ZOOMLION

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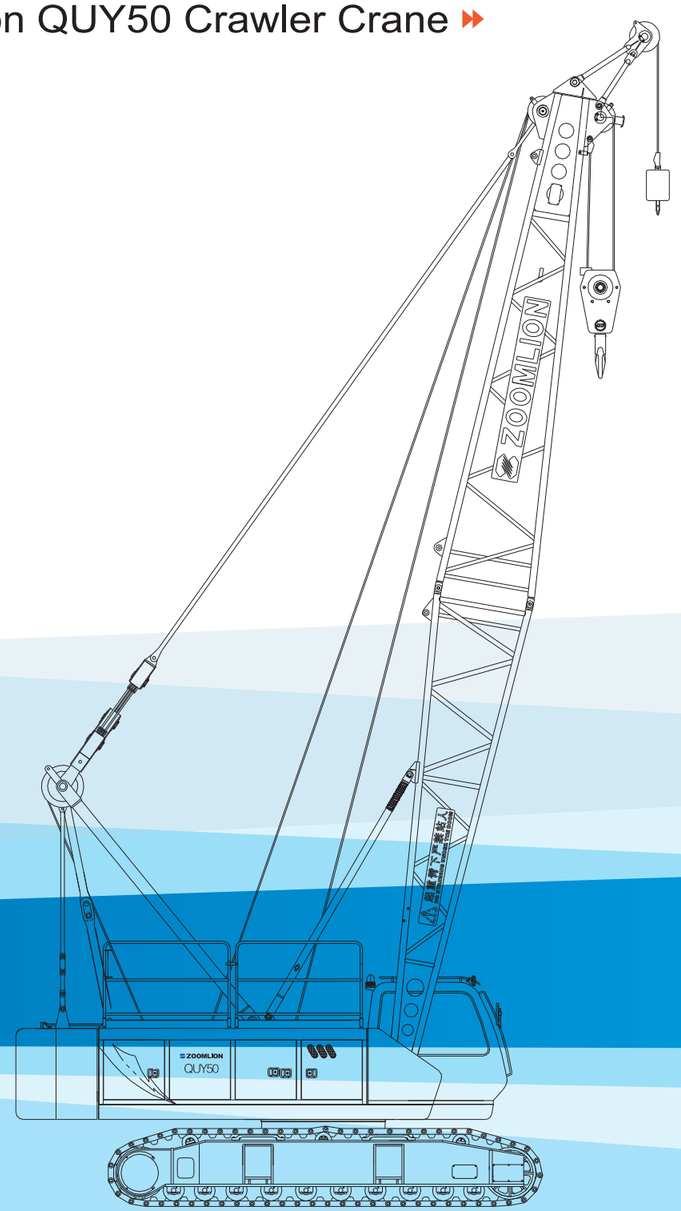
QUY50

Zoomlion QUY50 Crawler Crane



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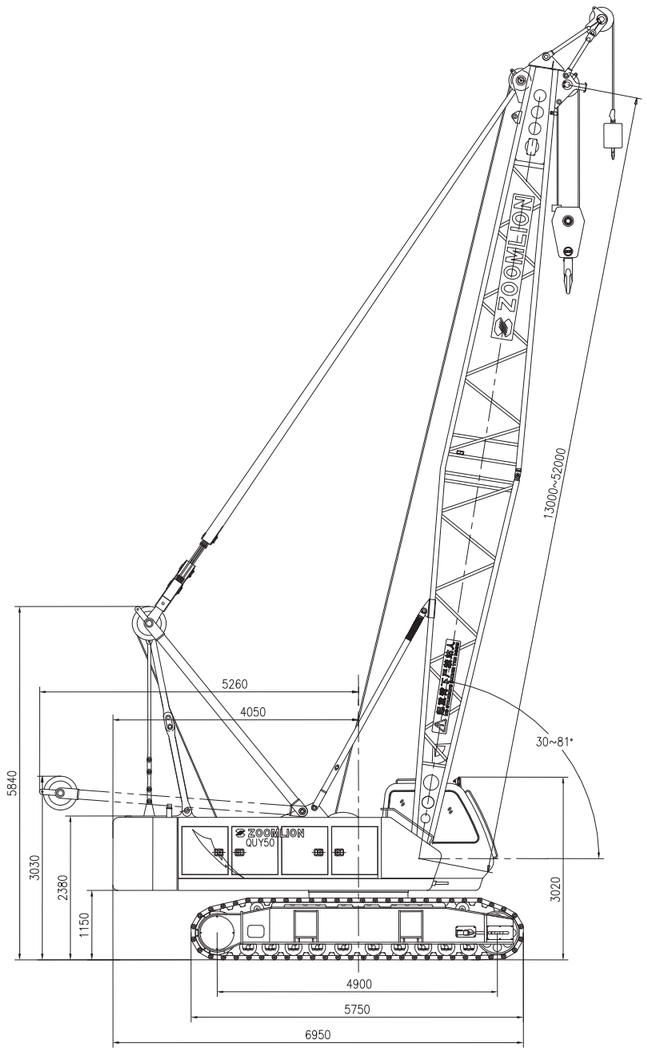
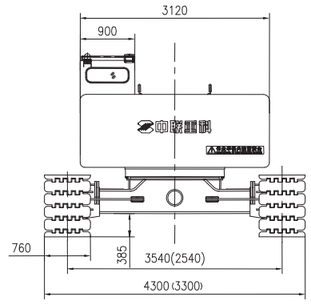
I. External Dimensions and Main Parameters

