Instruction Manual

MACHINERY:

Model: Mini Chopper 2020

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This manual is put together with all possible care but Heecon BV cannot take any responsibility for any inaccuracies or incomplete information in this manual or for any related consequences thereof.

Content

1. Manufacturer data

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2. Product data

2.1 General

Machinery name:	**Mini Chopper**
Year of construction:	**2020**
Serial number:	**See EC-Declaration of Conformity**

2.2 Nameplate and location

Heecon BV
Maxburgdreef 11
2321 Meer - Belgium

Machinery:	Mini Chopper
Year:	2020
No.:	XXX

3. EC-Declaration of Conformity

EC-Declaration of Conformity for the Machinery
(in accordance with Annex II.1.A of directive 2006/42/EC)

Heecon BV
Maxburgdreef 11
2321 Meer, België

Authorized representative to compile the technical file:
Name: Martijn Heestermans
Adress: Heecon BVBA
Maxburgdreef 11
2321 Meer, Belgium

Hereby declares that following product:

MACHINERY	: **Mini Chopper**
SERIAL No.	: **2020300408MI**
YEAR OF CONSTRUCTION	: **2020**

is consistent with the provisions of the following directives:

2006/42/EC	**Directive 2006/42/EC of the European Parliament and of the Counsel of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)**

as published in the Official Journal of the European Union;

and further declares that the following (parts of) harmonized standards have been applied

NBN EN ISO 12100:2010	**Safety of machinery - General principles for design – Risk assessment and risk reduction**
EN ISO 13849-1:2016	**Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design**
NBN EN ISO 13850:2015	**Safety of machinery - Emergency stop - Principles for design**
NBN EN ISO 13857:2008	**Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs**
EN ISO 4413 : 2010	**Hydraulic fluid power - General rules and safety requirements for systems and their components**

This declaration solely refers to the product in the condition in which it is introduced to trade and does not include any constituent parts added by the end user or any actions taken by the end user at a later date.

Done at: Meer Date: ……

Signiture of the authorized person:

Name: .....

Position: .....

Signature: .....

4. General terms

This machinery is designed and built according to the latest and best available techniques.

	***It is required to familiarize all users very carefully with the instructions and prescriptions in this document before starting any activity with this product. You will get the most benefit from your investment if you strictly follow the instructions for use, maintenance and inspection.***

This instruction manual belongs to this machinery and must be transferred along with the machinery to the new owner in case of a possible sale. The new owner must be made aware of these requirements. If there is a need for a new manual, for example, if yours is damaged or lost, please immediately contact the manufacturer.

4.1 Target group

The Mini Chopper may only be used by professionally trained and qualified adults that have adequate knowledge and experience regarding the installation, operation, maintenance and repair of the equipment.

The customer has the responsibility to train his/her employees according to applicable local (legal) requirements. This training of the user(s) may be provided by (a) specialist(s) of the manufacturer.

The Mini Chopper may only be operated by adults of 18 years and older who are not under the influence of alcohol, drugs and / or medication. Furthermore, it is the employer's responsibility to determine who is authorized to use the machine correctly and safely.

This manual is written on the assumption that users are familiar with similar products and the applicable terms and concepts. If the terms and definitions used are not clear to the reader, the reader should consult his / her supervisor and / or the manufacturer or an authorized representative.

4.2 Intended use

The machinery may solely be used in (glass) horticulture and with the simultaneous use of a suitable collection device for the processed material. The functionality of the machine, which falls under its intended use, is described in chapter 5 of this manual. Any other use excludes the manufacturer from any responsibility.

Normal use implies compliance with the operating, maintenance and repair conditions as prescribed by the manufacturer. The machinery may only be operated, maintained and repaired by persons who are familiar with it and who are familiar with the hazards. To avoid accidents, you must also adhere to all safety, health and hygiene regulations.

This machine is not suitable for use in areas with a potentially explosive atmosphere.

4.3 Not-recommended use or reasonably foreseeable misuse

Following operations are considered as not-recommended use or reasonably foreseeable misuse:

- Using the machine while it shows damage and / or wear;
- Intervening in the inlet openings or other moving parts without prior shutdown of these parts. The operation of the machinery does not allow complete guarding of moving parts of the inlet opening.

Residual risks are identified with warning labels and the machinery is equipped with emergency stops at critical locations;

- Working with the machinery without all safety devices in place and enabled;
- Operation, maintenance and repair of the machinery by untrained and unqualified persons;
- Locking the control levers (e.g. by tying to the machine frame) to keep the machine continuously in operation. The control levers may only be operated with human muscle power and may under no circumstances be locked;
- Changing the operating set pressures of the hydraulic system without prior consent of the manufacturer;
- Inadequate maintenance / cleaning of the machinery after use;
- Use the machinery as a stepping stone to reach other locations. Climbing onto the machinery can potentially lead to unintentional activation of moving parts;
- Inappropriate transport / relocation of the machinery;
- Any other use that is not described in this manual.

4.4 Marking conventions

Every topic in this instruction manual that deals with safety (requirements), is preceded by the following warning label:

	***Caution!*** ***Failure to comply with these instructions may result in (serious or very serious) injuries***

4.5 Liability and warranty

In no way may be waived of the abovementioned intended use without written consent of the manufacturer. Any deviation from the intended use will result in the expiration of any product liability and warranty by the manufacturer. The same applies in case of not-recommended use or reasonably foreseeable misuse.

Making changes to the product without preliminary written consent of the manufacturer is not permitted. This will also result in the expiration of the product liability and responsibility of the manufacturer. Any warranty claims from possible resulting damage will also expire. Furthermore this can have an adverse effect on the safety of the machinery.

5. Machinery assembly and characteristics

5.1 General description

The Mini Chopper is a medium sized mobile chopper suitable for shredding vegetable crops such as paprikas, tomatoes, aubergines, cucumbers ... and soft fruit such as raspberries and strawberries. This machine has a high capacity due to the 140 HP John Deere engine and is particularly strong. This makes the machine more suitable for heavier crops, intermediate crops and artificially illuminated crops. It is also a small machine and is easy to handle.

The machine is basically operated by 2 persons. A third person operates a forklift truck with a disposal container in order to empty the bunker container and remove the shredded material.

The machine is powered by a John Deere 4.5L OEM Diesel engine (Final Tier 4/Stage IV Platform). This engine is equipped with an SCR (Selective Catalytic Reduction) system for the reduction of nitrogen oxide emissions. Since 2005, European standards require to reduce pollutant emissions from diesel engines by imposing limit values for nitrogen oxide emissions. The European Euro VI standard is effective since September 2014 and aims to further reduce the environmental impact of the pollution produced by diesel engines. The SCR technology treats the exhaust gases after combustion. The harmful nitrogen oxide molecules are treated in a catalytic converter, which reduces the emission of harmful substances from diesel engines. AdBlue® controls this with the SCR system from an external tank that is not connected to the diesel tank.

When the diesel engine is running, fuel combustion causes emissions of nitrogen oxides due to the mixture of nitrogen and oxygen at high temperatures. The AdBlue® is injected into the exhaust pipe between the engine and the SCR catalytic converter. At high temperatures, AdBlue® is then converted into ammonia and carbon dioxide. When the nitrogen oxides within the catalytic converter react with the ammonia, harmful NOx molecules are converted into harmless nitrogen (N2) and water (H2O). This chemical reaction reduces the environmental impact of the engine: NOx + NH3 => H2O + N2.

The AdBlue® tank must always be filled to ensure that the SCR system works appropriately. If the tank is empty, the engine will not be able to start. A warning will appear on the engine display that you need to refill.

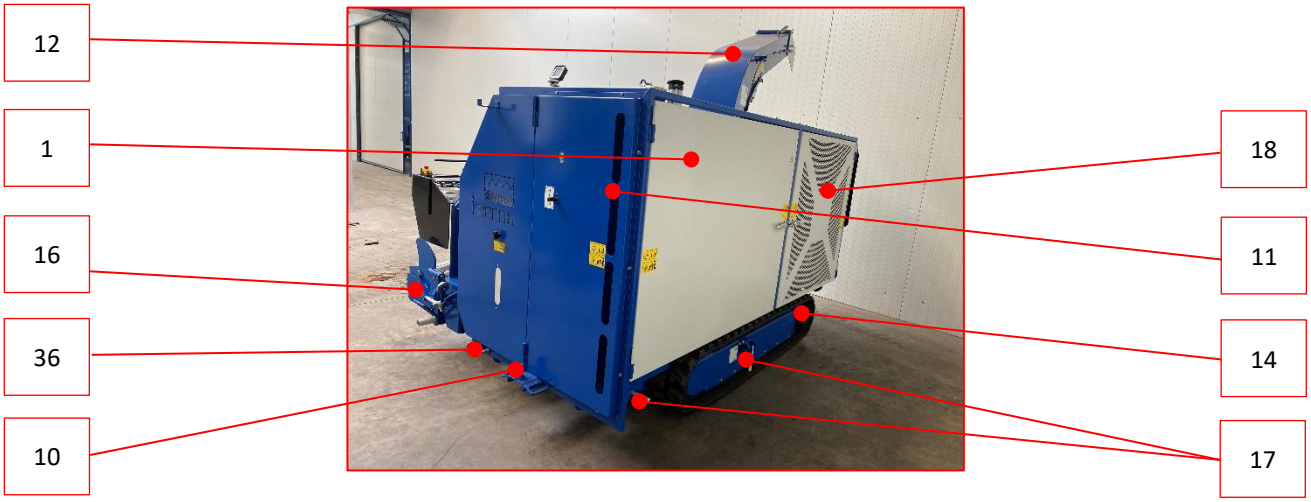
5.2 Description of the operation of the constituent parts

