ZOOMLION

ZOOMLION QY30V TRUCK CRANE

TECHNICAL SPECIFICATIONS

QY30V431R /27Y

Zoomlion Heavy Industry Science & Technology Co.,Ltd.

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1 Product characteristics

ZOOMLION QY30V truck crane, which integrates our several decades' experience in designing and manufacturing mobile cranes with advanced technologies, is a new-generation and high-performance product developed to meet the overseas market demands. Its performances such as lifting height, main boom length, work speed and lifting capacity, etc., have achieved advanced international levels.

This product is a truck crane of full range slewing function and with manually controlled boom sections (1 base section and 3 telescopic sections).

The crane adopts Zoomlion manufactured 3-axle special purpose chassis with full-width right-hand drive cab (8 × 4 drive), providing wide vision and simple decoration. The engine complies with EU III emission standard.

The latest directional control valve, quadruple gear pump system and safety devices such as relief valves, balance valves, hydraulic locks and brake valves etc. ensure that each executive mechanism makes full use of its work capability, prevent the accidents caused by oil line overload and oil pipe ruptures and greatly improve the work reliability and safety.

The complete lighting systems and the safety devices, such as load moment limiter, can ensure your safety during operation and are convenient for night work.

This crane has a novel style which makes it beautiful in figure, in form and in color.

2 Specifications, complete vehicle

2.1 Product model

Model in engineering industry: QY30V

Product code: QY30V431R

2.2 Technical data

Item		Value	Remarks
Work performance	Max. rated lifting capacity kg	30000	
	Max. load moment of basic boom kN.m	1102.5	
	Max. load moment of main boom (fully extended) kN.m	593	
	Max. lifting height of basic boom m	11.5	
	Max. lifting height of main boom m	33.8	The parameters do not include deflection of main boom and jib.
	Max. lifting height of jib m	46.9	
Work speeds	Max. hoist rope speed (Main winch) m/min	120	At the 4th layer
	Max. hoist rope speed (Auxiliary winch) m/min	100	At the 2nd layer
	Boom derricking up time s	40	
	Boom extending time s	66.5	
	Slewing speed r/min	0～2.2	
Driving	Max. driving speed km/h	78	
	Max. gradeability %	37	
	Turning diameter m	≤22	
	Min. ground clearance mm	220	
	Oil consumption per hundred kilometers L	35	
Mass	Deadweight in driving condition kg	30000	
	Complete vehicle kerb mass	29870	
	Front axle load kg	12000	
	Rear axle load kg	18000	
Dimensions	Overall dimensions (L × W × H) mm	12990×2550×3860	
	Outrigger spread (L) m	5.36	
	Outrigger spread (W) m	Fully extended 6.1、intermediately extended:4.2	
	Tail slewing radius mm	3385	
	Main boom length m	10.5～33.3	
	Boom angle °	-2～80	
	Jib length m	8.65、13.55	
	Offset °	5、17、30	

2.3 Lifting capacity tables

This crane is provided with 3 lifting capacity tables. The operator should select proper rated lifting load referring to resp. lifting capacity tables according to actual working conditions. Please see Table 2 – 1 to Table 2 – 3.

Table 2 – 1 Unit: Metric kg

Working radius (m)	Main boom (m)					
	Outriggers fully extended, over sides and rear					
	10.5	14.9	19.5	24.1	28.7	33.3
3.0	30000	20000				
3.5	29000	20000	18000			
4.0	28000	20000	18000			
4.5	25000	20000	17500	12000		
5.0	22000	20000	17000	12000		
5.5	20000	19000	16000	12000	9000	
6.0	18000	17500	15000	11500	9000	
6.5	15500	15000	14000	10800	9000	
7.0	14000	**14200**	12500	10200	9000	7500
8.0	11200	11200	**11200**	9000	8200	7000
9.0	8500	9200	9500	8300	7500	6500
10.0		7700	7900	**7900**	6800	6000
11.0		6200	6500	6600	6200	5500
12.0		5500	5800	6000	5800	5000
13.0		3500	4900	4900	5050	4500
14.0			4300	4500	4700	4200
15.0			3600	3850	4100	3800
16.0			3200	3500	3600	**3600**
18.0			2100	2700	2800	2800
20.0				2100	2200	2350
22.0				1650	1800	1900
24.0					1400	1500
26.0					1100	1200
28.0						800
30.0						550

