

AVANT[®]

Operator's Manual for Attachment



Collecting broom I500

Product number

Collecting Broom I500

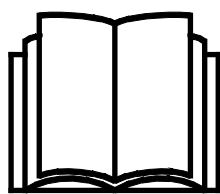
A35602

- with side brush

A35918

- with side brush and watering system

A35919



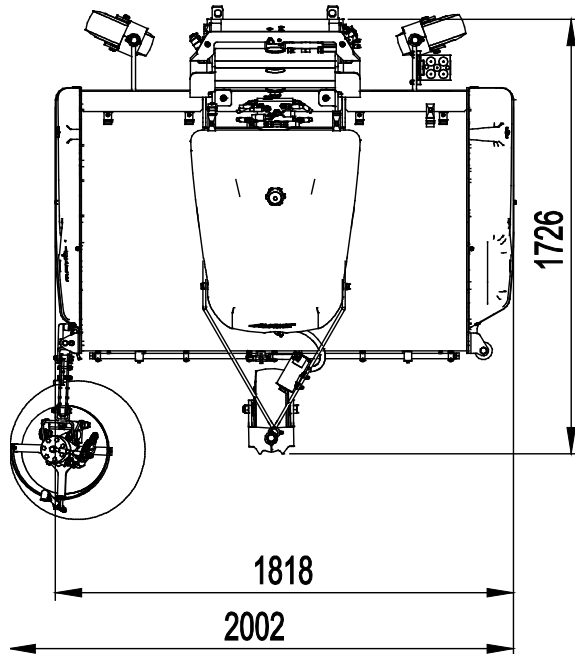
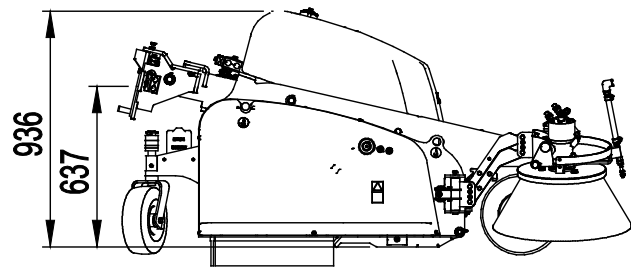
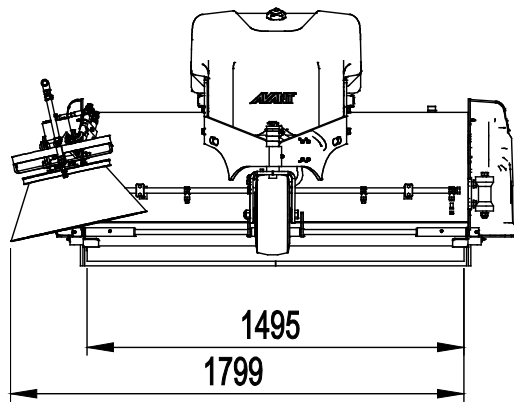
Please read this manual carefully before using the equipment, and follow all instructions.

Keep this manual for later reference.

Manufacturer:

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I. Foreword

Avant Tecno Oy would like to thank you for your purchase of this attachment for your Avant loader. It has been designed and manufactured based on years of experience on product development and manufacturing. By familiarising yourself with this manual and following the instructions, you ascertain your safety and ensure the reliable operation and long service life of the equipment. Read the instructions carefully before starting to use the equipment or performing maintenance.

The purpose of this manual is to help you to:

- operate the equipment in a safe and efficient manner
- observe and prevent any hazardous situations
- keep the equipment intact and ensure a long service life

With these instructions, even an inexperienced user can use the attachment and loader safely. The manual includes important instructions for experienced AVANT operators as well. Ensure that all persons using the loader have received proper guidance and familiarised themselves with the manual of the loader, each attachment that are used, and all safety instructions before using the equipment. Using the equipment for other purposes or use in any other way than described in this manual is prohibited. Keep this manual at hand throughout the service life of the equipment. If you sell or transfer the equipment, be sure to hand over this manual to the new owner. If the manual is lost or damaged, you can request a new one from your Avant dealer or from the manufacturer.

In addition to the safety instructions included in this manual, you must observe all occupational safety regulations, local laws, and other regulations concerning the use of the equipment. Particularly the regulations concerning the use of the equipment on public road areas must be observed. Contact your Avant dealer for more information about local requirements before you operate the loader on road areas.

Contact your local AVANT dealer for any questions, service, spare parts or about any problems that may occur with the operation of your machine.

This manual contains the original instructions in English. Due to continuous product development some of the details shown in this manual may differ from your equipment. Pictures may also depict optional equipment or features that are not currently available. We reserve the right to change the contents of the manual without notification. Copyright © 2018 Avant Tecno Oy. All rights reserved.

Warning symbols used in this manual

The following warning symbols are used throughout this manual. They indicate factors that must be taken into account to reduce the risk of personal injury or damage to property:



WARNING: SAFETY ALERT SYMBOL

This symbol means: **“Warning, be alert! Your safety is involved!”**

Carefully read the message that follows, it warns of an immediate hazard that could cause serious personal injury.

The safety alert symbol by itself and with related safety statement indicates important safety messages throughout this Manual. It is used to draw attention to instructions involving your personal safety or the safety of others. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

DANGER:

This signal word indicates a hazardous situation which, if not avoided, will cause death or serious injury.

WARNING:

This signal word indicates a potentially hazardous situation which, if not avoided, could cause serious injury or death.

CAUTION:

This signal word is used when minor injury could result if the instructions are not followed properly.

NOTICE

This signal word indicates information about the correct operation and maintenance of the equipment.

Failure to observe the instructions accompanying the symbol can lead to equipment breakdown or other property damage.

2. Designed purpose of use

The AVANT Collecting broom 1500 is an attachment that is designed and manufactured to be used with AVANT multi-purpose loaders shown in Table 1. The collecting broom is intended for removing sand, sanding gravel or other small trash from larger yards, streets, or other even and hard surfaces, and serves well also in professional use. The powerful collector will remove small material from surfaces with a single pass, leaving the surface completely clear. The collecting broom is not suitable for collecting larger trash, such as disposable cups, boxes, or similar materials, where other broom types, such as the bucket broom, may be more suitable.

The collecting broom is driven directly by a hydraulic motor. Also the collector box opening mechanism is hydraulic and does not require any additional equipment on the loader to operate. With the side brush, the cleaning of kerbs and operating near walls is easy. The side brush can be fitted on either side of the collecting broom. Another side brush is available as an option, and both can be used simultaneously. To reduce dust formation during operation, a water spraying system is available as an option, which includes nozzles for the side brush as well. The collecting broom is intended for outdoor use only and can be used only as a collecting system from the driver's seat of the loader, so that the collecting broom is firmly on the ground supported by its own wheels.

This operator's manual also includes instructions regarding installation of additional components, involving hydraulic assemblies. Safety instructions and safe working practices related to hydraulic assemblies must be followed strictly. Installation work is intended only for persons with adequate training or experience about hydraulic assemblies, and the system must be tested for safety before commissioning. Consult your nearest Avant service point if necessary.

The collecting broom 1500 is not designed for any other use than specified and must not be used for any other purposes than intended.

The attachment has been designed to require as little maintenance as possible. The operator can perform regular maintenance tasks. All repair work can't be performed by the operator, and demanding repair and maintenance operations are to be left for professional maintenance. All maintenance work must be done using proper safety equipment. Spare parts must be identical with original specifications, which can be ensured by using only original spare parts. A separate spare parts catalogue may be available, consult your Avant dealer.

Familiarise yourself with the manual's instructions regarding service and maintenance. Please contact your AVANT retailer if you have additional questions about the operation or maintenance of the equipment, or if you require spare parts or maintenance services.

Table 1 - Collecting broom 1500 - Compatibility with Avant loaders

Avant	220 series 2	313S	419	520	525LPG	630	745	e5 e6
	225	320S	420		R28	R35	750	
	225LPG		423		528	635	755i	
			523		530	640	760i	
A35602	-	-	-	-	(•)	•	•	-
A35918								
A35919								

The compatibility recommendations are based on the width of the loader, lifting capacity, and adequate breakout force. Normally the width of the attachment should match roughly the width of the loader. When using too wide attachment the actual breakout force (bucket tilting capacity) decreases and the overall performance will decrease.

It is recommended to use the attachment only with loaders marked with • in Table 1. When using with models marked with (•), full performance may not be achieved. Additional counterweights may also be required. For compatibility with a model not shown in table, contact your Avant dealer.

3. Safety instructions for using the attachment

Please bear in mind that safety is the result of several factors. The loader-attachment combination is highly powerful and improper or careless use or maintenance may cause serious personal injury or property damage. Due to this, all operators must carefully familiarise themselves about correct use and the operator's manuals of both the loader and the attachment before starting operation. Do not use the attachment if you have not completely familiarised yourself with its operation and the related hazards.



DANGER

Misuse, careless use, or using an attachment that is in poor condition, may cause risk of serious injuries. Familiarise yourself with the controls of the loader, correct coupling procedure, and the correct way to operate the attachment at a safe area. Study especially how to stop the equipment in a safe manner. Read all safety precautions carefully.

