

Operating manual

Multi6 M



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Legal notice

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Machine designation:

Paver-clamp „Multi6 M“ (for Optimas Paver laying machine)
Part no.: 55141

Paver-clamp „Multi6 M“ (for Optimas Paver laying machine P22)
Part no.: 114213

Paver-clamp „Multi6 M“ (2K)
Part no.: 55138

Paver-clamp „Multi6 M“ (1K)
Part no.: 55139

Paver-clamp „Multi6 M“ LIGHT (1K)
Part no.: 55165

Paver-clamp „Multi6 M“ 3K control
Part no.: 55353

Paver-clamp „Multi6 M“ (1K) for loader with balance beam
Part no.: 55413

Information on the operating manual:

This operating manual is a translation of the original German version. The original German version is the authoritative document.

Version: 07/2026 Rev. 1

Subject to technical changes

The manufacturer reserves the right to make changes to the machine and operating instructions as part of ongoing technical development, provided that this does not affect the guaranteed characteristics.

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1. General information

This user manual contains important information for the safe and proper operation of the paver-clamp Multi6 M. The instructions contained in this manual are intended to prevent hazards and ensure safe operation throughout the product's service life. This requires that all persons working with the product have read and understood the contents of this manual. The information, technical data, and illustrations are current as of the date of publication. We reserve the right to make changes in the interest of technical progress, which may affect the design and operation of the product. Before beginning any work, ensure that you have the most current version of the documentation.

1.1 Warranty

The warranty period for the device is 12 months from the date of purchase.

In the event of a warranty claim, Optimas or an authorized service center will, at its discretion, repair or replace all defective parts covered by the warranty at the manufacturer's facility or at the respective place of performance.

Any necessary travel costs and per diem expenses for service calls outside the place of performance will be billed to the customer at the applicable rates.

Excluded from the warranty are damages caused by improper use, incorrect operation, or unauthorized interventions— including those by third parties.

No liability is assumed for damage resulting from measurement errors, incorrect settings, or operating errors on the part of the user, to the extent permitted by law.

2. Safety

2.1 Safety principles

Most accidents during operation, maintenance, or repair result from failure to observe basic safety rules. Dangerous situations can often be identified and avoided in advance. This requires safety-conscious behavior on the part of all persons involved. The product may only be operated, maintained, or repaired by persons who:

- have received appropriate training,
- possess the necessary technical expertise,
- are familiar with the applicable safety regulations.

Improper operation, inadequate maintenance, or unprofessional repairs can result in serious or fatal injuries as well as property damage.

2.2 Safety and warning instructions

Safety instructions in this manual are indicated by symbols. Safety instructions are preceded by signal words that indicate the severity of the hazard. Be sure to follow the safety instructions and act with caution to prevent accidents and avoid injury or property damage.

	Danger	<u>Danger to life!</u> Indicates a hazard. If not avoided, it will result in death or serious injury.
	Warning	<u>Dangerous Situation!</u> Indicates a dangerous situation. If not avoided, it may result in injury or property damage.
	Prohibition	<u>Prohibited!</u> Indicates a prohibition. If not observed, death, serious injury, or property damage will result.
	Caution	<u>Caution!</u> Risk of crushing your hands.

Additional instructions for preventing property damage are marked as **NOTE**.

2.3 Residual hazards and operator responsibility

The device is intended for commercial use. The operator is obligated to comply with applicable regulations regarding occupational safety, accident prevention, and environmental protection.

In particular, the operator must:

- conduct a risk assessment for the area of use,
- prepare the necessary operating instructions,
- define responsibilities for installation, operation, maintenance, and cleaning,
- ensure that personnel are trained and follow these instructions.

Despite the device's safety-compliant design and compliance with relevant standards, residual risks cannot be completely ruled out during operation. These risks may occur in particular during:

- intended use,
- foreseeable misuse,
- maintenance and repair work.

The operator and operating personnel must take these residual risks into account and implement appropriate protective measures.

Hazards	Possible consequences	Protective measures
Mechanical hazards: unexpected movements of the paver-clamp and the moving attachments, pinch points, impact points, and joint points on moving components (e.g., pressure frames on both sides, the paver clamp's pendulum motion), and pinch points when picking up and setting down the paving stones	Bruises and serious injuries	Maintain a safe distance from all moving parts; avoid staying in the machine's work area; secure the machine before leaving (lower the paver-clamp, turn off the carrier vehicle) 
Hydraulic hazards: High-pressure hydraulic oil leaks, defects in hydraulic hoses or valves, uncontrolled movements of the paver-clamp	Injection injuries (pressurized hydraulic oil), burns from hot oil, uncontrolled machine movements	Check hydraulic hoses regularly, relieve pressure before performing maintenance, and use only suitable and approved components 
Electrical hazards: faulty electrical connections, damaged cables	Short circuits, control system failure, uncontrolled movements	Check electrical connections regularly; use only trained personnel; replace damaged components immediately 
Hazards in operation mode: Risk from uncontrolled movements	Risk to people within the work area; collisions with obstacles or people	Secure the work area, keep the line of sight clear, and completely shut down the carrier machine before leaving it

2.4 Special hazard warnings



Warning

Use of spare parts

The use of non-approved spare parts can result in malfunctions, damage to the product, and serious or fatal injuries. Only use original spare parts or technically equivalent parts.



Warning

Staying in the danger zone

Working within the machine's operating area poses a risk of death due to unexpected movements.

- Never step under a raised load
- Maintain a safe distance from the area of movement



Warning

Hot surface on hydraulic components

Hydraulic components can become very hot during operation. Touching them can cause burns.

- Do not touch hot surfaces
- Allow the machine to cool down before performing maintenance or repair work
- Wear appropriate protective gloves

There is a risk of burns if you touch hot surfaces!

2.5 Conformity

The paver-clamp Multi6 M was designed and manufactured in accordance with applicable European directives and harmonized standards. In particular, it was designed and manufactured in accordance with the requirements of the European Machinery Directive 2006/42/EC.

Complete information regarding the applicable directives, standards, and the machine's conformity can be found in the supplied CE Declaration of Conformity.

2.6 Intended use

The device is designed and constructed exclusively for the intended use described here.
This machine is intended exclusively for laying paving stones, concrete blocks, natural stone, etc.



Danger

Dangerous situation
Danger due to improper use!

The paver-clamp Multi6 M is an attachment for the Optimas paver laying machine S24 as well as standard construction machinery such as wheel loaders, hydraulic excavators, etc. The carrier vehicle must be capable of supporting the weight of the Multi6 M, the load to be lifted, and the stresses that occur during operation. The permissible load capacity, stability, and the carrier vehicle manufacturer's specifications must be observed.

This product is intended for use on construction sites and in similar work environments. This product is not approved for use on public roads!

Intended use requires:

- Installation on a suitable and approved carrier vehicle
- Use of a suitable and securely locked quick-change mount, if necessary
- Compliance with all technical connection requirements, particularly the hydraulic connections
- Safe and tension-free installation of hydraulic hoses
- Performing a functional test after installation and before the first use
- Operation is restricted to trained and qualified personnel only
- Follow all instructions in this operating manual

2.7 Foreseeable misuse

Any use that goes beyond or deviates from the intended use is considered improper.

In particular, the following applications are prohibited:

- Use of the device as a lifting or transport device for persons or loads
- Presence of persons in the danger zone of moving components
- Operation with unsuitable or non-approved carrier vehicles
- Operation with defective or deactivated safety devices
- Use outside the intended operating conditions (e.g., extreme inclines, unsuitable surfaces, loads that are too heavy)
- Use without sufficient visibility of the work area

The manufacturer is not liable for damage resulting from improper use.

2.8 Unauthorized modifications

The product is designed and constructed exclusively for the intended use described here.



Prohibition

Unauthorized modifications to the product or the use of any homemade attachments endanger life and limb and are therefore strictly prohibited!

2.9 Operating limits

The product may only be operated within the following limits:

- Compliance with the permissible operating parameters of the carrier vehicle
- Operation only when the carrier vehicle has sufficient stability
- Stone layers that can be processed: approx. 0.6 m² – 1.5 m²
- Stone thicknesses that can be processed: approx. 4 cm – 24 cm
- Permissible weight of stone layers: approx. 130 kg – max. 550 kg
- Compliance with the permissible terrain gradient as specified by the carrier vehicle manufacturer
- Use only with compatible sensor and control systems

The specified technical data (e.g., hydraulic pressure, dimensions) must be observed.

2.10 Personnel requirements



Warning

Dangerous situation!

Risk of injury if personnel are not sufficiently qualified!
Improper handling can result in serious personal injury and property damage.
Therefore, have all work performed only by qualified personnel.

The operating manual specifies the following qualifications for various areas of work.

- Trained person

has been instructed by the operator regarding the tasks assigned to them and the potential hazards associated with improper behavior.

- Qualified personnel

is capable, based on their professional training, knowledge, and experience, as well as their knowledge of the relevant regulations, of performing the assigned tasks and independently recognizing and avoiding potential hazards. Only persons who can be expected to perform their work reliably are authorized to work.

Persons whose reaction times are impaired, e.g., by drugs, alcohol, or medication, are not permitted.

2.11 Personal protective equipment

To minimize any remaining risks, the following personal protective equipment is recommended:

- Safety shoes,
- Work gloves
- Helmet
- Protective clothing (3D jacket)



2.12 Adjusting the handles

Before operation, the handles must be moved to their outermost position (third hole) (see Fig. 1) and secured with pipe folding pins. This ensures sufficient clearance from moving parts and reduces the risk of crush and impact injuries.

The handles can be adjusted to three positions. Each position is locked in place using a pipe folding pin.

Procedure:

1. Pull the pipe folding pin out of its current position.
2. Move the handle to the desired position.
3. Align the handle so that the holes are aligned.
4. Insert the pipe folding pin all the way in and lock it in place.
5. Check that the handle is securely fastened.

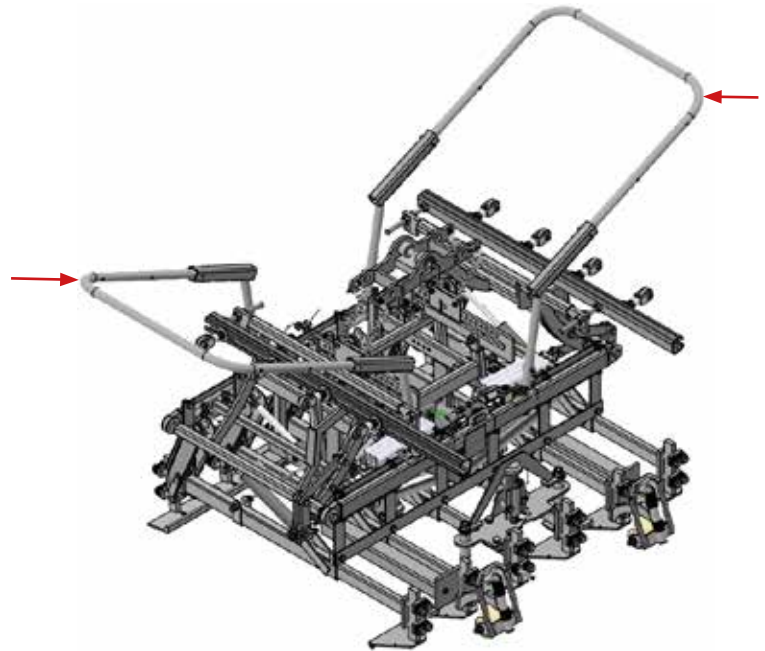


Fig. 1. Secure position of handles



Warning

Risk of injury from being pinched or bumping into protruding parts

Before operation, both handles must be fully extended and secured in the outer position using the pipe folding pins.

Operation with unlocked or only partially engaged pipe folding pins is not permitted.

3. Technical specifications

3.1 General technical specifications

Parameters	Value
Equipment type	Paver-clamp
Application	Paving
Total weight	min. 230 kg - max. 292 kg (depending on model; excluding optional equipment)
Length x width x height	min. 1,212 x 1158 x 870 mm

3.2 Hydraulic specifications

Parameters	Value
Laterally pressing	180 bar
Gripping	65 bar
Hydraulic connection	Depending on the device's features and the carrier vehicle

The hydraulic schematic is not included in this operating manual and is provided as a separate document. For more information, please contact the manufacturer.

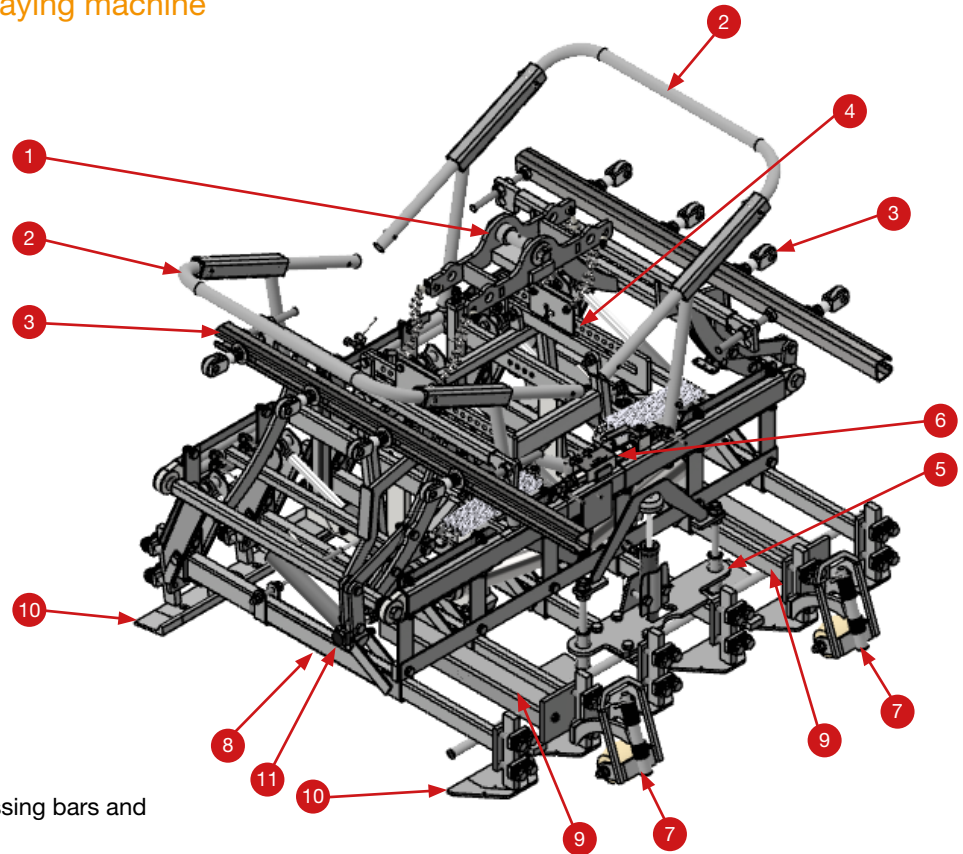
3.3 Available inner clamp arm lengths

The paver-clamp is available with inner clamp arms of various lengths. The respective inner clamp arm length determines the available gripping range (see chap. "6.1 Adjusting the gripping range").

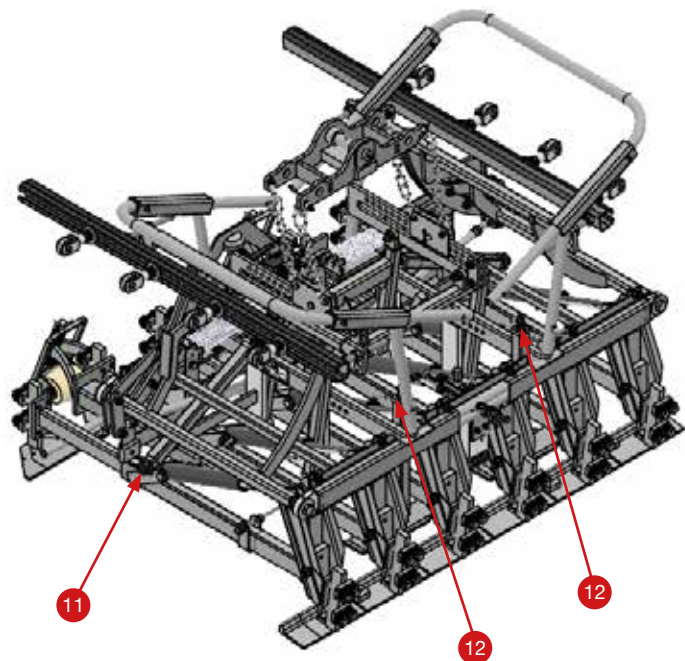
Inner clamp arm length	Gripping range
550 mm	580 - 920 mm
700 mm (Standard version)	720 - 1,050 mm
850 mm	870 - 1,150 mm
1,100 mm	1,120 - 1,400 mm

