

SUNWARD ROTARY DRILLING RIG

MAINTENANCE & SERVICE MANUAL

山河智能旋挖钻机 保养及维护手册



Contents

目录

Important Notice For Maintenance And Spare Parts Purchasing	01
旋挖钻机维修及配件选购注意事项	
Rotary drilling rig Warranty manual	03
旋挖钻机保修单	
Machine Delivery Report.....	11
旋挖钻机发运报告	
Report for first Start-up, Debugging and Acceptance	24
旋挖钻机首次安装、调试、验收报告	
Report for rotary drilling rig first training.....	12
旋挖钻机首次培训报告	
Regular Inspection, maintenance Instruction.....	12
旋挖钻机定期检查、保养说明	
Regular Inspection & Maintenance Record (50, 250, 500, 1000, 1500, 2000hours).....	26
定期检查和保养记录表（50，250，500，1000，1500，2000 小时）	

NOTICE:温馨提示

◆ Please well-keep this manual, put this manual behind the chair in the cabin, it is very convenient for you to get it any time. Please contact SUNWARD local authorized service agent or SUNWARD international after-sale service department immediately when you missed this manual.

请将本手册放置在您的机器的驾驶室的椅背袋中，以便您无论何时需要均能找到，如果不慎遗失本手册，请立即与山河智能授权的当地经销商联系或山河智能国际售后服务部联系。

◆ Please transfer this manual if you are going to sale your machine to convenient the new owner.

如果您需要转卖您的设备，请将本手册随机交给新买主，以便新买主需时使用。

旋挖钻机维修及配件选购注意事项

Important Notice for Maintenance and Spare Parts Purchasing

1. 真诚地感谢您购买山河智能公司的旋挖钻机。
2. 为了确保旋挖钻机的良好的性能及寿命，请您遵守安全操作规则，按山河智能的要求进行操作、检查和维护。并按发动机的使用说明书进行发动机保养。
3. 旋挖钻机的操作人员在操作旋挖钻机前必须经过操作培训,考核合格。
4. 使用非原厂配件进行保养或维修将降低旋挖钻机的使用寿命，因此，请从山河智能或山河智能授权经销商选购正宗配件。
5. 山河智能将不断的完善保修手册，恕不提前通知。
6. 山河智能将随时为您提供最优质的服务，当您需要帮助时请立即联系当地的代理商或者山河智能国际售后服务部进行处理。
客户服务热线：0086-731-83572715/83572716 传真：0086-731-83572714

1. We are extremely grateful for you purchasing SUNWARD Rotary drilling rig.
 2. In order to ensure the machine's good working performance and long-term use life, please following the safety norms and legal rules to do operation, inspection and maintenance. Follow the maintenance of the engines released from diesel engine manufacturers.
 3. Be sure that all operators been proper training before operating the machine.
 4. Using or installing spare parts for maintenance or repair which are not authorized by SUNWARD will reduce machine performance and its use life. Therefore, please purchase original parts from SUNWARD or authorized agent.
 5. SUNWARD reserve the right to make from time to time and without prior notice any modifications or amendment.
 6. SUNWARD will provide the best service to ensure any problem of the machine to be solved quickly. Please contact SUNWARD local agent or Sunward international service department for help when you need assistance.
- Customer hotline:** 0086-731-83572715/83572716 **Fax:** 0086-731-83572714

旋挖钻机产品保修单

ROTARY DRILLING RIG WARRANTY MANUAL

在保修期内，山河智能装备股份有限公司（以下简称山河智能）或山河智能授权代理商均负有对产品进行保修的责任，即旋挖钻机出现的任何故障，

将通过修理或更换零部件的方式解决。山河智能不承担本《旋挖钻机产品保修单》未明确表述的责任（包括由于设备故障附带造成的经济上或其它的损失），在任何合法的情况下，山河智能都拥有对本《旋挖钻机产品保修单》的最终解释权。

SUNWARD INTELLIGENT EQUIPMENT CO., LTD (hereinafter SUNWARD) and SUNWARD authorized distributors are responsible for the machine belong to warranty period. During the warranty period, any defective machine due to SUNWARD manufacturing or material failure will be repaired or replaced betimes, and SUNWARD will also offer free spare part. However, SUNWARD will not bear the liability of the unspecified items in 《rotary drilling rig warranty manual》 (including caused economic or other loss due to equipment failures), and all rights on explanations to this 《Rotary drilling rig warranty manual》 are reserved by SUNWARD under any legal circumstances.

第一条 保修期限

Clause 1 Warranty period

在严格按照《使用说明书》正确使用机器的情况下，旋挖钻机整机保修期为自主机交付之日起 12 个月或 2000 个工作小时，以先到为准。主机交付之日指《首次安装、调试、验收报告》双方签字之日或自整机提单日起 30 天后。以下为产品部分零部件的特殊保修期：

Under the premise of the equipment being operated strictly according to 《Operator's Manual》，SUNWARD offers 12 months or 2000 working hours warranty for the main machine whichever come first from the date of 《Report for first Start-up, Debugging and Acceptance》 signature date or dating from 30 days later from the Bill of Lading. The special warranty periods for some spare parts are considered and exception to the rule as below:

旋挖钻机零配件特殊保修期清单 Special warranty period for some spare parts of Rotary Drilling Rig

序号 pos	零件类别 item	零部件名称 Parts name	保修期 Warranty period
1	动力 engine	发动机 engine	12 个月或 2000 个工作小时 12months or 2000 working hours
2	液压元件 hydraulic parts	液压马达、液压泵、阀类（多路阀、先导阀等）、各种液压油缸、液压接头、钢管总成等液压件 Hydraulic motors, Pumps, Valves, Hydraulic cylinders, Hose connectors, Steel pipe	12 个月或 1500 个工作小时 12months or 1500 working hours
3	关键件 Key parts	动臂、主卷扬、副卷扬、钻桅、动力头装置、变幅机构、回转平台、行走车架、散热器、三角架、回转支承、中间体、减速机、中央回转接头、联轴器等 Boom, Main winch, Auxiliary winch, Mast, Rotary head, Parallelogram system, Swing flat, Travel unit, Radiator, Tripod, Swing bearing, Middle chassis, Gear box, Center rotary connector, Coupling and so on	12 个月或 2000 个工作小时 12months or 2000 working hours
4	一般零部件 Usual parts	驱动套、轴承、驱动轮、导向轮、支重轮、托轮、履带、张紧装置、空滤器、消音器、液压胶管总成等橡胶类 Drive sleeve, Bearings, Drive wheels, Oriented wheels, Track rollers, Carrier rollers, Crawlers, Tension units, Air filter, Muffle, hydraulic hose and other parts made by rubber	6 个月或 800 个工作小时 6 months or 800 hours
		钻杆、钻杆托架及其回转支承 Kelly bar, the A-frame and swing support bear	6 个月或 1000 个工作小时 6 months or 1000 hours
5	电器件 Electric parts	蓄电池、收音机、显示器、控制器、传感器、继电器等电器件、各铰点连接销轴、动力头和主卷油路胶管、回转绳头 Accumulators, Radio, displayer, Control module, Sensor, Relays and other electric accessory, all kinds of shafts ,Rotating connection, swing joint,	3 个月或 500 个工作小时 3 months or 500 hours
6	易损及消耗件 Consumable material	油料、冷却液、玻璃、反光镜、各种滤芯、油脂、油杯、皮带、密封垫、橡胶保险丝、线缆、灯具、座椅、锁具、钢丝绳、各种紧固件、各种连接件（螺栓、螺母、销钉、衬套）、履带板、主滑轮、副滑轮、钻杆上的导水盘、弹簧、内外键条、点烟器 oil, cooling fluid, glasses, rear mirror, all kinds of filters, grease , grease cup, belt, seal washer, rubber articles, fuses, electric wires, artistic lamp, seat, locks, steel wire rope, all kinds of connecting fittings(bolts, nuts, shaft, lining),crawler panels, head pulley, front head pulley, back head pulley, the water slide tray of the Kelly bar, spring, outside and inside bond, cigarette-lighter and so on.	不保修 no warranty

第貳条 保修责任范围

Clause 2 Warranty extension

2.1、保修责任范围是修理产品保修期限内由于材料和制造工艺方面有关的设备缺陷或故障，山河智能或其授权代理商免费提供产品配件或维修服务。

For these SUNWARD machine in warranty period , SUNWARD or its authorized distributors will be responsible for supplying free parts or repairing work for defective machine due to manufacturing or material failure.