Read all safety instructions carefully before handling the attachment



WARNING

- When attaching an attachment to the loader, **ensure that the locking pins of the loader's quick attach plate are in the lower position and that they have locked the attachment to the loader.** Never lift or move an unlocked attachment.
- The Collecting broom 1500 is designed to be used by one operator at a time. Do not let others near the danger area of the equipment when it is in use.
- Always transport the attachment as low as possible to keep the centre of gravity low, and keep the telescopic boom retracted during driving.
- Never leave the driver's seat when the broom is running or when the auxiliary hydraulics control lever of the loader is locked on and keep a safety distance of at least two metres from activated broom. Keep hands and feet away from moving parts.
- Beware of entanglement and severing hazards and possible debris thrown by the broom.
- Lower the attachment firmly on the ground before leaving the driver's seat. Make sure that the attachment is properly supported during any maintenance or inspections. Do not leave the driver's seat when the loader boom is lifted. Going under a raised attachment or loader boom is dangerous, as the boom may lower due to loss of stability, mechanical fault or when other person operates the controls of the loader.
- Beware of the crushing hazard of the moving broom shaft, always lower the broom completely, or use appropriate supports, if it is necessary to handle the broom while lifted.
- Be sure not to tilt the attachment too far up to prevent the broom from tilting over the tipping point of the hinged quick attach plate.
- Keep in mind that the broom may throw material or objects at high speed. Do not operate the equipment, if the broom cover is not in place.
- Shut down the loader and place the attachment to a safe position as shown in Safe stopping procedure before any cleaning, maintenance, or adjustments.
- Pay attention to the surroundings and any other persons and machines moving in the vicinity. Pay attention to the contours of the terrain and other hazards, such as branches and trees that can reach to the driver's area, loose rocks, and slippery surfaces.



- Make sure to use only an attachment that is in good condition. Check the attachment thoroughly in regular intervals. Do not modify the attachment in a manner that would affect its safety. It is prohibited to drill holes on the attachment, and welding or other means of fixing hooks or other objects on the attachment is strictly prohibited.
- Use the attachment only for its intended purpose. Other use may create unnecessary safety risks, and the equipment may get damaged.
- Make sure that the loader is equipped with necessary safety components, and that they are in working condition. Seat belt must be used. If there are specific hazards related to the operating area, use appropriate safety equipment.
- Also read the safety instructions and correct use of the loader from the operator's manual of the loader.



Hazard of thrown objects - Keep bystanders away. Note that the attachment can throw stones, gravel, or other objects found in the area at high speed. Always keep a safety distance of at least 2 metres to other persons.



Risk of tipping over - Avoid overload. Loader can tip over when handling too heavy loads, or because of dynamic movements caused by driving with and handling of a heavy load. Do not extend the telescopic boom when the load approaches the lifting capacity of the loader, or when the loader boom is in horizontal position. When you notice that the rear wheels of the loader are about to lift from the ground, or if the load indicator of the loader (if fitted) signals:

- Lower the load calmly and retract the telescopic boom
- Avoid sudden changes in speed or direction whenever load is lifted
- Use additional counterweights as needed



Entanglement hazard - do not use loose clothing during operation. Never wear loose clothing, long scarves, jewellery, or other items that might become entangled with rotating parts while operating the attachment. If needed, wear a hat to prevent long hair from coming into contact with the rotating parts.



Risk of crushing - Never allow anyone to get under a lifted attachment or loader boom. Keep in mind that the loader boom can be lowered or tilted even if the engine has been shut down (crushing hazard). The loader is not intended to be left to keep a load elevated for longer periods. Always lower the attachment to a safe position before leaving the driver's seat.



Safe stopping of the attachment, before going near the attachment:



Always stop the attachment following safe stopping procedure before leaving the driver's seat. Safe stopping procedure prevents all unintentional movements of the attachment. Note that the loader boom can move down even if the engine of the loader is turned off. Safe stopping procedure:

- Lower the boom and the attachment on the ground.
- Shut down the loader engine and lock the parking brake.
- Release residual pressure from the hydraulic system; move all hydraulic control levers to their extreme positions a couple of times.
- Prevent starting of the machine, remove ignition key.

3.1 Personal protective equipment

Remember to wear proper personal protective equipment:



- The noise level at the driver's seat may exceed 85 dB(A) depending on loader model and operating cycle. Extended exposure to loud noise can cause hearing impairment. Wear hearing protection while working with the loader.



- Wear protective gloves.



- Wear safety boots whenever working with the loader.



- Wear safety glasses when handling hydraulic components.



- Wear respirator mask when operating in dusty conditions.

4. Technical specifications

Table 2 – Collecting broom 1500 - Technical specifications

Product number	A35602	A35918	A35919
Working width:	1500 mm	~1810 mm	~2100 mm
Total width:	1818 mm	2000 mm	2100 mm
Side brush - standard/available:	0/2	1/2	2/2
Water spraying system:	Option A35642	Option A35642	Standard
Weight, without water spraying system	425 kg	450 kg	475 kg
Water spraying system:	150 l, empty weight 17 kg		
Collector box:	370 l, hydraulic opening		
Brush type:	550 mm, individually replaceable nylon brush discs side brush: diameter 350 mm, nylon & steel		
Recommended hydraulic flow:	50-60 l/min		
Maximum input of hydraulic energy:	70 l/min, 22,5 MPa (225 bar)		
Compatible AVANT loaders:	See Table 1, Designed purpose of use		

4.1 Safety labels and main components of the attachment

Listed below are the labels and markings on the attachment. They must be visible and readable on the equipment. Replace any unclear or missing label. New labels are available via your retailer or contact information provided on the cover.



WARNING

Make sure all warning decals are readable. The warning labels contain important safety information and they help to identify and remember the hazards related to the equipment. Replace damaged or missing warning labels with new ones.



A46771



A46772



A46799



A46803



A46806

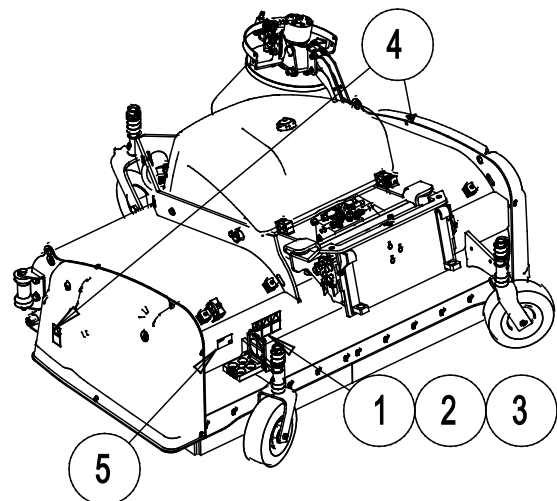
AVANT Avant Tecno Oy Ylötie 1 FIN-33470 YLÖJÄRVI			
TYPE	No.		
	kg		
	l/min		
Max	l/min,	MPa (	bar)
2014	Made in EU		CE
	www.avanttecno.com		

Attachment identification plate A423234

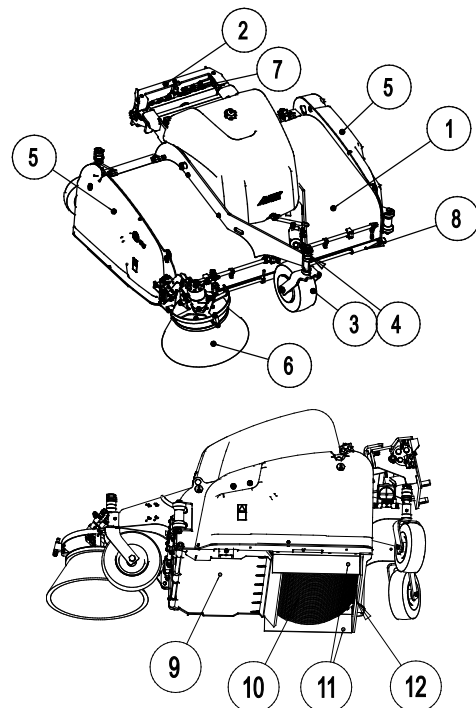
To apply a new label: Clean the surface thoroughly to remove all grease. Allow it to dry completely. Peel off the protective film of the label and press firmly to apply. Take care not to touch the glue of the label.

Table 3 - Decal locations and warning messages

Decal		Warning message
1	A46771	Read instructions before use.
2	A46772	Do not go under a raised attachment or loader boom; stay away from raised equipment.
3	A46803	Crushing hazard, floating attachment bracket and side turning. Keep clear of moving components.
4	A46799	Beware of thrown objects; keep a safe distance from the equipment. (2 m), 2 pcs.
5	A46806	Entanglement hazard, do not go near the broom when in operation. Beware also of entanglement of clothes or hair. 2 pcs.
6	A423077	Identification plate

**Table 4 - Collecting broom 1500 - Main components**

1	Frame, including collecting box
2	OptiFloat quick attach plate mechanism
3	Support wheel, 3 pcs
4	Support wheel adjustment on each wheel
5	Side cover plate on both sides
6	Side brush
7	Hydraulic valve and safety valve
8	Broom protective cover
9	Collector box hatch
10	Main broom
11	Side bristle skirt
12	Rear bristle skirt



5. Attaching the attachment

Attaching the attachment to the loader is quick and easy, but it must be done carefully. The attachment is mounted to the loader boom by using the quick attach plate on the loader boom and the counterpart on the attachment.

If the attachment is not locked to the loader, it may detach from the loader and cause a hazardous situation. The loader must not be driven and the boom must never be lifted when the attachment has not been locked. To prevent hazardous situations, always follow the coupling procedure shown below. Also remember the safety instructions shown in this manual. The attachment is mounted to the loader as follows:



WARNING

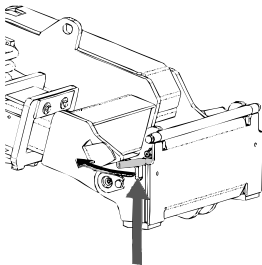
Crushing risk - Make sure that an unlocked attachment will not move or fall over.

Do not stay in the area between the attachment and the loader. Mount the attachment only on level surface.

Never move or lift an attachment that has not been locked.

