



Elho stone picker

Scorpio 550 Stone picker, Series 10.0-10.4

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 550

Additional equipment: External
hydraulic unit for Scorpio 500

is in conformity with the

Machine Directive 2006/42/EC

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

EN ISO 4254-5

Bennäs 29.11.2019



Michael Johansson, CEO

This is the original instruction manual for the Scorpio 550 serie 10.0-10.4. Translated versions of this manual exists.

LIMITED WARRANTY

This Limited Warranty is a product warranty given by Oy EI-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. It's not allowed to use the machine to transport stones or anything else on the road.

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.

 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.
---------------	---

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.

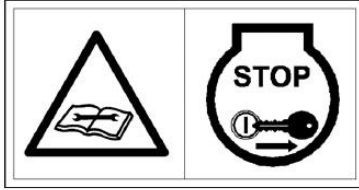
1.5.1 Education and skills

No special education or skills are needed to do maintenance and repairs mentioned in this manual. If you want your machine serviced or repaired by a professional, contact the Elho dealer closest to you.

1.6. Safety labels on the Stone picker

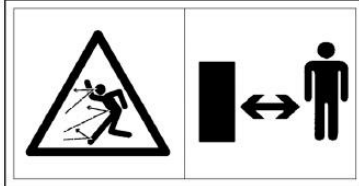
On the machine there are safety labels to make you aware of certain hazards.

1.



Stop the engine and remove the start key

2.



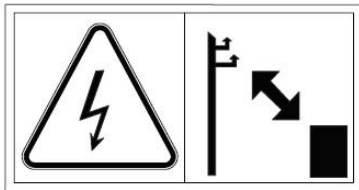
Do not go into the danger zone. There is a risk of being hit by flying objects, such as stones.

3.



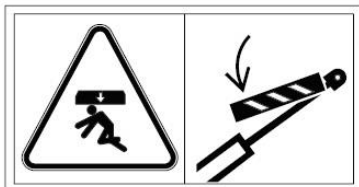
Do not empty the stone tank on soft ground or downhill.

4.



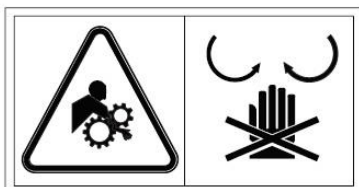
Keep distance to powerlines, especially when you empty the stone tank.

5.



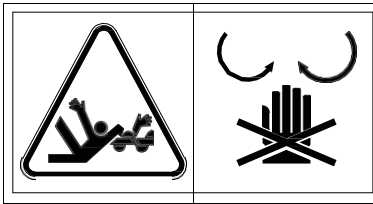
Before you go into the danger zone, make sure that the lifting cylinders are secured with safety labels.

6.



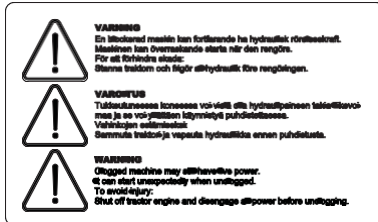
Before you touch the machine components, make sure that the tractor engine is stopped. The rotating parts of the machine continue to rotate even after the tractor engine is stopped.

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.

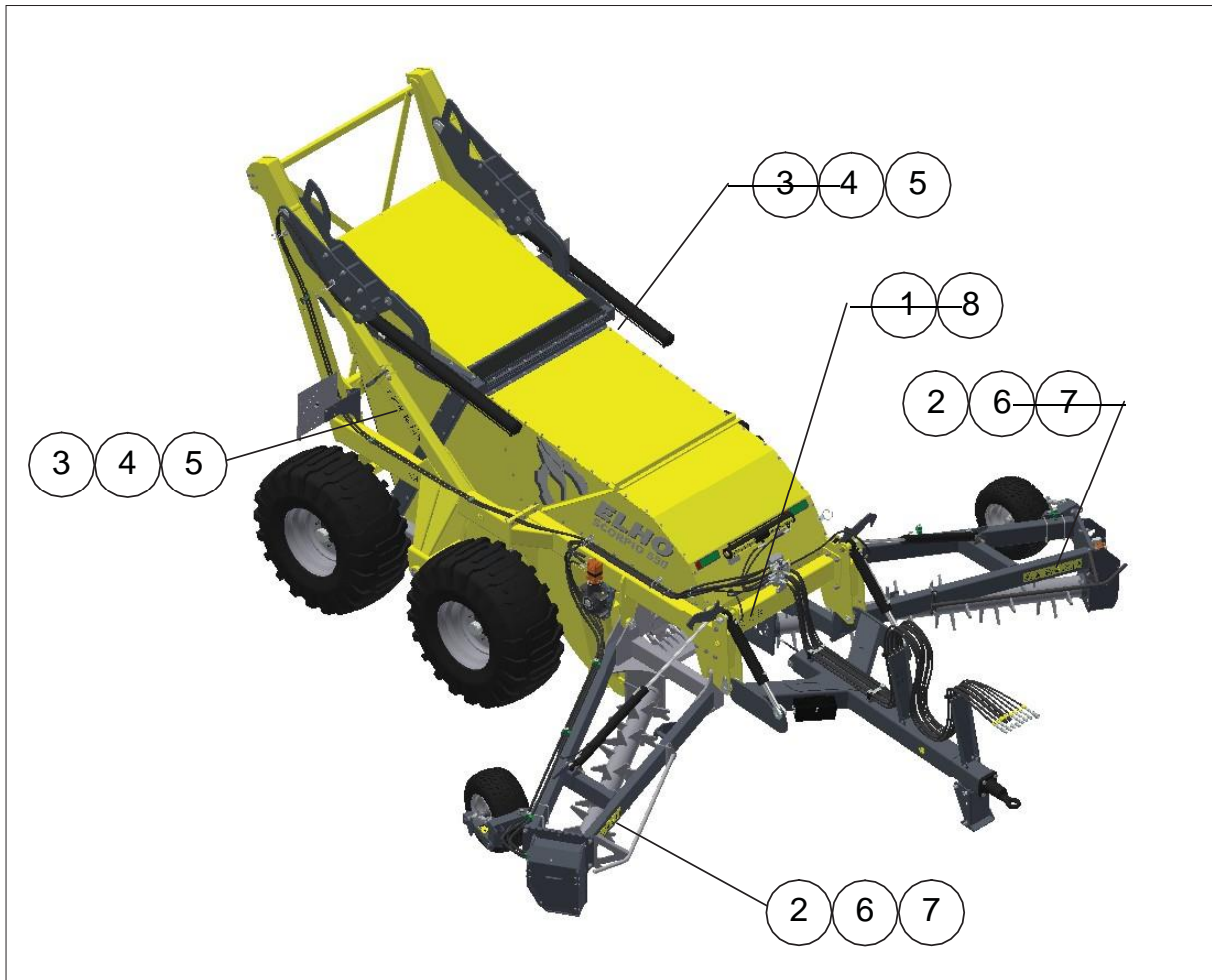
To avoid injury:

Shut off tractor engine and disengage all power before unclogging.

1.7. Replacement of safety labels

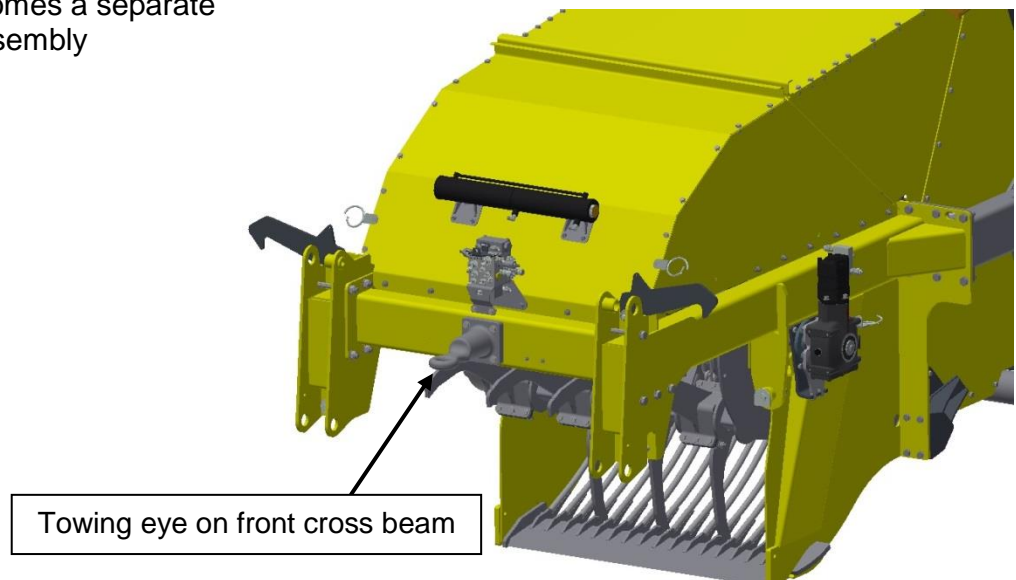
Replace missing or damaged safety labels. The replacement safety labels are available from your dealer.

18. Location of safety labels



19. Unloading and moving

The Scorpio 550 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

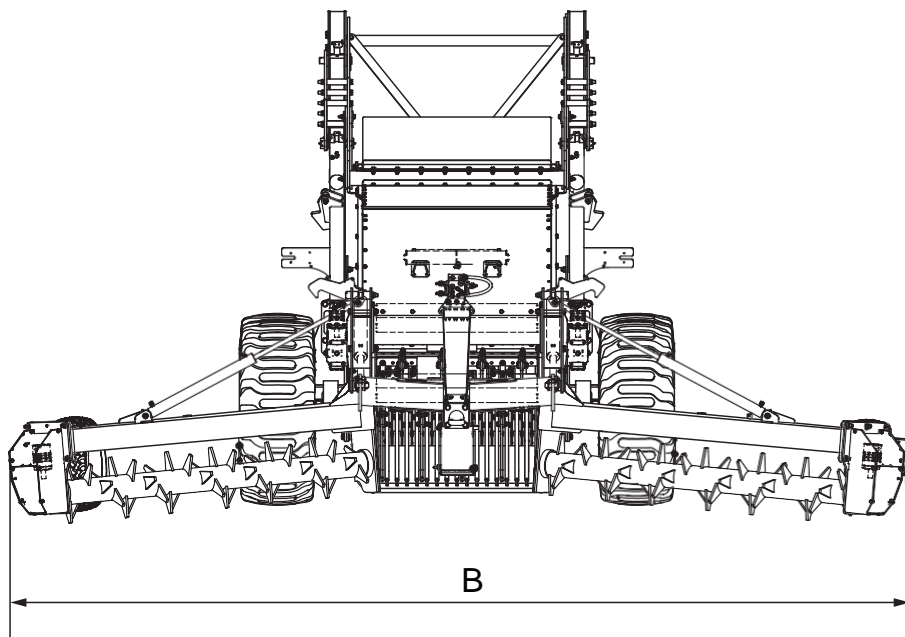
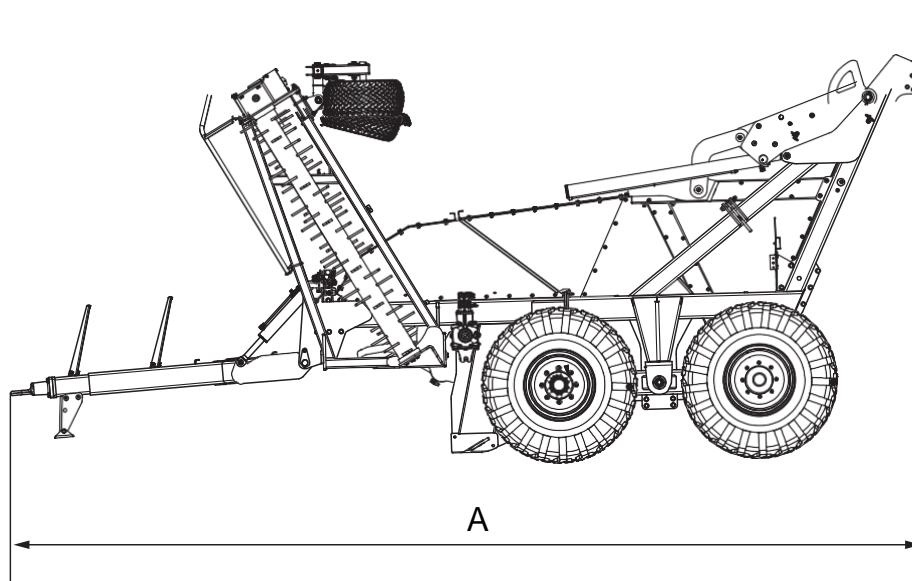
	Scorpio 550 stone picker
Dimensions	Refer to chapter 2.2 on page 14.
Working width, m	5,5
Transport width, m	3
Tipping height, m	2,7
Number of tines, pcs	16
Stone size, mm	40 – 400
Inlet rotor tine lifting force, kg	400
Inlet rotor tine deflection upwards, mm	210
Stone tank capacity, Useful, m ³	1,5 – 2,0
Oil flow, l/min	85
Power, kW	27
Working depth, cm	0-7
Working speed, km/h	1-7
Screen, mm	40/110
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	6800 (with brakes)
Towing eye load	1100 Kg
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.

