

Puyuan **QUY 600** Crawler Crane Technical Manual



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Courtesy of Crane.Market

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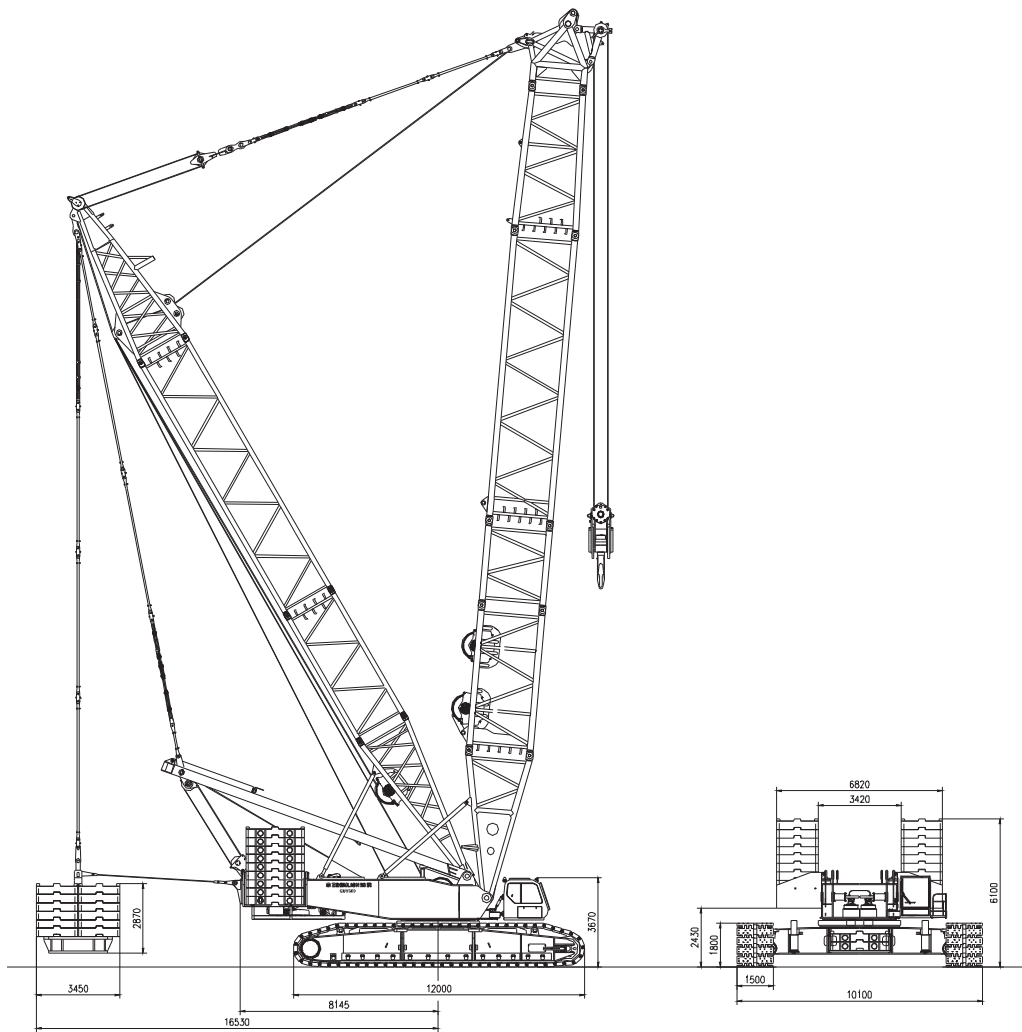
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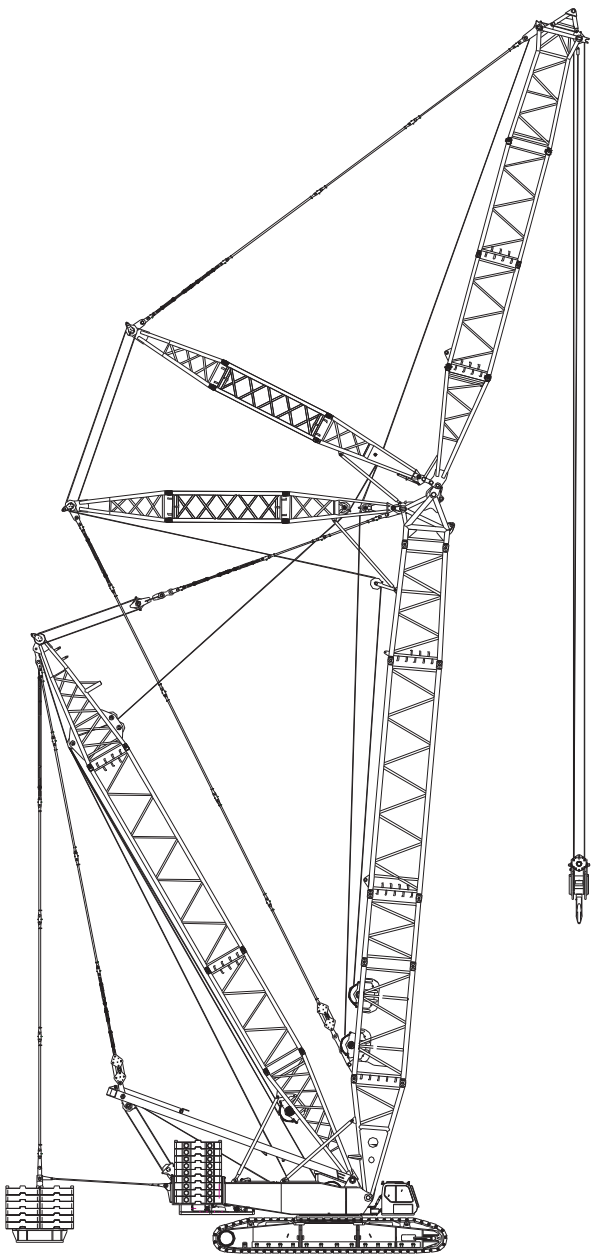
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Outline Dimensions and Main Parameters

