



HYDRARAM[®]

DEMOLITION & RECYCLING EQUIPMENT



STEEL SHEAR - HSS 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 that they have read and understood thoroughly.

SYMBOLS RELATING TO OPERATOR QUALIFICATION LEVELS	
	<p>General labourer: an operator with no specific skills who is qualified only to carry out simple tasks as directed by qualified technicians.</p>
	<p>Lifting and handling equipment operators: an operator qualified to use vehicles and equipment for lifting and handling materials and machinery (in strict accordance with the manufacturer's instructions), subject to the legislation in force in the country where the machinery is in use.</p>
	<p>Operator: person able to install and operate the attachment.</p>
	<p>Maintenance mechanic: a qualified technician, who is able to assemble and disassemble the attachment and adjust, service and repair its mechanical parts, as necessary. Typically, such personnel are not qualified to work on live electrical systems.</p>
	<p>Manufacturer's technician: a technician provided by the manufacturer to perform complex operations under unusual or special circumstances or when in agreed with the user. Depending on the situation, such personnel must possess the appropriate skills and qualifications for the work to be carried out.</p>

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

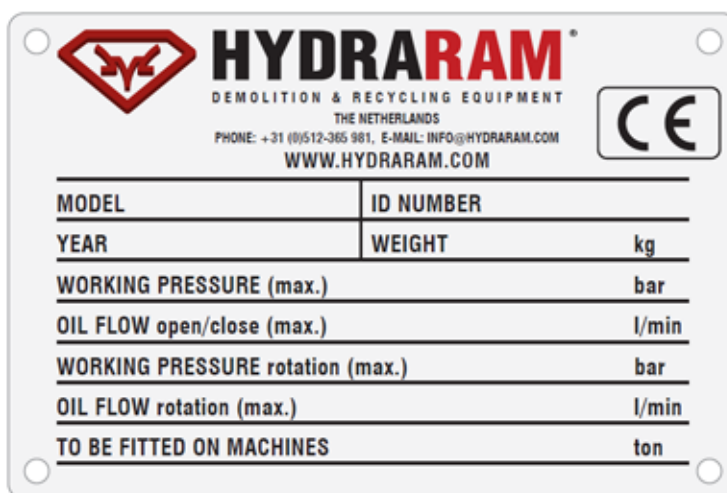
AFTER-SALES SERVICE / SPARE PARTS / CALL CENTRE

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.



2.3. Safety regulations

The attachment has been manufactured in conformity with the safety standards listed below:

- UNI EN ISO 12100:** Machine Safety - Fundamental concepts, general design principles - Risk assessment and reduction.
- UNI EN ISO 13857:** Machine safety - Safety distances to prevent hazard zones from being reached by upper and lower limbs.
- UNI EN 349:** Machine safety - Minimum distances to avoid crushing parts of the human body.
- UNI EN 474-1:** Earthmoving machines - Safety - General requirements.
- UNI EN 474-5:** Earthmoving machines - Safety - Requirements for hydraulic excavators.

The regulations mentioned in this manual may not apply to specific situations that may arise during various work phase

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, s/he 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 (refer to the Technical Data chapter for the type). The attachment must be used to cut and separate ferrous materials and metallic structures. The dimensions and consistency of the material to be processed must be compatible with the technical specifications of the equipment (see paragraph Technical Data). **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:

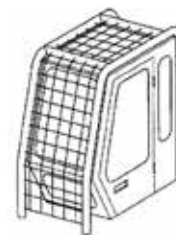
- For any purpose other than those set out in para. 3.2, or for any other purpose not mentioned in this manual;
- In an explosive or corrosive atmosphere or where there are high concentrations of dust or oily substances suspended in the air;
- In an atmosphere where there is a risk of fire;
- With its 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.
- Depending on the structure to be cut, do not start working on the lower tips of the structure when cutting as this could cause the upper part to collapse.
- 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.

⚠ 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 his/her 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 10 metres 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.

- For the hydraulic connections, only use hydraulic hoses and fittings that conform to the SAEJ517 or DIN20066 standards for the specified pressures. Failure to observe the above could compromise the safety of the attachment.
- 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.

⚠ 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.

3.6. Operator's position

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

Operator Areas:

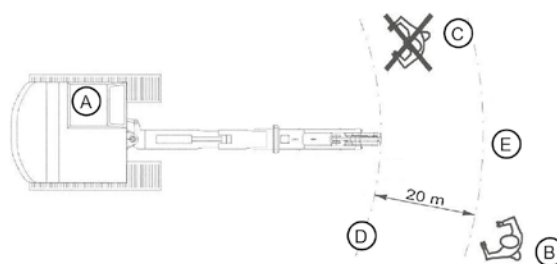
These are the areas in which the operator must work during normal operation of the attachment. The “operator areas” are considered potentially dangerous areas. In these areas, which are indicated on the following diagram, the operator should pay the maximum attention while working to protect the well-being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







Symbol	Description	Symbol	Description
	“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. Residual risks

A residual risk is a hazard that cannot be completely eliminated through design and protective techniques or a potential hazard that is not obvious.


 **Hazard:** crushing/cutting limbs

Possibility/location of hazard

When assembling/disassembling or performing maintenance on the attachment there is a risk of the attachment or part of it falling, or of sudden movement of part of the attachment.

Protections/precautions

Such operations must be carried out carefully by trained personnel. Wear suitable P.P.E.

 **Hazard:** ejected oil

Possibility/location of hazard

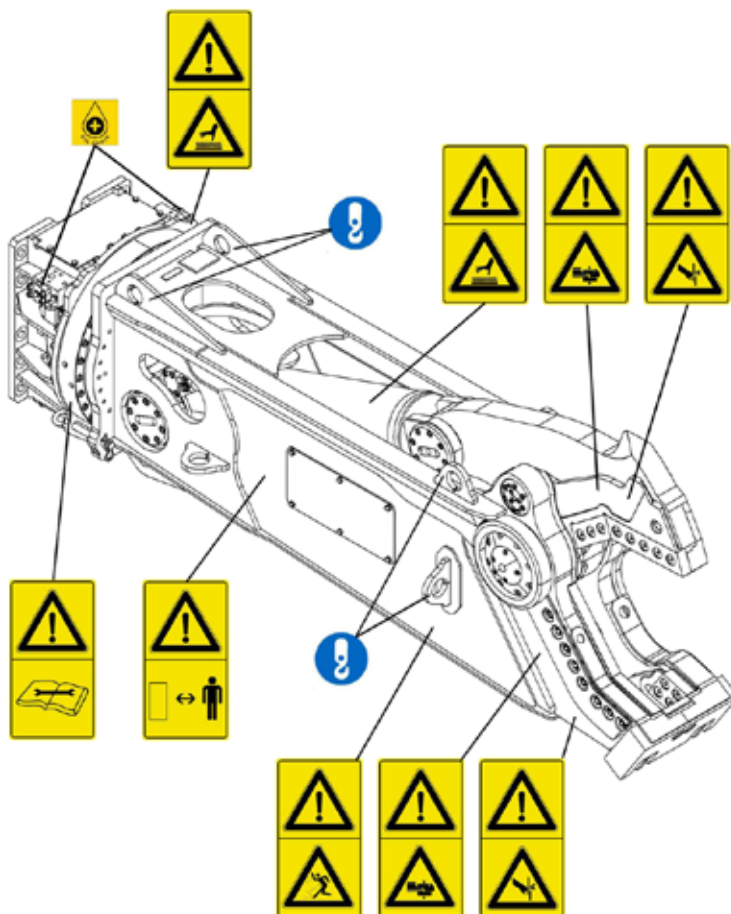
When assembling/disassembling or performing maintenance on the hydraulic components of the attachment there is a risk that oil may be ejected as a result of residual pressure.

Protections/precautions

De-pressurise the circuit fully as shown in this manual. Such operations must be carried out carefully by trained personnel. Wear eye protection.

3.10. Placement of accident prevention plates and labels

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



3.11. 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.

3.12. Vibration

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

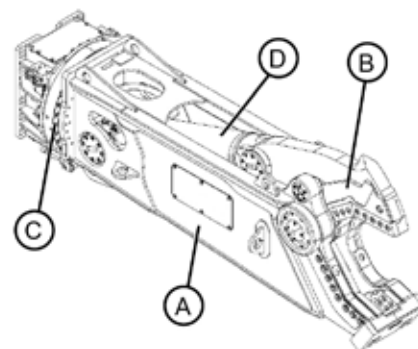
3.13. Noise emissions

The attachment does not generate noise (sound pollution).

