XR180D Rotary Drilling Rig

Technical Specification

XUZHOU CONSTRUCTION MACHINERY GROUP CO., LTD.

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Technical Specification of XR180D Rotary Drilling Rig

Product Type: XR180D Rotary Drilling Rig

Manufacturer: XCMG FOUNDATION CONSTRUCTION MACHINERY CO., LTD.

XR180D rotary drilling rig is composed of a base unit on crawlers and a drilling application module, it is in the foundation construction for ports, railroad bridges and high-rise buildings and other boreholes in foundation engineering. Suitable for: Telescopic friction and interlocking kelly bars.

Ⅰ. Advantage Introductions

1、With the special hydraulic telescopic crawler chassis (TDP series) of rotary drill rig and large diameter slewing bearing, it meets strong stability and easy transportation.

2、With the electronically controlled and turbocharged engine of Cummins, which is powerful and emissions meet Euro Ⅲ standards.

3、The hydraulic system adopts the limit of power control and positive flow control, that makes the hydraulic system more energy and efficient.

4、With the single rope main winch, it efficiently solves the problem of wire rope wear, and improves the service life of wire rope; a detection device of drilling depth on the main winch, and single rope makes deep inspection more accuracy.

5、The design of whole machine meets the requirements of the CE directive, that guarantees safety, and construction safer.

6、Configure centralized lubrication system, which makes maintenance more convenient.

7、Selection of a variety of specifications for kelly-bar, meeting the efficient construction of different strata.

8、Multi-function such as crowd winch、spin-off of rotary drive、casing driver and hydraulic casing oscillator is optional selected。

9、The removable type key.of rotary drive makes maintenance and exchange more convenient.

Ⅱ. Technical features

1. Undercarriage

XR180D equipped with dedicated drilling rig chassis of TDP series， has a strong stability. The heavy duty retractable undercarriage is easy for transportation and walking, controlled to

extend and retract the crawlers by fully hydraulic.

Crawler width（retracted/extended）	2960/4200mm
Track shoes width	700 mm
Wheel-based	4270mm
Length of crawler	5145mm
Supporting weight drum amount	2×9
Traction force	320kN
Max. gradient	35%
Max. traveling speed	1.5km/h
Ground pressure	94kPa

Overall weight: 61000kg （ The overall weight excluding kelly-bar and drilling tools：49500kg）

2. Engine system

Adopting Cummins QSB6.7- C260 engine, rated power is 194 KW / 2000 rpm, is EuroⅢ turbocharged and inter-cooled type engine.

Engine type	QSB6.7-C260
Rated power	194kW（260HP）
Max. torque	987N.m /（@1500r/min）
Rated speed	2200 r/min
Emission certification	U.S. EPA Tier 3, CARB Tier 3, EU Stage IIIA
Fuel tank capacity	410L

3. Hydraulic system

With limiting power control and positive flow control, it makes the hydraulic system more energy and efficient.

System force	35 MPa
Flow（Main loop +Ancillary loop）	2×215 L/min+1×90 L/min
Hydraulic oil tank capacity	750 L

4. Cab

The FOPS cabin is comfortable and soundproof, proved with adjustable seat, air conditioner and heater, with floodlight inside and outside. Control panel is designed with all meters and

operating joystick located in favorable position to the operator；The colorful display with more functions is in the control panel.

5. Winch

Single row rope for main winch efficiently solves the problem of wire rope wear, and improves the service life of wire rope.

Main winch

Max. Pulling force	180kN
Rope diameter	φ28 mm
Rope type	28 NAT35（W）×K7+1770ZS
Rope diameter allowed error	+2%~+4%
Rope length	96m（standard configuration，content with drill deep of 60m）

Auxiliary winch

Max. Pulling force	50kN
Rope diameter	16mm
Rope type	16NAT6X19W+IWS1770SZ
Rope diameter allowed error：	0%～+4%
Rope length：	70m

6. Mast

With the parallelogram mechanism of own patent, this jig allows wider operating area, the highly strengthened box-type steel structure design makes the mast with highly-rigidity and intensity, therefore the drilling accuracy is heightened. The lubrication-free bearings are equipped in the flexible articulation joints, and can work freely. Support cylinder can be selected.

