ZOOMLION QY30V532 TRUCK CRANE

TECHNICAL SPECIFICATION

CHANGSHA ZOOMLION HEAVY INDUSTRY SCIENCE & TECHNOLOGY
DEVELOMENT CO., LTD

QY30V532 TRUCK CRANE

TECHNICAL SPECIFICATION

QY30V532.1/27Y

1. Product Characteristics

The QY30V532 truck crane, which is developed independently to adapt to the market demands, is a new-generation and high-performance product integrating our company many years' manufacturing experience with advanced technologies. Its performances such as lifting height, boom length, working speed and lifting capacity have achieved advanced international level.

The truck crane, with spacious cab and compact decoration, adopts full slewing system, 5-section telescopic boom sections, hydraulic proportional control system and self-made full-width special purpose chassis with three axles. The 6×4 drive and hydraulic power steering mechanism provides the crane with good driving performance and flexible steering. The engine complies with the National Stage III emission standard.

The system with latest load feedback hydraulic operated proportional directional control valve and quadruple gear pump, and the safety devices fitted in hydraulic system, such as relief valve, balance valve, hydraulic lock and brake valve etc., prevents the oil line from overloading and the accidents caused by oil pipe breakage and makes full use of the working capacity of each actuating mechanism. Thus the reliability and safety of the crane are increased.

The safety devices such as load moment limiter, and the complete lighting system equipped in the crane ensure your safety during operation and are convenient for night work.

2. Complete vehicle specification

2.1 Product model

Model in auto industry: ZLJ5322JQZ30V

Model in engineering industry: QY30V

2.2 Main Technical Specifications

2.2.1 Chassis model and main specifications of engine

Chassis	Model		ZLJ5325	Code: ZLJ5325V3
	Class		II	
	Engine	Model	WP10.270	
		Rated power kW/r/min	199/2200	
		Max. outout torque N.m/r/min	1100/1300 ～1600	
	Manufacturer		Changsha Zoomlion Heavy Industry Science & Technology Development Co., Ltd.	

2.2.2 Main technical specifications

Item		Value	Remarks
Working performance	Max. rated lifting capacity kg	30000	
	Max. load moment of basic boom kN.m	1132	
	Max. load moment of max. boom length kN.m	588	
	Max. lifting height of basic boom m	11.1	
	Max. lifting height of boom m	40.5	Deformation of the boom is not taken into consideration.
	Max. lifting height of jib m	48.5	
Working speed	Max. hoist rope speed (main winch) m/min	120	At 4th layer
	Max. hoist rope speed (auxiliary winch) m/min	100	At 2nd layer
	Boom derricking time s	40	
	Boom extending time s	80	
	Slewing speed r/min	0～2.2	
Traveling specifications	Max. traveling speed km/h	78	
	Max. gradeability %	37	
	Min. turning diameter m	≤22	
	Min. ground clearance mm	220	
	Limits for exhaust pollutants and smoke	Meet with related standards	GB3847-2005 GB17691-2005 (National Stage III)
	Oil consumption per hundred kilometers L	45	
Weights	Deadweight traveling condition kg	32000	
	Complete vehicle kerb mass kg	31870	
	Front axle load kg	7000	
	Rear axle load kg	25000	
Dimensions	Overall dimensions (L×W×H) mm	12900×2500×3465	
	Longitudinal distance between outriggers m	5.36	
	Transverse distance between outriggers m	6.1	
	Boom length m	10.6～40	
	Boom angle °	-2～80	
	Jib length m	8	
	Offset °	0, 30	

2.2.3 Rated Lifting Capacity Table

额 定 起 重 量 表 2-1 RATED LIFTING CAPACITY TABLE Table 2-1

单位 UNIT kg

工作幅度(m)	主 臂 (m) BOOM						
	Ⅰ缸伸至100%，支腿全伸，侧方、后方作业						
WORKING	Cylinder Ⅰ fully extended, with outriggers fully extended, in side & rear area						
RADIUS(m)	10.6	14.3	18.0	23.5	29.0	34.5	40.0
3.0	30000	27000	22000				
3.5	30000	27000	22000				
4.0	28000	26000	20000	16500			
4.5	25000	24000	18500	15500			
5.0	23000	22000	17000	14500			
5.5	21000	20500	15600	13500	11500		
6.0	18500	18500	14600	12500	10900		
6.5	16500	16500	13700	11800	10300		
7.0	14600	14400	12800	11000	9700	8200	
7.5	13000	12800	11900	10400	9200	7900	
8.0	11600	11400	11100	9700	8800	7600	
9.0		9300	9100	8700	8000	7000	6300
10.0		7600	7450	7900	7200	6400	5600
11.0		6400	6250	6900	6600	5850	5200
12.0			5150	5850	6100	5400	4800
13.0			4300	4950	5350	5000	4500
14.0			3600	4250	4600	4600	4200
15.0				3650	4050	4300	4000
16.0				3100	3500	3700	3700
18.0				2300	2700	2950	2950
20.0					2050	2300	2300
22.0					1550	1800	1800
24.0					1150	1300	1400
26.0						900	1050
28.0						650	750
30.0							550
Ⅰ	0	3.7	7.4	7.4	7.4	7.4	7.4
Ⅱ	0	0	0	5.5	11.0	16.5	22.0
倍率 fall	8	6	6	4	4	3	3
吊钩 hook	30t hook						