Table 2 – 2 Unit: Metric kg

Working radius (m)	Main boom（m）					
	Outriggers intermediately extended, over sides and rear					
	10.5	14.9	19.5	24.1	28.7	33.3
3.0	30000	20000				
3.5	25000	20000	18000			
4.0	22000	20000	18000			
4.5	17500	17000	17000			
5.0	14000	14500	15000	12000		
5.5	12000	12000	12000	12000	9000	
6.0	10000	10000	10500	10500	9000	
6.5	8500	8800	8500	9100	9000	
7.0	7600	7500	7500	8200	8300	7500
8.0	5500	5500	5600	6200	6300	7000
9.0		4500	4600	5100	5300	5400
10.0		3500	3600	4200	4300	4400
11.0		3000	2800	3300	3500	3500
12.0		2300	2200	2700	2900	3050
13.0			1600	2200	2400	2600
14.0			1500	1900	2000	2200
15.0			1150	1450	1600	1800
16.0			820	1050	1300	1400
18.0				650	800	900
20.0					550	650

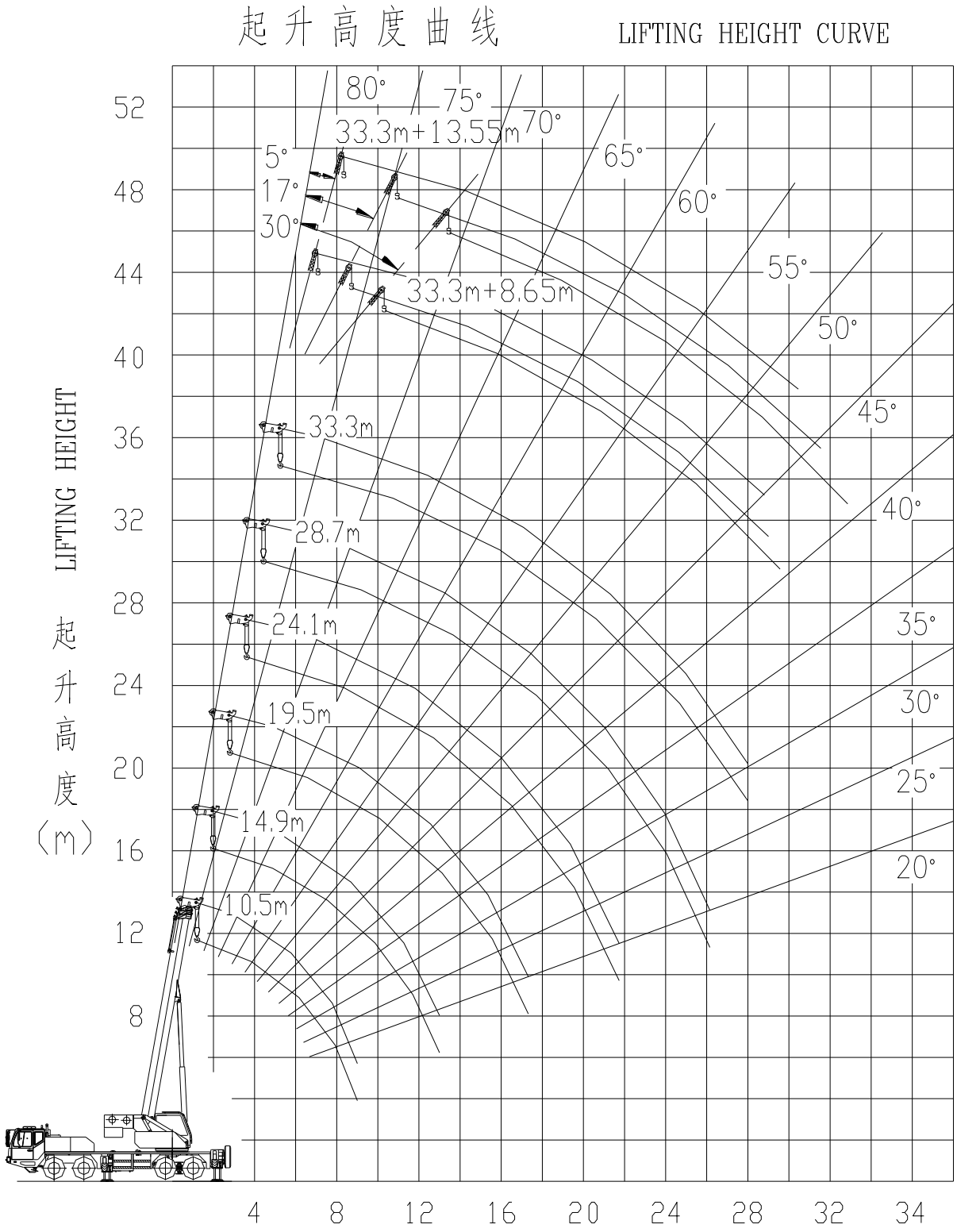
Table 2 – 3 Unit: Metric kg

Boom angle °	Main boom (m) + jib (m)					