Height off earth	20480mm
Mast left/right inclination	3°/3°
Mast front/back inclination	5°/15°

7. Rotary drive

Rotary drive is controlled by a pressurized cylinder for pressuring and lifting, it is equipped with drilling drive hydraulic motor, which top has a spring shock absorber. It is equipped with appropriate friction type and inner lock type drill pipe driver set, optional casing drive connection,

convenient construction. Standard drive set of 406 drill bar for the removable type key.

Drilling speed 7～27r/min

Max. drilling torque 180kN.m

Max. pull-down piston stroke 5000mm

Max. pull-down piston push 160kN

Max. pull-down piston pull 180kN

Rotary drive standard configuration or optional configuration list (standard configuration●, optional configuration○, no configuration –):			
Sleeve drive	○	Spin-off	○

8. Kelly bar

The Kelly bar of XR180D rotary drilling rig is optional.

Drill bar diameter φ406mm

Max. drilling diameter φ1800mm

Head size 200×200

Max. drilling depth Standard configuration:60m（5 telescopic friction MZ406-5×13.5）weight：7890kg

optional configuration：46m（4 length locking JS406-4×13） weight：8100kg

9. Drilling tools

A selection of long screw auger and short screw auger 、general drilling bucket, sand fishing drilling bucket, and cylinder rock drilling tool；

10. Electric system

We have developed the advanced intelligent control technology, CANBUS technology and virtual instrument technology, human-computer interface can ensure simple and reliable operation, providing with mast verticality and depth finder electronic indicators, automatic real-time drilling depth monitor, automatic monitor of operation malfunction, in/out signal online adjustment and mast、amplitude、main/auxiliary winch misoperation rotection, filter, maintain warning, and so on. PLC control system may automatic/manual adjust mast verticality, it is replayed in picture of"十"and number on the display.

Voltage 24V

Verticality 1/400

Depth deviation 1%

Main display	6.4 inches
Main winch monitor	5.6 inches

Electric system standard configuration or optional configuration list （standard configuration●，optional configuration〇）:			
The verticality of drilling bar detection	●	Derricking limit protection	●
Drilling depth detection	●	Mast limit (front and back、left and right)	●
Oil pressure detection	●	Filter clogging alarm	●
GPS location	●	Main winch bottom protection	〇
PLC intelligent control modules	●	Radio	●
Intelligent detection	●	Angle of revolution show	●
Manually/automatically adjusting of mast's verticality	●	Main winch infrared monitor	●
Main winch of floating	●	Auxiliary winch height limit	〇
Fuel oil pump	●	Rotary drive torque show	〇
Rotation alarm	●	Main winch pulling force detection	〇
Main winch height limit	●	The safety monitoring of the tail	●
Air-conditioner	●		