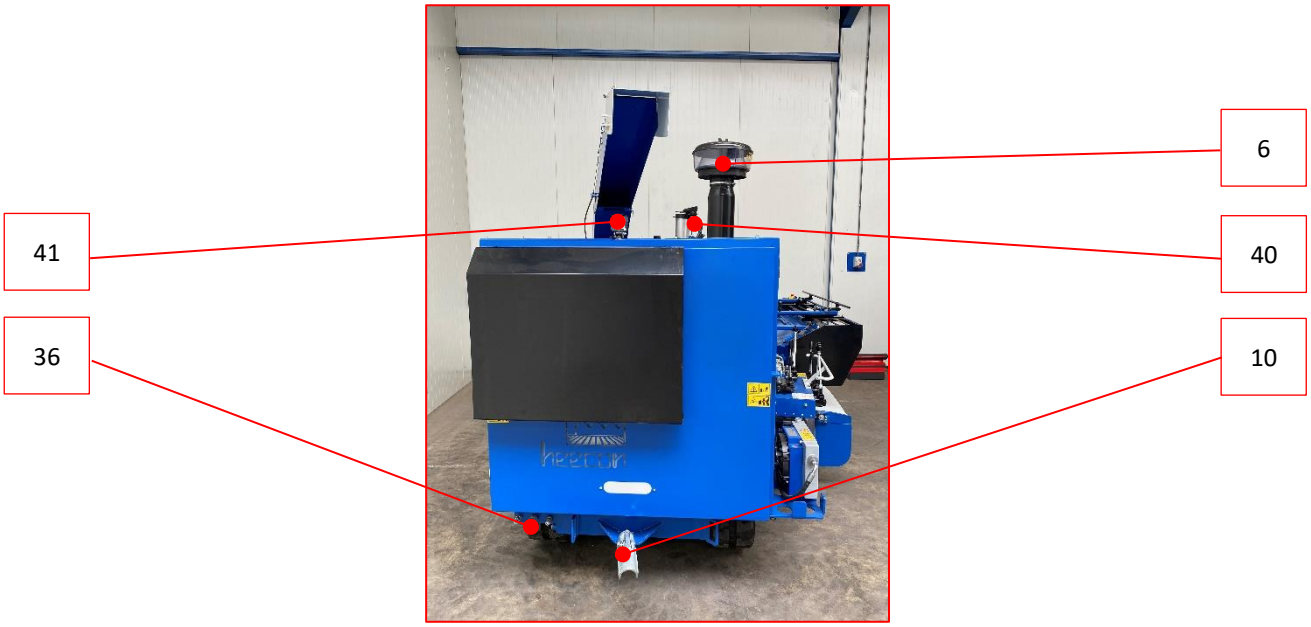
The machine consists of the machinery frame, the diesel engine with the transmission parts to drive the chopper rotor and hydraulic pump, the discharge pipe, the tracks and the control systems. The hydraulic pump drives the hydraulic motors of the moving parts for processing, such as the canvas sliding plate, the canvas coiling unit and the feed cylinders.

An overview of the constituent parts is given in chapter 5.3.

Unbounded, the crop is transported by the ground canvas to the rotating feed cylinders and chopper rotor, while the canvas coiling unit simultaneously coils the ground canvas. The crop is shredded with the chopper rotor. The shredded crop is temporary collected in the bunker container via the discharge pipe of the chopper. When the bunker container is full, it is emptied with the bunker conveyer into a suitable disposal container that is transported with a forklift, and then removed.

5.3 Components and naming



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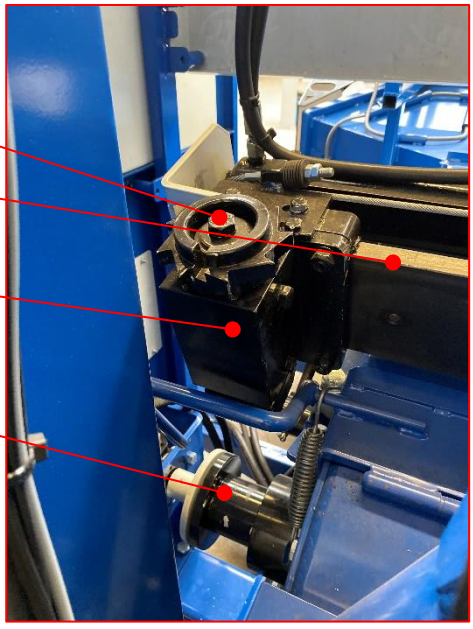
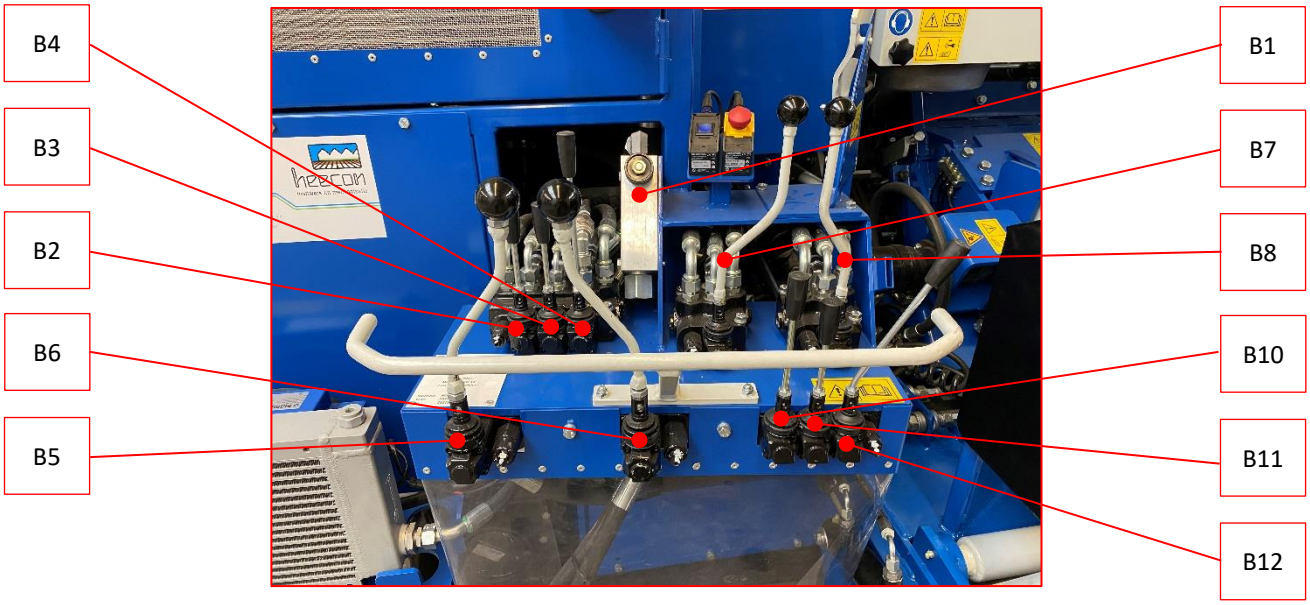

25
26
27
28

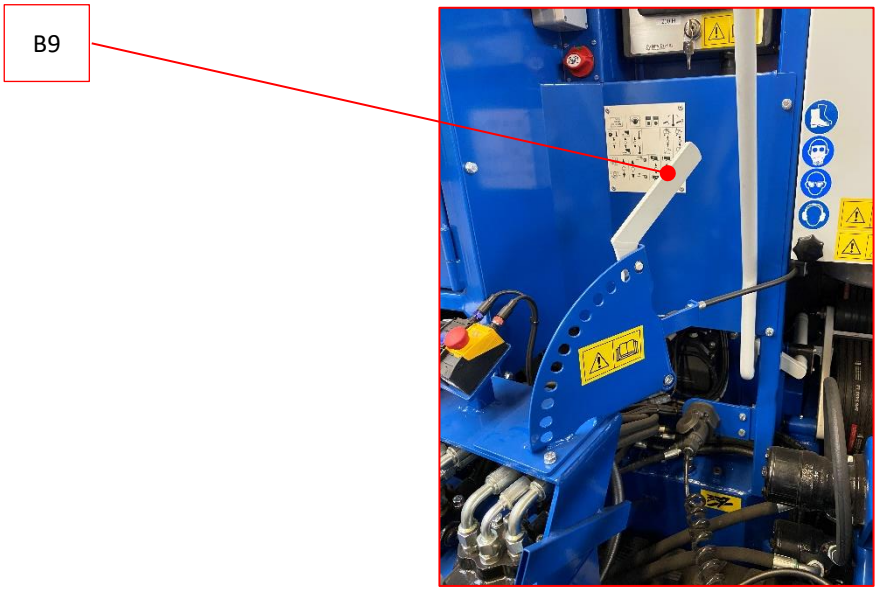
1	Movable guard discharge pipe + chopper rotor
2	Emergency stop in front of the machinery
3	Feed unit with feed cylinders
4	Canvas coiling unit (see 29 to 34)
5	Control system with hydraulic control levers
6	Cyclone air filter diesel engine
7	Display engine data
8	Cooling radiator diesel engine with fan
9	Electrical cabinet protective devices (behind movable guard back side)
10	Towbar to hook up bunker container (left and right side)
11	Diesel fuel tank with level indication
12	Adjustable exhaust flap discharge pipe
13	Discharge pipe

14	Track
15	Cooling radiator hydraulic oil (tank with hydraulic filter is located behind movable guard on the left side)
16	Locking device movable adaptor to attach and detach canvas tubes
17	Locking device extendable canvas roll-up and feed unit
18	Diesel engine John Deere (behind movable guard)
19	V-belt transmission chopper rotor
20	Clutch lever chopper rotor
21	Tensioning system V-belts
22	Chopper rotor with cutting blades
23	Hydraulic cylinder for positioning discharge pipe
24	Clamp with locking device discharge pipe
25	Height control system sharpening stone
26	Rail sharpening stone container (to move left and right)
27	Sharpening stone with container
28	Clutch hydraulic motor sharpening unit with chopper rotor
29	Hydraulic motor canvas coiling unit with adapter
30	Canvas sliding plate
31	Sliding cylinder canvas coiling unit
32	Movable adaptor to attach and detach canvas tubes
33	Movable guard above canvas coiling unit
34	Hydraulic cylinder to open and close canvas sliding plate of canvas coiling unit
35	Storage tube instruction manuals
36	Hydraulic couplings bunker container
37	AdBlue® tank (behind movable guard left side)
38	Hydraulic oil tank (behind movable guard left side)
39	Air filter
40	Exhaust pipe diesel engine
41	Lighting device

5.4 Control systems

5.4.1 Control systems main control panel





B1

Control valve feed unit speed
Turning control valve counter clockwise = decreasing feed unit speed
Turning control valve clockwise = increasing feed unit speed

B2

Control valve sharpening cutting blades chopper rotor
Lever control valve forward = reverse rotation chopper rotor
Lever control valve backward = no function

B3

Control valve extend/retract feed unit
Lever control valve forward = retracting feed unit
Lever control valve backward = extending feed unit

B4
Control valve discharge pipe
Lever control valve forward = discharge pipe moves away from machinery
Lever control valve backward = discharge pipe moves towards machinery

B5
Control valve feed cylinders feed unit
Lever control valve forward = feeding
Lever control valve backward = exporting

B6
Control valve canvas coiling unit winding and unwinding
Lever control valve forward = winding / coiling
Lever control valve backward = unwinding

B7
Control valve steering system rear tracks
Lever control valve forward = track rotates forward
Lever control valve backward = track rotates backwards

