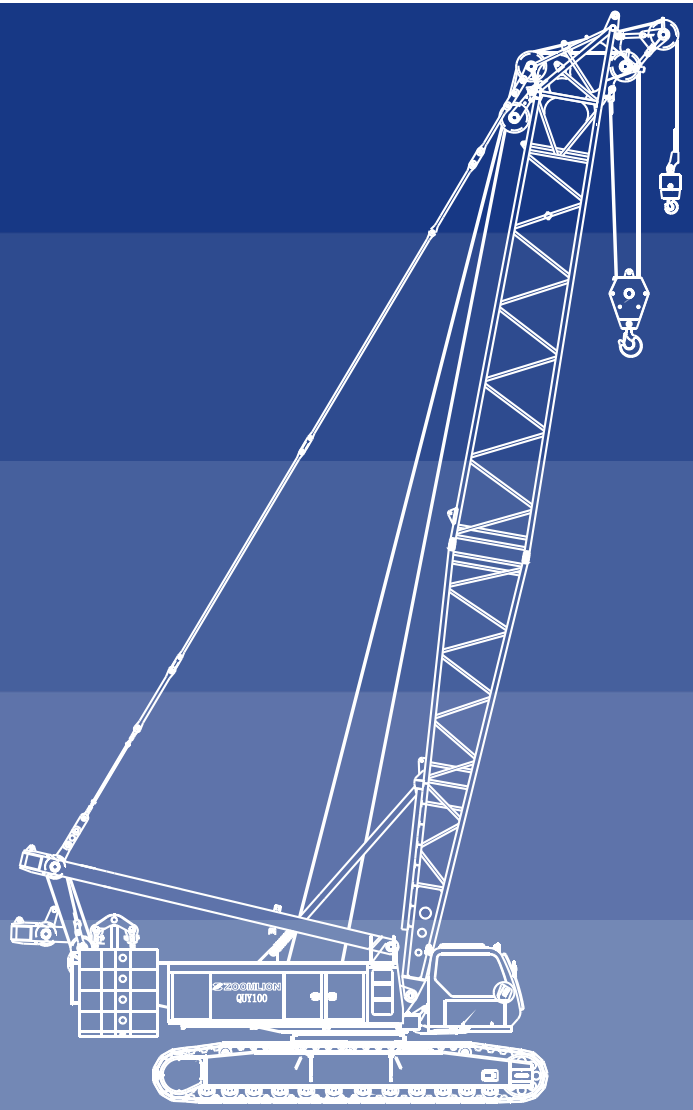
ZOOMLION

QUY100

Crawler Crane Technical Manual



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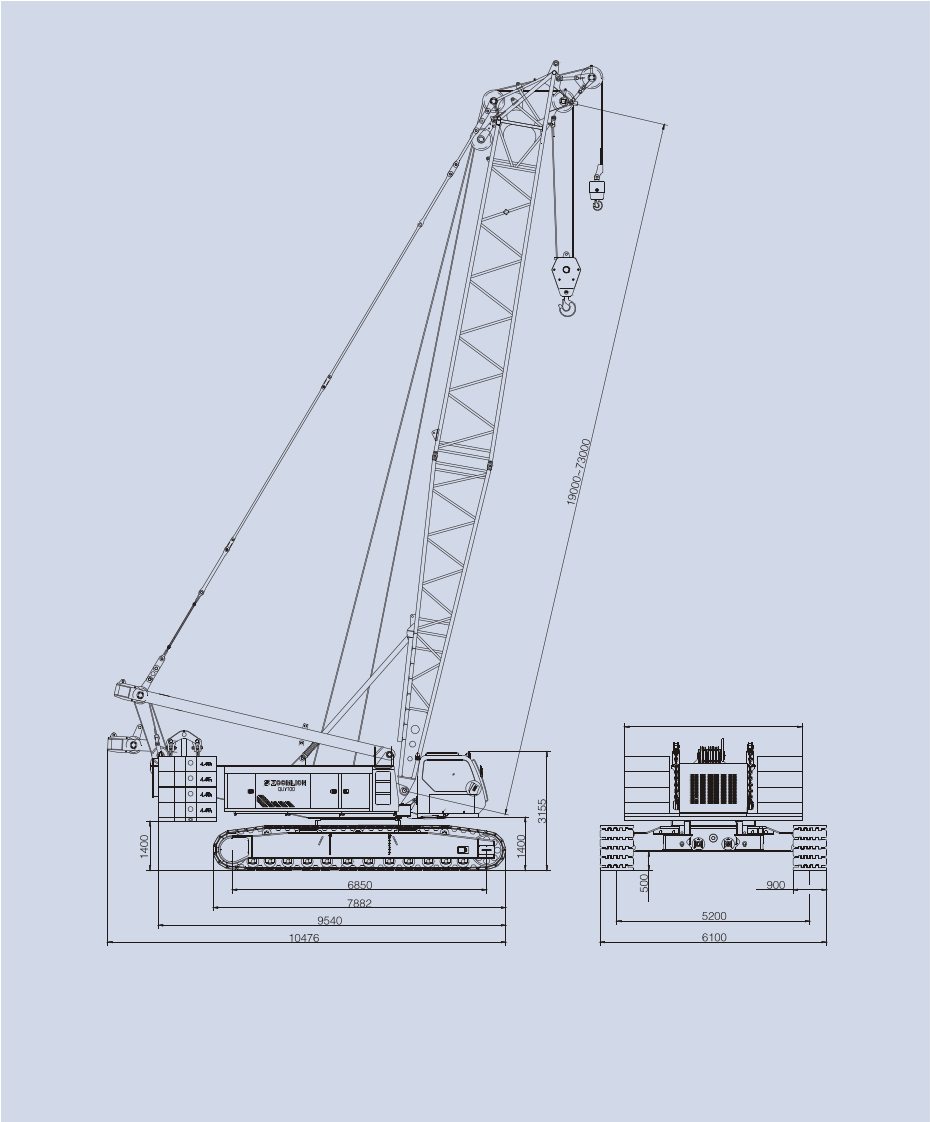
Ⅰ. Overall dimensions and main parameters

1.Overall dimensions of basic machine



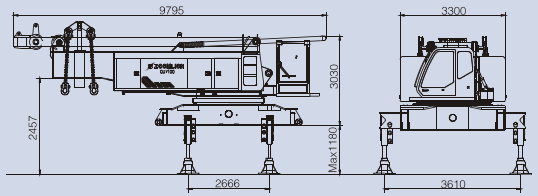
2.Main technical parameters

Item		Unit	Value	Remarks
Max. lifting capacity × radius		t×m	100/5	
Deadweight with basic boom		t	106	
Main boom length		m	19~73	
Fixed jib length		m	13~31	
Max. lifting capacity on fixed jib		t	12	
Fixed jib angle		°	10,30	
Max. length of main boom with fixed jib		m	55+31,58+25,61+19	
Luffing jib length		m	24~45	
Max. lifting capacity on luffing jib		t	24	
Main boom angle when luffing jib is used		°	65，75，85	
Max. length of main boom with luffing jib		m	46+45,49+42	
Single rope speed of winches	Hoisting winch 1	m/min	110	The 4th rope layer
	Hoisting winch 2	m/min	110	The 4th rope layer
	Derricking winch	m/min	45	The 4th rope layer
Slewing speed		rpm	0~2.2	
Traveling speed		km/h	0~1.3	
Gradeability		%	30	
Ground pressure		MPa	0.1	
Overall dimensions (L×W×H)		mm	9550×3300×3200	WithoutA-frame and boom frame
Engine	Rated power/ rotational speed	kW/rpm	209/2000	
	Max. output torque/ rotational speed	Nm/rpm	1356/1400	
	Exhaust emission standard		U.S. EPA Tier Ⅲ	
Distance between track center ×crawler contact length ×crawler width		mm	5200×6450×900	

