LilyMatic Lily Planter

Hans van der Poel B.V.
Veenderveld 51
2371 TT Roelofarendsveen
The Netherlands
T: +31 (0) 71 3315 278
www.hansvanderpoel.com
info@hansvanderpoel.com

Hans van der Poel B.V.
MECHANISATIE & MACHINEBOUW

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1. Manual LilyMatic Lily planter

1.1. Introduction

Congratulations on purchasing your new LilyMatic lily-planter. Read this manual and follow the instructions before using the LilyMatic lily-planter to ensure proper use of the machine.
You are responsible for the safe use and maintenance of your machine. You must ensure that you and any other person who will operate and/or maintain the machine, or who is otherwise involved in operating and/or maintaining the machine, are familiar with the operating and maintenance procedures and all safety information in this manual. This manual guides you step by step through your daily routine and makes you aware of all the measures necessary for the safe use of the LilyMatic lily-planter. Always keep this manual available for quick reference. **Hans van der Poel B.V. mechanization & mechanical** engineering continuously strives to improve its products and services. We therefore reserve the right to change the specifications contained in these operating instructions at any time and without prior notice.

1.2. Use of the LilyMatic Lily Planter

The lily planter complies with the requirements of the Machinery Directive 2006/42/EC.

The lily planter is intended exclusively for semi-automatic planting of lily bulbs. The manufacturer cannot be held liable for damage caused by use for purposes other than those specified here or by incorrect operation.

1.3. Important safety instructions and warnings

1.3.1. Installation

- Provide an electrical connection that meets the general and local guidelines (Low Voltage Directives 73/23/EEC and BS 1010).

1.3.2. Daily usage

- Only authorized and trained personnel may operate the LilyMatic lily-planter. It is not allowed for non-qualified persons to operate the machine.
- Provide a first aid kit for any accidents. Put this kits in a visible place.
- Before working with the lily planter, install all protections and safeguards and make sure they are properly secured (mechanically or electrically).
- Open the control box only when the power is turned off through the main switch.
- Call 1-1-2 (EU) or 9-1-1 (USA) for urgent assistance in immediately life-threatening situations.
- If you have further questions, contact your supplier.

1.3.3. Repairs and maintenance

- Repairs should only be carried out by professionals. Improper repairs may put the user at great risk.
- Turn off the lily planter, completely disconnect the power supply and carefully clean the lily planter before beginning any service, maintenance, adjustments or repairs.
- Make sure all electrical switches are off before turning the power back on.
- Make sure all protections are securely locked when you are finished with maintenance work.
- Replace damaged electrical wires, lines, switches or other components immediately..
- If you have further questions, contact your supplier.

1.4. Danger and Safety stickers

The safety stickers attached to the Lily Planter contain important and useful information so that you can safely operate your Lily Planter:

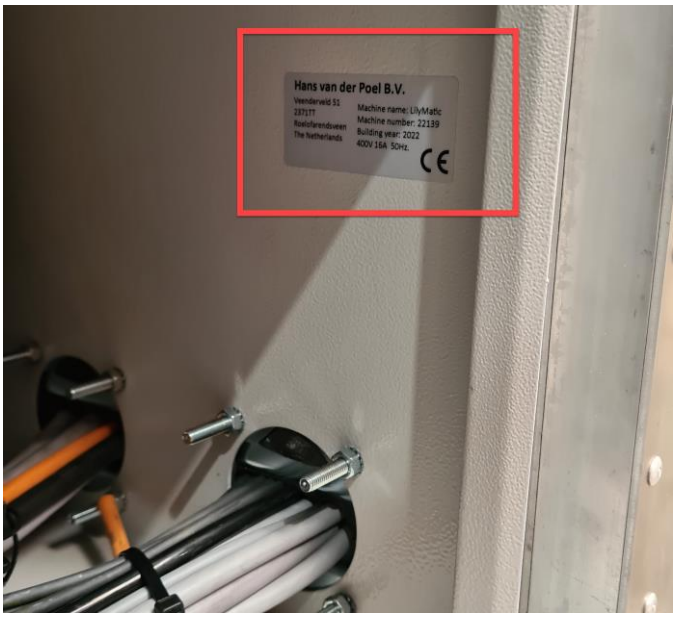
- Ensure that the safety stickers are always clean and readable.
- Replace missing stickers and stickers that have become unreadable.
- Reapply a sticker on replaced components with a safety sticker.
- Safety stickers are available at your supplier.
- The safety symbol refers to important safety warnings on the Lily Planter and in the manual. If you see this symbol, be aware of the danger of (fatal) bodily injury. Follow the instruction on the safety sticker.

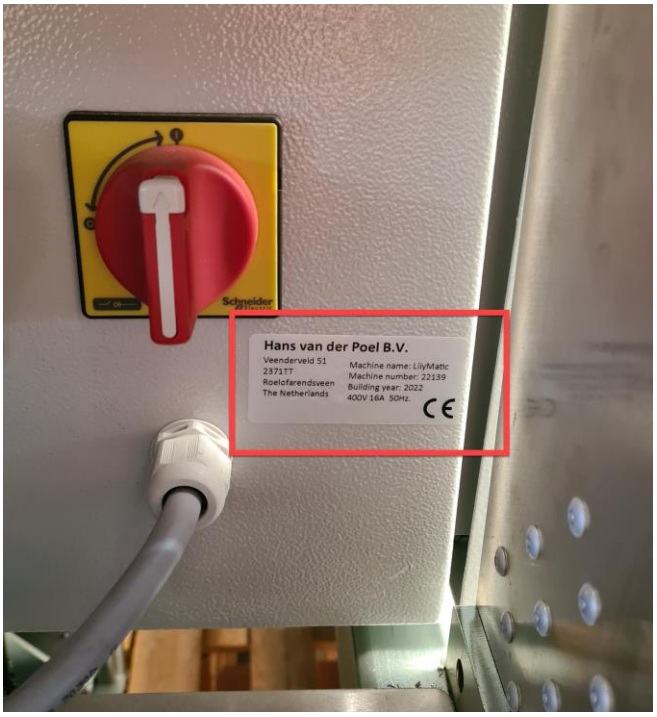
1.5. Warranty

Hans van der Poel B.V. guarantees for 1 year after delivery the reliability of the LilyMatic lily-planter delivered by it, provided it has been assembled, treated and used properly.
The warranty includes all defects to the delivered lily planter, which are the result of manufacturing faults or use of bad material. Improper use, improper or insufficient maintenance, normal wear and tear, damage from an external cause, improperly executed repairs and alterations will void all warranty liability. Components not manufactured by Hans van der Poel B.V., e.g. electronic and hydraulic components, are covered by the original manufacturer's warranty.
In case of malfunctions, damage or other complaints, always contact your supplier.

1.6. Location serialnumber

The serial number of the lily planter can be found on the inside and outside PLC control box (right side)





2. Safety features

The following safety features are provided at the lily planter:

- Emergency stop switch, located on the control panel.
- Thermal protection of the motors
- Certified security lock.
- Safety button on manual drive.

Note the use of the attention words "Danger," "Caution," "Moving parts," "Warning," in the safety warning.

3. LilyMatic lily planter

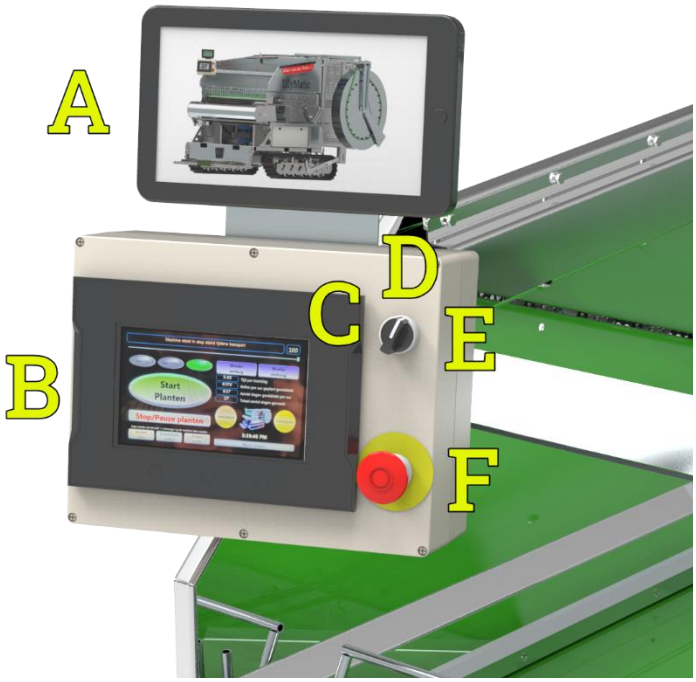
3.1. Description and operation LilyMatic lily planter

The LilyMatic is a semi-automatic lily planting machine. The machine consists of a rubber track undercarriage, a storage bunker with belt, a rotating system of bulb holders, bulb grippers and a drilling system. An elevator belt 3700x550 belongs to the machine as well, in order to easily supply the storage bunker with bulbs. The machine moves along an imaginary line of a laser system.

Method of operation:

After using the elevator to supply the bunker with bulbs and placing the laser system's signal unit in the correct position on the main path, one drives the machine to the end of the bed to be planted. Normally these caterpillars drive in the paths between the beds. However, if one starts with the " path with concrete feet of pillars", the corresponding caterpillar on this side can move up to under the machine. In this way one can plant as tightly as possible against the posts. When the end of the bed is reached, the control panel indicates that the laser system needs to be accurately adjusted. Via a wireless connection, the signal transmitter is instructed to adjust itself so that the signal enters the machine in the center of the laser transducer. With this system the machine will move in a straight line. After this, the machine is put in plant mode. The drill beam of the machine lowers until the drill plate touches the ground. From that point, the drills go into the ground to the set depth. As soon as the drilling beam rises again, the machine makes a (adjustable) step.When the machine is stationary, the system with the bulb grippers brings the bulbs to the bottom of the holes that have just been drilled. As the gripper system raises, the drilling system begins to drill the next row of holes, with the soil coming out of these holes falling into the previous holes. To sweep this soil flat again, the machine is equipped with a V-shaped slide. During these operations, the operator ensures that the lily bulbs are placed upright in the bulb holders. The cycle of drilling and planting repeats itself until one arrives back at the main path.

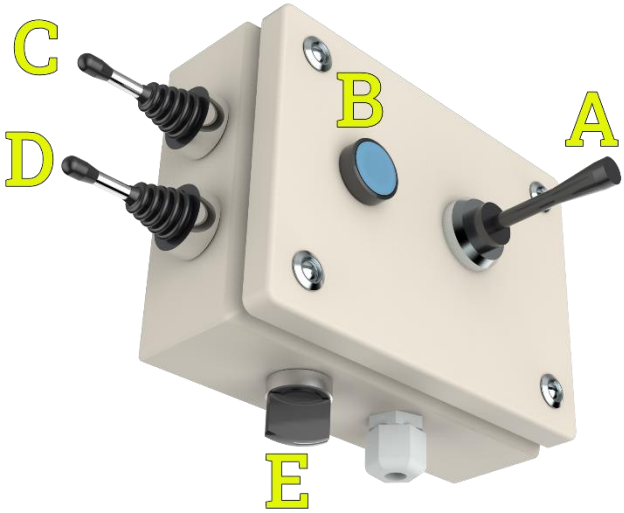
3.2. Control panel lily planter



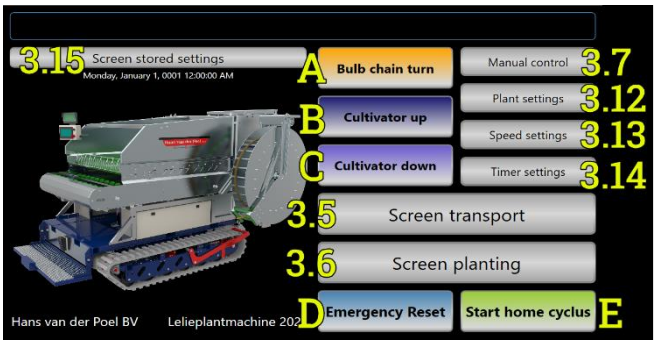
A. Display drill camera
B. Touchscreen control panel
C. Switch left → Directly to plant screen
D. Switch middle → Directly to main screen
E. Switch right → Directly to transportation screen
F. Emergency Stop

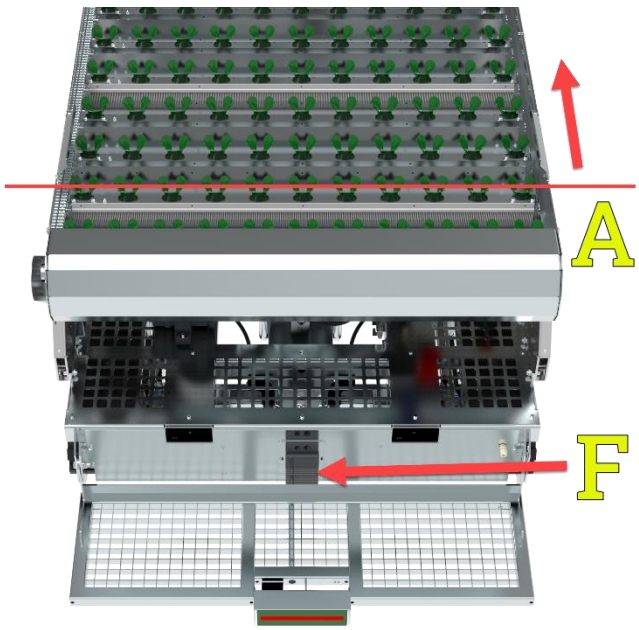
A. Joystick riding
B. Drive safety button (must be pressed while driving)
C. Caterpillar forward / backward
D. Caterpillar outward / inward
E. Left or right caterpillar selector switch
F. Reel roll up
G. Reel unrolling

