

# Operation Instruction

## Hydraulic Herculean Puller



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# Operation Instruction

## Hydraulic Herculean Puller

This handbook is an integrating part of the machine, and must be carefully read in full, before accomplishing every operation. It must be kept in case of future references, until getting rid of the machine.

The handbook is addressed to professional users; it reflects the state of the technique at the moment of the commercialization of the machine, and cannot be considered inadequate just because on the ground of new experience it will be afterwards up-to-date.

WREN CO. declines every responsibilities due to the following situations;

- improper use of the machine or its use by not professional operators;
- wrong installation;
- wrong feeding;
- absences in maintenance;
- alterations or interventions not authorized by the manufacturer;
- employment of not original parts, or not suitable for the model.

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### IMPORTANT INSTRUCTIONS ON RECEIPT

Always inspect the packages and all the material received, this to verify possible damages happened during the transport; in this case make a complaint to the transport company.

### INFORMATION ABOUT THE RISKS RESULTING FROM THE OF THE PRODUCT



This is the symbol of danger. Every time you meet this symbol it means that damages more or less serious towards persons, animals and things are possible. The kind of danger and the precautions to adopt in order to contain the relative risks are every time quoted in the text following the symbol.



**DANGER:** EVERY TIME THIS WARNING IS IGNORED, IT EXISTS A MINOR RISK FOR PERSONS' AND ANIMALS' SECURITY AND/OR DAMAGES TO THINGS.



**WARNING:** EVERY TIME THIS WARNING IS IGNORED, IT EXISTS A MINOR RISK FOR PERSONS' AND ANIMALS' SECURITY AND/OR DAMAGES TO THINGS.

**The user is requested to follow always and carefully these precautions. The manufacturer declines every responsibilities and wounds resulting from an improper use of the product.**

### SAFETY ISSUES

Hydraulic Herculean Puller is a power tool. Operators must read and understand all safety precautions and operation instructions included with the puller, electric pump, and cylinder before using the puller.

#### SAFETY FIRST

▲ **WARNING:** To avoid personal injury and possible equipment damage,

- Be sure that every components of the hydraulic system are designed for a max. pressure of 700bar (10,000 psi)

- Never rely on this puller to support, carry, or transport the workpiece being pulled.
- The following procedures should only be performed by qualified, trained personnel who are familiar with this equipment.
- Safety glasses must be worn at all times by the puller operator and anyone within sight of the puller. Locate the puller in an isolated area or shield it to minimize danger to others.
- The owner of this tool must ensure that all safety-related decals are installed, maintained and replaced if they become hard to read.
- Do not exceed equipment ratings. Try to minimize the danger of overloading. Overloading causes equipment failure and possible personal injury.
- The pressure gauge is installed in the system to monitor operating pressure. It is your window to what happening in the system.
- Immediately replace worn or damaged parts by genuine WREN parts.
- Keep hydraulic equipment away from flames, heat, sharp edge, and chemical corrosion
- To avoid personal injury and possible equipment damage, NEVER get rid of the protective device installed on the puller. Do not dismount any components of the puller without WREN's permission. Do not readjust the safety valve of the cylinder.
- Never stand to each side of the puller in case of personal injury in system operation.

## HOSES

- should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump. Never grasp a leaking pressurized hose with your hands.
- Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe backpressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure.
- Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- Do not subject the hose to potential hazard, such as fire, sharp surfaces, heavy impact, or extreme heat or cold. Do not allow the hose to kink, twist, curl, or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose and possibly result in personal injury.
- Do not use the hose to move attached equipment. Stress can damage the hose and possibly cause personal injury.
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive material such as creosote-impregnated objects and some paints. Consult the manufacturer before painting a hose. Never paint a coupler. Hose deterioration due to toxic materials can result in personal injury.

## 4. PUMP

- Do not exceed the PSI hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities can result in personal injury.
- Retract the system before adding oil to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when cylinders are retracted.

## PULLER

- align the puller on the same centerline as the part being removed.  
Failure to align parts correctly can result in a dangerous operating situation because of the high hydraulic pressure used.

- Adjust the puller jaws equally to make flat and square contact with the part being removed.
- The safety chain must be tightly attached to the jaw pin hooks before pressure is applied.

