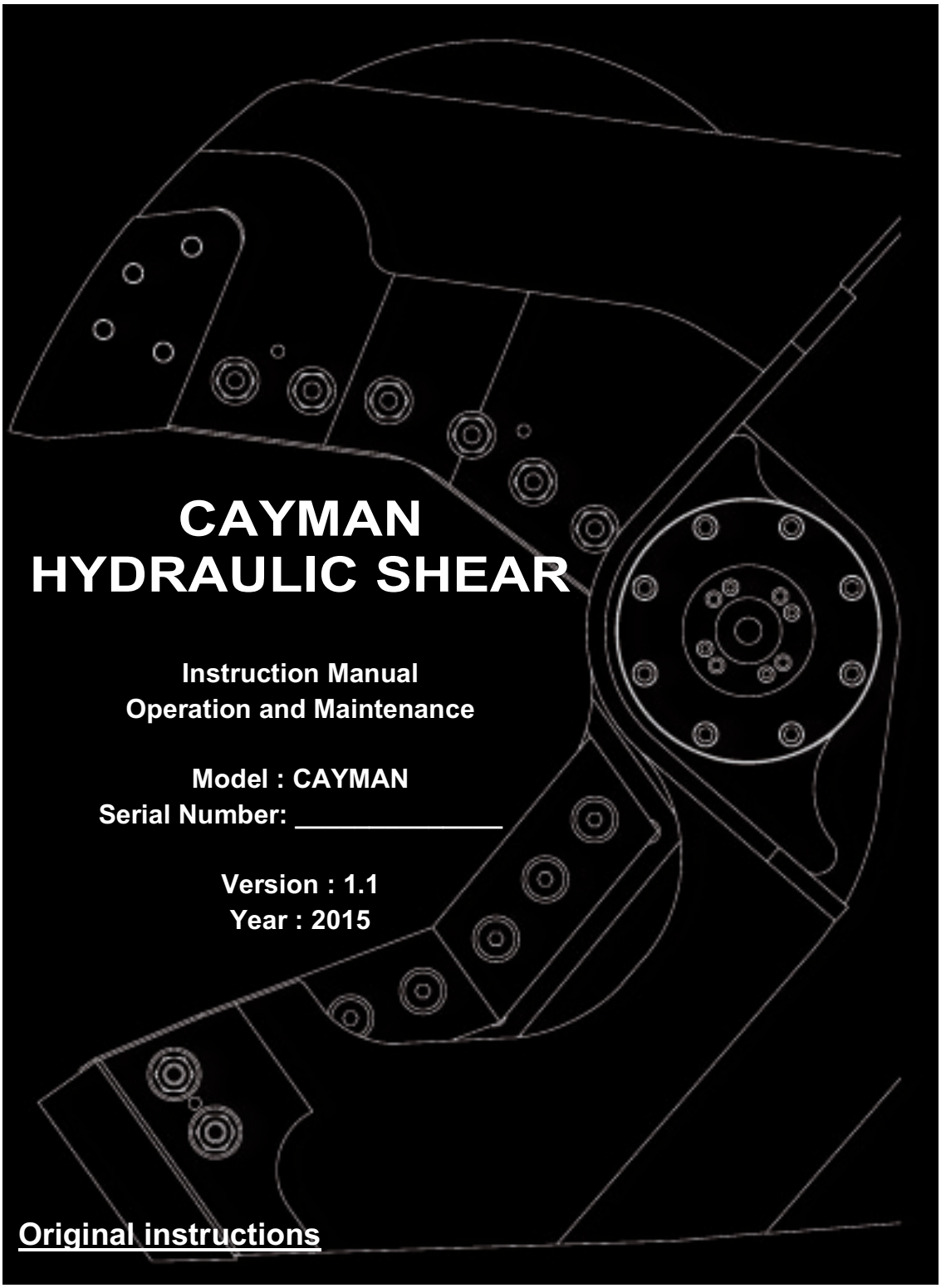
Zato



CAYMAN
HYDRAULIC SHEAR

Instruction Manual
Operation and Maintenance

Model : CAYMAN
Serial Number: _____

Version : 1.1
Year : 2015

Original instructions

ZATO S.r.l.
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PREFACE

The manufacturer is in no way responsible for any consequences resulting from incorrect use of the shear by the owner.

PUBLISHER'S NOTE

This documentation is specifically aimed at technicians, therefore some information which can be easily deduced by reading the text and observing the figures may not be explained in further detail. The publisher is not in any way responsible for the information and data contained herein: all information contained herein has been supplied, checked and approved when verification was carried out by the Manufacturer / Agent.
The publisher is in no way responsible for any consequences resulting from incorrect procedures carried out by the owner.

GENERAL CONSIDERATIONS

All operating instructions regarding maintenance, and recommendations described in this guide must be observed.

For best results, the MANUFACTURER recommends performing the cleaning and maintenance procedures on a regular basis to keep the equipment in top operating condition.

The training provided for personnel in charge of the machine is very important, regarding use as well as maintenance and monitoring compliance with operating procedures and all safety standards outlined in this manual.

Edition: 2015
Version: 1.1

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SOMMARIO

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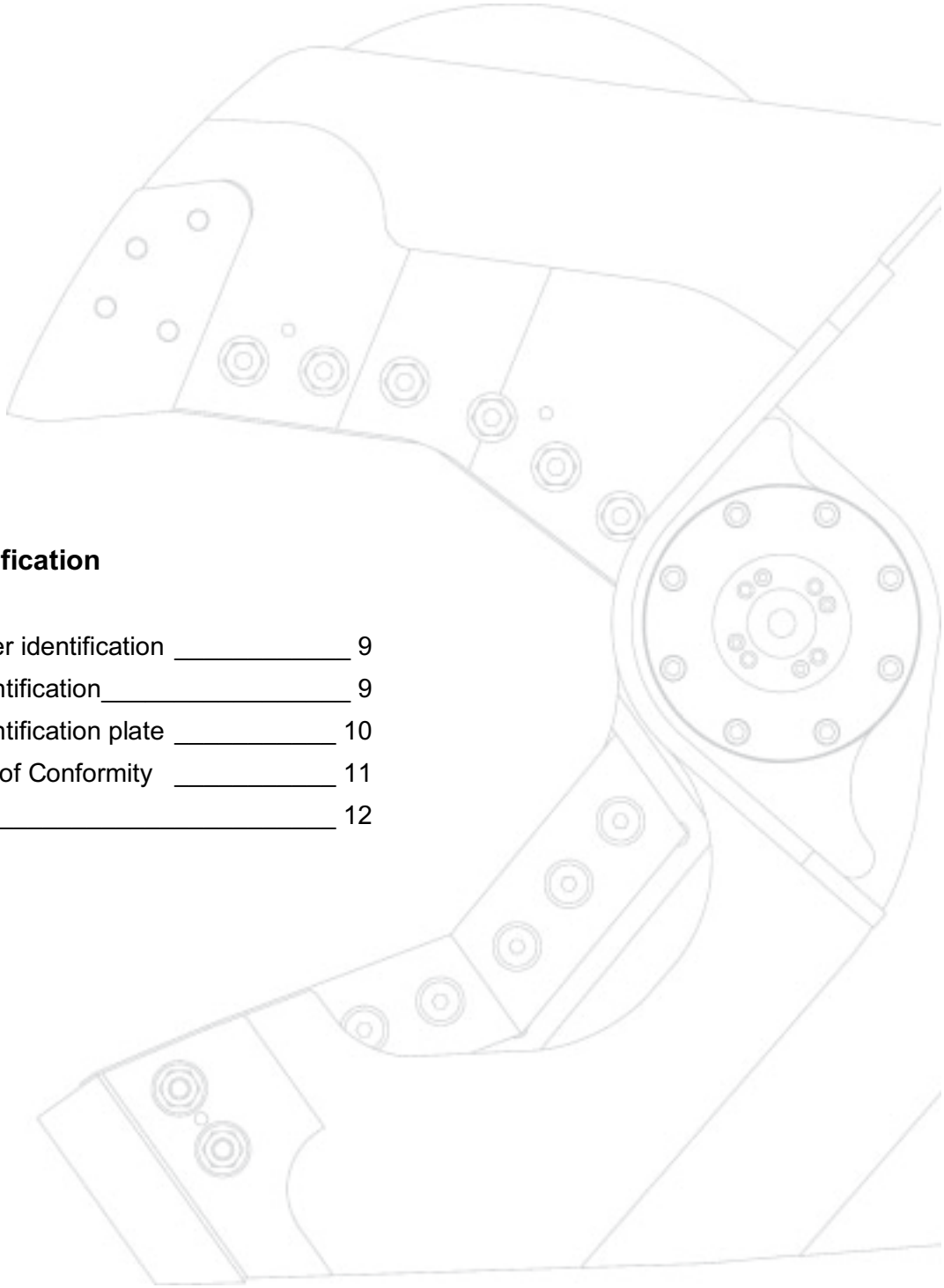


CHAPTER 1
Product identification

1. Product identificationNKSDKDSS

1.1Manufacturer identification

MANUFACTURER
ZATO S.r.l.
ADDRESS
Via Campi Grandi, 23 25080 Prevalle BS • Italy tel. +39 (0)30 6461800 fax +39 (0)30 6801897

1.2 Product identification

TYPE
Hydraulic shears
MODEL
Cayman
SERIAL NUMBER
MANUFACTURE YEAR

1.3Product identification plate

The machine is supplied with an identification plate, located on the front of the shear, engraved with data required by law.

SOMMARIO

CAUTION !

Removing the CE identification plate and / or replacing it with other identification plates is strictly forbidden. Should the identification plate be damaged, removed, or if the manufacturer's seal that holds it on simply comes loose, due to accidental causes, the customer is obliged to inform ZATO S.r.l.

1.4 Declaration of Conformity

Zato
Scrap Processing Solutions

DECLARATION OF CONFORMITY

In accordance with ANNEX IIA of Machinery Directive 2006/42/EC

THE UNDERSIGNED COMPANY

ZATO SRL
Via Campi Grandi, 23
25080 – Prevalle (BS) Italia
tel. +39 030 6461800 - fax 030 6801897

DECLARES

Under its sole responsibility, that the machine:
TYPE:
MODEL:
SERIAL NUMBER:
YEAR OF MANUFACTURE:

IS IN CONFORMITY WITH THE FOLLOWING DIRECTIVES:

- MACHINERY DIRECTIVE 2006/42/EC Annex II, Part A

The Technical Dossier is kept at the manufacturer's facilities.

Prevalle,

Ms Alessandra Bresciani
(Legal representative)

ZATO S.R.L.

Follow us!

www.zatoshredder.com

1.5 Test report

On (date)	
at the work site of the company	
in the presence of Mr./Mrs.	
as	

the following machine was tested:

TYPE	Hydraulic Shear
MODEL	Cayman
SERIAL NUMBER	
YEAR	
INSTALLED ON EXCAVATOR	
BRAND	
MODEL	
INSTALLING THE SHEAR TO REPLACE	☐ boom ☐ bucket

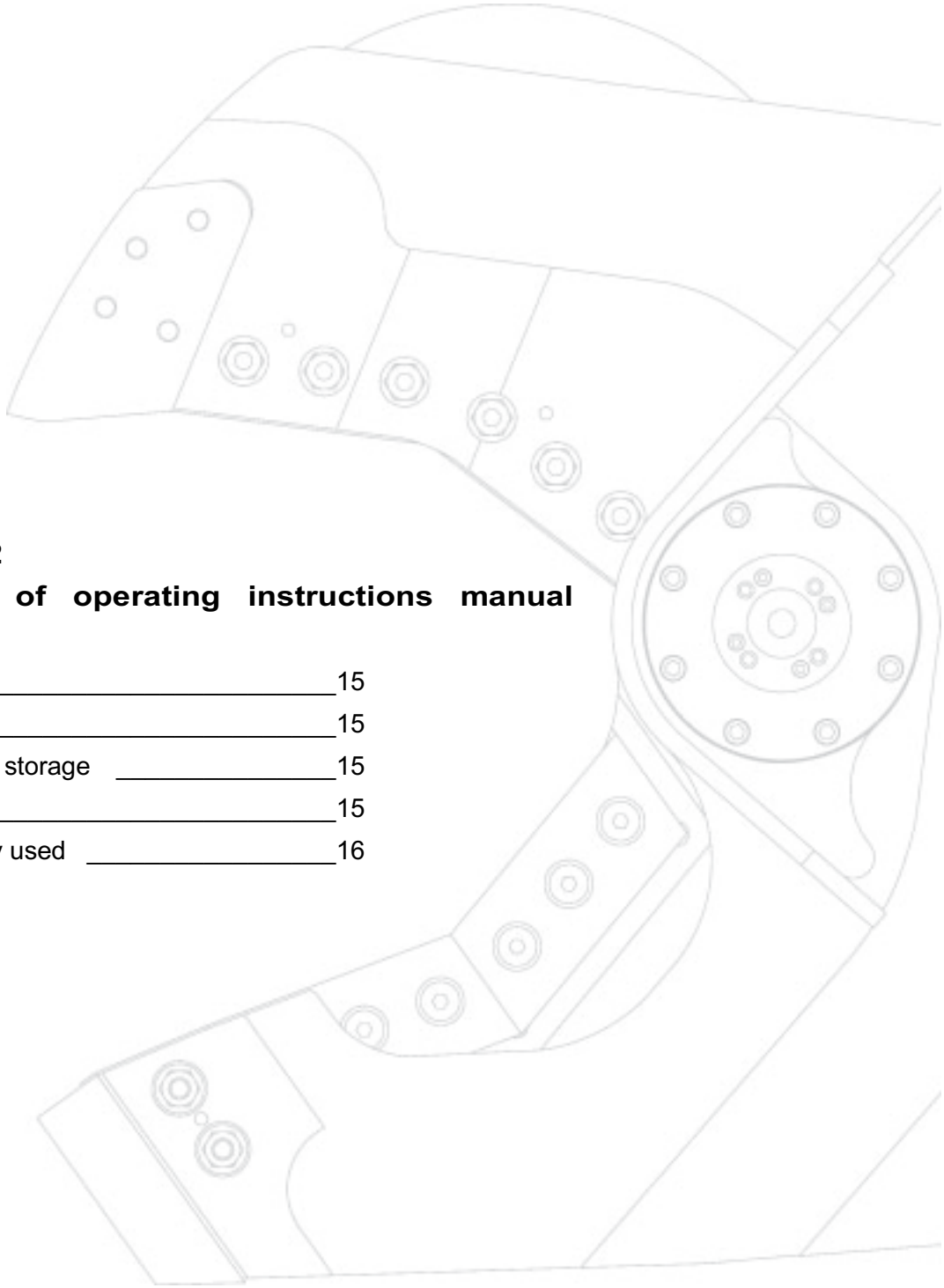
- The test was successful
- The safety devices function correctly
- The Operating Manual for Shear number _____ / ____ was provided

This Operation and Maintenance Manual is a document that is issued and supplied for a specific order and is an integral part of the machine, customized for the machine with a specific serial number and is accordingly identified for traceability.

Notes

Customer Signature

Signature for ZATO S.r.l.



CHAPTER 2
Description of operating instructions manual

2. Description of the operating instructions manual

2.1

Premise

This machine was built in accordance with Community directives on the free circulation of industrial products in EEC countries; it is therefore supplied with all documentation required by these directives.

2.2 Recipients

The manual is aimed at the operators in charge of handling the machine at every stage of its technical life. It contains information referring to the proper use of the machine, in order to maintain the functional and qualitative characteristics of the machine over time.
It is important to keep it in an easily accessible location that is close to the machine, and is known to all owners/operators who need to find and consult the manual promptly in any situation.

2.3 Supply and storage

The manual is supplied in paper and electronic form. All additional documentation (pneumatic, electrical, hydraulic diagrams, sub-contractor manuals) are provided in attachment to this manual.
This manual must be kept in the cab of the excavator being operated with the shear installed on it, at the operator's constant disposal.
The manual is an integral part of the machine in terms of safety, thus:

- it must be kept intact (in all of its parts). If it is lost or ruined you must immediately ask for a new copy;
- it must accompany the machine until it is scrapped (also when the machine is moved, sold,hired, rented, etc. ....).