4. Description of the attachment

4.1. Description of the attachment

The Steel Shear - HSS series is an attachment that has been fully designed and manufactured by Hydraram intended for modern industrial demolition sites which involve significant cutting effort at considerable heights and experts in recycling scrap and ferrous materials. The attachment consists of a main load-bearing body (A) and the jaw (B).



The body is fitted with a rotation plate (C) for continuous hydraulic rotation, so as to reduce moving operations as much as possible and provide the highest level of precision. The closing force is produced by a thrust from the hydraulic cylinder (D), which enables the device to cut even the most resistant materials.

The structure of the mouth and the arrangement of the interchangeable blades guarantee a linear, precise cut of the scrap cut, simplifying the loading work and reducing the cost of movement and transport, limiting machinery downtime as a result.

The supporting structure and the jaw are made from wear-resistant steel with high elasticity. This ensures excellent anti-abrasion characteristics together with exceptional mechanical strength enabling it to support the weight of the attachment. The hinges are made of thermally-treated steel alloy and rotate on hardened, ground bushings with grooves for internal lubrication. A “speed multiplier” valve is used in certain models which recovers and reuses the drained oil to reduce cycle time when closing the jaw and moving towards the material.

4.2. Permitted environmental conditions

The attachment is suitable for operating in environments that are:

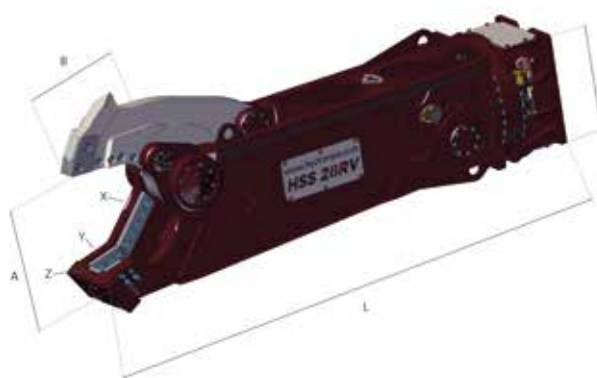
- At altitudes no higher than 3,000m above sea level;
- At temperatures between -20 °C and +50 °C with an average temperature of about 25°C;
- At relative humidity between 30% and 95%.

⚠ WARNING!

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

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

4.3. Attachment technical data



		HSS-2RV	HSS-3RV	HSS-6RV	HSS-10RV	HSS-14V	HSS-22RV	HSS-28RV	HSS-34RV
Excavatorclass	T.	1.5 - 3	4 - 5	5 - 8	8 - 12	12 - 18	18 - 23	23 - 30	30 - 38
Weight	Kg.	185	300	610	1020	1360	2180	2840	3360
Jaw opening	mm.	-	265	340	405	475	535	575	615
Jaw depth	mm.	-	230	320	355	385	445	495	545
Workingpressure	Bar	-	220	300	350	350	350	350	350
Oilflow at open/close	L/min.	-	80 - 100	80 - 150	100 - 150	150 - 250	180 - 250	200 - 300	200 - 300
Workingpressure rotation	Bar	-	120	120	120	140	140	140	140
Oilflow rotation	L/min.	-	5	10	10	10	10	10	10
Open/close	Sec.	-	1.0 / 2.8	1.0 / 2.0	1.9 / 3.6	1.9 / 2.5	2.0 / 2.8	2.9 / 2.9	3.9 / 4.1
A	mm.	-	265	340	405	475	535	570	615
B	mm.	-	230	320	370	385	445	505	545
C	mm.	-	380	460	570	570	715	715	715
L	mm.	-	1330	1725	2180	2300	2660	2950	3130
X	T.	-	131	148	260	299	331	558	666
Y	T.	-	62	68	109	125	146	239	278
Z	T.	-	34	40	60	73	80	133	152



		HSS-45RV	HSS-52RV	HSS-62RV	HSS-82RV	HSS-110RV	HSS-140RV	HSS-180RV	HSS-220RV
Excavatorclass	T.	40 - 50	52 - 65	55 - 70	75 - 100	120 - 150	140 - 170	140 - 210	200 - 280
Weight	Kg.	4380	5160	6480	8230	11680	14300	18340	21850
Jaw opening	mm.	680	730	780	845	920	1078	1100	1180
Jaw depth	mm.	600	640	690	710	780	1020	1080	1130
Workingpressure	Bar	350	350	350	350	350	350	350	350
Oilflow at open/close	L/min.	300 - 400	350 - 450	400 - 500	450 - 600	500 - 800	600 - 900	700 - 1000	900 - 1200
Workingpressure rotation	Bar	140	140	140	140	140	140	240	240
Oilflow rotation	L/min.	10	10	30	30	50	50	50	50
Open/close	Sec.	3.4 / 4.0	3.2 / 4.0	3.0 / 4.1	3.8 / 4.7	4.2 / 5.1	4.3 / 5.2	4.6 / 5.3	4.8 / 5.8
A	mm.	660	725	780	845	920	1090	1100	1180
B	mm.	610	675	690	710	780	1060	1080	1130
C	mm.	865	865	1000	1100	1200	1300	1325	1750
L	mm.	3435	3660	3905	4190	4400	5400	5440	5580
X	T.	726	835	847	987	1301	1734	1810	1865
Y	T.	327	345	350	454	581	686	738	836
Z	T.	176	185	194	249	321	371	399	424

5. Installation

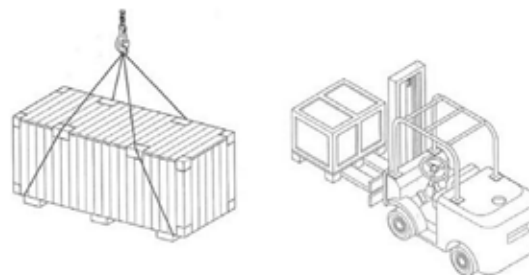
5.1. Moving and handling



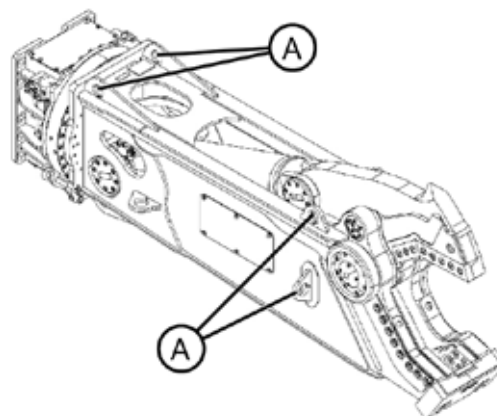
The attachment may be shipped on wooden beams or pallets, or in a crate, depending on the destination and the customer's request.

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 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 relative eyelets (A).



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;
- Lubricate all parts of the attachment;
- Protect the attachment from shocks and stress;
- Protect the attachment from humidity and large temperature variations;
- Keep the attachment away from corrosive substances.

5.3. Coupling check

Assembly preparations

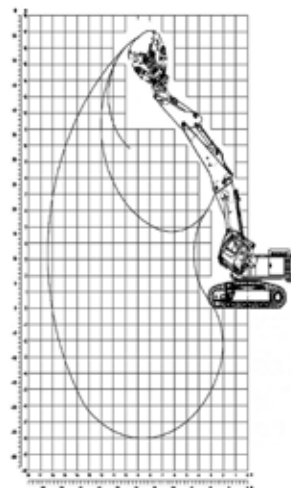
before installing the attachment, it is necessary to prepare a manoeuvring area that is adequate for the dimensions of the attachment and the lifting equipment to be used. Before mounting the attachment on the operating machine, check that the latter is stable, i.e., that the lifting capacity (LC) of the machine is sufficient to meet the essential safety requirements to avoid it tipping over.

To do this, you must:

- Check the minimum 360° lifting capacity value (LCmin) indicated in the specifications of the operating machine;
- Check the Mass M of the attachment, as indicated on the identification plate.

Ensure that: $M \times K \leq LC_{min}$

where K is a correction factor that takes into account the bounce of the attachment beyond the bucket hinge point: in the case of crushers and pulverisers $K=1.2$. If this condition is not met, the attachment **MAY NOT** be mounted onto the machine.



⚠ WARNING!

