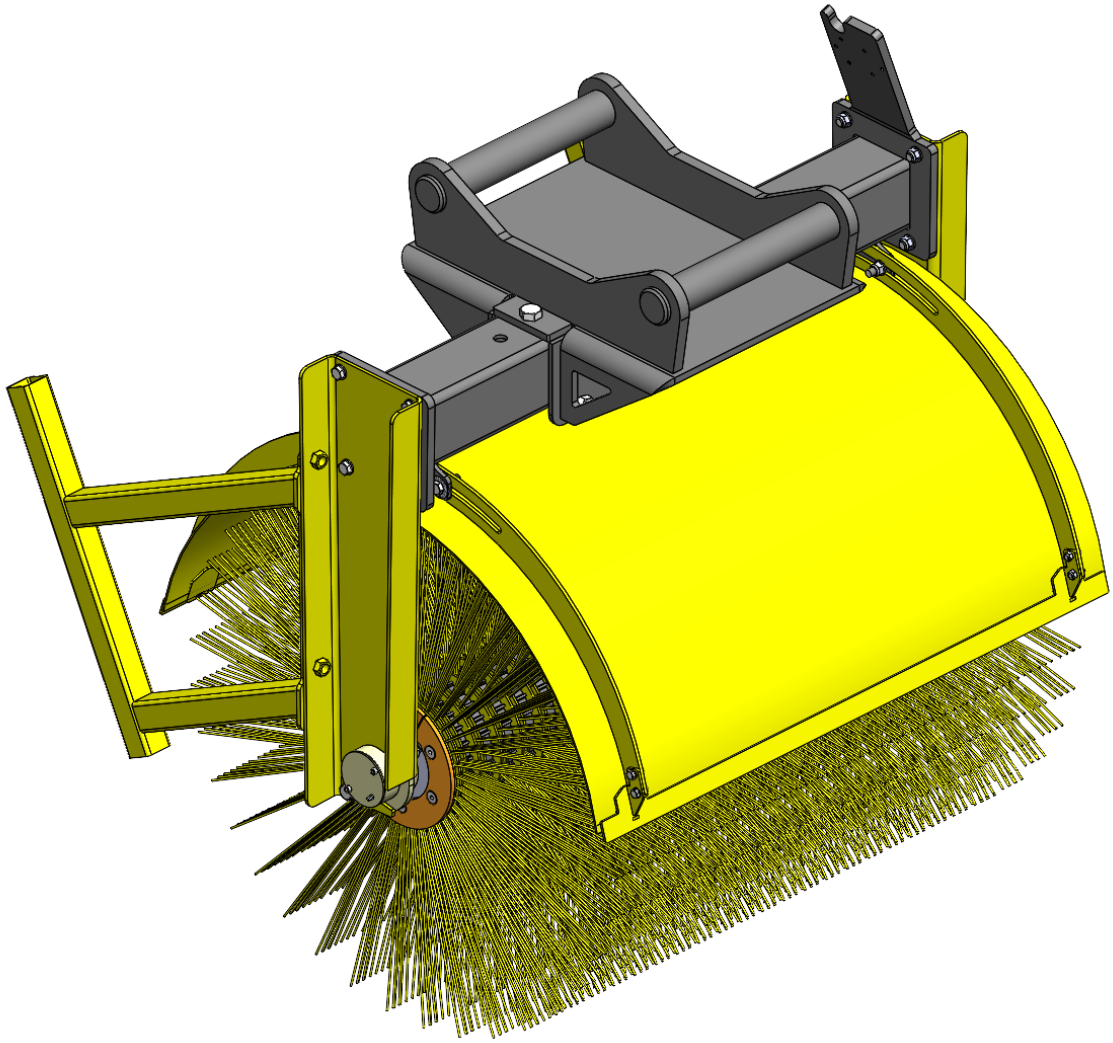
Original

Operating and maintenance manual

Excavator Sweeper



STARK / Lametal Oy
Kaskenviertäjäntie 2
73100 Lapinlahti, FINLAND

www.stark.fi
info@stark.fi, parts@stark.fi

General

Congratulations on the purchase of your STARK excavator sweeper!

For us, the long lifecycle and efficiency of your new equipment is a priority. To keep the sweeper in top working condition, read this manual carefully before using the equipment.
STARK products are engineered and manufactured in Finland, and each of them is equipped according to the needs of the customer.
Never let anyone operate or maintain the device without reading this manual carefully! Always make sure that safety precautions are observed in use and maintenance. Keep this manual for future reference and make sure to hand it over to a new owner.
The cornerstones of the product development of STARK attachments are quality, durability and economy. The products are engineered to be high-performing, safe and durable in professional use. Any feedback on our products is welcome and contributes to the further development of our products. If you have any questions about the use or maintenance of the broom, please contact us by e-mail: info@stark.fi
Visit our webpage www.stark.fi for the complete product range, including new products.
The manufacturer reserves the right for structural and technical changes without prior notice. Therefore, some pieces of information given in the manual may have changed after printing this manual.

