

HEAVY DUTY BASE MACHINE FOR FOUNDATION WORK BM1200

KOBELCO

Max. Lifting Capacity: 100 Metric Tons at 5.5 Meters

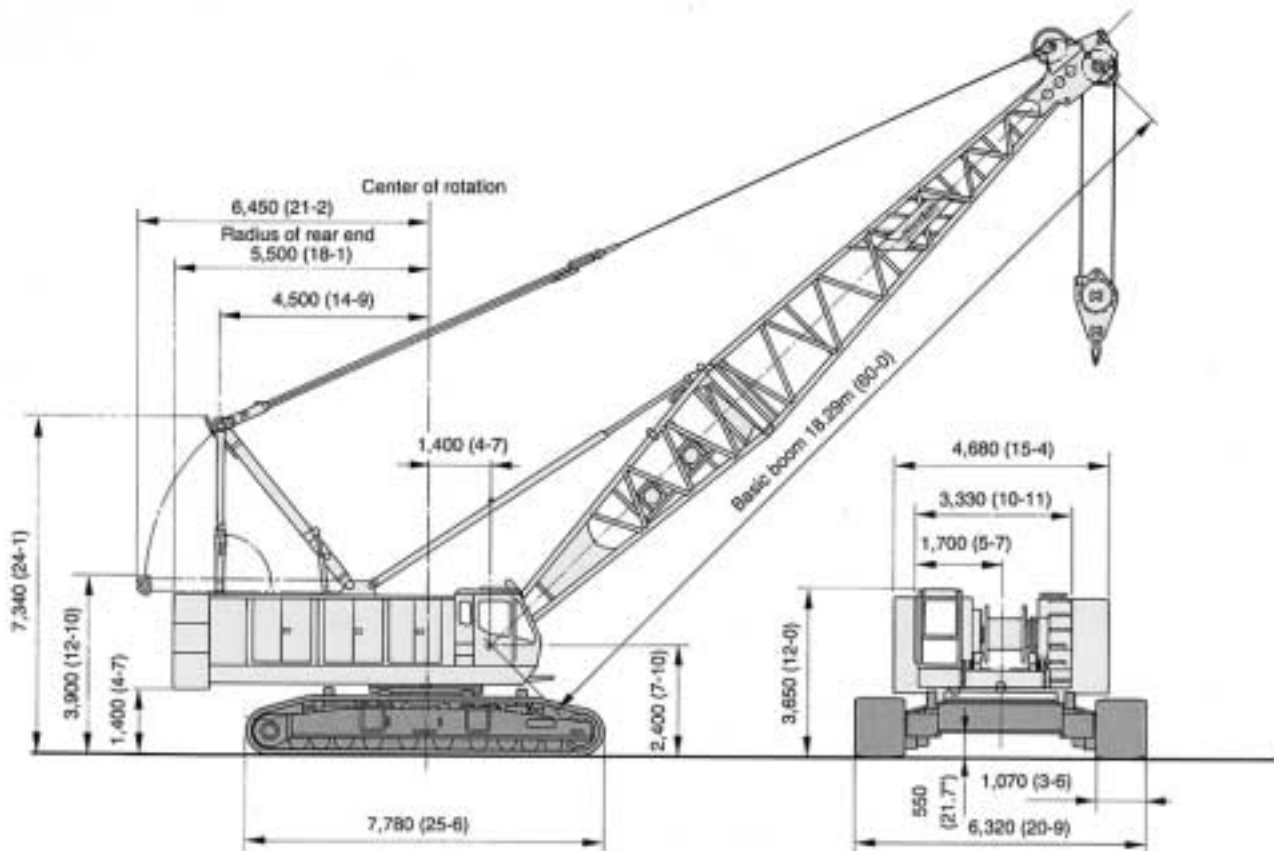
Max. Boom Length: 73.15 Meters

Specifications

- A mega-powered crane equipped with precision control capability.
- A mechatronic-micro control system allows precise diaphragm wall construction with a multi-axle rotary excavator.
- Automatic constant speed mode lowers excavator at constant speed regardless of changes in ground resistance.
- Automatic constant load mode prevents damage to cutters in hard ground.
- Powerful winch single layer maximum line pull of 32 tons, and wide, large-diameter drum with maximum rope capacity of 49 m on one layer.
- Maximum line speed of 100 m/min for main and auxiliary winches.
- Extra hydraulic outlets provided to power additional foundation construction machinery.

