



# Elho stone picker

Scorpio 430 Stone picker, Series 10.1

User Manual





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## EC DECLARATION OF CONFORMITY

**Manufacturer:**  
**Oy Elho AB**  
**Industrivägen 6**  
**68910 Bennäs**  
**Finland**

**Technical file:**  
**Johan Löfbacka**  
**Technical Product Department CTO**  
**Industrivägen 6**  
**68910 Bennäs**  
**Finland**

**We declare under our sole responsibility that the following product**

Equipment: Stone pickers  
Model/type: Scorpio 430

Additional equipment:

**is in conformity with the**

Machine Directive 2006/42/  
EC

**relevant part of the following standards has been applied when designing the machines:**

EN ISO 4254-5

Bennäs 21.01.2023



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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 owner. ELHO’s liability for defects in the manufactured products is limited as stated in the conditions below.

### 1. Warranty extent and period

ELHO warrants 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.

### 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 wear parts e.g. 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 damage to paint due to normal wear and tear.

#### **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 damage**

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 damage, 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 the 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

You can find the serial number of the machine from the plate on the machine frame.

Give the model indication and serial number when you order spare parts, by claim warranty etc.



Write down the information from your machine in the fields below. This makes spare part orders easier for you in the future.

**Type**

**Series**

**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 a field. It is not permitted to use machine for other purposes.

### **1.2. Tractor and machine noise**

EC Directive 86-1888-EEC and UK Noise at Work Regulations 1989 place responsibilities on employers and employees to assess and control noise at the workplace.

If you operate at full speed in an enclosed space, bystander noise level of the machine can exceed 87 dB (A).

We recommend that you do not run the machine at full speed in an enclosed space. Wear hearing protection if you have to 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 noise at the driving position generated by the machine with tractor cab windows open is in range of 80-96 dB (A) and occurs when the machine is collecting stones.

The noise level from the machine usually decreases when moving.

We recommend that you keep the cab windows of the tractor closed when you operate the machine.

If the window is required to be open for ventilation purposes, then use the side window furthest from the machine.

Bear in mind that radios and other sound sources inside the tractor cabin can also be a source of noise.

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**

EC directives 89/391/EEC and 90/269/EEC and UK Manual Handling Operations Regulations 1992, place responsibilities on employers and employees to observe safe working practices when you manually handle heavy weights.

When you assemble 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.



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

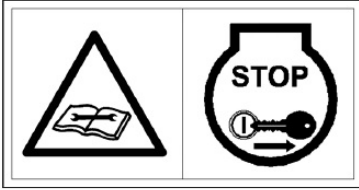
Before you operate or assemble the machine, read carefully this manual and the safety labels on the machine.

- 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.
- 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 in the dark.
- Before you disconnect 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 Stone picker

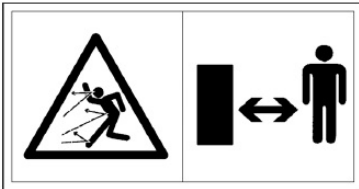
On the machine there are safety labels to make you aware of certain hazards.

1.



Stop the engine and remove the start key

2.



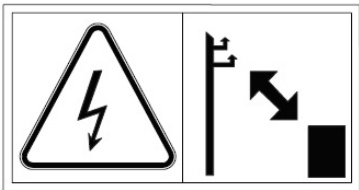
Do not go into the danger zone. There is a risk of being hit by flying objects, such as stones.

3.



Do not empty the stone tank on soft ground or downhill.

4.



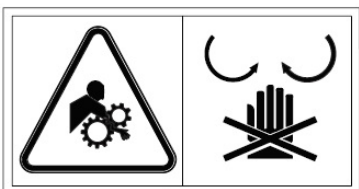
Keep distance to powerlines, especially when you empty the stone tank.

5.



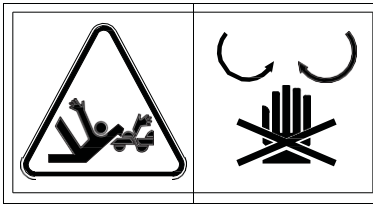
Before you go into the danger zone, make sure that the lifting cylinders are secured with safety labels.

6.



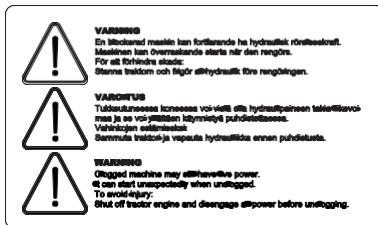
Before you touch the machine components, make sure that the tractor engine is stopped. The rotating parts of the machine continue to rotate even after the tractor engine is stopped.

7.



Do not reach over the rotating parts of the machine.

8.



Clogged machine may still have live power. It can start unexpectedly when unclogged.

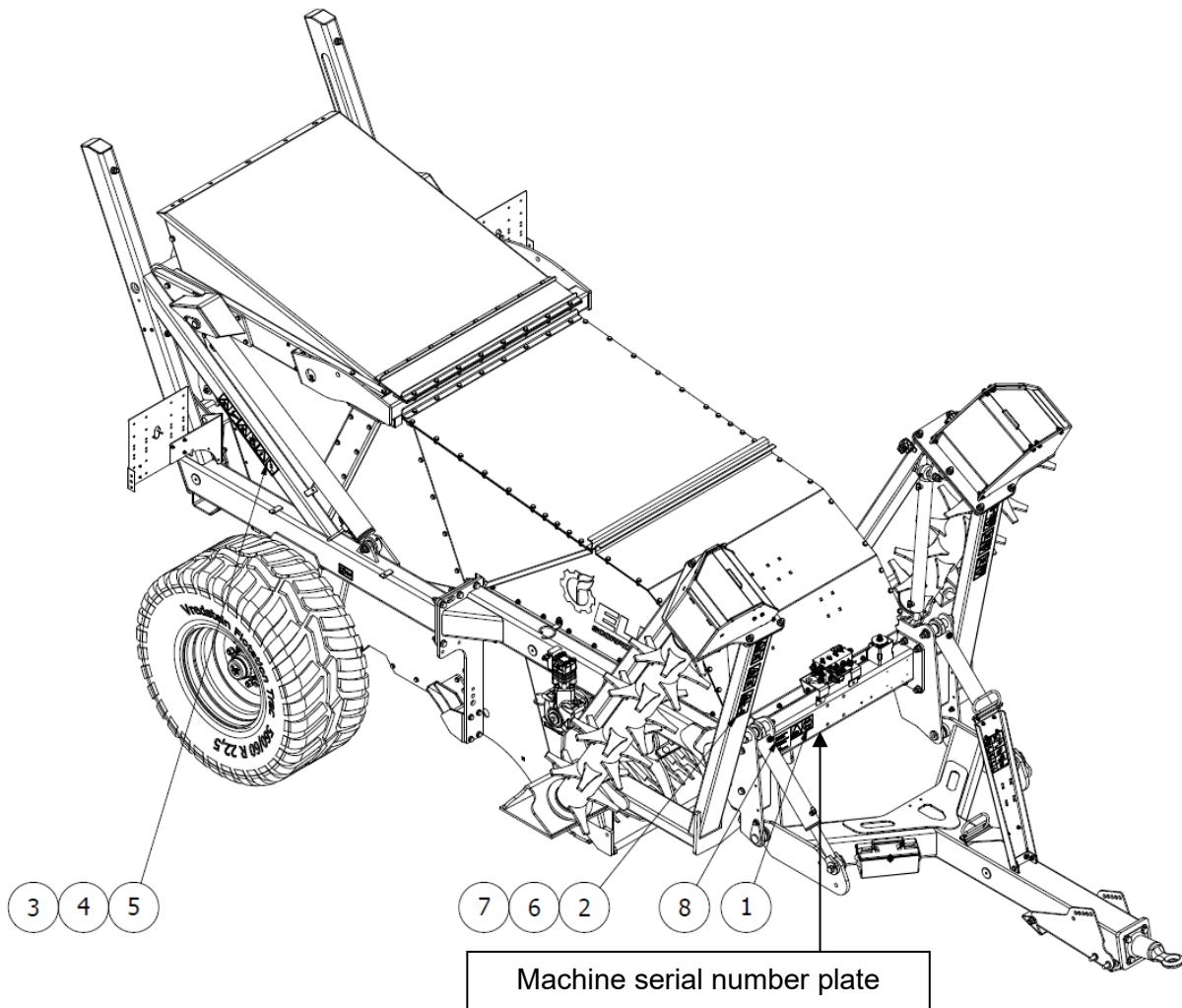
To avoid injury:

Shut off tractor engine and disengage all power before unclogging.

## 1.7. Replacement of safety labels

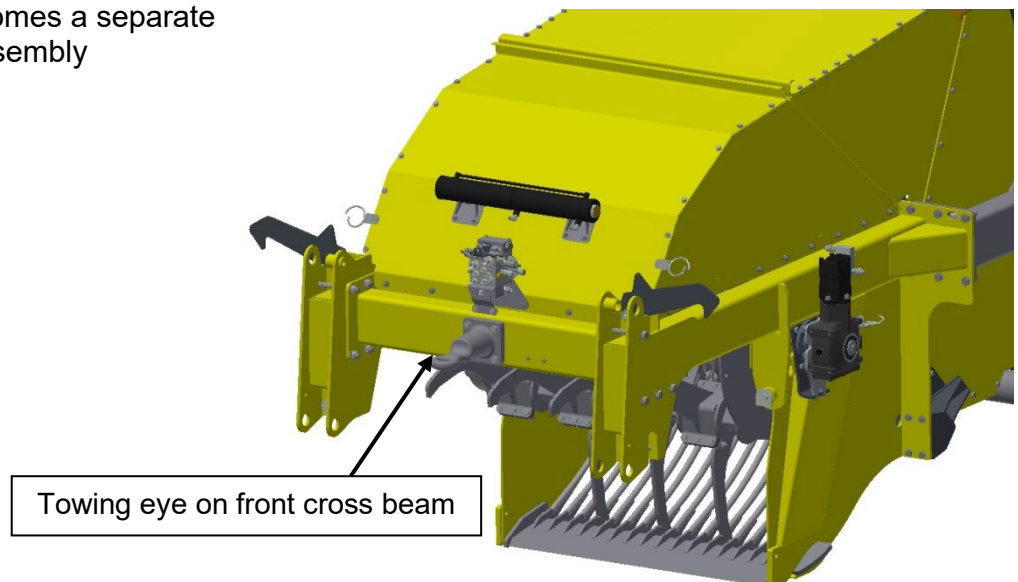
Replace missing or damaged safety labels. The replacement safety labels are available from your dealer.

