

User manual

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Compiled by SM

Responsible manufacturer: Tree Tech A/S -Part of Bredsgaard A/S

Machine: Tree tech Mini-net



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1. About this User manual

1.1. Purpose

The purpose of this User manual is to ensure correct installation, use, handling and maintenance of the machine. The machine is designed to function as a Netting machine for Christmas tree netting

1.2. Reading guide

This User manual is prepared in accordance with EN ISO 20607:2019 *Safety of machinery- Instruction handbook* and is a translated instruction manual for the machine.

Familiarity

It is the obligation of the employer (owner of the machine) to ensure that everyone who will operate, service, maintain or repair the machine has read the User manual; at least the parts of it that are relevant to their work.

In addition, anyone who is going to operate, service, maintain or repair the machine has a duty to seek information in the User manual themselves.

Accessibility

The User manual can be accessed at any time at www.treetech.dk. If the employer wants a printed version, please contact Tree Tech A/S

1.3. Version

Version 1.1

1.4. Manufacturer

Name: Tree Tech A/S

Address: parallelvej 19, 8620 Kjellerup, Denmark

Phone: +45 89707089

Email: kontakt@treetech.dk

Website: www.Treetech.dk

1.5. Machine designation

Tree Tech Mini-net

1.6. Document type

User manual for users of the machine

1.7. Relationship between this document and the machine

This User manual covers the use and maintenance of the Tree Tech Mini-net machine (identical information is provided on the machine's Rating plate):

Company name
Full address
Ce labelling
Specification of type designation
Year of manufacture



1.8. Symbol explanations



Safety footwear must be worn
Not placed on the machine



Protective gloves must be worn
Not placed on the machine



Keep distance, 3 m
Located on both sides of the claw



Pinch hazard warning
Located at the rear of the machine

2. Safety and security

2.1. Intended use, hazard warnings

Tree Tech Mini Net is a small Netting machine that nets Christmas trees

The machine is designed to net Christmas trees of different sizes

Extra vigilance must be exercised if multiple people are using the machine

2.2. Substances that can cause danger to people

Hydraulic oil, lubricating oil and grease can cause allergic reactions. When coming into contact with hydraulic oil, lubricating oil or grease, use gloves that can resist oil and grease.



2.3. Special conditions for different user groups, such as children

Person groups	Expected education level and physical characteristics of users
Operators	<p>Trained or trained personnel who have obtained sufficient qualifications to use the machine. The operator must, through training and review of the User manual, be familiar with all the machine's controls, including protective measures and their functions.</p> <p>General physical well-being.</p> <p>Operational staff must have normal physical and cognitive functioning.</p>
Tractor driver (if mounted on tractor)	<p>Tractor trained with knowledge of the machine and its prerequisites for use</p> <p>Tractor driver must be familiar with the protective measures and functions of the machine</p> <p>General physical well-being.</p> <p>Operational staff must have normal physical and cognitive functioning.</p>
Maintenance personnel	<p>Trained personnel with knowledge of the machine's functions, operating modes and safety measures.</p> <p>The qualifications must be obtained through vocational training or through adequate and equivalent training.</p> <p>Maintenance personnel must have read and understood all relevant documents such as User manuals, instructions and maintenance manuals (if available).</p> <p>Maintenance personnel must have normal physical and cognitive functioning.</p>

Trainees and apprentices	<p>Trainees or apprentices must be accompanied and supervised by experienced and trained personnel.</p> <p>When working with the machine, trainees and apprentices must be supervised during the entire period of use.</p> <p>Trainees and apprentices must have normal physical and cognitive functioning.</p>
People in general	<p>Visitors etc. must always be supervised by professional staff. In connection with display, this must be done after receiving safety instructions and only with a safety responsible employee.</p>

2.4. Residual risks

- Pinch hazard and risk of injury when the claws grip trees and pull the trees through. The claw is only partially shielded and if a person is caught, this can cause severe injuries and limb tearing



- When the machine is not mounted on a tractor, the tyres must be fitted with chocks to prevent the machine from moving. Serious injuries can occur if the machine moves uncontrollably.
- The claws can be sharp. This can cause cutting injuries
- Knives mounted on the blade arm are very sharp. This can cause serious cutting injuries. Wear cut-resistant gloves when handling knives



2.5. General warnings and precautions

Vigilance must be exercised when using the machine

The operator must be able to see the entire machine at all times to ensure that people do not enter hazardous areas of the machine

There is a safety distance of 3m around the machine for non-operators when in Operation



2.6. Use of personal protective equipment

During maintenance, repair and disassembly:

Safety gloves

Safety shoes



2.7. Safety symbols and pictograms

If symbols, signs and pictograms are missing, illegible or unclear, they must be replaced with new ones as soon as possible.

2.7.1. Safety symbols and pictograms

There are 2 safety symbols:



2.7.2. Renewal of safety symbols and pictograms

As soon as safety symbols and pictograms are illegible or unclear, new ones can be purchased from Tree Tech A/S

2.8. Safety features

There are several safety functions on Mini-net that all run over the safety PLC

2.8.1. Safety function 1

Name: Emergency stop at the back and front of the machine.

Mode of operation: Stops the machine immediately when the power circuit is interrupted, closing hydraulic valves

PL level: c
Operating modes: Works in all operating modes
Applied standard: EN ISO 13849-1:2015

2.8.2. Safety function 2

Name: Magnetic safety switch mounted on safety bar in rear
Mode of operation: Stops the machine immediately when the power circuit is interrupted, closing hydraulic valves
PL level: c
Operating modes: Works in all operating modes
Applied standard: EN ISO 13849-1:2015

2.9. Emergency situations

In emergency situations, stop the machine, provide first aid and call the proper authorities

2.9.1. How to operate in the event of an accident or breakdown

Accidents:

1. Activate emergency stop
2. Switch off the tractor
3. Provide first aid and contact relevant authorities

Crashes:

1. Press stop
2. Switch off the machine
3. Wait 30 seconds
4. Start the machine again

2.9.2. Emergency stop

Emergency stop is activated as soon as possible in case of an emergency and the machine can only be restarted by de-activating emergency stop and resetting the machine with the blue reset button.

Emergency stops must not be used as regular stops or service stops as this degrades the quality of the emergency stop and there is a greater chance of the emergency stop failing

2.9.3. Recommended firefighting equipment

CO2 extinguisher

2.9.4. Emission and/or leakage of hazardous substances

In case of emission and/or leakage, follow the authorities' instructions for the substance in question.