General Dimensions

Unit: mm (ft-in)



Specifications

Upper machinery



Power plant

Model Mitsubishi 8DC9TC

Type Water-cooled, direct fuel injection, intercooled turbo

No. of cylinder 6

Bore and stroke 135 mm x 140 mm (5.3" x 5.5")

Displacement 18.9 liters

Rated power 405 PS (298 kW) at 2,000 rpm (SAE J1349)

Max. torque 161 kg-m at 1,600 rpm (SAE J1349)

Cooling system Liquid, recirculating bypass

Starter 24 V, 6 kW

Generator 24 V, 2 kW

Cycles 4

Radiator Plate fin type core, thermostatically controlled

Air cleaner Dry type with replaceable paper element

Fuel tank capacity 600 liters (159 US gal)

Batteries Two 12V, 200A-hr capacity batteries, series connected

Fuel consumption (at 2,100 rpm) 180 g/PS-h



Hydraulic system

Pumps: All four variable displacement are driven by heavy-duty pump drive. One of these pumps is used in the right propel

circuit and hook hoist circuit. Another is used in the left propel circuit and hook hoist circuit, and can accommodate an optional third hoist circuit. The third is used in the boom hoist circuit, and the fourth variable displacement pump is used in the swing circuit. In addition, two gear pumps are used in the control system and auxiliary equipment. One of these serves the clutch and brakes. The second pump can be used at the operator's discretion for translifter, a cylinder for gantry lift, or a cylinder for boom foot pin or axle pin coupling and decoupling.

Control: Full-flow hydraulic control system for infinitely variable pressure to front and rear drums, boom hoist brakes and clutches. Controls respond instantly to the touch, delivering smooth function operation.

Max. relief valve pressure:

Load hoist, boom hoist

and propel system 280 kg/cm² (4,000 psi)

Swing system 280 kg/cm² (4,000 psi)

Control system 100 kg/cm² (1,400 psi)

Hoist drum service brake system ..100 kg/cm² (1,400 psi)

Reservoir capacity: 600 liters (159 US gal)

Cooling: Oil-to-air heat exchanger

Filtration: Full-flow and bypass type with replaceable

Hydraulic outlet: Hydraulic power outlet system is provided for foundation work, such as diaphragm wall bucket, oscillation works, and etc.

No. of outlet	Oil flow	Hydraulic pressure
2	300 liters/min	300 kg/cm ²
1	35 liters/min	175 kg/cm ²

Electrical system: All wiring corded for easy servicing, individual fused branch circuits.



Boom hoisting system

Powered by a hydraulic axial piston motor through a planetary reducer.

Brake: A spring-set, hydraulically released multiple-disc brake is mounted on the boom hoist motor and operated through a counter-balance valve. Safety pawls (external ratchet) are fitted for locking the drum.

Drum: Single drum, grooved for 18 mm dia. wire rope.

Line speed: Single line on first drum layer

Hoisting (max.) 54m/min (each)

Lowering (max.) 54m/min (each)



Load hoist system

Powered by a hydraulic axial piston motor, driven through a planetary reducer.

Clutches: Internally expanding band clutches. 1,035 mm (3' 5") dia. x 150 mm (5.9") wide

Brakes: Externally contracting band brakes, each using positive and negative actuation. 1,321 mm (4' 4") dia. x 203 mm (8") wide with additional spring set hydraulically released brake.

Safety pawls (external ratchet) are fitted for locking the drums. Both positive and negative brake systems are available. Air cooling fins mounted on brake drum.

Drums: (front and rear): 672 mm (26.5") P.C.D. x 785 mm (31") wide drums, each grooved for 32 mm (1.26") wire rope.