## 18. Location of safety labels



## 19. Unloading and moving

The Scorpio 430 is not designed to be lifted, when unloading or moving the machine it should be towed in the towing eye. Machines delivered with the drawbar disassembled has the towing eye mounted on front cross beam and can temporary be used to tow the machine before the drawbar is assembled. With machines that are not delivered fully assembled comes a separate document with assembly instructions.



## 2. TECHNICAL DATA

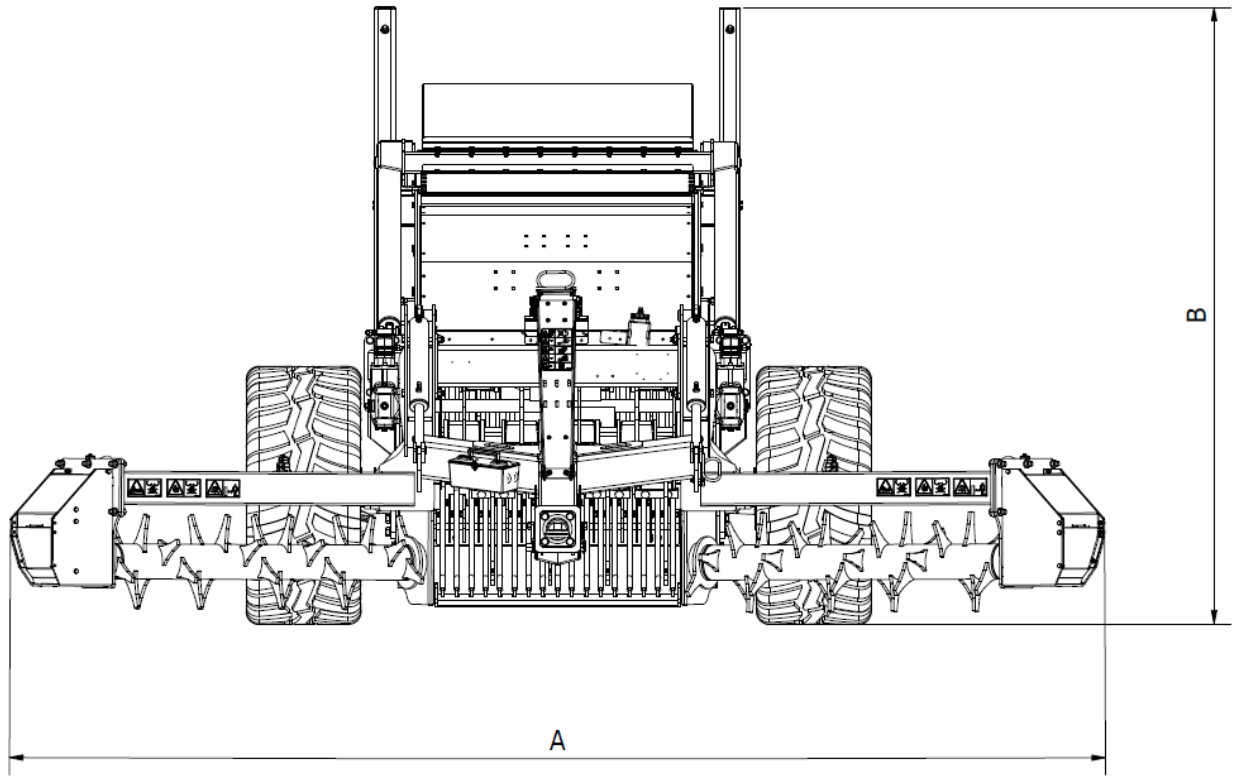
<b>Scorpio 430 stone picker</b>	
Dimensions	Refer to chapter 2.2 on page 14.
Working width, m	4,3
Transport width, m	3
Tipping height, m	2,4
Number of tines, pcs	16
Stone size, mm	40 - 400
Inlet rotor tine lifting force, kg	320
Inlet rotor tine deflection upwards, mm	210
Stone tank capacity, Useful, m <sup>3</sup>	1,5 - 2,0
Oil flow, l/min	60
Recommended tractor hydraulic pump, l/min	70
Power, kW	27
Working depth, cm	0-7
Working speed, km/h	1-7
Screen, mm	30/40/100/110
Tyres boggie	560/60 R22.5
Support tyres	26 x 12.00-12
Inlet rotor reversible	Standard
Windrower reversible	Standard
Automatic draft control	Standard
Weight, kg	5400
Tyre air pressure, bar	2

### 21. Paint

The manufacturing complies with the strictest international painting standards for the paint and painting procedure. This ensures a long lifetime of the ELHO machines. But even a good paint surface can be damaged or scratched during transport and use. Paint in the correct color is usually most easily accessible at your local paint shop, as post 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 helps you to get the right shade. The original paint is polyurethane based industrial truck paint but an alkyd based paint of good quality is also suitable for paint repair.

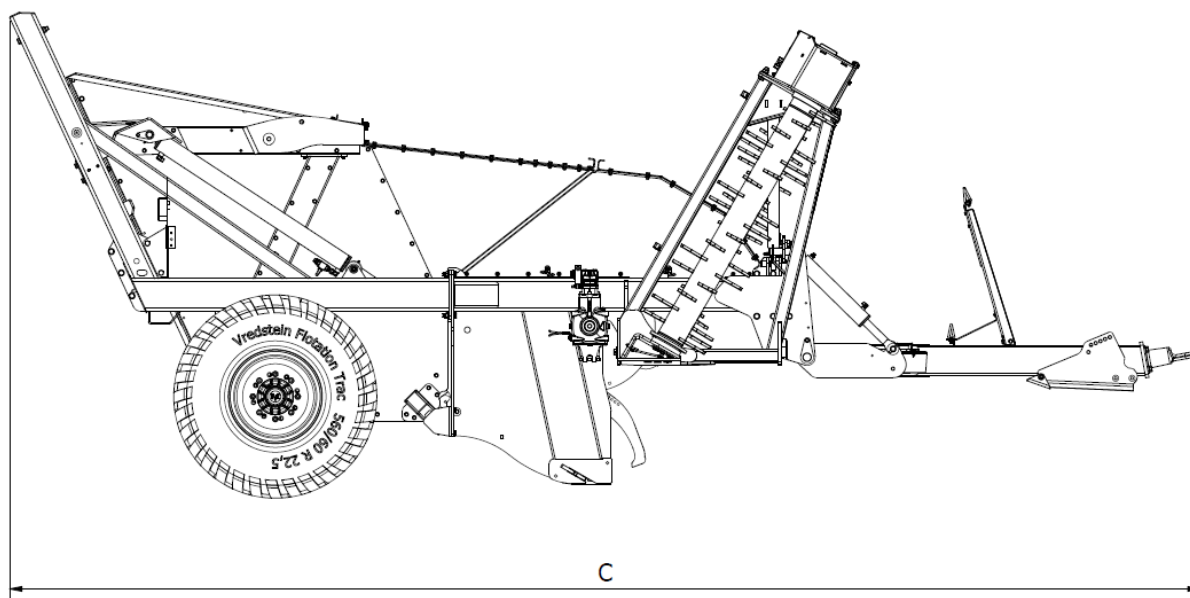
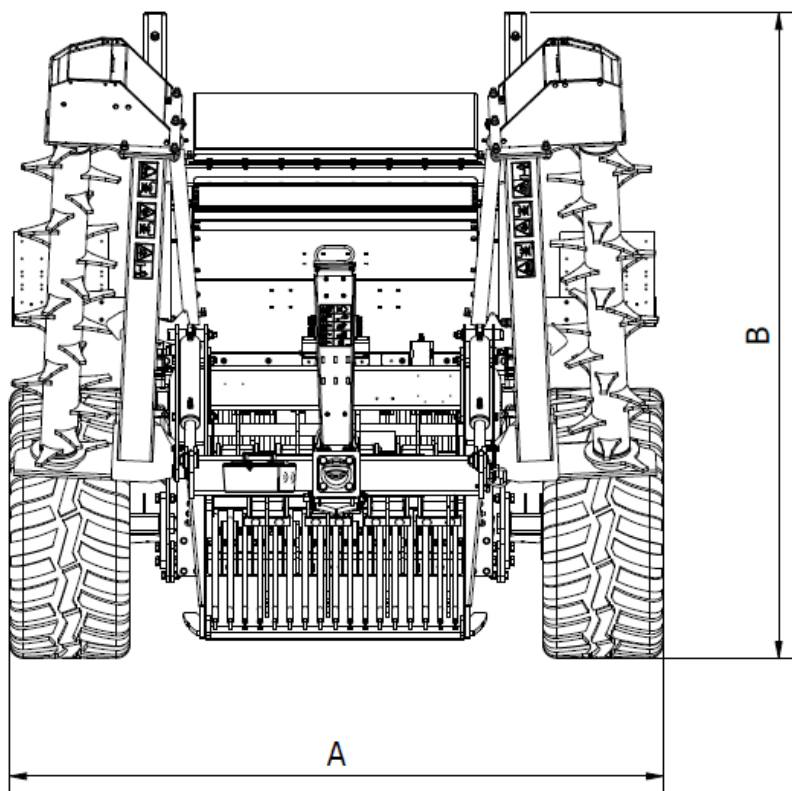
Yellow	RAL 1006
Gray	RAL 7024

## 2.2. Dimensions



Scorpio 430 stone picker	
<b>A</b>	5,2 m
<b>B</b>	2,9 m
<b>C</b>	7,2 m

## 2.3. Transport dimensions



Scorpio 430 stone picker	
<b>A</b>	3 m
<b>B</b>	2,9 m
<b>C</b>	7,2 m

### 3. SETTING UP THE STONE PICKER

#### 3.1. The environmental aspects on setting up the machine

##### Transport package

- 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.
- Bottom support and guards are made of wood, and they do not contain poisonous anti-rot agents. The wooden material can safely be burned in a furnace as solid fuel.
- You can return steel structures of the transport package to the factory for recycling or transport them 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



Do not use the machine without guards!

#### NOTICE

Make sure that all screws are tightened correctly.

#### 3.2. Preparations



When you start up a new machine, make sure that the machine is assembled correctly and it is not damaged. The ELHO warranty does not cover damage which are caused by incorrect assembly or incorrect operation.

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. Maintenance” on page 34.



