HEAVY DUTY BASE MACHINE FOR FOUNDATION WORK

KOBELCO

BM 500

Max. Lifting Capacity: 50 Metric Tons at 3.8 Meters

Max. Boom Length: 51.8 Meters

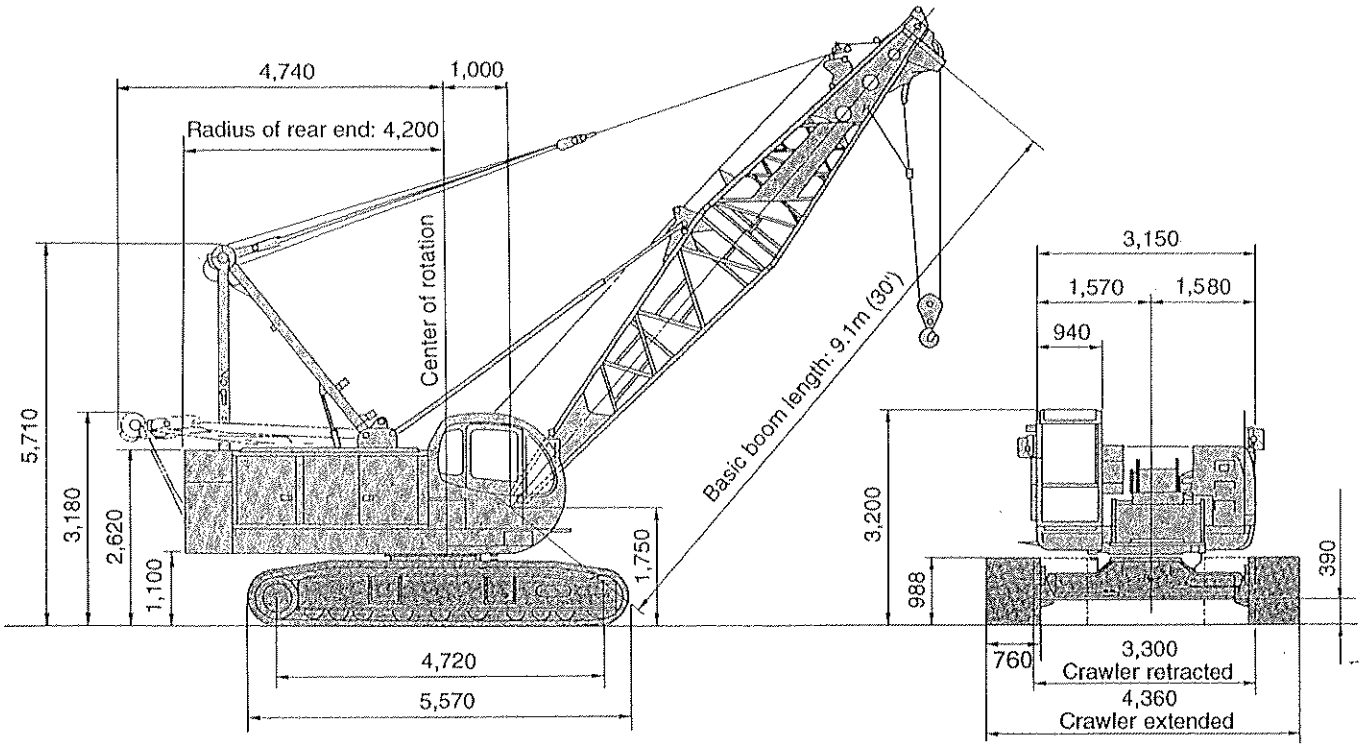
Specifications

- **A mega-powered crane equipped with precision control capability.**
- **Engine Speed Sensing (ESS) System makes efficient 100% use of engine power for steady, effortless operation.**
- **Powerful engine and strong line pull make light work of heavy-duty tasks such as diaphragm wall construction.**
- **Precise, full hydraulic control gives crane performance ideal for construction tasks demanding high precision.**
- **Powerful winch first layer maximum line pull of 17 tons, and wide, large-diameter drum with maximum rope capacity of 32 m at first layer.**
- **Maximum line speed of 100 m/min for main and auxiliary winches.**

TIONG WOON CRANE & TRANSPORT PTE. LTD.
NO. 15 PANDAN CRESCENT SINGAPORE 128470
TEL: 261 7888 (12 LINES) FAX: 777 4544

General Dimensions

Unit: mm



Specifications

Upper machinery

Power plant
Model .....Mitsubishi 6D16-TE1
Type ..... Water-cooled, direct fuel injection, with turbocharger
No. of cylinder 4
Bore and stroke .....118 mm x 115 mm
Displacement .....7.545 liters
Rated power .....180 PS (132.4 kW) at 2,150 rpm (JIS D1005)
Max. torque ..... 70 kg-m at 1,600 rpm (JIS D1005)
Cooling system ..... Liquid, recirculating bypass
Starter ..... 24 V, 5.0 kW
Generator .....24 V, 80 A
Cycles 4
Radiator ..... Plate fin type core, thermostatically controlled
Air cleaner..... Dry type with replaceable paper element
Fuel tank capacity.....350 liters
Batteries ..... Two 12V, 150 A-hr capacity batteries, series connected
Fuel consumption (at 1,500 rpm) ..... 163 g/PS-h
Filtration ..... Suction strainer return filter and drain filter
Electrical system ..... All wiring corded for easy servicing, individual fused branch circuits.

Hydraulic system
Pumps: All three variable displacement pumps are driven by heavy-duty pump drive. One of these pumps is used in the right propel circuit and hook hoist circuit, and can acommodate an optional third circuit. Another is used in the left propel circuit and hook hoist circuit. The third variable displacement pump is used in the swing circuit. In addition, one gear pumps are used in the control system and auxiliary equipment. One of these serves the clutch and brakes.
Control: Full-flow hydraulic control system for infinitely variable pressure to front and rear drums, and boom hoist. Controls respond instantly to the touch, delivering smooth function operation.
Pressure:
Load hoist, boom hoist and propel system ..... 315 kg/cm²
Swing system ..... 260 kg/cm²
Control system ..... 80 kg/cm²
Reservoir capacity..... 300 liters
Cooling: Oil-to-air heat exchanger
Filtration: Suction strainer, return filter, and drain filters

Boom hoisting system
Powered by a hydraulic axial piston motor through a planetary reducer.
Brake: A spring-set, hydraulically released multiple-disc brake mounted on the boom hoist motor and operated through a control valve. Safety pawl (external ratchet) are fitted for locking the drum.
Drum: Single drum, grooved for 16mm dia. wire rope.
Line speed: Single line on first drum layer
Hoisting (max.) 65m/min
Lowering (max.) 65m/min

Load hoist system
Tandem drums powered by two hydraulic axial piston motors, through planetary reducers.
Clutches: Internally expanding band clutches. 711 mm dia. x 102 mm wide
Brakes: Brake valves and externally contracting, spring set, hydraulically released band brakes, with positive and negative actuation. 900 mm dia. x 120 mm. Safety pawls (external rachet) for locking drums. Both positive and negative brake systems are available. Air cooling fins on brake drum.
Drums: (front and rear): 462 mm P.C.D. x 522 mm wide drums, each grooved for 22 mm wire rope. Rope capacity of 175 m working length and 278 m storage length.
Line speed: Single line on the first drum layer
Hoisting ..... 100/70/50/35 m/min
Lowering ..... 100/70/50/35 m/min

Swing system
Swing unit: Powered by hydraulic axial motor driving spur gears through a planetary reducer, the swing system provides 360° rotation.
Swing speed .....3.7 rpm
Swing brake: A spring-set, hydraulically released multiple-disc brake mounted on swing motor.
Swing circle: Single-row ball bearing with an internal cut swing gear.
Swing lock: Two-position pin-in-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 with a head rest and arm rests permits operators to set ideal working position. An air conditioner, FM/AM radio, signal horn, cigarette lighter, windshield wipers, washers, and floor mat 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 brake select switchs 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, a down speed adjusting knobs for front drum, rear drum and boom hoist drum. Creep speed control switch for hoist is on the hoist lever. A swing brake switch and a signal horn button are on the swing lever.
Lights: Two front flood lights and one cab inside light

Check & Safety Monitor
Gauges: Fuel, water temperature for engine, hour meter, optional tacho meter
Warning lamps: Engine oil pressure, hydraulic oil pressure, water temperature, battery charge, air cleaner and engine oil filter
Safety devices: Function lock lever, hook over-hoist alarm and shut-off switch, boom over-hoist limit switch, boom angle indicator, signal horn, boom hoist and front and rear drum locks, swing lock, free-fall warning lamps, free-fall interlock brakes, travel locking lever, boom back stops, hook safety latch and optional load moment limiter (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
Total weight ..... 17,000 kg

Tools
Tool set and accessories for routine machine maintenance are provided.

