

# QUY 70

## Crawler Crane

### Technical Manual



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**Outline dimension and main parameters**

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Main frame	
Counterweight	

**Technical instruction**

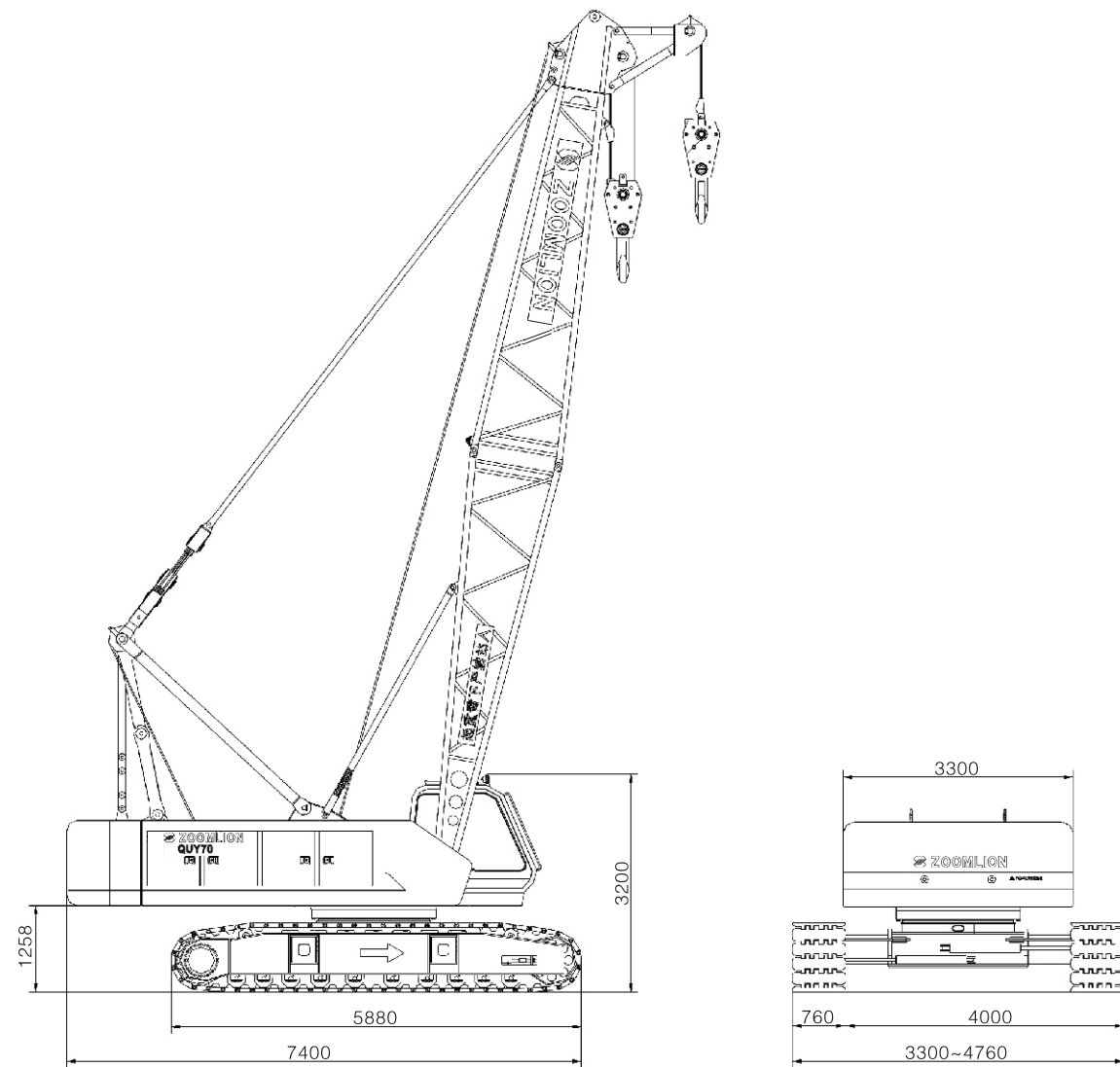
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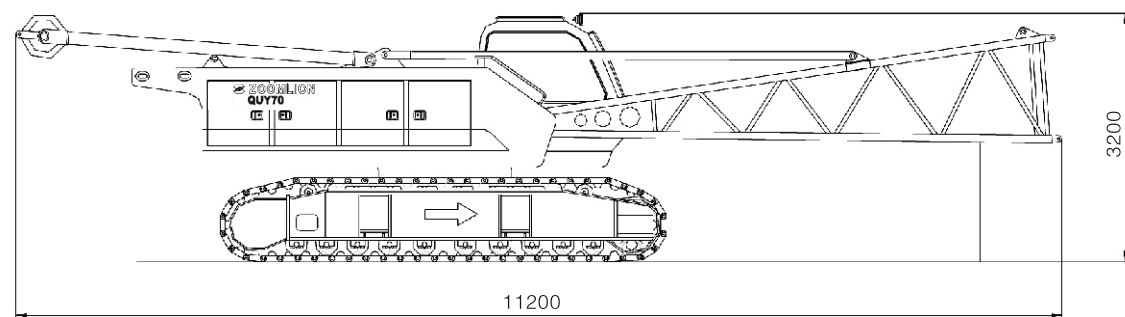




