ATiB MATERIAL HANDLING

USE AND MAINTENANCE MANUAL

CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES

TYPE 474.180 - 181

TABLE OF CONTENTS

CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES TYPE 474.180 - 181

⚠ ATTENTION ⚠

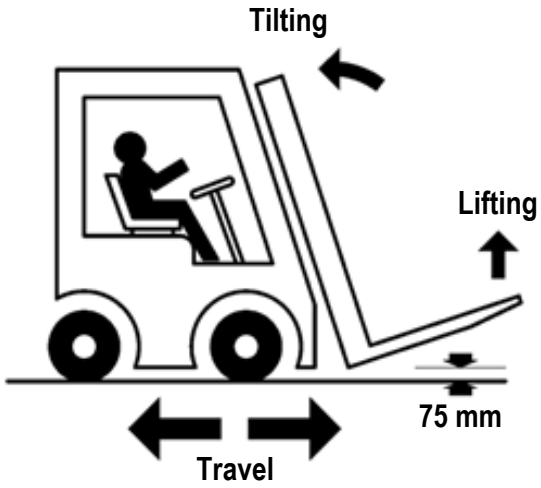
READ THIS USE AND MAINTENANCE MANUAL CAREFULLY BEFORE COMMISSIONING THE MACHINE

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. - CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES TYPE 474.180 - 181 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.

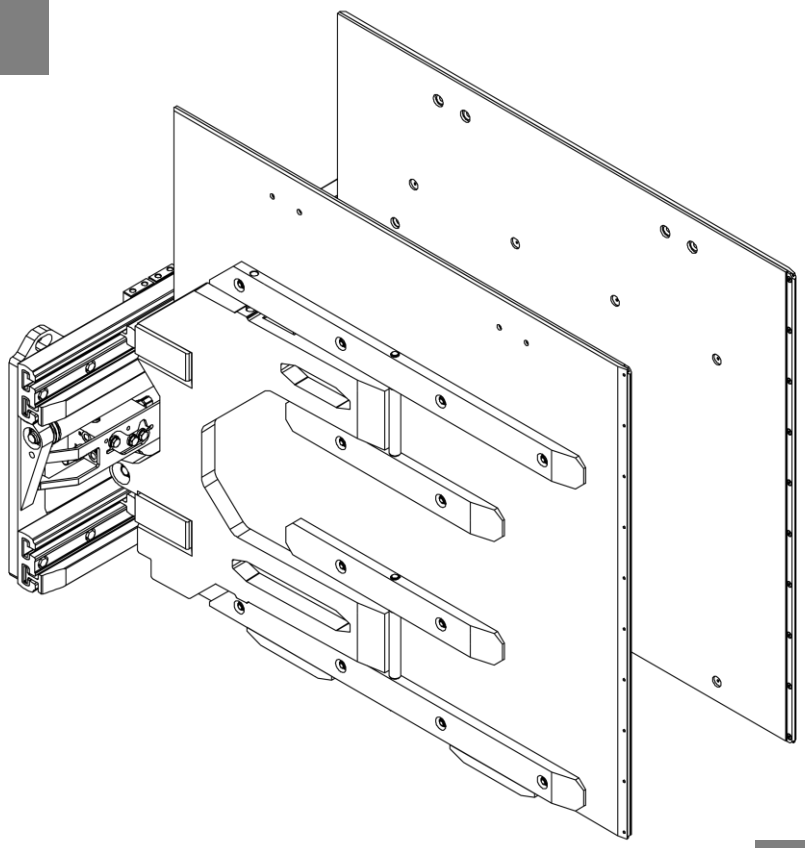
The manufacturer is exempted from any responsibility in the event of:

- 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.

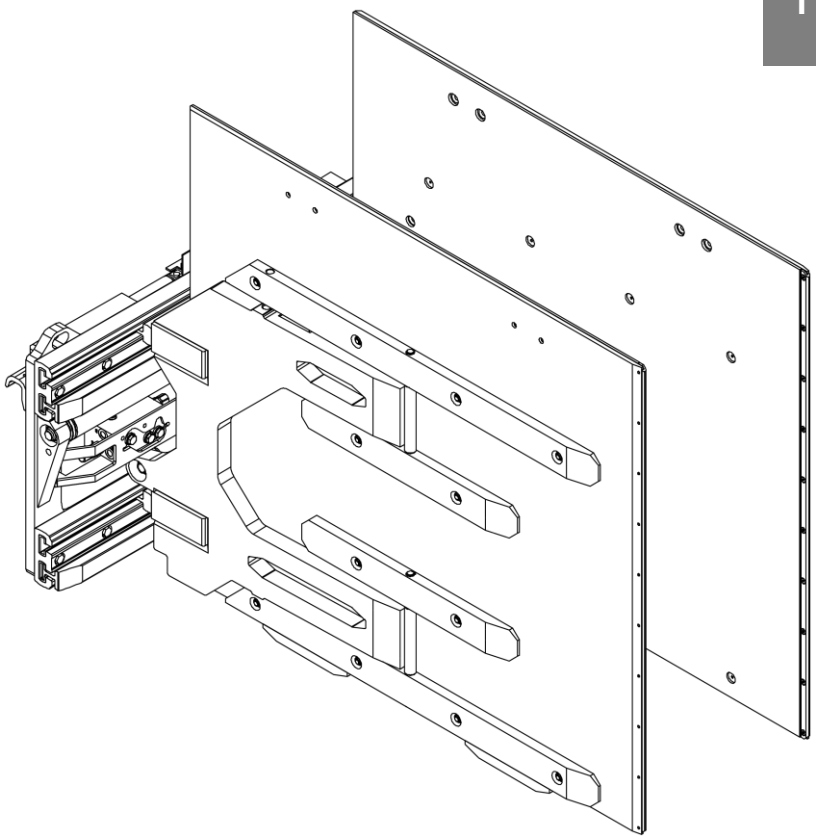
The nominal capacity of the forklift truck/equipment combination has been set by the original manufacturer of the forklift truck and may be less than that indicated on the equipment plate.
Consult forklift truck plate (Directive 2006/42/EC).

2.2 Equipment Description

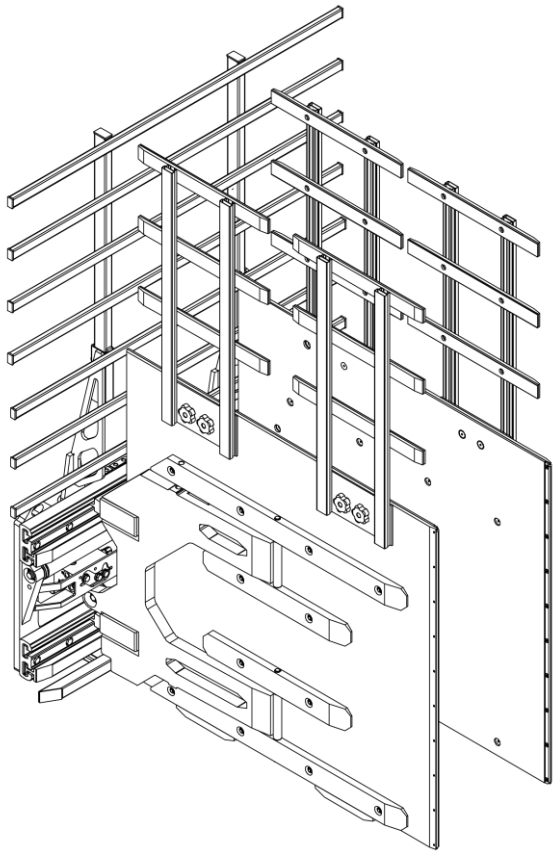
TYPE 474.12.180



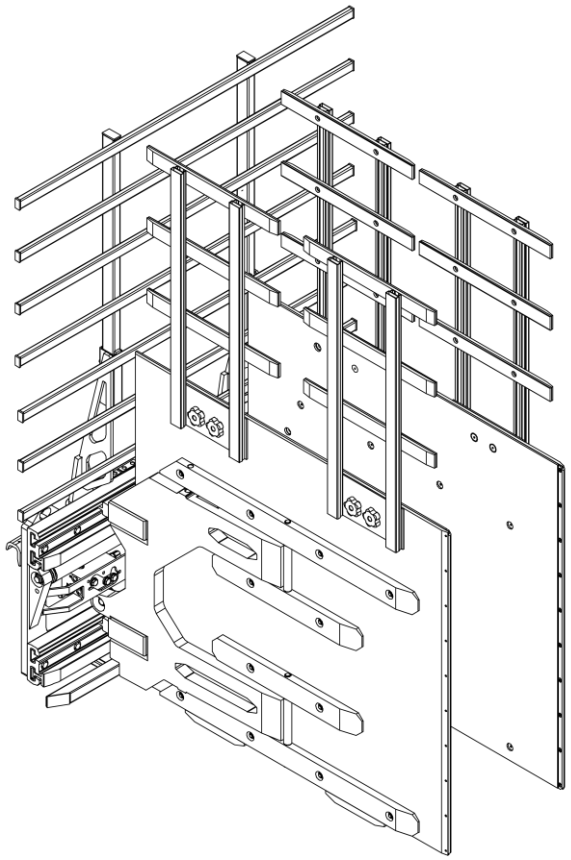
TYPE 474.12.180 SISS



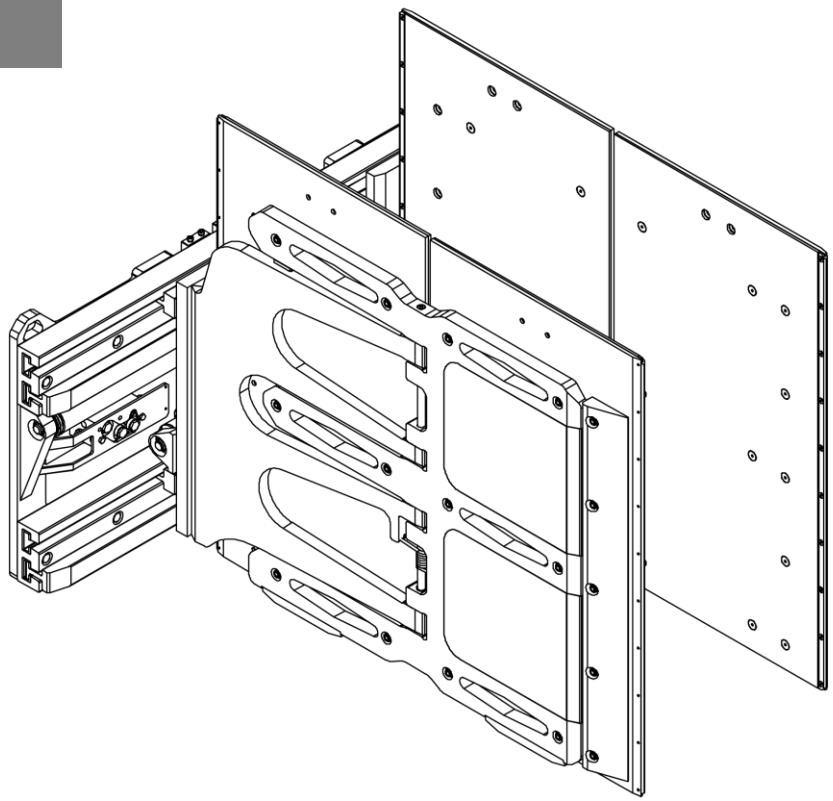
TYPE 474.12.180 WITH LOAD-RETAINING FRAMES



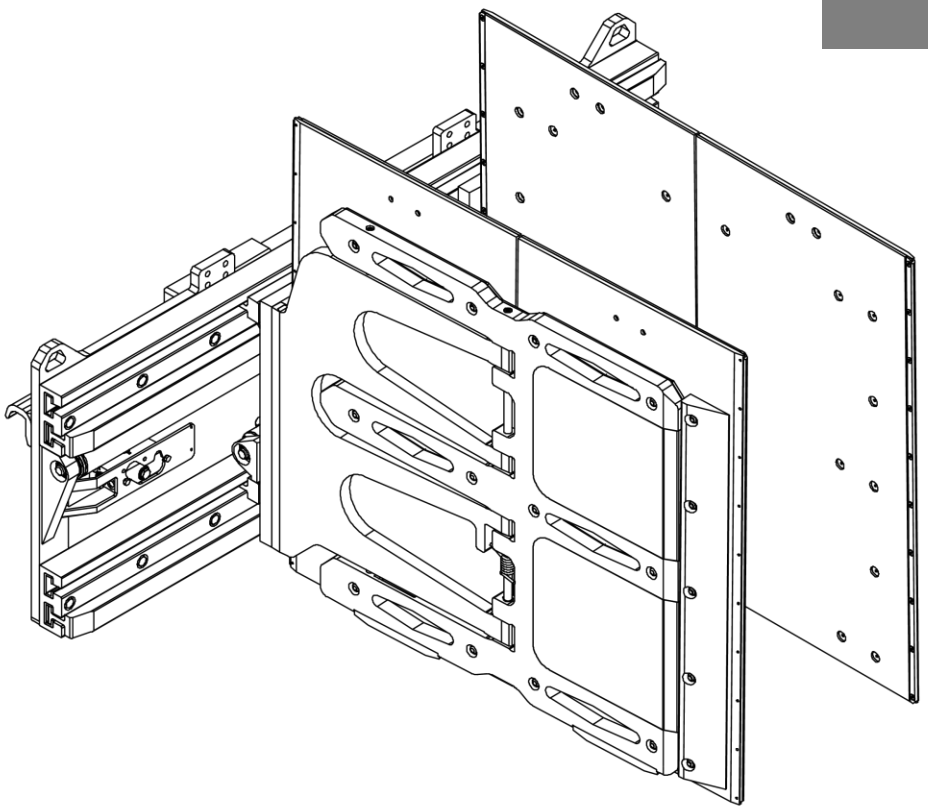
TYPE 474.12.180 SISS WITH LOAD-RETAINING FRAMES



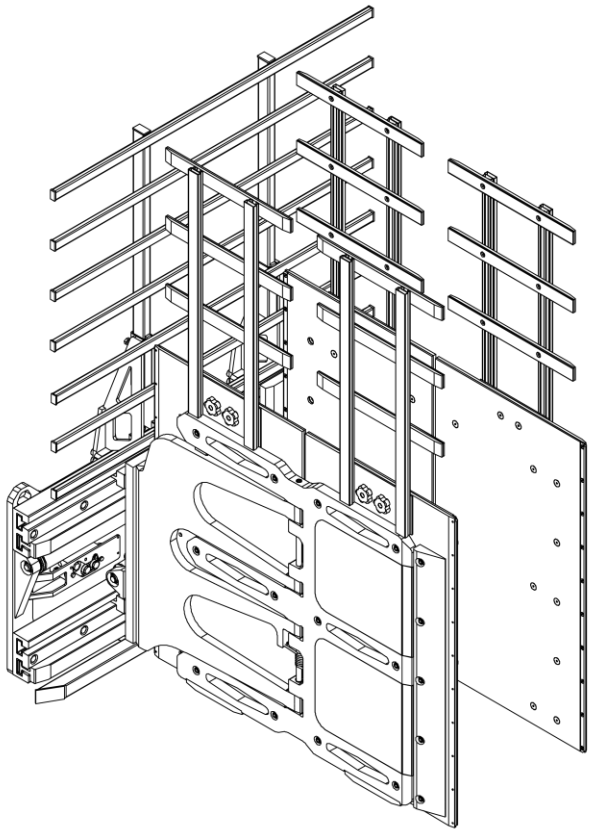
TYPE 474.24.180



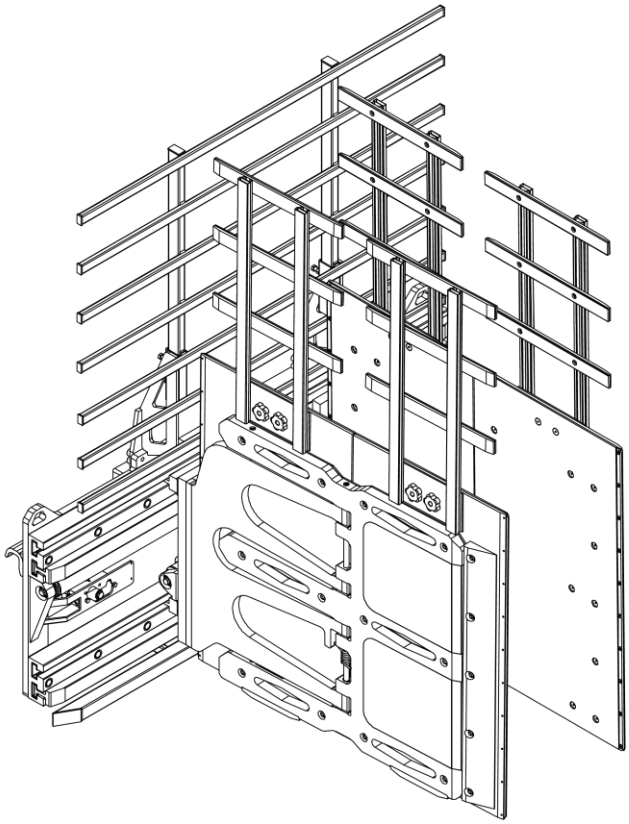
TYPE 474.24.180 SISS



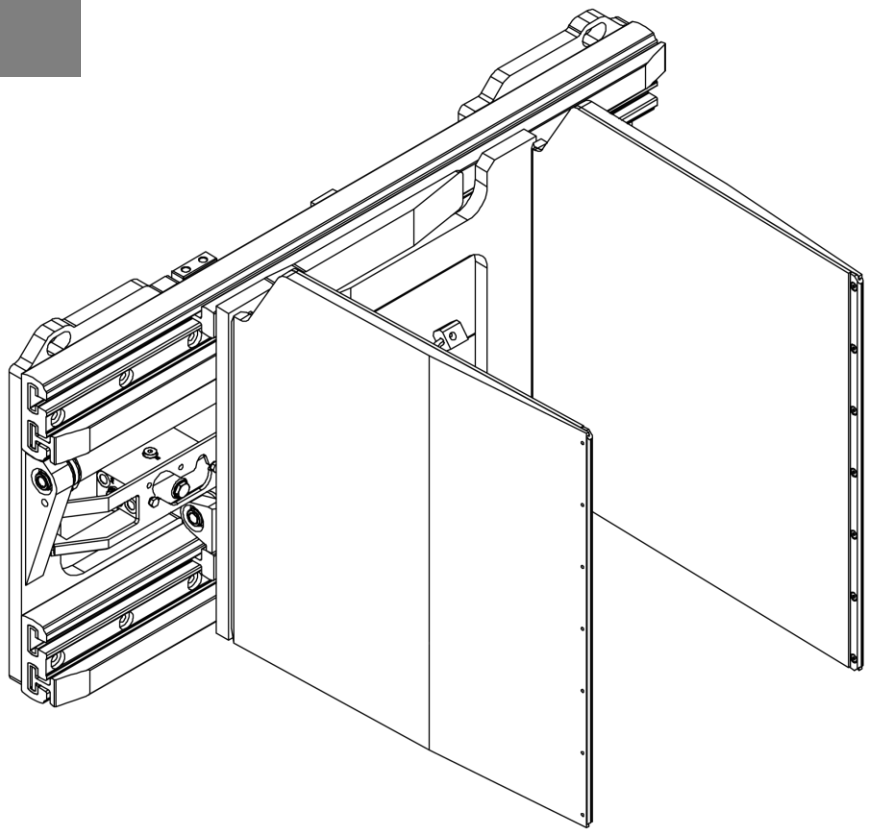
TYPE 474.24.180 WITH LOAD-RETAINING FRAMES



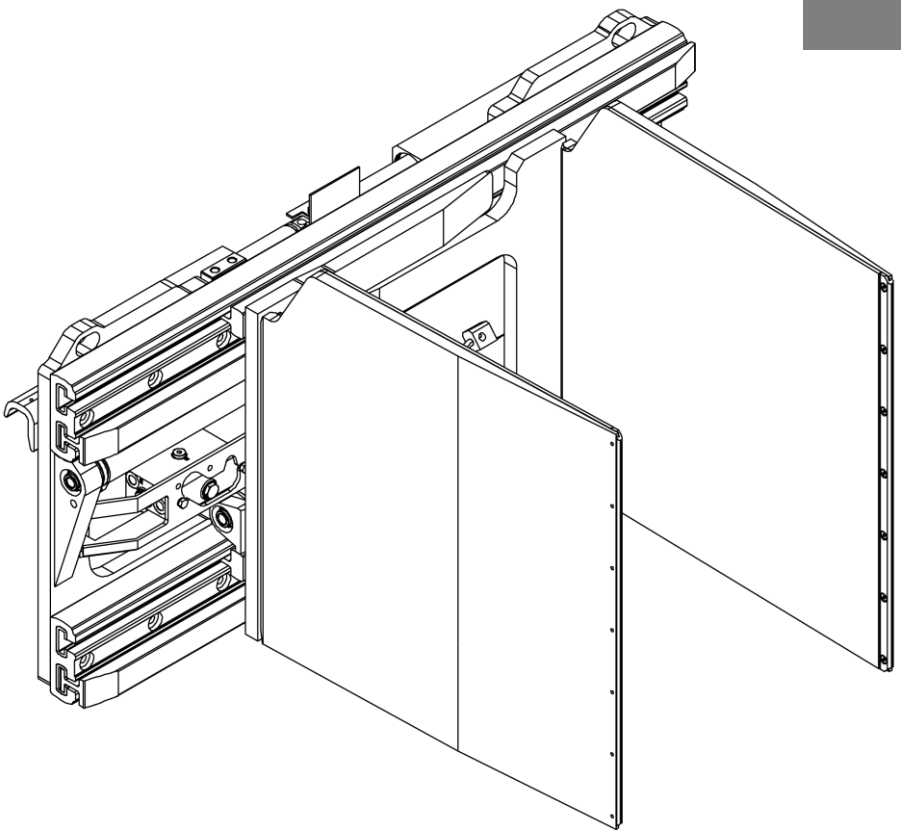
TYPE 474.24.180 SISS WITH LOAD-RETAINING FRAMES



TYPE 474.181



TYPE 474.181 SISS



All the A.T.I.B. equipment – CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES TYPE 474.180 - 181 are identified by means of an adhesive plate (see *Table 1*) located on the equipment (see *Figure 1*), always refer to the serial number.

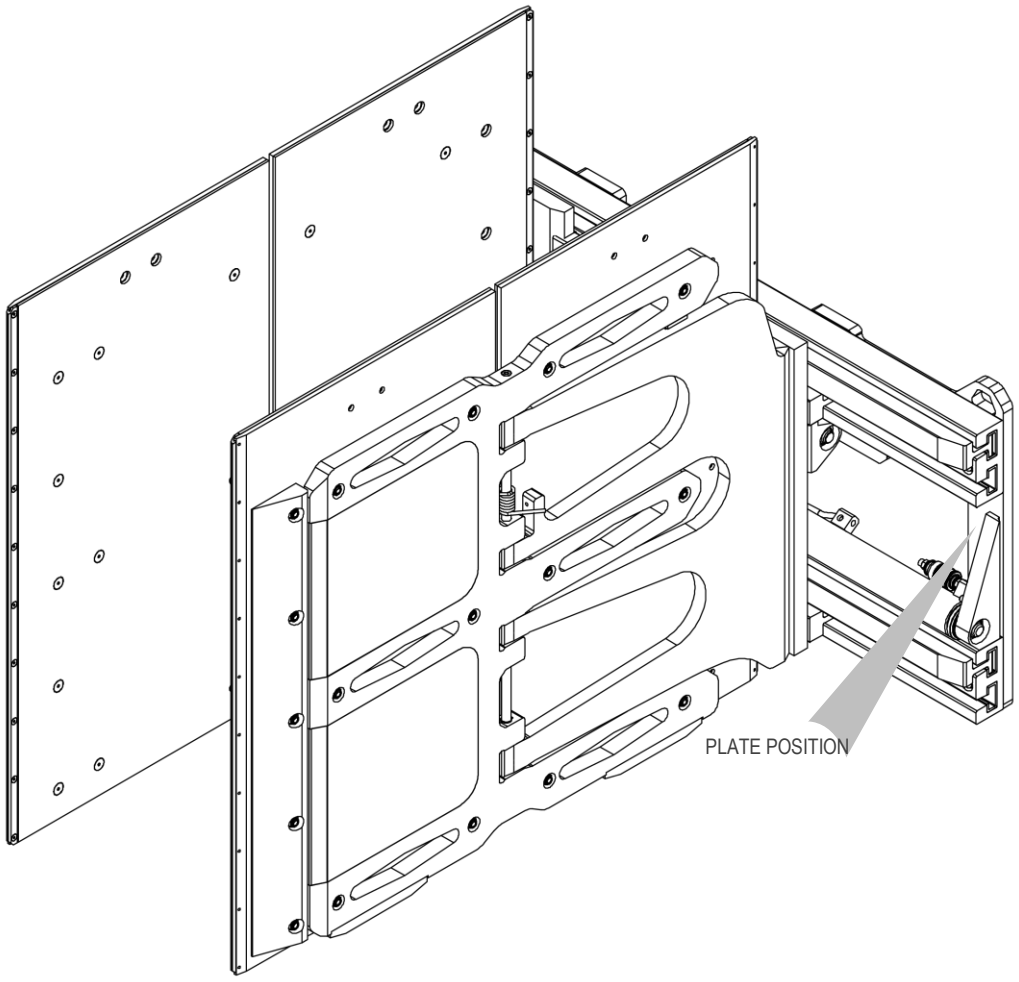


Figure 1

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

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 is damaged, the serial number is also stamped on the profile for connection to the fork-holder plate; for any information 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**
   Indicates the maximum weight that can be lifted via clamping.

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 - CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES TYPE 474.180 - 181 has been conceived, designed and constructed to allow the gripping of several rows of appliances/boxes with a distribution of gripping forces such that the load is neither dropped nor damaged, all at the expected operating pressures unless otherwise specified for specific applications (see plate).

- TYPE 474.180 - with SWING JAWS AND SINGLE OR SPLIT PANELS
- TYPE 474.181 - with FIXED JAWS

SISS = with SEMI-INTEGRAL SIDESHIFT
ISS= with INTEGRAL SIDESHIFT

This equipment must be attached to the fork carriage of the forklift truck and connected to the distributor via a hydraulic circuit.

Versions with load pusher and/or side/rear load carriers can be manufactured at the customer's request.

The relative motion for adjusting the distance between the gripper jaws is achieved by means of two hydraulic cylinders.

Semi-integral sideshift motion between the parts attached to the fork carriage and those attached to the lifting equipment is carried out by two hydraulic cylinders.

Integral sideshift motion is carried out by a special valve and uses the same cylinders that handle the jaws.

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 clamp, refer to the clamp's rating plate (See *Table 1* on page *12*).

⚠ 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 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/mm)			Operating pressure Maximum (Bar)
	minimum	maximum	recommended	
474.180 ISO II	10	40	20	175
474.181 ISO II	10	40	20	175

Table 2

⚠ ATTENTION!! ⚠

OBSERVE THE INDICATED MAXIMUM OPERATING PRESSURES

3.1 Installation Procedure

3.1.1 Installing the Equipment

(NO SISS)

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.

N.B. Although only type 474.24.180 is shown in the installation phase, the equipment installation procedure is also identical for different versions (474.12.180 and 474.181, always WITHOUT SISS).

4. Remove the lower couplings from the equipment (see *Figure 2*).

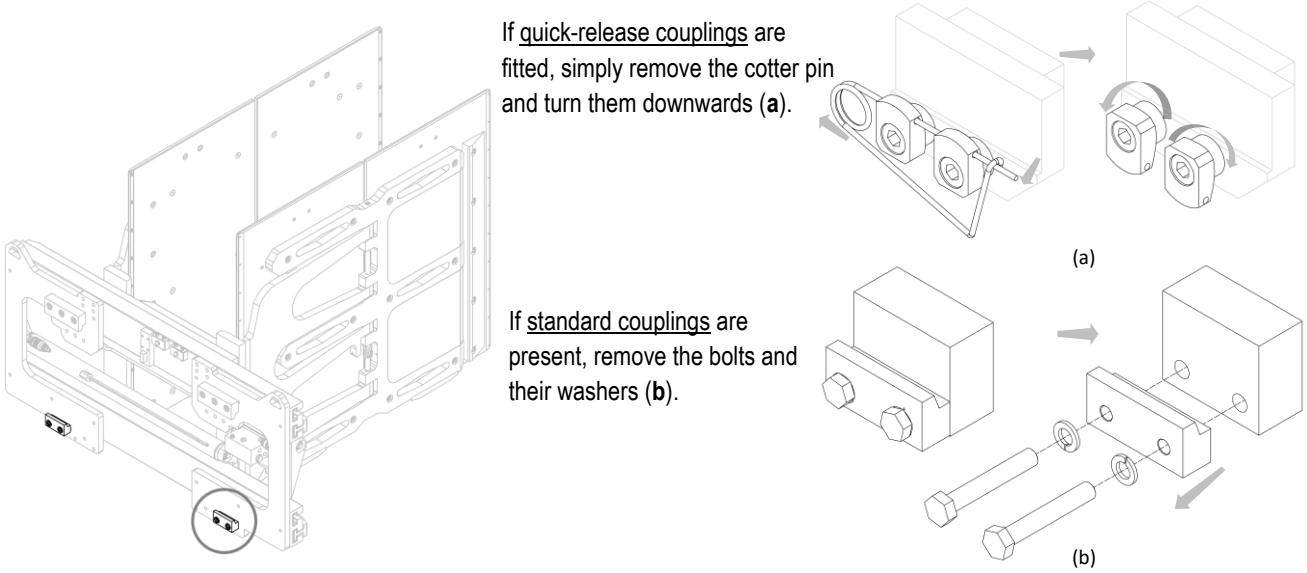


Figure 2

5. For handling, use straps or chains that are suitably sized in relation to the weight of the equipment as indicated on the plate (see *Figure 1* and *Table 1* on page *12*).

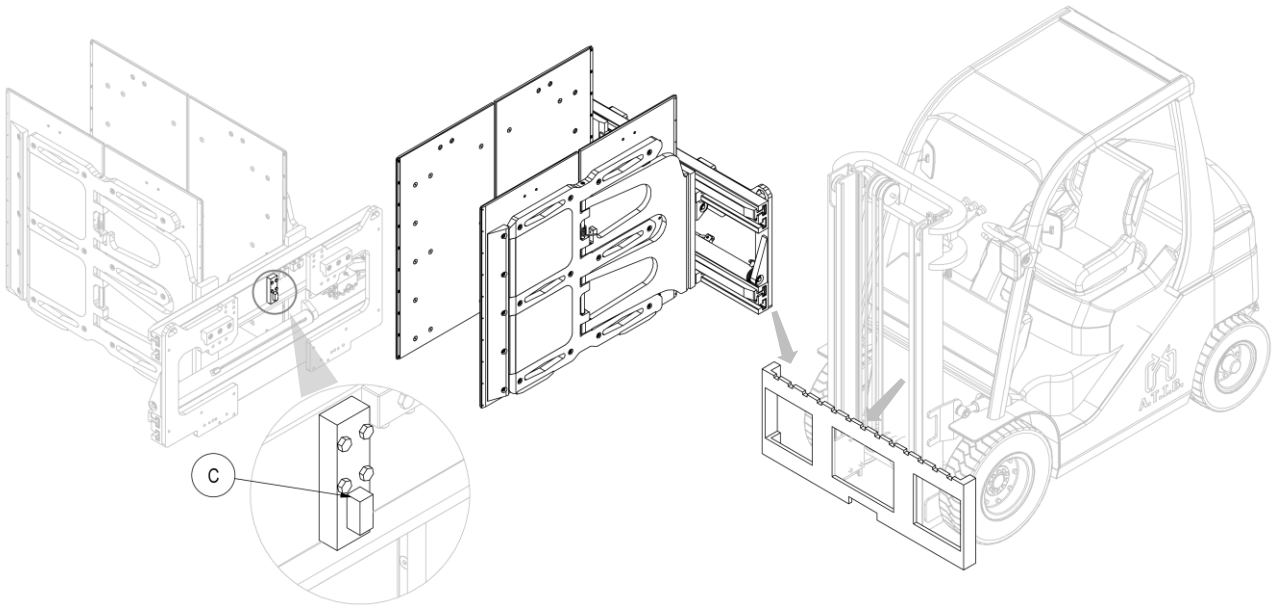


Figure 3

6. Then hook on the equipment using an overhead crane or a hoist of sufficient capacity and position it on the fork carriage, taking care to fit centring pin **C** into the central notch on the fork carriage (see *Figure 3*) and taking care to handle it in a suitable and safe manner.

7. Screw on the 2 lower couplings **G** in such a way that their bodies also remains coupled to the lower part of the fork carriage **P** (with max. clearance of 1.5 mm, see detail *Figure 4*), tightening with the torque indicated in *Table 3*.

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

Table 3

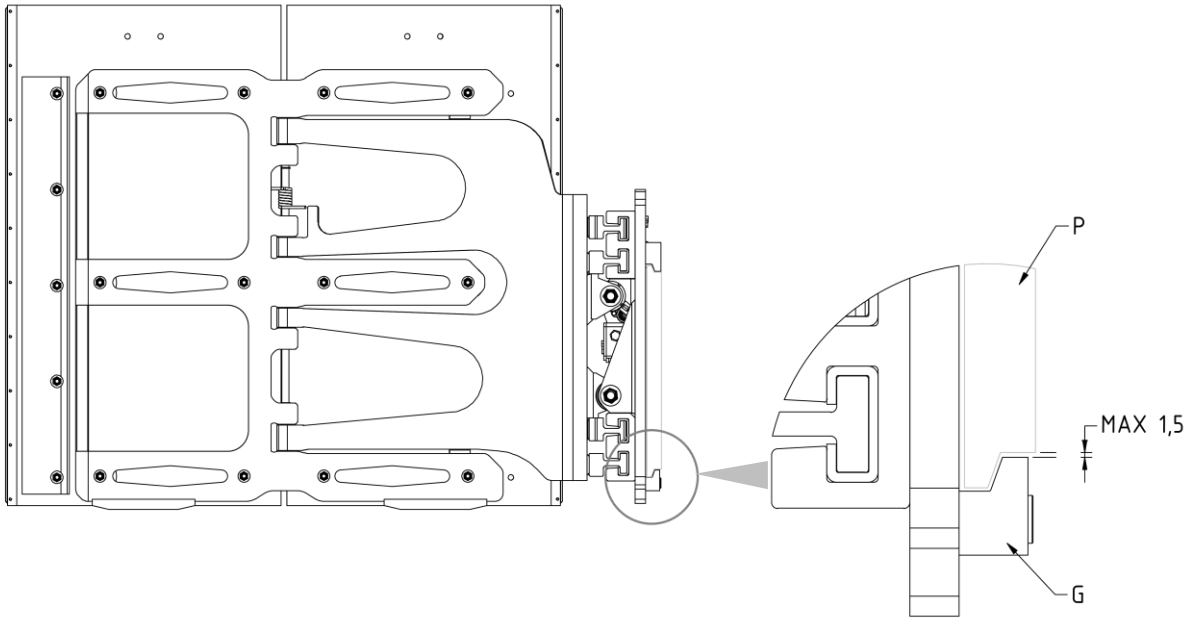


Figure 4

8. Lubricate the contact surfaces (see chapter *8.2 - Lubrication*).

9. Connect the hydraulic circuit, ensuring that the operating pressure of the lines is greater than or equal to that indicated on the rating plate (see *Figure 1* and *Table 1* on page *12)*.

3.1.2 Installing the Equipment - With Siss

WITH SISS

1. Prior to installation, check the condition of the fork carriage, ensuring that the lower profile is smooth which may otherwise affect the sliding of the lower pads.

