ATiB MATERIAL HANDLING

USE AND MAINTENANCE MANUAL

INTEGRATED FORK POSITIONER WITH INTEGRAL SIDESHIFT TYPE 678 | 679 | 688 | 689 and INTEGRATED FORK POSITIONER TYPE 579

I-D02-01-63 - Rev.3

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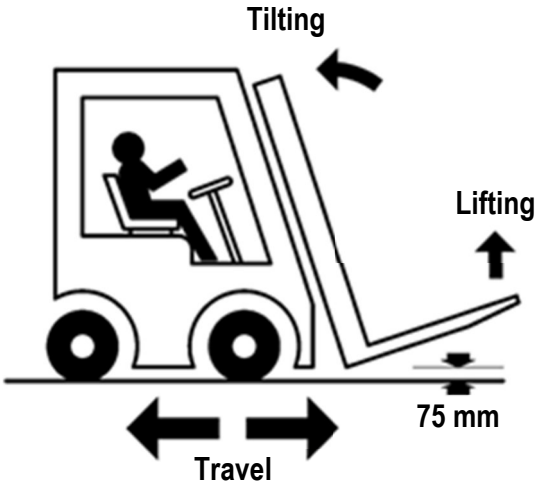
INTEGRATED FORK POSITIONER WITH INTEGRAL SIDESHIFT TYPE 678 | 679 | 688 | 689 and INTEGRATED FORK POSITIONER TYPE 579

1 SAFETY REGULATIONS FOR THE OPERATOR

Do not transport passengers

Do not cross the upright

Do not stand under the load



2 INTRODUCTION

2.1 Use and Storage of the Manual

This "Use and Instruction Manual" (hereinafter referred to as the Manual) is issued together with the A.T.I.B. equipment. – "FORK POSITIONER TYPE 678 | 679 | 688 | 689 | 579" in accordance with DIRECTIVE 2006/42/EC of the European Parliament and of the Council of 17/05/2006 and subsequent additions.

The following indications are essential for correct use of the equipment and must be brought to the attention of the personnel assigned to installation, use, maintenance and repair.

This Manual must be considered an integral part of the equipment and must be kept until it is dismantled in an accessible, protected and dry place and must be available for quick reference.

In the event of loss and/or damage, the user can request a copy from the manufacturer.

The manufacturer reserves the right to modify this manual without prior notice and without the obligation to update previously distributed copies.

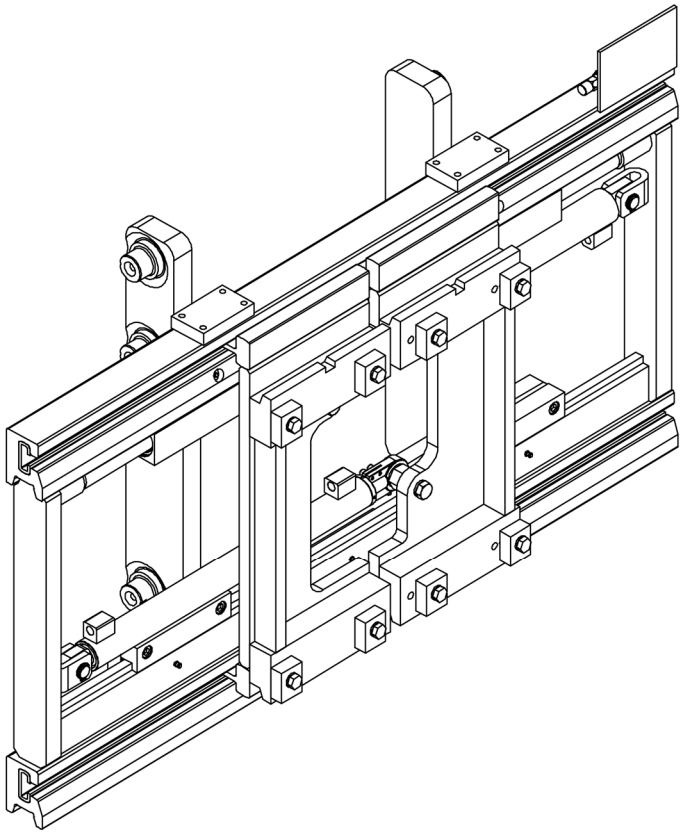
The manufacturer is exempted from any responsibility in the event of:

- Improper use of equipment;
- Use of equipment by untrained personnel;
- Use contrary to any national or international regulations;
- Inadequate scheduled maintenance;
- Unauthorised intervention or modification;
- Use of non-original and/or non-model specific spare parts;
- Full or partial non-compliance with instructions;
- Exceptional events.

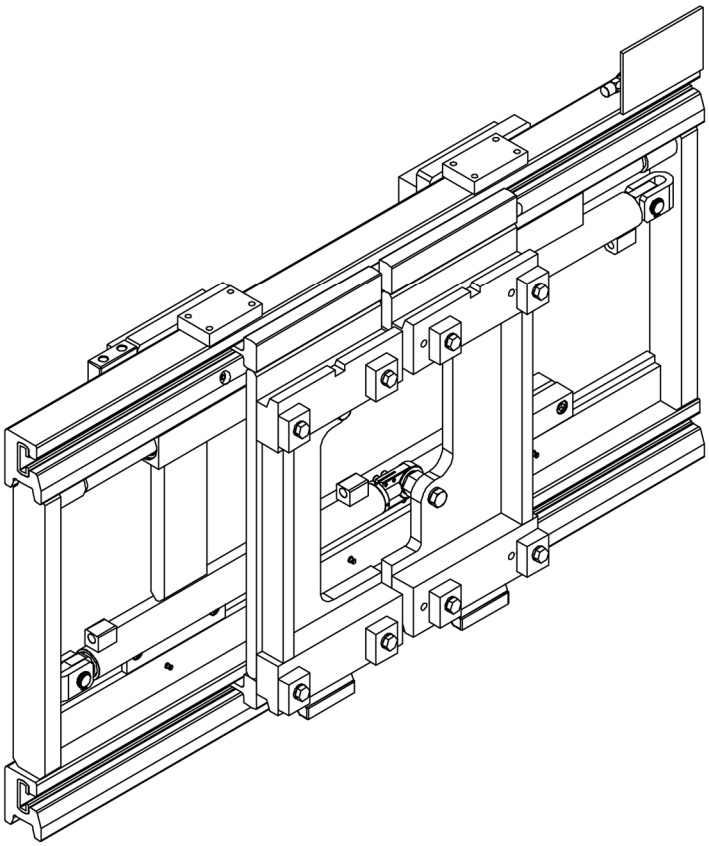
The nominal capacity of the forklift truck/equipment combination has been set by the original manufacturer of the forklift truck and may be less than that indicated on the equipment plate.
Consult forklift truck plate (Directive 2006/42/EC).

2.2 Equipment Description

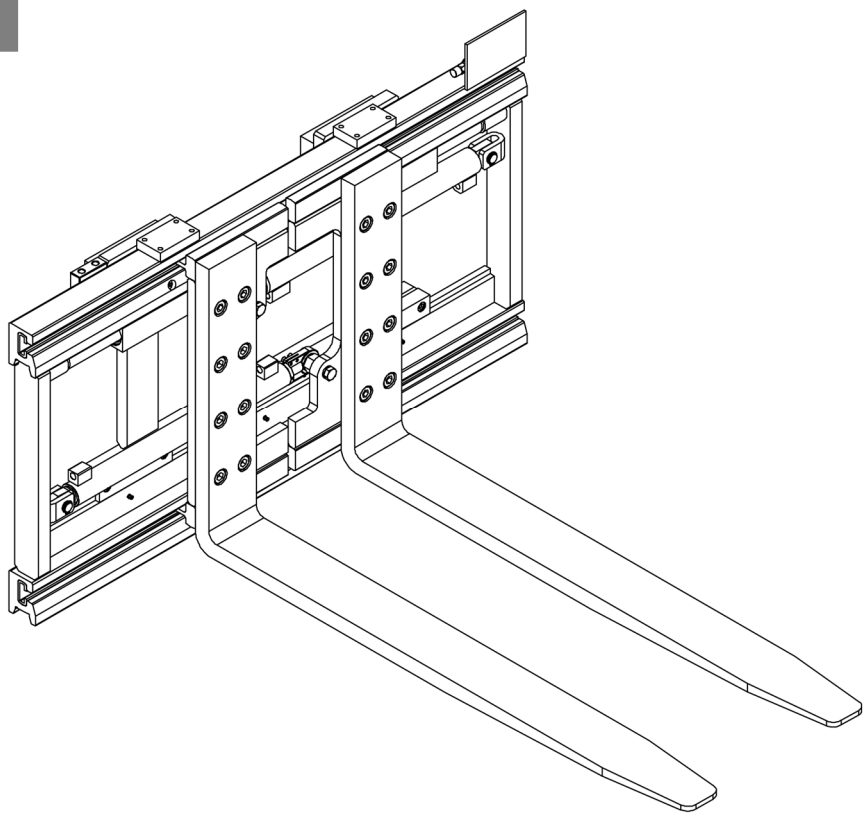
TYPE 678



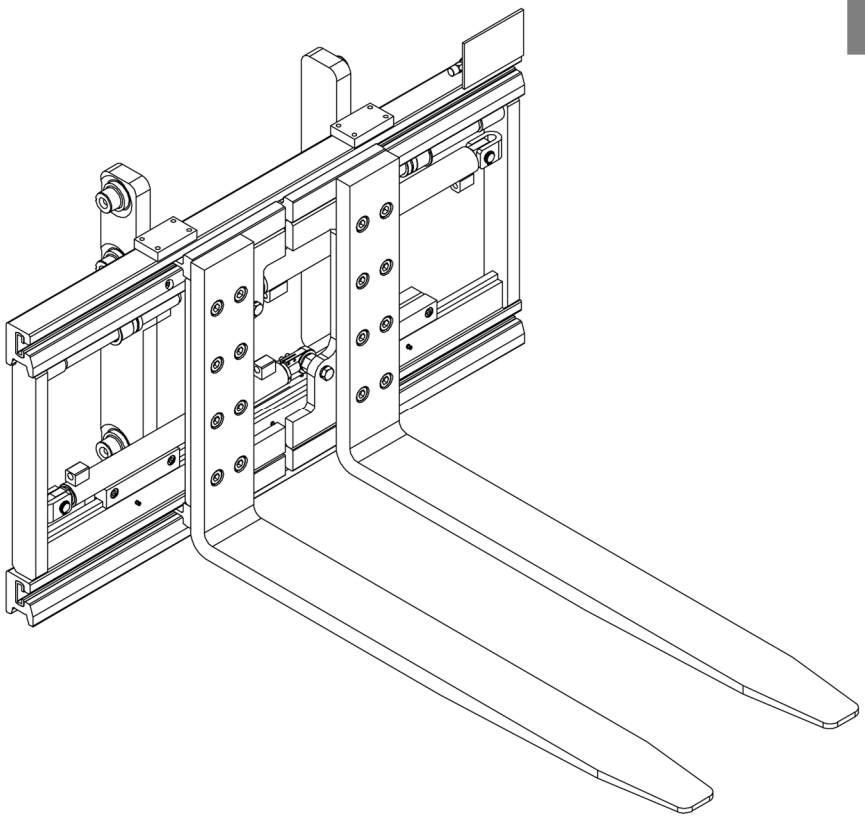
TYPE 679



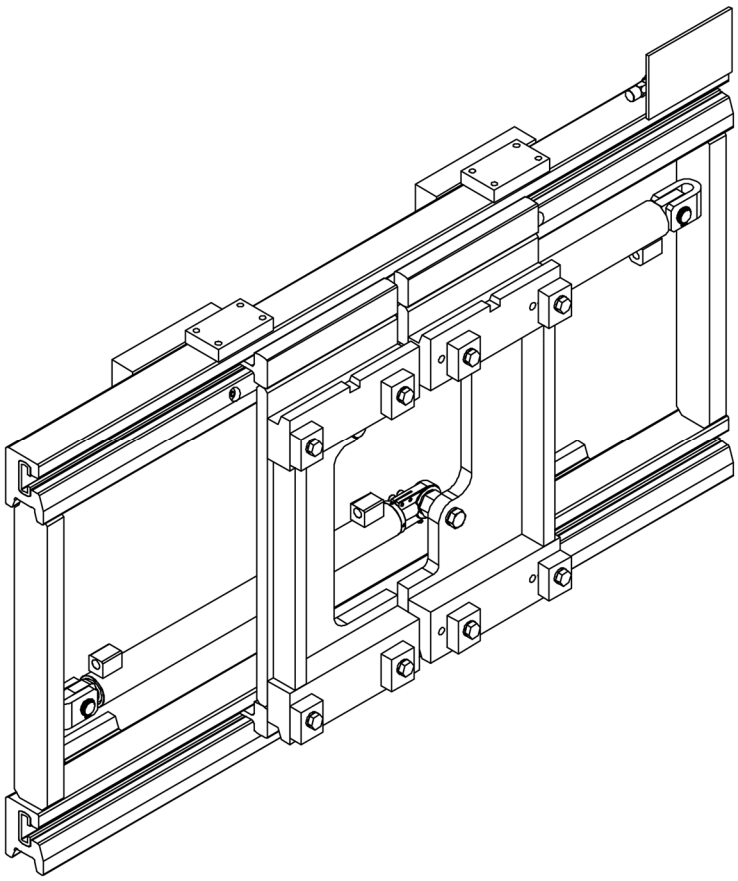
TYPE 688



TYPE 689



TYPE 579



All the A.T.I.B. equipment – "FORK POSITIONER TYPE 678 | 679 | 688 | 689 | 579 " is identified by an adhesive plate (see *Table 1*) positioned on the equipment (the position of the identification plate may vary depending on the equipment, see *Figure 1*). Always refer to the serial number.

