Rotary Drilling Rig main parts					
NO.	部件名称	Description	80	平衡阀	balance valves
1	行走机构	traveling mechanism	81	吊锚架	mast head
2	行走减速机	traveling gearbox	82	滑轮	sheave
3	行走液压马达	traveling hydraulic motor	83	动臂	moving arm
4	驱动轮	traveling sprocket	84	三角架	triangle-block
5	导轮	leading wheel	85	支撑杆	supporting arm
6	张紧装置	tension device	86	变幅油缸	mast-moving cylinder
7	履带	track shoe	87	桅杆油缸	mast cylinder
8	支重轮	bogie wheel	88	动力头	rotary drive
9	托链轮	carrier wheel	89	筒式主轴	hollow shaft
10	张紧油缸	tension cylinder	90	驱动牙板	driving tooth-like keys
11	手压黄油泵	manual grease pump	91	套筒式内牙板	sleeve tooth-like key
12	伸缩底架	extendable lower frame	92	短螺旋	short auger

13	履带行走机构	crawler mechanism	93	外牙板	external tooth-like key
14	回转支承	slewing bearing	94	内牙板	inner tooth-like key
15	液压油缸	hydraulic cylinder	95	加压点	pressing point
16	发动机	engine	96	随动架	end frame
17	液压系统	hydraulic system	97	提引器	swivel bearing
18	操作系统	control system	98	减震弹簧	spring shock absorber
19	变幅机构	mast-moving mechanism	99	主卷扬	main winch
20	液压油箱	hydraulic tank	100	副卷扬	auxiliary winch
21	配重	counterweight	101	卷筒	drum
22	回转机构	slewing mechanism	102	卷扬支架	winch`s supporter
23	回转马达	slewing motor	103	钢筋笼	steel-bar cage
24	上车	upper structure	104	螺栓	blot
25	输出小齿轮	outer pinion	105	螺塞	plug
26	回转减速机	slewing gearbox	106	螺母	nut

27	齿轮	gear teeth	107	钢丝绳	steel wire rope
28	开关	switch	108	钻杆流水盘	joint of Kelly bar
29	表盘	panel	109	钻杆弹簧	shock absorbing spring
30	操作手柄	operating handle	110	钻杆卡环	block of Kelly bar
31	自动控制空调	automatic A/C	111	钻杆连接销	blot of Kelly drive stub
32	滑移式遮阳板	sliding sun-shield	112	钻杆减震橡胶板	rubber board of kell bar
33	桅杆	mast	113	钻杆键条	key piece
34	导轨	guide way	114	钻杆	Kelly bar
35	加压油缸	crowd cylinder	115	润滑油箱	lubrication tank
36	动力头驱动套	drive sleeve of rotary drive	116	曲轴箱	crankcase tank
37	缓冲弹簧	bumping spring of rotary drive	117	钻斗底板	bottom board of drilling bucket
38	动力头用尼龙滑	nylon slider of rotary	118	斗齿	cutting tooth

	板	drive			
39	回油滤芯	filter core of return oil	119	斗齿齿根	adaptor of cutting tooth
40	高压油滤芯	filter core of high pressure oil	120	斗齿安装键	key of cutting tooth
41	空气滤芯(外、内）	outer、inner air filter core	121	堵塞指示器	plug indicator
42	排油胶管	oil leasing hose	122	导向条	guide piece
43	偏轴板	rope press equipment	123	埃索 EP320 油（208升/桶）	EP320 Oil(208L/Barrel)
44	主卷扬筒	sleeve of main winch	124	埃索 46#抗磨液压油（208L/桶）	46# Anti-grind hydraulic oil(208L/barrel)
45	侧滑板	side slide board	125	美孚 SHC200 油	Mobil gear oil SHC200
46	右滑板	right side board	126	美孚 ATP200 油	Mobil gear oil APT200
47	左滑板	left side board	127	壳牌-30℃ 防冻油	Shell -30℃ antifreeze

