



Instruction manual and safety measures

Sweepers



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1. Introduction


Congratulations on your purchase of this Zocon Sweeper.

This instruction manual describes how to use the Zocon Sweeper, which safety measures to take and how to service and transport the machine.

It must be read carefully before performing work with or on the machine for the first time.

This instruction manual may include components that are optional extras.

Any deviations between the text and/or diagrams in this instruction manual and your machine may, therefore, result from a difference in design. They may also stem from changes as a result of continuous development and innovation.

 NOTE	<p>Not observing the following instructions may result in a dangerous situation and the manufacturer's warranty may become invalid.</p>
--	--

Explanation of the warning symbols

- Read this instruction manual carefully before using the machine.
- Risk of getting trapped.
- Maximum operating pressure.
- Maximum oil flow rate.
- Lubrication point (see the lubrication schedule for the lubricating frequency).
- Warning: use an Accord coupling.



2. CE Declaration

Zonderland Constructie B.V.
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The Netherlands
Tel.: +31 (0)513 714334
Fax: +31 (0)513 714332
<http://www.Zocon.eu>

Zonderland Constructie B.V. declares that the machine:

Description of the machine	
Standard function:	SWEEPER
Type:	VM-150Z to VM-285M
Serial number:	...

Declares that the machine is in accordance with Machinery Directive **2006/42/EC** of the European Parliament and of the Council of 17 May 2006 amending Directive 95/16/EC (Official Journal of the EU, L 157/24 of 9/6/2006).

The person responsible for compiling the technical information is the head of the Research and Development department at Zonderland Constructie B.V.

This declaration only applies to the machine as sold in the market and does not concern components and/or treatments that are added at a later date.

3. Warranty

The manufacturer guarantees that the delivered machine meets the usual requirements and standards applicable to the machine and that the machine is free of faults. This warranty is valid for a period of twelve months after delivery. The warranty only concerns the components to be replaced.

This warranty is not valid if a fault occurs as a result of improper use.

Repairs may only be performed after approval from the manufacturer. Repairs that are performed before approval has been given by the manufacturer are at the owner's own expense and no claim can be made against the manufacturer for such repairs.

4. General information

General information concerning the Zocon Sweeper is given below.

4.1 Use

The Zocon Sweepers are only intended to be used to sweep clean hard surfaces. It is not permitted to use the sweeper on a soft surface, to move large quantities of soil or dirt or to use the sweeper for purposes other than those described in this instruction manual.

4.2 Explanation of the type plate

The sweeper's type plate is located on the sweeper's cover next to the central suspension point.

The type number consists of the code "RS" followed by the model type and the width of the sweeper. This is followed by "M" if the sweeper has a dirt collector or "Z" if the sweeper does not have a dirt collector.

Example:

Type plate of a sweeper that is 2.40 metres wide and has a dirt collector



4.3 Available types

The following Zocon Sweepers are available:

Type	Model	Width
VM150Z	Without dirt collector	1.50 metres
VM150M	With dirt collector	1.50 metres
VM195Z	Without dirt collector	1.95 metres
VM195M	With dirt collector	1.95 metres
VM240Z	Without dirt collector	2.40 metres
VM240M	With dirt collector	2.40 metres
VM285Z	Without dirt collector	2.85 metres
VM285M	With dirt collector	2.85 metres

5. Safety measures

To ensure that the work is carried out safely, the following safety measures must always be observed when using the Zocon Sweeper.

- Only use the machine for the intended purpose.
- Operate the machine safely.
- Make sure the warning symbols remain legible. Replace any missing or damaged symbols.
- Remain out of the reach of rotating parts.
- Make sure nobody is located within the machine's operating range.
- Before using the machine, check the nuts and bolts and if necessary, tighten them.
- Before using the machine, check the hydraulic circuit for leaks.

6. Technical information

6.1 Construction

The Zocon Sweeper has a modular construction. The sweeper can be constructed as desired using various bolted modules. There may be a difference between your sweeper and the one described in this instruction manual as a result of the chosen options or because of alterations and innovations.

The diagram below shows the Zocon Sweeper and its components. Study this diagram before reading chapter 7 "Using the Zocon Sweeper".