工作幅度(m)	主 臂 (m) BOOM						
	Ⅰ缸伸至50%，支腿全伸，侧方、后方作业						
WORKING	Cylinde Ⅰ half extended, with outriggers fully extended, in side & rear area						
RADIUS(m)	10.6	14.3	19.8	25.3	30.8	36.3	
3.0	30000	27000					
3.5	30000	27000					
4.0	28000	26000	16500				
4.5	25000	24000	15500				
5.0	23000	22000	14500	11500			
5.5	21000	20500	14000	11500			
6.0	18500	18500	13500	11500			
6.5	16500	16500	12800	11500	8200		
7.0	14600	14400	12000	11500	8200		
7.5	13000	12800	11200	11500	8100		
8.0	11600	11400	10700	11500	8000	6300	
9.0		9300	9700	10000	7400	6300	
10.0		7600	8500	8800	6700	5750	
11.0		6400	7200	7500	6300	5300	
12.0			6200	6300	5700	4900	
13.0			5200	5600	5400	4600	
14.0			4600	4900	5000	4250	
15.0			3900	4250	4600	4000	
16.0			3400	3700	4000	3700	
18.0				2900	3000	3100	
20.0				2200	2350	2500	
22.0				1700	1800	1900	
24.0					1400	1450	
26.0					1050	1150	
28.0					750	900	
30.0						650	
Ⅰ	0	3.7	3.7	3.7	3.7	3.7	
Ⅱ	0	0	5.5	11.0	16.5	22.0	
倍率 fall	8	6	4	4	3	3	
吊钩 hook	30t hook						

工作幅度(m)	主 臂 (m) BOOM					
	Ⅰ缸伸至0%，支腿全伸，侧方、后方作业					
WORKING	Cylinder Ⅰ fully retracted, with outriggers fully extended, in side & rear area					
RADIUS(m)	10.6	16.1	21.6	27.1	32.6	
3.0	30000	16500				
3.5	30000	16500				
4.0	28000	16500	11500			
4.5	25000	16500	11500			
5.0	23000	16500	11500			
5.5	21000	16000	11500	8200		
6.0	18500	15800	11500	8200		
6.5	16500	15300	11500	8200		
7.0	14600	15000	11500	7500		
7.5	13000	13500	10800	7300	6300	
8.0	11600	12000	10000	7000	6300	
9.0		10000	9000	6300	5700	
10.0		8500	8500	5800	5100	
11.0		7200	7500	5200	4700	
12.0		6200	6300	4900	4250	
13.0		5200	5600	4500	4000	
14.0		4600	4900	4100	3700	
15.0			4250	3800	3200	
16.0			3700	3600	3000	
18.0			2900	3100	2600	
20.0				2500	2300	
22.0				2000	2000	
24.0				1600	1700	
26.0					1300	
28.0					1100	
30.0						
Ⅰ	0	0	0	0	0	
Ⅱ	0	5.5	11.0	16.5	22.0	
倍率 fall	8	6	4	3	3	
吊钩 hook	30t hook					

额 定 起 重 量 表 2-2 RATED LIFTING CAPACITY TABLE Table 2-2

单位 UNIT kg

工作幅度(m) WORKING RADIUS(m)	主臂(m) BOOM I缸伸至100%，支腿半伸，侧方、后方作业 Cylinder I fully extended, with outriggers half extended, in side & rear area						
	10.6	14.3	18.0	23.5	29.0	34.5	40.0
3.0	30000	27000	21000				
3.5	26000	26000	19000				
4.0	23000	22000	18000	15000			
4.5	18000	18000	16000	14000			
5.0	16000	16000	15000	13000			
5.5	13000	13000	12500	12000	10500		
6.0	11000	11000	10500	11000	10000		
6.5	9500	9000	9000	9500	9200		
7.0	8200	8000	7500	8500	8600	8000	
7.5	6800	6600	6500	7200	7500	7300	
8.0	6200	4500	5500	6500	7000	7000	
9.0		3500	4500	5000	5500	6000	6000
10.0		2800	3500	4000	4500	4800	5000
11.0			2500	3200	3600	4000	4200
12.0			2000	2500	3000	3300	3500
13.0			1500	2000	2500	2600	3000
14.0			1100	1700	2000	2300	2500
15.0				1300	1600	1800	2100
16.0				1000	1300	1600	1800
18.0					800	1100	1200
20.0						700	900
22.0							600
I	0	3.7	7.4	7.4	7.4	7.4	7.4
II	0	0	0	5.5	11.0	16.5	22.0
倍率 fall	8	6	6	4	4	3	3
吊钩 hook	30t hook						

