



SAMI AUTOCHOPPER

Instruction Manual SAMI Autochopper

Version 2015/VL, updated 30.12.2016

S110 -EC440
S180 -EC440

S110 -TC440
S185 -TC440

S110 -TEC440
S185 -TEC440



Year of Manufacture: _____

Serial Number: _____



SAMI
SAMI-FINLAND.COM

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DECLARATION OF CONFORMITY

Manufaturer: **Reikälevy Oy**
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Technical File by: Reikälevy Oy / Design

Declares that the following machinery placed on the market:

Device: Firewood processor
Brand: SAMI Autochopper
Models: S110-EC440, S110-TC440, S110-TEC440
S185-EC440, S185-TC440, S185-TEC440

Conforms to the provisions of Machine Directive and the amendments thereto and to the national decrees through which they have been brought into force:

Directive

2006/42/EY

Standards

SFS-EN ISO 12100
SFS-EN 60204-1
SFS-EN 609-1+A2
SFS-EN ISO 13857
SFS-EN ISO 14119
SFS-EN 982 + A1

Ylihärmä, Finland, 19.12.2014



Marko Mäki-Haapoja, Managing Director

1. To the Owner of a SAMI Product

We would like to thank you for choosing our product.

Please read these instructions carefully before to start using the product. Complete familiarity with the machine, correct settings, proper maintenance and reliability of the machine, ensure the safety of the user in his complete work environment. The use of SAMI Products is reserved for specially trained professionals. The operator must be aware of every prohibited action and behavior while using the machine, which can include knowledge in using PTO shaft transmission, for example, for tractor powered machines, or electric supply for electric powered machines.

It is important that you understand everything in this manual. Following these instructions ensures that the machine will serve you safely, efficiently and reliably for a long time.

We strongly advise you to run your own risk analysis before to use the product.

Please keep this manual available to the user at all time.

If you have any question, please contact the supplier or the manufacturer.

We would like to ask you to return the warranty certificate to your supplier and the manufacturer after reading this Instruction manual.

Sincerely yours,

 **REIKÄLEVY**

Ylihärmä, Finland

2. Warranty Conditions

- 1) The warranty is valid for 1 year or a maximum of 1000 operating hours of intended use of the machine.
- 2) The warranty period begins from the delivery date of the machine.
- 3) The warranty includes all defects due to manufacturing and material defects. Damaged parts will be repaired or replaced. If discovered that the warranty does not cover the claimed damage, we will charge the related costs.
- 4) Warranty period will not be extended due to repair work covered by the warranty.
- 5) The warranty does not cover damages that are due to incorrect installation, use or maintenance of the machine (not in accordance with the instruction manual), overloading or normal wear.
- 6) The warranty does not cover indirect costs, shipping charges, travelling expenses, downtime costs or alterations to the original structure of the machine.
- 7) The warranty claim must primarily be addressed to the supplier of the machine. Before taking action, the warranty claim and potential costs have to be negotiated with the manufacturer.

3. General Information

3.1. Intended Use

The SAMI Autochopper models S110-TC440, S110-EC440, S110-TEC440, S185-TC440, S185-EC440, S185-TEC440 (called simply SAMI Autochopper from now on when referring to these models) are designed for making firewood of round trimmed logs that have been pre-cut into sections.

Table 1 Maximum dimensions for processed logs

Model	Max. diam. of blade* [mm]	Log length** [m]
S110 -		
TC-, EC- & TEC440	440	3 - 6
S185 -		
TC-, EC- & TEC440	440	3 - 6

* The dimension of the blade is not the same as the diameter of the log. When processing large logs, the length of the blade, the shape of the log, the position on the table and possible branches must be taken into account.

** The maximum length of a log also depends on its shape/centre of mass. When using automatic separator or manual feed table, the maximum log length is 3 - 6 m depending on the table. When using log lifter, the maximum log length is 3 m.

NOTE! Maximum size for logs handled with the hydraulic log lifter (accessory) is 220 kg / 3.0 m (110 kg/supporting beam). E.g. fresh birch diam. 300 mm weighs ca. 65 kg/m (3 m weighs ca. 195 kg).

3.2. Conditions of Use

The environment should be constant, lit and suitable for splitting logs.

The ground must be adequately cleaned, levelled, firm and clear of any object.

The danger zone is 5 m. Only the operator must be present within.

Temperature conditions for safe use of the machine: -15°C to +35°C.

Only persons over 18 years old may use the machine.

The operator must be familiarized with this Instruction Manual and keep it with him at all time.

All the safety devices must be present and in good condition on the machine.

Always wear protections: eye guards, noise protection, safety shoes, work gloves.

Never modify the construction of the machine.

Never operate the machine under the influence of alcohol or drugs.

If you use the machine indoor, make sure you have a suitable sawdust aspirator that will keep the air sane.

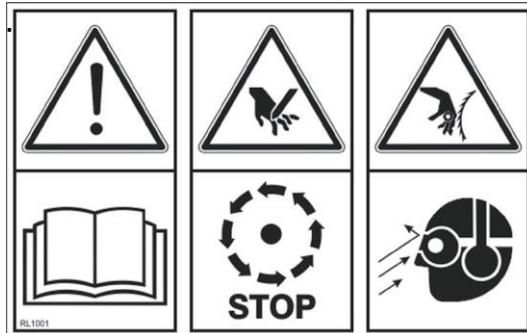


Start the machine when you fulfil all those conditions. It is the **operator's responsibility** to ensure the safety requirements at all time during the machine operation.

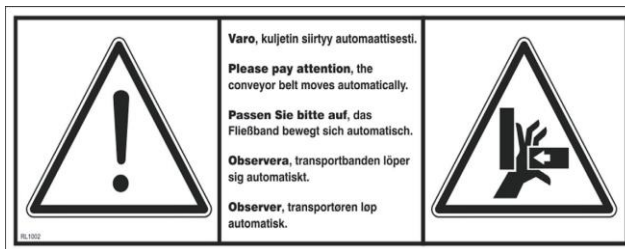
3.3. Descriptions and Information of the Machine

3.3.1. Warning Signs

RL1001: Read the manual before using the machine. Stop the machine before opening the protective cover or any protective plates. Look out for the rotating blade. Always wear eye and hearing protection.



RL1002: Pay attention that the conveyor belt moves automatically. Danger of crushing injury.



RL1003: Pay attention to the danger zone of the discharge conveyor.

RL1004: Look out for the rotating universal joint shaft.



RL1005: Look out for the splitting blade, danger of cutting injury. RL1006: Pay attention, electric danger.



RL1007: Refer to the Instruction Manual.



3.3.2. Identification Plate



Image 1 Identification plate information

The information in the identification plate on the machine:

- type and model
- serial number
- hydraulic pressure
- blade flange information
- size of the electric motor
- power
- voltage
- weight

4. Work Safety

4.1. Safety Precautions

- Please familiarize yourself with this manual carefully before using the machine.
- Before each use of the machine, please:
 - Check the functionality of the stop controls.
 - Check the condition of the hydraulic hoses and couplings.
 - Check the condition of the electric cables and their plugs.
 - Make sure that your working environment is clean and clear of obstacles impending movements.



- **Always wear hearing and eye protection.**

When the machine is working, the sound pressure is over 80 dB.

- Wearing appropriate protective shoes is strongly recommended when handling logs.
- The user has to make sure that his/her working clothes do not contain bands, strings or other projections which might get caught by the moving parts of the machine or the work piece.
- The user has to obtain his/her protective gear himself/herself and make sure that it is in good condition.
- The user has to pay attention to the fact that a very twisted or otherwise unusually shaped log may cause a malfunction or a dangerous situation. Therefore processing these kinds of logs should be carefully considered or avoided completely.
- Structural alterations to the machine are not allowed.
- Settings are not allowed when the machine is running.
- All the covers must be placed appropriately when using the machine.
- We strongly advise you to run your own **risk analysis** before to use the product. You should notably study and take notes of the different risks that could be encountered during the machine use, depending on your machine layout and environment: hazard identification (location, type of hazard), harm severity potential, and probability of occurrence. Once all the hazards are assessed, you can take the right risk reduction measures. This will help you to work in maximum safety.

4.2. Forbidden Procedures

- All protective covers of the machine are crucial to ensuring the safety of the user. When operating the machine, all protective covers should be in place. **The machine should never be operated when the protective covers are not appropriately placed.**
- **The user is always responsible of safety functioning while the machine is running!**
- The stop control and other safety devices have to be in operation when using the machine. The user is responsible for the condition of the stop control and other safety devices. The machine should never be operated when the stop control or other safety



devices are not functioning properly.

- When maintaining and cleaning the machine, the machine must be stopped and all safety precautions required by the instructions have to be taken. Maintaining and cleaning are not allowed when the machine is running. **Stop and disconnect the power source before to start any maintenance work.** Don't forget to put back all the safety devices into function before restarting the machine.
- If you use a high-pressure water jet to clean the machine, don't direct it toward any electrical component, such as wires, sensors, electric center, etc. Use the water jet cautiously.

Information on registered accidents indicate that serious accidents with log splitter machines are usually due to the user trying to fix a machine malfunction carelessly and against the instructions, which results in an accident. Another cause of accidents is unexpected action from the machine or another user:

- The user must follow the instructions and exercise extreme caution, especially in breakdown situations.
- Only one person must operate the machine at a time. Please make sure that there are no other people in the working zone.
- Even though the machine is automatic, it must never be left unattended. The user must always supervise the process and ensure that other people do not have access to the working area.

5. General Description

5.1. Main components

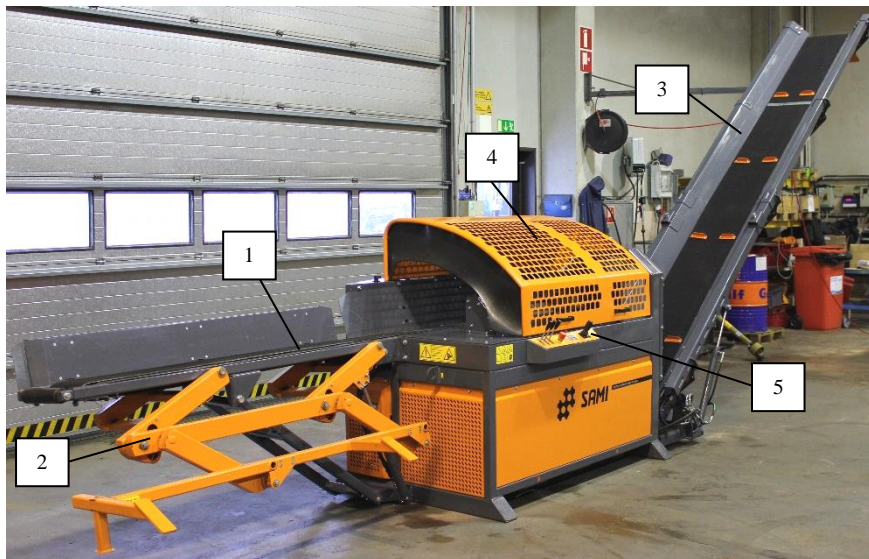


Figure 2 Main components 1

1. Feed conveyor
2. Hydraulic log lifter (accessory)
3. Discharge conveyor
4. Protective cover
5. Control panel

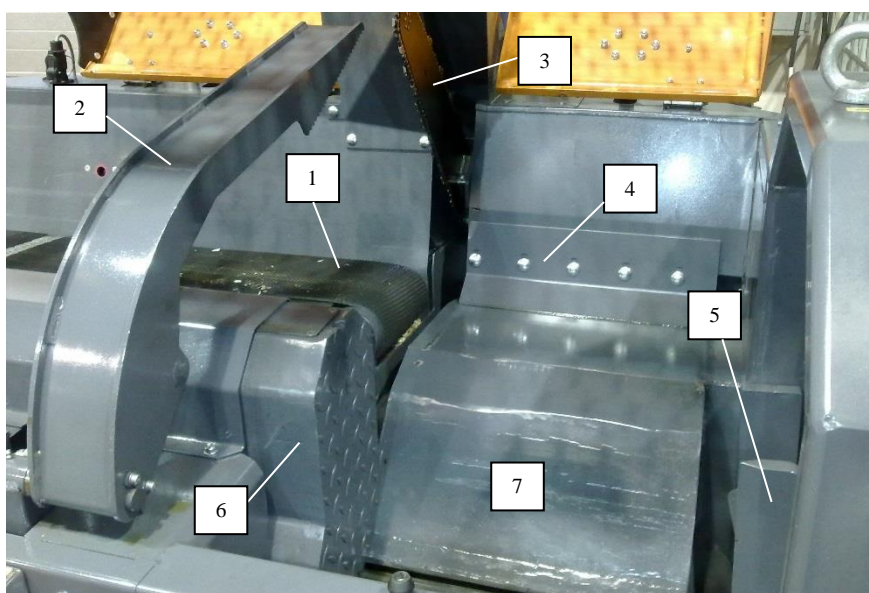


Figure 3 Main components 2

1. Feeding belt
2. Log ram
3. Cutting unit
4. Log pusher
5. Splitting blade
6. Splitting piston
7. Splitting sprout

5.2. Operating Principle

The user lays logs on the feed conveyor by hand or using a hydraulic lifter (accessory). The feed conveyor transfers the log toward the cutting unit. Before it reaches the cutting unit, an optical sensor (Figure 4) detects the log on the feed table.

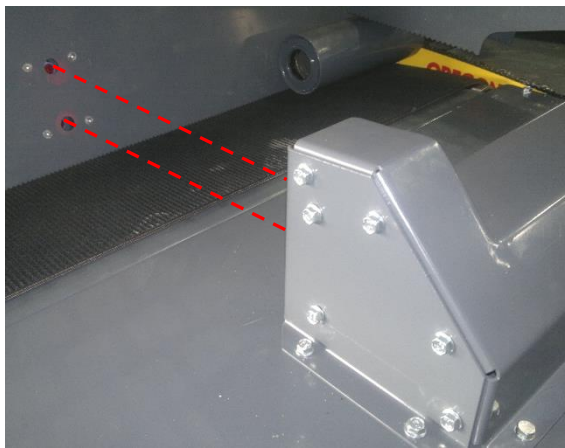


Figure 4 Optical sensor

The cutting unit cuts the log once the desired measure is fed to the blade. Next, the pusher transfers the cut log into the splitting spout. The splitting piston then propels the cut log through the splitting blade. When run on automatic, double cutting or nonstop modes, the splitting blade is centered in the middle of the log, based on the measurement gained from the ram.

The movements of the regulating units operate on hydraulics. The hydraulic pumps are operated with the power take-off from the tractor or with an electric motor. The hydraulics are controlled with electric-controlled valves regulated according to the automation program.

6. Delivery to the Customer

6.1. Delivery and Reception

The machine is always delivered fully assembled, tested and adjusted.

Please **check the delivered machine immediately for possible delivery damage**. In case of such damage, please contact the delivery company and the machine supplier.

6.2. Transportation

The machine has to be transported so that it cannot move during transportation. The machine has to be securely tied down during transportation with appropriate tie-down straps.

Dimensions of the machine in transport position: width 2630 mm, height 2700 mm, depth 1450 mm.

Dimensions of the machine in work position: width 7850 mm, height maximum 2920 mm, depth 1450 mm.

Machine weight by model (incl. hydr. oil) without the hydraulic lifter (75kg):

S110-TC440 => 1400 kg

S110-EC440 => 1480 kg

S110-TEC440 => 1540 kg

S185-TC440 => 1450 kg

S185-EC440 => 1510 kg

S185-TEC440 => 1590 kg

6.3. Lifting

To lift the machine with a crane, attach the straps or chains to the lifting points that have been marked with labels on the machine. Possible additional lifting tools (slings etc.) are not provided with the machine.

To lift the machine with a forklift, use the fork pockets in the base of the machine. Please make sure that the forks slip completely underneath the fork pockets. Ensure the complete safety of the lifting area and use the adequate forklift for this machine.



When using other lifting methods, you must use only the lifting points in the machine.

6.4. Storage

To ensure the functionality of the machine, it is recommended that the machine is kept in a dry and sheltered place protected from humidity overnight or during a longer idle time. The machine is provided with a tarpaulin, and it is recommendable to cover the machine with it during transportation or a longer idle time. The machine must be stored away from sunlight and rain. Although the machine is also intended for outdoor use, it should not be left outside

for a long period.

Clean the machine at the end of the work day. Clear the sawing and splitting debris, as well as any other foreign materials (snow, dirt, etc.), from the machine and the conveyors. To do so, the sawdust aspirator is well indicated. You may also use pressured air jet, but avoid to direct it toward electrical components. High-pressure water jet must be very cautiously used, as it could damage the electrical components.

Disconnect the power source before any cleaning operation.



Before storing the machine, make sure all the protective covers and safety devices are back to their place and are in good condition. Don't leave a machine without its safety features in place and functioning.

7. Transportation to the Worksite

- To transport the machine to the work site, use either forklift forks fitted into the fork pockets or a tractor's three-point hitch.
- It is very important that the machine is in transport position with the conveyors locked (conveyors in upper position) when transporting the machine to the work site. The machine is provided with a tightening strap that ensures safe transportation.
- Please pay attention to the width and height of the machine in transport position, especially on public roads.
- Always obey traffic regulations when on public roads.
- Please check and install all equipment necessary for transportation required by traffic regulations, such as lamps, reflectors and a slow moving vehicle triangle.
- Please pay attention to the maximum allowed axle loads and total weights.
- All tools used when transporting the machine, such as chains, beams etc., have to be positioned so that they cannot move by accident when the machine is in work position or transport position.
- Instruments and additional weights of the lifting instrument may have an effect on the control, steerability and brakes of the tractor during transportation. Therefore, it is important to ensure sufficient control of steering and braking.
- Carrying passengers either on top of the machine or with it is not allowed.
- The surface of the work site has to be leveled.
- The surface of the work site has to be firm so that the machine will not dig into the ground.
- The log lifter is attached to the feed table and therefore does not need support from the ground. When moving the machine, the log lifter moves with it.
- Please allow for enough space around the machine to ensure unrestricted functioning of the machine also when moving and adjusting the conveyors.

8. Operating the Machine by a Power Take-off from the Tractor

- When operating the machine by a power take-off (PTO) from the tractor, connect the machine to the three-point hitch of the tractor (the lifting arms and the top link), center it and lock it with the stabilizer bars. Always keep the machine on the three-point hitch while operating. Check the length of the PTO shaft. Please note that the protective guard of the machine's PTO shaft must extend at least 50 mm over the shaft when the three-point hitch is in its upward and downward positions. Shorten the PTO shaft as needed. The power take-off shaft has a determined model-specific maximum rotation speed which must not be exceeded due to safety reasons. The PTO shaft can be lifted onto the holding bracket of the machine when the machine and the shaft are not coupled to the tractor.
- In TEC models, make sure that the electric power plug is never connected to the electric motor when using the machine by a take-off from the tractor.
- Connect the 12 V power plug (ISO/TR 12369 male, 3-pin) to the tractor's socket.
- Make sure that the protective pipe of the PTO shaft cannot rotate with the shaft. Fasten the chain lock of the protective pipes with care.
- When transporting the machine on public roads, the driver must ensure that power transmission is disengaged.
- Before engaging the power transmission, please make sure that no one is close to the rotating shaft, nor the machine's discharge conveyor.

NOTE! The discharge conveyor of the machine is operating when the power take-off is on! The discharge conveyor stops to function when disengaging the power transmission only.



- It is only allowed to connect the PTO shaft to the tractor when the power transmission shaft is disengaged, the motor is standing still and the ignition key is off from the ignition lock.
- When starting the tractor engine, the power take-off shaft must be disengaged.

Table 2 Maximum allowed power take-off rotation speed for the different models.

Model	Maximum allowed r.p.m.
S110-TC 440	395 r/min
S110-TEC 440	500 r/min
S185-TC 440	435 r/min
S185-TEC 440	550 r/min

NOTE! Maximum rotation speed for the power take-off must not be exceeded. Exceeding this limit may damage the machine. The warranty does not cover damages caused by crossing the r.p.m. limit.

- The power take-off shaft has to be disengaged when not in use or when the angle between the tractor and the machine is too large.
- Before engaging the PTO shaft and also when the shaft is rotating, please make sure that

no one is in the danger zone.

- Do not use other than CE marked PTO shafts approved by the manufacturer. Protective pipes and funnels and the protection of the power take-off shaft always have to be installed properly and in good condition.
- Never use a damaged PTO shaft, because that poses a serious threat of accident. A damaged shaft must be repaired before used again.
- Please pay attention to the overlap of the shaft pipes of the PTO shaft in both transport and work positions.
- If the shaft needs to be shortened, please clean and lubricate the profile pipes carefully afterwards.
- Coupling and uncoupling the PTO shaft is only allowed when the tractor's power take-off shaft is disengaged. Never rely uncoupling of the PTO shaft only on the disengagement of the clutch.
- When the PTO shaft has been coupled, the locking pin must be inserted and locked in the locking groove of the power take-off shaft. Please make sure that the shaft is securely locked.
- Set the security chain of the shaft guard so that the guard cannot rotate.
- When not using the machine, please place the uncoupled PTO shaft to its support bracket.

9. Operating the Machine by an Electric Motor Drive

Table 3. Electric motor specifications of each electrically driven model.