Read before use



Make sure you know your equipment before you start using it.
Equipment may be operated only by an individual who is thoroughly familiar with its use.
All operators must be properly instructed before use and maintenance of the equipment. Use by individuals with insufficient instructions may pose serious risks to the operators themselves, to the environment and the equipment.

When coupling the attachment to the base machine, make sure:

- that all locking cotters are intact and in order
- there is no pressure in the hydraulic system
- that hydraulic hoses are intact
- there is no skin contact to hydraulic oil when connecting hydraulic hoses
- not to pull by the hydraulic hoses, but only by the hydraulic fitting



During operation, pay attention to:

- safe, appropriate travel speed
- other traffic, people and animals
- danger zones and objects that block your view
- children

NEVER use the machine, if there is someone in the danger zone.
NEVER go under the attachment.

Table of contents

General 2

Read before use 2

1. DECLARATION OF CONFORMITY 4

2. PURPOSE OF USE 5

3. SAFETY PRECAUTIONS 5

4. IDENTIFICATION INFORMATION AND SPAREPARTS 7

4.1. Identification plate 7
4.2. Maintenance services 7

5. MAIN PARTS OF THE EXCAVATOR SWEEPER 8

6. MAIN PARTS OF THE CRANE SWEEPER 9

7. USING THE EXCAVATOR SWEEPER 10

7.1. Attaching the excavator sweeper to the base machine 10

8. OPERATING THE EXCAVATOR SWEEPER 11

8.1. Using the excavator sweeper 11
8.2. Using the crane sweeper 11
8.3. Changing the brush rings 12
8.4. Detaching the excavator sweeper 14
8.5. Accessories 15

9. MAINTENANCE OF THE EXCAVATOR SWEEPER 16

9.1. General safety precautions for the use and maintenance 16
9.2. Tightening torque 16
9.3. Daily maintenance 16
9.4. Maintenance after first 10 hours of operation 16
9.5. Maintenance at 50-working hour intervals or on a weekly basis 16

10. HYDRAULICS 17

11. WARRANTY POLICY 18

1. DECLARATION OF CONFORMITY

The original manufacturer's EC declaration of conformity:
Generic product name: Excavator sweeper
Models: STARK TAH 600S, TAH 1000S, TAH 1300S, TAH 1600S, TAH 2000S, TAH 2500S, EBS 600, EBS 1000, EBS 1300, EBS 1600, EBS 2000, EBS 2500, CRSW 600, CRSW 1000, CRSW 1300

Manufacturer:
Lametal Ltd
Kaskenviertäjäntie 2 73100 LAPINLAHTI, Finland
tel. +358 400 480 401

Declares that the above-mentioned equipment meets the provisions of Directive 2006/42/EC on machinery and, where applicable, comply with the standards

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

The person authorized to compile technical documentation:



Lassi Mehtonen
Managing director
Kaskenviertäjäntie 2
73100 Lapinlahti, FINLAND

2. PURPOSE OF USE

Excavator sweepers are intended for sweeping of streets, yards and areas small and large.

3. SAFETY PRECAUTIONS



Make sure you know your equipment before you start using it. Equipment may be operated only by an individual who is thoroughly familiar with its use.

Before connecting hydraulics to the base machine, make sure that:

- there is no-one between the attachment and the base machine
- the base machine is turned off and the parking brake is on.

When coupling the attachment to the base machine, make sure that:

- all locking cotters are intact and in order
- hydraulic hoses are intact
- there is no skin contact to hydraulic oil when connecting hydraulic hoses
- you do not to pull by the hydraulic hoses, but only by the hydraulic fitting.

During operation, pay attention to:

- safe, appropriate travel speed
- other traffic, people and animals
- danger zones and objects that block your view
- children
- use of turn signal when driving



NEVER use the machine, if there is someone in the danger zone
NEVER go under the attachment



WARNING! Rotating rollers!



WARNING! Pressurized hydraulic hoses and components!

During maintenance, the hydraulics of the base machine MUST be turned off. The base machine MUST also be turned off and the parking brake MUST be applied. The equipment must be properly supported, if maintenance can only be performed by going under the equipment. Never go under the equipment if it is not properly supported.
Daily maintenance:

- check general condition of structures, make repairs if needed
- check the hydraulic hoses and fittings, and replace damaged parts

After every 50 hours of operation:

- lubricate points specified in later section of this manual
- check all bolts and nuts for tightness

Check all bolts, nuts and hydraulic fittings for tightness after the **first day** of operation!
If the equipment is not likely to be used for a longer period of time, clean it thoroughly after use and lubricate as instructed.

4. IDENTIFICATION INFORMATION AND SPAREPARTS

4.1. Identification plate

Identification plate is placed on the side of the equipment. The plate includes contact information, machine type, year of manufacture, serial number and weight. (See an example of an identification plate in picture 1 below).
The first four numbers in the serial number indicate the month and year of manufacture (month first). The remaining five numbers constitute the machine tracking number, which is stored in the manufacturer's database (13971 in the example below).



