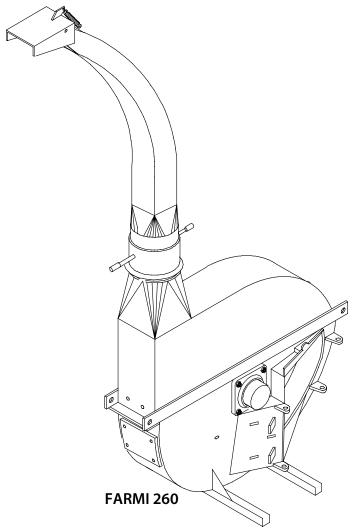
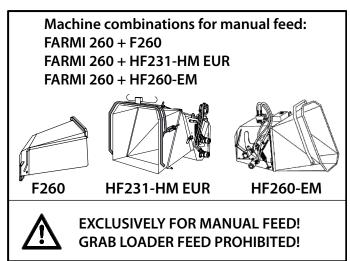
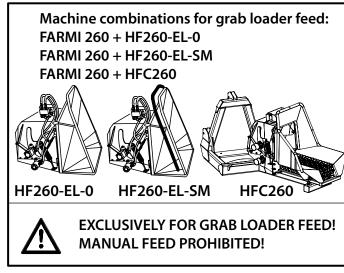
## **OPERATION, MAINTENANCE AND SPARE PARTS MANUAL**

# **CHIPPER FARMI 260**







PLEASE READ THE OPERATING AND MAINTENANCE INSTRUCTIONS OF THE CHIPPER AND THE SEPARATE OPERATING AND MAINTENANCE INSTRUCTIONS OF THE FEED UNIT BEFORE YOU OPERATE THE CHIPPER.



Farmi Forest Corporation Ahmolantie 6 FIN-74510 Iisalmi, Finland Tel. +358 (0)17 83 241 Fax. +358 (0)17 8324 372 www.farmiforest.fi

# GENERAL DESCRIPTION AND INTENDED USE OF THE CHIPPER

FARMI 260 is a disk chipper for tractor-mounted operation. As the chip size is adjustable, the chipper can be used e.g. for the production of chips to be used for landscaping or for bio energy. The chipper can be used to chop trunks, twigs and tree tops as well as chopping waste and saw mill waste. The chipper can shred wood with a max, trunk diameter of 260 mm.

The FARMI 260 chipper is mounted to the 3-point hitch of a tractor. It is driven by the tractor PTO. The driving force is transferred to the chipper via the PTO drive shaft. During chipping, the chipper rotor on which the blades for cutting the material are mounted is driven by the tractor. From the knives, the chips are fed to the additional knives which cut the chips to the desired size. Finally, the chips are discharged to the desired position using a discharge pipe. Depending on the feed unit used, the material to be cut is loaded into the chipper manually or using a grab loader.

The FARMI 260 chipper must always be used together with one of the following Farmi feed units:

Chipper and feed unit combinations for manual feed:

FARMI 260 + F260 FARMI 260 + HF231-HM EUR FARMI 260 + HF260-EM

Chipper and feed unit combinations for grab loader feed:

FARMI 260 + HF260-EL-0 FARMI 260 + HF260-EL-SM FARMI 260 + HFC260

The FARMI 260 chipper must never be coupled to other feed units. Moreover, the chipper must not be used without a feed unit.



The F260 feed hopper is described in the instruction manual of the feed units HF231-HM EUR and HF260-EM. There is a separate instruction manual for the feed units intended for grab loader feed.

Before operating the chipper, please read all pertinent instruction manuals. Store the instruction manuals of the chipper and of the feed unit at the same place.

Optional equipment for FARMI 260:

- separate hydraulic unit HD11
- twig breaker or high-power breaker
- screen
- short discharge pipe / long discharge pipe
- discharge pipe control system
- adjustment of the discharge pipe lid
- hydraulic opener of the upper chamber

### **PRODUCT WARRANTY**

Farmi provides a 12-months warranty on all Farmi products.

Register on our home page (www.farmiforest.fi) under FeedBack ("Product Registration" form) within 30 days after the receipt of the product to get full product warranty and additional information on your product. If it is not possible for you to register via internet, please register as follows: Complete the registration form on the last pages of this manual and return it to us within 30 days after the receipt of the product.



### **EC DECLARATION OF CONFORMITY**

Ν	N	a	n	u	fa	C	tι	ır	e	r

Farmi Forest Corporation Ahmolantie 6, FIN-74510 IISALMI, Finland

Person authorized to compile the technical documentation:

Name: Heikki Sirviö

Address: Ahmolantie 6, FIN-74510 IISALMI, Finland

**Commercial name:** 

Farmi

Machine denomination:

Farmi wood chipper with attachable Farmi feed hopper

Machine type:

Wood chipper: FARMI 260

Available feed hoppers for manual feed: F260

HF231-HM EUR HF260-EM

Available feed hoppers for grab loader feed: HF260-EL-0

HF260-EL-SM HFC260

Machine series number:

Herewith, we declare that the machine brought into circulation conforms with the pertinent requirements of the Machinery Directive 2006/42/EC and the EMC Directive (directive relating to electromagnetic compatibility) 2004/108/EC. The following harmonized standards have been applied for the conceptional design of the machine:

SFS EN ISO 12100-1/2, SFS EN 13525, SFS EN ISO 4254-1

The following additional standards and specifications have been applied for the conceptional design of the machine:

SFS ISO 730-1, SFS ISO 2332

lisalmi 21.5.2012 (Place) (date)

Me flee

Juha Hallivuori

### **TABLE OF CONTENTS**

GENERAL DESCRIPTION AND INTENDED USE OF THE CHIPPER	2
PRODUCT WARRANTY	2
GENERAL SAFETY INSTRUCTIONS	6
GENERAL SAFETY INSTRUCTIONS FOR THE CHIPPER	9
STICKERS AND PLATES	10
TECHNICAL INFORMATION	12
MOUNTING	14
LIFTING	14
MOUNTING OF THE DRAWBAR	15
MOUNTING OF THE FEED UNIT	15
SHORTENING THE PTO SHAFT	16
INSTALLING THE SCREEN AND BREAKER	17
MOUNTING OF THE DISCHARGE PIPE	18
ADJUSTING THE DISCHARGE PIPE AND LID	18
MOUNTING OF THE CHIPPER AND PRE-OPERATION INSPECTIONS	19
STARTING THE CHIPPER	19
STOPPING THE CHIPPER	19
CHIPPING	20
STORAGE OF THE CHIPPER	20
MAINTENANCE	21
KNIFE AND ANVIL MAINTENANCE	23
ADJUSTING THE CHIP LENGTH	26
REPLACING THE SPLINED SHAFT	27
FARMI 260	30
DISK, 2-KNIFE	34
DISK, 3-KNIFE	35
SHORT DISCHARGE PIPE, COMPLETE	36
LONG DISCHARGE PIPE, COMPLETE	37
TWIG CRUSHER, COMPLETE	38
CROSS BRAKER FOR SLAB, COMPLETE	38
PLASTIC SHREDDING SCREEN, COMPLETE	39
PRODUCT REGISTRATION FORM	42

When ordering spare parts, please indicate the machine's type and serial number from the machine plate, spare part's order number, description and quantity required. Example. CH260, serial number xxxxxxxx, 43298410, knife, 2 pc

#### WARNING SYMBOLS IN THIS MANUAL



imminent danger which could cause serious personal injury or death



danger which could cause personal injury



conditions or misuse that could damage equipment or machinery

NOTE!

 reminders, such as for performing checks or carrying out maintenance or repair procedures

### **INTRODUCTION**

This manual includes the information and maintenance instructions required for operating the machine in the optimal manner.

Although you have experience in using this kind of machinery, read the operation and maintenance instructions carefully since they include information enabling efficient and safe operation. Regular maintenance is the best way to guarantee the efficient and economical performance of the machine.



Each and every operator must read, understand, and follow all safety instructions and procedures.

### **CUSTOMER FEEDBACK**

We are happy to receive your opinions and suggestions for improvements by mail, fax or e-mail. All implemented suggestions for improvements will be rewarded.

#### **GENERAL SAFETY INSTRUCTIONS**

These safety instructions are meant for the owners of FARMI equipment, as well as those who operate, service or repair it.

The instructions help with:

- using the machine safely, appropriately and effectively.
- identifying, avoiding and preventing potentially dangerous situations.

The manufacturer supplies an instruction manual, which must always be available at the place of operation of the machine. Each user must read the safety, maintenance and operating instructions before operating the machine, and comply with these instructions at all times.



Ensure that every operator of the machine is familiar with the content of the instruction manual and situation-specific safety instructions, and has been suitably trained before operating the machine.

The machine complies with technical requirements and applicable safety regulations. However, incorrect use, maintenance or repair of the machine may cause risks.

In addition to the instruction manual, remember to comply with regulations of the local occupational health and safety authorities, and with your country's laws and decrees.

# The manufacturer is not liable for damages caused by:

- incorrect, negligent or inappropriate use of the product.
- non-original spare parts.
- normal wear and tear.
- misuse caused by an untrained person's improper actions.
- alterations made without the manufacturer's permission.



Written authorization must be requested from the manufacturer for any alterations to the machine.