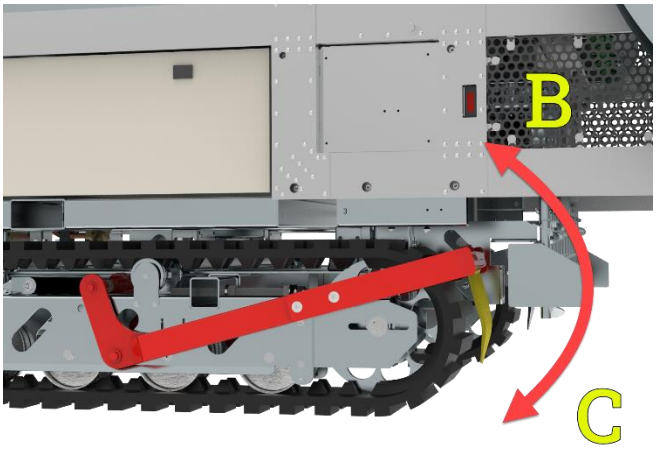
3.3. Manual Operation Lily Planter



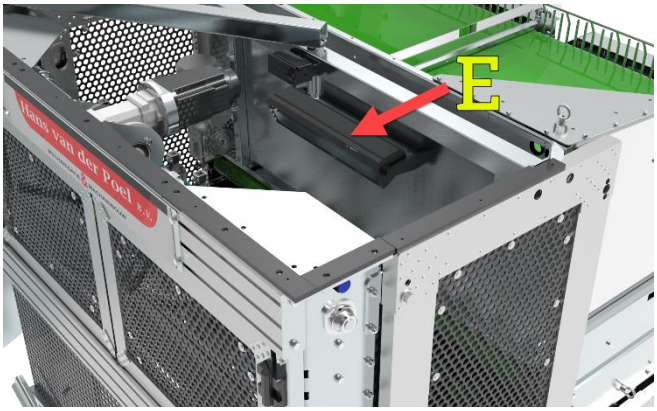
3.4. Main screen





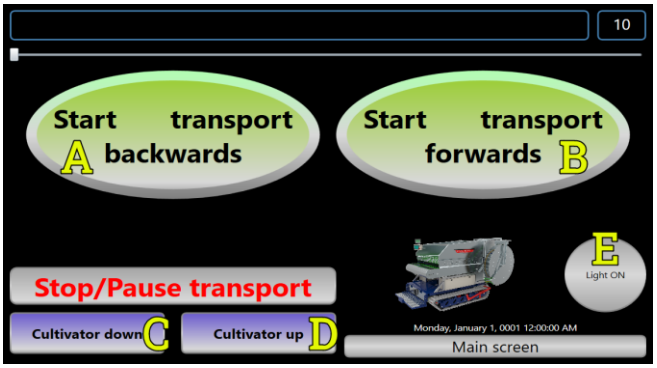


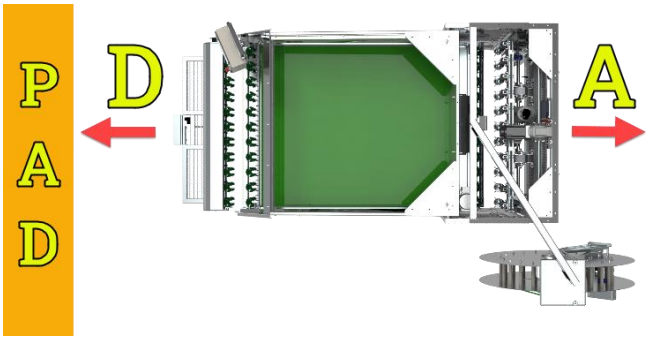
A. Turn bulb chain: pressing button moves bars with cups 1 position backwards.
B. Cultivator up
C. Cultivator down
D. Resetting the emergency stop circuit
E. In case of failure or after manual operation: all servo motors go to their zero point except the driving servo motors.
F. Foot pedal: when pressed, the bars with cups are moved backward 1 position.



E. Led lights on or off

3.5. Transportation screen



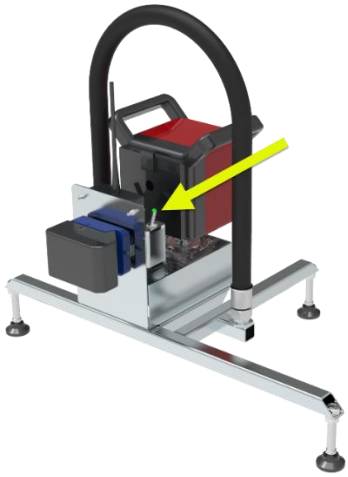


A. Start transportation tot he end of the glass greenhouse
B. Cultivator up
C. Cultivator down
D. Start transportation tot he path

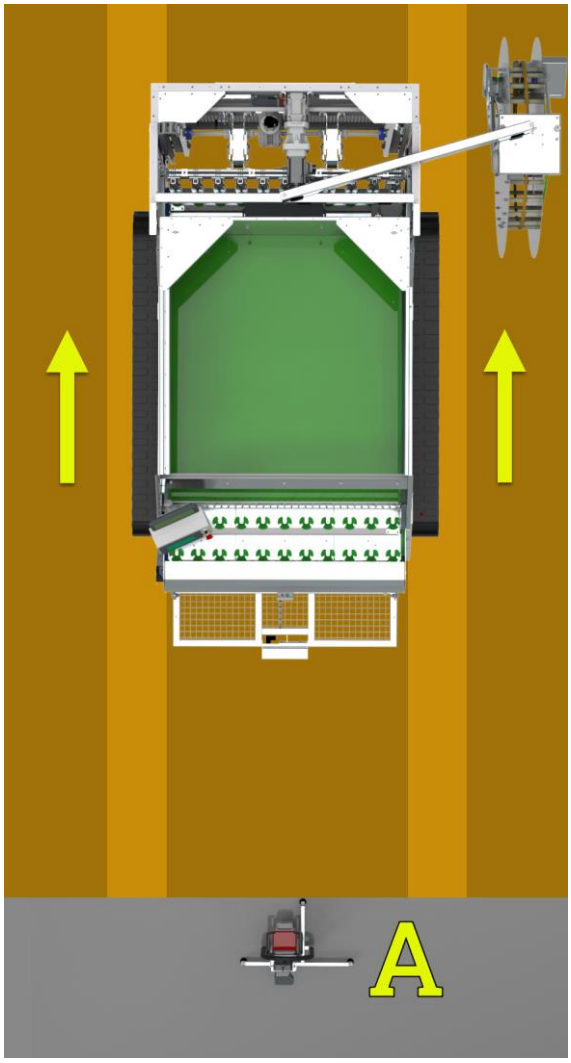
3.6. Planting screen / laser control lily planter

Laser adjustment procedure

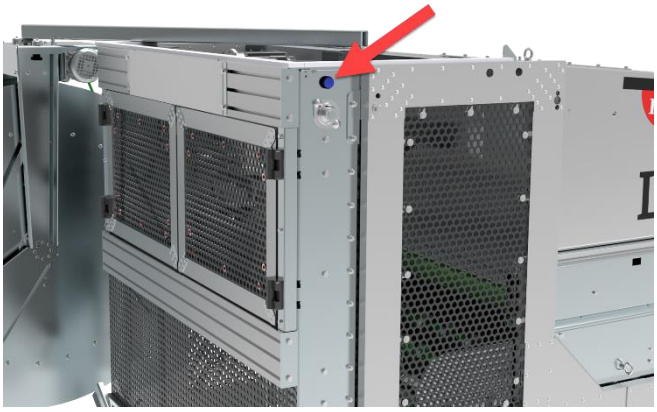
1. Place laser (A) in the center of the bed/mesh. Flip the rocker switch to turn on the electric motor. Press on/off button of laser receiver for 3 seconds so that it turns on.



2. Drive from the path to the back (center bed / mesh)



3. Drive the lily planter tight to the wall using blue jog buttons

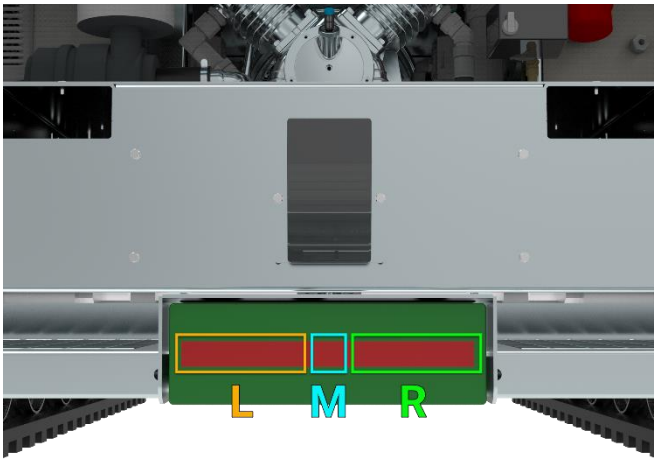


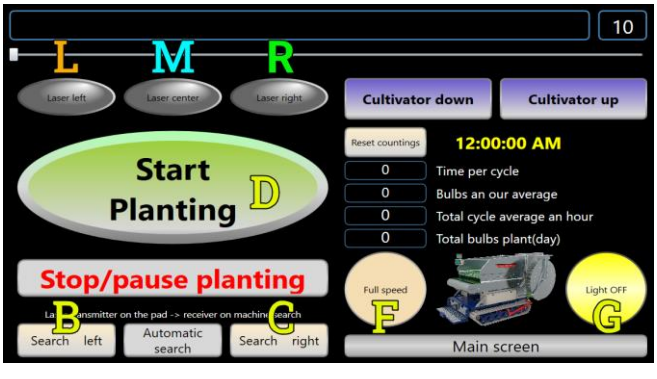
4. Remove V-shaped slide from lily planter and place against wall so it is ready for planting.

5. If the plant screen indicates 'Laser Left' (L) choose 'Search Right' (C)

   If the plant screen indicates 'Laser Right' (R) choose 'Search Left' (B)

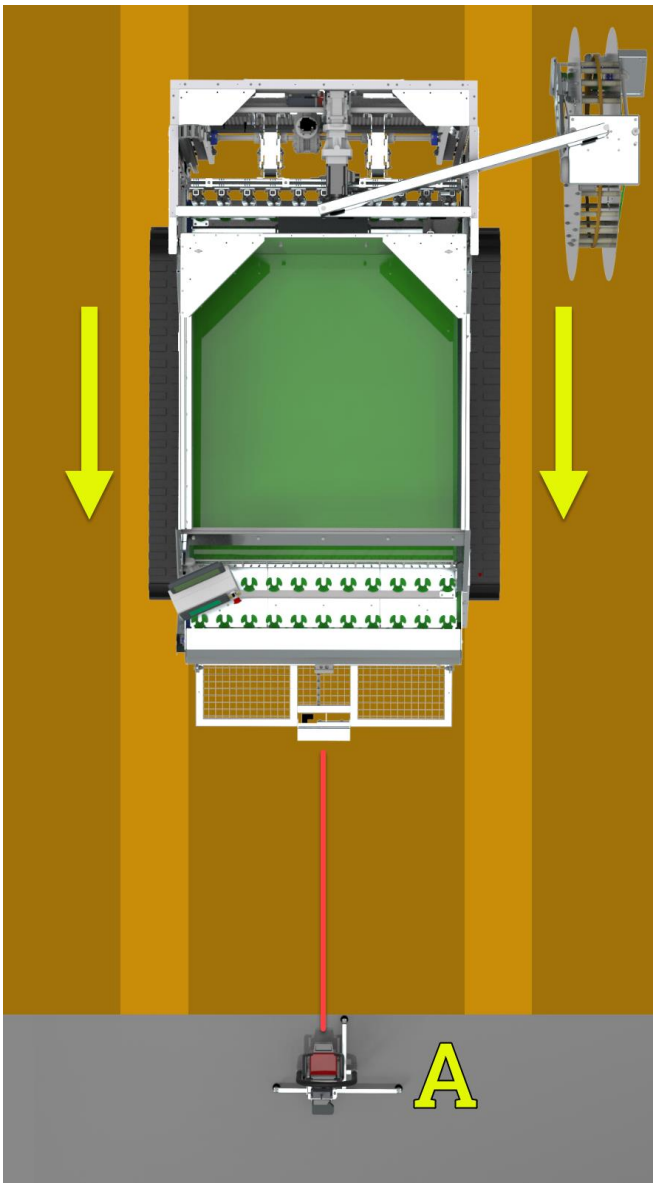
6. When the laser is found, the "Laser Middle" button (M) becomes visible

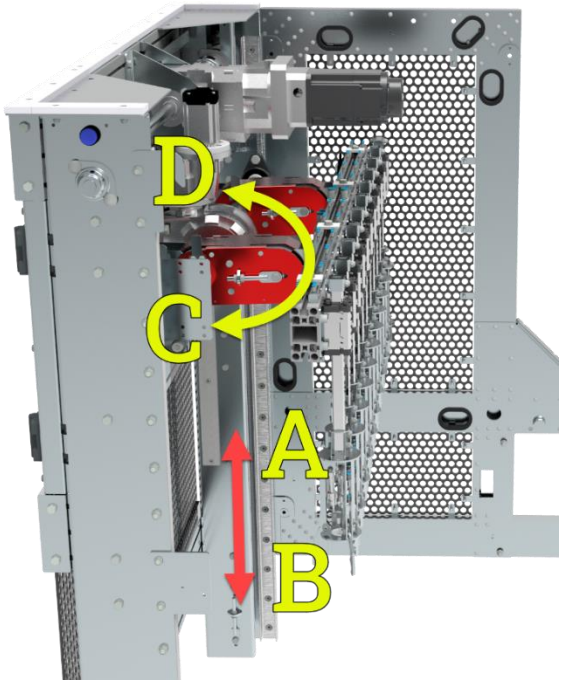


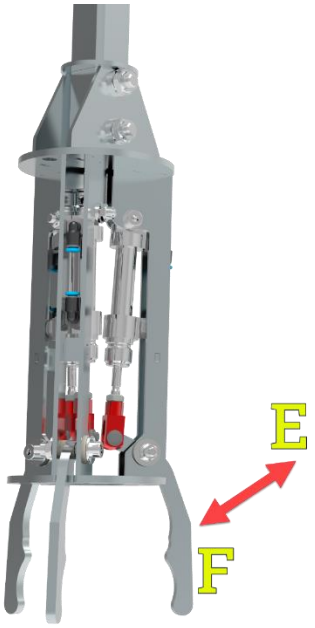


7. Press the "Start Planting" button (D).

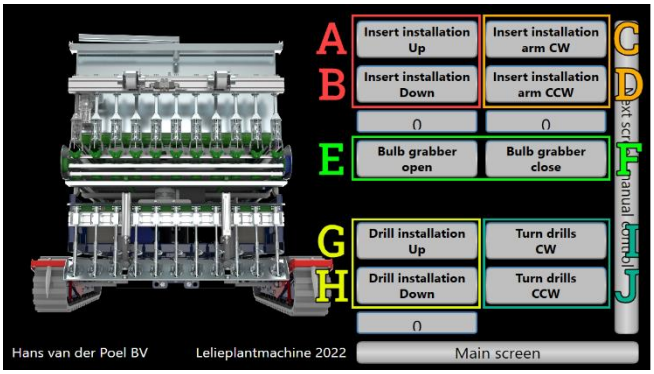
8. The button (F) can be used to switch between full speed and half speed. Half speed is useful when standing alone, for example, or when refilling bulbs with trays.

