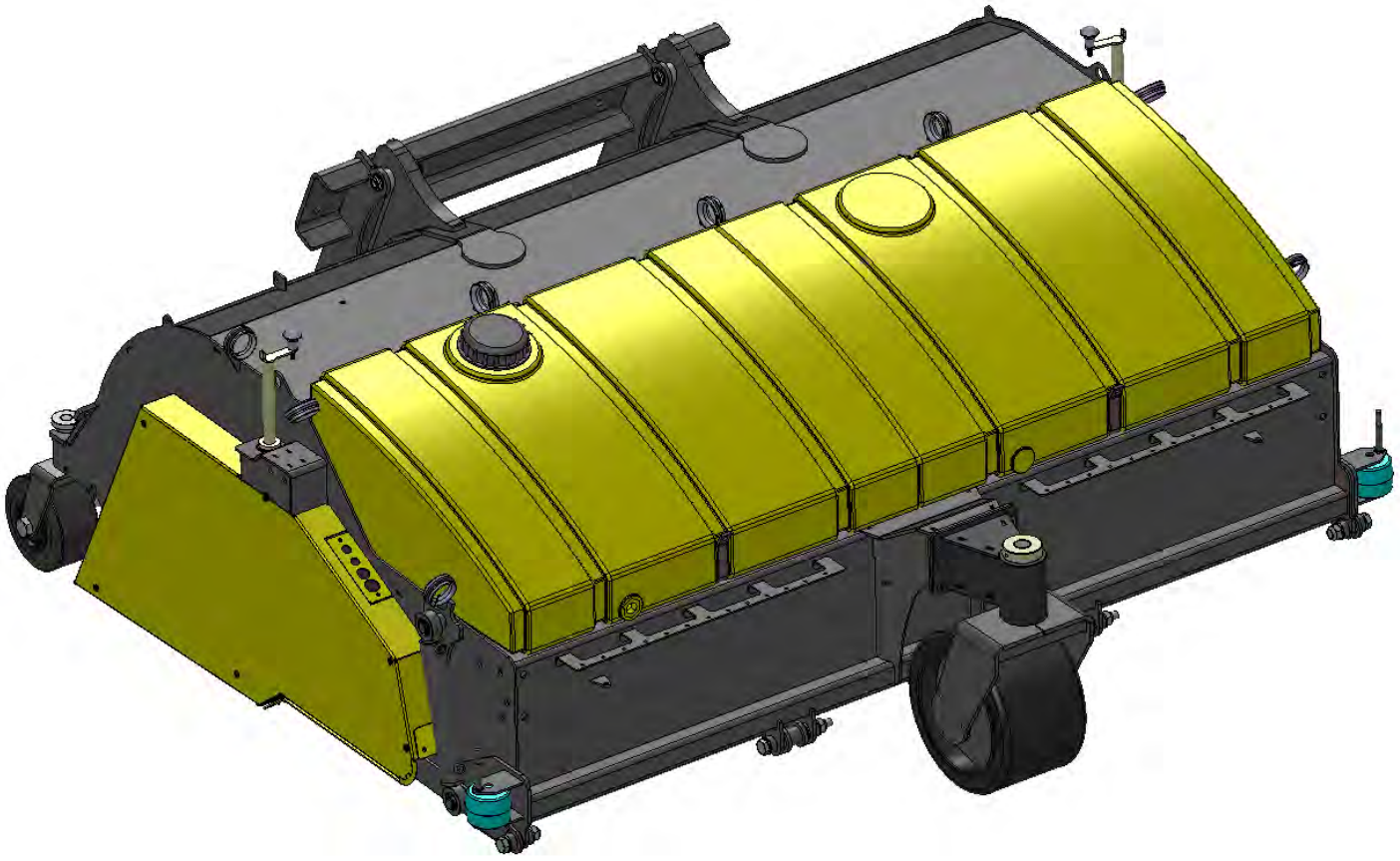
STARK

STRONGLY CHOSEN

Original

Operation and maintenance manual

CSW - Collecting sweeper



Lametal Oy • Kaskenviertäjäntie 2, 73100 LAPINLAHTI, FINLAND
• info@stark.fi • parts@stark.fi • www.stark.fi

General

Congratulations on the strong choice of STARK Collecting sweeper.

At STARK, we want your work equipment to serve you as well, efficiently and for a long time as possible. Therefore, read this user manual before using your new device.
STARK products are designed and manufactured in Finland, and each device is equipped according to the customer's needs.
Make sure that every person who uses or maintains the machine reads this manual before starting use or maintenance! Always take care of the machine's safe use and maintenance procedures. Keep this maintenance manual and make sure it is also passed on to the new owner.
Product development of STARK products is based on quality, durability and economy. The products are designed to be effective, safe and durable in professional use. So that we can continue to develop our products to suit the purposes of users, your feedback is important to us! You can also contact us by e-mail for further questions related to the use or maintenance of the sweeper: info@stark.fi
New products, like the rest of our product selection, are displayed on our website www.stark.fi.
The manufacturer reserves the right to make structural and technical changes without prior notice. For this reason, the information given in the manual may have changed after the manual was printed.

Read before use



Familiarize yourself with the device carefully before commissioning.
The device may only be used by a person familiar with its use.
The users of the work machine must be carefully familiarized with the use and maintenance of the machine. An inexperienced person can cause serious dangers to himself, the environment and the work equipment.
When connecting the implement to the basic machine, ensure the following:

- the locking pins and cotters are in order
- there is no pressure in the hydraulic system
- the hydraulic hoses are intact
- when connecting hydraulic hoses, avoid skin contact with hydraulic oil
- do not pull the hydraulic hoses from the hose section, only from the connector

During use, note:



- a safe speed suitable for the situation
- other traffic, people and animals
- danger areas and visual obstructions
- the device must not be used if someone is in the danger zone
- be aware of kids
- do not go under the implement

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Content

General 2

Read before use 2

1. DECLARATION OF CONFORMITY 4

2. INTENDED USE 5

3. SAFETY PRECAUTIONS 5

4. IDENTIFICATION INFORMATION AND SPARE PARTS 6

4.1. Identification plate 6
4.2. Maintenance services 6

5. MAIN PARTS OF COLLECTING SWEEPER 7

6. COMMISSIONING 9

6.1. Unpacking the collecting sweeper 9
6.2. Installing the front support wheel 9
6.3. Installing the side brush 10
6.4. Removing the flotation locking pins 13
6.5. Hydraulic controller (CSW-A) 14
6.6. Hydraulic controller (CSW-B) 17
6.7. Adjusting the hydraulics of the collecting sweeper (CSW-A) 20
6.8. Adjusting the hydraulics of the hydraulic block (CSW-B) 21
6.9. Attaching the collecting sweeper to the base machine 22

7. USE OF COLLECTING BRUSHES 23

7.1. Manual 23
7.2. Driving position of the collecting sweeper 24
7.3. Adjusting the height of the brush roller 25
7.4. Adjusting the side brushes 26
7.5. Changing the brush plates 27
7.6. Replacement of side brushes 29
7.7. Transferring the collecting sweeper 29
7.8. Removing the collecting sweeper from the basemachine 30
7.9. Dust control systems 30
7.10. High-pressure pump 31
7.11. High-pressure washer 32

8. MAINTENANCE OF COLLECTING SWEEPER 33

8.1. General precautions for use and maintenance of the device 33
8.2. Tightening torques 33
8.3. Daily maintenance 33
8.4. Service after the first 10 hours 33
8.5. Service every 50 hours or weekly 33
8.6. Grease nipple locations 34

9. HYDRAULIC 35

9.1. Hydraulic block, CSW-A 35
9.2. Hydraulic block CSW-B 37

10. WARRANTY TERMS 39

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1. DECLARATION OF CONFORMITY

Original manufacturer's EC declaration of conformity:
Common product name: Collecting sweeper
Models: CSW 2000, CSW 2500

Manufacturer:
Lametal Oy
Kaskenviertäjäntie 2 73100 LAPINLAHTI
tel. +358 17 731 565

Certifies that the following work equipment meets the machinery directive 2006/42/EC and the applicable standards.

- SFS-EN ISO 12100-1,
- SFS-EN ISO 12100-2
- SFS-EN 1050

Person authorized to compile the technical file:



Lassi Mehtonen
Managing director
Kaskenviertäjäntie 2
73100 Lapinlahti, FINLAND

2. INTENDED USE

The collecting sweeper is intended for cleaning streets and small / large areas.

3. SAFETY PRECAUTIONS

Familiarize yourself with the device carefully before commissioning. The device may only be used by a person familiar with its use.

Before connecting the hydraulics to the implement, make sure that:

- there is no one between the device and the base machine
- the base engine is switched off and the handbrake is on



When connecting the implement to the basic machine, make sure that:

- the locking pins and cotters are in order
- the hydraulic hoses are intact
- the hydraulic oil cannot come into contact with the skin when you connect the hydraulic hoses
- you do not pull the hydraulic hoses from the hose section

During use, note:

- a safe speed suitable for the situation
- other traffic, people and animals
- danger areas and visual obstructions
- that the device is not used if someone is in the danger zone
- be aware of kids
- use a flashing light when plowing
- do not go under the device



BEWARE of rotating rollers!



BEWARE of pressurized hydraulic hoses and components!

When servicing the device, the hydraulics of the basic machine must be switched off, the basic machine turned off and the handbrake on. The device must be placed on supports if maintenance requires going under the device. Never go under the device unless it is supported.

Daily maintenance:

- check the general condition of the structures, repair defects if necessary
- Check the condition of hydraulic hoses and connectors, replace broken ones with new ones

Every 50 operating hours:

- grease the items (locations are mentioned in the product-specific section)
- check the tightness of the bolts and nuts

Check the tightness of the bolts, nuts and hydraulic connectors after the first day of use!

If there is going to be a longer break in the use of the device, clean the device well after the last use and perform greasing.

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4. IDENTIFICATION INFORMATION AND SPARE PARTS

4.1. Identification plate

The identification plate is mounted on the side of the device. In addition to the factory's contact information, the sign shows the machine's type, year of manufacture, serial number and weight.
In the serial number, the first four digits indicate the month and year of manufacture (the first is the month of manufacture: KKKV). The last five digits of the serial number are the machine's actual serial number, which appears in the manufacturer's systems (13971 in the example below). Below is a model picture of the nameplate.



Picture 1. Identification plate

Enter the product type and serial number of the product on the lines below:

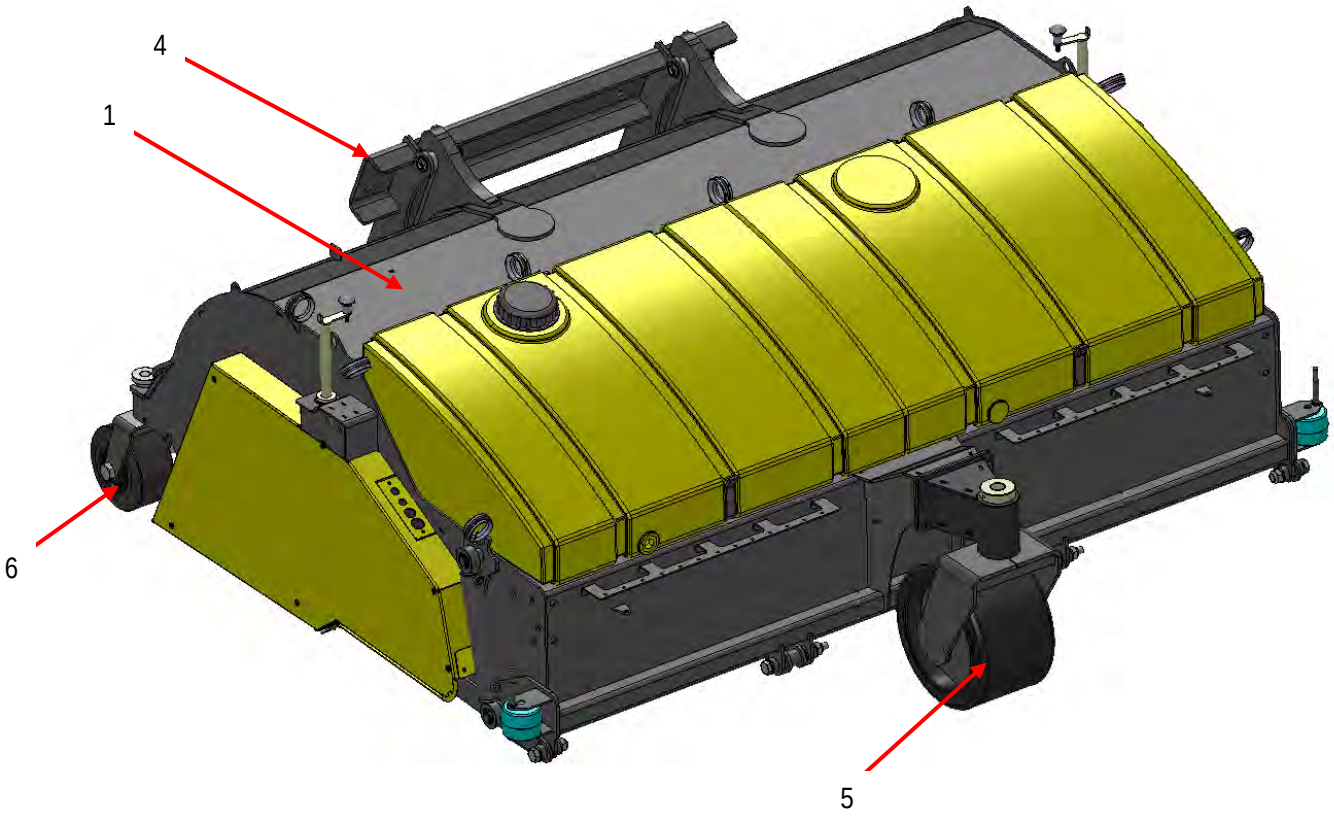
Product _____Serial Number _____

4.2. Maintenance services

Only original spare parts should be used to repair the product. By using original spare parts, you ensure the faultless operation of the collecting sweeper and maintain the warranty. When inquiring and ordering spare parts, state the type and serial number of the collecting sweeper from the type plate presented above to speed up the service.
STARK maintenance and spare parts service and your dealer will answer your questions related to maintenance or spare parts.
Contact your dealer or
For STARK service:
phone +358 (0)17 731 565, email info@stark.fi
For STARK spare parts service:
phone +358 (0)44 758 6221, email parts@stark.fi

