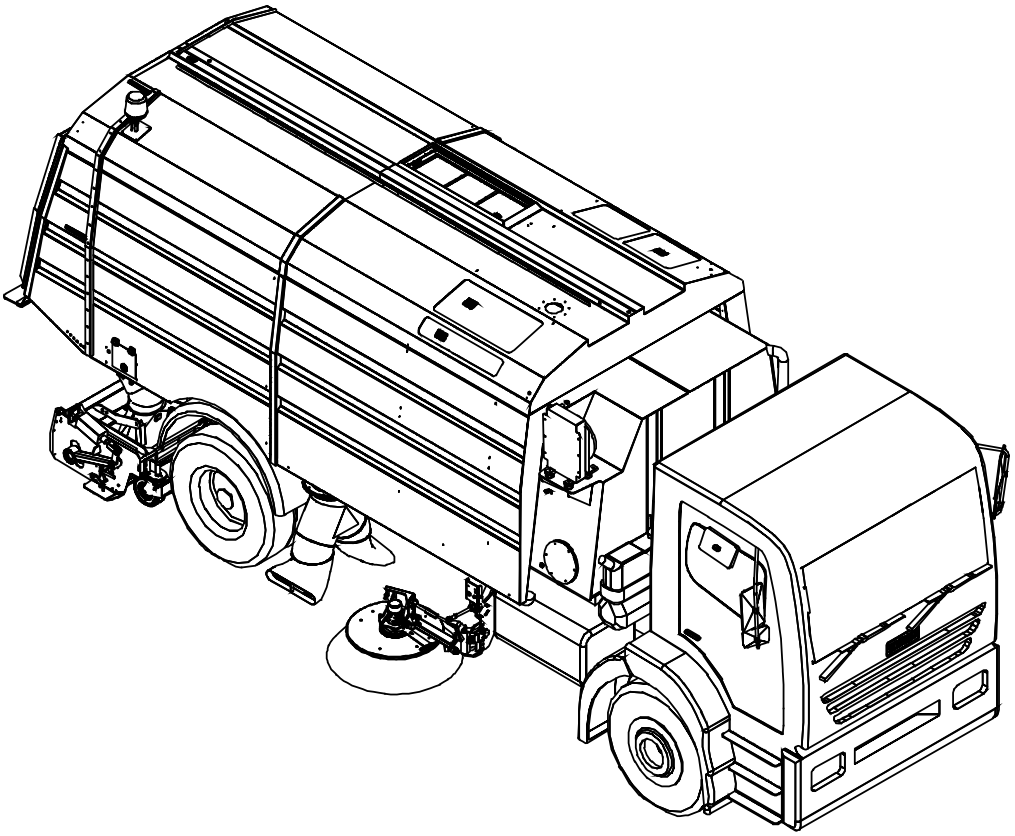
Product group:	Sweeper

Operating Instructions

Airport Sweeper
Airport Stand Cleaner

Model: AS 990

List No. 1048964-2 from 70-1-001 en Edition 11



Read the operating instructions before putting the machine into operation.
Keep the operating instructions in the machine and include them with the machine if it is transferred.
We reserve the right to make changes to the technical details included in the specifications and diagrams in these operating instructions. Reproduction, translation and photocopying in whole or in part without written permission is forbidden.

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Abbreviations

Co.	company
etc.	and so on
etc.	et cetera, and so on
e.g.	for example
and/or	or respectively
approx.	approximately
if required	if required
possible/any	possible/any
cpl.	complete
min.	minimum
max.	maximum
perm.	permissible
DIN	German Industry Standards
StVZO	German Road Traffic Act
UVV	Accident Prevention Regulations
No.	Number
PA	polyamide
rpm	revolutions per minute
min.	minute
s	second
km/h	Kilometres per hour
km	kilometre
cm	centimetre
mm	millimetre
V	volt
Nm	Newton metre
MA	torque for screw connections
l	litre
ml	millilitre
t	ton
kg	kilogram
g	gram
90°	angle annotation
°C	degrees Celsius
dB	Decibel
m/s^2	acceleration

References

During the machine wash, proceed as for ***Machine Cleaning***.

Texts written in italics refer to a corresponding chapter in the operating instructions

Corrections and amendments to technical documents

If you wish to suggest changes to this manual, or if you notice an error or would like to suggest other improvements, please copy the page, mark the error or text for improvement and attach a brief comment. All recommendations will be examined and, if accepted, will be included in the next version of this publication.
Please send your suggestions to the service representative for your area or directly to the manufacturer.

