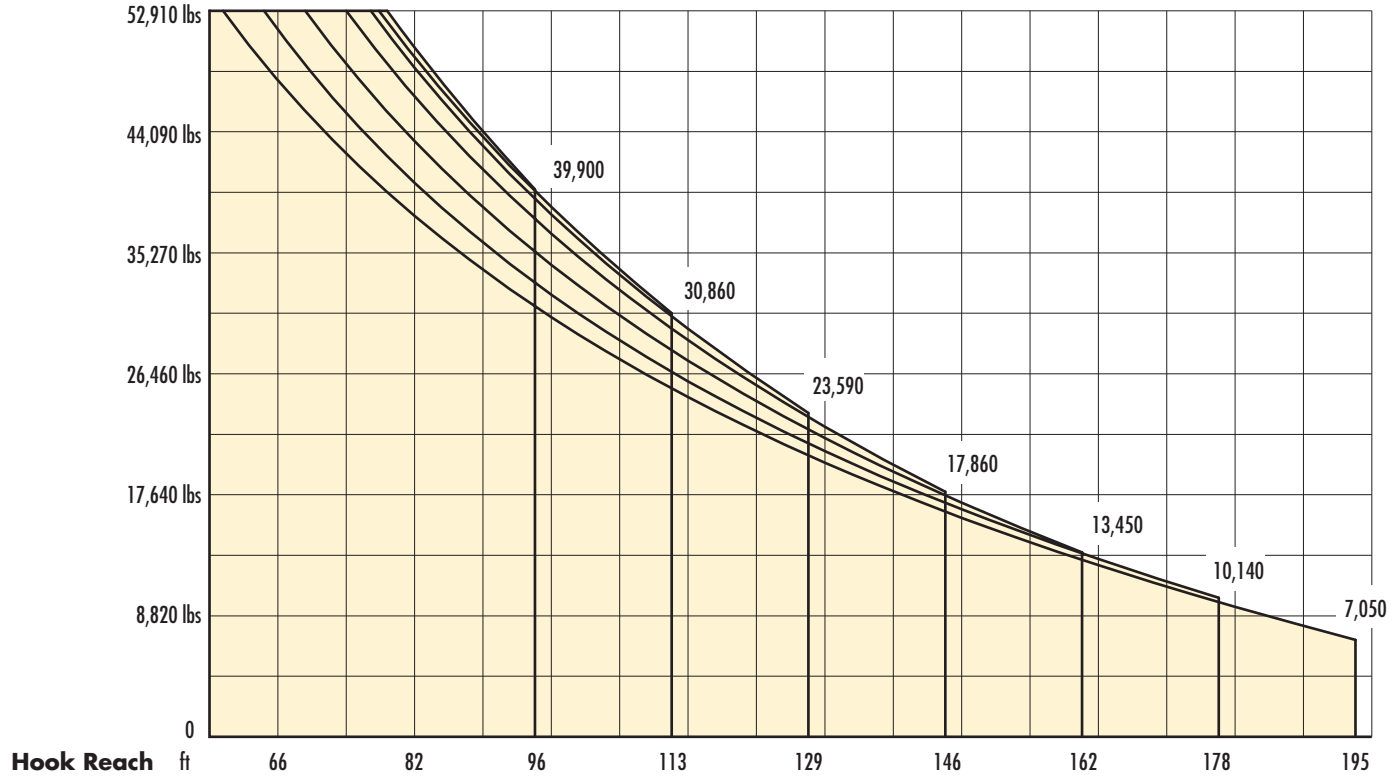
IMPORTANT: Litronic® cranes are equipped with Liebherr's state of the art PLC system that provides precise monitoring, control and coordination of all crane functions. Contact Morrow for more information regarding the many features of the 357 HC-L 12/24 Litronic tower crane.