This condition only ensures the stability of the operating machine when working on flat, horizontal and unyielding ground.

5.4. Mounting the attachment on the operating machine in bucket position

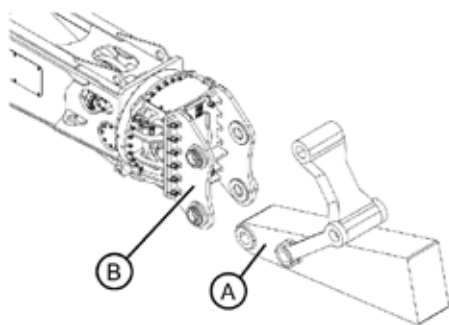
A residual risk is a hazard that cannot be completely eliminated through design and protective techniques or a potential hazard that is not obvious.

The mounting procedure begins with the attachment supported stably on the ground (see figure), the operating machine engine switched off and the parking brakes engaged. If the attachment is supplied without the operating machine couplings, the customer/operator shall be responsible for supplying and fitting suitable connection couplings that are compatible with the specifications of the operating machine.

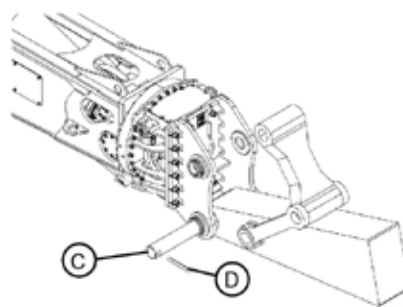
Proceed as follows:

Rotate the attachment coupling vertically. Clean the inside surfaces of the coupling with a cloth. Carefully clean the pins and bushings of the fitting of the attachment to remove any dirt.

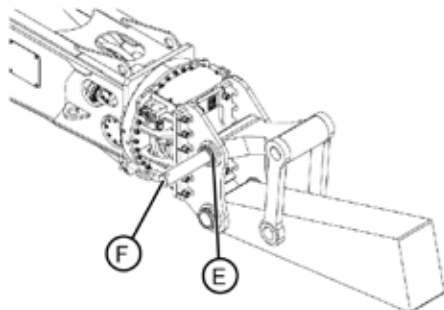
1. Move the operating machine close to the attachment, inserting the arm (A) into the adapter plate (B).



2. Insert the first pin (C) checking it is aligned correctly and secure it in position using the dedicated own safety system (D) (screws, cotter pins, etc.)



3. Move the arm so that the upper hole (E) on the saddle is aligned with the hole on the arm piston rod and insert the second pin (F), securing it in position with an appropriate safety system.



⚠ IMPORTANT!

Whenever carrying out mounting operations, never force the pins but are aligned correctly

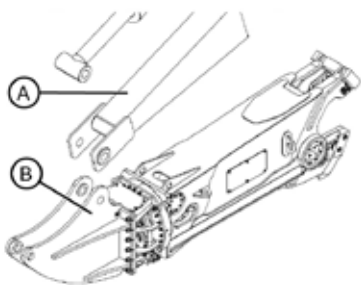
5.5. Mounting the attachment on the operating machine in arm position

⚠ WARNING!

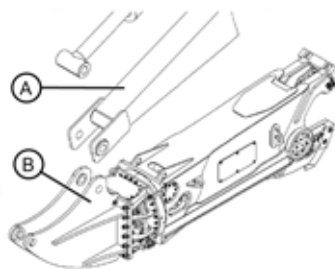
There should be a lifting device on site to carry out this kind of assembly with special coupling devices compliant with current legislation in the country in question.

The mounting procedure begins with the attachment horizontally and stably positioned on the ground with adequate support, and with the operating machine engine switched off and the parking brakes engaged. If the attachment is supplied without the operating machine couplings, the customer/operator shall be responsible for supplying and fitting suitable connection couplings that are compatible with the specifications of the operating machine.

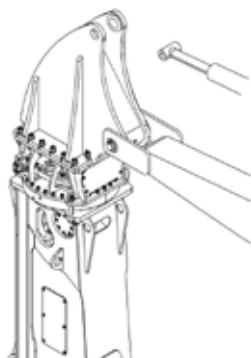
1. Clean the inside surfaces of the coupling with a cloth.
2. Carefully clean the pins and bushings of the fitting of the attachment to remove any dirt.
3. Bring the operating machine arm (A) near the attachment plate (B).



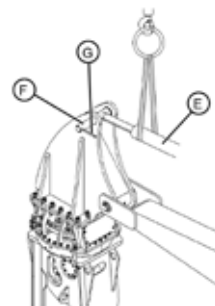
4. Insert the arm (A) until there is full alignment between the arm opening and plate opening (B).
5. Insert the first pin (C) checking it is aligned correctly and secure it in position using the dedicated own safety system (D) (screws, cotter pins, etc.)



6. Activating the arm, partially lift the attachment, leaving it lying on the ground. Make sure that the arm keeps the attachment in a stable position.



7. Couple the cylinder (E) to the lifting device and activate the cylinder itself in order to align the opening on the rod head with the second opening on the plate.
8. Insert the second pin (F), fastening it with the specific safety system foreseen (G).



5.6. Use on construction cranes

The range of possible applications for the HSS Series hydraulic demolition attachments includes installation on construction cranes. Below is a list of operating systems, rules and requirements that must be respected when using the attachment in this way.

- The first rule to follow when the attachment is installed is to check that the load bearing capacity of the construction crane is at least 2.4 times the operating weight of the attachment. This safety coefficient is double that which applies when mounting it on a hydraulic excavator.
- A external hydraulic control unit (See hydraulic connections) is necessary when using the attachment with a construction crane.
- The attachment must be used exclusively for demolition and not for transporting or moving objects.
- The demolition attachment and the construction crane must be used separately. The operator must use the two machines at different times.
- The attachment can work either vertically or horizontally depending on the type of structure to be demolished, so long as it is always attached to the couplings provided.
- Check the stability of the couplings and cables that support the attachment before every work cycle.

5.7. Hydraulic connections



The hydraulic system is connected by connecting the hydraulic fittings on the attachment to the corresponding fittings on the operating machine.

This is done for both the attachment hydraulic rotation fittings (if present), and those used for opening and closing the attachment. Connect the flexible hoses between the operating machine and the attachment (in accordance with the standard SAE J517 or DIN 20066 standards) and tighten the screws or fittings.









❗ IMPORTANT!




The presence of dirt (sand, gravel or dust) on the fittings could damage the attachment hydraulic system. The ROTATION system must be connected to a delivery and corresponding return line, in addition to a drain outlet when required.

The OPENING/CLOSING system must to be connected to a delivery and corresponding return line. Take care to ensure the two hydraulic systems are kept separate.

To ensure the attachment works correctly, the hydraulic system filters on the operating machine must undergo regular maintenance. Contamination must not exceed "11" on the NAS scale.

TECHNICAL CONNECTION SPECIFICATIONS

Hydraulic connections				
Attachment		A	B	Operating machine
Power				
Rotation				
Drainage				

									
A	B	B optional	A	B	B optional	A	B	B optional	HSS series
3/8" Gas	3/8" Gas	S 16 (M24x1.5)	1/4" Gas	1/4" Gas	L 12 (M18x1.5)	/	/	/	HSS-3RV
3/4" Gas	3/4" Gas	S 25 (M42x2)	3/8" Gas	3/8" Gas	S 16 (M24x1.5)	/	/	/	HSS-6RV HSS-10RV HSS-14RV
1" SAE 6000	1" Gas	S 30 (M36x2)	3/8" Gas	3/8" Gas	S 16 (M24x1.5)	/	/	/	HSS-22RV HSS-34RV HSS-45RV HSS-52RV
1" 1/4 SAE 6000	1" 1/4 SAE 6000	1" 1/4 Gas	1/2" Gas	1/2" Gas	S 16 (M24x1.5)	1/4" Gas	1/4" Gas	L 12 (M18x1.5)	HSS-62RV
1" 1/2 SAE 6000	1" 1/2 SAE 6000	1" 1/2 Gas	1/2" Gas	1/2" Gas	S 16 (M24x1.5)	1/4" Gas	1/4" Gas	L 12 (M18x1.5)	HSS-82RV HSS-110RV
1" 1/2 SAE 6000	1" 1/2 SAE 6000	1" 1/2 Gas	3/4" Gas	3/4" Gas	S 25 (M36x2)	1/2" Gas	1/2" Gas	S 16 (M24x1.5)	HSS-140RV HSS-180RV HSS-220RV

The operating machine output pressure and flow rate must always conform to the requirements of the attachment in use (see Attachment Specifications). If this is not possible, the system must be equipped with reduction valves (contact the manufacturer of the operating machine or a specialized workshop). Do not use the attachment without check that the pressure and oil flow of the operating machine are those required. Before using the attachment start the operating machine and pressurise the hydraulic system slowly to as to avoid any backlash, until it reaches the maximum operating pressure, which should conform to the specifications shown on the identification plate of the attachment. While the engine is running at idling speed, open the attachment 1/4 of the way, and then close it again, open it half way, and then close it again, open it 3/4 of the way, and then close it again, and then finally, open it fully and close it again. Open and close the attachment 5 or 6 times, checking that there are no leaks along the hydraulic circuits.