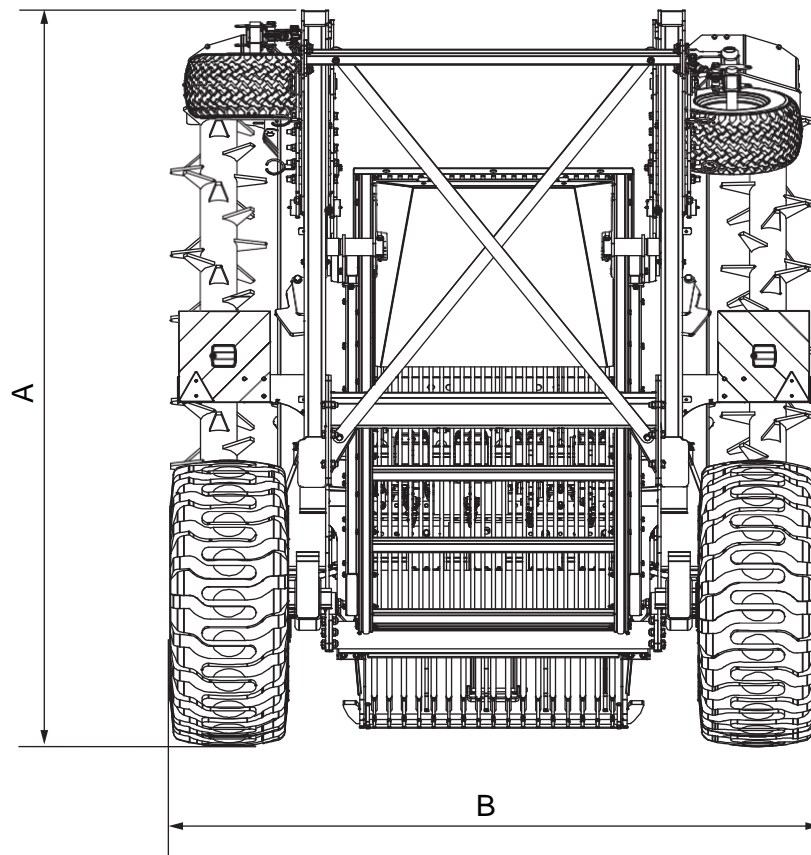
Yellow	RAL 1006
Gray	RAL 7024

Dimensions



Scorpio 550 stone picker	
A	7,2 m
B	5,5 m

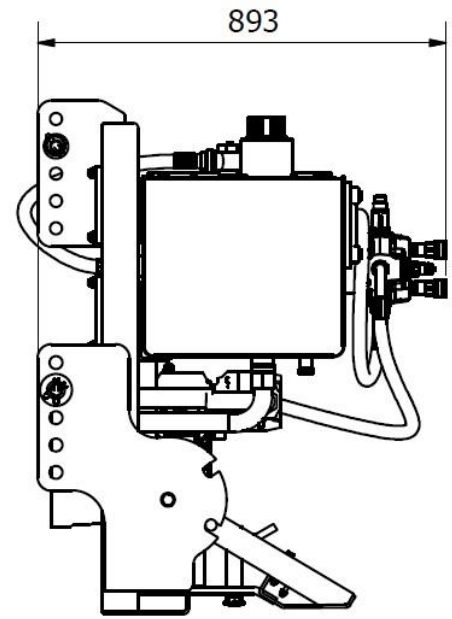
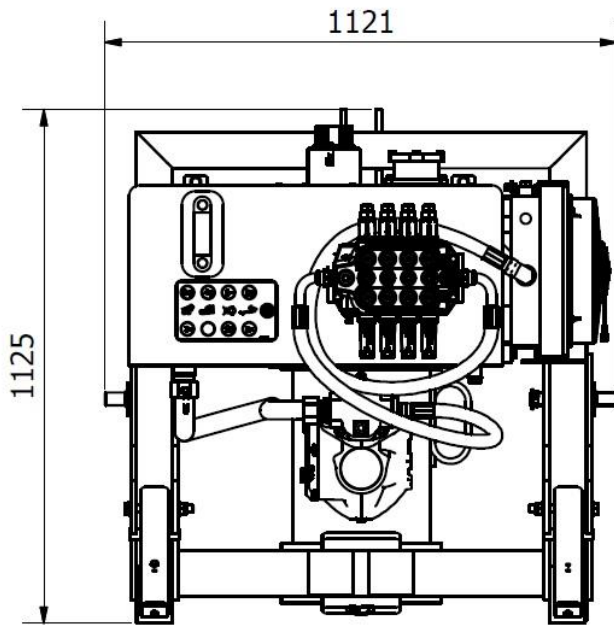
2.3. Transport dimensions



Scorpio 550 stone picker	
A	3,4 m
B	3 m

2.4 Scorpio external hydraulic unit

Dimensions	See figure on page 16
Weight	490 kg
Hydraulic max pressure	250 bar
Oil flow, PTO 450 rpm	85 l
Continuous power output	25 kW
Max power peak	40 kW
Tank size	120 l, (100 l oil)
Cooler cooling capacity	0,26 kW/ ΔC°
Cooler current consumption	17 A
Hydraulic controls	4 section tele cable operated valve block



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. All machines that are not fully assembled as delivered are delivered with necessary assembly instructions, document ID 954036.

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 39.

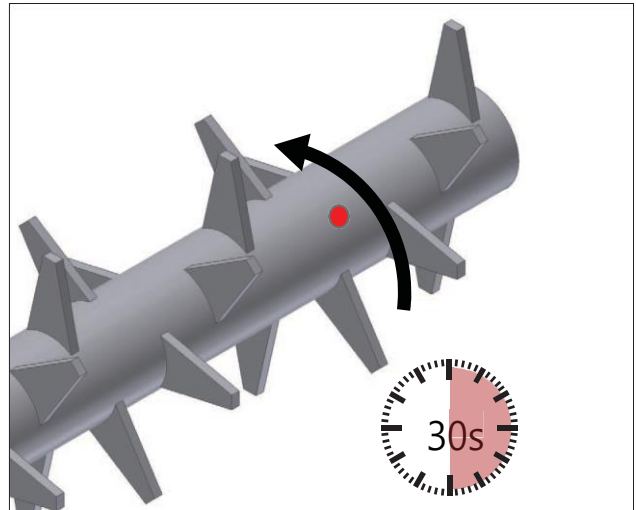
3.2.1. Adjusting the correct rotation speed for the windrower

 WARNING	
	<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 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.



3.3. How to bleed the hydraulic system

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

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

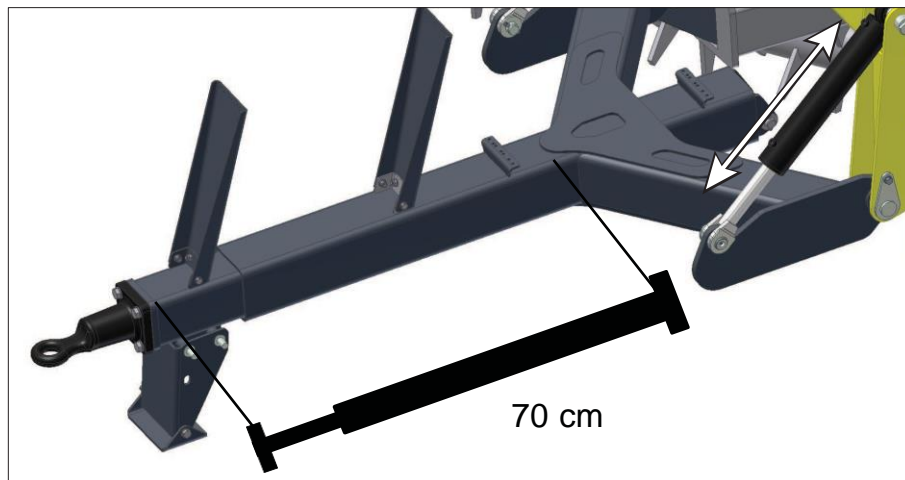
Normally there is no need to separately bleed the hydraulic system. Before you operate on the field, it is recommended to check the hydraulic functions.

4. USE OF THE STONE PICKER

4.1. Safety devices

4.1.1. Telescopic drawbar

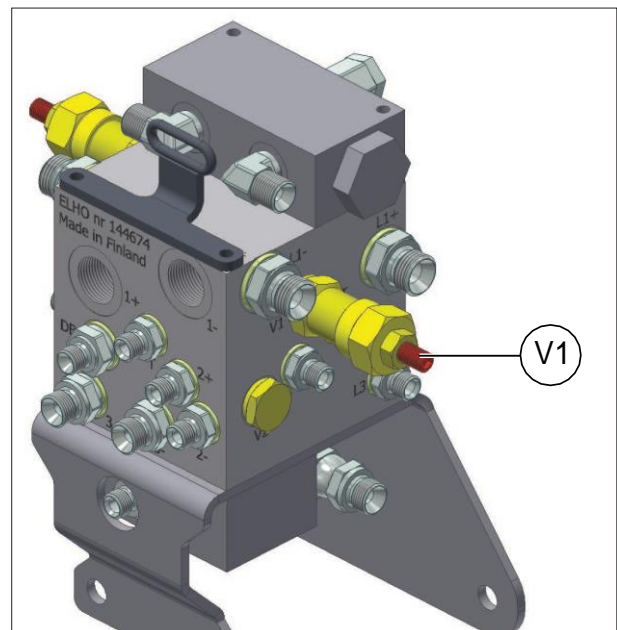
If the machine hits an obstacle, the drawbar extends. The contained oil from the cylinder inside the telescope lifts the blade to bypass the obstacle. The drawbar returns due to the machine's own weight. The force to pull out the drawbar is depending on the weight of the machine and cannot be adjusted. The telescopic drawbar cylinder is vented to the drain line, if the pressure to extend the drawbar suddenly seems to be too little, check the back pressure in the drain line, it should be less than 15 bars.