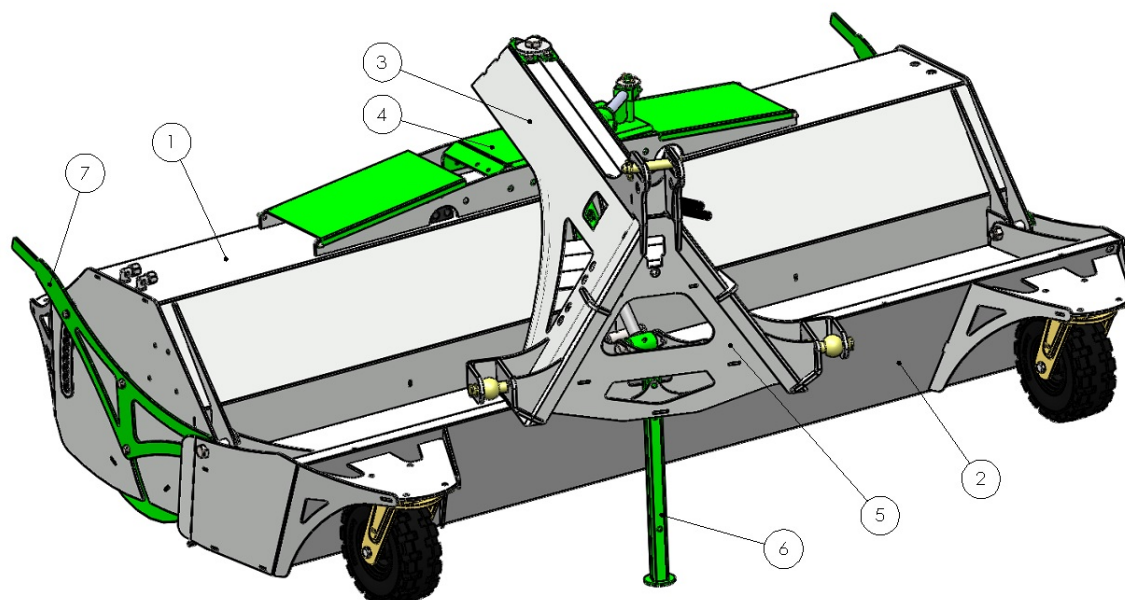


Figure 6.1.1

Number	Description
1	Sweeper's main frame
2	Dirt collector
3	Three-point hitch
4	Central suspension point
5	Quick-hitch A frame (Accord)
6	Foot
7	Depth adjustment handle

6.2 Technical specifications

Type of Zocon Sweeper	VM150Z	VM195Z	VM240Z	VM285Z	VM150M	VM195M	VM240M	VM285M
Working width (cm)	150	195	240	285	150	195	240	285
Brush diameter (mm)	600							
Wheel diameter (mm)	300							
Weight (kg) *	330	365	400	435	460	510	560	610
Collector volume (l)	-	-	-	-	160	204	247	290
Maximum width (cm)	165	210	255	300	170	215	260	305
Maximum height (cm)	119							

* The specifications given above are for a standard Zocon Sweeper with a three-point hitch.

7. Using the Zocon Sweeper

When using the Zocon Sweeper, the information given in this chapter must be observed in order to ensure safe working conditions.

7.1 Using the sweeper for the first time

Before using the Zocon Sweeper for the first time, you must check, pay attention to and adjust the following:

- On delivery, there is **no** oil in the hydraulic circuit!
- Check the nuts and bolts and if necessary, tighten them.
- Check whether all the assembly pins are securely locked.
- Check the hydraulic circuit for leaks and other faults.
- Check the tyre pressure (7.5 bar).
- Finally, check the direction of the hitch. It must be as follows:

Tractor

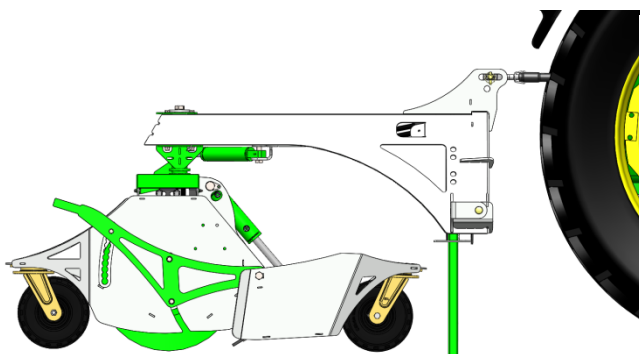


Figure 7.1.1

When using the sweeper behind a tractor, the three-point hitch must be on the same side as the dirt collector. This allows the tractor to be driven forwards when sweeping.

Front attachment/Wheel loader

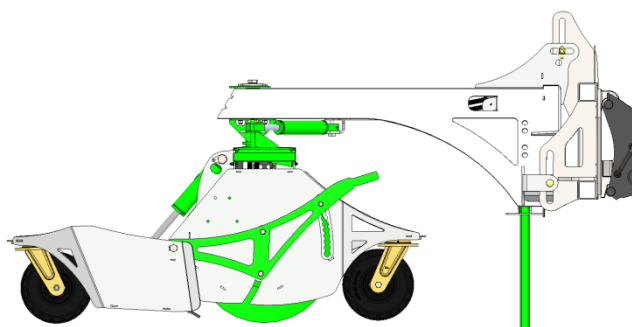


Figure 7.1.2

When the sweeper is used with a front lifting mechanism, a front loader or a wheel loader, the hitch must NOT be mounted on the same side as the dirt collector. This allows the vehicle to be driven forwards when sweeping.

If the hitch is attached in the wrong direction, it can be changed as follows:

- Remove the bolt (1) from the line clamp and remove the hoses from the three-point hitch.

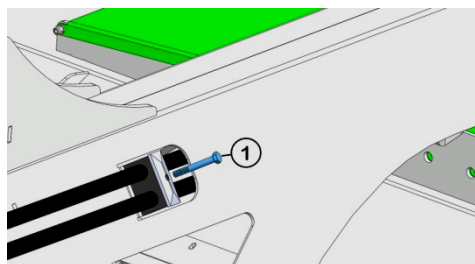


Figure 7.1.3

- Remove the angle adjustment handle/cylinder.