### **STARTING**

- Familiarize yourself thoroughly with the use, operation and controls of the machine and its equipment before starting.
- Familiarize yourself with the capacities and limitations of the machine and its equipment.
- Do not use the machine unless you are completely familiar with its operation.
- Be aware of the machine's danger zones.
- During operation, prevent bystanders from entering the danger zone.
- Ensure that each operator has the necessary safety equipment, such as a helmet, safety goggles, work safety boots and suitable protective clothing.
- Never wear loose clothing around moving parts.
   Protect long hair!
- Ensure that work is carried out according to the stipulations of applicable occupational health and safety legislation.
- Before starting up or using the machine, ensure that it cannot cause a risk to other people or property.
- Perform a safety check on the machine before every use. If you observe any faults or deficiencies, repair the machine immediately.
- Before operating the machine, ensure that there are no foreign articles in it.
- Place the machine on a hard, level surface for operation. In the winter avoid working in slippery areas.
- Before mounting and using the machine, check the PTO drive shaft for correct condition and attachment.
- Never use a faulty or deficient machine.

### **TRANSPORT**

- Before driving with the machine, ensure the safe mounting of the machine. Make sure that the journals are seating correctly and that the pins are tight. Check the tension of the lower link stabilizers.
- Before driving with the machine, make sure that the required lamps and reflectors as well as the slow moving vehicle sign are attached correctly. Moreover, the lamps should be checked for correct functioning.
- Before driving with the attached machine, make sure that the hydraulic unit of the machine is depressurized (unless otherwise instructed in the operating instructions).
- When driving on public roads, always observe the valid traffic regulations. The travel speed must be adapted to the specific conditions.
- When driving, please take into consideration the additional mass resulting from the machine's weight. It may affect the reactions, the steerability and the braking function of the tractor.
- Please note that the machine rear sways when turning.
- Pay attention to the machine's height near bridges or other height restricting objects.
- When backing off, the machine may obstruct the rear view. Exercise extreme caution. If necessary, ask a flagman to help you; he can indicate the required distances.
- It is prohibited for other people to ride on the machine.

- Never insert any body part into the machine with the engine running.
- If any faults arise that may jeopardize occupational safety, turn off the machine.
- During operation, the machine's operator is responsible for safety in the whole work area. Work may not be carried out in the presence of any factors that jeopardize occupational safety.
- Exercise extreme caution when hitching / unhitching the machine from a tractor/trailer.



The machine's operator must have constant, unobstructed visibility of the work area. If this is not possible, the operator must work with an assistant.

- Look out for moving parts when the machine is in operation.
- Secure the machine against unauthorized and accidental operation (e.g. moving when parked) whenever it is left unattended.
- Never leave the machine running unattended.
- Avoid causing fast, stroke-like loading.
- Never exceed the given operating values.
- All safety and warning signs on and in the machine must be legible and intact.
- The machine may not be operated by persons who are unwell or under the influence of drugs or alcohol.

### **OPERATION**



Many occupational accidents take place in abnormal circumstances. Therefore it is important to take into account all the possible circumstances that may arise during operation of the machine.

 Depending on the machine's type, it will have diverse safety devices and protectors. These are meant to protect the machine and its operator, and they must never be removed or altered. Never start up or use the machine without all the safety devices and protectors in place. Also check the universal joint's safety equipment and joins.

### **MAINTENANCE**

- The machine may only be serviced and repaired by professionals.
- Electrical and hydraulic faults may only be repaired by authorized professionals.
- In cases requiring welding, contact the manufacturer.
- Turn off the tractor engine and disconnect the universal joint before beginning service or maintenance actions.
- Before any maintenance work, turn the main power switch of the tractor to OFF.
- Ensure that there is no pressure in the hydraulic system.
- Take out the key from the tractor's ignition for the duration of the servicing or maintenance. Check that the power is off from the machine you are working on.

- When servicing the machine, place it on a level surface and ensure that it cannot be moved.
- Observe the service intervals and annual safety inspections.
- All spare parts and equipment must fulfill the manufacturer's requirements. This can be guaranteed by using original parts.
- Put all safety devices back into place immediately once servicing or maintenance is complete.



When lifting the machine, check that the lifting/hoisting equipment is in perfect working order. Check the weight of the machine before lifting it. Choose lifting trajectories so that they do not cause any danger.

Many countries have specific legislation on lifting, hoisting cables and hoists. Always comply with local safety regulations.

### **OILS AND LUBRICATION**

- Always use the oil types recommended by the manufacturer. Other types of oil may cause faults or improper operation of the equipment, which could lead to serious damage to people or property.
- Never mix different liquids or oils.
- Always follow the manufacturer's lubrication instructions.
- Use control equipment carefully until the hydraulic oil has had time to reach its operating temperature.

### SAFETY INSTRUCTIONS FOR HYDRAULIC CIRCUITS

- 1. Work on hydraulic equipment may only be carried out by professional hydraulic engineers.
- 2. Be cautious when using the equipment in cold conditions.
- 3. Check the machine for leaks. Do not use the machine if there is a leak from any system. Check all hydraulic hoses particularly those which are bent during use and replace any that are in poor condition or have leaks. Ensure that all joins are tight and that the lines are not damaged. Check that all protective caps and filler caps are closed properly. Check the hose sheathing for damage.

- 4. Check that all hose connectors, lengths and qualities comply with applicable requirements. When replacing or repairing hoses, use original parts or hoses and connectors recommended by the manufacturer. Check particularly that the pressure classes of the hoses and connectors are suitable to the operating pressure levels.
- Checkthatallsafetydevicessuchaspressurereliefvalves, etc., are in place and work properly. Familiarize yourself with their use. Safety systems may never be bypassed.
- Check the main hydraulic parts daily, and always after a fault. Replace any damaged parts immediately.
- 7. If a component is damaged, clean it before repairing it. Do not use solvents when cleaning parts.
- 8. Do not attempt to carry out repairs that you are not fully familiar with.
- Never carry out repairs of the hydraulic circuit when the system is pressurized. When pressurized, the oil spray can penetrate the skin and cause mortal danger.
- 10. Never work below a device or component that is only being held up by hydraulics. Use separate supports when carrying our maintenance or repairs. Do not disconnect cylinders or their valves until the machine is well supported.
- 11. Most hydraulic oils do not evaporate easily. Risk factors include hot oil, spills and oil mist (pressurized).
- 12. If oil gets into your eyes, rinse with plenty of water and contact a doctor.
- 13. Avoid prolonged or repeated contact with your skin.
- 14. If sprays or contact with the skin cannot be avoided, use protective gloves, goggles and clothing as necessary. Do not use oily clothing.
- 15. Avoid discharging hydraulic oil into the environment, as it can pollute waterways and the groundwater. If biodegradable oil is to be used, please contact the manufacturer beforehand and have the suitability of your equipment for the operation with biodegradable oil confirmed by him before such oil is used.
- 16. Store the oil in sealed containers provided by the manufacturer. Try to transfer the oil directly from its container into the tank.
- 17. If the oil must be passed through other containers, ensure that they are completely clean. Caps, funnels, sieves and filling holes must also be clean.
- 18. Never store oil outdoors, as water could condense in it.
- 19. Always dispose of oil in a suitable container, never into the environment!

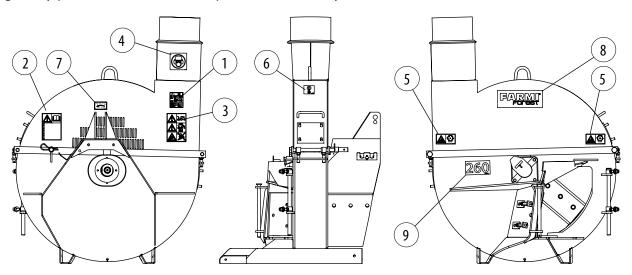
# GENERAL SAFETY INSTRUCTIONS FOR THE CHIPPER



- Please make sure any machine operator has the required personal protective equipment: safety helmet, protective goggles, cut resistant safety boots and required protective clothing.
- The chipper must not be used without being mounted to a tractor. It is prohibited to mount the chipper to another power source.
- It is not permitted to operate the chipper without feed unit or feed hopper.
- It is prohibited to manually load the material to be cut into a feed unit designed for grab loader feed.
- Indoor operation of the chipper is prohibited.
- Always keep a safe distance to the discharge position of the chips.
- Detach the chipper from the tractor before performing any maintenance or repair works. Caution! As a sole exception, adjust the speed of the feed rollers of the hydraulic feed with the machine running. For further instructions, please see the instruction manual of the feed unit concerned.
- Do not remove, lock, disable or modify in any other way the stop lever of the feed unit.
- The feed hopper or the feed unit must not be mounted at a higher or lower position as this would impede the stop lever function.

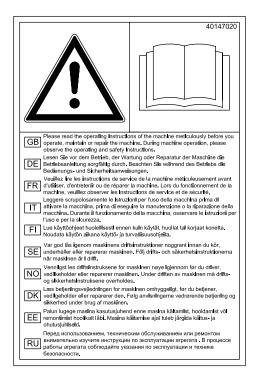
### STICKERS AND PLATES

The following plates and labels must be correctly attached to the chipper. Missing safety plates / labels must be replaced immediately.



