

# **User Manual**

**Series A**

**Series LA**

**Series TA**

**960007E**

Rev. 10/07

**BOLZONI**  
**AURAMO** 

# Safety Instructions

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## **WARNING !!!**

Know the capacity and limitations of your machine. Do not overload the lift truck or the clamp attachment. Please note that the rated capacity of the truck/attachment combination may be less than the capacity shown on the attachment nameplate. The lift truck manufacturer is responsible for calculating the rated capacity for the combination. See the lift truck nameplate.



## **WARNING !!!**

Never stand on the clamp attachment or on the load



## **WARNING !!!**

Never stand under a load or attachment.



## **WARNING !!!**

Never stand in the attachment operating area or between the clamping arms.

## **WARNING !!!**

Limit driving with a raised load to the minimum. Never accelerate or brake powerfully with a raised load.

## **WARNING !!!**

Handle only those products which the attachment has been designed for. It is unsafe to lift any other objects.

## **WARNING !!!**

Do not risk the lift truck stability by sideshifting or rotating. Sideshift only when the load is lowered down or near its seat. Use extreme caution when handling off-centered loads.

## **WARNING !!!**

Always check the operating condition of the attachment before use. Never use a defective or damaged attachment. Repairs may be done by authorized personnel only.

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- 6.1 Service Instructions

# 1. Introduction

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This manual contains installation, periodic maintenance and service instructions for the series A and LA paper roll clamps. All instructions include metric and U.S standard measurements

Please read this manual carefully before using or servicing this equipment. This will ensure safe and error-free operation of the clamp attachment right from the start.

Make sure that you know how the clamp works before attempting to use it.

The instructions in this service manual do not replace any existing legislation in force in connection with safety or industrial injury. Abiding such legislation is the responsibility of the truck user.

The paper roll clamp has been designed and manufactured following basic safety requirements. It is the responsibility of the user to check the rating plates on the truck and the clamp and to ensure safety of use.

## 1.1 Notices

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There are three different levels of notices in this manual:

**WARNING !!!** - These paragraphs contain information that will help to prevent injuries.

**CAUTION !!!** - These paragraphs contain information that will help to prevent damage to the equipment.

**NOTE !!!** These paragraphs contain information that will help to service the equipment.

## 1.2 Safety Instructions

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- Always check the operating condition of the clamp attachment before use. Never use a defective or damaged attachment.
- Never stand under a load or clamp attachment.
- Never stand in the clamp operating area or between the clamping surfaces.
- Handle only those products with the clamp attachment that it has been designed for. It is unsafe to lift any other objects.
- Know the capacity and limitations of your machine.

## 2. Installation Instructions

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### 2.1 Truck Requirements

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#### 2.1.1 Clamp Attachment Rated Capacity

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Refer to clamp rating plate for maximum nominal clamp capacity. Please note that the actual lifting capacity of a paper roll clamp is dependant on the hydraulic operation pressure, contact pad friction, roll wrapper friction, environmental conditions, dynamic handling situation and other load related matters.

**WARNING !!!**

Clamp attachment decreases the rated capacity of the lift truck.

**WARNING !!!**

The truck is dangerous to the driver and to persons working near the truck if the driver does not know the net working capacity.

Net capacity information must always be visible from the driver's seat.

**WARNING !!!**

The lift truck manufacturer is responsible for giving the final capacity rating to the forklift/attachment combination.

#### 2.1.2 Operation Pressure

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Please refer to clamp rating plate. For standard models the following information applies.

160 bar / 16.0 MPa / 2,620 psi max working pressure on rotation, clamping and opening functions.

210 bar / 21.0 MPa / 3,040 psi max connection pressure

**WARNING !!!**

Never exceed the maximum working pressure.

### **2.1.3 Oil Flow**

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Please refer to the documentation supplied with the clamp.

### **2.1.4 Hydraulic Oils**

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Use petroleum based hydraulic oil as recommended by the truck manufacturer.

Please contact Bolzoni Auramo before using aqueous-based, biohydraulic or other special oils.

### **2.1.5 Required Hydraulic Functions**

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Standard clamps require two hydraulic functions from the truck hydraulic system.

## **2.2 Handling and Storage**

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Prior to installation check the clamp carefully for possible damage occurred during transportation.

### **2.2.1 Lifting the clamp**

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If you have to lift the clamp during installation, make sure that the capacity of your lifting device is adequate.

**WARNING !!!**

Never go under a hanging load. Beware of load swing when lifting.