4. Device description

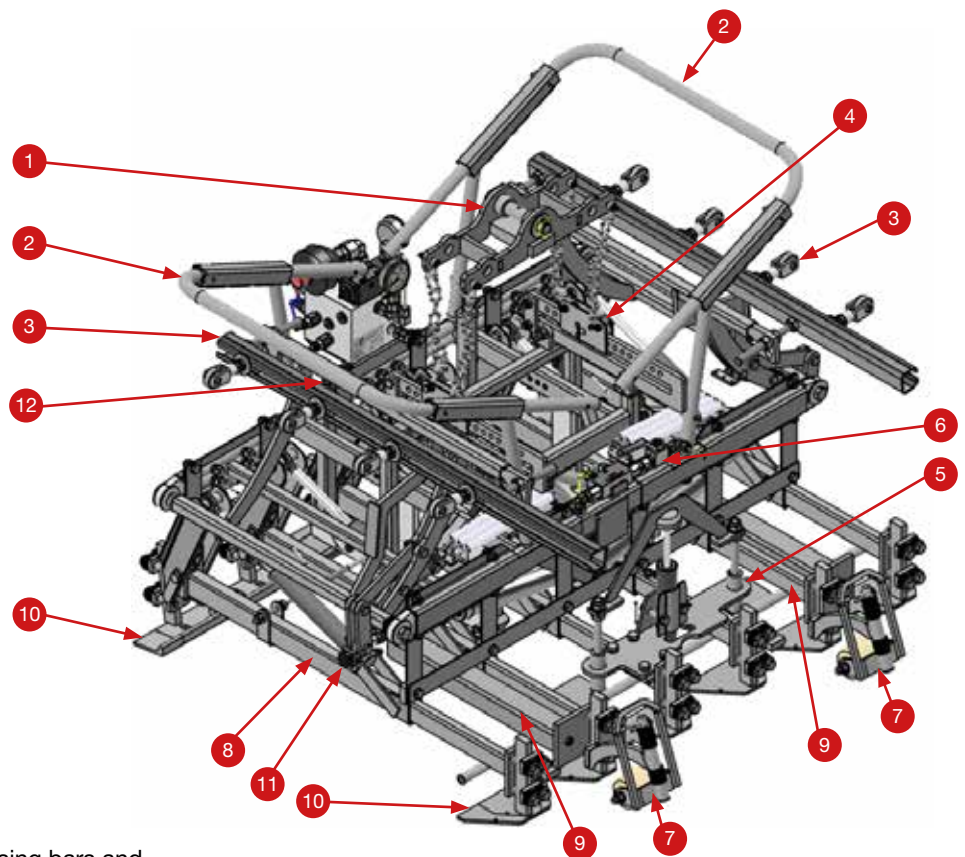
4.1 Paver-clamp on paver laying machine



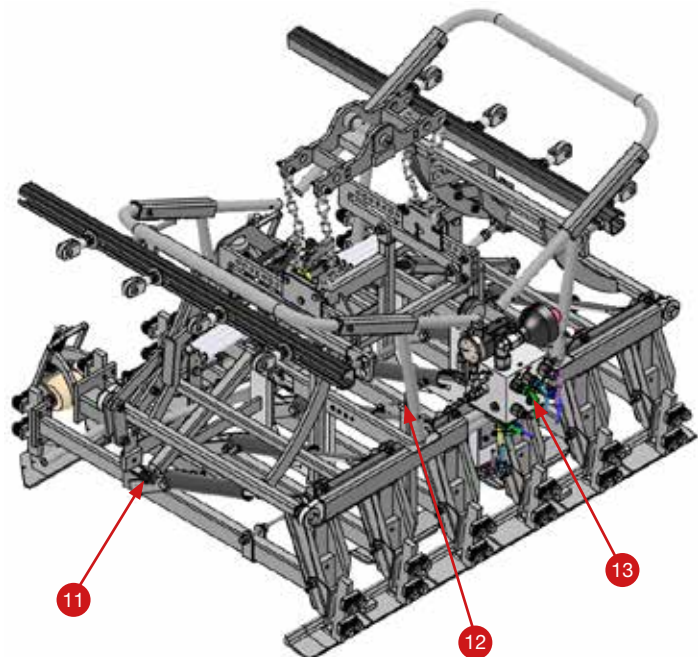
1. Crossbeam for carrier vehicle
2. Handles
3. Pressure frame with lateral pressing bars and pressure rollers
4. Balance beam
5. Tap-down-device
6. Hydraulic block for tap-down-device
7. Docking rollers
8. Clamp arm
9. Clamp arm with integrated height adjustment
10. Gripper jaw (changeable)
11. Limiter for lateral pressure
12. Height adjustment screw



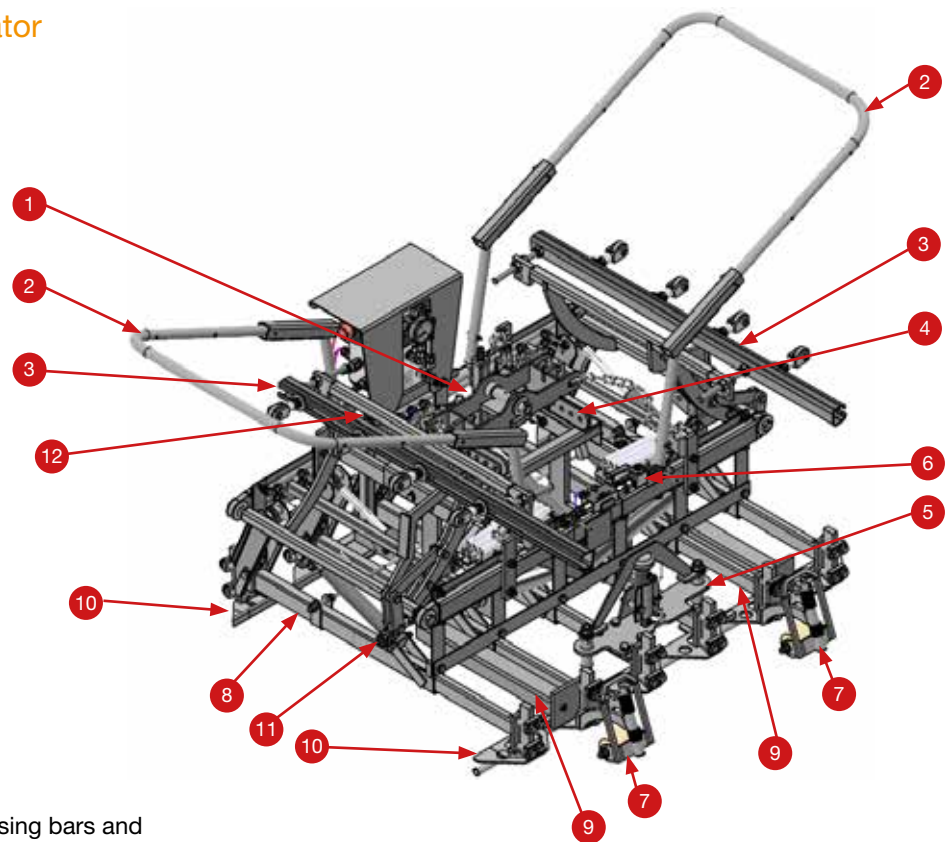
4.2 Paver-clamp for loader



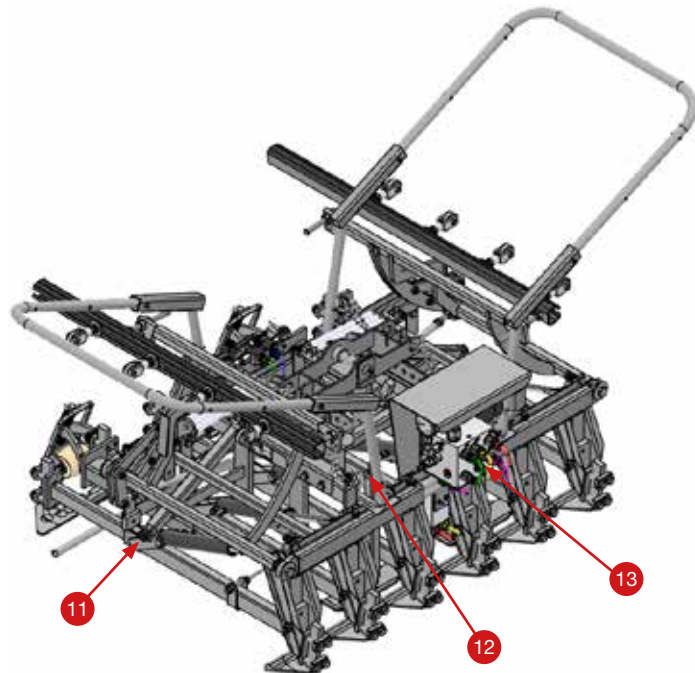
1. Crossbeam for carrier vehicle
2. Handles
3. Pressure frame with lateral pressing bars and pressure rollers
4. Balance beam
5. Tap-down-device
6. Hydraulic block for tap-down-device
7. Docking rollers
8. Clamp arm
9. Clamp arm with integrated height adjustment
10. Gripper jaw (changeable)
11. Limiter for lateral pressure
12. Height adjustment screw
13. Hydraulic block



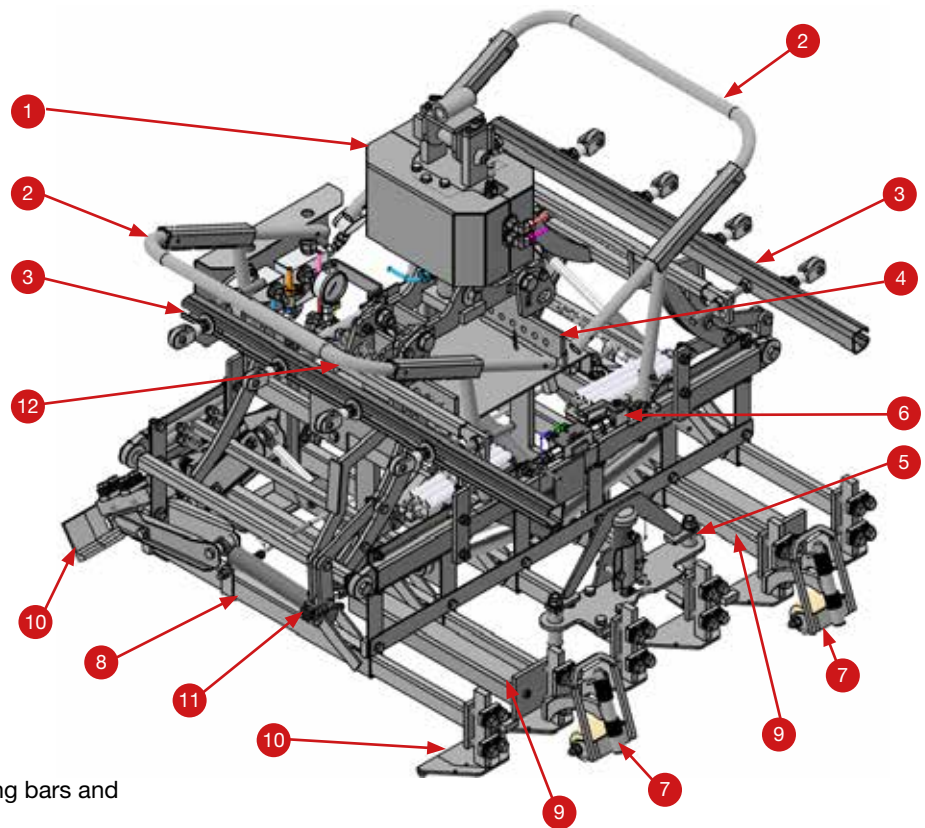
4.3 Paver-clamp for excavator



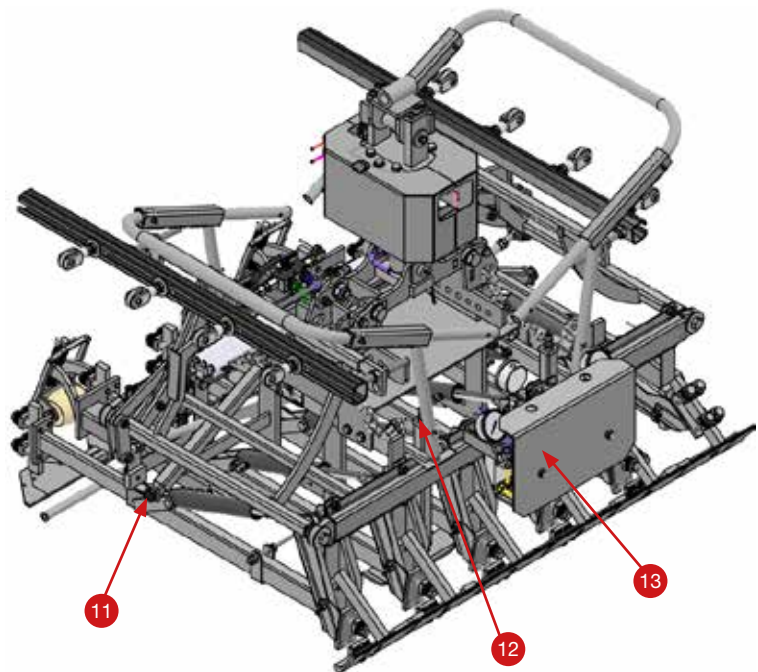
1. Crossbeam for carrier vehicle
2. Handles
3. Pressure frame with lateral pressing bars and pressure rollers
4. Transport lock for crossbeam
5. Tap-down-device
6. Hydraulic block for tap-down-device
7. Docking rollers
8. Clamp arm
9. Clamp arm with integrated height adjustment
10. Gripper jaw (changeable)
11. Limiter for lateral pressure
12. Height adjustment screw
13. Hydraulic block



4.4 Paver-clamp with 3K-SMART control for excavator



1. Rotator 3K-SMART control
2. Handles
3. Pressure frame with lateral pressing bars and pressure rollers
4. Transport lock for crossbeam
5. Tap-down-device
6. Hydraulic block for tap-down-device
7. Docking rollers
8. Clamp arm
9. Clamp arm with integrated height adjustment
10. Gripper jaw (changeable)
11. Limiter for lateral pressure
12. Height adjustment screw
13. Hydraulic block



4.5 Tool for adjusting the paver-clamp and the jaws

The following tool is required for adjusting the gripping width and the height:

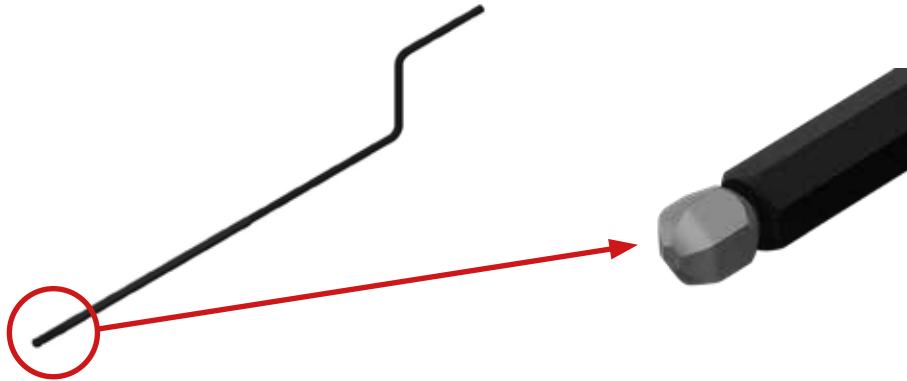


Fig. 2. Special crank (with hex screwdriver size 8)

The special crank is supplied with the paver-clamp or the paver laying machine!

An open-end wrench and an hex screwdriver are required for all other adjustments. They are listed in the individual chapters. These are not included with the product!

4.6 Tap-down-device

The hydraulic tap-down-device prevents the paving stones from tilting during positioning. The preload ensures that the gripped stone layer is pressed down evenly as the device opens.

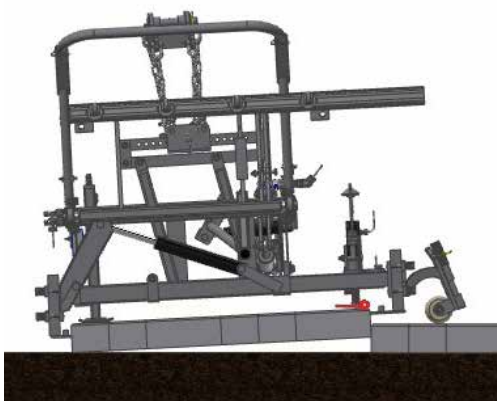


Fig. 3. Tap-down-device

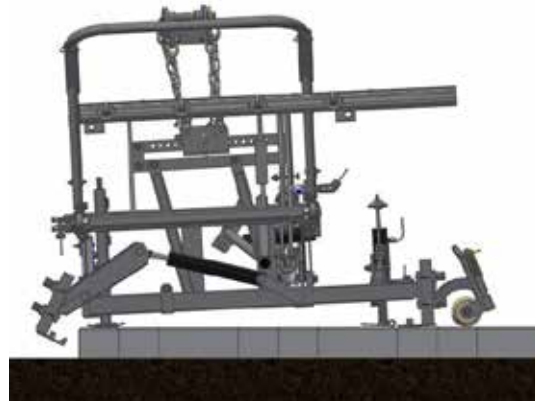


Fig. 4. Tap-down-device (bottom)

4.7 Gripper jaws

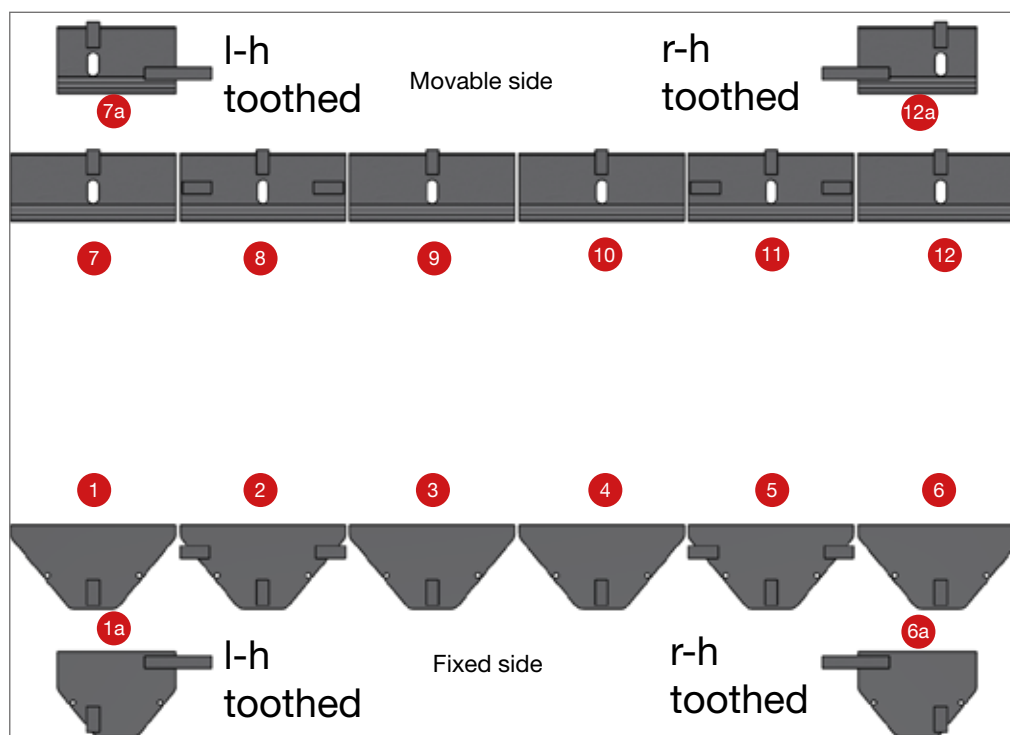


Fig. 5. Standard set of the gripper jaws

1. Jaw, part no.:	102001	7. Jaw, part no.:	102003
1a. Jaw left toothed, part no.:	102020	7a. Jaw left toothed, part no.:	102023
2. Jaw, part no.:	102056	8. Jaw, part no.:	102057
3. Jaw, part no.:	102001	9. Jaw, part no.:	102003
4. Jaw, part no.:	102001	10. Jaw, part no.:	102003
5. Jaw, part no.:	102056	11. Jaw, part no.:	102057
6. Jaw, part no.:	102001	12. Jaw, part no.:	102003
6a. Jaw right toothed, part no.:	102021	12a. Jaw right toothed, part no.:	102024

The paver-clamp comes standard with a standard set of jaws. This set is designed for the vast majority of common concrete paving stones and stone layers and enables the paving stone layers to be picked up safely and without damaging the material when used as intended.