4.1.2. Hydraulic transmission

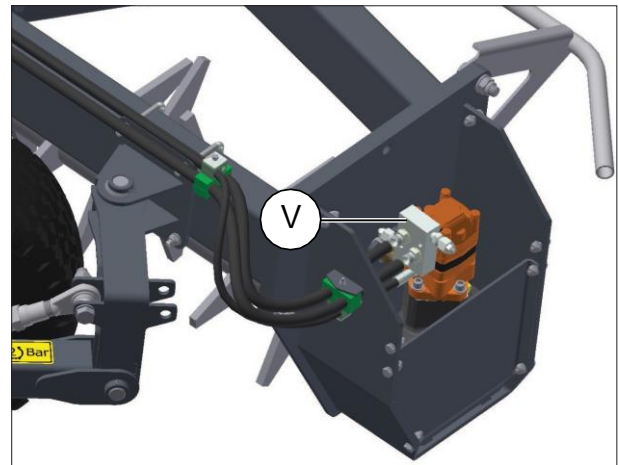
If stones get stuck between the screen and tines, the valve **V1** will bypass and all the rotors will stop. To correct this situation:

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

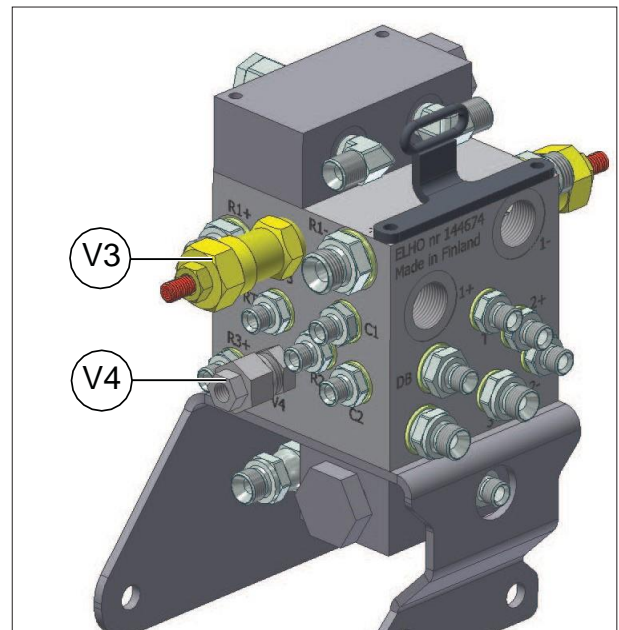


If stones get stuck in the windrowers, the valve **V** on the windrower will bypass and only the windrower with the overload will stop. To correct this situation:

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



The stone tank cylinders are double acting. For lowering the tank from the highest position the cylinders need pressure on the cylinder rod end. The valve **V4** limits the down force.





Pressure relief valves settings:



The relief valves are preset from the factory. Normally, there is no need to adjust the pressure relief valves.

The correct settings for the valves are:











Valve	Description	Setting (bar)
V1	Rotation Main	230
V3	Reverse Main	230
V4	Tank Down	50
V	Windrower motor	250

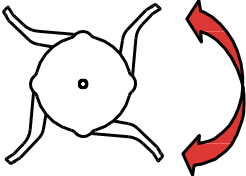
42. How to connect the Stone picker to the tractor

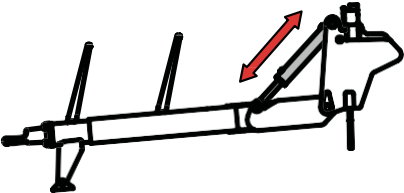
 WARNING	
	Before you leave the tractor cabin, stop the tractor engine, engage the parking brake and remove the start key from the tractor.

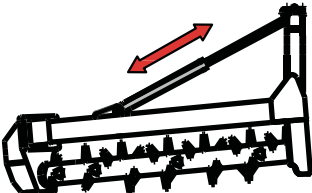
 WARNING	
	Make sure that the quick couplings are clean.



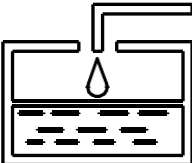
1. Connect the tractor towing hook to the machines drawbar eye.
2. Connect the hydraulic hoses. Refer to figure connection label.

	2 + Rotate 3 - Reverse Max 85 l/min	
	4 + Up 5 - Down	
	6 + Up 7 - Down	
	8 + Up	
	TANK	

NOTICE	Connect the hydraulic function for rotation in a valveblock aimed for constant circulation. Set the oil flow for rotation to 85 l/min and the oil flow for reversing to 30 l/min.	
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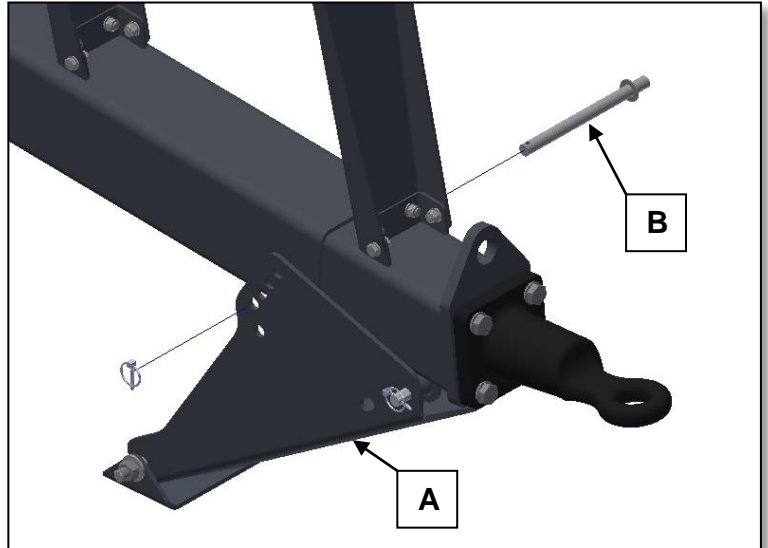
NOTICE	This function is frequently used and should be connected to a valve with an easy to access joystick.	
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NOTICE	This function needs floating position when you operate.	
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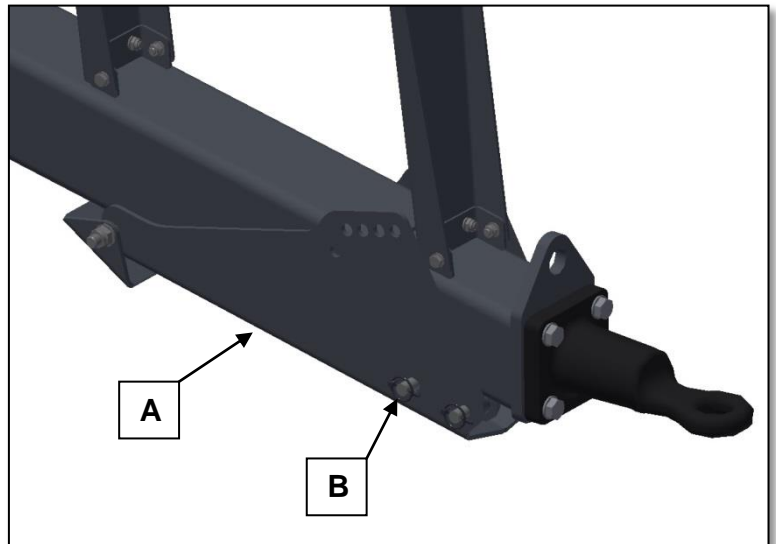
 WARNING		
	The tank line drains the motors. The maximum back pressure for the tank line is 15 bar.	

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)



NOTICE

The support leg on machines from series 10.0-10.2 is shorter but the function is the same.

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.

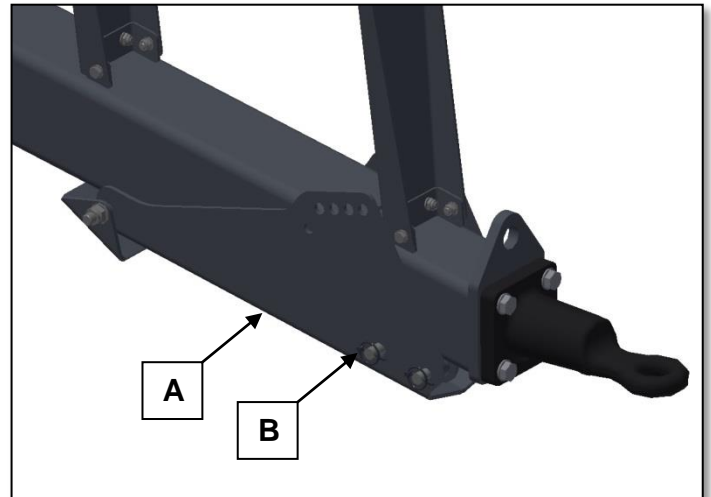
How to disconnect the Stone picker from the tractor

⚠ WARNING

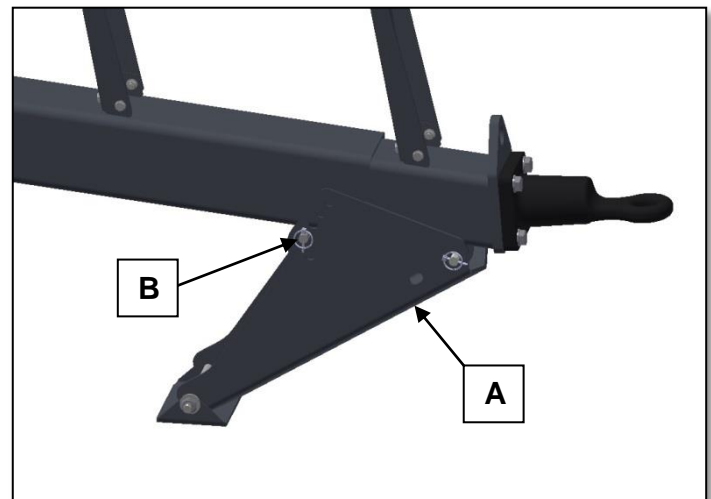


Make sure that the machine is in transport position, refer to chapter “4.7. Transport position” on page 29. Make sure that the transport hooks are locked! Lower the machine to the ground. Otherwise the machine can move by it’s own weight and cause personal injuries!

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.

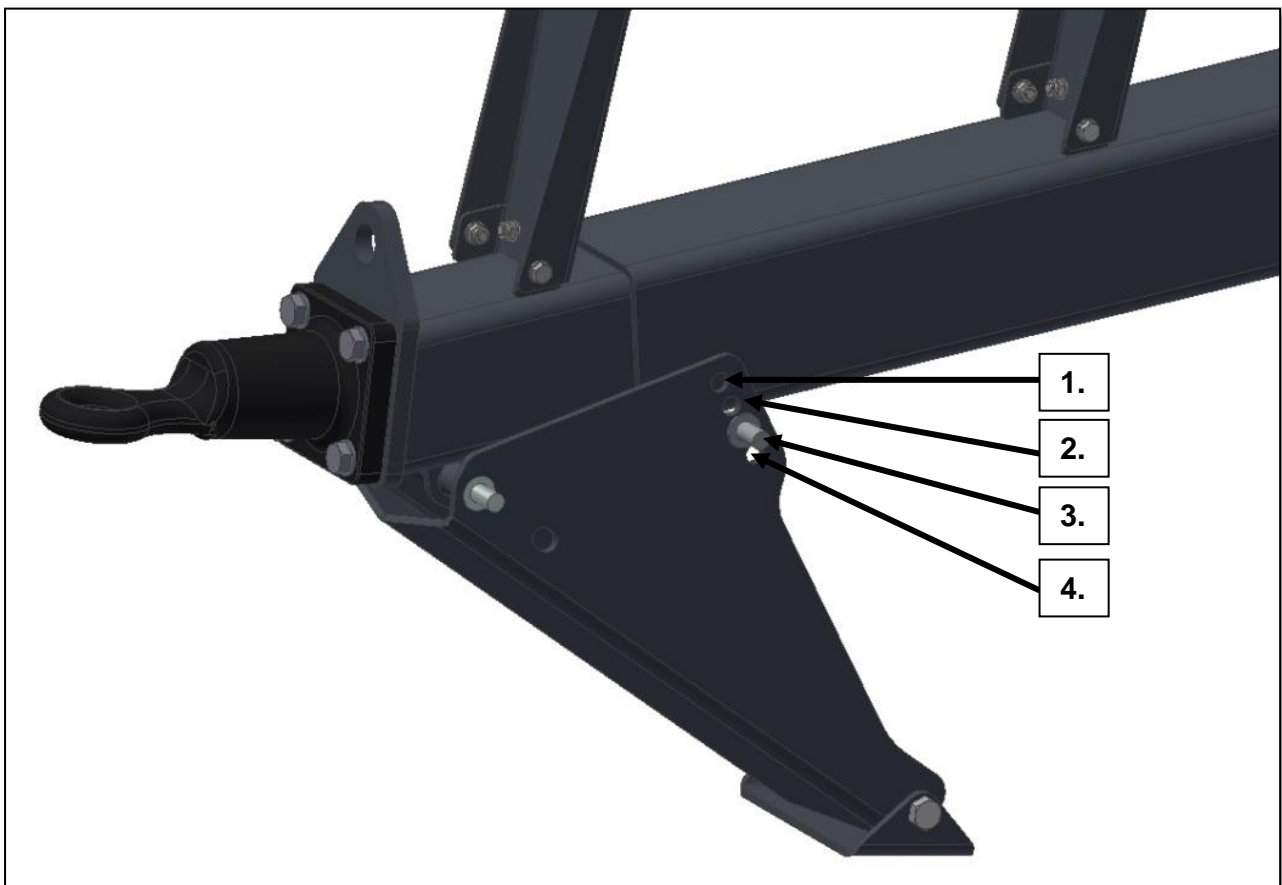
4.4 How to connect the Stone picker to a fixed height hitch