48	连接销	connecting pin	128	壳牌劲霸 D 多功能油	Shell D multifunction oil
49	大滑轮	big tackle	129	乐泰胶 515	LETAI mucus 515
50	脉冲编码器	PCM	130	乐泰胶 262	LETAI mucus 262
51	电磁阀	magnetic valve	131	硅胶	Silica gel
52	电磁换向阀	magnetic converter valve	132	二硫化钼润滑脂	lubrication of SiO2
53	线圈	electric line	133	先导阀	pilot valve
54	齿轮油泵	gear oil pump	134	履带架	track frame
55	摩擦片	friction pateh	135	组合阀	multiply control valve
56	密封件	seal kit	136	梭阀组	shuttle valve
57	注油阀	grease valve	137	左先导手柄	left control handle
58	油水分离器	oil-water separator	138	右先导手柄	right control handle
59	垫圈	washer	139	行走先导阀	traveling pilot valve
60	O 型圈	O-ring	140	溢流阀	relief valve
61	钢丝刷	wire brush	141	顺序阀	sequence valve

62	密封胶带	band tape	142	液晶显示器	LCD display
63	起子	screw driver	143	传感器	transducer
64	黄油枪	grease gun	144	反光镜	viewfinder
65	板钳	wrench	145	清孔钻	clear bucket
66	钳子	pliers	146	套管	casing
67	板手	spanner	147	套管靴	short casing shoe
68	铁橇	crowbar	148	搓管机	oscillator
69	冷动水箱	coolant tank	149	料斗	feed hopper
70	燃油箱	fuel tank	150	导管	tremie support
			151	井口架	wellhead frame

1. Drilling tools: ¢800mm-¢2500mm drilling tools are optional, and one piece of ¢1000mm and ¢1200mm is standard

2. Power head: It provides torque for drill pipe to drill soil and drill tool to throw soil, including reducer, hydraulic motor and tooth plate and other components.

3. Drill rod: There are two types: machine lock rod and friction rod.

A. Friction rod: generally suitable for soft formations and easy to operate. The number of sections is one more than that of the machine lock lever, which can hit 13-14 meters more. Currently standard is a friction bar.

B. Machine lock lever: generally suitable for hard formations, difficult to operate, and the number of sections is one less than that of friction levers.

4. Follower frame: The drill pipe slides up and down on the guide rail of the mast with the follower frame to guide the drill pipe.

5. Anchor frame: The pulley on the anchor frame is used to change the direction of movement of the wire rope

6. Mast: divided into three sections. There is a hanging anchor frame on the upper mast, and a winch is installed on the lower mast. The three sections can be folded during transportation. The hydraulic oil pipe and other components are installed in the middle.

7. Pressurized oil cylinder: pressurize the power head.

8. Main winch: The lifting and lowering of the drill pipe is controlled by the main winch wire rope.

9. Auxiliary winch: It is mainly used for hoisting other heavy objects such as drilling tools and steel cages. It is an auxiliary lifting device that can lift about 9 tons of heavy objects.

10. Boarding mechanism: There are oil cylinder, engine, electrical system and hydraulic system and other components inside.

11. Getting off the car mechanism: It is connected with the upper car through a slewing bearing, and there is an oil cylinder inside to realize the contraction of the undercarriage.

12. Crawler: During transportation, the crawler is retracted to reduce the width of the whole machine. When working, the crawler is extended to improve the stability of the drilling rig.

13. Luffing mechanism: It connects the mast and the upper vehicle. It is a parallelogram mechanism, which can make the mast approach and move away from the body in parallel, and change the angle of the mast relative to the body.