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

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

N.B. Although only the standard type is shown in the installation phase, the equipment installation procedure is also identical for different versions (474.12.180 and 474.181, always WITH SISS).

4. After removing the “protection bracket” (**P**) with its bolts, manually obtain the dual coupling **A** (with its sliding bushes), and position it on the upper profile of the fork carriage, taking care to fit the centring pin **C** into the central notch of the fork carriage (see *Figure 5*).

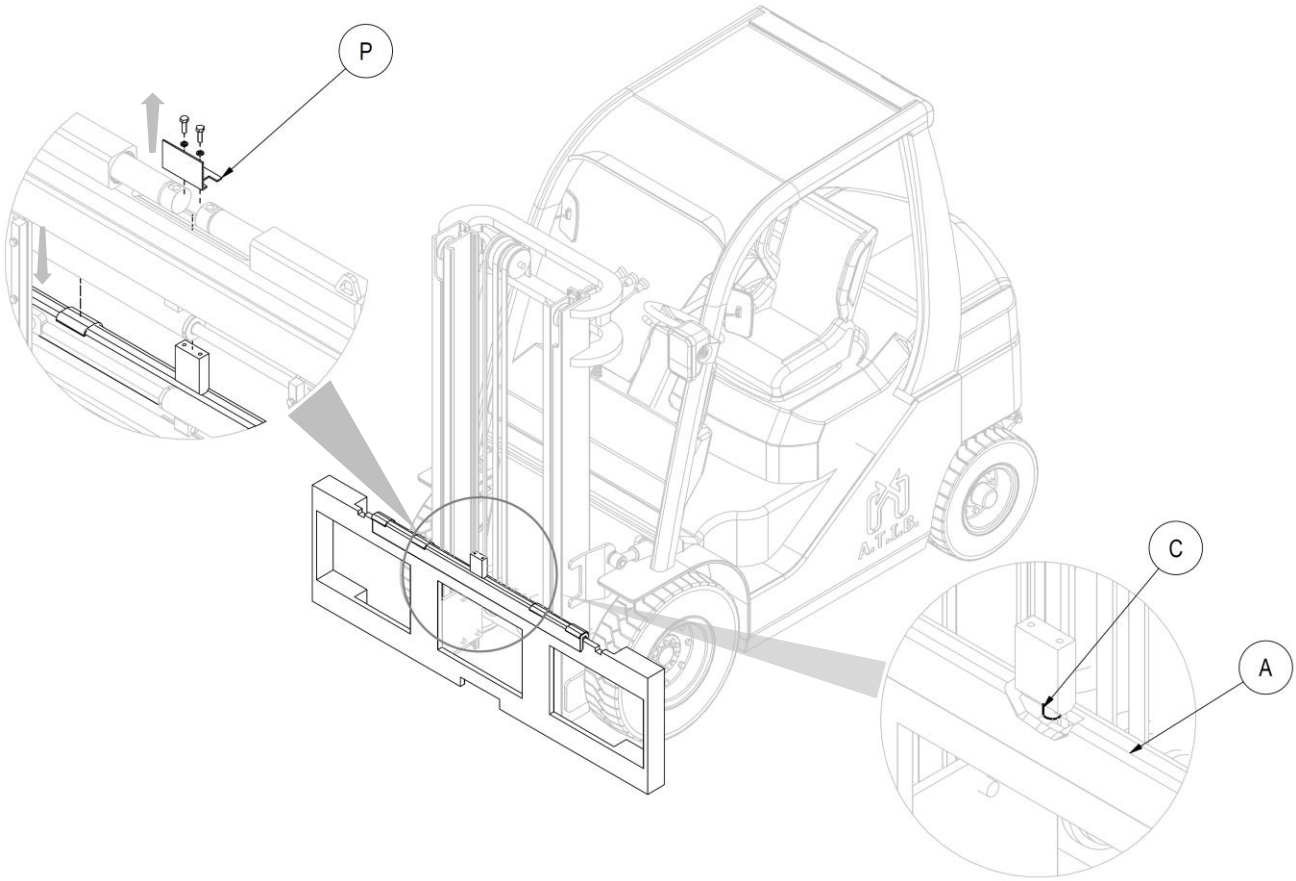


Figure 5

5. Remove the lower couplings from the equipment and grease the sliding gibs (see *Figure 6*).

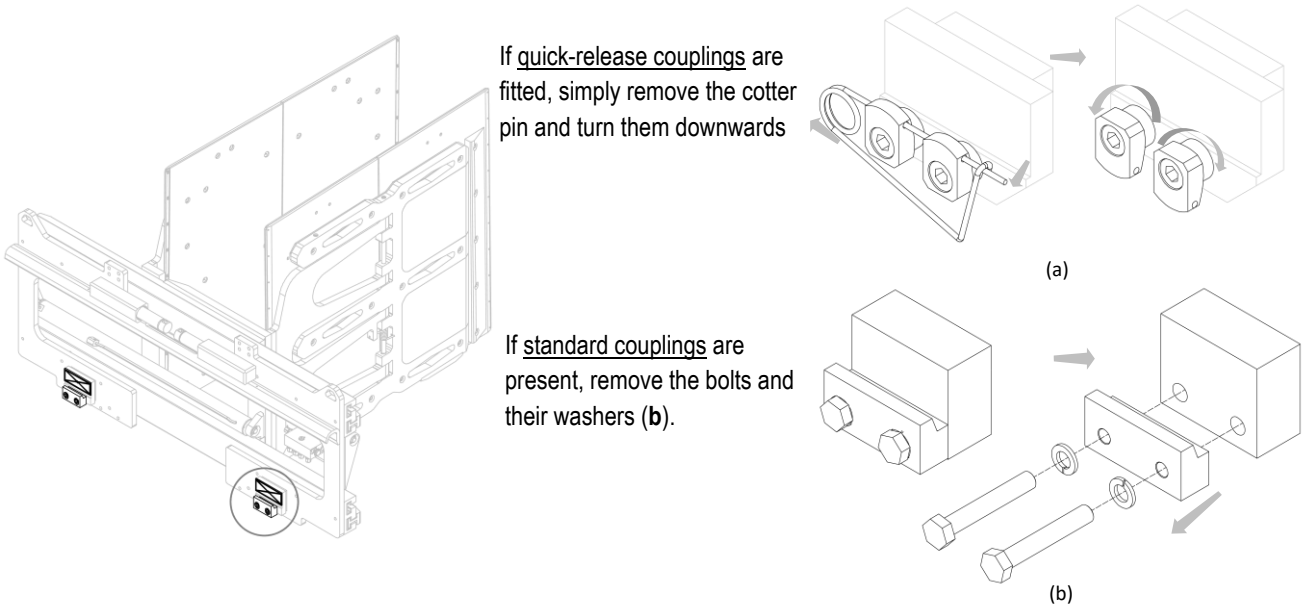


Figure 6

6. For handling, use straps or chains that are suitably sized in relation to the weight of the equipment as indicated on the plate (see *Figure 1* and *Table 1* on page *12*).

7. Then hook on the equipment using an overhead crane or hoist of sufficient capacity and position it onto the dual coupling, taking care to position it correctly (see *Figure 7)*.

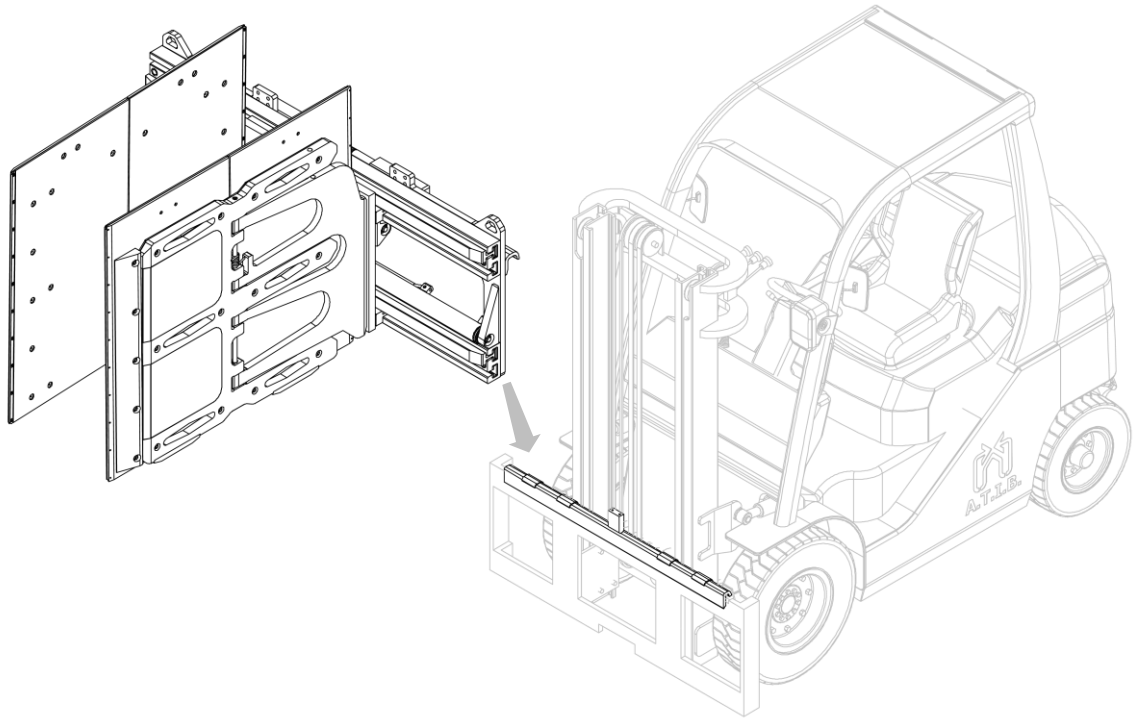


Figure 7

8. Reposition the “protection bracket”.

9. Screw on the 2 lower couplings **G** in such a way that their bodies also remains coupled to the lower part of the fork carriage **P** (with max. clearance of 1.5 mm, see detail *Figure 8*), tightening with the torque indicated in *Table 4*.

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

Table 4

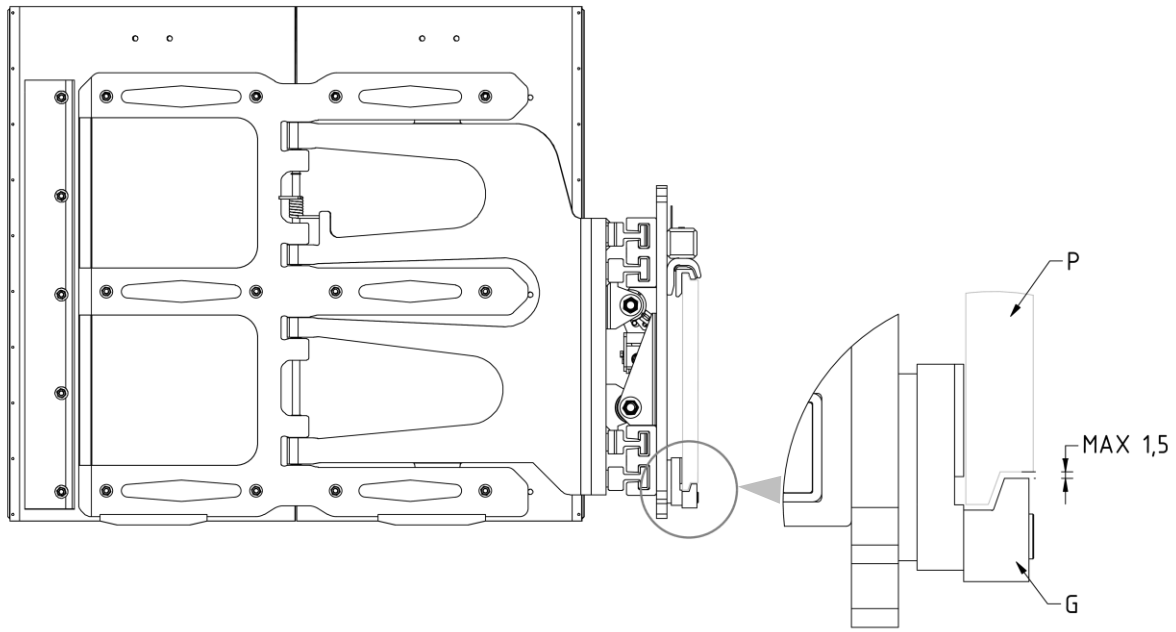


Figure 8

10. Lubricate the contact surfaces (see chapter *8.2 - Lubrication*).

11. Connect the hydraulic circuit, ensuring that the operating pressure of the lines is greater than or equal to that indicated on the rating plate (see *Figure 1* and *Table 1* on page *12)*.

3.2 Assembling the Aluminium Profiles

ALUMINIUM

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

2. Install the aluminium profiles one at a time, using the bolts provided (see *Figure 9* and *Figure 10*).

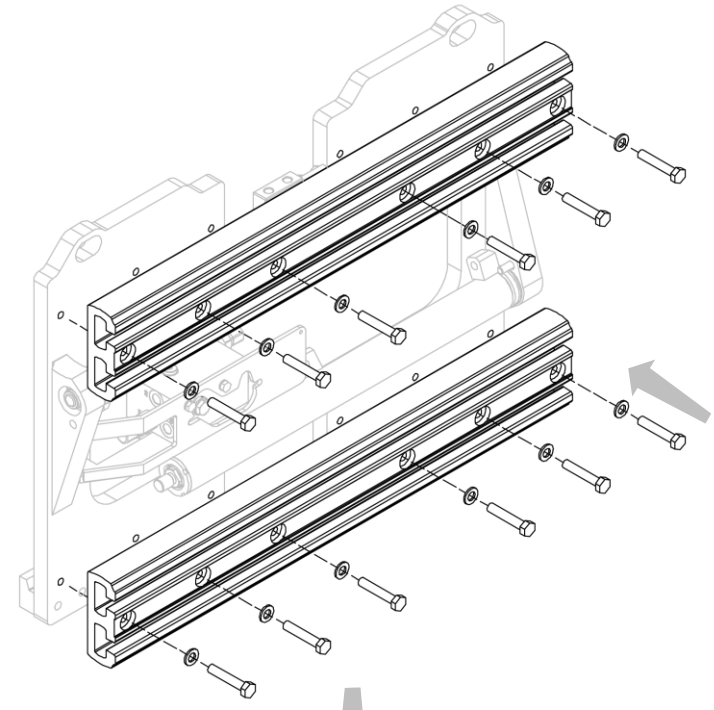


Figure 9

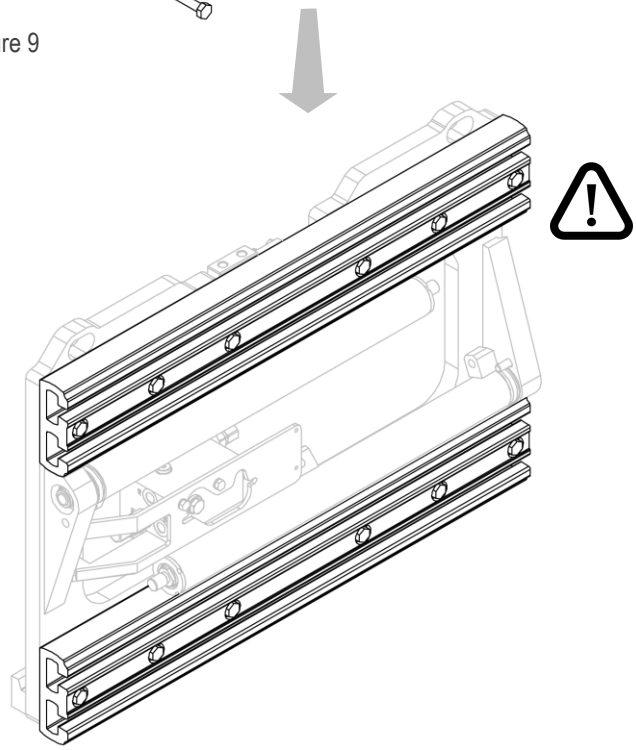


Figure 10

3.3 Assembling the Nylon Bushes

NYLON BUSHES

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

2. Insert the nylon bushes and secure them using the grub screws provided (see *Figure 11* and *Figure 12*).

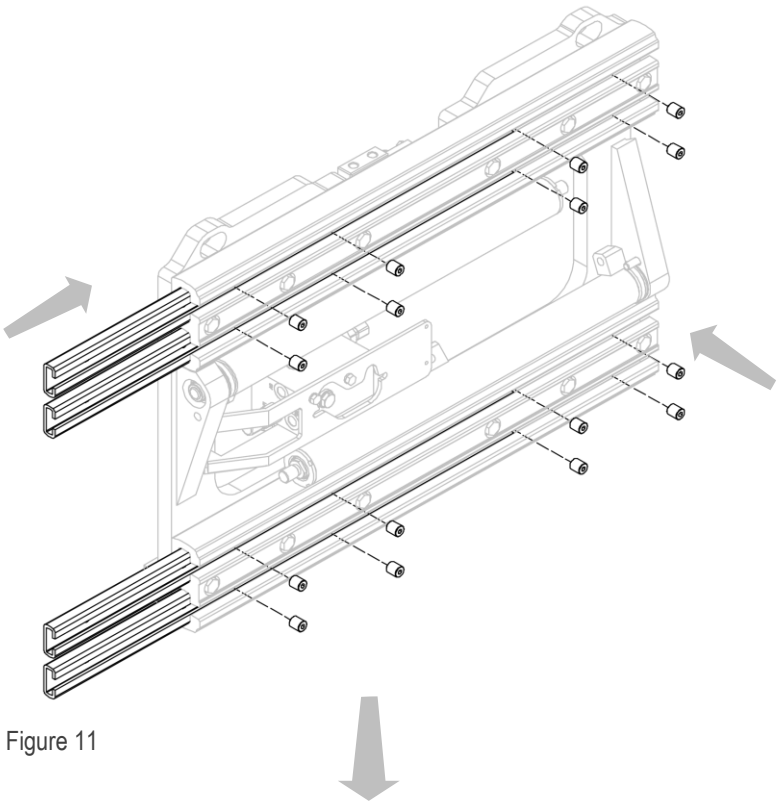


Figure 11

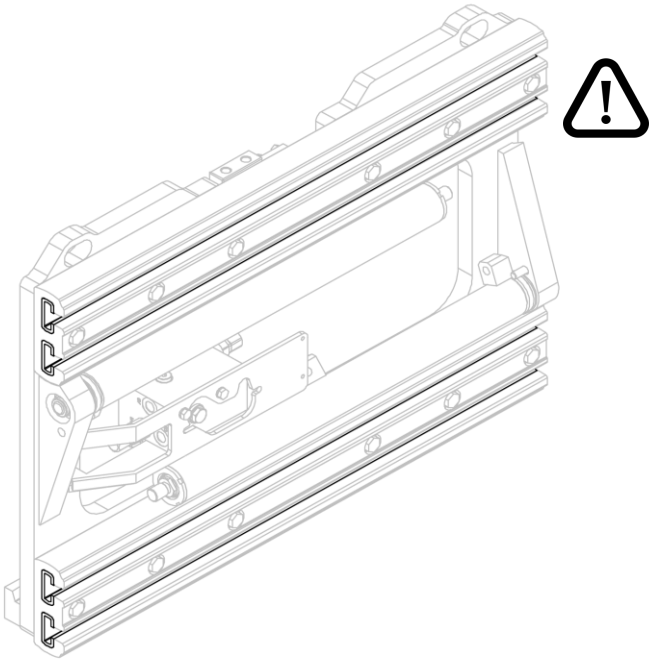


Figure 12

3.4 Assembling the Clamping Unit - TYPE 474.12.180

3.4.1 Assembling the Forks

FORKS

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

2. Insert the fork assembly, one at a time, into their appropriate housings and tighten the nuts that secure them to the cylinders (see *Figure 13* and *Figure 14*).

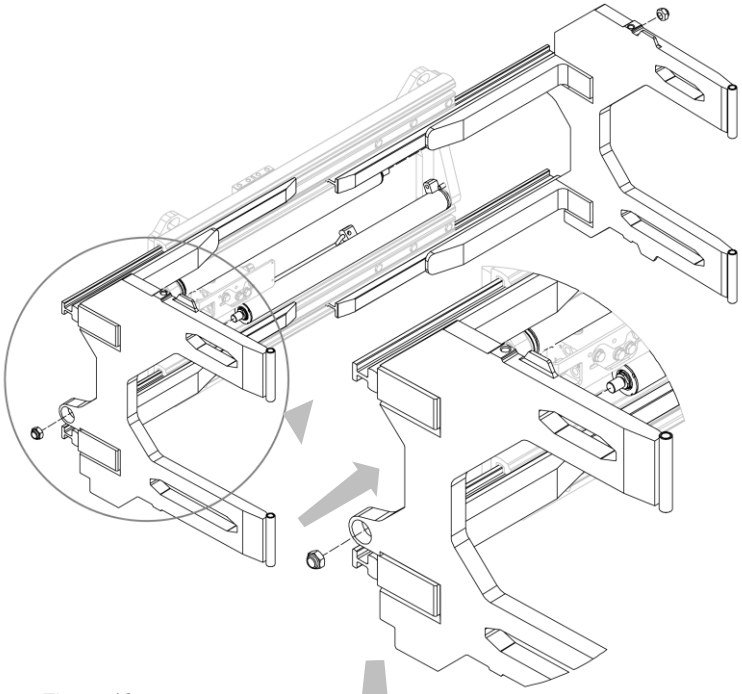


Figure 13

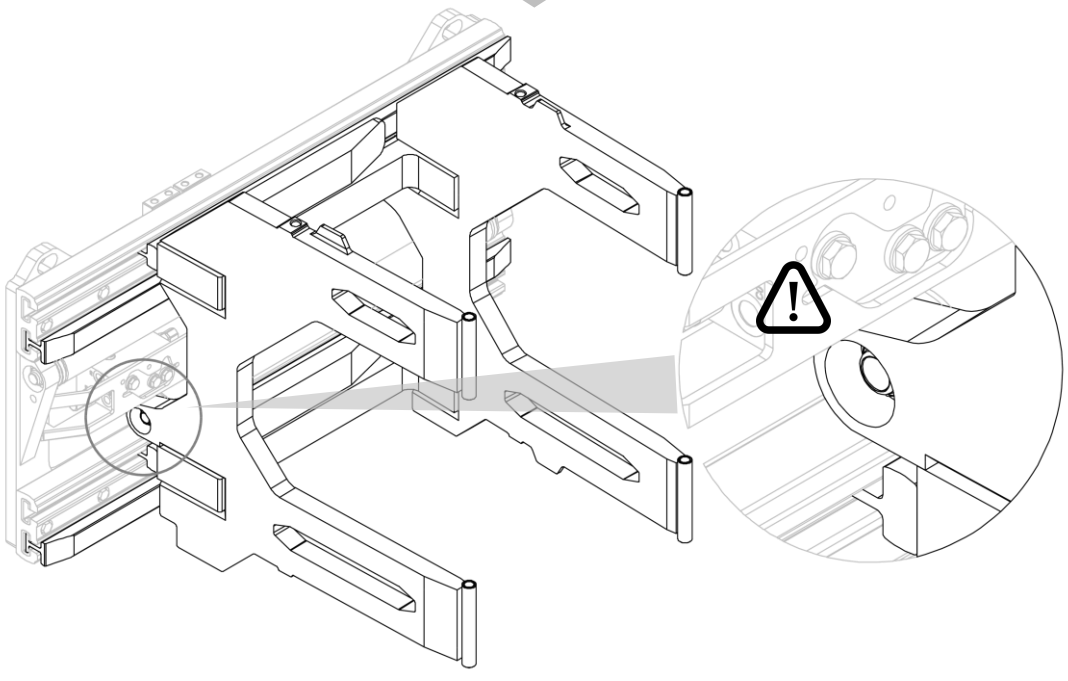


Figure 14

3.4.2 Assembling the Swing Bushes

SWING BUSHES

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Position the swing bushes in the appropriate housings (see *Figure 15* and *Figure 16*).

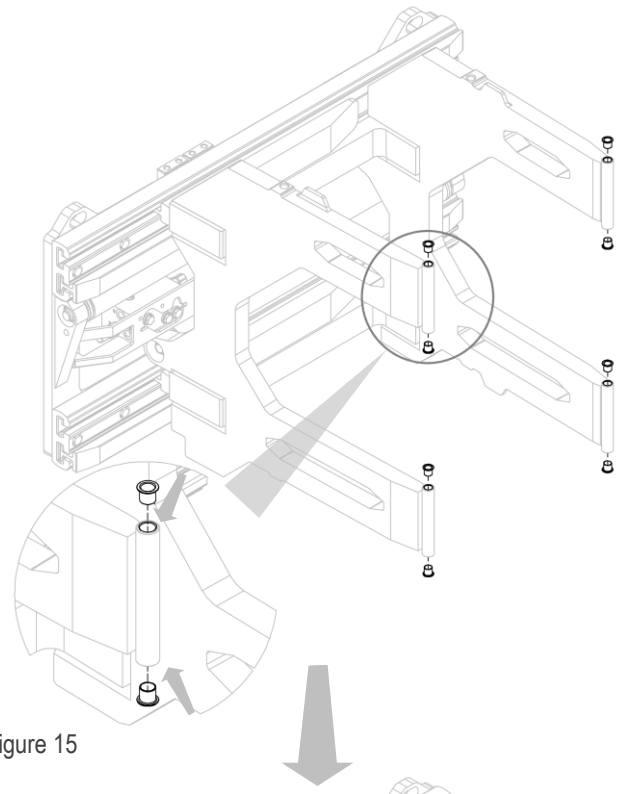


Figure 15

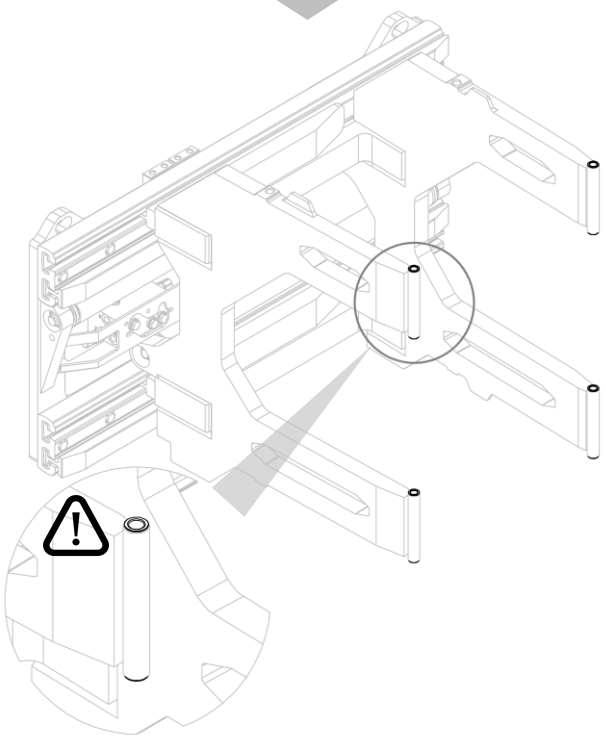


Figure 16

3.4.3 Assembling the Panels

PANELS

1. **N.B.** To carry out the procedure, open the cylinders in order to be able to install the panels easily and safely; in addition, the equipment must be lifted so that the lower fastening pins of the panels can be fitted. Once complete, release the pressure from the hydraulic system and disconnect the hoses.

2. Fit the fastening plates on the panels using the screws and nuts (see *Figure 17*), taking care of any shims to be placed between the plates and the panel itself.

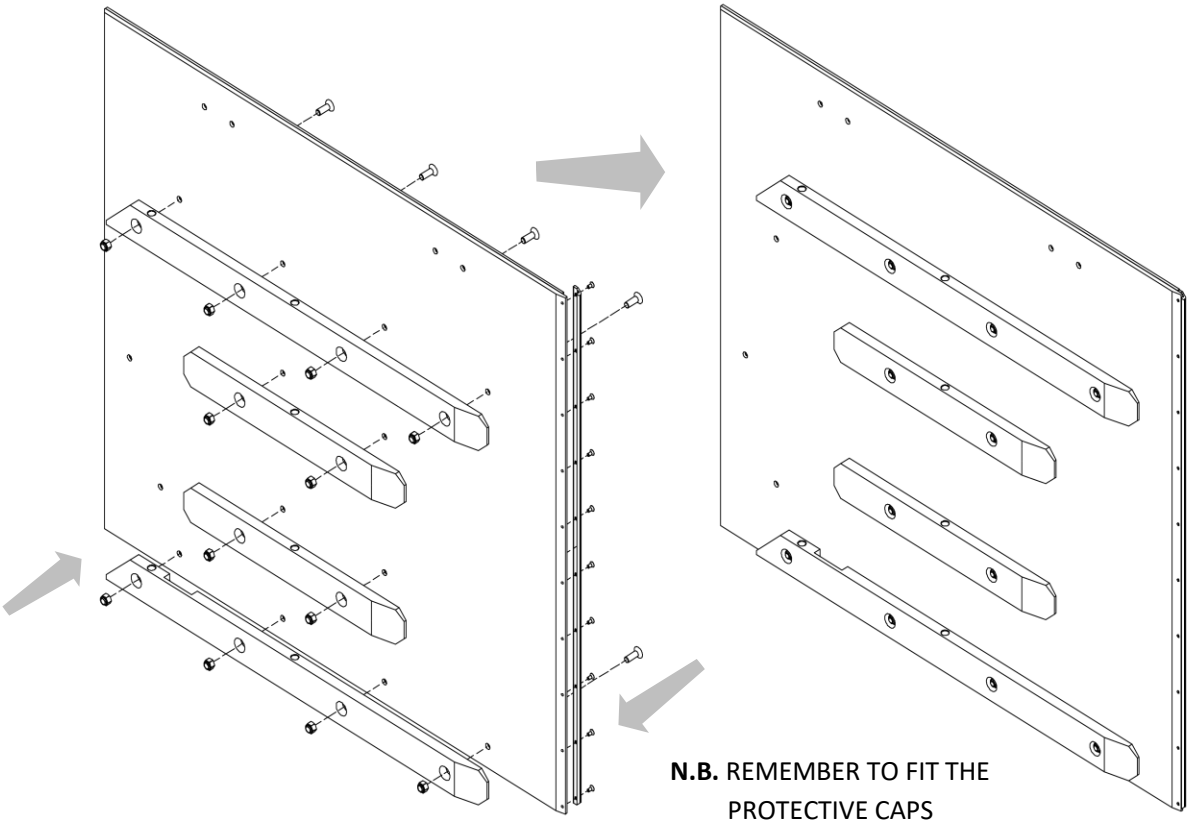


Figure 17

3. Position the panels (with their corresponding plates) onto the forks, taking care to position the fastening pins, with their snap rings, correctly (see *Figure 18* and *Figure 19*).

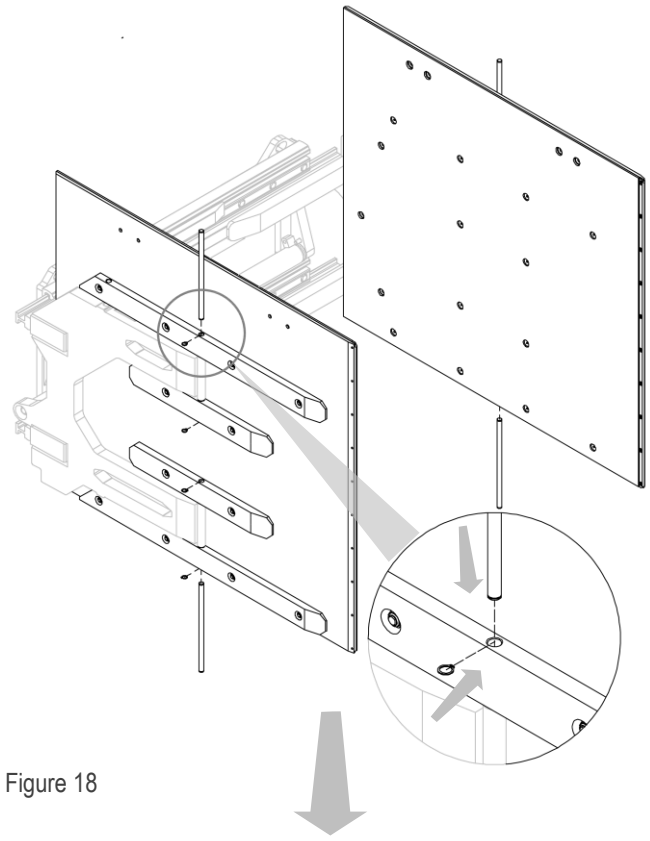


Figure 18

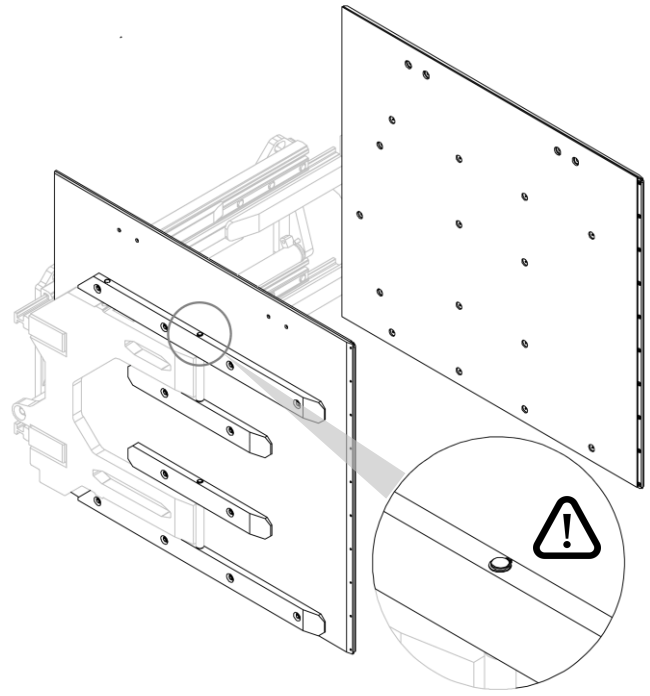


Figure 19

3.4.4 Assembling the Lower Anti-Slip Pads

ANTI-SLIP PADS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Mount the Ertalon lower anti-slip pads by screwing the screws into the respective holes (see *Figure 20* and *Figure 21*).