2.2、保修责任范围说明：Warranty extension instruction:

2.2.1 由于保修责任范围内的故障所需之修理可以采用修复的、新的或再制造的零部件；经山河智能从技术上认定不能修理的零部件。我们将免费更换，换下来

的零部件的正当性须认定且必须根据山河智能要求返回各地办事处仓库或指定地点。

SUNWARD will probably make use of repaired, new or reproducing spare parts for these failed machines which in the period of warranty. These defective parts which can't use any longer after technical verification by SUNWARD, must be sent back to warehouse of nearby branch of SUNWARD or someplace where is appointed by SUNWARD.

2.2.2 由于保修责任范围内的故障所造成的零部件更换同样给予保修，更换的零部件的保修期同该整机保修期相一致，并随整机的保修期结束而结束。

The replacement of new parts will still be vested with warranty, which is the same as the machine, and it will also be ended while the machine warranty terminated.

2.2.3 由于保修责任范围内的故障，山河智能其授权代理商指派的售后服务人员需要有合理充分的时间进行必要的检查与维修。经此告知，既视为得到用户您的同意并将得到用户您今后的支持。

The engineer, authorized by SUNWARD its authorized distributors, need reasonable time for necessary checking and repairing by the defective machine under warranty. Which noticed where though is considered as a approval by user like you and will deserve your support henceforth.

第三条 不属保修范围

Clause 3 Limited warranty terms

对于下列情况，即使是在产品保修期内，也不属于保修责任的范围：

The warranty does not cover failures caused by any of the following situation:

3.1 由于使用或储运不当、疏忽、不按产品《使用说明书》规定进行保养和操作造成的损坏或缺陷。

Parts malfunction caused by misuse or abuse, or improper storage and transportation; operation and maintenance not strictly according to 《Operator's Manual》

3.2 未经山河智能的书面认定，使用非山河智能提供的零部件造成的损坏或缺陷。

Malfunction caused by using or installing spare parts which are not provided by Sunward or without SUNWARD confirmation in writing.

3.3 一般不至于影响产品稳定性、可靠性和使用性能的轻微故障。

Some slight malfunction which will not affect the performance, stability and reliability of the machine.

3.4 由于他人、事故、自然灾害不可抗力造成的损坏或缺陷。

Damages caused by accident, natural calamity or other events beyond Sunward's control.

3.5 未经山河智能的书面认定，对产品或零部件拆卸改造、加装附属件，导致机器性能改变或失效。

Customer Refit the equipment or its spare parts without SUNWARD's permission in written.

第四条 保修服务特别说明

Clause 4 Warranty extra statement

4.1 在接收该设备后，若设备发生故障但不影响使用；虽影响使用但山河智能可以修理的，山河智能不接受退机、换机的要求。

SUNWARD will not accept any demands of returning or changing of the machine, in the case of the machine encountered something wrong but not impaired its use, or even

if it did, but it would be also repaired by SUNWARD.

4.2 本《旋挖钻机产品保修单》将取代任何其他明示或暗示的保证，包括对产品的销售性及特定用途或特定环境的适用性保证。

The 《warranty manual》 will take place all other plain or implicit warranty, including the warranty to the selling and specified usage or aptness to certain environment.

第五条 服务项目与承诺

Clause 2: Service and commitment

5.1、山河智能为客户免费提供施工技术咨询。

SUNWARD provide the consultations on the construction technology free of charge.

5.2、山河智能免费为客户提供操作、保养培训。

SUNWARD provide free training service for operation and maintenance.

5.3、山河智能提供配件服务。

SUNWARD supply machine original spare parts.

第六条 产品故障处理服务及维修服务

Clause 6 Maintenance service

6.1、客户应在故障发生的 24 小时内以电话、传真、电子邮件的形式据实通知山河智能国际售后服务部。在有山河智能服务工程师在场的情况下，可向服务工程师反馈，并尽快处理。没有山河智能服务工程师在场的情况下，为避免信息传递差错，请按山河智能的要求提供故障件图片及故障信息处理单。在收到客户的报修信息后，山河智能国际售后服务部受理客户所提报修的问题，考虑到时差等因素，在 8 小时内给予答复。

The customer should inform SUNWARD international after-sale service department by telephone, fax or by e-mail if the machine occurred fault. With in 24 hours, Problem will be solved very quickly if there are engineers in local country. If not, please provide warranty claim in written and the picture of the failure parts to SUNWARD to avoid fault information been sent. SUNWARD shall reply customer in 8 hours (considering of time difference).

6.2、保修期内：属于产品自身原因所造成的故障，山河智能提供免费配件或维修服务；不属于产品自身原因或属于操作使用不当等造成的故障，山河智能提供有偿维修服务，费用包括配件的成本费和运输费以及人员往返维修现场的差旅费。在完成维修服务且设备能正常工作后，客户就维修服务验收并签字确认，并在验收确认后一次性付清上述费用。

During the period of warranty, SUNWARD supply free parts or maintenance service if the fault is caused by the machine quality; Fault caused not by machine quality or by inappropriate operating, SUNWARD will charge the necessary cost which including cost of parts and transportation and the round trip tickets and for engineer between out and home. All of the fee should be paid at once when signing the service list.

第七条 配备服务人员的期限和条件

Clause 7: cost and terms for service engineer sending.

7.1. 设备的首次安装调试培训，山河智能可为客户提供设备一名售后服务人员进行跟机服务，正常的服务期为 30 天。服务期间由客户承担跟机人员的食宿费用。客户有额外的服务要求及费用承担方式在设备的购买合同中另行约定，按合同约定执行。

In the first installation, debugging and training process, SUNWARD agrees to dispatch one service engineer for 30 days operation, maintenance and service training, the customer should provide accommodation for the engineer and operators. Additional service requires and cost born manner should been written into terms in the machine purchase contract, SUNWARD will provide service according with the contract.

7.2 因客户施工场地安全警示标志不明确，客户方现场指挥不当，客户未预先告知施工现场地质环境导致山河智能操作手在操作过程中出现的问题，山河智能不承担任何责任。

Any problem occurred during the drilling process by SUNWRD operator due to construction site safety warning signs are not clear, customer improper command, or customer does not inform the machine operator about the geologic environment before work, SUNWARD does not assume any responsibility.

7.3 客户的旋挖钻机操作手须经山河智能专门培训并持有山河颁发的上岗证，山河智能为客户每台旋挖钻机免费培训 2 名操作手，如客户需要增加操作手培训客户需交纳每期 USD1000/人的培训费。

The drilling rig operator of customer should been trained by SUNWARD and got the operation license issued by SUNWARD. SUNWARD will train 2 operators for each rotary drilling rig. If customer need more operators trained, the train cost is USD1000 for each operator.。

7.4 服务期满，客户不再续留山河智能服务人员，特殊情况需要续留的，需与山河智能国际售后服务部申请协商。并自续留之日起支付山河智能服务人员 100 美元/天的服务费用，并承担食宿及相关费用。

If the machine owner want SUNWARD engineer continue to work for him when the operation training period expired, the machine owner should get the permission in written from SUNWARD international service department and pay the service engineer USD100 per day ,provide the accommodation and other charge during the work.

第八条 安装调试、使用和定期保养

Clause 8: Installation, adjusting and periodic maintenance

8.1、设备首次到达客户工地后，山河智能对产品进行首次使用前的安装调试。

SUNWARD shall install and adjust the equipment at the first arriving time at the working sit before the equipment work.

8.2、调试过程中，客户应对设备性能参数如实进行确认。

Customer shall make confirmation for all the function of the equipment under working condition.

8.3、安装调试完成后山河智能服务人员填写《旋挖钻机首次安装、调试、验收报告》，并由客户合同人或其授权代理人确认签字。未作验收签字的，客户不得擅自启动设备进行工作，否则山河智能有权拒绝继续服务，由此所致损失由客户承担。

After finishing installation and debug, The contract customer or his authorized people and sunward should sign 《report for Rotary drilling Rig first start-up, debugging and acceptance》. Customer use the equipment without sign to accept it, if do, SUNWARD can refuse continuing to offer after-sales service and customer bear all the loss.