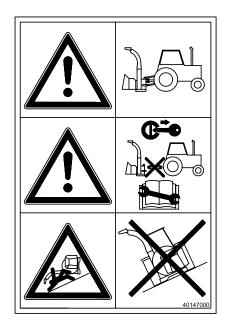
Farmi F Ahmolantie 6 FIN-74510 IIS FINLAND	orest Col	porati	on E	41011750
TYPE F	ARMI CHIF	PER	WEIGHT k	g
MODEL	CH260		561-71:	2
FEEDER	F260		82	
(hand feed)	HF231-HI	M EUR	210	
	HF260-E	Μ	290	
FEEDER	HF260-E	L/SM	262	
(loader feed)	HFC260		740	
SERIAL NO.				
YEAR OF MAI	NUFACTURE	20		
MAX. POWER		115 k	:W	
MAX. HYDR. I	PRESSURE	175 t	раг	
LOIL FLOW NE	EDED	15-5	0 l/min	

1. Machine plate FARMI 260 (41011750)



### 2. CAUTION!

Please read the instruction manuals of the machine meticulously before you operate, maintain or repair the machine. During machine operation, please observe the operating and safety instructions. (40147020)



3. (40147000)

### **CAUTION!**

Before operation, mount the chipper to the 3-point hitch of the tractor.

### **CAUTION!**

Before maintenance and repair, please turn off the tractor and disconnect the PTO drive shaft.

### **CAUTION!**

Before detaching the chipper from the tractor, it must be placed on a level surface.



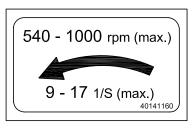
4. Wear personal protective equipment. (40142080).



5. Cutting hazard! (40147010)



6. Lifting point sticker (41014270).



7. SPEED sticker (40141160) Recommended speed range. The rated speed must not be exceeded.



8. FARMI Forest -sticker (40146900).

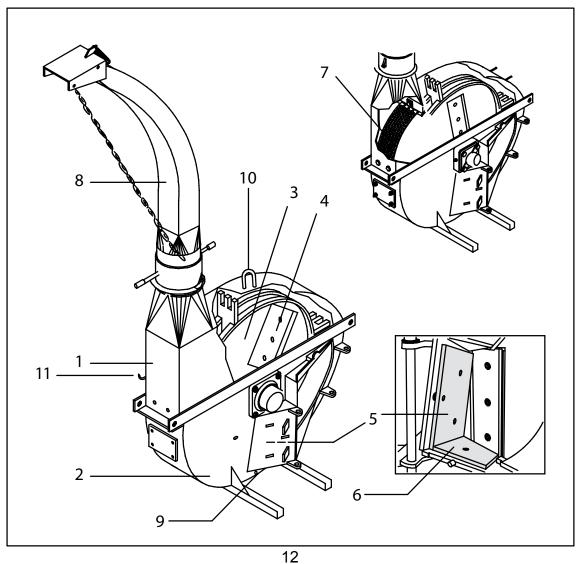


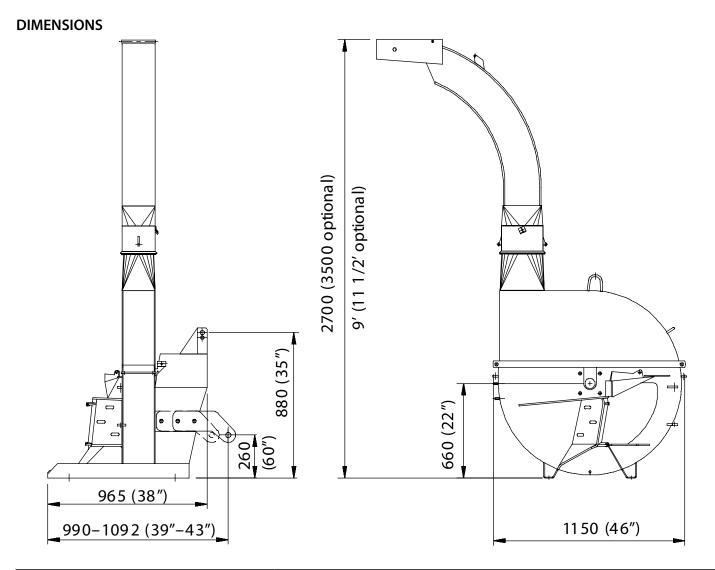
9. 260 (40147130)

### **TECHNICAL INFORMATION**

### **MAIN COMPONENTS**

- 1. UPPER CHAMBER
- 2. LOWER CHAMBER
- 3. DISK
- 4. KNIFE
- 5. VERTICAL ANVIL
- 6. HORIZONTAL ANVIL
- 7. BREAKER/SCREEN
- 8. DISCHARGE PIPE
- 9. WATER DRAINAGE HOLES
- 10. LIFTING POINT
- 11. HOLDING DEVICE FOR THE PTO SHAFT





TECHNICAL INFORMATION	FARMI 260
Туре	Disk chipper
Output	10-40 m <sup>3</sup> /h
Chip lenght	7-25 mm
Max. wood diameter	260 mm
Power demand	40-115 kW
PTO speed	540 / 1000 rpm
Number of knives	2 or 3
Power source	Tractor
Mounting	3-point
Chipper weight	561-712 kg (depending on the accessories)
Disk diameter	1050 mm
Rotor weight	240 kg
Discharge pipe turning	360°
Opening of upper chamber	to two sides
Feeder	manual feed or grab loader feed
Sound pressure level Sound power level CEN/TC144 WG8N16	102 dB (A) 120 dB (A)

### **MOUNTING**

### **LIFTING**



Lifting points for each machine are marked with hook symbols.

Lift only using the proper type of lifting device and ensure that it has an appropriate lifting capacity.

Check the lifting slings, cables, and chains regularly.

Ensure that you know the weight of the load to be lifted and never exceed the lifting capacity stated by the manufacturer of the lifting device.

Select the transport routes for lifting so that the load is not transported over people or a location where people might be.

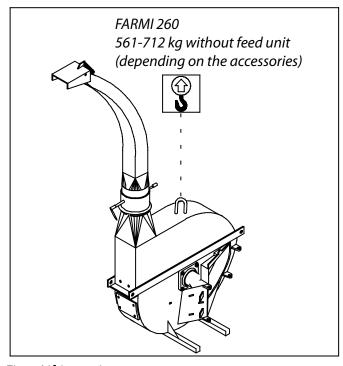


Fig 5. Lifting point

### MOUNTING OF THE DRAWBAR

- Attach the drawbar to the outermost holes of the chipper in order to use as long a PTO shaft as possible; this increases the shaft's service life.
- Mount the chipper on the tractor's 3-point hitch. If the tractor cannot lift the chipper up, or if the front of the tractor becomes too light, move the drawbar to the inner holes.
- Tighten the nuts (M20) to 340 Nm.

### MOUNTING OF THE FEED UNIT

- For hydraulic feed units, a fitting block is supplied which is to be installed between the chipper and the feed unit. Please make sure to install the appropriate fitting block. The fitting block for the feed unit HF231-HM has a height of approx. 180 mm, see fig. 6a. The fitting bock for the feed units HF260-EM, HF260-EL and HFC260 has a height of approx. 135 mm. See fig. 6b.
- The fitting block is installed on the pins in the bottom section of the feed opening. See figs. 6a and 6b.
- Carefully install the fitting block. Make sure the tip
  of the fitting block is seating tightly on the feed
  opening. Make sure the working surface is clean.
  Every time a knife is changed or at least every 100
  operating hours, check the system for vibration
  fatigue failure.
- The instructions for mounting the feed unit are to be found in the separate instruction manual of the feed unit used.
- The feed hopper F260 is mounted without fitting block.

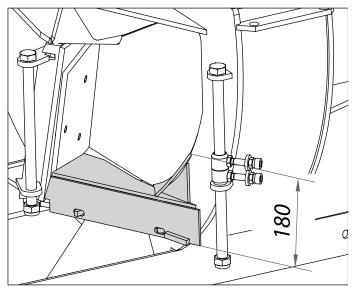


Fig. 6a. Installation of the fitting block HF231

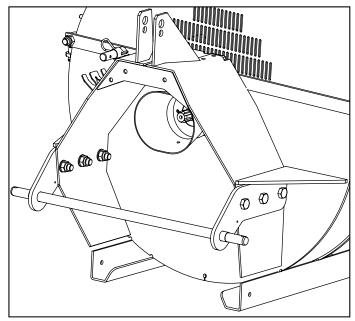


Fig. 5a. Mounting of the drawbar

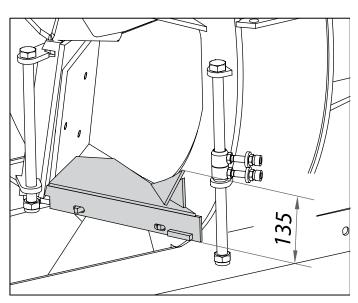


Fig. 6b. Installation of the fitting blocks HF260-EM, HF260-EL and HFC260

### SHORTENING THE PTO SHAFT



The use of too long a PTO shaft with a 3-point hitch could damage the chipper's bearings or the tractor's PTO shaft. Both halves of the PTO shaft must be shortened equally.

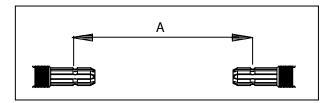


Fig. 8. Measure distance A when the distance between the splined shafts is at its shortest.

### **Recommended PTO shafts:**

- Bondioli & Pavesi A6 + (RA1 with overrunning clutch.)
- Walterscheid W2400 + (F3 with overrunning clutch.)