2.4 Update

Should the machine require functional changes or replacements, the manufacturer is responsible for revising or updating the manual. The manufacturer is in charge of providing updates to the manual.

2.5 Terminology used

The following table lists the terms and their meanings used in this manual:

TERM	DESCRIPTION
ALARM	reports failures and malfunctions.
STOP	an action that stops a process while it is in progress voluntary action taken by the operator in charge.
BREAKDOWN	the state of the machine when it is unable to carry out a required function, except for when it is disabled for preventive maintenance or other scheduled procedures or due to the lack of a carrier.
PRECAUTIONS FOR USE	general rules for using the machine correctly and preventing possible risks of accident from happening.
KEY	mechanical, electrical, magnetic or similar device with unique features.
EMERGENCY DEVICE	a safety device that allows you to perform actions, such as voluntarily stopping the machine, that are useful in dangerous situations or when there is a general malfunction of the machine.
SAFETY DEVICE	a device (other than a guard) that eliminates or reduces the risk, used either alone or in conjunction with a guard.
FAILURE	the tendency of a part to fail to complete the requested task.
MALFUNCTION	irregular operating condition that does not meet the required process conditions.
MAINTENANCE	a periodic and predefined set of procedures designed to maintain the functioning of the machine in all regards consequential to wear that is intrinsic to use.
OPERATION MODES	all of the procedures necessary to operate the machine in all of its functions.
DANGER	source of possible injuries or damage to the health of individuals.
FIXED GUARD	guard held in place (i.e. closed): • permanently (by welding, etc. ...); • or by using clamping devices (screws, bolts, etc ...) that make it impossible to remove/open them without the aid of tools.

2.5.
(continued)

TERM	DESCRIPTION
MOVABLE GUARD	a guard that is usually mechanically connected to the frame of the system or to a nearby stationary element (for example, by means of a hinge or a guide), or that can be opened without using tools
GUARD	Part of a machine that is used specifically to provide protection by creating a physical barrier. A guard can act: alone, it is therefore only effective when it is locked or used in conjunction with an interlocking device with or without locking the guard. Protection is ensured whatever the position of the guard. For fixed guards "Locked" means "held in place."
RISK	the combination of probability and severity of possible injury or damage to health occurring in a dangerous situation.
RESIDUAL RISK	a risk that continues, especially during maintenance, installation and cleaning, even after the implementation of design and construction safety measures, safety devices and deterrents.
FUNCTIONAL SPECIFICATIONS	a list of all possible situations that can happen to the machine in its various states of operation, including emergencies of any kind.
IDENTIFICATION PLATE	an identifying element that provides the machine's general and relevant data together with its serial number.
INTENDED USE	use of the machine in accordance with the information provided in the operating instructions.
REASONABLY PREDICTABLE IMPROPER USE	using the machine in a way that is different from the intended uses indicated in the instructions, but which may occur due to easily predictable human behavior.

CHAPTER 3
General Preliminary Information

3. General preliminary information

3.1 Reference Standards

The design, construction and installation of the machine have been carried out in accordance with the following standards:

DIRECTIVES
Machinery Directive 2006/42/CE

3.2 Operator and machine safety

The areas **around the excavator** are divided as follows::

TERM	DEFINITION
WORK AREAS	These are areas where the operator of the shear and other operators can perform command and control operations on the machinery ("helm station").
DANGEROUS AREAS	All areas inside the machine and within its range of action are considered dangerous. Access to these areas is prohibited to anyone, while the excavator is working.

CAUTION !
When the shears are operating, the work area must be cordoned-off and signs must be put up warning individuals to maintain a safety distance of at least 20 meters.

3.3 Definition of safety symbols

The following symbols are used to alert individuals of possible sources of danger:

SYMBOL	MEANING
	**CAUTION** This indicates that the partial or total failure to comply to the indications provided in this manual can cause injury to the operators or damage to the equipment.
	**DANGER OF MOVING MECHANICAL PARTS** This symbol is found next to the description of procedures that require the operator to stay within close proximity of parts of the machinery that are normally moving. Contact with these parts can cause serious harm to the operator.
	**ELECTRICAL HAZARD** This symbol is found next to the description of procedures that allow the operator to come into contact with parts that are normally live. Contact with these parts can cause immediate death.

3.4 Operator qualifications

In order to ascertain the operators' skills and qualifications required for the various tasks (start-up, cleaning, scheduled maintenance), consult the following table:

QUALIFICATION	DEFINITION
CONDUCTOR/ OPERATOR	the operator responsible for working the machine from the helm station and who cannot access the dangerous areas of the machine.
MECHANICAL HYDRAULIC SERVICEMAN	the operator in charge of the mechanical maintenance of the machine.
ZATO S.R.L. TECHNICIAN	This individual is a qualified operator, an employee of the manufacturer or of authorized assistance centers, trained and authorized to perform supplementary maintenance or repairs that require specific knowledge of the machine, its operation, its safety devices and their modes of action.

3.5 Residual risks

The design for this machine was developed so as to guarantee the basic safety requirements for the operator, who, on his/her part, must use personal protection equipment that is suitable for the risks he/she is exposed to (gloves, safety shoes...). Safety has been integrated into the design and construction of the machine as much as possible, however, risks subsist and the operators must be protected from them especially during maintenance, installation and cleaning procedures:

RESIDUAL RISK	PRECAUTIONS

It is the owner's responsibility to:

- raise awareness and train the operators;
- replace the visual safety signs if they are damaged.

3.6 Personal protective equipment

Workers must wear work clothes (with tight sleeves) and all necessary personal protective equipment (gloves, goggles, masks, etc..) as per legislation and applicable safety regulations in the country of use.

SYMBOL	REGULATION
	Mandatory use of hearing protection
	Mandatory use of safety shoes.
	Mandatory use of safety gloves.
	Mandatory use of protective clothing.
	Mandatory use of head protection.
	Mandatory use of eye protection.

3.7 Safety signs on the machine

Safety stickers and plates are fastened to the machine, as shown in the following table:

DANGER SIGNS (triangle, yellow)	
WARNING SIGNS (circle, red)	
REGULATION SIGNS (circle, blue)	

3.8
Noise

The machine is designed to reduce the sound power level at the source. Check the requirements of applicable laws in the country of installation and, if required by such laws, adopt the use of the following:

- personal protective equipment (such as expanding foam ear plugs, silicon ear plugs, reusable ear plugs, capsule ear protectors, helmet-mounted hearing protectors, etc.);
- sound proofing screens.

The machine itself (while operating the shear) does not produce significant noise levels. In any case, you must consider beforehand that the material being sheared could (during normal shearing procedures) produce significant noise level peaks. It is impossible to establish the noise level that will be produced as it varies considerably, depending on the material being sheared.

RECORDED SOUND LEVELS	POSITION OF SOUND LEVEL METER

3.9
General safety warnings and guidelines

The purpose of this chapter is to inform owners and operators of any particularly important risks and dangers, as well as general and specific precautions to eliminate or neutralize them.
The instructions and safety warnings are established taking into account that the provisions of the **"Consolidation Act Legislative Decree 81/08 document "** (concerning safety in the workplace) must be known and applied in the work site.

3.10
Owner obligations

The owner (the business owner or employer) must:

- take into account the abilities and conditions of the operators with regards to their health and safety;
- provide suitable personal protective equipment;
- require individual employees to comply with the company's rules and regulations regarding safety and the use of collective and individual protective equipment provided for them;
- teach staff about accident-related risks;
- teach staff about equipment designed for operator safety;
- teach staff about noise emission risks;
- teach staff about general accident prevention regulations enforced by European directives and legislation in the country where the machine is located;
- allow only properly trained staff to operate the machine.
- predisporre la marcatura CE del “sistema” costituito dalla macchina principale e dall’accessorio (cesoia). Nell’occasione della marcatura l’utilizzatore provvederà a verificare il corretto impiego dell’accessorio (cesoia) in relazione ai limiti di impiego del sistema costituito.

3.11
Operator duties

- Do not use the machine improperly, meaning uses other than those indicated in the "intended use" paragraph.
- Always perform maintenance procedures with the machine turned off. Never lubricate parts while they are moving.
- When the machine is started up, ensure that no one is situated in dangerous areas.
- Always observe the regulations and instructions provided by the employer, managers and individuals in charge, for the purpose of collective and individual protection.
- Always make appropriate use of protective equipment provided for them.
- Immediately report any failures to the machine or equipment to the employer, manager or person in charge.

3.12
Operator restrictions

Specifically, operators must not:

- remove or alter safety equipment or signs or control equipment without authorization;
- perform procedures or maneuvers of their own initiative that they are not trained for or that could compromise their own safety or that of co-workers;
- wear bracelets, rings or necklaces that dangle and could catch on moving parts, creating a hazard for the operator.

3.13
Warranty

Upon receipt of the machine ensure that:

- packaging is intact;
- the goods received correspond to the order specifications;
- there is no apparent damage.

Immediately inform ZATO S.r.l. in case of defects

TERMS OF WARRANTY

ZATO S.r.l. guarantees the CAYMAN series shear for a period of 12 months and/or 1,500 hours of work.

THE WARRANTY IS LIMITED

The warranty is limited to repairs and/or replacement of damaged components of the CAYMAN shear.

DAMAGES TO CARRIER MACHINES

No damage to the carrier machine (due to overloading or any other cause) may be charged to ZATO S.r.l.

ZATO S.r.l. grants the warranty on their machines as long as all assistance and maintenance is carried out by their technical support service.

ZATO S.r.l. must be promptly notified of all defects, malfunctions and/or potentially dangerous situations.

ZATO S.r.l. will not be held responsible for injury to people or damage to things resulting from tampering, misuse of equipment or lack of maintenance of installed safety devices.

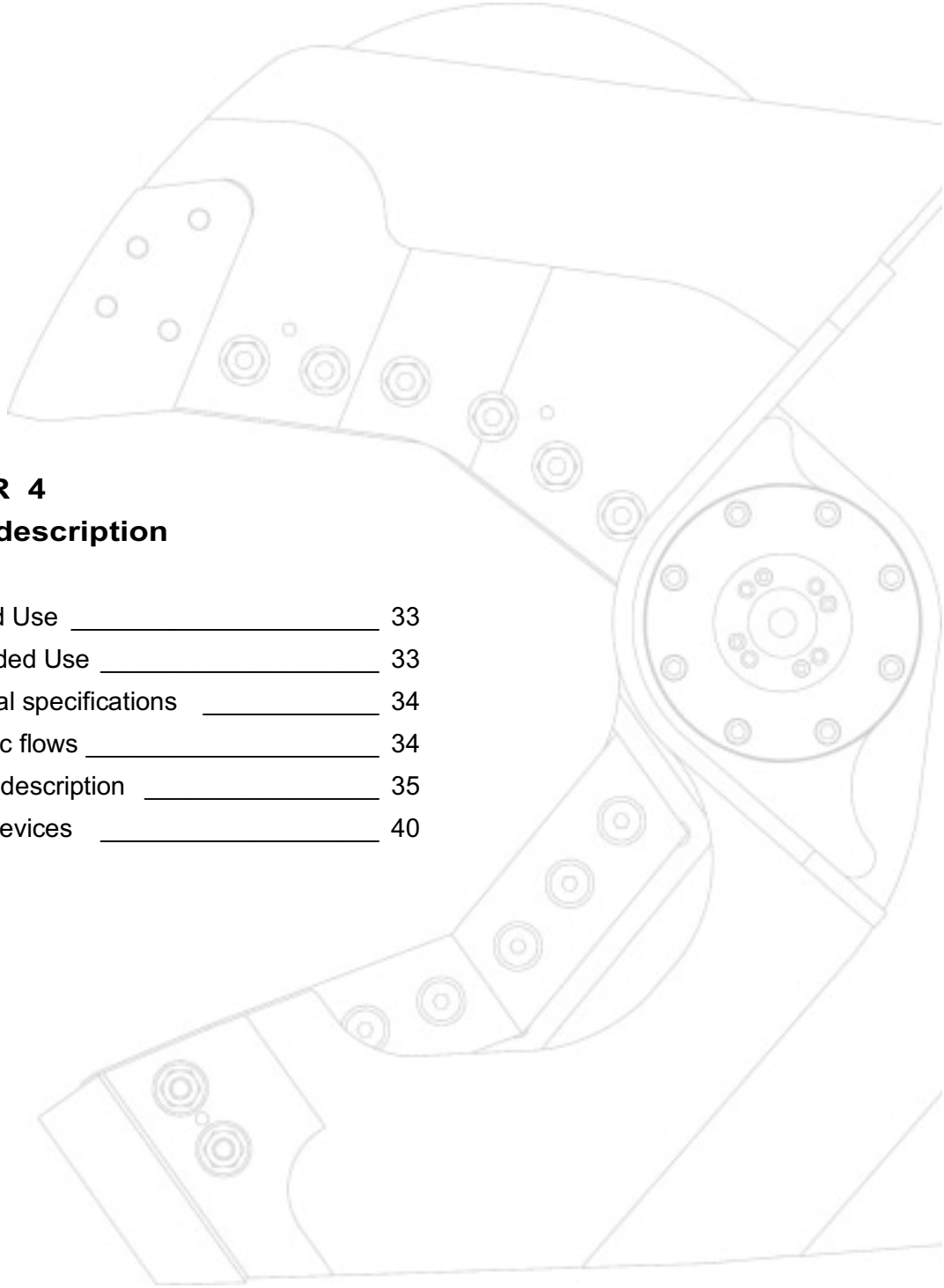
3.14
Declinazione di responsabilità

DECLAIMER OF LIABILITY

ZATO S.r.l. would like to remind their customers that any damage or injury to persons, equipment, systems and/or the environment resulting from:

- **improper use of the machine** by personnel that has not been fully trained;
- **uso contrario** alle disposizioni legislative vigenti. Nello specifico: mancanza di certificazione (certificato CE) del sistema così costituito: macchina operatrice con accessorio (cesoia) montato**;**
- incorrect **installation**;
- serious shortcomings in implementing scheduled **maintenance**;
- **changes and/or procedures that are either unauthorized** or performed by unqualified personnel;
- **tampering** with safety devices;
- using **non-original replacement parts** and parts that are not specific to the model;
- **partial or total failure to follow the instructions** provided in this manual may not be attributable to ZATO S.r.l. and, consequentially determine:
  - **the immediate effect of ZATO S.r.l.'s liability disclaimer**
  - **immediate void of the customer warranty**

ZATO S.r.l. reserves the right to change any characteristic of the machine without notice and without obligation to install such modifications to units that have already been sold.



CHAPTER 4
Product description

4. Product description

4.1 Intended use

This machine in question is designed to:

OPERATION	PERMITTED MATERIALS
SHEAR/CUT	**Ferrous material** **Cement-based material** **Cement and ferrous-based material**

The machine was also designed to:

- meet the specific requirements stated in the contract of sale;
- operate in accordance with the instructions and restrictions of use stated in this manual.

The machine is designed and built to work safely if:

- it is used to cut allowed materials;
- procedures described in the user manual are followed;
- scheduled maintenance is carried out on schedule and in the specified manner;
- supplementary maintenance is performed promptly whenever necessary;
- safety devices are not removed and/or bypassed.

4.2 Unintended Use

The warranty and the liability of the manufacturer are subordinate to the following conditions:

- the machine must be used within the limits stated in the contract of sale and those reported in this manual. It must only be used to fulfill the requirements for which it was designed;
- the machine must be used according to the instructions provided in the manual;
- maintenance must be carried out as scheduled and in the manner specified in the manual, using original spare parts and assigning servicing procedures to qualified personnel.

IMPROPER USES	Lifting people, objects and/or animals with the shears.
	Tearing and/or pulling structures or things that should be cut.
	Pushing and/or hammering against structures of any kind.
	Shearing/cutting tempered or hardened steel.

Any other use of the machine which is not included in its intended use must be

authorized in writing by the manufacturer beforehand. Failure to obtain written authorization means the use is considered "improper use"; the manufacturer therefore declines all responsibility with regards to any damage or injury caused to things or people, and considers void any warranty on the line and equipment supplied..