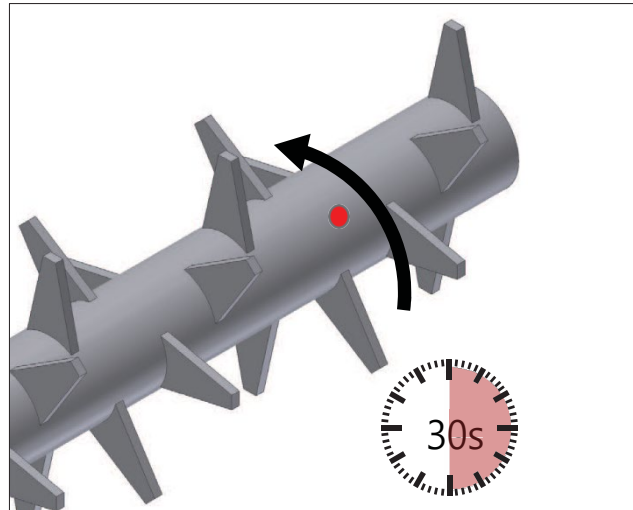
### 3.2.1. Adjusting the correct rotation speed for the windrower

 <b>WARNING</b>	
	<p>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!</p>



1. Mark the windrower with for example red paint. Refer to figure.
2. Set the oil flow from the tractor to 65 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.



### 3.3. How to bleed the hydraulic system

 <b>WARNING</b>	
	<p>Keep all persons out of the work area!</p>

 <b>WARNING</b>	
	<p>If the hydraulic cylinder contains air it can behave unexpected and not hold a load correctly!</p>

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

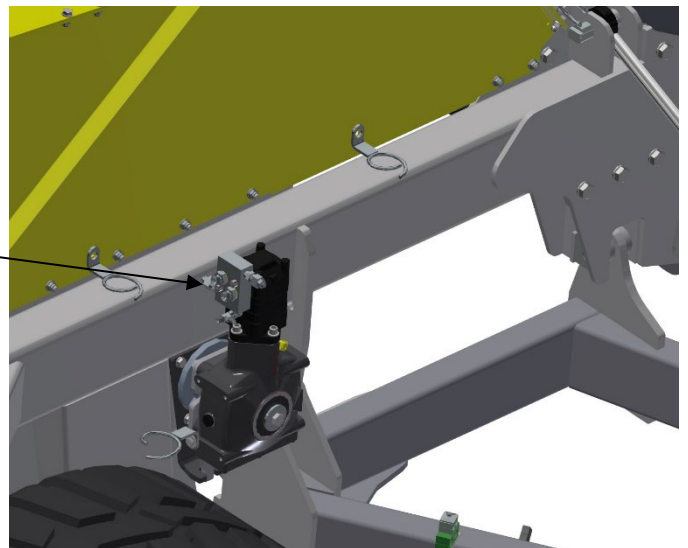
#### 4.1.1. Hydraulic transmission

If stones get stuck between the screen and tines, the relief valve in the tractor will bypass and all the rotors will stop. All motors are also fitted with a relief valve **V** as a secondary relief. To release stones stuck in the pickup:

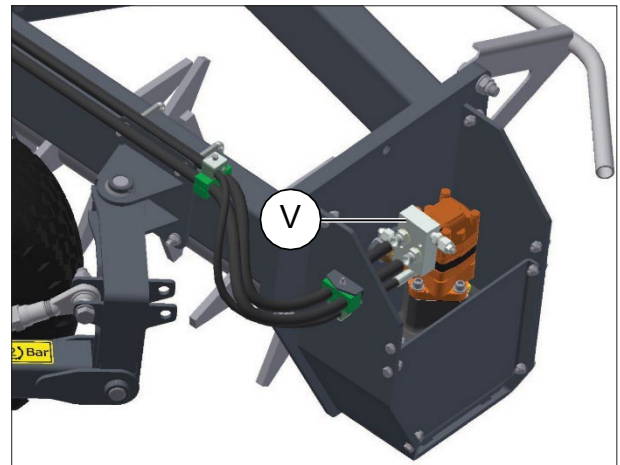
1. Stop the rotation oil flow
2. Lift up the machine
3. Reverse the rotors

**V1**

If stones get stuck in the windrowers, the relief valve **V2** on the windrower will bypass and only the windrower with the overload will stop. To correct this situation:

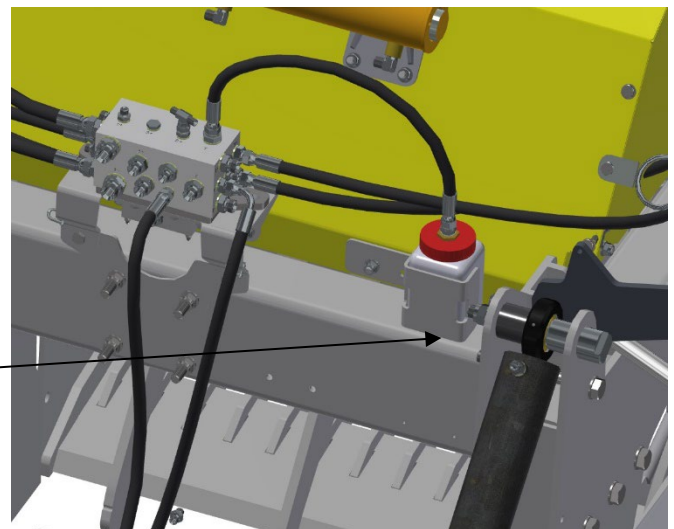


1. Stop the rotation oil flow
2. Lift up the machine
3. Reverse the rotors



Scorpio 430 machines are equipped with a safety valve **V3** assembled inside a plastic container on the front cross beam. This relief valve opens if the pressure in the drain line exceed 50 bar. The oil will be collected inside the plastic container. During normal operation there will be no oil in the plastic container.



**V3**



#### **Pressure relief valves settings:**

The cross over relief valves mounted on the hydraulic motor **V1** and **V2** are set to 250 bar from factory. Safety valve **V3** is set to 50 bar.

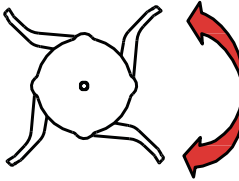
## 42. How to connect the Stone picker to the tractor

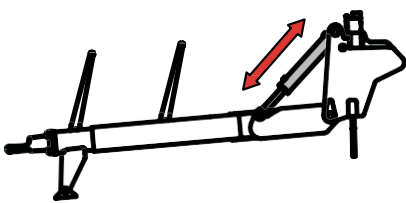
 <b>WARNING</b>	
	Before you leave the tractor cabin, stop the tractor engine, engage the parking brake and remove the start key from the tractor.

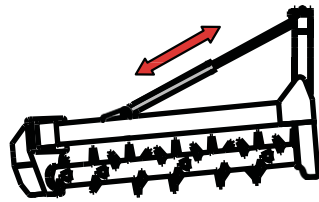
 <b>WARNING</b>	
	Make sure that the quick couplings are clean.



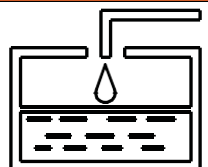
1. Connect the tractor towing hook to the machines drawbar eye.
2. Connect the hydraulic hoses. Refer to figure connection label. Scorpio has only one hose 2+ for the drawbar cylinders.



<b>NOTICE</b>	Connect the hydraulic function for rotation in a valveblock aimed for constant circulation. Set the oil flow for rotation to 65 l/min and the oil flow for reversing to 30 l/min.	
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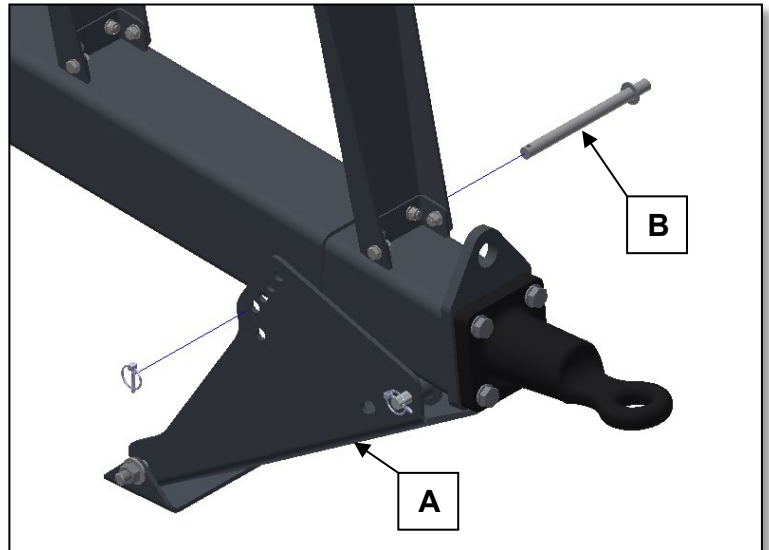
<b>NOTICE</b>	This function is frequently used and should be connected to a valve with an easy to access joystick.	
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<b>NOTICE</b>	This function needs floating position when you operate.	
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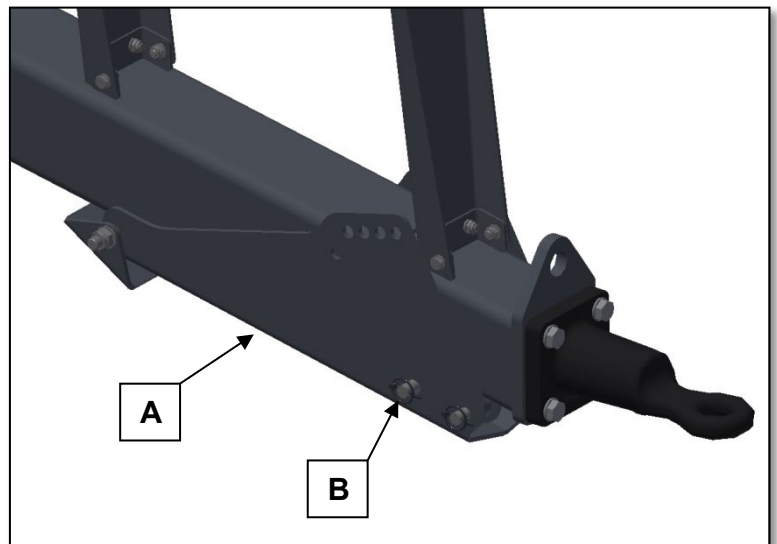
 <b>WARNING</b>		
	The tank line drains the motors. The maximum back pressure for the tank line is 15 bar.	

