



SXS Extreme Duty Shredder

SXS 1500 & 2000

Part Number: EXS-0003-S

Bulletin Number: BJ5-620

Effective: 9.30.2008

Write Down Your Serial Numbers Here For Future Reference:

_____	_____
_____	_____
_____	_____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____

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Shipping Info

Unpacking and Inspection

You should inspect your equipment for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. You should have:

- Bill of lading
- Packing list
- Operating and Installation packet
- Electrical schematic and panel layout drawings
- Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the parts and service department immediately at [262] 641-6410**. Have the order number and item number available.

Hold the items until you receive shipping instructions.

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Storage, Disposal, Transportation

Storage

Clean the machine (see Cleaning the Machine). Preserve all polished metal surfaces using a suitable rust preventing agent. Store the machine in an dry and enclosed space. Cover the machine completely with a plastic sheet.

Disposal

The disposal of machines, machine components, and process materials is partially subject to legal controls. More detailed information is given at the relevant administrative authority (i.e. regional and national Water Conservation Bureau and Environmental Protection Agencies). Only deposit the material to be disposed of at authorized drop-off points.

Transportation

WARNING! Suspended load!

- ***Falling loads can cause serious injury or death. Only use a crane or forklift that can withstand the weight and dimension of the load!***
- ***Use suitable stopping means and pay attention to gravity center location!***
- ***Do NOT step under the suspended load!***
- ***Wear protective helmet in addition to basic protective gear!***

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Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your equipment. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the equipment. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the equipment. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the equipment safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your equipment provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. A spare parts list with part numbers specific to your machine is provided with your shipping paperwork package. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

DANGER! *DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.*

WARNING! *WARNING indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.*

Caution! *CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.*

1-2 General Safety Regulations

This machine uses knives for the performance of its intended use. Consequently, it can be a dangerous machine to operate and maintain unless these safety regulations are followed.

These regulations should be read, understood and periodically reviewed by all personnel involved in any way with this machine.

Never operate or remove any machine components that are secured by wrench-type fasteners unless the motor is electrically locked out and the rotor is motionless.

Never operate the machine or jog the rotor unless the cutting chamber covers, discharge chute, or any guards or covers are in place and secure. Do not circumvent the safety interlocks.

Prior to clearing a jam or performing any maintenance, the motor should be turned off and electrically locked out. Be sure that the rotor has come to a stop. Hands must not be inserted into the machine to clear the jam.

Do not extend any part of the body into feed roll openings or discharge area unless the motors are electrically locked out and the rotor and feed rolls are motionless.

Never extend fingers through holes in screen.

Be sure that the v-belts are properly aligned and that tension is at its maximum.

Extreme care should be taken to see that all bolts are properly tightened at all times. During the operation of the machine, rotor knife bolts may come loose. Although fine threads are used on the rotor knife bolts because vibration does not easily loosen them, you should inspect the tightness of the bolts frequently.

This machine is designed for the granulation of plastic materials. Do not feed any other materials into the machine.

1-3 Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Becoming familiar with materials, inspection, speed limitations, screens, and guard maintenance and total user responsibility will assist you in learning potential areas in need of observation for danger.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All caution, warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

1-4 Warnings and Precautions

Our granulators are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this granulator, use good judgment and follow these safe practices:

- ☑ **LEARN AND OBEY** your company's safety policy regarding granulating equipment.
- ☑ **MOVING OR LIFTING THE GRANULATOR:** Although our equipment is built and engineered for great ruggedness in operation, care must be taken when moving the machine along the floor or lifting it. Damage may occur to sheet metal covers, electrical cabinets, or small brackets if pressure is applied to them when moving the granulator. When lifting the granulator, be certain of total machine weight and the capability of the lifting equipment. (See the Granulator Specification Sheets for machine weights and dimensions.)
- ☑ **SHREDDER LOCATION:** Adequate area for routine maintenance should be provided in order to open the machine for knife, screen, or cleanout service. Proper service area clearances also should allow people who are working on the machine to be clearly visible to others, thereby reducing the potential safety hazards.
- ☑ **SAFE HOUSEKEEPING:** The work area must be kept clean and uncluttered during periods of operation or maintenance. No hand tools or other metal objects should be left on or around the machine. Any tools or other metal objects that mistakenly fall into the hopper feed opening can cause severe damage to internal cutting chamber, rotor and screen components.
- ☑ **SAFETY GLASSES OR A FACE SHIELD MUST ALWAYS BE WORN** when servicing or operating the machine. Although our machines are designed for the maximum in flyback control, caution must be used when operating near the hopper feed opening in order to guard against unexpected material flyback.
- ☑ **EAR PROTECTION** may be required when operating the machine during granulation of very hard or noisy materials. The Occupational Safety and Health Act of 1970 has established guidelines for Permissible Noise Exposures (OSHA 1910.95) that should be followed.
- ☑ **NEVER** attempt to operate the machine unless it is fully assembled with all guards and interlocks in place and functional.
- ☑ **OBSERVE** all danger, warning, caution and safety labels on the equipment.
- ☑ Upon completion of any machine maintenance, be certain **ALL SAFETY GUARDS AND COVERS** are securely and properly fastened prior to resuming machine operation. All fasteners must be in place and properly tightened. **ANY SHORTCUTS MAY RESULT IN INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.**
- ☑ **NEVER** wear any loose fitting clothes, neckties, or dangling items such as earrings, belts, or shoestrings. Jewelry, such as wristwatches, bracelets, or rings should **NEVER** be worn. Long hair must be tied back or placed in a tight fitting hairnet. **NEVER** lean against or rest hands or feet on the granulator when it is in operation or open for maintenance. **NEVER** stand on the granulator when it is in operation.

- ☑ **ROTATION OF MOTORS:** The correct rotating direction for the machine motor is clearly marked on the machine. Always check for proper rotation of motors. Incorrect rotation direction can cause severe damage.
- ☑ **ELECTRICAL GROUNDING:** All electrical equipment on the granulator must be grounded in accordance to all local codes and Article 250 of the National Electric Code.
- ☑ **ALWAYS DISCONNECT AND LOCKOUT** the main electrical power to the granulator before performing any service.
- ☑ **SAFETY INTERLOCKS MUST NOT BE BYPASSED.** The mechanical and electrical safety interlocks ensure the safety of personnel. They should never be tampered with or removed for ANY reason. They should be checked frequently by a qualified mechanic for proper operation.
- ☑ **NEVER** modify the machine configuration or any individual component without written notice from the factory.

Remaining Risks

The machine is constructed so that you are able to operate it safely. Structurally non-avoidable dangers are prevented as well as possible by the protective devices. Certain risks still remain. It is imperative to be aware of these risks in order to avoid accidents. To avoid danger, please observe all safety advice provided.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Danger of crushing by heavy parts falling down/over	Unloading and transporting the machine and/or components	Serious injury	<ul style="list-style-type: none"> • Wear personal protective gear • Follow safety instructions in manual
Cutting caused by sharp knives—even when rotor is stationary	Knife replacement, knife setting, knife sharpening and other maintenance work	Serious injury particularly to hands and fingers	<ul style="list-style-type: none"> • Wear personal protective gear • Follow safety instructions in manual
Crushing when opening/closing maintenance doors on front side of machine	Maintenance work	Serious injury	<ul style="list-style-type: none"> • Make sure no persons are in the danger area while closing the door
Tripping over cables and other objects	All activities	Serious injury	<ul style="list-style-type: none"> • Lay cables in accordance with regulations. • Keep work station clean and tidy.
Crushing, cutting, amputation caused by run down of the rotor	Maintenance work	Serious injury or death	<ul style="list-style-type: none"> • Maintenance doors must always be tightly locked during operation. • DO NOT make the run down safety devices ineffective by using technical aids or other manipulations. • NEVER use hands to check if the rotor has stopped.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Pulling in caused by running V-belts	All activities	Serious injury can result from hair, jewelry, etc. being pulled into the machine.	<ul style="list-style-type: none"> • Never dismount V-belt protection and window.
Direct/indirect contact with live parts in terminal box.	Maintenance work, start up	Serious injury or death	<ul style="list-style-type: none"> • Only trained electricians may carry out all work on the electrical equipment. If work is necessary on parts that conduct dangerous voltage, a second person should be present to break the power supply in case of emergency. • The yellow-marked lines conduct voltage at all times—even when the machine is switched off. • Only use original safety fuses with stipulated intensity of current. • Faulty electrical components must be replaced immediately. • If faults occur in the electrical energy supply, switch machine off immediately. • The terminal box must be locked during operation. Before opening the terminal box switch too off (“O”).
Failure of Emergency Stop function	All activities	Serious injury or death	<ul style="list-style-type: none"> • It must be guaranteed that failure of an Emergency Stop button is displayed and leads to an immediate stop.
Fire/explosion caused by throwing dangerous objects (i.e. spray cans) into the shredder	Grinding	Serious injury or death	<ul style="list-style-type: none"> • Only grind material which corresponds to the agreed customer-specific specifications in all points.
Damage to hearing	All activities	Diminished hearing, headaches, impaired balance, deterioration of concentration	<ul style="list-style-type: none"> • Reduce noise emissions by taking suitable measures. • Wear ear protection.
Instability of machine caused by vibration	All activities	Serious injury	<ul style="list-style-type: none"> • Install the machine according to the instructions in the manual.
Loosening of the cutting knife mountings caused by vibration	All activities	Serious injury	<ul style="list-style-type: none"> • Check the cutting knife mountings regularly according to the instructions in the manual.
Inhalation of grinding dust	All activities	Diseases of the respiratory tract, etc.	<ul style="list-style-type: none"> • Mount a suitable air suction device and wear breathing equipment if necessary. • When cleaning the machine, use suction; do not blow out grinding dust.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Crushing, cutting, amputation caused by manipulation of protective devices	All activities	Serious injury or death	<ul style="list-style-type: none"> • Never make the protective devices ineffective. • Check the protective devices regularly for proper function according to the manual's specifications.

For further information on granulator safety, installation, and operation, see the *American National Standard for Plastics Machinery—Granulators, Pelletizers, and Dicers Used for Size Reduction of Plastics—Construction, Care, and Use*. ANSI B151.11-1982.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

The models included in this manual are the Sterling SXS 1500 and 2000 Extreme Duty Shredders. The SXS Extreme Duty Shredders are designed for processing plastic waste for reclamation and recycling, large extruder purgings, large reject parts, trip scraps, baled or loose film, synthetic fiber, wood processing scrap, medical waste, cardboard, paper, and carpet.

2-2 General Description

Mechanical Section

After the machine has been switched ON, a hydraulically controlled “swing-style” ram pushes a quantity of material onto the slow-running profiled rotor. The in-feed is controlled according to load.

The material can be placed (unsorted) in the hopper mounted on top of the machine. Pay attention to this material; it cannot contain **any other metal parts** except staples and nails. (*The guarantee does not cover any damage to the machine as a result of metal parts being fed into the machine.*) The material in the hopper is shredded by the cutters on the rotor. This shredding process is repeated as often as required until the whole diameter of the screen below the rotor has been reached.

The shredder can also be switched off with material still in the hopper.

Control

The machine is fitted with an automatic shut-down; i.e. when set to automatic, the machine switches off after a pre-set period in the time relay.

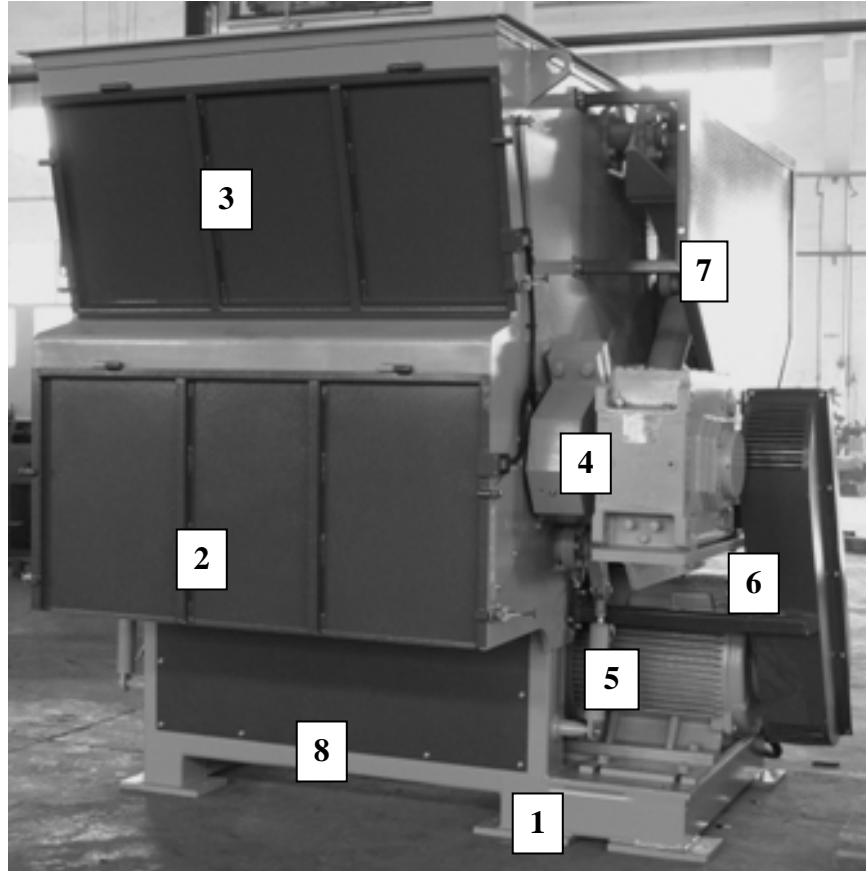
The ram feeds the shredding unit (rotor) with as much material as it is able to process. Upon reaching 70 to 90 % of rated current, the feeding of the ram will be stopped and automatically started again after the power consumption has fallen by 20% in comparison with rated current. If the high current is applied longer than 0.7 - 1.5 seconds, the main drive motor switches OFF and runs back after about 3 seconds standstill time. The ram plate also runs back while the rotor runs back. The drive motor then stops for another 3 seconds before starting again.

Duration of pauses and return and current settings can be adjusted.

NOTE: *Any alterations should only be carried out after consulting the manufacturer.*

Machine (Standard Execution)

- (1) Base Frame
- (2) Machine door
- (3) Hopper door
- (4) Gear Box
- (5) Drive motor
- (6) V-belt guards
- (7) Ram hydraulic guards
- (8) Discharge area



The machine housing, drive motor, gear box, hydraulic system and terminal box are mounted on the base frame for electrical connections.

2-3 Typical Features and Components

Material In-feed

The grinding material can be fed into the shredder in the following ways:

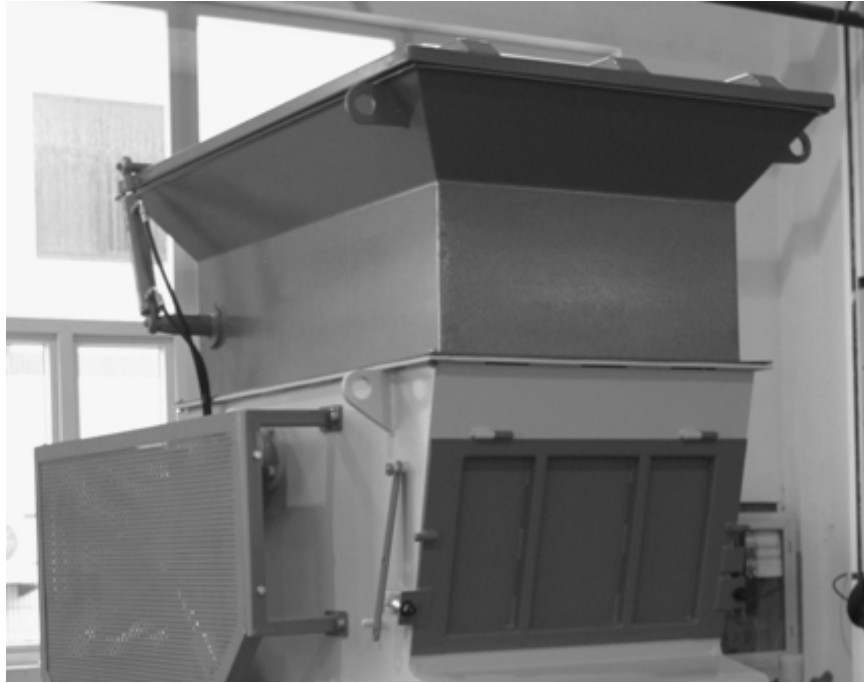
- Manual in-feed of the material directly into the in-feed hopper.
- Manual in-feed of the material with the help of an additional in-feed device (e.g. hydraulic feeding unit).
- Automatic in-feed of the material via an additional in-feed device (e.g. conveyor belt).