1 The operating instructions

Before operating the AS 990 (called "AS 990" or "machine" in the following) for the first time, please read this manual thoroughly and familiarise yourself with the features of the machine in advance.
Make sure that you read thoroughly and understand the contents of this manual, particularly the safety instructions. Only then can you be confident that you are operating the machine safely and economically.

Anyone working with the machine must fully understand the machine's functions and must be able to safely operate AS 990.

If there are references to other documents in this operating manual, this documentation is also binding. (e.g. for engines, vehicles, etc.).
Should you require further information, e.g. hydraulic or electrical circuit diagrams, your nearest Aebi Schmidt service workshop will be pleased to help.

These operating instructions contain all the important instructions for using and carrying out maintenance on your machine. To ensure this is the case, the operating instructions should always be available with the machine.

To prolong superior performance, we recommend that you observe the required maintenance intervals and use only original Aebi Schmidt spare parts.
In this way, the machine can complete its tasks to your satisfaction and offer a long service life.

During the warranty period, the required work must be performed by Aebi Schmidt Customer Service, which has the necessary factory information, expert knowledge, and tools.

Have the maintenance work performed only be qualified workshops, especially on safety-related systems.
Observe all safety and hazard instructions observed and retain in full and in a legible condition.

Before carrying out any maintenance work, apply the parking brake, turn the ignition OFF and switch off the battery isolator switch.

The directions "right" and "left" in this manual refer to the direction of travel or from the driver's line of vision, facing forwards.

The control panel can be adapted to your specific requirements. In this case, certain functions that are described in these operating instructions may not be activated on your control panel. Changes to set parameters may only be performed by Aebi Schmidt customer service.

Any alterations, additions or modifications that may affect the vehicle's safety must first be approved by Aebi Schmidt. This also applies to settings for safety devices and welding of load-bearing parts or to modifications to the hydraulic or electronic systems. Should you have any questions or problems with the machine, our service department will be pleased to assist you.

The operating instructions belong with the machine and should remain with it should it be transferred to a third party.

The operating instructions must not be reprinted, translated or copied without written permission.

2 Declaration of Conformity

AEBI SCHMIDT Deutschland GmbH
Albtalstrasse 36
D – 79837 St. Blasien

Konformitätserklärung

Für die von uns hergestellte

Maschine:	Flughafen-Kehrmaschine / Airport-Sweeper
Typ:	AS 990
Bautyp-Nr:	0401329-8 / 1059017-6
	bestätigen wir die Übereinstimmung mit den Anforderungen der nachfolgenden Richtlinien
Richtlinien:	2006/42/EG, 2000/14/EG
	Eine entsprechende technische Dokumentation kann bereitgestellt werden. Zur Zusammenstellung dieser Unterlagen ist bevollmächtigt: AEBI SCHMIDT Deutschland GmbH Abteilung: Standards, Dokumentation Albtalstrasse 36 D – 79837 St. Blasien
	Bei Konstruktion und Herstellung wurden folgende Normen beachtet:
Normen:	DIN EN ISO 12100:2011 • DIN EN ISO 13857:2008 • DIN EN ISO 13850:2016 • DIN EN ISO 13732-1:2008 • DIN EN 1679-1:2011 • DIN EN ISO 4413:2011 • DIN EN 13019:2009
Schallleistungspegel:	Garantierter Schallleistungspegel gem. 2000/14/EG und EN ISO 3744 bei Arbeitsdrehzahl: **L_{WA}= 122 dB** Konformitätsbewertungsverfahren gemäß Anhang V der Richtlinie

Bei Änderungen an der Maschine verliert diese Erklärung ihre Gültigkeit.

St. Blasien, 03.2017

Thomas Berger
Werksleiter

Marcus Scherer
Leiter Entwicklung

3 Explanation of symbols and safety notices

3.1 Explanation of symbols

The following symbols are used to indicate information that will make work easier, extend the service life of the machine, preserve the environment and prevent accidents.

 **DANGER**	This symbol denotes information that could lead to serious personal injury or possibly death if it is not adhered to.
 **WARNING**	This symbol denotes information that could lead to personal injury if it is not adhered to.
 **NOTE**	This symbol denotes information that helps to prevent damage to the machine.
 **TIP**	Information that contributes to a general improvement of work or machine output is marked with this symbol.
 **ENVIRONMENT**	This symbol denotes information that contributes to preserving the environment.

3.2 Safety regulations

The safety notices are present where there is direct danger. General safety notices are described hereafter and must be adhered to.