If the tractor features a PTO brake, an overrunning clutch must be used.

- 1. Mount the machine on the tractor's 3-point hitch.
- 2. Lift the machine with the hitch so that the distance between the splined shafts is at its shortest. Fig. 8.
- 3. First, cut the thicker shield to the correct length (1). Remember the 20-40 mm clearance. Then, cut a similar length from the profile tube (2). Shorten the other PTO shaft half similarly. Remove burrs using a file.
- 4. Insert the inner tube in the outer tube and carefully move the machine up and down. Ensure that the shaft was shortened sufficiently. Check that the shaft has a 20-40 mm clearance. In addition, move the machine sideways and ensure that the PTO shaft does not bottom.

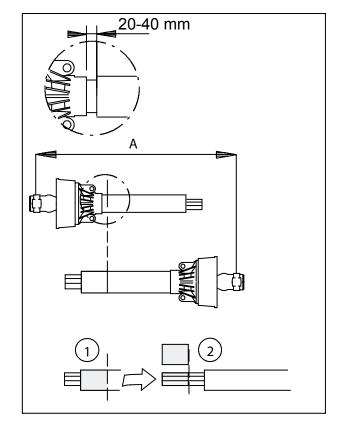


Fig. 9. Shortening the PTO shaft

### **INSTALLING THE SCREEN AND BREAKER**

The chipper can be equipped with a twig breaker or a high-power breaker or optionally with a screen. However, the screen cannot be mounted in conjunction with the breakers.

The breakers are intended to break the chips into smaller pieces before they enter the discharge pipe.

The FARMI 260 chipper can also be used to shred hard plastics. For this purpose, the twig or high-power breaker must be replaced by a screen. The screen prevents excessively large plastic chips from entering the discharge pipe. The screen may only be used for screening thin plastic pieces. The screen must be removed before chipping other materials!

The breakers or the screen are attached inside the upper chamber. The set screws (1) of the lower section are inserted using Nord Lock lock washers (2) and are secured with M16 lock nuts. Tighten the nuts with 170 Nm. The locking screw (4) of the upper section is inserted using a Nord Lock lock washer and is secured with a M16 lock nut which is to be tightened with 200 Nm. After having tightened the fastening elements, secure them using roll pins (5).



Check the welding seams of the twig breaker for damage and inspect them for vibration fatigue failure when changing the knives. Secure the fastening of the breaker using roll pins. Ot-

herwise, the twig breaker may loosen and damage the crushing elements and/or the chamber. Chips thrown out are dangerous for the chipper operator!



Caution! The screen and breakers increase the power demand and thus may decrease the chipper output.



The warranty does not cover defects resulting from:

- misuse of the product
- inadequate maintenance
- modifications of the product made without the manufacture's consent

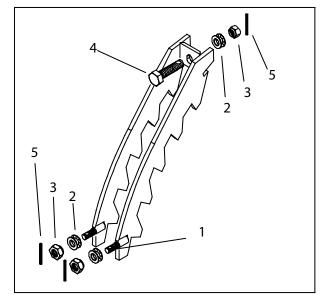


Fig. 10. Secure the fastening with roll pins

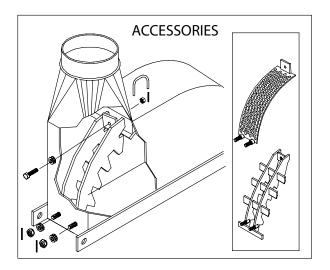


Fig. 11. Installing the screen, twig breaker and high-power breaker

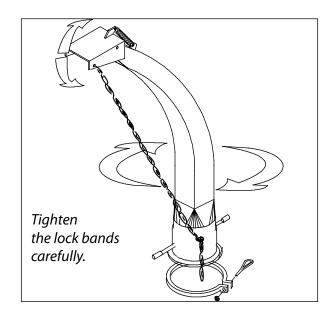
### MOUNTING OF THE DISCHARGE PIPE

- For the installation of the discharge pipe, always use a support of approx. 60 cm height. It is prohibited to climb onto the chipper!
- When installing a long discharge pipe, the pipe must be arranged in its transport position. Two workers are needed for installation.
- Before installing the discharge pipe, place the lock band under the connecting piece of the chipper.
- While standing on the support, lift the discharge pipe to the correct position.
- At the bottom, press the discharge pipe against the connecting piece.
- Carefully tighten the bolt on the lock band to prevent the pipe from rotating during operation. Insert the cotter pin.

If the chipper is equipped with an optional discharge pipe control device, the latter must be mounted on the chipper before the discharge pipe. First, the control device is mounted to the chipper using the lock band and then the discharge pipe is installed to the control device as described above.



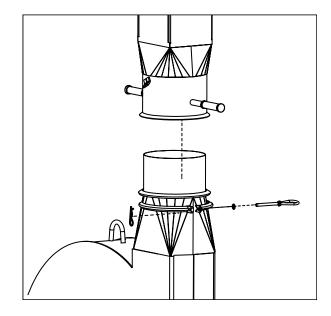
Direct the discharge pipe so that the thrown out chips do not pose a risk to the operator of the chipper or to or anyone else. Always keep a safe distance to the discharge position of the chips.





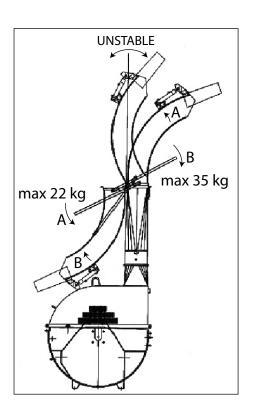
When swiveling the long discharge pipe into the transport/operation position, exercise extreme caution.

Please note the force required!



### ADJUSTING THE DISCHARGE PIPE AND LID

- Open the band tightening bolt. Turn the pipe in the desired direction. Tighten the bolt.
- Adjust the lid by changing the chain length.



# MOUNTING OF THE CHIPPER AND PRE-OPERATION INSPECTIONS

- For mounting or dismounting the chipper, always turn off the tractor and apply the parking brake before entering the area between chipper and tractor.
- Before connecting the hydraulic hoses, make sure the hydraulic ports of the tractor are depressurized. Moreover, ensure the correct connection of the hydraulic supply and return lines on the tractor.
- Before switching on the electric power supply, check the plug, the socket and the visible cables for damage.
- Check the PTO drive shaft for damage and make sure it has the appropriate length.
- Make sure the connection shields of the PTO drive shaft are seating correctly and the holding chain of the connection shields is fastened.
- Make sure all protective and safety devices of the chipper are installed. Never remove any protective device during operation.
- Before operation, please make sure there are no foreign objects in the feed unit.
- Before operation, please make sure there are no foreign objects in the chipper. Rotate the shaft to make sure that the cutting disk can rotate freely.
- Make sure that the water drainage holes on the lower chamber are open and that the disk is not frozen up.
- During operation, the chipper must stand on level and hard ground.
- As compared to the tractor, the chipper must not be lowered excessively. Otherwise, the PTO drive shaft connection may loosen during operation.
- Direct the discharge pipe so that the thrown out chips do not pose a risk to the operator of the chipper or to or anyone else. Always keep a safe distance to the discharge position of the chips.

### STARTING THE CHIPPER

- Start the chipper with caution while operating the tractor at low speed. Slowly increase the speed until the required chipping speed has been achieved (540/1000 rpm). CAUTION! Do not exceed the max. chipper speed of 1000 rpm.
- Now, the chipper is ready for operation.

### STOPPING THE CHIPPER

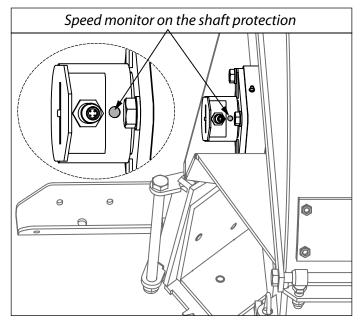
Slow the tractor engine speed to idle before disengaging the PTO. This is especially important with tractors featuring a PTO brake. Turn the PTO control lever slowly to the OFF position.



When the chipper is shut down, the cutting disk continues to rotate - just like a flywheel - after the PTO has been disengaged. Please wait until the disk has stopped completely before performing any further actions.

The chipper requires approx. 2 ½ minutes to slow down from maximum speed to complete stop (1000 rpm -> 0 rpm).

The shaft protection of the chipper is equipped with a speed monitor which indicates coasting down of the cutting disk after the PTO has been switched off (see below figure).



### **CHIPPING**



During chipping, please observe the following safety instructions:

- Always read the operating and safety instructions of the used feed unit before operating the chipper.
- The danger zone of the chipper is approx. 20 m.
- Chipper with grab loader feed: During operation, neither the operator nor other people may stay in the danger zone. The chipper is operated from the driver seat in the tractor's safety cab. Before engaging the tractor PTO and starting the feed unit, make sure no one is in the chipper's danger zone. During operation, the danger zone must be safeguarded to prevent unauthorized people from entering the danger zone If necessary, operation must be interrupted. Turn off the feed unit and disengage the tractor's PTO before you leave the safety cab. It is strictly prohibited to manually load a chipper which is designed for grab loader feed!
- Chipper with manual feed: Never work in front of the feed hopper. Stand on the left side of the feed hopper when feeding. During operation, the danger zone must be safeguarded to prevent unauthorized people from entering the danger zone If necessary, operation must be interrupted.
- The operator of a chipper with manual feed must wear the following personal protective equipment: safety helmet, ear protection, protective goggles, cut resistant safety boots and required protective clothing.
- The operator of a chipper with grab loader feed must wear an ear protection, cut resistant safety boots and required protective clothing.
- Never hold any part of the body into the feed hopper or into another part of the chipper with the machine running.
- Before feeding in the material to be chipped, ensure that the wood fed into the chipper is free from metal or soil (such as nails, stones, etc.).
- Do not use the chipper at temperatures below
   -20 °C. This is to avoid damage due to brittleness
   especially of the knives -caused by the cold.
- Avoid chipping wood that is frozen solid; otherwise, excessive stress will be exerted on the chipper and self-feeding will be impaired.