Outline Dimensions of Complete Vehicle under Superlifting Main Boom Operating Condition



Outline Dimensions of Complete Vehicle under Superlifting Luffing Fly Jib Operating Condition

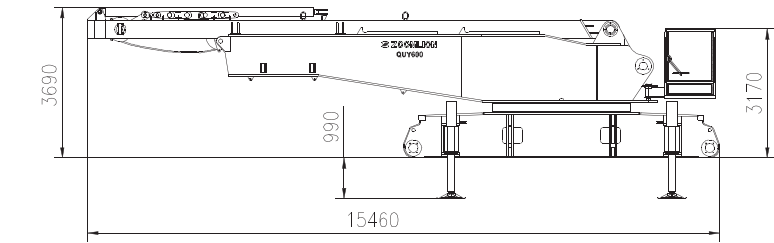


Main Performance Parameters

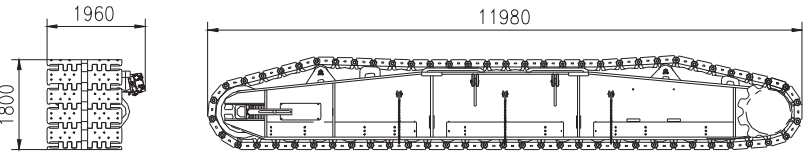
Item			Value	Remarks
Max. lifting load/ working radius	Standard	t × m	600 × 6	
	Superlifting	t × m	600 × 9	
Main boom length		m	24 ~ 84	
Light-duty boom	Standard	m	72~102	
	Superlifting	m	78~138	
Deadweight when use basic boom		t	480	
Fixed fly jib length		m	12~36	
Max. lifting load of fixed fly jib		t	110	
Offset angle of fixed fly jib		°	10,30	
Main boom + fixed fly jib	Standard	m	96 + 36	
	Superlifting	m	138 + 36	
Luffing fly jib length		m	24 ~ 96	
Max. lifting load of luffing fly jib	Standard	t	210	
	Superlifting	t	310	
Main boom working angle under luffing fly jib operating condition		°	65, 75, 85	
Main boom + luffing fly jib	Standard	m	66 + 84	
	Superlifting	m	84 + 96	
Speed of drum single layer rope	Main winch	m/min	130	
	Auxiliary winch	m/min	130	The 8th layer of a drum
	Luffing gear	m/min	2 × 56	The 7th layer of a drum
	Luffing gear of luffing fly jib		110	The 4th layer of a drum
	Luffing gear of superlifting luffing fly jib		130	The 6th layer of a drum
	Hoisting winch of runner		130	The 6th layer of a drum
Slewing speed		rpm	0~0.7	
Traveling speed		km/h	0 ~ 0.6/0 ~ 0.98	
Gradeability		%	30%	
Ground pressure		MPa	0.13	
Total outline dimensions L × W × H			15460 × 3400 × 3690	
Engine	Power/rotational speed	kW/rpm	420/1800	
	Torque/ rotational speed	Nm/rpm	2779/1400	
	Emission standard		EU Stage II	
Track space × ground contact length × track shoe width			8600 × 10580 × 1500	

Outline Dimensions and Weight of Main Transport Components

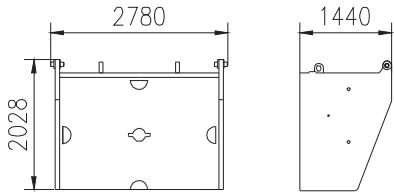
Basic machine (15460 × 3400 × 3690)—91t



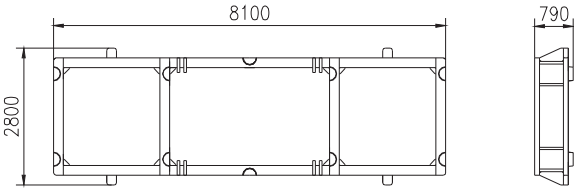
Crawler Side Frame (11980 × 1960 × 1800)—55t × 2



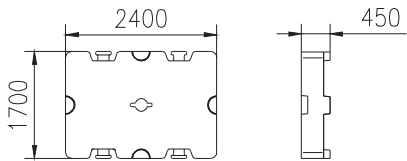
Base counterweight—6.5t × 2



Counterweight pedestal—1.1t × 2



Superlifting counterweight underframe—15.3t



Counterweight—9.5t × 52

2 Technical Instruction

1 Operating Conditions and Boom System

There are two kinds of operating conditions: standard operating condition and superlifting operating condition. The boom is lattice structure and made of imported high-strength tubular product. Pendant plate is made of imported high-strength plate material.