Lower machinery

Carbody: Steel-welded carbody with axles.
Crawler: Side frames can be hydraulically extended for wide-track operation or retracted for transportation. Extension cylinders operated with a valve in the upper control system. Crawler belt tension adjusted with hydraulic jack and maintained by shims between idler block and frame.
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: Brake valves and 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: 9 lower rollers and 2 upper rollers are fitted to each side frame, sealed and maintenance-free.
Shoes:
Number ..... 59 each side
Standard flat shoe width ..... 760 mm
Max. travel speed:
High range ..... 2.2 km/h
Low range ..... 1.4 km/h
Max. gradeability: 40%

Crane attachment

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

Max. lifting capacity	50,000 kg
Basic boom length	9.1m (30')
Max. boom length	51.8m (170')

Jib (optional):
Welded lattice construction using tubular, high-tensile steel cords with pin connections between sections.

	Fixed jib
Max. lifting capacity	6,600 kg
Max. jib length	15.2 m (50')
Max. total length (Boom length + jib length)	42.7 m (140') + 15.2 m (50')

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

Lifting capacity	50tons	32tons	19tons	6.6tons ball hook	6.6tons Light wt
No. of sheaves	5	3	2	1	0
Weight (kg)	650	500	400	160	60

Diameter of wire ropes
Standard:
Hook hoist ..... 22 mm
Aux. hoist ..... 22 mm
Boom hoist (12-part line) ..... 16 mm
Boom pendants (2-part line) ..... 30 mm
Optional:
Jib hook hoist ..... 22 mm
Jib back stay pendants (2-part line) ..... 20 mm
Boom hoist reeving: 12 parts of 16 mm dia. wire rope
Boom backstops: recommended for all boom lengths

Line pull
(for crane, diaphram wall bucket)

	Max. permissible	Max. available
Front:	6,600 kg	17,000 kg
Rear:	6,600 kg	17,000 kg

Weight

Operating weight:
Approx. 52,600 kg
(including 9.1 m (30 ft) boom and 50-ton hook block)
Ground pressure: 0.68 kg/cm² with 760 mm shoes

Lifting Capacities

Notes:

1. Operating radius is the horizontal distance from the centerline of rotation to a vertical line through the centerline of gravity of the load.
2. Rated loads included in the charts are the maximum allowable freely suspended loads at a given boom length, boom angle and radius, and have been determined for the machine standing level on firm supporting surface under ideal operating conditions. The user must limit or de-rate loads to allow for adverse conditions (such as soft or uneven ground, out-of-level conditions, winds, side loads, pendulum action, jerking or sudden stopping of loads, inexperience of personnel, multiple machine lifts, and traveling with a load).
3. Capacities do not exceed 75% of minimum tipping loads. Some of the rated crane loads are based on the structural strength, and overload could damage the boom, jib and frame, etc. without tipping.
4. Areas on rated crane load table where no rating are shown, operation is not intended or approved.
5. The loads can be lifted actually is obtained by deducting weight of hook block, slings and all other load handling accessories from the rated crane load.
6. For arrangements of the boom, jib and guy lines and reevings of the boom hoist rope, strictly observe the instruction of the operator's manual.
7. Gantry must be in fully raised position for all operations.
8. Hook block capacity and weight (metric ton).

Capacity of hook	50 ton	32 ton	19 ton	6.6 ton (ball hook)	6.6 ton (swivel hook)
Weight (metric ton)	0.65	0.5	0.4	0.16	0.06

9. Max. hoisting load

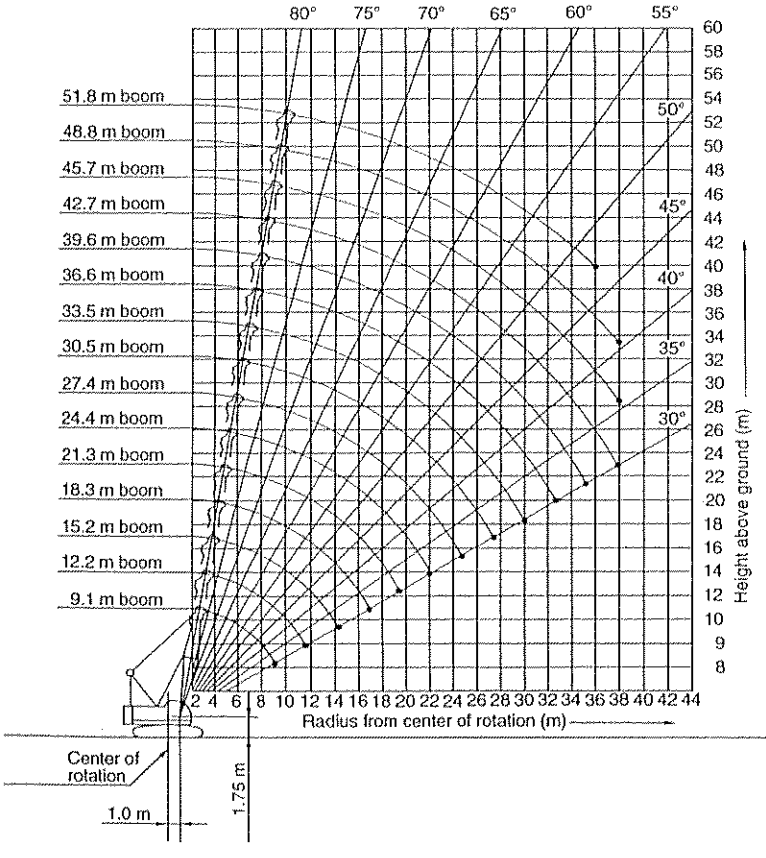
No. of parts of line	1	2	3	4	5
Max. load (metric ton)	6.6	13.2	19.8	26.4	33.0
No. of parts of line	6	7	8		
Max. load (metric ton)	39.6	46.2	50.0		

10. When lifting over boom point with jib or auxiliary sheave, rated loads for the boom must be deducted as shown below.

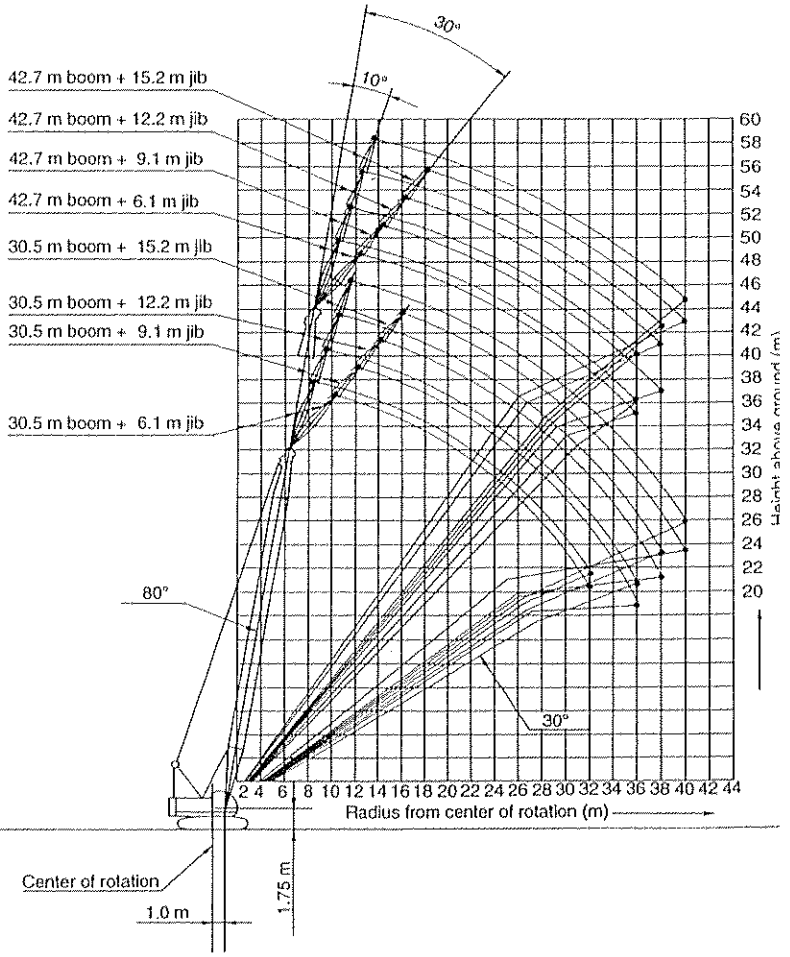
Jib length m (ft)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	Aux. sheave
Deduct (metric ton)	1.1	1.4	1.6	1.9	0.46