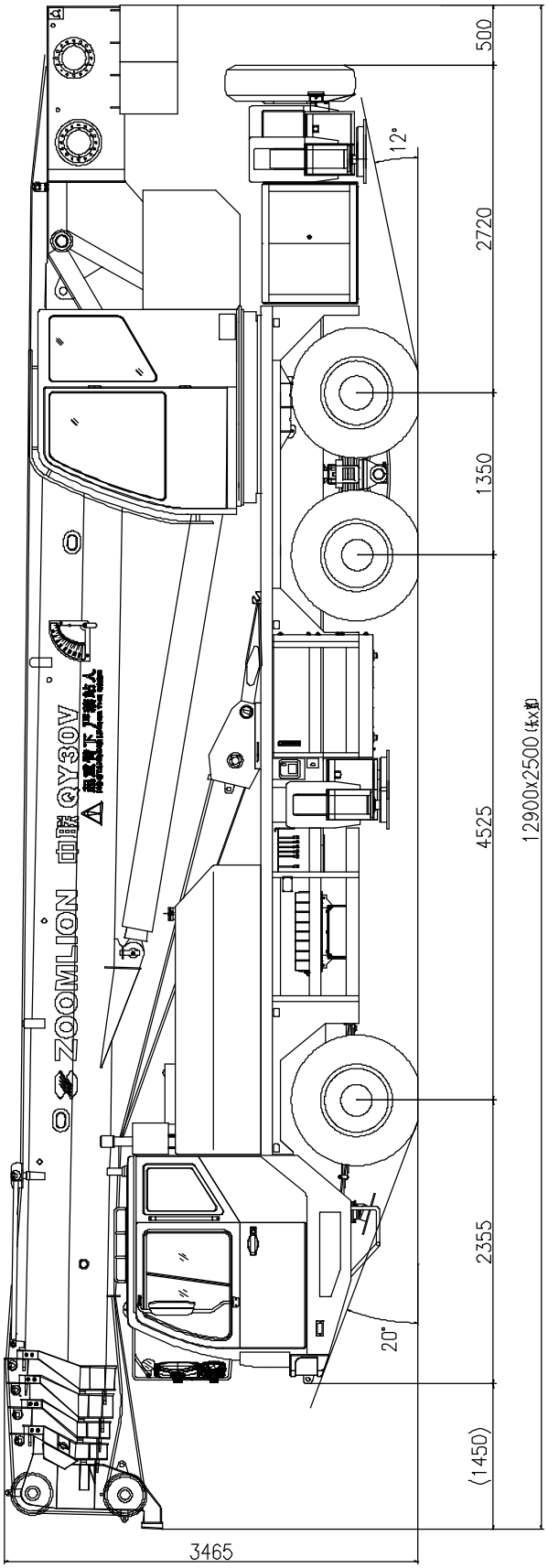
工作幅度(m) WORKING RADIUS(m)	主臂(m) BOOM I缸伸至50%，支腿半伸，侧方、后方作业 Cylinde I half extended, with outriggers half extended, in side & rear area					
	10.6	14.3	19.8	25.3	30.8	36.3
3.0	30000	27000				
3.5	26000	26000				
4.0	23000	22000	16500			
4.5	18000	18000	15500			
5.0	16000	16000	14500	11500		
5.5	13000	13000	13500	11500		
6.0	11000	11000	11500	11500		
6.5	9500	9000	10000	10500	8200	
7.0	8200	8000	8500	9200	8200	
7.5	6800	6600	7200	7600	7800	
8.0	6200	4500	6500	7100	7400	6300
9.0		3500	5200	5700	6000	6000
10.0		2800	4200	4500	5000	5200
11.0			3500	3800	4100	4400
12.0			2700	3100	3500	3700
13.0			2300	2700	2900	3100
14.0			1900	2100	2500	2700
15.0			1500	1800	2100	2300
16.0			1200	1500	1800	1900
18.0				1000	1200	1400
20.0				700	850	1000
22.0						700
I	0	3.7	3.7	3.7	3.7	3.7
II	0	0	5.5	11.0	16.5	22.0
倍率 fall	8	6	4	4	3	3
吊钩 hook	30t hook					