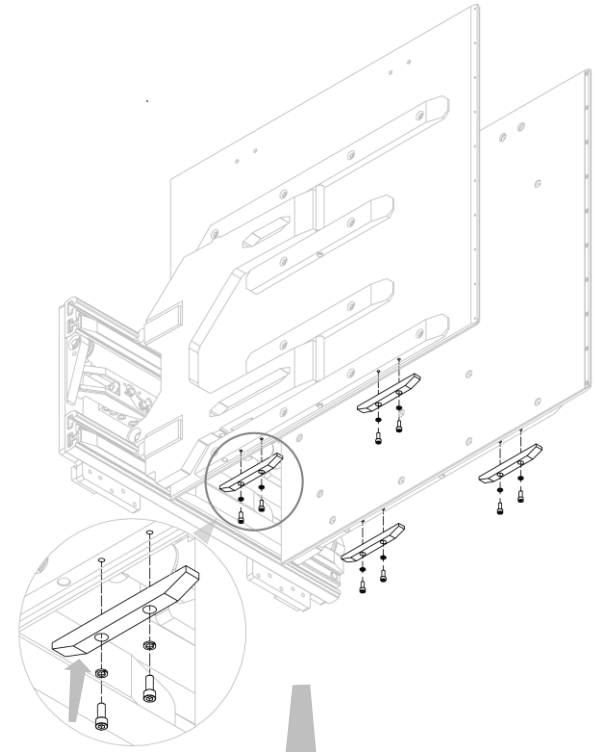


Figure 20

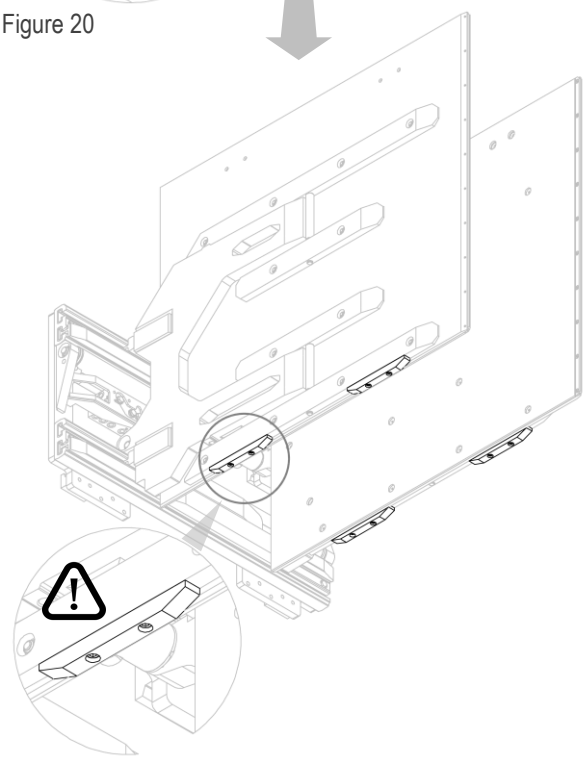


Figure 21

3.5 Assembling the Clamping Unit – TYPE 474.24.180

3.5.1 Assembling the Forks

FORKS

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

2. Insert the fork assembly, one at a time, into their appropriate housings and tighten the nuts that secure them to the cylinders (see *Figure 22* and *Figure 23*).

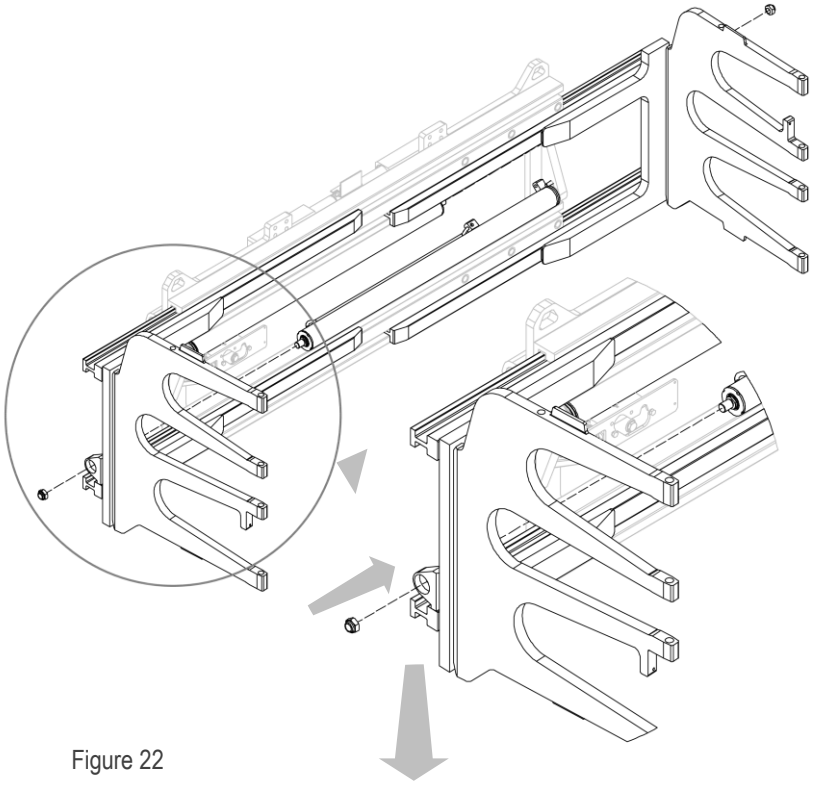


Figure 22

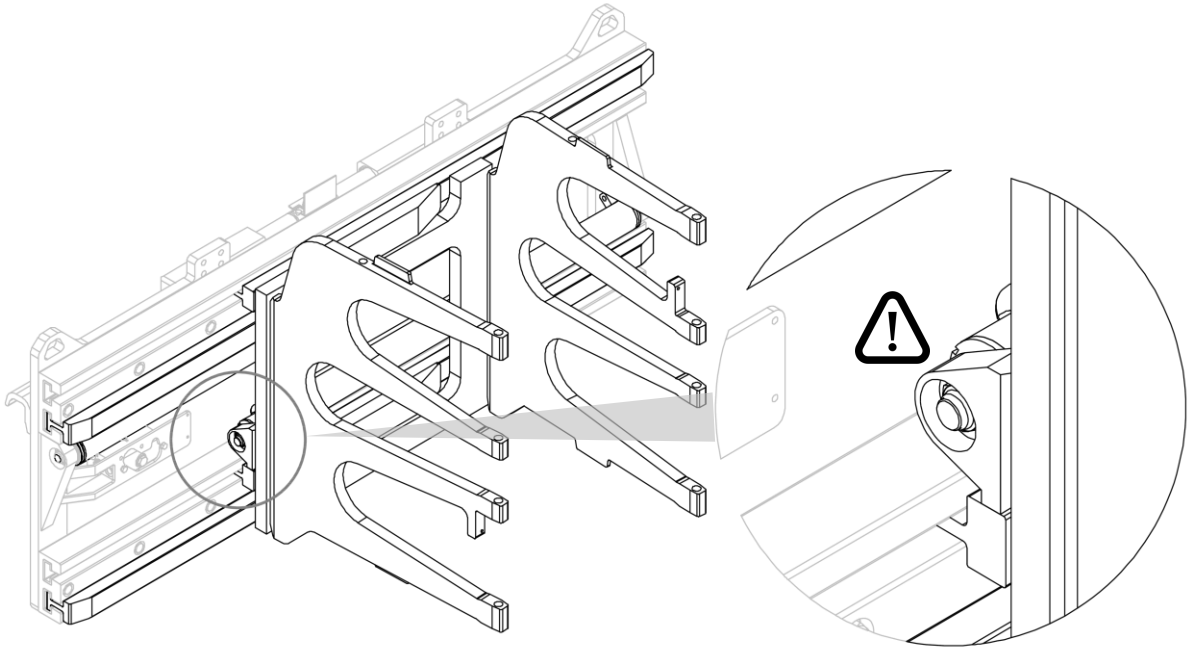


Figure 23

3.5.2 Assembling the Swing Bushes

SWING BUSHES

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Position the swing bushes into their housings (see *Figure 24* and *Figure 25*).

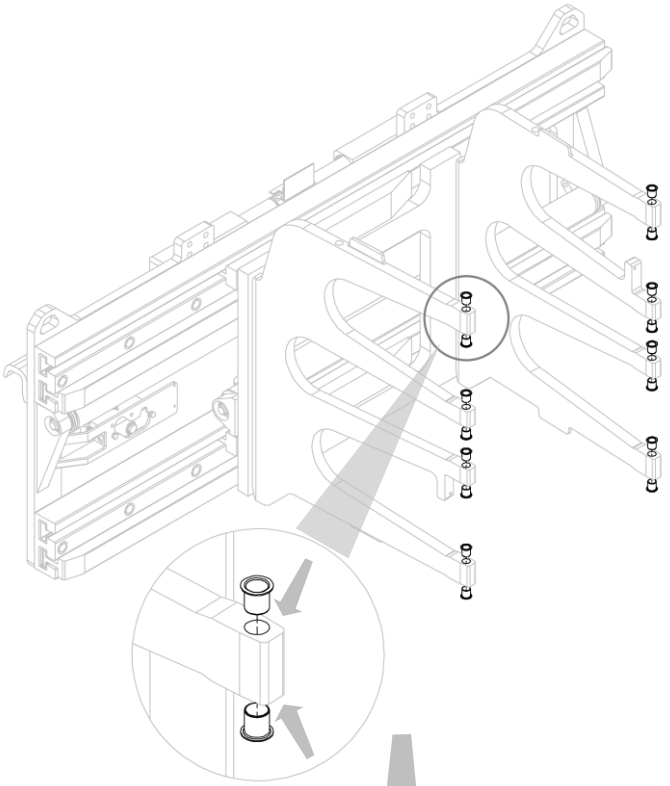


Figure 24

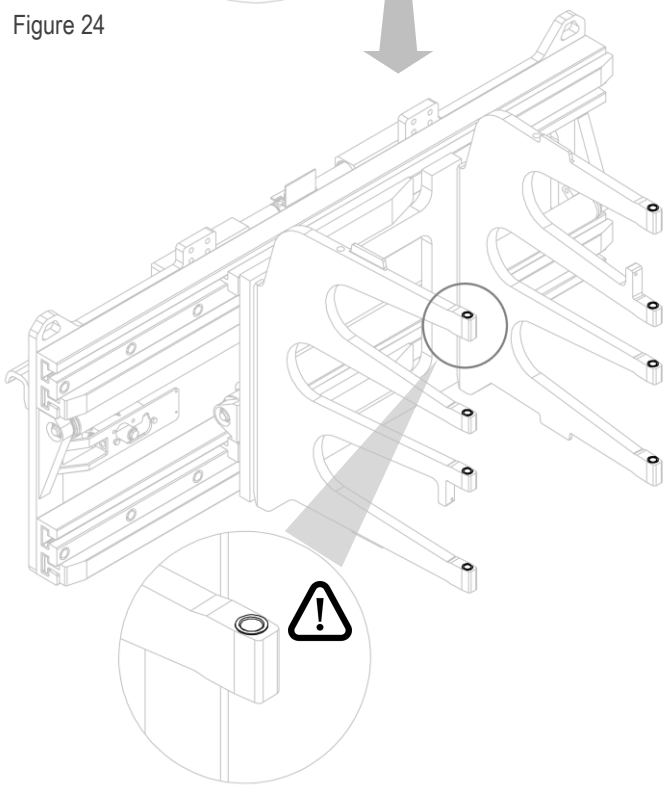


Figure 25

3.5.3 Assembling the Swing Jaws

SWING JAWS

3. **N.B.** To carry out this procedure, the equipment must be lifted to allow the lower pins to be installed safely; once this is done, release the pressure from the hydraulic system and disconnect the hoses.
4. Assemble one jaw at a time.
5. Use *Figure 26* and *Figure 27* as guides.
6. Correctly position the jaw on the fork so that the central through-hole in which the swing pin is to be positioned is aligned.
7. Insert the swing pins one at a time up to the jaw stop, taking care to position the corresponding snap rings in the meantime (and then place them in their housing on the pin) and the torsion spring, which must then be secured in the provided holes.

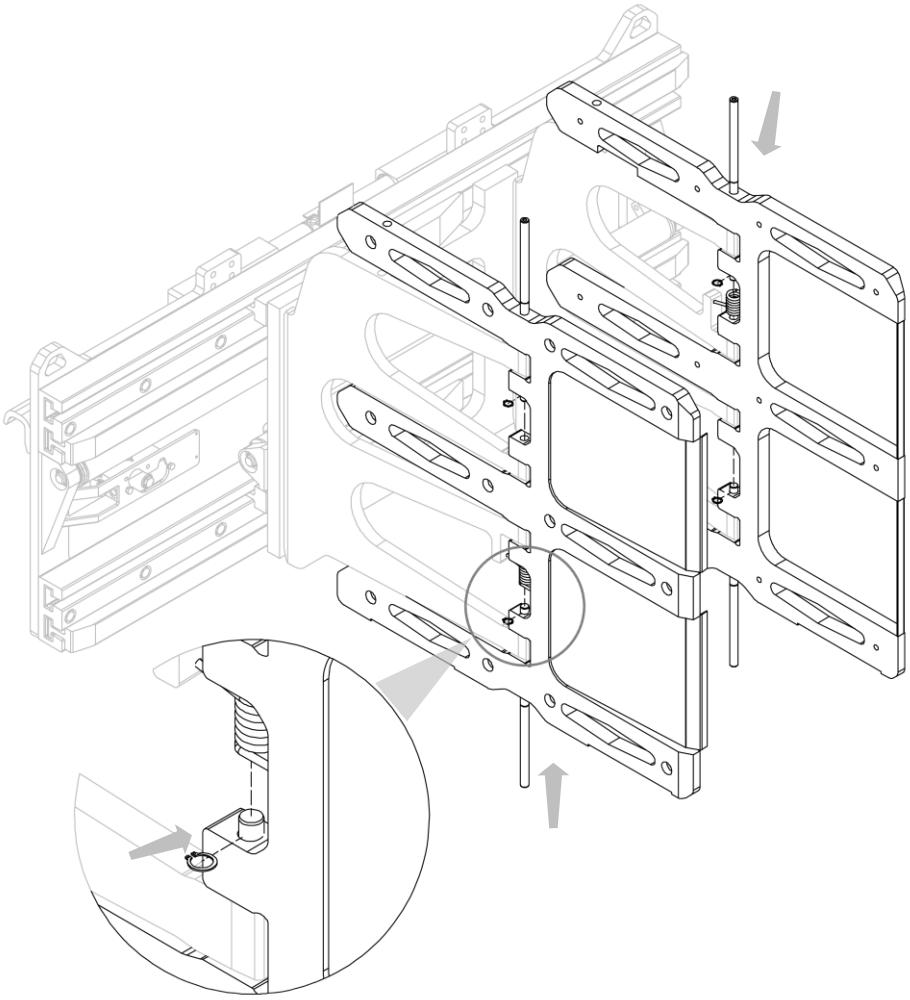


Figure 26

8. Check that the swing pins are correctly secured (see *Figure 27*).

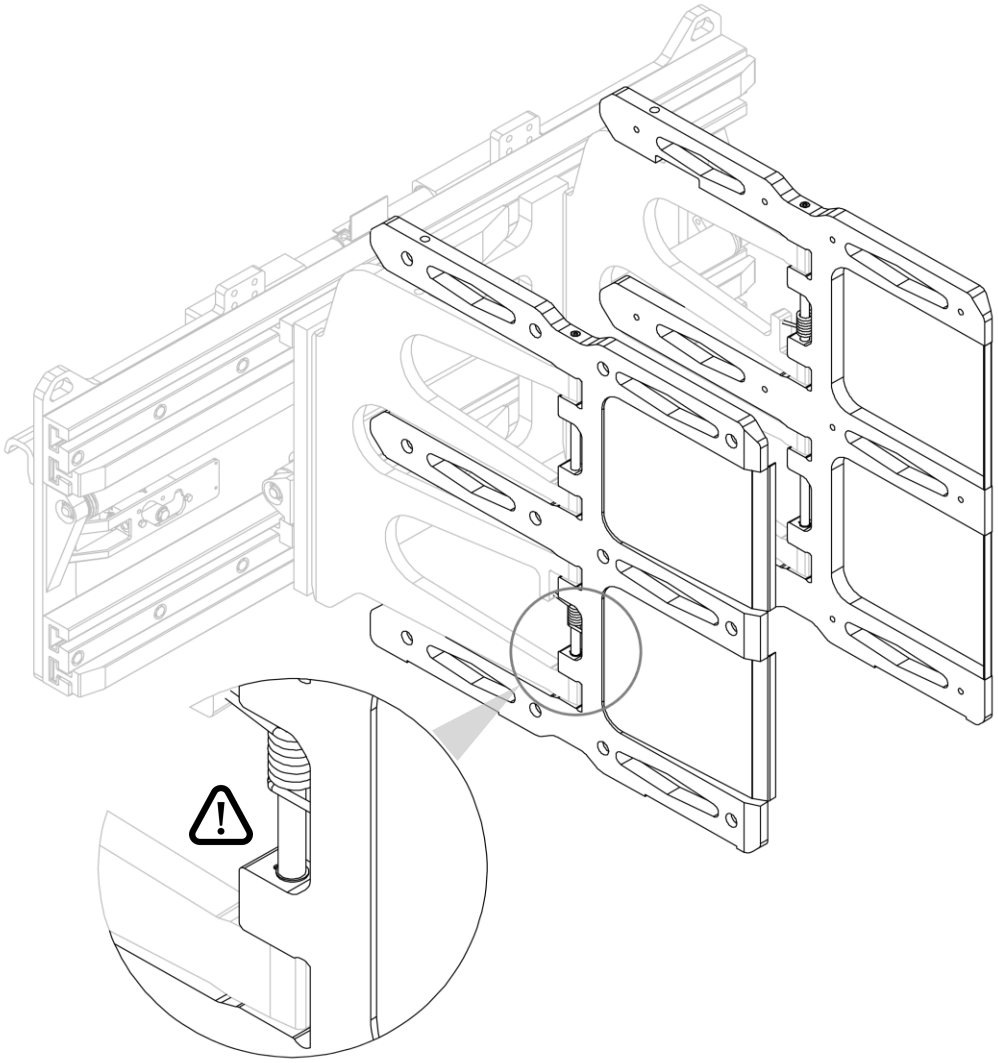


Figure 27

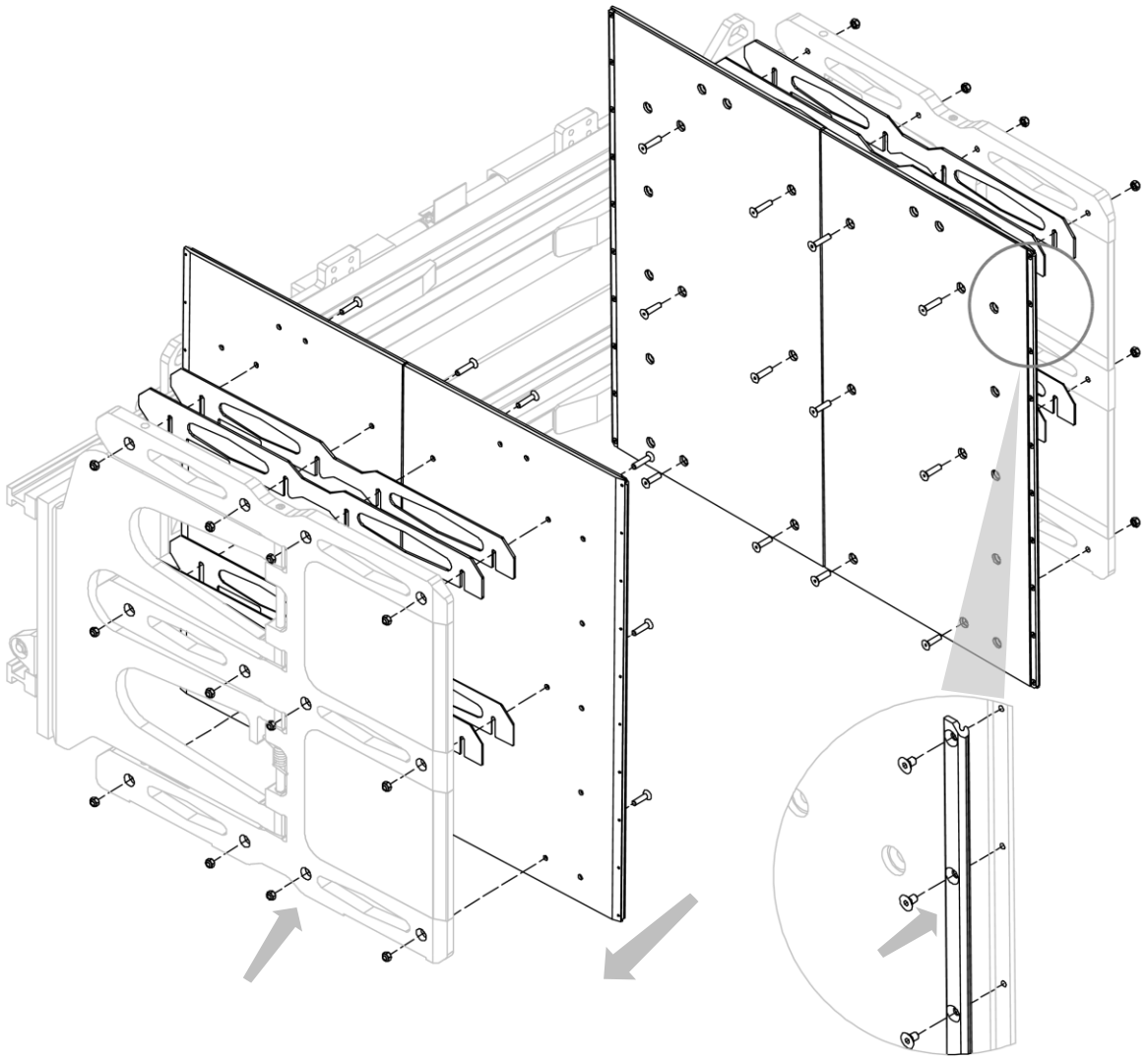
9. Lower the equipment to facilitate subsequent assembly of the panels.

3.5.4 Assembling the Panels

PANELS

1. **N.B.** To carry out this procedure, open the cylinders wide enough to allow the panels to be installed easily and safely; once this is done, release the pressure from the hydraulic system and disconnect the hoses

2. Install the panels onto the forks using the nut sand bolts, taking care of any shims to be placed between the jaw and the panel (see *Figure 28*).



N.B. REMEMBER TO FIT THE PROTECTIVE CAPS

Figure 28

3. Check that the panels and shims are properly secured (see *Figure 29*).

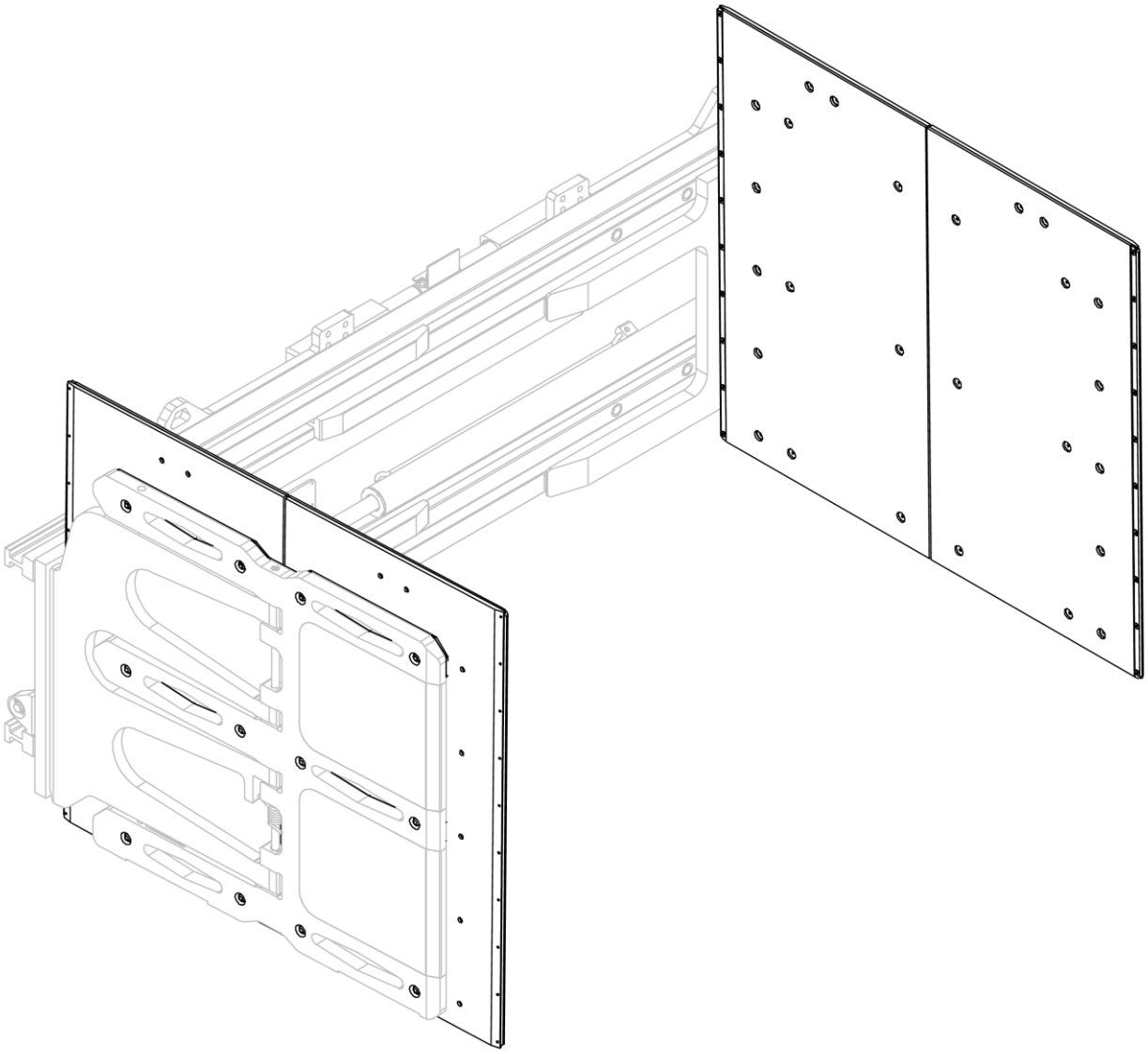


Figure 29

3.5.5 Assembling the Protective Caps

PROTECTIVE CAPS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Install the Ertalon protective caps (see *Figure 30* and *Figure 31*).

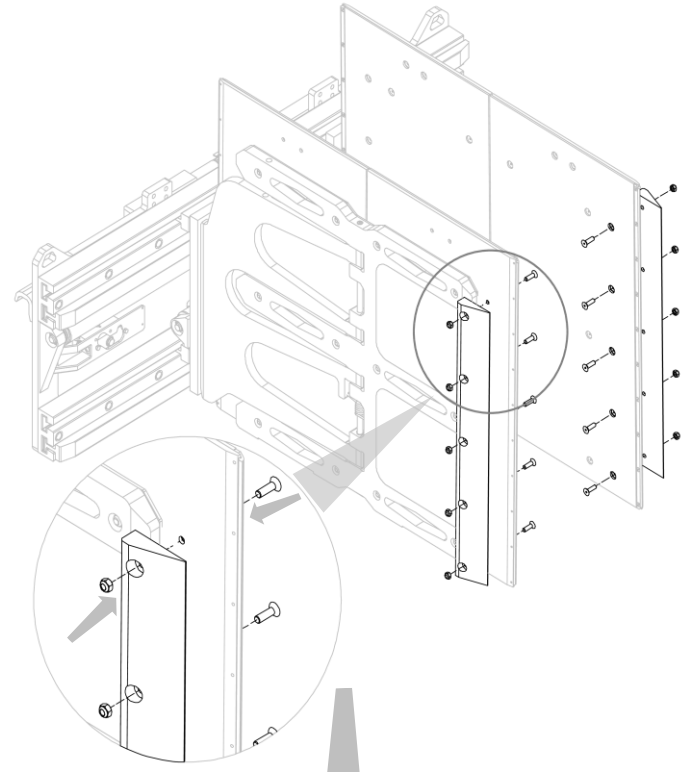


Figure 30

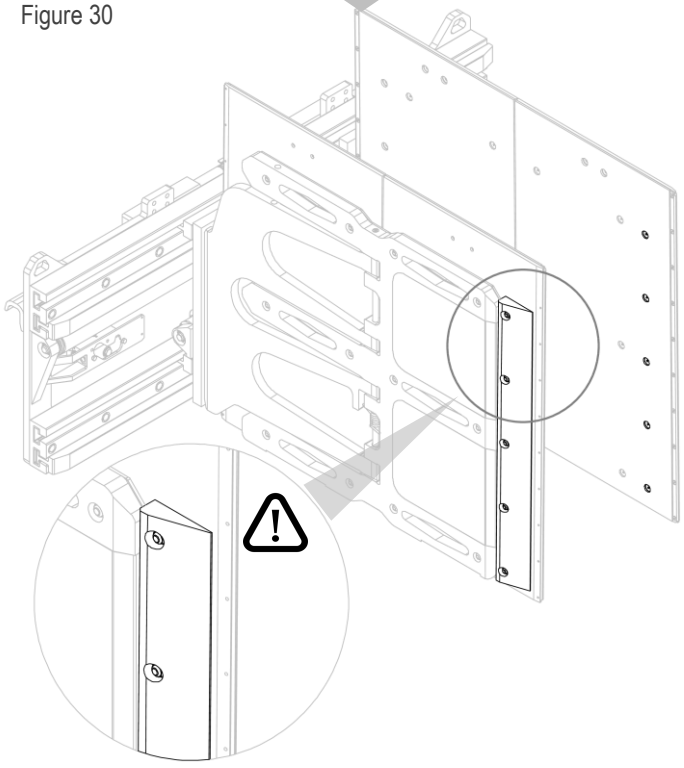


Figure 31

3.5.6 Assembling the Lower Anti-Slip Pads

ANTI-SLIP PADS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Mount the Ertalon lower anti-slip pads by screwing the screws into the respective holes (see *Figure 32* and *Figure 33*).

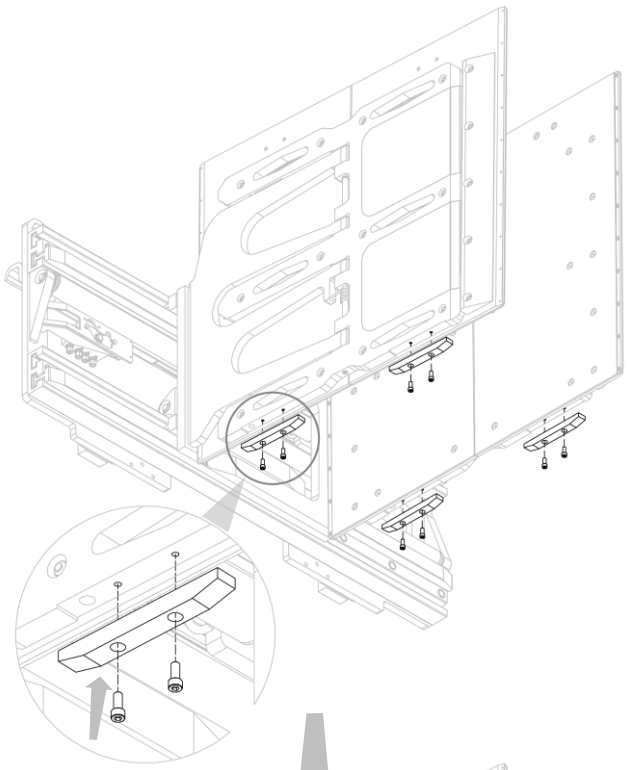


Figure 32

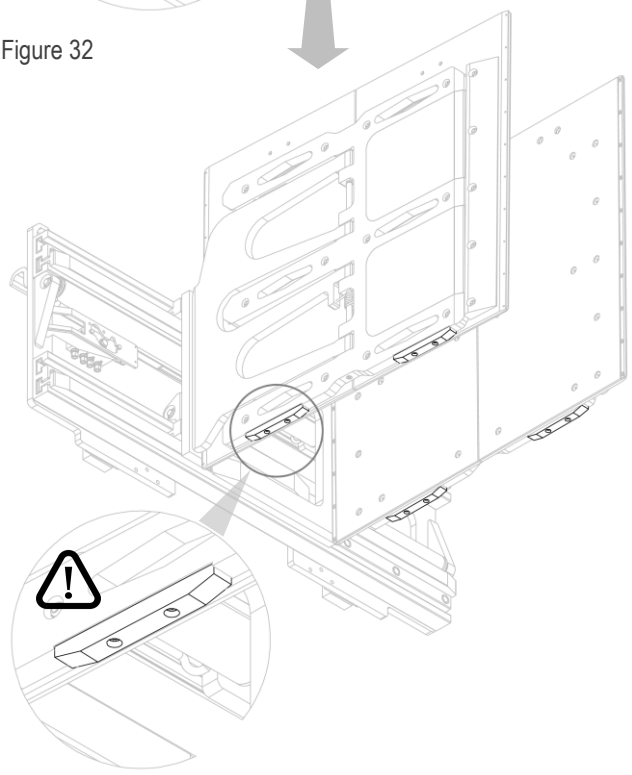


Figure 33

3.6 Assembling the Clamping Unit – TYPE 474.181

3.6.1 Assembling the Protective Caps

PROTECTIVE CAPS

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

2. Fit the protective caps onto the jaws (see *Figure 34*).

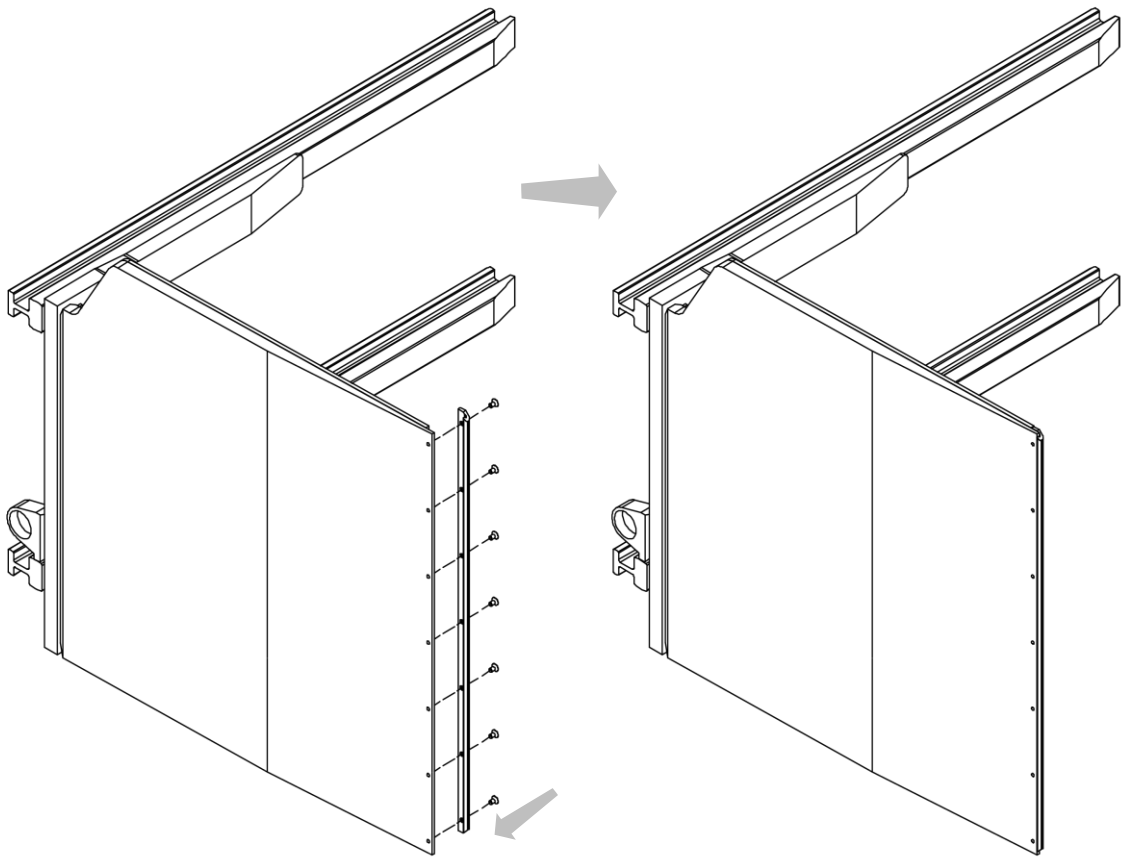


Figure 34

3.6.2 Assembling the Forks with Fixed Jaws

FORKS WITH FIXED JAWS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Insert the fork assembly, one at a time, into their appropriate housings and tighten the nuts that secure them to the cylinders (see *Figure 35* and *Figure 36*).

