

USER MANUAL

# STONE PICKERS

*SCORPIO 550 SIDEFLOW*



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## EC DECLARATION OF CONFORMITY

Manufacturer:  
Oy Elho AB  
Industrivägen 6  
68910 Bennäs  
Finland

Technical file:  
Johan Löfbacka  
Product Development Manager, CTO  
Industrivägen 6  
68910 Bennäs Finland

We declare this it is our sole responsibility that the following product

Equipment: Stone pickers  
Model/type: Scorpio 550 Sideflow

Optional attached equipment:

- External hydraulic unit for Scorpio 500

Is in conformity with the Machine Directive 2006/42/EC

and the following harmonized standards and technical specifications have been applied:

EN ISO 4254-5

Bennäs 02.02.2021



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Michael Johansson, CEO

## LIMITED WARRANTY

This Limited Warranty is a product warranty given by Oy El-Ho Ab (“ELHO”) warranting the quality of its manufactured products to the original retail owner (“the Distributor”). ELHO’s liability for defects in the manufactured products is limited as stated in the conditions below.

### 1. Warranty extent and period

ELHO warrants to the Distributor that new machinery and equipment manufactured by ELHO will be free from defects in material and workmanship under normal use for a period of twelve (12) months after the date of sale to the original owner (“the Customer”) and under the condition that the Distributor has registered the warranty at ELHO by returning the Warranty Registration Form within 14 days from the date of sale to the Customer (“the Limited Warranty”).

A repair under this Limited Warranty does not extend the warranty period.

The Limited Warranty ceases however forty-eight (48) months after the date of purchase by the Distributor.

### 2. Warranty claim

Any claim under the Limited Warranty shall be reported by returning a complete Warranty Application to ELHO within 14 days from the date when the Customer made the Distributor aware of the defect; or else the warranty claim will not be accepted. A complete Warranty Application shall in any case be sent to ELHO within 30 days from the date when the damage was discovered or should reasonably have been discovered; or else the warranty claim will not be accepted. The Distributor shall prove that the Warranty Application was sent within the time limits stated above.

### 3. Repair or replacement procedure

Under the conditions that the warranty has been correctly registered according to clause 1 and the warranty claim has been made in compliance with clause 2, ELHO assumes responsibility under the Limited Warranty to, at ELHO’s option, repair or replace all parts that in ELHO’s opinion are defected in material or workmanship. This responsibility can be satisfied by shipping the parts needed for repair or replacement to the Distributor. ELHO assumes responsibility for the costs of spare parts needed for repair or replacement and for the freight of these parts to the Distributor.

The Distributor shall maintain the defective parts for six (6) months after their replacement. On ELHO’s initiative and at its expense, the defective parts shall be shipped to ELHO for analysis.

### 4. Limitations on warranty coverage

#### 4.1 Components not manufactured by ELHO

Components not manufactured by ELHO, but incorporated in machinery and equipment manufactured by ELHO, e.g. hydraulic components, power transmission shafts, gearboxes, tires etc., are covered by the warranty granted by the original manufacturer of the components.

#### 4.2 No warrant for fitness or performance

ELHO does not warrant the fitness of the machinery or equipment for a particular purpose or the performance of the machinery or equipment.

#### 4.3 Damage caused by the owner

The Limited Warranty does not cover damage or loss that in ELHO’s opinion is resulting from normal wear and tear or damage or loss resulting from misuse, overload, accident, neglect or improper installation, operation or maintenance, alteration of the machinery or equipment without ELHO’s written

consent or usage of non-original parts. Agricultural machinery is subjected to wear and tear and needs regular maintenance.

#### 4.4 Deteriorating parts

The Limited Warranty does not cover damage on protective canvases, blades, flails, conditioner fingers and shafts, discs, gear shaft for discs, skids, friction clutches, tines, tires, sharpening equipment, mulcher chains, v-belts, roller chains, chain tightener parts, scrapers, rubber dampers, filters or damages to paint due to normal wear and tare.

#### 4.5 Transportation

The Limited Warranty does not cover damage or loss resulting from transportation from or to ELHO or between the Distributor and the Customer.

#### **4.6 Vandalism etc.**

The Limited Warranty does not cover damage or loss resulting from vandalism, theft, or other comparable damage.

#### **4.7 Product improvement**

ELHO has a policy of continuous product improvement. ELHO reserves the right to develop, improve and alter the design of any ELHO product without assuming any obligation to modify any ELHO product previously manufactured.

#### **4.8 Consequential damages**

ELHO will not be liable for lost profits, loss of business, inconvenience, additional operating expenses, damage to harvest, damage or injury to properties or persons, or other loss or damage relating in any way to the machinery, equipment, products or services, whether direct or consequential, special, indirect or punitive, even if advised of the possibility of such losses or damages, or for any claim by any third party. The foregoing limitations apply regardless of the causes or circumstances giving rise to such loss, damage or liability, even if such loss, or damage or liability is based on negligence or other torts or breach of contract including, without limitation, fundamental breach or breach of a fundamental term.

### **5. No assignment**

The rights of the Distributor under this Limited Warranty are not to be assigned to any third party.

### **6. Entire warranty**

The foregoing Limited Warranty constitutes the entire warranty given by ELHO. There are no other warranties or conditions, express or implied, in respect of the machinery, equipment, spare parts or services contemplated by these terms, including without limitation, no warranties or conditions of merchantability or fitness for a particular purpose.

### **7. Indemnity**

The Distributor shall indemnify ELHO against all warranty claims or other claims regarding any cost, loss, or liability from the Customer or any third party. The Distributor shall handle all warranty claims concerning ELHO products within its territory of business.

### **8. Governing law**

This Limited Warranty is governed by Finnish law.

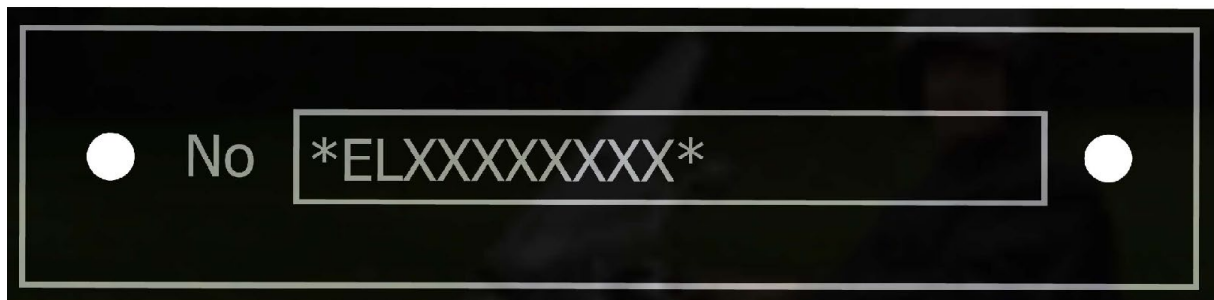
### **9. Disputes**

Any dispute, controversy or claim arising out of or in connection with this Limited Warranty, or the breach, termination, or invalidity thereof, shall be finally settled by arbitration in accordance with the Arbitration Rules of the Finland Chamber of Commerce. The number of arbitrators shall be three (3). The place of arbitration shall be Helsinki, Finland and the language of the arbitration shall be English.

## STONE PICKER SERIAL NUMBER

The serial number can be found on the machine which is situated on the plate on the frame of the machine.

When ordering spare parts, you must give the model and serial number, also if you are going to make a warranty claim.



Write down the information from your machine in the fields below.

This makes ordering the spare part easier for you in the future.

Type

Series  year Manufacture

No.

# 1 SAFETY

## 1.1 Intended use

The ELHO Scorpio stone picker is intended to use on well harrowed dry soil to pick up stones from the surface of the field. It is not permitted to use the machine for any other purposes. It is not allowed to use the machine to transport stones or any other material on the road.

## 1.2 Tractor and machine noise


According to the EC Directive 86-1888-EEC and UK Noise at Work Regulations 1989 places responsibility on employers and employees to assess and control noise in the workplace. If you operate the machine at full speed in an enclosed space, bystander noise level of the machine can exceed 87 dB (A). We therefore recommend that you do not run the machine at full speed in an enclosed space. We highly recommend the use of hearing protection if you must approach the machine when it is in operation. The noise level during normal field operation changes depending on the noise of the tractor and how the tractor operates. In some instances, the tractor, while operating under load and normal rotation speed, will produce the highest noise level. The approximate amount of noise in the driving position generated by the machine with tractor cab windows open can range from 80-96 dB (A) and will likely occur when the machine is collecting stones. The noise level from the machine usually decreases when moving. We recommend that you keep the windows of the tractor cab closed when you are operating the machine. If the window is required to be open for ventilation purposes, then use the side window furthest from the machine. The comments on noise levels are only for guidance and each combination of tractor and the machine must be individually assessed.

## 1.3 Manual handling - Components

According to the EC directives 89/391/EEC and 90/269/EEC and UK Manual Handling Operations Regulations 1992, places responsibilities on employers and employees to observe safe working practices when you manually handle heavy weights. When assembling the machine, move the parts with a mechanical lifting device. When you repair the machine, use a mechanical lifting device for the following mechanical parts: the gearboxes, the drawbar, the main frame and the windrowers. Depending on working conditions, some components can require two persons to handle them.

## 1.4 Warning signs

This manual contains clearly marked warnings which are intended for your personal safety and contain important advice for use of the machine.

 <b>WARNING</b>	Warning! Indicates the presence of a hazard which could result in personal injury.
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<b>NOTICE!</b>	Notice! is used to address practices not related to personal injury.
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## 1.5 Safe operation

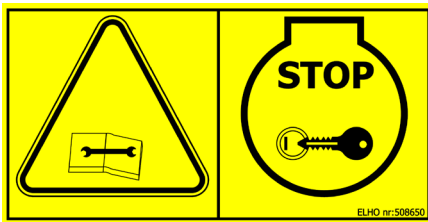
Before you operate or assemble the machine, you must carefully read this manual and the safety labels on the machine.

- Keep all guards and protection devices in good condition and correctly assembled.
- Before you do the maintenances and adjustments, stop the tractor engine, engage the parking brake, and remove the start key from the tractor.
- If the tractor hydraulic controls support the machine, do not work under the machine.
- Do not engage the tractor PTO shaft when the cutter bar side guards are raised into the transport position.
- Before you leave the tractor cab, stop the machine, and engage the parking brake of the tractor.
- Use only the original ELHO spare parts. Do not change the construction of the machine. Use the machine only for picking up stones from the surface of a field. Refer to chapter "1.1 Intended use" on page 8.
- Obey the local legislation for road transport. Use the rear lights when driving in the dark.
- Before disconnecting the machine from the tractor, release the hydraulic pressure. Otherwise, there is a risk of sudden uncontrolled movement of the machine frame when the machine is disconnected.

## 1.6 Safety labels on the mower

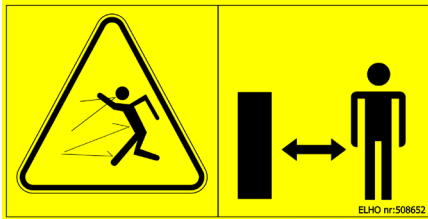
On the machine there are safety labels to make you aware of certain hazards.

1.



Stop the engine and remove the start key.

2.



