



INSTRUCTION SHEET FOR HYDRAULIC CYLINDERS

Repair Parts Sheets for hydraulic cylinders are available from your nearest authorized BELIUM Service Center or BELIUM Sales office.

NOTE

PLEASE READ AND FOLLOW THIS INSTRUCTION BEFORE YOU USE BELIUM CYLINDERS.

Carefully inspect all components for shipping damage, if shipping damage is found. Please notify carrier at once. The carrier, not the BELIUM, is responsible for any damage resulting from shipment.



1. SAFETY



To avoid personal injury or property damage, please follow all safety precautions. BELIUM cannot be responsible for injury or damage resulting from unsafe and incorrect products use or system operation, or lack of maintenance.

DANGER is only used when your action or lack of action may cause serious injury or even death.

WARNING indicates a potential danger that requires correct action to avoid personal injury.

IMPORTANT indicates correct action to prevent damage or equipment failure.



DANGER

- The hydraulic equipment operator must be a qualified operator familiar with correct training and work experience of hydraulic equipment. Lack of knowledge in any of these areas can lead to equipment damage or personal injury.
- Please carefully inspect cylinder(s), coupler(s) and hose(s) before use hydraulic equipment, if you find any damage on the cylinder(s), coupler(s), and hose(s), please stop using your equipment and contact with your nearest Authorized BELIUM Service Center or Sales office. These damages may cause equipment failure and possible personal injury.
- To avoid personal injury, please do not modify or weld hydraulic equipment without approved by BELIUM.
- Please never lift a load more than the capacity of the cylinder(s), overloading will cause equipment failure and possible personal injury.
- The operating pressure of cylinder(s) are designed for a max pressure of 700 bar (10,000 psi), please do not use a pump or relief valve with a higher pressure rating to connect the cylinder(s). Higher pressure pump or relief valve may cause equipment failure and possible personal injury.
- Cylinder is a load lifting device, not a load holding device. After the load has been raised or lowered, it must always be held mechanically, please never work under a load supported by

hydraulic.

- To avoid personal injury, please keep hands and feet away from cylinder(s) and workplace during operation.
- Please do not put poor-balanced or off-center loads on cylinder(s). The incorrect load can result in equipment failure and possible personal injury.



WARNING

- Please wear safety glasses, safety cap and other necessary personal protective equipment when operating hydraulic equipment.
- Use cylinder to lift load should have solid lifting surface for correct support. Please select steel or wood blocks that are capable of supporting the load.
- Please install pressure gauge in the system to monitor the operating pressure. The gauge must have same pressure rating as the pump and cylinder(s) in the system. The wrong gauge may cause equipment failure and possible personal injury.
- Please carefully inspect the cylinder(s) and coupler(s) before use cylinder(s) or shift coupler(s). Never connect the cylinder(s) with damaged coupler(s) or damaged port threads. The damaged coupler(s) or damaged port thread(s) may cause equipment failure and possible personal injury.
- To prevent dust or other small waste into cylinder body or tube, please shift coupler(s) in a clean place. Dust or other small waste will damage the cylinder and result in equipment failure and possible personal injury.
- Cylinder must be placed on a flat base, please use BELIUM cylinder base for added stability.
- Before removing or tightening hose(s) or coupler(s), please release hydraulic pressure in system.
- For hydraulic technical helps or repair service. Please contact the authorized BELIUM Service Center in your area. BELIUM is not responsible for any injury and property damage. If you repair your equipment in other hydraulic service centers which dose not authorized by BELIUM.
- Hydraulic cylinders must use special hydraulic oil, please use BELIUM oil or other approved hydraulic oil.

IMPORTANT

- Please keep the cylinder clean all the time.
- When the cylinder is not in use, please keep the piston rod fully retracts, remove hose and use rubber cap(s) to recover the coupler. If you use collar threads, please use the thread protector to recover it.
- Please do not drop heavy duty on hose.
- Please do not lift and carry hydraulic cylinders by the hose(s) or coupler(s), use the handle or other safe way.
- Please use hydraulic equipment in normal temperature, do not use equipment in temperatures of 65 °C (150°F) or higher. Overheating will soften seals and weakens hose materials, resulting in oil leaking or other equipment failure.
- Before load, Please fix a saddle into piston rod, saddle will protect the piston rod.

2. OPERATION

Before use cylinder, please visually check all units, to make sure there are no damage on cylinder(s), port threads, coupler(s) and hose(s). No oil leaking and shortage of parts. If you find any problem please stop using your equipment and contact with your nearest authorized BELIUM Service Center or Sales office.

