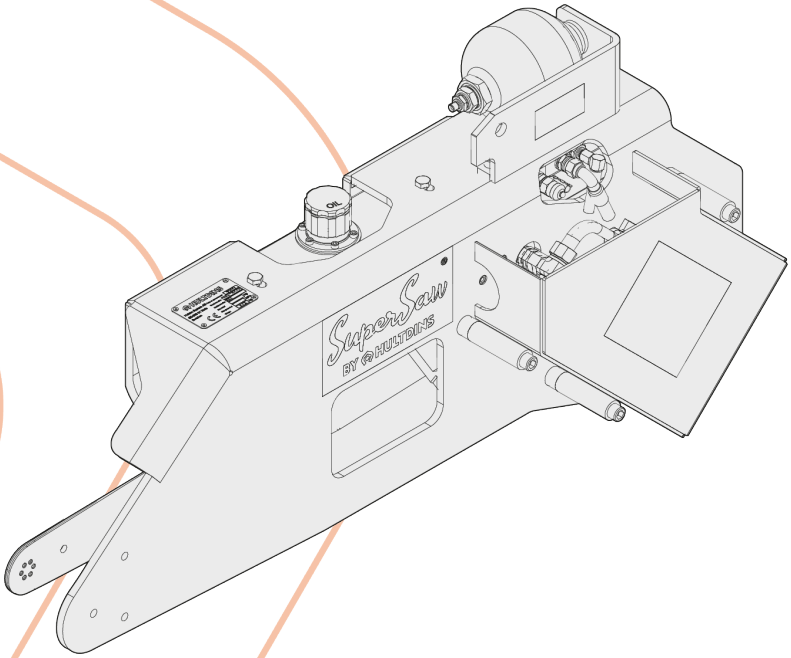
SuperSaw 550

Instructions for use
Original instructions



HULTDINS

This publication contains instructions for the installation and handling of the product. The instructions cover both general information for all models, and procedures or specifications applicable to individual models. If doubt should arise concerning the validity of the instructions please consult the nearest dealer for more detailed information.

Illustrations, technical information and specifications were, as far as we have been able to judge, correct at the time of print. However, we reserve the right to, without prior notice, revise specifications, instructions, equipment, etc. as a result of ongoing product improvement activities.

Even if all conceivable measures have been taken to make the contents as complete as possible, Hultdin System AB takes no responsibility for possible damages that may arise as a result of the instructions not being followed or improper use of the product.

Important!
The parts and components used in Hultdin System AB's products are specifically chosen. Therefore original spare parts are always the best alternative in a possible need of repairs or upgrading.

All service and repairs should be carried out by qualified service personnel or an authorized repair shop with suitable tools and lifting devices.

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This publication applies to the following models:

SS 550	S/N 031-1647 & up

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Safety instructions

General safety

- This page describes important safety instructions, which the operator should have a good knowledge of before the equipment is used.
- This product should only be used by operators with proper knowledge and training.
- The owner and the operator are responsible for following all safety regulations and that the machine is safely equipped.
- The owner and the operator are responsible for following National and local laws, regulations and other instructions when using the product.
- The owner and the operator are responsible for replacing damaged parts and/or unreadable warning signs.
- The manual should be available at all times so that the operator is able to follow safety regulations and the procedures of maintenance activities.

Meaning of safety messages

Danger!
Indicates a hazard with a high level of risk which, if not avoided, will result in death, serious injury and/or serious property damage.

Warning!
Indicates a hazard with a medium level of risk which, if not avoided, could result in death, serious injury and/or serious property damage.

Caution!
Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury and/or property damage.

Important!
Indicates a risk which, if not avoided, could result in material damages

Operational safety

- Before operation, check the unit according to the instructions for Daily maintenance.
- Make sure that the hydraulic pressure in the grapple cylinder is adjusted according to the specifications. If the pressure is too low the grapple will not be able to carry its load. If the pressure is too high, the grapple will be overloaded, which could cause a structural failure, resulting in injury and/or property damage.
- Unauthorized persons must remain at a distance (A) of at least 90 meters clear from the equipment during operation.

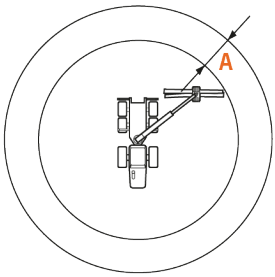

Fig. 1 Safety distance

- The operator must immediately evict unauthorized persons who are in the danger zone or are heading towards the danger zone.
- The operator must be well protected against falling load.
- The operator should be aware that the load, or parts of the load, could fall from the grapple at any time.
- Keep all windows and doors closed when operating.

Intended use

The unit is intended for timber handling. Cut-to-length, whole-tree and waste wood systems.

Any other use of the product is considered to be unintended use and is prohibited.

Chain shot hazard

Because of the high speeds, high stress, heavy loads, wear factors and varying levels of repair and maintenance given to saw-chain based machines, there is a possibility that chain or chain pieces can be thrown from the machine at high speed and enormous energy. Operators and bystanders are exposed to a risk of serious injury.

Machines should be designed with appropriate guards and shields, and care should be taken to minimize the exposure of users and bystanders to the cutting plane of the saw.

- There is risk of serious injury or death to machine operators and bystanders from "chain shot" which is the high-speed ejection of chain parts that can occur in the event of a derailed or a broken chain. For maximum protection, machines should be equipped with an energy-absorbing chain shot guard.
- Always use High Speed saw chains with 3/4" pitch saw units.