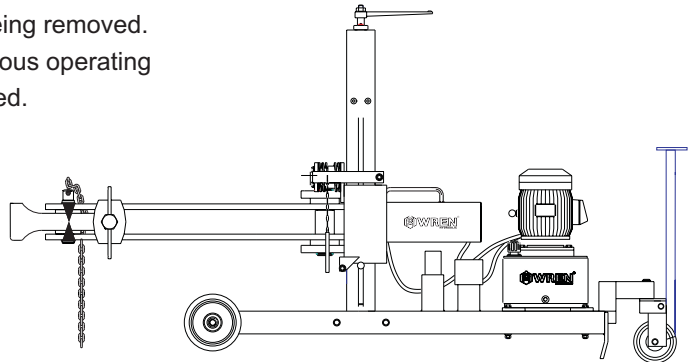


FIGURE 1

- Stand behind and to one side of the puller when applying pressure.
- Do not try to pull components that are thicker than 12" or require the jaw to be opened to more than 48" or less than 15".

## Description of LA25100 (LA2560) Hydraulic Herculean Puller

WREN's LA25100 Hydraulic Herculean Puller is made from High Strength Alloy Steel. Two acting hydraulic design controlled by remote hand switch. This puller is used for dismounting bearings, couplings, spindle sleeves and other large sized parts.

Cart's swivel casters give ease of mobility.

Caution: Do not do any alteration on design, configuration and application of the tool without authorization.

## OPERATION

VERTICAL SET-UP : See Figure 2

The head and pulling jaw assembly on this puller is designed to compensate for some degree of error in a job set-up. The puller head is spring-loaded, permitting 7° flexibility in upward movement and 3° flexibility in downward movement. Note: Because of this feature, the head and puller jaw assembly may rest at a slight upward angle.

1. Adjust vertical set-up by using the crank handle shown in Figure 2. the centerline of the object being pulled must be on the same centerline as the puller head. Note: Because of spring loading, you may have to turn the crank handle several times before the head starts moving.

2. Align the puller horizontally and vertically as close as possible to the same centerline as the object to be pulled. The head cannot compensate for poor alignment.

