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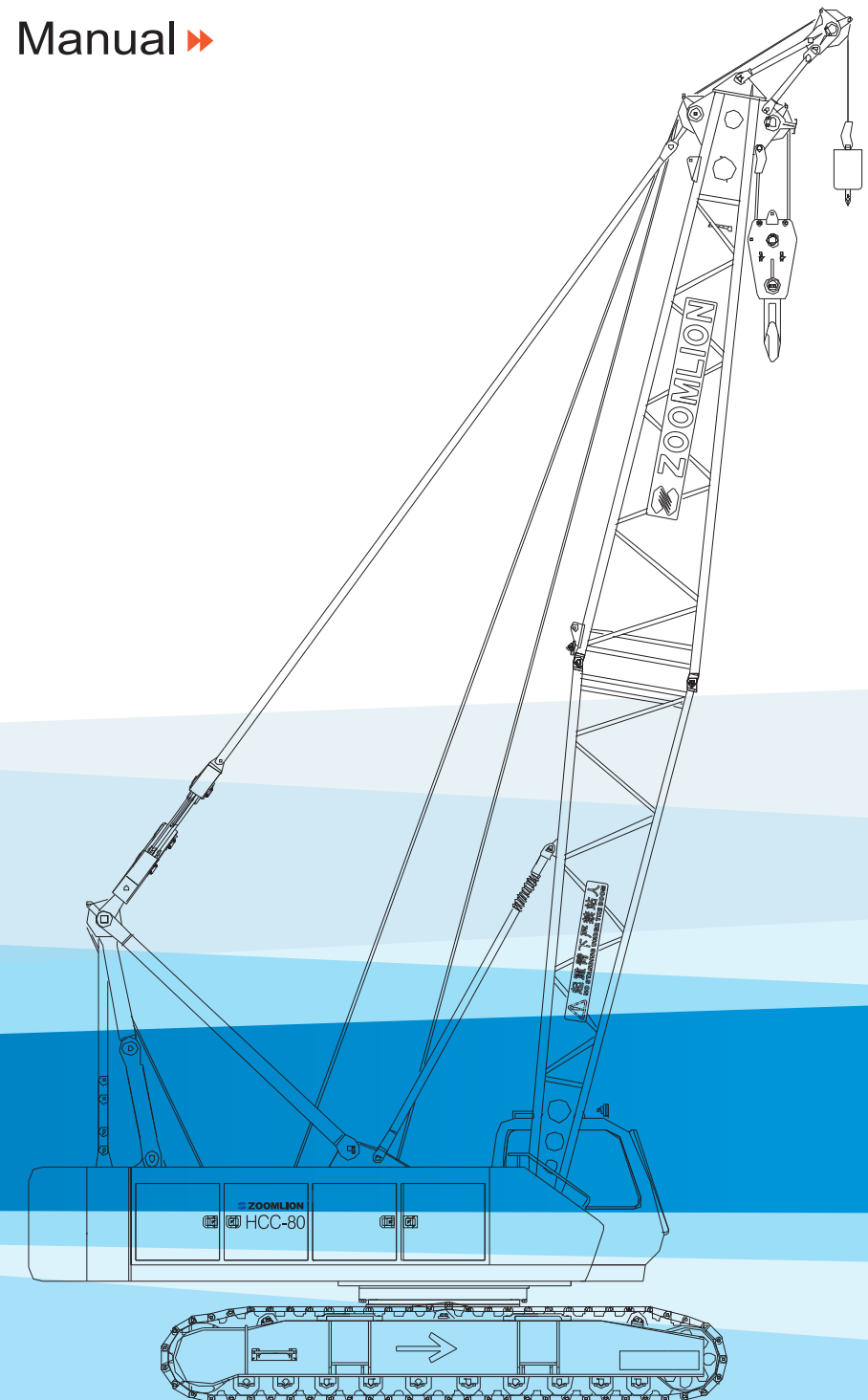RENTAL - SALES - PARTS & SERVICE

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ZOOMLION

HCC-80

Zoomlion HCC-80 Crawler Crane
Technical Manual ▸▸

Contents

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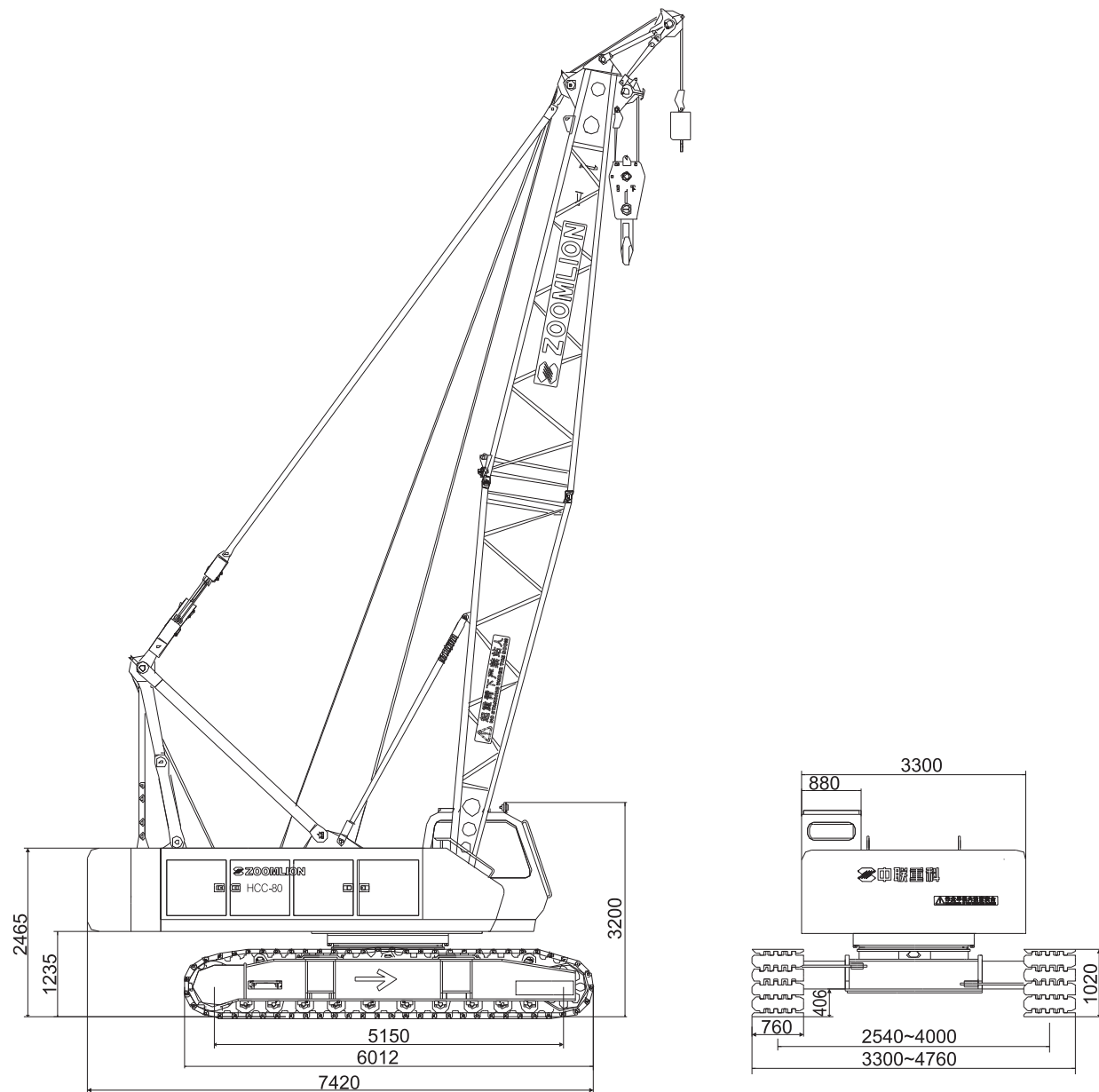
I. Overall Dimensions and Main Parameters