3. Overview of the machine

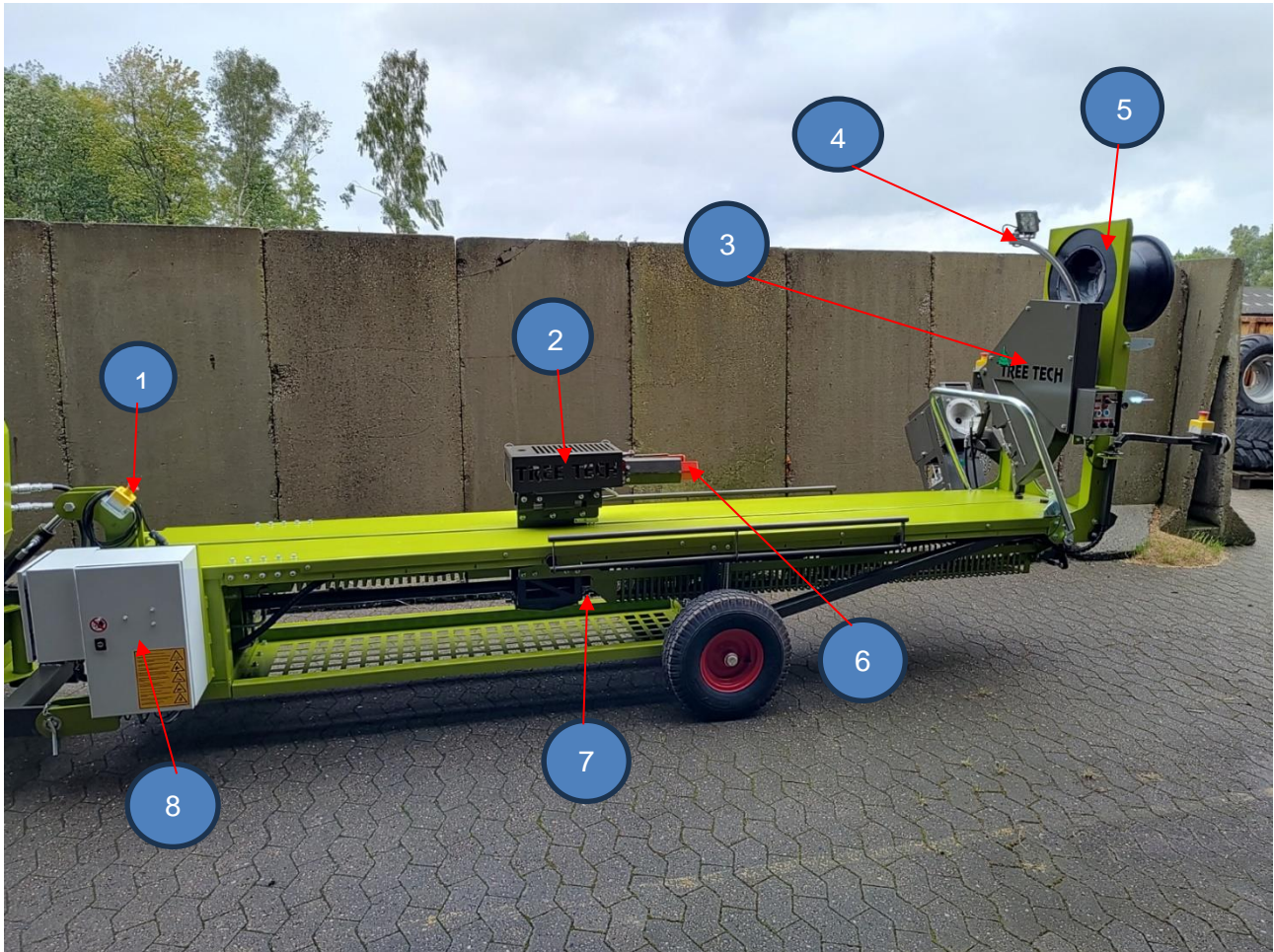
3.1. Description of the machine

Tree Tech MiniNet is a Christmas tree Netting machine made to be transported and used by smaller tractors

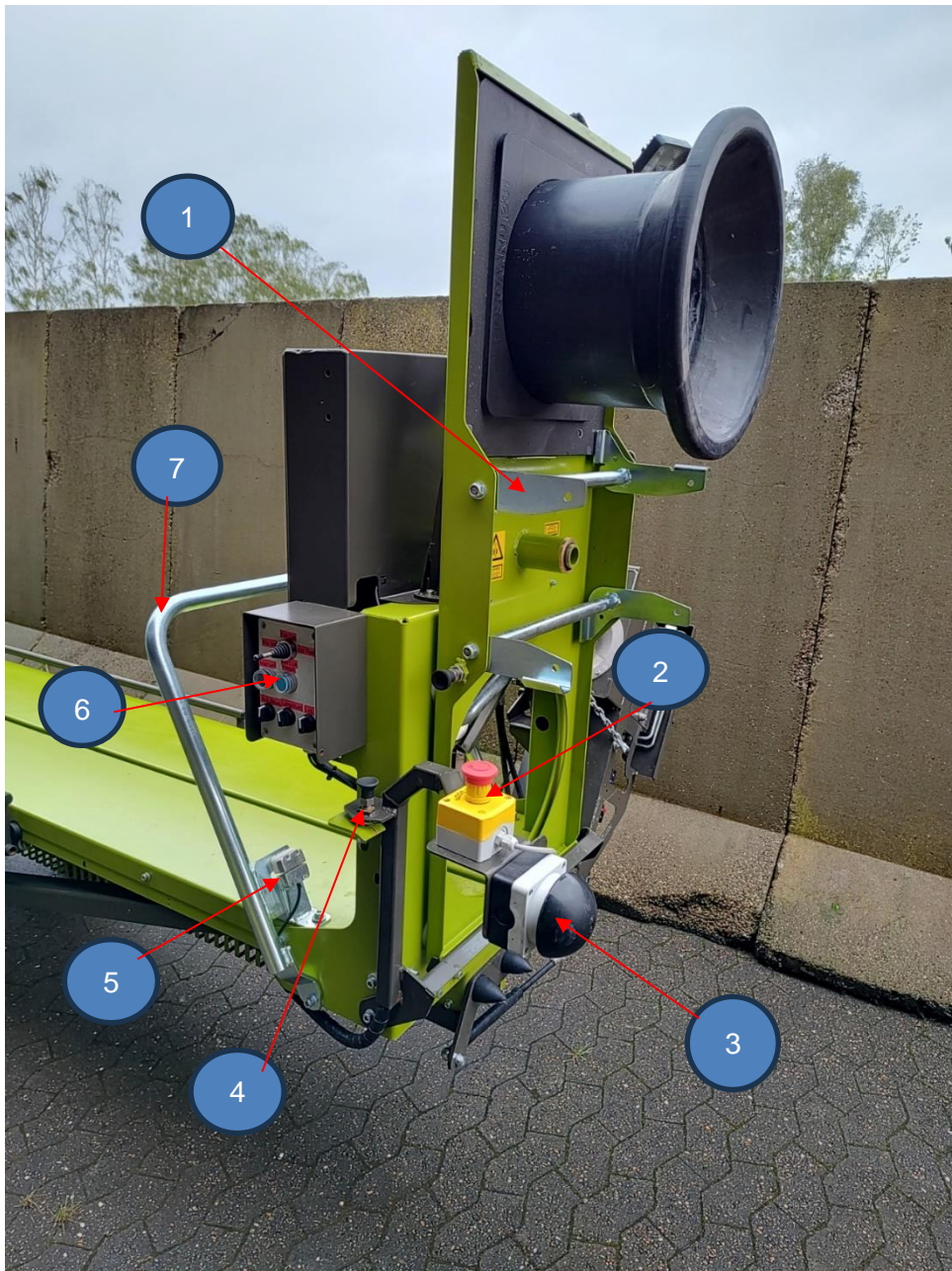
The main components of the machine are:

- The main frame
- Collar rams
- Top frames
- The exchange
- The claw
- Excavator with funnel holder
- Knife arm
- Control box
- Hydraulic block
- Electrical box

3.2. Overview drawings etc.



1. Front emergency stop
2. Claw
3. Knife arm protection
4. Light arm
5. Funnel holder (rotatable)
6. Red claws
7. Chain tensioner
8. Electrical cabinet



1. Locking handles for funnels
2. Emergency stop at the rear
3. Shoulder switch
4. Locking pin for Funnel rotation locking arm
5. Magnetic safety switch (there can be 2 different types)
6. Steering box
7. Safety bar

3.3. Intended use

Tree Tech Mini Net is a small Netting machine that nets Christmas trees.

The machine is designed to net Christmas trees of different sizes.

There are 3 operator functions that can be filled by 1, 2, 3... and more.

Net man: Feed MiniNet with Christmas trees, activate cycle, change funnels and attach nets.

Layers: Receive the netted Christmas trees and return claw.

Tractor driver: Drives and operates the tractor.

Extra vigilance must be exercised if several people are using the machine!

3.4. Permitted substances and materials

The hydraulic oil must be filtered to a purity class of ISO 4406 19/17/14 or better. And have a viscosity of 10 - 60 cSt.

Grease that must have a working temperature from -30°C - +150°C e.g. Castrol High Temperature Grease.

3.5. Specifications

3.5.1. Length, width and height

L:470cm W:105cm H:205cm

3.5.2. Weight

750kg

3.5.3. Work speed (cycle)

1 full cycle every 8 seconds

3.5.4. Power supply

12V

3.5.5. Tyre pressure

Tyre pressure 3 bar

3.5.6. Tractor requirements

3.5.6.1. Hydraulics

- Working pressure (hydraulics) 180-200 bar
- Oil flow: 25-35 L/min
- Hydraulic outlets: one double-acting, one for TREE TECH MiniNet.

