IMPACT CRUSHER

IMPACTOR BOX MANUAL

EXTEC SCREENS & CRUSHERS LTD

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OPERATING INSTRUCTIONS
And
SPARE PART LIST

For

IMPACT CRUSHER TYPE STARPACTOR APP 1013 EX
&
IMPACT CRUSHER TYPE STARPACTOR APP-R 1013 EX

customer :

Order - No. :

Krupp Hazemag SA

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APPENDIX

ATTENTION

After 24 H working :

- retighten all bolts

IMPORTANT ! **A weekly check is required to control if bolts or screws are tight**

NOTE : no intervention when machine is running

ATTENTION

The safety switches have to be integrated in the emergency stop circuit of the electrical parts of the machine.

IMPORTANT INSTRUCTIONS

The following instructions do not substitute the operating instructions.

The start-up of the crushing plant and the instruction of the operator should be effected by **Krupp Hazemag SA** commissioning personnel.

Align and support plant
Examine units on foreign matters
Remove transport protections
Control safety devices
Close maintenance openings
Check screwing and piping
Check oil levels
Check sense of rotation

The electrical connection must be executed according to the local electrical instructions. Direction of rotating field right.

For first material feed use small material per shift.

At low temperatures empty feed hopper at shift end.

Do not poke iron bars into the crusher inlet during crushing operation.

Execute maintenance or repair work only when crushing plant stands still and electric plant is switched off. Lock main switch against erroneous or unauthorised starting of the plant.

Check the tight fit of all screwed and screw-bolt-connections after 50, 100 and 500 operating hours, then every three months.

Use personal protective equipment.

Adjust the impact face only when rotor stands still.
The impact faces must not immerse into the impact range of rotor.

Make sure that the rotor stands still before opening parts of the housing or doors. For change of impact bars lock rotor.

Avoid danger area when opening the impact crusher.

Use the emergency-off switches in an emergency situation only and not for normal interruption of operation.

Remark for mobile crushing plants :

Change plant over to permissible driving height resp. driving width before driving on roads.

Lock all platforms, machine units and attached parts before driving.

Check the brake and lighting system before driving.

USE ORIGINAL Krupp Hazemag SA SPARE AND WEARING PARTS ONLY !

MAINTENANCE / CUSTOMER SERVICE :

For servicing and repair trained Krupp Hazemag SA personnel will be at your disposal.

Address: **Krupp Hazemag SA**
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FOREWORD

These operating instructions are designed to familiarise the user with the installation and its designated use.

The instruction manual contains important information on how to operate the installation safely, properly and most efficiently.
Observing these instructions helps to avoid danger, to reduce repair costs and downtimes and to increase the reliability and life of the installation.

The instruction manual is to be supplemented by the respective national rules and regulations for accident prevention and environmental protection.

The operating instructions must always be available wherever the installation is in use.

These operating instructions must be read and applied by any person in charge of carrying out work with and on the installation, such as :

- operation

including setting up, troubleshooting in the course of work,
care and disposal of fuels and consumables

- maintenance

(servicing, inspection, repair).

First assembly is to be executed by skilled personnel.

The respective foundation and assembly drawings are to be studied.

Included guidelines are to be observed.

The manual does not include guidelines for larger repairs.

Krupp Hazemag SA disposes of skilled erection personnel which carries out inspections and repairs, if required.

Technical modifications which become necessary for improving the installation operation are reserved contrary to the contents of this operating manual.

This operating manual is intended for the operating and maintenance staff. It includes guidelines and drawings of technical nature which are not allowed to be duplicated, distributed or utilised unauthorised in competition or be imparted to others, neither completely nor partly.

In addition to the operating instructions and to the mandatory rules and regulations for accident prevention and environmental protection in the country and place of use of the plant, the generally recognised technical rules for safe and proper working are to be observed, too.

SCOPE OF APPLICATION

The scope of application of the crushing installation is specified in the order confirmation.

Prior to the use of the crushing installation beyond this scope of application, consult the after-sales service, otherwise the warranty will lapse.

SPARE PARTS STOCK

Precondition for the continuous operation and readiness of function of the crushing installation is to keep the major spare and wearing parts on stock.

Please order spare parts according to the spare parts list.

The spare parts drawings listed in the spare parts list furnish additional information.

Our guarantee only refers to the original spare parts delivered by us.

We expressly point out that we do not assume any liability for spare parts and accessories which have not been delivered by us. Foreign products may have a negative effect on the characteristics features of the crushing installation impairing safe operation. Damages caused by using products other than the original spare parts and accessories are excluded from the warranty.

Please consider that own-manufactured and foreign products are often subject to special production and delivery specifications and that we will always offer you spare parts which are state-of-the-art and correspond to the latest legal regulations.

SAFETY

SYMBOL DEFINITION

SAFETY SYMBOL

You will find this symbol in the manual in conjunction with the safety rules if there is the danger to life and limb. Adhere strictly to the safety regulations and proceed with the utmost care.
Pass on all safety rules to other users. In addition to the regulations included in this manual observe the general safety rules and the rules for prevention of accidents.

SYMBOL ATTENTION

This symbol stands in the operating manual for strict observance of the guidelines, rules, instructions and the correct working sequence to prevent the machines and components from being damaged or destroyed.

SAFETY RULES

* The crushing installation has been built in accordance with state-of-the-art standards and the recognised safety rules. Nevertheless, its use may constitute a risk to life and limb of the user or of third parties, or cause damage to the machine and to other material property.

* The installation must only be used in technically perfect condition in accordance with its designated use and the instructions set out in the operating manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the installation.
Any functional disorders, especially those affecting the safety of the installation, should therefore be corrected immediately.

* In addition to the operating instructions, observe and instruct the user of all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection.

* These compulsory regulations may also deal with the handling of hazardous substances, issuing and/or wearing of personal protective equipment (safety helmet, safety boots, safety goggles, ear protection, breathing mask), or traffic regulations.

* Personnel entrusted with work on the installation must have read the operating instructions and in particular the chapter on safety before beginning work. Reading the instructions after work has begun is too late. This applies especially to persons working only occasionally on the installation, e.g. during setting up or maintenance.

* For reasons of safety, long hair must be tied back or otherwise secured, garments must be close-fitting and no jewellery – such as rings - may be worn. Injury may result from being caught up in the machinery or from rings catching on moving parts.

* Use protective equipment wherever required by the circumstances or by law.

* Observe all safety instructions and warnings attached to the installation.

* See to it that safety instructions and warnings attached to the installation are always complete and perfectly legible.

* In the event of safety-relevant modifications or changes in the behaviour of the installation during operation, stop the installation immediately and report the malfunction to the competent authority.

* Never make any modifications, additions or conversions which might affect safety without the supplier's approval. This also applies to the installation and adjustment of safety devices and valves as well as to welding work on load-bearing elements.

* Replace hydraulic hoses within stipulated and appropriate intervals even if no safety-relevant defects have been detected.

* Adhere to prescribed intervals or those specified in the operating instructions for routine checks and inspections.

* For the execution of maintenance work, tools and workshop equipment adapted to the task on hand are absolutely indispensable

* Any work on and with the installation must be executed by reliable personnel only. Statutory minimum age limits must be observed.

* Employ only trained or instructed staff and set out clearly the individual responsibilities of the personnel for operation, set-up, maintenance and repair.

* Define the machine operator's responsibilities - also with regard to observing traffic regulations - giving the operator the authority to refuse instructions by third parties that are contrary to safety.

* Work on the electrical system and equipment of the installation must be carried out only by a skilled electrician or by instructed persons under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

* Work on the hydraulic system must be carried out only by personnel with special knowledge and experience of hydraulic equipment.

* Operate the installation only if all protective and safety-oriented devices, such as removable safety devices, emergency shut-off equipment, sound-proofing elements and exhausters, are in place and fully functional.

* Check the installation at least once per working shift for obvious damage and defects. Report any changes (incl. changes in the machine's working behaviour) to the competent authority immediately. If necessary, stop the machine immediately and lock it.

* In the event of malfunctions, stop the installation immediately and lock it. Have any defects rectified immediately.

* During start-up and shut-down procedures always watch the indicators in accordance with the operating instructions.

* Before starting up the installation in motion, make sure that nobody is at risk.

* Observe the adjusting, maintenance and inspection activities and intervals set out in the operating instructions, including information on the replacement of parts and equipment. These activities may be executed by skilled personnel only.

* Brief operating personnel before beginning special operations and maintenance work, and appoint a person to supervise the activities.

* In any work concerning the operation, conversion or adjustment of the Installation and Its safety-oriented devices or any work related to maintenance, inspection and repair, always observe the start-up and shut-down procedures set out in the operating instructions and the information on maintenance work.

* Carry out work on the installation during standstill only.

* Before starting work the drives and auxiliary equipment are to be secured against unintentional start. This may be done by means of a lockable local switch.

* Before restarting the installation after repair work, check whether all safety devices are available.

* After electrical assembly or repair work check the protection system (e.g. earth resistance).

* To avoid the risk of accidents, individual parts and large assemblies being moved for replacement purposes should be carefully attached to lifting tackle and secured. Use only suitable and technically perfect lifting gear and suspension systems with adequate lifting capacity. Never work or stand under suspended loads.

* The fastening of loads and the instructing of crane operators should be entrusted to experienced persons only. The marshaller giving the instructions must be within sight or sound of the operator.

* For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms. Never use machine parts as a climbing aid.

* Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice.

* Before cleaning the installation with water, steam jet (high pressure cleaning) or detergents, cover or tape up all openings which - for safety and functional reasons – must be protected against water, steam or detergent penetration. Special care must be taken with electric motors and switchgear cabinets.

* After cleaning, remove all covers and tapes applied for that purpose.

* After cleaning, examine all fuel, lubricant, and hydraulic fluid lines for leaks, loose connections, chafe marks and damage. Any defects found must be rectified without delay.

* Always tighten any screwed connections that have been loosened during maintenance and repair.

* Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.

* Ensure that all consurnables and replaced parts are disposed of safely and with minimum environmental impact.

* Use only original fuses with the specified current rating. Switch off the installation immediately if trouble occurs in the electrical system.

* Work on the electrical system or equipment may only be carried out by a skilled electrician himself or by specially instructed personnel under the control and supervision of such electrician and in accordance with the applicable electrical engineering rules.

* If provided for in the regulations, the power supply to parts of machines and components, on which inspection, maintenance and repair work is to be carried out must be cut off.
Before starting any work, check the de-energized parts for the presence of power and ground or short-circuit them in addition to insulating adjacent live parts and elements.

* The electrical equipment of the installation is to be inspected and checked at regular intervals. Defects such as loose connections or scorched cables must be rectified immediately.

* Necessary work on live parts and elements must be carried out only in the presence of a second person who can cut off the power supply in case of danger by actuating the emergency shut-off or main power switch. Secure the working area with a red-and-white safety chain and a warning sign. Use insulated tools only.

* Operate internal combustion engines and fuel operated heating systems only on adequately ventilated premises. Before starting the machine on enclosed premises, make sure that there is sufficient ventilation.

* Observe the regulations in force at the respective site.

* Check all lines, hoses and screwed connections regularly for leaks and obvious damage. Repair damage immediately.
Splashed oil may cause injury and fire.

* Depressurize all system sections and pressure pipes (hydraulic system, compressed-air-system) to be removed in accordance with the specific instructions for the unit concerned before carrying out any repair work.

* Hydraulic and compressed-air lines must be laid and fitted properly. Ensure that no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.

* When handling oil, grease and other chemical substances, observe the product-related safety regulations.

* Be careful when handling hot consumables (risk of burning or scalding).

Mobile units :

* Work on chassis, brake and steering systems must be performed by skilled personnel only which has been specially trained for such work.

* Before beginning work, familiarise yourself with the surroundings and circumstances of the site, such as obstacles in the working and travelling area, the soil bearing capacity and any barriers separating the construction site from public roads.

* Before travelling with the installation, check that the braking, steering, signalling and lighting systems are fully functional.

* Before travelling the installation, check that the accessories have been safety stowed away.

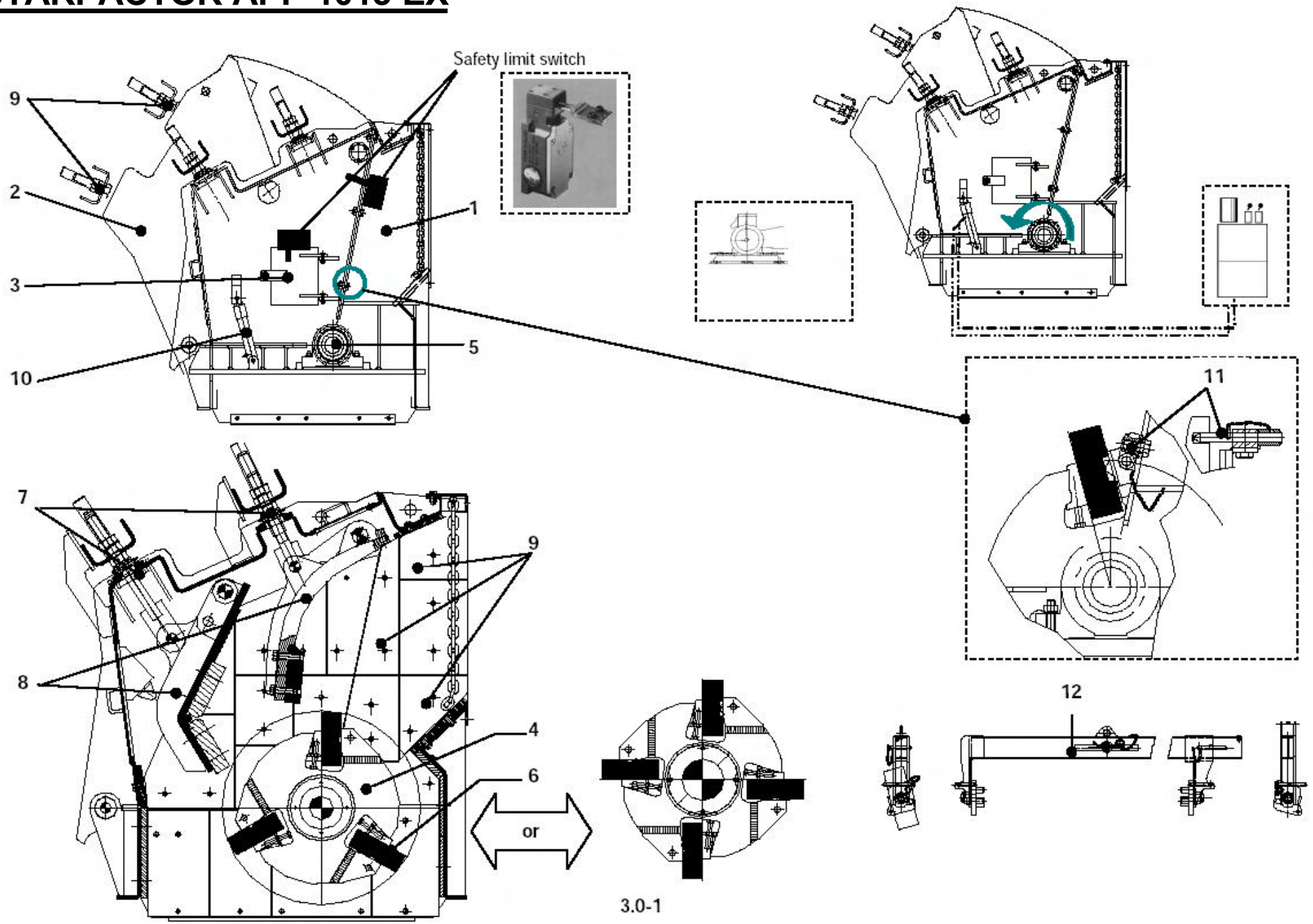
* When travelling on public roads, ways and places always observe the valid traffic regulations and, if necessary, make sure beforehand that the installation is in a condition compatible with these regulations.

* When crossing underpasses, bridges and tunnels or when passing under overhead lines always make sure that there is sufficient clearance.

* Always keep at a distance from the edges of building pits and slopes.

* Avoid any operation that might be a risk to installation stability.

STARPACTOR APP 1013 EX



STARPACTOR APP 1013 EX

GENERAL DESCRIPTION

MAIN COMPONENTS

Housing	**1**
Housing hood	**2**
Inlet door	**3**
Rotor	**4**
Bearing	**5**
Blow bar	**6**
Spindle suspension	**7**
Impact apron	**8**
Shielding	**9**
Hydraulic jack	**10**
Locking system for rotor	**11**
Gripper for blow bars removal	**12**

IMPACT CRUSHER TYPE STARPACTOR APP 10 13 EX

Description :

The mainframe 1 is made of heavy stiffened steel plate. The upper section has one large door 3 on opposite side of transmission for easy access to the internals of the crusher for inspection and setting control.

The mainframe inner walls are lined with bolt-on wear plates of HB 400 wear resistant steel easily exchangeable.

The mainframe upper section is in 2 parts, the rear part 2 can be opened hydraulically to provide easy access for servicing and maintenance work.

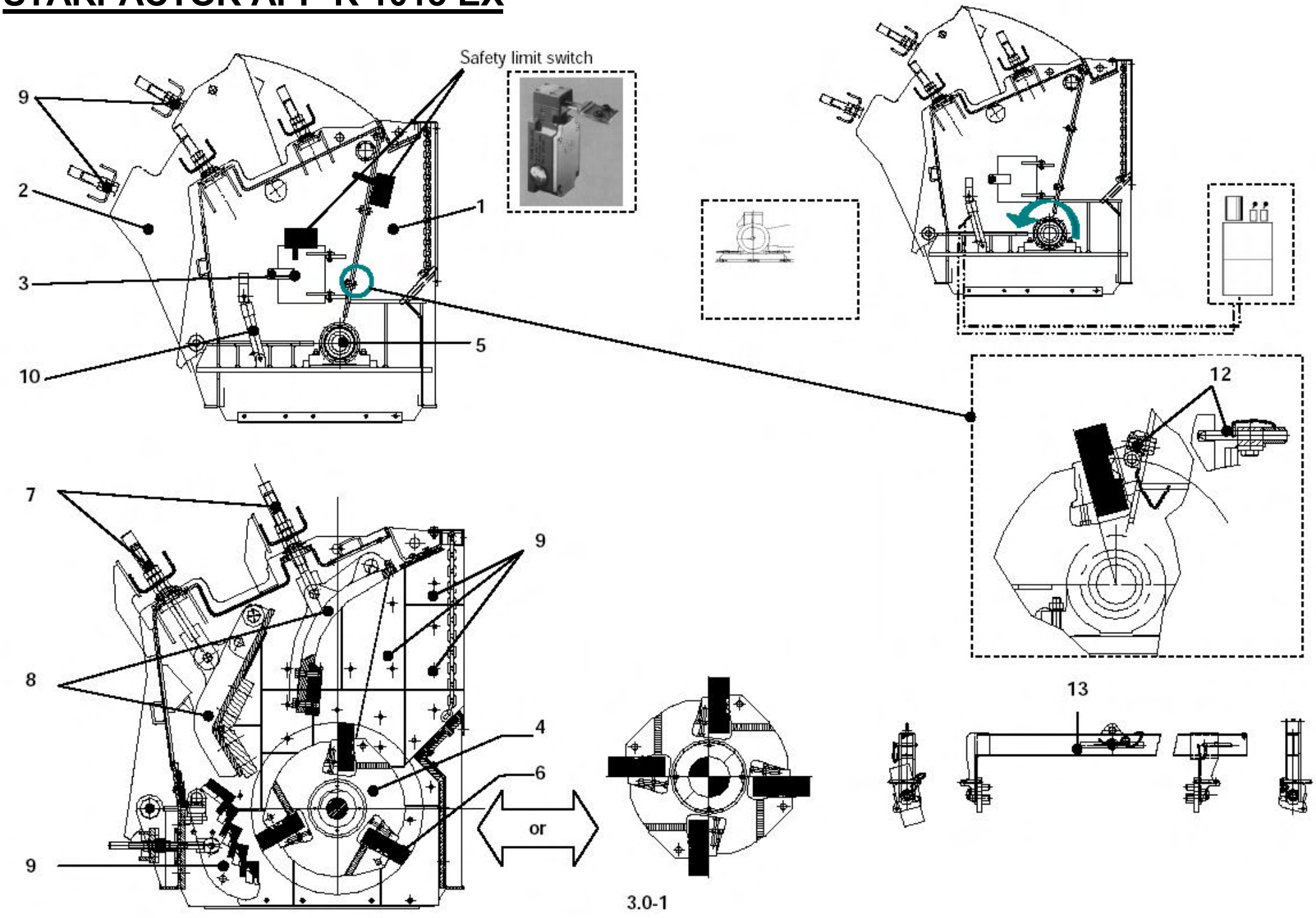
Both parts are locked during operation by means of bolts.

The rotor 4 is an heavy duty disc rotor type, assembled to the shaft by RINGFEDER locking assemblies. The blow bars are secured by easily replaceable wedges.

The blow bars 6 are Mn steel (12/14 %) casting and can be used on both sides. The rotor is statically and dynamically balanced. The rotor-bearings are heavy-duty, double-row self-aligning roller bearings, mounted in dust-tight housings with greased labyrinth seals.

The two impact aprons 8 are suspended in the upper mainframe. Setting between blow bar and impact aprons, which regulates the product size, is done through spindles located outside the mainframe (hydraulically assisted on first apron). The two identical front impact aprons are of monoblock design of cast manganese steel and are equipped at their bottom part with a bolted manganese steel wear plate easily exchangeable.

STARPACTOR APP-R 1013 EX



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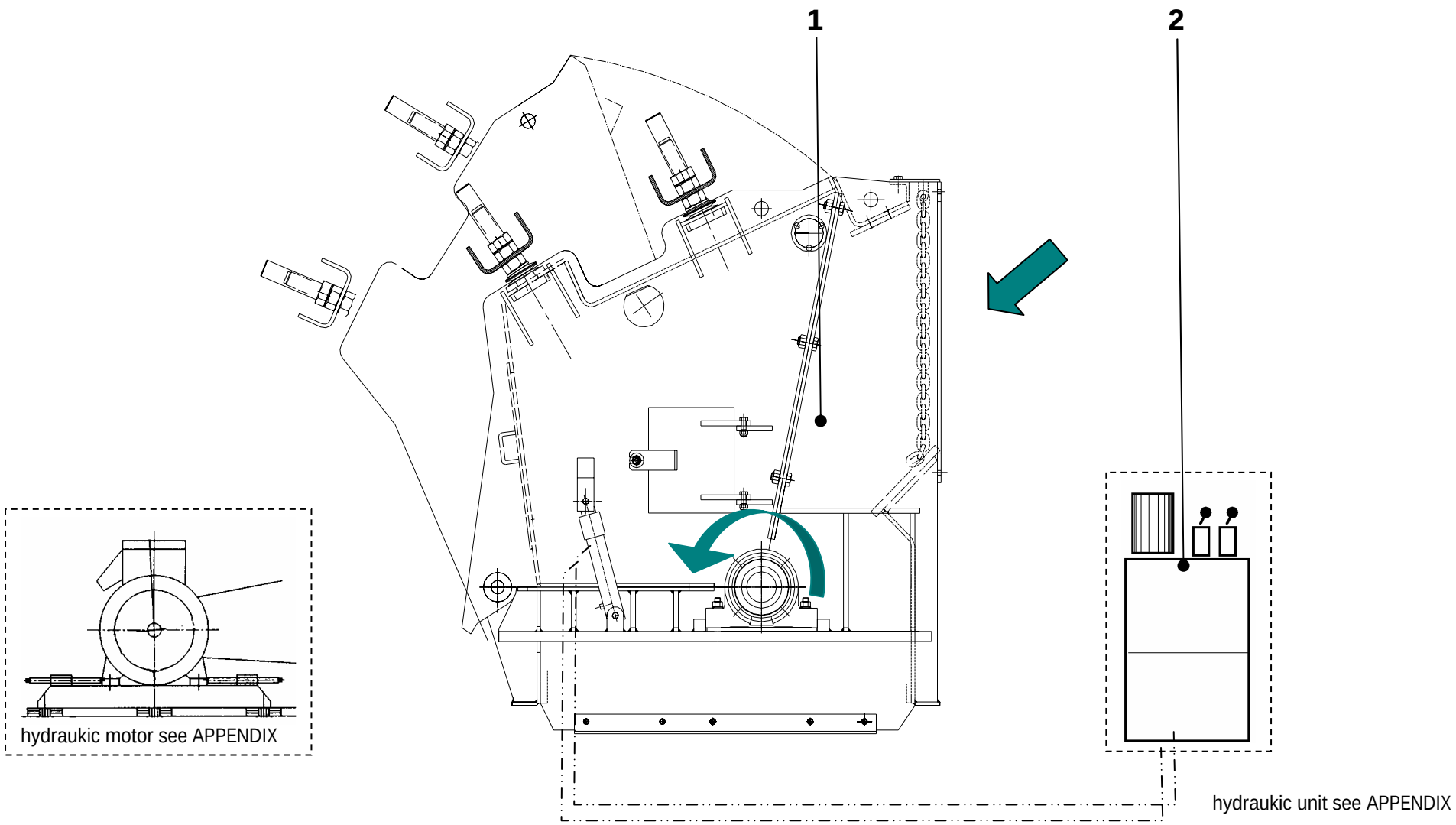
The two impact aprons 8 are suspended in the upper mainframe. Setting between blow bar and impact aprons, which regulates the product size, is done through spindles located outside the mainframe (hydraulically assisted on first apron. The grinding path 8, located at the rear part of the bottom main frame, is equipped with manganese steel bars installed parallel to the rotor and easily replaceable (no bolts).

The grinding path is adjustable from outside thanks to 2 spindle


1
2
hydraukic motor see APPENDIX
hydraukic unit see APPENDIX

OPERATING INSTRUCTIONS

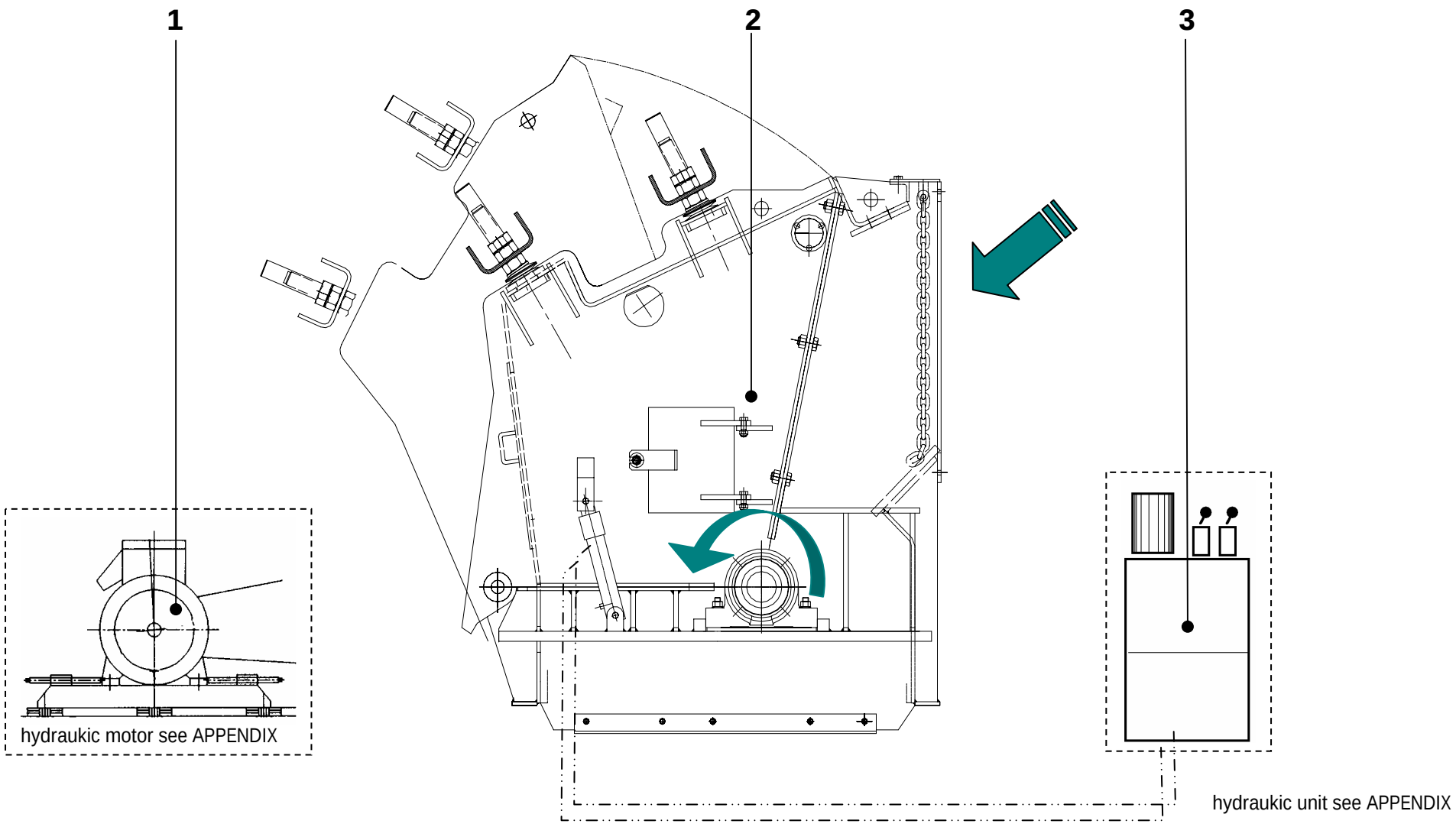
Observe the safety rules 2.0-2

COMMISSIONING

For different reasons we urgently recommend to order **KRUPP HAZEMAG SA** staff for first commissioning notonly for warranty reasons but also for :

- Inspecting the crushing installation. (possible transport damages, faulty assembly).
- Determining the optimum capacity.
- Instructing the operating staff.
- Giving additional guidelines regarding the mode of operation, the maintenance and the repair of the crushing installation.