## **2.3 Installation**

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Before installation carry out the following:

- Make sure that the lift truck fulfills all clamp requirements (Section 2.1).
- Make sure that the clamp mounting type and size is the same as the one used on the truck.
- Check that the truck's hydraulic oil level is correct.

- Check that the truck's hosing and fittings are in a good condition.
- Clean the truck carriage. Make sure that it has no defects or wear that could prevent installation or use of the clamp.

### 2.3.1 Installation, Standard Carriages

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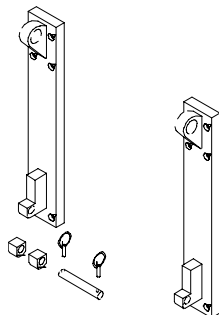
Installation on the most common lift truck standard carriages (ISO 2328 classes 2, 3 and 4 / ITA classes II, III and IV) goes as follows:

- Remove the lower mounting hooks. Do not touch the upper mounting hooks.
- If the clamp has quick release lower hooks, it is enough just to open the hooks.
- Lift the clamp on the carriage, so that it hangs from the upper mounting hooks. Ensure that the centering peg enters in the central notch of lift truck carriage. Note that the centering block can be removed for easier centering.
- **ALTERNATIVELY:** Position the clamp on the ground, tilt the lift mast completely forward and drive the upper side of the carriage carefully under the upper hooks. Ensure that the clamp is well centered and the centering peg enters in the central notch of the carriage. Tilt the lift mast slowly backwards and slightly lift the carriage up. Ensure that the upper mounting hooks are correctly positioned on the carriage.
- Install lower mounting hooks. In quick-change models, close lower mounting hooks. Note that some clamp models may require that the clamp must be rotated for easier access to the lower mounting hook screws. Rotate with extreme caution only.
- Tighten the mounting hook screws with the requested minimum torque

|                     |                              |
|---------------------|------------------------------|
| 540 Nm – 400 ft-lbs | Class ISO 2328 – 2 / ITA II  |
| 540 Nm – 400 ft-lbs | Class ISO 2328 – 3 / ITA III |
| 540 Nm – 400 ft-lbs | Class ISO 2328 – 4 / ITA IV  |

#### **WARNING !!!**

Upper mounting hooks and centering peg must be properly engaged to the upper carriage bar before fastening lower mounting hooks. If not properly engaged, the clamp can drop or move on the carriage.



### 2.3.2 Installation of Special or Large Mountings

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Pin type and hook type mountings that are common in larger clamp models are normally installed as follows:

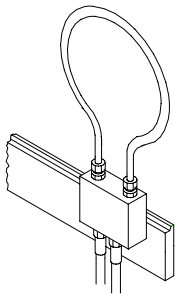
- Remove lower pins.
- Hang the clamp to the truck carriage from upper hooks or pins.
- Center the clamp.
- Attach lower locking pins and securing pins.

**NOTE !!!**

Check the spare parts book for possible additional instructions for installing special mountings.

## 2.4 Hose Flush

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Flush the truck mast hosing before installing the clamp attachment. It is estimated that up to 80% of all defects in hydraulic systems are caused by dirty hydraulic oil. Oil from the mast hoses should be run through the oil filter during the flushing to minimize the amount of debris and dirt in the hoses.

- Connect each hose pair with suitable fittings. If needed, use an extra hose.
- Turn the truck on and actuate control valves in both directions for about 40 seconds.

## 2.5 Connecting the Hoses

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For hydraulic connections, standard clamps have a connection block in the clamp mounting side.

Fittings, Metric models:

- Ø 12 mm (DIN 2353 M18x1,5 , 24°) , series AR-22/25/30/33/37
- Ø 15 mm (DIN 2353 M18x1,5 , 24°) , series AR-4X/5X/6X/7X

Fittings, U.S. models:

- JIC 8
- Attach connection hoses to clamp connection fittings. Make sure that hoses do not twist when attaching the fittings.
- Check that hose lengths are correct. Check that the hoses will not be pressed or chafed against the mast when lifting or tilting.
- Do not use a smaller hose-bending radius than recommended by the hose manufacturer.



**CAUTION !!!**

Do not over-tighten the hose fittings.

## **2.6 Checks Before Operating the Clamp**

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Check the correct operation of all functions of the clamp before using it for the first time with the load.

- Run all movements (clamping and rotation) several times between respective end positions.
- Check all cylinders, valves, hoses and fittings for leaks.