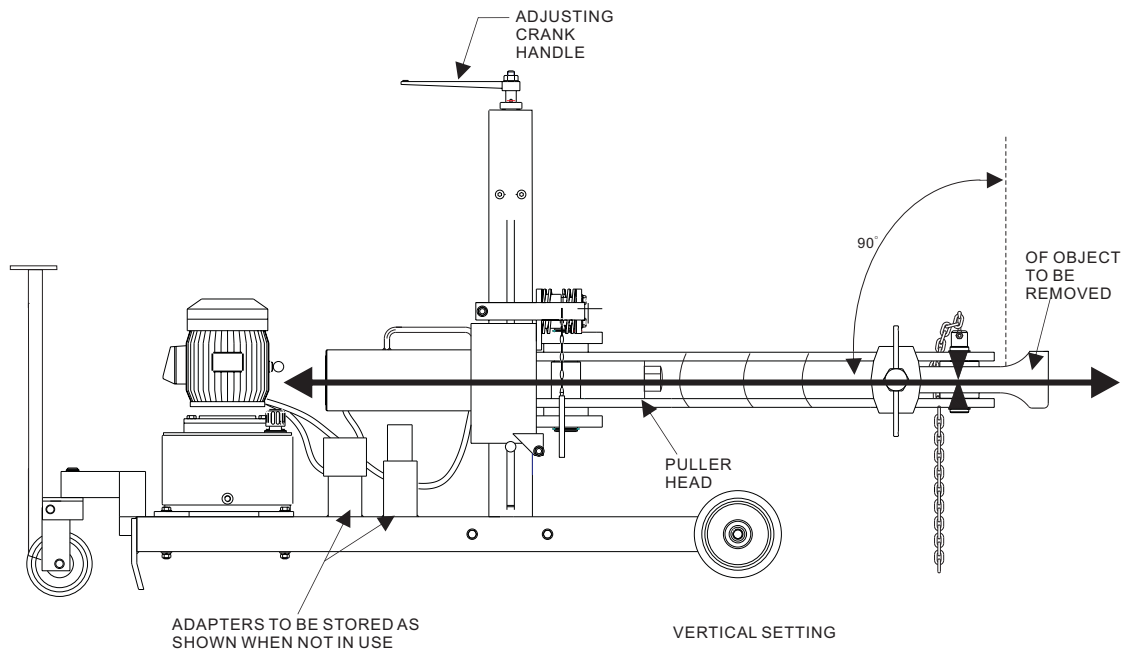


FIGURE 2

## HORIZONTAL SET-UP: See Figure 3

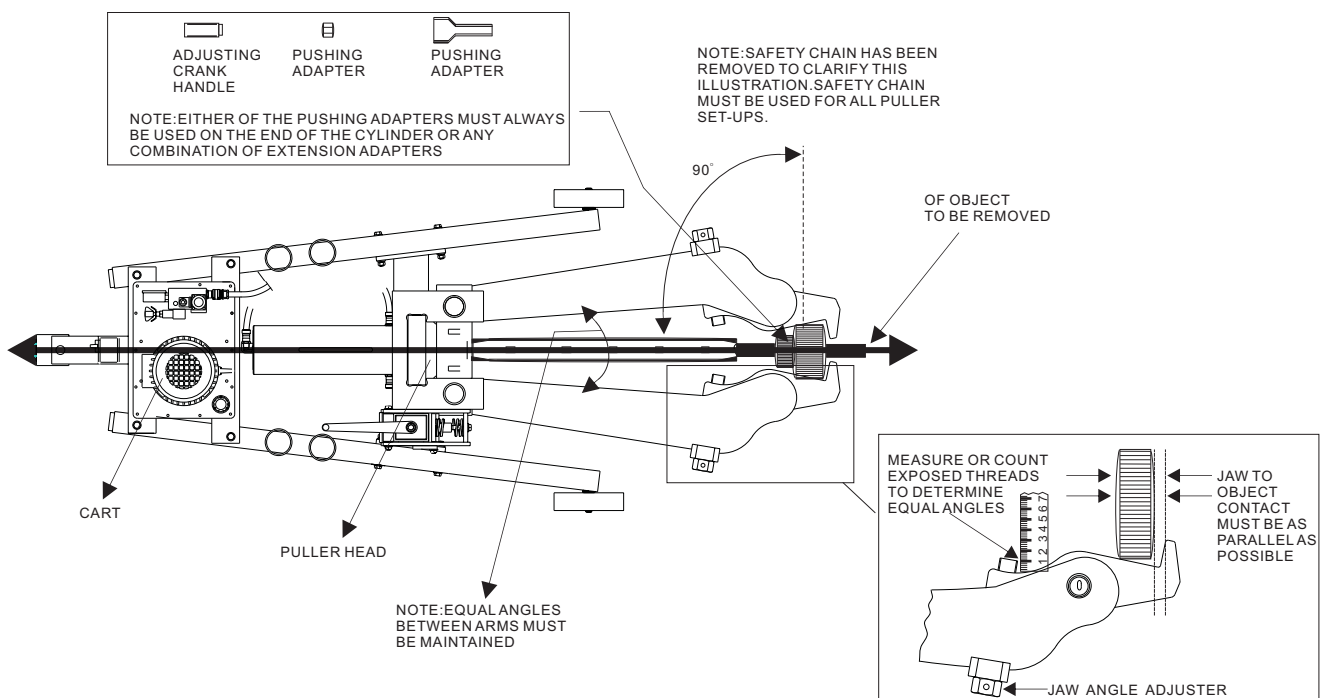
1. Adjust the horizontal by positioning the puller cart as shown in Figure 3. The centerline of the object being removed must be at a  $90^\circ$  angle to the flat surface of the jaw and on the same centerline as the puller cart and the puller head.

## JAW and ARM ADJUSTMENT: See Figure 3 Insert

**WARNING:** To help prevent personal injury, do NOT apply hydraulic pressure to the object being pulled until the angles of the jaw are set equally.

1. Move the puller arms inward to a minimum width of  $15^\circ$  or outward to a maximum width of  $48^\circ$ . In all adjustments with the arms, maintain equal angles between the arms as shown in the Figure 3 insert. Note: If the jaw contact area is flat and even on the object being pulled, an equal amount of threads visible on each screw shaft would indicate an equal angle between both arms.

2. The puller jaw must also be aligned to establish maximum jaw contact that is as parallel as possible whenever the setting of the arms is changed.



## EXTENSION ADAPTERS: See Figure 4

Extension adapters serve as spacers between the cylinder and the shaft of the object to be pulled.

Note: Use a pushing adapter on the end of the cylinder or on the end of any combination of extension adapters. When using extension adapters, there may be sagging away from the centerline as adapters are fitting together.

