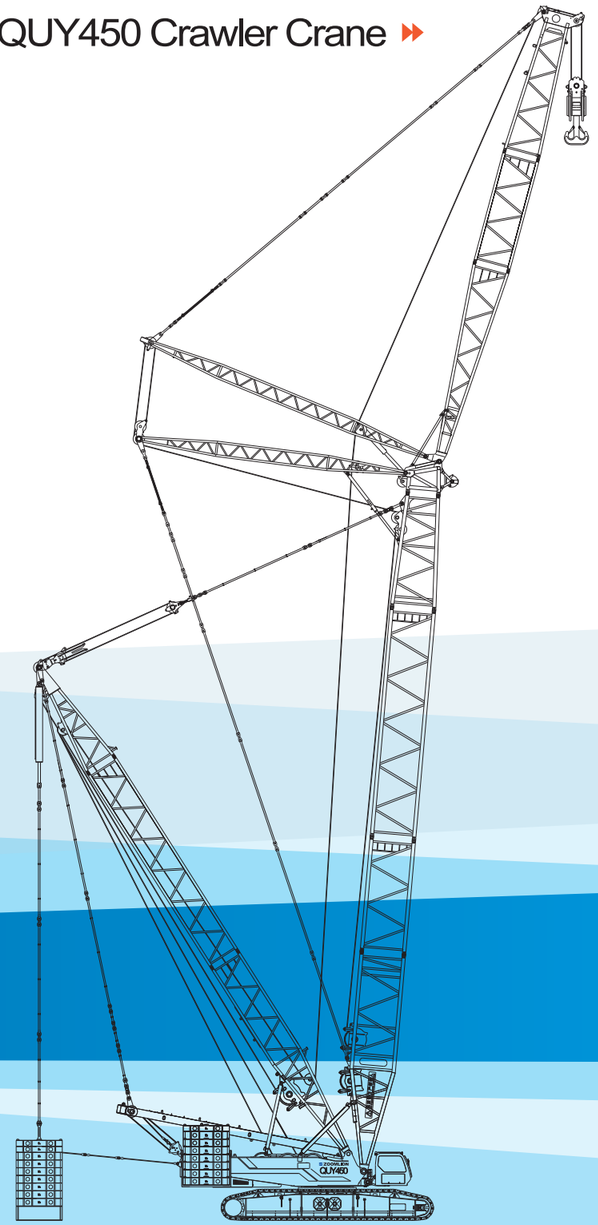
ZOOMLION

QUY450

Zoomlion QUY450 Crawler Crane



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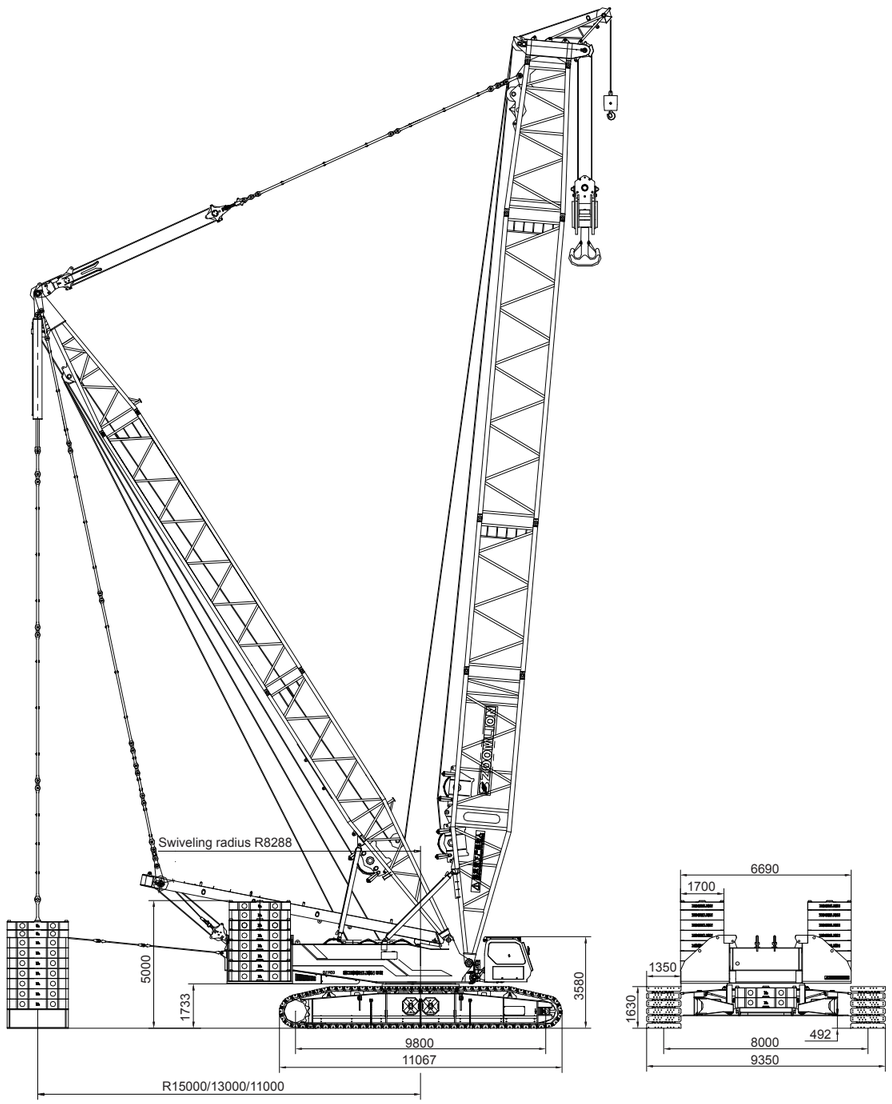
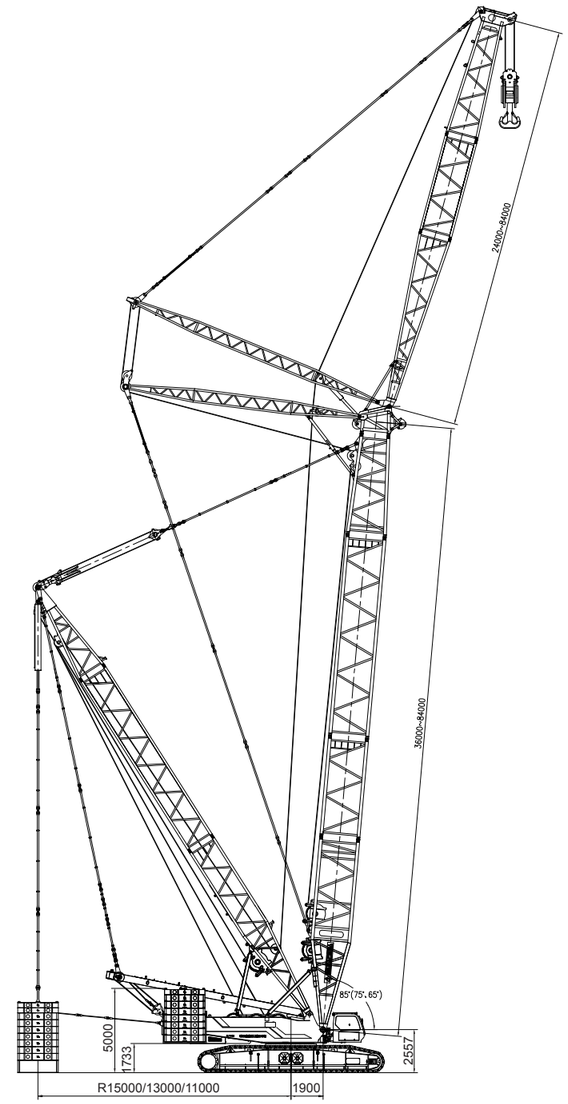


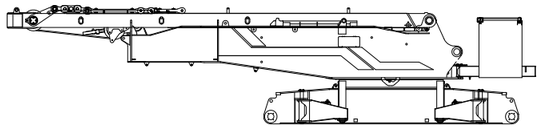
2. External Dimensions of Crane during Superlift Operations with Luffing Jib



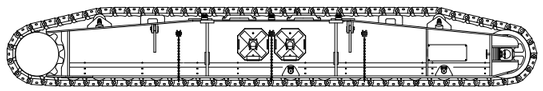
3. Main Performance Parameters

Items		Unit of measurement	Values	Remarks
Maximum lifting capacity/radius	Standard	t/m/m	400 × 6	
	Superlift	t/m/m	450 × 12	
Heavy duty boom	Standard	m	24~84	
	Superlift	m	36~84	
Light duty boom	Standard	m	48~102	
	Superlift	m	78~126	
Deadweight of crane with basic boom		m	370	
Length of fixed jib		t	12~36	
Maximum lifting capacity with fixed jib		m	80	
Setting angle of fixed jib		°	10, 30	
Main boom + fixed jib		t	78 + 36	
Main boom + heavy fixed jib		m	84 + 12	
Maximum lifting capacity with heavy fixed jib		t	100	
Setting angle of heavy fixed jib		°	15	
Length of luffing jib		m	24~84	
Maximum lifting capacity with luffing jib	Standard	t	142/14	
	Superlift	t	225/14	
Working angle of main boom in crane operation with luffing jib		°	65, 75, 85	
Longest main boom + longest luffing jib	Standard	m	60 + 72	
	Superlift	m	84 + 84	
Speed of single rope on drum	Primary lifting	m/min	0~143	
	Secondary lifting	m/min	0~143	
	Luffing	m/min	0~2 × 50	
	Luffing of tower crane	m/min	0~122	
	Superlift luffing	m/min	0~143	
	Gooseneck lifting	m/min	0~108	
Swiveling speed		rpm	0~1.1	
Traveling speed		km/h	0~1.6	
Gradeability		%	30	
Ground pressure		MPa	0.14	
Main machine transport dimensions L×W×H		mm	15500 × 3100 × 3400	With mast
Engine	Power/rotational speed	kW/rpm	360/1800	
	Torque/rotational speed	Nm/rpm	2200/1300	
	Emissions standard		T3	
Distance between track centers × crawler contact length × crawler shoe width		mm	8000 × 9800 × 1350	

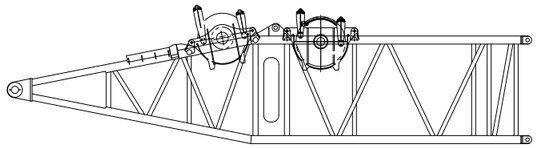
4. External Dimensions and Weight of Main Transport Components



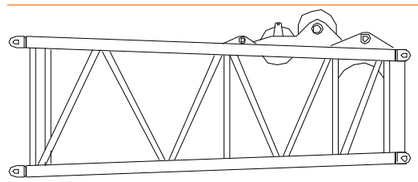
Main machine (excluding main and auxiliary winches)	
Length	15500mm
Width	3100mm
Height	3400mm
Weight	60.3t (including mast) 48.4t (excluding mast and main luffing winch)



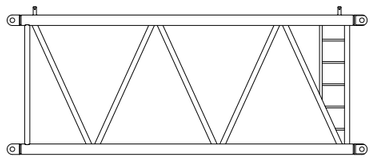
Crawler assembly	
Length	11070mm
Width	1910mm
Height	1630mm
Weight	34.3t



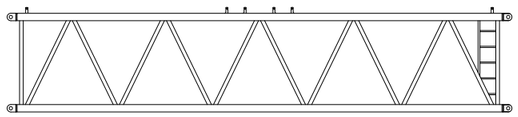
Base section of main boom	
Length	11670mm
Width	3080mm
Height	2980mm
Weight (including winch)	16.5t



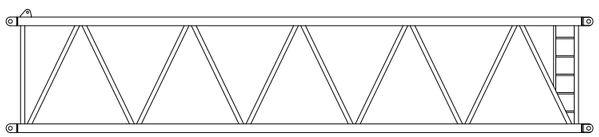
Top section of main boom	
Length	6180mm
Width	2780mm
Height	2720mm
Weight	3.95t