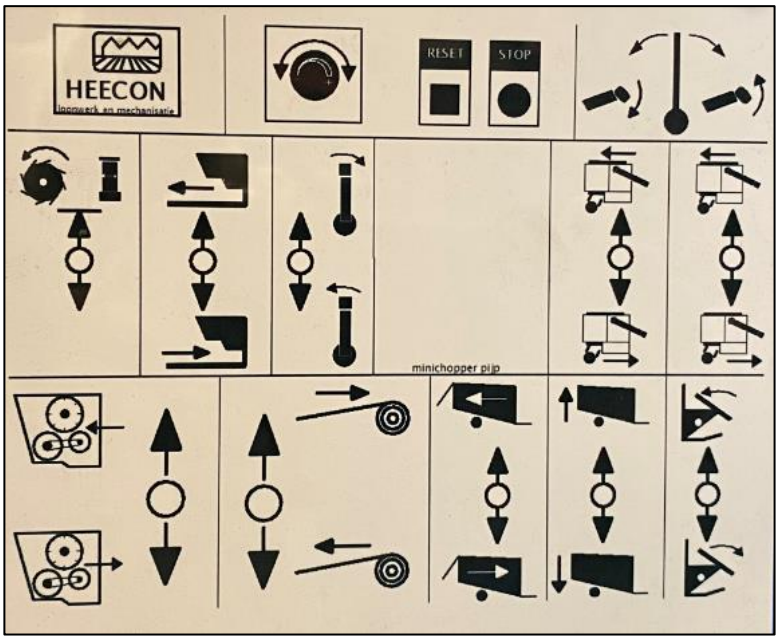
B8
Control valve steering system front track
Lever control valve forward = track rotates forward
Lever control valve backward = track rotates backwards

B9
Control lever blowing distance discharge pipe
Lever forward = flap moves downwards
Lever backward = flap moves upwards

B10
Control valve discharge conveyor bunker container
Lever control valve forward = conveyor bunker container rotates forward (clockwise) + outlet opens
Lever control valve backward = conveyor bunker container stops rotating + outlet hatch closes

B11
Control valve height control bunker container
Lever control valve forward = bunker container moves upwards
Lever control valve backward = bunker container moves downwards

B12
Control valve opening / closing canvas coiling unit
Lever control valve forward = canvas sliding plate closes
Lever control valve backward = canvas sliding plate opens



5.4.2 Other control systems

B13 **Display engine data (see instruction manual engine)**

Engine speed control

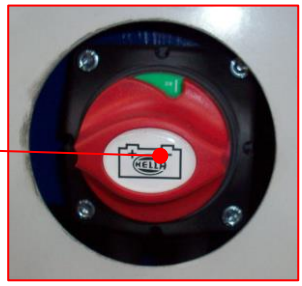
B14 Switch to the right = rpm increase

Switch to the left = rpm decrease

Ignition switch engine

B15 Key to the right = engine on

Key to the left = engine off



Main switch engine

Important note:

B16 ***When the switch is in the 'off' position, the red cover can be removed to prevent unintentional re-start.***

On/off switch for lighting

B17 Pull the switch out = lights on

Push the switch back = lights off

On/off switch fan cooling radiator hydraulic oil

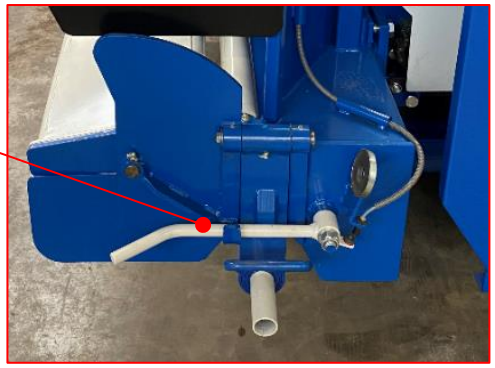
B18 Pull the switch out = fan on

Push the switch back = fan off

B19

On/off switch extraction fan coiling unit (optional)
Pull the switch out = fan on
Push the switch back = fan off

B20



Locking / unlocking lever movable adapter coiling unit to attach and detach canvas tubes

B20

Lever up = adapter is unlocked
Lever down = adapter is locked

B21

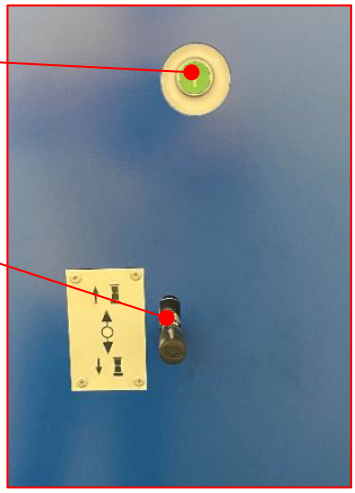
Clutch lever chopper rotor

B21

Pull the lever to the left = clutch geared
Pull the lever to the right = clutch ungeared

B23

B22



B22

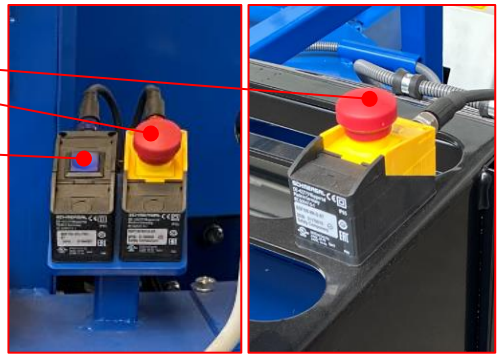
Control valve sharpening cutting blades chopper rotor
With this control valve the sharpening stone can be moved from left to right

B23

Pressure switch (hold to run) for reverse rotating of the coiling unit (with opened canvas sliding plate)

B24

B25



Emergency stop switch
Important note:
An emergency stop only stops the hydraulically driven moving parts of the feed unit, the coiling unit and the bunker container. The chopper rotor will not be stopped. The chopper rotor can be stopped by ungearing the clutch with (B21).

B24

Reset switch

B25

This switch must be pressed after a safety interlock is activated (e.g. after opening and closing a movable guard). The safety interlocks can be reset with this switch.

5.5 Characteristics drive / power supply

Electrical:
The safety circuit (emergency stops, safety switch (s)) works on battery voltage of the motor. (alternator)

- 12 V (battery voltage)

Hydraulic:

- Working pressure: 170 bar
- Maximum pressure: 200 bar

6. Safety

6.1 Safety signs

6.1.1 Meaning

Below warning labels are applied to the machine:

	***Caution!*** ***Carefully read the instruction manual before using the machine***
	***Caution crushing hazard!*** ***Do not stand between the machine and other objects***
	***Caution!*** ***Keep at a safe distance from the machine***
	***Caution objects under the influence of gravity!*** ***Do not stand underneath moving parts of the machine***
	***Caution cutting hazard!*** ***Presence of rotating parts/cutting blades under the guard***
	***Caution moving / rotating parts!*** ***Wait for the machine to stop completely before intervening***
	***Caution rotating parts!*** ***Winding hazard***
	***Caution fire hazard!*** ***No open fire/flame near hydraulic/fuel hoses***
	***Caution hydraulic oil under pressure!*** ***Risk of serious injury from penetration of skin***
	***Caution!*** ***Avoid unintentional start-up of the machine. Read the operating instructions and remove the key from the ignition switch before carrying out any maintenance or repair work.***

	*Caution hot surfaces!* *Burning hazard*
	*Wearing safety shoes is mandatory*
	*Wearing dust mask is mandatory (in case of dust formation)*
	*Wearing hearing protection is mandatory*
	*Wearing eye protection is mandatory*

6.1.2 Location

	• *Control panel* • *Movable guards* • *Guard feed unit / chopper rotor*
	• *Frontside (next to control panel)* • *Backside* • *Left and right side (next to towbar bunker container)*
	• *Frontside (next to control panel)* • *Discharge pipe* • *Backside* • *Left and right side (next to towbar bunker container)*
	• *Discharge pipe*
	• *Guard feed unit / chopper rotor*
	• *Guard feed unit / chopper rotor* • *Canvas coiling unit* • *Moving parts engine*

	• *Canvas coiling unit* • *Left and right side canvas coiling unit*
	• *Fuel tank*
	• *Hydraulic components*
	• *Control panel* • *Movable guards* • *Guard feed unit / chopper rotor*
	• *Engine* • *Hydraulic cooler*
	• *Movable guard front side*
	• *Movable guard front side*
	• *Movable guard front side*
	• *Movable guard front side*

6.2 Safety instructions

6.2.1 General safety instructions

	***In addition to the instructions in this manual, always comply with the general safety instructions to prevent accidents at the workplace.***
	***This machine may only be operated by authorized persons who:*** • ***Are at least 18 years of age*** • ***Do not use medicines that can affect their reaction time /responsiveness*** • ***Are fully informed about and have understood the operation and control of the machine.***
	***Before using the machine, a proper knowledge and application of the operating and safety instructions is strictly necessary. Familiarize yourself with the control levers and their operation before commencing the operation.***
	***Always ensure you are familiar with the meaning of the warning labels before start working with the machine. Apply new warning labels in case of damage or removal. If necessary, you can obtain these from the manufacturer.***
	***Never leave the machine unattended without first removing the key from the ignition switch.***
	***Do not use the machine in case of any damage or other deficiencies. Any damage or deficiencies must be repaired immediately.***
	***Never change the machine settings without written consent from the manufacturer. Always work with the prescribed machinery settings.***
	***The control levers may only be operated with human muscle power and may under no circumstances be locked by any other means.***

6.2.2 Electrical

	***Avoid direct contact of electrical parts with water jet or excessive moisture.***
	***Never use the machine if electrical parts are accessible (damage). Immediately replace loose or damaged electrical cables.***

6.2.3 Mechanical

	***Hazardous and moving parts of this machine are protected as much as possible by guards or other protection systems. However, due to the functionality of the machine, it is not possible to completely guard all moving parts. So always keep attention and be careful when operating the machine and always follow the safety instructions below!***
	***NEVER reach into the feed openings or other moving parts of the machine. This may result in serious or very serious injuries. Pay attention and be concentrated when operating the machine to avoid contact with rotating and moving parts. Use the emergency stop in case of emergency.***
	***Wear suitable and tight-fitting work clothes (preferably with short sleeves). Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothing, jewelry and long hair can be caught in moving parts. Wearing a hair net is strongly recommended in case of long hair.***
	***Before using the machine, check that all safety devices are working properly. Under no circumstances remove or disable safety devices or guards.***
	***Check the hydraulic hoses for damage before use. High-pressure fluids, such as hydraulic oil, can be released under high pressure, penetrate the skin and cause serious injury. In case such an accident happens, always consult a doctor immediately.***
	***During operation, only the operators (# 2) should be in the direct vicinity of the machine. Any other person must keep a larger safety distance.***
	***When moving the machine or (interchangeable) equipment, make sure that the area is clear of obstacles and the presence of persons.***
	***Only use the machine in combination with a suitable bunker container / disposal container. Under no circumstances should anyone be within the blowing range of the machine's discharge pipe.***
	***Always wear the following Personal Protective Equipment when working with the machine:***
	• ***Suitable safety shoes***
	• ***Tightly fitting safety glasses or goggles***
	• ***Hearing protection (+85dB(A))***

