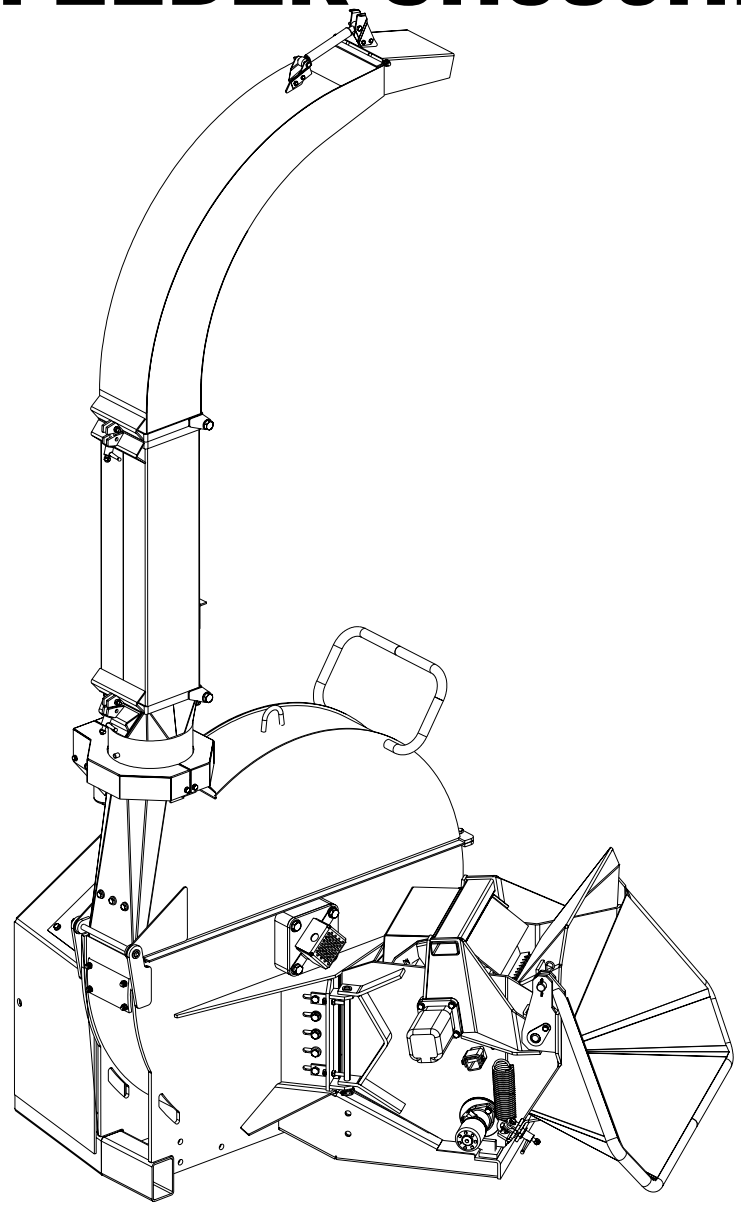
OPERATION, MAINTENANCE AND SPARE PARTS MANUAL

CHIPPER AND HYDRAULIC FEEDER CH380HF



READ THIS OPERATION AND MAINTENANCE MANUAL CAREFULLY BEFORE USING THE MACHINE

FARMI® Forest
Made in Finland

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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.

CE

EC DECLARATION OF CONFORMITY

Manufacturer:
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 Farmi feed hopper

Machine type:
Wood chipper: CH380HF / HFC

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

The following additional standards and specifications have been applied for the conceptional design of the machine:
SFS ISO 730-1, SFS ISO 2332

Iisalmi	11.2.2011
(Place)	(date)

Juha Hallivuori

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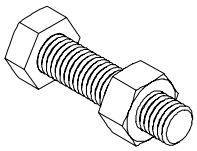
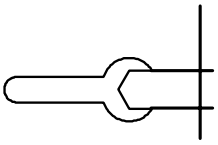
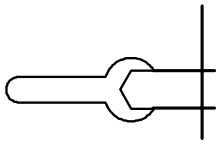
 Thread	 Millimeter	 Inch
M6	10	7/16
M8	13	1/2
M10	17	11/16
M12	19	3/4
M16	24	15/16
M20	30	1 3/16
M24	34	1 7/16

When ordering spare parts, please indicate the machine's type from the machine plate, spare part's order number, description and quantity required.
Example. CH380HF, 43800450, knife, 4 pc

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 operation, ensure the machine is properly connected.
- Never use a faulty or deficient machine.

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.
- 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.

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.
- 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

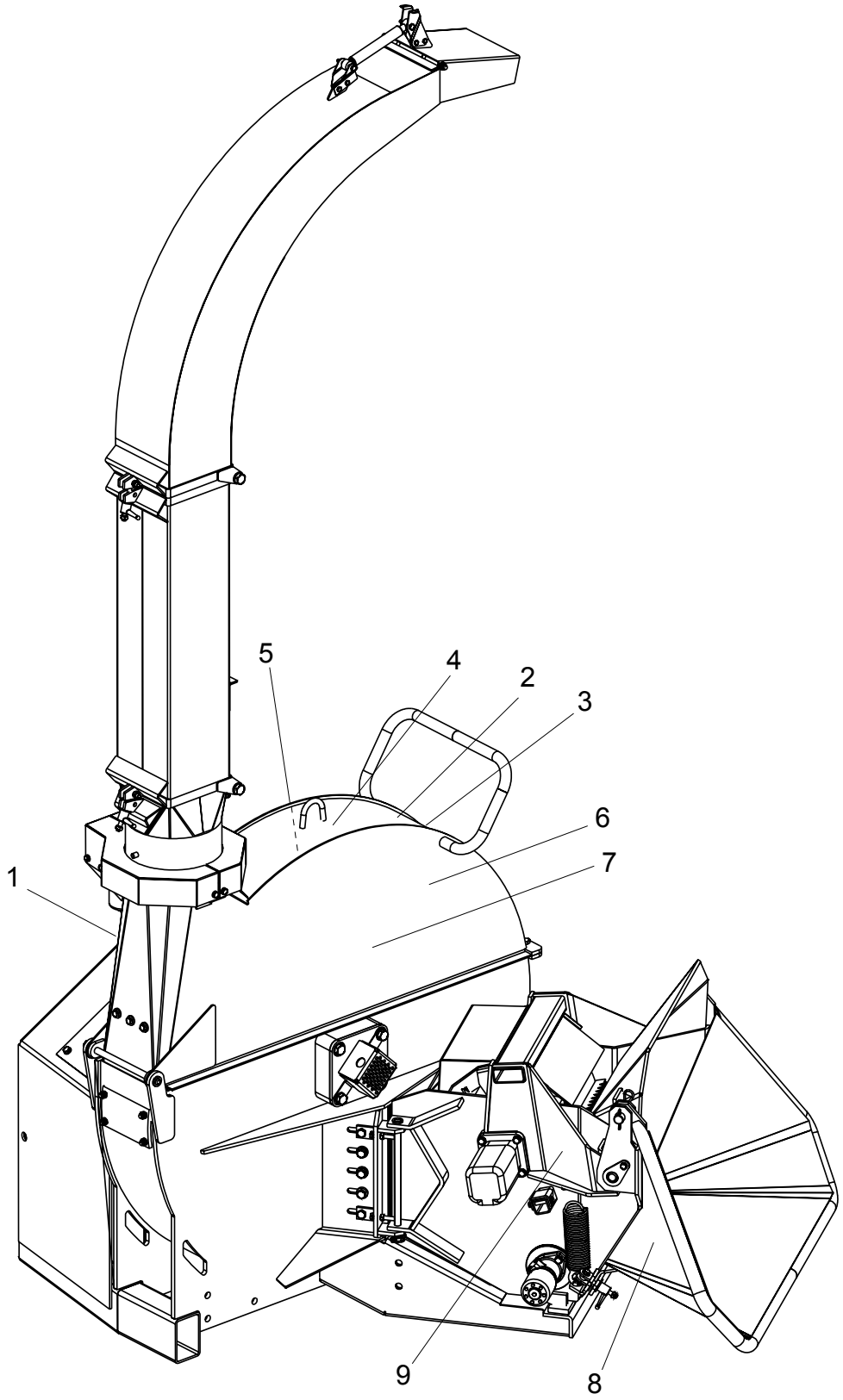
- Always use the oil types recommended by the manufacturer. Other types of oil may cause faults or improper operation of the equipment, which could lead to serious damage to people or property.
- Never mix different liquids or oils.
- Always follow the manufacturer's lubrication instructions.
- Use control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

SAFETY INSTRUCTIONS
FOR HYDRAULIC CIRCUITS

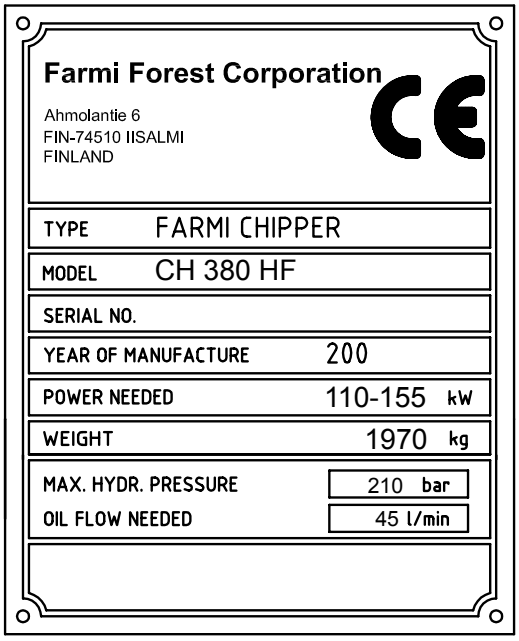
1. Work on hydraulic equipment may only be carried out by professional hydraulic engineers.
2. Be cautious when using the equipment in cold conditions.
3. Check the machine for leaks. Do not use the machine if there is a leak from any system. Check all hydraulic hoses – particularly those which are bent 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.
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.
5. Check that all safety devices such as pressure relief valves, etc., are in place and work properly. Familiarize yourself with their use.
   Safety systems may never be bypassed.
6. 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.
9. 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. When working in ecologically vulnerable areas, use biofuel.
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!

STICKERS AND PLATES

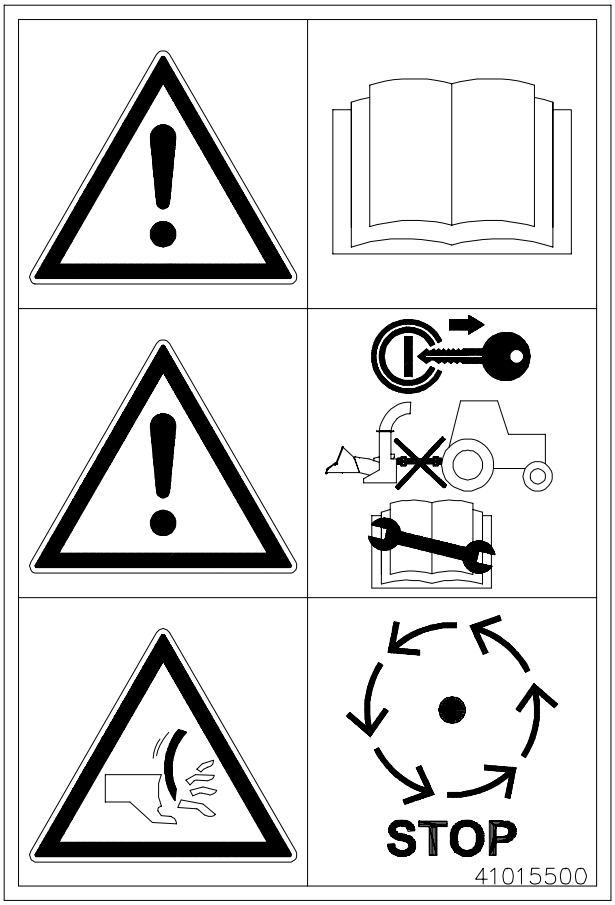
The following plates and labels must be correctly attached to the chipper.
Missing plates / labels must be replaced immediately.



STICKERS AND PLATES



Number 1. Machine plate CH380HF



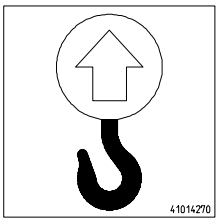
Number 2. (41015500)
Note! See operation and maintenance manual.

Note!
Stop the engine and remove the PTO shaft for maintenance.

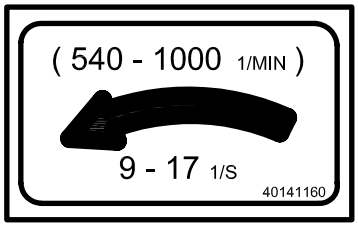
Risk of cutting injury!
Stop the engine and wait until the disk has stopped.

STICKERS AND PLATES

Number 3. Hearing protection symbol.
Wear hearing protection. (40142080).

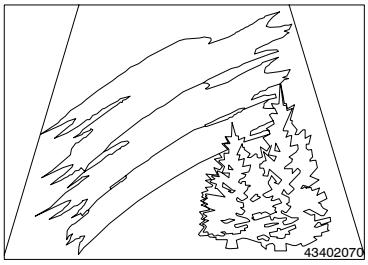


Number 4. Lifting point sticker (41014270).

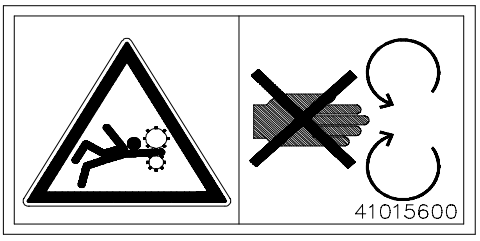


Number 5. Rotation speed sticker (40141160).

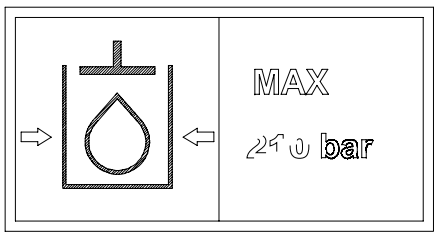
Number 6. FARMI Forest -sticker (41016100).



Number 7. Forest-sticker (43402070).



Number 8. Stay away from revolving parts.
(41015600)



Number 9.
MAXIMUM Hydraulic pressure 210 bar.

TECHNICAL INFORMATION

INTRODUCTION

The Farmi CH380 is a 4-knived chipper designed for grapple loader feeding of up to 380 mm diameter stems. The chip size can be adjusted to suit its various end uses, such as biofuel, industrial raw material, soil improvement or dry litter.

The HF380 hydraulic feed chute facilitates processing of difficult to feed materials. The feed chute comes standard equipped with No Stress revolution control, which shuts down the feed when the output Rpm drops too low. The benefits of the No Stress mechanism are:

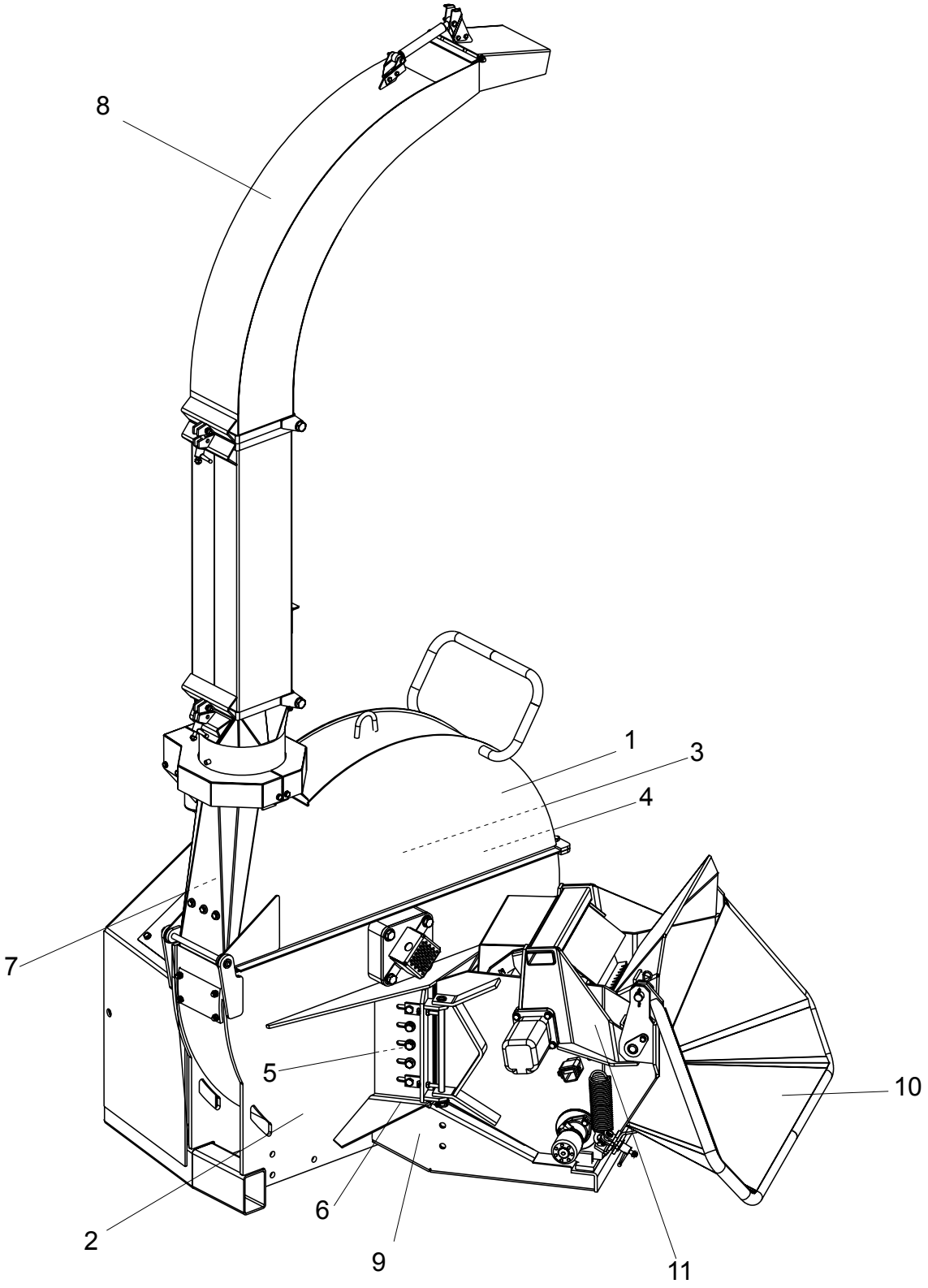
- tractors of lower power rating can be used
- more homogenous chip quality
- higher chip yield

The CH380HF chipper has its own hydraulic unit.