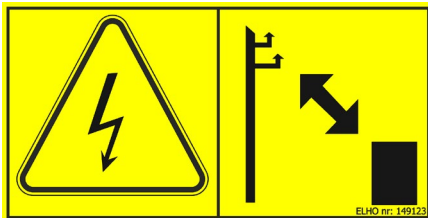
Do not go into the danger zone. There is a risk of being hit by flying objects, such as stones.

3.



Do not empty the stone tank on soft ground or downhill

4.



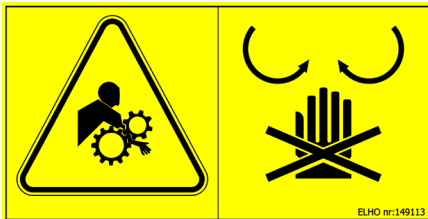
Keep distance to powerlines, especially when you empty the stone tank.

5.



Before you go into the danger zone, make sure that the lifting cylinders are secured with safety labels.

6.



Before you touch the machine components, make sure that the tractor engine is stopped. The rotating parts of the machine continue to rotate even after the tractor engine is stopped.

7.



Before you remove the guards, stop the tractor.

8.



Do not reach over the rotating parts of the machine.

9.

**! WARNING**  
 En blockerad maskin kan fortfarande ha hydraulisk rörelsekraft.  
 Maskinen kan överraskande starta när den rengörs.  
 För att förhindra skada:  
 Stanna traktorn och frigör all hydraulik före rengöringen.

**! VAROITUS**  
 Tukkuutuneessa koneessa voi vielä olla hydraulipaineen takia liikevoimaa ja se voi yllättäen käynnistyä puhdistettaessa.  
 Vahinkojen estämiseksi:  
 Sammuta traktori ja vapauta hydraulikka ennen puhdistusta.

**! WARNING**  
 Clogged machine may still have live power.  
 It can start unexpectedly when unclogged.  
 To avoid injury:  
 Shut off tractor engine and disengage all power before unclogging.

Clogged machine may still have live power, It can start unexpectedly when unclogged. To avoid injury: Shut tractor engine and disengage all power before unclogging.

10.

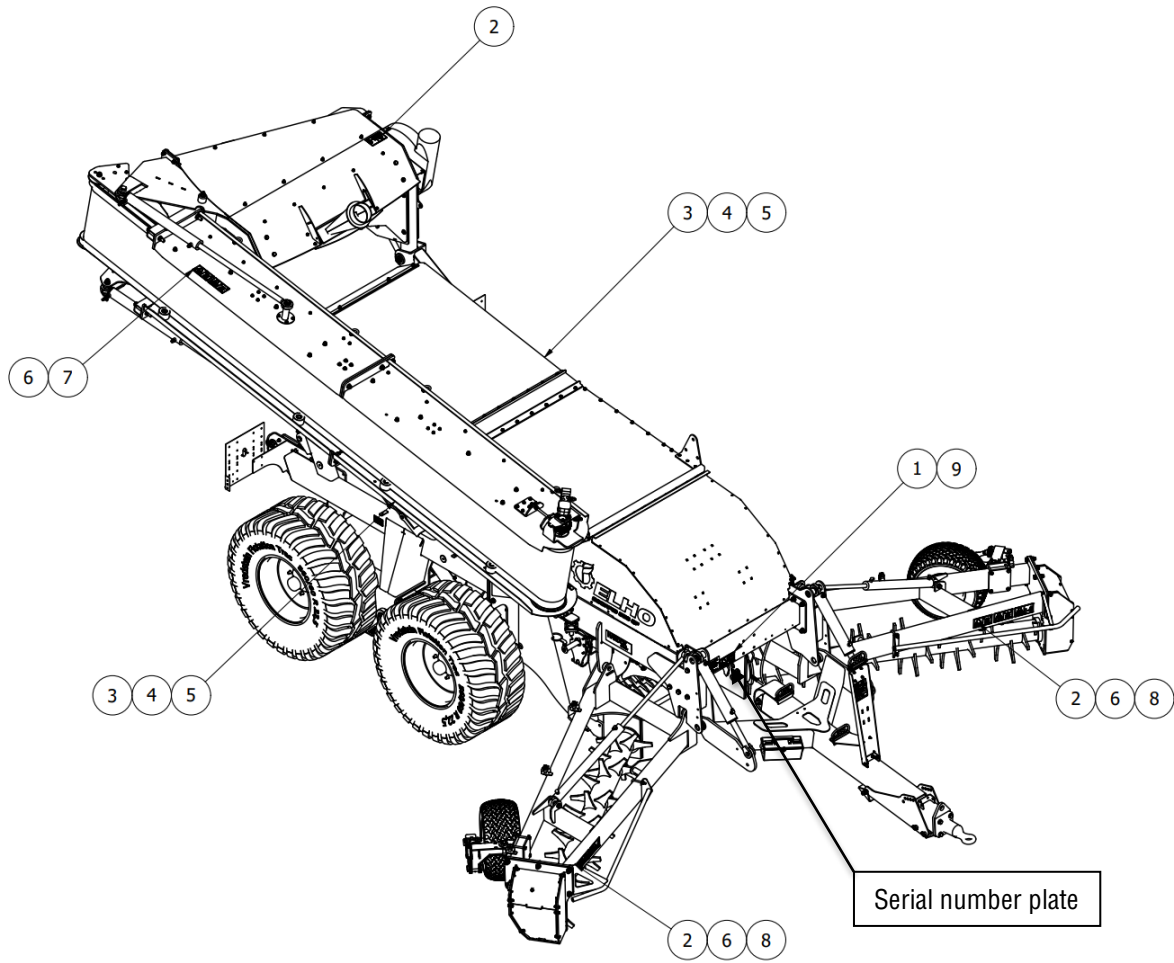
	4+ Up	
	5+ Up 5- Down	
	P	Nominal 140 L/min
	LS	Signal
	TANK	

149274

## 1.7 Replacement of safety labels

Always replace missing or damaged safety labels. The replacement of safety labels is available from your dealer.

## 1.8 Location of the safety labels



## 2 TECHNICAL DATA

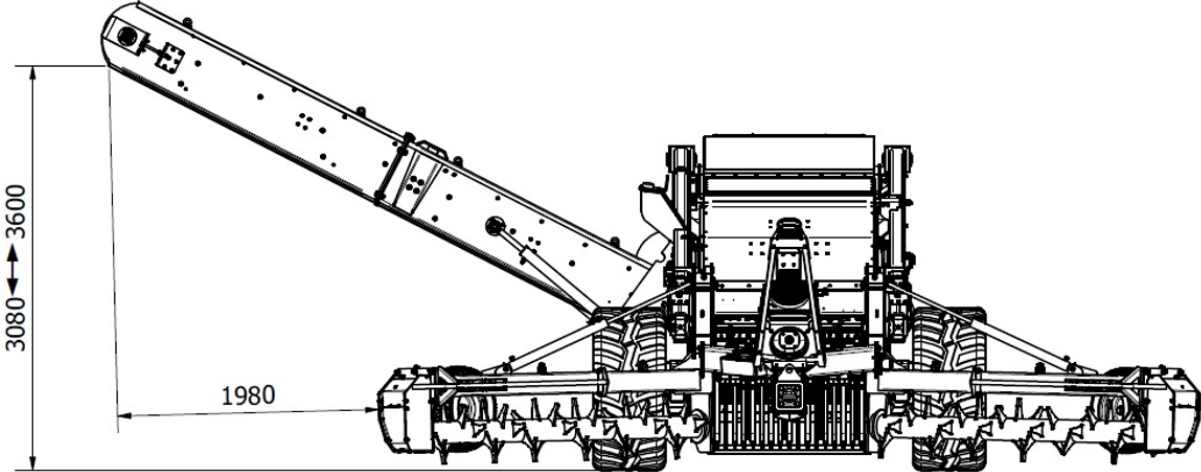
Scorpio 550 SF	
Dimensions	Refer to chapter 2.2 and 2.3 on page 14-15.
Working width, mm	5500
Transport width, mm	3000
Compatible trailer height, m	Up to 2,7
Number of tines, pcs	16
Stone size, mm	40 - 400
Inlet rotor tine lifting force, kg	400
Inlet rotor tine deflection upwards, mm	210
Oil flow, l/min	120
Power, kW	45
Working depth, cm	0 - 7
Working speed, km/h	1 - 7
Screen, mm	35
Tyres boggie	560/60 R22.5
Support tyres	26 x 12.00-12
Inlet rotor reversible	Standard
Windroller reversible	Standard
Conveyor reversible	Standard
Automatic draft control	Standard
Weight, kg	9000
Tyre air pressure, bar	2

### 2.1 Paint

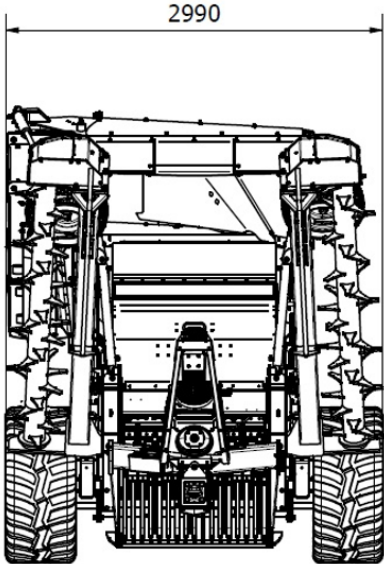
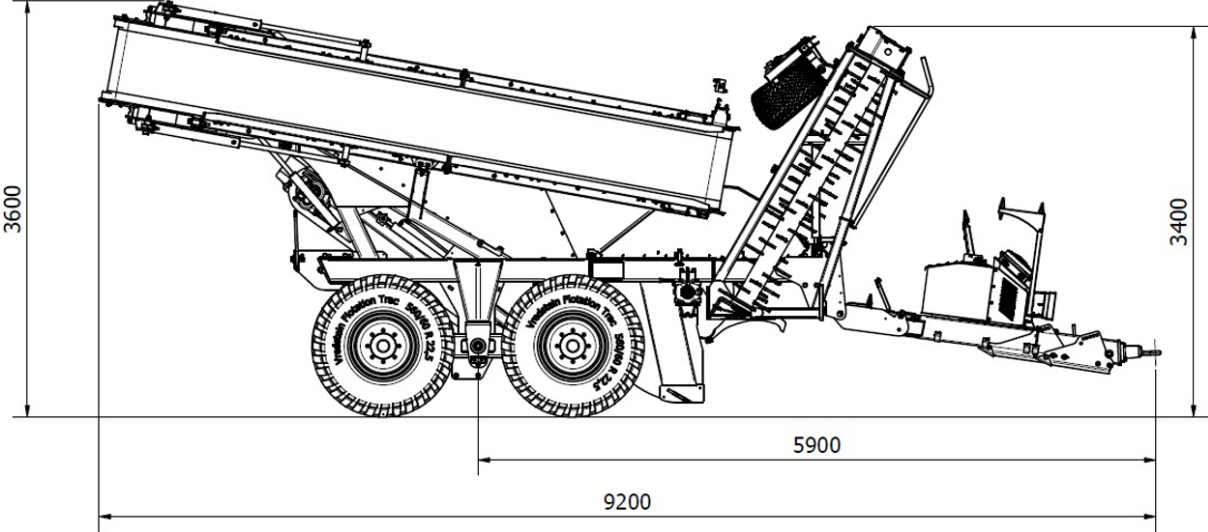
Manufacturing complies with the strictest International painting standards for the paint and painting procedures. This ensures a long lifetime of the ELHO machines. But even a good paint surface can be damaged or scratched during transport and use. The best way to access the correct paint color is via your local paint shop, as postage and parcel transport of paint is restricted by very strict safety rules. The following International color codes are used for the original painting of the ELHO machines. The international color codes will help you to acquire the correct shade if needed. The original paint is polyurethane based industrial truck paint, but an alkyd-based paint of good quality is also suitable for paint repair.