Picture 1. Identification plate

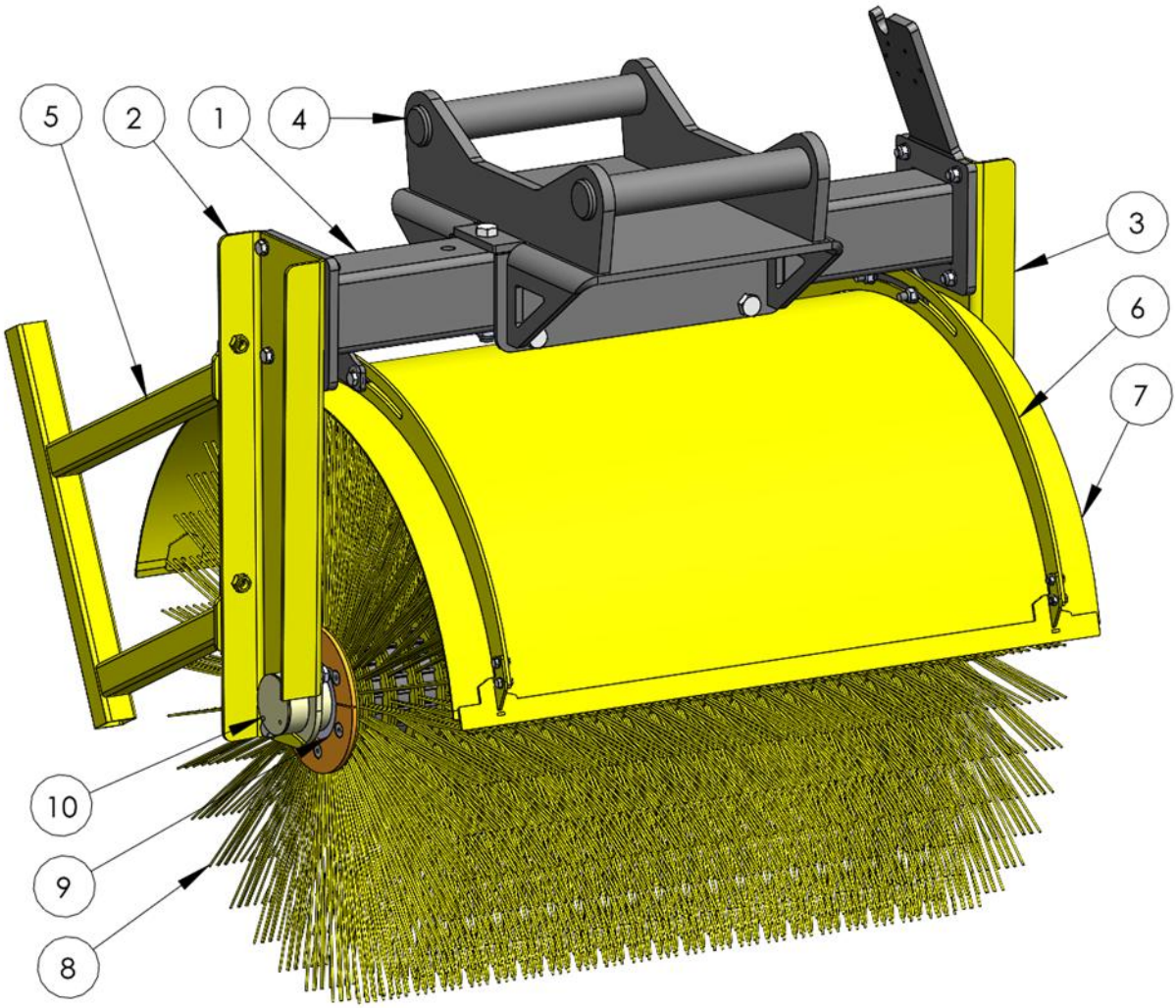
Take down the machine type and the serial number of your rotary broom beam:

Product and model _____Serial number_____

4.2. Maintenance services

When replacing parts, use original, manufacturer spare parts only. By using original spare parts you ensure dependable operation of the broom and comply with the warranty policy. To facilitate the supply of spare parts, always inform the manufacturer/retailer of the model and serial number of the broom (marked in the identification plate) when you order spare parts.
For more information on maintenance and spare parts, please contact the STARK maintenance and spare part services or your retailer.
Contact information for STARK maintenance services:
tel. +358 400 480 401, e-mail info@stark.fi
tel. +358 400 480 401, e-mail parts@stark.fi