Various jaw sets are available to accommodate different paving stone formats, stone layers, laying patterns, and manufacturer products. The jaw sets allow for the handling of rectangular paving stones, interlocking paving stones, UNI paving stones, H-shaped paving stones, honeycomb paving stones, clinker paving stones, heavy-duty paving stones, and other special formats. In addition, special versions are available for various laying patterns, such as herringbone, half-brick, radial, Roman, or random.

The appropriate set of jaws must be selected based on the type of paving to be picked up. Only by using a set of jaws suitable for the specific paving can secure pickup, trouble-free operation, and protection of the paving material be guaranteed.

Only jaw sets approved by the manufacturer may be used. Before each use, check whether the installed jaw set is suitable for the paving stones to be picked up, properly installed, and undamaged. Jaw sets may only be replaced when the machine is shut down and in accordance with the instructions in this operating manual (see chap. "6.2.3 Change in the position of the gripper jaws").

4.8 Filler holder (optional)

Filler holders are used when individual stones within a stone layer cannot be securely held by the gripper jaws, for example, in stone layers laid in a running bond pattern (see Fig. 6).

Depending on the application, mechanical or hydraulic filler holders are available.

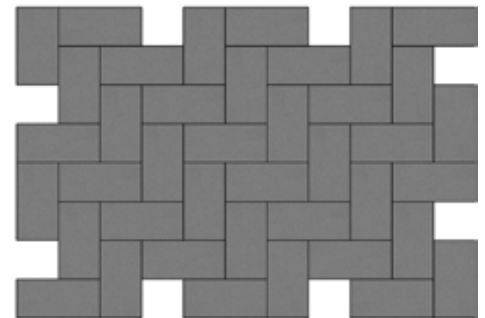


Fig. 6. Herringbone paving pattern

4.8.1 Mechanical filler holder

Mechanical filler holders are mounted on the pressure frames and actuated by tension springs. When the pressure frames are lowered, the fillers are automatically moved toward the stone layer. When the lateral pressure is released, the filler holders are retracted back to their initial position.

The installation and adjustment of the mechanical filler holders and the fillers are described in chap. "6.4 Installation and adjustment of the mechanical filler holders and fillers (optional)".

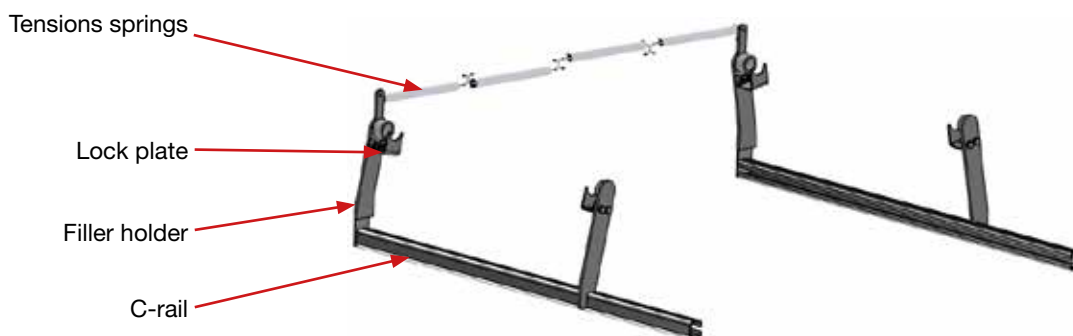


Fig. 7. Filler holder

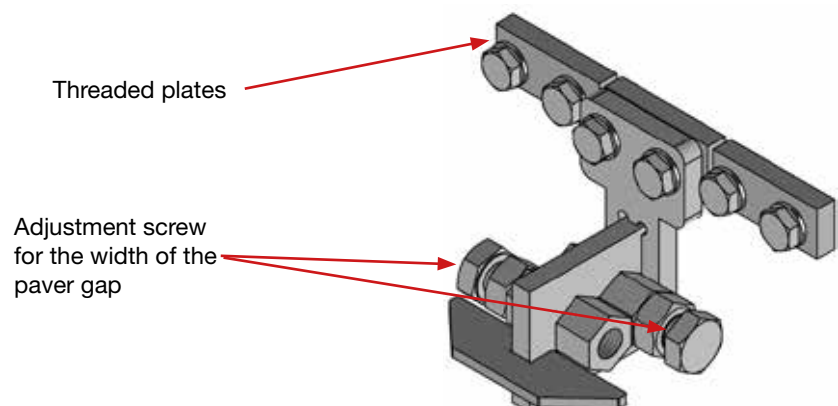


Fig. 8. Example: Filler piece

4.8.2 GAP-System - Hydraulic filler holder

The GAP system consists of hydraulic filler holders that are mounted on the outer arms of the paver-clamp. The fillers are positioned on the filler holders according to the stone layout. After the paver-clamp is placed on the stone layer, the hydraulic filler holders are activated during the gripping process. The filler pieces hydraulically clamp the respective paving stones in place. This ensures that the paving stones are securely held during the gripping process and can be picked up and laid together with the stone layer.

After the stone layer has been set down and the paver-clamp has been opened, the hydraulic filler holders return to their starting position.

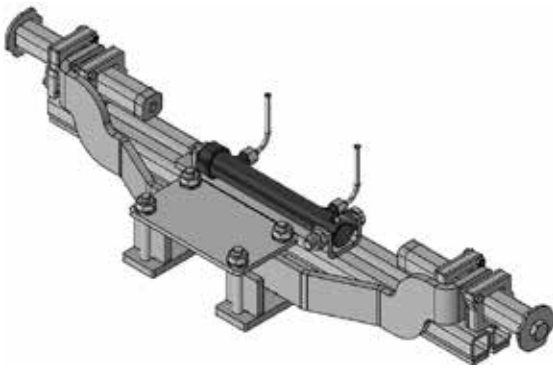


Fig. 9. Hydraulic filler holder (left)

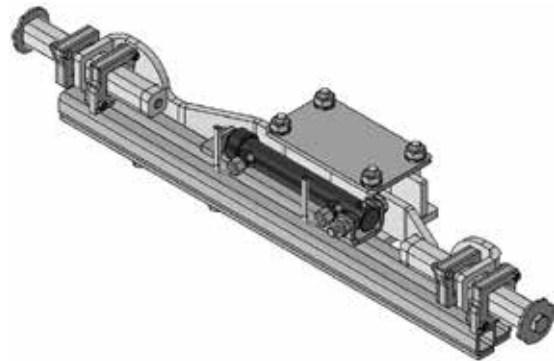


Fig. 10. Hydraulic filler holder (right)

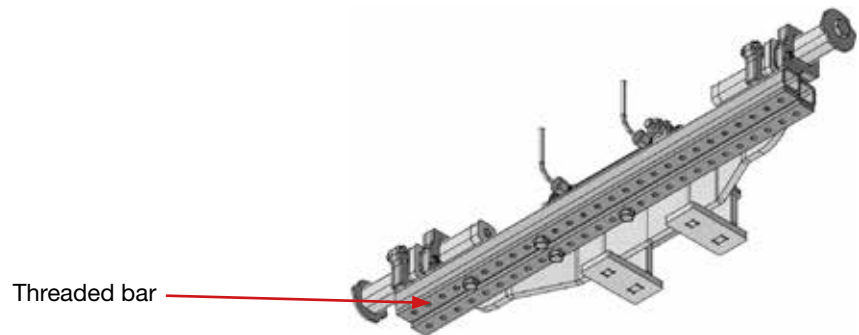


Fig. 11. Hydraulic filler holder (view from below)

4.9 Technical clarification

In general, an individual technical clarification must be conducted, taking into account the concrete paving stones to be handled and the carrier vehicle.

Information required:

1. Which carrier vehicle?
2. Which high-pressure couplings are on the carrier vehicle?
3. Is a quick-change coupler available on the carrier vehicle? If so, which one?
4. Which paving stones are to be laid?

Accordingly, the following options are recommended:

1. Set of clamping jaws
2. Inner clamp arm length (see chap. "3.3 Available inner clamp arm lengths")
3. Matching pressure rollers (see chap. "6.3.7 Pressure rollers/ Pressure pieces")
4. Height adjustment with rollers (for stone layer insertion; see chap. "6.2.6 Height adjustment with rollers (optional)")
5. Filler holder (see chap. "6.4 Installation an adjustment of the mechanical filler holders and fillers (optional)" + "6.5 Installation and adjustment of the GAP System (optional)")

5. Commissioning

5.1 Multi6 M with paver laying machine

If the paver-clamp Multi6 M is delivered together with an Optimas paver laying machine, the paver-clamp is factory-installed and set up and ready for operation.

Before initial startup, check the following:

- Visual inspection for shipping damage
- Completeness of the equipment
- All screw and plug connections are securely fastened
- Hydraulic hoses and couplings must be in good condition
- Unrestricted movement of all paver-clamp functions

For additional information on the startup, operation, and maintenance of the paver laying machine, please refer to the operating manuals for the respective Optimas paver laying machine.

5.2 Multi6 M with other carrier vehicles

The paver-clamp Multi6 M can be used on a variety of carrier vehicles, such as hydraulic excavators or wheel loaders. The paver-clamp is available for use with standard quick-change couplers.

Before commissioning, ensure that the mounting on the paver-clamp is compatible with the carrier's quick-change system.

Installation

1. Attach the paver-clamp to the carrier vehicle using the designated quick-change system.
2. Lock the quick-change system in accordance with the manufacturer's specifications for the carrier vehicle.
3. Connect the paver-clamp's hydraulic hoses to the designated hydraulic connections on the carrier vehicle.
4. Ensure that the hydraulic hoses are routed without tension and have sufficient freedom of movement during all operating maneuvers.
5. Start the carrier vehicle and check the paver clamp's hydraulic functions at low speed.
6. Check that all of the paver-clamp's movement functions are operating properly.

Before starting work

Before the first use, as well as after each installation and removal, the following points must be checked:

- Locking the quick-change mount
- Secure fit of all hydraulic connections
- Leak-free hydraulic system
- Unrestricted movement of the paver-clamp
- Proper operation of all control functions

NOTE:

The installation, locking, and functional testing of the quick-change mount must be performed in accordance with the specifications provided by the manufacturer of the respective carrier vehicle and the quick-change system being used.

6. Settings

6.1 Adjusting the gripping range

To simplify the adjustment of the gripping width, the tap-down-device can be temporarily locked hydraulically using the ball valve on the hydraulic block. This keeps the tap-down-device in its lower position, allowing the gripping width to be adjusted without the height limiter colliding with the tap-down-device.

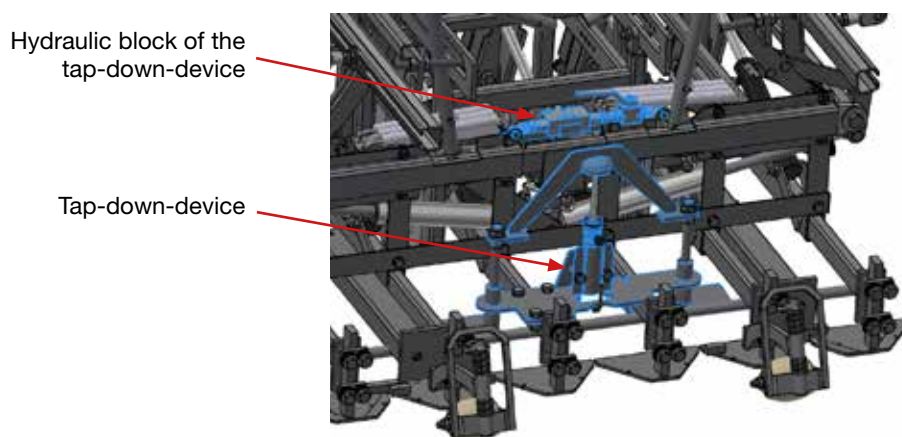


Fig. 12. Adjusting the gripping range: tap-down-device

NOTE

The available gripping range depends on the installed inner clamp arm length. For information on the available inner clamp arm lengths and the corresponding gripping ranges, see chap. "3.3 Available inner clamp arm lengths".

Procedure:

1. Close the paver-clamp on the carrier vehicle so that the tap-down-device moves to the lower position.
2. Close the ball valve on the hydraulic block to hydraulically lock the tap-down-device.
3. Open the paver-clamp on the carrier vehicle. The tap-down-device remains in its lower position due to the lock.
4. Measure the length "Z" of the stone layer (see Fig. 13)



Fig. 13. Adjusting the gripping range: measuring the stone layer

6. Adjust the gripping range. To do this, turn the adjustment screw (see Fig. 14) using the special crank (see chap. "4.5 Tool for adjusting the paver-clamp and the jaws"). The adjustment screw is located under the movable gripper jaw. One turn of the adjustment screw corresponds to an adjustment of 4 mm.
7. Transfer the measured value "Z" to a gripper arm (see Fig. 15): The measurement is taken from the leading edge of the fixed side of the jaw to the center of the hinge screw.
8. Adjust the remaining gripper arms accordingly.

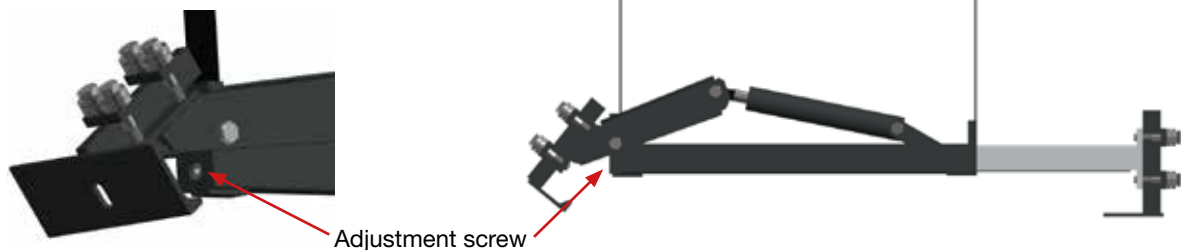


Fig. 14. Adjusting the gripper range: adjustment screw

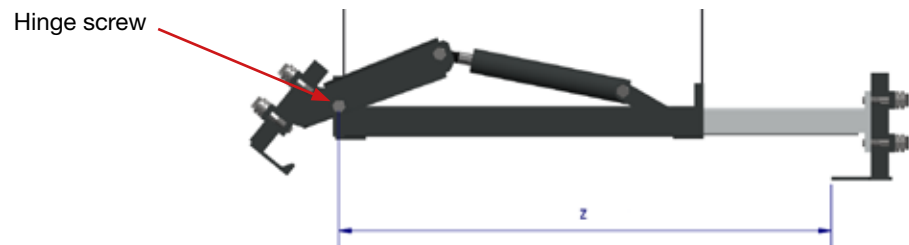


Fig. 15. Adjusting the gripper range: Adjust the measurement on the gripper arm

NOTE

The gripper jaws are partially toothed. The individual gripper arms must therefore be adjusted in such a way that the gripper jaws and the tap-down-device do not interfere with each other.

After completing the setup:

1. Open the ball valve on the hydraulic block of the tap-down-device.
2. Check that the tap-down-device is functioning properly by performing a test run.
3. Grip test: The paver-clamp's grip width is set correctly when the movable gripper jaw is perpendicular to the layer of stones as it grips it (see Fig. 16).



Fig. 16. Adjusting the gripper range: vertical position of the gripper jaw



Caution

Risk of property damage due to a closed ball valve

After completing the grip width adjustment, the ball valve on the hydraulic block must be fully opened again. Operating the device with the ball valve closed can cause damage to the equipment.

6.2 Height adjustment

The gripper jaws are factory-set for paving stones with a thickness of 8 cm and 10 cm. The distance between the top edge of the gripper jaw and the top edge of the clamping plates is 30 mm (see Fig. 18 and Fig. 19). For paving stones of other thicknesses or special shapes, it may be necessary to adjust the gripper jaws.

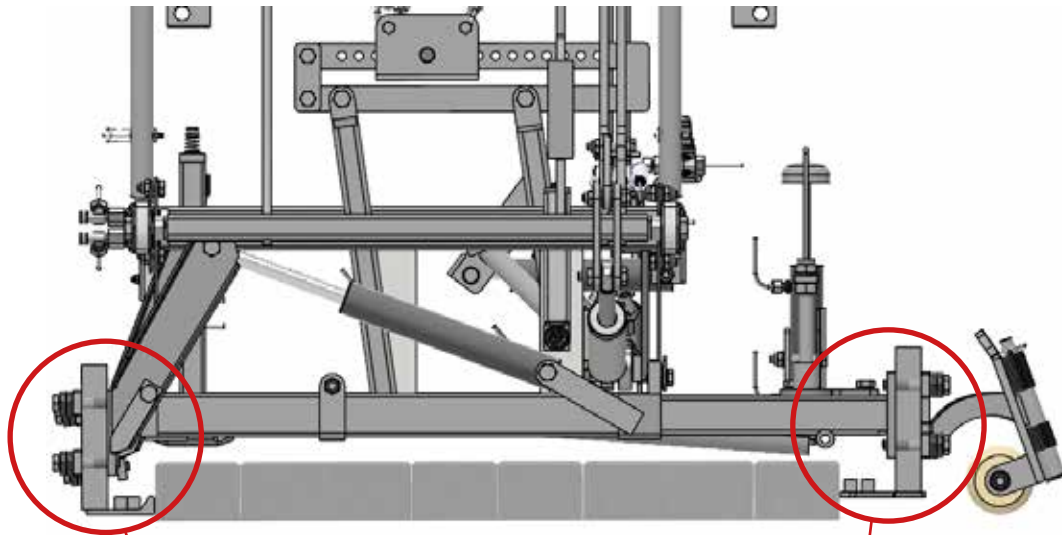


Fig. 17. Height adjustment: factory-set positions

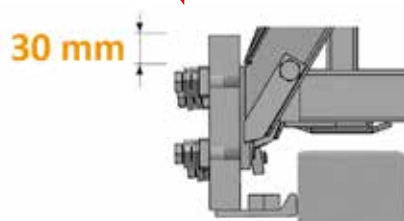


Fig. 18. Detail of moveable gripping jaw

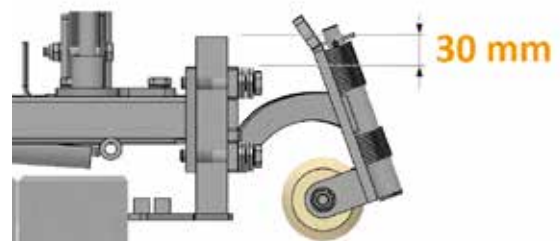


Fig. 19. Detail of fixed gripping jaw

6.2.1 Ideal points

To ensure secure gripping and even placement of the stone layer, the gripper jaws must make contact at the ideal points. Ideally, the fixed gripper jaw should grip the stone at its center (see Fig. 20). Ideally, the movable gripper jaw should engage the paver stone so that the distance between the bottom edge of the paver stone and the bottom edge of the gripper jaw is approx. 10 mm (see Fig. 21). When making fine adjustments or height adjustments for other paving stones, the ideal points should always be maintained.