In-feed Hopper

The material in-feed flows through an in-feed hopper made to ensure the material is delivered safely and correctly.

NOTE: An optional top-hinged cover to prevent in-feed material fly-back during size reduction is available.

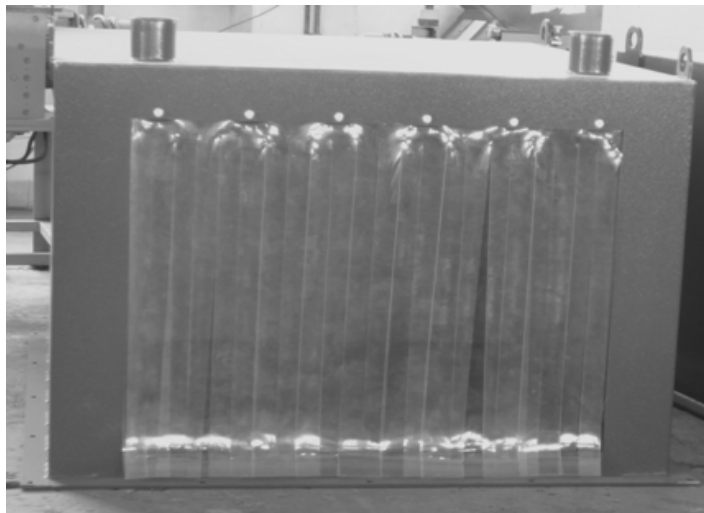
Special hopper
with hydraulic
cover



Additional In-feed Device

If the machine has an optional in-feed device, such as a conveyor belt, please refer to the additional information about the accessory in the manufacturer's manual that accompanied the accessory. A special hopper for an in-feed with conveyor arrangement can be supplied as an option to the standard hopper.

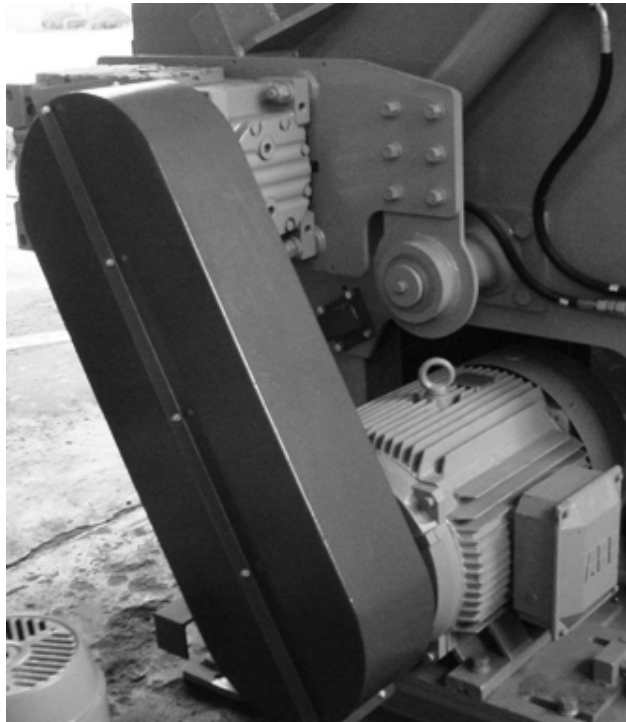
Hopper for conveyor
belt in-feed



Drive

The drive of the rotor runs using an electric motor via V-belts. The motor (mounted on sliding rails or a motor plate) can be adjusted for regulating the tension of the V-belts by using tensioning screws. The V-belt pulley is attached to the motor shaft with a special tensioning element.

Drive motor



NOTE: Please observe the operation manual from the manufacturer!

Rotor, Cutters, and Bed Knives

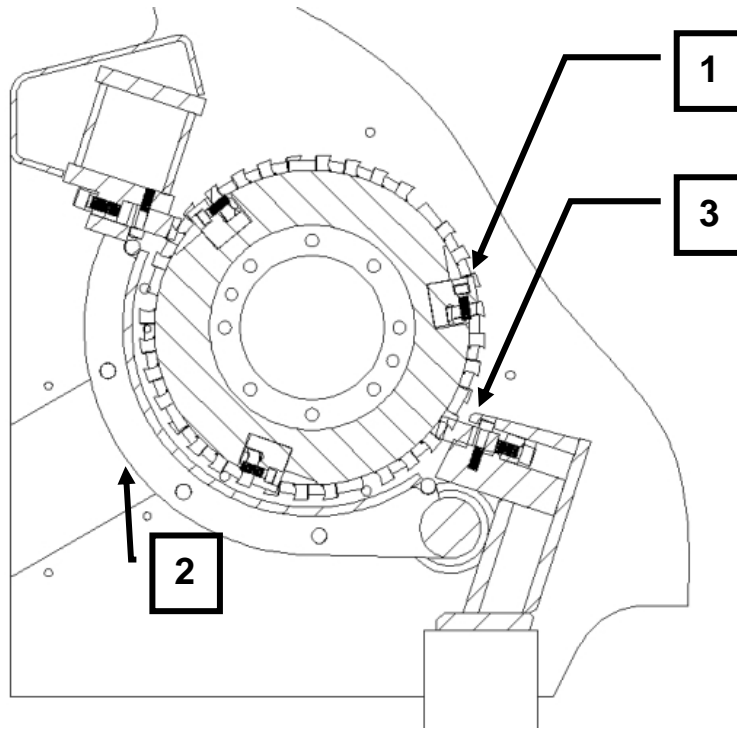
Rotor, cutters, bed knives

- The material is shredded between the cutters assembled on the rotor and the bed knives that are mounted in a fixed position in the machine lower section.
- All rotors are equipped with square cutters. These cutters make light work of the heaviest pieces.

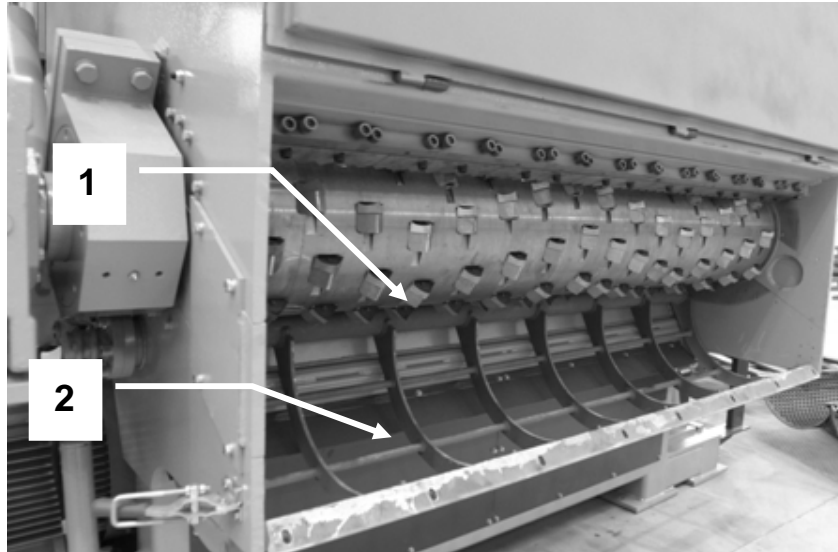
NOTE: The knives have four corners so they can be easily turned once a corner has worn out.

- The design of the rotor has a significant influence on the quality of the shredding process and the results. The rotor construction, the type of cutter mounting, and the number of cutters have been matched to the application.

- (1) Rotor cutter
- (2) Screen support (hydraulic)
- (3) Bed knife



- (1) Rotor cutter
- (2) Screen support

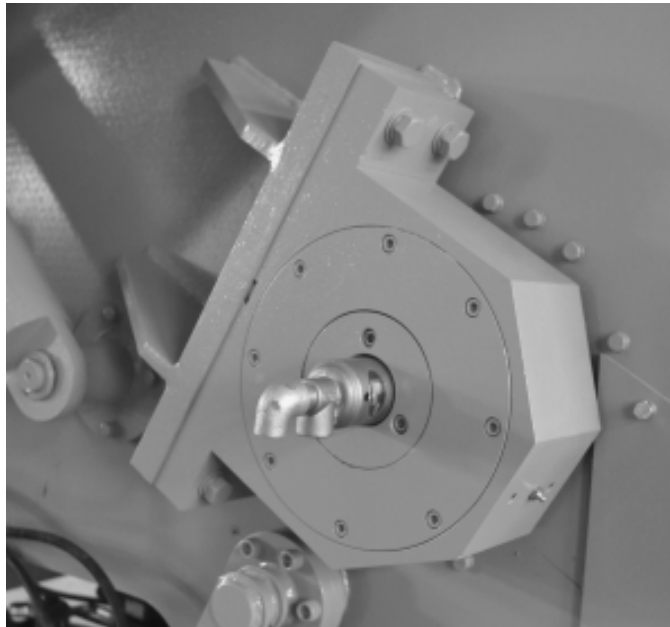


The rotor is accessible after opening the machine door and removing the screen.

The rotor is arranged on roller bearings that are situated outside the housing. The V-belt pulley is attached to the rotor axis with a taper brush. The rotor is dynamically counter balanced and has vibration-free concentricity.

An optional feature is a water cooling system for the rotor used for special applications.

Bearing with water plug
for rotor cooling

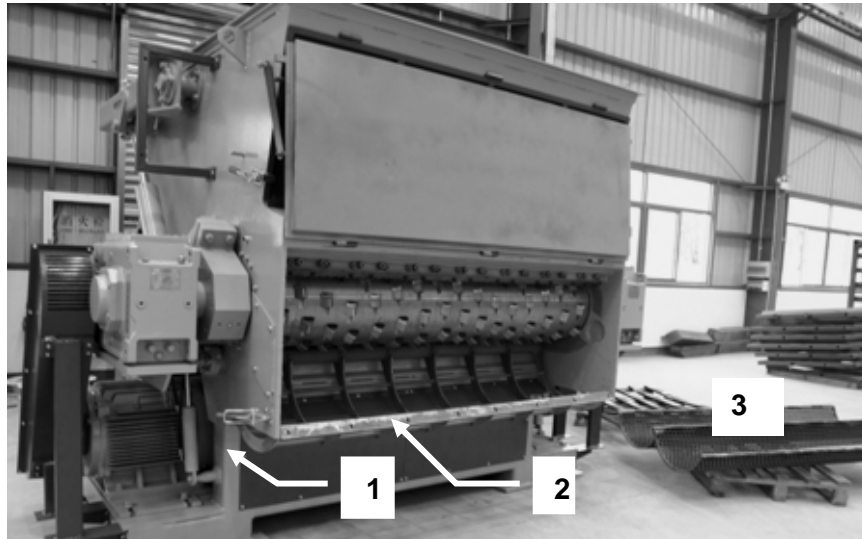


Screen and screen support

The screen and the screen support are welded together and fixed to the housing by screws in standard execution.

The screen is slightly larger in radius than the cutting circle of the rotor cutters. The screen perforation is selected according to the desired grain size of the shredded material. All shredded material parts which are smaller than the screen perforation fall through the screen. The screen is replaceable and can be taken out after opening the machine door. (See below.)

- (1) Hydraulic cylinder
- (2) Screen support
- (3) Screen



Discharge of Shredded Material

Normally the shredded material will be discharged onto a conveyor belt. (Options include a discharge with blower or with a screw conveyor.)

Conveyor belt discharge

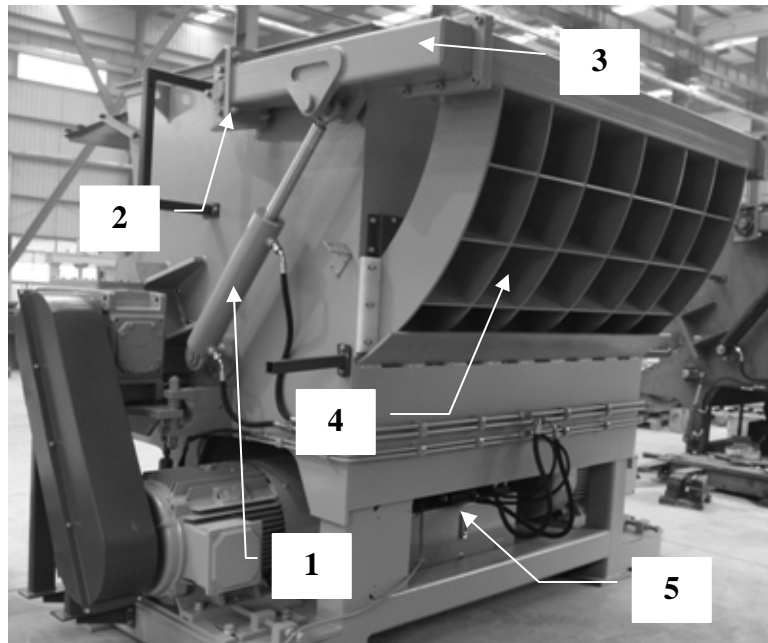


Hydraulic Ram

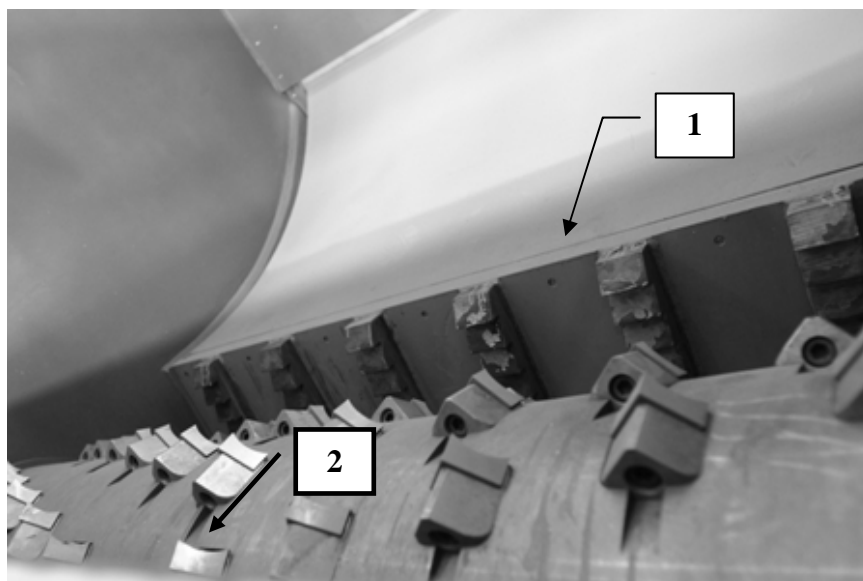
The hydraulic ram is fixed on two arms arranged on flange bearings. Two heavy duty hydraulic cylinders move the ram back and forth. The ram moves automatically after switching on the hydraulic system and the shredder when the machine is operated in automatic mode.

NOTE: The ram can be moved by hand on the control panel when run in manual mode.