Yellow	RAL 1006
Gray	RAL 7024

## 2.2 Dimensions

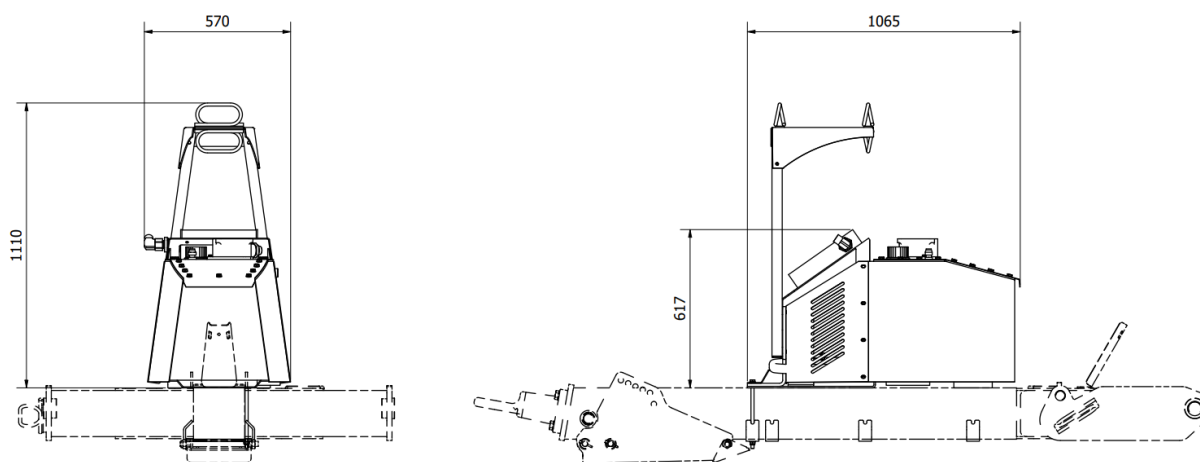


### 2.3 Transport dimensions



## 2.4 Scorpio external hydraulic unit

Dimensions	See figure on page
Weight	225 kg
Hydraulic max pressure	250 bar
Oil flow, PTO 600 rpm	120 l/min
Continuous power	35 kW
Max power peak	50 kW
Tank size	85 l
Cooler cooling capacity	0,2 kW/ $\Delta C^{\circ}$
Cooler current consumption	15 A





## 3 SETTING UP THE STONE PICKER

### 3.1 The environmentally aspect on setting up the machine.

#### Transport packaging

- There are different types of transport packaging alternatives. If the transport package is plastic film, it is made of pure polyester. You can recycle it together with fertilizer bags. You can also burn it, because it does not contain PVC.
- The bottom supports and guards are made of wood, which do not contain poisonous anti-rot agents. The wooden material can also be safely burned in a furnace as solid fuel.
- The steel structures of the transport packaging can be returned to the factory for recycling or they can be transported to a scrap metal station.

#### Lubricants

- Gearboxes have usually been filled with the correct quantity of oil at the factory. To prevent contamination of the environment, do not turn the gearboxes upside down during the assembly.

#### **WARNING**

Warning! Indicates the presence of a hazard which could result in personal injury.

#### **NOTICE!**

Notice! is used to address practices not related to personal injury.

### 3.2 Preparations

When you start up the new machine, make sure that the machine is assembled correctly, and it is not damaged. The ELHO warranty does not cover damage which is caused by incorrect assembly or incorrect operation. All machines that are not fully assembled as delivered are delivered with necessary assembly instructions, document ID 954084.

Make sure that the hydraulic hoses are tightened and assembled so that it allows the machine to move.

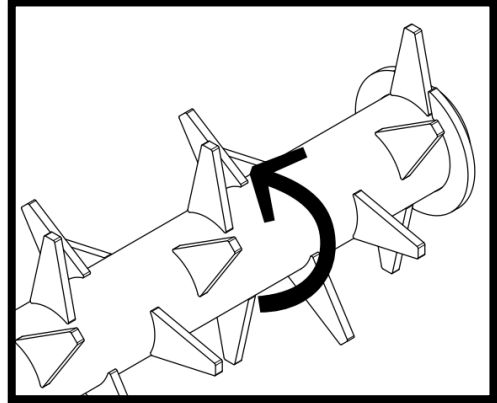
Check the oil levels of the gearboxes. Refer to chapter "5.3 Gearboxes oil" on page 35.

### 3.2.1 Adjusting the correct rotation speed for the windrower

#### **WARNING**

Before you disconnect or connect the machine, stop the tractor engine, engage the parking brake and remove the start key from the tractor. Any hydraulic movements from the tractor are not permitted. Use safety glasses and protective gloves!

1. Mark the windrower with for example red paint.
2. Set the oil flow from the tractor to 85 l/min
3. Start the machine
4. Count the windrower revolutions for 30 seconds and multiply the number with 2 to get the revolutions per minute.  
The correct rotating speed is approximately 120 revolutions per minute.
5. If needed, adjust the oil flow from the tractor and perform step 4.



### 3.2.2 How to bleed the hydraulic system

#### **WARNING**

Keep all persons out of the work area!

#### **WARNING**

If the hydraulic cylinder contains air it can behave unexpected and not hold a load correctly!

Normally there is no need to separately bleed the hydraulic system. Before you operate on the field it is recommended to check the hydraulic functions.

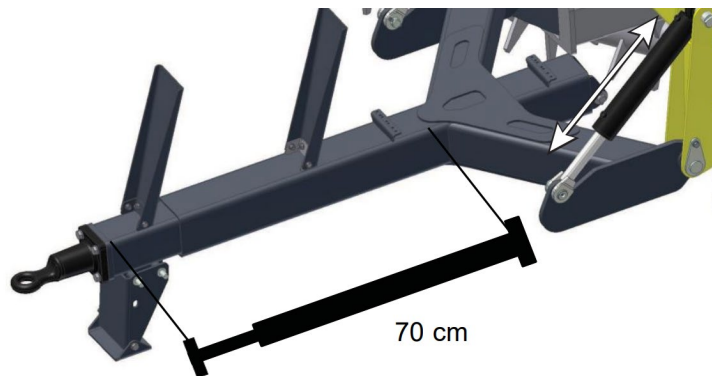
## 4 USE OF THE STONE PICKER

### 4.1 Safety devices

#### 4.1.1 Telescopic drawbar

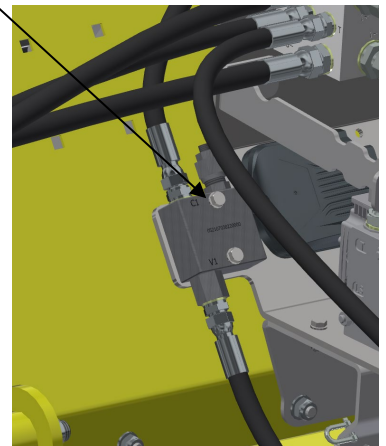
If the machine hits an obstacle, the drawbar extends. The contained oil from the cylinder inside the telescope lifts the blade to bypass the obstacle. The drawbar returns due to the machine's own weight.

The pressure at which the telescopic drawbar extends is adjustable using this valve located on the right hand side of the main hydraulic block.



Loosen the set screw two full revolutions and adjust it in or out from there depending on the working conditions and operator preference.

If the drawbar extends fully when the machine is operated with the automatic depth control the operator may manually need to lift the machine all the way up before the drawbar retracts.



## 4.2 How to connect the stone picker to the tractor

**WARNING**

Before you leave the tractor cabin, stop the tractor engine, engage the parking brake and remove the start key from the tractor.

**WARNING**

Make sure the quick couplings are clean.

1. Connect the tractor towing hook to the machine's drawbar eye.
2. Connect the hydraulic hoses. Refer to figure connection label.

	4+ Up	
	5+ Up 5- Down	
	P	Nominal 140 L/min
	LS	Signal
	TANK	 149274

**NOTICE!**

This function needs floating position when you operate.

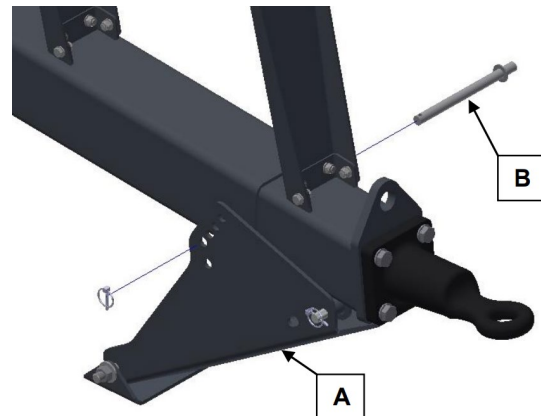


**WARNING**

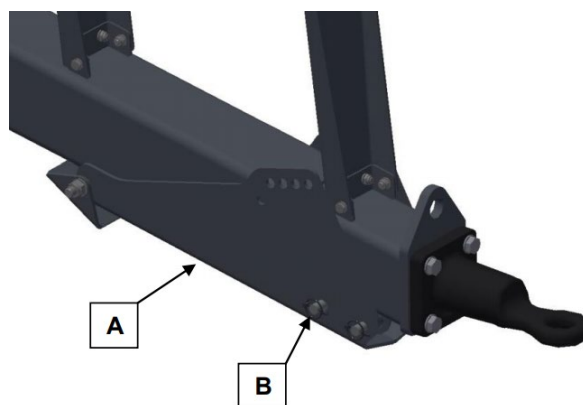
The tank line drains the motors. The maximum back pressure for the tank line is 15 bar.



3. The machine has a support leg (A).  
Turn up the leg by:
  - Removing the locking pin (B)



- Turn the support leg (A)
- Install the locking pin (B)



 **WARNING**

**HYDRAULIC OIL INJECTION HAZARD!**

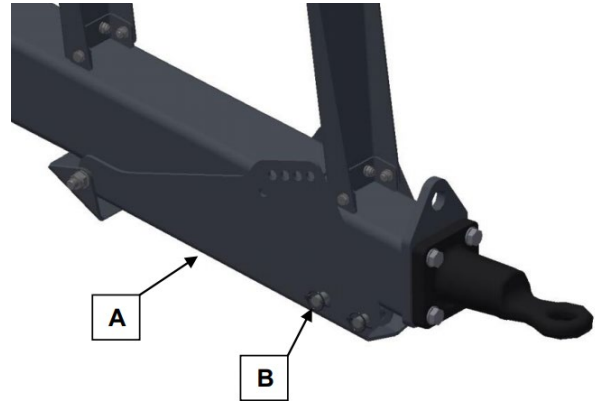
Connecting or disconnecting hydraulic components that are under pressure causes an injection hazard. Always make sure that the pressure is released before any maintenance.