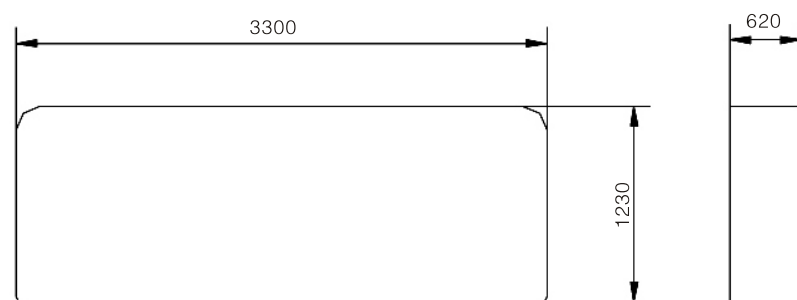
Item			Value	Remarks
Max. Lifting load × working radius		t × m	70 × 3.8	
Deadweight when use basic boom		t	61	
Main boom length		m	12~57	
Fixed fly jib length		m	6~18	
Max. lifting load of fixed fly jib		t	6.4	
Mounting angle of fixed fly jib		°	10,30	
Main boom+ fixed jib		m	42 + 18	
Speed of drum single layer rope	Main winch	m/min	120	The 4th layer of a drum
	Auxiliary winch	m/min	120	The 4th layer of a drum
	Luffing mechanism	m/min	45	The 4th layer of a drum
Slewing speed		rpm	0~2.4	
Traveling speed		km/h	0~1.35	
Gradieability		%	30	
Ground pressure		MPa	0.074	
Total outline dimension    L × W × H		mm	11.2 × 3.3 × 3.2	Mast and foot section are included
Engine	Model		WeichaiWD615.58	
	Rated power/rotational speed	kW/rpm	175/2200	
	Max. output torque/rotational speed	Nm/rpm	1000/1400 ~ 1600	
	Emission standard		Gb17691 – 2001standard stage II	
Track space × ground contact length × height		mm	2540 × 5032 × 1000	Track bracket retracts
			4000 × 5032 × 1000	Track bracket extends

### 3 Outline dimension and weight of main transport components

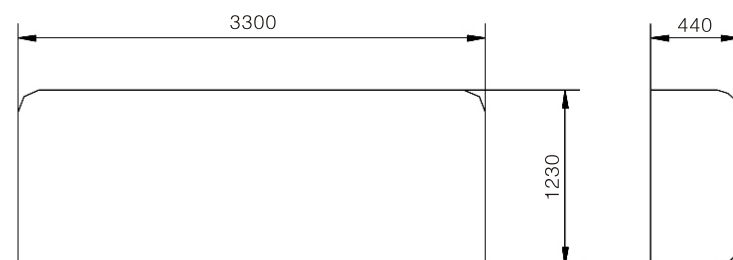
Transport weight of main frame: 39.5t



Counterweight I : 10t



Counterweight II : 10t



### 4 Technical instruction

#### 1 Boom system

It is lattice structure and made of domestic high-strength tubular product

Main boom

Main boom length:12~57m

Adjusting lengthened boom section length for main boom: 3m, 6m, or 9m

Fixed fly jib

Fixed fly jib length:6~18m

Adjusting lengthened boom section length for fixed fly jib: 6m

Main boom+ longest fixed fly jib length: 42+18m

#### 2 mechanism

##### Main hoist mechanism

It consists of axial concealed plunger hydraulic motor, balanced valve, reducer, normally closed brake and wire rope. It is independent of other mechanisms to be operated.

It is two-speed type, having two different lifting speeds, which can improve working efficiency.