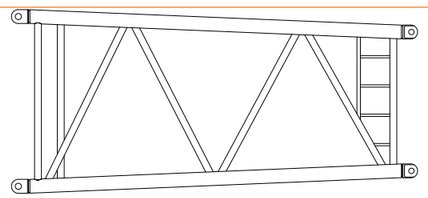
6m section of main boom	
Length	6180mm
Width	2780mm
Height	2520mm
Weight	3.12t



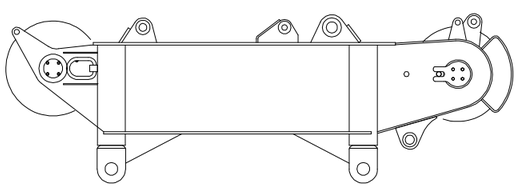
12m section of main boom	
Length	12180mm
Width	2780mm
Height	2520mm
Weight	5.69t



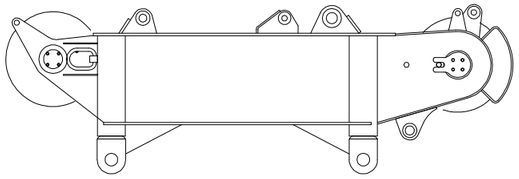
12m section of main boom A	
Length	12180mm
Width	2780mm
Height	2540mm
Weight	5.69t



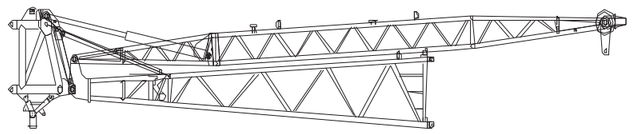
Transition section of light duty boom	
Length	5270mm
Width	2780mm
Height	2380mm
Weight	2.53t



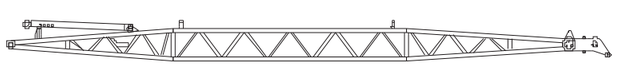
450t tower head	
Length	3220mm
Width	2430mm
Height	1080mm
Weight	3.55t



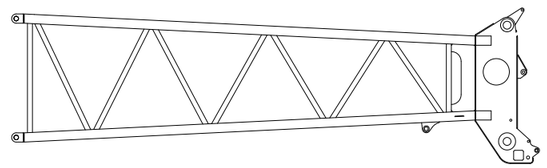
300t tower head	
Length	3220mm
Width	2430mm
Height	1080mm
Weight	2.7t



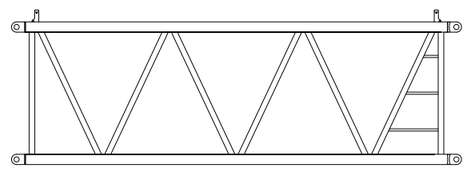
100t tower head + base section of luffing jib + front bracing pole of luffing jib	
Length	18000mm
Width	2510mm
Height	3180mm
Weight	12.4t



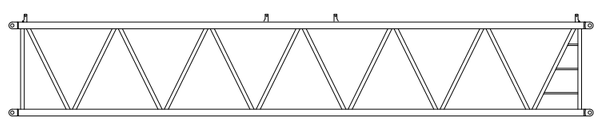
Rear bracing pole of luffing jib	
Length	15145mm
Width	2320mm
Height	1000mm
Weight	4.8t



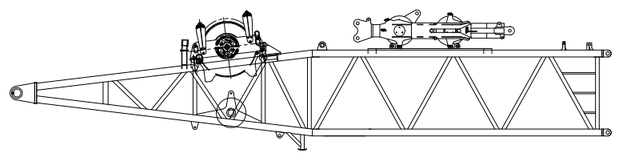
Top section of luffing jib	
Length	8070mm
Width	2340mm
Height	2360mm
Weight	3.5t



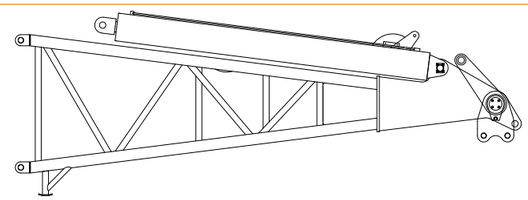
6m section of luffing jib	
Length	6140mm
Width	2340mm
Height	2100mm
Weight	1.86t



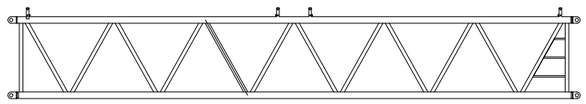
12m section of luffing jib/A	
Length	12140mm
Width	2340mm
Height	2100mm
Weight	3.5t/3.83t



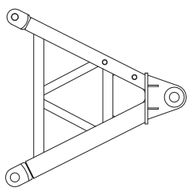
Base section of superlift mast	
Length	12210mm
Width	2660mm
Height	2560mm
Weight	13.5t



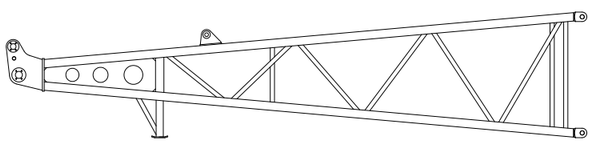
Top section of superlift mast	
Length	6400mm
Width	2550mm
Height	2320mm
Weight	6.8t



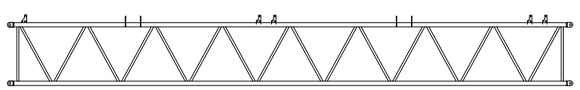
Intermediate section of superlift mast	
Length	12140mm
Width	2385mm
Height	1930mm
Weight	4.1t



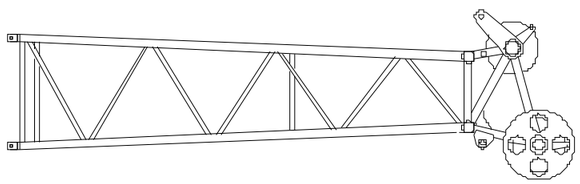
Connection bracket of fixed jib	
Length	12100mm
Width	1450mm
Height	1480mm
Weight	0.33t



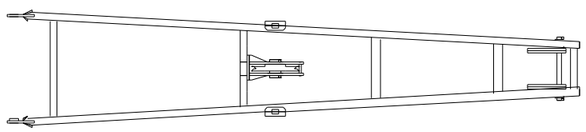
Base section of fixed jib	
Length	6190mm
Width	1580mm
Height	1330mm
Weight	0.75t



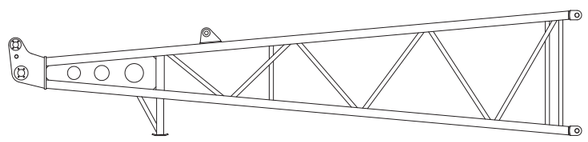
12m section of fixed jib	
Length	12100mm
Width	1450mm
Height	1480mm
Weight	1.25t



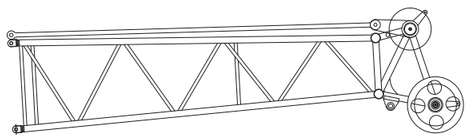
Top section of fixed jib	
Length	6450mm
Width	1450mm
Height	1800mm
Weight	1.1t



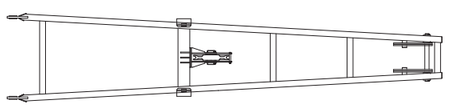
Bracing pole of fixed jib	
Length	7360mm
Width	1490mm
Height	660mm
Weight	0.98t



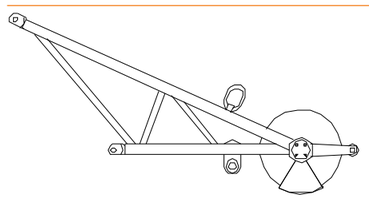
Base section of heavy fixed jib	
Length	6190mm
Width	1580mm
Height	1330mm
Weight	0.75t



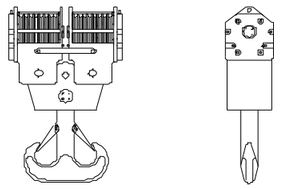
Top section of heavy fixed jib	
Length	6450mm
Width	1450mm
Height	1800mm
Weight	1.3t



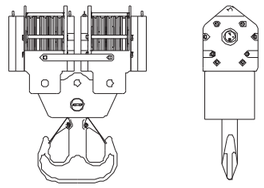
Bracing pole of heavy fixed jib	
Length	7360mm
Width	1490mm
Height	660mm
Weight	0.98t



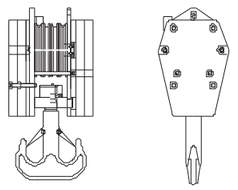
Gooseneck boom	
Length	2560mm
Width	870mm
Height	1330mm
Weight	0.22t



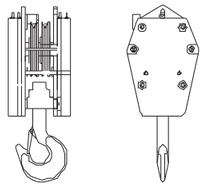
400t hook	
Length	1800mm
Width	916mm
Height	3062mm
Weight	7.2t



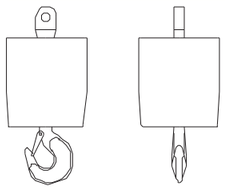
250t hook	
Length	1800mm
Width	912mm
Height	2482mm
Weight	5.9t



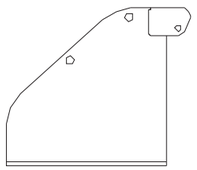
100t hook	
Length	970mm
Width	800mm
Height	1965mm
Weight	4.1t



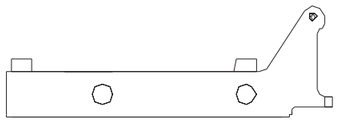
50t hook	
Length	700mm
Width	800mm
Height	1965mm
Weight	2.65t



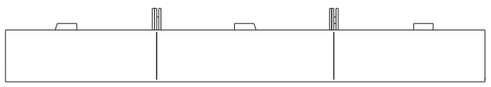
16t hook	
Length	530mm
Width	530mm
Height	1155mm
Weight	0.9t



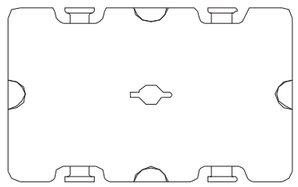
Counterweight frame	
Length	2200mm
Width	2622mm
Height	1890mm
Weight	5.2t



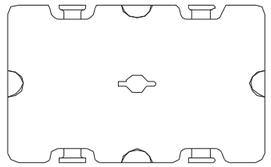
Ballast weight frame of vehicle body	
Length	2270mm
Width	2320mm
Height	780mm
Weight	1t



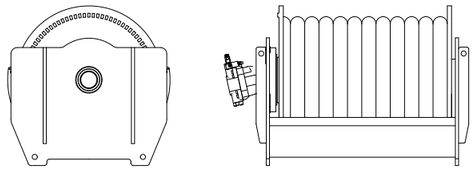
Base frame of counterweight during superlift operations	
Length	6700mm
Width	2400mm
Height	1062mm
Weight	4.8t



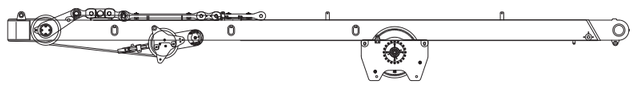
10t counterweight block	
Length	2400mm
Width	1700mm
Height	455mm
Weight	10t



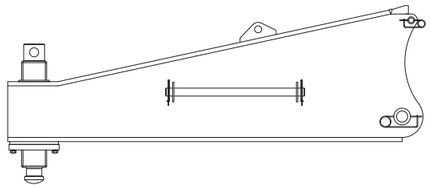
5t counterweight block	
Length	2400mm
Width	1700mm
Height	365mm
Weight	5t



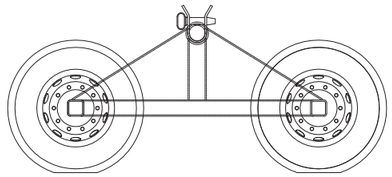
Main lifting winch	
Length	1920mm
Width	1280mm
Height	1250mm
Weight	5.6t



Mast + main luffing winch	
Length	12474mm
Width	3145mm
Height	1440mm
Weight	12.8t



Auxiliary outrigger	
Length	2985mm
Width	460mm
Height	1275mm
Weight	1.7t



Landing wheel	
Length	2340mm
Width	1865mm
Height	1035mm
Weight	0.7t

II. Technical Descriptions

5. Operating Modes and Boom System

The boom system offers two operating modes, i.e. standard operating mode and superlift operating mode; the boom is of a truss-type structure, imported high strength tubing is used for the main tubing material, and the anchoring rods are made of imported high strength plates.