3.5.6.2. Mechanical/strength

- At least 10% of the weight of the tractor and the suspended implement, plus the weight of the load, must rest on the front wheels. When the tractor begins to drive forwards with the MiniNet raised, the front wheels must not lose contact with the ground at any time. If this happens, the front weight must be increased.

- The lift's lifting force must be 1000 kg or more, measured in the lift arm eyes. If this is not possible, additional equipment such as a ball hitch can be used.

3.5.7. Lifetime, machine

The lifetime of the machine is set at 20 years. If the machine is to be used for a longer period, the owner/user of the machine must assess whether the structural and functional parts of the machine still have their original strength, stability, etc. If this is not the case, the parts must be replaced with parts with identical properties.

3.5.8. Lifetime, safety components

Emergency stop 300000 Circuit

Magnetic safety switch 20 years

3.6. Controls and interfaces

The machine is operated from the rear at the start of netting. After netting, the machine can be operated from both sides to return the claw.

3.7. Installation site and workplaces

The machine is made to work in the Christmas tree culture

The space requirement must be adapted to the size of the Christmas trees so they can be fed safely and efficiently.

It is recommended that there is at least 1000mm clearance on the sides of the machine.

4. Transport, handling and storage

4.1. Machine (part) dimensions during transport

The machine is fully assembled upon delivery and has the same dimensions and weight, see section 3.5.

4.2. Mass and centre of gravity

For mass see section 3.5.

Centre of gravity is approximately midway between the 2 wheels in the middle of the machine.

4.3. Lifting and docking points

The machine is equipped with 3 point suspension.

4.4. Transport and handling methods

The machine is made to be transported by tractors with a maximum speed of 40 km/h
When using 3-point suspension, the machine must be raised sufficiently above the ground to avoid breakdown.

4.4.1. Transport and handling methods

3-point suspension: Machine can be transported by lifting with 3-point suspension .

Ball hitch: By mounting the ball hitch on the 3-point suspension on the Mini net (available from Tree Tech A/S), the machine can also be towed.

The machine is not fitted with signing equipment as standard and can be purchased as an option.

4.4.2. Training and equipment

The tractor driver must have a valid driving licence and tractor training according to national regulations.

4.5. Environmental requirements during storage

It is recommended to store the machine in a dry place

Feeder tubes and funnels are stored in a cool place without load to avoid distortion

5. Assembly, installation and commissioning

5.1. Assembling the machine

The machine is delivered fully assembled, checked and lubricated.

5.2. Safety systems, control and testing

There are 2 emergency stops and 1 magnetic safety switch (available as 1 sensor or 2 split sensor).

All safety systems must be tested before commissioning, see section 9.12

5.3. Commissioning

Before Operation, the following must be checked:

- For the correct type of oil on the tractor, see oil specifications in section 3.4.
- Emergency stop is checked according to point 9.12.
- Magnetic safety switches are checked according to point 9.12.
- Correct oil pressure
- Correct oil flow

5.4. Training

When the machine is delivered to the customer, they will receive training on the machine. After this, training takes place as one-on-one training.

5.4.1. Operators

The operator must have read the user manual and the buyer has received training on the machine, which must be passed on to the operator.

Subsequent training can be done as one-on-one training after reading the user manual.

5.4.2. Tractor driver

The tractor driver must be tractor trained with knowledge of the machine and its conditions of use.

The tractor operator must be familiar with the protective measures and functions of the machine.

5.4.3. Service staff

Must have professional training or adequate equivalent training.

5.4.4. Cleaning staff

Operator level can clean the machine.

6. Factory settings

6.1. Hydraulic equipment

Pressure relief valve is set to 200 bar

Knife arm pilot valve is set so that the knife arm moves up from bottom to top position in 1.5 seconds

6.2. Electrical equipment

There is a 10A fuse in the electrical cabinet

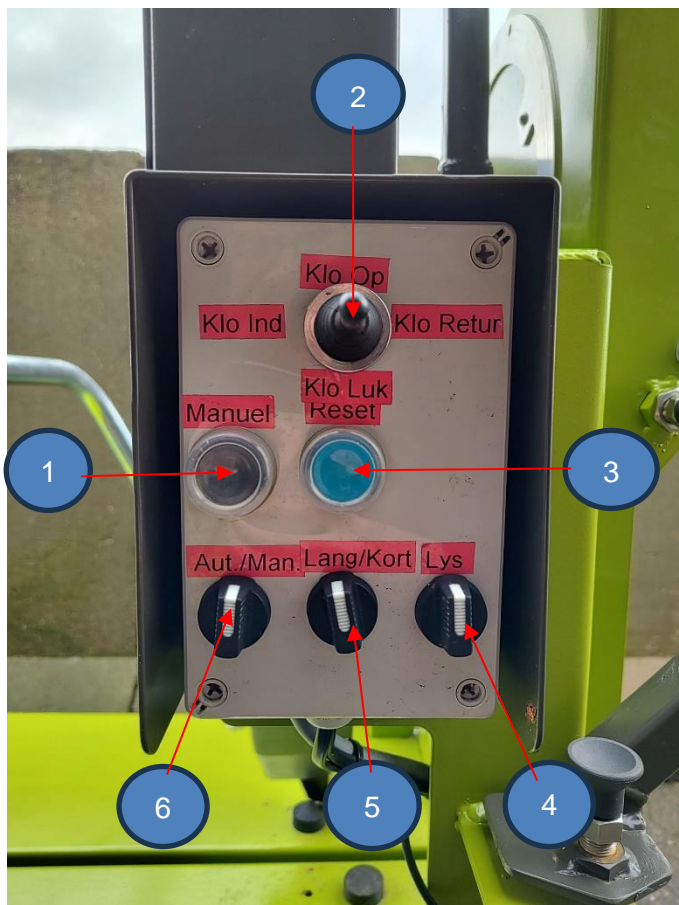
7. Operation

7.1. Risks and sources of danger

7.1.1. Training

All users (operators) must have undergone training (see above) before operating the machine for the first time. The training must ensure that the operators are aware of the risks and hazards present on the machine.

7.2. Manual controls

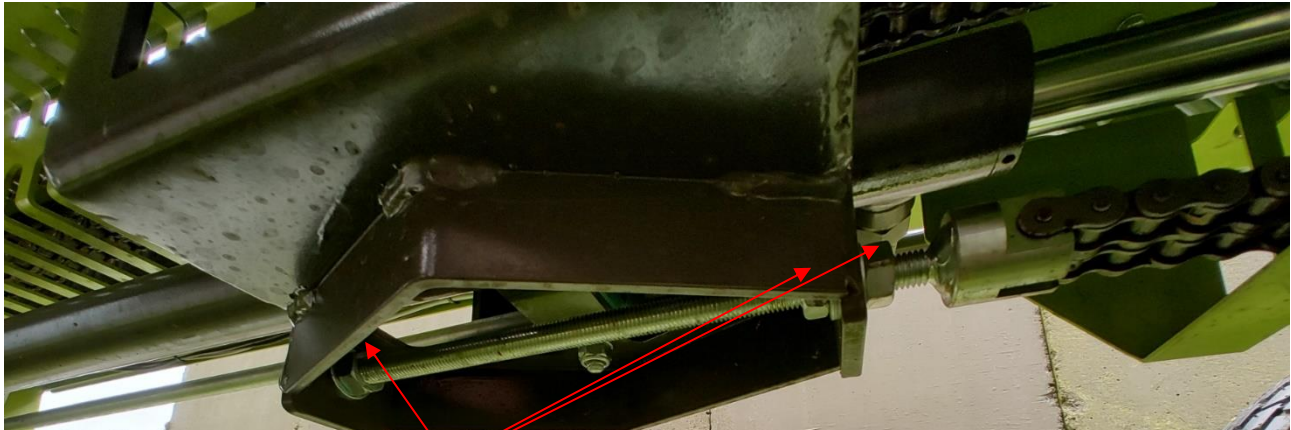


1. Button for manual return
2. Button for manual control of the claw
3. Reset button
4. On/off light
5. Long/short pull
6. Automatic or manual control