## 1. Overall Dimensions of Basic Machine, including Basic Boom

2. Main Performance Parameters

| Items		Unit of measurement	Values	Remarks
Maximum lifting capacity × radius		t × m	70 × 3.8	
Deadweight of crane with basic boom		t	61	
Length of main boom		m	12~57	
Length of fixed jib		m	6~18	
Maximum lifting capacity with fixed jib		t	6.4	
Fixed jib angle		°	10,30	
Max length of main boom+fixed jib		m	42 + 18	
Single rope speed of winches	Main hoisting winch (hoisting winch 1)	m/min	120	Fourth layer of drum
	Auxiliary hoisting winch (hoisting winch 2)	m/min	120	Fourth layer of drum
	Derricking winch	m/min	45	Fourth layer of drum
Slewing speed		rpm	0~2.4	
Traveling speed		km/h	0~1.35	
Gradeability		%	30	Basic boom, with frontal counterweight placement
Ground pressure		Mpa	0.074	
Overall dimensions (L × W × H)		mm	12400 × 3300 × 3200	With A-frame and bottom section of boom
Engine	Weichai Euro II	Rated power/rotational speed	kW/rpm	175/2200	
		Maximum output torque/rotational speed	Nm/rpm	1000/1400~1600	
		Exhaust emission standard		EU Stage II	
	Cummins (USA)	Rated power/rotational speed	kW/rpm	153/1800	
		Maximum output torque/rotational speed	Nm/rpm	929/1300	
		Exhaust emission standard		TIER3	
Distance between track centers × crawler contact length × crawler shoe width		mm	2540 × 5150 × 760	With crawler carrier retracted
		mm	4000 × 5150 × 760	With crawler carrier extended

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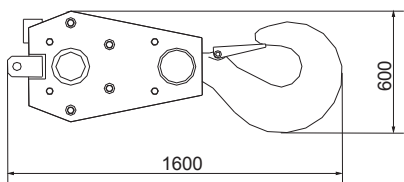## 3. Transport Dimensions and Weight of Main Components
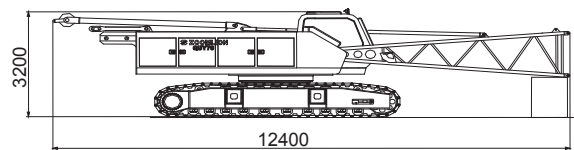
Name	Basic machine
Weight (t)	37
Quantity	1
Remarks	Width 3300mm
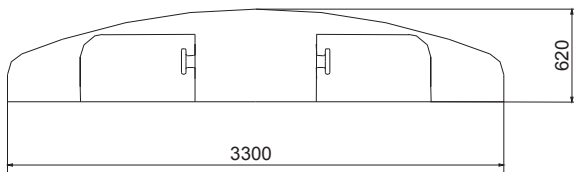
Name	Counterweight block
Weight (t)	12
Quantity	1
Remarks	Height 1230mm
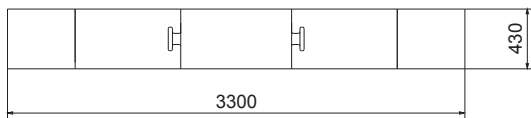
Name	Counterweight block
Weight (t)	9.87
Quantity	1
Remarks	Height 1230mm

Name	Load hook (70T)
Weight (t)	0.76
Quantity	1
Remarks	Width 820mm
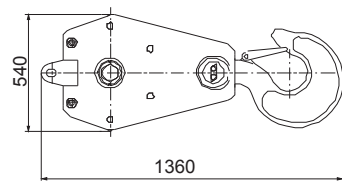
Name	Load hook (30T)
Weight (t)	0.38
Quantity	1
Remarks	Width 370mm
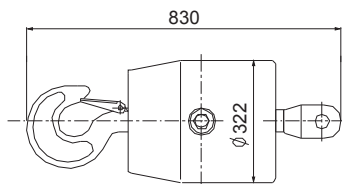
Name	Load hook (6T)
Weight (t)	0.18
Quantity	1
Remarks	Width 320mm
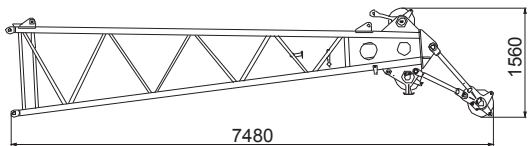
Name	Top section of main boom (with gooseneck boom)
Weight (t)	0.95
Quantity	1
Remarks	Width 1450mm
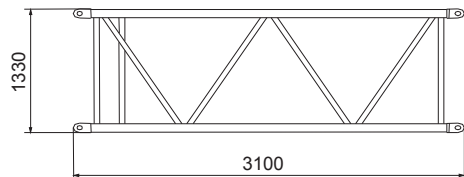
Name	3M main boom intermediate section
Weight (t)	0.29
Quantity	1 piece
Remarks	Width 1450mm
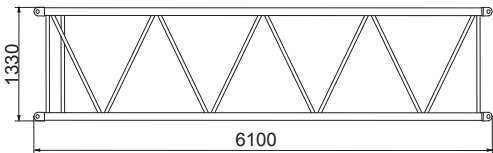
Name	6M main boom intermediate section
Weight (t)	0.53
Quantity	1 piece
Remarks	Width 1450mm
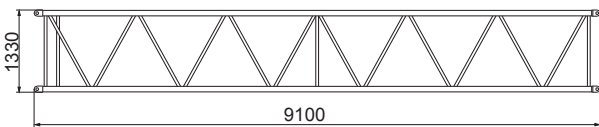
Name	9M main boom intermediate section
Single piece (t)	0.63
Weight (t)	2.52
Quantity	4
Remarks	Width 1450mm
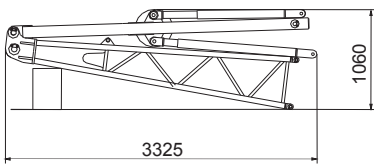
Name	Bottom section of fixed jib (including brace poles and tilting-back support of fixed jib)
Weight (t)	0.58
Quantity	1
Remarks	Width 560mm
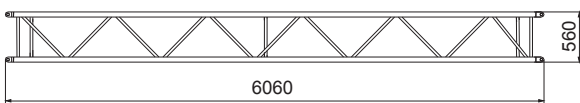
Name	6m fixed jib intermediate section
Weight (t)	0.16
Quantity	2
Remarks	Width 560mm
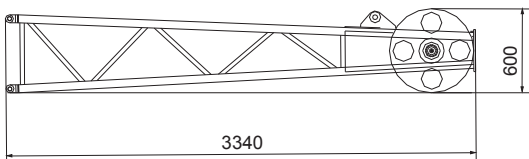
Name	Top section of fixed jib
Weight (t)	0.25
Quantity	1
Remarks	Width 560mm

II. Technical Descriptions

4. Boom System

Lattice structure and high-strength steel pipes.