Standard operating mode

①Crane operations with main boom - Length of main boom: 24~84 m

Length of additional adjustable section of main boom: 6m, 12m

Length of main boom (m)	Intermediate section of main boom	
	6m	12m
24	1	0
30	2	0
36	1	1
42	2	1
48	1	2
54	2	2
60	1	3
66	2	3
72	1	4
78	2	4
84	1	5

Length of light duty boom: 48 ~ 102m

Length of light duty boom (m)	Intermediate section of main boom		Intermediate section of luffing jib		
	6m	12m	6m	12mA	12m
48	1	1	1	0	0
54	1	1	2	0	0
60	2	1	2	0	0
66	2	1	1	1	0
72	1	2	1	1	0
78	1	2	2	1	0
84	2	2	2	1	0
90	2	2	1	1	1
96	1	3	1	1	1
102	1	3	2	1	1

② Crane operation with fixed jib -- Length of main boom: 30~78m

Length of fixed jib: 12~36m

Length of additional adjustable section of fixed jib: 12m

Length of fixed jib (m)	Intermediate section of fixed jib
	12m
12	0
24	1
36	2

③Length of main boom: 30~60 m

Length of luffing jib: 24~72m

Length of additional adjustable section of luffing jib: 6m, 12m

Length of luffing jib (m)	Intermediate section of luffing jib		
	6m	12m	12m
24	1	0	0
30	2	0	0
36	1	1	0
42	2	1	0
48	1	1	1
54	2	1	1
60	1	1	2
66	2	1	2
72	1	1	3

④Crane operation with heavy fixed jib - Length of main boom: 36~84m

Length of heavy fixed jib: 12 m

Superlift operating mode

① Crane superlift operation with main boom - Length of main boom: 36~84m

Length of light duty boom: 78~126m

Length of light duty boom (m)	Intermediate section of main boom		Intermediate section of luffing jib		
	6m	12m	6m	12mA	12m
78	1	4	0	0	0
84	1	4	1	0	0
90	1	4	2	0	0
96	1	4	1	1	0
102	1	4	2	1	0
108	1	4	1	1	1
114	1	4	2	1	1
120	1	4	1	1	2
126	1	4	2	1	2

②Crane superlift operation with fixed jib - Length of main boom: 24~84m

Length of luffing jib: 24 ~ 84m

Length of luffing jib (m)	Intermediate section of luffing jib		
	6m	12m	12m
24	1	0	0
30	2	0	0
36	1	1	0
42	2	1	0
48	1	1	1
54	2	1	1
60	1	1	2
66	2	1	2
72	1	1	3
78	2	1	3
84	1	1	4

6. Mechanisms

Primary and secondary lifting mechanisms

The primary and secondary lifting mechanisms are each comprised of an imported variable displacement axial plunger hydraulic motor, balance valve, speed reducer, normally closed brake, and wire ropes. They can be controlled independently of other mechanisms.

The wire ropes used are completely non-rotating and anti-twisting wire ropes, imported from Germany.

A synchronizing controller is available for when the primary and auxiliary mechanisms are working synchronously.

Winch #3, i.e. the gooseneck lifting winch, is an optional component; its maximum single rope speed is 110m/min.

Main and secondary lifting winches	Wire rope diameter	28mm
	Wire rope length	830m
	Single rope tension	158kN

Luffing mechanism

The luffing mechanism and superlift luffing mechanism are both comprised of an imported variable displacement axial plunger hydraulic motor, balance valve, speed reducer, normally closed brake, and wire ropes.

The main luffing mechanism is comprised of an imported fixed-displacement axial plunger hydraulic motor, balance valve, speed reducer, normally closed brake, and wire ropes.

The wire ropes used are completely non-rotating and anti-twisting wire ropes, imported from Germany.

Main luffing winch	Wire rope diameter	28mm
	Wire rope length	300m × 2
	Single rope tension	158kN

Main and secondary lifting winches	Wire rope diameter	28mm
	Wire rope length	700m
	Single rope tension	158kN

Main and secondary lifting winches	Wire rope diameter	28mm
	Wire rope length	950m
	Single rope tension	158kN

The maximum single rope speed of the main luffing winch is 2×50m/min.

The maximum single rope speed of the tower luffing winch is 122m/min.

The maximum single rope speed of the superlift luffing winch is 143m/min.

Slewing mechanism

The slewing mechanism employs a closed-type two-driving-two slewing mechanism, and is comprised of a fixed-displacement hydraulic motor, gear speed reducer, brake, pinions and slewing bearings.

The slewing mechanism is equipped with a controllable slip-turn function to reduce shock and allow for higher stability during initiation and braking.

The slewing mechanism employs original imported triple-row-roller external geared slewing bearings 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 0~1.1r/min.

Traveling mechanism

The traveling mechanism is a four-motor dual-reducer type; the hydraulic motor, traveling speed reducer and balance valve are all imported from Germany. The two crawlers are controlled by two different handles, allowing for a variety of traveling actions such as straight line traveling, unilateral steering, differential steering, pivotal steering, and driving with load, etc., thus offering a high level of mobility, maneuverability and flexibility.

Traveling speed: 0~1.6km/h.

Gradeability: 30%.

Crawler tensioning: the tensioning oil cylinder is controlled by a standalone pump station, making adjustment is fast, easy and reliable.

Mast jack-up mechanism

Comprised of the mast, mast jack-up oil cylinder, and auxiliary hydraulic system, etc., the mast jack-up mechanism is used during self-assembling/disassembling (or relocating) of the whole machine, where mast can be jacked up beyond 90° perpendicular from its horizontal position to make it easy to connect the anchoring rods, assemble the boom, and mount the crawler assembly.

Control room swiveling and luffing mechanism

The operational oscillating oil cylinder allows the control room to rotate by 90° from the side of the rotating platform to the front of the rotating platform, thus reducing the overall width of the crane and making it easier to transport.

The control room's luffing is controlled with oil cylinders; when lifting to a especially high height, the control room can luff upwards by 20°, thereby dramatically expanding the driver's field of vision.

Outrigger jack-up and crawler self-mounting and dismounting mechanism

The outrigger jack-up and crawler self-mounting and dismounting mechanism is comprised of the undercarriage outriggers, outrigger oil cylinders, outrigger valves, and crawler power pin, etc. The outrigger jack-up mechanism is the primary load carrying mechanism during the crawler self-mounting and dismounting process. The crawler self-mounting and dismounting mechanism lifts and installs the crawler assembly using the mast and mast jack-up mechanism, and uses the power pin to connect the chassis frame and the crawler assembly together. When no auxiliary lifting equipment is available, the outrigger jack-up and crawler self-mounting and dismounting mechanism can independently mount and dismount the crawler assembly, thereby improving operational efficiency, reducing the manual work intensity, and avoiding the risks involved in manual control.

7. Systems

Hydraulic system

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

The hydraulic system employs one of the world's most advanced pump control systems, imported products from Germany are used for all major components such as the pump, motor, and main return valve to help save energy and ensure high efficiency, high reliability, and long service life.

Main hydraulic pump: variable plunger pump with tandem gear pump, which is powered by the engine.

Oil source for auxiliary mechanisms: variable displacement constant pressure pump.

Main control valve: pilot electrohydraulic control valve.

Main circuit control method: control is provided by the pump control system and control handle.

Control of auxiliary mechanisms: solenoid change valve block, equipped with unloading overflow valve.

Outrigger control: multi-way solenoid valve operated by the electronic control box.

Capacity of hydraulic oil tank: 1000L.

Oil filter: oil return line oil filter, precise filter for control oil circuit.

Cooler: aluminum radiator, with hydraulic motor driven fan.

Electrical system

DC 24V, negative ground, 2 x 195AH batteries.

The electrical components of the vehicle primarily include: power supply, engine starter, engine misfiring, indicator lights, alarms, lighting devices, fans, windshield wipers, horn, lifting height limiters, hydraulic oil cooling fans, digital display monitor, PLC controller, load moment limiter system, engine preheater, and 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 vehicle employs

CAN bus technology to effectively connect the engine, PLC controller, load moment limiter and digital display monitor together; it offers fault detection and self-diagnosis functions, and also employs a GPS/GPRS global positioning system and remote fault diagnosis system.

Power system

The engine is an original imported BENZ electronic injection diesel engine with a CAN bus interface.

Rated output power: 360kw, 1800r/min

Maximum output torque: 2200Nm, 1300r/min

Emissions standard: T3

For the fuel tank, a large-volume 700L tank is used to ensure a sufficiently long working time of the engine.

Centralized display system

The 10.4 in. touch-screen LCD monitor, with the capability of switching between Chinese and English display, can centrally display the various operating mode signals collected by the PLC controller, including the engine's rotational speed, water temperature, fuel oil pressure, hydraulic pump pressure, main motor pressures, level of the main machine operation, and wind speed at the top of boom, etc. It can monitor working conditions in realtime; if the crane is working abnormally, the system will emit a yellow or red alarm.

Centralized lubrication system

Three sets of centralized lubrication systems are used (one for the upper machinery, and two for the undercarriage) to reduce the wear and tear on parts and components and to allow for easy maintenance.

8. Safety Devices

This crane uses multiple types of safety and alarm devices, including mechanical, electronic, and hydraulic, etc, to ensure safe operation of the machine.

Load moment limiter

The limiter is comprised of a load moment indicator and digital LCD monitor. When the lifting load reaches 90% of the rated load moment, an alarm lamp will light up and a buzzer alarm will sound; operation of the crane will stop automatically when the lifting load moment reaches the rated load moment in order to prevent any incidents that may occur as a result of crane overloading during construction operations, thus helping 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 lifting load

Maximum allowed lifting height

Tension value and percentage

Value and utilization percentage of superlift counterweight

Various overflow valves in the hydraulic system

These valves 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 excessive lifting of the hook. When the hook is lifted to a certain height, the limit switch signals the electrical system to automatically stop the lifting of the hook, also setting off an acoustooptic warning through the buzzer and display screen in the control room to prevent overwinding of the hook.

Angle indicator

The boom angle indicator is located along the lower rear part of the boom's bottom section (right side of control room), allowing the driver convenient, clear visibility of the elevation angle of the boom from the control room.

Lifting 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 an acoustooptic warning.

Whole machine level sensor

This electronic level meter can display in realtime the inclination angle of the whole machine and send an alarm on the digital display screen in order to ensure safe operation of the vehicle.

Hook safety latch

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

Wind speed indicator

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

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 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 control room.

Boom overturn protection device

The Chinese patented overturn protection oil cylinder makes the overturn protection cushioning process more stable and reliable, thus ensuring safe and stable operations.

Emergency stop button

In case of emergency, press this button to switch off the engine and stop all operations.

Tri-color warning light

With three different colors, red, yellow and green, the warning light can synchronously indicate 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

This system includes cameras for monitoring conditions at the rears of the main and auxiliary lifting, main luffing, tower luffing, superlift luffing winch mechanisms as well as the superlift counterweight and the whole machine.