工作幅度(m) WORKINC RADIUS(m)	主臂(m) BOOM I缸伸至0%，支腿半伸，侧方、后方作业 Cylinder I fully retracted, outriggers half extended, in side & rear area					
	10.6	16.1	21.6	27.1	32.6	
3.0	30000	16500				
3.5	26000	16500				
4.0	23000	16500	11500			
4.5	18000	16500	11500			
5.0	16000	16500	11500			
5.5	13000	13800	11500	8200		
6.0	11000	11300	11500	8200		
6.5	9500	10000	10300	8000		
7.0	8200	8300	9000	7400		
7.5	6800	7400	7800	7000	6300	
8.0	6200	6500	6800	6700	6100	
9.0		5000	5500	6000	5300	
10.0		4000	4500	5000	4800	
11.0		3600	3800	4200	4500	
12.0		3000	3000	3500	3800	
13.0		2500	2500	3000	3200	
14.0			2200	2500	2800	
15.0			1900	2100	2300	
16.0			1600	1800	2000	
18.0			1000	1400	1500	
20.0				900	1100	
22.0				700	800	
I	0	0	0	0	0	
II	0	5.5	11.0	16.5	22.0	
倍率 fall	8	6	4	3	3	
吊钩 hook	30t hook					

RATED LIFTING CAPACITY TABLE 单位 UNIT kg

主臂仰角 BOOM ANGLE (°)	主臂 + 副臂 BOOM + JIB			
	支腿全伸 with outriggers fully extended			
	40.0 + 8.0 (m)			
	0°		30°	
	后、侧方 REAR & SIDE	前方 FRONT	后、侧方 REAR & SIDE	前方 FRONT
80	3000	3000	1500	1500
78	3000	3000	1500	1500
76	3000	3000	1500	1500
74	2900	2750	1500	1500
72	2800	2250	1450	1450
70	2650	1800	1400	1400
68	2500	1450	1350	1200
66	2250	1150	1300	980
64	1900	900	1270	760
62	1650	660	1240	580
60	1400	450	1210	380
58	1200		1080	
56	1030		930	
54	870		800	
52	730		650	
50	600		530	
45	320			
倍率 Reevings	1			
吊钩 hook	3t hook			

2.2.4 Overall view (Unit: mm)



3 Specifications, superstructure

3.1 Boom and telescoping mechanism

The box-type boom consists of 5 hexagon-section boom sections which are made of high-strength low alloy steel, so it has strong bending resistance, great load bearing capacity, light deadweight, large lateral stiffness and small end deflection. Adopting a self-created support structure for sliding block angle, the deadweight of the boom has been greatly decreased and the stress on the boom is distributed more evenly after a series improvements. Thus, boom deformation caused by uneven stress distribution will never occur. Furthermore, the boom has good guidance quality and adjustability.

The boom telescoping mechanism is composed of two telescoping cylinders and two synchronous telescoping mechanisms. The 1st telescoping cylinder drives the 2nd boom section to telescope in / out; the 2nd telescoping cylinder drives the 3rd, 4th, 5th boom section to telescope in / out via the synchronous telescoping mechanism. This compact design makes the crane operate reliably. Each cylinder is fitted with a balance valve.

3.2 Jib

It is 1-section lattice jib. It is folded on the side of boom and fixed by inserting pins when it is not used. The offset is 0° or 30° and is conveniently changed by operating the shaft and pull bracket.

3.3 Slewing table

Single ribbed plate structured and optimized slewing table made from high-strength steel makes the layout of articulated points of boom and derricking mechanism more reasonable. It also has a unique structure and beautiful appearance. The engine hood is designed ergonomically.

3.4 Boom head single pulley

The boom head single pulley is mounted on the side of boom head when it is not used. It rotates around the shaft and aligns and then is fixed on the boom head by shaft. This option is set up for rapid hoists over the boom head to improve the working efficiency when the loads are light.

3.5 Derricking mechanism

Derricking mechanism adopts a front mounted single cylinder which can make the boom angle vary from -2° to 80°. Balance valve fitted on the cylinder can make derricking up/down stably.

3.6 Slewing mechanism

Axial plunger piston hydraulic motor drives the pinion on output shaft via planetary gear reducer to rotate around the slewing ring, providing crane superstructure 360° unlimited rotation. The slewing mechanism is of controllable and free slewing function which makes the load stop at any position. Slewing cushion valve and normally closed brake provide the crane stable and reliable slewing. 4-point ball type slewing ring makes the slewing table of super-strong bearing capability and long service life.