8.4、客户必须按《旋挖钻机操作手册》、《发动机保养手册》和对机器进行保养，保养使用物料为山河智能指定产品。在机器运行到 50 小时必须进行强制保养。



The preventive maintenance should be carried out by customer strictly in accordance with 《operator’s Manual》 and 《Engine Maintenance manual》 ,the materials used for maintenance should be under SUNWARD permission. The first engine maintenance must be carried out after 50 hours working.

第九条 语言与最终解释权

Clause 9 Language and right of interpretation

9.1 本保修单有中英文两种版本,具有同等效力,前述两种文本如有歧义,以中文文本为准.

This warranty manual shall be written in Chinese and in English, both language versions are equally authentic. In the event of any discrepancy between the two aforementioned versions, the Chinese version shall prevail.。

9.2 在任何情况下，山河智能都拥有对本《产品保修单》的最终解释权。

SUNWARD retained the ultimate right of interpretation of this 《warranty manual》。

客户签名（盖章）：	山河智能服务代表（盖章）
Customer (seal)	SUNWARD service engineer(seal):
电 话(Tel):	电 话(Tel):
法定代表人	法定代表人
(Legal representative):	(Legal representative):
日期（date）：	日期(date):

Delivery Report

SUNWARD_NO:

MACHINE : _____ MODEL : _____

MACHINE S/ NO : _____ EX-WORK DATE: _____

ENGINE MODEL : _____ ENGINE SERIES NO: _____

WARRANTY START : _____ TO : _____

OR : _____ HOURS , WHICHEVER COMES FIRST.

CUSTOMER NAME : _____

CUSTOMER ADDRESS : _____

ZIP CODE : _____ TEL / FAX _____

CUSTOMER CONFIRMATION :

I hereby acknowledge that the subject machine was delivered in satisfaction condition and operates satisfactorily, and that I received parts manual, operation maintenance manual and instruction as to its proper operation, preventive maintenance, and that all aspect of the standard warranty have been fully explained to me.

CUSTOMER SIGNATURE: _____

DATE _____

DELIVERY BY: _____

DATE: _____

SUNWARD SERVICE ENGINEER: _____

Date: _____

旋挖钻机首次安装、调试、验收报告

设备型号: _____ 出厂编号: _____ 出厂日期: _____

客户名称: _____ 联系人: _____ 联系电话: _____

使用工地: _____ 首次开机(调试)时间: _____

序号	内容	是否正常、齐全	是否培训	备注
1	油漆	是□ 否□	是□ 否□	
2	焊接件	是□ 否□	是□ 否□	
3	门锁 / 门扣 / 玻璃 / 窗扣 / 反光镜 / 雨刮器	是□ 否□	是□ 否□	
4	四轮一带: 导向轮 / 托链轮 / 支重轮 / 驱动轮 / 履带	是□ 否□	是□ 否□	
5	发动机润滑及冷却系统	是□ 否□	是□ 否□	
6	液压油油位、电瓶	是□ 否□	是□ 否□	
7	泵、马达	是□ 否□	是□ 否□	
8	钻杆、钻桅、主副卷扬以及各油缸	是□ 否□	是□ 否□	
9	黄油嘴及各销轴	是□ 否□	是□ 否□	
10	油管及接头	是□ 否□	是□ 否□	
11	各螺丝紧固情况	是□ 否□	是□ 否□	
12	发动机: 启动状况和性能	是□ 否□	是□ 否□	
13	电气系统: 电线 / 照明灯 / 发电机 / 启动机 / 启动器 / 收录机	是□ 否□	是□ 否□	
14	液压控制系统: 操作控制杆 / 行走操纵杆 / 推土操纵杆 / 液压开关	是□ 否□	是□ 否□	
15	检测系统: 仪表 / 报警监视组件	是□ 否□	是□ 否□	
设备运行状况是否正常:		对我司服务工程师的培训是否满意:		
□正常 □不正常(如不正常, 须说明情况, 方予确认)		□满意 □不满意		

客户方受培训人员代表签字 / 日期:

服务工程师签字 / 日期:

客户方代表签字 / 日期:

客户服务部部长签字 / 日期:

Report for rotary drilling rig first start-up, debugging and acceptance

Model: _____ Serial No.: _____ Date of consignment: _____

Customer: _____ Contact person: _____ Tel: _____

Construction site: _____ Date of start-up: _____

No.	description	Normal or not	Training or not	Remark
1	Painting	Yes ☐ No ☐	Yes ☐ No ☐	
2	Welding parts	Yes ☐ No ☐	Yes ☐ No ☐	
3	Door lock/lock pin/glass/window lock /rearview mirror /wiper	Yes ☐ No ☐	Yes ☐ No ☐	
4	Wheel : guide wheels/carrier rollers/track rollers/ driving wheels /Crawlers	Yes ☐ No ☐	Yes ☐ No ☐	
5	Engine's lubricant and cooling system	Yes ☐ No ☐	Yes ☐ No ☐	
6	Hydraulic oil level 、 accumulator	Yes ☐ No ☐	Yes ☐ No ☐	
7	Pumps and motors	Yes ☐ No ☐	Yes ☐ No ☐	
8	Kelly bar 、 drill mast 、 main and auxiliary winches 、 and cylinders	Yes ☐ No ☐	Yes ☐ No ☐	
9	Grease zerks and shafts	Yes ☐ No ☐	Yes ☐ No ☐	
10	Oil hoses and joints	Yes ☐ No ☐	Yes ☐ No ☐	
11	Bolts and nuts	Yes ☐ No ☐	Yes ☐ No ☐	
12	engine : start-up and performance	Yes ☐ No ☐	Yes ☐ No ☐	
13	Electric system : electric wires/ lighting /generator /starter/start relay/radio	Yes ☐ No ☐	Yes ☐ No ☐	
14	Hydraulic control system : operating levers/traveling levers/ dozing levers/ hydraulic switches	Yes ☐ No ☐	Yes ☐ No ☐	
15	check system : gauges/ LCD screen caution monitor	Yes ☐ No ☐	Yes ☐ No ☐	
Machine works normally or not : ☐ Normal ☐ Abnormal (Describe the details, if any)		Satisfy service engineer's work or not : ☐ Satisfactory ☐ Dissatisfactory		

Signature of customer trainee/date : _____ Signature of service

engineer/date:_____

Signature of customer/date : _____ Signature of customer service manager/date:_____

旋挖钻机新机首次培训报告

设备型号: _____ 出厂编号: _____ 出厂日期: _____ 使用工地: _____ 首次培训时间: _____

客户名称: _____ 联系人: _____ 联系电话: _____ 客户代表签字 / 日期: _____ 培训工程师签字 / 日期: _____

序号	培训项目	培训内容	培训人数	培训课时	培训效果	备注
1	钻机的结构	1、钻机的主要配置 2、底盘、发动机、主副卷扬、钻杆钻具、张紧张置 3、油泵及马达			☐ 好 ☐ 一般 ☐ 不好	
2	钻机的维护、保养	1、发动机 2、液压系统以及电气系统部件的维护保养 3、主副卷扬 4、钻杆钻具 5 钢丝绳			☐ 好 ☐ 一般 ☐ 不好	
3	钻机的液压原理	1、原理图的培训 2、主要液压部件的作用 3、主要液压管路走向等			☐ 好 ☐ 一般 ☐ 不好	
4	钻机的电气原理	1、原理图的培训 2、主要电气部件的作用 3、主要电气线路走向等			☐ 好 ☐ 一般 ☐ 不好	
5	钻机常见故障处理	包括发动机、液压、电气、焊接等故障			☐ 好 ☐ 一般 ☐ 不好	
6	钻机的操作	1、钻机的起机与停机 2、钻机的行走 3、钻机的开钻与钻进 4 机锁与摩阻钻杆的使用方法			☐ 好 ☐ 一般 ☐ 不好	
7	施工工艺	1、钻孔前准备工作 2、桩位确定 3、埋设护筒 4、钻机就位 5、钻进等			☐ 好 ☐ 一般 ☐ 不好	
8	施工地质	1、粘土地质 2、砂层 3、卵石层 4、强风化地层 5、素填土等			☐ 好 ☐ 一般 ☐ 不好	
9	钻具的配置	不同施工地层钻具的选型等			☐ 好 ☐ 一般 ☐ 不好	
客户意见:			国际售后服务部部长意见:			