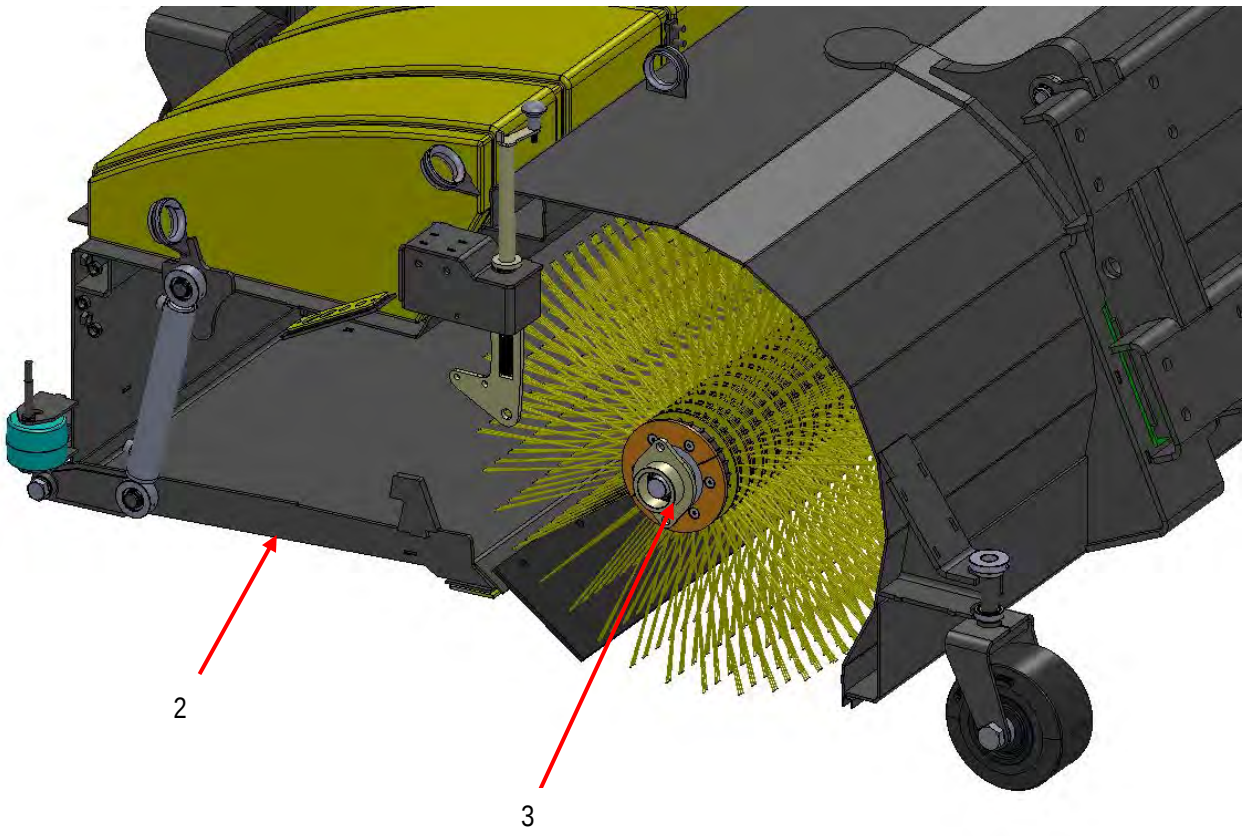
5. MAIN PARTS OF COLLECTING SWEEPER

1) Body of the collecting sweeper
2) Bottom hatch
3) Brush roller
4) Floating frame
5) Front support wheel
6) Rear support wheel



Picture 2. Parts of the collecting sweeper

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Picture 3. Parts of the collecting sweeper

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6. COMMISSIONING

Commissioning ensures that the basic machine and work equipment are compatible. Carry out commissioning for the implement every time the base machine changes.

6.1. Unpacking the collecting sweeper

The collecting sweeper arrives packaged as shown in Picture 4. A forklift platform is tied on top of the sweeper, where you can find the front support wheel of the sweeper and any side brushes.

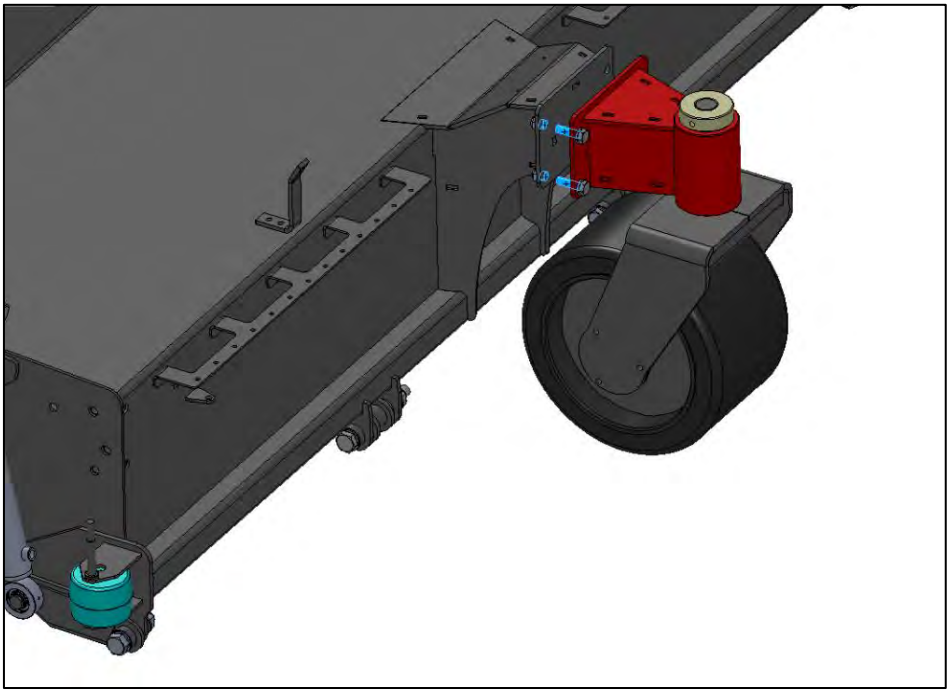
Lower the pallet from the sweeper with a forklift or lifted by several people.
PRECAUTIONARY! THE FRONT STEERING WHEEL IS HEAVY!



Picture 4. Collecting sweeper packed

6.2. Installing the front support wheel

The front support wheel is attached to the front of the brush assembly with four (4) M16 bolts as shown in Picture 5.

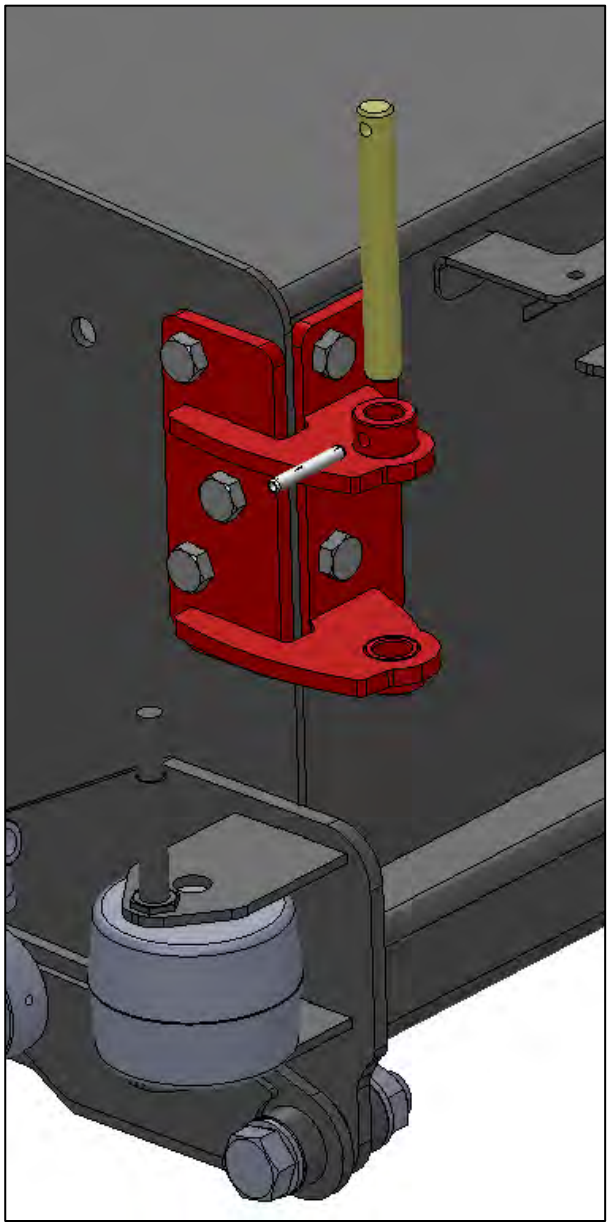


Picture 5. The front support wheel attaches to the front of the brush assembly with four (4) M16 bolts

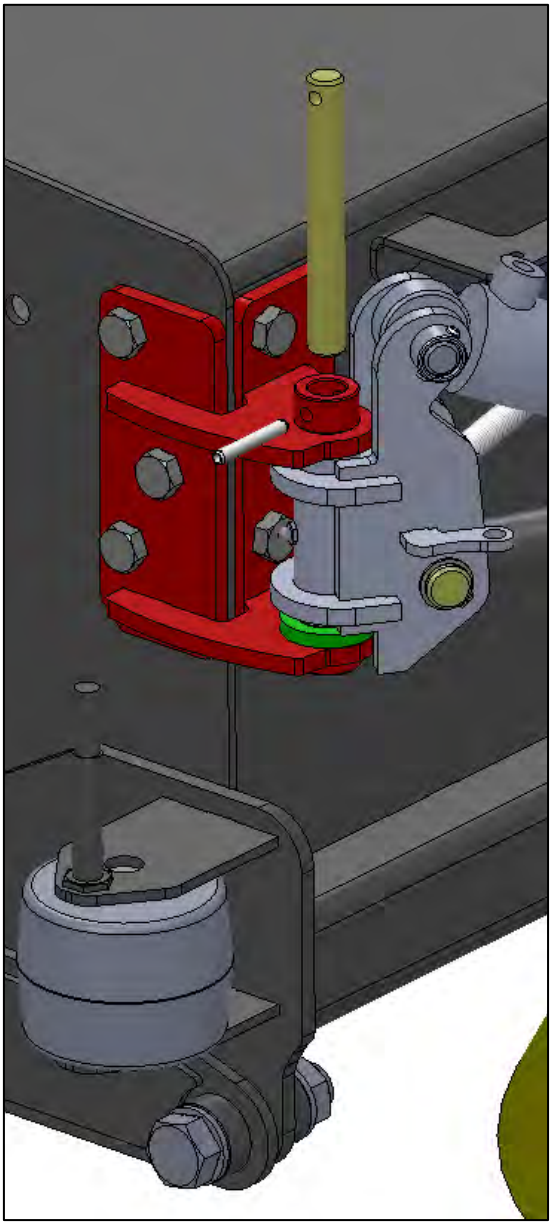
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6.3. Installing the side brush

The side brush attaches to the right or left side of the sweeper. The side brush is attached to the sweeper by removing the bar and pin (picture 6), placing the body of the side brush in place (picture 7), and locking the frame in place with the bar and pin (picture 8). In addition, the tension spring of the side brush is attached to the frame with one (1) M12 bolt (picture 9).

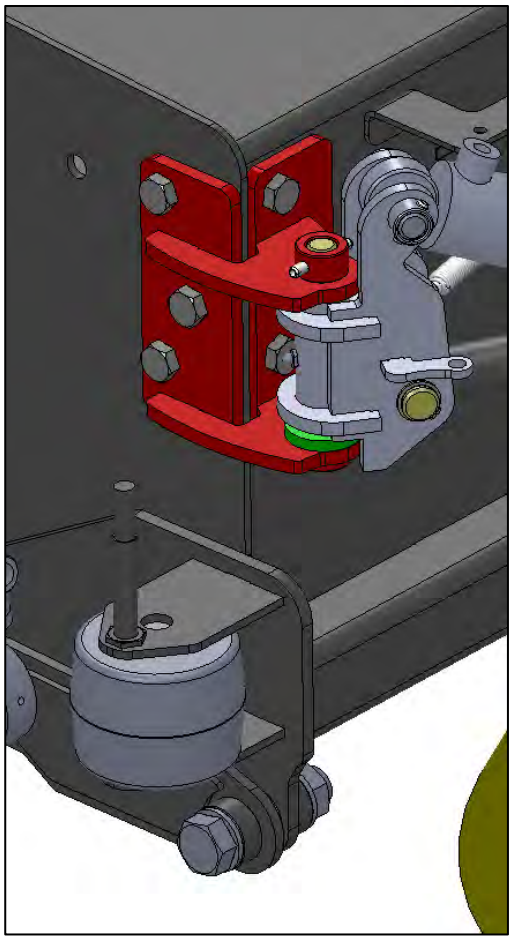


Picture 6. Remove the pin and cotter pin of the side brush

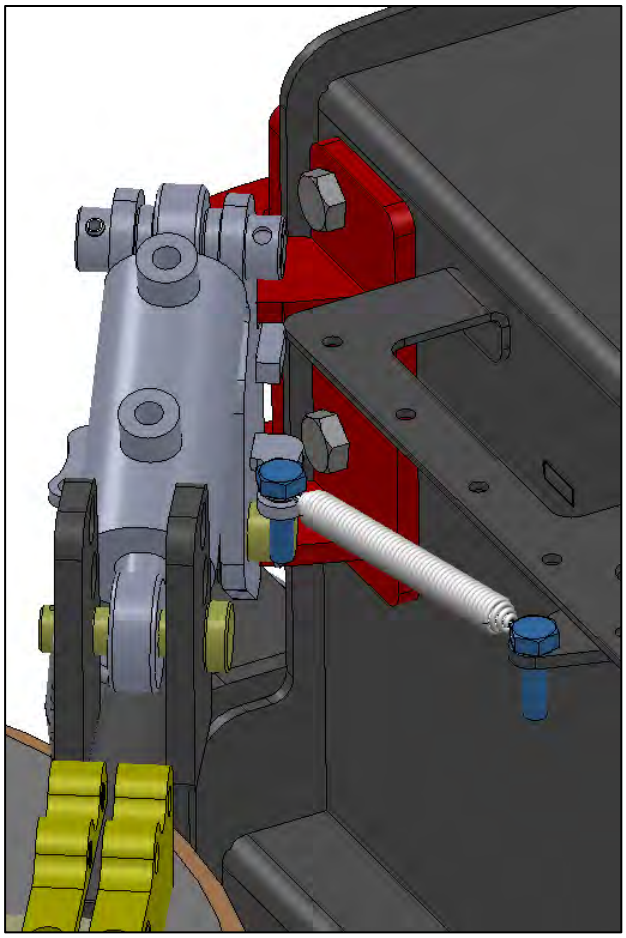


Picture 7. Place the body of the side brush in place

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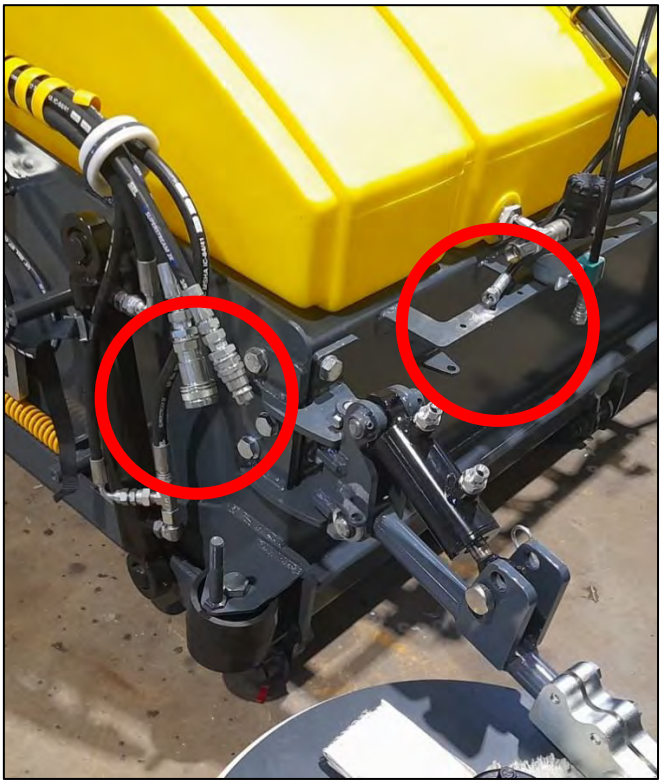
Picture 8. Lock the body of the side brush with a pin and cotter



Picture 9. Attach the spring to the bodies of the sweeper and the side brush

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The hydraulics and irrigation of the side brush are installed according to pictures 10 and 11. The side brush hydraulics are attached with male and female ends, so they cannot be installed incorrectly. The watering hose should be tightened in place with a size 19 spanner.