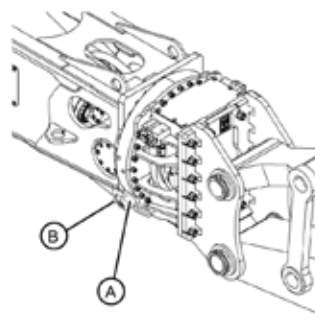
❗ IMPORTANT!

Before using the attachment for cutting operations, move it to an open space with no obstacles or persons within the range of action of the operating machine and perform a series of unladen manoeuvres to familiarize yourself with its workings. At this point, the attachment is ready for work.

5.8. Stopping and disassembly

Upon completing work and before lowering the attachment to the ground, proceed as follows:

- Using the ROTATION control on the operating machine, rotate the attachment so as to be able to insert the stopping pin (A) in the holes on the body and the adapter plate.
- Insert the respective cotter pin (B).



⚠ WARNING!

Check that the rotation locking pin has been inserted correctly to avoid unexpected movements of the attachment during transport.

- Using the operating machine OPEN/CLOSE control, open the jaw completely so that the attachment rod is retracted fully inside the cylinder.
- Place the attachment on two wooden supports on the ground, aligning it horizontally.
- Switch off the machine engine.
- Release the hydraulic pressure by operating the OPEN/CLOSE controls on the attachment several times while the engine is switched off and while depressurising the oil tank.
- Make sure that there is no residual pressure in the hydraulic system.
- Loosen the screws or fittings on the hoses and insert the safety plugs.

⚠ WARNING!

When disconnecting the hoses, take care to collect the oil in suitable containers. Do not spill oil on the ground.

- In order to dismantle the attachment, follow the assembly instructions in the relative paragraph, in reverse (bucket position or arm position).
- Use the lifting points indicated by the adhesive labels (see Moving and handling) after dismantling, if the attachment needs to be lifted or moved for any reason.
- Place the attachment in a dry, protected place.

6. Using the attachment

6.1. Putting into operation



Carry out the following checks each time before using the attachment:

- Check all the safety systems;
- Check safety panels and signage.

Operators must carry out a series of checks and controls designed to prevent errors or accidents during use each time before using the attachment:

- Check that the attachment has not been damaged during assembly;
- Carefully check the integrity of the hydraulic hoses, valves and various components;
- Check that all moving and rotating parts move freely;
- Check that the hydraulic couplings are tight to prevent dangerous leaks.

⚠ WARNING!

Carefully perform a visual inspection of the whole equipment and make sure that there are no objects or persons obstructing its normal operation and/or that no objects have inadvertently been left on top of it.

6.2. Operating cycle

- Move the operating machine to the work site.
- Ensure no personnel are present within the working range of the operating machine or in danger areas.
- Move the attachment, with its jaw open, towards the material to be cut, check that the material is well positioned in the attachment (if necessary move the excavator arm or rotate it to optimise its grip) and close the jaw to complete the operation.
- During the operation, make sure that the force is sufficient. If not, release the material by opening the jaw and close again, if necessary, on a different area of the material to be demolished.
- Once the cutting operation has been completed, move the operating machine away from the work site, making sure that there are no unstable parts or pieces in positions that are potentially dangerous for the operators assigned to clear away and/or load the material.

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

The user is responsible for the correct disposal of the waste produced by the attachment in conformity with the laws in force in the country of use. Lubricants and replaced parts must be disposed of in conformity with the laws in force in the country where the attachment is used.

6.6. Dismantling

When dismantling the attachment, the plastic parts must be separated and sent to the appropriate collection centre, in conformity with the applicable legislation. As for the metal elements of the attachment, it is sufficient to separate the steel pieces from those made of other metals or alloys, so they can be correctly sent for recycling by fusion.

7. 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

This attachment is subject to three levels of maintenance:

- Regular
- Scheduled
- Extraordinary

These include 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;
- 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 fault conditions;
- Check that the mechanical parts are always well lubricated (only those components that need lubrication).

⚠ 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. Regular maintenance



Regular maintenance must be carried out by a mechanic and includes inspections and checks intended to monitor the state of the attachment. The machine must be isolated for maintenance.

Daily Maintenance

1. Visual inspection of the structure of the attachment to find any faults (specifically the saddle connections between the attachment and the operating machine).
2. Check the play between the pins and bushings of the adapter plate.
3. Check that there are no cracks in the welds
4. Visual check of the cylinder and valves, and that the fittings are tight and hydraulic tubes are undamaged.
5. Check for the metal identification plate with the declaration of conformity of the attachment and its main technical specifications.
6. Check that the hazard warning labels on the attachment are present and in good condition. Replace any that are missing or difficult to read.

⚠ WARNING!

Failure to observe these requirements will release the manufacturer from any liability under the guarantee.

7.4. Scheduled maintenance



Scheduled maintenance must be carried out by a mechanic and includes inspections, checks and maintenance to ensure the attachment continues to function efficiently.

⚠ WARNING!

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



Scheduled maintenance table

The machine must be isolated for maintenance.

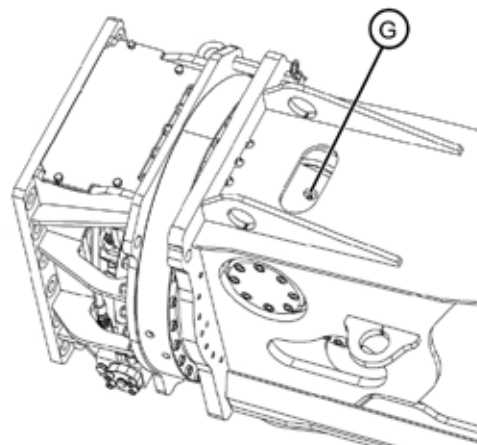
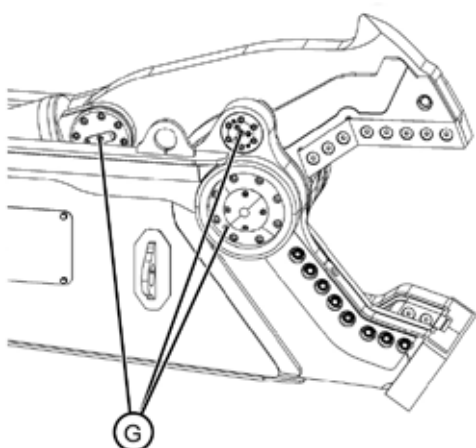
Interval	Operation
Every 8 hours	Grease the hinges, including the slew ring, and replace any damaged grease lubricators (see Lubrication).
Every 8 hours	Check that none of the screws are loose or damaged.
Every 40 hours	Check the play between the pins and bushings on the adapter plate (if the play is greater than 0.6 mm, replace the bushings or pin).
Every 40 hours	Use a feeler gauge to check the play between the blades, which must be between 0.2 and 1.2 mm. If the play exceeds this limit, insert shims as necessary (see Adjusting and replacing the blades).
Every 40 hours	Lubricate the pinion and the teeth on the slew ring.
Every 40 hours	Check the clutch locking clearance which should be between 0.1 mm and 0.2 mm. If the clearance exceeds this limit, adjust it (see Extraordinary Maintenance).
Every 6 months	Check that the gaskets on the slew ring are intact.
Recommended every 12 months	Check that there are no internal leaks on the cylinder.