CAUTION !
It is absolutely forbidden to climb onto any part of the shear.

CAUTION !
Never overload the lifting capacity, or try to lift loads either on unstable ground or sideways. This can cause the machine to overturn.

4.3 Technical specifications

MODEL	WEIGHT	LENGTH	WIDTH	HEIGHT
FCE06	660 Kg	1.765 mm	490 mm	682 mm
FCE10	1.140 Kg	2.003 mm	640 mm	777 mm
FCE20	2.000 Kg	2.565 mm	710 mm	928 mm
FCE30	2.900 Kg	2.955 mm	755 mm	1.180 mm
FCE40	4.150 Kg	3.340 mm	830 mm	1.385 mm
FCE40 S	4.600 Kg	3.770 mm	830 mm	1.385 mm
FCE50	6.400 Kg	4.010 mm	1.082 mm	1.515 mm
FCE60	7.180 Kg	4.130 mm	1.107 mm	1.732 mm
FCE70	7.540 Kg	4.150 mm	1.110 mm	1.680 mm
FCE90 S	8.600 Kg	4.615 mm	1.470 mm	1.855 mm
FCE100	12.440 Kg	4.760 mm	1.390 mm	1.972 mm

* the weight of the shear is considered net of the combination bracket used to install it on the excavator

4.4 Hydraulic flows

MODEL	OPERATING PRESSURE		RECOMMENDED CAPACITY	
	CUT	ROTATION	CUT	ROTATION
FCE06	200-250 bar	100-110 bar	100/150 lt/min	25 lt/min
FCE10	300-350 bar	100-110 bar	150/180 lt/min	25 lt/min
FCE20	250-380 bar	100-110 bar	150/180 lt/min	25 lt/min
FCE30	350-380 bar	100-110 bar	200/250 lt/min	25 lt/min
FCE40	350-380 bar	100-110 bar	250/300 lt/min	25 lt/min

FCE40 S	350-380 bar	100-110 bar	250-300 lt/min	25 lt/min
FCE50	350-380 bar	100-110bar	300/350 lt/min	25 lt/min
FCE60	350-380 bar	100-110 bar	350/400 lt/min	25 lt/min
FCE70	350-380 bar	100-110 bar	350-400 lt/min	25 lt/min
FCE90 S	350-380 bar	100-110 bar	400-450 lt/min	25 lt/min
FCE100	350-380 bar	100-110 bar	400/450 lt/min	25 lt/min

CAUTION !
If you operate the shear with higher oil flows than are recommended, it may cause damage to the shear and the hydraulic components, as well as create a serious hazard to people.

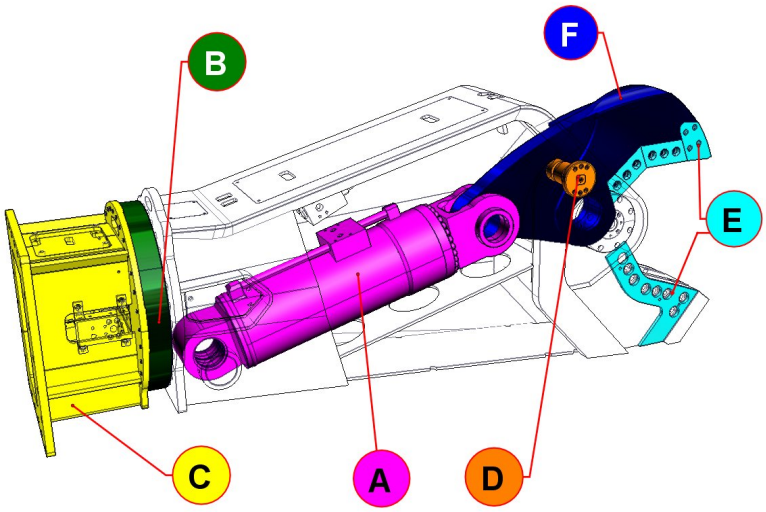
CAUTION !
If you operate the shear with low oil flows at the recommended intervals the machine will perform poorly.

4.5 Product description

It is composed of:

POS.	SHEAR ASSEMBLY
A	HYDRAULIC CYLINDER
B	ROTATING HYDRAULIC JOINT
C	ROTATION ASSEMBLY
D	GEAR ASSEMBLY
E	BLADES
F	MOVABLE JAW

Each letter corresponds to its part in the figure below.



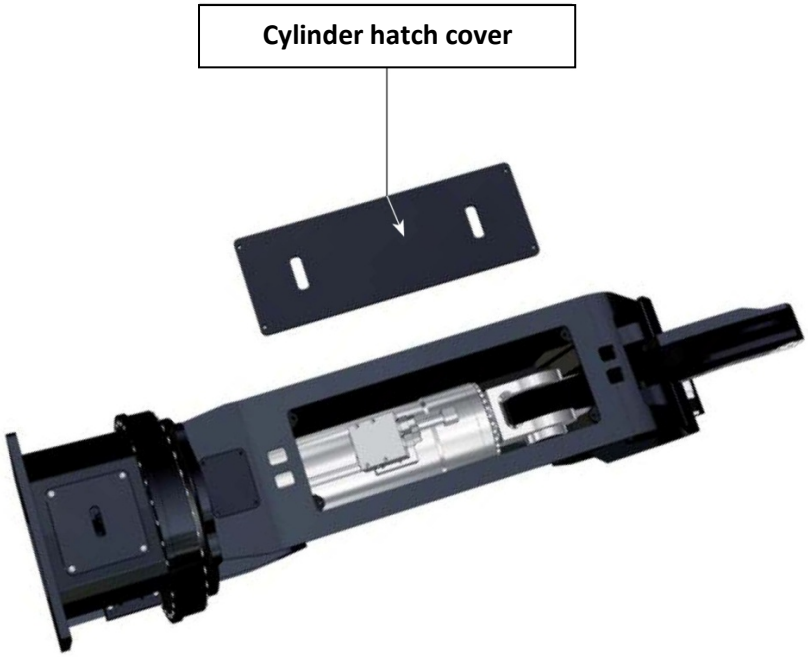
4.5.1
(A) Hydraulic cylinder

The hydraulic cylinder is the element that converts the hydraulic pressure of the excavator in linear mechanical motion.

When the hydraulic oil enters the large chamber of the cylinder it produces the movement of the piston rod which is firmly secured to the movable jaw part via the front pin, it moves the movable jaw and produces the force to cut the material.

The hydraulic cylinder contains hydraulic oil under pressure.

CAUTION !
The hydraulic cylinder is accessible from the large top hatch cover and from the front of the shear when the cylinder is fully open.



4.5.2 (B) Rotating hydraulic joint

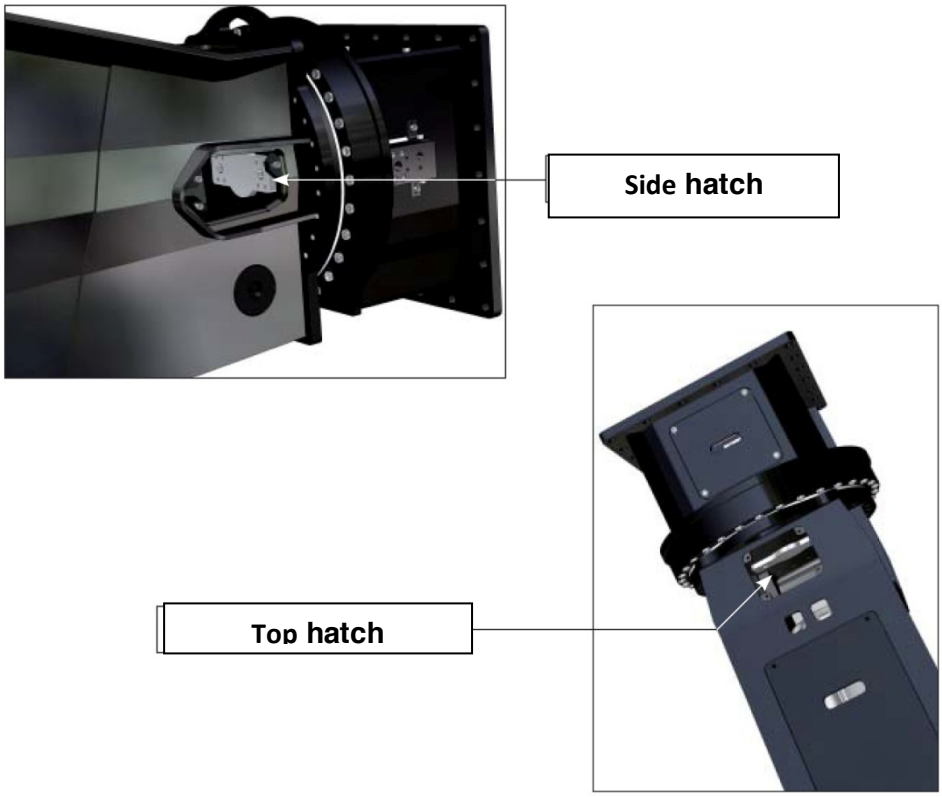
The rotating hydraulic joint is the element that allows the hydraulic oil to move from the back of the shear (the fixed part connected to the excavator) to the rotating part in the front of the shear where the cylinder is located.

The rotating hydraulic joint is basically composed of two elements:

- a stator;
- a rotor.

The watertight seal between the two elements is held by special gaskets.

CAUTION !
The rotating joint can be accessed from the side hatches and the top hatch located on the back of the frame, near the roller-bearing.



4.5.3 (C) Rotation assembly

The rotation assembly is the element connected to the frame of the hydraulic shear that allows it continuous movement over a range of 360° degrees in either direction, clockwise and counter-clockwise.

The two components that allow the circular movement of the rotation assembly are:

- the roller-bearing;
- the hydraulic gear motor

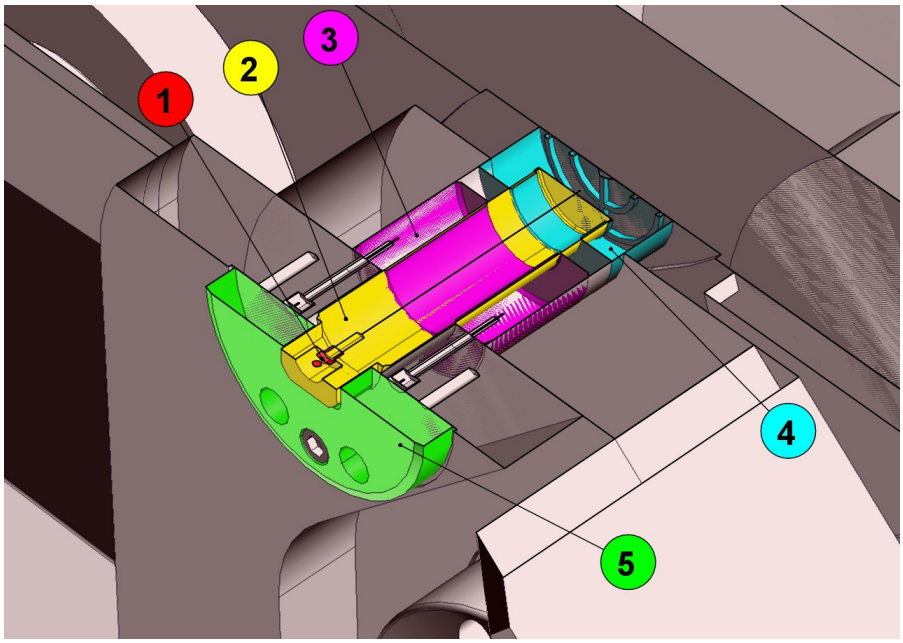
4.5.4
(D) Gear assembly

The gear assembly is on the right side of the fixed jaw of the shears, above the area of the central pin. This is a wear part that comes into contact with the friction surface of the movable jaw.

It is composed of:

POS.	DESCRIPTION
1	GREASER
2	REGISTER REGULATING PIN
3	COUNTER BUSH REGULATING PIN
4	COUNTER SHOE
5	EXTERNAL LOCKING FLANGE

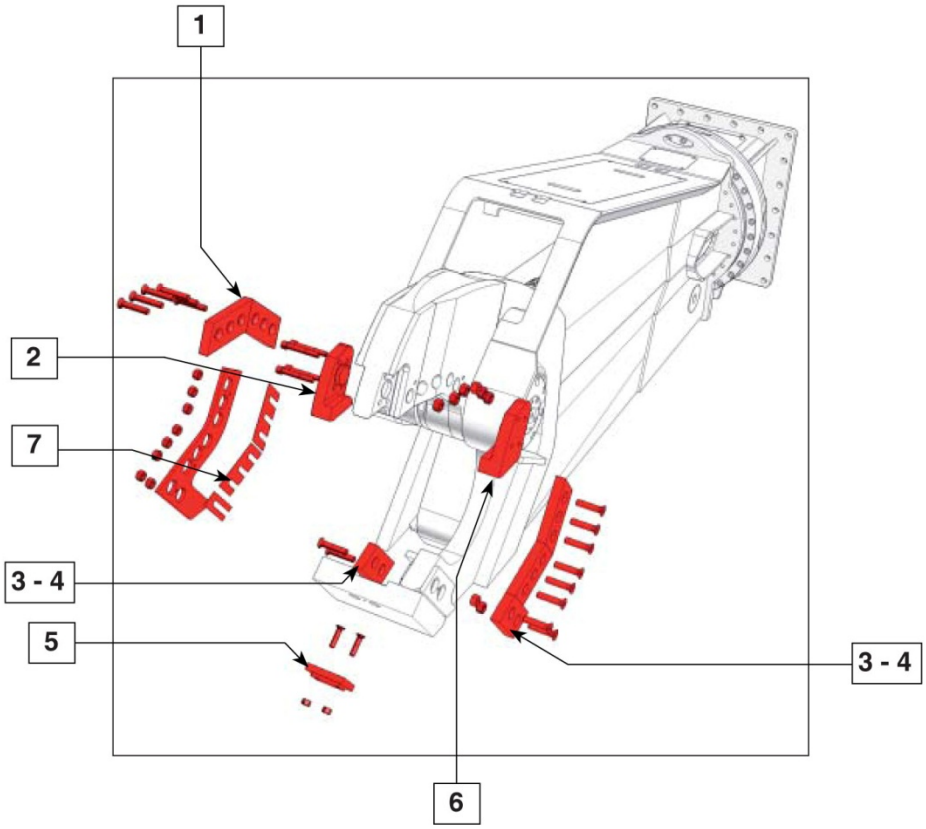
The counter shoe is the wear part for the gear assembly.