14. Steel wire rope: connect the drill pipe and raise and lower the drill pipe, and can also lift heavy objects.

Examples of transport packaging, dimensions and solutions

DESCRIPTION	QTTY	PACKING STYLE	DIMENSION (M)			UNIT VOL (M3)	TTL VOL (M3)	UNIT G.W (KG)	TTL G.W. (KG)
			L	W	H				
Main Machine	1	UNIT	15.160	3.100	3.500	164.486	164.486	58,000	58,000
Friction Kelly Bar	1	PKG	14.310	0.650	0.650	6.046	6.046	8,600	8,600
Drilling Bucket(1m)	1	PKG	2.000	1.000	1.000	2.000	2.000	**1,300**	**1,300**
Drilling Bucket(1.2m)	1	PKG	2.000	1.200	1.200	2.880	2.880	**1,600**	**1,600**
Moving Support	1	PKG	1.240	0.946	0.297	0.348	0.348	**250**	**250**
Wooden Case	1	PKG	0.950	0.600	0.750	0.428	0.428	250	250
TOTAL:	**6**	—	—	—	—	—	**176.188**	—	70,000
DESCRIPTION	QTTY	PACKING	DIMENSION (M)			UNIT VOL	TTL VOL	UNIT G.W	TTL G.W. (KG)

		STYLE	L	W	H	(M3)	(M3)	(KG)	
Main Machine	1	UNIT	17.310	3.100	3.500	187.814	187.814	60,500	60,500
Friction Kelly Bar	1	PKG	16.310	0.650	0.650	6.891	6.891	9,800	9,800
Drilling Bucket(1m)	1	PKG	2.000	1.000	1.000	2.000	2.000	**1,300**	**1,300**
Drilling Bucket(1.2m)	1	PKG	2.000	1.200	1.200	2.880	2.880	**1,600**	**1,600**
Moving Support	1	PKG	1.240	0.946	0.297	0.348	0.348	**250**	**250**
Wooden Case	1	PKG	0.950	0.600	0.750	0.428	0.428	250	250
TOTAL:	**6**	—	—	—	—	—	**200.360**	—	73,700
DESCRIPTION	QTTY	PACKING STYLE	DIMENSION (M)			UNIT VOL (M3)	TTL VOL (M3)	UNIT G.W (KG)	TTL G.W. (KG)
			L	W	H				
Main Machine	1	UNIT	17.310	3.100	3.500	187.814	187.814	63,100	63,100
Friction Kelly Bar	1	PKG	16.310	0.650	0.650	6.891	6.891	11,000	11,000

Drilling Bucket(1m)	1	PKG	2.000	1.000	1.000	2.000	2.000	**1,300**	**1,300**
Drilling Bucket(1.2m)	1	PKG	2.000	1.200	1.200	2.880	2.880	**1,600**	**1,600**
Moving Support	1	PKG	1.240	0.946	0.297	0.348	0.348	**250**	**250**
Wooden Case	1	PKG	0.950	0.600	0.750	0.428	0.428	250	250
	6	—	—	—	—	—	**200.360**	—	77,500
DESCRIPTION	QTTY	PACKING STYLE	DIMENSION (M)			UNIT VOL (M3)	TTL VOL (M3)	UNIT G.W (KG)	TTL G.W. (KG)
			L	W	H				
Main Machine	1	UNIT	14.626	3.000	3.281	143.964	143.964	38,500	38,500
Friction Kelly Bar	1	PKG	12.310	0.650	0.650	5.201	5.201	7,200	7,200
Drilling Bucket(1m)	1	PKG	2.000	1.000	1.000	2.000	2.000	**1,300**	**1,300**
Drilling	1	PKG	2.000	1.200	1.200	2.880	2.880	**1,600**	**1,600**

Bucket(1.2m)									
Moving Support	1	PKG	1.240	0.946	0.297	0.348	0.348	**250**	**250**
Wooden Case	1	PKG	0.950	0.600	0.750	0.428	0.428	250	250
	6	—	—	—	—	—	**154.821**	—	49,100
DESCRIPTION	QTTY	PACKING STYLE	DIMENSION (M)			UNIT VOL (M3)	TTL VOL (M3)	UNIT G.W (KG)	TTL G.W. (KG)
			L	W	H				
Main Machine	1	UNIT	16.610	3.100	3.500	180.219	180.219	60,300	60,300
Friction Kelly Bar	1	PKG	16.310	0.650	0.650	6.891	6.891	9,800	9,800
Drilling Bucket(1m)	1	PKG	2.000	1.000	1.000	2.000	2.000	**1,300**	**1,300**
Drilling Bucket(1.2m)	1	PKG	2.000	1.200	1.200	2.880	2.880	**1,600**	**1,600**
Moving Support	1	PKG	1.240	0.946	0.297	0.348	0.348	**250**	**250**
Wooden Case	1	PKG	0.950	0.600	0.750	0.428	0.428	250	250