Monitor: with the press of a button you can toggle between different monitoring feeds.

Remote GPS monitoring system (optional)

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

9. 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, electronic control handle, load moment indicator, digitalized display monitor, various switches, auxiliary remote control box operating assembly, air conditioner, electric fan, illuminating lamps, radio (CD player, mp3 player, and car DVD player optional), cigarette lighter, and fire extinguisher, etc. The control room offers a broad field of vision, and a spacious and comfortable interior.

10. Hook

All hooks have a rotating hook and safety latch.

400t hook (200t×2): equipped with 16 pulleys.

250t hook (125t×2): equipped with 10 pulleys.

100t main hook: equipped with 4 pulleys.

50t main hook: equipped with 2 pulleys.

16t hook: cylindrical hook.

11. Optional Devices

300t tower head

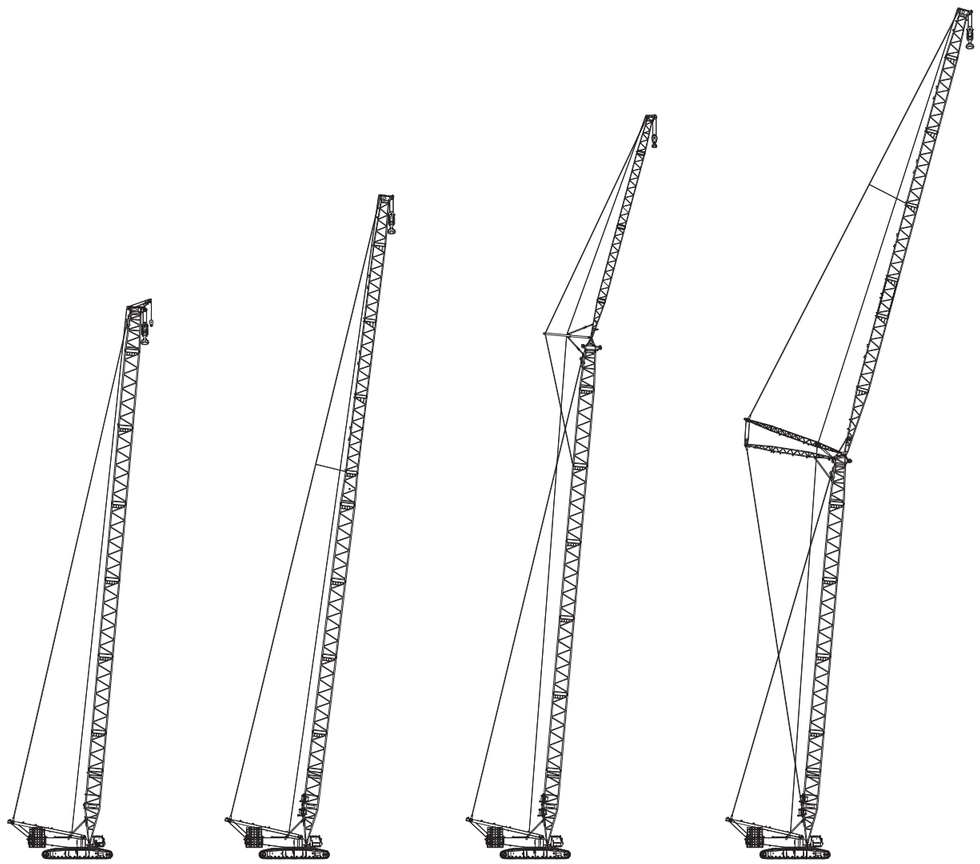
Gooseneck lifting winch, wire ropes, and gooseneck boom

III. Description of Boom Assembly

Description #1

Descriptions of Boom Assembly Codes

Code	Type	Working parameters
S	Heavy duty boom	24 ~ 84m
SL	Light duty boom	48 ~ 102m
SF	Fixed jib	Main boom: 30 ~ 78m Jib: 12 ~ 36m
SW	Luffing jib	Main boom: 30 ~ 60m Jib: 24 ~ 72m

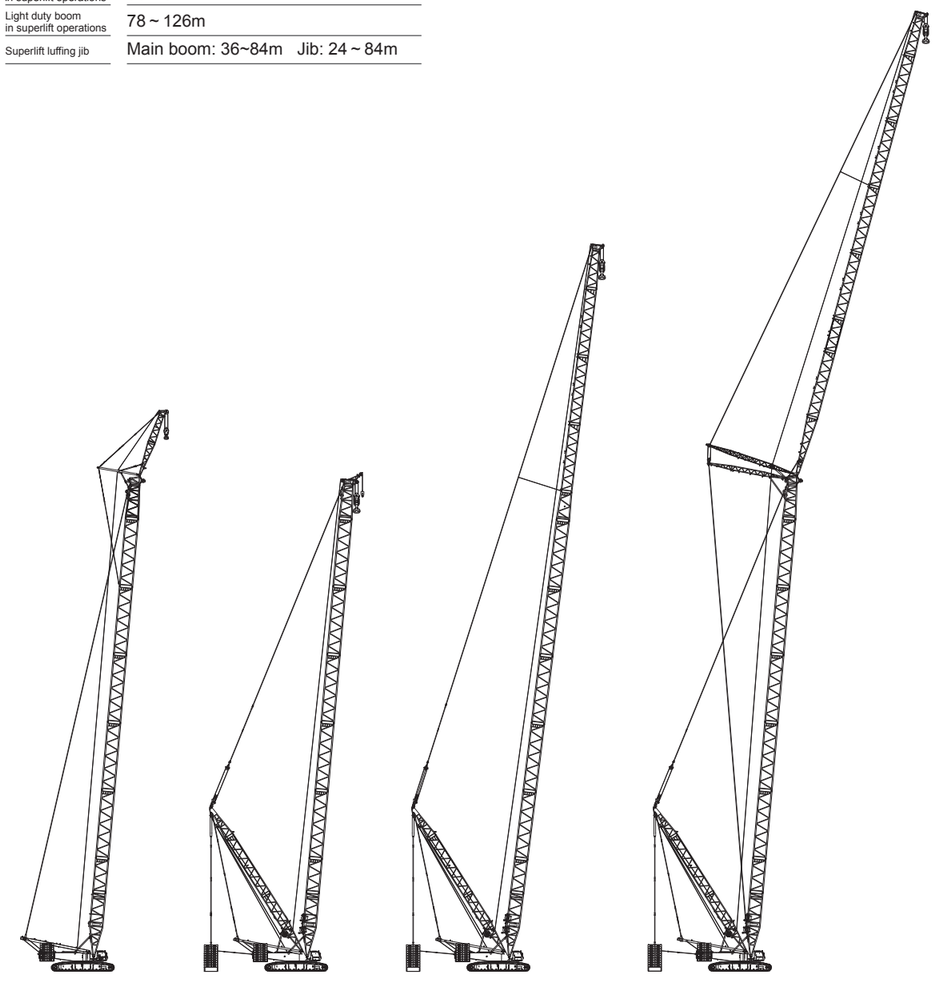


S SL SW SF

Description #2

Descriptions of Boom Assembly Codes

Code	Type	Working parameters
SFV	Heavy fixed jib	Main boom: 36~84m Jib: 12m
SDB	Heavy duty boom in superlift operations	36 ~ 84m
SLDB	Light duty boom in superlift operations	78 ~ 126m
SWDB	Superlift luffing jib	Main boom: 36~84m Jib: 24 ~ 84m



SFV SDB SLDB SWDB

IV. Lifting Performance

12. Lifting Characteristics Curves of Main Boom

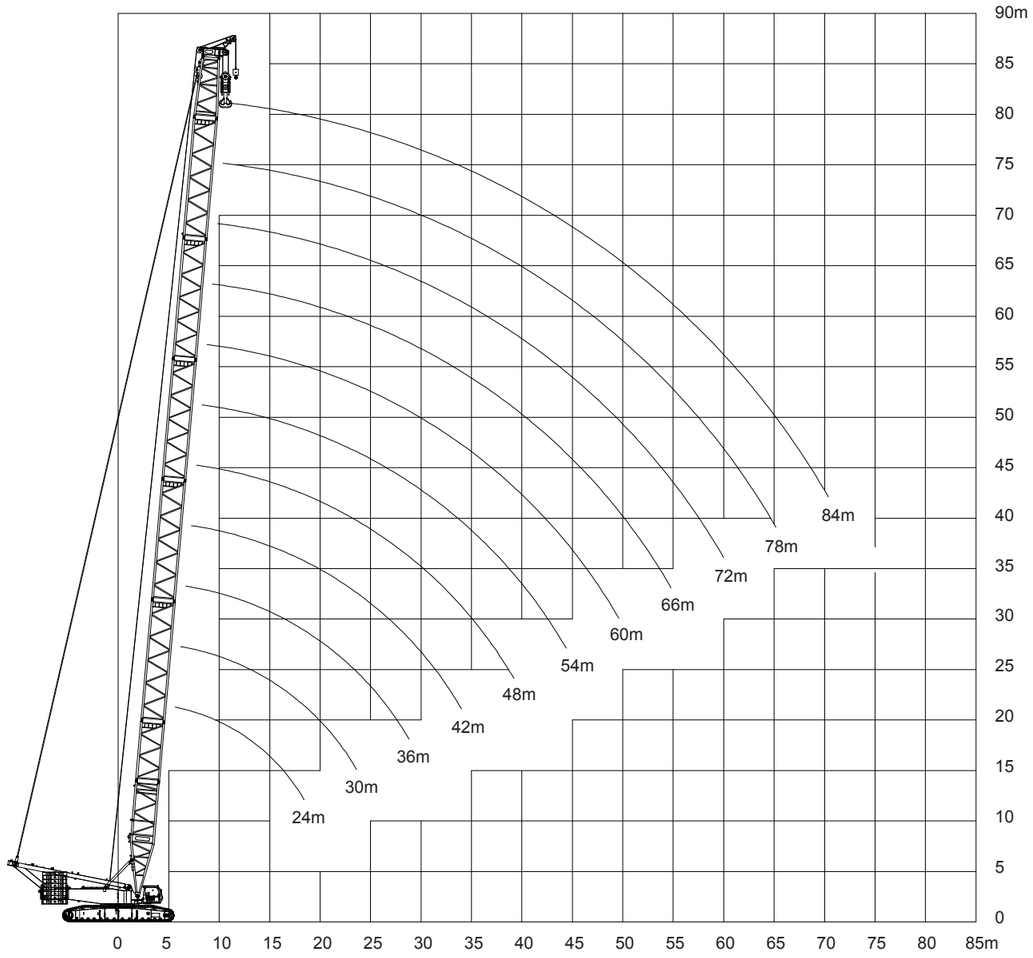


Table of Standard Main Boom Lifting Capacity

Unit of measurement: t

Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing											
Length of main boom (m)	24	30	36	42	48	54	60	66	72	78	84
Parts of line (m)	2 × 16	2 × 13	2 × 12	2 × 10	2 × 9	2 × 8	2 × 7	2 × 7	2 × 6	2 × 4	2 × 4
Radius (m)											
6	400										
7	361	348	338								
8	314	304	296	288							
9	278	269	263	256	248	235					
10	243	241	236	230	224	218					
11	222	217	217	215	207	200	195	188			
12	192	192	192	192	186	182	177	172	165	121	109
14	162	162	157	154	152	152	152	142	136	121	101
16	133	133	133	128	127	126	124	117	115	116	93
18	111	111	111	111	109	104	103	102	101	99	86
20	98	97	96	93	93	93	91	87	86	83	81
22	86	83	83	81	81	81	79	76	75	74	71
24		73	73	71	71	71	71	69	65	64	61
26		66	66	63	63	63	62.5	61	58	57	53
28			61	57.5	57	55.5	55.5	55	51.5	51	46
30			56	52.5	51	50.5	50.5	50	47.5	46	41
32				48	46.5	46	45.5	45	44	42	37.5
34				43.5	42.5	42.5	42.5	41	40.5	38	34.5
36				40	39	38.5	38	37.5	37	35	30.5
38				36.5	35.5	35.5	35.5	35.5	33.5	32.5	27
40					33	32.5	31.5	30.5	30.5	29	24.5
44						27.5	27	26.5	25.5	23	20
48						23	22.5	21.5	20.5	18.5	16.5
52							20	18	16.5	14.5	13
56								14.5	14	12	10.3
60									11	9	8.3
64									9	7	6
68										6	5
72											4
Wind speed m/s	14.3				12.8				11.1		