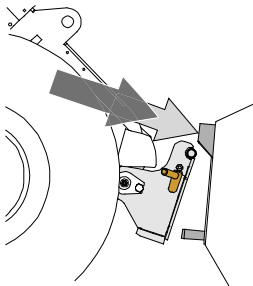
Avant quick coupling system:

Step 1:



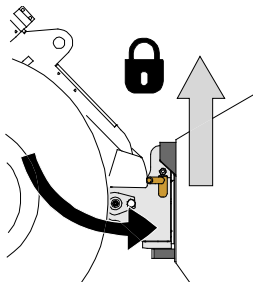
- Lift the quick attach plate locking pins up and turn them backwards into the slot so that they are locked in the upper position.
- If your loader is equipped with a hydraulic attachment locking system, see additional instructions about the use of the locking system from the relevant manuals.
- Ensure that the hydraulic hoses and the electric harness are not in the way during installation.

Step 2:



- Turn the quick attach plate hydraulically to an obliquely forward position.
- Drive the loader onto the attachment. If your loader is equipped with a telescopic boom, you can utilise this.
- Align the upper pins of the loader's quick coupling plate so that they are under the corresponding brackets of the attachment.

Step 3:



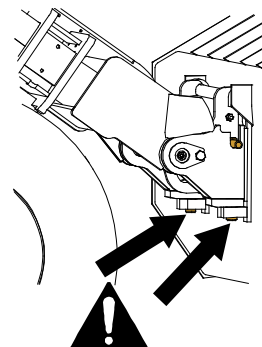
- Lift the boom slightly – pull the boom control lever backward to raise the attachment off the ground.
- Turn the boom control lever left to turn the bottom section of the quick attach plate onto the attachment.
- Lock the locking pins manually or lock the hydraulic locking.
- **Always check the locking of both locking pins.**

**WARNING****Risk of crushing - Avoid tipping over the attachment.**

Excessive tilting or lifting of an unlocked attachment increases the risk of tipping the attachment over. Do not use the automatic locking of the locking pins when the attachment is lifted more than one meter from the ground. If the locking pins do not return to the normal position when tilting, do not tilt or raise the attachment any more. Lower the attachment on the ground and secure the locking manually.

**WARNING****Risk of falling objects - Prevent dropping of attachment.**

An attachment that has not been completely locked to the loader may fall on the boom or towards the operator, or fall under the loader during driving, causing loss of control of the loader. Never move or lift an attachment that has not been locked. Before moving or lifting the attachment, make sure that the locking pins are in the lower position and come through the fasteners on the attachment on both sides.

**WARNING**

Make sure the loader is compatible with the attachment. Stability of the loader, possible overload of the attachment, and compatibility of loader control systems must be ensured in addition to mechanical compatibility of the attachment. If you use the attachment with a loader that is not fit to be used with the attachment model you have, risks include tipping over, damage to attachment due to overload, and risks related to uncontrolled motion of attachment and its parts. If your loader is not listed in Table 1 on page 6, ask your Avant dealer before using this attachment.

5.1 Connecting and disconnecting hydraulic hoses

On Avant loaders the hydraulic hoses are connected using the multi connector system. If you have an Avant 300-700 series loader with the conventional quick couplers and wish to change to the multi connector system, contact your Avant dealer or service point for instructions or installation services.

**WARNING**

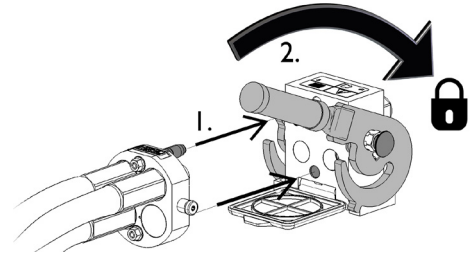
Risk of movement of the attachment and ejection of hydraulic oil - Never connect or disconnect quick couplings or other hydraulic components while the control lever of the auxiliary hydraulics control lever is locked on or if the system is pressurized. Connecting or disconnecting the hydraulic couplings while the system is pressurized may lead to unintended movements of the attachment, or ejection of high-pressure fluid, which can cause serious injuries or burns. Follow safe stopping procedure before disconnecting hydraulics.

NOTICE

Keep all fittings as clean as possible; use the protective caps on both the attachment and the loader. Dirt, ice, etc. may make using the fittings significantly more difficult. Never leave the hoses hanging on the ground; place the couplings onto the holder on the attachment.

Connecting the multi connector system:

1. Align the pins of the attachment connector with corresponding holes of the loader connector. The multi connector will not connect if the attachment connector is upside down.
2. Connect and lock the multi connector by turning the lever towards the loader.

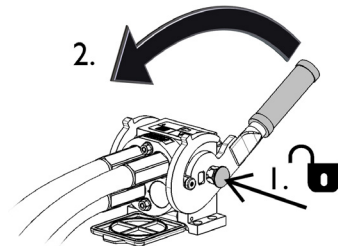


The lever should move easily all the way to its locking position. If the lever does not slide smoothly, check the alignment and position of the connector and clean the connectors. Also shut down the loader and release the residual hydraulic pressure.

To disconnect the multi connector system:

Before disconnecting put the attachment down on a solid and even surface.

1. Switch off the auxiliary hydraulics of the loader.
2. While pushing unlock button, turn the lever to disconnect the connector.
3. After ending operation put the multi connector on its holder on the attachment.

**Disconnecting hydraulic hoses:**

Before disconnecting the fittings, lower the attachment to safe position on solid and level surface. Turn the control lever of the auxiliary hydraulics to its neutral position.

NOTICE

When uncoupling the attachment, always disconnect the hydraulic couplings before unlocking the quick attach plate, to prevent hose damage and any oil spills. Reinstall the protective caps on the fittings to prevent impurities from entering the hydraulic system.

Releasing residual hydraulic pressure:

In case residual pressure is left in the hydraulic system of the attachment, it is often possible to disconnect the hydraulic couplings, but it may be difficult to connect them the next time. If the fittings will not connect, the residual pressure must be released by turning the auxiliary hydraulics control lever of the loader, when the engine is turned off. To make sure that there will not be residual pressure in the hydraulic system of the attachment, shut down the loader engine and move the auxiliary hydraulics control lever of the loader back and forth before disconnecting the couplings.

5.2 Electric connection

Electric functions of the attachment:

The pump of the optional Water spraying system is electric. The electric water pump of the Water spraying system can be controlled with the standard electric harness that is supplied with the attachment, or with the Attachment control switch pack of the loader.

5.2.1 To connect the electric harness of the attachment to the loader

Starting from year 2016, there is an integrated electric plug in the multiconnector of the attachment. However, a separate electric harness is also supplied with the attachment, to make it possible to connect and use the attachment with loaders that are not equipped with Attachment control switch pack.

There are three ways to connect the electric connector, depending on the equipment on the loader and the attachment:

1. If your loader is not equipped with the attachment control switch pack:

Use the separate cable kit with a switch that is supplied with the attachment. Connect this cable to the 12 V electric socket near the operator's seat of the loader, and to the electric plug of the attachment.

1. Electric plug, connects to the 12 V electric socket near the operator's seat of the loader.

More information about the power outlet of the loader can be found in the operator's manual of the loader.

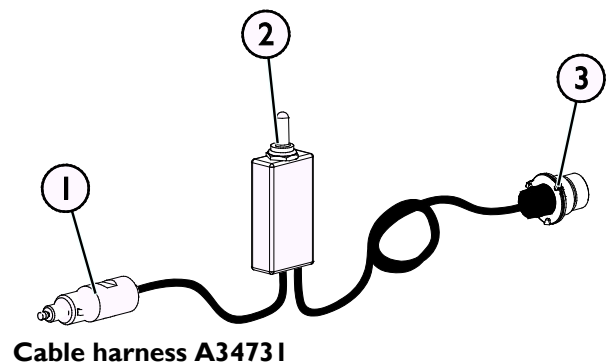
2. ON-OFF switch

Select the location of the switch in the cab so that it is easily accessible but will not be used inadvertently.

This cable with a switch can be used only to control the rotation of the chute.

3. Connect to the electric plug of the attachment.

If the attachment is equipped with a electric plug that is integrated to the multiconnector of the attachment, disconnect the electric cable from the multiconnector.



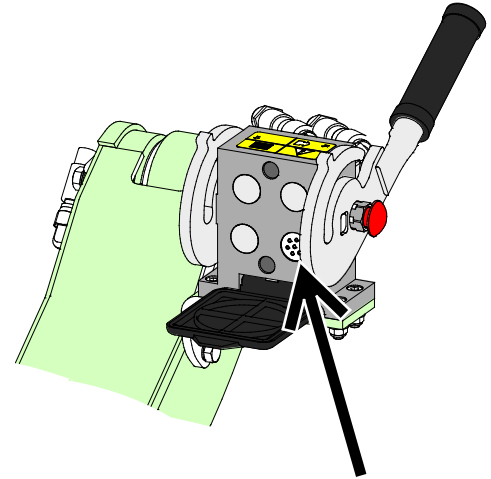
Cable harness A3473 I

2. If your loader is

- equipped with the attachment control switch pack, and
- the loader is manufactured **after** 2016:

If the loader is equipped with the attachment control switch pack, and the electric socket integrated in the multiconnector, the electric harness of the attachment is connected when the multiconnector is coupled. Clean both multiconnectors before connecting the multiconnector.

The separate cable harness A34731 is not needed when the loader is equipped with the Attachment control switch pack.