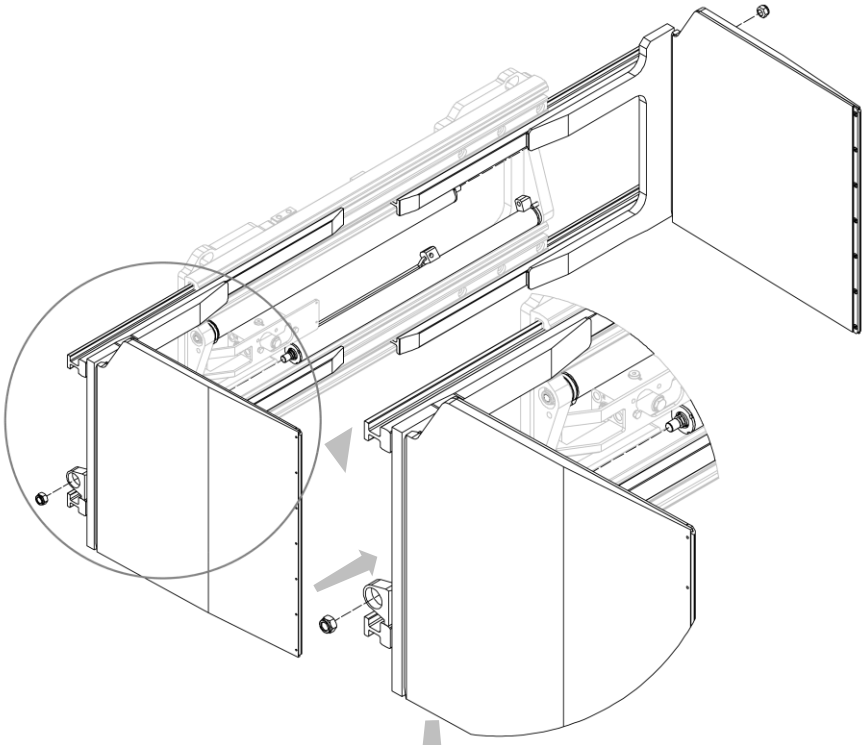


Figure 35

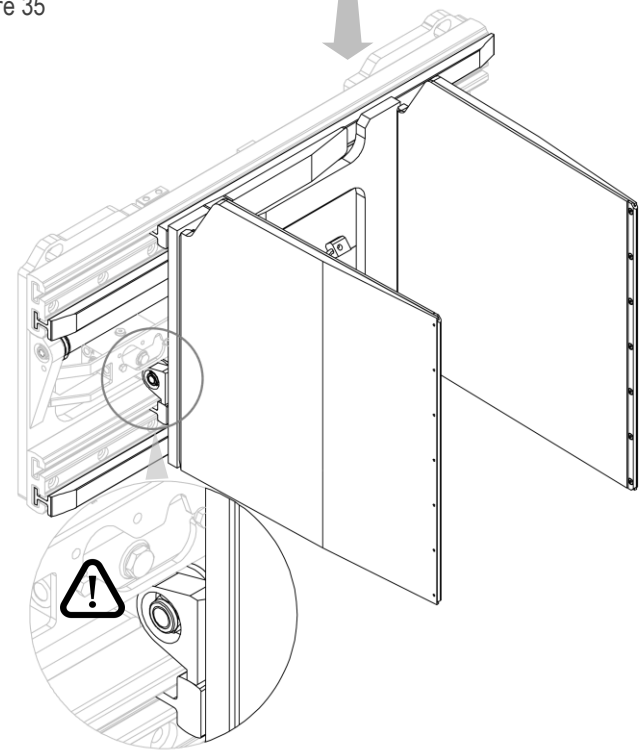


Figure 36

3.7 Assembling the Swing Stop Pins (474.180)

SWING STOP PINS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Insert the upper swing stop pins, one at a time, into the holes in the jaw (see *Figure 37*).

N.B. The pin fits into the fork stop, so when inserting the pins, the fork and jaw holes must match, and therefore the jaw swing on the fork must be 0° (see *Figure 37* and *Figure 38*).

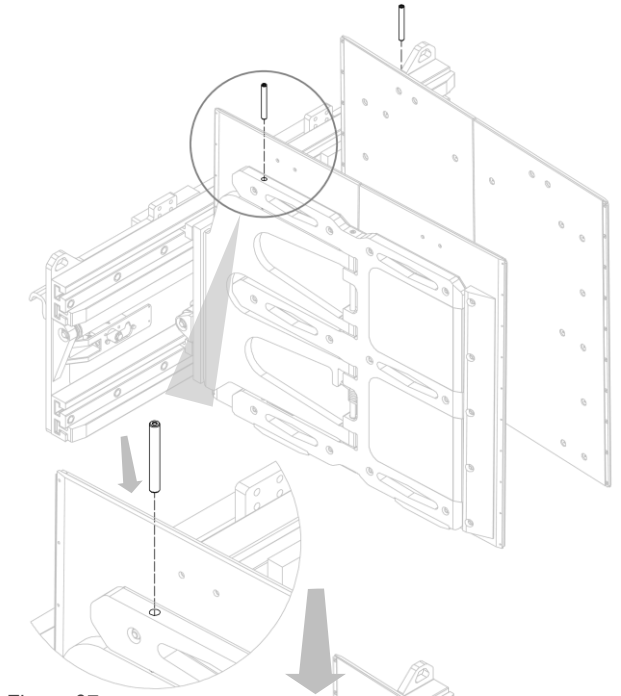


Figure 37

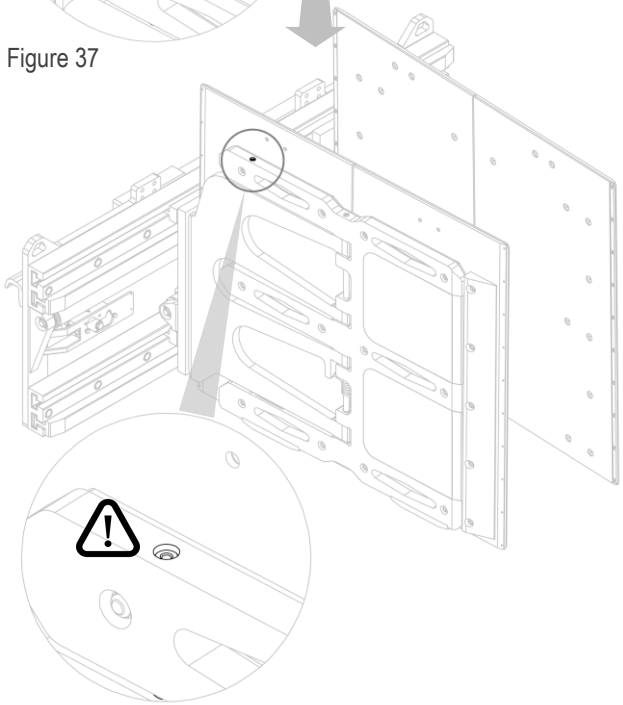


Figure 38

3. Insert the lower swing stop pins, one at a time, after temporarily removing the anti-slip pads (see *Figure 39* and *Figure 40*).

N.B. To carry out this procedure, the equipment must be lifted to allow the lower pins to be installed safely; once this is done, release the pressure from the hydraulic system and disconnect the hoses.

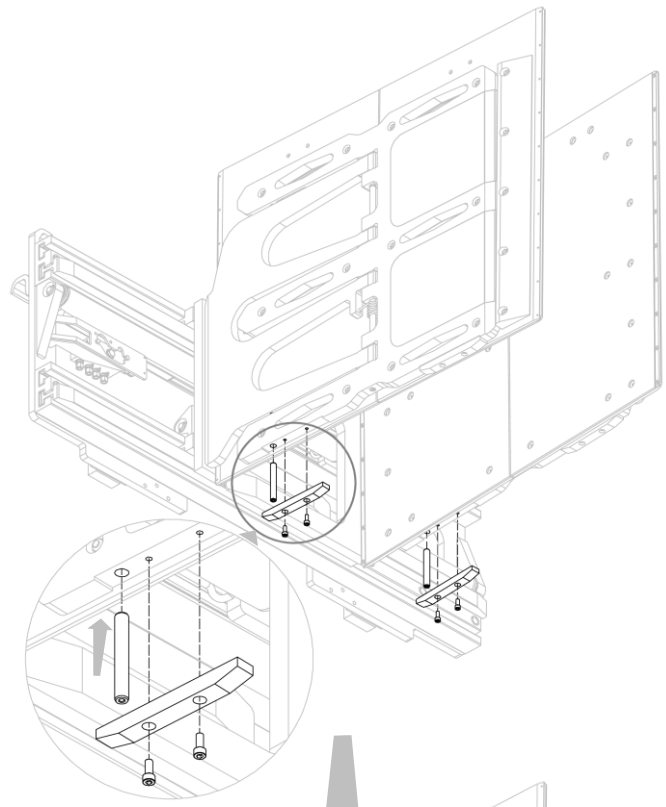


Figure 39

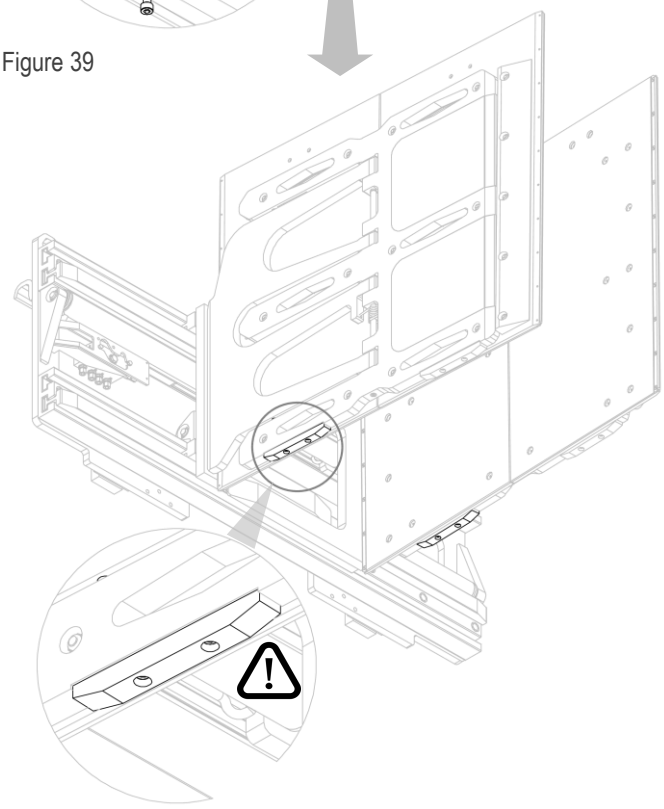


Figure 40

3.8 Assembling the Load-Retaining Frames

N.B. Although only type 474.24.180 is shown, the installation procedure for load-retaining frames is identical to that for different versions

3.8.1 Assembling the Side Load-Retaining Frames

SIDE LOAD-RETAINING FRAMES

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Secure the rubber-coated plates onto the guide profiles using the screws provided.
3. Secure the fastening plate onto the guide profiles using the screws provided.
4. Use *Figure 41 as a guide.*

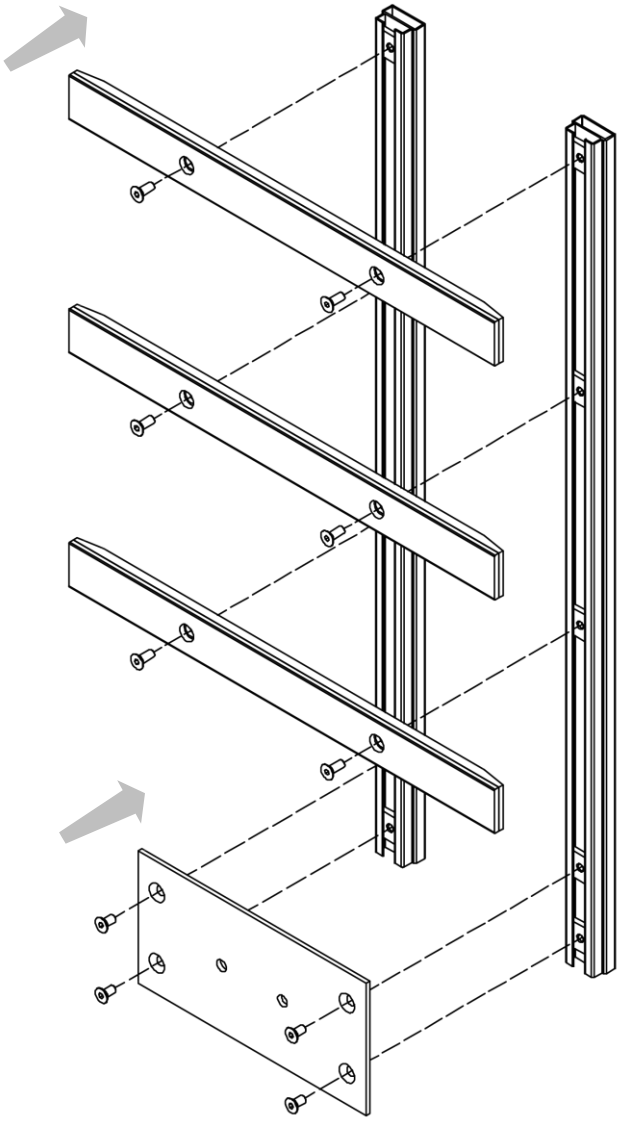


Figure 41

5. Install the side load-retaining frames onto the panels, using the screws and fastening knobs provided (see *Figure 42*).

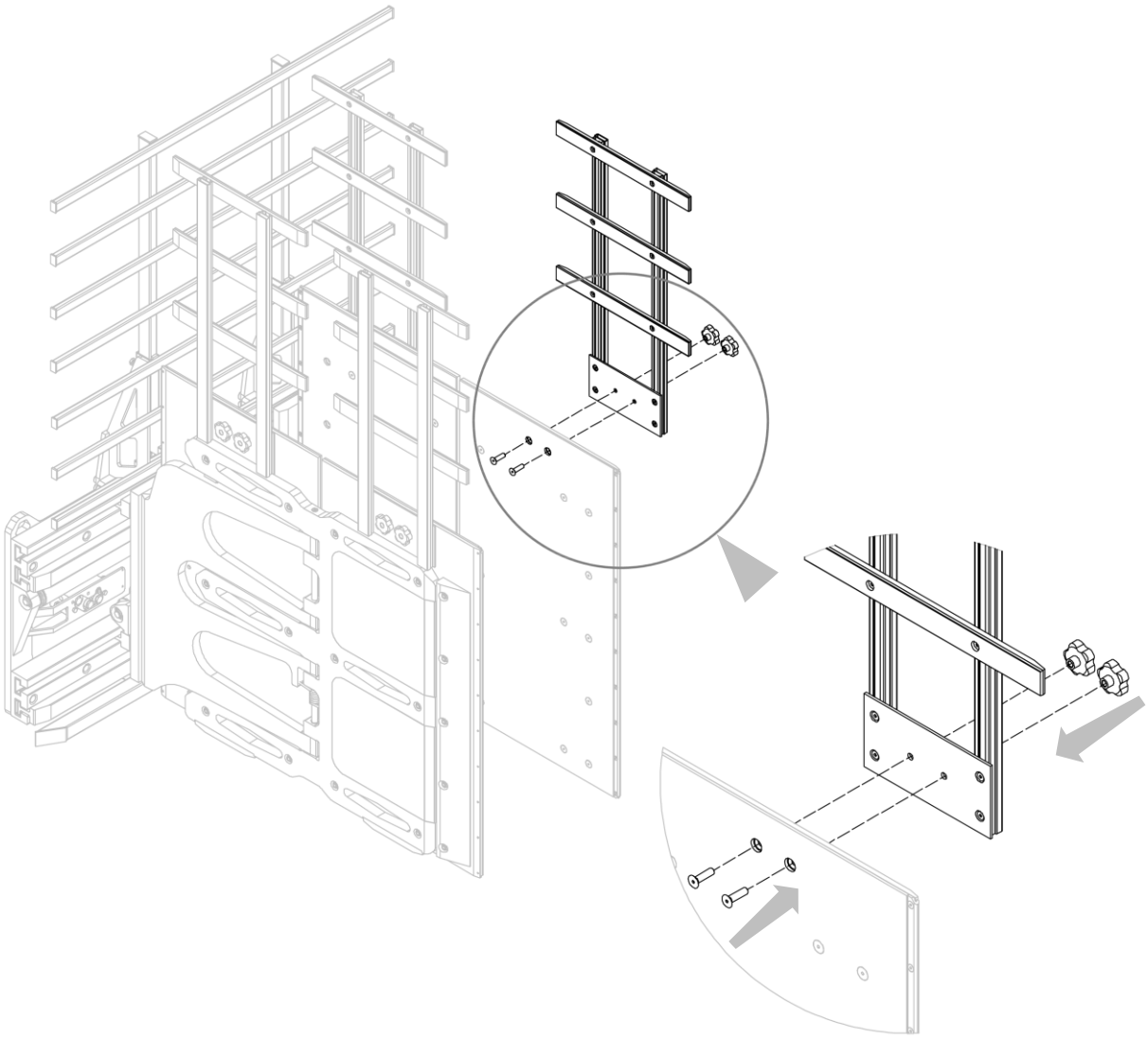


Figure 42

3.8.2 Assembling the Upper Load-Retaining Frame

UPPER LOAD-RETAINING FRAME

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. This step must be carried out with the equipment disassembled. (see *Disassembling the Equipment from* the Forklift Truck).

3. Install the retaining frame on the equipment (see *Figure 43*).

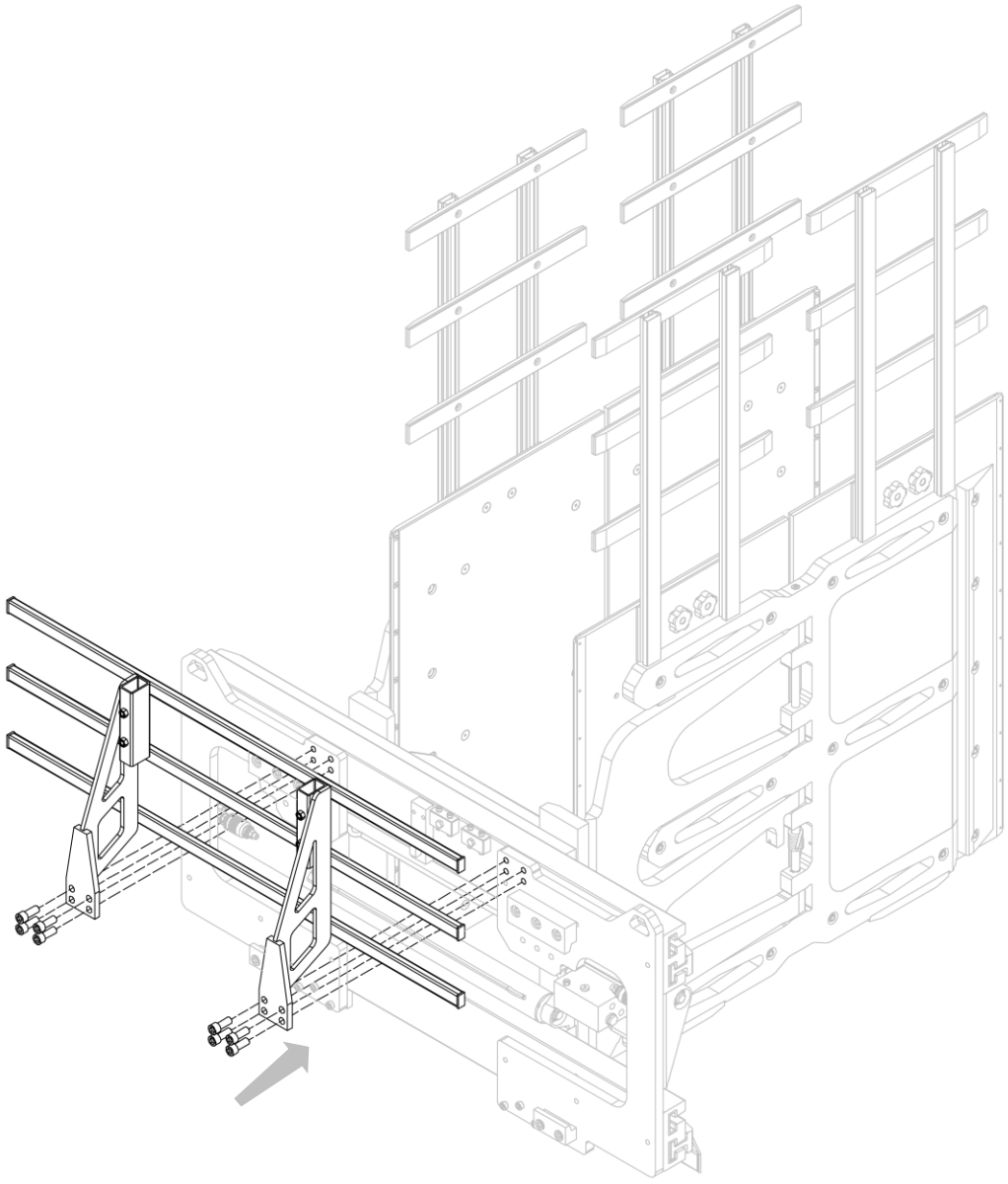


Figure 43

4. Fit the upper part of the load-retaining frame, using the screws and locknuts (see *Figure 44*).

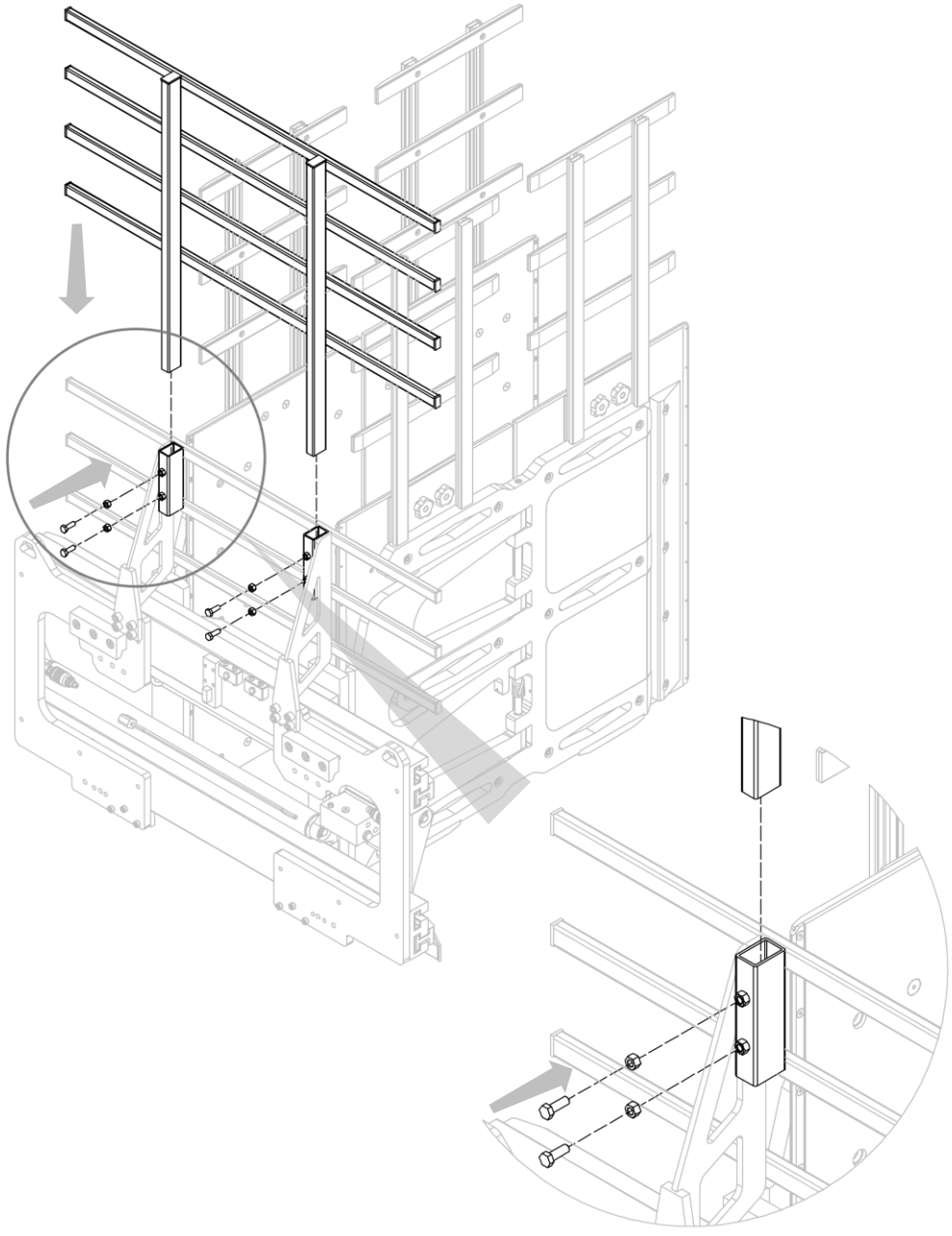


Figure 44

3.8.3 Assembling the Lower Load Pusher

LOWER LOAD PUSHER

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. This step must be carried out with the equipment disassembled. (see *Disassembling the Equipment from* the Forklift Truck).

3. Mount the lower load-retaining frame using the screws (see *Figure 45).*

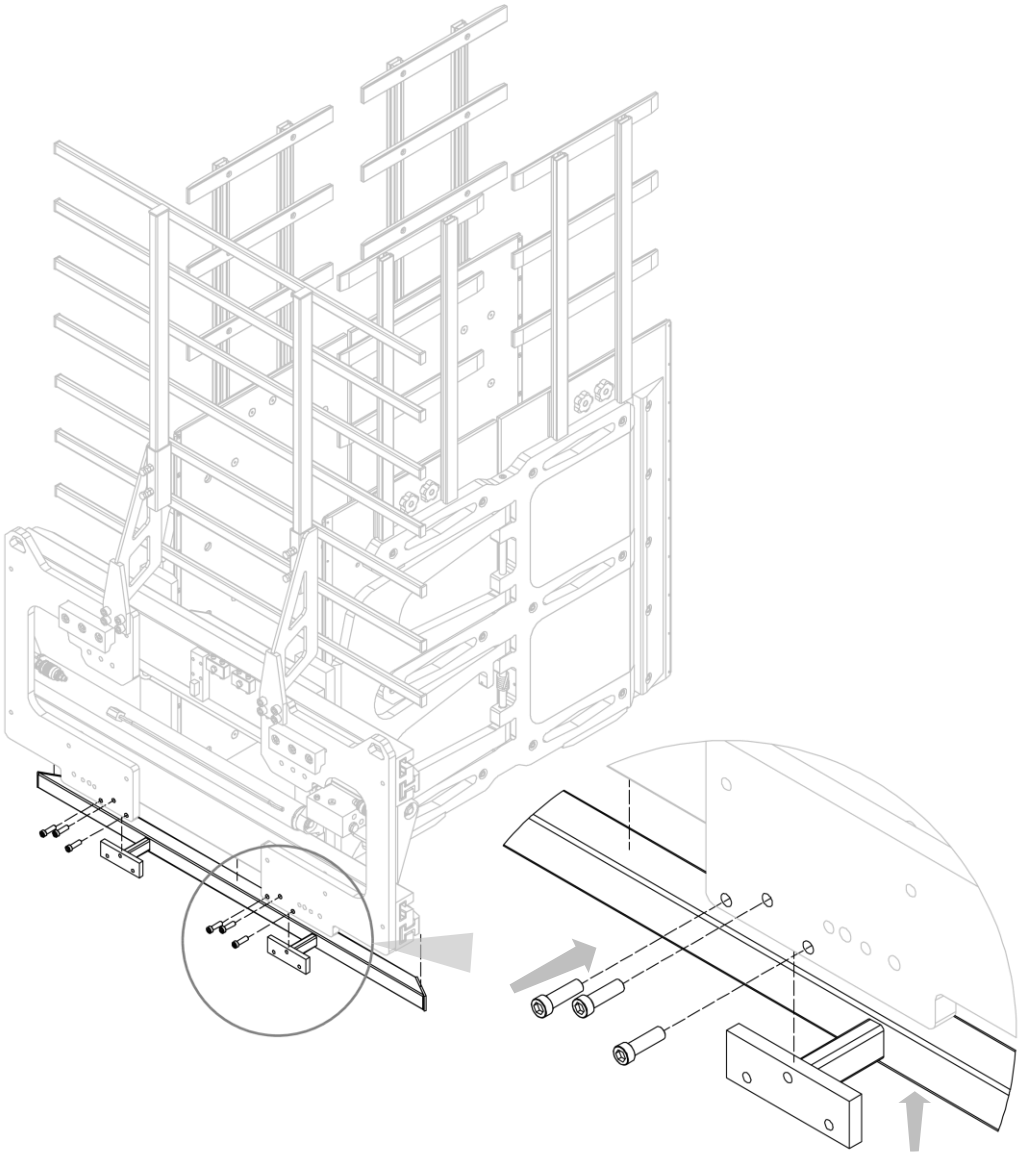


Figure 45

4 HYDRAULIC SYSTEM

N.B. Although only type 474.24.180 is shown in the images, the position of the solenoid valves is identical.