13. Lifting Characteristics Curves of Light Duty Boom

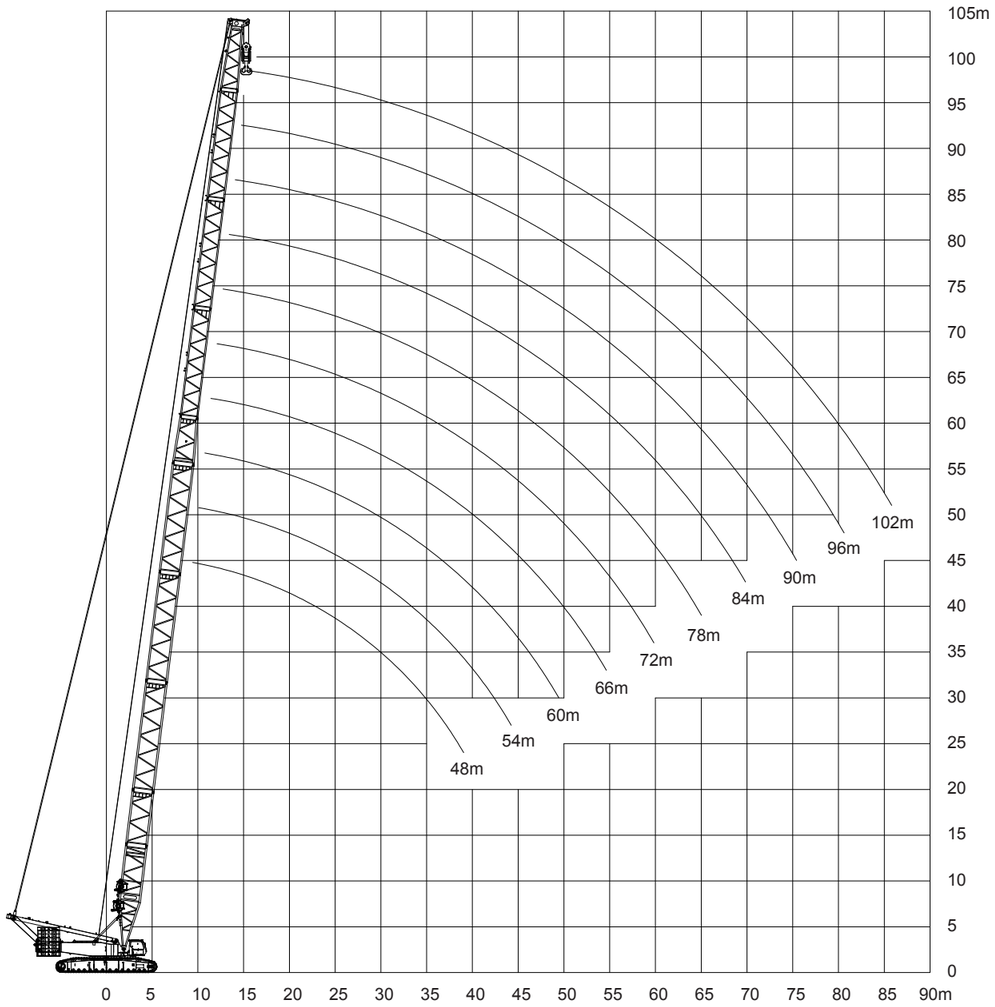


Table of Standard Light Duty Boom Lifting Capacity

Unit of measurement: t

Rear counterweight 160t	Ballast weight of vehicle body 40t						360° full slewing			
Length of main boom (m)	48	54	60	66	72	78	84	90	96	102
Parts of line (m)	2 × 7	2 × 7	2 × 6	2 × 6	10	9	7	6	6	5
Radius (m)										
9	207									
10	195	195								
12	170	168	172	154	147	121				
14	140	136	135	130	128	118	102	91		
16	120	113	110	108	108	107	95	87	79	67
18	105	99	93	93	95	92	86	83	75	65
20	92	87	82	79	83	80	78	76	70	61.5
22	81	79	76	71	75	72	69	67	65.5	58.5
24	72	71	69	64	68	66	63	61	58.5	54.5
26	65	64	61	58	62	60	58	56	52	50.5
28	58.5	57.5	55.5	52	56	54.5	52.5	51	47	45
30	53.5	51.5	51	48	51	50	48	47	43	41
32	48	47	46	44	46	45	44	43	40	38
34	45	44	43	41	42	41.5	40.5	39	37	34
36	42	41	40	39	39	38	37	36	34	31
38	39	38	37.5	36	36	35	34	33	31	28
40	36	35.5	35	34	33	32	31	30	29	25
44		31	30	29	28.5	27.5	26.5	26	24	21
48		28	27	26	25	24	22.5	22	20	17
52			24	23	22	21	19.5	19	17	13.5
56				19.5	18.5	18	16.5	16	14	11
60					16.5	16	14.5	13	12	9
64					13.5	13	12	12	10	6.5
68						11	10	10	8.5	5
72							9	8.2	7	4
76								6.8	6	3
80									5	
84									4	
Wind speed m/s	12.8				11.1					

14. Lifting Characteristics Curves of Main Boom + Fixed Jib

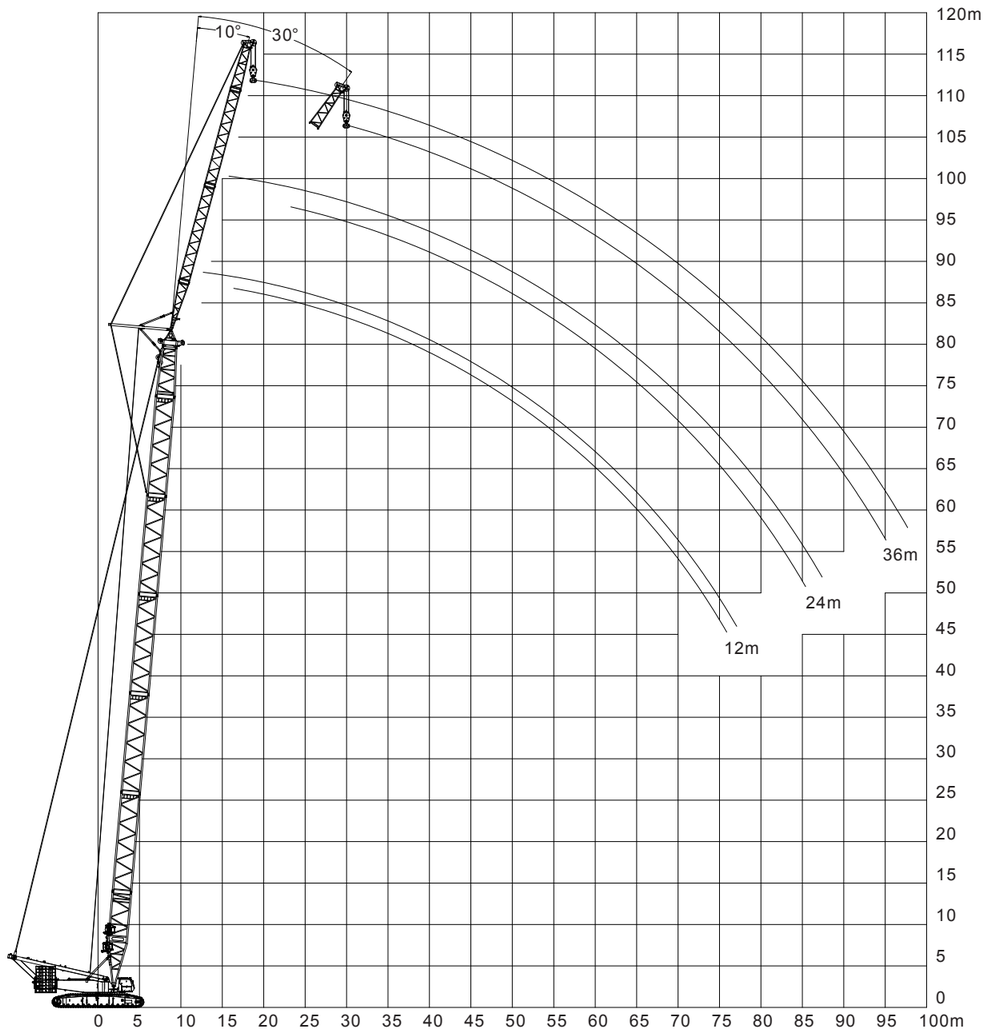


Table of Standard Fixed Jib Lifting Capacity (I)

Unit of measurement: t

Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing												
Length of main boom (m)	30						36					
Fixed jib (m)	12		24		36		12		24		36	
Angle	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
Radius (m) \ Parts of line	6	3	4	2	2	1	6	3	4	2	2	1
10	80						80					
12	80						80					
14	74.5	37	49.1				79.5	37	49.9			
16	69.5	35	45		32.2		73	35.5	46.5		32	
18	62	32.5	41.1		29.2		68	33.5	43		29.5	
20	56.5	30.5	37.3	20.2	26.4		62	31.5	39.6		27.5	
22	51.5	29.5	34.1	19.2	24.8		57	30.5	36.2	19.3	25.4	
24	47.6	27.5	31.3	18.2	23.4		52.5	29.5	33.8	18.3	23.7	
26	44.2	26.5	28.9	17.2	22		49	27.5	31.3	17.5	22.3	
28	41.2	25.5	26.9	16.4	20.8	12	45.7	26.5	29.1	17.3	21	13
30	38.7	24.5	25	15.7	19.3	12	42.9	25.4	27.2	16.2	20	12.3
32	34.5	23.5	22.1	14.5	16.9	10.4	36	24.4	24	15.2	17.8	11.2
34	31.3	22.5	19.7	13.4	14.9	10.4	32.5	23.4	21.5	14.2	16	10.2
36			18.8	12.9	14.2	9.8	31		20.5	13.7	15.2	9.7
38			17.1	12.1	12.8	8.7			18.7	12.7	13.7	8.8
40			15.7	11.5	11.6	7.9			17.2	12	12.5	8.3
44					10.6	7.4			15.9	11.5	11.4	7.7
48					9.8	7.1					10.5	7.3
52						6.9					9.8	7.1
56											9.2	6.9
Wind speed m/s	14.3											

Table of Standard Fixed Jib Lifting Capacity (II)