The Scorpio 550 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

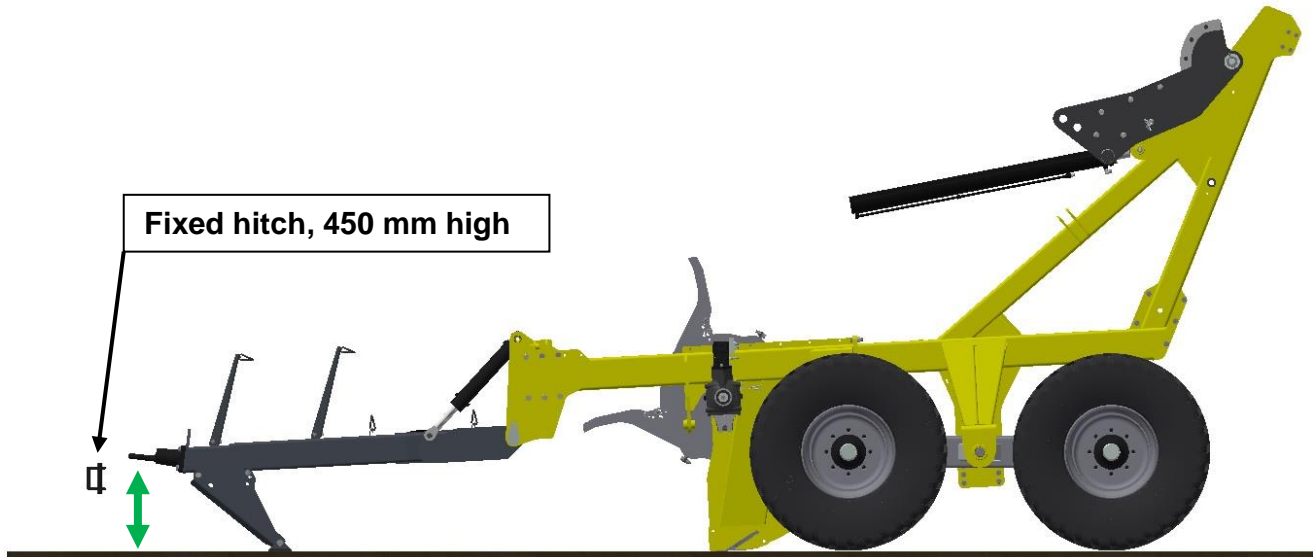


The support leg has four holes for four different hitch height ranges:

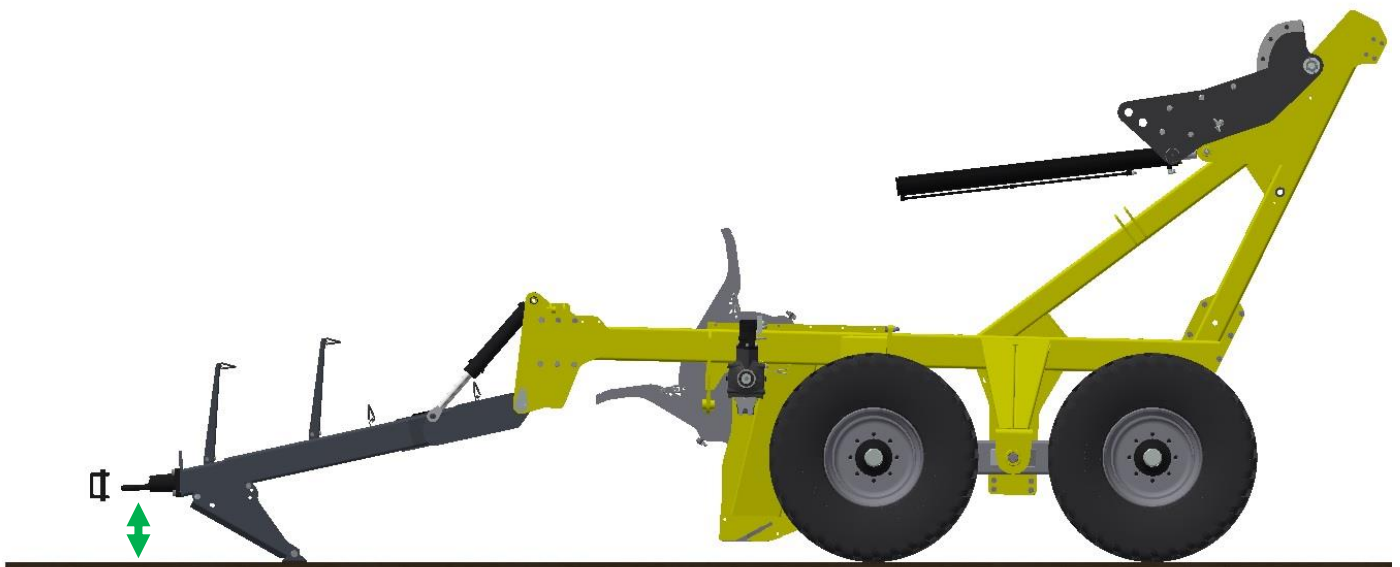
1. 720-480 mm
2. 650-420 mm
3. 590-350 mm
4. 530-270 mm

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

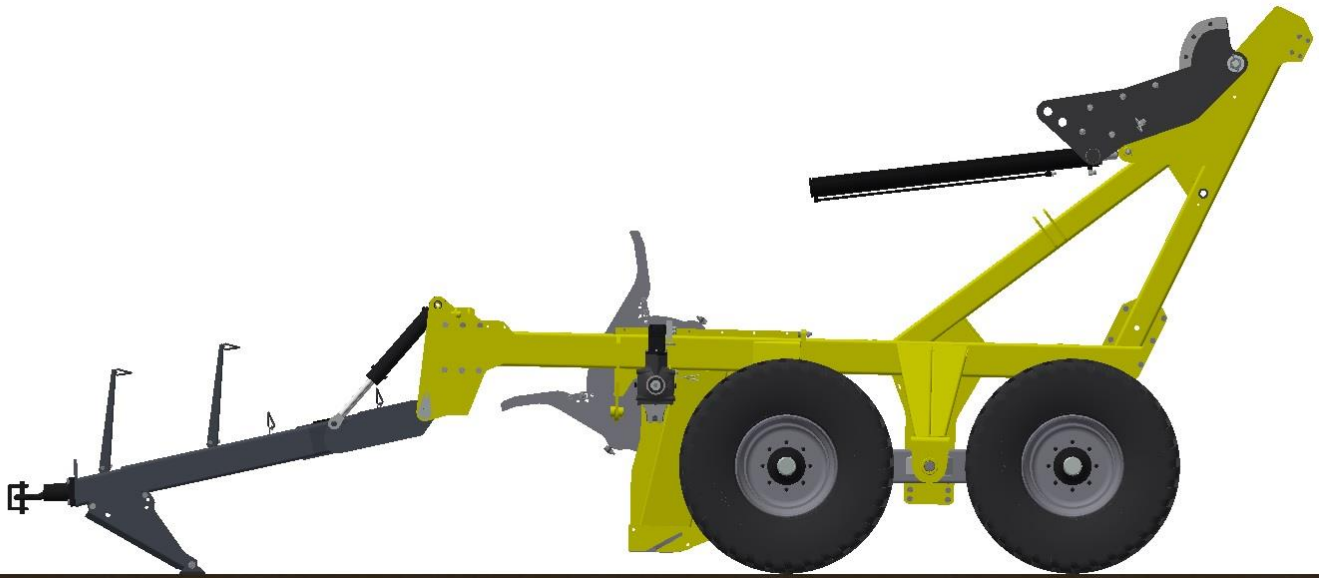
Below is the machine in the transport position with the support leg folded up and the blade lifted as high as possible from the ground.



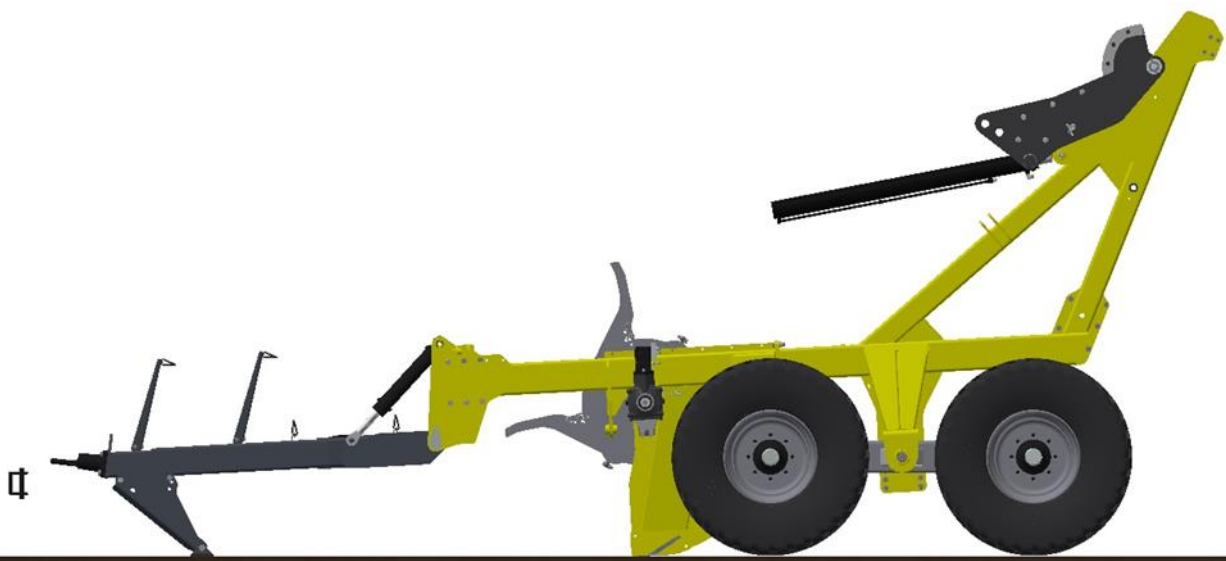
1. When in the transport position fold down the support leg and insert the pin in the correct hole for **your** tractor hitch height.



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.