- (1) Hydraulic cylinder
- (2) Bearing
- (3) Ram Arm
- (4) Ram
- (5) Hydraulic unit



- (1) Serrated ram front plate
- (2) Rotor



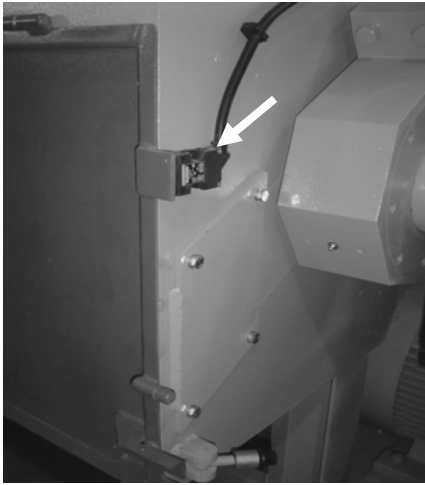
2-4 Safety Features

Protective Devices

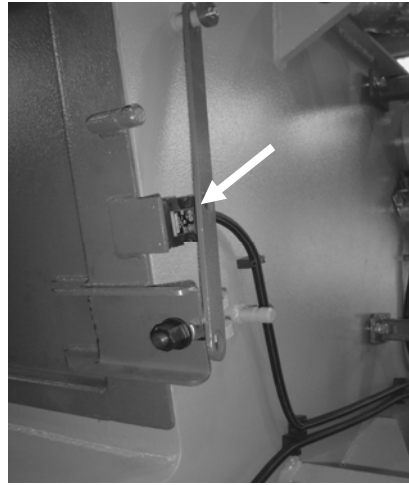
CAUTION! *The Machine may under no circumstances be operated without these protective devices. The use of faulty or manipulated protective devices is strongly prohibited.*

Safety Device for Machine and Hopper Doors

Safety device:
machine door



Safety device:
hopper door

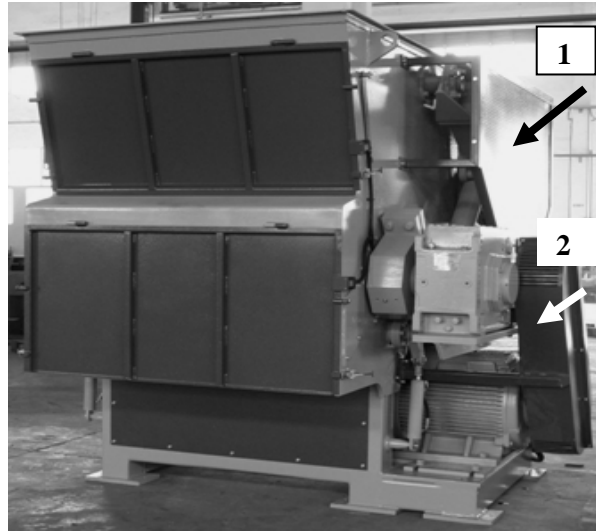


The shredder can only be operated if the doors are closed deactivating the safety switch. The safety contact is broken when the machine or hopper door is open, thus switching off the machine.

V-Belts and Ram Guards

V-belt and ram guards are bolted to the machine. They can be dismantled for installation and maintenance work when all rotating parts have come to a complete standstill and the machine is electronically locked out.

- (1) Ram guarding
- (2) V-belt guarding



NOTE: The operator must fit and mount the protective devices delivered with the machine according to the current legal safety regulations if the machine is delivered without drive motors upon customer request.

Safety Markings

Safety markings are attached to the machine. Should one of these markings becomes detached or is no longer recognizable, it must be replaced. New safety markings can be ordered through safety signage providers or from the manufacturer.

Personal Protective Gear

Wear close-fitting clothing. Hair must be pulled back, and loose fitting jewelry is prohibited. (See table below for more details.)

The following protective gear must be worn when performing the outlined tasks:

	Safety helmet	Safety boots	Safety gloves	Safety goggles	Ear muffs
Unloading machine.	x	x	x		
Connecting machine.		x			
Operation.		x	x	x	x
Cleaning.		x	x	x	
Maintenance of bearings.		x			
Screen replacement.		x	x		
Maintenance of V-belts.		x			
Maintenance of cutting knives.		x	x		
Knife sharpening.		x	x	x	x

Emergency Stop Button

The machine may only be operated with the installed Emergency Stop buttons. An Emergency Stop Button must be mounted to the control cabinet and another on the grinding material in-feed.

Immediately press one of the Emergency Stop buttons in case of an emergency.

CAUTION! *The Emergency Stop must be activated in all situations where injury or damage could result!*

Re-operation:

1. Eliminate cause of Emergency Stop.
2. Unlock Emergency Stop button
3. Acknowledge fault.
4. The machine is now ready for operation.

Chapter 3: Installation

3-1 Uncrating the Equipment

Requirements at Application Site

Check the application site to make sure it conforms to the qualifications listed below.

- The site has enclosed space.
- The ground has sufficient load-bearing capacity (refer to the “Technical Specifications” in the Appendix for machine weight). The unevenness of the ground surface may not exceed 5 mm.
- The machine must be freely accessible from all sides.
- There must be sufficient room for operating and service personnel.
- Spatial requirements: Refer to the “Drawings and Diagrams” in the Appendix for machine dimensions. All hinged parts must be able to be opened completely.
- The site is a vibration-free environment.
- The site has sufficient lighting.
- The machine may not be exposed to direct radiation caused by radiators or the sun.
- Room temperature: +41 to 104 °F (+5° to +40°C)
- Relative atmospheric humidity according to DIN 40040:
15 to 70 % (indoor)

NOTE: By humidity levels higher than 70 %, apply anticorrosive agent to the metallic-finished machine parts. Insulation for the tropics is also necessary.

- The machine may not be operated within range of static discharges or strong magnetic fields as this could lead to faults in the machine control system.

Unloading and Installing the Machine

The machine and components are packed so they arrive safely. Use a suitable crane or forklift for unloading the packaged machine and/or components.

1. Remove the packaging material and all transportation safety devices after unloading the machine.
2. In the case that the shredder and its accessory components have been delivered as individual items, mount these at the site of application in accordance with the Assembly Drawing. This is the only way to guarantee there are sufficient piping parts, tubing, and cable connections, and that the linking places match.

WARNING! SUSPENDED LOAD!

- *Falling loads can cause serious injury or death.*
- *Only use a crane or forklift suitable for the weight and the dimensions of the load.*
- *Use suitable stopping equipment and pay attention to the gravity center location.*
- *DO NOT step under the suspended load.*
- *Wear a safety helmet in addition to basic protective gear.*

WARNING! OVERTURNING OR FALLING MACHINE!

- *Serious injury or death can result.*
- *If erecting the granulator over a pit, on a frame, or on a platform, you MUST secure the machine by putting mounting screws through the holes on the mounting pads (see Assembly Drawing). If assembling the machine on solid ground, this safety device is not always necessary.*

3. Align the machine horizontally using a suitable spirit level.
4. Do not use blocks to place underneath the machine; use metal strips to prevent buckling of the base frame. Make sure that an even distribution of weight is achieved on all the points of support.

3-2 Electrical Connections

CAUTION! Electrical connections should only be made by a qualified electrician.



WARNING! DANGEROUS VOLTAGE! *Touching live parts can lead to serious injury or death. All work relating to the electricity of the machine may only be carried out by trained electricians. Observe the currently effective EMC regulations.*

Voltage, current, frequency, and protection are marked on the type plate. The voltage tolerance is +/- 10%.

The electrical connection is to be carried out in accordance with the wiring diagram in the terminal box for machines not pre-wired by the manufacturer.

NOTE: *When making electrical connections, the regulations of the local electricity authority must be followed. The required cable cross section is determined according to the rated capacity of the units.*



WARNING! Use caution when operating specific equipment to prevent electrical shock. Installation, service, alterations, and/or modifications must only be done by qualified personnel and with high regard for safety. Not conforming to the requirements could result in bodily harm, death, or costly damage.

NOTE: Alterations to the wiring diagrams require approval. Failure to do this will exclude all guarantee claims.

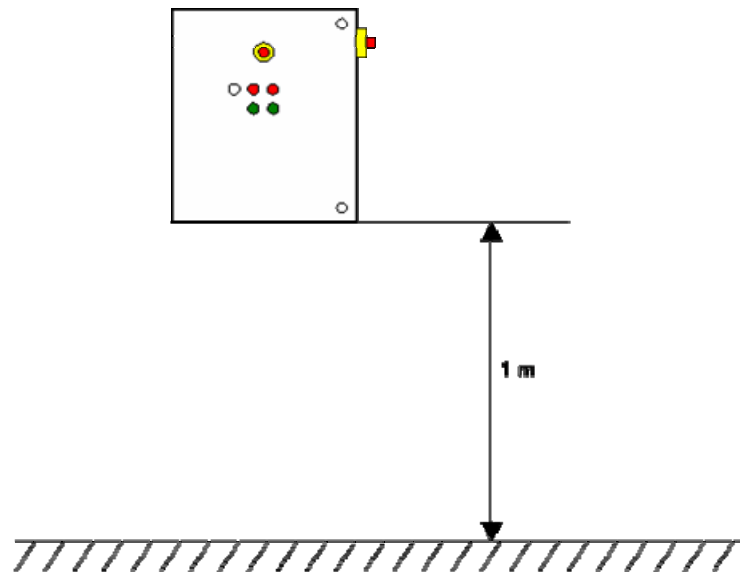
The wiring schematics are located in the control panel.

Connection of Emergency Stop Button

The machine may only be operated with installed Emergency Stop buttons. An Emergency Stop button must be installed at the control cabinet and at the grinding material in-feed if no Emergency Stop buttons have been installed at the factory.

The control panel with the switches and Emergency Stop button must be installed near the machine. The distance should not exceed 5 m.

The distance between the floor and the lower edge of the control panel should be at least 1 m.



The connecting cables between the control panel and the machine must be protected against damage (cable tray, protective sleeve).

An additional Emergency Stop button has to be installed on the machine if the control box cannot be installed according to these rules.

Checking the Rotational Direction

Rotational direction of the motors must be checked before initial start-up. The following steps must be completed.

1. Switch the machine ON and then immediately OFF again.
2. Observe whether the discharge air fan in the drive motor is rotating in the direction of the direction arrow.

NOTE: *If running in the wrong direction, reconnect the motor connection immediately. Damage to the machine will result from operation in the wrong direction.*

3-3 Initial Start-up

General Advice

- All work related to start-up may only be carried out by trained and specialized personnel.
- Check the machine for possible transportation damage or other damage. If any damage has occurred, confirm it with the freight company and report it to the manufacturer.
- After setting up for service and before starting up for the first time, you must carry out necessary checks according to the section Machine Check Prior to Initial Start-up (below).
- Check the oil level of the gear box before operating the machine.
- Fill oil into the hydraulic tank.
- *Please observe the operation manual from the manufacturer!*

Machine Check Prior to Start-up

- ✓ Use a torque wrench to check knife mounting screws when lower housing flap is open.
- ✓ Search the grinding chamber for foreign matter.
- ✓ Open the lower housing flap and make sure the screen has been inserted in accordance with the regulations.
- ✓ Close upper housing flap and fasten screws tightly.
- ✓ Check oil level of the gear box.
- ✓ Fill oil into the hydraulic unit.
- ✓ Examine in-feed device for foreign matter.
- ✓ Check that the Emergency Stop buttons are unlocked.
- ✓ Check all safety devices for proper functioning.

- ✓ Switch ON machine for a short period of time and check rotational direction. The rotational direction can be seen at the discharge air fan of the drive motor (observe running direction arrow).
- ✓ Switch ON hydraulic unit for a short time and check rotational direction.
- ✓ Allow machine to run for approximately 10 minutes without shredding material.
- ✓ Connect material discharge device and in-feed device; check rotational direction drives.
- ✓ Feed grinding material uniformly. Too much material can lead to overload of the machine.
- ✓ Check the temperature of the ground material if necessary.
- ✓ Monitor the ammeter. This displays the present current consumption and gives information on the load of the machine.

Chapter 4: Operation

4-1 Start-up

WARNING! No persons should operate the machine until they have read and understand all parts of the operation manual.

Machine Check—Before Switching Machine ON

- ✓ Cutters and bed knives are properly set and the screws are tightened with the specified torque.
- ✓ Screen is inserted into the screen support according to the instructions, and the screen support is fixed at the end position with tightened mounting screws.
- ✓ The cutting chamber is free of foreign matter.
- ✓ The machine and hopper doors are closed.
- ✓ All safety devices, including those of the installed material in-feed and discharge devices, are checked and operative.

Switch ON Machine

1. Switch ON the material discharge device.
2. Switch ON the shredder (main switch to 1). Wait until the rotor has reached its full speed and switched from star to delta.
3. Switch ON the hydraulic system.
4. Switch ON the material in-feed device.

4-2 Operation Procedures

Manual In-feed of Material

DANGER! Rotating Knives!



Can cause serious cutting and crushing injuries that could result in death.

Do NOT reach into the in-feed hopper or lean in while the rotor is running. (Pay attention to the run down time). Only use approved grinding material.

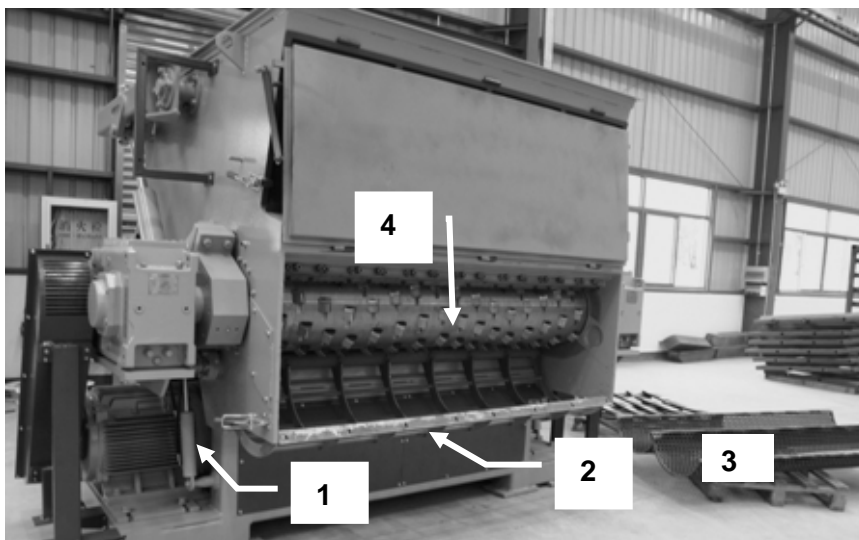
- Throw the material into the in-feed hopper.
- The machine should be fed from the front.
- If your machine has an additional in-feed device installed, please observe the additional information for working with the in-feed device.



DANGER! Do not climb into the in-feed hopper while operating the machine. Death will result.

Emptying the Screen

1. Switch off the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard machine door.
5. Pivot the screen support downwards by pushing the button screen open on the control box.
6. Remove the screen.
7. Empty the screen.
8. Put the screen back into the screen support.
9. Pivot the screen support into the working position and fasten using the mounting screws.
10. Close the machine.
11. Shredder can be started again.