Picture 10. Side brush hydraulic and watering hoses



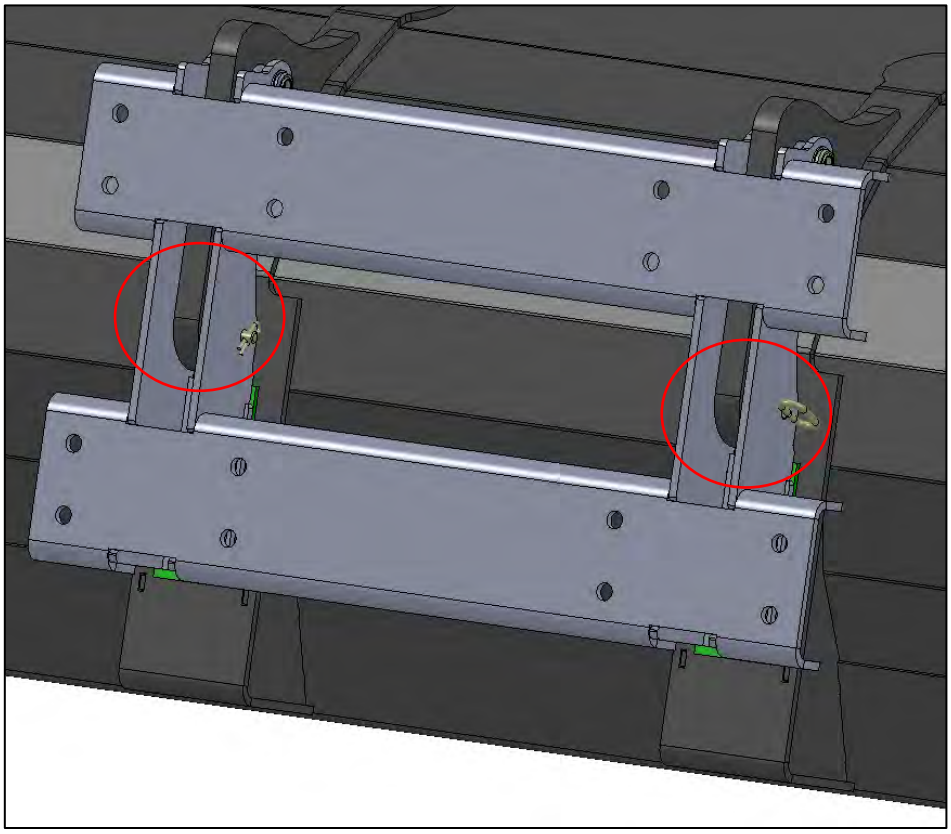
Picture 11. Side brush hydraulic and watering hoses attached

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6.4. Removing the flotation locking pins

The floating frame of the collecting sweeper is locked in place with two locking pins. Remove these pins before using the device. Support the float frame before removing the pins to prevent it from falling freely.

PRECAUTIONARY! After removing the locking pins, the float frame moves freely in its frame. The floating frame hits the ground at high speed, unless it is separately supported. The floating frame is heavy.

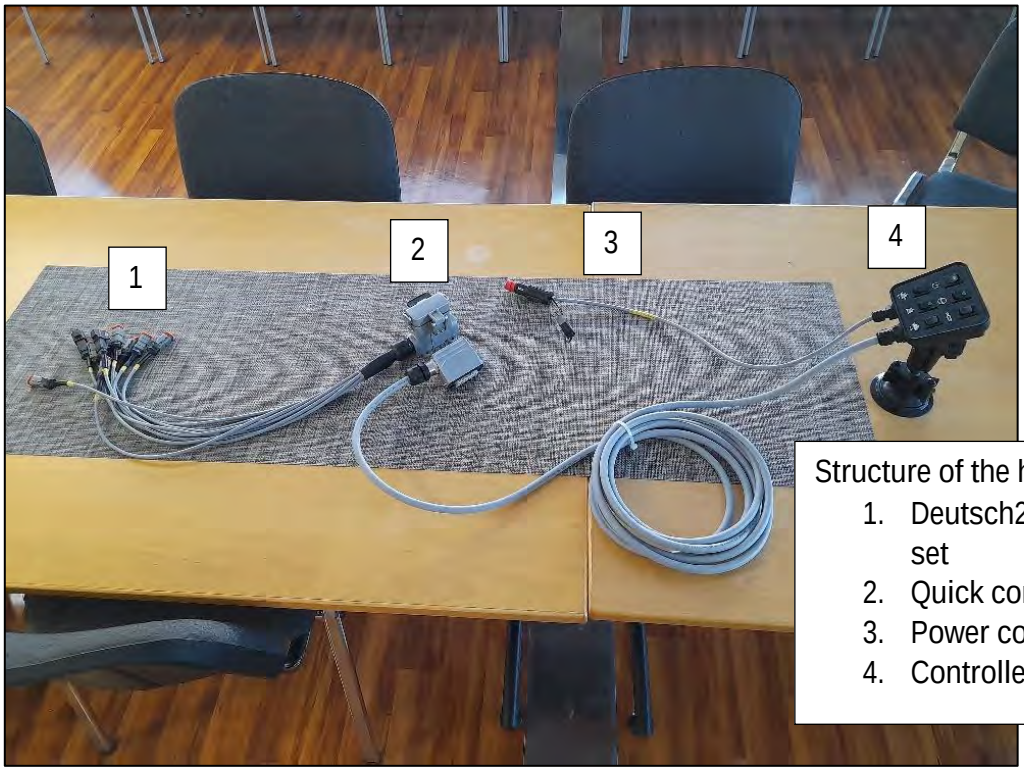


Picture 12. The floating frame is locked with two locking pins

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6.5. Hydraulic controller (CSW-A)

The collecting sweeper comes equipped with a hydraulic controller. The Deutsch2 connector set is already connected to the block valve.



Structure of the hydraulic:

1. Deutsch2-connector set
2. Quick connector
3. Power connector
4. Controller

Picture 13. Structure of the hydraulic controller



Controller commands:

1. Main power
2. Watering
3. Wastegate opening/closing
4. Side brush left
5. Main brush
6. Side brush right

Picture 14. Controller commands

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A fuse box is connected to the power connector, which contains a 15 A, 32 V fuse. This acts as a fuse for the entire hydraulics controller.



Picture 15. Power connector fuse

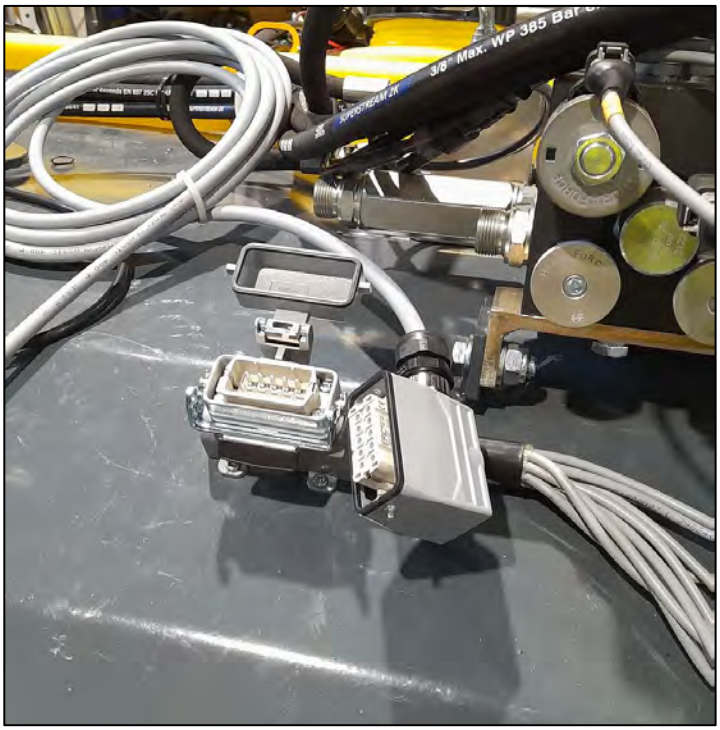
The controller can be attached to a window or other flat surface with the RAM mounting arm. Connect the power connector to the cigarette lighter of the machine. The cable of the quick connector goes out through the window of the work machine.



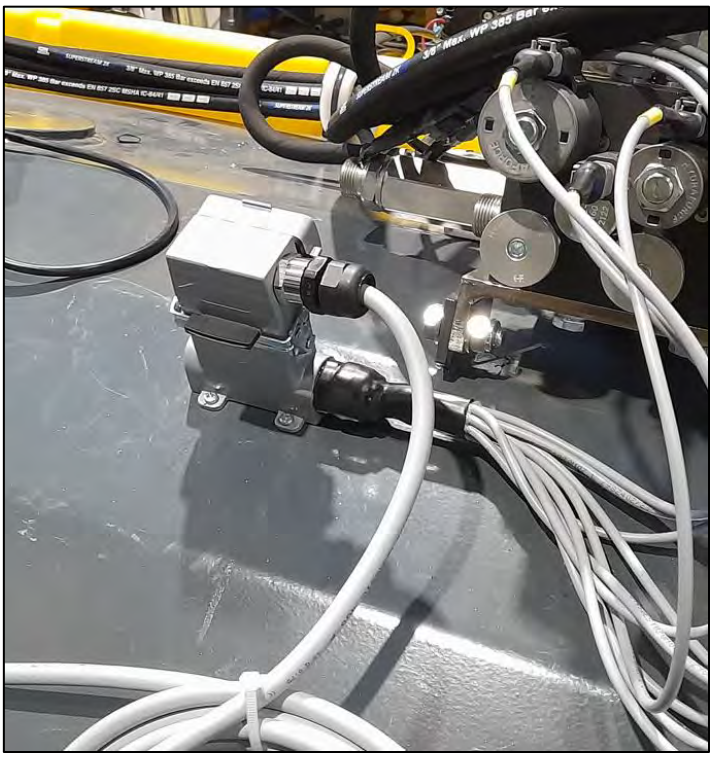
Picture 16. Attaching the controller to the work machine

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The female end of the pair of quick connectors is bolted to the body of the sweeper and the related Deutsch2 connector set is connected to the block hydraulics. Attach the male end of the quick coupler pair as shown in Picture 18. Make sure the quick connector wire is tied in place.



Picture 17. Couple of quick couplers detached

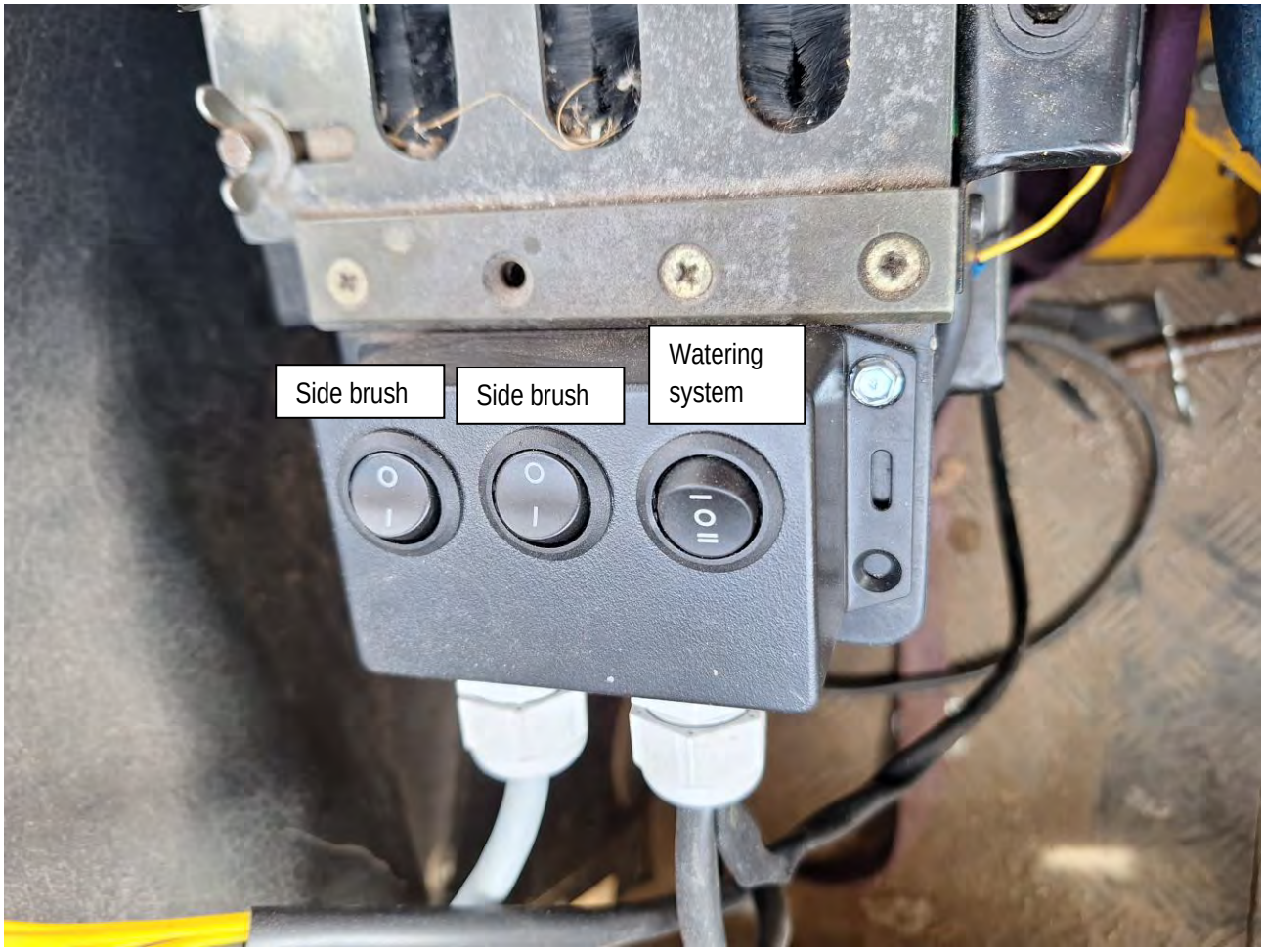


Picture 18. Pair of quick connectors connected

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6.6. Hydraulic controller (CSW-B)