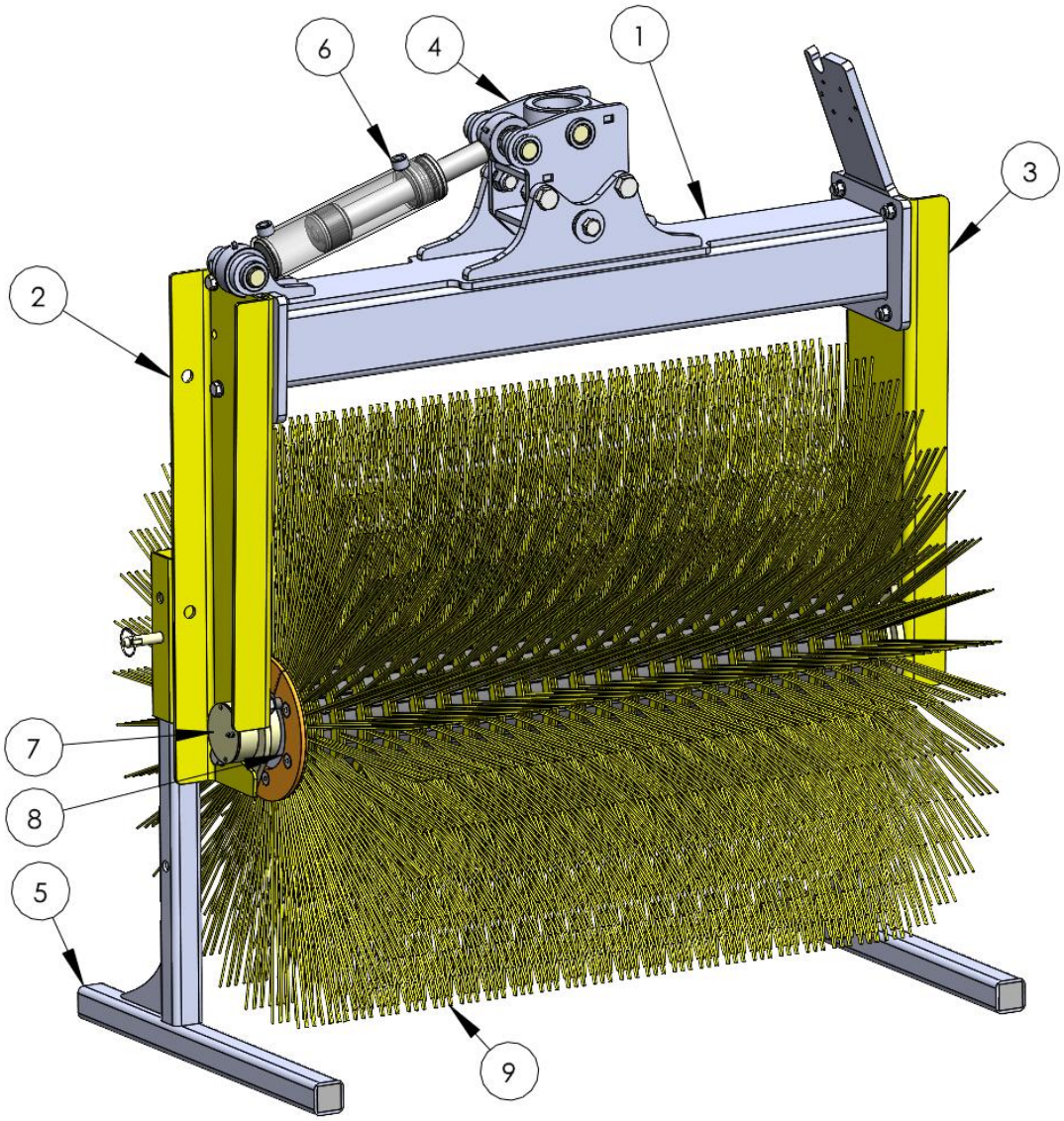
5. MAIN PARTS OF THE EXCAVATOR SWEEPER



Picture 2. Main parts of the excavator sweeper

1) Beam frame
2) Beam bearing support
3) Broom motor support
4) Bolt-on STARK FIT -fitting
5) Support leg
6) Bolt-on and adjustable mudguard fastener
7) Mudguard
8) Brush ring
9) Broom beam
10) Bearing housing

6. MAIN PARTS OF THE CRANE SWEEPER



Picture 3. Main parts of the crane sweeper

1) Beam frame
2) Beam bearing support
3) Broom motor support
4) Rotator mount
5) Support leg
6) Tilt cylinder
7) Bearing housing
8) Broom beam
9) Brush ring

7. USING THE EXCAVATOR SWEEPER

When attaching the sweeper for the first time, make sure it is compatible with the base machine by following the instructions below. Always check the compatibility when attaching the broom to a new base machine.

7.1. Attaching the excavator sweeper to the base machine

The excavator sweeper is attached to the base machine by welded or bolted STARK FIT quick hitches. The machine is connected to a hydraulic system. Hydraulic circuit diagrams can be found in a later section in this manual. Ask your retailer for available STARK FIT quick hitches.

Before using the excavator sweeper, MAKE SURE all locking cotters are secured and intact.

When coupling excavator sweeper to the base machine, please pay attention to the instructions on the use of the base machine.

1) Make sure that the attachment and the base machine are compatible in terms of mechanical solutions, hydraulics and electricity.

2) The excavator sweeper is attached to the coupler on the base machine (e.g. a loader). Attach the sweeper to the base machine, and make sure the locking cotters are secured. Apply parking brake.

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

4) Make sure there is no pressure in the base machine hydraulic system. When connecting, always make sure the hydraulic connectors are clean and the hoses are intact.

5) Check carefully the attachment's, the base machine's and the fitting's trajectory for collision. Make sure that the needed space for hydraulic hoses and -attachments is adequate. Check that the brush roll rotates outwards from the beam. If not, switch hoses in the base machine.

6) During first hours of operating the attachment, bolts, nuts and connectors might loosen up. **Retighten them** after the first day of operating the attachment.

