

# **ZOOMLION**

## **Zoomlion ZCC32000 Crawler Crane**

### **Technical Manual**

Zoomlion Heavy Industry Science & Technology Co., Ltd.

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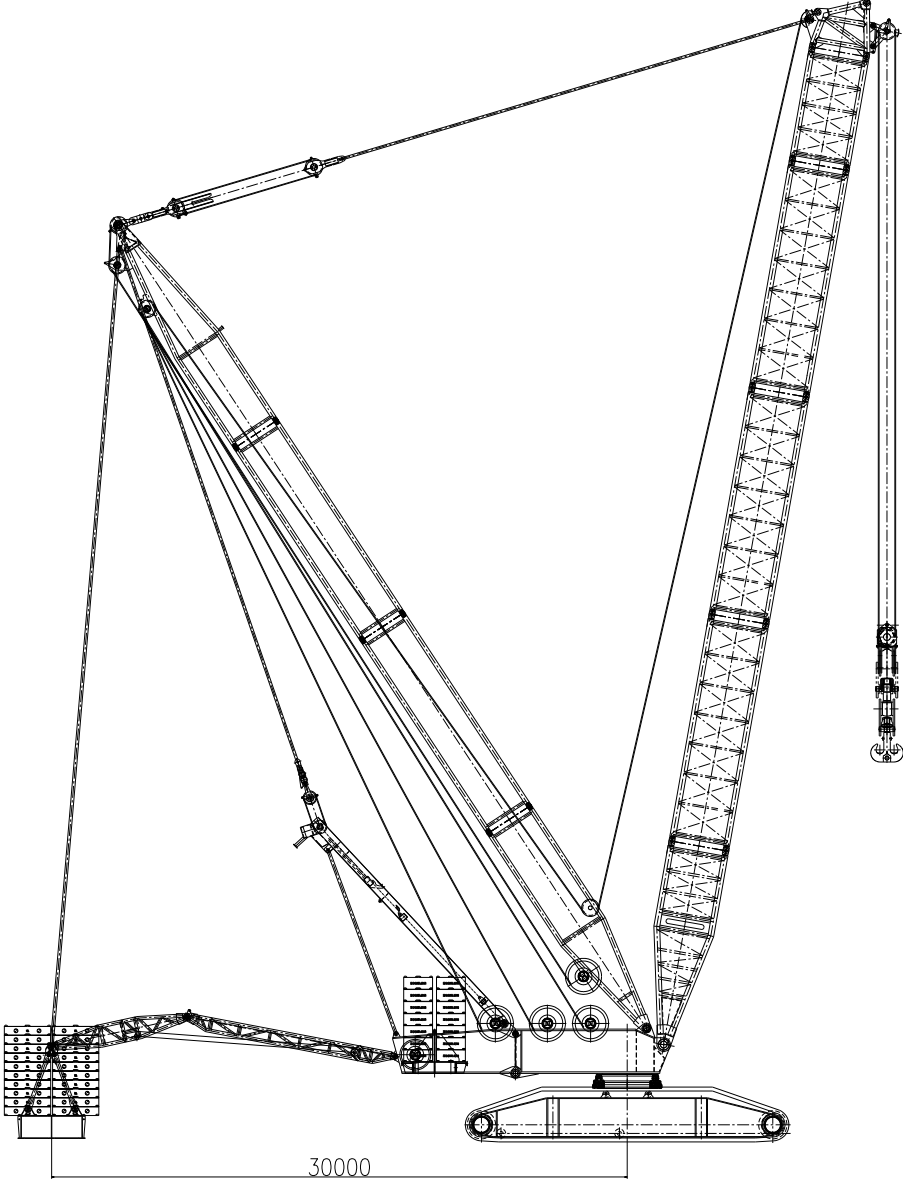