Maintenance safety

- To ensure personal safety the unit's condition must be checked regularly, daily maintenance shall be performed and any deficiencies must be corrected
- Never commit any service on the equipment without proper knowledge. All service and repairs in electrical and hydaulical systems should be carried out by qualified personnel only.
- Repair any damages immediate when discovered. Do not use the equipment until any damages are rectified.

Fig. 2 Safety symbols

- Before performing any maintenance or service work, lower the unit to the ground and shut off the engine. Turn off any master shut-offs and do not allow personnel in the cab.
- When working on the saw chain always ensure the engine is shut off and wear safety gloves to prevent injuries. Remove the saw chain when making any adjustments or servicing the saw unit.
- Use safety glasses and protective gloves when servicing the equipment. Hydraulic oil or lubricants in contact with skin or eyes may cause irritations or allergies.
- Use hard hat and safety boots when servicing the equipment. Leakage of hydraulic oil or lubricants will increase the risk of slipping or falling.

- The unit has sharp edges. Use proper wrenches and protective gloves when working on the unit.
- Hydraulic hoses and adapters may be pressurized even with the engine shut off. Loosen any parts with caution.
- Always make sure that the system is depressurized before committing any service on the equipment.
- Always secure movable parts mechanically before any hydraulic hose is loosened.
- Never try to stop a leakage in the hydraulic system with your hand. Pressurized hydraulic oil can be injected under the skin and cause death or severe damage.

Welding

In case of a structural repair of the equipment, when welding may be needed, consult the dealer for recommended instructions.

When welding on the unit the following steps must be taken:

- Make sure that fire-extinguishing equipment is available.
- Clean the area around the welding area to eliminate any fire hazard.
- Connect the ground wire so the welding current does not pass over any bushings.
- Place the ground wire as close to the welding area as possible.
- The bushings are affected by high temperatures. Protect or remove the bushings before welding close to their location.

Modifying the equipment

It is not approved to:

- Modify the unit without the consent of Hultdin System AB.
- Alter the function of the unit without the consent of Hultdin System AB.
- Use spare parts other than original Hultdins parts.

Design and function

SuperSaw

The SuperSaw 550 is a grapple saw that together with a grapple unit is generally mounted on cranes/booms intended for on road and off road-vehicles. The SuperSaw 550 consists of a frame, a SuperCut saw unit and a hydraulic system. It is only intended to be used for timber, pulp- and waste wood systems.

SuperCut

SuperCut standard is a complete unit with integrated feed cylinder, well protected from external damage. It has been equipped with automatic hydraulic chain tensioning and integrated lubrication pump that distributes lubricant to the chain during the complete sawing operation.

Labeling

The SuperSaw 550 is labeled with serial number, model number, manufacturing year, weight and a CE-label according to the following figure.

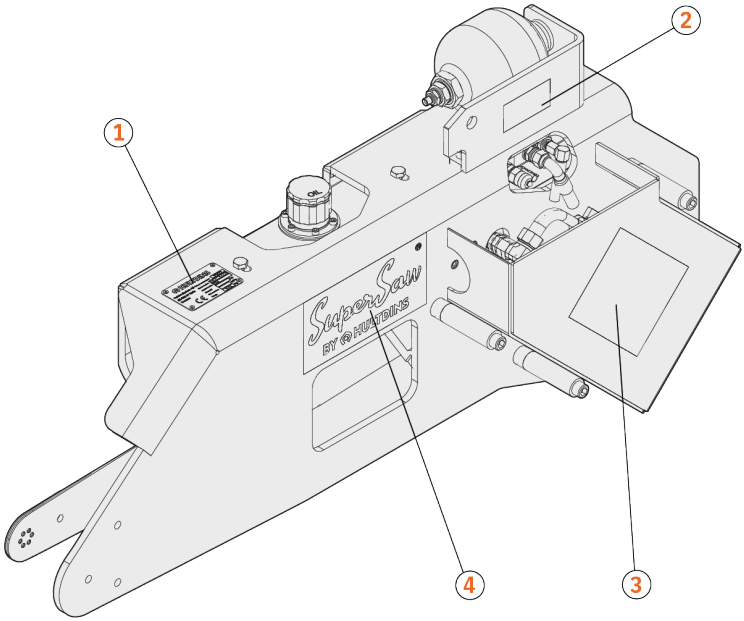

Fig. 3 Labeling

1. CE-label Serial number
2. Warning label
3. Warning label
4. Product label

Main parts SuperSaw

The SuperSaw 550 consists of the following main parts. All parts are replaceable.

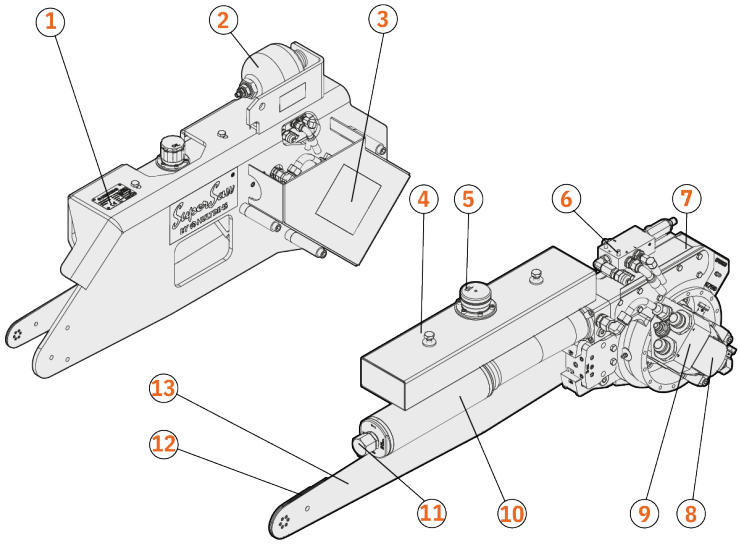

Fig. 4 Main parts

1. Frame
2. Accumulator for saw motor case drain
3. Saw motor cover
4. Lubrication oil tank
5. Refilling cap for chain lubrication oil
6. Adjustment valve for chain tension pressure
7. Saw unit
8. Saw motor
9. Saw motor manifold
10. Air tank for saw bar retraction
11. Air nipple for air-pressure adjustment
12. Saw chain
13. Saw bar

