Weed brush - Edge cutter

OBKS50-35

User Manual

Manufacturer: Becx Machines B.V.
De Sonman 35
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The Netherlands

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Although Becx Machines B.V. has taken the greatest care to make sure that individual parts have been described correctly and in full where necessary, it accepts no liability for damage as a result of inaccuracies or incompleteness of this manual.

This manual is a translation of the original Dutch version.

Preface

The Becx Machines weed brushes with edge cutter are specially designed and exclusively intended for removal of weeds from pavements safely and efficiently and leave a professional visual result. The combination of blade and brush allows edges of pavements to be cleaned in one pass.

This manual is intended for users and maintenance personnel and has been compiled with care. However, if it is not possible to find a clear answer to your question, please contact your supplier's technical service department.

- Read this manual carefully before you start to use the weed brush. Always follow the safety instructions set out in chapter 2.
- Always read the operating instructions for the tool carrier used carefully before putting it into operation. Always observe the safety requirements listed in the operating instructions.
- One copy of this manual must be kept with weed brush and must be available to the user. All important servicing sessions and any comments must be recorded and retained by the servicing company.
- The user is responsible for selecting a suitable tool carrier for the weed brush and for ensuring that the weed brush is properly attached and connected.

Table of contents

Certificate of conformity (IIa) (copy)

We:

Becx Machines B.V.
De Sonman 35
5066 GJ Moergestel
The Netherlands

declare entirely under our sole responsibility, that this product:

Description:	Becx weed brush – edge cutter
Type:	OBKS50-35
From serialnumber:	007-002-00

to which this declaration applies, complies with the provisions of the Directives:

Machinery Directive	2006/42/EG

Complies with the following standards:

NEN-EN-12100	Safety of machinery. Basic definitions, general design principles.
NEN-EN 4413	Hydraulics – Safety requirements for hydraulic and pneumatic systems and their components.
NEN-EN-ISO 14121-1	Safety of machinery - risk assessment.

Director; Erwin Hommen

Moergestel, The Netherlands

Date: 19 may 2014

List of symbols

For all operations and situations, where operator and/or technician safety is involved and care must be taken, the following symbols have been used in this user manual:

	**Warning!**
	**Explanation.**

1. Technical data

Technical data		
General		
Hydraulic oil filtering requirements	10	Micron
Required hydraulic oil quality	HV-46 or similar	
Required grease quality	NLGI 2	
Lubrication for translating parts (side-shift)	PTFE spray	
Dimensions and weights		
Width min.	1502	mm
Width max.	2102	
Length/depth	1302	mm
Height	959	mm
Brush mean diameter	500*	mm
Cutting disk diameter	350*	
* subject to wear		
Dead weight	221	kg
Attachment information		
Mounting face	545x378	mm
Mounting hole pattern	495x290 / 360x190 4x ø17,5	mm
Vertical force on attachment point (Fo)	1.700	N
Tipping moment (Mo)	+/- 500	Nm
Hydraulic connections		
Maximum operating pressure	200	bar
Maximum Oil flow	60	L/min
Oil flow for basis speed (150 rpm)	30	L/min
Maximum brush speed	300	rpm
Direction of rotation	CCW	
Required connections		
Pressure and return hoses	15L - M22x1,5 (2x)	
Drain hose	12L - M18x1,5 (1x)	
Hydraulic function hoses	10L – M16x1,5 (6x)	
Maximum pressure on drain line	2	bar
Switchable 12V functions	1	

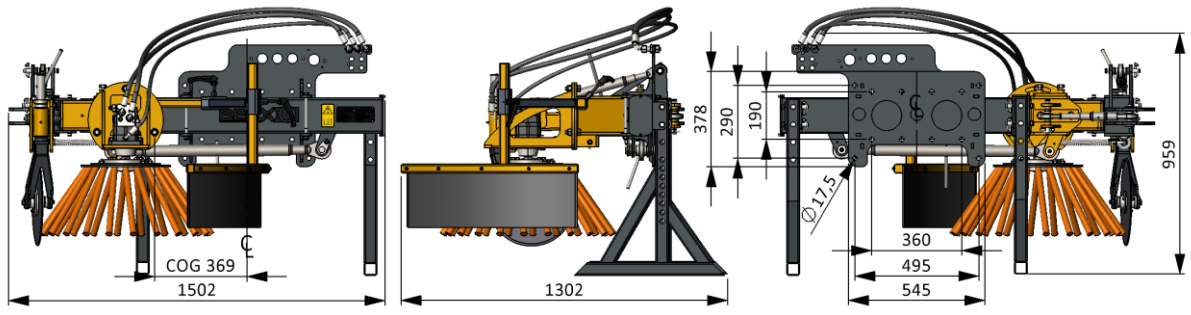


Figure 1: Dimensions and location centre of gravity (COG).