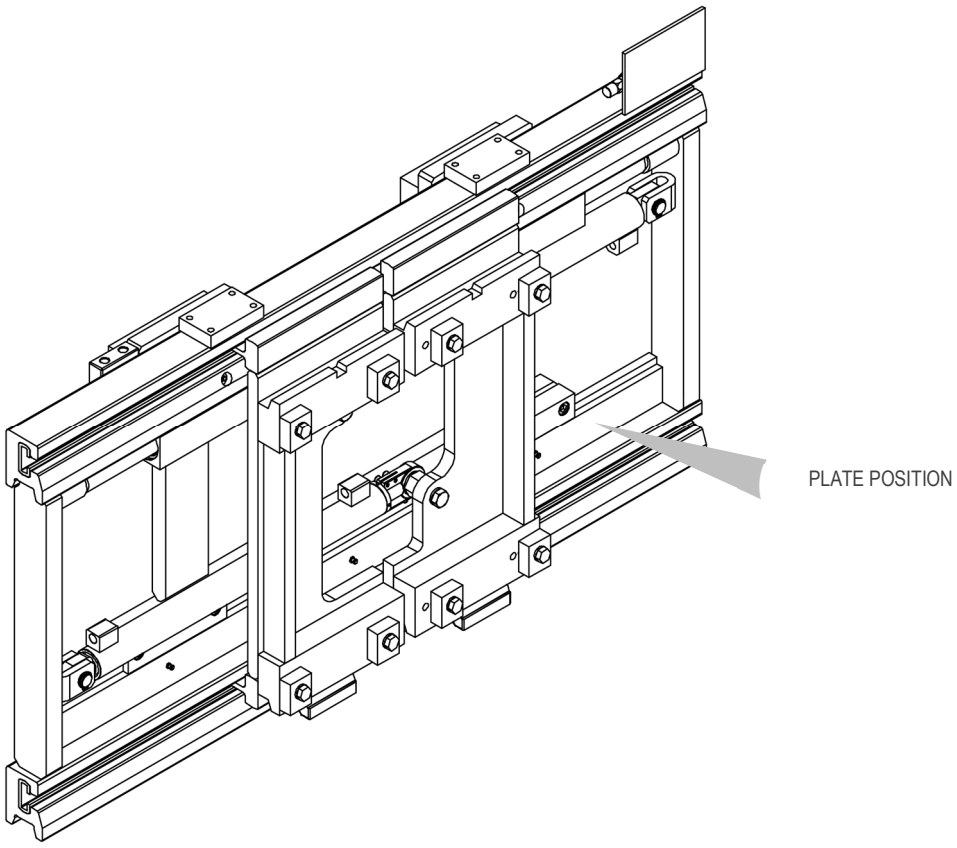


Figure 1

1. TIPO / TYPE	**8. PORTATA NOMINALE / NOMINAL CAPACITY**	**kg/mm**	**11. COPPIA MAX / MAX. TORQUE**	**daNm**
2. CODICE / CODE	**9. PORTATA IN SERRAGGIO / CLAMPING CAPACITY**	**kg/mm**	A.T.I.B. CE	
3. MATRICOLA N° / SERIAL N°				
4. ANNO DI COSTRUZIONE / YEAR OF MANUFACTURE	**10. PRESSIONE MAX. DI ESERCIZIO / MAX. OPERATING PRESSURE**	**bar**	**A.T.I.B. S.r.l.** Via Quinzanese snc, 25020 Dello (BS) - ITALY +39 030 9771711 info@atib.com - **atib.com**	
5. PESO / WEIGHT				
6. SPESSORE / THICKNESS	**NOTE: OSSERVARE I LIMITI DI PORTATA DELL'INSIEME CARRELLO CON ATTREZZATURA / WARNING: OBSERVE THE NOMINAL CAPACITY OF TRUCK AND ATTACHMENT COMBINED**			
7. CENTRO DI GRAVITÀ / CENTER OF GRAVITY				

Table 1

1. **TYPE**
   Indicates equipment model as shown in the catalogue.

2. **CODE**
   Indicates the equipment ordering code.

3. **SERIAL N°**
   It progressively identifies the individual equipment.
   In the event that the plate is missing or damaged, always refer to the serial number.

4. **YEAR OF MANUFACTURE**
   Indicates the year of manufacture.

5. **WEIGHT**
   Indicates the weight of the equipment in kg.

6. **THICKNESS**
   Indicates the thickness of the equipment in mm.

7. **CENTRE OF GRAVITY**
   Indicates the distance in mm of the *CG* centre of gravity of the equipment from the support plane of the fork-holder plate.

8. **NOMINAL CAPACITY**
   Indicates the maximum load applicable to the lifting equipment and the maximum centre of gravity of the load itself.

9. **CLAMPING CAPACITY**
   Not applicable to this equipment.

10. **MAX. OPERATING PRESSURE**
    Indicates the maximum pressure expressed in bar at which the equipment can work.

11. **MAX. TORQUE**
    Not applicable to this equipment.

The A.T.I.B. equipment – FORK POSITIONER "TYPE 678 | 679 | 688 | 689 | 579 " has been conceived, designed and constructed to hydraulically adjust the fork spacing in order to allow the handling of loads of different sizes.

This equipment must be applied directly to the mast of the forklift truck (678 and 689) or to the fork carriage plate (679 | 689 and 579) and connected to the distributor via a hydraulic circuit.

The equipment is able to perform the following functions:

- Fork spacing adjustment: the relative movement of the fork spacing adjustment is achieved by means of two hydraulic cylinders that act directly on their fork holders/plates;
- Semi-incorporated sideshift: the shifting movement between the parts integral with the fork carriage plate and those integral with the lifting equipment is carried out by means of a hydraulic cylinder (579 does not have this function).

Fork carriage coupling components are manufactured in accordance with ISO 2328.

3 INSTALLATION

Checking the Nominal Capacity of the Equipment

To check the nominal capacity of the equipment, consult the plate of the equipment itself (See *Table 1* on page *8*).

⚠ ATTENTION ⚠

Ensure that the driver of the forklift truck is aware of the maximum capacity of the equipment so that they do NOT constitute a hazard to themselves or to persons working in proximity.

The forklift truck manufacturer is responsible for calculating the residual load capacity of the truck/equipment combination.

Checking the Operating Pressure and Oil Flow Rate

A.T.I.B. recommends observing the hydraulic flow rates and operating pressures provided in *Table 2*, to optimise the operation of the equipment and avoid issues during work or commissioning. Values are for indicative purposes only and may vary depending on the equipment.

TYPE and ISO	FLOW RATE (l/min)			Operating pressure Maximum (Bar)
	minimum	maximum	recommended	
[all] ISO II	5	15	10	110
[all] ISO III	10	20	15	110

Table 2

⚠ ATTENTION!! ⚠

OBSERVE THE INDICATED MAXIMUM OPERATING PRESSURES

3.1 Installation Procedure

WELDED BRACKETS

3.1.1 Installing the Equipment - 678/689 - With Welded Brackets

1. Prior to installation, check the condition of the mast, making sure it is smooth.

2. In addition, ensure that the profiles of the mast are not deformed, in order to facilitate good coupling with the equipment.

3. Check the condition of the pipes, replacing those in a poor condition.

4. Couple the rollers/bearings (not always supplied) to the pins on the brackets of the equipment (see *Figure 2*. In this image, as in the following ones, bearings, brackets and masts will be purely indicative, with the sole purpose of showing the correct assembly of the equipment, as they may vary depending on type).

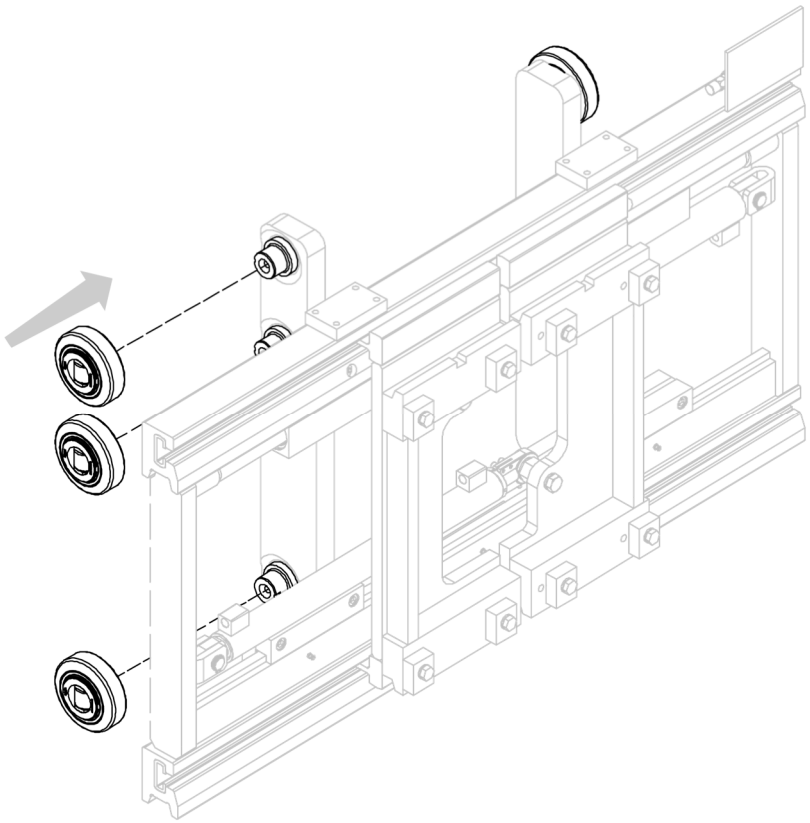


Figure 2

5. Install the equipment by inserting the bearings in the guides and fixing the mast chains into the holes of the brackets using the appropriate forks or according to the methods envisaged by the manufacturer of the mast (see *Figure 3*).

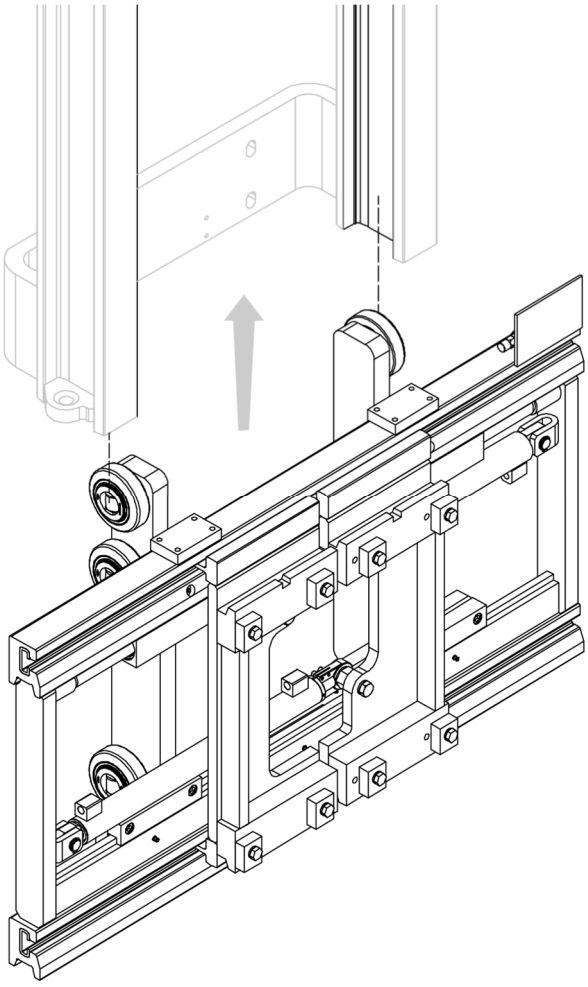


Figure 3

6. Lubricate the contact surfaces (see the *Lubrication* chapter on page *44*).

7. Install the forks (see the *Assembling the Forks* chapter on page *22*).

8. Connect the hydraulic circuit, making sure that the operating pressure of the lines is greater than or equal to that indicated on the identification plate (see *Figure 1* and *Table 1* on page *8)*.

3.1.2 Installing the Equipment - 678/689 - Without Brackets [The customer's

WITHOUT

1. Prior to installation, check the condition of the mast, making sure it is smooth.
2. In addition, ensure that the profiles of the mast are not deformed, in order to facilitate good coupling with the equipment.
3. Check the condition of the pipes, replacing those in a poor condition.
4. Remove the lower couplings that hold the front structure to the rear one (see *Figure 4*).

