

Manitowoc 31000

Product Guide

Provisional

Features

- 2 300 t (2,535 USt) main boom
- 1 400 t (1,543 USt) fixed jib
- 1 000 t (1,102 USt) luffing jib
- 34 800 t-m (252,100 ft-kips) maximum load moment
- Variable Position Counterweight (VPC) - U.S. Patent 7,546,928



Features

Variable Position Counterweight (VPC)

U.S. Patent 7,546,928

The Manitowoc 31000 features the only self-supporting counterweight system in the industry. By suspending the counterweights above the ground, site preparation is greatly reduced. As load increases on the hook, the VPC is automatically repositioned to maintain an optimum load moment allowing the operator to remain focused on the lift.



Power plant

Two 447 kW (600 hp) Cummins diesel engines deliver power.

Crawlers

Four independent, trunnion mounted crawlers.

Transportation

The Manitowoc 31000 is designed to be efficiently transported globally.

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Specifications

Upperworks



Engine

Two 447 kW (600 hp) Cummins QSX15 in-line six cylinder diesel engines, compliant to US EPA Tier 3, CARB Tier 3, and EU Stage IIIA emissions regulations.

Two independent main diesel engine power plants, operator's cab, and auxiliary electrical system are integrated into a common, rugged, and easily transportable package.

Power is transmitted from each diesel engine to the hydraulic system through an automotive clutch coupled to a four pad pump drive gearbox.

The 2 270 L (600 gal) diesel fuel tank is equipped with both a splash - type fill and pressurized fast fill. Level indicator is provided in the operator's cab.

A 240 VAC, 60 Hz, single phase, hydraulically driven auxiliary generator provides primary electrical power for the operator's cab heating and air conditioning and general crane area lighting.

A 240 volt, 60 Hz, single phase, diesel engine driven standby generator is provided.

- Optional: 240 VAC, 50 Hz, single phase, hydraulically driven auxiliary generator.
- Optional: 240 VAC, 50 Hz, single phase, diesel engine driven standby generator.
- Optional: Fire suppression system.



Controls

Modulating electronic over hydraulic controls provide infinite speed response directly proportional to the operator's control lever movement. Controls include Manitowoc's exclusive EPIC® Electronically Processed Independent Control system with CANBus technology providing microprocessor driven control logic, variable displacement pump and motor control, on-board diagnostics, and service information.

Block up limit control is provided for load hoist and whip lines.

The integrated Rated Capacity Limiter (RCL) is provided for main boom. The RCL for the extended

upper boom point, luffing jib, and fixed jib is provided with each of these optional configurations.

Travel, swing and VPC alarms are provided.



Hydraulic system

High-pressure variable displacement piston pumps, driven by two multi-pump transmissions, provide independent closed-loop hydraulic power for load hoist drums, boom hoist, VPC, swing, crawlers, and optional luffing hoist.

Accessory hydraulic power is provided by two variable displacement piston pumps, shared with the crawler drive, for actuation of cylinders and powered pins.

Hydraulic reservoir capacity is 1 741 L (460 gal) and is equipped with breather, sight and electrical level indicator, clean out access, and internal diffusers.

Each function is equipped with relief valves to protect the circuit from overload or shock.

Replaceable, ten micron (absolute) full flow tank filters are installed. All hydraulic fluid is filtered prior to returning to the reservoir.

The hydraulic system includes a hydraulic fluid heat exchanger designed for high ambient temperature operation.



Drums

The basic crane is equipped with three independent load hoist drums; two main and one auxiliary/whip. Each drum is 1 785 mm (70-1/4") wide, 1 118 mm (44") diameter, and grooved for 50 mm wire rope.

Power is provided by four variable displacement axial piston motors driving two planetary reduction gearboxes. Each motor is coupled to its mating gearbox through a spring applied, hydraulically released wet multi-disc brake.

Standard line pull is 490 kN (110,230 lb).

Maximum main load drum speed of 139 m/min (456 fpm) on the eighth layer.

Maximum auxiliary/whip drum speed of 117 m/min (383 fpm) on the fifth layer.

Drum rotation indicator, third wrap indicator (bail limit), and pressure rollers are standard for each drum.



Boom hoist system

An independent boom hoist drum, constructed with a common barrel divided equally by a center flange, is driven by four variable displacement axial piston motors through two planetary reduction gearboxes. Each motor is coupled to the mating gearbox through a spring applied, hydraulically released wet multi-disc brake.

The drum is grooved for 34 mm wire rope, continuously reeved with 28 parts of boom hoist line.



Swing system

Eight swing drives, each powered by a fixed displacement axial piston motor coupled to a planetary reduction gearbox. The motor is connected to the mating gearbox through a spring applied, hydraulically released wet multi-disc brake and mechanical disconnect.

Four swing drives are mounted to each of the front and rear roller carriers.

Swing system maximum speed: 0.50 rpm.



Variable Position Counterweight

The patent pending Variable Position Counterweight (VPC) system maintains an optimum crane load moment by automatically positioning the full compliment of crane counterweight between the fully retracted position of 8,38 m (27' 6") and fully extended position of 29,0 m (95' 1").

The crane is equipped with a maximum 949 t (2,092,700 lb) of variable position counterweight comprised of a 3-piece counterweight tray and forty-two 20 t (44,000 lb) counterweight boxes.

No carbody counterweights.

Optional: Cast iron counterweight boxes.



Operator's cab

The operator's cab is a fully enclosed and insulated steel module mounted at the left front corner of the crane. Standard equipment includes; two 10.4" RCL and

crane function displays, drum rotation indicators, travel cruise control, swing and travel alarms, RCL tower indicator light, sliding entry door, large safety glass windows, aluminum window covers, window washers and wipers, side mirrors, fire extinguisher, 6-way power seat with massage, tablet-style personal computer with mounting bracket, one-way loud hailer/speaker, 240 VAC air conditioner, 240 VAC heater, defroster fans, dome lights, aluminum storage cabinets, fold-down jump seat, and AM/FM radio with CD player.

The operator's station, including operator's seat and crane controls, tilt up to 20°.

Six closed circuit cameras provided; one to observe each of the two main load hoist drums, boom hoist drum, rigging assist drum, VPC and to view the load from the boom top. Camera information is displayed on two 10" and three 7" color monitors.

Optional: One closed circuit camera to view the third hoist load drum.

Optional: One closed circuit camera to view the luffing hoist drum.

Lowerworks



Carbody

The five-section, high strength welded steel carbody is comprised of two front/rear beams, two side beams, and a center beam with integral kingpin. The carbody beams are FACT™ connected and all pins hydraulically inserted.

Eight hydraulic jacking cylinders, four mounted to each side carbody beam, are provided to assist in crane assembly.

Roller Path and Ring Gear

Integrated into the carbody beams is a precision machined 12,19 m (40') outside diameter roller path, protected by replaceable high strength steel wear plates.

Precision machined ring gear segments are mounted internal to the roller path.



Crawlers

The four trunnion mounted crawler assemblies are 8,67 m (28' 5") long and outfitted with forty-two 2,03 m (80") wide cast steel track pads. The trunnion

Specifications

mounted design ensures uniform load distribution over the length of each crawler.

Each crawler assembly is hydraulically driven by two variable displacement motors through two planetary reduction gearboxes. Each motor is coupled to the mating gearbox through a spring applied, hydraulically released wet multi-disk brake. The operation of the two right-side crawlers is coordinated by the crane controls, and similarly the operation of the two left-side crawlers is coordinated.

Crawler drives enable travel and counter-rotation under full rated loads. Maximum travel speed is 0,60 km/h (0.37 mph).

Ground bearing pressure

The maximum ground bearing pressure under the crawlers with the boom positioned over the front of the crane:

No hook load: 434,5 kPa (63 psi / 9,075 psf)

Max load moment: 751,5 kPa (109 psi / 15,700 psf)

Ground bearing pressure with the boom swung 45° off of the crane longitudinal centerline:

Max load moment: 834,3 kPa (121 psi / 17,425 psf)

Attachments



No. 90 Heavy-lift boom

The lift crane is equipped with 55 m (180' 5") No. 90 tubular chord boom consisting of a 7,0 m (23') butt, one 10 m (32' 10") insert with wire rope guide, two 10 m (32' 10") inserts without boom straps, one 10 m (32' 10") insert with equalizer platform, an 8 m (26' 3") top, and two lower boom point assemblies each with twelve 1 321 mm (52") diameter roller bearing sheaves grooved for 50 mm diameter wire rope. Includes wire rope guides, boom hoist wire rope, and boom angle indicators.

The No. 90 boom utilizes steel suspension straps and Manitowoc's patent pending, exclusive FACT™ connection boom connectors. Hydraulic boom stops. Powered boom hinge pins are standard.

Luffing jib preparation included as standard.

- Optional: One 5 m (16' 5") No. 90 boom insert with steel suspension straps and FACT™ connection system.
- Optional: 10 m (32' 10") No. 90 boom inserts with steel suspension straps and FACT™ connection system.
- Optional: 200 t (220 US_t) detachable upper boom point with two 1 321 mm (52") diameter roller bearing sheaves grooved for 50 mm diameter wire rope.

Utilize optional boom inserts in combination with the No. 90 basic boom for total lengths up to 105 m (344' 6").



No. 91 Fixed jib

- Optional: Components to make up 24 m (78' 8") of basic fixed jib which includes a 7 m (23') No. 91 butt, 9 m (29' 6") No. 91 insert, an 8 m (26' 3") No. 91 top, wire rope guides, jib strut, basic fixed jib steel suspension straps, and FACT™ connection system.
- Optional: 6 m (19' 8") No. 91 and 12 m (39' 4") No. 91 inserts with steel suspension straps and FACT™ connection system.
- Optional: 200 t (220 US_t) detachable upper boom point with two 1 321 mm (52") diameter roller bearing sheaves grooved for 50 mm diameter wire rope.

Utilize the optional fixed jib inserts in combination with the No. 91 basic fixed jib for total lengths up to 42 m (137' 10").

Note: The fixed jib uses one lower boom point assembly from the No. 90 boom.



No. 91 Luffing jib

- Optional: Components to make up 36 m (118' 1") of basic luffing jib includes a 7 m (23') No. 91 butt, 9 m (29' 6") No. 91 insert, 12 m (39' 4") No. 91 insert, an 8 m (26' 3") No. 91 top, jib strut, main strut, main strut jib stop, luffing jib stop, basic luffing jib steel suspension straps, luffing jib boom raising dolly, luffing drum assembly, 34 mm luffing hoist wire rope, and wire rope guides.

Specifications

- Optional: 6 m (19' 8") No. 91 and 12 m (39' 4") No. 91 inserts with steel suspension straps and FACT™ connection system.
- Optional: 200 t (220 USt) detachable upper boom point with two 1 321 mm (52") diameter roller bearing sheaves grooved for 50 mm diameter wire rope.

Utilize the optional luffing jib inserts in combination with the No. 91 basic luffing jib for total lengths up to 102 m (334' 8").

Note: The luffing jib uses one lower point assembly from the No. 90 boom.



No. 90 -91 Combination boom

- Optional: 10 m (32' 10") No. 90 transition insert with steel suspension straps and FACT™ connection system.
- Optional: 8 m (26' 3") No. 91 jib top with steel suspension straps and FACT™ connection system.
- Optional: One 6 m (19' 8") No. 91 insert with steel suspension straps and FACT™ connection system.
- Optional: One 12 m (39' 4") No. 91 insert with steel suspension straps and FACT™ connection system.
- Optional: 200 t (220 USt) detachable upper boom point with two 1 321 mm (52") diameter roller bearing sheaves grooved for 50 mm diameter wire rope.

Utilize the optional No. 90 transition insert and No. 91 jib inserts and top in combination with the No. 90 boom for total lengths up to 138 m (452' 10").

Note: The combination boom uses one lower point assembly from the No. 90 boom.

Assembly equipment

Portable diesel / hydraulic power unit; DOT trailer mounted, 12 volt system power, two independent 207 bar (3,000 psi) hydraulic circuits providing power through two 30 m (100') hose reels. An assembly assist

tool kit consisting of two hand-held hydraulic cylinders for driving boom pins and a manually actuated hydraulic valve for remote cylinder operation is provided. Also, included is a hand operated winch to assist with connection of boom suspension straps.

Rigging kit consisting of lifting slings and chains, snatch block, load line reeving assist components, and crawler track handling bracket provided standard.

Optional equipment

- Optional: Blocks and hooks.

50 t (55 USt) swivel hook and weight ball and single hook with hook latch, weighing 5 000 kg (11,023 lb).