- Remove the M24 bolt (2) in the central suspension point.

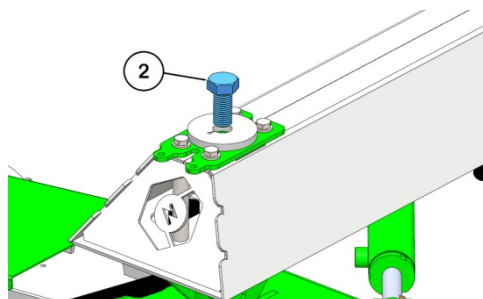


Figure 7.1.4

- Remove the three-point hitch and refit it in the opposite direction.

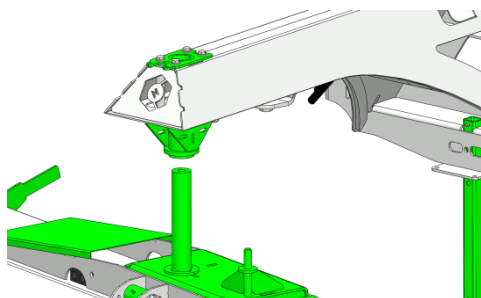


Figure 7.1.5

- Lead the hydraulic hoses through the three-point hitch via the feed-through hole on the same side as the hydraulic motor.

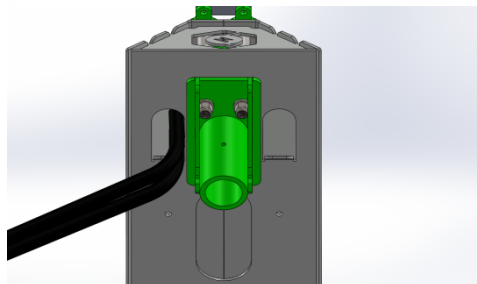


Figure 7.1.6

- Finally, refit the following parts:

- * Line clamp + bolt (1)
- * Bolt (2), tightening torque: 625 Nm
- * Angle adjustment handle/cylinder

7.2 Preparation work

Always make sure the Zocon Sweeper is in a good condition before using it. The points given below must be checked and taken into consideration every time you connect the Zocon Sweeper.

- Check the nuts and bolts and if necessary, tighten them.
- Check whether all the assembly pins are securely locked.
- Check the hydraulic circuit for leaks and other faults.
- Check the construction for faults.
- Check the brush for wear and/or faults.
- Check the tyre pressure (7.5 bar).
- Make sure the lights work correctly (if fitted).
- Check whether all of the lubrications points have enough grease.

The sweeper may only be connected if you are sure it has no faults.

7.3 Connecting the sweeper

The Zocon Sweeper can be connected to a tractor or wheel loader in a number of different ways. This section explains how to do so correctly. Read the following carefully and make sure you understand the information given. This information is extremely important to ensure the correct operation and a long service life of the sweeper.

7.3.1 Connecting to three-point hitch (rear-mounted hoisting mechanism)

Carry out the following to connect the Zocon Sweeper to a tractor:

- Drive the tractor so that it is just in front of the sweeper.
- Make sure the hydraulic valves to be used are not pressurized.
- Turn off the tractor and remove the key from the ignition.
- **Make sure the lifting mechanism is single action (lifting only).**
- **Place the connections between the pull rods and the lifting arms in the floating settings (slotted holes). This is extremely important for absorbing the sideways height difference.**
- Connect the sweeper to the tractor's three-point hoisting mechanism and secure the attachment pins using reliable circlips.
- **Adjust the top rod so that it is in the middle of the slotted hole when the wheels around the sweeper are just touching the ground (use the fixed hole for transport only).**
- Connect the hydraulic hoses to the tractor. (Max. 50 l/min, max. 180 bar.)
- Connect the electrical components (if fitted).
- Retract the foot (if fitted).

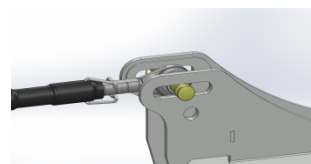


Figure 7.3.1.1

7.3.2 Connecting to front hoisting mechanism

Carry out the following to connect the Zocon Sweeper to a tractor:

- Drive the tractor so that it is just in front of the sweeper.
- Make sure the hydraulic valves to be used are not pressurized.
- Turn off the tractor and remove the key from the ignition.
- **Make sure the lifting mechanism is single action (lifting only).**
- **Place the connections between the pull rods and the lifting arms in the floating settings (slotted holes). This is extremely important for absorbing the sideways height difference.**
- Connect the sweeper to the tractor's three-point hoisting mechanism and secure the attachment pins using reliable circlips.
- **Adjust the top rod so that it is in the middle of the slotted hole when the wheels around the sweeper are just touching the ground (use the fixed hole for transport only).**
- Connect the hydraulic hoses to the tractor. (Max. 50 l/min, max. 180 bar.)
- Connect the electrical components (if fitted).
- Retract the foot (if fitted).

