

# Hydraulic Cylinders

## Operation and Maintenance Manual



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## OPERATION AND MAINTENANCE MANUAL FOR HYDRAULIC CYLINDERS

It is operating manual of hydraulic cylinders, please read carefully follow instructions, warnings and cautions before using these tools.

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### 1. IMPORTANT RECEIVING INSTRUCTION

Carefully inspect all components for shipping damage. If any shipping damage is found, please notify carrier at once. Shipping damage is NOT covered by warranty. The carrier is responsible for all repair or replacement cost resulting from damage in shipment.

### 2. SAFETY INFORMATION

Please read carefully follow instructions, warnings and cautions. Please observe the safety precautions so that it can avoid personal and equipment to injury when you operate the equipment. WREN is not responsible for any damage resulting from the operation of irregularity.



#### **WARNING**

#### **MAKE SURE THAT THE CYLINDER WILL NOT HOLD PRESSURE FOR A LONG TIME**

A cylinder, when used as a lifting device, should never be used as a holding device. After the pressure has been raised, it should be blocked.



#### **WARNING**

#### **DO NOT EXCEED EQUIPMENT RATINGS**

Never attempt to lift a load weighing more than the capacity of the cylinder. Overloading causes equipment failure and possible personal injury. These cylinders are designed for a maximum pressure of  $700\text{Kg/cm}^2$  (10000psi). DO not connect these cylinders to a pump with a higher pressure rating.



#### **WARNING**

#### **MAKE SURE SETUP IS STABLE BEFORE LIFTING**

The cylinder should be placed on a flat surface that can support the load. Where applies, use a cylinder base for added stability.



Do not weld or otherwise modify the cylinder to attach a base or other support. Avoid situations where load is not directly centered on the

cylinder plunger. Off-center loads produce considerable strain on cylinders and plungers. In addition, the load may slip or fall, causing potentially serious results.



**WARNING**

**USE ONLY RIGID PIECES TO HOLD LOADS**

Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.



**WARNING**

**ONLY USE HYDRAULIC CYLINDER IN A COUPLED SYSTEM**

Never use a cylinder with unconnected couplers. If the cylinder becomes extremely overloaded, the coupler check ball and/or hydraulic oil may shoot out of the cylinder causing severe personal injury.

**CAUTION**

**AVOID DAMAGING HYDRAULIC HOSE**



Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Also sharp bends and kinks will internally damage the hose leading to premature 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 use the hydraulic hose to carry a hydraulic component (PUMPS, CYLINDERS, VALVES)

**CAUTION**



**KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT**

Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 150° F (65° C) or higher. Protect hoses and cylinders from weld spatter.



**WARNING**

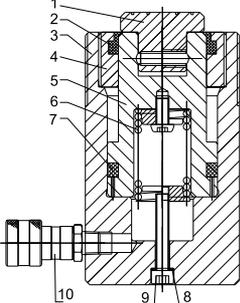
**DO NOT HANDLE PRESSURIZED HOSES.**

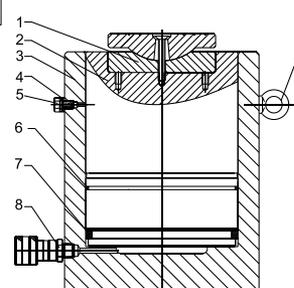
Escaping oil under pressure can penetrate the skin, causing serious injury, if oil is injected under the skin, see a doctor immediately.