Radius and capacities two-part operation

Boom Length	Hook Reach	Maximum Capacity – Radius	ft	74	82	90	98	107	115	123	131	139	148	156	164	172	180	189	197
197 ft	195 ft	52,910 lbs – 59 ft	lbs	42,500	37,960	34,040	30,580	27,510	24,760	22,270	20,000	17,900	15,960	14,180	12,520	10,960	9,480	8,080	7,050
180 ft	178 ft	52,910 lbs – 64 ft	lbs	45,480	40,390	36,020	32,230	28,900	25,930	23,240	20,810	18,610	16,580	14,700	12,960	11,330	10,140		
164 ft	162 ft	52,910 lbs – 69 ft	lbs	49,030	43,410	38,600	34.410	30,710	27,430	24,470	21,780	19,330	17,060	14,950	13,450				
148 ft	146 ft	52,910 lbs – 74 ft	lbs	52,910	44,140	37,520	32,340	29,450	25,790	23,720	20,990	19,810	17,860						
131 ft	129 ft	52,910 lbs – 77 ft	lbs	52,910	48,770	43,060	38,070	33,660	29,740	26,170	23,590								
115 ft	113 ft	52,910 lbs – 78 ft	lbs	52,910	49,540	43,720	38,620	34,080	30,860										
98 ft	96 ft	52,910 lbs – 79 ft	lbs	52,910	50,240	44,310	39,900												

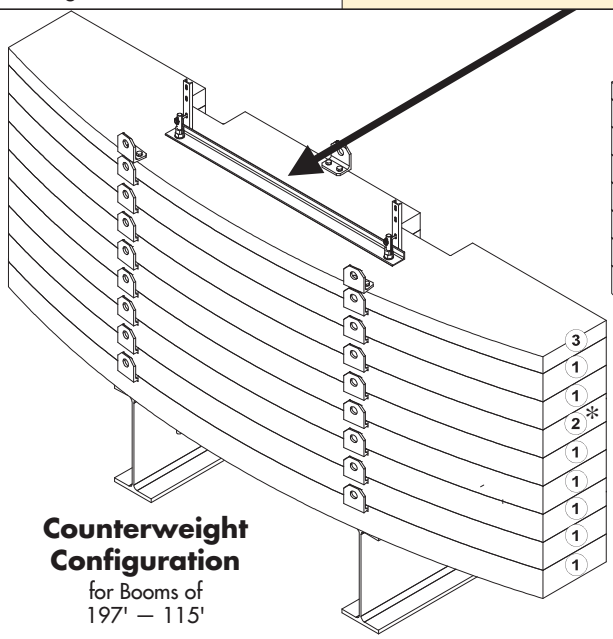


Lifting Capacity

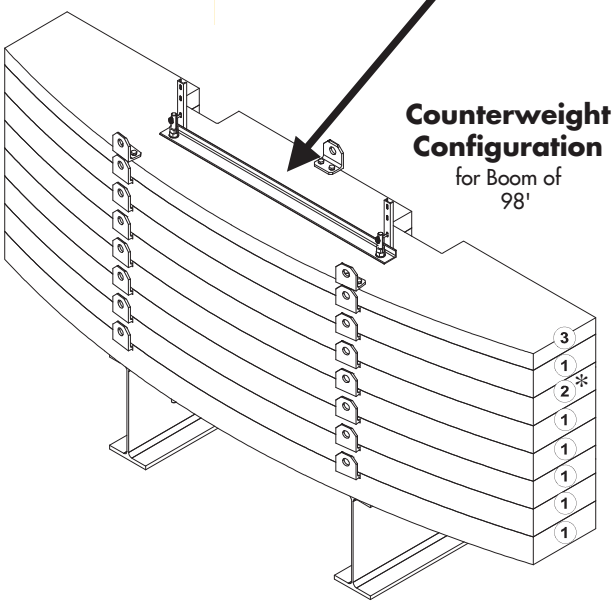


Counterweights (Steel)