4.5.5
(E) Blades

The shear is provided with the following blades:

POS.	DESCRIPTION
1	MAIN BLADES (X4)
2	LEFT TIP BLADE (X1)
3	GUIDE BLADE (X2)
4	GUIDE BLADE SHIMS (X2)
5	RAZOR BLADE (X1)
6	RIGHT TIP BLADE (X1)
7	FRAME BLADE SHIMS (X1)



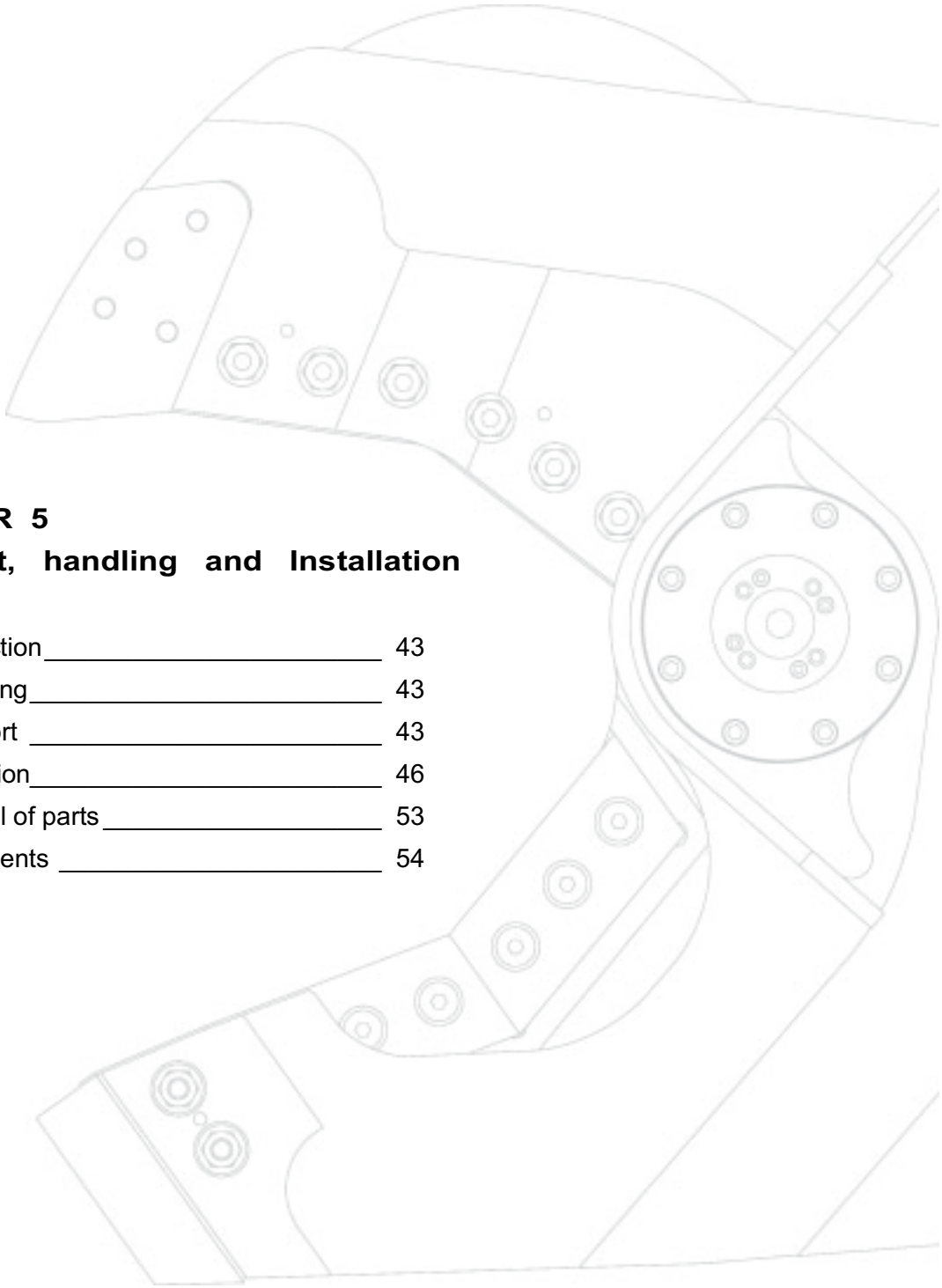
4.6 Safety devices

In order to ensure operator safety, the manufacturer has equipped the machine with a series of safety devices.

CAUTION !
It is absolutely forbidden and extremely dangerous to remove and/or bypass the installed devices.

SAFETY DEVICES	
CASING	In order to protect the moving parts protective casings have been installed for this purpose. These casings (as required by the Machinery Directive) may be only be removed with a tool designed for this purpose.
PICTOGRAMS	The sources of danger that the machine presents (despite being carefully designed to ensure personal safety) are highlighted and the operator is reminded of them thanks to special pictograph warnings.

CAUTION !
It is recommended, and we would like to remind the operator that the cab of the carrier where the shear will be installed must have laminated glass and a protective metal guard.
This is imperative as flying chips of debris create a hazard to operator safety.



CHAPTER 5
Transport, handling and Installation

5. Transport, handling and installation

5.1 Introduction

Packing, lifting, handling, transporting and unpacking the equipment must be performed by personnel that is:

- experienced in carrying out these procedures;
- trained and authorized by employees of the manufacturer;
- is familiar with the machine and its parts and the manual.

During installation, the technicians from ZATO S.r.l. should be assisted by the operators who will be servicing and operating the machine in the future.

CAUTION!
Staff must observe the following general rules:

- **move away from the load before moving it (lifting, lowering ,...);**
- **do not pass under suspended loads;**
- **keep bystanders out of the installation area;**
- **wear personal protection equipment: helmet, gloves,**
- **safety shoes and overalls.**

5.2 Packing

There are many packing possibilities, which vary depending on the destination of the machines, the means of transport or specific customer requirements.

If damage is reported:

- leave the package in question as is
- promptly request a damage assessment from the shipping company
- inform the transport insurance and dealership of the reported damage
- with a defects certificate.

If the machine is shipped in a crate on a skid or wood brackets possibly with protective cellophane shrink wrap, begin by removing the packaging or the cover.

5.2.1 Disposal of packaging

The packaging is an integral part of the supplied machinery and there is no pick-up service to dispose of it, therefore the disposal of the above mentioned packaging is the responsibility of the customer.
The disposal or destruction of the packaging must comply with applicable regulations in the customer's country, taking into account the nature of the materials:

- wood for the crates;
- plastic film to protect the machine and adhesive tape used to wrap it around the machine.

5.3 Transport

According to the mode of transport and the types of machines being shipped ZATO S.r.l. uses suitable packaging and fastening devices to ensure integrity and preservation during transport.
The handling procedures described in this section must be performed by personnel skilled in these tasks: staff specifically trained to safely load, unload and handle packages using lifting equipment, such as cranes or fork lifts, and that is familiar with accident prevention rules.

CAUTION !
ZATO S.r.l. is not liable for damage or injury, to things or people, due to accidents caused by failure to observe the instructions provided in this and subsequent chapters.

CAUTION !
Any assembly, dismantling and/or re-assembly of the machine cannot be carried out by anyone other than the personnel of ZATO S.r.l. given that the complexity of the whole process requires professional training, and therefore the above mentioned steps cannot be performed by unauthorized personnel.

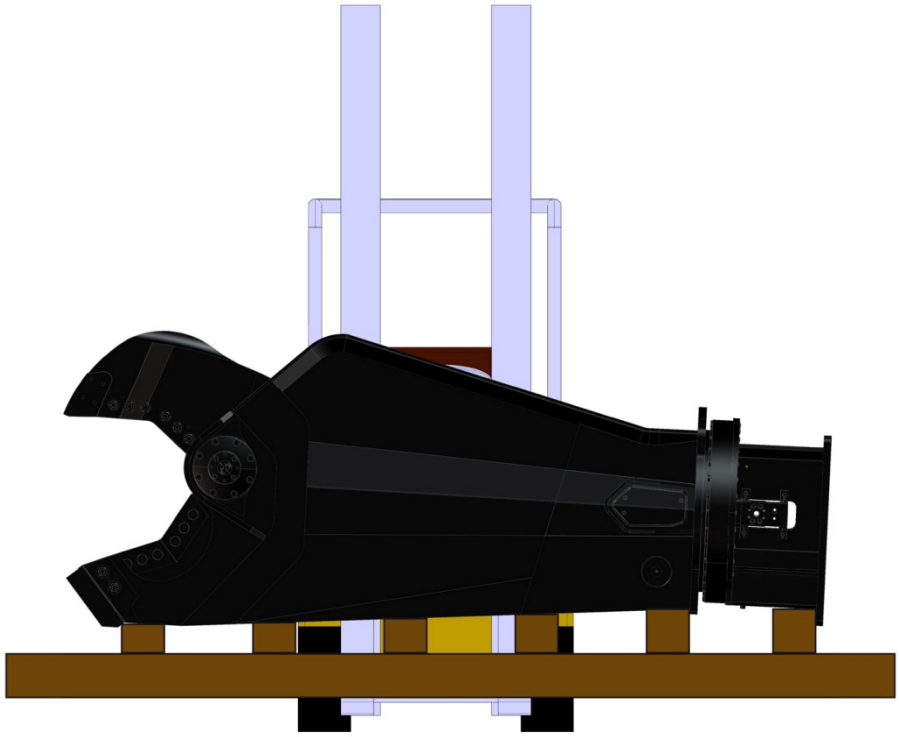
5.3.1 Machine assembly weight chart

Refer to the following table for the approximate weight of the assemblies that make up the machine:

ASSEMBLY	WEIGHT
Shear assembly	see identification plate

5.3.2 Transport by fork lift

To move the shear at any time, when it is not installed on the excavator, you must use the appropriate lift points found on the frame of the shear and marked with stickers.



Furthermore:

- be sure to use a fork lift that has the necessary capacity;
- make sure you have provided the operator of the lifting machinery with all instructions about the weight to be lifted.

5.3.3 Unloading and handling

During handling procedures, if the dimensions do not allow the handler sufficient visibility we recommend using the assistance of an operator on the ground. Before handling, always ensure that the lifting equipment and tools (ropes, hooks, straps, etc..) are suitable for lifting the load being handled and that the load is adequately stable before lifting.

CAUTION !
ZATO S.r.l. is not liable for damage or injury, to things or people, due to accidents caused by failure to observe the instructions provided in this and subsequent chapters.

5.4 Installation

WARNING !
You are required to check with the manufacturer of the carrier if it is adequately sized, to both carry the weight of the shear as well as operate correctly.

The shear can be installed on the excavator in two ways:

- to replace the main boom **(A);**
- to replace the bucket **(B).**

(Refer to paragraphs 3.2.4 and 3.2.5. for specific instructions).

5.4.1 Customer provided prearrangements

Without prejudice to any other contractual agreements, the customer is normally required to provide:

- hydraulic systems, in accordance with legislation in the country of installation and / or as required by the manufacturer of the machine;
- tools and consumable materials required for assembly and installation;
- lubricants necessary for starting up the machine;
- appropriate lifting and handling equipment.

5.4.2 Installing the hydraulic system

In order to commission the machine you must install a suitable hydraulic system on the excavator that operates both the cylinder that actuates the movable cutting jaw and the gear motor that actuates the rotation assembly.
The system must be designed and built in accordance with applicable law and its control commands must:

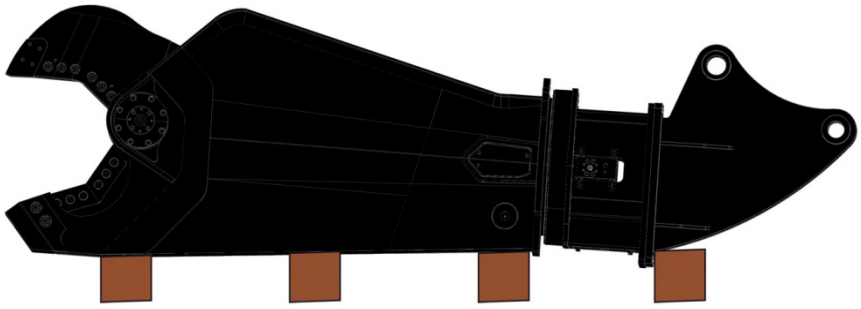
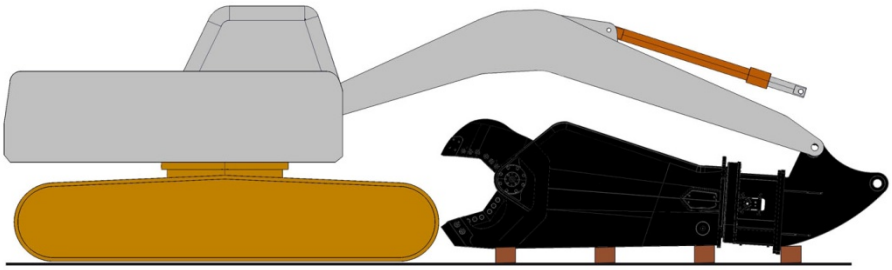
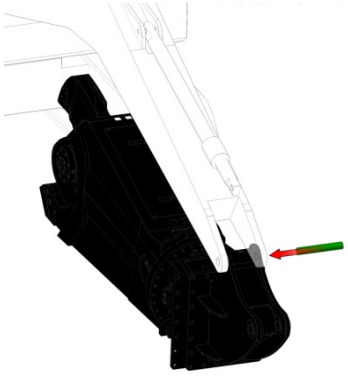
- identify without error or doubt their effect on the shear;
- the hydraulic system must generate hydraulic flows for the shear in compliance with the requirements provided in this manual;
- the shear must be able to function only when the carrier machine that it is mounted on and provides the hydraulic flow from is working;
- when you turn the working machine off the hydraulic flows to the shear and / or from the shear must stop;
- using the carrier machine again (i.e. when it is turned on)
- must not in any way lead to uncontrolled movements of the shear.

5.4.3 Installing drainage hoses

It is necessary to install a drainage hose in the rotating shear from 1 / "to connect the drain line from the rotation motor to the hydraulic oil tank, to avoid the engine from breaking down.

5.4.4 Installing the shear on the main boom (A)

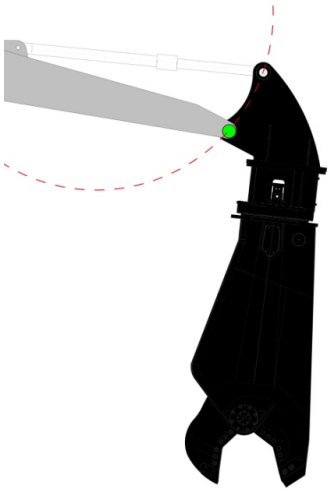
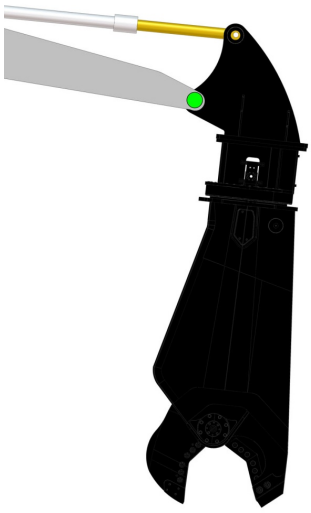
To install the shear on the main boom, follow the steps below:

STEP	ACTION
1	Lay the shear down by placing it on a flat and firm surface using sturdy wooden blocks to level it. 
2	Remove the bucket and the bucket arm (also called "Stick") from the excavator. Hold the cylinder rod in the "fully closed" position.
3	Position the excavator as shown in the figure and with extreme caution insert the boom into the combination bracket. 
4	Align the hole on the boom with the boom hole on the combination bracket.
5	Carefully insert the pin without forcing it, but by re-checking the alignment of the holes. 

5.4.4
(continued)

CAUTION !

You must be very careful when inserting the pins, since they may be made with very hard materials due to the heat treatment they undergo, therefore when you hit them with hammers or mallets they can chip causing blunt materials to fly and cause serious injury to surrounding personnel.

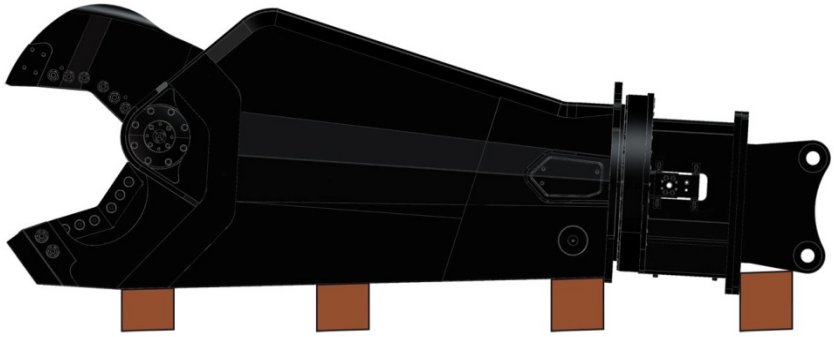
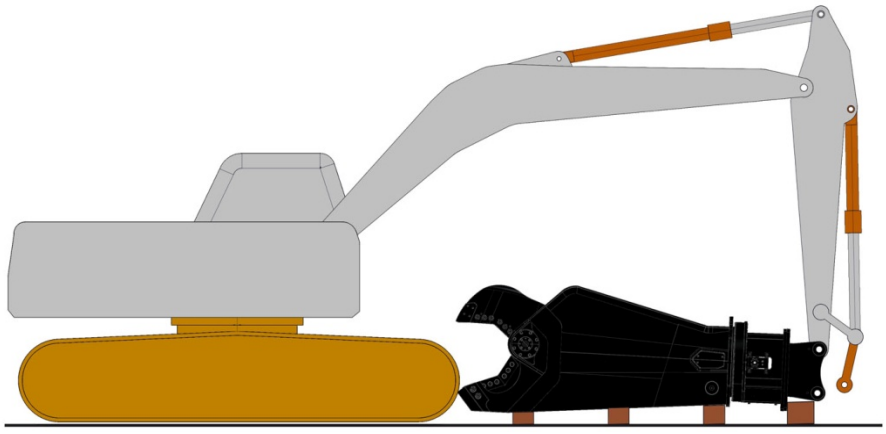
STEP	ACTION
6	Fasten the pin with its pin block.
7	Slowly lift the excavator boom, making the shear rotate around the pin you inserted previously, until the attachment on the combination bracket designed for the head of the cylinder is near the range of action of the cylinder's stroke. 
8	With extreme caution extend the rod of the cylinder until the hole on the head of the rod is perfectly aligned with the holes on the cylinder head attachment on the combination bracket. 