	• *Dust mask (P3) in case of dust formation*
	*Never exceed the prescribed maximum operating pressures of the machine.* • *The hydraulic pressure may not exceed 200 bar.* *Exceeding the maximum working pressure can cause damage to machine parts and consequently serious injuries.*
	*Only install or remove the canvas when the movable guard above the feed unit and the canvas coiling unit are fully open (the control of this feed unit is then disabled). The chopper rotor will continue to rotate in this case.*
	*Pay attention that only crops get into the machine. Remove all metal objects from the crop material before attaching the canvas or feeding the crop into the machine.*
	*During operation nobody is allowed on the canvas or crop material.*
	*Do not use the machine on a steeply sloping surfaces to avoid tilting.*

6.2.4 Other

	*Provide adequate ambient lighting to ensure optimal visibility of moving parts.*
	*Clean the machine thoroughly after use. Disinfect the machine if necessary.*
	*Always consult the Safety Data Sheet of the chemical products used for cleaning and maintenance of the machine. Carefully follow all instructions for the safe use of these chemicals.*
	*Avoid smoking or open flames in the vicinity of combustible or flammable products, e.g. during filling of hydraulic oil / diesel.*
	*Always work with the machine in well-ventilated areas. The exhaust gases from diesel engines are toxic and can cause poisoning or suffocation.*

	***Working in conditions of high temperatures / humidity can lead to dehydration, loss of attention, fatigue, etc. Timely take breaks and drink plenty of fluids.***
	***Always wear work gloves in case of exposure to hot oil hoses, for connecting and disconnecting canvas tubes and for inserting the crop / substrates. Only use undamaged canvases and always ensure correct positioning of the crops on the canvases (see 8.2 for clarification of this procedure).***
	***The machine produces noise levels that are destructive to the hearing organ. Long-term noise exposure can lead to hearing loss or deafness. Use appropriate noise protection devices such as earmuffs or earplugs.*** ***A-weighted level of the sound emitted by the machine (measured during machine operation): Lwa = 100 dB (A) (measured during machine operation)***

6.2.5 Safety instructions during maintenance, cleaning and repair

	***After each use and before cleaning, maintenance or repair work, switch off the machine and remove the key from the ignition switch to prevent accidental activation of the engine. Always follow the prescribed energy isolation procedures of the client.***
	***Under no circumstances open or remove the guards while the machine is in operation. Correctly reinstall all guards and other safety devices after cleaning, maintenance or repair.***
	***The machine may only be repaired by qualified and skilled personnel. Repairs / modifications must always be executed in consultation with the manufacturer. Only use accessories or spare parts approved by the manufacturer and described in this manual.***
	***It is not permitted to make any adjustments or changes to the machine without prior consent of the manufacturer.***
	***Avoid spills of chemical products to prevent environmental contamination. Always use suitable containers. Dispose all waste according legal environmental regulations.***
	***Wear suitable cutting gloves when handling / servicing sharp machine parts.***
	***Always wait with manipulations (maintenance) on hot systems until they have sufficiently cooled down to avoid the risk of burns. The engine is equipped with an exhaust filter cleaning system (SCR - selective catalytic reduction). During the exhaust filter cleaning, the engine and combustion gases can reach temperatures that are high enough to cause severe burns. Also avoid inhaling the combustion gases. For more information, please refer to the engine instruction manual.***

	***Always comply with the safety precautions of the battery. Always use electrically insulated tools and always wear chemical resistant protective gloves and appropriate eye protection when working with the battery. The acid in the battery electrolyte can cause burns to eyes and skin.***

6.3 Safety provisions

Diesel engine safety devices:
The diesel engine is equipped with multiple safety devices. For more information, see the included John Deere engine owner's manual.

Fixed guards:
All moving parts are protected to the utmost with fixed and movable guards to prevent injuries. The fixed guards can only be loosened and removed with suitable tools. Fixed guards must be reinstalled appropriately when the machine is put back into operation.

Emergency stops:
If an emergency stop is pressed during operation, all hydraulic functions of the machine stop. The machine can only be started again with the control levers after unlocking and resetting the emergency stops.

Important note:
An emergency stop only stops the hydraulically driven moving parts of the feed unit, the coiling unit and the bunker container. The chopper rotor will not be stopped. The chopper rotor can be stopped by ungearing the clutch with (B21).

Safety switches on movable guards:
All movable guards are equipped with safety switches in order to stop dangerous moving parts of the machinery if these guards are opened.

Overpressure protection:
The hydraulic equipment is by standard protected against overpressure (200 bar).

7. Instructions for assembly, installation and connection

The following assemblies and connections have to be made:

7.1 Assembly bunker container

- Position the bunker container so that the ball coupling can be connected with to the tow bar **(10)** of the machine.
- Stop the machine according to 8.1.2 until the engine has come to a complete stop.

- Connect the hydraulic hoses of the bunker container on the left or right side of the machine with the quick couplers **(36)**.
- There are 3 couplings provided:
  - 1 coupling for the height control of the bunker container
  - 2 couplings for the conveyor and the outlet hatch of the bunker container (if bunker container is equipped with an outlet hatch)

Note:

- If coupling is difficult, the remaining pressure in the hoses can be dissipated by moving the corresponding control valve **(B11)** forwards and backwards.

- Put the bunker container in the highest position with **(B11)** at the start of the operation. (The machine must first be started for this: see 8.1.1)

7.2 Disassembly bunker container

- Put the bunker container in the lowest position with **(B11)** at the end of the operation.
- Stop the machine according to 8.1.2.

- Disconnect the hydraulic hoses of the bunker container from the quick couplers **(36)**.

Note:

If disconnection is difficult, the remaining pressure in the hoses can be dissipated by moving the corresponding control valve **(B11)** forwards and backwards.

- Disconnect the ball coupling of the bunker container from the towbar **(10)** of the machine.

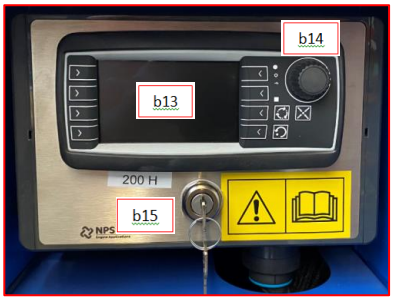
8. Operating and control instructions

8.1 General

8.1.1 Starting the machine

Important!	***Consult the engine instruction manual for more information regarding the starting and normal operation of the engine.***

	• Ensure that the clutch of the chopper rotor is not engaged. To do this, pull lever **(B21)** to the right.
	• Switch on the engine's main switch **(B16)**

	• Start the engine by turning the key of the ignition switch **(B15)** to the right (wait for a moment after the first stroke to allow the engine to preheat sufficiently)
	• Run the engine at 1200rpm until it is sufficiently warmed up (85-97°C).
	• Adjust the engine speed. The speed can be adjusted in 2 ways:
	  • Adjust the speed of the motor with **(B14)**
	  • Adjust the speed via fixed speeds as shown on the display **(B13)**

8.1.2 Stopping the machine

Important!	***Consult the engine instruction manual for more information regarding the stopping and normal operation of the engine.***


- Disengage the clutch of the chopper rotor. To do this, pull lever **(B21)** to the right.
- Let the engine idle at 1000-1200rpm for 2 minutes to cool before stopping. If the cleaning process of the SCR system has just taken place, the idling should be extended to 4 minutes. If maintenance work is carried out on the SCR after use, the idling should be extended to 10 minutes before stopping the engine.

- Stop the engine by turning the key of the ignition switch **(B15)** to the left. Remove the key to protect against unintentional start-up.


- Switch off the engine's main switch **(B16)**. If necessary, remove the red cover to prevent unintentional start-up.

Important!
Wait at least <u>4 minutes</u> before switching off the main switch or disconnecting the battery after stopping the engine! The SCR system automatically purges itself of DEF immediately after stopping the engine. If this time limit is not respected, the remaining DEF may freeze in cold conditions and damage components of the SCR system. Consult to the engine instruction manual for more information.

8.2 Working with canvases

8.2.1 Unwinding the ground canvas

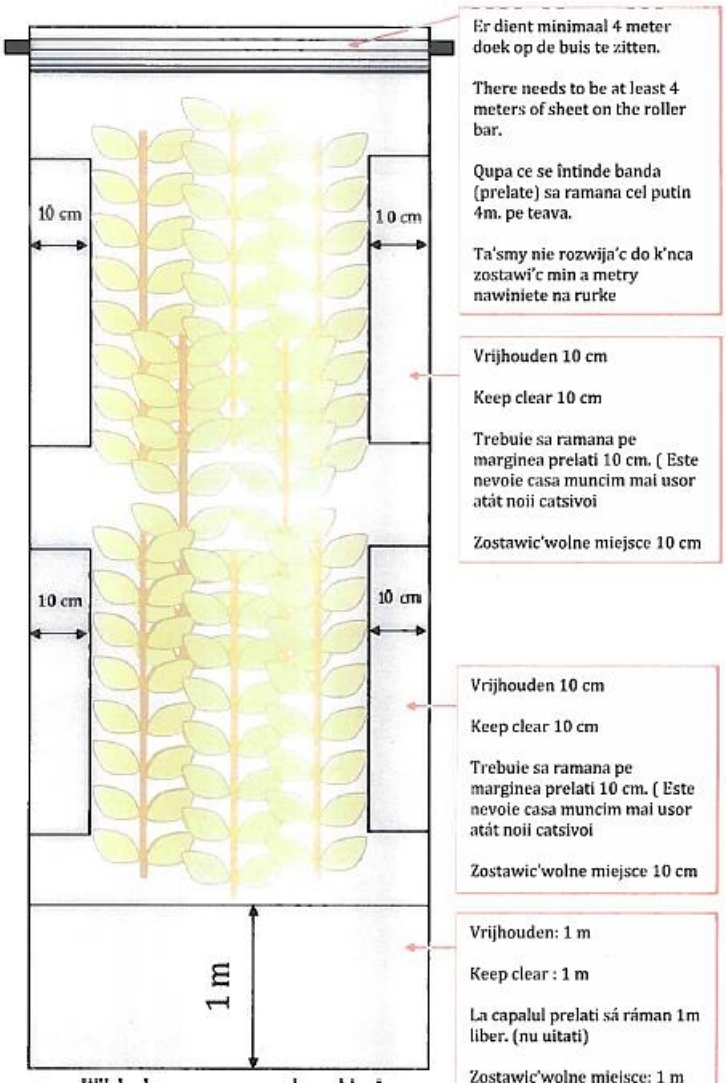
- Make sure that the canvas is always unwound in the correct way. The canvases must always leave the tube from the top. Roll out the canvas as straight and as centrally as possible. The canvas should be open over its entire width.
- Always use undamaged or correctly repaired canvases!