 **DANGER**	**The operating safety of the machine must be checked regularly, at least once a year. You can commission Aebi Schmidt works customer service to carry out an occupational safety check based on current accident prevention guidelines, if required.**
 **DANGER**	**All safety and hazard instructions for the machine must be observed and retained in full and in a legible condition.**

	**DANGER**	**In addition to the operating instructions, generally applicable statutory and other regulations regarding accident prevention and environmental protection must be observed and followed.**
	**DANGER**	**Check the warning equipment for winter service vehicles for completeness and proper function according to local road traffic regulations (StVZO (Road Traffic Act) in Germany).**
	**DANGER**	**No changes, attachments, or conversions may be made without the permission of Aebi Schmidt. This particularly applies to safety device settings and welded areas of support components.**
	**DANGER**	**The front and rear fields of vision are limited. Ensure that no one is standing in the danger area when driving away. A person could be run over and be severely injured or killed. If necessary, use a spotter.**
	**DANGER**	**Park the machine safely:** • **Lower hopper** • **Close hopper door** • **Raise the front-mounted unit, sweeper unit, and disc brush into the transport position and secure them from unintentional lowering using a transport safety cable.** • **Turn off the vehicle engine and auxiliary engine** • **Remove the ignition key of the vehicle and auxiliary engine** • **Switch off the control panel** • **Close the driver's cab doors** • **Place wheel chocks under both wheels of one axle so that the machine cannot roll away.**
	**DANGER**	**When lowering and raising or pivoting and switching on the disc brush and debris pick-up system, feet, for example, can get stuck or caught in the rotating components. Start up the machine only when you or the spotter can directly see the danger zone.**

	**DANGER**	**Inspection, maintenance, and repair work is only to be performed by suitably trained personnel. After completing maintenance and repair work, all protective equipment is to be put back in place properly. Work on the machine may be performed only when the vehicle is safely shut down.**
	**DANGER**	**Low quality replacement parts could cause accidents. Use only original parts or replacement parts of the same quality.**
	**DANGER**	**Oil can get onto area where the public walk or drive and cause accidents. The hydraulic equipment, (hoses and pipelines, hydraulic pump, hydraulic block, hydraulic tank, hydraulic connections etc.) must be checked daily for damage (chafe marks, cracks, leakages, screw connections that have come loose etc.) and to ensure that it is fastened tight before use and repaired if necessary. Replace defective parts. Hoses are to be replaced at least every 6 years. Note the manufacturer's date (month/year) on the hose fixtures.**
	**DANGER**	**Care must be taken to ensure that no persons are located in the danger zone when starting and using the machine. Work on the AS 990 may only be carried out if the machine has been shut down safely.**
	**WARNING**	**Injury due to excessive physical strain Corresponding maintenance and repair work, etc. must always be carried out with suitable lifting equipment or personal support.**
	**WARNING**	**Hot oil (over 50°C) or oil that comes out under high pressure can burn or penetrate the skin. This can cause serious injuries. Let hydraulic fluid cool down before carrying out repair work, free the hydraulic hose to be opened of pressure and wear protective clothing.**
	**WARNING**	**Plastics may contain hazardous materials (such as adhesives, solvents or hardeners). Prolonged skin contact with plastics may lead to skin irritations. Gloves must be worn for prolonged contact with rubber or plastic parts, such as connecting the hydraulic couplings, changing the plastic brushes, etc.**

4 Description

4.1 General information

The Aebi Schmidt automatic vacuum sweeper, Model AS 990 is a machine mounted on an HGV chassis. The HGV can be fitted with a single-circuit hydraulic system to control the front-mounted machines. The pick-up unit consists of vacuum unit with two suction nozzles steered by guide rollers. The sweeper liquid is picked up pneumatically, i.e. a vacuum is created within the hopper by a high-powered blower. This produces airflow within the pick-up unit, which sucks up the dirt/liquid from the sweeping surface and deposits it in the hopper.

Outgoing air is either routed upwards and out of the unit or is blown out through the blast nozzles.

The machine can be fitted with the following additional (optional) equipment:

- Liquid pick-up system
- Blowing equipment (Blowing direction right or left)
- Raise/lower blowing direction
- Channel brushes (right/left disc brushes)
- Spray beam above leaf filter
- Exhaust diffuser
- Path marking with foam peaks
- High-pressure spray equipment
- Water tank heater
- Aircraft stand cleaning system
- Side suction unit
- Front spray beam
- Set/adjust speed of cylindrical brushes

4.2 Operating personnel

4.2.1 Sweep mode

Prerequisites for the machine driver:

- Valid driving licence to drive the vehicle.
- Training and instruction for the machine.
- Training and instruction for the sweeper unit and pick-up unit.
- Training and instruction for the auxiliary engine.
- Training and instruction for the front-mounted machines, for example, the magnetic beam.
- Driver training with the machine.