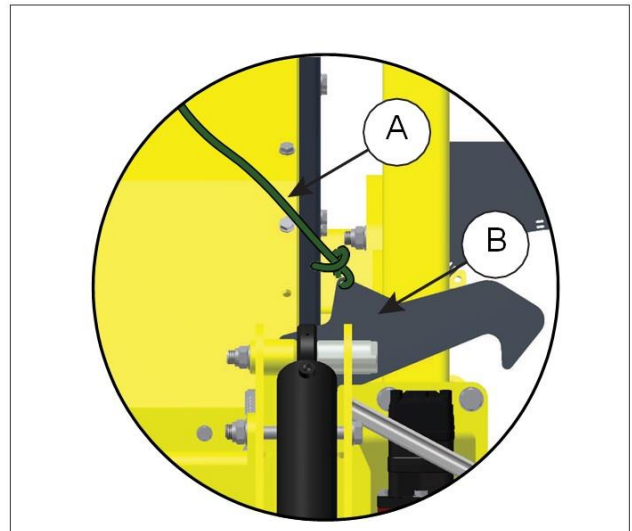
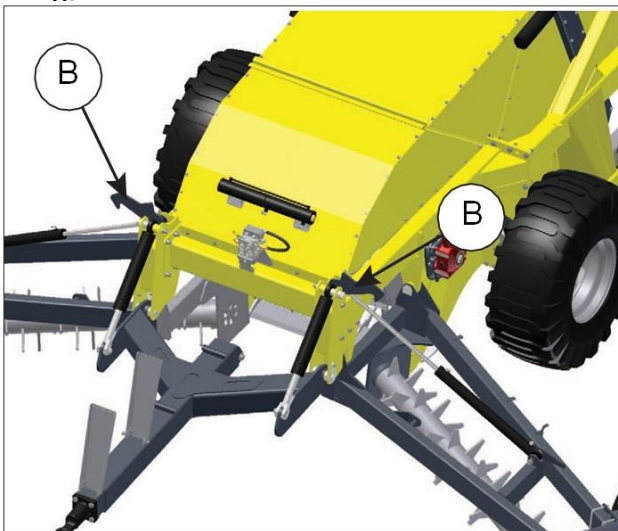
4.6 Work position

 WARNING	
	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.

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.



Transport position

 WARNING	
	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.

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.
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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

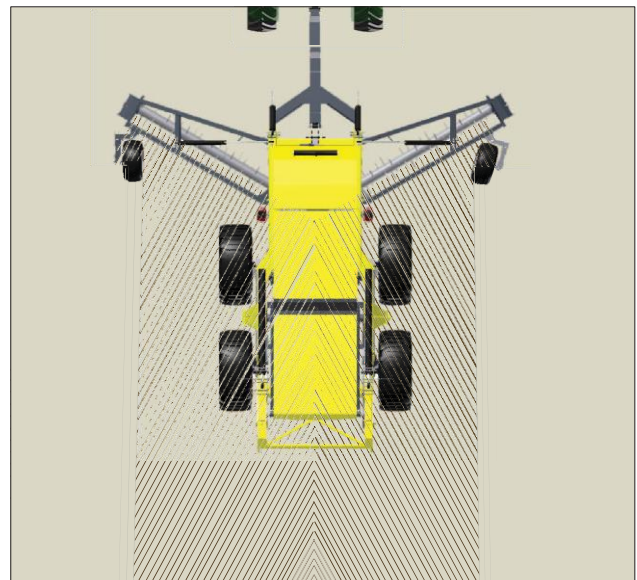
Choose correct driving speed depending on the stone content and field conditions.

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 18.

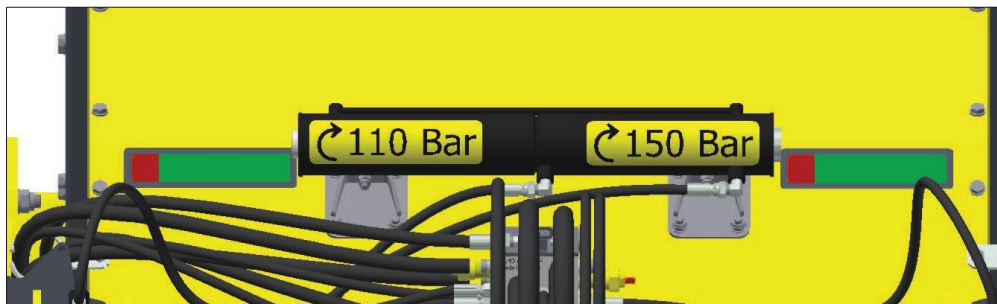


4.9.2 Adjustment of working depth

The machine has two working depth ranges. The right and left cylinder strokes show the machine working depth range according to the rotation resistance.

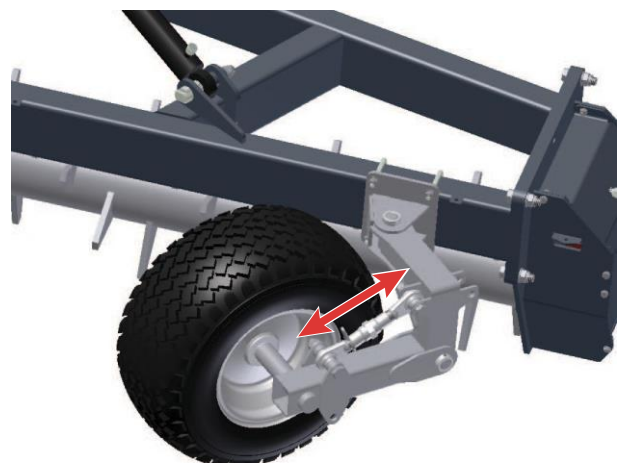
Automatic adjustment of working depth:

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.

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 mowing.



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.

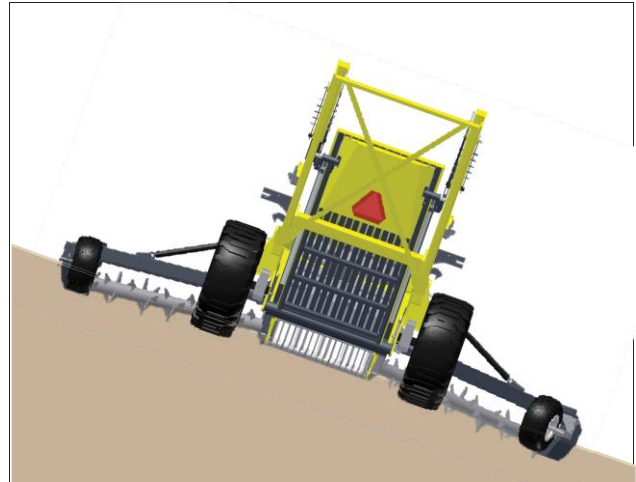
4.9.3 Other driving instructions

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

 WARNING	
	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!

 WARNING	
	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.

NOTICE	RISK OF DAMAGE TO EQUIPMENT
	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.

An external hydraulic unit is available for the Scorpio 550, part number: 115004. 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 32 super.

4.10.1 Connecting the external hydraulic unit to the tractor

The hydraulic unit is supported by two support legs during storage (A).

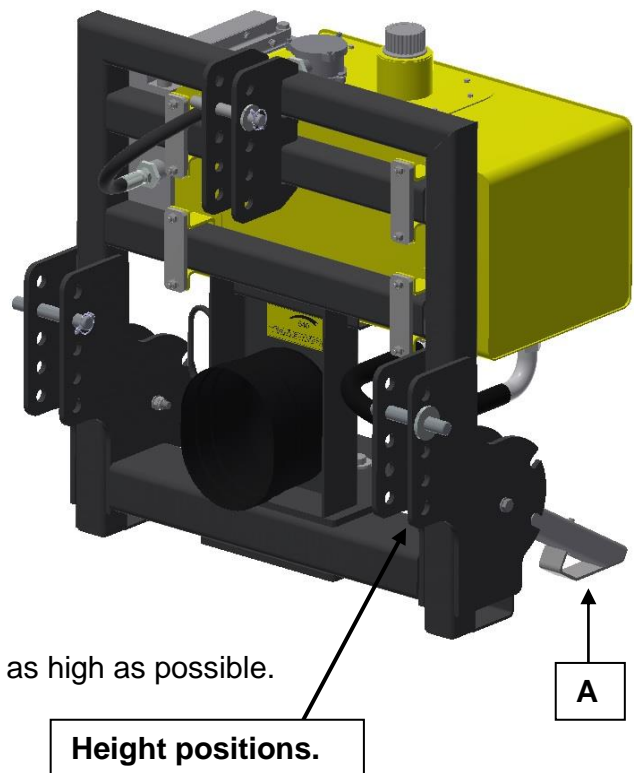
1. Connect the hydraulic unit to the tractors three point linkage.



The frame on the hydraulic unit has several positions for different heights.

When connected to the tractor the PTO shaft on the gearbox should be at the same height as the tractor PTO **when** the lifting arms are lifted

Fold up the support legs (A)

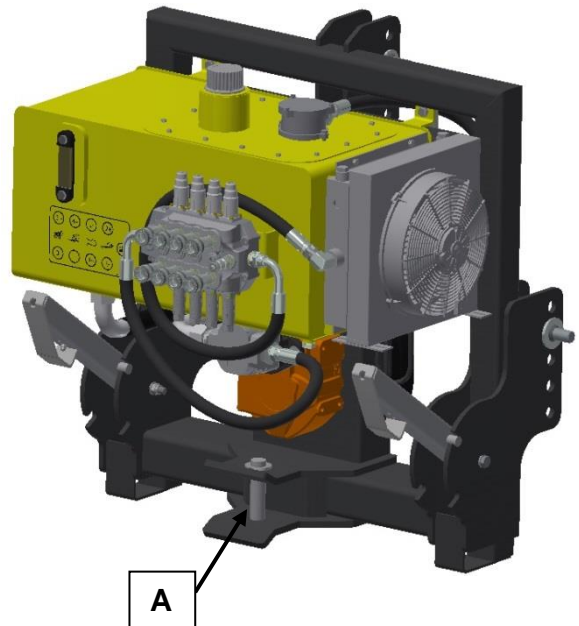
2. Connect the PTO shaft. Make sure that the PTO shaft has the correct length and is horizontal against the ground when the hydraulic unit is lifted as high as possible.



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

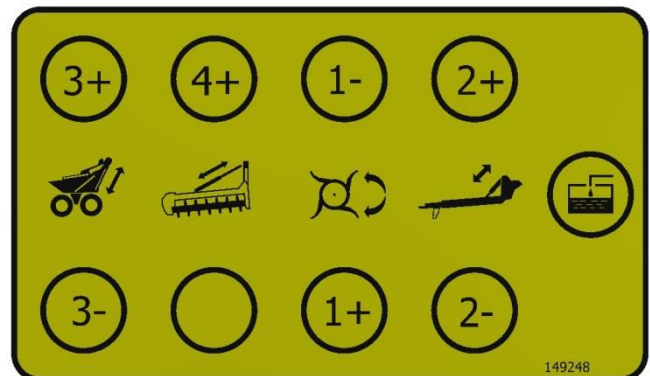
4.10.2 Connecting the Stone picker to the hydraulic unit

1. Connect the stone picker to the hitch on the hydraulic unit (A).



2. Connect the hydraulic hoses from the stonepicker to the valvebock on the hydraulic unit according to the label. Refer to figure.

If the machine is equipped with brakes, the brake lines are connected 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 that the quick couplings are clean.

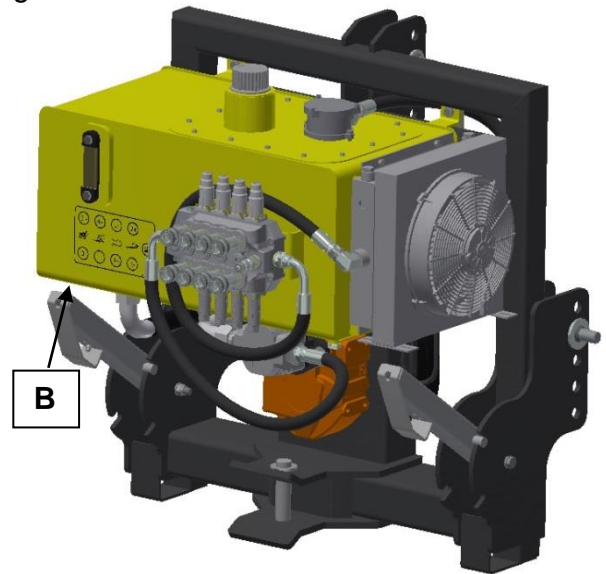
WARNING



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

4.10.3 Disconnect the hydraulic unit

1. Lower the stone picker until the blade is resting on the ground. Fold down the support legs (**B**) and lower the hydraulic unit to the ground.
2. Disconnect the hydraulic unit from the tractor three point linkage



NOTICE

You do not need to disconnect the Scorpio from the hydraulic unit

If you need to disconnect the stone picker from the hydraulic unit fold down the stone pickers support leg according to chapter 4.3 on page 23 and disconnect the stonepicker before disconnecting the Hydraulic unit.