200 t (220 USt) hook block with three 1 310 mm (51.6") diameter roller bearing sheaves grooved for 50 mm diameter wire rope, duplex swivel hook with hook latches, 90° swivel lock, and 250 t (275 USt) rated shackle hole, weighing 3 300 kg (7,275 lb).

Note: Supplied with a 4 400 kg (9,700 lb) weight kit for a total hook block weight of 7 700 kg (16,976 lb).

2 000 t (2,205 USt) modular hook block assembly with twenty-two 1 310 mm (51.6") diameter roller bearing sheaves; grooved for 50 mm diameter wire rope and grouped into six block assemblies, two 1 000 t (1,102 USt) rated duplex hooks with hook latches (one hook provided with 90° swivel lock) and 1 250 t (1,378 USt) rated shackle holes. Total weight of 55 t (60 USt).

Note: The 2 000 t (2,205 USt) rated hook block can be reconfigured into 1 400 t (1,543 USt), 1 200 t (1,323 USt), 1 000 t (1,102 USt), 600 t (661 USt), and 500 t (551 USt) rated hook block assemblies from the supplied parts.

Note: Supplied with a five piece shackle kit; 2 t (2.2 USt), 9.5 t (10.5 USt), 12 t (13.2 USt), 35 t (38.6 USt), and 85 t (93.7 USt).

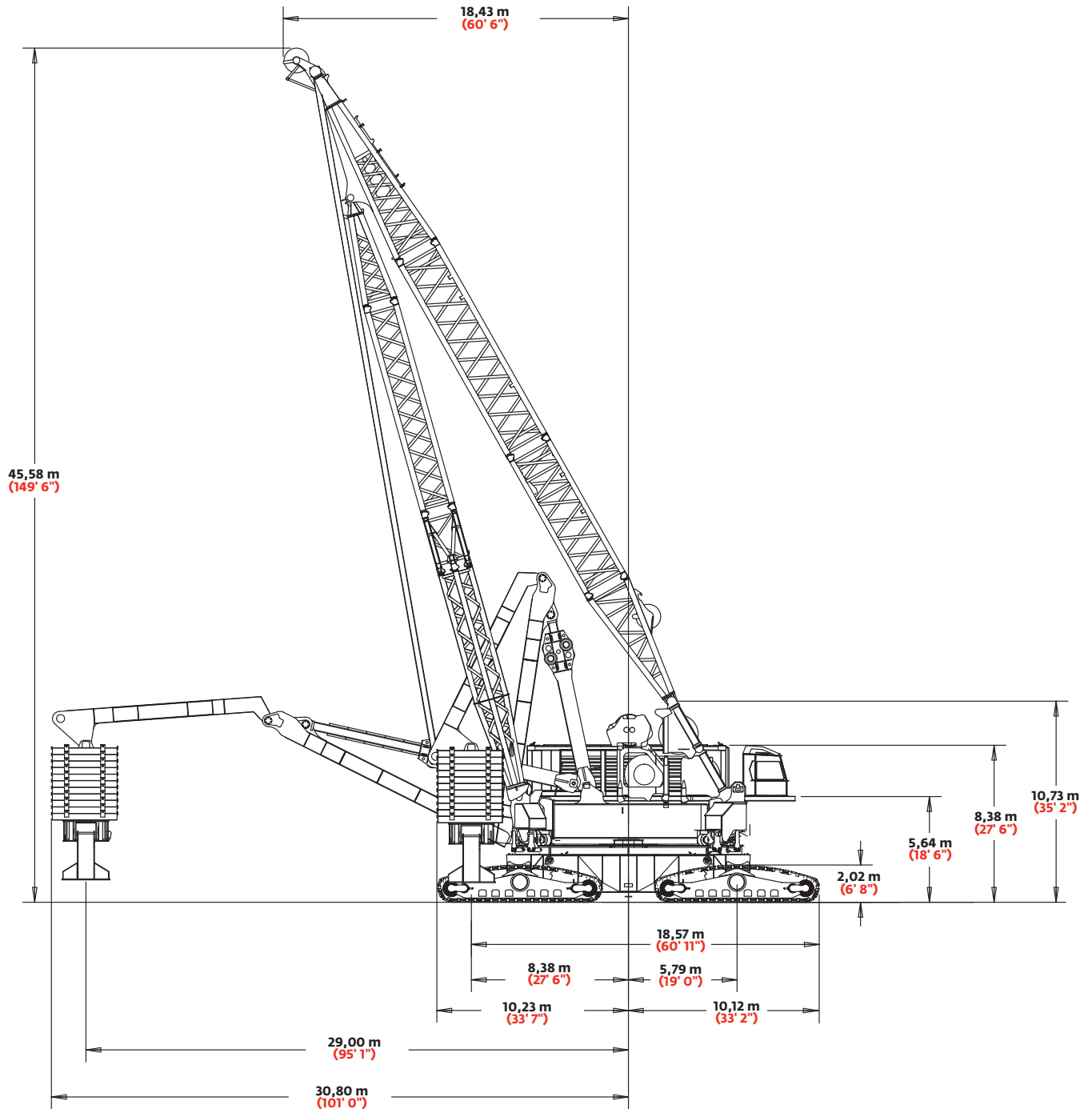
500 t (551 USt) rated link plates, when combined with one 5-sheave block and a 1 000 t (1,102 USt) duplex hook (with 90° swivel lock) from the 2 000 t (2,205 USt) modular hook block assembly, provides a compact 500 t (551 USt) rated hook block configuration for use during two hook operation. Weight of link components 12 t

Specifications

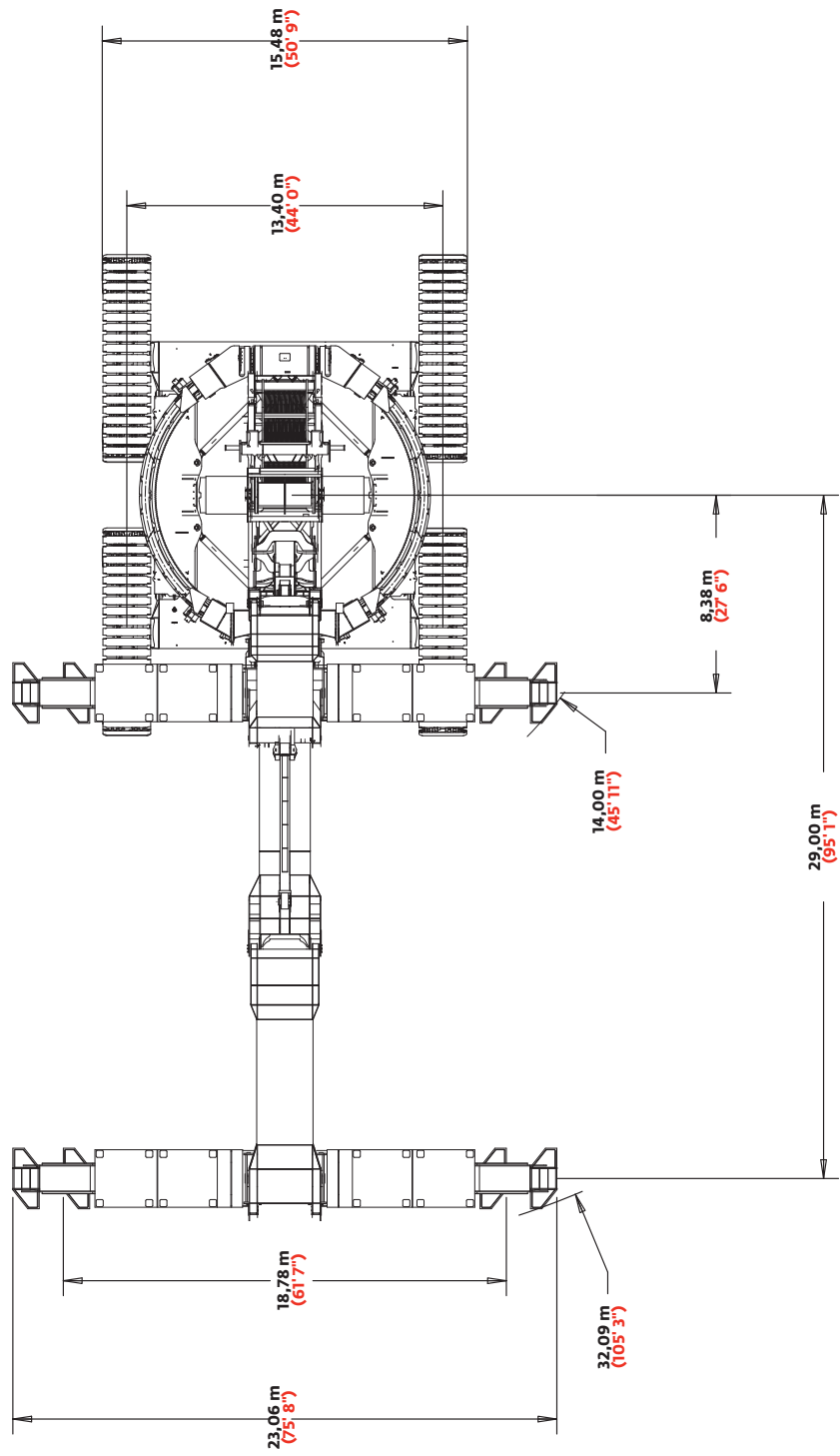
(13.2 USt) for a total assembled 500 t (551 USt) rated hook block weight of 22 t (24.3 USt).

- ▶ Optional: 250 t (275 USt) rated wide body shackle assembly.
- ▶ Optional: 1 250 t (1,378 USt) rated wide body shackle assembly.
- ▶ Optional: Hydraulic Test Kit, required to properly analyze the performance of the EPIC® control system.
- ▶ Optional: Service Interval Kits, for the regularly scheduled maintenance of general crane operations.
- ▶ Optional: Lighting package(s), consult factory for available options.
- ▶ Optional: Special paint, color(s) other than Manitowoc standard red and black.
- ▶ Optional: Custom vinyl decals, customer name and/or logo from customer supplied artwork.
- ▶ Optional: Export packaging; basic crane, boom, and jib sections.

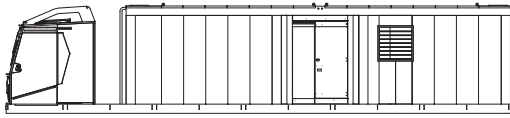
Outline dimensions



Outline dimensions

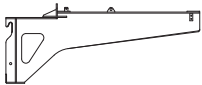


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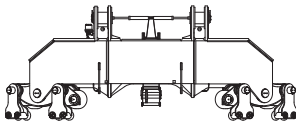
Power plant and cab assembly x 1

Length	15,90 m	52' 2"
Width	3,40 m	11' 2"
Height	3,15 m	10' 4"
Weight	34 880 kg	76,900 lb



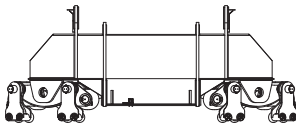
Power plant support x 2

Length	4,60 m	15' 1"
Width	1,90 m	6' 3"
Height	0,50 m	1' 8"
Weight	1750 kg	3,860 lb



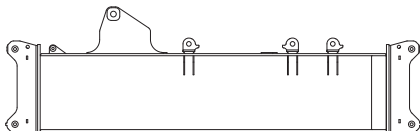
Front roller carrier and hook roller assembly x 1

Length	9,70 m	31' 10"
Width	3,10 m	10' 2"
Height	3,40 m	11' 2"
Weight	46 500 kg	102,500 lb



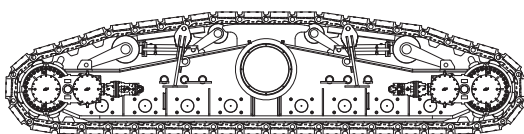
Rear roller carrier and hook roller assembly x 1

Length	8,80 m	28' 10"
Width	3,00 m	9' 10"
Height	3,20 m	10' 2"
Weight	37700 kg	83,200 lb



Rotating bed x 1

Length	9,80 m	32' 2"
Width	3,40 m	10' 2"
Height	3,10 m	9' 10"
Weight	37100 kg	81,800 lb



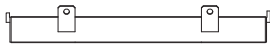
Crawlers x 4

Length	8,70 m	28' 5"
Width	2,60 m	6' 10"
Height*	2,30 m	6' 8"
Weight**	53 000 kg	116,800 lb

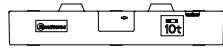
*Height with track tensioner at maximum travel 2,26 m (7' 5")