For first commissioning observe also the instructions for the components in **the APPENDIX**.


1
2
3
hydraukic motor see APPENDIX
hydraukic unit see APPENDIX

TRIAL RUN

To be checked resp. work to be carried out before the trial run :

- Tight fit of all screwed and bolted connections
- Visual inspection for foreign matter
- Initial tension of the V-belts **1** of the impact crusher **2**
- Lubricating points according to lubricating instructions **7.0**
- Bleeding of the hydraulic system **3**, if necessary, top up hydraulic oil
- Assembly of the protection devices
- Shut all housing flaps and doors
- Check the sense of rotation of drives :

Impact crusher	**2**
Hydraulic system	**3**

- Observe the instructions for components in the **APPENDIX**.

To be checked during the trial run :

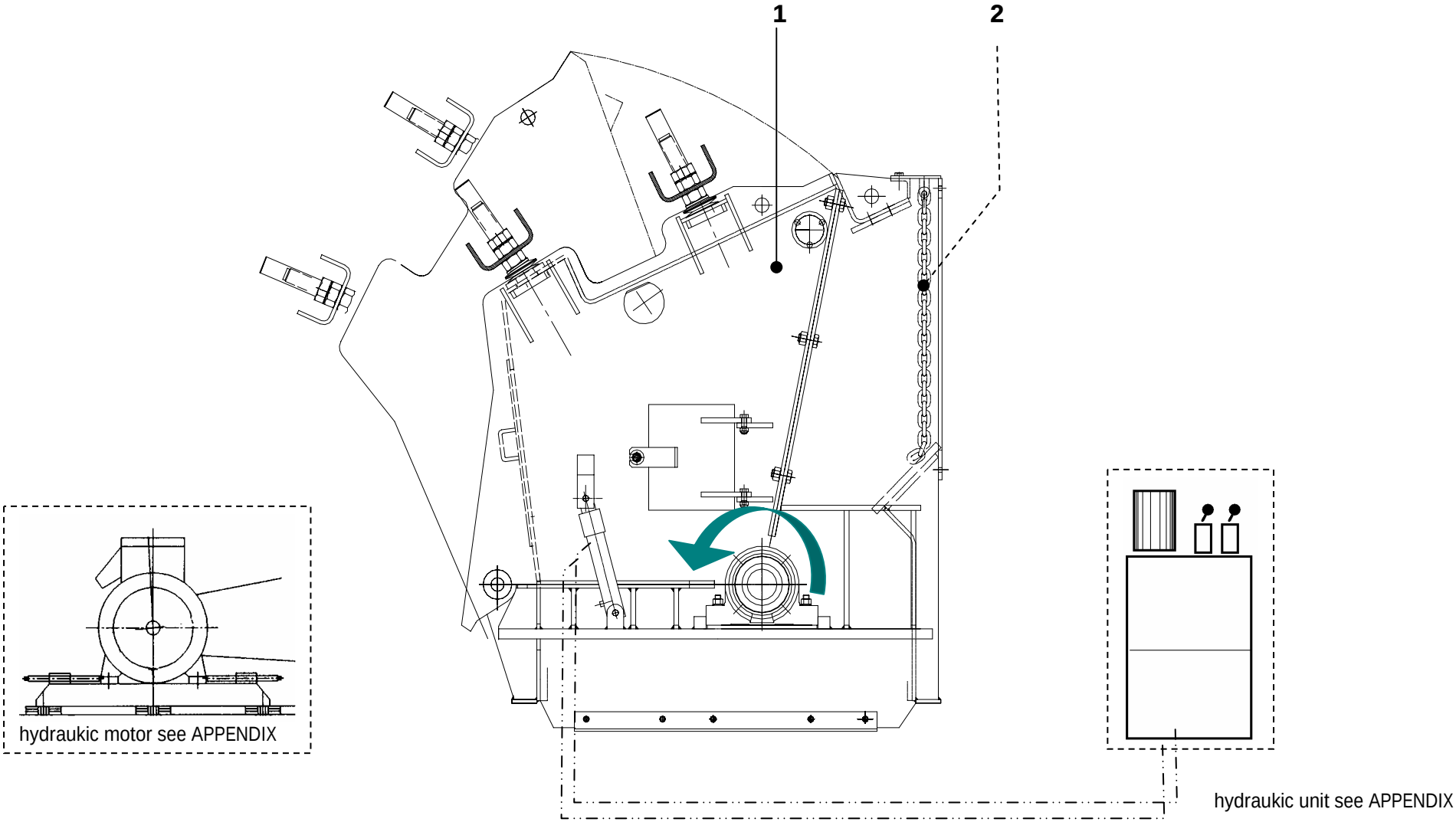
- Function and smooth running of the individual components
- Check that the direction of the rotor is correct
- Let the crusher run empty for a few minutes
- Ensure the absence of vibrations
- Check the speed of rotation of the rotor
- Monitor the current take-up with no load
- Compare the rotation and current values with the nominal values
- Bearing temperatures of the impact crusher **2**

  Normal : 50 – 70 °C

  Max. : 80 °C

The following work is to be carried out after the trial run :

- Check the tension of the V-belts **1**. **See 5.3-1**
- Check the blow bars of the impact crusher **2** for tight fit. **See 5.3-5**
- Retightening all bolted connections.
- Check the lubricating points according to the lubricating instructions **7.0**
- Clean or exchange the filter of the hydraulic system
- Retighten the hydraulic pipe unions
- Observe the instructions for components in the **APPENDIX**.


1
2
hydraukic motor see APPENDIX
hydraukic unit see APPENDIX

OPERATION UNDER LOAD

When feeding the plant take care that no foreign matters fall into the crusher. Foreign matters, as tramp metal invarying kinds of slag, metal tools, old boring tools, digging teeth, explosive agents, timber etc. can lead to seriousdamages and accidents.

Immediately stop the feeding equipment when foreignmatters are discovered in the feed material.

Shut off the total plant before removing foreign matter from the feed unit. While doing so take notice of the sequence of disconnection and wait till the complete standstill of theimpact crusher has been effected.

The crushing chamber must be empty when the impact crusher 1is started.

Dangers caused by matéral thrown out are minimized by use of chain curtain 2 in the inlet hood of the impact crusher 1.

There is however a remaining danger by material spurting from the crusher.

During operation don't push with bars into the crusher inlet.

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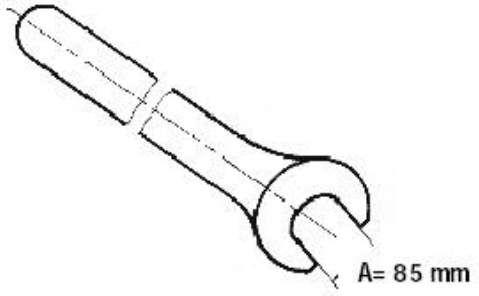


Increase de gap | Reduce de gap

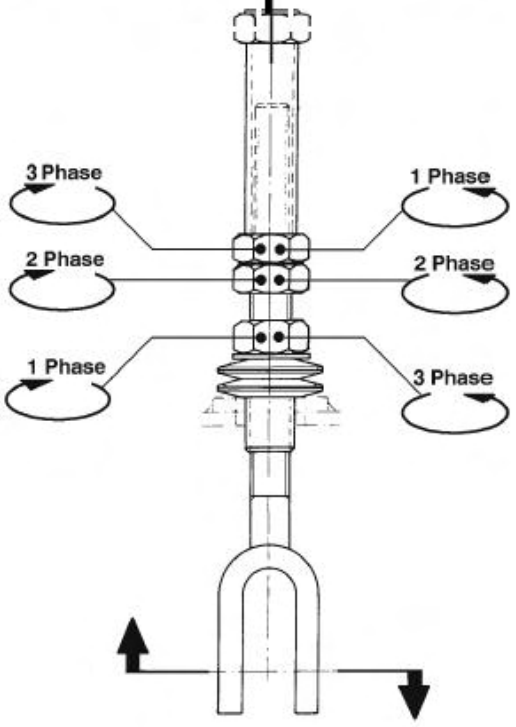
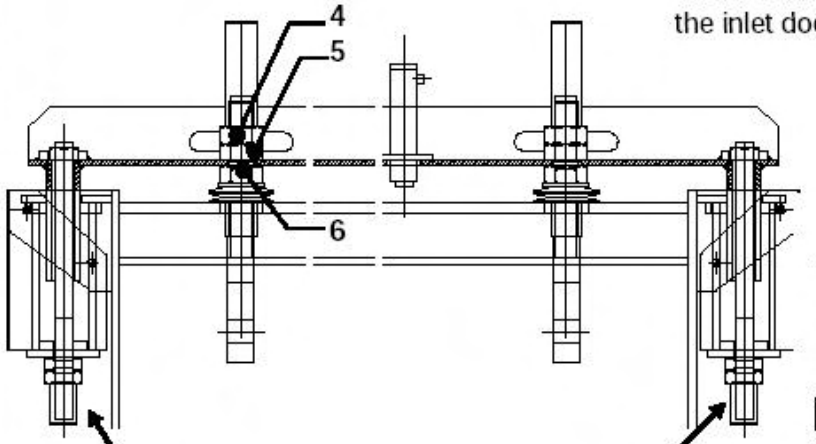


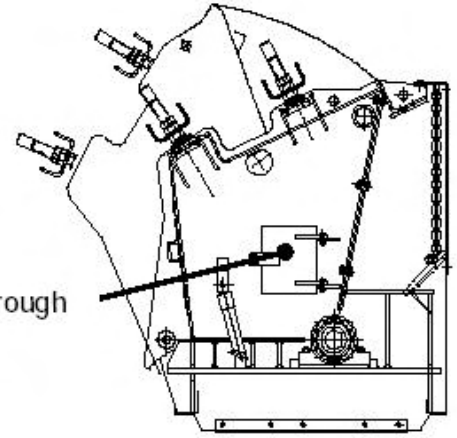
Fig. 1

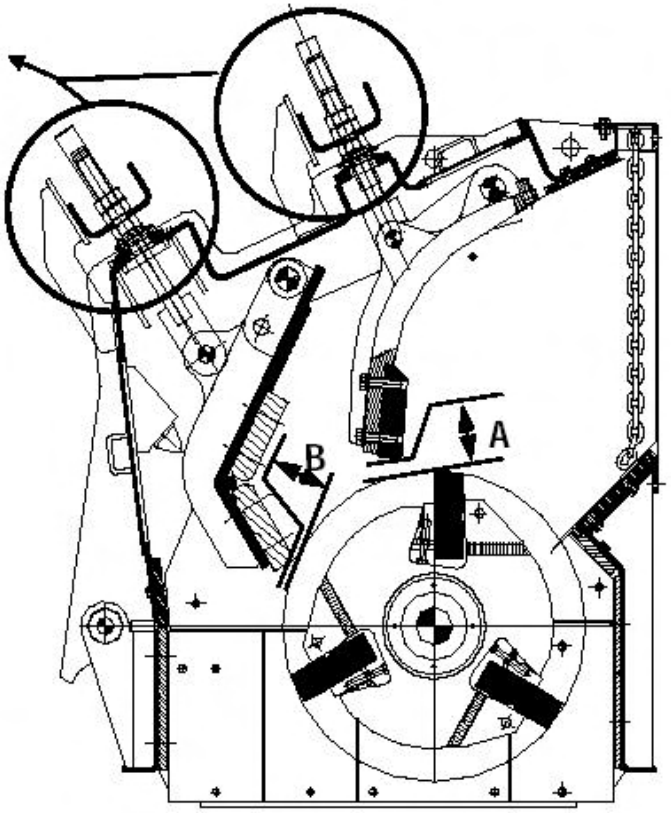


For the impact apron adjustment untied the spring before positioning the spindles

⚠ Control regularly the tightening of the springs.

Visual control through the inlet door





IMPACT APRONS ADJUSTMENT

The gap width between the impacts aprons and the rotor blow bars can be readjusted or changed by the adjusting device see Fig.

Readjust the impact aprons only when the installation is switched off and the rotor is out of operation!

The impact aprons must not interfere with the rotor impact circle.

The crusher has been pre-set in factory before delivery. The speed, rotor gap and impact apron are set to suit the product to be crusher. However for fine adjustment it possible to

Increase the gap : see Fig.
Reduce the gap : see Fig.

To after the granulometry by a crusher, it is possible to change two parameters :
1- variation of the rotation speed.
2- variation of the position of the impact aprons.

At the adjusting device fig.**1 - 2 - 3**, the upper nuts **4/5** are to be unscrewed. By turning the lower nuts **6** the gap width is changed and thus the finished product size.

Each impact apron has two adjusting devices. When adjusting the impact apron, both adjusting devices are to be adjusted uniformly.

WEAR ADJUSTMENT

Turn the adjusting device to the left.

INCREASE OF THE FINAL GRAIN SIZE

Turn the adjusting device to the right

DECREASE OF THE FINAL GRAIN SIZE

Turn the adjusting device to the left.

After having adjusted the desired gap width, the adjusting devices are to be secured by locking the nuts **4/5** and **6** resp.

PARAMETERS FOR ADJUSTMENT

Rear impact apron :

distance **B** = final grain size x 1,2

Front impact apron :

distance **A** = distance **B** x 2

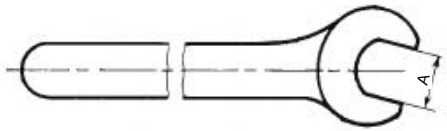
Operation :

- As material can stick between the sides of the apron plates and the housing wall, it is best to raise the apron before trying to adjust a different setting. The material is thus freed and setting is made easier.

- If necessary the spindle, having been released, can also be hammered. When the setting has been completed, ensure that both spindles are bearing the apron.

These guideline figures may change depending on the material

STARPACTOR APP-R 1013 EX



A= 85 mm

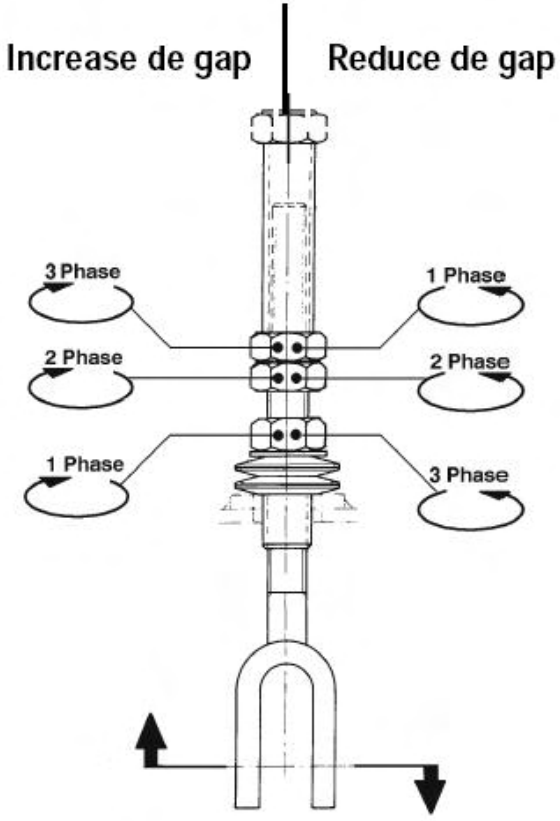
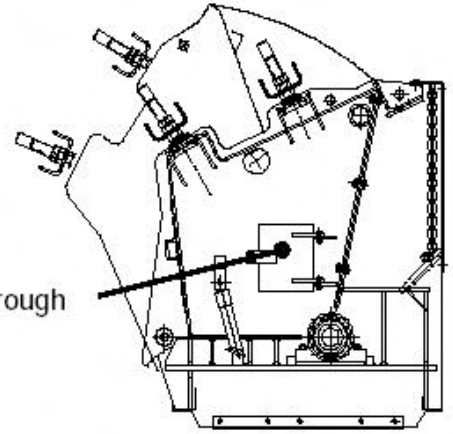
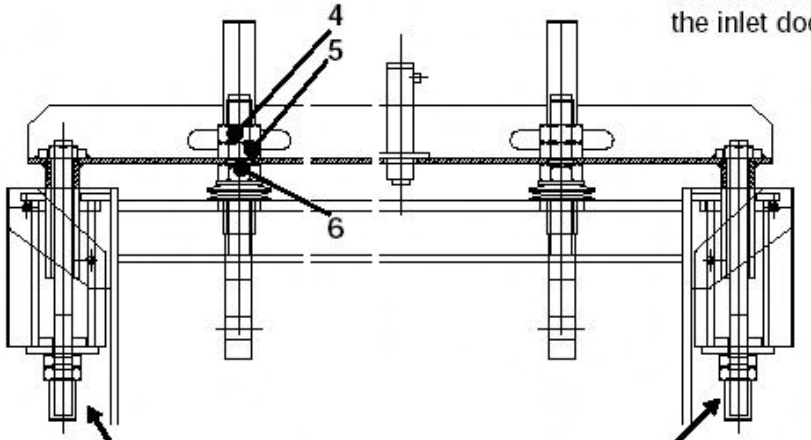


Fig. 1

⚠ **Control regularly the tightening of the springs.**



Visual control through the inlet door



For the impact apron adjustment untied the spring before positioning the spindles

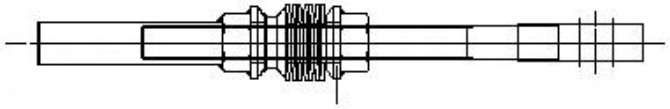
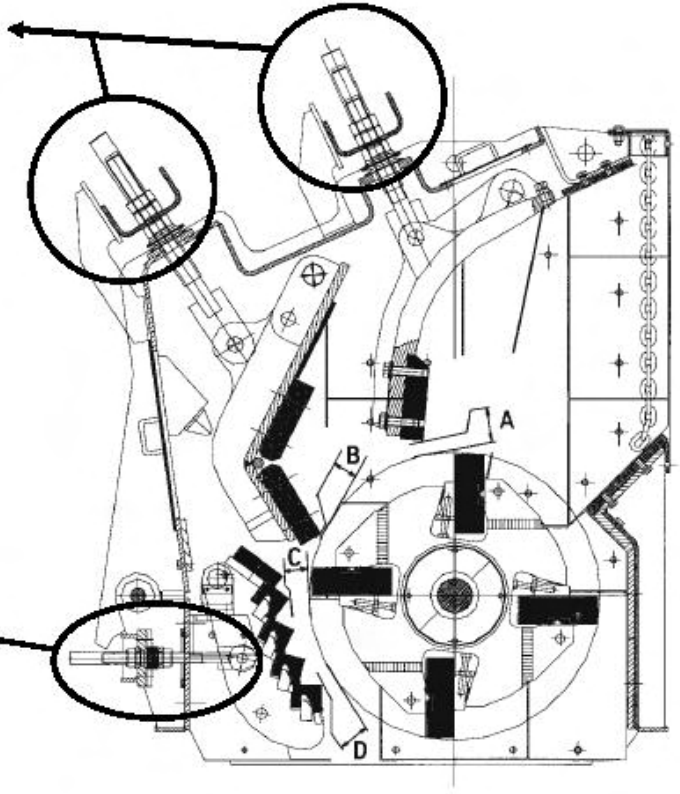


Fig. 2



STARPACTOR APP 1013 EX

GAP ADJUSTMENT

FUNCTION OF THE HYDRAULIC SYSTEM

1. Adjustment of front and rear impact aprons

A. Raising and lowering aprons

- Starting the hydraulic system
- Activating the directional control valve **1**

(see hydraulic diagram)

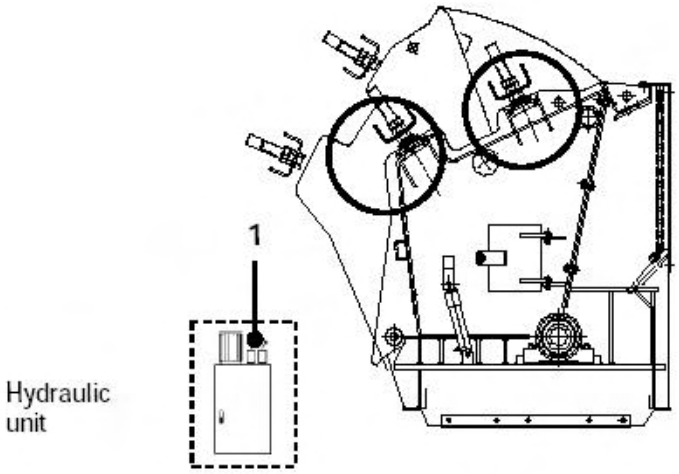
B. Impact apron - Gap setting

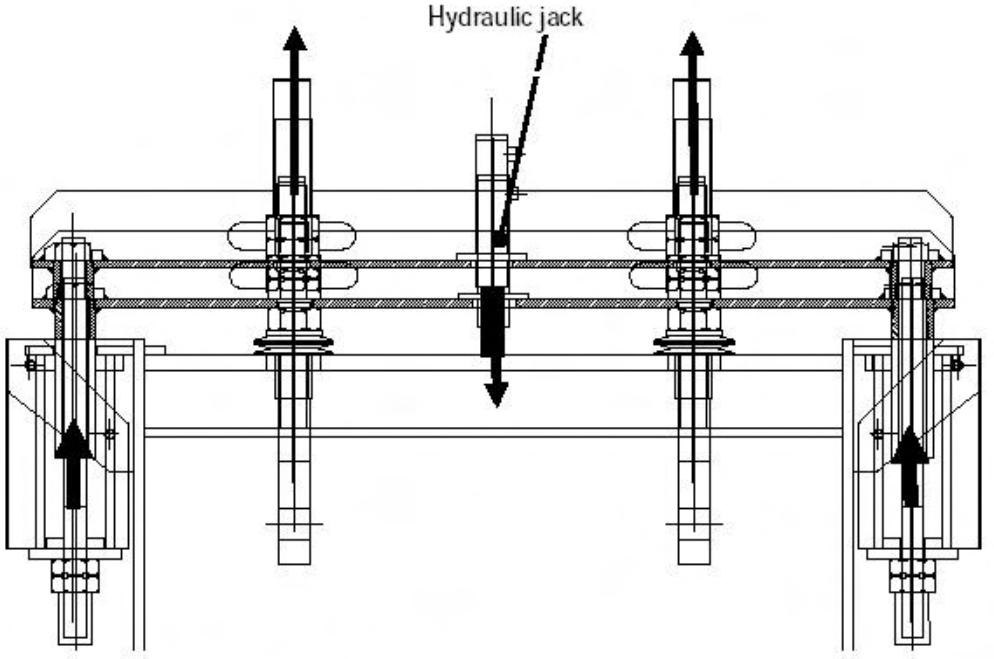
1. Increase of gap

- Activating the directional control valve
- Lower spindle nut can now be turned to desired setting
- Lower unit onto spindle protective gap
- Put the hydraulic jack in initial position

2. Reduce of gap

- Unscrew protective cap and adjust to desired setting (air between nut and crossbeam)
- Activating the directional control valve
- Unit lifts (until it reached protective cap)
- Adjust lower nut
- Lower unit
- Tighten cap
- Put the hydraulic jack initial position

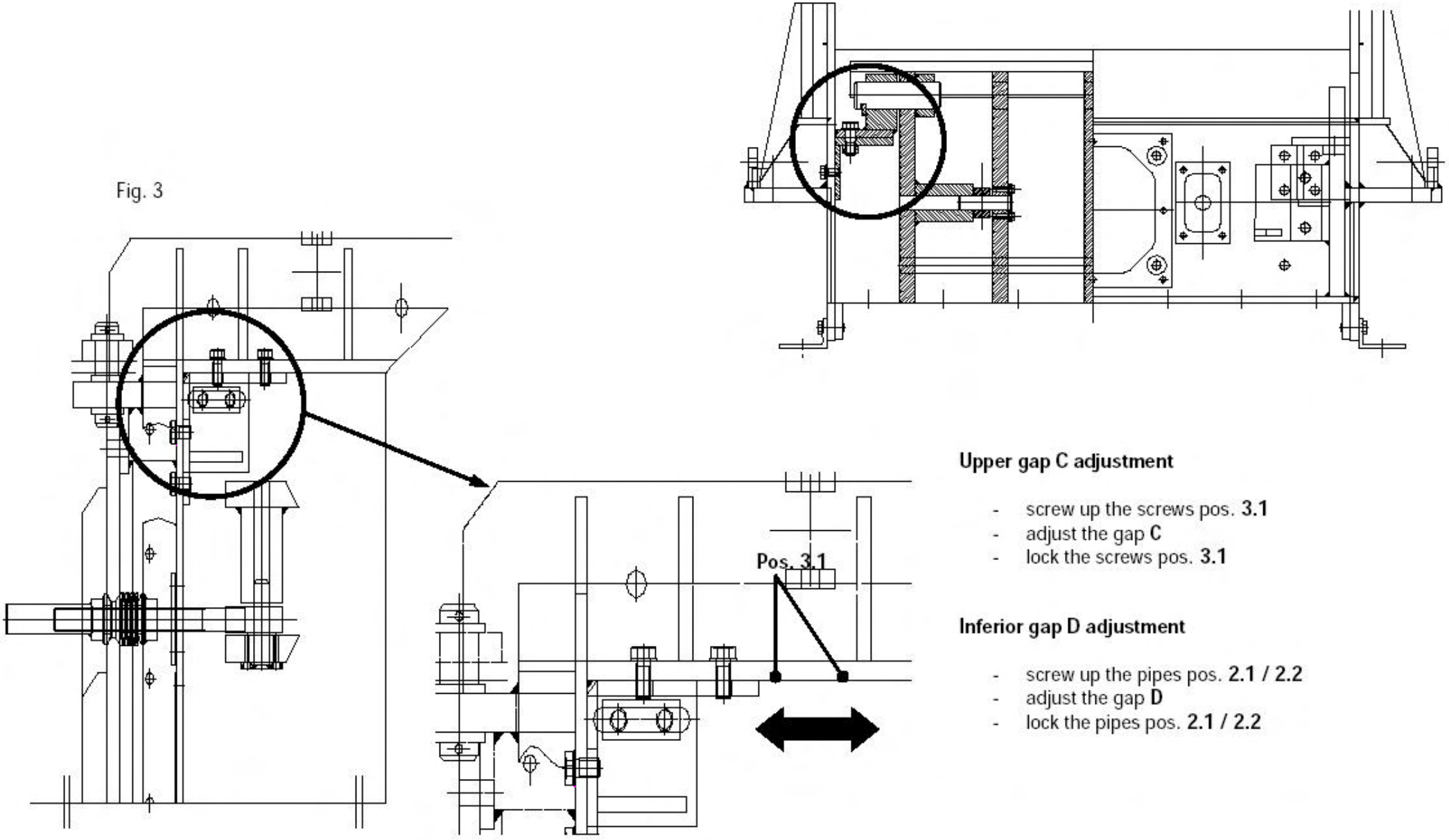




Spindle suspension compl. for impact aprons

STARPACTOR APP-R 1013 EX

Fig. 3



Upper gap C adjustment

- screw up the screws pos. **3.1**
- adjust the gap **C**
- lock the screws pos. **3.1**

Inferior gap D adjustment

- screw up the pipes pos. **2.1 / 2.2**
- adjust the gap **D**
- lock the pipes pos. **2.1 / 2.2**