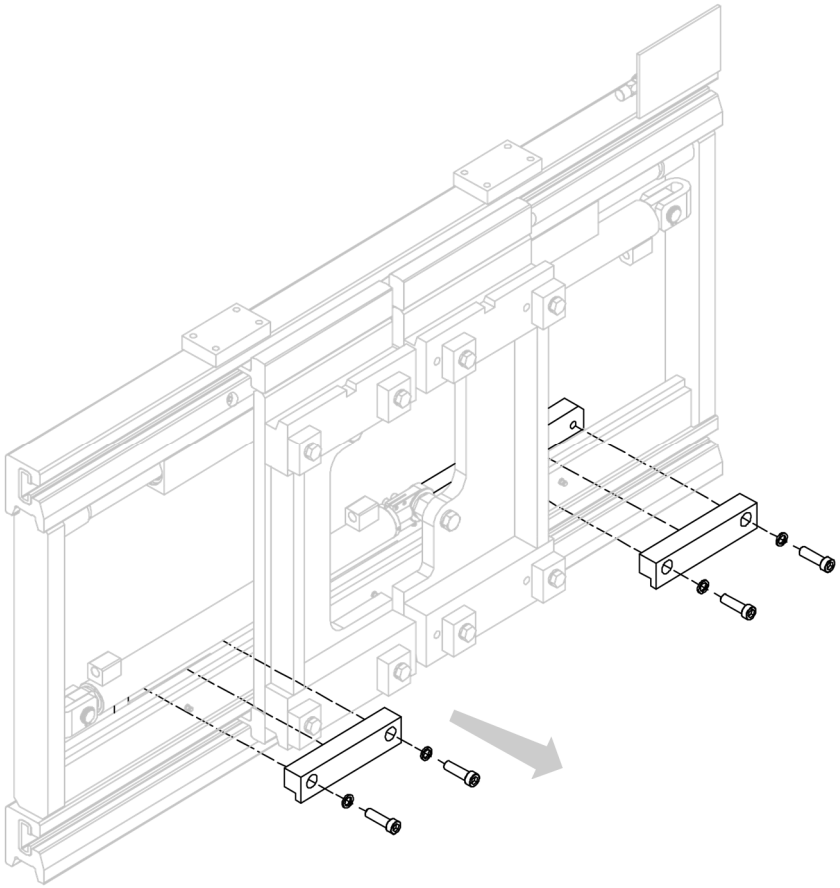


Figure 4

5. Remove the front structure profiles (see *Figure 5*).

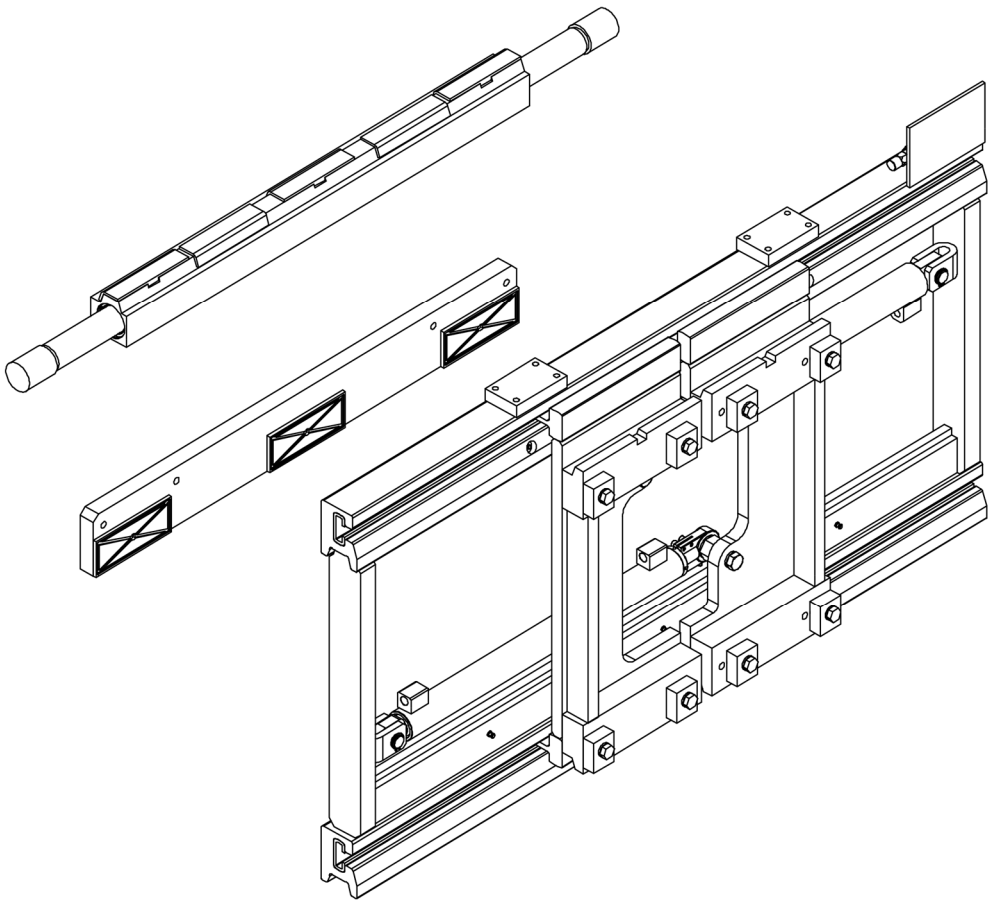


Figure 5

6. Remove the brackets and any chain attachments from the original fork carriage plate.

7. Weld the brackets to the rear profiles, contacting A.T.I.B. for the necessary technical information. Welding must be sized and done in such a way as to withstand the stresses expected when making use of the equipment and by taking into account the material with which the equipment's profiles are made (generally in Fe 510 C in accordance with UNI EN 10025 02.92, unless otherwise prescribed).
   N.B. Remove or temporarily cover the rods, bushes and sliding gibs, to prevent them from being damaged during the welding operation.

8. Reposition the rear structure (see *Figure 6*).

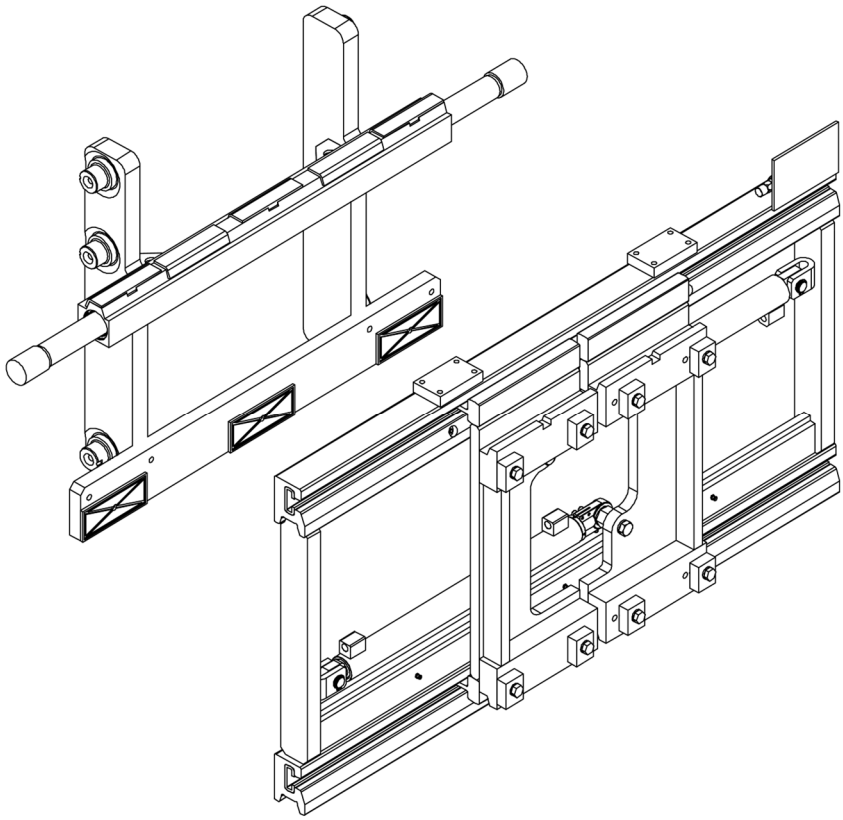


Figure 6

9. Install the lower couplings (see *Figure 7*).

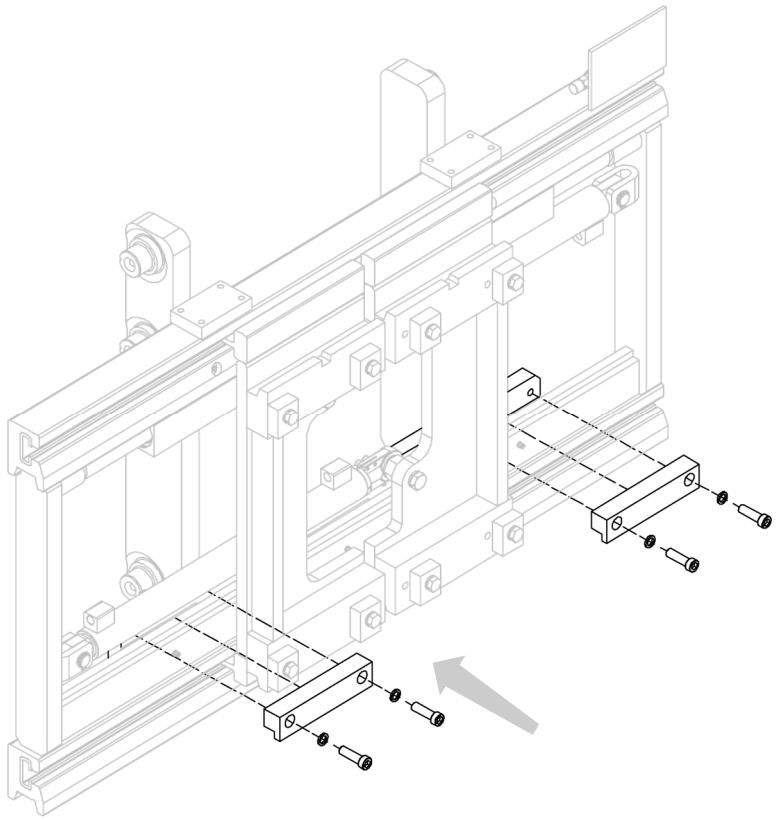


Figure 7

10. Couple the rollers/bearings (not always supplied) to the pins on the brackets of the equipment (see *Figure 8*. In this image, as in the following ones, the bearings, brackets and masts shown will be purely indicative, with the sole purpose of showing the correct assembly of the equipment, as they may vary depending on type).

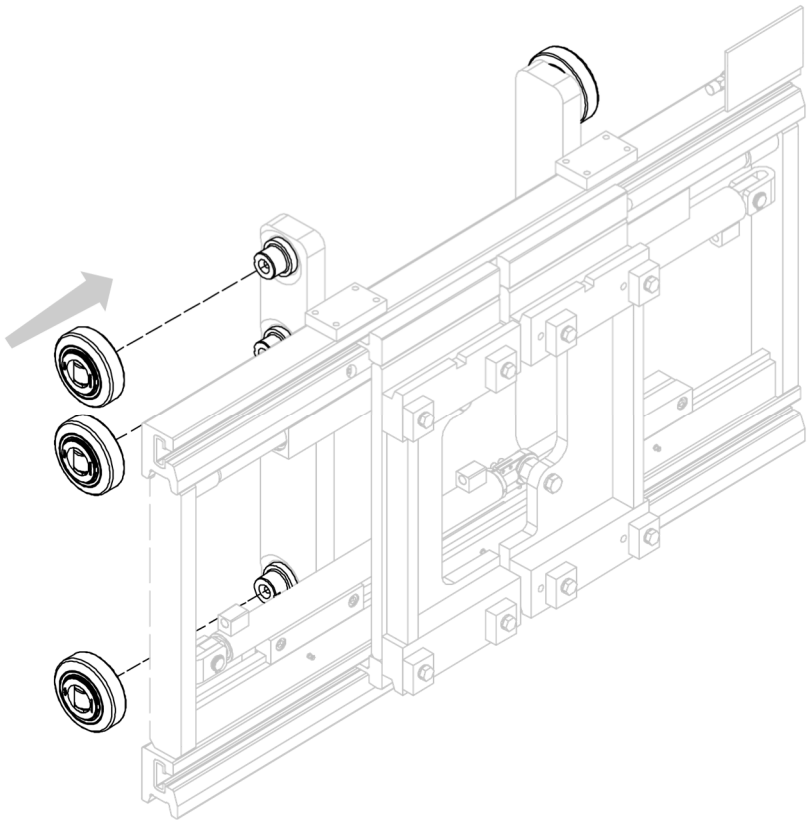


Figure 8

11. Install the equipment by inserting the bearings in the guides and fix the mast chains in the holes of the brackets using the appropriate forks or according to the methods envisaged by the manufacturer of the mast (see *Figure 9*).

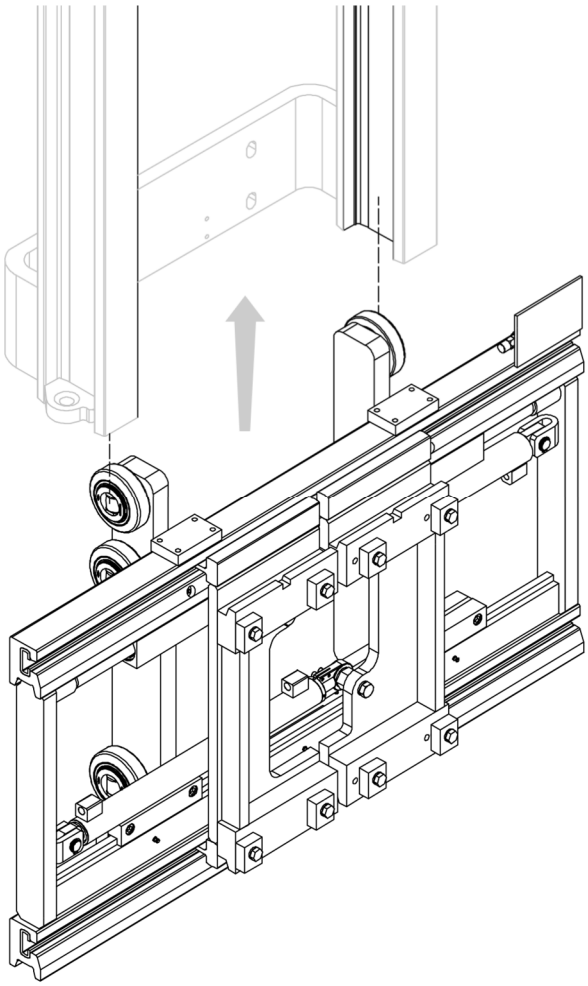


Figure 9

12. Lubricate the contact surfaces (see the *Lubrication* chapter on page *44*).

13. Install the forks (see the *Assembling the Forks* chapter on page *22*).

14. Connect the hydraulic circuit, making sure that the operating pressure of the lines is greater than or equal to that indicated on the identification plate (see *Figure 1* and *Table 1* on page *8)*.

3.1.3 Installing the Equipment - 679/688/579 - Standard/Hooked

HOOKED

1. Prior to installation, check the condition of the fork carriage, ensuring that the lower profile is smooth.
2. Also make sure that the profiles of the fork-holder plate are not deformed, in order to ensure good coupling with the equipment.
3. Check the condition of the pipes, replacing those in a poor condition.
4. Remove the lower couplings from the equipment (see *Figure 10*).

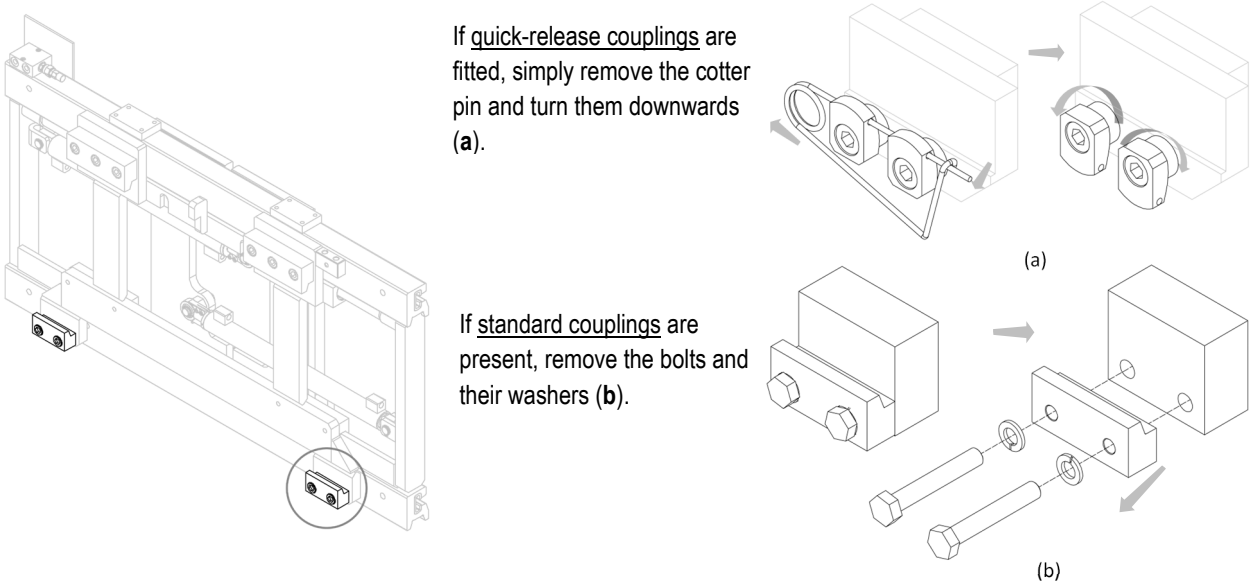


Figure 10

5. For handling, use belts or chains appropriately sized with regard to the weight of the equipment indicated on the plate (see *Figure 1* and *Table 1* on page *8*).