2.1 Connection

● Single Acting Cylinders

Use a pump with a release valve or a 3-way valve and one hose to connect with Single Acting Cylinder (Figure 1). After connected all parts, please fully hand-tighten all couplers. If not, oil will be leaked when you operate the equipment.

● Double Acting Cylinders

Use a pump with a 4-way valve and two hoses to connect with Double Acting Cylinder. After connected all parts, please fully hand-tighten all couplers. If not, oil will be leaked when you operate the equipment.

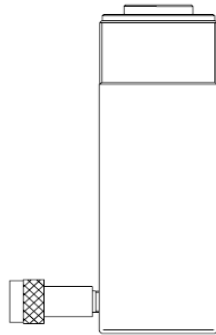


Figure 1

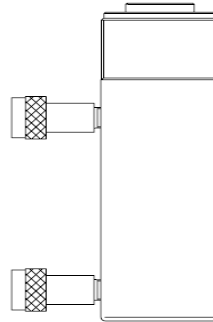


Figure 2

2.2 Bleeding Air from the cylinder

Air may accumulate within a cylinder during shipment or after prolonged use; this air can cause the piston rod to respond “dithering.” Please use the steps below to bleed the air from cylinder.

● Single-acting cylinders:

Position the cylinder as figure 3 shows, the piston rod is extended down and the cylinder lower than the pump. Fully extend and retract the cylinder 1 or 2 times. It may be necessary to repeat the above steps several times.

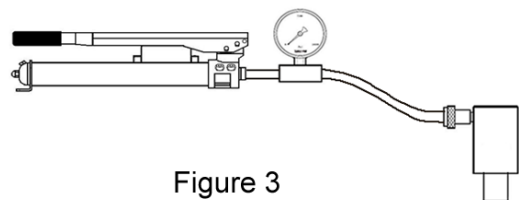


Figure 3

● Double-acting cylinders:

Lay the cylinder as figure 4 shows, to make sure the couplers facing up. Fully extend and retract the cylinder 1 or 2 times. It may be necessary to

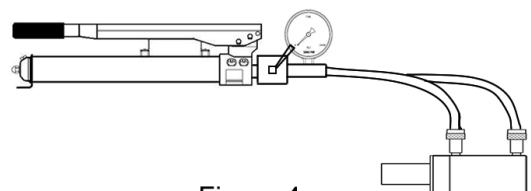



Figure 4

repeat the above steps several times.

2.3 Operation

- After finish the above steps, operate hydraulic pump to advance and retract the cylinder.
- Single acting cylinders use both spring-return and load return.
- Double-acting cylinders use hydraulic return.
- Do not allow piston rod to rotate when installing adaptors or during the work. Rotating piston rod may damage the return spring.
- To reduce the wear, please use less than full stroke and full capacity when possible.
- After finish the work, please fully return the piston rod, remove hose and use rubber cap(s) to recover the coupler. If you use collar threads, please use the thread protector to recover it.

3. HOISTING CYLINDER

 **WARNING:** To avoid equipment failure and possible personal injury, please always use all of the eye bolts when hoisting cylinder, Lifting straps must be at a 45 degree or greater angle ($\geq 45^\circ$) from horizontal (See Figure 5).

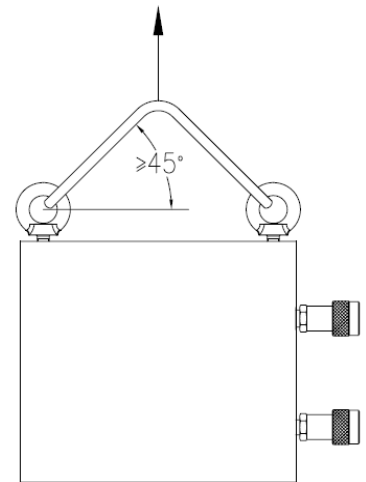


Figure 5

4. MAINTENANCE

- 4.1 Please always use clean BELIUM oil or other approved hydraulic oil with these cylinders. Use other unapproved oil or dirty oil will damage the cylinders.
- 4.2 Always keep cylinder clean, use thread proctor and dust cap to protect collar thread and couplers.
- 4.3 After finish work, Cylinder must be fully retracted, cleaned and stored in ventilation, moist-proof, corrosion-proof place.

5. TROUBLE-SHOOTING



WARNING: BELIUM Cylinders should be repaired only by a qualified operator or authorized BELIUM Service Centers. Repair cylinders without special tools and knowledge may result in personal injury. Please release pressure and disconnect hose(s) before making repair.