Operating personnel who have been trained and instructed in how to use the machine may initially only use it under the supervision of experienced persons. Once training and instruction in the entire machine has been completed, this should be confirmed in writing.

	**DANGER**	**Reduction in the perception of dangers when operating the machine** **► After a long period of use (e.g., winter), carry out subsequent training to guarantee safety**

4.3 Personal protection equipment

Hearing protection
When the device is running and the motor cabin is open, hearing protection must be worn when close to the clearing vehicle. Hearing protection must be worn at levels above 85dB(A).

Gloves

- Prolonged skin contact with plastics may lead to skin irritations. Plastics may contain hazardous materials (such as adhesives, solvents or hardeners).
- Protect hands from the cold. Skin can freeze onto cold objects.
- Sharp objects (such as cutting edge change, brush change) can injure hands.
- Sharp edges may arise due to wear or damage to components. These can injure hands.
- Fluids (such as oils, coolant, battery acid etc.) can injure hands.

Safety shoes
Reduce foot injuries and improve grip

Reflective clothing, weather protection and protective clothing

- Reflective clothing improves visibility when outside the machine.
- Weather protective clothing should protect against dangers to health when working in the open air.
- Protective clothing improves protection against damaging influences such as maintenance work, cleaning the machine, etc.

Facial protection

Facial protection protects the eyes in particular, e.g., from flying dirt particles when cleaning the machine with a high-pressure washer.

4.4 Lashing and mounting points

4.4.1 Lashing points

Loading personnel must adhere to the regulations on loading and handling and be experienced in properly securing loads. The load surface must be free of dirt (non-slip). The machine is to be parked securely on the load surface. The machine is to be fastened and lashed down in such a way that it cannot move on the loading surface during braking, acceleration, and when driving through curves. Particular care should be taken to ensure that the machine is well secured in the direction of travel (for braking manoeuvres). Make sure that lashing materials used to secure the machine do not cause damage to it. The stability should be re-tested after it has been secured.
A subsequent check of the load, and rectification if necessary (for example retensioning the lashing material) is to be made after approximately 10 km of transit.

4.4.2 Lashing points on the AS 990

The lashing points on the vehicle are to be used to lash the machine. These points are described in the operating manual or can be requested from the manufacturer.

4.4.3 Suspension points

The machine does not have any eyelets to raise the complete machine.

4.5 Safety equipment

4.5.1 Hopper

The hopper covers the danger zones of the complete drive unit. The danger zones are:

- Rotating ventilation wheel on the radiator
  - o People may be caught and seriously injured
- Rotating blower impeller
  - o People may be caught and seriously injured.
  - o Residual dirt in the blower housing may be blown outwards by the ventilation wheel.
- Exhaust system
  - o People could be seriously burnt on the exhaust.
- Water and oil cooler
  - o People could be seriously burnt or scalded on the water and oil cooler.

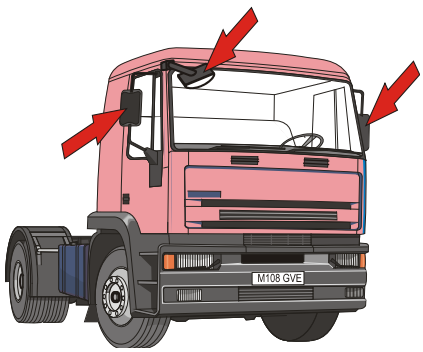
4.5.2 Sweeping unit cover

The cover goes over the sweeping unit.
The danger zones are:

- Rotating brushes
  - o People may be caught by the brush and seriously injured.
  - o People may be hit and injured when dirt particles are spun out

4.5.3 Mirrors

The danger zones are visible using the mirrors.
The danger zones are:



- Pivot area of the left and right disc brushes
  - o People can be caught between the disc brushes and frame parts.
- Raising and lowering area of the left and right disc brushes
  - o People can be caught between the disc brushes and frame parts.
- Raising and lowering area of the pick-up unit
  - o People can be caught between the pick-up unit and frame parts.
- Between the front-mounted machine and the vehicle plate.
  - o People can be caught when driving the vehicle to attach the mounted machine.