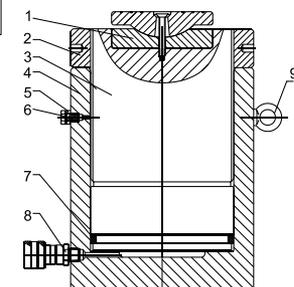
**3. DRAWING**

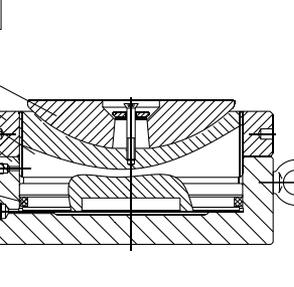
	▲ 9	Quick Coupling	1	C-9021
	8	Screw	1	RSM(RCS)_08
	7	Copper Gasket	1	RSM(RCS)_07
	6	Seal	1	RSM(RCS)_06
	5	Spring Component	1	RSM(RCS)_05
	4	Piston Rod	1	RSM(RCS)_04
	3	Cylinder	1	RSM(RCS)_03
	2	Compressed Nut	1	RSM(RCS)_02
	1	Seal Ring	1	RSM(RCS)_01
	<b>ITEM</b>	<b>NAME</b>	<b>QTY</b>	<b>PART NO</b>

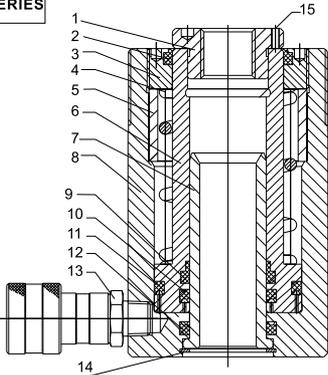
▲ RSM50 Quick coupling C9011

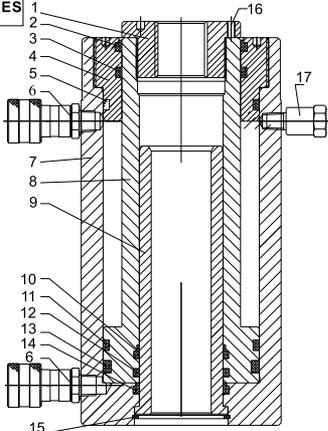
RC SERIES					
					
		10	Quick Coupling	1	C-9021
		9	Screw	1	RC_09
		8	Copper Gasket	1	RC_08
		7	Seal	1	RC_07
		6	Spring Components	1	RC_06
		5	Piston Rod	1	RC_05
		4	Compressed Nut	1	RC_04
		3	Cylinder	1	RC_03
2	Seal Ring	1	RC_02		
1	Saddle	1	RC_01		
ITEM	NAME	QTY	PART NO		

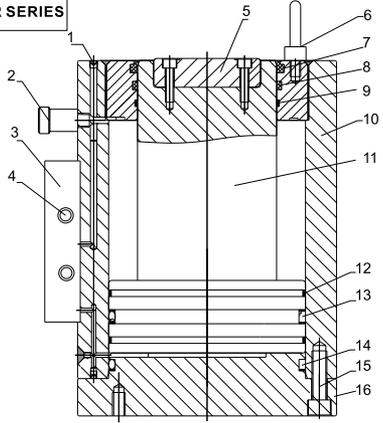
CLS SERIES					
					
		9	Hook	2	--
		8	Quick Coupling	1	C-9021
		7	Seal	1	CLS_07
		6	Wiper	1	CLS_06
		5	Relief Valve	1	CLS_05
		4	Washer of Relief Valve	1	CLS_04
		3	Cylinder	1	CLS_03
		2	Piston Rod	1	CLS_02
1	Saddle	1	CLS_01		
ITEM	NAME	QTY	PART NO		

CLL SERIES					
					
		9	Hook	2	--
		8	Quick Coupling	1	C-9021
		7	Seal	1	CLL_07
		6	Relief Valve	1	CLL_06
		5	Washer of Relief Valve	1	CLL_05
		4	Cylinder	1	CLL_04
		3	Piston Rod	1	CLL_03
		2	Lock Nut	1	CLL_02
1	Saddle	1	CLL_01		
ITEM	NAME	QTY	PART NO		

CLP SERIES					
					
		9	Hook	2	--
		8	Quick Coupling	1	C-9021
		7	Seal	1	CLP_07
		6	Relief Valve	1	CLP_06
		5	Washer of Relief Valve	1	CLP_05
		4	Cylinder	1	CLP_04
		3	Piston Rod	1	CLP_03
		2	Lock Nut	1	CLP_02
1	Saddle	1	CLP_01		
ITEM	NAME	QTY	PART NO		