1. External Dimensions of Entire Crane, including Basic Boom

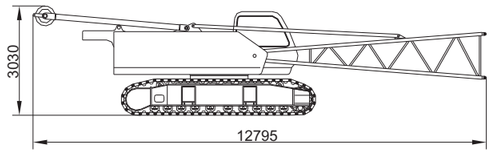




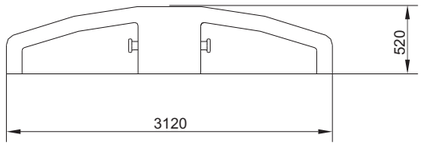
2. Main Performance Parameters

Items		Unit of measurement	Values	Remarks
Maximum lifting capacity x radius		t×m	55 × 3.7	
Deadweight of crane with basic boom		t	48	
Length of main boom		m	13~52	
Length of fixed jib		m	6~15	
Maximum lifting capacity with fixed jib		t	5	
Setting angle of fixed jib		°	10,30	
Maximum length of main boom + fixed jib		m	43 + 15	
Speed of single rope on drum	Primary lifting	m/min	125	Fourth layer
	Secondary lifting	m/min	125	Fourth layer
	Luffing	m/min	60	Fourth layer
Swiveling speed		rpm	0~2.6	
Traveling speed		km/h	0~1.7	
Gradeability		%	40	Basic boom, with frontal counterweight placement
Ground pressure		Mpa	0.066	
Overall dimensions L × W × H		mm	6950 × 3300 × 3030	Without boom
Engine	Model (I)		Cummins	
	Rated power/rotational speed	kW/rpm	132/2000	
	Maximum output torque/rotational speed	Nm/rpm	750/1300	
	Model (II)		Weichai Power	
	Rated power/rotational speed	kW/rpm	140/1900	
	Maximum output torque/rotational speed	Nm/rpm	830/1300	
Distance between track centers × crawler contact length × crawler shoe width		mm	2540 × 4900 × 760	With crawler carrier retracted
		mm	3540 × 4900 × 760	With crawler carrier extended

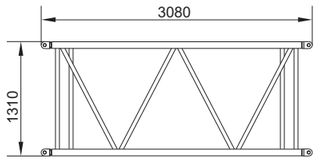
3.External Dimensions and Weight of Main Transport Components



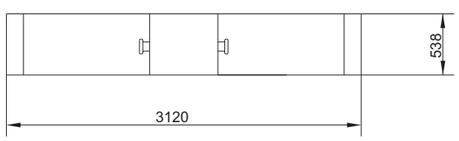
Name	Main machine
Weight (t)	30
Quantity	1
Remarks	Width 3300mm



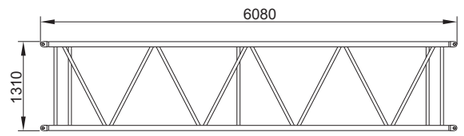
Name	Counterweight block
Weight (t)	8.25
Quantity	1
Remarks	Height 1205mm



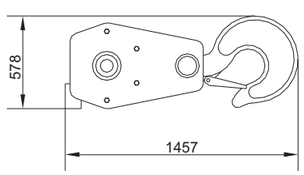
Name	Intermediate arm of main boom (3m)
Weight (t)	0.21
Quantity	1 piece
Remarks	Width 1450mm



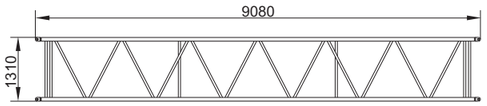
Name	Counterweight block
Weight (t)	8.25
Quantity	1
Remarks	Height 1205mm



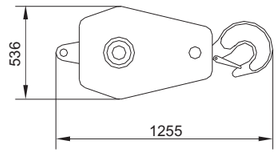
Name	Intermediate arm of main boom (6m)
Weight (t)	0.38
Quantity	3
Remarks	Width 1450mm



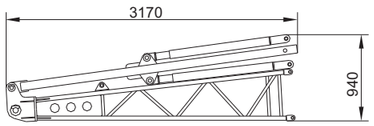
Name	Hook (50T)
Weight (t)	0.6
Quantity	1
Remarks	



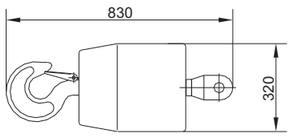
Name	Intermediate arm of main boom (9m)
Weight (t)	0.55
Quantity	2
Remarks	Width 1450mm



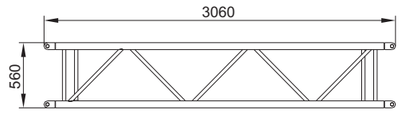
Name	Hook (16T)
Weight (t)	0.3
Quantity	1
Remarks	



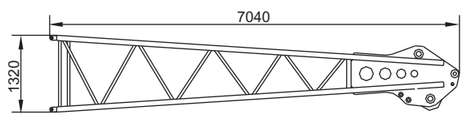
Name	Base section of jib (including brace poles and the bracing pole of jib)
Weight (t)	0.47
Quantity	1
Remarks	Width 560mm



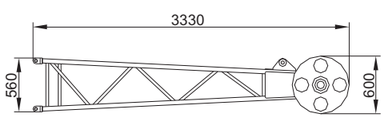
Name	Hook (6T)
Weight (t)	0.18
Quantity	1
Remarks	



Name	Intermediate arm of jib
Weight (t)	0.061
Quantity	3
Remarks	Width 560mm



Name	Top section of main boom
Weight (t)	0.73
Quantity	1
Remarks	Width 1450mm



Name	Top section of jib
Weight (t)	0.25
Quantity	1
Remarks	Width 560mm

II. Technical Descriptions

4. Boom System

Truss-type structure and high strength tubing.

Main boom

Length of main boom: 13~52m

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

Fixed jib

Length of main boom (operating mode using jib): 25m~43m

Length of fixed jib: 6~15m

Length of intermediate section of fixed jib: 3m

Maximum length of main boom + fixed jib: 43 + 15m

Table of Main Boom Lengths Configuration Combinations

Length of main boom (m)	Number of standard sections for corresponding lengths of main boom (pieces)		
	3m section	6m section	9m section
16	1	0	0
19	2	0	0
22	1	1	0
25	2	1	0
28	1	2	0
31	1	1	1
34	2	1	1
37	1	2	1
40	1	1	2
43	2	1	2
46	1	2	2
49	1	1	3
52	1	3	2

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.