Report for first training of rotary drilling rig

Model: _____ Serial No: _____ Date of consignment: _____ Construction site: _____

Date of training: _____ Customer: _____ Contact person: _____ Contact telephone: _____

the signature of the customer or deputy / date: _____ the signature of the training engineer / date: _____

SUNWARD 山河智能

Serial No	Item of training	Training content	receive trainings	Training hours	training effect	remark
1	Conformation of machine	1、main configures of the machine2、chassis、engine 、main and auxiliary winches、Kelly bar and rigs、tension unit 3、pumps and hydraulic motors			☐ good ☐ normal ☐ bad	
2	Maintenance of machine	1、engine 2、Maintenance of the electric system and hydraulic system 3、main/auxiliary winch 4、steel wire			☐ good ☐ normal ☐ bad	
3	Hydraulic theory	1、theory drawing training 2、main hydraulic parts' function training 3、main hydraulic hose array training			☐ good ☐ normal ☐ bad	
4	Electric theory	1、theory drawing training 2、main electric parts' function training 3、main electric wire array training			☐ good ☐ normal ☐ bad	
5	normal trouble shooting	Include engine、hydraulic system、Electric system、weld			☐ good ☐ normal ☐ bad	
6	Operator training.	1、start and stop 2、travel 3、drill work 4、operation of friction bar and inner locking bar			☐ good ☐ normal ☐ bad	
7	Technics of piling work	1、preparation before work 2、hole location 3、put casing down 4、machine ready for work 5、piling			☐ good ☐ normal ☐ bad	
8	geology	1、clay stratum 2、sand stratum 3、scree stratum 4、strong weathering stratum 5、refilling soil			☐ good ☐ normal ☐ bad	
9	Selection of rigs	Select rigs according to various geology			☐ good ☐ normal ☐ bad	
Customer opinion:			Director of customer service department opinion:			

旋挖钻机定期检查、保养事项

Regular Inspection ,Maintenance Instruction

定期的检查和维护是安全高效运行和延长旋挖钻机使用寿命的基础保证。当旋挖钻机运行 50、250、500、1000、1500、2000 小时，请安排技术人员进行检查或联系山河智能驻当地办事处或代理商进行例行检查与维护。

Regular inspection, maintenance ensure the machine good performance and prolong the machine service lifetime, Please arrange your technical

engineer do the inspection and maintenance for the machine or contact SUNWARD local agent when the machine working hours reach 50, 250, 500,1000,1500,2000.

周期检查和维修注意事项

1. 我们推荐您使用原厂零部件进行机器保养。请你按照《零部件图册》从山河智能或当地经销商选购正宗配件。
2. 补充或更换油品时，采用当地推荐的符合气温的油品并用滤清器过滤。
3. 保持旋挖钻机清洁以易于发现异常情况。
4. 检查或更换润滑油时，选择环境清洁的时候进行以防止尘土混入。
5. 将“正在检查和维护”的警告牌放在驾驶室门上防止他人启动机器。
6. 零部件更换时应使其表面清洁尤其是 O 型圈和垫圈。
7. 清洗机器时不要将电气系统元件弄湿。焊接时切记把动作控制器和发动机的 ECM 插头拔掉。
8. 尘土区域工作注意事项

随时检查空气滤清器，清除堵塞

随时检查散热器芯，及时清除堵塞

工作每 100-150 个小时更换柴油滤清器

注意保护电气元件，特别是启动马达和发电机

Attentions:

1. We recommend you use the original spare parts from SUNWARD for maintenance, please follow the instruction of “**SPARE PARTS BOOK**” to buy spare parts from SUNWARD or local authorized agent.
2. Fuel/Oil must be pure and adapt to local environmental temperature. Use filter to prevent dust.
3. Keep the machine cleanly ensure any defect can be discover easily.
4. Replace or adding lubricant oil must be carrying out in cleanly environment.
5. Use “Caution plate” when carrying out maintenance or repairing, Put a “Caution plate” in the cabin to avoid someone start machine.
6. The surface of the parts for replacement must be clean, especially for O-ring and washer used for seal.
7. Protect electrical components avoid wetting when wash machine. Unplug the PLC and ECM when do welding work.
8. working in dusting environment.

Clean air filter more often.

Inspect the radiator and clean the dust often.

Replace fuel filter every 100-150 working hours.

Protect electrical components, especially start motor and generator, pay more attention on their performance

重要提示：为了保证您的机器长期高效的运行，定期的保养与维护必须强制性的进行。

Important: Timely and regular maintenance must be compellingly carried out to ensure high performance and longer service lifetime.

旋挖钻机定期点检保养服务报告（第一次 500H）

巡检项目： 正常○ 不正常△

产品型号		使用地点		日期
产品编号		服务工程师		
工作时间		联系电话		



检查项目		正常	不正常	检查项目		正常	不正常	检查项目		正常	不正常
油位情况				各类滤芯				螺栓紧固			
●	发动机机油油位			●	机油滤芯			●	钻桅、变幅机构铰座以及螺栓紧固		
●	冷却器水位			●	柴油滤芯			●	动力头固定架及其他紧固情况		
●	大小液压油箱油位			●	发动机空气滤芯			●	主副卷扬固定座螺栓		
●	润滑油箱油位			●	液压油先导油滤芯			●	回转减速机固定座螺栓		
●	回转减速机润滑油位			●	液压油回油滤芯			其他			
●	动力头润滑油油位			●	动力头润滑油滤芯			●	发动机固定座螺栓紧固		
●	行走减速机润滑油油位			电气系统				●	各部位黄油润滑情况		
●	主卷扬减速机润滑油油			●	启动马达			●	蓄电池电解液液位		
液压系统				●	发电机发电量			●	钢丝绳润滑及磨损情况		
●	液压系统主压力值			●	启动钥匙开关			●	液压油散热器片清洁情况		
●	主副卷扬提升压力值			●	空调效果			●	水箱散热器片清洁情况		
●	动力头回转压力值			●	燃油切断阀						
●	行走压力值			●	电磁阀						
●	平举、变幅压力值			●	仪表盘各类传感器显示						
●	各类油管/接头是否漏油			●	雨刮器电机						
●	各类油缸是否漏油			●	保险管/片						

备注：请严格按照表中项目进行检查并在空白处做好记录，重大的问题请写专题报告。

客户签名/日期（盖章）：
客户电话：

500 hours regular maintenance record

Inspection item：Normal○ Abnormal△

Model		Working place		date
Series No		Service engineer		
Working hours		Tel No		

Inspection Item		result	Inspection Item		result	Inspection Item		result
oil level and health condition						●	Fuse box	
●	Engine oil level					Bolts		Hydrauli
●	Cooling fluid level					●	Arm , mast, seat	
●	Tank oil level		Hydraulic system			●	Rotary head	
●	Grease-box level		●	System pressure		●	Winch	
●	Grease level of slewing reducer		●	Winch pressure		●	Slewing head	
●	Grease level of rotary head		●	Rotary head pressure		Others		
●	Grease level of traveling reducer		●	Traveling pressure		●	Engine seat bolts	
●	Grease level of main winch		●	Arm cylinder pressure		●	Grease	
Filter			●	Cylinder leakage		●	Battery electrolyte level	
●	Engine oil filter		●	Center swivel joint, hose		●	Wire rope	
●	Diesel oil filter		Electrical system			●	Oil radiator	
●	Slewing bearing		●	Starting switch		●	Water radiator	
●	Air filter of engine		●	Battery, main power switch				
●	Pilot filter		●	Air condition				
●	Oil return filter		●	Fuel pump				
●	Grease oil filter of rotary head		●	Electromagnetic valve				
			●	Wipe				
Remark: Inspect every item carefully and record the result in the blank, write a separate report if necessary.								
Customer signature/Date :								
Phone No :								