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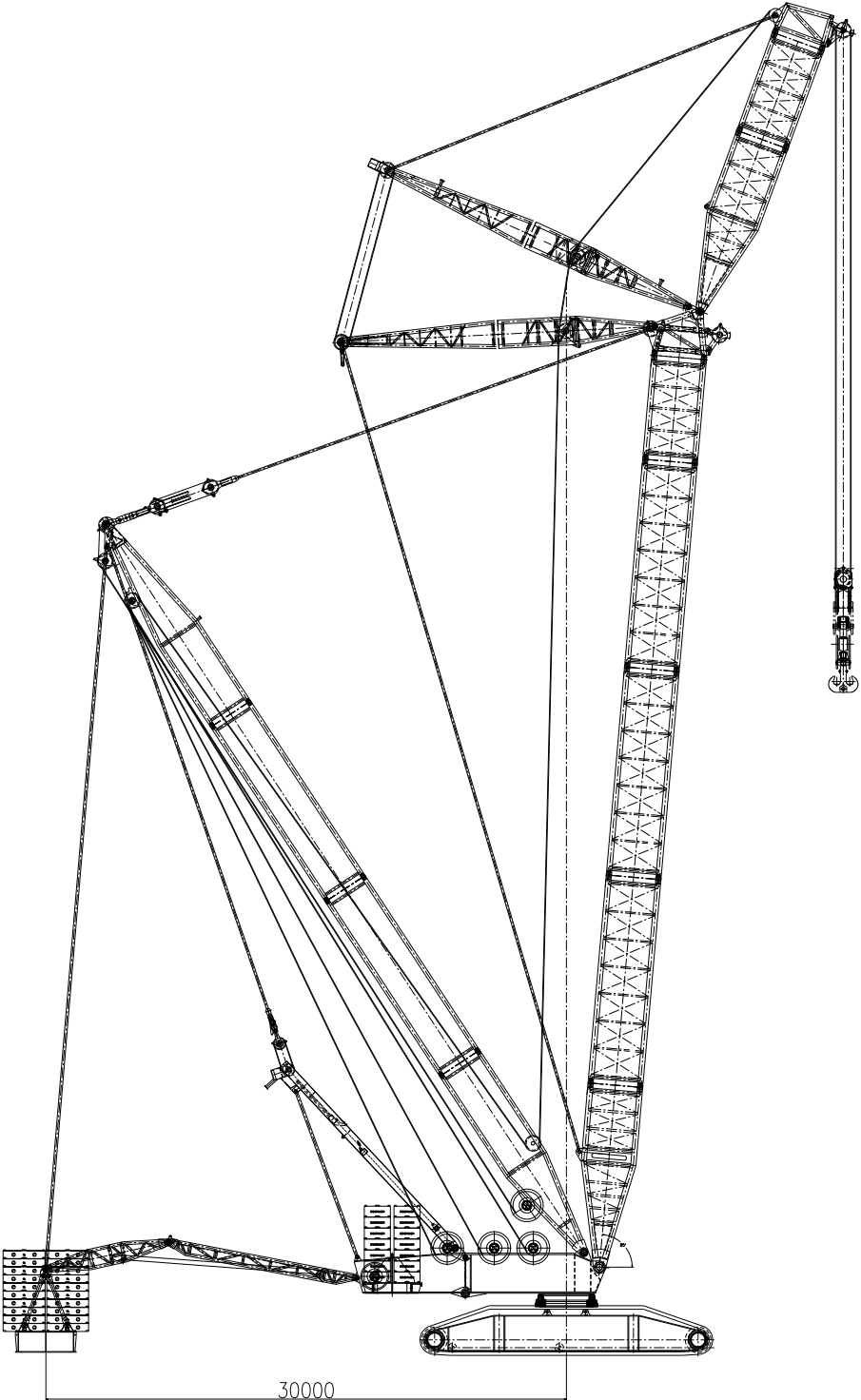
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# 1. Overall Dimensions and Main Parameters