Main parts SuperCut

The SuperCut standard consists of the following main parts. All parts are replaceable.

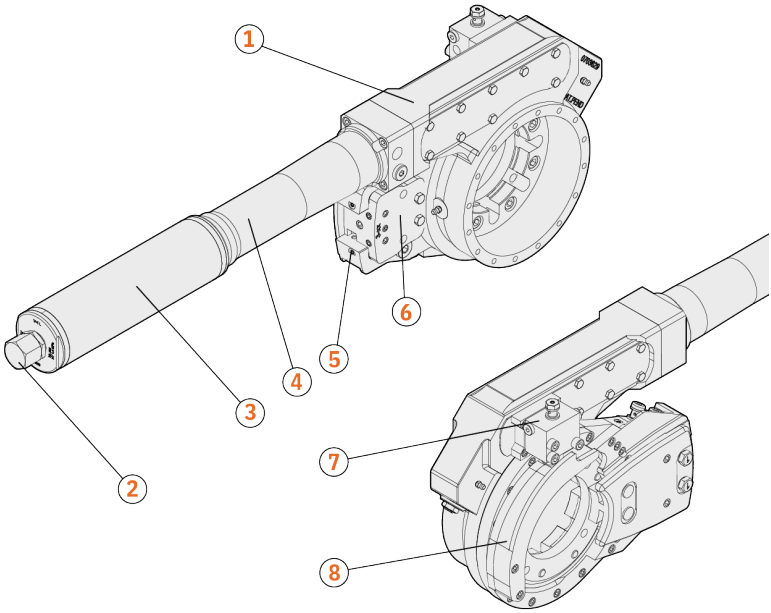

Fig. 5 Main parts

1. Housing
2. Air nipple for air-pressure adjustment (option)
3. Air tank for saw bar retraction (option)
4. Feed out cylinder
5. Tension device
6. Bar holder
7. Lubrication oil pump
8. Cam

Description

The SuperSaw 550 consists of a frame, a SuperCut saw unit, complete hydraulic system and an oil tank.

It has return feed system for the saw bar. While sawing, the integrated air tank takes care of the saw bar return and an accumulator takes care of the drainage oil.

The SuperCut standard is equipped with a feed out cylinder. The feed out cylinder feeds out the saw bar while the saw motor drives the saw chain. In its standard version, the SuperCut is equipped with integrated automatic hydraulic chain tensioning and a cam controlled mechanical lubrication oil pump.

Chain lubrication system

SuperCut is equipped with a M06 lubrication pump.

The lubrication oil pump supplies oil during the entire feed out process.

The lubrication oil pump is a piston pump operated by a cam, attached to the saw unit. During the saw bar feed out process, the cam will compress the piston and chain lubrication oil is fed out to the saw bar.

The volume of oil that is supplied to the saw bar depends on how much the piston is compressed.

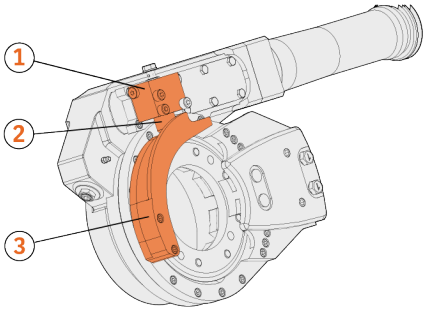

Fig. 6 Chain lubrication system

1. *Lubrication oil pump M06*
2. *Piston*
3. *Cam*

The lubrication volume can be adjusted by replacing the cam.

Technical data

SuperSaw 550

Special tools

The following special tools are supplied with the unit and required when servicing SuperSaw 550.

Air pump The air-pump is used when adjusting the saw bar retraction speed.

Check valve key The key, P/N 0696011, is used when bleeding the chain tensioning circuit, or when replacing the check valve in the lubrication oil pump.

Grease

Use a mineral oil based grease thickened with, or mixable with a lithium soap. The grease should be classified as L-XCCIB2 according to ISO 6743-9. Molybdendisulfid content max 3 %. Base fluid viscosity 170 to 220 cSt at 40°C. NLGI class 1-2.