### 4.3 How to disconnect the stone picker from the tractor

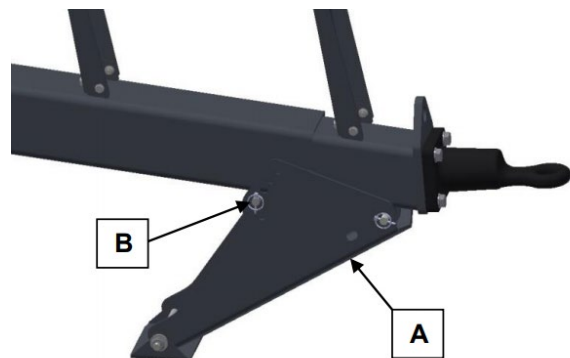
#### **WARNING**

Make sure that the machine is in transport position, refer to chapter “4.7.1 How to lift the stone picker into transport position” on page 27. Make sure that the transport hooks are locked! Lower the machine to the ground. Otherwise the machine can move by its own weight and cause personal injuries!

1. Turn down the support leg:
  - Remove the locking pin (B)



- Turn down the support leg (A)
- Install the locking pin (B)



2. Make sure the blade is against the ground.
3. Make sure the hydraulic system is pressure less and remove the hydraulic hoses.
4. Remove the tractor towing hook from the machine's drawbar eye.



#### **NOTICE!**

The support leg does only carry the drawbar.

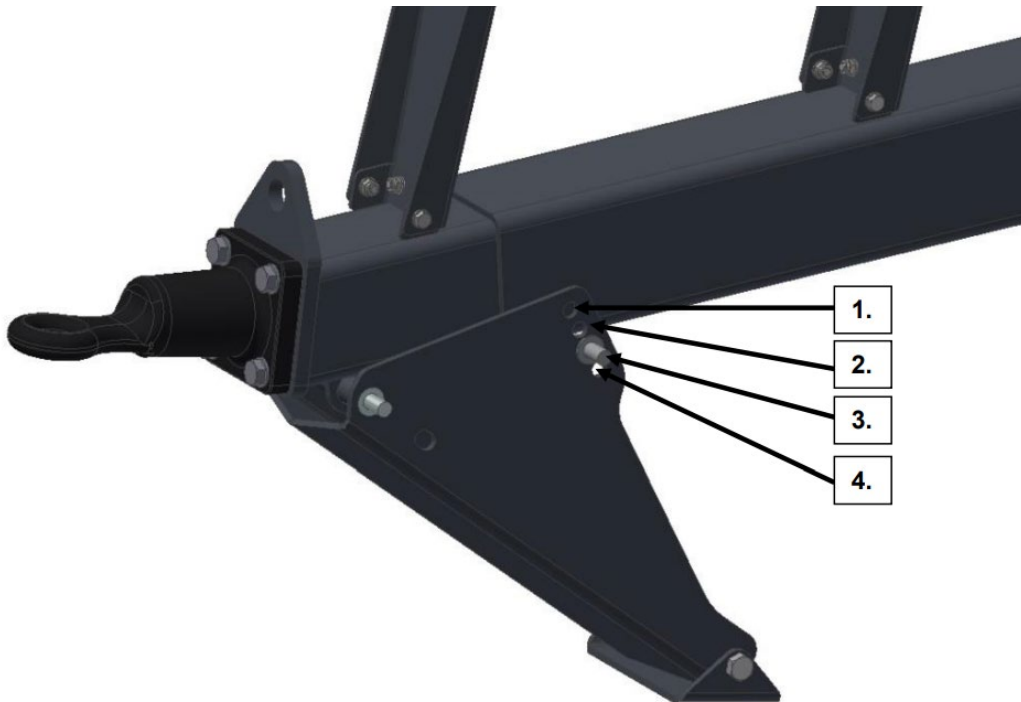
## 4.4 How to connect the stone picker to a fixed height hitch

The Scorpio 550 SF can be connected to a fixed height hitch using the multi positional support leg and the Scorpio hydraulics.

To lift or lower the machine see ISOBUS instructions **954089**.

To be able to lift the drawbar for connecting it to your machine you also need to use the support leg.

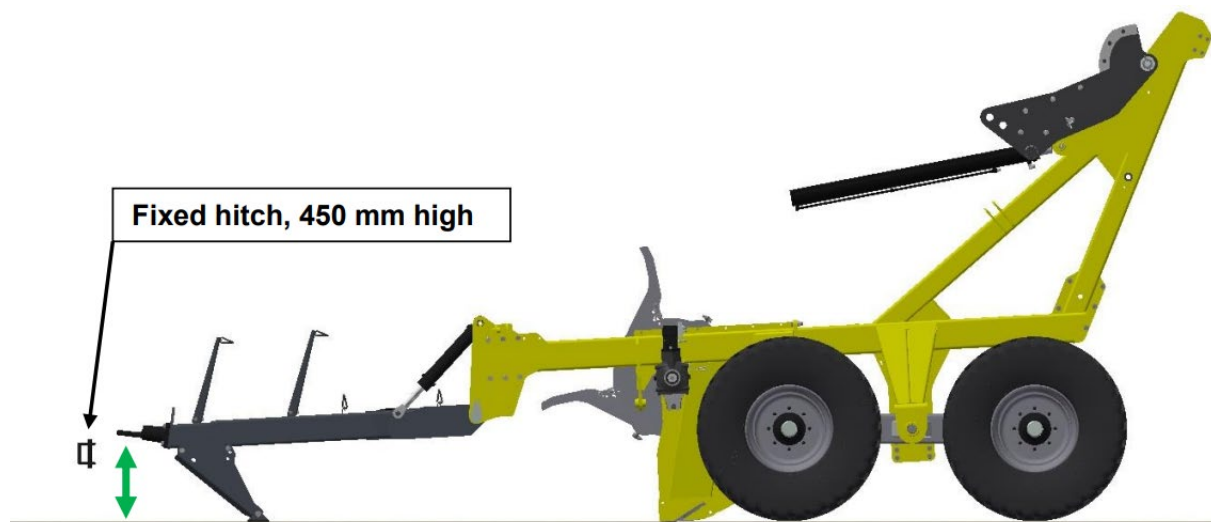
Support leg positions



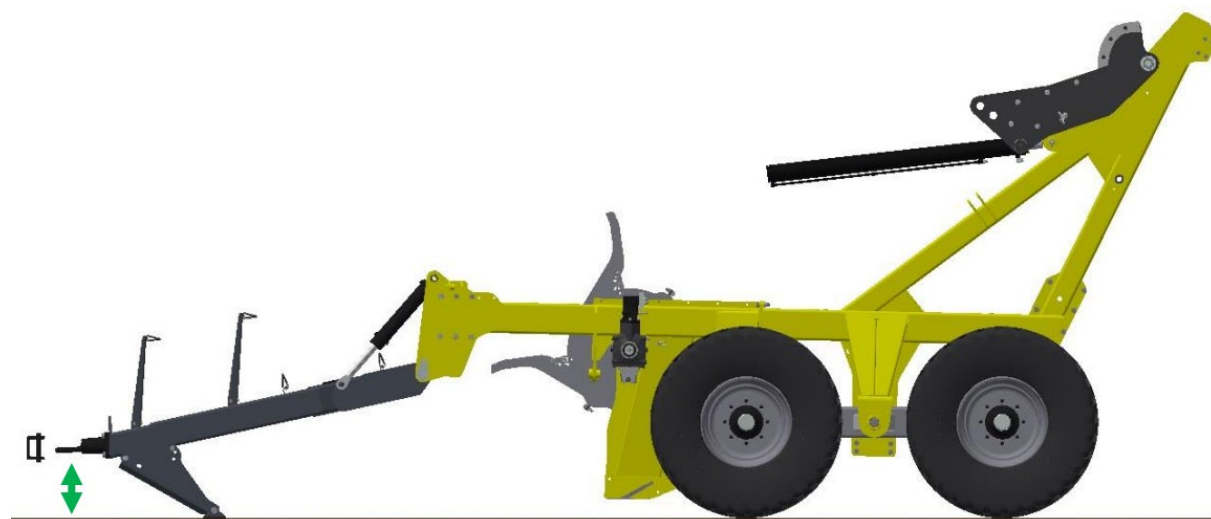
The support leg has four holes for four different hitch height ranges:

1. 720-480 mm
2. 650-420 mm
3. 590-350 mm
4. 530-270 mm

1. In the starting position the blade is resting on the ground and the drawbar is resting on the support leg. The fixed hitch in the figure is 450 mm high and the locking pin is set in the third hole for a height range of 590-350 mm.



2. Reverse against the stone picker close enough to connect hydraulic hoses.



Lift the blade to bring the drawbar down to the correct height according to your tractor and connect the stone picker.



## 4.5 How to disconnect the stone picker from a fixed height hitch

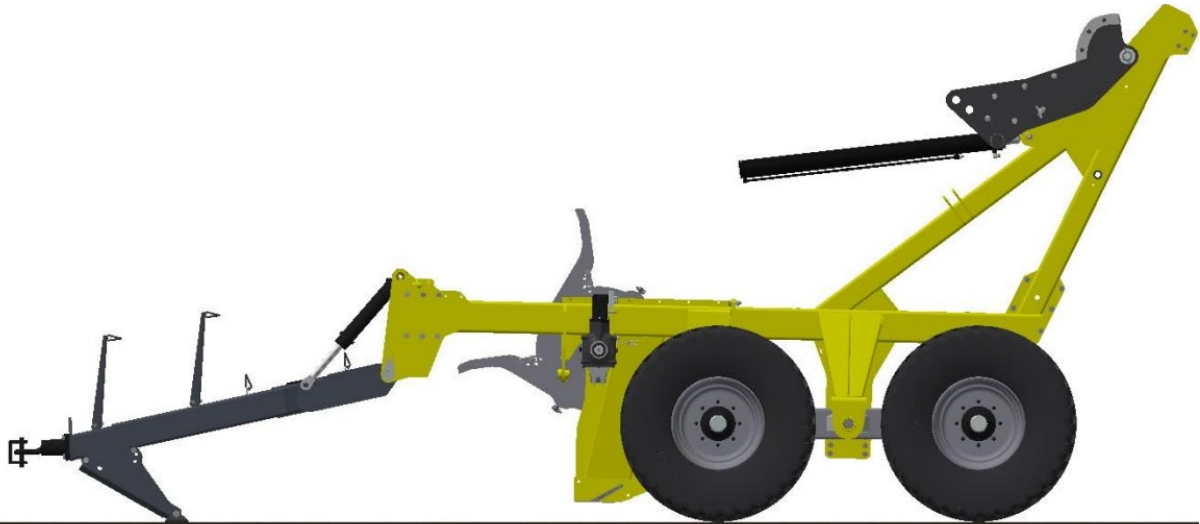
Below is the machine in the transport position with the support leg folded up and the blade lifted as high as possible from the ground.