5.4.4
(continued)

STEP	ACTION
9	With extreme caution insert the second pin and fasten it in place with its pin block, as shown in the figure. 
10	Install the supply and return hydraulic hoses by connecting the hydraulic system installed on the excavator to the manifold located on the shear. Connect the hydraulic hoses supplied by the customer.
11	Start the excavator and let it idle.
12	Slowly drive the command of the shear cylinder in one direction until the shear cylinder rod starts to slip out (the jaws of the shear close).
13	Then slowly drive the cylinder in the opposite direction (the jaws of the shear open).

5.4.5 Installing the shear in place of the bucket (B)

To install the shear in place of the bucket, do the following:

STEP	ACTION
1	Lay the shear down by placing it on a flat and firm surface using sturdy wooden blocks to level it. 
2	Remove the bucket from the excavator according to the instructions provided by the manufacturer of the excavator in order to work in safety, and remember to keep the cylinder in the limit position, fully closed.
3	Position the excavator as shown. 
4	Raise the bucket boom above the shear and, carefully insert it near the boom attachment on the combination bracket (top hole).
5	Carefully align the hole in the boom with the holes on the bracket and prepare to insert the pin.
6	Carefully insert the relative pin without forcing it but by re-checking the alignment of the holes.
7	Fasten the pin with its pin block.

5.4.5 (continued)	**8**	Slowly lift the excavator boom making the shear rotate around the installed pin

CAUTION !
You must be very careful when inserting the pins, since they may be made with very hard materials due to the heat treatment they undergo, therefore when you hit them with hammers or mallets they can chip causing blunt materials to fly and cause serious injury to surrounding personnel.

STEP	ACTION
9	Continue the procedure until the cylinder head attachment on the combination bracket (bottom hole) is within the range of action of the bucket's actuating levers.
10	Pull the bucket's cylinder rod out until the hole for the "bucket actuating levers" aligns with its attachment position on the combination bracket (bottom hole).
11	Carefully insert the pin without forcing it, but by carefully aligning the holes.
12	Fasten the pin using its clamp.
13	Install the hydraulic supply and return hoses, connecting the hydraulic system that is installed on the excavator to the manifold located on the shear.
14	Start the excavator and let it idle.
15	Start running the shear cylinder slowly in one direction until the piston rod from the shear cylinder starts to slip out (closing the shear jaws.)
16	Then slowly run the cylinder in the opposite direction (the shear jaws open).

5.4.6 Dismantling the shear

To dismantle the shear, do the following:

STEP	ACTION
1	Drive the excavator with the shears onto flat, firm ground.
2	Lower the boom of the excavator until the shear is lying on a flat and firm surface. Place the shears on solid blocks of wood, so that the unit is stable and level and in a position that allows the attachment pins to be removed without creating a hazard for yourself or others.
3	Turn the excavator off and let the machine and the oil cool down until they reach ambient temperature.
4	Before loosening the hydraulic fittings make sure you have adequate plugs for all the hoses.
5	Loosen the hydraulic oil fittings with great care and taking care to collect any spillage of hydraulic oil in a suitable container.
6	Close the hydraulic oil hoses with suitable plugs (on both the excavator and the shear systems).
7	Only when all hoses have been plugged, can you start the excavator again.
8	Remove the shear-excavator connecting pin clamp and then hammer the free head of the pin (with a suitable hammer and without overdoing it) until it comes out; after a few hits see if the pin is coming loose, otherwise line the holes up better to make it come out more easily.
9	Perform the same procedure on the attachment pin between the leverage-cylinder and the combination bracket.
10	Once both pins have been removed you can move the excavator away from the shear.

CAUTION !

You must be very careful when inserting the pins, since they may be made with very hard materials due to the heat treatment they undergo, therefore when you hit them with hammers or mallets they can chip causing blunt materials to fly and cause serious injury to surrounding personnel.

5.5 Disposal of parts

At the end of the machine's life it shall have to be demolished, and its parts shall have to be taken apart in order to dispose of it properly.
When consumable materials that are normally used on the machine are replaced and / or dismantled, they constitute controlled waste, and are therefore subject to applicable controlled waste laws.

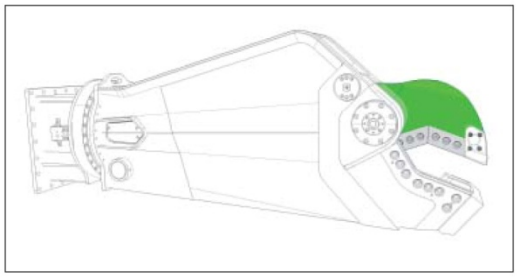
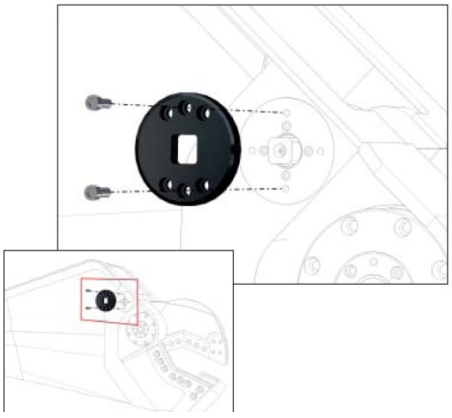
CAUTION !
During the disposal process it is necessary to follow the applicable laws of the country where the machine is used.
Store polluting materials such as oils and solvents in iron drums only.

5.6 Adjustments

WARNING !
Any type of adjustment must be strictly and solely performed by the mechanical serviceman

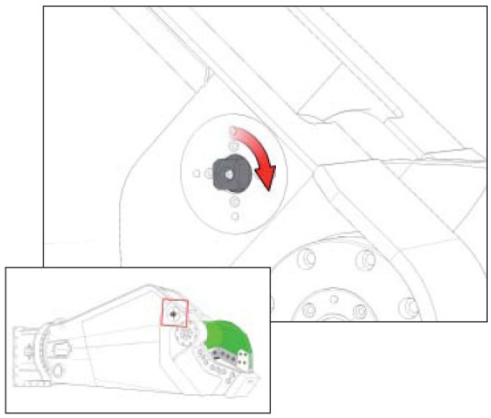
5.6.1 Adjusting the gear assembly

CAUTION !
The tolerances of the gear assembly must be set before servicing the blades on the shear.

STEP	ACTION	
1	Gently close the movable jaw until the counter slide shoe is positioned approximately halfway along the friction surface of the movable jaw.	
2	Remove the locking screws for the flange and from the flange itself.	

5.6.1
(continued)

3	Rotate the registration pin clockwise in order to push the counter slide shoe against the surface until the play between the movable jaw and the slide shoe itself reaches 0.2 - 0.3 mm.
4	Reposition the flange and screw it in using the two holes designed to lock it in place.



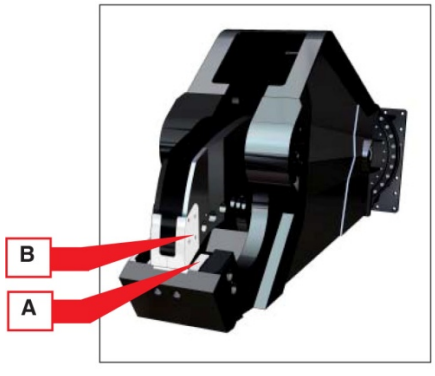
CAUTION !
To adjust the gear assembly the movable jaw of the shear must be actuated and it is therefore necessary to maintain the safety distance and always stay visible to the operator.

5.6.2
Adjusting the guide blade on the opposite side of the blades

After adjusting the gear assembly, the tolerances of the guide blade must be regulated.

CAUTION !
During the registration phase the correct clearance between the guide blade and the opposite tip blade is between 0.2-0.3 mm, then later, while working the shear, this clearance must never exceed 0.5 mm.

STEP	ACTION
1	Partially close the jaws of the shear so that the surface of the guide blade **(A)** is opposite the surface of the tip blade **(B)** and stop the machine in this position.



5.6.2 (continued)

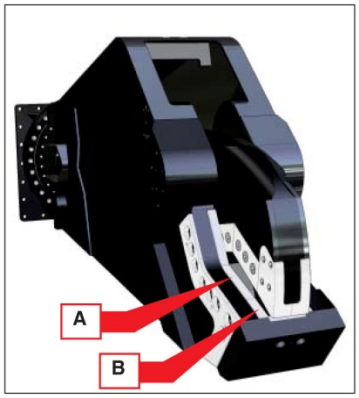
2	Verify and quantify the clearance between these two surfaces.
3	Slowly move the movable jaw in both directions to ensure that the clearance is constant throughout the range of the tip, and that it does not exceed 0.5 mm.
4	If the clearance is excessive, insert an adequate amount of shims behind the guide blade to bring the tolerance back within the indicated values.
5	If despite using all the shims provided the clearance remains excessive, it is time to replace the guide blade and/or tip blade.

5.6.3 Adjusting the clearance between the cutting blades

After adjusting the gear assembly and the clearance between the guide blade- tip blade you can proceed to regulating the clearance between the four cutting blades.

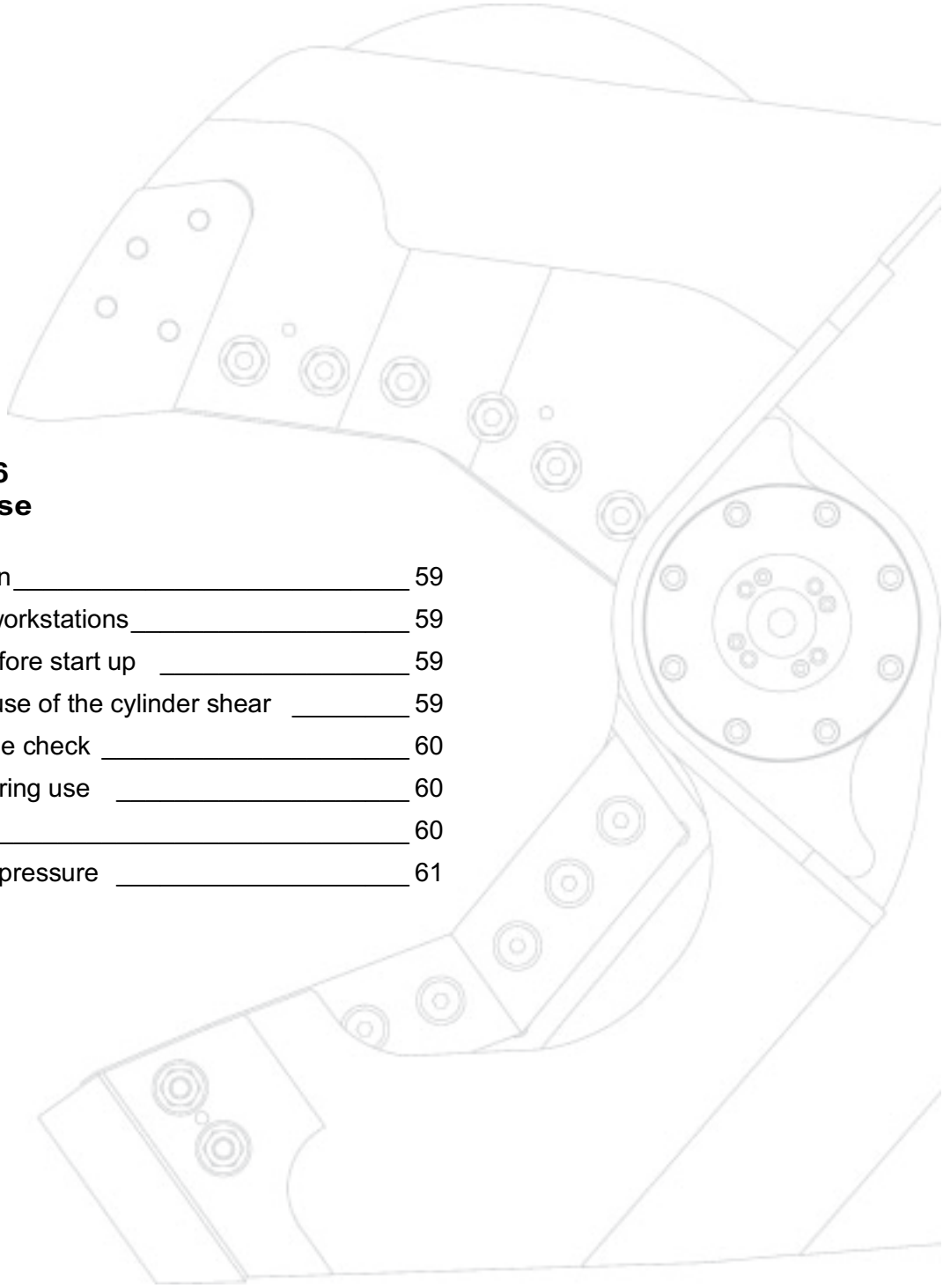
CAUTION !
During the registration phase the correct clearance between the cutting blades is between 0.2-0.3 mm, then later, while working the shear, this clearance must never exceed 1 mm.

- By registering the clearance between the cutting blades often and turning them over frequently, you increase the cutting quality and prolong the life of the blades.
- Frequently ensure that the cutting edges of the blades of the shear are sharp. The blades can be rotated to use all four cutting edges.

STEP	ACTION
1	Slowly close the cutting jaws until you reach the position shown in the figure here on the right. 
2	Using a feeler gauge, check the clearance between the blades on the fixed jaw and the movable jaw. The clearance between the blades can fluctuate within 0.2" and 0.3" max.
3	If for any reason the tolerance is greater than the values shown, contact the technical service at ZATO S.r.l.
4	If the clearance is excessive, insert an adequate amount of shims behind the frame blades **(A)** and guide blade **(B)** to bring the tolerance within the indicated values.
5	If despite using all the shims provided the clearance remains excessive, it is time to replace the guide blade and/or tip blade.

CAUTION !
If you carry out the proper maintenance procedures consistently and frequently the resulting clearance will also be consistent for the entire length of the blades.

NB Never shim the blades on the movable jaw!



CHAPTER 6
Modes of use

6. Modes of use

6.1 Introduction

The shear will only work if installed and connected to the hydraulic system of a carrier machine.

CAUTION !
Using the machine for purposes other than those intended by the manufacturer could cause serious harm to people and/or things. ZATO S.r.l. is not liable for damage resulting from improper use of the machine.

6.2 Operator workstations

To use the shear, the operator must be seated correctly in the driver's seat of the excavator.

6.3 Checks before start up

Before starting the shear, ensure that:

- all parts have been properly lubricated;
- the oil level is sufficient;
- the surfaces of the blades are clean and free of debris;
- all bolts are properly tightened.

For rotating shears, you must install a drainage device to prevent the rotation engine from failing..

CAUTION !
Do not use the machine without installing the drainage device first (if required).