11. The total loads that can be lifted over a jib is limited by rated jib loads.The total load that can be lifted over an auxiliary sheave is limited by rated aux. sheave load. Weight of hooks, hook blocks, slings and other lifting devices are a part of the total load. Their total weight must be subtracted from the rated load to obtain the weight that can be lifted.
12. Boom lengths for jib mounting are 30.5 m (100') to 42.7 m (150').
13. An aux. sheave cannot be used on 51.8m (170') boom length.
14. Insert boom with lug is required for jib mounting.

Working Ranges



Fixed Jib Working Range



Boom Lifting Capacities

BM500

Unit: metric ton

Boom rated loads in metric tons for 360° working area

Crawlers fully extended

Boom length m (ft) / Operating radius (m)	9.1 (30)	12.2 (40)	15.2 (50)	18.3 (60)	21.3 (70)	24.4 (80)	27.4 (90)	30.5 (100)	33.5 (110)	36.6 (120)	39.6 (130)	42.7 (140)	45.7 (150)	48.8 (160)	51.8 (170)	Boom length m (ft) / Operating radius (m)
3.5	50.0/3.5	50.0/3.5														3.5
3.8	50.0	50.0														3.8
4.0	49.0	48.9	48.8/4.0	41.8/4.5												4.0
5.0	35.1	35.0	35.0	34.9	34.8/5.0	29.7/5.6										5.0
6.0	26.4	26.4	26.3	26.3	26.2	26.2	26.0/6.1	23.0/6.6								6.0
7.0	21.1	21.0	21.0	20.9	20.9	20.8	20.8	20.7	19.8/7.2	18.0/7.7						7.0
8.0	17.5	17.5	17.4	17.4	17.3	17.3	17.2	17.2	17.1	17.1	16.9/8.2	15.3/8.7				8.0
9.0	14.9	14.9	14.8	14.8	14.7	14.7	14.6	14.6	14.5	14.5	14.4	14.4	13.2/9.3	13.2/9.8		9.0
10.0	14.7/9.1	13.0	12.9	12.9	12.8	12.8	12.7	12.7	12.6	12.6	12.5	12.5	12.4	12.4	11.5/10.3	10.0
12.0		10.5/11.7	10.1	10.1	10.0	10.0	9.9	9.9	9.8	9.8	9.7	9.7	9.6	9.6	9.5	12.0
14.0			8.3	8.3	8.2	8.2	8.1	8.1	8.0	8.0	7.9	7.9	7.8	7.8	7.7	14.0
16.0			8.0/14.4	7.0	6.8	6.8	6.7	6.7	6.6	6.6	6.5	6.5	6.4	6.4	6.3	16.0
18.0				6.4/17.0	5.9	5.8	5.7	5.7	5.6	5.6	5.5	5.4	5.4	5.3	5.2	18.0
20.0					5.2/19.7	5.0	4.9	4.9	4.9	4.8	4.8	4.6	4.5	4.4	4.3	20.0
22.0						4.4	4.3	4.2	4.1	4.1	4.0	3.9	3.9	3.8	3.6	22.0
24.0						4.3/22.3	3.8	3.7	3.6	3.6	3.5	3.4	3.3	3.2	3.1	24.0
26.0							3.6/24.9	3.2	3.2	3.1	3.0	2.9	2.8	2.8	2.6	26.0
28.0								2.9/27.6	2.8	2.8	2.6	2.5	2.5	2.3	2.2	28.0
30.0									2.5	2.4	2.3	2.2	2.1	2.0	1.8	30.0
32.0									2.5/30.2	2.2	2.0	1.9	1.8	1.6	1.5	32.0
34.0										2.1/32.9	1.7	1.6	1.5	1.3	1.2/34.0	34.0
36.0											1.5/35.5	1.3	1.2	1.1/36.0		36.0
38.0												1.1/38.5	1.1/37.0			38.0

Note: Ratings shown in ☐ are determined by of the strength the boom or other structual components.

Boom Arrangement

Arrangement A: 3.0m + 6.1 m + 9.1 m insert boom

Boom length m (ft)	Boom arrangement
9.1 (30)	Base-Tip
12.2 (40)	Base-A-Tip
15.2 (50)	Base-B-Tip, Base-A-A-Tip
18.3 (60)	Base-A-B-Tip, Base-C-Tip
21.3 (70)	Base-A-C-Tip, Base-B-B-Tip, Base-A-A-B-Tip
24.4 (80)	Base-B-C-Tip, Base-A-B-B-Tip, Base-A-A-C-Tip
27.4 (90)	Base-A-B-C-Tip, Base-B-B-B-Tip, Base-A-A-B-B-Tip, Base-C-C-Tip
30.5 (100)	Base-B-B-C-Tip, Base-A-B-B-B-Tip, Base-A-A-B-C-Tip, Base-A-C-C-Tip

Boom length m (ft)	Boom arrangement
33.5 (110)	Base-B-C-C-Tip, Base-A-B-B-C-Tip, Base-A-A-C-C-Tip
36.6 (120)	Base-A-B-C-C-Tip, Base-A-A-B-B-C-Tip, Base-B-B-B-C-Tip
39.6 (130)	Base-B-B-C-C-Tip, Base-A-A-B-C-C-Tip, Base-A-B-B-C-Tip
42.7 (140)	Base-A-A-B-B-B-C-Tip, Base-A-B-B-C-C-Tip
45.7 (150)	Base-A-A-B-B-C-C-Tip, Base-B-B-B-C-C-Tip
48.8 (160)	Base-A-B-B-B-C-C-Tip
51.8 (170)	Base-A-A-B-B-B-C-C-Tip

Base =5.1m(17'), Tip=4.0m(13')
Inserts: A = 3.0 m (10'), B =6.1 m (20'), C = 9.1m (30')

Arrangement B: 3.0m + 6.1 m insert boom

Boom length m (ft)	Boom arrangement
9.1 (30)	Base-Tip
12.2 (40)	Base-A-Tip
15.2 (50)	Base-B-Tip, Base-A-A-Tip
18.3 (60)	Base-A-B-Tip
21.3 (70)	Base-B-B-Tip, Base-A-A-B-Tip
24.4 (80)	Base-A-B-B-Tip
27.4 (90)	Base-B-B-B-Tip, Base-A-A-B-B-Tip

Boom length m (ft)	Boom arrangement
30.5 (100)	Base-A-A-A-B-B-Tip, Base-A-B-B-B-Tip
33.5 (110)	Base-B-B-B-B-Tip, Base-A-A-B-B-B-Tip
36.6 (120)	Base-A-B-B-B-B-Tip, Base-A-A-A-B-B-B-Tip
39.6 (130)	Base-B-B-B-B-B-Tip, Base-A-A-B-B-B-Tip
42.7 (140)	Base-A-B-B-B-B-B-Tip, Base-A-A-A-B-B-B-B-Tip
45.7 (150)	Base-B-B-B-B-B-B-Tip, Base-A-B-B-B-B-B-Tip
48.8 (160)	Base-A-B-B-B-B-B-B-Tip, Base-A-A-A-B-B-B-B-B-Tip
51.8 (170)	Base-A-A-B-B-B-B-B-B-Tip