Boom length	197' – 115'	98'
No. of counterweights required	7 x ① + 1 x ② + 1 x ③	6 x ① + 1 x ② + 1 x ③
Total weight	92,810 lbs	82,010 lbs



Counterweight Configuration
for Booms of
197' – 115'



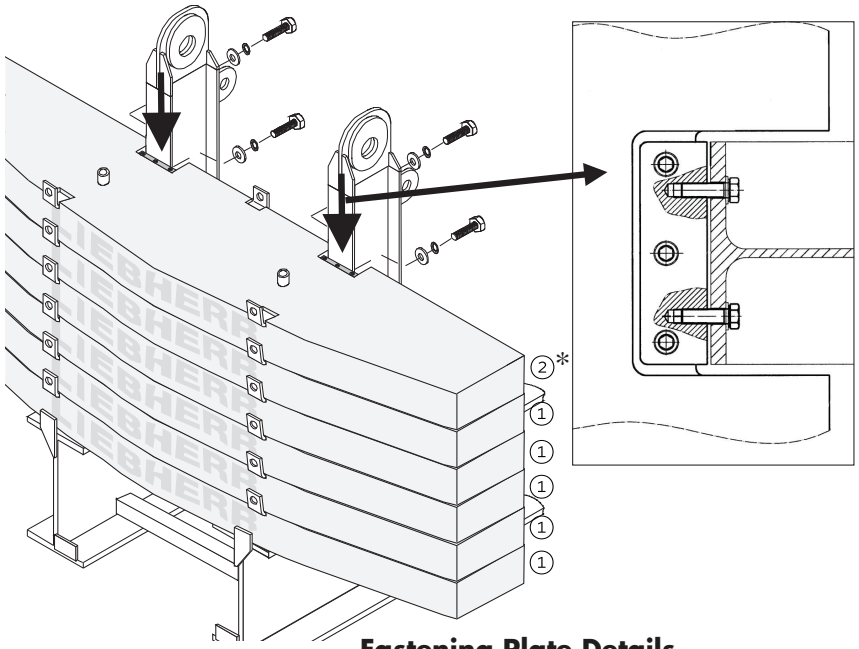
Counterweight Configuration
for Boom of
98'

***IMPORTANT:** Six (6) counterweights must be installed and secured before the boom is attached. Ballast blocks ② with fastening plates secured in the openings shown must be in the sixth position.

NOTE: Weights of the steel counterweight blocks are: ①=10,800 lbs, ②=10,800 lbs and ③=6,390 lbs each.

Block type 2 is installed after placing the first five type 1 blocks. Block type 2 has two fastening plates that bolt the six initial counterweight blocks to the gear platform prior to attaching the boom. Once the boom is installed, the rest of the counterweight blocks are to be added.

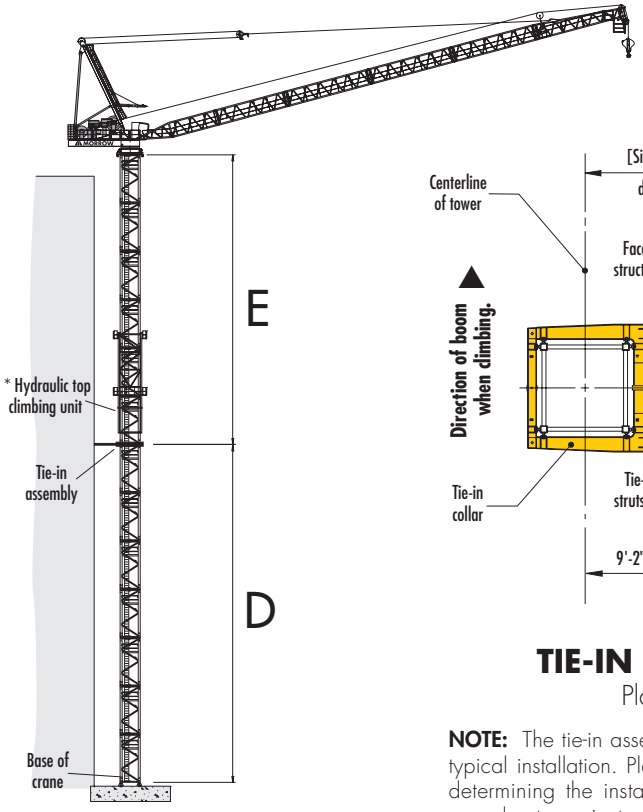
Counterweight figures displayed in the chart above are for crane with hoist unit WiW 300 VZ 412. If another hoist unit is installed, refer to the 357 HC-L 12 Operation Manual or contact MORROW for information.