Rope capacity of 420 m (1,378') working length and 570 m (1,870') storage length.

Line speed: Single line on the first drum layer

Hoisting 100/50, 54/27 m/min

Lowering 100/50, 54/27 m/min



Swing system

Swing unit: Powered by hydraulic axial piston motor driving spur gears through planetary reducers, the swing system

provides 360° rotation.

Swing speed 2.4 rpm

Swing brakes: A spring-set, hydraulically released multiple-disc brake is mounted on swing motor.

Swing circle: Single-row ball bearing with an integral internally cut swing gear.

Swing lock: Four position pin-hole lock (manually engaged)



Operator's cab

Totally enclosed, full-vision cab fitted with safety glass and a sliding front window. A fully adjustable, high-backed seat permits operators to set their ideal working position. A signal horn, cigarette lighter, windshield wiper and inspection lamp socket are standard features.



Controls

In front of the operator are foot pedals for front and rear drum brakes. At the operator's right are console-mounted adjustable short levers for front and rear drum control, boom hoist control lever and positive/negative break select switch for front and rear drum brakes. Beside the operator's seat on the right are two short levers for propel control. At the operator's left are: a console-mounted swing lever, an optional third drum control lever, and front and rear drum pawl control switches; switches for ignition, engine stop, low and high speed control for front drum, rear drum and propel; and creep speed control for hoist and propel. A swing brake switch and a signal horn button are on the swing lever.

Gauges: Fuel, water temperature for engine, engine oil pressure, and hour meter

Warning lamps: Engine oil pressure, hydraulic oil pressure, battery charge, air cleaner and engine oil filter.

Safety devices: Hook over-hoist alarm and shut-off switch, boom over-hoist limit switch and shut-off switch, boom over-hoist limit switch, boom angle indicator, signal horn, boom hoist and front and rear drum locks, swing lock, boom back stop, hook safety latch and optional load moment limiters (overload protection device) are provided.



Gantry

Folding type, fitted with sheave frame for boom hoist reeving, lowers toward rear onto cab roof. Hydraulic lift is standard. Full up, full down positions with linkage.

Counterweight

Three-piece stack, mounted behind the machinery compartment

Total weight 28,000 kg (61,700 lb)



Tools

Tool set and accessories for routine machine maintenance are provided.

Lower machinery

Carbody: Steel-welded carbody with an integral seat designed for pin-connected axles.

Crawler: Crawler assemblies designed with a quick disconnect feature that allows complete individual removal from the axles. Crawler belt tension is maintained by hydraulic jack force on the track-adjusting bearing block.

Crawler drive: Independent hydraulic propel drive is built into each side frame, each with a hydraulic motor propelling a driving tumbler through a planetary gear box.

Crawler brakes: Spring-set, hydraulically released multiple-disc parking brakes are built into each propel drive.

Steering mechanism: A hydraulic propel system provides both skid steering (driving one track only) and counter-rotating steering (driving tracks in opposite directions).

Track rollers: 12 lower rollers and 2 upper rollers are fitted to each side frame, all permanently sealed and maintenance-free.

Shoes:

Number 59 each side

Standard flat shoe width 1,070 mm (42")

Max. travel speed:

High range 1.6 km/h (0.99mph)

Low range 0.8 km/h (0.50mph)

Max. gradeability: 30%

Trans-Lifter : Trans-Lifter system allows quick and easy crawler side frame removal and replacement. 4 vertical cylinders lift the basic machine. 2 horizontal cylinders facilitate side frames for removal or replacement.

Crane attachment



Boom:

Welded lattice construction using tubular, high-tensile steel cords with pin connections between sections.

Max. lifting capacity	100,000 kg (220,000lb)
Basic boom length	18.29m (60')
Max. boom length	73.15m (240')



Jib (optional):

Welded lattice construction using tubular, high-tensile steel cords with pin connections between sections.