7.3. Setting and adjusting

7.3.1. Tightening the chain

1. Loosen the 3 nuts that lock the threaded rod
 2. Tighten the last nut to make the chain tighter (be careful not to over-tighten the chain)
 3. Tighten the 3 nuts to lock the threaded rod
- Must be tightened sufficiently so that the chain does not overload



Nuts loosening threaded rod
Nut for chain tensioning



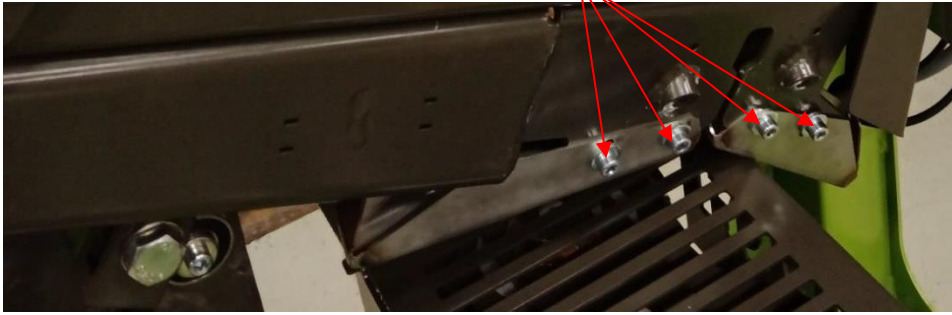
7.3.2. Loosening the chain

1. Loosen the 3 nuts that lock the threaded rod
2. Loosen the chain with the last nut

7.3.3. Adjusting guide plates for knives on knife arm

The guide plates for the blades on the blade arm can be adjusted for better cutting of the net.

1. Loosen the bolts so that the guide plates can be moved but are not loose



2. Adjust the guide plates so that there is 2 mm between the plates and they are bevelled so that they guide the net into the blades (see image). The blades must not go on the guide plates.



7.3.4. Adjusting the return handle

The return handle can be adjusted in height

1. Loosen bolts and nuts
2. Adjust to desired height
3. Tighten bolts and nuts



7.3.5. Checking and adjusting sensors:

Sensors are individually adjusted as needed.

For the sensors to work correctly, the sensors must be 3mm from the sensor plate

Control: Control is performed in the following way

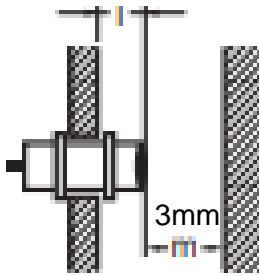
1. Switch the machine to ON
2. A plain piece of metal is held in front of the sensor. The top of the sensor will light up if the sensor is working. If the sensor does not work, check the wire. If the sensor still does not work, contact Tree Tech



3. Check that the distance to the sensor plate is correct and that the sensor lights up when the sensor plate is in front of the sensor

Adjustment: adjustment is performed in the following way

- Machine must be switched off during sensor adjustment
1. Loosen the bolts on the sensor. Adjust so that the sensor is 3mm away from the sensor plate
- Nuts are tightened with a torque of 30 Nm



2. Check the sensor again

7.3.6. Shoulder pressure adjustment and emergency stop:

Loosen handle and adjust to desired position

7.4. Operating modes

Auto/cycle:

1. Shoulder switch activation starts the cycle and the machine nets the Christmas tree
2. When return is activated, the claw returns to the start position (there is both semi-automatic return and manual return)

Manual control:

- The claw movements can be controlled back and forth, and open and close.
- Return function does not work

7.5. Location of operator workstations

There are 3 operator seats:

- 1 for netting Christmas trees: operator position is around the rear of the machine
- 2 for unloading netted Christmas trees: the operator position is on the right and left side of the machine, along its entire length.

7.6. Special risks

The machine is supplied with hydraulic and electrical energy from a tractor, so you need to focus on the correct tractor setting.

The tractor operator must exercise extra care when handling the tractor when the machine is in Operation. Do not move the tractor during Operation of the machine



7.7. Risks that are not eliminated through design

Pinch and injury hazard when the claws grip trees and pull the trees through. The claw is only partially shielded and if a person is caught, this can cause severe injuries and limb tearing

7.8. Control of hazardous areas



Before activating the cycle, the operator must be sure

- Nothing in the claw but the stump end of the Christmas tree
- That there is nothing or no one on the machine behind the claw.

7.9. Procedures

Start-up and Operation takes place under the following conditions:

- Operation is carried out by trained staff
- Operation can be stopped by activating the emergency stop
- The operator has the necessary training or experience
- That the machine is maintained and serviced

7.9.1. Mounting

1. Behind the tractor to mount the lift arms
2. Mount the hydraulic hoses on the tractor
3. Connect power
4. Lift the lift arms so that they grip and lock around the lift balls
5. Mount the Top bars
6. Adjust the Top bar length so the MiniNet is straight
7. Tighten sling chains
8. Pull nose wheel all the way up

7.9.2. Dismantling

1. Run nose wheel down to support MiniNet
2. Remove power and hydraulic hoses
3. Loosen and remove Top bar
4. Unlock and lower the lift arms

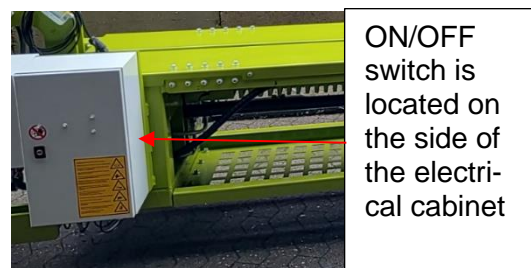
Remember to place chocks under the wheels of the Mini-net to prevent the machine from moving.

7.9.3. Machine ON

1. Switch on the tractor
2. Activate hydraulics from the tractor
3. Turn the knob to ON and the machine is started

7.9.4. Machine OFF

1. Set the knob to OFF
2. Switch off the tractor



ON/OFF switch is located on the side of the electrical cabinet

7.9.5. Funnel

Funnel size should always be adapted to the size of the wood for the greatest efficiency and quality.

7.9.5.1. Loading Tree Tech funnels

1. Unscrew the ring, anti-clockwise



2. Attaching the charging pipe



3. Feed the net pack down - the arrow should point down towards the Funnel opening where the tree is fed in
4. The net is pressed down on the net cartridge, held in place, e.g. with your knees, and the feed tube is removed.



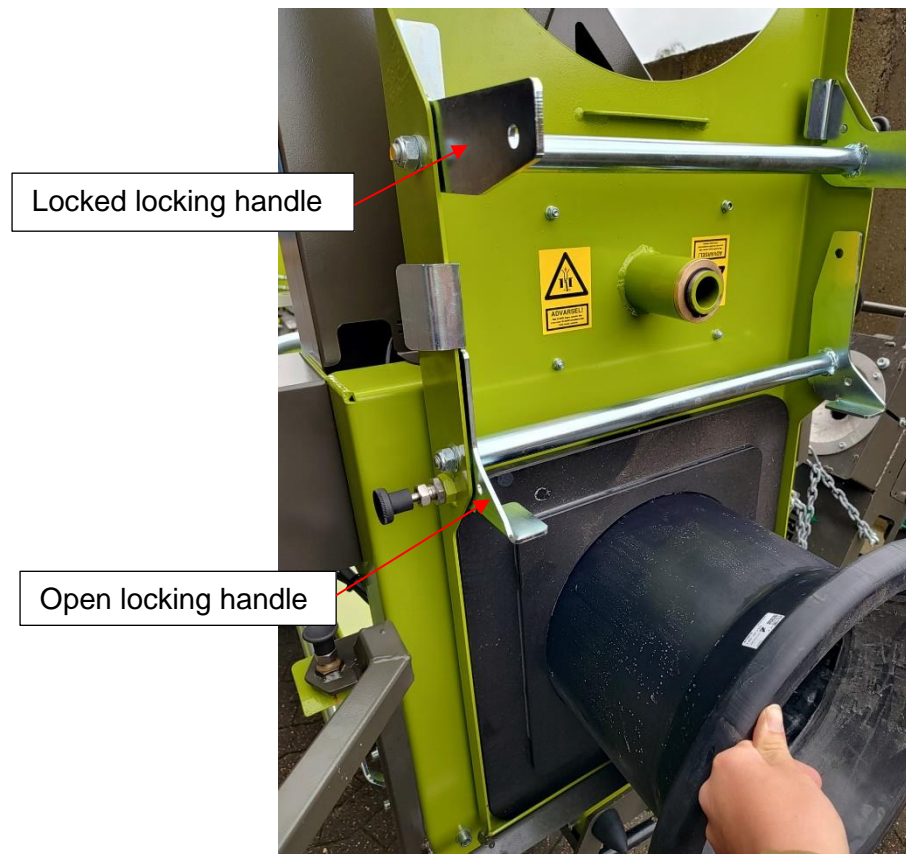
5. Set the ring down and turn clockwise to lock.