Standard operating conditions
① Main boom operating condition
Main boom length:24m~84m
Light boom length:72m~102m
Adjusting lengthened boom section length for main boom: 6m or 12m
② Fixed fly jib operating condition
Main boom length:30m~96m
Fixed fly jib length:12m~36m
Adjusting lengthened boom section length for fixed fly jib: 6m
③ Luffing fly jib operating condition
Main boom length:30m~72m
Luffing fly jib length:24m~60m
Adjusting lengthened boom section length for luffing fly jib: 6m or 12m

Superlifting operating conditions
①Superlifting main boom operating condition
Main boom + light boom length:36m~138m
② Superlifting fixed fly jib operating condition
Main boom length:36m~138m
Fixed fly jib length:12m~36m
③ Superlifting luffing fly jib operating condition
Main boom length:36m~84m
Luffing fly jib length:24m~96m

2 Mechanisms

Main and Auxiliary Hoist Mechanisms
The hoist mechanism consists of imported axial piston variable displacement hydraulic motor, balanced valve, reducer, normally closed brake and wire rope. It is independent of other mechanisms to be operated.
Wire rope is a kind of special torsion-resistant one from Germany.
The maximum single rope speed of main and auxiliary hoisting winch on the 8th rope layer is 130m/min.
The hoist mechanism is two-speed type, having two different lifting speeds, which can improve working efficiency. The main and auxiliary hoist mechanisms are controlled by the synchronizing controller when the mechanisms work synchronously.
Hoisting winch of runner is optional. The maximum single rope speed on the 6th rope layer is 130m/min.

Boom Hoist Mechanism
It consists of imported axial piston variable displacement hydraulic motor, balanced valve, reducer, normally closed brake and wire rope.
Wire rope is a kind of special torsion-resistant one from Germany.
The maximum single rope speed of main luffing gear on the 4th rope layer is 2×56m/min.
The maximum single rope speed of luffing gear of luffing fly jib on the 6th rope layer is 110m/min.
The maximum single rope speed of luffing gear of superlifting luffing fly jib on the 6th rope layer is 130m/min.

Slewing Mechanism
Adopting closed bi-drive double-slewing mechanism, slewing mechanism consists of concealed axial piston variable displacement hydraulic motor, gear reducer, brake, pinion gear and slewing ring etc.
With controllable sliding control, slewing gear can reduce impact to ensure slewing start/ brake more stably.
With imported original external gear and roller type slewing ring (triple row) and slewing reducer from Germany, slewing gear possesses the advantages of great load capacity and high accuracy to ensure the stability and accuracy of slewing. Slewing can realize stepless speed regulation varying from 0 to 0.7r/min.

Traveling Mechanism
It adopts double-motor and double-reducer. Hydraulic motor, traveling reducer 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., which ensure the crawler crane has great mobility and flexibility.
Traveling speed: 0~0.98km/h
Gradeability: 30%.
Tension degree of track can be adjusted by individual pumping station. It is very quick, convenient and reliable.

Mast Raising Mechanism
It consists of mast, mast raising cylinder and auxiliary hydraulic system etc. It is used for self-assembly/dismantling of the complete vehicle (or the change of working place). Before doing this work, the mast should be raised 90° over the horizontal level so as to connect pendant plate, assemble boom and install crawler side frame and counterweight.

Operator’ s Cab Rotary and Pitching Mechanism
Controlled by cylinder, operator’ s cab can rotate90° from the side of slewing table to the front of slewing table and then be fixed by positioning pin, which can reduce the width of complete vehicle to make it convenient for transporting.
Operator’ s cab is tilted by cylinder. When the lifting height is high, operator’ s cab can be raised upwards for 20° to broaden the driver’ s vision greatly.

Outrigger Raising Mechanism and Track Self- assembly/dismantling Mechanism
Outrigger raising mechanism and track self-assembly/dismantling mechanism consist of outriggers, outrigger cylinder, outrigger valve and track power pin etc. Outrigger raising mechanism is the main load bearing mechanism when self-assemble/dismantle track. Through mast and mast raising mechanism, track self-assembly/dismantling mechanism is used for lifting crawler side frame which is connected with frame by power pin. Through wireless remote control, outrigger raising mechanism and track self-assembly/dismantling mechanism can assemble/dismantle crawler side frame without auxiliary lifting equipment, which can improve working efficiency and reduce labor intensity and avoid danger of manual operation.

3 Systems

Hydraulic System
Hydraulic system consists of main pump, control valve, hydraulic motor, hydraulic oil tank and cooler etc.
Hydraulic system adopts advanced pump control system in the world and its main components such as pump, motor and main loop valves are all imported from Germany and have advantages of high efficiency, energy-saving, high reliability and long service life.
Main hydraulic pump: is piston variable displacement pump with tandem gear pump, driven by engine.
Oil source of auxiliary mechanism: constant pressure pump.
Main control valve: pilot electro-hydraulic control valve.
Control method for main loop: controlled by pump control system and joysticks.
Control of auxiliary mechanism: electromagnetic reversing valve blocks. It is equipped with unloading overflow valve.
Outrigger operating: remote controllable electromagnetic valve.
Hydraulic oil tank capacity: 1000L.
Oil filter: oil filter of oil return circuit, precision filter of oil control circuit.
Cooler: aluminium radiator, with electric fan driven by hydraulic motor.