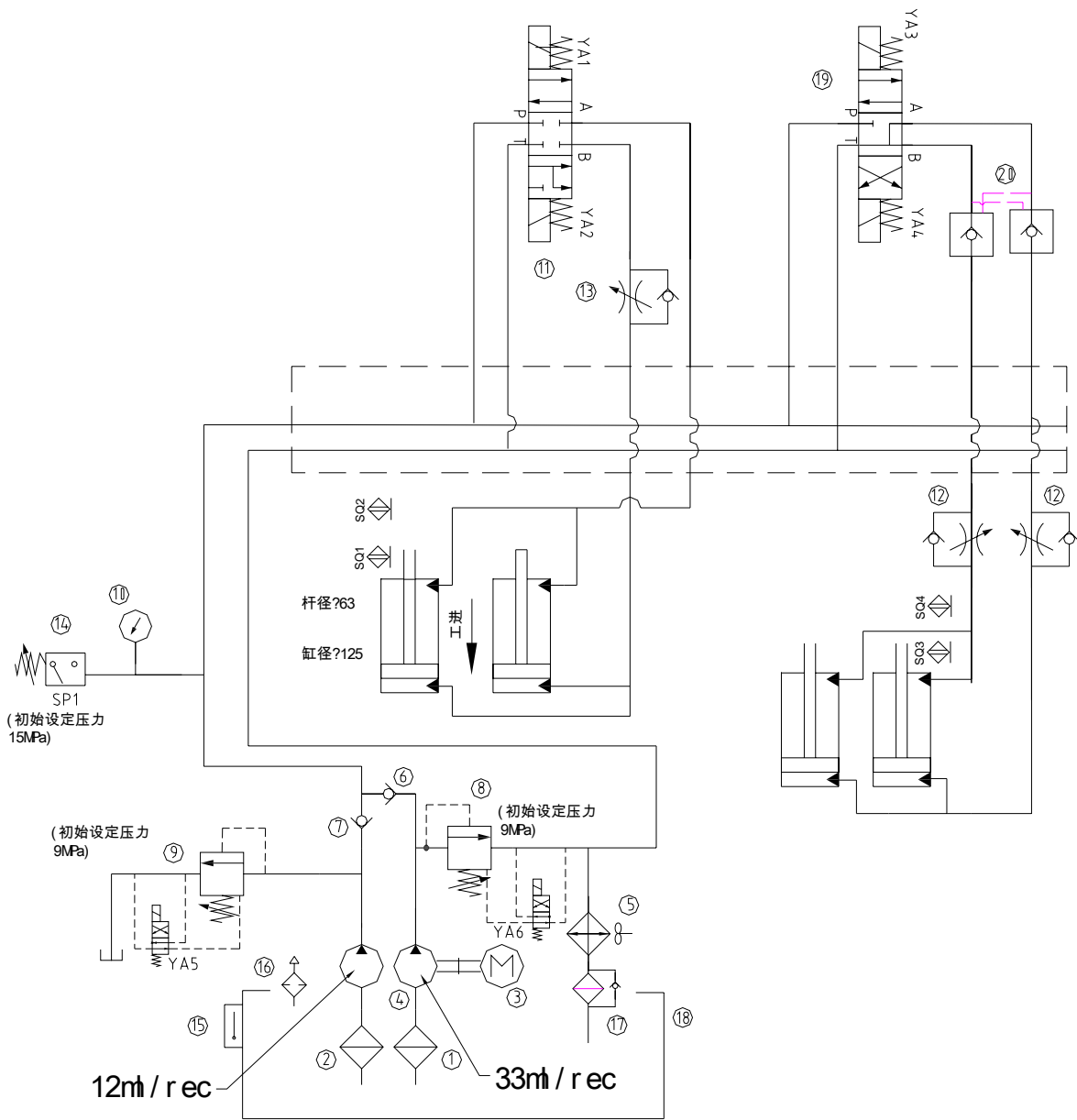
- (1) Hydraulic cylinder
- (2) Screen support
- (3) Screen
- (4) Rotor

Hydraulic Set-up

1. Connect hydraulic pipes to the machine—make sure the upper hydraulic pipe is connected to the upper pipe at the machine.
2. Connect the wires for the motor and magnetic valves.
3. Fill the oil tank with hydraulic oil No. 46 or No. 32 until the maximum is reached and mark the level indicated by the gauge.
4. Run motor to see whether the running direction is correct (facing the motor blade, the motor should run clockwise); if the direction is not correct, change the position of 2 of the 3 electrical wires.
5. Run motor; operate the magnetic valve to check the function and wiring connections.
6. With the magnetic valve (11-YA1) current switch on, set the sequence valve (9) pressure to 30 bar.
7. With the magnetic valves (11-YA2 and 24-YA6) current switches on, set the spillover valve (8) pressure to 110 bar.

NOTE: *Refer to the corresponding drawing on the next page; refer to Chapter 6 for Hydraulic troubleshooting.*

Figure: Hydraulic Set-up



4-3 Shut-down

Switch OFF Machine

1. Switch OFF the material in-feed device (accessories).
2. Wait until the remaining material has been shredded, and then switch OFF the shredder (main switch to 0).
3. Switch OFF the material discharge device.

Chapter 5: Maintenance

5-1 Preventative Maintenance Schedule

Only trained and specialized personnel should carry out maintenance work.

Maintenance Plan

WARNING!

- *Danger caused by electrical voltage and starting the machine during maintenance work. Death can result!*
- *ALWAYS turn main switch to 0, safeguard using a padlock, and attach a warning sign while carrying out maintenance work.*



The tasks for maintenance work are described below.

Perform the following after every 8 operation hours:

- Check protective devices.
- Check cutting knife mountings.
- Check condition of cutting knives.

Perform the following after every 40 operation hours:

- Check V-belt tension force and V-belt condition.
- Check all screws of the machine for a tight fit.
- Check wearing parts.
- Check hydraulic oil level and consistence.

Per form the following after every 2000 operation hours:

- Change hydraulic oil
- Check gearbox oil level

Yearly maintenance:

- The purpose of yearly maintenance is primarily to check the general condition of the machine and to arrange for the supply of any necessary replacement parts. A service engineer can carry out this request.

5-2 Preventative and Corrective Maintenance

Checking the Protective Devices

Check the safety devices for:

- Stipulated condition
- Stipulated location
- Safe mounting
- Stipulated function

WARNING! Danger due to non-functioning protective devices can cause serious injury or death!

- *Eliminate all defects before operating the machine!*
- *If defects occur during operation, stop the machine immediately and eliminate the defects!*
- *Do NOT change or remove any protective devices. Do NOT put any protective devices out of action by modifying them.*



Cleaning the Machine

WARNING! Danger of cutting caused by sharp cutting knives—even when the rotor is not operating! Serious injury, especially to the hands and fingers, can result. Wear protective gloves!

Proceed as follows:

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open machine and hopper doors.
4. Safeguard the machine and hopper doors.
5. Remove the screen.
6. Empty the screen.

WARNING! Inhalation of process dust is hazardous to your health! Never blow out the shredded material residue—always use suction instead! Wear breathing protection if necessary!

7. Pre-clean the cutting chamber using a hand brush.
8. Vacuum the remaining shredded material residue using a suitable suction device.

9. Remove clinging shredded material residue using a suitable wooden scraper.
10. Place the screen back into its working position and fasten with the mounting screws.
11. Close the machine and hopper doors.
12. Machine can be started again.

Replacing the Gear Box

The gearbox is designed so a replacement is only necessary in exceptional cases. Dismounting and mounting of the gear box requires specialist knowledge and a careful working method. Please observe the instructions given in the installation manual of the gear box manufacturer or ask the service department for help.

Replacing the Rotor

The rotor's design is heavy duty design, so a replacement is necessary only after a crash, (i.e. a hammer fall inside). Dismounting and mounting of the rotor requires specialist knowledge and a careful working method. Contact the Service Department for assistance.

Dismounting the Rotor

1. Dismount the V-belt cover.
2. Dismount the V-belts.
3. Dismount the gearbox.
4. Remove the screen.
5. Remove the rotor mounting slot cover plates from the housing.
6. Screw in hooks on both shaft ends.
7. Remove the bearing housing fixing bolt.
8. Carefully lift out the complete rotor using suitable lifting and stopping equipment.
9. Lay the rotor down in a safe location using appropriately sized timber beams.

Mounting the Rotor

1. Before starting, clean the bearing seat surfaces and check the key.
2. Lift the rotor using suitable lifting and stopping equipment and place carefully into the bearing seats.
3. Attach the bearing housing (Pos.) to the bearing seats using screws.
4. Put the gear onto the rotor axis.
5. Put back the rotor mounting slot cover plates.
6. Put in the screen.
7. Pull on V-belts and adjust the V-belt tension force.
8. Attach the V-belt.
9. Carry out a test run.

NOTE: If the spare rotor is delivered without bearings, the bearings MUST be mounted first.

Replacing the Main Bearings

The main bearings of the machine are designed so a bearing replacement is necessary only in exceptional cases. Dismounting and mounting of the bearings requires specialist knowledge and a careful working method. In addition to the following advice, please observe the instructions given in the installation manual of the bearing manufacturer or ask the service department for help.

The bearings mounted in this machine are indicated in the spare parts list. A suitable pulling-off device is required for dismounting and mounting the bearings.

Dismounting the Main Bearings

1. Dismount the V-belt cover.
2. Dismount the V-belts.
3. Dismount the gearbox.
4. Pull the distance sleeve off the rotor axis.
5. Remove the screen
6. Remove the rotor cover plates from the machine housing.
7. Screw in hooks on both shaft ends.
8. Hang on rotor on both shaft ends.
9. Remove the bearing housing fixing bolt.

10. Carefully lift out the complete rotor using suitable lifting and stopping equipment.
11. Lay the rotor down in a safe location. Suitable for this are timber beams of appropriate size.
12. Loosen the mounting screws on the bearings cover.
13. Pull the bearing housing off using a pulling-off device.
14. Pull the bearing off the rotor axis using a pulling-off device.

Mounting the Main Bearings

1. Before mounting, clean the bearing surfaces and the shaft surfaces thoroughly and grease lightly.
2. Mount bearing in bearing housing.
3. Attach the bearing with the bearing housing to the rotor axis.
4. Lift the rotor using suitable lifting and stopping equipment and place carefully into the bearing seats
5. Attach the bearing housing to the bearing seats using screws.
6. Push the distance sleeve onto the rotor axis.
7. Put the gear onto the rotor axis
8. Put back the rotor cover plates
9. Put in the screen
10. Pull on V-belts and adjust the V-belt tension force.
11. Attach the V-belt cover.
12. Carry out a test run.

NOTE:

- **The roller bodies will be damaged unless the mounting forces engage into inner ring.**
- **The hardened bearing rings are sensitive to impact stress; never hit the rings with the hammer. Use a brass arbor or a striking bushing (piping piece) made from a soft material. The inner diameter of the striking bushing should be only slightly larger than the diameter of the bearing base.**
- **The bearing is then pushed onto the shaft using light blows. The force of pressure must be evenly distributed on the circumference of the bearing ring.**

Lubricating the Main Bearings

An important requirement for high operational safety and long service life of the arrangement of bearings is the correct lubricant supply. Every machine is greased and checked in test runs before delivery.

NOTE: Unsuitable lubricant, lubricant deficiency, excessive lubricant, or impurities in the lubricant lead to overheating and extreme wear of the bearings.

Lubrication Intervals

Shift Operation	Replace Lubricant	Check
One shift operation	Every 18 months	Monthly
Two shift operation	Every 9 months	Monthly
Three shift operation	Every 6 months	Monthly

Check lubricant quality

You can judge whether the lubricant needs to be replaced by checking for the following features:

- Change in consistency
- Discoloration
- Degree of soiling

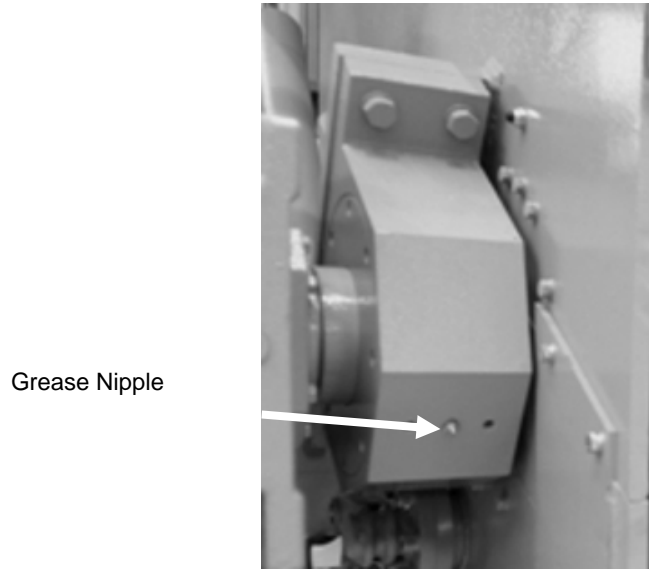
Replacing or Refilling Lubricant

- Fill the bearings uniformly with grease until all operating surfaces are well greased.
- For the rotor bearings, a lubricant quantity of one third to a maximum of half of the bearing volume per bearing is required. If too much grease is used, the lubricant will become unusable due to excessive temperature.
- Only one type of grease may be used, mixing different types of grease is prohibited. The bearings have been filled at the factory with lithium base saponification roller bearing grease F3.
- Refer to the “List of Lubricants” in this section for recommended bearing grease.

Refilling lubricant

The grease reaches through the circulating grooves and bores via lubrication nipples into the interior of the bearing.

The greasing quantity is .13 to .22 lbs (60 to 100 g) roller bearing grease F3 per bearing.



Replacing Lubricant

Renewing the lubricant between intervals is only necessary when there unusual noises or overheating. Mounting and dismounting of the bearings must be carried out in accordance with the instructions in this operation manual (see replacing the bearings).

1. Open the bearing.
2. Remove the bearing housing and the bearing cover.
3. Clean the bearing carefully using petroleum ether.

NOTE: *Petroleum ether, petroleum, spirit, aqueous neutral or alkaline cleaning agents may be used to clean the bearings. After washing out, the bearing must immediately be preserved using lubricant, in order to avoid corrosion.*

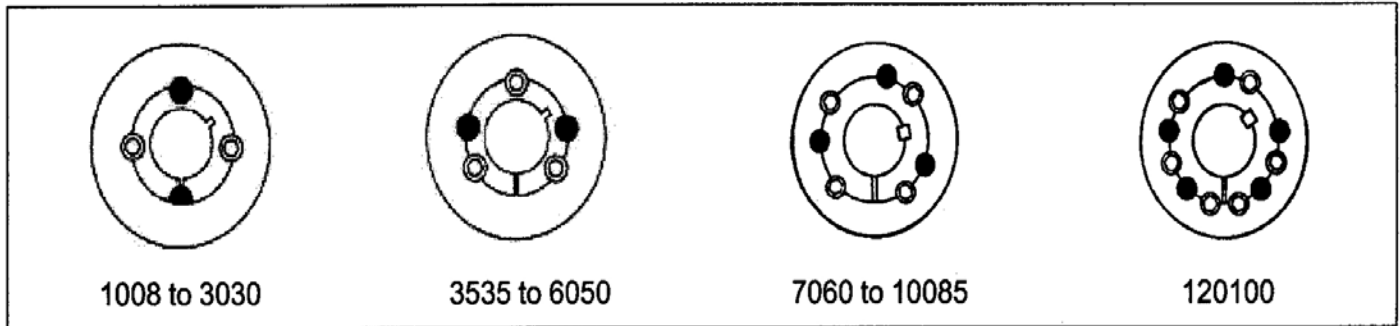
4. Fill bearing with approved lubricant (refer to the “List of Lubricants”).

List of Recommended Lubricants


Country of Manufacturer/Manufacturer	Roller Bearing Grease
ARAL	ARL Grease HL 3
BP	BP ENERGREASE LS 3
CASTROL	CASTROL SPHEEROL AP 3
ESSO	Beacon 3
FUCHS	FUCHS Grease 1200 FUCHS Grease FWA 220
SHELL	SHELL Alvania Grease 3
MOBIL-OIL	MOBILUX 3
WISURA	WISURA Liba L 3
Zeller & Gmelin	ZET GE Grease M 50
FAG	FAG L 71
ANTAR	ROLEXA
Holland, Beverol	Beverol Multi Purpose Grease
Italy, Agip	AGIP Grease 33 FD
Swede, NYNAS	Nynas FI 3-42

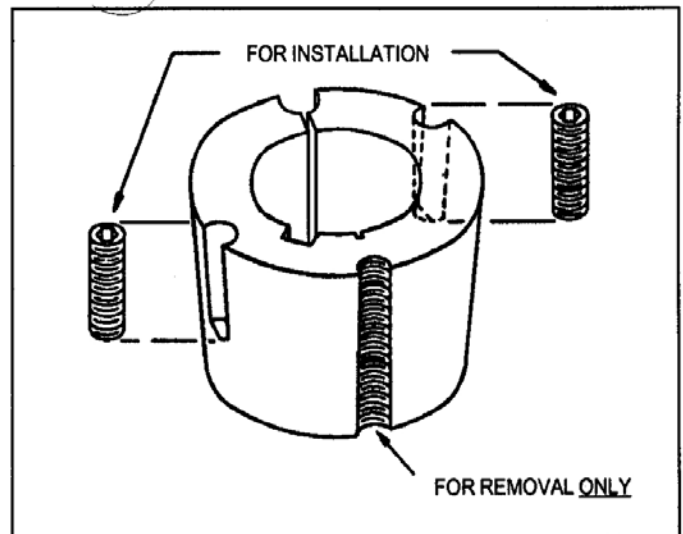
Mounting and Dismounting TAPER-LOCK Tensioning Element

The motor and the gear V-belt pulleys are attached to the shaft using a TAPER-LOCK tensioning element. The disks must be dismantled for certain maintenance processes.




