



HYDRARAM[®]

DEMOLITION & RECYCLING EQUIPMENT



CRUSHING BUCKET - HCB SERIES

Operation and maintenance manual

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Certified company





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1. Introduction

1.1. Purpose of the user and maintenance instruction manual

This manual forms an integral part of the attachment and is intended to provide all the information necessary to:

- Inform operators correctly regarding safety issues;
- Handle, pack and unpack the attachment safely;
- Install the attachment safely;
- Ensure users are fully aware of its operating features and limits;
- Ensure the attachment is used correctly and safely;
- Ensure maintenance operations are carried out correctly and safely;
- Dismantle the attachment safely and in accordance with the standards and regulations regarding health and safety in the workplace and environmental protection.

❗ IMPORTANT!

Under current law, the personnel responsible for using and operating this attachment are obliged to read the contents of this document carefully and to ensure the operators and maintenance technicians have read the parts relating to their specific duties. The time spent doing this will ensure correct and safe operation of the attachment.

This document assumes that the applicable laws on safety and occupational hygiene are adhered to where the attachment is to be used. The instructions, drawings and documentation contained in this manual are of a confidential, technical nature and may not be reproduced in whole or in part.

This manual is subject to the following limitations:

- It may never take the place of an adequately experienced user;
- For particularly demanding operations, the manual can only provide a summary of the main steps.

The manual should be regarded as an integral part of the attachment and must be kept for future reference until the attachment is dismantled for disposal. The manual must be stored correctly and kept where it may be readily consulted when using the attachment with the operating machine.

The company Hydraram may not be held liable in the following cases:

- Improper use of the attachment;
- Use contrary to specific national law;
- Incorrect installation (in the case where the attachment was installed by unauthorised personnel);
- Power supply defects;
- Serious failures to perform the required maintenance;
- Unauthorised modifications and operations;
- Use of replacement parts or materials not specific to the model;
- A total or partial failure to follow the instructions provided;
- Use of the attachment with an incompatible machine;
- Exceptional events.

1.2. Safekeeping of the instruction manual

The manual must be stored carefully and kept together with the attachment whenever the latter changes hands throughout its working life. The manual will last longer if it is handled carefully with clean hands and not placed on dirty surfaces.

No parts of the manual should be removed, torn out or modified arbitrarily. This manual should be stored in a cool, dry place near to the attachment it refers to. The manufacturer can supply additional copies of the manual upon request.

1.3. Updating the instruction manual

The manufacturer reserves the right to change the design of, and make improvements to, the attachment without notifying customers and without updating manuals that have already been delivered to the user. Moreover, if the manufacturer makes changes to the attachment already in use at the customer's premises that require changes to one or more chapters of the manual, the manufacturer shall be responsible for sending the manual holder the chapters affected by the change, together with a copy of the new manual revision list.

1.4. Who is this manual intended for?

This manual is intended for: Installation personnel, Operators and Technicians qualified to carry out maintenance on the attachment.

➤ **OPERATOR** refers to the person assigned to operate, adjust, clean and perform regular maintenance on the attachment.

➤ **QUALIFIED PERSONNEL** or **QUALIFIED OPERATOR**, refers to those persons who have attended specialisation and training courses etc. and who have experience in the installation, operation and maintenance, repair or transport of the attachment.

➤ **EXPOSED PERSON** refers to any person located inside an area inside and/or near an operating machine where their presence may be hazardous to their safety, health or well-being.

The attachment is intended for industrial use and, thus, professional and not general use. As a result, it may only be operated by qualified persons and persons who specifically:

- are adults;
- are physically and mentally able to perform work of particular technical difficulty;
- have been adequately instructed in the use and maintenance of the attachment;
- have been judged suitable by the employer to perform the work entrusted to them;
- are capable of understanding and interpreting the manual and the safety instructions;
- are familiar with the emergency procedures and how to implement them;
- are able to operate the specific type of attachment;
- are familiar with the regulations in force;
- have understood the operating procedures defined by the manufacturer of the attachment.

1.5. Glossary and symbols

This section defines the abbreviations used and the meaning of the symbols used to indicate the operator qualification level and the status of the attachment. Their use allows for information regarding the correct and safe use of the attachment to be communicated quickly and clearly.

OPERATOR AREA

The area where the operator must work during normal use of the attachment.

DANGER ZONE

An area inside and/or near the attachment where the presence of an exposed person is a risk to the health of that person.

EXPOSED PERSON

Any person wholly or partially located inside a danger zone.

MAN-OPERATING MACHINE INTERACTION:

Any situation where an operator interacts with the attachment during any of the operational phases at any time during its life cycle.

OPERATOR QUALIFICATION LEVEL

Minimum skill level that the operator must have to perform the operation described.

NUMBER OF OPERATORS

The number of operators required to perform the operation described. This number is derived from a careful analysis by the manufacturer, meaning that the presence of a different number of personnel could prevent the expected result from being achieved or expose the personnel to danger.

STATUS OF THE OPERATING MACHINE

The status of the operating machine includes its operating mode, for example, automatic, jog, stopped, etc., the condition of the safety devices on the operating machine, such as safety devices enabled, safety devices disabled, emergency stop button pressed, power source insulation type, etc.

RESIDUAL HAZARD

A hazard that it has not been possible to eliminate or reduce sufficiently during the design stage, and against which the existing safety device are not (or are not completely) effective. Information on the presence of such hazards is provided in the manual, as well as instructions and precautions on how to avoid it.

SAFETY COMPONENT

This is a component used to guarantee a given safety function and whose failure or poor operation may have a negative impact on the safety and/or health of exposed persons: its specific function is to guarantee safety and is ancillary to the main function of the machine.

P.P.E.

Acronym for Personal Protective Equipment.

⚠ WARNING!

Descriptions preceded by this symbol contain very important information/instructions regarding safety. Failure to observe them may:

- Endanger the well-being of the operators;
- Render the warranty null and void;
- Result in the manufacturer not accepting liability.

❗ IMPORTANT!

This symbol is used to indicate particularly important information regarding the use of the attachment that the operator must make sure to read and understand thoroughly.

1.6. Copyright

The copyright of this manual is the property of Hydraram. This manual is intended for use by operating and maintenance personnel. It contains instructions and technical diagrams that may not be copied, in whole or in part, distributed or examined by unauthorised persons for competitive purposes or divulged to any other third party.

2. General information

2.1. Manufacturer's identification data

Hydraram B.V.

Meander 7 9231DB Surhuisterveen - The Netherlands

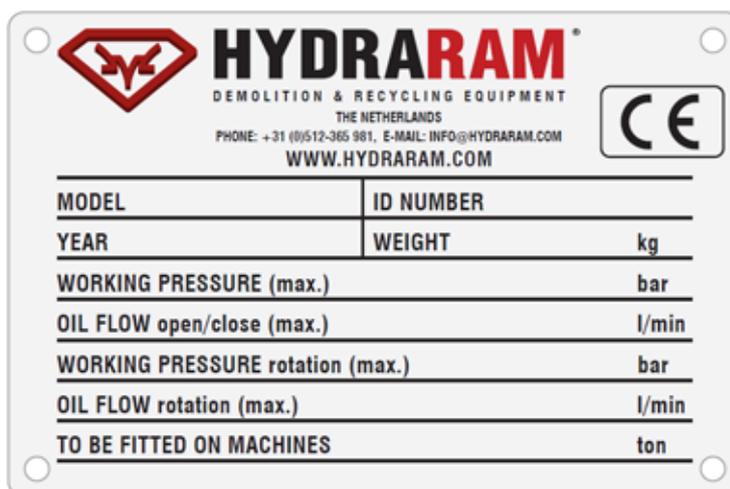
AFTER-SALES SERVICE / SPARE PARTS / CALL CENTRE

Tel: +31 (0)512-365981 - info@hydraram.com

www.hydraram.com

2.2. Attachment identification data and plate

Each attachment is identified by a CE plate indelibly marked with all the relevant machine information. Always provide this information when contacting Hydraram or the customer service centre. The plate is secured to the attachment in a protected position where it is easy to read. This position may vary depending on the model.



2.4. Set-up procedures to be carried out by customer technician

Except where otherwise stipulated in the contract, the customer shall be responsible for:

- Preparing the working environment/area and operating equipment in conformity with the legally applicable specific safety regulations in the country where the attachment is to be used;
- Checking that the attachment is coupled to the operating machine in compliance with the legally applicable specific safety regulations in the country where the attachment is to be used;
- Providing the hydraulic supply system for the attachment, in conformity with the regulations applicable in the country of use and the instructions in this manual.

⚠ WARNING!

It is the specific responsibility of the customer/user to integrate these instructions into the system/plant user and maintenance manual and to provide any additional information the operator may require.

2.5. General warranty conditions

Hydraram guarantees that all products are free from material or manufacturing defects. Under the terms of this warranty, Hydraram's responsibilities are limited to the repair or replacement with a similar part at the company's plant, on condition that the product is returned within 8 days of the date on which the defect is detected, and provided the defect is correctly identified by photographs or the product is returned with all shipping expenses prepaid.

The company will replace or repair, at its own discretion, any part that, after examination, is determined to demonstrate material or manufacturing defects. In any event, Hydraram's responsibility shall be limited to the original purchase price of the product; any costs incurred in relation to the necessary inspections or report generation are excluded. No repairs will be carried out on site; the warranty applies exclusively when the product is returned to the company.

This warranty replaces any other warranties, expressed or implied, including, but not limited to, guarantees of marketability and suitability, irrespective of purpose; furthermore, under the terms of this warranty Hydraram's obligations and responsibilities shall not include any shipping or other expenses, i.e. installation costs or liability for any direct, indirect or resultant damages or for delays caused by any such defect.