Unit of measurement: t

Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing												
Length of main boom (m)	54						60					
Fixed jib (m)	12		24		36		12		24		36	
Angle	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°	10°	30°
Radius (m) \ Parts of line	6	3	4	2	2	1	6	3	4	2	2	1
12	80						80					
14	80						80					
16	80	37.5	49.5				80	38.5	50.5			
18	78.5	36.5	44.5		30.3		80	36.5	46.5			
20	73.5	34.5	41.5		29.3		75.5	35.5	43.9		29.4	
22	66.5	33.5	38.5	20.3	28.3		68.5	33.5	42.5		28.4	
24	61.5	31.5	35.5	19.3	26.3		60.5	32.5	40.3	20.4	27.4	
26	54.5	30.5	33.5	19.3	24.3		53.5	31.5	38	19.4	25.4	
28	48.5	29.5	30.5	18.3	23		47.5	30.5	35.7	18.4	23.3	
30	44.5	28.5	29.5	17.3	22.4	13	43.5	29.4	34	17.3	22.7	13.2
32	40.5	28	28	16.8	21.8	12.1	39.5	28.4	32.4	16.9	22.2	12.7
34	36.5	27.5	26.4	16.2	21.1	11.2	35.5	27.4	30.7	16.4	21.6	12.2
36	33.5	26.5	24.9	15.7	20.1	11.2	32.5	26.9	29	16	20.8	11.7
38	30.5	25.4	23.4	15.2	19.1	11.2	29.5	26.4	27.3	15.6	20	11.2
40	28.5	24.9	22.4	14.7	18.2	10.7	27.5	25.9	25.7	15.3	19.1	10.7
44	24.4	23.9	20.3	13.7	16.5	9.7	23.4	23.9	22.5	14.5	17.3	9.7
48	20.9	21.4	18.8	13.2	15.1	9.2	19.9	20.3	20.2	13.8	15.4	9.2
52	17.8	18.2	17.8	12.7	13.9	8.7	16.9	16.8	18.4	13.1	14.6	8.8
56	15.3	16.3	16.3	12.2	12.8	8.2	14.3	14.4	15.8	12.6	13.5	8.3
60			14.2	11.7	11.9	7.7	12.3		13.2	12	12.5	7.8
64			12.7		11.1	7.2			11.2	11.4	11.1	7.3
68			11.2		10.2	7.2			9.7	10.9	9.7	7.1
72					9.1	6.7			8.2	10.3	8.7	7
76					8.3	6.1					7.7	6.8
80					7.8	5.9					6.7	6.4
84											5.6	6.3
Wind speed m/s	12.8											

Table of Standard Fixed Jib Lifting Capacity (III)

Unit of measurement: t

Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing						
Length of main boom (m)	66					
Fixed jib (m)	12		24		36	
Angle	10°	30°	10°	30°	10°	30°
Radius (m) \ Parts of line	6	3	4	2	2	1
14	76					
16	74.5					
18	73.5	36.8	40			
20	70.5	35.5	39.1		24.5	
22	61	34.4	38.6		24	
24	53.5	33.3	38	20	23.5	
26	47.1	32.3	37.4	19.6	23	
28	41.9	31.4	36.8	19.1	22.6	
30	37.4	30.5	36.2	18.6	22.1	
32	33.8	29.8	34.3	18.1	21.8	11.8
34	30.2	29	32.3	17.6	21.5	11.5
36	27.4	27.5	29.5	17.2	21.2	11.2
38	24.6	26.1	26.7	16.7	20.9	10.8
40	22.3	23.8	24.5	16.3	20.5	10.6
44	18.1	19.4	20.3	15.5	19.5	10.1
48	14.7	15.8	16.8	14.8	17.6	9.6
52	11.9	13.9	13.9	14.1	15	9.2
56	9.5	10.4	11.4	12.9	12.6	8.7
60	7.5	8.2	9.3	10.9	10.4	8.3
64	5.7	6.3	7.5	8.9	8.6	8
68	4.2	4.3	5.9	7.2	6.9	7.6
72	2.8	2.3	4.5	5.6	5.5	7
76			3.3	4.2	4.2	5.8
80			2.3	3	3.1	4.5
84					2.2	3.4
88						2.3
92						
Wind speed m/s	11.1					

15. Lifting Characteristics Curves of Luffing Jib

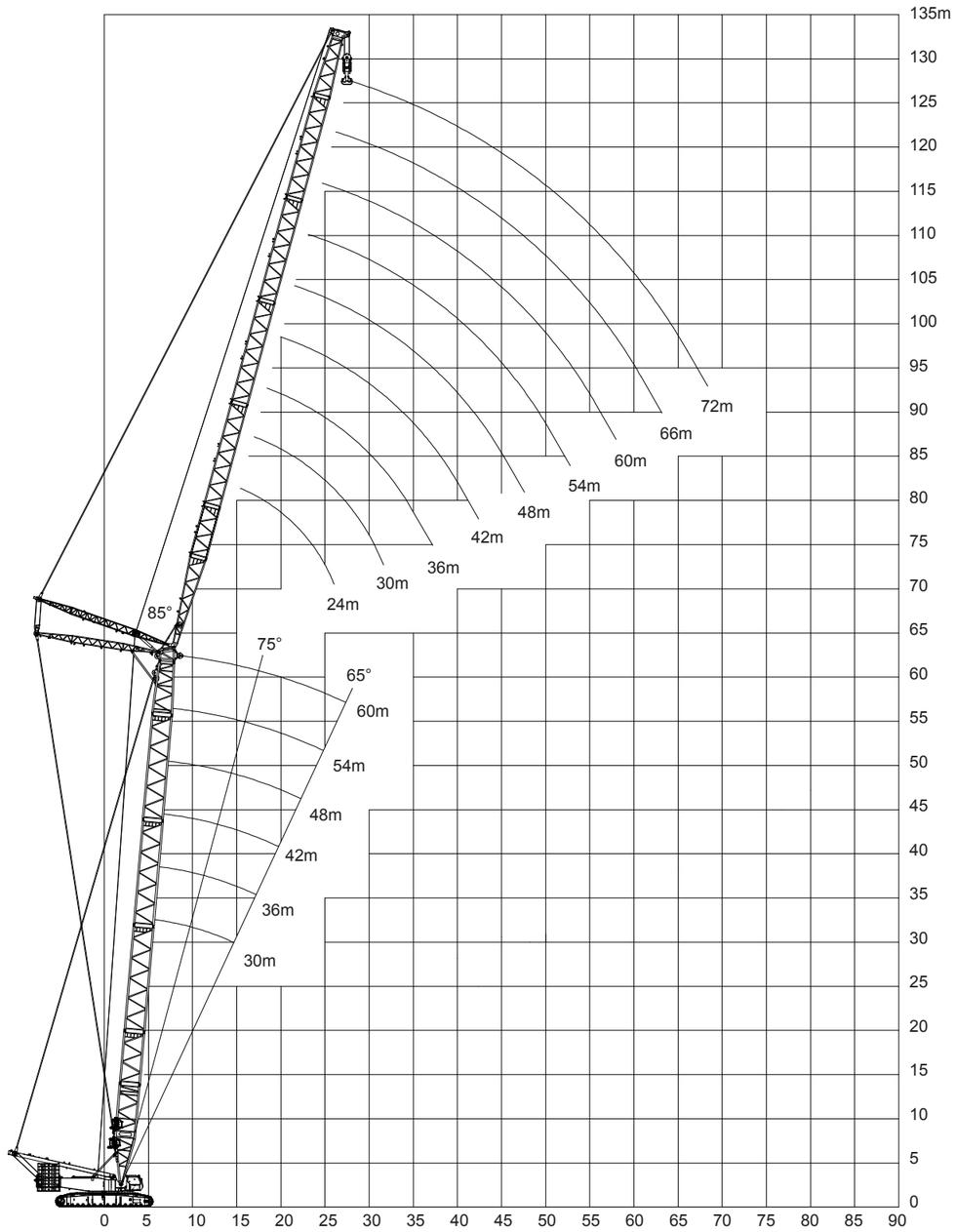


Table of Standard Luffing Jib Lifting Capacity (I)

Unit of measurement: t

Main boom 85° Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing									
Length of main boom (m)	30								
Length of luffing jib (m)	24	30	36	42	48	54	60	66	72
Radius (m)									
14	142								
16	118	112	108						
18	100	99	95	94					
20	89	88	85.5	83	81				
22	81	80	77.8	75	72.8	71	66		
24	74	73	71	69	66.8	64	61.5	58	
26	67	66	65	63.5	61.5	59	57	54	50
28		60	59.5	58.5	56.6	54.5	53	51.5	49
30		55	54.5	54	52.6	50.5	49.5	47.5	45.5
32		51	50.5	50	49	47	46.2	44.5	42.5
34			46.5	46.5	45.6	44	43	41.5	40
36			43.5	43	42.6	41	40.2	39	37
38			41	40	39.8	38.5	37.8	36.5	34.5
40				37.5	37.2	36	35.5	34	32.5
44					32.5	32	31.2	30.5	29
48					29	28.5	28	27	25.5
52						25.5	25	24	23
56							22.5	21.3	20.5
60							20	19.4	18.2
64								17.5	16.5
68									15
72									13
Wind speed m/s	12.8		11.1						

Table of Standard Luffing Jib Lifting Capacity (II)

Unit of measurement: t

Main boom 85° Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing									
Length of main boom (m)	48								
Length of luffing jib (m)	24	30	36	42	48	54	60	66	72
Radius (m)									
16	108								
18	96	94	92						
20	83	82	81	80					
22	73	72	72	71	69				
24	67	66	64	63	61	59	57		
26	62	61	59	57	56.5	55	53	51	
28	56	56.5	55	52	51	50	48	46	44
30		52.5	51	48.5	47.5	46.2	45	43	41
32		49	47.5	45.5	44.5	43	41.5	40	38
34		46	44.5	42.5	42	40.5	39	37.5	36.5
36			42	40	39.5	38	36.5	35.5	34
38			39.5	38	37	35.5	34.5	33	31.5
40				36	35	33.5	32.5	31	29
44				32.5	31.5	30	29	27.5	25.5
48					28	27	26	24.6	22
52						24	23	22	20
56						21.5	20.5	19.5	17.5
60							18.5	17.5	15.5
64								15.5	13.5
68								14	12
72									10
Wind speed m/s	11.1		9						

Table of Standard Luffing Jib Lifting Capacity (III)

Unit of measurement: t

Main boom 85° Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing									
Length of main boom (m)	60								
Length of luffing jib (m)	24	30	36	42	48	54	60	66	72
Radius (m)									
16	104								
18	94	92							
20	81	80	78						
22	71	70	70	68	66				
24	62.5	62	62	61	59	57			
26	56.5	55.5	55.5	54.5	54.5	52	50		
28	51.5	50.5	49.5	49.5	49.5	46	44	42	
30	46.5	45.5	45.5	44.5	44.5	43	40.5	38	36
32		41	41	40	40.5	39	38	36	33
34		38.5	38	37.5	37	36	36	34.5	30.5
36			35	34.5	33.5	33	33	31	29.5
38			32	31.5	31	31	31	29.5	28.5
40			30	29.5	28.5	28	27.5	27.5	26.5
44				26	25	24.5	24	23.5	22.5
48					21.5	21	20.5	19.5	19
52					18.5	18	17.5	17.5	16.5
56						16	15.5	15.5	14.5
60							13.5	13.5	12.5
64							12	11.5	10.5
68								10	9
72									7.5
76									6
Wind speed m/s	11.1		9						