3.7 Hoisting mechanism

It consists of main and auxiliary winch mechanisms. The hydraulic motor drives the grooved drum via the planetary gear reducer to lift and lower the hook. There is a brake mounted between the motor and reducer. The main winch and auxiliary winch can work independently or simultaneously. Models of main / auxiliary winch reducer are the same. However, the main winch is driven by variable motor and auxiliary winch is driven by fixed displacement motor. A spring-type rope guard is installed on each winch. The main winch is also equipped with a lowering limit switch. The built-in two-stage planetary reducer has such advantages as compact structure, light deadweight and high reliability. The hoist rope is anti-twisting and of high-strength and its specifications are as following:

Diameter: ϕ 17.0mm

Strength grade: 1960 N/mm^2

Length: main hoist rope: 175m

auxiliary hoist rope 105m

3.8 Main and auxiliary hook

The lifting capacity of main hook is 30t. The wire rope is reeved on the pulley block for 4 times. The main hook is rotatable and is equipped with a hook safety device and the mounting lugs for fixing the tail end of wire rope. The lifting capacity of auxiliary hook is 3t and the wire rope is reeved on the pulley for 1 time. The auxiliary hook is a rotatable hook and is equipped with a hook safety device.

3.9 Operator’s cab

Wide-vision operator's cab with adjustable headrest seat is made of steel. All the instrument panels are installed in front of the seat, and the control levers are beside the left and right armrest. The spacious, comfortable and safe cab, which is equipped with wiper, washer, A/C and heater, is ergonomically designed.

3.10 Outrigger

The crane adopts H-type outriggers. The outrigger box and sliding beam, which are made of low-alloy and high-strength steel, are of box structure. After Pro/E simulation design and actual-use calculation, the section of the outrigger is of good performance and strong bearing capacity. The horizontal sliding beam can be telescoped in /out via the horizontal cylinder. Large outrigger span ensures the stability of the crane. The outrigger pad is mounted on the head of vertical cylinder and can be pushed and pulled horizontally. When the outriggers are fully extended or fully retracted, they are fixed by locking pins. The outrigger control levers are installed on both sides of chassis frame and can be operated synchronously 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 all-direction slewing operation.

3.11 Hydraulic system

It is an open type hydraulic system. The advanced hydraulic proportional pilot lever control system and the hydraulic proportional control system are used to control the slewing, telescoping, derricking and hoisting mechanisms individually. The pipeline adopts the anti-pollution bite-type fitting, which ensures the high reliability of the hydraulic system. The quadruple gear pump is the main power supply device. Among the four pumps, two pumps are used for the main and auxiliary hoisting mechanism, telescoping mechanism and derricking mechanism together; the other one is used for the hydraulic system, slewing mechanism and A/C; the smallest pump supplies stable oil for the control oil line. The chassis hydraulic system controls the moving direction of the horizontal cylinders and vertical cylinders by manual multiple directional control valve. The new multiple directional control valve with an additional pressure limit valve can effectively prevent piston rod of the horizontal cylinder from bending.

The outrigger control valve is manual multiple directional control valve which controls the

outrigger control mechanism on both sides of chassis frame to control the outriggers telescoping synchronously or independently.

3.12 Electrical system

This is a single wire system with negative earthed. Its rated voltage is DC 24V. The superstructure electric includes the superstructure power control light, superstructure start control light, superstructure shutdown control light, overwinding control light, overlowering control light, overpressure control light, hoisting limit switch, lowering limit switch, overload warning device, lighting lamps, fan, wiper, horn and hydraulic oil cooling fan as well as A/C and so on. All the above devices ensure the safety operation and good working environment of the crane.

Press the red emergency stop button in an emergency, then the power supply of the vehicle will be cut off and the safety of the vehicle can be ensured.

3.13 Safety device

The crane is equipped with an automatic load moment limiter whose display and warning device is 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, all dangerous crane movements are switched off. According to the requirements, the digital LCD will display the following data: load moment ratio, boom angle, boom length, working radius, actual lifting capacity, permitted lifting capacity and the maximum permitted lifting height.

In addition, the crane is also equipped with the following safety devices to ensure the safety of the crane:

a) Boom angle indicator;

b) Suspended hoisting limit switch;

c) Hook safety device;

d) Lowering limit switch;

e) The 5^{th} outrigger overpressure protection device;

f) Two-way hydraulic lock;

g) Balance valve;

h) Relief valve.

4. Accessories

4.1 A/C

The driver's cab is equipped with an A/C special for auto.

The A/C for operator's cab is optional.

4.2 Fuel heater (optional)

The operator's cab is equipped with a fuel heater which is used for heating the cab.

5. Specification of special purpose chassis for truck crane

Chassis model	Engine model	Manufacturer
ZLJ5325V3	WP10.270	Weichai Power Co., Ltd.

For detailed information, please refer to the *Technical Specification for Special Purpose Chassis*.