## 1.1 Overall dimension under superlift boom working conditions



1.2 Overall dimension under superlift heavy-duty jib working conditions



### 1.3 Main performance parameters

	Item	Parameter
Max. lifting moment	$t \times m$	31500
Superlift boom working conditions	Max. lifting capacity $\times$ Radius $t \times m$	2000 $\times$ 12
	Heavy-duty boom length, m	54~108
	Light-duty boom length, m	114~156
	Boom transport dimensions (L $\times$ W $\times$ H), mm	12300 $\times$ 3600 $\times$ 3300
Superlift heavy-duty jib working conditions	Max. lifting capacity $\times$ Radius $t \times m$	1350 $\times$ 16
	Mounting angle	15°
	Jib length, m	18
	Boom length under jib working conditions, m	54~108
Superlift tower jib working conditions	Max. lifting capacity $\times$ Radius $t \times m$	1000 $\times$ 20
	Tower jib length, m	36~108
	Boom length under jib working conditions, m	54~108
	Boom working angle	85°、75°、65°
Main hoisting winch (I, II)	Speed of outermost single rope of main winch, m/min	112
	Rope diameter, mm	40
	Rated single rope tension, KN	365
Auxiliary hoisting winch	Speed of outermost single rope of auxiliary winch, m/min	100
	Winch rope diameter, mm	40
	Single rope tension, KN	365
Boom luffing	Speed of outermost single rope of boom luffing, m/min	36 $\times$ 2
	Winch rope diameter, mm	32
	Single rope tension, KN	226
Superlift luffing	Speed of outermost single rope of superlift luffing winch, m/min	112
	Winch rope diameter, mm	40
	Single rope tension, KN	365
Tower jib luffing	Speed of outermost single rope of jib luffing winch, m/min	100
	Winch rope diameter, mm	40
	Single rope tension, KN	365
Slewing speed, rpm		0~0.77
Traveling speed, km/h		0.45/0.76
Gradeability		15%
Ground pressure, MPa		0.233
Max. transport dimensions (L $\times$ W $\times$ H) of single piece, mm		5810 $\times$ 3600 $\times$ 3550

Max. transport weight of single piece, t	67
Suspension superlift counterweight, t	900
Gross weight, t	1800

## 2. Load Chart

### 2.1 Partial load chart of superlift boom: (Unit: t)

#### SDB-1

Superlift counterweight: 900t Superlift counterweight slewing radius: 30m Turntable counterweight: 340t Body counterweight: 112t											
Boom length	54	60	66	72	78	84	90	96	102	108	Boom length
Radius											Radius
12	2000	1901									12
14	1985	1901	1738	1531	1394						14
16	1973	1901	1738	1531	1394	1240	1069	936			16
18	1740	1734	1734	1531	1394	1240	1069	936	825	727	18
20	1550	1550	1544	1531	1394	1240	1069	936	825	727	20
22	1400	1396	1390	1384	1384	1240	1069	936	825	727	22
24	1272	1268	1262	1258	1258	1240	1069	936	825	727	24
26	1164	1161	1157	1151	1151	1147	1069	936	825	727	26
28	1072	1069	1065	1062	1059	1055	1049	936	825	727	28
30	993	990	986	980	980	976	970	936	825	727	30
34	865	861	855	853	849	846	843	839	825	727	34
38	739	760	754	751	747	743	741	735	731	727	38
42	630	677	672	668	666	662	658	652	648	646	42
46	535	592	606	602	597	593	589	586	581	577	46
50		510	549	545	541	537	533	528	524	521	50
54		435	482	497	492	488	486	480	476	472	54
58			418	454	452	448	443	439	435	431	58
62				397	415	412	407	403	399	394	62
66					377	379	376	370	367	363	66
70					330	350	348	343	338	334	70
74						313	322	318	314	309	74
78							296	295	291	287	78
82								275	270	267	82
86									247	252	86
90										232	90
94											94

#### SDB-2

Superlift counterweight: 900t Superlift counterweight slewing radius: 30m Turntable counterweight: 340t Body counterweight: 112t								
Boom length	72	78	84	90	96	102	108	Boom length
Radius								Radius

14	1531	1475						14
16	1531	1475	1360	1182	1120			16
18	1531	1475	1360	1182	1120	1058	994	18
20	1495	1475	1360	1182	1120	1058	994	20
22	1345	1337	1337	1182	1120	1058	994	22
24	1216	1209	1209	1182	1120	1058	994	24
26	1108	1104	1098	1092	1088	1058	994	26
28	1019	1009	1009	1003	997	993	990	28
30	940	931	928	921	918	915	911	30
34	810	800	800	790	786	784	780	34
38	707	701	697	688	685	682	678	38
42	626	616	613	606	603	600	596	42
46	557	549	547	539	534	531	528	46
50	500	492	490	482	478	476	470	50
54	452	443	442	433	429	425	423	54
58	399	403	399	393	389	385	380	58
62	342	366	363	357	353	348	344	62
66		317	332	324	320	316	312	66
70		269	296	295	291	288	284	70
74			254	270	267	263	259	74
78				233	244	240	236	78
82					215	220	216	82
86					184	198	198	86
90						170	180	90
94							155	94