4.6 Protective measures to be taken by the user

4.6.1 Park the vehicle safely.

For any work that is carried out on the machine, the machine must be safely turned off.

Park the machine safely:

- Fully lower the hopper
- Close hopper door
- Raise the rear sweeper unit to the transport position. Secure it from unintended lowering using the transport securing cable on the left and right.
- Raise the side disc brushes on the left and right to transport position.
  Disc brushes with a diameter of 1200 mm are to be secured against unintended lowering with a transit securing cable.
- Raise the front-mounted machine and secure it from unintended lowering using the mechanical transport lock (see operating instructions for the mounted machine).
- Turn off the vehicle engine and auxiliary engine
- Take out the ignition key for the vehicle and auxiliary engine.
- Turn off the control panel to control the machine.
- Close the driver's cab doors
- Place wheel chocks under both wheels so that the machine cannot roll away.

4.6.2 General notes on the danger area

If the danger zone is not visible, a position adapter that has a line of sight to the driver is to be used.

4.6.3 Reversing

If the driver cannot see the space to the rear, a guide must be used.

4.6.4 Unloading the hopper

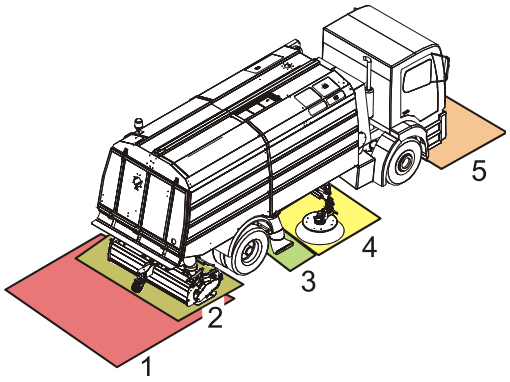
If the driver cannot see the space to the rear when emptying the hopper, a guide is to be used.

4.6.5 Driving into junctions

If there is a machine mounted on the front which protrudes, such as a snow plough, driving into crossings or side roads can constitute a dangerous situation. A guide is always to be used in these cases.

4.6.5.1 Danger zone when steering the machine

This data only applies when the blower, pick-up unit and disc brush operation is switched off.



Hopper (1)
When raising the empty hopper, a distance of 10 m to the rear and 3 m from the side is to be maintained.

Pick-up unit (2)
Control is to be relinquished immediately if somebody steps into the raising and lowering area. People must keep a distance of 2 m to the rear and the side.

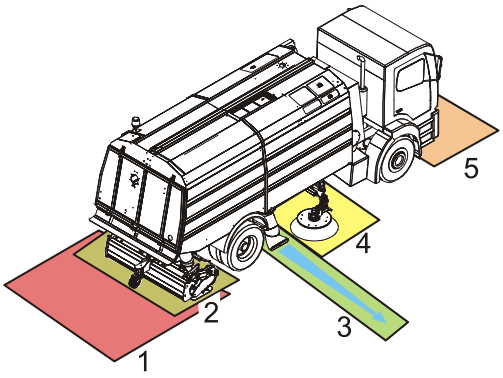
Blower fan direction (3)
Control is to be relinquished immediately if somebody steps into the raising and lowering area of the blowing equipment (1). A distance of 2 m must be maintained.

Disc brush (4)
Control is to be relinquished immediately if somebody steps into the raising, lowering and pivoting area of the disc brush (2). A distance of 2 m must be maintained.

Front-mounted machine (5)
If a mounted machine is attached, its operating instructions are to be observed.

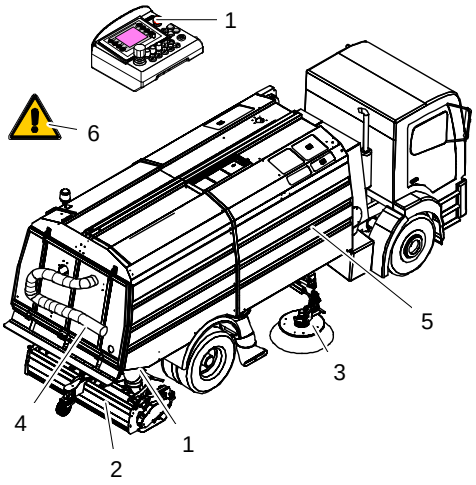
4.6.5.2 Danger zone in use

Work is to be halted if somebody enters the danger zone. The vehicle is to be stopped and drive to the blower unit, disc brush and pick-up unit is to be switched off immediately.
It should be noted that heavy objects (such as stones, etc.) may fly further than normal dirt.