Model	Electric Motor	Required fuse size	Size of required extension	Starter
S110-TEC440 S110-EC440	400 V (480 V in USA), 11 kW, 1500 r.p.m.	25 A slow	5-pole 6 mm ² (32A plug)	Soft starter
S185-TEC440 S185-EC440	400 V (480 V in USA), 15 kW, 1500 r.p.m.	32 A slow	5-pole 6 mm ² (32A plug)	Soft starter

- The machine's starter has an emergency stop function.
- To execute an emergency stop, press down the Emergency Stop button in the control panel.
- To release the button, pull it back up.
- Electrical installation has been completed on the machine.
- Always check that the motor rotates in the correct direction. The power take-off shaft of the angular drive has to rotate anticlockwise. If the motor rotates in the wrong direction, stop and unplug it immediately. In this case, the two phase wires of the plug have to be interchanged. Leave this to an authorized electrician.
- Install the shaft guard provided with the machine to the angular drive shaft which is intended for the tractor.
- Make sure that the fuse size is sufficient for using the machine.
- If an electrically driven machine is operated in a temperature under -15 °C, low-temp hydraulic oil is recommended, e.g. ISO VG 22 S multigrade oil or synthetic hydraulic oil.
- In severe negative temperature, let the machine run idle for a short while to warm it up.

10. Operating Position and Transport Position

10.1. Feed Conveyor Operating and Transport Position

Feed table without the log lifter

Open the locking latch of the feed conveyor (Figure 5) and pull the feed conveyor **carefully toward yourself**, so that the conveyor begins to lower by its own weight; also, support it at the same time. The conveyor settles automatically to its correct downward position. Clear the ground beforehand and keep holding the feed conveyor carefully during its descent.

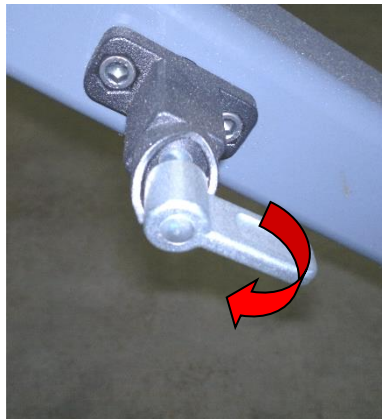


Figure 5 Opening the locking latch of the feed conveyor

Feed table with the log lifter

If a log lifter (accessory) is connected to the machine, the feed conveyor is brought into operating position hydraulically. Open the locking latch of the feed conveyor (Figure 5). Start the machine in **manual mode**. Use the hydraulic lever on the control panel (Figure 6) to lower the conveyor to its downward position; the lifter also lowers against the base.



Figure 6 Hydraulic levers: **1.** Position of discharge conveyor; **2.** Position of hydraulic log lifter (accessory) and feed conveyor; “+” = conveyor up; “-” = conveyor down.

NOTE! Depending on the number of accessories, the feed table control and log lifter control may be located also in number 3.

NOTE! Lift the feed conveyor into transport position when the machine runs on manual

mode by using the hydraulic lever of the log lifter and by simultaneously pressing down the Start button.

10.2. Discharge Conveyor Operating and Transport Position

1. Start the machine in **manual mode** and make sure that the manual valve of the discharge conveyor is in upright position.

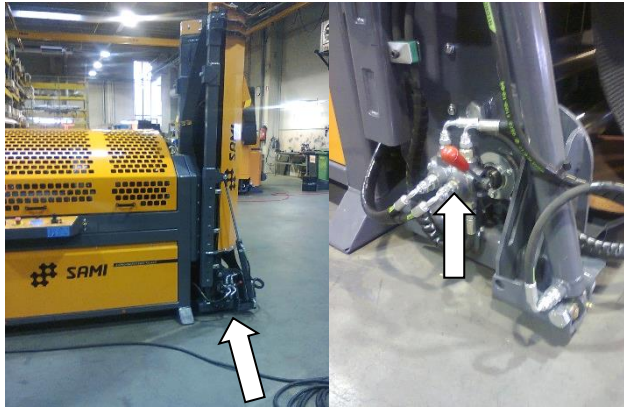


Figure 7. The manual valve of the discharge conveyor into upright position

2. Pull the hydraulic lever of the discharge conveyor slowly downwards.



Figure 8. Lowering the discharge conveyor

3. When the conveyor has lowered enough, turn the manual valve of the discharge conveyor into down position.

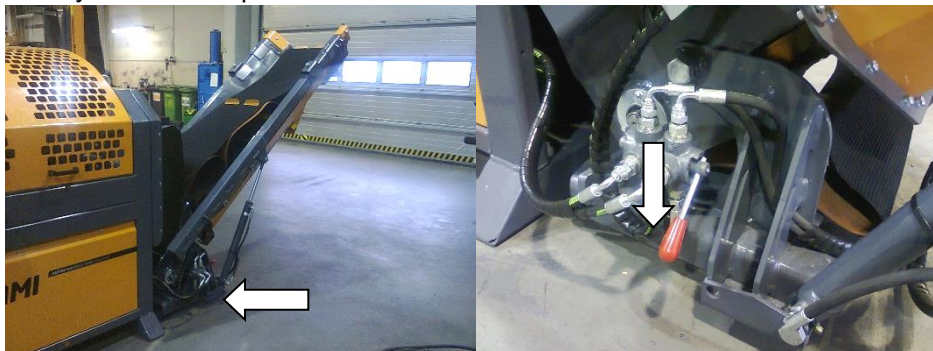


Figure 9. Manual valve of the discharge conveyor into down position

4. Push the hydraulics lever of the discharge conveyor slowly upwards so that the conveyor is in its full length and the discharge conveyor belt starts running.



Figure 10. Using the telescope of the discharge conveyor

5. Turn the manual valve of the discharge conveyor into upright position and adjust the height with hydraulic lever of the discharge conveyor.



Figure 11. Adjusting the height of the discharge conveyor

Setting the discharge conveyor into transport position is achieved by performing the steps above in reverse order.

10.3. Sideways Adjuster of the Discharge Conveyor

- The discharge conveyor can also be adjusted sideways ca. ± 13 degrees by pushing it from the sides by hand.
- As an accessory, you can purchase a hydraulic sideways adjuster for the discharge conveyor that is controlled from the hydraulic lever in the control panel.
- To bring the machine into transport position, carry out the aforementioned operations in reverse order. **Please note that if a log lifter (accessory) is connected to the machine, lift the feed conveyor to its upward position by simultaneously pressing down the Start button and using the hydraulics lever.**

Fold the discharge conveyor belt inside of the conveyor before lifting the conveyor into transport position. See step 1 in "DISCHARGE CONVEYOR OPERATING POSITION".

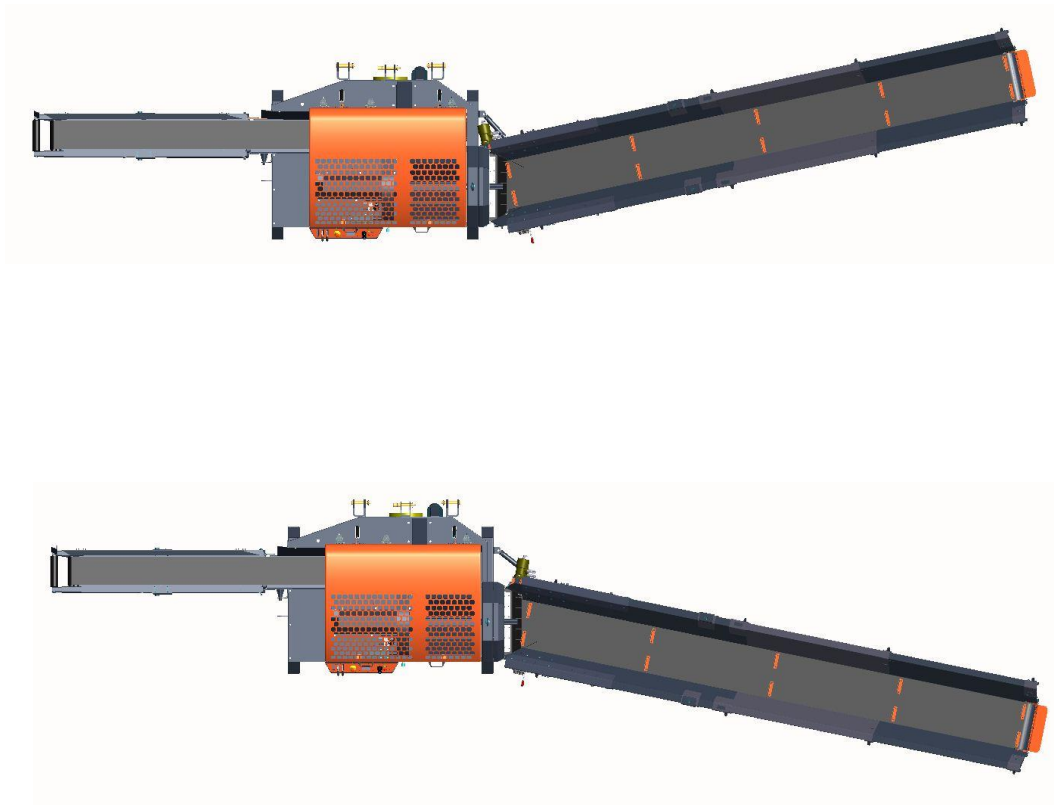




Figure 12. Sideways adjuster of the discharge conveyor

11. Notes on the Operation of the Machine

- Before starting the machine, check the hydraulic oil level.
- Check the chain blade oil level.
- Ensure that there is **no one in the hazard zone** when starting the machine. 
- Ensure that the chain blade lubrication works.
- Dosage of the chain blade lubrication may require adjustment if the oil is cold or warm. The lubrication is adjusted in the control panel by changing the lubrication pulse.
- In cold temperatures (under 0 °C), allow the machine to idle at low speed for about 10 minutes or until the oil temperature raises to ca. 20 °C before starting to use the machine; this warms up the hydraulic oil and ensures proper functioning of the hydraulics.
- Since the different hydraulically operated movements use partially the same hydraulic circuits, the simultaneous use of two movements may in some cases affect the speed of one of those movements. E.g. when turning the log lifter lever into extreme position, the splitting cylinder stops moving. In simultaneous operation, it is recommended that the log lifter is not operated in extreme position. This is to ensure that the splitting cylinder does not stop moving.
- **All protective guards must be in place and in good condition.** They are necessary for the safety of the user. 
- **Never touch any rotating part.**
- When maintaining or repairing the machine, first **always stop the machine** and disengage the tractor's power take-off or, if electric motor operated, remove the electric power plug from the socket.
- When the power take-off from the tractor is on, the **discharge conveyor of the machine is always on.** The discharge conveyor stops when the power take-off from the tractor is disconnected.
- Stop the machine when you leave it.
- **Only one person must operate the machine at a time.** Don't allow anyone to approach the work area.
- The machine must not be cleaned until the power take-off has been disengaged or the electric power supply has been unplugged.
- Do not cut logs in a bunch; cut only one log at a time.
- Never saw timber with foreign bodies in it (notably nails, barbed wire, etc.).
- The minimum log diameter is 5 cm.
- The maximum blade range is 440 mm; this is not same value as the log diameter. When operating large logs, always take the shape of the log, the position on the table and possible branches or knots into account.
- Maintain the machine according to the maintenance instructions and the maintenance schedule.

Take advantage of the machine's versatile possibilities. The machine has very multifunctional adjustment possibilities. See adjustment possibilities and adjusting in chapter 14 of the manual.

12. Operating the Machine

12.1. Control Panel

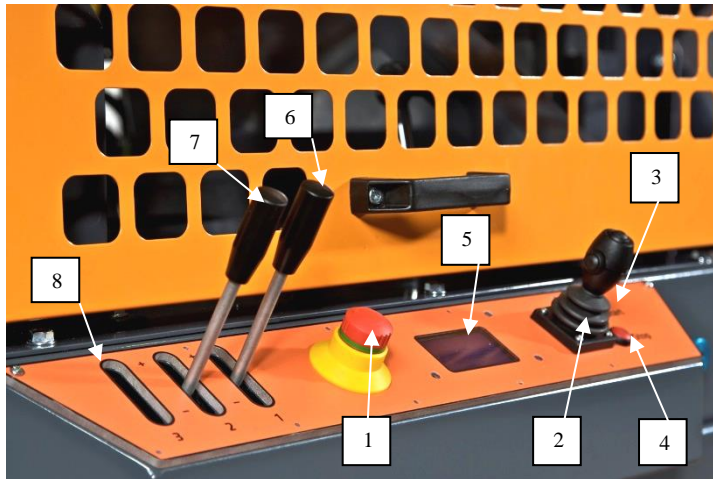


Figure 13. Control panel

1. Emergency Stop switch
2. Joystick controller
3. Start button
4. Stop button
5. Display
6. Valve lever 1: discharge conveyor
7. Valve lever 2 (for accessories): hydraulic log lifter, sideways-adjustable discharge conveyor or external hydraulic motor controller.
8. Valve lever 3 (for accessories): if a hydraulic log lifter or sideways-adjustable discharge conveyor is installed on the machine, this valve lever can be installed with an external hydraulic motor controller, e.g. for the feed table.

12.2. Hydraulic Log Lifter (Accessory)

Logs must be laid on the supporters so that their weight is distributed evenly on both supporting beams (log foot toward the machine). Overloading the lifter may damage it.

NOTE! Maximum size of logs processed with the hydraulic log lifter (accessory) is 220 kg / 3.0 m (110 kg / supporting beam). E.g. fresh birch diam. 300 mm weighs ca. 65kg / m (3 m weighs ca. 195 kg).

Please note that when using a log lifter (accessory), the feed conveyor is brought into its upper position by holding the Start button down and at the same time using the hydraulic lever.

Please take special caution when operating the lifter. Unusually shaped logs, branches etc. may jam the lifter or move in an unexpected way. Avoid fast movements to prevent unexpected situations and to minimize unnecessary use and wear of



the lifter's structure.

Placing footing pieces under the log pile makes it easier to transfer logs to the lifter.

Care about your personal safety: wear protective shoes in addition to your usual safety gears.

12.3. Display and Menus

Display functions

- Navigate the menus with the joystick controller. Different modes are chosen by moving the joystick up and down.
- Joystick top button: to the menu functions and confirming the selections.
- Joystick side button: to select the optimization mode in automatic mode.

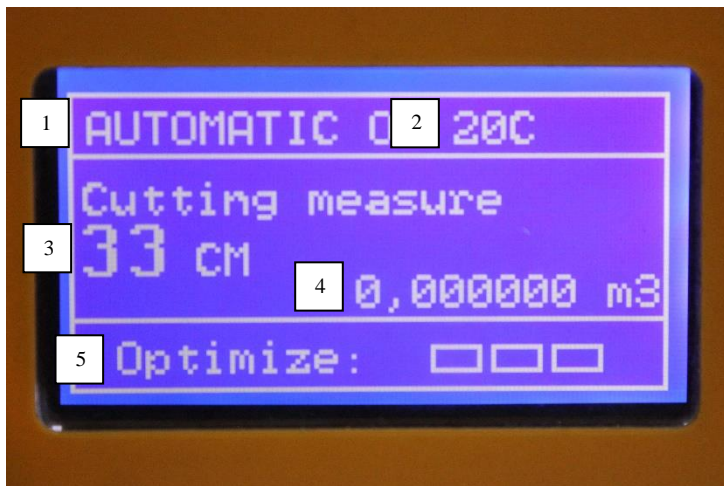


Figure 14. Start-up display (here in automatic mode)

1. Display of the selected work mode. The mode can be changed by moving the joystick controller up and down.
2. Hydraulic oil temperature.
3. Preset cutting length. Setting the cutting length by moving the joystick controller left or right.
4. Volume counter, in solid cubic meters.
5. Display of selected optimization. Changing the optimization by pressing the side button of the joystick controller.

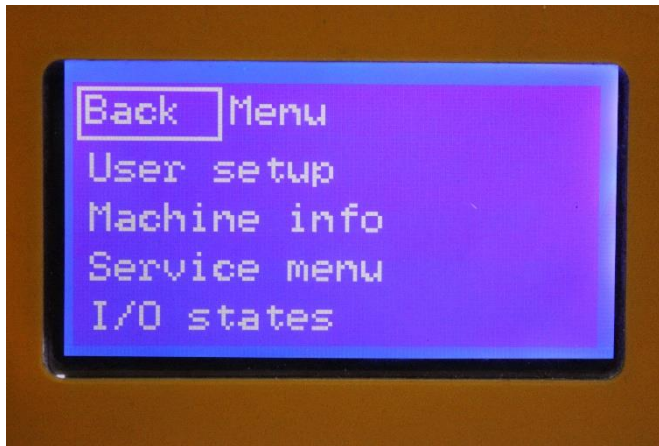


Figure 15. Menu (to the menu by pressing the top button of the joystick controller)

- User settings (Figure 16)
- Machine specifications (Figure 17)
- Maintenance menu. See separate instructions in chapter 15 of the manual.
- I/O properties, information for calibrating the machine. See separate instructions in chapter 14.6 and 14.7 of the manual.

User settings

In the user settings menu, the following settings can be determined:

- Menu language

- **Splitting size limit:** setting the size limit (mm) below which the logs are split in half with the shaft part of the splitting blade.

- **Amount of the chain lubrication oil:** with a greater pulse value the lubrication increases and with a smaller value the lubrication decreases.

- **Pusher limit:** setting the diameter limit (mm) below which the logs are pushed by the log conveyor at the top speed.

- **Volume counter** (solid cubic meters): can be used in automatic mode. Value 1 means that the counter is activated and value 0 means that the counter is deactivated.



Figure 16. User settings

Machine specifications

In the machine specifications, all the operating hours and solid cubic meters can be seen. To reset the cubic meter counter, navigate to the bottom of the menu which shows the notice "Reset cubic meters?" and press the Top button to confirm the reset. The operating hours counter cannot be reset.

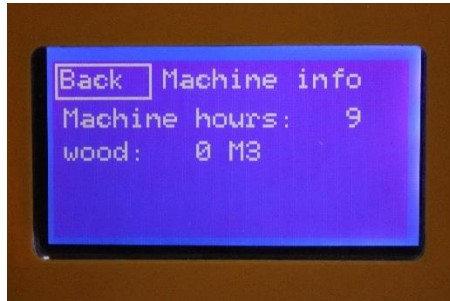


Figure 17. Machine specifications

12.4. Joystick Controller Functions

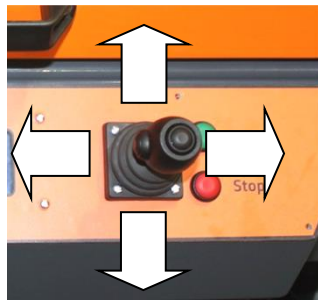


Figure 18. Joystick controller

Manual mode

- RIGHT: the feed conveyor feeds logs.
- LEFT: the feed conveyor reverses.
- DOWN: sawing blade lowers; release the joystick and the sawing blade raises back up.
- SIDE BUTTON and RIGHT at the same time: splitting movement of the splitting cylinder.
- SIDE BUTTON and LEFT at the same time: return stroke of the splitting cylinder.
- SIDE BUTTON and UP at the same time: splitting blade up.
- SIDE BUTTON and DOWN at the same time: splitting blade down.
- TOP BUTTON: the log pusher performs a forward stroke and push the log into the splitting spout; button release brings it back in place.

Semi-auto mode

The functions are similar to the manual mode, except:

- UP: the splitting cylinder performs a series of splitting movements and returns automatically.

12.5. Replacing the Splitting Blade

1. Set manual mode.
2. Lift the splitting blade into top position and the blade is released (Joystick controller UP and push the side button simultaneously).
3. Stop the machine (STOP button) and disconnect the plug from the socket. When using the power take-off from the tractor, stop the power take-off and remove the key from the ignition lock.
4. Open the protective cover and lift the splitting blade (for instance, standing on the discharge conveyor). Please take special caution and use appropriate safety gloves; there are sharp and even cutting edges in the splitting blade.
5. Lift the new splitting blade in place.
6. Close the protective cover, ensure its safety and start the machine in manual mode.
7. Lock the blade by running it into down position (joystick controller down and the side button simultaneously pressed down).

12.6. Work Modes

12.6.1. Manual Mode



Figure 19. Manual mode

To control the functions manually, use the joystick controller.

The log pusher always propels a cut log into the splitting spout when the cut has been executed without action from the user.

Please note that the belt of the discharge conveyor begins to move when the machine is started and stops when the machine is stopped; the same applies to tractor-driven use when the power take-off shaft is rotating.

12.6.2. Semi-Auto Mode



Figure 20. Semi-auto mode

The devices are controlled manually with the joystick controller, but the feed conveyor belt feeds logs to the splitting blade according to the pre-set length.

The log pusher always propels a cut log into the splitting spout when the cut has been executed without action from the user.

To propel a log with the splitting cylinder, move the joystick controller up. When the joystick is released to the center position, the splitting cylinder completes the function by returning to its initial position.

Please note that the belt of the discharge conveyor begins to move when the machine is started and stops when the machine is stopped; the same applies to tractor-driven use when the power take-off shaft is rotating.

12.6.3. Automatic Mode



Figure 21. Automatic mode

All the functions begin and end according to the program when the user places logs on the feed conveyor.

The machine automatically detects a stuck splitting blade, releases it and continues the process.

Please note that the belt of the discharge conveyor begins to move when automation mode is selected and started with the Start button.

Please note that the belt of the discharge conveyor begins to move when the machine is started and stops when the machine is stopped; the same applies to tractor-driven use when the power take-off shaft is rotating.

Please note that while using the machine in Automatic mode, the splitting piston will sometimes wait until the splitting blade is centered.