6. Remove the plastic and pull the net over the ring - pull a few metres free to release any tangled net.

7.9.5.2. Changing funnels

1. Pull out the Locking pin and open the locking handle



2. Take out the Funnel
3. Put in a new Funnel
4. Close the locking handle and check the Locking pin is engaged

7.9.5.3. Rotation of funnels

1. Pull out in the Locking pin



2. Open the locking handle



3. Turn funnel holder

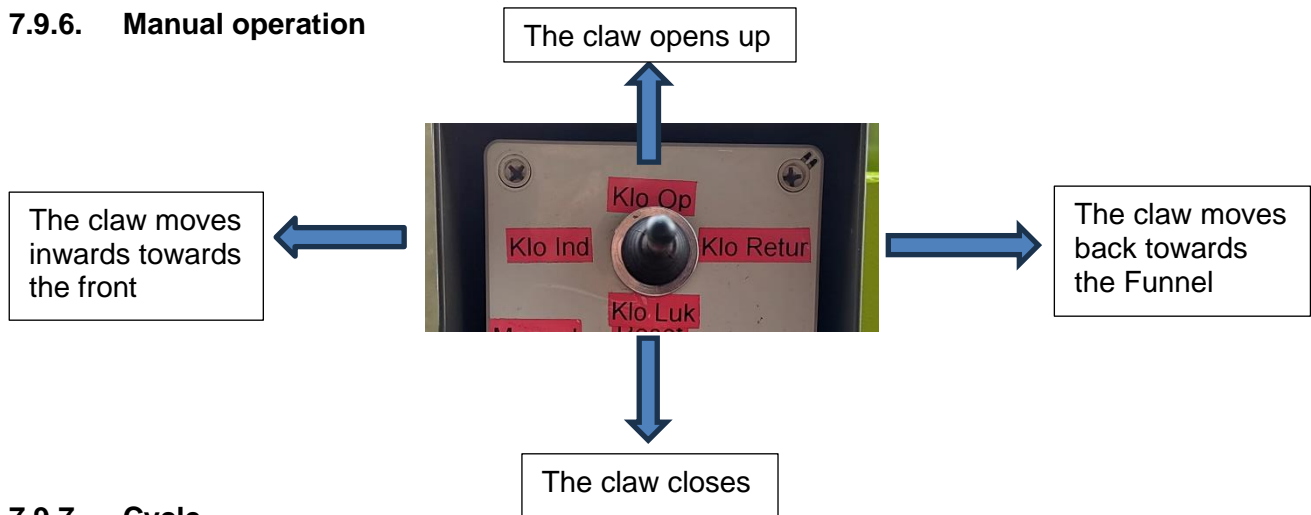


4. Close the locking handle



5. Check the Locking pin is engaged

7.9.6. Manual operation



7.9.7. Cycle

7.9.7.1. Start cycle

1. The root end of the tree is placed in the claw so the net hangs on the root end.
2. The shoulder button is activated and while the next tree is retrieved, the machine pulls the tree in and opens the claw.

7.9.7.2. Stop cycle

If a cycle has started the shoulder switch can be used again to switch off the cycle

1. Activate shoulder switch

Please note that after stopping, the machine must be reset before starting can be activated again.

7.9.7.3. semi-automatic return

- Grasp the wood and pull it over the return handles so they tilt

7.9.7.4. Manual return

For manual return, you can remove the springs from the return levers, so they don't get in the way of large trees, for example.

- Once the tree is removed, press manual return and the claw returns again



Start/Stop switch

7.9.8. Tree Tech counts

New version



1. Green contact (number up)
2. Reset contact (Resets to 0)
3. down contact (number down)

4. Power connector
5. ON/OFF
6. Communication connectors
7. Car

The new version works like this:

Counting trees:

Manual: Green contact is pressed and the counter is one more

Automatic: If automatic is enabled, the sensor automatically counts the trees. The green contact can still be used.

Count down: If one too many trees have been counted, the down contact can subtract 1 number from the counter.

Installation of power and communication connectors:

Power connector mounted in Supply

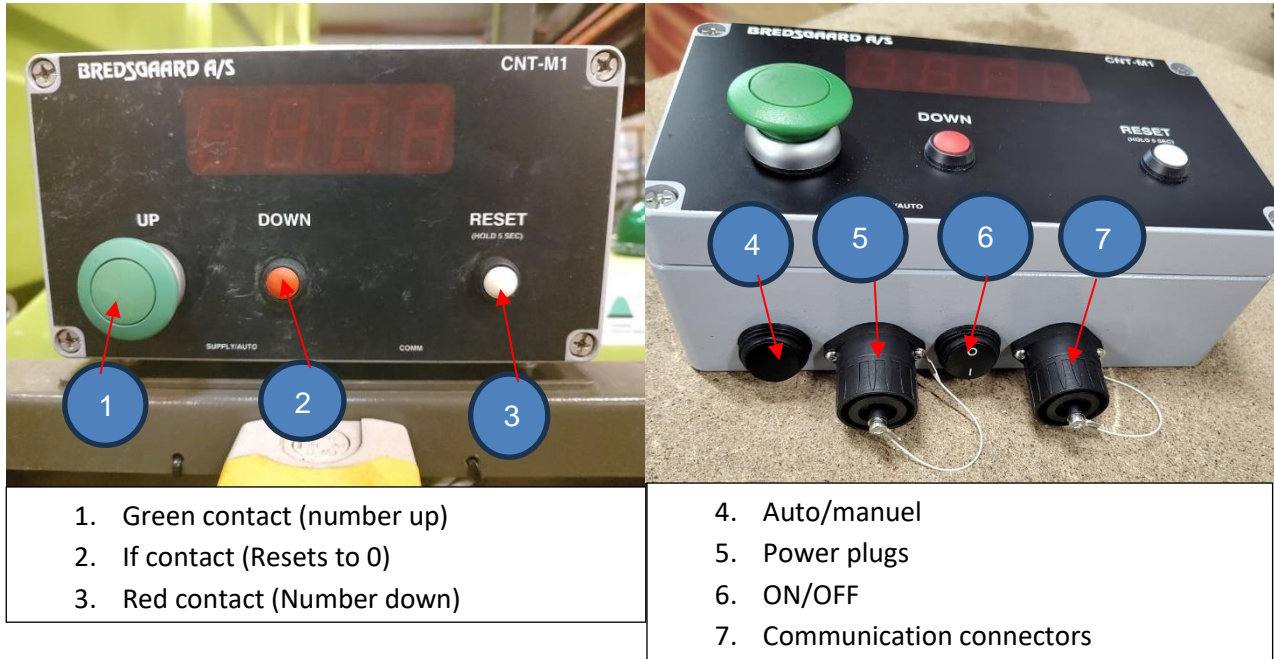
The communication connector is mounted in the comm and pulled between the 2 counters.

Adjusting the counting time:

The time when a new count can happen can be adjusted

1. Hold down the reset and down contact while switching on the counter on the ON/OFF contact
2. The number on the screen is time in seconds and is adjusted up on the green contact and adjusted down on the down contact
3. Set the counter to 0-1 sec
4. Switch off the counter
- Now the counter time is adjusted

Old version|



The old version works like this:

Counting trees:

Manual: Green contact is pressed and the counter is one more

Automatic: If automatic is enabled, the sensor automatically counts the trees **NOTE** the green contact cannot count when in automatic mode.