**Weight without track pad: 30 250 kg (66,700 lb)

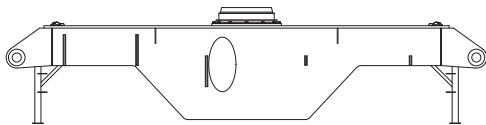
Outline dimensions



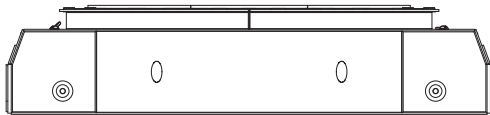
Counterweight fabricated x 42		
Length	3,50 m	11' 6"
Width	2,50 m	8' 2"
Height	0,60 m	2' 0"
Weight	20 000 kg	44,000 lb



Counterweight cast x 84		
Length	2,40 m	7' 10"
Width	1,90 m	6' 3"
Height	0,46 m	1' 6"
Weight	10 000 kg	22,000 lb



Carbody center beam x 1		
Length	8,00 m	26' 3"
Width	1,90 m	6' 3"
Height	2,00 m	6' 7"
Weight	9 900 kg	21,800 lb



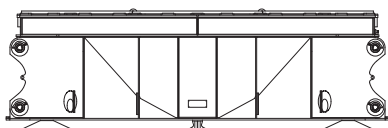
Carbody front/rear beam (no trunnions) x 2		
Length	11,80 m	38' 9"
Width	2,80 m	9' 2"
Height	2,60 m	8' 6"
Weight	37100 kg	81,800 lb



Swing drive assembly x 4		
Length	3,00 m	9' 10"
Width	1,30 m	4' 3"
Height	2,00 m	6' 7"
Weight	2 500 kg	5,500 lb

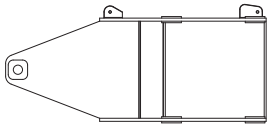


Trunnion x 4		
Length	3,00 m	9' 10"
Width	1,00 m	3' 3"
Height	1,00 m	3' 3"
Weight	5 400 kg	11,900 lb



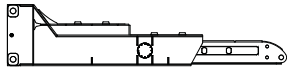
Carbody side beam with struts x 2		
Length	9,10 m	29' 10"
Width	2,70 m	8' 10"
Height	2,90 m	9' 6"
Weight	33 900 kg	74,740 lb

Outline dimensions



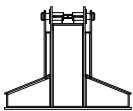
Counterweight tray center x1

Length	5,30 m	17' 5"
Width	3,50 m	11' 6"
Height	2,50 m	8' 2"
Weight	30 000 kg	66,140 lb



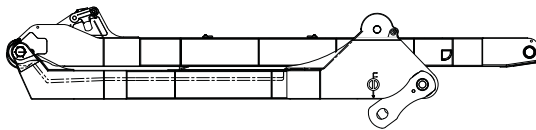
Counterweight tray side x2

Length	6,97 m	22' 11"
Width	2,40 m	7' 10"
Height	2,18 m	7' 2"
Weight	37 900 kg	83,600 lb



Counterweight support x2

Length	3,35 m	11' 0"
Width	1,31 m	4' 4"
Height	2,72 m	8' 11"
Weight	9 344 kg	20,550 lb



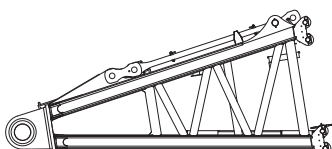
Counterweight positioning frame x1

Length	14,70 m	48' 3"
Width	3,47 m	11' 5"
Height	2,50 m	8' 2"
Weight	39 700 kg	87,500 lb



Counterweight positioning actuator x1

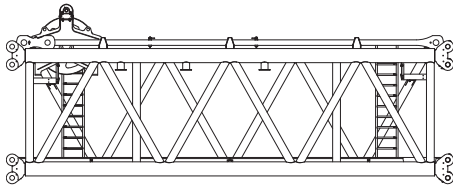
Length	10,70 m	35' 1"
Width	2,70 m	8' 10"
Height	3,10 m	10' 2"
Weight	27 200 kg	59,980 lb



No. 90 Boom butt 7 m x1

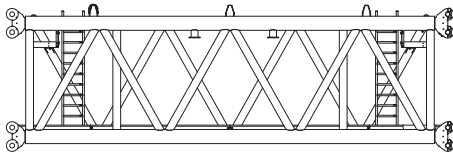
Length	7,90 m	25' 11"
Width	4,00 m	13' 1"
Height	3,20 m	10' 6"
Weight	21 700 kg	47,840 lb

Outline dimensions



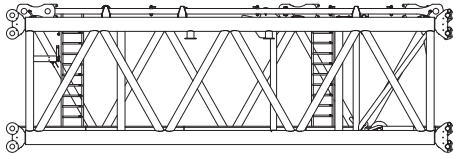
No. 90 Boom insert with wire rope guide 10 m x 1

Length	10,30 m	33' 9"
Width	4,00 m	13' 1"
Height	3,2 m	10' 6"
Weight	24 700 kg	54,340 lb



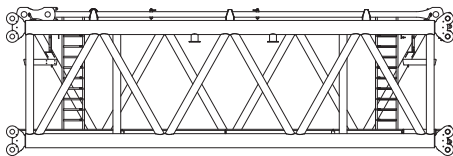
No. 90 Boom insert without straps 10 m x 2

Length	10,30 m	33' 9"
Width	4,00 m	13' 1"
Height	3,20 m	10' 6"
Weight	23 100 kg	50,940 lb



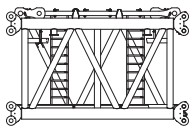
No. 90 Boom insert with equalizer platform 10 m x 1

Length	10,30 m	33' 9"
Width	4,00 m	13' 1"
Height	3,20 m	10' 6"
Weight	30 500 kg	67,240 lb



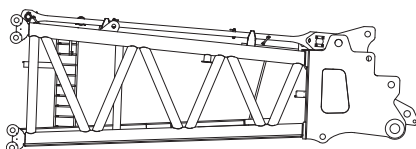
No. 90 Boom insert with straps 10 m x 5

Length	10,30 m	33' 9"
Width	4,00 m	13' 1"
Height	3,2 m	10' 6"
Weight	26 000 kg	57,320 lb



No. 90 Boom insert with straps 5 m x 1

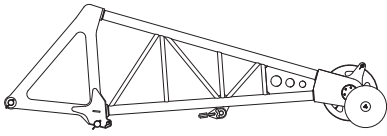
Length	5,30 m	17' 5"
Width	4,00 m	13' 1"
Height	3,20 m	10' 6"
Weight	15 900 kg	35,060 lb



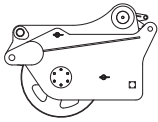
No. 90 Boom top 8 m x 1

Length	9,80 m	32' 2"
Width	4,00 m	13' 1"
Height	3,20 m	10' 6"
Weight	37 200 kg	82,020 lb

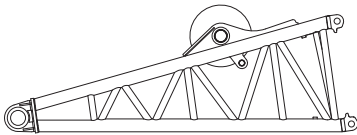
Outline dimensions



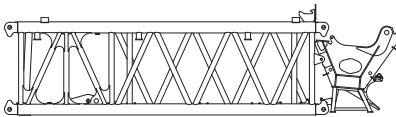
Upper boom point assembly x 1		
Length	9,10 m	29' 10"
Width	2,20 m	7' 3"
Height	3,00 m	9' 10"
Weight	7150 kg	15,730 lb



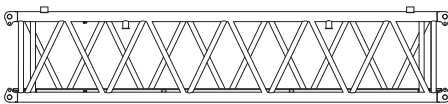
Lower boom point assembly x 2		
Length	2,60 m	8' 6"
Width	1,90 m	6' 3"
Height	1,90 m	6' 3"
Weight	10 600 kg	23,369 lb



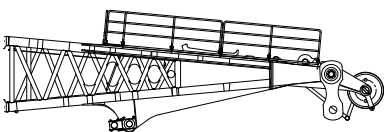
No. 92 Mast butt 7,05 m x 1		
Length	7,60 m	24' 11"
Width	3,10 m	10' 2"
Height	2,80 m	9' 2"
Weight	10 500 kg	23,160 lb



No. 92 Mast insert with raising frame 8,5 m x 1		
Length	10,70 m	35' 1"
Width	3,10 m	10' 2"
Height	3,00 m	9' 10"
Weight	15 900 kg	35,060 lb

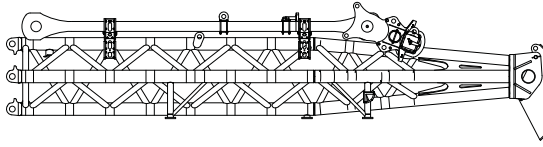


No. 92 Mast insert 12 m x 1		
Length	12,30 m	40' 4"
Width	3,10 m	10' 2"
Height	2,70 m	8' 10"
Weight	9 400 kg	20,720 lb



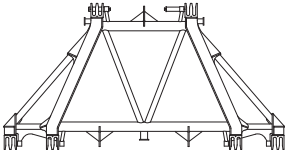
No. 92 Mast top 11,05 m x 1		
Length	12,90 m	42' 0"
Width	3,49 m	11' 6"
Height	3,21 m	10' 6"
Weight	27 900 kg	65,500 lb

Outline dimensions



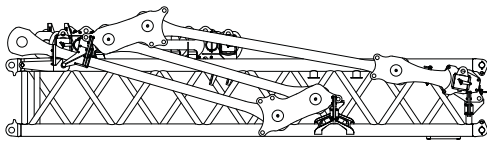
No. 93 Backhitch butt 12,5 m x 2

Length	12,89 m	42' 4"
Width	1,62 m	5' 4"
Height	2,47 m	8' 2"
Weight	10 100 kg	22,000 lb



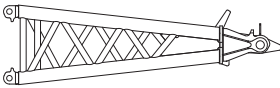
No. 93 Backhitch transition insert 3,2 m x 1

Length	6,70 m	22' 0"
Width	1,90 m	6' 3"
Height	3,50 m	11' 6"
Weight	8 400 kg	18,520 lb



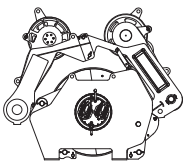
No. 93 Backhitch insert 11,4 m x 1

Length	11,50 m	37' 9"
Width	3,47 m	11' 5"
Height	3,20 m	10' 6"
Weight	25 000 kg	55,200 lb



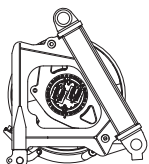
No. 93 Backhitch top 5,9 m x 1

Length	6,60 m	21' 8"
Width	3,20 m	10' 6"
Height	1,90 m	6' 3"
Weight	5 300 kg	11,680 lb



Boom hoist drum with sheave bank and equalizer x 1

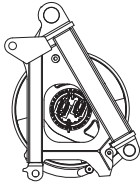
Length	4,20 m	13' 9"
Width	2,50 m	8' 2"
Height	2,20 m	7' 3"
Weight	40 000 kg	84,000 lb



Whip hoist drum and boom stops x 1

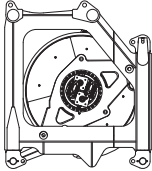
Length	3,70 m	12' 2"
Width	2,70 m	8' 10"
Height	3,10 m	10' 2"
Weight	33 200 kg	73,200 lb

Outline dimensions



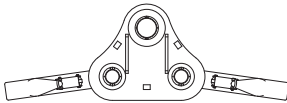
Main hoist drum #1 x 1

Length	3,90 m	12' 9"
Width	2,60 m	8' 6"
Height	3,40 m	11' 2"
Weight	41 820 kg	91,000 lb



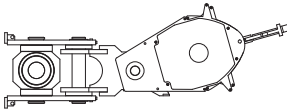
Main hoist drum #2 x 1

Length	5,10 m	16' 9"
Width	2,80 m	9' 2"
Height	3,20 m	10' 6"
Weight	37 420 kg	82,500 lb



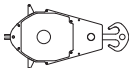
▶ Hook assembly, 2 000 t x 1

Length	5,40 m	17' 9"
Width	1,70 m	5' 7"
Height	1,90 m	6' 3"
Weight	14 800 kg	32,640 lb