To continue in the automatic mode after an interruption

Operate the machine in Manual or Semi-Automatic mode until the conveyor table is empty. There can be logs waiting in the splitting spout.

Place the front end of the next log to the blade flange and the back end beyond the optical sensors.

You can then continue operating the machine in Automatic mode by selecting the Automatic mode and pressing Start.

The machine starts the work circle immediately by moving the splitting cylinder and feeding new logs for the cutting at the same time.

12.6.4. Nonstop Auto Mode



Figure 22. Nonstop auto mode

Similar to the Automatic mode but independent from log traffic; the cutting and feeding functions are continuous.

Optimal for splitting small logs.

12.6.5. Double Cutting Mode



Figure 23. Double cut mode

Similar to the Automatic mode but cuts two logs before the log pusher conveys the logs into the splitting spout for.

For processing short logs of 20–23cm length.

Processing short logs is fast. When running short logs, the logs are not able to "fall" into an incorrect position when moving them into the splitting spout.

12.6.6. Sorter Manual Mode



Figure 24. Sorter manual mode

In case the machine is connected to the SAMI Autosorter, in the control menus of the machine, there is also the sorter manual mode.

The whole SAMI Autosorter, i.e. the loading table, the automatic sorter and the transfer conveyor can be operated manually.

SAMI Autosorter instructions are separate.

12.7. Optimization of Logs

- **Option 1.** The waste bit is sawed off before the last log of the pre-set length. The waste bit falls into the splitting channel and is split (Figure 25, pos. 1). All the other logs are of the preset length. The waste bit length varies. In the automatic mode optimization menu, the figure looks so: -- - --
- **Option 2.** The waste bit is divided into two (Figure 25, pos. 2). The waste bit length is spread over the two last logs, so they might be longer than the preset length. In the automatic mode optimization menu, the figure looks so: --- ---
- **Option 3.** The waste bit is divided into three so that the preset log length is not exceeded, but the last logs are shorter than the preset length (Figure 25, pos. 3). In the automatic mode optimization menu, the figure looks so: -- -- --
- **NOTE!** The length of the waste bits depends on the preset length, in relation to the log length. This is why the length of the waste bits varies.

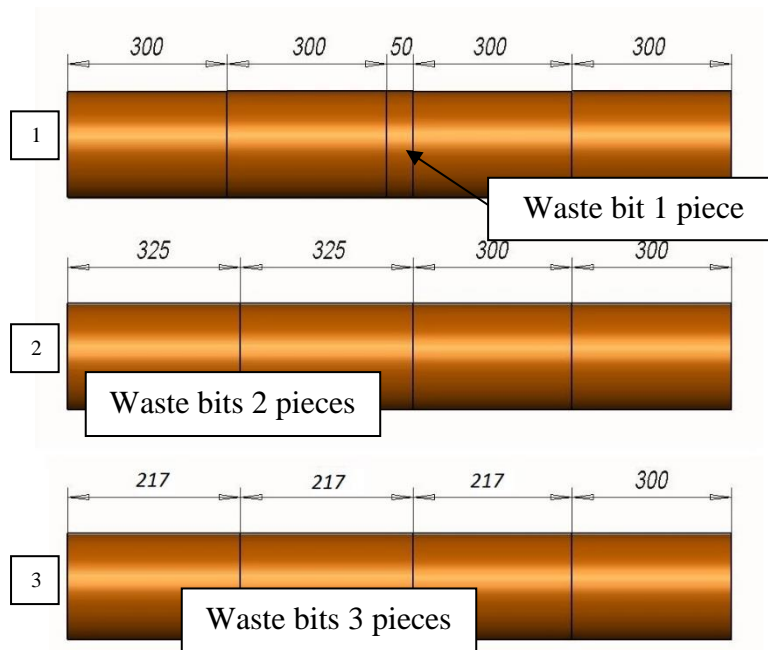


Figure 25. Optimization alternatives of the logs. The measurements in the figure are examples, the length of the waste bits varies depending on the processed wood and the length of the cut log.

The machine optimizes automatically the waste bits. The automatic optimization can be used in automatic and double cutting mode.

Between logs placed onto the feed table, a space of at least 2cm must be left so that the optical sensors on the feed table recognize automatically when the log ends and the next one begins.

The optimization functions in a way that when the end of the log passes the optical sensors on the feed table, the automatic optimization starts and the end bit of the log is optimized according to the preset optimization selection.

The preferred optimization option is selected in the presets of the automatic mode before the machine is started by using the side button in the Joystick controller.

12.8. Initial Selections in Automatic Mode Prior to Starting the Machine

First, ensure that there are no other people in the working area and that the machine is in operation position and that the appropriate splitting blade is in place.

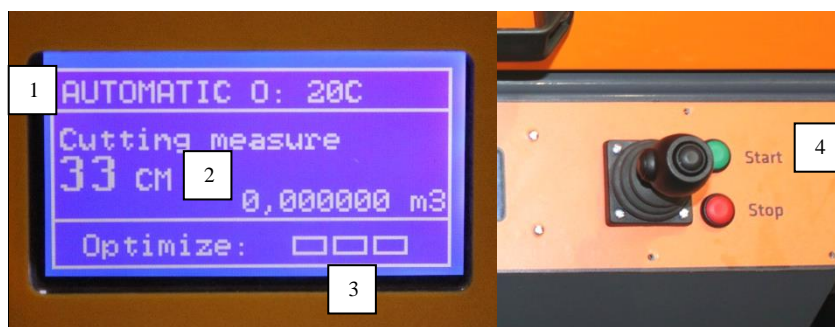


Figure 26. Initial selection in automatic mode

1. Select "AUTOMATIC" mode by turning the Joystick controller upwards or downwards (in this example selections of the automatic mode).
2. Set the preferred length for the log with the Joystick controller. By turning the Joystick to the right, the length increases and by turning it to the left, the length decreases.
3. The preferred optimization is selected by pressing the side button of the Joystick.
4. Push Start button to start the machine. In automatic mode, the feed conveyor starts running immediately after the machine is started. The machine starts the work cycle automatically when you place wood on the feed conveyor, as it is detected by the optical sensors.

12.9 Working in Automatic Mode

The machine works automatically after it has been started. The work cycle begins only after wood has been placed onto the feed conveyor. If there is no wood on the feed conveyor, only the feed conveyor and the discharge conveyor run. The optical sensors on the feed conveyor recognize the wood placed on it, and the work cycle begins.

NOTE! Any object in front of the optical sensor will start the work cycle of the machine!

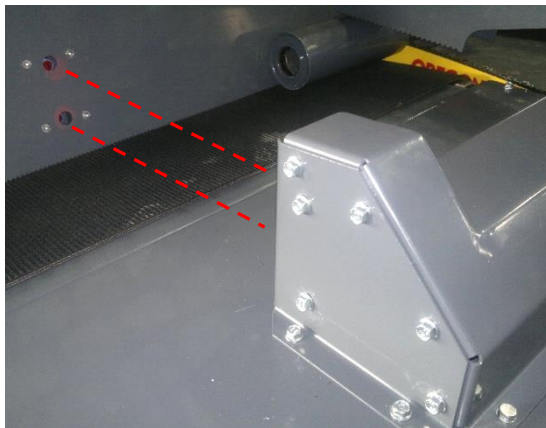


Figure 27. Optical sensors

12.10. Automatic Work Cycle

The machine operates automatically after having been started. The work cycle begins only after wood has been placed onto the feed table.

1. The optical sensors of the feed conveyor detect the present wood.
2. The wood moves to the saw according to the preset cut length.
3. The feed belt stops and the log ram lowers down to push the log. At the same time the angle sensor measures the log thickness.
4. The chain starts to run and the flange cuts the log.

6. The pusher transfers the cut log into the splitting spout and, at the same time, the splitting blade is positioned in the right height according to the information received from the log ram.

7. The flange moves up and, simultaneously, the splitting piston presses the log through the splitting blade. During the splitting, the feed belt feeds a new log for cutting and the cutting process begins. The work cycle continues as long as there are logs on the feed table.

8. The optical sensors recognize the end bit of the log and it is optimized automatically according to the presets.

NOTE! Between the logs placed into the feed table, a space of at least 2 cm must be left so that the optical sensors on the feed table recognize automatically when the log ends and the next one begins. The optimization of the end bit is automatic.

13. Sensors

There are several different types of sensors in the machine. The automatic operation of the machine is controlled with the sensors.

In this section, the most important sensors and their operation are described.

1. The optical photocell sensors of the feed conveyor: These sensors detect the presence of wood on the feed conveyor and where the log ends and the next one begins. These sensors are also used for the optimization process of the end bit and for the first cut log length control.



Figure 28. The optical sensors of the feed conveyor

2. The angle sensor of the feed belt: The angle sensor of the machine monitors the movement of the feed belt and it is used to measure and to control the running distance of feed belt.



Figure 29. The angle sensor of the feed belt

3. The angle sensor of the log ram: During each cut, this sensor measures the log diameter. The sensor follows the position of the log ram when it pushes the log. Also the splitting blade height and is adjusted with this sensor. The volume counter uses the information received from this sensor and the running distance information received from the angular sensor of the feed table.

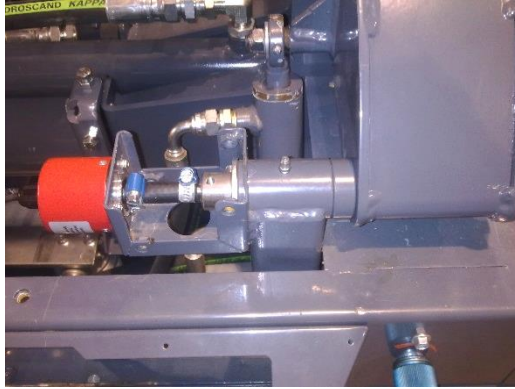


Figure 30. The angle sensor of the log ram

4. The angle sensor of the splitting blade: This sensor is used to adjust the height of the splitting blade. The splitting blade is adjusted in the right height according to the information received from the angle sensor of the log ram. This sensor monitors the height measurement of the splitting blade.



Figure 31. The angle sensor of the splitting blade

5. The inductive sensors of the blade flange: There are two inductive sensors in the blade flange. They are used to measure the top and down positions of the flange. These sensors are used to control the releasing of the jammed blade flange and the re-cutting, and some specific safety measures of the blade flange. A time limit has been set for the blade flange, in which it should move from the top sensor to the bottom sensor. Should the limit be exceeded, the machine lifts the flange up automatically and cuts again. The preset time limit for the flange can be adjusted in the maintenance menu. The feed belt is not able to feed a new log before the machine received the information that the flange is at the top sensor. This is to ensure that, e.g. in manual mode, the log is not accidentally fed towards the flange.

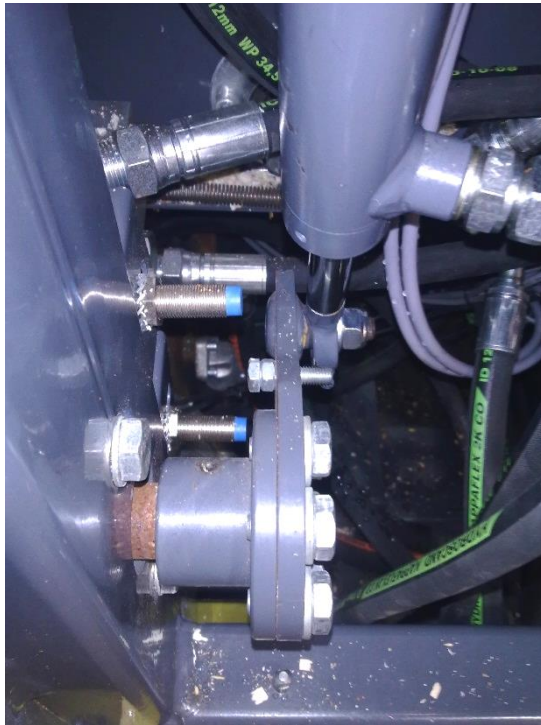


Figure 32. The inductive sensors of the blade flange

6. The inductive sensors of the splitting cylinder to recognize the front and rear positions:

There are two inductive sensors in the splitting cylinder. They are used to monitor the front and rear positions of the splitting cylinder. A time limit has been set for the splitting cylinder, in which it should move from the front sensor to the rear sensor. Should the limit be exceeded, the machine stops automatically. The positions of the sensors can be adjusted, which affects the stroke length. The preset time limit for the cylinder can be adjusted in the maintenance menu.



Figure 33. The inductive front and rear sensors of the splitting cylinder

7. The inductive sensor of the log lifter (accessory): In case a hydraulic log lifter is installed in the machine, the feed conveyor is locked in down position electrically. When the log lifter is installed in the machine, the feed conveyor is lowered and lifted hydraulically into operating and transport positions. The feed conveyor is locked into operating position electrically with the inductive sensor of the log lifter. The feed table can be lifted into transport position by using the control lever of the log lifter when the machine is running and by pushing Start button at the same time.



Figure 34. The inductive sensor of the log lifter

NOTE! Operate the machine only in manual mode when lowering or lifting the feed conveyor hydraulically. In automatic mode, when preparing the feed conveyor for operating or transport position, the feed belt might move in front of the photocell sensors and start the cutting. In case this happens, there is a risk of the belt being cut by the blade flange!

14. General Adjustments and Functions of the Machine

14.1. Adjusting the Speed of the Blade Flange

- The descent speed of the cutting arm can be adjusted steplessly.
- The speed of the cutting arm should be adjusted according to the characteristics of the processed wood.
- To adjust the speed, turn the valve to its minimum position (Figure 35).
- Saw the logs on the manual mode and enlarge the parameter until attaining the desired speed of the cutting arm.

NOTE! If the speed of the cutting arm is too high, the chain blade may get jammed in a log. If this happens, decrease the speed.

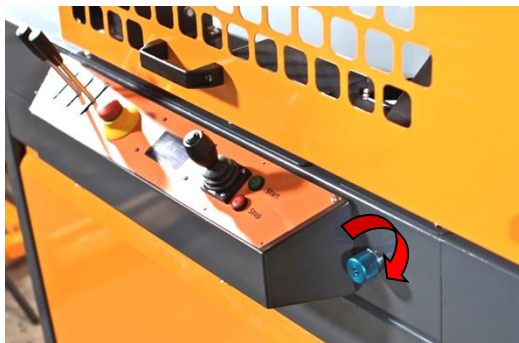


Figure 35 Speed control valve of the cutting arm

14.2. Adjusting the Speed of the Log Pusher

- The speed of the log pusher can be adjusted steplessly. Adjust the speed according to the log characteristics and weather conditions. When the wood is frozen or branched, decrease the speed. By decreasing the speed, feeding the logs into the splitting spout upright position can be avoided. When the speed is too high and the log is frozen or branched, the logs can be fed vertically into the splitting spout.
- The speed of the log pusher is adjusted from the speed control valve of the conveyor cylinder.

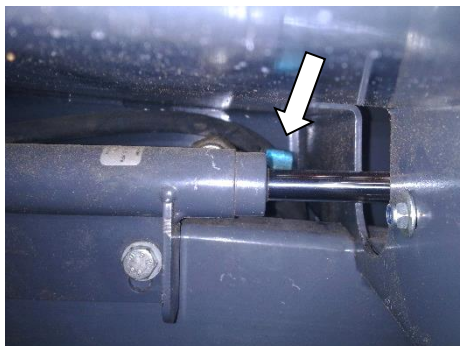


Figure 36 Speed control valve of the log pusher

NOTE! The speed of the log conveyor must only be adjusted when the machine is off!

14.3. Adjusting the Speed of the Feed Belt

- The speed of the feed belt can be adjusted steplessly. Adjust the speed according to the log characteristics and weather conditions. When the wood is frozen or wet, decrease the speed. By decreasing the speed, feeding the logs do not slip on the feed belt. Correspondently, in dry and good conditions, the speed of the feed belt can be increased.
- The speed of the feed belt is adjusted from the control valve of the feed belt motor (Figure 37).
- In the machine, there is also an automatic feed belt advance adjustment, which monitors the machine oil temperature. The warmer the hydraulic oil is, the faster the electric valves close and open and vice versa. The advance changes automatically according to the oil temperature, as long as the initial advance is preset appropriately.
- By adjusting the initial advance in the maintenance menu, the dimensional accuracy of the machine is adapted, after which the machine adjusts automatically the feed belt advance according to the oil temperature.
- Adjust the initial advance of the feed belt always after changing the speed of the feed belt.



Figure 37. Adjusting the speed of the feed belt



NOTE! The speed of the speed belt must only be adjusted when the machine is off!

Adjust the speed of the feed belt by performing the following steps:

1. Switch off the machine, and open the small right-hand-side protective cover on the back of the machine.
2. Adjust the speed of the feed belt from the control valve attached to the feed belt motor.
3. Place the protective cover in its place and start the machine on automatic mode.
4. Check the size of the cut logs. The acceptable dimensional accuracy is +/- 1 cm.
5. If the size of the logs does not correspond to the preset, open the maintenance menu (See separate instructions in the maintenance menu manual, in chapter 15).
6. Select sensors in the maintenance menu, then select encoder and then initial advance. Confirm selections by pushing the top button in the Joystick controller.

7. Change the advance when needed. The advance scale is in millimeters. If the logs are short, decrease the advance value and correspondently; if the logs are long, increase the advance value. The set value is active and remains so even when the machine is switched off.

8. Start the machine again in automatic mode and check the size of the cut logs.

9. Repeat the adjustment process if necessary.

Good to know!

By adjusting the initial advance, you can set the measurement tolerance of the log as you prefer. For instance, if you process timber of the length 33cm, by adjusting the advance, the size variation can be 32-33 cm or 32.5-33.5 cm.

In the default settings, the machine is set from the preset into length of +/- 0.5 cm.

14.4. Adjusting the Stroke Length of the Splitting Cylinder

- The stroke length of the splitting cylinder can be adjusted appropriately by moving the inductive sensors placed under the splitting cylinder.
- The closer the sensor is moved to the splitting blade, the closer the splitting cylinder will move to the splitting blade.
- Moving the rear sensor of the splitting cylinder affects the depth of the splitting cylinder return stroke into the cylinder cover.
- When adjusting the sensor, always make sure that the top end of the sensor is in 2 mm distance from the recognition plate in the cylinder rear end. When the distance is too short, the sensor is easily broken, and when the distance is too long, malfunctions occur. In the rear support of the splitting cylinder, there is a sensor recognition plate that moves with the cylinder and when the sensors move forward, the plate stops the movement of the splitting cylinder.



Figure 38. Adjusting the stroke length of the splitting

Good to know!

If the last log turns in vertically into the splitting spout, move the rear sensor of the splitting jack towards the feed table. This way the jack is deeper in the cover, and the last log will not touch it when moving into the splitting spout. Correspondently, when processing long timber of length 45-50 cm, the front sensor of the splitting jack need to be

placed into extreme position into the right towards the splitting blade.

14.5. Adjusting the Speed and Power of the Splitting Cylinder

- There are two integrated cylinders in the splitting cylinder. It is a double-acting cylinder: the speed of the splitting movement is generated by the smaller cylinder and the power when both of the cylinders push simultaneously. The speed and the delay can be adjusted from the upper valve (Figure 39).
- The faster the cylinder is adjusted, the longer the delay is when increasing the power. The power of the rapid movement is 3.0 t and the power of the pushing movement is 11 t or 18.5 t depending on the machine model. If the power of the rapid movement is not enough for splitting, the machine increases the power automatically.
- When increasing the power, also the delay increases the faster the rapid movement is adjusted.
- The return stroke of the splitting cylinder is performed automatically with the rapid movement.
- Adjust the rapid movement appropriately faster by turning the upper control valve counterclockwise and correspondently the movements slows down by turning the control valve clockwise. Note that when decreasing the power, also the delay decreases.

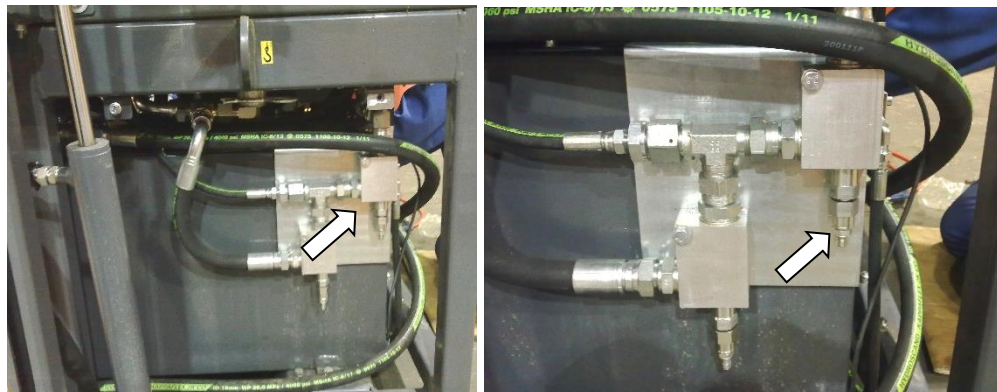


Figure 39. Adjusting the speed and the power of the splitting cylinder

Good to know!

When processing plenty of small timber, adjust the rapid movement as fast as possible, so that the power of the rapid movement is enough to split the logs. Correspondently, when processing plenty of large timber, adjust the rapid movement slower, so that the delay decreases and you do not unnecessarily slow down the work cycle of the machine.

The speed of the return stroke is always automatically performed with the rapid movement.