Electrical System
This system with 24V DC and earth negative, has two 195 AH accumulators.
Electric appliance of complete vehicle mainly includes power, engine start, engine shut-down, indicator light, annunciator, illumination, fan, wiper, horn, hoisting limiter, hydraulic oil cooling fan, digitized display, PLC controller, load moment limiter, 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, load moment limiter and digitized display efficiently, and possesses trouble detecting and self-diagnosis function.

Power System
Engine: imported original VOLVO electric spraying diesel engine with CAN-bus interface.
Rated output power: 420kw, 1800r/min
Max. output torque: 2779Nm, 1400r/min
Emission standard: U.S. EPA Tier II and EU Stage II
Fuel tank capacity is 700L which ensures long working hours of engine.

Centralized Display System
10.4 inches large touch LCD intercalates Multilanguage display and can centralized display operating condition signals collected by PLC controller, such as engine rotary speed, water temperature, quantity of fuel, engine oil pressure, hydraulic pump pressure, main motor pressure and operating level of basic machine etc. It can monitor working state in real time and give out a yellow or red warning signal when the working state of crane is abnormal.

GPS/GPRS Remote Monitoring System
GPS/GPRS remote monitoring system consists of on-board computer system, on-board communication/navigation system, GPS global positioning system, GPRS wireless communication system, web server system and remote monitoring center system etc. It can realize the global positioning, working information monitor, trouble diagnosis, remote maintenance and warning of equipments and possesses door locking and anti-theft functions etc.

Centralized Lubrication System
It adopts Bake centralized lubrication system imported from Germany, which is convenient for maintenance and can reduce the abrasion of components.

4 Safety Equipment

The crane adopts mechanical, electric and hydraulic safety equipments and warning devices so as to ensure the crane can work safely.

Load Moment Limiter
It consists of load moment display and digitized LCD. When actual load moment reaches 90% of rated load moment, the warning lamp lights up and the buzzer alarms; when it reaches rated load moment, the crane stops working automatically to prevent accidents occur due to overload during operation and ensure normal and safe work.
The digitized LCD displays the following data:
Moment ratio
Elevation angle of main boom
Main boom length
Working radius
Actual load
Permissible lifting load
Max. permissible lifting height
Wind speed at the top of boom

Overflow Valves of Hydraulic System
It can restrain the abnormal high pressure in loop to prevent hydraulic oil pump and hydraulic motor from being damaged and prevent hydraulic system from overloading.