 FIRE HAZARD! Always keep adequate fire-fighting equipment on hand when using the chipper. Regularly check the surface temperature of the chipper. If the chipper suddenly heats up abnormally, stop the chipper and determine the cause of overheating. Regularly, check the temperature of the bearings. Pay special attention to careful maintenance, and keep the chipper free from dust. If the chipper starts smoking, pour water into the feed hopper.

#### STORAGE OF THE CHIPPER

- Before detaching the chipper from the tractor, park it on level and hard ground. Take appropriate measures to prevent the chipper from moving or falling.
- If the chipper is to be stored for a long period, lubricate the knives e.g. with petroleum jelly.
- Take appropriate measures to keep the water drainage holes on the lower chamber open.

#### **MAINTENANCE**

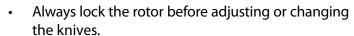
### PERIODIC MAINTENANCE

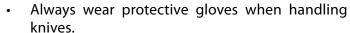


# Before beginning maintenance and repair

- place the chipper onto level and hard ground and make sure it cannot tip;
- turn off the tractor and disconnect the PTO drive shaft;
- disconnect the hydraulic hoses from the tractor;
- familiarize yourself with the machine-specific maintenance and repair instructions.

In case of doubt, please contact the manufacturer.





### **LUBRICATING THE BEARINGS**

- The bearings are lubricated at the factory, and a similar lubricant should be used for subsequent lubrication (Shell Alvania Grease R 3. or Kendall L427). An excessive amount of grease causes overheating and impairs lubrication.
- Lubricate the bearings every 200 working hours or at least once a year. See Fig. 12..

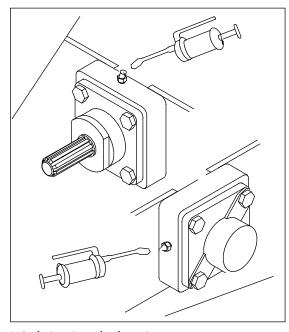


Fig 12. Lubricating the bearings

### LUBRICATING THE PTO SHAFT

- Lubricate the PTO shaft prior to operation and regularly, as shown in Fig. 13.
- Lubricate the inner surface of the PTO shaft, accessed via the outer profile tube.
- Lubricate the shield tubes in wintertime to prevent them from freezing and sticking.

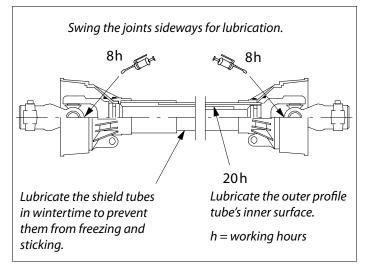


Fig 13. Lubrication points and intervals for the PTO shaft

### **PERIODIC INSPECTIONS**

- With new machines, check the mounting bolts for tightness after the first operating hour, tightening them if necessary. Tightening torques are shown in Table 2.
- Check the mounting bolts for tightness once a week.
- The knife-to-anvil clearance is adjusted to the specified values.

### **MAINTENANCE**

Check the tightness of the bolts and tighten if necessary. Check the tightness of all fastenings once a week, and the fastenings on a new machine after one hour of use. Tighten as shown in the diagram below.

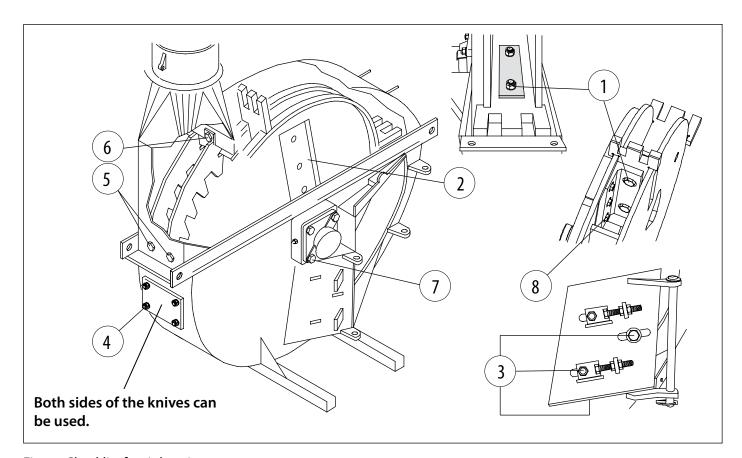


Fig 14. Checklist for tightening

lter	n	Width across flats, mm	Tightening torque, Nm
1	Knife bracket fastening bolts	30	250
2	Knife fastening bolts	19	78
3	Anvil fastening bolts	24	200
4	Breaker blade fastening bolts	19	80
5	Lower breaker and screen fastening nuts	24	170
6	Upper breaker and screen fastening nuts	24	200
7	Bearing fastening bolts	24	200
8	Knife fastening nuts	19	68

*Table 2. Tightening torques* 

### KNIFE AND ANVIL MAINTENANCE



Read the safety instructions. The disk continues rotating like a flywheel after the PTO is disengaged.

Please wait until the disk has stopped completely before performing any further actions.



When manually turning the rotor, never touch the edges of the lower chamber or other parts where there is the risk for the hands to get squeezed between the lower chamber and the rotor knives or blades.

### **OPENING AND REMOVING THE UPPER CHAMBER**

- Remove the lock bolt (M6) (1).
- Loosen the hinge bushing nuts (M20) (2) slightly.
- Pull the hinge pin (3) out.
- Turn the upper chamber to the side.
- Lock the disk with the lock bolt. See Fig. 16.
- Remove the feeder or turn it to the side.



Exercise extreme caution when opening the upper chamber. Take appropriate measures to keep the upper chamber from falling down.

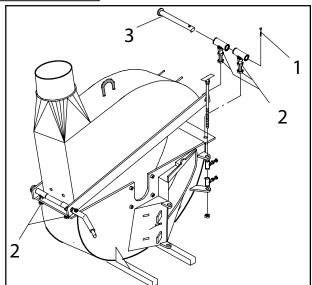


Fig 15. Turning the upper chamber

### REMOVING THE KNIVES FROM THE KNIFE BRACKETS

- 1. Remove the knife lock nuts (M12). Fig. 16.
- 2. Remove the knife fastening bolts (M12). Turn the wrench in such a way that your hands would not hit the knife if the wrench should slip. Fig. 17.



Wear protective gloves when handling knives or anvils.

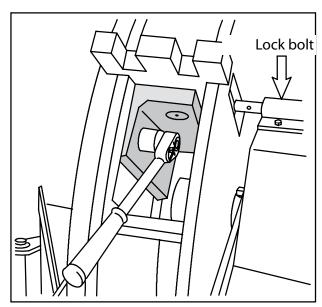


Fig 16. Locking the disk and removing the lock nuts

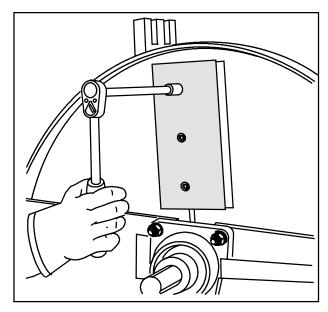


Fig 17. Removing the knife fastening bolts

#### SHARPENING THE KNIVES



Sharpen all knives equally. This ensures disk balance.

Avoid heating the knife during sharpening.

The hone angle is ground to a 45° angle with two to three longitudinal strokes, using a level sharpening stone

Burrs are removed from the knife fastening bolt side, grinding with the surface. Fig 20.

The knives need sharpening when:

- The self-feeding of wood has decreased
- The power demand has increased
- The chip surface is rough
- The individual chips have become smaller.

Normally, the knives can be sharpened several times without actually being removed (with, e.g., a sharpening stone or belt grinder).

More thorough conditioning is carried out with a surface grinder, with the knives removed.

The new knives are sharpened to a concave shape, R=200. The sharpening angle is 30° and hone angle is 45°. The hone angle prevents the edge from breaking. Fig. 18.

It is recommended that the knives be sharpened to a concave shape. If this is not possible, the knife is sharpened to a flat profile. Fig. 19.

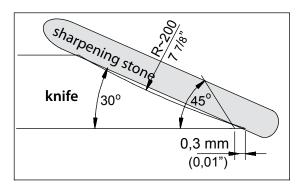


Fig 18. The profile of a concave knife

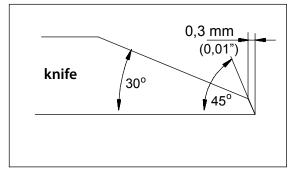


Fig 19. A knife with a flat profile

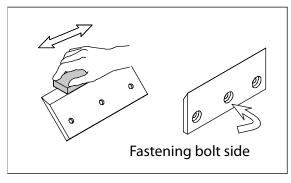


Fig 20. Final grinding of the knife

### **REMOVING THE ANVILS**

The chipper features both a vertical and horizontal anvil. To remove the anvils, open the fastening bolts (A) and (B) (M16). The horizontal anvil fastening bolt (B) is located below the feed opening. Fig. 21.