Problem	Cause	Solution
Cylinder will not extend or fully extend	<ol style="list-style-type: none"> 1. Pump release valve open 2. Couplers not fully tightened 3. Oil level in pump reservoir is low 4. Pump or valve malfunctioning 5. Overload for cylinder 6. Cylinder piston rod binding 	<ol style="list-style-type: none"> 1. Fully tighten pump release valve 2. Fully tighten couplers 3. Fill oil in pump 4. Repair or use another pump and valve 5. Change another cylinder with appropriate capacity 6. Check for dirt or leaks, change the damage parts
Cylinder can not maintain pressure	<ol style="list-style-type: none"> 1. Leaky connection 2. Cylinder seals leaking 3. Release valve not fully closed 4. Pump or valve malfunctioning 	<ol style="list-style-type: none"> 1. Clean and reseal thread, tighten connection 2. Replace worn seals. Clean inside cylinder and use clean hydraulic oil 3. Fully tightening the release valve 3. Repair, or use another pump and valve
Cylinder extends slower than normal	<ol style="list-style-type: none"> 1. Leaky connection 2. Coupler not fully tightened 3. Pump malfunctioning 	<ol style="list-style-type: none"> 1. Clean and reseal thread, tighten connection 2. Fully tighten couplers 3. Repair or use another pump and valve
Cylinder extend in dithering	<ol style="list-style-type: none"> 1. Air in cylinder 2. Cylinder piston rod binding 	<ol style="list-style-type: none"> 1. Bleed air (see chapter 2.2) 2. Check for dirt or leaks. Check for bent, misaligned and worn parts
Cylinder leaks hydraulic oil	<ol style="list-style-type: none"> 1. Leaky connection 2. Worn or damaged seals 3. Cylinder damage 	<ol style="list-style-type: none"> 1. Clean and reseal thread, tighten connection 2. Replace worn seals, clean inside cylinder and use clean hydraulic oil 3. Use new cylinder or contact with your nearest Authorized BELIUM Hydraulic Service Center.
Cylinder will not retract or Retracts slower than normal	<ol style="list-style-type: none"> 1. Pump release valve closed 2. Couplers are not fully tightened 3. Pump reservoir is full 4. Hose is blocked 5. Return spring is damaged 6. Cylinder damaged 	<ol style="list-style-type: none"> 1. Open release valve 2. Tightening the couplers 3. Drain hydraulic oil to correct level 4. Clean or change hose 5. Change return spring 6. Use new cylinder or contact your nearest Authorized BELIUM Hydraulic Service Center

液压缸使用说明书

液压缸的易损件清单请向BELIUM授权服务中心和BELIUM经销商索取

注意：

在使用本产品前请仔细阅读并依照下面的注意事项；请仔细检查任何运输损伤，如果存在运输损伤，请马上联系运输商，运输商将负责一切由运输原因产生的损失。

1. 安全



为了防止人身伤害和财产损失，请依照下列所有的安全事项。**BELIUM** 不对任何因为使用者不安全使用和不正确使用产品或系统设备以及缺乏维护所造成的人身伤害和财产损失负责。

危险 只用于当您的行为或者缺乏某种行动可能造成严重的人身伤害甚至死亡

警告 指出一个可能的危险会造成人身伤害，需要用正确的行动来预防

重要 指出正确的行动来预防设备损伤



危险

- 液压设备的使用人员必须是具备相关资格，并能熟练操作液压设备的人员，缺少液压领域的使用知识会造成人员伤害和设备损伤。
- 在使用前，请仔细检查液压缸、接头和油管。如果您发现任何接头、油管、螺纹和液压缸有损伤，请联系最近的**BELIUM**授权服务中心和经销商，这些损伤有可能会造成人身伤害。
- 为了防止人身伤害，请不要擅自修改或改装液压设备。
- 液压缸使用时请不要超过液压缸额定载荷，超载会造成设备故障和人身伤害。
- 一般液压缸的设计使用最大压力是 700bar (10,000psi)，请不要使用高于液压缸额定压力的高压泵和阀连接液压缸，过高的压力会造成设备故障和人员伤害。
- 液压缸只能被用作举升而不能用作支撑，在举升或下降物体完成后，请使用机械方式支撑物体，请不要在液压系统支撑的物体下工作。
- 为了防止人身伤害，在操作设备时，请保持手脚远离液压缸的工作区域。
- 请不要举升不平衡或没有放置在液压缸顶头中心的物体，不正确的载荷会造成设备故障和人身伤害。