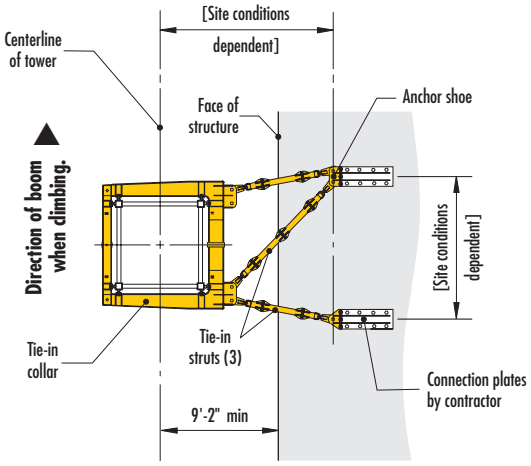
Fastening Plate Details
for counterweight Block type 2
(see Note this page.)

Tie-in details

IMPORTANT: Please consult crane operation manual before erecting, operating, climbing, servicing and dismantling.

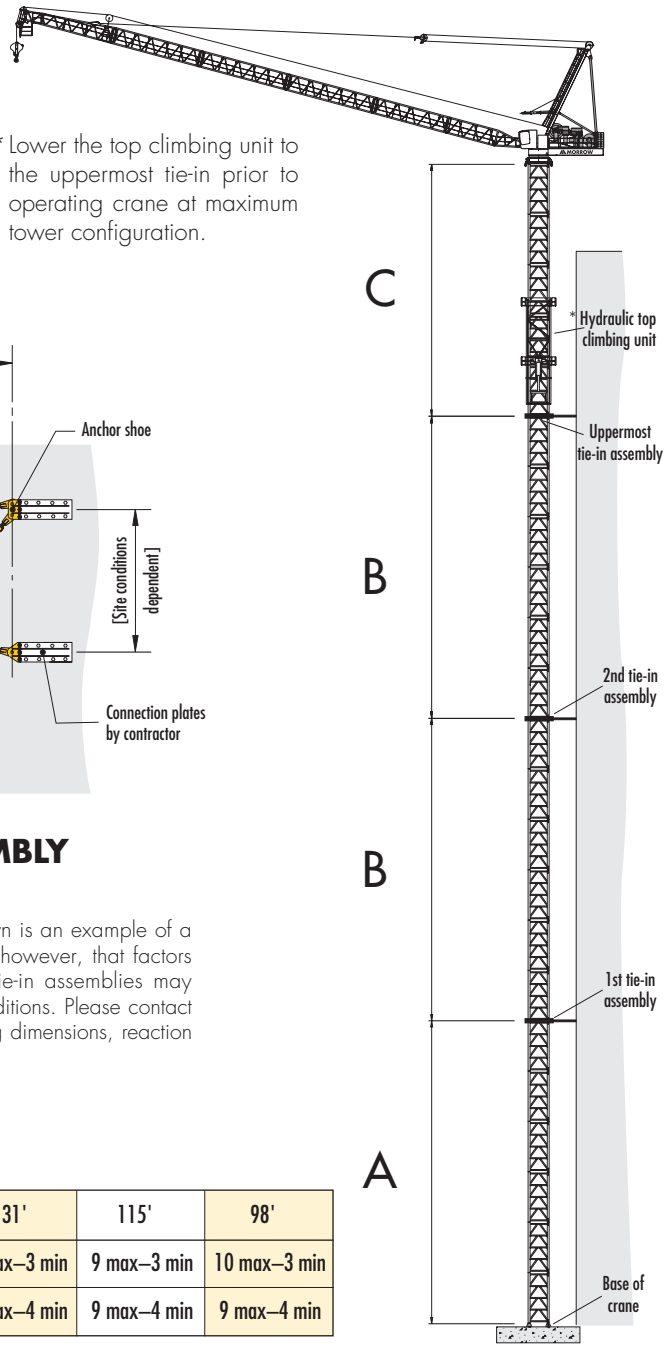


with 550 HC Tower
Tied to structure with 1 tie-in



TIE-IN ASSEMBLY
Plan View

NOTE: The tie-in assembly shown is an example of a typical installation. Please note, however, that factors determining the installation of tie-in assemblies may vary due to project specific conditions. Please contact Morrow for information regarding dimensions, reaction forces and tie-in locations.



with 550 HC tower
Tied to structure with two or more tie-ins

Tower sections permitted with 1 tie-in **