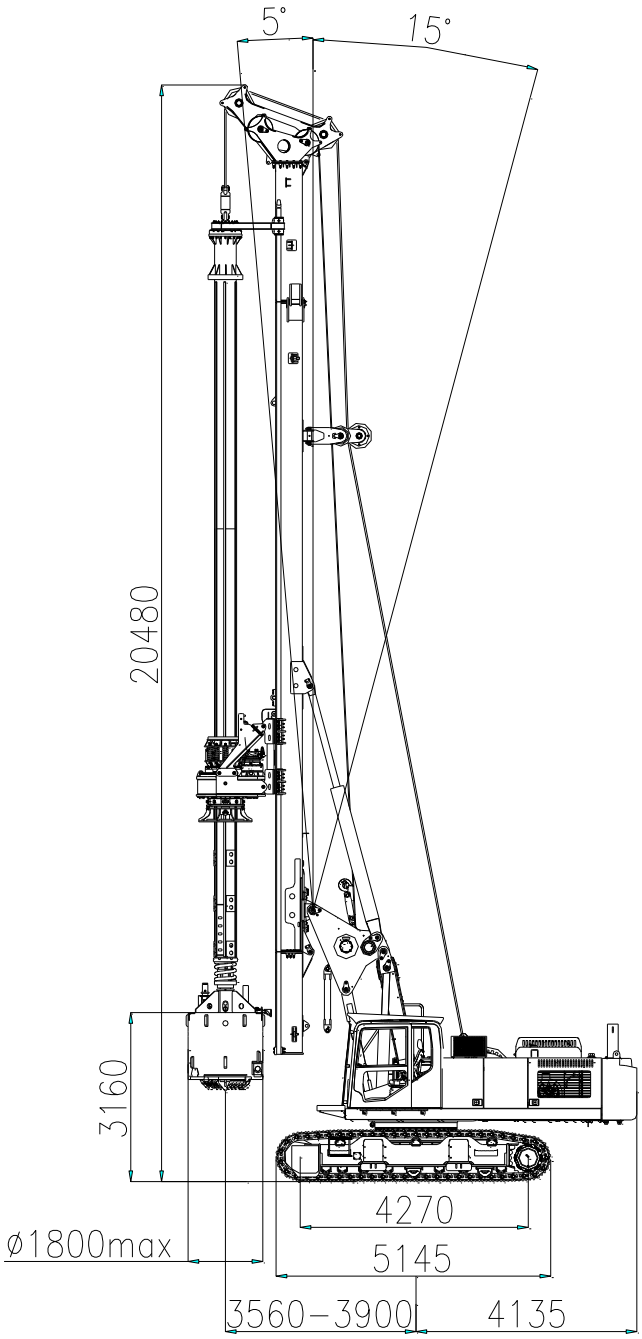
11. Centralized lubricating system

Standard configure centralized lubrication system

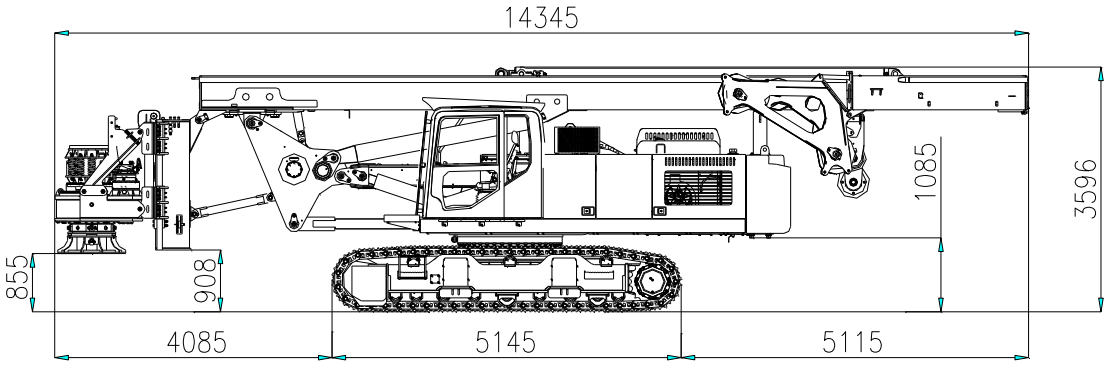
Main Technical Data

No.	Description		Unit	Data
1	Max. drilling diameter		mm	∅1800
2	Max. drilling depth		m	60，standard configuration (5-section friction kelly bar) 46，optional configuration (4-section-locking Kelly bar)
3	Allowable luffing scope (from center of drill rod to slewing center)		mm	3560～3900
4	Drilling rig dimension in working condition (L × W × H)		mm	8350×4200×20480
5	Drilling rig dimension in transport condition (L × W × H)		mm	14255×3000×3455
6	Weight of overall unit (standard configuration, excluding drilling tool)		t	58
7	Engine	Model		CUMMINS QSB6.7-C
		Rated power/speed	kW	194 /2000r/min
8	Hydraulic system	Main pump Max. pull-down piston push	Mpa	32
		Axiliary pump Max. pull-down piston push	Mpa	28
9	Rotary drive	Max. torque	kN.m	180
		Rotational speed	rpm	7～27
10	Crowd cylinder	Max. Pushing force	kN	160
		Max. Pulling force	kN	180
		stroke	mm	5000
11	Main winch	Lifting force	kN	180
		Max. single-rope speed	m/min	65
		Diameter of the steel wire rope	mm	28
12	Auxiliary winch	Lifting force	kN	50
		Max. single-rope speed	m/min	70
		Diameter of the steel wire rope	mm	16
13	Mast	Left/right inclination of mast	°	3 / 3
		Front/back inclination of mast	°	5
14	Rotary table slewing	Rotary table slewing angle	°	360