2. Safety

2.1 General

- No modifications may be made to the hedge trimmer.
- It is the user's responsibility to ensure that the correct tool carrier and support arm are used.

The following points are particularly important here:

- The maximum pressure and oil flow (speed) must not be exceeded. Exceeding this may result in damage to the equipment and injury to bystanders.
- The tool carrier must have sufficient strength and stability to safely absorb the forces and moments caused by the hedge trimmer under all conditions.

2.2 During operation

- The system may only be used for the intended work.
- Consult the manual of the tool carrier for the noise levels generated. As this will be considerably higher than that of the weed brush itself, the noise level of the tool carrier is decisive in determining whether hearing protection is required.
- If persons or animals are present or approach in the working area (approx. 5m around the machine), stop immediately and stop the weed brush.
- If excessively heavy traffic from passers-by restricts the progress of the work too much, consideration can be given to cordoning off the work area.
- If the weed brush starts making a different noise and/or vibrating, it should be stopped immediately and the weed brush stopped. Only when the cause is found and removed may work be resumed.

	• Inspection and maintenance work should be carried out in a timely manner. • During inspection, maintenance or cleaning, the implement carrier must be switched off. • Local working and safety regulations must always be followed. • To prevent damage to the system, switching on and off should always be done at low speed. Depending on the tool carrier used, this is at idle speed or at the minimum oil flow.

2.3 Operating personnel

	• Operating personnel must be over 18. • Persons must only carry out jobs for which they are trained. This applies to both maintenance work and normal operations. • If the operating personnel identify errors or risks or disagree with the safety measures, this should be reported to the owner or chief operating officer.

2.4 Warning symbols

	**Read manual before operation!**
	**Caution!** Ensure that nobody is in the danger zone of the machine.
	**Caution!** Entrapment hazard!

3. Component description

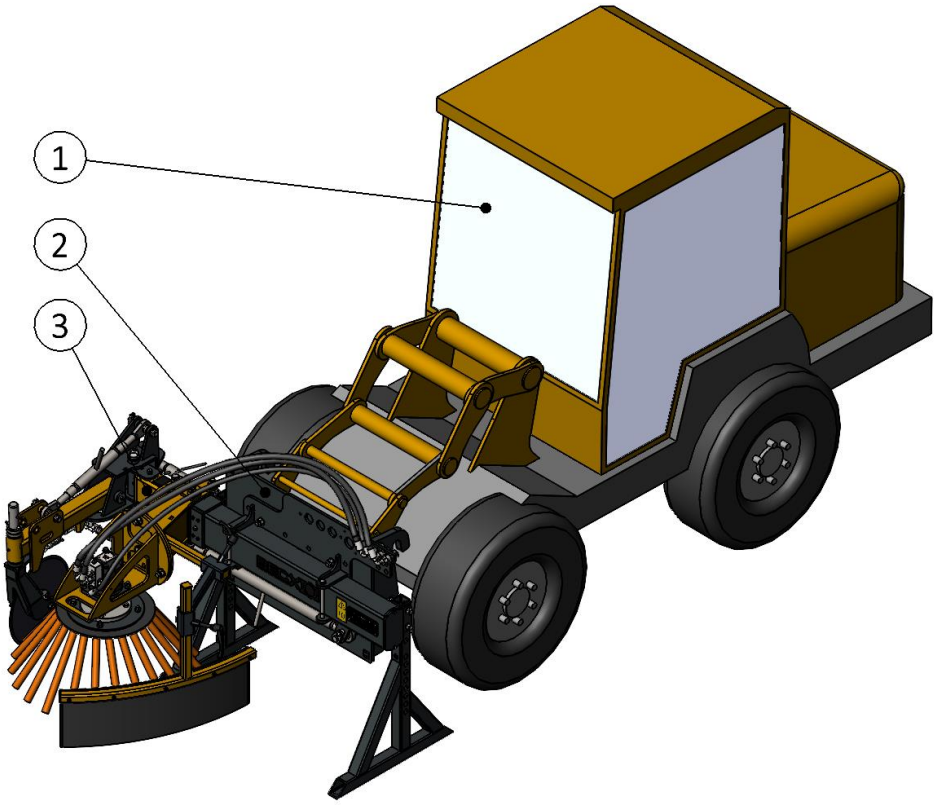


Figure 2: Overview.