6.4 First use of the shear cylinder

To carry out the first correct use of the shear cylinder, follow the rules listed below

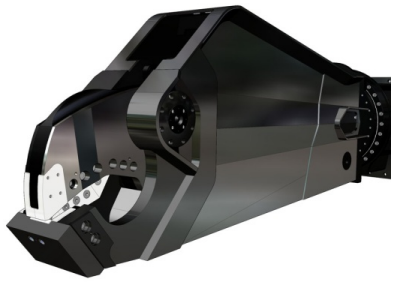
STEP	ACTION
1	Do not extend or retract the cylinder rod to its limit, but carry out 5-6 partial runs instead (about 100 mm in one direction and then in the other).
2	Then, check the hydraulic oil level in the excavator reservoir, adding more as needed.
3	Repeat the above steps until you reach the maximum open-close values for the jaws and progressively until the oil pressure reaches its maximum value.
4	Remember to keep the diesel engine running at a low rotation speed.
5	During the closing and opening movements of the cutting jaws make sure there are no obstacles of any other nature that can impede the proper functioning of the shear.

6.4 (continued)

6	Make sure there are no oil leaks anywhere in the hydraulic system.

6.5 Razor blade check

Check the proper functioning of the Razor Blade, following the steps described below:

STEP	ACTION
1	Slowly move the movable jaw of the shears until it reaches the position shown in the figure here on the right. 
2	Using a tape measure, measure the distance as in the figure above.
3	If the distance exceeds 20 mm, then check if the extra distance is caused by excessive wear of the tip blade and / or front Razor blade.
4	In the event that the tip blades and / or Razor blade are worn, proceed with replacing them.

6.6 Checks during use

While operating:

- if the Razor blade vibrates, check for any debris inside.
- insufficient perforation may occur because the blades are subject to
- thermal expansion caused by friction.

6.7 Turn off

In order to shut the shear off correctly, you must do the following:

STEP	ACTION
1	Lay the shear on the ground.
2	Turn off the excavator.
3	Check the hydraulic oil pressure.

6.8 Releasing pressure

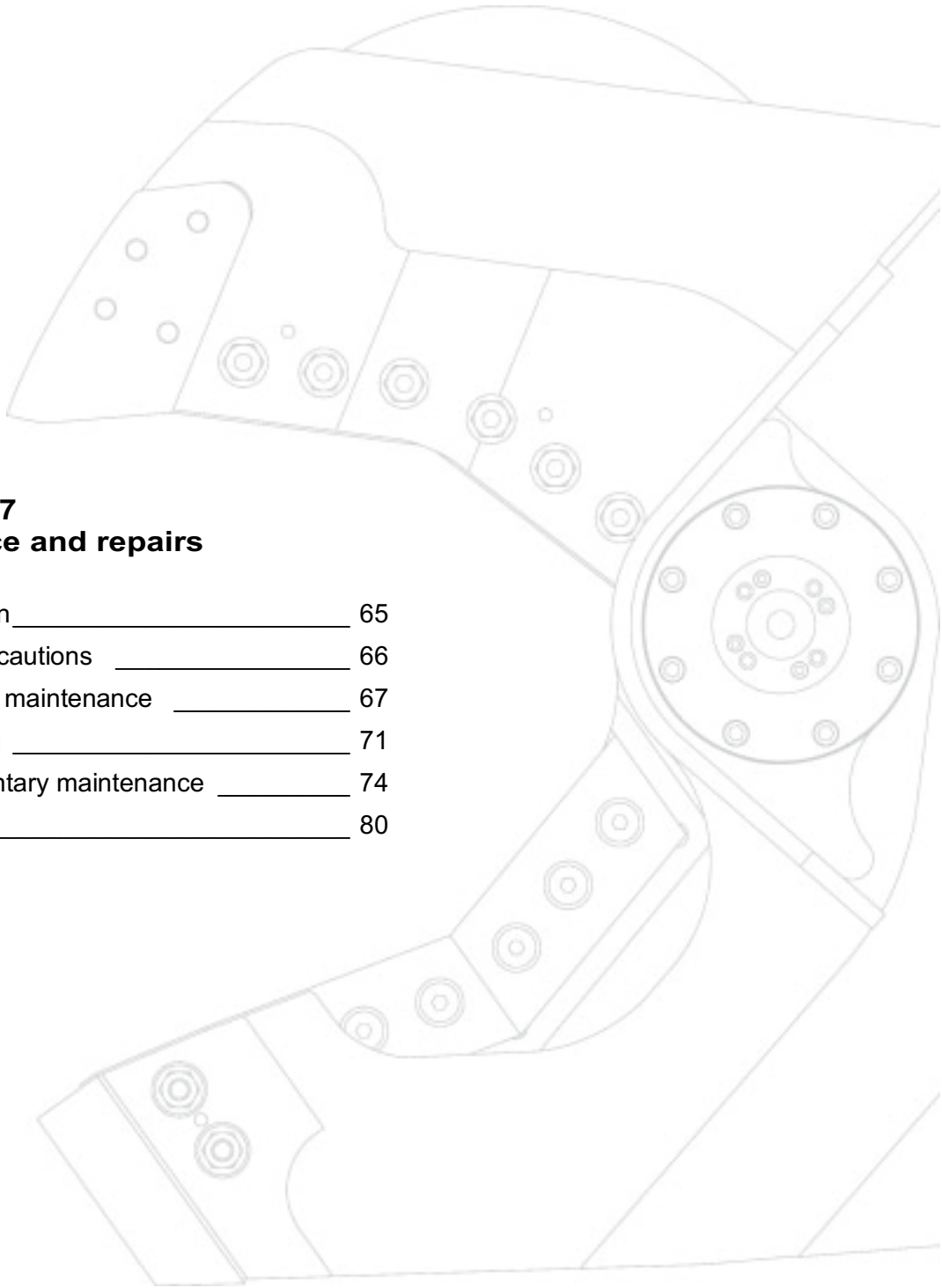
Before connecting and disconnecting the hydraulic fittings make sure that the hydraulic pressure has been released, first of all by following the instructions provided by the manufacturer of the hydraulic system and, by performing the following minimal procedures:

STEP	ACTION
1	Turn off the working machine.
2	De-pressurize the hydraulic oil reservoir.
3	While idling, operate the excavator control levers several times and in all directions.

Once all these activities have been completed it is possible to very carefully and slowly remove the hydraulic hose fittings.

CAUTION !
Hydraulic oil can reach very high temperatures! Before carrying out any operation that could put you in contact with the oil, is it imperative that you wait for it to cool down.

CAUTION !
Hydraulic oil is toxic and can cause severe damage to the person if it comes into contact with skin or eyes.



CHAPTER 7
Maintenance and repairs

7. Maintenance and repairs

7.1 Introduction

CAUTION!
Maintenance procedures must be performed by qualified and authorized personnel.

CAUTION!
Before performing any type of maintenance procedure on the shear, you must lodge appropriately sized blocks of wood in the jaws in order to avoid the movable jaw from accidentally closing.

Maintenance of the machine includes procedures (inspection, verification, checking, adjusting and replacing) that are required after normal use of the machine.
In terms of servicing, maintenance on the machine is divided into two main categories:

SCHEDULED MAINTENANCE	All operations that the operator must perform preventively in order to guarantee the proper functioning of the machine over time.
SUPPLEMENTARY MAINTENANCE	All operations that the operator must perform whenever required by the machine (damage, malfunction ...).

7.2
Safety
Precautions

CAUTION!
Before performing any type of maintenance procedure on the shear, you must lodge appropriately sized blocks of wood in the jaws in order to avoid the movable jaw from accidentally closing.

To avoid the machine from accidentally turning on while it is being serviced, press the emergency button and fasten signs on the machine with the words: CAUTION!!! DO NOT OPERATE MACHINE UNDER REPAIR

- The servicemen are required to wear all necessary personal protective equipment (gloves, goggles, overalls) for the procedures they will perform.
- During maintenance unauthorized personnel must stay away from the servicing area.
- If the procedure involves the removal of guards, cordon off the servicing area
- and display signs prohibiting access to bystanders.

CAUTION!
Before performing any type of maintenance procedure on the shear, you must lodge appropriately sized blocks of wood in the jaws in order to avoid the movable jaw from accidentally closing.

CAUTION!
Keep away from fire to avoid fire hazards.

CAUTION!
Do not work on hydraulic components when they are under pressure. Hydraulic oil can cause serious injury. Lower the pressure of the hydraulic system before intervening.
The hydraulic oil reaches very high temperatures while the machine is working: let it cool down before servicing, and wear protective clothing.

7.3 Scheduled maintenance

When the machine, is shipped to the owner, it is already regulated to work properly; however, in order to guarantee proper functioning, you should perform regular and preventative checks and maintenance procedures.

Scheduled maintenance includes inspections, checks and procedures that, in order prevent the machinery from breaking down, keep the following under control:

- the mechanical conditions of the machine;
- lubrication of the machine.

The tables below list a number of controls and procedures to be performed following a recommended schedule. The indicated frequency of scheduled maintenance jobs refer to normal operating conditions, i.e. in compliance with the conditions of intended use.

7.3.1 Scheduled maintenance tables

SCHEDULED MAINTENANCE PROCEDURES	8 ore	16 ore	40 ore	160 ore
HYDRAULIC CYLINDER				
Make sure there are no oil leaks around the piston rod.	◘			
Make sure that the screws that hold the flanges closed on the hydraulic hoses are secure.			◘	
Check the screws that hold the cylinder head closed and make sure they are tight.				◘
ROTATING HYDRAULIC JOINT				
Check for oil leaks.	◘			
Make sure the screws that hold the rotor and the stator closed are secure.			◘	
ROTATION ASSEMBLY				
Check that all bolts are tight.	see bolt tightening table			
Lubricate the pinions.			◘	
Lubricate the fittings.	see paragraph on lubrication			

GEAR ASSEMBLY				
Check the level of wear of the counter slide shoe.			◘	
TIP BLADE				
Check the edges of the cutter profile.	◘			
GUIDE BLADE				
Check for wear.	◘			
TOP/BOTTOM BLADE				
Check for wear.	◘			
RAZOR BLADE				
Check the clearance with the tip blade.	◘			
Check for wear.	◘			
CUTTING WIRE				
Clean the cutting wire.	◘			
BOLT TIGHTENING				
Check that the bolts on all blades are tight.	◘			

7.3.2
Bolt tightening

CAUTION!

Whenever bolts are tightened they are lengthened, causing a decrease in the resistant section that affects the strength of their hold. Therefore, all bolts can only be tightened twice, after which they must be replaced

We recommend replacing all the bolts every 1500 hours or 12 months of work, whichever comes first.

If you notice bolts that slacken too often, do not use the machine and immediately inform the technical service at ZATO S.r.l.

CAUTION!

Per serrare le viti con una corretta coppia di serraggio utilizzare una tabella con le coppie standard in base al tipologia di vite. Prima di serrare le viti si raccomanda di pulire accuratamente i fori di passaggio dei bulloni, le viti ed i relativi dadi, al fine di rimuovere sporco, grasso ed olio che comprometterebbero la tenuta del bullone.

CAUTION!

Il fissaggio delle viti deve essere effettuato tramite un fissante e non deve essere assolutamente usato il grasso.

7.3.3 Bolt tightening control frequency table

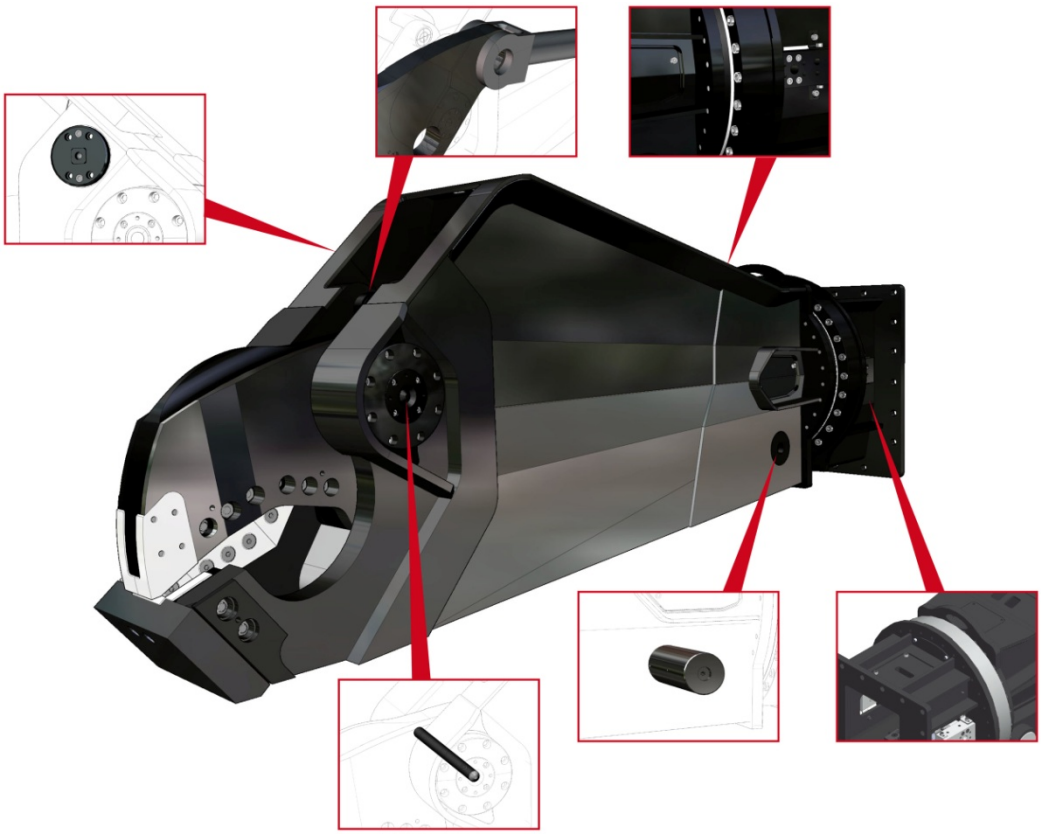
CAUTION !
At the first use of the shear and/or after periods of disuse, check the bolts before use and check them again after 4 hours of work. On the second day, check all bolts after 8 hours of work.

After the second day of using the machine, follow the table for the frequency of tightening screws and bolts provided below:

LOCATION OF BOLTS/SCREWS	8 hours	16 hours	40 hours	160 hours
BOLTS FASTENING THE MAIN BLADES ON THE TIP	◘			
TIP BLADE SCREWS	◘			
MAIN FRAME BLADES BOLTS	◘			
GUIDE BLADE BOLTS	◘			
RAZOR BLADE BOLTS	◘			
GEAR ASSEMBLY SCREWS		◘		
ROLLER BEARING TIGHTENING BOLTS			◘	
FIXED BOLTS ON THE PINS			◘	
CENTRAL PIN ASSEMBLY SCREWS			◘	
LOCKING SCREWS FOR FLANGE AND/OR HYDRAULIC TUBE FITTINGS			◘	
HYDRAULIC JOINT BOLTS			◘	
GEAR MOTOR SCREWS			◘	
HYDRAULIC CYLINDER VALVE SCREWS				◘
CYLINDER HEAD CLOSING SCREWS				◘
VARIOUS HATCH COVER SCREWS				◘

7.4 Lubrication

The picture below highlights the parts of the machine that need to be greased:



CAUTION !
Grease the parts at the end of the work shift, or when the shear is not completely cold.

CAUTION !
Wipe away the excess lubricant that could create a hazard. This will facilitate the operator's work later on.

CAUTION !
The points on the shear that require lubricating (grease) are marked by the "GRASSO-GREASE" decals.

In order to obtain optimal lubrication, we recommend using **AGIP GR** grease lithium based containing special additives **EP** (Extreme Pressure).

7.4.1
Machine
lubrication tables

PARTS REQUIRING LUBRICATION	8 hours	20 hours	40 hours	N. PUMPS
BALL BEARING ROTATION			◘	3
SPUR GEAR AND RACK ROLLER BEARING		◘		3-4
CENTRAL PIN ASSEMBLY	◘			3
FRONT PIN SHEAR CYLINDER	◘			3
SHEAR CYLINDER REAR PIN	◘			3
GEAR	◘			3 on the greaser 3 on the friction surface
EXCAVATOR BOOM PIN	◘			3
EXCAVATOR CYLINDER PIN	◘			3

7.4.2 Changing the gear lubricant

The lubricant for the motor-gear unit must be changed after the first 50 hours or work and checked after every 250 hours thereafter.