15	Undercarriage	Max. traveling speed of the overall unit	km/h	1.5
		Max. climbable gradient of the overall unit	%	35
		Width of crawler plate	mm	700
		External width of crawler (min.-max.)	mm	2960～4200
		Center distance between two longitudinal wheels of crawler	mm	4270
		Average ground pressure	KPa	94

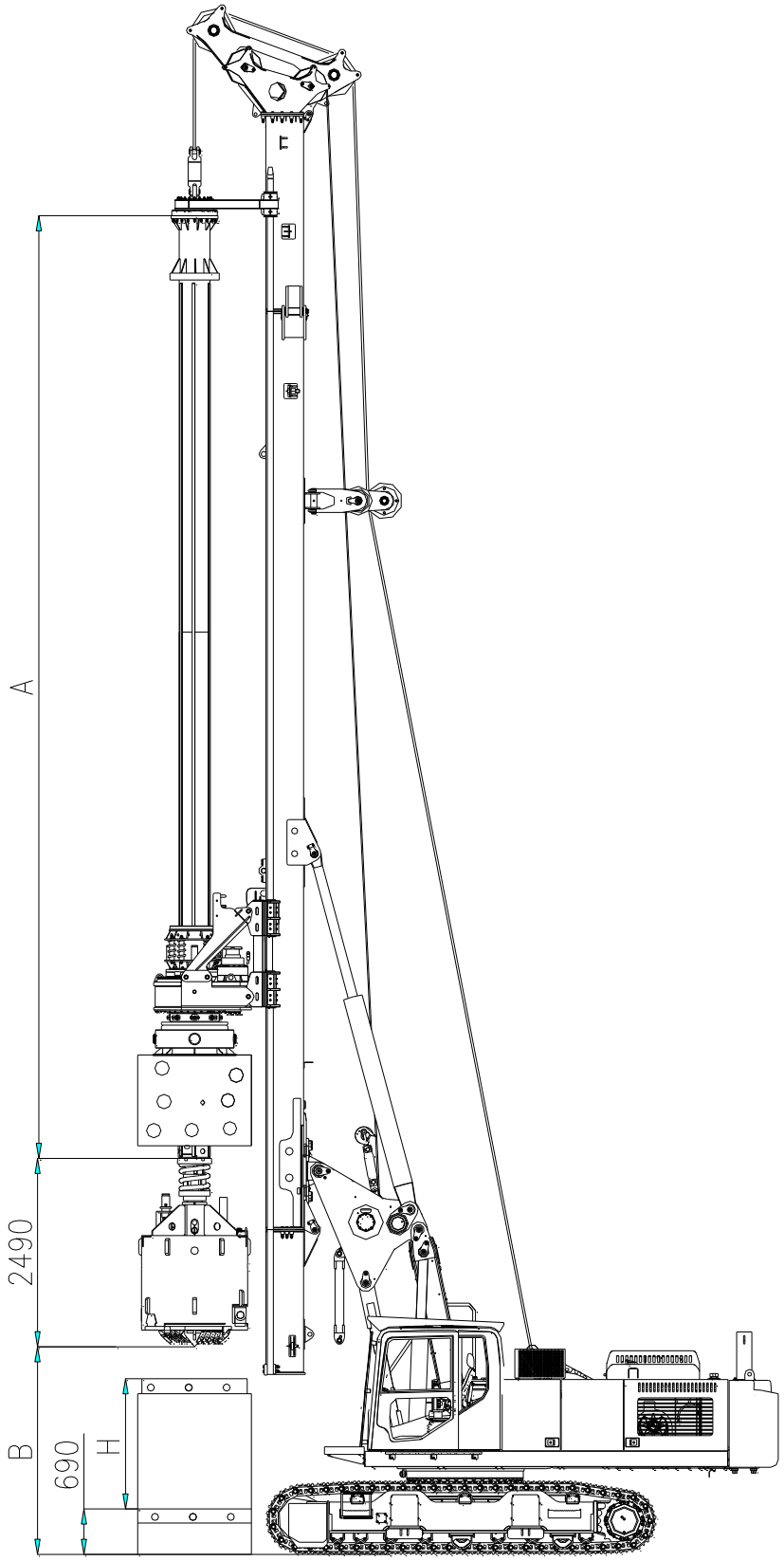


工作状态 working station



运输状态 transportation station

Technical Data of Sleeve Drive



Note：The graphics above and data of the table below is in Min. derricking state.

Type of Kelly bar	A/m Length of Kelly bar	The clearance between drilling tools and ground	The length of casing recommended	Max. drilling depth