ZOOMLION ZLJ5325 SPECIAL PURPOSE CHASSIS

TECHNICAL SPECIFICATION

ZLJ5325V3/27Y

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1. Product characteristic

ZLJ5325 special purpose chassis for truck crane, integrating many years' design and manufacturing experience and different kinds of high-tech, is a new generation product with high performances, developed independently by our company in accordance with market trend and consumers' demands. The chassis is designed, manufactured and tested strictly in accordance with the requirements stipulated in national standard and industrial standard. Emission of the crane complies with the regulations of GB17691-2005 National Stage Ⅲ and GB3847-2005, and safety devices conform to the requirements of 3C certification.

This vehicle adopts low-mounted full-width driver's cab and integrated guard plate designed by ourselves and made in special manufacturer, which has original and unique appearance and good characteristic of aerodynamics. The design in driver's cab, including the positions and controls of each switch, control lever and signal lamp, base on the ergonomics theory, so as to provide comfortable environment and convenient operation condition for drivers. The electric control engine can more save energy and protect environment. The control system adopts CAN bus technology and has the function of self-troubleshooting. The 6*4 driving type has excellent driving performance. The hydraulic power steering system makes the steering easy and agile. The dual-circuit pneumatic braking system ensures reliable work. The emergency steering system is optional. It is convenient for emergency steering and tow which makes traveling more safe.

Maintenance cost and convenience for customers has been taken into consideration in our original design. Therefore, each instrument in the driver's cab is independent, and connecting elements of pneumatic circuit and oil circuit mostly adopt industrial standardized components.

2. Chassis Specification

2.1 Product Model

Model in auto industry: ZLJ5325

Code:ZLJ5325V3

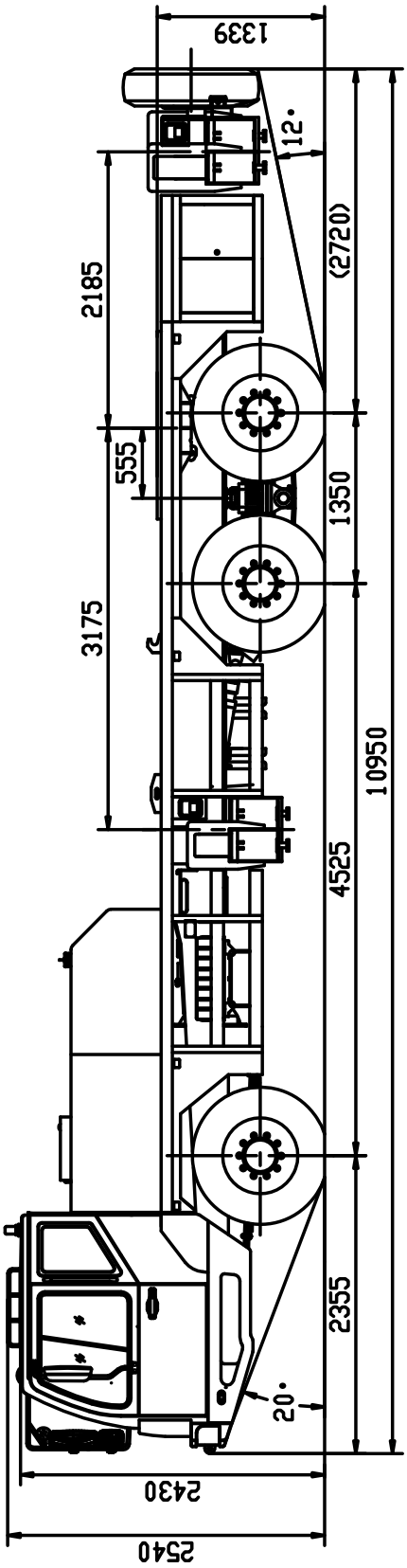
2.2 Main Technical Specifications

Item		Value	Remarks
Mass specifications	Max. design total mass kg	32000	
	Max. design axle load (front /rear) kg	7000/25000 (tandem axles)	
	Complete vehicle kerb mass kg	12200	
	Axle load (front/rear) kg	4450/7750 (tandem axles)	
Traveling specifications	Max. traveling speed km/h	78	
	Max. gradeability %	37	
	Min. turning diameter m	≤22	
	Min. ground clearance mm	220	
	Approach/departure angle °	20/12	
	Braking distance m	≤10	Initial speed: 30km/h
	Limits for exhaust pollutants and smoke	Comply with relative standards	GB3847-2005 GB17691-2005 (stage Ⅲ)
	Oil consumption per hundred kilometers	45 L	
	Fuel tank capacity L	250	
Dimension specifications	Overall dimensions (L×W×H) mm	10950×2500×2540	
	Front / rear overhang mm	2355/2720	
	Quantity of axle	3	