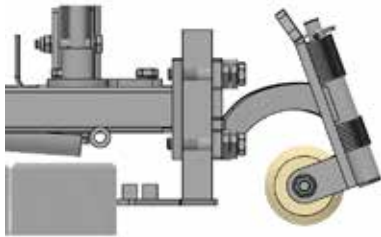


Fig. 20. Ideal point on fixed gripper jaw

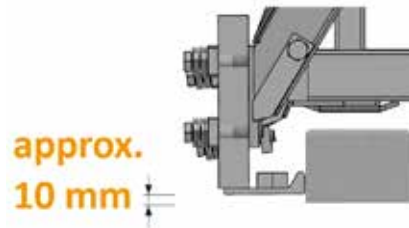


Fig. 21. Ideal point on moveable gripper jaw

If the ideal points are not maintained, the stone layer may deform when gripped. This can result in a bulging stone layer and compromise the quality of the paving.

6.2.2 Correction for a bulging stone layer

If the stone layer is bulging after the paver-clamp has picked it up, the paver-clamp is resting on the middle section of the stone layer. In this case, check the contact points of the gripping jaws (see Fig. 22).

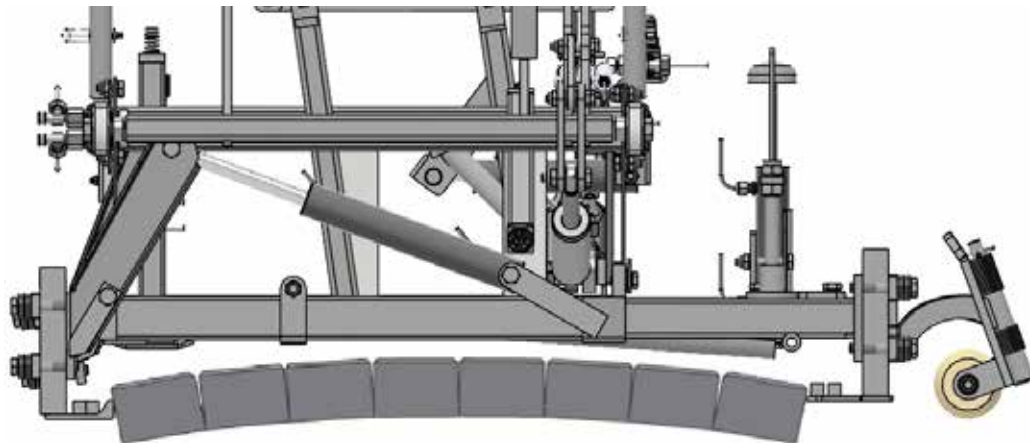


Fig. 22. Bulging stone layer

Correction:

- Fully retract the height adjuster
- Fully retract the telescopic plate
- Lower the gripper jaws (see chap. "6.2.3 Change in the position of the gripper jaws")
- Then perform a fine adjustment (see chap. "6.2.4 Fine adjustment of height")

6.2.3 Change in the position of the gripper jaws

The position of the gripper jaws must be adjusted to the height of the paving stones to be laid. For paving stones 12 cm high, the gripper jaws should be mounted lower; for paving stones 6 cm high, they should be mounted higher accordingly. To do this, loosen the hex screws on the gripper jaws (see Fig. 23) and move the gripper jaws to the required position.

Tools required:

- Open-end wrench size 19
- Ring ratchet wrench size 19

Procedure:

1. Loosen the four mounting screws on the respective gripper jaw.
2. Move the gripper jaw to the desired position.
3. Reinstall the fasteners as they were when the unit was originally delivered.
4. Make sure that the flat steel strips and clamping discs are positioned correctly (see Fig. 24).
5. Tighten the screws to a torque of 40 Nm.

NOTE:

Depending on the brick size and type, it may be necessary to switch to a suitable set of gripper jaws.

For paving stones with poor dimensional stability or bulging side surfaces, it may be necessary to position the grippers lower to ensure a secure grip on the stone layer.

After adjusting the gripper jaws, perform a fine adjustment (see chap. "6.2.4 Fine adjustment of height").

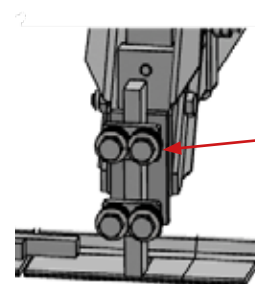


Fig. 23. Screws for adjusting the position of the gripper jaws

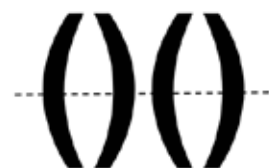


Fig. 24. Arrangement of clamping discs

6.2.4 Fine adjustment of height

Using the special crank, adjust the height adjuster on the adjustment screw (Item 1, Fig. 25) or the telescopic plate (Item 3, Fig. 25) up or down until the gripper jaws reach the ideal height.

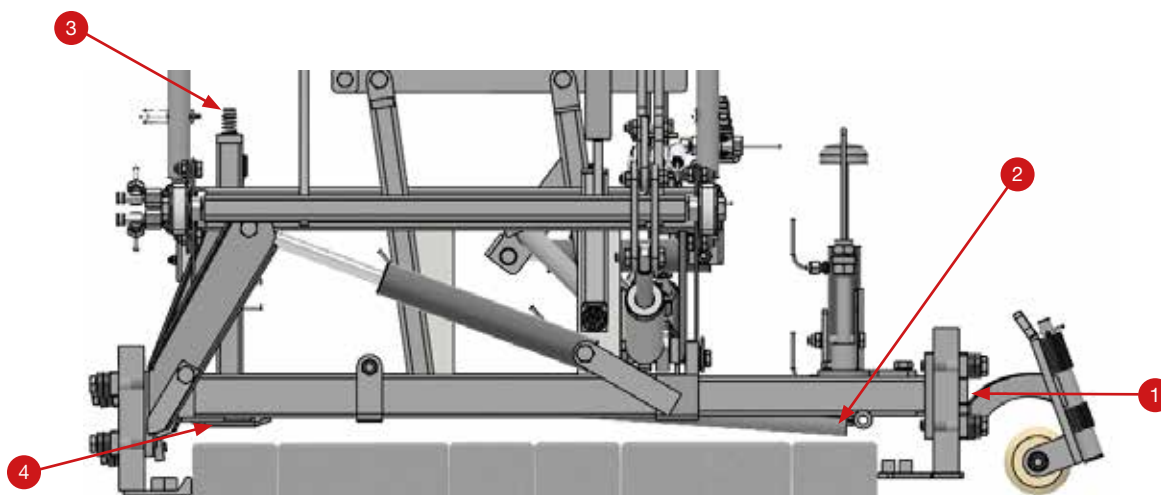


Fig. 25. Fine adjustment of height

1. Adjustment screw for height adjuster
2. Height adjuster
3. Adjustment screw for telescoping plate
4. Telescoping plate

6.2.5 Height adjustment of the docking roller

The height of the docking roller can be adjusted by moving the washers:

1. Remove pipe folding pin (Fig. 26)
2. Pull out the locking pin (Fig. 27)
3. Adjust the required number of washers (Fig. 28)
4. Reinsert the locking pin
5. Reinsert pipe folding pin (Fig. 29).

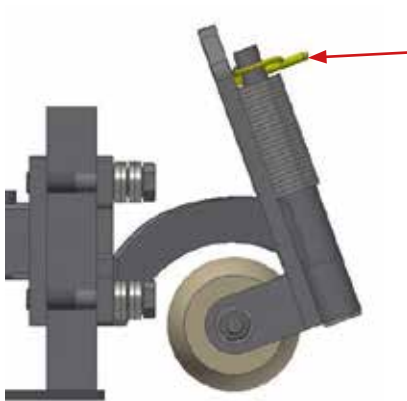


Fig. 26. Remove pipe folding pin



Fig. 27. Pull out the locking pin



Fig. 28. Adjust the washers

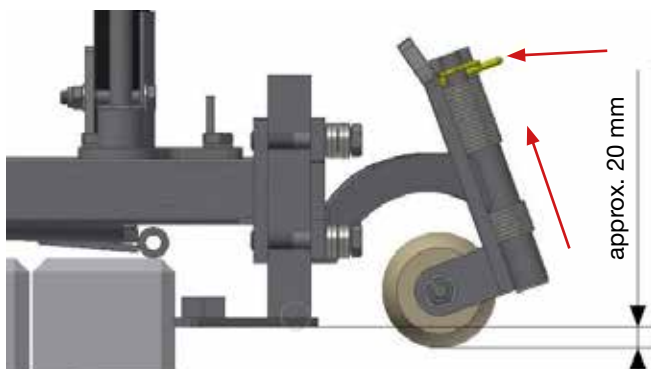


Fig. 29. Reinsert the locking pin and the pipe folding pin



Fig. 30. Docking roller

6.2.6 Height adjustment with rollers (optional)

For applications in which layers of stone need to be moved during the paving process, height adjusters with rollers can be used as an option.

To replace them, the factory-installed height adjusters (telescopic plates) are replaced with height adjusters with rollers.

Tools required:

- Special crank

Procedure:

1. Turn the adjustment screw with the special crank until the telescopic plate can be removed.
2. Remove the height adjuster.
3. Insert the height adjuster with rollers into the mounting tube.
4. Connect the adjustment screw to the new height adjuster.
5. Adjust the height adjuster to the required height (see chap. "6.2.4 Fine adjustment of height").

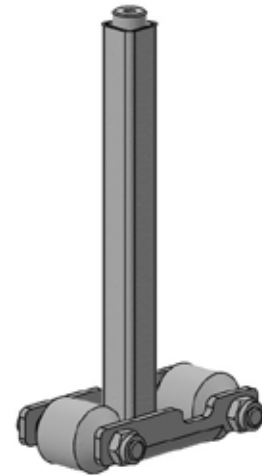


Fig. 31. Height adjuster with rollers on movable side

6.3 Adjusting the lateral pressure

6.3.1 Adjusting the lateral pressing bars

1. Lateral pressing bar
2. Hex nut M16
3. Pressure roller

The lateral pressure bars (Item 1) are used to adjust the paver-clamp to the width of the stone layer to be picked up. The adjustment is made using the two nuts (Item 2) on the threaded rods. The standard pressure bars can accommodate widths ranging from 1,150 mm to 1,380 mm.

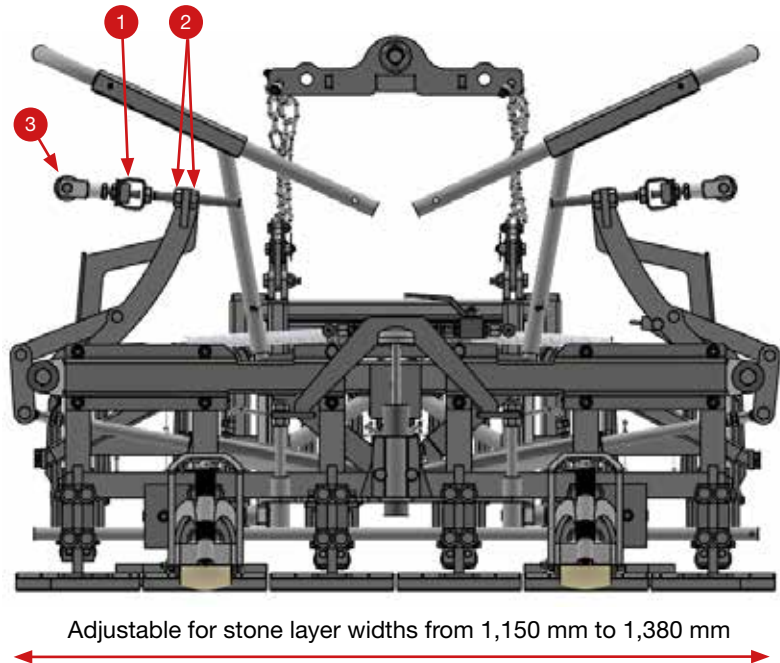


Fig. 32. Adjust the width of the stone layer

Tools required:

- Open-end wrench size 24

Procedure:

1. Measure the width of the stone layer to be laid
2. Find the corresponding “Y” value in the adjustment table (see Tab. 1)
3. Loosen the outer locknut

Stone layer width (X) in mm	Distance (Y) in mm	Stone layer width (X) in mm	Distance (Y) in mm
1,380	0	1,260	60
1,370	5	1,250	65
1,360	10	1,240	70
1,350	15	1,230	75
1,340	20	1,220	80
1,330	25	1,210	85
1,320	30	1,200	90
1,310	35	1,190	95
1,300	40	1,180	100
1,290	45	1,170	105
1,280	50	1,160	110
1,270	55	1,150	115

Tab. 1. Distance between the pressure bar and the pressure frame (1)

4. Adjust the adjusting nut on the threaded rod so that the determined dimension "Y" is set (see Fig. 34)
5. Tighten the lock nut back against the pressure frame to secure the adjustment
6. Make the corresponding adjustment on the opposite side
7. Perform a test grip and compare the clearance measurement with the width of the stone layer

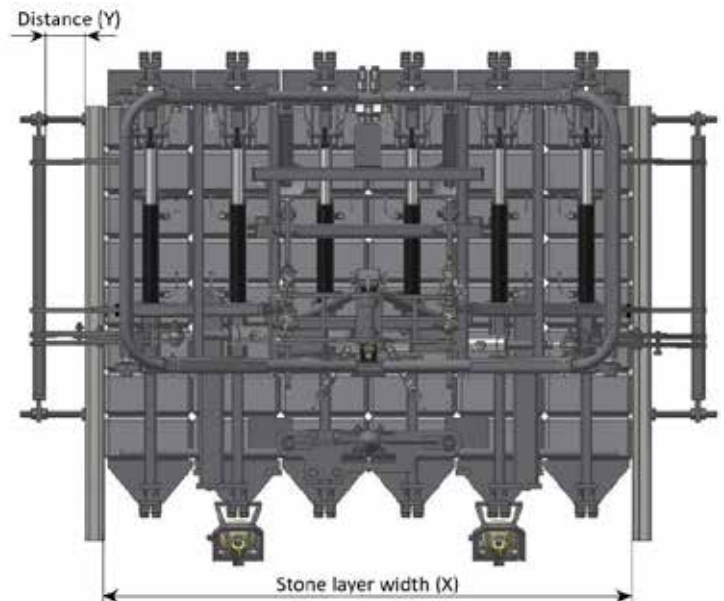


Fig. 33. Transfer the Y-distance measurement to the paver-clamp

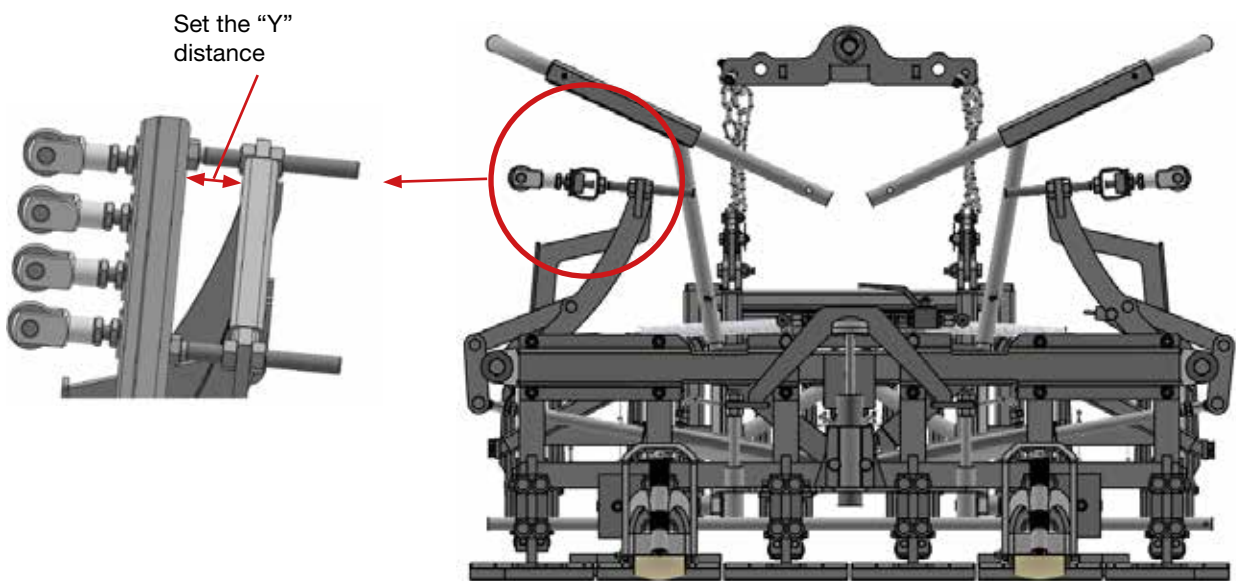


Fig. 34. Adjust the "Y" spacing on the paver-clamp

NOTE:

Both pressure bars must be adjusted to the same measurement so that the stone layer can be pressed down evenly and held securely in place.