Hydraulic diagram

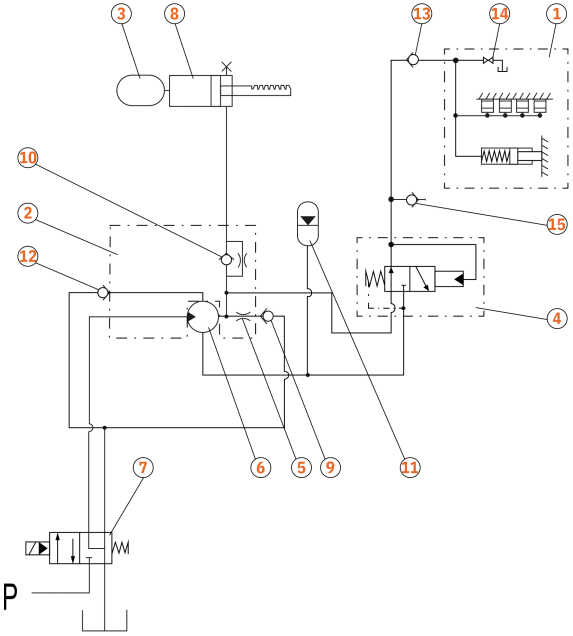

Fig. 7 Hydraulic diagram

1. Tension device
2. Saw motor manifold
3. Air tank for saw bar retraction
4. Pressure regulating valve for chain tensioning
5. Restrictor for saw bar feed out pressure
6. Saw motor
7. Main valve on carrier*
8. Saw bar feed out cylinder
9. Check valve
10. Check restrictor valve for saw bar feed out
11. Accumulator for saw motor case drain
12. Check valve
13. Check valve for chain tensioning
14. Bleed valve for chain tensioning
15. Pressure test point

* Required on carrier, but not supplied with the grapple saw.

SuperSaw 550 models

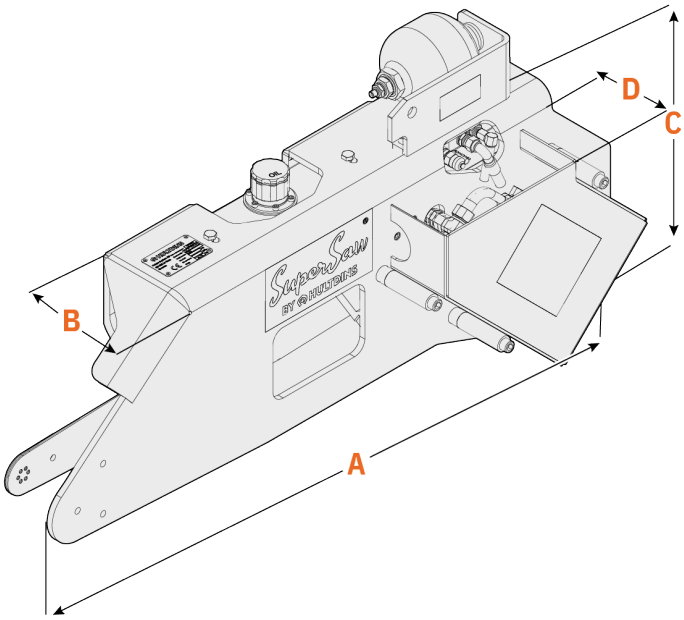

Fig. 8 Dimensions

Dimensions

		10 cc	19 cc
Total weight .404"	**kg**	102	105
Length (A)	**mm**	1095	1095
Width (B)	**mm**	162	162
Height (C)	**mm**	400	400
Width (D)	**mm**	120	120
Saw bar .404"	**cm**	90	90

Hydraulic system

		10 cc	19 cc
Saw motor displacement	**cm^3**	10	19
Min. pressure, saw motor	**MPa***	16,0	16,0
Min. flow, saw motor	**lpm***	65	125
Pressure, saw bar feed out (P1)	**MPa**	5,0 - 5,5	5,0 - 5,5
Pressure, chain tensioning (P2)	**MPa**	3,0	3,0
Gas pressure, accumulator (P3)	**MPa**	0,1	0,1
Air pressure, saw bar retraction (P4)	**MPa**	1,2 - 1,4	1,2 - 1,4

Chain lubrication

		10 cc	19 cc
Type of lubrication		Proportional	Proportional
Lub. oil tank capacity	**lit.**	3,0	3,0

* Max. saw chain speed and Max. power input to the saw chain may NEVER exceed recommendations from each saw chain manufacturer.

Rotator bracket std

Dimensions

	std
Weight incl. hoses	38 kg
Length (A)	100 mm
Length (B)	182 mm
Height (C)	132 mm
Rotator hole pattern	M16 / 173 mm

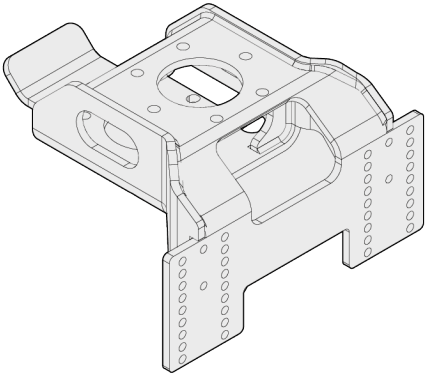

Fig. 9

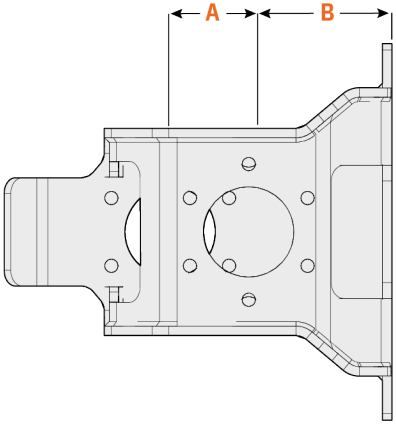

Fig. 10

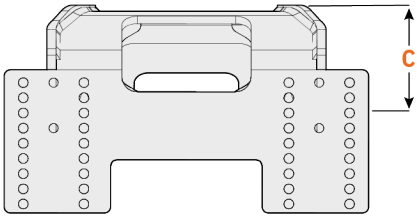

Fig. 11

Installation

Installing the grapple saw

SuperSaw 550 should normally be installed with the saw motor on the same side as the piston rod of the grapple cylinder, to achive the best weight balance.