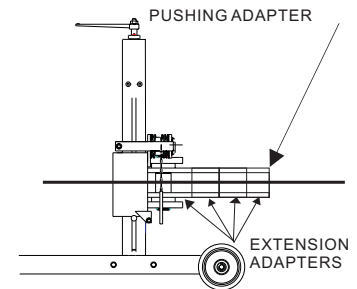


FIGURE 4

To correct the alignment, use the following procedure:

1. Before applying hydraulic pressure to an object, lift the pushing adapter to position it on the common centerline of the object being pulled and the puller head.
2. Lightly apply hydraulic pressure to hold the pushing adapter in position. Check the alignment. All adapters must be in a straight line at 90° angle to the object being pulled.
3. When not in use, store extension adapters on the puller cart as shown in Figure 1

## SAFETY CHAIN: See Figure 5

1. Use the safety chain at all times with this puller. The puller arms must be hooked and checked before hydraulic pressure is applied to the object being pulled.

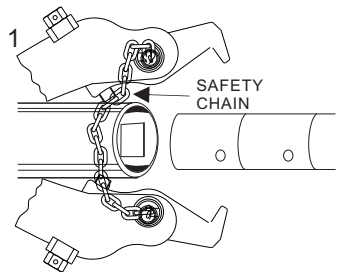


FIGURE 5

## LIFTING INSTRUCTIONS: See Figure 6

**▲WARNING:** To help prevent personal injury, the following steps must be performed if it is necessary to lift the entire 100 ton puller assembly. The cotterless hitch pin prevents the entire puller head and jaws assembly from coming off the tube upright.

1. Lower the puller head and jaw assembly until it is resting on the base.
2. Insert the cotterless hitch pin into the hole located on the tube upright above the lowered head and jaw assembly.
3. Hook the crane to the lifting hook located near the head of the puller jaw assembly.

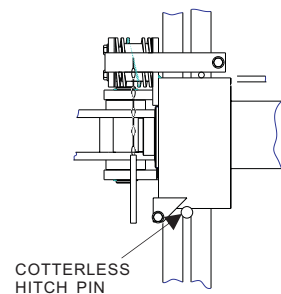


FIGURE 6

## GENERAL MAINTENANCE

1. Regularly grease the acme screw, wheel zerks, all pivoting pins and the side of the upright tube.
2. Regularly check the jaw pins for signs of excessive wear.
3. Regularly check the tightness of all nuts and bolts.



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## 车载式液压拉马操作保养手册

本操作手册是整套机器的一部分，并且在完成每一步操作之前都要仔细地阅读。它必须留作将来参考，直到机器报废为止。

此说明书为专业使用者设计，它反映了在此机器商业化的今天它的技术水平，不能认为仅仅因为在新经验基础上它就会落后于时代。

任何在此书上未提到的疑问或使用方法，请在安装和使用之前询问供应商。

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安装错误；

用油错误；

不进行保养维护；

未经生产商授权的改装或者拆卸；


使用非原装部件，或者型号不适用。


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### 一 收货须知（开箱检查）

检查包装和所有收到货物，以确定在运输过程中的可能造成的损坏；在这种情况下对运输商提出异议。

#### 安全提示：


 这是危险标记。每当你看到此标记，就意味着对人、动物、和物品可能存在或多或少的危险。在此册中这种危险和相关的预防措施都用此标记标出。


 危险：忽略此警告可能会对人，动物或物品的安全存在重大危险。

 警告：忽略此警告可能会对人，动物或物品的安全存在重大危险。

敬请使用者仔细遵守这些措施，生产商拒绝对任何由使用不当引起的损坏和伤害承担任何责任。

液压拉马是一种动力工具，使用前应仔细阅读所有的说明、警告和注意事项，遵守安全措施以避免在操作设备时发生人身或设备的损伤！WREN对因为不安全操作及错误操作导致的损坏不负责任。

 **警告** 为避免人身伤害及可能的设备损坏，要确保每一个液压元件能够承受700BAR的压力。

 **警告** 不要超过设备的额定负荷！

尽量减少超载的危险；大行程使用时不要超过油缸额定压力的2/3。

在系统中使用压力表显示操作负载。压力表是系统内发生情况的窗口。

 **警告**  
尽快用WREN原厂零件替换破旧的零件！



### ▲ 注意

确保各元件避免受到过热、火焰、机器扎压、利刃和化学腐蚀等伤害。

### ▲ 注意

避免损坏液压油管！

使用中应该避免液压油管严重弯曲或缠绕。使用弯曲或缠绕的油管将产生过大的背压，严重弯曲和缠绕使油管内部损坏，从而过早报废。不要将重物掉到或压在油管上。严重冲击可引起油管内部金属线损坏，加压时被损伤的油管可能破裂。