3. The machine has 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 work.

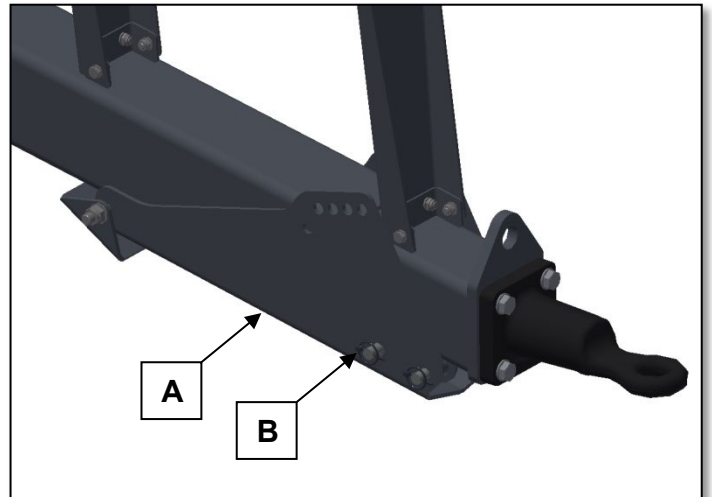
### 4.3 How to disconnects the Stone picker from the tractor

#### ⚠ WARNING

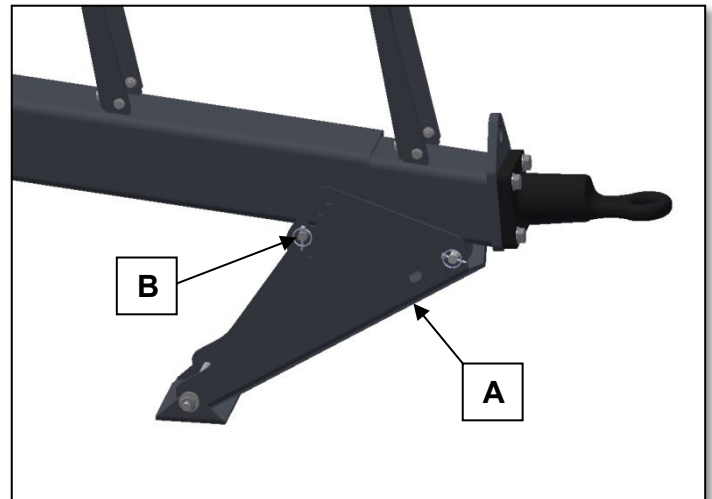


Make sure that the machine is in transport position, refer to chapter “4.7. Transport position” on page 28. Make sure that the transport hooks are locked! Lower the machine to the ground. Otherwise the machine can move by it’s own weight and cause personal injuries!

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 machines drawbar eye.



#### NOTICE

The support leg carries only the drawbar.

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

The Scorpio 430 can be connected to a fixed height hitch using the multi positional support leg and the Scorpio hydraulics.

Hydraulic function **2+** lifts the machine while **2-** opens the check valve and the machine go down by its own weight.

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

##### Support leg positions

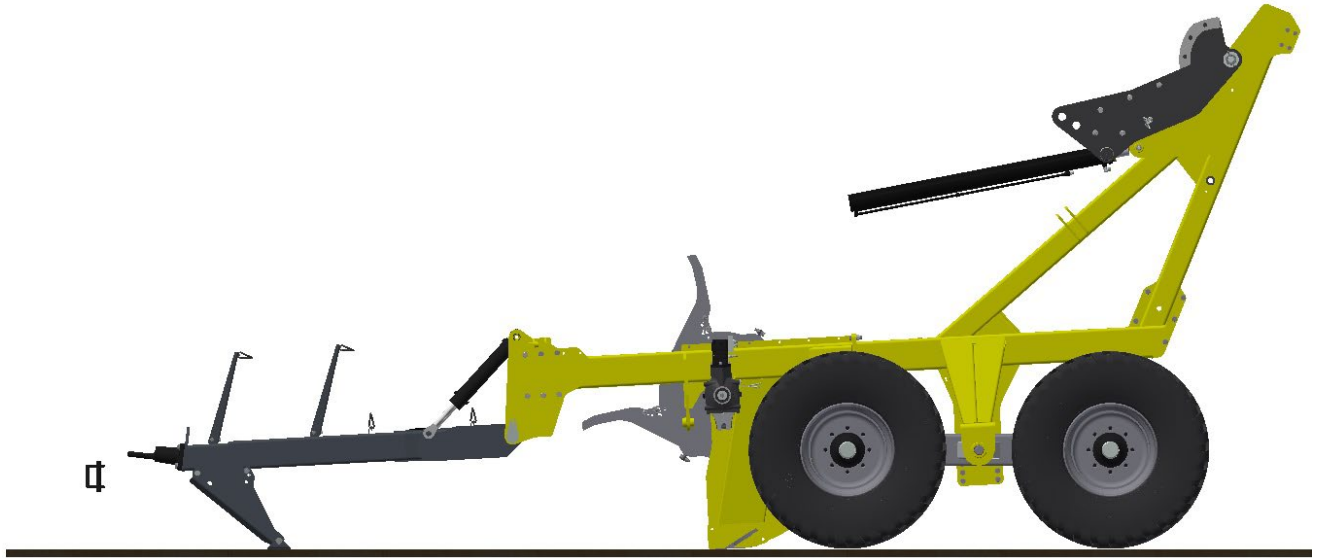


The support leg has four holes for four different hitch height ranges:

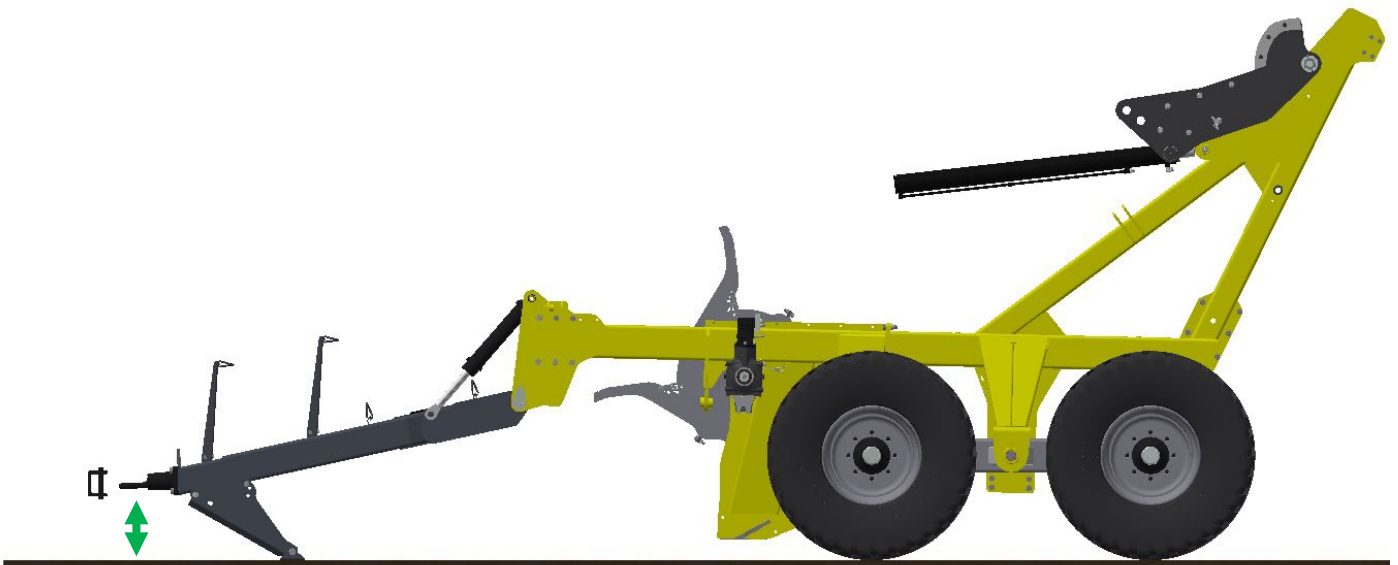
1. 720-480 mm
2. 650-420 mm
3. 590-350 mm
4. 530-270 mm

1. In the starting position the blade is resting on ground and the drawbar is resting on the support leg.

The fixed hitch in the figure below 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 hose **2+** and **2-**.



Lift the blade (**2+**) 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

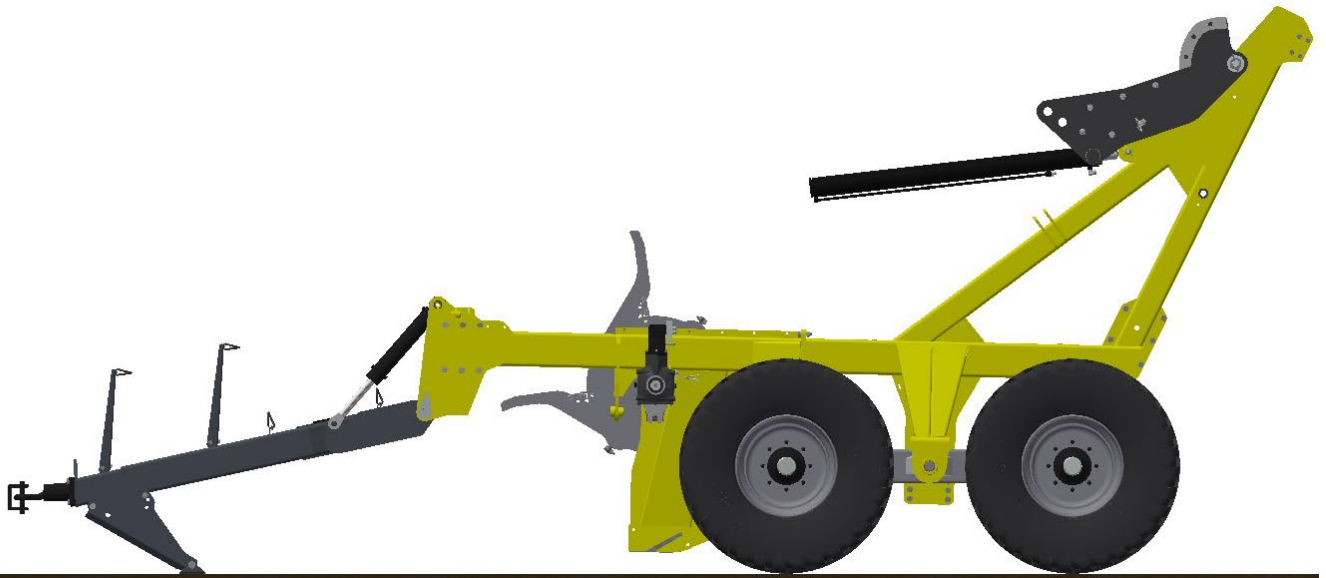
Below is the machine in the transport position with the support leg folded up and the blade lifted as high as possible from the ground.