### **SHARPENING THE ANVILS**

If you notice wear or rounding of the inner edge of the vertical anvil, sharpen the anvil so that the original angle is retained. Fig. 22.

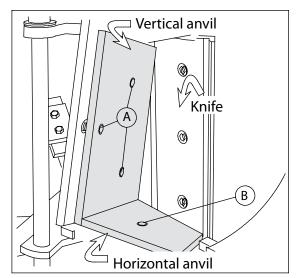


Fig 21. Anvil fastening bolts

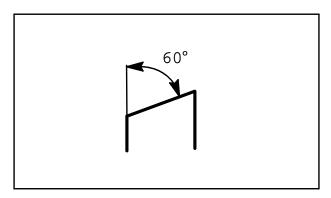


Fig 22. Vertical anvil profile

### **INSTALLING THE KNIVES AND ANVILS**

- Check the condition of the fastening bolts and nuts.
- Install the knives and anvils and tighten the fastening bolts to the torques specified in Table 2.
- Adjust the knife-to-anvil clearance.



The need for adjusting the anvils is determined by the amount the knives are sharpened. Always check and, if necessary, adjust the clearance between knives and anvils:

- After a heavy sharpening;
- If the knives were removed for example, due to sharpening;
- If new knives are replaced;
- If chip length is adjusted.

Check the clearance with a feeler gauge.

- Turn the disk until the knife edge is aligned with the vertical anvil.
- Measure the knife-to-anvil clearance; adjust if necessary.
- 1. Loosen the vertical anvil fastening bolts (M16) (A).
- 2. Adjust the clearance between the knife and vertical anvil to 1.5 mm with the adjusting nuts (M12) (C).
- 3. Tightentheadjustingboltnuts(M12).Tightenthean-vil fastening bolts to 200 Nm (20 kpm).
- 4. Checkthattheknife-to-anvilclearanceisthesamefor all knives.

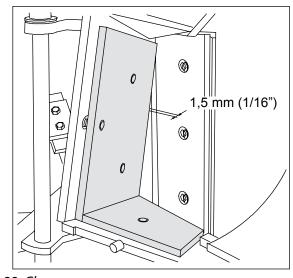


Fig 23. Clearance

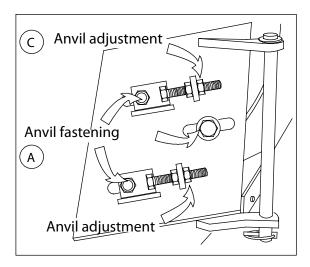


Fig 24. Anvil fastening and adjustment

### **ADJUSTING THE CHIP LENGTH**

The chip length is determined by the distance between the knife and the cutting disk (see fig. 25). The chip length is adjusted by changing the position of the knife brackets. The chip length can be adjusted between 7 and 25 mm. (The chip length can be adjusted to a minimum value of 3 mm. However, this is not recommended as the hydraulic oils may heat up excessively in this case.) See fig. 26.

- 1. See Section "Opening and removing the upper chamber" for further instructions.
- 2. To increase the chip length, loosen the anvil fastening bolts (A) and (B) (M16) first.
- 3. Move the anvils further from the disk.
- 4. Loosen the knife bracket fastening nuts (M20). See Fig. 27. Adjust so that the distance from both ends of the knife to the edge of the disk is equal. If necessary, tap the knife bracket with wood or a rubber hammer. See Fig. 28.
- 5. Tighten one knife bracket nut and check the other end of the knife by measuring.

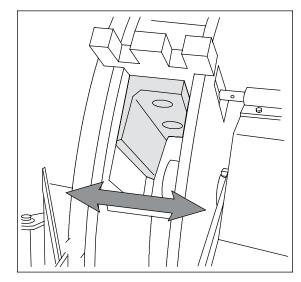


Fig 26. Knife bracket adjustment direction

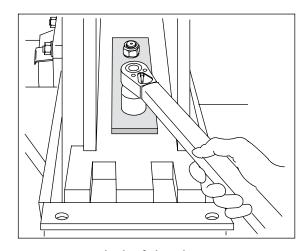


Fig 27. Loosening the knife bracket nuts

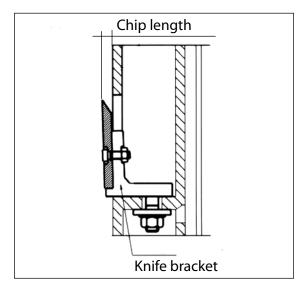


Fig 25. Chip length

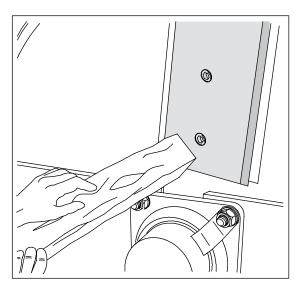


Fig 28. Moving the knife bracket

### The remaining knives are adjusted as follows:

- 1. Measure the knife-to-chamber distances for both ends of the adjusted knife. The knife-to-chamber distance is the distance between the edge of the knife and the frame chamber, see Fig. 29.
- 2. Theremaining knives are adjusted so that the knifeto-chamber distances of all knives are equal.
- 3. Tightentheknifebracketfasteningboltsto 250 Nm.
- 4. Check all knives by measuring.
- 5. Check the knife-to-anvil clearances according to Section "Adjusting and checking the knife-to-anvil clearance".

### REPLACING THE SPLINED SHAFT

- 1. Remove the upper chamber.
- 2. Remove the bearings (Fig 32). Welding damages the bearings.
- 3. Lift the cutting disk using a crane.
- 4. At a distance of 2 mm from the shaft end, grind a groove of 15 mm depth into the shaft See fig 30.
- 5. Heat the joint area, if necessary.
- 6. Move the splined shaft so that it comes loose and can be removed.
- 7. Clean the shaft hole and install the new shaft.
- 8. Make a fillet weld up to the surface level with three runs. Use ESAB 68.81, OK 48, OK Femax 38.65, or equivalent filler.