⚠ 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.


⚠ WARNING



Make sure that the machine is in transport position, refer to chapter “4.5. Transport position” on page 29. 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!

Working with the hydraulic unit

The Hydraulic unit has a four section valveblock from walvoil, SDM140. The valve block is designed for a continuous flow of 85 l/min which is obtained when the PTO is working at **450 RPM**.

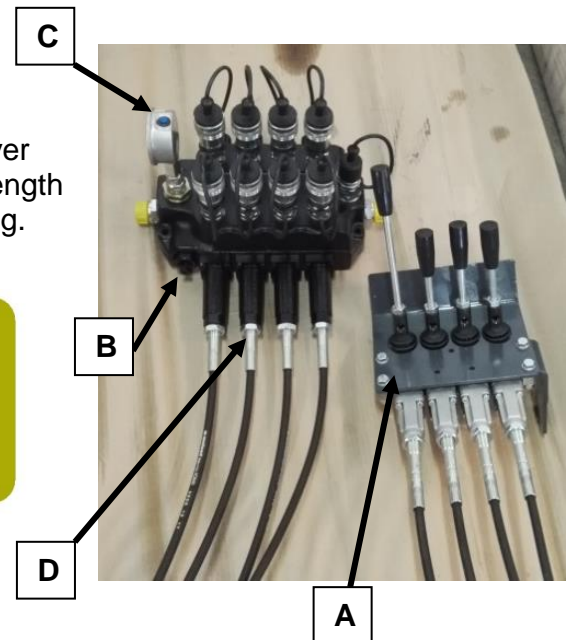
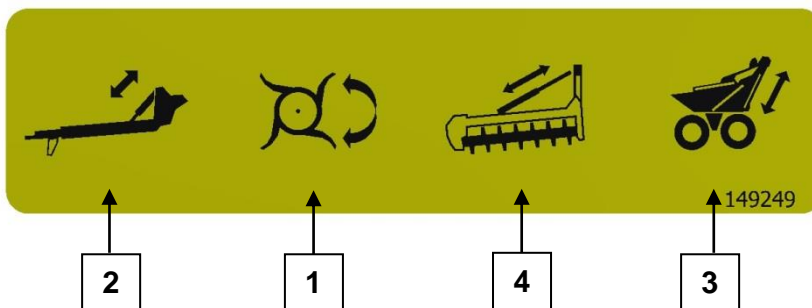
⚠ WARNING	
	<p>The recommended rpm for the PTO when working with the stone picker is 450 rpm. Higher rpm will lead to excessive heating of the oil and can cause damage on the stone picker.</p>

4.11.1 Cooler

The hydraulic unit is equipped with a cooler. The cooler has a cooling capacity of 0,26 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.

4.9.2 Hydraulic unit controls


The valve block is cable controlled. The cable control lever section (**A**) need to be mounted inside the tractor. The length of the cables may need to be fine adjusted after mounting. The length can be fine adjusted using set screw (**D**)



When connected according to chapter 4.8.2 side 34 the four levers controls the following functions:

2. Lifting the blade, (**2+,2-**)
1. Rotation, (**1+,1-**). When working with the machine, this lever is locked in the forward position. (**1+**)
4. Lifting the stone rake (**4+**) When working with the machine, this lever should be locked forward in the floating position.
3. Emptying and lowering the stone container, (**3+,3-**).

The working pressure is shown on pressure gauge © and is set to maximum 250 bar. The max pressure is adjustable using the set screw (**B**) under the inlet port.

⚠ WARNING	
	Function nr. 2 (2+,2-) and nr.3(3+,3-) must be connected to the same hydraulic source. These two functions exchange oil, if they are connected to two different sources one will be emptied on oil and the other will be overfilled with oil.

The SDM140 valve block is not pressure compensated, the oil will always take the easiest way. This means that you cannot lift the blade all the way up when the rotor and rakes are rotating. You will be able to lower the machine and to adjust the working depth, up **and** down. To lift the blade in the headlands you need to switch of the rotation of the rotors.

NOTICE	RISK OF DAMAGE TO EQUIPMENT
	Function nr 2 (2+,2-) is frequently used and can be connected to the tractors hydraulics, if preferred, but then you also must connect function nr.3 (3+ and 3-) to the tractor.

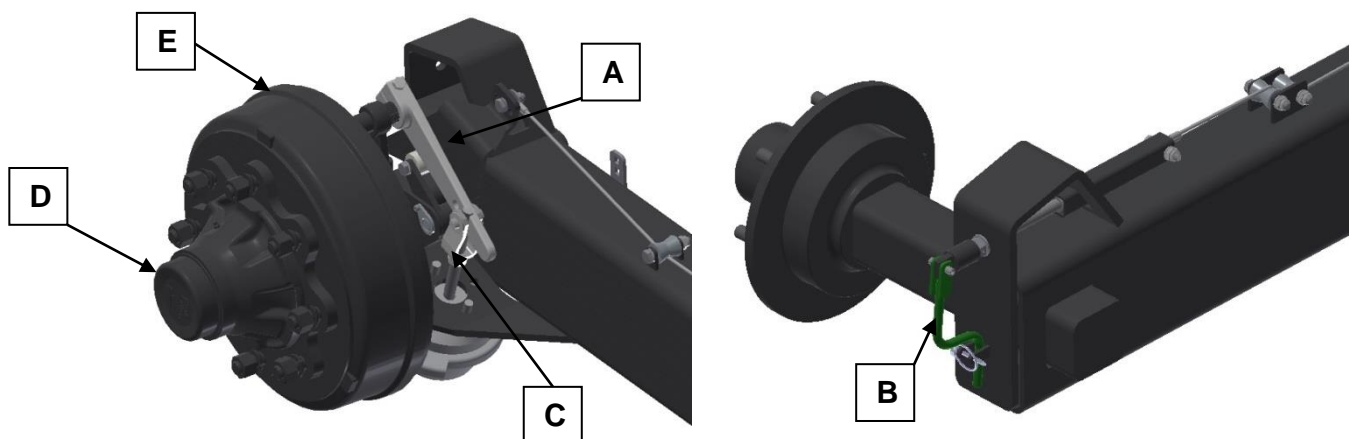
4.12 Brakes

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

4.12.1 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 10mm
- When the brakes are engaged, the angle between the brake lever and the pneumatic[©] 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:

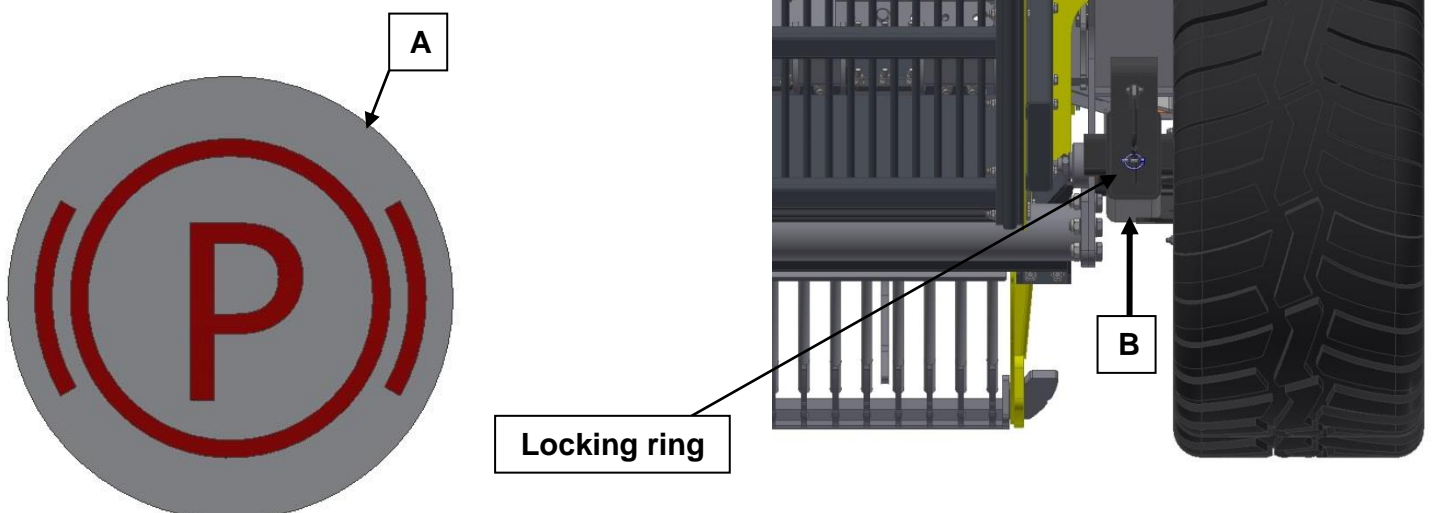
- Remove the wheel.
- Remove the hub cover (**D**) and unscrew the crown nut.
- Pull out the outer drum ©.
- Check liner thickness, replace liner and tension springs if necessary.
- If necessary clean parts and apply new grease, be careful not to smear grease on the brake lining.
- Reassemble and adjust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



4.13 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

 WARNING	
	<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>

 WARNING	
	<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.

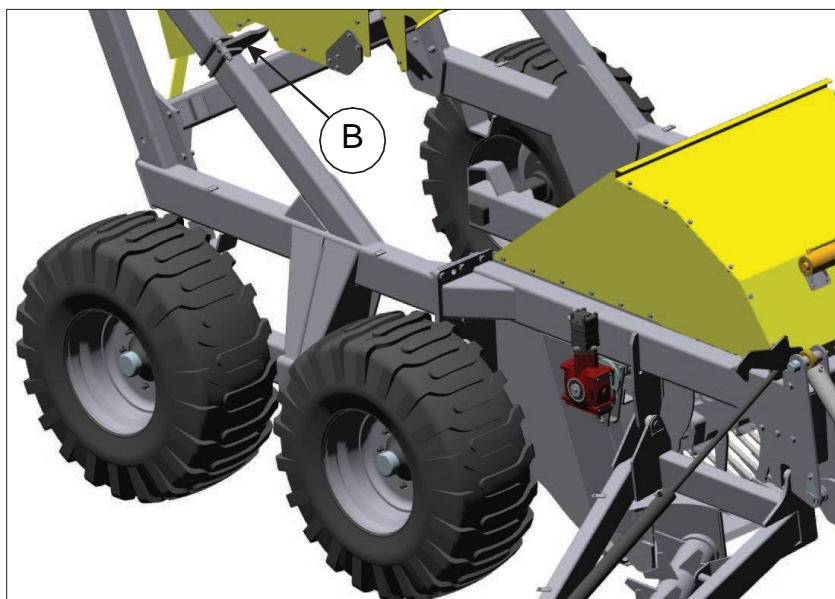
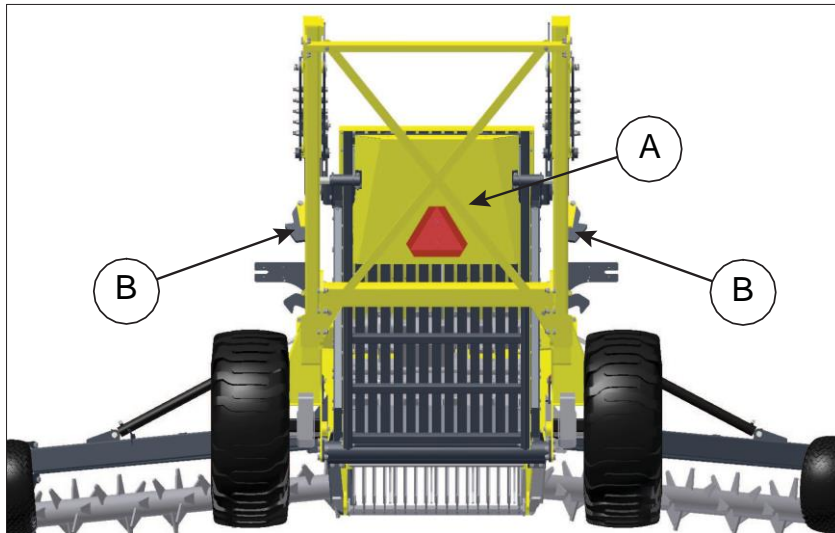
Tightening torques