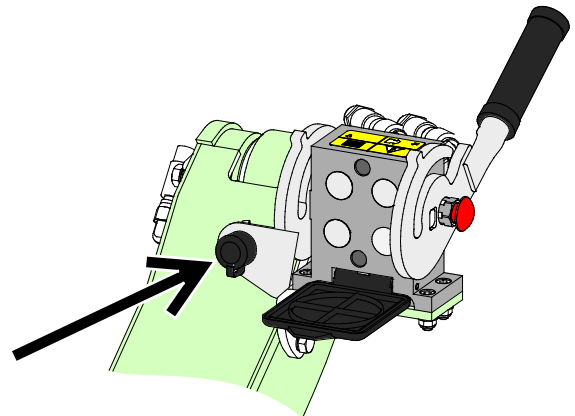
Attachment control switch pack, loader manufactured in 2016 or later

3. If your loader is

- equipped with the attachment control switch pack, and
- the loader is manufactured **before** 2016:

If the loader is equipped with the attachment control switch pack, and there is an electric socket near the multiconnector of the loader, connect the electric plug of the attachment to the socket of the loader.

The separate cable harness A34731 is not needed when the loader is equipped with the Attachment control switch pack.



Attachment control switch pack, loader manufactured in 2015 or before

NOTICE

Make sure that electric cables will not get stuck, squeezed, or stretched when the equipment moves.

With the help of the attachment control switch pack available for the loader, the attachment control switches are easily accessible at the end of the boom control lever.

More information about the power outlet of the loader can be found in the operator's manual of the loader.

5.3 Storage / transport support brackets

The broom shaft is connected in a way that allows it to move, so that the broom will always be pressed against the ground with correct force. To prevent the constant pressure from permanently bending the bristles when the broom is not used, there are storage supports located inside the side covers, on both sides of the broom.

Also, before longer storage periods or transportation the supports should be set to prevent bending of the bristles.

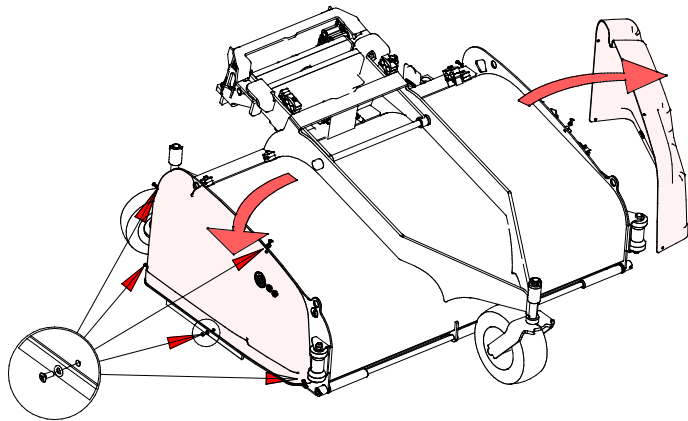
NOTICE

Before using the collecting broom for the first time, the support brackets holding the broom up must be released on both sides of the attachment.

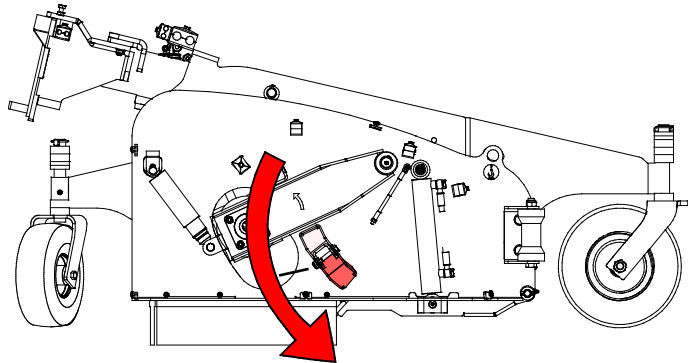
To set or release the storage supports:

1. Remove the side covers on both side of the collecting broom.

The covers are held in place by five screws on each side.



2. Release the red support brackets to their lower position.



NOTICE

Always store the broom in a way that no weight is applied on the bristles. Make sure that unintended slow lowering of the broom during its storage will not cause a crushing hazard or block the broom from moving. The bristles may bend permanently if weight is left on them.

NOTICE

To prevent freezing of the watering system, ensure that during cold seasons all water is drained from the system. The pump of the watering system will get damaged if water gets frozen inside it. Disconnect the water hoses to drain the system completely.

6. Using the broom

Check the attachment and the operating environment once more before starting to work, and that all obstacles have been removed from the operating area. Quick inspection of the equipment and the operating area before use are parts of ensuring safety and the best performance of the equipment. Practise the use of the attachment and its controls in an open and safe area. If you are unfamiliar with the loader in use, it is recommended to practise its use without any attachments.



WARNING

Entanglement hazard - Never leave the driver's seat when the broom is in operation. Keep a safe distance between the broom and other persons and stop the broom and lower it down completely whenever others are in proximity with the broom. Never perform any maintenance or adjustments if the broom can start by accident. Shut down the loader engine, turn off auxiliary hydraulics and lower the loader boom before going near the attachment.



WARNING

Hazard of thrown objects - Keep bystanders away. Note that the attachment can throw stones, gravel, or other objects found in the area at high speed. Always keep a safety distance of at least 2 metres to other persons.



WARNING

Risk of tipping over - Avoid overload. Loader can tip over when handling too heavy loads, or because of dynamic movements caused by driving with and handling of a heavy load. Do not extend the telescopic boom when the load approaches the lifting capacity of the loader, or when the loader boom is in horizontal position. When you notice that the rear wheels of the loader are about to lift from the ground, or if the load indicator of the loader (if fitted) signals:

- Lower the load calmly and retract the telescopic boom
- Avoid sudden changes in speed or direction whenever load is lifted
- Use additional counterweights as needed



6.1 Checks before use

- Before starting work, remove large items that can't be collected with the broom from the working area.
- Drive carefully on uneven terrain and note the effect of heavy load at the front of the loader to the stability and handling of the loader.
- Before each use, check the operation of the broom and ensure that the brush can rotate freely. Check that there is no string or other foreign material coiled around the broom. Check also the condition and the setting of the side brush.
- Ensure that bystanders are at a safe distance when operating the equipment. Do not let anyone to enter danger area of the boom or to stay directly in front of the loader. Also make sure that it is safe to reverse with the loader. Never assume that bystanders will remain where you last saw them; especially children are often attracted to the moving equipment.
- Check the general condition of the attachment and the loader, and check for possible hydraulic oil leaks. The attachment must not be used, if there is a fault in the hydraulic system of the loader or the attachment. Refer to Chapter 9 for maintenance instructions.
- Operate the attachment and the controls of the loader only when seated on the driver's seat. Ensure that the loader and the attachment are used in a safe manner and as intended. Do not allow children to operate the equipment.
- Never operate the loader or attachments while under the influence of alcohol, drugs, medication that may impair judgement or cause drowsiness, or if not otherwise medically fit to operate the equipment.
- Remember correct working methods and avoid leaving the driver's seat unnecessarily.



WARNING

Hazard of thrown objects - Keep bystanders away. Note that regardless of the protective housing of the broom, the broom may eject sand, stones, pieces of wood or other material far from the broom. Stop the broom immediately if there are others closer than 3 meters from the broom.

NOTICE

Regularly clean the loader oil cooler core; refer to the operator's manual of the loader for more instructions. Overheating oil decreases the power and affects the service life of the hydraulic components of both the attachment and the loader.

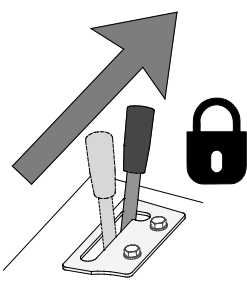
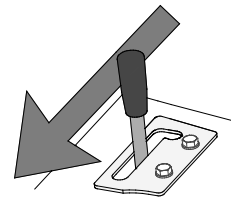
6.2 Operator qualification

Anyone who intends to use the collecting broom must:

- Know the intended use of the attachment.
- Know how to use the loader safely in different operating conditions.
- Read and always follow the instructions concerning the use of the attachment in this operator's manual.
- Have this manual and the operator's manual of the loader available.
- Ensure that the loader and the attachment are used in a safe manner and as intended.
- Never allow children to operate the equipment.
- Never operate the loader or attachments while under the influence of alcohol, drugs, medication that may impair judgement or cause drowsiness, or if not otherwise medically fit to operate the equipment.
- Complete any possible mandatory training required by the employer before use.

6.3 Operating the broom

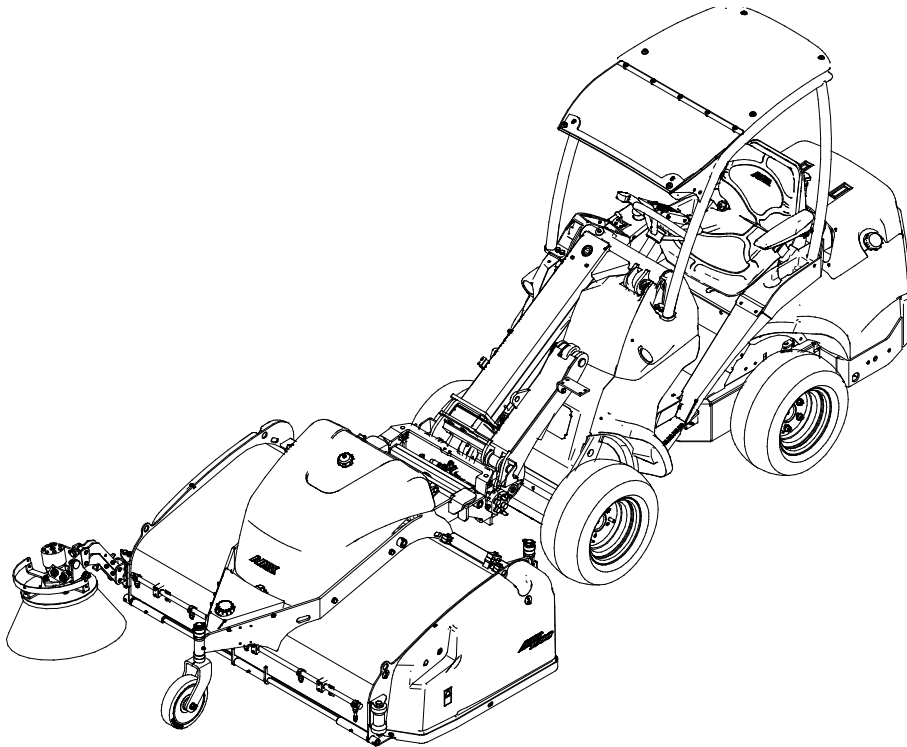
The broom is operated with the auxiliary hydraulics of the loader. The broom has two operating modes:

Auxiliary hydraulics control lever: (or electric joystick buttons):	Broom on its support wheels:	Broom lifted off the ground:
	Broom rotate	Close collector box
	-	Open collector box

NOTICE

Check the position of the storage supports before using the attachment. See instructions in this manual.