This warranty applies exclusively to new products manufactured by Hydraram. Products manufactured by third parties are covered exclusively by warranties offered to Hydraram by the respective suppliers and will be subjected to any inspections or checks as requested by such parties.

Products manufactured or welded by Hydraram as standard units are guaranteed for twelve (12) months from the delivery date. This guarantee period is completely independent of the effective date the product was put into operation.

If the customer tampers with the product or attempts to disassemble in any other location than the supplier's premises or repair workshop, and/or without notifying the manufacturer in advance, this warranty shall be considered null and void. Hydraulic cylinders or components returned under the guarantee must not be disassembled and must be returned intact to Hydraram. Any welding, modifications or repairs to

the attachment must be authorised in writing in advance by Hydraram; any service operations performed without such authorisation shall result in this warranty being considered null and void. Hydraram may not be held liable for any costs/charges deriving from the customer's failure to meet these warranty conditions.

Hydraram reserves the right to make changes or modifications to the accessories, which, in the company's reasonable opinion, may improve the performance and efficiency of the machine or improve production techniques, at any time. Hydraram is under no obligation to implement such changes or modifications retroactively on any machines that are already in use. Any operations that are expressly forbidden, either verbally or in any written document, or repairs or assembly procedures that are not recommended or authorised by Hydraram shall result in the warranty being considered null and void.

The warranty does not include any parts that are subject to normal wear and tear, or any that are broken or damaged due to improper use of the attachments supplied by Hydraram. In this case, the customer shall arrange for delivery and collection at our factory at their own expense; if the customer requests repairs at their own premises (assuming this is possible), they shall be required to pay for the seller's travel expenses. If, during the warranty period and as a result of customer negligence or any other factor out of the control of Hydraram, the company is unable to intervene promptly in the aftermath of breakdown or fault condition, the customer shall be responsible for any further deterioration or damages resulting from the continued use of the Hydraram products. Any such additional damage is not included in the terms of the warranty.

The company Hydraram may not be held liable for any expenses for repairs performed by, or requested by the customer in workshops other than the authorised structures or in the event where such activities were not authorised in advance. The customer may not claim compensation for any damages deriving from machine downtime during the warranty period.

❗ IMPORTANT!

This warranty is valid only if the product has been entirely paid for in conformity with the required supply conditions and is returned within 2 weeks from the date of purchase. Failure to pay for the products within the agreed terms shall result in the warranty being considered null and void, even if the goods in question are entirely paid for at a later date.

3. Safety

3.1. General precautions

Operator safety is one of the manufacturer's main concerns. When designing and manufacturing a new attachment, we attempt to foresee all possible danger situations and, naturally, to adopt suitable safety measures, paying particular attention to operations that are especially hazardous. The manufacturer may not be held liable for the consequences of any failure to adhere to the safety and accident prevention instructions set out in this manual.

❗ IMPORTANT!

Before using the attachment, operators must read the instructions contained in this manual carefully read and ensure they adhere to the instructions it contains.

The manufacturer has fitted the attachment with all the protection and safety devices considered necessary and, in addition, has provided sufficient information for its safe and correct use. To this end, wherever necessary, each chapter contains the following information regarding every possible man-attachment interaction:

- Minimum operator qualifications required;
- Number of operators necessary;
- Status of the attachment;
- Residual risks;
- Necessary or recommended personal protective equipment;
- Prevention of human errors;
- Prohibitions/obligations regarding reasonably foreseeable incorrect behaviour.

⚠ WARNING!

This information must be adhered to scrupulously.

The user may supplement the manufacturer's information with additional instructions, provided that they do not conflict with that set out in the manual, in order to contribute to the safe use of the attachment. All personnel assigned to work on the attachment must ensure they are wearing appropriate clothing.

- Avoid the use of clothing that could become entangled with parts of the attachment;
- Avoid wearing ties or other loose items of clothing;
- Avoid wearing rings or bracelets that could cause hands to be trapped in the components of the attachment.

Wherever necessary, the manual provides additional recommendations for preventive measures to taken by the user, personal protective equipment, helpful information for avoiding human errors and instructions designed to prevent reasonably foreseeable prohibited behaviours.

It is, however, extremely important to adhere scrupulously to the following instructions:

- It is strictly forbidden to operate the attachment with the fixed protection panels removed;
- It is strictly forbidden to inhibit or bypass the safety devices installed on the attachment;
- Washing must be performed with the hydraulic separation devices disconnected;
- Do not modify any parts of the attachment;
- The manufacturer may not be held responsible for malfunctions caused by failure to respect the above instructions. In the event it is necessary to modify the attachment, we strongly recommend contacting the manufacturer directly.

❗ IMPORTANT!

The manufacturer may not be held liable for personal injury or damage caused by the attachment in the case of:

- Use of the attachment by inadequately trained personnel;
- Improper use of the attachment;
- Defects in the hydraulic power supply;
- Incorrect installation;
- Lack of the required maintenance;
- Unauthorized service or modifications;
- Use of non-original or unsuitable spare parts;
- Total or partial failure to follow the instructions;
- Use contrary to specific national law;
- Disasters or exceptional events.

Control and checks

Checks must be performed by an expert; they must be visual and functional, with the purpose of guaranteeing the safety of the attachment. They include:

- A check of all the load-bearing structures, which must be free from cracks, breakages, damage, deformation, corrosion, wear or alteration with respect to their original specifications;
- A check of all the mechanical components;
- A check of all the safety devices installed on the attachment;
- A check of all connections with pins and screws;
- A functional check of the attachment;
- A check of the status of the attachment;
- A check to ensure that the hydraulic system is airtight and that it operates correctly.

⚠ WARNING!

If anomalies are found, they must be eliminated before putting the attachment back into operation.

If the person performing the check finds any dangerous cracks or faults, they must notify the manufacturer of the attachment immediately. In the event of a malfunction, stop using the attachment immediately and carry out the appropriate checks and/or repairs.

Make sure that there are no objects between the parts of the attachment. After any maintenance work, check that there are no objects remaining between moving parts.

To guarantee maximum safety when transporting the attachment, it is **FORBIDDEN**:

- To tamper with any part of the attachment;
- To leave moving parts unattended;
- To use the attachment when it is not working at 100% efficiency;
- To modify the attachment with respect to its intended use without explicit authorisation from the manufacturer or without assuming full liability as per current legislation;
- To attempt to move the moving parts manually in the absence of power.

3.2. Intended use

The attachment described in this manual was designed to be mounted and used on earthmoving machines. The attachment is made to crush various materials.

This attachment is intended exclusively for professional use.

3.3. Unforeseen improper use

It is strictly prohibited for anyone to use the attachment for any purpose other than that expressly permitted and documented. Any improper use of the latter will absolve the manufacturer of all and any damage to property and persons and render any guarantees null and void. The attachment must always be used in the manner and at the times and places required by good practice and in conformity with the applicable legislation, even if there are no laws regulating the sector in the country of use.

Specifically, the attachment must not be used:

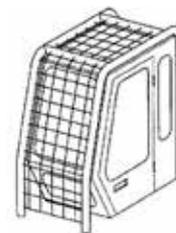
- For any purpose other than those set out in para. 3.2, or for any other purpose not mentioned in this manual;
- In an explosive or corrosive atmosphere or where there are high concentrations of dust or oily substances suspended in the air;
- In an atmosphere where there is a risk of fire;
- With its safety devices disabled or not working.
- To lift or transport persons, animals or objects.
- To lift or extract parts stuck in the ground.
- To reach elevated positions by climbing onto the equipment.
- To strike structures to be demolished.
- As a support point for moving the operating machine.
- To pull, push from the front or the side, strike or impact in any way.
- To compress material.
- To hit or push unfiltered material with the attachment.
- To be filled materials that are larger than intended, as this could cause a blockage in movement of the mechanical function of the attachment.

⚠ WARNING!

The arm must be moved safely, with slow, accurate movements. Avoid abrupt movements.

3.4. Safety indications relating to use of the attachment

Overhead working may result in falling debris or blocks of material. Make sure that the machine the attachment is installed on has the necessary protections for performing this type of work and that the cab has falling object protective structures (FOPS).



- Before operating the attachment, the operator must read this manual carefully and have thorough knowledge of the operating machine's technical specifications and controls.
- It is recommended that the operator be trained to make best use of the attachment. Unauthorized and/or unqualified personnel may not use the attachment.
- Do not approach to within 20 metres of the range of action of an operating machine when working with an attachment.
- Before starting work with the attachment, warn any persons in its vicinity.
- Wear personal protective equipment whenever the attachment is in use.
- The attachment may only be operated by a qualified operator who has read and understood the contents of this manual.
- Do not allow unauthorized personnel to operate the attachment or perform any type of maintenance on it.
- The operator must quickly release their grip on the attachment in the event of danger.
- Do not use the attachment if it is not working properly.
- The attachment may only be used when it is installed on the operating machine using the upper bracket and the pins provided.
- Make sure that the floor can support the load of the operating machine.
- Make sure in advance that the work area contains no pipes with pressurised gas or fluids that could be damaged during demolition: risk of explosion.
- Ensure the operating machine remains at a distance of at least 16 m (50 ft) from live, overhead electrical lines.
- To avoid generating and spreading dust while working, it is necessary to dampen the work area with water.
- In the event of a malfunction of the attachment or damage to its components, contact the maintenance manager without attempting to repair it.
- Do not remove the safety devices or protective guards.