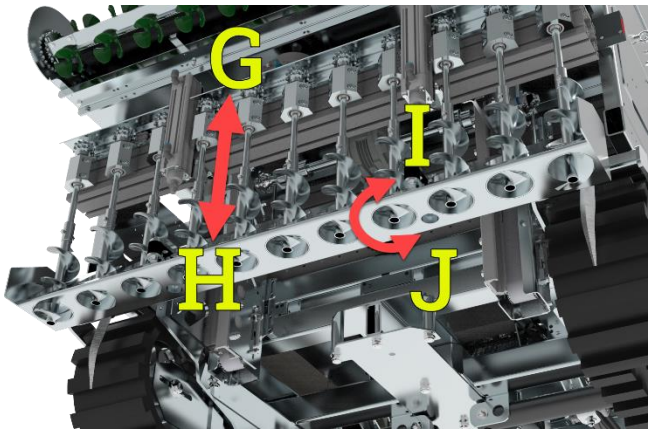




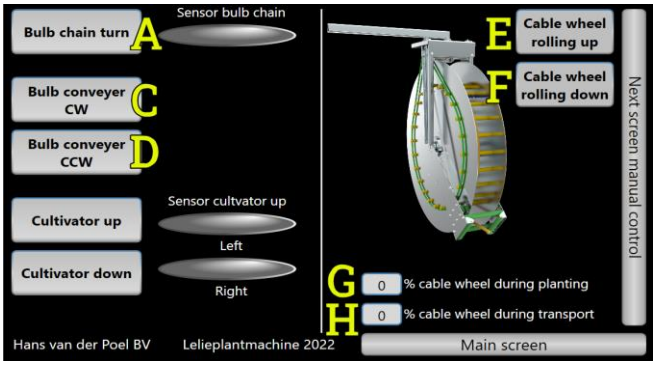


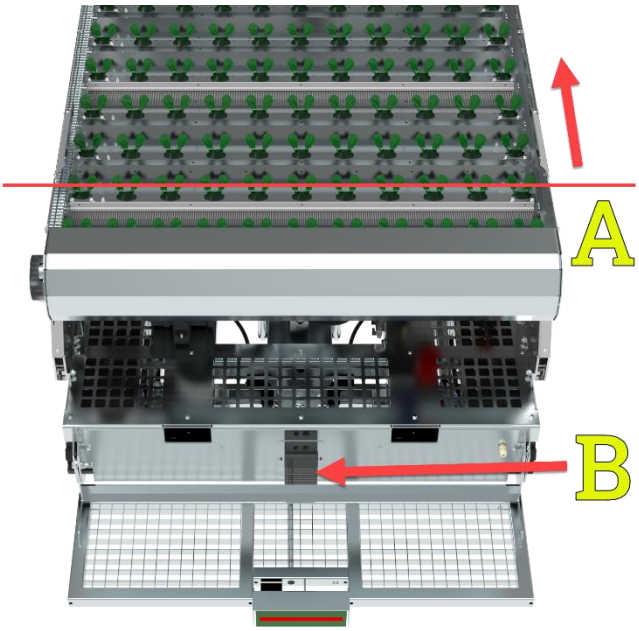
3.7. Manual control drills/grippers



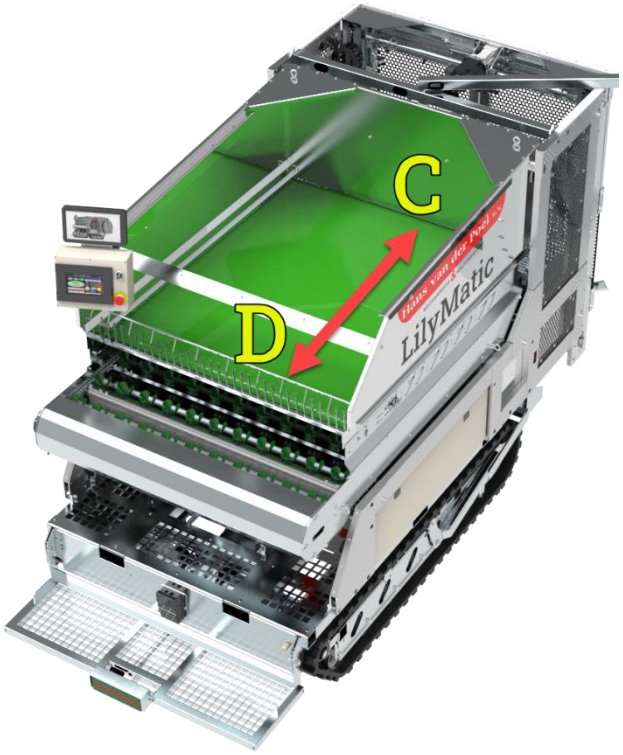


3.8. Manual control bulb chain/conveyor & cable wheel



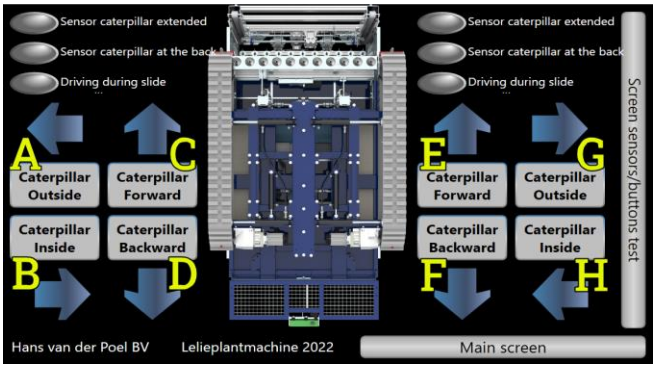


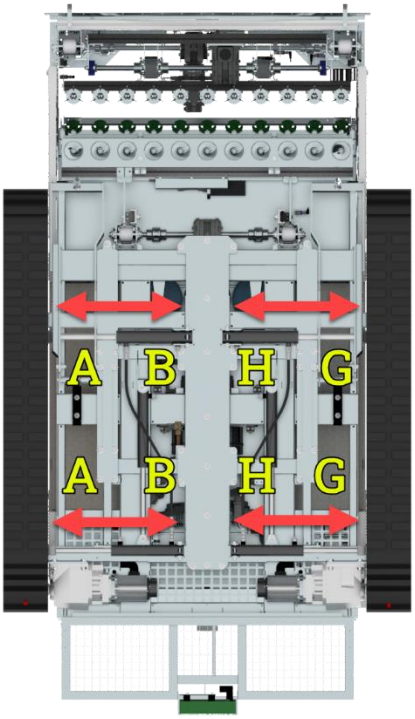
A. Rotate bulb chain: pressing button moves bars with cups 1 position backwards.
B. Foot pedal: when pressed, the bars with cups are moved backward 1 position.

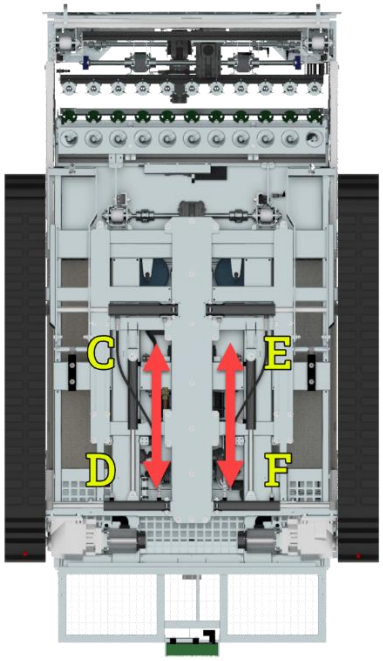


C. Bulb conveyor CW: green conveyor belt with bulbs moves backwards (C)
D. Bulb conveyor CCW: green conveyor belt with bulbs moves forward (D)
E. Manual control cable wheel rewind
F. Manual control cable wheel unwind
G. Adjustability of cable wheel winding speed during planting in percent.
H. Adjustability of cable wheel winding speed during transportation in percent.