▶ Block assembly, 2 000 t x 1

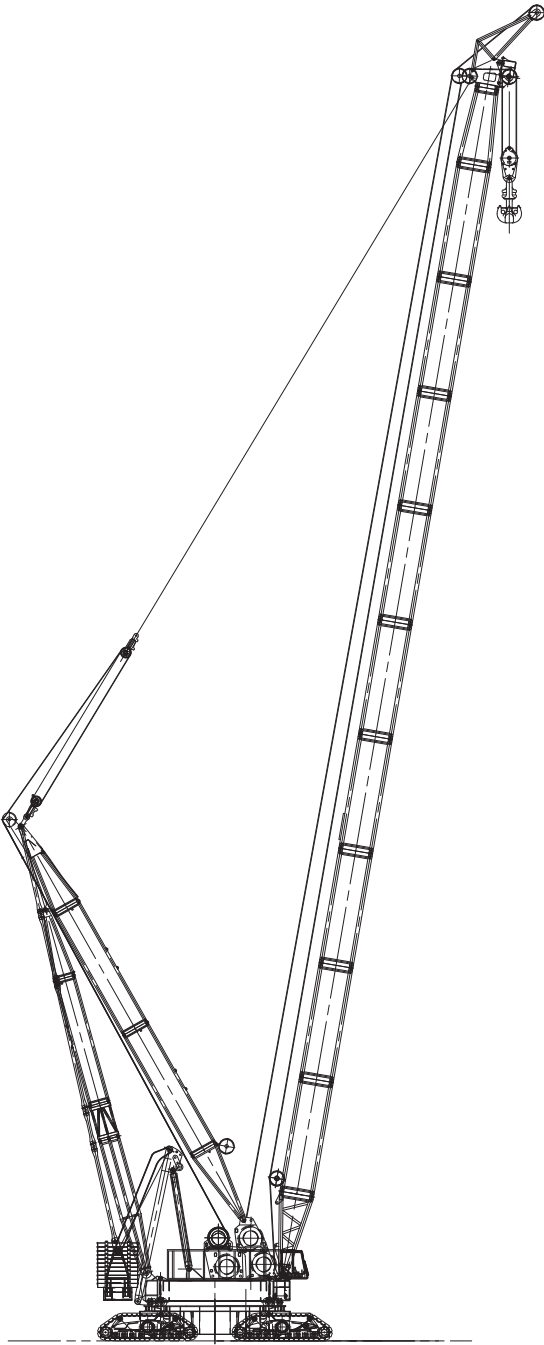
Length	3,40 m	11' 2"
Width	3,50 m	11' 6"
Height	3,60 m	11' 10"
Weight	38 900 kg	85,760 lb



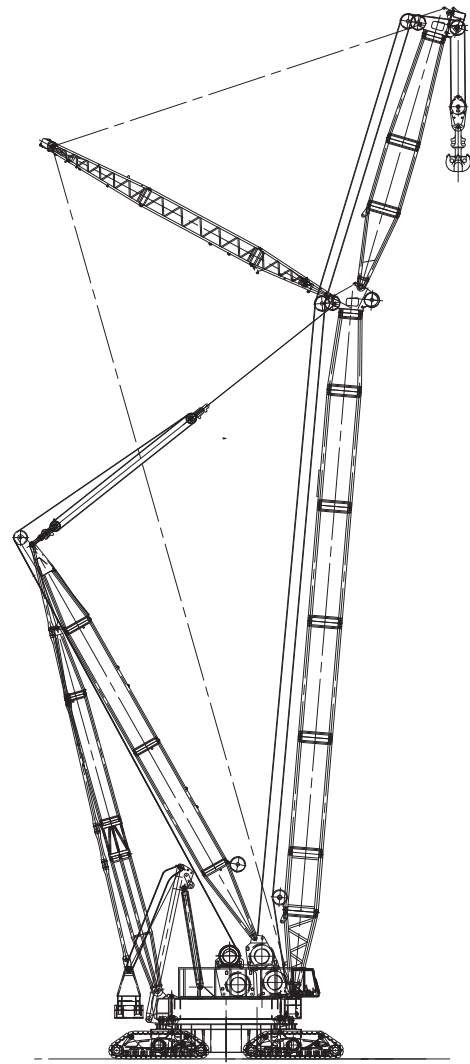
▶ Hook block, 200 t x 1

Length	3,10 m	10' 2"
Width	1,50 m	4' 11"
Height	1,00 m	3' 3"
Weight	7 700 kg	16,940 lb

Boom combinations

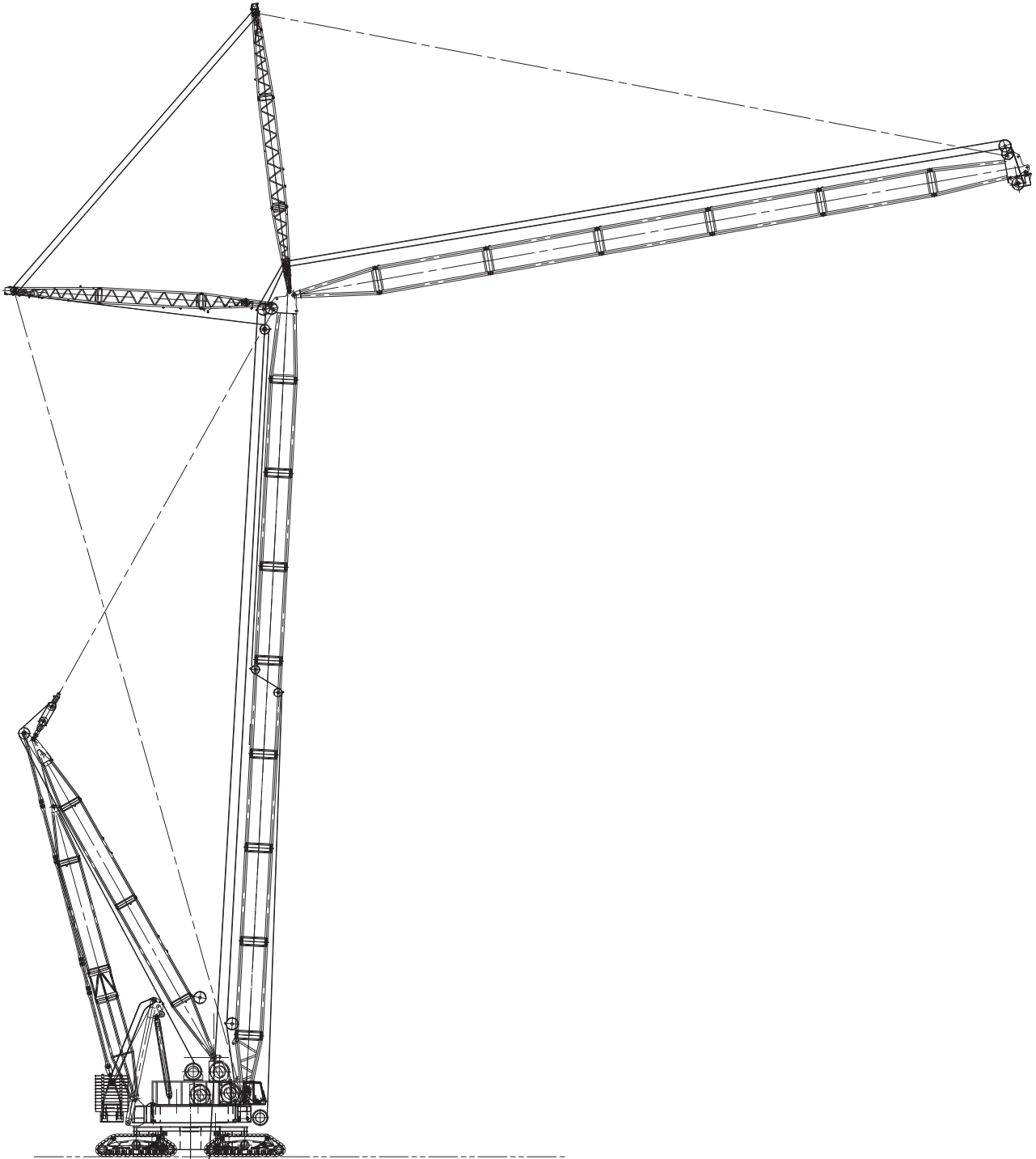


Model 31000
No. 90 Heavy-Lift Main Boom
105 m (344.5 ft)



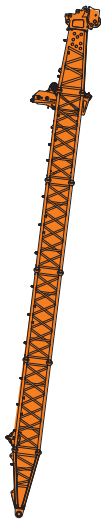
Model 31000
No. 91 Fixed Jib on
No. 90 Heavy-Lift Main Boom
95 m + 24 m (311.7 ft + 78.7 ft)

Boom combinations

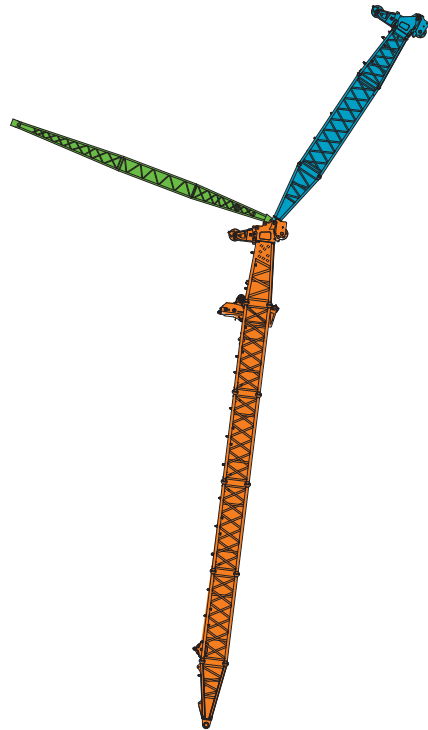


Model 31000
No. 91 Luffing Jib on
No. 90 Heavy-Lift Main Boom
85 m + 102 m
(278.9 ft + 334.6 ft)