	Outriggers fully extended, over sides and rear					
	33.3+ 8.65			33.3 + 13.55		
	5°	17°	30°	5°	17°	30°
80	3000	2200	1600	2000	1300	900
78	3000	2200	1600	2000	1300	900
76	3000	2200	1600	1850	1240	900
74	2750	2050	1550	1680	1150	850
72	2500	1900	1500	1500	1060	810
70	2300	1800	1450	1360	970	770
68	2150	1700	1400	1250	910	740
66	2000	1600	1320	1150	850	700
64	1850	1500	1250	1060	790	670
62	1700	1400	1200	980	740	640
60	1600	1350	1150	900	700	600
58	1480	1250	1080	830	670	570
56	1280	1120	1020	770	640	550
54	1080	1000	980	720	600	530
52	900	810	800	660	570	520
50	750	700	670	570	520	500
45	470	450	430			

Standard rope reevings for various boom lengths

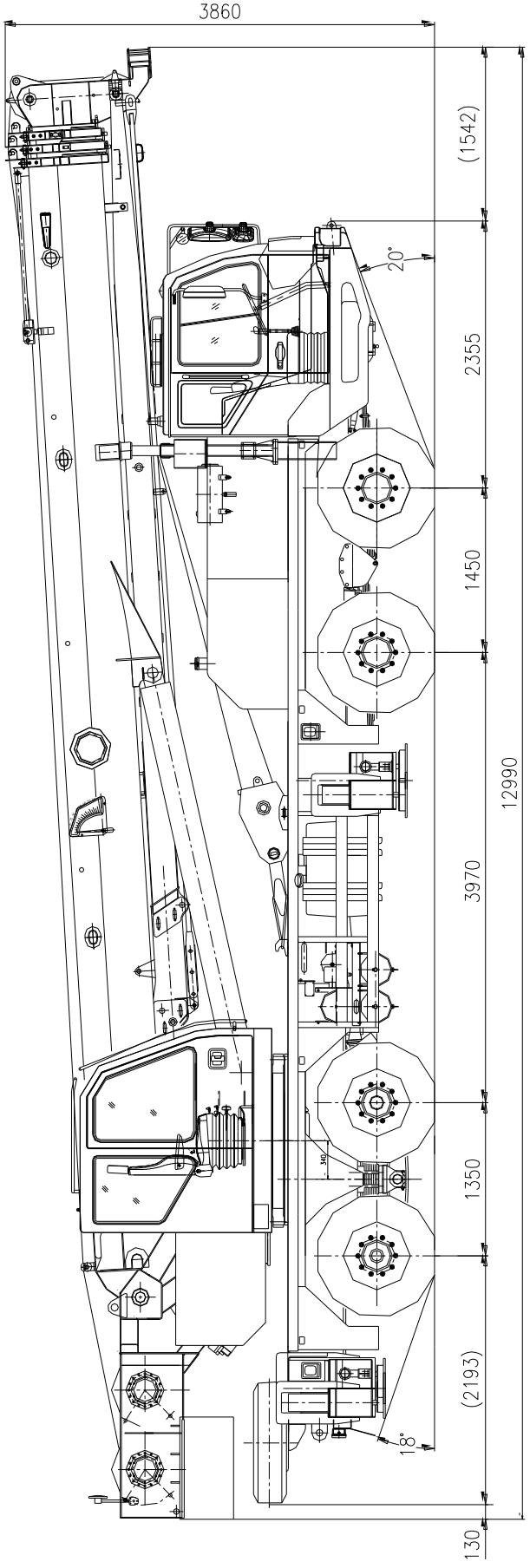
Boom length (m)	10.5	10.5~19.5	19.5~28.7	28.7~33.3	33.3+8.65	33.3+13.55
Reevings	8	6	4	3	1	1