Danger zone in use:

- Tip hopper (1)
  - 5 m to the side.
  - 15 m to rear
- Pick-up unit (2)
  - 2 m to the side
  - 2 m to rear
- Blower unit (3)
  - Blowing direction 30 m
    It should be observed that heavy objects (such as stones, etc.) may fly further than normal dirt.
- Disc brush (4)
  - 5 m to the side
- Front-mounted machine (5)
  - If a mounted machine is attached, its operating instructions are to be observed.



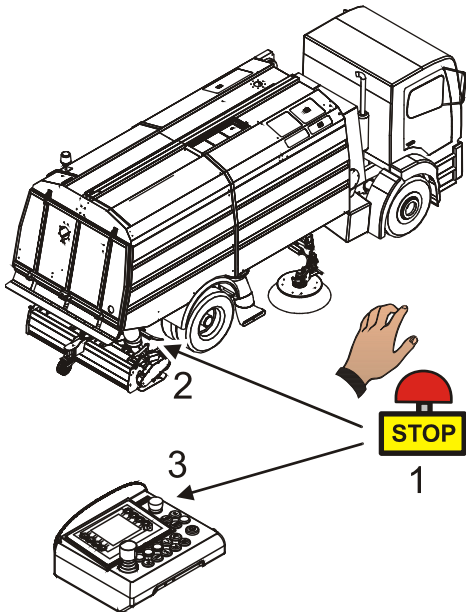
4.6.6 Safety equipment

The machine is fitted with safety equipment.
The machine must not be operated without this equipment.

The safety equipment is as follows:

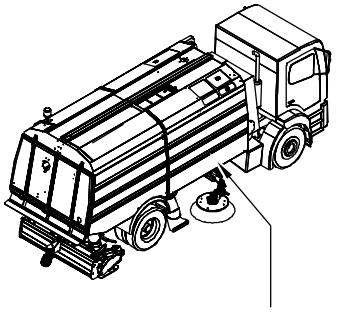
- EMERGENCY STOP switch (1)
- Transport safety devices for pick-up unit (2)
- Transport safety devices for disc brushes Ø 1200 mm (3)
- Transport safety devices for wanderhose (4)
- Hopper support (5)
- Signs, including warning signs (6)

4.7 Labelling



EMERGENCY STOP switch (1)

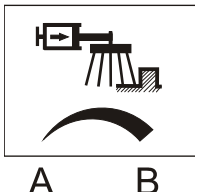
The machine is fitted with two EMERGENCY STOP switches. They are at the right of the vehicle (2) and at the control panel (3). If one of these buttons is pressed, all components are switched off immediately. Note that moving parts may continue moving for a short time. Once a button has been pressed, it is locked automatically. The engine cannot be started while the button is locked.
To release the EMERGENCY STOP switch, turn the respective button knob to the right.



Danger sign

- Rotating brushes
  Hands or feet may be caught and seriously injured.

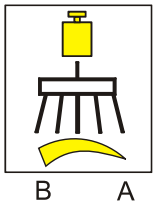
There are signs on the left and right above the disc brushes on the hopper.



Notice sign

Note for setting pivot pressure:

- A Decrease pivot pressure
- B Increase pivot pressure



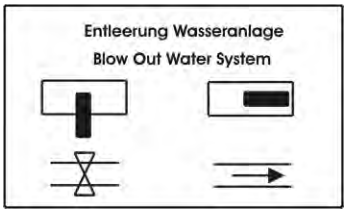
Notice sign

Note for setting contact pressure:

- A Decrease brush contact pressure
- B Increase brush contact pressure

High-pressure cleaning system

- Ball valve setting on the water filter
- Switching the water pump on/off

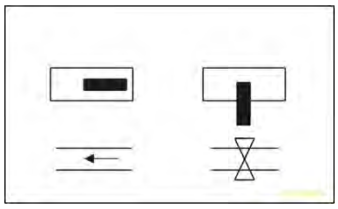


Notice sign

Drain water system

Ball valve position

- Air cut off
- Air is blown through the water system



Notice sign

Stopcock on the tank

Ball valve position

- Water supply open
- Water supply closed

Mandatory sign

- The water system is to be drained if there is a danger of freezing.

Danger sign

- Wear ear protectors when using the wanderhose

Danger sign

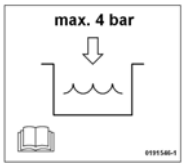
- Operating instructions must be read before it is operated for the first time.