Collecting Sweeper Basic model comes equipped with hydraulic controller. CSW B's main brush and bottom hatch are controlled by the base machine's double action hydraulics (pictures 20-22). Side brush and watering system are turned on / off with the hydraulic controller. (picture 19)



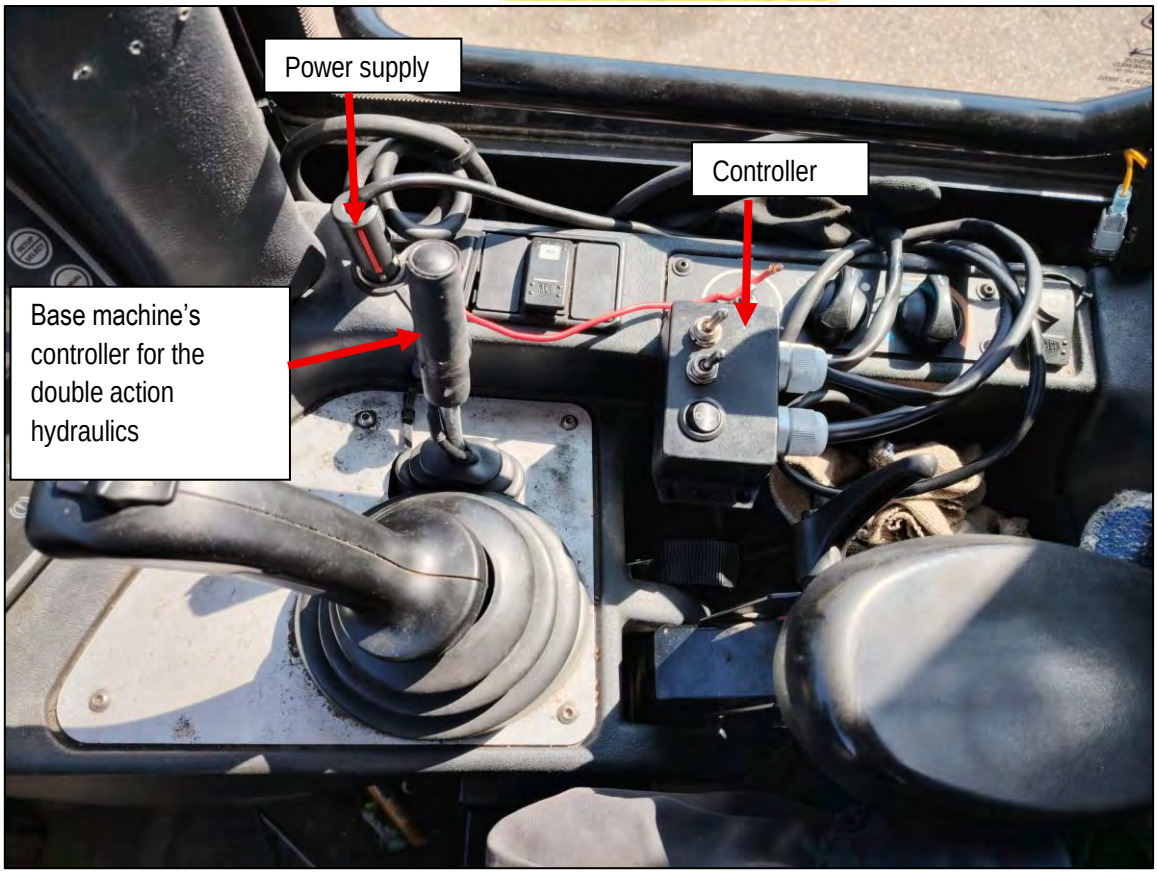
Picture 19. Commands for the CSW B -controller

Closing the bottom hatch:

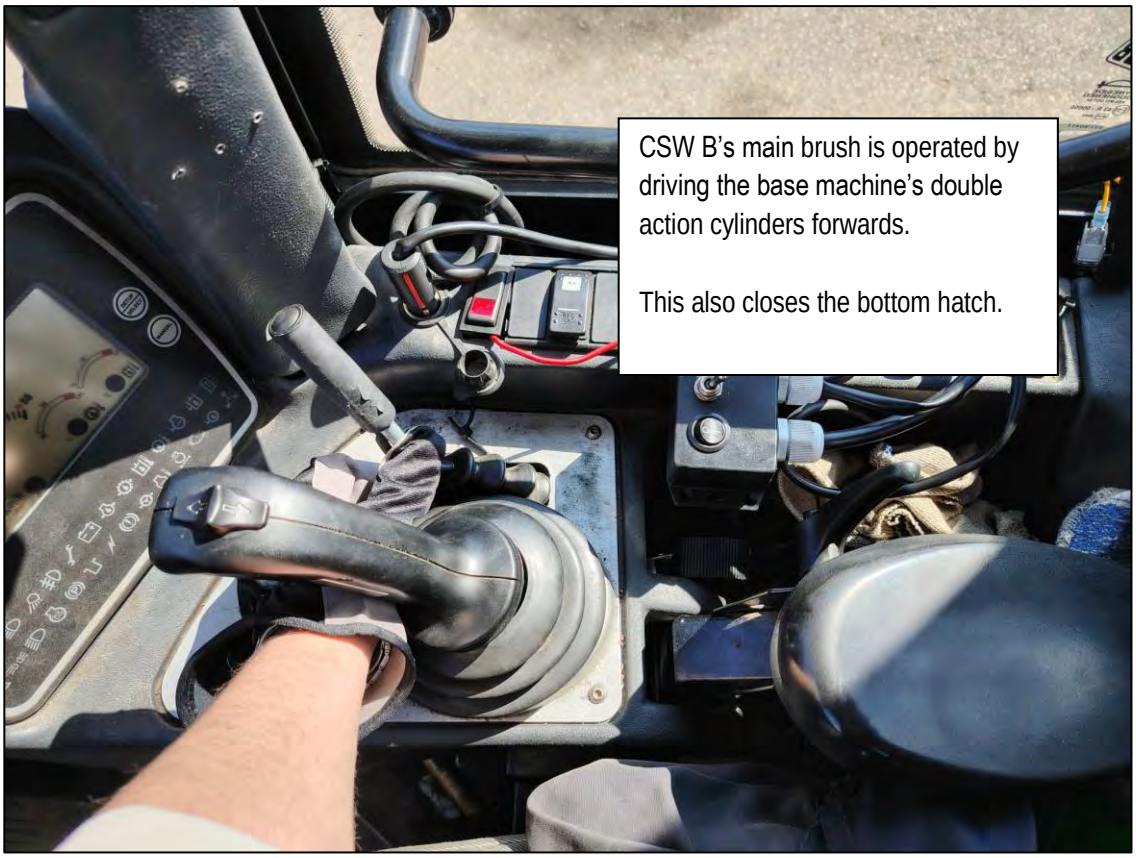
CSW B's bottom hatch is closed by driving the base machine's double action hydraulics forward (picture 21). This closes the bottom hatch but will not lock it. To lock the bottom hatch, lower the CSW on the ground or increase the RPM of the motor. This will increase the pressure in the bottom hatch's cylinders, and the cylinders have enough power to lock in.

CSW B:n roskaluukku suljetaan ajamalla peruskoneen moottorihydrauliikkaa eteenpäin. Tällöin roskaluukku menee kiinni, mutta ei lukitu. Lukitaksesi roskaluukun, laske CSW maata vasten tai lisää moottorin kierroksia. Tällöin harjatelan moottorissa ja luukun sylintereissä paine kasvaa, ja luukun sylinteri jaksaa vetää luukun kiinni.

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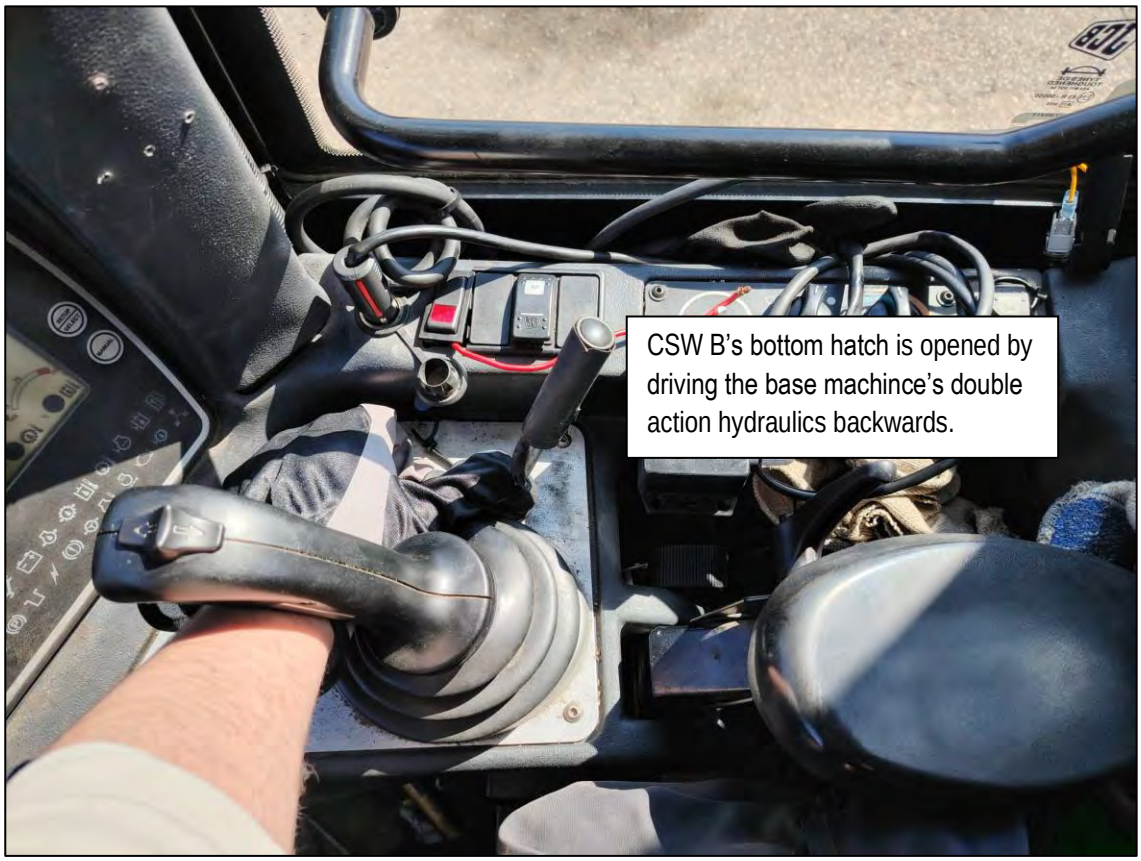


Picture 20. Set up of the CSW B -controller



Picture 21. Using the main brush / closing the hatch.

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Picture 22. Closing the hatch

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6.7. Adjusting the hydraulics of the collecting sweeper (CSW-A)

The functions of the collecting sweeper are controlled by a block valve. The oil flow of the hydraulics can be adjusted with the controls of the block valve (picture 19). It is a complex hydraulic system, make adjustments a little at a time.

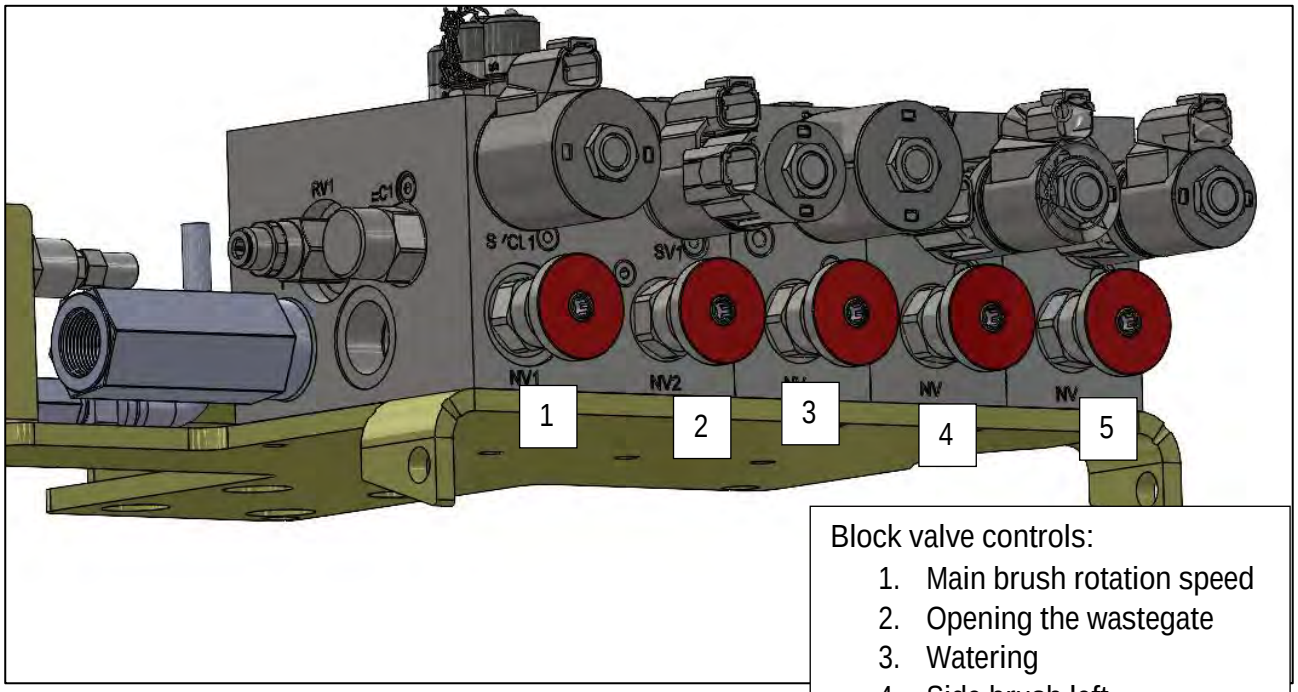
Adjust the oil output of the basic machine to 50 L/min CSW 2000 and 60 L/min CSW 2500. During the first run, the block hydraulics and the oil output of the basic machine may have to be adjusted several times in order to make the oil flow suitable for all characteristics.

Adjust hydraulics to suit when all valve blocks are in use.

Please note that when using the sweeper, the temperature and viscosity of the hydraulic oil change. Be prepared to adjust the hydraulics while using the sweeper.

Please note that the hydraulic adjustments of the sweeper are specific to the basic machine. Oil quality, flow and other factors change between basic machines. When you connect the collecting sweeper to the new base machine, adjust the hydraulics of the sweeper and the oil output of the base machine to suit this base machine.

The recommended rotation speed of the brush roller is 100–140 revolutions/min. At a rotation speed higher than this, the debris gets stuck to the slats.