## SLDB-1

Superlift counterweight: 900t Superlift counterweight slewing radius: 30m Turntable counterweight: 340t Body counterweight: 112t									
Boom length	114	120	126	132	138	144	150	156	Boom length
Radius									Radius
20	641	568	501						20
22	641	568	501	444	391	354			22
24	641	568	501	444	391	354	309	272	24
26	641	568	501	444	391	354	309	272	26
28	641	568	501	444	391	354	309	272	28
30	641	568	501	444	391	354	309	272	30
34	641	568	501	444	391	354	309	272	34
38	641	568	501	444	391	354	309	272	38
42	641	568	501	444	391	354	309	272	42
46	588	568	501	444	391	354	309	270	46
50	533	531	501	444	391	354	308	268	50
54	483	482	479	444	391	353	305	266	54
58	442	440	437	434	391	350	303	264	58
62	406	404	400	398	388	339	300	261	62
66	375	372	369	367	363	326	297	258	66
70	346	344	341	338	335	316	283	255	70

74	321	320	316	313	310	305	273	249	74
78	300	297	293	291	288	285	265	241	78
82	278	277	273	270	267	264	254	231	82
86	260	258	255	252	249	246	243	225	86
90	244	242	238	236	233	230	226	218	90
94	228	226	223	221	216	214	211	206	94
98	214	213	209	206	203	200	196	193	98
102		199	196	193	190	187	183	180	102
106		186	184	181	178	175	171	168	106
110			173	170	167	164	160	157	110
114				160	157	153	150	147	114
118					147	143	140	137	118
122					137	129	131	127	122

## 2.2 Partial load chart of heavy-duty fixed jib: (Unit: t)

Jib mounting angle: 15° Superlift counterweight: 900t Superlift counterweight slewing radius: 30m Turntable counterweight: 340t Body counterweight: 112 t										
Jib length, m	18									Jib length, m
Boom length, m	60	66	72	78	84	90	96	102	108	Boom length, m
Radius										Radius
24	1309									24
26	1251	1190	1049							26
28	1148	1160	1049	932	827					28
30	1057	1071	1049	932	827	740	661			30
34	907	923	926	918	827	740	661	595	535	34
38	785	803	809	806	795	740	661	595	535	38
42	713	732	740	739	730	698	651	595	531	42
46	603	622	633	635	631	622	609	579	525	46
50	530	551	563	567	565	559	549	536	509	50
54	467	488	501	508	508	504	496	485	473	54
58	411	433	447	456	458	456	450	441	430	58
62	360	383	399	409	412	412	408	401	392	62
66	313	338	355	366	371	373	370	364	357	66
70	267	295	314	327	334	337	335	331	325	70
74		255	276	291	299	304	304	301	296	74
78			240	257	267	273	274	272	269	78
82				225	237	244	247	246	244	82
86					207	216	221	222	220	86
90					179	190	196	198	198	90
94						165	172	176	177	94
98							149	155	157	98
102								134	137	102
106								113	118	106
110									100	110



## 3. Technical Specification

### 3.1 Working conditions and boom system

Superlift working conditions, lattice-boom structure, high-strength main pipes, and high-strength anchoring rods.

#### 3.1.1 Superlift working conditions

- ① Superlift boom working conditions: boom section length: 6 m, 12 m  
Heavy-duty boom length: 54~108 m  
Light-duty boom length: 114~156 m
- ② Superlift heavy-duty jib working conditions——boom length: 54~108 m  
Heavy-duty jib length: 18 m
- ③ Superlift tower jib working conditions——boom length: 54~108 m  
Tower jib length: 36~108 m

### 3.2 Mechanisms

#### 3.2.1 Main and auxiliary hoisting mechanisms

They consist of imported variable displacement axial piston hydraulic motors, reducers, normally engaged brakes, and wire ropes. They can be controlled independently from other mechanisms.

The **non-rotating wire ropes** imported from Germany are used.

The main hoisting mechanisms I and II can be equipped with a synchronous controller when they are required to work synchronously.

The auxiliary hoisting winch is optional.

#### 3.2.2 Luffing mechanism

Tower luffing, superlift luffing and boom luffing are composed of imported variable displacement axial piston hydraulic motors, reducers, normally engaged brakes, and wire ropes.

The **non-rotating wire ropes** imported from Germany are used.

The maximum single rope speed of main luffing winch is 2×36 m/min.