##### Auxiliary hoist mechanism

It consists of axial concealed plunger hydraulic motor, balance valve, reducer, normally closed brake and wire rope. It is independent of other mechanisms to be operated .

It is two-speed type, having two different lifting speeds, which can improve working efficiency.

##### Boom hoist mechanism

It consists of axial concealed plunger hydraulic motor, balance valve, reducer, normally closed brake, pulley block and wire rope. It is independent of other mechanisms to be operated.

It is also equipped with ratchet self-locking protecting mechanism which can prevent luffing gear from slipping because of long time parking.

##### Slewing gear

It consists of axial concealed plunger hydraulic motor, gear reducer, slewing brake valve, brake, pinion gear and slewing ring. The superstructure can realize 360° slewing via slewing ring which is driven by pinion gear.

The mechanism adopts internal-geared slewing ring and slewing reducer. Its great carrying capacity and high accuracy ensure the stability and accuracy of slewing.

Slewing can realize stepless-speed regulation varying from 0 to 2.4r/min.

The slewing gear can be locked by two mechanical locking devices in the front of the slewing table.

#### Traveling mechanism

Traveling mechanism adopts double-motor and double-reducer. Hydraulic motor and balanced valve are all imported from Germany. Two sets of control levers respectively control two tracks' traveling to realize straight-line traveling, one-sided steering, differential steering, spot turn and traveling with load etc. and then ensure the crawler crane have great mobility and flexibility.

Traveling speed: 0~1.35km/h( when ground is level and firm and main boom length is 20m without load).

Gradeability: 30%.

Tension degree of track can be changed by jack. It is very quick, convenient and reliable.

#### Mast mechanism

It consists of mast, pendant plate of mast, self-assembly/dismantling pendant plate etc.. it is used for self-assembly/dismantling of the crane. Before doing this work, the mast should be turned back to connect the pendant plate and disassemble and assemble the counterweight.

When the crane is traveling, the mast is laid flat on the rear side of slewing table.

Counterweight and its assembly/dismantling mechanism

It consists of two pieces of counterweight, mounting pin of counterweight, fixing bolt etc... QY70 crawler crane can realize self-assembly/dismantling of counterweight.

#### Track telescoping mechanism

Track telescoping and operating mechanism consists of outriggers, horizontal cylinders, track, pendant plate, and inserted pin etc...

The telescoping of outriggers can be carried out by operating the control lever in the straight front of the vehicle frame.



3system

Hydraulic system

Hydraulic system consists of main pump, control valve, hydraulic motor, hydraulic oil tank and condenser etc...

Hydraulic system adopts advanced pump control system in the world and its main components such as motor are all imported and have advantages of high efficiency, energy-saving, high reliability and long service life.

Main hydraulic pump: domestic plunger pump, driven by engine.

Oil source of auxiliary mechanism: gear pump.

Main control valve: pilot electrohydraulic control valve

Control method of main loop: the variable quantity of variable main pump+ main reversing valve, both controlled by the two operating handles.

Hydraulic oil tank capacity: 700L.

Cooler: aluminium radiator with electric fan.

Electric system

This system with 24V DC and earth negative, has two 195 AH accumulators.

Electric appliance of complete vehicle mainly include power, engine start, engine shutdown, indicator lamp, annunciator, illumination, fan, wiper, horn, lifting height limiter, hydraulic oil cooling fan, digitized display, PLC controller, preheating device for engine and safety equipment etc. , which ensure safe operation and excellent working environment of the crane. The complete vehicle adopts CAN-bus technology, which connects the engine, PLC controller and digitized display efficiently, and has trouble detecting and self-diagnosis function.

Power system

Weichai engine, in-line six cylinder, supercharge, water-cooling engine

Rated power/rotational speed: 175kw/2200r/min

Fuel tank capacity: is 300L which ensures that the working hour of engine is long enough.

Emission standard: meets the requirement of GB3847-1999 and GB17691-2001 stage II.

It can select to assemble imported CUMMINS engine QSB6.7-C205, America.

Centralized Display System

11 inch large LCD intercalates Multilanguage display and can centralized display kinds of working condition signals collected by PLC controller, including rotational speed of engine, water temperature, fuel oil pressure, hydraulic pump pressure, main motor pressure and main frame working level circs etc. it can monitor working states in real time and give a yellow or red warning when the working state of crane is abnormal.