4.1 Hydraulic System – Valve B2383021

VALVE B2383021

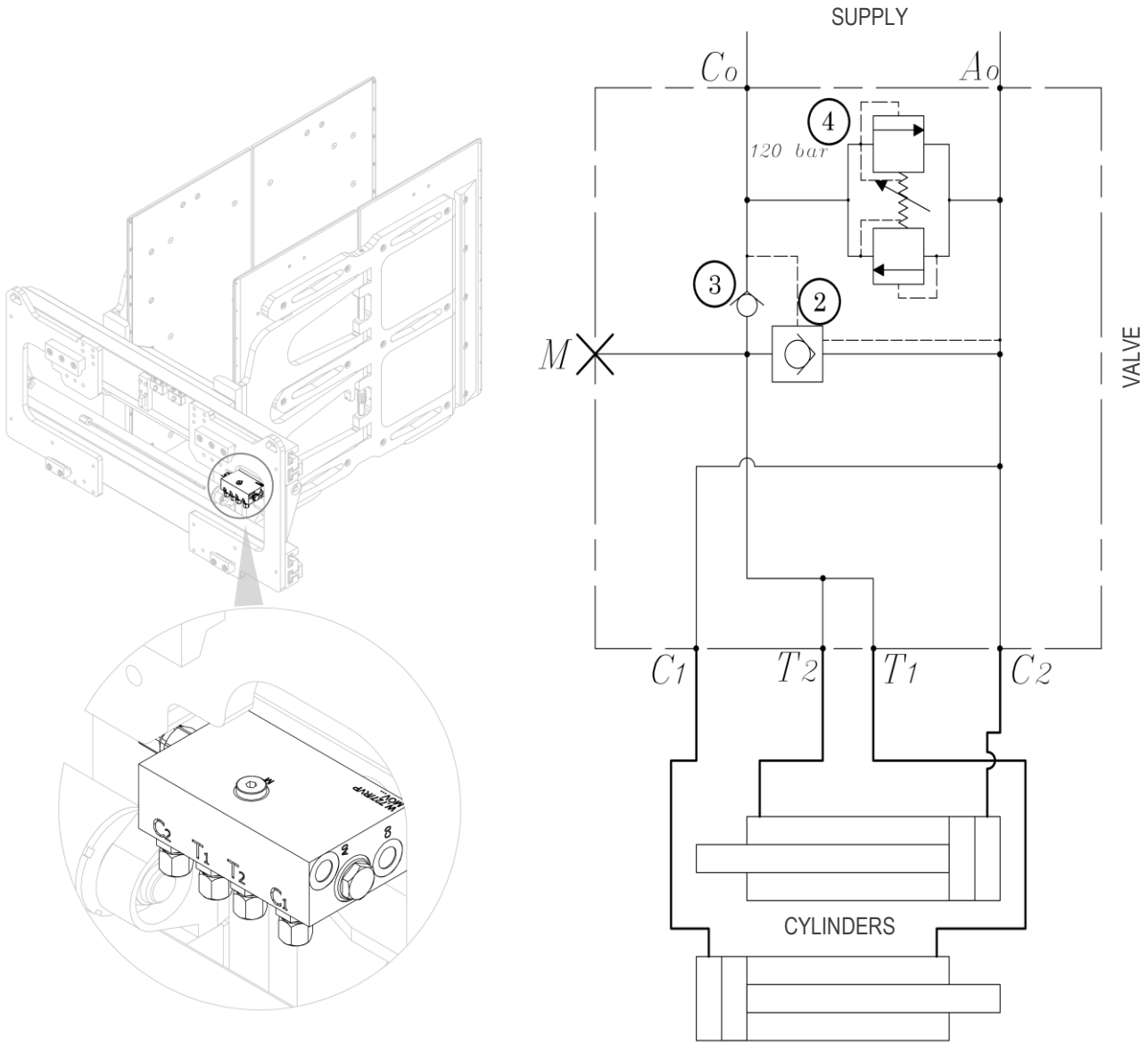


Figure 46

4.2 Hydraulic System – Valve B2383021 with Siss

VALVE B2383021

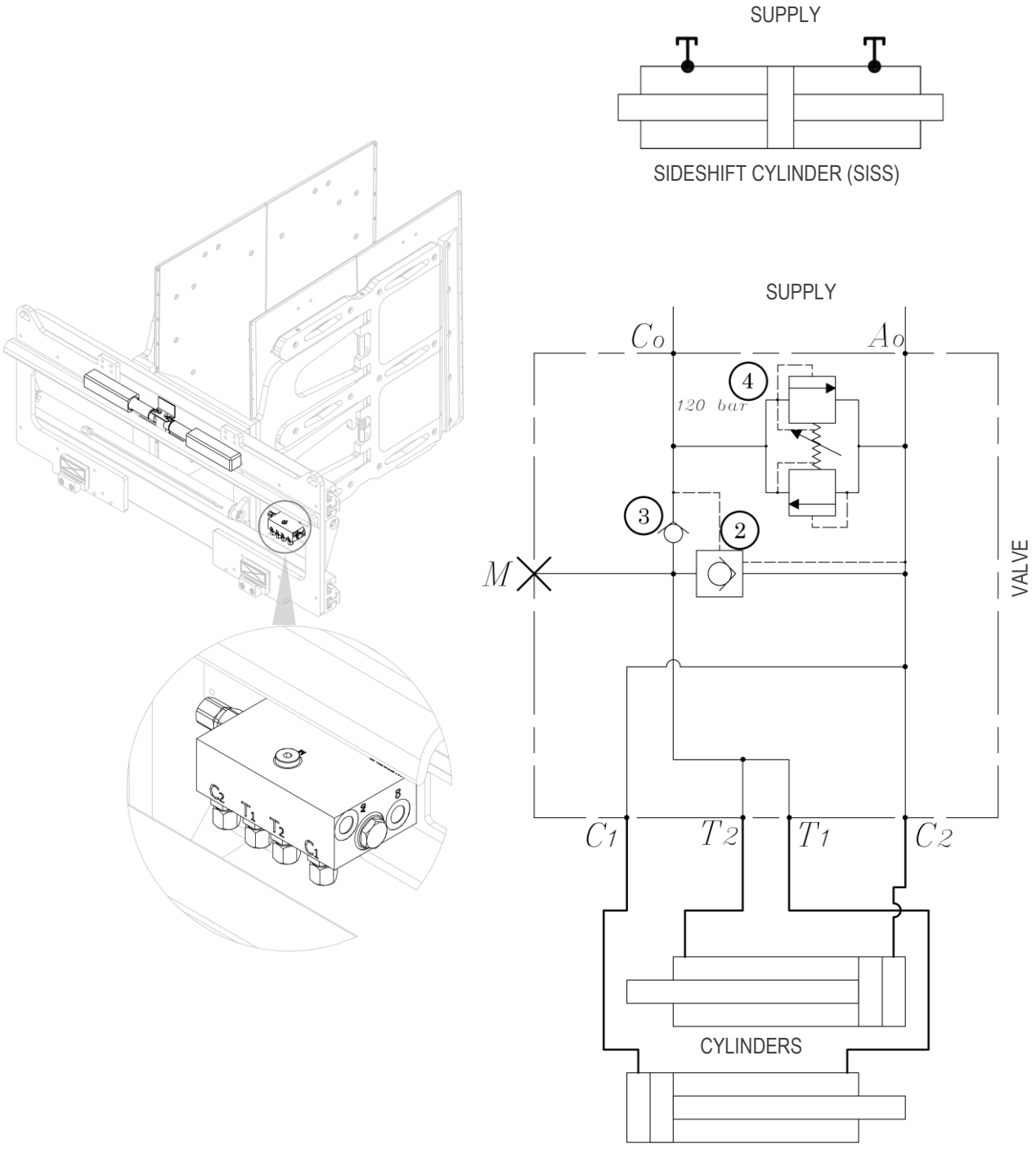


Figure 47

4.3 Hydraulic System – Valve B2383022

VALVE B2383022

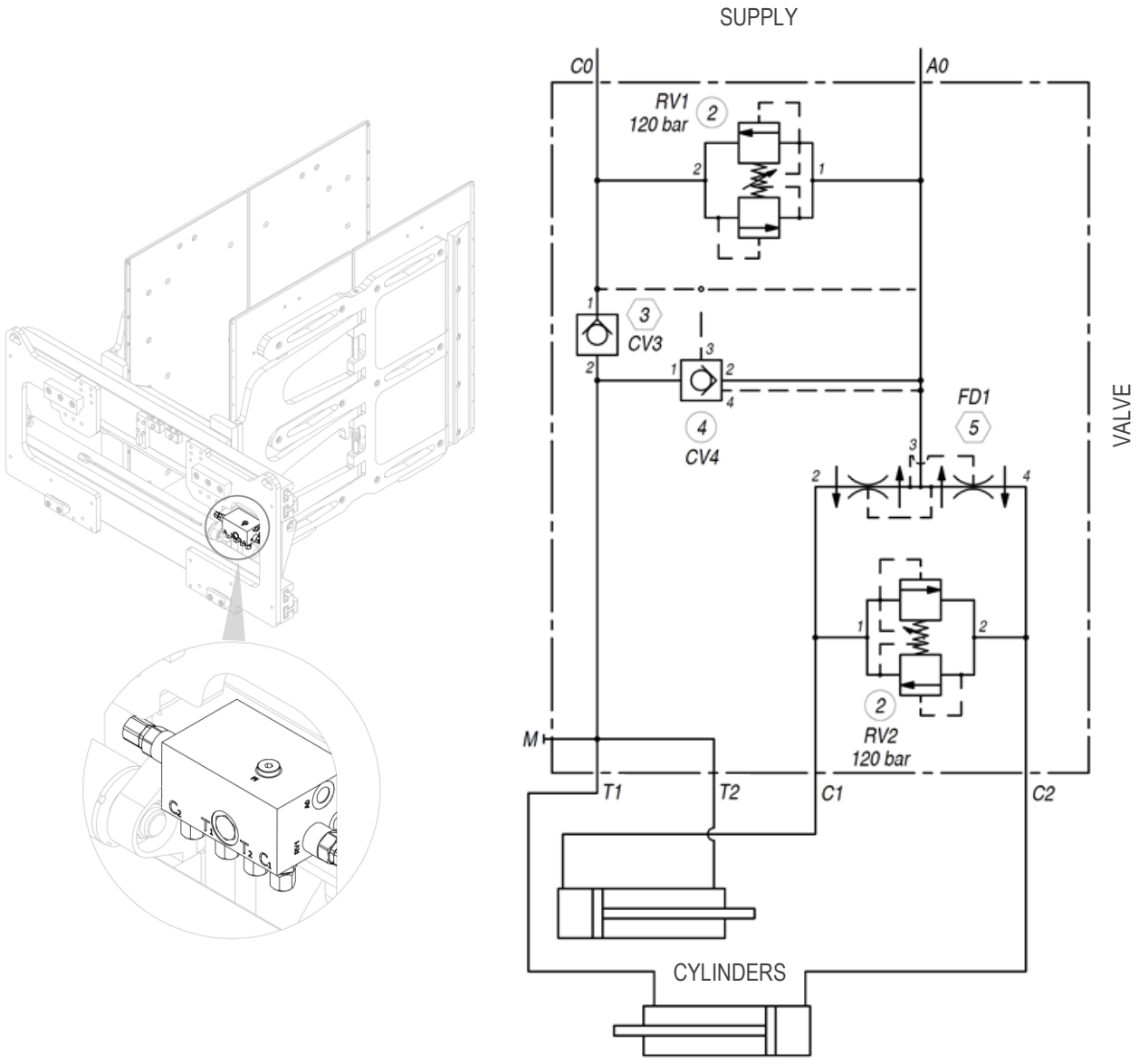


Figure 48

4.4 Hydraulic System – Valve B2383022 with Siss

VALVE B2383022

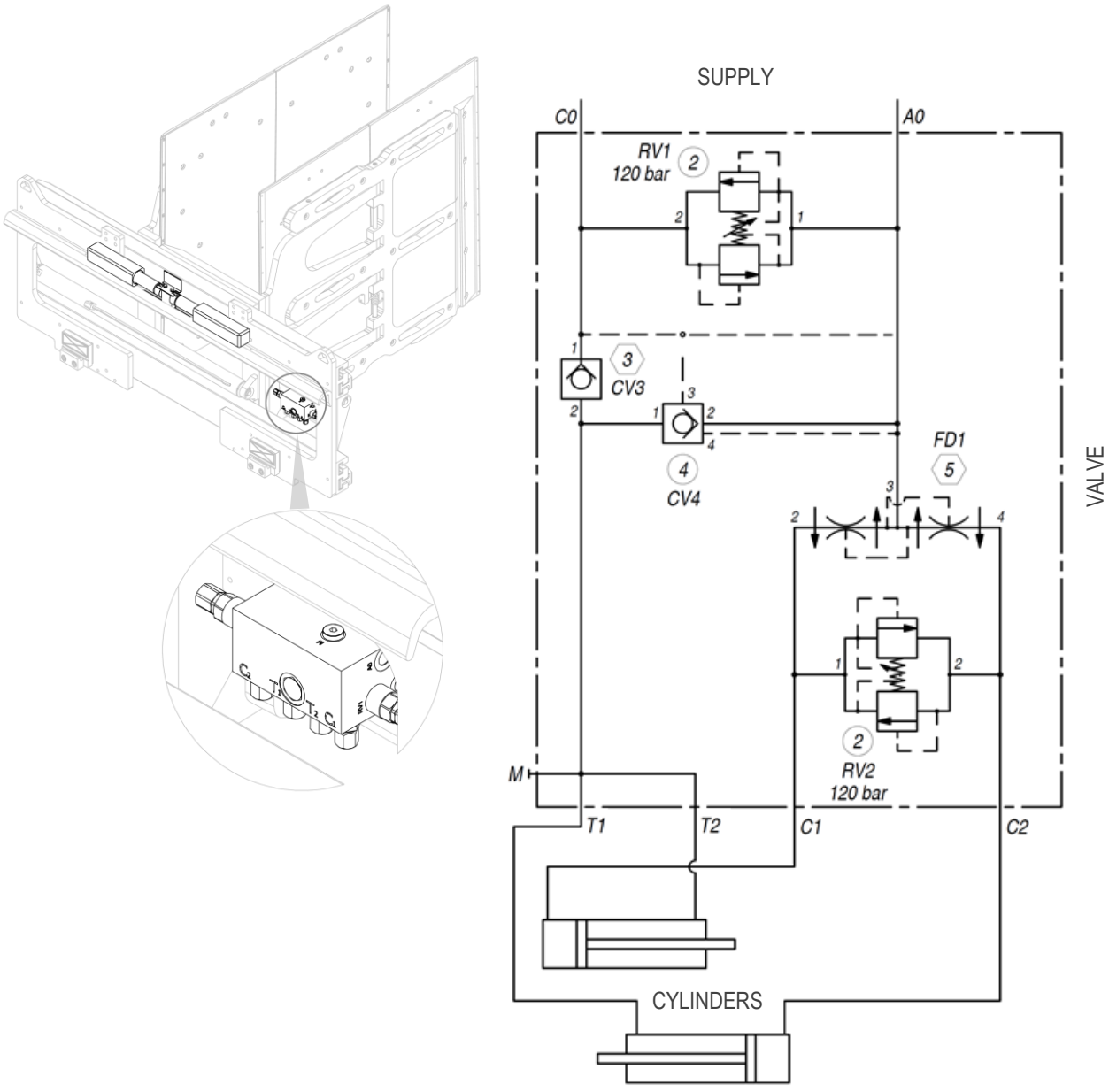


Figure 49

4.5 Hydraulic System – Iss – Valve B2383020

VALVE B2383020

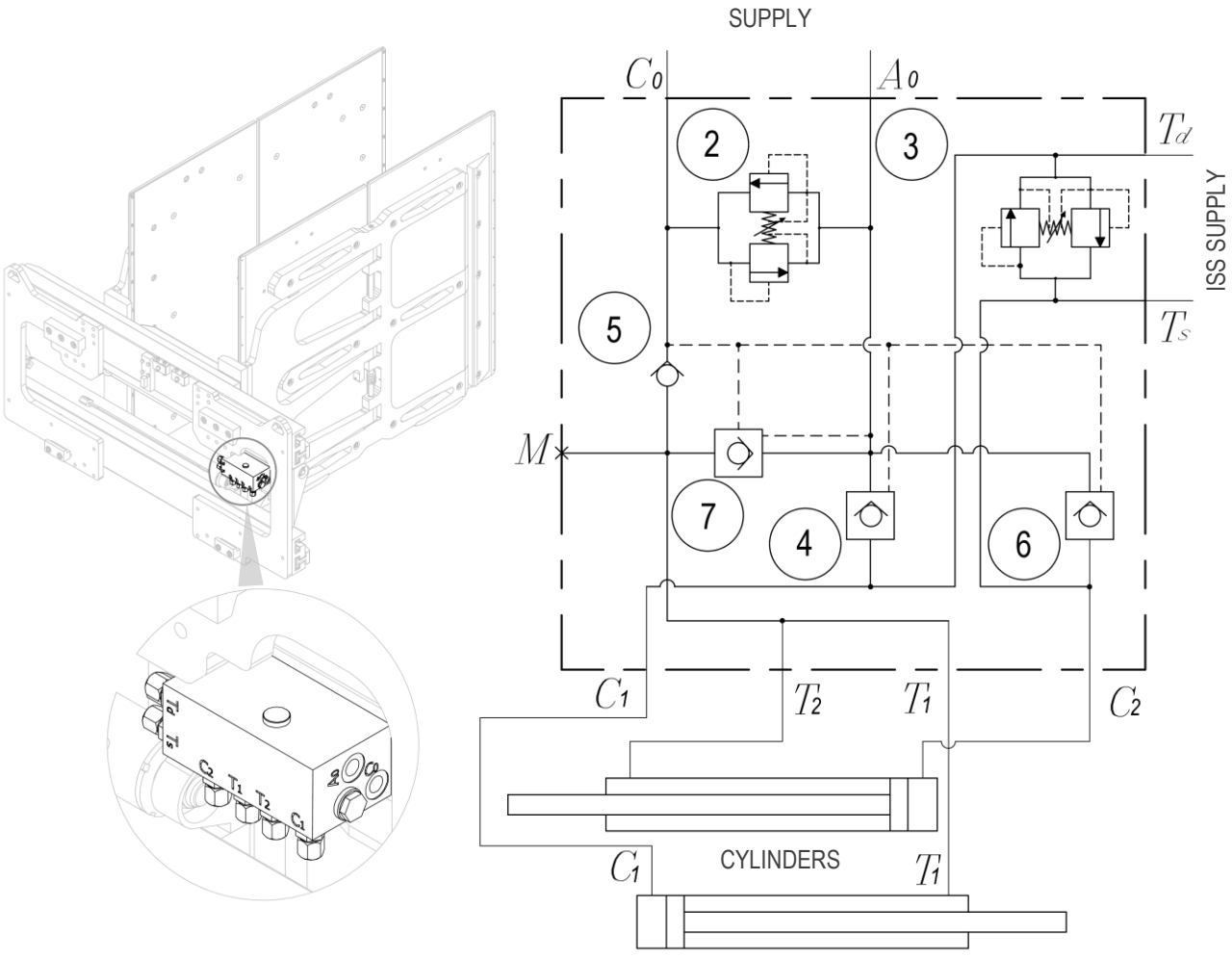


Figure 50

4.6 Hydraulic System – Iss – Valve B2383023

VALVE B2383023

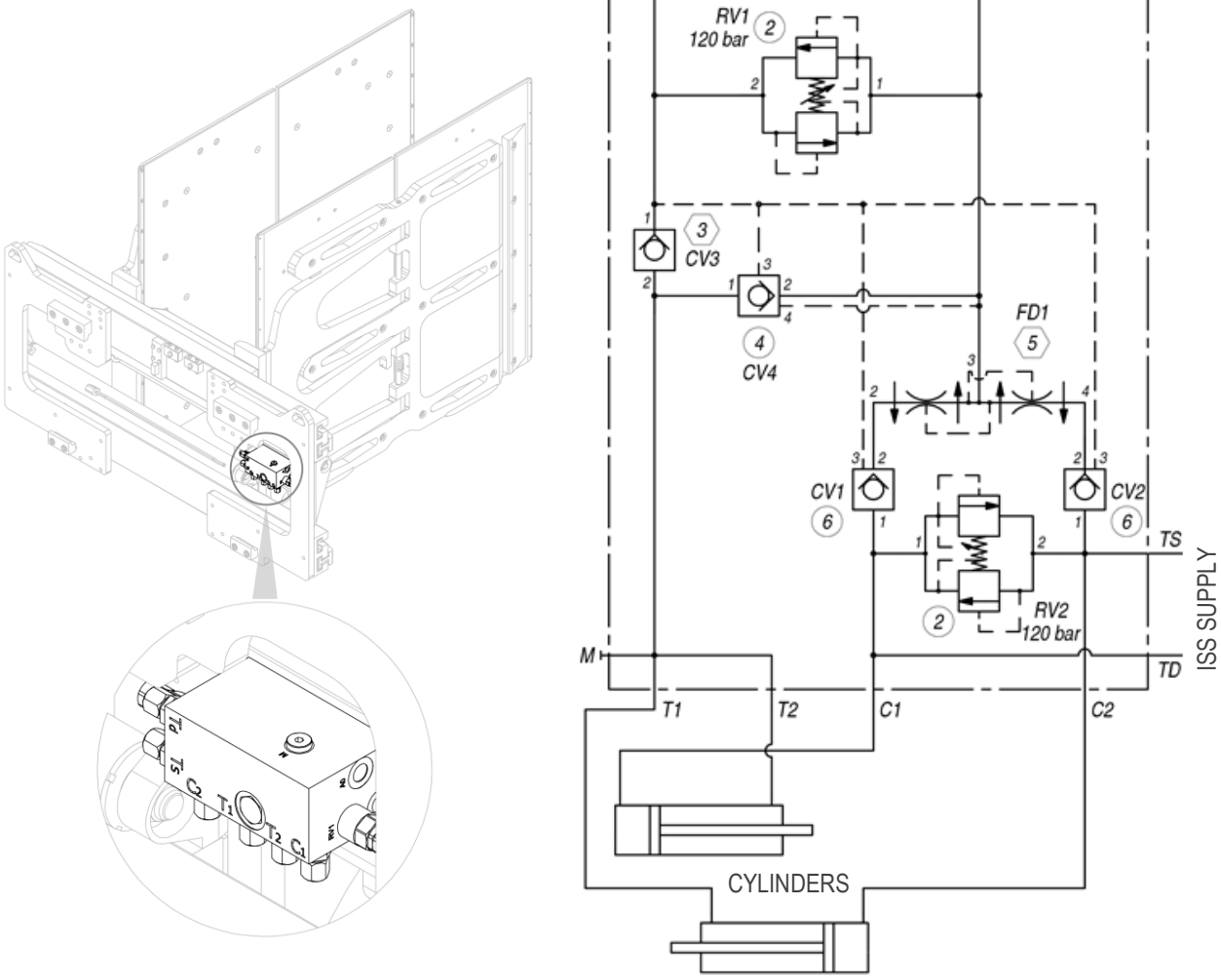


Figure 51

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 lift loads by clamping them between the two jaws.
4. Do not attempt to move loads sideways by dragging them across the floor.
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 sideshift control lever gently to avoid 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 jaws, operator intervention is required to nullify the displacement differences, which will increment over time.
The operator simply needs to hold one of the two jaws 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 ATIB equipment is designed and manufactured according to a load positioned (with respect to its centre of gravity) at a certain distance from the vertical plane of the jaws.

If the distance of the centre of gravity from the vertical part of the jaws needs to be increased, the weight of the load must be reduced.
In this case, consult the chart shown in *Figure 52* 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.

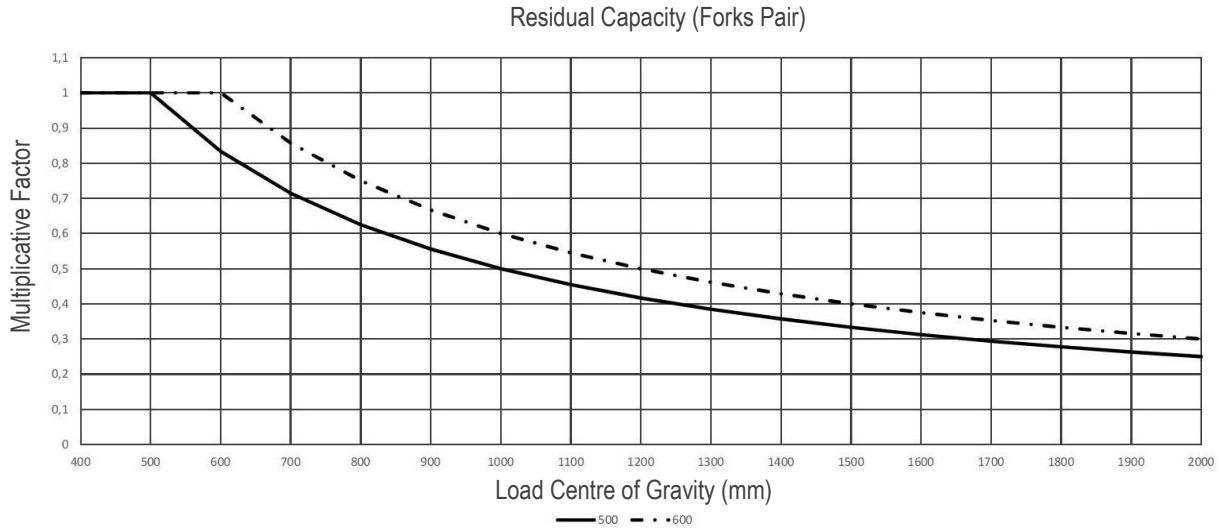


Figure 52

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 one most frequently used in “CLAMP FOR HOUSEHOLD APPLIANCES AND BOXES TYPE 474.180 - 181” and uses the same cylinders that carry out the clamping. 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]

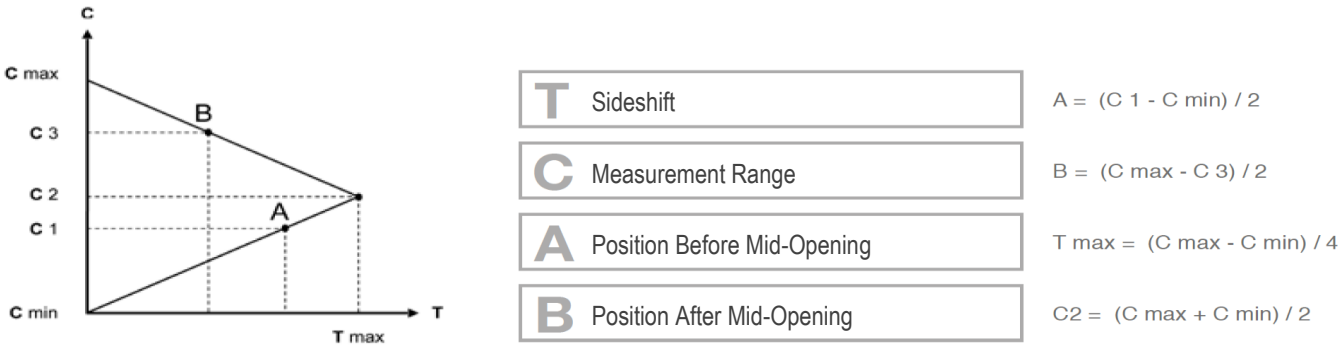
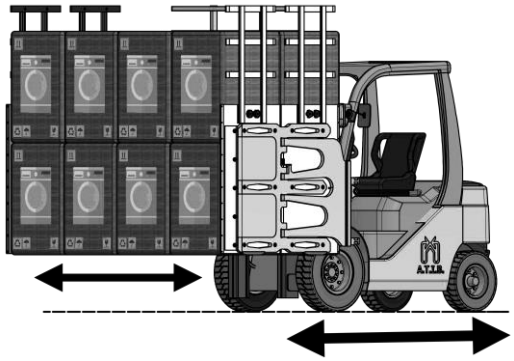
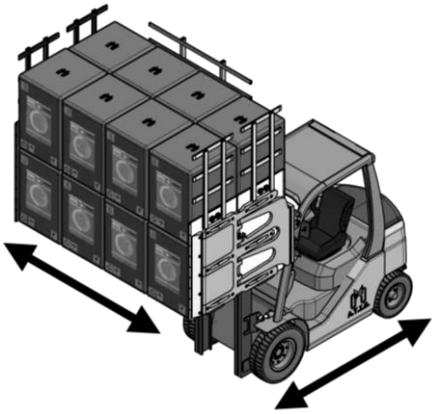
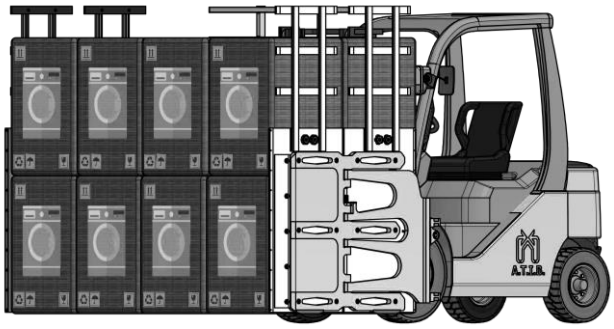
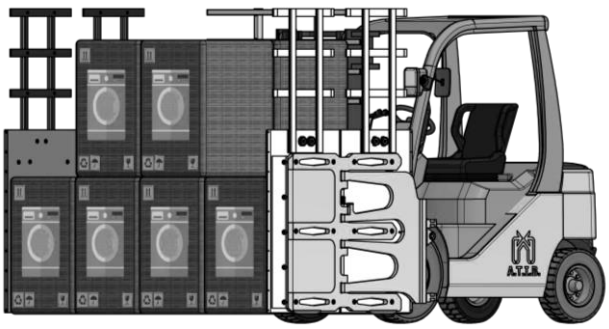
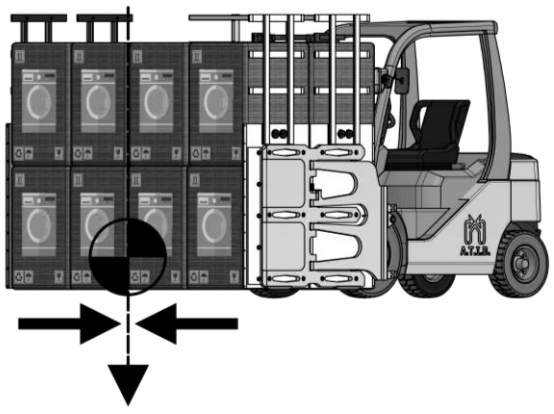
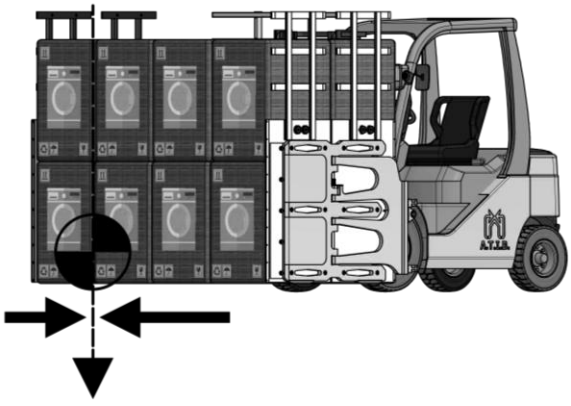


Figure 53

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.

PERMITTED OPERATIONS	PROHIBITED OPERATIONS
AVOID SIDESHIFT AND/OR HANDLING OF THE TRUCK 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	
	

→ CENTRE OF GRAVITY OF LOAD

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, ATIB 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 tightening torque of the bolts of the lower retaining couplings of the equipment, ensuring that it is as indicated in *Table 3* (page *18*) and in *Table 4* (page *21*) and, if necessary, adjust the bolts holding them in place.
3. Check clearance between the lower part of the fork carriage and the lower equipment couplings, ensuring that it is as shown in *Figure 4* (page *18*) and in *Figure 8* (page *21*) and, if necessary, adjust the bolts holding them in place.
4. Clean and lubricate/grease all sliding parts (see *Figure 96*, *Figure 97* and *Figure 98* on page *90* and *91*).

6.2 Maintenance Every 300 Hours

1. Check condition of bushes and sliding gibs. If excessively worn component are detected, replace the entire component assembly in question.
2. Carry out the additional operations listed in the previous point (*Point 6.1*).

6.3 Maintenance Every 1000 Hours

1. Check condition of bushes and sliding gibs. If excessively worn component are detected, replace the entire component assembly in question.
2. Check condition of the jaw swing bushes. If an excessively worn component is detected, replace the entire component assembly. To check the condition of the bushes, the jaws must be removed, see chapter *7.6* and *7.7* on page *69* and *74*.
3. Check the condition of the panels and, if necessary, repair/replace.
4. Carry out the additional operations listed in the previous point (*Point 6.1* and *6.2* on page *57*).

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 condition of sliding and working surfaces and replace/repair if damaged.

   For further potential issues (and their solutions), refer additionally to *Table 5* on page *89*.
2. Disassemble cylinders (see points *7.9* and *7.10* on page *84* and *87)* and check the condition of the rods and seals; if a damaged or excessively worn seal is present, replace 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 (*Point 6.1*, and points *6.2* and *6.3* on page *57*).

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 Disassembling the Equipment from the Forklift Truck

1. Release the pressure from the hydraulic system.
2. Remove load-retaining frames, if present, as described in chapter *7.4 -Disassembling the Load-Retaining Frames* .
3. Remove, if the equipment comes WITH SISS, the dual coupling protection bracket, as shown in *Figure 5 on page 19*.
4. Remove the lower couplings from the assembly (see *Figure 2 and Figure 6* on page *16 and 20).*
5. For handling, use straps/chains that are suitably sized in relation to the weight of the equipment as indicated on the plate.
6. Then lift the equipment using an overhead crane or hoist of sufficient capacity and remove it from the forklift truck (see *Figure 3 and Figure 7 on page 17 and 20*).

7.2 Disassembling the Nylon Bushes

NYLON BUSHES

1. Remove the fork assembly from the equipment.
2. Release the pressure from the hydraulic system and disconnect the lines.
3. Remove the nylon bushes after unscrewing the corresponding grub screws (see *Figure 54* and *Figure 55*).

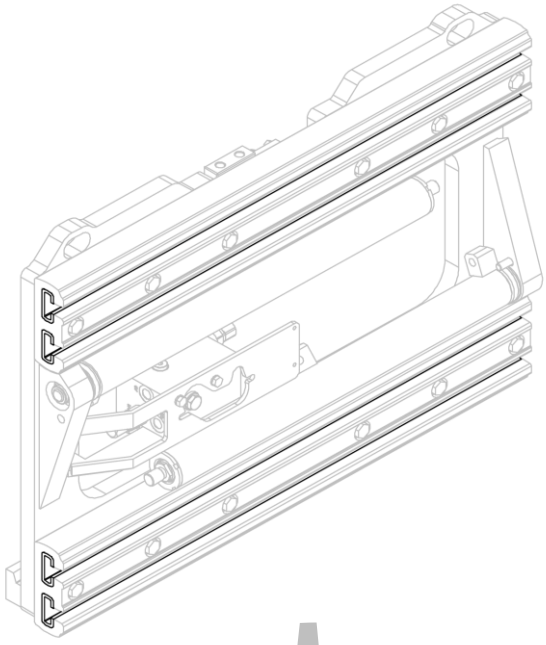


Figure 54

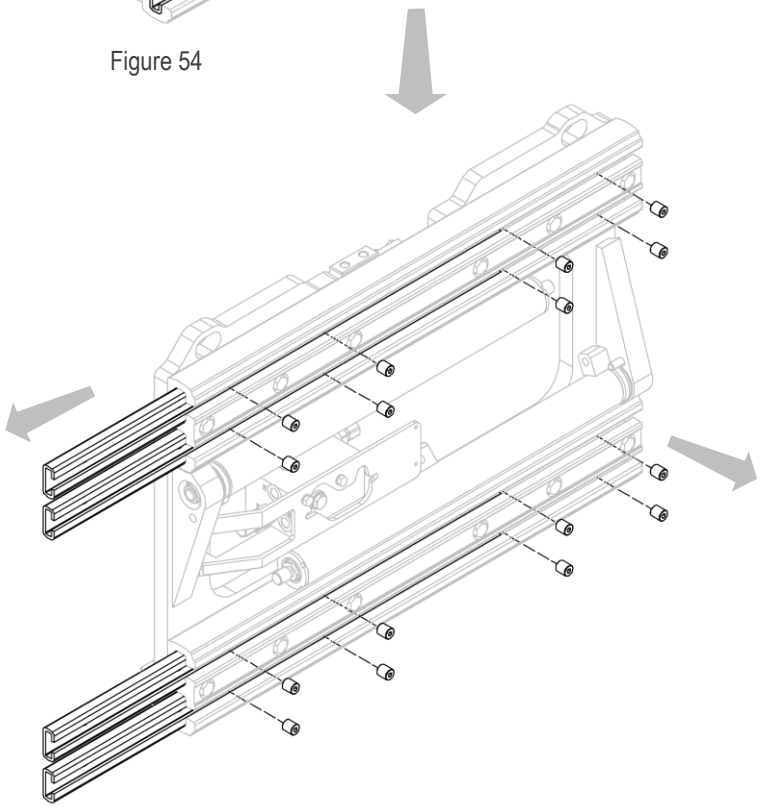


Figure 55

7.3 Disassembling the Aluminium Profiles

ALUMINIUM

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Remove the aluminium profiles, one at a time, after unscrewing the bolts (see *Figure 56* and *Figure 57*).

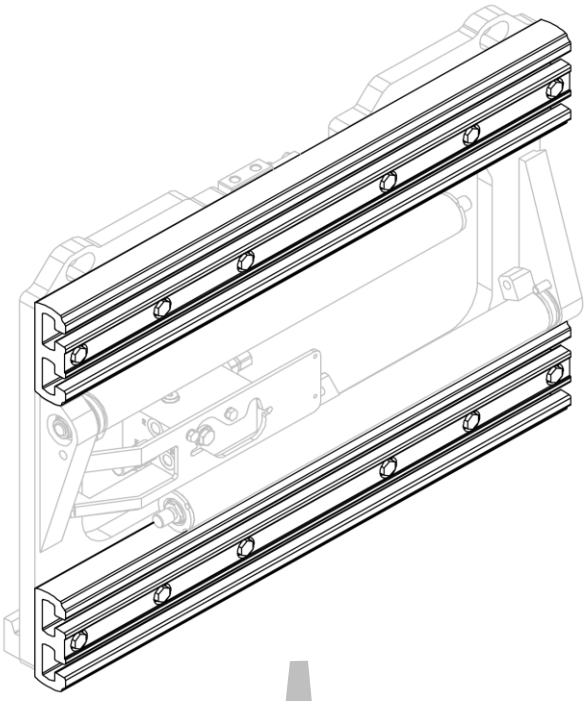


Figure 56

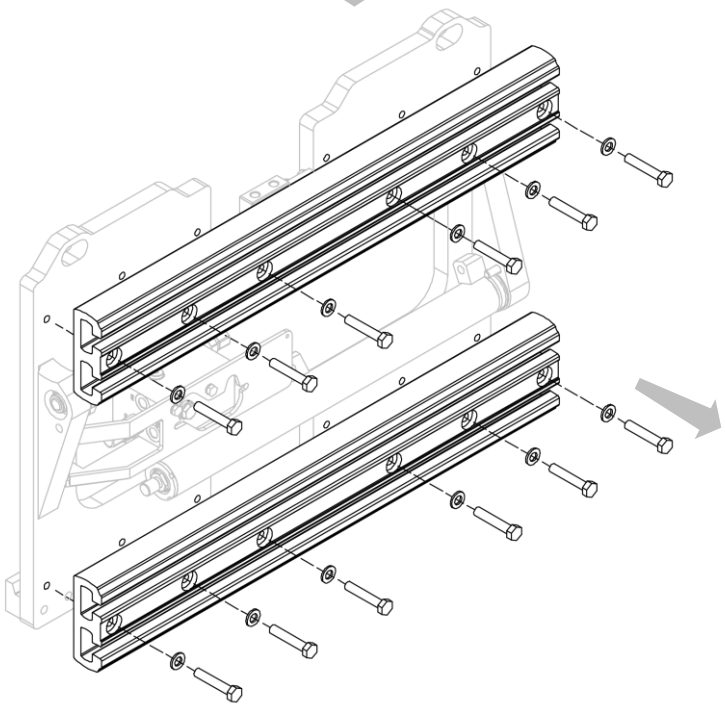


Figure 57

7.4 Disassembling the Load-Retaining Frames

N.B. Although only type 474.24.180 is shown, the disassembly procedure for load-retaining frames is identical to that for different versions.

7.4.1 Removing and Disassembling the Side Load-Retaining Frames

SIDE LOAD-RETAINING FRAMES

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Remove the side load-retaining frames by unscrewing the screws and knobs that secure them to the panels (see *Figure 58*).