TOTAL:	**6**	__	__	__	__	__	**192.765**	__	73,500

Shipping plan and cost structure

1. Bulk cargo ship: because the excavator is an overweight machine, you need to ask the port of destination and the port of departure and the lifting capacity of the ship. If the lifting capacity of the port is not enough, you need to consider the ship crane. If the ship crane capacity is not enough, you need to Considering the floating crane, the cost is expensive, and this cost needs to be considered when quoting.

2. Rolling ship: The machine can drive into the ship by itself, but some rolling ships are not allowed to carry accessories or spare parts boxes. Therefore, items other than the main engine need to be transported in other ways, such as containers.

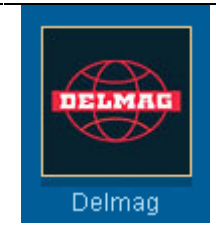
3. Under normal circumstances, the port miscellaneous fee for the machine is 10,000 RMB.

Land transportation plan and cost structure

If the machine is to be transported to ports other than Shanghai Port or transported to other places by land, the rate is: 0.53 yuan/km*ton

Brand & country	Icon	website
Sany Heavy Industry (China)		www.sany.com.cn
Yutong Heavy Industries (China)		www.yutong.com
Sunward Smart (China)		www.sunward.cn

XCMG (China)		www.xcmg.com
Bauer (Germany)		www.bauer.de
Casa Grande (Italy)		www.casagrandegroup.com
Junttan (Finland)		www.junttan.com
Mait (Italy)		www.mait.it

Wirth (Germany)		www.wirthinternational.com
Liebherr (Germany)		www.liebherr.com
Soilmec (Italy)		www.soilmec.com
Delmag (Germany)		www.delmag.cc

Imt (Italy)		www.imt.com
Kamui (Italy)		www.cmv.it
Terex (USA)		www.terexchina.com
Kato (Japan)		www.kato-works.co.jp
Caterpillar (USA)		www.china.cat.com

Comparison table of main technical indicators of similar rotary drilling rigs

Factory	Yutong	Yutong	Sany	Sany	Sumward	Sumward	NHL	ZOOMLION	ZOOMLION
Model	YTR230	YTR260	SYR220Ⅱ	SYR250	SWDM22	SWDM-25	NR2203	ZR220A	ZR250A
The weight of the whole machine kg	65000	68000	71000	72000	80000	66000	68000	70500	745000
engine model	CAT C-9ATAAC	CAT C-9ATAAC	CAT C-9ATAAC	CAT C-9ATAAC	Cummins M11	Cummins M11	Cummins QSL9	Cummins QSL9	Cummins QSL9
Flywheel power kW	250	250	250	250	298	246	220	252	252
chassis	CAT330C	CAT330C	CAT330C	CAT330C	自制	自制	自制	自制	自制
Traction kN	510	510	510	510				432	423
Rated speed r/min	1800	1800	1800	1800	2700	2100	2100	2000	2000
Maximum drilling diameter mm	2000	2000	2300	2500	2500	2000	2000	2000	2500
Maximum drilling depth mm	65	70	70	70	70/55	60	48/60	48/60	56/70

drill pipe	Beijing Xianghong	Beijing Xianghong			Beijing Xianghong/神威	Beijing Xianghong	Beijing Xianghong	Beijing Xianghong/Nantong Hengtong	Beijing Xianghong/Nantong Hengtong
Power head torque kNm	235	265	250	285	250	200	220	220	250
Power Head	自制	自制	自制	自制	Shanghai	Shanghai	永腾	Shanghai	Shanghai
Walking speedkm/h	0-1.9	1.9	1.9	1.9	0-7.5	0-4	1．7	2．23	2．23
Power head speed r/min	7-28	7-28	7-35	6-30	7-26	6-26	19	7-26	6-24
Soil throwing speed r/min	145				125	110	112	140	125
Main winch capacity kN	210	270	240	256	230	180	220	196	200
Main winch rope mm	28	32	28	32		32	28	28	28