Count down: If one tree is counted too many, the red contact can subtract 1 number from the counter

Installation of power and communication connectors:

Power connector mounted in Supply

The communication connector is mounted in the comm and pulled between the 2 counters

Adjusting the counting time:

The time when a new count can happen can be adjusted

1. Hold down the red and white contact while switching on the counter on the ON/OFF contact
2. The number on the screen is time in seconds and is adjusted up on the green contact and adjusted down on the red contact
3. Set the counter to 0-1 sec
4. Switch off the counter
 - Now the counter time is adjusted

7.9.9. Emergency situations

1. Activate emergency stop
2. Switch off the tractor
3. Provide first aid if necessary
4. Call the relevant authorities

When restarting the machine, deactivate the emergency stop and reset the machine (press and hold the reset button for at least 2 seconds).

7.9.10. Restart

1. Switch off the machine
2. Switch off the tractor
3. Wait 10 minutes.
4. Switch on the tractor
5. Switch on the machine

7.10. Unblocking

When unblocking

1. Press stop on the machine
2. First try to remove the wood by pulling it through with manual claw operation
3. Then try to remove the wood by pulling it back through the funnel
4. Disassemble the Funnel and remove the tree

7.11. Place of use

Christmas tree culture and at stalls.

7.12. User environment

Note that the Christmas tree culture can be very uneven, so the operator must focus on the ground to avoid falling or tripping.

Allowable temperature range: -15°C to 30°C

Lighting in the work areas around the machine must comply with the recommendations in EN 12464 - Light and lighting - Workplace lighting - Part 2: Outdoor workplaces.

7.13. Starting up and shutting down the machine

Start-up and shutdown of the machine takes place when the tractor is switched on and off

8. Product or capacity changes

8.1. Changes to the size of the product or workpiece

- When changing the size of Christmas trees, the Funnels can be resized for customised tree netting
- For greater efficiency, the pull of the machine is changed to the either short or long pull according to the length of the tree

9. Inspection, testing and maintenance

9.1. Planned lifetime

20 years with maintenance and service performed

9.2. Spare parts, specification

For spare parts contact Tree Tech A/S

9.3. Substances used, properties

For hydraulic oil, see section 3.4

For grease, see section 3.4

Lubricating oil for chains: Preferably good chain oil with high adhesion that can withstand weather

Lubricating oil for other: Preferably a good lubricating oil that also provides protection against corrosion, e.g. WD40 or GT-7

9.4. Safe execution of maintenance operations

9.4.1. Maintenance operations that require technical knowledge or skills

During maintenance, the machine must be switched OFF and the tractor must be switched off

- Repairs to the machine, including hydraulics, electrical, PLC programming and frames.

9.4.2. Maintenance operations that do not require technical knowledge or skills

During maintenance, the machine must be switched OFF and the tractor must be switched off

- Maintenance described in section 9.11.

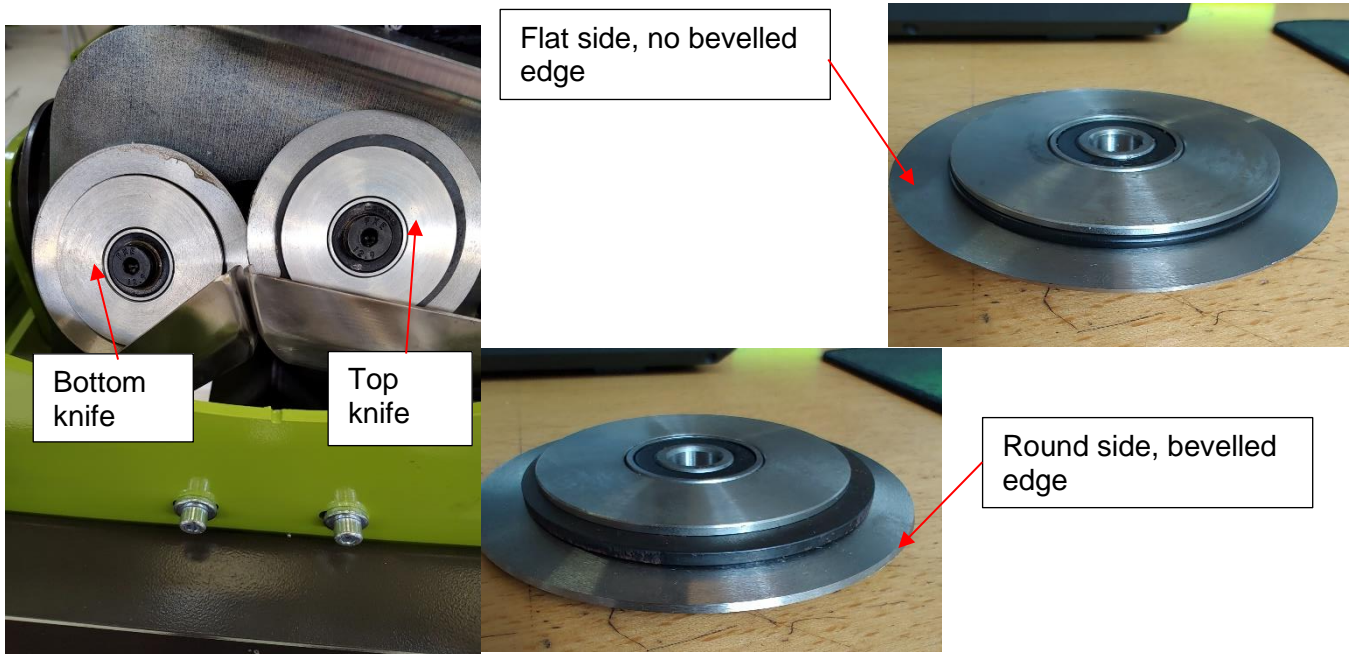
9.5. Changing the fuse:

The fuse is located in the electrical cabinet and must be replaced with a 10A fuse