	Element	Description
1	Tool carrier	• The tool carrier is not part of the delivery. It is the user's responsibility to use a tool carrier suitable for the weed brush.
2	Connector	• Depending on the implement carrier used, a specific connector may be used to connect brush unit to the implement carrier. This item can therefore be part of the delivery, but is not discussed further in this manual.
3	Weed brush unit / Edge cutter	• Everything the user of this machine needs to know is described in this user manual.

3.1 Mechanical components

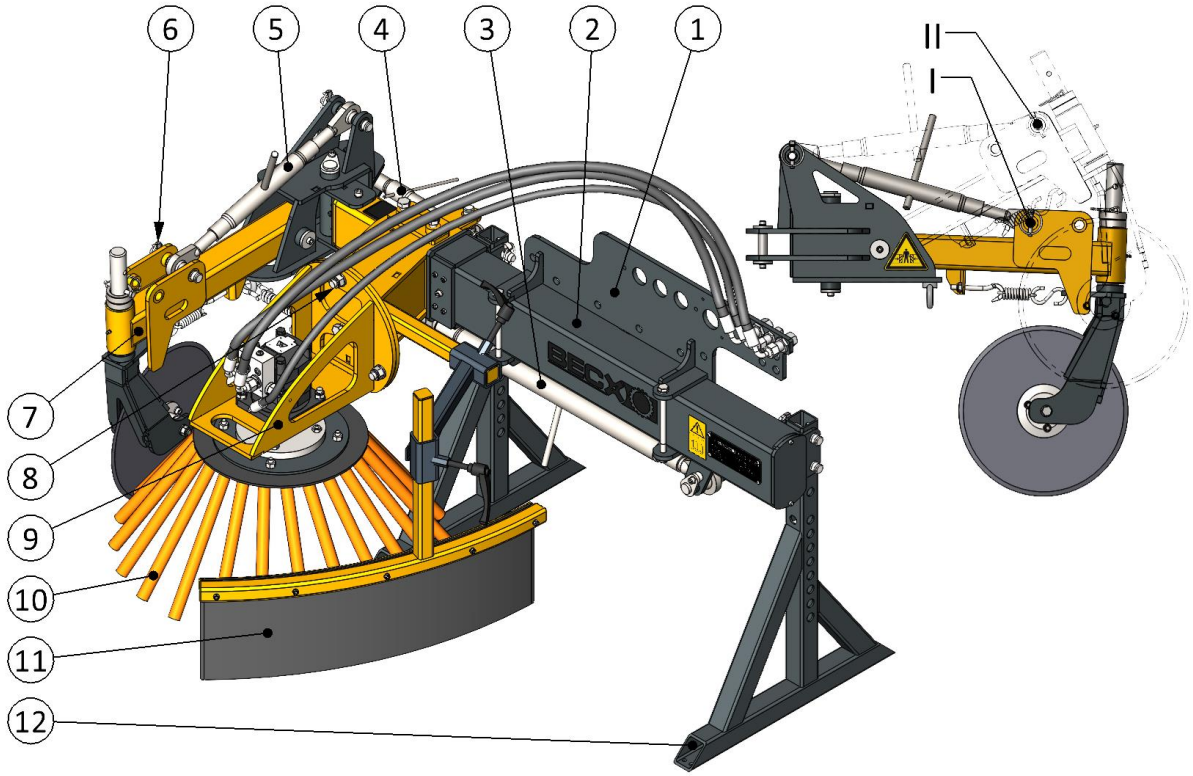


Figure 3: Overview of mechanical components.

	Element	Description
1	Mounting plate	• This surface has a standard hole pattern. This allows it to be mounted on a tool carrier directly or in combination with an additional connector.
2	Supporting structure	• This part is the supporting structure of the machine. Because an outer and inner tube can slide in relation to each other, a width adjustment is built in.
3	Side-shift	• By making the toplink bar longer or shorter, the position of the brush/knife combination can be adjusted in width direction. The maximum adjustment is 600mm. • Optionally, this function can be performed hydraulically.