5. Mechanisms

Primary lifting mechanism

The primary lifting mechanism offers a compact structure, comprised of an axial plunger hydraulic motor, internal speed reducer, control valve, balance valve, a normally closed brake and wire ropes; it can be controlled independently of other mechanisms. Lowering and lifting of the hook is achieved through forward and reverse rotations of the winch.
Drum: the concealed dual-range cast drum ensures that the wire ropes are neatly coiled in multiple layers and do not become entangled.
Lifting operations are quick and highly efficient.
The main winch can be additionally equipped with the Fast Fall function.

Main winch	Wire rope diameter	Φ20mm
	Wire rope length	200m
	Single rope speed (4th layer)	0~125m/min
	Single rope tension	65kN

Secondary lifting mechanism

The secondary lifting mechanism offers a compact structure, comprised of an axial plunger hydraulic motor, internal speed reducer, control valve, balance valve, normally closed brake and wire ropes; it can be controlled independently of other mechanisms. Lowering and lifting of the hook is achieved through forward and reverse rotations of the winch.
Drum: the concealed dual-range cast drum ensures that the wire ropes are neatly coiled in multiple layers and do not become entangled.
Lifting operations are quick and highly efficient.

Auxiliary winch	Wire rope diameter	Φ20mm
	Wire rope length	130m
	Single rope speed (4th layer)	0~125m/min
	Single rope tension	65kN

Luffing mechanism

This mechanism offers a compact structure comprised of an axial plunger hydraulic motor, internal speed reducer, control valve, balance valve, normally closed brake, wire ropes and a ratchet mechanism.
Drum: the concealed dual-range cast drum ensures that the wire ropes are neatly coiled in multiple layers and do not become entangled.
The luffing mechanism also has a ratchet auto-locking protection mechanism, which prevents the luffing winch from slipping after being parked for long periods of time.

Luffing winch	Wire rope diameter	Φ17mm
	Wire rope length	130m
	Single rope speed (4th layer)	0~60m/min
	Single rope tension	45kN

Slewing mechanism

This mechanism is driven by an axial plunger hydraulic motor through the planetary gear reducer. The small gear on its output shaft rotates around the slewing bearing gear ring that is fixed on the chassis frame to drive individual mechanisms on the rotating platform and allow for 360° slewing movements.
The slewing mechanism employs internal geared slewing bearings and a slewing speed reducer to provide strong bearing capacity and high accuracy, thus ensuring slewing stability and accuracy.
The slewing mechanism offers stepless speed regulation within the range of 0~2.60rpm.
The slewing mechanism is lockable through the mechanical locking device located at the front of the rotating platform.

Traveling mechanism

The traveling mechanism is a dual-motor and dual-reducer type. A foot pedal is used to control the crawler's movements, such as straight line traveling, unilateral steering, differential steering, pivotal steering, driving with load, etc., thus offering a high level of maneuverability and flexibility.
Travel speed: 0~1.7km/h;
Gradeability: 40%
Driving wheels: these wheels are installed on the traveling speed reducer and are made of high strength cast alloy steel; the contact surface has been specially treated;
Guide wheels: these wheels are installed on the front of the crawler carrier and are made of high strength cast alloy steel; the contact surface has been specially treated;
Thrust wheels: these wheels are made of high strength cast alloy steel and properly arranged along the bottom face of the crawler carrier with 10 wheels on each side; the contact surface has been specially treated;
Track carrier rollers: these rollers are made of high strength cast alloy steel and properly arranged along the top face of the crawler carrier with 3 rollers on each side; the contact surface has been specially treated;
Track shoes: each crawler is comprised of 61 track shoes that are installed on the crawler carrier; they are made of high strength cast alloy steel, with specially treated surfaces;
Crawler tensioning: crawlers are tensioned through jacks, making adjustment is fast, easy and reliable.

A-bracket mechanism

This mechanism is comprised of the A-bracket, A-bracket anchoring rods, self-mounting and dismounting anchoring rods, etc. While the vehicle is self-assembling/disassembling (or relocating), the A-bracket is rotated backwards to allow for easy connecting of the anchoring rods as well as for mounting and dismounting of the counterweight.
During transport, the A-bracket lies flat on the back of the rotating platform.

Counterweight and counterweight loading/ unloading mechanism

This is comprised of 2 counterweight blocks, counterweight mounting pins, counterweight anchoring screws, etc. This mechanism allows for self-mounting and dismounting of the counterweight.

Crawler retraction mechanism

The crawler carrier is connected to the chassis frame through the extending outriggers of the chassis frame, and its retraction is powered by the oil cylinder. One end of the crawler carrier's retraction oil cylinder is connected to the chassis frame, while the other end is connected to the crawler carrier. The retraction oil cylinders are arranged along the inner side of the crawler carrier.

6. Systems

Hydraulic system

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

Main hydraulic pump: constant power variable displacement pump, powered by the engine.
Oil pump of the slewing mechanism: gear pump.
Main control valve: hydraulic pilot proportional valve.
Main circuit control method: valve controlled system.
Control of telescoping oil cylinder of crawler carrier: manually controlled directional control valve.

Capacity of hydraulic oil tank: 500L.
Oil filter: discharge oil filter.
Cooler: aluminium radiator.

Hydraulic control handle: the hydraulic control handle offers such advantages as high precision, strong inching performance, and exceptionally comfortable operation in comparison to ordinary hand-operated control levers.

Electrical system

DC 24V, negative ground, 2 batteries.
The electrical components of the vehicle primarily include the: power supply, engine starter, engine misfiring, indicator lights, alarms, lighting devices, fans, media (cd) player, windshield wipers, horn, lifting height limiters, hydraulic oil cooling fans, load moment limiter system, engine preheater, safety devices, etc. These appliances ensure that the crane will operate safely and provide a comfortable working environment for the driver and other workers.