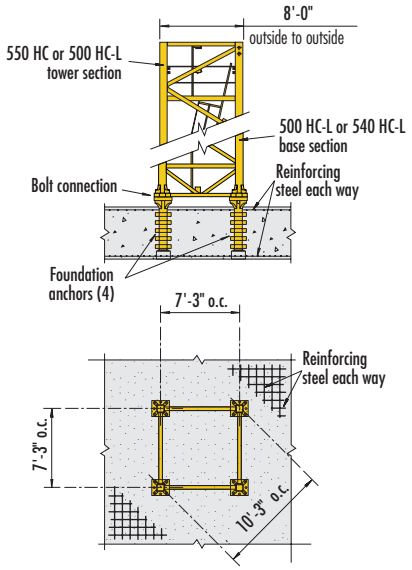
Boom Length	197'	180'	164'	148'	131'	115'	98'
Above top tie-in (E)	7 max–3 min	7 max–3 min	8 max–3 min	8 max–3 min	9 max–3 min	9 max–3 min	10 max–3 min
Base to 1st tie-in (D)	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min

Tower sections permitted with 2 or more tie-ins**

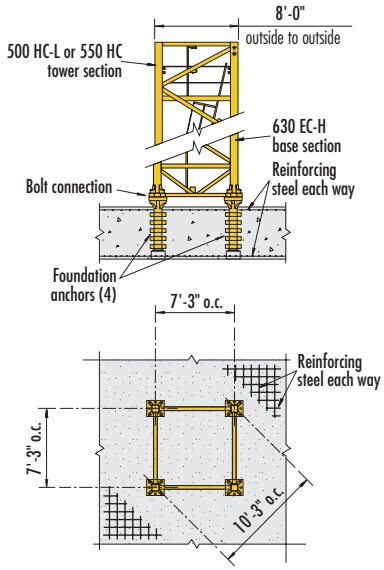
Boom Length	197'	180'	164'	148'	131'	115'	98'
Above top tie-in (C)	6 max–3 min	7 max–3 min	7 max–3 min	8 max–3 min	8 max–3 min	9 max–3 min	9 max–3 min
Between tie-ins (B)	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min	9 max–4 min
Base to 1st tie-in (A)							

****NOTE!** Charts above apply only to 357 HC-L 12/24 configurations with 550 HC tower. Other configurations available. Restrictions may apply; contact Morrow engineering.