警告

- 在操作液压设备时，请佩戴符合国家标准的安全眼罩、安全帽和其他必要的个人防护装备。
- 使用液压缸时需要有一个坚固的支撑平面，请使用钢板或者坚固合适的木块来支撑液

压缸底部。

- 操作液压设备时请使用压力表，压力表可以帮助您监视系统内液压压力，防止因超过额定压力而产生的人身伤害和财产损失。
- 请在干净的环境里连接或更换液压缸设备，防止尘土或其他垃圾进入液压缸和油管，尘土和垃圾会损害液压缸，造成设备故障和潜在人员伤害。
- 在连接液压缸前，请检查接头螺纹，确认螺纹没有损伤，螺纹损伤会导致连接处漏油和潜在的人身伤害。
- 个别液压缸需要放置在稳定的底座上，请使用 **BELIUM** 液压缸底座来增加液压缸稳定性。
- 需要寻求液压技术的帮助或维修服务，请联系所在地区的 **BELIUM** 授权服务中心。**BELIUM** 没有责任承担因在未经授权服务中心维修所造成的人员伤害或财产损失。
- 液压设备需要使用专业的液压油，请使用 **BELIUM** 液压油或 **BELIUM** 认可的液压油。

重要

- 请保持液压设备的清洁。
- 不使用液压缸时，请让液压缸活塞杆回到液压缸内，移除油管，使用橡胶帽盖住接头。如果使用液压缸外环螺纹，请使用橡胶帽盖住螺纹。
- 请不要把重物压在油管上，会造成油管损伤。
- 请不要用接头或油管来提举或搬运液压缸，请使用缸体把手或其他更安全的方式。
- 请在正常的温度环境中使用液压设备，不要使用液压设备在高于 65 °C (150°F) 的环境里。过高的温度会软化密封件和降低油管的强度，造成漏油和设备故障。
- 请正确使用顶头，顶头可以保护活塞杆。

2. 操作使用

在使用液压缸前，请检查所有液压设备，确认没有液压设备损伤，没有漏油或则缺少零部件。如果您发现任何问题，请先停止使用设备并联系最近的**BELIUM**授权服务中心或经销商。

2.1 连接

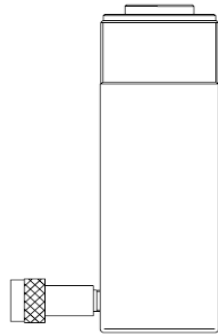
● 单作用液压缸

请使用一个拥有放油阀的泵（或3路阀）和油管连接单作用液压缸（图片1）。连接所有部件后，请充分用手拧紧所有的接头，如果没有拧紧，会产生漏油现象。

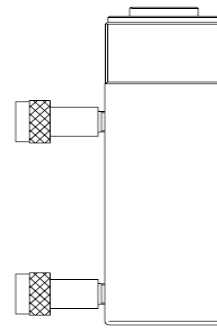
● 双作用液压缸

请使用带有4路阀的泵和两根油管来连接双作用液压缸（图片2）。连接所有部件后，请用手充分拧紧所有接头，如果没有拧紧，会产生漏油现象。

注意：双作用液压缸两个油口必须全部连接并拧紧。



图片 1



图片 2

2.2 排气

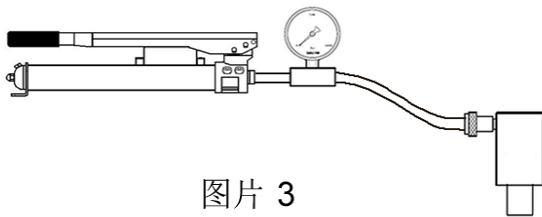
空气会在运输过程中或长时间放置时进入液压缸内，这些空气会造成液压缸使用时活塞杆跳动，请使用以下步骤排除液压缸内空气。

● 单作用液压缸

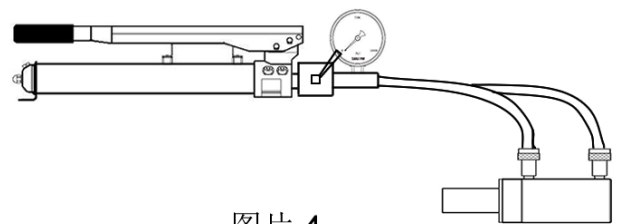
放置液压缸到图片3显示的位置，让活塞杆向下伸出并且液压缸位置低于泵，完全伸出和缩回活塞杆1到2次。如果有必要请重复做几次。