	Fixed jib
Max. lifting capacity	15,000 kg (33,000 lb)
Max. jib length	30.48 m (100')
Max. total length (Boom length + jib length)	64.01m (210') + 18.29 (60')



Hook blocks

A range of hook blocks can be specified, each with a safety latch.

Lifting capacity	100 tons	70 tons	50 tons	15 tons ball hook
No. of sheaves	4	3	3	0
Weight (kg)	2,200	1,100	700	450

Diameter of wire ropes

Standard:

Hook hoist	32 mm (1.26")
Boom hoist (12-part line)	20 mm (0.79")
Boom pendants (4-part line)	28 mm (1.10")

Optional:

Jib hook hoist	32 mm (1.26")
Jib back stay pendants (2-part line)	26 mm (1.02")
Boom midpoint suspension	22 mm (0.87")

Boom hoist reeving: 12 parts of 20 mm dia. wire rope

Boom backstops: recommended for all boom lengths

Line pull

(for crane, clamshell, diaphragm wall bucket)

	Max. permissible	Max. available
Front:	15,000 kg (33,000 lb)	32,000 kg (71,000 lb)
Rear:	15,000 kg (33,000 lb)	32,000 kg (71,000 lb)



Weight

Operating weight:

Approx. 115,000 kg (253,500 lb)

(including 18.29 m (60 ft) boom and 100 ton

hook block)

Ground pressure: 0.75 kg/cm² with 1,070 mm (42") shoes

Measurement and weight for transportation

	Width x Height x Length (mm x mm x mm)	Weight (kg)	Remarks
BASE MACHINE			
Upper frame	5,500 x 3,350 x 8,820	46,000	with carbody
	3,330 x 2,340 x 7,660	32,500	without carbody and gantry
Gantry	5,400 x 500 x 1,730	3,000	
Carbody	3,270 x 930 x 5,500	10,500	
Crawler frame	1,070 x 1,280 x 7,780	17,000	
Transliifer	1,350 x 400 x 770	460	4-pieces
Counterweight(A)	785 x 900 x 4,680	10,500	
Counterweight(B)	785 x 730 x 4,680	8,750	
Counterweight(C)	785 x 730 x 4,680	8,750	
ATTACHMENT			
100 ton hook	900 x 550 x 2,050	1,500	
70 ton hook	900 x 480 x 2,090	1,200	
50 ton hook	420 x 1,965 x 900	950	
Ball hook	370 dia. x 1,265	450	

	Width x Height x Length (mm x mm x mm)	Weight (kg)	Remarks
Upper boom	2,180 x 2,050 x 11,355	3,100	including guy line
Lower boom	2,180 x 2,065 x 7,825	2,100	including cable roller
Upper spreader	750 x 250 x 1,360	280	
3.05m (10') boom insert	2,180 x 2,060 x 3,180	700	including guy line
6.10m (20') boom insert	2,180 x 2,060 x 6,230	1,200	including guy line
9.14m (30') boom insert	2,180 x 2,060 x 9,270	1,600	including guy line
12.19m (40') boom insert	2,180 x 2,060 x 12,320	1,700	including guy line
Upper jib	1,040 x 840 x 4,990	400	including guy line base
Lower jib	1,040 x 840 x 4,760	200	
3.05m (10') jib insert	1,040 x 840 x 3,050	150	including guy line
6.10m (20') jib insert	1,040 x 840 x 6,170	200	including guy line
Strut	1,040 x 560 x 5,130	300	

Notes:

- Working radius is the horizontal from the center of rotation through the center of gravity of load.
- Ratings do not exceed 78% of tipping load on the hard horizontal ground and includes weight of hook block, slings and all other load handling accessories from main boom or jib rating shown.
- Ratings shown are based on freely suspended load and make no allowance for such factors as wind effect on lifted load, out-of-level ground conditions, operating speeds or any other condition that could be detrimental to the safe operation of this equipment.
- No operation is possible in the range indicated by blank spaces in the chart.
- The actual hoistable loads using main boom must be calculated by deducting the weight of main hook, slings and all other load handling accessories etc. from the ratings shown.
- Configurations of main Boom/Jib inserts and guy cables installations must be arranged as per the instruction of the owner and operator's manual, to be provided with machine.
- For the boom length exceeding 60.96m(200ft), mid point suspension pendant is required.
- Hook block weight and capacity (metric ton).
- Auxiliary sheave rating is determined by deducting weight of auxiliary sheave (720kg) and weight of main hook from main boom rating. It must not exceed 13.0 tons. Minimum rating is 1.5 tons.
- Actual hoistable loads using auxiliary sheave can be calculated by deducting weight of 15 ton ball-hook and weight of slings and other loads handling accessories from rating shown.
- Main boom rating when it is equipped with auxiliary sheave is determined by deducting the weight of the auxiliary sheave (720kg) from the rating for main boom without auxiliary sheave. When using main boom equipped with a ball-hook, weight of ball-hook (450kg) must also be deducted.
- Actual hoistable load with main boom being equipped with auxiliary sheave can be calculated by deducting weight of hook, and any other slings and accessories from the main boom rating with auxiliary sheave.
- Auxiliary sheave can be attached to boom between 18.29m and 70.10 m in length.
- Maximum working radius with auxiliary sheave attached must not exceed maximum working radius of main boom. Minimum working radius is working radius of auxiliary sheave at boom angle for minimum working radius of boom.
- Do not use hook on main boom and hook on auxiliary sheave simultaneously.
- Boom should in principle be erected over front of crawlers. For boom lengths shown in following table, steel plates must be used under front end of crawlers when erecting/lowering boom.

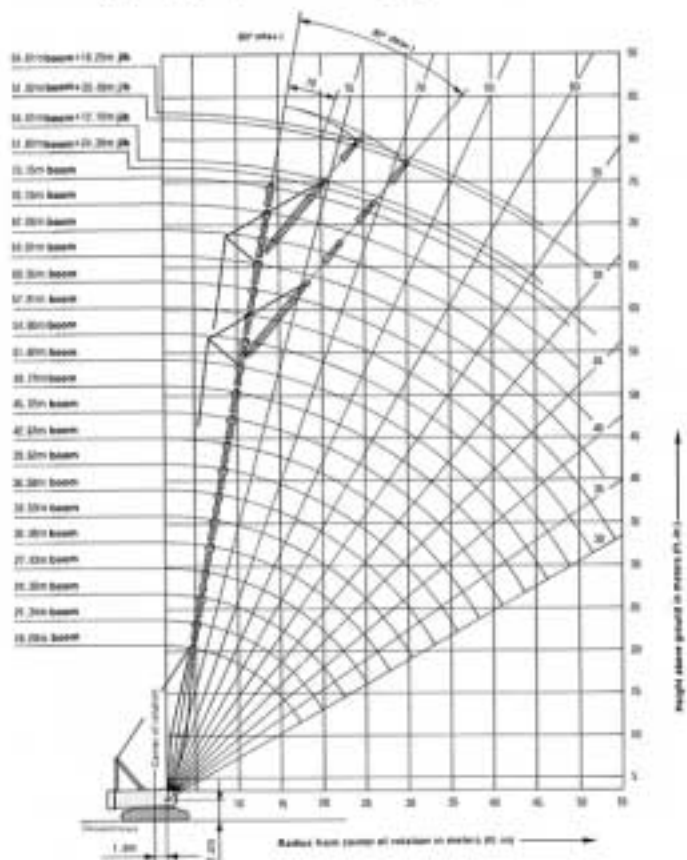
Capacity of hook	100 ton	70 ton	50 ton	15 ton (ball-hook)
Weight (metric ton)	1.5	1.2	0.95	0.45

9. Max. hoisting load

No. of parts of line	1	2	3	4	5
Max. load (metric ton)	15.0	29.0	43.0	57.0	71.0
No. of parts of line	6	7	8		
Max. load (metric ton)	85.0	89.0	100.0		

Equipment	Boom length
Boom only	70.10m, 73.15m
Boom + jib	60.96m, 64.01m
Boom + aux. sheave	67.06m, 70.10m