Notice sign

- Oil drain plug

Notice sign

- Only fill with standard vehicle diesel fuel (DIN EN 590). See manufacturer's instructions.



Notice sign

- Water tank filling connection
  Do not exceed a filling pressure of maximum 4 bar.

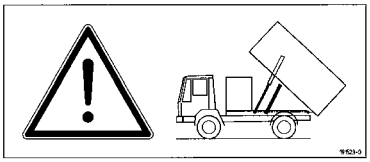
Mandatory sign

- Operating coupling-dependent auxiliary drives.

Danger sign

- Danger of burns

Risk of burning from hot items (e.g. engine parts) and scalding by hot liquids (e.g. coolant).



Mandatory sign

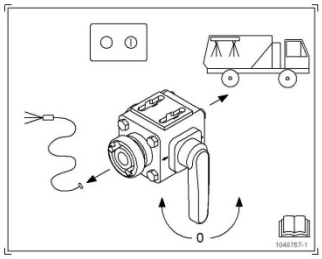
- Before working under the raised hopper, the mechanical support bar on the hopper must be securely engaged.

Notice sign

- Keep off

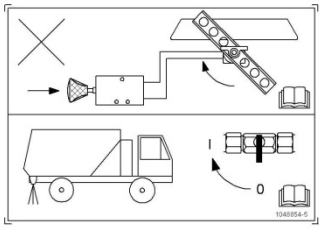
Notice sign

- Noise value at operating speed



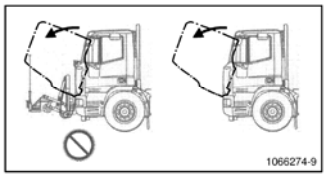
Notice sign

- Valve: Activates the spraying hose or the hopper cleaning.



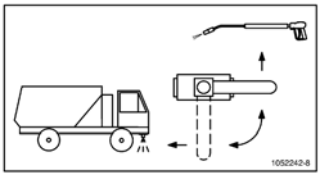
Notice sign

- Diffuser control, switch off blow operation.
- Path marker water valve



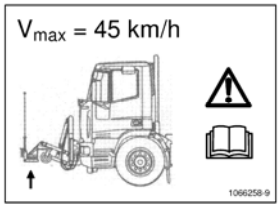
Notice sign

- The driver's cab must never be tipped with the front-mounted machine attached.
  Risk of damage!



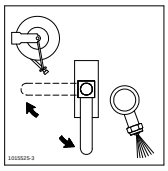
Notice sign

- Ball valve setting: Front spray beam or high-pressure wand.



Notice sign

- Pay attention to the front axle load with the front-mounted machine attached.
  Do not exceed maximum driving speed.

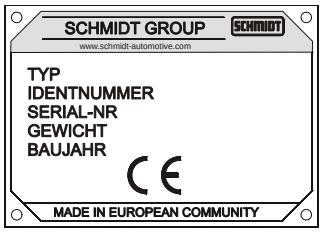


Notice sign

- Spraying / roller

5 Technical data

Type plate



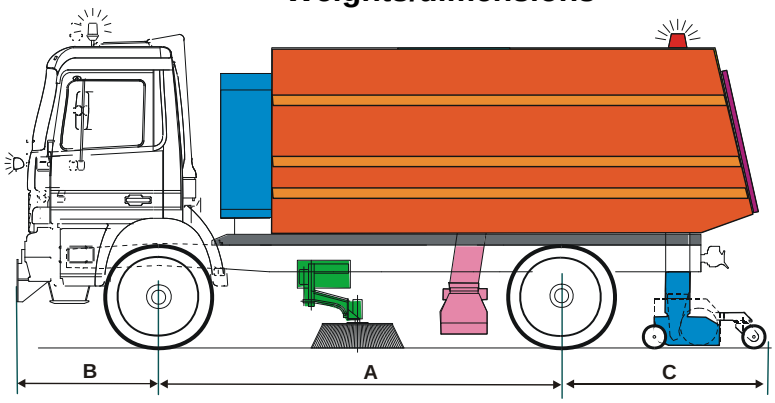
The type plate of the vehicle and auxiliary engine is described in the respective manufacturer's operating instructions.

Manufacturer information can be found on the machine type plate (1), such as:

- CE mark
- TYPE
- ID NUMBER
- SERIAL NUMBER
- WEIGHT
- YEAR OF CONSTRUCTION, etc.

This information is also required when ordering spare parts.