14.6. Calibration of the Diameter Measuring

1. Place a log of known diameter under the log ram on to the feed belt.
2. Remove the protective guard of the angle sensor.
3. Loosen the hexagonal socket-head screw (1) that locks the cross-over shaft of the angle sensor (2).

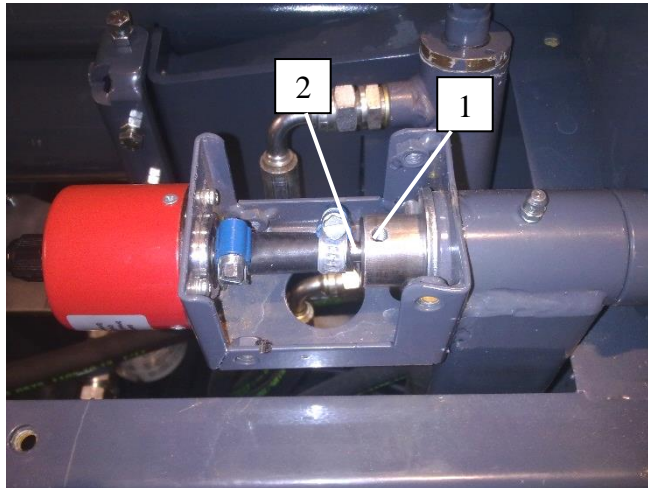


Figure 40 Calibration of the log ram

4. Navigate to I/O properties in the menu (Figure 41).

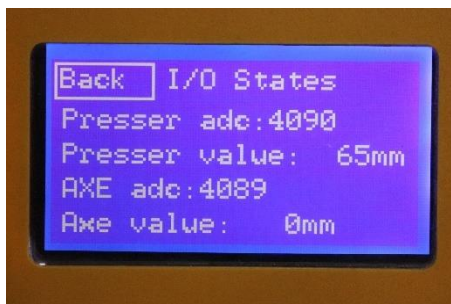


Figure 41 I/O properties

5. Roll the cross-over shaft of the angle sensor until the ram value is in millimeters same as the log diameter placed under the log ram.
6. Tighten the hexagonal socket-head screw (1), leave the menu and attach the protective guard of the sensor.

14.7. Calibration of the Splitting Blade

1. Place a log of known diameter into the splitting spout.
2. Centre the splitting blade into the center of the log.
3. Remove the protective guard of the angle sensor.
4. Loosen the hexagonal socket-head screw (1) that locks the cross-over shaft of the angle sensor (2).

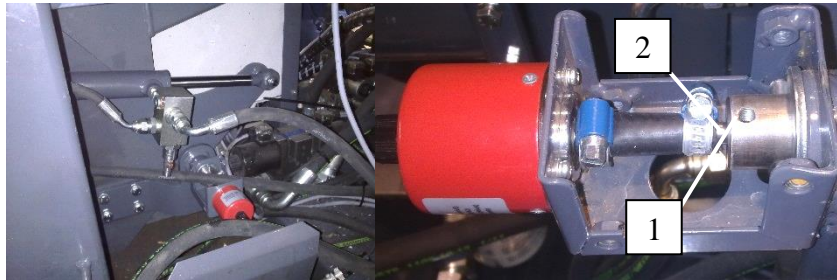


Figure 42 Calibration of the splitting blade

5. Navigate to I/O properties in the menu (Figure 43).

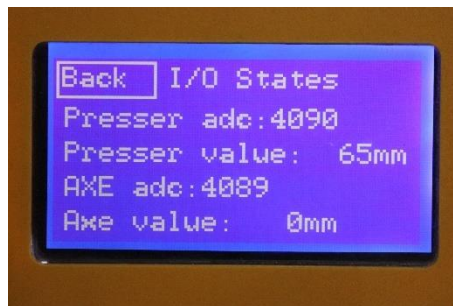


Figure 43 I/O properties

6. Roll the cross-over shaft of the angle sensor until the axe value is in millimetres same as the log diameter placed into the splitting spout.
7. Tighten the hexagonal socket-head screw (1), leave the menu and attach the protective guard of the sensor.

NOTE! The angle sensor is located behind the chain oil can in the lever mechanism of the splitting blade. You might need another person to help you to check the axe value at the same time you roll the cross-over shaft.

15. Service Menu

15.1. Opening the Service Menu

Service menu and its adjustment alternatives are purposed for an experienced user. Do not adjust any settings in the service menu in case you are not sure of what you are doing.

In the following section, all the functions of the service menu and how they affect the operation of the machine are described.

NOTE! Read the operation of the service menu carefully!

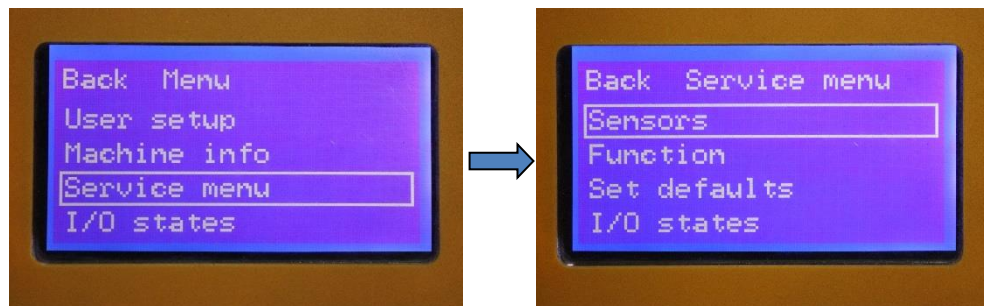


Figure 44 Opening the Service Menu

The service menu can be opened by pushing three buttons so that in the end all three buttons are pushed at the same time. Direct access to the service menu is forbidden to prevent the accidental adjustment of the machine's settings.

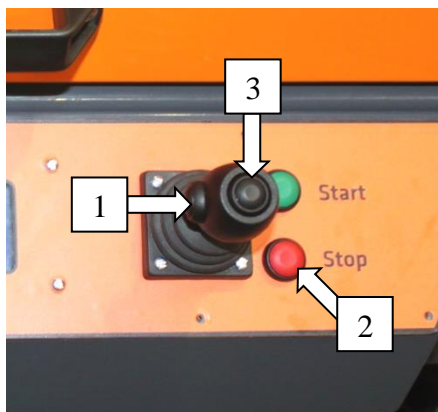


Figure 45 Button combination to access the Service Menu

To access the Service Menu, do simultaneously:

1. Push the side button of the Joystick controller to the bottom and hold still.
2. Push the Stop button in the control panel to the bottom and hold still.
3. Push the top button of the Joystick controller to the bottom.

15.2. Sensors and Their Controls

Under the Service menu and Sensors, there is the diameter dimension table of the log ram, the splitting blade position and the encoder menu that is used to set the feed accuracy of the feed belt and the advance to the electrical control valves of the feed belt.

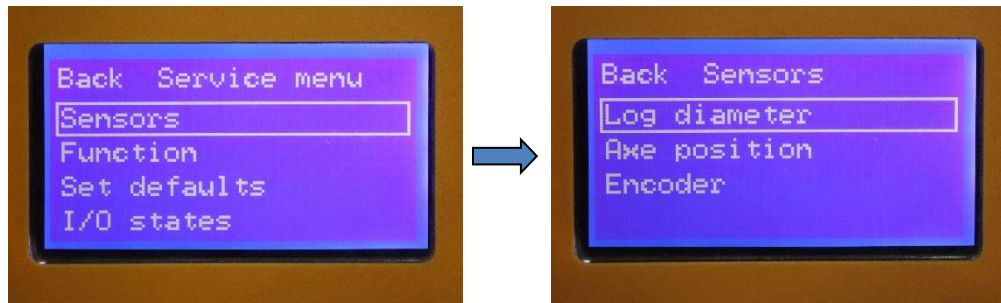


Figure 46 Service Menu

15.2.1. Log Diameter

Under the Log diameter menu, there is the dimension table of the log ram angle sensor. By using the test points, the log diameter is determined according to the angle sensor figure. Only a qualified maintenance person is allowed to change the values in this table.

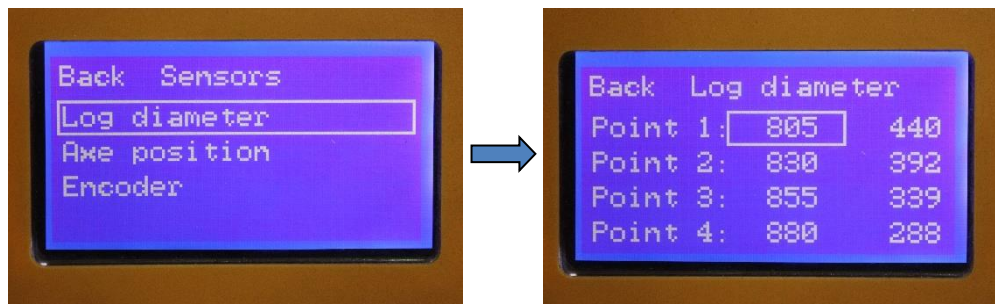


Figure 47 The dimension table for the log diameter

15.2.2. Axe Position

Under the Axe position menu, there is the dimension table of the splitting blade angle sensor. By using the test points, the height of the splitting blade is determined according to the angle sensor figure. Only a qualified maintenance person is allowed to change the values in this table.

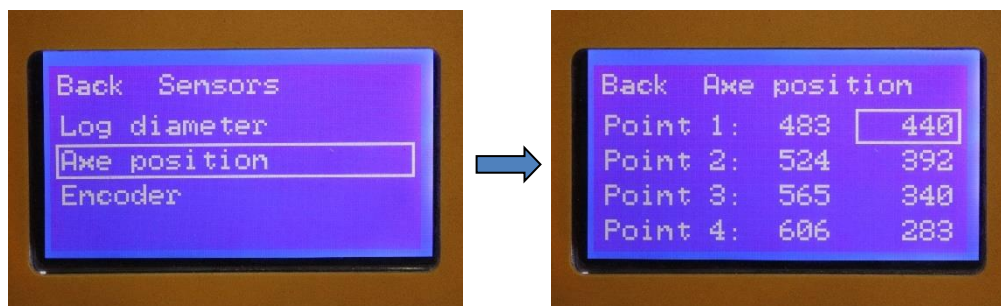


Figure 48 Axe position dimension table

15.2.3. Encoder

Under the Encoder menu, there is the advance ratio. By changing the ratio, the dimensional accuracy of the feed belt and the initial advance can be affected. The initial advance must be adjusted always after adjusting the speed of the feed belt.

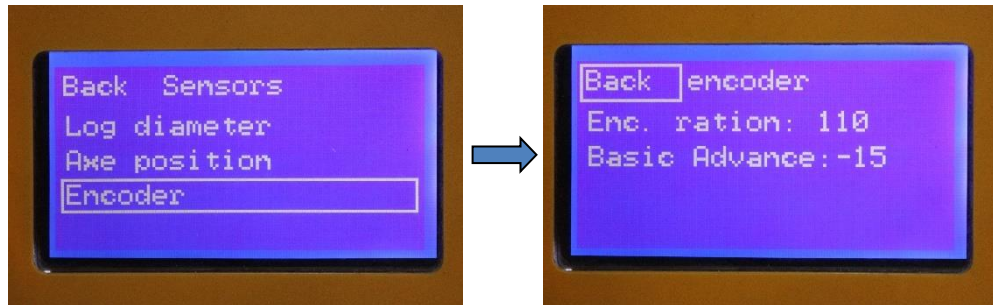


Figure 49 Encoder and the advance of the feed belt

Adjustment instructions for the encoder values

1. Encoder ratio

The encoder ratio affects the dimensional accuracy of the feed belt on the manual mode.

Checking: draw a mark on the feed table and run the belt forward on the manual mode. Check according to the marks the distance of the belt and check if it matches the figure on the display. An acceptable deviation is $\pm 0.5\text{cm}$. In case the display value and the distance of the feed belt differ significantly, change the advance ratio and check again as long as the display figure and the feed belt distance are in correspondence.

2. Initial advance

The initial advance is needed when the speed of the feed belt is adjusted. The speed of the feed belt can be changed steplessly. When changing the speed of the feed belt, also the initial advance must be changed. In the machine, there is also an automatic feed belt advance adjustment, which monitors the machine oil temperature. The warmer the hydraulic oil is, the faster the electric valves close and open and vice versa. The advance changes automatically according to the oil temperature, as long as the initial advance is preset appropriately.

1. On the automatic mode, check the length of the processed logs. In case the length differs more than $\pm 1\text{cm}$ from the pre-set value, adjust the value of the initial advance.
2. If the logs are shorter than the set value => decrease the initial advance value.
3. If the logs are longer than the set value => increase the initial advance value.

The value of the initial advance is in millimeters.

NOTE! The advance ratio and the initial advance are set by default as accurate. When adjusting the speed of the feed belt, change only the value of the initial advance!

Good to know!

If the log length differs occasionally from the pre-set measure, check that there is no dirt in the angle sensor inside the feed table that would prevent it from working.

15.3. Settings and Their Controls

Under the Service menu functions, there are photocell sensor distance, automatic function delays, lubrication pulse settings, language settings and feed belt reverse switch on and off.

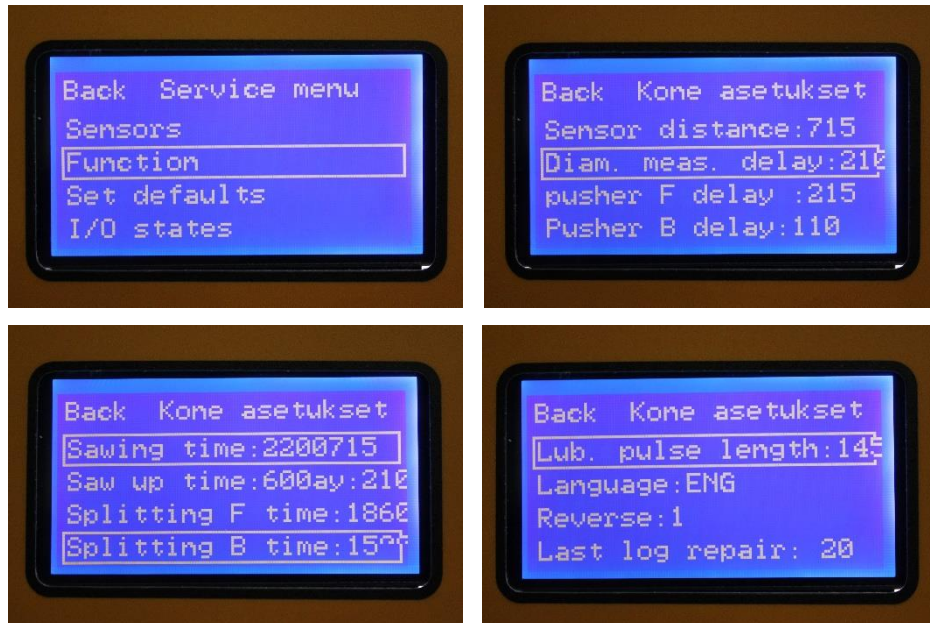


Figure 50 Function menu

15.3.1. Sensor Distance

The sensor distance means the distance of the photocell sensors on the feed table from the cutting flange. By changing the value, the length of the first and the last cut log can be adjusted. The value is in millimeters.

15.3.2. Diameter Measurement Delay

The diameter measurement delay is the time the angle sensor of the ram waits before measuring the log during each cut in order to count the full cubic meters and to center the splitting blade. The time is in milliseconds.

15.3.3. Ram F Delay

Ram to the front delay means the time in which the hydraulic oil is guided to the log conveyor cylinder in order to move the cut log into the splitting spout. The time is in milliseconds.

15.3.4. Ram B Delay

Ram to the back delay means the time in which the hydraulic oil is guided to the log

conveyor cylinder in order to return the conveyor into the initial position. The time is in milliseconds.

15.3.5. Cutting Time

Cutting time is the time, in which the saw bar moves from the top sensor of the saw to the lower sensor of the saw. If the cutting time is exceeded, the saw disconnects itself and cuts again automatically. The machine performs automatic re-cuts 3 times at maximum, after which the machine is switched off automatically, unless during the 3rd time the saw bar does reach the lower sensor. The time is in milliseconds.

15.3.6. Saw Up Time

Saw up time is the time, in which the saw bar must move from the lower sensor of the saw to the top sensor of the saw. If the time is exceeded, the machine is switched off automatically, because a mechanical obstacle (e.g. a branch) is preventing the blade to move to the top position. The time is in milliseconds.

The operation of the feed belt is prevented unless the blade is at the top sensor!

15.3.7. Splitting F Time

Splitting front time is the time, in which the splitting jack must move from the rear sensor of the splitting cylinder to the front sensor of the splitting cylinder. If the time is exceeded, the machine is switched off automatically, because an obstacle is preventing the splitting jack from moving to the splitting blades (e.g. feeding the log sideways to the splitting spout). The time is in milliseconds.

15.3.8. Splitting B Time

Splitting front time is the time, in which the splitting jack must move from the front sensor of the splitting cylinder to the rear sensor of the splitting cylinder. If the time is exceeded, the machine is switched off automatically. The time is in milliseconds.

15.3.9. Lubrication Pulse

The amount of machine chain lubrication can also be adjusted in the maintenance menu. The greater the pulse value, the greater the lubrication amount and vice versa. The same setting can be performed also in the user settings.

15.3.10. Language

The machine's language settings can be adjusted also in the maintenance menu. The same setting can be performed also in the user settings.

15.3.11. Reverse

This is to switch the feed belt reverse function on and off. The value 1 means that the feed belt reverse is on and the value 0 means that it is off.

15.4. Restore Default Settings

The original default settings of the machine can be restored through the service menu. Select Restore from the service menu and navigate the choice box to Function by using the Joystick controller. Then push the top button in the Joystick controller. After performing these steps, the default settings will be restored into the service menu functions.

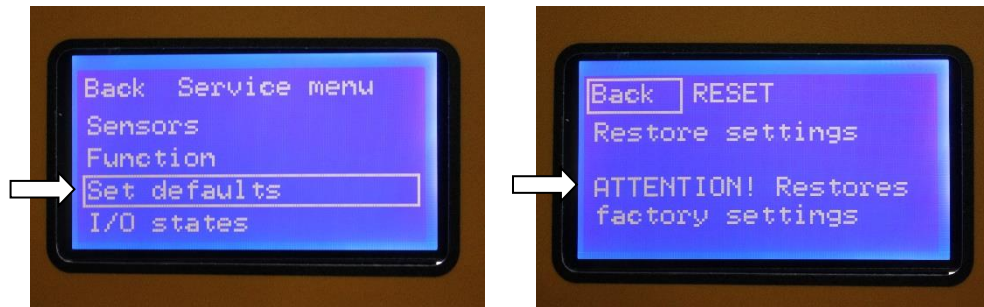


Figure 51 Restoring default settings

15.5. I/O Properties

The service menu can also be used to check the properties and the measuring information of the log ram and the angle sensors.

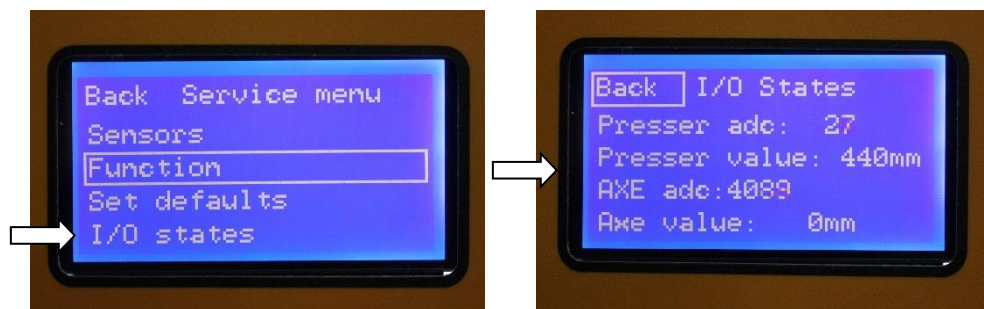


Figure 52 I/O properties

16. Service and Maintenance

16.1. Chain Blade Maintenance

Before performing any maintenance work, stop the tractor engine or unplug the electric motor.

When the chain blade is sharpened correctly, cutting is efficient and effortless. A dull chain blade slows down the work process and is uneconomical. A damaged or worn chain always needs to be replaced.

To sharpen the chain blade, use only chain blade files designed for this particular chain type.

Remember the correct tightness of the chain.

NOTE! After tightening, check that the chain and the flange do not collide into the machine structures.

Type of chain blade for 440 models:

Chain blade 16H, 404", 66 links

Flange Iggesund, 54cm, 16 H, 404" modified specially for Autochopper.

When sharpening the chain blade, please follow carefully instructions provided by the manufacturer, e.g. Oregon.

When sharpening the hard metal blade sold as an accessory, a special chain blade file is required; please contact the spare parts sale for correct sharpening tools.

Clean the chain blade thoroughly after sharpening. Remove any chips and dust from the blade.

When the chain blade is not in use, clean it with a brush or similar cleaning device and store it lubricated.

16.2. Blade Flange Maintenance

If the flange is worn, file the edge of the flange. Also, clean the chain groove and the lubrication channel as needed.

A damaged or worn blade flange has to be replaced with a new one.

Removal of the blade flange: remove the protective plate behind the cutting unit; loosen the fastening screws of the flange; turn the tightening screw anticlockwise; remove the fastening screws of the flange.

16.3. Tightening and Replacing the Chain Blade

Remove the protective plate behind the cutting unit.