7.4.1 Lubrication

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



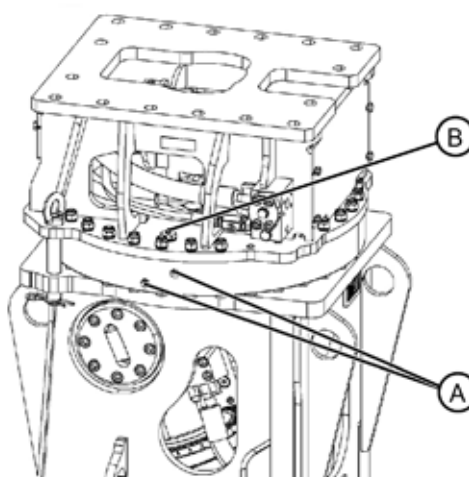
Lubrication intervals must be determined based on operating conditions. The attachment must be re-lubricated before or after prolonged periods of inactivity. This is especially true for the winter break. Take care that no detergent penetrates the ball roller system or damages the gaskets.



! 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.

Once the attachment has been mounted on the operating machine, lubricate the ball rolling system (A) and the teeth (B) using the lubricators on either side. The lubricants used for this and all subsequent lubricating procedures must be acid and resin free, non-hygroscopic, resistant to ageing and suitable for use at the bearing operating temperature range (see table below). The purpose of the complete greasing procedure is to reduce friction, create a seal and protect against corrosion. We recommend applying the grease until it begins to escape via the bearing labyrinth seals or the sealing gaskets. There are synthetic spacers fitted between the revolving bodies in the rolling tracks: the use of aggressive products changes the properties of the grease, corrodes the rolling tracks and damages the spacers.



7.4.2. Table of lubricants

We have checked the compatibility of the greases shown in the table with the materials used for spacers and gaskets and consider them suitable for use in the bearings. For this reason, if the user wishes to use lubricants differing from those shown here they must obtain confirmation from the supplier or maker that the selected lubricant is suitable for use and that its specifications are at least equivalent to those of the products listed in the table. Use at low temperatures requires special lubricants.

The maintenance personnel are responsible for determining the quantity of lubricant required through scheduled checks of the condition of the lubricant.

● = Greases for use with ball rolling system/hinges

▲ = Greases for use with teeth

Brand	Type	Name	Ambient temperature
BP	●	Energrease LS-EP2	from -20° to +120°C
	▲	Energrease LC 2	from -25° to +160°C
CASTROL	●	Spheerol EPL 2	from -30° to +130°C
	▲	Castrol LZV-EP	from -30° to +130°C
ELF	●	EPEXA 2	from -30° to +130°C
	▲	CARDREXA GR 1-AL	from -30° to +130°C
ESSO	●	BEACON EP2	from -30° to +130°C
	▲	Esso Multi-Purpose Grease (Moly)	from -30° to +130°C
IP	●	Athesia EP 2	from -25° to + 100°C
	▲	Viscum Fluids	from -10° to +150°C
MOBIL	●	Mobilux EP 2	from -30° to +130°C
	▲	Mobiltac 81	from -30° to +130°C
KLUBER	●	CENTOPLEX 2 EP	from -30° to +130°C
	▲	GRAFLOSCON C-SG 0 ultra	from -30° to +130°C
SHELL	●	Shell Alvania EP (LF) 2	from -30° to +130°C
	▲	Shell Malleus GL 95	from -30° to +130°C

7.4.3. Tightening the screws

Tightening must be performed exclusively by specialised technicians using a torque wrench and applying the torque values indicated in the table Tightening Torques and Stresses. The screws may only be re-tightened once, after which they must be replaced.

Tightening Torques and Stresses										
UNI 3740			6S		8.8-(8G)		10.9-(10K)		12.9-(12K)	
Nominal Diameter	Wide pitch	Resistant section	Tightening torque	Tightening stress on the screw	Tightening torque	Tightening stress on the screw	Tightening torque	Tightening stress on the screw	Tightening torque	Tightening stress on the screw
d	p	s	(M)	(P)	(M)	(P)	(M)	(P)	(M)	(P)
mm	mm	mm ²	Nm	KN	Nm	KN	Nm	KN	Nm	KN
M5	0.8	12.03	5.10	5.3	5.98	6.3	8.50	8.8	10.20	10.6
M6	1	17.3	8.73	7.5	10.3	8.8	14.7	12.4	17.6	14.9
M8	1.25	31.9	21.58	13.7	25.5	16.2	35.30	22.8	42	27.4
M10	1.5	50.9	42.2	21.8	50	25.8	70.6	36.3	85.5	43.60
M12	1.75	74.3	73.6	31.8	87.3	37.7	122.6	52.9	147	63.6
M14	2	102	116.7	43.7	138.3	51.7	194.2	72.7	235.5	87.3
M16	2	141	178.5	60	210.9	71.20	299.2	100	358	120
M18	2.5	171	245	73	289.4	86.5	412	121.6	490.5	146.1
M20	2.5	220	348.5	93.9	412	111.3	578.8	156.5	696.5	187.8
M22	2.5	276	471	117.3	559.2	139.3	784.8	195.7	942	234.5
M24	3	317	598.5	135.4	711.2	160.4	1000.5	225.6	1197	271
M27	3	419	888	178.1	1049.7	210.9	1481	296.3	1776	356
M30	3.5	509	1206.5	215.8	1422.4	256	2011	360	2403	432.6
M33	3.5	636	1628.5	269.8	1932.6	319.8	2717	449.3	3267	539.6

7.5 Extraordinary Maintenance



Extraordinary maintenance must be carried out by a mechanic and includes maintenance, repairs and the replacement of components to ensure the attachment runs correctly.

⚠ WARNING!

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



Scheduled maintenance table

The machine must be isolated for maintenance.

Interval	Operation
When necessary	Adjusting the clutch lock
	Adjusting blades (in vent of excessive play).
	Replacing worn blades.
	Rotating the blades (in event of worn profile).
	Restoring the anti-wear material.

7.5.1. Adjusting and replacing the blades

The paragraphs that follow describe the operations to be performed on the attachment when it is necessary to adjust or replace components subject to wear (due to normal use when cutting materials).

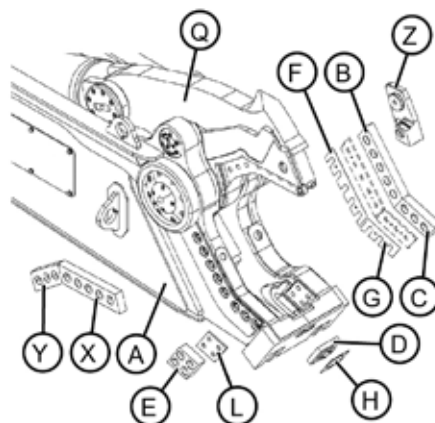
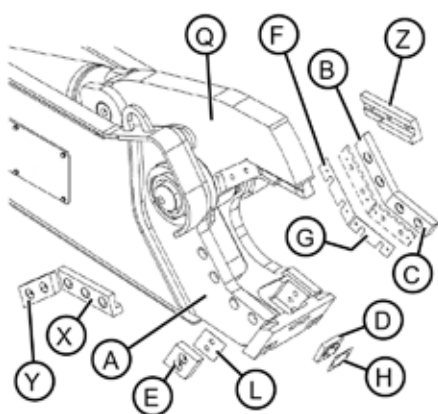
ⓘ IMPORTANT!

Excessive play between the cutting blades leads to material becoming jammed and, as a result, a considerable reduction of perforating efficiency. The jammed material can create hazardous situations.

Component subject to adjustment and/or wear:

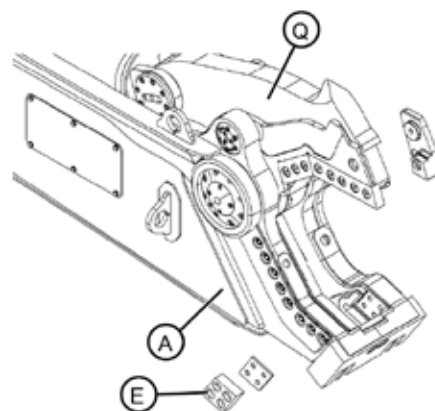
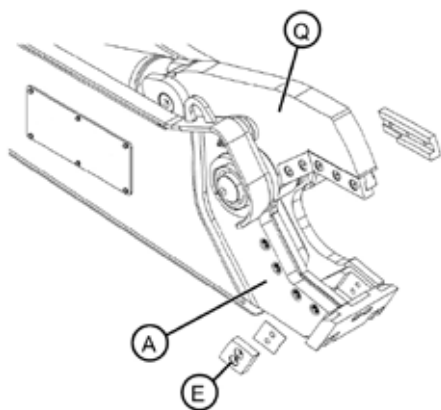
- (A) Chassis
- (B) Primary lower blade
- (C) Secondary lower blade
- (D) Front blade
- (E) Guide blade
- (F) Primary shim
- (G) Secondary shim
- (H) Front shim
- (L) Guide shim
- (Q) Jaw
- (X) Secondary upper blade
- (Y) Primary upper blade
- (Z) Tip blade

The shape of the attachment may vary depending on the model.