Working Ranges (with fixed jib)



Boom Lifting Capacities

BM1200

Unit: metric ton

Rated loads in metric tons for 360° working area

Crawler fully extended

Boom length m (ft) Working radius m (ft-in)	18.29 (60)	21.34 (70)	24.38 (80)	27.43 (90)	30.48 (100)	33.53 (110)	36.58 (120)	39.62 (130)	42.67 (140)	45.72 (150)	48.77 (160)	51.82 (170)	54.86 (180)	57.91 (190)	60.96 (200)	64.01 (210)	67.06 (220)	70.10 (230)	73.15 (240)	Boom length m (ft) Working radius m (ft-in)	
5 (16-5)	100.0																			5 (16-5)	
5.5 (18-1)	100.0																			5.5 (18-1)	
6 (19-8)	91.6	91.5	91.4	6.5m /84.2																6 (19-8)	
7 (23-0)	78.2	78.0	77.9	77.8	7.1m /90.5	7.6m /98.1														7 (23-0)	
8 (26-3)	62.9	62.7	62.6	62.5	62.3	62.2	8.1m /90.9	8.6m /95.2												8 (26-3)	
9 (29-6)	52.5	52.2	52.1	52.0	51.8	51.7	51.6	51.5	9.2m /90.2	9.7m /95.9										9 (29-6)	
10 (32-10)	44.9	44.6	44.5	44.4	44.2	44.1	44.0	43.9	43.8	43.7	10.2m /102.2	10.8m /108.2	11.3m /106.4	11.8m /103.9						10 (32-10)	
12 (39-4)	34.6	34.4	34.3	34.1	33.9	33.8	33.7	33.6	33.5	33.3	33.2	33.1	33.0	32.9	12.3m /129.0	12.9m /128.0	13.4m /125.7	13.9m /123.2		12 (39-4)	
14 (45-11)	28.0	27.8	27.6	27.5	27.3	27.2	27.1	27.0	26.8	26.7	26.6	26.5	26.4	26.2	26.0	25.9	25.2	23.1	14.5m /120.9	14 (45-11)	
16 (52-6)	23.3	23.2	23.0	22.9	22.6	22.5	22.4	22.3	22.2	22.0	21.9	21.8	21.7	21.5	21.3	21.2	21.1	21.0	19.7	16 (52-6)	
18 (59-0)	17.4m /18.0	19.8	19.6	19.5	19.2	19.1	19.0	18.9	18.7	18.6	18.5	18.4	18.2	18.1	17.8	17.7	17.6	17.5	17.4	18 (59-1)	
20 (65-7)		16.2	17.0	16.9	16.6	16.5	16.3	16.2	16.1	15.9	15.8	15.7	15.6	15.4	15.2	15.1	15.0	14.9	14.7	20 (65-7)	
22 (72-2)			15.0	14.8	14.5	14.4	14.2	14.1	14.0	13.8	13.7	13.6	13.5	13.3	13.1	13.0	12.9	12.8	12.6	22 (72-2)	
24 (78-9)			22.7m /13.9	13.2	12.9	12.7	12.5	12.4	12.3	12.1	12.0	11.9	11.8	11.6	11.4	11.3	11.2	11.1	10.9	24 (78-9)	
26 (85-4)				25.3m /13.0	11.5	11.3	11.1	11.0	10.9	10.7	10.6	10.5	10.4	10.2	10.0	9.9	9.8	9.7	9.5	26 (85-4)	
28 (91-10)					10.3	10.2	10.0	9.9	9.8	9.6	9.4	9.3	9.2	9.0	8.8	8.7	8.6	8.5	8.3	28 (91-10)	
30 (98-5)						9.2	9.0	8.9	8.8	8.6	8.4	8.3	8.2	8.0	7.8	7.7	7.6	7.5	7.3	30 (98-5)	
32 (105-0)						30.8m /8.9	8.2	8.1	7.9	7.7	7.6	7.5	7.3	7.1	6.9	6.8	6.7	6.6	6.4	32 (105-0)	
34 (111-7)							33.3m /7.5	7.4	7.2	7.0	6.8	6.7	6.6	6.4	6.2	6.1	6.0	5.9	5.6	34 (111-7)	
36 (118-1)								35.9m /6.7	6.5	6.3	6.2	6.1	5.9	5.7	5.5	5.4	5.3	5.2	5.0	36 (118-1)	
38 (124-8)									6.0	5.8	5.6	5.5	5.3	5.1	4.9	4.8	4.7	4.6	4.3	38 (124-8)	
40 (131-3)									38.5m /5.8	5.3	5.1	5.0	4.8	4.6	4.4	4.3	4.2	4.0	3.6	40 (131-3)	
42 (137-10)										41.2m /4.9	4.6	4.5	4.4	4.2	3.9	3.8	3.7	3.4	3.1	42 (137-10)	
44 (144-4)											43.8m /4.0	4.2	4.0	3.7	3.4	3.3	3.1	2.9	2.6	44 (144-4)	
46 (150-11)												3.6	3.5	3.3	2.9	2.8	2.7	2.4	2.1	46 (150-11)	
48 (157-6)													46.5m /3.4	3.1	2.9	2.5	2.4	2.3	2.0	1.7	48 (157-6)
50 (164-1)														49.1m /2.8	2.5	2.1	2.0	1.9	1.6	49.0m /1.5	50 (164-1)
52 (170-7)															51.7m /2.1	1.8	1.7	1.5		52 (170-7)	
54 (177-0)																1.5	53.0m /1.5			54 (177-0)	
56 (183-9)																	54.4m /1.3			56 (183-9)	