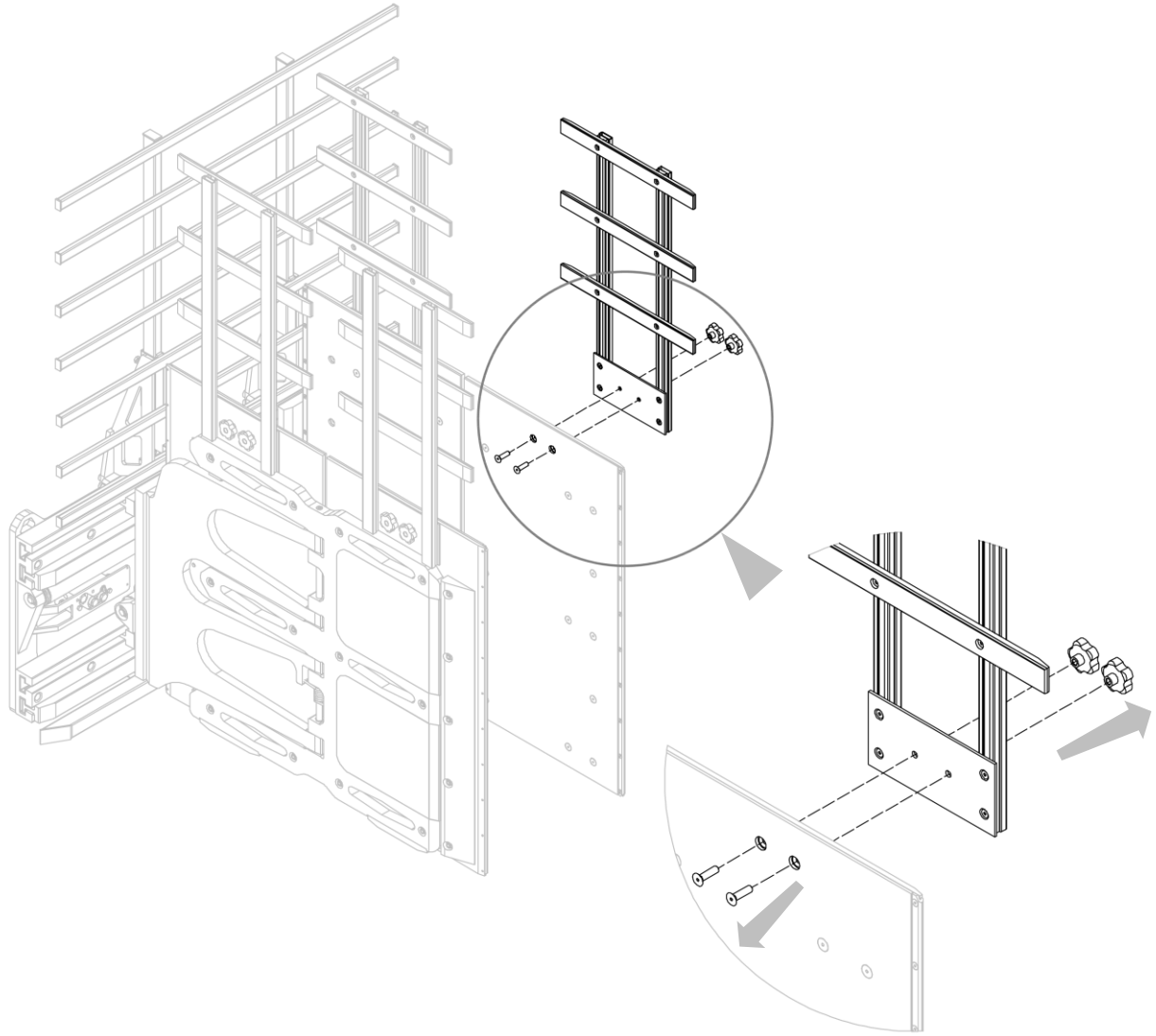


Figure 58

3. Remove the rubber plates from the guide profiles after removing the screws.
4. Remove the fastening plate from the guide profiles after removing the screws.
5. Use *Figure 59 as a guide*.

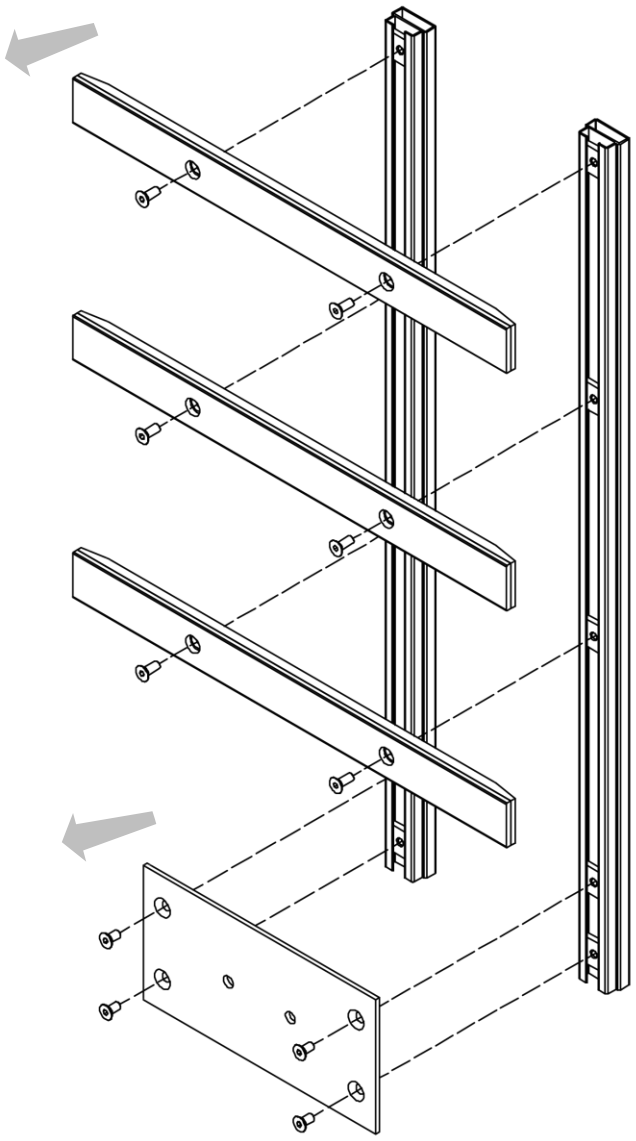


Figure 59

7.4.2 Disassembling the Upper Load-Retaining Frame

UPPER LOAD-RETAINING FRAME

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. This step must be carried out with the equipment disassembled. (see *Disassembling the Equipment from* the Forklift Truck).

3. Remove the upper part of the load-retaining frame after removing the screws and locknuts (see *Figure 60*).

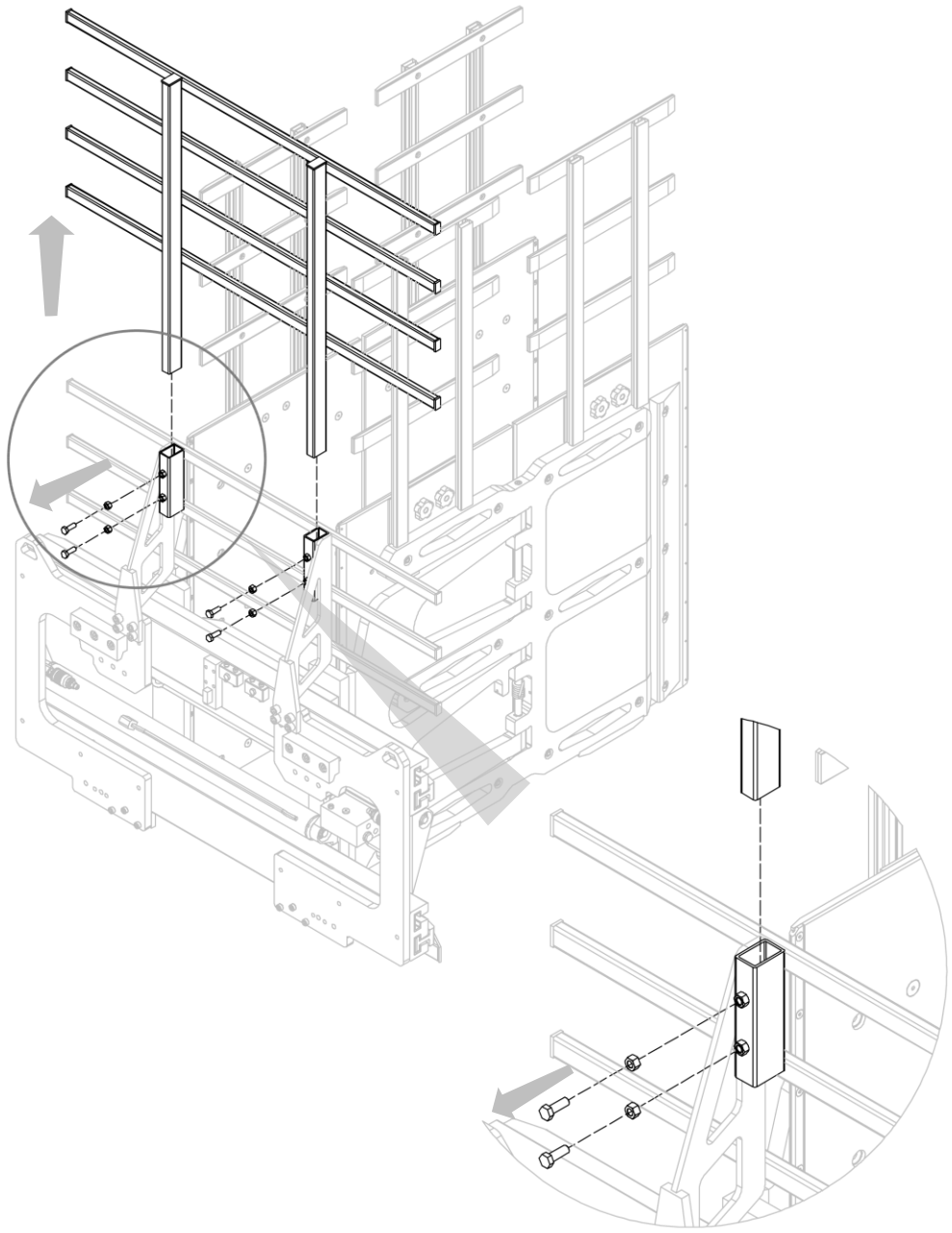


Figure 60

4. Remove the load-retaining frame from the equipment after unscrewing the screws that secure it (see *Figure 61*).

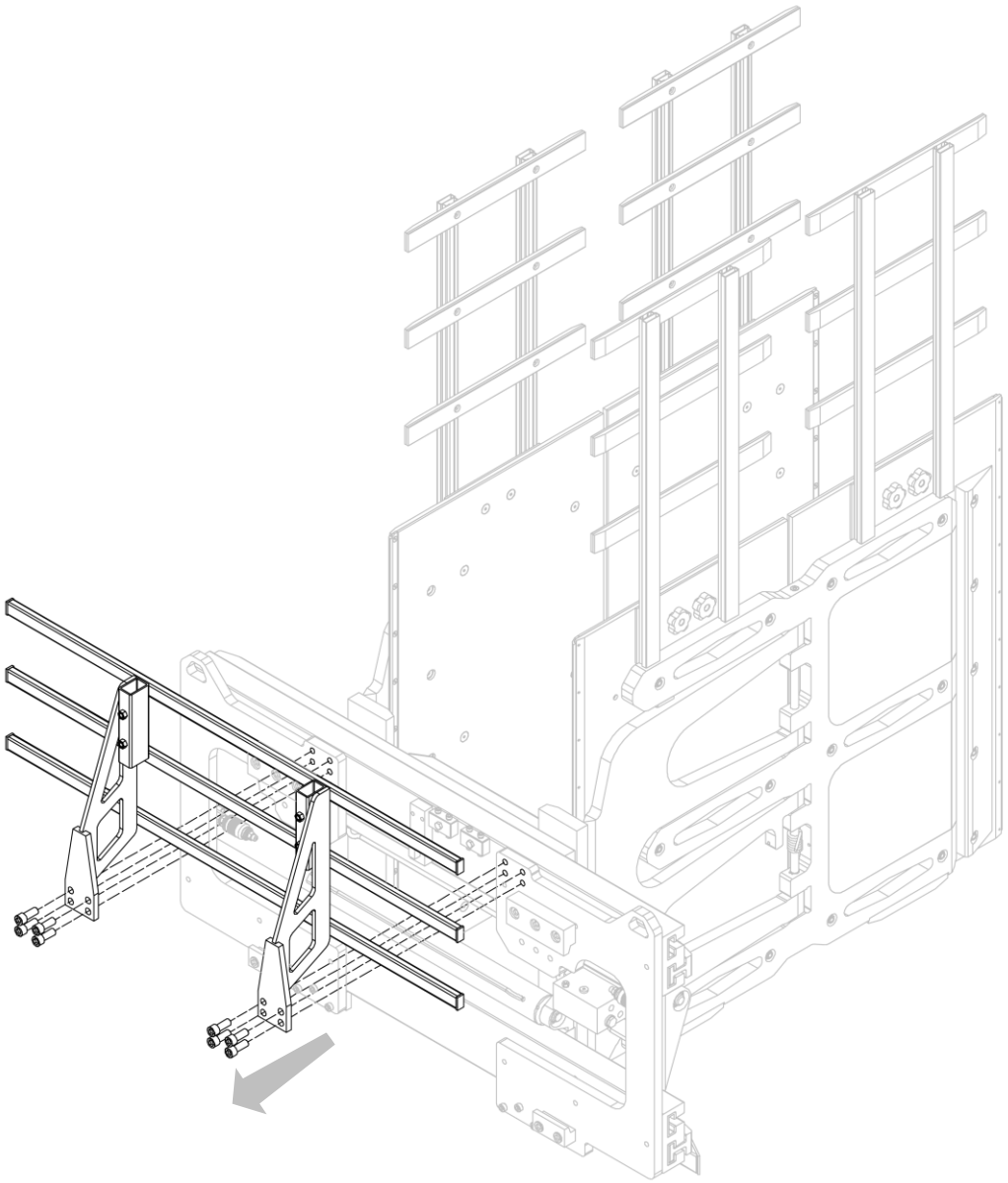


Figure 61

7.4.3 Disassembling the Lower Load Pusher

LOWER LOAD PUSHER

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. This step must be carried out with the equipment disassembled. (see *Disassembling the Equipment from* the Forklift Truck).

3. Remove the lower load-retaining frame after removing the screws (see *Figure 62*).

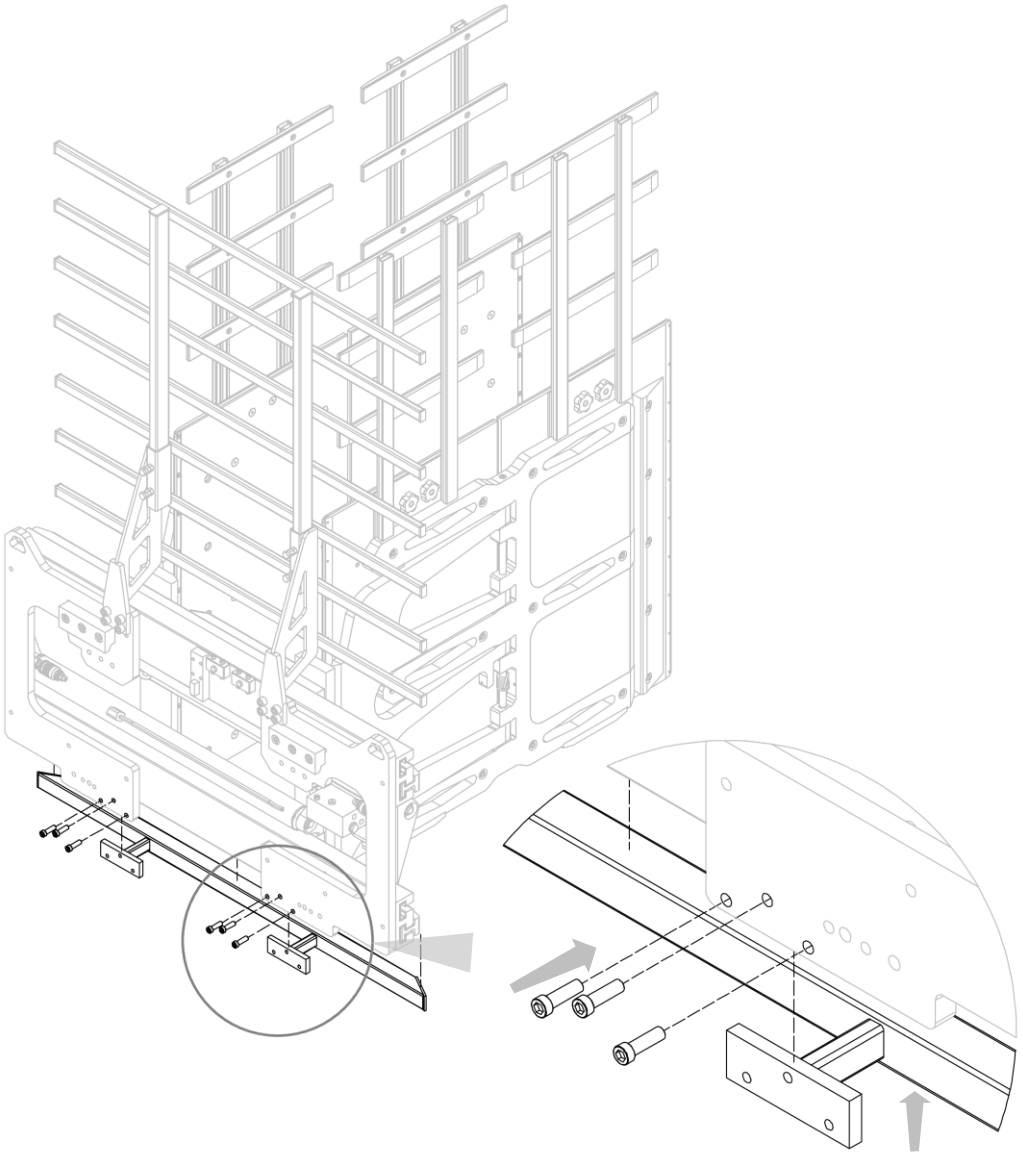


Figure 62

7.5 Disassembling the Swing Stop Pins (474.180)

SWING STOP PINS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove, the upper swing stop pins, one at a time (see *Figure 63* and *Figure 64*).

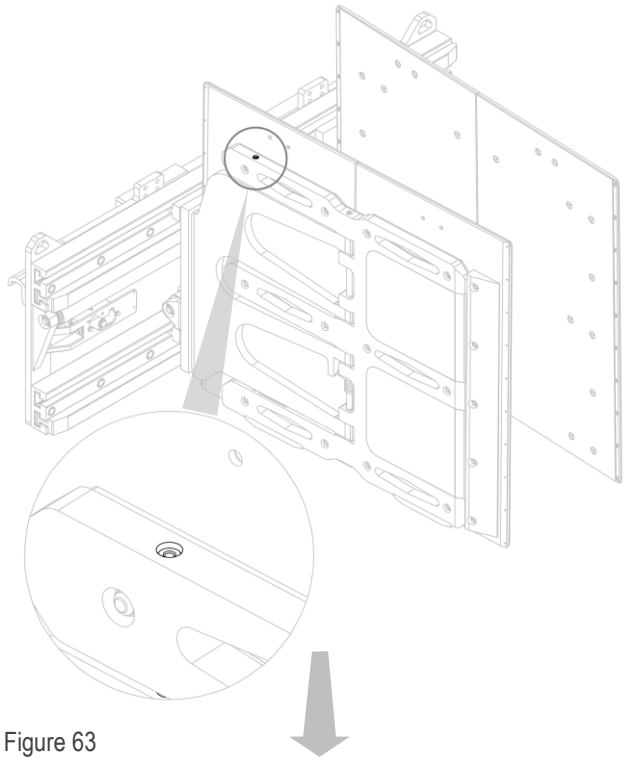


Figure 63

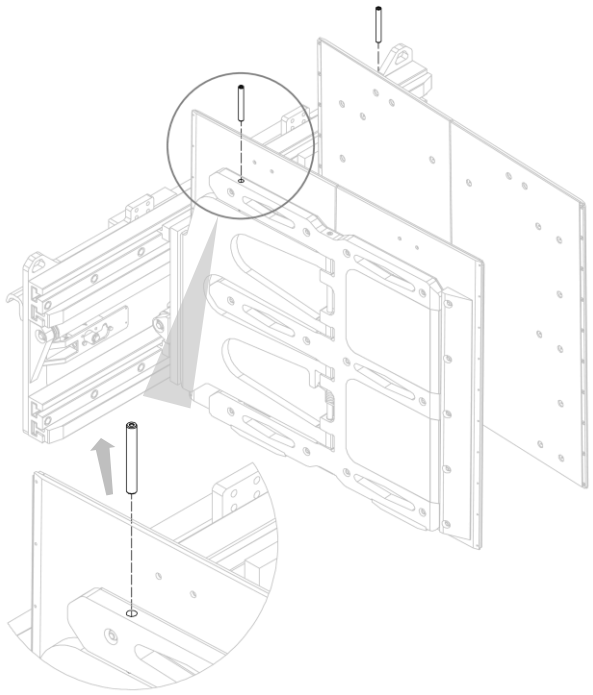


Figure 64

3. Remove the lower swing stop pins, one at a time, after temporarily removing the anti-slip pads. (see *Figure 65* and *Figure 66*).

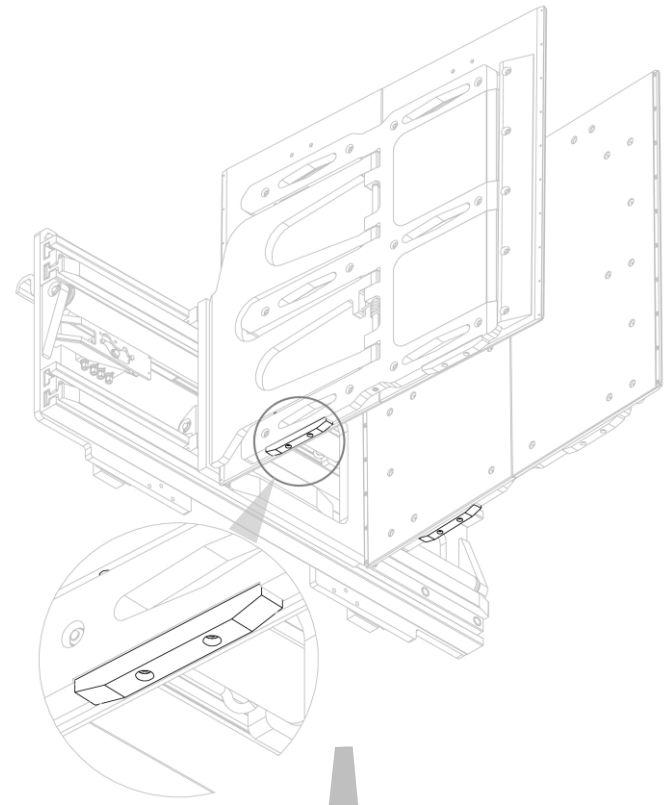


Figure 65

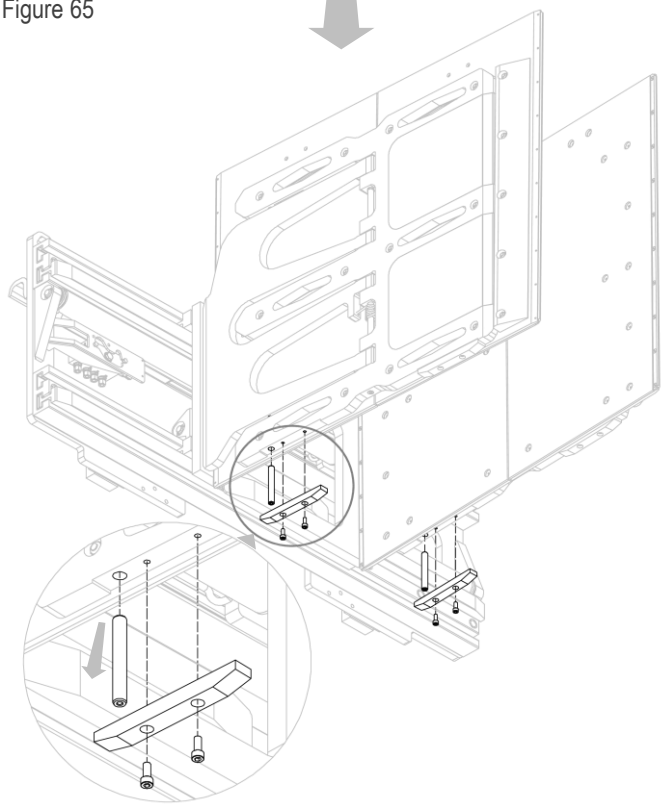


Figure 66

7.6 Disassembling the Clamping Unit – TYPE 474.12.180

7.6.1 Disassembling the Lower Anti-Slip Pads

ANTI-SLIP PADS

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Remove the lower Ertalon anti-slip pads by unscrewing the screws securing them in place (see *Figure 67* and *Figure 68*).

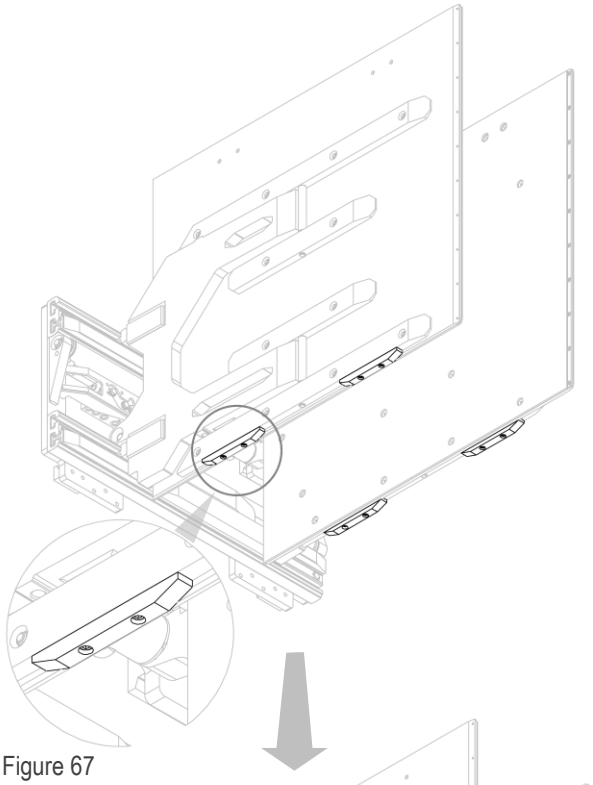


Figure 67

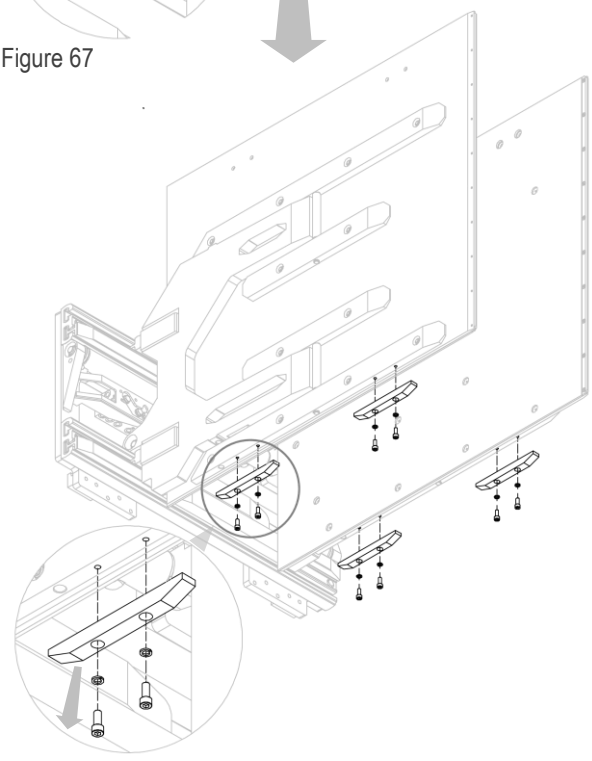


Figure 68

7.6.2 Disassembling the Panels

PANELS

1. **N.B.** To carry out the procedure, open the cylinders in order to be able to remove the panels easily and safely; in addition, the equipment must be lifted so that the lower fastening pins of the panels can be removed. Once complete, release the pressure from the hydraulic system and disconnect the hoses.

2. Remove the panels (with their plates) from the forks, after removing, the pins that support them one by one (see *Figure 69* and *Figure 70).*

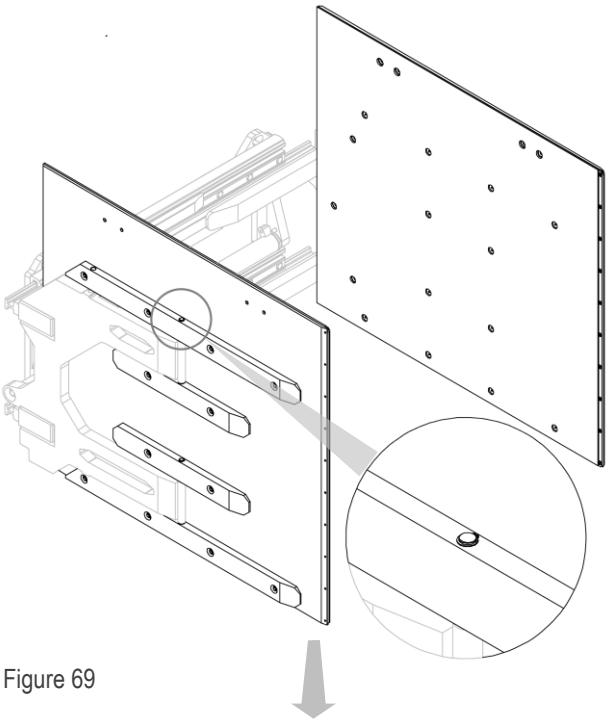


Figure 69

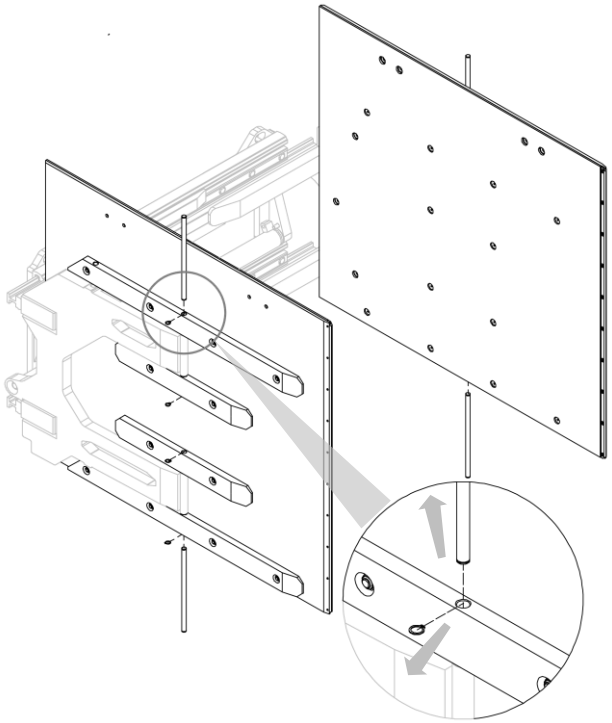


Figure 70

3. Separate the fastening plates from the panels after unscrewing the screws and nuts (see *Figure 71*), also taking care of any shims placed between the plates and the panel itself.

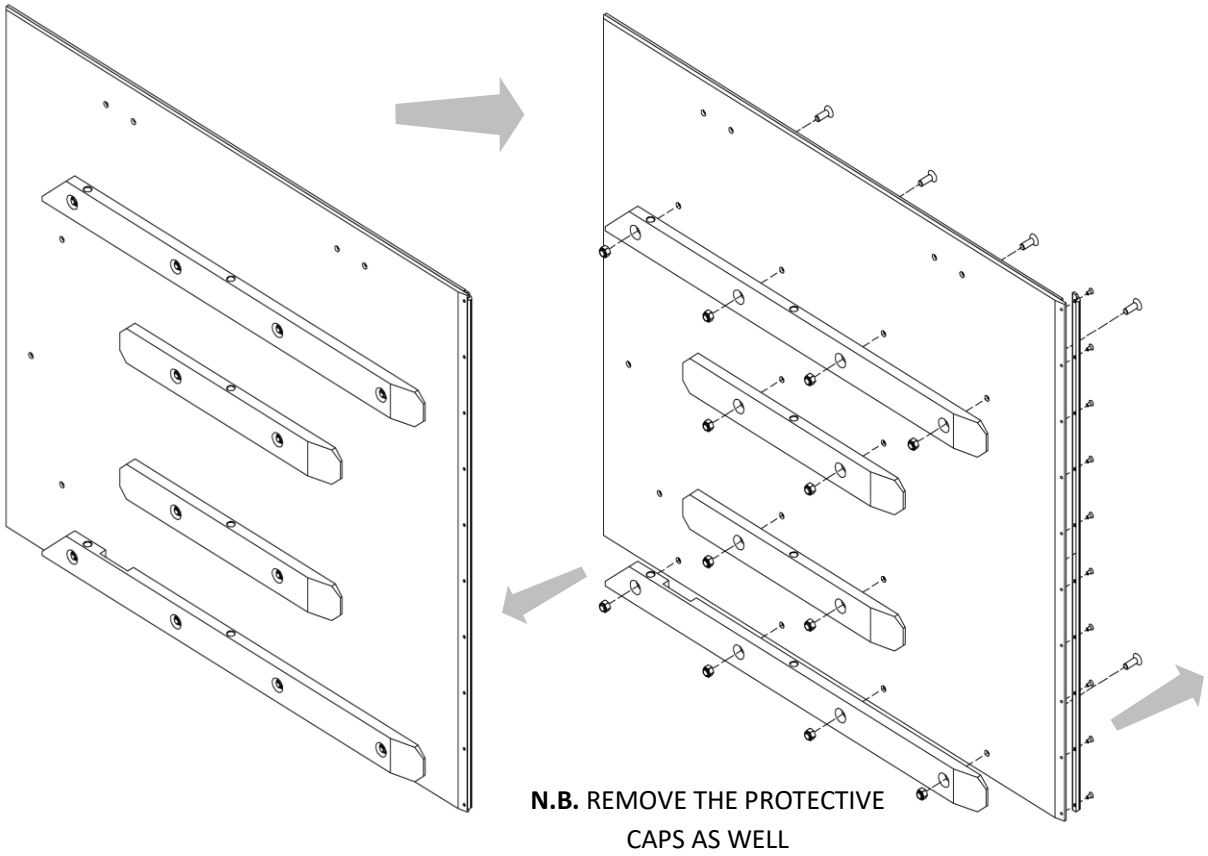


Figure 71

7.6.3 Disassembling the Swing Bushes

SWING BUSHES

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove the lower pads and panels, as outlined in the previous points.

3. Remove the swing bushes from their housings (see *Figure 72* and *Figure 73*).

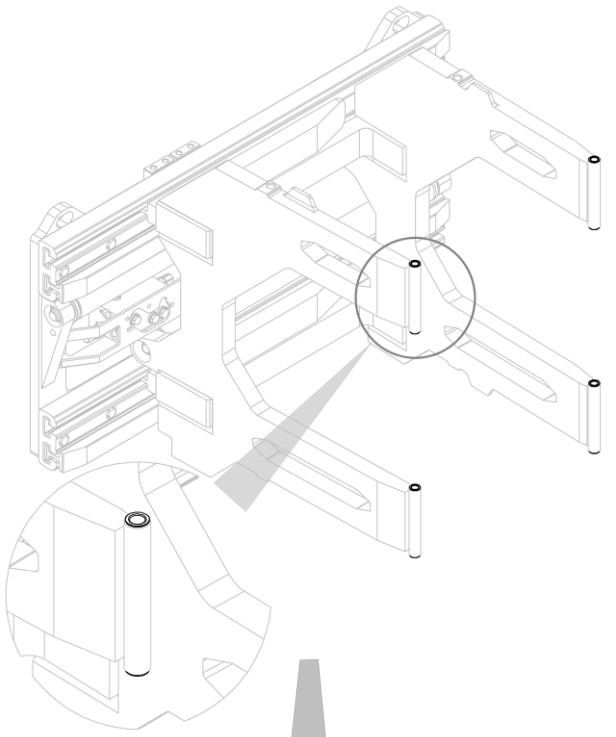


Figure 72

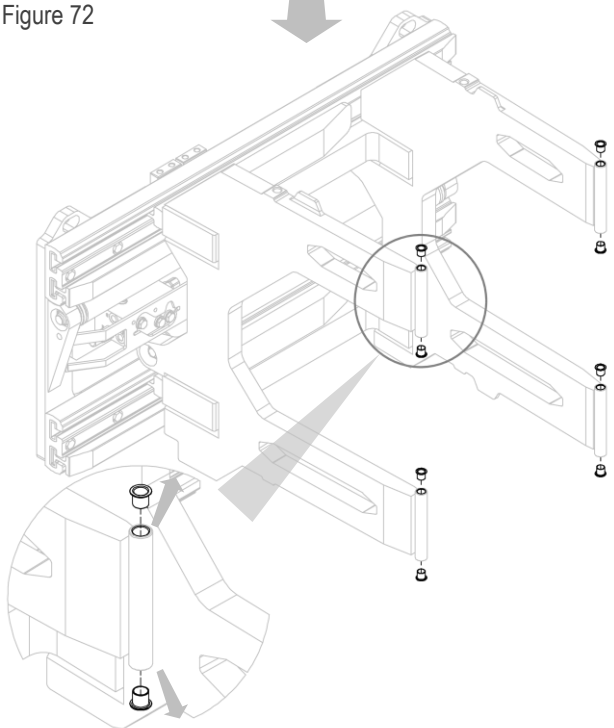


Figure 73

7.6.4 Disassembling the Forks

FORKS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove the swing bushes, as outlined in the previous point.