STARPACTOR APP-R 1013 EX

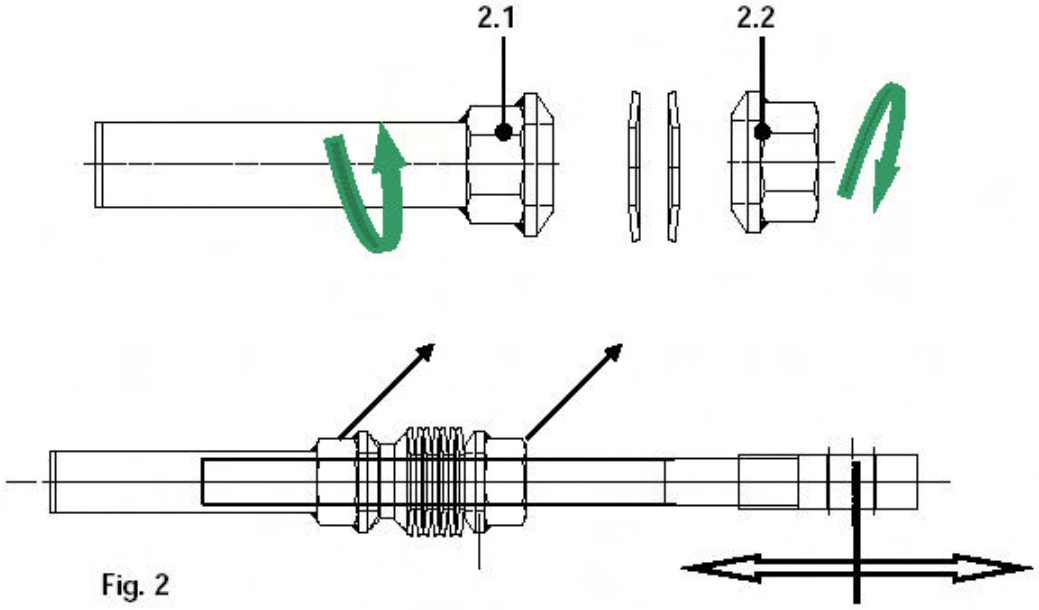
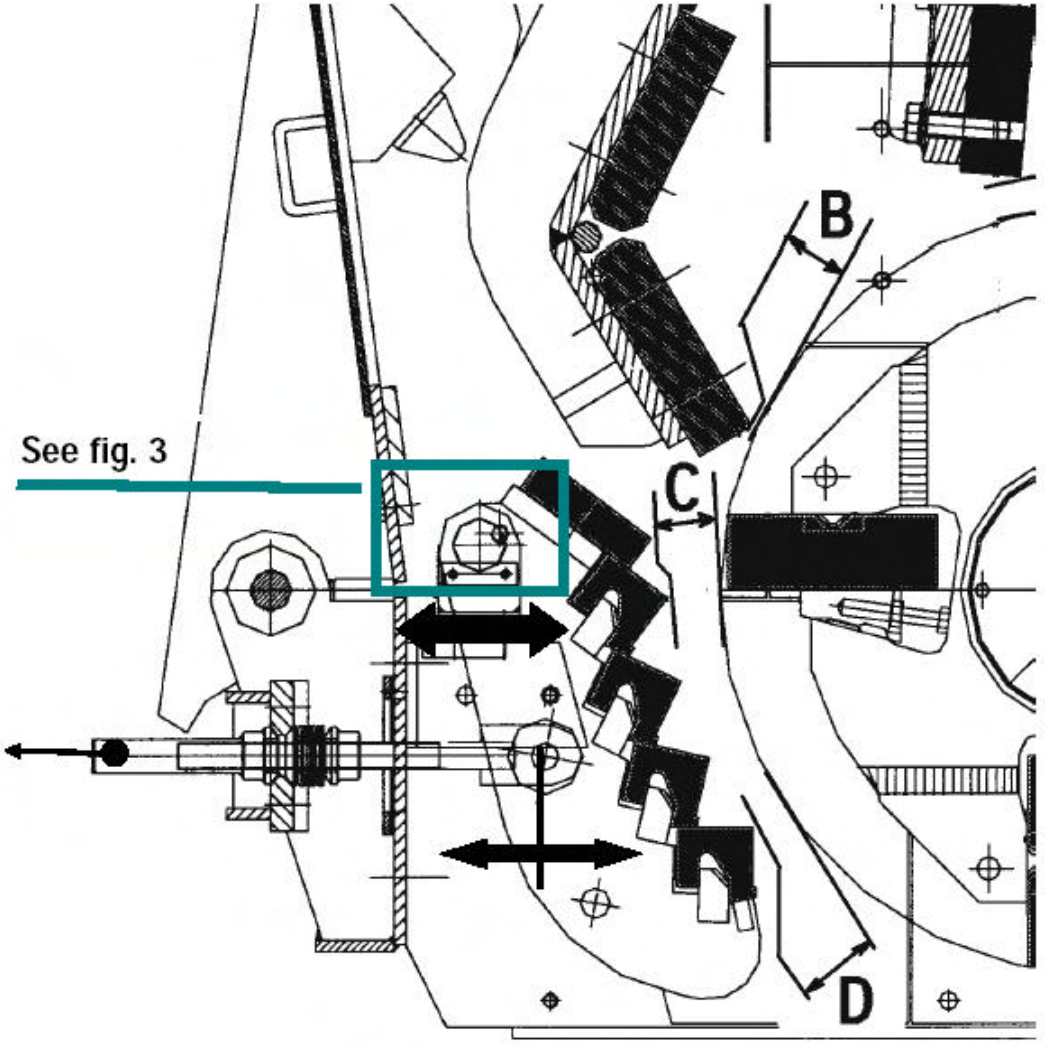


Fig. 2



STARPACTOR APP-R 1013 EX

GAP ADJUSTMENT

FUNCTION OF THE HYDRAULIC SYSTEM

1. Adjustment of front and rear impact aprons

A. Raising and lowering aprons

- Starting the hydraulic system
- Activating the directional control valve

(see hydraulic diagram)

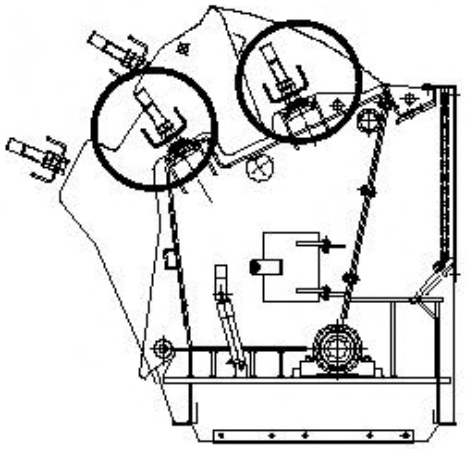
B. Impact apron - Gap setting

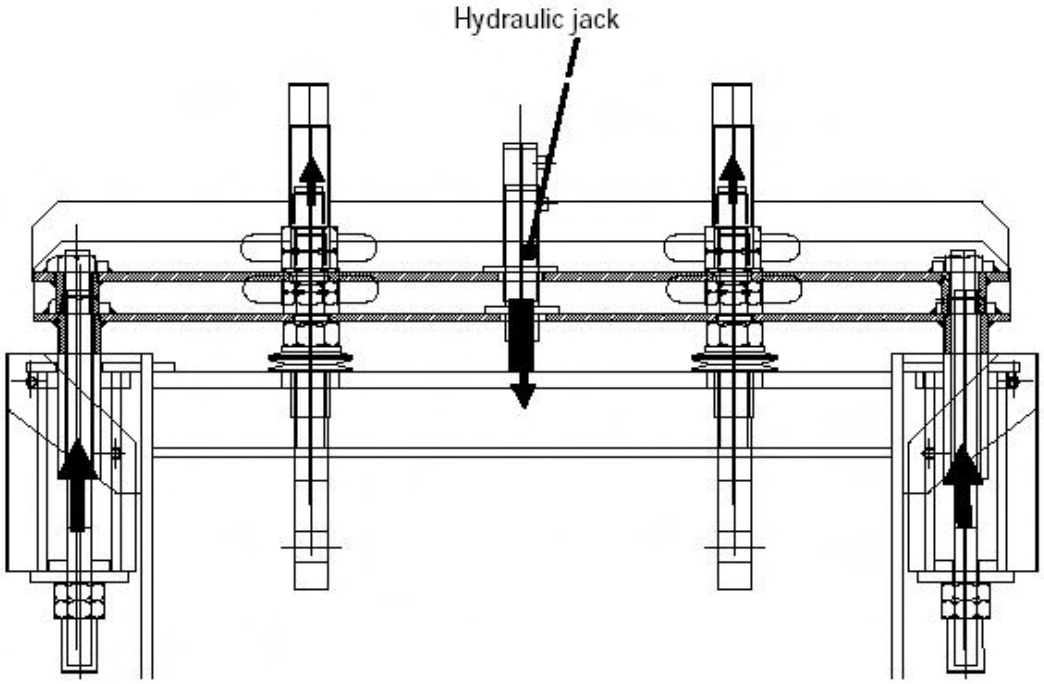
1. Increase of gap

- Activating the directional control valve
- Lower spindle nut can now be turned to desired setting
- Lower unit onto spindle protective gap
- Put the hydraulic jack in initial position

2. Reduce of gap

- Unscrew protective cap and adjust to desired setting (air between nut and crossbeam)
- Activating the directional control valve
- Unit lifts (until it reached protective cap)
- Adjust lower nut
- Lower unit
- Tighten cap
- Put the hydraulic jack initial position





Spindle suspension compl. for front and rear impact aprons

STARPACTOR APP-R 1013 EX

PARAMETERS FOR ADJUSTMENT

Rear impact apron : *(see Figure 1)*

distance **B** = **final grain size** x 1,2

Front impact apron : *(see Figure 1)*

distance **A** = distance **B** x 2

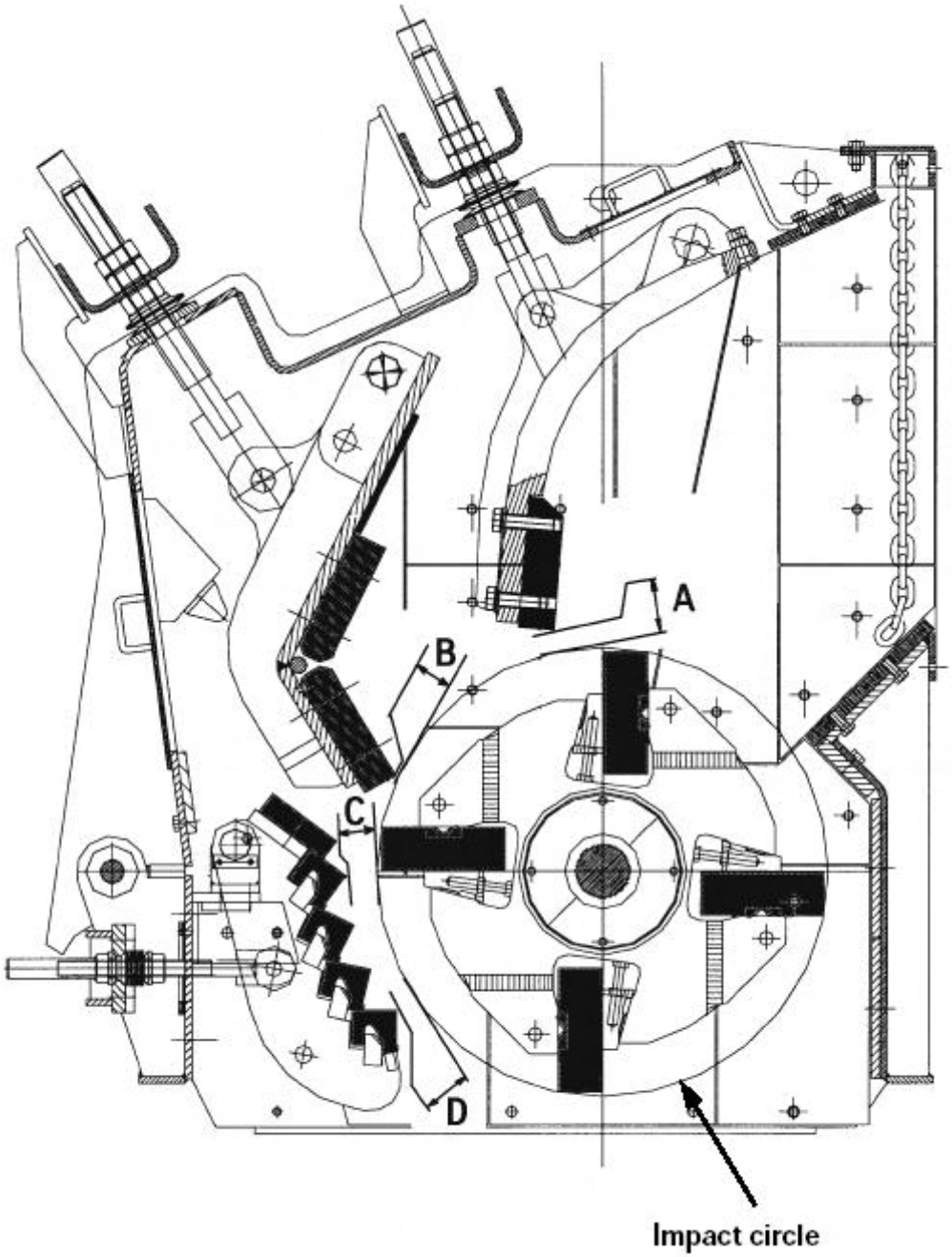
Grinding path – Top : *(see Figure 3)*

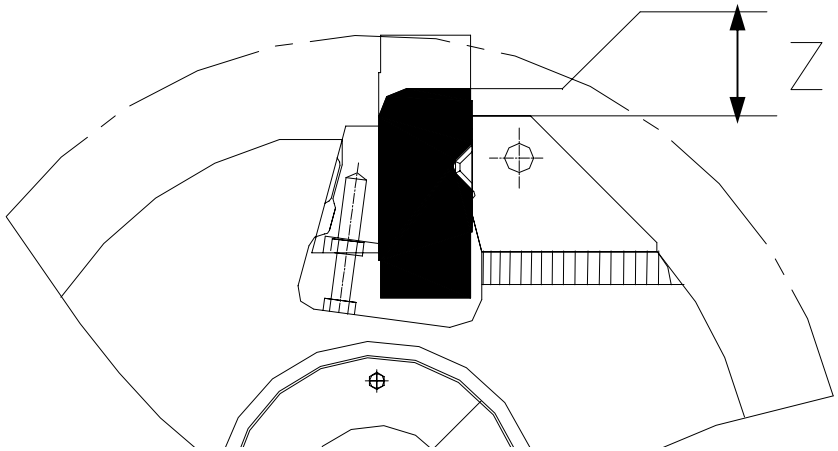
distance **C** = distance **B** x 1,5

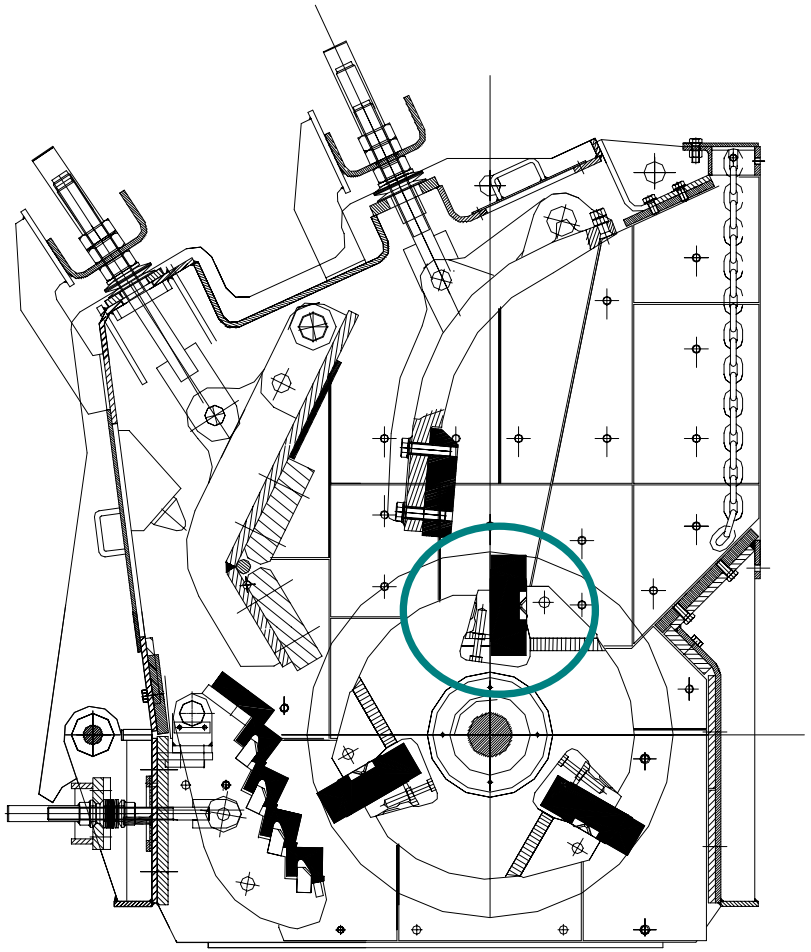
Grinding path – Bottom : *(see Figure 2)*

distance **D** = distance **B** x 0,8

These guideline figures may change depending on the material




Z



WEAR OF BLOW BARS

It is essential that the bar is not worn down too far, otherwise the rear holding beam will be exposed to excessive wear.
For this reason, the distance from the top edge of the beam to the top edge of the bar should never be less than z = 25 mm.

For readjustment or exchange of the blow bar please refer to 5.3-5

TROUBLE SHOOTING

Symptons	Cause	Measures
Strong vibrations of the crusher	- unbalance of rotor	- check the blow bars, if necessary, demount, reweight and uniformly distribute the blow bars.
Excessive bearing temperatures	- insufficient lubrication - faulty assembly - tension of V-belts too high	- check lubrication - check bearing assembly - check tension of V-belts
Smell of rubber	- V-belts slip - rotor blocks	- check tension of V-belts - clear the crusher from material
V-belts twist	- low V-belt tension - worn out V-belts - foreign bodies in the pulley grooves - pulleys are out of alignement	- check tension of V-belts - fit new V-belts - remove foreign bodies - align pulleys
Abnormal noise inside the crusher	- foreign bodies inside the crusher	- shut down the crusher and remove foreign bodies
Crusher product too coarse	- gap between the impact aprons and the rotor too large - blow bars worn out	- correct the gap width between the impact aprons and the rotor - readjust or exchange the blow bars
Motor is not capable to rotate the rotor	- material in the crusher	- clear the crusher from material

Observe the instructions for components in the APPENDIX

MAINTENANCE INSTRUCTIONS

Failure as a result of inadequate or improper maintenance may cause high repair costs and long down periods. Thus regular maintenance is a must.

Different operating conditions necessitate wear tests, inspections, maintenance and repairs at different intervals. With regard to the operating conditions a suitable routine inspection schedule is to be prepared.

The inspection and maintenance check list **5.1** is to be considered as guideline for inspection and maintenance.

For maintenance and repair work strictly adheres to the safety rules **2.0-2**

Do not open the crusher housing and doors before the rotor has Stopped.

Watch the V-belts.

For lubrication of the plant please refer to **7.0**.

For maintenance and repair of the components please refer to **APPENDIX**.

As for commissioning we recommend to have repairs carried out by **KRUPP HAZEMAG S.A.** iff the first time. Your maintenance staff will have the opportunity for an intensive training.

MAINTENANCE AND INSPECTION CHECK LIST

Operating Hours / Period :	Control / Maintenance Instructions
daily	- spherical rollers bearings of crusher rotor control temperature, max. 70°C (measured at the outer bearing cover) - abnormal noise inside the crusher caused by foreign bodies - lubrication system lubricating instructions according to **7.0**
every 2 days	- check the blow bars for tight fit, refer to **5.3-5**
10 h after commissioning thereafter	- V-belts check the V-belts tension, refer to **5.3-1**
after 50, 100 and 500 h, thereafter quarterly	- check all bolted connections for tight fit
daily till weekly depending on the feed material	- check the wear of blow bars of crusher
weekly till monthly depending on the feed material	- ckeck the impact aprons and liner plates for wear
yearly	- general wear control and cleaning
every 3 years	- general overhaul

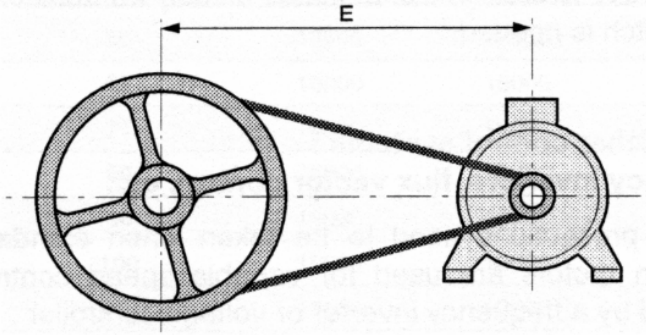
Observe the instructions for components in the **APPENDIX.**

V-BELTS

Observe the safety rules 2.0-2

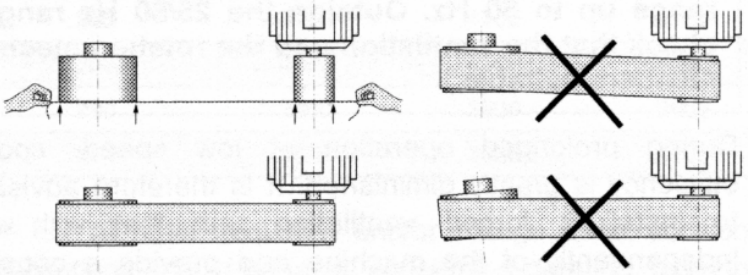
Positioning the belts

So that the belts can be correctly positioned, allow for possible adjustment of approximately 3% with respect to the calculated distance E.
Force should never be used when mounting the belts.
For notched belts position the notches in the pulley grooves.



Aligning the pulleys

Check that the motor shaft is completely parallel with that of the receiving pulley.



Protect all rotating parts before switching on.

Adjusting the tension of the belts

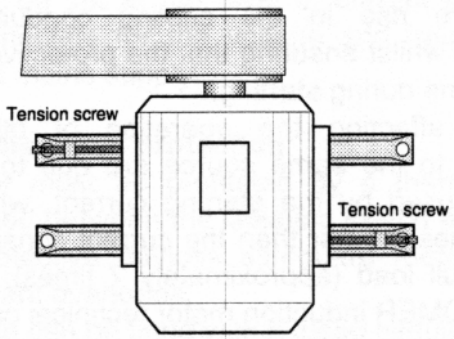
The tension of the belts should be adjusted very carefully in line with the recommendations of the belt supplier and the calculations made when the product was specified.
Reminder :
- tension too great = unnecessary force on the end shields which can wear out the bearing unit (end shield-bearings) prematurely and eventually break the shaft.
- tension too weak = vibration (wearing of bearing unit).

fixed distance between centres :

place a belt tensioning pulley on the slack side of the belts :
- smooth pulley on the outside of the belt;
- grooved pulley on the inside of the belts when using V-belts.

adjustable distance between centres

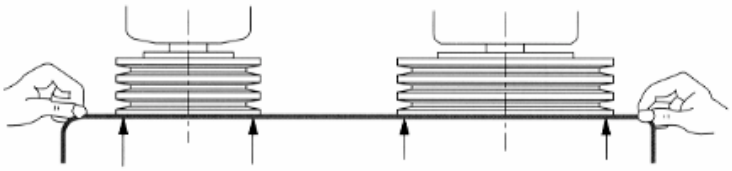
The motor is usually mounted on slide rails, enabling optimum adjustment of the pulley alignment and the belt tension.
Place the slide rails on a perfectly horizontal baseplate.
Lengthways, the position of the slide rails is determined by the length of the belt, and crossways by the pulley of the driven machine.
Mount the slide rails firmly with the tension screws in the direction shown in the diagram (the slide rail screw on the belt side is between the motor and the driven machine).
Fix the slide rails to the baseplate, adjust the belt tension as before.



BELT INSTALLATION AND MAINTENANCE

- Pulley grooves should show no signs of damage and should be cleaned before installing belts.

- Pulley shafts should be parallel and the pulleys aligned.
Before securing motor or machine in position check pulley alignment as shown below.



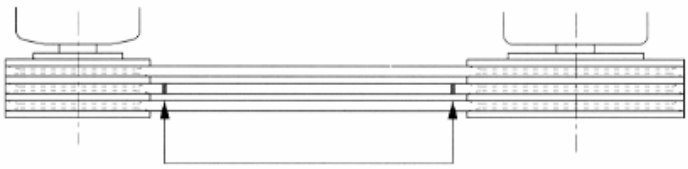
- A set of TEXROPE narrow V-belts can be installed without checking marks as belts have been length-stabilized.

- In general, belt installation with adjustable centre distance is preferable.

- Adjustable Centre Distance
(Motor or machine on slide rails)
To permit belt positioning and tightening, allow a take-up adjustment of - 3% to + 3% of effective calculated centre distance E.
Never force the belts on as this might damage the tensile member.

- Fixed Centre Distance
For belt tightening, use an idler on the slack belt strand :
- on inside face of belt set if idler is grooved
- on outside face of belt set if idler is cylindrical.

- Tensionning of TEXROPE VP 2 and CSX 2 Belts.
before tensionning the belts installed on the pulleys, mark out two thin transverse lines on back of belt in middle of set. These lines should be as far apart as possible while both being on straight section of belt strand (see sketch below).



Thin lines on straight section of belt strand.

INSTALLATION ET ENTRETIEN DES COURROIES

- Les gorges des poulies ne doivent pas présenter de trace de chocs et doivent être nettoyées avant montage des courroies.

- Les axes des poulies doivent être parallèles et les poulies alignées.
Avant de bloquer le moteur ou la machine, vérifier l'alignement des poulies selon la méthode ci-dessous.

- Une nappe de courroies étroites TEXROPE peut être montée sans contrôle du repérage, ces dernières étant stabilisées en longueur.

- D'une manière générale, préférer les montages avec entraxe réglable.

- Entraxe réglable
(moteur ou machine sur glissières)
Pour permettre la mise en place et la tension des courroies, réserver de part et d'autre de l'entraxe réel calculé E, une course de réglage de - 3% à + 3% de E.
Ne jamais faire passer les courroies en force, au risque de détériorer l'armature.

- Entraxe fixe
Utiliser pour la tension un galet tendeur sur le brin mou des courroies :
- soit sur la face interne de la nappe si c'est un galet à gorges,
- soit sur la face externe de la nappe si c'est un galet lisse.

- Mise sous tension des courroies TEXROPE VP 2 et CSX 2
Avant de tendre les courroies montées sur les poulies, tracer sur le dos d'une courroie située au milieu de la nappe, deux traits fins transversaux ; ces repères doivent être aussi écartés que possible tout en demeurant ensemble sur la partie rectiligne du brin de courroie (voir croquis ci-dessous).

Traits fins sur la partie rectiligne du brin de courroie.

MONTAGE UND WARTUNG DER KEILRIEMEN

- Die Laufrillen müssen sauber und frei von Dellen, Kratzern oder anderen Oberflächenfehlern sein.

- Durch entsprechende Wellenausrichtung - am einfachsten mit Hilfe einer außenseitig an die Stirnwände beider Scheiben angelegten Schnur - ist für eine einwandfreie Ausfluchtung zu sorgen.

- TEXROPE Schmalkeilriemen können ohne Kontrolle zu Sätzen vereinigt werden, da sie verfahrenstechnisch "längenstabilisiert" sind.

- Im allgemeinen ist eine Montage mit verstellbarem Achsabstand vorzuziehen.

- Der Achsabstand ist verstellbar
(Motor oder Maschine auf Spannschienen)
Zum zwanglosen Auflegen sowie zum Spannen der Riemen soll eine Verstellmöglichkeit des errechneten Achsabstandes E von - 3% bis + 3% gegeben sein.
Niemals die Riemen gewaltsam in die Rillen drücken, da dies zu einem Bruch der inneren Zugträger führt.

- Der Achsabstand ist fest
Eine auf das gezogene Trum wirkende Spannrolle ist vorzusehen, welche :
- rillig auszuführen ist, wenn sie von innen nach außen drückt,
- glatt auszuführen ist, wenn sie auf die Riemenrücken drückt.

- Spannen der TEXROPE VP 2 und CSX 2 Riemen :
Vor dem Spannen der in die Scheiben bereits eingelegten Riemen auf dem Rücken eines in den mittleren Rillen liegenden Riemens zwei feine, möglichst weit voneinander entfernte Querstriche auf gleichem geraden Abschnitt anbringen (siehe Darstellung unten).

Feine Kontrollstriche auf dem Rücken des geraden Abschnittes.

BELT INSTALLATION AND MAINTENANCE

Gradually tighten belts after running them for approximately one minute until length between marked lines is increased by percentage given in table below.

After about 24 hour running, check the drive and retighten belts if necessary, to respect elongation given in table between two more marked lines.

Example :
An initial distance of 1000 mm between the two marked lines is increased by take-up travel to 1006 mm (0.6%), 1008 mm (0.8%) or 1010 mm (1%) as the case may be.

INSTALLATION ET ENTRETIEN DES COURROIES

Tendre les courroies progressivement après les avoir fait tourner pendant environ une minute jusqu'à ce que la longueur entre repères soit amenée au pourcentage indiqué dans le tableau ci-dessous.

Après 24 heures de fonctionnement environ, examiner la transmission et retendre les courroies si nécessaire, de façon à respecter l'allongement donné dans le tableau entre deux nouveaux repères.

Exemple :
Une distance initiale de 1000 mm entre les deux repères sera amenée par le jeu de la tension à 1006 mm (0.6%), 1008 mm (0.8%) ou 1010 mm (1%) suivant le cas.

MONTAGE UND WARTUNG DER KEILRIEMEN

Die Riemen allmählich spannen, indem man den Antrieb mehrmals ca. 1 Minute laufen läßt und sie anschliessend solange nachspannt, bis die in der folgenden Tabelle angegebene prozentuale Vergrößerung des Abstandes zwischen den Kontrollstrichen erreicht ist.

Nach ca. 24 Betriebsstunden Abstand der Kontrollstriche nachmessen und, falls notwendig, Riemen nachspannen.

Beispiel :
Ein ursprünglicher Abstand zwischen den Kontrollstrichen von 1000 mm soll auf 1006 (0.6%), 1008 (0.8%) oder 1010 (1%) gebracht und gehalten werden.

Drive data **Caractéristiques de la transmission** **Antriebsdaten**	**Uniform motor torque or load moment** **Couple moteur et résistant uniformes** **Gleichmäßige, wenig veränderliche Belastung**	**Irregular motor torque or load moment** **Couple moteur ou résistant irréguliers** **Ungleichmäßige Belastung, Drehmomentspitzen**
Small pulleys with short centre distance (E < D + d) Poulies de petits diamètres, entraxe court (E < D + d) Kleine Scheibendurchmesser, kurzer Achsabstand (E < D + d)	0,6%	0,8%
Medium or large Pulleys with medium or large centre distance Poulies de diamètres moyens ou grands, entraxe moyen ou grand Größere Scheibendurchmesser, kein kurzer Achsabstand	0,8%	1%

Insufficient tension results in belt slippage and premature wear. It is advisable to check drive periodically and tighten it if necessary.

Une tension insuffisante entraîne un glissement et une usure prématurée de la courroie. Il est recommandé de vérifier de temps en temps la transmission et de la retendre si cela s'avère nécessaire.

Falsch gespannte Riemen verschleißen vorzeitig. Es empfiehlt sich deshalb, den Antrieb intervallmäßig auf die Haltung der Riemenspannung zu kontrollieren.

INSTALLATION INSTRUCTIONS *Magic-Grip-T*

TO ASSEMBLE

1. Clean shaft, bush, screws and the pulley taper bore.

2. The slitted taper bush is fitted on the shaft after enlarging the slit with a screwdriver.

3. Lubricate the conical bore of the pulley and slide it on the bush - the drilled holes for screws must correspond to the tapped holes.

4. Lubricate the thread and the head-underface of both screws, place and tighten them one after the other progressively until the blocking-up, without exceeding the torque indicated in the table page MGT2.