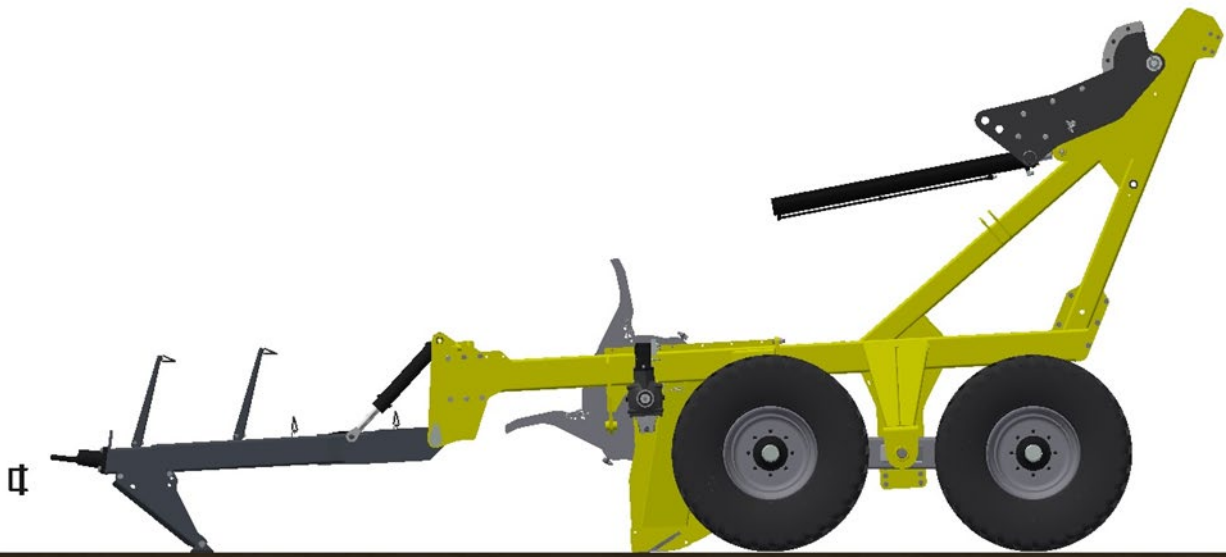
1. When in the transport position fold down the support leg and insert the pin in the correct hole for **your** tractor hitch height.



2. Lower the blade (2-) 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 hose 2+ and 2- 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 carries only 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 work.

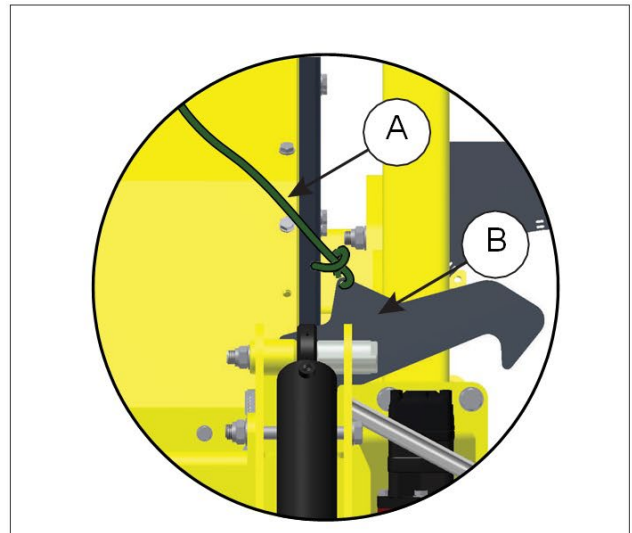
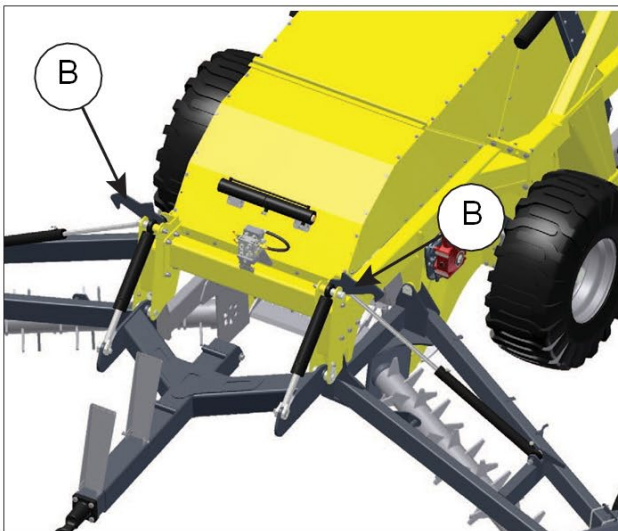
## 4.6 Work position

 <b>WARNING</b>	
	Keep all persons out of the work area! Unnecessary staying at 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.



### 4.6.1. How to lower the Stone picker into work position

1. Lower the blade by tilting the machine frame forward.
2. Lift up 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



6.

## 4.7 Transport position

 <b>WARNING</b>	
	Make sure that the mechanical safety locks are in the locked position. You can hear 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 up the windrowers to the transport position.
2. Lift up the blade.
3. Make sure that the stone tank is in the down position.



### 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 the warranty).
- Obey the local legislation for road transport. In some countries it can be necessary to install a SMV triangle when the machine is on a public road.

<b>NOTICE</b>	The maximum road speed for the ELHO machine is 30 km/h.
---------------	---

## 4.8 Storage after the season

- Open the windrowers 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 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	RISK OF DAMAGE TO EQUIPMENT
	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 layer 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 working depth of 7 cm depending on field conditions.

### Rotation rate

NOTICE	RISK OF DAMAGE TO EQUIPMENT
	Too high rotation rate can also cause damage to the rotor tines, or otherwise cause unnecessary wear. Too high rotation can also increase oil temperature.

### Driving speed

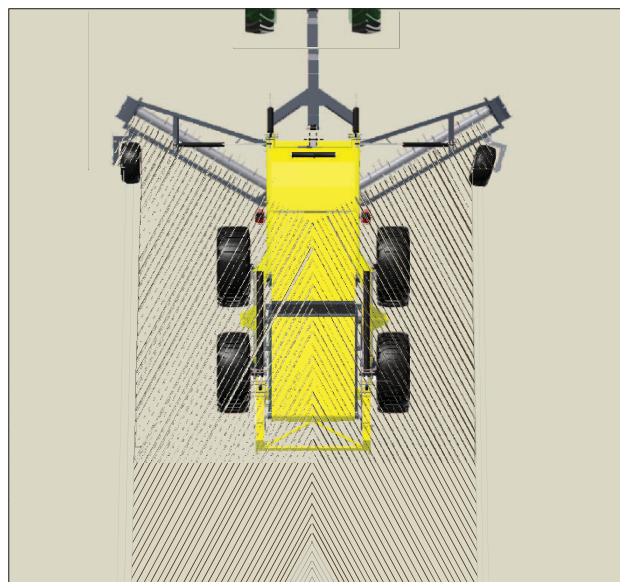
Choose correct driving speed depending on the stone content and field conditions.

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

If the field has few stones or the stones are small ( $\varnothing$  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 17.

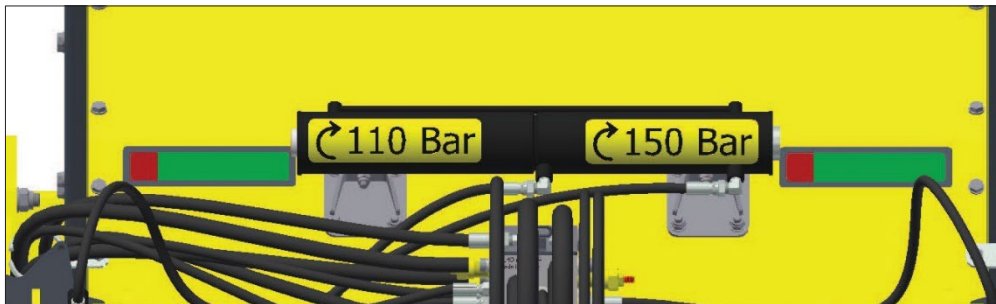


## 4.9.2 Adjustment of working depth

Adjustment of the working depth is done by **(2+)**. With automatic working depth (optional) the machine has two working depth ranges. The right and left cylinder strokes show the machine working depth range according to the rotation resistance.

### Automatic adjustment of working depth:

1. Start the rotation.
2. Lower the blade to the ground.
3. Start moving forward, lower the machine until the 110 bar cylinder is on the green area of the indicator label.



4. To use this setting, leave the height adjustment valve in neutral position (center). The machine frame will automatically adjust how deep the machine works in the soil to maintain 110 bar pressure in the circuit for rotation. The stroke of the 110 bar cylinder indicates the range of movement for this setting.
5. To set the machine to 150 bar resistance lower the machine while working, the 110 bar cylinder will go to the minimum position and the 150 bar cylinder will start moving. Stop moving the machine down when the 150 bar cylinder is on the area of the green label.
6. The operator can at any time override the automatic function by changing the machine height.

**OPTINAL EQUIPMENT** 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.



#### NOTICE

The **Automatic adjustment of working depth** does not affect the depth of the windrower outer ends.

#### NOTICE

If you force the machine too deep, the machine can be clogged.

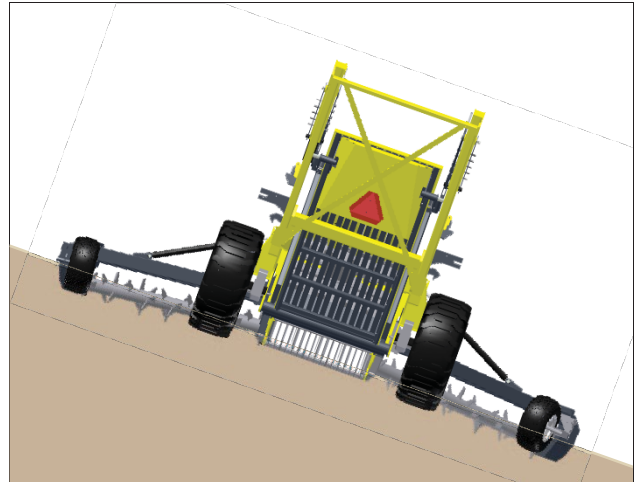
### 4.9.3 Other driving instructions

#### 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 you must operate the machine in downhill, it is recommended to start with empty stone tank.

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



### 4.9.4 How to empty the stone tank

 <b>WARNING</b>	
	Keep all persons out of the work area! Unnecessary staying at the work area (field) is not permitted. It is not permitted to stay under the hanging load!

 <b>WARNING</b>	
	Keep the machine and tractor aligned. Empty the stone tank in safe, flat and hard ground. Otherwise the machine can tip over and cause personal injuries!