### **2.6.1 Clamping Force Test**

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It is recommended that regular clamping force tests are carried out in order to minimize the possibility of roll damage. Use suitable testing device for testing the clamping force.

- Check that the clamping force is maintained when clamping for an extended period of time. Leave the pressure on for 5-10 minutes and check for the loss of pressure. Clamping force may decrease up to 10-15% in ten minutes maximum.
- Check that the clamping force is correct for the load.

## 3. User Instructions

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### 3.1 Clamping the Paper Roll

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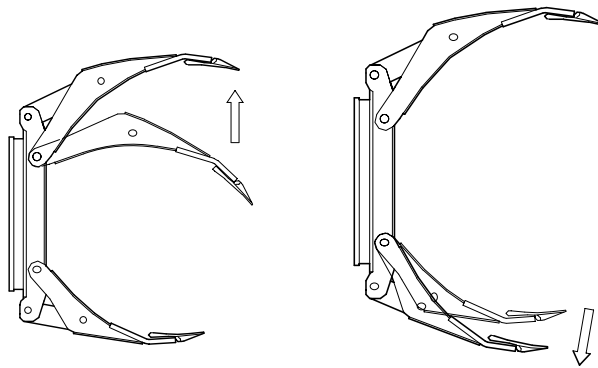
#### 3.1.1 Opening the Long and Short Arms (Series TA and A clamps only)

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Series A clamps can be supplied with short and long arm design, having a sequenced short arm operation principle.

The short arm begins to open only after the long arm has been opened completely. Therefore, before opening the short arm, the long arm must be open.

- Open the long arm fully. Continue the opening function until the short arm has opened enough.

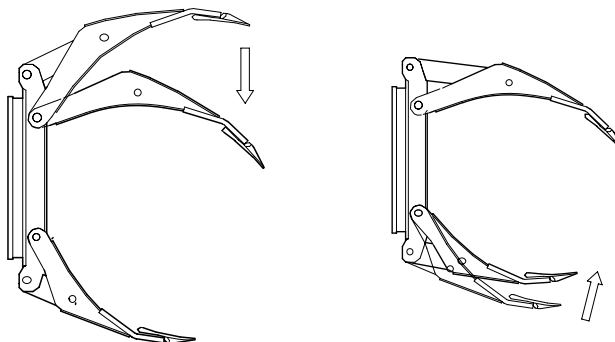


#### 3.1.2 Closing the Arms (Series TA and A clamps only)

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The short arm begins to close only after the long arm is fully closed. Therefore, before closing the short arm, the long arm must be closed.

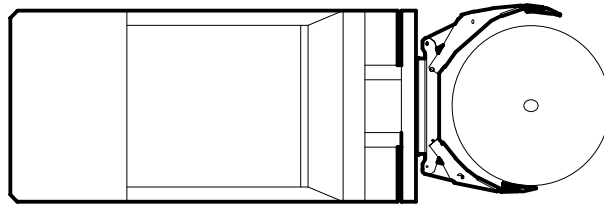
- Close the long arm fully. Continue the closing function until the short arm has closed.



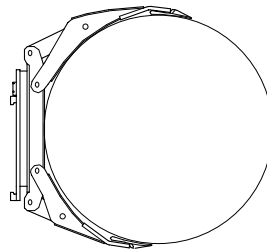
### 3.1.3 Clamping a Vertical Roll

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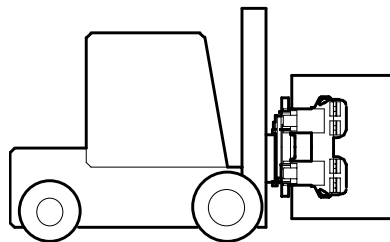
- Big rolls - Open all arms fully. Drive the truck near the roll into a position where the short arm / non-moving arm just touches the roll and the roll leans against the clamp body.
- Small rolls - Close the short arm fully (if the short arm can be positioned), open the long arms sufficiently. Drive the truck near the roll into a position where the short arm / non-moving arm just touches the roll.



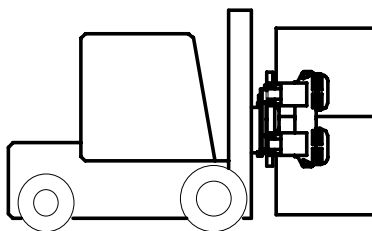
- Grip the roll by closing the long arm. Hold on closing for a couple of seconds to ensure necessary clamping force. Do not pump the valve.
- Grip big rolls (= max diameter ... max diameter - 10%) in such a way that the roll touches the clamp body and contact pads.