Power system

The Dongfeng Cummins (Weichai Power) engine is an in-line 6-cylinder turbocharged water-cooled engine

Rated power/rotational speed:
132kW/2000 rpm (Weichai 140kW/1900rpm)

Maximum torque/rotational speed:
750N.m/1300 rpm (Weichai 830Nm/1300rpm)

Fuel tank:
300L capacity, which ensures a sufficiently long working time for the engine.

7. Safety Devices

Multiple types of safety and alarm devices, such as mechanical, electronic, hydraulic, etc., are provided to ensure safe operation of the machine.

Load moment limiter

A buzzer alarm will sound when the lifting load moment reaches 90% of the rated load moment; operation of the crane will stop automatically when the lifting load moment reaches 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.

Various overflow valves in the hydraulic system

These can suppress abnormally high pressures in the circuit, preventing damage to the hydraulic oil pump and motor, and preventing system overload.

Height limiter devices

The limit switch, movement weight and other components, are mounted on the top section boom, and are used to prevent the hook from over-lifting. When the hook has been raised to its maximum height, the limit switch activates and sends out a signal to automatically stop the ascending hook, simultaneously triggering a buzzer alarm in the control room, thus preventing over-winding of the hook.

Angle indicator

The boom angle indicator is located at the lower rear side of the boom's base section (i.e. to the right of the control room), allowing the driver convenient, clear visibility of the elevation angle of the boom from the control room.

Working boom limiting position alarm and protection system

This protection system has a load moment limiter and limit switch for dual-level control, enabling automatic termination of luffing movements of the boom's limited elevation angle position, while also simultaneously triggering alarms.

Boom overturn protection device

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

Hook safety latch

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

Luffing winch ratchet locking mechanism

This mechanism prevents the luffing decline when the vehicle is parked for long periods of time.

Wire rope over-release protection device

When the wire rope in the drum has been released until only three single wound coils remain, this protection device sends out a signal automatically cutting off the releasing of rope and the descending hook, also triggering a buzzer alarm in the control room.

Wind speed indicator (optional)

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

Emergency stop button

In case of any emergency, pressing this button will stop all movements and actions.

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.

Monitoring system (optional)

This system includes two video cameras which simultaneously monitor conditions at both the rear of the winch mechanism and the rear of the whole machine.
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, and more.

8. Control Room

The structure of the control room 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, adjustable seat, windshield wipers, control handle, load moment indicator, air conditioners, electric fans, illuminating lamps, media player, fire extinguishers, and more.
The arrangement of the seat, control handle, control lever, and various control buttons follows an ergonomic design, making operation both easy and comfortable.

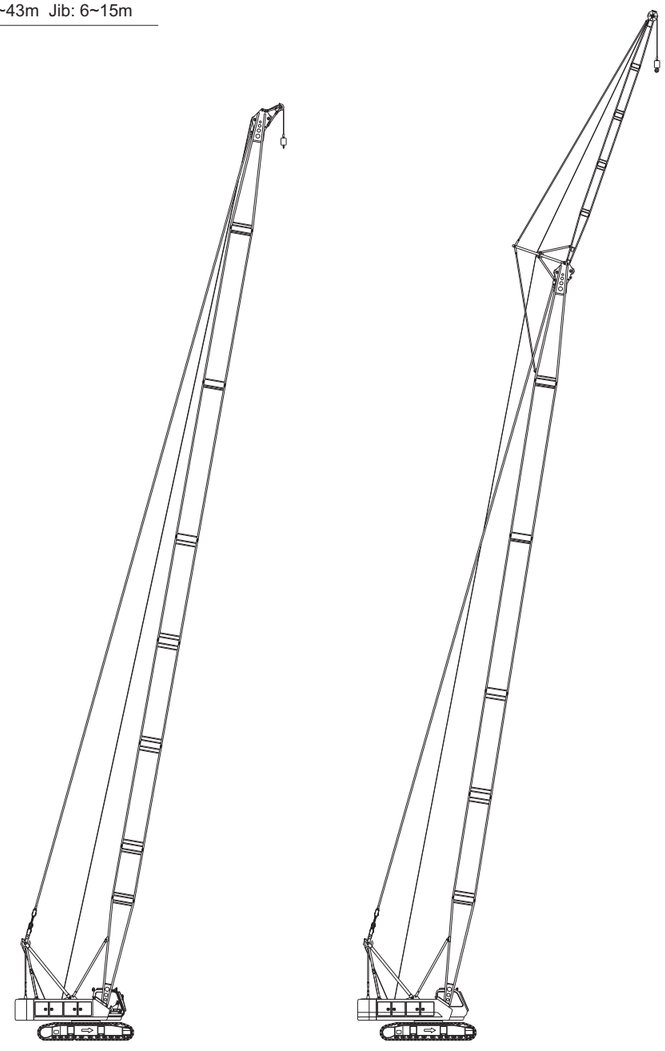
9. Hook

The following hooks are optionally available; all include a rotating hook and safety latch.
50t main hook: equipped with 5 pulleys.
16t auxiliary hook: equipped with 1 pulley.
6t auxiliary hook: without pulleys.