Hoisting speed of main winch m/min	77	80	70	62	65	55	70	62.5	65
Auxiliary winch capacity kN	120	120	110	110	100	80	94	110	110
F auxiliary winch rope warp mm	20	20	20	20		24	18	22	22
Lifting speed of auxiliary winch m/min	70	70	70	70	65	55	60	66	66
Ground length mm	4600	4600	4600	4600	4624	轮距 4672	4600	4600	4600
Pressurized cylinder pressure kN	190	215	180	180	180	180	180	180	200
Lifting force of pressurized cylinder kN	210	230	200	200	215	160	200	200	220
Pressurization stroke mm	5330	5330	5300	5300	6000	5000	5600	5300	5300

Track outer edge width mm	3000-4300	3000-4300	3000-4300	3000-4300	3500-4800	3200-4300	3200-4400	3000-4300	3000-4300

- Main models at home and abroad

The main models at home and abroad are mainly models with a maximum diameter of about 2 meters, and the medium-sized pile diameters are mainly models with a maximum diameter of about 1.5 meters. For specific parameters, please refer to the website of each machine. Basically, compared with foreign machines, domestic machines are at least 1/2-2/3 cheaper, but the work efficiency is basically the same, and the cost performance is high. When it is necessary to do a good job in after-sales.

A list of advantages and disadvantages of rotary drilling and other pile machinery

Comparison of advantages and disadvantages of rotary drilling drills

The unit price of rotary drilling is high, and the hardest conventional one can drill strong weathered strata. It is generally suitable for pile foundation projects with large and medium pile diameters. It is suitable for projects with high engineering requirements, high pile quality, and time-critical projects. The machine has low noise, low pollution, and high efficiency. High, the cost of the machine can be recovered in more than half a year, and it can also be second-hand or leased. Disadvantages: Only vertical piles

can be drilled, and generally cannot be drilled in hard strata such as weakly weathered strata with low efficiency and high value.

If the engineering or environmental protection requirements are not high, the competitiveness is low. In addition, it is only a piling machine and cannot realize perfusion.

The price of other pile machinery is relatively low, the design is simple, the construction efficiency is low, the hole forming quality is not high, and the pollution is serious. All in all, it is a project with insufficient funds and low construction requirements.

Fault Analysis and Treatment of Rotary Drilling Rig

Hydraulic pilot control oil circuit

Fault	Analysis	Solutions
When the machine is on the engine and the hydraulic unlocking handle is pressed down, no matter whether it is the main working condition or the auxiliary working condition, the operating handle does not move.	1. When this phenomenon occurs, the first thing is to unlock the operation of the mast and operate the handle of the mast. (1) There is movement, indicating that there is no problem with the coupling connecting the main pump and the engine. (2) No movement, and vice versa! 2. When the first possibility is excluded, check the Y16 solenoid valve, first check whether the coil and waterproof plug are burned, and use a multimeter to check whether the circuit on the Y16 solenoid valve	1. When the second phenomenon occurs, first close the shut-off valve under the hydraulic oil tank, then remove the main pump from the diesel engine, and observe whether the coupling between the diesel engine and the main pump is broken or the coupling The bolts on the device are broken, and if the above problems occur, you need to purchase accessories to install them.

	plug is energized.	
When there is no response to the following single actions: 1. There is no action when walking. 2. Expand the confiscation action. 3. Expand and expand without action. 4. There is no action when turning forward. 5. There is no action when turning and reversing. 6. Luffing confiscation action. 7. There is no action for luffing stretching. 8. The main hoist does not move up. 9. The main hoist does not move down. 10. The power head does not move	First of all, the control solenoid valve corresponding to each action should be clarified. 1.Y1 2.Y5 3.Y6 4.Y2 5.Y3 6.Y15 7.Y13 8.Y8 9.Y10 10.Y4 11.Y7 12.Y12 13.Y14 14.Y20 15.Y18 16.Y17 17.Y19	Generally check whether the solenoid valve coil and the waterproof plug and line on the coil are burned out, if there is no problem. Then the spool of the solenoid valve is stuck, you only need to clean the spool (the valve body itself is very difficult to damage, try not to think about it, except in special cases).