- The stone tank is full when the rotor throws the stones in front of the inlet.
- Before you empty the stone tank, keep the machine frame in the high position.
- Do not empty the stone tank if the machine is angled sideways.
- Avoid emptying the stone tank in uphill.
- When you lower the stone tank make sure that there is no stones stuck between the screen and the stone tank.
- It is forbidden to drive with stone tank up.

<b>NOTICE</b>	<b>RISK OF DAMAGE TO EQUIPMENT</b>
	If the tank gets overfilled and does not rise more than halfway, rise the tank by tipping in steep downhill. Make sure that the tipping mechanism is well lubricated.

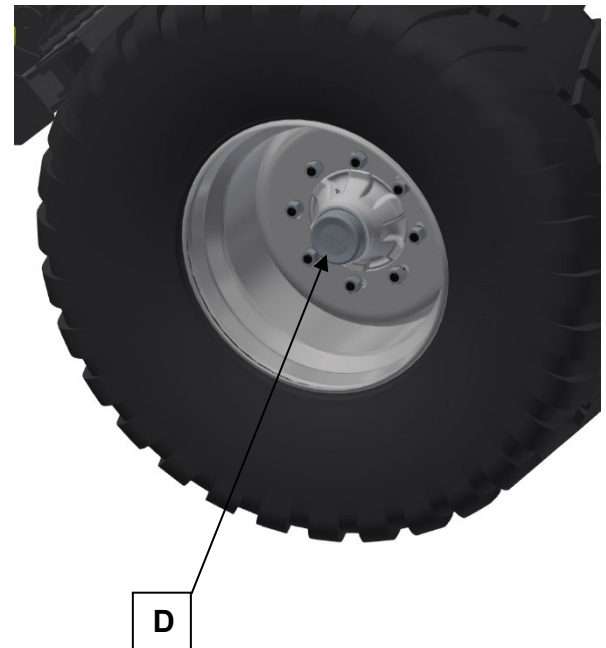
## 4.10 Brakes

The Scorpio can be equipped with brakes according to local requirements and conditions. There are three types of brakes available for the Scorpio 430.

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

### 4.10.1 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 5 mm
- When the 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.

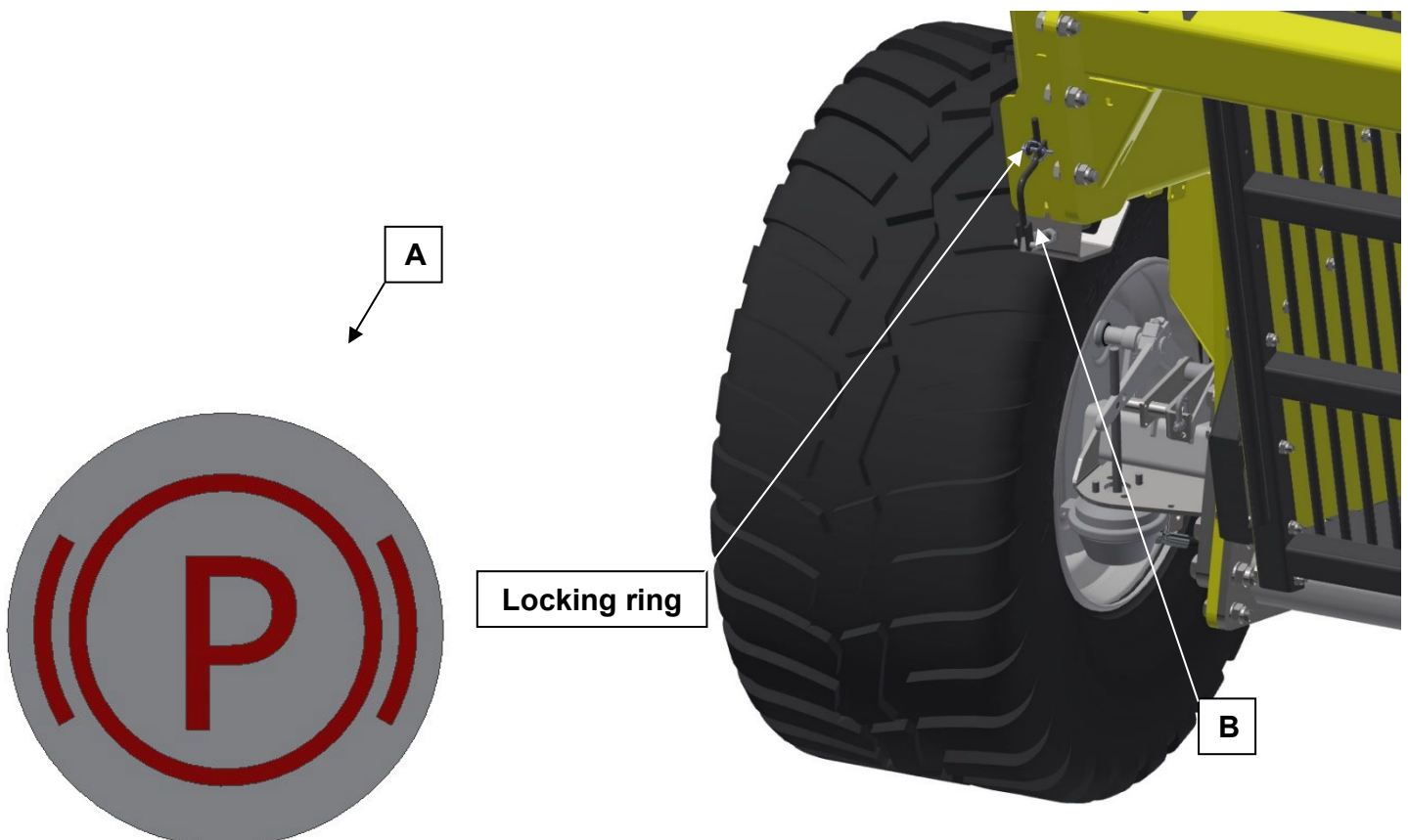
The brake lining need be checked every two years or after 1000 working hours. The minimum liner thickness is 2mm. To check the liner thickness you need to disassemble the brake drum:

- Remove the wheel.
- Remove the hub cover (**D**) and unscrew the crown nut.
- Pull out the outer drum.
- Check 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**)



#### 4.11 Prevent unauthorized use

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



## 5. MAINTENANCE

 <b>WARNING</b>	
	<p>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!</p>

 <b>WARNING</b>	
	<p>Before you perform any maintenance under the machine, make sure that the machine is supported!</p>

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.

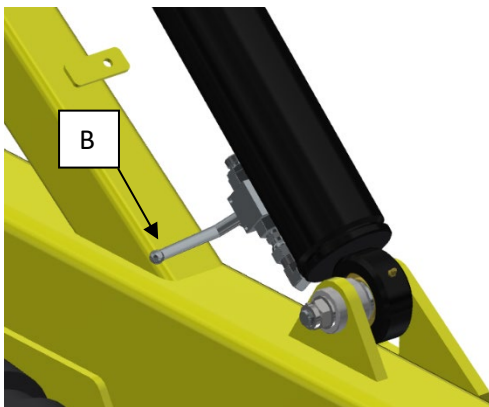
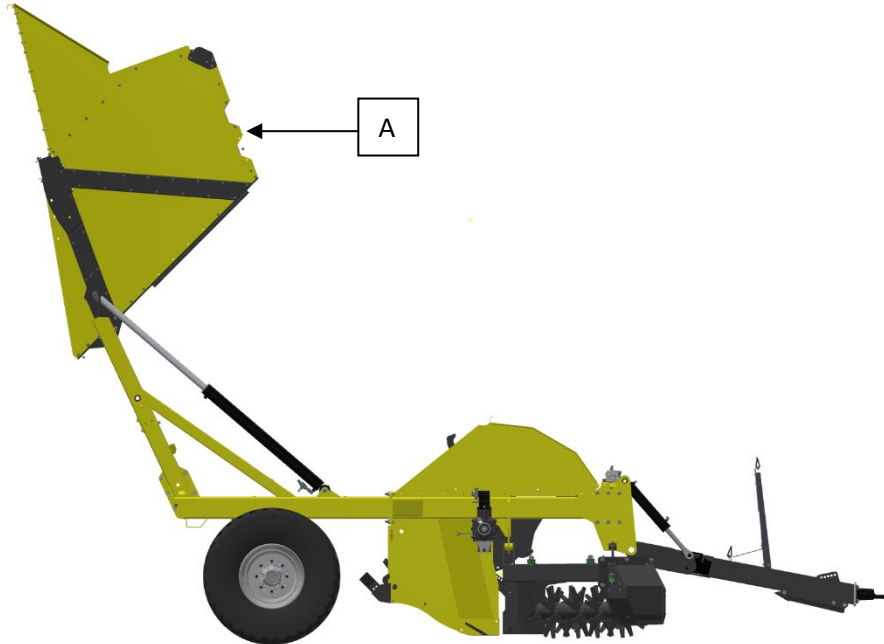
### Tightening torques

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 8.8 (Nm)	Bolt class 10.9 (Nm)	Bolt class 12.9 (Nm)
6	4,2	11	17	
8	10	28	40	
10	20	55	80	89
12	34	95	140	154
16	83	235	350	375
20	163	475	675	732
24	281	825	1170	1270
30	555	1630	2320	2500

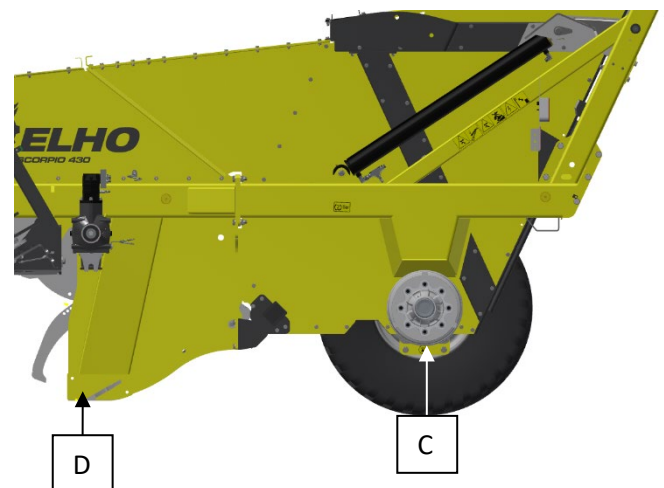
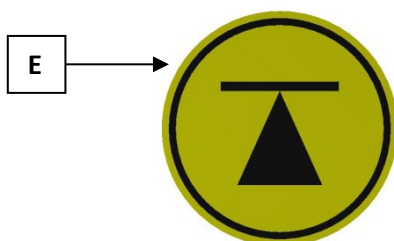
## 5.1. Maintenance position

1. Lift up the stone tank fully (**A**).
2. Shut the valves on the lift cylinders by turning the lever (**B**) that is located on both lift cylinders.