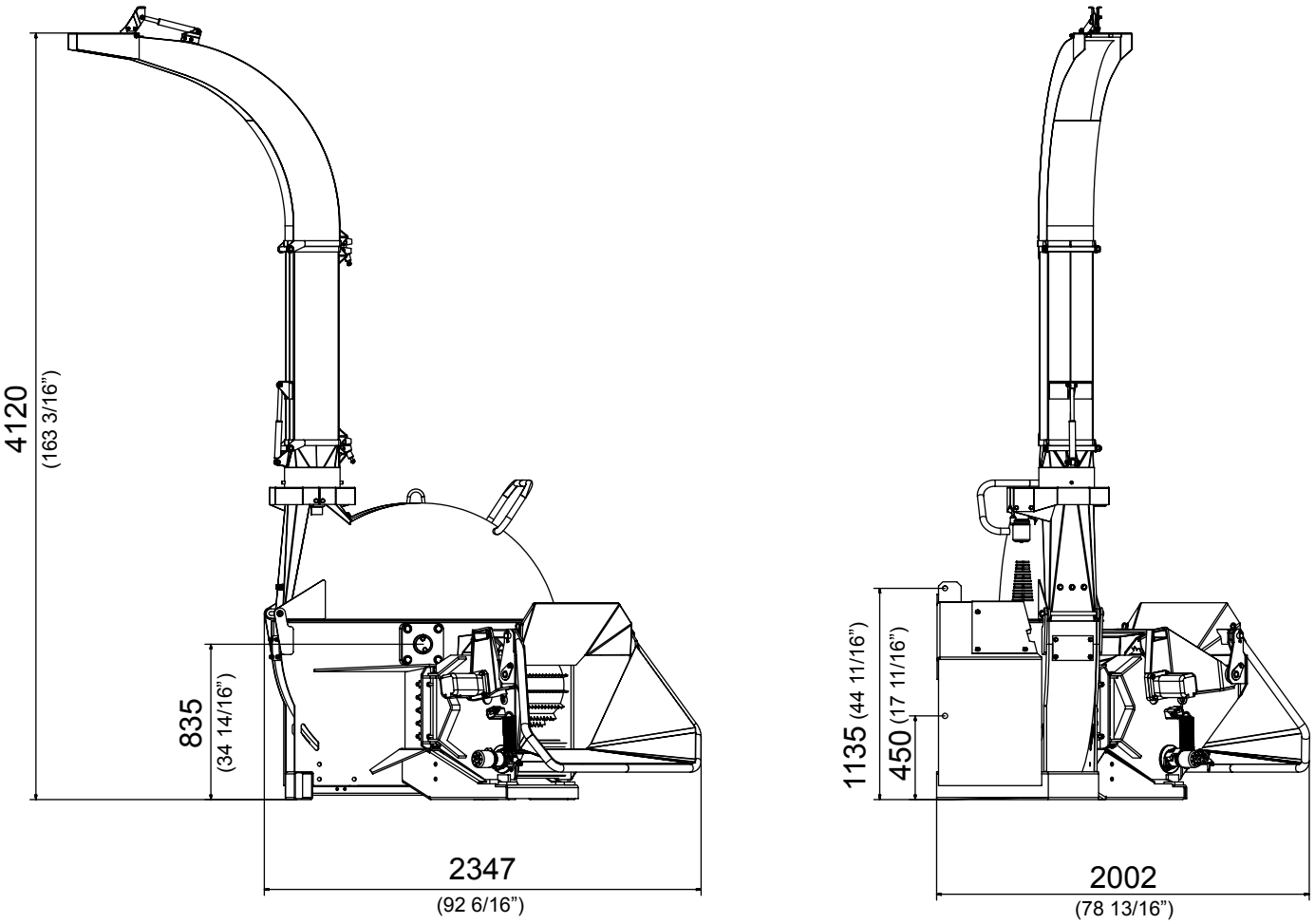
MAIN COMPONENTS

CH380
1. Upper chamber
2. Lower chamber
3. Disc
4. Knife
5. Vertical anvil
6. Horizontal anvil
7. Breaker
8. Discharge pipe
9. Feed chute frame
10. Feed chute
11. Roller swing

TECHNICAL INFORMATION



TECHNICAL INFORMATION



CH380HF dimensional diagram

CH380HF

TECHNICAL INFORMATION

TECHNICAL INFORMATION	CH380HF
Type	Double disc chipper
Output, m^3/h	30-70
Max. stem diameter, mm	380
Feed opening, mm	380 x 420
Chip length, mm / 1000 rpm	10 - 20
Chip length, mm / 540 rpm	20 - 30
Power demand, kW	110 - 155
Operating rpm	min 540 - max 1000
Number of knives	4
Disc drive	direct, splined shaft 1 $^3/_4$", 6 splines
Power source	tractor PTO
Assembly	3-point hitch
Chipper weight, kg	1970
Disc ø, mm	1460
Disc weight, kg	600
2-roller hydraulic feed	standard
Discharge pipe	300^o rotating
Discharge control	hydraulic
Operating pressure	210 bar
No Stress rpm guard	standard
Discharge height, m	4,1
Feed control	by pedal
Twig breaker	standard
Hydraulic unit HD38	45 l / 210 bar

MOUNTING

LIFTING

The lifting points are marked on each machine with hook symbols

Only use appropriate lifting equipment of sufficient lifting capacity to lift the equipment.

Lifting belts, cables and chains used for lifting must be checked regularly.

The weight of the load to be lifted must be known. Never exceed the lifting capacity limit specified by the lifting device manufacturer.

Avoid lifting equipment over areas where people may be present.

POWER TAKE-OFF SHAFT

Tractor's PTO drive shaft dimensions should be 1 3/4" to maximize its operating life.

PTO shaft recommendations:

- Bondioli & Pavesi 10 (106 kW / 540 rpm) with overrunning clutch
- Walterscheid W2600 + F3 with overrunning clutch

If the tractor is equipped with a power-take-off break, use the overrunning clutch.

If the PTO shaft is too long it can cause damage to the chipper's bearings or the tractor's power take-off shaft when using the 3-point hitch when cutting.

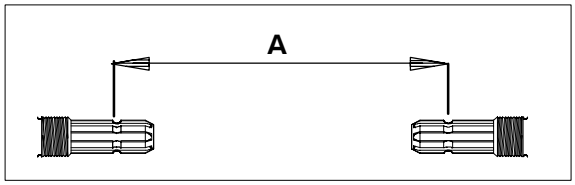
MOUNTING

- Attach the chipper to the tractor's 3-point hitch.
- When handling the chipper, ensure that it is coupled to the 3-point hitch.
- Check that the power take-off (PTO) drive shaft is the correct length. For details on shortening the PTO shaft see the Power Take-Off Shaft" section.
- Check that the PTO shaft shields are in place and the shield rotation prevention chain is attached.

MOUNTING

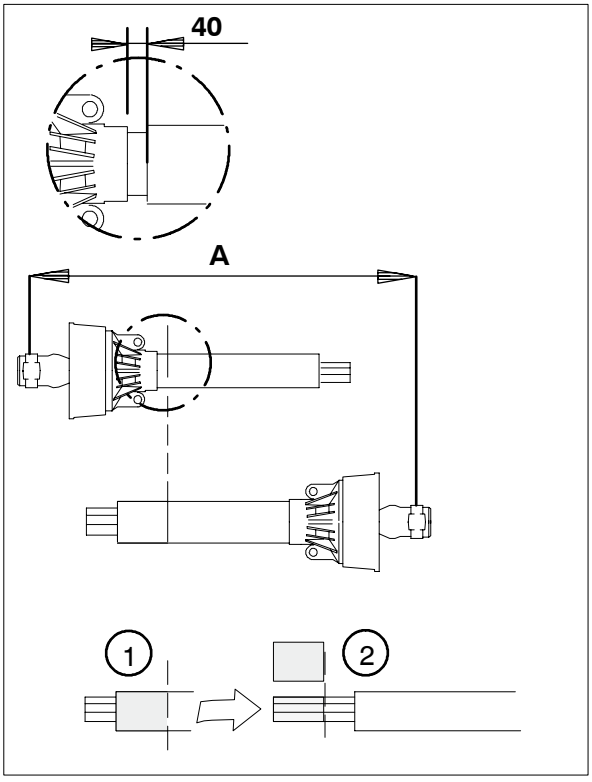
SHORTENING THE PTO SHAFT

1. Connect the device to 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.



Distance A, when the distance between the splined shafts is at its shortest.

3. First cut the thicker shaft shield to the correct length. Remember to leave a 40 mm clearance. Next, cut a similar length from the profile tube. Shorten the other half of the PTO shaft in a similar manner. File off the burr.



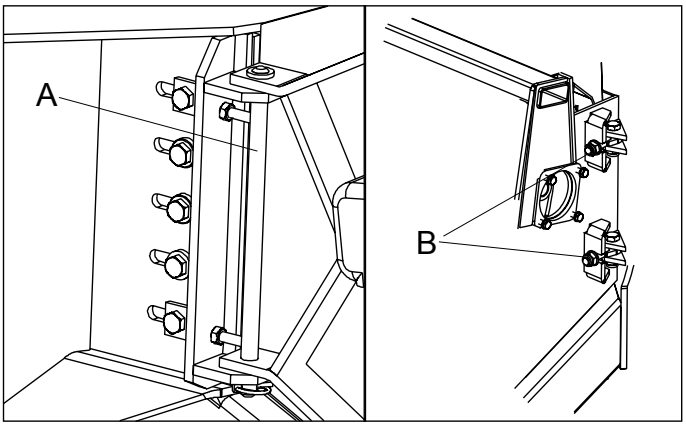
Shortening the PTO shaft

4. Interconnect the tubes and check that the shaft is sufficiently shortened by carefully lifting up and down with the hoist. Ensure that the shaft has a 40 mm movement clearance. Also move the machine sideways to check that the shaft moves freely.

MOUNTING

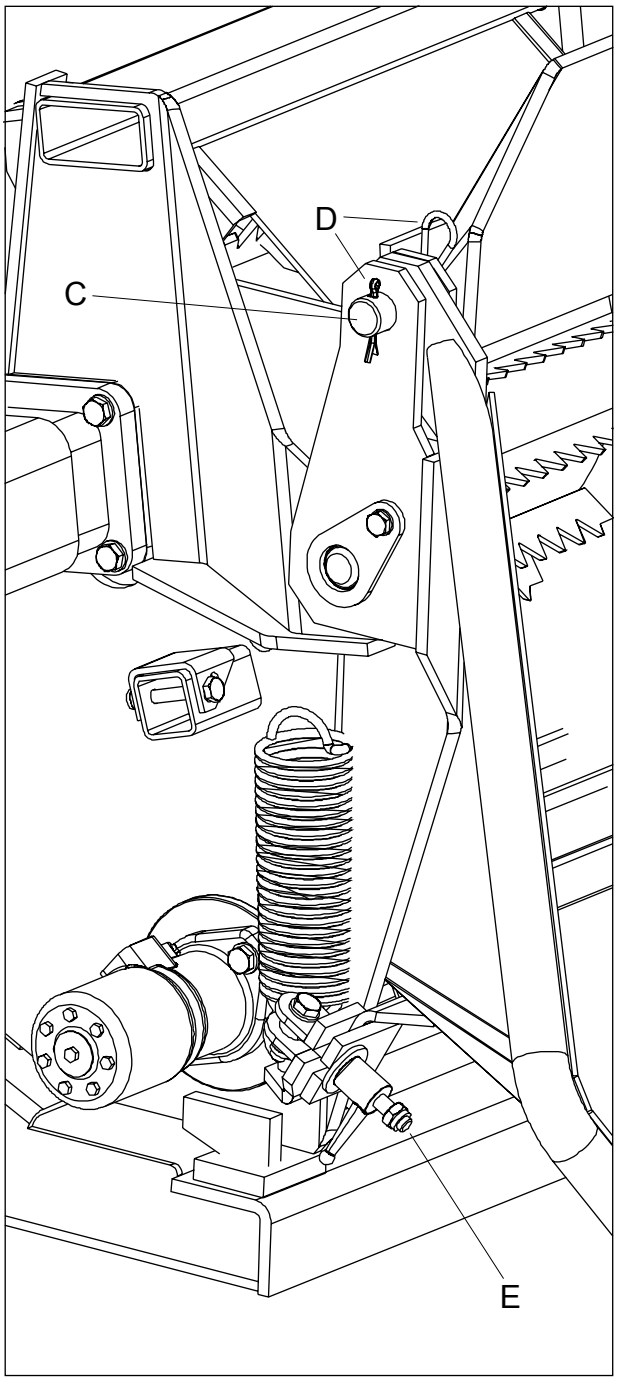
MOUNTING THE FEED CHUTE

1. Fix the feed chute frame to the chipper with pins (A) and locking screws (B).



Fixing the feed chute frame to the chipper

2. Fix the feed chute to the frame on both sides with pins (C) and cotter pins (D) Lock the chute in the operation position (E).



Fixing and locking the chute to the feed chute frame

OPERATION

INSPECTION PRIOR TO USE

- Position the chipper on a level, hard surface.
- Carry out the inspection with the tractor engine switched off and the chipper disc fully stopped.
- Check that the disc rotates freely and that the chipper is free of any foreign objects.
- Check that all protective equipment is in place and in good condition. Do not remove any protective shields.

CAUTION!
Check the oil level of the hydraulic oil reservoir. The oil level eyelet must be covered.

- Check the tightness of the hydraulic pump belt, see ”Maintenance”
- Check the condition and tightness of hoses and couplings.

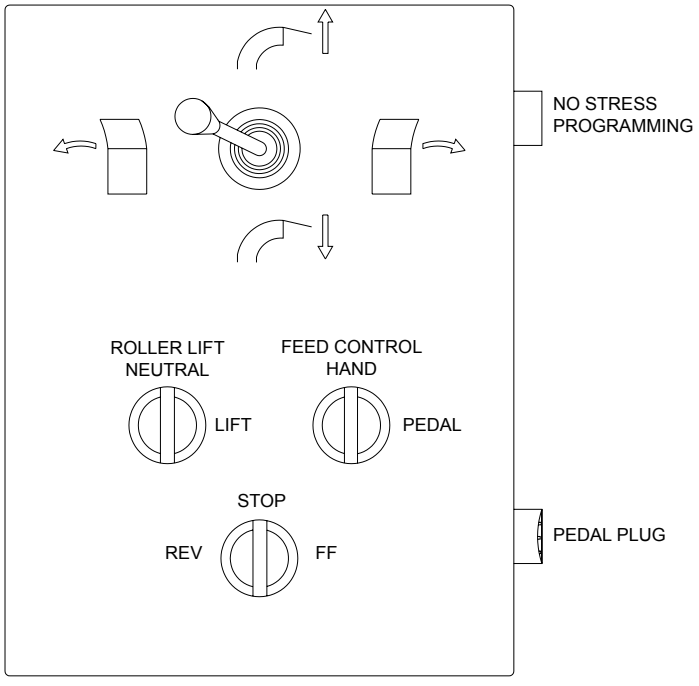
CONTROL EQUIPMENT

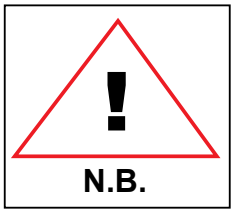
The feed chute is operated from a remote control panel either with a manual switch or foot pedal.

1. STOP
   Feed rollers stop rotating.

2. FEED FORWARD = FF
   (Right-hand foot pedal)
   The feed rollers begin rotating inwards and wood can be fed into the chipper.

3. REVERSE = REV
   (Left-hand foot pedal)
   The feed rollers begin rotating outwards and wood can be removed from the rollers.The operating switch returns automatically to the STOP position.





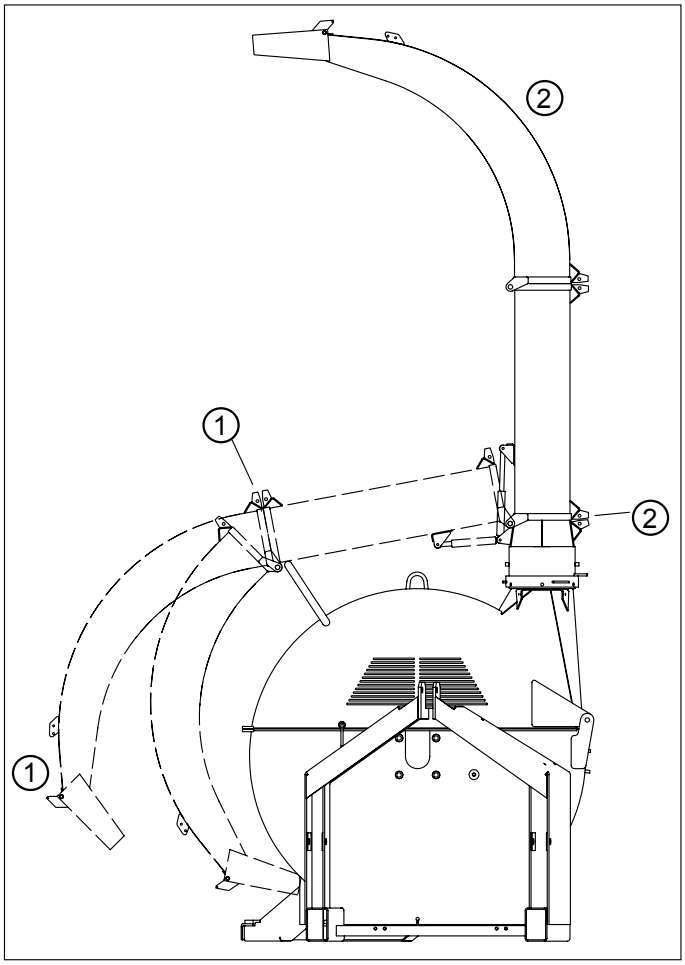
Do not operate in temperatures -20° C due to the risk of cold brittleness damage which can occur in particular with the knife blades. Avoid chipping wood which has frozen through, as this weakens the self-feed function.

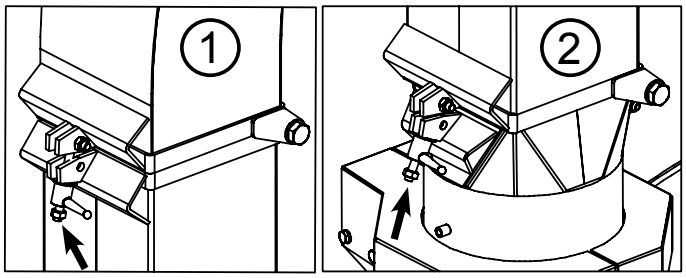
ROTATING KNIVES!
Serious risk of cutting injury. Never place hands into the feed chute.

FIRE HAZARD!
Always keep appropriate fire extinguishing equipment near to hand when using the chipper. Monitor the surface temperature of the chipper. If the chipper begins to overheat, stop the chipper and investigate the cause.
Monitor the temperature of the bearings. Carry out regular maintenance and keep the chipper clean of dust.