8.2.2 Placing the crops on the canvas

	***Besides the crops themselves, remove all other materials from the canvas before attaching it to the canvas coiling unit. Metals and/or other objects can be dangerous projectiles if they enter the chopper.***

	***The canvas should not contain any folds or tears, to avoid dangerous manual interventions when being coiled. Canvases with folds or tears make coiling difficult, which can lead to manual pulling on the canvas while coiling. This has to be avoided because in these cases the risk present to be pulled into the machine.***

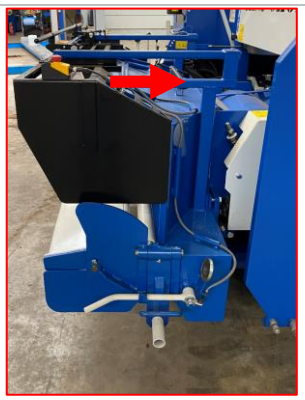
- At the end of the row at least 1 meter of canvas should be kept free of crop, so that the canvas can be safely and easily held in place
- There must be sufficient canvas on the tube for a safe attachment of the tube to the machine. The metal tube must reach the other side of the path without detaching from the canvas.
- Put the crops on the canvas so that they are equally distributed in the middle of the longitudinal direction of the canvas. The canvas should be free of crop for 10 cm on both sides. The correct positioning of the crop on the canvas is indicated on the drawing below. Avoid accumulated crop material. The above method of installation guarantees that the machine will function properly and that the canvases will last for a long time.


10 cm
10 cm
10 cm
10 cm
1 m
Er dient minimaal 4 meter doek op de buis te zitten.
There needs to be at least 4 meters of sheet on the roller bar.
Qupa ce se întinde banda (prelate) sa ramana cel putin 4m. pe teava.
Ta'smy nie rozwija'c do k'nca zostawi'c min a metry nawiniete na rurke
Vrijhouden 10 cm
Keep clear 10 cm
Trebuie sa ramana pe marginea prelati 10 cm. (Este nevoie casa muncim mai usor atát noii catsivoi
Zostawic'wolne miejsce 10 cm
Vrijhouden 10 cm
Keep clear 10 cm
Trebuie sa ramana pe marginea prelati 10 cm. (Este nevoie casa muncim mai usor atát noii catsivoi
Zostawic'wolne miejsce 10 cm
Vrijhouden: 1 m
Keep clear : 1 m
La capalul prelati sá ráman 1m liber. (nu uitati)
Zostawic'wolne miejsce: 1 m

8.2.3 Attaching the canvas to the coiling unit

	***Before attaching the canvas, the coiling unit must be completely open, so that the rotating parts of the feed and coiling unit cannot be started during the attachment of the canvas.***

- Assemble the bunker container as described in 7.1.
- Start the machine according to 8.1.1

		• Open the movable guard above the canvas coiling unit **(34)** by pushing the lever backwards.
		• Open the canvas coiling unit with **(B12)**. The canvas sliding plate **(30)** is positioned vertically. If the canvas sliding plate is opened, the feed unit and the canvas coiling unit cannot be started.
		• Unlock the movable adapter **(32)** with **(B20)** to attach the canvas tube. Pull the movable adapter (gaff) **(32)** of the canvas coiling unit backwards. • If a tube has already been placed in the machine, this tube with the coiled canvas will fall on the ground.

		• Slide the metal tube of the canvas over the fixed adapter of the canvas coiling unit **(29)**.
		• Push the movable adapter **(32)** back in and close the locking device **(B20)** again.
		• Close the canvas coiling unit with **(B12).** The canvas sliding plate **(30)** will return to a horizontal position. The canvas coiling unit and feed unit can now be started again.
		• Close the movable guard above the canvas coiling unit **(33)** by pulling the lever back forward.

8.2.4 Coiling the canvas and shredding

	NEVER reach into the feed openings or other moving parts of the machine. This may result in serious or very serious injuries. Pay attention and be concentrated when operating the machine to avoid contact with rotating and moving parts. Use the emergency stop in case of emergency.

- Engage the clutch of the chopper rotor. To do this, pull lever **(B21)** to the left.
- Set the speed to 2350 rpm and then increase the speed of the engine with **(B14).**

- The feed unit and the canvas coiling unit is operated by simultaneously actuating the control valves **(B5)** and **(B6).** When the 2 valves **(B5)** and **(B6)** are pulled backwards, the feed cylinders move the crop material back out of the feed unit and the canvas unwinds. Pushing forward the control valves **(B5)** and **(B6)** inserts the plant material into the chopper by simultaneously winding the canvas in the coiling unit and rotating forward of the feed cylinders of the feed unit. This is the normal operation of the machine. Releasing these valves immediately stops the feed unit and canvas coiling unit.
- The speed of the feed unit can be controlled with the control valve **(B1)**.
  - Turning anticlockwise = increases the feed unit speed
  - Turning clockwise = decreases the feed unit speed

- Control valves **(B7)** and **(B8)** control the crawler tracks and therefor the position of the entire machine (see 5.1). With this you control the correct positioning of the canvas on the canvas sliding plate **(30)**.

- If necessary, the coiling unit can be reversed with the 'hold-to-run' switch **(B23)**, while the canvas sliding plate **(30)** is opened.

Important to note:

The capacity of the machine is partly determined by the machine operator, as well as by the nature of the crop (dry, fresh, weight, ...). The greatest capacity is achieved by an equal distribution of the crop material (avoid the accumulation of crops). The coiling speed of the canvas is determined by the amount of crop material placed on it. The insight of the machine operator is very important:

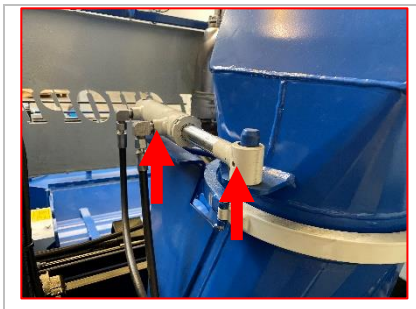
- Equal feed of the crop material increases the capacity, extends the life of the machine, ensures a safer way of working and reduces the risk of tears and unnecessary wear.
- Sharpening and adjusting the cutter blades regularly is very important. The point of time is mainly determined by foreign materials that do not belong in the chopper (metal objects, plastic, nylon, rock wool and other materials besides crop materials)

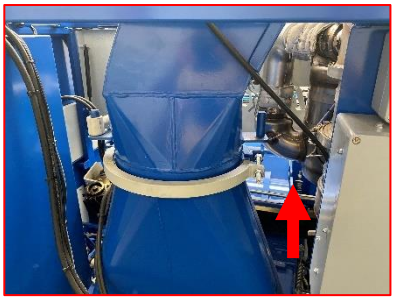
8.2.5 Pointing the discharge pipe

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***

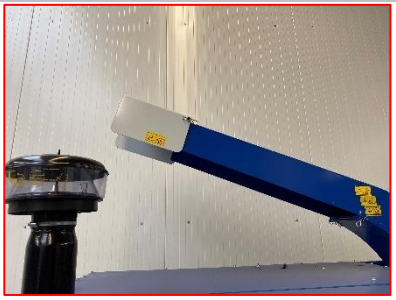
	***Only use the machine in combination with a suitable bunker container. Under no circumstances should anyone be within the blowing range of the machine's discharge pipe.***

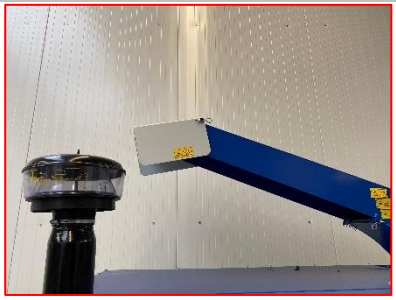
	***During operation, only the operators (# 2) should be in the direct vicinity of the machine. Any other person must keep a larger safety distance.***





- The bunker container can be attached to both the left and right side of the machine. The blowing direction of the discharge pipe **(13)** is set depending on the side to which the bunker container is attached. This is done as follows:
  - Stop the machine according to 8.1.2
  - Lift the hydraulic cylinder **(23)** out of the mounting pins
  - Turn the discharge pipe to the side to which the bunker container is attached. To do this, loosen the fastening clamp slightly.
  - Slide the hydraulic cylinder **(23)** back into the mounting pins after changing the position. Then retighten the retaining clip.
    - If the discharge pipe is pointing to the right, the hydraulic cylinder must be placed on the left side of the discharge pipe
    - If the discharge pipe is pointing to the left, the hydraulic cylinder must be placed on the right side of the discharge pipe
- Start the machine according to 8.1.1
- The correct blowing direction can then be set hydraulically with the control valve **(B4)**.





- The blowing distance of the shredded material is determined by the position of the adjustable exhaust flap **(12)** of the discharge pipe **(13)**.
- The adjustable exhaust flap **(12)** can be operated with operating lever **(B9)**.

8.2.6 Setting and operation of the bunker container

⚠	***Only use the machine in combination with a suitable bunker container. Under no circumstances should anyone be within the blowing range of the machine's discharge pipe.***

⚠	***During operation, only the operators (# 2) should be in the direct vicinity of the machine. Any other person must keep a larger safety distance.***

⚠	***Always ensure that the blowing direction and blowing distance of the discharge pipe is correctly oriented towards the filling opening of the bunker container before starting the shredding process!***

⚠	***Shredding must be temporarily stopped while emptying of the bunker container!***

For connecting the HEECON bunker container: see 7.1 and the instruction manual of the HEECON bunker container.

Depending on the amount of material in the bunker container, the height of the bunker truck can be adjusted relative to the outlet of the discharge pipe. This is done with control valve **(B11)**.

Lever control valve forward = bunker container moves upwards

Lever control valve backward = bunker container moves downwards

Always put the bunker container in the highest possible position with **(B11)** at the start of the operation.