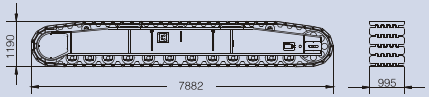
3.Transport dimensions and weights of main components

Unit：mm

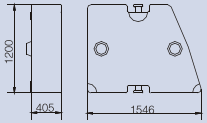
Transport weight of basic machine: 35t Number: 1



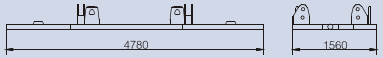
Crawler carrier: 13.68t Number: 2



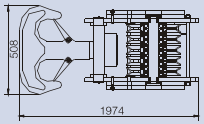
Counterweight plate: 4.45t Number: 8



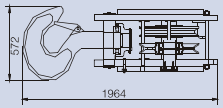
Counterweight base plate: 5.5t Number: 1



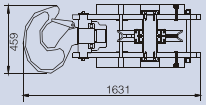
Load hook (100t): 1.93t Number: 1



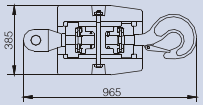
Load hook (50t): 1.358t Number: 1



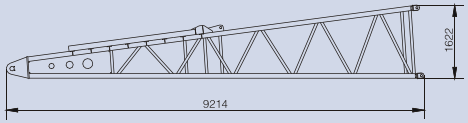
Load hook (30t): 1.085t Number: 1



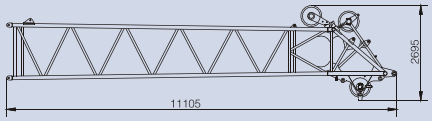
Load hook (12t): 0.461t Number: 1



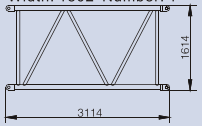
Main boom pivot section : 1.447t Width: 1802 Number: 1



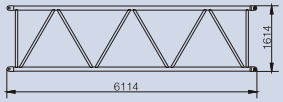
Main boom head: 1.86t Width: 1802 Number: 1



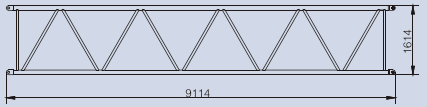
3m main boom intermediate section: 0.386t
Width: 1802 Number: 1



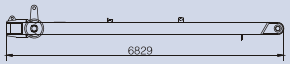
6m main boom intermediate section: 0.665t
Width: 1802 Number: 1



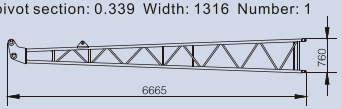
9m main boom intermediate section: 0.937t
Width: 1802 Number:5



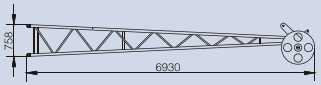
A-frame: 2.24t Width: 1560 Number: 1



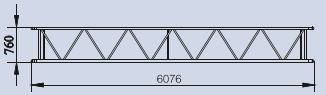
Fixed jib pivot section: 0.339 Width: 1316 Number: 1



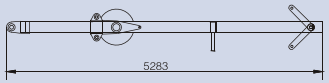
Fixed jib head: 0.397t Width: 960 Number: 1



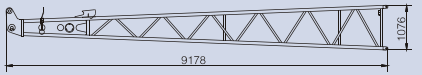
6m fixed jib intermediate section: 0.233t
Width: 960 Number:3



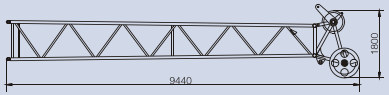
FA-frame: 0.475t Width: 1320 Number: 1



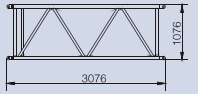
Luffing jib pivot section: 0.688t Width: 1276 Number: 1