### ▲ 警告

为避免损坏设备及人身伤害，不得去掉拉马上的保护装置，不得随意拆卸拉马附件，不得任意调节安全阀。

### ▲ 注意

尽量保持拉马顶杆与工件的同轴度，以保持系统的稳定性。

### ▲ 警告

拉马工作过程中，为防止伤害事故，严禁在拉马两面站人。

## 二 产品描述

WREN LA25100 ( LA2560 ) 液压拉马采用超高强度合金材料制造，为线开关控制，双作用液压设计，可以拆卸大型轴、孔类工件，轮式小车方便移动，可随时更换工作场所。

注意:在设计、结构及应用上不得有任何未经授权的改动。

## 三 操作使用

—参看图(-)，将拉马小车移至待处理工件合适位置处，抬起小车使小车挂轮离地，固定支脚着地，固定小车位置。

★只需将小车把手压下使挂轮着地，小车即可移动。

—转动升降摇柄，调整拉马的中心高度，尽可能使拉马油缸的中心线与工件的轴心线一致。

—推动拉爪，使其抱住工件外边；转动调节手柄，使拉爪爪面与工件紧密贴合；用固定链条、挂钩固定拉爪。

—根据工作的位置，在拉马油缸的顶头上放置适当长度的补偿顶杆。

注意：拉马工作时必需使用压头，以保护拉马其它零部件不受损坏！

—接通电源，电源指示灯亮，按前进或后退按钮，检查电机是否转动，泵站是否工作。

—按前进按钮，这时油泵工作，推动拉马油缸前进，工作上压力逐渐加大。直至把被拆工件分离开来；然后按下后退按钮，拉马油缸逐渐退回原位。注意不要同时按下前进和后退按钮。