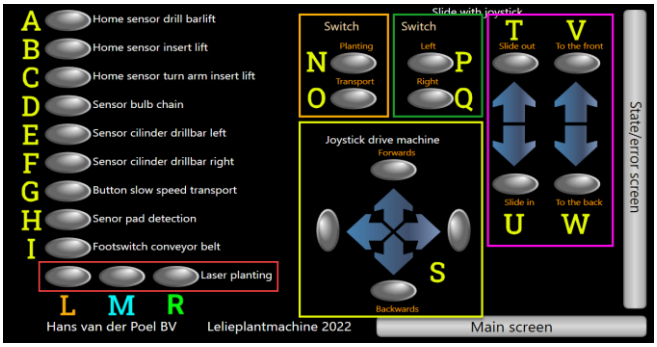
3.9. Caterpillar control

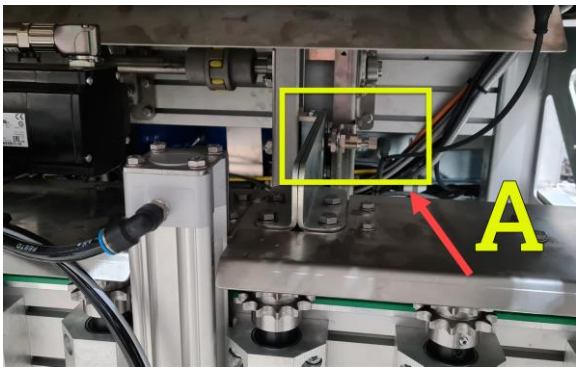


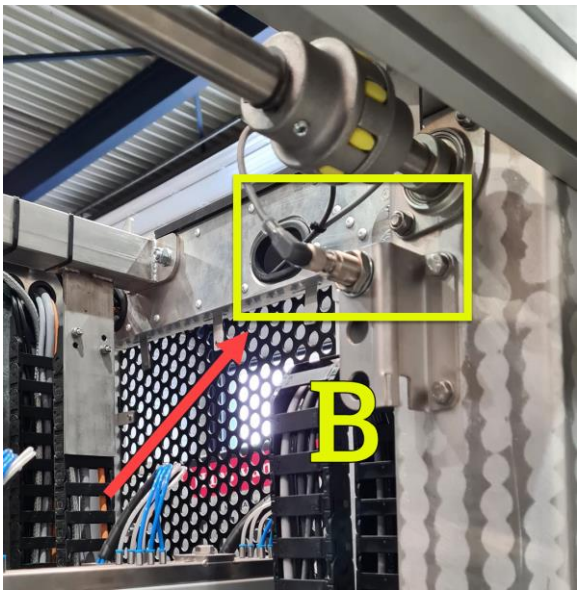


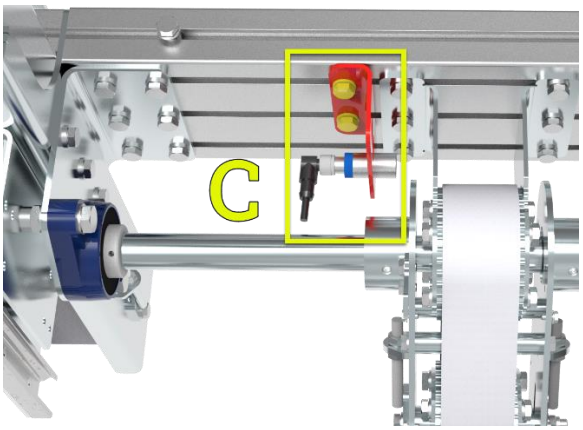


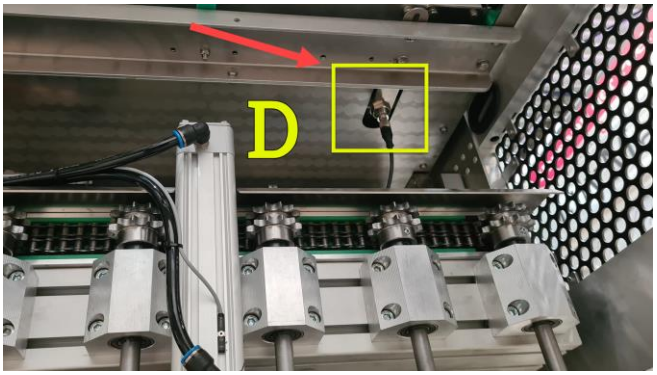
3.10. Screen sensors / buttons







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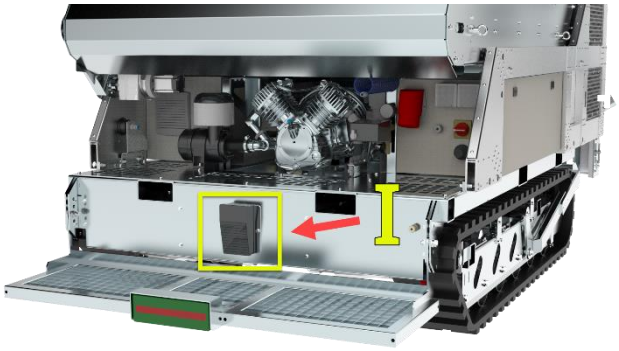
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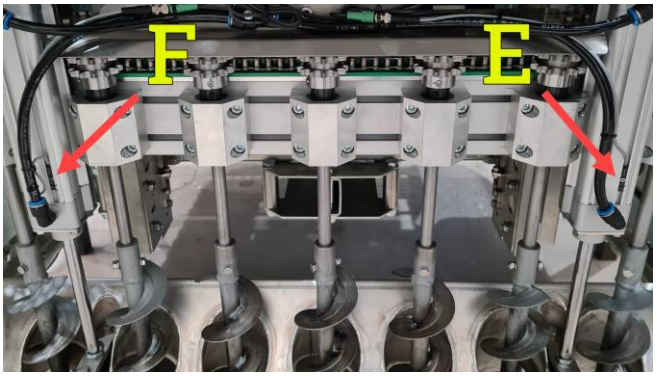
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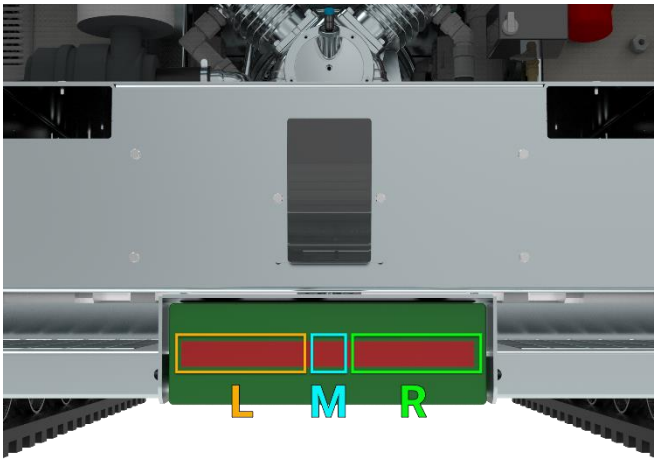
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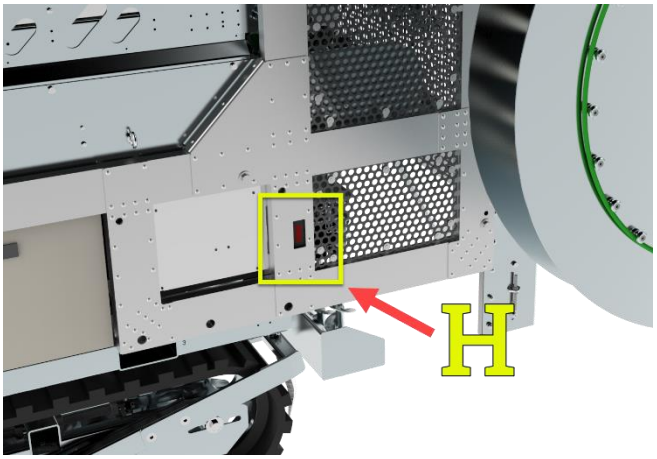
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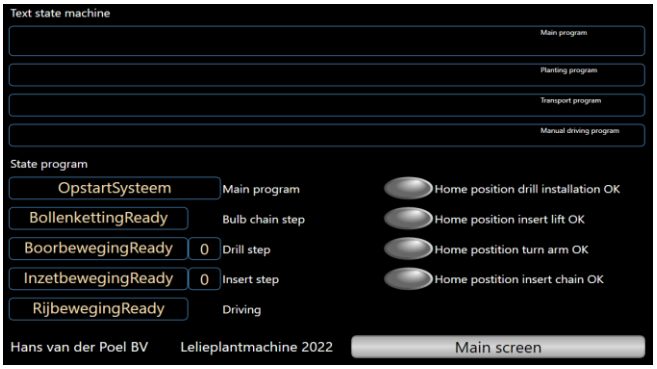
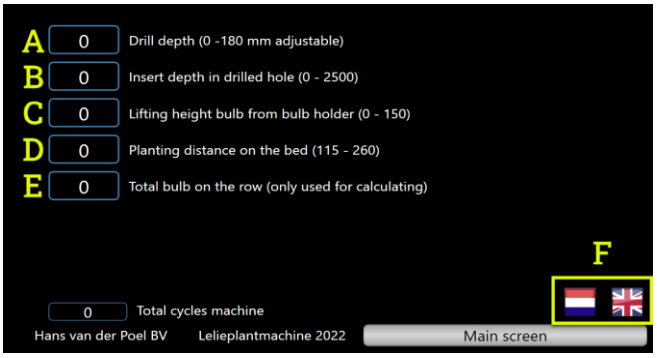
S
P
Q

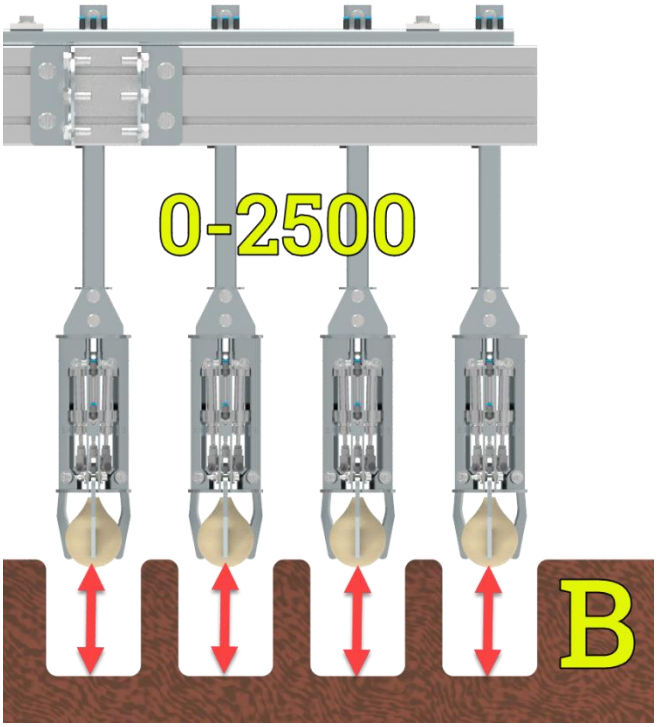
3.11. State / malfunction screen

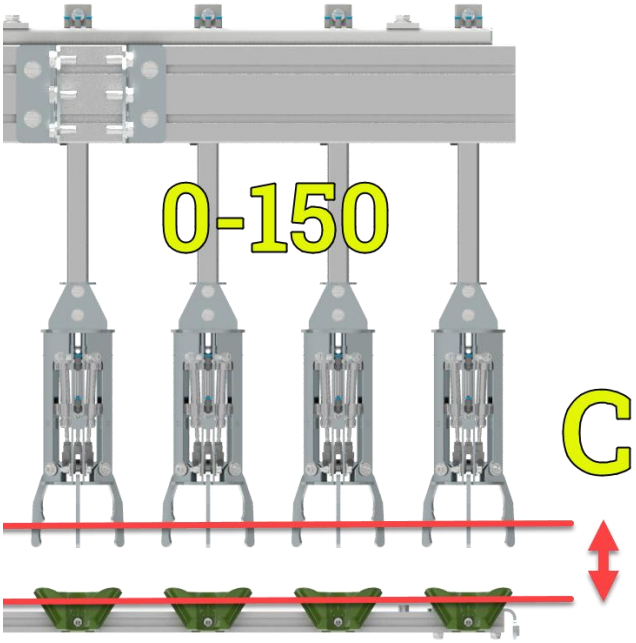


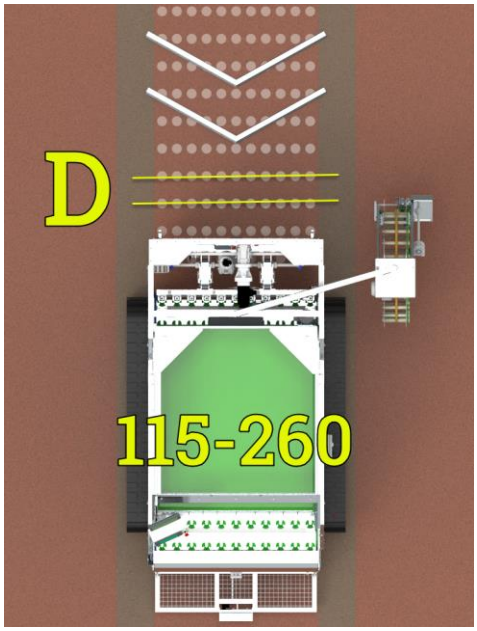
3.12. Plant settings screen

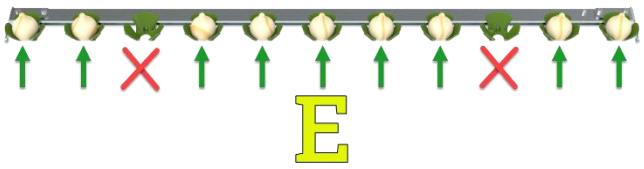


F. Change language Dutch / English



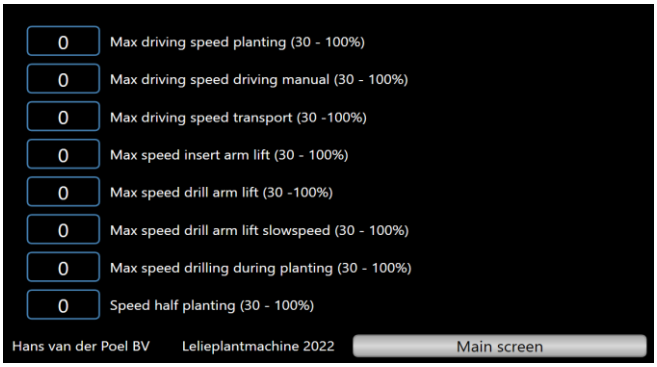




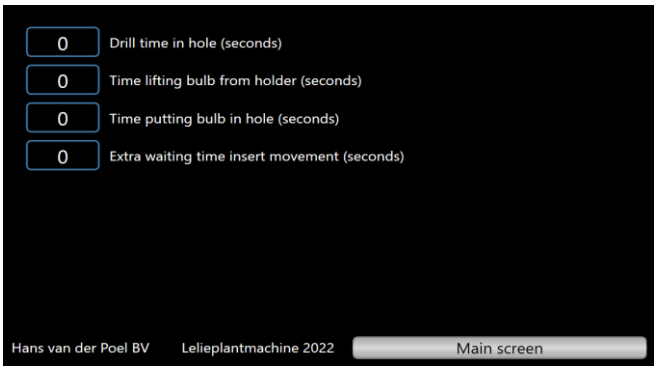


E. If you do not use all the cups in a row during planting, you can enter a lower number of bulbs per row so that the count is correct.

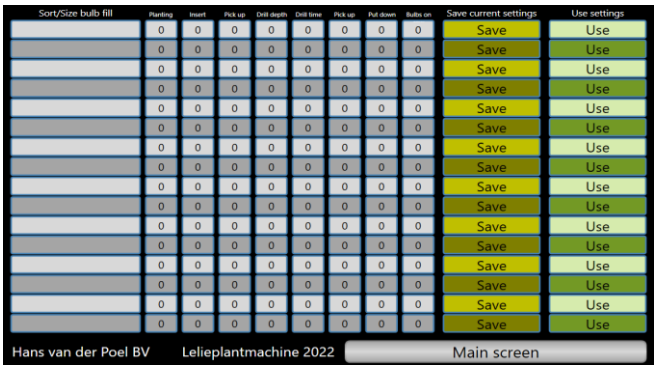
3.13. Plant settings speed



3.14. Plant settings time

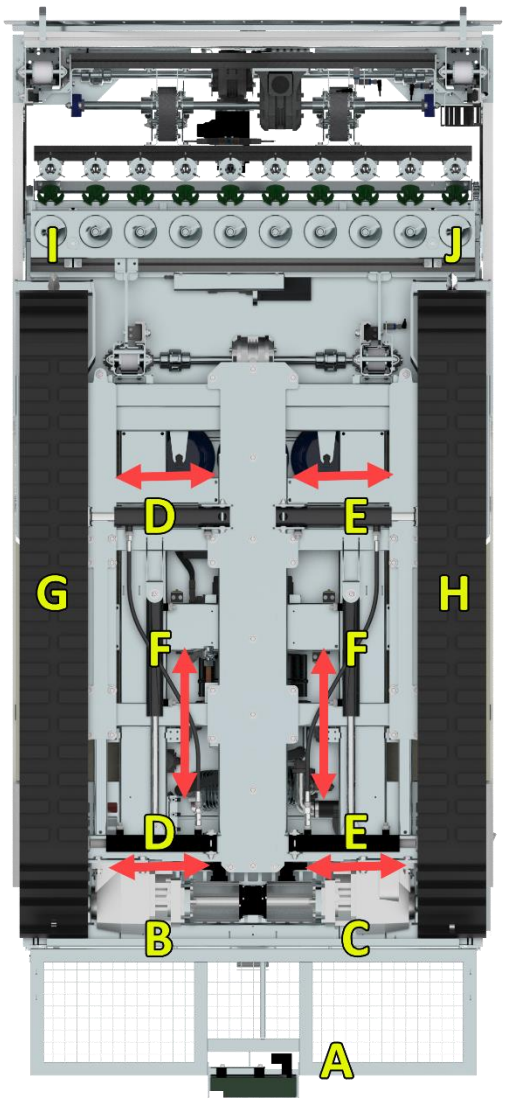


3.15. Stored settings screen

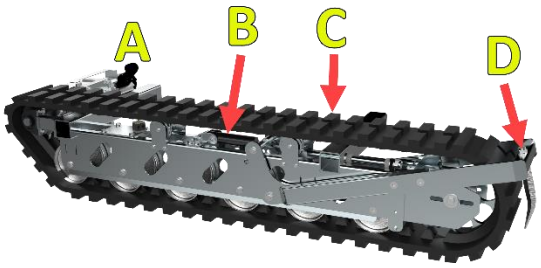


4. Location parts

4.1. Location of lower chassis parts

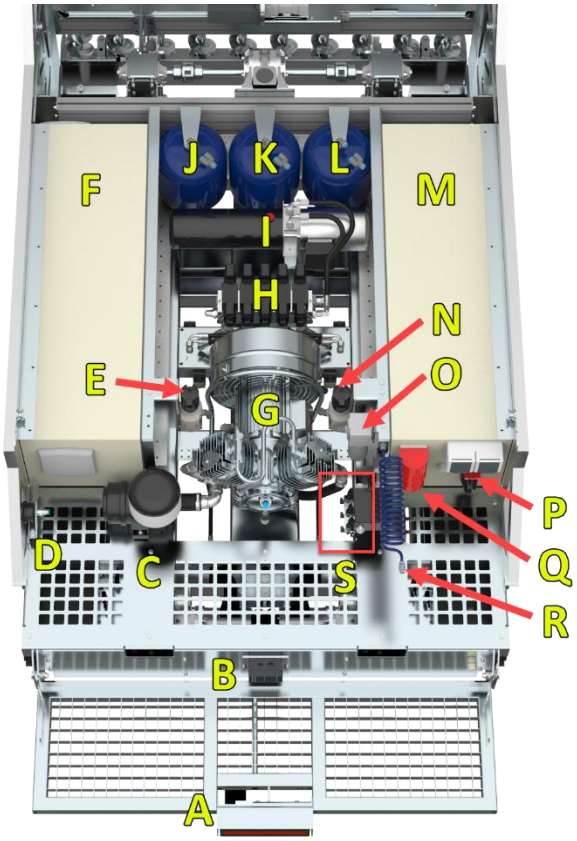


A. Laser receiver
B. Servomotor driving right
C. Servomotor driving left
D. Hydraulic cylinders right (inside outside)
E. Hydraulic cylinders left (inside outside)
F. Hydraulic cylinders (front rear)
G. Caterpillar undercarriage right
H. Caterpillar undercarriage left
I. Hook right caterpillar undercarriage
J. Hook left caterpillar undercarriage