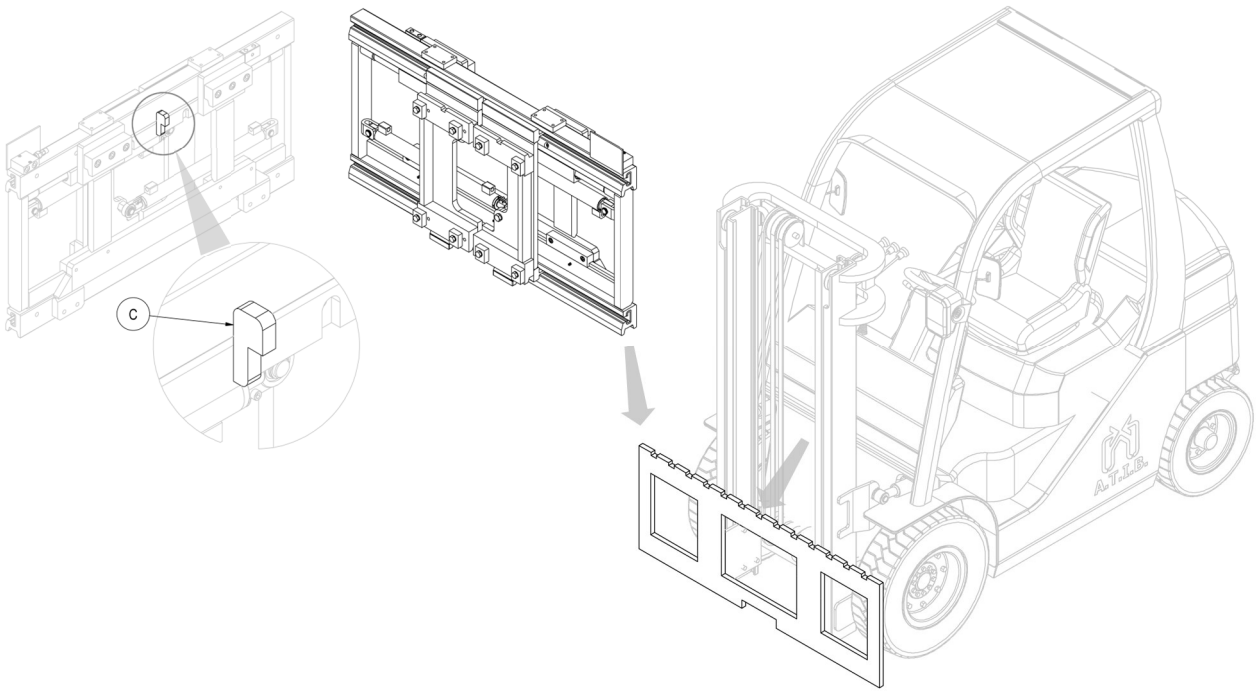


Figure 11

6. With an overhead crane or a hoist of sufficient capacity, place the equipment on the fork carriage plate, taking care to engage the centring pin **C** in its central notch (see *Figure 11*).

7. Tighten the 2 lower couplings **G** so that the body of the couplings remains coupled to the lower fork carriage plate **P** (with max. 1.5mm clearance, see detail *Figure 12*), tightening with the torque indicated in *Table 3*.

CLASS	THREAD	TIGHTENING TORQUE
ISO II	**M12**	**90 Nm**
ISO III	**M14**	**140 Nm**

Table 3

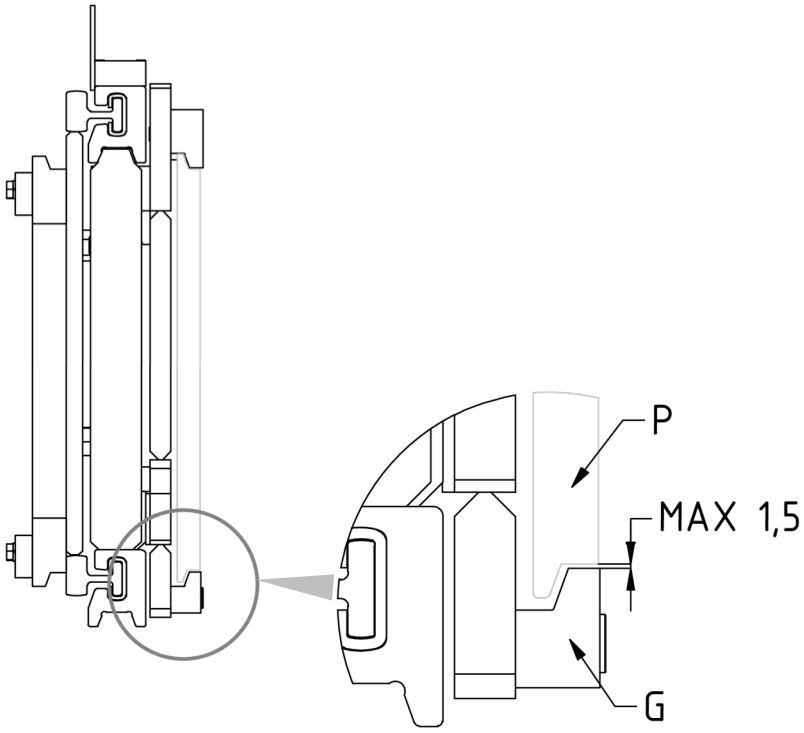


Figure 12

8. Lubricate the contact surfaces (see the *Lubrication* chapter on page *44*).

9. Install the forks (see the *Assembling the Forks* chapter on page *22*).

10. Connect the hydraulic circuit, making sure that the operating pressure of the lines is greater than or equal to that indicated on the identification plate (see *Figure 1* and *Table 1* on page *8)*.

3.2 Assembling the Forks

3.2.1 Assembling the Forks - 678/679/579 - Standard/Hooked

HOOKED

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Apply the forks after removing the relative fork stops (see *Figure 13*).

3. After installing the forks, reposition the fork stops in the most appropriate position (see *Figure 14*).

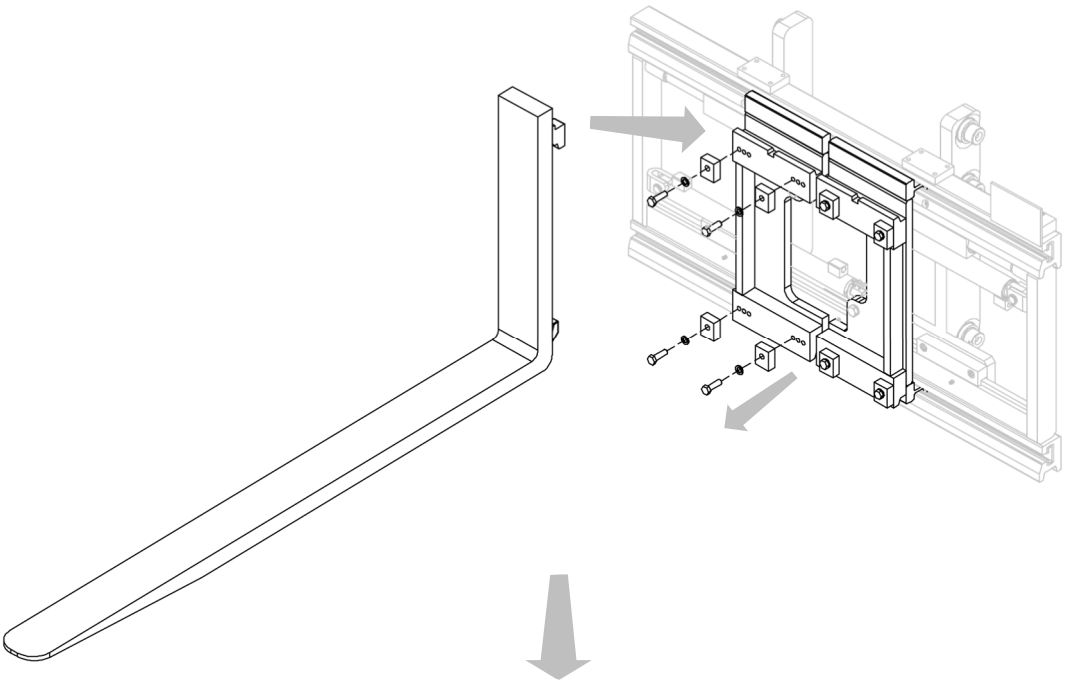


Figure 13

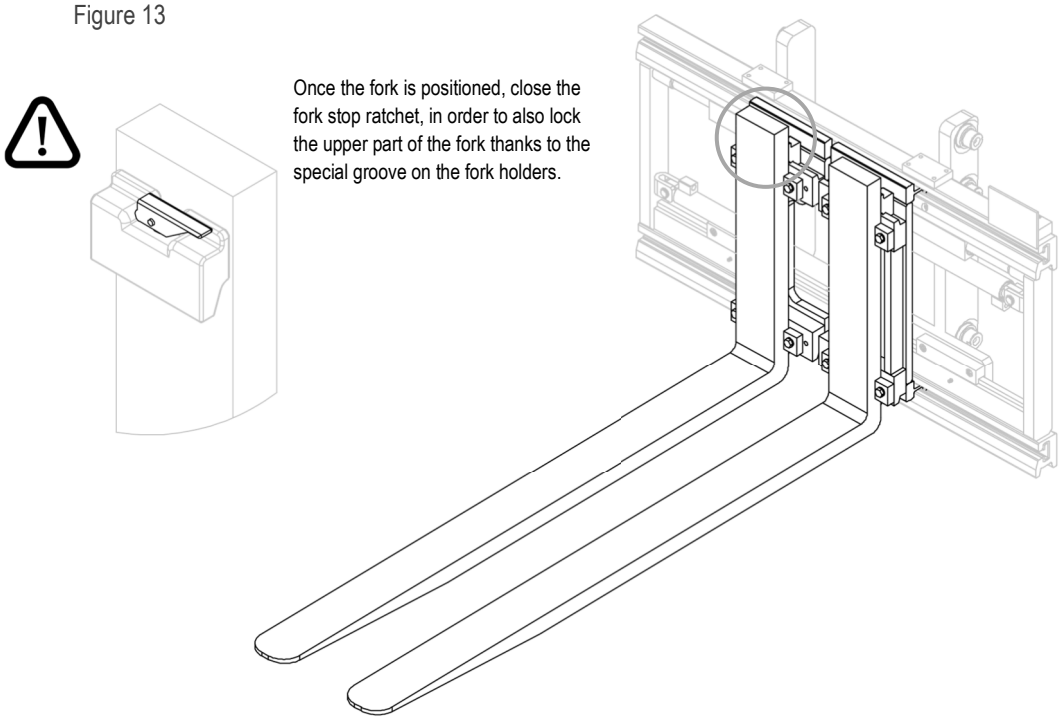


Figure 14

3.2.2 Assembling the Forks - 688/689 - Bolts

BOLTS

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Apply the forks to the plates, using the appropriate screws and washers (see *Figure 15* and *Figure 16*).