III. Description of Boom Assembly

Descriptions of Boom Assembly Codes

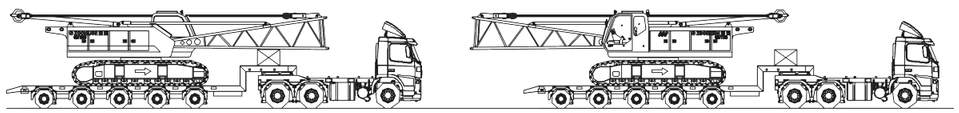
Code	Type	Operation mode parameters
S	Main boom	Main boom: 13~52m
SF	Fixed jib	Main boom: 25~43m Jib: 6~15m

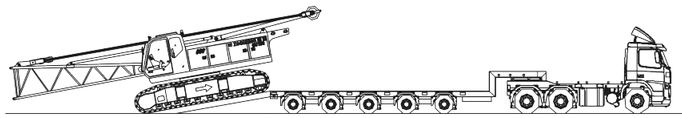


S　　SF

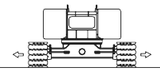
IV. Self-Mounting and Dismounting Functions

(Taking the self-mounting process of the crane operation with fixed jib as an example)

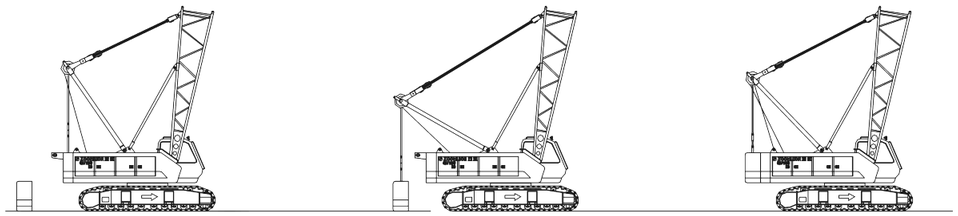




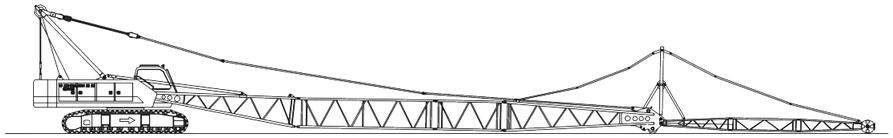
Unloading of main machine



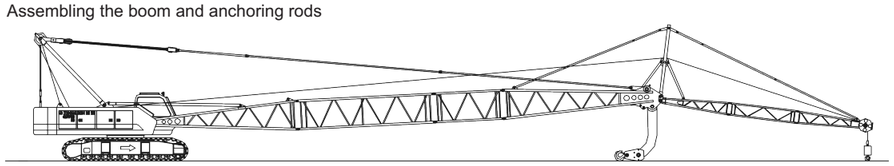
Extending crawlers



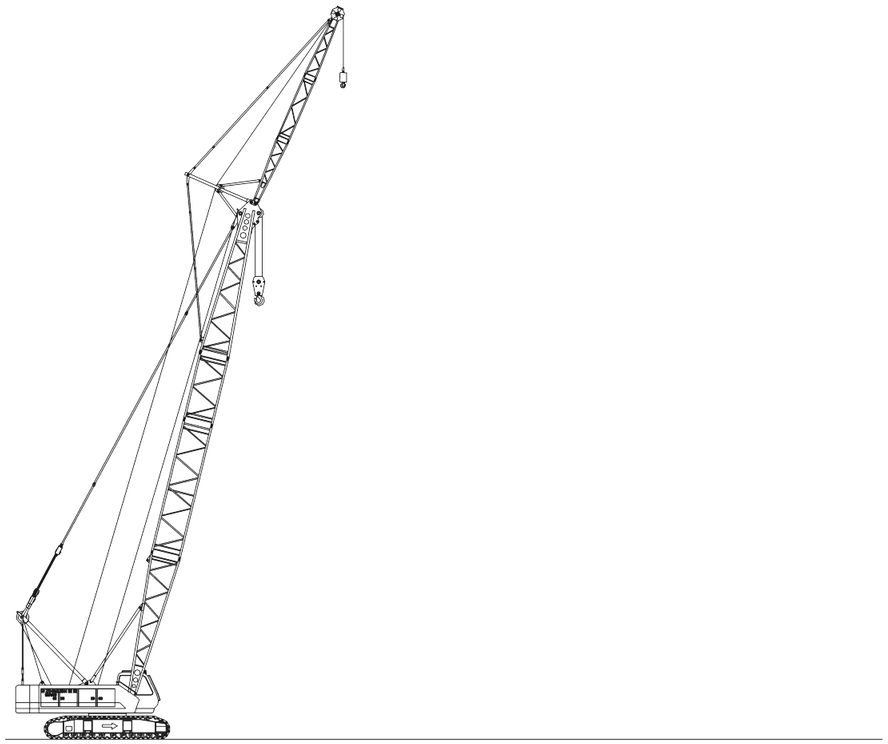
Unloading and assembling of counterweight