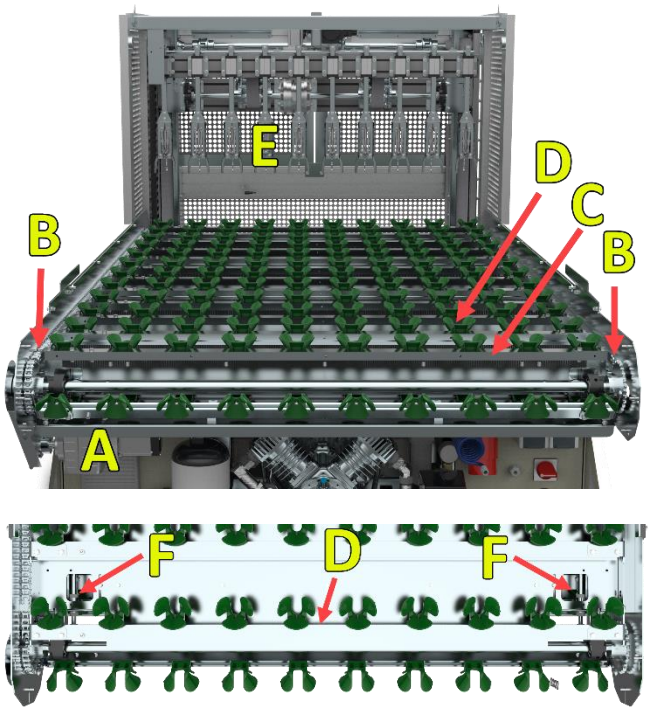
A. Servomotor
B. Hydraulic cylinder hook (up down)
C. Rubber track
D. Hook

4.2. Location of upper chassis parts



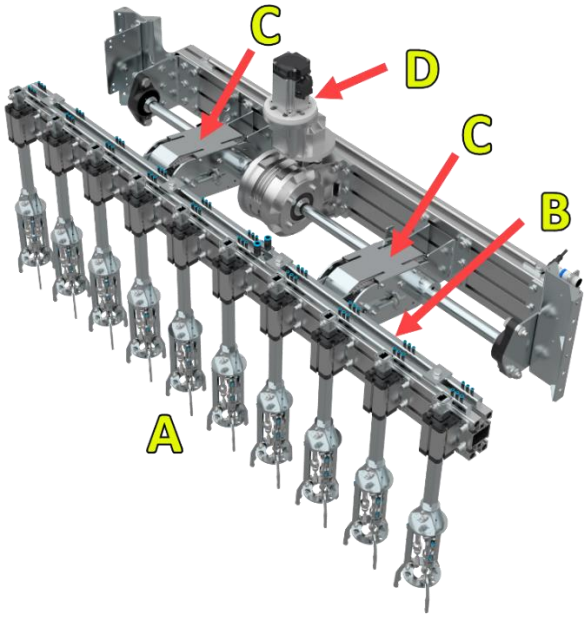
A. Laser receiver
B. Pedal foot control
C. Cycloon air filter
D. Air filter
E. Pressure gauge drill plate (2 bar)
F. Control box left side
G. Air Compressor
H. Hydraulic valve block
I. Hydrounit
J. Air reservoir for the entire machine
K. Air reservoir for the entire machine
L. Air reservoir (2 bar) for drilling plate
M. Control box right side (PLC side)
N. Pressure gauge grippers (7 bar)
O. Dehumidifier compressed air
P. Main switch lily planter
Q. Socket 400V for elevator
R. Connection for compressed air gun
S. Air bleed valves (3x)

4.3. Location parts cup beams track



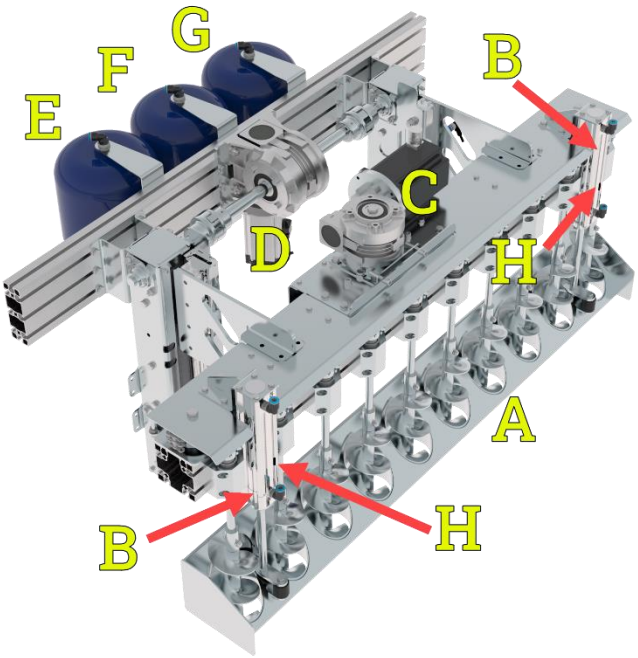
A. Servo motor cup beams track
B. Chain drive cup beam track
C. Brushes cup beams track (8x)
D. Beams with cups (25x)
E. Grippers
F. Tensioners cup beams track (remove panels first)

4.4. Location parts grippers



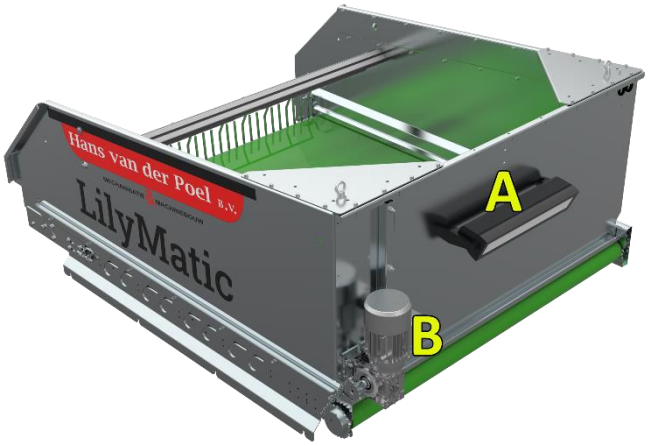
A. Grippers
B. Air supply grippers
C. Intermediate arm (2x)
D. Servo motor grippers

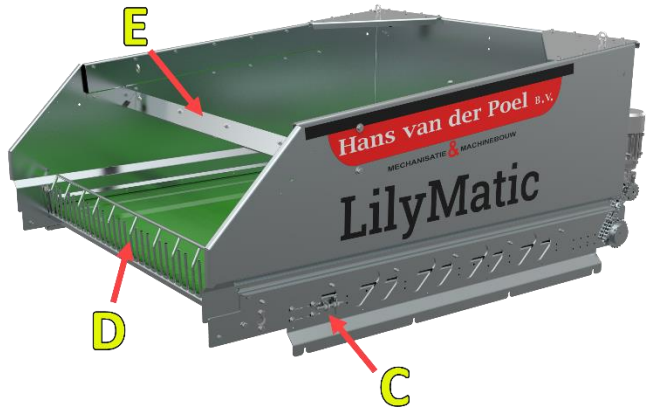
4.5. Location of components drill bar / plate

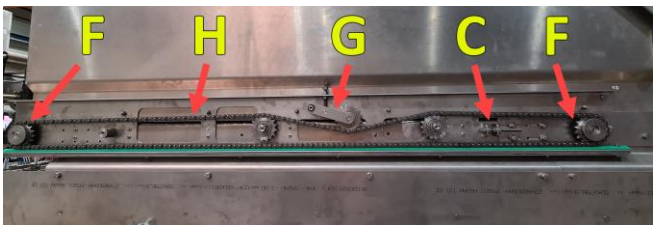


A. Drilling plate with drills
B. Pneumatic cylinders drilling plate
C. Servo motor drills
D. Servo motor drilling beam up / down
E. Air reservoir for the entire machine
F. Air reservoir for the entire machine
G. Air reservoir (2 bar) for drilling plate
H. Reed contact pneumatic cylinders

4.6. Location of bunker belt components.

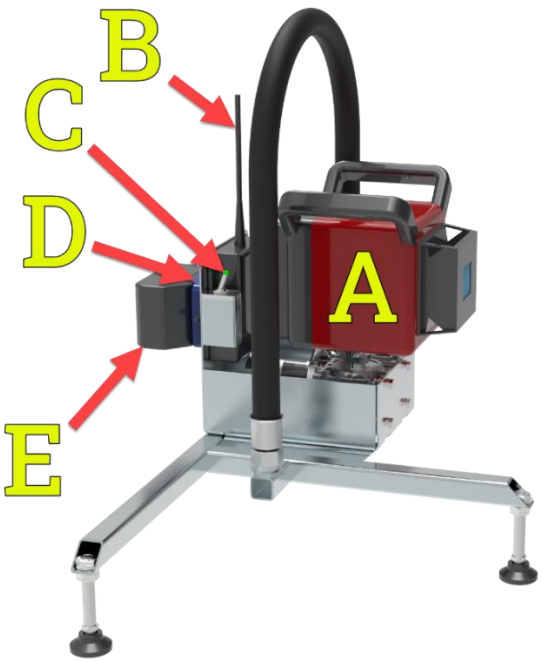






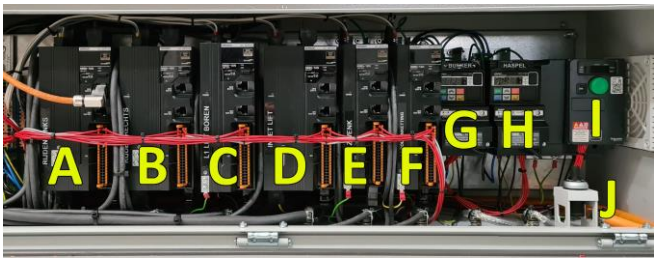
A. LED light
B. Motor bulk conveyor
C. Tensioners bulk conveyor
D. Bulb Rack
E. Aluminum profile with LED lamp
F. Drive rolls bulk conveyor
G. Tensioner chain bunker conveyor
H. Chain bunker conveyor

4.7. Location parts laser unit



A. Laser
B. Transmitter / receiver
C. Rocker switch on / off
D. Charger battery pack
E. Replaceable battery

4.8. Location components left control box



A. Servo drive 'Drive left'
B. Servo drive 'Drive right'
C. Servo drive 'L1 elevator drilling'
D. Servo drive 'Gripper elevator'
E. Servo drive 'L2 Swivel'
F. Servo drive "L1 Bulb chain'
G. Frequency controller bulk conveyor
H. Frequency controller reel
I. Frequency controller drill motor
J. Potentiometer frequency controller drill motor

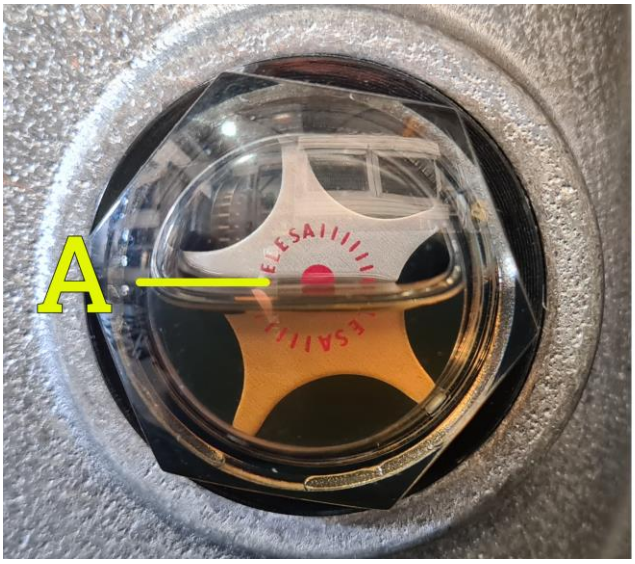
4.9. Location components right control box (PLC side).

A. Main switch lily planter
B. Circuit Breaker
C. Switch relay
D. Switch relay phase control
E. Terminal block
F. Switch phase override
G. Ewon
H. Hydraulic relay
I. Emergency stop circuit
J. Release emergency stop circuit
K. Schakelrelais noodstop
L. Power supply 20A 12V
M. Power supply CPU 5A 12V
N. PLC
O. Optos hydraulic control
P. Switch relay Led lighting

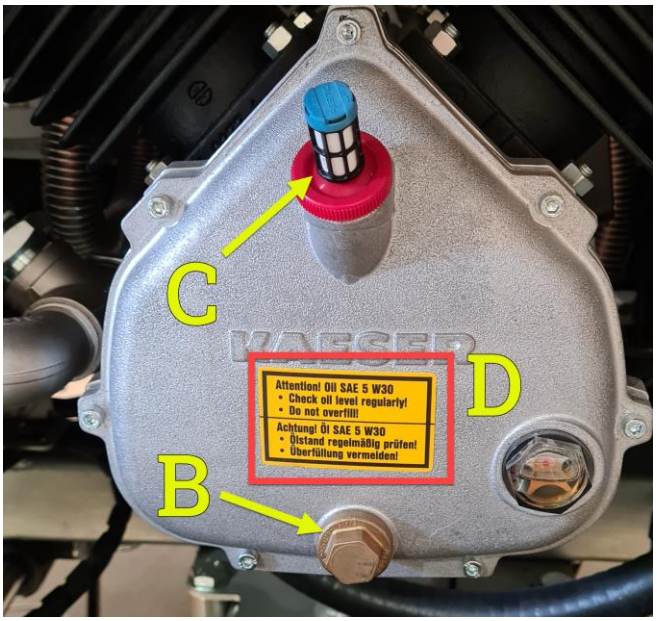
5. Maintenance lily planter

5.1. Checking/replacing oil air compressor

Check the level and color of the air compressor oil every day before putting the lily planter into operation.