To Install:

1. Clean shaft, bore, and outside of bushing, and bore of hub (taking bushing from hub if already assembled). Remove any oil, lacquer, or dirt. Place bushing in hub and match half holes to make complete holes (each complete hole will be threaded on one side only).
2. Oil thread and point of set screws or thread and under head of cap screws. Place screws loosely in holes that are threaded on hub side (shown thus  in diagram).
3. Make sure bushing is free in hub. Slip assembly onto shaft and locate in position desired.
4. Tighten screws (see note*) alternately and evenly until all are pulled up very tightly. Use a piece of pipe on wrench to increase leverage. (See table for wrench torque on reverse side.)
5. Hammer against large end of bushing using hammer and block or sleeve to avoid damage. Screws can now be turned a little more using the specified wrench torque. Repeat this alternate hammering and screw re-tightening until the specified wrench torque no longer turns the screws after hammering.
6. After drive has been running under load for a short time stop and check tightness of screws. Fill other holes with grease to exclude dirt.



To Remove:

1. Remove all screws. Oil thread and point of set screws or thread and under head of cap screws.
2. Insert screws in holds that are threaded on bushing side (shown thus  in diagram). In sizes where washers are found under screw heads, be sure to use these washers. Note that one screw in each hub is left over and is not used in this loosening operation.
3. Tighten screws alternately until bushing is loosened in hub. If bushing does not loosen immediately, tap on hub.

Tightening Torque of the Screws

Refer to the table below.

Tensioning element (Type)	Screws- Tightening torque in Nm	Screw details	
		Number	Size (BSW)
1008	5,6	2	$\frac{1}{4}$ "
1108	5,6	2	$\frac{1}{4}$ "
1310	20	2	$\frac{3}{8}$ "
1315	20	2	$\frac{3}{8}$ "
1210	20	2	$\frac{3}{8}$ "
1215	20	2	$\frac{3}{8}$ "
1610	20	2	$\frac{3}{8}$ "
1615	20	2	$\frac{3}{8}$ "
2012	31	2	$\frac{7}{16}$ "
2017	31	2	$\frac{7}{16}$ "
2517	48	2	$\frac{1}{16}$ "
2525	48	2	$\frac{1}{16}$ "
3020	90	2	$\frac{5}{8}$ "
3030	90	2	$\frac{5}{8}$ "
3535	60	3	$\frac{1}{2}$ "
4040	102	3	$\frac{5}{8}$ "
4545	155	3	$\frac{3}{4}$ "
5050	185	3	$\frac{7}{8}$ "

Replacing the Screen

The condition of the screen must be checked regularly in order to keep the throughput of the shredder and the quality of the shredded material constant.

The screen may be damaged, dirty, or not suitable for the shredding material when:

- Screen holes too fine—overheating of the material can occur.
- Screen holes too course—shredded material can have larger pieces that are unacceptable.

Hydraulic Screen Support (optional)

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard the machine door.
5. Pivot the screen support downwards by pushing the button screen open on the control box.
6. Remove the screen.
7. Put a new screen into the screen support.

8. Pivot the screen support into the working position and fasten using mounting screws.
9. Close the machine door.
10. Shredder can be started again.

(Please refer to image from "Emptying the Screen".)

V-Belts

V-belts are wearing parts that stretch and must be re-tensioned. Regular checks on the tension force of the V-belts and the condition of the V-belts are necessary in order to guarantee a long service life of the V-belts.

Checking the tension force of the V-belt

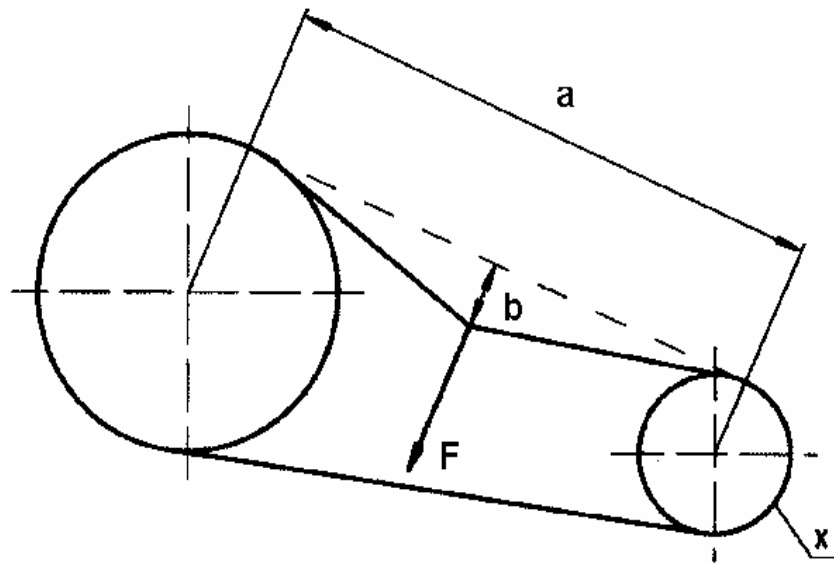
1. Remove the V-belt cover.
2. Measure the distance between the roller centres.
3. Determine the belt sag force F for each belt at 16 mm sag if sag "b" is equal to 1 m distance between roller centres. Do this by measuring the distance between roller centres at a right angle to the V-belt.

Force required for 1m distance between roller centres and 16mm sag

Profile section	Efficiency of x in mm	P in Newton	P in lbs
SPA	100 - 132	20 - 27	4,4 - 5,9
SPA	140 - 200	27 - 35	5,9 - 7,7
SPB	160 - 224	35 - 50	7,7 - 11
SPB	236 - 315	50 - 65	11 - 14,3
SPC	224 - 355	60 - 90	13,2 - 19,8
SPC	375 - 560	90 - 120	19,8 - 26,4
XPB	224 - 250	25 - 35	5,5 - 7,7

4. Compare determined value with the value in the above table. If the value lies below the lowest tolerance limit, the V-belt must be re-tensioned. If the value lies above the highest tolerance limit, the V-belt must be relaxed.

a: Distance between roller centers.
 b: Sag
 F: Force (direction)



Re-tensioning and relaxing the V-belt

Enlarging or decreasing the centre distance “A” tensions or relaxes the V-belt.

1. Loosen the tensioning screw.
2. Shift the drive motor as required onto the sliding rails.
3. Lock the drive motor into new position using tensioning screws so that the motor shaft is parallel to the rotor axis and aligned.
4. Check the tension force of the V-belt (see “Checking the Tension Force of the V-belt”).
5. Mount the V-belt cover.

Checking V-belt condition, replacing V-belt

CAUTION! Danger of pulling into machine caused by running V-belts. Hair, jewelry etc. can be pulled into machine without proper precaution resulting in serious injury. NEVER dismount the V-belt cover and window during operation.

A porous or ripped V-belt must be replaced as follows:

1. Remove the V-belt cover.
2. Loosen the front and rear tensioning screw.
3. Relax the V-belt by shifting the drive motor.
4. Put new V-belt in.
5. Tension the V-belt (see “Checking the Tension Force of the V-belt”).
6. Mount the V-belt cover.

Working on the Cutting Knives

Correctly setting and mounting the cutting knives is important when working with shredders to ensure efficient and economic function.

Replacing and Checking the Cutting Knife Mountings

Certain machine parts are subject to stress during operation as a result of vibrations that can lead to loosening of the screw connections. It is absolutely necessary to check the cutter and bed knife mounting screws in accordance with the maintenance plan.

1. Tighten the mounting screws on the cutters and bed knives using a torque wrench (check required torque for the screw size). **The required torque for the knife fixing bolts is 355 Nm.**

NOTE: You can find out the required torque from the following table. Tightening capacity decreases for screws when loosened and tightened again several times.

New screws of the same material quality must replace the cutting knife mounting screws after they have been loosened and tightened several times.

Torque						
Bolt type	Grade 8.8		Grade 10.9		Grade 12.9	
	Nm	lbf ft	Nm	lbf ft	Nm	lbf ft
M8	25	18.4	35	25.8	41	30.2
M10	49	36.1	69	50.9	83	61.2
M12	86	63.4	120	88.5	145	106
M16	210	154	295	217	355	261
M20	410	302	580	428	690	508
M24	710	523	1000	737	1200	885

Checking the Condition of the Cutters



WARNING! Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

The cutting knives become blunt after a certain number of operation hours; they should be checked regularly. Using blunt knives can affect the efficiency and performance of the machine in the following ways:

- Decreased shredding capacity.
- Increased current consumption of the drive motor.
- Inexact cut.
- Overheating of the shredded material.

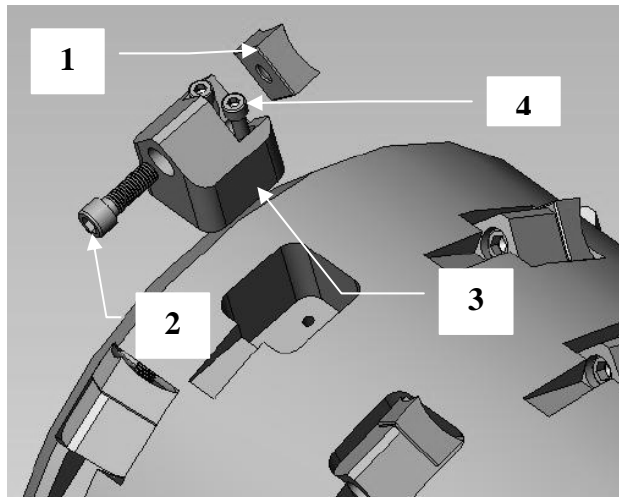
Dismounting the Cutters

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard the machine door.
5. Remove screen.

NOTE: *Although it is possible to reach the cutting shaft by climbing into the feeding chamber, it is recommended to access the cutters through the machine door located at the front of the machine. The shaft can be rotated manually by turning the motor v-belt pulley.*

6. Clean the hexagon head socket of the cutter mounting screw (2).
7. Loosen the bolt using a high quality Allen key (10 mm). Knock the Allen key lightly with a hammer to loosen it if necessary.
8. Take out the cutter mounting screw, the washer, and the cutter.

- (1) Cutter
- (2) Cutter mounting screw
- (3) Cutter holder
- (4) Cutter holder mounting screws



Dismounting the Cutter Holders

1. Switch OFF the shredder at the main switch
2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard the machine door.
5. Remove screen

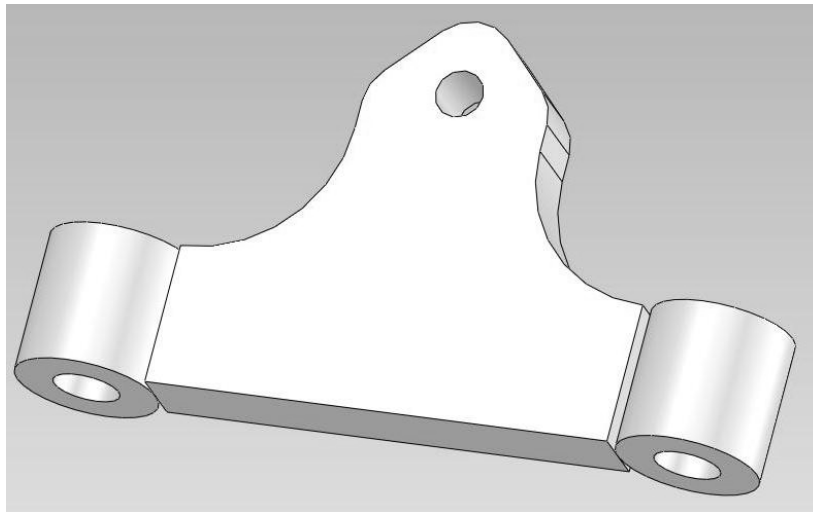
NOTE: *Although it is possible to reach the cutting shaft by climbing into the feeding chamber it is recommended to access the cutters through the machine door located at the front of the machine. The shaft can be rotated manually by turning the motor v-belt pulley.*

6. Clean the hexagon head socket of the cutter mounting screw (2).
7. Loosen the bolt using a high quality Allen key (10 mm). If necessary knock the Allen key lightly with a hammer to loosen it.
8. Take out the cutter mounting screw, the washer and the cutter.
9. Clean the hexagon head socket of the knife holder fixing bolts (4).
10. Loose the bolt using a high quality Allen key (6 mm). Knock the Allen key lightly with a hammer to loose it if necessary.
11. Take out the cutter holder mounting screws (4).
12. Remove the cutter holder with the delivered Extractor.

NOTE: See drawing in “Dismounting the rotor knives”.



WARNING! *Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!*



Dismounting the Bed Knives

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the hopper door.
4. Safeguard the hopper door.

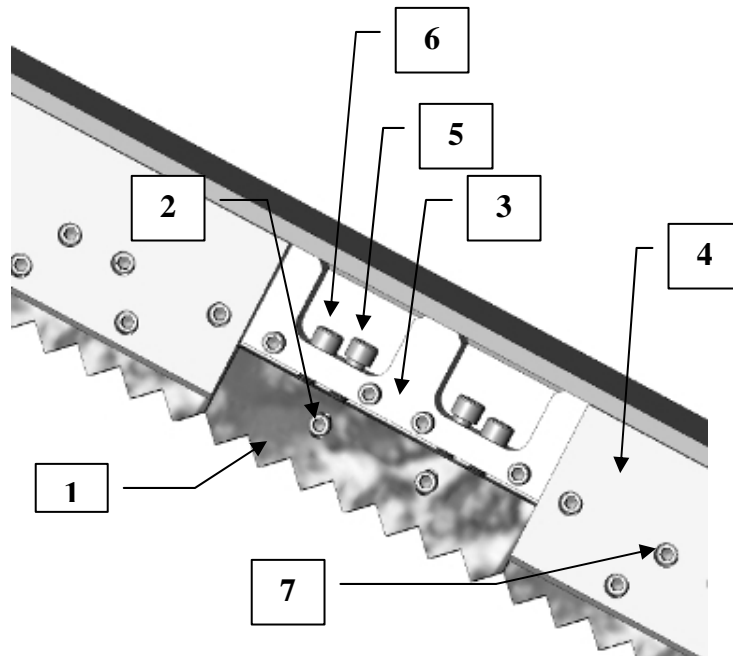
NOTE: *Although it is possible to reach the knives by climbing into the feeding chamber, it is recommended to access the knives through the front side door.*

5. Clean the hexagon head socket of the knife mounting bolts (2) and the cover plates mounting bolts.
6. Loosen the cover plate mounting bolts using a high quality Allen key (10 mm). Knock the Allen key lightly with a hammer to loosen if necessary.
7. Take out the bolts and cover plates.
8. Loosen the knife adjusting screws for pulling and take them out.
9. Loosen the knife mounting bolts with Allen key (10 mm). Use a hammer to lightly knock key if necessary.
10. Take out the knife mounting bolt and knife.



WARNING! Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

- (1) Bed knife
- (2) Knife mounting screws
- (3) Knife holder
- (4) Cover plates
- (5) Knife adjusting screw for pushing
- (6) Knife adjusting screw for pulling
- (7) Cover plate mounting screws



Mounting the Cutter Holders

1. Clean the cutter pocket and the cutter holder.
2. Insert cutter holder into the pocket.

NOTE: Cutter holder must slide in easily. Do not damage the cutter holder surfaces with a hammer.

3. Put in the cutter holder mounting bolts (DIN912 – M10x30 – 12.9) and put some Loctite on them.
4. **Make sure that the cutter holder fits properly.**
5. Tighten the cutter mounting bolts using a torque wrench.



NOTE: *The required torque for the cutter holder mounting bolts is 83 Nm (also see the table under “Replacing and checking the cutting knife mountings”).*

WARNING! Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Mounting the Cutters

1. Clean the cutter supporting surface and the hole on the cutter holder.
2. Insert sharp cutter or turn old cutter and push against the cutter holder surface.
3. Put in the cutter mounting bolt (DIN912 – M16x50 – 12.9) and the washer (DIN433 – 17 – 300HV).
4. Screw in the mounting screws and tighten lightly first.
5. **Make sure the cutter fits planar in the seat.**
6. Tighten the cutter mounting bolts using a torque wrench.