16. Lifting Characteristics Curves of Main Boom during Crane Superlift Operations

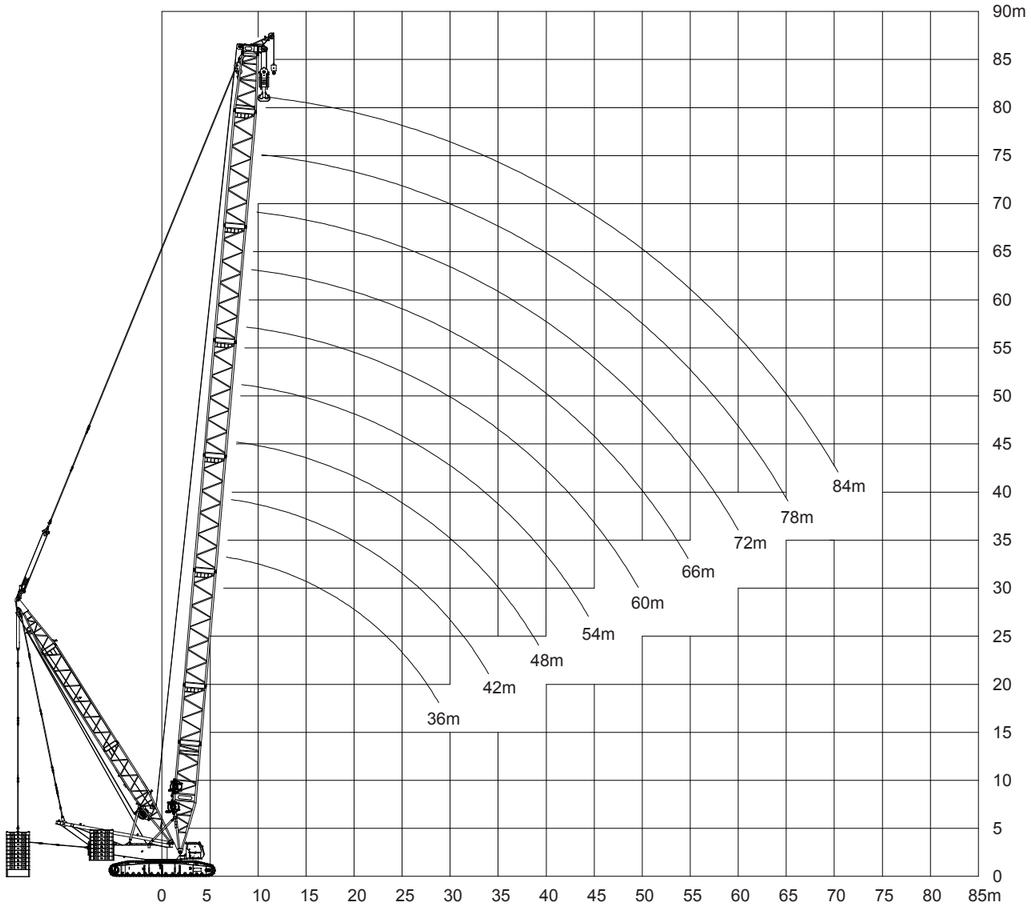


Table of Lifting Capacity of Main Boom in Crane Superlift Operations

Unit of measurement: t

Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing									
Radius (m)	Length of main boom (m)								
	36	42	48	54	60	66	72	78	84
7	450								
8	450	450	412						
9	450	450	412	362					
10	450	450	412	362	315	269			
12	450	450	412	362	315	269	232	201	160
14	398	397	396	362	315	269	232	201	160
16	342	342	341	341	310	269	232	201	158
18	306	305	303	302	290	269	232	201	157
20	270	269	267	266	264	257	232	201	156
22	243	242	242	238	237	234	231	201	155
24	223	222	222	220	215	214	212	201	153
26	203	202	202	201	198	197	195	194	151
28	189	188	187	185	183	182	180	179	148
30	173	172.5	172	170	171	170	169	168	145
32	153	160.5	160	153	159	158	157	156	142
34		148.5	148	146	147	146	145	144	137
36		139	138.5	136	138	137	136.5	134	130
38		123	129	127	128	127.5	127	125	124
40			121	118	121	120	119	117	116
44				104	107	106	105	103	102
48				94	95.5	95	94	92	91
52					86	85	84	83	81.5
56						77	76	75.5	73
60							68	68	66
64							63	63	60.5
68								58.5	55.5
72									52
Wind speed m/s	14.3		12.8			11.1			

17. Lifting Characteristics Curves of Light Duty Boom during Superlift Operations

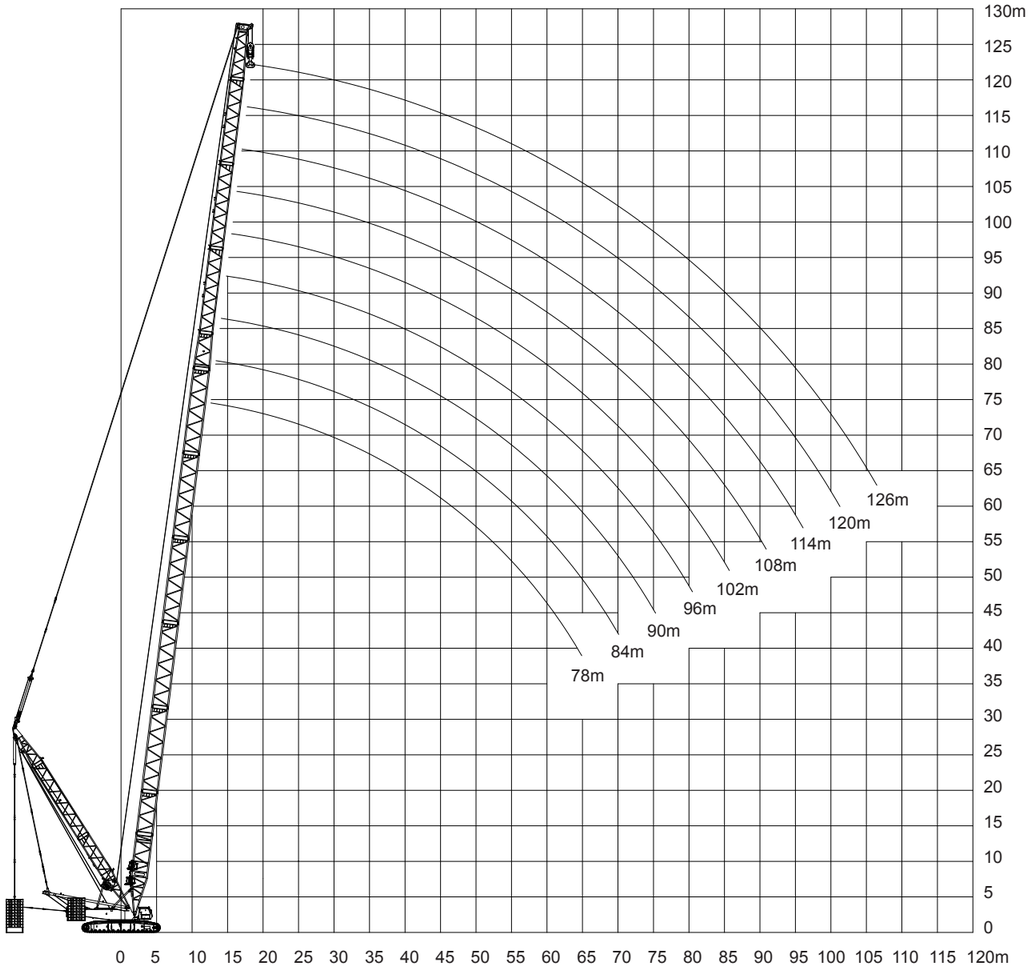


Table of Lifting Capacity of Light Duty Boom in Crane Superlift Operations

Unit of measurement: t

Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing									
Radius (m)	Length of main boom (m)								
	78	84	90	96	102	108	114	120	126
14	207	175	145						
16	207	175	143	125	107				
18	207	175	142	125	106	90.5	78	60	
20	206	175	141	125	105	90.5	77	60	58
22	204	175	138	125	104	89	76	60	58
24	203	172	138	125	102	88	75	60	58
26	196	166	138	125	101	87	74	60	57
28	182	160	135	125	99	85	73	60	57
30	169	158	135	125	98	84	72	60	56
32	155	149	135	125	97	83.5	70.5	60	55
34	143.5	140	135	122	94	81	69.1	60	54
36	131	131	125	122	93	80.5	69.1	60	53.5
38	125	122	120	119	91	78	68.8	60	53
40	117	116	115.5	115	90	77.5	68	60	52
44	105	104.5	104	103.5	86	74.5	68	60	50.5
48	94	93.5	93	92.5	82.5	71.5	64.5	60	49
52	84	84	84	83	79	68.5	59	58	47
56	76	76	76	75	74	65	56.5	56	45.5
60	70	69.5	69.5	69	68.5	62.5	54.5	54	44
64	64.5	64	64	63	63	60	52.5	52	42
68	59	59	59	58.5	58	57	51	50	40.5
72		54.5	54.5	54.5	53.5	53.5	49	48	39
76			50.5	50.5	50	49.5	47	46	37
80				47	46.5	46	45	44	35.5
84				43.5	43	43	41.5	41.5	34.5
88					40.5	40	39	39	33
92						37.5	36.5	36.5	31.5
96							34	34	30.5
Wind speed m/s	11.1		9						

18. Lifting Characteristics Curves of Luffing Jib in Superlift Operating Mode

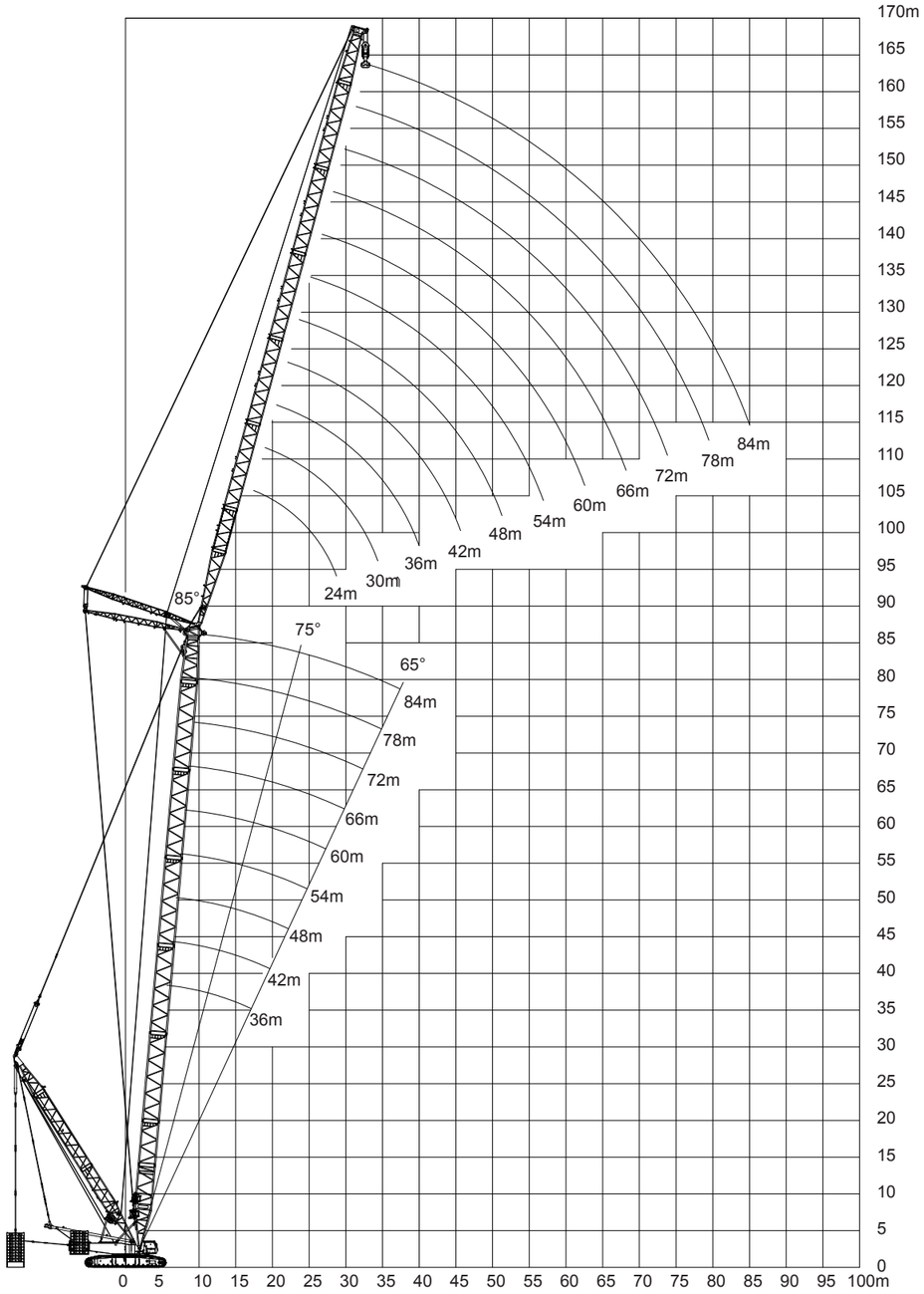


Table of Lifting Capacity of Luffing Jib in Superlift Operating Mode (I)