Guide blade

The guide blade (E) is located on the front of the chassis (A) and is used to guide the jaw (Q) when cutting the material.

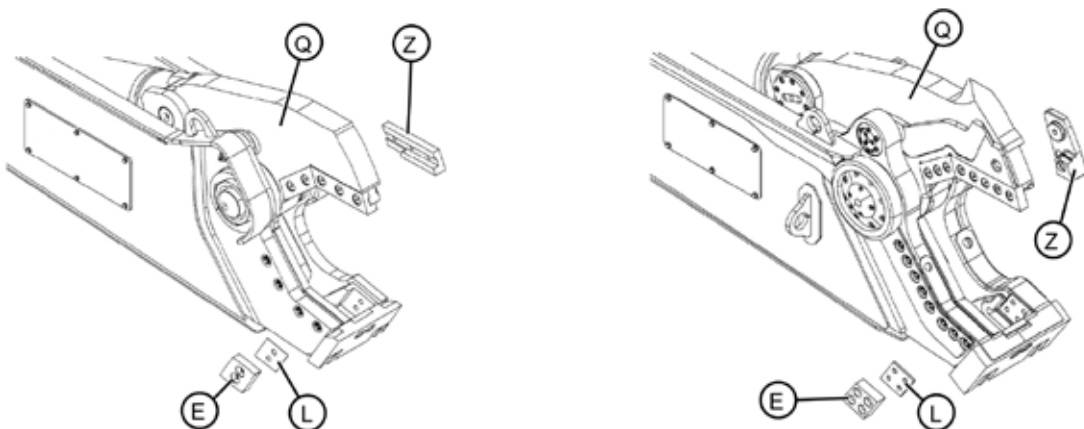


DANGER!

When adjusting the blades, it is necessary to move the jaw. Ensure no one is in the danger area or in areas where the operator cannot see them.

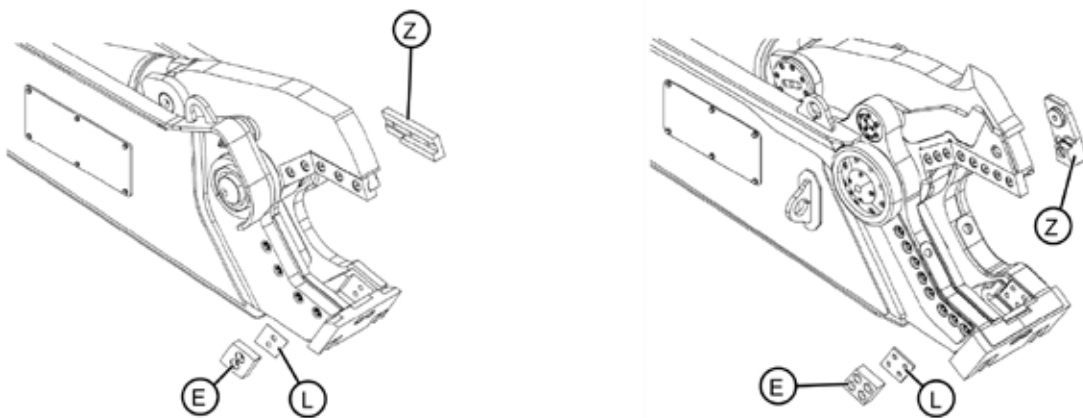
Adjustment

- Partially close the jaw of the attachment so that the tip blade (Z) on the jaw (Q) meets the guide blade (E).
- Slowly move the jaw (Q) and check the clearance between the tip blade (Z) and the guide blade (E) in several positions. Make sure that it never exceeds 0.4 mm (it is initially adjusted to 0.15 mm).
- If the clearance exceeds this limit, insert shims (L) behind the guide blade to restore the tolerance level.
- If the clearance remains excessive despite the use of all the shims, the guide blade (E) can be rotated a maximum of four times.



Replacement

- If the play remains excessive, even when all the shims provided (L) have been used, and after having rotated it, the guide blade (E) must be replaced.
- Remove the worn guide blade and all the shims by loosening the screws.
- Install the new blade guide, without inserting the shims.
- Repeat the adjustment between the guide blade (E) and the tip blade (Z).
- If, after replacing the guide blade (E), the play is still excessive, even when all the shims provided have been used, the tip blade (Z) must be replaced.

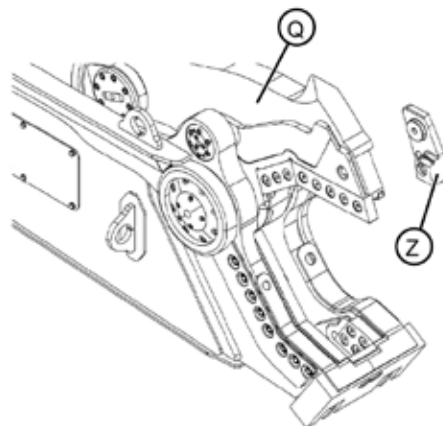
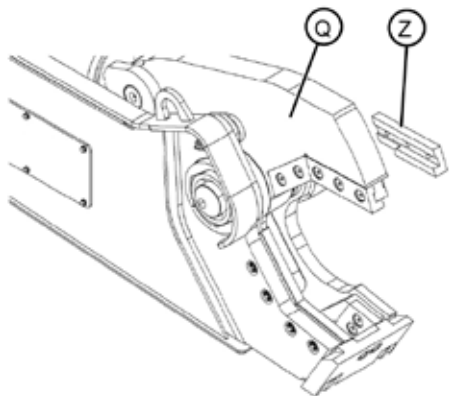


❗ IMPORTANT!

Turning the blades of the attachment increases the quality of the cut and extends the life of the blades.

Tip blade

The tip blade (Z) is located on the front of the jaw (Q) and is used to penetrate the material to start the cut.



DANGER!

When adjusting the blades, it is necessary to move the jaw. Ensure no one is in the danger area or in areas where the operator cannot see them.

Adjustment:

There are no adjustments to this component.

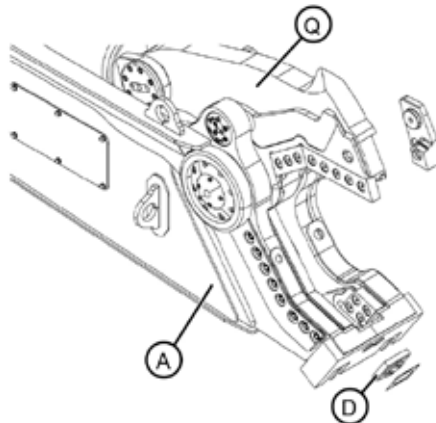
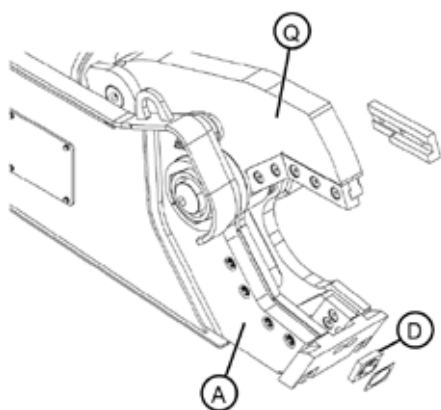
Replacement:

- To replace the tip blade (Z) loosen the locking screws.
- Remove the worn blade and install the new tip blade.

After replacement, adjust to restore the tolerances with respect to the guide blade.