RCH SERIES			
	15	Screw	1 RCH_14
	14	Backup Ring	1 RCH_13
	13	Quick Coupling	1 C-9021
	12	Seal	1 RCH_12
	11	Seal	1 RCH_11
	10	Seal	1 RCH_10
	9	Seal Ring	1 RCH_09
	8	Cylinder	1 RCH_08
	7	Seal	1 RCH_07
	6	Piston Rod	1 RCH_06
	5	Backup Ring	1 RCH_05
	4	Compressed Spring	1 RCH_04
	3	Compressed Nut	1 RCH_03
	2	Seal	1 RCH_02
	1	Saddle	1 RCH_01
ITEM	NAME	QTY	PART NO

RRH SERIES			
	17	Relief Valve	1 RRH_16
	16	Screw	1 RRH_15
	15	Backup Ring	1 RRH_14
	14	Seal	1 RRH_13
	13	Seal	1 RRH_12
	12	Seal	1 RRH_11
	11	Seal	1 RRH_10
	10	Seal	1 RRH_09
	9	Seal	1 RRH_08
	8	Backup Ring	1 RRH_07
	7	Cylinder	1 RRH_06
	6	Quick Coupling	2 C-9021
	5	Seal	1 RRH_05
	4	Compressed Nut	1 RRH_04
	3	Seal	1 RRH_03
	2	Seal	1 RRH_02
	1	Saddle	1 RRH_01
ITEM	NAME	QTY	PART NO

CLR SERIES			
	* CLR series do not have Pilot operated check valve V-42		
	16	Cylinder End	1 CLR_12
	▲15	Screw	N -
	14	Seal	1 CLR_11
	13	Seal	1 CLR_10
	12	Wearable Ring	2 CLR_09
	11	Backup Ring	1 CLR_08
	10	Cylinder	1 CLR_07
	9	Wearable Ring	1 CLR_06
	8	Seal	1 CLR_05
	7	Seal	1 CLR_04
	6	Shackle	3 -
	5	Saddle	1 CLR_03
	4	Quick Coupling	2 C-9021
	3	Pilot Operated Check Valve	1 V-42
	2	Relief Valve	1 CLR_02
	1	Casing Cap	2 CLR_01
ITEM	NAME	QTY	PART NO

▲ Capacity of cylinder determine the quantity of screws.

## 4. INSTALLATION

### HYDRAULIC SYSTEM CONNECTION

Please use a pump with a release valve or a 3-way valve and one hose for single-acting cylinders. Please use a pump with a release valve or a 4-way valve and two hoses for double-acting cylinders.

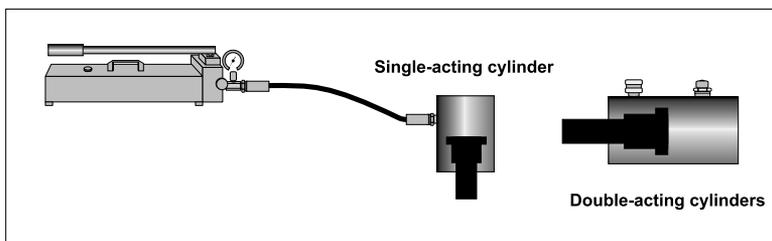
**CAUTION:** Double-acting cylinders must have both couplers connected. Make sure the couplers will be tightened fully.

**WARNING:** Loose coupler connections will block the flow of oil between the pump and the cylinder.

## 5. OPERATION

Make sure the hydraulic system will connect and install correctly.

Remove air from the cylinder as shown of below.



Single-acting cylinders: Position the cylinder so that the piston rod is pointed down and so that the cylinder is lower than the pump. The piston rod need fully extend and retract for two or three times.