2.4 Lifting height chart



Working radius (m)

2.5 Overall view (Unit: Metric mm)



3 Components, superstructure

3.1 Main boom and telescoping system

4-section telescopic boom (1 base section and 3 telescopic sections made from low-alloy and high-tensile steel

U boom profile of particular torsional rigidity

The weight-optimized design provides the boom with super load bearing capacity, light deadweight, large lateral stiffness and small end deflection. The self-created built-in support structure of slide block and a series of optimized design have the deadweight of the boom greatly decreased and the stress on the boom evenly distributed. Thus, boom deformation caused by uneven stress distribution will never occur. Furthermore, the boom has good guidance quality and adjustability.

The telescopic boom sections are telescoped in/out via a telescoping cylinder and 2 sets of boom extension / retraction wire rope. The cylinder drives telescopic boom section 1 to telescope in/out, and telescopic boom sections 2 and 3 telescope in / out simultaneously via boom extension / retraction wire ropes. Moreover, each cylinder is fitted with a balance valve. This compact design makes the crane work reliably.

3.2 Jib

The crane has a 2-section drag rod type jib. When it is not used, the jib is installed under the boom. It connects to the boom by pins.

The jib section can be assembled below an angle of 5°, 17° or 30° in relation to the telescopic boom. The offset can be conveniently changed via the pins and pull bracket.

3.3 Slewing table

The slewing table is of profiled steel structure. Its optimized design makes the layout of articulated points of main boom and derricking gear more reasonable. Besides, it also has a distinctive structure and beautiful appearance.

3.4 Rooster sheave

It is secured at the outside of the top boom section head when it is not used.

It can be rotated around the shaft and pinned onto the boom head when it is used.

This option is set up for rapid hoists over the boom head to improve the work efficiency when the loads are light.

3.5 Derricking gear

The front-mounted hydraulic cylinder with a balance valve provides the boom with smooth derricking movements from -2° to 80°.

3.6 Slewing gear

Via the planetary gear reducer, the axial plunger hydraulic motor drives the pinion gear on the output shaft to rotate the toothed ring of slewing bearing fixed on chassis frame, providing superstructure with 360° unlimited slewing.

The slewing gear is of controllable free swing function, which can let the boom automatically

align the end of the boom above the load during operation.

The slewing cushion valve and the normally-closed brake can ensure stable and reliable slewing operation of the crane.

The 4-point ball-type slewing bearing ensures the slewing table with super-high load bearing capacity and long service life.

3.7 Hoist gear

- Main and auxiliary winches

  Main and auxiliary winches have the same parts, which include:

  - Hydraulic motor
  - Planetary gear reducer, with brake.

  The hydraulic motor drives the winch with a planetary reducer. When the winch turns (rotates), the wire-rope reels off or spools on to the winch.

  The models of main and auxiliary winches are the same. The two winches are respectively driven by a variable motor and can be operated independently or simultaneously.

  The built-in two-stage planetary reducer is of compact structure, light deadweight and high reliability.

  A lowering limit switch is installed on the main winch.

- Wire ropes

  Rotation-resistant high-tensile main / auxiliary hoist rope

  Rope diameter: φ17.0 mm

  Rope strength: 1870 N/mm^2

  Main hoist rope length: 175 m

  Auxiliary hoist rope length: 105 m

3.8 Hook block

Rotatable main hook: 30 t, with 4 pulleys, a press nipple and a hook latch

Rotatable auxiliary hook (one reeving): 3 t, with a hook latch

3.9 Operator’s cab

The sheet steel cab offers an extended field of view and a comfortable and functional working environment.

The control elements and displays are ergonomically arranged. Thus a safe and fatigue free working is assured.

The cab has the following features:

- The seat with headrest can be easily adjusted to a suitable position to meet the demands of different operators.
- The instrument panels are respectively located in the right side of the operator and the right top area of the cab.

- Five control levers are located in front of operator's seat.
- With such standard equipment as windshield wiper, washing system and special single-cool air-conditioning for vehicle.