Main boom (S boom)

Length of main boom: 12~57m

Length of intermediate section of main boom: 3m, 6m, and 9m

Table of Main Boom Lengths Configuration Combinations

Length of main boom (m)	Number of intermediate sections for corresponding lengths of main boom (pieces)		
	3m section	6m section	9m section
15	1	0	0
18	2	0	0
21	1	1	0
24	2	1	0
27	1	2	0
30	1	1	1
33	2	1	1
36	1	2	1
39	1	1	2
42	2	1	2
45	1	2	2
48	1	1	3
51	2	1	3
54	1	2	3
57	1	1	4

Note: the table above shows recommended configurations optionally sold according to boom length rather than standard configurations; the actual contract shall be the basis for reference.

Main boom with fixed jib (SF boom)

Length of main boom (operating mode of jib): 30m~42m

Length of fixed jib: 6~18m

Length of intermediate section of fixed jib: 6m

Maximum length of main boom + fixed jib: 42 + 18m

5. Working Mechanism

Main hoisting mechanism

The main hoisting mechanism is composed of an internal axial piston hydraulic motor, balance valve, reducer, normally closed brake and wire rope. It can be controlled independently of other mechanisms.

The main hoisting mechanism is dual-speed, offering two different hoisting speeds to improve operational efficiency.

Main hoisting winch (hoisting winch 1)	Wire rope diameter	20mm
	Wire rope length	240m
	Single rope speed (4th layer)	0~120m/min
	Single rope tension	69kN

Auxiliary hoisting mechanism

This mechanism is composed of an internal axial piston hydraulic motor, balance valve, reducer, normally closed brake and wire rope. It can be controlled independently of other mechanisms.

The auxiliary hoisting mechanism is dual-speed, offering two different hoisting speeds to improve operational efficiency.

Auxiliary hoisting winch (hoisting winch 2)	Wire rope diameter	20mm
	Wire rope length	160m
	Single rope speed (4th layer)	0~120m/min
	Single rope tension	69kN

Derricking mechanism

This mechanism is composed of an internal axial piston hydraulic motor, balance valve, speed reducer, normally closed brake, pulley block and wire rope. It can be controlled independently of other mechanisms.

The derricking mechanism has a ratchet auto-locking protection device, which prevents the derricking winch from slipping after being parked for long periods of time.

Derricking winch	Wire rope diameter	20mm
	Wire rope length	120m
	Single rope speed (4th layer)	0~45m/min
	Single rope tension	71kN

Slewing mechanism

The slewing mechanism is composed of an internal axial piston hydraulic motor, gear reducer, slewing brake valve, brake, pinion gear and slewing bearing. The pinion-driven slewing bearing allows for full 360° slewing movement, thereby providing slewing functionality to the superstructure.

The slewing mechanism employs internal geared slewing bearings and a slewing speed reducer to provide strong carrying capacity and high precision, thereby ensuring slewing stability and accuracy.

The slewing mechanism offers stepless speed regulation within the range of 0~2.4r/min.

The slewing mechanism is lockable through the mechanical locking device located at the front of the slewing table.

Traveling mechanism

The traveling mechanism is a dual-motor and dual-reducer type. With two control handles for respective control of the two crawlers' movement, this traveling mechanism can perform straight line traveling, unilateral steering, differential steering, pivotal steering, driving with load, etc., thus offering a high level of maneuverability and flexibility.

Traveling speed: 0~1.35km/h (on solid horizontal surface, main boom carrying no load).

Gradeability: 30%

The crawlers are tensioned through jacks, making adjustment is fast, easy and reliable.

A-frame mechanism

This mechanism is composed of the A-frame, A-frame anchoring rods, self-assembly and dismantling anchoring rods, etc. While the crane is self-assembling/dismantling (or relocating), the A-frame is rotated backwards to allow for easy connecting of the anchoring rods as well as for assembly and dismantling of the counterweight.

During transport, the A-frame lies flat on the back of the slewing table.

Counterweight and counterweight loading/unloading mechanism

The counterweight is composed of 2 counterweight blocks, counterweight mounted pins, counterweight anchoring screws, etc.

The counterweight loading/unloading mechanism is composed of a counterweight anchoring rod, A-frame rear anchoring rod, A-frame front bracing pole, derricking pulley block, the bottom section of main boom, a tilting back support of main boom and more. Its function is to properly assemble the counterweight on the crane in order to maintain balance, or to remove it from the crane to allow for the self-assembly and dismantling of the counterweight.

Crawler carrier extending/retracting mechanism

The crawler carrier extending/retracting mechanism is composed of outriggers, horizontal cylinders, crawler carrier assembly, anchoring rod, inserting pin, etc. Switch between traveling mode and retraction mode is achieved through the control handle on the lower part of frame front side. Traveling and retraction are controlled by the electronic handle located in the operator's cab.

6. Crane System

Hydraulic system

The hydraulic system is composed of a main pump, control valve, motor, hydraulic oil tank, cooler, etc.

The hydraulic system adopts one of the world's most advanced pump control system, to save energy, ensure high efficiency, high reliability, and long service life.

Main hydraulic pump: domestically produced (Chinese) piston pump, powered by the engine. The slewing pump used is imported.

Oil source for auxiliary mechanisms: gear pump.

Main control valve: pilot electro-hydraulic control valve.

Main circuit control method:main directional control vavle+main proportional Solenoid valve on the variable displacement main pump which is centrally controlled by two control handles.

Capacity of hydraulic oil tank: 700L.

Cooler: aluminum cooler, with electrically powered fan.

Various overflow valves in the hydraulic system can suppress abnormally high pressure in the circuit, preventing damage to the hydraulic oil pump and motor and preventing system overload.

Electrical system

24V DC, negative ground, two 165AH batteries.

The electrical components of the crane primarily include: power supply, engine starter, engine misfiring, indicator lights, warning device, illumination device, fans, windshield wipers, horn, hoisting limiter, hydraulic oil cooling fan, digital display, PLC controller, safety devices, etc. These appliances ensure that the crane will operate safely and provide a comfortable working environment for the driver and other workers. The whole crane uses CAN bus technology, which connects the engine, PLC controller and digital display together, with fault detection and self-diagnosis functions.

Crane engine

The Weichai (Cummins) diesel engine is an in-line six-cylinder turbocharged water-cooled engine
Fuel tank: 300L, which ensures a sufficiently long working time for the engine.
Exhaust emission standard: EU Stage II (TIER 3)

Centralized digital display system

The system features an 11-inch large-screen LCD display with multiple-language display functions. It can centrally display all types of working condition signals collected by PLC controller, including engine rotational speed, water temperature, oil pressure, hydraulic pump pressure, main motor pressure, main machine operation levels, wind speed, working hours of engine, etc. and monitor the working conditions in realtime. When the crane is working abnormally, the system will send out a yellow or red alarm.

Monitoring system

The monitoring system includes a camera which can monitor the condition of the winch mechanism.
Monitor: with the press of a button you can toggle between different monitoring feeds.

Remote GPS monitoring system

This system allows for GPS satellite positioning, GPRS data transmission, equipment use status inquiry, statistical information, remote fault diagnosis and other functions.

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7. Safety Devices

Load moment limiter

This limiter is composed of a load moment indicator and digital LCD monitor. The alarm light will light on and a buzzer alarm will sound when the actual load moment reaches 90% of the rated load moment; an alarm signal will be sent out and operation of the crane will stop automatically when the actual load moment reaches or exceeds the maximum rated load moment in order to prevent any accident that might occur as a result of overloading, and to ensure normal and safe operation of the crane.