Double-acting cylinders: Lay the cylinder on its side and have the couplers facing up. The piston rod need fully extend and retract for two or three times.

Operate the hydraulic pump to advance and retract the cylinder. Some single-acting cylinders are spring-return, others are load return. The speed of retraction is affected by the length of the hose and other restrictions in the line. Double-acting cylinders are powered in both directions by the pump. The cylinder stop ring is designed to take the full load. In order to reduce wear of cylinder, please do not use the full stroke as good.

## 6. MAINTENANCE

1. Use only WREN's oil with these cylinders. The use of any other oil may invalidate your warranty.
2. Use dust caps when cylinders are disconnected from the hose. Keep entire cylinder clean to prolong cylinder life.
3. Store cylinders up-right seal distortion.

## 7.TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES
Cylinder will not advance	Pump release valve open
	Coupler not fully tightened
	Oil level in pump is low
	Pump malfunctioning
	Load is too heavy for cylinder
Cylinder advances part way	Oil level in pump is low
	Coupler not fully tightened
	Cylinder plunger binding
Cylinder advances in spurts	Air in hydraulic system
	Cylinder plunger binding
Cylinder advances slower than normal	Leaking connection
	Coupler not fully tightened
	Pump malfunctioning
Cylinder advances but will not hold	Cylinder seals leaking
	Pump malfunctioning
	Leaking connecton
	Incorrect system set-up
Cylinder leaks oil	Worn or damaged seals
	Internal cylinder damage
	Loose connection
Cylinder will not retract or retracts slower than normal	Pump release valve is closed
	Coupler not fully tightened
	Pump reservoir over-filled
	Narrow hose restricting flow
	Broken or weak retraction spring
	Cylinder damaged internally
Oil leaking from external relief valve	Coupler not fully tightened
	Restriction in return line



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PAPER



# 液压缸操作保养手册

本操作手册内容为液压缸操作规程、警告和注意事项以及故障排除。使用前，请仔细阅读本手册，彻底理解其内容并妥善保管。本说明书仅作为最终用户参考。

## 一 收货须知（开箱检查）

仔细检查产品外观有无损伤，是否有运输损坏。运输损坏不包括在保修范围内。如果发现因货运受损，应及时向货运商申报。货运商应支付运输损坏带来的所有维修和更换费用。

## 二 安全提示

阅读所有说明书，警告及注意事项。操作时，遵守一切安全规程，避免发生人身伤害及财产损失。如果因为您的不安全操作，缺乏正常维护，操作或使用不当而造成的人身伤害或财产损失，WREN不负任何责任。

不遵守下列警示及防范条例，将会造成设备损坏及人身伤害。

**注意**-用来说明正确的操作、维护程序以及如何避免伤害或损害设备及其它财产。

**警告**-说明有潜在的危險，要求有正确程序和习惯以避免人身伤害。

### 警告：液压缸不适合长时间来支撑重物

液压缸的作用只是用作提升重物，不适合长时间支撑。在载荷被提升后，请塞入垫块。

### 警告：不要超过设备的额定负荷

不要试图提升超过液压缸负荷的载荷；超载将造成液压缸的损坏和个人人身伤害。

液压缸的最大设计压力为700Kg/cm<sup>2</sup>，不要把液压缸连接到更高压力等级的泵上。

### 警告：在提升载荷前应确保液压缸支撑的稳固

把液压缸放置在坚固的平板上（为了使液压缸更稳固，建议使用液压缸支座。）



**警告：严禁偏载**

应避免负荷不作用在液压缸的中心。偏载将使活塞和油缸拉伤。偏载会使负载滑落，产生严重的后果。



**警告：必须用垫铁块或木块支撑负荷**

仔细选择可用于支撑负荷力的铁块或木块，不要把液压缸当作垫块使用。



**警告：选用正确的配件**

不要使用不匹配接头的液压缸。如果液压缸超载严重，连接头中的钢珠及压力油将会射出，可能造成严重的人身伤害。



**注意：避免损坏压力油管**

使用中应避免液压油管严重弯曲和缠绕。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。



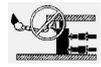
不要将重物掉在或压在油管上。严重冲击可引起油管内部金属线损坏，加压时被损伤的油管可能破裂。