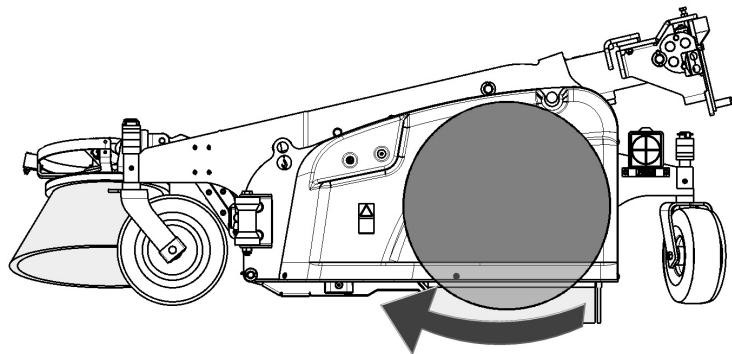
Operate the controls of the loader and its attachment in a careful and smooth manner, and avoid sharp turns and sudden changes in speed or direction whenever using the collecting broom.



Direction of operation:

The broom is intended to rotate only to its normal operating direction so that the broom will function as collecting broom.

When moving the auxiliary hydraulics control lever towards its locking position, the broom will rotate as illustrated in the adjacent figure.



NOTICE

To prevent damaging the bristles, do not drive with the loader keeping the broom on the ground without rotating it.

Rotating speed:

Use high engine rpm for best collecting results. Depending on the loader model and drive speed, one or two hydraulic pumps may be used. Note that unnecessarily high rotating speed will wear the broom down more quickly, so the speed should be set according to operating conditions, material being handled, and the drive speed.

NOTICE

Operate the attachment keeping the hydraulic flow within recommended range. Never exceed maximum allowed input of hydraulic energy.

6.3.1 OptiFloat[®]

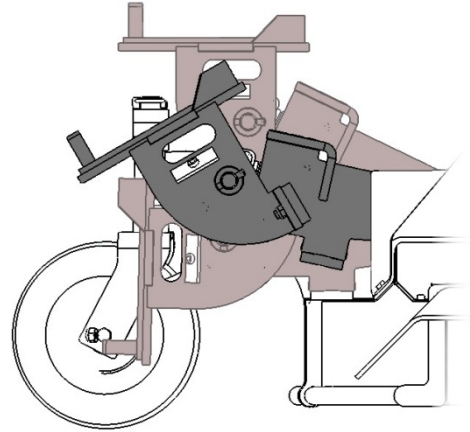
The attachment is equipped with a mechanical floating system, which enables efficient operation on uneven terrains. Floating refers to a linkage that allows the attachment to follow the contours of the ground surface without moving the loader boom. OptiFloat[®] allows the attachment to tilt sideways as well and eliminates the need for floating of the loader boom.

Floating is adjusted by using the controls of the loader boom from the driver's seat, when ready to begin use.

To set the optifloat linkage to correct initial position:

- Position the loader boom and its quick coupling plate to about in the middle of the extreme positions of the floating linkage.
- The middle position in the adjacent figure indicates the correct initial setting.

The operation of floating is greatly affected by its setting. If the floating has been set too high, the attachment is easily left hanging in the air. When it is too low, the loader's front wheels are easily raised off the ground.



NOTICE

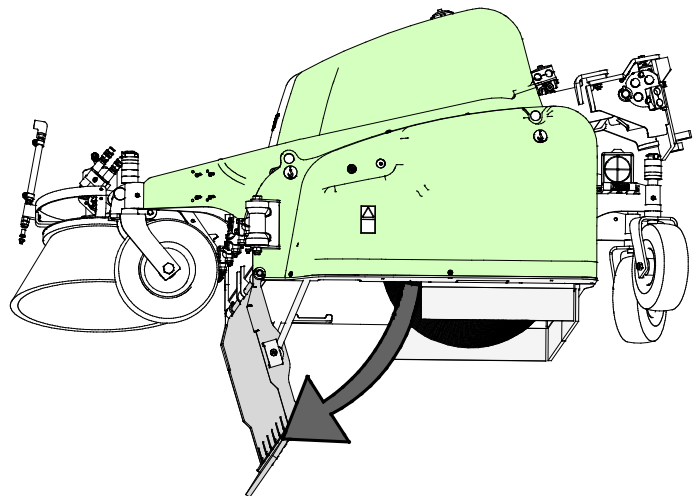
When setting the mower floating linkage to correct operating position, avoid pressing the attachment hard against the ground with the loader boom to avoid damaging it. Operate both the lift and tilt movements of the loader boom carefully.

6.4 Emptying the collector

When the collector box is about to fill or all of the material is not collected anymore, stop the broom and drive to emptying site keeping the broom at a horizontal position or tilted slightly forward to prevent material from spilling out from the box.

For emptying, the collector box opens hydraulically from front below of the machine. The broom collecting box is emptied from the driver's seat by moving the auxiliary hydraulics control lever when the broom is lifted off from the ground.

To get all the material out from the box, you can move the auxiliary hydraulics lever back and forth rapidly a couple of times to move it just a little, but avoid shaking or banging the broom hard.



NOTICE

The auxiliary hydraulics control lever will move the collector box opening cylinders when the broom is lifted off from the ground. Make sure that the box is completely closed before lowering the attachment on the ground.

6.5 Adjusting operating height

The operating height of the broom can be adjusted with the plastic sleeves on the vertical axles of the support wheels. Suitable setting depends on the operating area and the material being handled, and the height should also be adjusted as the broom wears down.

1. Lift the attachment slightly off the ground with the loader and shut down the engine.
2. Remove the cotter pin from the vertical axle of the bearing wheel. Pull the wheel off its holder.
3. Move some plastic sleeves from above the bracket to below it or vice versa, depending on whether you wish to raise or lower the mower.
4. Push the axle back in through the bracket and reinstall the cotter pin.
5. Repeat steps 2–4 for each wheel. Ensure that all wheels are adjusted to the same height.



It is easiest to adjust the height while the attachment is lifted slightly off the ground with the loader.



DANGER

Risk of serious injury or death - Lowering of boom can crush anyone under the attachment or loader boom. Stop use immediately and if anyone is in risk of getting under an attachment or in the area between the loader and the attachment. The boom or attachment may move unexpectedly even if the loader has been shut down. Keep a safe distance from the hazard area and from any moving component.

Correct height adjustment:

The suspended, floating broom shaft will lower against the ground to correct operating pressure. Lower the broom on its wheels and set the floating to correct operating position. The support wheels are set correctly when:

- the rubber edge plate of the collector box is close to the broom, but not in contact with it
- side bristle skirts are close to the ground or only touch it lightly

NOTICE

If the broom is set too low, it will require more power and the broom will wear down quickly.

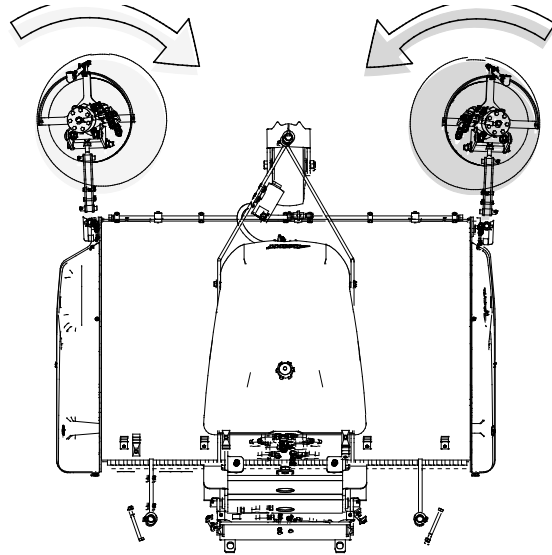
6.6 Side brush

The collector broom can be equipped with two side brushes.

Using a side brush improves the reach of the collector broom when operating near walls, for example.

The side brushes are rotated by their own individual hydraulic motors, and the rotation of the side brushes can be adjusted with the valve on the attachment.

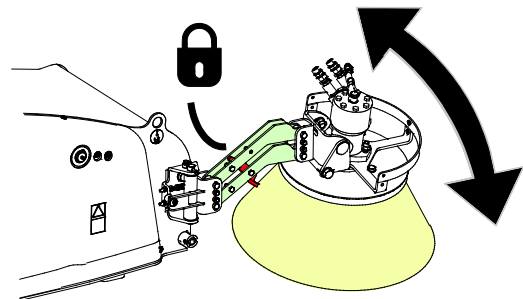
The side brushes rotate as to sweep material towards the front of the broom.



6.6.1 Setting the side brush

Lifting and lowering:

If the side brush is not needed, it can be locked off the ground with the red locking bracket.



Activating of side brush:

The side brush is activated or stopped with the knob at the valve of the collecting broom.

- Turning the screw clockwise activates the side brush.