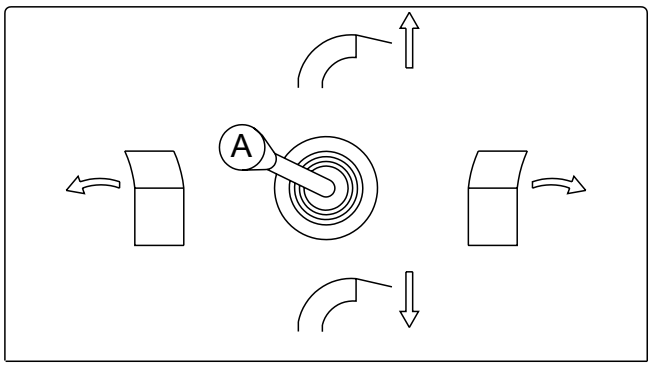
STARTING UP THE CHIPPER

1. Connect the chipper's power plug. Connect the hoses of the discharge pipe to the tractor hydraulics.
2. Lift and lock the top of the discharge pipe in place (1). Lift the discharge pipe to its operating position (2). Ensure the parts are locked in place.
3. Start the chipper with the tractor running at low rpm. Gradually bring the speed up to the level required for chipping.
(540 / 1000 rpm).
4. Move the discharge pipe by moving the lever left or right. Adjust the lid position by moving the lever (A) up or down.





Locking the discharge pipe parts



Directional positioning of the discharge pipe and lid

5. The directional positioning of the discharge pipe and the lid can only be performed while the chipper is running.

NO STRESS PROGRAMMING

Press the black programming button (see p.22) for about three seconds while the chipper is running unloaded at around 100-300 revs below the tractor's chipping speed. Next, raise the speed to match the chipping speed, after which chipping can begin.

If the tractor has a wide torque range and you feel that the No Stress function is interrupting the feed too frequently, you can try re-programming at lower rpm.

Programming example:
The max. Rpm of the tractor is 2400. Run the tractor at 2250 rpm with the chipper also running unloaded and press the black programming button for about three seconds. Then raise the speed to 2400 rpm. Chipping can now commence.

CHIPPING

CH380HF is designed only for grapple loader feeding. The danger area radius is 20m. Ensure that the danger area is clear of people.

1. Make sure the feed chute is empty.
2. Turn the manual switch to the feed position FF (or press the right-hand foot pedal).
3. Check before feeding material into the chute that the material to be chipped contains no nails, stones etc.
4. Feed the wood into the chute using a grapple loader. Release the grapple as soon as the feed rollers begin to draw in the wood.
5. If necessary, adjust the rotational speed of the feed rollers, see the section "Feed speed control".
6. Discontinue feeding while adjusting the discharge direction.
7. If you need to remove wood from the feed chute in the middle of chipping, turn the manual switch to the reverse position REV (left foot pedal). Keep the switch in the REV position until the feed roller releases the wood.

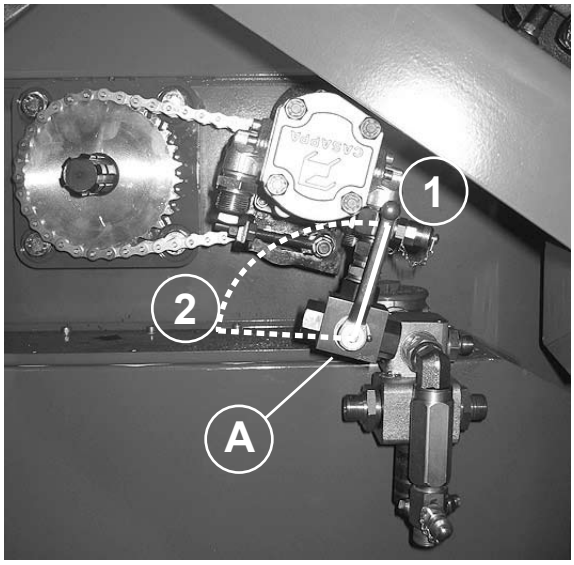
Oil heats up as it circulates through the hydraulic pump, motor and valves. Check the oil temperature twice each hour to prevent overheating If the oil heats excessively, stop chipping and allow the oil to cool.

STOPPING THE CHIPPER VIA THE TRACTOR DRIVE

Slow the tractor rpm to idling speed before disengaging the PTO. This is especially important with tractors equipped with a power take-off brake (e.g. Ford). Move the PTO control lever slowly to the OFF position.

FEED SPEED CONTROL

The hydraulic system is equipped with a double pump. The output of one pump can be directed either to the drive or to the tank via valve (A).



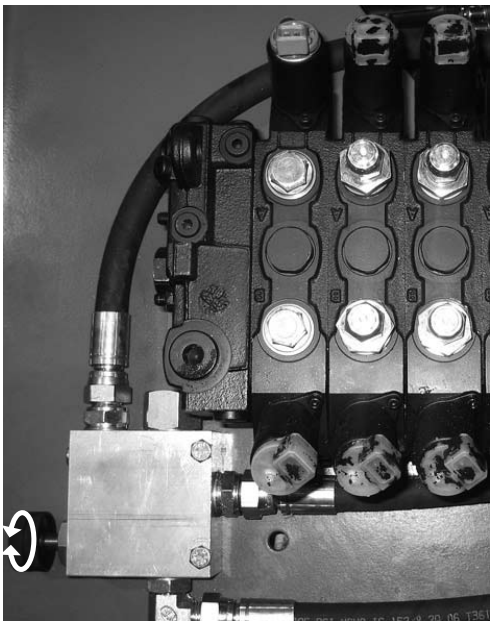
Feed speed control

When the chip size is big (20-30 mm), both pumps must be in use (lever in position 2). When the chip size is below 20 mm, use only one pump (lever in position 1).

CAUTION!

There is a danger of system overheating if both pumps are used at the same time when the chip size is below 20 mm.

Fine adjustment of the feed speed is performed using a flow regulator. When you turn the button in the anticlockwise direction, the feed roller rotates faster. When you turn the button clockwise, the feed roller rotates slower.
The speed is optimal when the wood does not push against the chipping disc and the feed roller does not slow down the feed.



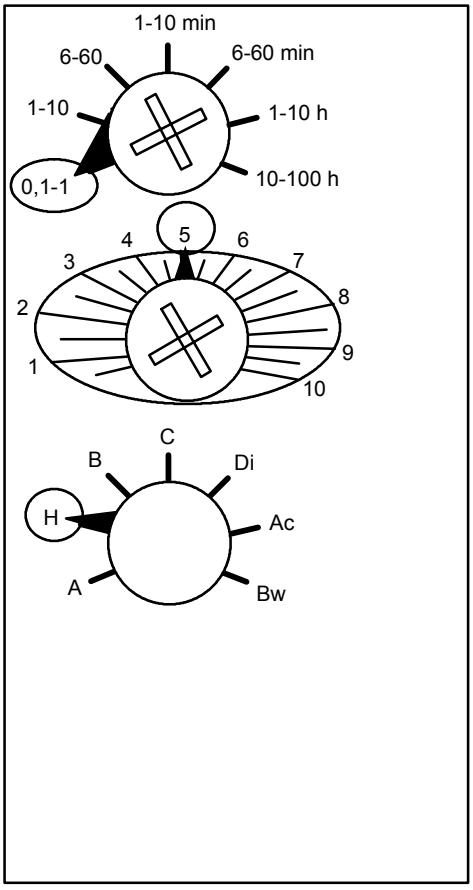
Feed speed fine adjustment

CAUTION!

Do not adjust the feed speed while feeding wood into the chipper. The valve can become damaged. Adjust the feed speed when the rollers rotate unloaded.

FEED REVERSE

The feed reverse function reduces the amount of frictional heat generated in the knives and reduces the power requirement during the acceleration phase following No Stress stoppage of the chipper. When the No Stress sensor stops the feed rollers the feed reverse function is activated for a set time, during which the material to be chipped is ejected from the knives.



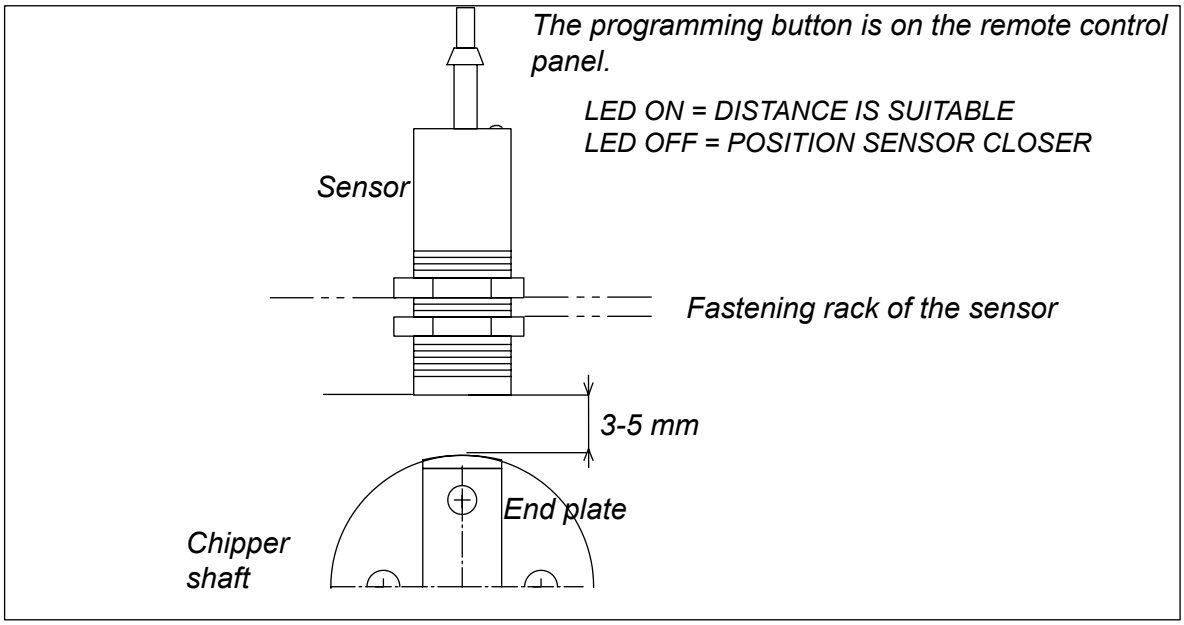
Adjusting the feed reverse settings.

SETTINGS AND CONTROL

o The pointer of the uppermost adjustment screw must point to 0.1-1.
o The actual adjustment is performed via the middle blue adjustment screw. Position the pointer between positions 5 – 7. This sets the feed reverse 50 - 100 mm and releases the material to be chipped from the knives.
o The pointer of the uppermost adjustment screw must point at position H.

CAUTION!

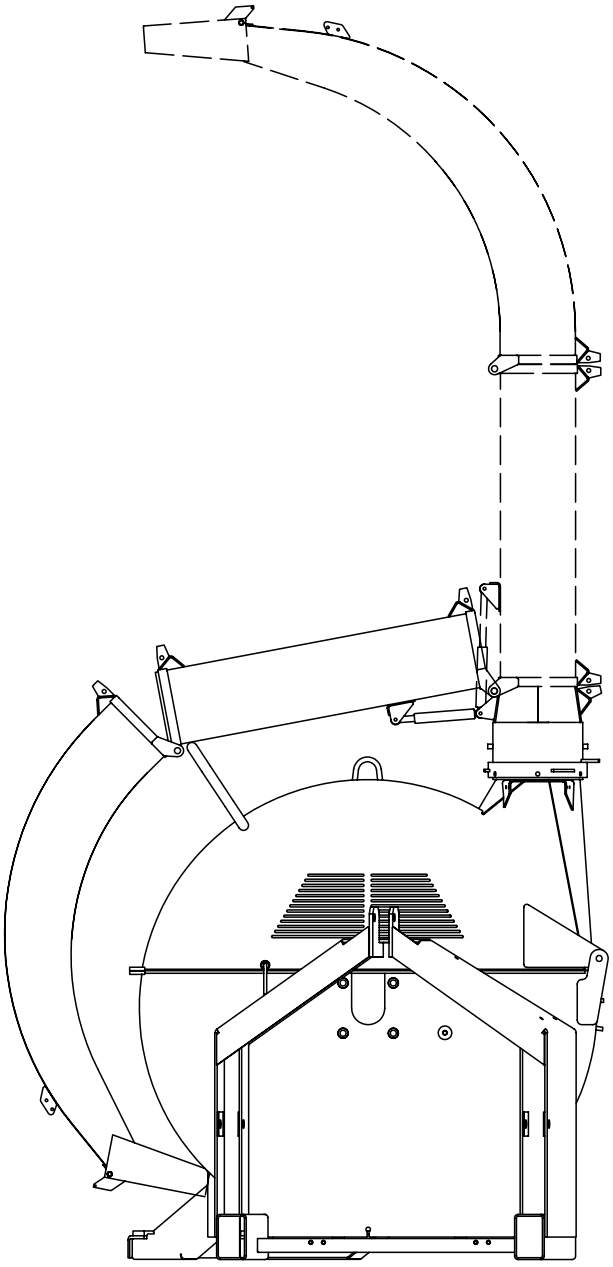
Only adjust the blue screw!



No Stress control

CHIPPER TRANSPORTATION

Before transporting the unit, turn the discharge pipe parallel with the upper chamber and lower it.



Transportation position

Take extreme care when turning the discharge pipe!

CAUTION!

STORAGE

- Ensure that the chipper is stored on a solid surface and is unable to topple over.
- If the chipper has been left unused for a prolonged period, lubricate the knives e.g. with Vaseline.
- Ensure that the water drainage holes in the lower chamber are open.

MAINTENANCE

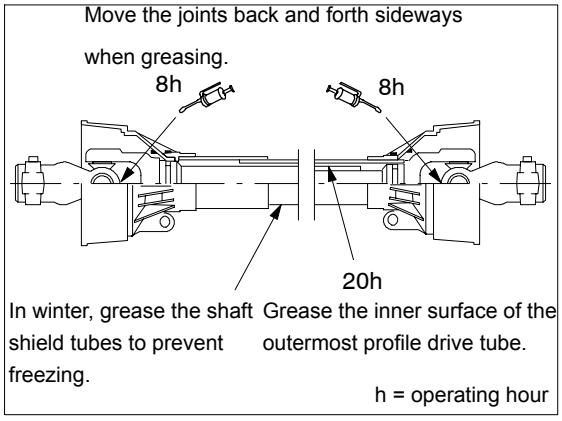
Position the chipper on solid,level ground to safeguard against toppling. Always disconnect the power-take-off and stop the chipper and tractor fully before embarking on maintenance or repair work. The chipping disc continues to rotate freely in the manner of a flywheel after the power take-off has been disconnected. WAIT UNTIL THE DISC COMPLETELY STOPS ROTATING!

Lock the disc in place before commencing maintenance and repair work.

Wear eye protection when handling the knives.

PTO SHAFT LUBRICATION

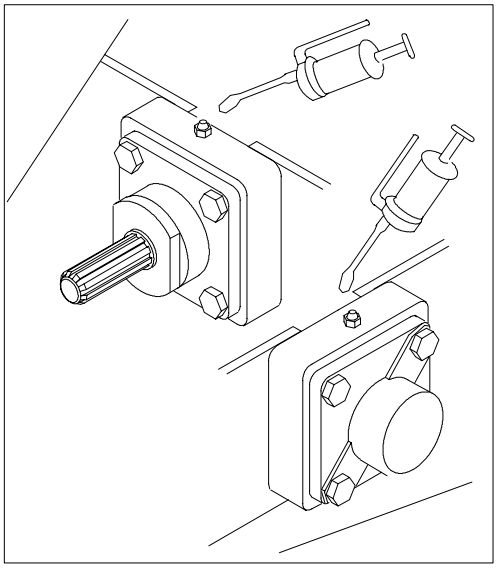
- o Grease the PTO shaft before operating and at regular intervals as shown in the diagram.
- o Grease the inner surface of the outermost PTO shaft profile drive tube.
- o In winter, grease the shaft shield tubes to prevent freezing.



PTO shaft greasing points and greasing intervals

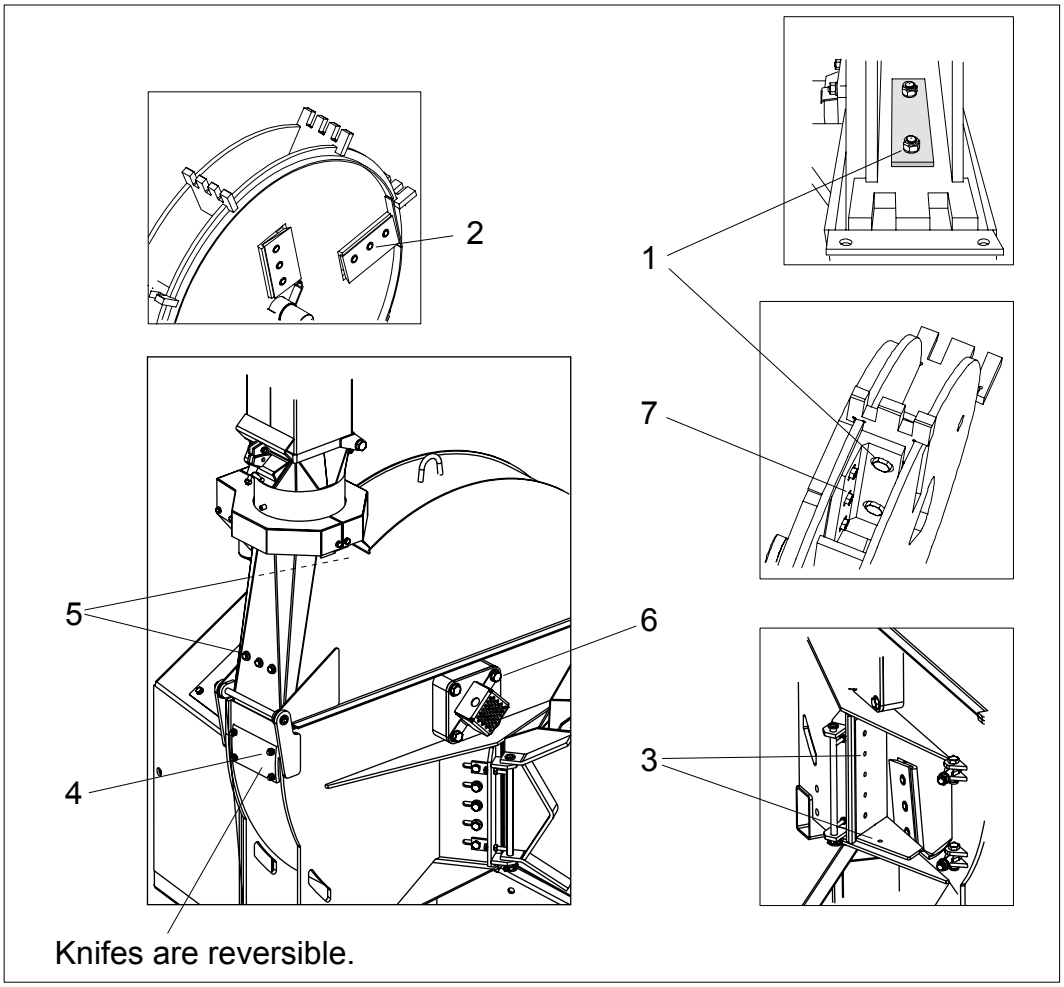
PERIODIC INSPECTIONS

- o The tightness of the fastening bolts of a brand new chipper must be checked after the first operating hour and tightened as necessary. Tightening torques as shown in the table below.
- o The tightness of fastening bolts should be checked on a weekly basis.
- o The knife clearances must be adjusted in accordance with the given values. See the Knife Clearance Adjustment instructions.
- o Bearings are factory greased. Use high quality grease for post-lubrication.
- o The feed roller bearings are self-lubricating and do not require regular maintenance.
- o Grease the joint bearings of the roller swing at intervals of 50 operating hours
- o Grease the disc bearings at intervals of 50 operating
- o Regularly monitor the condition and connection tightness of the hydraulic hoses.
- o Only use clean oil in the hydraulic system. Dirty oil damages valves and hydraulic motors.