JS406-4×13	13	2.2	1.5	46
JS406-4×12	12	3.2	2.5	42
JS406-4×11	11	4.2	3.5	38
JS406-4×10	10	4.5	3.8	34
MZ406-5×13.5	13.5	1.7	1	60
MZ406-5×12	12	3.2	2.5	52.5
MZ406-5×11	11	4.2	3.5	47.5
MZ406-5×10	10	4.5	3.8	42.5

The Kelly bar/casing data of XR180D Rotary Drilling Rig

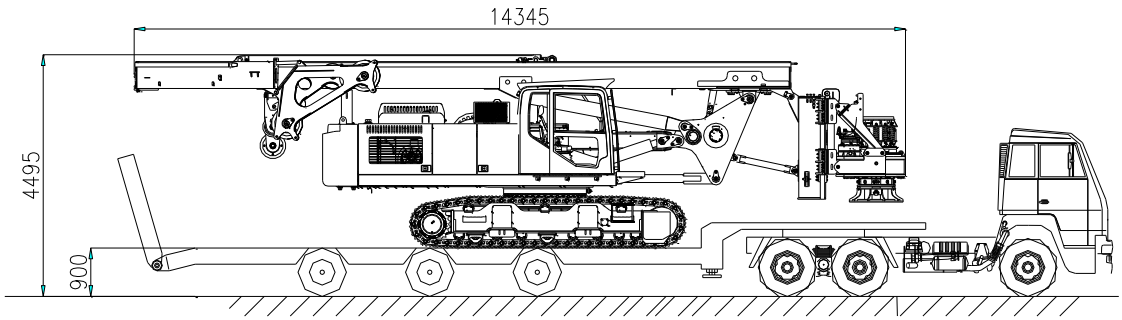
Ⅳ. List of main parts

Parts	Brand	Producing area
Engine	CUMMINS	U.K.
Hydraulic main pump	REXROTH	German
Hydraulic main valve	REXROTH	German
Motor of rotary drive	REXROTH	China
Reducer of rotary drive	BONFIGLIOLI	China
Motor of main winch	REXROTH	China
Controller	TTC	German
Pilot control handle	QP	China

