

# HEAVY DUTY BASE MACHINE FOR FOUNDATION WORK BM 500

# KOBELCO

Max. Lifting Capacity: 50 Metric Tons at 3.8 Meters  
Max. Boom Length: 51.8 Meters

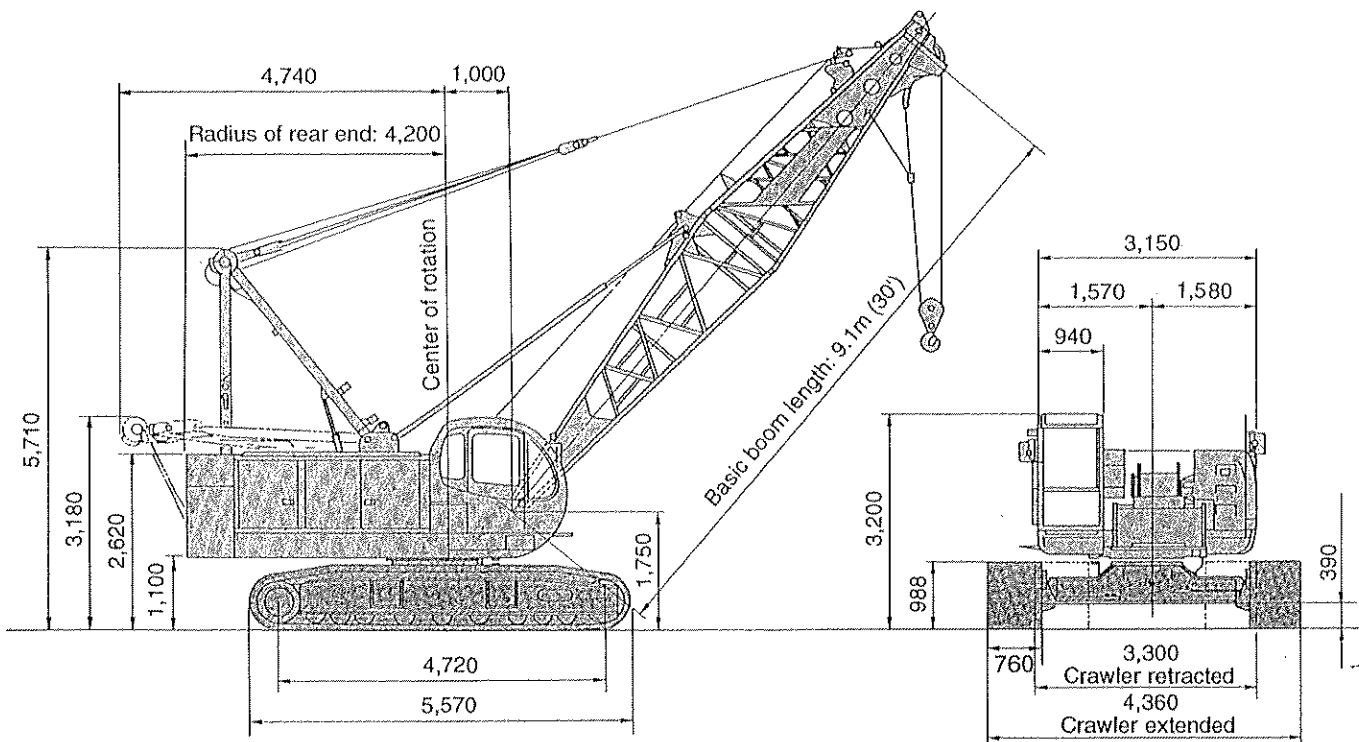
## Specifications

- 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.

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NO. 15 PANDAN CRESCENT SINGAPORE 128470  
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## 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 accommodate 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/cm<sup>2</sup>

**Swing system** ..... 260 kg/cm<sup>2</sup>

**Control system** ..... 80 kg/cm<sup>2</sup>

**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 ratchet) 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 switches 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	9.1 m (30')
Max. boom length	51.8 m (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	50 tons	32 tons	19 tons	6.6 tons ball hook	6.6 tons 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, diaphragm 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/cm<sup>2</sup> with 760 mm shoes