4safety equipment

Load moment limiter

It consists of load moment display and digital LCD. When actual load moment reaches 90% of rated moment, the warning lamp is on and the buzzer alarms; when it nearly reaches the rated load moment, the crane stops working automatically to prevent accidents occur during operation because of overload and ensure normal and safe work.

Digital LCD displays following data:

Moment ratio

Elevation angle of main boom

Main boom length

Working radius

Actual load

Permissible lifting load

Max. permissible lifting height

Overflow valves of hydraulic system

It can restrain the abnormal high pressure in loop to prevent hydraulic oil pump and hydraulic motor from damage and prevent hydraulic system from overload.

Hoisting limiter

Prevent hook from excessive lifting and avoid accidents occurring.

Boom angle indicator

It is mounted at the lower rear side of foot section (namely the right side of operator’ s cab). The driver can observe the elevation angle of boom clearly from the cab.

Limit position alarm system for actuating arm

The system can ensure that the actuating arm angle is within the specified range.

Level sensor of the complete vehicle

Detect the level state of the complete vehicle.

Anti-unhook device

Prevent load fall off from the hook when lifting.

Ratchet locking mechanism of luffing gear

Prevent luffing gear from sliding down because of long time parking.

Overwind and overrelease protection device for wire rope

Anemoscope

5operator’ s cab

It adopts all-steel structure. The four sides are all made of hardened glass, and the roof and the front window are furnished with laminated glass. It is equipped with right sun visor, adjustable seat, wiper, electric control lever, load moment display, digitized displayer, auxiliary remote-control box operation assembly of switches, air conditioner, electric fan, illumination lamp, radio, cigarette lighter, fire extinguisher etc. inside. It also supplies wide vision and spacious and comfortable inner room for operator.

6hook

Following types of hook can be selected to assemble:

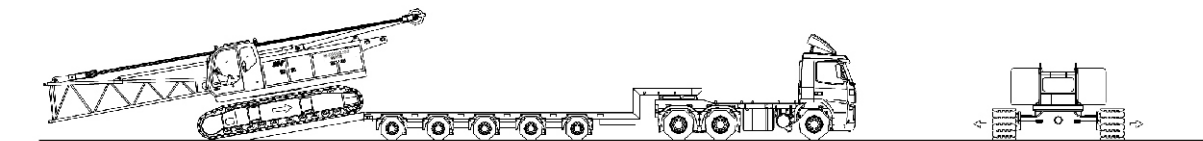
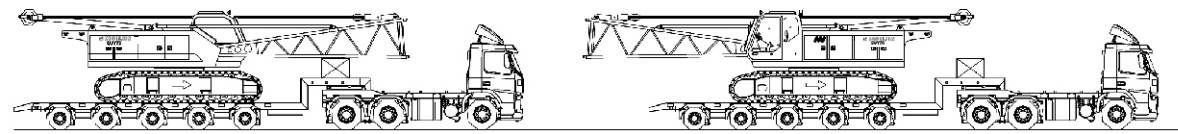
70t main hook: assembled 6 sheaves

30t hook: assembled 2 sheaves

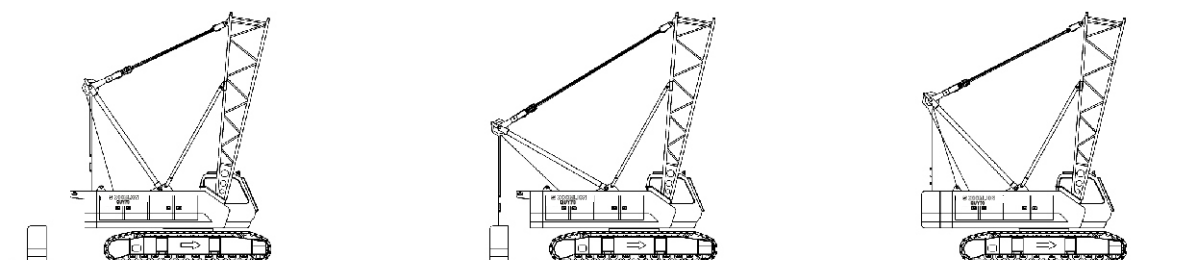
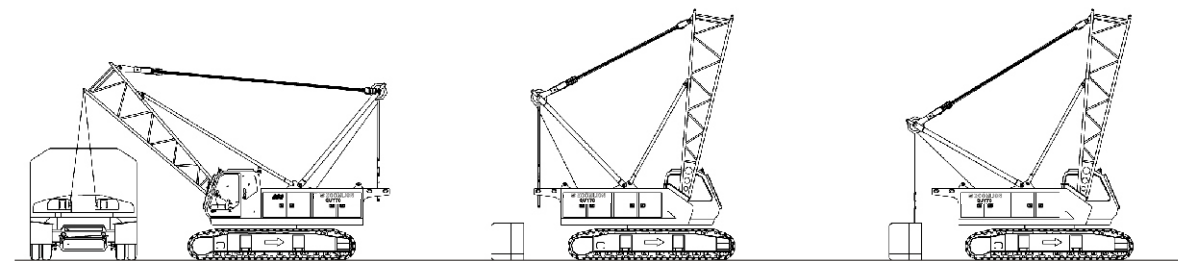
6t hook: without sheave