The digital LCD monitor can display the following data:

Moment ratio
Main boom elevation angle
Length of main boom
Working radius
Actual hook load
Allowed actual load
Maximum allowed lifting height

Height limiter devices (Hoisting limiter)

The limit switch, movement weight and other components are mounted on the top section boom, and are used to prevent excessive lifting of the load hook. When the load hook has been raised to a certain height, the limit switch signals the electrical system to automatically stop the lifting of the load hook, also setting off an acoustooptic warning through the buzzer and display screen in the operator's cab to prevent overwinding of the load hook.

Angle indicator

The boom angle indicator is located at the lower rear side of the boom's bottom section (right side of operator's cab), allowing the operator convenient, clear visibility of the elevation angle of the boom from the operator's cab.

Working boom limiting position alarm and protection system (Derricking limiter)

This protection system is dual-level controlled by the load moment limiter and limit switch, enabling automatic termination of derricking movements of the boom's limited elevation angle position, while also simultaneously triggering an acoustooptic warning.

Wire rope over-release protection device (Lowering limiter)

When the wire rope in the drum has been released until only three single wound coils remain, this protection device signals the electrical system to automatically cut off the releasing of rope and the descending hook, also setting off an acoustooptic warning through the buzzer and display screen in the operator's cab.

Anemometer

The electronic wind speed sensor can indicate wind speed levels on digital display screen in realtime, conveniently alerting workers of potentially dangerous working conditions.

Hook safety latch

This device prevents the load from unhooking when lifting heavy loads.

Tilting back support for main boom

The brace poles, which are of a nested steel tube and spring structure, are mounted at the bottom section of the main boom. They employ spring-loaded compression force to provide support and to prevent the main boom from overturning.

Derricking winch ratchet locking device

The derricking winch ratchet locking device prevents derricking decline when the crane is parked for long periods of time.

Emergency stop button

In case of emergency, pressing this button will switch off all electric control systems and engines and stop all operations.

Tri-color warning light

With three different colors, red, yellow and green, the warning light can synchronously indicate current overload status. Green indicates that the load factor is below 90%, yellow informs operators that the load factor is between 90% and 100%, while the red color warns that the load factor has exceeded 100% and that the crane is in danger of overloading.

8. Operator's Cab

The structure of the operator's cab is made entirely of steel, is surrounded by reinforced glass on all four sides, and has laminated glass for its sunroof and windshield. The interior is equipped with a sun shield on the right side, adjustable seat, windshield wipers, electric control handle, load moment indicator, digital displays, various switches, auxiliary remote control box operation assembly, air conditioners, electric fans, illuminating lamps, radio (CD player and car DVD are optional), fire extinguishers, and more. The operator's cab offers a broad field of vision, and is spacious and comfortable.

9. Load Hook

70t main hook: equipped with 6 pulleys
30t load hook: equipped with 2 pulleys
6t load hook: without pulleys

III. Description of Boom Assembly

Descriptions of Boom Assembly Codes

Code	Type	Operation mode parameters	
S	Main boom	Main boom: 12~57m	
SF	Fixed jib	Main boom: 30~42m	Jib: 6~18m

S

SF

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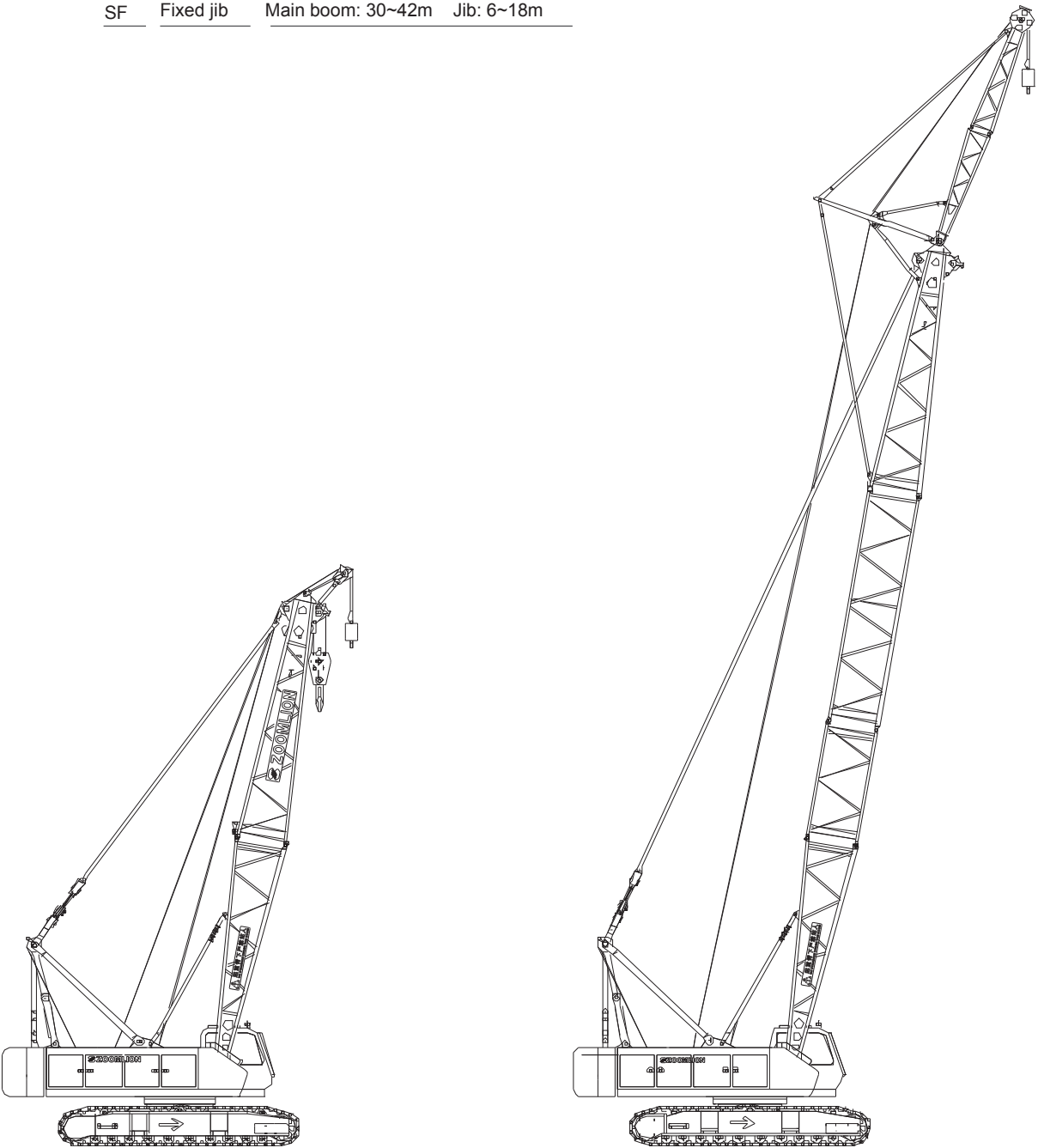
IV. Self-Assembly and Dismantling Functions