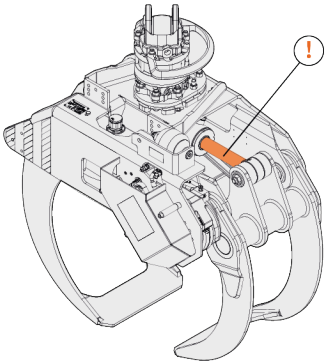

Fig. 12

On the A-models of the Super-Grip II grapples, the SuperSaw 550 should be installed on the same side as the longer tips of the grapple arms, to optimize the performance of the grapple saw together with the grapple.

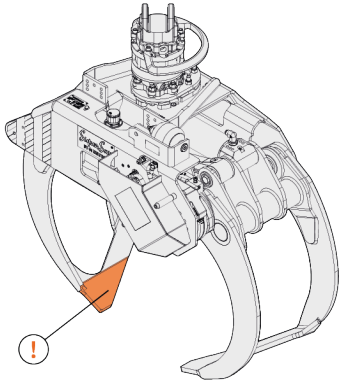

Fig. 13

The grapple saw should be installed with a minimum distance (A) of 70 mm from the saw chain to the log, with the saw bar fully retracted.

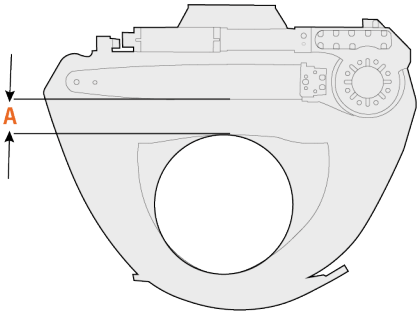

Fig. 14

Installing standard rotator bracket

1. Use the fasteners and the hardened plate to assemble the rotator bracket with the grapple. Torque 320 Nm, M16, 6 pcs.

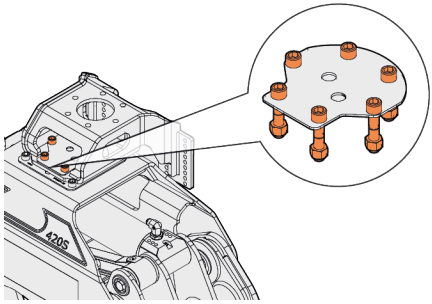

Fig. 15

2. Use the fasteners and the hardened plate to assemble the rotator bracket with the rotator. Torque 320 Nm, M16, 6 pcs.

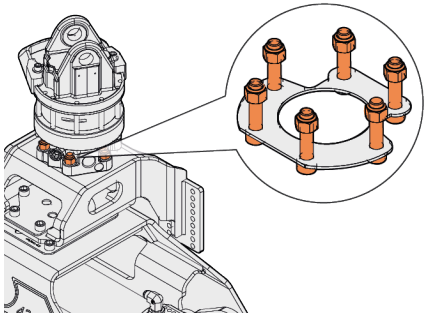

Fig. 16

3. Install the grapple saw assembly onto the rotator bracket. Torque 130 Nm, M12, 12 pcs.

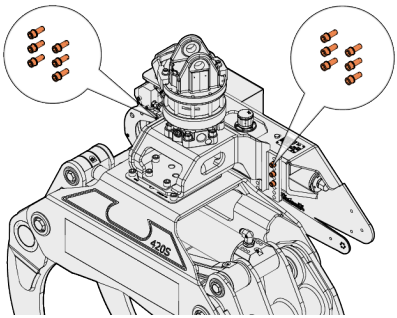

Fig. 17

Hydraulic installation std

1. Install the bulkhead adapters to the plate in the rotator bracket and connect the hoses to the grapple cylinder.
   G+ = Grapple close
   G0 = Grapple open

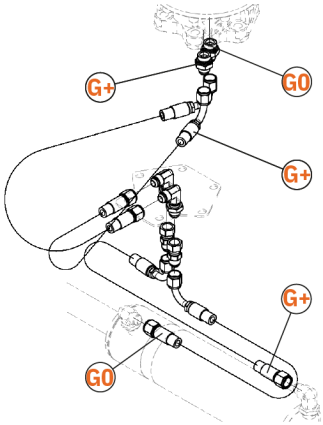

Fig. 18 Hydraulic installation

2. Install the hoses between the rotator and the saw motor manifold.

- Connect the saw motor pressure line (P) to port “1” on the rotator.
- Connect the saw motor return line (T) to port “2” on the rotator.
- Start the machine and test all functions to make sure that everything is working properly.

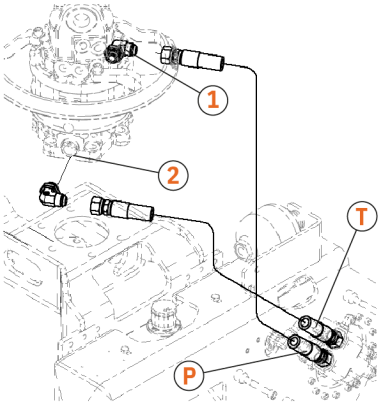

Fig. 19 Hydraulic installation

Initial start

Preparation

Important!
Fill the saw motor casing with hydraulic oil before starting the motor.

Important!
The warranty will not be valid if the motor is disassembled.