When the bunker container is almost full, it must be emptied to a disposal container for removal of the shredded material. This is done as follows:

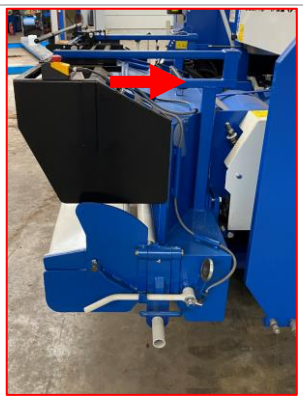
1. Stop the operation of the feed unit and the canvas coiling unit by releasing the control valves **(B5)** and **(B6)**
2. Position the disposal container with a suitable transportation device (forklift) under the closed bunker container.
3. Empty the bunker container by starting the conveyor chain, the outlet hatch of the bunker truck also opens. Operation is done with control valve **(B10)**. The operator must ensure that the disposal container is not overloaded. See load diagram for means of transport.

• Lever control valve forward = conveyor bunker container rotates forward (clockwise) + outlet hatch opens • Lever control valve backward = conveyor bunker container stops rotating + outlet hatch closes
When the bunker container is empty: 1. Stop the conveyer of the bunker container by returning control valve **(B10)** back to its normal position. 2. Move the disposal container away from the bunker container 3. Close the outlet hatch of the bunker container by pulling back the control valve **(B10)**

8.2.7 Detaching the canvas from the coiling unit

The method for removing the canvas is partly analog to the method for attaching the canvas as described in 8.2.3.

The following steps of 8.2.3 are followed again for detaching the canvas from the coiling unit:

		• Open the movable guard above the canvas coiling unit **(34)** by pushing the lever backwards.
		• Open the canvas coiling unit with **(B12)**. The canvas sliding plate **(30)** is positioned vertically. If the canvas sliding plate is opened, the feed unit and the canvas coiling unit cannot be started.
		• Unlock the movable adapter **(32)** with **(B20)** to attach the canvas tube. Pull the movable adapter (gaff) **(32)** of the canvas coiling unit backwards. If a tube has already been placed in the machine, this tube with the coiled canvas will fall on the ground.

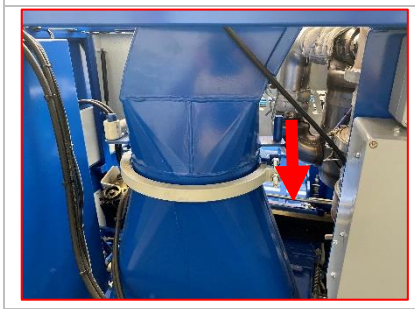
9. Maintenance instructions

	***All maintenance, repair and cleaning operation must be carried out with the engine switched off, unless stated otherwise in this manual to enable certain functions. Always remove the key from the ignition switch to prevent accidental activation of the engine.***

9.1 Emptying blocked discharge pipe

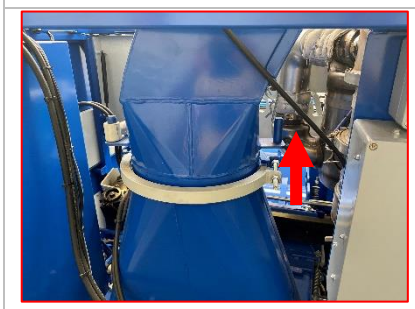
	***Only disconnect the discharge pipe after the machine has been completely switched off and the key removed from the ignition switch. Wait for the chopper rotor to come to a complete standstill. Please note that the rotation of the chopper rotor does not immediately stop at the moment the engine is switched off.***
	***Be aware of the weight of both the metal and the crop debris. Therefore, be careful that the pipe does not fall because of the heavy weight. Remove the pipe with at least 2 people, so that 1 person can support the pipe during unscrewing.***

- Stop the machine according to 8.1.2



- Unlock the bolt lock and remove the clamp **(24)** from the discharge pipe.

- Remove the discharge pipe **(13)**
- Remove the crop residues with a suitable tool. Wear cut-resistant protective gloves as protection against cuts.



- Put the discharge pipe **(13)** back in place and secure the clamp **(24)** of the discharge pipe. Lock the bolt lock again.

9.2 Sharpening the rotor cutting blades

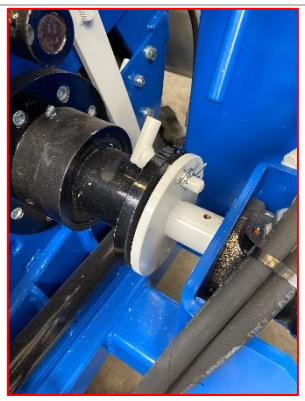
	***Unscrew the guard of the sharpening unit only after the base machine has been completely turned off and the key removed from the ignition switch. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off.***

	***Be aware of the great danger from the moving and rotating parts during sharpening. Sharpening must be carried out with the guard closed. Never sharpen when you are alone and always with the utmost caution. Never reach into moving or rotating parts with your hands while sharpening, and never wear loose clothing!*** ***Use the emergency stop in case of an emergency!***

9.2.1 Start sharpening

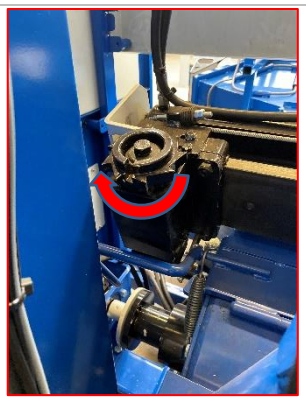
- Stop the machine according to 8.1.2.

- Open the guard of the sharpening unit on the right side and backside of the machine.



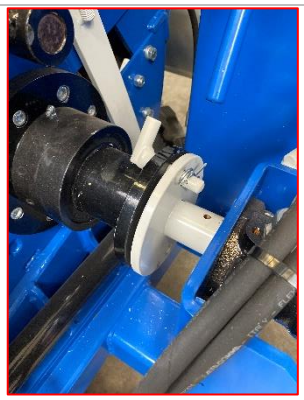
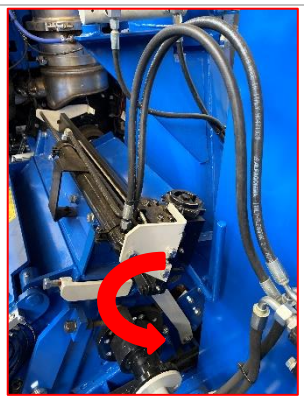
- Position the holes for the coupling bolts of the chopper rotor and the hydraulic motor of the sharpening unit so that all openings are just opposite to each other. Insert the 2 coupling bolts in the holes as shown in the picture on the right. Lock the coupling bolts with the locking pin.

- Open the protective cover of the chopper rotor with the lever so that the sharpening stone can move from left to right.

	• Screw the sharpening stone slowly against the cutting blades by turning the rotary knob **(25)** clockwise. The sharpening stone and cutting blades must touch each other.
	• Close the guard of the sharpening unit on the right side and backside of the machine.
• Start the machine according to 8.1.1. However, the clutch of the chopper rotor **(B21)** must not be engaged.	
• Activate the sharpening process by pushing the lever of control valve **(B2)** forward. Then adjust the engine speed to 1500 rpm. This causes the chopper rotor to rotate in the opposite direction.	
	• Start sharpening by moving control valve **(B22)** up and down. This moves the sharpening stone from left to right. At the end points of the movement, the height adjustment of the sharpening stone will adjust itself.

9.2.2 Stop sharpening

• Stop the movement of the sharpening stone with the control valve **(B22)** when the sharpening stone is back in its basic position on the far right.
• Stop the sharpening process by placing the lever of control valve **(B2)** in its center position. This will stop the chopper rotor from rotating.
• Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

		• Open the guard of the sharpening unit on the right side and backside of the machine again.
		• Remove the 2 coupling bolts from the holes as indicated at the photo on the right and store them in the provided storage holders.
		• Close the protective cover of the chopper rotor with the lever as indicated on the pictures beside.
		• Close the guard of the sharpening unit on the right side and backside of the machine again.

9.3 Extending and retracting feed unit

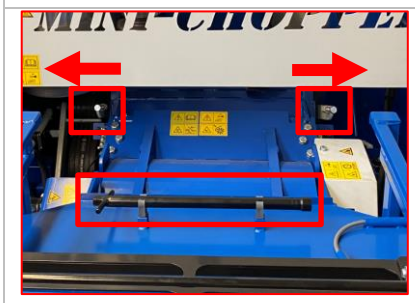
	***Beware of trapping of lower or upper limbs while extending and retracting the feed unit***

9.3.1 Extending feed unit

Before servicing the chopper unit, the feed unit should be extended forward for accessibility. This is done as follows:

- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

- Unlock the locking pins on the rear track and open them



- Disconnect the feed unit from the main machine by opening the clamps on the left and right side of the chopper rotor using the wrench.

- Start the machine according to 8.1.1.

- Extend the feed unit forward with **(B3)**
  Lever control valve forward = retracting feed unit
  Lever control valve backwards = extending feed unit

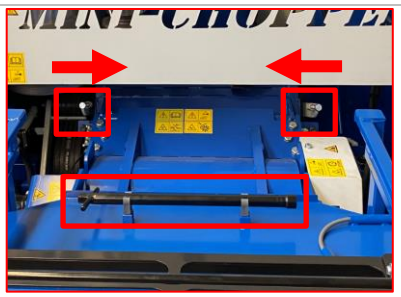
9.3.2 Retracting feed unit

- Start the machine according to 8.1.1.

- Retract the feed unit backwards with **(B3)**
  Lever control valve forward = retracting feed unit
  Lever control valve backwards = extending feed unit

- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

- Close the locking pins on the rear track and lock them again



- Connect the feed unit back to the main machine by closing the clamps on the left and right side of the chopper rotor. Finger tighten the bolts using the wrench.

9.4 Adjusting the lower cutting blade of the chopper unit

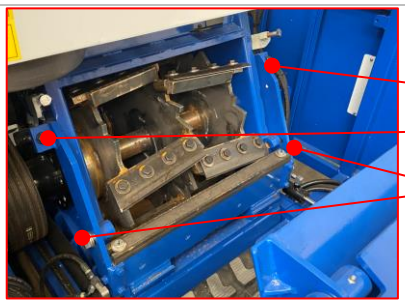
This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

Under no circumstances open or remove guards while the engine is running. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off. Replace all guards and other safety equipment properly after maintenance.

Always wear cut-resistant safety gloves while working nearby the cutting blades or other sharp installation parts.

- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.


- Disengage the clutch of the chopper rotor. To do this, pull lever **(B21)** to the right.