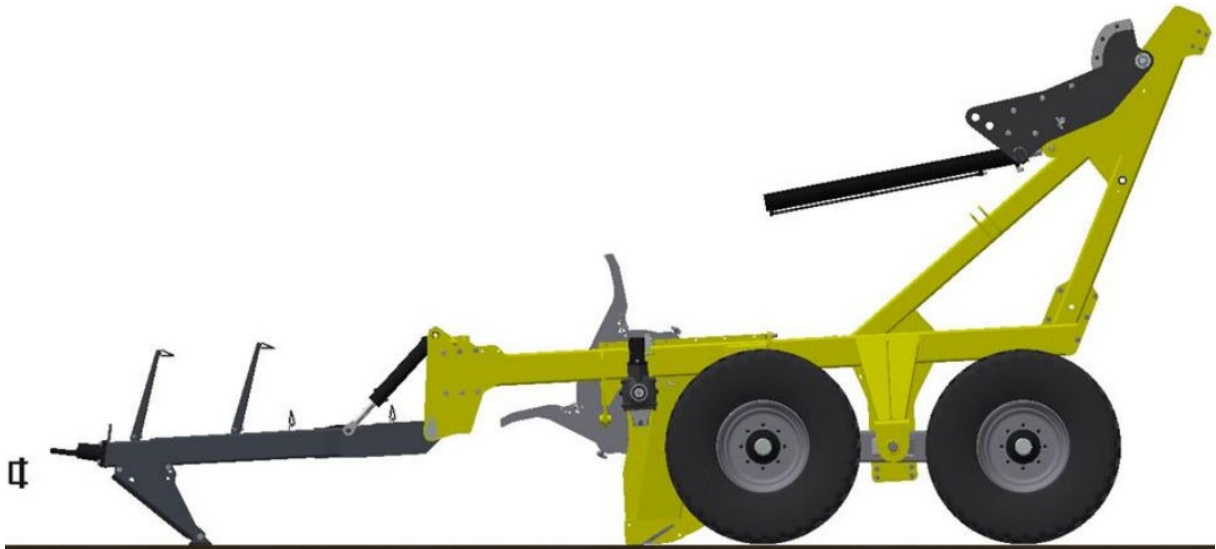
1. When in the transport position fold down the support leg and insert the pin in the correct hole for **your** tractor hitch height.



2. Lower the blade until the support leg carries the weight of the stone picker instead of the tractor hitch and disconnect the stone picker.



3. After disconnecting the stone picker but before you disconnect the hydraulic hoses lower the blade to the ground. When the blade is resting on the ground the hydraulic system is pressure free and you can disconnect the hydraulic hoses.

**NOTICE!**

The support leg does only carry the drawbar during storage.

 **WARNING****HYDRAULIC OIL INJECTION HAZARD!**

Connecting or disconnecting hydraulic components that are under pressure causes an injection hazard. Always make sure that the pressure is released before any maintenance.

## 4.6 Work position

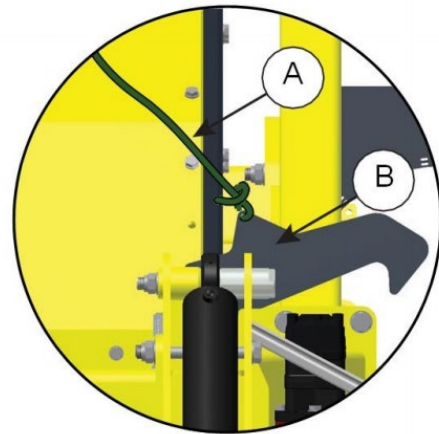
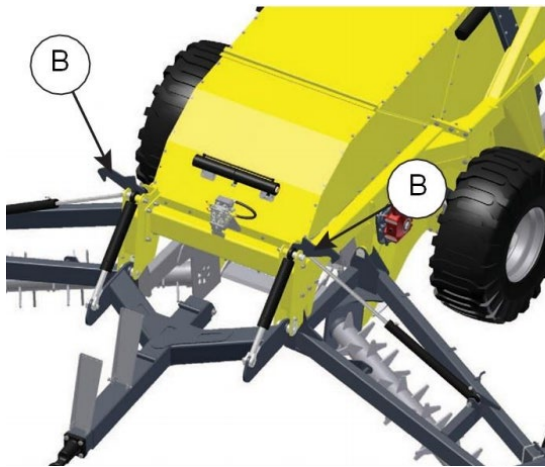
### **WARNING**

Keep all persons out of the work area! Unnecessary stay in the work area (field) is not permitted.

- Adapt the speed of the tractor to the terrain conditions. Decrease the speed on stony and rough fields, for example.

#### Lower the stone picker into work position:

1. Lower the blade by tilting the machine frame forward.
2. Lift the windrowers to get clearance between the safety locks and the windrower.
3. Pull the rope (A). The mechanical safety locks (B) are released.
4. Lower the windrowers to the work position.
5. Make sure that the stone tank is in the down position



## 4.7 Transport position

When lowering or raising the side elevator, the oil flow should be around 20 l/min.  
The rear frame and the side elevator are both operated in the same motion.

### **WARNING**

Make sure that the mechanical safety locks are in the locked position. You can hear an audible click when the mechanical safety locks snap shut to the locked position.

### 4.7.1 How to lift the stone picker into transport position

1. Lift the windrowers to the transport position.
2. Lift the blade.
3. Make sure that the stone tank is in the down position.



### 4.7.2 How to transport the stone picker

- Decrease the speed on rough roads. High speed can cause large shock loads to the construction. Shock loads can cause damage to the frame (not covered by warranty).
- Obey the law legislation for road transport. In some countries it can be necessary to install a SMV triangle when the machine is on a public road.

**NOTICE!**

The maximum road speed for the ELHO machine is 30 km/h. It is not allowed to transport anything inside the machine on roads.

### 4.8 Storage after season

- Open the windrower covers to access the motor and gearbox. Remove possible soil inside the casing using air blow gun.
- Clean and start the machine. Use plenty of water, do not use a pressure cleaner. Do not point the water jet to the bearings.
- Replace the damaged or worn parts.
- Repair possible paint damage.
- Clean carefully all extended cylinder piston rods and use grease to prevent rust damage.
- Before you spray the machine with rust preventing oil for storage, clean the machine and let it dry.
- Make sure that the building where you store the machine has good ventilation. This increases the lifetime of your machine.

## 4.9 Field operation

### 4.9.1 When to collect stones

#### NOTICE!

Do not try to pull up stones by force, collect only loose stones. Use appropriate machinery (e.g. excavator or cultivator) to loosen the stones. The ELHO warranty does not cover damage which are caused by incorrect operation.

Before you start to collect stones:

- Make sure that the surface of the field is dry, solid and the stones are loose.
- Do not use the machine for stones larger than 40 cm.
- The stones are collected to a working depth of 7 cm depending on the field conditions.

#### Rotation rate

#### NOTICE!

Too high rotation can also cause damage to the rotor tines, or otherwise cause unnecessary wear. Too high rotation can also increase oil temperature.

#### Driving speed

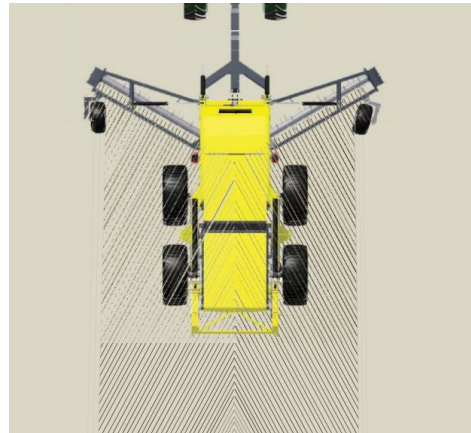
Choose correct driving speed depending on the stone content and field conditions.

If the field has a lot of stones (Ø 15-30 cm), drive 0 – 2 km/h.

If the field has few stones or the stones are small (Ø 4-10 cm), drive 3 – 6 km/h.

When the right driving speed and rotation rate are set, the collector creates fishbone pattern.

To set correct rotation, refer chapter “3.2.1. Adjusting the correct rotation speed for the windrower” on page 18.



### 4.9.2 Adjusting of working depth

The rake outer end working depth is set by altering the height of the rake from the linkarm. The correct setting of the windrower support tyre is when the soil is not moving towards the machine center, only stones are moving.

The working depth of the blade is done through Isobus. Refer to document ID 954089 for Isobus instructions.

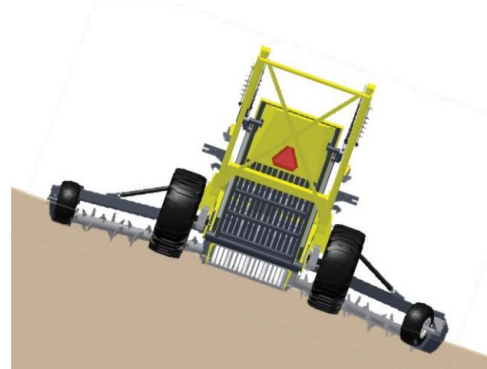


## 4.9.3 Other driving instructions

### Hilly conditions

If you operate the machine in a hilly environment, it is recommended to drive uphill or diagonally to uphill to get the windrowers to operate properly.

If the downhill is too steep the stones will only move forward, and not to the center of the machine.

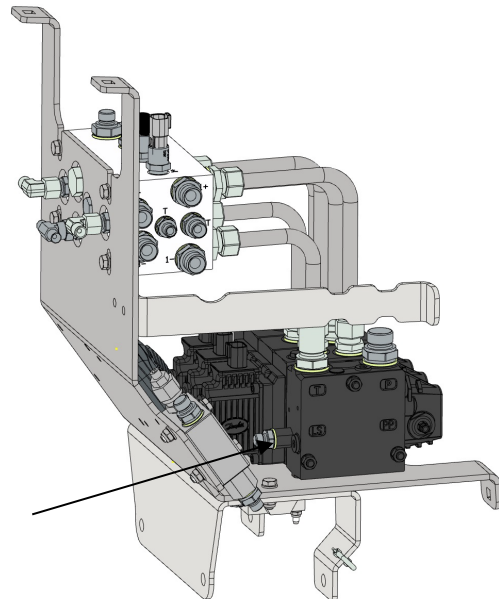


## 4.10 Inlet module selector

The Danfoss Pvg 32 valveblock used on the Scorpio 710 and Scorpio 550 SF comes with a selectable inlet module for both open and closed center configuration

When the stonepicker is delivered the machine is set in the open center configuration which is used with the hydraulic unit. In this configuration the selector screw is turned all the way in.

To change to closed center configuration that is used when using the load sensing pump on the tractor the 6 mm selector has to be turned counter-clockwise (screw out) all the way which is about 6 full revolutions. When used with a LS pump the 3/16" LS hose has to be connected.



## 4.11 How to use the external hydraulic unit

An external hydraulic unit is available for the Scorpio 550 SF, part number: 473576. The main purpose for the hydraulic unit is to provide enough oil flow and number of ports to work with the Scorpio with a tractor that does not have sufficient hydraulics. The external unit can also be used in situations where you do not want to mix the tractors hydraulic oil with the oil from the stone picker. If the hydraulic unit is delivered filled with oil the oil quality is Neste 68 super.

### 4.11.1 Connecting the external hydraulic unit

If the machine has a hydraulic unit is is attached with brackets to the drawbar.

Two 3/4" hydraulic hoses on the hydraulic unit should be connected to the electrical hydraulic block.

Start by removing the longer hoses currently assembled on the block. These longer hoses the ones used for a tractor with a LS pump. The block also has a small 3/16" LS hydraulic hose prepared for LS drive, this hose is not used when using the hydraulic unit.

The longer hydraulic hose connects the pump to the P port on the block. The shorter hose is installed between the cooler and the T port on the block.