旋挖钻机定期点检保养服务报告（第二次 1000H）

巡检项目： 正常○ 不正常△

产品型号		使用地点		日期
产品编号		服务工程师		
工作时间		联系电话		



检查项目		正常	不正常	检查项目		正常	不正常	检查项目		正常	不正常
油位情况				各类滤芯				螺栓紧固			
●	发动机机油油位			●	机油滤芯			●	钻桅、变幅机构铰座以及螺栓紧固		
●	冷却器水位			●	柴油滤芯			●	动力头固定架及其他紧固情况		
●	大小液压油箱油位			●	发动机空气滤芯			●	主副卷扬固定座螺栓		
●	润滑油箱油位			●	液压油先导油滤芯			●	回转减速机固定座螺栓		
●	回转减速机润滑油位			●	液压油回油滤芯			其他			
●	动力头润滑油油位			●	动力头润滑油滤芯			●	发动机固定座螺栓紧固		
●	行走减速机润滑油油位			电气系统				●	各部位黄油润滑情况		
●	主卷扬减速机润滑油油			●	启动马达			●	蓄电池电解液液位		
液压系统				●	发电机发电量			●	钢丝绳润滑及磨损情况		
●	液压系统主压力值			●	启动钥匙开关			●	液压油散热器片清洁情况		
●	主副卷扬提升压力值			●	空调效果			●	水箱散热器片清洁情况		
●	动力头回转压力值			●	燃油切断阀						
●	行走压力值			●	电磁阀						
●	平举、变幅压力值			●	仪表盘各类传感器显示						
●	各类油管/接头是否漏油			●	雨刮器电机						
●	各类油缸是否漏油			●	保险管/片						

备注：请严格按照表中项目进行检查并在空白处做好记录，重大的问题请写专题报告。

客户签名/日期（盖章）：
客户电话：

1000 hours regular maintenance record

Inspection item：Normal○ Abnormal△

Model		Working place		date
Series No		Service engineer		
Working hours		Tel No		

Inspection Item		result	Inspection Item		result	Inspection Item		result
oil level and health condition						●	Fuse box	
●	Engine oil level					Bolts		Hydrauli
●	Cooling fluid level					●	Arm , mast, seat	
●	Tank oil level		Hydraulic system			●	Rotary head	
●	Grease-box level		●	System pressure		●	Winch	
●	Grease level of slewing reducer		●	Winch pressure		●	Slewing head	
●	Grease level of rotary head		●	Rotary head pressure		Others		
●	Grease level of traveling reducer		●	Traveling pressure		●	Engine seat bolts	
●	Grease level of main winch		●	Arm cylinder pressure		●	Grease	
Filter			●	Cylinder leakage		●	Battery electrolyte level	
●	Engine oil filter		●	Center swivel joint, hose		●	Wire rope	
●	Diesel oil filter		Electrical system			●	Oil radiator	
●	Slewing bearing		●	Starting switch		●	Water radiator	
●	Air filter of engine		●	Battery, main power switch				
●	Pilot filter		●	Air condition				
●	Oil return filter		●	Fuel pump				
●	Grease oil filter of rotary head		●	Electromagnetic valve				
			●	Wipe				
Remark: Inspect every item carefully and record the result in the blank, write a separate report if necessary.								
Customer signature/Date :								
Phone No :								

旋挖钻机定期点检保养服务报告（第三 次 1500H）

巡检项目： 正常○ 不正常△

产品型号		使用地点		日 期
产品编号		服务工程师		
工作时间		联系电话		



检查项目		正常	不正常	检查项目		正常	不正常	检查项目		正常	不正常
油位情况				各类滤芯				螺栓紧固			
●	发动机机油油位			●	机油滤芯			●	钻桅、变幅机构铰座以及螺栓紧固		
●	冷却器水位			●	柴油滤芯			●	动力头固定架及其他紧固情况		
●	大小液压油箱油位			●	发动机空气滤芯			●	主副卷扬固定座螺栓		
●	润滑油箱油位			●	液压油先导油滤芯			●	回转减速机固定座螺栓		
●	回转减速机润滑油位			●	液压油回油滤芯			其他			
●	动力头润滑油油位			●	动力头润滑油滤芯			●	发动机固定座螺栓紧固		
●	行走减速机润滑油油位			电气系统				●	各部位黄油润滑情况		
●	主卷扬减速机润滑油油			●	启动马达			●	蓄电池电解液液位		
液压系统				●	发电机发电量			●	钢丝绳润滑及磨损情况		
●	液压系统主压力值			●	启动钥匙开关			●	液压油散热器片清洁情况		
●	主副卷扬提升压力值			●	空调效果			●	水箱散热器片清洁情况		
●	动力头回转压力值			●	燃油切断阀						
●	行走压力值			●	电磁阀						
●	平举、变幅压力值			●	仪表盘各类传感器显示						
●	各类油管/接头是否漏油			●	雨刮器电机						
●	各类油缸是否漏油			●	保险管/片						

备注：请严格按照表中项目进行检查并在空白处做好记录，重大的问题请写专题报告。

客户签名/日期（盖章）：
客户电话：

1500 hours regular maintenance record

Inspection item： Normal○ Abnormal△

Model		Working place		date
Series No		Service engineer		
Working hours		Tel No		

Inspection Item		result	Inspection Item		result	Inspection Item		result
oil level and health condition						●	Fuse box	
●	Engine oil level					Bolts		Hydrauli
●	Cooling fluid level					●	Arm , mast, seat	
●	Tank oil level		Hydraulic system			●	Rotary head	
●	Grease-box level		●	System pressure		●	Winch	
●	Grease level of slewing reducer		●	Winch pressure		●	Slewing head	
●	Grease level of rotary head		●	Rotary head pressure		Others		
●	Grease level of traveling reducer		●	Traveling pressure		●	Engine seat bolts	
●	Grease level of main winch		●	Arm cylinder pressure		●	Grease	
Filter			●	Cylinder leakage		●	Battery electrolyte level	
●	Engine oil filter		●	Center swivel joint, hose		●	Wire rope	
●	Diesel oil filter		Electrical system			●	Oil radiator	
●	Slewing bearing		●	Starting switch		●	Water radiator	
●	Air filter of engine		●	Battery, main power switch				
●	Pilot filter		●	Air condition				
●	Oil return filter		●	Fuel pump				
●	Grease oil filter of rotary head		●	Electromagnetic valve				
			●	Wipe				
Remark: Inspect every item carefully and record the result in the blank, write a separate report if necessary.								
Customer signature/Date :								
Phone No :								

旋挖钻机定期点检保养服务报告（第四次 2000H）

巡检项目： 正常○ 不正常△

产品型号		使用地点		日期
产品编号		服务工程师		
工作时间		联系电话		



检查项目		正常	不正常	检查项目		正常	不正常	检查项目		正常	不正常
油位情况				各类滤芯				螺栓紧固			
●	发动机机油油位			●	机油滤芯			●	钻桅、变幅机构铰座以及螺栓紧固		
●	冷却器水位			●	柴油滤芯			●	动力头固定架及其他紧固情况		
●	大小液压油箱油位			●	发动机空气滤芯			●	主副卷扬固定座螺栓		
●	润滑油箱油位			●	液压油先导油滤芯			●	回转减速机固定座螺栓		
●	回转减速机润滑油位			●	液压油回油滤芯			其他			
●	动力头润滑油油位			●	动力头润滑油滤芯			●	发动机固定座螺栓紧固		
●	行走减速机润滑油油位			电气系统				●	各部位黄油润滑情况		
●	主卷扬减速机润滑油油			●	启动马达			●	蓄电池电解液液位		
液压系统				●	发电机发电量			●	钢丝绳润滑及磨损情况		
●	液压系统主压力值			●	启动钥匙开关			●	液压油散热器片清洁情况		
●	主副卷扬提升压力值			●	空调效果			●	水箱散热器片清洁情况		
●	动力头回转压力值			●	燃油切断阀						
●	行走压力值			●	电磁阀						
●	平举、变幅压力值			●	仪表盘各类传感器显示						
●	各类油管/接头是否漏油			●	雨刮器电机						
●	各类油缸是否漏油			●	保险管/片						