### 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**).



## 52. Hydraulic hoses

 <b>WARNING</b>	
	<p><b>HYDRAULIC OIL INJECTION HAZARD!</b> Connecting or disconnecting hydraulic components that are under pressure causes an injection hazard. Always make sure that the pressure is released before any maintenance work.</p>

 <b>WARNING</b>	
	<p>Note that the oil can reach temperatures of 80°C. Do not touch any hydraulic equipment (hoses, valves, gearbox etc.) immediately after use.</p>

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.

## 53. Gearboxes oil

Before you start up a new machine, check of the oil levels in all gearboxes.

 <b>WARNING</b>	
	<p>Note that the oil can reach temperatures of 80°C. Do not touch any hydraulic equipment (hoses, valves, gearbox etc.) immediately after use.</p>

### Gearboxes

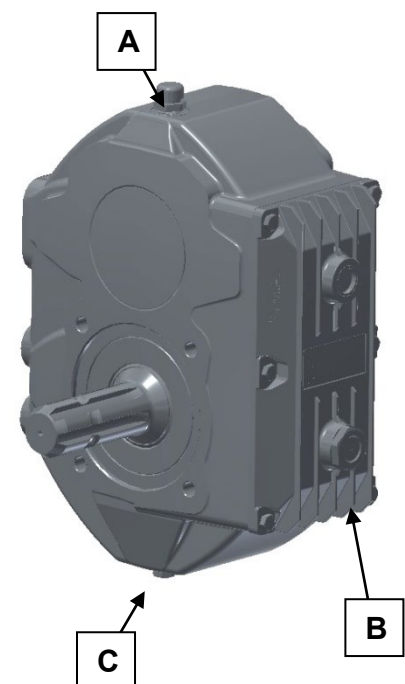
- Fill the oil through the plug (1).
- Do a check of the oil level through the oil plug (2).
- Remove the oil through the bottom plug (3) under the gearbox.



TYPE OF OIL	QUANTITY OF OIL	CHANGING INTERVAL
SAE 80W90 EP	up to check plug (1,3 l)	After the first 50 hours of use, then after 600 h 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.

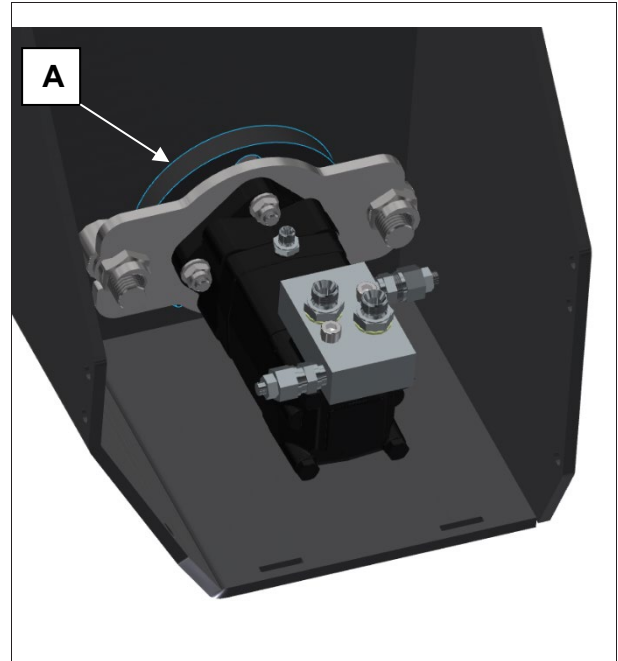
- **A** Filler plug/ breather
- **B** Oil level eye
- **C** Bottom plug



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 h or one time/season.

#### 54. How to clean the windrower driveline casing

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



<b>NOTICE</b>	<b>RISK OF DAMAGE TO EQUIPMENT</b>
	Soil, sand and moisture damage the shaft seals. Replace damaged foam discs.

## 5.5 Inlet rotor

### WARNING



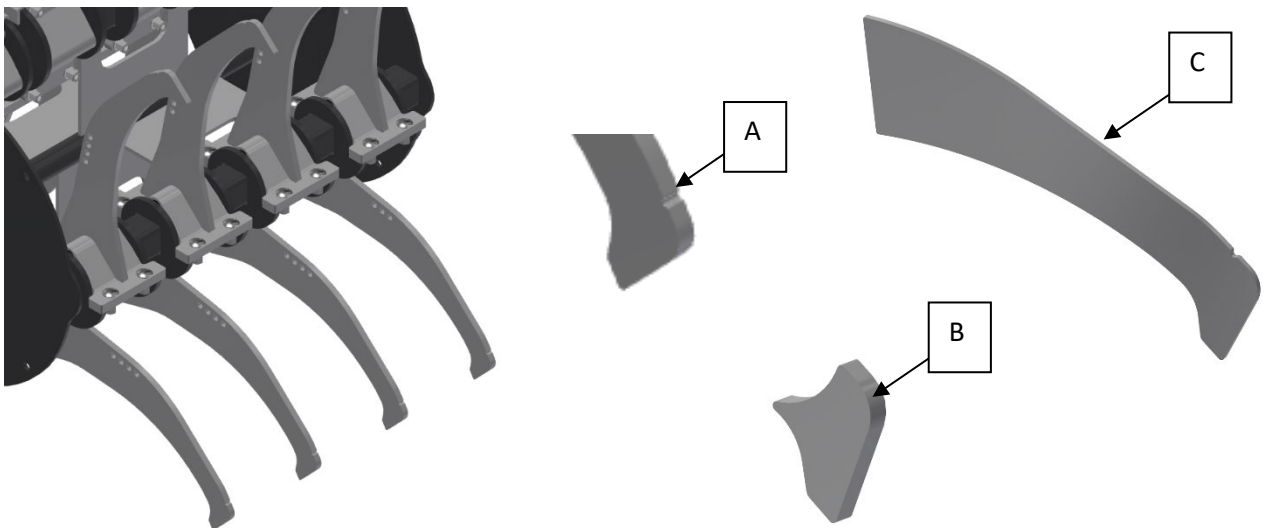
Before you perform maintenance, stop the tractor engine, engage the parking brake and remove the start key from the tractor. Any hydraulic movements from the tractor are not permitted. Use safety glasses and protective gloves!

### 5.5.1. Rotor tines repair welding

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

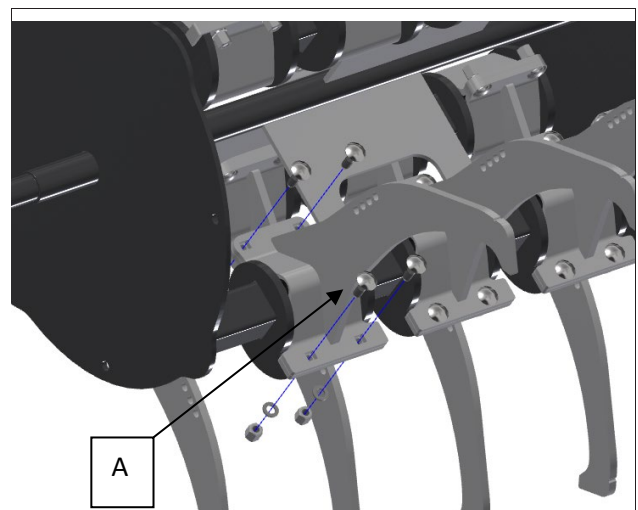
Spare part code for rotor tine repair kit: 472797.

1. Remove the rotor tine. Refer to chapter “5.5.2. How to replace the rotor tines”.
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.

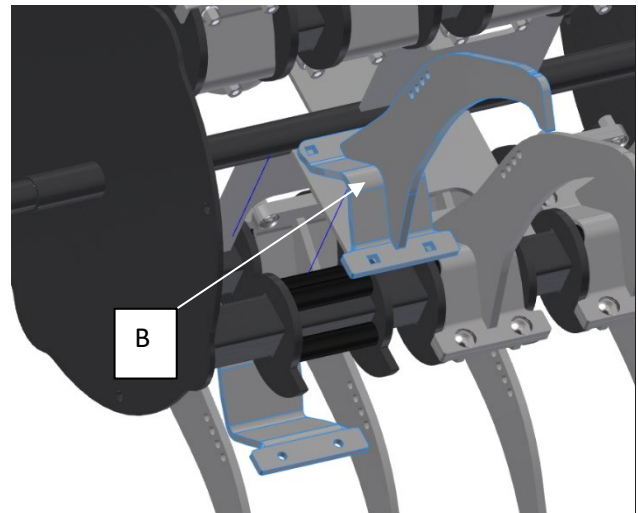


### 5.5.2. How to replace the rotor tines

1. Remove the bolts (A), 4 pcs.



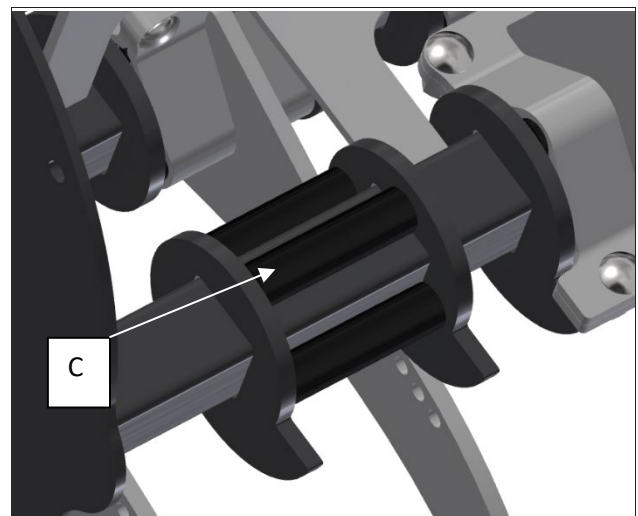
2. Remove the surface plates (**B**).