Block valve controls:

1. Main brush rotation speed
2. Opening the wastegate
3. Watering
4. Side brush left
5. Side brush right

Picture 23. Block valve controls

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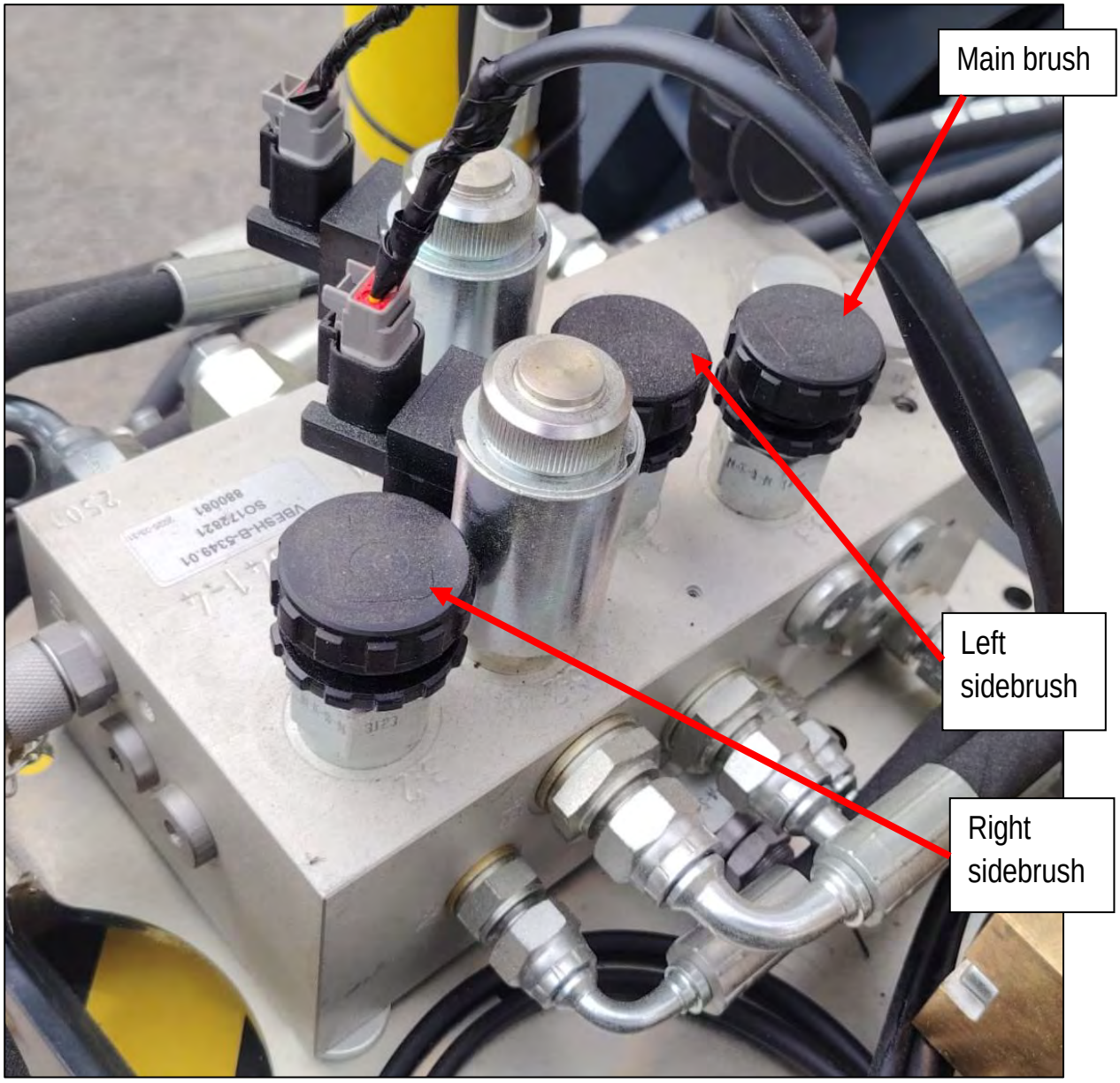
6.8. Adjusting the hydraulics of the hydraulic block (CSW-B)

CSW B Hydraulic block is adjusted for the oil flow of 40-50 L/min in the factory. If the oil flow is too low, the side brush won't raise up when not in use. If the oil flow is too high, the hydraulic block will overheat and be damaged. CSW B's functions will also become erratic.

Adjusting the hydraulic block is done in the following order. This may need to be done several times for the oil flow to be correct for every function.

1. Adjust the rotating speed of the main brush.
2. Adjust the rotating speed of the right-side brush.
3. Adjustt the rotating speed of the left side brush.

NB! If the left- or right-**side brush is not in use, it's adjustment must remain** shut.
Adjust the base machine's oil flow to 40-50 L/min. Higher oil flow can damage the hydraulic block.



Picture 24. Functions for the CSW-B hydraulic block

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6.9. Attaching the collecting sweeper to the base machine

The collecting sweeper is attached to the base machine with bolted STARK FIT adapters, which in turn are attached to the floating frame. The connection diagrams of the machine are shown earlier in the user manual. Ask your dealer about available STARK FIT fittings.

Before using the device, MAKE SURE that all locking pins and cotter pins are in place!

Pay attention to the operating instructions of the basic machine when attaching the collecting sweeper to the basic machine.

1. Check the mechanical, hydraulic and electrical compatibility of the implement and the base machine.

2. The collecting sweeper is attached to the work equipment attachment of the basic machine (e.g. front loader). Attach the sweeper to the basic machine, make sure the pins are locked. Put the parking brake on.

3. Turn off the base machine and make sure the parking brake is on.

4. Make sure there is no pressure in the base machine's hydraulic system. When installing, always check the cleanliness of the hydraulic connectors and the condition of the hoses.

5. Carefully check the trajectories between the implement attachment, the base machine and the implement for collisions. Also check the space required by the hydraulic hoses and connectors. Make all extreme movements with the base machine and the loader to ensure that the implement does not collide with the base machine. Check that the rotation of the brush roller is towards the waste container.

6. The oil flow of the hydraulics of the collecting sweeper is adjusted with the block hydraulic controls (picture 18) and by adjusting the oil flow of the basic machine. Adjust the oil output of the basic machine to 50 L/min (CSW 2000) and 60 L/min (CSW 2500).

7. The bolts, nuts and connectors of the new work equipment may loosen during the first hours of use. Do their POST-TIGHTENING after the first working day.

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7. USE OF COLLECTING BRUSHES

Check before driving:

- that the device is installed correctly
- all locking pins are in place
- the hydraulic hoses are connected correctly
- the hoses are intact
- that there are no oil leaks in the device
- that all functions work correctly
- learn the functions of the sweeper in a closed area before starting actual use

7.1. Manual

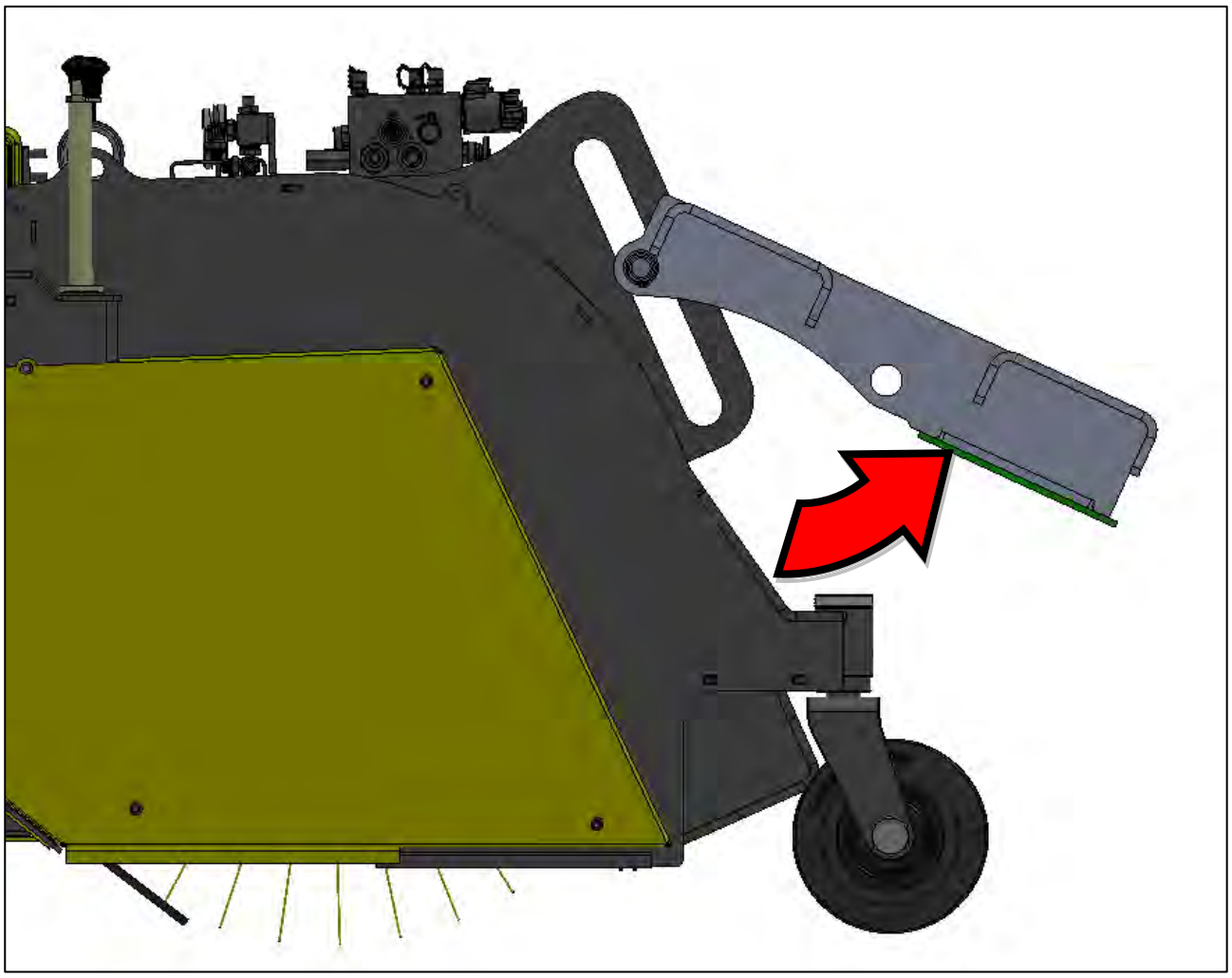
1. Check the mechanical, hydraulic and electrical compatibility of the implement and the base machine.
2. The collecting sweeper is attached to the work equipment attachment of the basic machine (e.g. front loader). Attach the sweeper to the basic machine, make sure the pins are locked. Turn on the parking brake.
3. Turn off the base machine and make sure the parking brake is on.
4. Make sure there is no pressure in the base machine's hydraulic system. When installing, always check the cleanliness of the hydraulic connectors and the condition of the hoses.
5. Carefully check the trajectories between the implement attachment, the base machine and the implement for collisions. Also check the space required by the hydraulic hoses and connectors.
6. Check that the direction of rotation of the sweeper roller is towards the housing and that any side brushes are rotating towards the device. If necessary, change the positions of the hoses in the basic machine.
7. The rotation speed of the brush roller can be adjusted with the block hydraulics controller.
8. Adjust the driving speed to suit the work site.
9. Adjust the rotation speed of the brush roller according to the brushing need. The rotation speed of the brush roller is controlled by the block valve regulator.
10. Adjust the sweeper to a suitable height from the ground using the adjustment bar. A suitable height is approx. 10–20 mm in printing (picture 21).
11. As far as possible, keep the float in the middle position so that the collecting sweeper runs on the support rollers, adapting to the slope variations and shapes of the road as well as possible. Do not push the brush with the lifting device.
12. Observe abnormal behavior and oil leaks even while driving.

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7.2. Driving position of the collecting sweeper

The collecting sweeper comes equipped with a floating body. The floating frame is attached to the sweeper with two fixing pins, which correct the oscillations of the basic machine. The floating frame enables an even brushing result even on an uneven surface.

During driving, the float frame should only push the sweeper with the upper pins, with the pins in the center of the float lugs and the float frame tilted (picture 25). In this case, floating has the most room to correct the wrong movements of the basic machine.



Picture 25. Thrust angle and upper pins

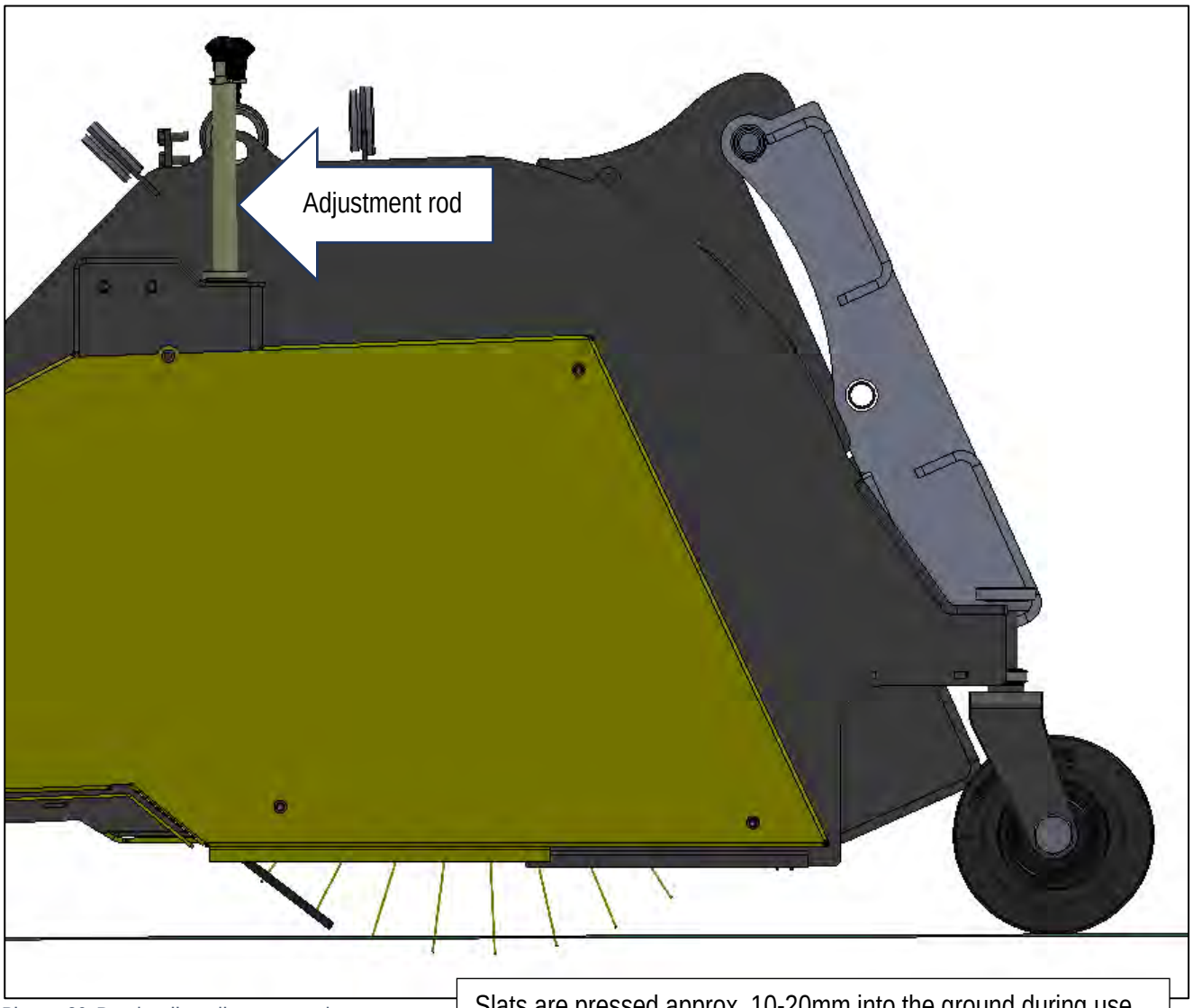
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7.3. Adjusting the height of the brush roller

Adjusting the height of the brush roller of the collecting sweeper is done with the adjustment bars located on both sides of the sweeper (picture 26). Both height adjustment rods of the main brush must be adjusted the same amount, otherwise the sweeper will be crooked, and the slats will wear unevenly.