不能用液压油管拖拉及吊拿其它液压部件（如：泵、液压缸、阀等）

**注意：液压元件应远离火焰和热源**

过热将使表面保护层及密封圈软化，导致液体泄漏；高温将降低油管材料和表面保护层的性能。为了保持其最优的性能，不要使设备的温度超过150° F (65° C)。在焊接时应保护油管和顶，防止焊接飞溅。

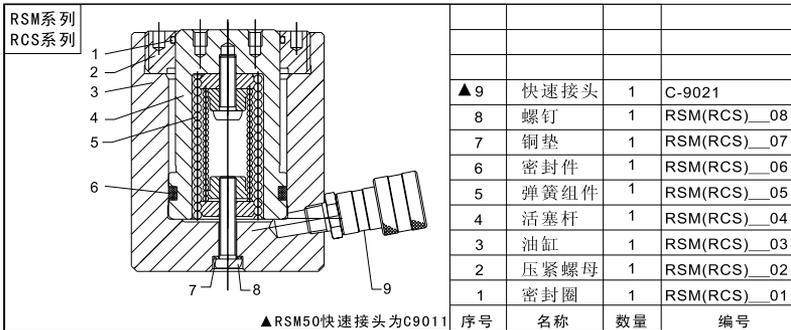


**危险：不要用手拿正打压力油管**

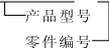
可以泄漏的高压油会穿透皮肤，并导致严重伤害；如果压力油渗入皮下，应立即到医院治疗。

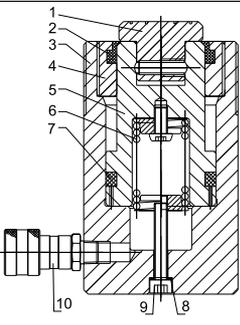
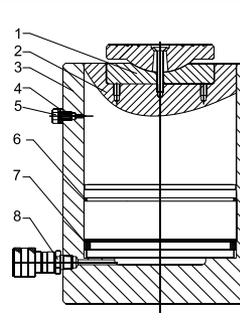
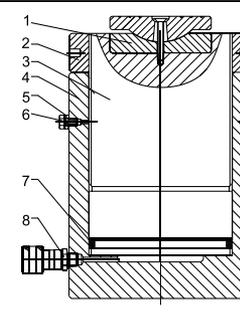
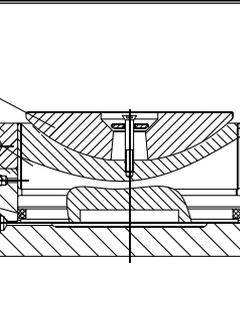