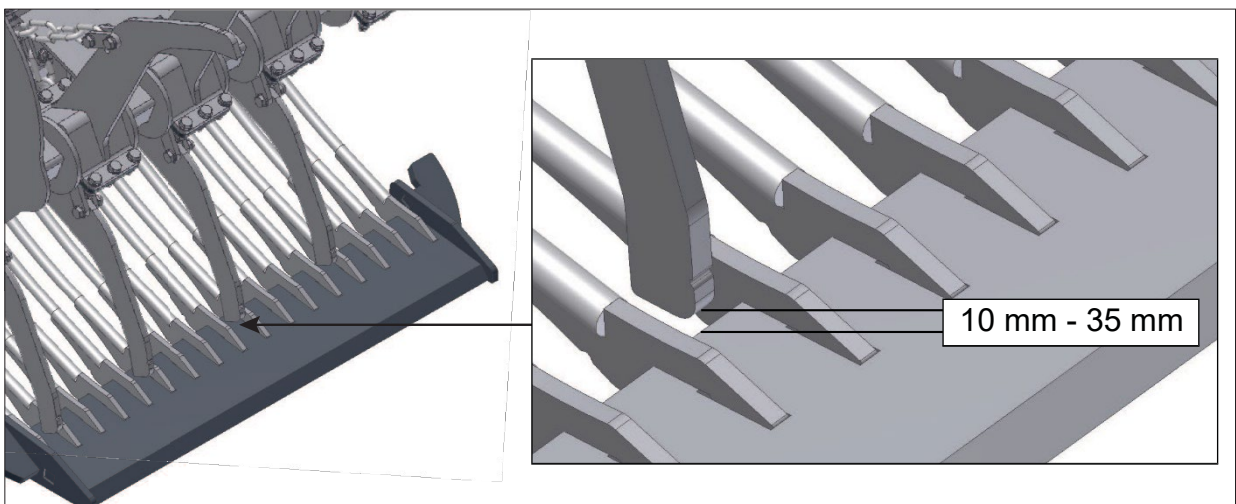
3. Tape the rubber sticks (**C**) in place to facilitate installation.

4. Attach the surface plates (**B**) with the bolts (**A**).

5. Tighten all bolts.



7. Make sure that the tines go close enough to the blade. 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.





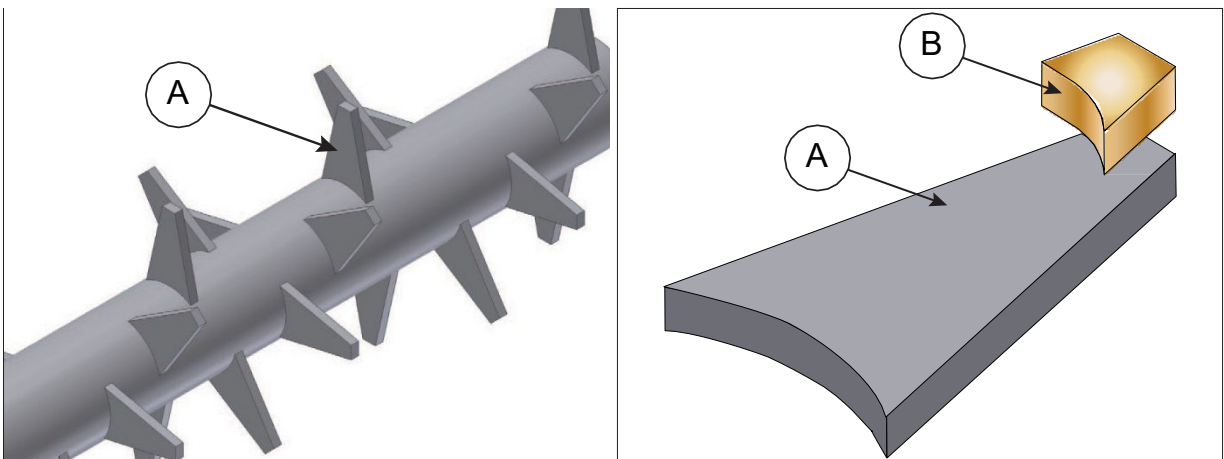
## 5.6. Windrower

### 5.6.1. Tines repair welding



The windrower tines (**A**) cannot be replaced individually without welding. The original length of the windrower tine (**A**) is 15.5 cm. If the windrower tine (**A**) is worn to 11.5 cm.

Repair the tine in order to the machine work correctly.

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

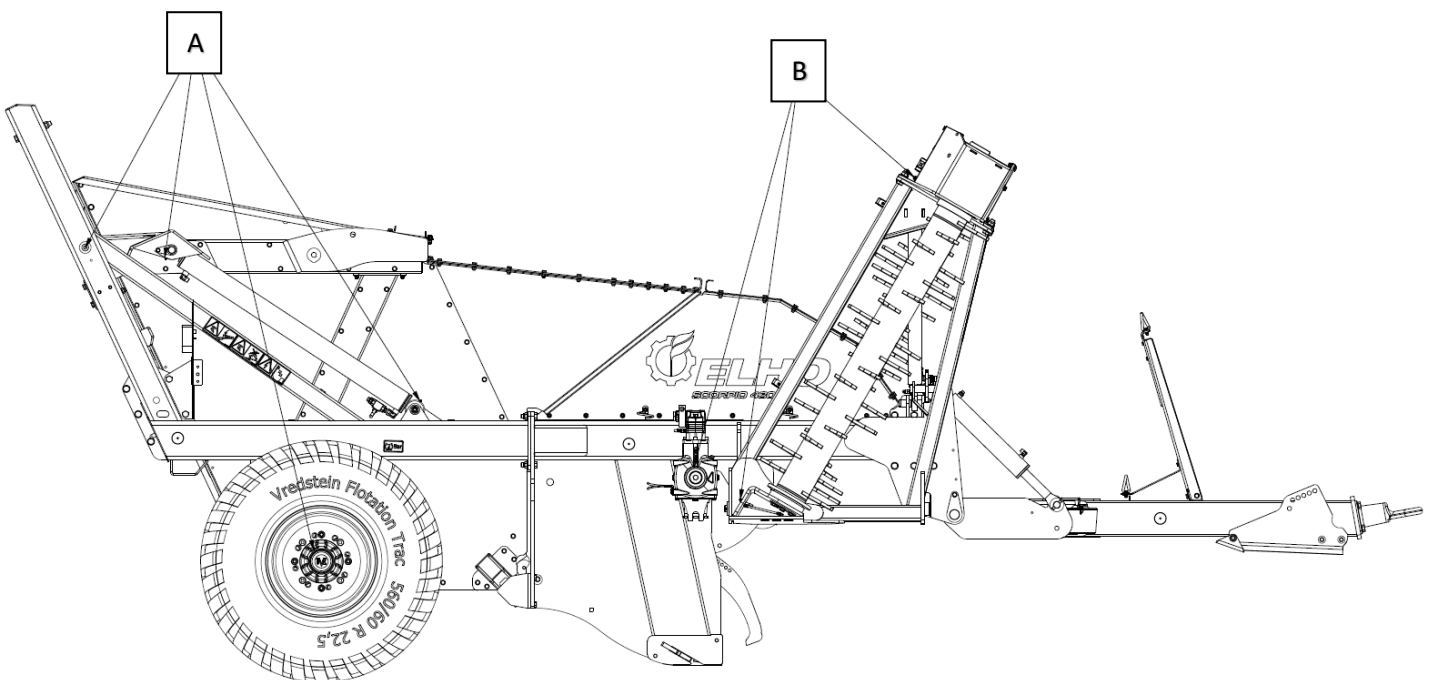
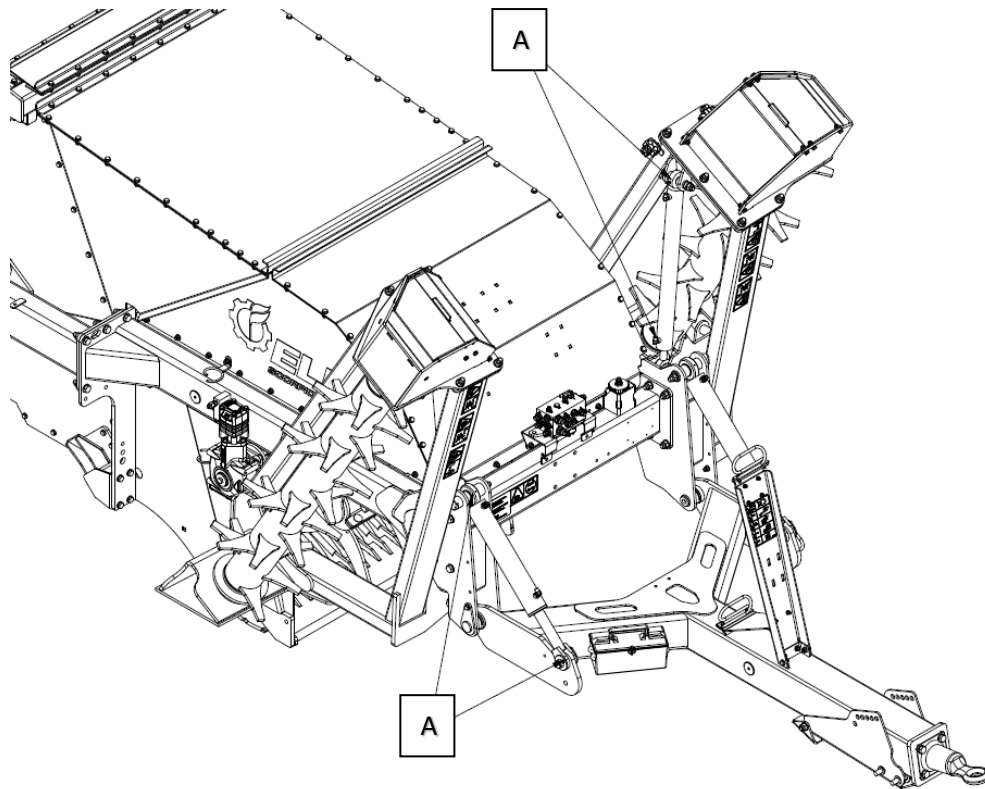


### 5.6.2. Tyre air pressure

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

## 5.7 Lubrication

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





Lubrication point		Maintenance interval
A	Joints	Lubricate every 20 hours
B	Rotor bearings	Lubricate every 8 hours

## 6. TROUBLESHOOTING

Problem	Possible cause	Solution
<b>Stones stay on the field.</b>	Too low working depth.	Make sure that the working depth is correct. Increase the working depth.
	Uneven field.	Harrow the field.
<b>Stones are not entering machine.</b>	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 is too low.	Check the tractor.
<b>Stone tank lowers slowly or is stuck when being lowered.</b>	Quick-couplers are blocked.	Check condition of the quick-couplers and tractor.
	Machine is angled downhill.	Lower the blade against the ground.
<b>Screen is clogged.</b>	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 40.

## 7. FINAL DISASSEMBLY OF THE STONE PICKER

 <b>WARNING</b>	
	Keep all persons out of the work 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.

### **Tyres**

Supply the tyres to the landfill.

### **Disassemble**

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





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