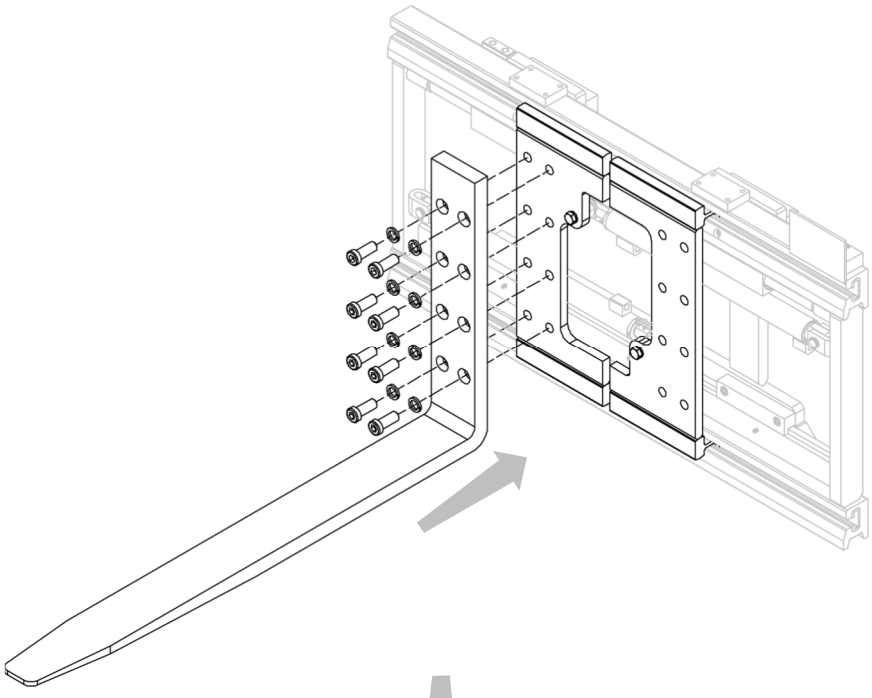


Figure 15

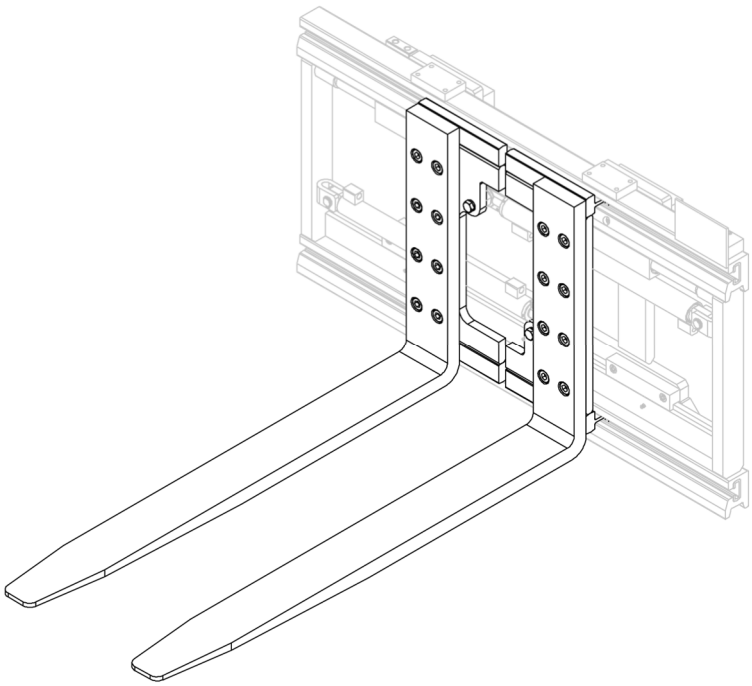


Figure 16

4 HYDRAULIC SYSTEM

4.1 Hydraulic system - Standard

STANDARD

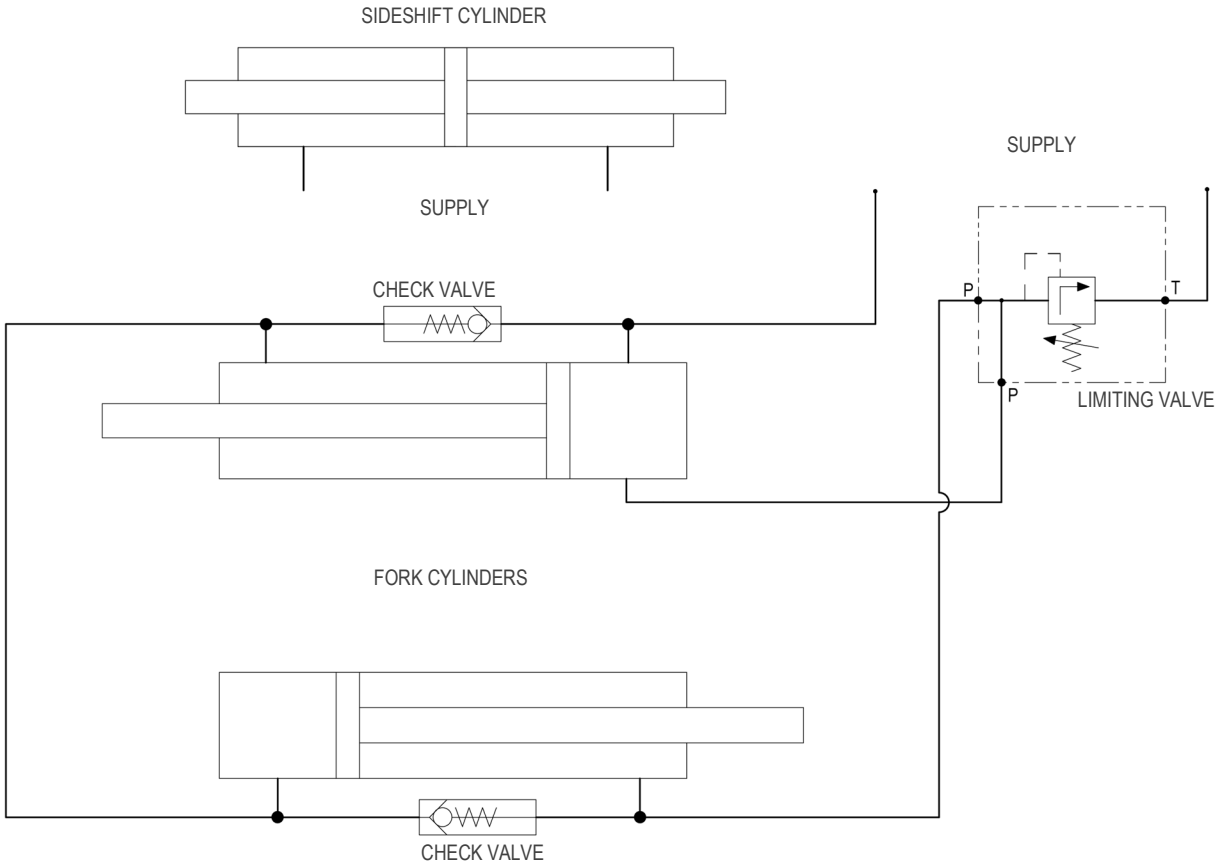


Figure 17

4.2 Hydraulic System - TYPE 579

NO SISS

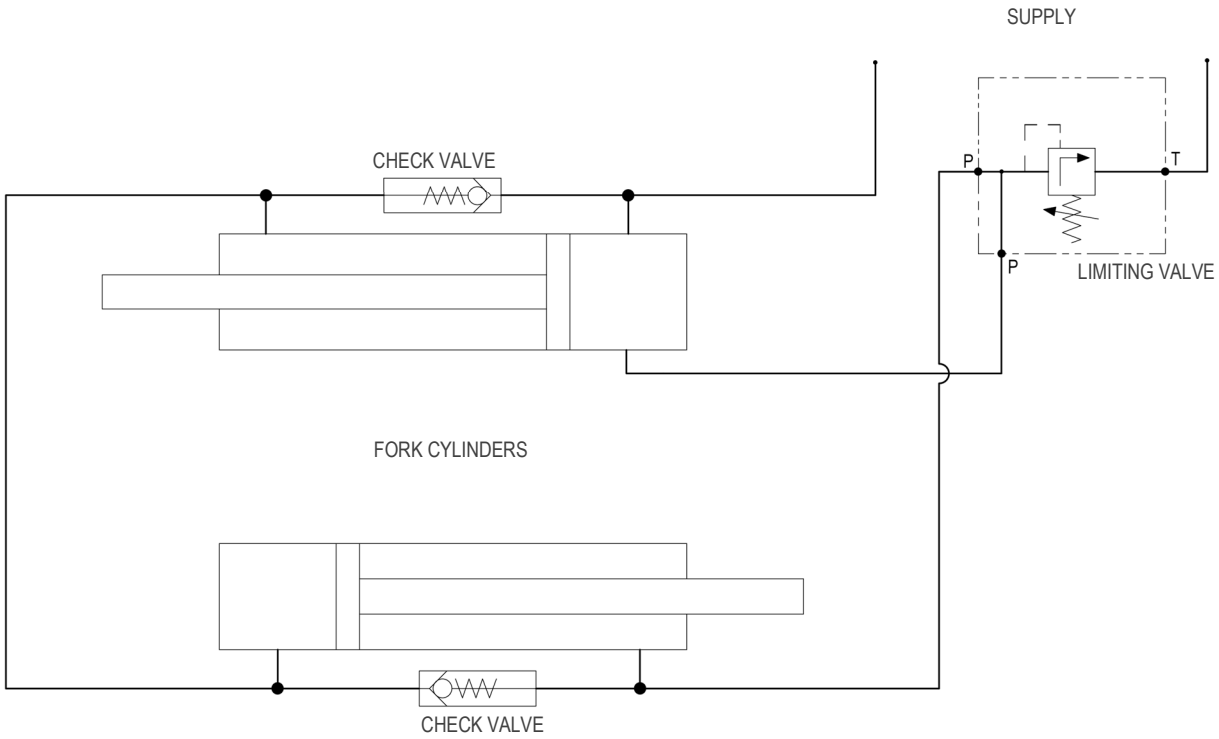


Figure 18

5 RULES GOVERNING USE

Before using the equipment, check the tightness of the piping and the correctness of assembly and also the connection by performing a dozen preliminary operations.

The following instructions must be followed when using the equipment:

1. Observe the capacity limits of the equipment.
2. Do not operate the equipment when persons or animals are within range of the forklift truck.
3. Do not attempt to move loads sideways by dragging them across the floor.
4. Do not attempt to lift loads by clamping them between the two forks.
5. Do not exceed the maximum pressure indicated on the rating plate.
6. Operate the equipment from the forklift truck driver's seat using only a single operator.
7. Operate the control lever gently, avoiding water hammer as far as possible.
8. All operations relating to installation, use and maintenance must be carried out by specialist personnel using suitable equipment for the type of work to be carried out.
9. Carry out maintenance and/or repairs with the forklift truck stationary and the hydraulic circuit inactive, using appropriate means of protection (gloves, safety shoes, etc.).
10. Only operate cylinder rods when they are correctly fitted on the equipment;
    The rods may otherwise be ejected at great speed by the elevated oil pressures.

The weighted sound pressure level is less than 70 dB (A).

If the equipment is subject to slight errors in the synchronisation of movement between the two forks, operator intervention is required to nullify the displacement differences, which will increment over time.
The operator simply needs to hold one of the two forks at the end of the opening or closing stroke for the time required for the other fork to recoup the accumulated difference in displacement.

All A.T.I.B. equipment is designed and manufactured with a load positioned (with respect to its centre of gravity) at a certain distance from the vertical plane of the fork.

If the distance of the centre of gravity from the vertical part of the fork needs to be increased, the weight of the load must be reduced.
In this case, consult the chart shown in *Figure 19*, where, as the distance from the centre of gravity increases (x-axis line), a multiplicative factor is included for load reduction purposes (y-axis line).

The multiplicative factor, obtained on the basis of the desired centre of gravity position, will be multiplied with the nominal capacity of the equipment. The product of this multiplication will be the actual transportable load.

The continuous line is to be considered for equipment declared with a 500mm centre of gravity load.
The dashed line is to be used for equipment declared with a 600mm centre of gravity load.

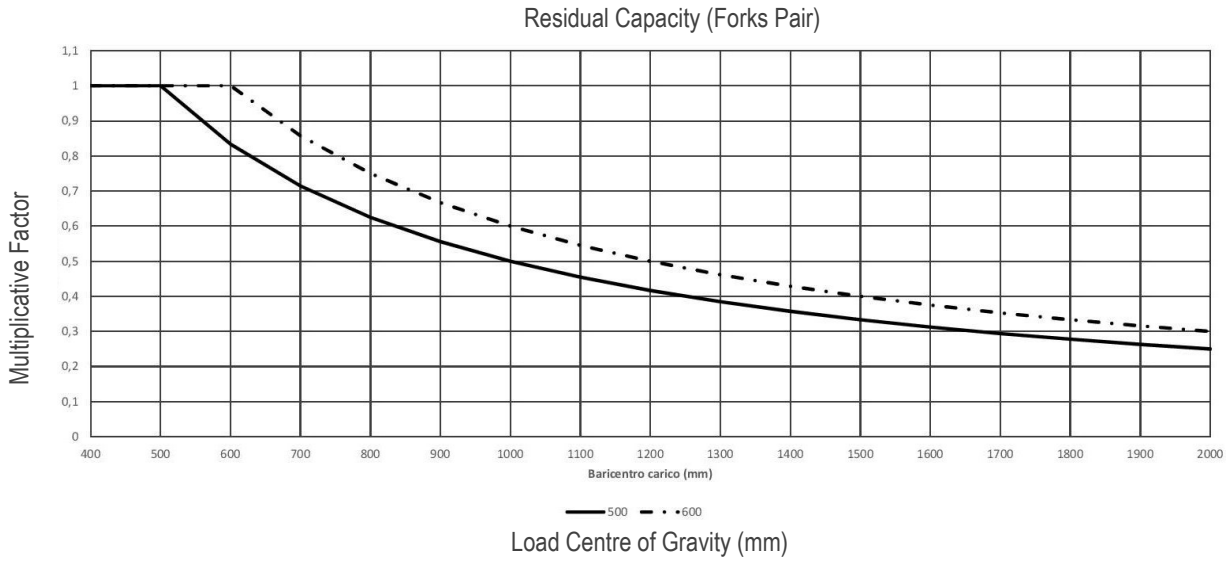


Figure 19

NOTE: calculations are valid only for "stable" loads. Contact the manufacturer for transporting liquid containers.

The attainable sideshift may compromise the stability of the forklift truck.

It is advisable to consult the manufacturer of the forklift truck to check the residual capacity of the forklift truck-equipment assembly.

The condition of the road surface, the speed at which the load is handled and the elevation may all affect the load's grip, which must be taken into account on a case-by-case basis.

Displacing the load whilst in motion is prohibited.
Handling the load with the mast raised off the ground is only permitted when returning the load to the centre of the mast.

The nominal capacity of the forklift truck/equipment combination is established by the original manufacturer of the forklift truck and may be less than that indicated on the equipment plate.

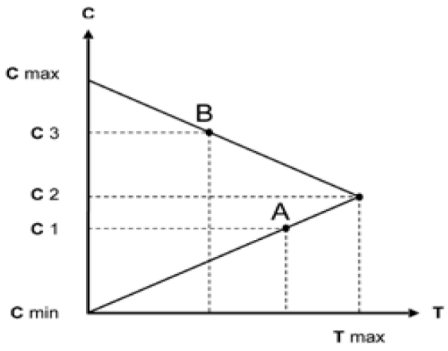
Consult forklift truck plate (Directive 2006/42/EC).

5.1 Integral Sideshift

This is the most frequently used in the "FORK POSITIONER TYPE 678 | 679 | 688 | 689 | 579" and uses the same cylinders that shift the forks. The stroke depends on the opening and will be equal to zero in maximum opening and minimum closing. **Since the stroke of the equipment may be higher than that defined by the stability regulations of forklift trucks (100 + 100 mm up to 6300 kg capacity and 150 +150 mm for higher capacities) and can, therefore, generate issues regarding lateral stability and premature wear of the upright profiles, it will be necessary to check feasibility with the forklift truck manufacturer.**

Sideshift with a given load will be the minimum between the following two values:

1. Maximum opening (A max) less load width (Lc) divided by two. [(A max – Lc) / 2]
2. Load width (Lc) less minimum opening (A min) divided by two. [(Lc – A min) / 2]



T	Sideshift	A = (C 1 - C min) / 2
C	Measurement Range	B = (C max - C 3) / 2
A	Position Before Mid-Opening	T max = (C max - C min) / 4
B	Position After Mid-Opening	C2 = (C max + C min) / 2

Figure 20

Off-centre sideshift of the load is only permitted on the ground. In this case, a loss of clamping force may occur, which may result in load loss. As a precaution, the centre of gravity of the equipment can be assumed to move laterally by the value of the sideshift (per side). If the precise value is required, consult the manufacturer of the equipment.

5.2 Handling Loads

The minimum transportable dimensions must be greater than the minimum grip. Depending on the load to be transported, this difference may vary and must be evaluated on a case by case basis by the operator.

Avoid handling and/or sideshift of the forklift truck/equipment with a load that is excessively high off the ground, as this may affect its stability.

Avoid displacing/handling unstable loads.

Avoid displacing/handling loads with an uncentred centre of gravity.

6 PERIODIC MAINTENANCE

Failure to comply with the rules and intervals established for maintenance will compromise the correct operation of the equipment and will void the conditions of the warranty.