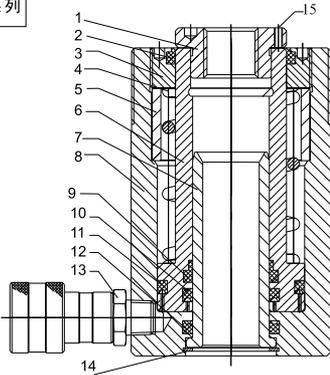
**三 示意图**

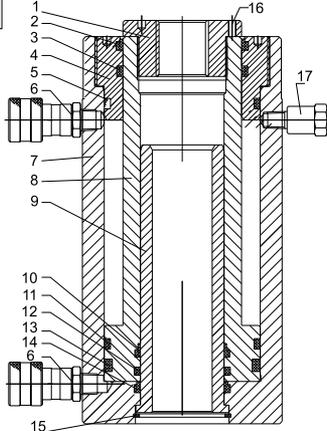


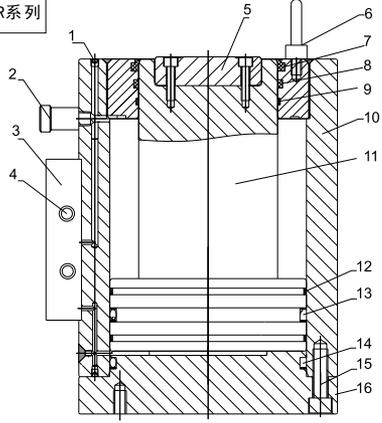
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RC系列		<table border="1"> <thead> <tr> <th>序号</th> <th>名称</th> <th>数量</th> <th>编号</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>快速接头</td> <td>1</td> <td>C-9021</td> </tr> <tr> <td>9</td> <td>螺钉</td> <td>1</td> <td>RC_09</td> </tr> <tr> <td>8</td> <td>铜垫</td> <td>1</td> <td>RC_08</td> </tr> <tr> <td>7</td> <td>密封件</td> <td>1</td> <td>RC_07</td> </tr> <tr> <td>6</td> <td>弹簧组件</td> <td>1</td> <td>RC_06</td> </tr> <tr> <td>5</td> <td>活塞杆</td> <td>1</td> <td>RC_05</td> </tr> <tr> <td>4</td> <td>压紧螺母</td> <td>1</td> <td>RC_04</td> </tr> <tr> <td>3</td> <td>油缸</td> <td>1</td> <td>RC_03</td> </tr> <tr> <td>2</td> <td>密封圈</td> <td>1</td> <td>RC_02</td> </tr> <tr> <td>1</td> <td>压头</td> <td>1</td> <td>RC_01</td> </tr> <tr> <th>序号</th> <th>名称</th> <th>数量</th> <th>编号</th> </tr> </tbody> </table>	序号	名称	数量	编号	10	快速接头	1	C-9021	9	螺钉	1	RC_09	8	铜垫	1	RC_08	7	密封件	1	RC_07	6	弹簧组件	1	RC_06	5	活塞杆	1	RC_05	4	压紧螺母	1	RC_04	3	油缸	1	RC_03	2	密封圈	1	RC_02	1	压头	1	RC_01	序号	名称	数量	编号
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RCH系列				
	15	螺钉	1	RCH_14
	14	挡圈	1	RCH_13
	13	快速接头	1	C-9021
	12	密封件3	1	RCH_12
	11	密封件2	1	RCH_11
	10	密封件1	1	RCH_10
	9	密封圈2	1	RCH_09
	8	缸体	1	RCH_08
	7	密封套	1	RCH_07
	6	活塞杆	1	RCH_06
	5	定位挡圈	1	RCH_05
	4	压簧	1	RCH_04
	3	压紧螺母	1	RCH_03
	2	密封圈	1	RCH_02
	1	压头	1	RCH_01
序号	名称	数量	编号	

RRH系列				
	17	超压阀	1	RRH_16
	16	螺钉	1	RRH_15
	15	挡圈	1	RRH_14
	14	密封件8	1	RRH_13
	13	密封件7	1	RRH_12
	12	密封件6	1	RRH_11
	11	密封件5	1	RRH_10
	10	密封件4	1	RRH_09
	9	密封套	1	RRH_08
	8	活塞杆	1	RRH_07
	7	缸体	1	RRH_06
	6	快速接头	2	C-9021
	5	密封件3	1	RRH_05
	4	压紧螺母	1	RRH_04
	3	密封件2	1	RRH_03
	2	密封件1	1	RRH_02
	1	压头	1	RRH_01
序号	名称	数量	编号	

CLR系列				
* 缺少V-42液控单向阀为CLR6型				
	16	缸底	1	CLR_12
	▲15	螺钉	N	-
	14	密封件	1	CLR_11
	13	密封件	1	CLR_10
	12	耐磨环	2	CLR_09
	11	活塞	1	CLR_08
	10	油缸	1	CLR_07
	9	耐磨环	1	CLR_06
	8	密封件	1	CLR_05
	7	密封件	1	CLR_04
	6	吊环螺钉	3	-
	5	压头	1	CLR_03
	4	快速接头	2	C-9021
	3	单向阀	1	V-42
	2	超压阀	1	CLR_02
	1	堵头	2	CLR_01
序号	名称	数量	编号	