	Element	Description
4	Brush-blade distance adjustment	• The minimum distance between the brush and the blade in width direction can be adjusted by turning the toplink bar out or in. • The optimum position depends on the desired brush angle and the brush wear level.
5	Blade height adjustment	• The edge cutter can be adjusted up/down by lengthening or shortening the toplink bar. • Inserting the locking pin (pos. 6) in position I (see inset in figure 3) puts the cutting arm in the low, working position and allows simultaneous edge cutting and brushing. • Inserting the locking pin in position II puts the cutting arm in the high, transport position and only brushing is possible. • Optionally, this function can be performed hydraulically.
6	Pin	• Removable pin for height adjustment purposes.
7	Edge-cutting blade arm	• Using this arm, the cutting blade can be held in the desired position. However, the suspension is not rigid, but spring-mounted to reduce stress on the blade during operation.
8	Angle adjustment	• The angle at which the brush brushes the pavement cleanly can be adjusted. By loosening the fixing bolts, move the brush holder to the desired position and tighten the fixing bolts again.
9	Brush head	• The brush head in which the brush motor is mounted.
10	Weed brush	• The brush loosens weeds from the pavement. • If the brush is worn out, it can easily be replaced. For this, the fastening nuts have to be loosened, after which the brush can be removed from its holder. • Mounting the new brush should be done in reverse order.

	Element	Description
11	Mud flap	• The mud flap prevents loose-bristled material from being thrown the wrong way. • The desired position can be adjusted using clamping bolts.
12	Support legs	• Attach the support legs before putting the machine in storage. • Remove the support legs once the weed brush is attached to a tool carrier or mount them up-side-down.

3.2 Hydraulic components

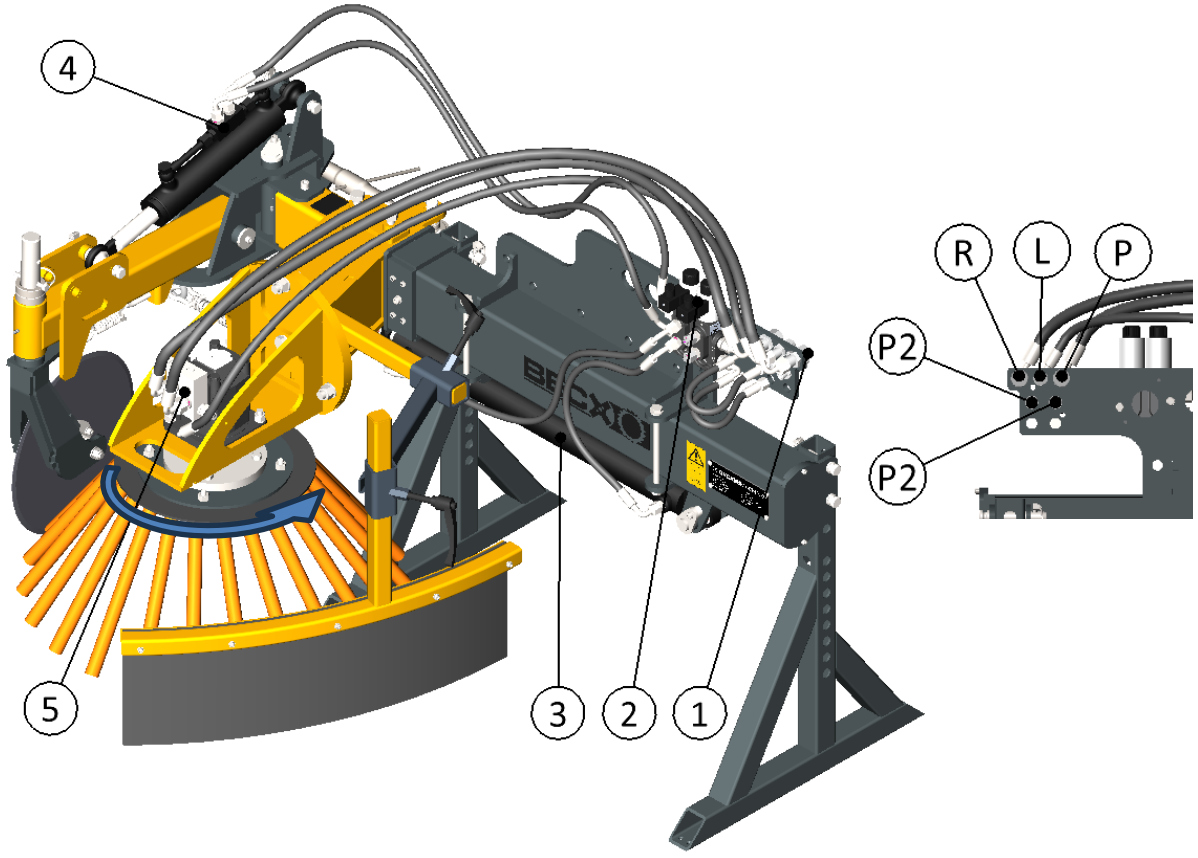


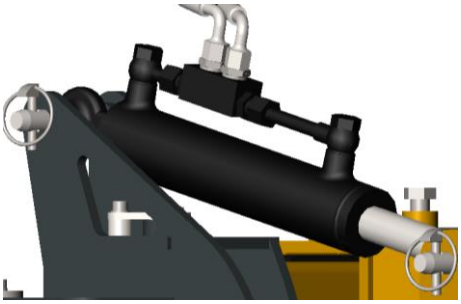
Figure 4: Overview hydraulic components, direction of rotation and connections.