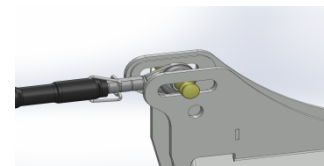


Figure 7.3.2.1

7.3.3 Connecting to a quick-hitch A frame (Accord)

Carry out the following to connect the Zocon Sweeper to a quick-hitch A frame:

- **First, place a telescopic top rod between the tractor and the quick-hitch A frame.**
- Drive the tractor so that it is just in front of the sweeper.
- Sufficiently lower the quick-hitch A frame (front lift).
- Place the quick-hitch A frame in the quick-hitch adaptor and lift the sweeper.
- Make sure the hydraulic valves to be used are not pressurized.
- Turn off the tractor and remove the key from the ignition.
- **Make sure the lifting mechanism is single action (lifting only).**
- **Place the connections between the pull rods and the lifting arms in the floating settings (slotted holes). This is extremely important for absorbing the sideways height difference.**
- **Adjust the telescopic top rod so that it has been extended by half its range when the wheels around the sweeper are just touching the ground.**
- Connect the hydraulic hoses to the tractor. (Max. 50 l/min, max. 180 bar.)
- Connect the electrical components (if fitted).
- Retract the foot (if fitted).

7.3.4 Connecting the sweeper using the wheel loader coupling board

Carry out the following to connect the Zocon Sweeper to a wheel loader:

- Make sure nobody is located between the sweeper and the wheel loader and connect the sweeper.
- Lock the coupling.
- Connect the hydraulic hoses to the wheel loader. (Max. 50 l/min, max. 180 bar.)
- Connect the electrical components (if fitted).
- Retract the foot (if fitted).



Warning!

When starting to sweep, make sure the arrows on the coupling board point to the top of the top rod pin. The sweeper is then able to freely move up and down.

7.3.5 Connecting the sweeper using the pallet fork pockets

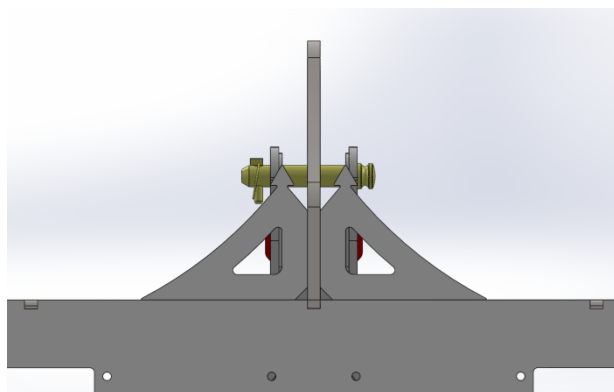


Figure 7.3.4.1

Carry out the following to connect the Zocon Sweeper using the pallet fork pockets:

- Make sure nobody is located between the sweeper and the vehicle to which it is to be connected and insert the forks into the pockets.
- Lock the forks using the pin for the holes.
- Connect the hydraulic hoses to the wheel loader. (Max. 50 l/min, max. 180 bar.)
- Connect the electrical components (if fitted).
- Retract the foot (if fitted).



Warning!

When starting to sweep, make sure the arrows on the coupling board point to the top of the top rod pin. The sweeper is then able to freely move up and down.

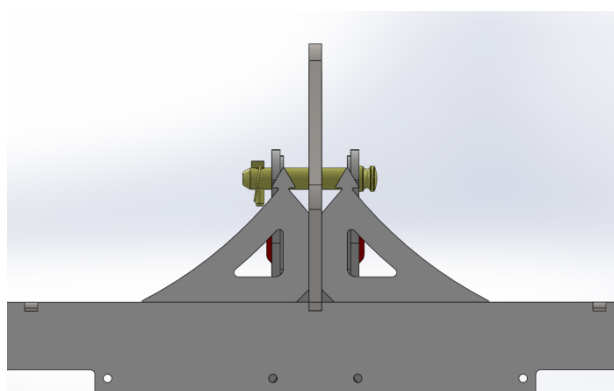


Figure 7.3.5.1

7.4 Adjusting the Zocon Sweeper

The Zocon Sweeper must be adjusted correctly before it can be used. Carry out the following:

- Check whether the sweeper is connected as described in 7.3 "Connecting the sweeper".
- Adjust the oil flow from the tractor/wheel loader to the sweeper to a maximum of 50 litres per minute. Contact your dealer if it is more than 50 litres per minute and cannot be adjusted.
- Adjust the oil pressure of the oil that flows from the tractor/wheel loader to the sweeper to a maximum of 180 bar. Contact your dealer if it is more than 180 bar and cannot be adjusted.
- Finally, it is extremely important that the depth of the brush is set correctly. The Zocon Sweeper has a central brush shaft adjusting device as standard. This brush shaft adjusting device allows you to lower the brush using only the handles on either side of the sweeper. To ensure that the brush wears evenly, make sure both handles are set to the same height.

The correct brush height setting

The hairs of a correctly set brush are pushed in by **5 to 15** mm.