★工作的前进过程中将前进按钮松开，此时拉马油缸处于维持压力状态，如重新按下前进按钮，油缸继续加压工作。

注意：

—吊装拉马时必须使用提升吊耳，不得受力于其它部件上，吊装时应先将插销插入图中所示立柱上的孔中，再将两拉爪用固定链条锁住，以防止意外的人员或设备损害。

—尽量不要将拉马顶头推进到最大位置，这时会引起油压升至最高压力，可能会引起液压油泄漏。

### 三 日常维护

每天：检查液压油油量，当不足时及时添加。

每月：检查连接管有否损坏，系统液压油有否渗漏。

#### 液压油

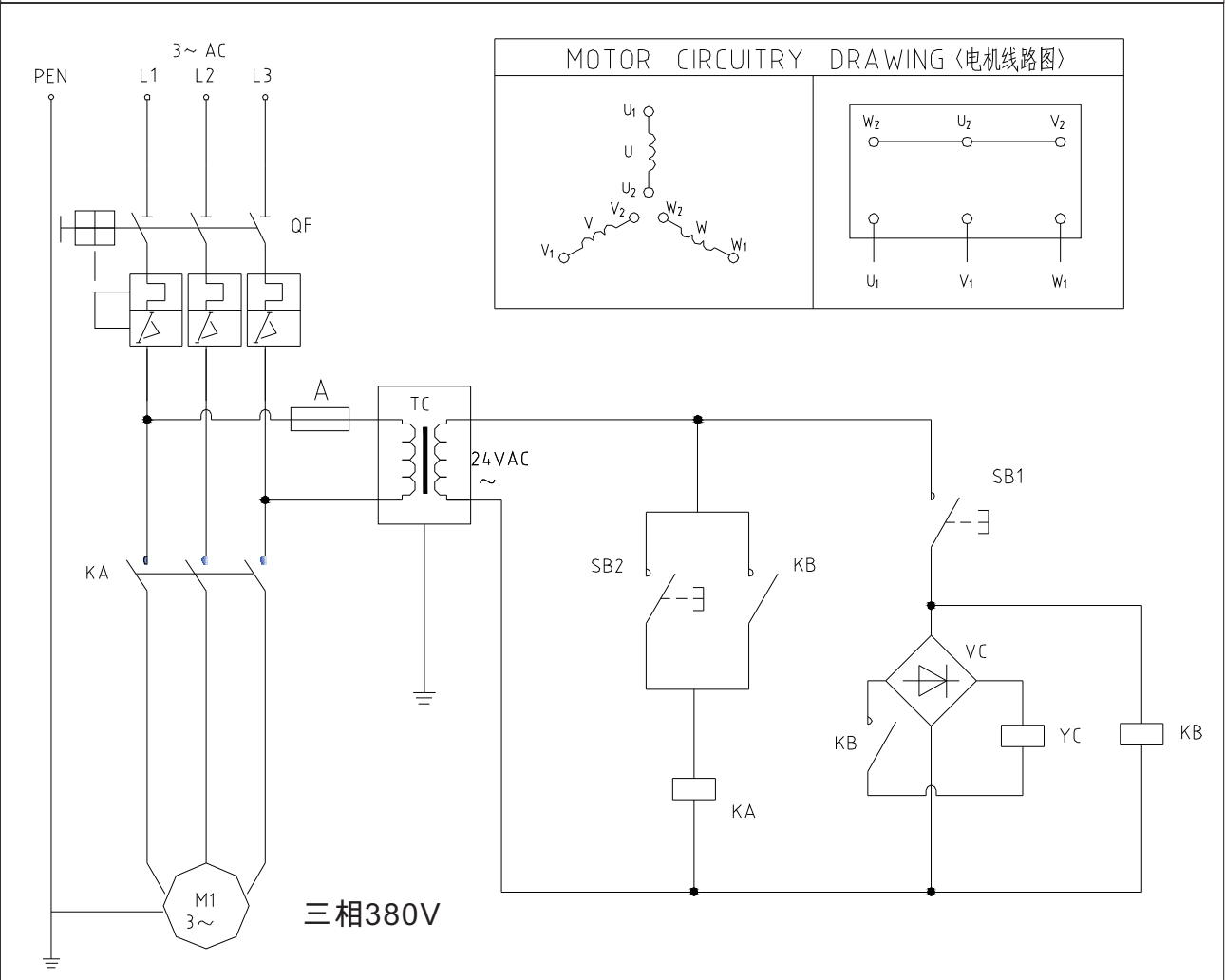
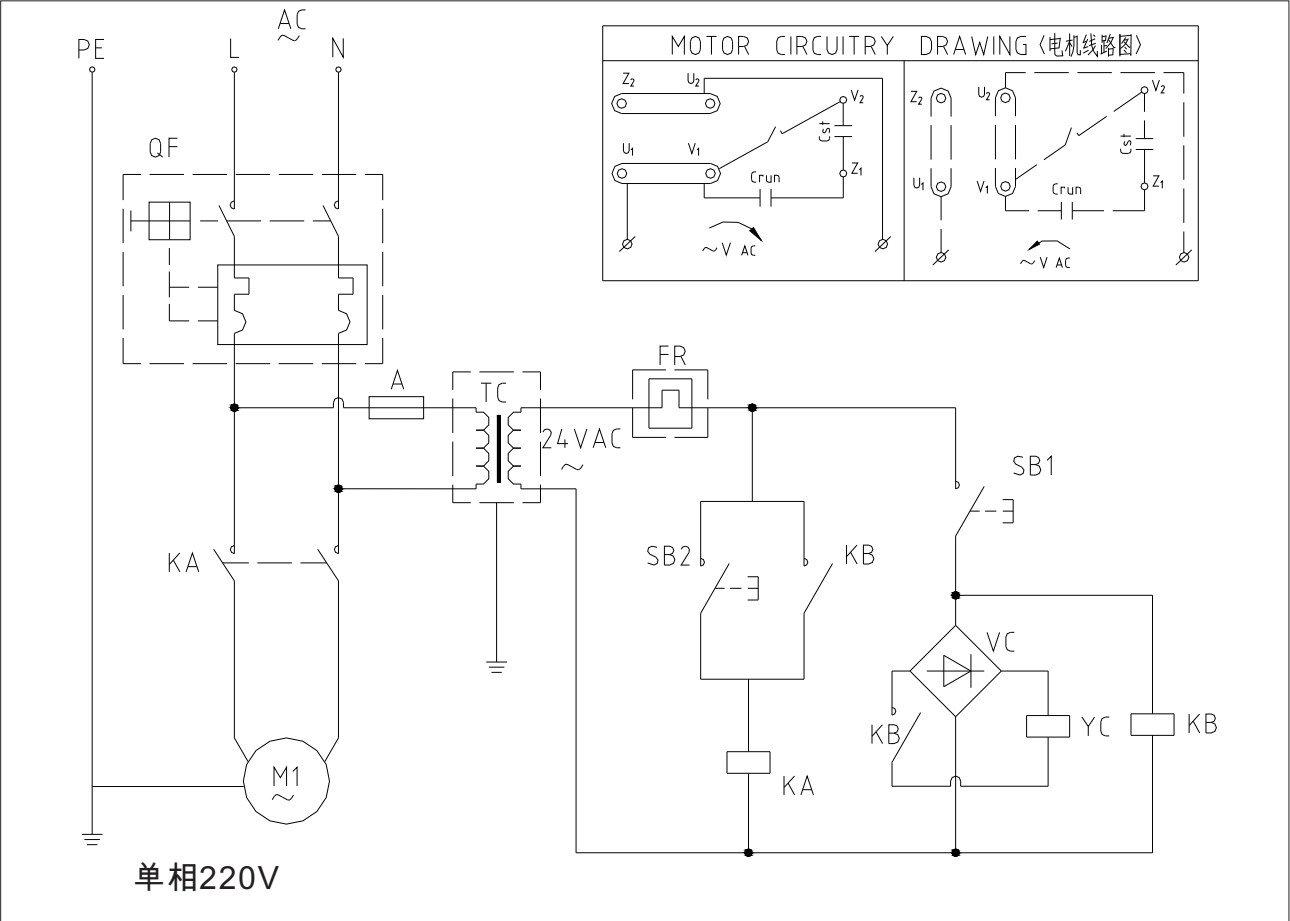
液压油在系统工作中起三个作用，1、传递能量 2、润滑 3、冷却 因此液压油的选择相当重要。液压油在产品出厂时已经注满。由于使用一段时间后会损失部分液压油或液压油受污损需要及时补充或更换新油。选用液压油应符合GB7631.2-87标准。当环境温度较底时采用L-HM32号抗磨液压油，当环境温度一般时可采用L-HM46号抗磨液压油，当环境温度较高时可采用L-HM68号液压油。