Tightening of the chain blade: loosen the fastening screws of the saw bar; turn the tightening screw clockwise. Tighten the fastening screws.

Removal of chain blade: loosen the fastening screws of the flange; turn the tightening screw anticlockwise; if needed, remove the fastening screws of the saw bar.

The chain blade is correctly tightened when it does not hang loose underneath the saw

bar.

Check the tightness of the chain regularly.

16.4. Adjustment and Maintenance of the Discharge Conveyor

Lower the discharge conveyor to an appropriate height. In the end of the discharge conveyor, there are holes to adjust the tightness of the belt.

To tighten the belt, adjust the nuts in front of the springs on the stud bolt.

The tightness is right when the springs subside ca. 1.5-2 cm. Do not tighten too much. The conveyor belt must be able to stop in an abnormal situation when its movement is hindered.

Use the same nuts to adjust the position of the belt on the rollers.

Keep the conveyor clean to ensure proper functioning.

Especially in winter, it is important to clean the conveyor at the end of every working session. Small amount of anti-freeze added daily into the roll or on the capstan decreases the ice on the belt and in the rolls.

NOTE! Do not tighten the conveyor belt too tight. The conveyor must be able to slide off from the capstan if the movement is hindered. E.g. when the log pile becomes too high, discharging becomes hindered which causes a jam in the upper end. In this case, the capstan must be able to slide.

16.5. Adjustment and Maintenance of the Feed Conveyor Belt

To tighten the belt, adjust the screws at the end of the feed conveyor table.

Use the same nuts to adjust the position of the belt on the rollers.

Keep the conveyor clean to ensure proper functioning.

Especially in winter, it is important to clean the conveyor at the end of every working session. Small amount of anti-freeze added daily onto the belt decreases the ice.

16.6. Tightening and Replacing the V-Belt of an Electric Motor

Remove the protective plate of the V-belts.

Turn the screws in the base of the electric motor clockwise so that the belts tighten (Figure 53).

Correspondingly, when replacing the belts, turn the screws anticlockwise so that the belts loosen and can be removed.

NOTE! Always tighten and loosen both adjustment screws equally to retain the alignment of the belt rollers.

When tightening, follow the general tightening instructions of V-belts.

All V-belts always have to be changed at the same time!



Figure 53 Tightening of V-belt from the base of the electric motor

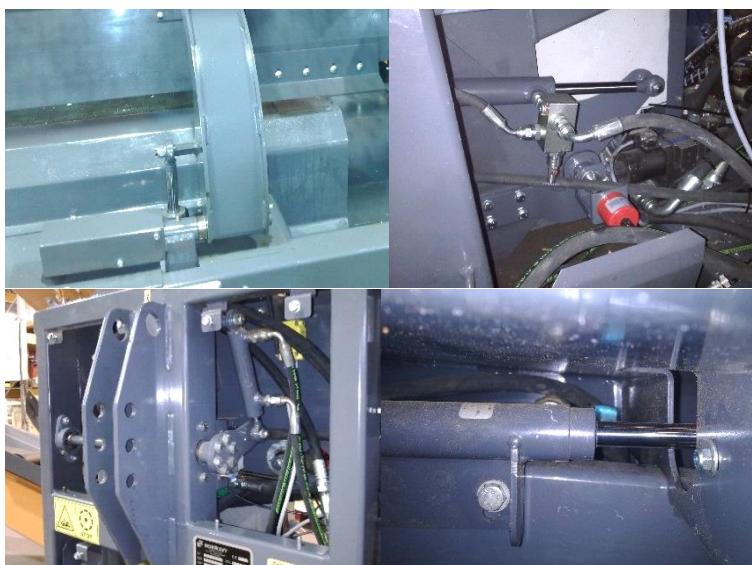
16.7. Grease Nipples

16.7.1. Log Lifter: 12 Grease Nipples



Figure 54 Log lifter, 12 grease nipples (accessory)

16.7.2. Hydraulic Cylinders: 14 Grease Nipples



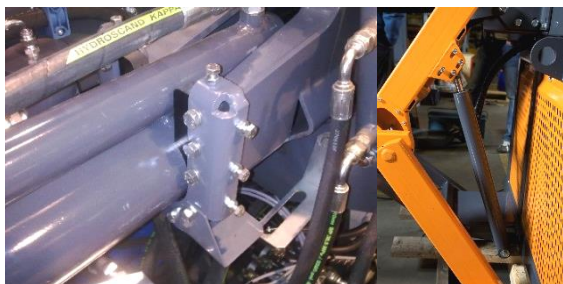


Figure 55 Hydraulic cylinder (7 pcs) and rod ends (14 pcs)

16.7.3. Ram Bearing: 1 Grease Nipple

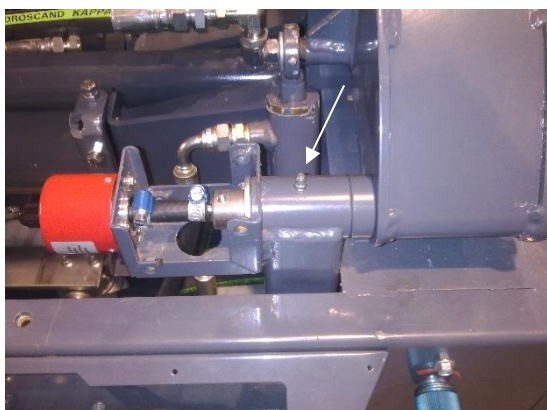


Figure 56 Ram bearing, 1 grease nipple

16.7.4. Bearing of Axe Lever: 1 Grease Nipple



Figure 57 Bearing of axe lever, 1 grease nipple

16.7.5. Flange Bearings in the Cutting Unit: 2 Grease Nipples

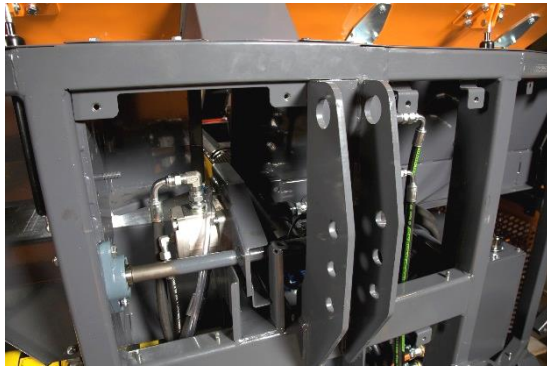


Figure 58 Flange bearings in the cutting unit, 2 grease nipples

16.8. Changing the Hydraulic Oil

Amount of hydraulic oil 115 liters in all models.

Oil type **ISO VG 32**, e.g. Shell Tellus 32 or similar oil type.

Oil type in **warm temperatures ISO VG 46**.

Oil type in **cold temperatures ISO VG 22 S**.

NOTE! Always change the filter as well when changing the oil.

The purity of the oil has a significant effect on the machine's working order; please make sure that you change the oil and the filter in clean conditions.

Remove the plug in the bottom of the hydraulics tank and drain the old oil into a suitable container.

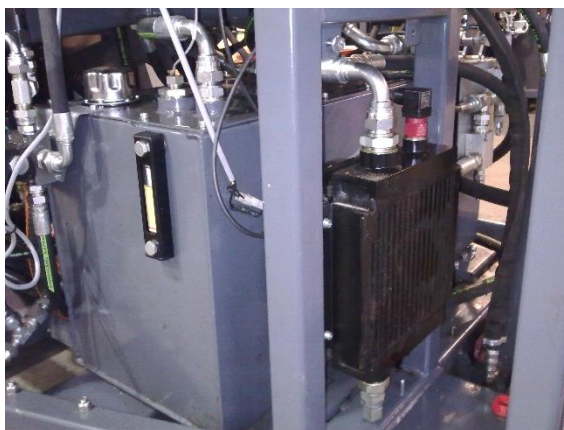


Figure 59 Oil tank

16.9. Changing the Angular Gear Oil (TEC Models)

Open the plug in the bottom (Figure 60, pos 1) and remove the old oil.

Shut and tighten the bottom plug.

Open the filling plug (Figure 60, pos 2).

Add new oil ca. **0.7 liters** from the filling hole.

Tighten the filling plug.

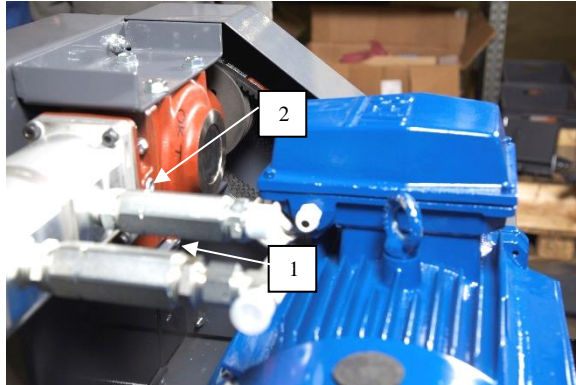


Figure 60 Angular gear

16.10. Changing the Multiplier Gear Oil (Only TC Models)

Open the plug in the bottom (Figure 61, pos 1) and remove the old oil.

Shut and tighten the bottom plug.

Open the filling plug (Figure 61, pos 2).

Add new oil ca. 0.7 litres from the filling hole.

Tighten the filling plug.

Check the oil level from the checking plug (Figure 61, pos 3).

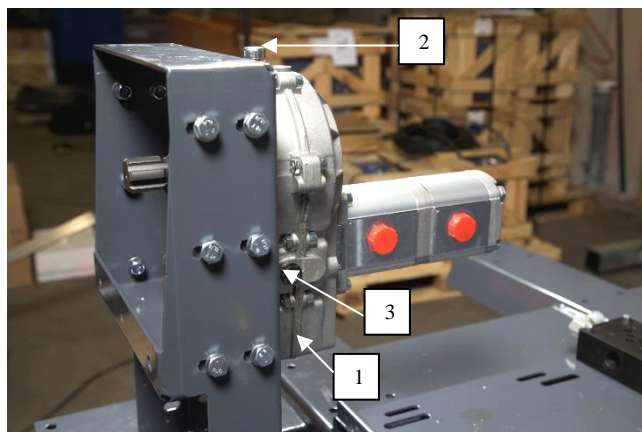


Figure 61 Multiplier gear

16.11. Replacing the Hydraulic Oil Filter

Always replace the filter when changing the hydraulic oil.

Open the filter with a filter removal tool or unscrew by hand.

Lubricate the gasket of the new filter with oil.

Screw the new filter in so that the gasket touches the sealing surface; tighten well by hand.



Figure 62 Oil filter

16.12. Replacing the Chain Blade Oil Canister

Replace the canister with a new one well before the lubrication of the chain blade stops. (Figure 63).

Loosen the hose coupling next to the lid of the canister, remove the protective guard and pull the hose from the canister. Clean the fluid filter if necessary. Replace the old canister with a new 10 l canister. Unscrew the lid of the new canister and push the hose inside the canister, place the protective guard in its place and tighten the hose coupling.

The oil remaining in the old canister may be used again when replacing the canister next time.



Figure 63 Chain blade oil canister

1. Oil canister
2. Fluid filter (inside the canister)
3. Lubrication pump

16.13. Maintenance Schedule

Table 4 Maintenance intervals for different maintenance items

Maintenance item	Action	Daily	Every 50 h	Every 250 h	Every 500 h	Oil/Lubricant/Other
Hydraulic oil	Check Change		x		x	ISO VG 32
Hydraulic hoses	Check and change as needed		x			
Oil filter*	Change			x		
Angular gear/multiplier oil	Check Change		x		x	SAE 80
Grease nipples	Lubricate		x			Vaseline
V-belts	Check, tighten and change as needed		x			XPA 1120 Ld (3 kpl)
Chain blade	Sharpen, tighten and change as needed	x				16H .404
Blade flange	File and change as needed					54 cm 16H .404 Machined!
Conveyor belts	Tighten as needed	x				
Electric motor	Cleaning	x				
Electric equipment	Cleaning	x				
Entire machine	Cleaning	x				

* NOTE! First change of oil filter after 50 hours of use.

Please be sure not to weld anywhere near the machine or do any welding on the machine because that may damage its electric components.

17. Troubleshooting and Repair Guide

17.1. Diagnostics

If you notice a malfunction in the machine, it is recommended to use the manual drive to locate the problem and to see whether the machine functions normally manually driven. Mechanical and hydraulic malfunctions can usually be located by driving the machine manually and trying each of the functions separately.

If there is a malfunction only when driven automatically, monitor the function of the machine and locate the potential malfunction / adjustment target by using the table below. The most common reason for malfunctions during automatic drive is lacking information from one of the sensors. This means the need to readjust the specific sensor.

Table 5 Troubleshooting

Trouble	Other remarks	Remedy
The machine does not start.	<ul style="list-style-type: none"> - Emergency Stop button is activated. - Protective cover open. 	<ul style="list-style-type: none"> - Release Emergency Stop. - Close the protective cover.
	The machine or the electric motor do not start when pushing the Start button.	<ol style="list-style-type: none"> 1. Check the fuses of the property's electrical center (also that further behind and that of the tractor). 2. Check that the soft starter has two green led lights on top of each other. In case the lower one is red → the stage is dead. Check the fuses and the condition of the supply cable (especially the plugs). 3. Press start and stop buttons one after another → automatic reset function of the soft starter. 4. Check the position of the electrical center's automatic fuse. 5. Make sure that the start button functions: Press Start and then the joystick's top button. The menu can be accessed → Start button is defective or there is a contact malfunction with the button.
	The electrical motor tries to function, but it does not start or blows the fuse when starting.	<ol style="list-style-type: none"> 1. Check the fuses size and their sufficiency. 2. Check that the soft starter has two green led lights on top of each other. In case the lower one is red → the stage is dead. Check the fuses and the condition of the

		<p>supply cable (especially the plugs).</p> <p>3. Press start and stop buttons one after another → automatic reset function of the soft starter.</p> <p>4. Check the position of the splitting cylinder and the operation of the splitting cylinder sensors. If the splitting cylinder is on rear position and the signal light in the front sensor is on, the sensor is defective (when starting, the machine tries to run the splitting cylinder into rear position but the machine is not able to start or blows the fuse).</p>
<p>The feed conveyor does not run or there are malfunctions.</p>	<p>The feed conveyor does not run in neither direction.</p>	<p>1. Check the tightness of the feed belt and tighten if necessary.</p> <p>2. Check that the cutting flange is up.</p> <p>3. Check the operation of the top sensor of the cutting flange and replace if necessary (if the sensor does not provide information on the flange being up, the operation of the feed conveyor is hindered).</p> <p>4. Check that the led lamp on the feed belt control valve reel lights up when the movement is used.</p> <p>5. Check the operation of the feed belt control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the hole with a sharp object.</p> <p>6. Open and clean the valve if necessary.</p>
	<p>The feed conveyor runs only in one direction.</p>	<p>1. Check that the led lamp on the feed belt directional control valve is on when the movement is used (the valve is attached to the side of the oil tank behind the machine).</p> <p>2. Check the operation of the feed belt directional control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the</p>

		<p>hole with a sharp object.</p> <p>3. Open and clean the valve if necessary.</p>
	<p>The length of the logs varies or the first log length does not correspond to the preset length.</p>	<p>1. Check the operation and the cleanliness of the feed belt angular sensor. Twigs and branches in the measuring roll of the angular sensor make the roll slide and the measure is incorrect.</p> <p>2. Check if the log slides on the feed belt. If necessary, adjust the speed of the feed belt slower. Do not forget to adjust also the initial advance! See chapter 14.3 in the manual.</p> <p>3. Operate the feed belt on the manual mode and check if the feed belt moves the same distance as the figure on the screen shows. If the belt distance and the screen figure do not match, adjust the encoder settings. See chapter 15.2.3 in the manual.</p> <p>In case the first log length does not correspond to the preset length, open the maintenance menu and adjust the sensor distance in the settings. See chapter 15.3.1 in the manual.</p>
	<p>The feed belt does not stop for cutting in automatic mode.</p>	<p>1. Check the diameter of the log: minimum 5 cm. The photocell sensors of the feed table do not recognize logs under 5 cm. Logs under 5 cm must be processed on the manual, semi or nonstop mode.</p> <p>2. Check the operation of the photocell sensors on the feed table. There must be a red light on in both of the sending sensors. The signal lights of the receiving sensors must be green when there is nothing in front of the beam and red when the operation is hindered.</p> <p>3. Check the operation of the feed table angular sensor by switching on the manual mode and checking if the feed belt operation distance can be seen in the machine screen.</p>

		If the screen figure is 0 cm even though the belt is moving, check if there is something hindering the measuring roll of the angular sensor.
	The feed conveyor misses, that is, the machine does not cut and the log conveyor tries to move the long log directly into the splitting.	When the log ram is pushing the log, a thin and a twisting log might swing off from the photo cells. The machine interprets that the log ends and does not cut anymore. Thin and twisting logs can be processed on the manual, semi and nonstop modes.
The discharge conveyor does not function.	The capstan rolls but the conveyor belt does not move.	1. Check that the belt is not frozen and that there is no wood anywhere to hinder the movement of the belt. 2. Using the control lever of the discharge conveyor, make sure that the discharge conveyor is in its full length. 3. Check the tightness of the belt and tighten if necessary.
	The capstan does not roll.	1. Check the coupling of the hydraulic motor and the capstan shaft. 2. Check the operation of the hydraulic motor.
	The conveyor belt does not run directly.	Check the direction of the idle roller in the conveyor top end and redirect if necessary.
	The length, height or the sideways movement of the discharge conveyor does not function.	1. Check if there are any mechanical obstructions and remove, if necessary. 2. Check the operation of the cylinders.
Cutting the log with the blade flange does not function or there are malfunctions.	The blade flange stops in the log and the chain keeps on rolling.	1. The chain is dull. Sharpen or replace the chain. 2. Check that there are no jams in the blade flange tunnel or that there are no mechanical obstructions blocking the descent of the blade flange (e.g. a branch or a piece of bark). 3. Check the condition of the blade flange and its gaskets. Replace if necessary.

		<p>4. Check the speed control valve of the blade flange descent:</p> <ul style="list-style-type: none"> - Close the valve entirely → the blade flange does not move. - Open the valve entirely → the blade flange descends in an instant.
	<p>The blade flange stops in the log and the chain does not roll.</p>	<p>1. Check that the blade flange descent speed is not adjusted too fast.</p> <p>2. Check the chain lubrication and its sufficiency.</p> <p>3. Check if the shaft of the chain blade's motor is operating even though the chain is jammed. If yes → replace the wedge of the motor shaft.</p> <p>4. Check the operation of the blade flange's motor.</p> <p>5. Using the tractor operation, check that the tractor's torque is sufficient.</p> <p>6. Check that the belts between the electric motor and the pump do not slide.</p>
	<p>The blade flange does re-cuts. The log conveyor does not move the cut log into the splitting spout.</p>	<p>Check the operation of the blade flange lower sensor and replace, if necessary. (If the cutting time is exceeded or there is no information available from the lower sensor, the machine cuts again automatically).</p>
	<p>The blade flange does not cut the log into the end and the log conveyor tries to move the log into the splitting spout.</p>	<p>1. Check the operation of the blade flange lower sensor.</p> <p>2. Move the lower sensor of the blade flange a bit lower so that the flange lowers before sending a moving pulse to the log conveyor.</p>
	<p>The blade flange does not cut and the log conveyor tries to move the long log straight into the splitting spout.</p>	<p>When the log ram is pushing the log, a thin and a twisting log might swing off from the photo cells. The machine interprets that the log ends and does not cut anymore. Thin and twisting logs can be processed on the manual, semi and nonstop modes.</p>
<p>The log ram does not function.</p>	<p>The log ram does not move or the movement is slow</p>	<p>1. Check that the led lamp on the log ram directional control valve's reel is on when the movement is</p>

The cubic meter counter does not function or is inaccurate.	and the power is not sufficient to hold the log still.	used. 2. Check the operation of the log ram directional control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the hole with a sharp object. 3. Check the condition of the cylinders and their gaskets. If necessary, replace the gaskets and the entire cylinder.
	The cubic meter counter is inaccurate.	Calibrate the angular sensor of the ram. See chapter 14.6 in the manual.
	The cubic meter counter does not function.	Check in the maintenance menu if the counter is activated. See chapter 15.3.11 in the manual.
The log conveyor does not function or there are malfunctions.	The log conveyor does not move.	1. Check that the led lamp on the log conveyor directional control valve's reel is on when the movement is used. 2. Check the operation of the log conveyor directional control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the hole with a sharp object. 3. Check the condition of the cylinders and their gaskets. If necessary, replace the gaskets and the entire cylinder. 4. Check the cylinder speed control valve of the conveyor by opening it entirely and operating the conveyor movement on the manual mode. 5. When operating with the tractor, check the input current of the tractor. If the volts and the amperes are too low, the log conveyor does not function.
	The log conveyor does not push the log far enough.	1. Check and remove any mechanical obstructions behind the log conveyor (e.g. a log chip) by opening the right-hand back cover. 2. If the log conveyor is adjusted to move slowly, add the work time for the cylinder from the maintenance

		menu, if necessary. See chapter 15.3.3 in the manual.
	The log conveyor moves too fast or too slowly.	<ol style="list-style-type: none"> 1. Check in the user settings that the “pusher” limit is set to 400. 2. Adjust the speed of the conveyor in the cylinder control valve. See chapter 14.2 in the manual.
The splitting cylinder does not function or there are malfunctions.	The splitting cylinder does not move.	<ol style="list-style-type: none"> 1. Check the operation of the splitting cylinder front and rear sensors. Defective rear sensor: the splitting cylinder does not start moving forward on the automatic or on the manual mode. Defective front sensor: the splitting cylinder does not start moving forward or backward on the automatic mode. On the manual mode, the splitting cylinder is moving. 2. Check that the led lamp on the splitting cylinder directional control valve’s reel is on when the movement is used. 3. Check the operation of the splitting cylinder directional control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the hole with a sharp object. Open and clean the valve if necessary.
	The splitting cylinder waits a long time before starting to move.	<ol style="list-style-type: none"> 1. Check the mechanical obstructions hindering the splitting blade’s correct position. 2. Clean the attaching shaft of the splitting spout of trash. 3. Check the measuring information of the log ram and calibrate, if necessary. See chapter 14.6 in the manual. 4. Check the measuring information of the splitting blade and calibrate, if necessary. See chapter 14.7 in the manual.
	The splitting	1. Check the operation of the

	cylinder remains in the front, the machine is switched off and an alarm appears on the screen: "splitting outer limit".	splitting cylinder front sensor and its distance from the splitting cylinder recognition plate. Adjust the distance to approx. 2 mm, if necessary. 2. Check if the sensor's signal light is on when there is metal in front of it. If the signal light is off, the sensor is defective and needs to be replaced.
	When switching to greater power, there is a long delay in the splitting cylinder.	Adjust the speed and power control valves of the splitting cylinder. See chapter 14.5 in the manual.
	The power of the splitting cylinder is insufficient.	1. Using the tractor operation, check that the tractor's torque is sufficient. 2. Check that the belts between the electric motor and the pump do not slide. 3. In case the malfunction continues to appear after performing steps 1 and 2, please contact maintenance.
The splitting blade does not move or there are malfunctions.	The splitting blade does not move.	1. Check the mechanical obstructions hindering the splitting blade's movement. 2. Check that the led lamp on the splitting cylinder directional control valve's reel is on when the movement is used. 3. Check the operation of the splitting cylinder directional control valve shaft. In the end of the valve reel, there is a hole. The operation of the shaft can be checked by pushing into the hole with a sharp object. Open and clean the valve if necessary. 4. Open the right-hand rear cover of the machine and check the operation of the splitting blade's height adjustment rocker lever and cylinder.
	The splitting blade's position is incorrect.	1. Check the mechanical obstructions hindering the splitting blade from moving into the correct

		<p>position.</p> <p>2. Clean the attaching shaft of the splitting spout of trash.</p> <p>3. Check the measuring information of the log ram and calibrate, if necessary. See chapter 14.6 in the manual.</p> <p>4. Check the measuring information of the splitting blade and calibrate, if necessary. See chapter 14.7 in the manual.</p>
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17.2. Electrical Valves and Controls

On top of each electrical valve, there is a reel with a signal light on when the function is used.