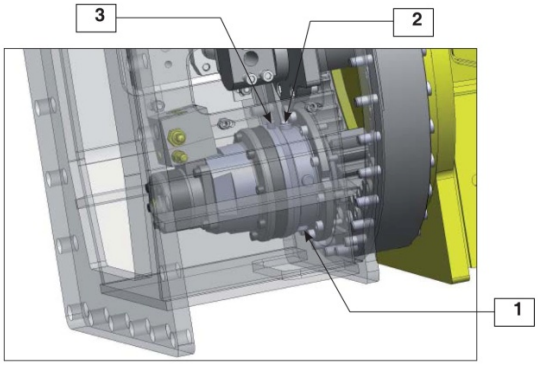
We recommend using lubricant with gradients and characteristics suitable for the following temperature ranges:

AMBIENT TEMPERATURE	RECOMMENDED GRADIENT	FREQUENCY OF LUBRICANT CHANGE
-10°C/ +45°C	SAE 80W-90W	500 hours/ 1 year

CAUTION!
For ambient conditions different from those indicated, consult technical service at ZATO S.r.l.

To change the gearbox lubricant, do the following:

STEP	ACTION
1	Position the shear at a comfortable working height so that the gearbox is level (horizontal).
2	Place a pan under the gear motor to collect spent oil.
3	Remove the bottom drain plug **(1)** and the top filler cap **(2)** together with the vent cap **(3)** to make emptying quick and easy.
4	After you have drained the oil, screw the bottom plug back on to refill it.
5	Add the appropriate lubricant for the gearbox through the top filler cap.
6	Screw the top cap back on and the vent cap, and dispose of the spent oil correctly.



7.5 Supplementary maintenance

CAUTION !
The repair and replacement of parts of the machine must be performed by qualified, trained and authorized technicians. These procedures require extensive and specialized knowledge of the machines, related risks and correct procedures to work in safety.

CAUTION !
Spare parts must be ordered from ZATO S.r.l. as described in the relative chapter of this manual. Should the customer decide not to use original parts or parts authorized by the manufacturer, the manufacturer is not considered responsible for the functioning of the machine and operator safety. Authorization and / or instructions must always be provided in writing. It is forbidden to operate the machine without written permission and the manufacturer will not be held responsible.

Procedures that are not included among those listed under scheduled maintenance are considered supplementary maintenance.

CAUTION !
Before removing the blades from the shear make absolutely sure that the excavator is turned off.

While the blades are being dismantled they may fall out of their seat. Ensure that staff wears adequate protective equipment (safety shoes), and that all bystanders maintain the safety distance.

CAUTION !
After replacing any blade, work for 6 / 8 hours and then proceed to tighten the bolts while the blade is still "hot."

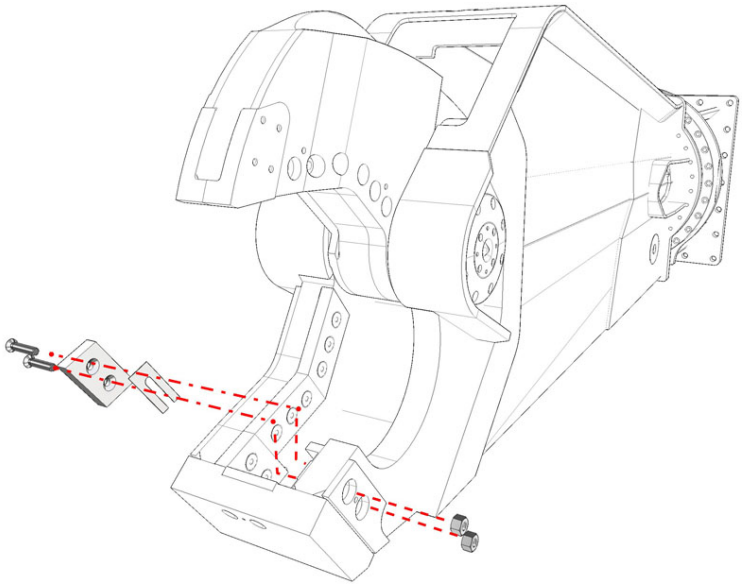
CAUTION !
Once the old blades have been removed , proceed to clean their seats and check conditions before installing the new blade.

7.5.1 Replacing the guide blade

To replace the guide blade, do the following:

STEP	ACTION
1	Remove the blade bolts.
2	Remove the blade from its seat along with the shims.
3	Insert the new blade without shims.
4	Perform the adjustment procedure on the guide blade (described in the "Adjustments" paragraph) to provide the best set-up for the machine.

CAUTION !
In the event that the guide blade has been replaced and all of the shims provided have been used but the clearance is still excessive, it is time to replace the tip blade.

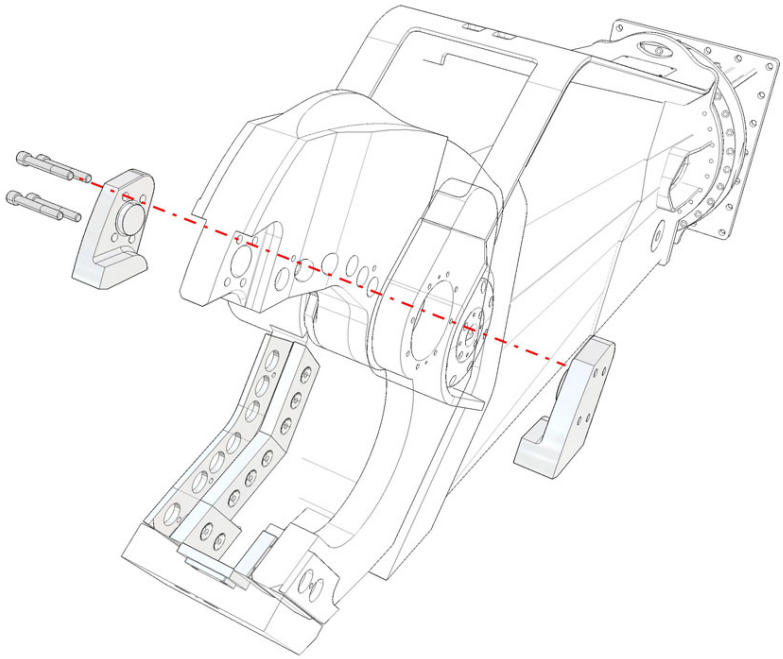


7.5.2 Replacing the tip blades

To replace the tip blade, do the following:

STEP	ACTION
1	Remove the screws that hold the blades in place.
2	Thoroughly clean any residue from the seat of the blades that could prevent them from being correctly installed.
3	Put the new blades in place and put the screws back in.
4	Perform the adjustment procedure on the guide blade (described in the "Adjustments" paragraph) to provide the best set-up for the machine.

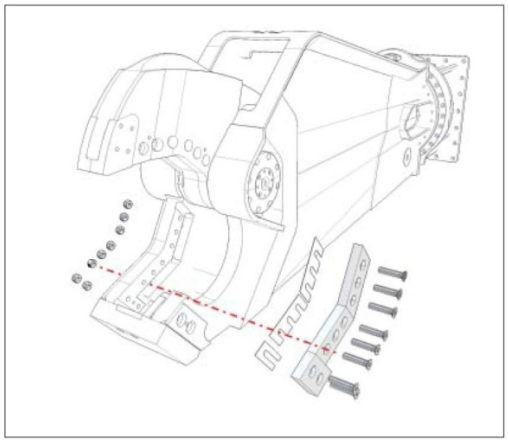
CAUTION !
The tip blades should always be replaced in pairs.

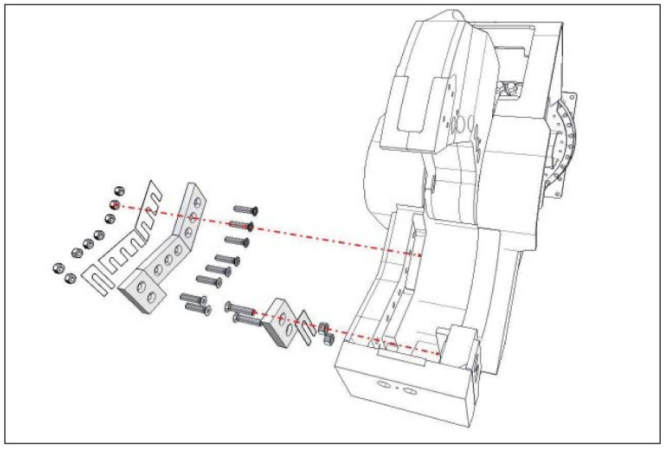


7.5.3 Replacing the cutter blades on the fixed jaw

To replace the cutter blades on the fixed jaw, do the following:

STEP	ACTION
1	Remove the screws holding the primary bottom blade of the shears (the blade closest to the central pin of the movable jaw).
2	If the blade is stuck in place, insert a pin in one of the two blade-removal holes (holes located between the bolt holes).
3	Once the first blade has been removed, repeat the process with the second and third blades.
4	Insert in this order, the new third blade and the new second blade and bolt them into place as required, then proceed to insert the new primary blade and bolt it into place.
5	Repeat the checking process with a feeler gauge and if necessary repeat the registration of the blades until you reach the desired tolerance.



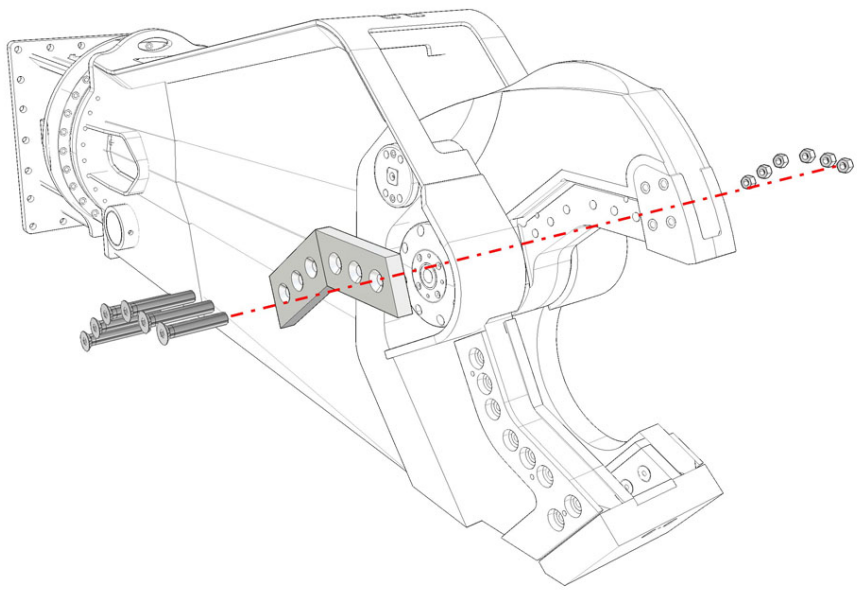


7.5.4 Replacing the cutter blades on the movable jaw

To replace the cutter blades on the movable jaw, do the following:

STEP	ACTION
1	Remove the screws holding the primary top blade of the shear (the blade closest to the central pin of the movable jaw).
2	If the blade is stuck in place, insert a pin in one of the two blade-removal holes (holes located between the bolt holes).
3	Once the primary blade has been removed, repeat the process with the secondary blade.
4	Insert the new secondary blade and bolt it into place as required, then proceed to insert the new primary blade and bolt it into place.
5	Check the clearance between the blades and should it appear incorrect adjust the clearance by shimming the cutter blades on the fixed jaw.

CAUTION!
The cutter blades on the movable jaw must never be shimmed. Never use shims.



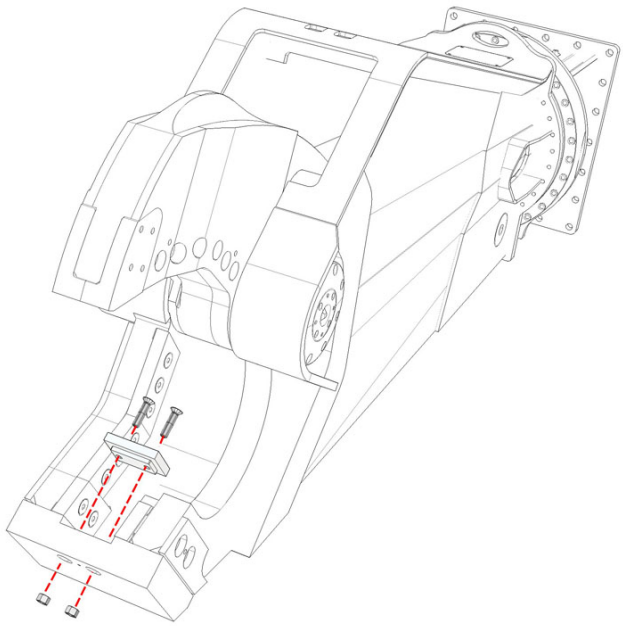
7.5.5 Replacing the front blade of the fixed jaw (RAZOR blade)

To replace the front blade of the fixed jaw, the RAZOR blade, do the following

STEP	ACTION
1	Remove the guide blade and the bottom secondary blade, as shown in the picture below.
2	Removing the Razor blade.
3	After thoroughly cleaning its seat, insert the new blade.
4	Tighten the screws according to the tightening instructions.

CAUTION !
The Razor blade must never be shimmed.

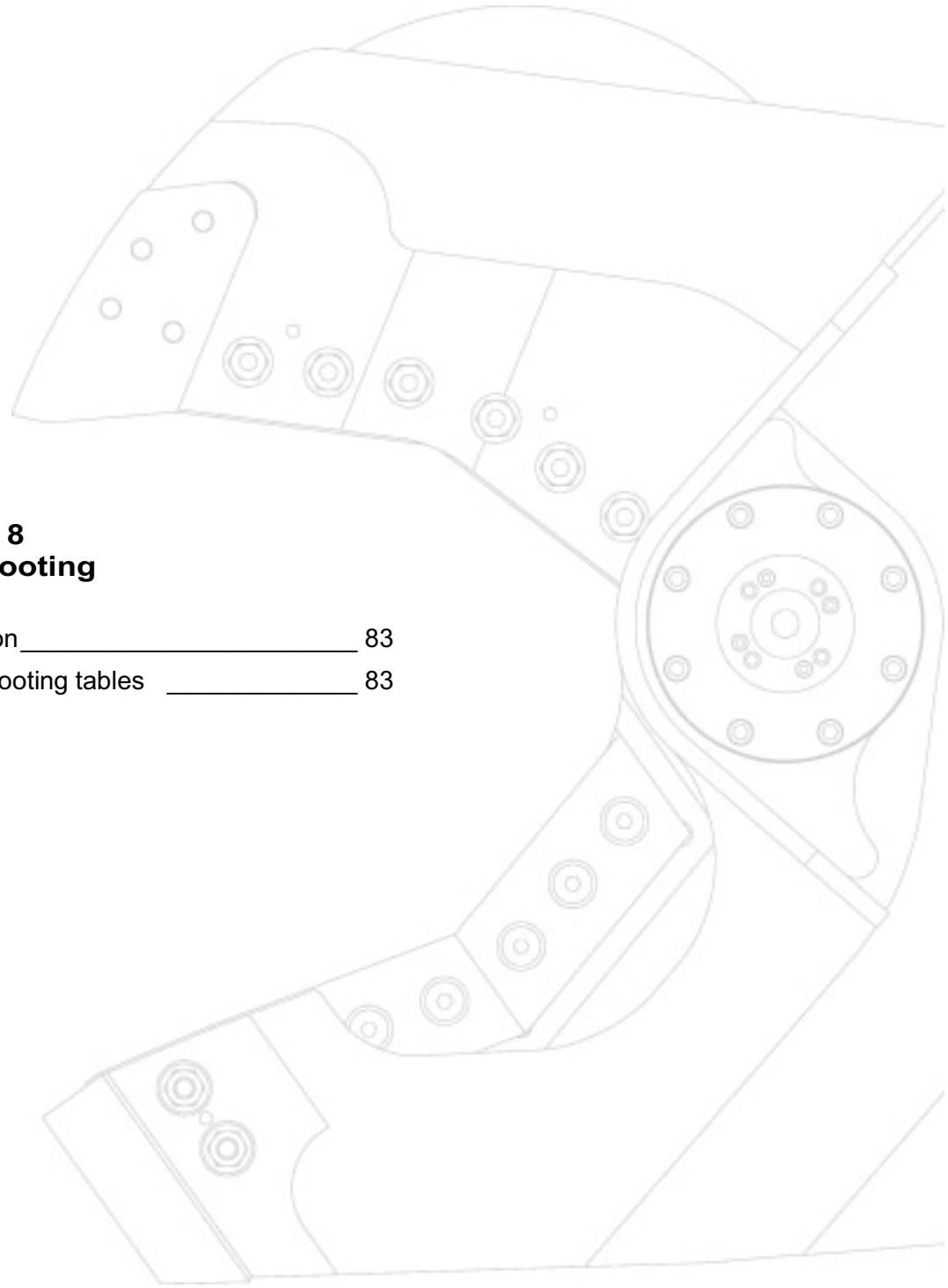
CAUTION !
The Razor blade needs to be turned over frequently to maintain a functional cutting edge.
The correct clearance between the cutting edge of the tip blade and that of the Razor blade must be between 14 and 18 mm and later, due to wear from work, it must never exceed 20 mm.