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

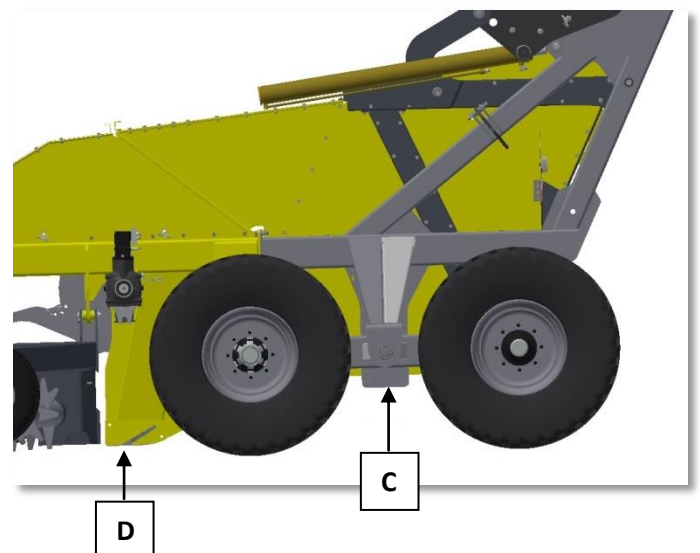
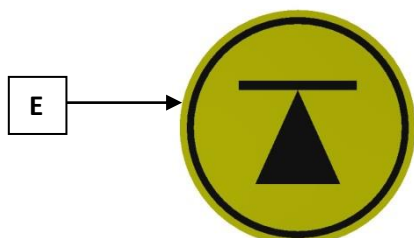
5.1. Maintenance position

1. Lift up the stone tank (A).
2. Lift up the limiters (B) manually.
3. When you lower the stone tank, the tank goes against the limiters (B).




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

⚠ WARNING	
	<p>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.</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.

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.

Gearboxes

- Fill the oil through the plug (1).
- Do a check of the oil level through the oil plug (2).
- Remove the oil throught 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.

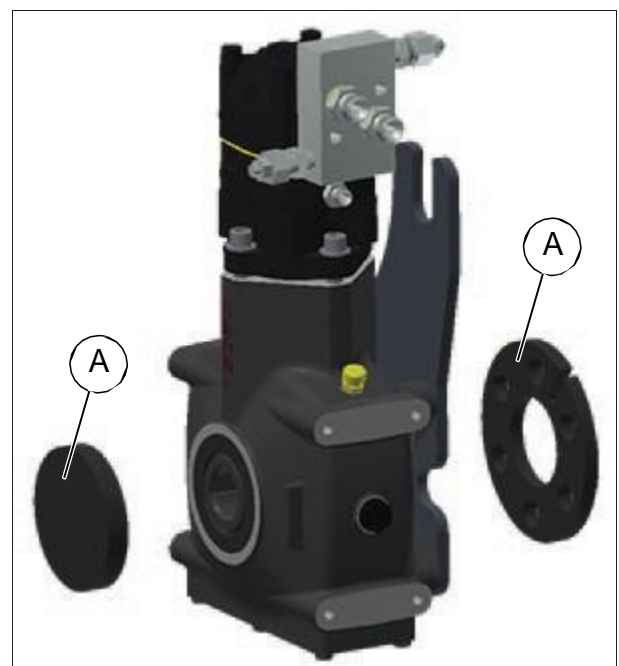
- **A** Filler plug/ breather
- **B** Oil level eye
- **C** Bottom plug



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 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	RISK OF DAMAGE TO EQUIPMENT
	Soil, sand and moisture damage the shaft seals. Replace damaged foam discs.

5.5 Inlet rotor

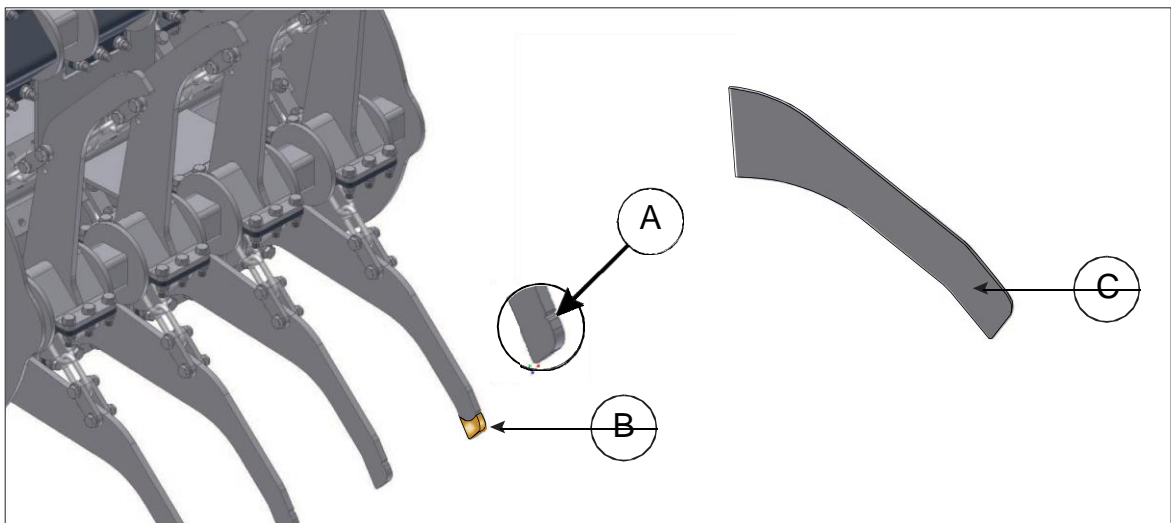
 WARNING	
	<p>Before you perform maintenance, stop the tractor engine, engage the parking brake and remove the start key from the tractor.</p> <p>Any hydraulic movements from the tractor are not permitted.</p> <p>Use safety glasses and protective gloves!</p>

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.

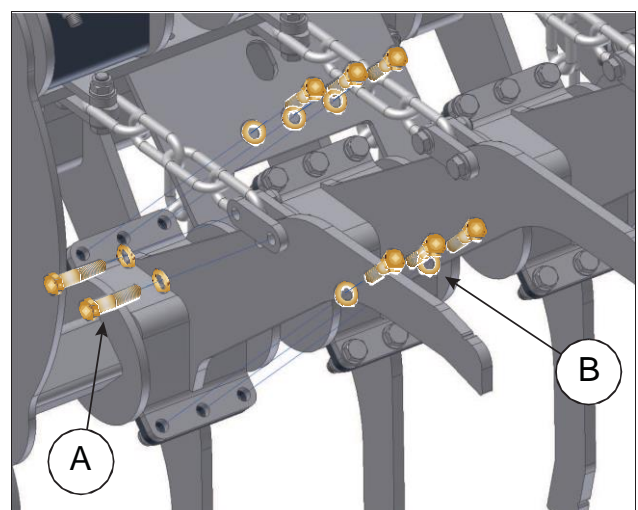
Spare part code for rotor tine repair kit: 472451.

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 © delivered with the repair kit to fix the repair part to correct position.
4. Weld the part in position.

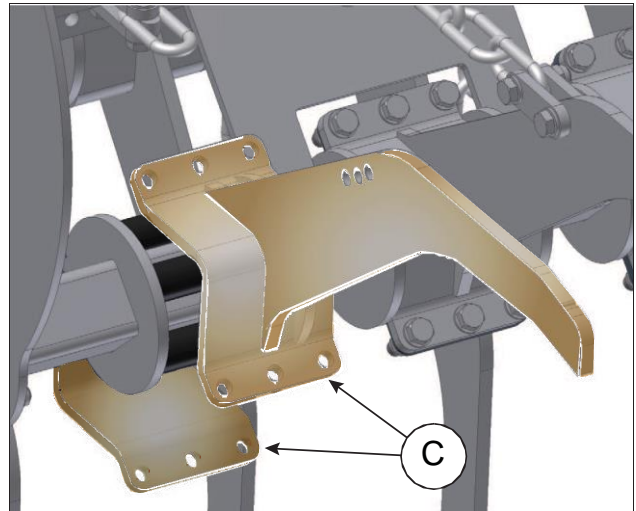


5.5.2. How to replace the rotor tines

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



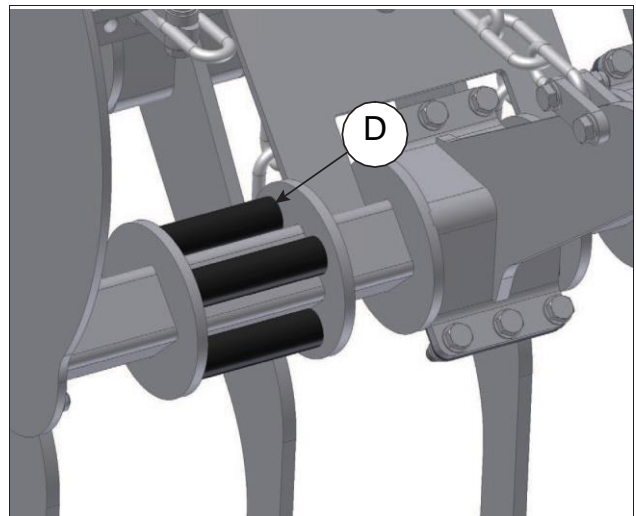
3. Remove the surface plates ©.



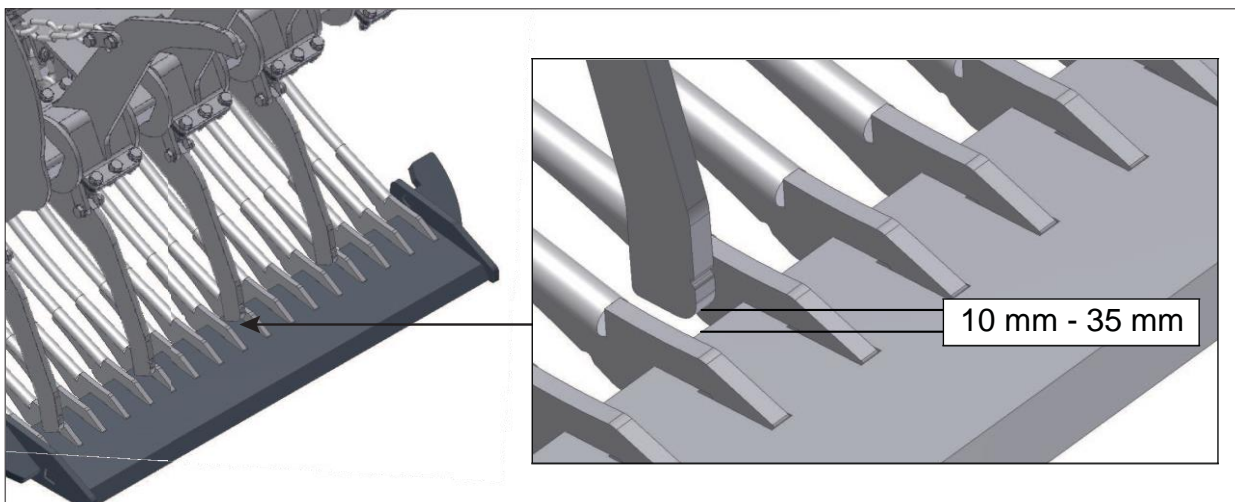
4. Tape the rubber sticks (D) in place to facilitate installation.