8. OPERATING THE EXCAVATOR SWEEPER

Check following before using the excavator sweeper:

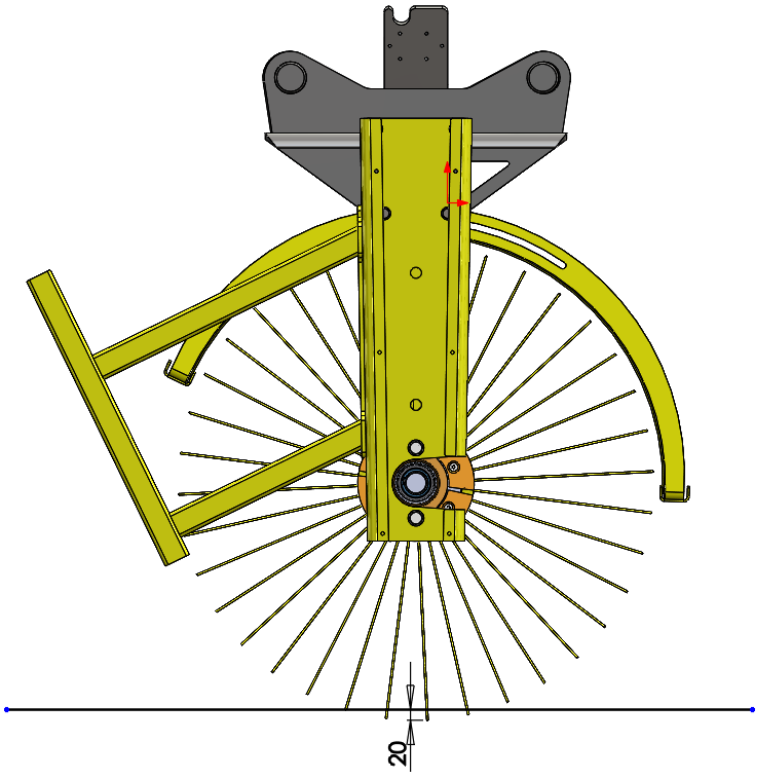
- Sweeper is installed properly to the base machine
- All locking cotters are in place
- Hydraulic hoses are attached properly
- Hoses are intact
- There are no oil leaks in attachment
- All functions are in order
- Learn the functions of the rotary broom beam in an enclosed area before actual usage.

8.1. Using the excavator sweeper

1. Make sure that the attachment and the base machine are compatible in terms of mechanical solutions, hydraulics and electricity.
2. Apply parking brake. The excavator sweeper is attached to the coupler on the base machine (e.g. a loader). Attach the broom to the base machine, and make sure the locking cotters are secured.
3. Turn off the base machine and make sure the parking brake is applied.
4. Make sure there is no pressure in the base machine hydraulic system. When connecting, always make sure the hydraulic connectors are clean and the hoses are intact.
5. Check carefully the attachment's, the base machine's and the fitting's trajectory for collision. Make sure that the needed space for hydraulic hoses and -attachments is adequate. Check that the brush roll rotates outwards from the beam. If not, switch hoses in the base machine.
6. Keep the rotary broom beam in suitable distance from ground (Picture 4). Brush ring should bend approx. 20mm. Do not press the broom too hard with a base machine. Brush rings wear down faster and the **attachment could be damaged!**
7. Stay alert for any abnormal behaviour and oil leaks also during driving.

8.2. Using the crane sweeper

1. Make sure that the attachment and the base machine are compatible in terms of mechanical solutions, hydraulics and electricity.
2. Apply parking brake. The crane sweeper is attached to the coupler on the base machine (e.g. a crane). Attach the sweeper to the base machine and make sure the locking cotters are secured.
3. Turn off the base machine and make sure the parking brake is applied.
4. Make sure there is no pressure in the base machine hydraulic system. When connecting, always make sure the hydraulic connectors are clean and the hoses are intact.
5. Check carefully the attachment's, the base machines and the fitting's trajectory for collision. Make sure that the needed space for hydraulic hoses and -attachments is adequate. Check that the brush roll rotates outwards from the beam. If not, switch hoses in the base machine.
6. Keep the rotary broom beam in suitable distance from ground (Picture 4). Brush ring should bend approx. 20mm. Do not press the broom too hard with a base machine. Brush rings wear down faster and the **attachment could be damaged!**
7. Use the crane sweeper periodically. Due to the long hydraulic hoses, the oil may get boiling hot during continuous usage. The oil needs to be cooled down occasionally to avoid damage.
8. Check the back pressure in the hydraulic return line. It should not exceed 80 bar.
9. Stay alert for any abnormal behaviour and oil leaks also during driving.