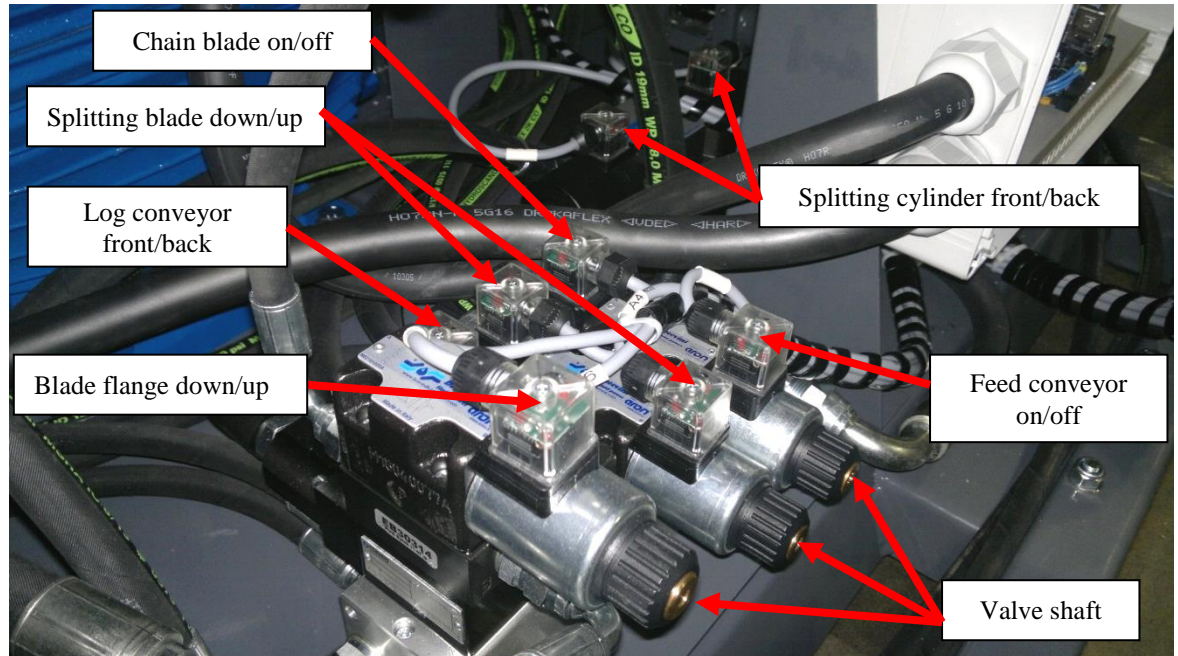


Figure 64 Electrical valves and controls

The directional control valve of the feed conveyor is used to control the feed belt's direction of rotation.

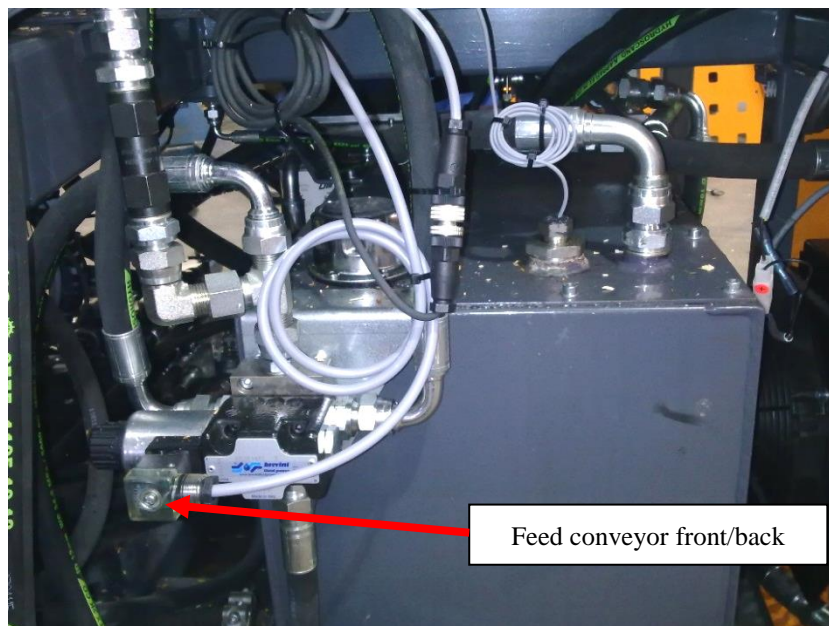


Figure 65 Directional control valve of the feed conveyor (behind the machine, attached to the oil tank)

17.3. Switchboard and Soft Starter

The switch board and its essential parts. All the same parts are in the tractor-operated machine, with the exception of soft starter and transformer.

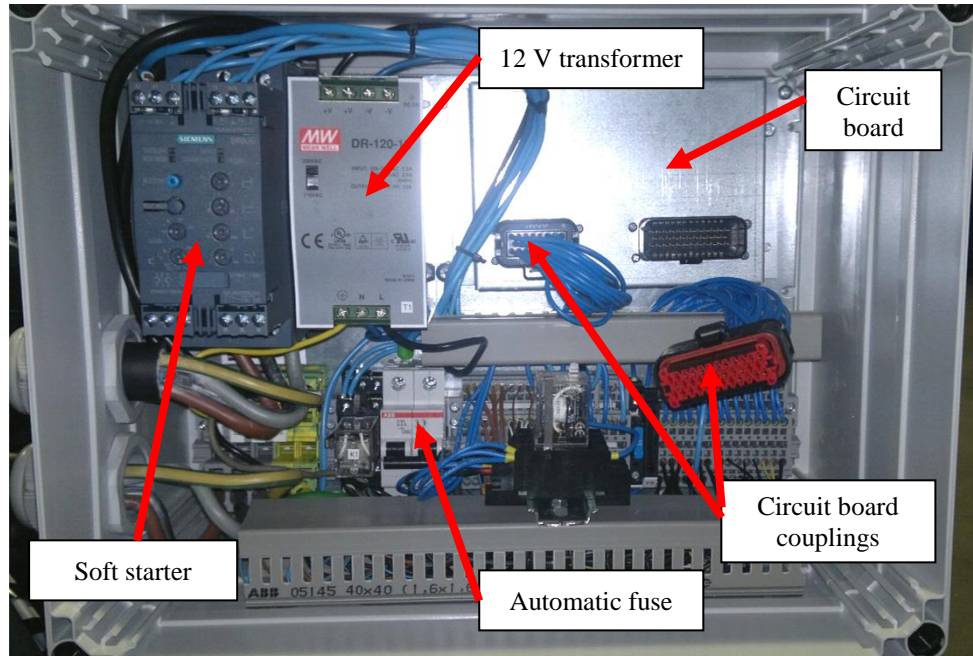


Figure 66 Switchboard

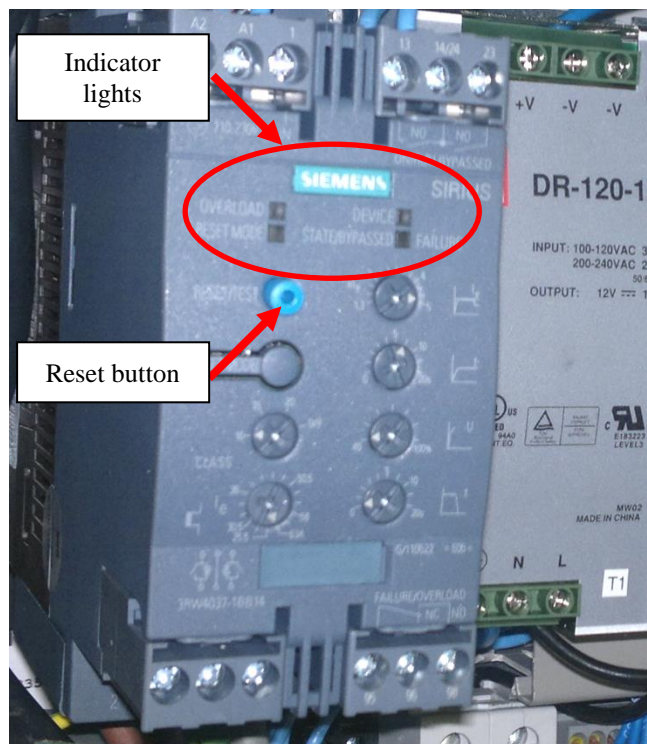


Figure 67 Soft starter

17.4. Meanings of the Soft Starter Indicators Lights

		LEDs on 3RW40			
		Soft starter		Motor protection	
3RW40		DEVICE (rd/gn/ylw)	STATE / BYPASSED / FAILURE (gn/rd)	OVERLOAD (rd)	RESET MODE / AUTO (ylw/gn)
$U_s = 0$					
Operating state	IN				
Off	0	gn			
Start	1	gn	gn		
Bypassed	1	gn	gn		
Stop	0	gn	gn		
Warning					
I_e / impermissible CLASS setting ²⁾		gn	gn / gn		
Start inhibited, device too hot (cooling time may vary according to thyristor temperature) ³⁾		ylw			
Fault					
Impermissible electronics supply voltage ²⁾			rd		
Impermissible I_e / CLASS setting and IN (0 -> 1) ²⁾		gn	rd		
Motor protection tripping, overload relay ¹⁾ cooling time 60 s / thermistor cooling time may vary according to motor temperature		gn			
Thermistor motor protection Wire breakage / short-circuit ^{1) 3)}		gn			
Thermal overload on device ³⁾ (cooling time > 30 s)		ylw	rd		
- Missing load voltage - Phase failure, missing load ³⁾		gn	rd		
Device fault (cannot be acknowledged, device defective) ⁵⁾					
		rd	rd		
Testfunction					
Press TEST $t > 5$ s ⁴⁾		gn		rd	
RESET MODE (press to change)					
Manual RESET					
Auto RESET					ylw
Remote RESET					gn

Figure 68 Soft starter indicator lights

18. Ending the Use of the Machine



Clean the machine of sawdust and bark as well as any other material (snow, dirt, etc.).
Do so only after taking the power supply off!

Remove the bark and the sticks from between the articulated frame and the conveyor belt so that the discharge conveyor can easily be lifted into top position.

Lift the discharge conveyor and the feed conveyor into top position (transport position), and at the same time lift the discharge conveyor belt inside the conveyor when the conveyor telescope has gone in. Make sure both the conveyors are locked into top positions.

Cleaning the conveyors after use is extremely important in the winter.

Replace all the protective covers and safety devices back to their position. Check every safety feature functions correctly.

If the machine cannot be sheltered, cover it with its tarpaulin.

19. Protecting Yourself from Oils and Lubricants



When handling oils and lubricants, always wear appropriate protective clothing and oil-resistant gloves.

Avoid any skin contact with oil and lubricants. They might damage your skin.

Never use oils or lubricants to clean your skin! These substances may contain small metal particles that cause wounds in hands that are only deteriorated by oil.

Follow the instructions of use and safety regulations provided by lubricant manufacturers.

Synthetic oils are often corrosive and strongly irritate the skin.

Waste oil

Waste oil must be collected and discarded according to the national regulations.

Accidents

If oil soaks into the ground, immediately prevent it from spreading further and collect it by absorbing it into something that binds oil, e.g. turf.

If oils or lubricants damage your skin, immediately contact a doctor.

20. Removing the Product from Use

The complete responsibility for removing the product from use is on the end user of the product or the person or company that owns the product at the time of disposal.

Every country has its own national laws, instructions, and regulations for removal of products from use and handling of different waste materials which must be obeyed.

The product contains non-biodegradable materials. Therefore, the machine has to be disassembled and its different materials discarded according to national regulations.

Iron and other metals should be recycled through machine and device waste companies.

Waste oil, plastics and rubber parts are considered toxic waste that are discarded by either recycling them or safely deposited at a dump site or otherwise disposing of them according to national regulations.

When necessary, environmental authorities provide information on scrapping and waste disposal.

21. Useful Information

21.1. Influence of the Log Diameter to the Productivity

The productivity of the machine is influenced by several factors, e.g. quality and dimensions of wood, machine adjustments, and the arrangements surrounding the machine all affect the actual productivity of the machine.

The quality of the wood has a significant role in the productivity of the machine. Essentially important is the log diameter and the hardness, the number of branches, the length of the raw log and the firewood logs.

The following table shows the number of meters required for one cubic meter when the log diameter varies.

Table 6. Required meters, solid cubic meters, bulk cubic meters

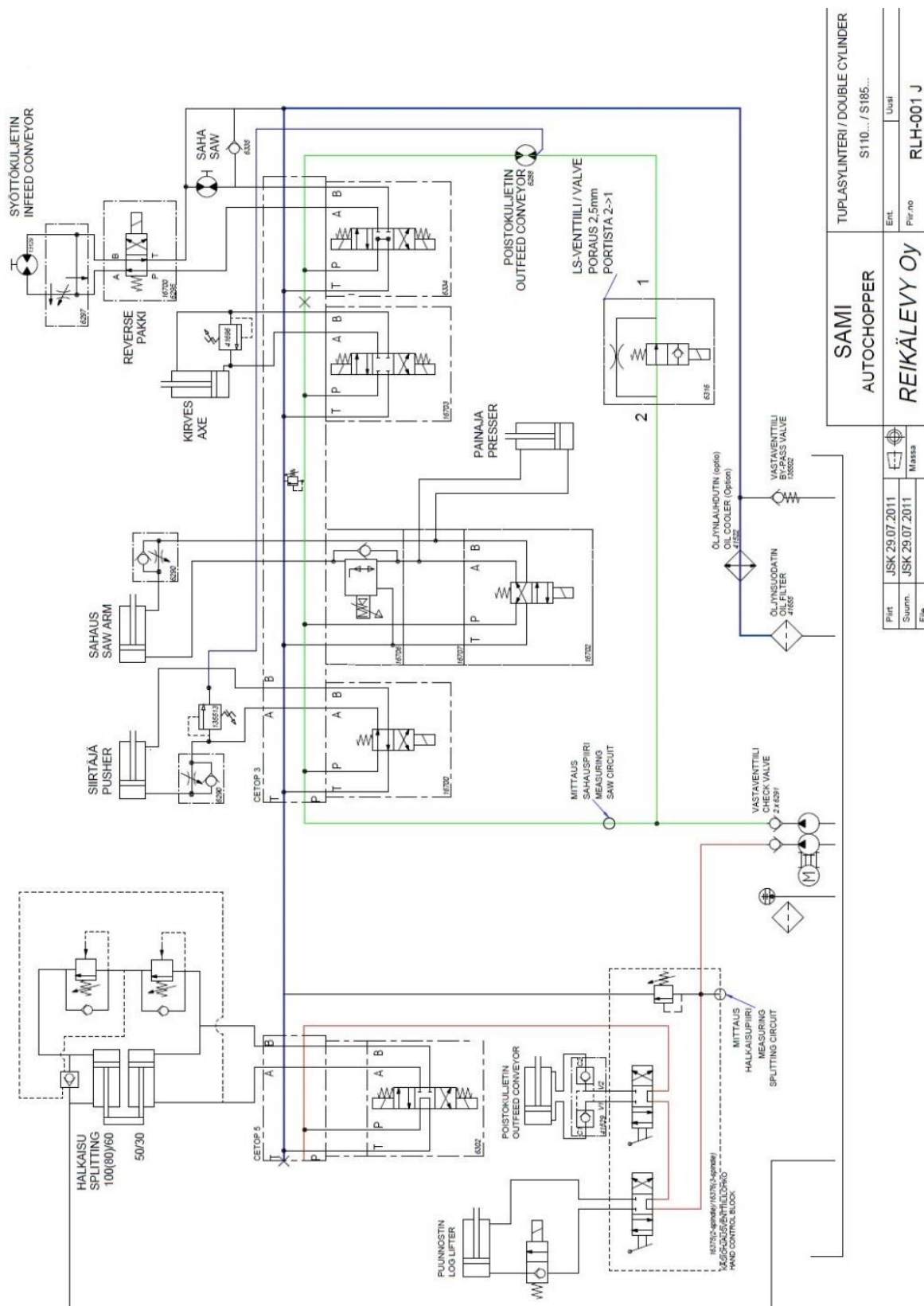
Log diameter cm	Required meters /m ³	Required meters /bulk m ³
5 cm	400 m	160 m
10 cm	100 m	40 m
15 cm	44,5 m	17,8 m
20 cm	25 m	10 m
25 cm	16 m	6,4 m
30 cm	11,2 m	4,5 m
35 cm	8,2 m	3,3 m
40 cm	6,5 m	2,6 m