6.3.2 Additional C-rail (duplication) for lateral pressing (optional)

Stone layer widths between 1,120 mm and 1,140 mm cannot be adjusted for lateral pressing using either the standard pressing bars or the extensions (see section “6.3.3 Extension for lateral pressing (optional)”). This adjustment range is referred to as the unusable range.

To accommodate stone layers in this width range, the existing C-rail must be extended by doubling it with an additional C-rail (see Fig. 35 + Fig. 36).



Fig. 35. Duplication (front view) - for lateral pressing



Fig. 36. Duplication (rear view) - for lateral pressing

Tools required:

- Hex screwdriver size 12

Procedure:

1. Measure the width of the stone layer to be laid.
2. Refer to the adjustment table for the corresponding measurement “Y” (see Tab. 2).
3. Slide the duplicates into the pressure bars and tighten the screws with the hex screwdriver.
4. Adjust the “Y” distance between the doubled C-rail and the pressure frame (see Fig. 37).
5. Tighten the lock nut back against the pressure frame to secure the adjustment.
6. Make the same adjustment on the opposite side.
7. Perform a test grip and compare the distance measurement with the width of the stone layer.

Stone layer width (X) in mm	Distance (Y) in mm
1,140	120
1,130	125
1,120	130

Tab. 2. Distance between the pressure bar and the pressure frame (2)

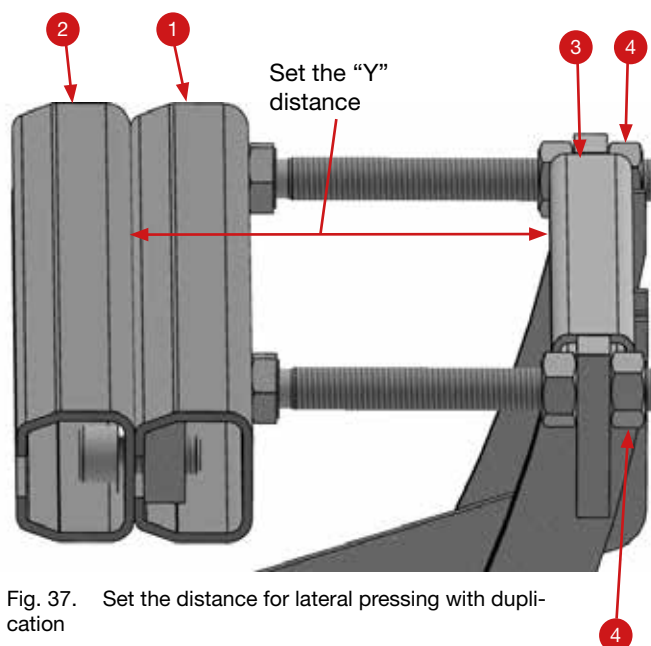


Fig. 37. Set the distance for lateral pressing with duplication

1. Pressure bar
2. Duplication for lateral pressure
3. Pressure frame
4. Lock nut

6.3.3 Extension for lateral pressing (optional)

For stone layer widths of 1,110 mm or narrower, the extensions must be used for lateral pressing (see Fig. 38). Two extensions are installed on each pressing side.

The extensions are screwed onto the existing threaded rods of the pressing bars using the long nut.

Tools required:

- Open-end wrench size 24

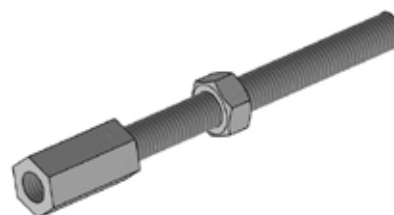


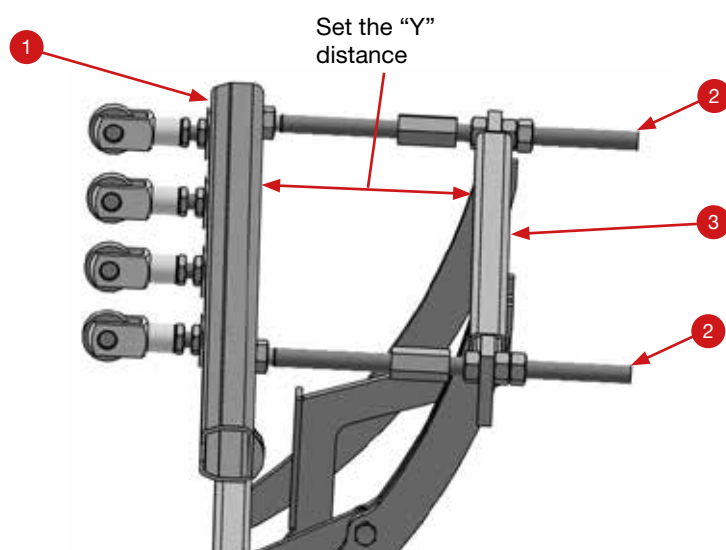
Fig. 38. Extension for lateral pressing

Procedure:

1. Measure the width of the stone layer to be laid.
2. Refer to the adjustment table for the corresponding “Y” distance (see Tab. 3).
3. Attach the extensions to the pressure bars and screw them securely in place.
4. Adjust “Y” between the C-rail and the pressure frame (see Fig. 39).
5. Secure the adjustment by tightening the lock nuts.
6. Perform the same adjustment on the opposite side.
7. Perform a test grip and compare the distance measurement with the width of the stone layer.

Stone layer width (X) in mm	Distance (Y) in mm	Stone layer width (X) in mm	Distance (Y) in mm
1,110	135	1,020	180
1,100	140	1,010	185
1,090	145	1,000	190
1,080	150	990	195
1,070	155	980	200
1,060	160	970	205
1,050	165	960	210
1,040	170	950	215
1,030	175		

Tab. 3. Distance between pressure bar and pressure frame (3)



1. Pressure bar with pressure rollers
2. Extensions for lateral pressing
3. Pressure frame

Fig. 39. Set the distance for lateral pressing with the extensions

6.3.4 Trapezoidal adjustment of the pressure bars

For optimal lateral alignment with previously laid paving stones or laying edges, the pressure bars should be positioned in the lowered position (see Fig. 40) and aligned with the paving stones in a slightly trapezoidal pattern. This setting is factory preset.

To do this, adjust the pressure frames on the movable paver-clamp side 5 mm further inward than on the fixed paver-clamp side.

This adjustment makes it easier to guide the stone layer onto the laying edge and reduces the risk of the stones tilting.

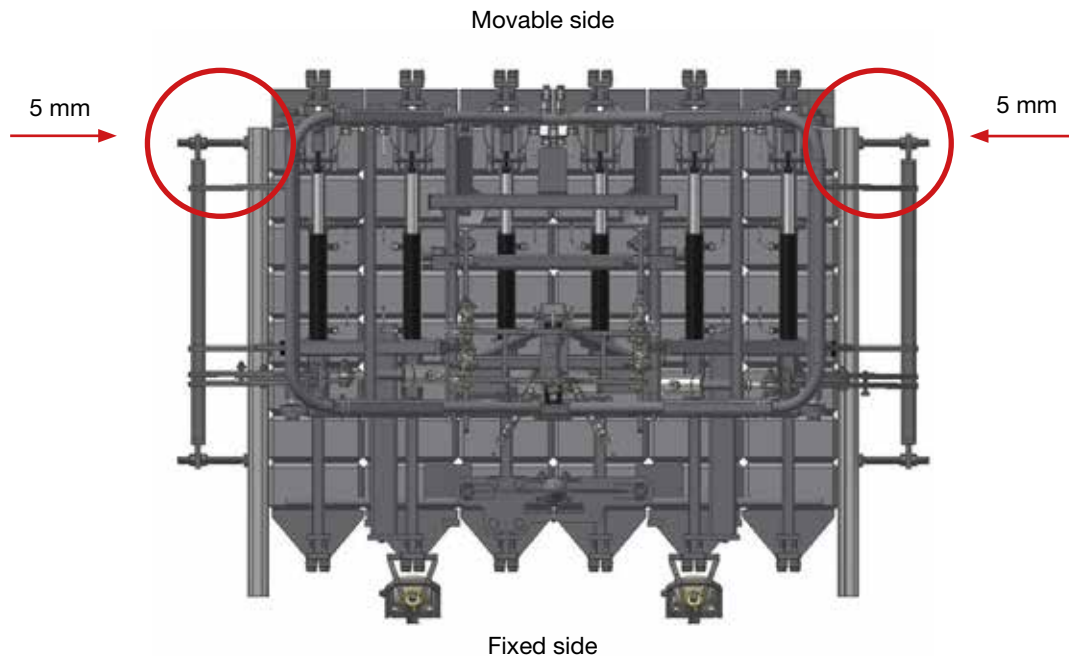


Fig. 40. Trapezoidal adjustment of the pressure bars in the lowered position

6.3.5 Pressing bars for paving stones 6cm high

The lateral pressure bars are factory-set for paving stones 8 cm high or taller. For paving stones 6 cm high or shorter, the bars can be repositioned (see Fig. 41).

Tools required:

- Open-end wrench size 24

Procedure:

1. Loosen the lock nut
2. Offset the bar by one hole
3. Tighten the lock nut

Position of the pressure bar for paving stones 6cm high

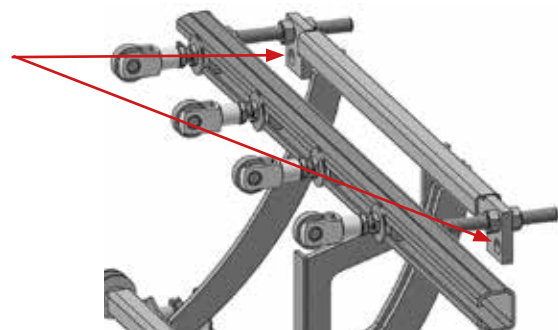


Fig. 41. Position of the pressure bar for paving stones 6cm high

6.3.6 Adjustment limit for lateral pressure

The telescopic tubes limit the adjustment range of the pressing frames and ensure that the paver-clamp automatically aligns itself with the center of the stone layer when pressing from the side.

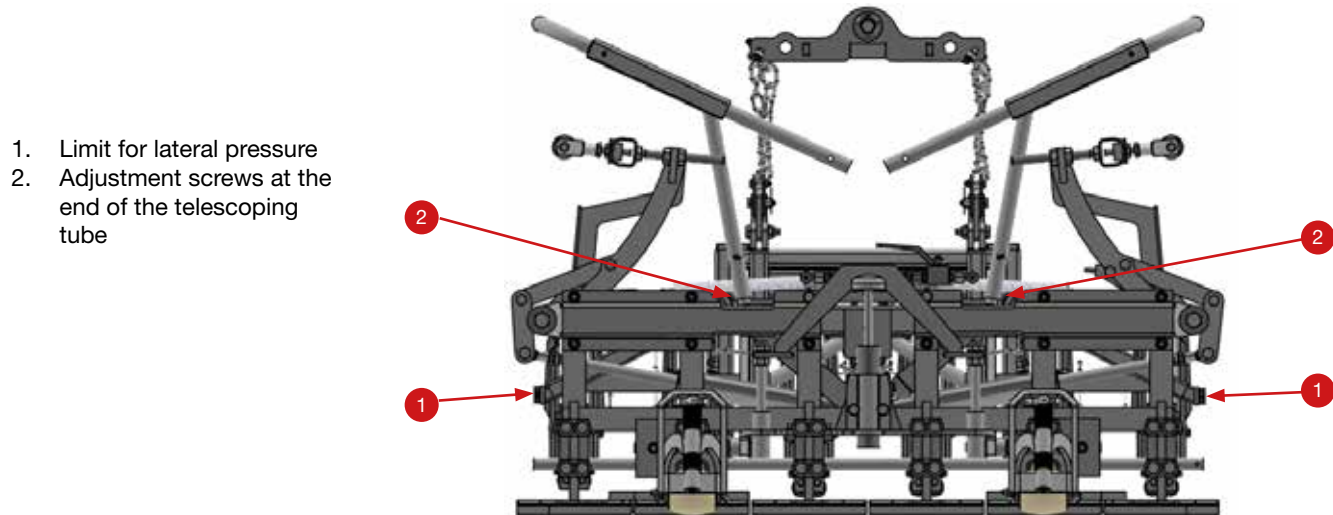


Fig. 42. Limit for lateral pressure

Tools required:

- Special crank

Procedure:

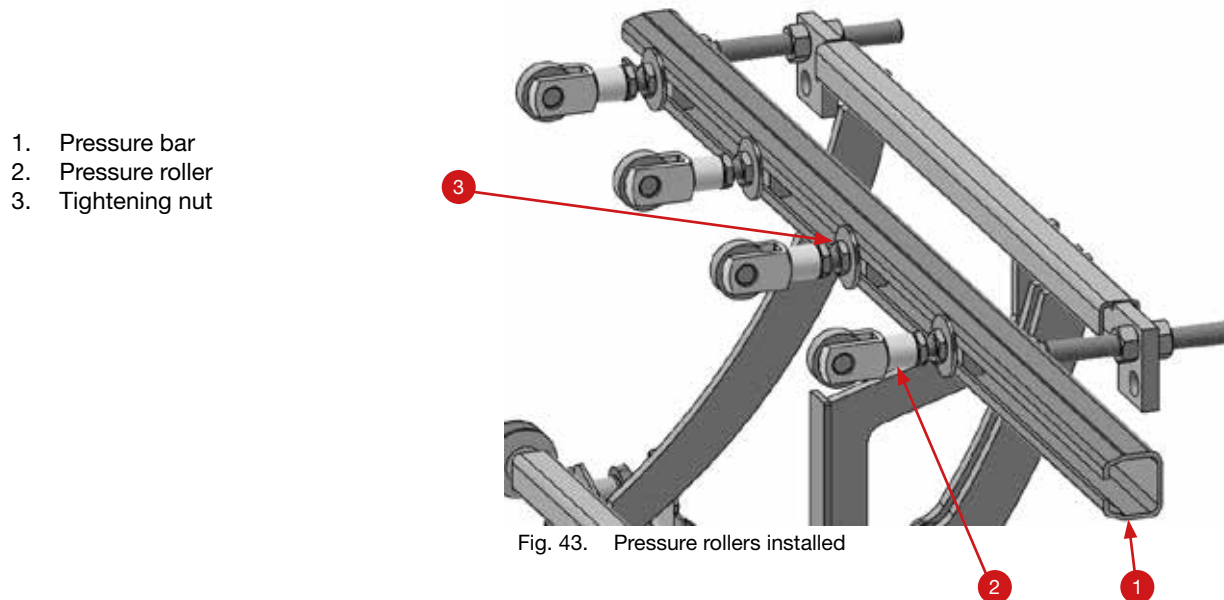
1. Position the paver-clamp in the center of the stone layer.
2. Move the pressure frame to its lowered position (if using an Optimas paver laying machine, press the button for lateral pressure for about 5 seconds; see the paver laying machine's operating manual).
3. Use the special crank to adjust both adjustment screws so that the rubber stops on the limitation rest lightly against the pressure frame.
4. Release the lateral pressure.
5. Perform a test run: Place the paver-clamp offset on the stone layer and engage the lateral pressing. The paver-clamp must automatically align itself centrally on the stone layer.
6. If necessary, readjust the guides.

NOTE:

If a gripper jaw is equipped with a pin or if filler pieces need to be fine-tuned, the limits can be set off-center as needed.

6.3.7 Pressure rollers/ Pressure pieces

The use of pressure rollers is recommended for interlocking paving stones (e.g., H-paving stones) and is absolutely necessary for rectangular paving stones or slabs that need to be shifted into a running bond pattern.



Tools required:

- Open-end wrench size 22

Procedure:

1. Loosen the nut.
2. Thread the pressure rollers into the C-rail.
3. Measure the stone layer to determine where the pressure rollers should be positioned.
4. Attach the pressure rollers to the C-rail.
5. Perform a test: Place the paver-clamp on the stone layer and activate the lateral pressure mechanism. The paver-clamp should automatically center itself on the stone layer and move the paving stones into the running bond pattern; the pressure rollers must be in contact with the paving stones.
6. If necessary, readjust the pressure rollers.

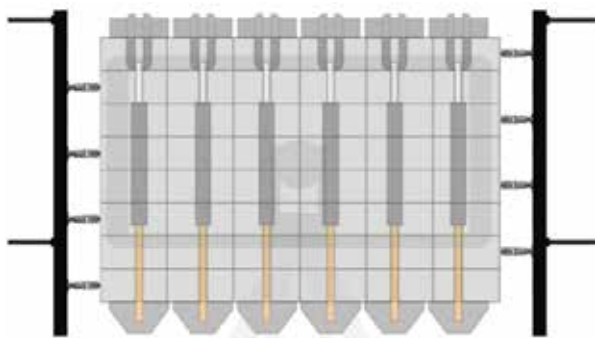


Fig. 44. Paving stones not ready for laying

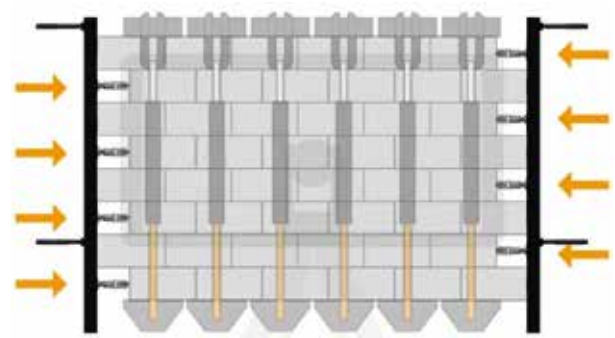


Fig. 45. Stone layer shifted in a running bond

The side pressure bars and pressure rollers shift the individual rows of stones against one another and arrange them in the desired running bond pattern.

NOTE:

When using pressure rollers, the effective width of the stone layer increases by the amount of the set offset.
The stone layer width used to set the pressure bars is calculated as follows:

$$X_1 + X_2 = X_3$$

Where:

X_1 = actual width of the stone layer

X_2 = offset of the pressure roller

X_3 = stone layer width to be set

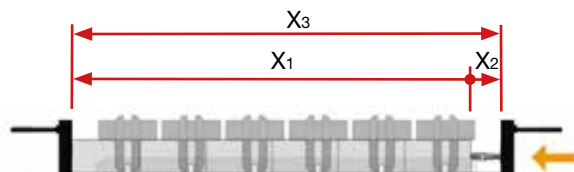


Fig. 49. Offset dimension of the pressure rollers/pieces

Example:

Stone layer width: 1,200mm

Offset of the pressure rollers: 100mm

To adjust the pressure bars, use a stone layer width of 1,300 mm.