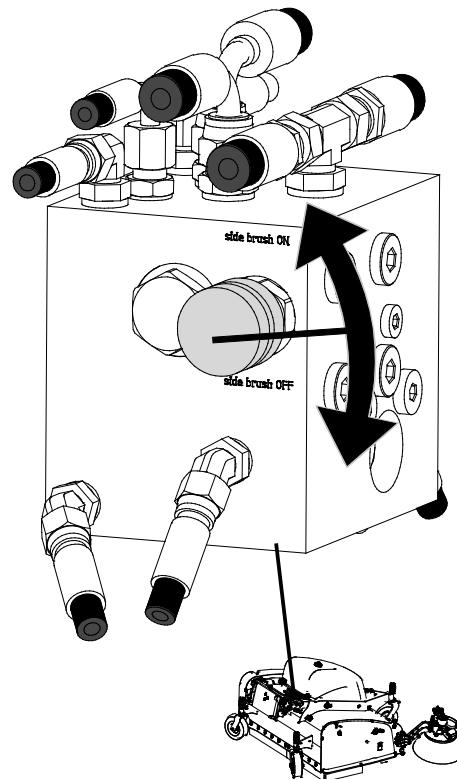
Lock the screw so that the setting will not change as the machine vibrates.

To stop the side brush:

- Turn the knob counterclockwise to stop the side brush.

NOTICE

Keep the valve in fully closed or open setting. Leaving the adjustment in other position will heat up the hydraulic oil quickly. The valve is not intended to control the speed of the side brush.



6.7 Water spraying system

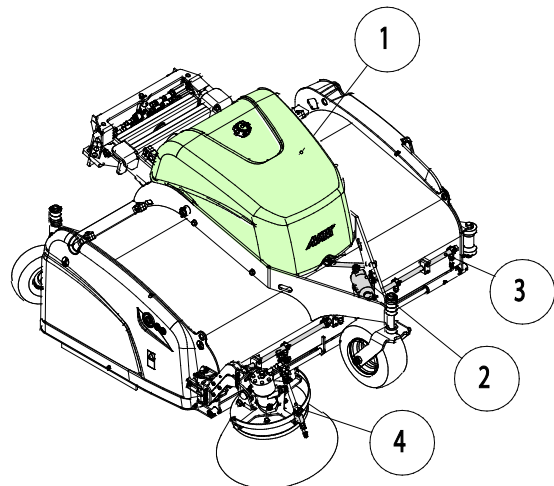
A water spraying system is available for reducing the spreading of dust during use of the broom.

The system contains:

1. 150-litre water tank and an electric pump under the tank
2. shut off valve
3. spraying tube with four or five nozzles

The spraying system is intended for spraying only water. Using solvents or cleaning agents is not permitted, as they might damage the components of the system. Do not leave water lying in the tank for long periods and make sure that the water in the system will not get frozen.

4. Side brush water nozzle is included in the side brush assembly.



NOTICE

Drain the system completely before storing the attachment in freezing conditions. Adding some wiper fluid in the tank and running it through the pump and nozzles can prevent freezing of small amount of water.

NOTICE

The pump of the water spraying system will get damaged easily, if it is run dry. Make sure that there is water in the tank. After use switch off the spraying system and close the water hose valve to prevent draining of water. Also remember to open the valve before use.

6.7.1 Using the water spraying system

To operate the water spraying system, if fitted, the electric harness for the water pump in the collecting broom must be connected to the loader. The pump of the water spraying is operated with either of the electric switch options or attachment control switch pack. See page 16 for more information about connecting the electric harness of the attachment.

- I. A cable harness with an ON-OFF switch is delivered with the attachment. Use the switch to turn the watering system pump on or off.

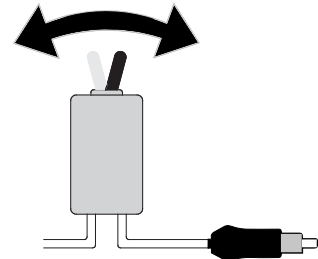
See page 16 for instructions about how to connect the electric harness of the attachment.

Keep the switch in the cab so that it is easily accessible, but will not be used inadvertently.

- I. Alternatively, when the loader is equipped with the optional Attachment control switch pack, it can be used to control the discharge chute rotation and throw height of the snow blower.

See page 16 for instructions about how to connect the electric harness of the attachment.

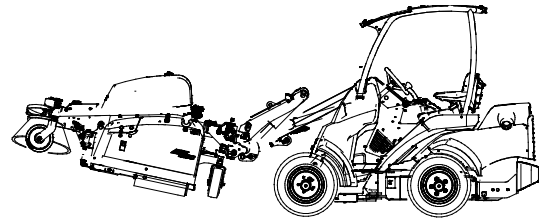
The pump of the water spraying is operated with switch number 1 of the attachment control switch pack. Other switches are not in use with this attachment.



6.8 Transport position

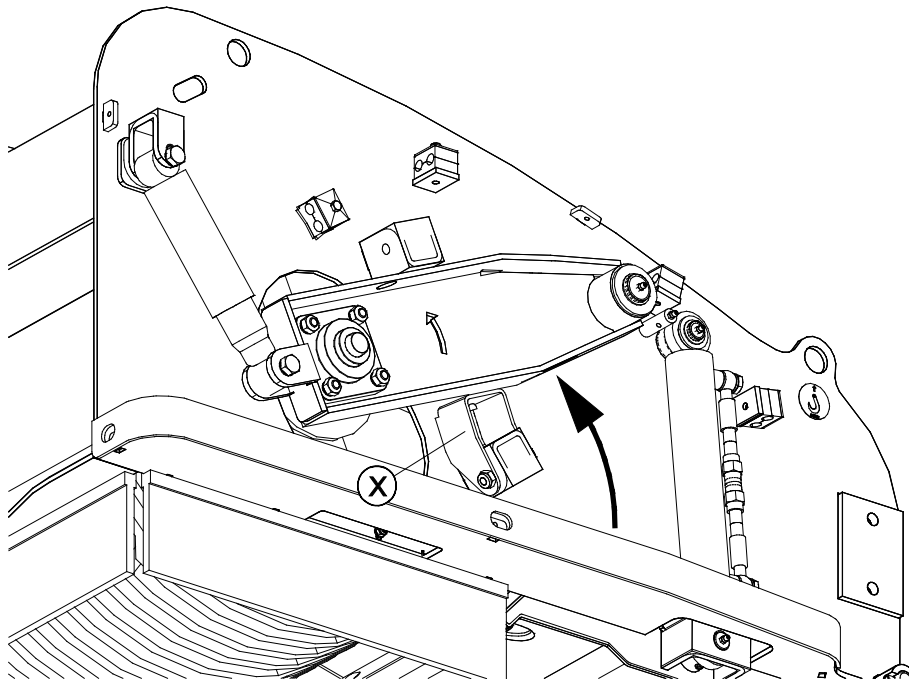


Keep the loader stable. Always transport the collecting broom as low and close to the ground as possible. Keep the telescopic boom retracted during drive.



6.9 Storing the attachment

Uncouple and store the attachment on level ground, but avoid leaving the attachment laying directly on the bristles. Set the storage supports (X) to their upper position in order to prevent bending of the bristles. Also see paragraph 5.3 Storage / transport supports. The best way to store the attachment is a place where it is protected from direct sunlight, rain, and extreme temperatures. Make sure that the attachment is secured against all movements during storage. Never climb on the attachment.



For longer storage periods touch up the paint where needed, grease the lubrication points and oil the visible parts of the hydraulic cylinder shaft in order to prevent rust damage.

7. Installing a side brush

The side brush can be fitted on either side of the collecting broom, and two side brushes simultaneously is also possible. As standard, the broom is equipped with a control valve with necessary outlets for this. The side brush installation kit also includes the needed components to connect the water spraying system to the side brush.

7.1 Qualification requirements for installation work:

Knowledge and skills about hydraulic assemblies are required for making the installation. It is recommended to leave the installation of hydraulic components to qualified service technicians. The manufacturer or its representative are not responsible for damages, losses or injuries resulted from incorrect or incomplete installations. Contact your nearest Avant dealer or service point, if you have any additional questions or require installation services.



DANGER

Risk of high pressure fluid injection through skin. Installation includes assembling hydraulic components. Incorrect assembly or loose fittings may cause ejection of high pressure fluid. Follow carefully all safety procedures regarding hydraulic assemblies and all given instructions.

The instructions given in this chapter are intended for qualified service technicians or individuals with training and experience about hydraulic assemblies.



WARNING

Risk of serious personal injury. The safety procedures concerning hydraulic assemblies apply both when installing new components or when modifying existing hydraulic systems. The following installation instructions include the necessary information needed in installation, but installation or modification work are allowed only if the person doing them can perform them safely.

The following safety procedures and general safety principles regarding hydraulic systems must be followed. Contact your Avant dealer or service point for more information or installation services.

NOTICE

Protect the environment from leaking of hydraulic oil and prevent oil from draining on the ground. Keep any loosened hydraulic hose in an upright position or plugged, so that they will leak as little as possible.

NOTICE

Clean the equipment thoroughly before starting the installation and make sure that i.e. dirt, dust or water will not enter the hydraulic components or the hydraulic oil. Keep the protective covers in place until the components can be installed directly. Follow safety procedures and wear proper personal protective equipment.

7.2 Safety instructions for hydraulic assemblies

High-pressure ejection of fluid may penetrate skin and cause serious injuries:



DANGER

Risk of high pressure fluid injection through skin - High-pressure ejection of fluid may penetrate skin and cause serious injuries.

Before handling hydraulic components, make sure that the hydraulic system of the attachment and the loader are completely depressurized. Never handle pressurized fittings.