Boom asset management

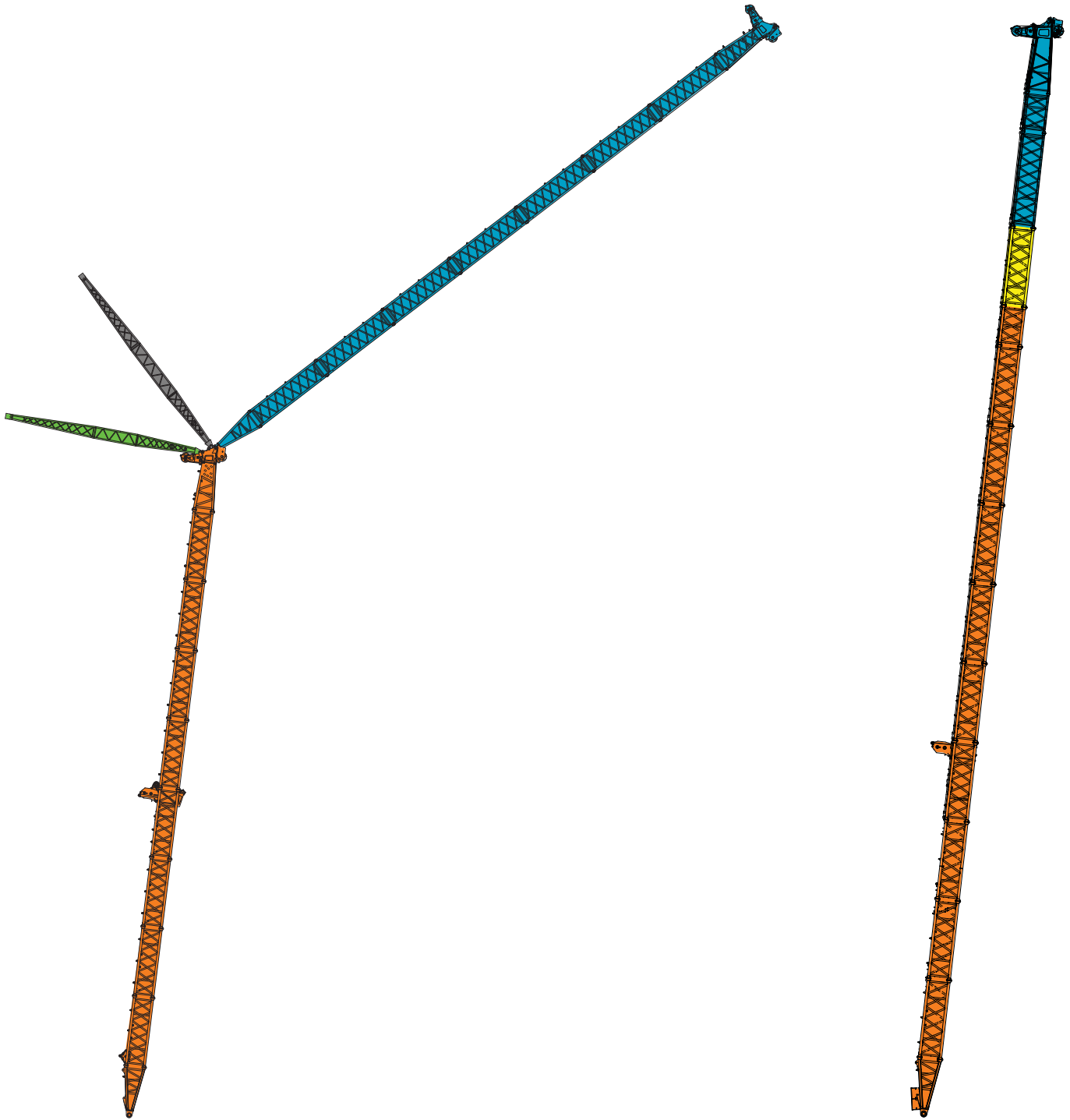


#90 MAIN BOOM



#90 MAIN BOOM +
#91 FIXED JIB

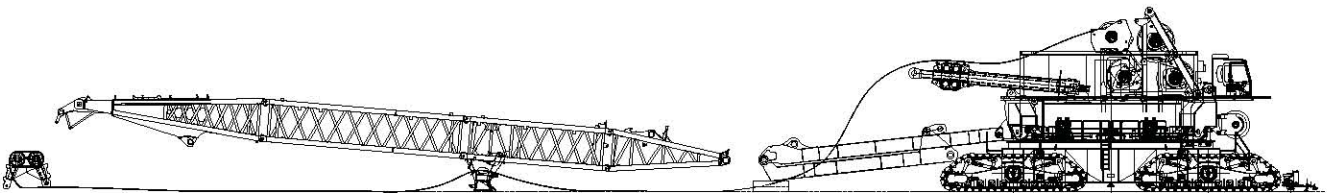
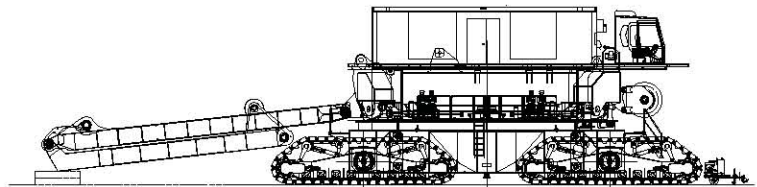
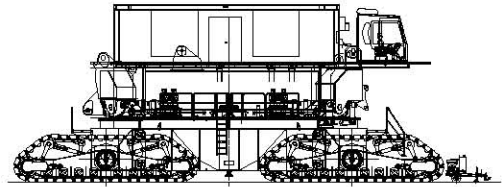
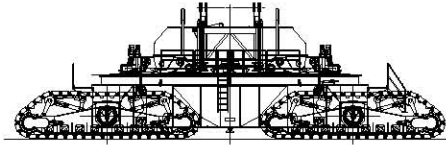
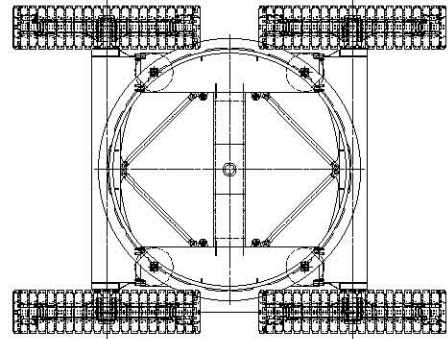
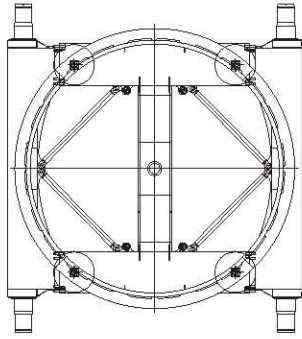
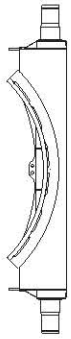
Boom asset management



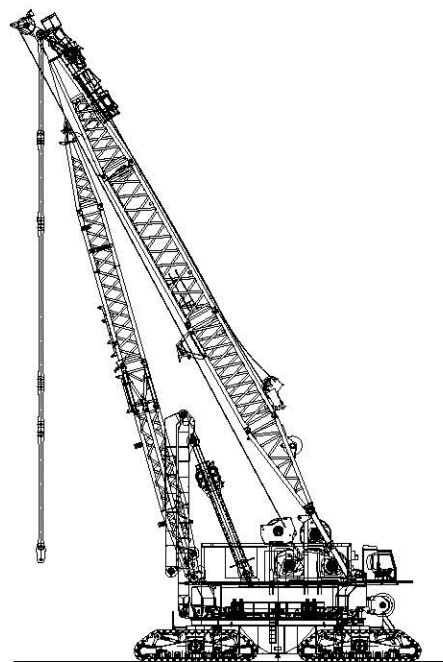
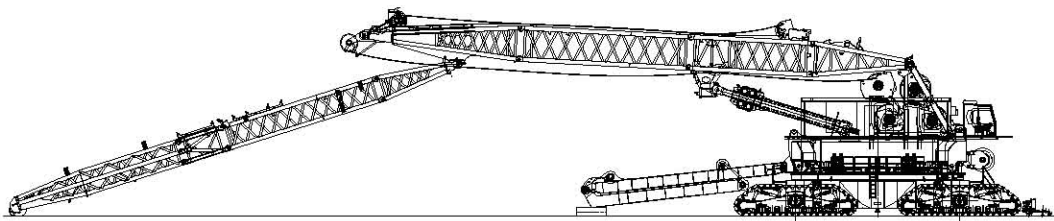
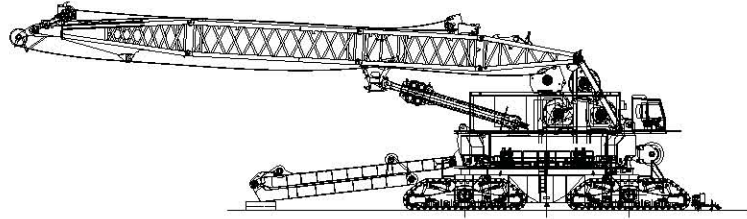
#90 MAIN BOOM +
#91 LUFFING JIB

#90/91 MAIN BOOM

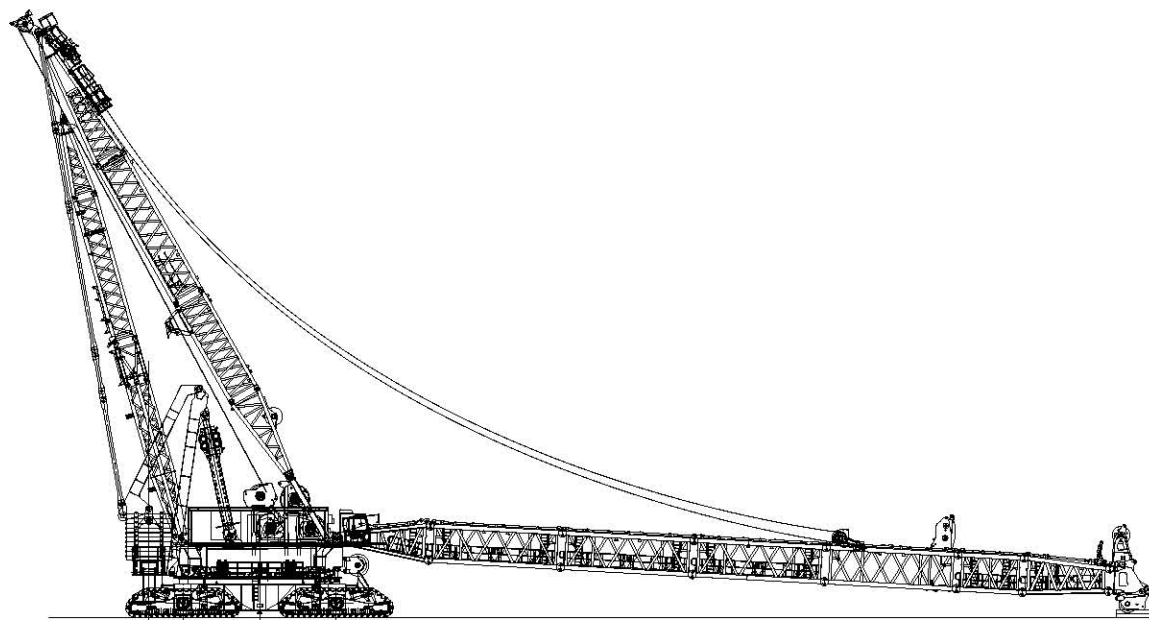
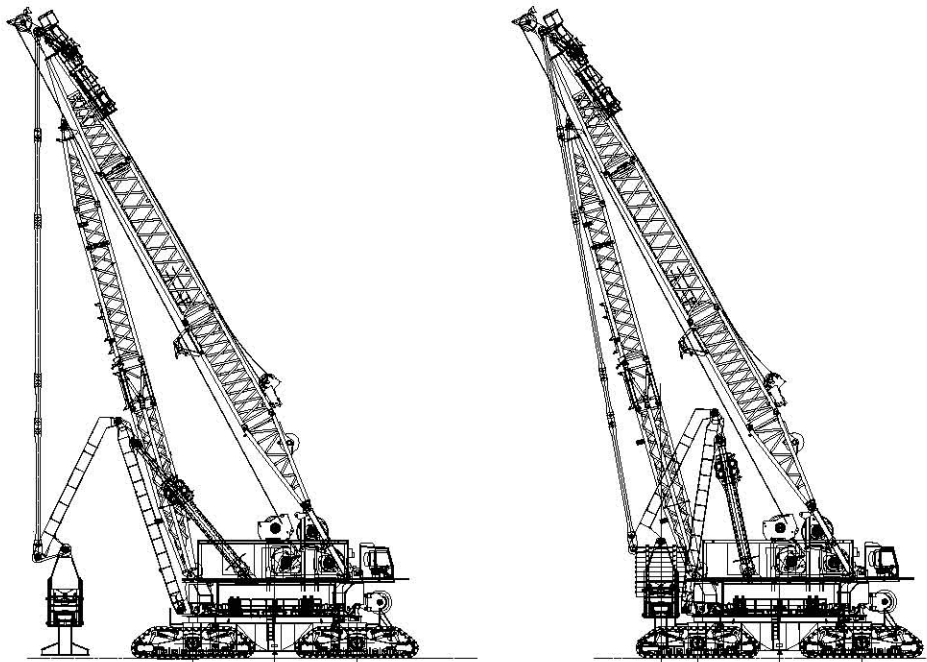
Crane assembly