INSTRUCTIONS DE MONTAGE *Magic-Grip-T*

MONTAGE

1. Nettoyer arbre, douille, vis et l'alésage conique de la poulie.

2. Monter la douille conique fendue sur l'arbre en écartant l'ouverture de la douille à l'aide d'un tournevis.

3. Graisser l'alésage conique de la poulie, la monter sur la douille en faisant correspondre les trous des vis.

4. Graisser le filetage et le dessous de la tête des 2 vis, les mettre en place puis les serrer alternativement et progressivement jusqu'au blocage sans dépasser le couple de serrage donné dans le tableau page MGT2.

MONTAGEANLEITUNG *Magic-Grip-T*

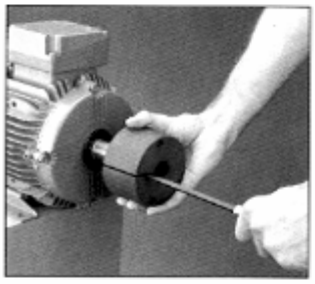
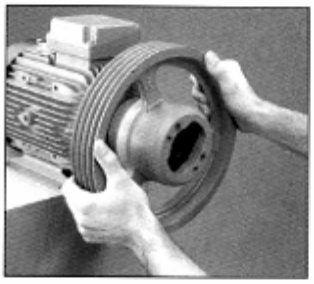
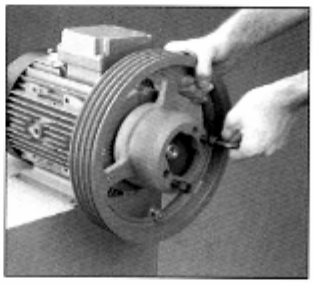
EINBAU

1. Welle, Buchse, Schrauben, sowie konische Bohrung der Scheibe säubern.

2. Die Buchse auf die Welle setzen, gleichzeitig deren längsseitigen Schlitz mit Hilfe eines Schraubenziehers leicht verbreitern.

3. Konische Bohrung der Scheibe fetten und letztere so auf die Buchse setzen, daß sich die Verschraubungslöcher decken.

4. Gewinde und Kopfauflageflächen der 2 Schrauben fetten. Schrauben einsetzen und gleichmässig wechselweise festziehen, ohne das Schraubenanzugsmoment gemäß Tabelle auf Seite MGT2 zu überschreiten.


REMOVAL

Remove both set-screws, screw them into the tapped holes of the pulley, provided for disassembling, and tighten them progressively until the release of the pulley.

DEMONTAGE

Démonter les 2 vis de serrage, les visser dans les trous de démontage de la poulie et les serrer alternativement jusqu'au déblocage.

AUSBAU

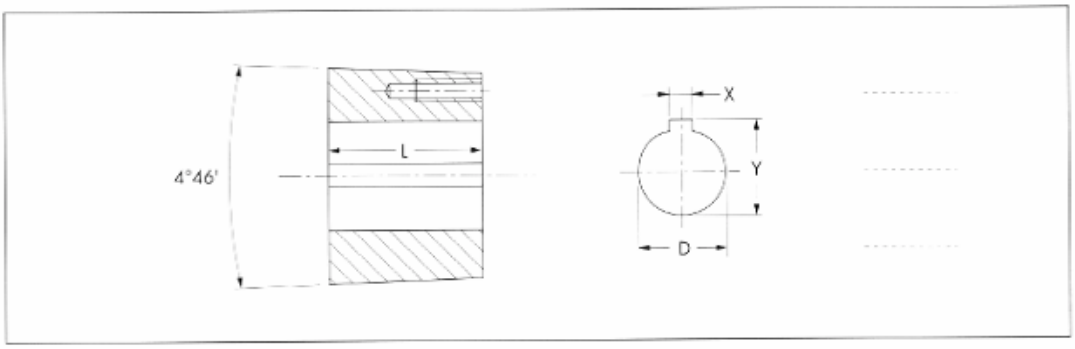
Beide Schrauben lösen, herausnehmen und wechselweise in die Gewindelöcher der Scheibe bis zur Befreiung des Spannsitzes verschrauben.

Magic-Grip-T 97C2S60101 **mm**	**Taper bushes *Magic-Grip-T*** **Number** **Bore diameter**	**Douilles *Magic-Grip-T*** **Numéro** **Diamètre d'alésage**	***Magic-Grip-T* Spannbuchsen** **Nummer** **Bohrungsdurchmesser**	**MGT** 25 ► 160 13 ► 160

The user is responsible for the provision of safety guards and correct installation of all equipment.

Les dispositifs de protection doivent être prévus par **l'utilisateur**. Celui-ci est responsable de l'installation correcte de l'ensemble.

Der Benutzer ist verantwortlich für die Beistellung der Schutzhauben und das fachgemäße Aufstellen der gesamten Ausrüstung.



Dimensions in mm and masses in kg are given as a guide only. Certified dimensions upon request.

Dimensions en mm et masses en kg sans engagement. Dimensions définitives sur demande.

Abmessungen in mm, Massen in kg - Änderungen vorbehalten. Verbindliche Maße auf Wunsch.

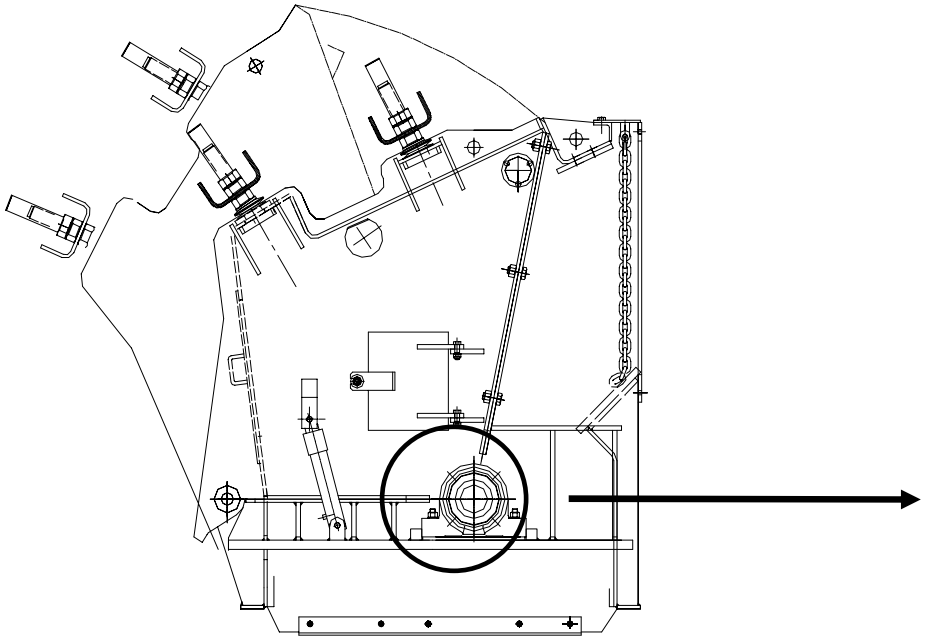
Bush Douille Buchse N° Nr.	Hexagon socket screws Vis CHc Zylinderkopfschrauben	Tightening torques of screws Couple de serrage des vis Schraubenanzugsmoment Nm	Rated torque with key Couple transmissible avec clavette Übertragbares Drehmoment mit Paßfeder Nm (1)
25	M4 x 20/20	2,5	116
28	M4 x 20/20	2,5	126
32	M5 x 25/25	5	235
36	M5 x 25/25	5	260
40	M6 x 30/30	8,4	414
45	M6 x 30/30	8,4	454
50	M8 x 35/35	20	955
56	M8 x 35/35	20	1030
63	M10 x 45/45	40	1870
80	M12 x 50/50	68	3390
100	M16 x 60/60	165	8000
125	M20 x 75/75	320	15500
160	M24 x 90/90	560	28100

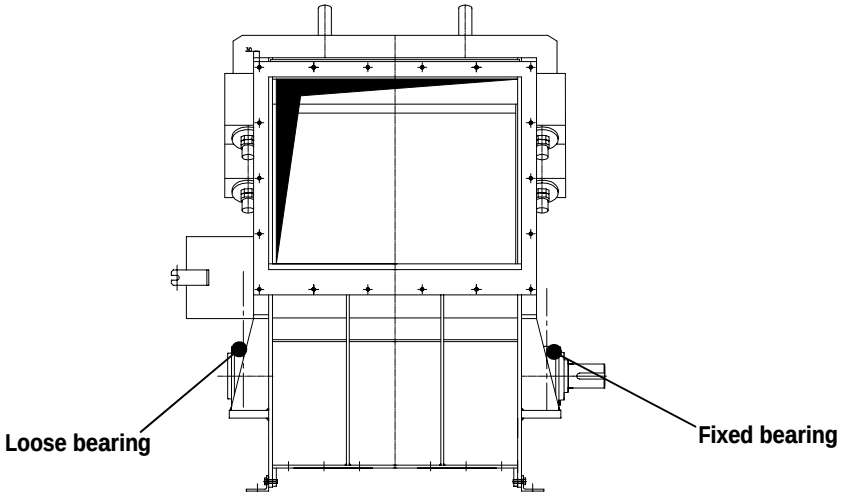
Bush Douille Buchse N° Nr.	D min	D max	L	m kg (2)	Standard bores - Alésages standard - Standardbohrungen (3)
25	13	25	22,5	0,13	14 16 18 19 20 22 24 25
28	13	28	25	0,17	14 16 18 19 20 22 24 25 28
32	12	32	29	0,24	14 16 18 19 20 22 24 25 28 30 32
36	14	36	32,5	0,31	14 16 18 19 20 22 24 25 28 30 32 35
40	14	40	36	0,44	14 16 18 19 20 22 24 25 28 30 32 35 38 40
45	16	45	40,5	0,57	16 18 19 20 22 24 25 28 30 32 35 38 40 42 45
50	19	50	45	0,92	19 20 22 24 25 28 30 32 35 38 40 42 45 48 50
56	22	56	50	1,1	24 25 28 30 32 35 38 40 42 45 48 50 55
63	24	63	57	1,75	24 25 28 30 32 35 38 40 42 45 48 50 55 60
80	28	80	72	3,3	28 30 32 35 38 40 42 45 48 50 55 60 65 70 75 80
100	40	100	90	6,7	40 42 45 48 50 55 60 65 70 75 80 85 90 95 100
125	50	125	113	13	70 75 80 85 90 95 100 110 120 125
160	63	160	144	25	

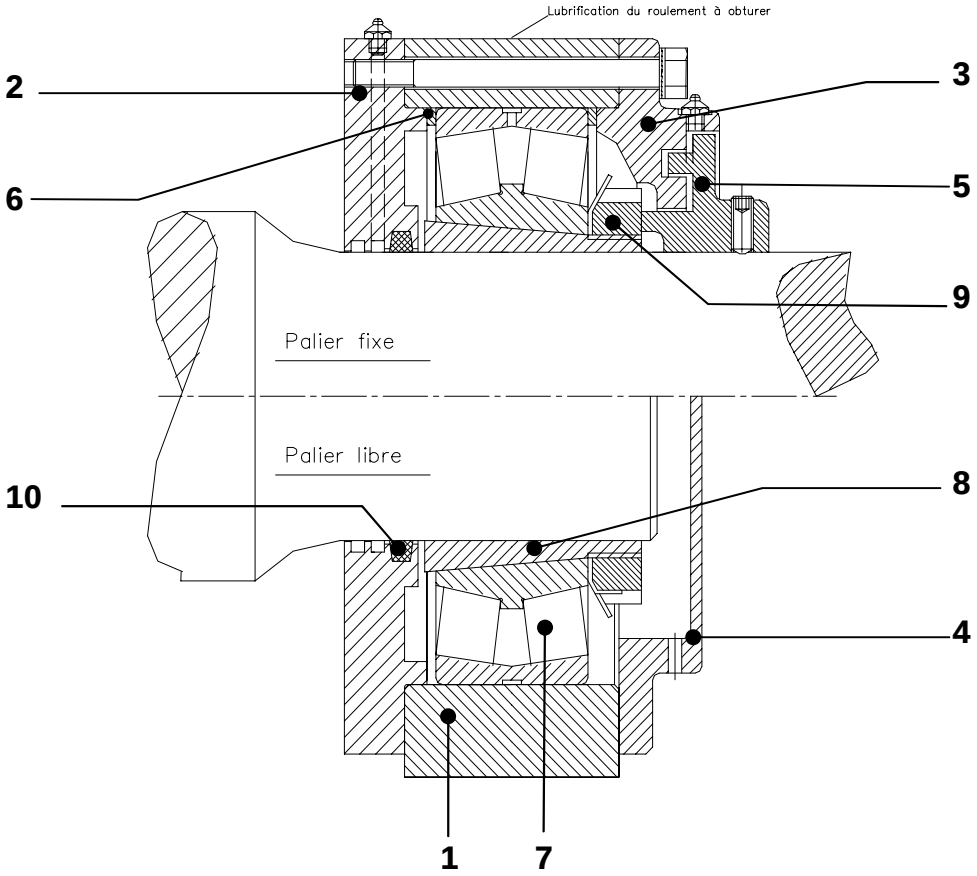
Remarks :
(1) Bushes rated torque permanently.
(2) Mass with D max and screws.
(3) Available from stock.

Remarques :
(1) Couple permanent transmis par la douille.
(2) Masse avec D max et vis.
(3) Disponibles en stock.

Anmerkungen :
(1) Über die Spannbuchse übertragbares Dauer-Drehmoment.
(2) Masse mit D max und Schrauben.
(3) Ab Lager lieferbar.







Pos.	Désignation
1	Bearing housing
2	Bearing cover-inner
3	Bearing cover-outer / for fixed bearing
4	Bearing cover-outer / for loose bearing
5	Labyrinth ring / for fixed bearing
6	Ring for fixed bearing
7	Self aligning roller bearing
8	Adapter sleeve
9	Lock nut with washer
10	J oint

BEARINGS

They are fitted with self-aligning bearings on rollers which are fixed to the shaft with sleeves. The bearings are lubricated with grease.

The bearing bodies are fitted with grease valves to allow drainage of the excess grease and of used grease.

Monitor the drainage of the grease.

The bearing must never be completely full of grease as an excess leads to a sharp increase in the temperature and can damage the bearing.

Approximately every year, it is recommended that the bearings be thoroughly cleaned and that their rings, cage and rolling elements be checked.

At the same time, the tightening of all nuts and the fixing of tapered sleeves is checked.

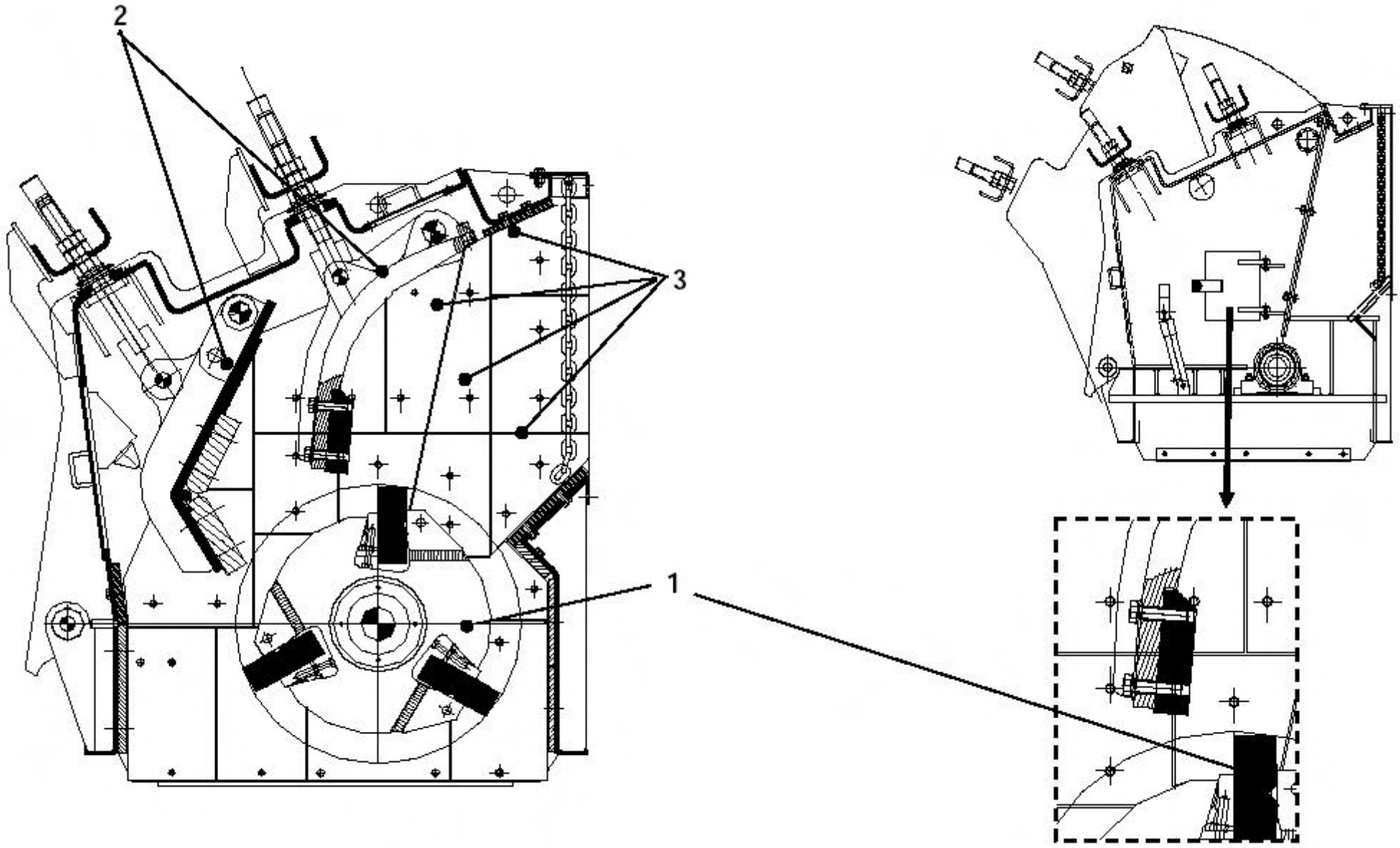
To clean the bearings, white spirit, good quality «water white" our, petrol or benzene should be used.

After cleaning, do flit leave the bearings dry for a long tine, but lubricate immediately with grease.

For this purpose, the bearings should be rotated a few times that the grease reaches all the vital components and thus the bearing is protected against oxidation

When carrying out welding work on the crusher, always ensure that the welding current does not pass through the bearings. Otherwise the rollers may become cold-welded to the races, ruining the bearings.

STARPACTOR APP 1013 EX



STARPACTOR APP 1013 EX

WEARING PARTS

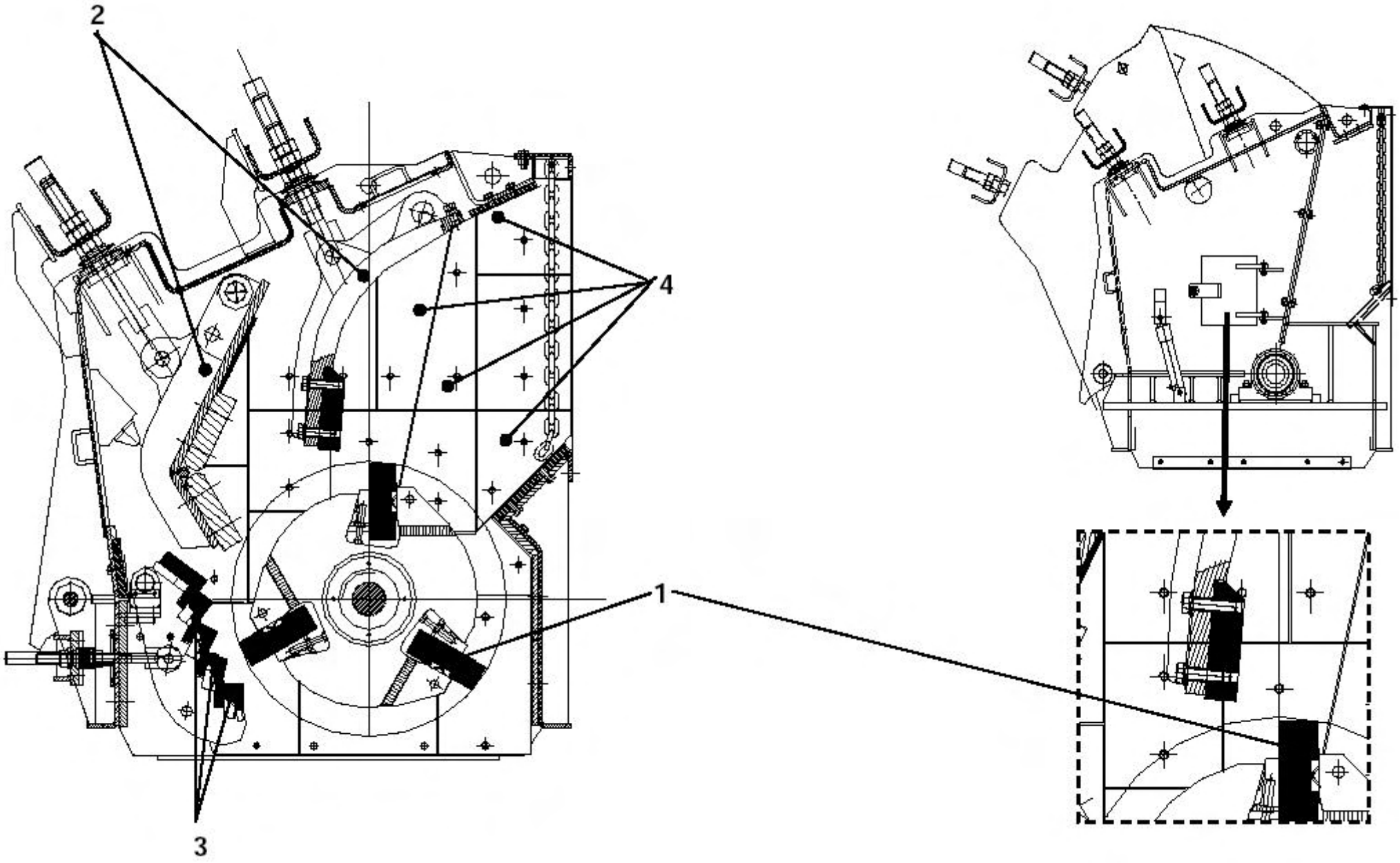
Observe the safety rules 2.0-2

Do not open the crusher housing and doors before the rotor has stopped.

Watch the V-belts.

Blow bars	**1**	: visual control through the inlet door
Impact aprons	**2**	: visual control through the inlet door
Housing lining	**3**	: visual inspection by folding Up the impact crusher housing

STARPACTOR APP-R 1013 EX



STARPACTOR APP-R 1013 EX

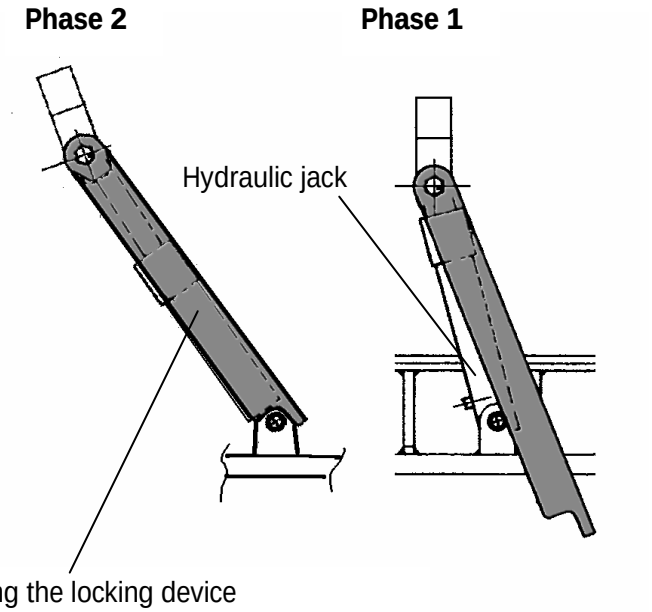
WEARING PARTS

Observe the safety rules 2.0-2

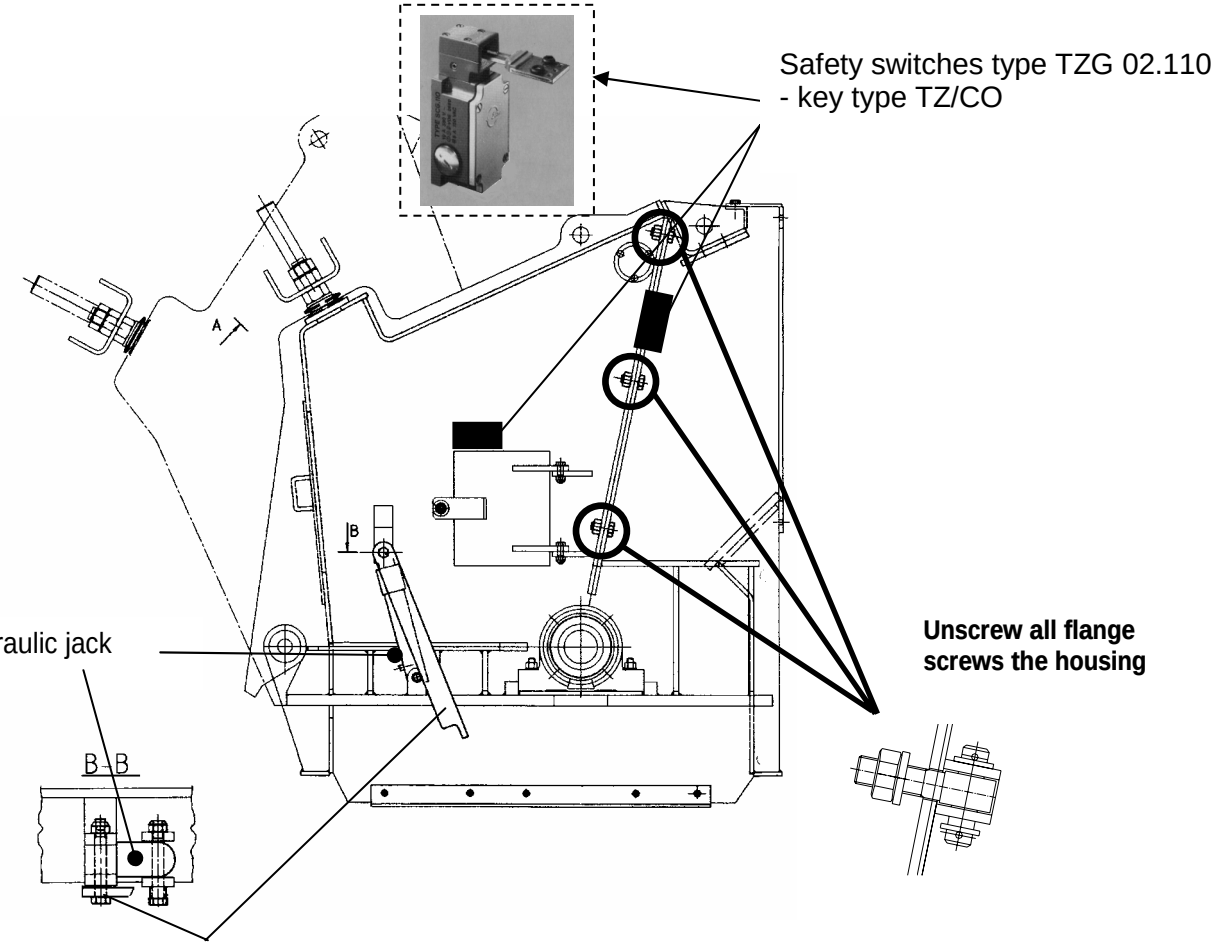
Do not open the crusher housing and doors before the rotor has stopped.

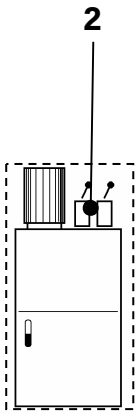
Watch the V-belts.

Blow bars	**1**	: visual control through the inlet door
Impact aprons	**2**	: visual control through the inlet door
Grinding path beam	**3**	: visual inspection by folding Up the impact crusher housing
Housing lining	**4**	: visual inspection by folding Up the impact crusher housing



The safety switches have to be integrated in the emergency stop circuit of the electrical parts of the machine.





EXCHANGE OF WEARING PARTS

FOLDING UP THE IMPACT CRUSHER HOUSING

Observe the safety rules 2.0-2

Do not open the crusher housing and doors before the rotor has stopped.

Watch the V-belts.

Prior to opening the impact crusher housing, unscrew all flange screws of the housing hood.