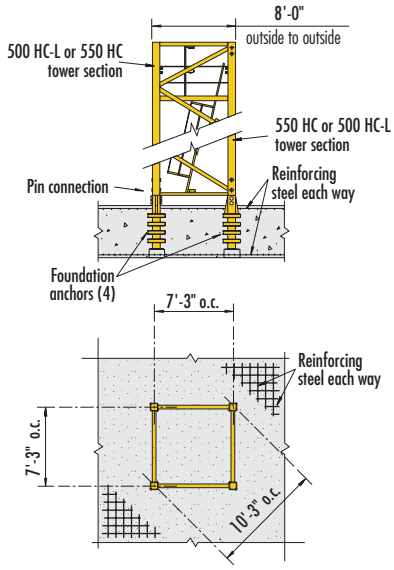
Foundation details on concrete footing



with 500 HC-L or 540 HC-L Base Section

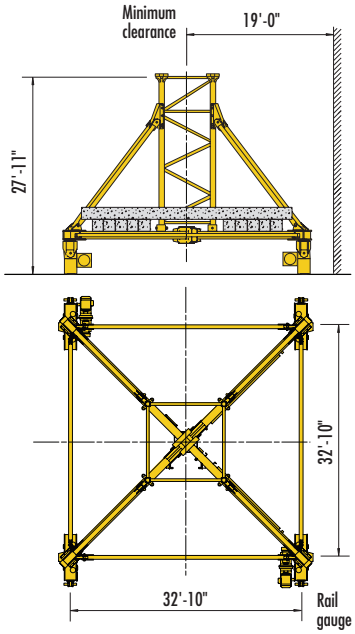


with 630 EC-H Base Section

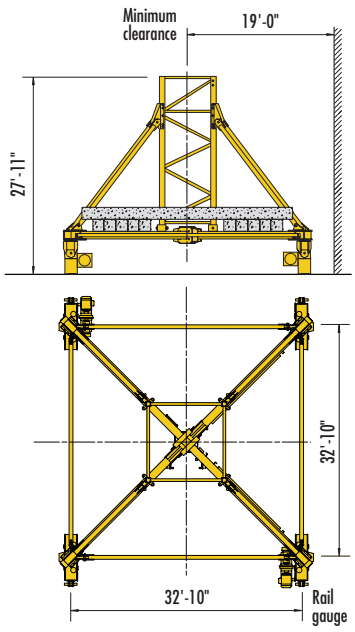


with 550 HC or 500 HC-L Tower Section

Undercarriage details on rail-travelling undercarriage



630 EC-H



550 HC

NOTE: For information regarding rail-travelling, static undercarriages and central ballast configurations, see 357 HC-L Litronic Operation Manual.

Hoist speed and capacity

Hoist Unit — WiW 300 VZ 412			
147 hp (110 kW) AC hoist unit Variable frequency drive 3-speed gearbox Electromagnetic gear shifting	**1-Part Line**		
	Speed	**Capacity**	**Line Speed**
	1	up to 26,460 lbs up to 11,680 lbs	@ 148 fpm @ 272 fpm
	2	up to 13,890 lbs up to 4,630 lbs	@ 256 fpm @ 472 fpm
	3	up to 6,610 lbs up to 660 lbs	@ 429 fpm @ 787 fpm
	2-Part Line		
	1	up to 52,910 lbs up to 24,690 lbs	@ 75 fpm @ 138 fpm
	2	up to 29,100 lbs up to 12,350 lbs	@ 128 fpm @ 236 fpm
1P - 4L435 2P - 4L217	3	up to 15,650 lbs up to 5,070 lbs	@ 213 fpm @ 394 fpm

NOTE: Capacities and line speeds indicated will vary depending on the amount of hoist rope installed. This crane model may be equipped with a hoist unit other than that specified in the data above. To verify, check the serial number of the crane and refer to the Liebherr 357 HC-L Operation Manual for additional information.

Motor information

Drive Unit	Horsepower	Kilowatts	Speed*
Luffing* (VFD)	147 hp	110 kW	1.7 min
Swing (VFD)	2 x 10 hp	2 x 7.5 kW	0.7 rpm
Rail travelling	Information available upon request		

*** NOTE:** Luffing speed shown is for a typical working range of 15° to 75° with load. Luffing speeds are variable. Factors such as hook load, boom length will affect speed.