Over-wind and Over-release Protection Device for Wire Rope

Hoisting Limiter

Boom Angle Indicator

Motion Limiter

Level Sensor of the Complete Vehicle

Anti-unhook Device

Anemoscope

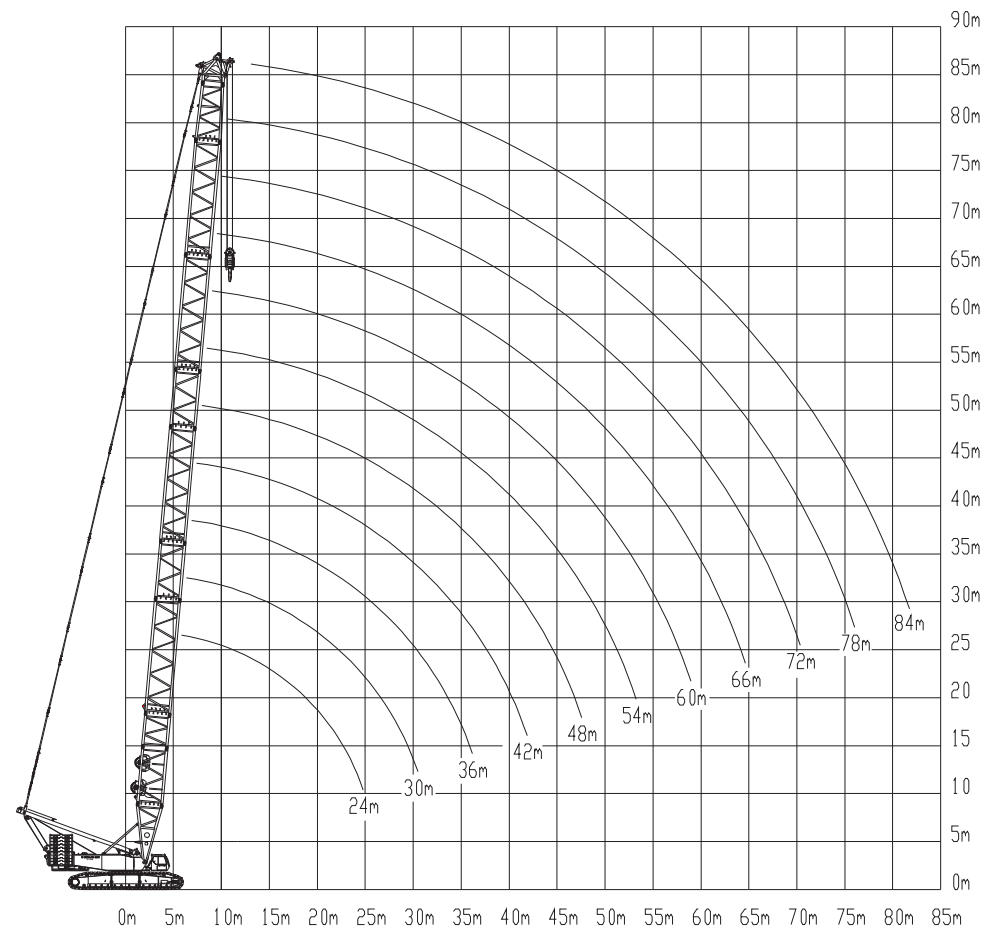
Video Monitoring System

Operator’ s Cab
It adopts all-steel structure. Its all sides are made of hardened glass, and the roof and the front window are furnished with laminated glass. It is equipped with sun visor, adjustable seat, wiper, electric control handles, load moment display, digitized display, auxiliary remote control box operation assembly of switches, air conditioner, electric fan, illumination lamp, radio (CD player and DVD player are optional), cigarette lighter, fire extinguisher etc. Wide vision and spacious room in the cab fully embody ergonomic design.

Hook
It is equipped with rotatable hook and anti-unhook device.
600t main hook with 24 sheaves is used under main boom operating condition 400t main hook (optional) with 15 sheaves is used under main boom operating condition.
300t main hook with 12 sheaves is used under luffing fly jib operating condition.
200t main hook (optional) with 8 sheaves is used under luffing fly jib operating condition.
100t auxiliary hook with 4 sheaves is used under fixed fly jib operating condition.
50t auxiliary hook with 2 sheaves is used under fixed fly jib operating condition.
16t auxiliary hook is cylindrical member.

3 Lifting Performance

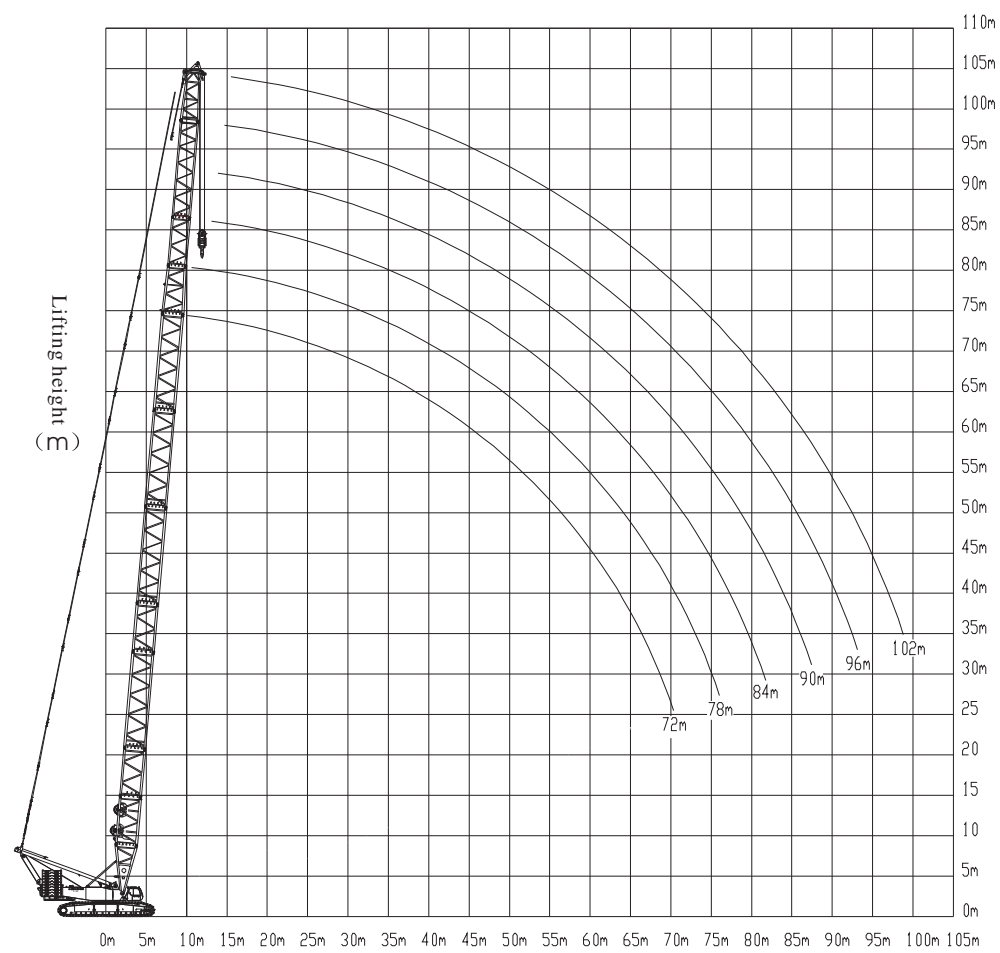
Heavy-duty main boom lifting performance



Heavy-duty main boom load rating chart (counterweight is 140+40t)