The main part list of XR180D Rotary Drilling Rig

Ⅴ. Transportation Scheme

1. Complete vehicle transportation

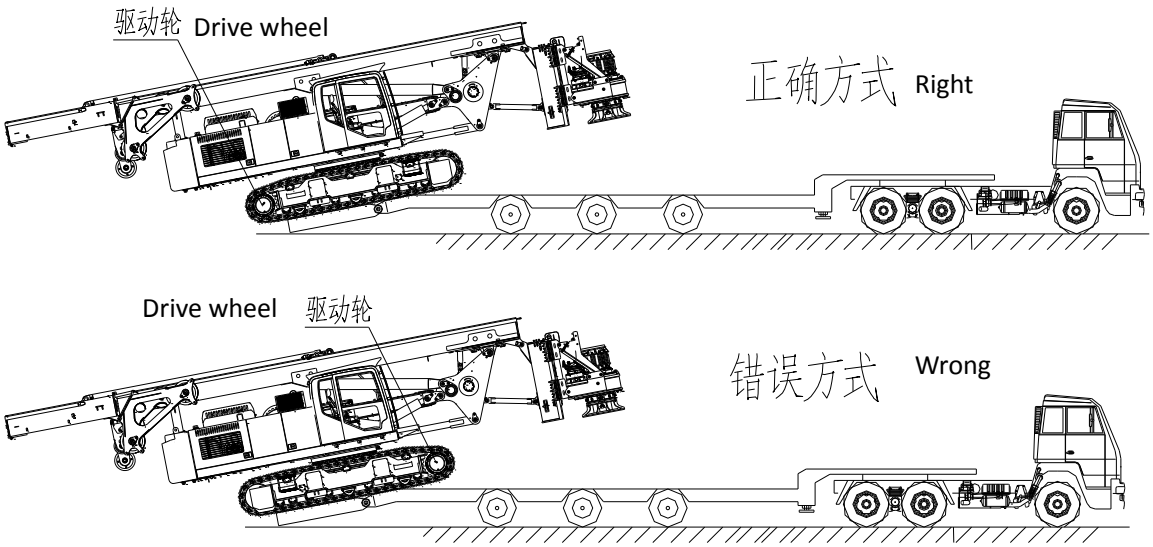


Transport weight: 50t (excluding trailer, kelly bar and drill bit)

Transport width: 3,000mm

Crawler width: 700mm

Loading schematics



2. Disassembly Transportation

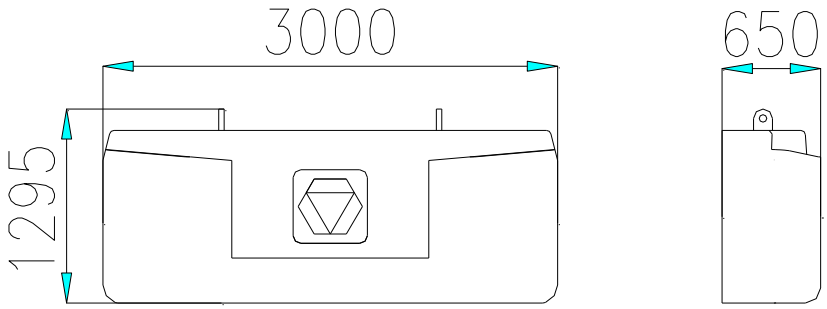
If the transportation weight exceeds the tonnage limit of highway, the disassembly transportation is required to transfer the equipment in long distance.

① . Removal of counterweight

- Lift the drilling mast and remove its bracket on the counterweight;
- Remove the bolt connecting the counterweight and rotary table and remove the counterweight;
- Install the bolt connecting the transport bracket and rotary table and tighten the nut;
- Install the bolt connecting the transport bracket and drilling mast bracket and tighten the

nut;

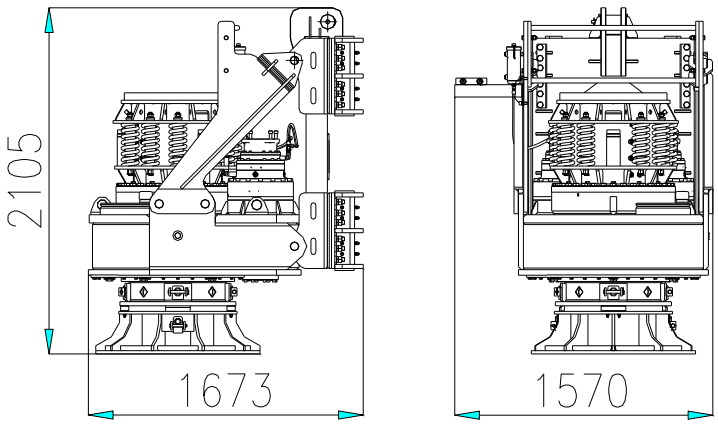
- Place the drilling mast gently on its bracket.



The weight of counterweight: 6.9t; the main dimension as above figure.