If the brush is set too high:

- *The sweeper does not sweep at all or not enough.*

If the brush is set too low:

- *The hairs of the brush drag over the surface too long and lose the dirt they collect. This results in the sweeper not sweeping efficiently enough.*

- *The hairs of the brush wear too quickly or may even break off a couple of centimetres from their ends.*

Depending on the type of dirt and the unevenness of the ground, it is permitted to deviate slightly from the given measurements in order to improve the sweeper's effectiveness. Be aware that it may lead to increased wear of the hairs of the brush.

7.5 Emptying the dirt collector

The Zocon Sweeper is equipped as standard with a hydraulically-emptying dirt collector. The hydraulic cylinder is operated from the tractor/wheel loader. How it is operated depends on the sweeper's hydraulic system.

- **Standard hydraulic system**
A double-action hydraulic valve operated from the vehicle controls the cylinder.
- **Hydraulic system with flow-direction valve**
A single double-action hydraulic valve operated from the vehicle operates both the brush and the dirt container. When the valve is activated in flow direction 1, the dirt collector closes and the brush starts rotating. When the valve is activated in flow direction 2, the brush remains stationary and the dirt collector is raised.
- **Hydraulic system with electronically-operated control valve**
A single double-action hydraulic valve operated from the vehicle operates the brush, the dirt collector and/or the hydraulic angle adjustment. You choose the desired function by switching the electronically-operated control valve.

7.6 Adjusting the angle of the sweeper

The Zocon Sweeper is equipped as standard with a mechanical angle adjusting device. Besides mechanical angle adjustment, the sweeper can also be equipped with a hydraulic angle adjusting device. The angle is adjusted as follows:

- **Mechanical angle adjustment**
The mechanical angle adjusting device works by means of a spring-tensioned angle adjustment handle. The angle of the sweeper is altered by pulling the handle. The sweeping angle can be set to four different angles: -20 degrees, -10 degrees, 0 degrees, 10 degrees, 20 degrees.
- **Hydraulic angular adjustment**
The hydraulic angular adjustment is made by means of a hydraulic cylinder. The sweeping angle can be adjusted from 20 degrees to the left to 20 degrees to the right.

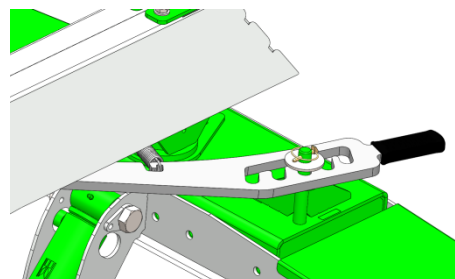


Figure 7.6.1

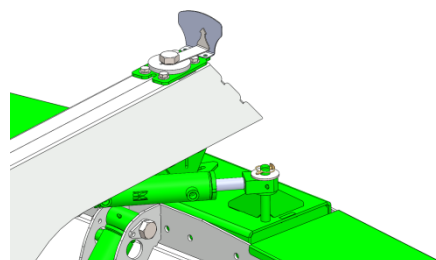


Figure 7.6.2



Warning!!

Pay attention to the angle indicator when adjusting the angle of your sweeper!

The dirt collector can only be raised when the angle indicator is in the green area.

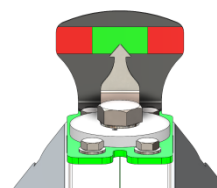


Figure 7.6.3

8. Maintenance

Important information on how to keep the sweeper in optimal condition is given below.

8.1 General maintenance

The following maintenance work must be performed each time after use:

- Thoroughly clean the sweeper.
- Lubricate the machine with a rust-preventing agent.
- Check all the bolted connections and retighten any that are loose.
- Lubricate the grease nipples (the lubrication points on the sweeper are indicated by the following sticker)

Mind your own safety when performing maintenance and/or repairs. Make sure:

- The connected vehicle is turned off.
- The vehicle's handbrake has been applied.
- The sweeper is in a stable position when it is not connected to a vehicle.
- **The brush is in the highest position when it is disconnected. This prevents the hairs of the brush from being flattened and damaged. If one side of the brush is flat, the sweeper does not sweep very effectively and becomes unstable when used.**

8.2 Wear of the brush

The hairs of the brush wear when the sweeper is used. A properly adjusted brush prevents excessive wear. To adjust the brush correctly, see 7.4 "Adjusting the Zocon Sweeper".

The central brush shaft adjusting device allows the brush to be set to 10 different settings. A change of one setting is equal to an increase/decrease in brush height of approx. 13 mm.

The brush needs replacing when, in spite of adjusting the height of the brush, the desired sweeping result can no longer be achieved.

At which length of the brush hairs this occurs (height setting) depends very much on the type of surface to be cleaned and the amount of dirt to be collected. On a very uneven surface, the minimum hair length has to be approximately 50 mm, while on a very flat surface, a good sweeping result can be achieved with a hair length of 30 mm.

8.3 Replacing the brush rings

If the brush is worn, it can easily be replaced as follows. *(In some of the diagrams, a number of parts are shown as being transparent. This is in order to show what is behind them.)*

- Raise the dirt collector (if fitted).

- Remove the bolt (1) from the handles of the central brush shaft adjusting device.

NOTE: There is a tensioned spring on the inside of the cover! Do not lose this spring or its rings.