Item			Value	Remarks
	Wheel space mm		4525+1350	
	Track	Front mm	2040	
		Rear mm	1830/1830	
Drive axle	Drive type		6×4	
	Speed ratio		5.938	
Quantity of leaf spring (front/rear)			12/10	
Tire	Specification		11.00-20	11.00R20 (optional)
	Number (excluding spare tire)		10	
Engine	Engine model		WP10.270	
	Type		6-cylinder in line , turbocharger, middle-cooling	
	Fuel type		Light diesel oil	
	Displacement ml		9726	
	Rated power / rotational speed kW/r/min		199/2200	
	Max. torque / rotational speed N.m/r/min		1100/1200～1600	
Transmission	Model		8JS118TB-B	
	Type		Mechanical step change	
	Operating method		Mechanical manual operation	
	Quantity of gears		8 forward speeds, 1 reverse speed	
	Speed ratio		Forward speed:11.40 / 7.94 /5.63 / 4.06 / 2.81 /1.96 / 1.39 /1.0 Reverse speed:11.35	
The number of persons allowed in the driver's cab			2	
Steering system	Steering type		Steering wheel	
	Outer diameter of steering wheel mm		500	

Item			Value	Remarks
	Steering axle		Universal coupling	
	Steering gear	Model	PY-ZJ120C-Z/Y	
		Type	Integral circulating ball hydraulic booster steering gear	
	Power steering tank	Model	QC25/13-WP-PY	Outer circulation
		Type	Gear type	

2.3 Overall View (unit: mm)



3. Specifications for chassis main components

3.1 Engine

This chassis adopts special purpose WP10.270 diesel engine for construction machinery which is developed under special operating conditions for truck crane. The engine has larger output torque, excellence starting performance and quick acceleration while complete vehicle starting. The forced-induction system can usefully ensure engine has larger torque at low-speed running, obviously upgrade its low-speed dynamic property and strengthen gradeability of complete vehicle. Meanwhile, availably prolong service life of complete vehicle under low-speed operating conditions when emission temperature is relatively low. The electrical fuel injection system can save energy and protect environment.

3.2 Clutch and its control

The diameter of friction lining is Φ420mm.

The crane adopts single-dry-plate clutch whose work performance is steady and pedal effort that thorough separation needed is small.

The crane adopts air-assisted hydraulic control mechanism, which makes operation more expediently and reliably. Depressed clutch pedal by driver can get enough hydraulic pressure and make clutch disengage completely even if the air-assisted system is out of control. (Caution: pedal force needed will be increase greatly at this moment).

3.3 Transmission and its control

The crane adopts eight-gear mechanical transmission which has eight forward gears and one reverse gear. The transmission is made up of a main section and a rear mounted auxiliary section which adopt two intermediate shafts of the same structure. The power is inputted from input shaft, and then branches into two intermediate shafts, collects to main shaft to output at last. This structure not only reduces the thickness of gear, shorten the axial dimension of transmission, lighten the mass of complete vehicle, but also make main shaft structure more simple, make it bear toque and not bear bending moment, which improves the force conditions of main shaft and bearing, greatly enhance service reliability and endurance of transmission. The transmission has many gears and its difference of speed ratio between each gear is small, therefore the rotational speed difference between neighbouring gears is small during operation to make shift steady. The output flange has end tooth which comply with ISO8667-T180 requirements.

The fully synchronizer is installed in transmission. High/low gear changeover switch is fixed on gearshift control lever, which controls shift cylinder. The transmission can operate only when

transmission changing from high gear to low gear or from low gear to high gear.

The control system adopts mechanical manual control structure, which is simple in structure, convenient in maintenance and reliable in operation.

3.4 PTO

Rated output torque:686N.m.

Output type: connect the flange, the rotary direction of output flange is the same as that of engine.

The rear mounted PTO is installed on extension intermediate shaft of auxiliary tank on transmission's rear end. Its power is taken out from extension intermediate shaft of transmission by PTO hollow shaft, passes engagement sleeve, input gear, output gear shaft and output flange. At last, the power is output. This type of PTO has larger power.

It adopts two-way electropneumatic control, which can availably avoid accidence caused by the vehicle is in work state by mistake due to vibration and other reasons while the PTO is out of service.

3.5 Propeller shaft

It adopts steyr series propeller shaft assembly, which are all open type. The coupling flange has end tooth.

The rear end of the 1st propeller shaft installs a intermediate support, which is satisfied with the arrangement need of transmission shaft, at the same time, minishes included angle of universal joint, heightens critical rotational speed and ameliorates resonance characteristic of drive system. The 2nd propeller shaft assembly's structure is similar to that of intermediate/rear axial propeller shaft assembly. There is universal joint at both ends and telescopic spline at intermediate part in order to adjust to axle hopping.

3.6 Axle

The axle consists of a driven axle and two drive axles, all axles are joined to frame by suspension, among which the front axle is steering driven axle, the intermediate axle is through rigid drive axle with longitudinal/transversal differential lock device and the rear axle is normal rigid drive axle with transversal differential lock device. The flange connecting to propeller shaft has end tooth which comply with ISO8667-T180 requirements.