备注：请严格按照表中项目进行检查并在空白处做好记录，重大的问题请写专题报告。

客户签名/日期（盖章）：
客户电话：

2000 hours regular maintenance record

Inspection item: Normal○ Abnormal△

Model		Working place		date
Series No		Service engineer		
Working hours		Tel No		

Inspection Item		result	Inspection Item		result	Inspection Item		result
oil level and health condition						●	Fuse box	
●	Engine oil level					Bolts		Hydrauli
●	Cooling fluid level					●	Arm , mast, seat	
●	Tank oil level		Hydraulic system			●	Rotary head	
●	Grease-box level		●	System pressure		●	Winch	
●	Grease level of slewing reducer		●	Winch pressure		●	Slewing head	
●	Grease level of rotary head		●	Rotary head pressure		Others		
●	Grease level of traveling reducer		●	Traveling pressure		●	Engine seat bolts	
●	Grease level of main winch		●	Arm cylinder pressure		●	Grease	
Filter			●	Cylinder leakage		●	Battery electrolyte level	
●	Engine oil filter		●	Center swivel joint, hose		●	Wire rope	
●	Diesel oil filter		Electrical system			●	Oil radiator	
●	Slewing bearing		●	Starting switch		●	Water radiator	
●	Air filter of engine		●	Battery, main power switch				
●	Pilot filter		●	Air condition				
●	Oil return filter		●	Fuel pump				
●	Grease oil filter of rotary head		●	Electromagnetic valve				
			●	Wipe				
Remark: Inspect every item carefully and record the result in the blank, write a separate report if necessary.								
Customer signature/Date :								
Phone No :								

旋挖钻机常见故障分析及处理方案

Common fault analysis of rotary drilling machine

序号 No.	故障现象 Symptom	故障原因分析 Reason Analysis	处理方案及技巧 Solution
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1	显示屏黑屏 Display gets dark	<1>线路故障 Problem of wires <2>显示亮度太低 Problem of screen luminance <3>显示屏故障 Display is broken	<1>检测 CAN1L、CAN1H、42#、GND 线路是否正常, 确保线路 42#与线路 GND 之间有 24V 电压; Make sure CAN1L, CAN1H, 42#, GND is firm connected <2>按住显示屏右边第 2 键, 点动右边第 3 键调整亮度; Keep pressing the second key on the right side of the display, adjust the third key on the right side of the display. <3>更换显示屏。 Replace the display
2	深度显示无效 No depth display	<1>设置故障 The wrong value is set <2>线路故障 Problem of wires <3>接近开关损坏 Proximity switch is broken	<1>检查设置中“转盘直径”是否为 617 (机型不同设置有区别); The set value of “turntable diameter” should be 617. (difference according to different model) <2>检测线路 SQ1、SQ2、42#、GND 是否正常, 检查接近开关与滑轮间距离是否 ≤5mm 或者 11mm (M18 螺纹型参考值为 5mm, M30 螺纹型为 11mm); Make sure the wire SQ1, SQ2, 42#, GND is firm connected; The space between proximity switch and pulley should less than 5mm (To bolt-M18) or 11mm. (To bolt-M30) <3>更换接近开关。Replace the proximity switch
3	回转角度显示故障 Malfunction of rotary angle display	<1>线路故障 Problem of wires <2>回转编码器故障 Problem of rotary encoder	<1>检查线路 A12V、SP2A、SP2B、GND 是否正常; Make sure wires A12V, SP2A, SP2B, GND is firm connected <2>检测回转编码器是否损坏。Check the rotary encoder
4	压力传感故障 Malfunction of pressure sensor	<1>线路故障 Problem of wires <2>传感器故障 Problem of sensor	<1>检查线路是否正常: CHECK THE FOLLOWING WIRES 推进加压为: A+5V、P1、REF-A (新机型为) Force adding: A+5V、P1、REF-A (New model: A12V、P1、GND/A) 动力头压力: B+5V、P2、REF-B (新机型为: A12V、P2、GND/A) Pressure of rotary head: B+5V、P2、REF-B (New model: A12V、P2、GND/A) 主卷扬压力: C+5V、P3、REF-C (新机型为: A12V、P3、GND/A) Pressure of main winch C+5V、P3、REF-C (New model: A12V、P3、GND/A) <2>检查相应传感器是否正常 Check the relevant sensor
5	机油压力报警 Pressure alarm of engine oil	<1>发动机实际机油压力过低 Low pressure of engine oil <2>传感线路故障 Problem of sensor wires <3>机油压力传感器损坏 Engine oil pressure sensor is broken	<1>用机械压力表检测发动机机实际油压力是否低于 0.1mpa; The pressure of engine oil should higher than 0.1mpa <2>检测 SP7、C12V 线路及电阻 (560 欧姆) 是否正常 (机械型发动机检查项); Check wire SP7, C12V and resistance (560ohm) <3>更换压力传感器。Replace the pressure sensor
6	温度显示报警 Temperature alarm	<1>实际温度过高 Temperature is too high <2>传感线路故障	<1>见故障 8 和故障 9; Refer to malfunction 8th and 9th <2>检测水温传感 C12V、SP9、线路及电阻 (910 欧姆) 是否正常 (机械型发动机

		Problem of sensor wires <3>传感器故障 Problem of sensor	检查项); Check the wire C12V, SP9 and resistance(910ohm) 检测油温传感 C12V、SP3、线路及电阻 (560 欧姆) 是否正常; Check the wire C12V, SP3 and resistance(560ohm) <3>检测温度传感器是否损坏。Check the sensor
7	柴油液位传感故障 Problem of fuel leveling sensor	<1>线路故障 Problem of wires <2>传感器故障 Problem of sensor	<1>检测传感线路是 B12V、SP1、线路及电阻 (180 欧姆) 是否正常; Check the wire B12V, SP1 and resistance(180ohm) <2>检测传感器是否损坏。Check the sensor
8	油温过高 Overheated oil	<1>油位过低 Oil level is too low <2>散热器杂物较多 Too many eyewinker in the radiator <3>冷却风扇转速过低 Speed of cooling fan is too slow	<1>液压油位位于上液位计三分之二处、否则补充液压油; Filling enough hydraulic oil(oil level should be kept over the2/3 of the level gauge) <2>清洗散热器; Clean the radiator <3>检测冷却液压系统压力是否为 12-14mpa。Make sure the pressure of cooling system is 12-14Mpa
9	水温过高 Overheated water	<1>水位过低 Water level is too low <2>散热器杂物较多 Too many eyewinker in the radiator <3>节温器故障 Problem of thermostat	<1>补充纯净水及防冻液; Filling the water and antifreeze <2>清洗散热器上的杂物; Clean the radiator <3>检修节温器。Examine the thermostat
10	调平系统故障 Leveling problem	<1>线路故障 Problem of wires <2>电手柄故障 Problem of handle <3>倾角传感故障 Problem of inclination sensor <4>程序参数混乱 Problem of program	<1>检测调平系统电路 D5V、JOY、JOYX、JOYY、REF-D 是否正常; Check the wires D5V、JOY、JOYX、JOYY、REF-D <2>检测电手柄是否损坏; examine the leveling handle <3>检测倾角传感是否正常; examine the inclination sensor <4>设置系统参数 (此操作需要经过培训的山河智能售后服务工程师进行) 。 Reset the program (by SUNWARD engineer)
11	发动机掉速 Engine can not meet the rated speed	空滤、柴滤、油水分离器、柴油油路、机油压力故障 Problem of air filter, fuel filter, oil-water separator,	<1>检查主泵上功率调节阀插头及线路是否正常; Check the wires and adjusting pin on the main pump. <2>如检测以上部件无故障应及时向康明斯反映请康明斯检修。 Report to CUMMINS SERVICE if the referring checks have no effect
12	发动机转速传感故障 Problem of speed sensor	<1>发动机故障 Malfunction of engine <2>传感线路故障 Problem of wires <3>传感器故障	<1>观察发动机是否有异常现象; Examine the engine <2>检查 SP8、GND 传感线路是否正常 (机械型发动机检查项); Check the wire SP8, GND. <3>检查传感器安装位置是否正确; Make sure the sensor is on the right position