出厂时所加液压油为：GB7631.2-87 L-HM46。

### 四 液压拉马主要零部件表

编 号	名 称	型 号
1	拉马主油缸	LA-01
2	拉爪	LA-02
3	拉爪连接板	LA-03
4	拉爪护板	LA-04
5	拉马座	LA-05
6	拉马头	LA-06
7	夹紧油缸	LA-07
8	拉马抱箍/支座	LA-08
9	油泵	LA-09
10	电器箱	LA-010
11	压力表	LA-011
12	液压控制阀块组	LA-012

五 原理图





## 六 故障及排除

故障现象	原因	排除方法
电机不工作	电源未接好， 电源开关未合上或故障	检查电源及开关
漏油	接头未拧紧；密封环损坏；用于密封的螺钉预紧力不够；活塞杆表面拉伤其槽；擅自调高压力造成元件损坏、液压油泄漏。	拧紧接头、螺钉，拆修更换密封件。调整溢流阀至设定值。
液压油过热	<p>①长时连续超载工作。</p> <p>②顶杆与工作严重不同轴引起活塞偏载与缸体、缸盖剧烈摩擦产生热量。</p> <p>③液压油污染造成阀件阻塞、密封圈磨损，使液阻增大、内漏增大。</p> <p>④液压泵、马达运动副磨损，内漏大，效率</p>	<p>适当间歇作业。</p> <p>拉马与工件尽可能同轴，如已引起缸体磨损，要及时修复或更换。</p> <p>检查油路是否通畅或进行拆修。</p> <p>拆修。</p>
振动和噪声过大	<p>底。</p> <p>①电动机底座、油泵固定螺栓松动；联轴节松动。</p> <p>②液压泵损坏，轴承磨损或破裂。</p> <p>③油位过低，油液污染。</p> <p>④溢流阀噪声为油路系统含有空气。</p>	<p>拧紧螺钉。</p> <p>拆修。</p> <p>加油或更新新油。</p> <p>检查液位，排出管路中空气。</p>

▲ 注意： 如不能排除故障或其它问题，请与WREN工程师联系！



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