NOTE! During storage, lift the brush slats off the surface of the ground.

The suitable height for sweeper slats is pressed approx. 10–20 mm into the ground.



Picture 26. Brush roller adjustment rod

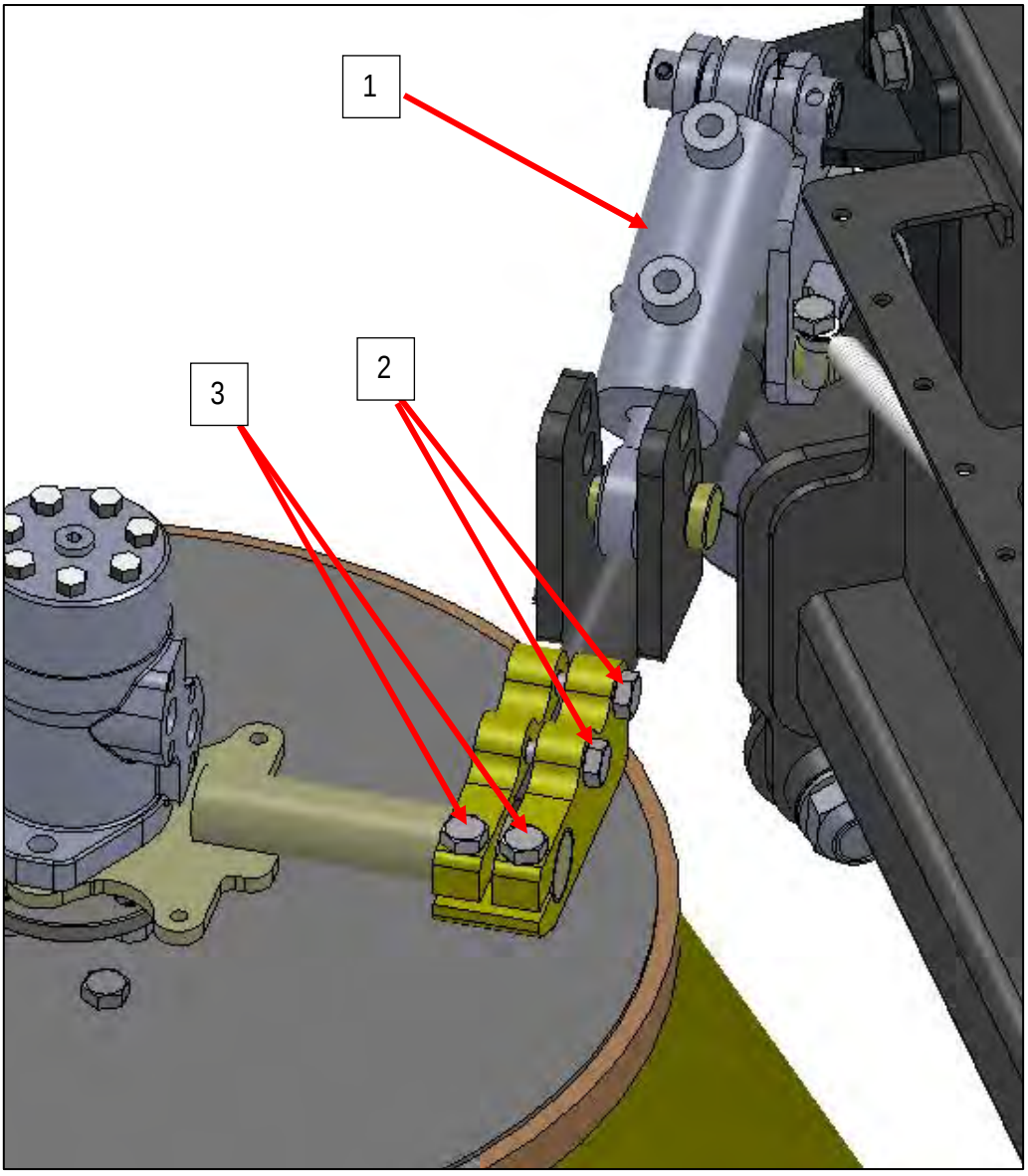
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7.4. Adjusting the side brushes

Side brushes for both sides of the device are available as an accessory for the collecting sweeper. The side brush works best when it is angled from the outer edge and front.

To adjust the position of the brush:

1) Adjusting brush height and wear: With hydraulic cylinder
2) Tilting the brush sideways: Loosen the bolts, turn the sweeper to the desired position, tighten the bolts
3) Tilting the brush forward / backward: Loosen the bolts, turn the sweeper to the desired position, tighten the bolts



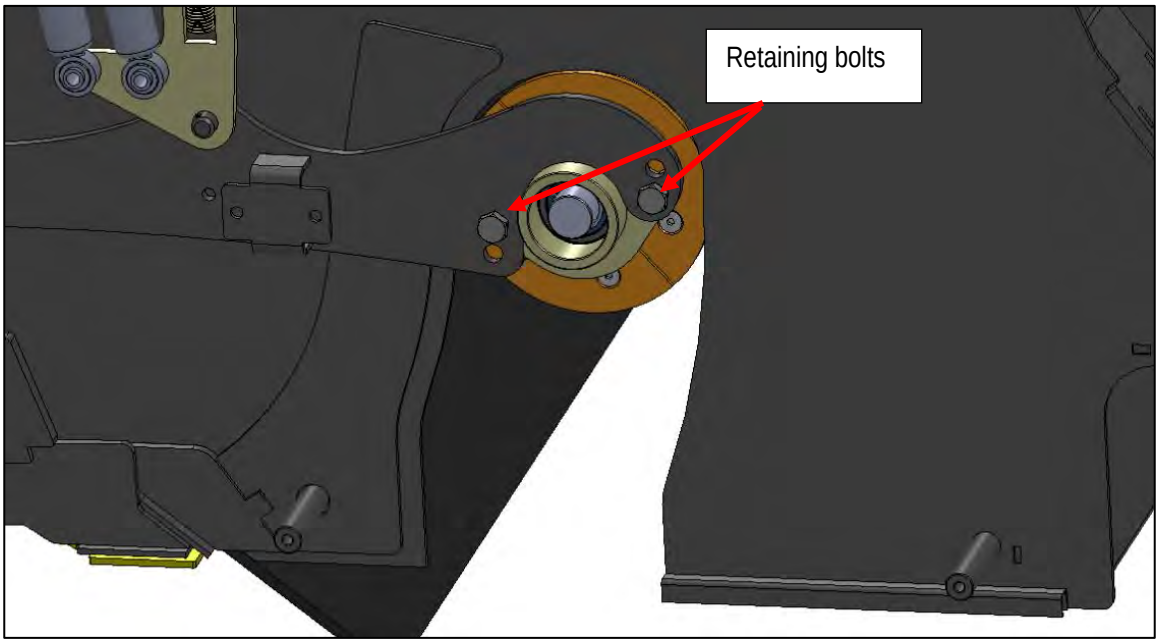
Picture 27. Adjusting the side brush

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7.5. Changing the brush plates

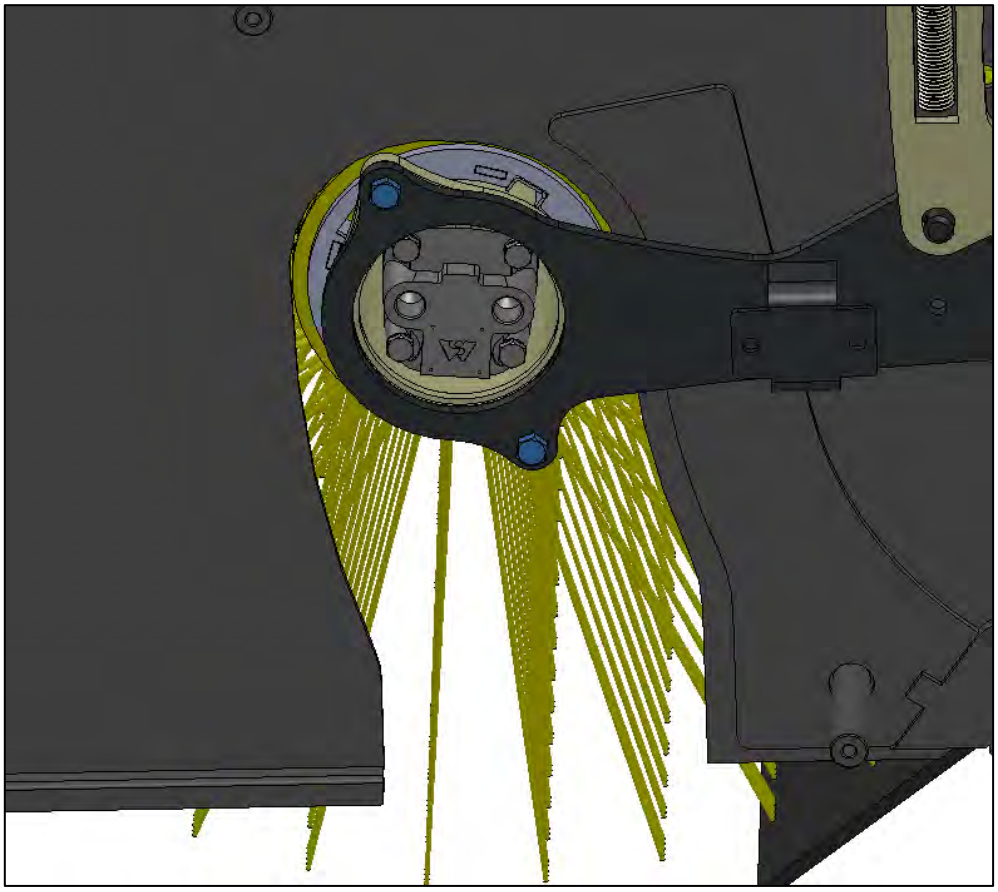
Wash the sweeper carefully from inside the frame housing.

1. Open the protective cases on both sides of the brush.
2. Remove the hydraulic hoses of the brush roller motor from inside the protective case (note that mark the hoses to facilitate re-installation). Install protective plugs on the removed hydraulic connectors.
3. Remove the two M16 mounting bolts of the bearing side claw (picture 28). The bearing side of the brush roller is now off the claw. Support the bearing side of the brush roller before removing the right one.
4. Remove the M16 bolts from the motor side of the brush roller (picture 29). After this, the brush roller is detached from the frame.
5. The slats are held in place by two end plates, which are attached with M10 bolts. Remove the bolts and remove the plates.
6. Take out the lamellas. Note that it is not necessary to remove the bearing housing to remove the plates.
7. After changing the lamellas, carry out the assembly in reverse order. Install the lamellas so that there are more lamellas at the ends of the brush roller, as they wear out faster than the middle part. Remember to keep the hydraulic connectors clean.

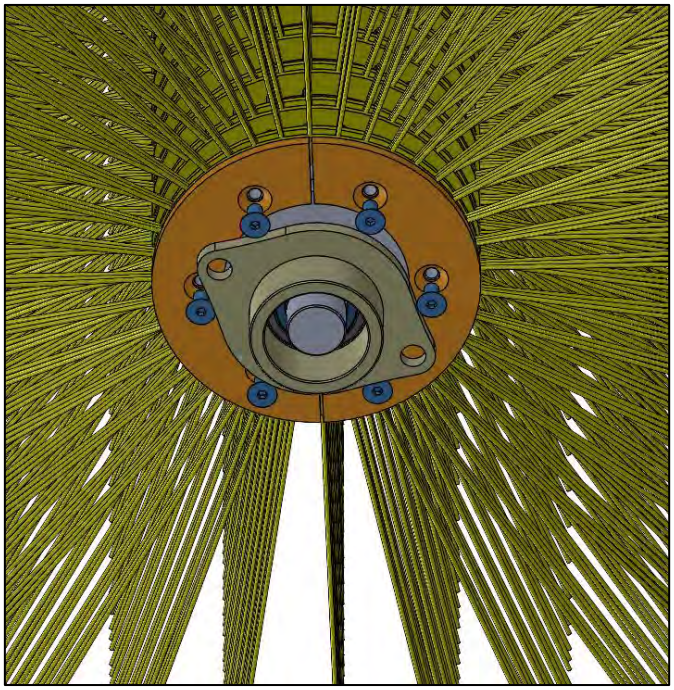


Picture 28. The bearing side of the brush roller is held in place by two retaining bolts

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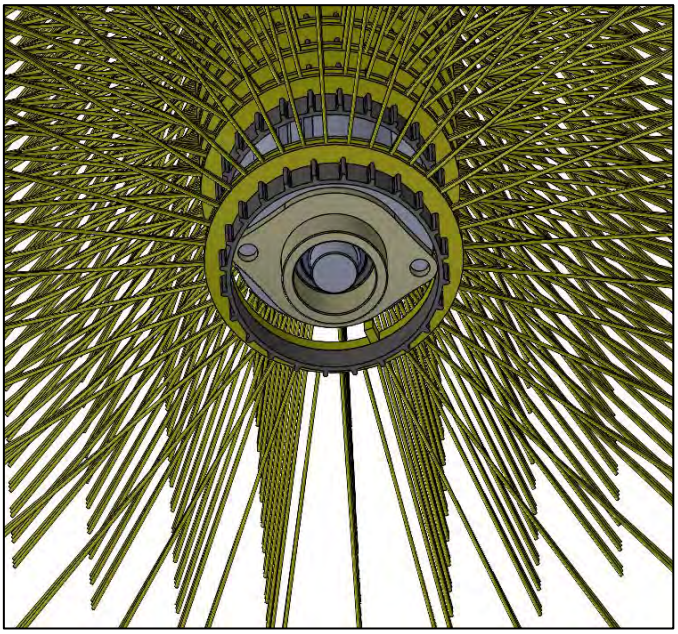


Picture 29. The motor side of the brush roller is held in place by two retaining bolts



Picture 30. The brush slats stay in the roller with the fixing plates

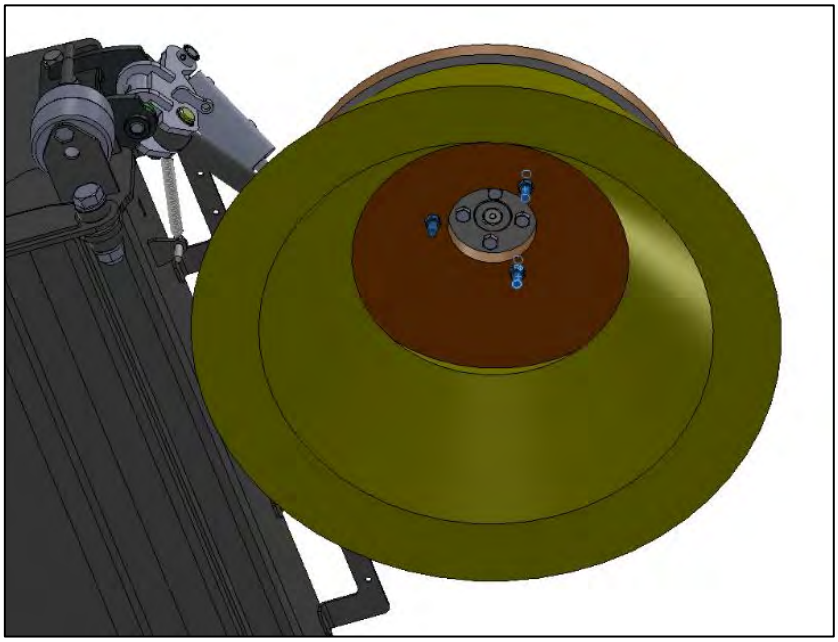
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Picture 31. The brush plates can be removed without removing the bearing housing

7.6. Replacement of side brushes

Open the bolts at the bottom of the side brush (picture 32) and remove the brush. Attach the new brush in place.