NOTE: *The required torque for all cutter mounting bolts is 355 Nm (also see the table under “Replacing and checking the cutting cutter mountings”).*

7. **Check if the cutting gap is correct and if the cutting knives do not collide as the rotor turns.**
8. Remove tools and other objects from the cutting chamber.
9. Put back screen and fix it.
10. Switch on the shredder for a short time without grinding material, and listen for noises. If there are unusual noises, determine the cause and eliminate it.

NOTE: *The cutting knives, in particular the cutters, should only be sharpened or replaced in sets. There is a danger of balance error if a combination of rotor knives from different cutter sets is used.*

Cutters are reversible and have four symmetrical cutting edges. This makes it possible to turn the knives and only to sharpen after every fourth cutter change.

Mounting the Bed Knives

1. Clean the knife supporting surface and the holes on the knife holder
2. Insert sharp knife or turn old knife.
3. Put in the knife adjusting bolts and adjust them roughly
4. Put in the knife mounting bolts (DIN912 – M16x60 – 12.9) and tighten lightly first
5. **Adjust the gap between cutter and bed knife to 0.8-1.0 mm**
6. Tighten the knife mounting bolts using a torque wrench.

NOTE: The required torque for all knife mounting bolts is 355 Nm (also see the table under “Replacing and checking the cutting knife mountings”).

7. Turn the rotor by hand
8. **Check whether the cutting gap is correct and make sure the cutting knives do not collide as the rotor turns.**
9. Put back the cover plates and mount them with the bolts.
10. Remove tools and other objects from the cutting chamber.
11. Put screen back and mount it.
12. Switch ON the shredder for a short time without material and listen for noises. If there are unusual noises, determine the cause and eliminate it.

NOTE: Cutters are reversible and have four symmetrical cutting edges. This makes it possible to turn the knives and only to sharpen after every fourth knife change.



WARNING! Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Sharpening Cutters and Bed Knives

Shredder cutters have 4 cutting edges. This means they can be turned 3 times. The cutters should be replaced after the third use. Bed knives can be turned 2 times and can be re-sharpened as long as you can fix them with the long hole.

1. Dismount the cutters and bed knives (see “dismounting the cutters”).
2. Sharpen the cutters and bed knives.

NOTE: A specialist in accordance with the sharpening plan using particular care should uniformly sharpen the cutting knives mechanically. It is important to make sure that sharpening takes place with small grinding allowance and sufficient coolant supply. The sharpening process is finished when the cutting edge is sharply cut. Not all indentations must be ground out; otherwise the number of possibilities for sharpening is unnecessarily reduced. For the sharpening process, use soft grinding wheels (Quality 40 H or 46 K). Knives, which have grinding cracks, are not to be reused due to danger of breakage during operation.

3. Whet the cutting edges of the cutting knives using a whetstone.

NOTE: The service life of the cutting knives can be increased by taking this measure.

4. Set the cutters and bed knives (see “setting the cutting knives”).
5. Mount the cutters and bed knives (see “mounting the stator knives”).

NOTE: The cutting knives, in particular the rotor knives, should only be sharpened or replaced in sets. There is a danger of balance error if a combination of cutters from different knife sets is used.

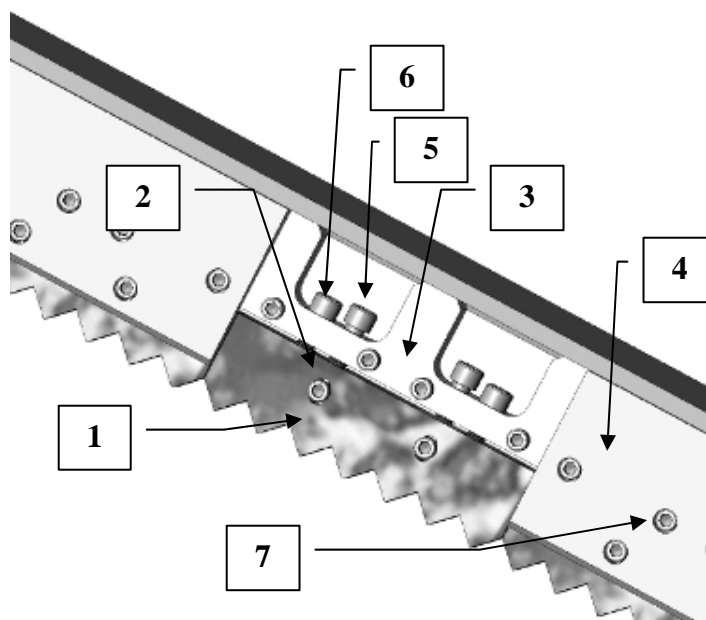


WARNING! Danger of cutting caused by sharp knives at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Setting the Cutting Knives

Cutters for the SXS series shredder do not have to be adjusted. All adjustments have to be done with the bed knives. To simplify knife setting and shorten standstill periods when replacing knives, bed knives have 4 adjusting screws, 2 each for pushing and pulling the knife. Having several knife sets helps to avoid standstill periods. Correct and careful setting of the gap between the cutters and bed knives (cutting gap) is important for productive capacity of the shredder. Factors for the size of the knife gap are the size of the rotor, the design of the rotor, and the material to be ground.

- (1) Bed knife
- (2) Knife mounting screws
- (3) Knife holder
- (4) Cover plates
- (5) Knife adjusting screw for pushing
- (6) Knife adjusting screw for pulling
- (7) Cover plate mounting screws



1. Remove old knives (see “Dismounting the bed knives”).
2. Insert sharp knife or turn old knife.
3. Put in the knife adjusting bolts and adjust them roughly
4. Put in the knife mounting bolts and tighten lightly first
5. **Adjust the gap between cutters and bed knife to 0.8-1.0 mm using a calibre gauge.**
6. Tighten the knife mounting bolts using a torque wrench.

NOTE: The required torque for all knife mounting bolts is 355 Nm (see the table under “Replacing and checking the cutting knife mountings”).

7. Turn the rotor by hand.
8. **Check whether the cutting gap is correct and make sure the cutters and bed knives do not collide as the rotor turns.**

NOTE: Recommended knife gap: 0.8 mm – 1 mm

9. Fix the knife cover plates.

Transporting and Storing the Cutting Knives

WARNING!

- *Danger of cutting caused by sharp knives.*
- *Serious injury, in particular to hands and fingers, can result.*
- *Wear protective gloves.*
- *Only transport and store the packaged cutting knives.*
- *Grease the cutting knives well so they do not rust. Protect the cutting edges with doubled cardboard and use adhesive tape to safeguard the knives against slipping out of the sides of the sheath.*
- *De-grease the cutting knives so that they can be gripped safely after unpacking.*

Hydraulic Maintenance

Hydraulic oil has to be filled into the tank *before start-up of the machine*. The type of oil that should be used depends on location. Recommended oils include of the type DIN 51524 HLP 32 for areas with temperatures below 32°F (0°C) in the winter and HLP 46 for temperatures of around 86°F (30°C) in the summer. For extremely hot tropical areas (i.e. Thailand, Malaysia, Nigeria etc.) it is recommended to use HLP 68. The first oil replacement should be done after 1,000 operating hours and then after every 2,000 operating hours. The oil filter must be replaced too.

NOTE: *Overheating of the oil and dirt in the oil will cause damage to the hydraulic system if the oil is not replaced in the specified amount of time. This can lead to complete standstill of the machine.*

The same type of oil **must** be used when adding hydraulic oil. If the same type of oil is unavailable or if it is unknown, then the oil in the tank and the entire hydraulic system has to be removed and carefully and completely flushed. The system may only be filled with new oil after this procedure has been done because it is necessary in preventing the valves from gumming.

Hydraulic liquid recommendation

Designation to DIN 51 524	HLP 32
Ambient temperature:	-7 to +70°C
Supplier	Name of the oil
ARAL	Aral Vitam GF 32 Aral Vitam HF 32
BP	BP Energol HLP-D 32 BP Energol HLP 32 BP Energol SHF 32
ELF	Elfolna 32 Hydrelf 32
ESSO	Nuto H 32 HLPD-Oel 32
FINA	Fina Hydran 32
FUCHS	Renolin MR 10 Renolin B 10
MOBIL	Mobil DTE 24 Mobil DTE 17 Drucköl HLP 32 - C Hydrauliköl HLPD 32
TEXACO	Rando Oil HD A - 32 Rando Oil HD AZ - 32 Alcor Oil DD 32

Chapter 6: Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal troubleshooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

Problem	Possible Cause	Possible Remedy
Machine blocks or switches itself off	Too much feed material.	Reduce grinding material in-feed.
	Screen blocked.	Clean screen, check condition, select larger screen perforation if necessary.
	V-belts slip.	Check V-belt tension and condition. Re-tighten or replace if necessary.
	Knife condition.	Check knives and re-sharpen or replace if necessary.
	Cutting gap.	Check cutting gap and set following the instructions in this manual.
	Discharge blocked.	Check if discharge conveyor belt is running.
	Current failure.	<ul style="list-style-type: none"> • Check limit switch for defective contact. • Check electrical connection. • Tighten limit switch if necessary.
	Fuse too small.	Fit larger fuse only after consulting the service department.
	Rotational direction of rotor.	Check motor and reverse polarity if necessary.
Rotor does not grip bulky material.	Rotor speed.	Change rotor speed only after consulting the service department.
	Knife condition.	Check and sharpen if needed following the instructions provided in this manual.
	Protruding bed knife.	Consult the service department.
	Knives not aggressive enough.	Fit underlay plates below knife holders.

Problem	Possible Cause	Possible Remedy
Overheating of the shredded material.	View first 5 possible causes for "Machine blocks or switches itself off"	View first 5 possible remedies of "Machine blocks or switches itself off"
	Screen perforation too small.	Insert a screen with larger perforation.
	Knives wrongly sharpened.	Modify knife finish only after consulting the service department.
	Material rubs against the housing wall.	Fit anti-winding device.
	Insufficient cooling.	Fit rotor cooling.
Unusual vibrations.	Rotor out of balance.	Weight knives, balance rotor.
	Bearing damage.	Check bearings and replace if necessary.
	Anti-vibration pads defective.	Check mounting pads and replace if necessary.
Extreme cutter wear.	Bearing damage.	Check bearings and replace if necessary.
	Knife finish.	Check knife and sharpen or replace if necessary.
	Wrong cutting gap.	Check cutting gap and set following the instructions in this manual.
	Foreign matter.	Fit feed device with metal detector.
Bearings too hot.	Too much grease in bearing.	Reduce amount of grease.
	V-belts too tight.	Reduce tension.
	Rubbing on housing sealing ring.	Check sealing ring and oil or replace.
	Bearing damage.	Check bearings and replace if necessary.
	No grease in bearing.	Lubricate bearing.
Too many fines in shredded material.	Screen worn.	Renew screen (possibly using manganese steel).
	Unsuitable screen perforation.	Replace screen after consulting the service department.

Problem	Possible Cause	Possible Remedy
Cutting gap alters during operation.	Knife mounting screws not tight.	Re-tighten using torque wrench following the instructions in this manual.
	Screw fatigue.	Fit new screws.
	Washers deformed.	Insert new washers.
	Knife holder surface deformed.	Insert new knife holders.
	Supporting surfaces not clean.	Clean and re-dust supporting surfaces.
	Threads in housing worn.	Fit new bushes in housing.
Screen damage.	Screen wrongly inserted.	Fit screen correctly.
	Screen support buckled.	Replace screen support.
	Wrong screen radius.	Correct it.
Shredder does not start.	Limit switches not activated.	Check position of limit switch and correct.
	Main and control fuses.	Replace fuse.
	Feed device not connected.	Switch on in sequence.
	Material jam.	Empty shredder before switching ON.
	Star delta connection.	Correct wiring on motor.
	Motor protection switches off.	Check motor relay for correct setting and increase if necessary.
Shredder blocks when under load.	Star delta time relay.	Correct time.
	Feed starts too early.	Start feed only after switch over from star to delta.
	Limit switch loose or wrongly set.	Re-position and tighten limit switch.
	Fuse defective.	<ul style="list-style-type: none"> • Replace fuse. • Fit larger fuse only after consulting the service department.
Frequent switching off of grinding material in-feed device.	Motor fuse switches off – red indicator.	<ul style="list-style-type: none"> • Reduce feed quantity of the grinding material. • Correct setting. • Replace fuse.
	Current relay switches off	Correct setting.

Hydraulic Troubleshooting

Problem	Possible Cause	Possible Remedy
Motor doesn't work.	Electric source.	Correct wire connection.
	Motor damage.	Replace motor.
Oil pump doesn't work.	Motor not functioning.	Correct wire connection.
	Pump damage.	Replace pump.
Oil pump noise	Filter jam.	Clean the filter.
	Hydraulic oil is too thick.	Change hydraulic oil.
	Hydraulic oil has bad quality.	Change hydraulic oil.
	Pipe is leaking.	Tighten pipe connectors.
	Pump damage.	Change pump.
	Motor and pump misalignment.	
Working pressure is abnormal.	Spillover valve and sequence valve jam.	Clean spillover and sequence valves.
	Pump damage.	Replace pump.
Pressure maintain is abnormal.	Sealing is broken.	Change sealing.
	Pipe is leaking.	Check and solve leak.
	Single direction valve jam.	Clean the valve.
Work is abnormal.	Pressure is abnormal.	Clean spillover valve and sequence valve.
	Magnetic valve is abnormal.	If the valve jams, clean it; if it is broken, replace it.
	Electrical problem.	Check and change the broken electrical parts.
High oil temperature.	Sequence valve pressure is too high.	Correctly set it to 30 bar.

Appendix

A-1 Returned Material Policy

Credit Returns

Prior to the return of any material, **authorization** must be given by the **manufacturer**. A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returned material purchased from the manufacturer is subject to 15% (75.00 minimum) restocking charge.

All returns are to be shipped prepaid.

The invoice number and ate or purchase order number and ate must supplied.

No credit will be issued for material that is not within the manufacture's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, **authorization** must be given by the **manufacturer**. A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and ate or purchase order number and ate must supplied.

After inspecting the material, a replacement or credit will be given, at the **manufacturer's** discretion, if the item is found to be defective in materials or workmanship. Purchased components are covered under their specified warranty terms.