	Element	Description
1	Hydraulic bulkhead couplings	• Pressure (P) and Return (R) connection 15L. • Case drain (L) connection 12L. • P1 and P2 (optional) hydraulic cylinder functions 10L.
2	8/3-valve (option)	• If a implement carrier does not have enough hydraulic functions: - Unactivated: HO/HN lifting edge cutter arm up/down. - Valve 1 activated: not in use. - Valve 2 activated: BU/BI side shift out/in.
3	Side shift cylinder (option)	• For the hydraulically operated side-shift.
4	Lifting cylinder Edge trimmer (option)	• For hydraulic height adjustment of the edge cutter. • The cylinder is fitted with a double-acting check valve.
5	Hydraulic motor with safety valve	• The hydraulic motor directly drives the brush. The direction of rotation seen from above is counter clockwise (CCW). • This valve allows the hydraulic motor to coast after the oil supply has been turned off. This prevents damage to the motor. Run out time is approx. 3 sec. • Pressure setting on P side: 200 bar. • Pressure setting on R side: 25 bar*.

3.3 Options

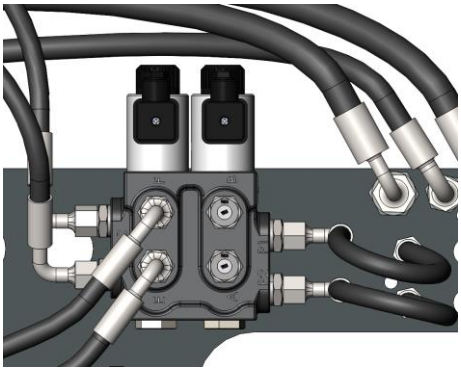
Hydraulic side shift
(art.nr. BEC-MP50-001)

Hydraulic cutter height adjustment
(art.nr. BEC-MP50-002)



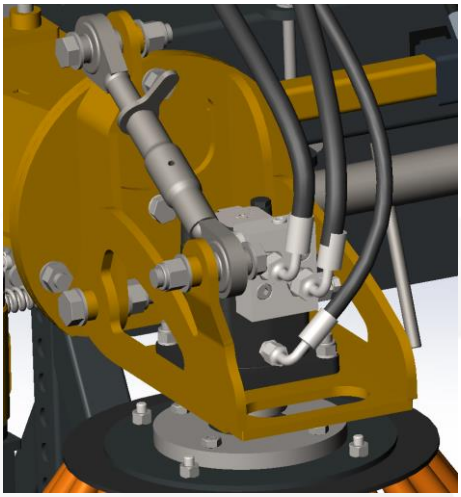
2 double 8/3-valve instead 1
(art.nr. BEC-MP90-003)

With this valve, 1 double-acting function of the implement carrier can control 2 hydraulic functions. The valve is equipped with 2 control slides, each of which must be activated by an external 12V signal.



Tilting brush head
(art.nr. BEC-MP90-006)

A mechanical adjustment option to adjust the brush 8° forwards or 10° backwards.