		Problem of sensor	<4>判断传感器是否损坏。Make sure the sensor is all right.
13	发动机无法启动 Engine can not start-up	<1>电器故障 Problem of wires <2>柴油油路故障 Problem of fuel oil-line	<1>检查使能开关 SQ3、点火锁、GPS 线路 LX212 与 LX211 是否接通、启动马达 6#、7#、8# 线路及电瓶是否正常；Make sure the switch SQ3,Ignition,GPS ,LX212 and LX211 get through.Make sure the start motor,wire 6#,7#,8#,and accumulator is all right. <2>检查柴油油路是否正常、油路中是否存有空气（机械发动机应检查断油阀是否正常）。Check the fuel oil-line,
14	发动机无法熄火 Can not switch off Engine	<1>电路故障 Problem of wires <2>断油阀故障 Problem of fuel cut valve	<1>检查点火锁及 3#线路是否正常； Check the ignition and wire 3# <2>检测断油阀阀芯是否卡死（机械型发动机检查项）。 Check fuel cut valve,maybe eyewinkers in the fuel cut valve
15	发动机冒蓝烟故障 Blue fumes from engine	发动机冒蓝烟主要是烧机油所致 engine oil is burning	<1>检查机油油位是否过高； Engine oil level is too high <2>请康明斯维修。Report to CUMMINS
16	发动机冒白烟故障 White fumes from engine	<1>发动机温度过低 Low temperature engine <2>供油系中有水 Water in the fuel oil-line	<1>发动机启动后应先进行预热； Reheat engine befor start-up <2>检查供油系统是否清洁； Clean the fuel oil-line <3>请康明斯检修。Reprot to CUMMINS
17	履带涨紧故障 Problem of pedrail tension	<1>单向阀故障 check the check valve <2>涨紧油缸故障 Problem of tension cylinder <3>机械部件故障 Mechanical pars problem	<1>单向阀损坏无法正常保压； Replace check valve <2>涨紧油缸内泄或外泄而使其不能正常保压 Repair the tension cylinder <3>履带或导向轮等其它部件卡死。 Seizure of pedrail or guide wheel
18	履带伸缩故障 Problem of pedrail stretch out or draw back	<1>电器故障 Problem of wires <2>液压故障 Problem of hydraulic parts	<1>检查翘板开关 SA1、Y34 线路、电磁铁是否正常 Examin the wire SA1,Y34 and electric magnet <2>检测换向阀、履带伸缩油缸是否损坏； Check the reversing valve and stretch out-draw back cylinder

		<3>机械故障 Problem of mechanical parts	<3>检查机械部件有无卡死现象。 Seizure of mechanical parts
19	支腿伸缩故障 Problem of stabilizer	<1>电路故障 Problem of wires <2>电磁阀故障 Problem of electromagnetic valve <3>支腿伸缩油缸故障 Problem of stabilizer cylinder	<1>检查 SA1、Y34 线路是否正常； Check the wire SA1,Y34 <2>检查换向电磁阀 Y34 是否损坏； Check the electromagnetic valve Y34 <3>检查伸缩油缸抗衡阳是否损坏、油缸是否内泄等。 Check the stabilizer cylinder
20	主卷不能正常上提 Main winch can not rise up	<1>电器故障 Problem of wires <2>液压系统故障 Problem of hydraulic system	<1>依次进入“监控-传感-主卷上限”检查主卷上限是否开启； Check “supervision-sense-main winch up limitation”, check function of main winch up limitation is off. <2>检测主卷先导及其油路、多路阀、主卷马达开锁压力等是否正常。 Check the main winch pilot valve, multidirectional valve, and relevant oil-line
21	主卷扬刹车失灵故障 Main winch brake problem	<1>浮动故障 Problem of floating valve <2>减速机刹车片故障 Brake plate of reducer	<1>检测浮动电磁阀 Y37 浮动开锁电磁阀 Y36 是否正常工作； Check the floating controlled valve Y37 and electromagnetic valve Y36 <2>检查减速机刹车片是否损坏。 Check the brake plate of reducer
22	主卷钢丝绳跳槽 Wire rope convolves at the main winch	主卷扬滚筒上第一层与第二层过度处过陡 Too steep between the first and second Intermediate	<1>补焊滚筒并打磨； Welding and wearing the drum <2>适当垫高主卷机架左边高度。 Block up the left side of the main winch
23	主卷扬无浮动故障	<1>电路故障	<1>检查 SA10、Y37、Y36 线路是否正常；

	Main winch has no floating function	Problem of wires <2>主卷浮动电磁阀故障 Problem of floating controlled valve <3>主卷开锁电磁阀故障 Problem of unlock electromagnetic valve	Check the wires SA10, Y37, Y36 <2>检测主卷浮动电磁阀 Y37 是否损坏; Check the floating controlled valve Y34 <3>检测主卷浮动开锁电磁阀 Y36 是否损坏。 Check the unlock electromagnetic valve Y36
24	主卷扬快速下放抖动故障 Main winch shakes when downpassing at a high speed	<1>回油不畅通 Oil return is not smooth <2>开锁压力过低 Unlock pressure is too low <3>马达 S 口补油不够充分 Poor oil make-up at motor S port <4>抗衡阀导压比过低 Problem of counter balance valve	<1>检查回油是否流畅; Make sure oil return is smooth <2>检查实际开锁压力是否高于 2.2MPa; Unlock pressure should higher than 2.2MPa <3>检查补油油路是否正常; Check the oil line of oil make-up <4>更换抗衡阀(外配缓冲阀主卷)。 Replace the counter balance valve
25	钢丝绳万向绳头连接处易断 wire rope breakdown at the shackle	<1>钢丝绳质量问题 Problem of wire rope <2>回转接头故障 Problem of rotary joint	<1>观测钢丝绳性能是否在设计参数要求范围内; Make sure the wire rope is of the high quality <2>检测回转接头回转是否灵活。 Check the rotary joint
26	副卷扬无浮动故障 (部分机型选用副卷浮动功能) Auxiliary winch has no floating function	<1>电路故障 Problem of electric circuit <2>副卷浮动电磁阀故障 Problem of floating controlled valve <3>副卷开锁电磁阀故障 Problem of unlock electromagnetic valve	<1>检查线路 Y22、Y33 是否正常; Check the wires Y22, Y33 <2>检测副卷浮动电磁阀 Y33 是否损坏; Check the floating controlled valve Y33 <3>检测副卷浮动开锁电磁阀 Y22 是否损坏。 Check the unlock electromagnetic valve Y22
27	钻桅调整失控故障 Malfunction of mast leveling	<1>倾角传感器故障 Problem of obliquity sensor <2>动作控制器故障 Problem of movement controller <3>程序异动 problem of program <4>钻桅油缸故障 problem of mast cylinder	<1>检测倾角传感器及线路是否正常; Check the obliquity sensor and its electric circuit <2>检测动作控制器及线路连接处是否正常; Check the movement controller and its electric circuit <3>检测动作控制器程序是否有变化(调查焊接其它部件时是否将动作控制器的插座拔下); Check the program of movement controller

			<4>检查钻桅油缸是否正常工作。 Check the mast cylinder
28	动臂升降故障 Malfunction of boom fluctuation	<1>电磁阀没正常工作 Problem of electromagnetic valve <2>油缸故障 Problem of cylinder	<1>检查 Y32 电磁阀及线路是否正常; Check the electromagnetic valve Y32 and its electric circuit <2>检查油缸抗平衡阀能否正常开启、油缸有无内泄或外泄迹象。 Check the cylinder
29	无作业档故障 No work/move function	<1>GPS 故障 Problem of GPS <2>线路故障 Problem of electric circuit <3>电磁阀故障 Problem of electromagnetic valve	<1>检测 GPS 是否正常工作（见故障 48）; Check GPS <2>检查 SA9、Y9、Y10 线路是否正常; Check the wire SA9, Y9, Y10 <3>检查电磁阀 Y9、Y10 有无损坏。 Check the electromagnetic valve Y9, Y10 （以上以 20/22 机型为准）
30	GPS 故障 Problem of GPS	GPS 出现故障时会影响整车电源的开启、先导、作业档、立桅、启动、熄火等 GPS effects main power, pilot oil way, work/move function, mast leveling, start-up and flame out	首先排除 GPS 的 LX101、LX102 线路故障、及当地 GPS 信号强弱程度再判断 GPS 是否损坏 Check the wires LX101, LX102
31	加压无动作 No adding force function	<1>电器故障 Problem of electric circuit <2>换向电磁阀故障 Problem of electromagnetic directional valve <3>加压油缸故障 Problem of adding force cylinder	<1>作业档/调整档是否正常; Check the work/move function <2>检查换向电磁阀 Y9 有无损坏 Check the electromagnetic valve Y9 <3>检查加压油缸是否正常。 Check the adding force cylinder
32	保险易损故障 Problem of fuse	<1>易损保险相应线路故障 Problem of the relevant electric circuit <2>易损保险相应执行元件故障 Problem of the relevant electric parts	<1>检查相关电路是否有短路现象; Check the relevant electric circuit, there may be a short circuit <2>检查相应部件是否因损坏而短路导致故障发生。 Check the relevant electric parts