(Taking the self-assembly process of the crane operation with fixed jib as an example) (SF boom)
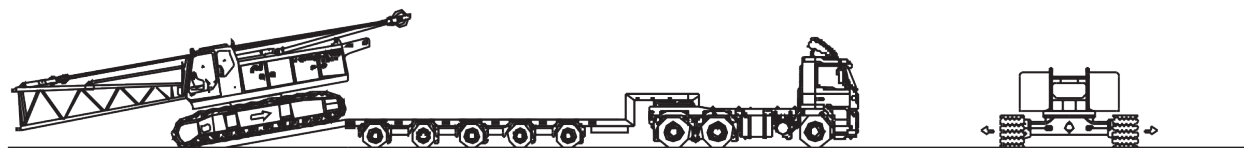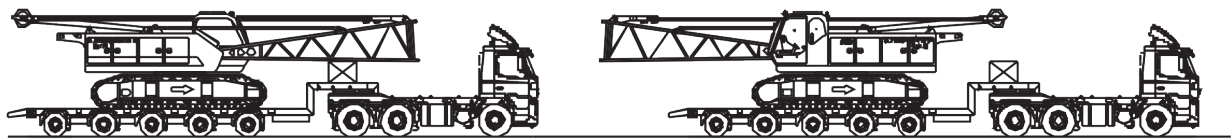
Unloading of basic machine   With crawler carrier extended

Unloading and assembling of counterweight

Assembling the boom and anchoring rods
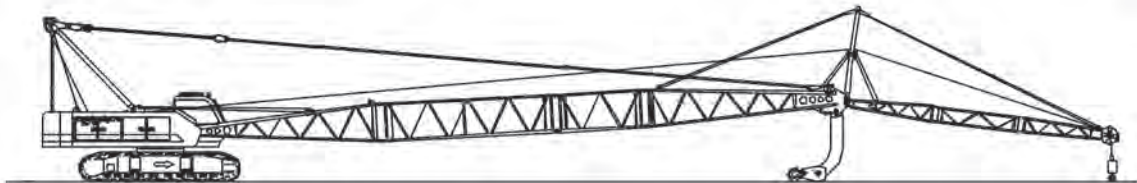
Boom in erecting position
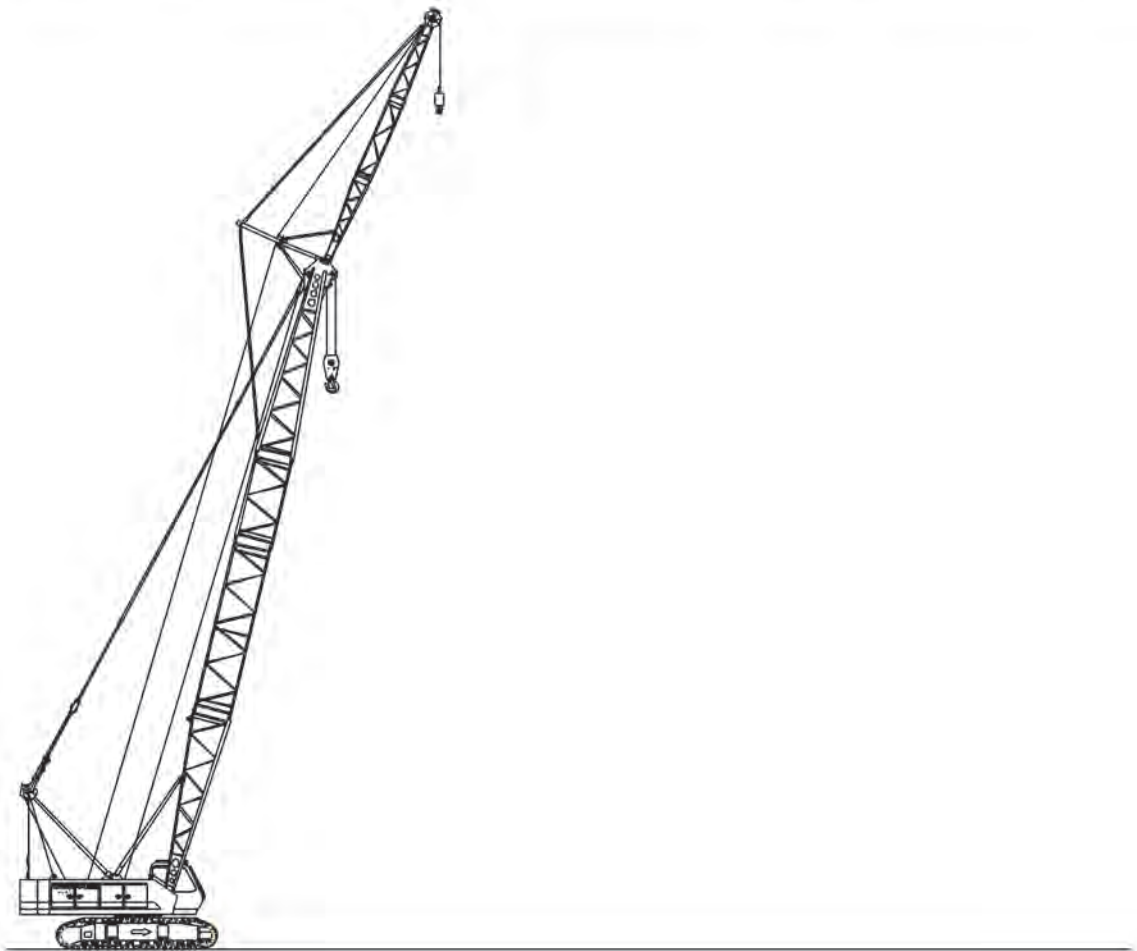
Boom in working position

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V. Lifting Performance

10. Lifting Characteristics of Main Boom (S Boom)

Main Boom Lifting Height Characteristics Curve

Working radius (m)
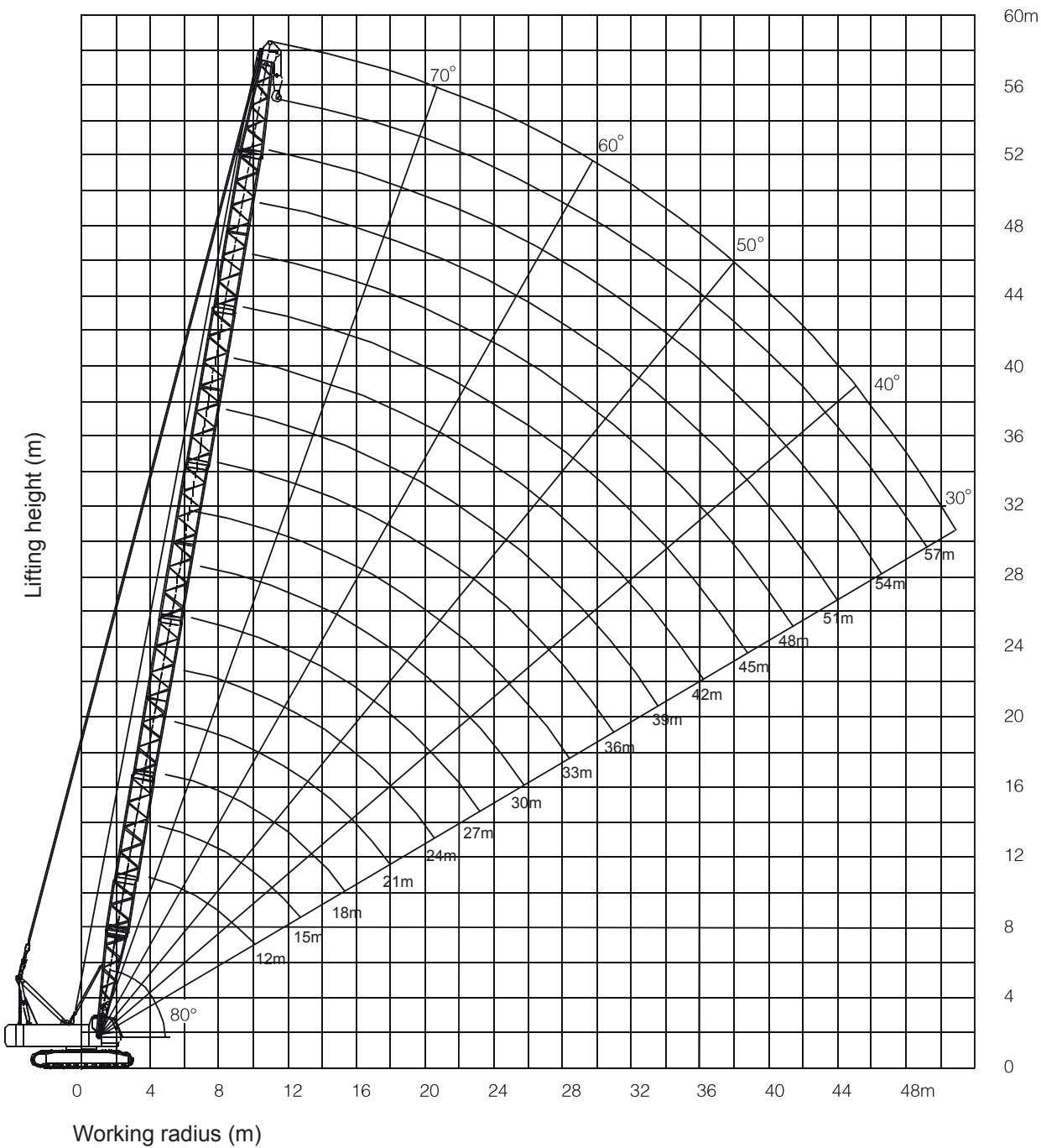
Table of Main Boom Lifting Performance (I) (S boom)