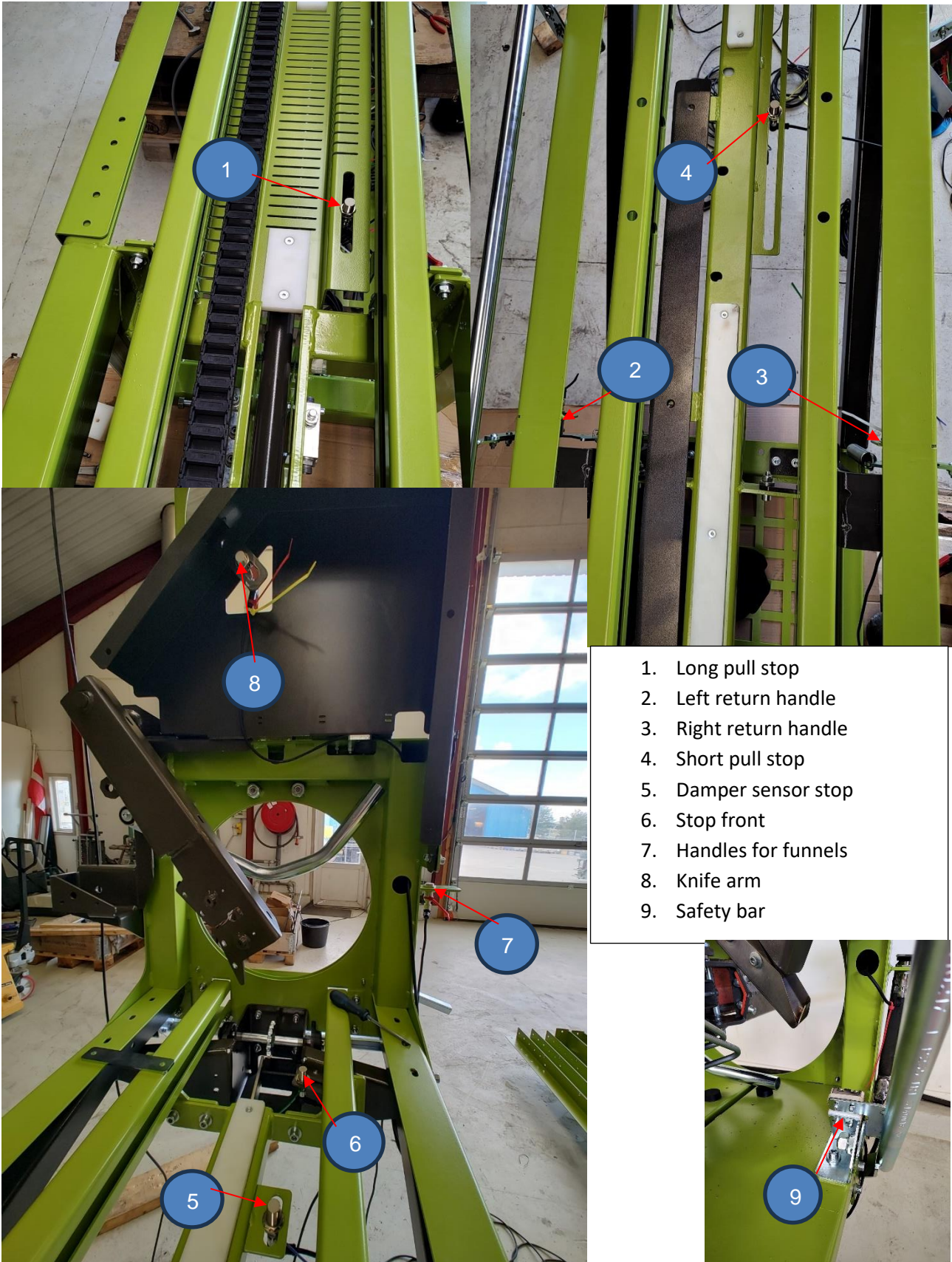
9.5.1. Changing blades

1. Loosen and remove the top blade
2. Loosen and remove the lower blade
3. Apply copper grease to the shaft part of the fitting bolt
4. Install the lower knife (the flat knife side going up) and tighten with 47 Nm torque
5. Install the top blade (flat blade side down) and tighten with 47 Nm torque

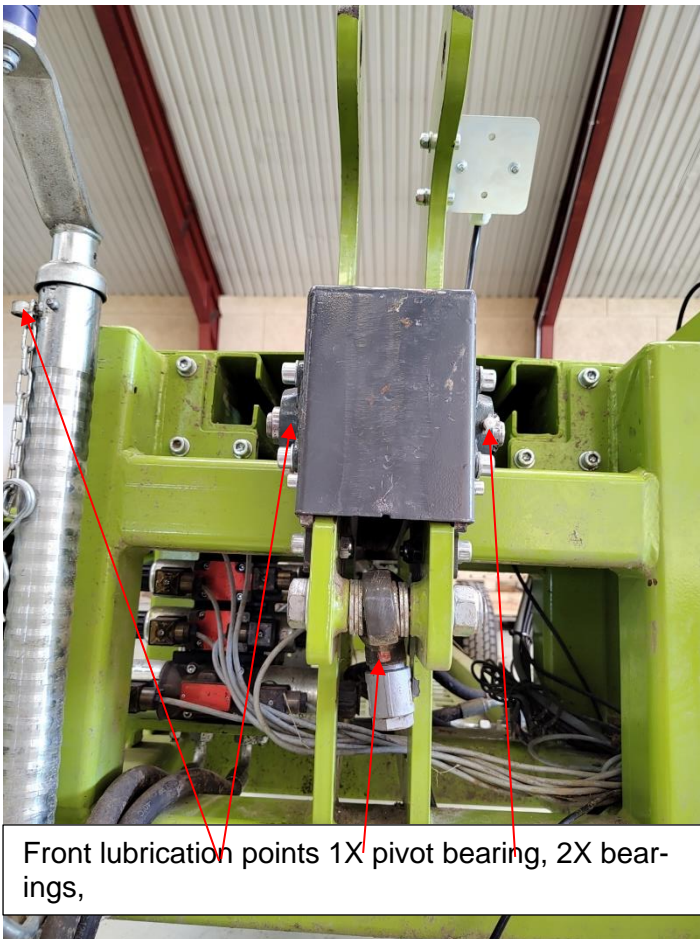


9.6. Drawings and diagrams - troubleshooting help

9.6.1. Sensor scheme



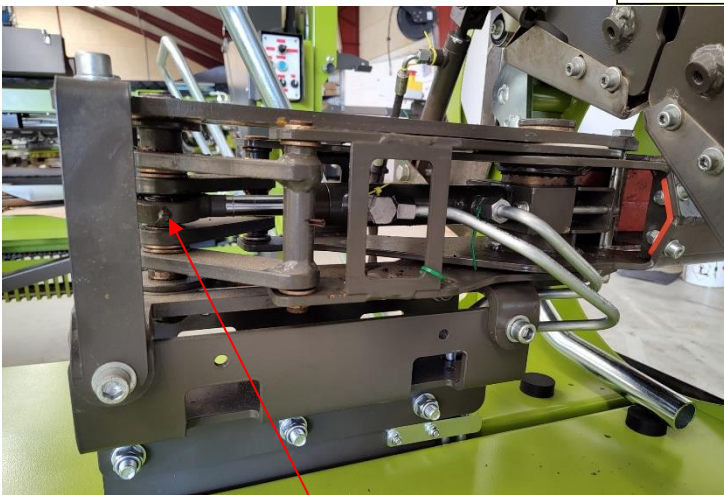
9.6.2. Lubrication schedule



Front lubrication points 1X pivot bearing, 2X bearings,



Lubrication points exchange, 1X pivot bearing, 2X bearings



Lubrication point claw, 1X pivot bearing

9.7. Equipment needed for maintenance

9.7.1. Tools and tools

- Socket wrench set with allen key and sockets
- Grease gun

9.8. Energy management

9.8.1. Disconnection and locking

Disconnecting energy is done by switching off the tractor

9.8.2. Field of action

Switch off hydraulic and electrical energy to the machine

9.9. Spare parts list

Contact Tree Tech A/S for spare parts

9.10. Maintenance plan

Daily/ongoing

Frequency	Maintenance	Commentary
On a daily basis	Test emergency stop and open emergency stop if necessary and spray contact spray to avoid condensation.	See section 9.12.
Daily and ongoing	Remove all wood and mesh stuck in gears and gearing	
Ongoing	Clean the machine	Do not use high pressure on electrical components <i>Note. Do not wash the machine if it is to be left freezing and cannot dry in time</i>

Weekly

Frequency	Maintenance	Commentary
Weekly	Lubricate pivot bearings on the hydraulic cylinders	Lubricate through grease nipples
Weekly	Lubricate all bearings	Lubricate through grease nipples
Weekly	Lubricate chain	

Before the start of the season

Frequency	Maintenance	Comments and feedback
Before the start of the season at least every 12 months	Service inspection of the machine	Please contact Tree Tech for service
Before the start of the season	Check for damage	Please contact Tree Tech for repair

Before the start of the season	Check that the bearings on the hydraulic cylinders are greased or lubricated	Lubricate through grease nipples
Before the start of the season	Check all bearings are greased or lubricated	Lubricate through grease nipples
Before the start of the season	Check chain is lubricated	
Before the start of the season	Lubricate c-profiles where sliding blocks run inside	WD-40 is used
Before the start of the season	Check tyre pressure	3 bar pressure
Before the start of the season	Tighten the chain	See section 7.3.1.
Before the start of the season	Test emergency stop	See section 9.12.
Before the start of the season	Open emergency stop and spray contact spray to avoid condensation	
Before the start of the season	Check magnetic safety switch	See section 9.12.
Before the start of the season	Check Red claws are sharp. If not, sharpen	

Before storage

Frequency	Maintenance	Comments and feedback
Before storage	Remove all nets, wood and needles in and on the machine	
Before storage	Wash and clean the machine	Do not use high pressure on electrical components <i>Note. Do not wash the machine if it is to be left Freezing and cannot dry in time</i>
Before storage	Grease pivot bearings on the hydraulic cylinders	Lubricate through grease nipples
Before storage	Grease all bearings	Lubricate through grease nipples
Before storage	lubricate chain	
Before storage	Lubricate c-profiles where sliding blocks run inside	
Before storage	Grease nose wheel	Lubricate through grease nipple
Before storage	Check tyre pressure	3 bar pressure
Before storage	Any scratches or damage to the paint should be spray painted to prevent rust.	Contact Tree Tech for the right colour and spray cans

Before storage	Check electrical wires for breaks	
Before storage	Check and tighten hydraulic fittings if necessary	
Before storage	Loosen the chain	See section 9.4.2.2.2.
Before storage	Control emergency stop	See section 9.12.