33	空调故障 Problem of air-conditioner	<1>缺少制冷剂 Lack of refrigerants <2>空调压缩机皮带松动 Compressor belt is looseness <3>电路故障 Problem of electric circuit <4>空调压缩机损坏 Problem of compressor <5>冷凝器故障 Problem of condenser	<1>检测制冷剂是否够量; Make sure the refrigerants is enough <2>检测压缩机皮带松紧程度是否正常 Check the compressor belt; <3>检查 23#电源线路及保险是否正常; Check the wire 23# and its fuse <4>检测压缩机是否正常; Check the compressor <5>检查冷凝器风机是否正常, 用压缩空气清洁冷凝器。 Check and clean the condenser
34	动力头无动作 Rotary head can not work	<1>作业档失效 Problem of work/move function <2>线路故障 Problem of wires <3>马达故障 Problem of motor <4>驱动套与齿轮总成连接螺栓断裂 Problem of bolt between drive sleeve and gear assemble	<1>检查作业档是否正常 (见故障 29) ; Check the work/move function <2>检查 Y9 线路及 Y9 电磁阀是否正常; Check the wire Y9 and electromagnetic valve Y9 <3>检查动力头马达是否正常; Check the motor <4>驱动套与齿轮总成连接是否有正常。 Check the connection between drive sleeve and gear assemble
35	平台回转制动故障 Slewing platform can not apply the brake	<1>回转开锁单向节流阀故障 Problem of slewing unlock check valve <2>回转减速机故障 Problem of slewing reducer <3>回转制动压力低 Problem of slewing brake pressure	<1>清洗或更换单向节流阀; Clean or replace the check valve <2>检修回转减速机; Examine the slewing reducer <3>调整回转制动压力。 Adjust the slewing brake pressure
36	自动回转故障 Problem of automatic slewing	<1>线路故障 Problem of electric circuit <2>回转角度传感故障 Problem of turning angle sensor <3>电比例阀故障 Problem of proportional valve <4>控制器故障 Problem of controller	<1>在深度小于-40cm 的情况下, 检查 SB4、Y5、Y6 线路是否正常; Check the wires SB4, Y5, Y6 <2>检查回转角度传感是否正常 (见故障 3) Check the turning angle sensor; <3>检测电比例阀是否损坏; Check the proportional valve <4>检测动作控制器程序是否有异动。 Check the control program

37	行走跑偏或无动作故障 Problem of travelling	<1>多路阀故障 Problem of multidirectional valve <2>行走马达故障 Problem of travel motor <3>中央回转接头故障 Problem of centre rotating connection	<1>检查多路阀是否正常; Check the multidirectional valve <2>检测行走马达溢流阀是否正常、保证溢流压力相同; Check relief valve of travel motor <3>检查中央回转接头是否有卸压现象。 Check the centre rotating connection
38	动力头马达骨架油封易损 oil-seal is easily wearied	<1>马达壳体压力过高 Excess Pressure in motor <2>机械磨损严重 Problem of mechanical parts	<1>检查马达壳体压力是否过高 (0.3MPa) ; The pressure in motor should not exceed 0.3MPa <2>查找机械传输部件是否存在故障。 Check the mechanical parts
39	冷却马达漏油故障 Cooling motor leakage	<1>冷却马达骨架油封损坏 Oil seal is worn <2>马达端盖 O 型圈损坏 O-ring	<1>更换冷却马达输出轴端骨架油封; Change the gasket from the outer shaft of the cooling motor. <2>更换马达端盖 O 型圈损坏。 Change the o-ring of the motor cover
40	冷却马达骨架油封易损 Gasket of cooling motor broken	<1>冷却溢流阀压力设置过高 High oil pressure of the cooling relief valve. <2>马达泄油压力高 Leakage oil pressure was too high.	<1>调节冷却溢流阀的压力在 12-14MPa 之间; Adjust the pressure of the relief valve between 120bar and 140bar <2>更换冷却马达。 Change cooling motor
41	高压油管易损故障 Pipe broken	<1>磨损严重导致 Pipe wearied <2>油管转向处弧度过小 Angle of pipe corner was too small. <3>系统压力过高 Hydraulic system oil pressure too high	<1>检查油管是否受到外物干扰而导致严重磨损; Check the oil pipe blocked by other stuff result in wearing. <2>检查油管布局是否合理; Check the oil layout reasonable. <3>检测系统压力是否符合设计要求。 Check the system oil pressure
42	行走减速机易损故障 Traveling reducer wearing problem	<1>减速机轴承故障 Problem of the bearing inside the reducer <2>减速机齿轮滚故障 Problem of the gear ring inside the reducer	<1>缺少润滑脂; Limited lubrication oil <2>应定期检查补加或更换减速机齿轮油。 Check the oil regularly, and change it if needed.
43	减速机开锁压力过低 Release oil pressure	马达减压阀故障 Problem of pressure reducing	检查减压阀是否正常 Check the pressure reducing valve inside the motor.

	of the reducer was too low	valve	
44	常见油缸故障 Cylinders' problem	油缸无动作 Cylinders can't work	<1>抗衡阀阀芯卡死; Spool of the balanced valve blocked <2>油缸内泄; Oil leakage inside <3>油缸外泄; Oil leakage outside <4>缸体或者活塞杆变形。 Cylinder body or piston distortion
45	整车无动作故障 Machine can't work	<1>电器故障 Electric system problem <2>液压故障 Hydraulic system problem	<1>检测 GPS 的 LX241 和 LX242 是否接通; Check the wire harness connect well between LX241 and LX242 of GPS <2>先导使能开关 SQ3 及线路、急停开关 SB0 和 SB7、SB8 及线路、中间继电器以及先导电磁阀 Y18 及线路是否正常; Check the pilot enable switch SQ3, urgently-stop switch SB0, SB7, SB8, relays, pilot solenoid valves and all the wire harness. <3>检测先导泵以及先导溢流阀、先导滤芯是否正常; Check the pilot pump, pilot relief valve and pilot filter <4>主泵是否正常工作。 Check the main pump
46	钻机工作无力故障 No working power while machine runing	<1>发动机故障 Engine problem <2>主泵故障 Main pump problem <3>相应执行部件故障 all working sets problem	<1>观测发动机无力导致整个钻机工作无力、检修发动机; Check the engine <2>查看终端显示屏上的压力显示是否正常、主泵压力设置有变动或主泵损坏; Check the oil pressure showed on the monitor, and check the main pump <3>相应执行部件出现故障。 Check all working sets
47	钻杆卡杆故障 Problem of kelly bar	<1>因磨损产生毛刺 Burrs by worn <2>钻杆变形严重 Kelly bar is out of sharp	<1>拆卸钻杆检修并打磨毛刺; Wearing the burrs <2>校正或更换故障部分。 (注: 钻杆应定期检修) Check the Kelly bar periodically, revise or replace the Kelly bar
48	电瓶亏电故障 Battery is poor of power	<1>发电机到电瓶线路故障 Problem of wires from generator to battery <2>发电机皮带故障 Problem of generator belt <3>发电机故障	<1>检查 1#线路是否正常; Check the wire 1# <2>检查发电机皮带是否松弛及完好; Check the generator belt <3>检测发电机是否损坏; Check the generator

		Problem of generator <4>电瓶故障 Problem of battery <5>客户另外增加了大功率用电负载 Extra electrical parts	<4>检测电瓶是否损坏 Check the battery <5>取消增加的额外负载。 Cancel the extra electrical parts
49	电源开启后烧保险故障 Fuse burnt when power stat	<1>线路中有接地现象 Problem of wire earthing <2>某部件损坏接地 Problem of broken parts	<1>检查电路找出短路处; Check the short circuit <2>检测是否有部件损坏。 Find the broken parts
50	钻桅不能向左或向右摆动调节 Mast can not swing	<1>立桅电手柄或控制器及线路故障 Problem of PLC, electrical handle or wires <2>向左或向右摆动限位开关或线路故障 Problem of limit switch or wires	<1>见故障 10 和 27; Refer to malfunction 10 and 27 <2>检查钻桅左摆限位开关 SQ6 或右摆限位开关 SQ5 及线路是否正常。 Examine the limit switch SQ6, SQ7 and their wires.