② . Removal of Rotary drive

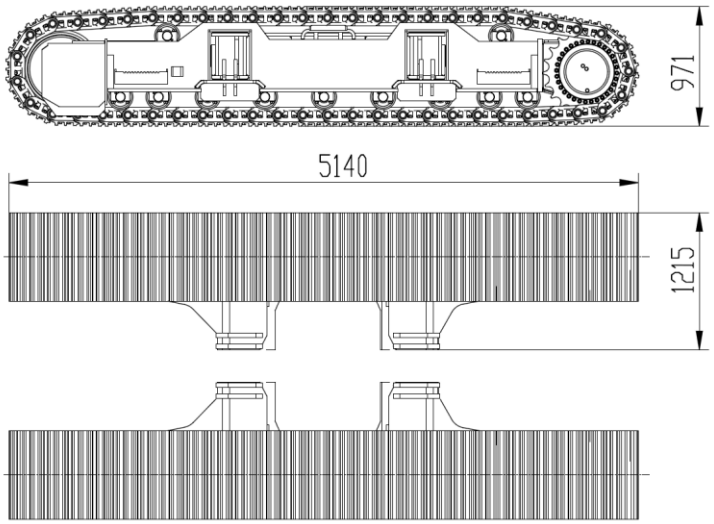
- Remove the hose at the valve block of the unit head and transport the hose with the unit head.;
- Seal the hose with proper joint and end cap (VSK28L; VSK30S);
- Seal the oil port of valve block with plate and end cap (VDT30S/N; VDT28L/N);
- Use an auxiliary hoist to lift and dismount the unit head.



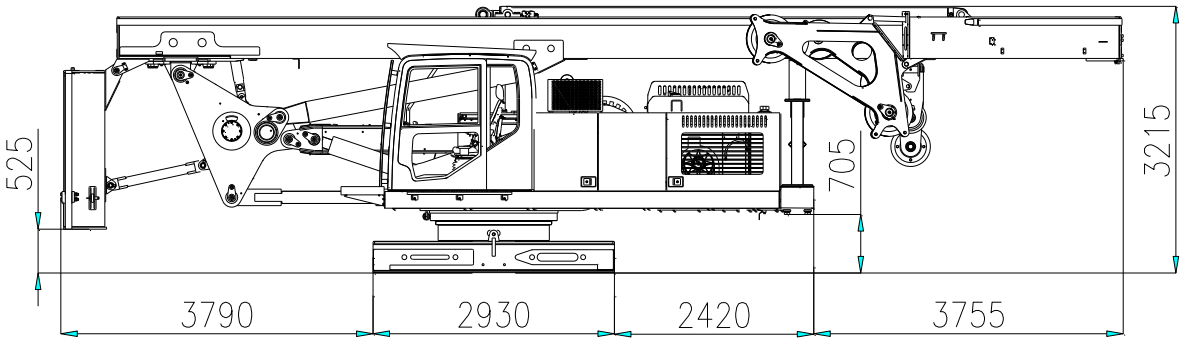
Weight of rotary drive assembly: 4.5t; the main dimension as above figure.

③ . Removal of left/right longitudinal beams and crawler assembly

- Remove retractable cylinder of crawler and connecting pin roll of left/right longitudinal beams;
- Remove hoses at left/right traveling motors and transport the hoses with main unit;
- Lift and remove the left/right longitudinal beams and crawler assembly by using an auxiliary crane.



Each weight of left and right longitudinal beams and crawlers: 6t. the main dimension as above figure.



Main unit after removal of the drill rod, drilling bit, counterweight and rotary head left and right longitudinal beams and crawler assembly: the main dimension as above figure; weight: 26t.，the width is 3000mm

④ . Lift the dismounted parts and upper structure onto the trailer and fix them firmly.

Ⅵ. Attached Documents

Accompanied by the packing list when XR180D to send, contains the following files:

Quality certificate

Operation and maintenance manual

Spare parts catalogue

Engine instruction and parts list

Kelly Bar Manual

Packing list (Accompanied spare details and tools List)

Due to the continuous improvement of technology and design, we will not inform you in an effective manner if any product change occurs. Thanks for your understanding!

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