If the hydraulic unit is shipped without oil we recommend to fill the unit with 80 litres of 68 grade hydraulic oil or similar.



#### **WARNING**

The hydraulic unit is to be used only with the tractor linkage arms lifted to max height.

### 4.12 Working with the hydraulic unit

The valve block is designed for a continuous flow of 120 l/min which is obtained when the PTO is working at 540 rpm.

#### **WARNING**

The recommended rpm for the PTO when working with the stone picker is 540 rpm. Higher rpm will lead to excessive heating of the oil and can cause damage on the stone picker.

#### 4.12.1 Cooler

The hydraulic unit is equipped with a cooler. The cooler has a cooling capacity of 0,2 kW/ΔC°, which is equal to 10 kW when the ambient temperature difference is 40 C°. The cooler fan is electrically driven. The optimum working temperature for the hydraulic oil is 45-60 C° and the oil should not exceed 90 C°. The cooler fan has to be connected to fused tractor plug

### 4.13 Brakes

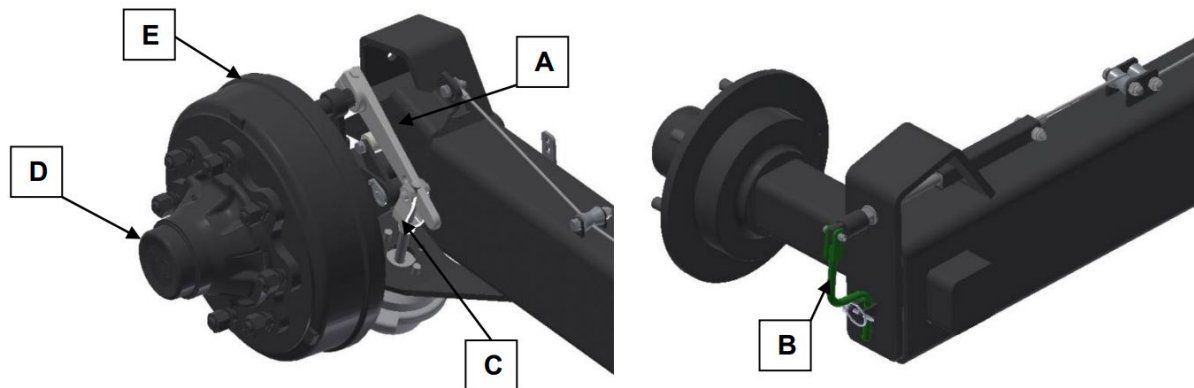
The scorpio can be equipped with brakes according to local requirements and conditions. There are three types of brakes available for the Scorpio 550

1. Hydraulic brake
2. Pneumatic brake
3. Pneumatic brake + manual parking brake



### 4.13.1 Check and adjust the brakes

- It is important to check that the brakes are working properly at least two times a year.
- Inspect the functionality of the brakes and adjust the brakes if necessary.
- The brakes should be frictionless when not engaged and the lever play should be no more than 10 mm.
- When the hydraulic brakes are engaged, the angle between the brake lever and the pneumatic (C) or hydraulic actuator should be close to 90 deg. Adjust the lever accordingly (A).
- The manual parking brake is activated by winding the hand lever (B).



#### **WARNING**

Improperly maintained and poorly adjusted brakes can be weaker and will wear out faster and may lead to failing brakes.

The brake lining need be checked every two years or after 1000 working hours. The minimum liner thickness is 2mm. To check the liner thickness you need to disassemble the brake drum:

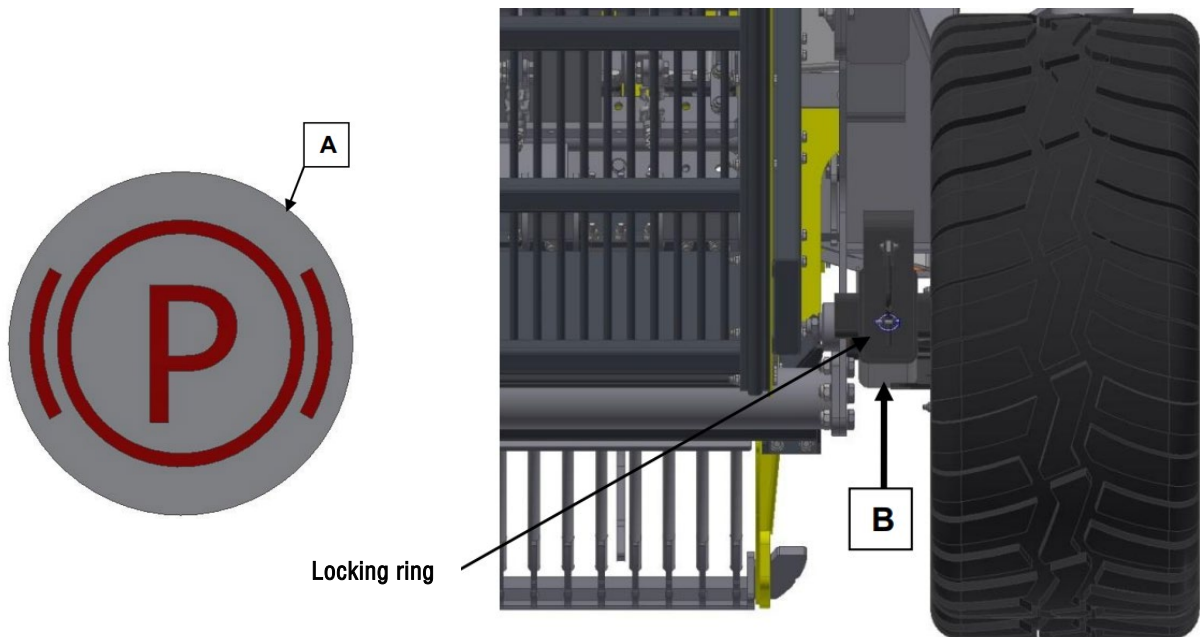
- Remove the wheel.
- Remove the hub cover (D) and unscrew the crown nut.
- Pull out the outer drum (C).
- Check the liner thickness, replace liner and tension springs if necessary.
- If necessary clean parts and apply new grease, be careful not to smear grease on the brake lining.
- Reassemble and adjust the lever if needed.

The hand lever (B) for the manual parking brake is located on the back of the wheel axles and is kept in place with a locking ring. On the machine the place of the manual parking brake is marked with a sticker (A).



## 4.14 Prevent unauthorized use

To prevent unauthorized use the locking ring can be replaced with a padlock and the lock hand lever with the parking brake engaged.



## 5 MAINTENANCE

### WARNING

Before you perform maintenance, stop the tractor engine, engage the parking brake and remove the start key from the tractor. Any hydraulic movements from the tractor are not permitted! Use protective gloves!

### WARNING

Before you perform any maintenance under the machine, make sure that the machine is supported!

To make sure a long and trouble free use of the machine, keep the machine clean and follow the maintenance instructions. Before you start the maintenance work, make sure that the machine is completely stopped.

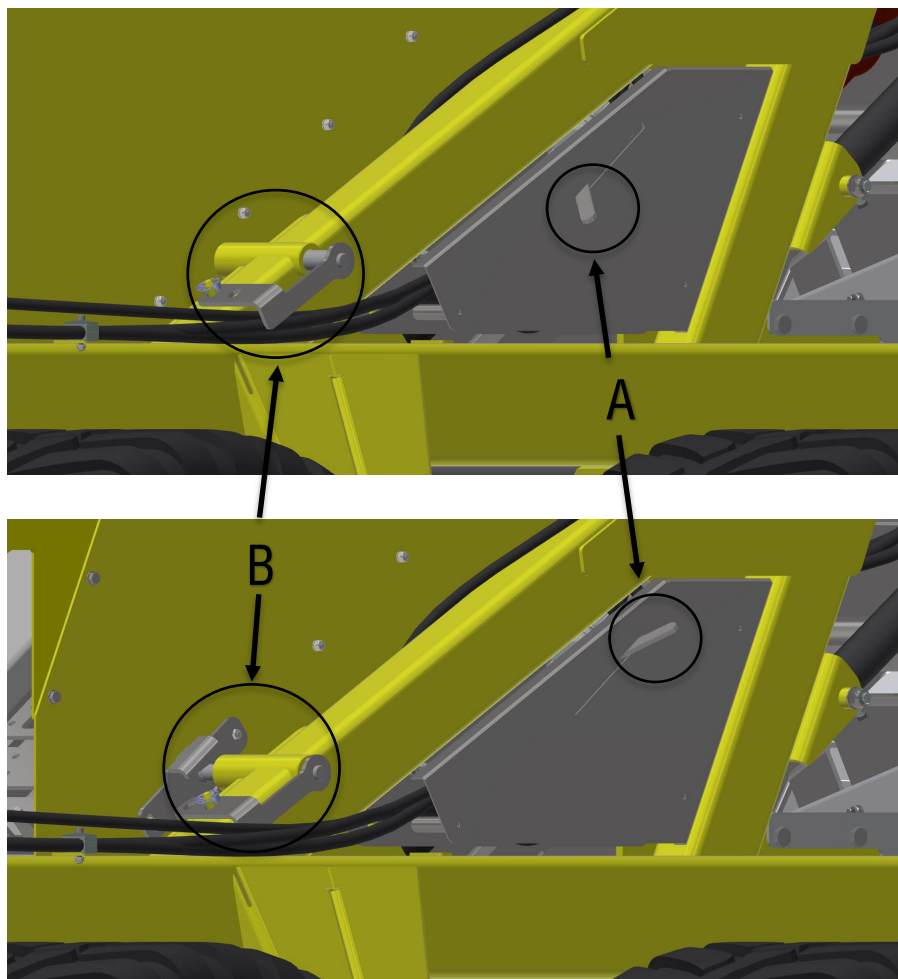
### Tightening torques

Do a check of all hex screws and nuts regularly, tighten them if necessary. If nothing special is mentioned, use the tightening torques seen on the table below:

Bolt size M (mm)	Bolt class 4.6 (Nm)	Bolt class 5.8 (Nm)	Bolt class 8.8 (Nm)	Bolt class 10.9 (Nm)	Bolt class 12.9 (Nm)
6	3,7	6,1	9,8	14	17
8	8,9	15	24	33	40
10	17	29	47	65	79
12	30	51	81	114	136
14	48	80	128	181	217
16	74	123	197	277	333
18	103	172	275	386	463
20	144	240	385	541	649
22	194	324	518	728	874
24	249	416	665	935	1120
27	360	600	961	1350	1620
30	492	819	1310	1840	2210

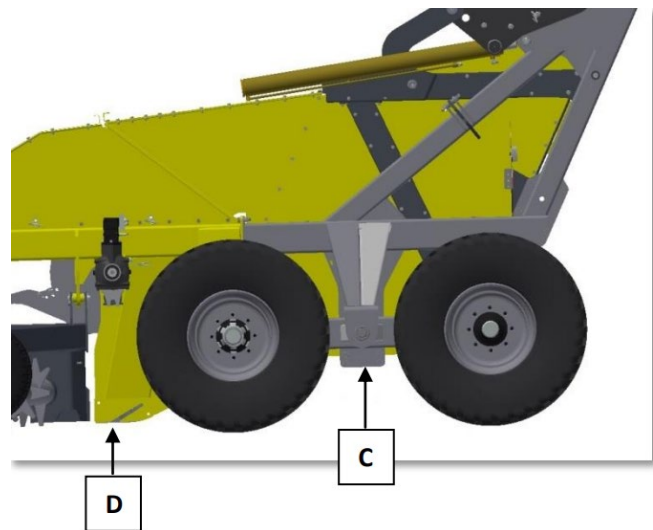
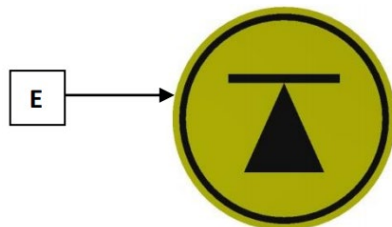
## 5.1 Maintenance position

1. The lever (A) is pointing downwards and is in normal mode and the lock pin (B) is not out.
2. Lift the elevator by changing the position of the lever (A), it should now be pointing upwards.
3. The elevator will automatically rise when reversing the elevator.
4. When the elevator is risen far enough, use the lock pin (B) on both sides to secure the elevators position.