Bearing lubrication

MAINTENANCE DIAGRAM



Tightening points

Maintenance point	Width across flats, mm	Tightening torque, Nm
1. Tightness of knife holder fastening bolts	36	450
2. Tightness of knife fastening bolts	22	120
3. Tightness of anvil fastening bolts	24	200
4. Tightness of twig breaker fastening bolts	19	80
5. Breaker fastenings	19	80
	24	170
6. Tightness of bearing fastening bolts	30	300
7. Tightness of knife fastening bolts	22	100

MAINTENANCE

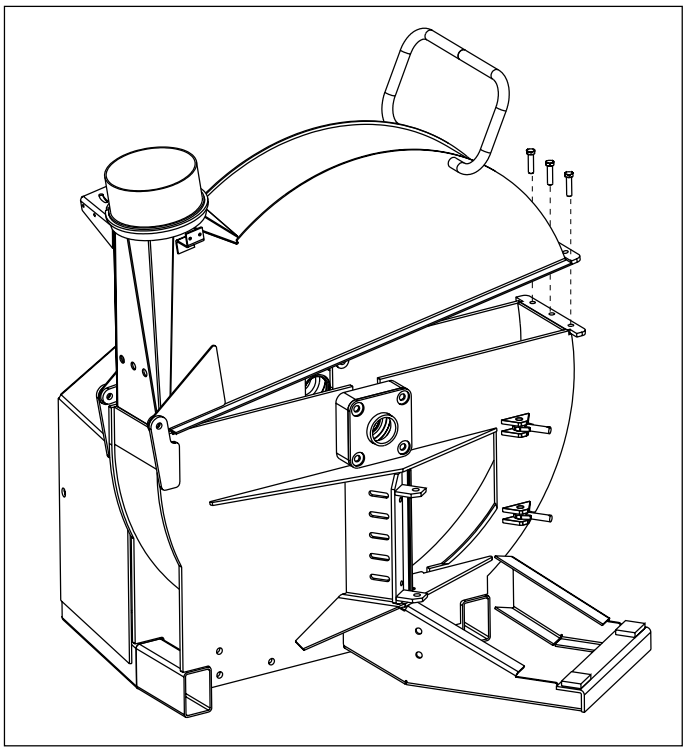
KNIFE MAINTENANCE

Please refer to the safety instructions. The chipping disc continues to rotate freely in the manner of a flywheel after the power take-off has been disconnected.

Use protective gloves when handling the knives.

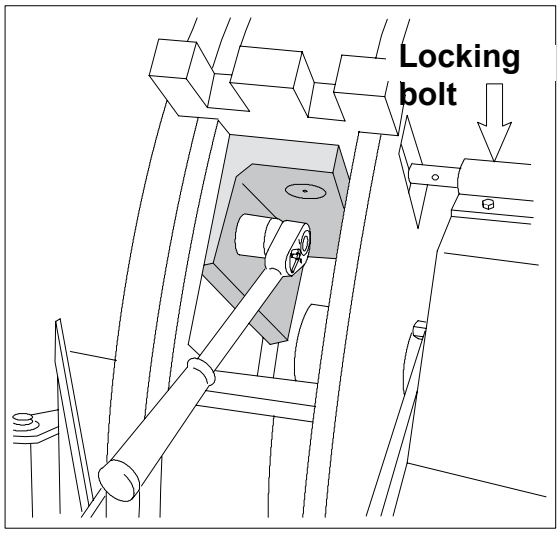
OPENING AND REMOVAL OF THE UPPER CHAMBER

- o Remove the M16 (3 pcs) locking screws.
- o Turn the upper chamber onto its side.
- o Lock the disc with the locking bolt.
- o Remove the feed chute or turn it to the side.



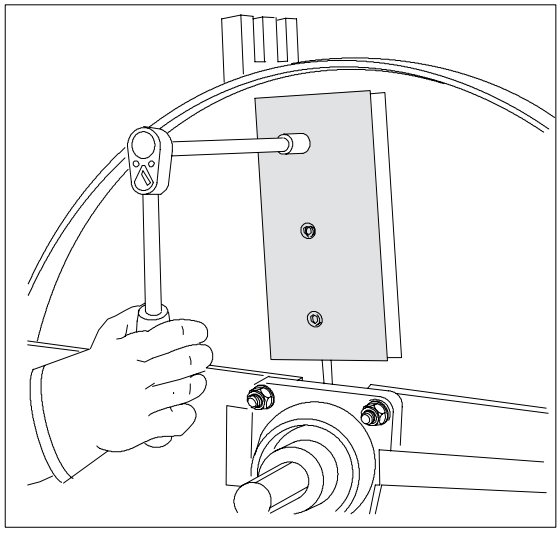
Opening the upper chamber

KNIFE REMOVAL FROM THE KNIFE HOLDERS



Locking the disc and removing the lock nuts

1. Remove the knife's lock nuts (M14).
2. Remove the knife fastening bolts (M14). Turn the wrench carefully to avoid hand injury by the knife should the wrench slip.



Removing the knife fastening bolts

BLADE SHARPENING

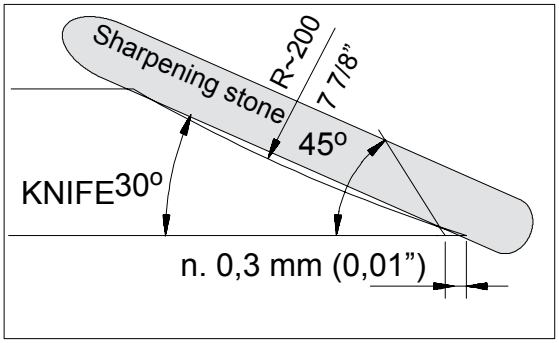
Sharpen all blades equally. This ensures disc balance. Avoid heating the blades during grinding.

Indications that the knife blades need sharpening are:

- o self-feed is less effective.
- o increased power demand.
- o cut surface of the chip is rough.

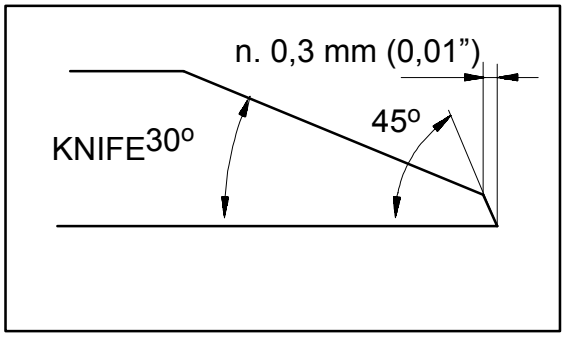
Normally, the knives can be sharpened a number of times in situ (grindstone, belt grinder) before complete removal becomes necessary.

Thorough reconditioning, however, requires blade removal and use of a knife grinder.
The new knives are sharpened to a concave shape, R=200. The sharpening angle is 30° and the hone angle 45° The hone angle prevents the blade edge from breaking.



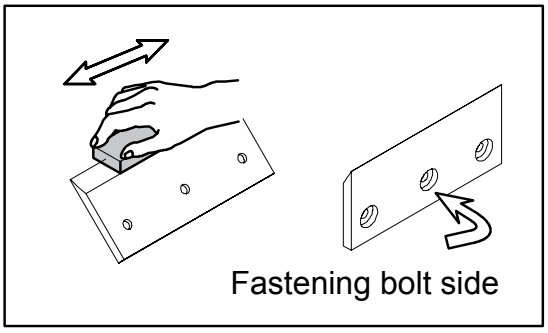
Concave blade profile

It is recommended that post-sharpening of the knives is also performed to a concave shape. If this is not possible, sharpen the knives to a flat profile.



Concave blade profile

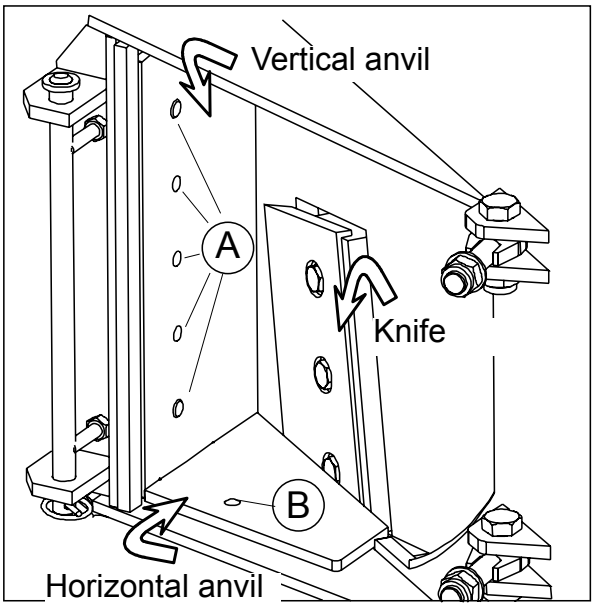
Grind the hone angle at 45° with two to three longitudinal strokes, using a level sharpening stone. Remove the burrs from the knife fastening bolt side by grinding along the blade surface.



Final knife grinding

REMOVING THE ANVILS

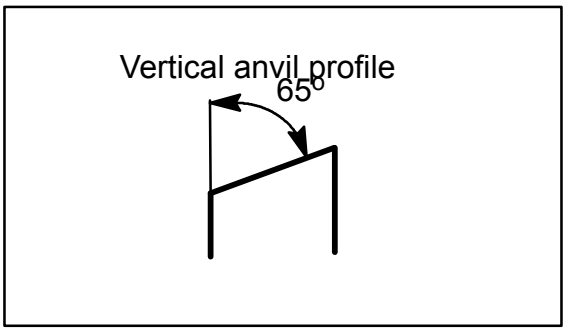
The chipper is equipped with both vertical and horizontal anvils. To remove the anvils, open the fastening bolts (A) and (B). The horizontal anvil fastening bolt (B) is located below the feed opening.



Anvil fastening bolts

SHARPENING THE ANVILS

If you notice wear or rounding of the inner edge of the anvil, sharpen the anvils so that the original angles are retained.



Vertical anvil profile

INSTALLING THE ANVILS

- o Check the condition of the knife fastening bolts and nuts.
- o Install the knives and tighten the fastening bolts to the torques specified in the torque table.
- o Adjust the knife-to-anvil clearance.

KNIFE-TO-ANVIL CLEARANCE ADJUSTMENT AND INSPECTION

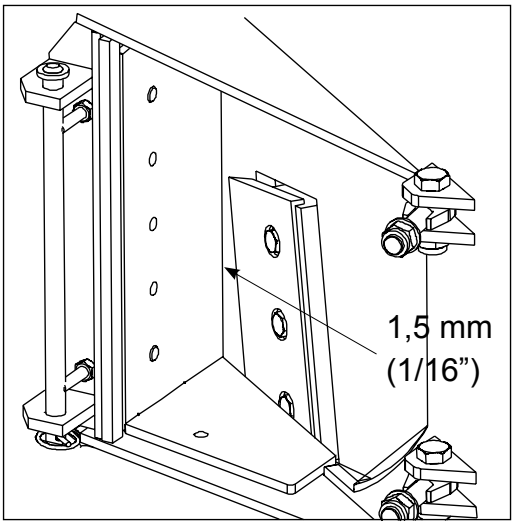
The amount of anvil adjustment required is determined by the amount the knives are sharpened. Always check and, if necessary, adjust the clearance between the knives and anvils:

- o after a heavy sharpening
- o whenever the knives are removed, e.g. for sharpening
- o whenever knives are replace
- o when changing the chip length.

Use a feeler gauge to check and adjust the clearance.

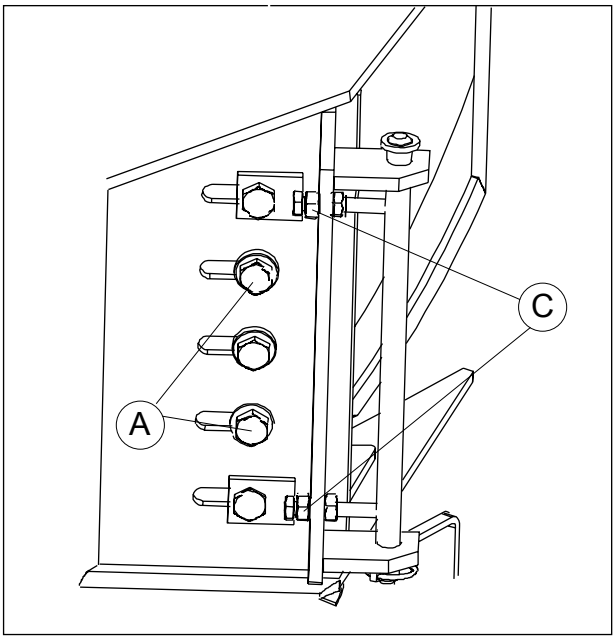
- o Turn the disc so that the knife edge is aligned with the vertical anvil.
- o Measure the clearance and adjust as necessary.

1. Remove the fastening bolts of the vertical anvils M16 (A).
2. Adjust the knife-to-vertical anvil clearance with the adjusting nuts (M12) (C) to 1.5 mm.



Blade clearance

3. Tighten the adjusting screw nuts M12. Tighten the anvil fastening bolts to 200 Nm.
4. Check that the blade clearance of all knives is the same.

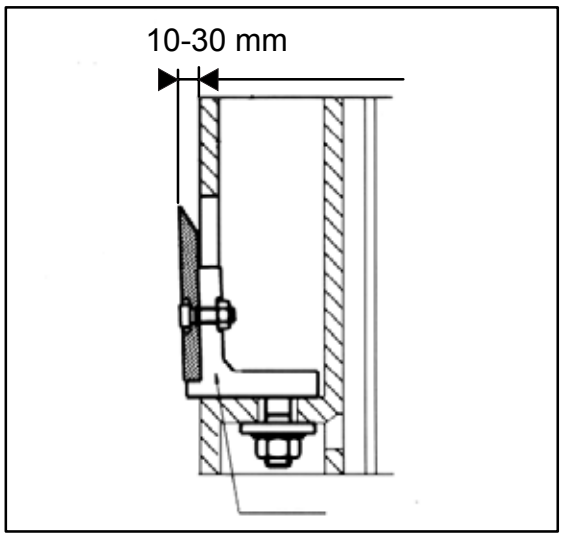


Installation and adjustment of anvils

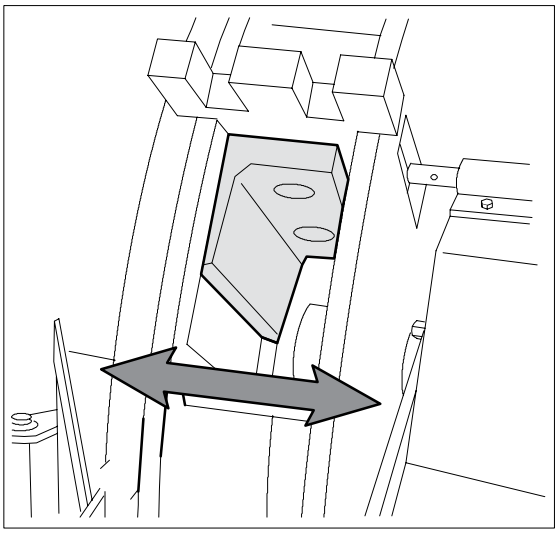
CHIP LENGTH ADJUSTMENT

Chip length is determined by the distance between the knives and the disc. Chip length is adjusted by moving the knife holders. The chip length can range between 10-30 mm.

Chip length adjustment

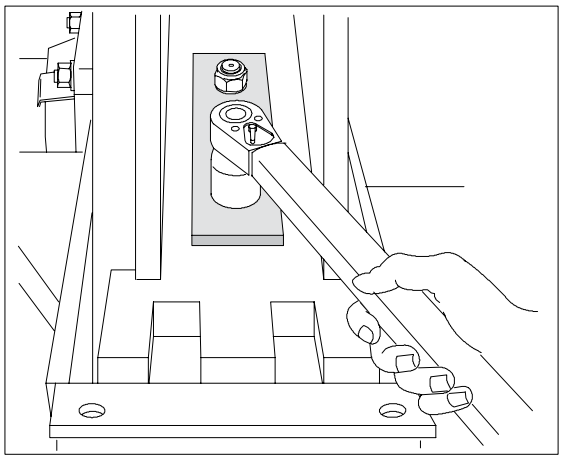


Chip length adjustment

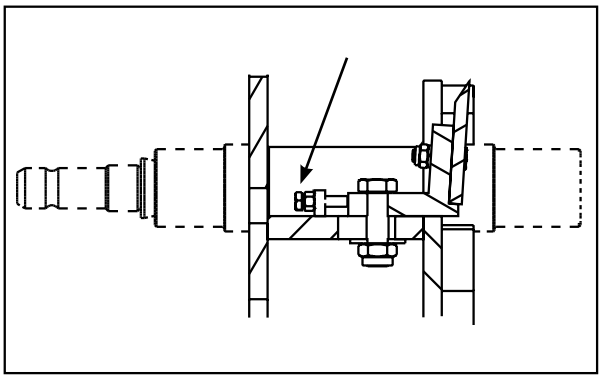


Knife holder adjustment direction

1. Firstly, follow the “Opening and removal of the upper chamber” instructions.
2. To extend the chip length, first remove the anvil fastening bolts M16 (A)
3. Move the anvils further from the disc.
4. Remove the knife holder fastening nuts, M24. Set both ends of the knives to the same distance from the disc. Use the adjustment screws for this purpose.