7.6 Cleaning

CAUTION !
All cleaning must be performed with the machine turned off. The emergency button must be pressed and locked down.

To clean the shear after a normal work cycle, blow it with compressed air.



CHAPTER 8
Trouble shooting

8.Trouble shooting

8.1 Introduction

Below is a list of some defects and problems that may occur while operating the shear.

8.2 Trouble shooting tables

SYMPTOM	**1. The shear lacks power**
CAUSE	a. The excavator is not sending maximum pressure to the shear's circuit. b. The shear cylinder is bypassing internally. c. The shears' hydraulic joint is bypassing internally.
SOLUTION	a. Check the hydraulic pressures of the excavator. b. Replace the cylinder seals. c. Replace the seals on the hydraulic joint.

SYMPTOM	**2. The shear does not cut the material**
CAUSE	a. The size of the material is beyond the capacity of the shear. b. The blades are worn. c. The clearance between the blades is excessive. d. The back pressure on the return side of the cylinder is excessive.
SOLUTION	a. For information on the cutting capacity of the shear contact ZATO S.r.l. b. See the paragraph regarding the maintenance of the shear. c. See the paragraph regarding the maintenance of the shear. d. Check the excavator's main control valve.

SYMPTOM	**3. The shear is not perforating the material**
CAUSE	a. The tip blade is excessively worn. b. The Razor Blade is excessively worn.
SOLUTION	a. See section regarding maintenance of the shear. b. See section regarding maintenance of the shear.

8.2.
(continued)

SYMPTOM	**4. Il corpo mobile si muove più lentamente rispetto ai parametri impostati originariamente in entrambe le direzioni**
CAUSE	a. La valvola Power Speed non lavora correttamente. b. Le portate di olio in arrivo dall'escavatore non sono regolari.
SOLUTION	a. Sostituire la valvola Power Speed. b. Controllare le portare dell'escavatore.

SYMPTOM	**5. The material remains locked in the jaws of the shear**
CAUSE	a. The clearance between the blades is excessive. b. The blades are too worn. c. The tip blades are worn down. d. The clearance between the tip blade and the guide blade is excessive
SOLUTION	a. See the paragraph on maintenance of the shear. b. See the paragraph on maintenance of the shear. c. See the paragraph on maintenance of the shear. d. See the paragraph on maintenance of the shear.

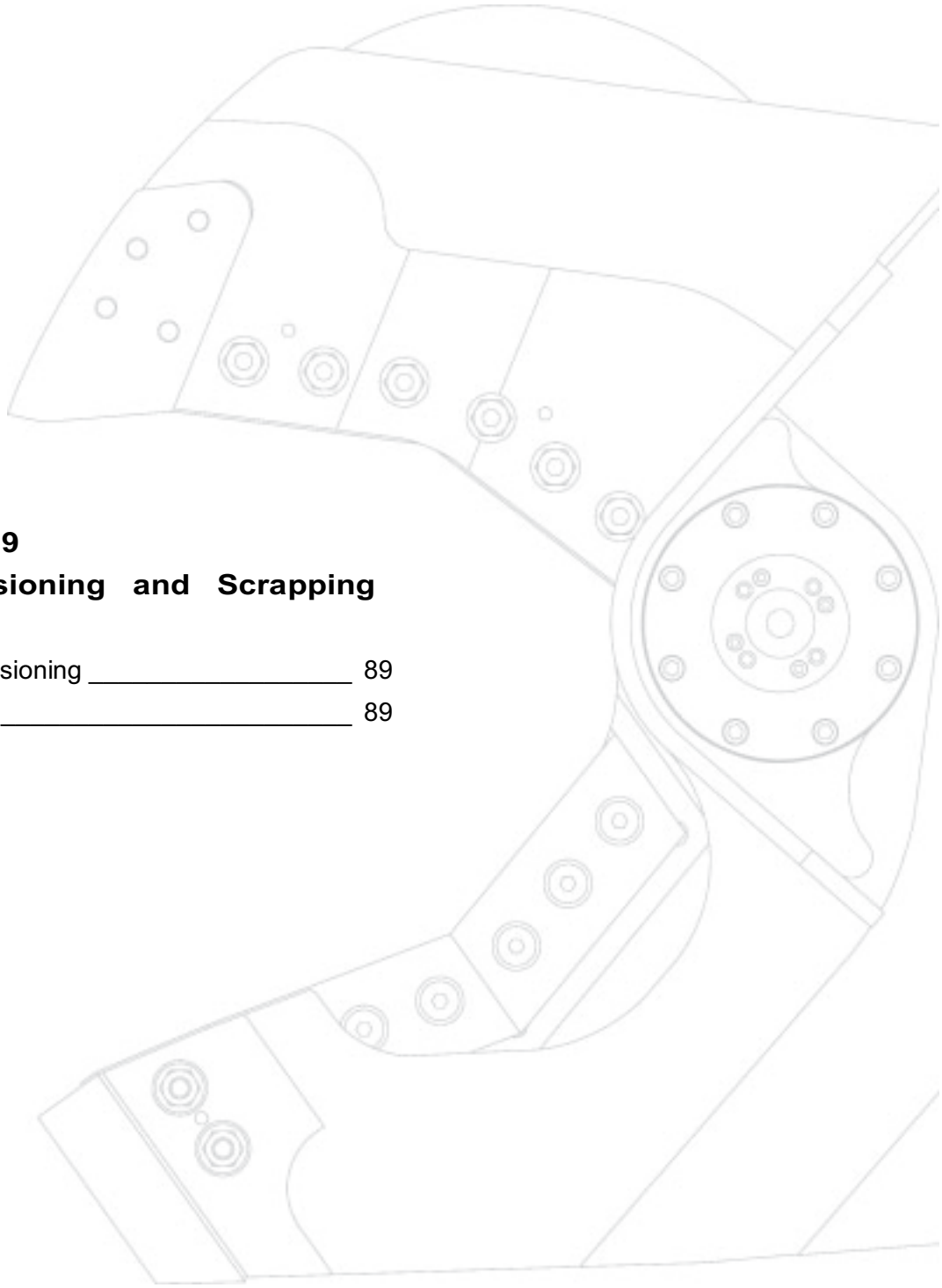
SYMPTOM	**6. The movable jaw moves slower than originally set in the parameters only in one direction, while the speed in the opposite direction is correct**
CAUSE	a. There is back pressure on the return side of the cylinder.
SOLUTION	a. Check the excavator's main control valve.

SYMPTOM	**7. The shear does not rotate**
CAUSE	a. The excavator is not sending the correct pressure to the shear's circuit. b. The rotation motor is faulty. c. The rotation reduction gear is faulty. d. The rotation control valve is faulty. e. The rotation control valve is not correctly calibrated.
SOLUTION	a. Adjust the pressure of the excavator. b. Replace the hydraulic motor. c. Replace the reduction gear. d. Replace control valve.

	e. Adjust the control valve.

8.2
(continued)

SYMPTOM	**8. The rotation speed is faulty**
CAUSE	a. The oil flow from the excavator is incorrect. b. The directional control valve is faulty.
SOLUTION	a. Adjust the oil flow from the excavator. b. Replace the directional valve unit.



CHAPTER 9
Decommissioning and Scrapping

9. Decommissioning and scrapping

9.1 Decommissioning

CAUTION !
The procedures for decommissioning and dismantling must be performed by personnel that is specialised in these activities and equipped with the necessary mechanical and electrical skills. Observe the security regulations provided in this manual.

The machine does not present particular problems for decommissioning. It is a good idea to take the necessary precautions (eg. disconnect the hydraulic system) to prevent unauthorized personnel from re-commissioning the machinery.

As for the legal and tax aspects of these operations (any reports, complaints, etc. ..), follow the laws of the country where the machine is installed.

To decommission the machine, follow the procedure described here below:

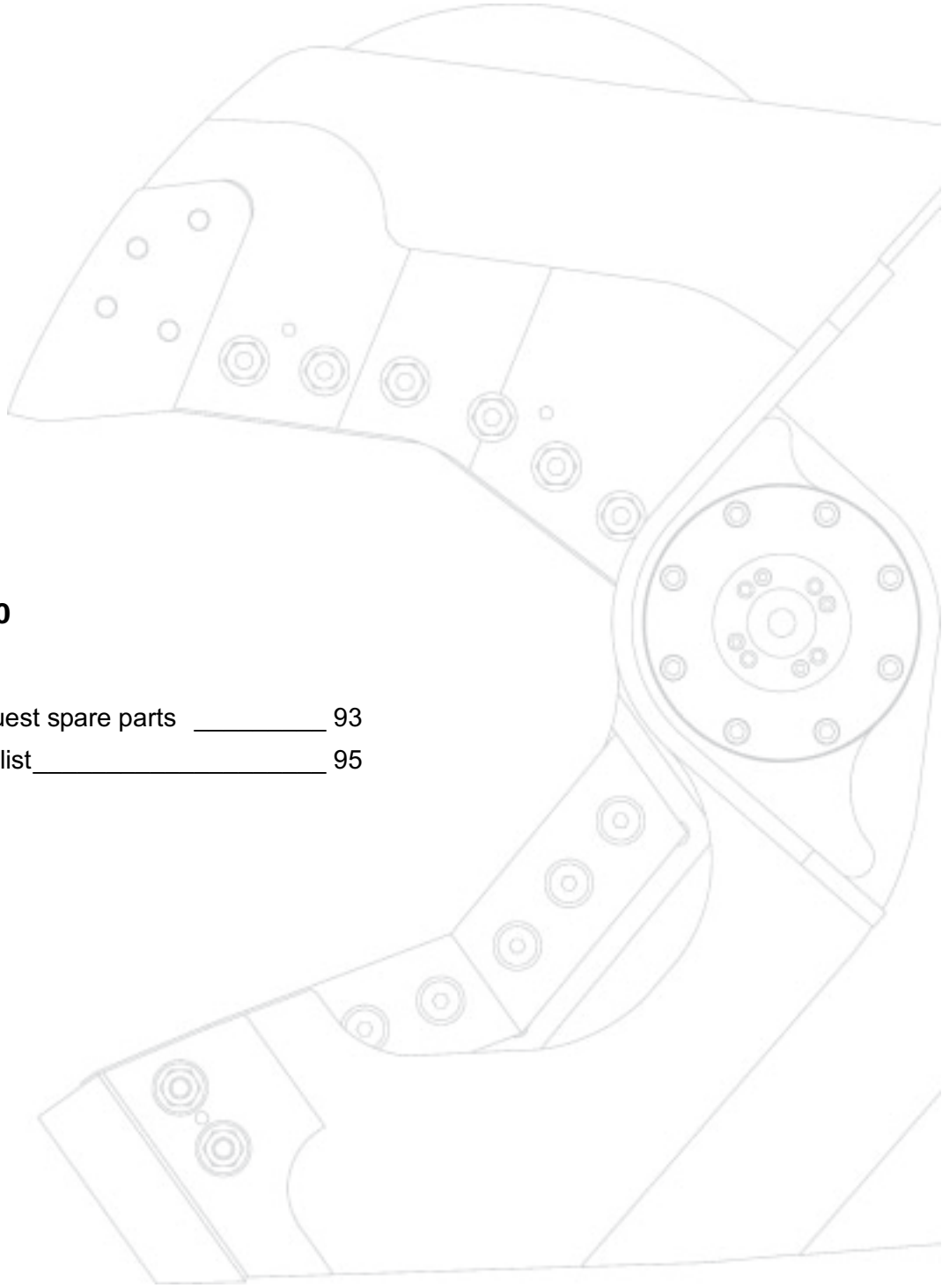
STEP	ACTION
1	Set up a work area free of obstacles in order to perform the steps to dismantle the machine.
2	Drain the spent oil and place it in appropriate containers.
3	Separate the assemblies for sorted disposal.

9.2 Scrapping

Once the machine has been dismantled, it can be disposed of as industrial waste. All waste must be handled in accordance with the applicable legislation in the country of installation.

Some consumable materials must be sent to recycling centers to be sorted and for treatment of the polluting parts, according to the applicable laws in the country where the machine is installed.

CAUTION !
Spent oil must be sent to companies authorized to dispose of oils.



CHAPTER 10
Spare Parts

10. Spare parts

10.1
How to request spare parts

If you need to order spare parts, follow these steps:

1. Xerox the form from the next page;
2. Fill in the appropriate information as follows:
3. Send a copy of the form completed in its entirety to the fax number provided.

In response, you will be sent an offer indicating price, shipping and sales conditions, as soon as possible.

Zato	**SERVICE AND SPARE PARTS DEPARTMENT FAX.**			A
B	**REQUEST FORM FOR SPARE PARTS QUOTATION**			
C		D		
E	F		H	
	G		I	
ASSEMBLY CODE	**ITEM CODE**	**DESCRIPTION**	**UNITS OF MEASUREMENT**	**QUANTITY**
L	M	N	O	P

A: Number of pages of the request for quotation (Example: if the parts list takes up 2 forms, on the first write "1 / 2" and on the second "2 / 2).
B: A preprinted form for the serial number of the machine in question to avoid errors. (Be sure not to use this form to another one of our machines, we will have the wrong reference.)
C: Details of the address where the goods will be delivered.
D: Details of the address where the invoice will be sent.
E: Name and surname of the person the quotation is addressed to (please print).
F: Phone number of the individual requesting the quotation.
G: Fax number to send the offer to.
H: The writer's preferential shipping method.
I: Date of request for quotation.
L: ZATO S.r.l. code, the assembly the required code was taken from (from spare part tables).
M: ZATO S.r.l. item code (from spare parts tables).
N: Item description (from spare parts tables).
O: Unit of measurement of the item (from spare parts tables).

P: Quantity of spare parts required

10.1.1
Request form for spare parts

Zato	**SERVICE AND SPARE PARTS DEPARTMENT TEL. / FAX.**	
Serial number machine	**Request form for spare parts offer**	
Delivery address for goods		Delivery address for invoice
Name of applicant	Phone Number	Shipping by:
	Fax Number	Date

ASSEMBLY CODE	ITEM CODE	DESCRIPTION	UNITS OF MEASUREMENT	QUANTITY

10.2

Spare parts list

WARNING !
We strongly recommend that you keep the following spare parts in stock as they are considered essential to creating smooth working conditions.

Below is a list of spare parts that ZATO S.r.l. recommends keeping in stock:

CODE	DESCRIPTION	MIN. RECOMMENDED Q.TY
	Complete series of blades (2 x Guide blade – 1 x Razor Blade – 1 pair Tip Blade)	1
	Complete set of blade bolts	3
	Complete kit blade shims	1
	Counter gear puck	1
	Hydraulic motor complete with control valve	1
	Series of rotating hydraulic joint hoses with hydraulic cylinder	1
	Series of plugs for the hydraulic fittings of the shears and the excavator	1
	Complete set of stickers	3
	Grease nipples	20

SOMMARIO