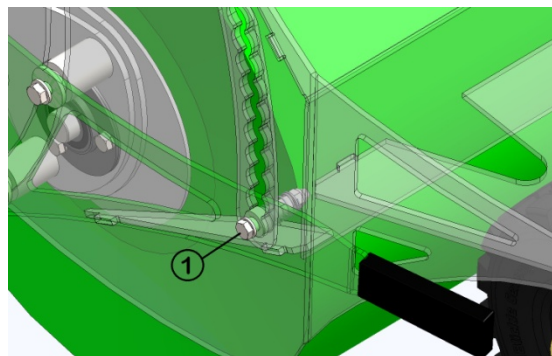


Figure 8.3.1

- Slowly raise the sweeper until the hydraulic hoses under the cover (the hydraulic motor's drive mechanism) are pulled almost tight.

- Next, disconnect the quick-release connections (2 and 3) on the inside of the cover.

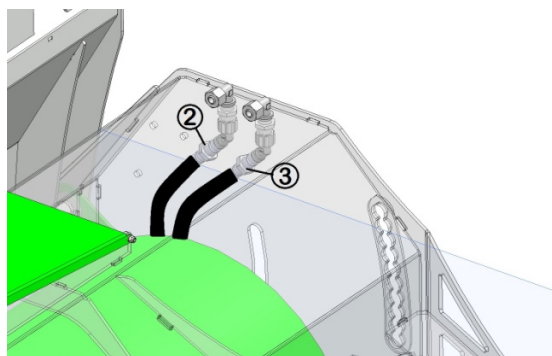


Figure 8.3.2

- Slowly raise the sweeper. The brush is now loose and can be removed from under the sweeper.

- Remove the adjusting screw (4) from the bearing and slide the bearing, together with the mounting, off the shaft.

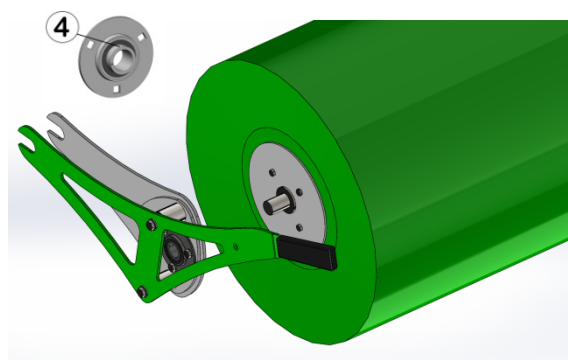


Figure 8.3.3

- Remove the four M8 bolts from the locking plate.

- The brush rings can now be removed from the brush shaft.

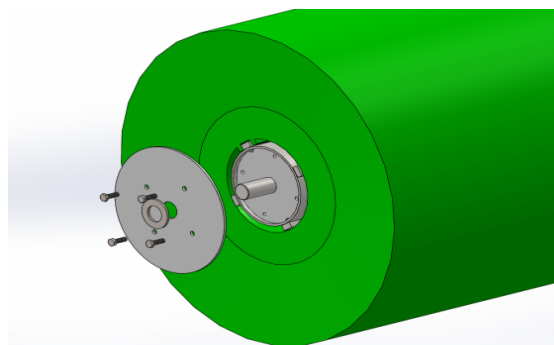


Figure 8.3.4

- Slide the new brush rings on to the shaft. Make sure all the drive cams of the brush rings are aligned, the teeth interlock correctly and the rings are fitted so that the pattern shown in figure 8.3.5 is created.



Figure 8.3.5

- Fit the locking plate and the mounting with the bearing back on the brush shaft.

- Fit the mounting plates (5) (on the same side as the bearing and the same side as the motor) back on the bush (6).
If a dirt collector is fitted, the plates fall between the dirt collector's mounting.
If a dirt collector is not fitted, the plates fall between the mudguard washers.

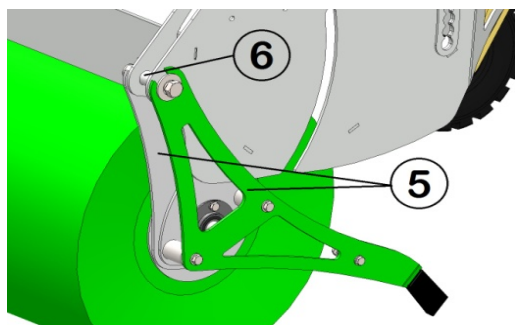


Figure 8.3.6

- Slowly lower the sweeper and guide the mounting in the curve.

- Connect the quick-release connections (2 and 3) on the inside of the cover.

- Fit the bolt (1) back in the handles of the central brush shaft adjusting device.