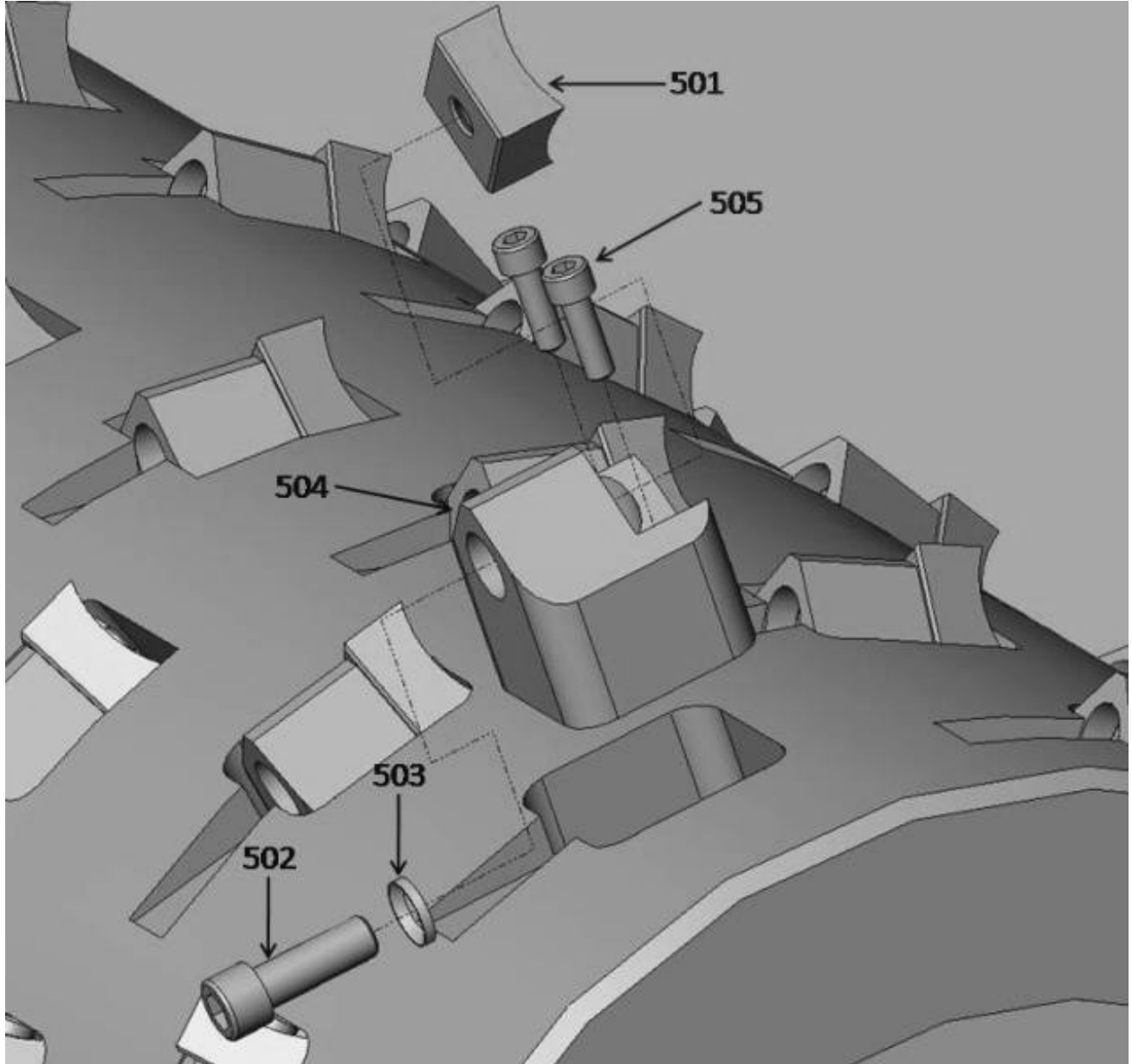
A-2 Technical Specifications

Standard Description	SXS 1500	SXS 2000
Large Capacity Hopper Feed Opening, in (mm)	100 x 63 (2540 x 1620)	100 x 79 (2540 x 2020)
Usable Open Area of Cutting Chamber, in (mm)	59 x 58 (1500 x 1490)	59 x 75 (1500 x 1900)
Standard motor in hp (kW)	2 x 100 HP (2 x 75)	2 x 100 HP (2 x 75)
Number of Rotor knives	76	96
Number of Bed Blades	4	5
Rotor Diameter, in (mm)	29.5 (750)	29.5 (750)
Rotor speed in rpm	54	54
Motor of Hydraulic device, hp (kW)	15 (11)	15 (11)
Screen Sizes Available, in (mm)	1-4 (20-100)	1-4 (20-100)
Mounted Knife-holders	Included	Included
Hopper for manual/conveyor feeding	Included	Included
Hydraulic feeding ram	Included	Included
Two speed Turbo-Hydraulic	Included	Included
Ram comb plate	Included	Included
Control panel SPS	Included	Included
Ampere-Meter in control cabinet	Included	Included

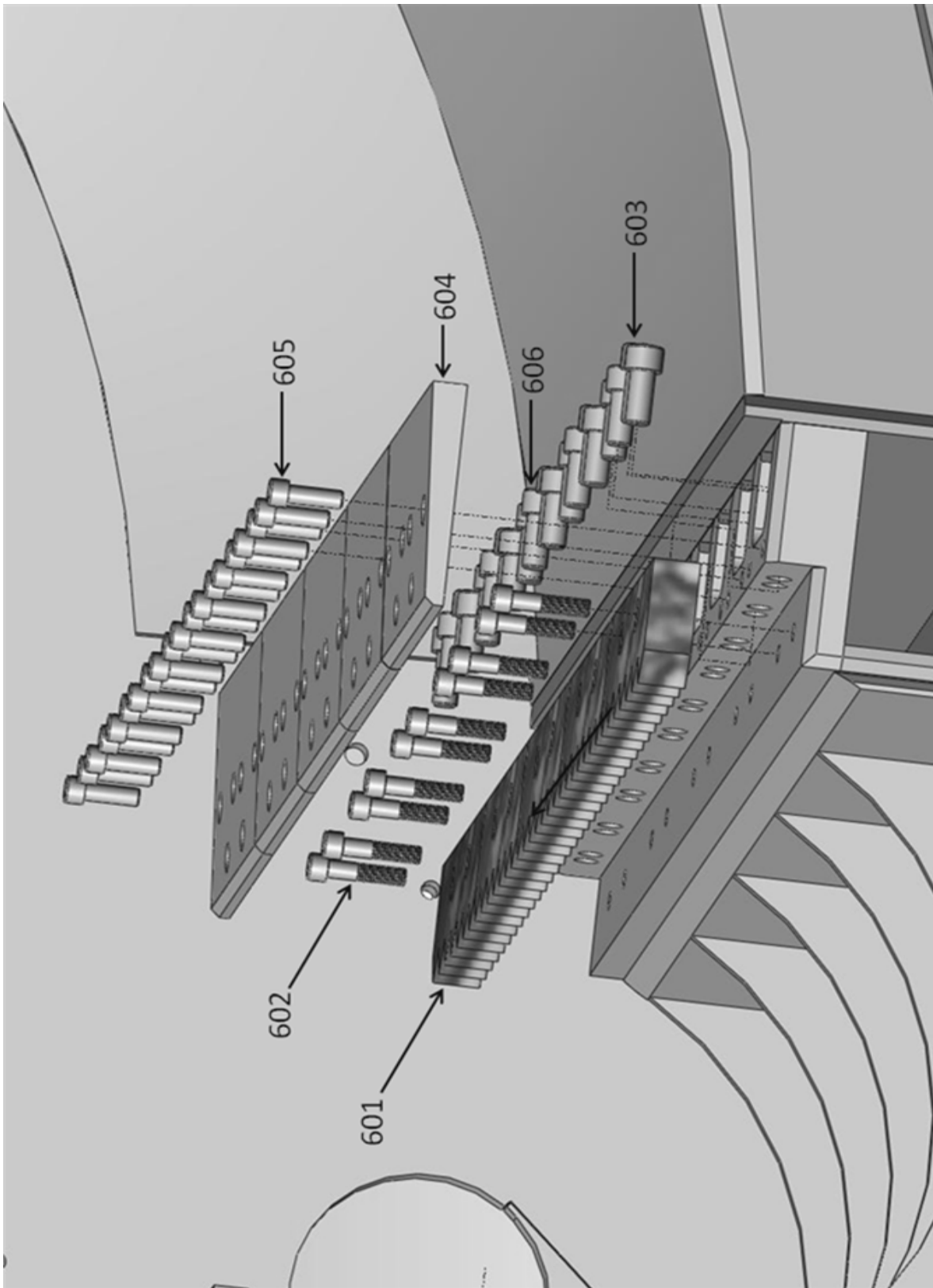
A-3 Drawings and Diagrams

NOTE: Please refer to the corresponding spare parts lists in the following section.