Base =5.1m(17'), Tip=4.0m(13')
Inserts: A = 3.0 m (10'), B =6.1 m (20'), C = 9.1m (30')

Fixed Jib Lifting Capacities

BM500

Unit: metric ton

Jib rated loads in metric tons for 360° working area (Jib offset angle 10°/with 19-ton main hook)

Crawlers fully extended

Boom length m(ft)	30.5 (100)				33.5 (110)				36.6 (120)				39.6 (130)				42.7 (140)			
Jib length m (ft) / Radius (m)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)
9	6.6				6.6															
10	6.6	6.6			6.6	6.6			6.6				6.6							
12	6.6	6.6	6.0	5.2	6.6	6.6	6.0	5.2	6.6	6.6	6.0		6.6	6.6			6.6	6.6		
14	6.6	6.6	6.0	5.2	6.6	6.6	6.0	5.2	6.6	6.6	6.0	5.2	6.6	6.6	6.0	5.2	6.6	6.6	6.0	5.2
16	6.2	6.4	6.0	5.2	6.0	6.2	6.0	5.2	6.0	6.2	6.0	5.2	5.8	6.1	6.0	5.2	5.8	6.0	6.0	5.2
18	5.1	5.3	5.4	5.2	5.0	5.2	5.3	5.2	4.9	5.1	5.2	5.2	4.8	5.0	5.1	5.2	4.7	4.9	5.0	5.1
20	4.3	4.4	4.6	4.7	4.2	4.3	4.5	4.6	4.1	4.3	4.4	4.5	4.0	4.1	4.3	4.4	3.9	4.0	4.2	4.3
22	3.6	3.8	3.9	4.0	3.5	3.7	3.8	3.9	3.4	3.6	3.7	3.8	3.3	3.5	3.6	3.7	3.2	3.4	3.5	3.6
24	3.1	3.2	3.4	3.4	3.0	3.1	3.3	3.3	2.9	3.0	3.2	3.2	2.7	2.9	3.0	3.1	2.7	2.8	3.0	3.0
26	2.6	2.8	2.9	3.0	2.5	2.7	2.8	2.9	2.4	2.6	2.7	2.8	2.3	2.4	2.6	2.7	2.2	2.4	2.5	2.6
28	2.2	2.4	2.5	2.6	2.1	2.3	2.4	2.5	2.0	2.2	2.3	2.4	1.8	2.0	2.2	2.3	1.7	1.9	2.1	2.2
30	1.9	2.1	2.2	2.3	1.7	1.9	2.1	2.1	1.6	1.8	2.0	2.0	1.4	1.6	1.8	1.9	1.3	1.5	1.7	1.8
32	1.6	1.7	1.9	2.0	1.4	1.6	1.7	1.8	1.3	1.5	1.6	1.7	1.1	1.3	1.4	1.5		1.2	1.3	1.4
34		1.4	1.6	1.7	1.1	1.3	1.4	1.5		1.2	1.3	1.4			1.1	1.2				1.1
36		1.2	1.3	1.4			1.2	1.3				1.1								
38			1.1	1.2																

Note: Ratings shown in ☐ are determined by the strength of the boom or other structual components.

Jib rated loads in metric tons for 360° working area (Jib offset angle 30°/with 19-ton main hook)

Crawlers fully extended

Boom length m(ft)	30.5 (100)				33.5 (110)				36.6 (120)				39.6 (130)				42.7 (140)			
Jib length m (ft) / Radius (m)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)
12	6.6				6.6				6.6				6.6							
14	6.6	6.0			6.6	6.0			6.6	6.0			6.6	6.0			6.6			
16	6.2	6.0	4.3	3.7	6.1	6.0	4.3		6.1	6.0	4.3		6.0	6.0	4.3		5.9	5.3		
18	5.1	5.4	4.3	3.7	5.1	5.3	4.3	3.7	5.0	5.3	4.3	3.7	4.9	5.2	4.3	3.7	4.8	5.1	4.3	3.7
20	4.3	4.6	4.3	3.7	4.2	4.5	4.3	3.7	4.2	4.4	4.3	3.7	4.1	4.3	4.3	3.7	4.0	4.3	4.3	3.7
22	3.7	3.9	4.1	3.7	3.6	3.8	4.0	3.7	3.5	3.7	3.9	3.7	3.4	3.6	3.9	3.7	3.3	3.6	3.8	3.7
24	3.1	3.3	3.5	3.7	3.0	3.2	3.4	3.6	2.9	3.2	3.4	3.5	2.8	3.1	3.3	3.4	2.8	3.0	3.2	3.4
26	2.6	2.8	3.0	3.2	2.5	2.8	2.9	3.1	2.5	2.7	2.9	3.0	2.4	2.6	2.8	2.9	2.3	2.5	2.7	2.9
28	2.3	2.4	2.6	2.8	2.2	2.4	2.5	2.7	2.1	2.3	2.5	2.6	2.0	2.2	2.4	2.5	1.9	2.1	2.3	2.4
30	1.9	2.1	2.3	2.4	1.8	2.0	2.2	2.3	1.7	1.9	2.1	2.2	1.6	1.8	2.0	2.1	1.5	1.7	1.9	2.1
32	1.6	1.8	2.0	2.1	1.5	1.7	1.9	2.0	1.4	1.6	1.8	1.9	1.2	1.5	1.7	1.8	1.1	1.4	1.6	1.8
34		1.5	1.7	1.8	1.2	1.4	1.6	1.7	1.1	1.3	1.5	1.6		1.1	1.4	1.5			1.3	1.5
36		1.2	1.4	1.6		1.1	1.3	1.5			1.2	1.4			1.1	1.2				1.1
38			1.2	1.3				1.2				1.1								
40				1.1																

Note: Ratings inside shown in ☐ are determined by the strength of the boom or other structual components.

Jib Arrangement

Jib length m (ft)	Jib arrangement
6.1 (20)	Base-Tip
9.1 (30)	Base-A-Tip
12.2 (40)	Base-B-Tip
15.2 (50)	Base-A-B-Tip

Base =3.0m(10'), Tip=3.0m(10')
Inserts: A =3.0 m (10'), B =6.10 m (20')

Note:

1. Jib may be used with main boom lengths from 30.5 m (100') to 42.7 m (140').
2. An insert boom with lugs is required for jib attachment.
3. Actual hoistable loads using jib can be calculated by deducting the total weight of jib hook and slings and all other load handling accessories from jib ratings.

Clamshell

BM500

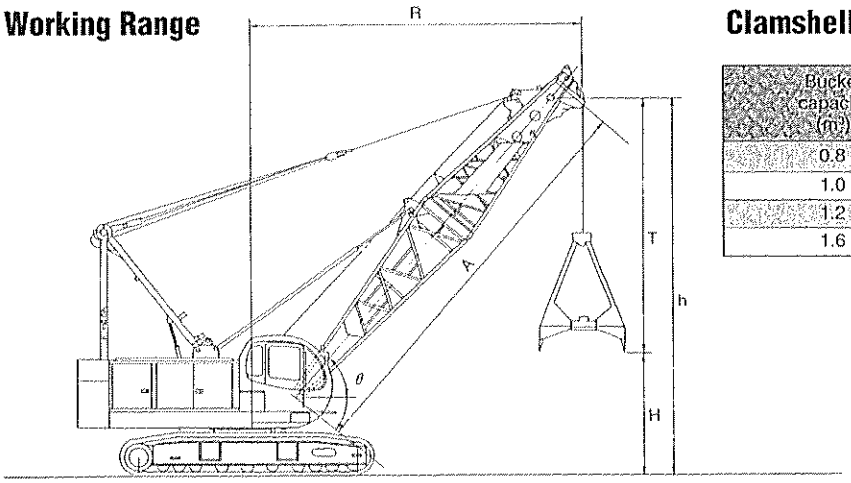
Clamshell ratings in metric tons for 360° working area