Assembling the boom and anchoring rods



Lifting of boom



Operating mode

V. Lifting Performance

10. Lifting Characteristics of Main Boom

Main Boom Lifting Height Characteristics Curve

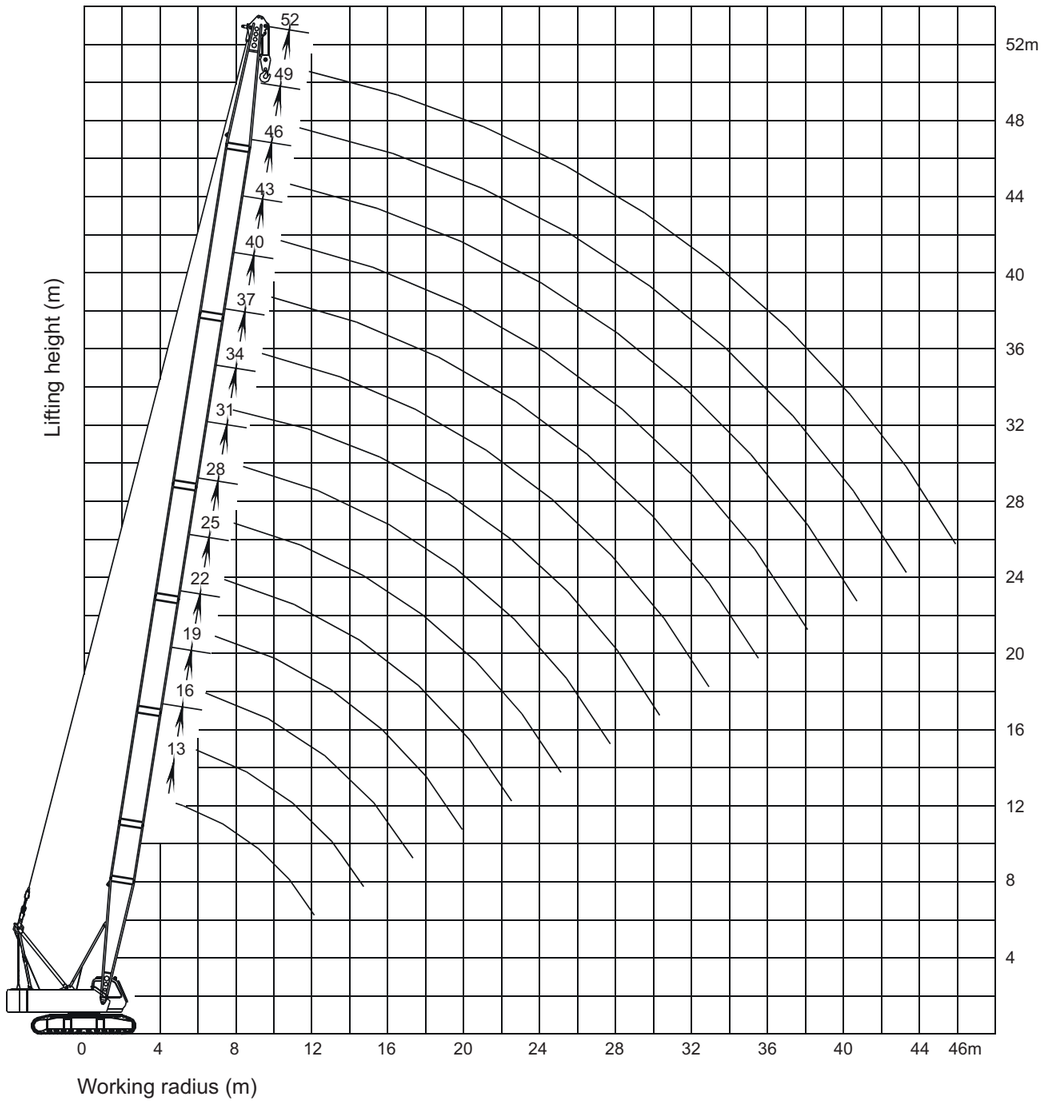


Table of Main Boom Lifting Performance

Unit of measurement: t

Radius (m)	Boom length (m)													
	13	16	19	22	25	28	31	34	37	40	43	46	49	52
3.7	55													
4	49.5	47.3												
4.5	41	40.1	38.5											
5	34.3	34.2	33.7	32										
5.5	29.5	29.4	29.3	29.1	27.5									
6	25.8	25.8	25.6	25.5	25.4	24.2								
7	20.6	20.6	20.4	20.4	20.3	20.2	20							
8	17.1	17.5	16.8	16.8	16.8	16.6	16.6	16.4	16.2					
9	14.6	14.5	14.5	14.3	14.2	14.1	14.0	13.75	13.6	13.4	13.2			
10	12.7	12.55	12.5	12.3	12.3	12.2	12.1	12	11.8	11.5	11.3	11.1	11.0	10.3
12	10	9.8	9.8	9.6	9.5	9.58	9.45	9.2	9	8.8	8.7	8.6	8.4	8.3
14		8.1	8.1	8	7.8	7.7	7.6	7.4	7.2	7.1	7.0	6.9	6.8	6.7
16			6.8	6.5	6.4	6.35	6.3	6.1	6.0	5.9	5.8	5.7	5.6	5.5
18				5.7	5.5	5.35	5.3	5.1	5.1	5.0	4.9	4.8	4.7	4.6
20				4.9	4.8	4.6	4.5	4.4	4.4	4.3	4.2	4.1	4.0	3.9
22					4.1	4.0	3.9	3.8	3.8	3.7	3.6	3.5	3.4	3.3
24						3.5	3.4	3.3	3.3	3.2	3.1	3.0	2.9	2.8
26							3.0	2.9	2.9	2.8	2.7	2.5	2.4	2.35
28								2.6	2.5	2.4	2.4	2.2	2.1	2.0
30								23	2.3	2.2	2.1	1.9	1.8	1.7
32									1.9	1.8	1.7	1.6	1.5	1.4
34										1.6	1.5	1.3	1.2	1.1