- Grip smaller rolls so that the center of the roll is on a line that goes through the contact pad center-points.
- Do not grip the roll too much behind its centerline, as the roll can easily slip off the clamp. Furthermore, do not grip any roll too far in front of its centerline, as this can lead to the clamp frame and the contact pad corners damaging the roll.
- Always grip the roll so that the clamp attachment is well aligned to the roll. Misalignment easily leads to roll damage. When handling singular rolls, always grip the roll so that the arms are centered between the ends of the roll.



- When handling multiple rolls, always use a clamp attachment having split clamping arms. Grip rolls in such a way that each roll is clamped with own contact pad.



### **3.2 Tilting the Roll (Series TA only)**

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- Lift the roll high enough before tilting.
- Beware of roll touching the mast profiles during the tilting motion.
- Check that the lift truck capacity is adequate for tilting the rolls.

### **3.3 Positioning the Upper Frame Height**

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- Some series LA and A clamps have a hydraulic height positioning on the upper frame (see the spare parts documentation for further details).
- This function has separate hydraulic control on the lift truck hydraulic system.

### **3.4 Tips for Safe Operation**

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- Grip the roll correctly.
- Drive carefully and safely. Avoid strong acceleration and braking.
- Always drive with the load lowered down and the mast in a vertical or backward-tilt position. Note that too much tilt backward or forward increases the risk of roll edge damage.
- When taking a roll from the stack, back away only so far as to be able to lower the roll safely. Never accelerate or brake powerfully when the roll is up, as this can lead to loss of balance.
- Do not release the roll before it is in its place. Never allow the roll to fall down.
- Beware of slackness in the mast chains when opening the clamp arms.

## 4. Periodic Maintenance

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### 4.1 Daily Checks

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Check that there are no leaks, worn hoses or loosened parts. Check the clamp frame and arms for defects or cracks.

Check that there are no sharp edges on such parts that come into contact with the load. Remove any such edges, for example, by grinding them.

Check all arms and contact pads and clean them if necessary. Contact pads should move easily when tested by hand.

Check that the clamping force is correct for your load. If needed, adjust the clamping pressure to suit your needs.

**WARNING !!!**

Always check the clamp operating condition before you use it. Never use a defective or damaged clamp.

Never exceed the maximum operating pressure.

### 4.2 Inspection and Service

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Carry out the following checks and services twice a year, or every 300 hours (whichever comes first).

**WARNING !!!**

In the following service actions the clamp is to be moved hydraulically. Do not leave any body parts between moving clamp attachment parts.

Before servicing any of the clamp components, turn the lift truck off and relieve the pressure off from the hydraulic circuit by actuating all the control levers several times in both directions.

- Clean the clamp
- Carry out all routine tasks mentioned in Section 4.1
- Lubricate pivot pin bearings.
- Check the clamp for parts that might become defective or cause other trouble during the next service interval. Especially check hinge pins and their bushings, contact pads and wear plates. Replace or repair all parts showing signs of excessive wear.

In the next section, you will find some guidelines on how to estimate the amount of wear in some parts.

#### **Arm pivots (pins, bushings and their seats)**

When moving arms up and down by hand, the play should be less than 5 mm (0.2 inch) measured from 1000 mm (40-inch) arm length. For longer (or shorter) arm lengths use the following formula: max. play = Arm length in mm \* 5 / 1000 (or max. play = Arm length in inch \* 0.2 / 40). If the play is greater than this and disturbs normal operations, worn arm bushings or clamp cylinder bushings must be replaced.

### **4.3 Tightening the Bolts**

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Bolts on Bolzoni Auramo paper roll clamps are secured using LOCTITE 270. Bolts under high stresses are also tightened to a certain fastening torque. In normal cases, regular re-tightening of the bolts is unnecessary.

Should loose bolts be found during daily checks, open them, apply some LOCTITE 270, or any equivalent product, to the bolt threads and retighten the bolts.

Recommended fastening torques are mentioned in the spare parts documentation.

### **4.4 Recommended Lubricants (Greases)**

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Other components: Mobil Mobilplex 47, or other equivalent good quality universal greases.

## 5. Trouble Shooting

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### 5.1 General

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It is estimated that up to 80% of all trouble and defects in hydraulic systems originate from contaminated or dirty hydraulic oils. Bolzoni Auramo strongly recommends that the hydraulic oil and oil filters are changed regularly.