Removing the knife holder nuts

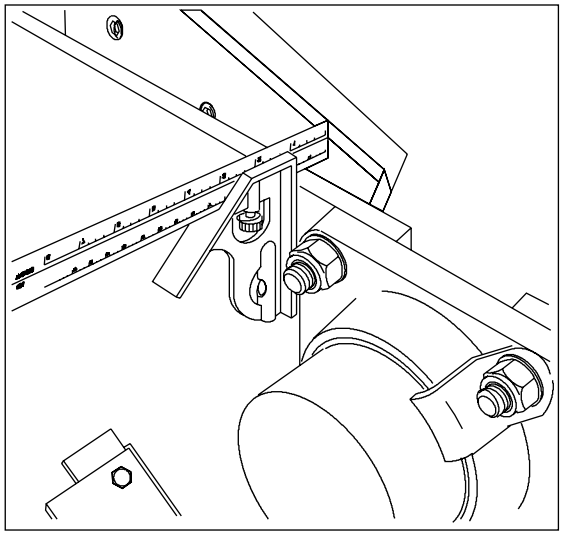


Knife holder adjustment screw

5. Tighten one of the knife holder nuts and re-check the distance measurement at the other end.

Adjust the remaining knives as follows:

1. Take the guide measurement from both ends of the knife you have just positioned. The guide measurement is the distance between the knife edge and the chamber.

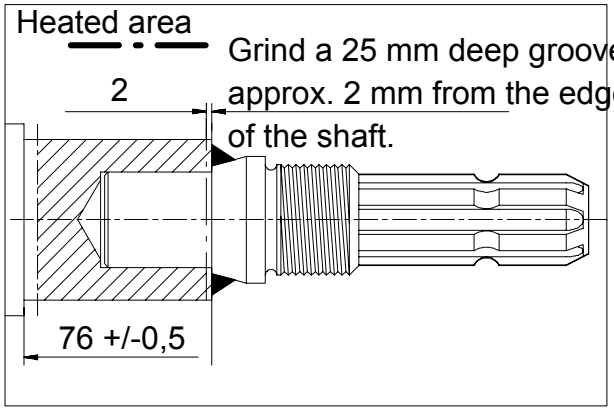


Guide measurement

2. Adjust the remaining knives using the guide measurement so that the guide measurement is the same for all of the knifes.
3. Tighten the knife holder fastening bolts to 450 Nm.
4. Carry out a measurement check of all knives.
5. Check the knife clearances in accordance with the “Knife clearance adjustment and checking” instructions.

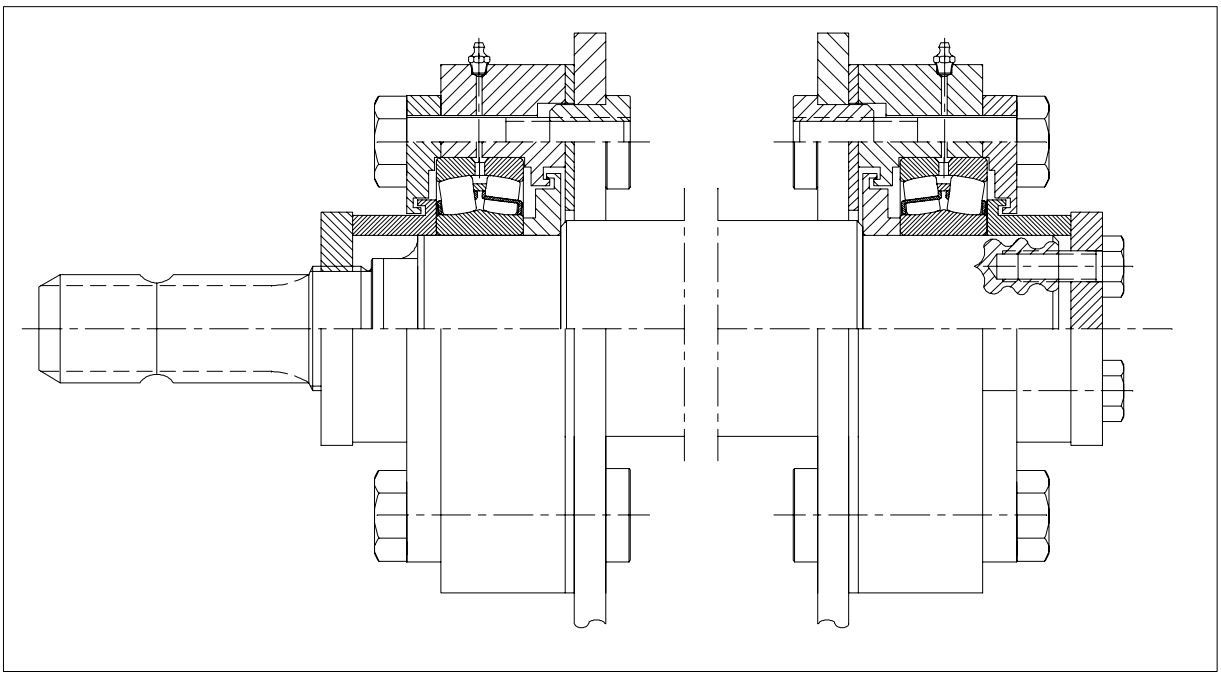
SPLINED SHAFT REPLACEMENT

1. Remove the upper chamber.
2. Remove the bearings (see figure “Bearings installation). Welding damages the bearings.
3. Hoist up the disc.
4. Grind a 25 mm deep groove about 2 mm from the edge of the shaft.
   See the illustration.
5. Heat the joint area if necessary.
6. Move the splined shaft first to loosen it, then remove it.
7. Clean the shaft hole and carefully fit the new shaft in place.
8. Make an 8 mm fillet weld in three runs. Use ESAB 68.81, K 48, OK Femax 38.65, or equivalent filler.



Replacing the splined shaft

MAINTENANCE



Bearing replacement

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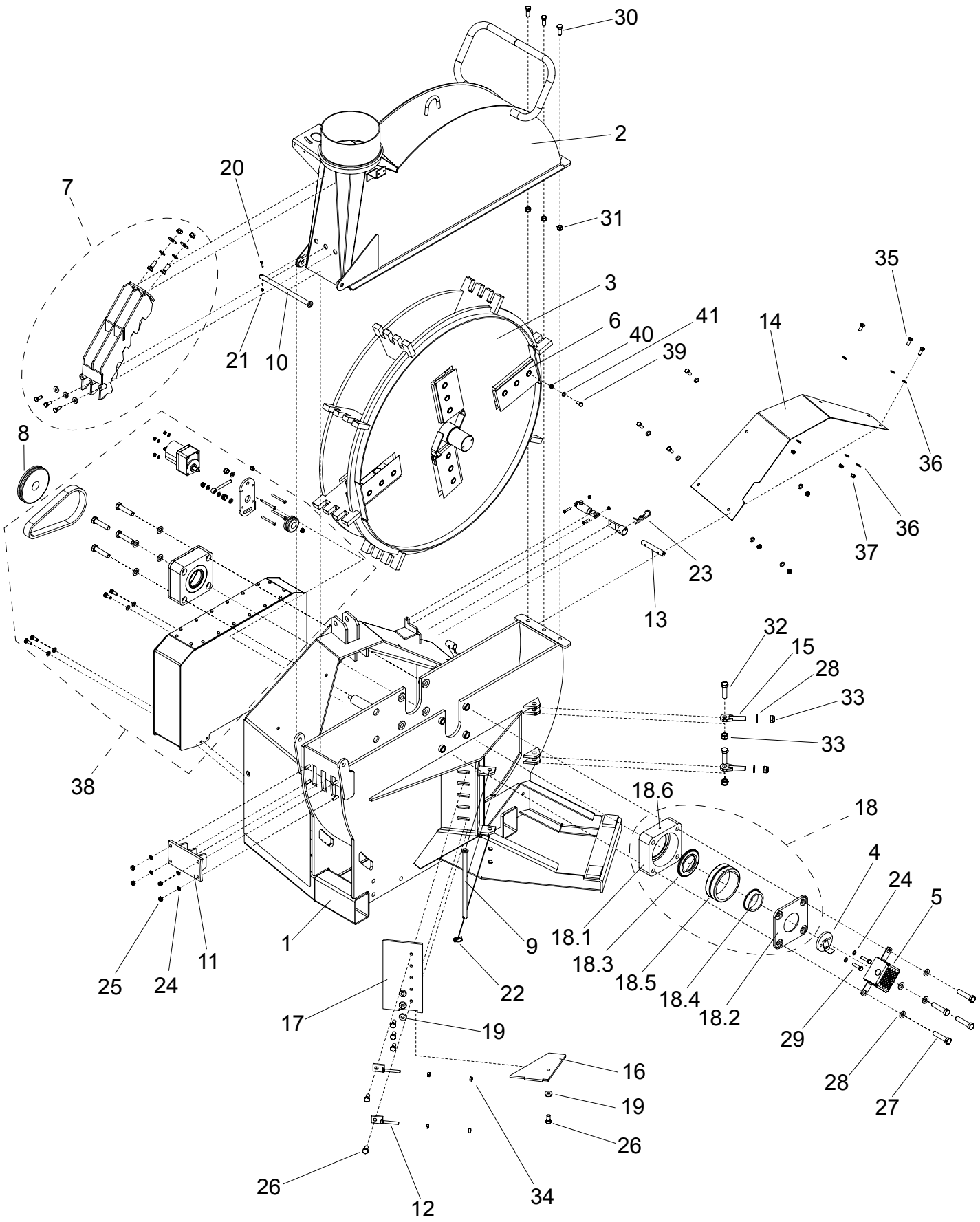
CHIPPER



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CHIPPER

Part	Order no	Description	Remarks	Qty
1	33802410	Lower housing		1
2	33800030	Upper housing		1
3	43800100	Rotor		1
4	43802560	End plate		1
5	43804130	No Stress frame		1
6	43803060	Knife	270x135x14	4
7	03801160	Twig crusher, complete		1
8	43803200	Belt pulley	Z=30	1
9	43801650	Hinge pin, feed hopper		1
10	43801670	Hinge pin, upper housing		1
11	43801510	Twig blade		1
12	43291103	Anvil adjuster		2
13	43801590	Pin	L=150	1
14	43800990	Protective plate		1
15	43802460	Lock nut		2
16	43802350	Horizontal anvil		1
17	43802360	Vertical anvil		1
18	03801900	Bearing, complete		2
18.1	43800590	Bearing housing		1
18.2	43800600	Cover for bearing housing		1
18.3	43800610	Labyrinth ring		1
18.4	43800620	Labyrinth sleeve		1
18.5	54523213	Roller bearing		1
18.6	52401015	Grease nipple	AR1/8	1
19	43292739	Washer	9	4
20	52060050	Screw	M6X40 DIN933 8.8ZN	1
21	52117066	Lock nut	M6 DIN985 8.8ZN	1
22	52842168	Ring cotter	6,5X40	1
23	52842143	Cotter	5X105	1

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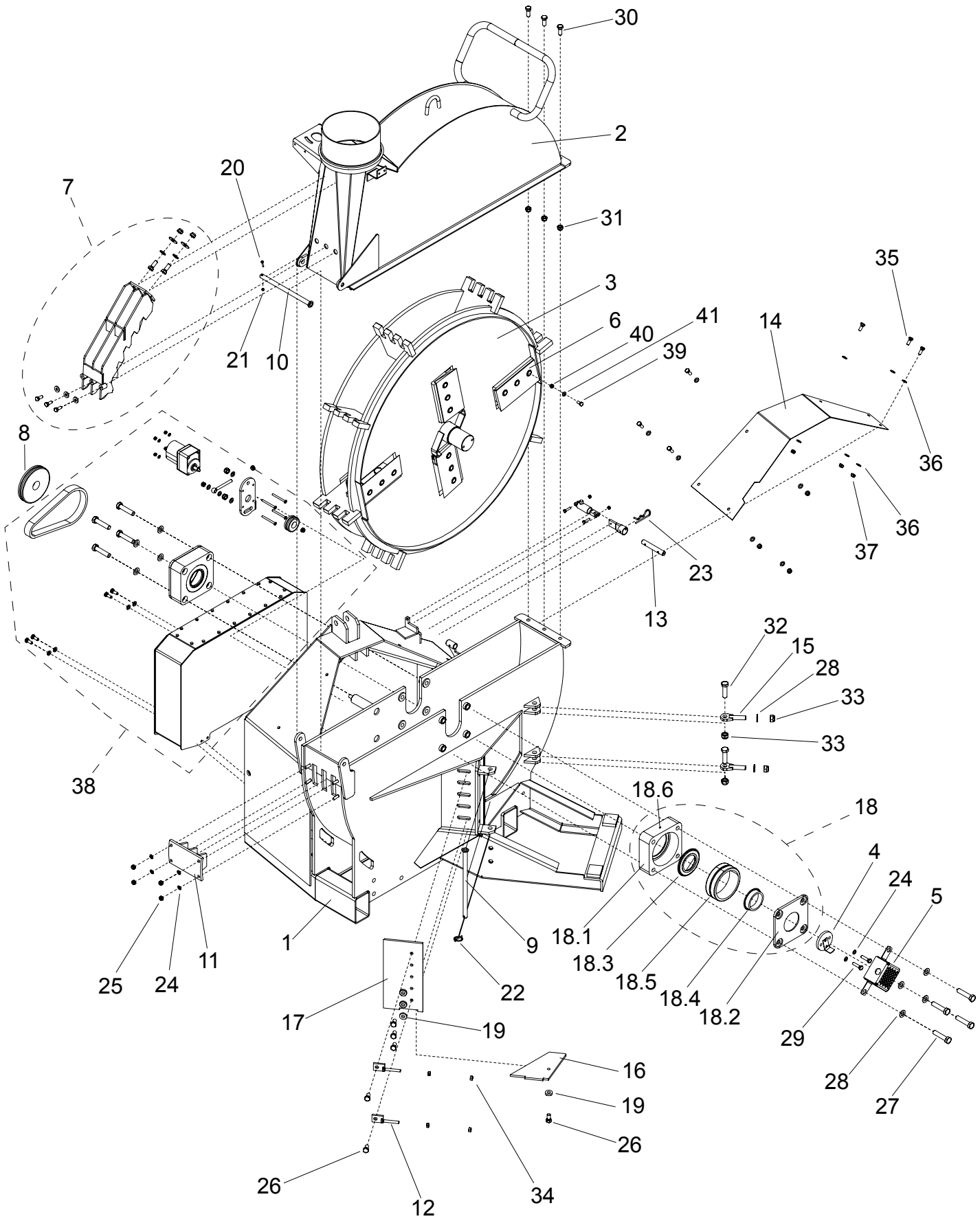
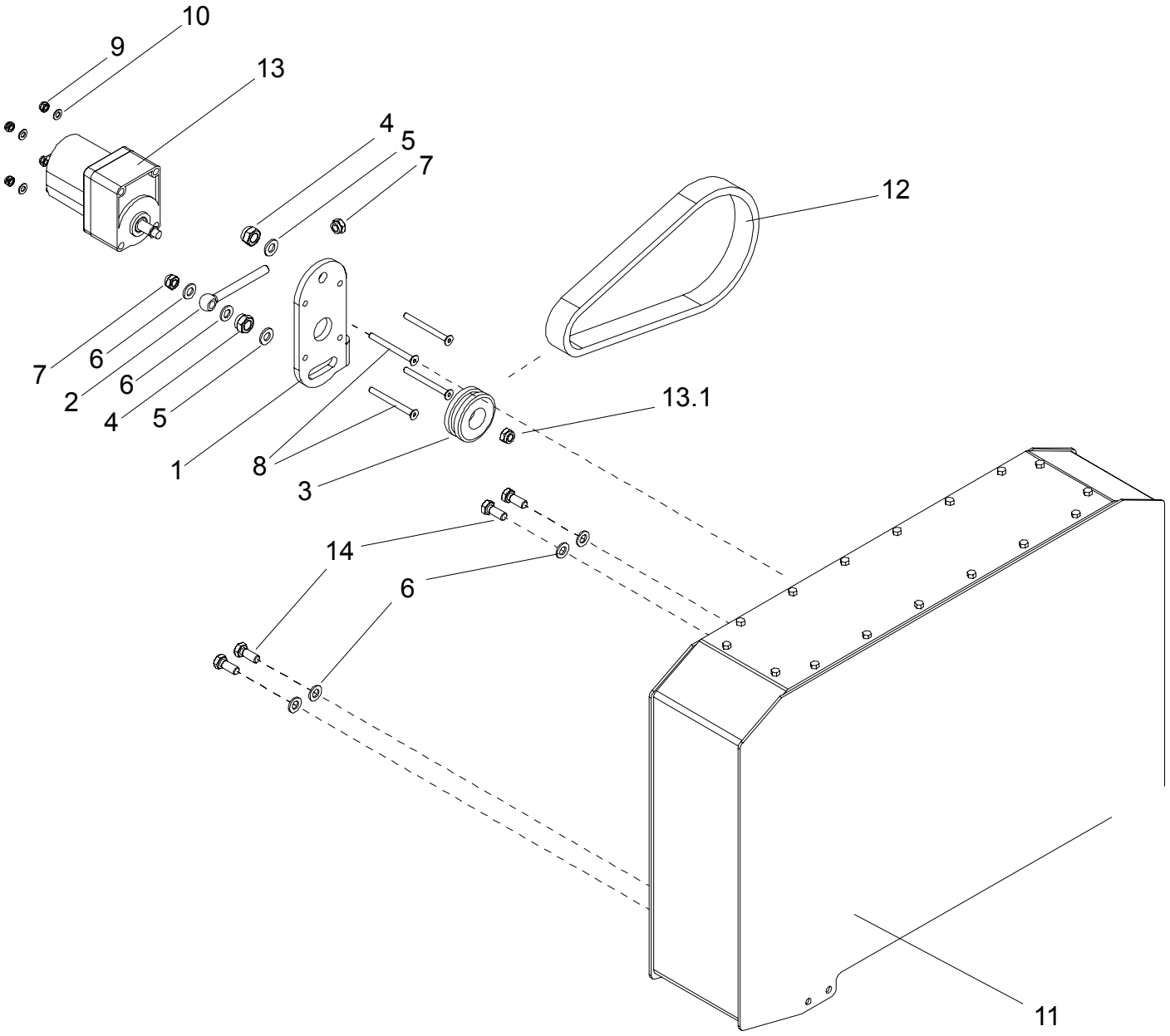
CHIPPER



CHIPPER

Part	Order no	Description	Remarks	Qty
24	52211059	Spring washer	M12 DIN127 ZN	3
25	52117124	Lock nut	M12 DIN985 8.8ZN	4
26	52062106	Screw	M16X30 DIN933 8.8ZN	6
27	52062280	Screw	M20X90 DIN931 8.8ZN	8
28	52200086	Washer	M20 DIN126 5.8ZN	10
29	52062041	Screw	M12X50 DIN933 8.8ZN	2
30	52062114	Screw	M16X40 DIN933 8.8ZN	3
31	52117165	Lock nut	M16 DIN985 8.8ZN	3
32	52062247	Screw	M20X70 DIN931 8.8ZN	2
33	52117207	Lock nut	M20 DIN985 8.8ZN	4
34	52110053	Nut	M12 DIN934 8.8ZN	4
35	52060233	Screw	M10X30 DIN033 8.8ZN	6
36	52200045	Washer	M10 DIN126 5.8ZN	12
37	52117108	Lock nut	M10 DIN985 8.8ZN	6
38	03800080	Hydraulic unit HD380	see separate spare part page	
39	52090933	Screw	M14x50 DIN931 10.9	12
40	52117140	Lock nut	M14 DIN985 8ZN	12
41	52211067	Spring washer	M14 DIN127 ZN	12