Boom Component Chart

Boom length m (ft)	Boom arrangement
18.29 (60)	Base-Tip
21.34 (70)	Base-A-Tip
24.38 (80)	Base-C-Tip, Base-A-A-Tip
27.43 (90)	Base-C-Tip, Base-A-B-Tip
30.48 (100)	Base-A-C-Tip, Base-A-A-B-Tip, Base-B-B-Tip
33.53 (110)	Base-B-C-Tip, Base-A-B-B-Tip
36.58 (120)	Base-A-B-C-Tip
39.62 (130)	Base-B-B-C-Tip, Base-C-D-Tip, Base-A-A-B-C-Tip, Base-A-B-D-Tip, Base-A-C-C-Tip
42.67 (140)	Base-A-C-D-Tip, Base-A-B-B-C-Tip, Base-B-C-C-Tip
45.72 (150)	Base-B-C-D-Tip, Base-A-B-C-C-Tip
48.77 (160)	Base-A-B-C-D-Tip

Boom length m (ft)	Boom arrangement
51.82 (170)	Base-C-D-D-Tip, Base-A-A-B-C-D-Tip, Base-A-B-D-D-Tip, Base-B-B-C-D-Tip, Base-A-C-C-D-Tip
54.86 (180)	Base-A-C-D-D-Tip, Base-A-B-B-C-D-Tip, Base-B-C-C-D-Tip
57.91 (190)	Base-B-C-D-D-Tip, Base-A-B-C-C-D-Tip, Base-A-D-D-D-Tip
60.96 (200)	Base-A-B-C-D-D-Tip, Base-B-D-D-D-Tip
64.01 (210)	Base-C-D-D-D-Tip, Base-A-A-B-C-D-D-Tip, Base-A-B-D-D-D-Tip, Base-B-B-C-D-D-Tip, Base-A-C-C-D-D-Tip
67.06 (220)	Base-A-C-D-D-D-Tip, Base-A-B-B-C-D-D-Tip, Base-B-C-C-D-D-Tip
70.10 (230)	Base-B-C-D-D-D-Tip, Base-A-B-C-C-D-D-Tip
73.15 (240)	Base-A-B-C-D-D-D-Tip

Base = 7.62m(25'), Tip = 10.67m(35')
 Inserts: A = 3.05 m (10'), B = 6.10 m (20'), C = 9.14m (30'),
 D = 12.19 m(40')