Never hold your hand tightly around or near a fitting when tightening or opening it, or when searching for leaks. Use a piece of cardboard to find leaks.

Seek medical attention immediately in case hydraulic fluid is injected through the skin. Also general skin contact with the oil can be harmful. Always wear protective gloves, safety goggles and protective clothing.



1. Allow the hydraulic systems of the loader and of the attachment to cool down completely before any work on hydraulic systems.
2. Make sure that the loader boom or any other part of the attachment can't move causing crushing or pinching hazards:
3. Lower the loader boom to its lower position and lower the boom firmly on the ground. For the best stability, keep the attachment locked on the loader.
4. Shut down the loader engine.
5. Move the auxiliary hydraulics control lever to its extreme positions several times to release residual pressure.
6. Uncouple the multiconnector or quick couplings from the loader to prevent draining of hydraulic oil.

7.3 Tightening hydraulic fittings

Tighten the fittings carefully according to given instructions and safety procedures. Keep in mind that over tightening will break a fitting. Tighten basic fittings carefully with hand tools using moderate torque. The elbow fittings should be tightened at last, after hoses have been fitted to their clamps.

Tapered JIC-type fittings:

NOTICE

- Lubricate the inner surfaces and threads of the fittings.
- A JIC type fitting is not tightened only by torque and it will not need a lot of force at any point when tightening. Overtightening or misalignment will break the fitting.
- Turn the manually as far as possible, and then lightly with tools ensuring that the fitting is threaded properly. When noticing clear increase in needed force, tighten fitting to its final tightness by turning only 1/3 to 1/2 turns using tools.
- After tightening, try to twist the hydraulic hose manually, the fitting should stay firm.

Test to find any leaks



DANGER

Before checking for leakages, or going near any hydraulic fitting, to avoid possible ejection of pressurized hydraulic oil:

- Shut down the loader engine
- Depressurize the hydraulic system completely
- Wipe the hydraulic components clean to find leaks more easily.
- Place pieces of cardboard around the fittings to detect leaks.
- Start the engine. While running on idle, operate the auxiliary hydraulics control lever briefly a couple of times. Shut down the engine, depressurize the hydraulics, and check for any sign of leak. Tighten if necessary.
- Repeat the test by gradually increasing engine rpm and operating time. Use both directions of the auxiliary hydraulics control lever.



DANGER

Risk of high pressure fluid injection through skin - Test the tightness of the hydraulic fittings carefully. Use idle rpm when starting the first time and keep a safe distance due to the risk of hydraulic fluid ejection. Shut down the loader and release the residual pressure before checking for leaks. Remember to use and wear protective equipment.



DANGER

Risk of high pressure fluid injection through skin - Never test the tightness of the hydraulic components by placing hands near the fittings. Never tighten a pressurized hydraulic fitting, since the fitting may break and the released oil may cause serious injuries.

Check the routing of hoses and movements of the attachment

After tightening the hydraulic components, test the movements of the attachment thoroughly. Check that the hydraulic hoses can not get stretched or pinched in any position of the loader boom or the attachment, or that the hoses are not in contact with sharp edges.

After thoroughly checking that the hoses are connected and fittings tightening, check the tightness of the fittings as described below. The hydraulic system will de-air itself when using the auxiliary hydraulics of the loader.

7.4 Fitting a side brush or changing the installation side

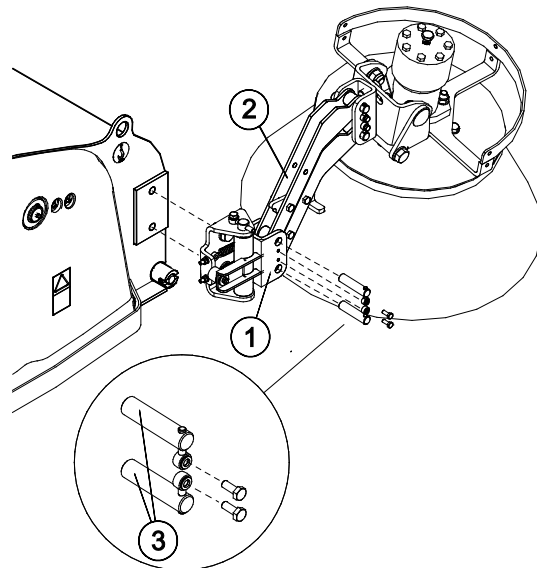
The separate installation kit A35698 for the side brush is ready to be installed on the right side of the broom when delivered.

1. Install the side brush installation bracket
2. Check for correct orientation of the hydraulic motor
3. Connect hydraulic hoses and secure them from hanging loose
4. Check all made connections carefully and test for leakage

1. To install a side brush, first install the bracket (1) to the broom.

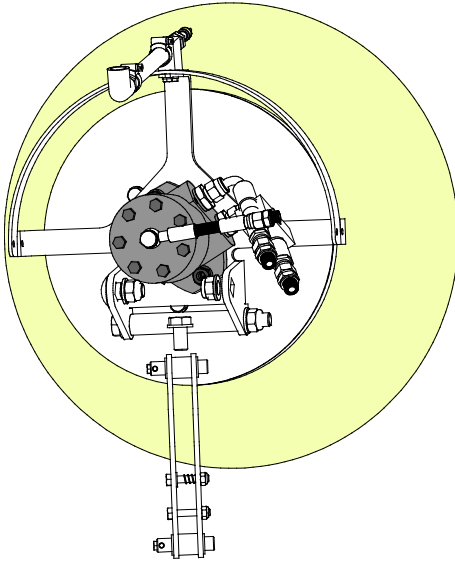
Fit the brush arm (2) with its locking pins (3).

The adjacent figure shows the orientation of fitting when installing the brush to the right side of the broom.

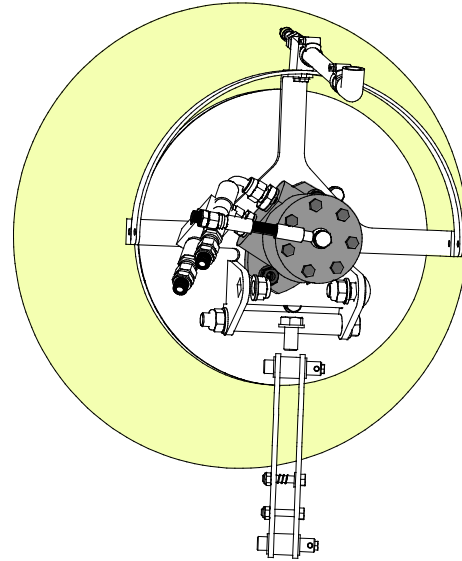


2. The hydraulic motor must be fitted according to which side the brush is installed to.

Positions of the hydraulic motor and hydraulic hose lines depending on the side to which the brush is installed:



Fitting the side brush on the left side



Fitting the side brush on the right side

3. ■ The hydraulic connections of the valve of the broom are shown below in Table 5.
- To make the installation easier, it's a good idea to mark both ends of each hose with i.e. tape, making it easier to connect the hoses correctly.
- When seen from above, the hydraulic motor will rotate clockwise, when pressure is connected to port A of the motor.
- Route the hydraulic hoses in a way that they will not be left stretched, twisted or bent tightly. Tighten the hose clamps after all hoses and fittings have been tightened to their final tightness.

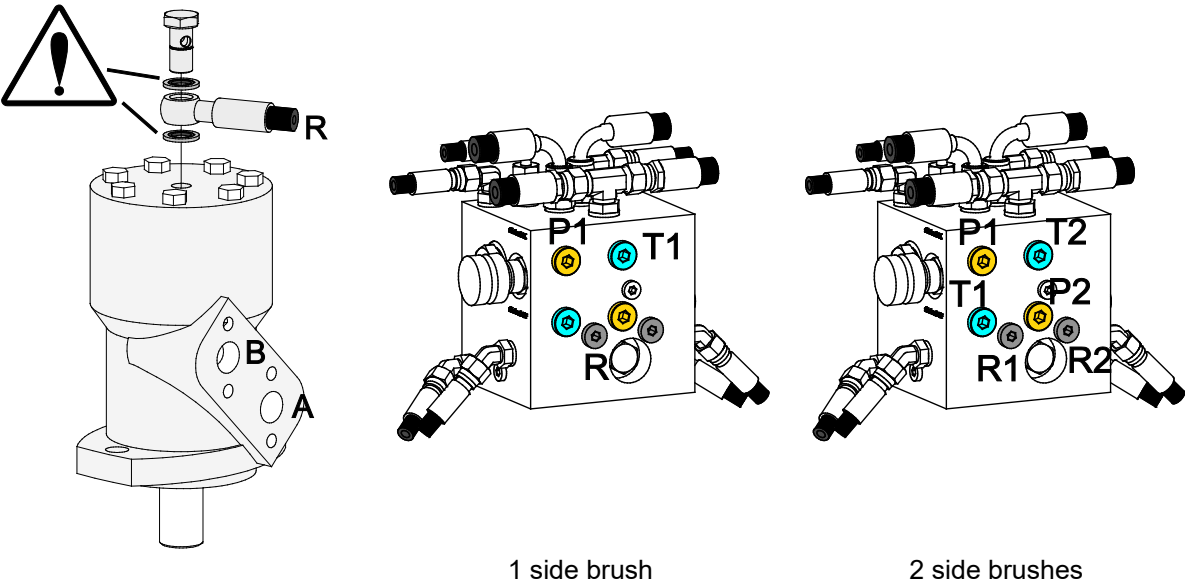


Table 5 - Side brush - Hydraulic connections

	Right brush		Left brush		Valve port
	A	B	A	B	
1 brush, right (standard setting)	P1	T1	-	-	
1 brush, left	-	-	T1	P1	
2 brushes, simultaneous operation	P1	T2	T1	P2	

Hydraulic motor drain line: R (free return line)

8. Maintenance and Service

The attachment has been designed to be as maintenance free as possible. Continuous maintenance includes regular cleaning and lubrication, and monitoring the condition of the attachment. Because of the crushing hazard caused by lowering machine parts, all maintenance work must be done when moving parts have been lowered down completely and the attachment is lowered flat against the ground.