Unit of measurement: t

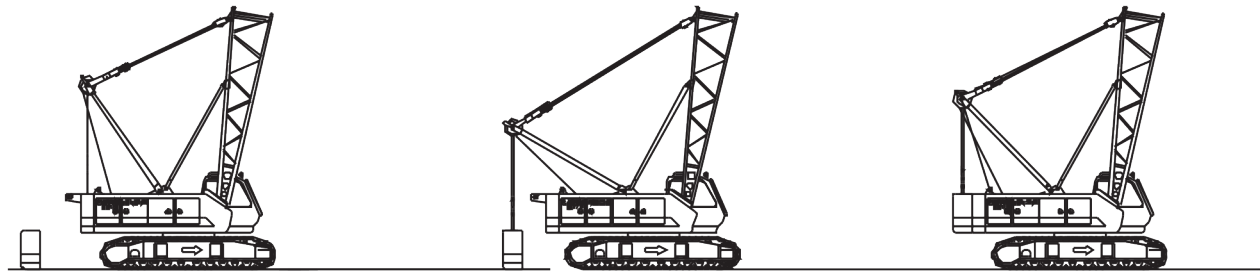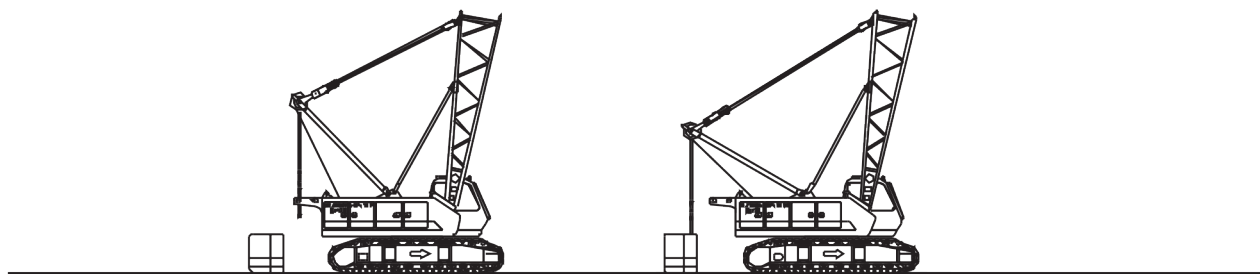| Length of main boom (m)	12	15	18	21	24	27	30	33
Parts of line	12	12	10	8	8	6	6	6
Radius (m)								
3.8	70							
4	65	65	58.2/4.1	51.2/4.6				
5	53.6	52.3	51	49.8	44.2/5.2	37/5.7		
6	40.5	40.1	39.3	38.5	37.7	36.9	34/6.2	30.4/6.7
7	32.1	32	31.8	31.2	30.6	30.1	29.5	28.9
8	26.6	26.5	26.4	26.2	25.8	25.3	24.8	24.3
9	22.6	22.5	22.4	22.3	22.2	21.8	21.4	21
10	19.7	19.5	19.4	19.3	19.2	19.1	18.7	18.4
12		15.4	15.3	15.1	15	14.9	14.8	14.6
14		12.6	12.5	12.4	12.2	12.1	12	11.9
16			10.5	10.4	10.2	10.1	10	9.9
19				8.3	8.1	8	7.9	7.8
20					7.6	7.5	7.3	7.2
22					6.7	6.5	6.4	6.3
24						5.8	5.7	5.5
26							5	4.9
28								4.4
29								4.1

Notes:

1. Values in lifting performance table include the weight of the load hook and of the wire ropes from the head of the boom to the load hook.

2. When a gooseneck boom is used to lift a load, the lifting capacity is equal to the single rope tension of the main boom's lifting capacity at the same boom length and radius.

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Table of Main Boom Lifting Performance (S Boom) (II)

Unit of measurement: t

Length of main boom (m)	36	39	42	45	48	51	54	57
Parts of line	4	4	4	3	3	3	3	3
Radius (m)								
7	27.1/7.3	24.3/7.8						
8	23.9	23.4	21.9/8.3	19.9/8.8				
9	20.6	20.2	19.8	19.4	18.1/9.3	14.6/9.9		
10	18	17.7	17.3	17	16.6	14.6	14.6/10.4	13.7/10.9
12	14.3	14	13.7	13.5	13.2	13.3	13.1	12.8
14	11.7	11.5	11.3	11	10.8	10.9	10.7	10.5
16	9.8	9.6	9.5	9.2	9	9.1	8.9	8.7
19	7.6	7.5	7.4	7.3	7.7	7	6.9	6.8
20	7.1	7	6.8	6.7	7.1	6.5	6.3	6.2
22	6.2	6	5.9	5.8	6.6	5.5	5.4	5.3
24	5.4	5.3	5.1	5	5.7	4.8	4.6	4.5
26	4.8	4.6	4.5	4.4	4.9	4.1	4	3.9
28	4.2	4.1	4	3.9	4.3	3.6	3.5	3.3
29	4	3.9	3.7	3.6	3.7	3.4	3.2	3.1
30	3.8	3.6	3.5	3.4	3.5	3.1	3	2.9
32	3.4	3.2	3.1	3	3.3	2.7	2.6	2.5
34		2.9	2.8	2.6	2.9	2.4	2.3	2.1
36			2.5	2.3	2.5	2.1	1.9	1.8
37			2.3	2.2	2.2	1.9	1.8	1.7
38				2.1	2.1	1.8	1.7	1.5
39				1.9	1.9	1.7	1.5	1.4
40					1.8	1.6	1.4	1.3
42					1.7	1.3	1.2	1.1

Notes:

1. Values in lifting performance table include the weight of the load hook and of the wire ropes from the head of the boom to the load hook.