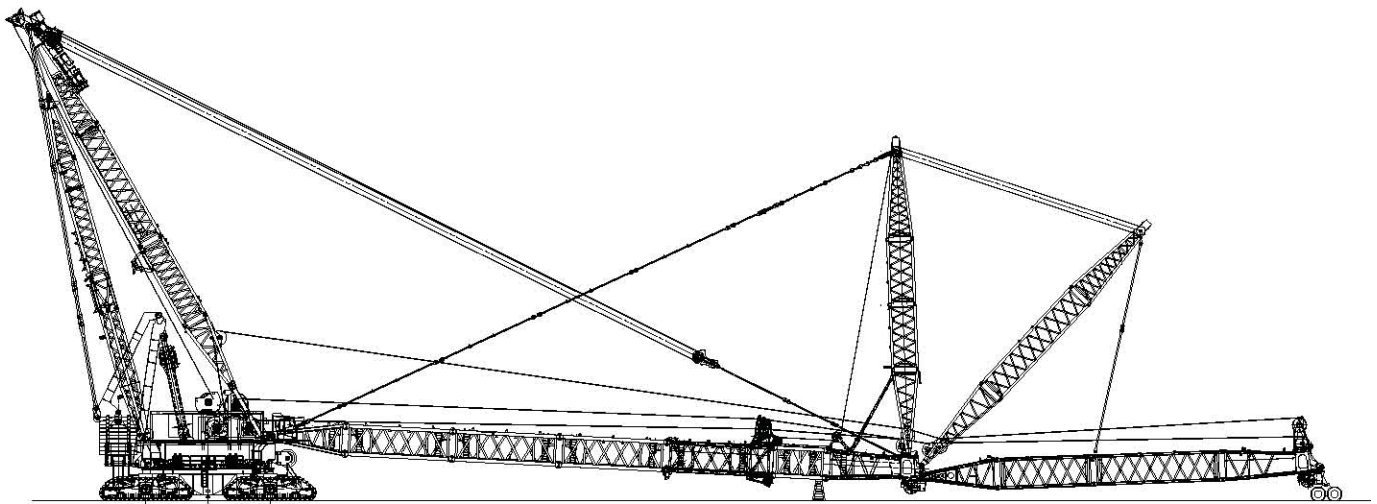
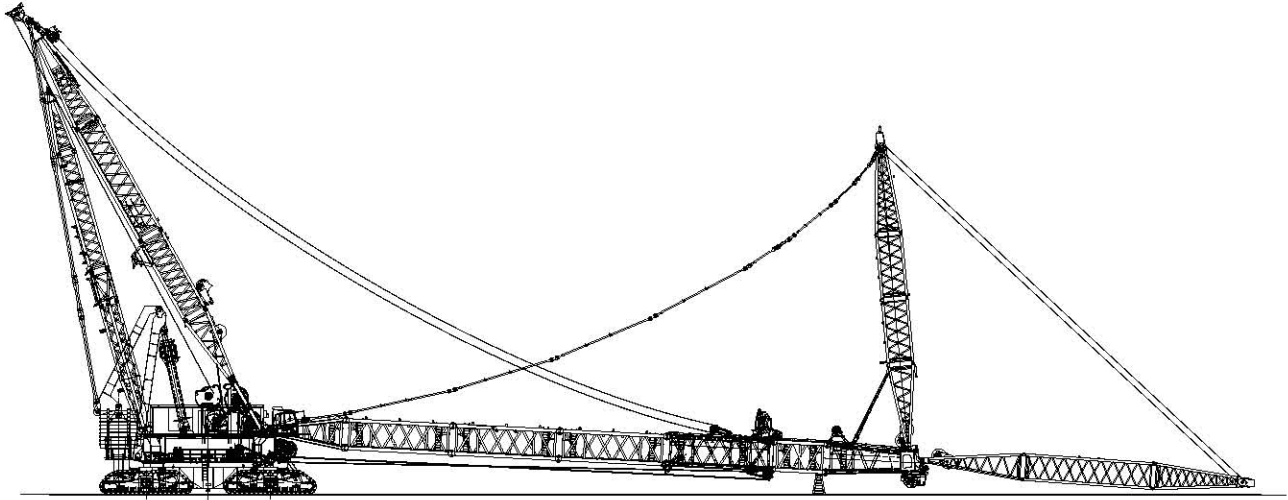


Crane assembly

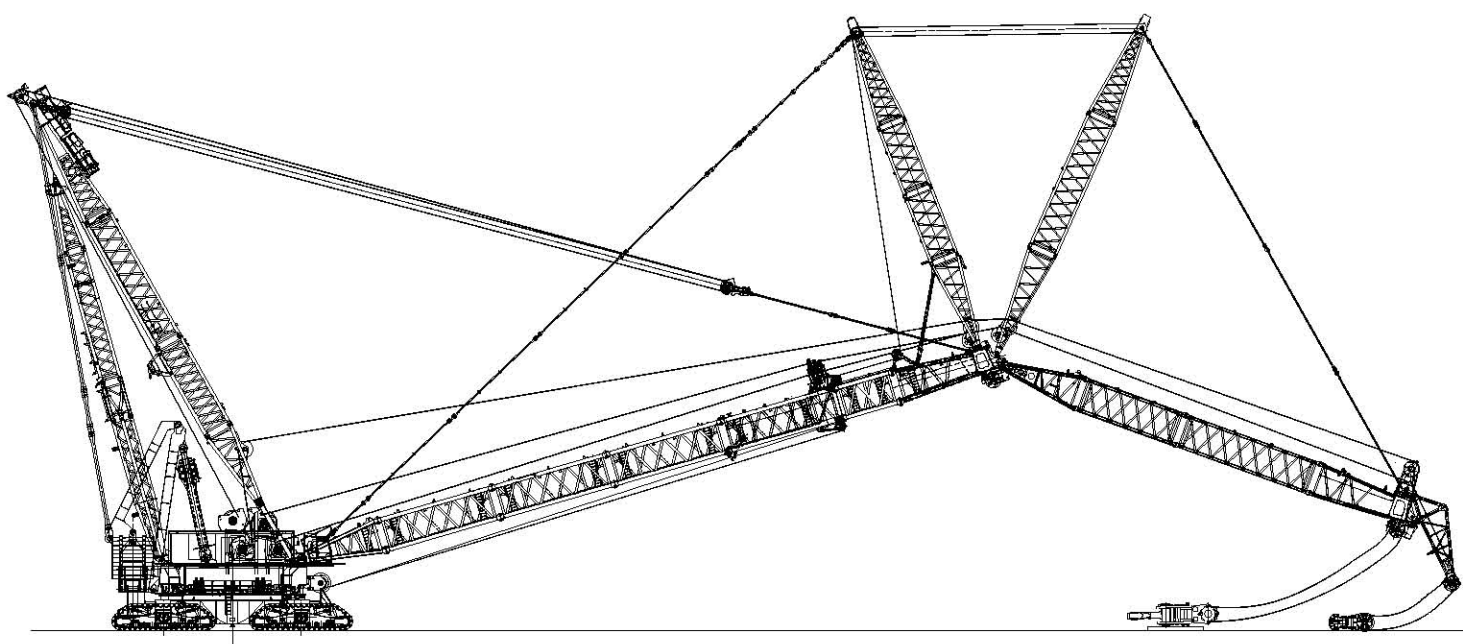


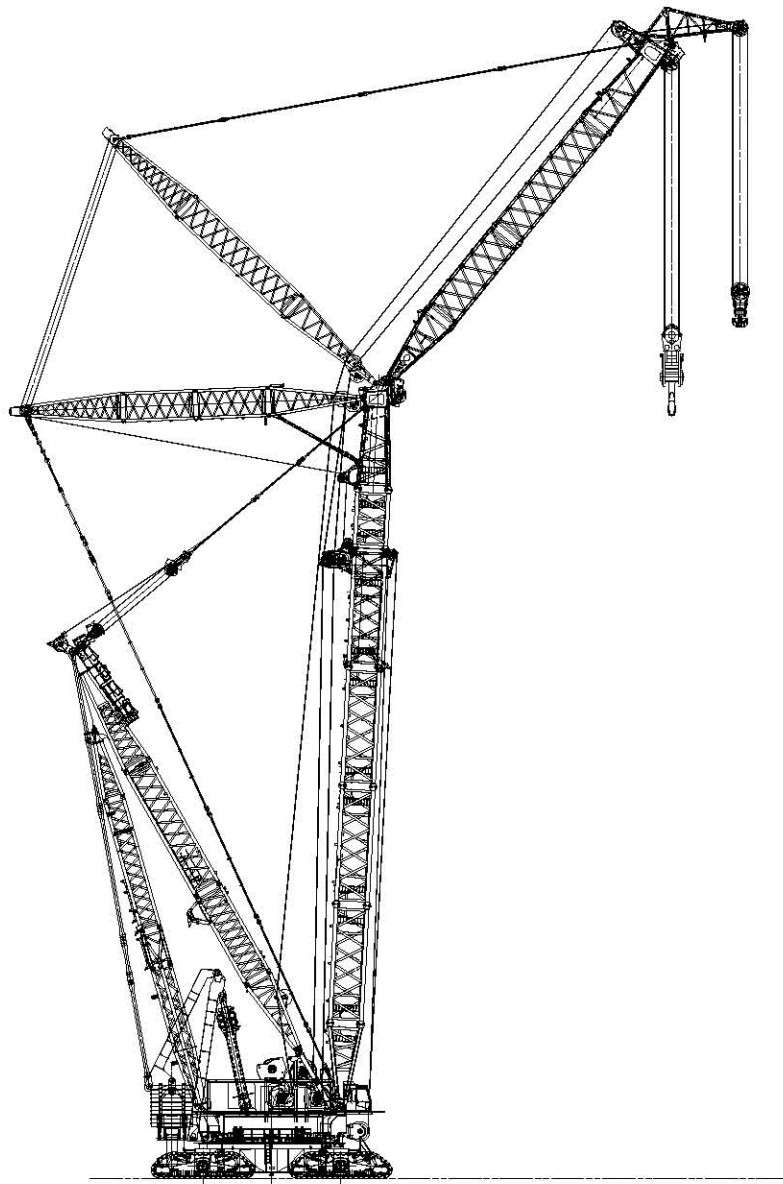
Crane assembly





Crane assembly

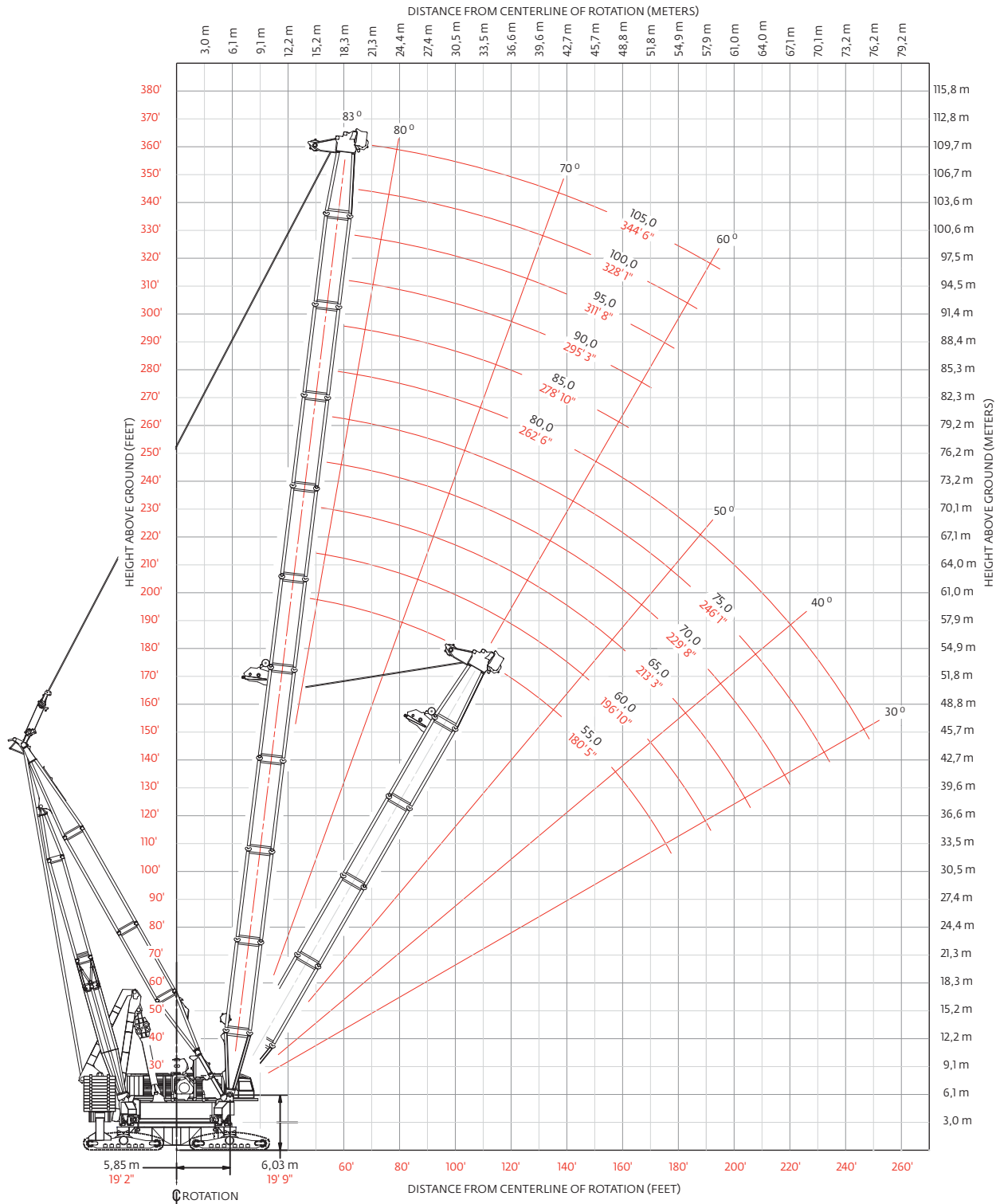




Heavy-lift boom range diagram

SUBJECT TO ANSI B30.5 TEST

No. 90 Main boom



Heavy-lift boom load charts

SUBJECT TO ANSI B30.5 TEST

Liftcrane boom capacities No. 90 Main boom

949 230 kg (2,092,700 lb) Variable Position Counterweight (VPC)