The maximum single rope speed of tower luffing winch is 100 m/min.

The maximum single rope speed of superlift luffing winch is 112 m/min.

#### 3.2.3 Slewing mechanism

This is a closed four-drive and four-slewing mechanism, which is composed of variable displacement hydraulic motor, gear reducer, brake, pinion and slewing bearing.

The slewing mechanism has controllable slip to reduce impact, and achieves higher stability when the brake is engaged.

The slewing mechanism adopts the original imported six-row roller external gear slewing bearing, which has strong bearing capacity and high precision, thereby ensuring stability and accuracy of slewing.

The slewing can achieve stepless speed regulation from 0 to 0.77 r/min.

### **3.2.4 Travel gear**

It adopts four-drive, and its hydraulic motor and travel reducer are imported from Germany. Two sets of control levers are used to control the travel of two tracks, which can achieve straight-line traveling, single-sided steering, differential steering, in-situ steering and loaded traveling, thus providing a high degree of mobility and flexibility.

Traveling speed: 0~0.76 km/h.

Gradeability: 15%.

Track tension: The tension cylinder is controlled by a separate pump station, which is fast, convenient and reliable.

### **3.2.5 A-frame hoisting mechanism**

It is composed of front stay bar, hoist cylinder and auxiliary hydraulic system.

### **3.2.6 Outrigger hoisting mechanism**

It is composed of carrier outrigger, outrigger cylinder, outrigger valve, and track power pin. The outrigger hoisting mechanism is the main bearing mechanism when the track is disassembled or assembled. The power pin is used to connect frame to cross member, and cross member to track assembly. The outrigger hoisting mechanism can improve work efficiency, reduce labor intensity and avoid danger of manual operation when the carrier assembly is installed.

## **3.3 Systems**

### **3.3.1 Hydraulic system**

It consists of main pump, control valve, hydraulic motor, hydraulic tank, cooler and others.

The hydraulic system adopts the world advanced pump control system. The main components such as pump, motor and main circuit valve are imported from Germany, which achieve high efficiency and energy saving, high reliability and extended service life.

Main hydraulic pump: variable displacement piston pump with tandem gear pump, driven by engine.

Auxiliary mechanism oil source: variable displacement constant pressure pump.

Main control valve: electro-hydraulic pilot control valve.

Main circuit control mode: pump control system and control lever.

Auxiliary mechanism control: solenoid directional control valve group, with relief valve.

Outrigger operation: multi-way solenoid valve operated by electric control box.

Oil filter: oil return circuit filter, and control oil circuit precision filter.

Cooler: aluminum radiator, and fan driven by hydraulic motor.

### **3.3.2 Electrical system**

24V DC, negative ground, two 195AH batteries.

The electrical system of the crane mainly include power supply, engine start and stop, indicator, warning device, lighting, fan, wiper, horn, hoisting height limiter, hydraulic oil cooling fan,

digital display, PLC, load moment limiter, engine preheating device, safety device, etc., all of which ensure safe operation and good working environment for the crane. The crane adopts CAN bus technology, which effectively connects engine, PLC, load moment limiter and digital display together and has fault detection and self-diagnosis function, GPS/GPRS and remote fault diagnosis system.

### **3.3.3 Powertrain**

It adopts an original imported EFI diesel engine of Mercedes-Benz (Germany), which has CAN bus interface and uses two-set parallel operation mode.

Rated output power: 420 kw, 1800 r/min

Max. output torque: 2700 Nm, 1300 r/min

Emission standard: U.S. EPA Tier 3 and EU Stage III

The 2000 L large-capacity fuel tank is used to ensure sufficient engine operating time.

### **3.3.4 Centralized display system**

The 10.4-inch touch screen LCD, with Chinese-English switching function, can display various working condition signals collected by PLC such as engine speed, water temperature, fuel pressure, hydraulic pump pressure, main motor pressure, crane operation condition, and wind speed on the top of boom, monitor the working conditions in real time, and send yellow or red alarm when the working condition of the crane is abnormal.

### **3.3.5 Closed circuit television system**

It monitors the winding of wire ropes of hoisting, boom luffing, tower luffing, superlift luffing and other winch mechanisms, the superlift counterweight, and the surroundings of working area.

### **3.3.6 Centralized lubrication system**

It provides easy maintenance and reduces wear of parts.