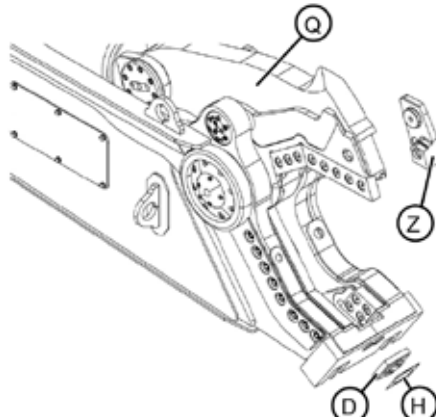
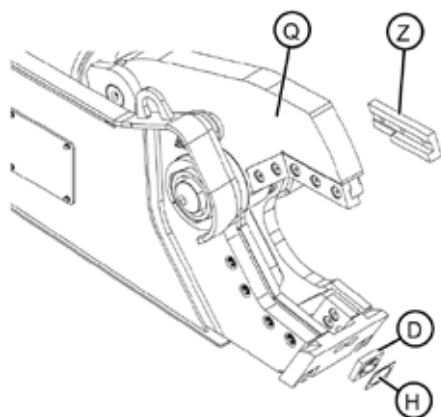
Front blade

The front blade (D) is located at the front of the chassis (A) and is used to improve the penetration of the jaw (Q).



Adjustment

- Slowly move the jaw (Q) and check the clearance between the tip blade (Z) and the front blade (D). Make sure that it never exceeds 0.4mm (it is initially adjusted to 0.15mm).
- Insert shims (H) as necessary.
- If the clearance remains excessive despite the use of all the shims, the front blade can be rotated a maximum of 4 times.
- Replace the front blade if excessively worn.

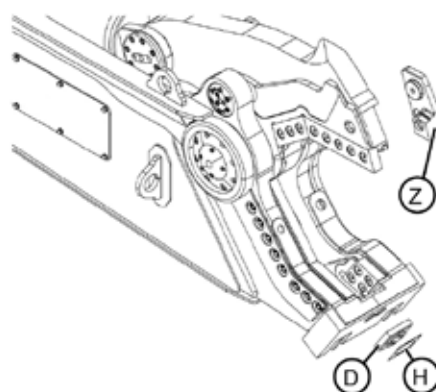
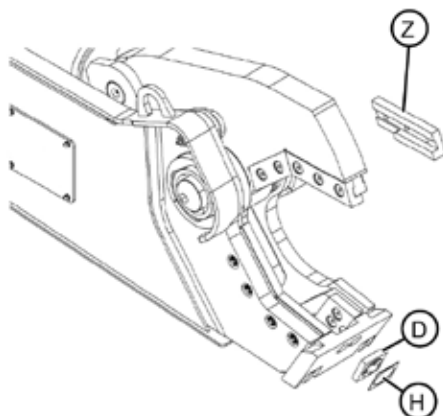


! IMPORTANT!

Turning the blades of the attachment increases the quality of the cut and extends the life of the blades.

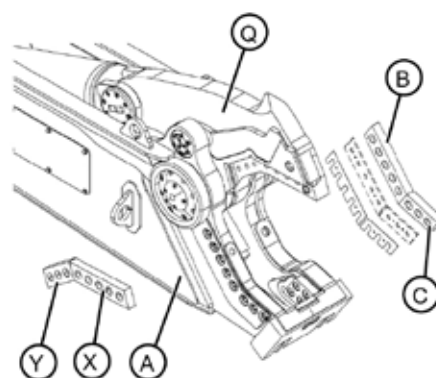
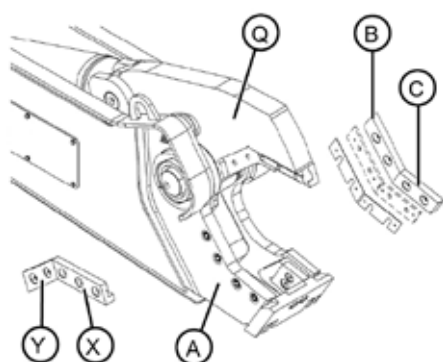
Replacement

- If there is still excessive clearance despite using all the shims provided (H) and after having rotated it, then the front blade (D) must be replaced.
- Remove the worn front blade and all the shims by loosening the screws.
- Install the new front blade without inserting the shims.
- Repeat the adjustment of the clearance between the front blade (D) and the tip blade (Z).
- If there is still excessive clearance even after replacing the front blade (D) and despite using all the shims provided, the tip blade (Z) should be replaced.



Primary and secondary blades

The primary and secondary blades (B, C, X and Y) are both located on the front part of the chassis (A) and the jaw (Q) and perform the main cutting function.

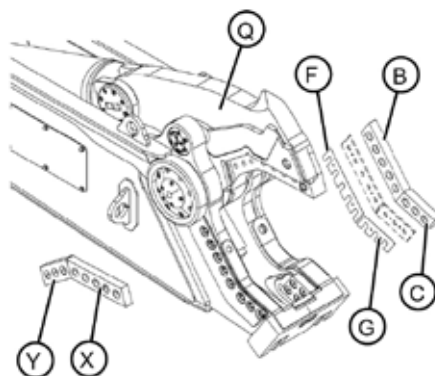
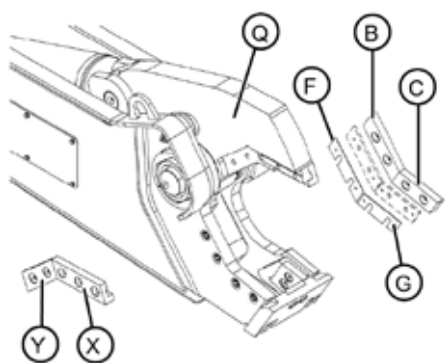


DANGER!

When adjusting the blades, it is necessary to move the jaw. Ensure no one is in the danger area or in areas where the operator cannot see them.

Adjustment

- Slowly move the jaw (Q) and check clearance between the blades on the chassis (B and C) and the blades on the jaw (X and Y). Make sure that it never exceeds 0.4 mm (it is initially adjusted to 0.1 mm).
- Loosen the locking bolts on the blades (B and C) located on the chassis (without removing them), insert one or more adjustment shims (F and G) and then re-tighten the bolts.
- If there is still excessive clearance, despite using all the shims provided (F and G), the blades on both the chassis and jaw can be rotated.
- If the blades are very worn, they must be replaced.

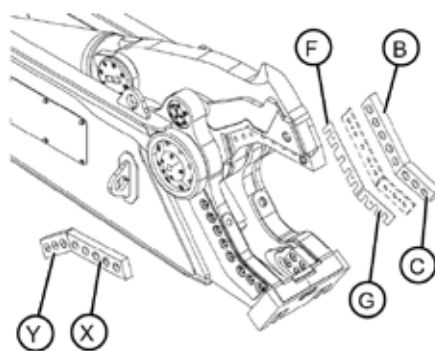
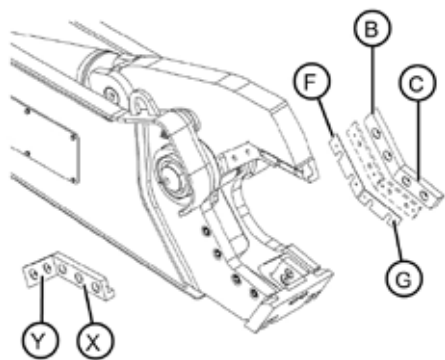


❗ IMPORTANT!

Turning the blades of the attachment increases the quality of the cut and extends the life of the blades.

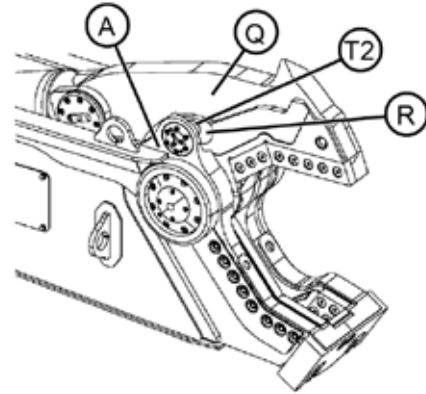
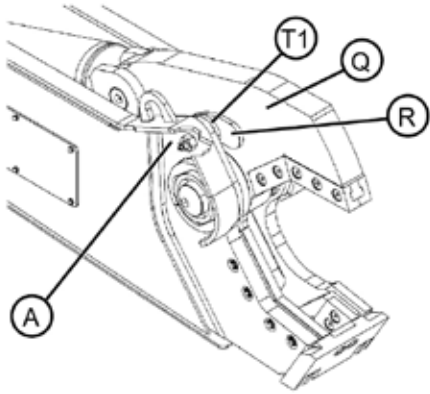
Replacement

- If the play remains excessive, despite using all the shims provided (F and G) and after having rotated them, it is necessary to replace the blades (B, C, X and Y).
- Remove the worn guide blade and all the shims by loosening the locking screws.
- Install the new blade and repeat the adjustment of the play between the blades (B, C, X and Y).