3.5. Safety indications relating to maintenance of the attachment

- Maintenance must only be performed by qualified personnel. Unauthorized and/or unqualified personnel may not adjust or repair the attachment.
- Use the most suitable tools for the tasks required.
- All adjustments, maintenance, repair or cleaning must be performed while the operating machine's engine is off, the attachment must be stably supported on the ground and there must be no residual hydraulic pressure. Any residual hydraulic pressure must be released by opening and closing the attachment several times while the engine is off and while depressurising the oil tank. All maintenance operations must be marked on the card in the cabin.
- When cleaning, assembling, disassembling, performing maintenance and transporting, ensure that the attachment is perfectly stable and lock it with the pins provided to prevent it rotating (if present). All moving parts must be secured by external constraints (such as slings or supports).
- All service operations on the rotation slew ring must be performed by a specialized technician equipped with a torque wrench for tightening the screws.

- Always check the hoses are intact and that they have not been damaged in any way. If necessary, ensure they are replaced immediately. Search for leaks using small pieces of paper or cardboard and never with fingers to avoid injuries to the skin due by high pressure oil.
- The oil can reach very high temperatures. Before performing any service on external surfaces, wait for them to completely cool.
- Never perform hasty or makeshift repairs that could compromise the correct operation of the attachment. If in doubt, always request service by specialized personnel.
- It is forbidden to perform checks and/or replace parts during operation.
- All checks and maintenance that require the removal of the safety protections shall be performed entirely at the user's risk. Therefore, we recommend that such operations be performed exclusively by specialised and authorised technicians.
- In the case of operations or repairs that need to be performed in positions that are not directly accessible from the ground, use ladders or lifting devices that are safe and that conform to national safety regulations.
- In the event of repairs near or below the attachment, make sure that there are no moving parts that can start working and that parts that are unstable by nature are not positioned on or near the attachment; always block them using adequate tools.
- Unless expressly specified by this manual, do not repair or adjust the attachment (or parts of it) during operation, in order to avoid being hooked by moving parts.
- Wear personal protective equipment whenever the attachment is in use, or when working in its vicinity.
- Only use original spare parts to replace worn parts.
- Do not make any adjustments or changes that the manufacturer has not previously agreed to and approved in writing.
- Do not operate the machine near energized power lines.
- Always contact the electrical company when operating near power lines, power lines should be moved, insulated, disconnected or de-energized and grounded before operating in the area.

⚠ WARNING!

- These safety standards supplement and do not replace current local safety standards.
- Any tampering by the user shall absolve the manufacturer of all and any liability and shall render the user solely responsible to the competent authorities for the prevention of accidents.

❗ IMPORTANT!

Hydraram declines all liability for any accidents, injuries to personnel or damage to property resulting from the failure to adhere to the general safety instructions and the standards set out in this document.

- Excavators in overhead demolition or high reach applications must have prioritized oil flow to their main valves. Machines require high volumes of oil at lower pressures to open and close the jaw in the non-cutting mode.

❗ IMPORTANT!

In the event of a building or structure collapse, if the excavator does not have prioritized flow, opening the jaw will render all other functions such as boom and tracking slow or inoperable because the oil will take the path of least resistance, which is the shear function. Although this is not a common situation, it is something that should be addressed with your excavator dealer prior to machine installation.

The machines are sized for excavator stability when properly operated. However, improper operation, faulty maintenance or unauthorized modifications may cause instability. Know the working ranges and capacities of the excavator to avoid tipping. Always use the recommended counterweight.

The following conditions affect stability:

- Ground conditions
- Grade
- Weight of attachment
- Contents of attachment
- Operator judgment

3.6. Operator’s position

When the operating machine is working, the operator must pay particular attention to their own position in order to avoid potential hazards to themselves and persons nearby. The area adjacent to the attachment is divided into two areas:

Operator Areas:

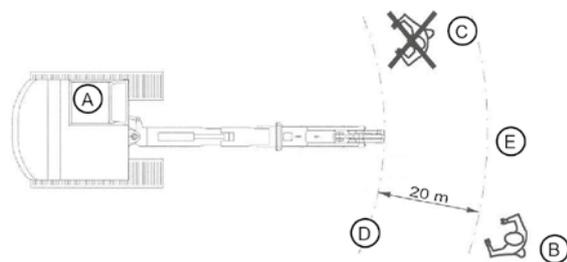
These are the areas in which the operator must work during normal operation of the attachment. The “operator areas” are considered potentially dangerous areas. In these areas, which are indicated on the following diagram, the operator should pay the maximum attention while working to protect the well-being of persons close by;

It is extremely important to follow all the accident prevention rules described up to this point.

Danger Zones:

These are the areas that unauthorised personnel must not approach while the attachment is in use.

- (A) Control area
- (B) Person in safe area
- (C) Person in danger area
- (D) Range of action of the machine
- (E) Safe area limit



3.7. Accident prevention plates and labels

The accident prevention plates attached to the attachment include the main warnings and instructions that should be borne in mind during use.

Symbol	Description	Symbol	Description
	“Read the manual” Read this Use and Maintenance Manual carefully.		“Safety distance” Remain at a safe distance from the range of operation of the operating machine.
	“Burn hazard” Surfaces that can reach high temperatures resulting in burn hazards. Wait for the attachment to cool before carrying out any work on it.		“Danger of ejected material” Remain at a safe distance from the range of operation of the operating machine.
	“Cutting hazard” Do not approach the operating machine during the work cycle. In the event of maintenance, wear personal protective equipment.		“Crushing hazard” Do not approach the operating machine during the work cycle. In the event of maintenance, wear personal protective equipment.
	“Greasing points” Indicates the points to be lubricated.		“Oil input” Power/rotation oil inlet.
	“Oil return” Power/rotation oil outlet		“Rotation direction” Direction in which the attachment must rotate
	“Drainage” Overflow point for excess oil.		“Lifting points” Use the indicated points when handling and moving the attachment

3.8. Safety pictograms

In the manual various pictogram may be used to indicate warnings regarding DANGER, PROHIBITION and OBLIGATION.

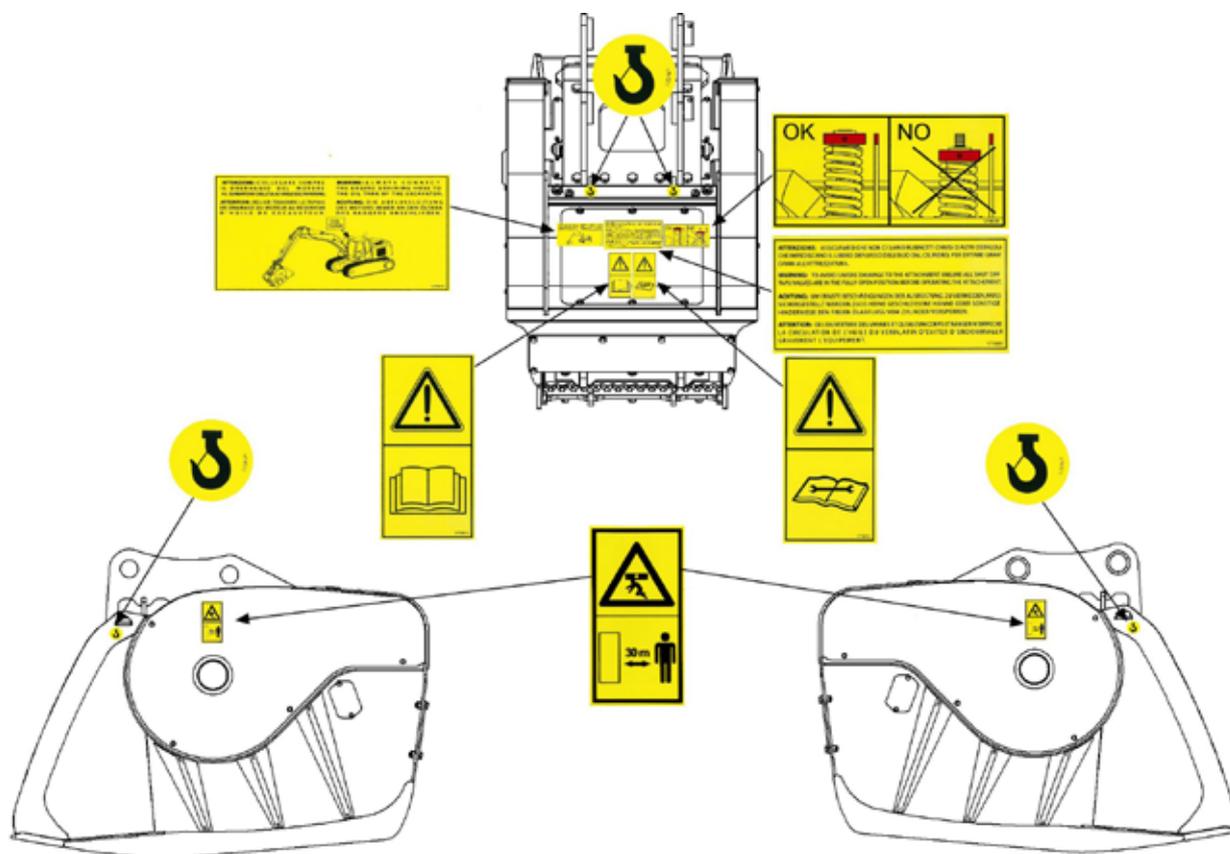
Symbol	Description	Symbol	Description
	Danger of crushing upper limbs		Danger of crushing limbs
	Entanglement hazard		Dragging hazard
	Generic hazard		Removal of safety devices prohibited
	Cleaning, greasing, repairing or adjusting moving parts manually prohibited		

The following pictograms indicate when it is obligatory to wear personal protective equipment (PPE)

Symbol	Description	Symbol	Description
	Protective goggles obligatory		Work clothing obligatory
	Ear defenders obligatory		Protective gloves obligatory
	Safety shoes obligatory		Hard hat obligatory

3.9. Placement of accident prevention plates and labels

The position of the accident prevention plates may vary depending on the model of the attachment.