Main boom length number of lines working radius	24	30	36	42	48	54	60	66	72	78	84
	48	46	46	40	32	26	26	20	20	14	14
6	600										
7	569.9	570	576								
8	521.9	514.8	509.4	507.4							
9	430.7	418.2	415.8	413.4	411.1						
10	356.8	351.7	346.7	341.9	337.3	334.5	331.1				
12	261.8	259.6	253.9	248.4	245.9	244.7	242.5	240.3	240.1		
14	205.6	202	198.4	197.1	195.3	192.4	188.7	186.1	185.8	184.4	182.9
16	168.7	165.4	164.1	162.9	160.6	158.2	157.0	154.0	152.9	151.7	152.2
18	140.9	137.9	136.5	135.3	132.3	131.0	129.0	126.5	125.6	124.6	123.6
20	121.5	118.8	117.4	116.1	113.4	112.1	110.8	108.1	107.3	105.1	104.2
22	106.7	104.1	102.7	101.3	98.8	96.2	94.9	93.6	92.3	90.9	88.9
24		92.3	90.9	88.5	87.1	84.7	83.3	81.0	80.7	79.4	78
26		82.7	81.3	79	77.6	75.2	74.0	71.7	71.2	69.9	68.5
28		74.7	73.3	71.1	69.7	67.5	66.1	63.9	63.3	62	59.9
30			66.6	64.4	62.2	60.8	59.5	57.4	56.0	54.6	53.3
34				53.7	51.7	50.3	48.9	47	45.5	43.1	42.8
38				45.6	43.7	42.3	40.3	39	36.7	35.3	33.9
42					37.3	35.9	34.1	31.8	30.5	28.3	26.7
46						30.4	28.2	26.9	25.5	22	20.4
50							24.8	22.9	20.1	17.2	16.1
54								18.7	16.4	13.7	12
58								16.0	13.3	11.5	9.3
62									10.8	8.8	
66										6.8	

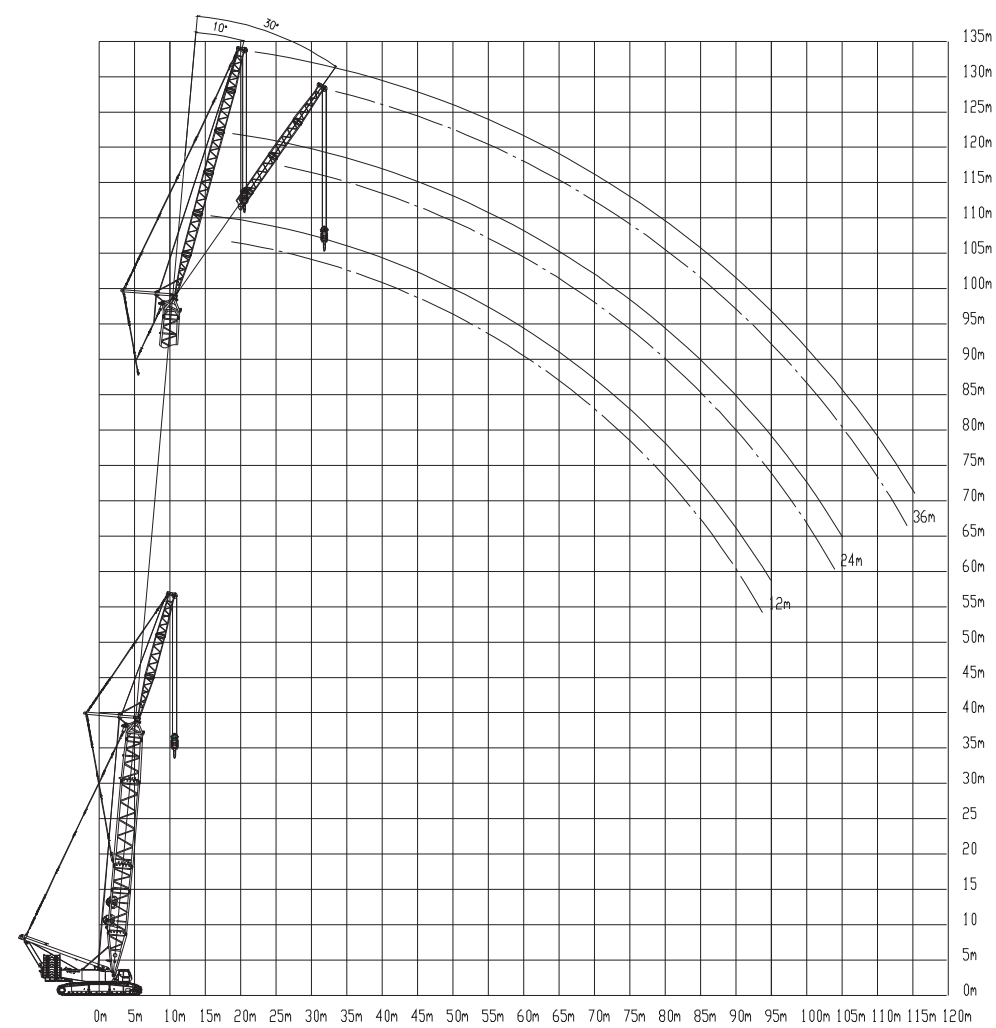
Light-duty main boom lifting performance