## Entire self-assembly/dismantling function

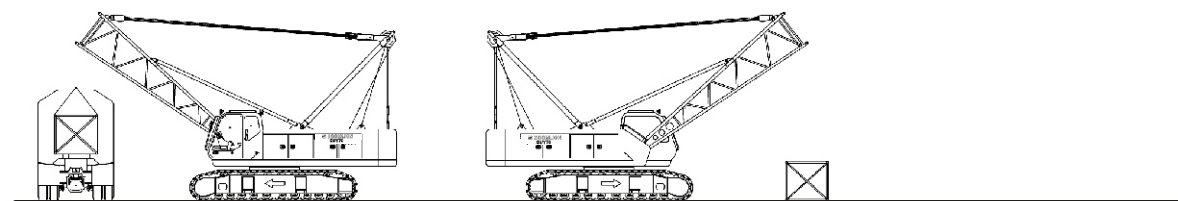
Take self-assembly under fixed fly jib operating condition for example



Remove the main frame from the flatcar

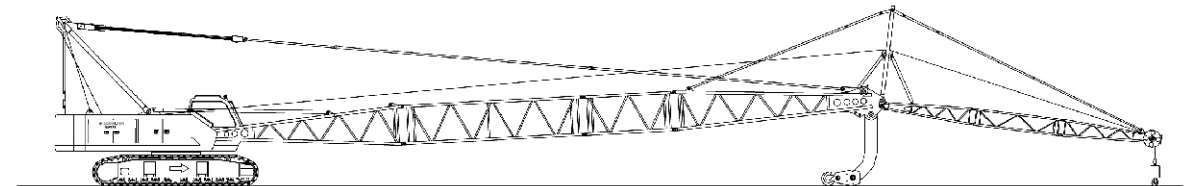
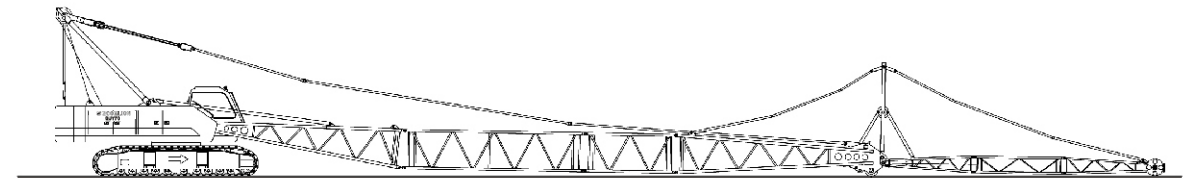