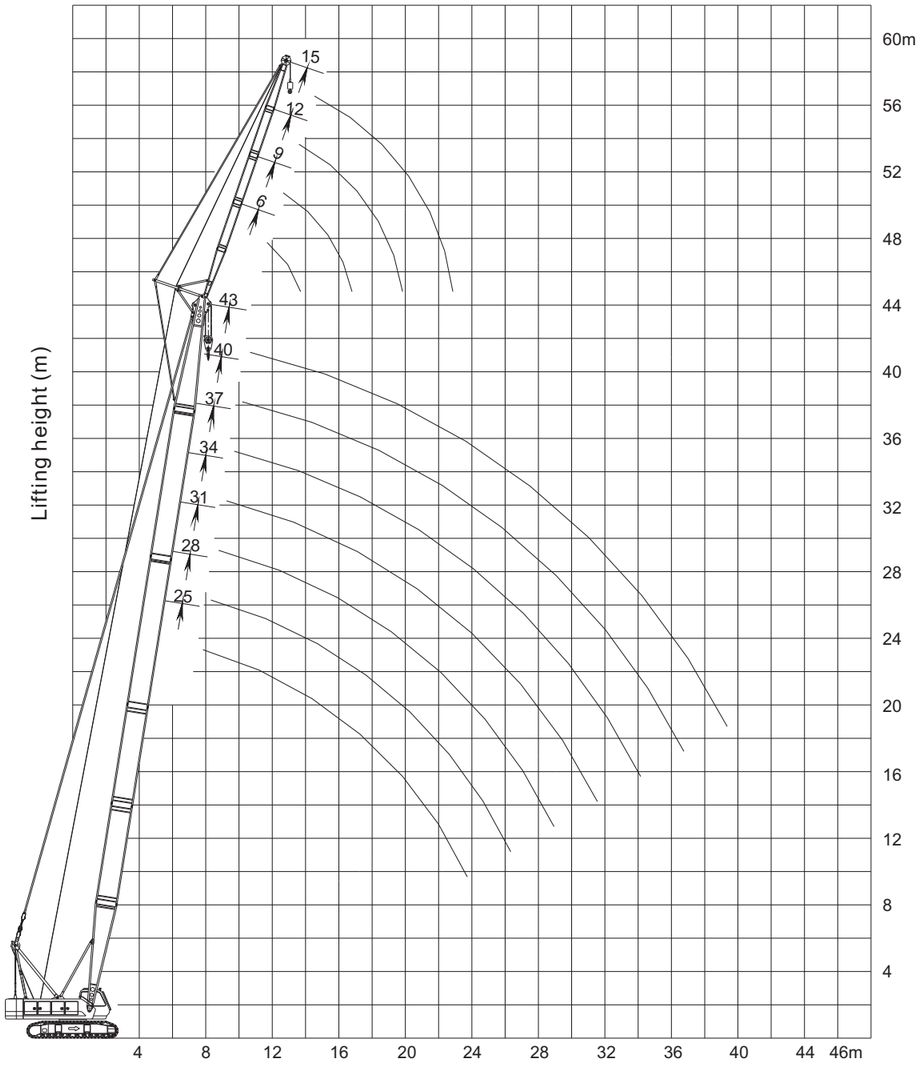
Notes:

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

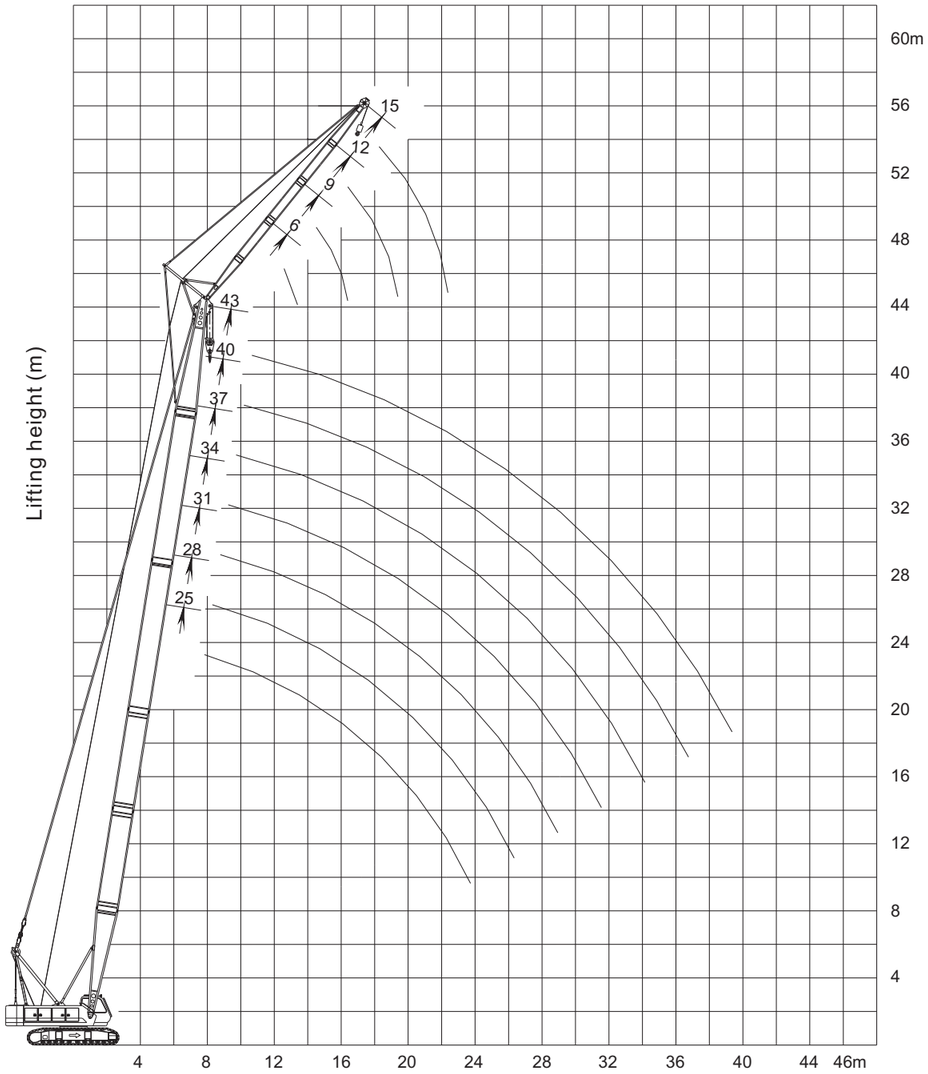
2. When a gooseneck boom is used to lift a load, the lifting capacity is equal to the single rope tension of the main boom's lifting capacity at the same boom length and radius.