forward. 11. The power head does not move in reverse. 12. The pressurized cylinder does not move up. 13. The pressurized cylinder does not work. 14. Float has no action. 15. There is no action when throwing soil at high speed. 16. Swing brake valve. 17. Main winch brake valve		

Equipment walking failure

Fault	Analysis	Solutions
When the left and right walking control levers are operated forward or backward, the walking is normal. When the control levers are operated individually forward or	First of all, there must be no problem with the pilot oil circuit, and secondly! The information feedback oil circuit of walking is also normal. at last! From the comprehensive analysis of the	If you encounter the above phenomenon, first check the travel motor to see where there is gear oil leaking, and then open the baffle outside the travel motor to check whether the motor on the non-moving side has fallen off the reducer, so like these relatively hidden places Bolts need to be checked regularly for looseness. (The above is for reference only and represents personal opinion).

backward, one of the control levers does not move.	pressure value of the main pump on the display and the control, the motor and the reducer are also normal.	
When the left and right travel control levers are operated forward or backward, one side of the travel does not move.	If the above problems occur, consider the motor and reducer. In addition, there is a failure in the feedback oil circuit.	first! Pull out the non-moving motor over there, and then operate the travel control lever. It is clear at a glance whether the motor is normal. If it is normal, further check whether the reducer is normal, mainly checking the friction plate in the reducer. Finally, check the pressure of opening the brake cylinder with a hydraulic pressure gauge. If it is less than 3.2Mpa, you need to adjust the pressure value. If the above problems do not exist, reverse the connection of the two hydraulic oil pipes for feedback information on the main pump, and operate the travel control lever forward or backward together. Like this phenomenon, one of the information feedback pipes is blocked by something, and the oil cannot pass through. In general, replace it with a new oil pipe. (For reference only, only represent personal

		point of view).

Cylinder problems

Fault	Analysis	Solutions
Mast cylinder does not move	Electrically possible: just check if the wiring under the mast joystick has come off, and also check if the F12 fuse is burned.	Electrical aspects: Remove the cover plate under the mast handle, and you can see the wiring below, and it is clear at a glance whether it has fallen off. Check the fuse: disconnect the power, unplug the fuse and you will know.
After the mast was straightened, the handle of the mast was locked, and the work soon turned to one side.	Hydraulic pressure: check whether the auxiliary pump is normal, you can know it from the display. Also check the balance valve on the cylinder.	Hydraulic pressure: Unlock the mast on the working interface of the display screen, operate the handle of the mast, and judge whether the auxiliary pump is normal according to the change of the pressure value of the auxiliary pump. As for the balance valve, you can remove the balance valve from the luffing cylinder and replace it with the one on the mast, and then operate the mast, and the mast is normal. Remove the balance valve of the mast cylinder and clean it with diesel or gasoline. If it still doesn't work, then there is a problem with the valve body itself, and you need to replace it with a new mast balance valve (for reference only, representing personal opinions).

Pressurized cylinder does not work	There are generally three possibilities when encountering such problems: 1. Internal leakage occurs in the oil cylinder. 2. The problem of the balance valve. 3. The gasket at the connection between the mast and the mast turntable is damaged.	First check the gasket in 3, if it is intact, then! Just change the balance valve on the luffing surface to the mast. If the mast is normal, it is the problem of the balance valve. If the mast still runs to one side, it means that the mast has internal leakage. It is necessary to remove the mast, pull out the piston rod, and put the Replace the oil seal above.
The pressurized cylinder falls	Same as Mast Question 1. Same as Question 2	Refer to the mast handling method (the above problems require the cooperation of the crane).