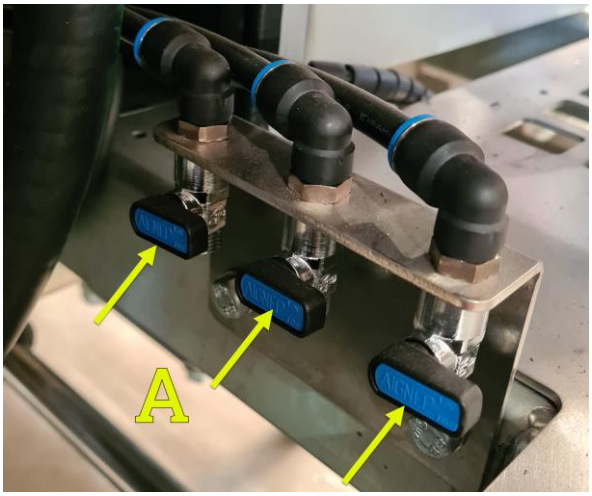


A. The correct level is as in the picture above, up to the red dot. If the oil is less clear than the picture above then it should be replaced.



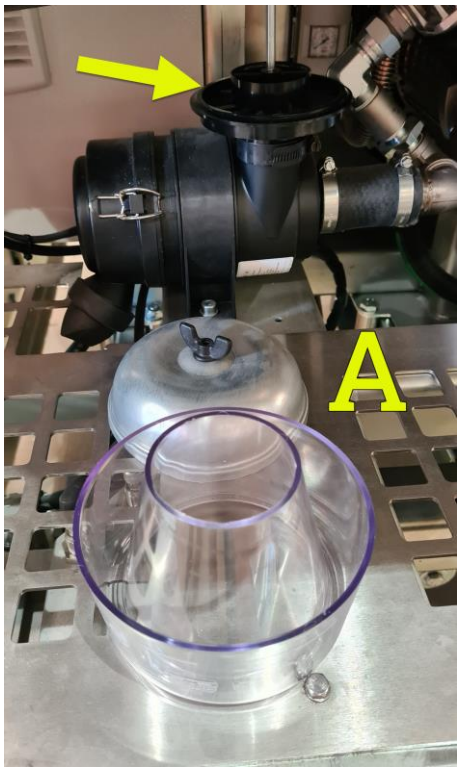
B. Oil drain plug
C. Refilling oil
D. Oil Type 5W30

5.2. Bleed air containers

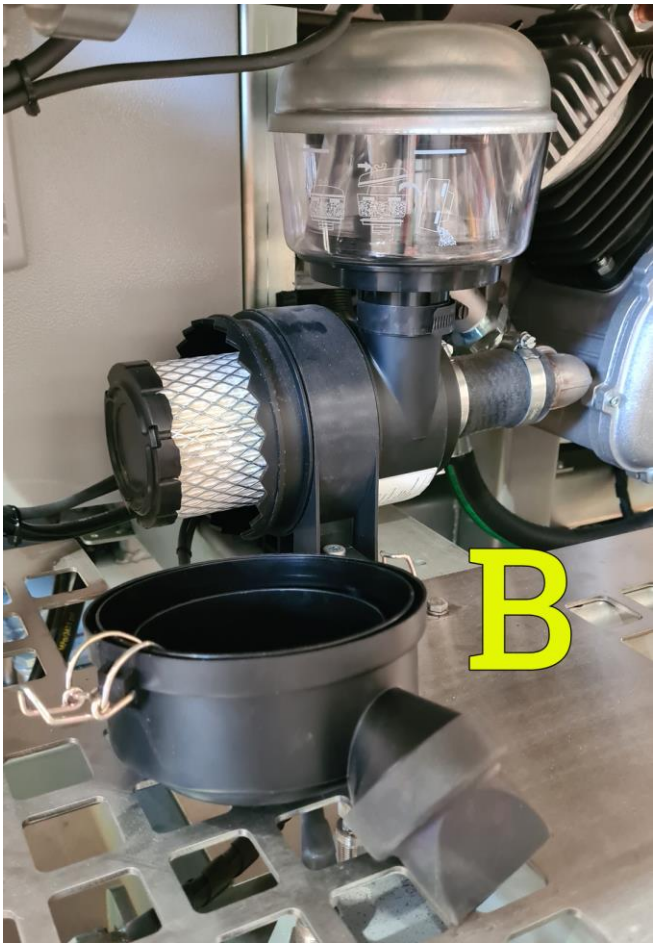


A. Bleed pressure containers once a day via taps, keeping them open until no more moisture comes out. Note: not all three at once but one at a time.

5.3. Clean cycloonfilter



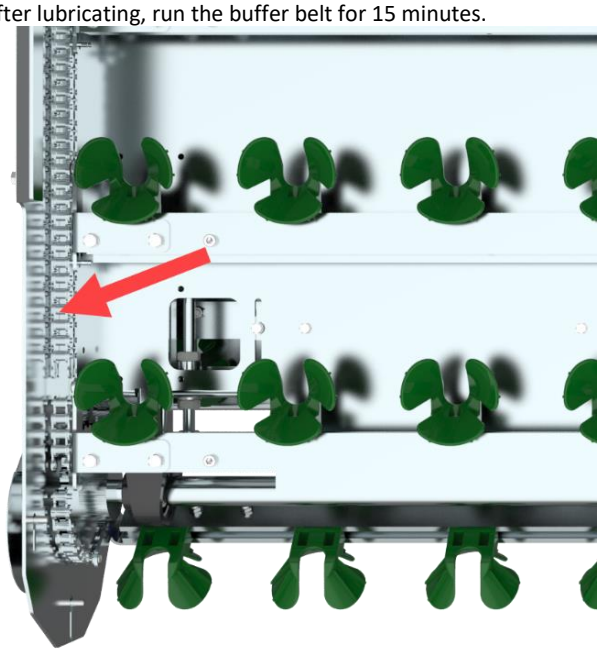
A. Clean cyclone filter once a day.
Do not clean with compressed air!



A. Clean filter once a month.
Do not clean with compressed air!

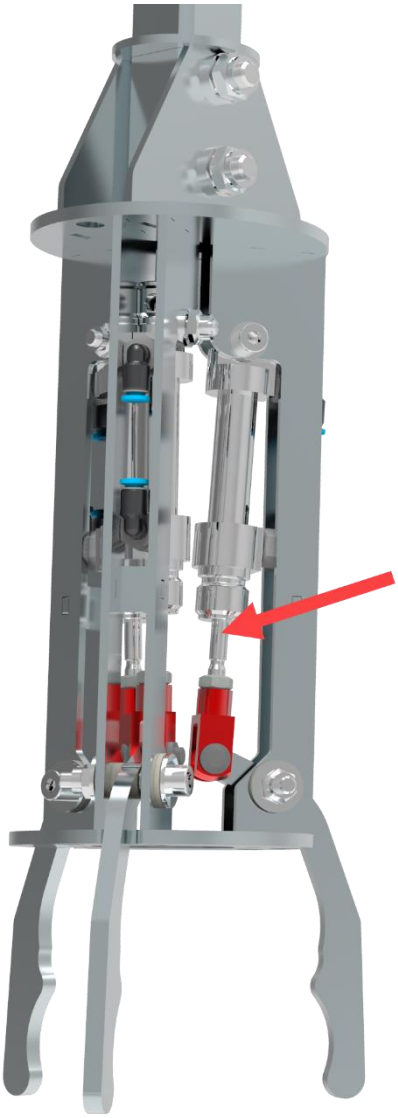
5.4. Lubricate chains

Lubricate the two chains of the buffer belt once a week with creep oil. After lubricating, run the buffer belt for 15 minutes.



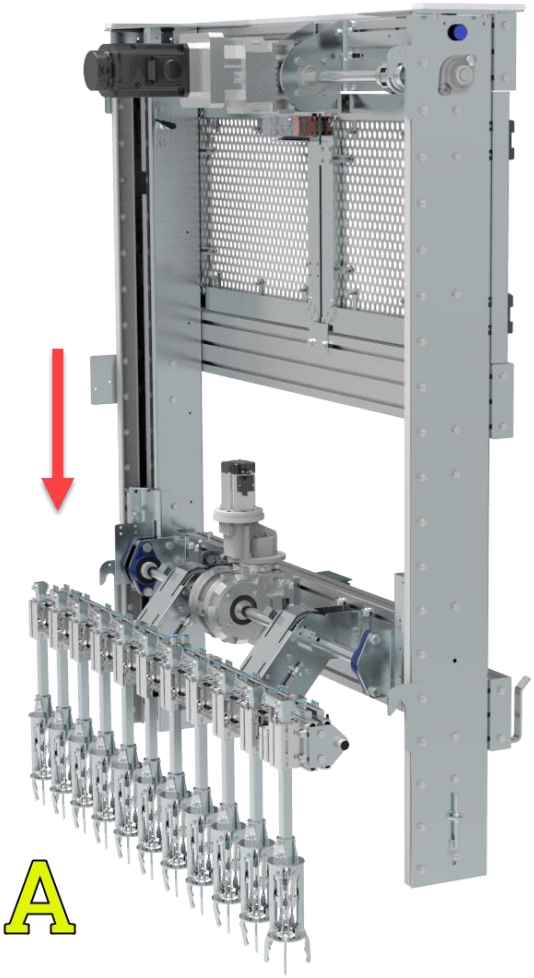
5.5. Spray cylinders grippers

Spray the three cylinders of the grippers once a week with silicone spray

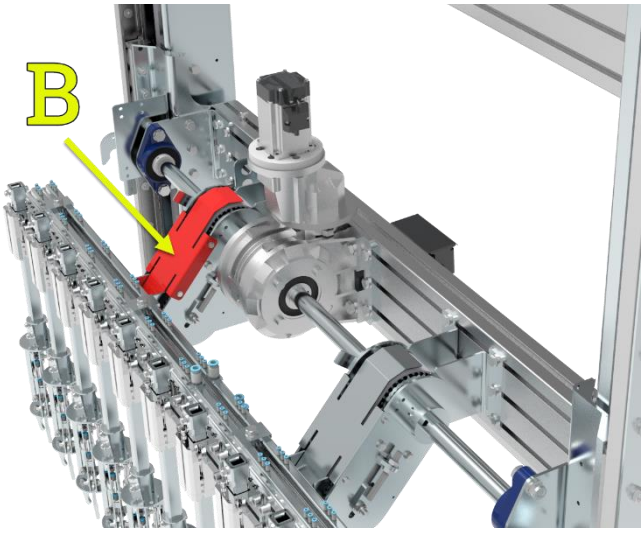


5.6. Replacing toothed belt grippers

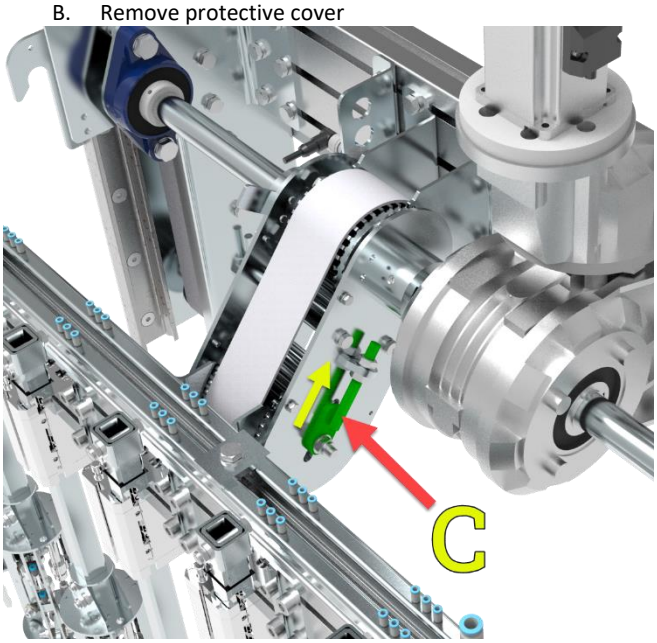
NOTE: Always replace only 1 belt at a time, not 2 at the same time!