3.10. Lighting

Lighting in the work area must conform to applicable legislation law in the country where the attachment is being used and must provide good visibility at every point, not create dangerous reflections and allow for clear visibility of the controls and the entire work area up to the safety limits required for objects that may be ejected. Since the attachment has no independent lighting, the environment must be provided with general lighting of 250 to 400 lux at every point in the work area.

3.11. Vibration

No dangerous vibrations are generated provided the attachment is used in accordance with the correct operating instructions.

3.12. Noise emissions

The equivalent continuous sound pressure level weighted in the workplace is less than 70 dB (A).

4. Description of the attachment

4.1. Description of the attachment

This is a piece of equipment to be fitted on earthmoving machinery. It is made up of a metal case containing two jaws, one fixed and the other moving. The moving jaw is hinged at the base, and connected to a shaft and a large flywheel at the head. The off-centre position of the shaft on the flywheel causes the movement at the head of the moving jaw, making it close against the fixed jaw and generating a vertical oscillation at the same time, assisting the uniform crushing of the material.

4.2. Permitted environmental conditions

The attachment is suitable for operating in environments that are:

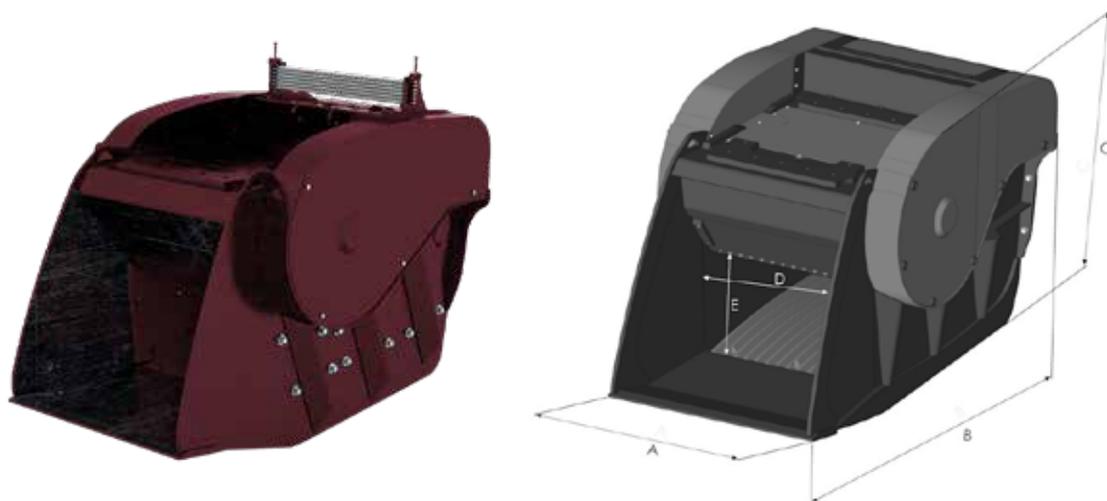
- At altitudes no higher than 3,000m above sea level;
- At temperatures between -20 °C and +50 °C with an average temperature of about 25°C;
- At relative humidity between 30% and 95%.

⚠ WARNING!

The attachment is **NOT** suitable for use in environments that are:

- Explosive.
- Corrosive.
- Subject to high fire risk

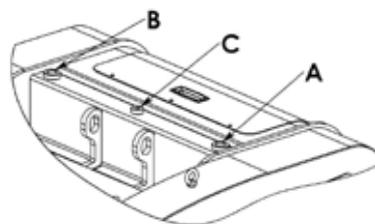
4.3. Attachment technical data



		HCB-16	HCB-26	HCB-32	HCB-42	HCB-56
Excavatorclass:	T.	14 - 22	22 - 32	28 - 38	36 - 50	40 - 65
Weight:	Kg.	1720	2380	3310	4280	5570
Workingpressure:	Bar.	270	300	300	300	300
Oilflow:	L/min.	90 - 100	130 - 140	130 - 140	170 - 180	250 - 300
A:	mm.	740	900	1030	1100	1390
B:	mm.	1800	2050	2050	2150	2250
C:	mm.	1100	1330	1330	1400	1450
D:	mm.	600	700	820	900	1200
E:	mm.	450	500	500	500	550
Capacity:	ca. Ltr.	480	580	640	700	1050

The crushing bucket works both with dual flow circuit and single flow one.

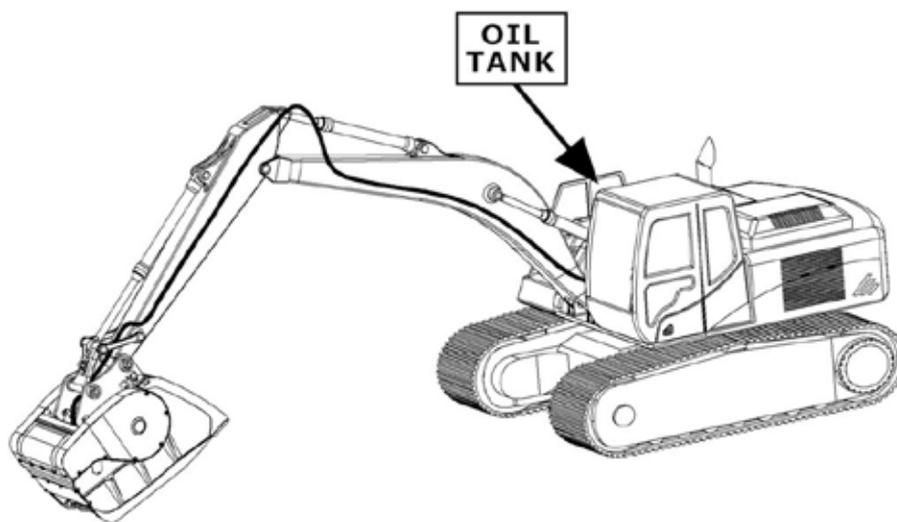
- A- OUTLET
- B- INLET
- C-DRAINAGE



⚠ WARNING!

Strictly comply with the operating pressure and output valves!

Model	Hydraulics Connections BSPP	Hydraulics Connections BSPP	Pressure max (BAR)	Oil flow (l/min)	Hydraulics Connections BSPP
	A	B	B	B	C
HCB-16	3/4"	3/4"	270	90/100	3/8"
HCB-26	3/4"	3/4"	300	115/125	3/8"
HCB-32	3/4"	3/4"	300	130/140	3/8"
HCB-42	1"	1"	300	170/180	3/8"
HCB-56	1"	1"	300	250/300	3/8"



⚠ WARNING!

In order to eliminate any back pressure, the hydraulic motor drain line must be an independant return line piped directly back to the hydraulic oil tank of the excavator.

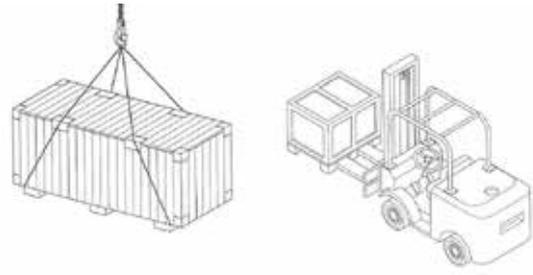
5. Installation

5.1. Moving and handling

The attachment may be shipped on wooden beams or pallets, or in a crate, depending on the destination and the customer's request. Appropriate P.P.E. must be used during transit and installation.

Lifting the attachment in its packaging using cables and a gantry crane or a forklift truck

The attachment unloading, lifting and handling operations must be carried out by personnel qualified to operate lifting equipment. Before starting operations, identify all the areas that will be affected by the attachment moving and handling operations, including loading it on the transport vehicle and installing it on the machine, and note any hazardous points.

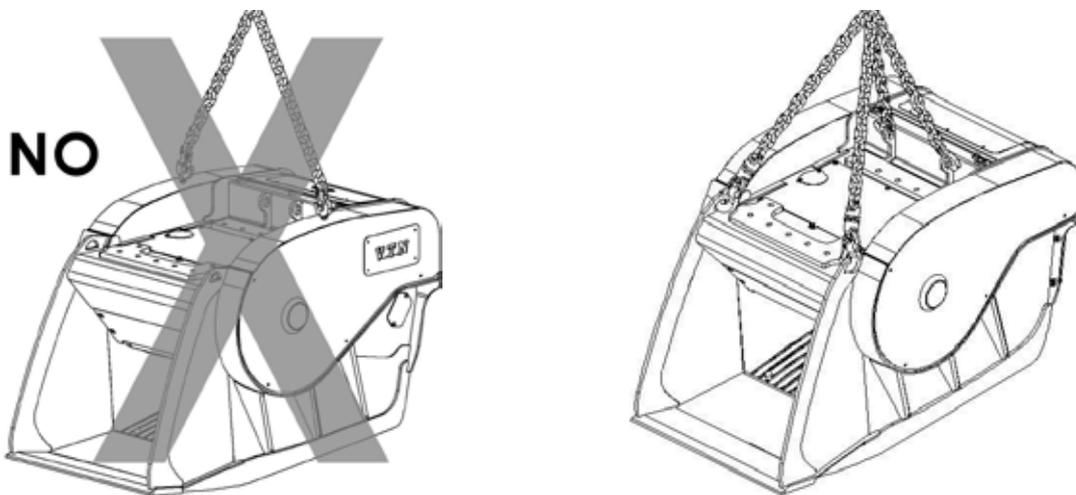
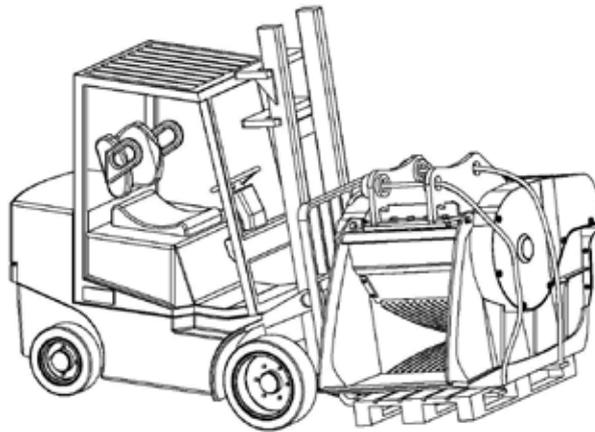


- It is forbidden to climb on the attachment or loiter and/or pass underneath it during movement or handling.
- Unauthorized persons are forbidden to enter the movement and handling area.
- All operators must keep at a safe distance to avoid being hit if the attachment or one of its parts should fall.
- The equipment and vehicles used to lift and transport the attachment must have sufficient load bearing capacity.
- When using lifting cables, check that they are certified and are labelled with manufacturer's information and load bearing capacity. Check for damage, broken wires and signs of wear.
- Hook the cables to the eyelets indicated by stickers.