2. When a boom tip pulley is used to lift the heavy load, the lifting capacity is equal to that of the main boom at the same boom length and radius, but not more than 6.0t.

11. Lifting Performance of Main Boom + Fixed Jib (SF Boom)

Main Boom + Fixed Jib Lifting Height Characteristics Curve (I)

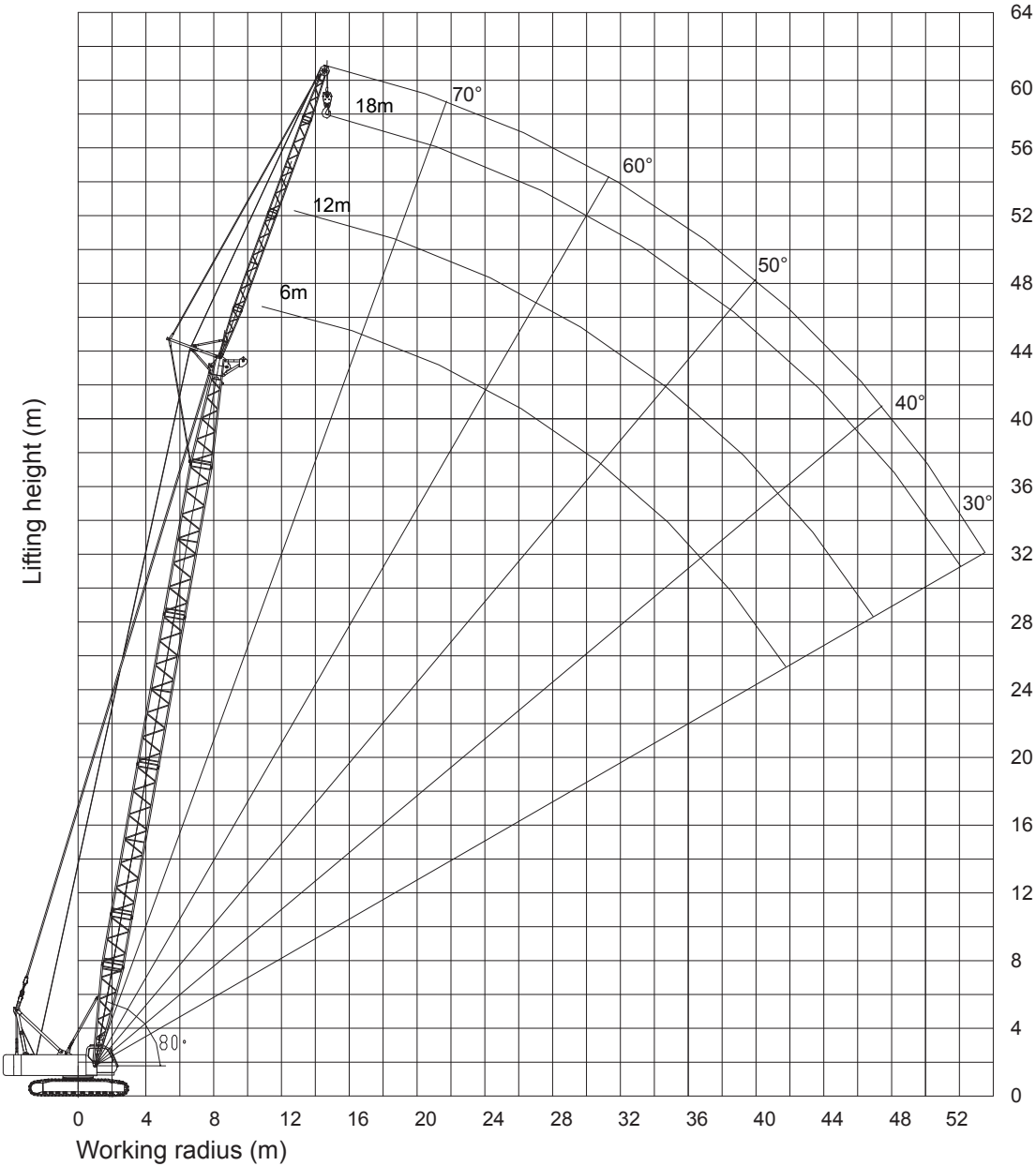Main Boom and Fixed Jib Lifting Height Characteristics Curve Diagram
(A 10° angle is formed between the the center line of main boom and the center line of jib)

13

14

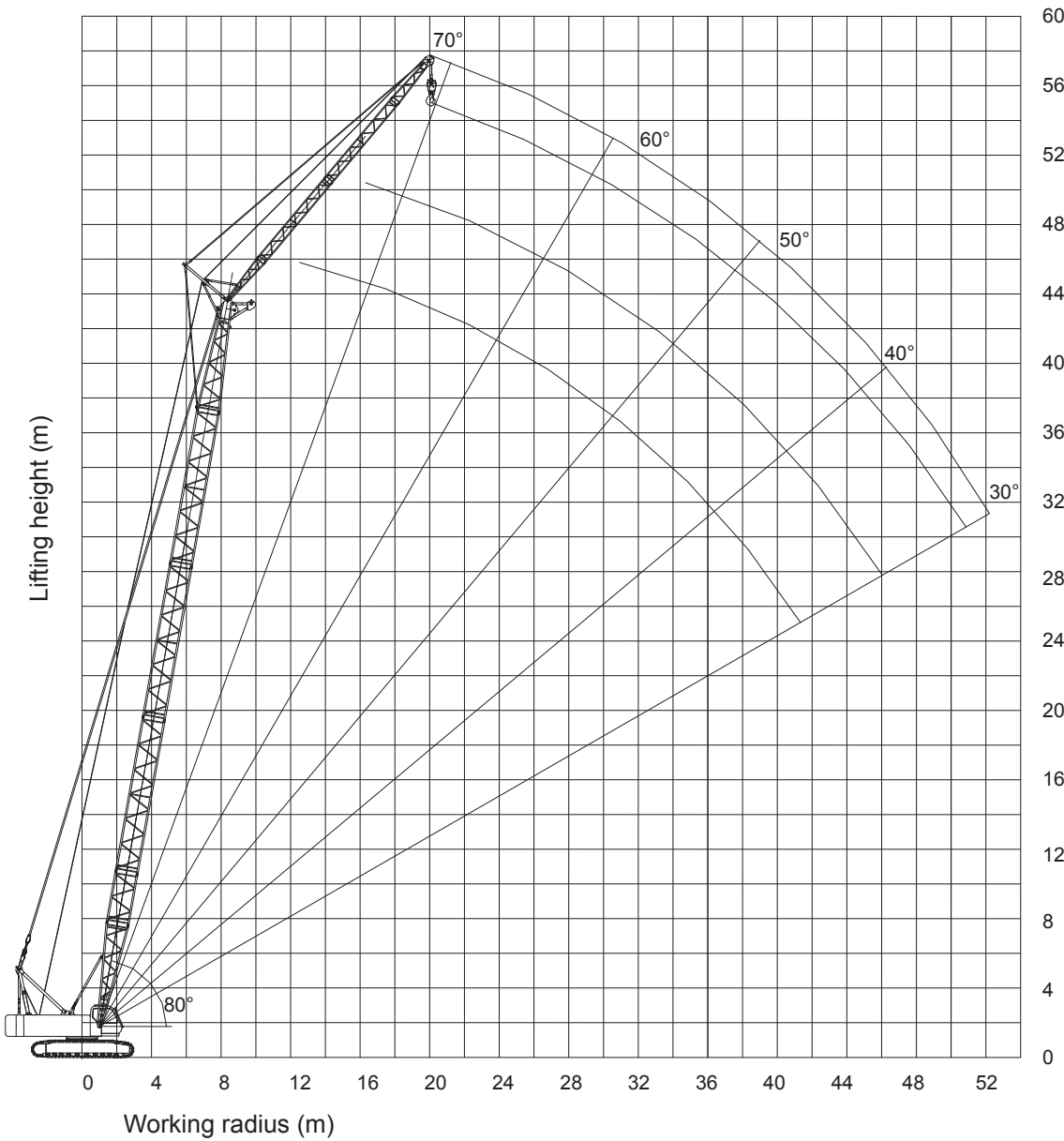## Main Boom + Fixed Jib Lifting Height Characteristics Curve (SF Boom) (II)