3. Remove the forks one at a time from their respective housings, after removing the nuts that secure them to the cylinders (see *Figure 74* and *Figure 75*).

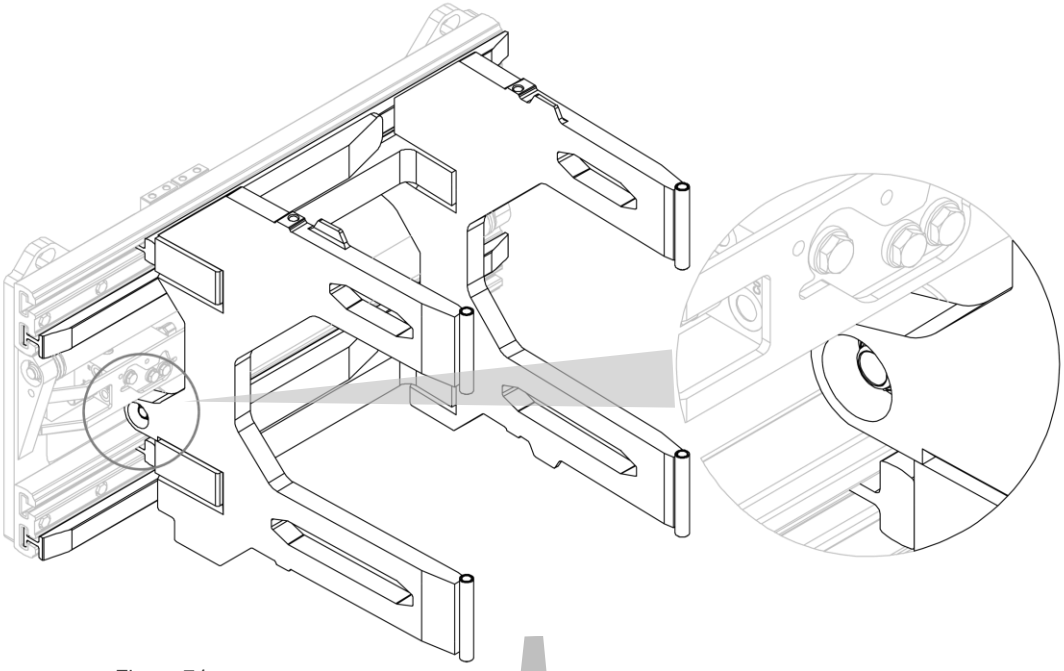


Figure 74

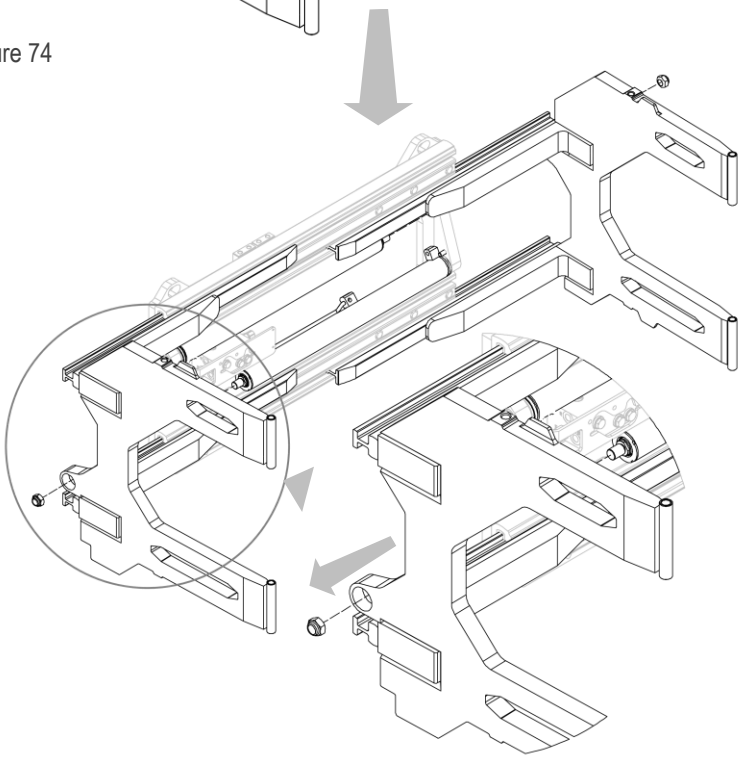


Figure 75

7.7 Disassembling the Clamping Unit – TYPE 474.24.180

7.7.1 Disassembling the Lower Anti-Slip Pads

ANTI-SLIP PADS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove the lower Ertalon anti-slip pads after removing the screws (see *Figure 76* and *Figure 77*).

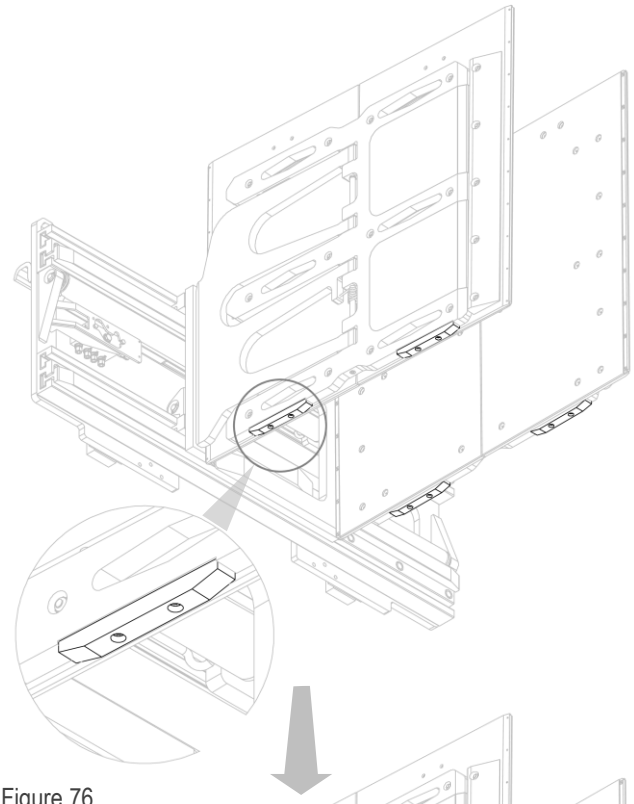


Figure 76

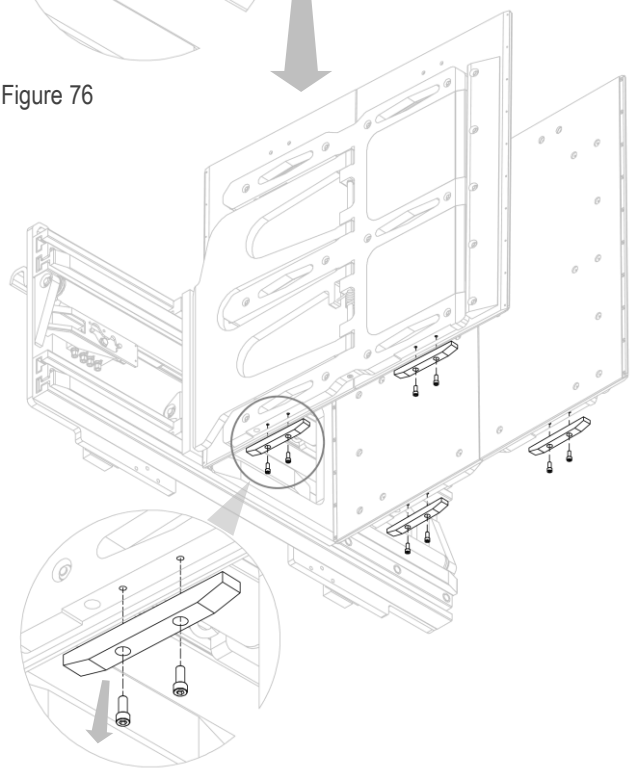


Figure 77

7.7.2 Disassembling the Protective Caps

PROTECTIVE CAPS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove the Ertalon protective caps after removing the nuts and screws (see *Figure 78* and *Figure 79*).

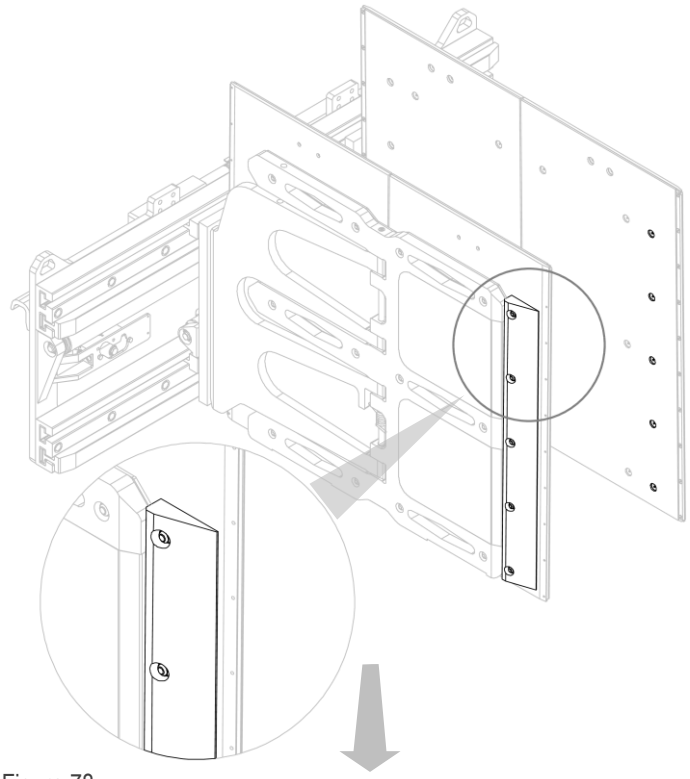


Figure 78

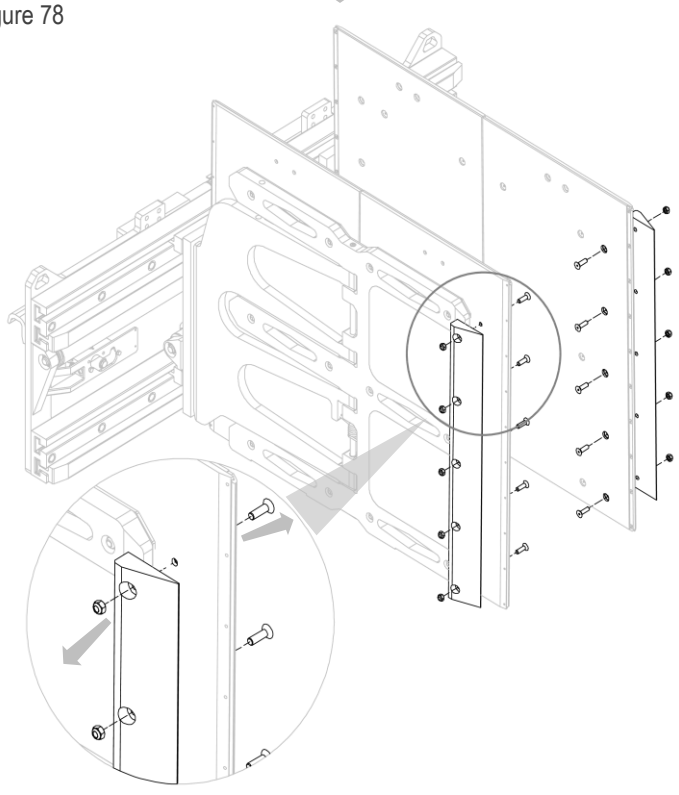


Figure 79

7.7.3 Disassembling the Panels

PANELS

1. **N.B.** To carry out this procedure, open the cylinders in order to allow the removal of the panels easily and safely; once this is done, release the pressure from the hydraulic system and disconnect the hoses.

2. Remove the lower pads and protective caps as outlined in the previous points.

3. Remove the panels after removing the screws and nuts, taking care of any shims between the jaw and the panel (see *Figure 80* and *Figure 81*).

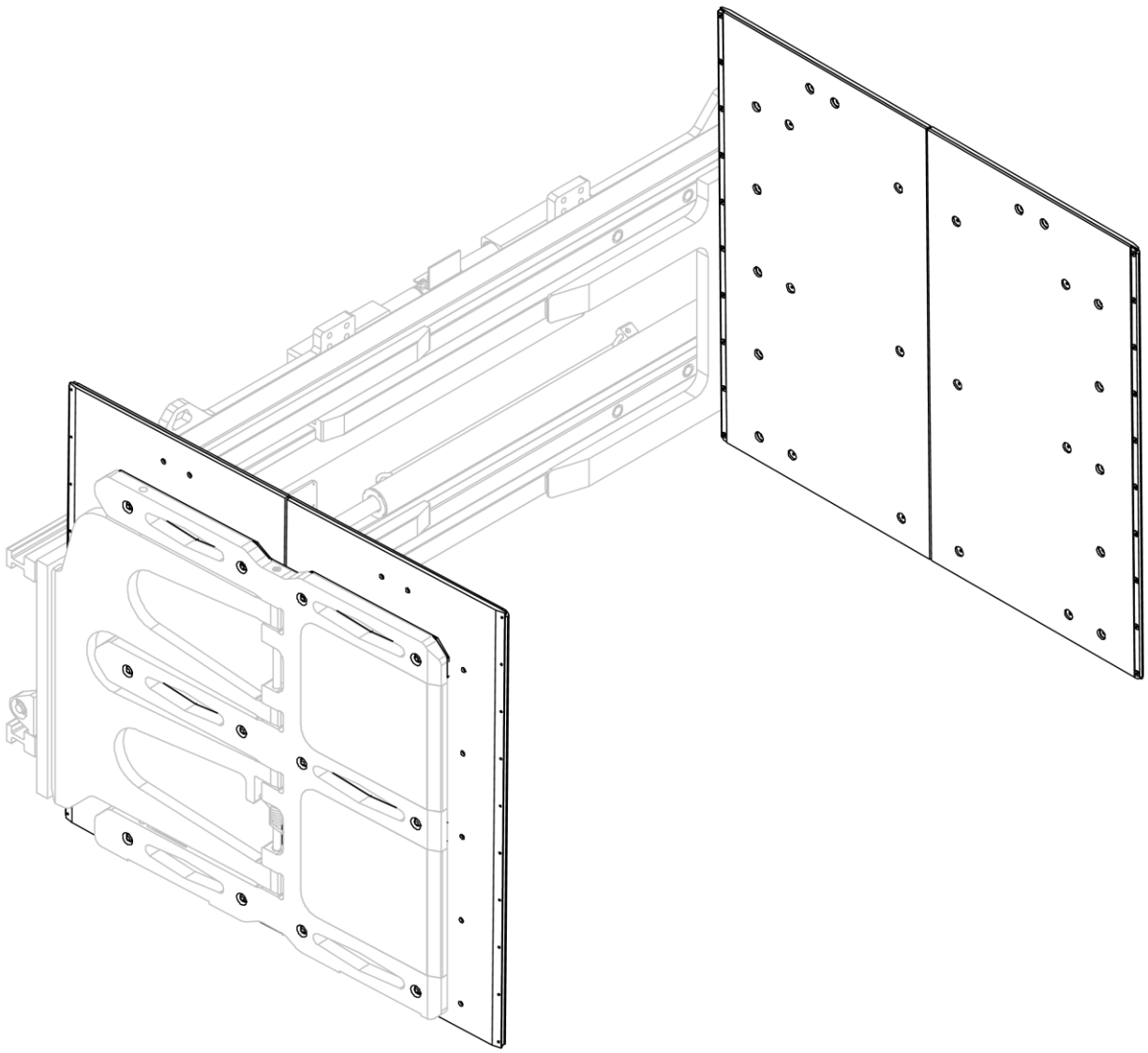
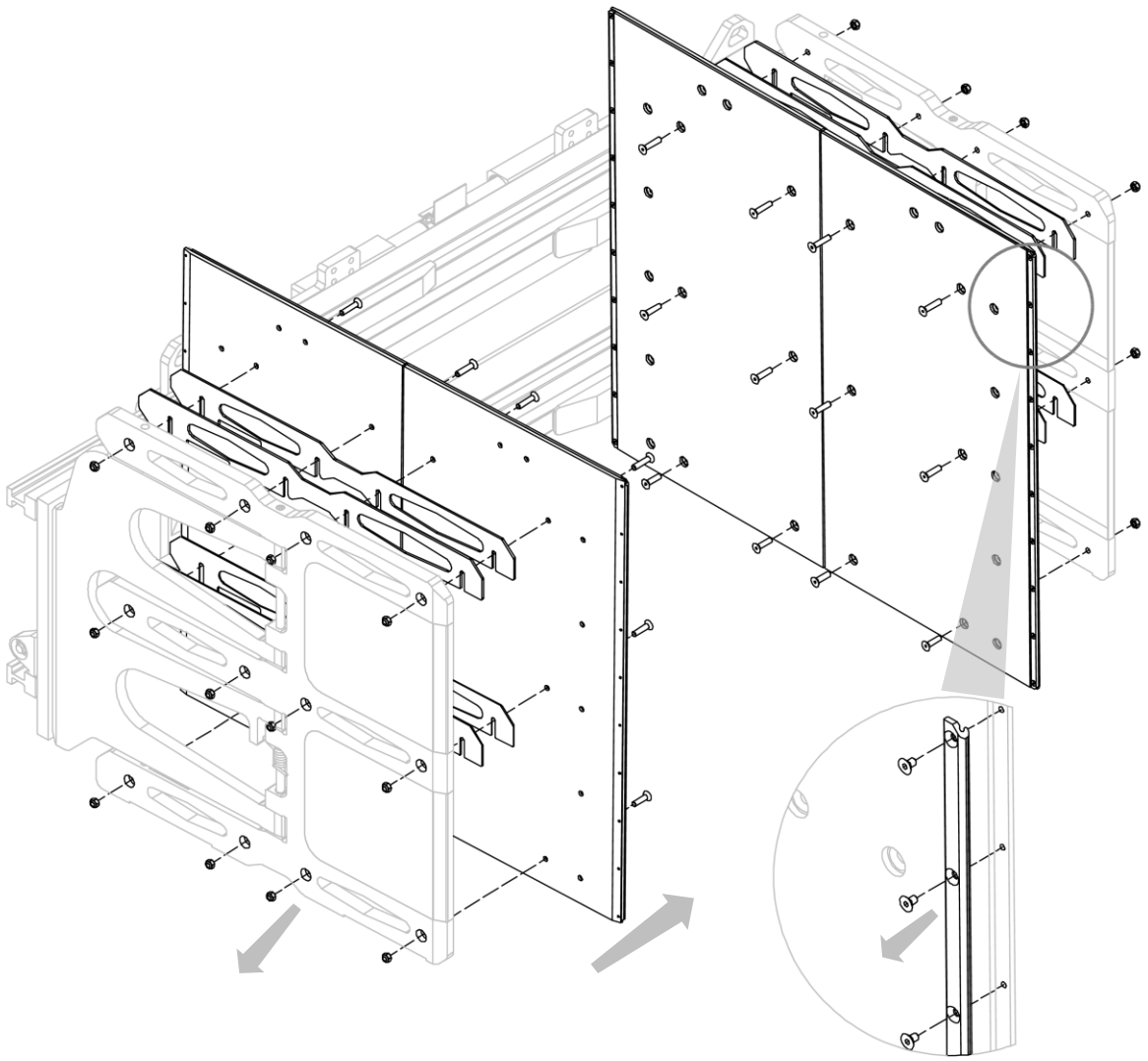


Figure 80



N.B. REMOVE THE PROTECTIVE CAPS AS WELL

Figure 81

7.7.4 Disassembling the Swing Jaws

SWING JAWS

1. **N.B.** To carry out this procedure, the equipment must be lifted to allow the lower pins to be removed easily and safely; once this is done, release the pressure from the hydraulic system and disconnect the hoses.
2. Firstly, remove the panels, as outlined in the previous point.
3. Disassemble one jaw at a time.
4. Use *Figure 82* and *Figure 83* as guides.
5. Remove the swing pins of the jaw, one at a time, taking care to remove the snap rings in the process (by pulling them out) and the torsion spring, which must be removed via the holes provided.

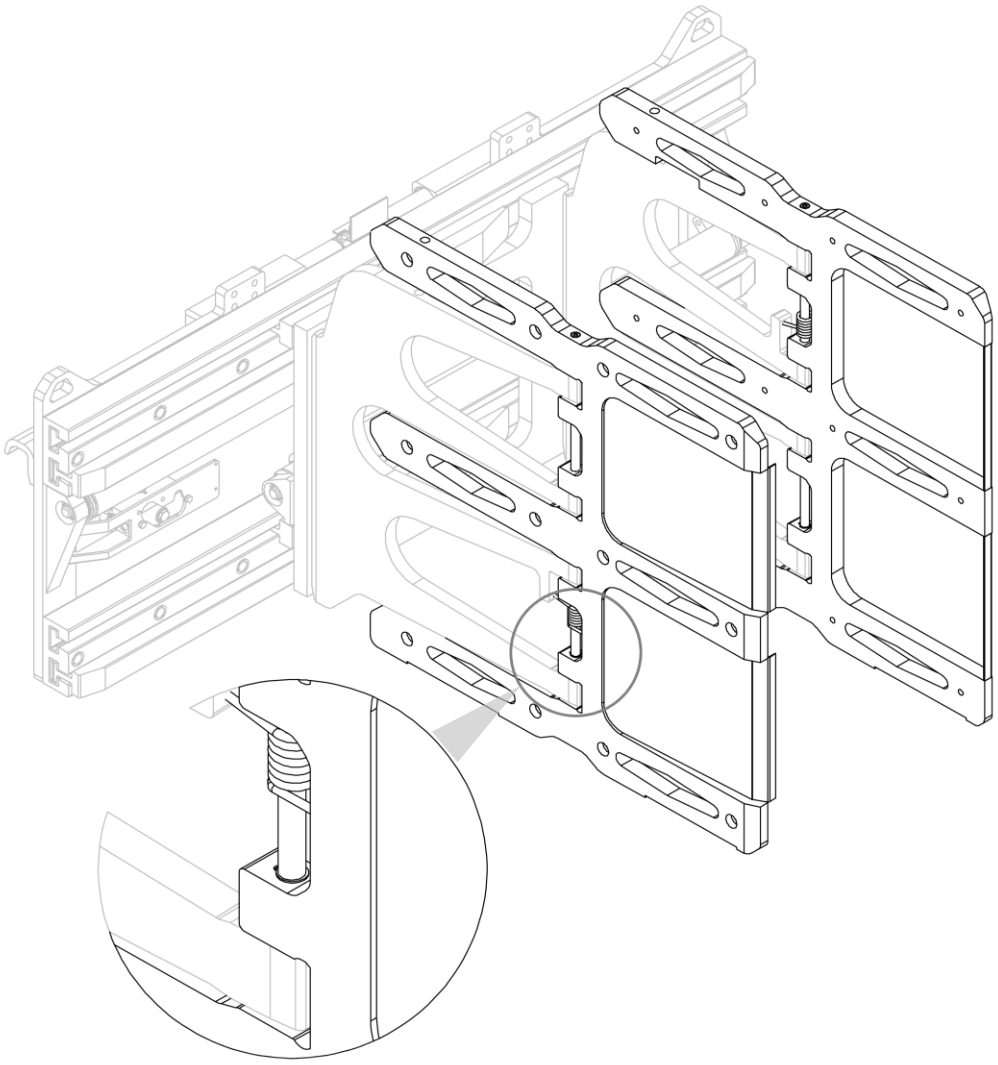


Figure 82

N.B. Take care that, once both pins (upper and lower) have been removed, there is no sudden movement of the jaw; take all necessary precautions.

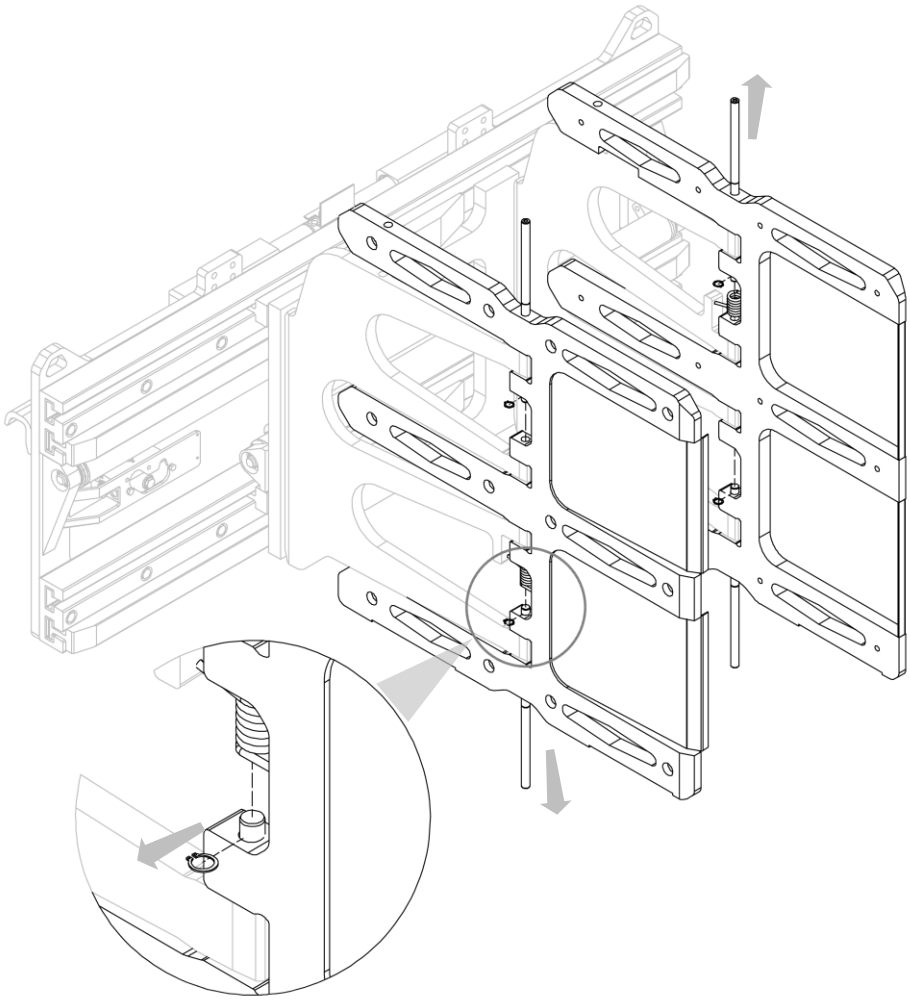


Figure 83

7.7.5 Disassembling the Swing Bushes

SWING BUSHES

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove the jaws, as outlined in the previous point.

3. Remove the bushes from their housings (see *Figure 84* and *Figure 85*).

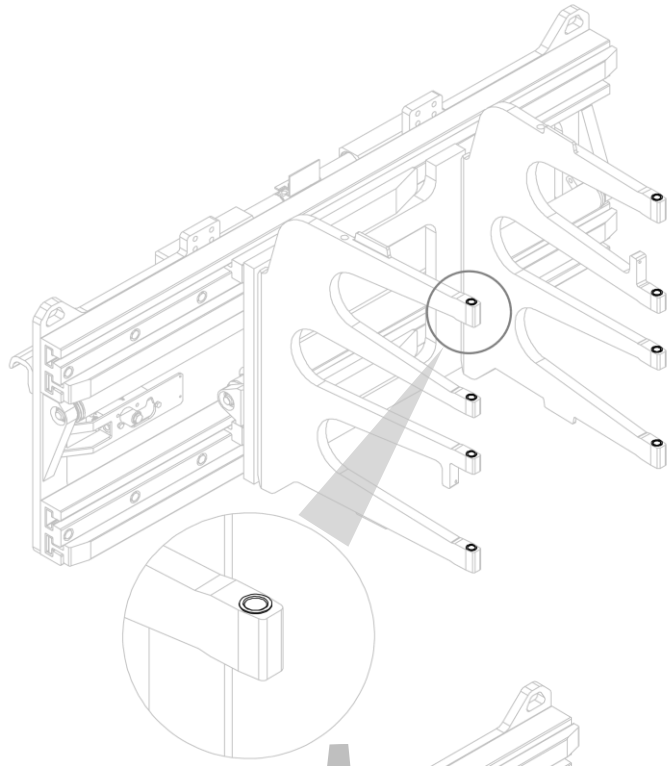


Figure 84

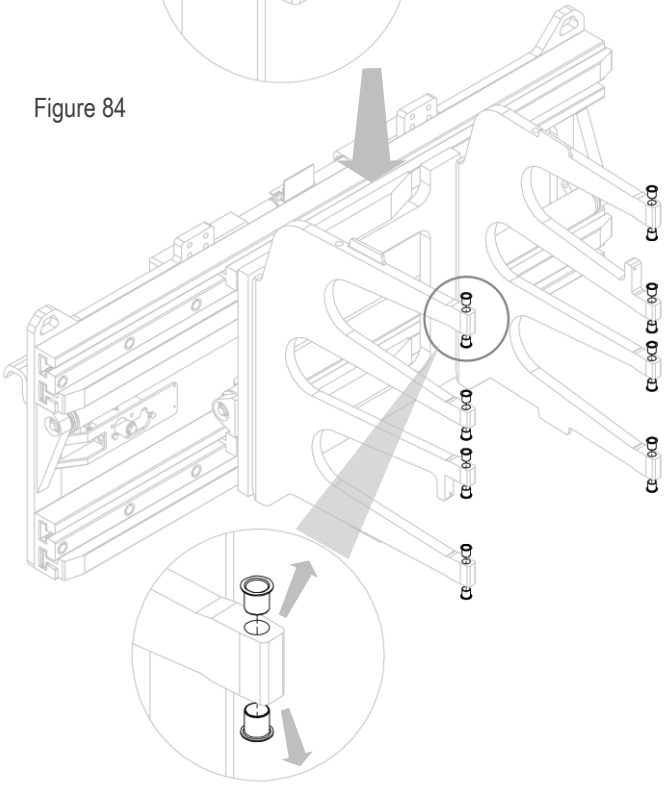


Figure 85

7.7.6 Disassembling the Forks

FORKS

1. Check that the pressure in the hydraulic system has been discharged and that the hoses have been disconnected.

2. Remove panels, jaws and their swing bushes, as outlined in the previous points.

3. Remove the forks, one at a time, from their housings after removing the nuts that secure them to the cylinders (see *Figure 86* and *Figure 87*).