Remove the counterweight from the flatcar and assemble it

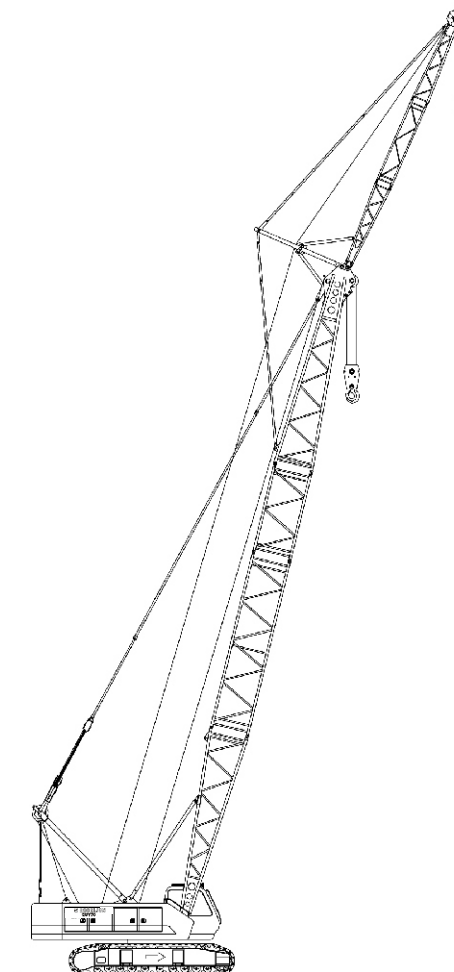


Remove the boom from the flatcar and assemble it

Assemble the boom and pendant plate



Raise the boom

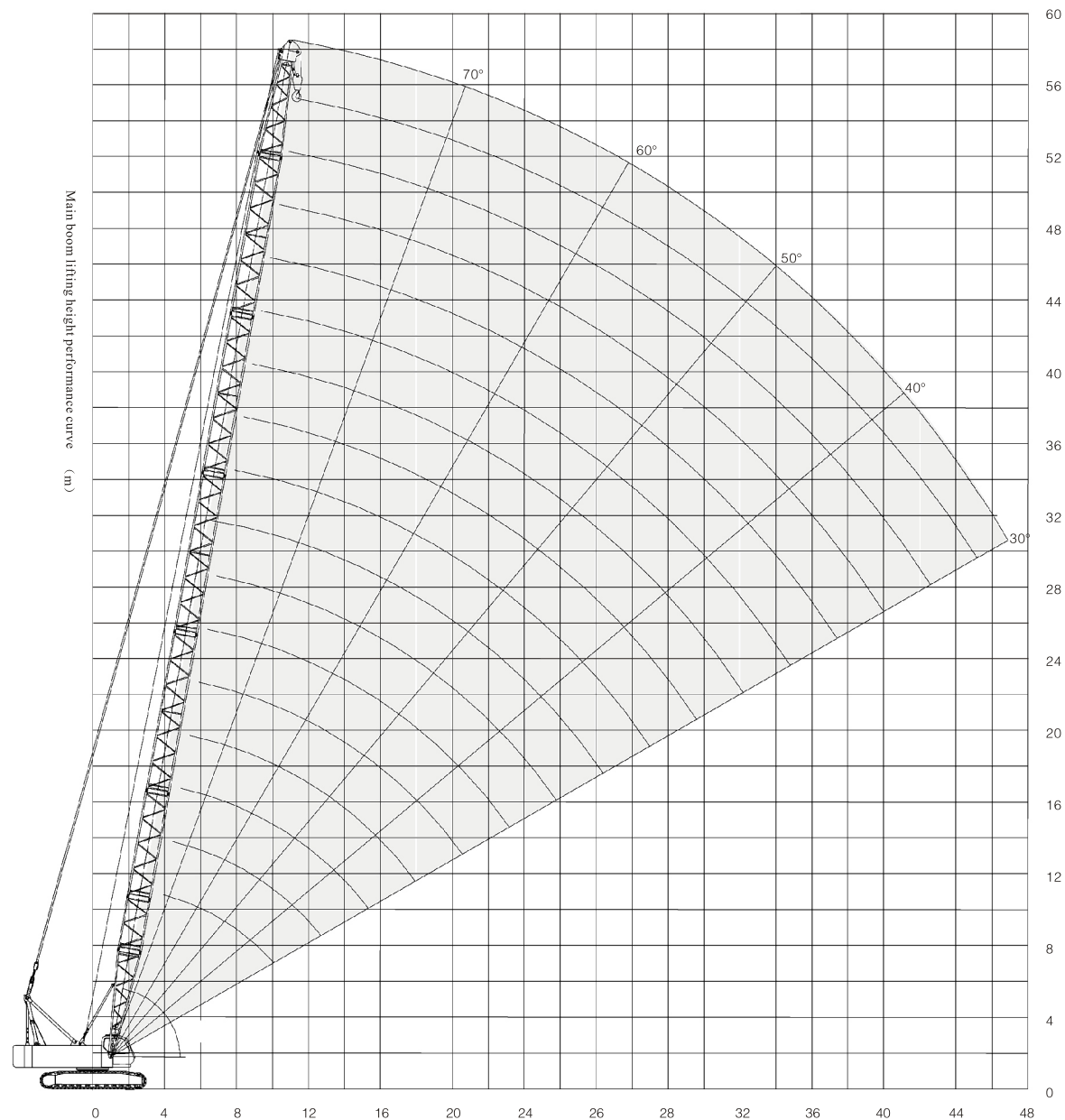


Working condition

1

Main boom lifting performance

Main boom liting height curve



Main boom load rating chart ( 1 )