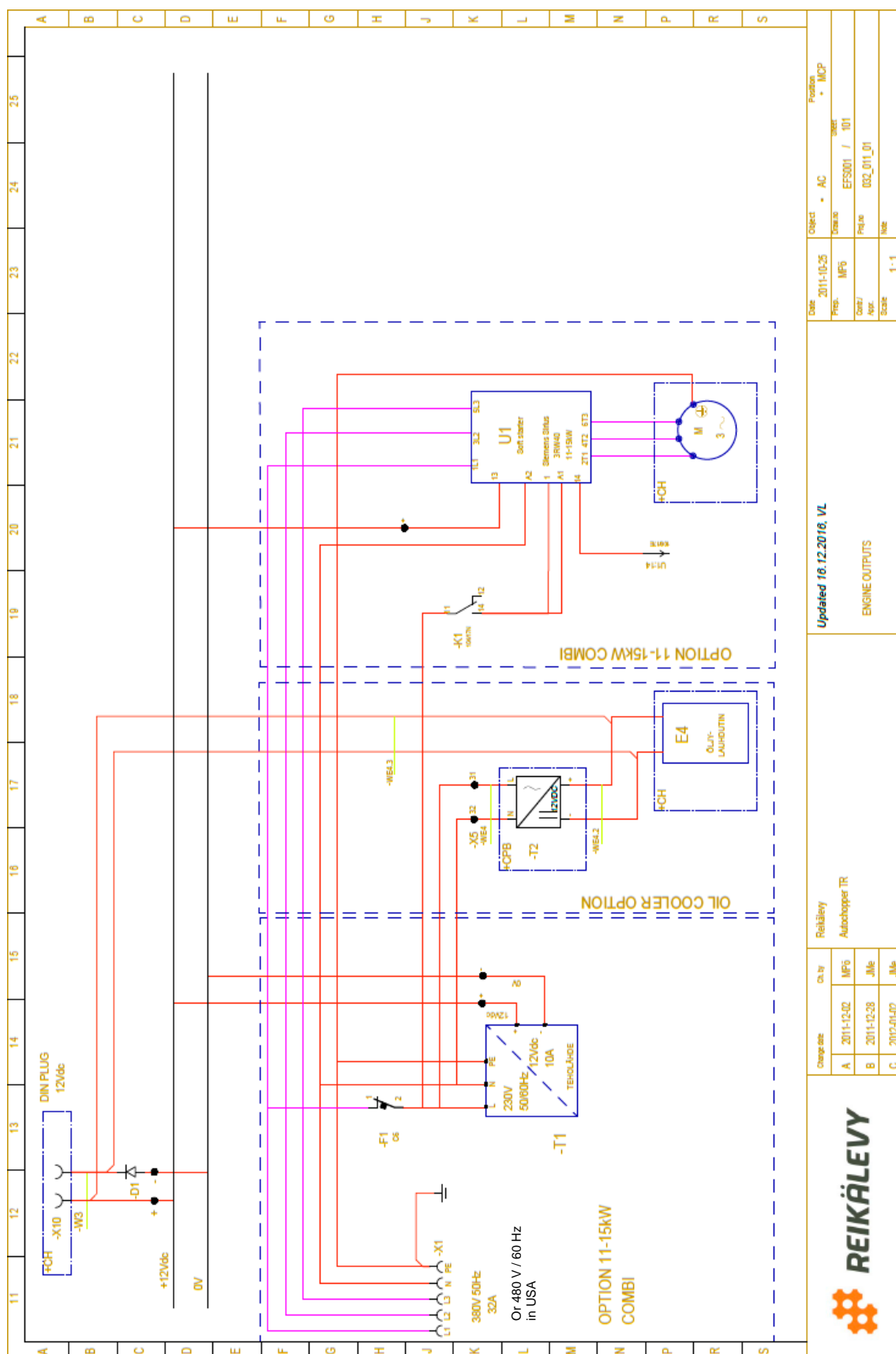
21.2. Caloric Value and Wood Density

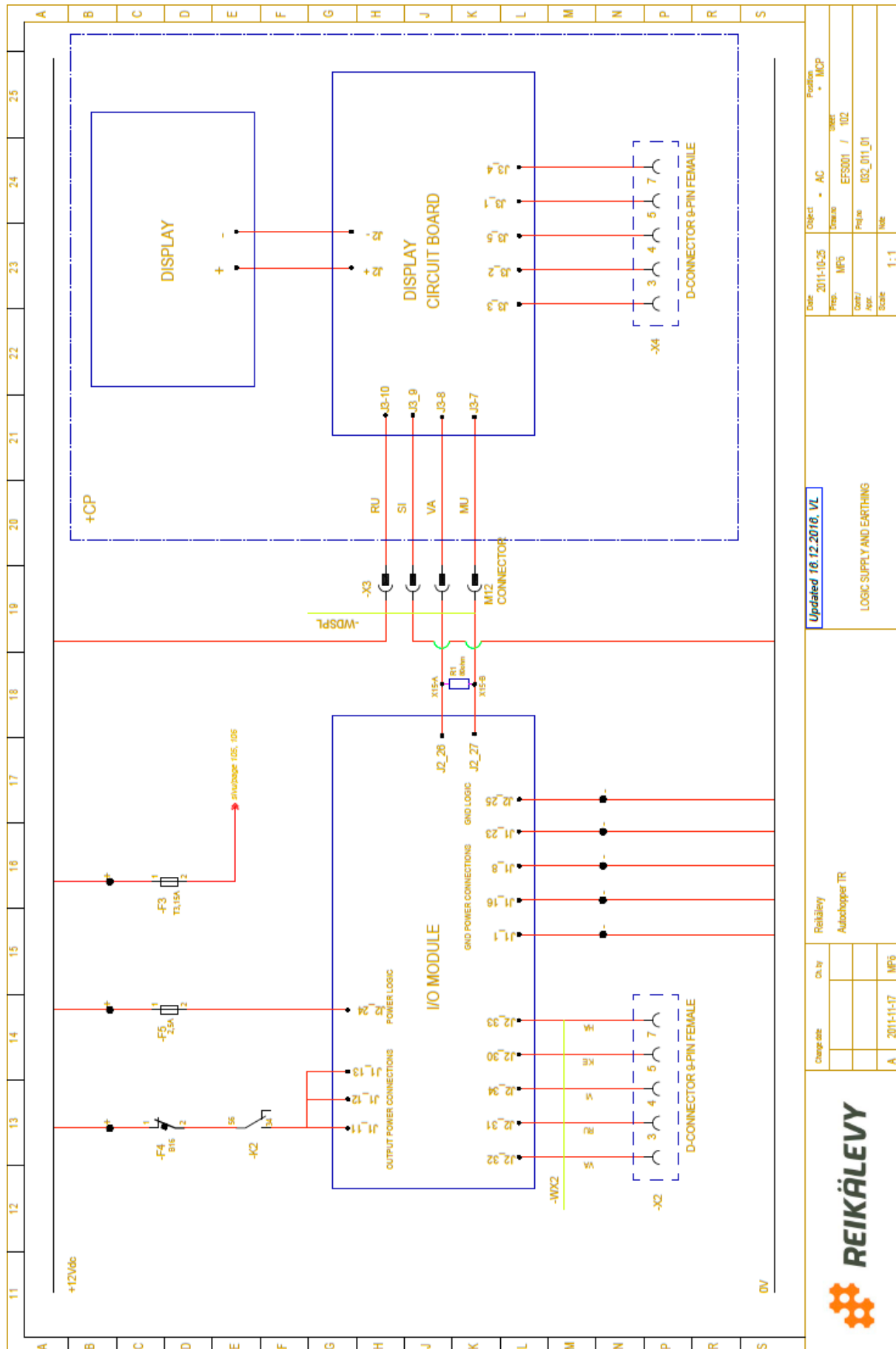
The caloric value of the wood shows how efficiently the burning log warms. The caloric value is affected by the humidity. The drier the wood, the greater the caloric value.

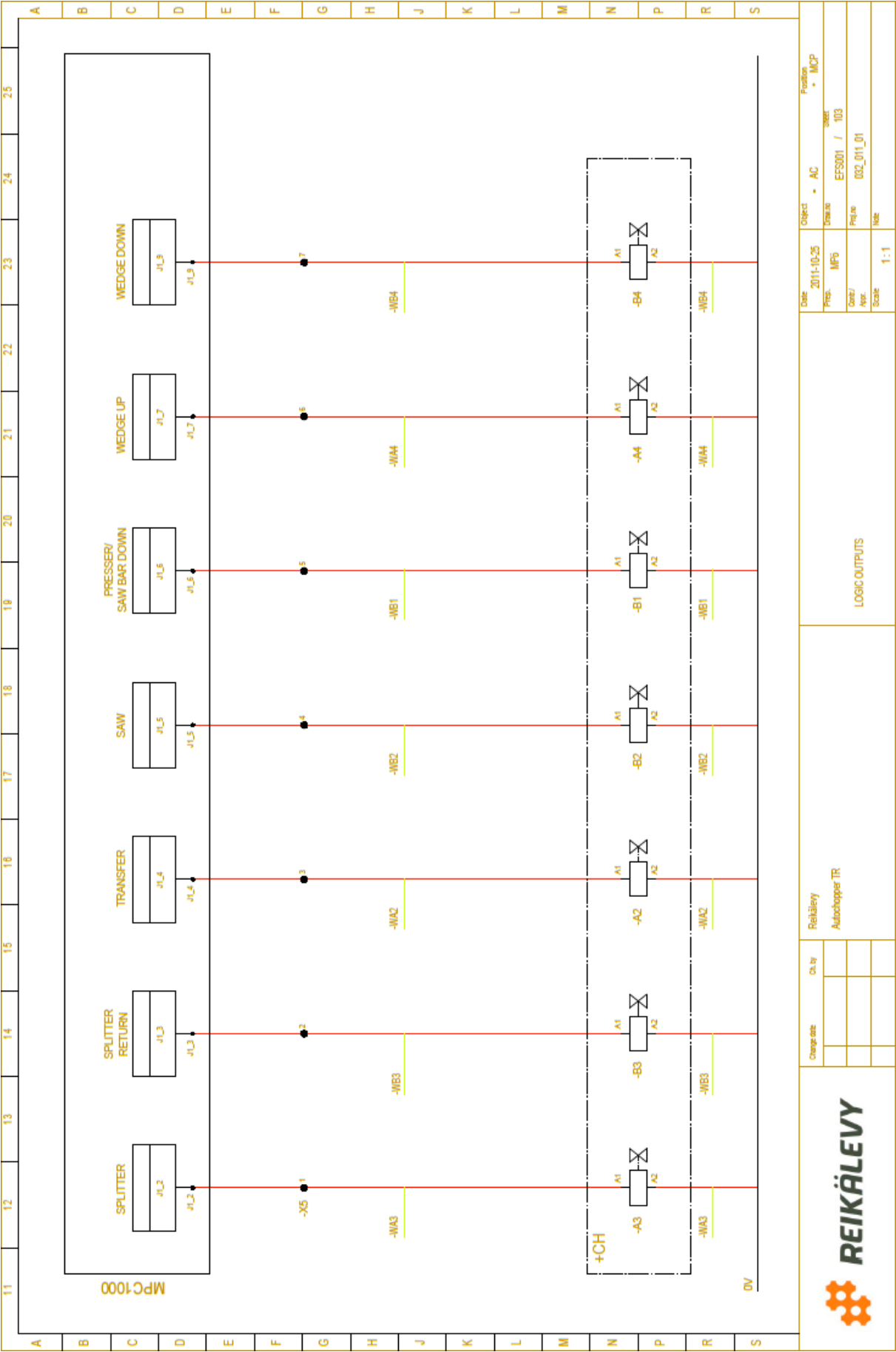
Table 7. The caloric value of dry firewood (humidity 20%), in bulk cubic meters and solid cubic meters, and the energy content according to different Finnish tree species

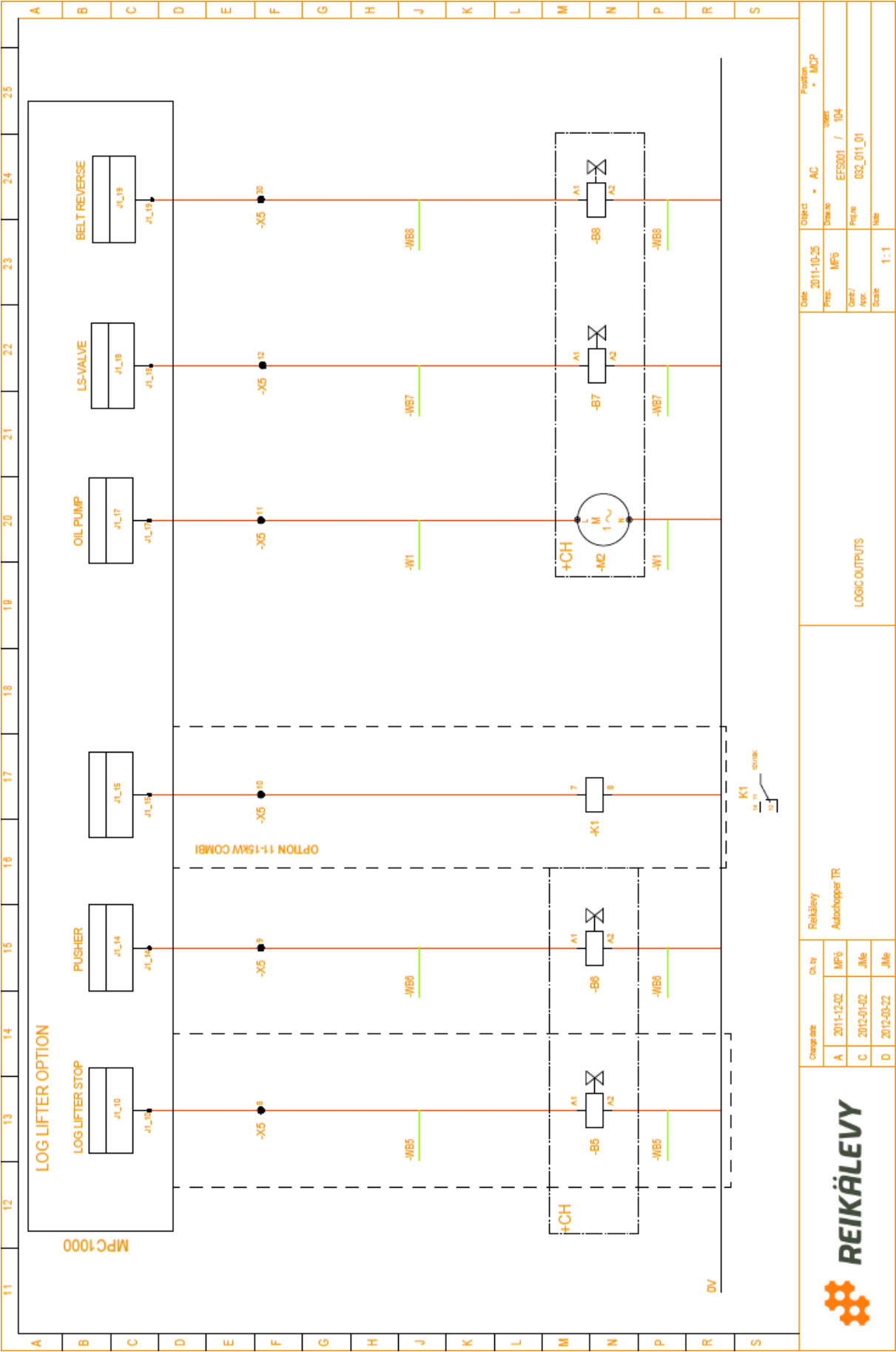
Species	Caloric value kWh/kg	Weight kg/m ³	Weight kg/bulk m ³	Energy content kWh/m ³	Energy content kWh/bulk m ³
Birch	4,15	410	243	1700	1010
Pine	4,15	328	195	1360	810
Spruce	4,10	322	193	1320	790
Alder	4,05	304	183	1230	740
Aspen	4,00	333	198	1330	790

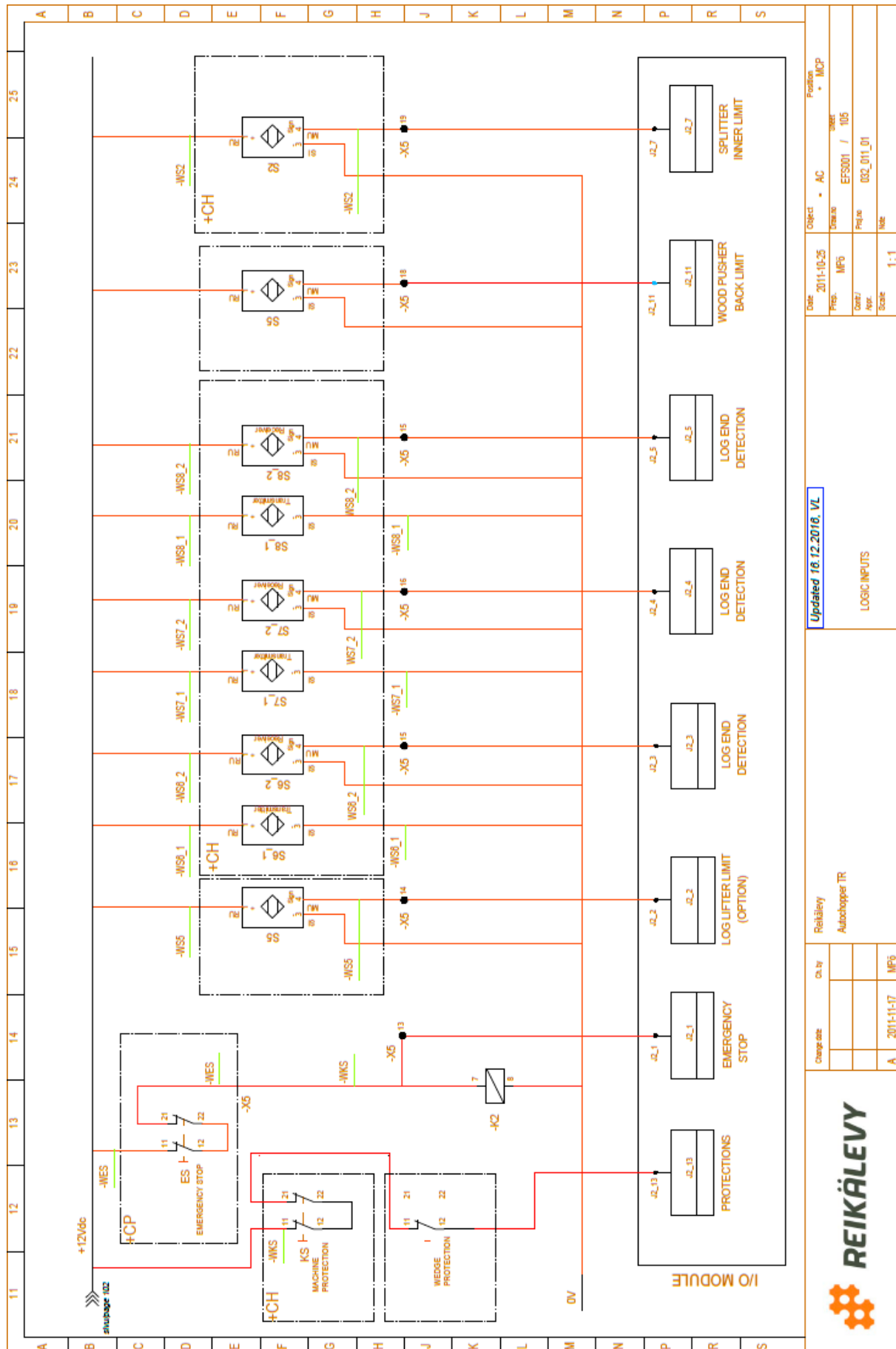


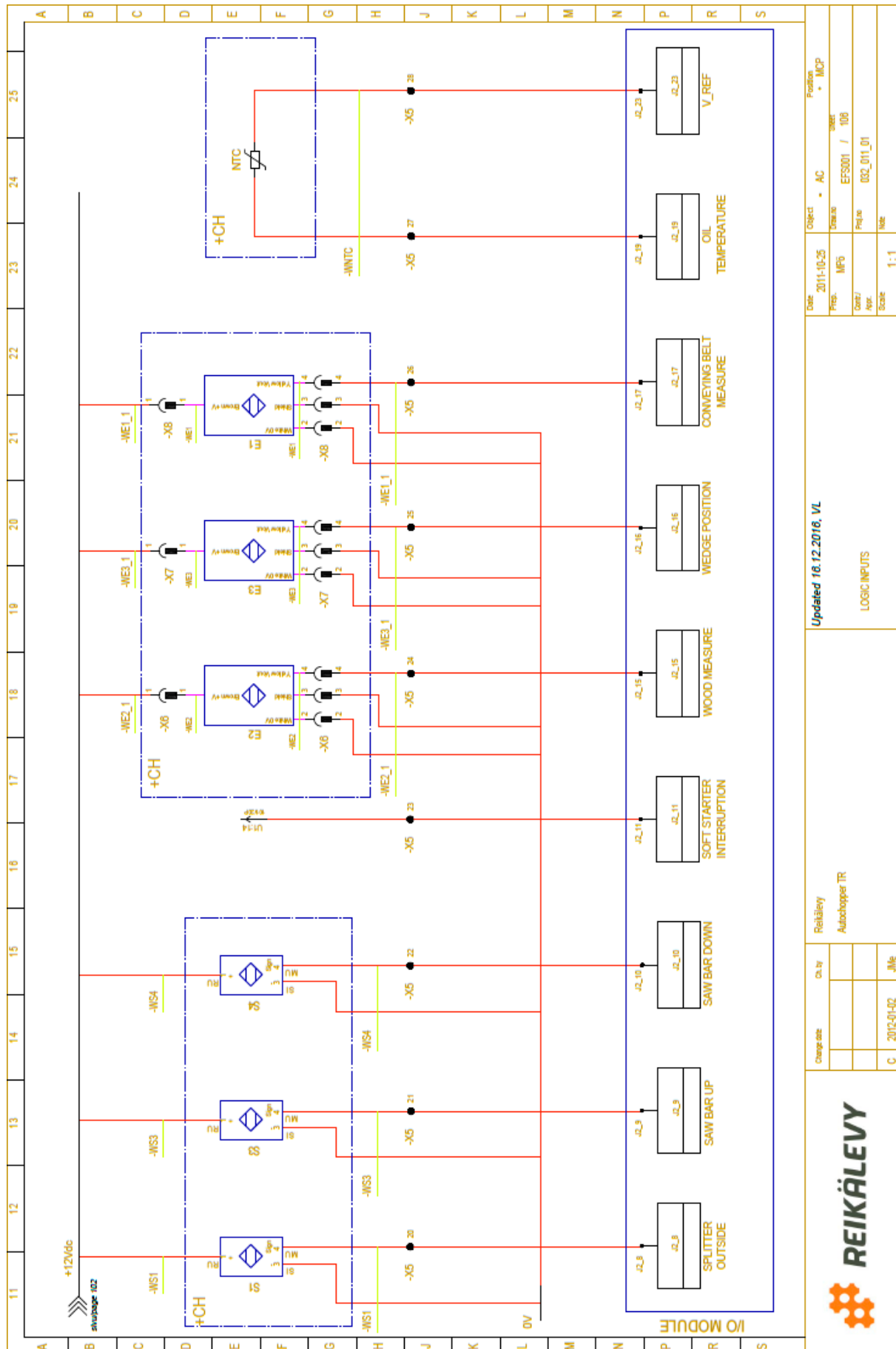












Updated 16.12.2016, VL

Reikälevy
Autohopper TR

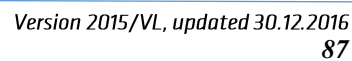


REIKÄLEVY

Date	2011-10-25	Object	AC	Revision	MCP
Proj.	MF6	Drawn	EF5001	1	108
Coord.	108	Proj.	032_011_01		
Scale	1:1	Unit			

LOGIC INPUTS

Change size	On by	Drawn	Checked
C	2012-01-02	J.Me	





SAMI

Additional splitting area protection Installation and wiring

version 1.0.0



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Purpose of protection

This additional protection is now standard on new machines (2015 onwards).