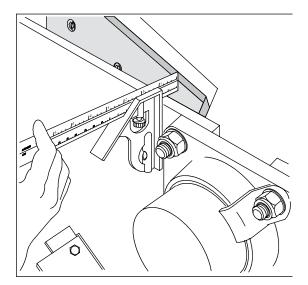


Fig 29. Knife-to-chamber distance

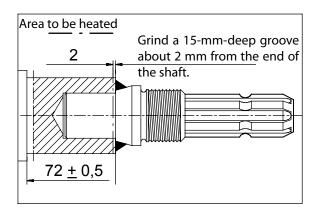


Fig 30. Replacing the splined shaft

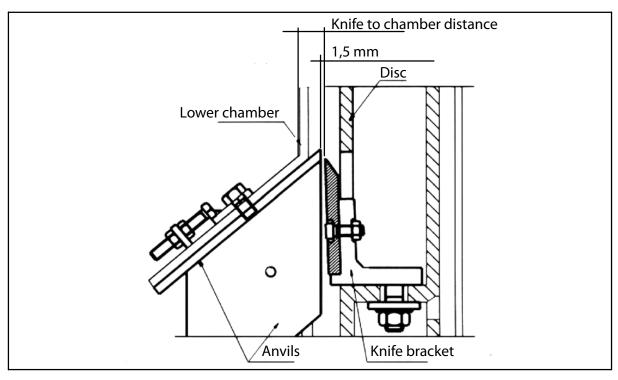


Fig. 31. Cross-sectional view of cutting disk and knives

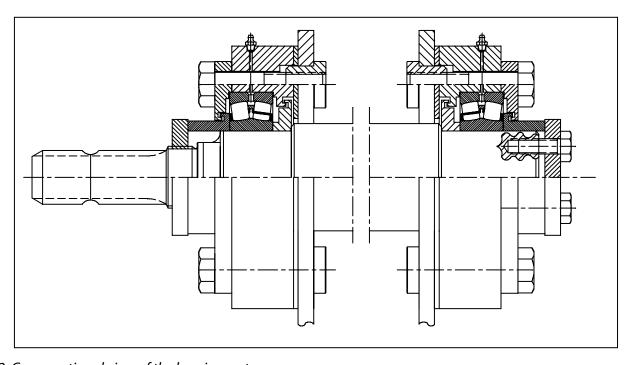
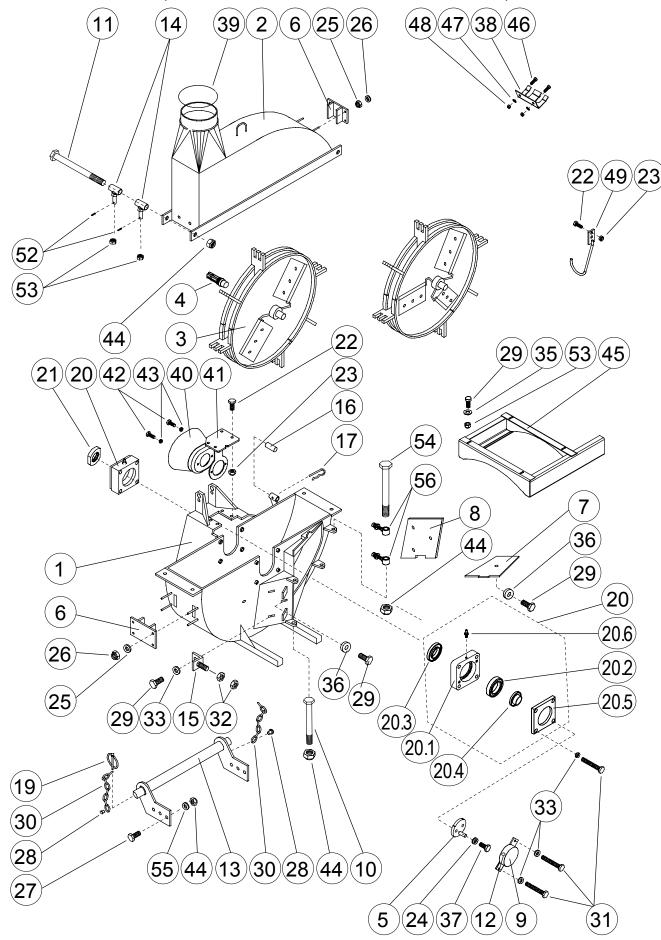
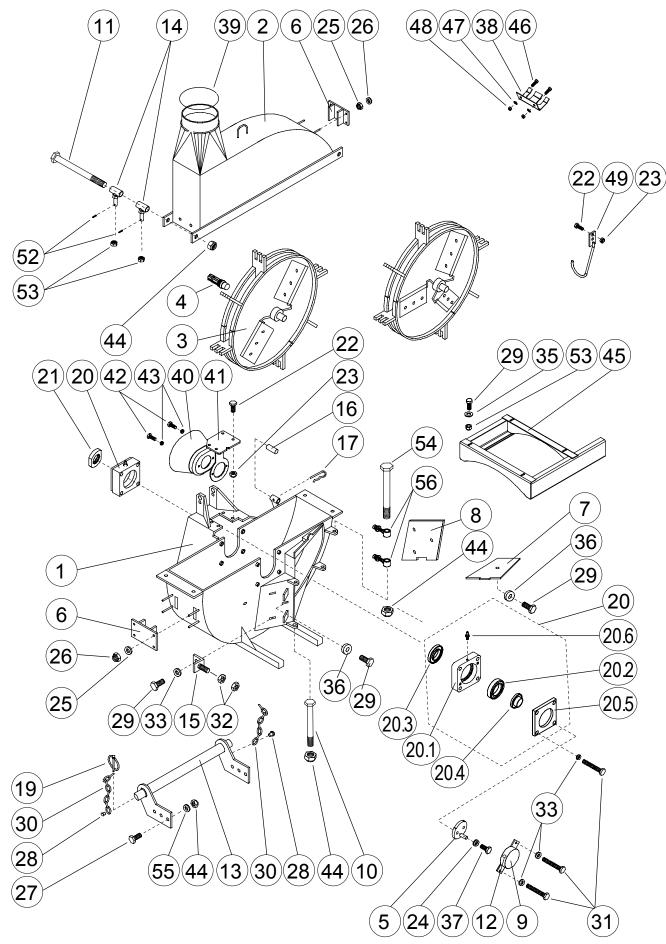


Fig. 32. Cross-sectional view of the bearing system

When ordering spare parts, please indicate the machine's type and serial number from the machine plate, spare part's order number, description and quantity required. Example. CH260, serial number xxxxxxx, 43298410, knife, 2 pc

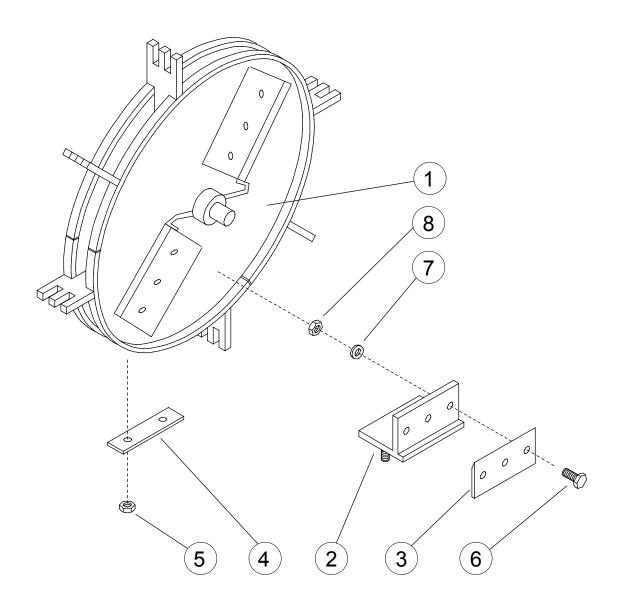


Part	Order no	Description	Remarks	Qty
1	13297010	Lower chamber		1
2	43297620	Upper chamber		1
3	33298590	Disk 2-knife	from machine: 3295001	1
	13298580	Disk 3-knife	from machine: 3295001	1
4	43483870	Splined shaft	from machine: 3295001	1
5	43563080	Flange		1
6	33296470	Twig blade		2
7	43297090	Horizontal anvil		1
8	43297080	Vertical anvil		1
9	33296290	Shield		1
10	52063930	Screw	M20x320 DIN931 88ZN	1
11	52062437	Screw	M20X260 DIN931 88ZN	2
12	54934170	Plug	rubber, D20	1
13	43298050	Draw bar		1
14	43482430	Hinge bushing		4
15	43291103	Anvil adjuster		2
16	43291137	Pin	L 116	1
17	52842143	Split pin	5X105	1
18	03487760	Chain	(USA)	1
19	52842150	Ring cotter	10X45	2
1		Ta		
20	03296370	Bearing unit, complete		2
20.1	33296020	Bearing housing		1
20.2	54523212	Bearing		1
20.3	43296060	Labyrinth ring		1
20.4	43296120	Labyrinth sleeve		1
20.5	43296070	Cover		1
20.6	52401015	Grease nipple	AR1/8	1
21	43296360	Axle nut		1
22	52060233	Screw	M10X30 DIN933 88ZN	5
23	52117108	Lock nut	M10 DIN985 8ZN	5
24	52214251	Lock washer	M10 NORD-LOCK	2
25	52211059	Spring washer	M12 DIN127 ZN	8
26	52117124	Lock nut	M12 DIN985 8ZN	8
27	52062221	Screw	M20X50 DIN933 88ZN	4
28	52832045	Rivet	4,8X19 (USA 4 pc)	2
29	52062106	Screw	M16X30 DIN933 88ZN	8
30	03291143	Chain	250	2



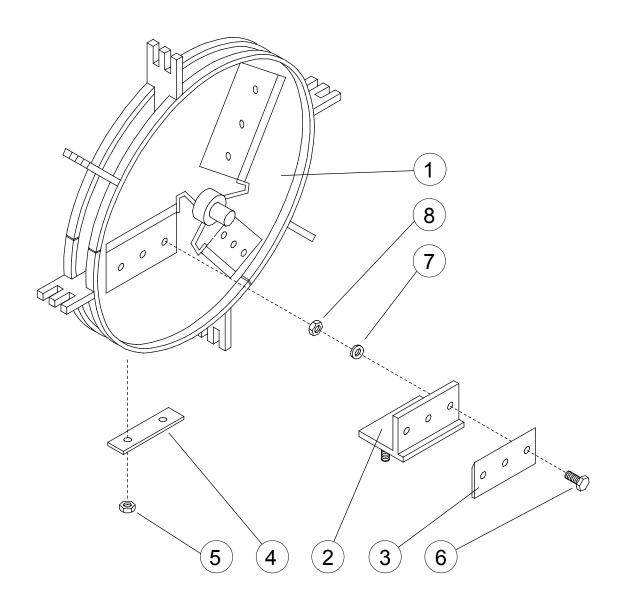
Part	Order no	Description	Remarks	Qty
31	52062148	Screw	M16X70 DIN931 88ZN	8
32	52110053	Nut	M12 DIN934 8ZN	4
33	52200078	Washer	M16 DIN126 58ZN	8
34	-	-	-	-
35	52200470	Washer	M16 DIN 7989 ZN	4
36	43292739	Washer	9	2
37	52060258	Screw	M10X40 DIN933 88ZN	2
38	43482290	Hose holder		1
39	43298060	O-ring		1
40	43511780	Cover of the universal shaft		1
41	43299400	Fastener of cover		1
42	52060126	Screw	M8X20 DIN933 88ZN	2
43	52200334	Washer	M8 DIN440 ZN	2
44	52117207	Lock nut	M20 DIN985 8ZN	8
45	33485040	Frame		1
46	52060175	Screw	M8X25 DIN933 88ZN	2
47	52200037	Washer	M8 DIN126 58ZN	2
48	52117082	Lock nut	M8 DIN985 8ZN	2
49	43130376	Hook		1
50	-	-	-	-
51	-	-	-	-
52	52840279	Cotter pin	4X24 DIN1481	4
53	52117165	Lock nut	M16 DIN985 8ZN	8
54	43482400	Screw	M20X400 DIN931 88ZN	1
55	52200086	Washer	M20 DIN126 58ZN	4
56	43482440	Locking bolt		2