Main boom length	12	15	18	21	24	27	30	33
number of lines	12	12	10	8	8	6	6	6
working radius	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

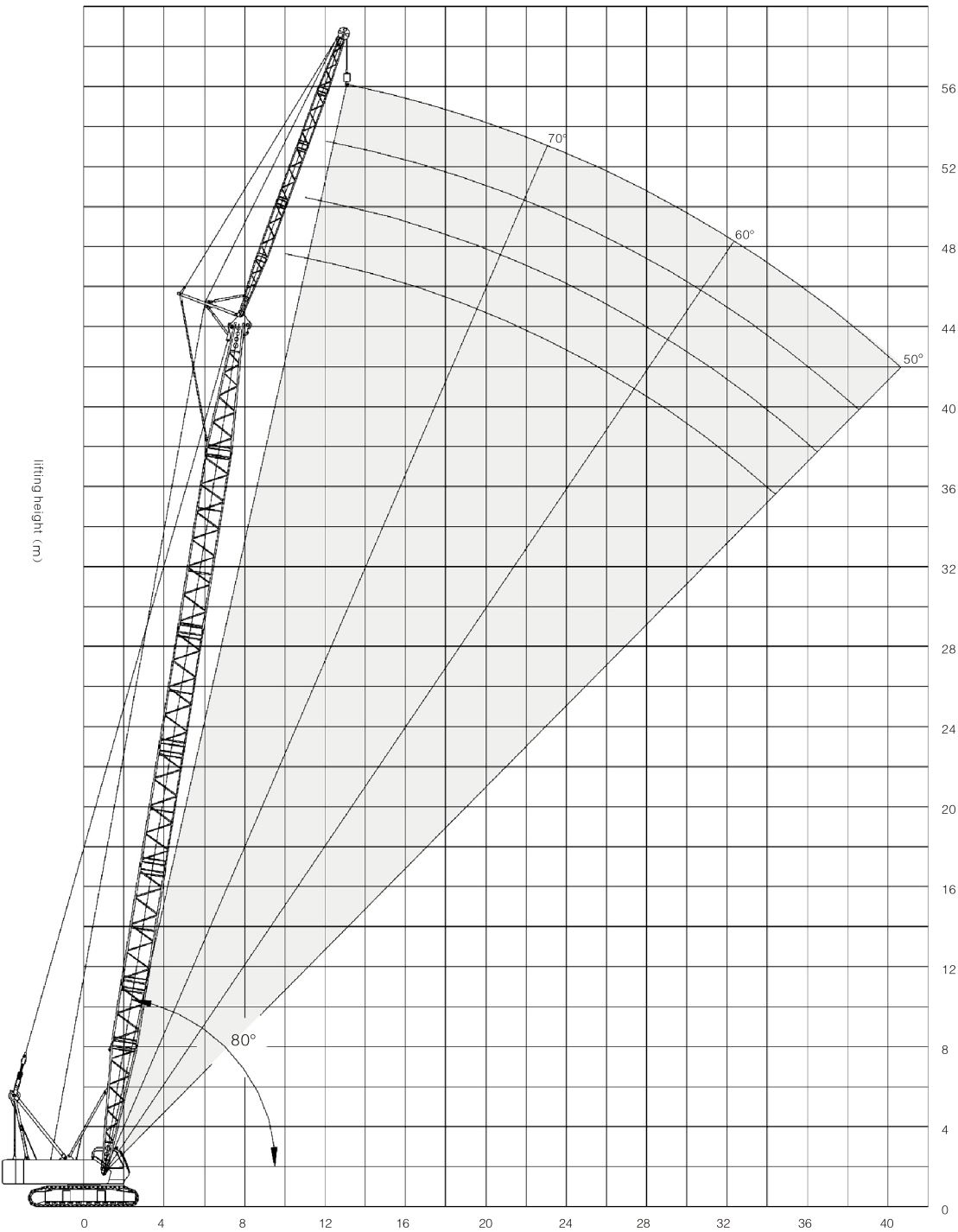
**Notes:**  
1. Values in load rating chart include the weight of hook, wire rope between head of boom and hook.  
2. When lift load with runner, the lifting load is the same as that of main boom of the same length at the same working radius, but its max. lifting load should be no more than 6.4t.