### 5.2 Safety Warnings

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During all trouble shooting operations, work will be carried out near the clamp. Always work safely.

**WARNING !!!**

Hydraulic components can be hot. Use suitable protection.

Beware of leaks. High-pressure oil can damage the eyes and skin. Always wear protection goggles having side-protection.

Do not remove cartridge valves, hoses or other potentially pressurized components when pressure is on.

### 5.3 Hydraulic Circuit

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TA-, LA- and TA-Series clamps are manufactured with several different hydraulics options.

Every clamp has a unique spare parts book which contains a description of the hydraulic components.

## 5.4 Trouble Shooting

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### **Problem: No pressure in the clamp**

Possible cause: Hose connection between clamp and truck is defective

- Check all connections. If needed, replace them.

Possible cause: Failure in the truck hydraulic system

- Check that oil is coming from truck hydraulic system.

### **Problem: Pressure is on, arms do not move**

Possible cause: Incorrect hose connection

- Check the hoses. Rectify connections if needed.

Possible cause: Defective check valve, defective flow divider valve

- Clean or replace check valves, flow divider valve or short-arm pressure-relief valve (refer to spare parts book for further details)

Possible cause: Pressure-relief valve cartridge defective or wrongly set

- Replace valve or correct the setting.

Possible cause: Leak in pressure cylinders

- Check and replace seals if needed.

### **Problem: Pressure is on, tilting function does not work**

**(series TA only)**

Possible cause: Defective flow control valve, defective tilting pressure relief valve

- Clean or replace.

### **Problem: Clamping force too low**

Possible cause: Hydraulic pressure is too low

- Check truck pressure settings. Measure pressure coming from the truck. Pressure must be the same as, or higher than, what is required for the clamp.
- Check oil level.
- Check for external leaks. If needed, clean components before checking.
- Blocked hose or fitting. Repair or replace.

Possible cause: Wrong setting in the main pressure relief valve

- Check clamping pressure. The pressure can be adjusted by turning the adjustment screw (clockwise - pressure increases, counterclockwise - pressure decreases). Never exceed the maximum operating pressure of the clamp!



Possible cause: Defective check valve

- Clean or replace check valves.

Possible cause: Leak in cylinder seals

- Replace seals.

Possible cause: Too much pressure in tank line

- Check hoses and repair if needed.

**Problem: Clamping force OK, load falls**

Possible cause: Dirty contact pads

- Clean the contact pads.

Possible cause: Worn or damaged contact pads

- Replace contact pads or friction surfaces.

Possible cause: Operator error

- Check that the load is clamped correctly and that there is no overloading.

Possible cause: Wrong clamp for the load

- Check if the clamp capacity, opening range and arm/contact pad models are suitable for the load.

**Problem: Loss of clamping force**

Possible cause: Leaks in hoses or fittings

- Check for external leaks. If needed, clean components before checking.

Possible cause: Leak in check valve

- Clean or replace check valves or short-arm pressure-relief valve.

Possible cause: Leak in cylinder seals

- Replace seals.

**Problem: Clamp arms close or open too slowly**

Possible cause: Oil flow from the pump is too small or much too big

- Check the oil flow rate

Possible cause: Defective or too small hoses

- Repair or replace with correct sizes.

Possible cause: Defective flow divider valve (Split arm models only)

- Check and replace.

**Problem: Short arms move simultaneously with long arms  
(series TA, A only)**

Possible cause: Wrong setting in short arm pressure-relief valve.

- Check the setting and readjust.

**Problem: Short arms do not move (series TA, A only)**

Possible cause: Defect in short arm pressure relief valve.

- Check the setting and readjust. If trouble persists, change valve.

**Problem: Shaking arm movement**

Possible cause: Air in the system

- Remove air by fully opening and closing arms several times.

Possible cause: Dirt in hydraulic system

- Clean system, check all cartridge valves.

**Problem: Split long arms do not move at the same speed  
(Split arm models only)**

Possible cause: Wrong setting on flow divider valve or on cylinder throttle valve, defective flow divider valve.

- Check and readjust. Check the arms for defects and wear.

## 6. Service and Repairs

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Perform all maintenance actions with the lift truck turned off and only after relieving pressure in the hydraulic circuit, by actuating all control levers in both directions.

### 6.1 Service Instructions

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In the following pages you will find instructions on how to perform such service actions and repairs that are outside the normal maintenance schedule.