Picture 32. The side brush is attached with three bolts

7.7. Transferring the collecting sweeper

When moving the collecting sweeper, raise it high enough and slow down the driving speed to suit, especially if the road is uneven. The basic machine or sweeper may be damaged if the driving speed is too high.

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7.8. Removing the collecting sweeper from the base machine

1. Place the collecting sweeper on a flat surface. Raise the brush roller so that the slats do not press against the ground.
2. Turn off the base machine, turn on the handbrake and depressurize the system.
3. Disconnect the hydraulic hoses and protect the ends of the hoses with plugs.
4. Unlock the attachment of the work equipment and remove the equipment.
5. If the device will not be used for a long time, clean it properly, grease it, carefully remove the water from the tank and hoses. If possible, store the device indoors.

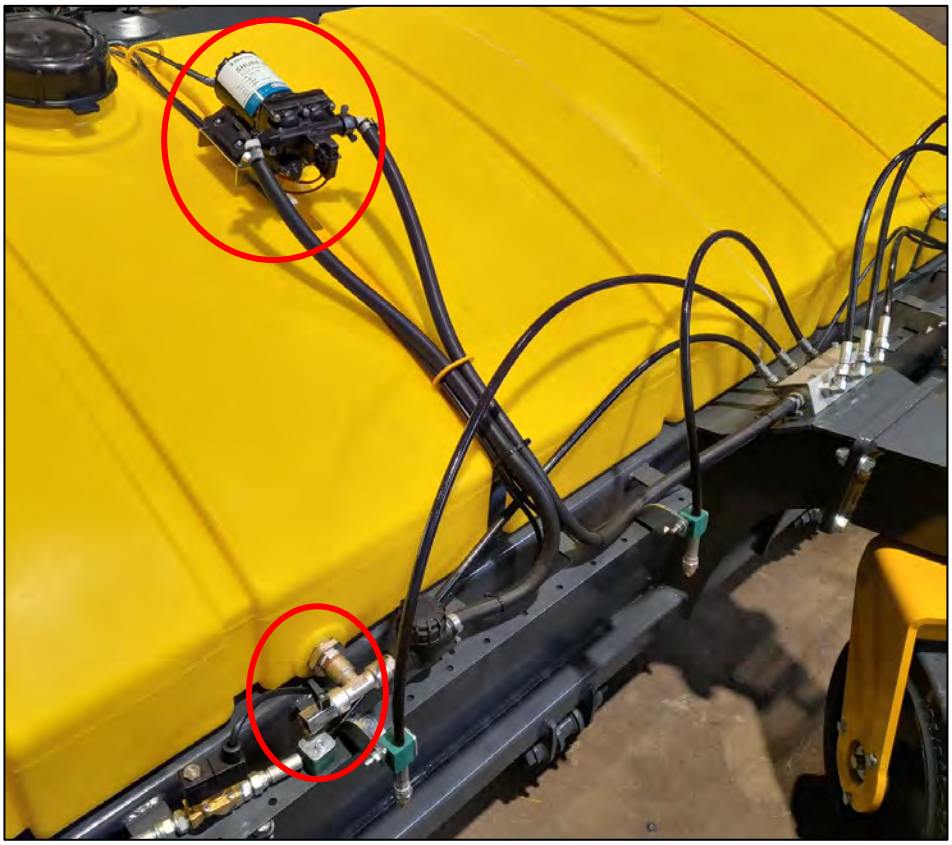
7.9. Dust control systems

Either a watering system or a dust binding system is available for the collecting sweeper. A low-pressure pump is used for watering and a high-pressure pump for dust binding. The size of the tank is 480 L - CSW 2000 or 600 L CSW 2500. Water reduces sand dusting, improves the cleaning result, lubricates the brushes and reduces the wear of the brushes. Detergent can be used in water to enhance dust binding. The tanks can be emptied from the tap next to the pump (picture 28) after use. Empty the water tanks if the irrigation system will not be in use soon.

NOTE!

Use only fresh water in the system!

If you store the attachment in freezing temperatures, drive anti-freeze through the system by mixing it to the water. Otherwise, the system will get damaged.



Picture 33. Low-pressure pump and tank drain valve

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7.10. High-pressure pump

It is possible to add a high-pressure pump to the attachment. Pressure of the pump and the oil flow is adjusted with hydraulic block (picture 34).

The pressure of the pump can be seen in its gauge). Adjust the pressure to 60-80 bar.



Picture 34. Gauge of the pump

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7.11. High-pressure washer

Collecting sweeper is possible to equip with dust binging system and high-pressure washer. When using high-pressure washer, turn the flow of the 3-way tap next to the high-pressure pump to the high-pressure washer. This directs the water from the machines dust binding to the high-pressure washer. If necessary, adjust the water pressure using the “Watering” -regulator on the hydraulic block.

Operating the pressure washer:

1. Turn off the base machine.
2. Put on a hand brake.
3. Turn off the hydraulics of the base machine.
4. Turn the 3-way valve on the pressure washer (picture 36).
5. Turn on the base machine.
6. Turn on the hydraulics of the base machine.
7. Adjust the oil flow to the suitable levels with the block hydraulics. Press the trigger of the pressure washer. At the same time adjust the pressure of the pump. A suitable pressure for the pump is 60-80 bars.



Picture 35. High-pressure washer



Picture 36. High-pressure pump and 3-way valve

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8. MAINTENANCE OF COLLECTING SWEEPER

8.1. General precautions for use and maintenance of the device

- Follow the applicable laws and regulations as well as the instructions mentioned in this user manual.
- Never go under an unsecured device.
- Always engage the handbrake of the basic machine before working on the device.
- Only use tools that are in good condition.
- Watch out for pressurized hydraulic hoses and components.
- Make sure the hydraulic system is depressurized. Note the pressure accumulator.
- Do not let hydraulic fluids or greases fall on the ground.
- Use the necessary personal protective equipment.

8.2. Tightening torques

	Nm (Strength 8.8)
M4	3,3
M5	6,5
M6	11,3
M8	27,3
M10	54
M12	93
M14	148
M16	230
M18	329
M20	464
M22	634
M24	798
M27	1176
M30	1597
M33	2161
M36	2778
M39	3597

Table 1. Tightening torques

8.3. Daily maintenance

A daily visual inspection is important so that possible faults can be noticed in time and further damage can be prevented. Check the device daily for the following items:

- Possible leaks of hydraulic hoses and components
- General mechanical condition

8.4. Service after the first 10 hours

- Perform greasing, recommended grease quality NLGI-2 classification grease or similar (see instructions below)
- Check the tightness of the bolts and nuts (table 1.)

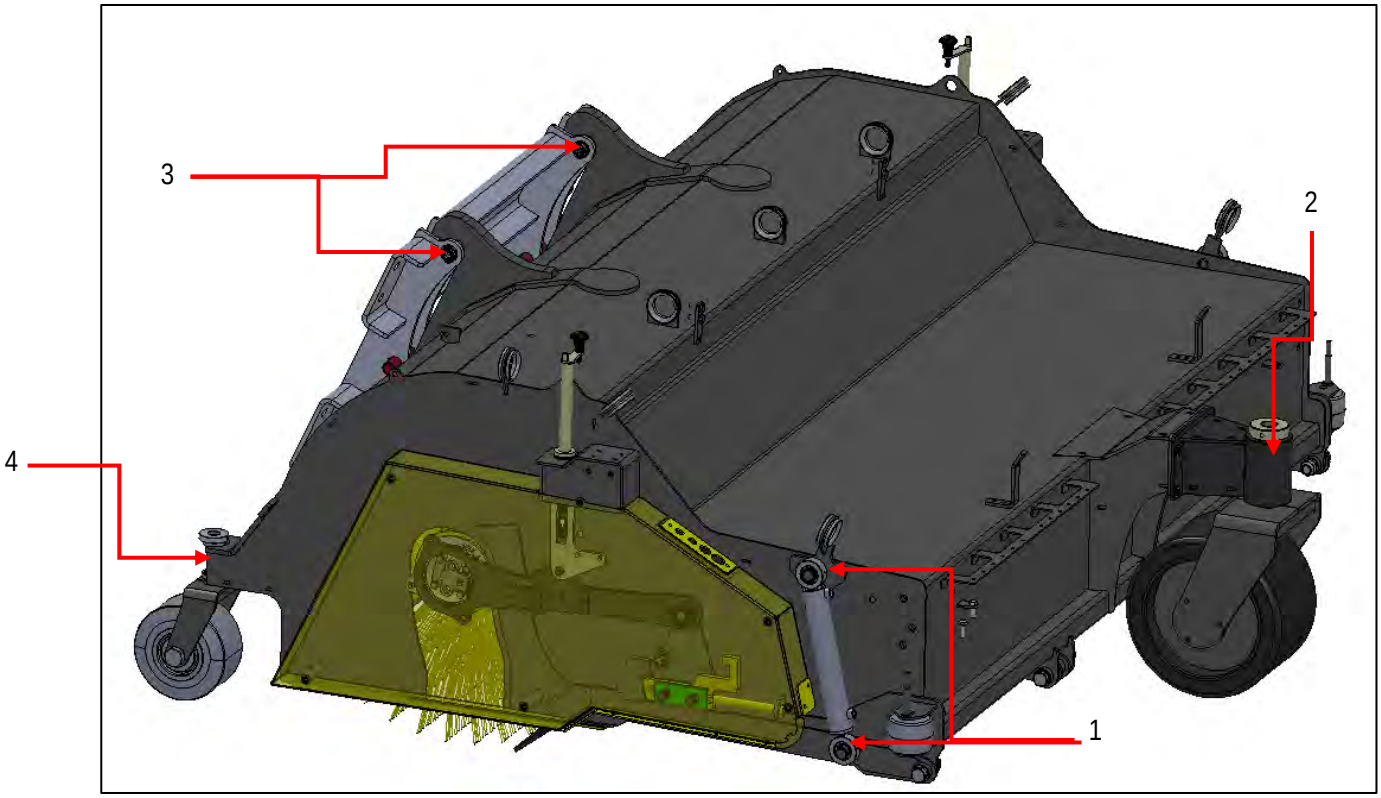
8.5. Service every 50 hours or weekly

- Perform greasing, recommended grease quality NLGI-2 classification grease or similar (see instructions below)
- Check the mechanical condition of the device for distortions or loosening
- Check the tightness of the bolts and nuts (table 1.)

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8.6. Grease nipple locations

1) Hydraulic cylinder eyes (both sides of the sweeper)
2) Front wheel bearing
3) Grease nipple of the float pin
4) Rear tire grease nipple



Picture 37. Grease nipple locations

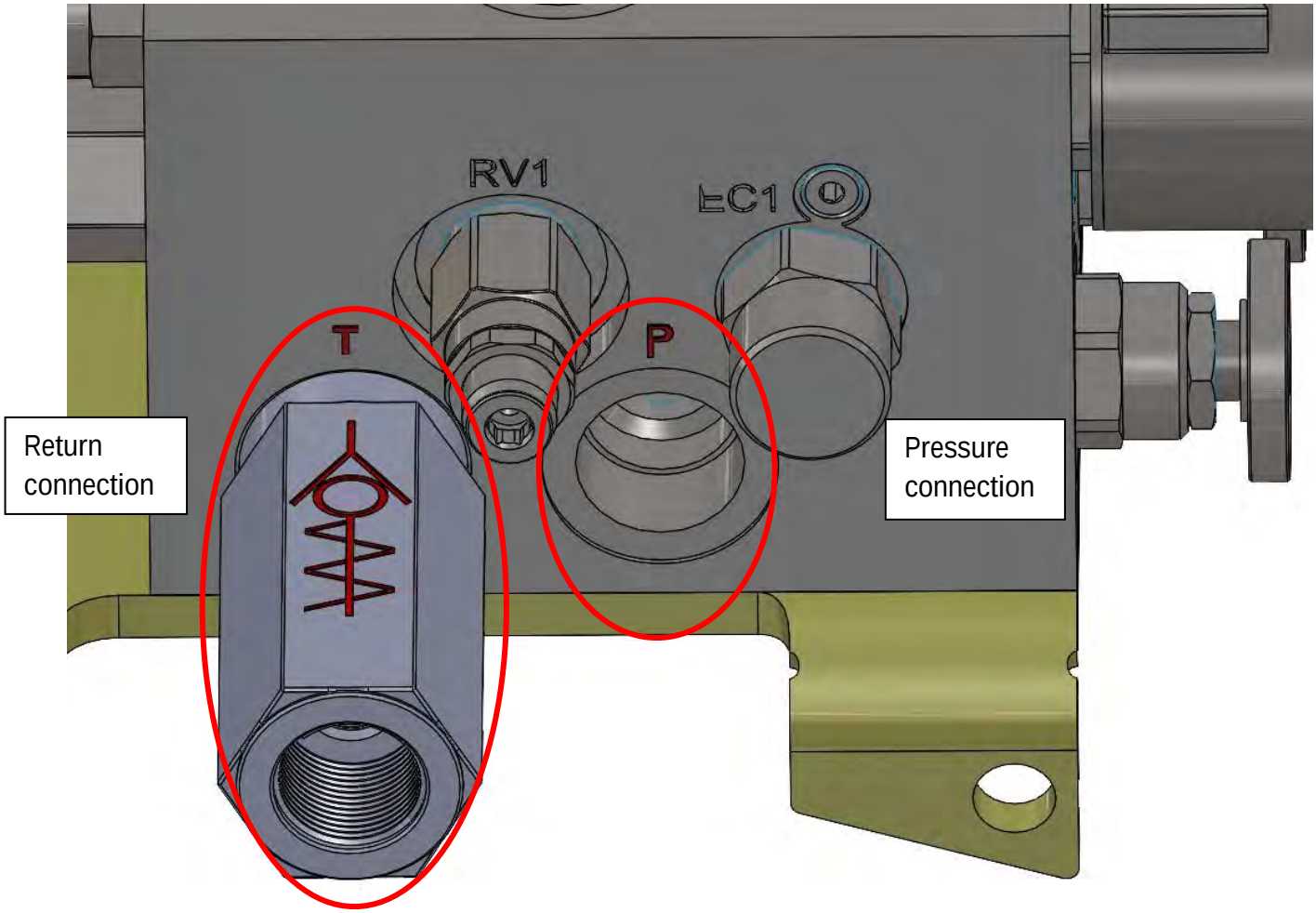
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9. HYDRAULICS