### DISK, 2-KNIFE



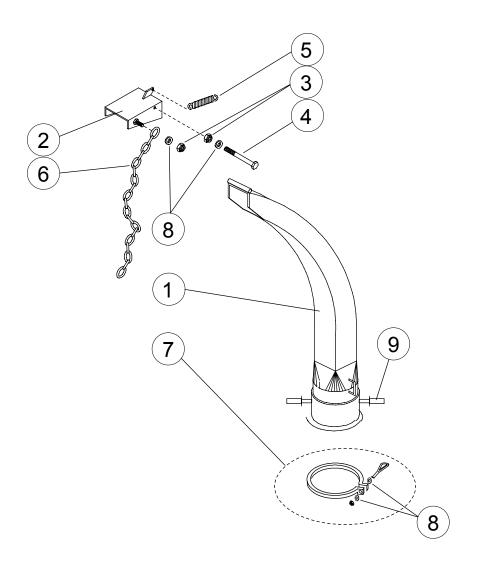
Part	Order no	Description	Remarks	Qty
1	33298590	Disk	2-knife	1
2	23293910	Knife bracket		2
3	43298410	Knife		2
4	43290741	Support plate		2
5	52117215	Lock nut	M20X1.5,10.9 DIN985	4
6	52063592	Screw	M12x35 DIN933 10.9ZN	6
7	52211059	Spring washer	M12 DIN127 ZN	6
8	52111051	Nut	M12 DIN936 8ZN	6

### DISK, 3-KNIFE



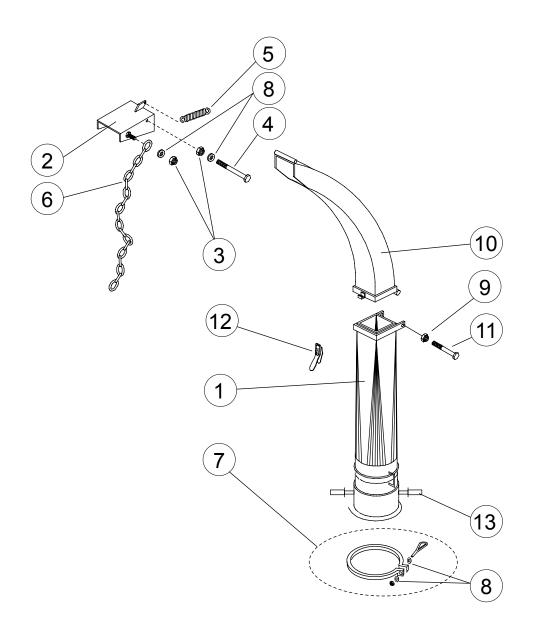
Part	Order no	Description	Remarks	Qty
1	13298580	Disk	3-knife	1
2	23293910	Knife bracket		3
3	43298410	Knife		3
4	43290741	Support plate		3
5	52117215	Lock nut	M20X1.5,10.9 DIN985	6
6	52063592	Screw	M12x35 DIN933 10.9ZN	9
7	52211059	Spring washer	M12 DIN127 ZN	9
8	52111051	Nut	M12 DIN936 8ZN	9

### 03296450 SHORT DISCHARGE PIPE, COMPLETE



Part	Order no	Description	Remarks	Qty
1	23296430	Discharge pipe		1
2	43314509	Lid		1
3	52117108	Lock nut	M10 DIN985 8ZN	2
4	43314533	Hinge screw		1
5	94612082	Tension spring	DU26 DL2,6 L106	1
6	03314556	Chain	L1600	1
7	43482320	Lock band	complete	1
8	52200045	Washer	M10 DIN126 58ZN	2
9	54924014	Handle	black, pvc	2

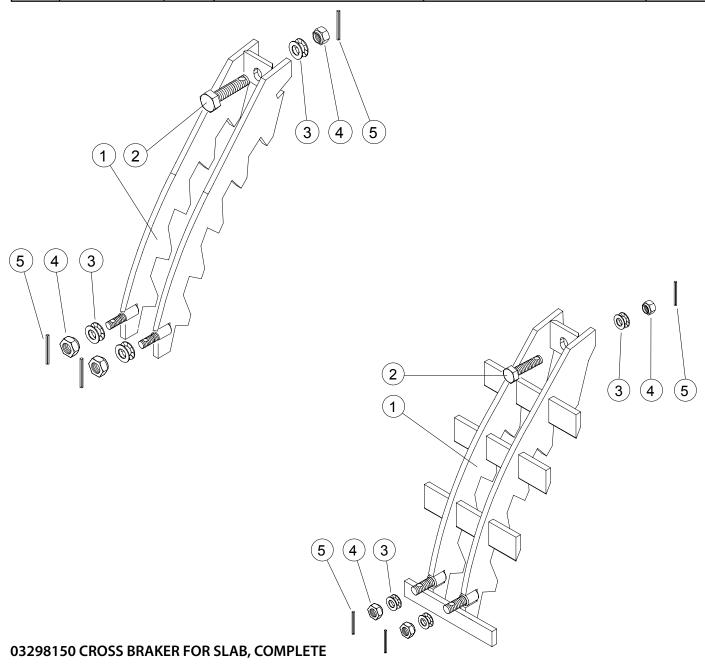
### 03297370 LONG DISCHARGE PIPE, COMPLETE



Part	Order no	Description	Remarks	Qty
1	33297360	Vertical pipe		1
2	43314509	Lid		1
3	52117108	Lock nut	M10 DIN985 8ZN	2
4	43314533	Hinge screw		1
5	94612082	Tension spring	DU26 DL2,6 L106	1
6	03312550	Chain	L2300	1
7	43482320	Lock band	complete	1
8	52200045	Washer	M10 DIN126 58ZN	2
9	52117124	Nut	M12 DIN985 8ZN	1
10	33312513	Curved pipe		1
11	43310796	Hinge screw		1
12	54712088	Locking handle		1
13	54924014	Handle	black, pvc	2

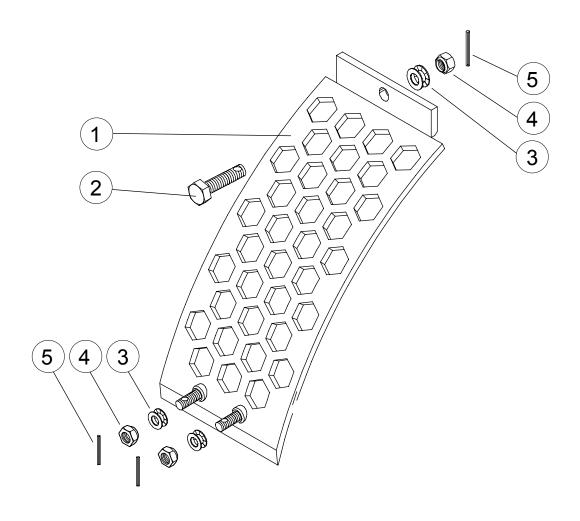
### 03297650 TWIG CRUSHER, COMPLETE

Part	Order no	Description	Remarks	Qty
1	43297560	Twig crusher		1
2	43297680	Locking bolt		1
3	52214285	Lock washer	M16 NORD-LOCK	3
4	52117165	Lock nut	M16 DIN985 8ZN	3
5	52840071	Cotter pin	4X22 DIN1481	3



Part	Order no	Description	Remarks	Qty
1	43298140	Cross braker for slab		1
2	43297680	Locking bolt		1
3	52214285	Lock washer	M16 NORD-LOCK	3
4	52117165	Lock nut	M16 DIN985 8ZN	3
5	52840071	Cotter pin	4X22 DIN1481	3

### 03297630 PLASTIC SHREDDING SCREEN, COMPLETE



Part	Order no	Description	Remarks	Qty
1	43297640	Plastic shredding screen		1
2	43297680	Locking bolt		1
3	52214285	Lock washer	M16 NORD-LOCK	3
4	52117165	Lock nut	M16 DIN985 8ZN	3
5	52840071	Cotter pin	4X22 DIN1481	3


### WARRANTY

Farmi Forest Oy grants a 12-month warranty on all of its products, covering material and manufacturing faults. The warranty comes into effect on the product's delivery date.

The manufacturer is not liable for damages caused by:

- misuse of the product
- alterations or repairs made without the manufacturer's permission
- insufficient maintenance
- non-original parts

The warranty does not cover wearing parts.

Send faulty parts, carriage paid, to the manufacturer for inspection. Repairs will be conducted by Farmi Forest Oy or an authorized expert. The warranty is valid only if the bottom part of this page is filled in and returned to the manufacturer within 14 days of receipt of the product.

By returning the warranty certificate, you confirm that you have read and understood the instruction manual that came with the product.

Г	_	 _
1		



Farmi Forest Corporation Ahmolantie 6 FIN-74510 IISALMI FINLAND

PRODUCT REGISTRATION FORM
Date of delivery:/ 20
Dealer:
Dealer's address:
Dealer's tel:
Product and type:
Serial number:
<b>*************************************</b>
Return to the manufacturer
Date of delivery:/20
Dealer:
Dealer's address:
Dealer's tel:
Customer:
Customer's address:
Customer's tel:
E-mail:
Product and type:
Serial number:



Farmi Forest Corporation Ahmolantie 6 FIN-74510 lisalmi, Finland Puh. +358 (0)17 83 241 Fax. +358 (0)17 8324 372 www.farmiforest.fi