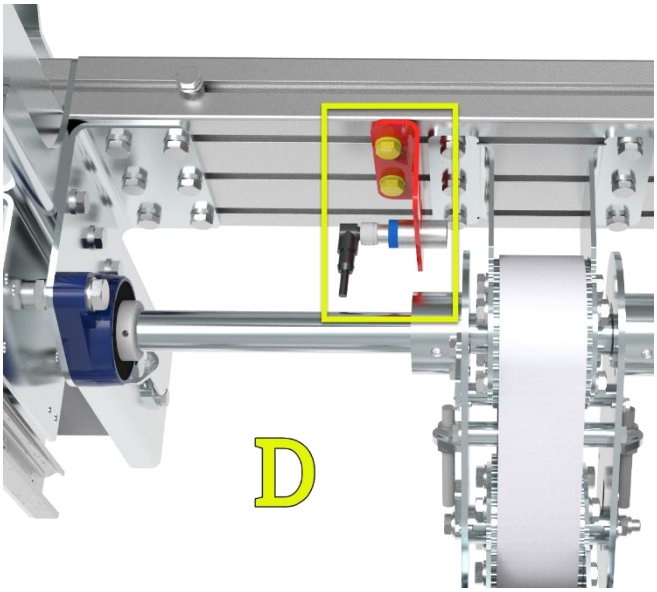
A. Bring gripper beam with hand control into position as shown above



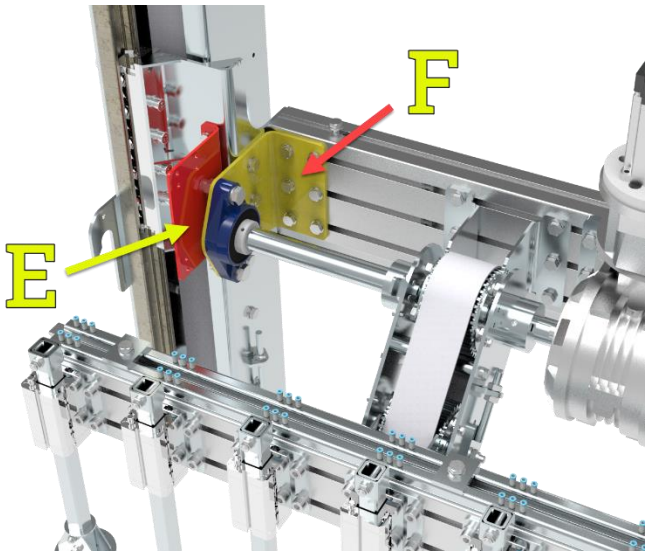
B. Remove protective cover



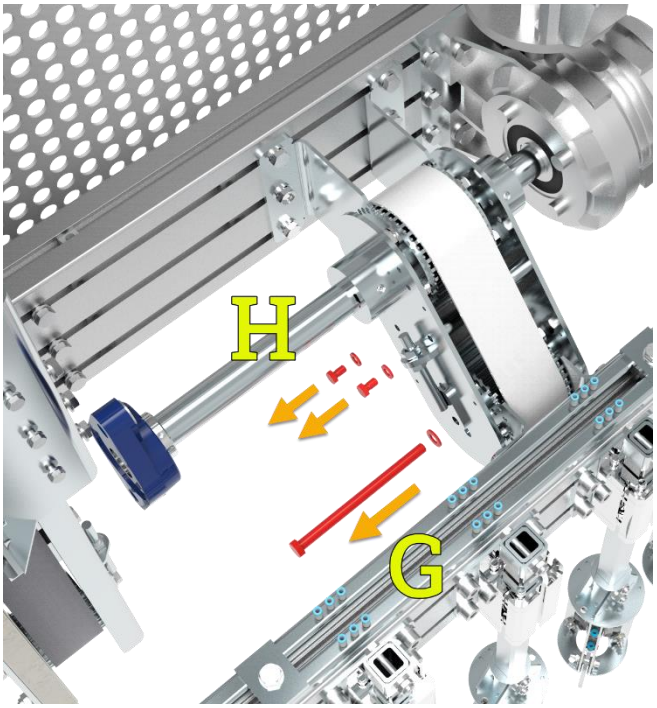
C. Remove tension from the toothed belt



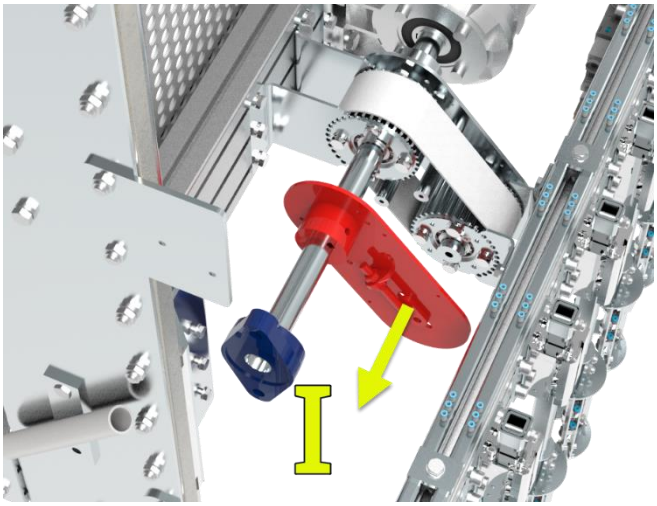
D. Remove bracket with inductive sensor, do not remove sensor from bracket (leave in place). Bracket with sensor must be reinstalled in exact same place after replacing toothed belt.



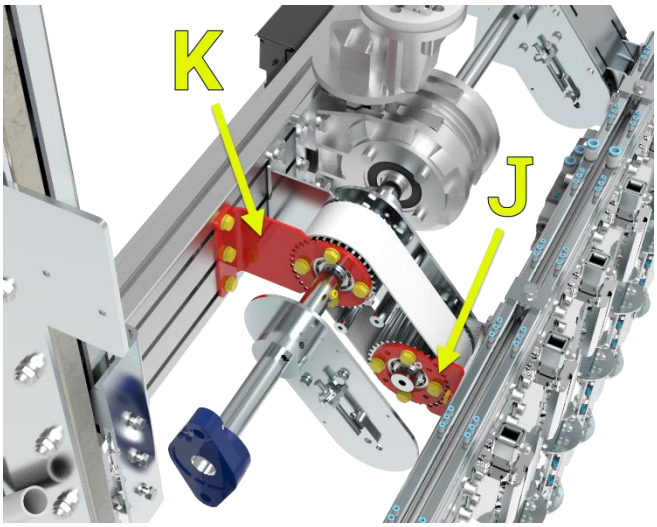
E. Remove bracket cable carrier
F. Remove bracket bearing



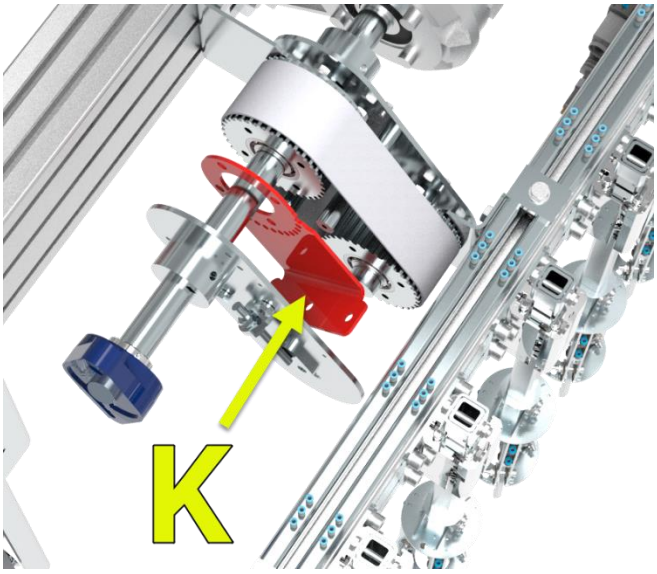
G. Remove M8x120 bolt
H. Remove M6x10 bolts (2x)

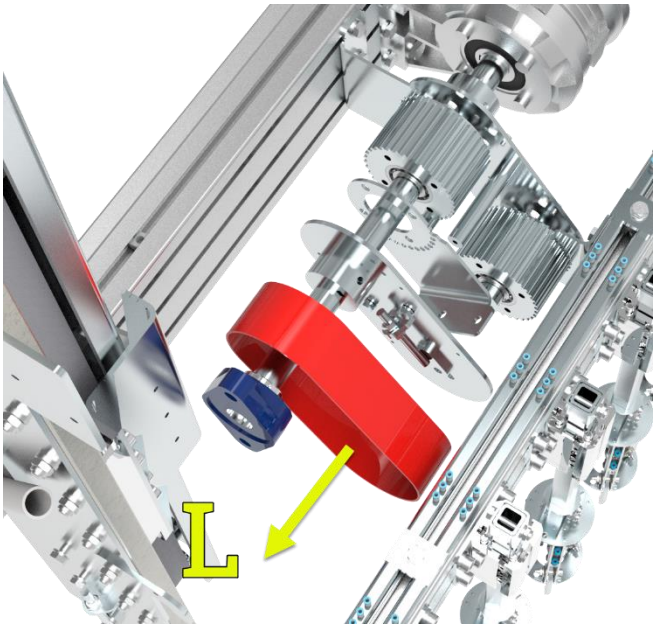


I. Slide side plate a bit off the intermediate arm

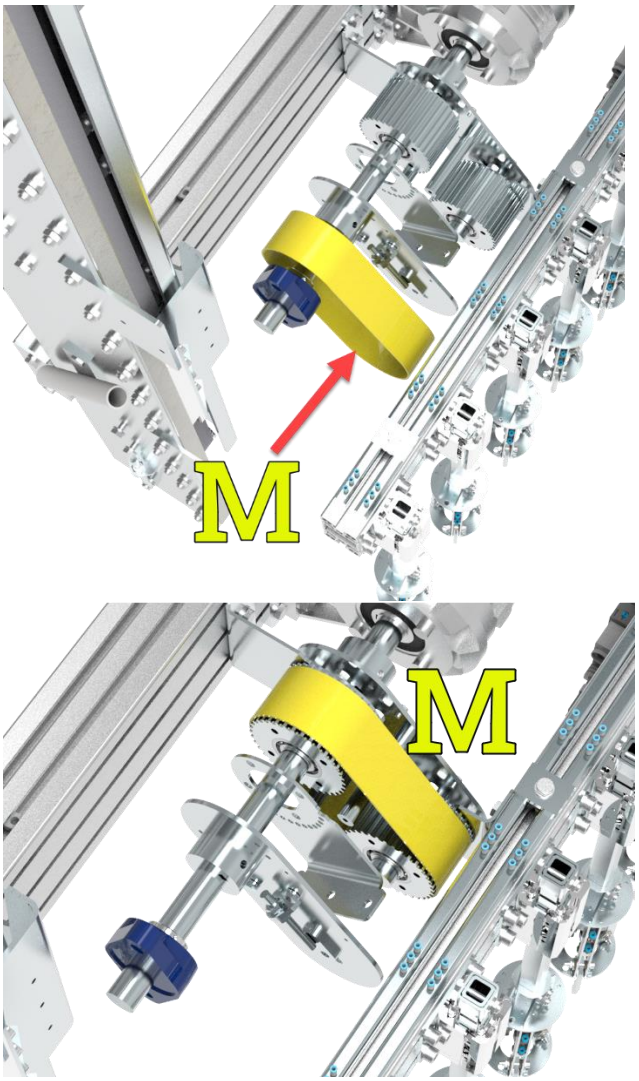


J. Remove bracket
K. Remove bolts and leave bracket attached to shaft

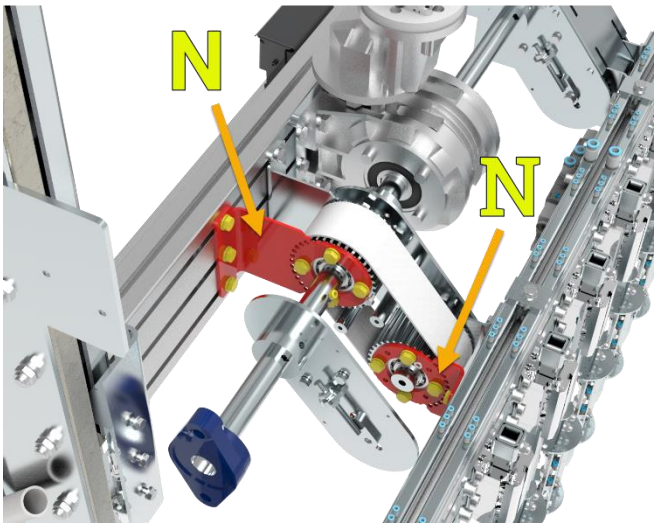




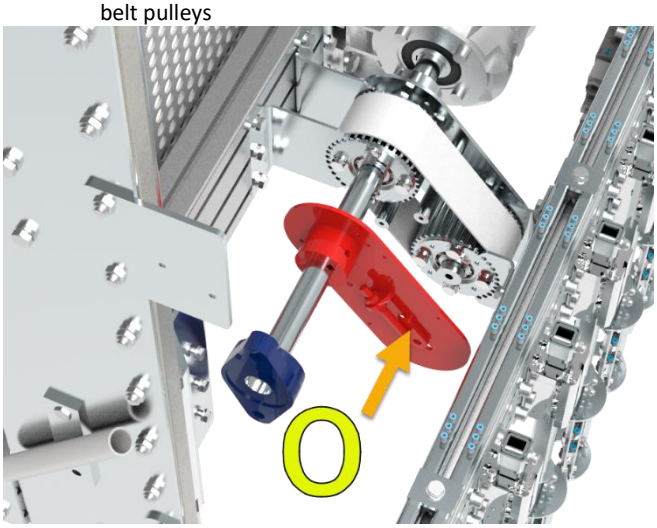
L. Remove old toothed belt



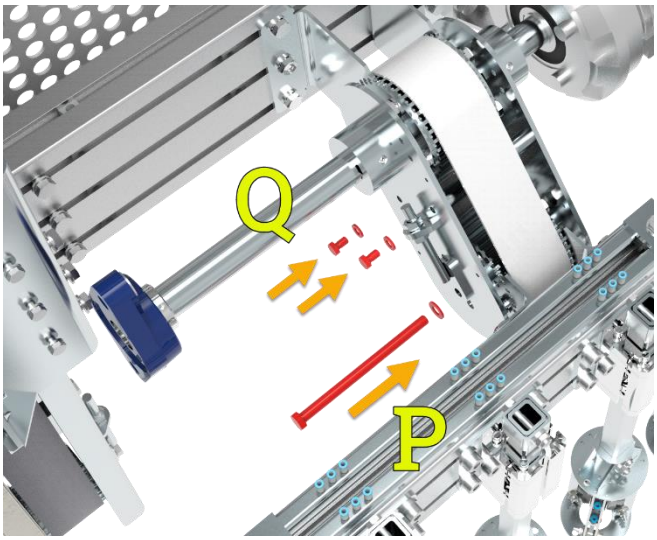
M. Install new toothed belt



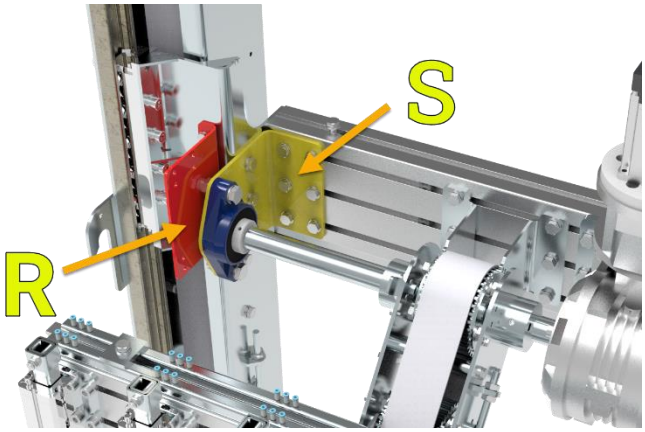
N. Reattach both brackets to aluminum profiles and timing belt pulleys