Mainframe opening safety device

The machine is equipped with a safety device against hazardous opening of mainframe:

- the opening is possible through the hydraulic panel only if circuit breaker of
  crusher electric motor is open.
- safety limit switch electrical connection refer to **APPENDIX 9.0**

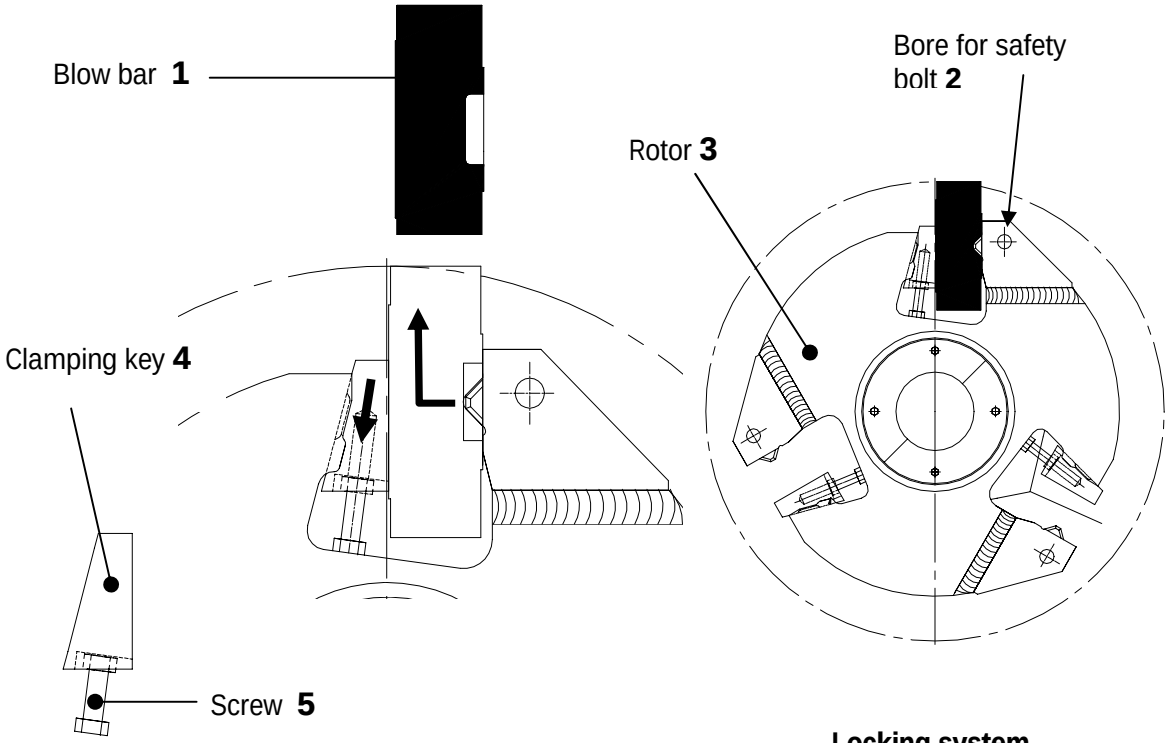
Operation of the hydraulic system

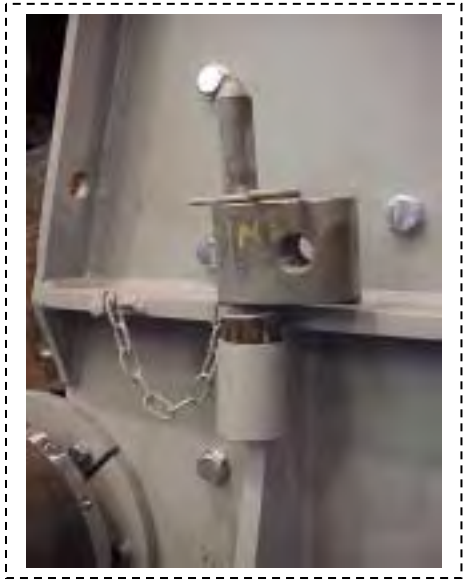
- switch on the hydraulic system at the control panel.
- open the housing hood 1 by the directional control valve 2 see **APPENDIX 8.0**

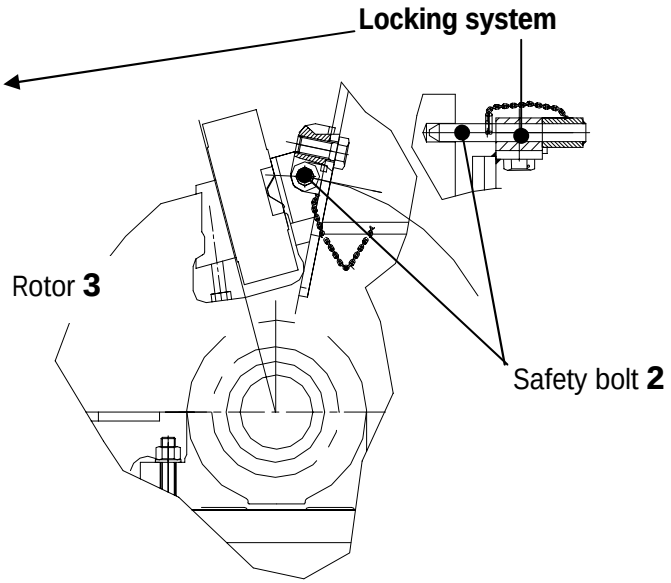
Keep off the danger zone when the housing hood opens

After having finished the service work shut the impact crusher housing by the hand lever 2

Tighten all flange screws

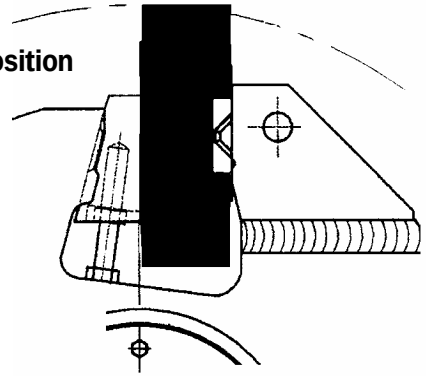




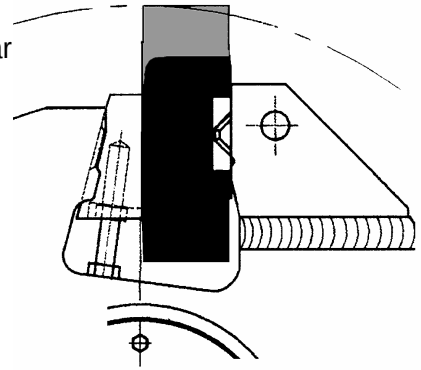


WEAR PATTERN AND BLOW BAR POSITION CHANGE

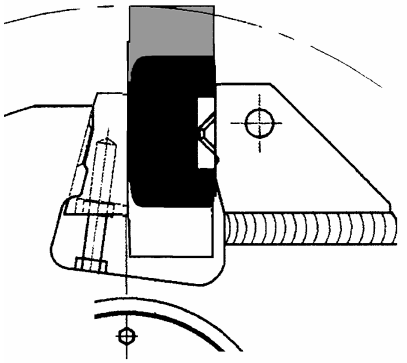
Initial blow bar position



Readjusted blow bar
Phase 1



Readjusted blow bar
Phase 2



BLOW BARS

For opening the impact crusher housing please refer to 5.3-4

Do not open the crusher housing and doors before the rotor has ped. Watch the V-belts.

Do not exchange the blow bars **4** in order but always opposite blow bars to prevent unbalance of the rotor.

Lock the rotor **3** by inserting the safety bolt **1** in the bore **2**.

Carefully reinsert the safety bolt in the next bore. The rotor may suddenly rotate because of the unbalance.

Change the blow bar as shown in the following drawing. Pay particular attention to getting blow bars of the same weight diametrically opposite to each other.

Disassembly

- Lock the rotor **3** by inserting the safety bolt **1** in the bore **2**
- Unscrew the adjusting bolts **5**.
- Loosen the blow bars **6** by blows on the clamping keys **4**.

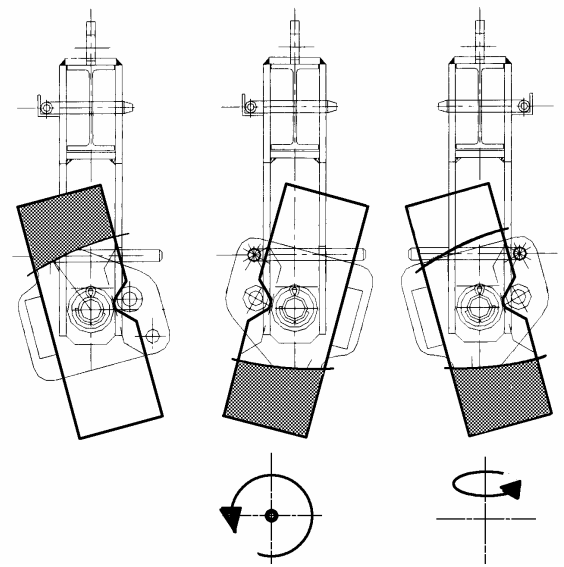
Do not beat on the blow bars directly but always use a hardwood backing.

- Remove the blow bars **6** with the gripper.
- Clean support faces

Mounting

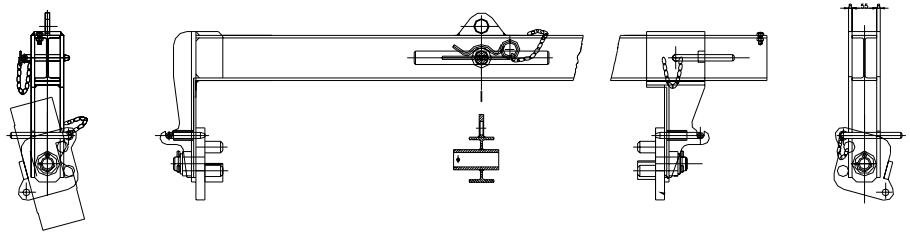
- engage the new blow bar (or the old one turned round)
- fit the clamping key **4**
- check the contact surfaces of the blow bars
- tightening the adjusting bolts **5** arrest the clamping keys **4**
- the blow bar noses must fit centrally in the pick-up groove.

Control the blow bars for tight fit after commissioning, thereafter every 2 operating days

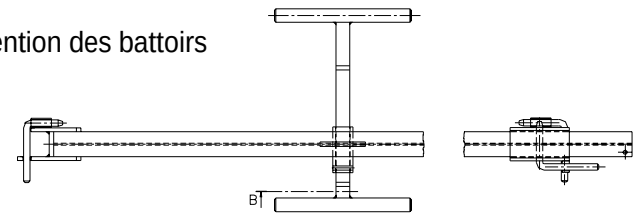


Phase 1 Phase 2 Phase 3

- Phase 1 : remove the blow bar
- Phase 2 : to turn
- Phase 3 : rotation, for engage the blow bar



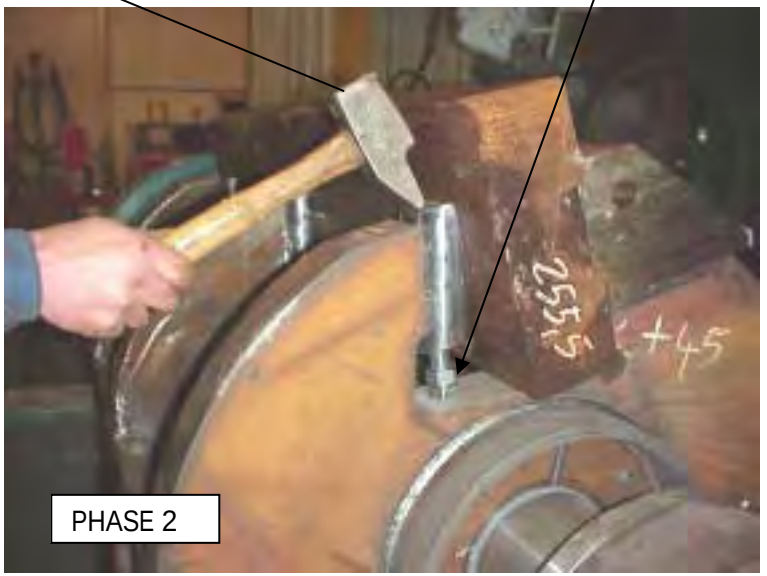
Pince de manutention des battoirs



Gripper for blow bars removal

Blow on locking key to loose it

- Unscrew the locking nut
- Unscrew the safety bolt



Blow bar disassembly phase

Gripper for blow bars removal

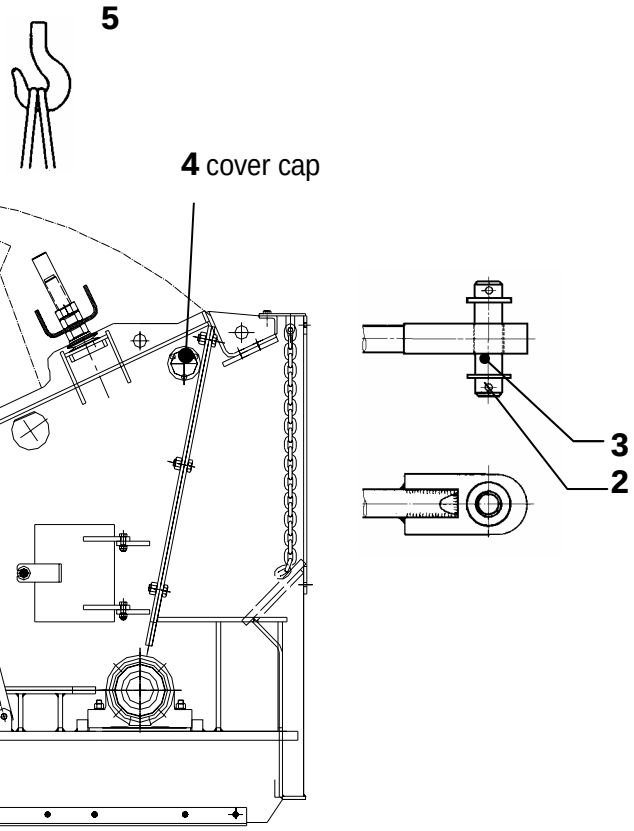
Positionning of the locking key

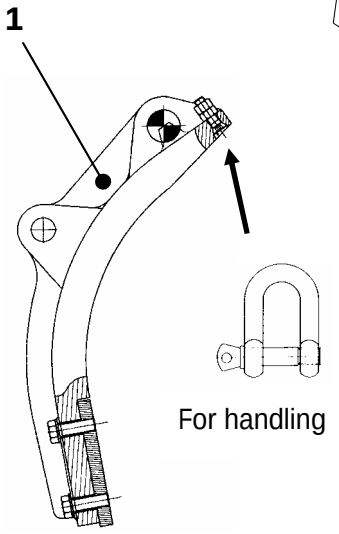
Phase 1

Phase 2

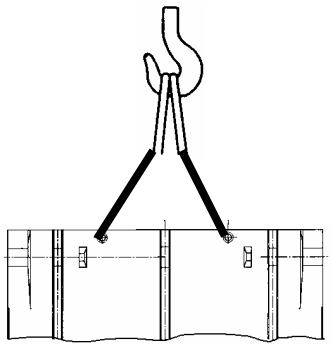
Phase 3

Locking key tightening phase



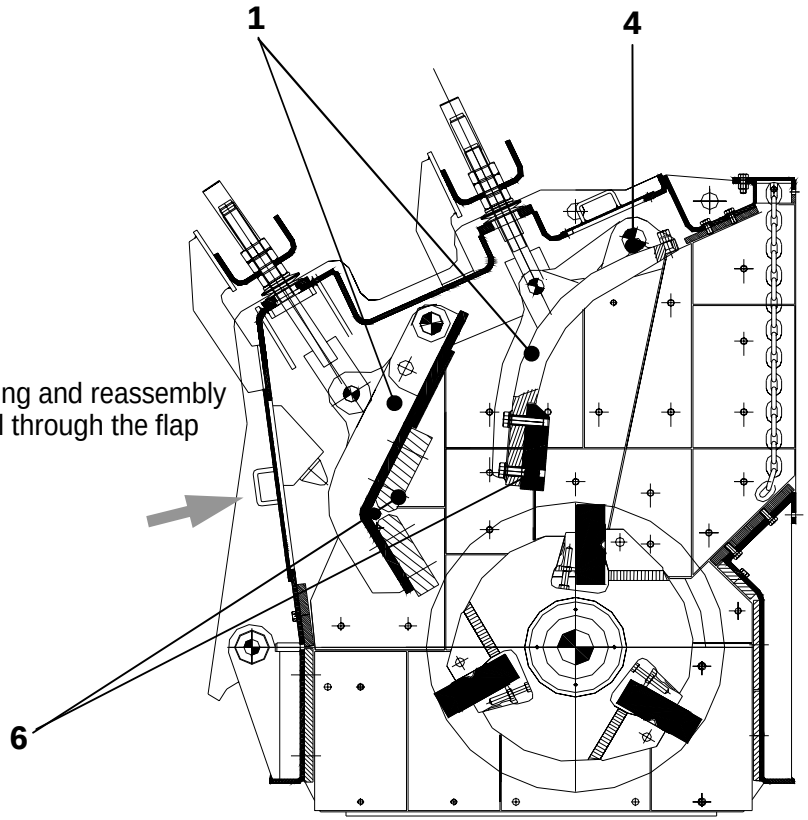


For handling

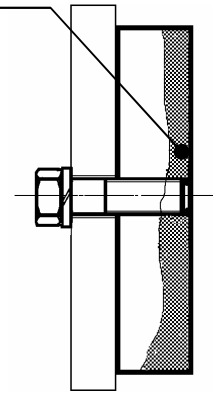


Impact plate

- for dismantling and reassembly
  - visual control through the flap



When wear reaches the screw it is time to make a replacement



IMPACT APRON 1

For opening the impact crusher housing please refer to 5.3-4

For disassembly of the impact faces 1 :

- remove the retaining bolts 3 secured by the split-pins 2
- remove the retaining bolts 4, take off the cover cap to have access to the bolts 4.

The impact apron are to be lifted out of the opened housing by means of a separate crane 5 .

IMPACT PLATE 6

Remove the fastening screws to exchange the impact plate 6

The fastening screws of the impact plates are to be retightened after the first 20 operating hours.

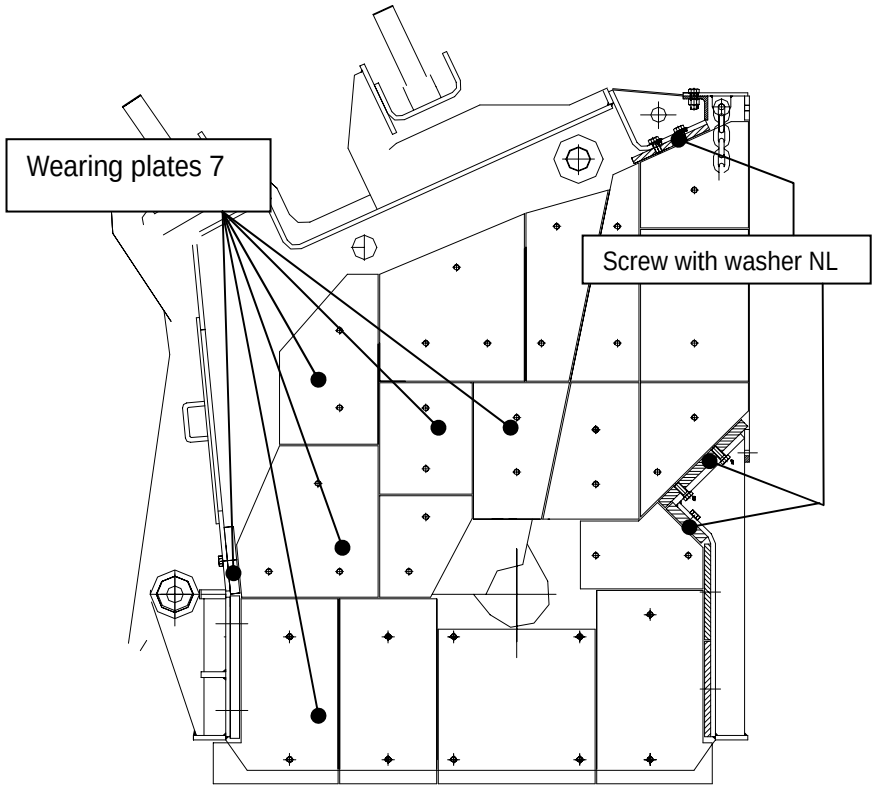
Screw	Classe	Tighten torque
M 20	**10.9**	**700 Nm** – rear apron
M 30	**10.9**	**2400 Nm** – front apron
M 36	**10.9**	**4020 Nm** – rear apron

WEARING PLATE 7

Remove the fastening screws to exchange the wearing plate 6.

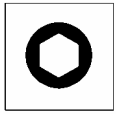
Screw	Classe	Tighten torque
M 20	**8.8**	**410 Nm**
M 20 with washer NL20	**8.8**	**490 Nm**

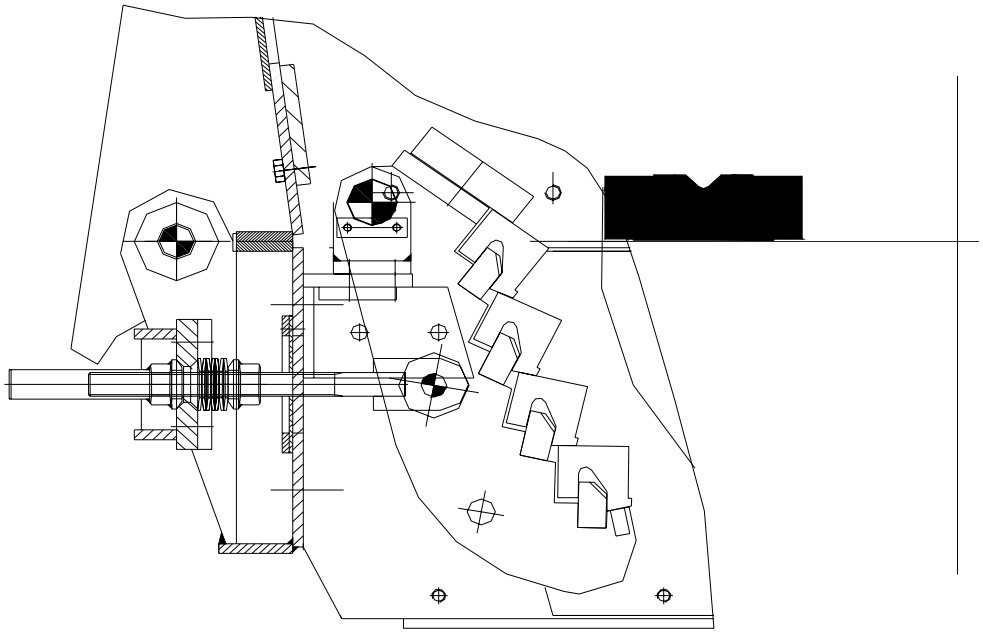
The fasening screws of the wearing plates are to retightened after the first 20 operating hours.

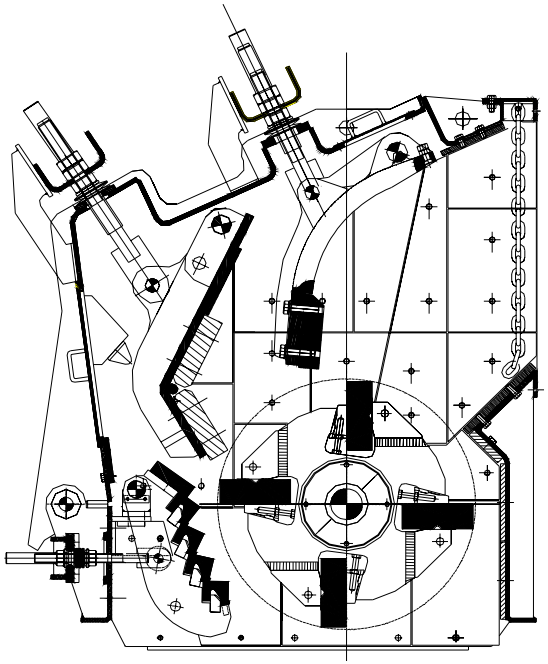


Torquin tool

Wearing plate **- Vis M 20** - Soket **30**
Impact plate **- Vis M 30** - Soket **46**
Impact plate **- Vis M 36** - Soket **55**



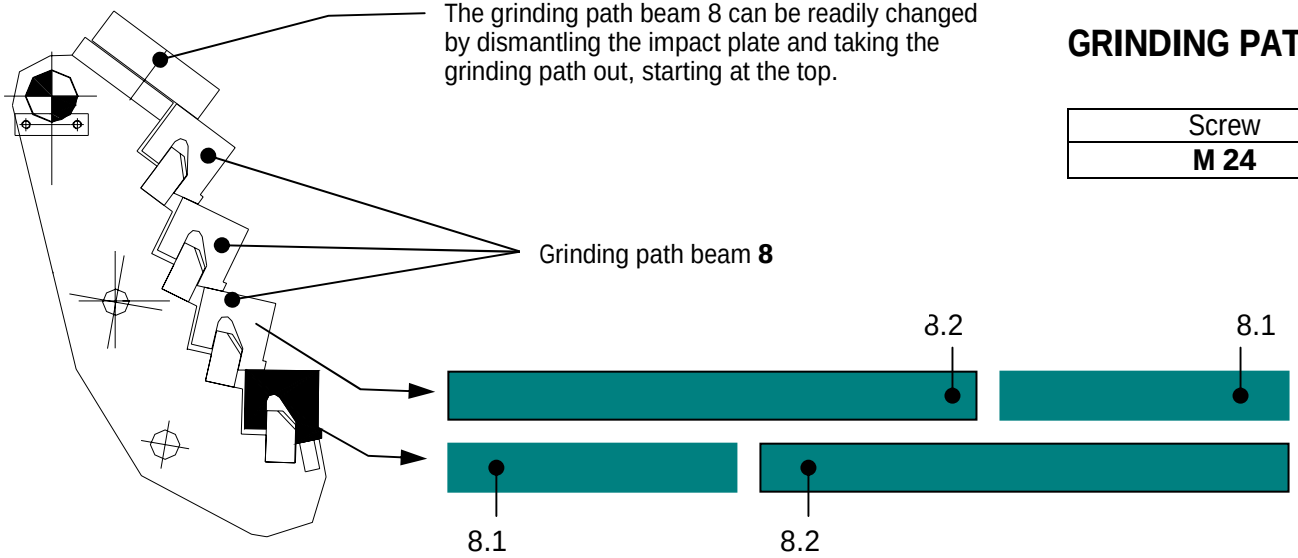


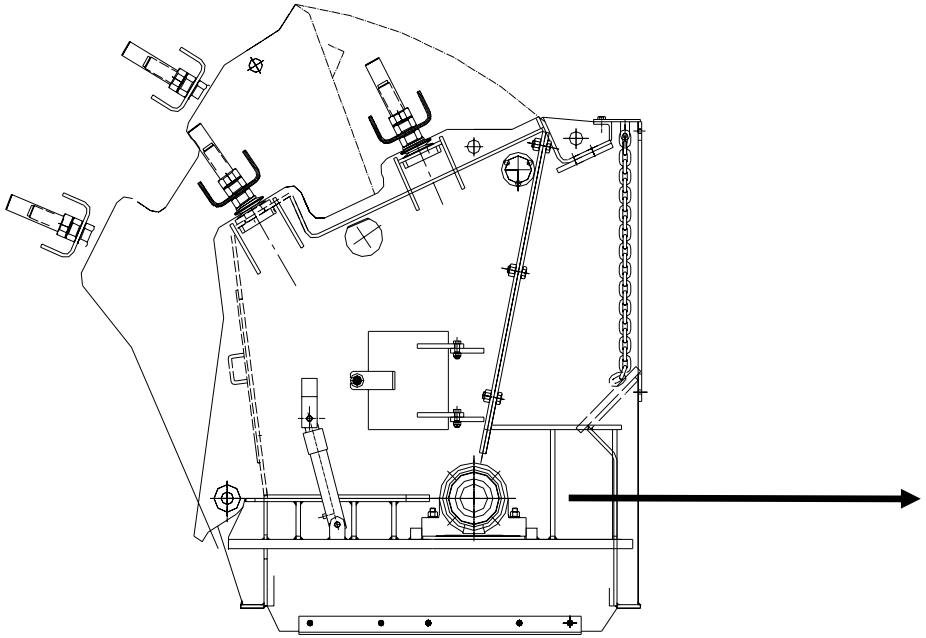


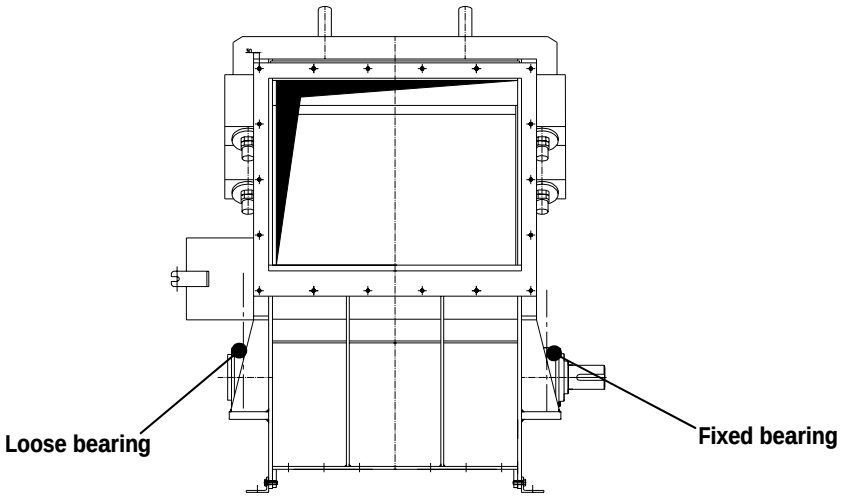
The grinding path beam 8 can be readily changed by dismantling the impact plate and taking the grinding path out, starting at the top.