Crawlers fully extended

Boom length		m (ft)	A	9.1 (30)				12.2 (40)				15.2 (50)				18.3 (60)			
Boom angle		(°)	θ	35	45	55	65	35	45	55	65	35	45	55	65	35	45	55	65
Operating radius		(m)	R	8.7	7.7	6.5	5.2	11.2	9.9	8.3	6.5	13.7	12.0	10.0	7.7	16.2	14.2	11.8	9.0
Dumping height (m)	Bucket capacity (m³)	0.8	H	0.9	2.2	3.2	4.1	2.7	4.3	5.7	6.9	4.4	6.5	8.2	9.6	6.2	8.6	10.7	12.4
		1.0		0.9	2.2	3.2	4.1	2.7	4.3	5.7	6.9	4.4	6.5	8.2	9.6	6.2	8.6	10.7	12.4
		1.2		0.5	1.8	2.8	3.7	2.3	3.9	5.3	6.5	4.0	6.1	7.8	9.2	5.8	8.2	10.3	12.0
		1.6		0.6	1.9	2.9	3.8	2.4	4.0	5.4	6.6	4.1	6.2	7.9	9.3	5.9	8.3	10.4	12.1
Boom point height		(m)	h	6.7	8.0	9.0	9.9	8.5	10.1	11.6	12.7	10.2	12.3	14.0	15.4	12.0	14.4	16.5	18.2
Rated load		(ton)		5.5															

Note:
1. Working radius is the horizontal distance between the center of rotation and the bucket's center of gravity.
2. 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
3. Rated load must not be exceeded, even when using bucket of different capacity for separate task.
4. Bucket unit weight must not exceed 3.1 tons. Bucket weight must also be decreased according to operating cycle and bucket lowering height.
5. 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.
6. The 1.6 m³ bucket is for loading operations.

Working Range



Clamshell Bucket

Bucket capacity (m³)	Approximate weight (ton)	Bucket clearance (m) T
0.8	2.1	3.3
1.0	2.5	3.3
1.2	3.1	3.7
1.6	2.8	3.6

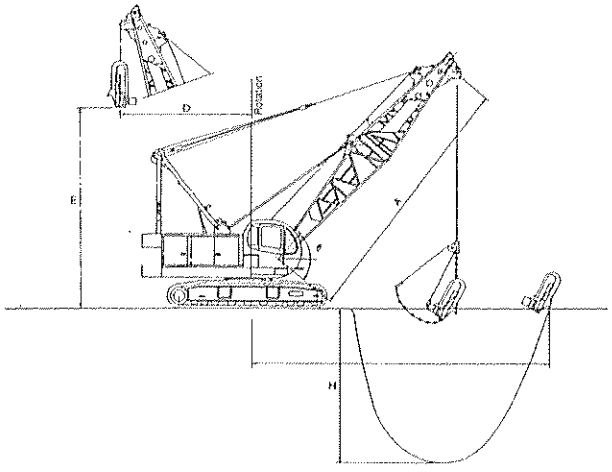
Dragline

Dragline ratings in metric tons for 360° working area

Crawlers fully extended

A	Boom length m (ft)	12.2 (40)			15.2 (50)			18.3 (60)		
F	Boom angle (°)	30	40	50	30	40	50	30	40	50
D	Dumping radius (m)	12.0	10.9	9.4	14.7	13.2	11.3	17.3	15.5	13.3
E	Max. dumping height (m)	5.1	6.8	8.3	6.6	8.8	10.7	8.1	10.8	13.0
G	Max. digging reach (m)	16.8	15.3	13.3	20.2	18.3	15.7	23.6	21.3	18.2
H	Max. digging depth (m)	9.4	8.2	6.6	12.0	10.5	8.6	11.1	8.5	6.2
Rated load	(ton)	6.6	6.6	6.0	4.9	6.3	6.6	4.0	4.8	6.0

Dimensions



Note:
1. Dimension G may vary considerably depending on digging conditions and the skill of the operator.
2. Dimension H may vary depending on digging material.
3. Above ratings are for combined weights of bucket, accessories, and material.
4. Maximum boom length recommended for dragline operation is 18.3m (60').
5. A 10.5-ton counterweight should be attached for dragline operation.
6. Maximum allowable bucket weight is 2.1 tons.
7. Maximum allowable digging bucket size:
   Heavy-duty type: 1.5 m³
   Light-duty type: 2.0 m³

Luffing Tower Attachment

BM500

Luffing tower attachment

Luffing tower:
Welded lattice construction using tubular, high-tensile steel cords with pin connections.

Max. lifting capacity	12 tons at 10 m
Basic tower length	21.0 m (69')
Lower tower length*	5.1 m (17')
Tower cap length	0.6 m (2')
Max. luffing tower length	39.3 m (129')

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

Basic jib length	16.8 m (55')
Max. luffing jib length	29.0 m (95')

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

Lifting capacity	19 tons	6.6 tons (ball hook)
No. of sheave	1	0
Weight (kg)	400	160

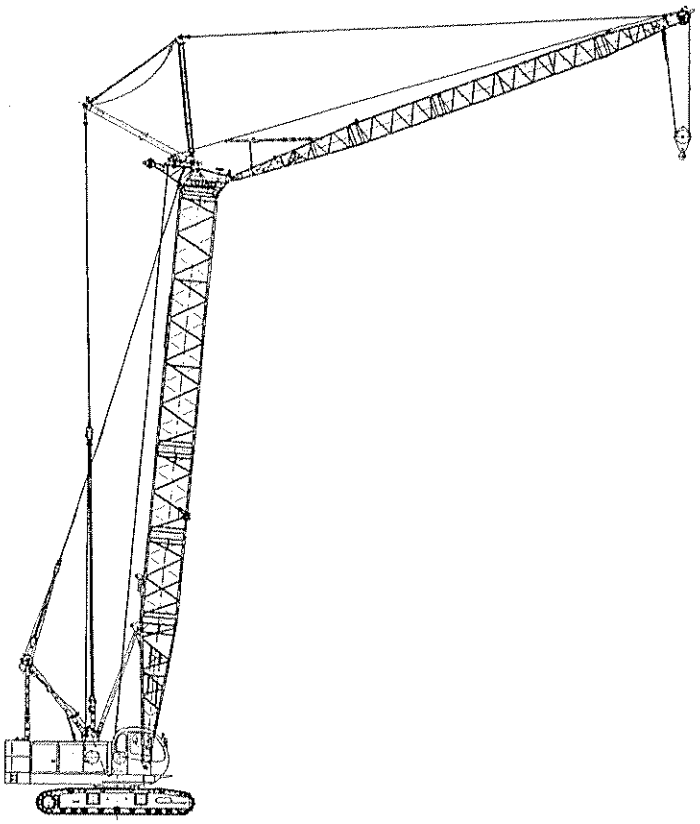
Diameter of wire ropes

Hook hoist ..... 22 mm
Jib. hoist (9-part line) ..... 22 mm
Tower hoist (12-part line) ..... 16 mm
Tower guy line (2-part line) ..... 30 mm
Upper jib guy line (2-part line)..... 28 mm
Lower jib guy line (2-part line) ..... 28 mm

Weight

Operating weight:
Approx. 56,400 kg
(including 21.0 m (69 ft) tower, 16.8 m (55 ft) jib, and 19 ton hook block)
Ground pressure: 0.73 kg/cm^2 with 760 mm shoes

Luffing tower configuration



Luffing Tower Lifting Capacities BM500

Notes:

1. Operating radius is the horizontal distance from the centerline of rotation to a vertical line through the centerline of gravity of the load.
2. Rated loads included in the charts are the maximum allowable freely suspended loads at a given tower length, tower and jib angle and load radius, and have been determined for the machine standing level on firm supporting surface under ideal operating conditions. The user must limit or de-rate rated loads to allow for adverse conditions (such as soft or uneven ground, out-of-level conditions, wind, side loads, pendulum action, jerking or sudden stopping of loads, inexperience of personnel, multiple machine lifts, and traveling with a load).
3. Capacities do not exceed 75% of minimum tipping loads. Some of the rated crane loads are based on the structural strength, and overload could damage the tower, jib and frame, etc. without tipping.
4. Areas on rated crane load table where no rating are shown, operation is not intended or approved.
5. The load which can be lifted actually is obtained by deducting weight of hook block, slings and all other load handling accessories from the rated crane load.
6. For arrangements of the tower, jib and guy lines and reevings of the tower hoist rope and jib hoist rope, strictly observe the instruction of the operator's manual.
7. A pillow plate must be used in the front end of the crawlers when erecting or lowering 39.3 m (129') tower.
8. Hook block capacity and weight (metric ton)

Lifting capacity	19 tons	6.6 tons (ball hook)
No. of sheave	1	0
Weight (ton)	0.4	0.16

9. Max. hoisting load

No. of parts of line	1	2
Max. load (metric ton)	6.6	12.0

10. For combinations of 19-ton hook with 16.8 m (55') jib, or 6.6-ton ball hook with 19.8 m jib, the jib tip weight (300 kg) must be attached to the upper tip of the jib.
11. The 6.6 ton ball hook must not be used with 16.8 m (55') jib.

Tower Arrangement

Arrangement A: 3.0 m + 6.1 m + 9.1 m insert tower

Tower length m (ft)	Tower arrangement
21.0 (69)	BaseA-A-C-Cap
24.1 (79)	Base-A-B-C-Cap
27.1 (89)	Base-A-C-C-Cap, Base-A-A-B-C-Cap
30.2 (99)	Base-A-B-B-C-Cap, Base-A-A-C-C-Cap
33.2 (109)	Base-A-A-B-B-C-Cap, Base-A-B-C-C-Cap
36.3 (119)	Base-A-A-B-C-C-Cap, Base-A-B-B-B-C-Cap
39.3 (129)	Base-A-A-B-B-B-C-Cap, Base-A-B-B-C-C-Cap

Base = 5.1m (17'), Cap= 0.6 m (2')
Inserts: A = 3.0 m (10'), B = 6.1 m (20'), C = 9.1 m (30')

Arrangement B: 3.0 m + 6.1 m insert tower

Tower length m (ft)	Tower arrangement
21.0 (69)	BaseA-B-B-Cap
24.1 (79)	Base-A-A-B-B-Cap
27.1 (89)	Base-A-A-A-B-B-Cap, Base-A-B-B-B-Cap
30.2 (99)	Base-A-A-B-B-B-Cap
33.2 (109)	Base-A-A-A-B-B-B-Cap, Base-A-B-B-B-B-Cap
36.3 (119)	Base-A-B-B-B-B-Cap
39.3 (129)	Base-A-A-A-B-B-B-B-Cap, Base-A-B-B-B-B-B-Cap

Base = 5.1m (17'), Cap = 0.6 m (2')
Inserts: A = 3.0 m (10'), B = 6.1 m (20'), C = 9.1 m (30')

Jib Arrangement

Jib length m (ft)	Jib arrangement
16.8 (55)	Base-A-B-Tip
19.8 (65)	Base-A-A-B-Tip, Base-B-B-Tip
22.9 (75)	Base-A-B-B-Tip
25.9 (85)	Base-B-B-B-Tip, Base-A-A-B-B-Tip
29.0 (95)	Base-A-B-B-B-Tip

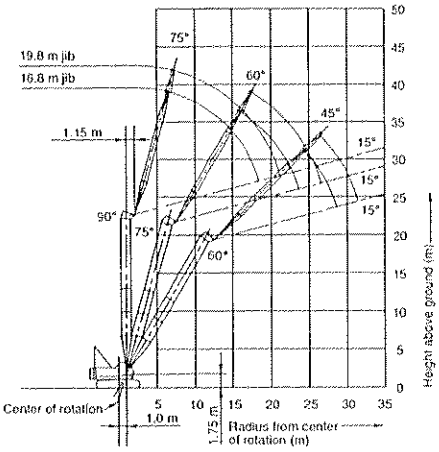
Base = 3.1 m (10'), Tip = 4.6 m (15')
Inserts: A = 3.0 m (10'), B = 6.1 m (20')

Tower and Jib Combinations and Allowable Tower Angle

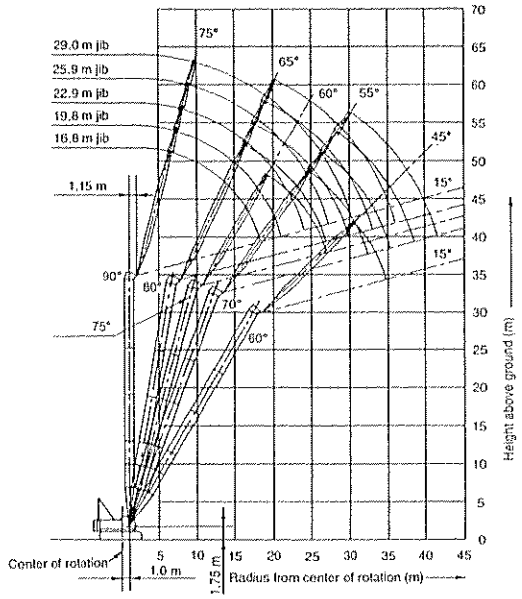
Tower Length	16.8 m (55') jib	19.8 m (65') jib	22.9 m (75') jib	25.9 m (85') jib	29.0 m (95') jib	Pillow plate
21.0 m (69')	90° - 60°	90° - 60°	-	-	-	×
24.1 m (79')	90° - 60°	90° - 60°	90° - 60°	-	-	×
27.1 m (89')	90° - 60°	90° - 60°	90° - 60°	90° - 60°	-	×
30.2 m (99')	90° - 60°	90° - 60°	90° - 60°	90° - 70°	90° - 70°	×
33.2m (109')	90° - 60°	90° - 70°	90° - 70°	90° - 70°	90° - 70°	×
36.3m (119')	90° - 70°	90° - 70°	90° - 70°	90° - 70°	90° - 70°	×
39.3m (129')	90° - 70°	90° - 70°	90° - 70°	90° - 80°	90° - 80°	○
19-ton hook	○	○	○	○	○	-
Ball hook	×	○	○	○	○	-