The same precautions must be taken if using chains. When using a gantry or mobile crane for lifting, ensure that they have sufficient span and load bearing capacity. Perform the set-up by moving the lifting vehicle for short distances until the condition of optimum stability is reached. Slowly lift and handle with the maximum care to avoid oscillations.

⚠ WARNING!

The manufacturer may not be held liable for personal injuries or damage to property in the event that lifting systems other than those described are used.



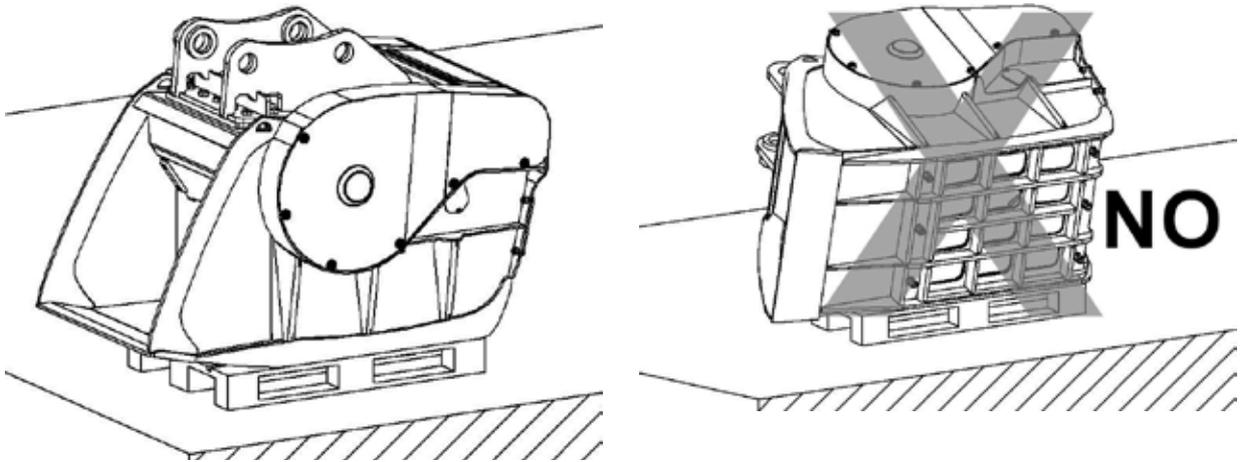
❗ IMPORTANT!

When the attachment arrives, the user must check it for any damage (breakage or significant dents) that may have occurred during shipping or unloading. If damage has occurred, immediately make it known to the transporter and add the words **“ACCEPTED WITH RESERVATIONS”** to the delivery document. In the presence of damage, submit a written claim to the transporter within 8 days of receiving the attachment. If significant transport damage is noted at the time of delivery and/or any parts are found to be missing notify the Manufacturer immediately. It is also necessary to check the received material against the detailed list on the transport document.

5.2. Storage

If the attachment is to be stored before use, the following precautions must be taken:

- Store the attachment in a protected place;
- Position the attachment on wooden beam for greater stability;
- Protect the attachment from shocks and stress;
- Protect the attachment from humidity and large temperature variations;
- Keep the attachment away from corrosive substances.



⚠ WARNING!

Do not position the machine on its side. It could tip over, risking serious cuts or crushing.

If the attachment needs to be stored for more than 2 months, please follow these instructions:

- Grease the various rotation points to protect them from wear.
- Store the equipment in a dry place, at a temperature of between -5°C and $+30^{\circ}\text{C}$.
- Protect the equipment from dirt, dust and humidity..

5.3. Preparation prior to installation

- Warn everyone in the area that you are about to start operation.
- Check underneath and around the machine for obstructions. Make sure that all personnel and equipment are clear from the area of operation. Check clearances in all directions, including overhead.
- Be properly seated in the operator's seat.
- Personnel must not eat or drink in works areas.
- Personnel must not smoke cigarettes in work areas.
- Personnel must not operate machinery under the influence of drugs or alcohol.
- Do not wear loose clothing or jewelry that could get caught on the machinery and cause injury.
- Keep hands, feet, hair and clothing away from moving parts.
- Keep hands and feet within the operator's platform.
- Know the pinch and crushing points as well as all rotating components and avoid them during operation.
- Always know where to get assistance in case of an emergency. Know where to locate and how to use safety equipment, such as a first aid kit and fire extinguisher. Report all injuries to your supervisor or as directed.

Ensure that:

- There are no unusual or potentially hazardous condition and that no unauthorized personnel are present in the work area.

- There are no materials in the work area that may obstruct or impede visibility.
- All protection systems are correctly installed and operational.
- Make sure that the ambient and working temperatures do not exceed the permitted limits of -16°C to +45°C (3°F to 113°F). If working in temperatures below 3°F (-16°C) it is very important to operate the bucket without crushing material to increase internal temperature. To ensure the hydraulic oil reaches normal working temperature, open and close the jaw 10 times slowly.

At the beginning of each shift, take the time to check the equipment and have all systems in good operational condition. Check the following:

- Ensure all warning decals, special instructions and operator's manuals are legible and in their proper locations.
- All grease fittings have been lubricated,
- Check blades and wear surfaces for wear or damage.
- All fluid levels.
- Hydraulic connections. Repair or replace any damaged hoses or connections.
- All controls levers for proper operation.
- Rotation bearings.
- Visually check for loose or damaged bolts.

Know the Work Area:

- Check clearances in the work area.
- Keep all bystanders at a safe distance.
- Do not work under obstacles within the working range of the machine.
- Check the location for overhead and buried power lines or other utilities before operation.

Know the Rules:

- Most employers have rules for proper operation and maintenance of the equipment.
- Before starting work at a new location, ask your supervisor or safety coordinator about rules you are expected to follow.
- Understand traffic rules at your jobsite.
- You must recognize and understand all signs, flags and markings.

5.4. Installing the attachment

⚠ WARNING!

The installer, operator and maintenance personnel must wear the suitable protection devices specified by the Italian decree 81/2008, or the relevant safety legislation in force in the country where the equipment is used.



Hydraram declines all liability in the event of accidents if the installer, operator or maintenance personnel fail to use the suitable safety devices.

⚠ WARNING!

- Before proceeding to install the attachment you need to be sure that the attachment is intact as it might have been damaged during transportation.
- It is especially important to check that the pipes are intact and the hydraulic connections are firmly attached.
- The attachment must be installed in a space large enough to allow the necessary operations to be carried out in complete safety.
- While being assembled, the attachment should be laid firmly on the ground with the excavator's engine at a standstill and parking brakes pulled on.
- If our attachment is supplied without couplings, it is up to the client to fit it with suitable couplings according to current safety standards.

ⓘ IMPORTANT!

The attachment is not allowed to be used at temperatures below -16°C or above 45°C .

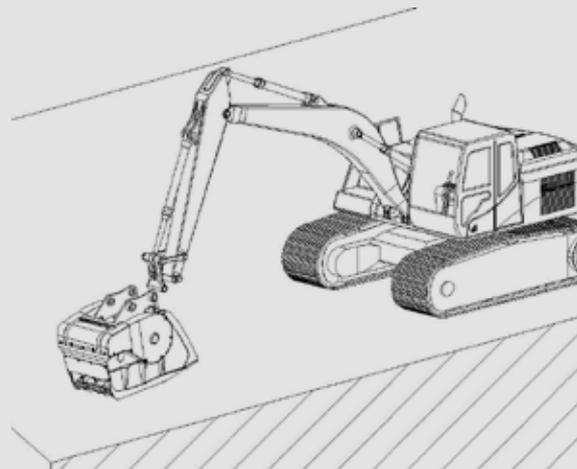
If the air temperature is below -16°C , follow the steps below:

- Carry out working cycles with the attachment free of material for 20 minutes.
- Begin with a job that is not too heavy for 10 minutes

The couplings provided in our attachment are equivalent to those supplied for the standard buckets for the type of vehicle on which this attachment is mounted. For a detailed explanation on mechanical connection please refer to the instruction handbook of the working vehicle.

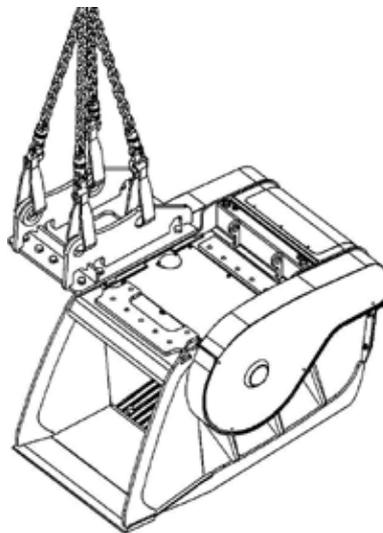
⚠ WARNING!