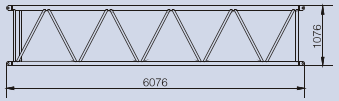
Luffing jib head: 0.72t Width: 1276 Number: 1



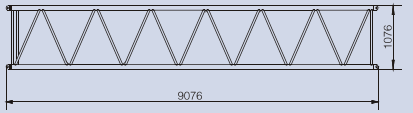
3m luffing jib intermediate section: 0.194t
Width: 1276 Number:1



6m luffing jib intermediate section: 0.363t
Width: 1276 Number:1

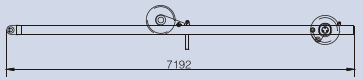


9m luffing jib intermediate section: 0.52t
Width: 1276 Number:2



WA-frame 1: 0.912t Width: 1145 Number: 1

WA-frame 2: 0.85t Width: 1482 Number: 1



Ⅱ. Technical instruction

4. Boom system

The lattice boom is made of high-strength seamless steel pipes and all boom sections are pinned together.

Main boom (S boom)

S- main boom: 19m~73m

Main boom intermediate section: 3m, 6m and 9m

Number of main boom intermediate section for S boom

Main boom length (m)	Number of main boom intermediate section		
	3m	6m	9m
19	0	0	0
22	1	0	0
25	2	0	0
28	1	1	0
31	2	1	0
34	1	2	0
37	1	1	1
40	2	1	1
43	1	2	1
46	1	1	2
49	2	1	2
52	1	2	2
55	1	1	3
58	2	1	3
61	1	2	3
64	1	1	4
67	2	1	4
70	1	2	4
73	1	1	5

Main boom with fixed jib (SF boom)

S- main boom: 40m~61m

F- fixed jib: 13 m ~31 m

Fixed jib intermediate section: 6m

Number of fixed jib intermediate section for SF boom

Fixed jib length (m)	Number of fixed jib intermediate section
	6m
13	0
19	1
25	2
31	3

Main boom with luffing jib (SW boom)

S- main boom: 31m~49m

W- luffing jib: 24 m ~45 m

Luffing jib intermediate section: 3m, 6m, and 9m

S-boom angle: 65°, 75°, 85°

Number of luffing jib intermediate section for SW boom

Luffing jib length (m)	Number of luffing jib intermediate section		
	3m	6m	9m
24	0	1	0
27	1	1	0
30	2	1	0
33	1	2	0
36	1	1	1
39	2	1	1
42	1	2	1
45	1	1	2

5. Working mechanism

Hoisting winches

The crane is fitted with two hoisting winches: hoisting winch 1 and hoisting winch 2. Both of them are equipped with planetary reducer with normally closed disc brake, which is driven by hydraulic motor.

High hoisting speed and lower hoisting speed are available for hoisting winches.

The winding drums are those with double broken line grooves.

Hoisting winches 1 and 2	Rope diameter	26mm
	Rope length	310m
	Single rope force	125kN
	Max. rope speed on the outmost rope layer	105m/min

Derricking winch

The derricking winch is fitted with planetary reducer with normally closed disc brake, which is driven by hydraulic motor.

The winding drums, with ratchet locking device, are drums with double broken line grooves.

Derricking winch	Rope diameter	26mm
	Rope length	210m
	Single rope force	114kN
	Max. rope speed on the outmost rope layer	45m/min

Slewing mechanism

The slewing mechanism consists of concealed axial piston variable displacement motor, gear reducer, slewing brake valve, brake and pinion gear as well as slewing ring. The superstructure can realize 360° continuous rotation via slewing ring which is driven by pinion gear.

The slewing mechanism has controllable free swing function which can reduce the impacts on the crane and ensure that the slewing motion can be initiated /stopped more stably.

3-row roller type, external-geared slewing ring and slewing reducer built in the crane, are of strong load-carrying capacity and high precision, which can ensure stable and accurate slewing motion.