3.4 Hydraulic circuit diagram

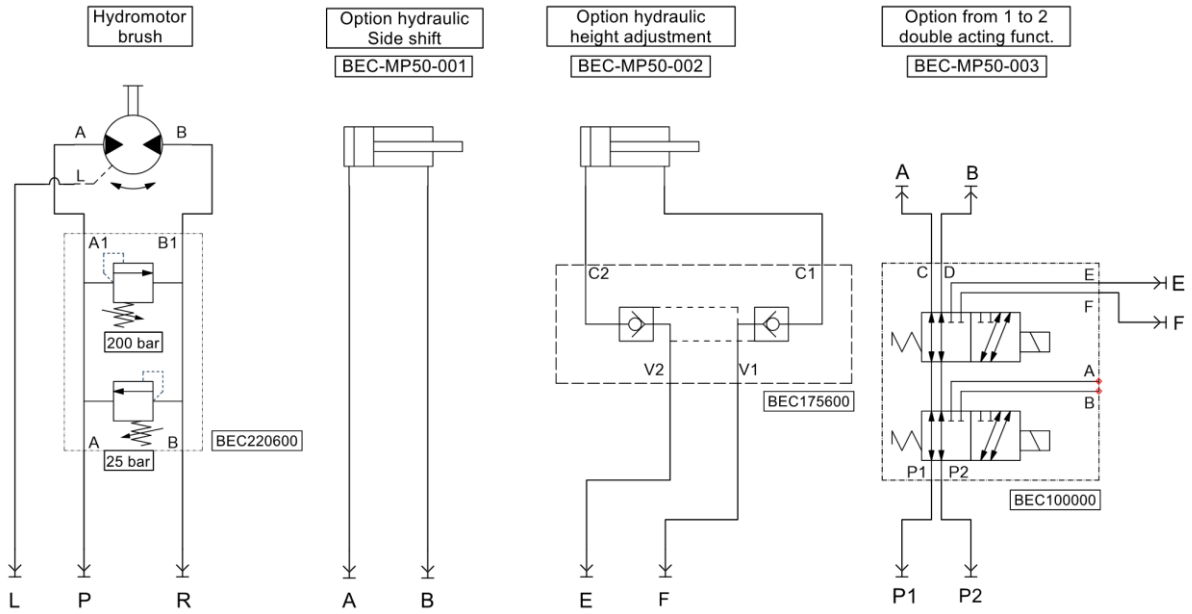


Figure 5: Hydraulic circuit diagram.

3.5 Electric circuit diagram

Only to control the coils of the optional valves, a simple circuit will have to be built based on 12V direct current.
In any case, make sure the circuit is protected by a fuse.

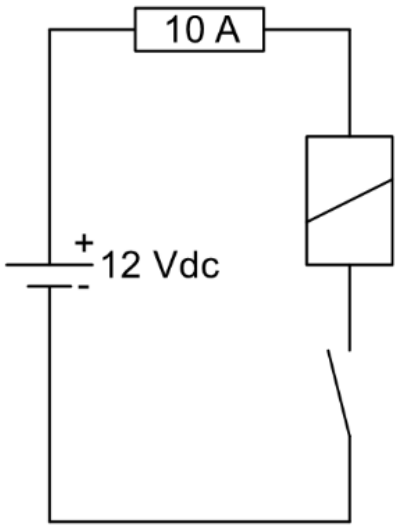
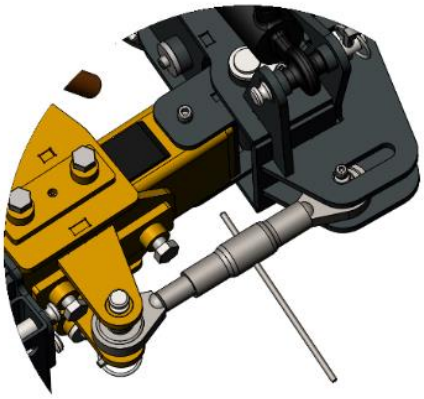


Figure 6: Electric circuit diagram.

4. Operation

4.1 Preparing the weed brush for use

	What to do	Action	Result
1	Choose the right tool carrier 	Mechanical requirements • Ensure that the tool carrier is sufficiently strong and stable for the weed brush. See the technical data for weight, maximum vertical load and tipping moment occurring in the mounting point. Hydraulic requirements • Ensure that the maximum pressure and oil flow are not exceeded. • Ensure that the correct (quick) couplings are fitted for oil pressure, return and leakage lines.	Failure to comply with the specified values may result in damage to the installation and injury.
2	Mechanical connection	• Attach the implement to an adapter or directly to the implement carrier with at least 4x M16 - 8.8 on the standard hole pattern. • See section 5.3 for the correct tightening torque.	
3	Hydraulic connection	• Connect the quick connectors for the pressure/return and leakage oil lines. • Connect the hoses for the cylinder functions as described in section 3.2. • See the implement carrier manual for the correct connection positions.	
4	Set oil supply and brush speed	• Set the tool carrier's oil supply so that the maximum pressure and brush speed cannot be exceeded. • See the manual of the implement carrier for instructions. • Check the direction of rotation: anti-clockwise. • Set brush speed to approx. 150 rpm as basic speed. Depending on the working conditions, the speed can be increased or decreased.	