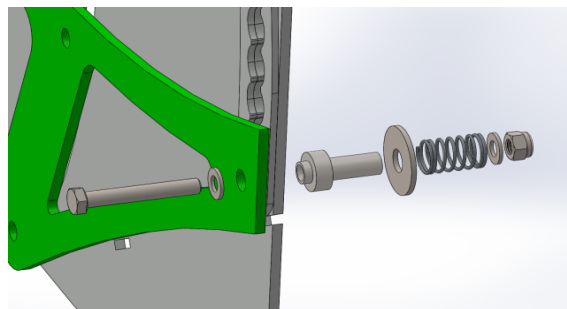
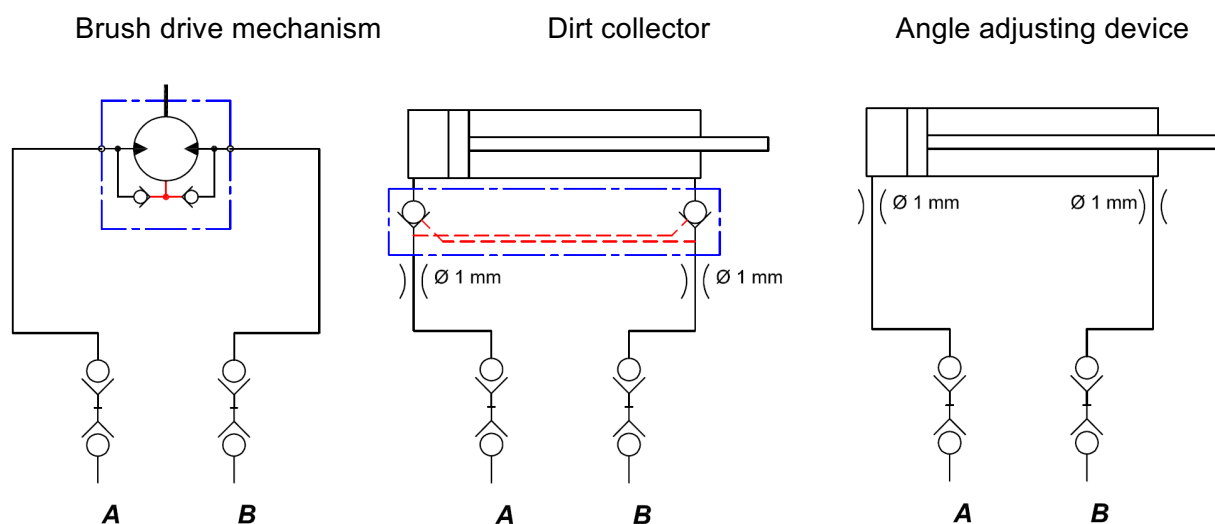