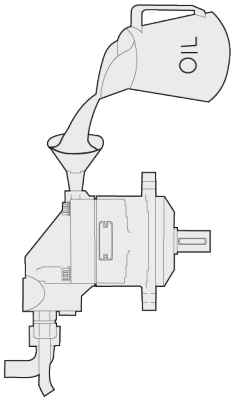

Fig. 20 Fill oil

Adjustments

Adjustment valves

The SuperSaw 550 has the following adjustment valves.

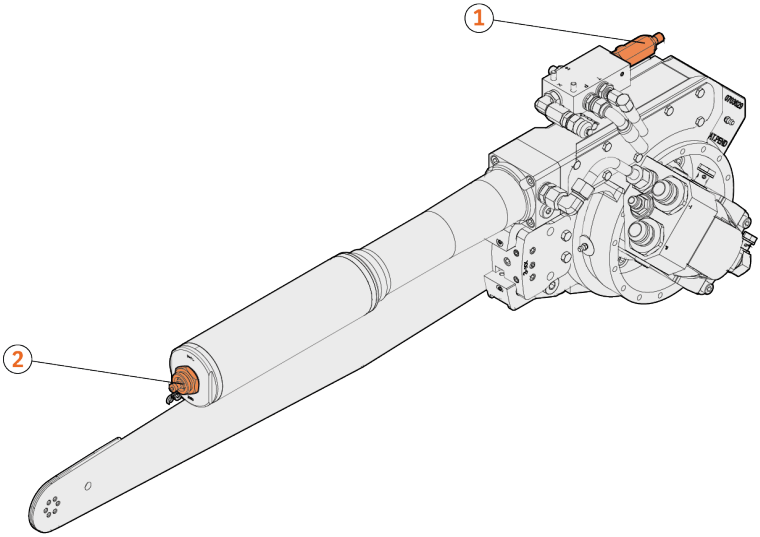

Fig. 21 Adjustment valves

1. Pressure regulating valve for saw chain tension pressure
2. Air nipple for saw bar retraction adjustment

Pressure test points

The SuperSaw 550 has different hydraulic pressure test points, as shown on the illustration.

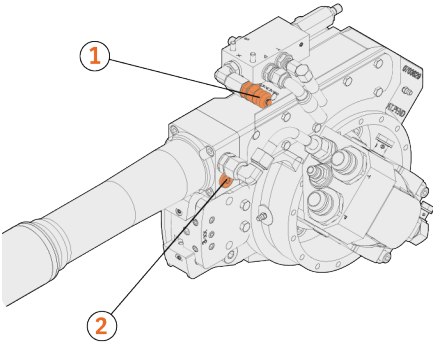

Fig. 22 Test points

1. *Chain tension pressure*
2. *Saw bar feed out pressure*

Saw bar feed out pressure

The saw bar feed out pressure is created by a restrictor installed in the saw motors pressure line. The feed out pressure can be adjusted by changing the size of the restrictor.

- a smaller restrictor will create a higher pressure.
- a larger restrictor will create a lower pressure.

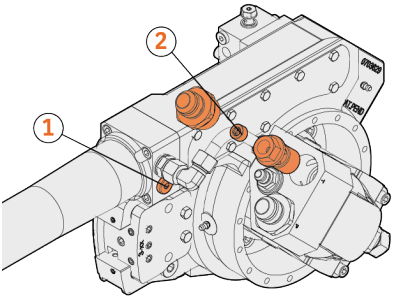

Fig. 23 Saw bar feed out pressure

1. *Pressure test point*
2. *Restrictor*

1. Lower the grapple saw to the ground and shut off the engine.
2. Remove the saw motor cover.
3. Connect a suitable pressure gauge to the pressure test point.

Note!
Place the pressure gauge so that the pressure easily can be checked from the operator's cabin when the saw function is activated.

Important!
Never adjust any hydraulic pressures without using a pressure gauge.

4. Start the engine and read the feed out pressure when the saw bar is completely fed out.

Note!
Do not activate the saw function more than 5 seconds at a time.

5. If needed, adjust the feed out pressure.
   For a proper pressure range, see "Hydraulic system"
6. Remove the pressure gauge and assemble the saw motor cover.

Saw bar retraction

When the saw bar retraction is properly adjusted, the saw bar should be fully retracted in 1,3 - 1,7 seconds.

Important!
The saw unit may be damaged if the saw bar retraction speed is too high.

The saw bar retraction speed is adjusted with the air-pressure in the air-tank.

- If the pressure is increased, the retraction speed will be higher.
- If the pressure is decreased, the retraction speed will be lower.

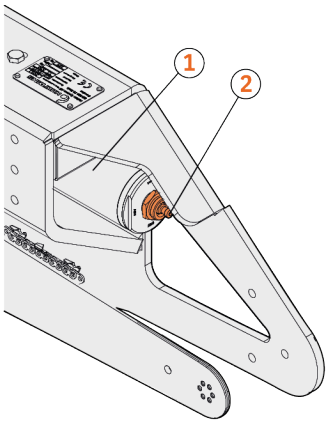

Fig. 24 Saw bar retraction

1. *Air-tank*
2. *Adjustment nipple for air-pressure*

For a proper pressure range, see "Hydraulic system"

Chain tension pressure

1. Lower the grapple saw to the ground and shut off the engine.
2. Connect a suitable pressure gauge to the pressure test point.

Note!
Place the pressure gauge so that the pressure easily can be checked from the operator's cabin.

Important!
Never adjust any hydraulic pressures without using a pressure gauge.