The corresponding adjustment values can be found in Tab. 1, Tab. 2 and Tab. 3.

The package includes 8 pressure rollers measuring 100 mm to 140 mm. The following pressure rollers and pressure pieces are available as optional accessories:

Roller	Min. setting dimension (in mm)	Max. setting dimension (in mm)
Pressure roller	70	90
Pressure roller (standard)	100	140
Pressure roller	140	180
Pressure roller	180	220
Pressure roller	220	260
Pressure roller Double roll	140	180
Pressure roller Double roll	180	220
Pressure roller Double roll	220	260
Pressure roller Modula Plus	80	100
Pressure roller Modula Plus	110	130
Pressure roller Modula Plus	140	160
Pressure piece	20	40
Pressure piece	40	65

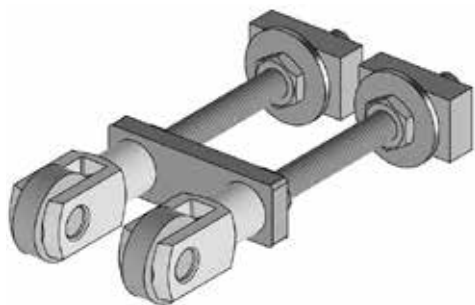


Fig. 46. Pressure roller Double roll

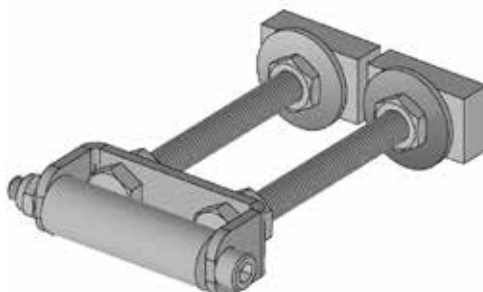


Fig. 47. Pressure roller Modula Plus

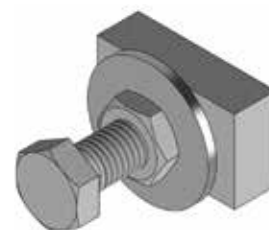


Fig. 48. Pressure piece

6.4 Installation and adjustment of the mechanical filler holders and fillers (optional)

Mechanical filler holders are attached to the pressure frames. The fillers are positioned according to the stone layout:

Tools required:

- Open-end wrench size 13
- Open-end wrench size 24

Procedure:

1. Remove the retaining plate from the filler holders.
2. Slide the filler holders onto the pressure frames.
3. Reinstall the retaining plate.
4. Install the tension springs between the filler holders.

This secures the filler holders in place and connects them to one another.



Fig. 50. Filler holder

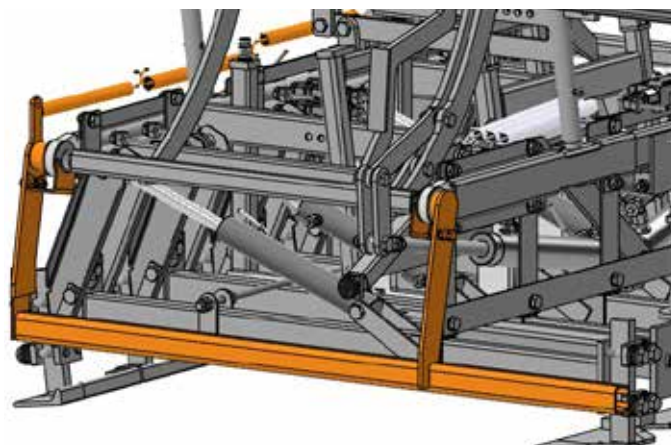


Fig. 51. Filler holder mounted on the paver-clamp (view of the tensioned state)

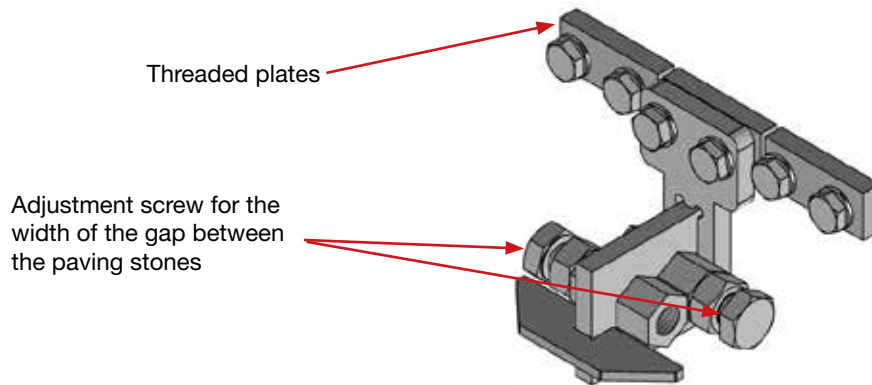


Fig. 52. Example of filler

Installation and adjustment of fillers:

1. Slide the threaded plates of the fillers into the C-rails.
2. Determine the positions of the required fillers on the stone layer.
3. Install the fillers in the corresponding positions.
4. Tighten the threaded plates on the left and right sides of the filler.
5. Adjust the width of the filler to the gap between the paving stones using the adjustment screws.

The fillers can also be readjusted after they have been installed and the system is closed.

When the pressure frames are lowered, the filler holders are automatically moved along with them. When the lateral pressure is released, the tension springs pull the filler holders back to their original position.

6.5 Installation and adjustment of the GAP System (optional)

The GAP system is mounted on the outer arms of the paver-clamp. The fillers must be positioned according to the stone layer to be picked up.

Tools required:

- Open-end wrench size 13
- Open-end wrench size 17

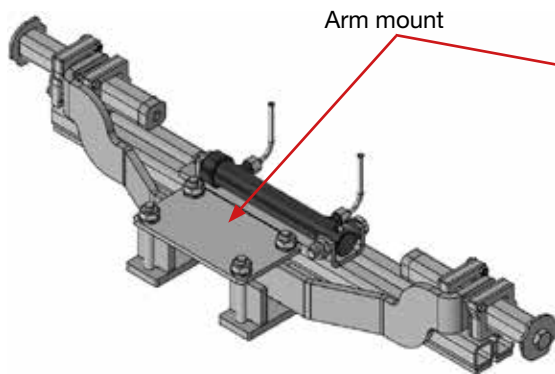


Fig. 53. Hydraulic filler holder (left)

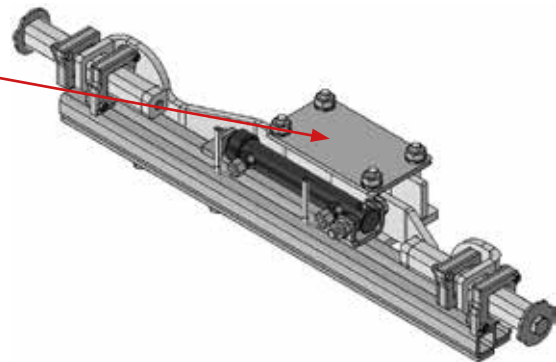


Fig. 54. Hydraulic filler holder (right)

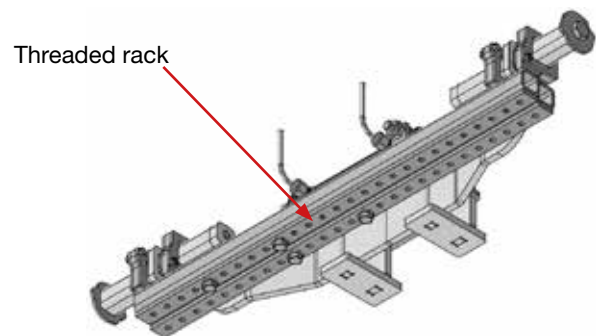


Fig. 55. Hydraulic filler holder (view from below)

Procedure:

1. Remove the nuts, washers, and adapter plate from the filler holder.
2. Slide the filler holder onto the outer tube of the paver-clamp arm.
3. Reinstall the adapter plate with washers and nuts.
4. Set the distance to 180mm between the outer tube and the adapter plate (see Fig. 56 - Fig. 59).
5. Attach the fillers to the threaded rail according to the stone layout.

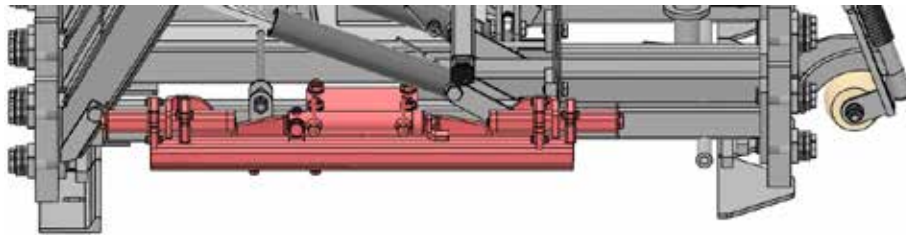


Fig. 56. GAP system on the left

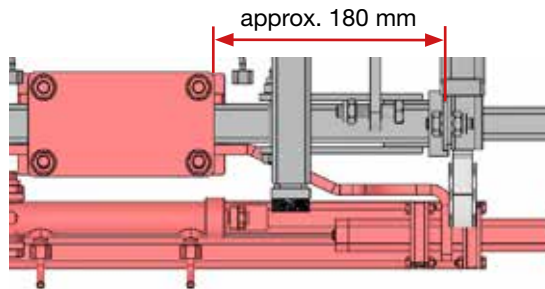


Fig. 57. GAP system on the left - Installation detail

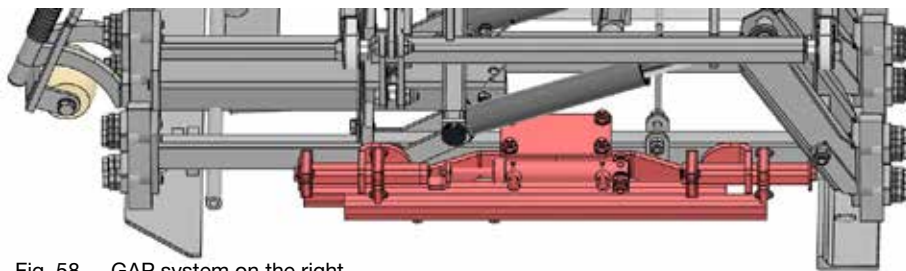


Fig. 58. GAP system on the right

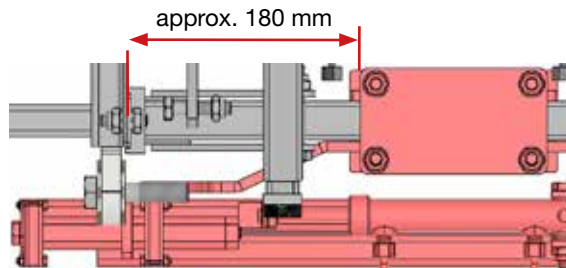


Fig. 59. GAP system on the right - Installation detail

Various filler sets are available for different stone layers. The fillers are attached to the threaded rail using the provided screws. The slotted holes in the fillers allow for fine adjustment to accommodate different paving stone dimensions.

Before use, perform a test run to verify that all fillers engage correctly in their designated recesses.

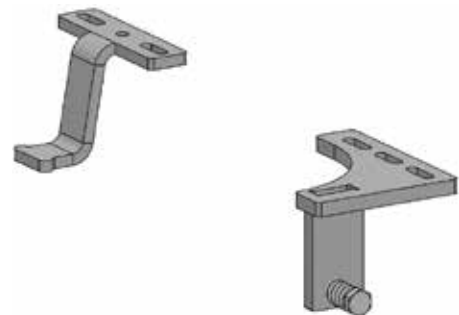


Fig. 60. Example fillers for GAP system

6.5.1 Connecting the hydraulic hoses

To operate the GAP system, the supplied hydraulic hoses must be integrated into the paver-clamp's existing hydraulic system.

Connecting the blue hydraulic hose:

1. Disconnect the existing hydraulic hose (Fig. 61, Item 1)
2. Screw outlet 1 of the T-fitting (Fig. 62) onto the free lower connection
3. Connect the hydraulic hose to outlet 2
4. Connect the blue hydraulic hose to outlet 3

Connecting the red hydraulic hose:

1. Disconnect the existing hydraulic hose (Fig. 61, Item 2)
2. Screw outlet 1 of the T-fitting (Fig. 64) onto the free upper connection
3. Connect the hydraulic hose to outlet 2
4. Connect the red hydraulic hose to outlet 3

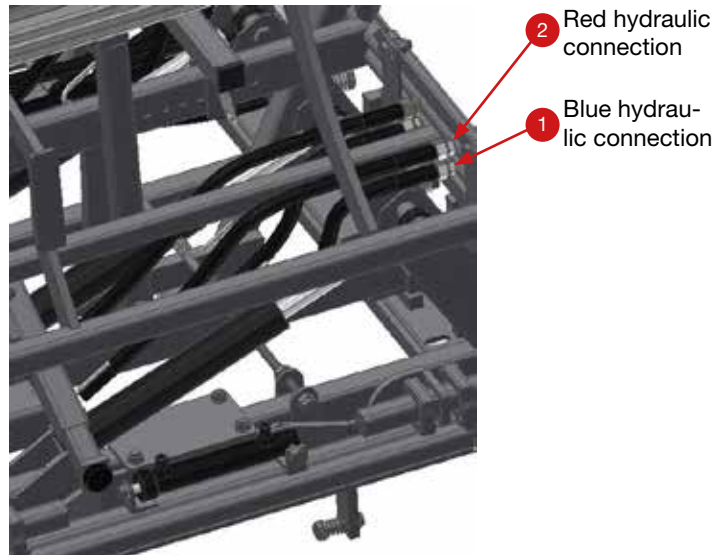


Fig. 61. Connection hydraulic hose



Fig. 62. Blue hydraulic hose connection



Fig. 63. Connected blue hydraulic hose



Fig. 64. Red hydraulic hose connection



Fig. 65. Connected red hydraulic hose

NOTE:

There is one red and one blue hydraulic connection for both the left and right paver-clamp sides. When connecting the hydraulic hoses, ensure that the connections are correctly matched.

After assembly is complete, check all screw connections to ensure they are tight and leak-free.

6.6 Adjusting the balance beam

Paver-clamps designed for use with an Optimas paving layer machine or a wheel loader are equipped with a balance beam.

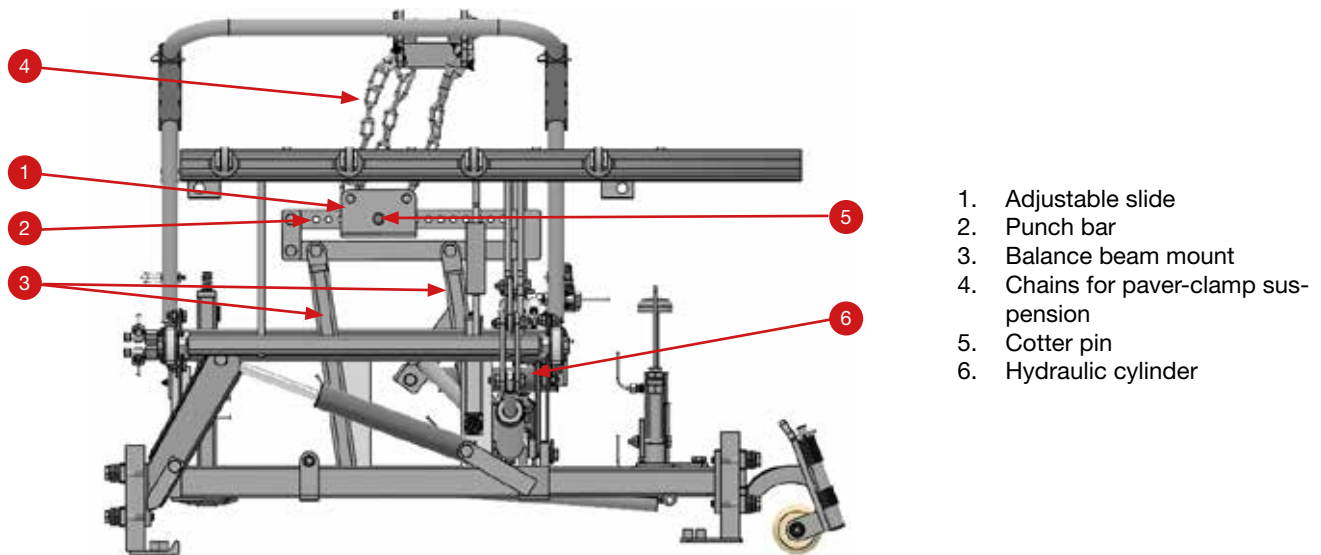


Fig. 66. Balance beam on the paver-clamp

The balance beam is used to adjust the paver-clamp's center of gravity to the specific model and intended application. To do this, the adjustment slides can be moved along the guide rail.

If the paver-clamp is not suspended at its center of gravity, it will tilt forward or backward when raised. In this case, the position of the adjustment slides must be corrected.

Procedure:

1. Park the paver-clamp securely and lock it to prevent unintended movement.
2. Remove the cotter pin from the bolt (Pos. 5).
3. Pull out the bolt.
4. Move the adjustment slides (Pos. 1) to the desired position on the guide rail.
5. Reinsert the bolt.
6. Insert the split pin fully and secure it.
7. Set the same position on the opposite side.

NOTE:

Both adjustment slides must be in the same position. Different settings can cause the paver-clamp to tilt and result in uneven load distribution.

After each adjustment of the balance beam, check the alignment of the paver-clamp by performing a test run.

6.6.1 Tilt angle of the paver-clamp with a stone layer

The balance beam is adjusted correctly if the paver-clamp hangs horizontally after picking up a stone layer (see Fig. 68).

If the paver-clamp tilts forward or backward while holding a layer of stones, the position of the adjustment slides must be adjusted accordingly.