7.5.2. Clutch adjustment and replacement

The clutch lock (T1-T2) can be found on the attachment chassis (A) above the central pin and serves to guide the jaw (Q) when cutting and avoid making a dent. This is an adjustment slide which comes slightly into contact with the skimming surface (R) of the jaw. Some models have a clutch (T1) on one side only with screw adjustment, while others have a clutch on either side (T2) with shim adjustment.



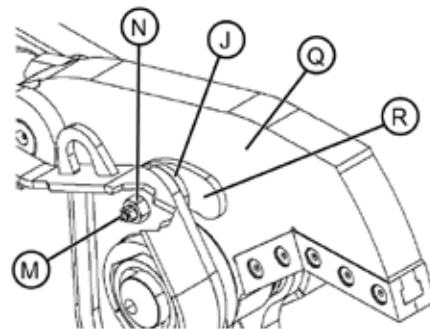
DANGER!

When adjusting the blades, it is necessary to move the jaw. Ensure no one is in the danger area or in areas where the operator cannot see them.

Clutch lock (with screw adjustment)

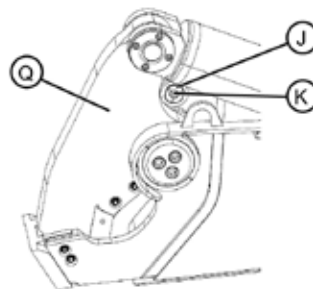
Adjustment

- Close the jaw (Q) carefully until the adjustment slide (J) on the clutch lock is centred on the skimming surface (R).
- Slacken the nut (N) and rotate the adjustment screw (M) (push the adjustment slide clockwise against the jaw's skimming surface).
- Check that the clearance between the parts is between 0.1 mm and 0.2 mm and tighten the locking nut (N).
- Never over tighten the adjustment slide against the skimming surface to block the movement of the jaw.

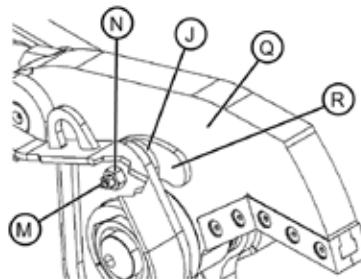


Replacement

- Carefully close the jaw (Q) fully.
- Slacken the screw (K) and remove the slide (J).
- Fit the slide again.



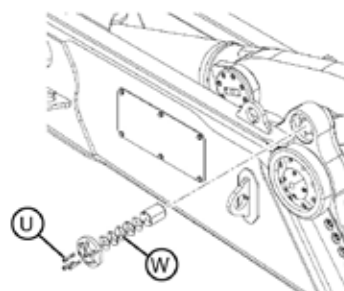
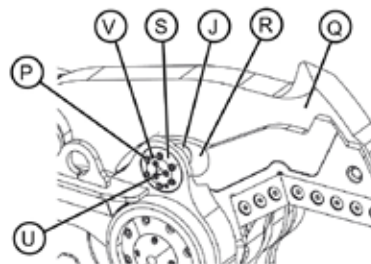
- Slacken the nut (N) and unscrew the adjustment screw (M).
- Open the jaw (Q) carefully until the slide (J) is centred on the skimming surface (R).
- Adjust the slide.



Clutch lock (with shim adjustment)

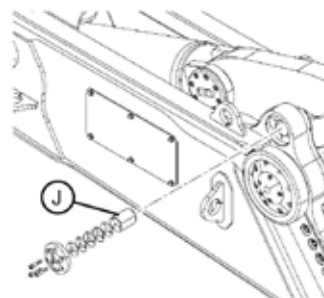
Adjustment

- Close the jaw (Q) carefully until the clutch lock slide (J) is centred on the skimming surface (R).
- Slacken the 3 screws (U).
- Unscrew the 6 screws (P) and remove the flange (S) with the slide. In the event of difficulties, unscrew the 2 dowels (V) and screw in 2 screws in their place to use as extractors.
- After removing the clutch lock, slacken the 3 screws (U), add or remove one shim (W) and re-assemble everything.
- Check that the clearance between the parts is between 0.1 mm and 0.2 mm. Repeat shimming if this is not the case.



Replacement

- Remove the clutch lock as described above.
- Replace the slide (J).
- Re-assemble everything and make sure that the clearance between the parts is between 0.1 mm and 0.2 mm. Repeat shimming if this is not the case.



7.5.3. Anti-wear material

Periodically, check the state of deterioration of the jaws on the attachment and replace the anti-wear material when necessary. The material must be applied in accordance with the instructions below.

WARNING!

- Before replacing the material, carefully remove any paint residues to avoid releasing toxic vapours. Also, remove any deposits of cement, concrete and accumulated crushing waste on the part to be filled.
- Before adding welded material, make sure there is no oil or inflammable liquids near the working area.

To add the wear repair material, connect the ground pole of the welding machine to the part to be welded, as close as possible to the welding area. The ground pole must be connected so that the current does not pass through the hinges or the hydraulic cylinder. If the attachment is mounted on the operating machine during welding, follow the instructions in the manual supplied with the latter to avoid damaging its battery or electronics.

- After carefully cleaning the area where material is to be added and the surrounding area, pre-heat to 150 °C to 200 °C, checking the temperature frequently. Exceeding these temperatures can alter the mechanical properties of the material.
- Do not deposit more than two overlapping layers on attachment jaws or on the part to be filled. If the part in question is significantly worn, insert shaped and bevelled material to restore the part to its original dimensions. Then, proceed with welding the piece and filling it.
- Grind the ends of the fill material beads.
- Allow the part to cool slowly in the absence of air drafts.
- Follow the technical application standards recommended by the manufacturer of the repair wire.

To add material use 57 HRC (600 Brinell) repair wire, Ø 1.2 mm K 300.

The recommended wires are:

UTP: A67S Ø 1.2 mm

FORTARGEN: A7111 MIG Ø 1.2 mm



DANGER!

Before replacing material, it is necessary to switch off the operating machine and wear suitable PPE (gloves, goggles, safety shoes and suitable clothing).

7.6. Diagnostics and troubleshooting

General requirements

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.

Problem	Possible cause	Possible solution
Lower than expected crushing power	The operating machine is not delivering adequate pressure to the attachment's hydraulic circuit.	→ Check the pressures on the operating machine.
	The speed valve is incorrectly calibrated.	→ Calibrate the speed valve.
	The speed valve gasket seals are damaged.	→ Replace the gasket seals on the speed valve.
	The attachment cylinder gasket seals are damaged.	→ Replace the gasket seals on the cylinder.
	The attachment rotating joint seals are damaged.	→ Replace the gasket seals on the rotating joint.
Problems when cutting	The dimensions or resistance of the material are greater than the attachment cutting capacity.	→ See Technical data.
	The blades are not correctly adjusted or are excessively worn.	→ See Extraordinary Maintenance.
The jaw closes by itself	Oil leaking from the operating machine distributor.	→ Contact technical assistance for the operating machine.
	Oil leaking from the speed valve.	→ Replace the hydraulic cartridges or the /entire speed/booster valve.
	Oil leaking from the cylinder.	→ Replace the gasket seals on the cylinder.
	Oil leaking from the rotating joint.	→ Replace the gasket seals on the rotating joint.
The jaw is blocked	There is material between the cutting blades that prevents them from opening.	→ Remove the material stuck between the blades with a blowtorch, and then restore the adjustments.

Problem	Possible cause	Possible solution
The attachment does not rotate	Operating machine pressure not calibrated correctly.	→ Adjust the pressure of the operating machine.
	Rotation motor is damaged.	→ Replace the motor.
	Motor valve damaged.	→ Replace the motor valve.
	Flow regulator valve closed.	→ Open the flow regulator valve.
The attachment rotates slowly or too fast	Incorrect oil flow from the operating machine.	→ Adjust the flow of oil from the operating machine.
	Flow regulator valve calibrated incorrectly.	→ Calibrate the flow regulator valve correctly.
Oil leaks	Gasket seals damaged.	→ Replace the gasket seals.
	Hydraulic tubing loose.	→ Tighten the fittings on the hydraulic tubing.

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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