All maintenance operations must be carried out with the forklift truck stationary and the hydraulic circuit disconnected and depressurised. The entire maintenance area must be barricaded using regulation protection devices and, if the cylinders require disassembly, a tray or container must be provided to catch the oil present in the cylinder.

To prevent issues when using the equipment, A.T.I.B. recommends changing the hydraulic oil and filters regularly and keeping the system as clean as possible during maintenance operations.

⚠ ATTENTION ⚠

Hydraulic parts may be very hot. Use suitable protective equipment.
Watch out for leakage. High-pressure oil can injure eyes and skin. Wear protective eyewear that includes side shields.
Do not remove valves, lines or other potentially pressurised parts when this is active.

6.1 Maintenance Every 100 Hours

1. Check the condition of the hydraulic connections (lines and fittings), replacing worn parts if necessary.
2. Check the tightening torque of the bolts of the lower retaining hooks of the equipment, ensuring that it is as indicated in *Table 3* (page *21*) and, if necessary, adjust the bolts holding them in place.
3. Check the clearance between the lower part of the fork carriage plate and the lower equipment couplings, checking that it is as shown in *Figure 12* (page *21*) and, if necessary, tighten the screws that support them.
4. Clean and lubricate all sliding parts (see *Figure 34 and Figure 35* on page *44*).

6.2 Maintenance Every 300 Hours

1. Check the condition of the bushes and sliding gibs (see chapter *7.6.1* on page *41*), and, if an excessively worn component is found, A.T.I.B. recommends replacing the entire assembly of the component in question.
2. Carry out the additional operations listed in the previous point (*Point 6.1*).

6.3 Maintenance Every 1000 Hours

1. Check the condition of the bushes and sliding gibs (see chapter *7.6.1* on page *41*), and, if an excessively worn component is found, A.T.I.B. recommends replacing the entire assembly of the component in question.
2. Check the state of wear of the bracket bearings.
3. Carry out the additional operations listed in the previous points (Points *6.1* and *6.2* on page *31*).

6.4 Maintenance Every 2000 Hours

1. Carry out a thorough inspection of the equipment. If possible, this should be carried out by qualified personnel who are able to identify any issues that may compromise the safety and efficiency of the equipment. There may be a number of defects, such as the following:

   - Check condition of all equipment components (cylinders, couplings, seals, fittings, grease nipples, etc.) to ensure that they are in good condition and replace any worn parts.

   Check for any breaks/cracks at the welded joints and, if any damaged components are found, contact A.T.I.B.

   - Check condition of sliding and working surfaces and replace if damaged.

   For further possible problems (and related solutions) refer to *Table 4* on page *43*.
2. Dismantle cylinders and check condition of piston rods and seals. If a damaged or excessively worn seal is detected, A.T.I.B. recommends replacing the entire seal assembly.
3. Replace seals in the event of oil leakage and replace rods if they are scratched (cylinders should always be tested when inserted into the equipment to prevent sudden ejection of rods).
4. Carry out the additional operations listed in the previous points (*Points 6.1*, *6.2* and *6.3)*

N.B. Reduce intervals in the event of use under particularly harsh conditions

7 DISASSEMBLY PROCEDURE

All maintenance operations must be carried out with the forklift truck stationary and the hydraulic circuit disconnected and depressurised. The entire maintenance area must be barricaded using regulation protection devices and, if the cylinders require disassembly, a tray or container must be provided to catch the oil present in the cylinder.

7.1 Removing the Equipment from the Forklift Truck

7.1.1 Removing the Equipment - 678/689 - With Brackets

WITH BRACKETS

1. Position the equipment so as to loosen the chains supporting the equipment.
2. Release the pressure from the hydraulic system and disconnect the lines.
3. Remove the chains from their brackets.
4. Remove the equipment and remove it from the mast.

7.1.2 Removing the Equipment - 679/688/579 - Standard/Hooked

HOOKED

1. Release the pressure from the hydraulic system.
2. Remove the lower couplings from the structure (see *Figure 10* on page *19)*.
3. For handling, use straps/chains that are suitably sized in relation to the weight of the equipment as indicated on the plate.
4. Then lift the equipment with an overhead crane or hoist of sufficient capacity and remove it from the forklift (see *Figure 11* on page *20*).

7.2 Disassembling the forks

7.2.1 Disassembling the Forks - 678/679/579 - Standard/Hooked

HOOKED

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the forks after removing the relative fork stops (see *Figure 21* and *Figure 22*).

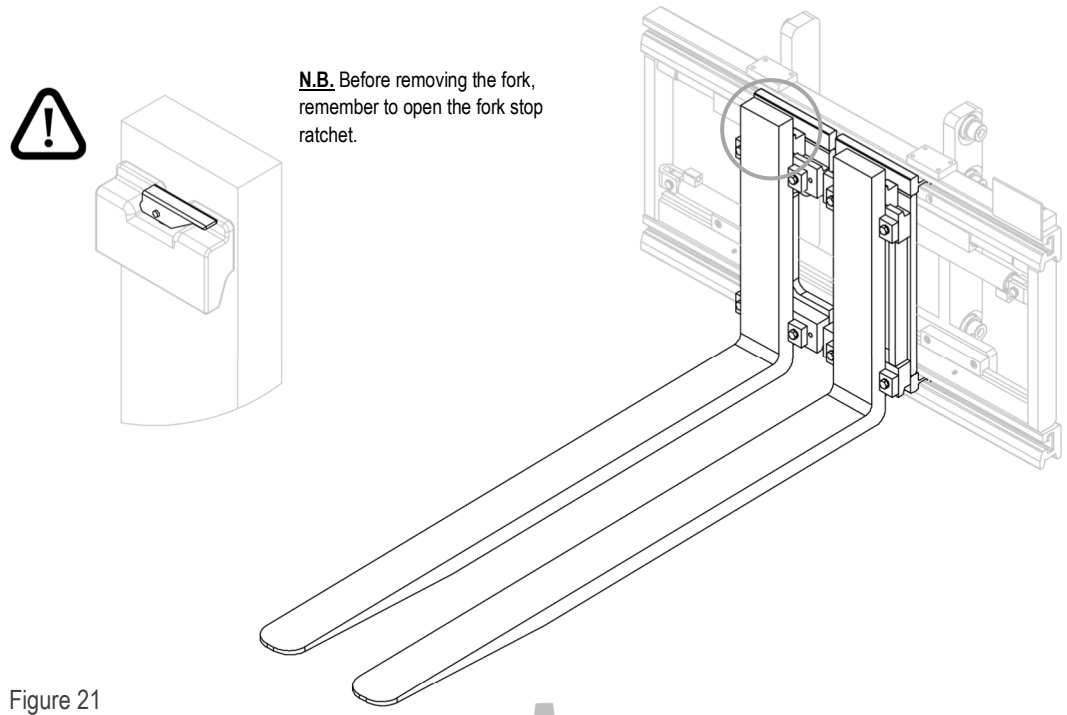


Figure 21

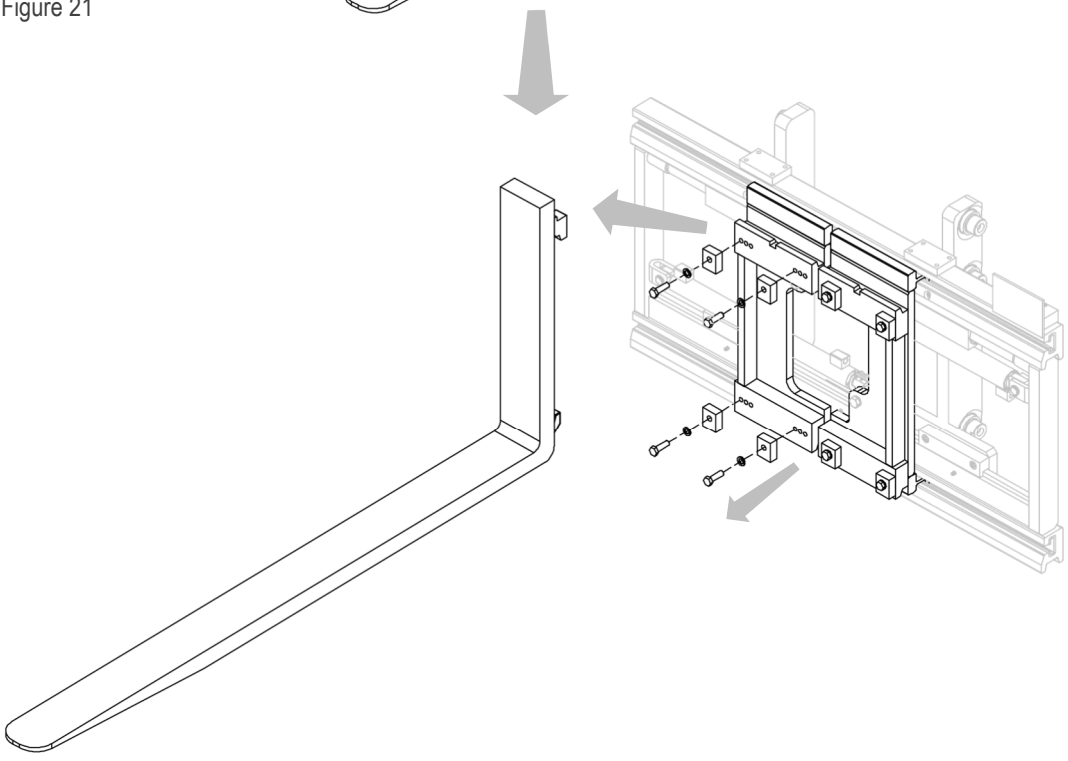


Figure 22

7.2.2 Disassembling the Forks - 688/689 - Bolts

BOLTS

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the forks from the plates, after removing the relative screws and washers that hold them (see *Figure 23* and *Figure 24*).

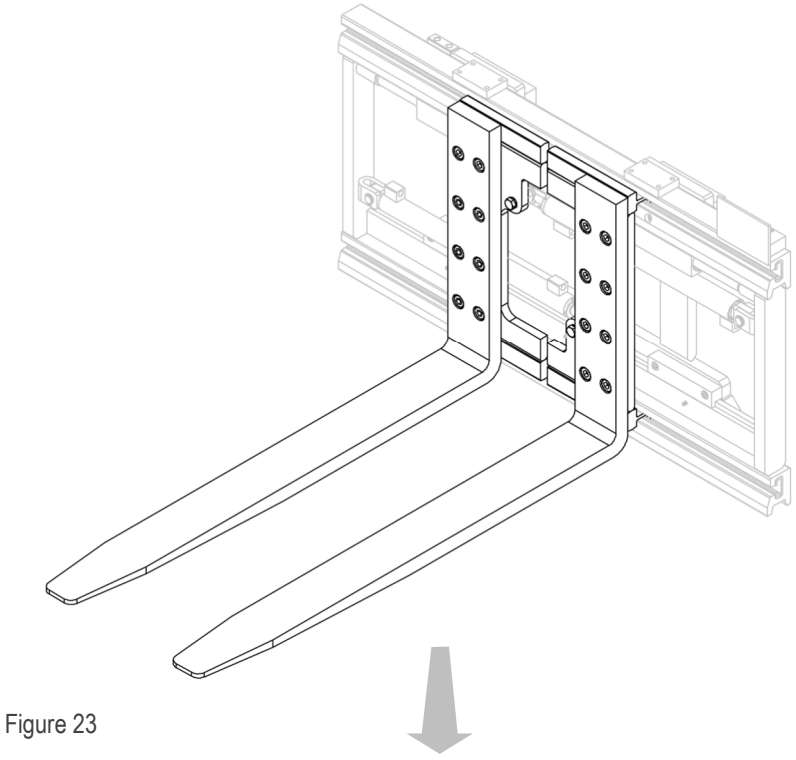


Figure 23

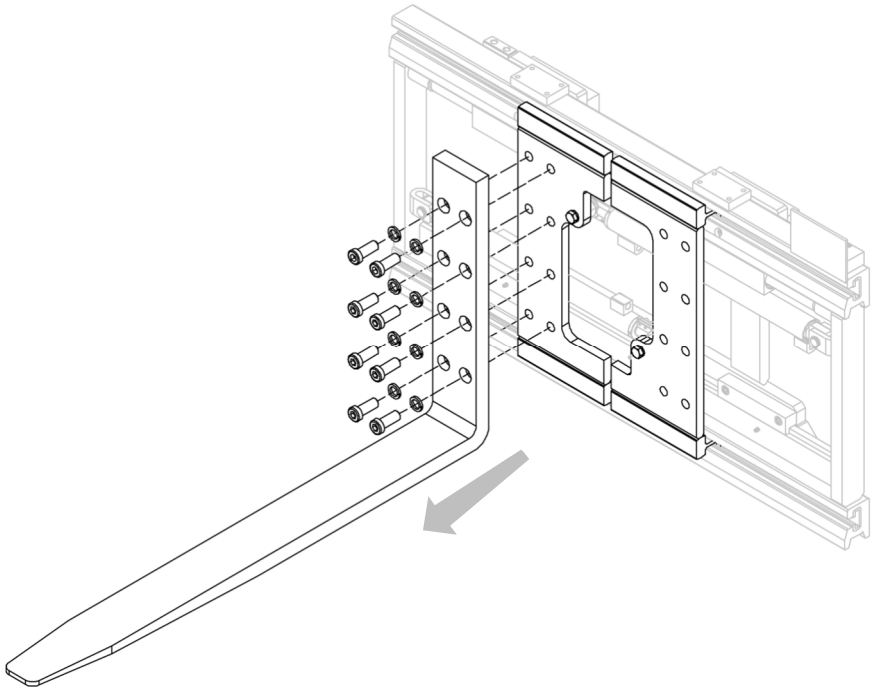


Figure 24

7.3 Disassembly the Fork Holders

FORK HOLDERS

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the fork holders after removing the pins and screws that hold them to the cylinders (see *Figure 25* and *Figure 26*).