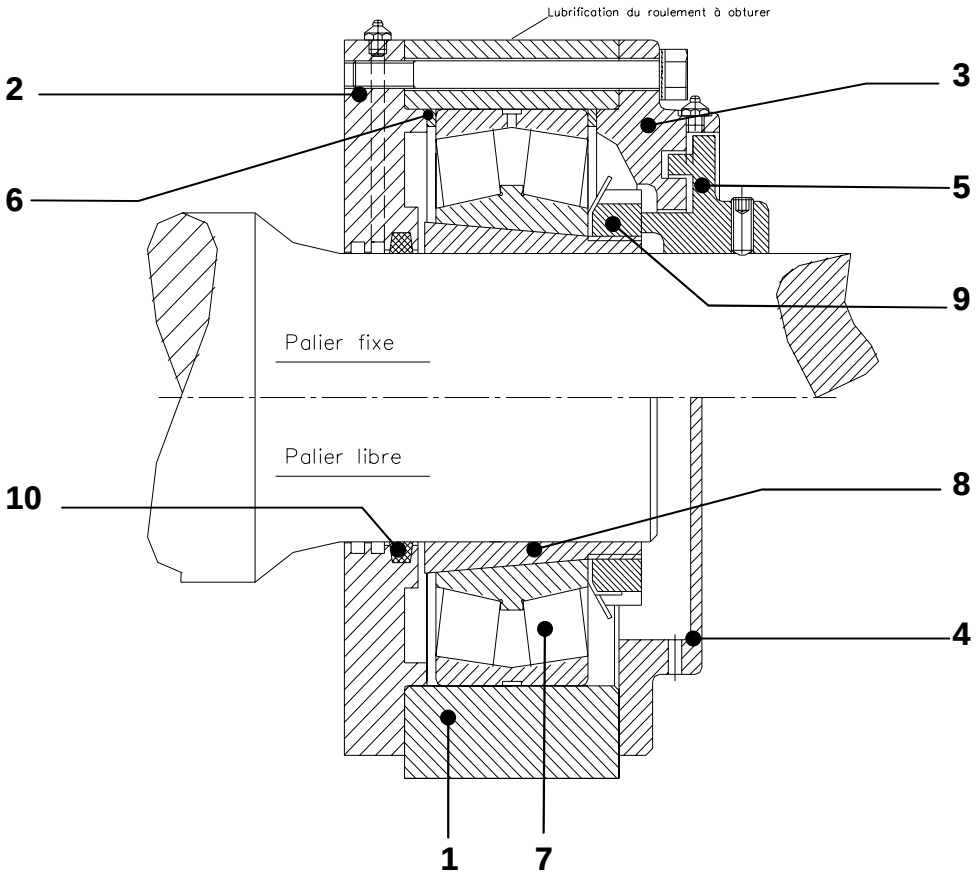
GRINDING PATH BEAM 8

Screw	Classe	Tighten torque
M 24	**10.9**	**900 Nm**

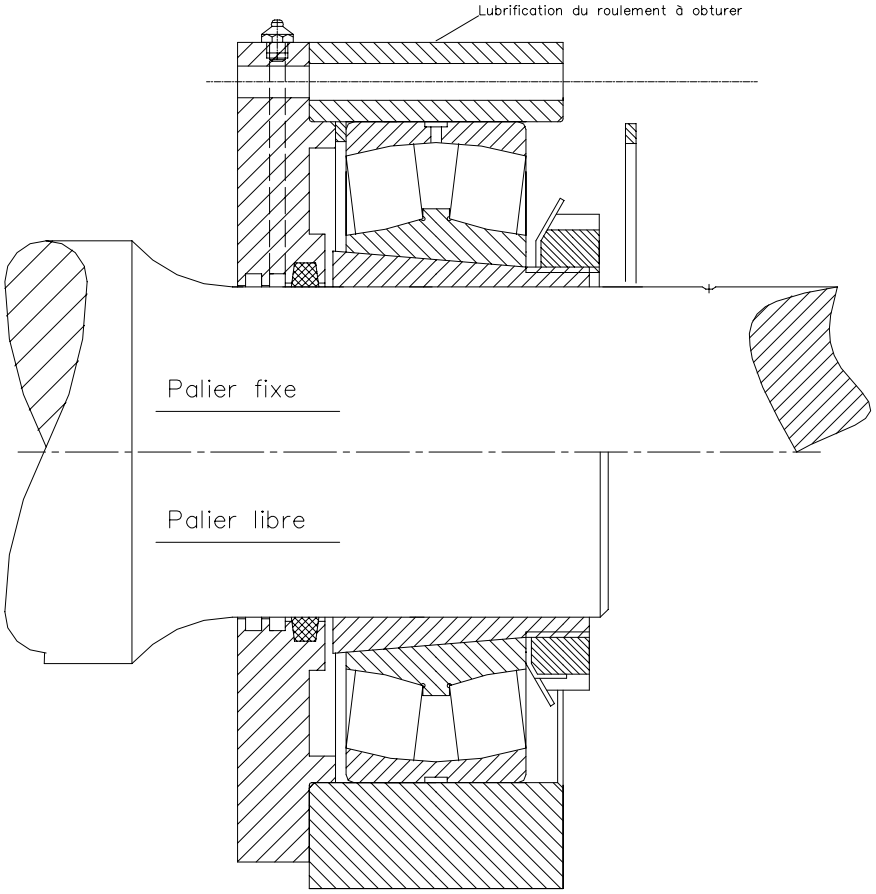


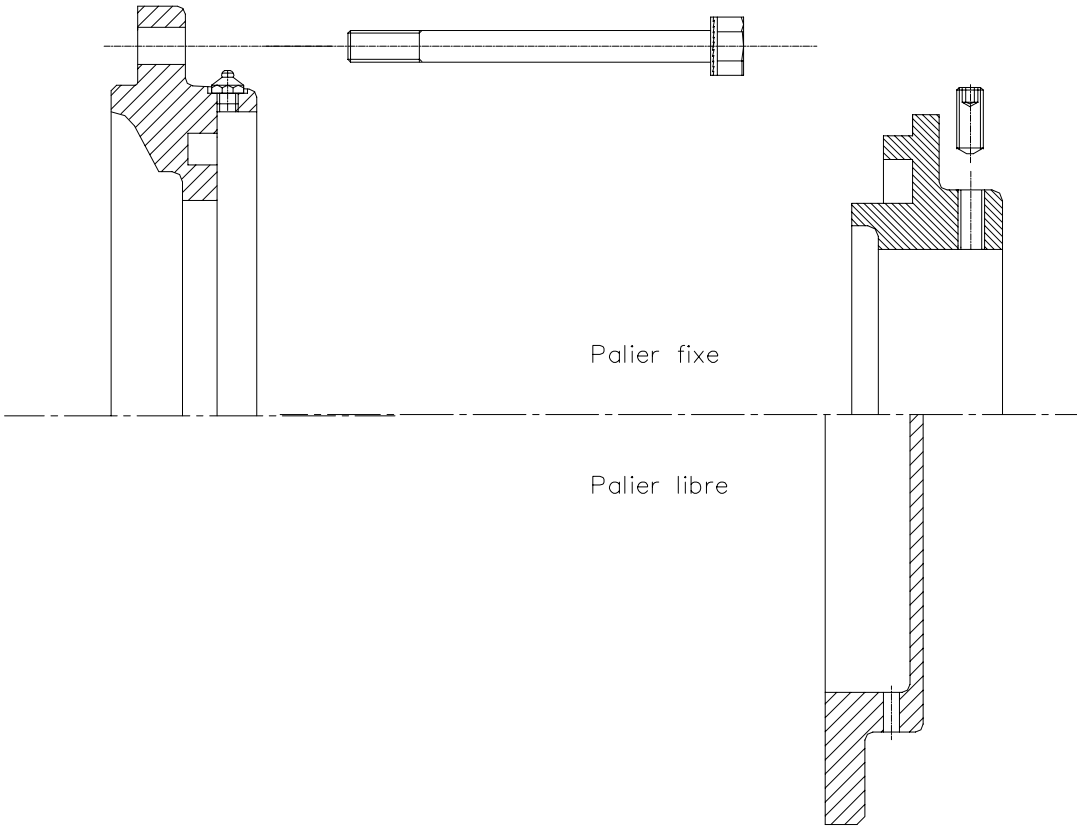






Pos.	Désignation
1	Bearing housing
2	Bearing cover-inner
3	Bearing cover-outer / for fixed bearing
4	Bearing cover-outer / for loose bearing
5	Labyrinth ring / for fixed bearing
6	Ring for fixed bearing
7	Self aligning roller bearing
8	Adapter sleeve
9	Lock nut with washer
10	J oint


Lubrification du roulement à obturer
Palier fixe
Palier libre


Palier fixe
Palier fixe
Palier libre

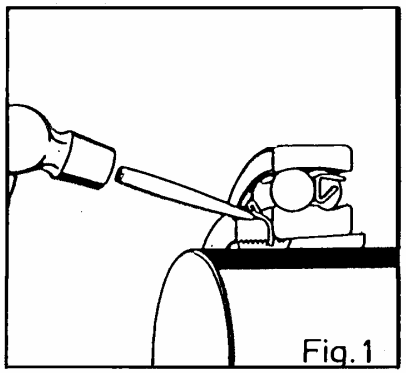


Fig.1

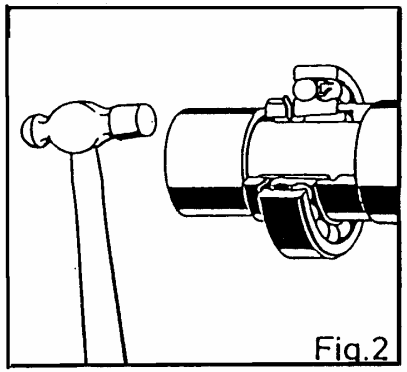


Fig.2

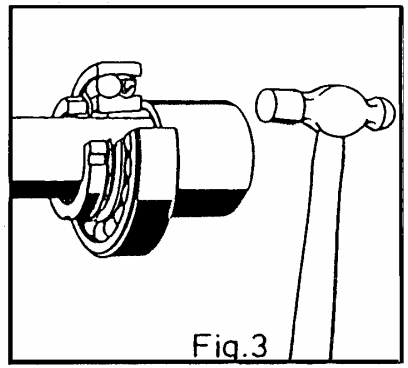


Fig.3

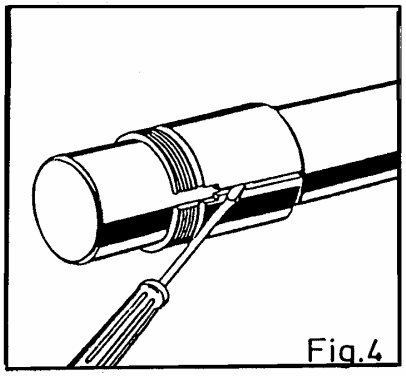


Fig.4

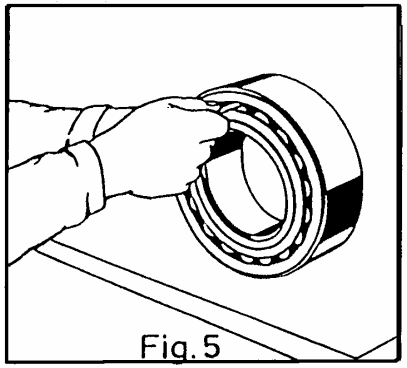


Fig.5

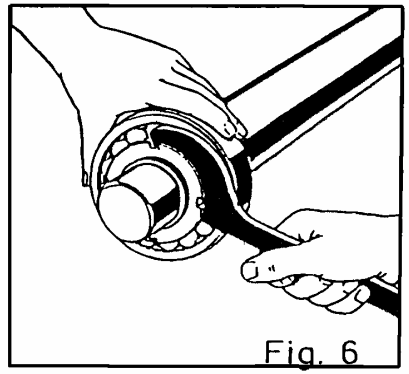


Fig. 6

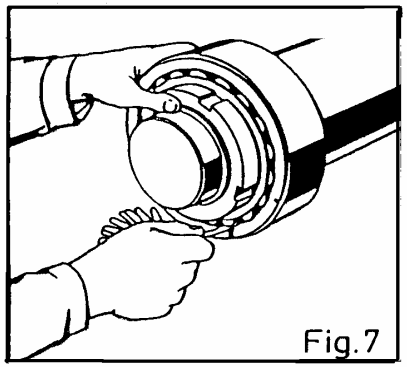


Fig.7

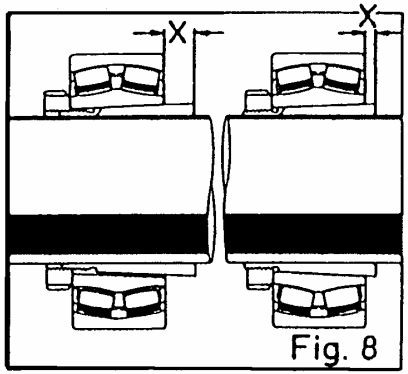


Fig. 8

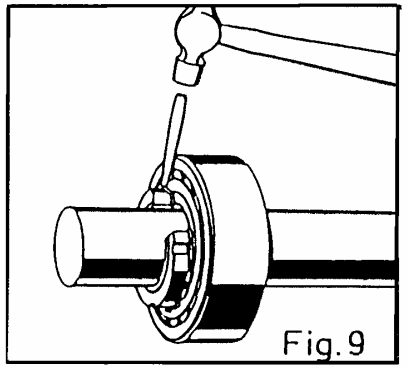


Fig.9

BEARINGS WITH ADAPTER SLEEVES

Demounting

- Mark the position of the adapter sleeve on the shaft and unlock the adapter sleeve nut by bending up the locking plate (fig. **1**).

- Unscrew the adapter sleeve nut by some turns. Place a drive cap or a tube section against the adapter sleeve nut and loosen the bearing by strong, uniformly distributed blows (fig. **2**).

If the bearing is mounted on a bright shaft, the tool is to be put on the inner ring of the bearing (fig. **3**).

Bearings that do not show indentations or other kinds of damages on the raceways, rolling elements or on the cage and which run uniformly without excessive bearing play can be reinstalled.

Installation

Prior to installation the bearings seats are slightly to be oiled to avoid damage during assembly.

The following installation sequence is to be adhered to:

- Push the adapter sleeve up to the marked position on the shaft (fig. **4**). This work is facilitated by expanding the sleeves slot by means of a screw driver.

- Unpack the bearings and check the radial play in the state as delivered. The bearings are identified correspondingly.

The marking means :

C normal	- normal bearing play
C3	- bearing play larger than normal
C4	- bearing play larger than C3

- Check the bearing play as per (fig. **5**) by a feeler gauge between the outer ring and the unloaded roller.

Do not overroll the measuring blade of the feeler gauge, but pull it through between the roller and the outer ring.

- Push the bearing onto the adapter sleeve, screw on the adapter sleeve nut ant tighten until the required bearing ply reduction is reached (fig. **6**).

Bearing play required

The tight seating of bearings with a tapered bore is achieved by driving the bearing onto the adapter sleeve.

In doing so, the original bearing play of the bearing is reduced.

Any intuitive pressing-on of the bearing is not permissible. When pressing the bearing on the adapter sleeve, the reduction of the bearing play is continuously to be checked.

The weight of the outer ring must not affect the insertion of the measuring blade (fig. **7**).

Measuring is always to be done with the rollers unloaded.

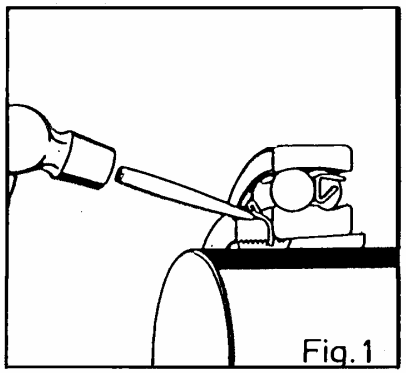
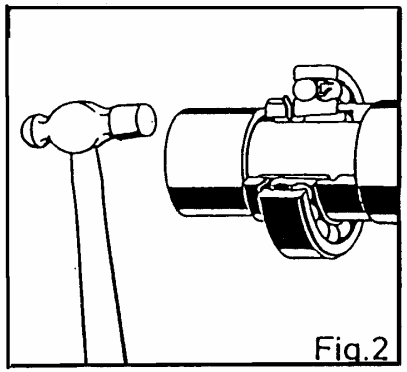


Fig.1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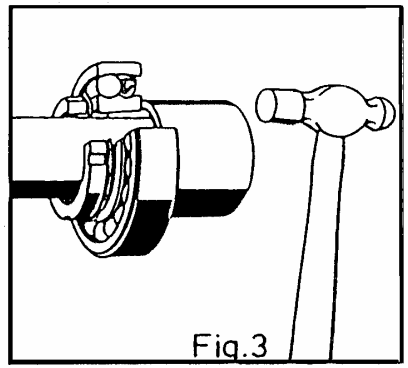
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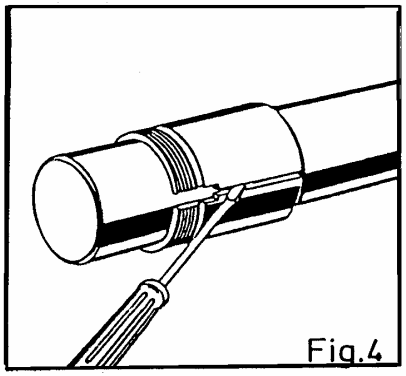


Fig.4

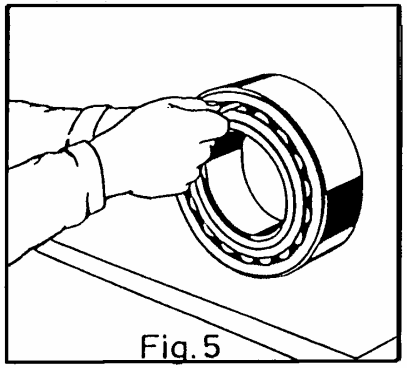


Fig.5

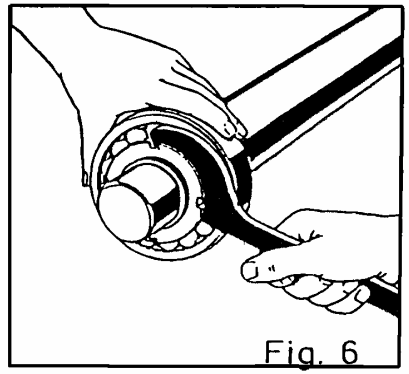


Fig. 6

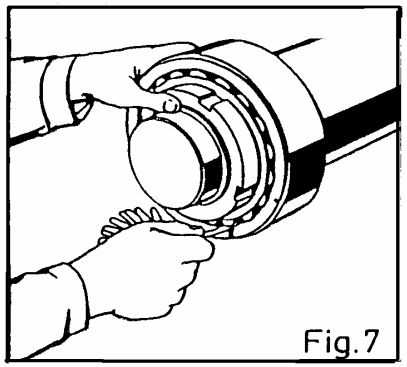


Fig.7

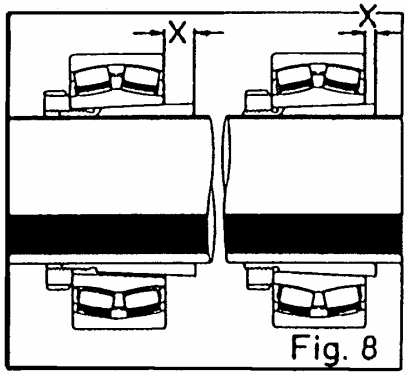


Fig. 8

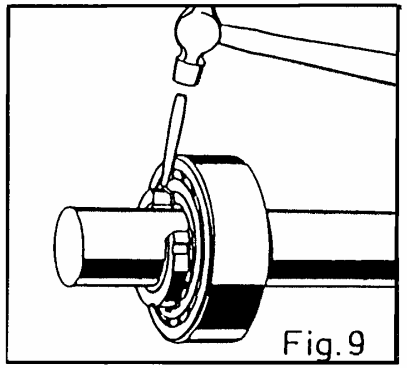


Fig.9

If it is possible to measure the radial play, the axial displacement X of the inner ring to the adapter sleeve may be used as measure for the correct fitting (fig. **8**).

The following table show the values for the reduction in play, the axial displacement and the minimum permissible end play.

- After pressing on the bearing, the adapter sleeve nut is to be removed, the locking plate is to be placed in position and the nut is again to be screwed on and tightened.

The lug of the locking plate being located opposite to one groove in the nut is bent down (fig. **9**).
In this way, the adapter sleeve nut is locked once again.

- Mount the bearing housing.

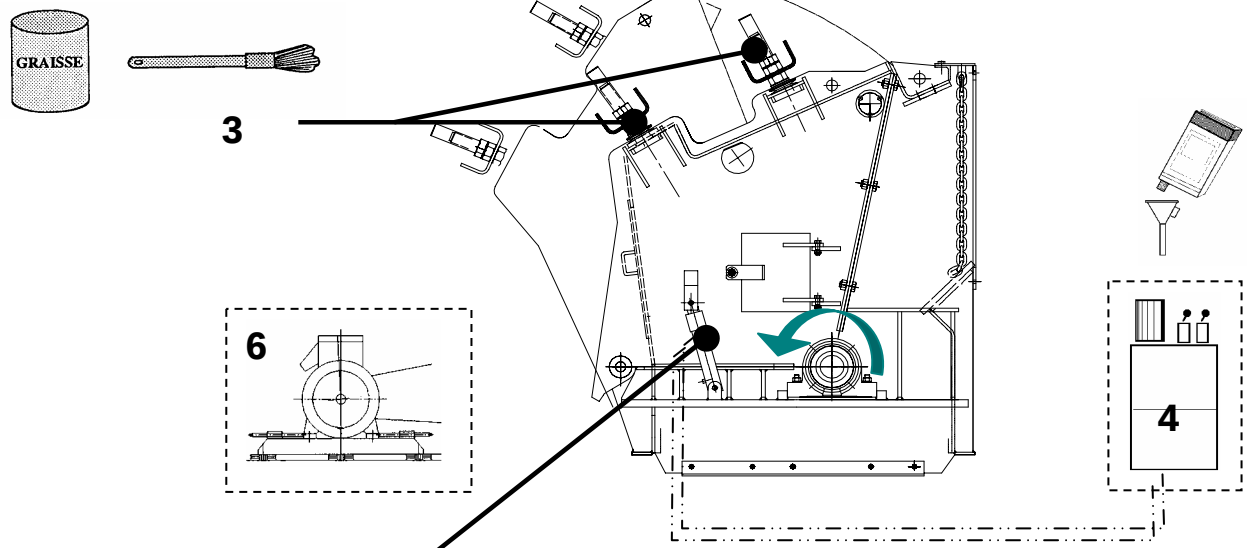
Pay attention to the differences between the loose and fixed bearings. Fixed rings are to be inserted for the fixed bearings.

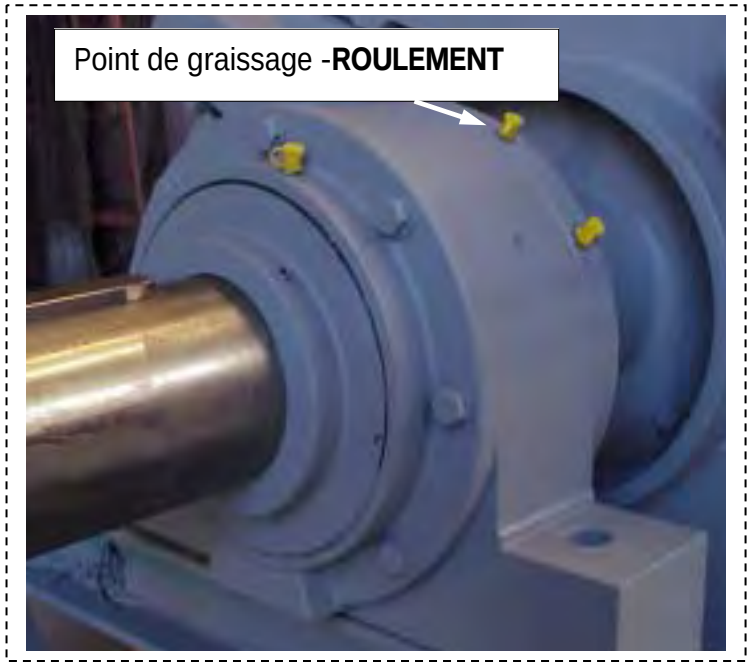
- The hollow spaces of the bearings as well those of the housings are amply to be filled with grease. See lubricating instructions 7.0.

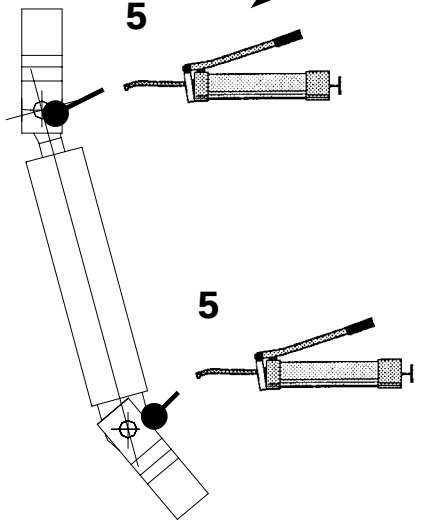
Guide values for reduction of the radial clearance and the axial displacement at the installation of spherical roller bearings

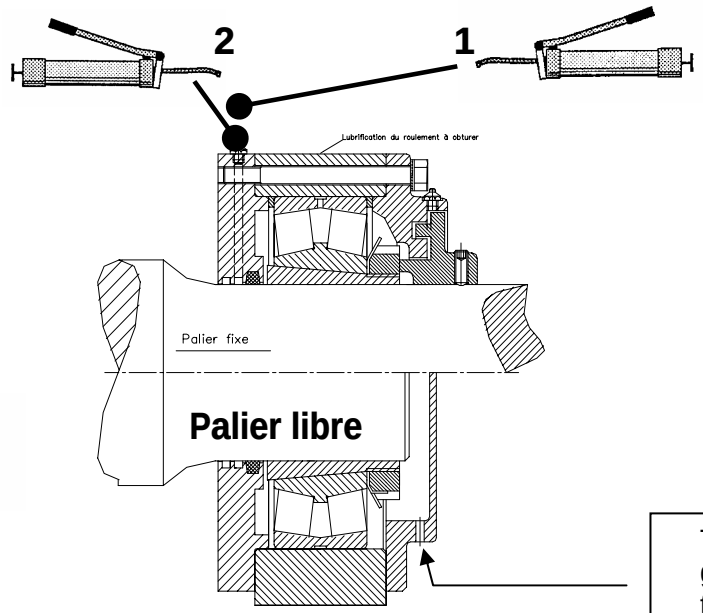
Bearing bore diameter d		Reduction in radial bearing clearance		Axial displacment [1] Taper 1:12		Taper 1:30		Min. permissible residual clearance after mounting bearings with initial clearance		
over	incl.	min	max	min	max	min	max	C0	C3	C4
mm		mm		mm				mm		
30	40	0,020	0,025	0,35	0,4	-	-	0,015	0,025	0,040
40	50	0,025	0,030	0,4	0,45	-	-	0,020	0,030	0,050
50	65	0.030	0,040	0,45	0,6	-	-	0,025	0,035	0,055
65	80	0,040	0,050	0,6	0,75	-	-	0,025	0,040	0,070
80	100	0,045	0,060	0,7	0,9	1,75	2,25	0,035	0,050	0,080
100	120	0,050	0,070	0,75	1,1	1,9	2,75	0,050	0,065	0,100
120	140	0,065	0,090	1,1	1,4	2,75	3,5	0,055	0,080	0,110
140	160	0,075	0,100	1,2	1,6	3,0	4,0	0,055	0,090	0,130
160	180	0,080	0,110	1,3	1,7	3,25	4,25	0,060	0,100	0,150
180	220	0,090	0,130	1,4	2,0	3,5	5,0	0,070	0,100	0,160
200	225	0,100	0,140	1,6	2,2	4,0	5,5	0,080	0,120	0,180
225	250	0,110	0,150	1,7	2,4	4,25	6,0	0,090	0,130	0,200
250	280	0,120	0,170	1,9	2,7	4,75	6,75	0,100	0,140	0,220
280	315	0,130	0,190	2,0	3,0	5,0	7,5	0,110	0,150	0,240
315	355	0,150	0,210	2,4	3,3	6,0	8,25	0,120	0,170	0,260
355	400	0,170	0,230	2,6	3,6	6,5	9,0	0,130	0,190	0,290
400	450	0,200	0,260	3,1	4,0	7,75	10	0,130	0,200	0,310
450	500	0,210	0,280	3,3	4,4	8,25	11	0,160	0,230	0,350

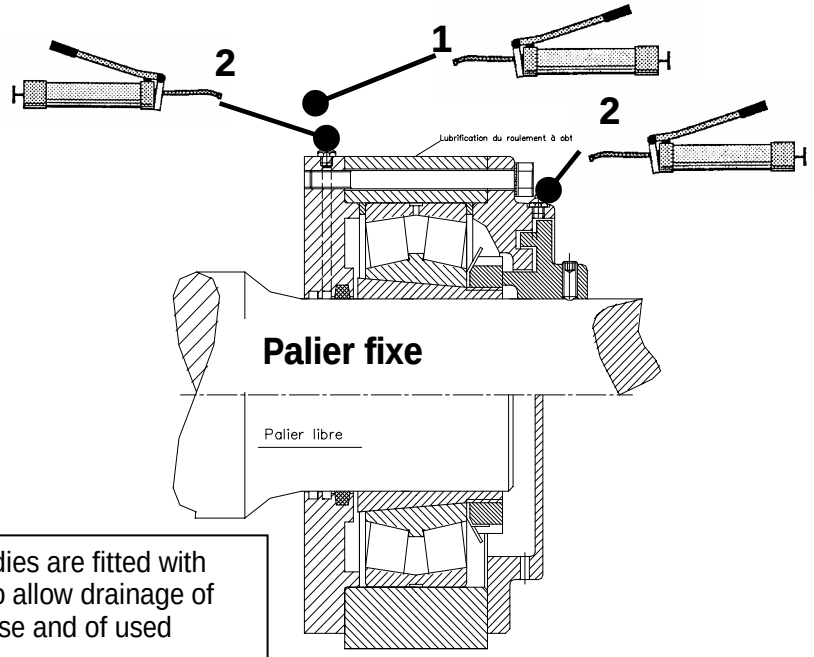
[1] valid for solid steel shafts only











The bearing bodies are fitted with grease valves to allow drainage of the excess grease and of used grease.