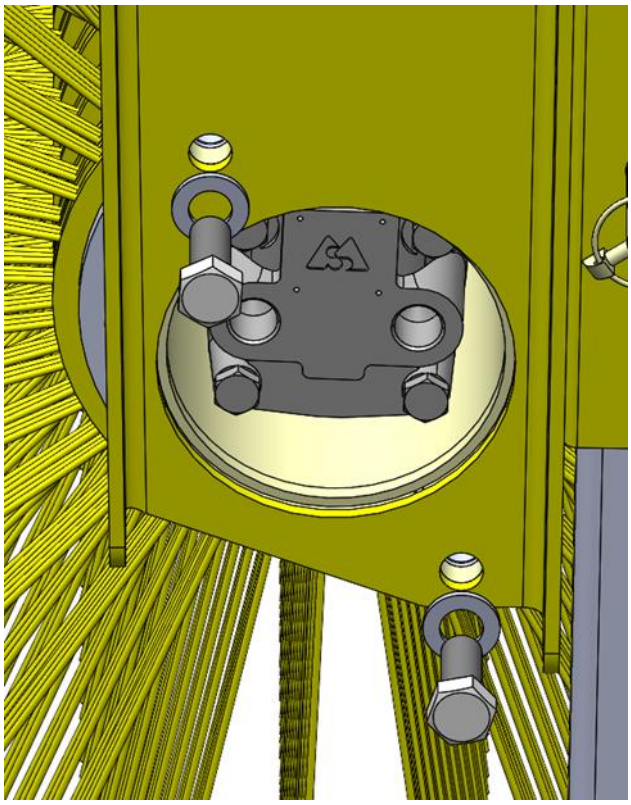
Picture 4. Brushing height

8.3. Changing the brush rings

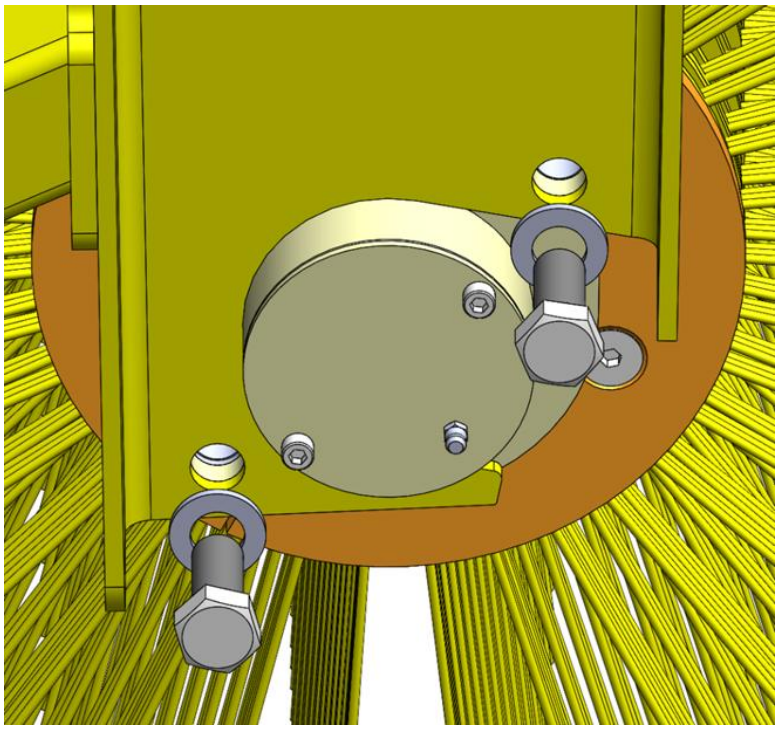
1. Detach the hydraulic hoses from the motor (picture 5).
2. Remove bolts from broom beam's bearing- and motor support (Pictures 6 and 7).
3. Lift the sweeper frame.
4. Open secure cotters in broom beam.
5. Remove brush rings.
6. Change brush rings to new ones and assemble the attachment in reverse order.



Picture 5. Hydraulic hoses in the motors end



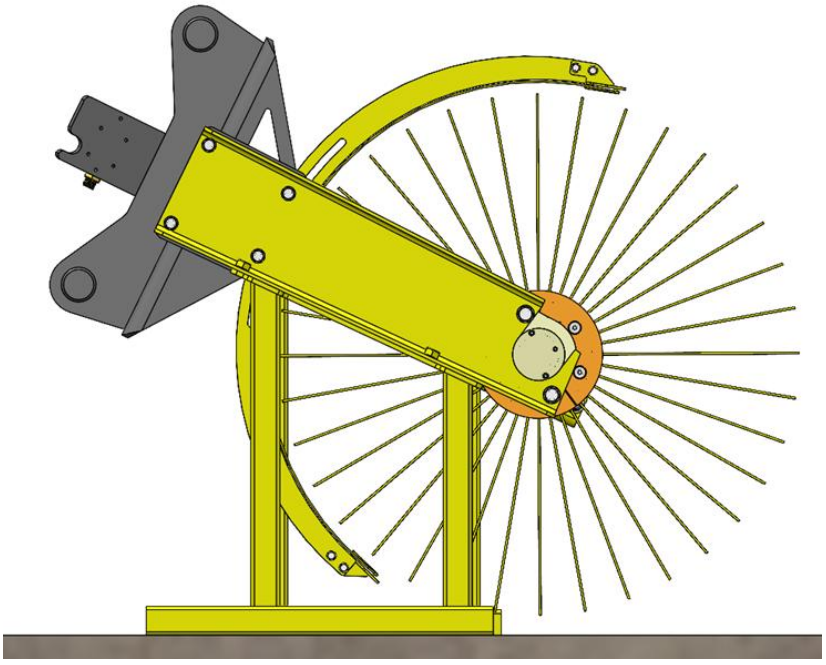
Picture 6. Removing bolts from the motor side