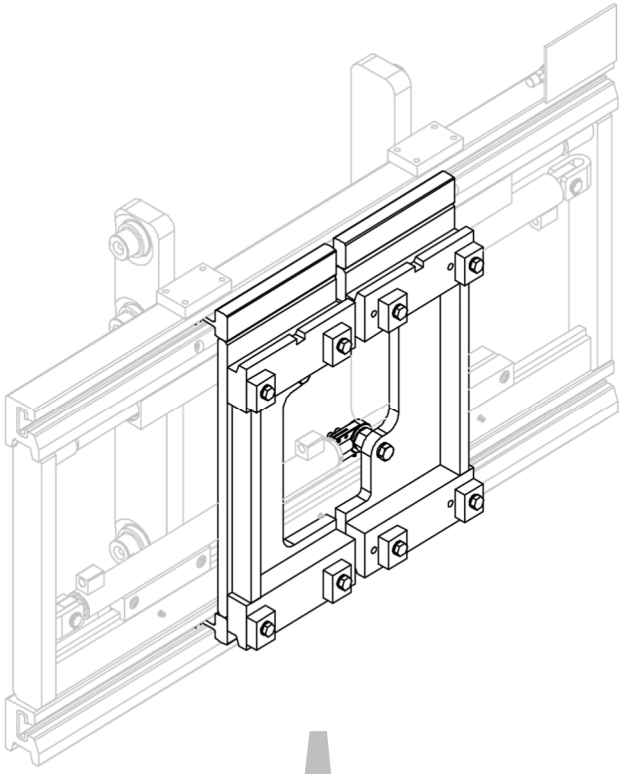


Figure 25

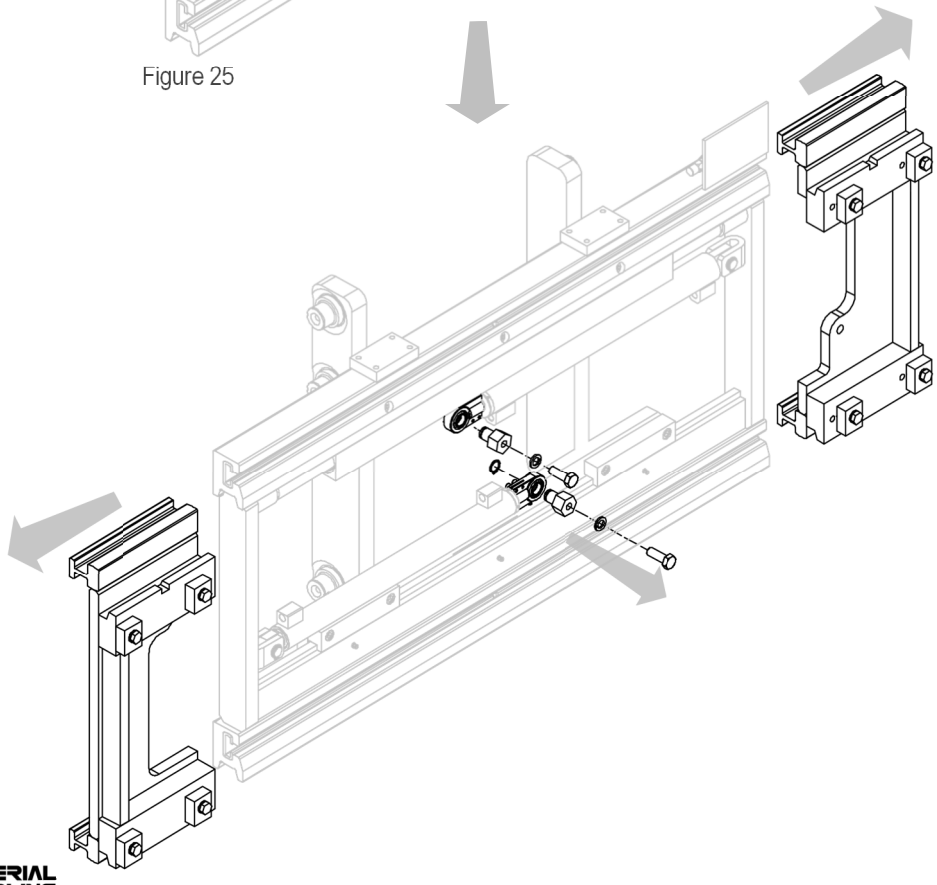


Figure 26

7.4 Disassembling the Brass Bushes

BRASS BUSHES

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the fork holders from the equipment, as explained in the previous chapter.

3. Remove the brass bushes after unscrewing the relative screws (see *Figure 27* and *Figure 28*).

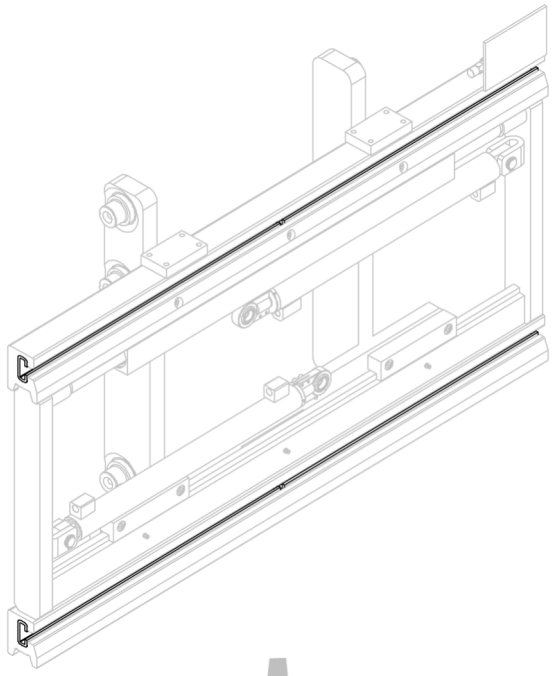


Figure 27

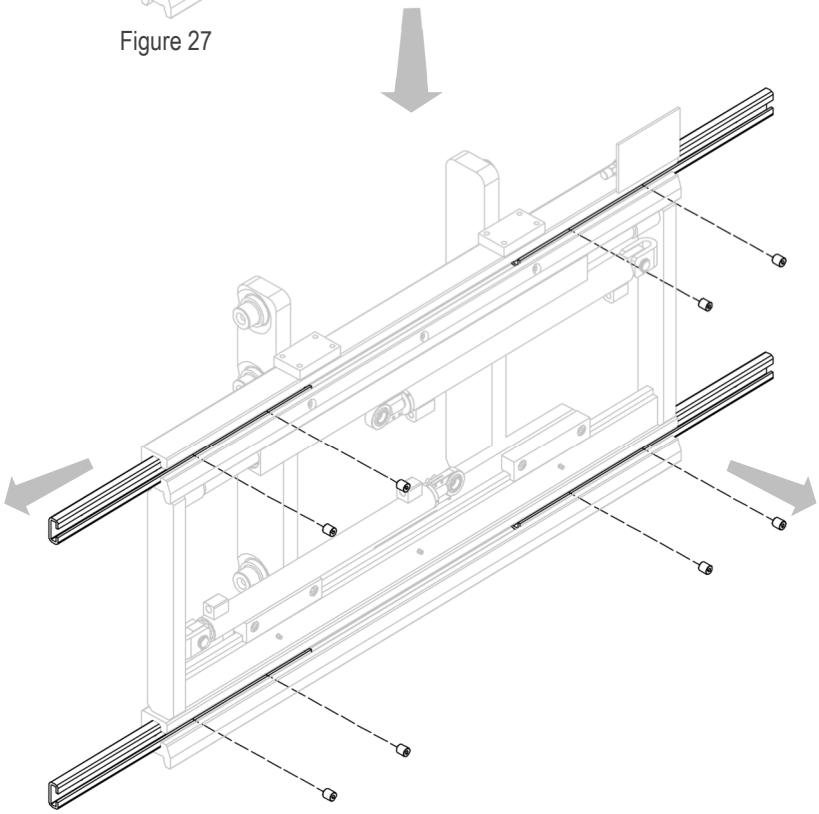


Figure 28

7.5 Removing the Fork Cylinders from the Equipment

FORK CYLINDERS

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the fork holders as explained in the *Disassembling the Fork Holders* chapter on page *36*.

3. Remove, one at a time, the cylinders after removing the relative pins and snap rings that constrain hold to the structure of the equipment (see *Figure 29*).

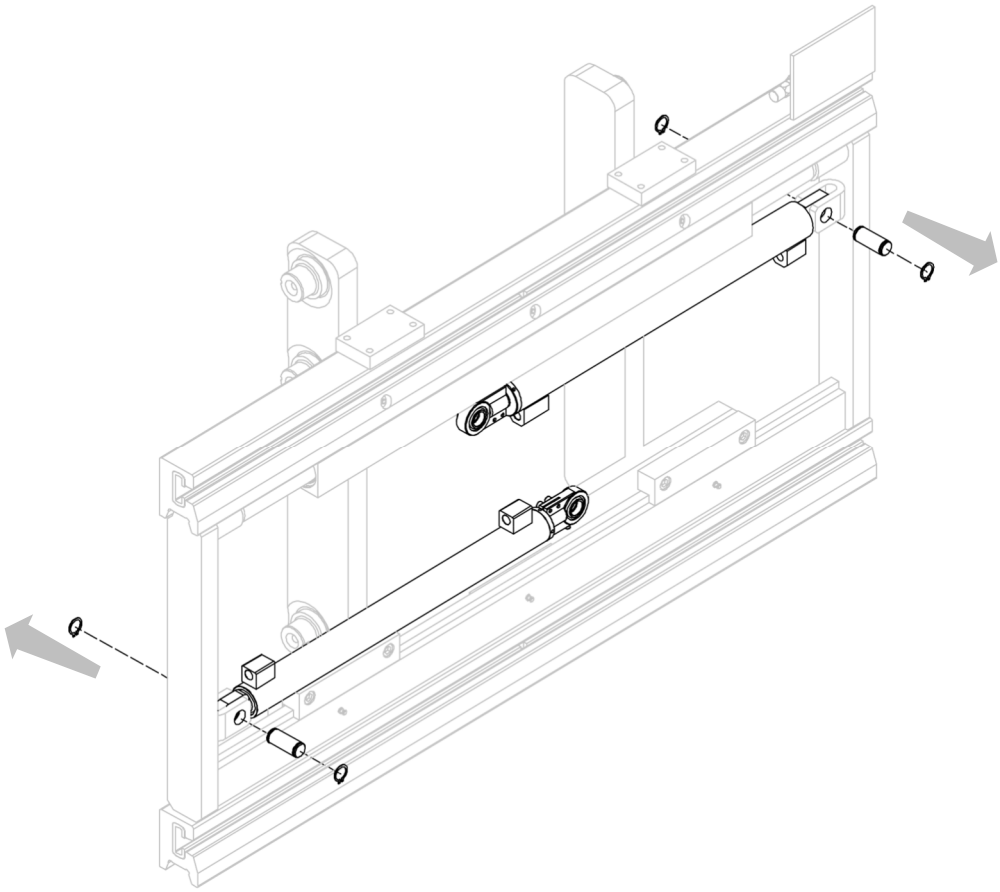


Figure 29

7.5.1 Disassembling and Reassembling the Cylinders

If the entire cylinder needs to be replaced, reassemble following the instructions listed in the previous point. If any cylinder components need to be replaced, proceed as indicated below:

1. Clamp the cylinder body in a vice using soft jaws (taking care not to deform the liner).
2. Remove the joint at the cylinder head after loosening the relative screws.
3. Use a C-hook spanner to remove cap **T**.
4. If the cap will not unscrew, slightly heat the area of the thread in question to facilitate unscrewing.
5. Unscrew rod **C**.
6. Disassemble/separate the rest of the components and seals (this will be easy and rather intuitive at this stage).
7. Replace damaged parts and reassemble by repeating the above steps in reverse order, taking care to relock the cylinder cap using medium strength threadlocker.
8. If a damaged seal is found, A.T.I.B. recommends replacing the entire seal assembly.
9. For reference, see *Figure 30*.

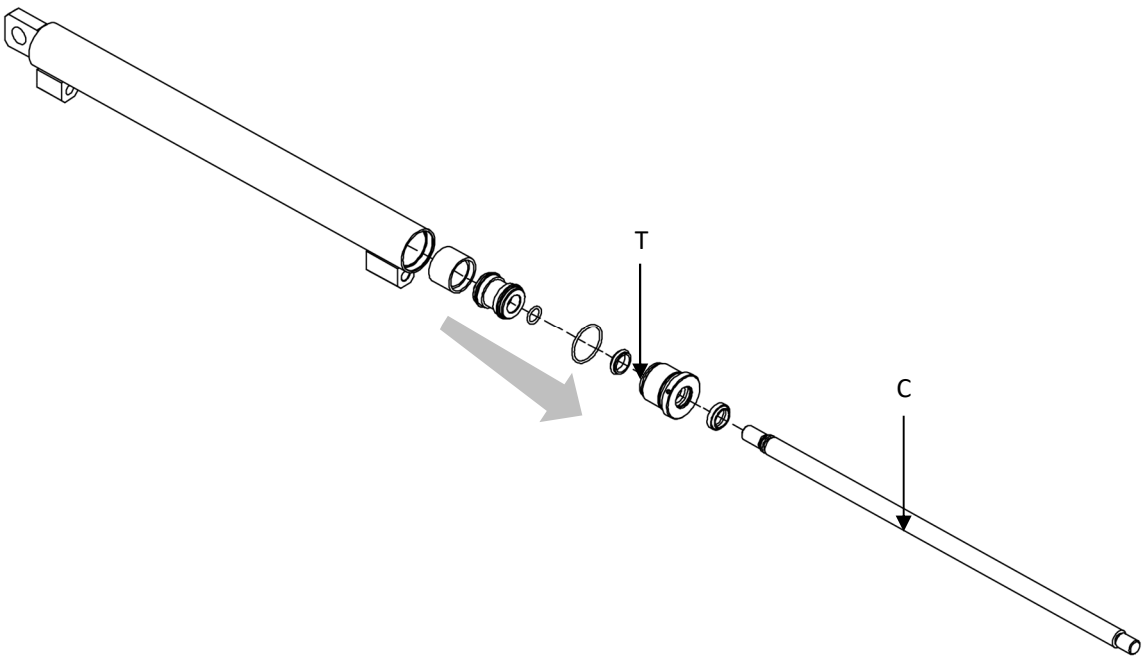


Figure 30

7.6 Disassembling the Front Sliding Structure

FRONT STRUCTURE

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove the lower couplings that hold the front structure to the rear one (see *Figure 31*).