● 双作用液压缸

放置液压缸到图片4显示的位置，让接头向上，完全伸出和缩回活塞杆1到2次。如果有必要请重复做几次。



图片 3



图片 4

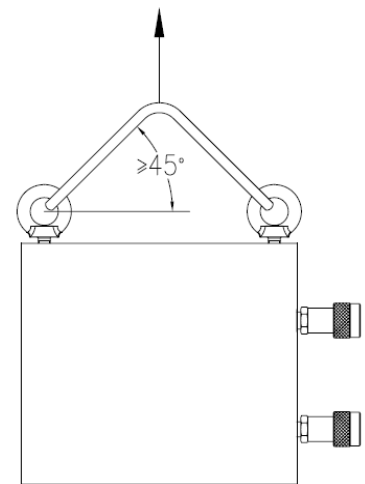
2.3 操作

- 在完成上述步骤后，操作液压泵来伸缩液压缸。
- 单作用液压缸使用拉簧、弹簧或重载复位。
- 双作用液压缸使用液压复位。
- 在安装顶头或操作液压缸时，请不要旋转活塞杆，以防止拉簧或弹簧损伤。
- 为减少液压缸部件损耗和增加使用安全性，在条件允许时，请尽量不要完全使用液压缸额定行程和额定载荷。
- 操作完毕后，请让液压缸活塞杆回到液压缸内，移除油管，使用橡胶帽盖住接头。如果使用液压缸外环螺纹，请使用橡胶帽盖住螺纹。

3. 吊装液压缸



警告：为防止设备损伤和潜在人身伤害，在吊装液压缸时，请使用液压缸上所有的吊环，吊带的角度应该等于或大于45°（见图片 5）。



图片 5

4. 维护

- 4.1 请使用BELIUM液压油或者BELIUM认可的液压油,使用其他未认可的液压油可能会损坏液压缸。
- 4.2 保持液压缸清洁,用橡胶帽保护外环螺纹和接头。
- 4.3 完成工作后,活塞杆必须缩回到液压缸内,清洁并储藏到通风,防潮和防腐蚀的地方。

5. 常见问题

警告: BELIUM液压缸必须由专业人员或BELIUM授权服务中心维修, 修理液压缸如果缺乏专业工具和知识会造成人身伤害, 维修前请完全释放液压系统内的压力。

问题	原因	解决方案
液压缸活塞杆无法伸出, 伸出较慢或无法完全伸出	<ol style="list-style-type: none">1. 泵的放油阀打开2. 接头没有拧紧3. 泵油箱内缺少液压油4. 泵或阀出现问题5. 液压缸超载6. 液压缸活塞杆阻塞	<ol style="list-style-type: none">1. 充分拧紧放油阀2. 充分拧紧接头3. 加液压油4. 修理, 或使用新的泵或阀5. 使用其他符合载荷需要的液压缸6. 检查缸内清洁程度, 更换损坏的零件
液压缸无法保压	<ol style="list-style-type: none">1. 连接处漏油2. 液压缸密封圈漏油3. 放油阀没有拧紧4. 泵或阀出现故障	<ol style="list-style-type: none">1. 清洗接头螺纹并重新连接, 拧紧接头2. 清洗钢体, 更换密封件, 使用清洁的液压油3. 完全拧紧放油阀3. 修理或更换泵或阀
活塞杆伸出时抖动	<ol style="list-style-type: none">1. 液压缸内有空气2. 液压缸活塞杆阻塞	<ol style="list-style-type: none">1. 排气2. 检查缸内清洁程度, 更换已损坏的零件
液压缸漏油	<ol style="list-style-type: none">1. 连接处漏油2. 密封件损坏3. 液压缸损坏	<ol style="list-style-type: none">1. 清洗接头螺纹并重新连接, 拧紧接头2. 清洗钢体, 更换密封件, 使用清洁的液压油3. 更换新液压缸, 或联系最近的BELIUM服务中心修理
液压缸活塞杆无法缩回或回复较慢	<ol style="list-style-type: none">1. 放油阀没有或没有完全打开2. 接头没有充分拧紧3. 泵储油箱已满4. 油管阻塞5. 液压缸内拉簧或压簧损坏6. 液压缸损坏	<ol style="list-style-type: none">1. 充分打开放油阀2. 完全拧紧接头3. 排掉储油箱内的液压油到合适的位置4. 清洁或更换油管5. 更换拉簧或压簧6. 更换液压缸, 或联系最近的BELIUM服务中心修理

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