Problems with the main hoist

Fault	Analysis	Solutions
The main winch does not move, and the pressure of the main pump on the display is normal.	First of all, if there is a problem with the pilot oil circuit, generally you only need to check the following aspects: 1. Motor. 2. Reducer (mainly friction plate). 3. Anti-slip rod device.	To check whether there is a problem with the motor, you only need to pull out the motor from the reducer, operate the main winch handle, and see if the motor is working, it is clear at a glance. If the motor is normal, then check whether the friction plate in the reducer is burnt, connect the oil pipe above the anti-slip rod solenoid valve Y30 to open the brake cylinder, remove it, use a plug to block it, and then check to open the brake cylinder If the pressure value is lower than 3.2Mpa, you need to adjust the pressure to 3.2Mpa. Then operate the main winch to see if it works normally. If there is still no action, then nine out of ten the friction plate is burnt, and a new friction plate needs to be replaced. When changing the friction plate, if the drill pipe is suspended, a crane is required to hang the drill pipe. It is very simple to judge whether there is a problem with the anti-slip rod device. Just remove the oil pipe connected to the

		brake cylinder above the anti-slip rod solenoid valve to judge. If the oil pipe is removed, the main winch If it works normally, it means that the anti-slip rod device causes the main winch to fail to move. In this case, the solenoid valve core of the anti-slip rod is usually stuck, and it only needs to be cleaned. Closed state, need to exchange for new accessories.
The drilling rig is in a stopped state, the drill pipe is suspended in the air, and the drill pipe will slowly slide down.	In this case, the friction plate is generally not working and needs to be replaced with a new one.	I won't go into details on how to replace the friction plate, pay attention! When changing the friction lining, the drill pipe must be on the ground (for reference only, representing personal opinion).

Hydraulic cooling system failure

Fault	Analysis	Solutions
Hydraulic oil prone to oil temperature is too high	This phenomenon generally considers the following aspects: 1. Fan overflow valve. 2. Fan motor. 3. Fan blades. 4. Radiator cleanliness.	1. As long as the overflow valve is cleaned, if the effect is not obvious, it is necessary to check the pressure at the fan motor, mainly for fear of internal leakage of the motor. The pressure value here should be 170Mpa. If the above problems are normal, it is necessary to consider whether the number of blades of the fan is insufficient. Whenever there is such a problem that the oil temperature is too high, the radiator should be cleaned first.

Can't show depth

Fault	Analysis	Solutions
When the drilling rig is piling, the depth display on the display does not change or is 0.	This kind of problem is mainly in two aspects, 1. Electrical problems (also the main problem). 2. Mechanical problems.	1. First check the fuse F13 to see if it is burned, and check whether the 412 line and the 100 line are powered on (use a multimeter or use a self-made small light bulb). 2. Remove the bottom of the main winch reducer and the depth encoder If the output shaft of the depth encoder is broken, you can see if the output shaft of the depth encoder is broken. If it is broken, replace the encoder with a new one. If it does not look damaged, remove the encoder and turn the depth encoder by hand. Check the shaft of the encoder to see if the display responds. If there is a response, it means that the bolts at the connection may not be tightened. If there is no response, then there is a problem with the encoder (in the case of excluding 1). It needs to be replaced with a new one (only For reference, represents personal advice).

Other faults

Fault	Analysis	Solutions
The display suddenly goes black	Mainly an electrical issue.	For this kind of problem, first turn off the machine, restart the machine, and check whether the display screen is normal. In many cases, it is necessary to restart the machine, and the display screen is normal again. If the engine is still not normal, then replace the first relay and the third relay in the electric cabinet, if the display is not normal, then there is something wrong with the display. On the contrary, there is a problem with the relay. If any of the accessories is broken, you need to replace it with a new one (for reference only, for advice only)
How to drain a diesel engine		1. Just remove the plug between the fuel primary filter and the fine filter, then fill up the diesel in the engine, let its own pressure remove the air in the oil pipe. 2. It is also possible to remove the small elbow pipe above the high-pressure oil pump that delivers oil to the fuel injector. Then turn on the engine switch key repeatedly (3-5 times is enough).