Infinitely variable speed from 0 to 2.2 r/min

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

Traveling mechanism

The traveling mechanism is fitted with two hydraulic motors and two traveling reducers. The hydraulic motor, traveling reducer and balance valve are all imported. Using control levers, the traveling movements can be controlled, such as traveling straight ahead/backwards, turning with a crawler, differential steering, turning on spot, traveling with load. This kind of design enables crane to have high maneuverability.

Traveling speed：0～1.2km/h Gradeability: 30％

The tension degree of crawler can be adjusted by jack quickly and conveniently.

A-frame erecting mechanism

The A-frame erecting mechanism consists of A-frame, erection cylinder, auxiliary hydraulic system and so on. It is mainly used for the assembly, dismantling or conversion of the machine on the site. After the A-frame is erected over 90°, it can be used to connect anchoring rods on it and anchoring rods on main boom, assemble boom sections as well as install crawler carriers and counterweight.

Operator's cab movement-controlling mechanism

To reduce the transport width of the basic machine, the operator's cab can be swiveled out of the side working position to the centre of slewing table.

To broaden the field of vision of crane operator, the cab can tilt backwards for 20° via tilting cylinder when the load is lifted to a high position.

Counterweight and its fitting & removal mechanism

The counterweight plates, 40t in total, are protected against swinging by two locking chains. The counterweight can be fitted and removed by crane itself without the help of auxiliary crane. After the counterweight plates are lifted in specified position, they are secured with pin spindles.

Crawler carrier self-assembly/dismantling mechanism

The crawler carrier self-assembly/dismantling mechanism consists of folding brackets, support cylinders, support cylinder control valves, crawler carrier bolting cylinders and so on.

Support cylinders, the main load bearing components of crane, are used for raising the basic machine during assembly/dismantling. The load bearing capacity of single support cylinder is 25t. The support plates can be dismantled.

The crawler carrier can be assembled/ dismantled by crane itself without the help of auxiliary crane. They can be connected to undercarriage center section via crawler carrier bolting cylinders.

6. Crane system

Hydraulic system

The hydraulic system is composed of main pump, control valve, hydraulic motor, hydraulic oil tank, and oil cooler and so on.

International advanced pump-control technology is applied in the hydraulic system. Main hydraulic elements such as pump, motor and main control valve, are imported from Germany.

Main hydraulic pump: electro-hydraulic proportional double variable displacement piston pump;

Slewing pump: electro-hydraulic proportional piston pump;

Auxiliary pump: gear pump.

Main control valve: electro-hydraulic proportional pilot valve

Main circuit control way： main pump＋main changeover valve，controlled by two control levers.

Slewing mechanism: closed oil circuit

Hydraulic oil tank: 700L

Oil cooler: it is an aluminium cooler, and the cooler fan is driven by hydraulic motor.

Overflow valve

The overflow valve fitted in hydraulic system can restrain the pressure in the oil circuit from rising irregularly, thus protect such hydraulic elements as hydraulic oil pump and hydraulic motor against damage and prevent the hydraulic system from being overloaded.

Electrical system

24VDC, negative ground, two batteries of 165 AH each

The electrical system of machine includes power source, engine start, engine shutdown, indicator lights, warning device, illumination device, fan, wiper, horn, hoisting limiter, hydraulic oil cooling fan, digital display system, PLC controller, engine preheating device, safety equipment etc. which not only ensure safe operation of the crane, but also provide a good working environment. The crane adopts CAN bus control technology, which connects the engine, PLC controller and digital display efficiently, possessing fault detecting and self-diagnosis function.

Crane engine

Imported Cummins Electronic Fuel Injection engine with CAN bus interface

Rated power/ rotational speed:209kw,2100r/min

Max. output torque/ rotational speed:1425Nm,1400r/min

Exhaust emissions according to U.S. EPA TierⅢ

Fuel tank: 700L

Digital display system

The 10.4-inch LCD, having Chinese and English language versions, can show various data collected by PLC controller such as engine speed, water temperature, engine oil pressure, pressure of hydraulic pump, pressure of main motor, crane inclination, wind speed and operating hours of engine and so on. In this way, it can monitor the working state of crane at any time. When abnormal conditions occur, the system will send out red or yellow warning signal.