## **3.4 Safety devices**

This crane adopts mechanical, electronic and hydraulic safety and alarm devices to ensure safe operation of the crane.

### **3.4.1 Load moment limiter**

It is composed of load moment indicator and digital LCD. When the lifting moment exceeds 90% of the rated moment, the alarm lamp will come on and the buzzer will sound; when the rated moment is exceeded, the crane will be automatically stopped to prevent accidents caused by overloading during construction and ensure normal and safe operation.

The digital LCD can display the following data:

Moment percentage

Boom angle

Boom length

Working radius

Actual hook load

Permissible lifting load

Max. allowable hoisting height

#### **3.4.2 Relief valves in hydraulic system**

They can suppress abnormally high pressure in the hydraulic circuit to prevent damage to the hydraulic pump and motor, and prevent the hydraulic system from being overloaded.

#### **3.4.3 Height limiter**

The limit switch and counterweight mounted on the boom top are used to prevent the hook from being lifted excessively. When the hook is lifted to a certain height, the limit switch will act to send a signal, the electrical system will automatically cut off the lifting action of the hook, and an audible and visual alarm will be sent from the buzzer and display screen in the control room to prevent the hook from over-hoist.

#### **3.4.4 Angle indicator**

The boom angle indicator is mounted below the rear end of the boom base (on the right side of control room), and the driver can clearly see the boom angle in the control room.

#### **3.4.5 Alarm protection system of boom in limit positions**

The protection system is controlled by load moment limiter and limit switch in two stages, which ensures that the luffing action of the boom can be automatically cut off in the limit elevation angle positions and the system can send an audible and visual alarm.

#### **3.4.6 Machine horizon sensor**

The electronic gradiometer can display inclination angle of the crane in real time on the digital display so as to ensure the safety of the crane.

#### **3.4.7 Hook safety catch**

It prevents the lifted heavy objects from being unhooked.

#### **3.4.8 Anemometer**

The electronic wind speed sensor can display the real-time wind scale on the digital display, which is convenient for indication of risky working environment.

#### **3.4.9 Wire rope lowering limiter**

When the wire rope in reeler is unreeled to the last three wraps, the protection device will send a signal, the electrical system will automatically cut off the unreeling and free-fall action of the rope, and an audible and visual alarm will be sent from the buzzer and display screen in the control room.

#### **3.4.10 Boom back-stop**

The nationally patented back-stop cylinder can make the anti-tilt buffering more stable and reliable, provide mechanical-electrical-hydraulic safety protection, and ensure safe and stable operation.

#### **3.4.11 Emergency stop button**

In case of an emergency, this button can be pressed to shut down the engine and stop all actions.

#### **3.4.12 Tri-color warning lamp**

The three colors of the warning lamp, that is, red, yellow and green, can simultaneously display the load status. Green means that the load rate is below 90%, yellow means that between 90% and 100%, and red means that above 100% which is in danger of overload.

#### **3.4.13 Safety monitoring and management system**

It has black box and video monitoring and recording functions, by recording operation commands over 30 working days as well as operation and lifting videos of 72 hours.

#### **3.4.15 Remote GPS monitoring system**

It has satellite-based GPS, GPRS data transmission, equipment usage status query and statistics, and remote fault diagnosis functions.

#### **3.4.16 Wireless remote control function**

The actions that can be realized include extensions and retractions of boom pin cylinder, superlift mast pin cylinder, and lower structure outrigger cylinder.

### **3.5 Control room**

The control room is 2.5 m in length × 2.3 m in width × 2.3 m in height. It adopts all-steel structure, with tempered glass all around, and laminated glass on the top and front window. It is internally equipped with sun visor, operator's seat, wipers and electric control handle, load moment indicator, digital display, various switch-assisted remote control box assemblies, split air conditioner, small refrigerator, workbench, retractable seat, electric fan, lamps, cigar lighter, fire extinguisher, etc. The control room provides wide view and its interior is spacious and comfortable.

### **3.6 Hook**

Both rotatable hook and safety catch are available.

#### **3.6.1 1800t hook:**

It can be disassembled into 900t, 480t and 420t hooks.

1800t hook: with 30 pulleys.

900t hook: with 15 pulleys.

480t hook: with 8 pulleys.

420t hook: with 7 pulleys.

#### **3.6.2 200t hook:**

With 3 pulleys.

(Parameters subject to changes. Please in kind prevail.)