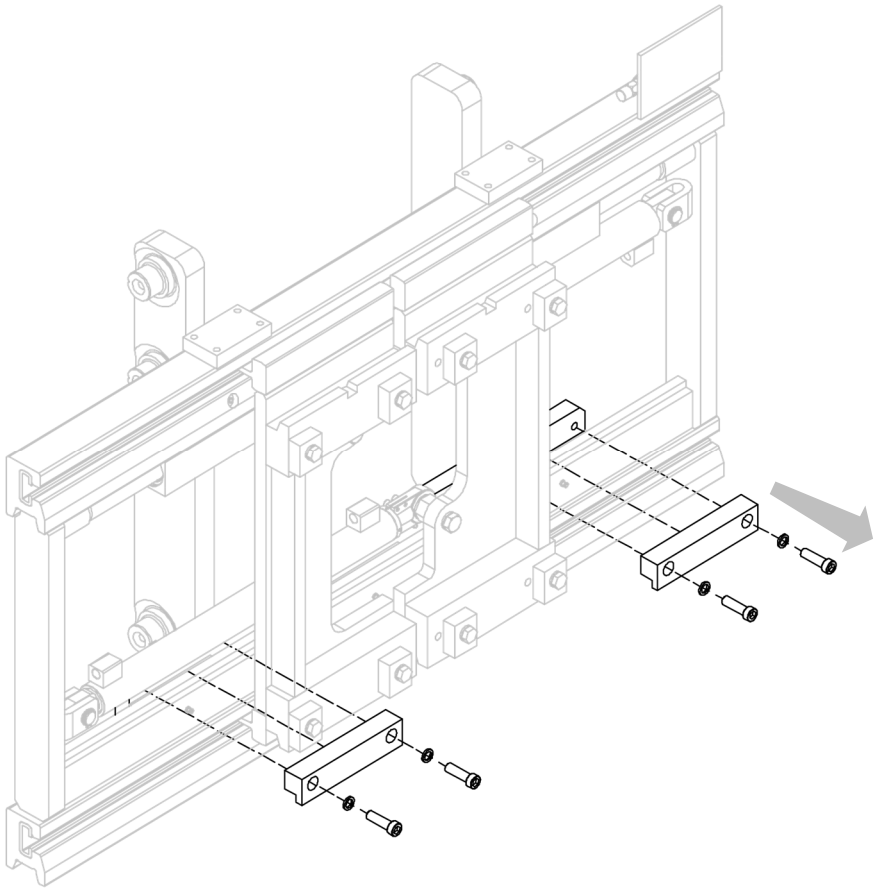


Figure 31

3. Remove the front sliding structure by lifting it properly (see *Figure 32*).

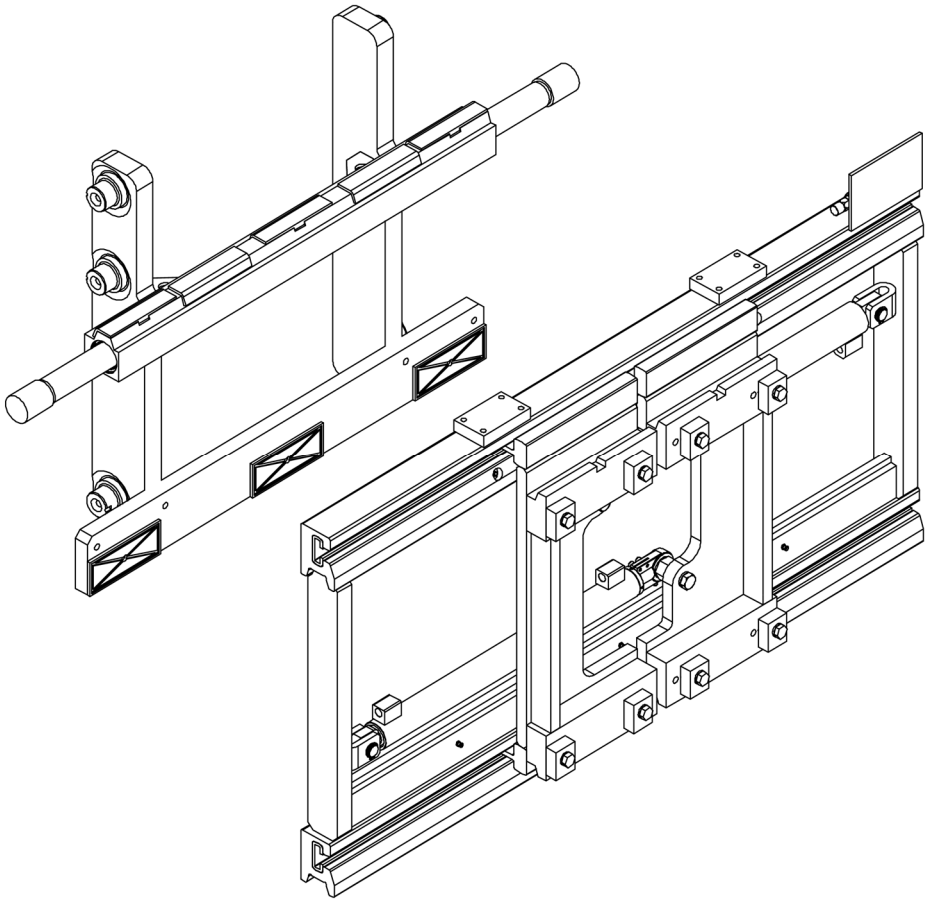


Figure 32

7.6.1 Disassembling the Nylon Bushes and Gibs

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Remove/separate the front structure from the rear one as explained in the previous chapter.
3. At this point, check the state of wear of the components in question and replace them if necessary.

7.7 Disassembling the Sideshift Cylinder

SIDESHIFT CYLINDER

1. Release the pressure from the hydraulic system and disconnect the lines.

2. Remove/separate the front structure from the rear one as explained in chapter *7.6* on page *40*.

3. Remove the snap rings that block the rods.

4. At this point, remove the rods and their caps from their seat.

5. Replace damaged parts and reassemble by repeating the above steps in reverse order.

6. If a damaged seal is found, A.T.I.B. recommends replacing the entire seal assembly.

7. For reference, see *Figure 33*.

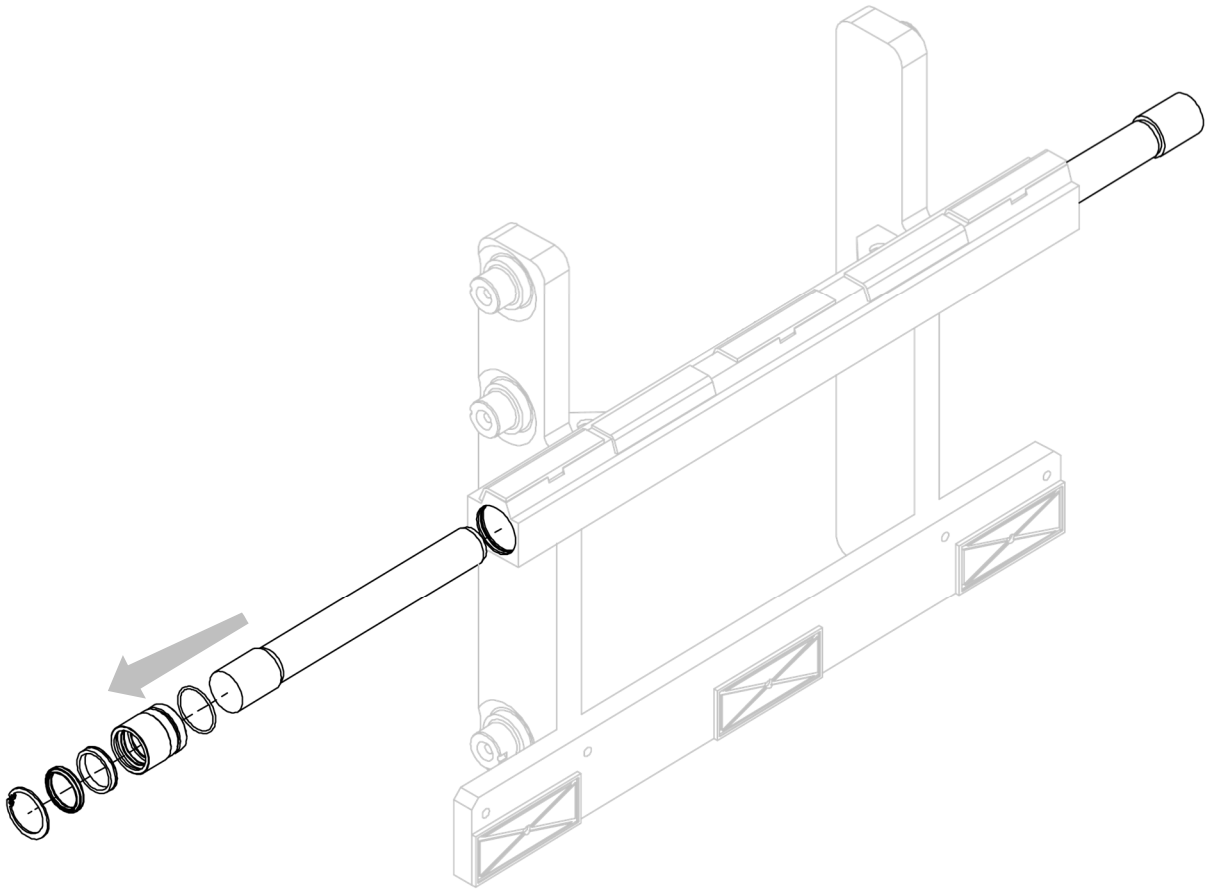


Figure 33

8 TROUBLESHOOTING

8.1 Probable Faults and Solutions

FAULT	CAUSE	SOLUTION
Insufficient force	Calibration of the maximum pressure valve too low	Increase the pressure without exceeding the maximum limit
	Insufficient pressure	Contact the forklift truck manufacturer
	Worn pump	Replace it
	Worn cylinder seals	Replace them
	No oil in the tank	Fill up
Pressure drop	Oil leakage through pipes and fittings	Tighten the fittings or replace them
	Oil leakage from the cylinders	Replace the seals or, if necessary, the cylinders
	Load loss in sideshift	Lower sideshift pressure
	Load loss	Check fork camber
Slow opening and closing	Low oil flow rate	Check the tank level and/or the pump
		Constrictions in the system: search for them and remove them
	Insufficient pressure	Adjust the calibration of the maximum pressure valve
	Mechanical deformations of some parts	Repair or replace
	Worn cylinder seals	Replace them
	No oil in the tank	Fill up
Erratic displacement	Air in hydraulic system	Purge system
	Worn sliding gibs	Replace
	Worn out sliding bushing	Replace them
	Excessive friction between sliding parts	Clean and grease sliding parts
	Worn cylinder seals	Replace them
	No oil in the tank	Fill up

Table 4

For further issues, contact A.T.I.B. S.r.l.

8.2 Lubrication

1. Lubricate sliding components using grease nipples.
2. Lubricate the gibs and sliding surfaces (bushes, etc.).

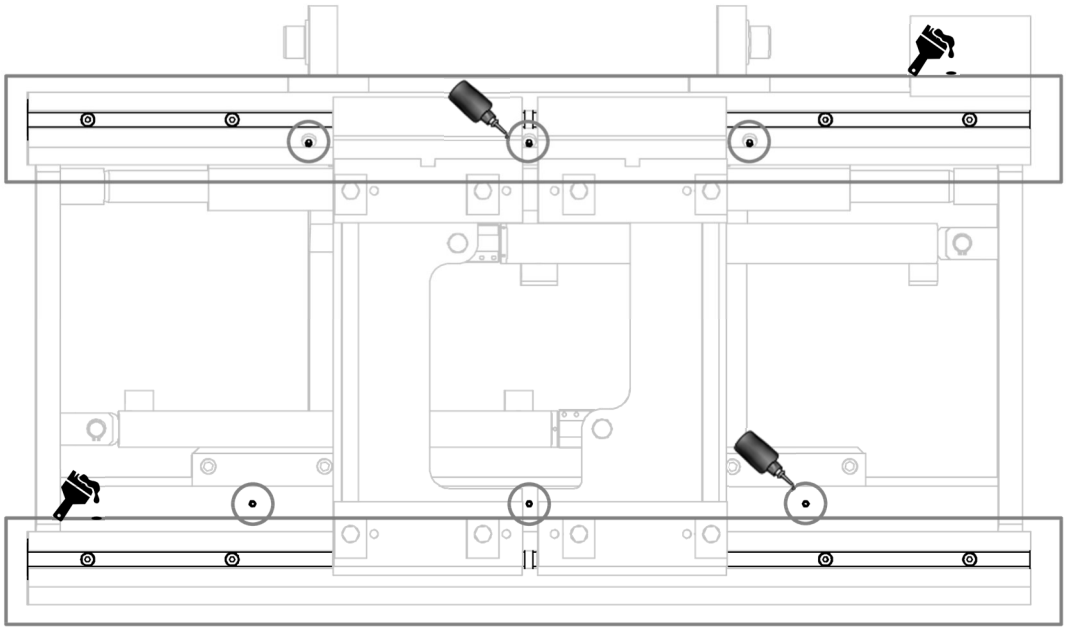


Figure 34

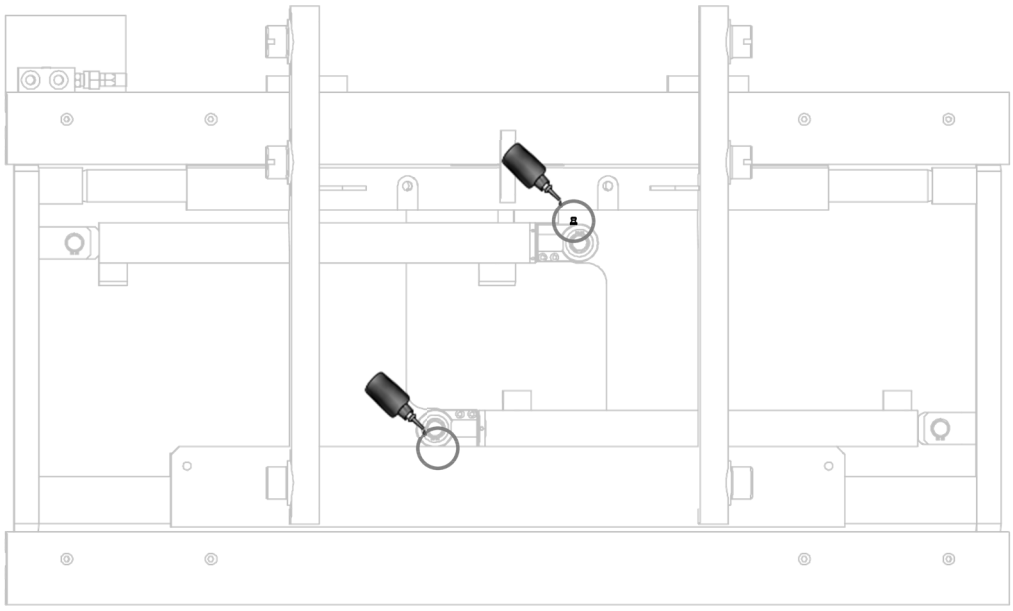


Figure 35

MADE IN ITALY

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