Power requirements

Power supply: 3-phase 480 V, 60 Hz; 3-wire plus ground; no Neutral.
480 V phase-phase, 277 V each phase to ground with 120° phase shift between phases.
Service size: 300 Amperes

NOTES:

1. For electric power provided by an electric utility, do not use open Delta transformers.
2. For electric power provided by a generator, the minimum generator size required is 350 kW. Verify the generator provided is suitable for use with variable frequency drives (VFDs). A properly sized generator is critical to the safe operation of the crane.

Specifications subject to change without prior notice. For additional information, contact MORROW.

Hoist speed and capacity

Hoist Unit WiW 320 VZ 403			
215 hp (160 kW) AC hoist unit Variable frequency drive 3-speed gearbox Electromagnetic gear shifting	**1-Part Line**		
	Speed	**Capacity**	**Line Speed**
	1	up to 26,460 lbs up to 14,110 lbs	@ 223 fpm @ 341 fpm
	2	up to 14,550 lbs up to 6,830 lbs	@ 364 fpm @ 558 fpm
	3	up to 6,170 lbs up to 1,320 lbs	@ 650 fpm @ 994 fpm
	2-Part Line		
	1	up to 52,910 lbs up to 29,320 lbs	@ 112 fpm @ 171 fpm
	2	up to 29,980 lbs up to 16,090 lbs	@ 180 fpm @ 279 fpm
1P - 4L435 2P - 4L217	3	up to 14,770 lbs up to 6,610 lbs	@ 325 fpm @ 499 fpm

NOTE: Capacities and line speeds indicated will vary depending on the amount of hoist rope installed. This crane model may be equipped with a hoist unit other than that specified in the data above. To verify, check the serial number of the crane and refer to the Liebherr 357 HC-L Operation Manual for additional information.

Motor information

Drive Unit	Horsepower	Kilowatts	Speed*
Luffing* (VFD)	147 hp	110 kW	1.7 min
Swing (VFD)	2 x 10 hp	2 x 7.5 kW	0.7 rpm
Rail travelling	Information available upon request		

*** NOTE:** Luffing speed shown is for a typical working range of 15° to 75° with load. Luffing speeds are variable. Factors such as hook load, boom length will affect speed.

Power requirements

Power supply: 3-phase 480 V, 60 Hz; 3-wire plus ground; no Neutral.
480 V phase-phase, 277 V each phase to ground with 120° phase shift between phases.
Service size: 350 Amperes

NOTES:

1. For electric power provided by an electric utility, do not use open Delta transformers.
2. For electric power provided by a generator, the minimum generator size required is 400 kW. Verify the generator provided is suitable for use with variable frequency drives (VFDs). A properly sized generator is critical to the safe operation of the crane.

Specifications subject to change without prior notice. For additional information, contact MORROW.

Component List

Description	Dimensions L x W x H	Weight
Slewing Ring Support	9'-6" x 8'-1" x 7'-1"	9,410 lbs
Connection Brackets (4) (each)	3'-8" x 2'-4" x 10"	470 lbs
Slewing Platform [1] plus swing motors	9'-8" x 7'-5" x 6'-1"	16,250 lbs
Machine Deck with electrical panels	22'-8" x 7'-3" x 8'-0"	19,180 lbs
Hoist Gear [2] 147 hp (110 kW)	10'-6" x 8'-0" x 5'-9"	14,990 lbs
Luffing Gear (w/wire rope) 147 hp (110 kW)	9'-2" x 7'-3" x 5'-3"	11 020 lbs
Operator's Cab with access platform	17'-5" x 6'-3" x 8'-5"	3,640 lbs
Platforms (3) for machine deck	18'-1" x 3'-7" x 6'-1"	1,650 lbs
Gantry [3] (complete)	39'-3" x 7'-7" x 4'-11"	12,200 lbs
Base Section 630 EC-H	40'-9" x 8'-10" x 8'-10"	31,010 lbs
Base Section 500 HC-L	40'-9" x 8'-10" x 8'-10"	37,850 lbs
Base Section 540 HC-L	40'-9" x 8'-10" x 8'-10"	31,880 lbs
Std Tower Section 550 HC	20'-7" x 8'-0" x 8'-0"	14,280 lbs
Long Section 550 HC	39'-8" x 8'-0" x 8'-0"	23,480 lbs
Tower Section 500 HC-L	20'-7" x 8'-0" x 8'-0"	17,900 lbs
Hook Block	7'-10" x 4'-9" x 2'-8"	3,420 lbs
Luffing Rope Sheave Block	4'-11" x 3'-11" x 3'-7"	1,320 lbs