The steering knuckle of front axle is cast solid forked structure, which is connected to Elliot spindle nose by main pin. The main pinhole of steering knuckle has tin bronze alloy bush inside. The limit

screw mounted above knuckle can restrict and adjust internal-external corner and satisfy right steering characteristic.

3.7 Wheel and tire

Rim type：8.00V-20

Tire type: 11.00-20(18 layer)/11.00R20（18 layer）

Tire pressure: 0.91MPa/0.93 MPa（single tire）， 0.84MPa/0.86 MPa（double tire）

The flat base wide rim can effectively enhance the service life of tire and improve trafficability for vehicle and stability for travel.

3.8 Steering system

The steering system consists of integral recirculating ball power steering gear, steering oil pump and steering drive mechanism.

The steering gear adopts inside booster cylinder, recirculating ball cog rack and gear segment steering mechanism and high-sensitivity distributing valve, which has the advantages of larger output torque, good steering performance, safe and reliable operation, simple assembly and convenience maintenance.

The emergency steering system is optional. When the crane is traveling in normal condition, the main steering system works and main steering pump gets power from engine. When the engine can not work and main steering pump can not get power, the main steering system does not work. At this moment, the emergency steering works and it gets power from gearbox (caution: only when the crane is traveling, can the emergency pump get power from gearbox).

3.9 Suspension device

The front suspension adopts leaf spring suspension system in line, which has the advantages of simple structure, high working dependability and convenience maintenance. The rubber buffer block is fitted on leaf spring. When the vehicle is traveling on uneven ground or impacted, the rubber buffer touches limit stop on lower aerofoil of chassis frame to avoid damage of leaf spring.

The rear suspension adopts twin axle balanced suspension of leaf spring, balance beam and propelling rod, among which rear steel spring is fixed on bracket of balance beam by stud platen, balance beam and propelling rod are in series. When the rear axle is distorted, this structure has large absorbability. Even if the crane is traveling on uneven ground, the skidding phenomenon does

not appear. The rubber block and limit stop are installed on rear leaf spring to protect leaf spring.

3.10 Braking system

Main brake：Dual-circuit air pressure brake can act on all wheel hubs;

Parking and emergency brake：Spring brake can act on wheel hubs of intermediate/rear axle;

Auxiliary brake：Exhaust auxiliary brake for engine.

If one of dual-circuit brake pipeline fails, the other could still works normally which greatly enhance work reliability.

When there is a need to apply the emergency brake (under the condition that the foot brake is fails or the pedal is not depressed timely), move the hand brake control lever to exhaust air in the hand brake chamber. The braking spring will be expanded at once to ensure traveling safety.

The brake system adopts brake components such as high integrated solenoid valve, four-circuit protection valve, dryer and so on to make position and repair of pipeline more simple and convenient.

3.11 Electrical system

This chassis uses N200 battery with two tandem connection (voltage of each tandem connection is 12V) to form 24V output voltage and adopts single wire. Its metal (negative pole) is return lead, earth negative pole thru the main power switch .Battery should be conformed to standard GB/T5008.1-2005 “Technical conditions and test methods of lead acid battery for the crane” and lead meets the national requirements of QC/T29106-2004.

Standard generator is a rectification and voltage regulation integration alternating current generator, its output power is 2kW.

It adopts combination lamp, mounts front/rear fog lamp and reversing video camera, which make appearance graceful and increase travel’s safety.

The instruction panel in driver’s cab adopts background lamp with meter, which can offer convenience not only to operate at night and in bad whether, but also to maintain. All connectors of electrical component adopt import parts to reliably link and reduce running cost.

3.12 Driver’s cab

The low-mounted overall width driver’s cab adopts all metallic welded structure and is covered with soft plastic interior decoration of silencing and heat-insulating materials. There is sun visor in driver’s cab. The seats of driver and passenger are adjustable shock- absorbing high-back seat with safety belt. The steering wheel and electric window on both sides can be adjusted. The

vibration-absorptive material stuck near engine can effectively reduce the noise in driver's cab. The door is connected with driver's cab in interior hinged way and the doorframe is equipped with rubber sealing strip to ensure the door has good tightness. The door can be opened with 85° angle to make person get in or out conveniently.

The front window in driver's cab is installed large parallel electric wiper with window washer and the large combination view mirror is installed on both sides, which has elegant appearance, capacious space and good aerodynamics characteristic.

3.13 A/C system

It is installed adjustable heater system and cooling A/C system, and has the functions of cold air, heater, air circulation, air humidity adjustment, windshield defrosting, which can keep temperature, air humidity, cleanliness and wind velocity comfortable in different weather.