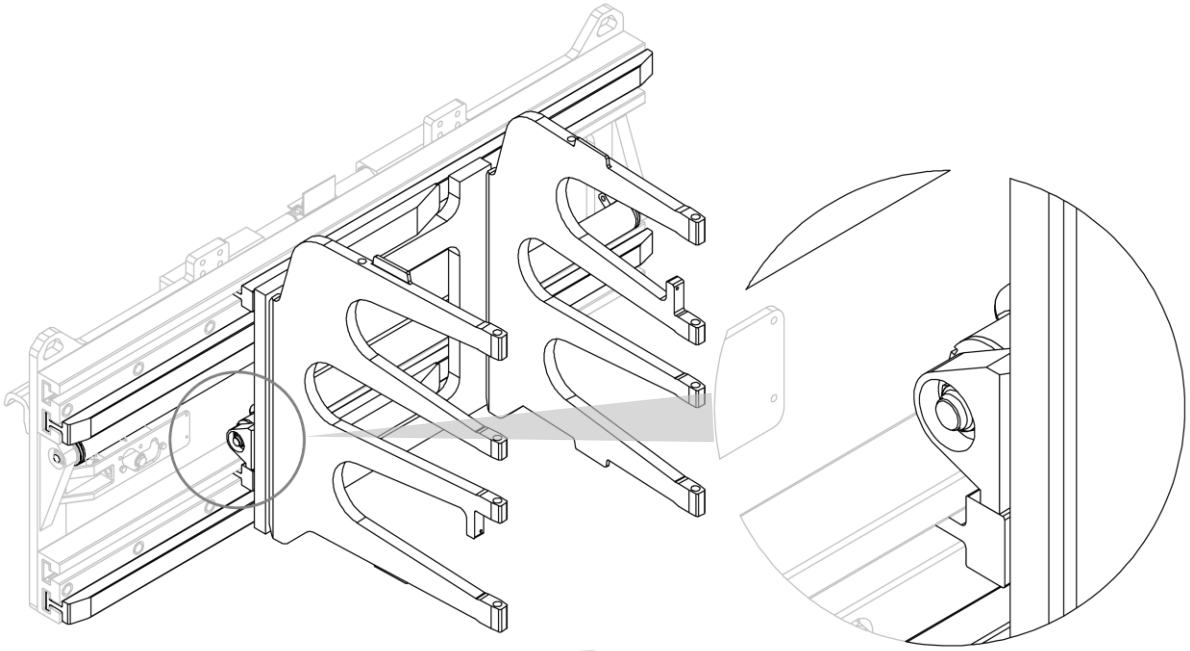


Figure 86

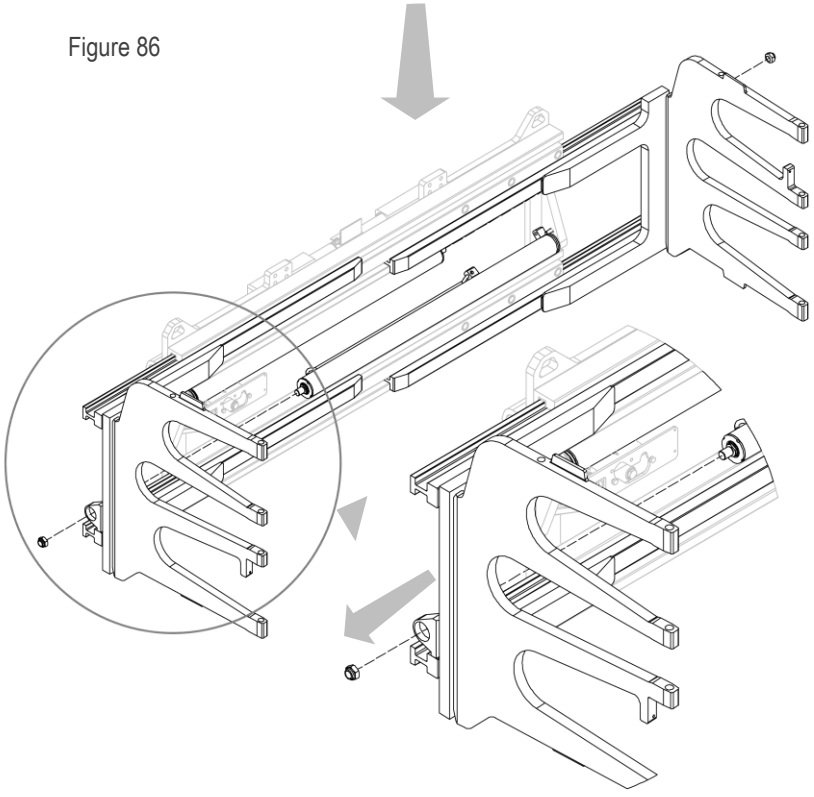


Figure 87

7.8 Disassembling the Clamping Unit – TYPE 474.181

7.8.1 Disassembling the Protective Caps

PROTECTIVE CAPS

1. Release the pressure from the hydraulic system and disconnect the lines.
2. Remove the forks, one at a time, from their housings after removing the nuts that secure them to the cylinders (see *Figure 88* and *Figure 89*)

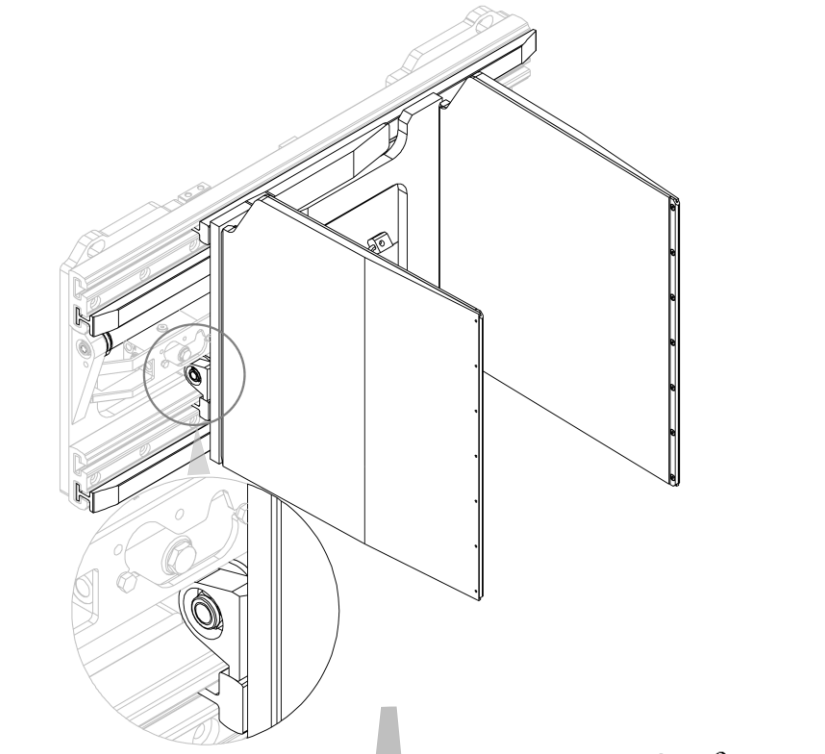


Figure 88

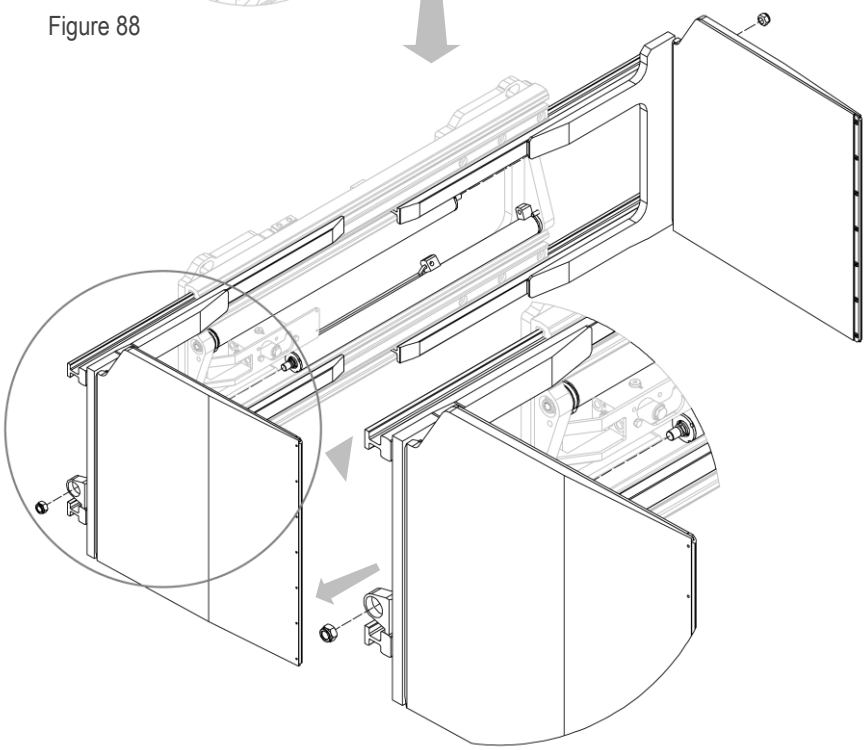


Figure 89

7.8.2 Disassembling the Protective Caps

PROTECTIVE CAPS

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

2. Remove the protective caps by unscrewing the screws that fasten them to the jaws (see *Figure 90*).

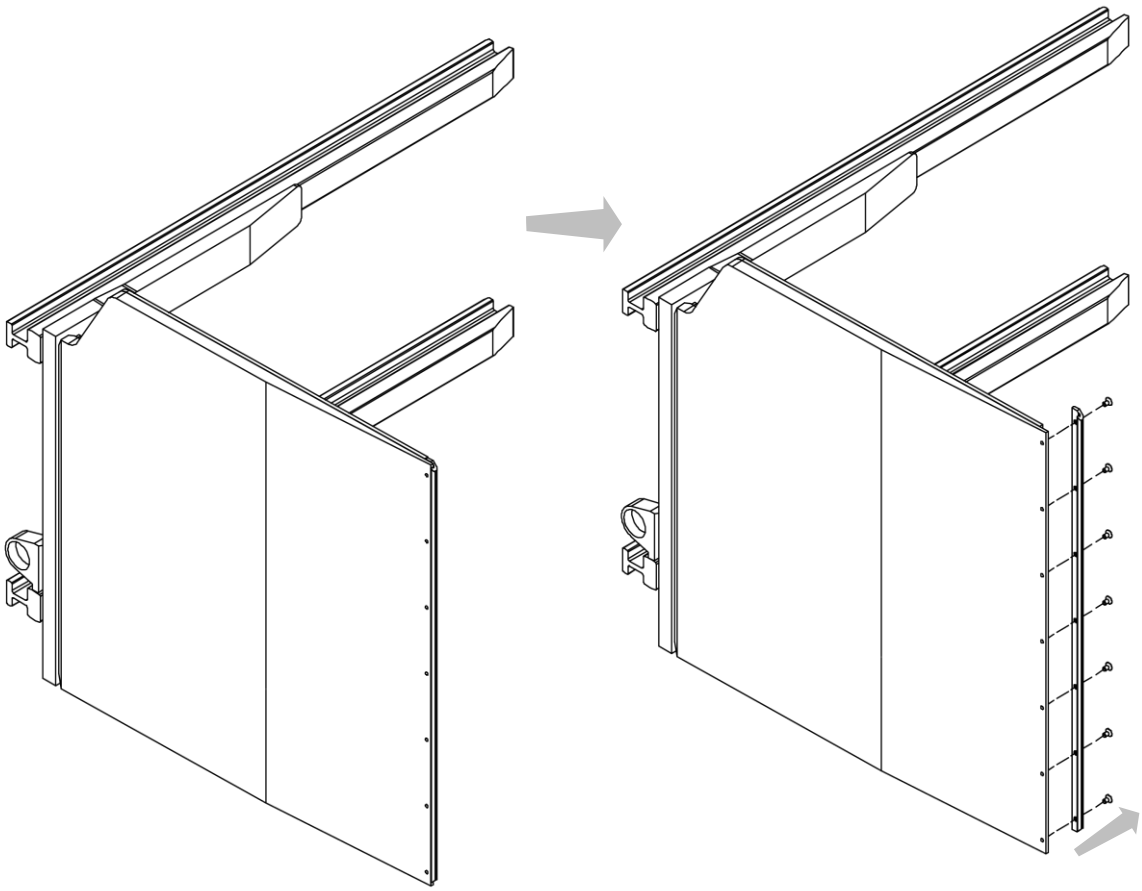


Figure 90

7.9 Removing the Jaw Cylinders from the Equipment

N.B. Although only type 474.24.180 is shown, the procedure for removing and disassembling the jaw cylinders is identical for different versions.

JAW CYLINDERS

1. Open the cylinders.
2. Release the pressure from the hydraulic system and disconnect the lines.
3. Remove the nuts **D** that secure the cylinders to the forks (see *Figure 91*).

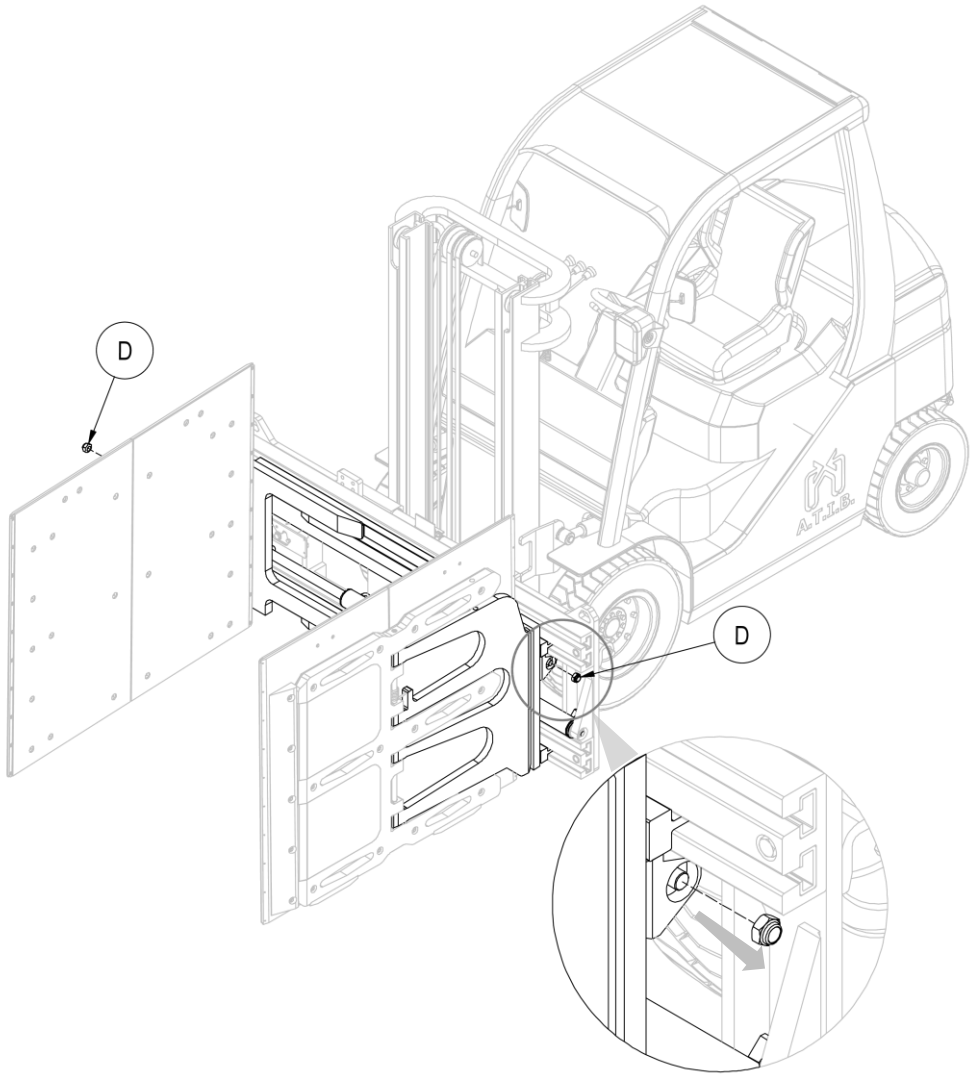


Figure 91

4. Reconnect the hydraulic system.

5. Close the cylinders.

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

7. Remove the nuts **D** that secure the cylinders to the equipment assembly and remove the cylinders, taking care not to damage them (see *Figure 92*).

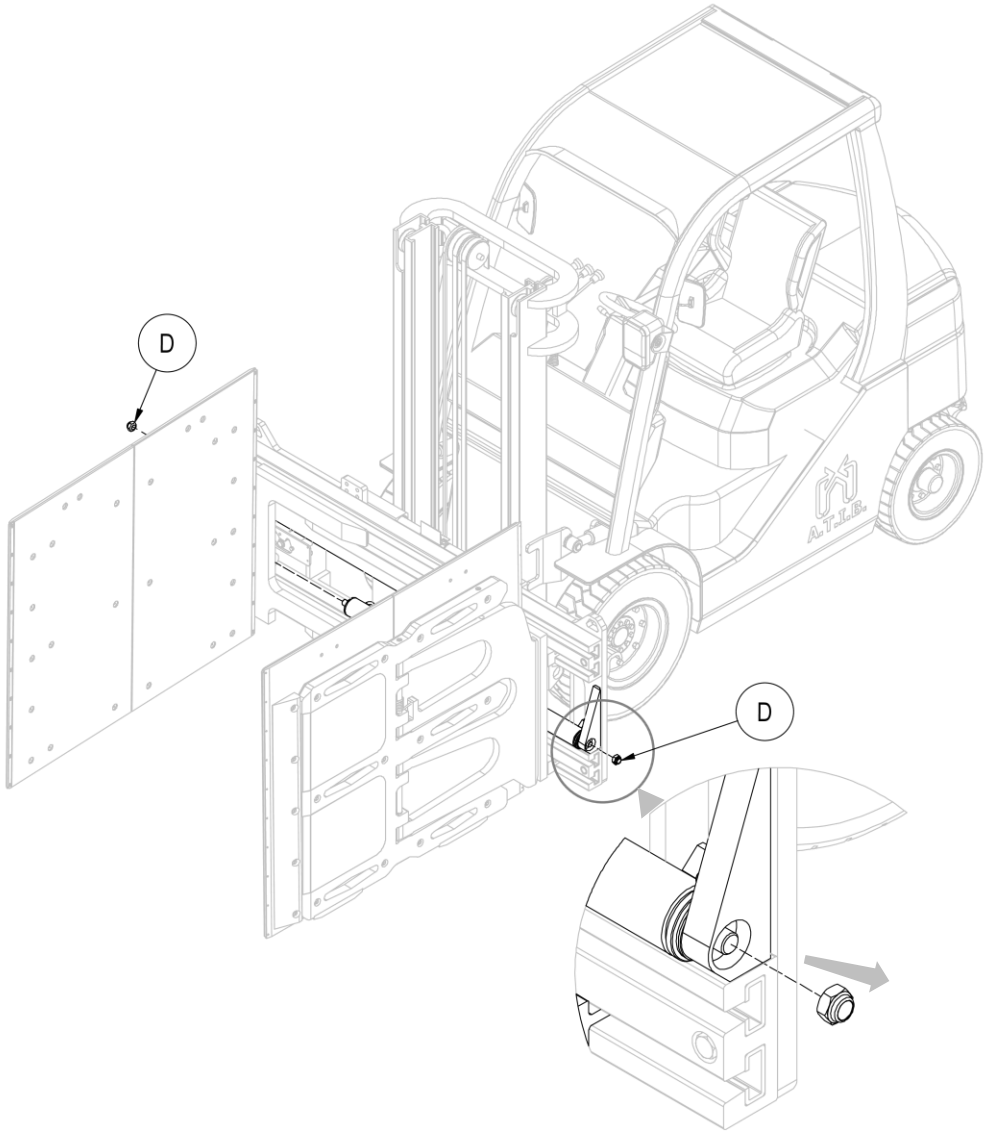


Figure 92

7.9.1 Disassembling and Reassembling the Jaw 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. Use a C-hook spanner to remove cap **T**.
3. If the cap will not unscrew, slightly heat the area of the thread in question to facilitate unscrewing.
4. Unscrew rod **C**.
5. Disassemble/separate the rest of the components and seals (this will be easy and rather intuitive at this stage).
6. Replace damaged parts and reassemble by repeating the above steps in reverse order, taking care to relock the cylinder cap using medium strength threadlocker.
7. If a damaged seal is found, it is advisable to replace the entire seal assembly.
8. Use *Figure 93* as a guide.

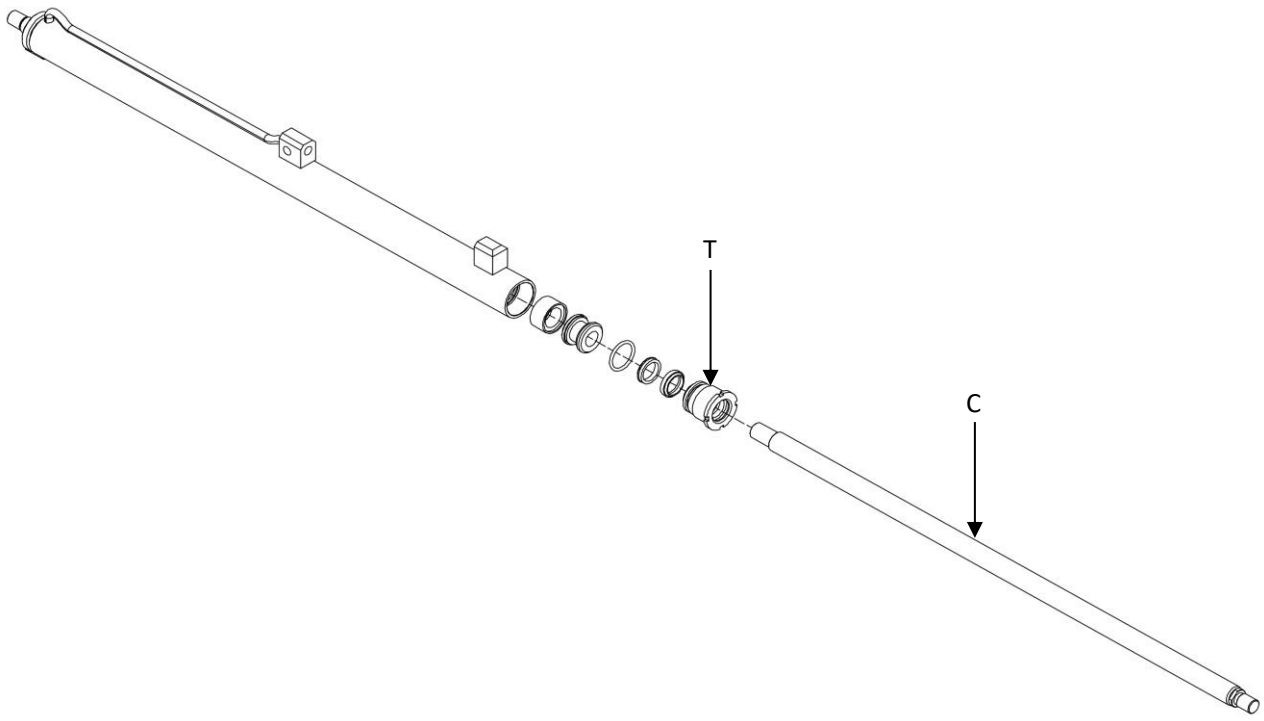


Figure 93

7.10 Sideshift Cylinder Maintenance (siss)

CYLINDERS SISS

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

2. Remove the equipment from the forklift truck, as outlined in point *7.1 Disassembling the Equipment from* the Forklift Truck on page *59*.

3. Remove the dual coupling (**A**) after removing the protection bracket (**P**) with its screws.

4. Extract the rods one at a time and remove the related seals from their housings (after removing the snap ring that holds them in place).

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

6. If a damaged seal is found, it is advisable to replace the entire seal assembly.

7. Use *Figure 94* and *Figure 95* as guides.

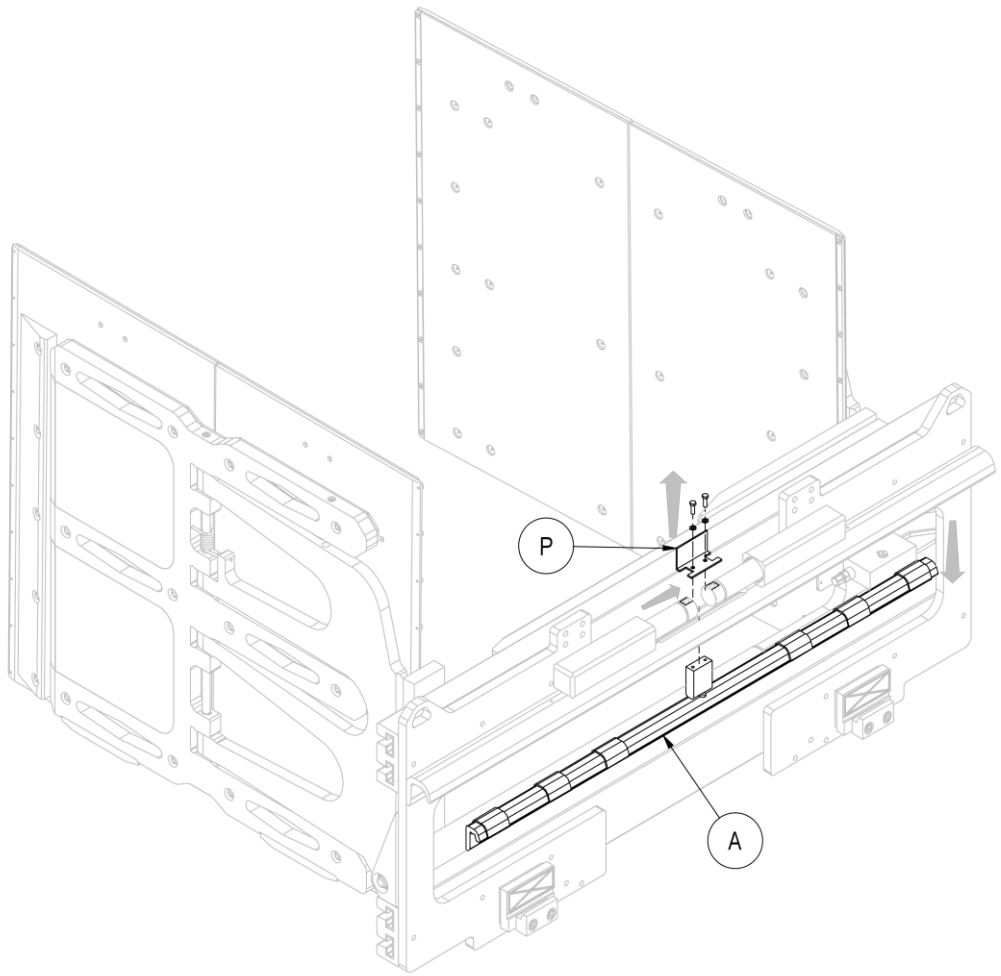


Figure 94

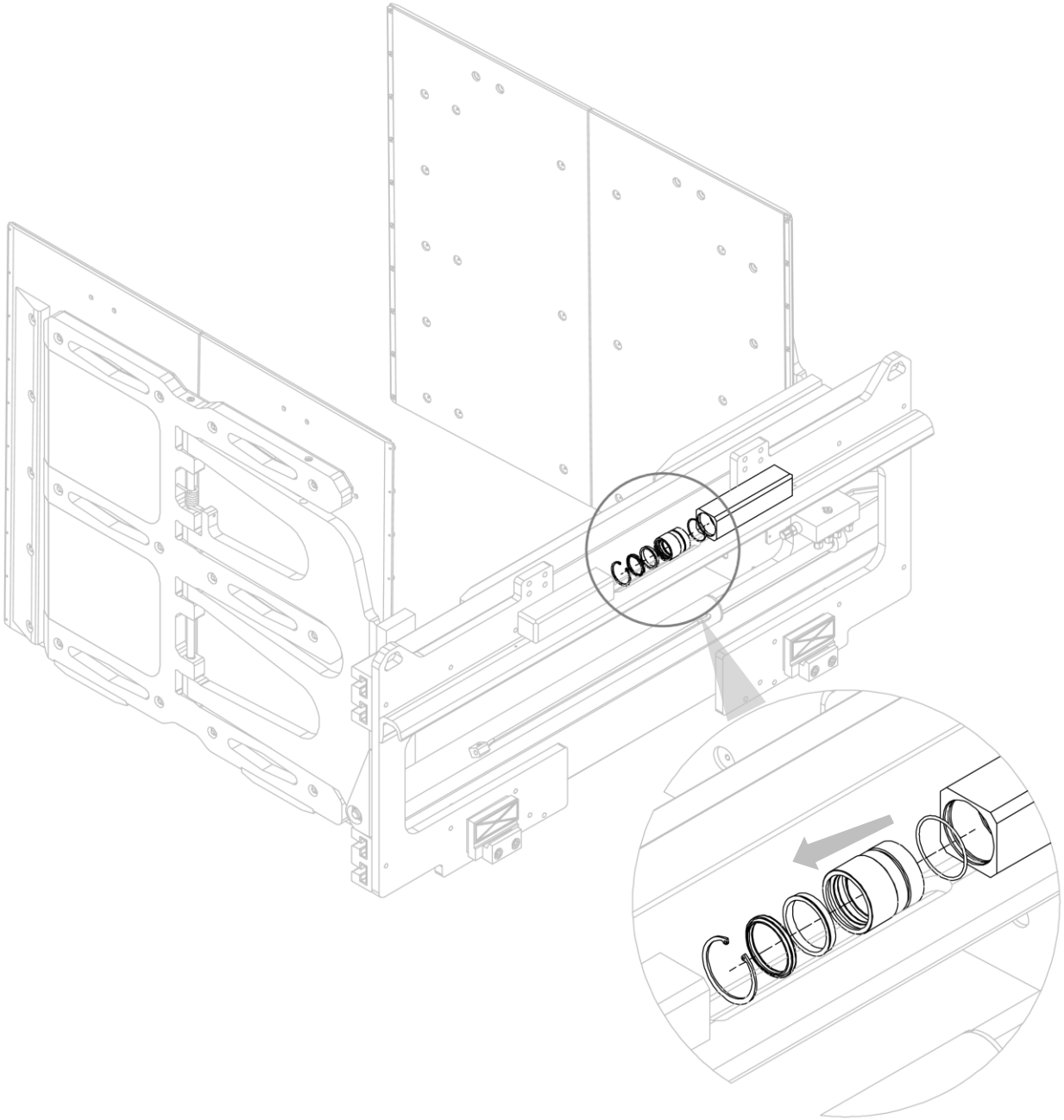


Figure 95

N.B. Although only type 474.24.180 is shown, the procedure for removing and disassembling the sideshift cylinders is identical even for different versions (always WITH SISS).

8 TROUBLESHOOTING

8.1 Probable Faults and Solutions

FAULT	CAUSE	SOLUTION
Insufficient clamping 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 loss with the load tightened	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 jaw camber angle
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 gibs or sliding rollers	Replace
	Excessive friction between sliding parts	Clean and grease sliding parts
	Worn cylinder seals	Replace them
	No oil in the tank	Fill up

Table 5

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

8.2 Lubrication

1. Lubricate sliding components using grease nipples.

2. Grease sliding gibs and sliding axles/surfaces (e.g. nylon bushes)

N.B. Although only type 474.24.180 is shown, the lubrication procedure is identical for different versions.

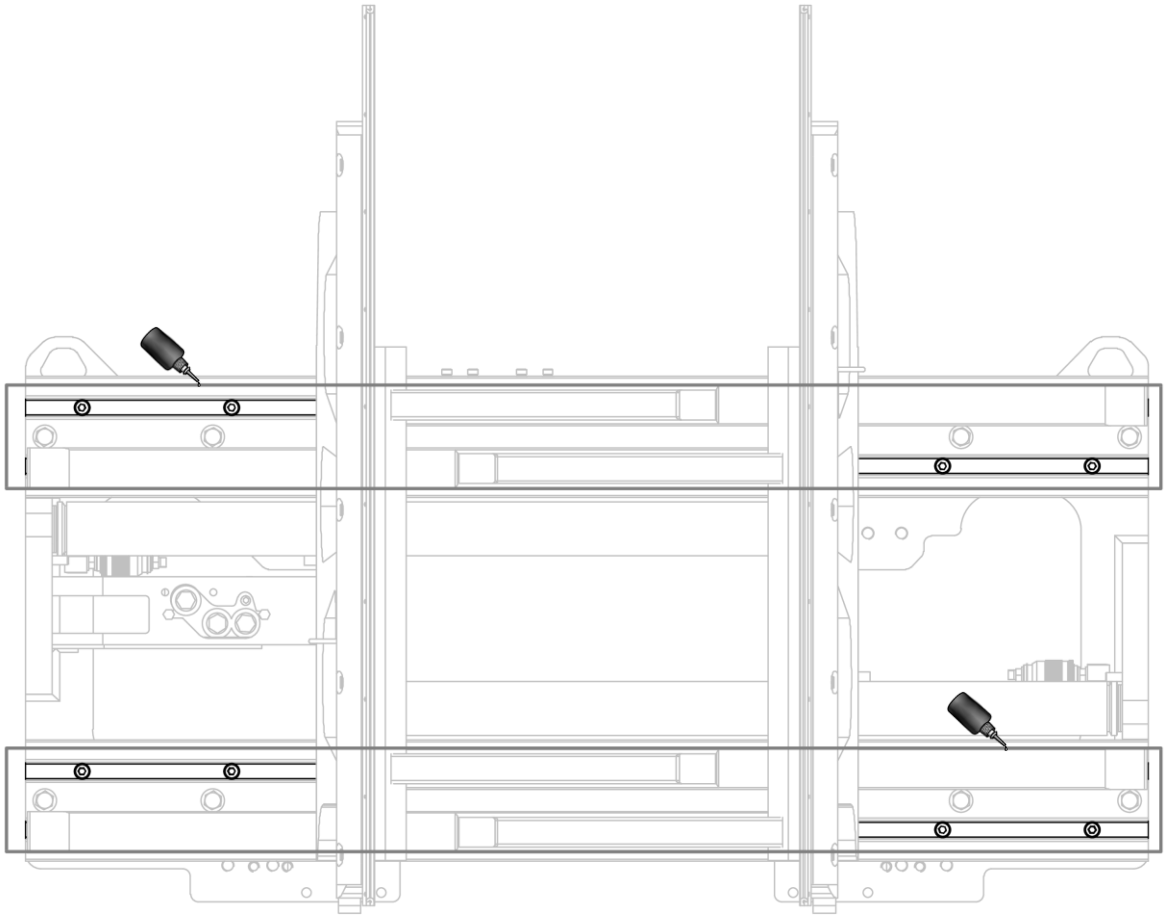


Figure 96

WITH SISS

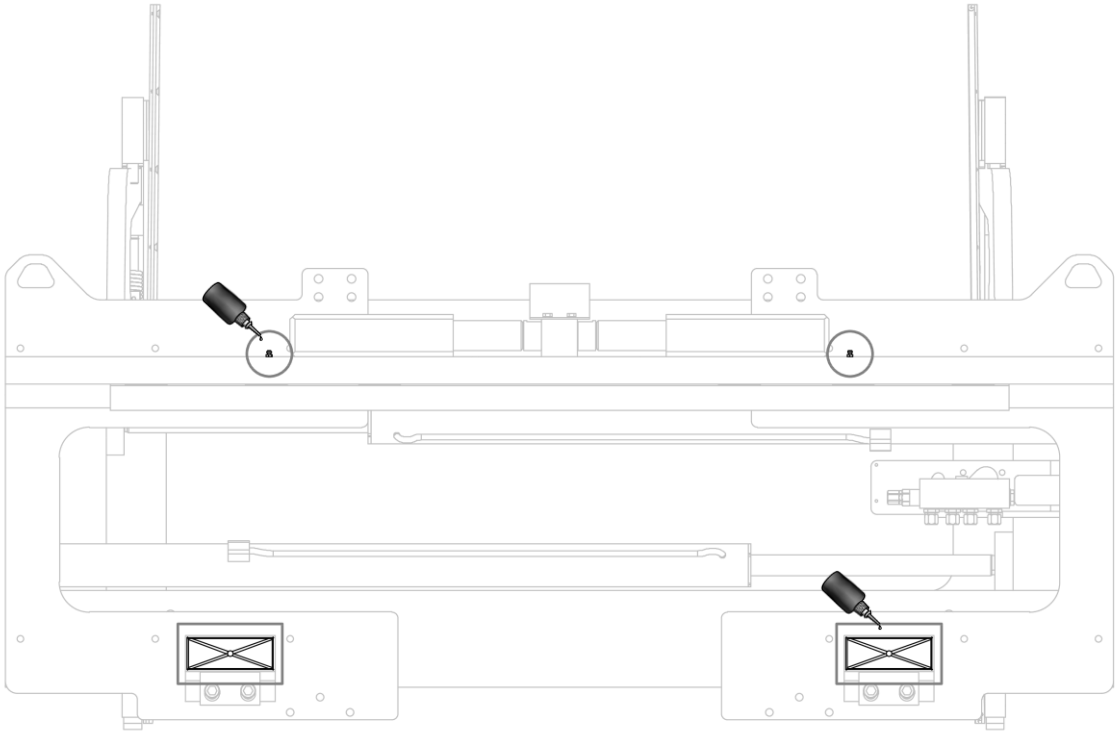


Figure 97

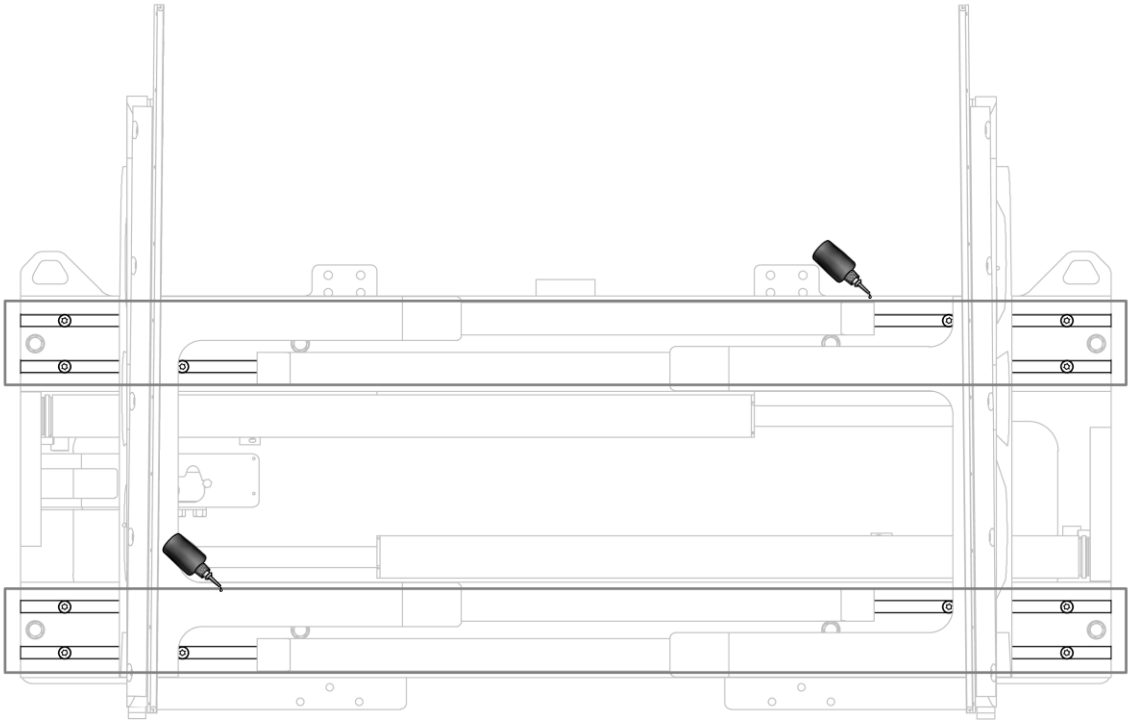


Figure 98

MADE IN ITALY

A.T.I.B. S.r.l.
Via Quinzanese snc, 25020 Dello (BS) - ITALY

+39 030 977 17 11
info@atib.com
atib.com