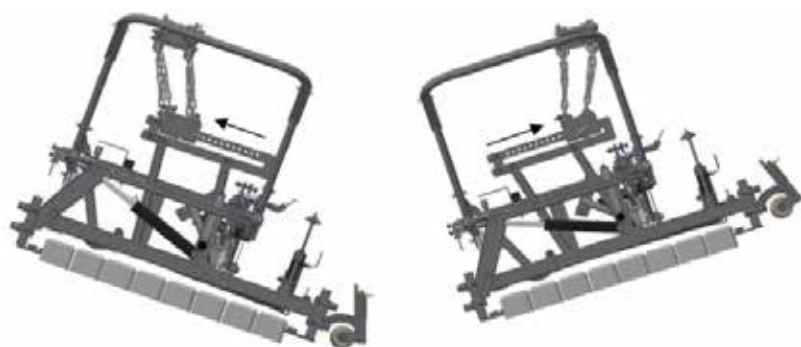


Fig. 67. Tilting positions of the paver-clamp on the balance beam

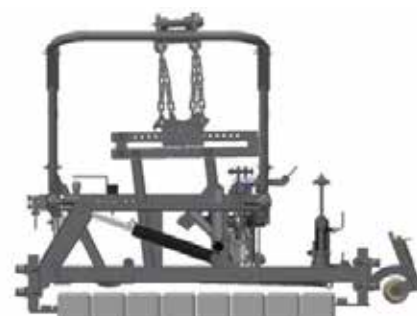


Fig. 68. Proper alignment of the paver-clamp on the balance beam

6.7 Adjusting the excavator suspension

In the version for hydraulic excavators, the paver-clamp is connected to the excavator's suspension via chains. The tilt of the paver-clamp can be adjusted by repositioning the chain on the suspension.

This adjustment is necessary if the paver-clamp is not hanging horizontally when it is holding a layer of stones.

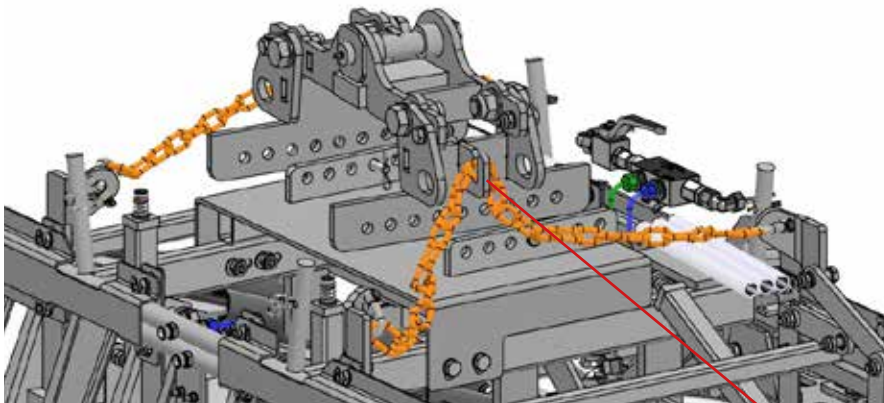


Fig. 69. Detail: Excavator suspension

Procedure:

1. Place the paver-clamp on a level and stable surface until the excavator's suspension rests on the paver-clamp and the chains are relaxed.
2. Unhook the chain link from the suspension.
3. Move the chain the required number of links and re-hook it into the suspension (see Fig. 70).
4. Make the adjustment on the opposite side accordingly.
5. Lift the paver-clamp and check the alignment.
6. Repeat the adjustment as needed until the desired angle is achieved.

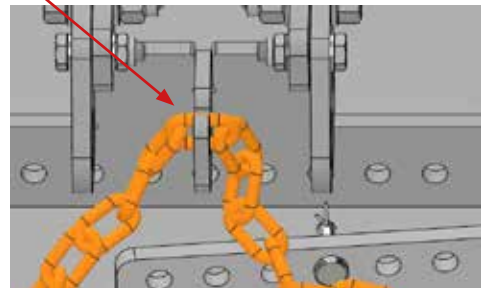


Fig. 70. Detail: Excavator suspension chain

NOTE:

The chains must be hooked in the same position on both sides, unless a specific angled position of the paver-clamp is required.

The excavator suspension is adjusted correctly when the paver-clamp hangs horizontally with a stone layer loaded and the stone layer is held evenly.

6.8 Throttle check valves

The throttle check valves are used exclusively to adjust the speed of the tilting frame (see Fig. 71). The factory settings ensure optimal operation. If any changes are to be made, contact the manufacturer first!

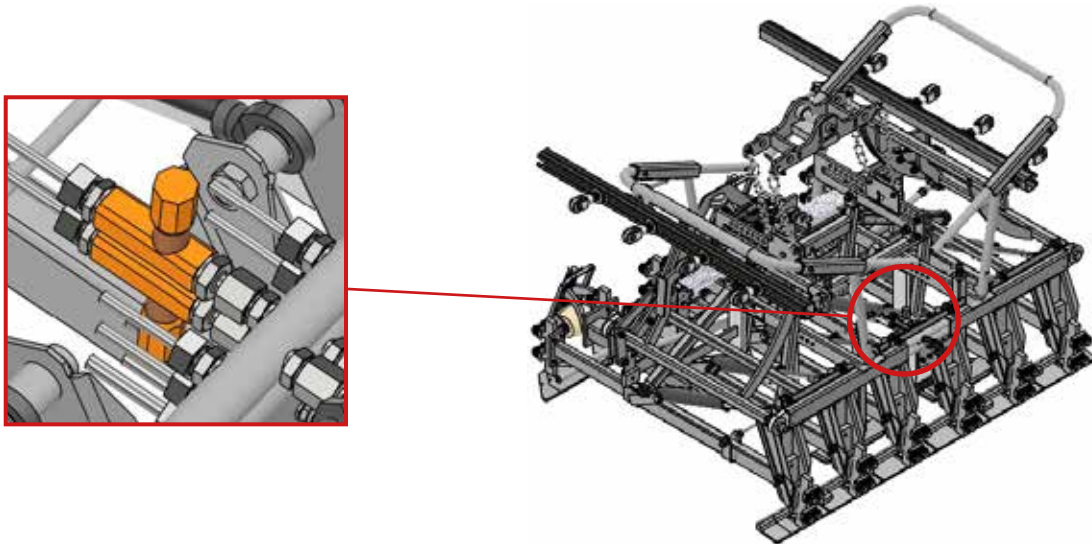


Fig. 71. Throttle check valves on the paver-clamp

6.9 Pressure settings for an excavator paver-clamp on the hydraulic block (if equipped)

The paver-clamps Multi6 M, when operated on a carrier vehicle other than an Optimas paver laying machine, are equipped with a hydraulic block. The pressures of the individual hydraulic circuits can be adjusted on this hydraulic block. The set pressures are displayed on the pressure gauges on the hydraulic block.



Warning

Risk of injury from pressurized hydraulic fluid

Adjustments to the hydraulic block may only be performed by qualified personnel. Before working on the hydraulic system, it must be completely depressurized. Incorrect pressure settings can lead to malfunctions of the paver-clamp as well as property damage and personal injury.



Warning

Risk of injury from moving parts of the paver-clamp

The following adjustment tasks pose a risk of pinching and injury from moving parts of the paver-clamp. Both the driver and the operator at the paver-clamp must exercise extreme caution.

6.9.1 Pressure setting for an excavator paver-clamp with 1 hydraulic circuit

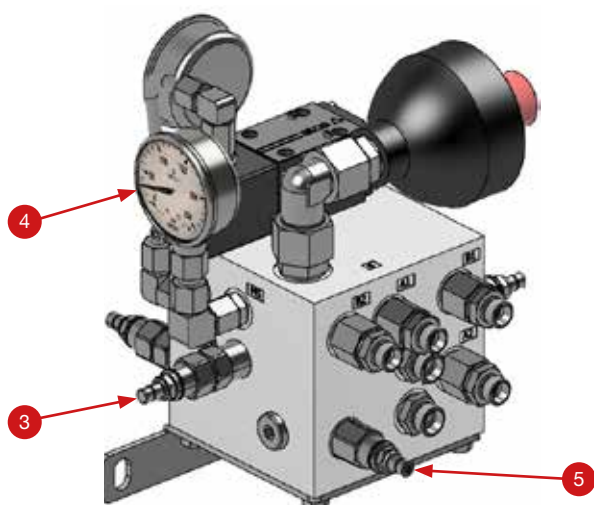


Fig. 72. Hydraulic block 1 circuit - front view

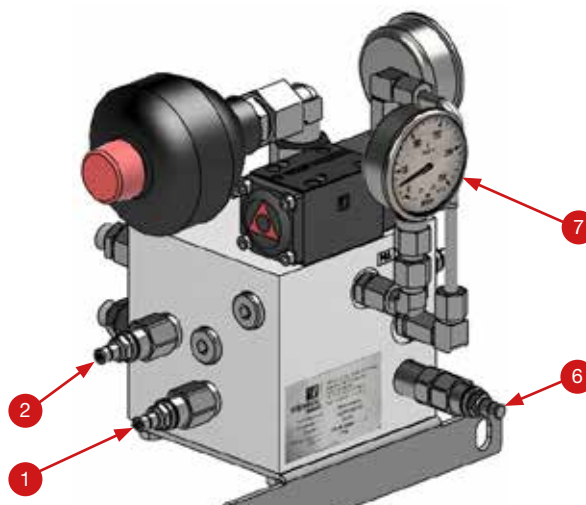


Fig. 73. Hydraulic block 1 circuit - rear view

1. Valve 1 - Open
2. Valve 2 - Lateral pressing
3. Valve 3 - Close paver-clamp
4. Pressure gauge for gripping pressure
5. Valve 4 - Gripping pressure
6. Valve 5 - Lateral pressing and raising
7. Pressure gauge for lateral pressing (up to 250 bar during shift)

Tools required:

- Open-end wrench size 15
- Hex screwdriver size 5

Procedure:

1. Before connecting to the carrier, fully close valves 3 and 5.
2. Connect the hydraulic hoses and check that they are securely fastened.
3. Turn on the carrier vehicle and build up pressure to the paver-clamp. **CAUTION:** The lateral pressure bars will be activated.
4. Set valve 2 to a pressure of 120 to 180 bar. The set pressure is displayed on the pressure gauge (Fig. 73, item 7).
5. Slowly open valve 3 until the paver-clamp closes.
6. Set valve 4 to a pressure of 65 bar. The set pressure is displayed on the pressure gauge (Fig. 72, item 4).
7. Slowly open valve 5 until the lateral pressure bars raise.
8. Valve 1 is factory-set and generally does not need to be adjusted. If necessary, set the pressure to 50 bar. Check the pressure using the customer's pressure gauge.

NOTES:

- Before making any new adjustments to the hydraulic block, valves 3 and 5 must be fully closed.
- For carrier vehicles with a hydraulic flow rate exceeding 76 l/min, a hydraulic flow control valve (throttle valve) must be provided by the customer.
- After completing the pressure adjustments, verify that the paver-clamp is functioning properly by performing a test run. In particular, check that the gripping motion and the lateral pressing function correctly.

6.9.2 Pressure setting for an excavator paver-clamp with 2 hydraulic circuits

Two people are required to commission and adjust an excavator paver-clamp with two hydraulic circuits:

Person 1: Carrier vehicle operator

Person 2: Paver-clamp operator

During all adjustment work, the carrier vehicle operator must keep the respective hydraulic circuit activated at all times so that the paver-clamp is continuously supplied with hydraulic oil.

Requirements:

Pressure in the "Lateral pressing" circuit: approx. 200 bar

Pressure in the "Gripping" circuit: approx. 70 bar

Hydraulic flow rate: 25-30 l/min

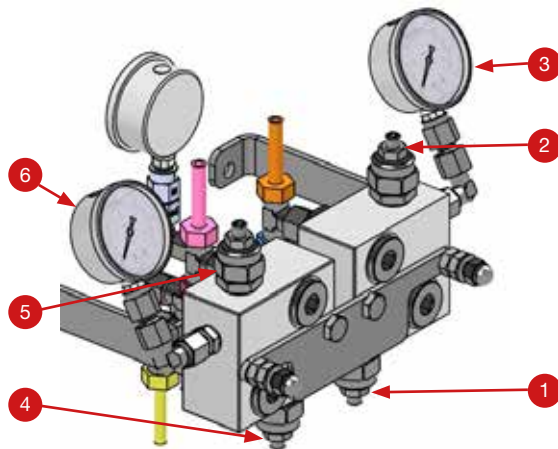


Fig. 74. Hydraulic block 2 circuits - front view

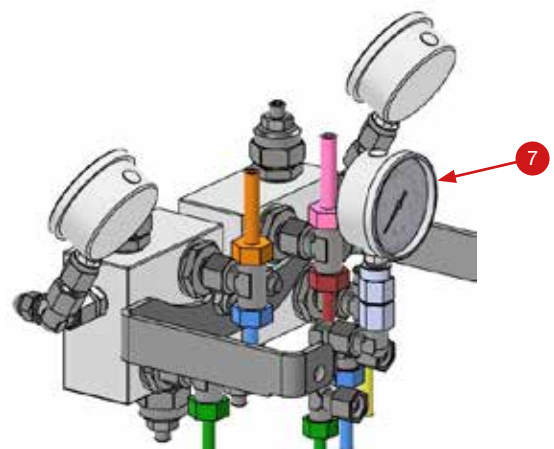


Fig. 75. Hydraulic block 2 circuits - rear view

1. Valve 1 - Close paver-clamp
2. Valve 2 - Open paver-clamp
3. Pressure gauge for gripping pressure
4. Valve 3 - Close lateral pressing
5. Valve 4 - Open lateral pressing
6. Pressure gauge for lateral pressure
7. Pressure gauge for opening the paver-clamp

Tools required:

- Open-end wrench size 17
- Hex screwdriver size 5

Procedure:

1. Assign the carrier vehicle's hydraulic circuits to the paver-clamp's functions (e.g., Circuit 1 = Gripping, Circuit 2 = Lateral Pressing).
2. Connect both hydraulic circuits.
3. Check that the throttle check valves are installed correctly.



Fig. 76. Connection throttle check valve

NOTE:

The throttle check valves are factory-preset. They regulate the flow rate of the respective hydraulic function. Fine adjustments can be made as needed.

The valves on the hydraulic block are factory-set as follows:

Valve	Factory setting
Valve 1	60-65 bar
Valve 2	60-65 bar
Valve 3	110 bar
Valve 4	100 bar

Circuit 1: Adjust the paver-clamp

1. The operator of the carrier vehicle places the paver-clamp so that the suspension chains are relieved of load.
2. Activate the "Gripping" hydraulic circuit and hold the joystick in this position. The paver-clamp closes.
3. The operator at the paver-clamp loosens the lock nut on valve 1.
4. Adjust valve 1 (see Fig. 74, item 1) until the pressure gauge reads approximately 65 bar.
5. If the paver-clamp closes too slowly, the pressure can be increased gradually.
6. Secure the setting with the lock nut.

NOTE:

Setting the gripping pressure too high can result in stone layers not being securely picked up or individual stones being damaged during the gripping process.

7. The paver-clamp's opening pressure is displayed on the pressure gauge visible to the carrier vehicle operator.
8. Loosen the lock nut on valve 2.
9. Adjust the set screw in small increments as needed.
10. Secure the setting with the lock nut.

Circuit 2: Adjust the lateral pressing

1. The carrier vehicle operator activates the "Lateral Pressing" hydraulic circuit and holds the joystick in this position. The pressing frames close.
2. The operator at the paver-clamp monitors the pressure on the pressure gauge (see Fig. 74, item 6) to ensure it is 110 bar. A pressure of 180 bar must be set for lateral shifting of the stone layer.
3. Loosen the lock nut on valve 3.
4. Adjust the set screw accordingly.
5. Secure the setting with the lock nut.
6. Valve 4 is factory-set. Readjust as needed.
7. To do this, loosen the lock nut on valve 4.
8. Adjust the set screw in small increments.
9. Secure the setting with the lock nut.

6.9.3 Pressure setting for an excavator paver-clamp with 3K control

The hydraulic block of a paver-clamp with 3K control corresponds to the hydraulic block described in section “6.9.2 Pressure setting for an excavator paver-clamp with 2 hydraulic circuits”. The pressure settings described there remain unchanged.

In addition, with the 3K control, the rotational speed of the rotary gear can be adjusted.

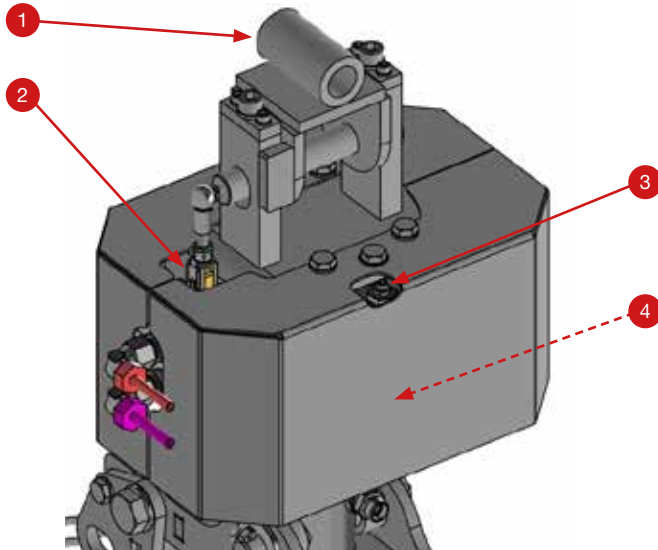


Fig. 77. Rotator 3K control

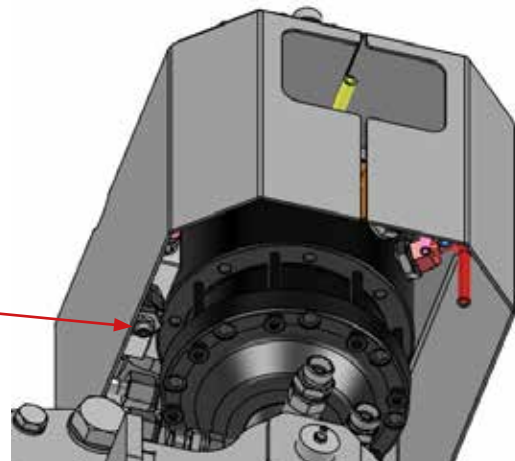


Fig. 78. Rotator 3K control - view from below

1. Excavator mount
2. Bolt with clevis on the mechanical directional control valve
3. Setting for clockwise rotation speed
4. Setting for counterclockwise rotation speed

Tools required:

- Open-end wrench size 13
- Hex screwdriver size 4

Procedure:

1. Raise the paver-clamp so that it swings freely above the ground.
2. Now you can adjust the speed at the rotary gearbox:
 - At pos. 3, adjust the speed of clockwise rotation,
 - At pos. 4, adjust the speed of counterclockwise rotation.
3. Loosen the corresponding lock nut.
4. Adjust the rotation speed:
 - Screw the set screw in: Increase the rotation speed
 - Unscrew the set screw: Decrease the rotation speed
5. Secure the setting with the lock nut.
6. Perform a test run and readjust if necessary.