11. Lifting Characteristics of Main Boom + Fixed Jib

Fixed Jib Lifting Height Characteristics Curve
The working angle of the main boom ranges from 50°~81°



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



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

Table of Jib Lifting Characteristics (I)

Unit of measurement: t

Length of main boom (m)	25								28							
Length of jib (m)	6		9		12		15		6		9		12		15	
Radius (m)	Jib set angle								Jib set angle							
	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
8																
10	5															
12	5	5	5	4.7	4		3.3		5	5	5	4.6	4			
14	5	5	5	4.5	4	3.7	3.2		5	5	5	4.5	4	3.6	3.2	
16	5	5	5	4.2	4	3.5	3.2	3	5	5	5	4.3	4	3.6	3.2	
18	5	4.8	5	3.9	3.9	3.4	3.2	3	5	4.8	5	4	3.9	3.5	3.2	3
20	4.8	4.5	4.9	3.8	3.8	3.2	3.1	2.8	4.7	4.7	4.8	3.9	3.8	3.3	3.1	2.9
22	4.2	4.2	4.2	3.6	3.7	3.1	3	2.7	4.1	4.1	4.1	3.7	3.7	3.2	3	2.7
24	3.7	3.7	3.7	3.4	3.5	3	2.9	2.5	3.5	3.6	3.6	3.5	3.5	3	3	2.6
26	3.2	3.3	3.3	3.3	3	2.8	2.8	2.4	3.1	3.1	3.2	3.2	3.2	2.9	2.8	2.5
28	2.9	2.9	2.9	3	2.7	2.7	2.7	2.3	2.8	2.8	2.8	2.9	2.8	2.8	2.7	2.4
30	2.5	2.5	2.6	2.6	2.5	2.5	2.6	2.2	2.4	2.5	2.5	2.5	2.5	2.6	2.6	2.3
32			2.3	2.3	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2
34						2.1	2.1	2.1			2	2	2	2.1	2	2.1

Table of Jib Lifting Characteristics (II)

Unit of measurement: t

Length of main boom (m)	31								34							
Length of jib (m)	6		9		12		15		6		9		12		15	
Radius (m)	Jib set angle								Jib set angle							
	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
8																
10																
12	5	5	5		4				5		5					
14	5	5	5	4.7	4		3.2		5	5	5	4.6	4		3.2	
16	5	5	5	4.3	4	3.7	3.2		5	5	5	4.5	4	3.6	3.2	
18	5	5	5	4.1	3.9	3.5	3.2	3.1	5	5	5	4.3	3.9	3.5	3.2	
20	4.5	4.6	4.6	4	3.8	3.4	3.1	3	4.5	4.5	4.6	4.1	3.8	3.5	3.1	3
22	4	4	4	3.8	3.7	3.2	3	2.8	3.8	4	3.9	3.8	3.7	3.4	3	2.9
24	3.5	3.5	3.5	3.6	3.6	3.1	2.9	2.7	3.4	3.5	3.4	3.6	3.5	3.1	3	2.8
26	3.1	3.1	3.1	3.2	3.1	3	2.8	2.6	2.9	3	3	3.1	3	2.9	2.8	2.7
28	2.7	2.7	2.7	2.8	2.7	2.9	2.75	2.5	2.6	2.6	2.6	2.7	2.7	2.8	2.7	2.6
30	2.3	2.4	2.4	2.5	2.4	2.5	2.5	2.4	2.2	2.3	2.3	2.4	2.3	2.5	2.4	2.5
32	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2	2	2	2.1	2.1	2.2	2.1	2.2
34	1.8	1.8	1.9	1.9	1.9	2	1.9	2.1	1.7	1.8	1.8	1.8	1.8	1.9	1.8	2

Table of Jib Lifting Characteristics (III)

Unit of measurement: t

Length of main boom (m)	37								40							
Length of jib (m)	6		9		12		15		6		9		12		15	
Radius (m)	Jib set angle								Jib set angle							
	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
8																
10																
12	5								5							
14	5	5	5		4				5	5	5					
16	5	5	5	4.5	4		3.2		5	5	5	4.6	4		3.3	
18	5	5	5	4.4	3.9	3.6	3.2		5	5	5	4.3	3.9	3.7	3.2	
20	4.4	4.5	4.5	4.2	3.8	3.5	3.1	3	4.3	4.4	4.3	4.2	3.8	3.5	3.1	3
22	3.8	3.9	3.9	4	3.7	3.3	3	2.9	3.7	3.8	3.7	3.9	3.7	3.4	3	2.9
24	3.3	3.4	3.3	3.5	3.4	3.2	2.9	2.8	3.2	3.3	3.2	3.4	3.3	3.2	2.9	2.8
26	2.8	2.9	2.9	3	2.9	3.1	2.8	2.7	2.7	2.8	2.8	3	2.8	3.1	2.8	2.7
28	2.5	2.5	2.5	2.6	2.6	2.7	2.6	2.6	2.4	2.5	2.4	2.6	2.5	2.7	2.5	2.6
30	2.1	2.2	2.2	2.3	2.2	2.4	2.3	2.5	2	2.1	2.1	2.2	2.1	2.3	2.2	2.4
32	1.9	1.9	1.9	2	2	2.1	2	2.2	1.8	1.8	1.8	1.9	1.9	2	1.9	2.1
34	1.6	1.7	1.7	1.8	1.7	1.8	1.7	1.9	1.5	1.6	1.6	1.7	1.6	1.7	1.6	1.8

Table of Jib Lifting Characteristics (IV)

Unit of measurement: t

Length of main boom (m)	43							
Length of jib (m)	6		9		12		15	
Radius (m)	Jib set angle							
	10°	30°	10°	30°	10°	30°	10°	30°
12								
14	5		5					
16	5	5	5		4			
18	4.8	5	4.7	4.5	3.9		3.2	
20	4.1	4.3	4.2	4.3	3.8	3.7	3.1	
22	3.5	3.7	3.6	4	3.6	3.5	3	3
24	3.1	3.2	3.1	3.3	3.1	3.3	2.9	2.9
26	2.6	2.8	2.7	2.9	2.7	2.9	2.7	2.8
28	2.3	2.4	2.3	2.5	2.4	2.6	2.4	2.6
30	1.9	2	2	2.1	2	2.2	2.1	2.3
32	1.7	1.7	1.7	1.8	1.8	1.9	1.8	2
34	1.4	1.5	1.5	1.6	1.5	1.7	1.6	1.7