Luffing Tower Working Ranges

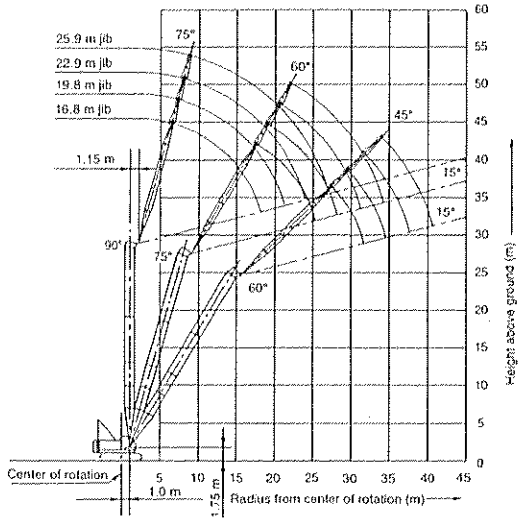
Tower Length: 21.0 m



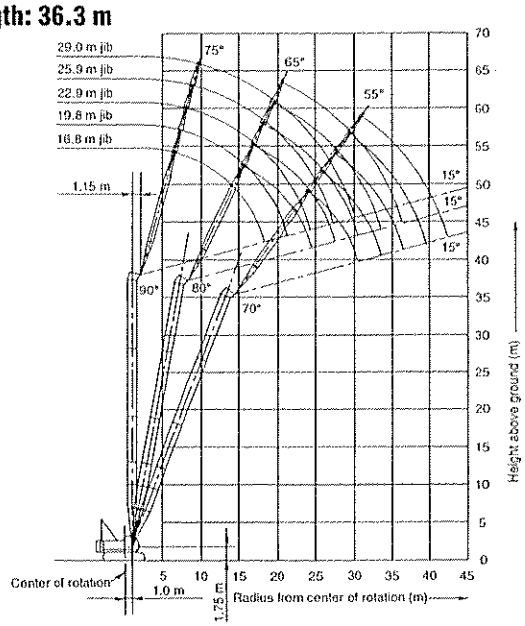
Tower Length: 33.2 m



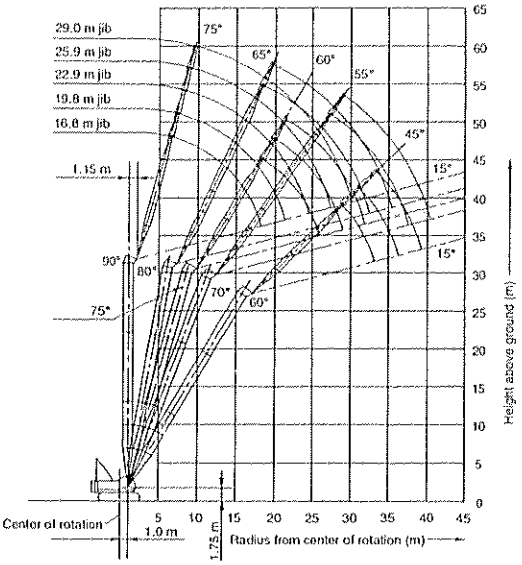
Tower Length: 27.1 m



Tower Length: 36.3 m



Tower Length: 30.2 m



Tower Length: 39.3 m

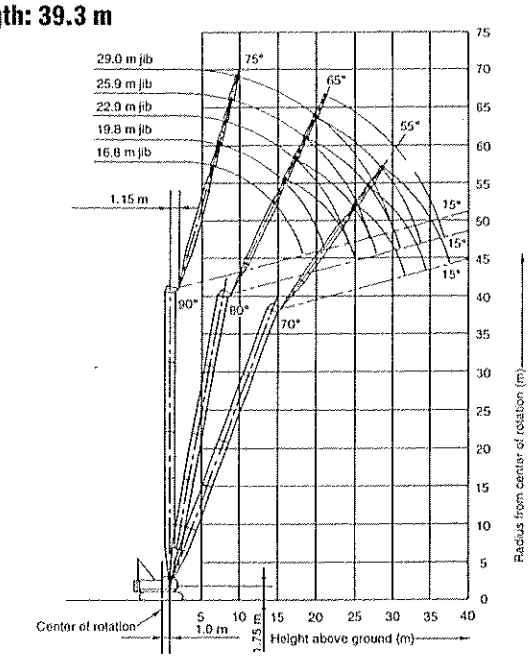


Figure for 24.1 m tower is also provided. Please contact your nearest dealers.

Luffing Tower Lifting Capacities

Unit: metric ton

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	21.0 m (69') Tower						24.1 m (79') Tower									Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			
	Tower angle			Tower angle			Tower angle			Tower angle			Tower angle			
	90°	75°	60°	90°	75°	60°	90°	75°	60°	90°	75°	60°	90°	75°	60°	
6.5	12.0/6.5						12.0/6.5									6.5
7.0	12.0			12.0/7.3			12.0			12.0/7.3						7.0
8.0	12.0			12.0			12.0			12.0			11.5/8.1			8.0
9.0	12.0			12.0			12.0			12.0			11.2			9.0
10.0	12.0			11.8			12.0			11.8			11.0			10.0
12.0	10.7			10.5			10.7			10.5			10.3			12.0
14.0	9.6	6.9/15.9		9.4			9.6			9.4			9.2			14.0
16.0	8.2	6.9		8.1	6.1/17.5		8.2	6.3/16.7		8.1			8.1			16.0
18.0	6.2	6.0		7.1	5.9		6.2	5.8		7.2	5.6/18.3		7.2	5.0/19.8		18.0
20.0	5.5/18.3	5.2		5.9	5.2		5.5/18.3	5.1		5.9	5.0		6.3	4.9		20.0
22.0		4.7		4.6/21.3	4.6			4.5		4.6/21.3	4.4		5.3	4.4		22.0
24.0		4.2/23.7	3.5/24.4		4.1			4.0	3.0/25.9		4.0		4.1	3.9		24.0
26.0			3.2		3.7	3.1/26.5		3.9/24.5	3.0		3.6		3.9/24.2	3.5		26.0
28.0			2.9		3.6/26.7	2.8			2.7		3.3/27.5	2.6/28.0		3.2		28.0
30.0			2.8/28.7			2.6			2.5			2.4		2.9	2.3/30.2	30.0
32.0						2.4/31.6			2.4/30.2			2.2		2.9/30.4	2.1	32.0
34.0												2.1/33.2			2.0	34.0
36.0															1.8	36.0
38.0															1.8/36.1	38.0

Note: Ratings shown in ☐ are determined by the strength of the boom or other structual components.

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	27.1 m (89') Tower												Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			25.9 m (85') Jib			
	Tower angle			Tower angle			Tower angle			Tower angle			
	90°	75°	60°	90°	75°	60°	90°	75°	60°	90°	75°	60°	
6.5	12.0/6.5												6.5
7.0	12.0			12.0/7.3									7.0
8.0	12.0			12.0			11.5/8.1			8.6/8.9			8.0
9.0	12.0			12.0			11.2			8.6			9.0
10.0	12.0			11.8			11.0			8.4			10.0
12.0	10.7			10.4			10.3			8.2			12.0
14.0	9.5			9.3			9.2			7.7			14.0
16.0	8.2	5.8/17.5		8.1			8.1			7.1			16.0
18.0	6.2	5.6		7.2	5.1/19.0		7.2			6.5			18.0
20.0	5.5/18.3	4.9		5.9	4.8		6.3	4.6/20.6		5.9			20.0
22.0		4.4		4.6/21.3	4.3		5.3	4.2		5.3	4.1/22.1		22.0
24.0		3.9			3.8		4.1	3.8		4.7	3.7		24.0
26.0		3.6/25.3	2.5/27.4		3.5		3.9/24.2	3.4		4.0	3.3		26.0
28.0			2.5		3.1	2.1/29.6		3.1		3.3/27.2	3.0		28.0
30.0			2.2		3.1/28.3	2.1		2.8	1.8/31.7		2.7		30.0
32.0			2.0/31.7			2.0		2.7/31.2	1.8		2.5	1.5/33.9	32.0
34.0						1.8			1.7		2.3	1.5	34.0
36.0						1.7/34.7			1.6		2.3/34.2	1.4	36.0
38.0									1.4/37.6			1.3	38.0
40.0												1.2	40.0
42.0												1.1/40.6	42.0

Note: Ratings shown in ☐ are determined by of the strength the boom or other structual components.

Unit: metric ton

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	30.2 m (99') Tower															Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			25.9 m (85') Jib			29.0 m (95') Jib			
	Tower angle			Tower angle			Tower angle			Tower angle			Tower angle			
	90°	75°	60°	90°	75°	60°	90°	75°	60°	90°	80°	70°	90°	80°	70°	
6.5	12.0/6.5															6.5
7.0	12.0			12.0/7.3												7.0
8.0	12.0			12.0			11.5/8.1			8.6/8.9						8.0
9.0	12.0			12.0			11.2			8.6			6.2/9.7			9.0
10.0	12.0			11.8			11.0			8.4			6.2			10.0
12.0	10.6			10.4			10.3			8.2			6.2			12.0
14.0	9.5			9.3			9.2			7.7			6.0			14.0
16.0	8.2			8.1			8.1			7.1			5.6			16.0
18.0	6.2	5.3/18.0		7.2	4.7/19.8		7.2			6.4	5.5/18.3		5.1	5.0/19.6		18.0
20.0	5.5/18.3	4.7		5.9	4.6		6.3	4.2/21.4		5.9	4.9		4.6	4.9		20.0
22.0		4.2		4.6/21.3	4.1		5.3	4.0		5.3	4.4		4.2	4.3		22.0
24.0		3.8			3.7		4.1	3.6		4.7	3.9		3.8	3.9		24.0
26.0		3.4			3.3		3.9/24.2	3.3		4.0	3.5	2.6/27.3	3.5	3.5		26.0
28.0		3.4/26.1	2.0/28.9		3.0			3.0		3.3/27.2	3.2	2.5	3.2	3.1	2.3/29.0	28.0
30.0			2.0		2.9/29.1	1.7/31.1		2.7			2.9	2.3	2.8	2.9	2.2	30.0
32.0			1.8			1.7		2.5/32.0	1.4/33.3		2.7	2.1	2.8/30.1	2.6	2.0	32.0
34.0			1.6/33.3			1.5			1.4		2.6/32.4	1.9		2.4	1.9	34.0
36.0						1.4			1.3			1.8		2.3/35.3	1.7	36.0
38.0						1.3/36.2			1.2			1.6/37.4			1.6	38.0
40.0									1.1/39.0						1.5	40.0
42.0															1.3/40.4	42.0

Note: Ratings shown in ☐ are determined by the strength of the boom or other structual components.