Figure 8.3.7

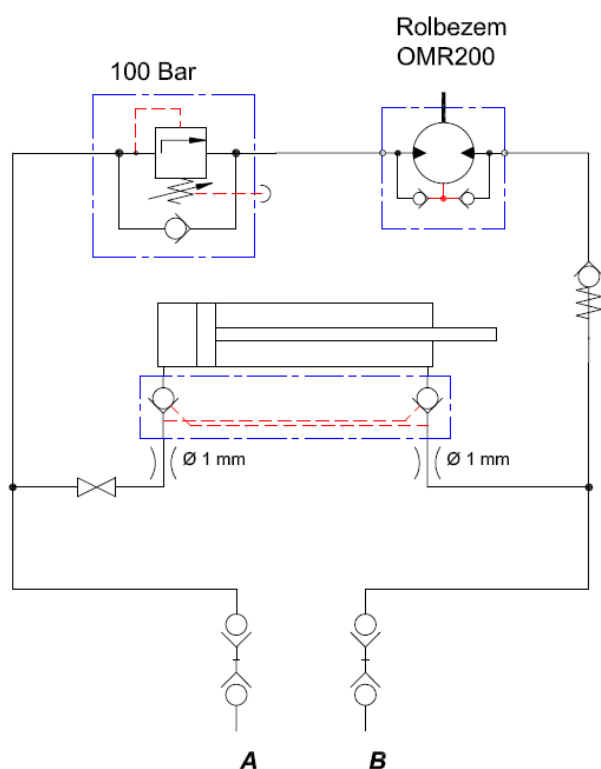
9. Technical diagrams

9.1 Hydraulic diagrams

A separate system for each function

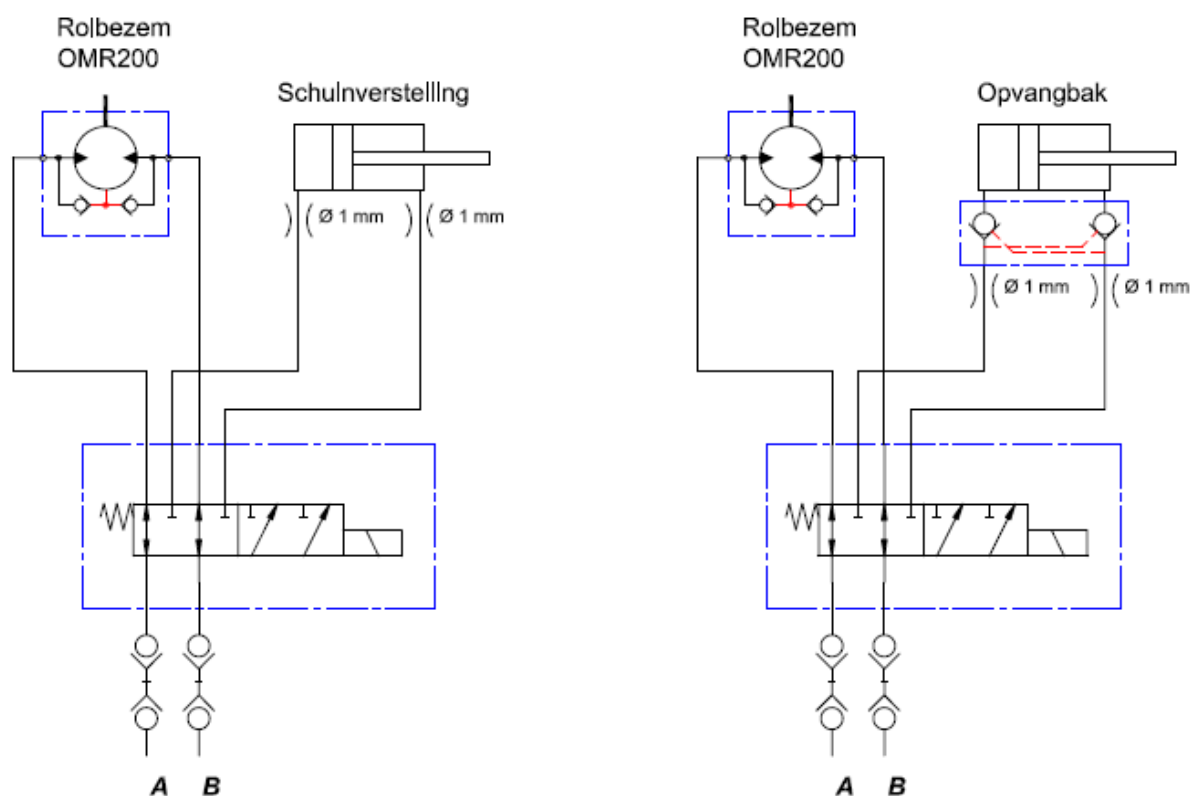


Operation using a sequence valve

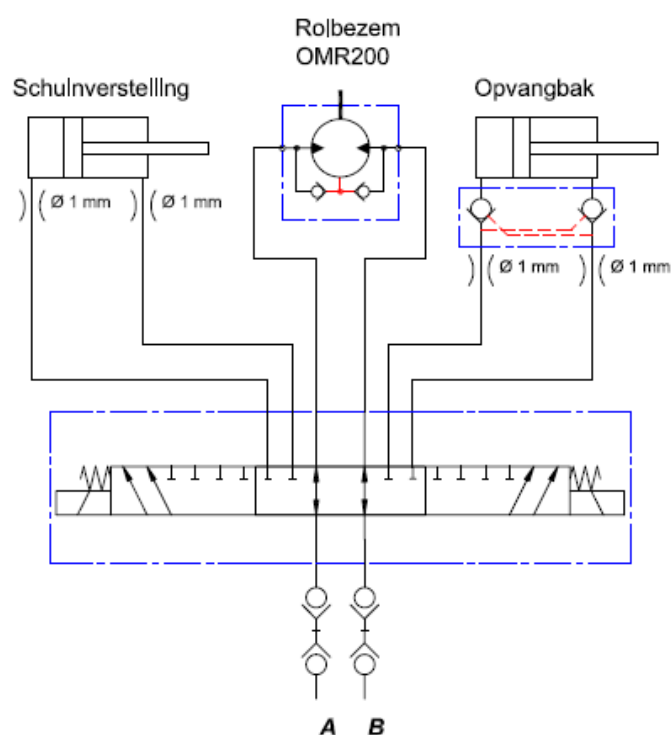


Hydraulic diagram of the brush drive mechanism and the dirt collector's cylinder operated by means of a single double-action valve with the aid of a sequence valve.

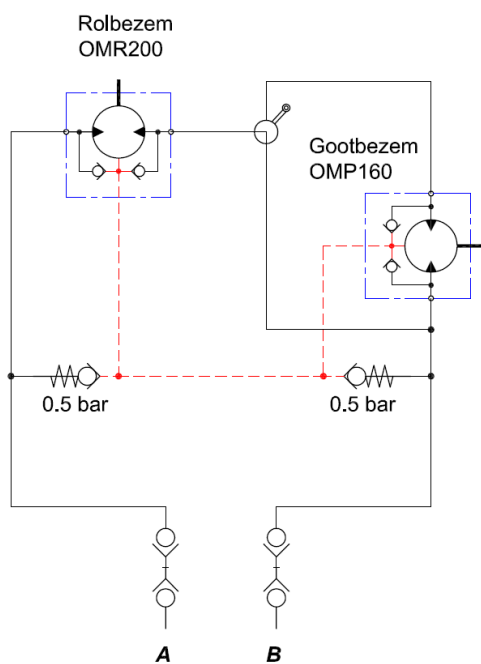
Operation using an electrically-operated 6/2 control valve



Operation using an electrically-operated 8/3 control valve



Optional gutter brush



The roller brush and gutter brush are switched in series. The gutter brush is turned on and off by means of a ball valve.

The brushes can both rotate clockwise and anticlockwise.

Rolbezem = Roller brush
 Schuinverstelling = Angle adjusting device
 Opvangbak = Dirt collector
 Gootbezem = Gutter brush