9.1. Hydraulic block, CSW-A

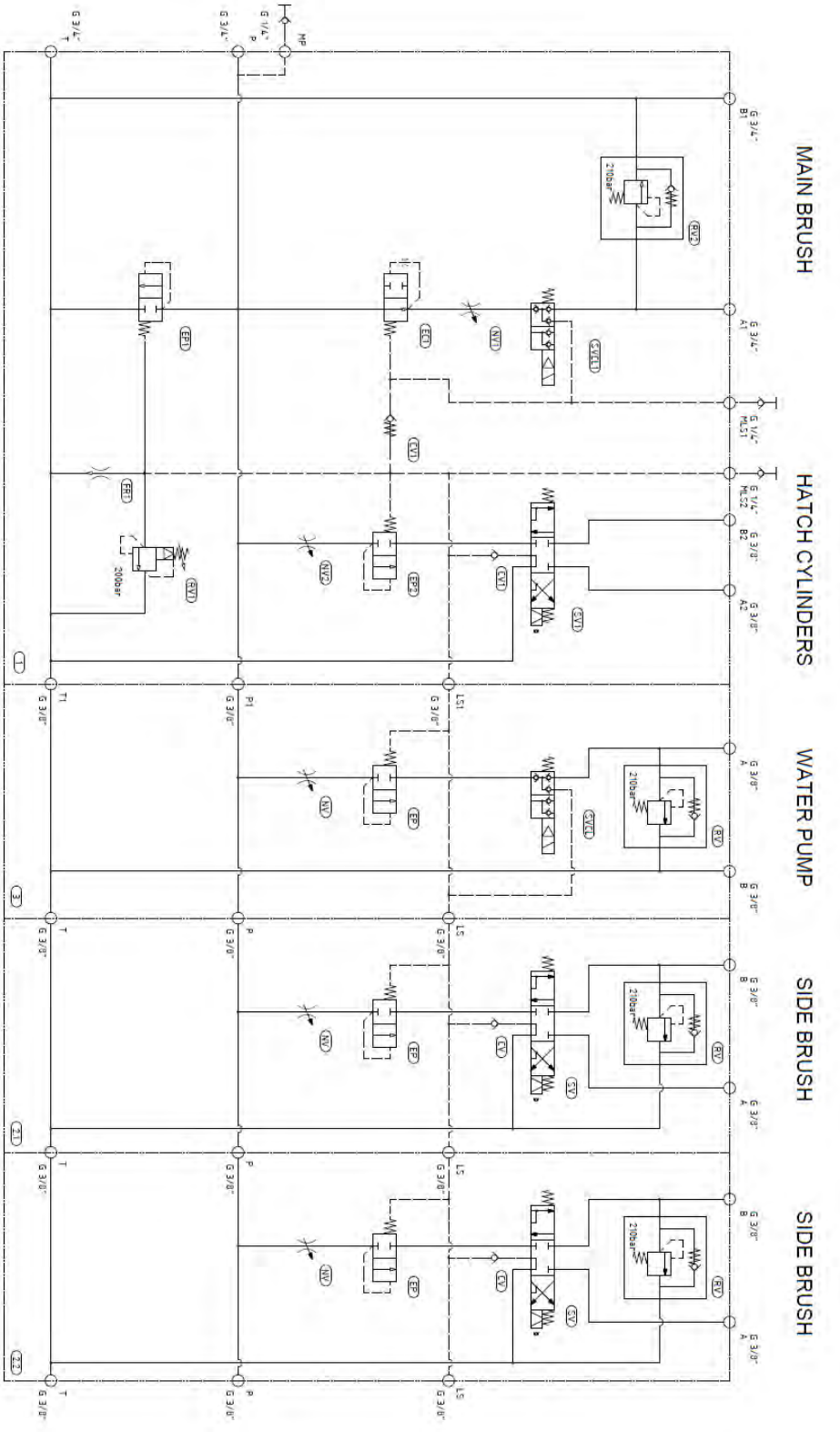
It is possible to connect the collecting sweeper to 2-hose hydraulics. Any changes to the hydraulic system are the customer's responsibility.

The collecting sweeper is connected to the pressure and return connectors of the block valve. The pressure connection is marked with the letter P and the return connection with the letter T. A non-return valve is installed in the return port (picture 38). NOTE! THE OIL FLOW MUST ALWAYS BE TOWARDS THE PRESSURE CONNECTION!



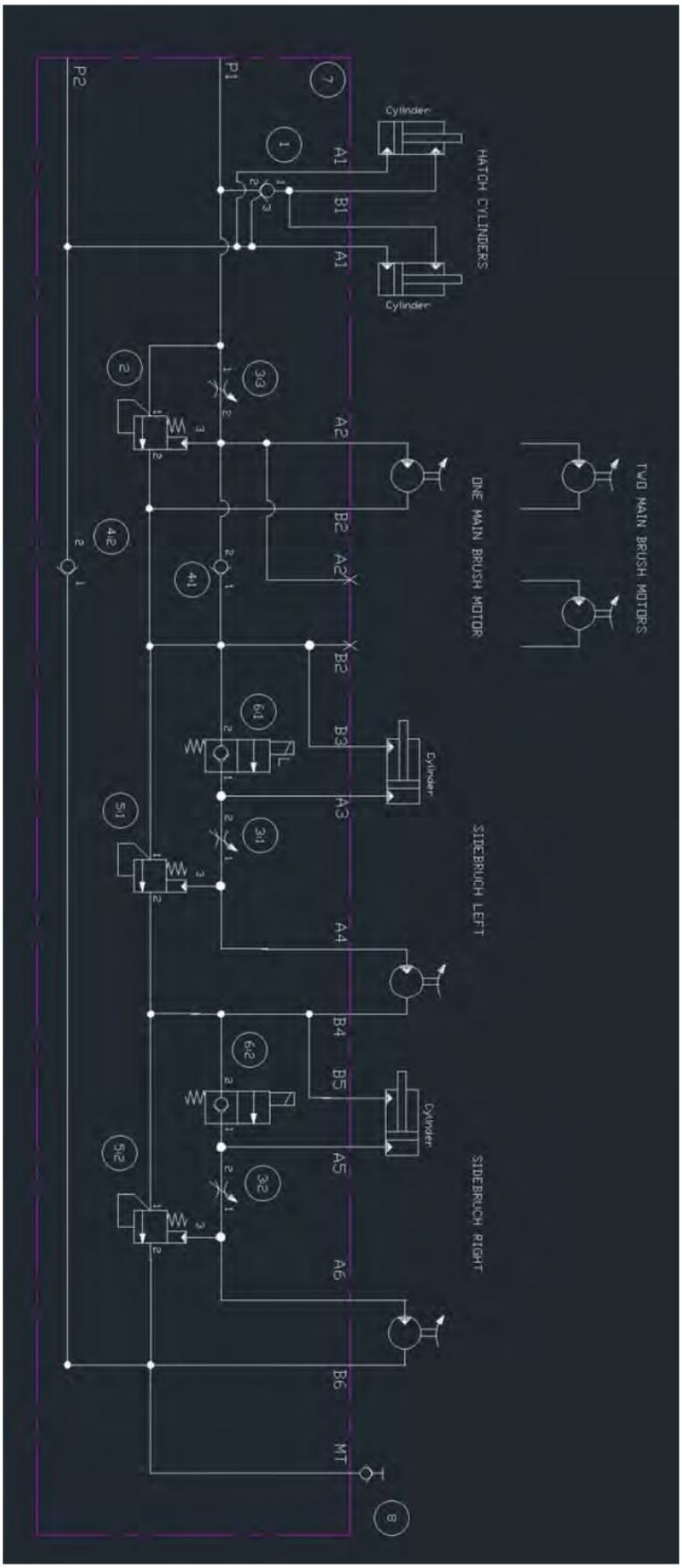
Picture 38. Block hydraulic pressure

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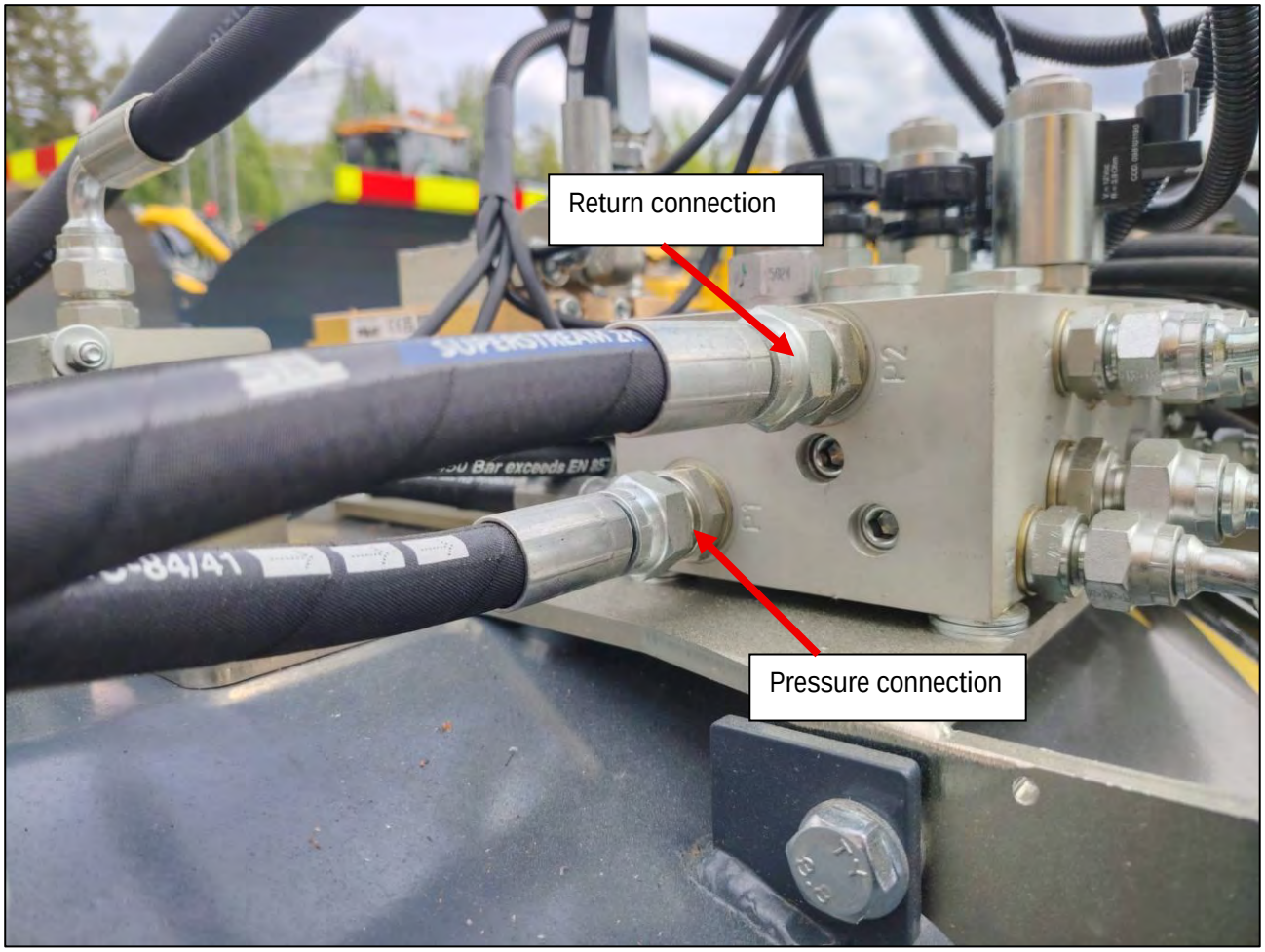
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9.2. Hydraulic block CSW-B



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The collecting sweeper is connected to the pressure and return connectors of the block valve. The pressure connection is marked with the marking P1 and the return connection with the marking P2 (picture 39).



Picture 39. Connectors of the hydraulic block.

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10. WARRANTY TERMS

1. Warranty coverage
   Lametal Oy, the manufacturer of STARK work equipment, gives new equipment a warranty in accordance with these warranty conditions, which applies to material and manufacturing defects. The limitations given to the guarantee are described in section 7.
2. Commencement of the guarantee
   The warranty starts from the approved delivery date of the device or the day when the installation has been approved or the work equipment has been put into work use. The device is considered accepted for work use when the device has been delivered to the end customer in accordance with the contract and registered as received by the end customer. The customer must carry out the commissioning inspection of the device as defined in the user manual and notify the manufacturer or the retailer who delivered the device in writing without delay of any errors they have detected within eight (8) days of delivery. If the error is latent or otherwise difficult to detect, it must be reported as soon as it is detected or, in any case, no later than one (1) year after receiving the device.
3. Duration of the warranty period
   The STARK warranty is valid for one (1) year. If necessary, the customer and the manufacturer agree separately on the warranty for the repair work and the spare parts used in it.
4. Warranty repair
   Repairs found during the warranty period are carried out free of charge during normal working hours at the manufacturer's service repair shop or a service repair shop authorized by the manufacturer. If the repair work has been carried out somewhere other than a maintenance repair shop approved by the manufacturer, the manufacturer will not compensate for costs not covered by the warranty, such as travel and waiting hours, per diems, travel expenses or costs incurred from the removal and re-installation of the device. The manufacturer does not compensate for indirect costs resulting from warranty repairs, such as lost working time. Original parts replaced under warranty remain the property of the manufacturer. The customer must keep the broken parts for six (6) months, unless otherwise agreed, and upon request, deliver the broken part to the manufacturer without delay.
5. Conditions for warranty repair
   The manufacturer's instructions for use, installation and maintenance have been followed.
   The breakage has occurred under conditions considered normal in which the device is designed to be used.
   The manufacturer's original parts have been used when servicing and repairing the device
   The complaint form available from the manufacturer or retailer has been filled in according to the instructions and returned to the handler.
6. Product warranty after repair
   The warranty continues normally until the end of the original warranty. Warranty repair does not extend the original warranty period of the device.
7. Warranty limitations
   The warranty does not cover:
   - consequential costs caused by damage to the device
   - indirect costs, such as lost working time
   - damages caused to a third party
   - device or components that have undergone modifications or repairs themselves
   - damage caused by natural wear and tear, incorrect maintenance procedures, neglect, accident, connection error, overloading of the device, inexperience of the user or the use of non-original parts

   The manufacturer's warranty does not exceed the selling price of the device.
8. Warranty processing
   The condition for warranty processing is that the complaint form obtained from the manufacturer or retailer has been filled in according to the instructions and returned to the processor. Warranty processing is carried out in Finnish or English.

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