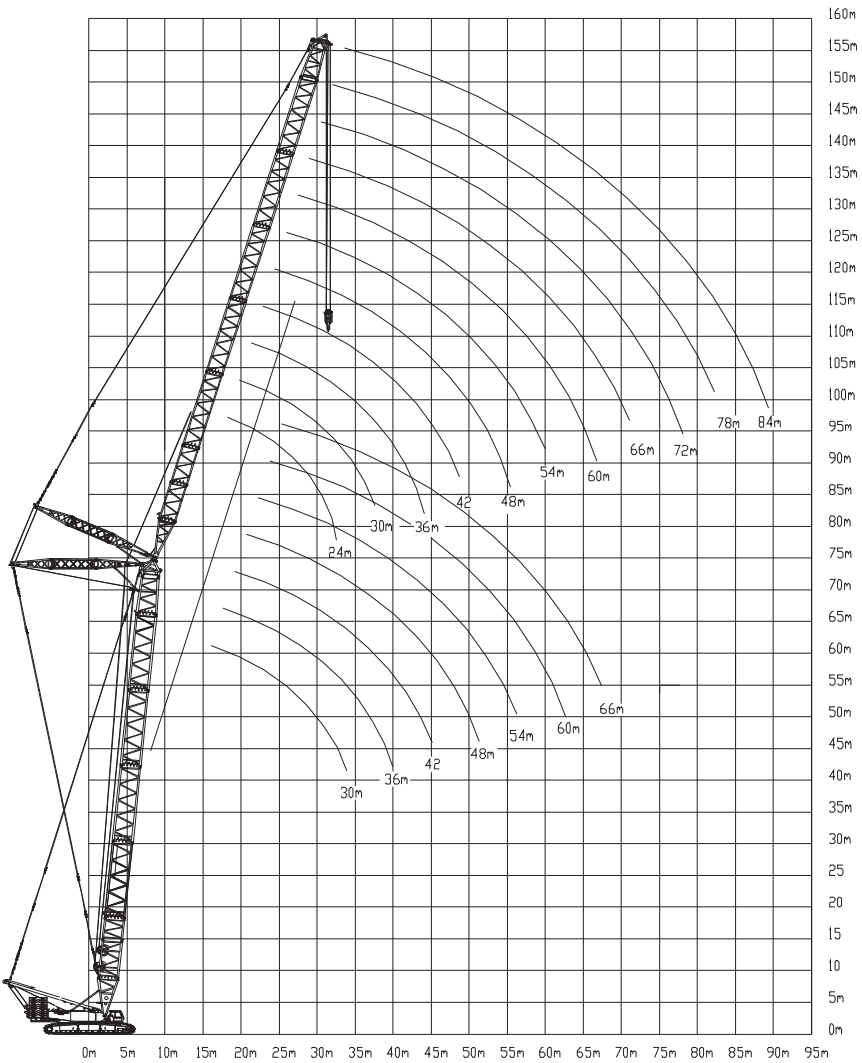
Light-duty main boom load rating chart

Main boom length	72	78	84	90	96	102
number of lines	20	16	12	12	10	8
12	252.8					
14	197.9	189.0	157.3			
16	164.6	159.2	138.2	148.2	135.1	
18	133.9	133.9	120.6	130.7	121.2	97.1
20	115.7	115.6	114.5	113.1	111.6	85.7
22	100.6	100.2	100.3	99.0	97.7	80.6
24	87.8	87.7	87.3	86.6	85.4	73.9
26	77.4	76.7	76.0	76.5	76.0	71.7
28	69.5	68.1	68.2	67.8	67.3	66.0
30	62.1	61.2	60.9	60.4	59.2	58.7
34	50.9	50.1	49.8	48.8	47.7	47.1
38	42.3	41.6	40.8	40.7	39.7	38.2
42	35.8	35.5	33.7	33.5	32.6	31.2
46	30.4	29.5	27.9	27.7	26.8	25.9
50	25.7	24.6	23.6	22.9	22.1	21.4
54	22.1	20.9	19.7	19.0	18.4	17.8
58	18.7	17.8	16.6	16.0	15.3	14.7
62	16.0	15.2	13.9	13.4	12.7	11.5
66		12.7	11.6	11.1	10.4	9.4
70		11.0	9.6	9.3	8.5	7.3
74			7.7	7.2	6.7	5.8
78				5.6	5.1	