The installation of this protection device according to the instructions improves the safety.

The electronic and mechanical protection installation can require different types of couplings, depending on the machine model and software.

In case of doubt, please contact the manufacturer.

Safety

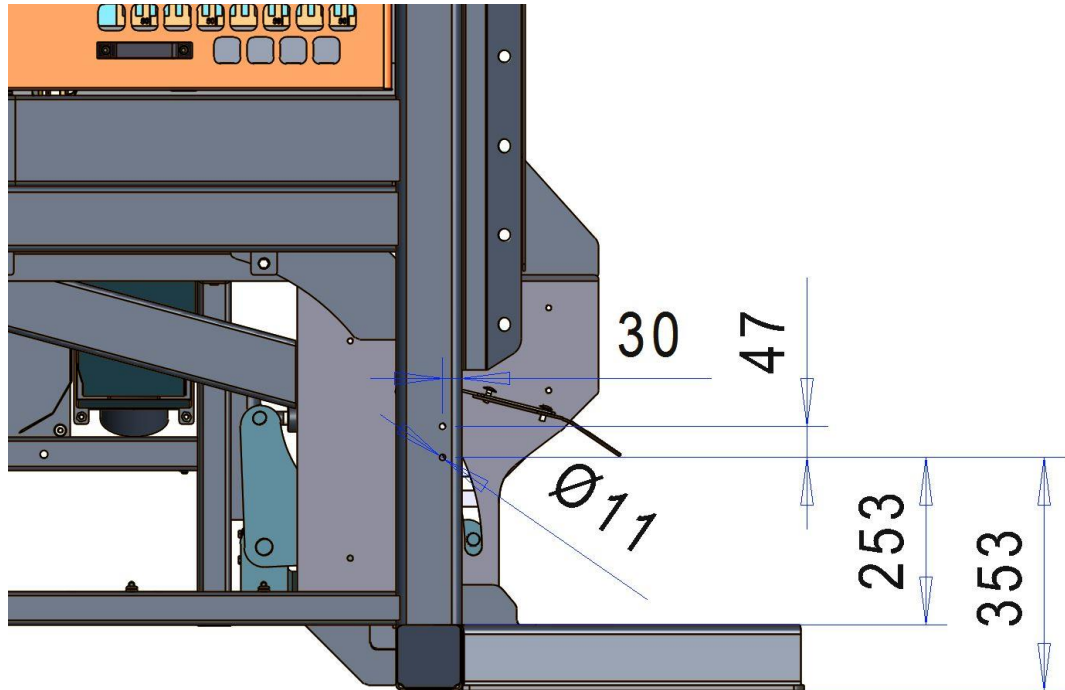
Please read what follows before you start to work!

On electric powered models, unplug the electric power cables from the machine.

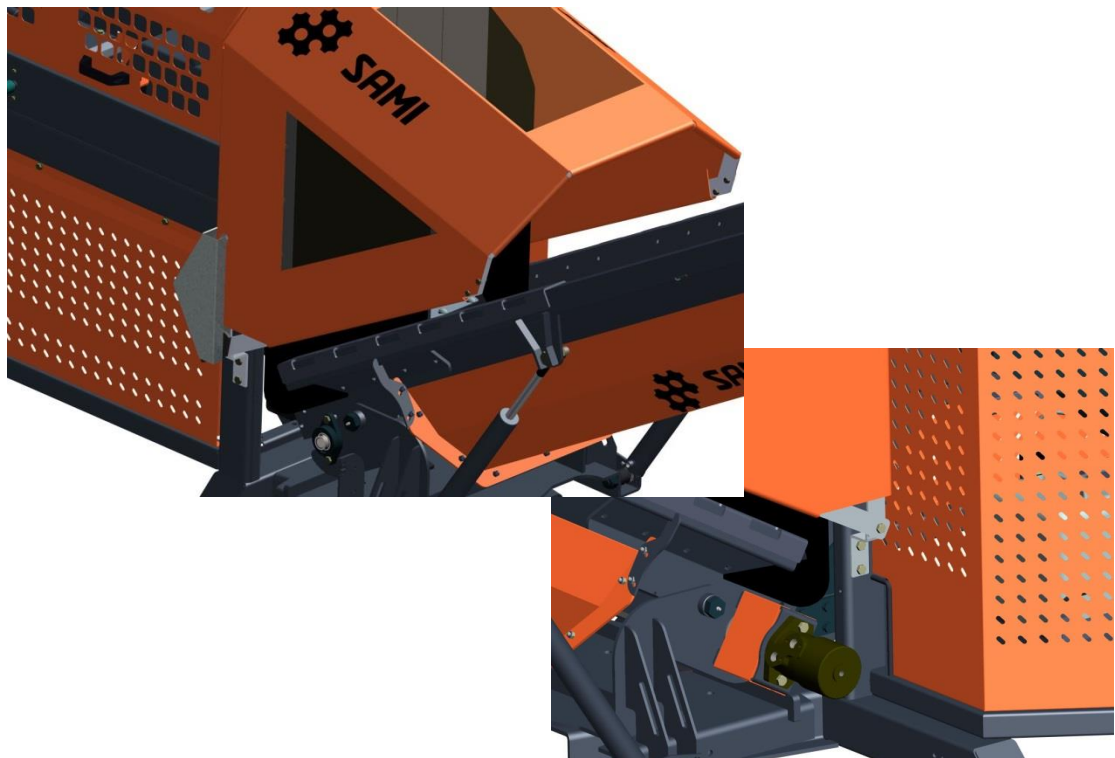
On tractor powered models, first turn off the tractor, then disengage the PTO shaft and unplug the electric power cables from the machine.

The new machines and the machines which include the software version I/O v2.6.0 and Dsp.v2.4.0

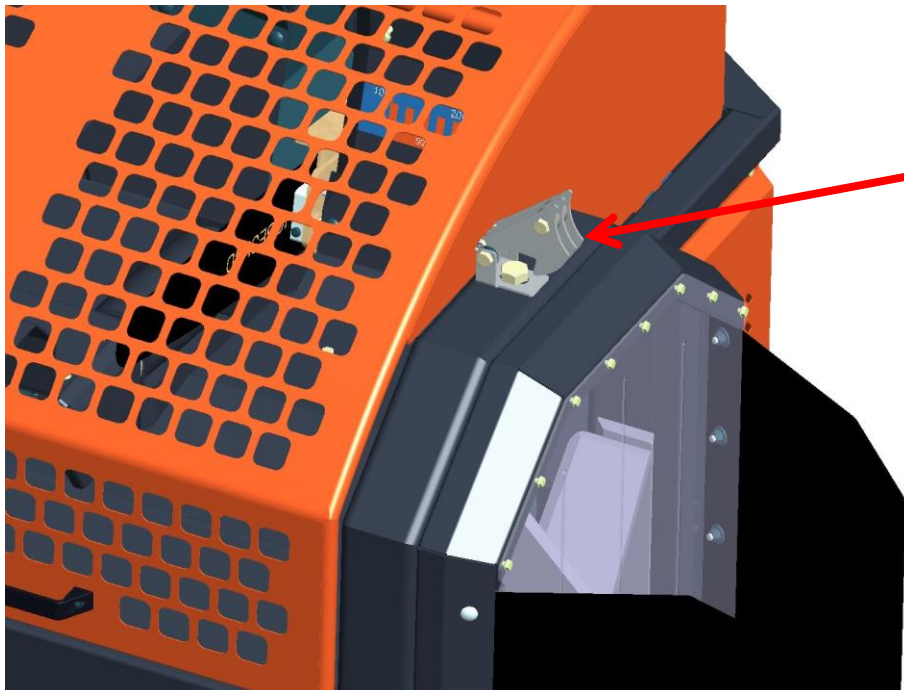
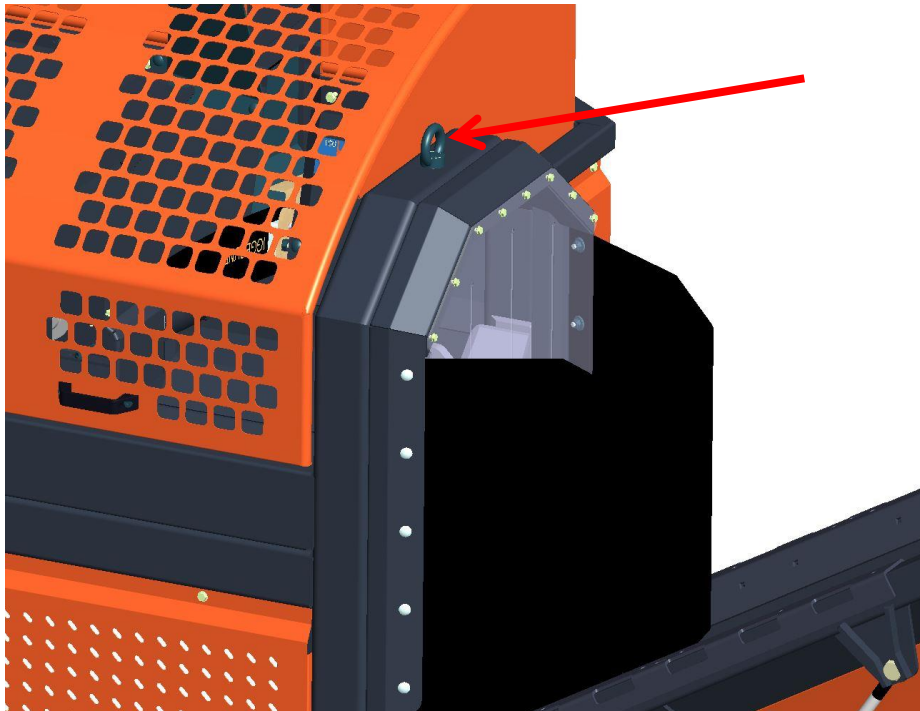
Installation of the protection hinge into the frame tube d10-d11 drillings.



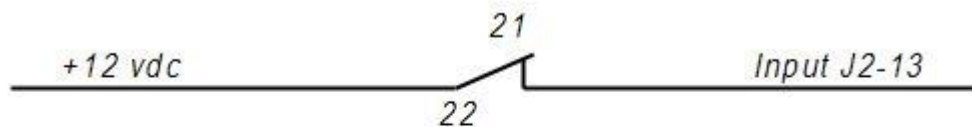
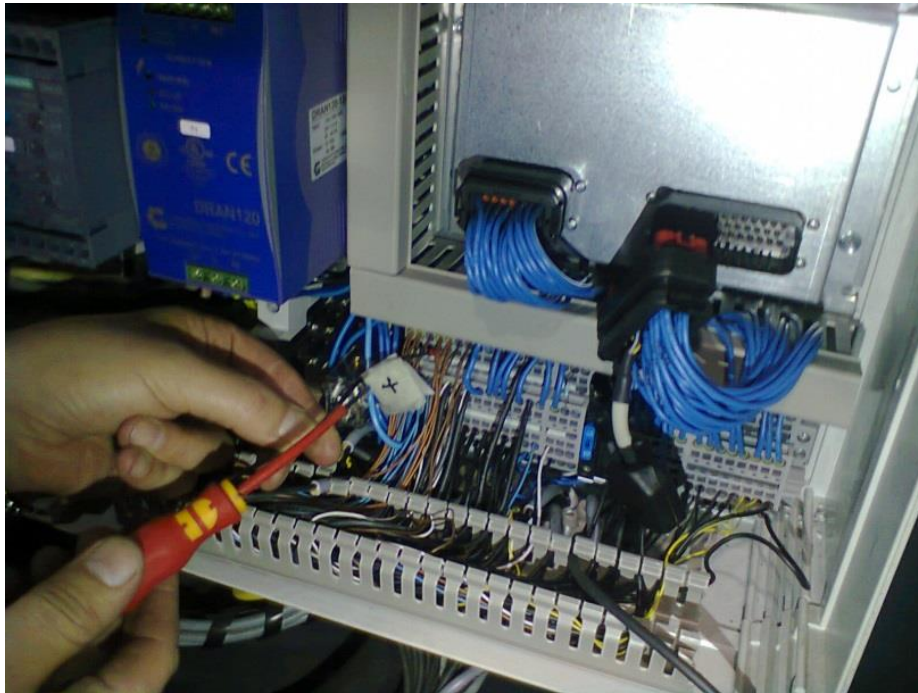
Install the protection cover in place and control the movement.



Install the locking device at the top of the arc. Remove first the sling and install the protection lock with a bolt M20x20.



Operate the locking device connection to the control electronics.

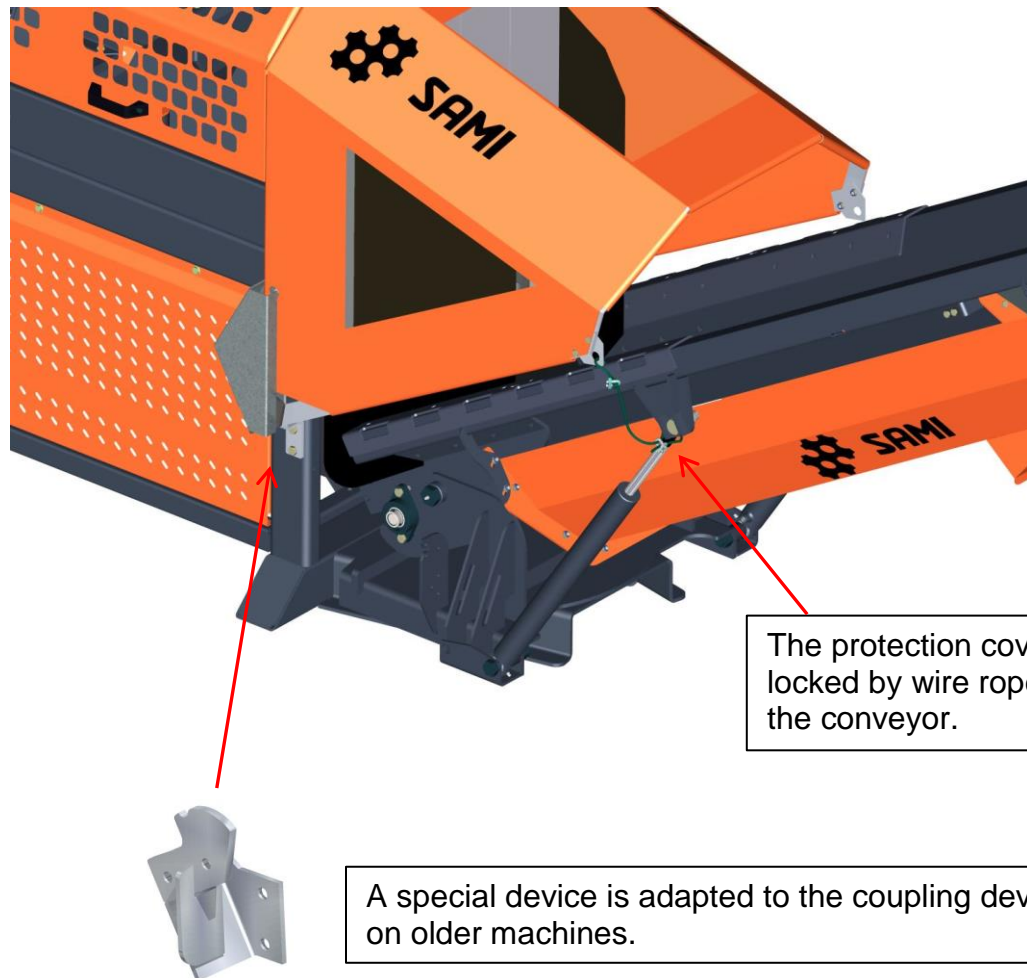


Plug the wire connector that comes from safety limit, to +12vdc, and the second connector to J2-13.

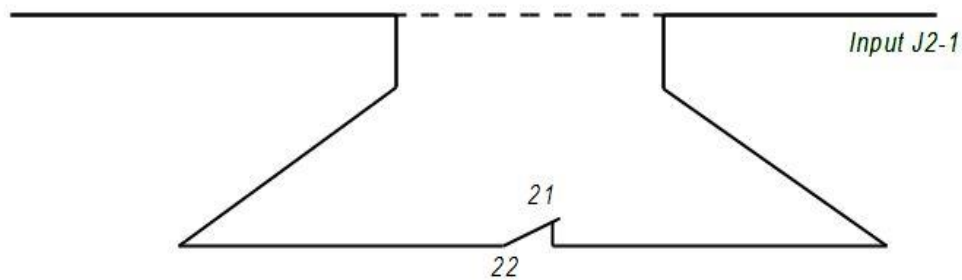


The older machines and the previous software versions

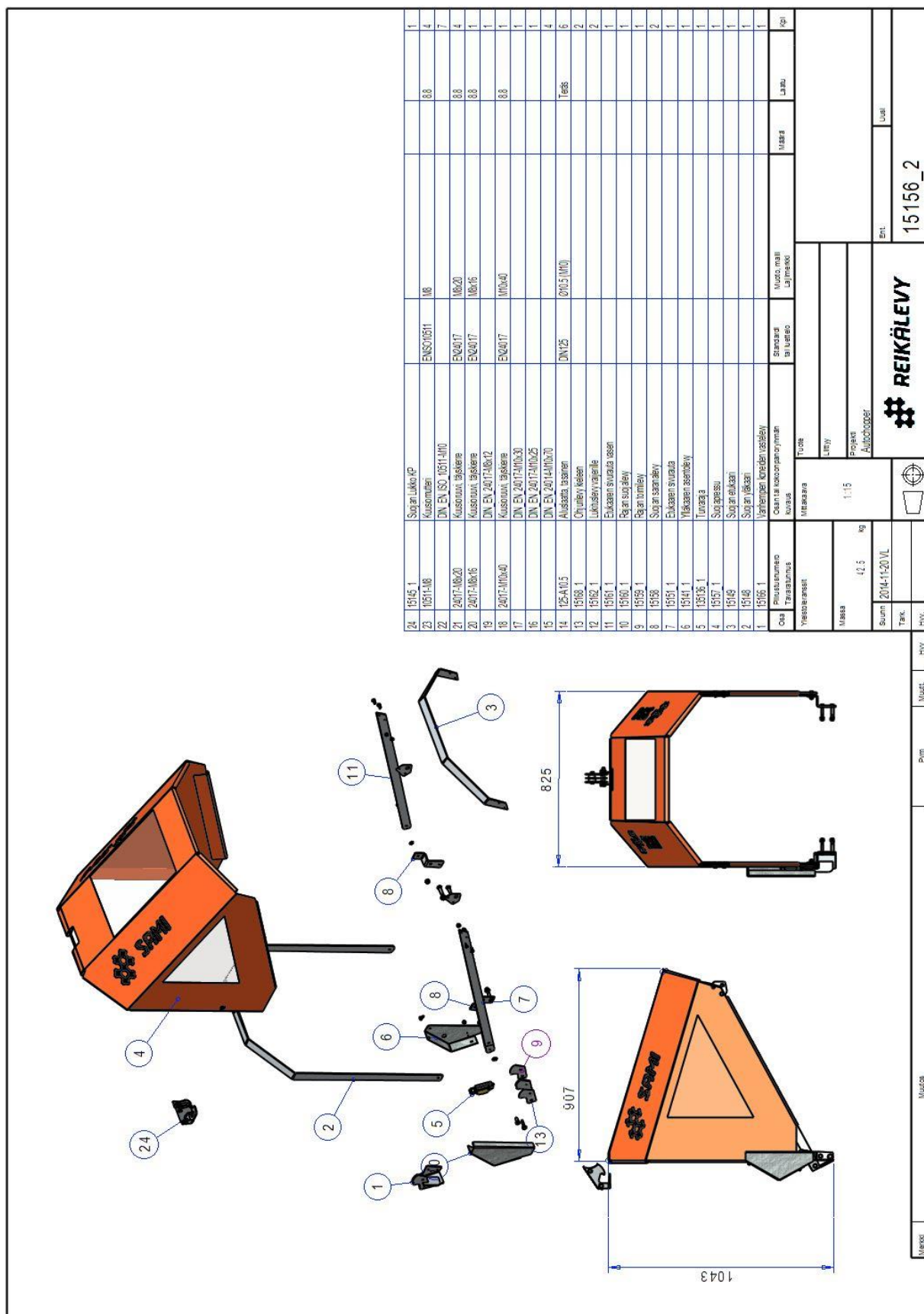
Due to the different function of the electrical motor on the older versions of the Autochopper, the installation is slightly different too. Indeed, on those machines, opening the main cover stops the machine completely, including the motor and the pump. So, in order to keep a fluent work process, the discharge area protection cover will be fastened with cable to the discharge conveyor, so it cannot be lifted during machine operations. Moreover, a replacement device will be installed (see picture).



Operate the locking device connection to the control electronics (for older machines).



Cut the J2-1 wire, leaving a certain length of wire before the plug, like on the picture above (about 10 cm). Connect this wire to the new wire circuit of the splitting area protection, so the J2-1 input goes through and is able to transmit the command to stop the machine when the splitting area cover is in up position (see diagram above).



MEMO