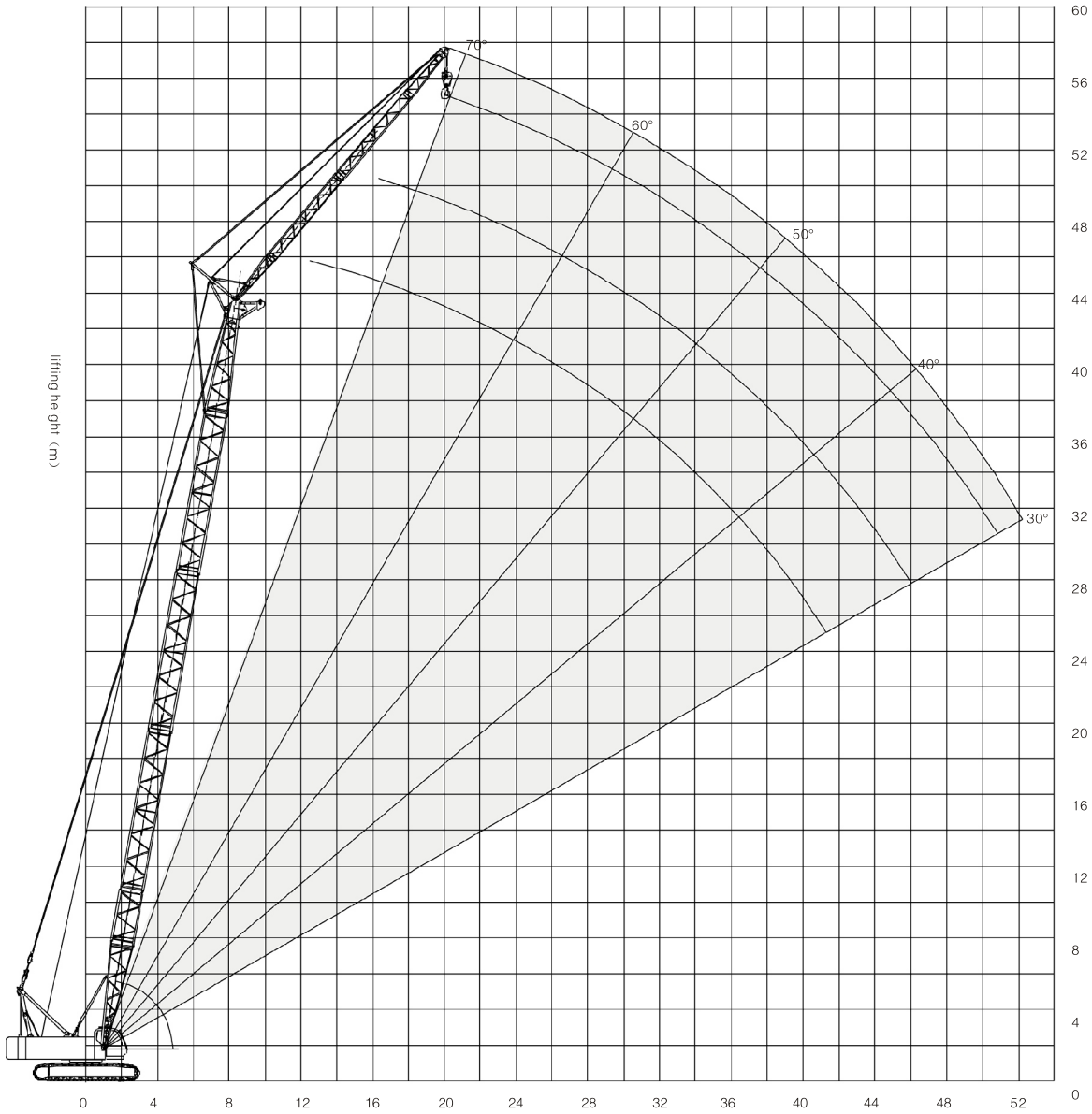
Main boom load rating chart ( 2 )

Main boom length	36	39	42	45	48	51	54	57
number of lines	4	4	4	3	3	3	3	3
working radius								
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

Fly jib lifting height performance curve



Boom+ fly jib lifting height performance curve diagram (the angle between fly jib central line and boom central line is 10° )



Main boom + fly jib lifting height performance curve (the angle between fly jib central line and main boom central line is 30° )

Fly jib load rating chart

main boom length	30						33					
	6		12		18		6		12		18	
fly jib length												
working radius	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	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	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	3	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

Fly jib load rating chart

main boom length	36						39					
	6		12		18		6		12		18	
fly jib length												
working radius	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	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	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	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	2	2	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	1.0

Fly jib load rating chart

main boom length	42					
	6		12		18	
fly jib length						
working radius	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	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	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