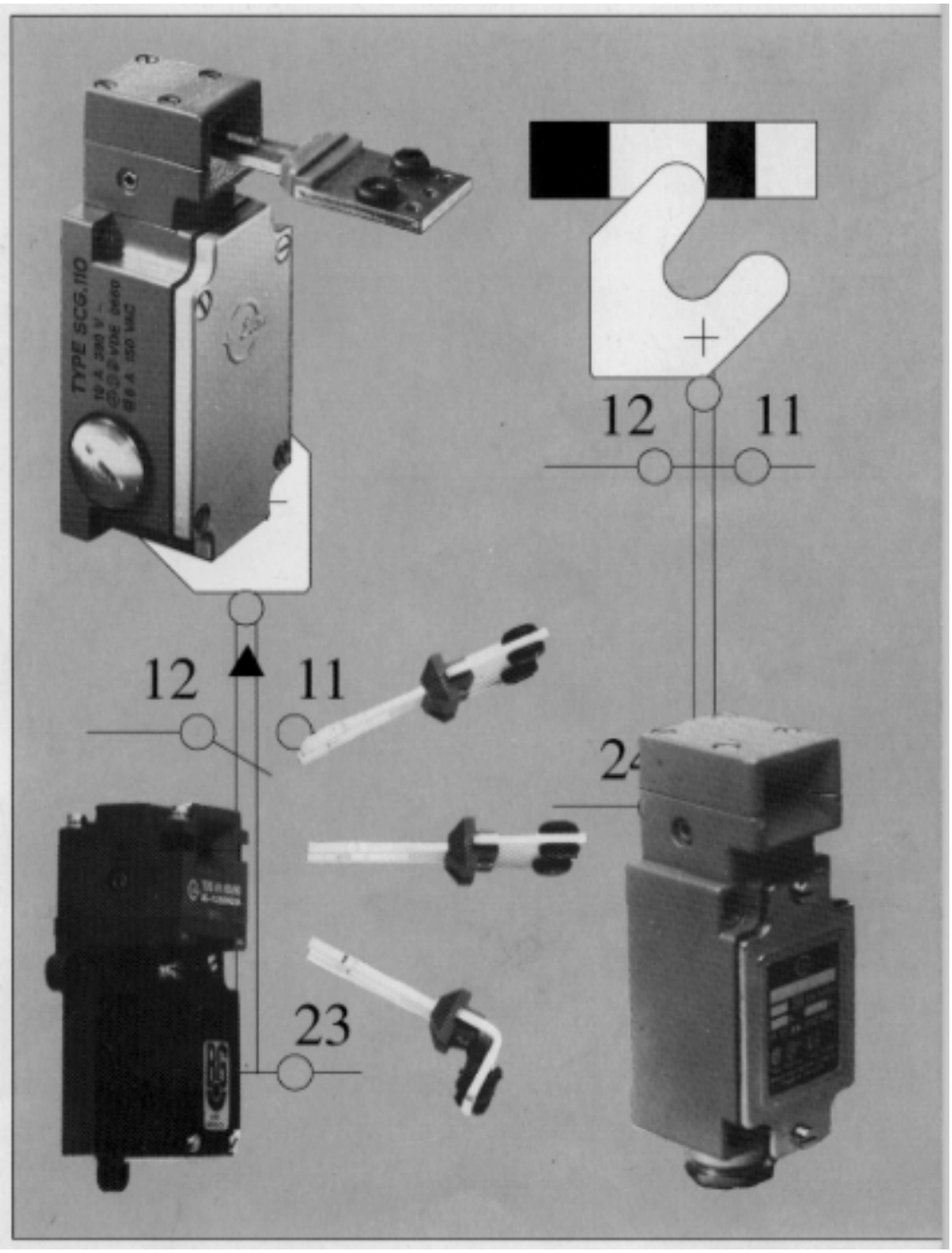
LUBRICATING INSTRUCTIONS - *FOR BOTH CRUSHER TYPES*

Lubricating point		Number	Lubricant acc. to table	Lubricating intervals in operating hours		Lubricant quantity	
				Change	Relubrication	Change	Relubrication
1	Rotor bearings crusher	2	KL 2 K	every 2000 h or yearly	every 50 h	hollow space of bearings to be filled 1/3	30 gr.
2	Rotor bearing Labyrinths	3	KL 2 K	every 2000 h or yearly	every 50 h		inject the new grease up to see the used grease
3	Spindle	4	Black grease type BELLEVILLE				
4	Hydraulic unit	1		see APPENDIX			
5	Hydraulic cylinders	4	KL 2 K	grease nipples at the ball-and-socket joints of the hydraulic cylinders are to be lubricated every 3 months			
6	Drive						

TABLE OF LUBRICANTS

Symbole suivant DIN 51502	Agip	ARAL	BP	elf	Esso	FINA	Mobil	Shell	TEXACO
Grease for •**Bearing** KL 2 K	**Agip GR MU 2**	**Aral Aralub HL 2**	**BP Energrease LS 2**	**Elf multi 2**	**Beacon 2**	**Fina Marson L2**	**Mobilux 2**	**Shell Alvania Fett R 2**	**Multifak 2**
Lubricants for •**Bearing** •**Gear motors** CLP 220	**Agip Blasia 220**	**Aral Degol TU 220**	**BP Energol GR-XP 220**	**Reductelf SP 220**	**Spartan EP 220**	**Fina Giran 220**	**Mobilgear 630**	**Shell Omala Öl 220**	**Meropa 220**
Lubricants for •**hydaulic unit** HLP 46	**Agip Oso 46**	**Aral Vitam GF 46**	**BP Energol HLP 46**	**Elfolna 46**	**Nuto H 46**	**Fina Hydran 46**	**Mobil DTE 25**	**Shell Tellus Öl 46**	**Rando Oil HD B-46**

Safety switches for the supervision of opening housings and secured accesses



The safety switches have to be integrated in the emergency stop circuit of the electrical parts of the machine.

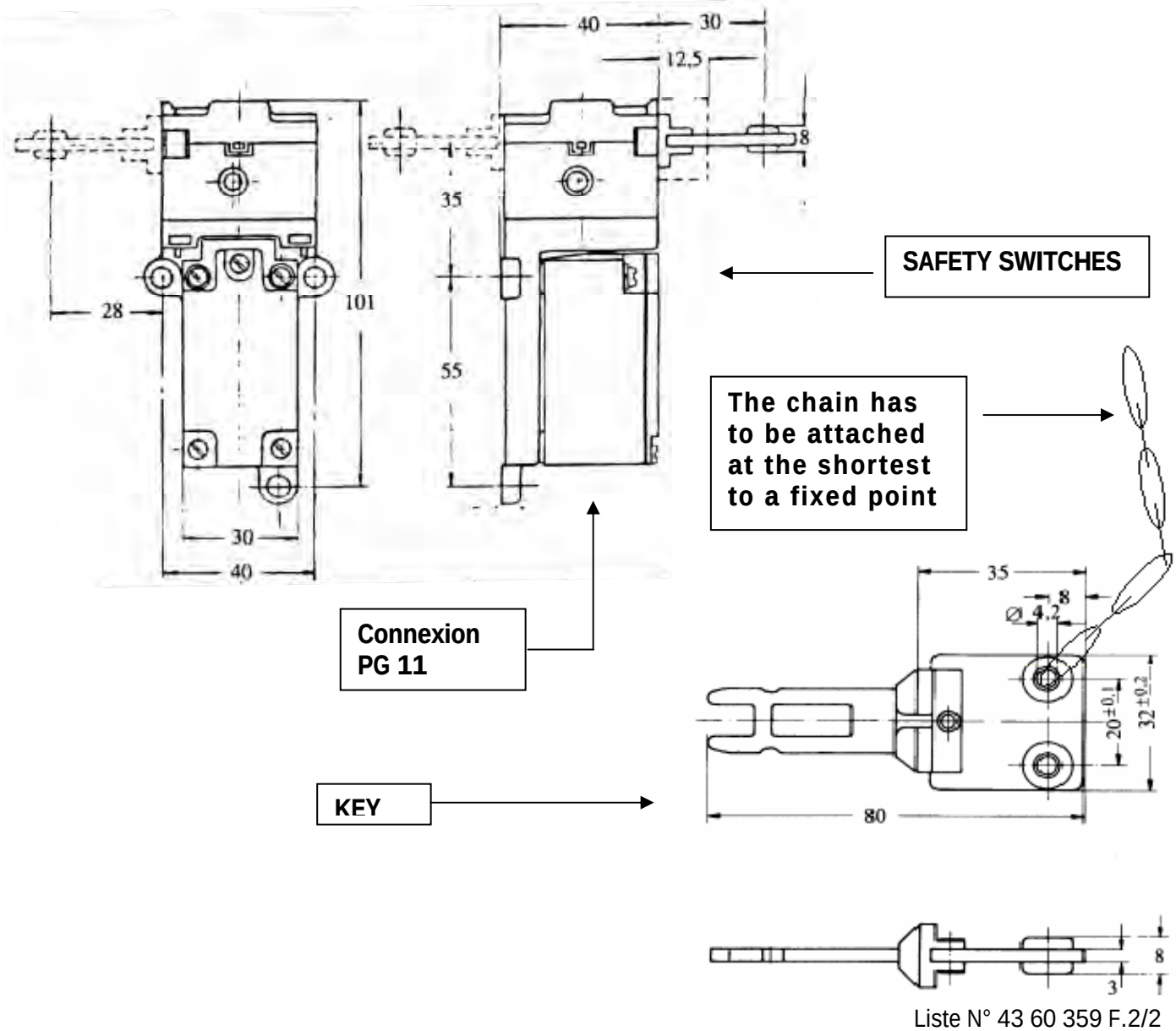
SAFETY SWITCHES

Modele	Contact combinaison	Action way	Type	Order ref.
T Z G	2 opening contacts	At the left	T Z G 02.110	134 7321

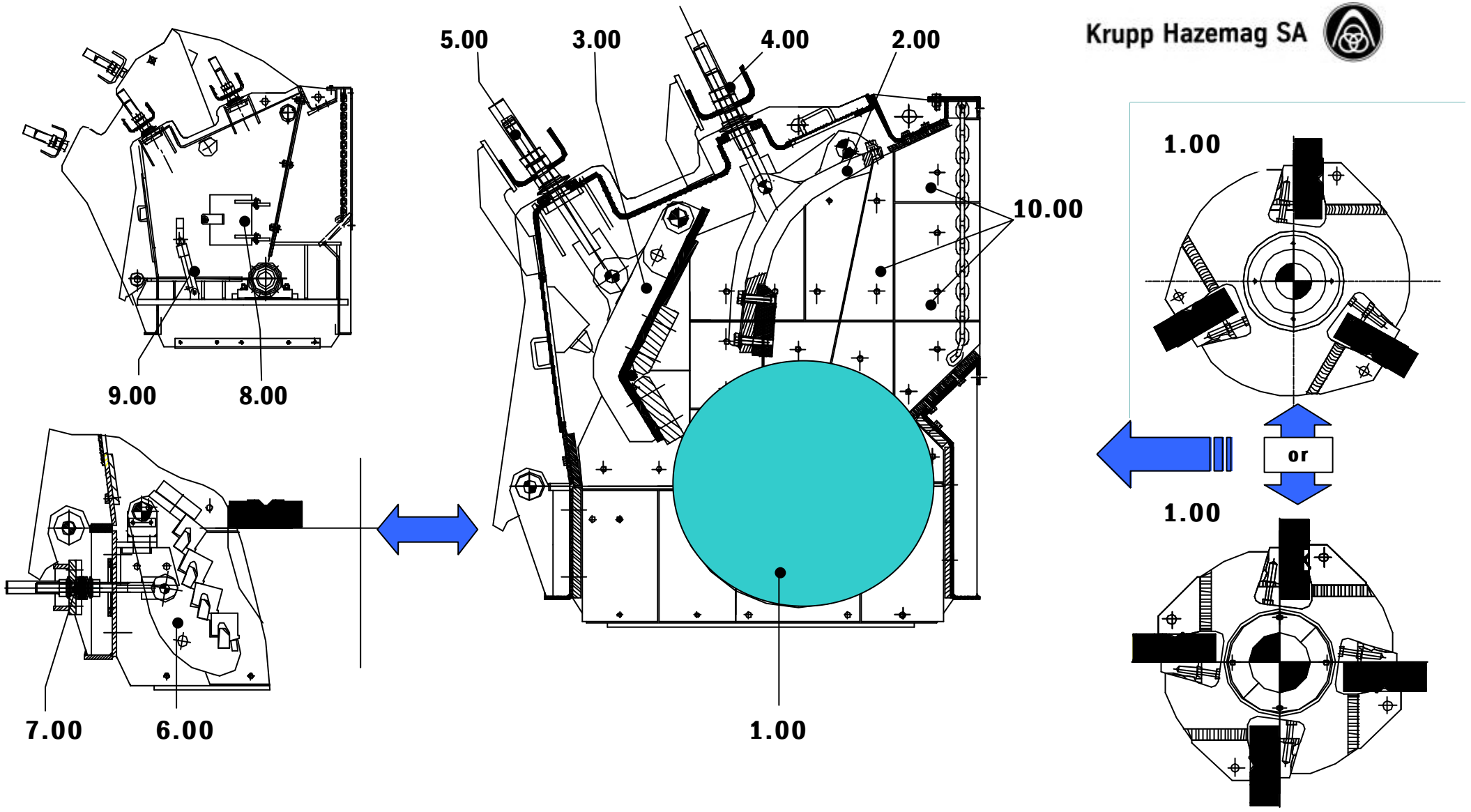
KEY for SAFETY SWITCHES TYPE TZG

Execution	Form	Order ref.
Right (field of action > 250 mm)	T Z /CO	191 9600

DIMENSIONS



Krupp Hazemag SA

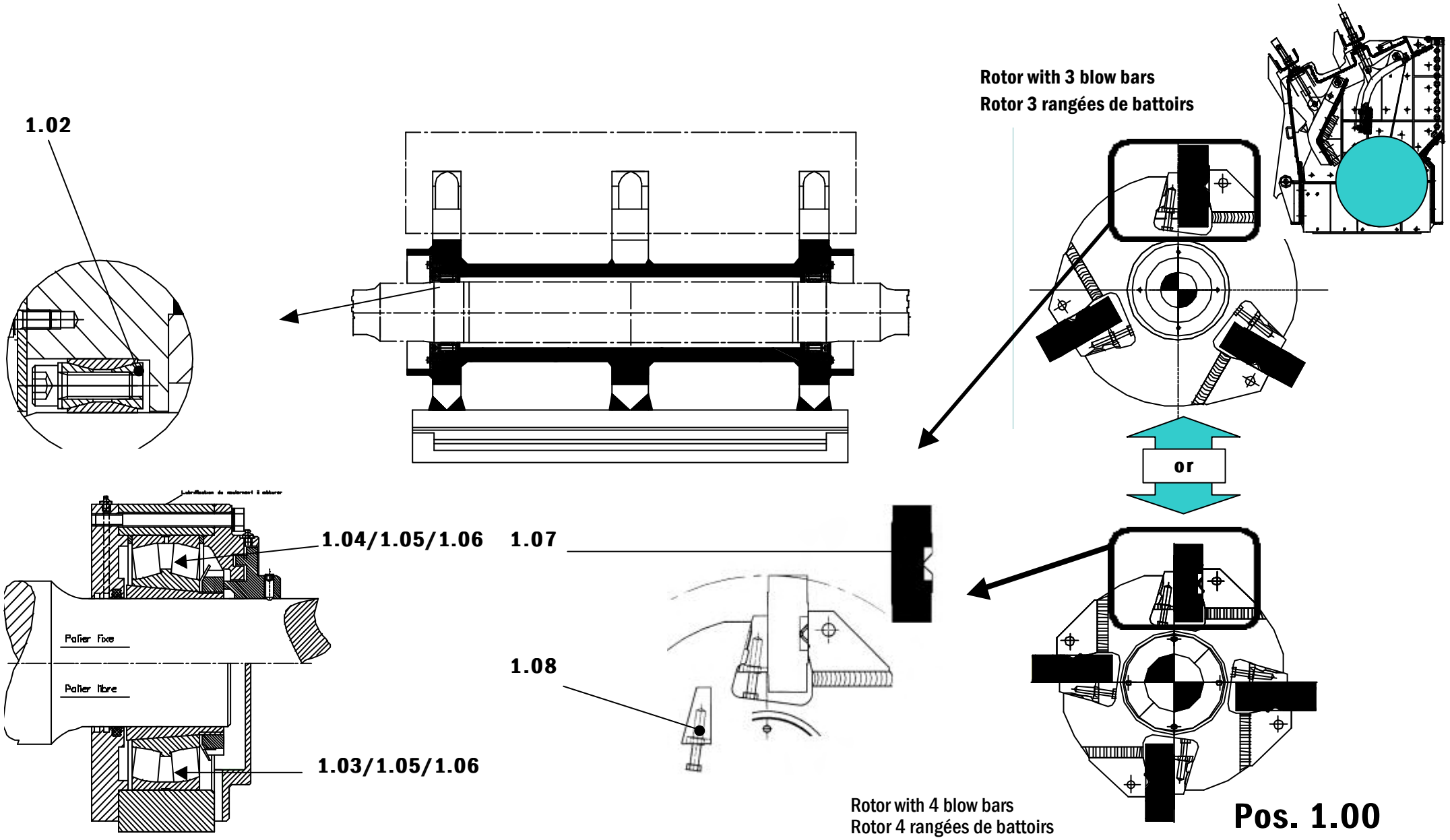


Spare parts list for
Liste des pièces de rechange pour

IMPACT CRUSHER
CONCASSEUR A PERCUSSION
9.01

type STARPACTOR APP-R 1013 EX
type STARPACTOR APP-R 1013 EX

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
1.00	**Rotor assembly complete** **Rotor complet**	See Sheet/ Voir F.3 - 5	**1**			
2.00	**Front impact apron impact apron compl.** **Ecran de chocs avant complet**	See Sheet/ Voir F.6 - 7	**1**			
3.00	**Rear impact apron compl.** **Ecran de chocs arrière complet**	See Sheet/ Voir F.6 - 7	**1**			
4.00	**Spindle suspension compl. for front impact apron** **Suspension tige filetée pour écran de chocs avant**	See Sheet/ Voir F.8 - 9	**1**			
5.00	**Spindle suspension compl. for rear impact apron** **Suspension tige filetée pour écran de chocs arrière**	See Sheet/ Voir F.10 - 11	**1**			
6.00	**Grinding path** **Rampe de broyage**	See Sheet/ Voir F.12 - 13	**1**			
7.00	**Spindle suspension compl. for grinding path** **Tige filetée complète pour rampe de broyage**	See Sheet/ Voir F.12 - 13	**2**			
8.00	**Inlet door** **Porte de visite**	See Sheet/ Voir F.14 - 15	**1**			
9.00	**Hydraulic system** **Système hydraulique**	See Sheet/ Voir F.16 - 17	**1**			
10.00	**Shielding** **Blindage**	See Sheet/ Voir F.18 - 20	**1**			

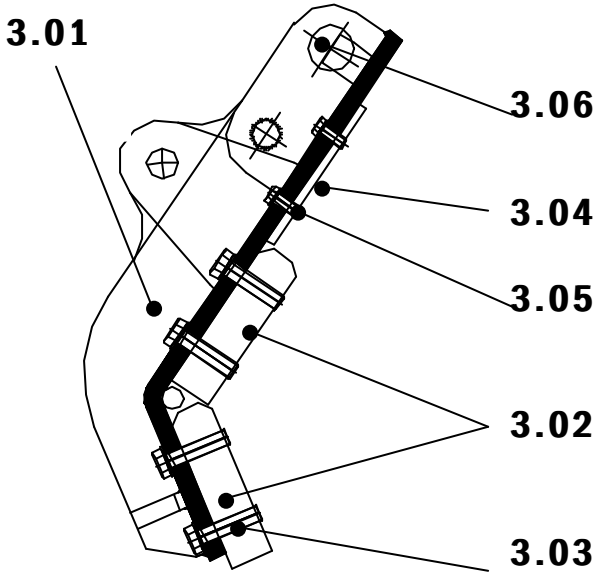

1.02
Rotor with 3 blow bars
Rotor 3 rangées de battoirs
or
1.04/1.05/1.06
1.07
1.08
Palier Fixe
Palier libre
1.03/1.05/1.06
Rotor with 4 blow bars
Rotor 4 rangées de battoirs
Pos. 1.00

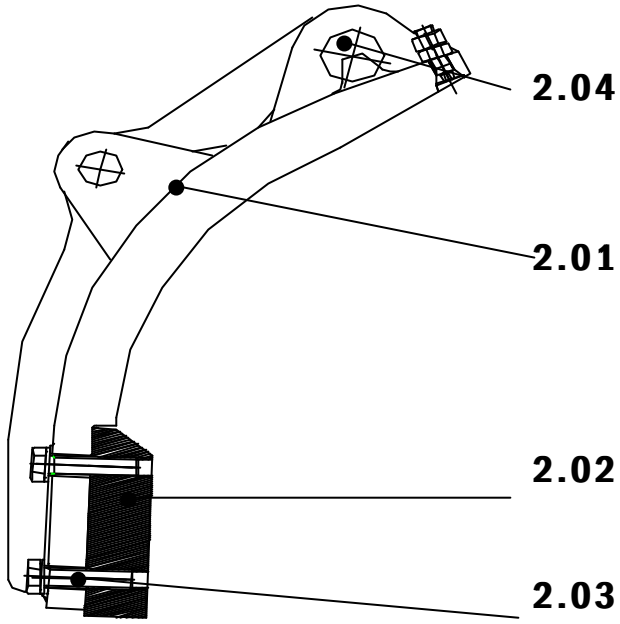
ROTOR ASSEMBLY FOR 3 BLOW BARS
ROTOR POUR 3 RANGEES

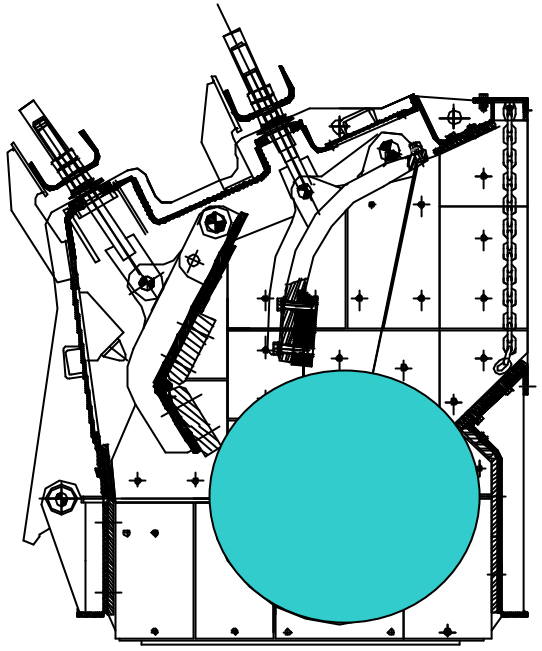
POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
1.00	**Rotor assembly compl. / Rotor complet** **Rotor without shaft / Rotor sans arbre**	**652588841-HO** **07210947-HO**		Rotor 3 blow bars / 3 rangées de battoirs		**2745** **1475**
1.01	**Shaft / Arbre de rotor**	**322588845**	**1**	For rotor 3 blow bars / Pour rotor 3 rangées		
1.02	**Clamping sleeve** **Eléments dynanoblocs**	**03200223**	**2**			**11.2**
1.03	**Bearing compl.fixed** **Palier fixe complet** **Bearing housing** **Corps de paliers**	**39210058** **312559471**	**1** **1**			**90** **48**
1.04	**Bearing compl. _Loose** **Palier libre complet** **Bearing housing** **Corps de paliers**	**39210059** **312559471**	**1** **1**			**82** **48**
1.05	**Self-aligning roller bearing** **Roulement à rotule sur rouleaux**	**05204471**	**2**			**17.7**
1.06	**Adapter sleeve** **Manchon de serrage**	**05200168**	**2**			
1.07	**Blow bar** **Battoirs**	**0125887000**	**3**	For rotor 3 blow bars Pour rotor 3 rangées		**261**
1.08	**Locking key** **Coin de blocage** Screw/Vis	**07410010235A BR** 040933201102	**9** **9**	For rotor 3 blow bars Pour rotor3 rangées		**3.4**

ROTOR ASSEMBLY FOR 4 BLOW BARS
ROTOR POUR 4 RANGEES

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
1.00	**Rotor assembly compl. / Rotor complet** **Rotor without shaft / Rotor sans arbre**	**654271341** **433271341**		Rotor 4 blow bars / 4 rangées de battoirs		**3050** **1520**
1.01	**Shaft / Arbre de rotor**	**074271753**	**1**	For rotor 4 blow bars / Pour rotor 4 rangées		
1.02	**Clamping sleeve** **Eléments dynanoblocs**	**03200223**	**2**			**11.2**
1.03	**Bearing compl.fixed** **Palier fixe complet** **Bearing housing** **Corps de paliers**	**39210058** **312559471**	**1** **1**			**90** **48**
1.04	**Bearing compl. _Loose** **Palier libre complet** **Bearing housing** **Corps de paliers**	**39210059** **312559471**	**1** **1**			**82** **48**
1.05	**Self-aligning roller bearing** **Roulement à rotule sur rouleaux**	**05204471**	**2**			**17.7**
1.06	**Adapter sleeve** **Manchon de serrage**	**05200168**	**2**			
1.07	**Blow bar** **Battoirs**	**0125887005-40**	**4**	For rotor 4 blow bars Pour rotor 4 rangées		**261**
1.08	**Locking key** **Coin de blocage** Screw/Vis	**07410010235A BR** 040933201102	**12** **12**	For rotor 4 blow bars Pour rotor 4 rangées		**3.4**

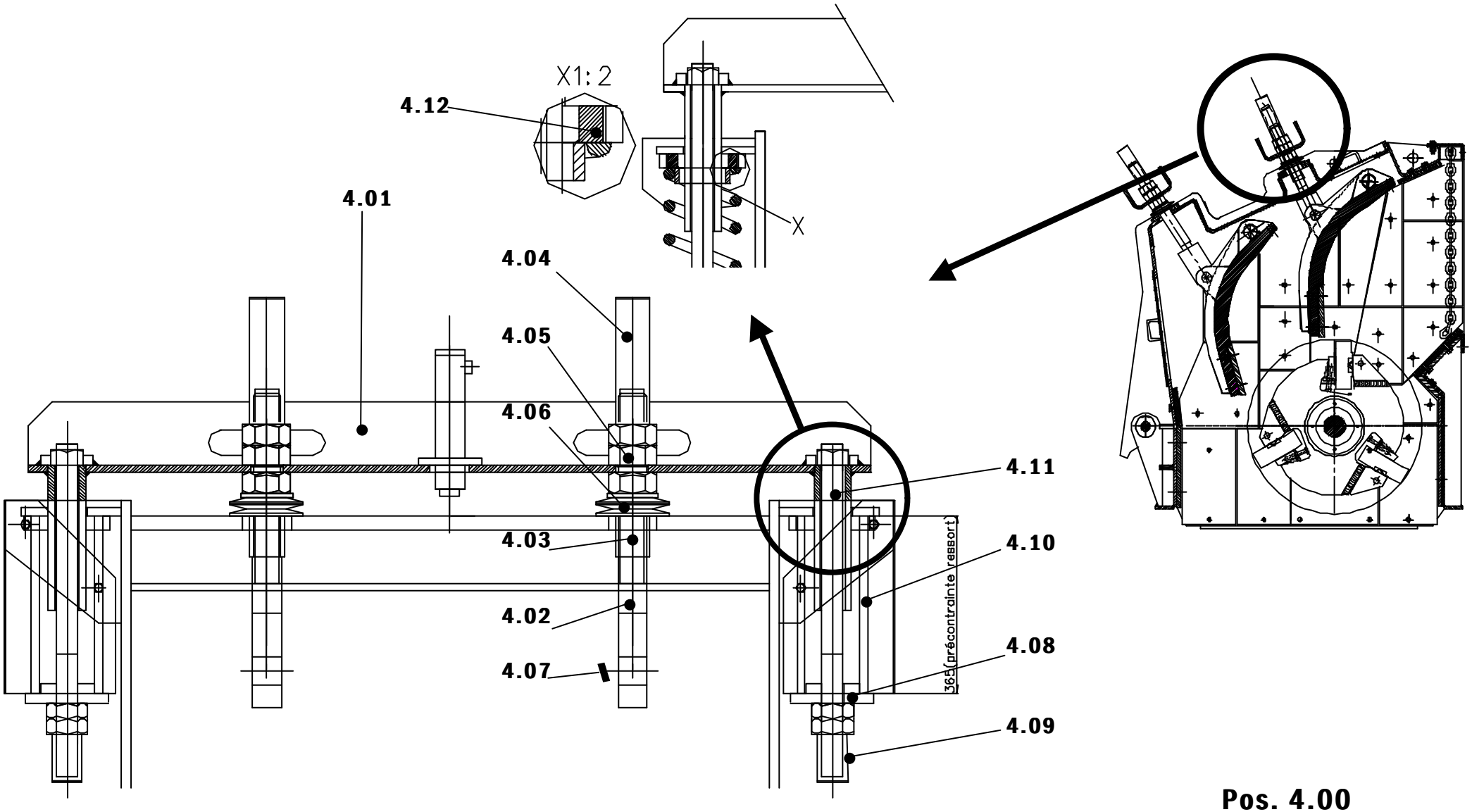






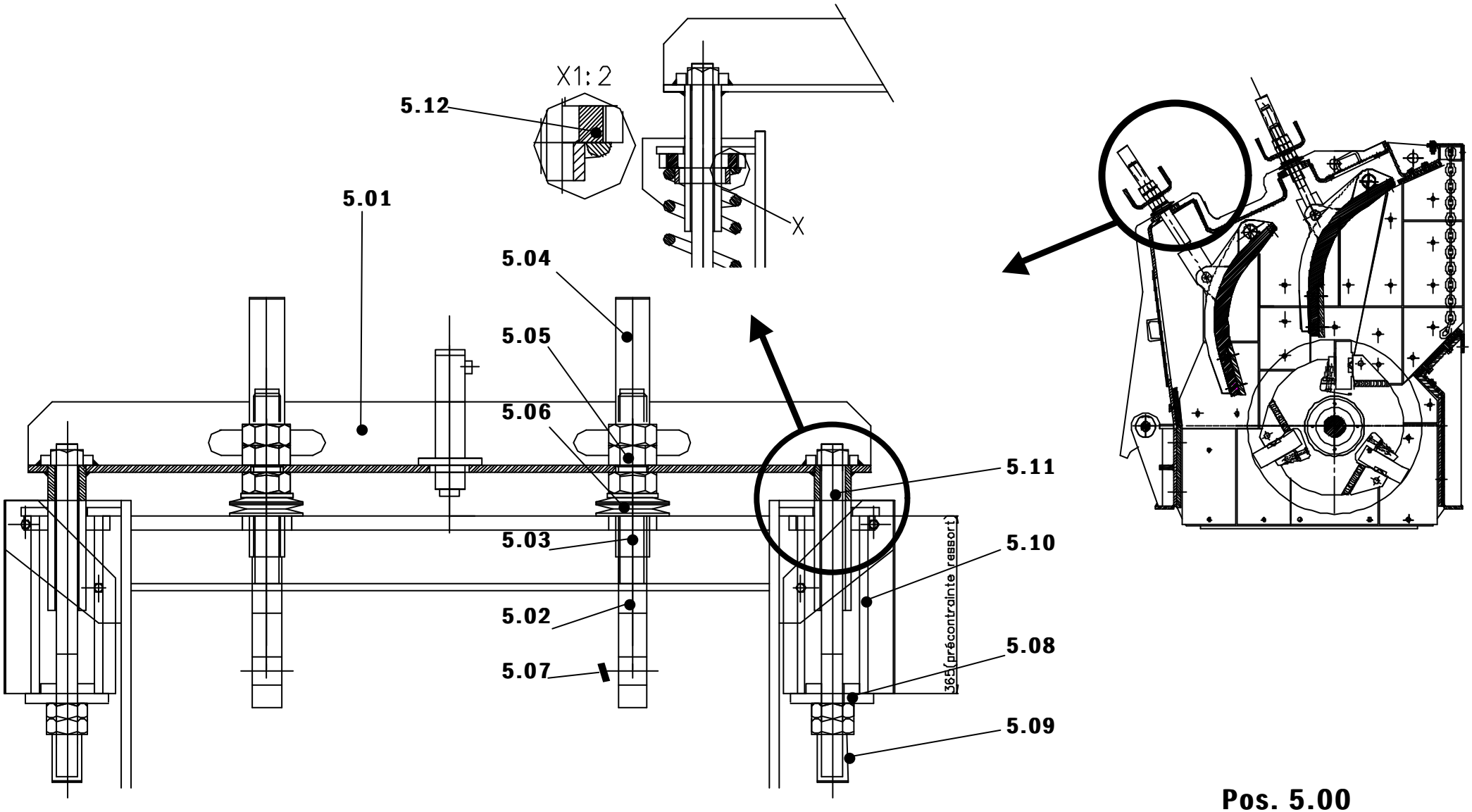
Pos. 2.00
Pos. 3.00

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
2.00	**Front impact apron compl.** **Ecran de chocs avant complet**	**2 672 092B**	**1**	Without spindles Sans tiges filetées		**1100**
2.01	**Impact arm** **Chassis écran de chocs**	**012672093B0**	**1**			**850**
2.02	**Impact plate** **Plaque de chocs**	**074271624_38**	**2**			**120**
2.03	**Screw / Vis**	**040933301203**	**8**	Washer/Rondelle _045310MDNL30AC-C		
2.04	**Hinge pin** **Axe de suspension**	**32258890501**	**2**			15
3.00	**Rear impact apron compl.** **Ecran de chocs arrière complet**	**4 271 741**	**1**	Without spindles Sans tiges filetées		945
3.01	**Impact arm** **Chassis écran de chocs**	**324271730**	**1**			850
3.02	**Impact plate** **Plaque de chocs**	**074271739_38**	**4**			112
3.03	**Screw / Vis** **Vis**	**040933301203**	**16**	Washer/Rondelle _045310MDNL30AC-C		
3.04	**Impact plate** **Plaque de chocs**	**074271740_38**	**2**			22
3.05	**Screw / Vis**	**04093320503**	**8**	Washer/Rondelle _045310MDNL20AC-C		
3.06	**Hinge pin** **Axe de suspension**	**32258890501**	**2**			15