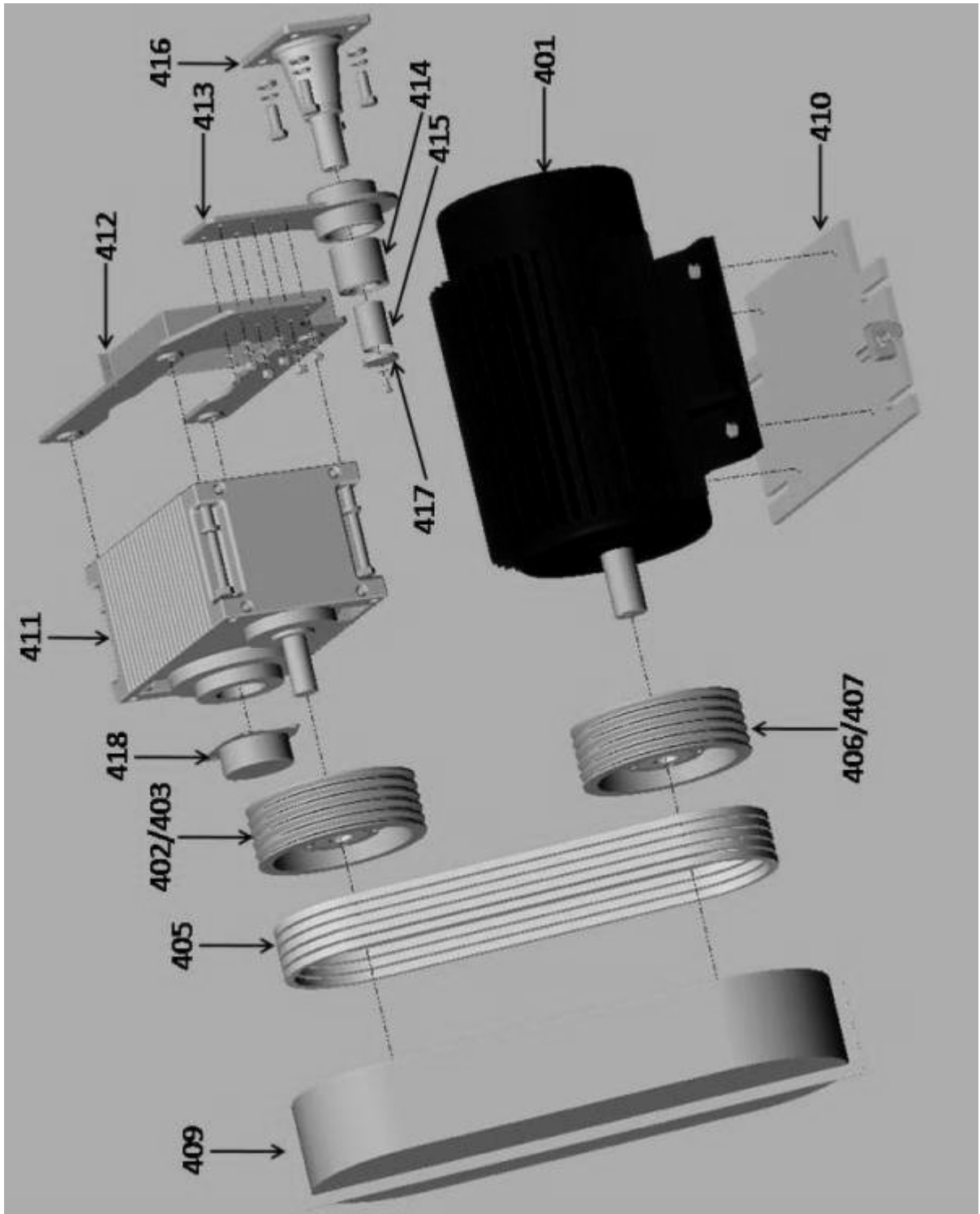
Cutter mounting



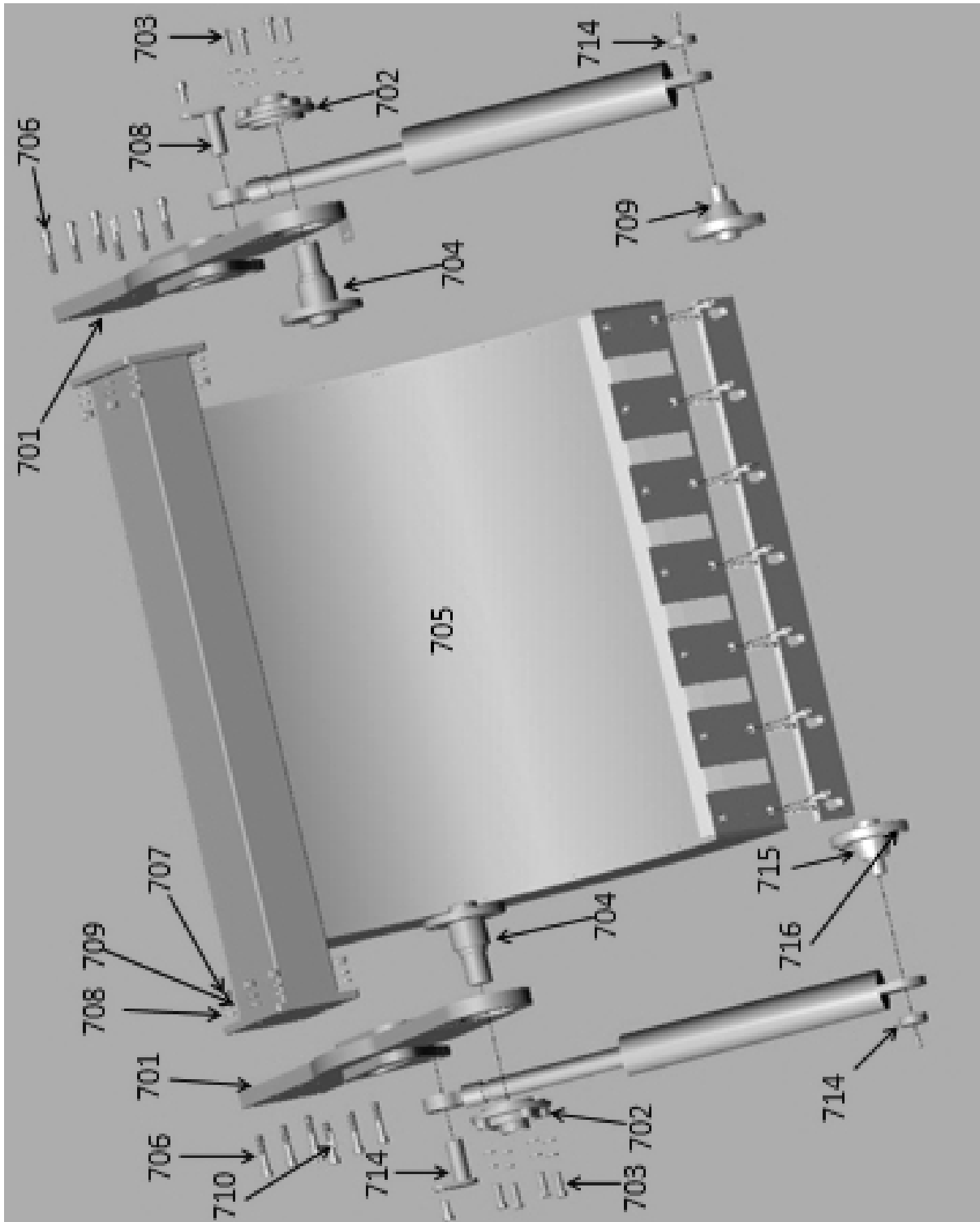
Bed knife fixing



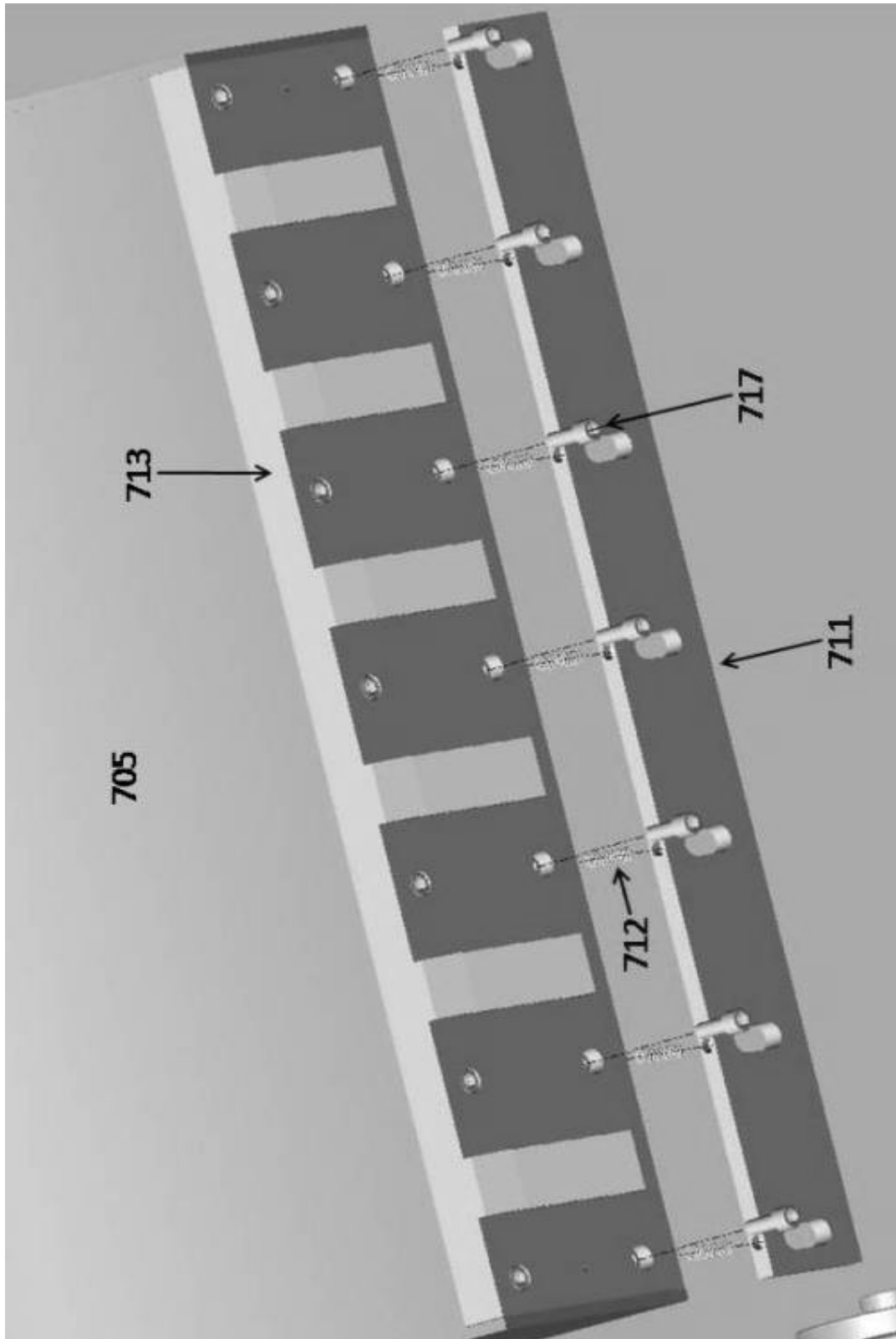
Drive



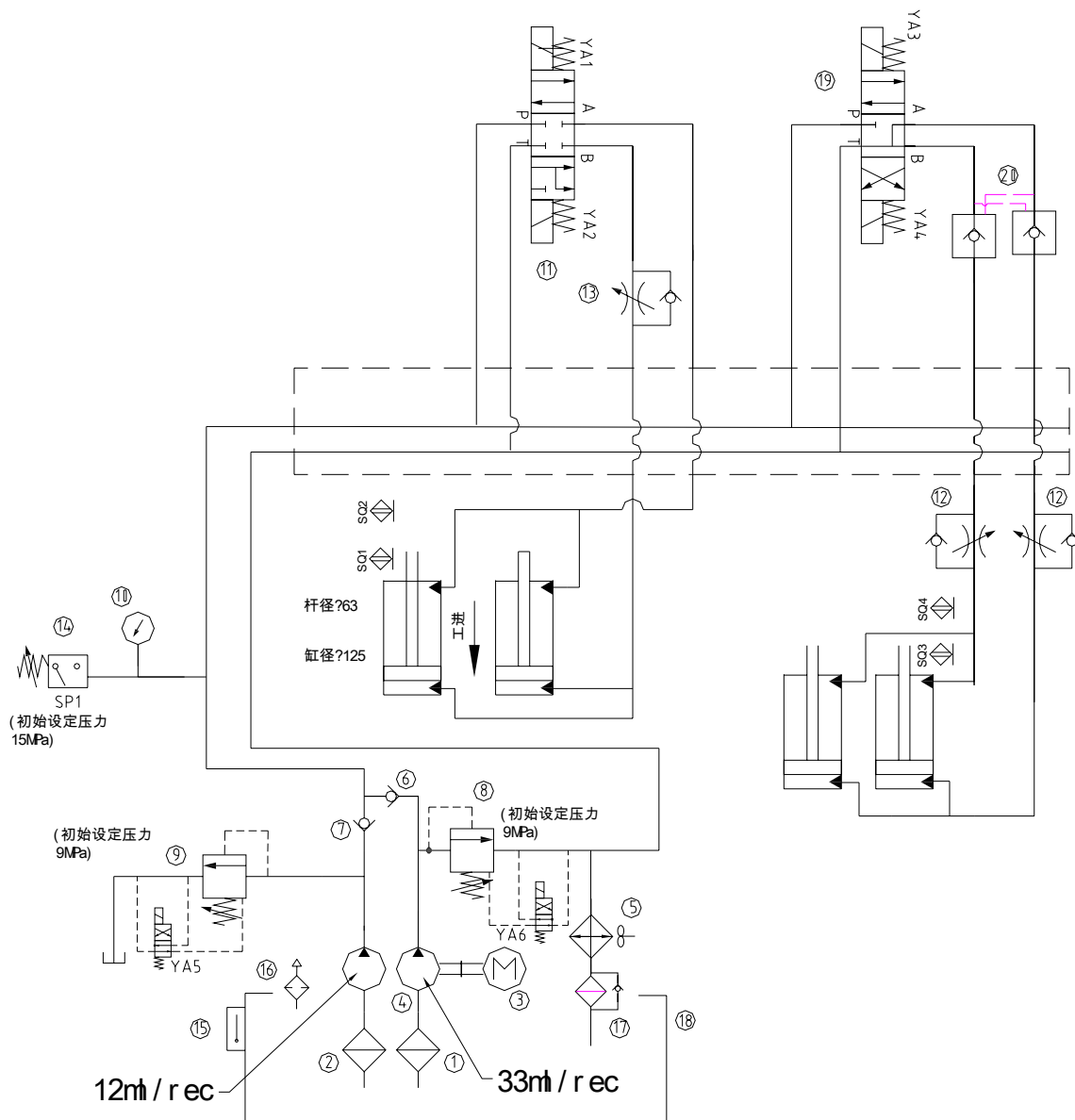
Ram



Ram scraper



SXS 1500/2000 Standard Hydraulic Diagram



A-4 Spare Parts List

SXS 1500

Pos.	Pc	Description/Standard
100		Machine complete
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		Screen complete (Hydraulic)
201	1	Screen
202	6	Screen support screws DIN912 – M16x25 – 8.8
203	2	Screen adjusting bolt
204	1	Screen support
205	2	Cylinder for screen support opening Ø63xØ35x155
206	4	Washer DIN125 -A- 13
207	4	Lock washer DIN 127 - 12
300	2	Bearing
301	2	Bearing housing SN236
302	2	Bearing 22236/W33
303	3	Bearing Cover A
304	1	Bearing Cover B
305	0	
306	4	Sealing DIN3760 D200 x 230 x 15
307	2	Grease nipple GB1152-89/M8x1
308	2	Sleeve
309	32	Mounting bolt DIN912 – M10x40 – 8.8
310	2	Washer disc
311	2	Mounting bolt DIN912 – M16x50 – 12.9
400		Drive
401	1	Motor 75 kW 460V/60Hz (right)
	1	Motor 75 kW 460V/60Hz (left)
402	2	Gear pulley SPC375-5
403	2	Gear pulley taper bush TB 3535-48
404	0	Key
405	10	V-Belt SPC3250
406	2	Motor pulley SPC315-5 (60Hz)
407	2	Motor pulley taper bush TB 3535-75
408	2	Key Motor shaft
409	2	Pulley cover + support
410	2	Base frame for motor
411	2	Gear box SEW MC3PLHF06-SD i=23
412	2	Torque arm plate

413	2	Rubber bush plate
414	2	Rubber bush Ø116x68x100
415	2	Copper bush ø68x63x100
416	2	Torque arm bolt
417	2	Washer disc
418	2	Rotor cover
419	12	Rubber bush plate bolts DIN933 – M20x65 – 12.9
420	12	Washer DIN433 – 20
421	12	Spring washer DIN127 – A – 20
422	12	Nut DIN934 – M20 – 10
423	2	Torque arm complete 75kW
500	1	E-knife rotor ø660x1500
501	76	Rotor knife 60x60x30
502	76	Rotor knife Mounting Bolt DIN 912 - M16x50 - 12.9
503	76	Washer DIN433 - 17
504	76	Rotor knife holder
505	152	Knife holder Mounting bolt DIN912 - M10x30 12.9
600	1	Bed knife complete
601	4	Bed knife 399x110x30
602	8	Mounting Bolt DIN 912 - M16x60 12.9
603	8	Bed knife adjusting bolt for pushing DIN 912 - M16x45 - 12.9
604	2	Bed knife cover plate
	1	Bed knife cover plate right
	1	Bed knife cover plate left
605	16	Cover plate Mounting bolt DIN912 - M12x30 - 12.9
606	8	Bed knife adjusting bolt for pulling DIN912 - M16x65 - 12.9
700	1	Ram complete
701	2	Arm for Ram
702	2	Bearing for arm HCFC214
703	8	Mounting bolt for bearing DIN912 - M16x80 - 12.9
704	2	Bolt for arm
705	1	Ram
706	12	Mounting bolt Ram arm DIN933 - M24x120-12.9
707	12	Nut DIN934 - M24 - 10
708	12	Washer DIN 433 – 24 – 300HV
709	12	Spring washer DIN127 – A – 24
710	12	Mounting pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper GB1358-78 n=12/d=2/D=12/H=60
713	1	Cover plate for scraper
714	2	Upper cylinder bolt
715	2	Lower bolt for cylinder Mounting
716	8	Mounting bolt for cylinder bolt DIN912 – M16x45 – 12.9
717	4	Grease nipple GB1152-89-M8x1
800		Hydraulic
801	2	Cylinder for Ram ø125 x ø63 x 1000
802	1	Hydraulic unit SHC-406 A
803		Piping
804		Connectors
805	1	Set of sealing for Ram cylinder

806	1	Oil filter SP-10
900		Electrical parts
901	2	Safety switch CAZ15zvrk
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for Proximity switch E10200

SXS 2000

Pos.	Pc	Description/Standard
100		Machine complete
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		Screen complete (Hydraulic)
201	1	Screen
202	6	Screen support screws DIN912 – M16x25 – 8.8
203	2	Screen adjusting bolt
204	1	Screen support
205	2	Cylinder for screen support opening Ø63xØ35x155
206	4	Washer DIN125 -A- 13
207	4	Lock washer DIN 127 - 12
300	2	Bearing
301	2	Bearing housing SN236
302	2	Bearing 22236/W33
303	3	Bearing Cover A
304	1	Bearing Cover B
305	0	
306	4	Sealing DIN3760 D200 x 230 x 15
307	2	Grease nipple GB1152-89/M8x1
308	2	Sleeve
309	32	Fixing bolt DIN912 – M10x40 – 8.8
310	2	Washer disc
311	2	Fixing bolt DIN912 – M16x50 – 12.9
400		Drive
401	1	Motor 75 kW 460V/60Hz (right)
	1	Motor 75 kW 460V/60Hz (left)
	1	Motor 90 kW 460V/60Hz (right)
	1	Motor 90 kW 460V/60Hz (left)
402	2	Gear pulley SPC375-5
		Gear pulley SPC400-6
403	2	Gear pulley taper bush TB 3535-48
		Gear pulley taper bush TB 4040-50
404	0	
405	10	V-Belt SPC3250

		V-Belt SPC3250
406	2	Motor pulley SPC315-5 Motor pulley SPC335-6
407	2	Motor pulley taper bush TB 3535-75 Motor pulley taper bush TB 4040-75
408	2	Key Motor shaft
409	2	Pulley cover + support
410	2	Base frame for motor
411	2	Gear box SEW MC3PLHF07-SD i=23
412	2	Torque arm plate
413	2	Rubber bush plate
414	2	Rubber bush Ø116x68x100
415	2	Copper bush ø68x63x100
416	2	Torque arm bolt
417	2	Washer disc
418	2	Rotor cover
419	12	Rubber bush plate bolts DIN933 – M20x65 – 12.9
420	12	Washer DIN433 – 20
421	12	Spring washer DIN127 – A – 20
422	12	Nut DIN934 – M20 – 10
423	2	Torque arm complete 90kW
500	1	E-knife rotor ø660x1900
501	96	Rotor knife 60x60x30
502	96	Rotor knife fixing Bolt DIN 912 - M16x50 - 12.9
503	96	Washer DIN433 - 17
504	96	Rotor knife holder
505	192	Knife holder fixing bolt DIN912 - M10x30 - 12.9
600	1	Stator knife complete
601	5	Stator knife 399x110x30
602	10	Fixing Bolt DIN 912 - M16x60 12.9
603	108	Stator knife adjusting bolt for pushing DIN 912 - M16x45 - 12.9
604	3	Stator knife cover plate
	1	Stator knife cover plate right
	1	Stator knife cover plate left
605	20	Cover plate fixing bolt DIN912 - M12x30 - 12.9
606	10	Stator knife adjusting bolt for pulling DIN912 - M16x65 - 12.9
700	1	Pusher complete
701	2	Arm for pusher
702	2	Bearing for arm HCFC214
703	8	Fixing bolt for bearing DIN912 - M16x80 - 12.9
704	2	Bolt for arm
705	1	Pusher
706	12	Fixing bolt pusher arm DIN933 - M24x120-12.9
707	12	Nut DIN934 - M24 - 10
708	12	Washer DIN 433 – 24 – 300HV
709	12	Spring washer DIN127 – A – 24
710	12	Fixing pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper GB1358-78 n=12/d=2/D=12/H=60
713	1	Cover plate for scraper
714	2	Upper cylinder bolt
715	2	Lower bolt for cylinder fixing

716	8	Fixing bolt for cylinder bolt DIN912 – M16x45 – 12.9
717	4	Grease nipple GB1152-89-M8x1
800		Hydraulic
801	2	Cylinder for pusher $\varnothing 125 \times \varnothing 63 \times 1000$
802	1	Hydraulic unit SHC-406 A
803		Piping
804		Connectors
805	1	Set of sealing for pusher cylinder
806	1	Oil filter SP-10
900		Electrical parts
901	2	Safety switch CAZ15zvrk
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for Proximity switch E10200

Hydraulic Unit Spare Parts List

Pos	Description	Standard	Pc	Supplier
1	Suction filter	MF-06	1	CLC
2	Suction filter	MF-08	1	CLC
3	Electric motor	20HPX4P(straight system)380V	1	Qunce
4	Gear pump	PVL12-12-33	1	Xinhong
5	Oil cooler	JC-YL-AH1012	1	
6	Check valve	CRG-03-1-10	1	CLC
7	Check valve	CRG-03-1-10	1	7Ocean
8	Solenoid control relief valve	DBW10-22AL-2-DC-DN+MSL-02P	1	7Ocean
9	Solenoid control relief valve	BSG-03-1PN-2-DC24-DN10+ MSL-02P	1	7Ocean
10	Pressure valve	2-1/2" – 25Mpa	1	7Ocean
11	Solenoid valve	DG07-E1-521C-T-DC24-DN-71	1	7Ocean
12	Throttle and check valve	PT-03	2	FTB
13	Throttle and check valve	MTC-04-B-O-10	1	7Ocean
14	Pressure switch	PS-02-3-10	1	7Ocean
15	Fluid level	LS-3"	1	CLC
16	Filler breather	AB-1163	1	CLC
17	Return suction filter	SP-10	1	7Ocean
18	Tank	160l	1	7Ocean
19	Solenoid valve	DSD-G02-6C-DC24-31	1	7Ocean
20	Modular pilot check valve	MPC-02-W1-10	1	7Ocean

A-5 Technical Assistance

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [262] 641-8610, Fax [262] 641-8653

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8am–5pm CST [800] 423-3183 or call [262] 641-8610

Emergencies after 5pm CST, call [847] 439-5655

We have a qualified service department ready to help. Service contracts are available for most of our products.

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Call [262] 641-8610 Monday–Friday, 8am–5pm CST

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Call [262] 641-8610 Monday–Friday, 8am–5pm CST

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