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	33.2 m (109') Tower															Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			25.9 m (85') Jib			29.0 m (95') Jib			
	Tower angle			Tower angle			Tower angle			Tower angle			Tower angle			
	90°	75°	60°	90°	80°	70°	90°	80°	70°	90°	80°	70°	90°	80°	70°	
6.5	12.0/6.5															6.5
7.0	12.0			12.0/7.3												7.0
8.0	12.0			12.0			11.5/8.1			8.6/8.9						8.0
9.0	12.0			12.0			11.2			8.6			6.2/9.7			9.0
10.0	12.0			11.8			11.0			8.3			6.2			10.0
12.0	10.6			10.4			10.3			8.0			6.2			12.0
14.0	9.5			9.3			9.2			7.7			6.0			14.0
16.0	8.2			8.1	6.4/16.3		8.1	5.7/17.6		7.1			5.6			16.0
18.0	6.2	4.8/19.1		7.2	5.6		7.2	5.6		6.4	5.2/18.9		5.1			18.0
20.0	5.5/18.3	4.5		5.9	4.9		6.3	4.9		5.8	4.8		4.6	4.7/20.1		20.0
22.0		4.0		4.6/21.3	4.4		5.3	4.3		5.3	4.2		4.2	4.2		22.0
24.0		3.6			3.9	2.9/24.8	4.1	3.9		4.7	3.8		3.8	3.7		24.0
26.0		3.2			3.6	2.8	3.9/24.2	3.5	2.6/26.6	4.0	3.4		3.5	3.4		26.0
28.0		3.1/26.9			3.4/27.0	2.5		3.2	2.4	3.3/27.2	3.1	2.2/28.3	3.1	3.0		28.0
30.0			1.5/30.5			2.3		2.9/30.0	2.2		2.8	2.1	2.8	2.8	2.0/30.1	30.0
32.0			1.5			2.1			2.0		2.6	1.9	2.8/30.1	2.5	1.9	32.0
34.0			1.3			2.0/32.6			1.9		2.5/32.9	1.8		2.3	1.7	34.0
36.0			1.2/34.8						1.7/35.5			1.6		2.2/35.9	1.5	36.0
38.0												1.5			1.4	38.0
40.0												1.3/38.5			1.3	40.0
42.0															1.1/41.4	42.0

Note: Ratings shown in ☐ are determined by the strength of the boom or other structual components.

Unit: metric ton

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	36.3 m (119') Tower															Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			25.9 m (85') Jib			29.0 m (95') Jib			
	Tower angle			Tower angle			Tower angle			Tower angle			Tower angle			
	90°	80°	70°	90°	80°	70°	90°	80°	70°	90°	80°	70°	90°	80°	70°	
6.5	12.0/6.5															6.5
7.0	12.0			11.4/7.3												7.0
8.0	12.0			11.4			10.1/8.1			8.6/8.9						8.0
9.0	12.0			11.4			10.1			8.5			6.2/9.7			9.0
10.0	12.0			11.4			10.1			8.3			6.2			10.0
12.0	10.6			10.4			10.1			8.0			6.2			12.0
14.0	9.5	6.7/15.5		9.3			9.2			7.7			6.0			14.0
16.0	8.2	6.5		8.1	6.0/16.8		8.1			7.1			5.6			16.0
18.0	6.2	5.6		7.2	5.5		7.2	5.4/18.1		6.4	4.8/19.6		5.1			18.0
20.0	5.5/18.3	4.9		5.9	4.8		6.3	4.7		5.8	4.6		4.6	4.4/20.7		20.0
22.0		4.4		4.6/21.3	4.3		5.3	4.2		5.3	4.1		4.2	4.1		22.0
24.0		3.9	2.9/24.1		3.8	2.5/25.9	4.1	3.8		4.7	3.7		3.8	3.6		24.0
26.0		3.8/24.6	2.7		3.5	2.5	3.9/24.2	3.4	2.2/27.6	3.9	3.3		3.5	3.3		26.0
28.0			2.4		3.2/27.6	2.3		3.1	2.2	3.3/27.2	3.0	1.9/29.4	3.1	2.9		28.0
30.0			2.2			2.1		2.8	2.0		2.7	1.9	2.8	2.7	1.6/31.1	30.0
32.0			2.1/30.7			1.9		2.7/30.5	1.9		2.5	1.7	2.8/30.1	2.5	1.6	32.0
34.0						1.7/33.6			1.7		2.3/33.5	1.6		2.2	1.5	34.0
36.0									1.5			1.4		2.1	1.3	36.0
38.0									1.4/36.6			1.3		2.0/36.4	1.2	38.0
40.0												1.1/39.5			1.1/40.0	40.0

Note: Ratings shown in ☐ are determined by of the strength the boom or other structual components.

Luffing tower rated loads in metric tons for 360° working area

Crawlers fully extended

Operating radius (m)	39.3 m (129') Tower													Operating radius (m)
	16.8 m (55') Jib			19.8 m (65') Jib			22.9 m (75') Jib			25.9m (85') Jib		29.0 m (95') Jib		
	Tower angle			Tower angle			Tower angle			Tower angle		Tower angle		
	90°	80°	70°	90°	80°	70°	90°	80°	70°	90°	80°	90°	80°	
6.5	11.4/6.5													6.5
7.0	11.4			9.5/7.3										7.0
8.0	11.4			9.5			8.1/8.1			6.7/8.9				8.0
9.0	11.4			9.5			8.1			6.7		6.2/9.7		9.0
10.0	11.0			9.5			8.1			6.7		6.2		10.0
12.0	10.4			9.5			8.1			6.7		6.2		12.0
14.0	9.5			9.2			8.1			6.7		6.0		14.0
16.0	8.2	6.2/16.0		8.1	5.6/17.3		8.1			6.7		5.6		16.0
18.0	6.2	5.4		7.2	5.3		7.2	5.0/18.6		6.4	4.5/19.9	5.0		18.0
20.0	5.5/18.3	4.8		5.9	4.7		6.3	4.6		5.8	4.5	4.6	4.1/21.2	20.0
22.0		4.2		4.6/21.3	4.1		5.3	4.1		5.3	4.0	4.2	3.9	22.0
24.0		3.8	2.4/25.1		3.7		4.1	3.6		4.7	3.5	3.8	3.5	24.0
26.0		3.5/25.1	2.4		3.3	2.1/26.9	3.9/24.2	3.3		3.9	3.2	3.4	3.1	26.0
28.0			2.2		3.0	2.1		3.0	1.8/28.6	3.3/27.2	2.9	3.1	2.8	28.0
30.0			2.0		3.0/28.1	1.9		2.7	1.8		2.6	2.8	2.6	30.0
32.0			1.7/31.7			1.7		2.6/31.0	1.6		2.4	2.8/30.1	2.3	32.0
34.0						1.5			1.4		2.2/34.0		2.2	34.0
36.0						1.3/34.7			1.3				2.0	36.0
38.0									1.1/37.6				1.9/36.9	38.0

Note: Ratings shown in ☐ are determined by the strength of the boom or other structual components.

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980302TF Printed in Japan