7. Safety equipment

Load moment limiter

It is composed of digital LCD, CPU, signal converter, sensor and so on. When actual load moment reaches 90% of the maximum permissible load moment, the warning light will light up and the buzzer will sound. When actual load moment reaches the maximum permissible load moment, the warning signals will sent out, and the dangerous movements will be switched off automatically so as to avoid accidents caused by overloading of crane, and thus ensure normal and safe crane operation.

The following data can be shown on the digital LCD:

Moment ratio

Main boom angle

Main boom length

Working radius

Actual load

Maximum permissible lifting load

Maximum permissible lifting height

Wind speed at boom head

Hoisting limiter

Device to prevent any specified upper limitation of the load lifting attachment from being exceeded.

If the load hook comes into contact with hoisting limit switch weight during its upward movement, the hoisting limit switch is triggered, the buzzer sounds, and the crane movement “spool up winch” is switched off.

Angle indicator

It is fitted at the lower rear end of boom pivot section (i.e. on the right side of the operator's cab). The operator can clearly see the boom angle in the cab.

Derricking (luffing) limiter

Device, constituted by load moment limiter and limit switch, to prevent derricking (luffing) motions of the main boom and/or luffing jib beyond specified limits

Tilting back support for main boom

The spring-loaded tilting-back steel support, mounted on the main boom pivot section, is used to prevent the main boom from tilting backwards.

Crane inclinometer

An electronic inclinometer to indicate the “leveled position” of the crane

Safety catch

Device to protect the lifted load from jumping out from the hook

Ratchet locking device for derricking winch

Device to prevent the derricking winch from rotating during long time parking

Lowering limiter

Device to ensure that three windings of rope on the hoist drum are maintained at all times during operation

When there are only 3 windings of rope left on the drum, the lowering limit switch is triggered, the buzzer sounds, and the crane movement “reel off winch” is switched off.

Anemometer

An electronic device to indicate the actual wind speed to the crane operator

Emergency shut-down button

Allow all crane movements and electrical control system to be cut off quickly in a dangerous situation.

Tricolor warning light

The warning light, by showing red, yellow and green three colors, can indicate loading status synchronously. The green color means the load ratio is less than 90%, the yellow color means the load ratio is between 90% and 100%, and the red color means that the load ratio has exceeded 100% and the crane is overloaded.

Monitoring system (optional)

2 video cameras: respectively monitor the working condition of crane winches and rear side of the crane

Display: switch between the monitoring screens via press-key.

Remote monitoring system GPS (optional)

Application of GPS enables such functions to be available as global positioning, GPRS data transmitting, working condition monitoring, remote fault diagnosing.

8. Operator's cab

Spacious, comfortable and all-steel construction cab, equipped with sun visor, adjustable seat, wiper, electric control levers, display of load moment limiter, digital display system, switches on auxiliary control box, air conditioning, fan, lighting lamp, CD player (and/or DVD player), cigarette lighter, fire extinguisher etc.