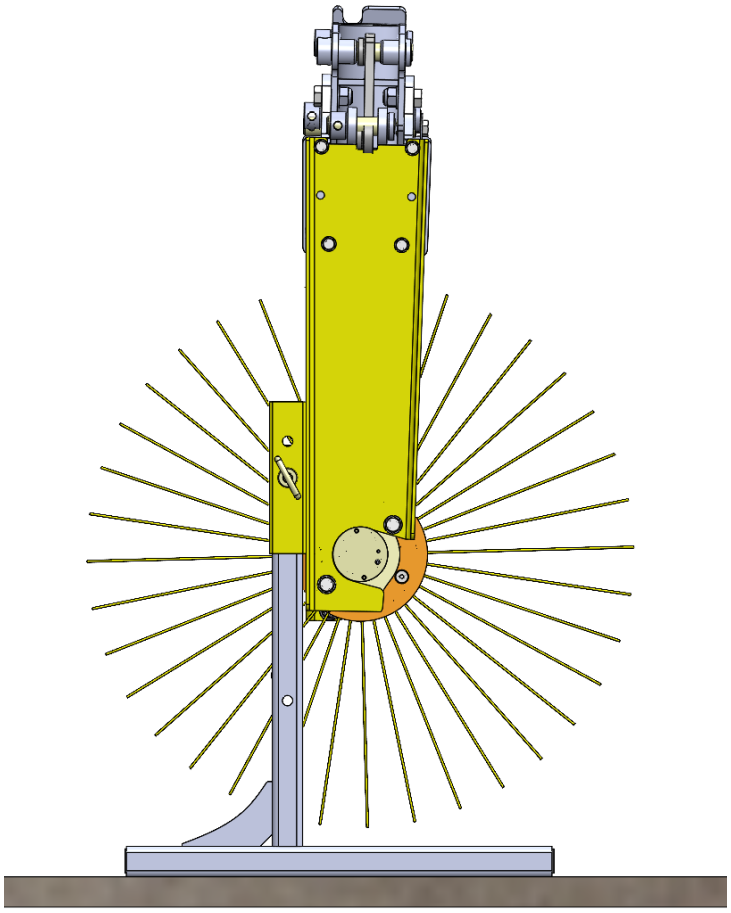
Picture 7. Removing bolts from the bearing side

8.4. Detaching the excavator sweeper

1. Lower the excavator sweeper down on an even surface on its support legs (picture 8 and 9).
2. Turn off the base machine, apply the parking brake and depressurize the system.
3. Detach the hydraulic hoses and protect hose ends with plugs.
4. Unlock the coupling mechanism and detach the device.
5. If the equipment is not likely to be used for a longer period, clean it thoroughly after operating and lubricate as instructed.



Picture 8. The excavator sweeper on its support legs



Picture 9. The crane sweeper on its support legs

8.5. Accessories

The following accessories are available for the rotary broom beam:

- Bolt-on STARK FIT -fittings
- Bolt-on and adjustable mudguard fastener
- High pressure watering system
- Limitation valve for the flow (if base machine's output is over 120 l/min)

9. MAINTENANCE OF THE EXCAVATOR SWEEPER

9.1. General safety precautions for the use and maintenance

- Comply with existing laws and regulations and the instructions given in this manual.
- Never go under an unsecured device.
- Always apply the parking brake of the base machine before performing any actions on the device.
- Only use tools that are in proper working order.
- Be careful with the pressurized hydraulic hoses and components.
- Make sure there is no pressure in the hydraulic system. Take into account the pressure accumulator.
- Make sure hydraulic fluids or greases do not leak to the ground.
- Use all necessary personal protectors.

9.2. Tightening torque

	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 torque

9.3. Daily maintenance

In order to prevent further damages, it is important to inspect the device visually for possible defects. Inspect at least the following daily:

- Hydraulic hoses and components for possible leaks
- General mechanical functioning

9.4. Maintenance after first 10 hours of operation

- Bearing unit in broom beam is permanently lubricated so it does not require any added oil
- Check the bolts for tightness (table 1.)

9.5. Maintenance at 50-working hour intervals or on a weekly basis

- Bearing unit in broom beam is permanently lubricated so it does not require any added oil
- Check the mechanical condition of the device for bends, distortions or breaches
- Check fastening bolts for tightness (table 1).

10. HYDRAULICS

The excavator sweeper uses 2-hose hydraulic system (figure 1). The device is equipped with a complex closed hydraulic system, which has been tested and adjusted by the manufacturer. Any repairs to the system are to be performed by replacing one component at a time by a professional in hydraulics. Any alterations or modifications to the hydraulic system are on the sole responsibility of the client.

- Max. pressure: 250 bar
- Max. oil flow: 120 l/min
- Max. counterpressure for return line: 80 bar

If the attachment is equipped with high pressure watering system, needed oil flow can be taken from the broom's return flow.