### 5.1.1 Jack point

When doing any work with the wheels disassembled support the frame on the jack point (C) and the blade (D). The jack points are marked on the machine with sticker (E).



### 5.2 Hydraulic hoses

#### WARNING

#### HYDRAULIC OIL INJECTION HAZARD!

Connecting or disconnecting hydraulic components that are under pressure causes an injection hazard. Always make sure that the pressure is released before any maintenance.

#### WARNING

Note that the oil can reach temperatures of 80°. Do not touch any hydraulic equipment (hoses, valves, gearbox etc.) immediately after use.

Replace the hydraulic hoses with new ones after an interval of 6 years. Perform regular inspections of the hydraulic hoses to find possible damage or leakages with an interval of 20 hours.

#### To replace a hydraulic hose:

1. Lower the machine to the ground.
2. Make sure that the hose is not under pressure.
  - Open the connection for approximately 1.5 turns to release the remaining pressure.
3. Open the hose connections and place plugs to the open ends of the hydraulic lines and components.
4. Remove the hose from the machine.
5. Remove the plugs and install a new hose.
6. Operate the machine and make sure that there are no leaks. Add hydraulic oil if necessary.

All leakage oil must be collected and disposed of properly.

### 5.3 Gearboxes oil

<b>⚠ WARNING</b>	Note that the oil can reach temperatures of 80°. Do not touch any hydraulic equipment (hoses, valves, gearbox etc.) immediately after use.
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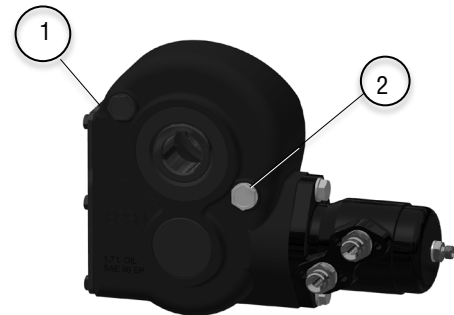
Before you start up a new machine, check the oil levels in all gearboxes.

**Gearboxes**

- Fill the oil through the plug (1).
- Do a check of the oil level through the oil plug (2).
- Remove the oil through the bottom plug (3) under the gearbox.



Type of oil	Quantity of oil	Changing interval
SAE 80W90 EP	Up to the check plug (1,3 l)	After the first 50 hours of use, then after 600 hours or one time/season.



Type of oil	Quantity of oil	Changing interval
SAE 80W90 EP	Up to the check plug (1,7 l)	After the first 50 hours of use, then after 600 hours or one time/season.

If your machine is equipped with a hydraulic unit you also need to check and maintain the gearbox on the hydraulic unit.

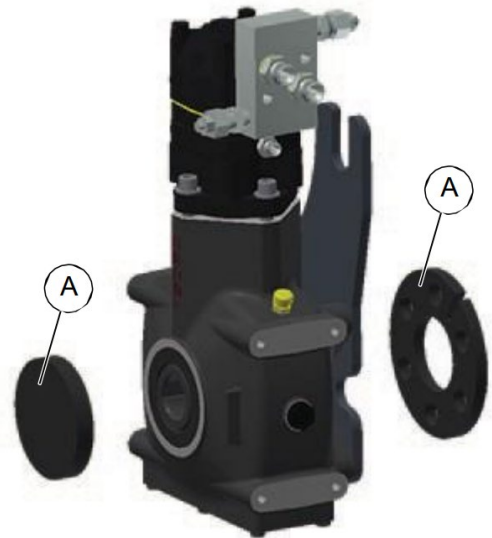
- A filler plug/Breather
- B oil level eye
- C Bottom plug

Type of oil	Quantity of oil	Changing interval
SAE 80W90 EP	Up to the oil level eye (B) (1 l)	After the first 50 hours of use, then after 600 hours or one time/season.



## 5.4 How to clean the windrower driveline casing

- Open the windrowers cover to access the motor and gearbox.
- Empty and clean out the possible soil inside the casing using air blow gun. The gearbox shaft seals are protected by elastic foam discs (A). Refer to figure.



### NOTICE!

Soil, sand and moisture damage the shaft seals. Replace damaged foam discs.

## 5.5 Inlet rotor

### WARNING

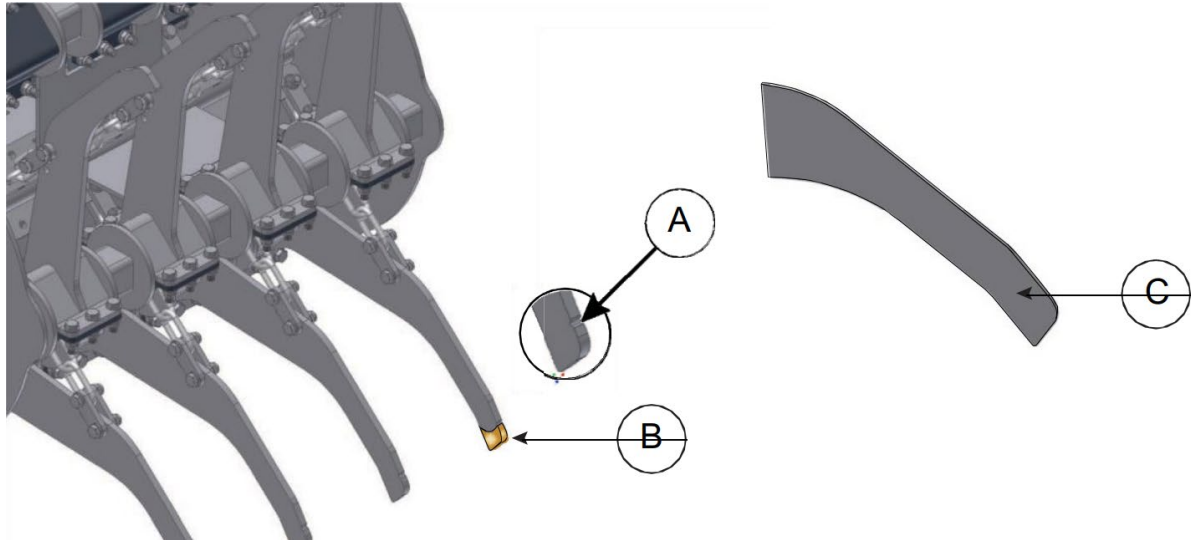
Before you perform maintenance, stop the tractor engine, engage the parking brake and remove the start key from the tractor. Any hydraulic movements from the tractor are not permitted! Use safety glasses and protective gloves!

### 5.5.1 Rotor tines repair welding

If the rotor tine is worn to groove (A). Repair the tine in order to keep the machine working correctly.

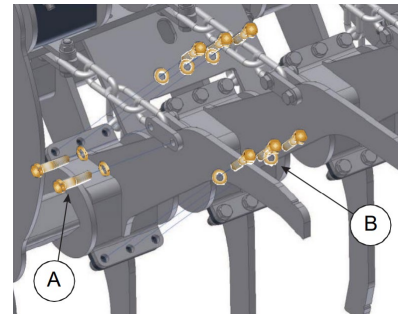
Spare part code for rotor tine repair kit: 472797

1. Remove the rotor tine. Refer to chapter "5.5.2" page 37.
2. Grind the tine in order to install the repair part (B).
3. Use the template (C) delivered with the repair kit to fix the repair part to correct position.
4. Weld the part in position.

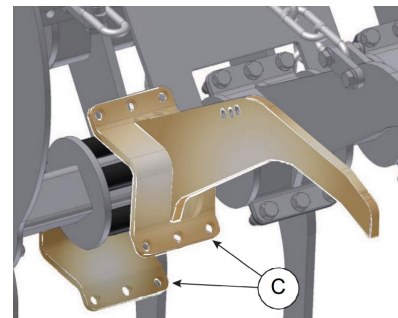


### 5.5.2 How to replace the rotor tines

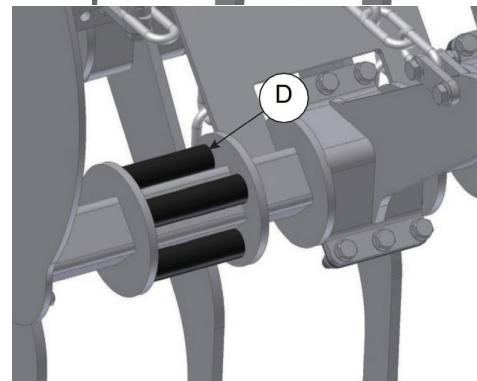
1. Remove the limiter chain bolts (A), 2 pcs.
2. Remove the bolts (B), 6 pcs.



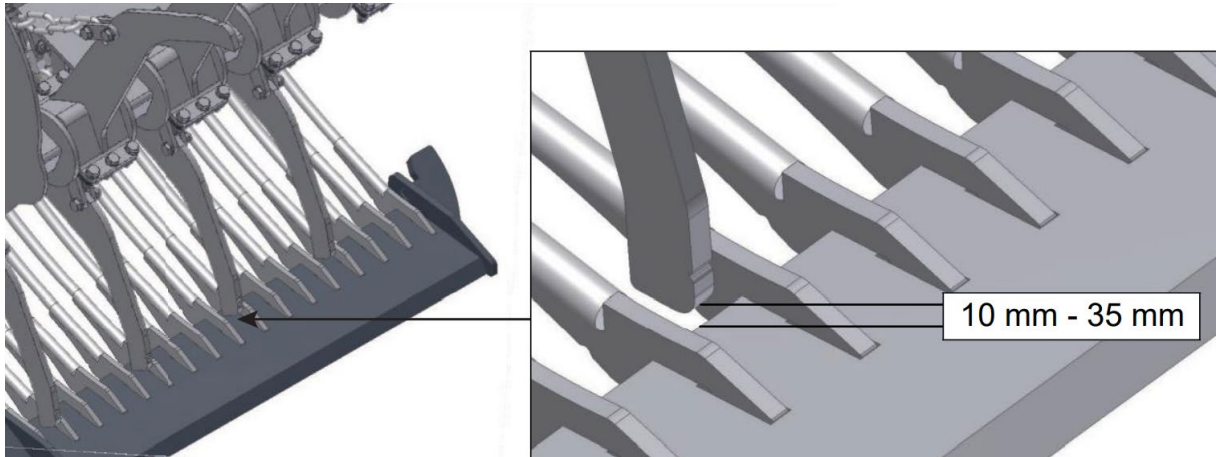
3. Remove the surface plates (C).