5. Attach the surface plates © with the bolts (A and B).

6. Tighten all bolts.



14 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 34. 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.

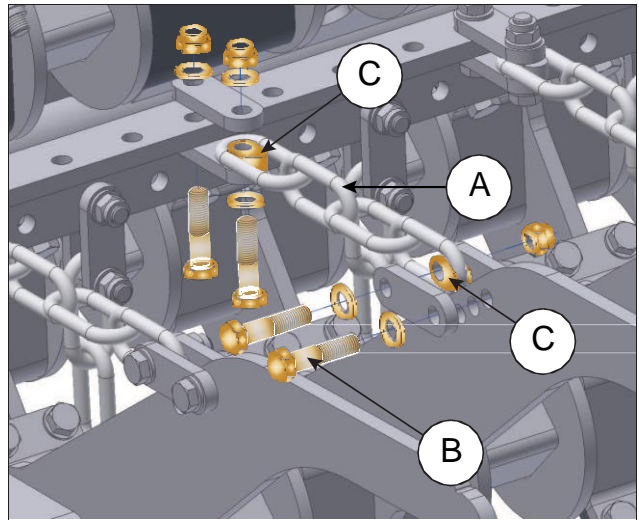


How to replace the limiter chains

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

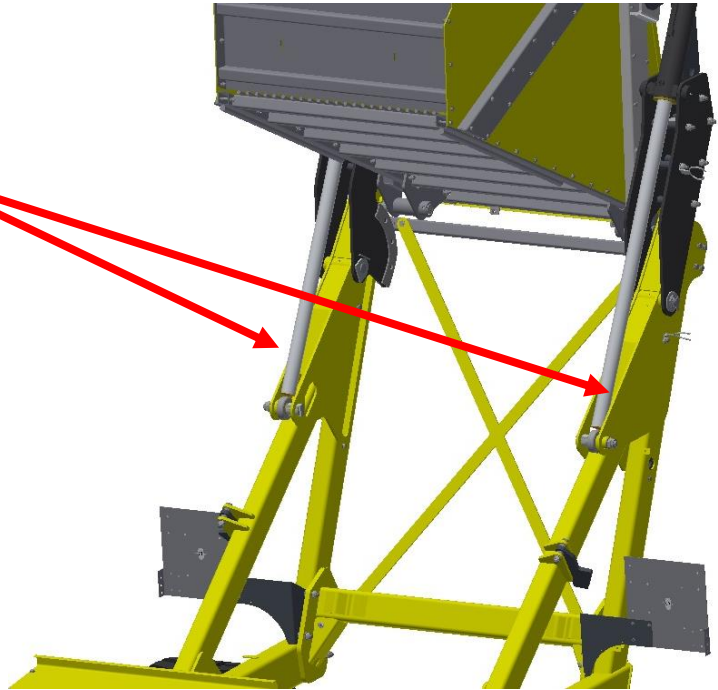
1. Remove the limiter chain bolts **(B)**,
16 pcs.
2. Replace the limiter chain **(A)**.
3. Adjust the tine position. The tine has 3
different hole options.
4. Attach the limiter chain **(A)** with the
limiter chain bolts **(B)**, 4 pcs.
5. The fine adjustment is done with the
setting of the spacer washers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



NOTICE	Make sure that all screws are tightened correctly.
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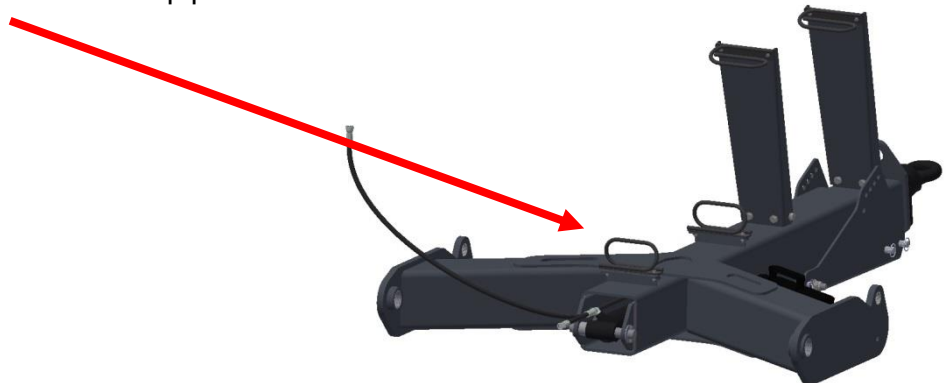
5.6 Critical areas to clean

Clean the area around the big cylinders used for the stone hopper, 3+ and 3- daily.

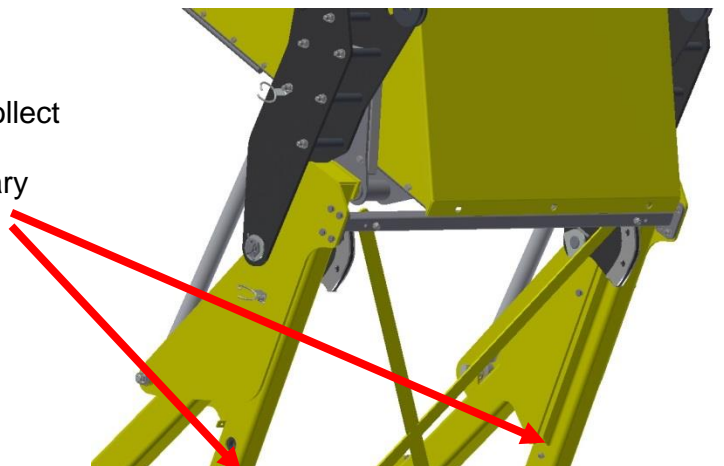


NOTICE	RISK OF DAMAGE TO EQUIPMENT
	Elho warranty does not cover damage caused by improper cleaning.

Clean the end of the drawbar pipe regularly.



In some working conditions soil have a tendency to collect inside the rear beam where the support wheel for the stone hopper is located. Check the rear beams regularly and clean if needed..



5.7 Windrower

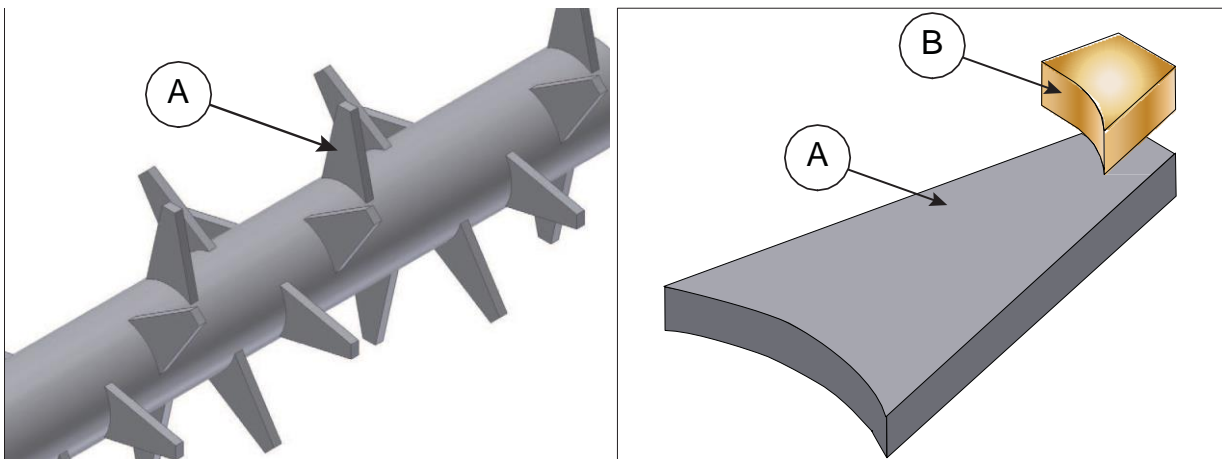
5.7.1 Tines repair welding

The windrower 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 the machine work 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: 472580 (single part 472406).



5.7.2 Tyre air pressure

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

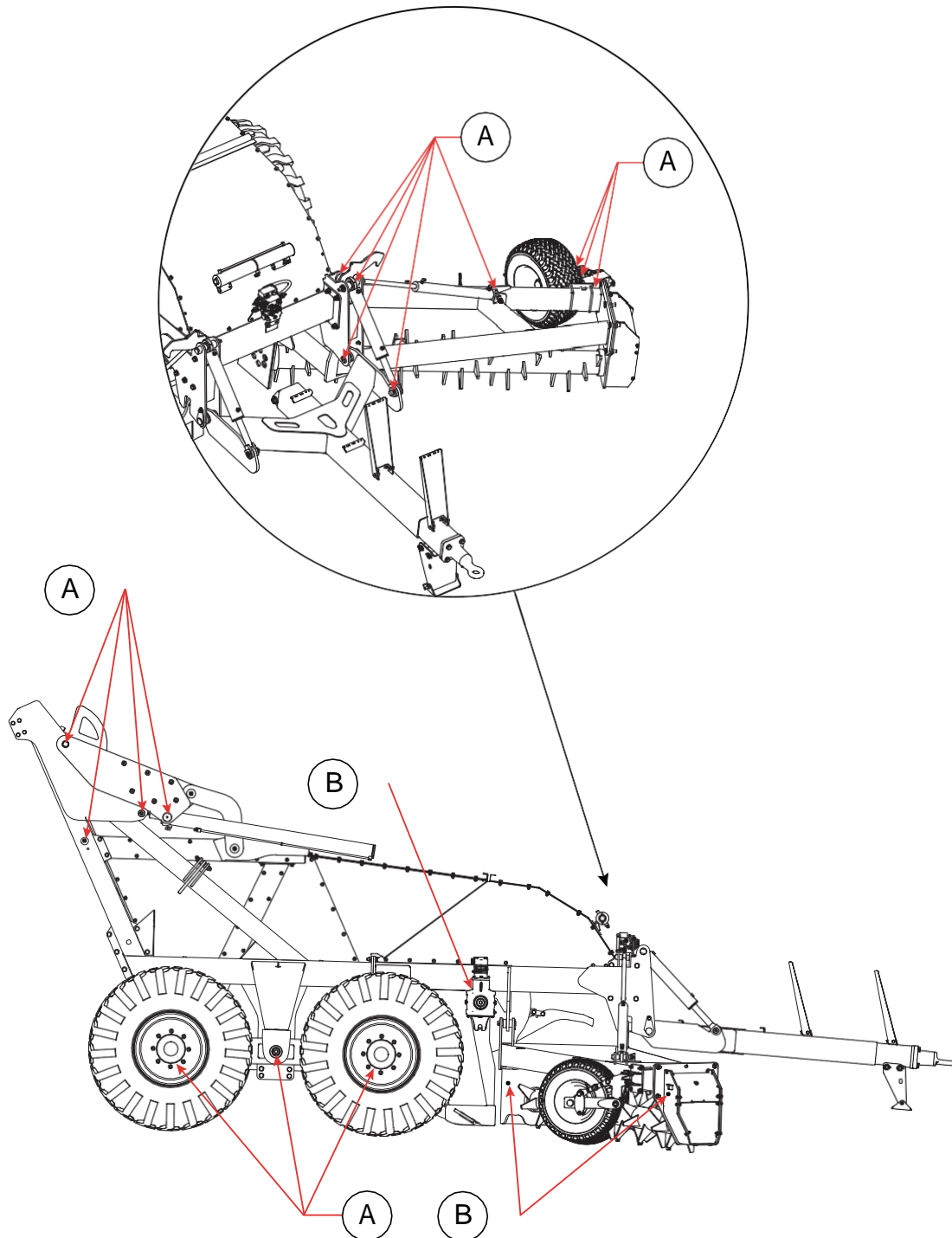
5.8 Hydraulic unit

The hydraulic reservoir is filled with 100L of Neste 32 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.

5.9 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



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 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 is 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 "5.5.1. How to replace the rotor tines" on page 45.

7. FINAL DISASSEMBLY OF THE STONE PICKER

 WARNING	
	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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