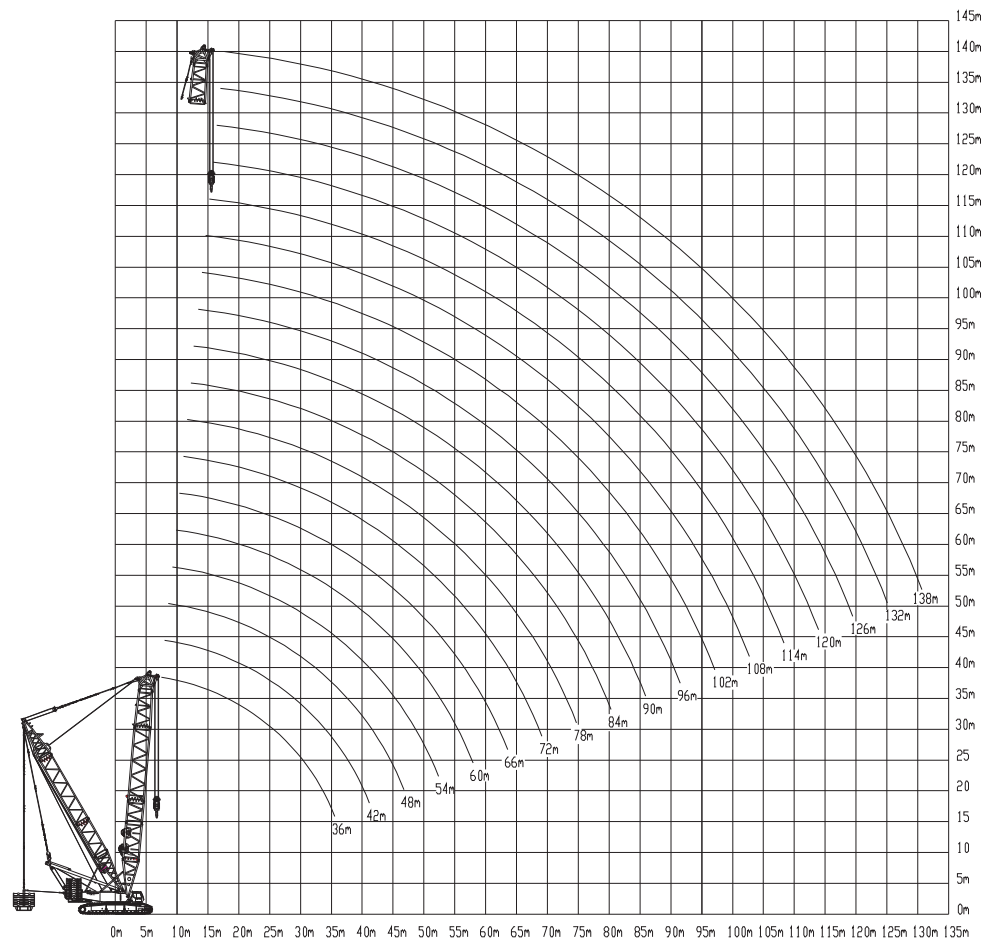
Fixed fly jib lifting performance



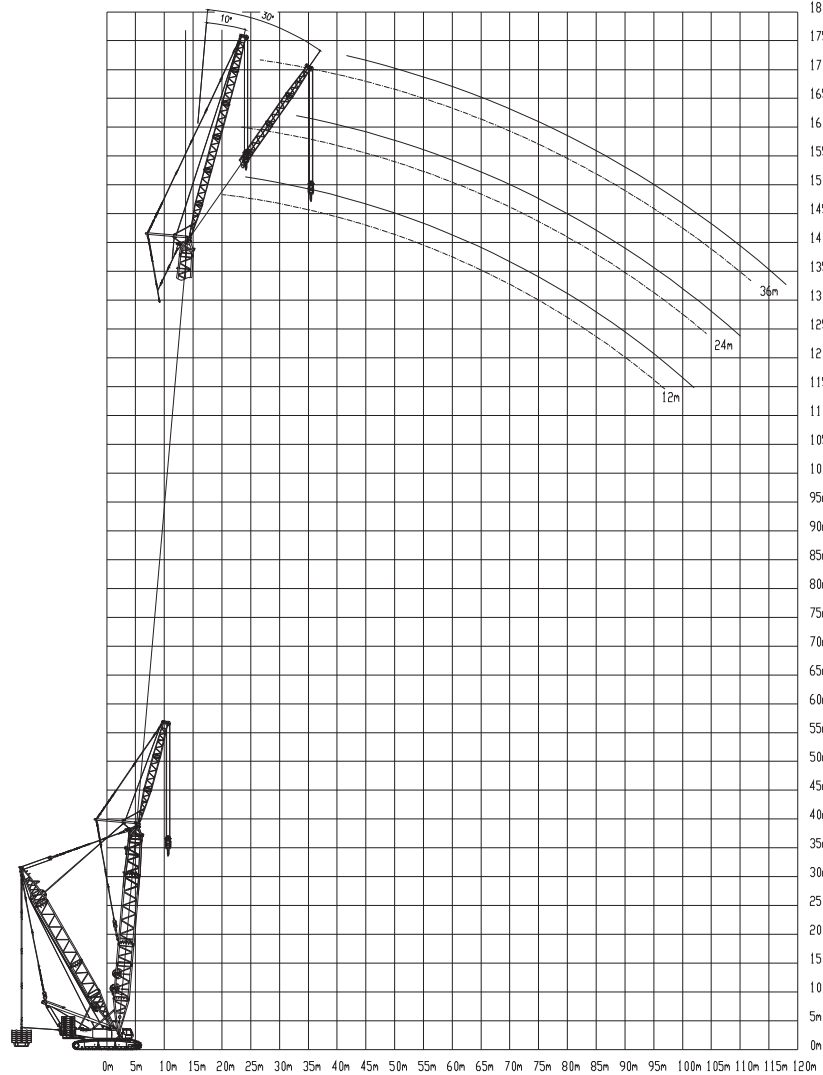
Luffing fly jib lifting performance



Superlifting main boom lifting performance



Superlifting fixed fly jib lifting performance



Superlifting luffing fly jib lifting performance