	What to do	Action	Result
5	Adjust the brush	• Using the various adjustment options, you can adjust the brush and edge cutter to achieve the optimum setting. • Never work with the brush when it is lying flat on the ground due to excessive wear. But circumstances and experience of the user are decisive in this. • As a guideline, approx. ¼ of the brush should touch the ground. But circumstances and user experience are decisive. • Take care that the brush and the edge cutter do not damage each other. • Brushing against the edge cutter is allowed, but make sure the brush does not touch the edge cutter more than just barely.	
6	Adjust the edge cutter 	• Lengthening the toplink bar reduces the distance between brush and blade; Shortening the toplink bar increases the distance.  • **IMPORTANT!** Adjust the brush-blade distance only when the tool carrier is switched off! • As the brush wears down, the distance between the brush and the blade increases. The best result with the least wear is achieved with a brush that just barely touches the blade.	

	What to do	Action	Result
		• Keep in mind that the diameter during rotation is larger than when the brush is stationary, and the diameter also increases when the brush is pressed onto the pavement during brushing. • Therefore, after adjusting, visually check if the spacing is correct during brushing a test distance and adjust the adjustment if necessary.	

4.2 Execution of operations

	What to do	Action	Result
1	Check the installation	• Check the direction of rotation and speed of the brush motor (150 rpm). This is sufficient for good results in most cases, but lowering or increasing the speed may be necessary depending on conditions. • Check that the brush motor runs vibration-free and there are no abnormal noises. • If any deficiency is found in one of the above points, it must be rectified before putting the weed brush into use.	
2	Transit to work site	• Always switch off the brush motor at times when it is not in use.	
3	Switch on the brush motor	• For detailed instructions, see the tool carrier manual. • To avoid damage to the installation, it is important to switch on the weed brush at the lowest possible speed. After switching on, you can speed up if required.	Switching on or off at high speed leads to high loads in the system.
4	Position the brush	• For detailed instructions, refer to the manual of the tool carrier. • Make sure there are no persons in the working area.	

	What to do	Action	Result
5	Brushing	• Drive the tool carrier over the pavement carefully. • Too much pressure on the ground causes a high level of load and wear on the brush. Adjust the brush so that the desired result is achieved with as little pressure as possible.	
	Edge cutting	• Adjust the edge cutter to achieve the desired result: Do not set the blade deeper than necessary. Guideline max. 5 cm. • With driveways or other obstacles in the cutting path, raise the blade in time to avoid damage to driveways, the blade and the installation.	
6	**Stop work in the following situations !!** 	• **If persons or animals are present or about to enter the work area.** • **The weed brush makes a different sound or starts vibrating.**	**Failure to stop in time in the aforementioned situation could lead to serious injury.**
7	Switch off the weed brush	• When the work is finished, the weed brush should be switched off. • For detailed instructions, see the implement carrier manual.	Switching on or off at high speed leads to high loads in the system.

5. Maintenance

- When replacing or repairing parts, only components supplied or approved by the manufacturer should be used.
- If work is carried out on the installation, always disconnect the power supply from the implement. This can be done by disconnecting the hydraulic hoses.
- Only persons with proven knowledge of mechanical and hydraulic installations through training and/or experience may carry out maintenance work.
- The implement may be hosed down with a high-pressure cleaner. However, never spray directly on hydraulic components.
- Always grease the machine immediately after cleaning.

5.1 Daily maintenance

	What to do	Action
1	Lubricate pivot points	• Lubricate the grease nipples on the pivot points. • Lubricate the ball heads of the cylinders.
2	Side shift	• Spray the plastic sliding strips of the width adjustment with PTFE lubricant.

5.2 Weekly maintenance

	What to do	Action
1	Retighten fasteners	• Retighten nuts and bolts (see 5.5).
2	Visual inspection	• Check the construction and hydraulic components visually for damage, cracks and tears.
3	Retighten Taperlock	• After the first 4 working hours, retighten (48 Nm) the sets screws of the taperlock bush on the motor shaft and check them regularly thereafter (see figure 7)!
4	Adjusting distance brush-cutter	• See 4.1 item 6 for adjustment instructions.

	What to do	Action
5	Play of side-shift	• Check the play on the side-shift-tubes. • Adjust if necessary (see 5.4).
6	Clean	• Clean the machine at the end of the working week, before the machine is put into storage. Lubricate after cleaning.