9. Load Hook

Rotatable load hook and with safety catch

100t load hook: 5 pulleys

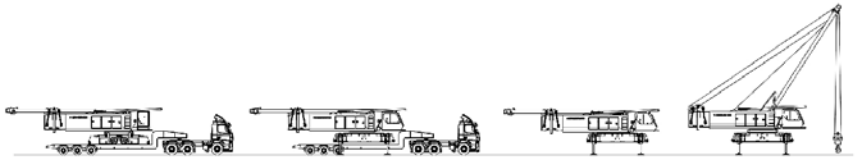
50t load hook (optional): 2 pulleys

30t load hook: 1 pulley

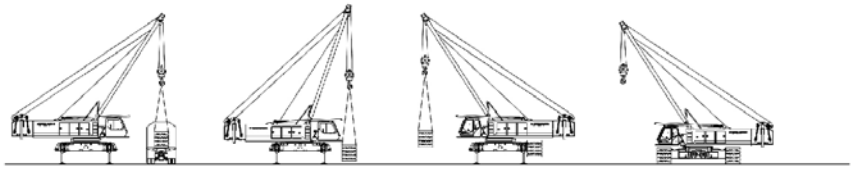
12t load hook: without pulley 。

III. Self–assembly & dismantling function

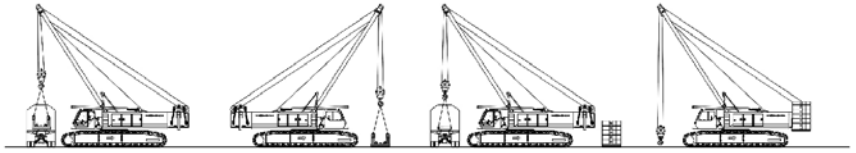
Take the self-assembly of crane in SW boom configuration as an example



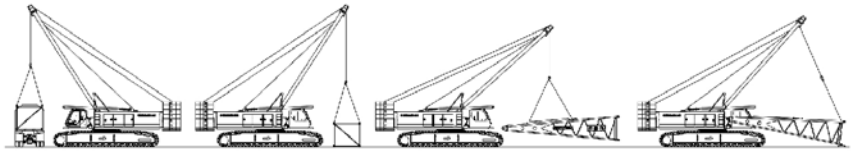
Unloading of basic machine



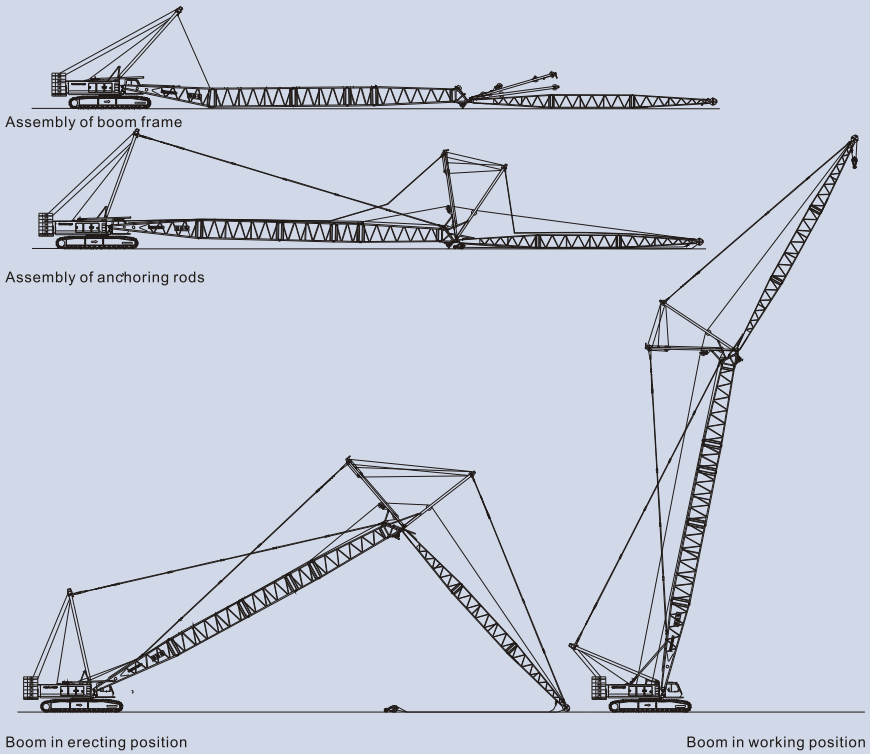
Unloading and assembly of crawler carriers



Unloading and assembly of rear counterweight



Unloading of boom frame



Ⅳ. Lifting capacity

10. Lifting performance on S boom

Lifting height on S boom