3.10 Outriggers

H-type outriggers in box structure are welded by low-alloy and high-tensile steel. After simulation design by Pro/E software and emulation calculation, the outriggers are of good sectional performance and strong load bearing capacity.

The sliding beam is extended / retracted via a one-stage horizontal cylinder. Large outrigger spread ensures stability of the crane.

The outrigger pad is mounted at the bottom of vertical cylinder and can be pushed or pulled horizontally. When the outriggers are fully extended or retracted, they can be locked with retaining pins.

The outrigger control levers, which are manually controlled, are installed on both sides of the chassis frame and can be operated simultaneously or independently. Each vertical cylinder is equipped with a two-way hydraulic lock to ensure stable and reliable operation of the crane.

The 5^{th} outrigger is installed beneath the driver's cab. When the 5^{th} outrigger is set up, the crane can realize full range slewing operation.

3.11 Counterweight

The counterweight system is a 2.5 t fixed counterweight plate, which is installed under the rear section of the slewing table by bolts and can be assembled and disassembled by lifting equipment such as traveling cranes or other cranes.

3.12 Hydraulic system

It is an open hydraulic system.

The five control levers (manually operated) control the movements "Slew", "Telescope", "Derrick", "Hoist (main winch)" and "Hoist (auxiliary winch)".

The adopted antipollution bite-type fitting ensures high reliability of the hydraulic system.

The main power element is a quadruple gear pump. Two pumps (converging flow) are for the main winch, auxiliary winch, derricking gear and telescoping system, one of the other two is for the chassis hydraulic system, slewing gear and air conditioning for the superstructure, and the smallest one is for the oil supply of the control oil line and the control of the hoisting and slewing brakes etc.

The outrigger control valves are new-type manual multiple unit directional control valves to control the movements of horizontal and vertical cylinders. Each of them is fitted with a pressure limiting valve, thus to prevent the piston rods of horizontal cylinders from bending. They can be operated independently or simultaneously from both sides of the vehicle. Additionally, the 5^{th} outrigger can retract synchronically, thus avoiding wrong operation and ensuring safety.

3.13 Electrical system

Single wire system, negative grounded, 24 Volt DC.

The superstructure electrics includes the devices such as battery master switch, ignition starter switch, engine off button, control light "Power source", warning light "Main / auxiliary winch approaching upper limit", warning light "Main / auxiliary winch approaching lower limit", warning light "The 5^{th} outrigger pressure too high", hoisting limit switch, lowering limit switch, overload protection device, illumination, fan, windshield wiper, horn, hydraulic oil cooling fan slewing warning device and slewing monitoring system etc. These devices can ensure safe operation and provide a comfortable working environment.

In an emergency, press the red emergency-off switch to stop the engine and cut off all the

movements of the superstructure so as to ensure the safety of operation.

3.14 Safety devices

This crane is equipped with an automatic load moment limiter whose display and warning devices are all fitted in the operator's cab.

If the actual load reaches 90% of the rated one, the warning light lights up and buzzer sends out slow acoustic warning.

If the actual load approaches 100% of the rated one, the warning light lights up, buzzer sends out fast acoustic warning and all dangerous crane movements are switched off.

The basic parameters, such as moment ratio, boom angle, boom length, working radius, actual lifting capacity, rated lifting capacity, etc. will be displayed on the digital LCD.

This crane is also equipped with the following safety devices to ensure the crane safety:

a) Boom angle indicator

b) Hoisting limit switch

c) Hook latch

d) Lowering limit switch

e) The 5th outrigger overpressure protection device

f) Two-way hydraulic lock

g) Balance valve

h) Relief valve

3.15 Single-cool air conditioning

The operator's cab is equipped with special single-cool air conditioning for vehicle.

4 Specifications, chassis

Chassis	Engine	Model	WP10.270
		Rated power kW/r/min	199/2200
		Max. output torque N.m/r/min	1100/1200 – 1600
		Manufacturer	WEICHAI POWER Co., Ltd.
	Model		ZLJ5300V3.1Y special purpose chassis for truck crane
	Type		II
	Code		ZLJ5300V3
	Limits for exhaust pollutants and smoke		EU III emission standard
	Manufacturer		Zoomlion Heavy Industry Science and Technology Co., Ltd.