Risk of crushing - Never go under lifted attachment. Make sure the attachment is properly supported during all maintenance work. Never go under a lifted attachment. The loader boom may lower unexpectedly during maintenance causing serious injuries from crushing or impact even when the loader engine is not running. All maintenance and service must be performed when the attachment has been lowered down to a safe position.

8.1 Inspection of hydraulic components

Check the condition of the hydraulic hoses and components when the engine has been turned off and the pressure has been relieved. Do not use the equipment, if you have discovered a leak in the hydraulic system of the attachment or the loader. Leaking hydraulic fluid may penetrate skin and cause serious injuries. Seek medical attention immediately in case hydraulic fluid penetrates the skin. Wash any part of body that has been in contact with hydraulic oil carefully with water and soap. Hydraulic fluid is also harmful to the environment and any leak to the environment must be prevented. Repair all leaks immediately after detecting them; a small leak can quickly grow into a big one. Operate the attachment only with type of hydraulic oil that is accepted for use in Avant loaders.



Risk of high pressure fluid injection through skin - Release residual pressure before maintenance. Never handle hydraulic components when the hydraulic system is pressurised, since a fitting may break or become loose and the released oil may cause serious injuries. Do not use the equipment, if you have discovered a fault in the hydraulic system.



Check hoses visually for cracks or abrasions. If there are signs of leaks, to check a component, hold up a piece of cardboard in the area where a leak is suspected. Do not use hands to search for leaks. Monitor the wearing of the hoses and stop the use, if the surface layer of any hose has worn off. Check the routing of the hoses; adjust the hose clamps to avoid abrasion to the hoses. The hoses have limited service life. Depending on operating conditions all hoses must be inspected thoroughly no later than after 3 to 5 years of use, and if required, they must be replaced with new ones.

Finding any fault means that the hydraulic hose or component must be replaced and the equipment must not be used until it is repaired. Spare parts are available from your nearest AVANT retailer or authorised service point. Leave the repair work to professional service technicians, if you don't have adequate knowledge and experience about hydraulic assemblies and how to perform the repairing safely.

8.2 Cleaning and lubrication

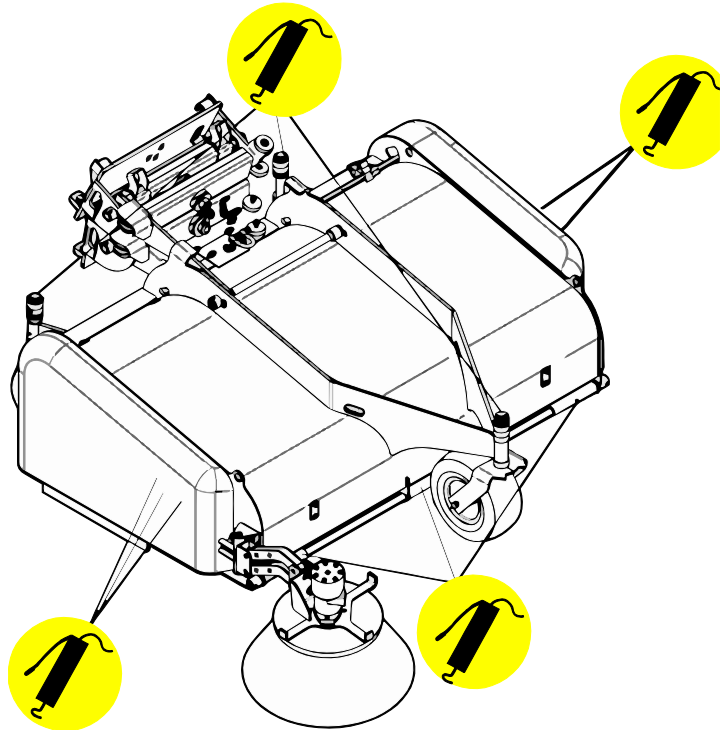
Clean the broom as soon as possible after use, so that it is easier to remove all dirt. A pressure washer and mild detergent can be used. Avoid using solvents or spraying directly at the bristles or hydraulic parts at high pressure. In addition, mind the labels on the attachment.

Do not store the attachment directly against the ground; place it on blocks of wood or on a pallet, for example. For longer storage periods touch up the paint where needed, grease the lubrication points and oil the visible parts of the hydraulic cylinder shaft to prevent rust damage.

There are a total of 11 lubricating points on the broom, as shown in the adjacent figure.

The lubricating points should be greased after every 5 to 10 hours of use, and the support wheel axles should be lubricated at least twice per year.

The pivot pins of the floating mechanism and of the side brush should be oiled regularly.



NOTICE

Bearing must be lubricated approximately after every 5 to 10 operating hours. Clean the end of the nipple before greasing. Only add the grease amount of a couple of grease press pushes at a time.

Clean the collector box thoroughly, do not leave water in the collector. Empty and rinse the water spraying system completely.

8.3 Brush

The nylon brush bristles have a long service life in normal operating conditions. As the brush wears down its diameter decreases, and eventually it will not throw material at sufficient speed for good collecting performance.

The brush consists of several parallel discs connected on a shaft. If you notice that a specific part of the brush has damaged or worn clearly more than the rest of it, the discs may be rearranged on the shaft to achieve more even wearing. The damaged brush discs can be changed individually, but usually a larger section should be replaced to keep the performance of the broom even. If the damaged brush discs are worn clearly more than new ones, all of the discs should be replaced at once. Steel bristle discs may also be available, contact your dealer.

To replace the brush discs the broom shaft must be removed. The brush is made denser at the ends of the shaft by setting three discs the same way round at the both ends of the shaft. The discs are held together on the shaft by a tightening flange. When tightening the flange, the total compression of the discs along the shaft must not be more than 5 – 10 mm.

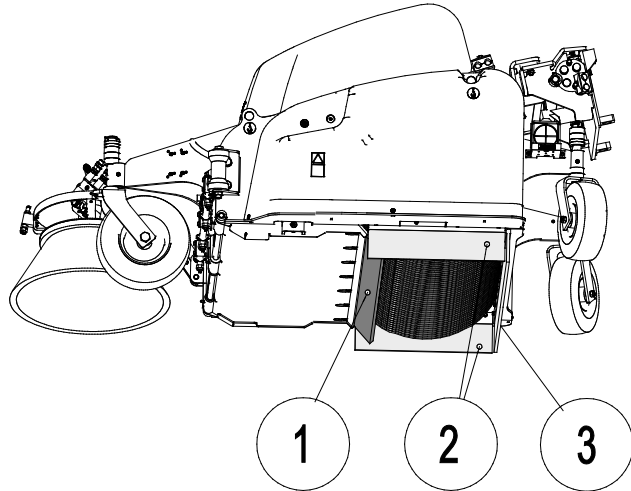
8.3.1 Side brush

The side brush has both nylon and steel bristles. Keep the side brush and its pivot joints clean, other maintenance is not needed.

8.3.2 Side bristle skirts and rubber edge plate

For the best collecting operation and preventing the spreading of dust, monitor the side and rear bristle skirts and the rubber lip plate, shown in adjacent figure. Replace if necessary.

1. Rubber edge plate A415559
2. Side bristle skirt (2 pcs) A415565
3. Rear bristle skirt (2 pcs) A415569



9. Warranty terms

Avant Tecno Oy grants a warranty of one year (12 months) from the date of purchase for the attachment it manufactures.

The warranty covers repair costs as follows:

- Work costs are covered, if the repair is not performed at the factory.
- The factory replaces any defective components or consumables.

The factory may reimburse the price of components purchased by the customer in special cases that have been agreed in advance.

The warranty does not cover:

- Normal maintenance work or parts and consumables required for it.
- Damages caused by unusual operating conditions or ways of use, negligence, structural changes made without the consent of Avant Tecno Oy, use of non-original parts or lack of maintenance.
- Consequences of a defect, such as interruption of work or other possible additional damages.
- Travel and/or freight costs caused by the repair.

EY-vaatimustenmukaisuusvakuutus
EG-försäkran om överensstämmelse
EC Declaration of Conformity



Valmistaja / Tillverkare / Manufacturer:
 Osoite / Adress / Address:

AVANT TECNO OY
 Ylötie 1
 33470 YLÖJÄRVI, FINLAND

Vakuutamme täten, että alla mainitut tuotteet täyttävät konedirektiivin turvallisuus- ja terveysvaatimukset (direktiivi 2006/42/EY muutoksineen). Seuraavia yhdenmukaistettuja standardeja on sovellettu /

Vi försäkrar härmed att nedan beskrivna produkter överensstämmer med hälso- och säkerhetskrav i EG-maskindirektiv (EG-direktiv 2006/42/EG som ändrat). Följande harmoniserade standarder har tillämpats /

We hereby declare that the products listed below are in conformity with the provisions of the Machinery Directive (directive 2006/42/EC as amended). The following harmonized standards have been applied:

SFS-EN ISO 12100, SFS-EN ISO 4413

Mallit / Modeller / Models:

Avant	
Hydraulitoiminen keräävä harjalaite; Avant-kuormaajan työlaite	A35602
Hydraulisk sopvals med uppsamlare; arbetsredskap för Avant lastare	A35918
HydraulicCollecting broom; attachment for Avant loaders	A35919



23.7.2018 Ylöjärvi, Finland

Risto Käkelä,
 Toimitusjohtaja / Verkställande direktör /
 Managing Director

Original language version



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