HYDRAULIC UNIT HD380

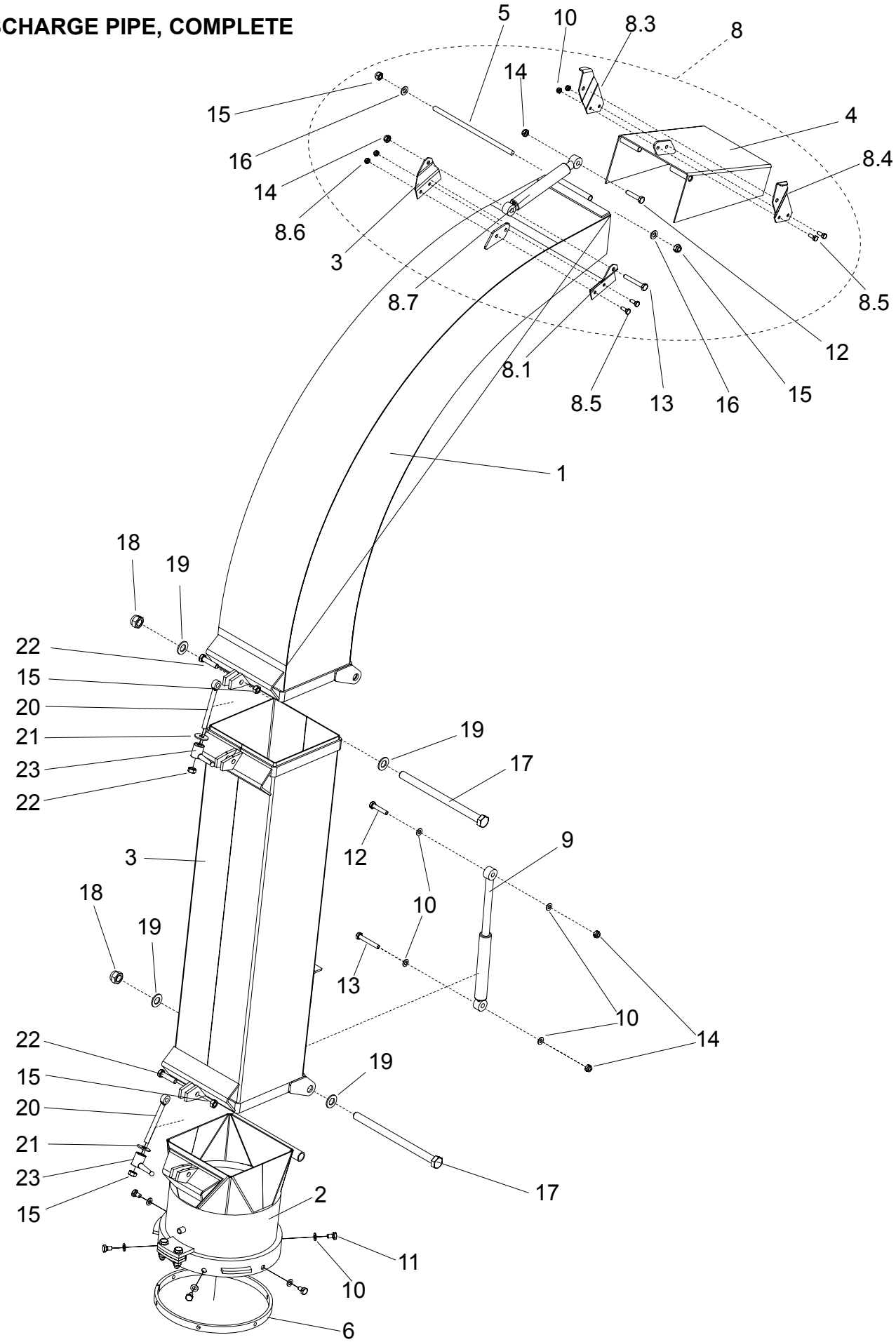


HYDRAULIC UNIT HD380

Part	Order no	Description	Remarks	Qty
1	43801860	Fastening plate for hydraulic pump		1
2	52062840	Eyebolt	M12X120 8.8ZN	1
3	03803210	Belt pulley	Z=48	1
4	52117165	Lock nut	M16 DIN985 8.8ZN	2
5	52200078	Washer	M16 DIN126 5.8ZN	2
6	52200052	Washer	M12 DIN125 5.8ZN	6
7	52117124	Lock nut	M12 DIN985 8.8ZN	2
8	52090702	Socket head screw	M8X90 DIN7991	4
9	52117082	Lock nut	M8 DIN985 8.8ZN	4
10	52200037	Washer	M8 DIN126 5.8ZN	4
11	03803000	Tank	85 l	1
12	53220410	Belt		1
13	56025340	Hydraulic pump		1
13.1		Nut	with the pump	
14	52062023	Screw	M12X30 DIN933 8.8ZN	4

CH380HF

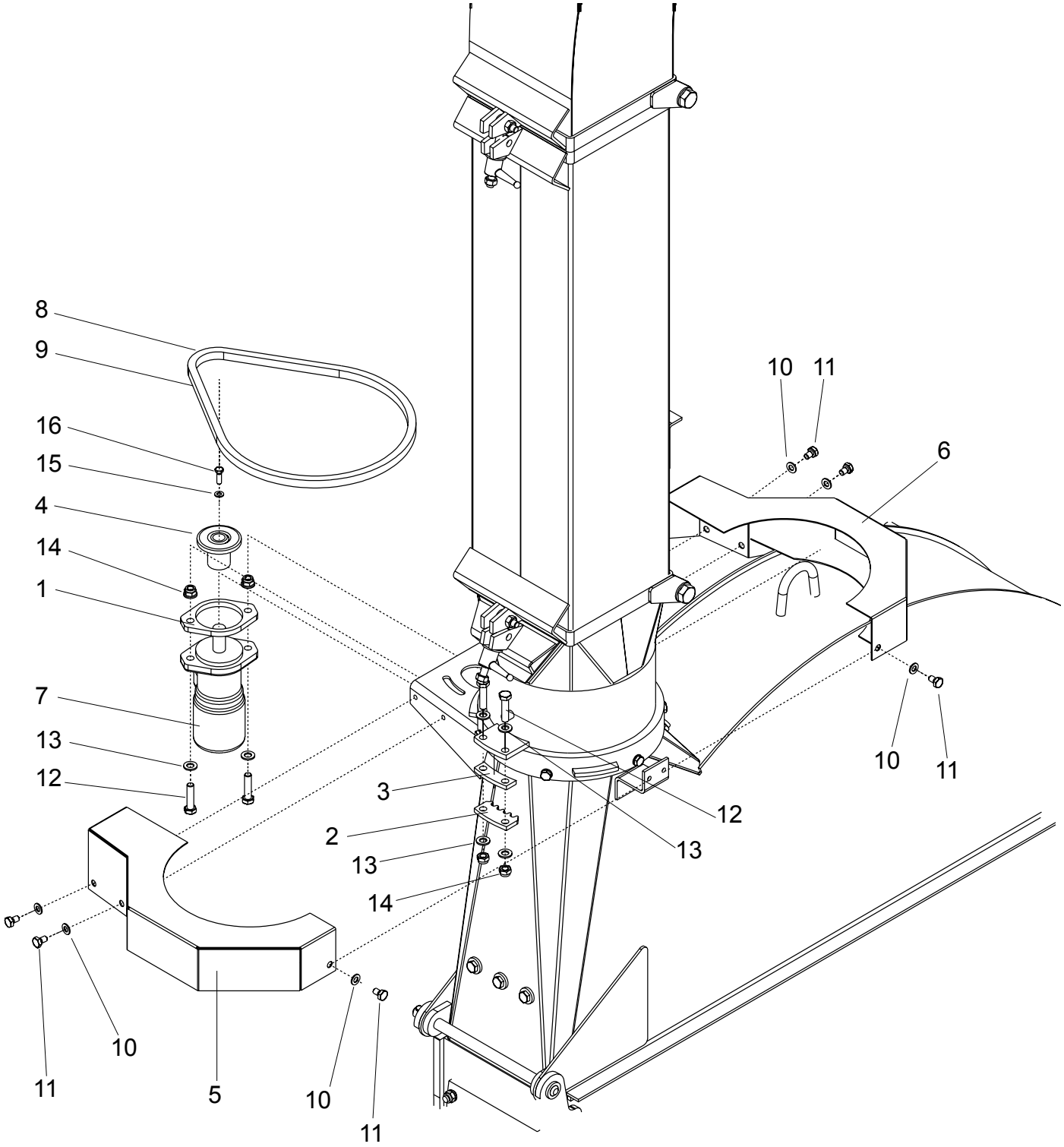
DISCHARGE PIPE, COMPLETE



DISCHARGE PIPE, COMPLETE

Part	Order no	Description	Remarks	Qty
1	33800040	Chute		1
2	43801360	Discharge pipe		1
3	43801240	Extension		1
4	43801290	Vizor		1
5	43802940	Vizor pin		1
6	43801430	Pair of locking flat iron		1
7	03800090	Actuator for discharge chute rotation, complete	see separate spare part page	1
8	43487460	Actuator for discharge chute blow distance		1
8.1	43487270	Fastening plate for cylinder	left	1
8.2	43487280	Fastening plate for cylinder	right	1
8.3	43487470	Fastening plate for piston rod	left	1
8.4	43487480	Fastening plate for piston rod	right	1
8.5	52060126	Screw	M8X20 DIN933 8.8ZN	4
8.6	52117082	Lock nut	M8 DIN985 8.8ZN	4
8.7	56097793	Hydraulic cylinder	32/20-150	1
9	56097793	Hydraulic cylinder	32/20-150	1
10	52200045	Washer	M10 DIN126 5.8ZN	10
11	52060209	Screw	M10X16 DIN933 8.8ZN	6
12	52060266	Screw	M10X50 DIN931 8.8ZN	1
13	52060282	Screw	M10X70 DIN931 8.8ZN	1
14	52117108	Lock nut	M10 DIN985 8.8ZN	2
15	52117124	Lock nut	M12 DIN985 8.8ZN	6
16	52200052	Washer	M12 DIN125 5.8ZN	2
17	52063087	Screw	M20X300 DIN931 8.8ZN	2
18	52117207	Lock nut	M20 DIN985 8.8ZN	2
19	52200086	Washer	M20 DIN126 5.8ZN	4
20	52062840	Eyebolt	M12X120 8.8ZN	2
21	52200466	Washer	M12 DIN440 ZN	2
22	52062627	Screw	M12X50 DIN931 8.8ZN	2
23	52110420	Hand level	M12	2

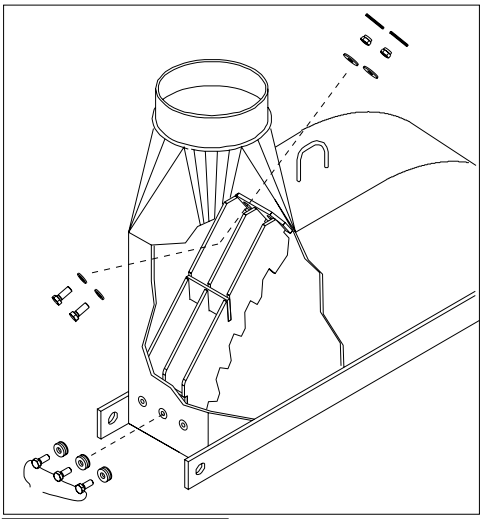
ACTUATOR FOR DISCHARGE CHUTE ROTATION, COMPLETE



ACTUATOR FOR DISCHARGE CHUTE ROTATION, COMPLETE

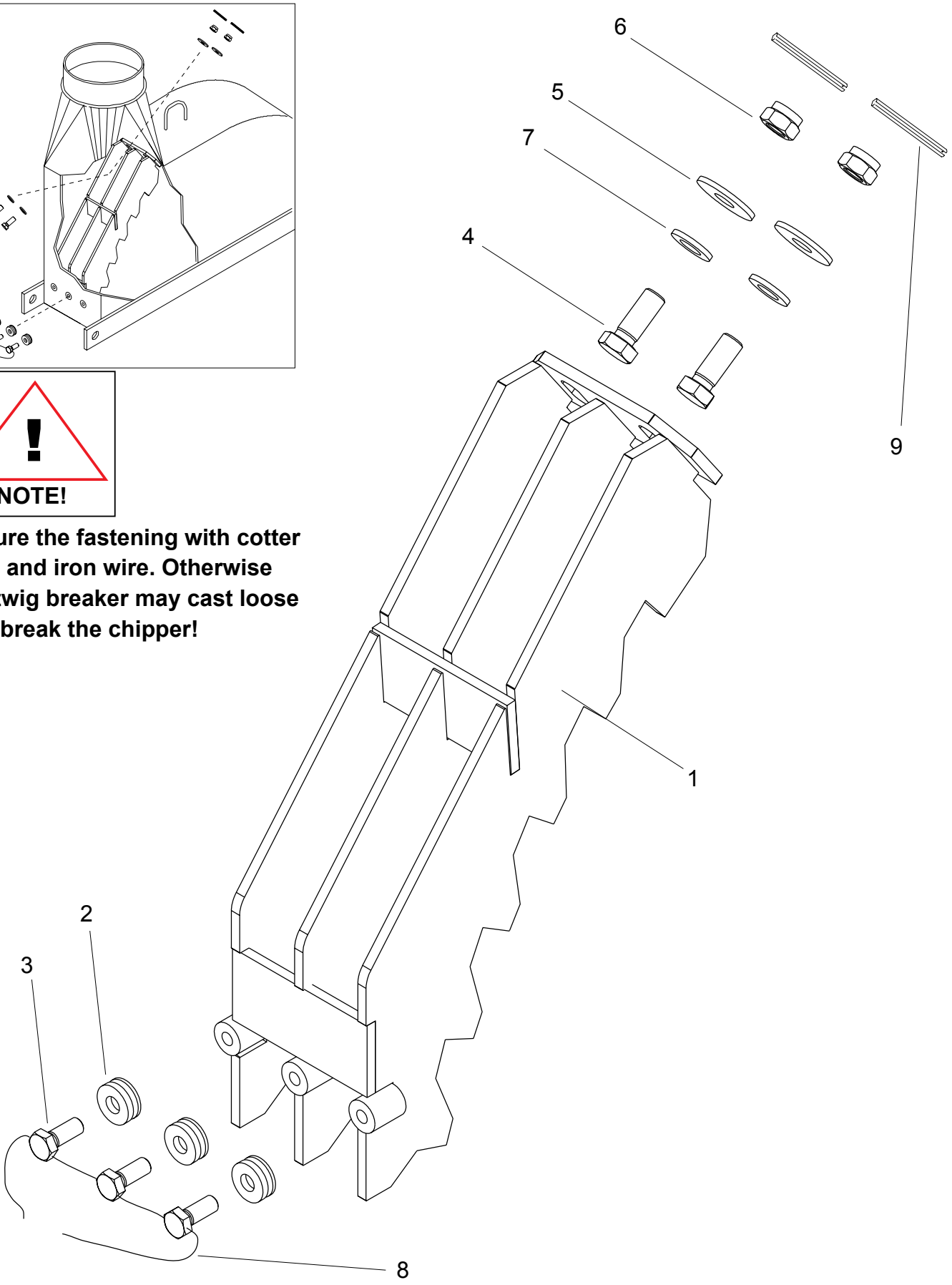
Part	Order no	Description	Remarks	Qty
1	43800820	Bottom flat iron for turn motor		1
2	43801400	Chain plate		1
3	43801410	Spacer plate		1
4	43801800	Splined shaft		1
5	43802530	Chain cover, right		1
6	43802540	Chain cover, left		1
7	56001902	Hydraulic motor	OMP160	1
8	54820014	Roller chain	5/8X83 links	1
9	54820048	Chain link	5/8” DIN8187	1
10	52200045	Washer	M10 DIN126 5.8ZN	6
11	52060209	Screw	M10X16 DIN933 8.8ZN	6
12	52062627	Screw	M12X50 DIN931 8.8ZN	4
13	52200052	Washer	M12 DIN125 5.8ZN	8
14	52117124	Lock nut	M12 DIN985 8.8ZN	4
15	52200037	Washer	M8 DIN126 5.8ZN	1
16	52060175	Screw	M8X25 DIN933 8.8ZN	1

TWIG CRUSHER, COMPLETE



NOTE!

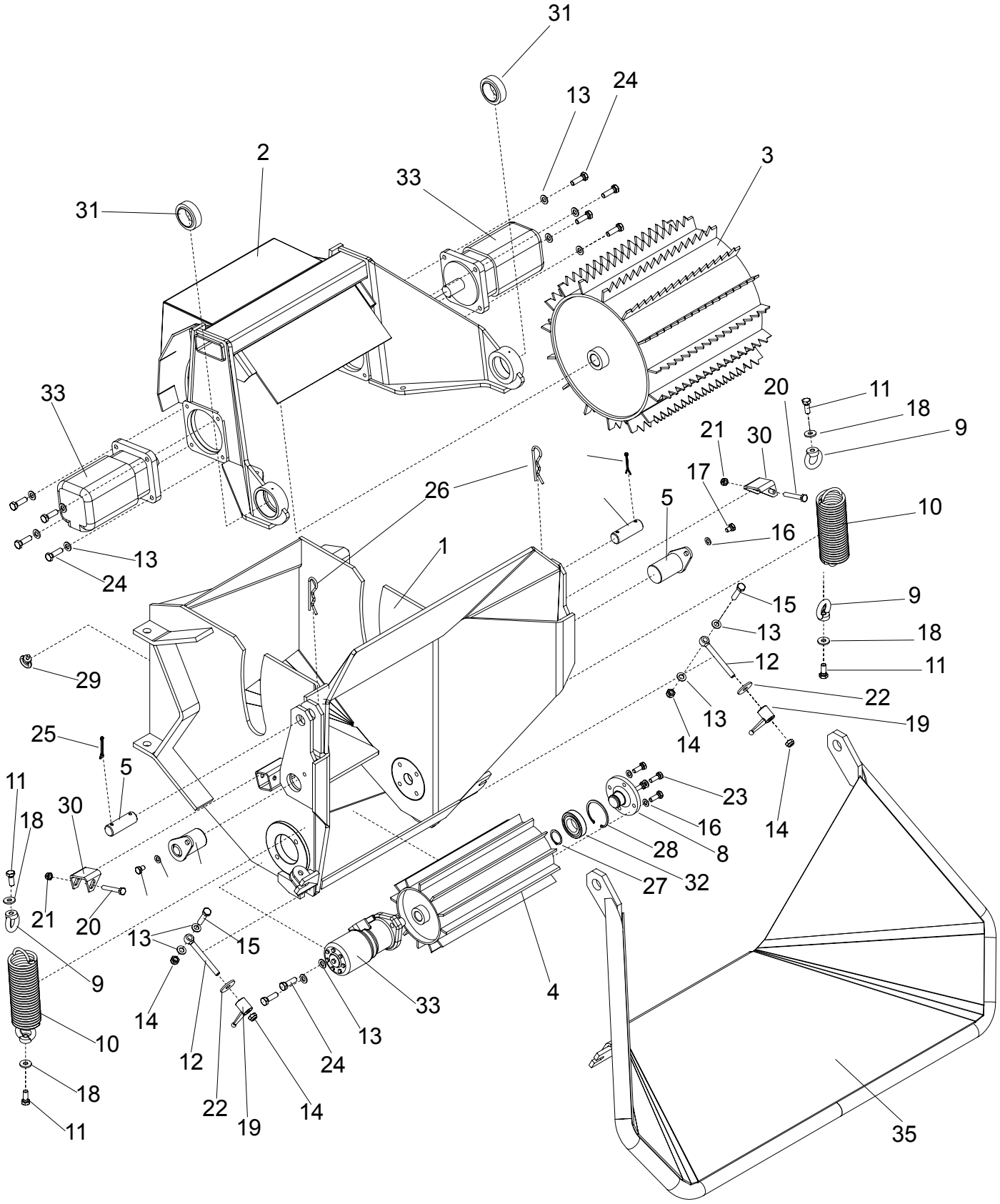
Secure the fastening with cotter pins and iron wire. Otherwise the twig breaker may cast loose and break the chipper!