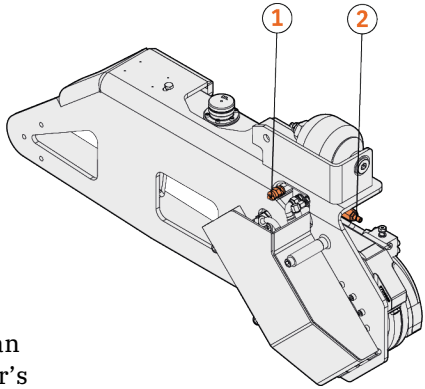

Fig. 25 Chain tension pressure

1. *Test point*
2. *Regulating valve*

3. Start the engine and read the chain tension presure when the saw function is activated.
4. Adjust the chain tension pressure on the pressure regulating valve.
    - Increase the pressure by tightening the set screw.
    - Decrease the pressure by loosening the set screw.

For a proper pressure range, see "Hydraulic system"

Bleeding the chain tension system

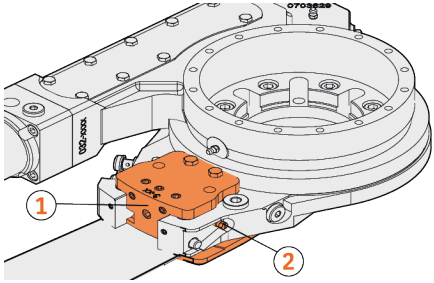

Fig. 26 Bleeding the chain tension system

1. *Bar holder*
2. *Bleeder valve*

1. Lower the grapple saw to the ground and shut off the engine.
2. Open the bleeder valve 1 - 2 turns with e.g. a screw driver, or with the check valve key, P/N 0696011.
3. Push in the bar holder completely and close the bleeder valve with the bar holder in the inner position.
4. Start the engine and activate the saw function 4-5 times.
5. Repeat step 1-3.
6. Repeat this process after 30-60 minutes of operation.

Important!
Always bleed the system if there is any suspicion of air having entered the system, e.g. after replacing a hose or other component.

Maintenance instructions

Warning!
Before performing any maintenance or service work, lower the attachment to the ground and shut off the engine. Turn off any master shut-offs and do not allow personnel in the cab.

Warning!
When working on the saw chain always ensure the engine is shut off and wear safety gloves to prevent injuries. Remove the saw chain when making any adjustments or servicing the saw unit.

First month of operation

Fasteners

Tightening of the fasteners should be made once a week during the first month of operation. Failure to do so may cause serious property damage.

Regular maintenance

Ensure that faults and deficiencies are corrected. All service and repairs in electrical and hydraulic systems should be carried out by qualified personnel only.

Daily maintenance

Make sure that:

- Fastener joints are properly tightened.
- No damages or cracking have occurred on the unit.
- There is no leakage on the unit.
- Start each shift with a sharp saw chain.

Every 250 hours of operation

Make sure that:

- No fasteners are loose.
- No damages or cracking have occurred on the unit.
- The hydraulic hoses are not damaged and there is no leakage on the unit.

Lubrication

The unit should be lubricated every 8 to 200 hours of operation depending on the conditions that the unit is working under. The unit has 2 lubrication points as shown.

Note! Use a mineral oil based grease thickened with, or mixable with a lithium soap. See "Grease"

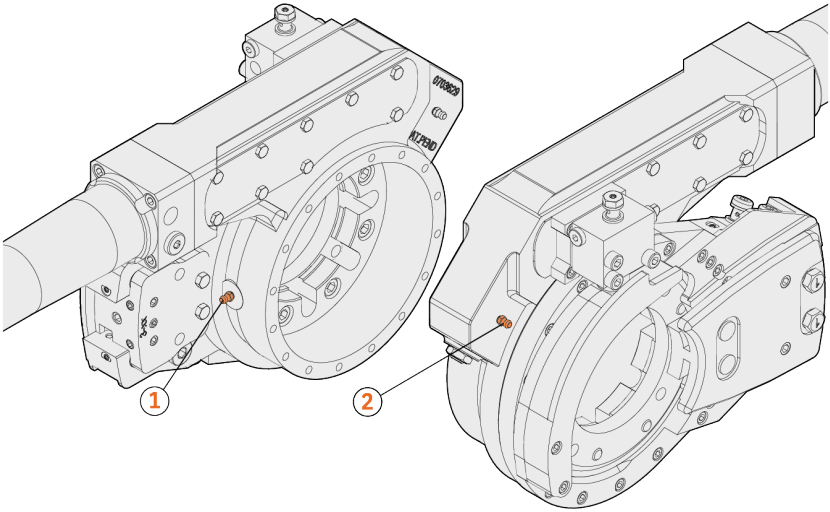

Fig. 27 Lubrication points

1. Bearing, 1 pcs.
2. Housing, 1 pcs.

Chain lubrication oil

1. Place the unit steady on the ground and shut off the engine.
2. Clean the area around the refilling cap to avoid contamination of the lubrication oil tank.
3. Open the refilling cap and make sure that the strainer isn't missing or damaged.

Important!
NEVER refill lubrication oil with the strainer missing or damaged.

Important!
Debris in the lubrication tank can cause check valves in the lubrication system to malfunction.

4. Fill the tank with chain lubrication oil.

Important!
NEVER use old motor oil or hydraulic fluid in the chain lubrication system. Always use a good quality chain lubrication oil.

5. Close the refilling cap.

Strainer

The strainer should be disassembled and cleaned at least every 1000 hours of operation or when necessary.