360° Rating

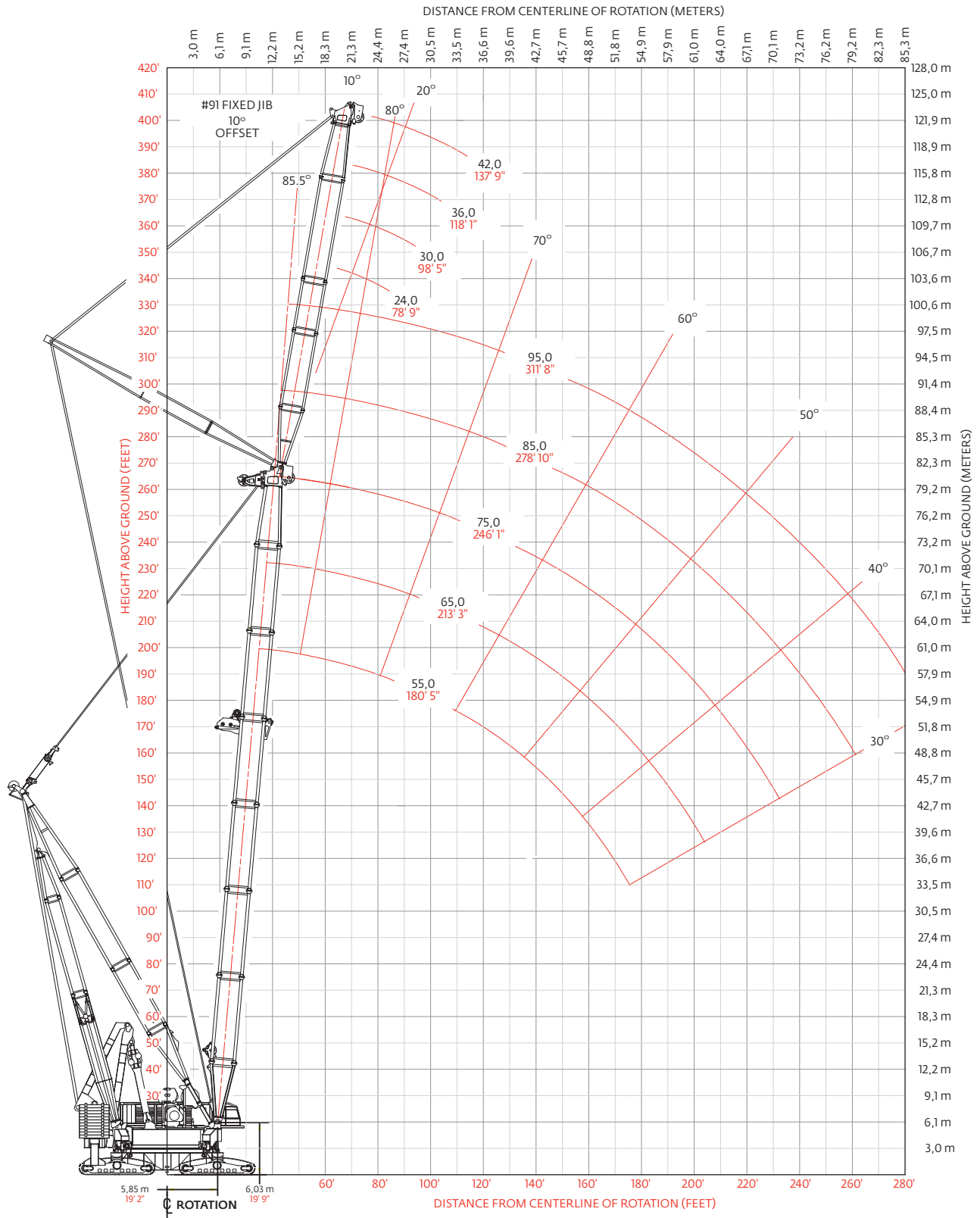
kg (lb) x1 000

Boom m (ft)	55,0 (180.4)	60,0 (196.9)	65,0 (213.2)	70,0 (229.7)	75,0 (246.1)	80,0 (262.5)	85,0 (278.9)	90,0 (295.3)	95,0 (311.7)	100,0 (328.1)	105,0 (344.5)
Radius											
14,6 (48)	2000 (4409)										
15 (50)	2000 (4409)	1896 (4181)									
16 (55)	1966 (4263)	1883 (4122)	1753 (3865)	1656 (3651)	1524 (3360)						
18 (60)	1833 (3978)	1797 (3910)	1726 (3792)	1656 (3651)	1524 (3360)	1398 (3082)	1283 (2830)				
20 (70)	1675 (3495)	1669 (3479)	1628 (3444)	1575 (3336)	1517 (3232)	1398 (3082)	1283 (2830)	1185 (2612)	1095 (2414)	1002 (2211)	- (1977)
24 (80)	1431 (3113)	1424 (3097)	1422 (3089)	1402 (3058)	1362 (2972)	1317 (2873)	1267 (2782)	1185 (2612)	1095 (2414)	1002 (2211)	896 (1977)
28 (90)	1243 (2802)	1236 (2786)	1233 (2778)	1227 (2762)	1222 (2744)	1189 (2659)	1155 (2582)	1121 (2505)	1084 (2414)	1002 (2211)	896 (1977)
32 (100)	1043 (2455)	1038 (2446)	1037 (2442)	1032 (2432)	1031 (2428)	1025 (2417)	1024 (2404)	1019 (2336)	999 (2276)	969 (2206)	896 (1977)
36 (115)	891 (2037)	887 (2026)	885 (2023)	880 (2012)	878 (2009)	873 (1997)	872 (1993)	866 (1982)	864 (1978)	860 (1966)	861 (1955)
40 (130)	775 (1731)	770 (1720)	769 (1717)	764 (1706)	762 (1702)	756 (1690)	755 (1686)	750 (1675)	748 (1670)	742 (1658)	740 (1654)
44 (145)	683 (1497)	678 (1487)	676 (1483)	671 (1472)	670 (1468)	664 (1456)	663 (1452)	657 (1440)	655 (1436)	650 (1424)	647 (1419)
48 (160)	607 (1309)	603 (1303)	602 (1299)	597 (1288)	595 (1284)	589 (1271)	588 (1268)	582 (1256)	580 (1251)	575 (1239)	572 (1235)
52 (175)	514 (1063)	541 (1154)	540 (1150)	535 (1139)	533 (1135)	527 (1122)	526 (1119)	520 (1107)	518 (1102)	513 (1090)	510 (1085)
56 (190)		475 (961)	488 (1027)	483 (1016)	481 (1012)	475 (999)	473 (996)	468 (984)	466 (979)	460 (967)	458 (962)
60 (205)			441 (877)	438 (912)	436 (908)	430 (896)	429 (892)	423 (880)	421 (875)	416 (863)	414 (858)
64 (220)				400 (790)	398 (820)	392 (807)	390 (804)	385 (792)	383 (787)	377 (775)	375 (770)
68 (230)					364 (766)	358 (755)	357 (752)	351 (740)	349 (735)	344 (723)	341 (718)
72 (240)						329 (708)	327 (705)	322 (693)	320 (688)	314 (676)	312 (671)
76 (250)							301 (662)	296 (649)	293 (645)	288 (632)	286 (628)
80 (260)							- (622)	272 (610)	270 (605)	264 (593)	262 (588)
84 (270)								- (573)	249 (569)	243 (556)	241 (552)
88 (280)									230 (535)	224 (522)	222 (518)
92 (300)										206 (462)	205 (457)
96 (320)											189 (398)

Fixed jib range diagram

SUBJECT TO ANSI B30.5 TEST

No. 91 Fixed jib on No. 90 Main boom



Fixed jib load charts

SUBJECT TO ANSI B30.5 TEST

Liftcrane boom capacities No. 91 Fixed jib on No. 90 Main boom

949 230 kg (2,092,700 lb) Variable Position Counterweight (VPC)
360° Rating kg (lb) x 1 000

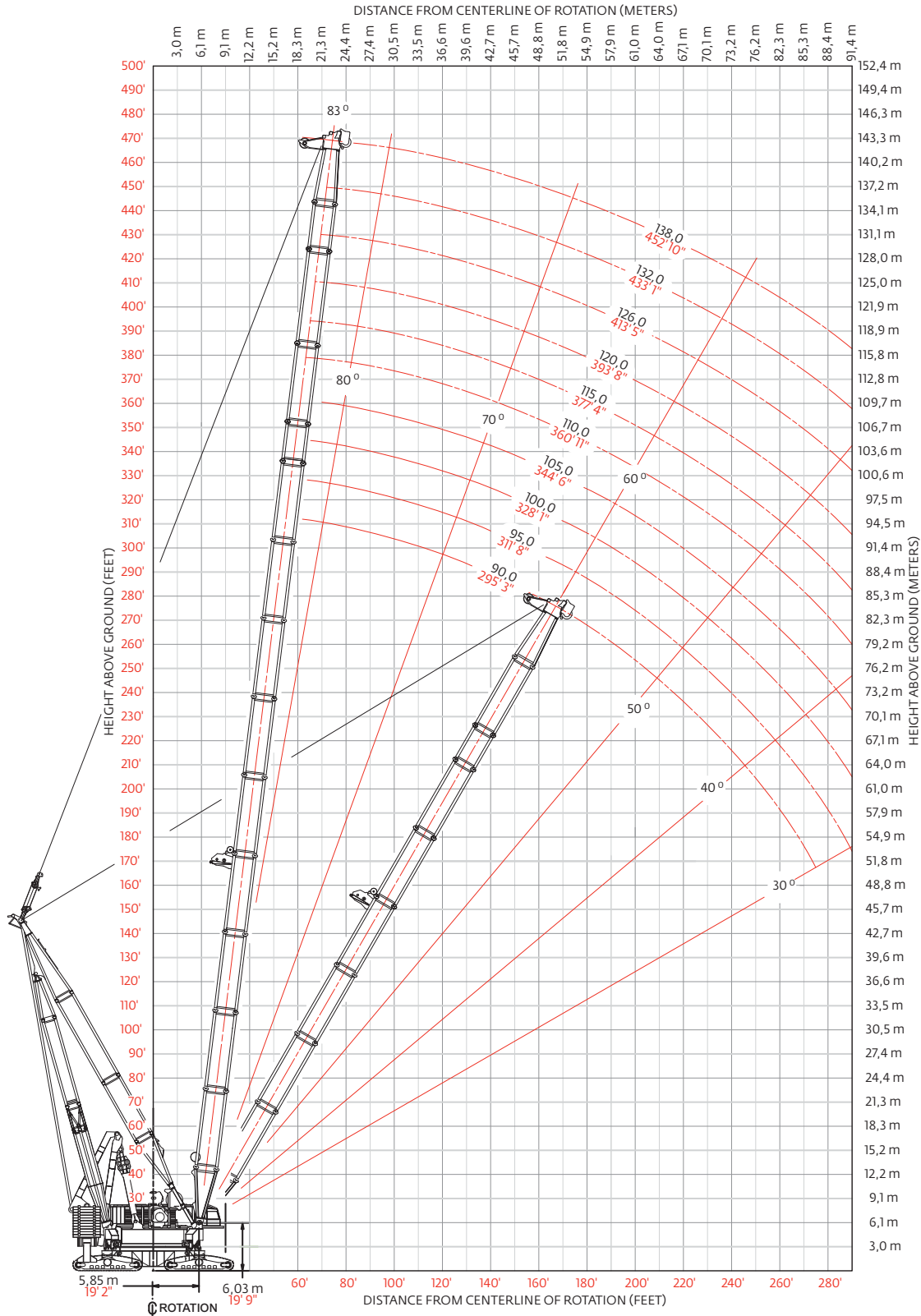
		10° Offset					20° Offset				
Boom m (ft)	55,0 (180.4)	65,0 (213.2)	75,0 (246.1)	85,0 (278.9)	95,0 (311.7)	55,0 (180.4)	65,0 (213.2)	75,0 (246.1)	85,0 (278.9)	95,0 (311.7)	
Radius											
Jib Length 24,0 m (78.7 ft)	19,8 (65)	1400 (3086)									
	22 (75)	1383 (3004)	1170 (2579)	989 (2181)	791 (1744)	632 (1393)					
	26 (90)	1250 (2652)	1168 (2510)	989 (2181)	791 (1744)	632 (1393)	913 (1955)	958 (2059)	895 (1974)	743 (1640)	- (1364)
	36 (120)	888 (1914)	882 (1902)	878 (1889)	791 (1744)	632 (1393)	755 (1648)	811 (1773)	852 (1864)	743 (1640)	618 (1364)
	46 (150)	627 (1395)	620 (1380)	613 (1365)	606 (1349)	600 (1334)	635 (1409)	630 (1401)	624 (1388)	617 (1375)	614 (1362)
	56 (180)	469 (1067)	462 (1051)	454 (1035)	447 (1018)	439 (1002)	474 (1080)	468 (1066)	462 (1052)	455 (1037)	449 (1023)
	64 (210)	381 (840)	374 (824)	366 (808)	358 (790)	351 (773)	385 (848)	378 (835)	372 (820)	365 (804)	358 (789)
	74 (240)	256 (587)	292 (657)	284 (641)	276 (623)	269 (606)	263 (604)	295 (664)	288 (649)	281 (634)	274 (618)
	84 (270)		- (472)	223 (512)	215 (495)	207 (478)		- (485)	225 (518)	218 (502)	211 (487)
	94 (310)				164 (354)	159 (347)				168 (364)	161 (352)
	106 (350)					99 (210)					102 (216)