- Loosen the locking bolts on both sides of the chopper rotor by a half turn
- The lower cutting blade can then be adjusted as follows:
  - Loosen the locking nut on both sides of the chopper rotor by a quarter turn.
  - Tighten the adjusting nut on both sides of the chopper rotor by the same quarter turn.
  - Repeat these steps until the cutting blades of the chopper rotor slightly touch the lower cutting blade.
- Tighten the locking bolts on both sides of the chopper rotor.
- Retract the feed unit backwards again according to 9.3.2.

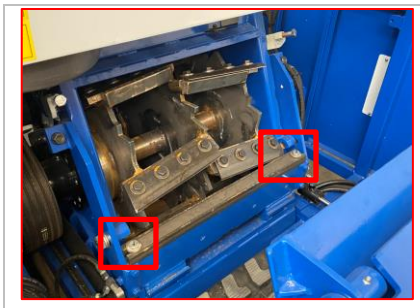
9.5 Changing the lower blade of the chopper rotor

This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

Under no circumstances open or remove guards while the engine is running. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off. Replace all guards and other safety equipment properly after maintenance.

Always wear cut-resistant safety gloves while working nearby the cutting blades or other sharp installation parts.

- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.



- Loosen the 2 fastening bolts of the lower cutting blade.
- Replace the cutting blade
- Tighten the 2 fastening bolts back to 250 Nm
- Adjust the lower cutting blade according to 9.4

- Retract the feed unit backwards again according to 9.3.2.

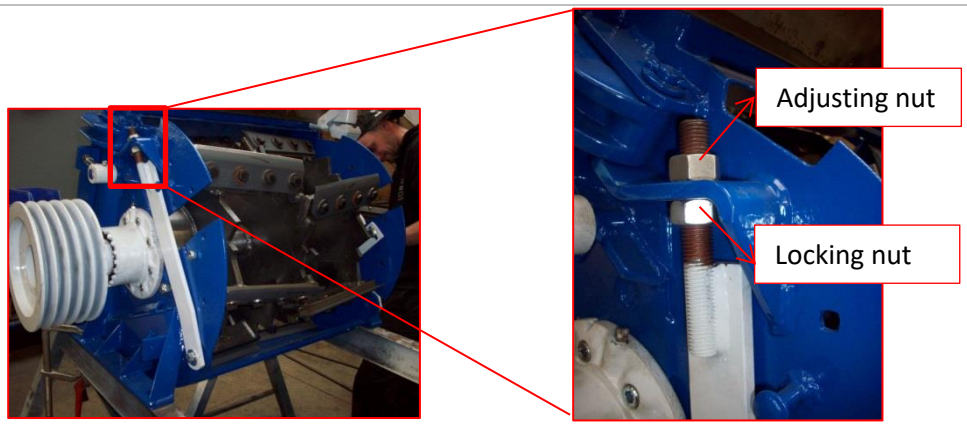
9.6 Adjusting the bottom distance of the chopper cutting blades

This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

Under no circumstances open or remove guards while the engine is running. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off. Replace all guards and other safety equipment properly after maintenance.

Always wear cut-resistant safety gloves while working nearby the cutting blades or other sharp installation parts.

- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

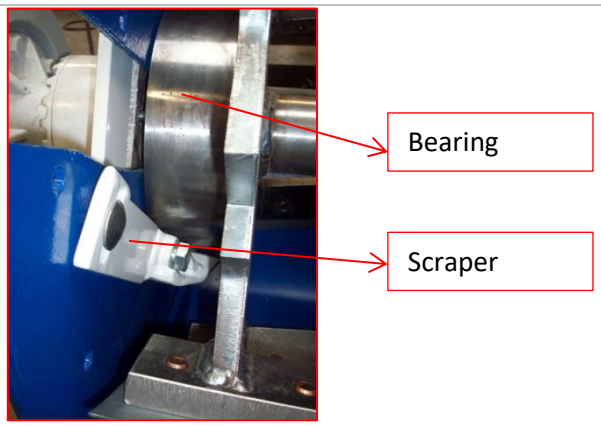


- The bottom distance of the chopper cutting blades can be adjusted as follows:
  - Loosen the locking nut on both sides of the chopper rotor by a quarter turn.
  - Tighten the adjusting nut on both sides of the chopper rotor by the same quarter turn.
- Repeat these steps until the chopper cutting blades slightly touch the base.

- Retract the feed unit backwards again according to 9.3.2.

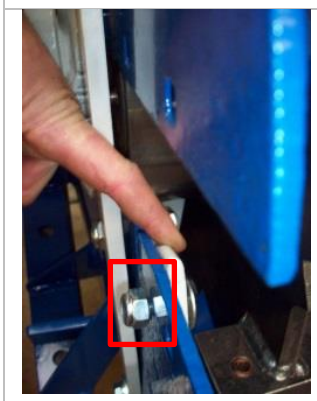
9.7 Adjusting the scraper bearings of the chopper rotor

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***
	***Under no circumstances open or remove guards while the engine is running. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off. Replace all guards and other safety equipment properly after maintenance.***
	***Always wear cut-resistant safety gloves while working nearby the cutting blades or other sharp installation parts.***



- The scrapers must touch the bearings on both sides of the chopper rotor and must be adjusted once per season. The adjustment is done as follows:
- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

- Loosen the M12 fastening nuts of the scrapers on both sides of the chopper rotor.

	• Hit the scrapers with a light hammer and chisel slightly down until the front of the scraper touches the bearings again. Do this for both sides of the chopper rotor.
	• Tighten the M12 fastening nuts of the scrapers on both sides of the chopper rotor.

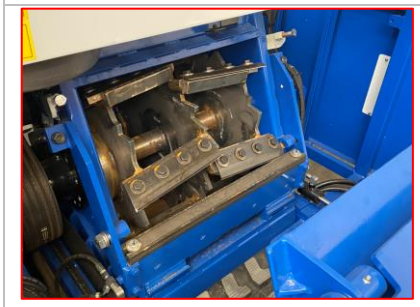
- Retract the feed unit backwards again according to 9.3.2.

9.8 Changing the rotor cutting blades

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***
	***Under no circumstances open or remove guards while the engine is running. Wait until the chopper rotor has come to a complete stop. Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off. Replace all guards and other safety equipment properly after maintenance.***
	***Always wear cut-resistant safety gloves while working nearby the cutting blades or other sharp installation parts.***
	***If pieces of the old blade have broken off, make sure that these pieces do not remain on the bottom guard of the rotor. Also make sure that nothing is left behind the guards.***

- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

- If the cutting blade to be replaced is positioned at the bottom side of the machine, turn the rotor manually until the cutting blade is in an accessible position.



- Now remove the cutting blade by unscrewing the four bolts that secure it.
- Replace the removed cutting blade with a new blade and tighten it with the 4 bolts.
- After replacing some or all of the rotor cutting blades, check whether the lower cutting blade needs to be adjusted or replaced. For adjusting the lower cutting blade, refer to 9.4 and for replacing the lower cutting blade, refer to 9.5
- Adjust the bottom distance of the rotor cutting blades in accordance with 9.6

- Retract the feed unit backwards again according to 9.3.2.

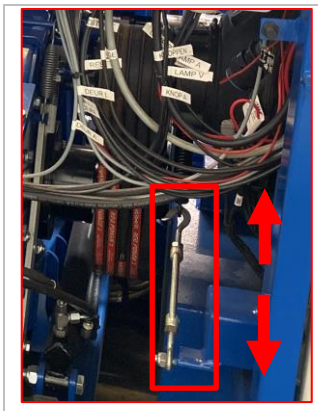
9.9 Adjusting the V-belt

Open the movable guard of the V-belt only after the engine has been switched off and the key removed from the ignition switch. Wait until the rotor has come to a complete stop.

Be aware that the rotation of the chopper rotor does not stop immediately after the motor is turned off.

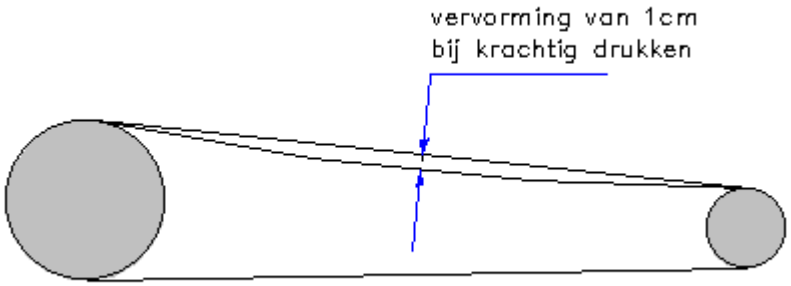
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.

- The V-belt is located behind the V-belt protective guard at the backside of the machine. Open the protective guard.



- The tension on the V-belt is controlled by moving the tensioning cylinder relative to the V-belt. This displacement is caused by the tightening or loosening the nuts of the screw thread behind the tensioning cylinder. Correct tensioning of the V-belts is essential for their service life and for the proper operation of the machine. The adjustment should be carried out by a trained mechanic.

A correct tensioning of the V-belt under normal conditions (see further) can be checked by firmly pressing the V-belt. The deformation must be within ±1 cm (see drawing below)



In order to avoid unnecessary stretching of the V-belts, it is recommended to relax (loosen) them at the end of the season.

Important to note:
What are normal conditions?
➔ *The crop to be processed is without fruit.*
What are abnormal conditions?
➔ *The crop to be processed is still fresh and has a lot of fruit (cucumbers, tomatoes, etc.). These fruits produce a lot of juice during shredding. These juices moisten the entire machine as well as the V-belts, which may cause the V-belts to slip. This cannot be solved by tightening the V-belts. Under these circumstances, the machine operator must control the feed, in such a way that slippage is prevented and the rotor remains at speed. All this increases the risk of blockage of the discharge pipe and wear on the V-belts.*

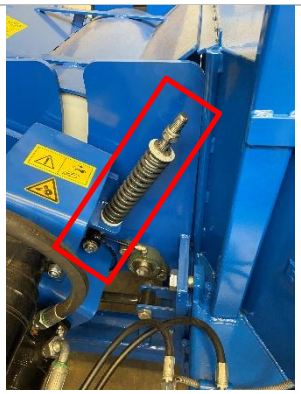
9.10 Adjusting tension of the upper feed cylinder

This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

- Depending on the volume and density of the crop to be processed, the tension on the upper feed cylinder can be adjusted.
  - In case of light crop, the tension on the upper feed cylinder should be increased. Too little tension on this feed cylinder will result in difficulties to pull the crop material from the canvas(slipping of the crop between the feed cylinders).