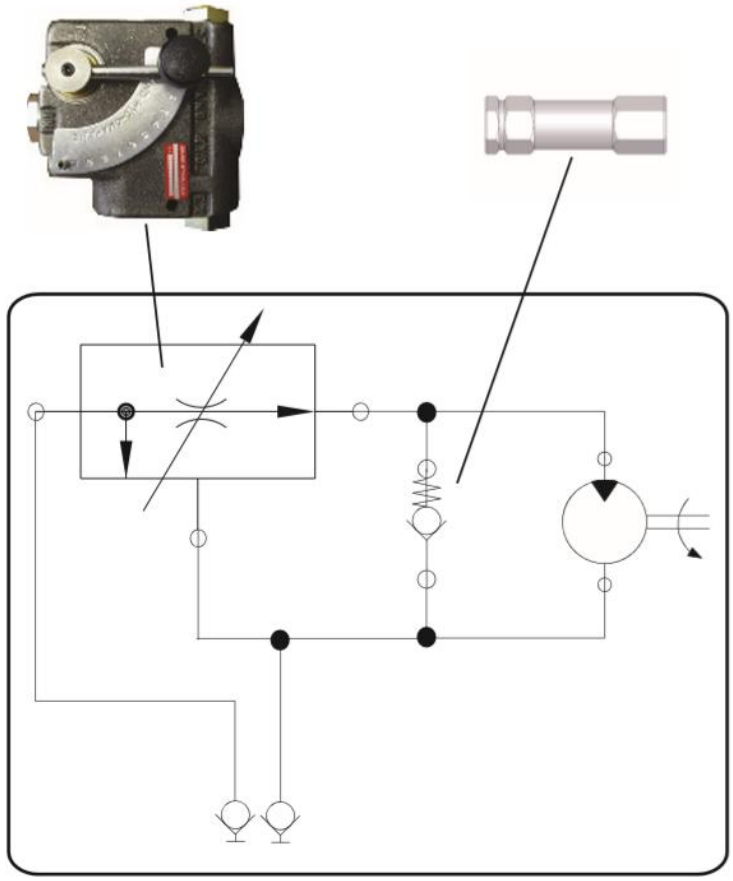


Figure 1. 2-hose hydraulics

11. WARRANTY POLICY

1. **Warranty coverage**
   Lametal Oy, the manufacturer of STARK attachments, offers new devices a guarantee which covers material and manufacturing defects in accordance with the terms in this warranty policy. Limitations to the warranty are specified in point 7.
2. **Warranty starting date**
   The warranty starts on the agreed date of product delivery to the client, or on the date of approved instalment or on the date the equipment has been taken into operation. The equipment is taken into operation when it has been delivered to the client in accordance with the agreement and the client has acknowledged receipt of the equipment. The client is to check the equipment before use as instructed in this manual and to notify the manufacturer or the reseller of the equipment of any defects or flaws that are noticed during initial inspection. This notification is to be done in writing within eight (8) days after delivery. Hidden defects and defects that are otherwise difficult to detect must be reported immediately after detecting them, within one (1) year after receipt of the equipment at the latest.
3. **Warranty period**
   STARK warranty covers a period of one (1) year. If need be, the client and the manufacturer make separate agreements on warranty concerning repairs and spare parts used in repairs.
4. **Repairs during the warranty period**
   Repairs during the warranty period are carried out free of charge within the normal working hours by the manufacturer repair and maintenance services or by a repair service provider accredited by the manufacturer. If repairs are carried out by a repair service provider which has not been accredited by the manufacturer, the manufacturer does not compensate for costs that are not covered by the warranty, such as travel and waiting hours, daily allowances, travel expenses or costs arising from detaching and reinstalling the equipment. The manufacturer does not compensate for indirect costs caused by repairs during the warranty period, such as lost working hours. Original parts replaced during the warranty period shall remain with the manufacturer. The client must keep the damaged parts for six (6) months unless otherwise agreed, and have them delivered to the manufacturer without delay upon request.
5. **Conditions for repair under warranty**
   Manufacturer's instructions for operation, instalment and maintenance have been followed.
   The equipment was damaged when operated in conditions for which it has been engineered.
   In maintenance and repairs, only original, manufacturer parts have been used.
   The form for the notification of defects provided by the manufacturer or the retailer has been filled in according to the instructions and submitted for processing.
6. **Warranty after repair**
   Warranty holds until the end of the original warranty period. Repair under warranty does not prolong the warranty period.
7. **Limitation to the warranty**
   The warranty does not cover:
   - consequential expenses resulting from the damaged equipment
   - indirect costs, such as loss of working hours
   - damages caused to a third party
   - equipment or components that have been modified or repaired by the client themselves
   - damages caused by normal wear and tear, inappropriate maintenance operations, neglect, accident, connecting error, equipment overloading, user's inexperience or use of other than original parts

   The warranty offered by the manufacturer does not exceed the purchase price of the equipment.
8. **Warranty claim procedure**
   For a warranty claim to be processed, the form for the notification of defects provided by the manufacturer or the retailer must be filled in according to the instructions and submitted for processor. The warranty claim procedure is carried out either in Finnish or English.