6.9.4 Schematic diagram of a 3K control system

The 3K control system allows three hydraulic functions to be performed independently of one another using the carrier vehicle's two hydraulic circuits. The mechanical changeover valve switches between the gripping and rotating functions within the first hydraulic circuit.

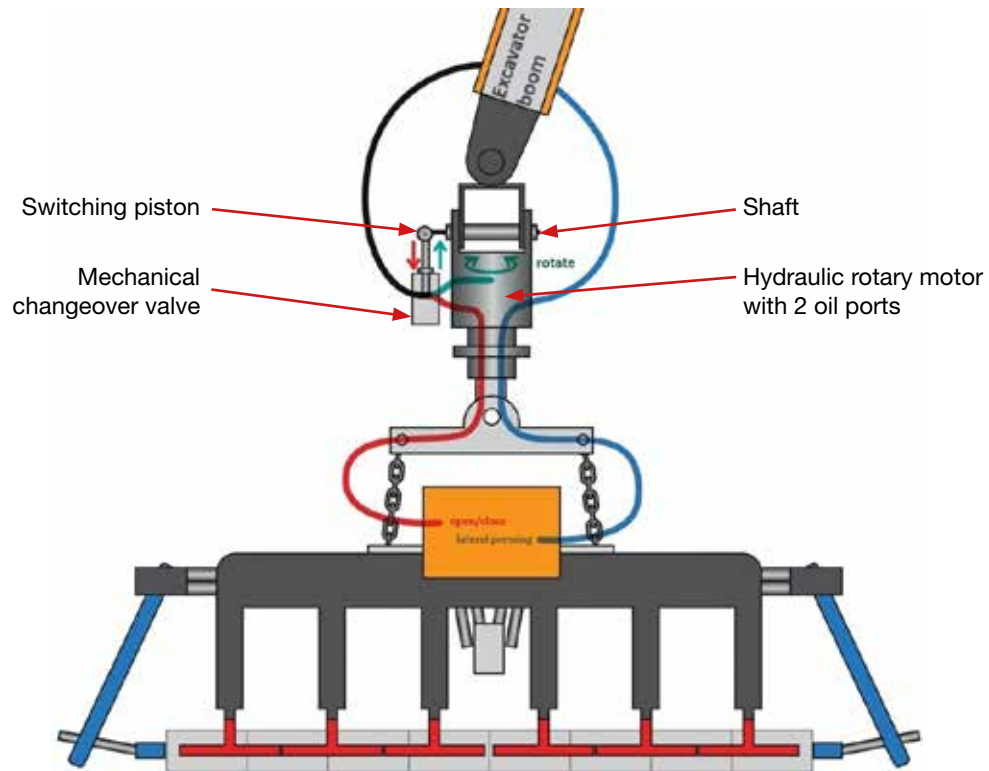


Fig. 79. Schematic diagram of the 3K control

Circuit 1:

Open/close paver-clamp
(red line)

- Changeover valve retracted
- Chains unloaded
- Paver-clamp on the layer of stones or with paving stones on the planum

Circuit 2:

Open/close lateral pressing
(blue line)

Rotate (green line)

- Changeover valve extended
- Chains under tension
- Paver-clamp attached to the carrier vehicle

7. Decommissioning, transport and storage

7.1 Decommissioning

Decommissioning may only be carried out by trained personnel.

Before decommissioning, the paver-clamp Multi6 M must be parked on a level, load-bearing surface. In addition:

- Open the paver-clamp completely
- Place the paver-clamp on a pallet or a suitable surface
- Depressurize the hydraulic system
- Disconnect the hydraulic hoses of the carrier vehicle, if the paver-clamp is not mounted on the Optimas paver laying machine. See the paver laying machine's operating manuals for more information.
- Install protective caps on the hydraulic couplings
- Disconnect the paver-clamp from the carrier vehicle's quick-change mount
- Inspect the paver-clamp for damage and wear
- Remove heavy dirt

NOTE

Hydraulic hoses and couplings must be protected from contamination. Contamination can lead to malfunctions and damage to the hydraulic system.



Warning

Hydraulic components can become very hot during operation.

- Do not touch hot surfaces
 - Allow the device to cool down before performing maintenance or repair work
 - Wear appropriate protective gloves
- Contact with hot surfaces poses a risk of burns!

7.2 Transport

Transport may only be carried out by trained personnel.

The paver-clamp Multi6 M may only be transported using suitable lifting and transport equipment. During transport, all applicable national load-securing regulations and the permissible load capacities of the lifting equipment used must be observed.

Before every transport operation, ensure that

- moving parts and loose accessories are secured separately,
- hydraulic hoses are protected from damage,
- the paver-clamp is placed on a suitable pallet or transport device.



Warning

Danger from falling loads

When lifting and transporting suspended loads, there is a risk of injury from falling or swinging loads.

- Never stand beneath suspended loads
- Use only suitable and approved lifting slings
- Observe the load capacity of the crane and lifting gear (at least 1 metric ton)
- Lift the device slowly and without jerking movements

Before lifting, make sure that the lifting slings are properly secured.

7.2.1 Secure lashing

For transport, the paver-clamp must be placed on a suitable pallet and secured to prevent slipping, tilting, or tipping over. The paver-clamp's base frame must rest completely on the pallet. The load must be secured using suitable lashing straps through the designated areas on the upper frame of the paver-clamp (see Fig. 80).

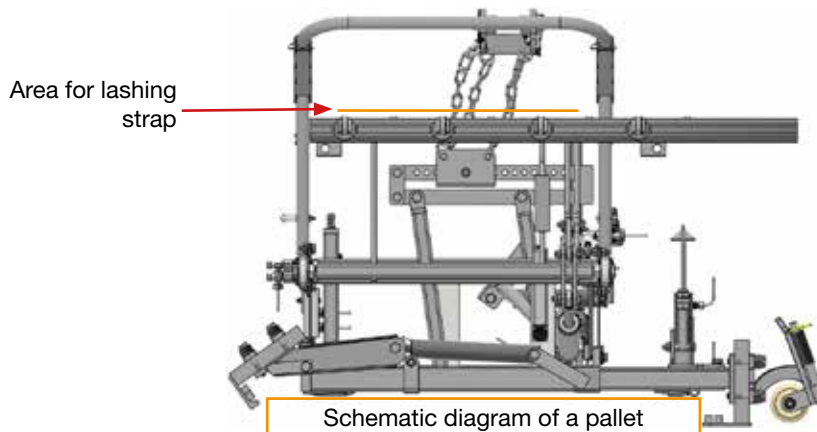


Fig. 80. Transport on a pallet

NOTE:

To prevent damage to the paint finish and scuff marks, it is recommended to use suitable protective materials (e.g., edge protectors) between the lashing strap and the paver-clamp.

After securing the load, check that:

- the paver-clamp is securely positioned on the pallet,
- the lashing straps are sufficiently tightened,
- no components are damaged or subjected to excessive stress,
- the paver-clamp cannot move on the pallet.

**Warning****Danger due to inadequate load securing**

A paver-clamp that is not adequately secured may slip, tip over, or fall during transport. The paver-clamp must be adequately secured before every transport.

**Caution****Risk of property damage due to improper lashing**

Lashing straps must not be attached to hydraulic hoses, hydraulic cylinders, chains, or other moving components.

Lashing straps must be attached exclusively to the designated lashing points.

7.3 Storage

If the paver-clamp is to be taken out of service for an extended period, it must be stored properly to prevent damage caused by weather conditions, corrosion, or aging of components.

Storage conditions:

- A dry, clean, and well-ventilated environment
- Protect from direct sunlight, precipitation, snow, and ice
- Permissible relative humidity: up to 95% (non-condensing)
- Place the device on a level and stable surface
- Secure the device to prevent it from tipping over
- Move the device to a safe and depressurized position

For long-term storage, it is recommended to:

- Clean the device thoroughly
- Touch up any damaged paintwork
- Seal hydraulic couplings with protective caps

7.4 Recommissioning after storage

If the device has been in storage for an extended period, check that it is in proper working order before putting it back into service.

In particular, the following must be checked:

- Completeness of all components
- All screws and fasteners are securely fastened
- Condition of hydraulic hoses and couplings
- Unrestricted movement of all moving parts
- Proper operation of all gripping, clamping, and adjustment mechanisms.

Damaged or worn components must be replaced before commissioning. Any corrosion damage or leaks must be repaired before use.

The paver-clamp may not be used in operation again until a functional test has been successfully completed.

7.5 Disposal

At the end of its service life, the paver-clamp Multi6 M must be disposed of properly and in accordance with applicable national environmental and waste disposal regulations.

Dismantling and disposal may only be performed by qualified personnel.

Before disposal, the device must be taken out of service and disconnected from all power sources. Any remaining operating fluids must be removed in accordance with applicable regulations and disposed of separately.

Where possible, individual materials should be sorted by type and directed to the appropriate recycling or disposal channels.

The paver-clamp consists primarily of:

- Steel components
- Hydraulic components
- Hydraulic hoses and seals
- Plastic parts
- Rubber parts

NOTE

Operating fluids, hydraulic oil, soiled cleaning cloths, and other environmentally hazardous substances must not be disposed of with household waste. The applicable national and regional regulations for disposal must be followed.



Warning

Environmental hazard

Improper disposal can lead to environmental pollution and legal consequences. The applicable legal regulations of the country of use must be observed!

8. Service and maintenance

Regular maintenance and servicing are essential for the safe and trouble-free operation of the Multi6 M. Maintenance and repair work may only be performed by trained qualified personnel.

Before beginning any work:

- Place the device on a level and stable surface
- Secure the carrier vehicle to prevent it from starting accidentally
- Depressurize the hydraulic system
- Secure the paver-clamp to prevent unintended movements



Warning

Hot surfaces

Hydraulic components can become very hot during operation. Allow the device to cool sufficiently before use!

8.1 Maintenance schedule

The machine should be serviced as recommended. Any defects found must be corrected before the machine is used again.

Maintenance work	Before starting work	Weekly	Annually
Visual inspection for damage and deformation	X		
Checking the hydraulic hoses and fittings for leaks	X		
Inspection of all fasteners (counter springs, bolts, etc.)	X		
Inspect the gripper jaws for damage and wear	X		
Check the pressure bars for damage and to ensure they are securely fastened	X		
Check all screw connections to ensure they are tight	X		
Functional testing of all movements	X		
Inspection of the compression springs in the gripper arms		X	
Inspection of the lateral pressure springs		X	
Inspection of link chains and chain fasteners		X	
Inspection of the docking rollers and pressure rollers for wear		X	
Inspection of the rubber-metal buffers		X	
Inspection of the lateral pressure bearings			X

8.2 Compression springs for the gripper arms

The compression springs in the gripper arms are essential for the proper functioning of the gripper arms and must be checked regularly to ensure they are working properly. To perform the check, manually compress the spring. If the spring cannot be moved, does not return to its original position on its own, or shows signs of damage, it must be replaced.

8.2.1 Replacing the compression springs in the gripper arms

We recommend that two people perform the replacement of the compression springs, using only the special tool “Threaded spindle for paver-clamp”. The special tool is available separately.

1. Socket nut
2. Spring retainer



Fig. 81. Special tool “Threaded spindle for paver-clamp”

Tools required:

- Special crank
- Special tool “Threaded spindle for paver-clamp”

Procedure:

1. Loosen the gripper jaw (see chap. “6.2.3 Change in the position of the gripper jaws”).
2. Remove the gripper arm using the special crank. To do this, completely unscrew the adjustment screw from the gripper arm (see chap. “6.1 Adjusting the gripping range”).
3. Place the long socket nut of the special tool onto the threaded spindle (see Fig. 82).

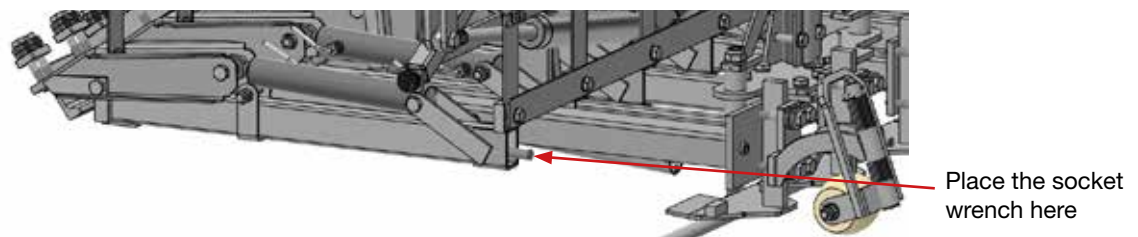


Fig. 82. Replacing the compression spring of the gripper arm

4. Loosen the adjustment screw.
5. Pull out the socket nut along with the threaded spindle.
6. Remove the compression spring; if the compression spring remains in the arm, use compressed air or the spring retainer (Fig. 81, item 2) to help remove it.
7. Push the spring retainer of the special tool into the arm from the movable side (see Fig. 83).
8. Install the new compression spring (see Fig. 83).

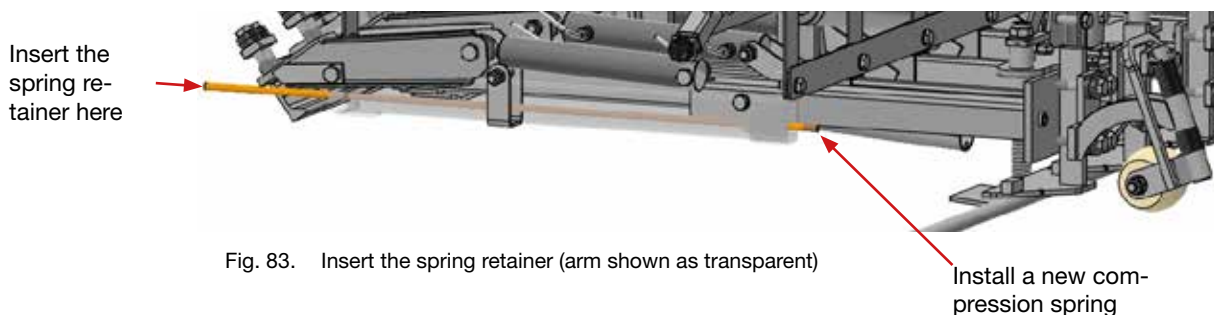


Fig. 83. Insert the spring retainer (arm shown as transparent)

9. Preload the compression spring using the socket nut and slide it through the arm.
10. Before removing the spring retainer, secure the spring with the socket nut (apply pressure).
11. Reinsert the adjustment screw so that the compression spring rests on it.
12. Remove the socket nut.
13. Reinsert the threaded spindle and screw it onto the adjustment screw.
14. Install the gripper arm and adjust it to the stone layer dimension.
15. Install the gripper jaw and adjust it to the paving stone dimension.
16. Perform a functional test.

8.3 Hydraulic system maintenance

The hydraulic system must be inspected regularly to ensure it is in proper working order. Pay particular attention to:

- Hydraulic hoses
- Fittings
- Cylinders
- Valves
- Pressure gauges

Damaged or worn components must be replaced immediately. Only technically equivalent or approved replacement components may be used. See also the Optimas spare parts lists.

Regardless of their external condition, it is recommended that hydraulic hoses be replaced no later than 6 years after manufacture. The relevant date is the manufacturing date marked on the hydraulic hose assembly.

All applicable national regulations and guidelines concerning hydraulic hose assemblies must be observed.



Warning

Risk of injury from pressurized hydraulic systems

Before working on hydraulic components, they must be completely depressurized. Leaking hydraulic fluid can cause serious injury.

8.4 Spare parts

Worn, damaged, or malfunctioning components must be replaced immediately with suitable replacement parts. Only original spare parts or spare parts approved by the manufacturer may be used for maintenance and repair work. The use of unapproved spare parts may compromise operational safety and result in the voiding of warranty and liability claims.

The following components are subject to natural wear and tear depending on operating conditions and service life and must be replaced as needed:

- Gripper jaws
- Compression springs for the gripper arms
- Hydraulic cylinders
- Lateral pressing bearings
- Lateral pressing springs
- Suspension link chains
- Docking rollers
- Pressure rollers
- Rubber-metal buffer
- Hydraulic hoses
- Retaining elements (e.g., cotter pins)



Warning

Danger from damaged or worn components

Damaged or worn components can lead to malfunctions, loss of load, or damage to the paver-clamp.

Damaged components must not be used further and must be replaced before the next use.

9. Troubleshooting

Malfunction	Cause	Resolution
Stone layer falls out	Grip pressure is too low	Check the pressure settings
	Paving stone layer is too big	Adjust the gripper jaws to a lower position (see chap. "6.2 Height adjustment")
	Paving stone quality is insufficient	Check the quality of the paving stones
The paver-clamp does not close completely	Grip pressure is too low	- Check the pressure settings - Check that the hydraulic couplings are securely fastened - Check the flow rate of the throttle check valves
Individual paving stones are falling out	The dimensions of the paving stones vary	Check and readjust the pressure rollers and fillers (see chap. "6.3 Adjusting the lateral pressure", "6.4 Installation an adjustment of the mechanical filler holders and fillers (optional)", "6.5 Installation and adjustment of the GAP System (optional)")
The paving stones are not shifted sideways, or are shifted only slightly	Paving stones are too heavy	- Readjust the pressure for lateral pressing - Use height adjusters with rollers (see chap. "6.2.6 Height adjustment with rollers (optional)")
The rotary gear on the 3K control is not turning	Bolt bent due to an impact or similar event	Repair or replace the bolt (see chap. "6.9.3 Pressure setting for an excavator paver-clamp with 3K control")
	The piston rod on the pull valve does not extend all the way out	Readjust the piston rod
The tap-down device is not moving properly	The cylinder is depressurized	Close and then fully open the ball valve on the hydraulic block of the docking aid
	The throttle discs in the hydraulic block of the tap-down device are sealed	Clean the throttle discs and reinstall them
Cylinder is leaking	The seal kit in the cylinder is defective	Replace the cylinder (see spare parts lists)



Warning

Risk of injury from pressurized hydraulic systems

Before working on hydraulic components, they must be completely depressurized. Leaking hydraulic fluid can cause serious injury.