Replacements

Saw chain

The first signs of a worn chain are abnormally long saw times and blue smoke emerging from the cut. When replacing the saw chain we recommend the following method.

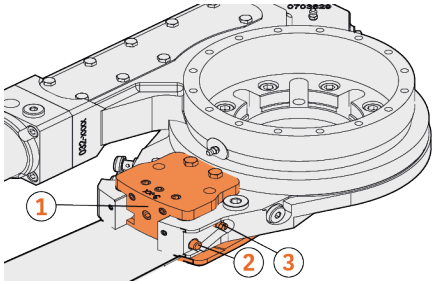

Fig. 28 Replacing saw chain

1. *Bar holder*
2. *Locking pin*
3. *Bleeder valve*

1. Place the unit steady on the ground with the saw unit facing up (when possible).
2. Depressurize the chain tension system by opening the bleeder valve approx. 1 turn.
3. Retract the bar holder.
    - alt. 1 Slowly pull out the saw chain, until the locking pin is possible to push in.
    - alt. 2 If the saw chain is missing. Slowly push in the bar holder by hand, until the locking pin is possible to push in.
4. Lock the bar holder in place by pushing in the locking pin.
5. Close the bleeder valve.
6. Remove the saw chain.
7. Make sure that the drive sprocket isn't worn or damaged. Replace if necessary. See "Drive sprocket"
8. Install the new saw chain and slowly pull out the chain from the saw bar until the locking pin releases.
9. Operate the saw carefully a few times to secure the pressure in the chain tensioner. If after replacing a chain it repeatedly jumps off the saw bar, you may have to bleed the system. See "Bleeding the chain tension system"

Saw bar

1. Place the unit steady on the ground with the saw unit facing up (when possible).
2. Remove the saw chain. See "Saw chain"
3. Loosen the guide screws and remove the saw bar.
4. Install a new saw bar and tighten the guide screws. Torque 45 Nm.
5. Install the saw chain. See "Saw chain"

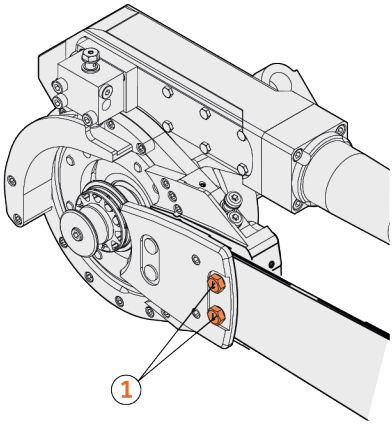

Fig. 29 Replacing saw bar

1. *Guide screws*

Bar holder

When replacing the bar holder, always use the following method.

1. Place the unit steady on the ground with the saw unit facing up (when possible).
2. Remove the saw chain. See "Saw chain"
3. Remove the saw bar. See "Saw bar"
4. Disassemble the guide screws and remove the bar holder from the tension device.

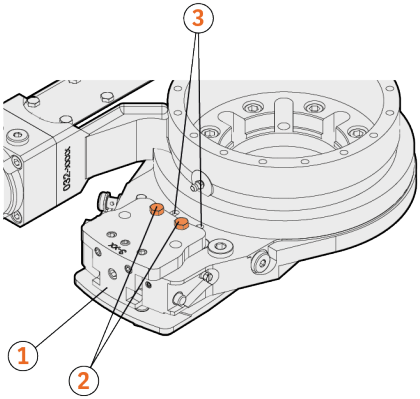

Fig. 30 Replace bar holder

1. *Bar holder*
2. *Guide screws*
3. *Grooves*

Warning!
Never start the machine with the bar holder removed.

5. Inspect and clean the grooves from any debris.
6. Install the bar holder into the tension device. Fit the guide screws into the grooves and tighten the guide screws. Torque 20 Nm.
7. Install the saw bar. See "Saw bar"
8. Install the saw chain. See "Saw chain"

Drive sprocket

Warning!
A worn or damaged drive sprocket may cause damage or breakage to the saw chain.

1. Place the unit steady on the ground with the saw unit facing up (when possible).
2. Remove the saw chain. See "Saw chain"
3. Remove the drive sprocket.
    1. Remove the cap screw.
    2. Remove the chain catcher.
    3. Remove the drive sprocket.
4. Install the new drive sprocket.
    1. Install the drive sprocket onto the saw motor shaft.
    2. Clean the cap screw and the threaded hole in the saw motor shaft.
    3. Apply oil to the thread on the cap screw.
    4. Install the lock washer and the chain catcher and tighten the cap screw.
    5. Install the saw chain. See "Saw chain"

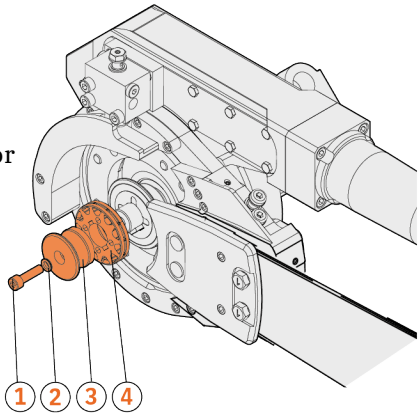

Fig. 31 Replacing drive sprocket

1. *Cap screw*
2. *Lock washer*
3. *Chain catcher*
4. *Drive sprocket*

Recommended torques

Thread	Torque
M6	16 Nm
M8	38 Nm

Recycling

Contact local authorities or Hultdin System AB for information about recycling the product properly.

The product contains metal and hydraulic oil which needs to be drained and recycled according to local regulations.

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