Main Boom and Fixed Jib Lifting Height Characteristics Curve Diagram
(A 30° angle is formed between the the center line of main boom and the center line of jib)

Table of Jib Lifting Performance (I)

Unit of measurement: t

Length of main boom (m)	30						33					
Length of jib (m)	6		12		18		6		12		18	
Angle (°)												
Radius (m)	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
8	6.4/8.3						6.4/8.8					
10	6.4	6.4/10.1	6.4/10.3				6.4	6.4/10.6	6.4/10.8			
12	6.4	6.4	6.4	6.4/13.9	5.0/12.4		6.4	6.4	6.4		4.9/12.9	
14	6.4	6.4	6.4	6.4	4.8		6.4	6.4	6.4	6.4/14.4	4.9	
16	6.4	6.4	6.4	6.4	4.8	4.5/17.8	6.4	6.4	6.4	6.4	4.8	
18	6.4	6.4	6.4	6.4	4.7	4.5	6.4	6.4	6.4	6.4	4.8	4.4/18.3
20	6.4	6.4	6.4	6.4	4.6	4.3	6.4	6.4	6.4	6.4	4.6	4.3
22	6.4	6.4	6.4	6.4	4.5	4.3	6.3	6.3	6.4	6.4	4.5	4.3
24	5.6	5.6	5.9	5.9	4.5	4.3	5.5	5.5	5.6	5.8	4.5	4.3
26	4.9	4.9	5.2	5.2	4.4	4.2	4.8	4.8	5.0	5.1	4.5	4.2
28	4.4	4.4	4.6	4.6	4.4	4.2	4.3	4.3	4.4	4.5	4.4	4.2
30	3.9	3.9	4.1	4.1	4.2	4.2	3.8	3.8	3.9	4.0	4.0	4.2
32	3.5	3.5	3.7	3.7	3.6	3.9	3.4	3.4	3.5	3.6	3.6	3.8
34			3.3	3.3	3.4	3.5	3.0	3.0	3.2	3.2	3.3	3.4
36			3.0	3.0	3.1	3.1	2.6	2.6	2.9	2.9	2.9	3.0
38			2.6	2.6	2.8	2.8			2.5	2.5	2.6	2.7
40					2.5	2.5			2.3	2.3	2.4	2.4
42					2.3	2.3			2.0	2.0	2.2	2.2
44					2.0	2.0					1.9	1.9

ZOOMLION

Vision creates future

Table of Jib Lifting Performance (II)

Unit of measurement: t

Length of main boom (m)	36						39					
Length of jib (m)	6		12		18		6		12		18	
Angle (°)												
Radius (m)	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
8	6.4/9.3						6.4/9.8		6.4/11.9			
10	6.4	6.4/11.1	6.4/11.4				6.4	6.4/11.6	6.4			
12	6.4	6.4	6.4		4.9/13.4		6.4	6.4	6.4		4.9/13.9	
14	6.4	6.4	6.4	6.4/15	4.9		6.4	6.4	6.4	6.4/15.5	4.9	
16	6.4	6.4	6.4	6.4	4.8		6.4	6.4	6.4	6.4	4.8	
18	6.4	6.4	6.4	6.4	4.8	4.5/18.8	6.4	6.4	6.4	6.4	4.8	4.5/19.3
20	6.4	6.4	6.4	6.4	4.7	4.4	6.4	6.4	6.4	6.4	4.7	4.5
22	6.1	6.2	6.3	6.4	4.5	4.3	6.0	6.1	6.2	6.4	4.6	4.3
24	5.3	5.4	5.5	5.7	4.5	4.3	5.2	5.3	5.4	5.6	4.6	4.3
26	4.7	4.7	4.9	5.0	4.5	4.3	4.6	4.6	4.7	4.9	4.5	4.3
28	4.1	4.1	4.3	4.4	4.3	4.2	4.0	4.0	4.2	4.3	4.2	4.2
30	3.7	3.7	3.8	3.9	3.9	4.1	3.5	3.5	3.7	3.8	3.8	4.0
32	3.2	3.2	3.4	3.5	3.5	3.7	3.1	3.1	3.3	3.4	3.4	3.6
34	2.9	2.9	3	3.1	3.1	3.3	2.8	2.8	2.9	3.0	3.0	3.2
36	2.5	2.5	2.7	2.8	2.8	2.9	2.4	2.4	2.6	2.6	2.7	2.8
38	2.2	2.2	2.4	2.4	2.5	2.6	2.1	2.1	2.3	2.3	2.4	2.5
40			2.2	2.2	2.3	2.3	1.9	1.9	2.1	2.1	2.1	2.2
42			2.0	2.0	2.0	2.1	1.6	1.6	1.8	1.8	1.9	2.0
44			1.7	1.7	1.8	1.8			1.6	1.6	1.7	1.8
46					1.6	1.6			1.4	1.4	1.5	1.5
48					1.4	1.4					1.3	1.3
50					1.2	1.2					1.2	1.2
52											1.0	1.0

Table of Jib Lifting Performance (III)

Unit of measurement: t

Length of main boom (m)	42					
Length of jib (m)	6		12		18	
Angle (°)						
Radius (m)	10°	30°	10°	30°	10°	30°
10	6.4/10.3					
12	6.4	6.4/12.2	6.4/12.4			
14	6.4	6.4	6.4		4.9/14.4	
16	6.4	6.4	6.4	6.4	4.9	
18	6.4	6.4	6.4	6.4	4.8	4.5/19.9
20	6.4	6.4	6.4	6.4	4.7	4.5
22	5.9	6.1	6.1	6.3	4.7	4.3
24	5.1	5.2	5.3	5.5	4.6	4.3
26	4.4	4.5	4.6	4.8	4.6	4.3
28	3.9	4.0	4.1	4.2	4.2	4.3
30	3.4	3.4	3.6	3.7	3.7	3.9
32	3	3.0	3.2	3.3	3.3	3.3
34	2.6	2.6	2.8	2.9	2.9	3.1
36	2.3	2.3	2.5	2.5	2.6	2.7
38	2.1	2.0	2.2	2.2	2.3	2.4
40	1.8	1.8	1.9	2.0	2.0	2.1
42	1.5	1.5	1.7	1.7	1.8	1.9
44	1.3	1.3	1.5	1.5	1.6	1.7
46			1.3	1.3	1.4	1.4
48			1.1	1.1	1.2	1.2
50					1.1	1.1
52					0.9	0.9
54					0.8	0.8