9.11. Safety-relevant inspection, testing and maintenance

9.11.1. Covered topics

- Emergency stop
- Magnetic safety switch



9.11.2. Frequency

Emergency stop: Daily when the machine is in Operation, at the latest every 12 months

Standard magnetic safety switch: Before season start, at the latest every 12 months

2-part magnetic safety switch: Before season start, at the latest every 12 months

9.11.3. Methodology

Emergency stop:

Inspection: Check for cracks and breaks.

Testing: The emergency stop is pressed very slowly, as soon as a click is heard, the emergency stop is released.

Maintenance: Before the season starts, open the emergency stop and spray contact spray to avoid condensation .

When needed open the emergency stop and spray contact spray to prevent condensation.

Ordinary Magnetic safety switch:

Inspection: Look for cracks and breaks on the body and cable. Check the magnetic safety switch is directly opposite the sensor plate.

Testing: When the machine is switched on, disconnect the magnetic safety switch. The switch must be at least 2 cm apart

2-piece Magnetic safety switch:

Inspection: Look for cracks and breaks on the body and cable. Check that the magnetic safety switches are directly opposite each other and not offset in any way.

Testing: When the machine is switched on, disconnect the magnetic safety switch. The switch must be at least 2 cm apart

9.11.4. Criteria for acceptance/non-acceptance

Emergency stop:

Inspection:

Acceptance: There are **no** breaks or cracks in the emergency stop

Not acceptance: There are breaks or cracks in the emergency stop

Testing:

Acceptance: If the emergency stop is locked after the click, it is accepted.

Not acceptance: If the emergency stop **does not** lock, it is not accepted

Ordinary Magnetic safety switch:

Inspection:

Acceptance: **There are no** breaks or cracks in the magnetic safety switch

Not acceptance: There are breaks or cracks in the magnetic safety switch

Testing:

Acceptance: When the magnetic safety switch is disconnected and reactivated, the reset button starts flashing

Not acceptance: When the magnetic safety switch is disconnected and reactivated, the reset button **does not** start flashing

2-piece Magnetic safety switch:

Inspection:

Acceptance: **There are no** breaks or cracks in the magnetic safety switch

Not acceptance: There are breaks or cracks in the magnetic safety switch

Testing:

Acceptance: When the magnetic safety switch is disconnected and reactivated, the reset button starts flashing

Not acceptance: When the magnetic safety switch is disconnected and reactivated, the reset button **does not** start flashing

9.11.5. Required actions in case of non-acceptance

Emergency stop:

A new emergency stop must be installed before the machine can be used again.

Common Magnetic safety switch:

1. The magnetic safety switch must be readjusted by trained personnel
2. To be retested
3. If still not accepted, replace the magnetic safety switch before using the machine

2-piece Magnetic safety switch:

1. The magnetic safety switch must be readjusted by trained personnel
2. To be retested
3. If still not accepted, replace the magnetic safety switch before using the machine

10. Cleaning & disinfection

10.1. Equipment and procedures needed

10.1.1. Tools, equipment, cleaning products

Brush, soap

10.1.2. Personal protective equipment

See instructions for used substance

10.1.3. Machine operating mode during cleaning

The machine must be set to OFF

10.1.4. Interrupting, diverting or isolating energy

The tractor must be switched off

10.1.5. Cleaning procedures

Clean as needed and before storage

Note. Do not wash the machine if it is going to be left freezing and cannot dry in time

Do not use high pressure on electrical components

11. Troubleshooting and repair

The machine does not move and the blue reset button is not lit:	Reason	Problem solving
1. No power	Power plug is not plugged into the tractor	Plug the power plug into the tractor
	The tractor does not supply power	Switch on the tractor
2. Emergency stop	Emergency stop is activated	Disable emergency stop and reset the machine with the blue button
3. Hydraulics	Hydraulic hoses are inserted incorrectly	Insert the hydraulic hoses correctly
	The tractor does not deliver oil	Activate oil from the tractor
4. Electrical cabinet	The fuse has blown in the electrical cabinet	Replace the fuse in the electrical cabinet
	The PLC (large black box with many wires located in the top right corner) is not lit	Contact Tree Tech
5. Sensors	A sensor is defective	Check and test sensors
6. Contacts	Shoulder switch defective/broken	Contact Tree Tech
	Shoulder switch and or emergency stop is frozen	Gently defrost the contacts, activate and deactivate emergency stop, reset the machine
7. Contact Tree Tech	Contact Tree Tech	Contact Tree Tech

The machine does not move and the blue button is lit	Reason	Problem solving
Sensors	Funnel locking handle is not fully closed	Open and close the Funnel locking handle and reset the machine
	Safety bar is not all the way forward	Push the safety bar back and make sure it comes all the way out and reset the machine
	Sensor defective	Check and test all sensors
1. Contact Tree Tech	Contact Tree Tech	Contact Tree Tech

The claw does not want to move back	Reason	Problem solving
1. Hydraulics	The tractor does not deliver oil	Check and activate oil from the tractor
2. Manual function	MiniNet is set in manual mode	Manual: Manually retract the claw using the joystick or manual button
		Automatic: turn the knob to automatic and activate the return handle

3. Sensors	Check that sensors 4 and 5 are activated when the return handle is pulled down	Adjust the sensor so that it is 2-3mm from the metal it reads on
	Sensors defective	Check and test all sensors
4. Emergency stop	Emergency stop is activated	Check and disable emergency stop, reset the machine
5. Contact Tree Tech	Contact Tree Tech	Contact Tree Tech

The claw doesn't want to hold on to the trees	Reason	Problem solving
1. KLO	The red claws are not sharp anymore	Check and sharpen claws if necessary
2. Contact Tree Tech	Contact Tree Tech	Contact Tree Tech

Knife arm does not cut nets	Reason	Problem solving
1. Knives	Incorrectly mounted blades	Check and correct if necessary. See point 9.5.1
	Knives have become dull and no longer cut	Check and, if necessary, purchase new blades from Tree tech A/S, see section 9.5.1.
2. Guide plates	Guide plates not aligned	Adjust guide plates see section 7.3.3.
3. Contact Tree Tech	Contact Tree Tech	Contact Tree Tech

11.1. Error reporting:

In case of errors or unexpected problems, please contact Tree Tech A/S

12. Disassembly, deactivation and scrapping

12.1. Interrupting, diverting or isolating energy

Tractor must be switched off or machine must be dismantled from tractor

12.2. Personal protective equipment

When handling heavy objects

Safety footwear with toe protection must be worn



When handling hydraulic oil, lubricating oil and grease:

Safety gloves that resist oil and grease



When handling claw and knives from knife arm:

Safety gloves that are cut resistant

12.3. Disassembly

When dismantling, use approved lifting equipment for parts weighing over 15 kg

12.4. Disposal

When disposing of the material, the national applicable environmental requirements must be followed, according to the applicable regulations for each type of material.

12.5. Recycling and reutilisation

When disposing of the material, the national applicable environmental requirements must be followed, according to the applicable regulations for each type of material.

13. Documents and drawings

13.1. Information from the EC Declaration of Conformity

<h2>EU Declaration of conformity (DoC)</h2>			
Machinery Directive 2006/42/EC			
Company name	Tree Tech A/S		
Address	Parallelvej 19		
Postcode and city	8620, Kjellerup		
Declaring this type of machinery type:			
- Tree Tech netmaskine			
Is in conformity with the relevant union harmonisation legislation:			
- 2006/42/EC Machinery directive			
- 2014/30/EU EMC directive			
Bent Hansen	CEO	Kjellerup	
Name	Function	Place	Date
Signature:			