		10° Offset			20° Offset		
Boom m (ft)	55,0 (180.4)	65,0 (213.2)	75,0 (246.1)	55,0 (180.4)	65,0 (213.2)	75,0 (246.1)	
Radius							
Jib Length 42,0 m (137.8 ft)	24,4 (80)	960 (2116)					
	28 (90)	947 (2096)	800 (1763)	669 (1476)			
	36 (120)	854 (1859)	781 (1714)	668 (1472)	708 (1546)	688 (1517)	586 (1292)
	46 (150)	639 (1422)	633 (1408)	628 (1394)	598 (1324)	641 (1421)	586 (1292)
	56 (180)	480 (1092)	473 (1077)	466 (1061)	489 (1111)	483 (1099)	477 (1085)
	64 (210)	392 (865)	385 (849)	377 (832)	399 (880)	392 (865)	386 (851)
	74 (240)	311 (699)	303 (681)	295 (664)	315 (709)	308 (694)	301 (679)
	84 (280)	226 (474)	241 (516)	233 (498)	237 (497)	245 (525)	238 (509)
	94 (320)		177 (336)	185 (374)		185 (353)	188 (382)
	106 (360)			118 (212)			124 (224)

Combination boom range diagram

SUBJECT TO ANSI B30.5 TEST

No. 90-91 Main boom



Combination boom load charts

SUBJECT TO ANSI B30.5 TEST

Liftcrane boom capacities No. 90-91 Main boom

949 230 kg (2,092,700 lb) Variable Position Counterweight (VPC)
360° Rating kg (lb) x 1 000

Boom m (ft)	90,0 (295.3)	95,0 (311.7)	100,0 (328.1)	105,0 (344.5)	110,0 (360.9)	115,0 (377.3)	120,0 (393.7)	126,0 (413.4)	132,0 (433.1)	138,0 (452.8)
Radius										
19,8 (65)	1200 (2645)	1101 (2428)	985 (2173)							
22 (75)	1200 (2645)	1101 (2428)	985 (2173)	889 (1961)	801 (1766)	726 (1602)	657 (1448)	586 (1292)		
24 (80)	1200 (2645)	1101 (2428)	985 (2173)	889 (1961)	801 (1766)	726 (1602)	657 (1448)	586 (1292)	525 (1159)	470 (1036)
26 (85)	1197 (2645)	1101 (2428)	985 (2173)	889 (1961)	801 (1766)	726 (1602)	657 (1448)	586 (1292)	525 (1159)	470 (1036)
28 (90)	1145 (2557)	1097 (2428)	985 (2173)	889 (1961)	801 (1766)	726 (1602)	657 (1448)	586 (1292)	525 (1159)	470 (1036)
32 (105)	1035 (2281)	1020 (2249)	985 (2173)	889 (1961)	801 (1766)	726 (1602)	657 (1448)	586 (1292)	525 (1159)	470 (1036)
36 (120)	882 (1905)	880 (1900)	875 (1889)	867 (1884)	801 (1766)	726 (1602)	657 (1448)	586 (1292)	525 (1159)	470 (1036)
40 (130)	766 (1710)	763 (1705)	758 (1694)	756 (1689)	751 (1677)	725 (1602)	657 (1448)	586 (1292)	525 (1159)	450 (997)
44 (145)	673 (1476)	671 (1471)	666 (1460)	663 (1454)	658 (1443)	656 (1437)	647 (1423)	585 (1291)	507 (1115)	426 (937)
48 (155)	598 (1349)	596 (1344)	591 (1332)	589 (1327)	583 (1315)	581 (1310)	574 (1295)	575 (1288)	484 (1076)	404 (900)
52 (170)	537 (1189)	534 (1184)	529 (1172)	526 (1167)	521 (1155)	519 (1150)	512 (1135)	510 (1132)	463 (1022)	384 (849)
56 (185)	484 (1058)	482 (1053)	477 (1041)	474 (1036)	469 (1024)	466 (1019)	460 (1004)	458 (1000)	443 (974)	366 (804)
60 (195)	440 (983)	438 (978)	432 (966)	430 (961)	424 (949)	422 (944)	415 (929)	414 (926)	414 (926)	350 (776)
64 (210)	401 (886)	399 (880)	394 (868)	391 (863)	386 (851)	383 (846)	377 (831)	376 (828)	376 (828)	335 (738)
68 (225)	368 (802)	366 (797)	360 (785)	358 (779)	352 (767)	350 (762)	343 (747)	342 (745)	342 (745)	321 (704)
72 (240)	338 (729)	336 (724)	331 (712)	328 (707)	323 (695)	320 (689)	314 (674)	312 (672)	312 (672)	308 (667)
76 (250)	312 (686)	310 (681)	304 (669)	302 (664)	296 (651)	294 (646)	287 (631)	286 (629)	286 (629)	284 (624)
80 (270)	289 (610)	286 (605)	281 (593)	279 (588)	273 (575)	271 (570)	264 (555)	263 (553)	263 (553)	261 (548)
84 (280)		265 (571)	260 (559)	258 (554)	252 (542)	250 (536)	243 (521)	242 (519)	242 (519)	240 (514)
88 (290)		246 (540)	241 (528)	238 (523)	233 (510)	231 (505)	233 (490)	223 (486)	223 (488)	221 (483)
92 (300)			223 (498)	221 (493)	216 (481)	213 (476)	207 (461)	205 (457)	205 (459)	203 (454)
96 (320)				205 (441)	200 (428)	197 (423)	191 (408)	189 (406)	190 (406)	188 (402)
100 (330)					185 (405)	183 (399)	176 (385)	175 (381)	175 (382)	173 (378)
108 (350)							- (341)	150 (339)	150 (339)	147 (335)
116 (380)									128 (283)	126 (278)
124 410										104 (222)

Manitowoc Crane Care

Crane Care is Manitowoc's comprehensive service and support program. It includes classroom and on-site training, prompt parts availability, expert field service, and technical support and documentation — for every one of the more than 7,000 Manitowoc cranes currently in use throughout the world.

That's commitment you won't find anywhere else.

That's **Crane Care**.

Service training

Manitowoc specialists work with you in our training center and in the field to make sure you know how to get maximum performance, reliability, and life from your cranes.

Manitowoc Cranes Technical Training Center provides valuable multi-level training, which is available for all models and attachments, in the following format:

- **Basic** – Provides technicians with the basic skills required in our Level I and II classes covering hydraulic and electrical theory and schematics, pump, motor, control, and LMI operation and the use of meters and gauges.
- **Level 1** – This model-specific class covers theory and offers hands-on training and trouble shooting or all crane systems.
- **Level 2** – This model-specific class provides in-depth coverage of all crane systems and components, and advanced troubleshooting of simulated faults. (Requires Level 1.)
- **Level 3 / Master** – Covering all EPIC models and the 4100W, this class stresses high level system knowledge and trouble shooting of simulated faults. (Requires Level 2.)

Parts availability

Genuine Manitowoc replacement parts are accessible through your distributor 24 hours a day, 7 days a week, 365 days a year.

Service Interval Kits

Provides all the parts required by Manitowoc's Preventative Maintenance Checklist.

200 Hour Kit

Consists of the following:

Engine

- Filter, Oil (2)
- Filter, Water (2)
- Filter, Fuel (2)

Diesel Generator

- Filter, Oil (1)
- Filter, Fuel (1)

1,000 Hour Kit

Consists of the following:

Engine

- Filter, Air Cleaner - Primary (2)
- Filter, Oil (2)
- Filter, Water (2)
- Filter, Fuel (2)

Diesel Generator

- Filter, Oil (1)
- Filter, Fuel (1)

Hydraulic Generator

- Filter, Hydraulic (1)

Hydraulic

- Filter Element - Hydraulic in Tank* (4)
- Element - Hydraulic Tank Breather (2)

2,000 Hour Kit

Consists of the following:

Engine

- Filter, Air Cleaner - Primary (2)
- Filter, Air Cleaner - Safety (2)
- Filter, Oil (2)
- Filter, Water (2)
- Filter, Fuel (2)
- Ether, (Bottle) (2)
- Sensor, Coolant Level (2)
- Belt, Fan (2)
- Belt, Alternator (2)

Diesel Generator

- Filter, Oil (1)
- Filter, Fuel (1)
- Filter, Air Cleaner (1)

Hydraulic Generator

- Filter, Hydraulic (1)

Hydraulic

- Filter Element - Hydraulic in Tank* (4)
- Filter - Hydraulic In-Tank Suction (4)
- Element - Hydraulic Tank Breather (2)

Kit, Engine Coolant Additive (SCA) Test (2)

Kit, Seal (for hydraulic in tank filter) (1)

Seal, Radial (for air cleaner) (2)

Hydraulic Test Kit

Protect your investment by demanding Genuine Manitowoc Parts Service Kits. The Hydraulic Service Kit consist of the following:

- All hydraulic fittings to access all pressures and flows
- Hydraulic flow meters and pressure gauges to record hydraulic data.
- Electrical "Break out" harnesses to access voltages on all electrical circuits on all machines.
- Fluke® Digital volt ohm meter, as used in all Manitowoc service literature.

**No substitutions allowed.*

U.S. Standard Tools Kit

All standard tools needed to properly maintain and service your crane. (Does not include torque wrench.)

Field service

Factory-trained service experts are always ready to help maintain your crane's peak performance.

For a worldwide listing of dealer locations, please consult our website at:

www.manitowoc.com

Technical support

Manitowoc's dealer network and factory personnel are available 24 hours a day, 7 days a week, 365 days a year to answer your technical questions and more; with the help of computerized programs that simplify crane selection, lift planning and ground-bearing calculations.

For a worldwide listing of dealer locations, please consult our website at:

www.manitowoc.com

Technical documentation

Manitowoc has the industry's most comprehensive documentation; available in major languages and formats that include print, disk, and videotape.

Additional copies available through your Authorized Manitowoc Distributor.

- **Crane Operator's Manual**
- **Crane Parts Manual**
- **Crane Capacity Chart Manual**
- **Crane Vendor Manual**
- **Service Manual (EPIC)**
- **Luffing Jib Operator's/Parts Manual**
- **Capacity Chart Manual - Attachments**

CD rom versions of the Operator's and Parts Manuals are shipped with each crane.

Also available are the following CDs:

- Crane Care Owner CD
- Ground Bearing Pressure Estimator CD
- Crane Selection and Planning Software (CompuCRANE©)
- EPIC Crane Library CD consisting of capacity charts, range diagrams, wire rope specifications, travel specifications, crane weights, counterweight arrangements, luffing jib raising procedures, operating range diagrams, drum and lagging charts, boom rigging drawings, jib rigging drawings, outline dimensions and wind condition charts.

Available from your Authorized Manitowoc Cranes Distributor, these videos are available in NTSC, PAL and SECAM formats.

- Your Capacity Chart Video
- Respect the Limits Video
- Crane Safety Video
- Boom Inspection/Repair Video

Crane Care Package

Manitowoc has assembled all of the available literature, CD's, and videos listed above plus several Manitowoc premiums into one complete Crane Care Package.

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Dubai

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Gawcott

Europe, Middle East, Africa

Czech Republic

Netvorice

France

Baudemont

Cergy

Decines

Germany

Langenfeld

Hungary

Budapest

Italy

Parabiago

Netherlands

Breda

Poland

Warsaw

Asia - Pacific

Australia

Brisbane

Melbourne

Sydney

China

Beijing

Xi'an

India

Hyderabad

Pune

Korea

Seoul

Philippines

Makati City

Singapore

Factories

Brazil

Alphaville

China

TaiAn

Zhangjiagang

France

Charlieu

La Clayette

Moulins

Germany

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