For the details, please refer to the *Technical Specifications, Special Purpose Chassis for Truck Crane*.

5 Working conditions

5.1 Temperature

Do not operate the crane if the temperature at the jobsite is not in the proper range from -20°C to 40°C.

5.2 Wind speed

During operation, the instantaneous wind speed should be taken as the actual one. Wind

speed during crane operation should not exceed 14.1 m/s.

The wind speed during crane operation (3 s instantaneous wind speed) = average value of wind speed for 10 minutes of 10 m above the ground × conversion coefficient 1.5.

If the instantaneous wind speed is greater than the permissible value of 14.1 m/s, while the crane is in operation, do the tasks that follow:

a) Stop the work (safely lower the load).

b) Retract the boom.

c) Correctly stow the boom.

5.3 Height above sea level

During crane operation, height above sea level should not be higher than 2000 m.

Appendix

Table – Main purchased parts and manufacturers

Ser. No.	Description	Manufacturer	Remarks
1	Main valve	Changde Zoomlion Heavy Industry Science & Technology Hydraulic Co., Ltd.	
2	Main pump	Tongshan County Branch Company, Xuzhou Keyuan Hydraulic Co., Ltd.	
		Ji'nan Hydraulic Pump Co., Ltd.	
3	Winch motor	Avic Liyuan Hydraulic Co., Ltd.	
		Beijing Huade Hydraulic Industrial Co., Ltd.	
		Shanghai Electric Hydraulic & Pneumatics Co., Ltd Hydraulic Pump Factory	
		HIGH-TECH Fluid Power Co., Ltd.	
4	Winch reducer	Tongshan County Branch Company, Xuzhou Keyuan Hydraulic Co., Ltd.	
		Bosch Rexroth (Beijing) Hydraulic Co., Ltd.	
		Shanghai Wanhui Mechanical Manufacture Co., Ltd.	
5	Slewing motor	Shanghai Electric Hydraulic & Pneumatics Co., Ltd Hydraulic Pump Factory	
		HIGH-TECH Fluid Power Co., Ltd.	
		Beijing Huade Hydraulic Industrial Co., Ltd.	
		Avic Liyuan Hydraulic Co., Ltd.	
6	Slewing reducer	Shanghai Wanhui Mechanical Manufacture Co., Ltd.	
		Tongshan County Branch Company, Xuzhou Keyuan Hydraulic Co., Ltd.	
		Bosch Rexroth (Beijing) Hydraulic Co., Ltd.	
7	Slewing bearing	Xuzhou Rothe Erde Slewing Bearing Co., Ltd.	
		Yantai Haoyang Mechanical Co., Ltd.	
8	Telescoping cylinder	Hunan Teli Hydraulic Co., Ltd.	
9	Derricking cylinder	Hunan Teli Hydraulic Co., Ltd.	
10	Horizontal cylinder	Hunan Teli Hydraulic Co., Ltd.	
11	Vertical cylinder	Hunan Teli Hydraulic Co., Ltd.	
12	Telescoping balance valve	Changde Zoomlion Heavy Industry Science & Technology Hydraulic Co., Ltd.	
13	Derricking balance valve	Changde Zoomlion Heavy Industry Science & Technology Hydraulic Co., Ltd.	
14	Hoist balance valve	Changde Zoomlion Heavy Industry Science & Technology Hydraulic Co., Ltd.	
15	Wire rope	Hubei Fuxing Science and Technology Co., Ltd.	
		Juli Sling Co., Ltd.	
		Jiangsu Safety Steel Rope Co., Ltd.	
		Wuxi Universal Steel Rope Co., Ltd.	
		Wuxi Universal Steel Rope Co., Ltd.	
16	Hook block	Shandong Hong Ruida Mechanical Co., Ltd.	
		Xuzhou Da Changshi Construction Mechanical Co., Ltd.	
		Changsha Lanying Industry Co., Ltd.	
17	Load moment limiter	Changsha Huade Science and Technology	

Ser. No.	Description	Manufacturer	Remarks
		Development Co., Ltd.	
18	Operator’s cab assy.	Shenzhou Automobile Internal Ornament Co., Ltd.	

NOTE

The equipment fitted in the crane is subject to change due to product design or other reasons. Therefore, the above table is for reference only.