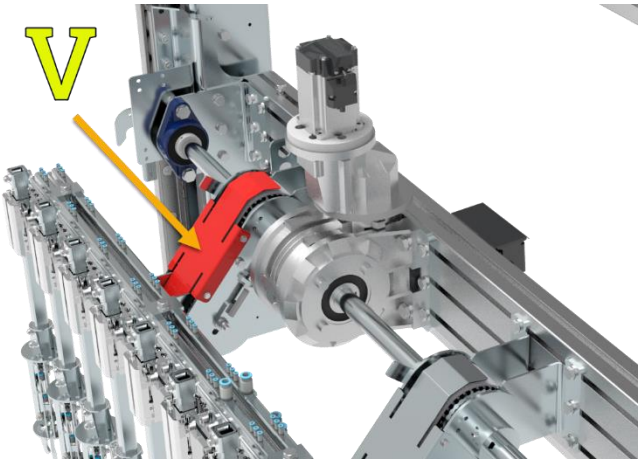
O. Slide side plate back to intermediate arm



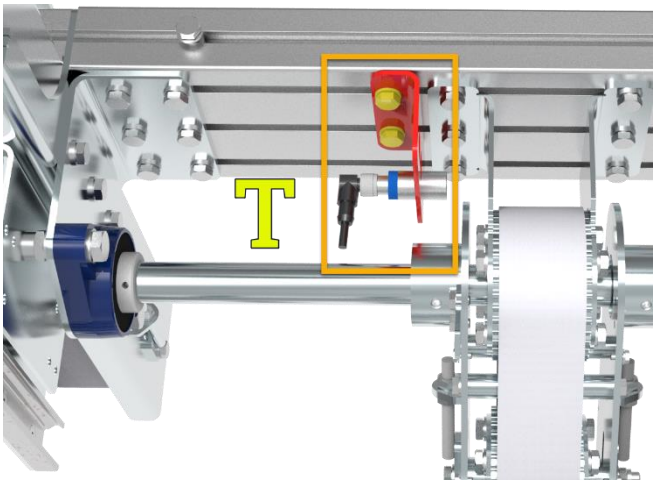
P. Install bolt M8x120 through the tensioner, side plate and timing belt pulley
Q. Secure side plate with M6x10 (2x).



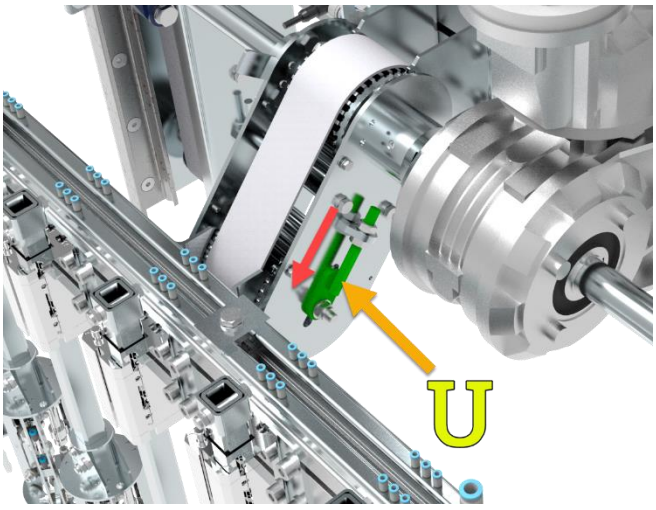
R. Install bracket cable carrier
S. Install bracket bearing



V. Install protective cover



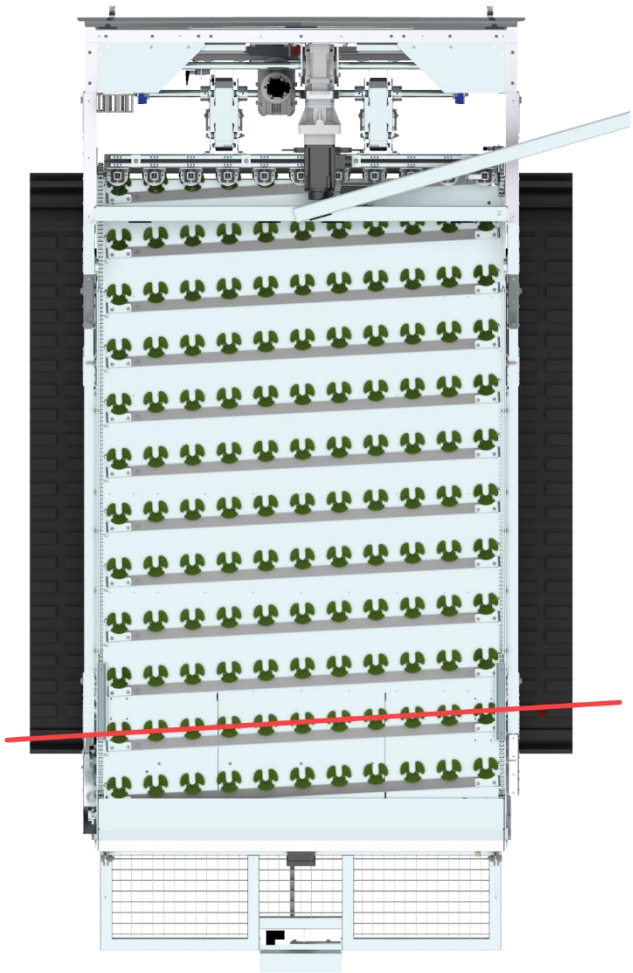
T. Reinstall bracket with inductive sensor **<u>in exact same position</u>**

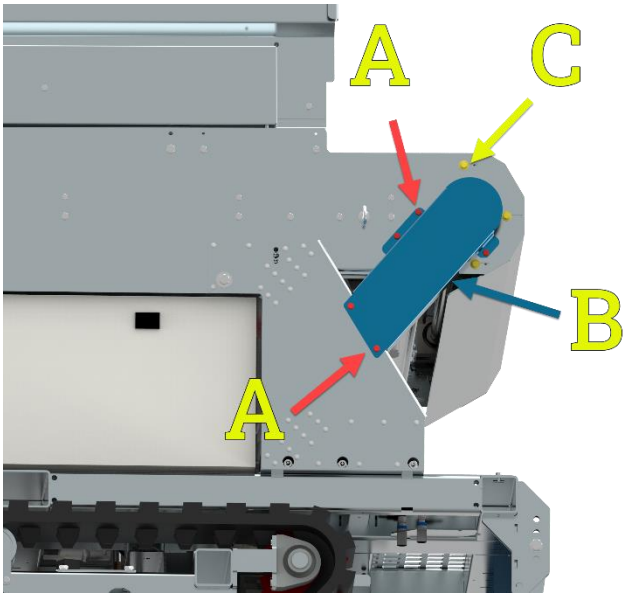


U. Tension the toothed belt

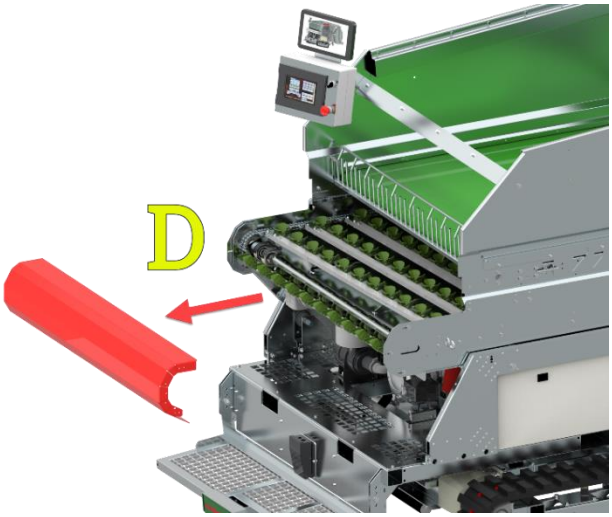
5.7. Straightening cup bars

If pollution at the sprockets has caused the chain to skip a chain link, the cup bars are misaligned

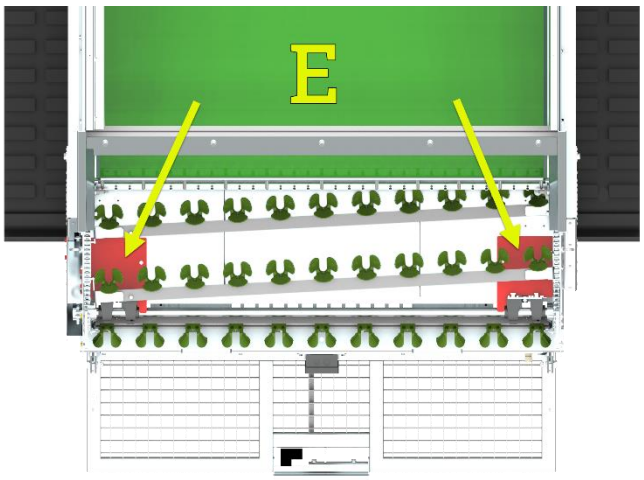




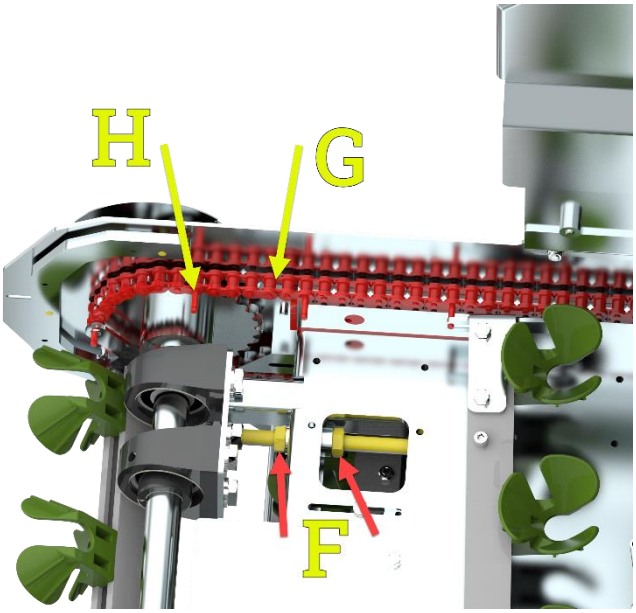
A. Remove bolts M6x10 (5x)
B. Remove protective chain cover
C. Remove bolts from protective cover cup beams track



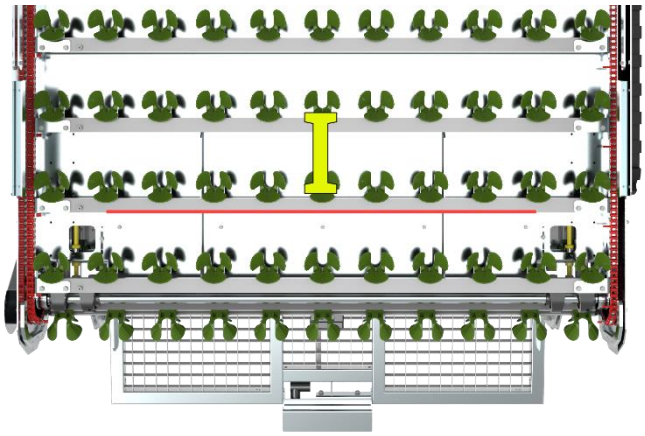
D. Remove protective cover cup beams track



E. Remove plates



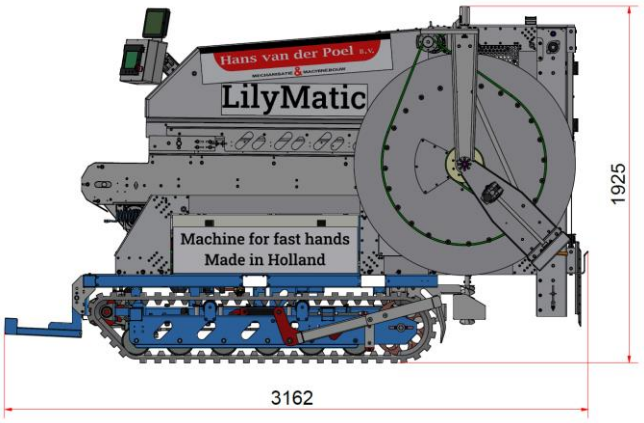
F. Remove tension from chain by loosening nuts (both chains left and right)
G. If the chain is loose try pulling it over the sprocket so that the chain pins (H) line up on both sides

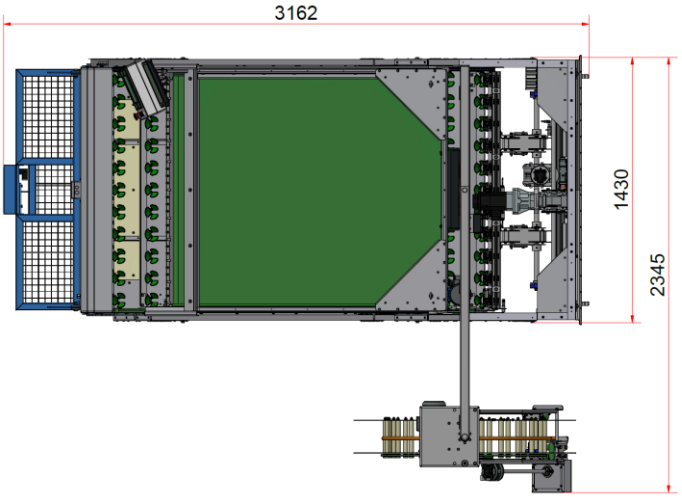


I. When the cup bars are aligned again then re-tension the chains at both sprockets (F)

6. Technical Data

Dimensies	
Length:	3162 mm
Width:	1430 / 2345 mm
Height:	1925 mm
Structure weight:	1550 Kg
Connection:	3 Phase + N + Gr 400VAC 16A 50Hz
Connection value:	2000 W





7. Malfunctions

7.1. Lily planter won't start

No electrical power supply

- Check the condition of the fuses
- Check circuit breaker in control box

8. Declaration of Conformity

LilyMatic Lily planter

Mechanization & Machine construction Hans van der Poel B.V declares hereby that the above named LilyMatic lily planter conforms to the Machine directive (Directive 2006/42/EG).

Roelofarendsveen 1 augustus 2020

Hans van der Poel
(Director)

Mechanization & Machine construction
Hans van der Poel B.V.
Veenderveld 51
2371 TT Roelofarendsveen