TWIG CRUSHER, COMPLETE

Part	Order no	Description	Remarks	Qty
1	43801160	Twig crusher		1
2	41215682	Washer	10	3
3	52091839	Screw	M12X30 DIN933 10.9ZN	3
4	52090917	Screw	M16X40 DIN933 10.9ZN	2
5	52214285	Lock washer	NORD-LOCK	2
6	52117165	Lock nut	M16 DIN985 8.8ZN	2
7	52200078	Washer	M16 DIN126 5.8ZN	2
8	-	Iron wire		1
9	52840071	Cotter pin	4X22 DIN1481	2

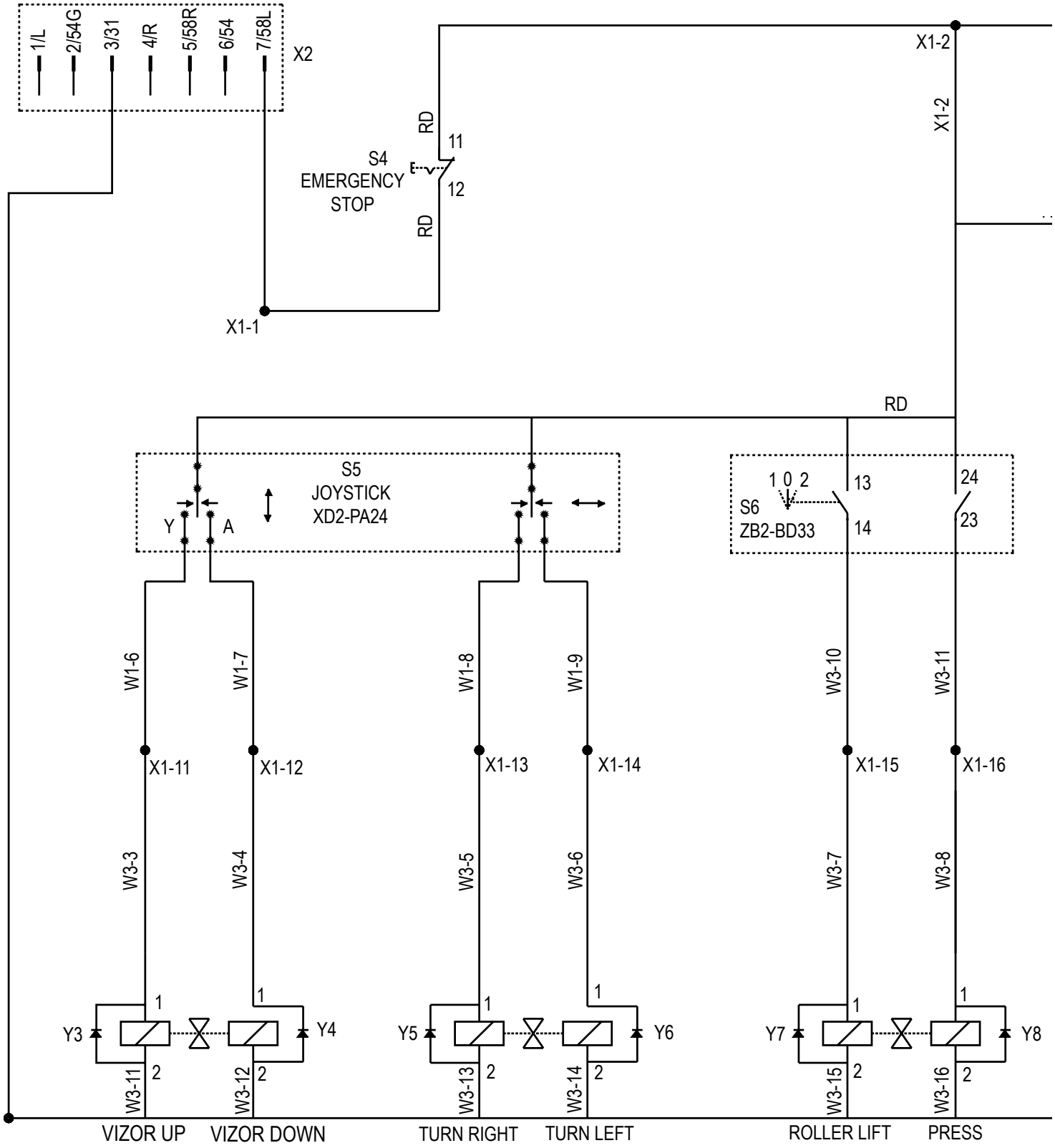
HYDRAULIC FEEDER HF380



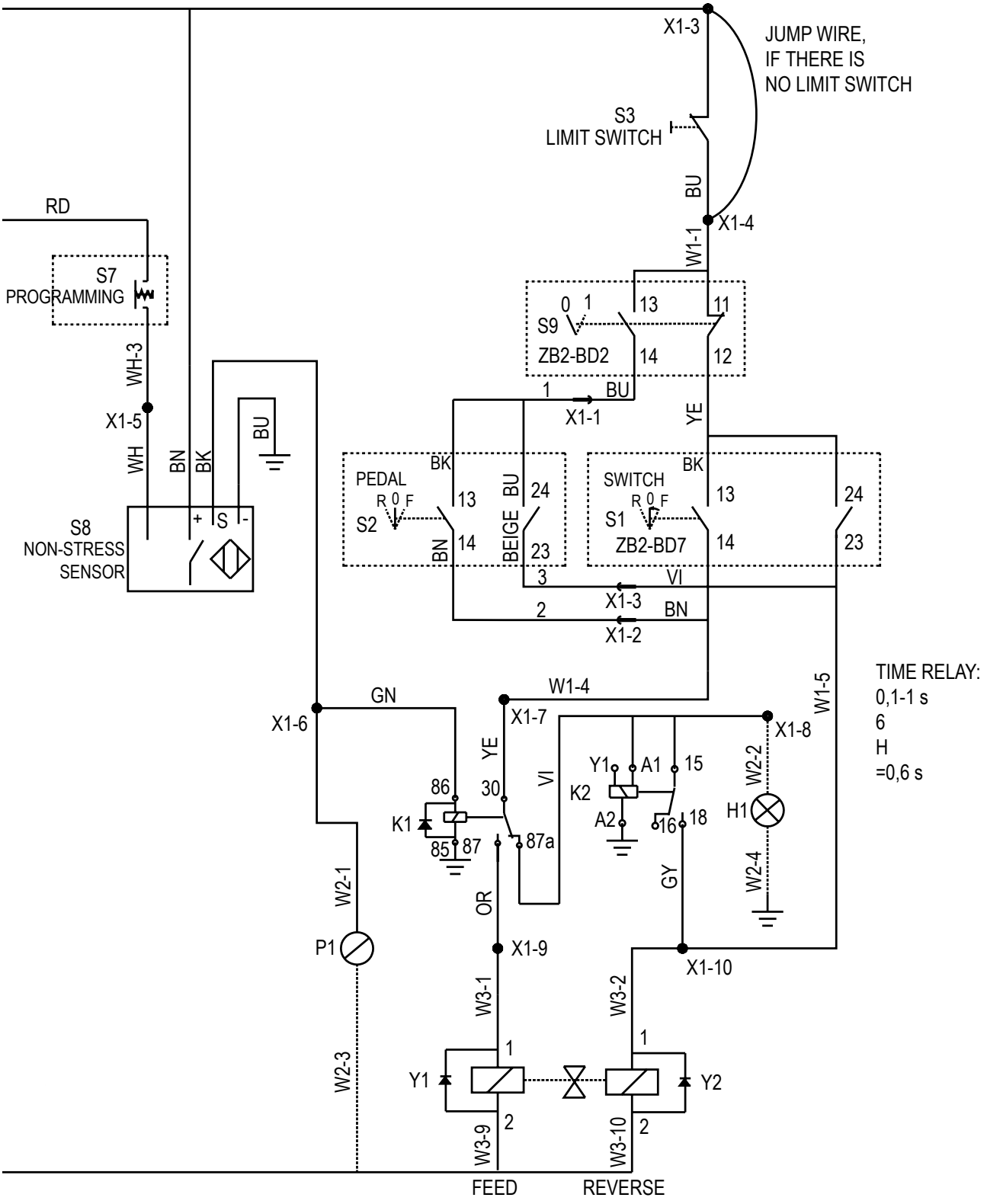
HYDRAULIC FEEDER HF380

Part	Order no	Description	Remarks	Qty
1	43802240	Frame		1
2	33802220	Roller's swing		1
3	43800410	Upper feed roller		1
4	43800350	Lower feed roller		1
5	43801960	Pin	L90	2
6	43501430	Pin		2
7	43802490	Bushing		2
8	43313048	Fastening for lower feed roller		1
9	52091600	Eyebolt nut	M12 DIN582	4
10	94617073	Draw-spring	DU68 DL7 L245	2
11	52062023	Screw	M12X30 DIN933 8.8ZN	4
12	52062840	Eyebolt	M12X120 8.8ZN	2
13	52200052	Washer	M12 DIN125 5.8ZN	14
14	52117124	Lock nut	M12 DIN985 8.8ZN	4
15	52062627	Screw	M12X50 DIN931 8.8ZN	2
16	52200045	Washer	M10 DIN126 5.8ZN	6
17	52060209	Screw	M10X16 DIN933 8.8ZN	2
18	52214269	Lock washer	M12 Nord-Lock	4
19	52110420	Hand level	M12	2
20	52060282	Screw	M10X70 DIN931 8.8ZN	2
21	52117108	Lock nut	M10 DIN985 8.8ZN	2
22	52200466	Washer	M12 DIN440 ZN	2
23	52060233	Screw	M10X30 DIN933 8.8ZN	4
24	52063617	Screw	M12X40 DIN933 10.9	10
25	52813151	Split pin	5X50 DIN94 ZN	2
26	52842143	Cotter	5X105	2
27	52230067	Circlip	35X2,5 DIN471	1
28	52231172	Circlip	72X2,5 DIN472	1
29	52090490	Eyebolt	M8 DIN580	1
30	40180432	Limiter		2
31	54592050	Articulation bearing		2
32	54511340	Ball bearing		1
33	03803020	Hydraulics		
34	43802900	Electrics	see separate spare part page	
35	43801770	Feedhopper		1

43802900 ELECTRICS HF380



43802900 ELECTRICS HF380



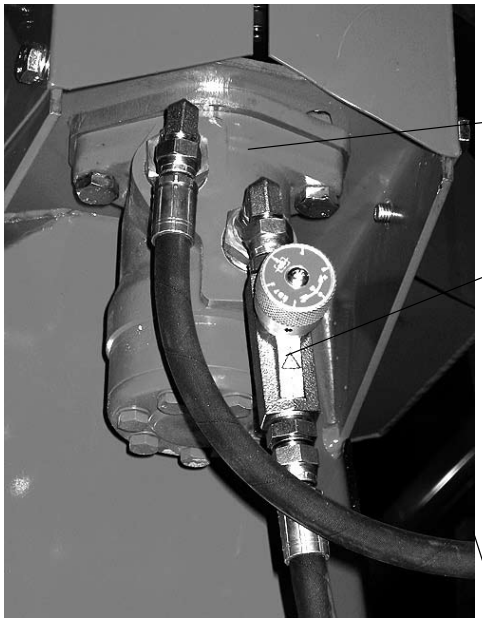
43802900 ELECTRICS HF380

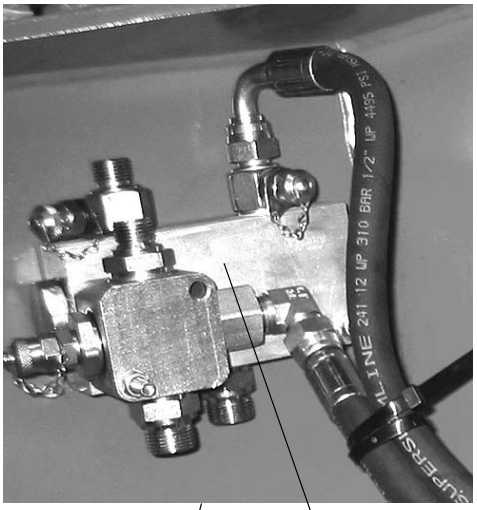
Part	Order no	Description	Remarks	Qty
	55136405	Box	Joystick / operating box	1
	55132470	Emergency stop button	red	1
	55130760	Connecting plug	Hella	1
	55136402	Box	Connection box	1
	55114375	Mounting rail	15 cm	1
	55144770	Cable seal	BG21	3
	55119077	End clamp		2
	55119060	Switching bridge	BJM6D1	1
	55119050	End plate		2
	55131924	Connector	AMP Junior	8
	52091634	Screw	M4,8X16 DIN7981	2
	52200037	Washer	M8 DIN126 5.8 ZN	4
	55144740	Rubber seal	4-part	1
	55119800	2-layer connector	M4/6 D2	10
	55119080	Ferrule		44
	55129019	Box	Safety switch box	1
	55131312	Rotary control switch		1
	55132420	Switch body		1
	55132460	Contact block		1
	55128698	Contact block		1
	55132300	Switch body		3

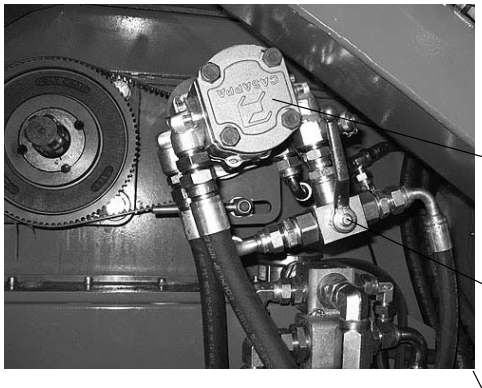
43802900 ELECTRICS HF380

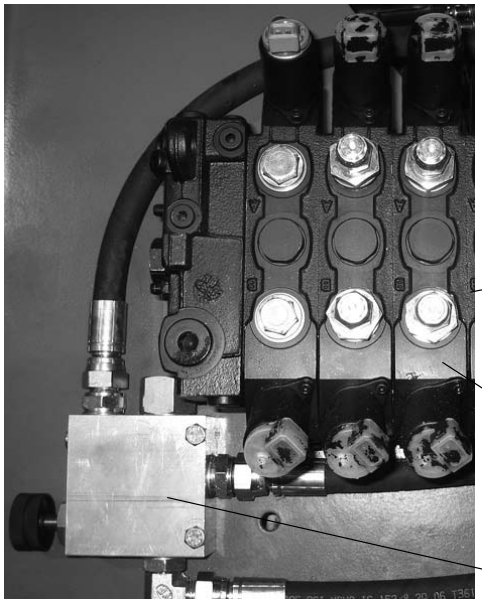
Part	Order no	Description	Remarks	Qty
	55128620	Rotary control switch	ZB2-BD7	1
	55144182	Counter nut	BG21	2
	55144174	Cable seal	BG16	2
	55144125	Counter nut	BG16	2
	58218230	Joystick	XD2PA24	1
	55142430	Foot switch		1
	43489330	Plug, female		1
	43489340	Plug, male		1
	54946380	Cable	2X2,5 6 m	1
	54946390	Cable	12X1,5 10 m	1
	54946397	Cable	3X1,5 1,5 m	1
	54946370	Cable	18X1,5 1,3 m	1
	54946360	Cable	4X0,75 5 m	1
	54946350	Cable	3X0,75 1,5 m	1
	55131410	Installation set	for 3-pin socket	1
		No Stress electrical parts		
	55121360	Induction sensor		1
	55121350	Timing relay		1