X1: 2
4.12
X
4.01
4.04
4.05
4.06
4.03
4.02
4.07
4.11
4.10
4.08
4.09
365 (précontrainte ressort)

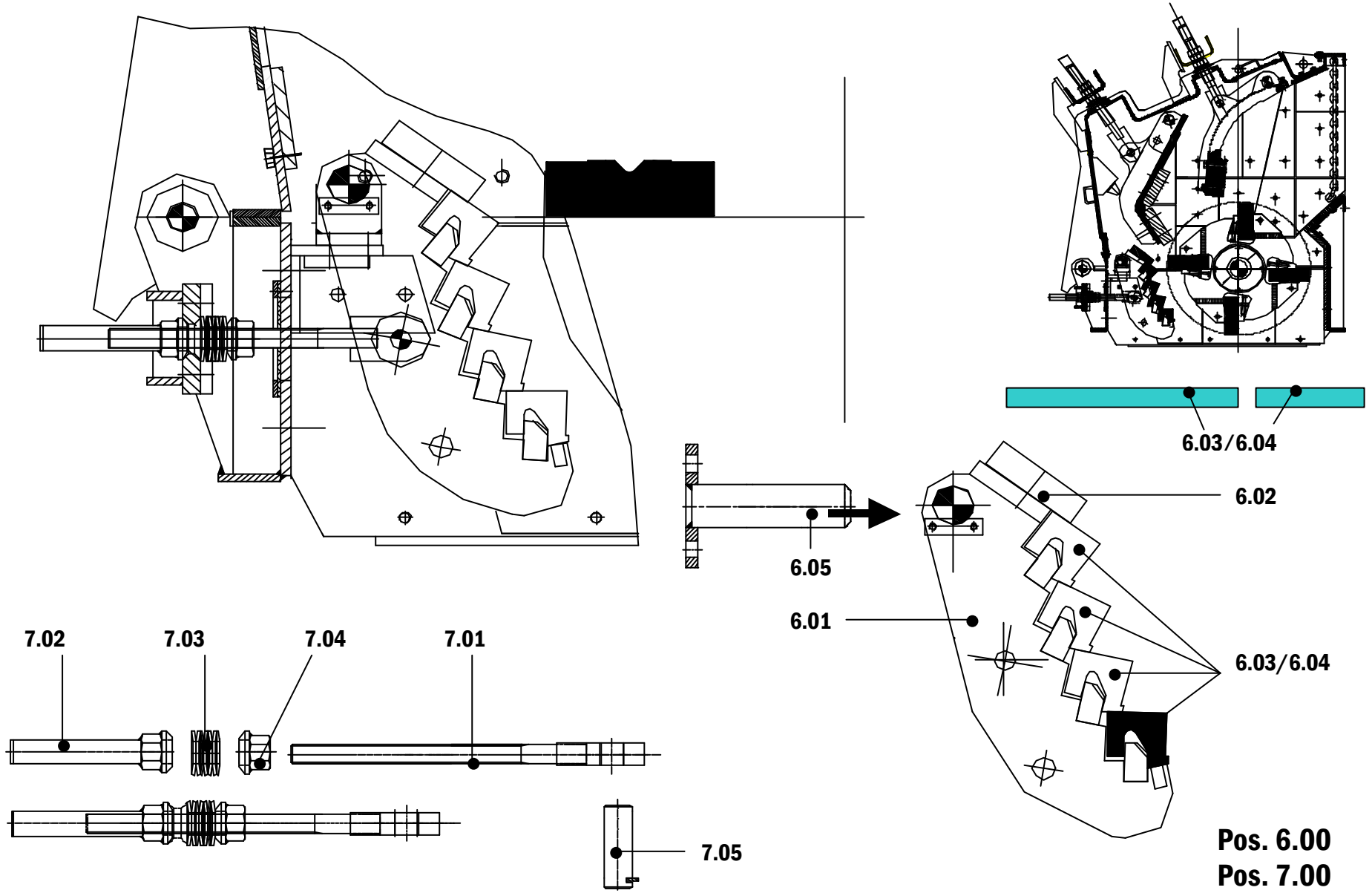
Pos. 4.00

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
4.00	**Spindle suspension compl. For front impact apron** **Suspension tige filetée complète pour écran de chocs avant**	**2 672 185**	**1**			**257**
4.01	**Crossbeam /** Traverse	**322672184 BR**	**1**			**111**
4.02	**Spindle /** Tige filetée	**382559070**	**2**			**17**
4.03	**Protective tube /** Tube de protection	**32280001838**	**2**			**3**
4.04	**Protective cap /** Capot de protection	**322588936**	**2**			**3.5**
4.05	**Nut /** Ecrou	**322559072**	**2**			**1.2**
4.06	**Spring washer /** Rondelle Belleville	**042093150718**	**6**			**0.8**
4.07	**Axis /** Axe **Washer /** Rondelle **Pin /** Goupille	**31212069** 041441-56 0400941080	**2** **4** **4**			**3.5**
4.08	**Spring bracket /** Plaque de compression	**32210031557**	**2**			**5**
4.09	**Protective tube /** Tube de protection	**32280001905**	**2**			**1.4**
4.10	**Spring /** Ressort	**07210105591 BR**	**2**			**5.5**
4.11	**Fastening screw /** Boulon d'ancrage	**321880892**	**2**			**16**
4.12	**Spring guiding /** Guidage ressort	**3242709494902**	**2**			**7.5**

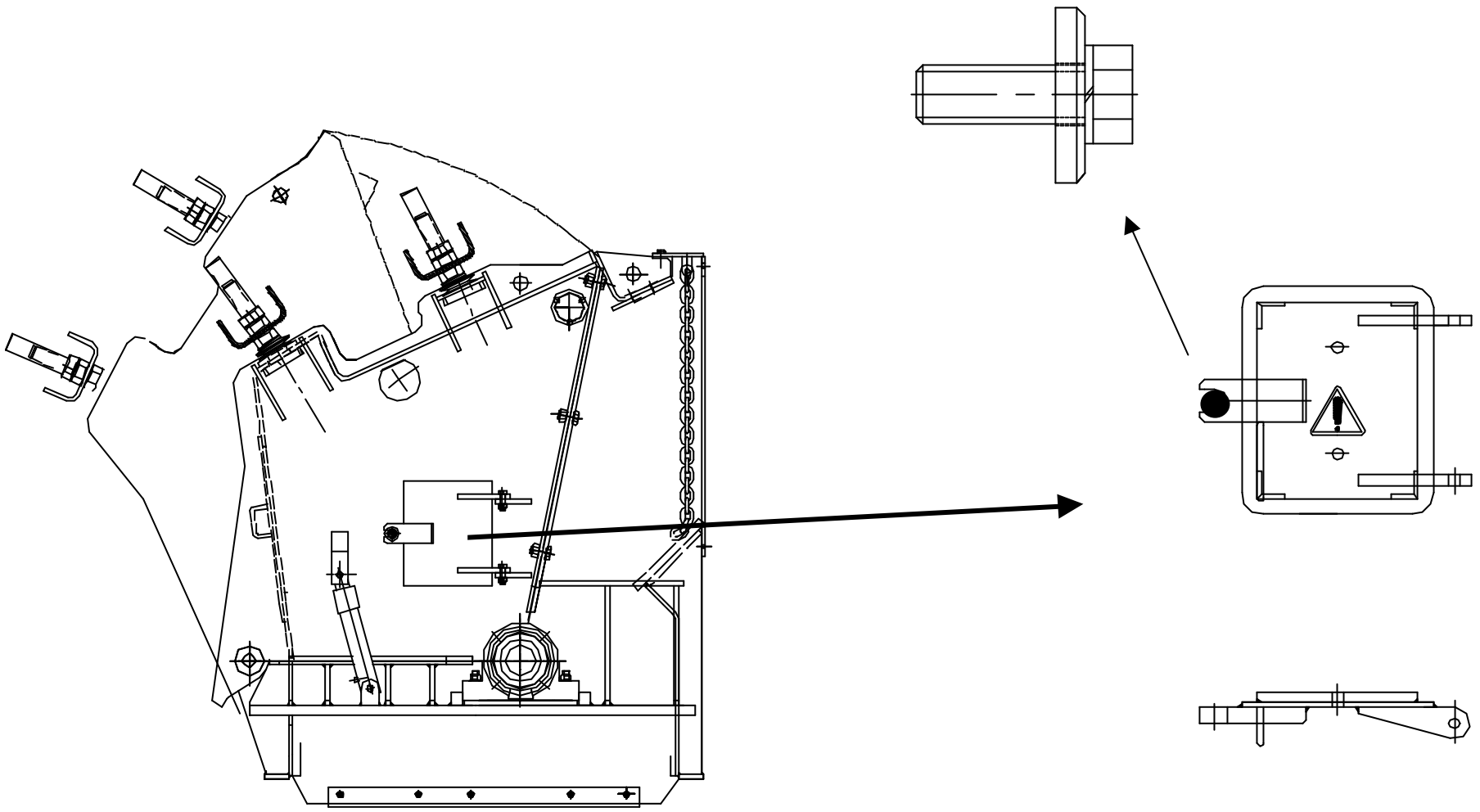

X1: 2
5.12
X
5.01
5.04
5.05
5.06
5.03
5.02
5.07
5.11
5.10
5.08
5.09
365 (précontrainte ressort)

Pos. 5.00

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
5.00	**Spindle suspension compl. For front impact apron** **Suspension tige filetée complète pour écran de chocs avant**	**2 672 183**	**1**			**257**
5.01	**Crossbeam /** Traverse	**322672184 BR**	**1**			**111**
5.02	**Spindle /** Tige filetée	**38210018694**	**2**			**17**
5.03	**Protective tube /** Tube de protection	**32280001983**	**2**			**3**
5.04	**Protective cap /** Capot de protection	**322588936**	**2**			**3.5**
5.05	**Nut /** Ecrou	**322559072**	**2**			**1.2**
5.06	**Spring washer /** Rondelle Belleville	**042093150718**	**6**			**0.8**
5.07	**Axis /** Axe **Washer /** Rondelle **Pin /** Goupille	**31212069** 041441-56 0400941080	**2** **4** **4**			**3.5**
5.08	**Spring bracket /** Plaque de compression	**32210031557**	**2**			**5**
5.09	**Protective tube /** Tube de protection	**32280001905**	**2**			**1.4**
5.10	**Spring /** Ressort	**07210105591 BR**	**2**			**5.5**
5.11	**Fastening screw /** Boulon d'ancrage	**321880892**	**2**			**16**
5.12	**Spring guiding /** Guidage ressort	**3242709494902**	**2**			**7.5**

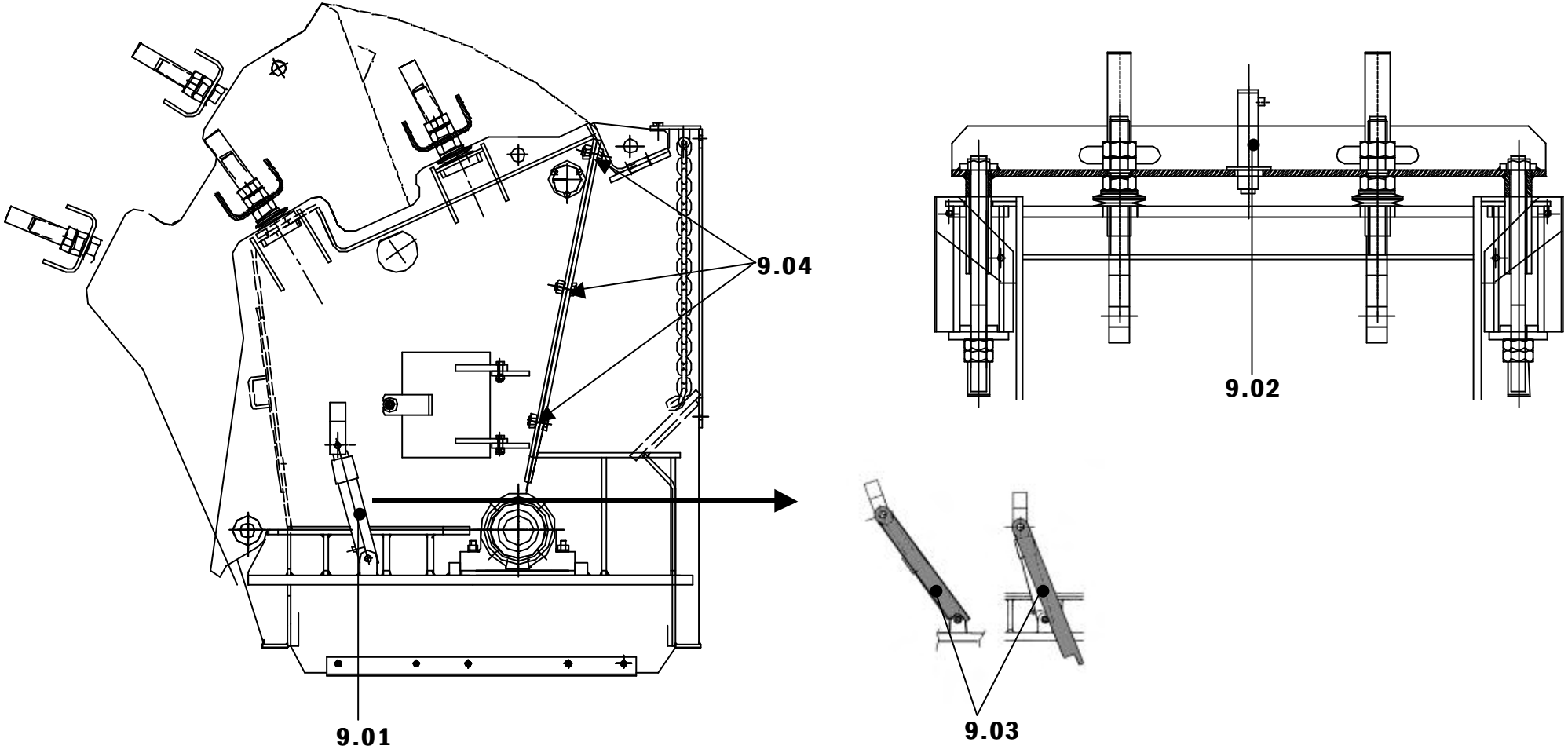

6.03/6.04
6.02
6.05
6.01
6.03/6.04
7.02
7.03
7.04
7.01
7.05
Pos. 6.00
Pos. 7.00

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
6.00	**Grinding path** **Rampe de broyage**	**42 70 879**		**42 71 784**		**733**
6.01	**Grinding arm** **Chassis rampe**	**324270873**	**1**			**361**
6.02	**Wearing plate** **Tôle d'usure** **Screw / Vis**	**074270880 38** **04093324502**	**2** **6**			
6.03	**Grinding path beam** **Barreau de broyage**	**018680**	**4**			42
6.04	**Grinding path beam** **Axe de suspension**	**018060**	**4**			28
6.05	**Hinge pin**	**321875097**	**2**			13
	Axe de suspension					
7.00	**Spindle compl. For grinding path** **Tige filetée complete pour rampe de broyage**	**42 70 882**	**2**			8
7.01	**Spindle** **Tige filetée**	**384270885**	**2**			6
7.02	**Protective cap** **Capot de protection**	**32280001825**	**2**	With washer 322111358		
7.03	**Spring washer** **Rondelle ressort**	**04209380414**	**14**			
7.04	**Nut with washer** **Ecrou avec rondelle**	**040934362**	**2**			0.4
7.05	**Axis** **Axe**	**324270890**	**2**			1.5



Pos. 8.00

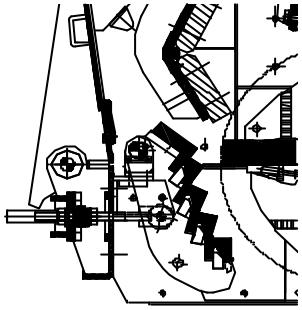
POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
8.00	**Inlet door** **Porte de visite**	**2 589 413**	**1**	Without wearing plate		**37**
	Door locking compl. **verrou de fermeture complet_pour porte**	**2 559 351**	**1**			**0.5**
	Screw / Vis	4093320602	**1**			
	Washer / Rondelle	040127A20	**1**			
	Plate / Tôle	2 559 351 - 1	**1**			

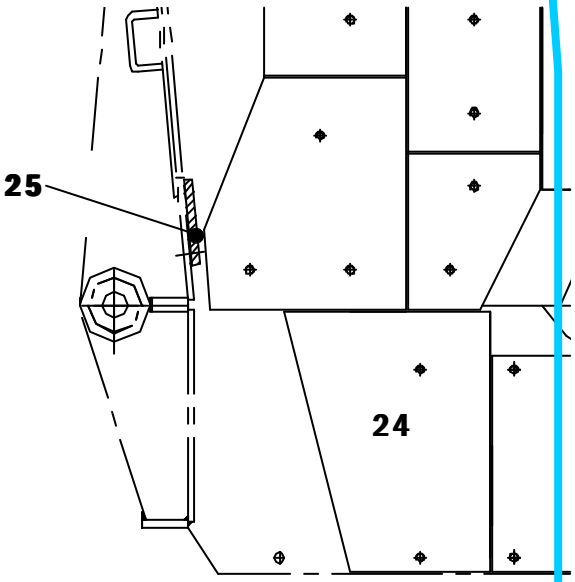


Pos. 9.00

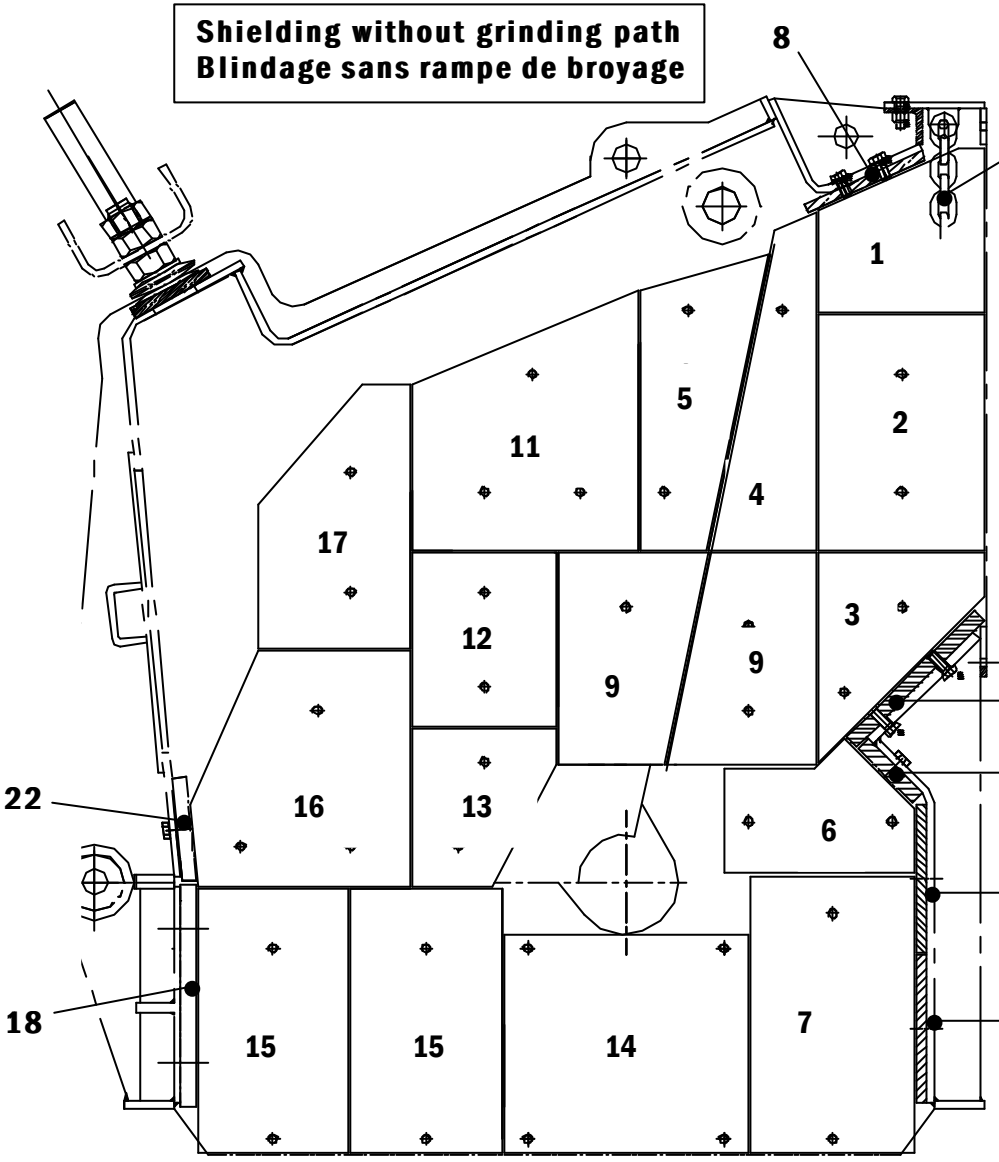
POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
9.00	**Hydraulic system** **Système hydraulique**	**642589058 B**	**1**			
9.01	**Hydraulic jack_for Housing** **Vérin hydraulique_ouverture carter**	**0D210300**	**2**			**17**
	Bolt / Boulon	040609241702	**4**			
	Nut / Ecrou frein	040980V242	**4**			
	Washer/Rondelle	040125A25	**2**			
9.02	**Hydraulic jack_for suspension spindle** **Vérin hydraulique_pour suspension tige filetée**	**0D210301**	**2**			**7**
	Screw / Vis	04093312452	**12**			
	Nut / Ecrou	040934122	**12**			
9.03	**Locking bar / Verrou de maintien**	**2 589 059 A**	**2**			**10**
9.04	**Bolt for housing / Verrou de fermeture carter**	**232 4 10 123320**	**6**			
	Eye bolt / Vis à œuil	040444A301200	**6**			
	Nut / Ecrou	040555300	**6**			
	Washer / Rondelle	047349-31	**6**			
	Axis / Axe	31202432	**6**			
	Washer / Rondelle	041441-29	**12**			
	Pin / Goupille	0400940650	**12**			

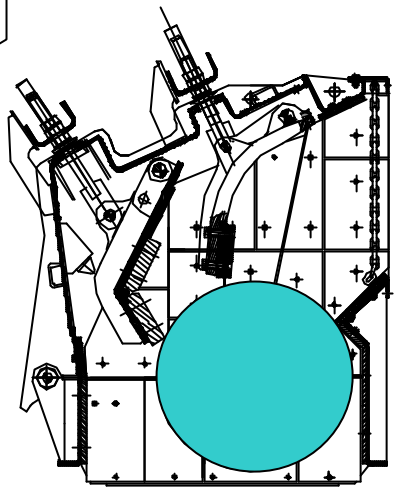
Shielding with grinding path
Blindage pour rampe de broyage





Shielding without grinding path
Blindage sans rampe de broyage





Pos. 10.00

PLEASE CHECK YOUR EXTEC PARTS MANUAL FOR VARIATIONS TO THE TYPE OF WEARPLATES FITTED

Shielding with grinding path
Blindage avec rampe de broyage

Shielding without grinding path
Blindage sans rampe de broyage

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
10.00	**Shielding** **Blindage**	**452588926A**	**1**			**1265**
10.01	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588927 38** 04093320402	**2** **2**			**13**
10.02	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588928 38** 04093320402	**2** **4**			**27**
10.03	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588929 38** 04093320402	**2** **6**			**15**
10.04	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588930 38** 04093320402	**2** **4**			**13**
10.05	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588931 38** 04093320402	**2** **6**			**20**
10.06	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588932 38** 04093320402	**2** **4**			**14**
10.07	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588933 38** 04093320402 04093320552	**2** **2** **2**			**32**
10.08	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 045310MDNL20AC-C	**072588934 38** 04093320402	**3** **6**			**18**
10.09	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588935 38** 04093320402	**4** **12**			**18**
10.10						
10.11	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588937 38** 04093320402	**2** **6**			**33**
10.12	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588938 38** 04093320402	**2** **4**			**17**
10.13	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040120A21	**072588939 38** 04093320402	**2** **4**			**13**
10.14	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588940 38** 04093320402 04093320552	**2** **2** **2**			**37**

PLEASE CHECK YOUR EXTEC PARTS MANUAL FOR VARIATIONS TO THE TYPE OF WEARPLATES FITTED

Shielding with grinding path
Blindage avec rampe de broyage

Shielding with grinding path
Blindage avec rampe de broyage

POS.	DESCRIPTION BENENUNG DESIGNATION	DRAWING ZEICHNUNG CODE/PLAN	QTY MGE NBR	REMARKS BEMERKUNG REMARQUE	UNIT VALUE PREISE STUCK PRIX UNIT.	WEIGHT GEWICHT POIDS UNIT.
10.15	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588941 38** 04093320402 04093320502	**4** **4** **4**			**27**
10.16	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588942 38** 04093320402	**2** **6**			**32**
10.17	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588943A 38** 04093320402	**2** **4**			**24**
10.18	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588944 38** 04093320502	**4** **8**			**35**
10.19	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 045310MDNL20AC-C	**072588945 38** 04093320502	**3** **12**			**38**
10.20	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 045310MDNL20AC-C	**072588946 38** 04093320502	**3** **6**			**16**
10.21	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588947 38** 04093320402	**6** **12**			**20.6**
10.22	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**072588948 38** 04093320502	**2** **4**			**33**
10.23	**Chain curtain / Rideau de chaîne** Chaîne Axe Ø 18 Couvercle	**2 588 907 B** 2 588 907 B - 34 2 588 907 B - 33 2 588 907 B - 16	 **34** **1** **1**			 **6.5** **22** **22**
10.24	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**074270864 38** 04093320402	**2** **4**			**34**
10.25	**Wearing plate / Tôle d'usure** Screw/Vis Washer/Rondelle 040125A21	**074270950 38** 04093320402	**2** **4**			**18.5**

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