4. Tape the rubber sticks (D) in place to facilitate installation.
5. Attach the surface plates (C) with the bolts (A and B).
6. Tighten all bolts.



Make sure that the tines go close enough to the blade. The clearance is set with the limiter chains. Refer to chapter "5.5.3. How to replace the limiter chains" on page 38. The tine must go to the cutting groove. The gap between the tine and blade is min. 10 mm and max. 35 mm. Refer to figure.



### 5.5.3 How to replace the limiter chains

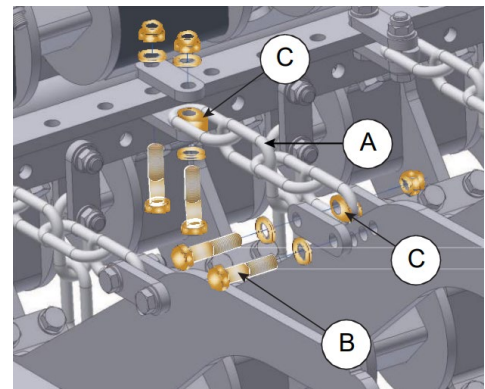
#### NOTICE!

#### Risk of damage to equipment

Do not operate if limiter chain (A) is damaged or broken. The broken rotor tine goes too deep and can cause damage to the machine.

Do not operate if limiter chain (A) is damaged or broken. The broken rotor tine goes too deep

1. Remove the limiter chain bolts (B), pcs.
2. Replace the limiter chain (A).
3. Adjust the tine position. The tine has 3 different hole options.
4. Attach the limiter chain (A) with the limiter chain bolts (B), 4 pcs.
5. The fine adjustment is done with the setting of the spacer washers (C).



#### NOTICE!

Make sure that all screws are tightened correctly.



## 5.6 Windrower

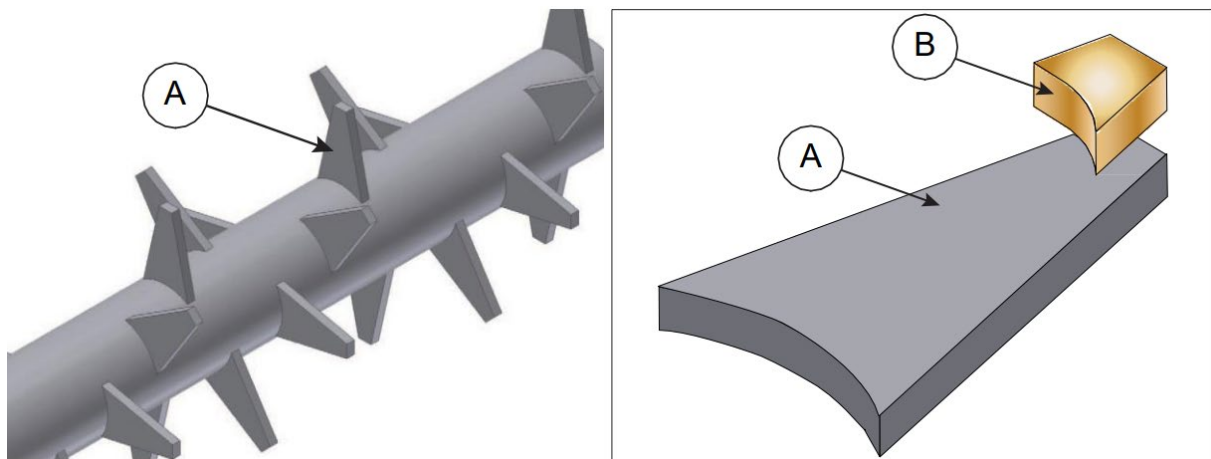
### 5.6.1 Tines repair welding

The windrower r tines (A) cannot be replaced individually without welding. The original length of the windrower tine (A) is 13.5 cm. If the windrower tine (A) is worn to 11.5 cm.

Repair the tine in order to keep the machine working correctly.

1. Grind the tine in order to install the repair part (B)
2. Weld the repair part (B) in position.

Spare part code for windrower tine repair kit: 472996 (single part 472788)



### 5.6.2 Tyre air pressure

Do a check tyre air pressure, refer to chapter "2. Technical data" on page 13.

#### **WARNING**

While working with or handling tyres you should always be cautious of hazards such as over inflating (for correct air pressure refer to chapter "2. Technical data" on page 13.) or getting crushed by the tyres.

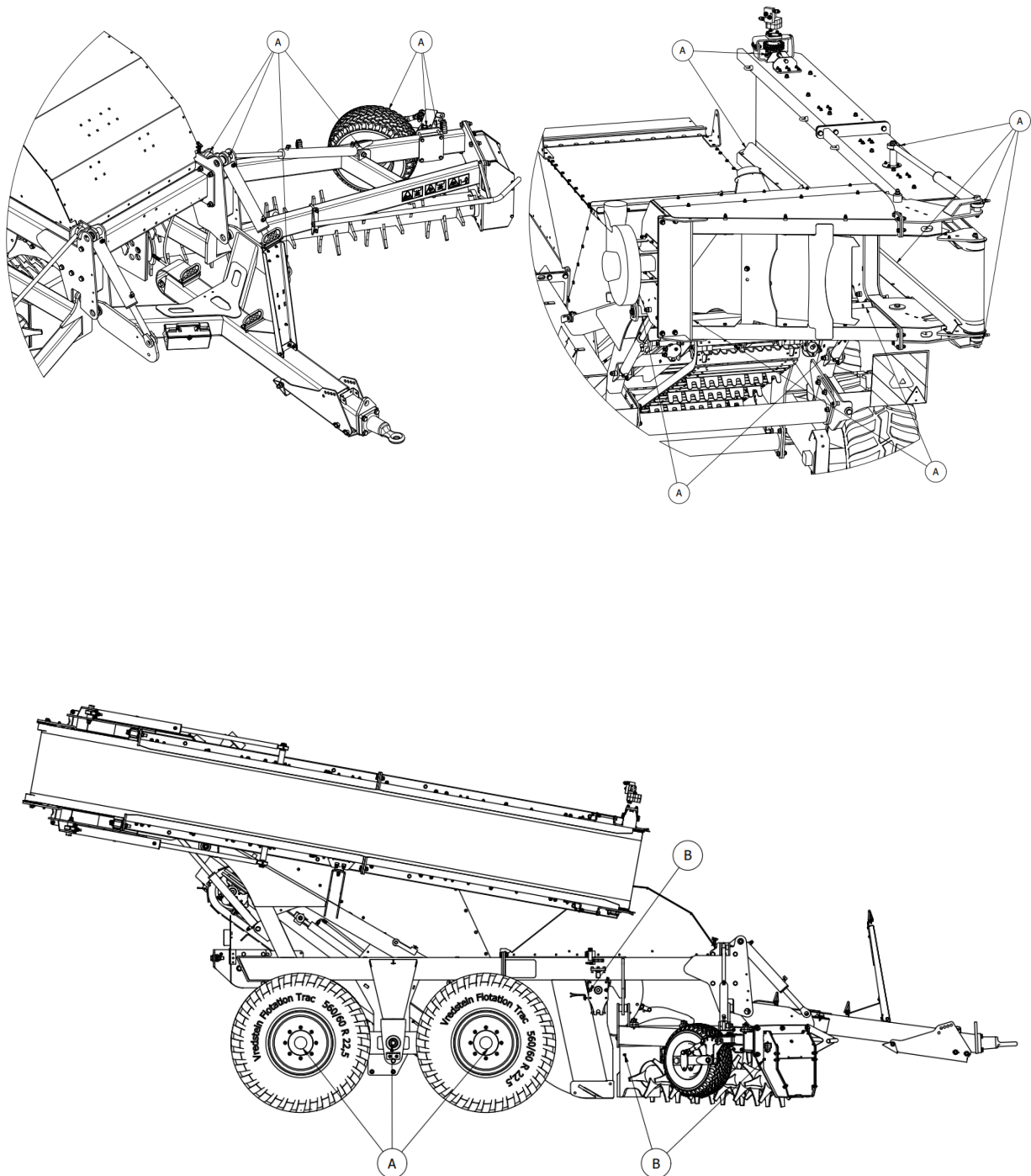
## 5.7 Hydraulic unit

The hydraulic reservoir is filled with 80 l of Neste 68 hydraulic fluid. Check the hydraulic oil quality every season and change if needed. Under normal working conditions the oil should last two seasons or more before an oil change is needed.

The oil filter need to be replaced every season or when the back pressure in the filter is 2 bars. At 2 bars a bypass valve will open if the filter is clogged and the max working pressure for the filter is 3 bar.

## 5.8 Lubrication

Use correct grease for the lubrication points. Refer to figure.



Lubrication	Maintenance interval
A	Lubricate every 20 hours
B	Lubricate every 8 hours

### NOTICE!

Use intended equipment when maintaining the stone picker at the higher points.

## 6 TROUBLESHOOTING

Problem	Possible cause	Solution
Stones stay on the field.	Too low working depth.	Make sure that the working depth is correct. Increase the working depth.
	Uneven field.	Harrow the field.
Stones are not entering the machine.	Incorrect working depth.	Make sure that the working depth is correct. Do a check of tines condition and field conditions.
	Tank is full.	Empty the tank
	Hydraulic oil flow is too low.	Check the tractor
	Hydraulic pressure too low.	Check the tractor.
Stone tank lowers slowly or is stuck when being lowered.	Quick-couplers are blocked.	Check condition of the quick-couplers and tractor.
	Machine is angled downhill.	Lower the blade against the ground
Screen is clogged.	Rotor tines are too short or worn out.	Replace the rotor tines or do repair welding. Refer to chapter 5.5.2. How to replace the rotor tines on page 37.
Pickup rotor feels powerless.	Incorrect pressure.	Check the pressure in 1+ with manometer when blocking the pickup rotor, adjust to 200 bar. Check the pressure in 1- when running the rotor at full speed, if pressure is over 20 bar change oil filter in the tractor.
Rake feels powerless.	Incorrect pressure.	Check the pressure in the line between pickup motor and rake motor when blocking the rake, adjust cross over valve on rake rotor to 250 bar.
Stone hopper is low and sometimes stop.	Incorrect pressure.	Turn in V4, 1,5 turns to set the down pressure to 75-100 bars.
Oil is leaking from the air breather on the main block.	Hydraulic connections assembled wrong.	Check the tank line, one way valve, quick coupling and the return line 1- is connected properly.

## 7 FINAL DISASSEMBLY OF THE MACHINE

### **WARNING**

Keep all persons out of the working area!  
It is not permitted to stay under the hanging load. Also use protective gloves.

- Make sure that you use appropriate and validated lifting devices/slings/chains on all lifting works.
- Unnecessary staying at the lifting area is not permitted.
- Take extra caution when you lift the parts of the machine by hand.
- Before you start disassembly, disconnect the machine from the tractor and make sure that the machine is stopped.
- Before you start disassembly, release the pressures from the hydraulic systems.

### **Oil**

Collect the oil from the hydraulic system and deliver the oil to an oil waste collection point.

### **Tires**

Take any used tires to your local recycling point.

### **Disassemble**

We recommend that you deliver the machine to a scrap yard for recycling, after you have removed the tires and the oil.