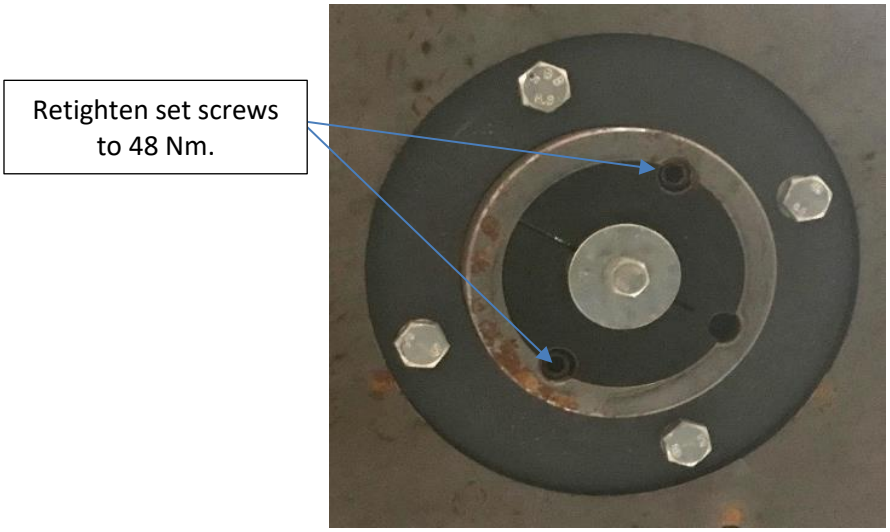


Figure 7: Taperlock bush connection.

5.3 Annual maintenance

	What to do	Action
1	Inspect	• Check structural parts for damage, cracks and play. • Check hydraulic parts for leaks and damage to hoses.

5.4 Sliding plate adjustment

See figure 8. At the end of the outer tube (pos. 1), a plastic sliding plate (pos. 2) is fitted on both sides to eliminate the play between inner and outer tube. With use, the play will increase over time.

If the play becomes noticeable, it can be reduced again by readjusting the slide plates.
To do this, loosen 8x locknut (pos. 4) a few turns.
Then tighten all eight adjusting screws by the same amount. The opposing adjusting screws must each take up half of the play to keep the inner and outer sleeve concentric.

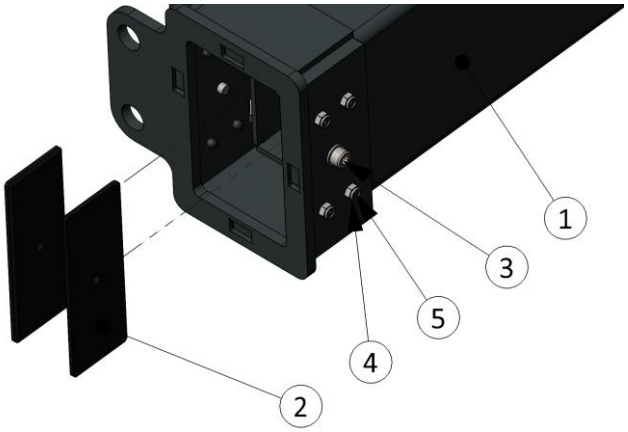


Figure 8: The sliding plates of the outer tube.

5.5 Torque settings

Torque values in the table are given in Nm.

These can be used when tightening and checking screw connections.

In most cases, the strength classes are indicated on the bolt head.

If in doubt, contact your supplier.

		Grade		
		8,8	**10,9**	**12,9**
Thread	**M8**	25	35	42
	M10	50	70	85
	M12	87	123	147
	M14	138	194	235
	M16	211	299	358
	M18	289	412	490
	M20	412	579	696

6. Failure analysis

	Failure	Solution
1	After switching on, the brush motor does not rotate.	• Check that the hydraulic hoses are connected correctly.
2	The machine works but has no / insufficient brushing power.	• Check that the direction of rotation of the motor is correct. If this is not the case, it can be changed by changing the pressure and return hoses using the quick connectors.

If the fault cannot be solved with the recommendations from the table above, consult your dealer or service department.

7. Storage

The storage location is preferably dry, stable and flat. Placing the machine on a pallet is advised due to its manageability.

8. End of life

When parts are replaced or at end-of-life, care should be taken to ensure that all materials are disposed of, destroyed or reused in a ‘legally’ responsible and environmentally friendly manner.

9. Logbook

Good insight into the technical condition of a machine is of great importance to use a machine efficiently and sustainably. We therefore advise every user of a Becx machine to keep a written record of inspections, maintenance and repairs.

A tool for this can be the following table. Tip: Write Machine and serial number in the boxes reserved for future reference.

Type:		**Serialnumber:**
Date	**Executed by**	**Activities/Peculiarities**