- While the coupling pins are being mounted or dismantled, there is a risk of loosening splinters. Always wear gloves, protective goggles and a helmet.
- If the equipment is being substituted, and there is no rapid attachment system, the help of another person will be required. It is important to agree upon the words and gestures to use.
- Do not use your fingers to find the centres of the holes. If sudden, uncontrolled movements occur, your fingers could be sliced off.
- The figure (right) only shows the initial position required for mounting the machine. For the other operations involved, please consult the use and maintenance manual for the operating machine.

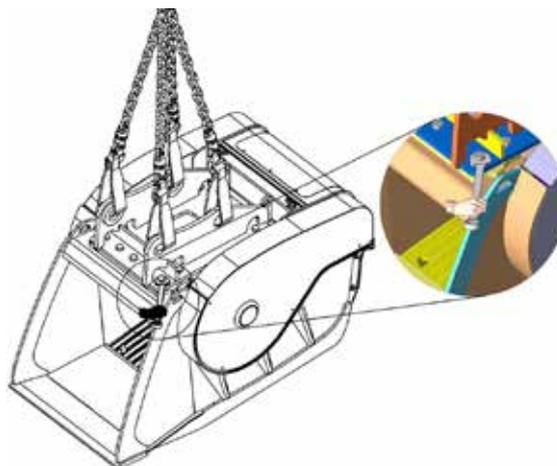


5.4.1. Holed adapter plate assembly

1. Position the attachment as shown in the figure and, using suitable lifting gear, approach the holed adapter plate to the machine



2. After positioning the holed adapter plate on the attachment plate of the machine, insert the bolts and tighten them with a spanner. Repeat the operation 2/3 times to ensure they are properly tightened.



5.5. Disassembly

When disassembling, the attachment must be laid firmly on the ground.

1. Turn off the excavator engine and pull the parking brakes
2. Ensure that the hydraulic system connected to the machine is not under pressure. For this operation, please refer to the use and maintenance manual for the operating machine.
3. Wait for the oil temperature to cool down.
4. Remove hydraulic connections between the excavator and attachment.
5. Uncouple the coupling pins of the attachment as described in the excavator instruction handbook.

5.6. Hydraulic hoses

For the operations to be followed for connecting the hydraulic tubes to the machine, please refer to the instructions given in the user's manual for the operating machine. The figure indicates the way in which the connecting tubes should be arranged.

The outlet pressure of the excavator must always be as required for the attachment in use. See paragraph 4.3.

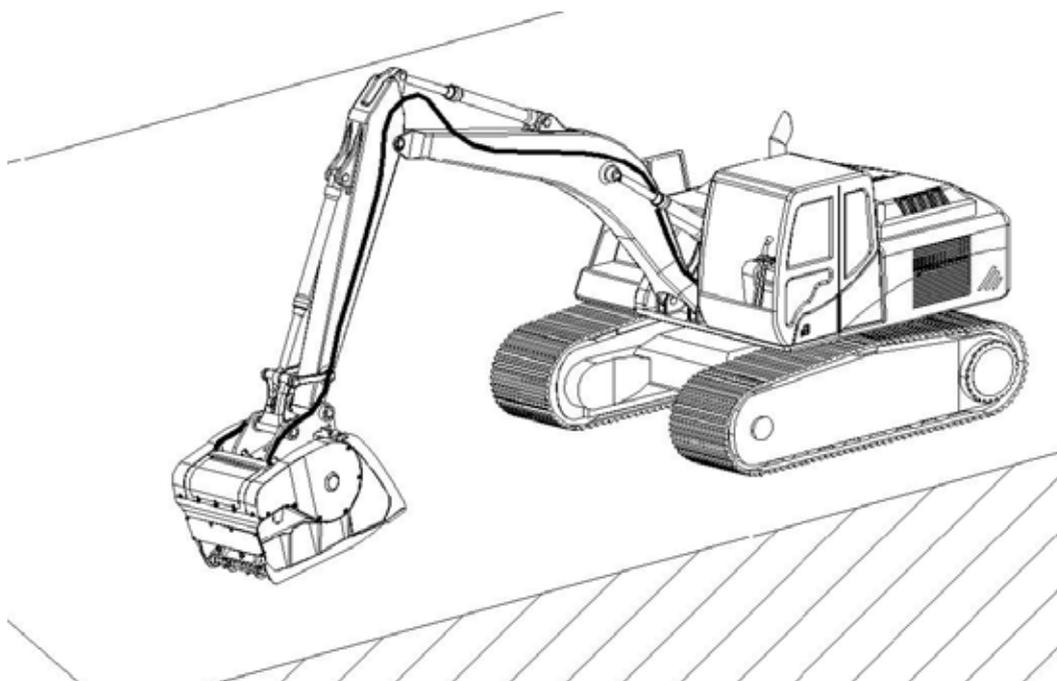
❗ IMPORTANT!

The use of rapid couplings for connecting the equipment is not advised. These cause severe overheating of the hydraulic oil and therefore shorten the life of the components.

A possible malfunctioning of the rapid couplings can cause serious damage to the machine.

⚠ WARNING!

Do not use the attachment without first checking that the delivery pressure of the attachment is as required.



6. Using the attachment

6.1. Purpose of the attachment

1. Load the bucket with the material to be crushed.



2. Work the crusher bucket as shown in the figure. Keep it in operation in order to draw it back to a vertical position.

Never stop the crusher bucket in a vertical position while crushing the material.



3. Correct position of the crusher bucket for best performance.



6.2. Forbidden use of the attachment

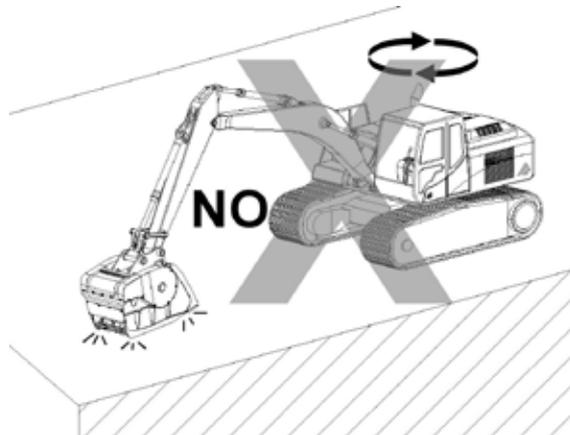
Do not use the attachment to compress the material.



Do not hit or push the unfiltered material with the equipment.



Do not lean the machine on the ground and use it as a support-prop for turning the operating machine.
This will very likely damage the equipment.



⚠ WARNING!

- Do not overfill the attachment with material to be crushed that is larger than intended, as this can block the crushing bucket.
- The work space must be properly enclosed to prevent access of unauthorized personnel.

6.3. Stopping the attachment

To stop attachment, simply leave the hydraulic distributor controls on the operating machine in the idle position. Under normal conditions, if the controls are not operated, the attachment will remain stationary.

6.4. Temporary decommissioning

When the attachment is not used for prolonged periods, disconnect its hydraulic system.

6.5. Waste disposal

Disposal of the packaging materials associated with the machine, as well as substitute parts and lubricants, must be carried out with respect for the environment, avoiding pollution of soil, air and water. It is the responsibility of the consignee to ensure that the operation is executed in full conformity with the current regulations of the country where the machine is put to use.

- **Ferrous material, such as aluminium and copper:** to be treated as recyclable material and taken to an official collection centre.
- **Plastic and rubber materials:** these materials should be taken to the scrapyard or official recycling centre.
- **Oil waste:** to be taken to an official centre for the collection of oil waste, to be properly destroyed. Never tip oil waste into drains, rivers etc. Never discharge oil waste straight onto the ground.
- Fully comply with the laws and regulations regarding the treatment of dangerous substances such as oil, fuel, solvents used filters and batteries.

6.6. Dismantling

If you ever decide to scrap the machine, you are advised to render it inoperable by dismantling the various components. The dismantling process must be carried out by specialized personnel.

Every time the machine is moved around on the demolition site, suitable means of transport must be used, with a carrying capacity greater than the weight of the machine. All oil content must be removed from the machine.

7. Maintenance

⚠ WARNING!

Wear P.P.E. whenever carrying out scheduled maintenance.



7.1. De-energising the attachment

Before performing any type of maintenance and/or repairs, the attachment must be disconnected from the hydraulic power supply. The residual hydraulic pressure must be released by operating the OPEN/CLOSE controls on the attachment several times while the engine is off and while depressurising the oil tank. All maintenance operations must be marked on the card in the cabin.

7.2. General information

Maintenance includes operations such as lubrication, cleaning, adjustment, replacement, inspection, tightening, etc. When performing maintenance and/or repairs, it is best to follow these **recommendations**:

- Before beginning work, display a, "ATTACHMENT IN MAINTENANCE" sign in a position where it can be clearly seen;
- Any operation requiring direct handling by the operator (inspection, maintenance) must be performed with the excavator off, with its parking brakes pulled on with the attachment laid firmly on the ground. Wait for the machine oil to cool (approx. 2 hours);
- Do not use solvents or inflammable materials;
- Take care not to spill lubricants;
- When accessing parts of the attachment, use appropriate tools for the operations to be performed;
- Do not climb on the components of the attachment because they were not designed to carry the weight of people;
- Once the work is complete, replace and secure all the safety panels that were removed and/or opened correctly;
- Carefully clean individual components with an appropriate degreaser and without using compressed air (as this just moves dirt around);
- Determine maintenance intervals based on the specific requirements in relation to the production cycle of the attachment;
- Every day, before using the attachment, the operator should visually inspect the general state of its components and request maintenance if they notice any strange noises or faulty conditions;
- Check that the mechanical parts which require lubrication are always well lubricated.