Clamshell ratings in metric tons for 360° working area

Crawler fully extended/with 19.3 ton counterweight

Working radius m	Boom length m (ft)							Working radius m
	18.29 (60)	21.34 (70)	24.38 (80)	27.43 (90)	30.48 (100)	33.53 (110)	36.58 (120)	
6	15.0	15.0						6
7	15.0	15.0	15.0	15.0				7
8	15.0	15.0	15.0	15.0	15.0	15.0		8
9	15.0	15.0	15.0	15.0	15.0	15.0	15.0	9
10	15.0	15.0	15.0	15.0	15.0	15.0	15.0	10
12	15.0	15.0	15.0	15.0	15.0	15.0	15.0	12
14	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14
16	15.0	15.0	15.0	15.0	15.0	15.0	15.0	16
18		15.0	14.9	14.8	14.6	14.4	14.2	18
20			12.9	12.7	12.6	12.4	12.2	20
22			11.3	11.1	11.0	10.8	10.6	22
24				9.9	9.7	9.5	9.2	24
26					8.6	8.4	8.2	26
28						7.5	7.3	28
30						6.8	6.5	30
32							5.9	32

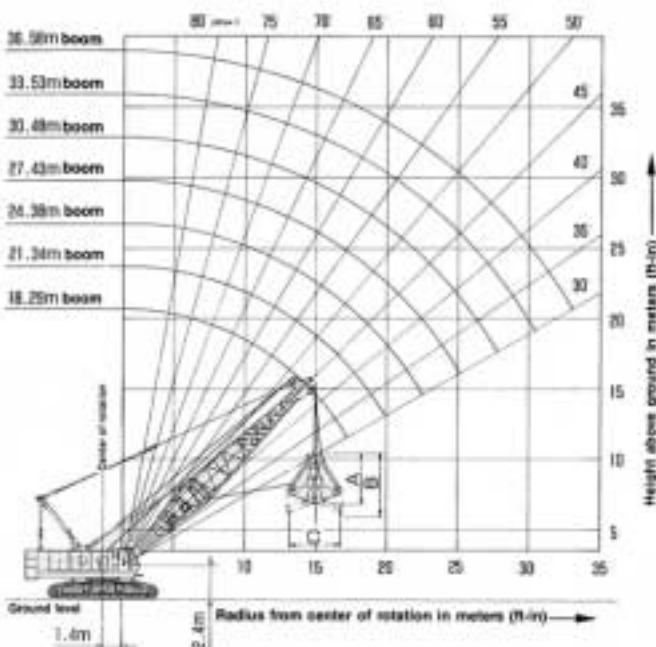
Note:

- Working radius is the horizontal distance between the center of rotation and the bucket's center of gravity.
- Rated loads assume a 19.3 ton counterweight, and total weight of bucket and materials must not exceed rated load.

Bucket capacity (m³) x specific gravity of material (ton/m³) + bucket weight (ton) ≤ rated load

- Rated load must not be exceeded, even when using bucket of different capacity for separate task.
- Bucket unit weight must not exceed 10 tons. Bucket weight must also be decreased according to operating cycle and bucket lowering height.
- Rated loads are determined by degree of stability. During simultaneous operations of boom and swing, rapid acceleration or deceleration must be avoided. Particular care is required with long boom lengths.

Working Range



Clamshell Bucket

Bucket capacity (m ³)	Approximate weight (ton)	Bucket clearance (m)			Application
		A	B	C	
2.5	5.0	3.4	4.4	3.8	Digging
3.0	6.0	3.6	4.6	3.7	Digging
3.5	8.0	3.6	4.6	3.7	Digging
4.0	7.5	4.3	4.7	3.9	Loading
5.0	4.0	4.5	5.0	4.2	Loading

KOBELCO

**HEAVY DUTY BASE MACHINE
FOR FOUNDATION WORK
BM1200**

Address inquiries to:

NOTE: Due to our policy of continual product improvement, all designs and specifications are subject to change without advance notice.

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