Description		Dimensions L x W x H	Weight
Butt Section ① 611		32'-6" x 6'-3" x 6'-3"	5,620 lbs
Boom Section ② 612		29'-4" x 6'-3" x 6'-11"	4,670 lbs
Boom Section ③ 621		34'-9" x 6'-3" x 6'-11"	4,960 lbs
Boom Section ④ 631		34'-9" x 6'-3" x 6'-3"	3,640 lbs
Boom Section ⑤ 622		18'-0" x 6'-3" x 6'-3"	1,980 lbs
Tip Section ⑥ 641		36'-5" x 6'-7" x 6'-11"	6,720 lbs
Top Climbing Unit [4] Panels (2)		41'-4" x 9'-8" x 5'-9"	17,415 lbs
Top Climbing Unit [4] Hydraulics/etc.		8'-6" x 4'-11" x 2'-0"	6,830 lbs
Boom Assembly Part 1 [5] 197 ft boom	①②③	95'-2" x 6'-3" x 6'-11"	20,060 lbs
Boom Assembly Part 2 [6] 197 ft boom	④④⑥	104'-4" x 6'-7" x 6'-11"	16,090 lbs
Boom Assembly Part 1 [6] 180 ft – 98 ft booms	①②	61'-4" x 6'-3" x 6'-11"	13,890 lbs
Boom Assembly Part 2 [6] 180 ft boom	③④⑤⑥	121'-5" x 6'-7" x 6'-11"	19,840 lbs
Boom Assembly Part 2 [6] 164 ft boom	③④⑥	104'-4" x 6'-7" x 6'-11"	17,420 lbs
Boom Assembly Part 2 [6] 148 ft boom	③⑤⑥	87'-3" x 6'-7" x 6'-11"	15,650 lbs
Boom Assembly Complete [7] 131 ft boom	①②③⑥	131'-11" x 6'-7" x 6'-11"	26,240 lbs
Boom Assembly Complete [7] 115 ft boom	①②⑤⑥	114'-10" x 6'-7" x 6'-11"	23,150 lbs
Boom Assembly Complete [7] 98 ft boom	①②⑥	97'-9" x 6'-7" x 6'-11"	20,500 lbs

NOTE: Weights and dimensions are approximate. Scale components before lifting. Consult operation manual before erecting, operating, servicing and dismantling crane.

[1] Slewing platform can be split into four parts i.e., slewing platform, slewing ring and two swing drives.
[2] Wire rope included. Typical rope installation; 985 ft at 2,315 lbs.
[3] Gantry (boom retaining frame) can be split into component parts.
[4] Top climbing unit complete includes front and rear panel, hydraulic system, ladders and platforms with a total weight of 22,420 lbs.
[5] Boom assembly Part 1 includes boom sections 1, 2 and 3 and erection wire rope for the 197 ft boom. For all other booms, Part 1 includes boom sections 1 and 2 plus erection rope.
[6] Boom assembly Part 2 includes boom sections and pendent bars.
[7] Complete boom assemblies can be split into two parts.