⚠ WARNING!

Thin sprays of high pressure hydraulic liquid can penetrate skin. DO NOT use your finger to search for any leaks. DO NOT place your face close to suspected leaks. To highlight signs of hydraulic leaks, place a piece of cardboard close to the suspected leaks and then inspect the cardboard itself. Should the hydraulic fluid penetrate your skin, immediately call for medical help.

⚠ WARNING!

The manufacturer may not be held liable for the consequences of any failure to observe the recommendations listed above, or if the attachment is used in any way that differs from that stated in these instructions.

7.3. Maintenance scheule

It is extremely important for operational safety to inspect and maintain the following thoroughly:

- Control the integrity of attachment.
- Ensure the hydraulic pipes and connections are in perfect condition.

If any of the following anomalies are present, the hydraulic pipe will have to be immediately taken apart and replaced:

- Displacement of the connection on the flexible pipe
- In case of damages, cut or abrasions on the superficial layer
- Hardening or rigidity of the flexible pipe, presence of burns or leaks due to heat
- Cracks, rust on the connection
- Points of loss on the flexible pipe or the connection
- Permanent folds, crushings, flattening or torsions on the flexible pipe
- Bubbles, softening, usury or detachment of the external layer

Every 40 hours of use of the attachment:

- Check that there are no cracks in the welding;
- Check that the screws are undamaged and securely tightened according to the enclosed table in paragraph 7.3.3.
- Check the condition of screws, elastic pegs, seeger and split pins.

⚠ WARNING!

- The level of fluid contamination must be in class 19/15 or better.
- The temperature of the oil in use SHALL NEVER EXCEED 70 °C.

⚠ WARNING!

If the attachment breaks down, contact the manufacturer or skilled personnel.
Neither the attachment itself nor its functionality may be modified in any way.

After the first 40 hours of use of the equipment, check the tightness of the tubes and joints inside the attachment. Loosening can occur during the initial phase of adjustment after the fastening of the hydraulic parts.

Scheduled maintenance table

The machine must be isolated for maintenance.

Interval	Operation
Every 8 hours	Inspect and adjust tightness of hose and joints
Every 10 hours	Inspect and adjust tightness of bolts

7.3.1 Lubrication

The attachment must be lubricated at all the greasing points indicated on the respective plate.

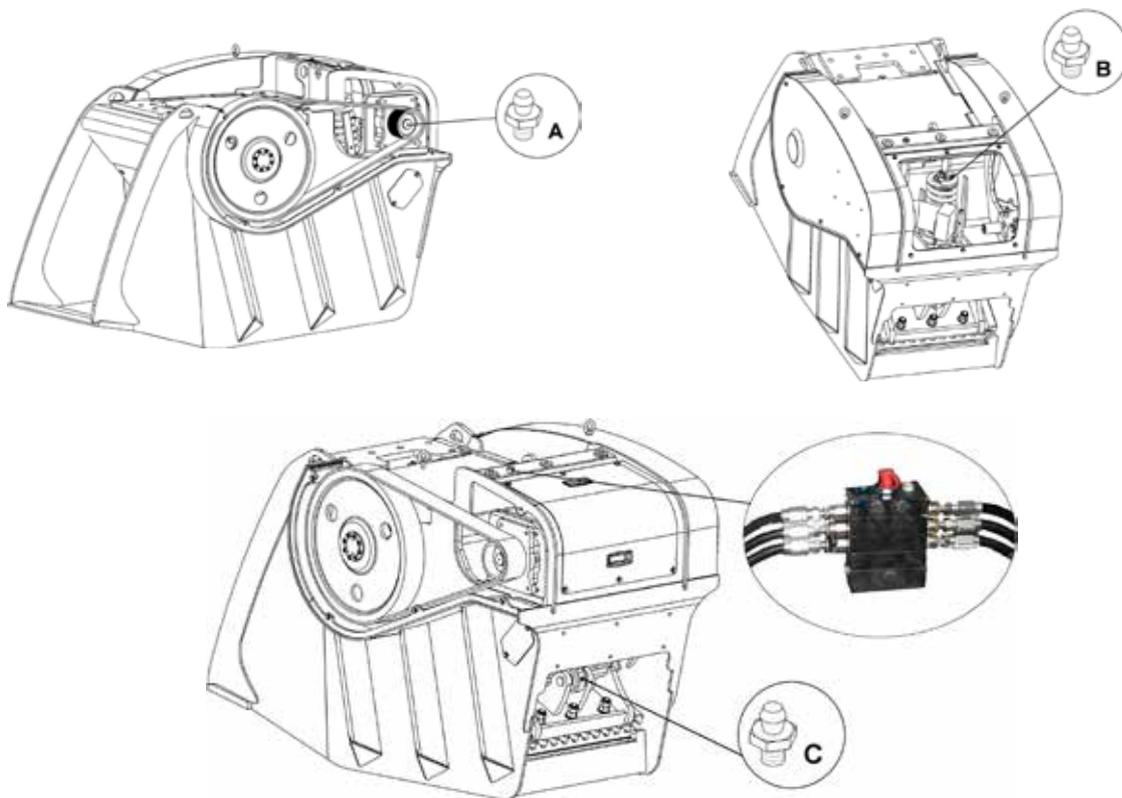


Lubrication intervals must be determined based on operating conditions. The attachment must be re-lubricated before or after prolonged periods of inactivity. This is especially true for the winter break. Take care that no detergent penetrates the ball roller system or damages the gaskets.

❗ IMPORTANT!

- More frequent lubrication is recommended in regions with a tropical climate and in places that are damp, dusty, impregnated with impurities and subject to sudden changes in temperature.
- Following use under water, disassemble the hinges and carefully clean the pins and bushings to eliminate any trace of oxidation before lubricating again.

Interval	Operation
Every 300 hours	Grease point A with 2-3 squeezes of the grease gun
Every 80 hours	Grease point B with 4-5 squeezes of the grease gun
Every 10 hours	Grease point C with 4-5 squeezes of the grease gun
Every 10 hours	Grease the distributor with 4-5 squeezes of the grease gun



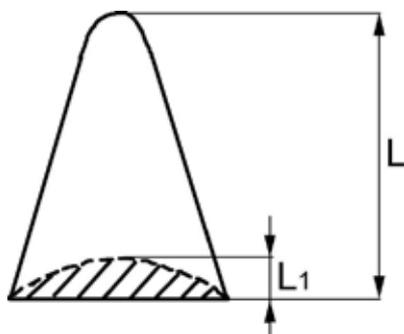
7.3.2. Jaw wear

Jaws should be rotated by 180°. However, this operation should be done on both of the jaw grips so a collision does not occur between them, leading to a sudden blockage of the machine.

Jaw's position can be reversed, in order to ensure uniform wear.

⚠ WARNING!

Unscrew the screws very carefully when removing the top jaw, since it may fall down and cause damage to property or injure people or animals. It is advised to rotate or invert the position of jaws in a workshop equipped with the correct tools for the procedure.



L = NEW WAVE
L1 = 5mm WORN WAVE

7.3.3. Tightening the screws

The tightening torque in the table is valid approximately for the following conditions :

- Hexagonal- head screws (UNI 5737 type), cylindrical-head screws (UNI 5931 and UNI 6107 type).
- The tightening torque must be applied slowly with dynamometric wrenches.
- The diagram is based on a static coefficient of friction $\mu = 0.14$. For a different friction coefficient μ_x , the value of the clamping force detected by the diagram must be multiplied for the correction factor.



$$k = \frac{0.14}{\mu_x}$$

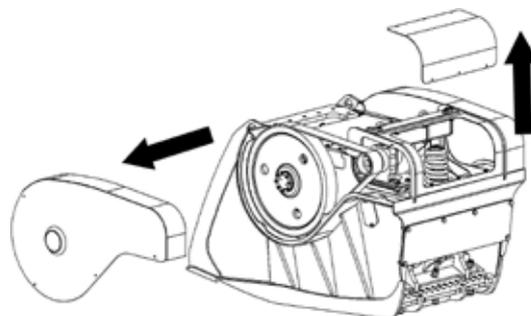
NORM				8.8		10.9		12.9	
Ø bolt ↓	hexagon mm	Metric thread		Metric thread		Metric thread		Metric thread	
		coarse mm	fine mm	coarse Nm	fine Nm	coarse Nm	fine Nm	coarse Nm	fine Nm
M8	13	1,25	1,0	25	27	35	38	42	46
M10	17	1,5	1,25	50	53	70	74	84	89
M12	19	1,75	1,5	85	89	119	125	143	150
M14	22	2,0	1,5	135	148	190	208	228	250
M16	24	2	1,5	212	226	298	318	357	382
M18	27	2,5	2,0	290	310	402	436	490	523
M20	30	2,5	2,0	413	436	580	614	697	736
M22	34	2,5	2,0	568	597	798	840	958	1.008
M24	36	3,0	2,0	714	781	1.004	1.098	1.204	1.317
M27	41	3,0	2,0	1.050	1.139	1.477	1.602	1.772	1.923
M30	46	3,5	2,0	1.429	1.590	2.009	2.236	2.411	2.648
M33	50	3,5	2,0	1.941	2.136	2.729	3.004	3.275	3.605
M36	55	4,0	3,0	2.497	2.652	3.511	3.730	4.213	4.476

+ 1 Nm = 0,102 kg m

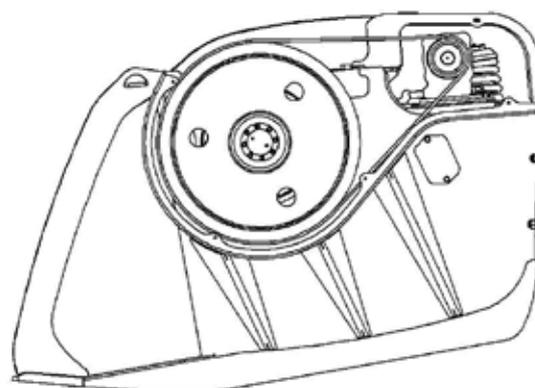
The data in the table refers to Regulation DIN 267