## 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 block	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

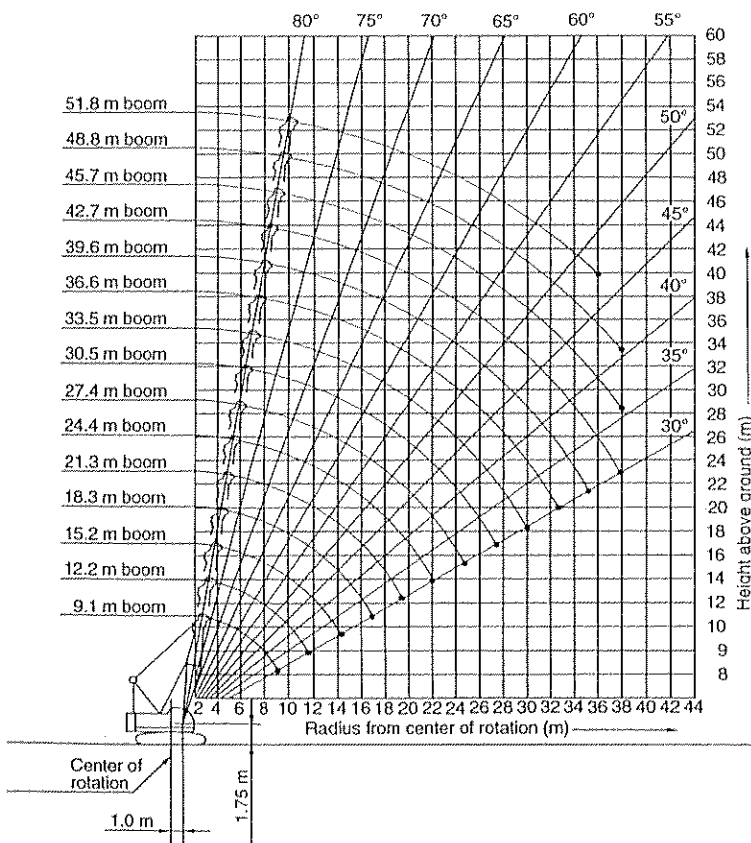
No. of parts of line	1	2	3	4	5
Max. load (metric ton)	6.6	13.2	19.8	26.4	33.0
No. of parts of line	6	7	8		
Max. load (metric ton)	39.6	46.2	50.0		

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

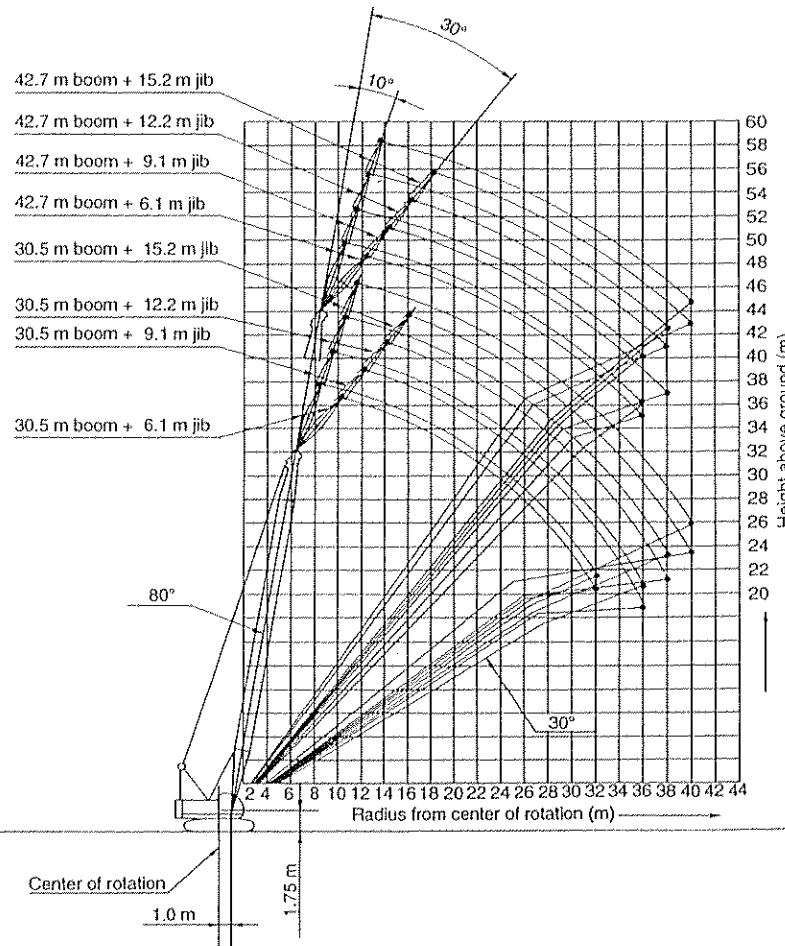
Jib length m (ft)	6.1 (20)	9.1 (30)	12.2 (40)	15.2 (50)	Aux sheave
Deduct (metric ton)	1.1	1.4	1.6	1.9	0.46

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 Operating radius (m)	3.0 (10)	6.1 (20)	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 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	34.0/5.0	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 the strength the boom or other structural 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

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

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-B-C-C-Tip, Base-A-B-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

### 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

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

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-Tip
51.8 (170)	Base-A-A-B-B-B-B-B-B-Tip