▲螺钉根据千斤顶吨位不同，数量不等

## 四 安装

### 泵的管路连接

软管旋入泵的外接头，使用特氟龙带（或其它螺纹密封材料）在软管接头上缠绕至少4圈以上。螺纹的第一圈不要被密封带覆盖，以避免密封带脱落进入液压系统产生危害。挑去松散的密封带。

为安全和更好的控制系统，需要在泵的液压管路中安装压力表。

液压系统连接：用一个带有释放阀或三通阀的泵和一根油管连接单作用液压缸上。

用一个带有四通阀的泵和二根油管连接至双作用液压缸上。

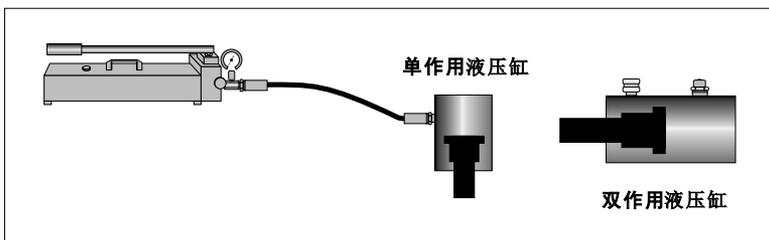
双作用液压缸必须两个接头都接好。

用手完全拧紧接头。如果接头不拧紧，将阻塞泵和液压缸之间的油路。

## 五 操作

检查系统的安装和连接是否紧固、无泄漏。

按图示除去液压缸中的空气：



单作用液压缸：将液压缸倒置，底部朝上活塞杆朝下，并且使之底于油泵的位置，油泵供油，使之活塞杆完全伸出和收缩2-3次。

双作用液压缸：将液压缸平放地上，接头朝上，油泵供油，使之活塞杆完全伸出和收缩2-3次。

启动液压泵操作液压缸升起和降下。分部单作用液压缸为弹簧回复，有些为加载回退；回退的速度受油管的长度影响和其它一些因素限制；双作用液压缸双向都有由油泵驱动。液压缸的停止环是为满负荷设计的。为减少液压缸的磨损，在通常情况下，应尽量不要满行程使用。

## 六 维护

- 1、一定要使用WREN指定的液压油，其它牌号的液压油可能损坏液压缸及泵的密封。
- 2、保持整个液压缸的干净可延长液压缸的寿命。
- 3、为避免密封件的损坏，存放液压缸时应立式向上。

## 七 故障与排除

引起的故障	可能引起故障的原因	解决方法
液压缸不前进，前进较慢或突然停止前进	1、泵的油太少	1、请加液压油
	2、卸荷阀未关紧	2、关闭卸荷阀
	3、快速接头松动	3、检查并拧紧所有接头
	4、负载超重	4、请不要超载
	5、系统中有空气	5、按照前图排除油中空气
	6、液压缸活塞卡死	6、检查液压缸损坏情况， 请专业人员来修理
液压缸无法顶升重物	1、连接处有泄漏	1、检查所有的连接处是否牢固无泄漏
	2、密封处泄漏	2、确定泄漏位置，请专业人员来维修
	3、液压缸内部泄漏	3、请专业人员来维修
	4、负载超重	4、请不要超载
液压缸不能回缩、部分回缩或回缩慢于正常速度	1、卸荷阀未打开	1、打开卸荷阀
	2、快速接头松动	2、检查并且拧紧快速接头
	3、泵中的油太少	3、请加油
	4、系统中有空气	4、按照前图排除油中空气
	5、软管内径太小	5、使用内径较大的液压软管
	6、液压缸回程弹簧断裂或其他油缸损坏	6、请专业人员维修



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