7.3.4. Adjusting belt tension

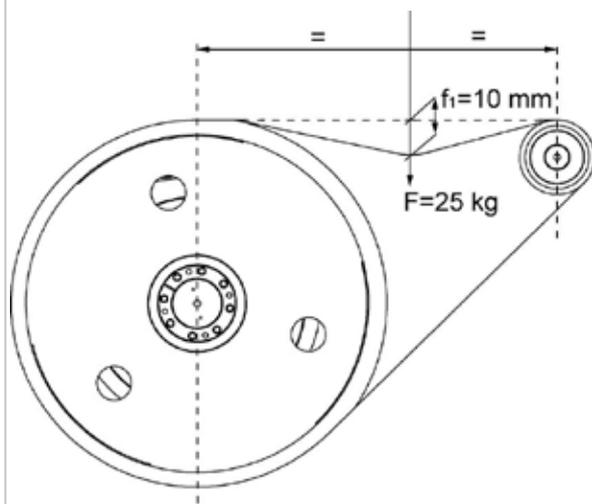
1. Remove the hoods and the cover using suitable tools and wearing safety clothing.
The operation must be performed with the machine off, the parking brakes engaged and the crushing bucket resting on the ground.



2. Dispose the crushing bucket so that the top of the belt is in horizontal position.
After positioning the crushing bucket, switch the machine off and engage the parking brakes before proceeding with the next steps.



3. Check belt tension using the following method:



HCB-16 - HCB-26
HCB-32 - HCB-42

HCB-56

Use a dynamometer to apply a perpendicular force $F=25\text{kg}$ to the belt halfway between the axes of the two pulleys. This should cause the belt to flex down by $f_1=10\text{mm}$.

Use a dynamometer to apply a perpendicular force $F=48\text{kg}$ to the belt halfway between the axes of the two pulleys. This should cause the belt to flex down by $f_1=11\text{mm}$.

$f_1 < 10\text{ mm}$

Loosen the belt

$f_1 < 11\text{ mm}$

Loosen the belt

$f_1 = 10\text{ mm}$

Ok

$f_1 = 11\text{ mm}$

Ok

$f_1 > 10$

Tighten the belt

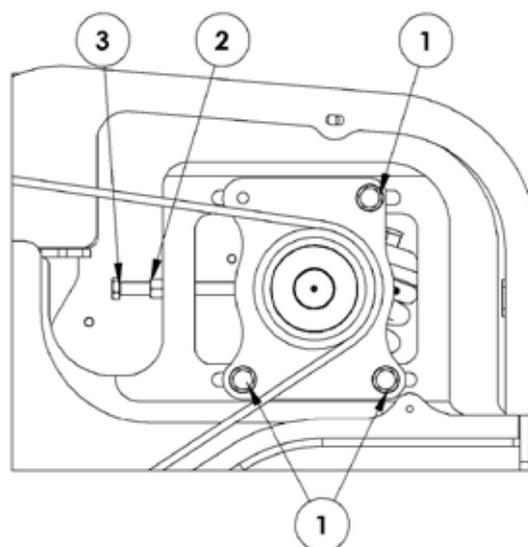
$f_1 > 11$

Tighten the belt

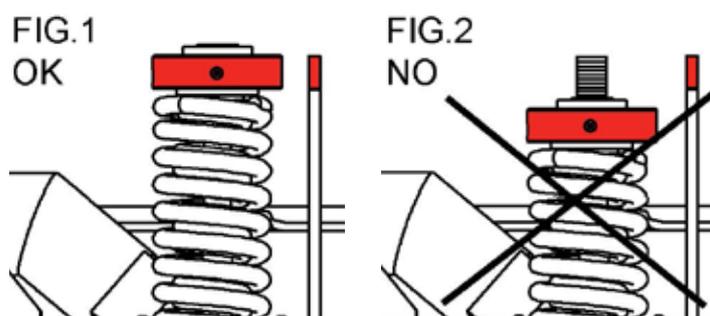
4. **Adjusting belt tension:**

Loosen the nuts 1 that secure the engine support. Unscrew the lock nut 2 on the belt tensioner screw 3. Tighten or loosen the belt tensioner screw 3 until achieving the result shown in the previous figure. After completing the operation, secure the belt tensioner screw with the lock nut 2. Tighten the nuts 1 that secure the engine support.

Once all the operations have been completed, put back the hoods and the cover.



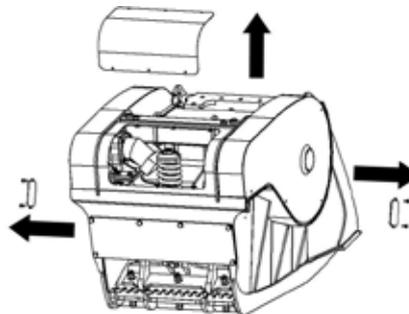
7.3.5. Adjusting spring tension



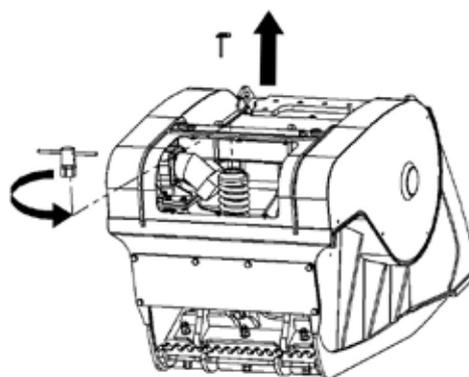
To adjust the tension of the spring, align the red part of the spring stop with the red part of the indicator located to the side. The adjustment must be performed with the spring fully extended.

7.3.6. Jaw opening settings

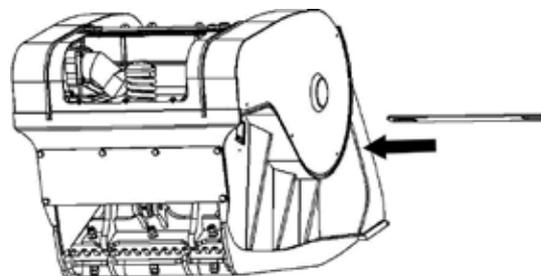
1. Unscrew the fastening screws on the guards indicated and remove the guards.



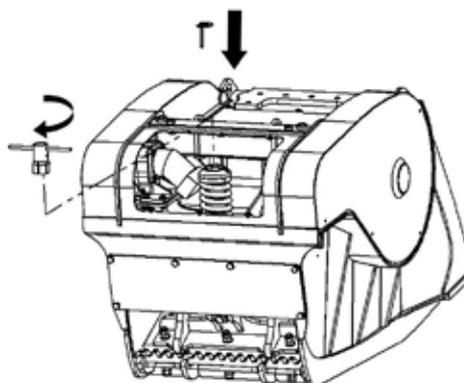
2. Unscrew the screw on the safety stop and remove it. Unscrew the nut that adjusts the tension of the spring until sufficient space is created to add or remove spacers. Before unscrewing the nut that adjusts the tension of the spring, always check that the spring is fully extended.



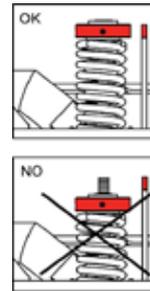
3. Add spacers to create a screen size for smaller material. Remove spacers to create a screen size for larger material.



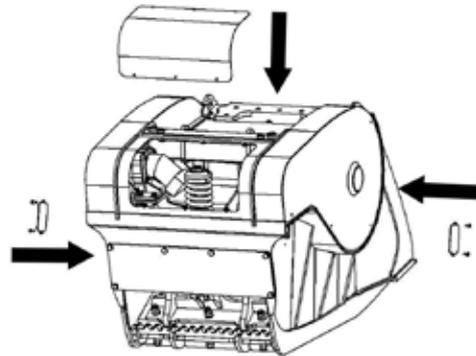
4. Tighten the nut that adjusts the tension of the spring until reaching the situation shown in step 2. and reposition the safety stop, fastening it with the screw.



5. Check that the red part of the spring stop and the red part of the indicator located to the side are aligned.



6. Reposition the guards, fastening them with the screws.



7.4. Diagnostics and troubleshooting

In the event of an attachment malfunction, request a specialised technician to carry out a troubleshooting investigation on it or call the manufacturer's technical support service.

Contact the manufacturer in the case of any defects or malfunctions affecting the attachment that are not described in this manual.

8. Spare parts

8.1. Assistance

For any information relating to the use, maintenance and installation of the attachment, Hydraram is always at the customer's service. The customer should submit questions in as clear a manner as possible, referring to this manual and the instructions provided.

8.2. Spare parts

Contact the manufacturer to request any replacement parts.

⚠ WARNING!

Always use original replacement parts. We strongly advise against the use of non-original parts and, in the event non-original spare parts are used Hydraram may not be held responsible for the consequences of resulting breakages, malfunctions, injuries to personnel or damage to property. In addition, in such cases, the guarantee will be rendered null and void (if still valid).



In order to interact more effectively with our technicians when ordering replacement parts, please follow this procedure:

- Call the spare parts service of Hydraram and describe the type of fault experienced.
- Quote the attachment serial number indicated on the identification plate.
- Describe the part that is not working (with the help of photographs if necessary);
- Indicate the shipping method. If this field is not filled out, Hydraram while taking every care to provide the requested service, may not be held liable for any delivery delays caused by force majeure. The recipient is always liable for shipping expenses.



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