- In case of heavy crops, the tension on the upper feed cylinder should be reduced. In heavier crops, too much tension on this feed cylinder will lead to an overload of the hydraulic drive and eventually blocking of the crop between the feed cylinders.

- Extend the feed unit according to 9.3.1.
- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.



- The tension between the top and bottom feed cylinder can be adjusted with the spring pressure control as shown in the photos on the right.
- Tightening the adjustment nuts on both sides of the top feed cylinder will increase the tension between the top and bottom feed cylinders.
- Loosening the adjustment nuts on both sides of the top feed cylinder will reduce the tension between the top and bottom feed cylinders.
- Make sure that the tension between the feed cylinders is the same on both sides during the adjustment. So adjust both sides evenly.

9.11 Checking and refilling fuel

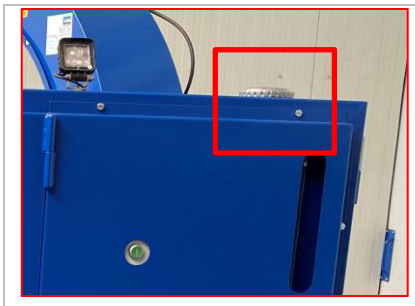
This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

Avoid smoking or naked flames in the vicinity of flammable or combustible products

Avoid spills of chemical products to prevent environmental contamination. Always use suitable containers. Dispose all waste according legal environmental regulations.

- The fuel tank is located at the rear right side of the machine.
- Check the fuel level in the fuel tank with the sight glass on the tank. Add fuel if necessary.

- Stop the machine according to 8.1.2. Remove the key from the ignition switch to protect against unintentional start of the engine.



- Open the fill opening at the top of the tank and add fuel through the opening. Avoid spilling fuel.

- If necessary, use a suitable aid (step, stepladder,…) to reach the fill opening.

9.12 Checking and refilling hydraulic oil

This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.

Avoid smoking or naked flames in the vicinity of flammable or combustible products

Avoid spills of chemical products to prevent environmental contamination. Always use suitable containers. Dispose all waste according legal environmental regulations.

The hydraulic tank is located on the lower left side of the machine behind the movable guard.

The oil level and oil filter must be inspected **before the start of each season**. Check the level with a dipstick. If necessary, add hydraulic oil through the fill opening on the tank. The normal oil level is approximately 7 cm from the top of the oil reservoir. Use Q8 Trade 68 oil or an equivalent product.

Replace the oil filter if necessary.

In the event of a leak, repair the leak and immediately increase the oil level to the original level.

9.13 Checking and refilling coolant

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***
	***Avoid spills of chemical products to prevent environmental contamination. Always use suitable containers. Dispose all waste according legal environmental regulations.***

The coolant tank is located at the top rear of the machine behind the movable guard.

The level of coolant should be checked periodically (see engine manual) and the level should be between the minimum and maximum indication on the reservoir. Add coolant, if necessary, through the fill opening on the top of the machine / reservoir.

9.14 Checking and refilling Diesel Exhaust Fluid (DEF)

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***
	***Avoid contact of DEF with eyes and avoid ingestion. Use goggles when refilling. In case of contact with the eyes, rinse the eyes with clean water for at least 15 minutes. Refer to the Material Safety Data Sheet (MSDS) of the used DEF.***
IMPORTANT!	***For additional information regarding the usage and storage requirements of the DEF, refer to the enclosed engine manual.***

		The DEF tank and DEF dosing unit are located at the left side of the machine behind the movable guard.
	The DEF tank is equipped with a level measurement. If the level in the tank is too low, this will be indicated on the engine display **(B13)** and the DEF tank must be refilled with DEF. Filling of DEF is done via the filling opening on the tank. Refer to the engine operating instructions regarding the used symbols on the engine display **(B13)**.	

9.15 Cleaning air filters

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***

	• The cyclone filter **(6)** is located on the top of the machine. • The cyclone filter should be emptied and cleaned daily after use. The level of the particles may in no case exceed the maximum indication on the filter. • Before removing the reservoir, loosen the wing nut on top of the filter.

		• The other air filter **(39)** is located on the lower left side of the machine behind the movable guard. • This air filter should also be emptied and cleaned daily after use. • To disassemble the filter cartridge, loosen the clamps and remove the front cover. • Clean the filter by blowing it clean with compressed air. • In case of permanent blockage, replace the filter with a new one.

9.16 Lubricating the machine

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***

Use normal bearing grease as a lubricant. All rotating and moving parts are fitted with a grease nipple. All lubrication points must be greased at least every 8 operating hours.
The lubrication schedule below must be adhered to:

What?	Frequency?	Location grease nipple?
Shaft canvas sliding plate	2x/day (4h)	Left and right canvas sliding plate (#2)
Bearings canvas sliding cylinder coiling unit	2x/day (4h)	Left and right canvas sliding cylinder (#2)
Hydraulic cylinder canvas sliding plate	2x/day (4h)	Joints cylinder (#2)
Movable gaff	2x/day (4h)	Joint (#1)
Bearings movable gaff coiling unit	2x/day (4h)	Bottom side movable gaff (#1)
Bearings fixed gaff coiling unit	2x/day (4h)	Bottom side fixed gaff (#1)
Tension control upper feed cylinder	1x/day (8h)	Joints both sides upper feed cylinder (#2)
Bearings feed cylinders	1x/day (8h)	Left and right feed cylinders (# 2 x 3)
Joint frame upper feed cylinder	1x/day (8h)	Left and right joint (#2)
Bearings rotor coupling	1x/week	Left and right chopper rotor (#2)
Main shaft drive V-belts	1x/week	Shaft bearing (#1)
Sharpening system	1x/week	Housing sharpening system (#3)
Bearings tension cylinder V-belts	2x/day (4h)	Left and right tension cylinder
Oil level gearbox	1x/season	
Changing oil gearbox (Orion oil)	1x/500 hours	

9.17 Cleaning the machine

	***This activity must be performed with the engine switched off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***
	***Avoid direct contact of electrical parts with water jet or excessive moisture. This can lead to electrical disturbances, which can affect the proper and safe operation of the machine.***

To ensure a long service life of the machine, the following is recommended:

- Clean the machine after every working day and after the season with a high-pressure cleaner and remove crop remains. Always wear at least a pair of goggles and waterproof protective clothing.
- Use a non-acidic or neutral detergent.
- Lubricate non-painted parts or rub them with oil
- Lubricate all joints and bearings so that moisture can escape.

9.18 Maintenance of the engine

	***This activity must be performed with the motor switched off and the battery main switch off. Always remove the key from the ignition switch to prevent accidental activation of the engine.***

For the necessary maintenance of the engine, please refer to the enclosed operating instructions of the engine.

9.19 Other periodic inspections/checks

What?	Frequency	How?
Hydraulic hoses	Before each season	Visually
Fuel level (see 9.11)	Daily	Visually
Hydraulic oil level (see 9.12)	Before each season	Visually
Level of Diesel Exhaust Fluid (DEF)	Weekly	Display John Deere
Coolant level (see 9.13)	Weekly	Visually
Safety systems (emergency stops, safety switches)	Each time before using the machine	Start the machine, check each safety system separately
Screw and bolt connections / hinge points / joints	Before each season	Lubrication

Check star couplings (#2)	Daily	Visually
Thoroughly clean the entire machine	Daily	If necessary, disassemble
Cutting blades rotor / lower cutting blade	Daily / based on use	Check / sharpen / replace
V-belts	Daily	See 9.9
Safety labels	Daily before starting work	Visual / Replace if no longer legible
General visual inspection	Daily before starting work	Visually
Engine and engine parts	Refer to engine user manual	Refer to engine instruction manual
Tension of tracks	Refer to tracks user manual	Refer to tracks instruction manual

10. Fault analysis

Fault	Cause	Measure / solution
Fault analysis diesel engine	Refer to engine instruction manual	Refer to engine instruction manual
	Key ignition switch is not pressed in properly.	Fully press key of ignition swith and turn it clockwise
	Diesel suction filters blocked	Open the suction filters / replace filter.
	Defective fuse (s)	Check fuse (s) and replace if necessary
	Air slot in fuel line	Vent fuel line (see instruction manual engine)
	Fuel (filter) or injectors is (are) contaminated	Clean fuel system, check injectors and / or replace fuel filter (see instruction manual engine)
	Oil pressure is too low Check oil level (see maintenance)	Check oil level (see instruction manual engine)
	Battery has too little voltage Use an auxiliary battery or replace the battery	Use an auxiliary battery or replace the battery
	Coolant temperature is too high	Check oil and coolant level, radiator cooling fins, V-belts fan and thermostat (see instruction manual engine)
	Starter motor, alternator and / or battery is (are) defective	Check starter motor, alternator, belt alternator transmission and battery (see instruction manual engine)
	Air filters dirty / saturated	Clean / replace air filters
Hydraulic system does not work properly	Hydraulic oil level too low	Top up the hydraulic tank with hydraulic oil (TRADE 68)
	Leak in hydraulic hose(s)	Check hoses and repair
	Hydraulic pump(s) is (are) worn	Replace hydraulic pump(s)
	Hydraulic motor(s) is (are) worn	Replace hydraulic motor(s) Check star coupling
	Hydraulic filters are contaminated	Replace hydraulic filters
Safety systems (emergency stops, safety switches) not working	Damaged / contaminated	Check connection and repair
Bunker container is not responding	Hydraulic couplings not working properly/insufficient	Check connection and repair
V-belts slipping	V-belts are wet V-belts too loose	Dry the V-belts Tension V-belts

No output shredded material Discharge pipe blocked	Blunt or defective cutting blades / wind paddle worn out	Sharpen / replace cutting blades Replace wind paddle
Oil overheating	Oil cooler contaminated / defective	Clean/replace cooler
Extreme vibration	Unbalanced shaft in chopper unit	Check parts on the chopper unit shaft
Material feed is not working properly.	Tension upper feed cylinder not set correctly.	Adjust tension upper feed cylinder
Material insufficiently shredded / difficult shredding / blockage	Cutting blades chopping rotor insufficiently sharp / damaged	Replace cutting blades shredding rotor
	Chopping rotor lower cutting blade insufficiently sharp / damaged	Replace chopping rotor lower cutting blade
	Distance between lower cutting blade and cutting blades chopper rotor too large	Adjust distance between lower cutting blade and cutting blades chopper rotor
	Bottom distance of cutting blades chopper rotor too large.	Adjust bottom distance of cutting blades chopper rotor

11. Equipment list (Spare parts)

(to be added)

12. Elektrical diagram

(to be added)

13. Hydraulic diagram

(to be added)

Never change the set operating pressures of the hydraulic system without the manufacturer's approval.