**WARNING !!!**

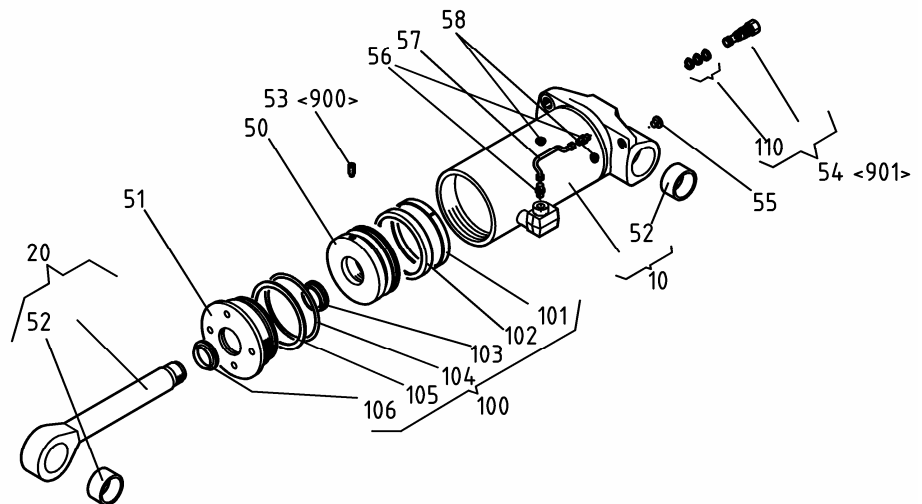
Read instructions carefully before you do anything. Repairs done incorrectly are safety hazards.

Follow all safety instructions given in previous chapters.

Never remove pressurized parts or hoses.

#### 6.1.1 Seal Change, Clamping and Tilting Cylinders

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**CAUTION !!!**

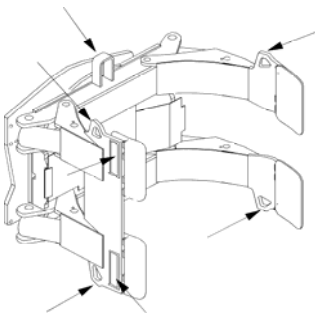
Do not scratch piston rod or cylinder barrel surfaces with sharp tools.

Note the direction of the seals.

1. Open the cylinder housing and pull the piston rod assembly off the cylinder shell.
2. Open the grub screw (53). If necessary, heat the screw before opening. Unscrew the piston (50) from the piston rod (20). Slide the housing (51) off the piston end of the rod.
3. Remove old seals from housing.
4. Clean and check piston, piston rod, cylinder shell and housing. See if there are any scratches, wear, corrosion, cracks or other similar damage that could prevent normal operation of the cylinder. Replace all damaged or worn parts.
5. Install new seals to the housing.
6. Oil seals and piston rod. Slide housing onto the rod from the piston end of the rod.
7. Install the piston back onto the piston rod. Use LOCTITE 542 to secure the joint. Screw the grub screw back into piston. Use LOCTITE 270 to lock the screw.
8. Install new seals on the piston.
9. Oil the cylinder shell. Slide piston assembly into the cylinder shell. Screw the housing into the cylinder shell.
10. If possible, test run the cylinder before re-assembling it to the clamp. Max. test pressure is 22 MPa / 220 bar / 3,200 psi.
11. Check the condition of pin bushings at both ends of the cylinder and replace bushings if necessary.
12. Re-install the cylinder to the clamp. Connect the hoses. Test run all cylinder functions. Check for leaks.

### **6.1.2 Replacement of Wear Plates**

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Outer sides of the clamping arms and contact pads may have wear plates.

The purpose of these plates is to protect the arms and pads from wearing during normal operation.

Plates should be replaced before they become totally worn out.

- Remove the remnants of an old plate by, for example, grinding. Weld a new plate at the same location.
- Check also if there is excessive wear on other parts of the clamp and repair if necessary.

### **6.1.5 Split Arm Synchronization**

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Clamps have restrictor valves in clamping cylinders. These valves enable arm speed synchronization.

Restrictor valves are adjusted at our factory, but due to operating conditions or wear it is possible that arms may begin to move with different speeds. In this case, you have to re-adjust valves.

- Open fully adjustment screws of all restrictor valves.
- Test arm speeds at normal running power.
- Slightly tighten the adjustment screw of the arm which moves fastest. Test the speed again. Continue adjusting until all arm sections move at the same speed.

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