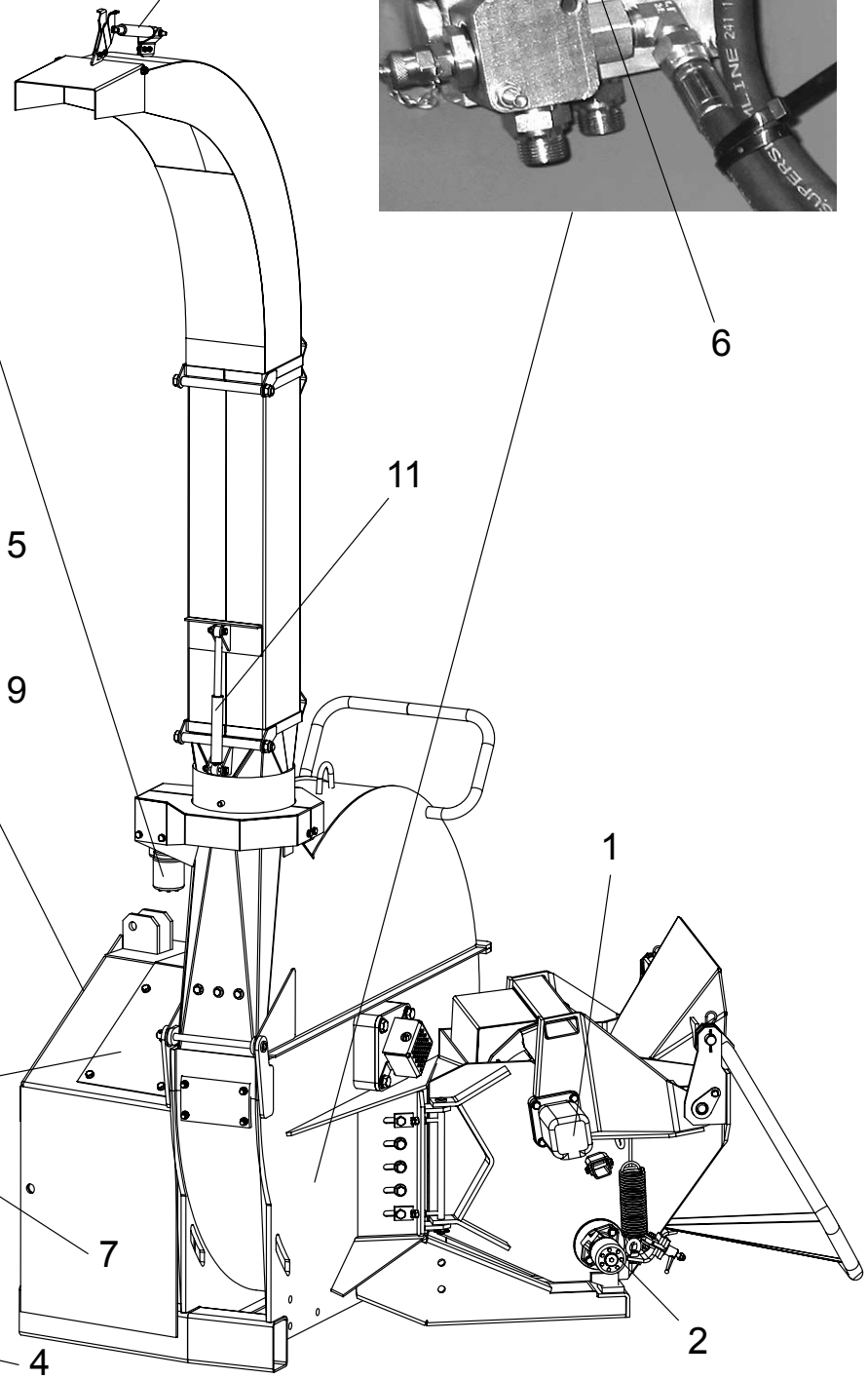
03803020 HYDRAULICS







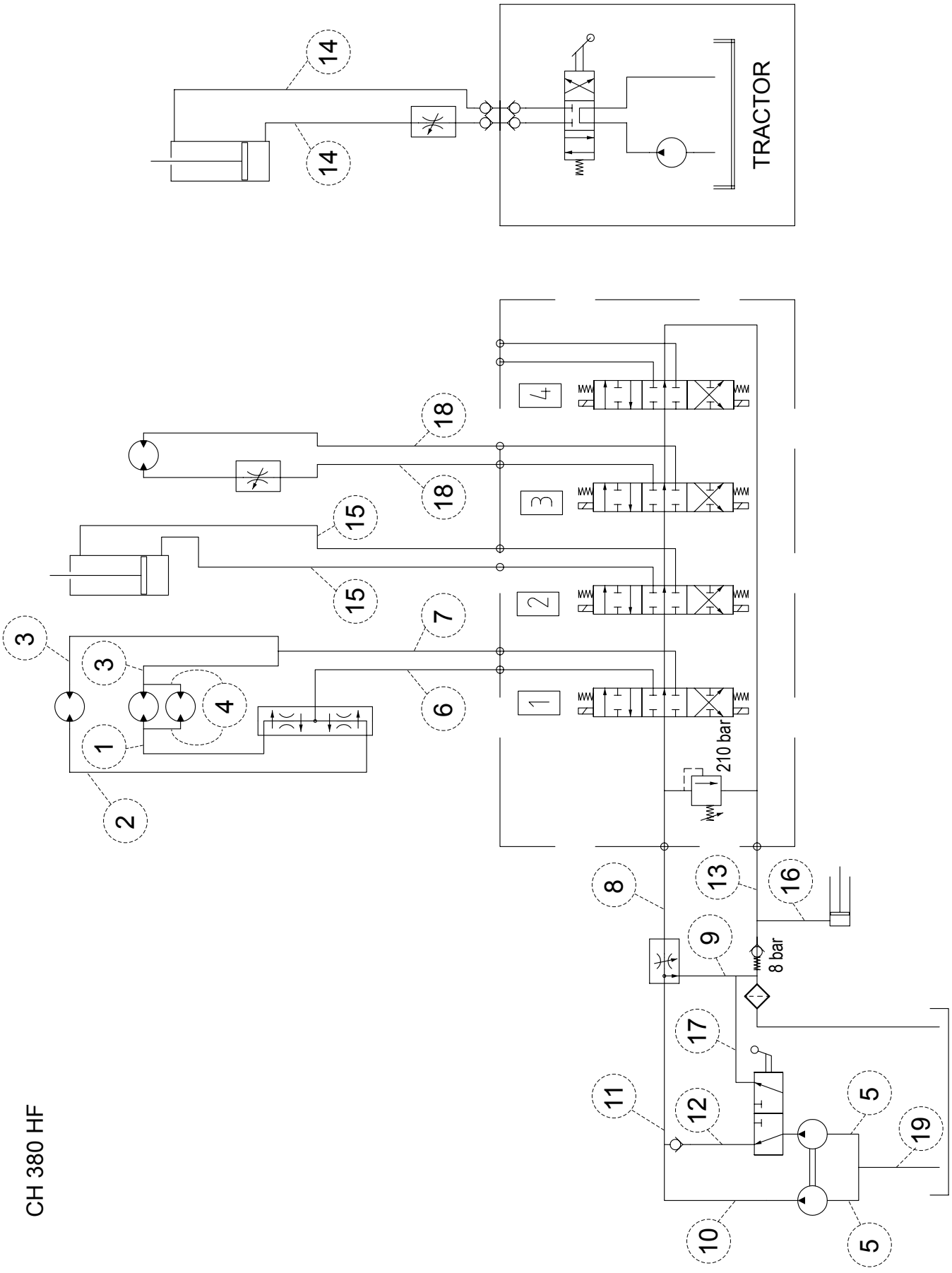




03803020 HYDRAULICS

Part	Order no	Description	Remarks	Qty
1	56028860	Hydraulic motor	EPMSY W400	2
2	56002033	Hydraulic motor	OMR 375	1
3	56001902	Hydraulic motor	OMP 160	1
4	56048390	Directional control valve	P70CF, 12V	1
5	56025310	Hydraulic double pump		1
6	56040744	Flow divider valve		1
7	56070832	Flow regulator valve		1
8	56070261	Restrictor valve		3
9	56043670	Ball valve	3-way	1
10	56013246	Check valve		1
11	56097793	Hydraulic cylinder	32/20-150	1
12	43487460	Actuator for discharge chute blow distance	complete	1
13	03803040	Hose series		1

Hydraulic diagram

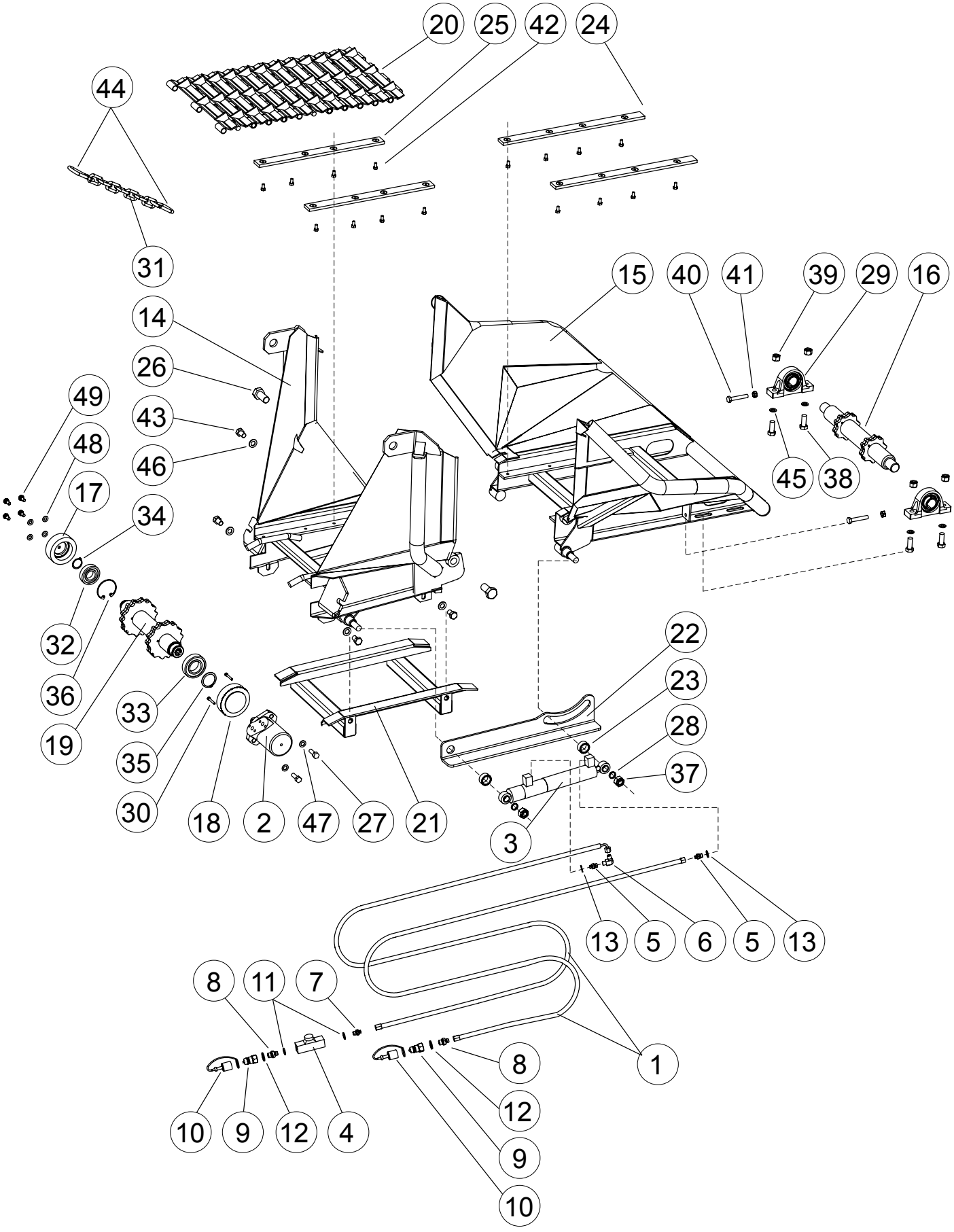


CH 380 HF

03803040 Hose series

Part	Order no	Description	Remarks	Qty
1	56526114	Hose assy K1/2”S	L=0,8 m	1
2	56526148	Hose assy K1/2”S	L=0,95 m	1
3	56526100	Hose assy K1/2”S	L=0,75 m	2
4	56525173	Hose assy V1/2”S	L=1,2 m	2
5	56534092	Hose assy K3/4”S	L=0,7 m	2
6	56534225	Hose assy K3/4”S	L=1,7 m	1
7	56534217	Hose assy K3/4”S	L=1,6 m	1
8	56526098	Hose assy K1/2”S	L=0,7 m	1
9	56526163	Hose assy K1/2”S	L=1,1 m	1
10	56526000	Hose assy K1/2”S	L=0,25 m	1
11	56524051	Hose assy S1/2”S	L=0,5 m	1
12	56526023	Hose assy K1/2”S	L=0,35 m	1
13	56534142	Hose assy K3/4”S	L=0,95 m	1
14	56516354	Hose assy S1/4”S	L=3,0 m	2
15	56518430	Hose assy S1/4”K	L=4,6 m	2
16	56516230	Hose assy S1/4”S	L=1,8 m	1
17	56526056	Hose assy K1/2”S	L=0,5 m	1
18	56518178	Hose assy K1/4”S	L=1,2 m	2
19	44093990	Suction hose	L=0,83 m	1

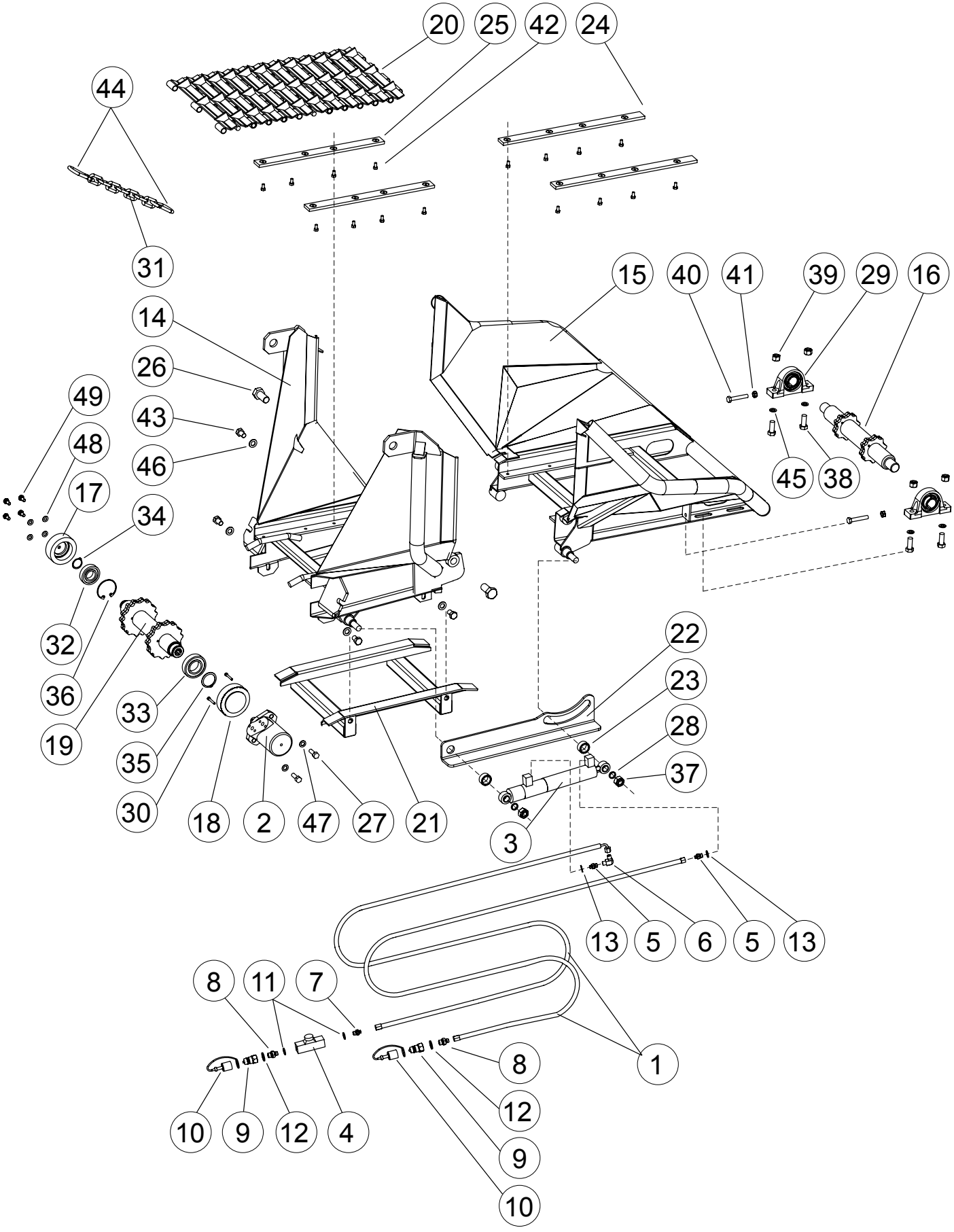
03803950 Feed conveyor FC380



03803950 Feed conveyor FC380

Part	Order no	Description	Remarks	Qty
1	03809020	Hose assy		1
2	56002020	Hydraulic motor	OMR250	1
3	56016040	Hydraulic cylinder	40/20-200, double acting	1
4	56070261	Choker		1
5	52432119	Double fitting	R1/4-3/8	2
6	52442761	Angle nipple	R1/4, 90º	1
7	52432101	Angle nipple	R1/4	1
8	52432226	Double fitting	R1/4-1/2	2
9	52449022	Quick fitting	1/2	2
10	54922141	Cap	1/2	2
11	52391034	Usit-ring	U13,5x18,7x1,5	2
12	52390200	Usit-ring	U21,5X28,7X2,5	2
13	52390556	Usit-ring	U17,4X24,0X1,5	2
14	33804700	Mounting frame		1
15	33804400	Front frame		1
16	43803730	Front axle		1
17	43803760	Bearing housing	right	1
18	43803770	Bearing housing	left	1
19	43803720	Rear axle		1
20	43803870	Conveyor		1
21	43803900	Support		1
22	43803920	Cylinder cover	left	1
23	43804810	Bushing		2
24	43804830	Slide plate, complet	L=570	2
25	43804840	Slide plate, complet	L=505	2
26	43803580	Screw	M24	2
27	43803940	Screw	M12	2
28	43800400	Bushing	D25X4,5	2
29	54822850	Bearing unit	vertical	2
30	52070125	Hexagonal socket head screw	M6x40 DIN912 88ZN	2
31	43804850	Chain		1

03803950 Feed conveyor FC380



03803950 Feed conveyor FC380

Part	Order no	Description	Remarks	Qty
32	54511340	Slotted sealed ball bearing		1
33	54512140	Ball bearing		1
34	52230067	Circlip	35X2,5 DIN471	1
35	52230257	Circlip	45x2,5 DIN471	1
36	52231172	Circlip	72x2,5 DIN472	1
37	52117207	Lock nut	M20 DIN985 8ZN	2
38	52062130	Screw	M16X60 DIN931 88ZN	4
39	52117165	Lock nut	M16 DIN985 8ZN	4
40	52063609	Screw	M12X70 DIN933 88ZN	2
41	52110053	Nut	M12 DIN934 8ZN	2
42	52060118	Screw	M8x16 DIN933 88ZN	16
43	52062098	Screw	M16X25 DIN933 88ZN	4
44	53804136	Spring hook	DIN 5299C	2
45	43292739	Washer		4
46	52214285	Lock washer	M16 NORD-LOCK	4
47	52214269	Lock washer	M12 NORD-LOCK	2
48	52214251	Lock washer	M10 NORD-LOCK	4
49	52060233	Screw	M10X30 DIN933 88ZN	4

GUARANTEE

Farmi Forest products are guaranteed to be free from defects in materials and workmanship for 12 months from the date of purchase.

This warranty does not cover defects resulting from:
- misuse of the product
- inadequate maintenance
- modifications of the product made without the manufacture's consent

The warranty is effective only, if the lower portion of this page is completed and returned to the manufacturer within 14 days of receipt of the product.

Important
Before putting your FARMI to use, be sure to read the instruction and service booklet provided with the machine.

Farmi Forest Corporation
Ahmolantie 6
FIN-74510 Iisalmi
Finland

Farmi Forest Corporation
Ahmolantie 6
FIN-74510 IISALMI
FINLAND

Date of delivery:_____/_____ 20_____

Dealer:

Dealer’s address:

Dealer’s tel:

Product and type:

Serial number:

Return to the manufacturer

Date of delivery:_____/_____ 20_____

Dealer:

Dealer’s address:

Dealer’s tel:

Customer:

Customer’s address:

Customer’s tel:

Product and type:

Serial number:

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