Unit of measurement: t

Main boom 85° Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing											
Length of main boom (m)	36										
Length of jib (m)	24	30	36	42	48	54	60	66	72	78	84
Radius (m)											
14	225										
16	225	218									
18	224	215	173								
20	217	205	172	145							
22	198	192	166	145	120						
24	177.5	175.5	158	144	118	100					
26	158	156	150	137	114	99	83				
28	131	142	142	130	110	97	83	68			
30		119.5	130	118	107.5	94	83	68	62.5		
32		112	118.5	109	103	91	82	68	62.5		
34		103.5	111	101	99	87	81	68	61.5	48	40
36			101.5	95	93	83	80	66.5	60.5	47	39.5
38			95.5	88	87	80	79	66	60	47	39
40			88.5	83	82	78	77	64	60	46.5	38.5
44				72	71	72	71.5	62	59	45.5	37.5
48					64	64	63.5	59	56.5	44.5	36.5
52						58	57	55.5	54	43.5	36
56							52	51.5	50.5	43	35.5
60							46.5	45.5	45	42	34.5
64								43	41	39.5	33.5
68								38.5	37	36.5	33
72									33.5	33	31.5
76										30	28
80											25
84											20.5
Wind speed m/s	9.0										

Table of Lifting Capacity of Luffing Jib in Superlift Operating Mode (II)

Unit of measurement: t

Main boom 85° Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing											
Length of main boom (m)	48										
Length of jib (m)	24	30	36	42	48	54	60	66	72	78	84
Radius (m)											
16	200										
18	194	168									
20	186	165	144								
22	176	160	141	121							
24	157	154	138	120	101						
26	142	141	133	116	100	83					
28	130	129	129	116	98.5	83	71				
30		117.5	117.5	112	95	82	71	60			
32		110	110	106.5	94	80	70	59	52	44	36
34		102	101	100.5	93	78	70	58.5	52	44	36
36			94.5	92.5	89.5	76	69	58	52	44	36
38			87	87	86	74	69	57.5	52	44	36
40				82	81	71	68	56	52	43	35
44				71.5	71	67	66.5	54.5	51.5	45.5	35
48					63	62	62	53	50	40.5	34
52					57	57	56	52	49	40	33.5
56						51	50.5	50	47	39	32.5
60							45.5	44.5	44.5	38.5	32
64								42	41	37.5	31.5
68								37.5	37	35.5	30.5
72									33	32.5	30
76										30	28.5
80										25.3	25
84											22.5
Wind speed m/s	9.0										

Table of Lifting Capacity of Luffing Jib in Superlift Operating Mode (III)

Unit of measurement: t

Main boom 85° Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing											
Length of main boom (m)	60										
Length of jib (m)	24	30	36	42	48	54	60	66	72	78	84
Radius (m)											
16	149										
18	149	127									
20	145	127	109								
22	140	124	109	94							
24	135	120	107	93	81						
26	130.5	114	104	92	80	69					
28	126.5	114	101	91	79	69	60				
30	117	110	95	89	78	69	60	49.5			
32		105	94	87	76	68	60	49	45		
34		99	94	85	74.5	67	60	48.5	45	36	
36		91	89.5	83.5	73	66	59	48.5	44.5	35.5	
38			86	82	71.5	65	58	48.5	44	35	29
40			80	79	70	62	57	48	44	35	29
44				71	67	59.5	55	47	43.5	35	29
48				62.5	62.5	58	53.5	47	42.5	35	29
52					55.5	55	51.5	46.5	42	34.5	29
56						49	49	45	41.5	33.5	28
60							44	43	40.5	33	27.5
64							40	39.5	39	32.5	27
68								36.5	36	32	26.5
72									31.5	31.5	26
76									29	29	25.5
80										25	24.5
84											22
Wind speed m/s	9.0										

Table of Lifting Capacity of Luffing Jib in Superlift Operating Mode (IV)

Unit of measurement: t

Main boom 85° Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing											
Length of main boom (m)	72										
Length of jib (m)	24	30	36	42	48	54	60	66	72	78	84
Radius (m)											
18	110										
20	108	95									
22	105	93	82								
24	102	92	81	71							
26	98	89	79	70	61.5						
28	97	86	78	69	61.5	52.5					
30	91.5	84	76	68	60.5	52.5	46.5	39			
32		81.5	74	66.5	60	51.5	46	39	32		
34		79	72	65	58.5	50.5	45.5	39	32	26	21.6
36		70	70	63.5	57	50	45	38.5	32	26	21.2
38		68	68	62	55.5	49.5	44.5	38	32	26	21
40			64	60.5	54.5	48.5	44	37.5	32	26	21
44				56	52	46	42	36.5	32	26	21
48				49.5	48.5	44	40	35.5	32	26	21
52					44.5	42	38	34.5	32	26	21
56						39.5	36.5	33	31.5	25.5	21
60						35	35	31.5	30.5	25	21
64							32.5	30.5	29.5	24.5	21
68								29	28	23.5	21
72								26.5	25.5	22.5	20.5
76									23.5	22	20
80										20	20
84											19
88											17.5
Wind speed m/s	9.0										

Table of Lifting Capacity of Luffing Jib in Superlift Operating Mode (V)

Unit of measurement: t

Main boom 85° Superlift mast 30m Superlift radius 15m Rear counterweight 140t Ballast weight of vehicle body 40t 360° full slewing									
Length of main boom (m)	84								
Length of jib (m)	36	42	48	54	60	66	72	78	84
Radius (m)									
22	63								
24	62	54.5							
26	62	53.5	47.5						
28	58.5	52.5	46.5	39.5					
30	57.5	51.5	45.5	39.5	33.5				
32	56	50	45	39.5	33				
34	54.5	48.5	44.5	38.5	32.5	27	23.2	20.5	
36	52.5	47.5	43	38	32.5	27	22.5	20.2	16.9
38	50.5	46.5	41.5	37.5	32.5	27	22.2	19.7	16.1
40	45.5	45	40.5	36.5	31.5	27	21.5	19.2	15.4
44	42.5	42.5	39.5	34.5	30.5	26.5	21	18.2	13.9
48		40.5	37	33	29	25.5	21	17.2	12.9
52			35	31.5	27.5	24.5	21	17	12.3
56			30	30	26.5	24	21	17	12
60				28.5	24.5	23.5	20	16	12
64					22	22	19.5	16	12
68						20	18.5	16	12
72						18	17	15	12
76							15.5	14.5	12
80								13.5	11
84								12	11
88									10
Wind speed m/s	9.0								

19. Lifting Characteristics Curves of Main Boom + Heavy Fixed Jib

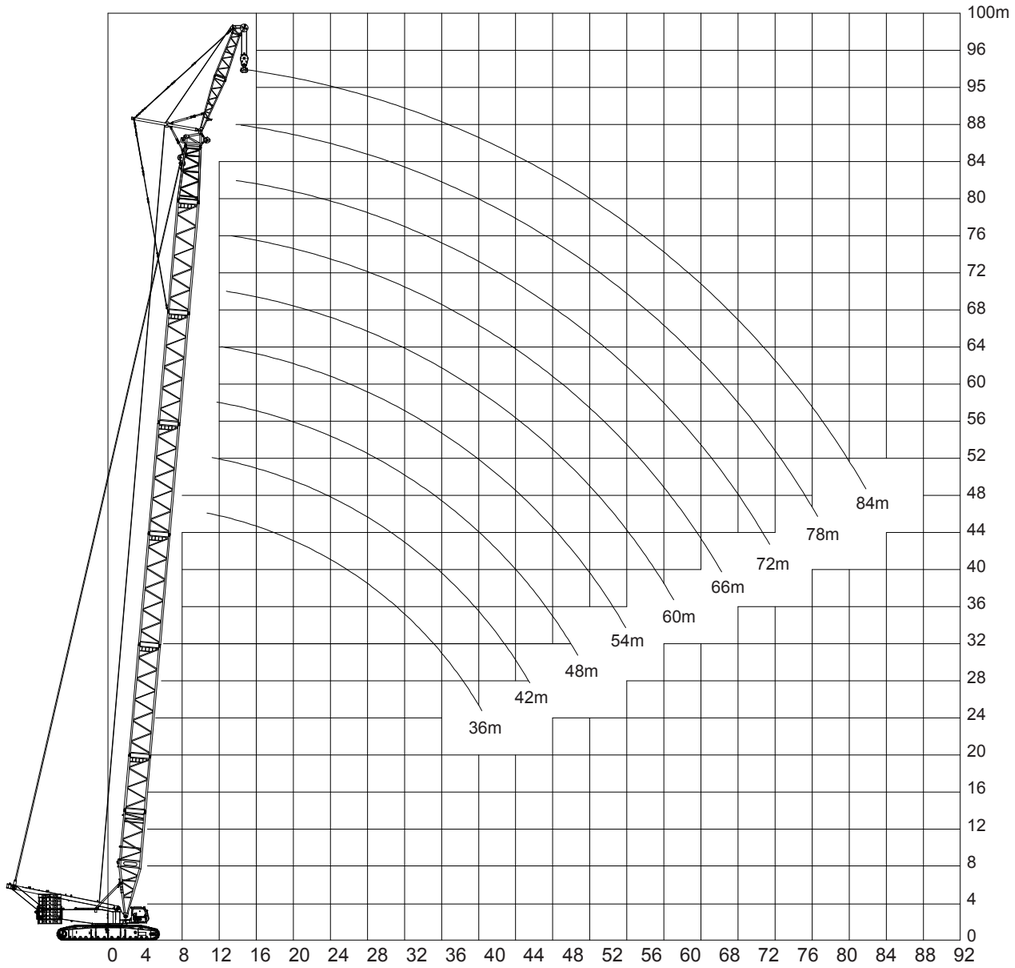


Table of Heavy Fixed Jib Lifting Capacity

Unit of measurement: t

Length of jib 12m Rear counterweight 160t Ballast weight of vehicle body 40t 360° full slewing									
Length of main boom (m)	36	42	48	54	60	66	72	78	84
Radius (m)									
12	100	100	100	100					
14	100	100	100	100	100	100	100	100	
16	100	100	100	100	100	100	100	100	100
18	100	97	97	100	100	100	100	100	96
20	96	95	95	94.5	94.5	94	94	94	93
22	88	87	86	85	83.5	82.5	81.5	81	81
24	78	77	76	75	74	73.5	72.5	72	72
26	70	69	68	67.5	66.5	65	64.5	64	63.5
28	63.5	62.5	61.5	61	60	59	58	57.5	57
30	58	57	56	55	54	53	52	51.5	51
32	53	52	51	50.5	49	48	47.5	47	46.5
34	48.5	48	47.5	46.5	45.5	44.5	44	43.5	42.5
36	44.5	44	43.5	43	41.5	41.5	40	39.5	39
38	41	40.5	40	39.5	38.5	37.5	37	36.5	35.5
40	38	37.5	37.5	36.5	35.5	34.5	34	33.5	32.5
44	32.5	32	32	31	30	29.5	29	28.5	27.5
48		28.5	28	27	26	25.5	24.5	24	23
52			24.5	23.5	22.5	22	21.5	20.5	20
56			20.5	20.5	19.5	19	18	17.5	17
60				17.5	17.5	16.5	16	15	14.5
64					15.5	14.5	13.5	13	12.5
68						12.5	11.5	11	10.3
72							10	9	8.3
76							8.3	8	7
80								6.5	6
Wind speed m/s	12.8					11.1			