Weights/dimensions



Weights/dimensions

Carrier vehicle
Vehicle MB 2032, 4x2, 4500

Unladen weight of basic machine:	13,580 kg
Load capacity:	5,420 kg
Total weight:	19,000 kg
Length "A":	See vehicle manufacturer's operating instructions
Length "B":	See vehicle manufacturer's operating instructions
Length "C":	2,200 mm

Carrier vehicle
Vehicle MB 1823, 4x2, 4500

Unladen weight of basic machine:	13,380 kg
Load capacity:	4,620 kg
Total weight:	19,000 kg
Length "A":	See vehicle manufacturer's operating instructions
Length "B":	See vehicle manufacturer's operating instructions
Length "C":	2,200 mm

Debris hopper

Attached weight	5,800 kg
Hopper capacity	9.5 m^3
Hopper tipping angle:	52°

Water supply

Water tank capacity:	2,000 / 4,000 l

Debris pick-up unit

Gutter brush speed:	0 - 200 rpm
Gutter brush:	∅ 1,000 mm
Width of suction nozzle (inner):	2 x 1,150 mm
Inner coating of suction nozzle:	Rubber lining, 5 mm
Cross brush dimensions:	∅ 400 x 2,300 mm
Castor wheels:	∅ 250 x 80 mm
Suction hose:	∅ 250 mm
Suction hose material:	Rubber

Sweeping widths

Suction nozzle:	2,300 mm
Gutter brush with suction nozzle:	3,500 mm

Auxiliary engine EuroMot 3A

Brand:	Daimler EuroMot 3A (EU 97/68/EC) / EPA Tier 3
Model:	DC-OM 906 LA
Engine capacity:	6,370 cm^3
Output:	205 kW at 2,200 rpm
Torque:	1,100 kW at 1,200 rpm
Speed levels:	can be set as required

Auxiliary engine EuroMot 3B

Brand:	Daimler EuroMot 3B (EU97/68/EC) / EPA Tier 4i
Model:	OM 926 LA.E3B/3
Engine capacity:	7,200 cm^3
Output:	210 kW at 2,200 rpm
Torque:	1,120 Nm at 1,200 rpm
Speed levels:	can be set as required
Carbamide tank volume:	25 l, Diaxol (carbamide conforming to ISO 22241)

Hydraulics of AS 990

Oil tank volume/capacity:	160 /136 l
Oil to use:	ATF Suffix A

Hydraulic system for Front-mounted machinery

Delivery volumes: Single-circuit Dual-circuit	 20 l/min 150/20 l/min
Oil tank volume/capacity: Single-circuit Dual-circuit	 10 l (electrohydraulics) 140 l
Oil to use: Winter operation All-year operation	 HLP 22 hydraulic oil with DIN 51524 T2 or ISO VG 22 DIN 51519 increased corrosion protection. HVLP 32 DIN 51524 – T3
Electrical voltage: Supply Controls	 24V 24V
Pressure control Single circuit hydraulic system System pressure circuit 1 Dual-circuit hydraulic system System pressure circuit 1 System pressure circuit 2	 150 bar 150 bar 210 bar
Collision protection for pivot cylinder	300 bar

High-pressure blower

Speed:	3,300 rpm
Air flow: (Free Flow):	Max. 32,000 m^3/h
Max. vacuum:	1,070 mm AC
Hydraulic motor:	Sauer 90 M 075
Drive pump:	Sauer 90 R 130

Blowing equipment

Number of blast nozzles:	4
Blow-out direction:	2 blast nozzles each Can be switched to the right or left

Noise emission values

Normal suction power:	Approx. 69 dB (A)
Max. suction power:	Approx. 70 dB(A)

Wanderhose*

Position:	Hopper door
Suction hose diameter:	200 mm

Water pump with spray hose

Output at n=800 rpm:	10 bar, 45 l/min
Spray hose with roller and nozzle:	10 m

High-pressure water pump	
Output at n=1450 rpm	100 bar, 30 l/min

Airport stand cleaning system

Capacity	
• Water tank • Cleaning tank	3,000 l 700 or 130 l
Spray bar	
• Water • Cleaning agent	6 spray nozzles 6 spray nozzles
Filling connection	Size "C" DIN 14307

5.1 Intended use

The machine is intended for summer and winter service on airport areas. Special use on motorways and major roads is possible. The machine is only suitable for the following applications.

Use at airports

Winter use

- Moving residual snow, slush and water with the blast nozzles.
- Picking up surface water (at temperatures over 5°C) and defrosting agents with the suction duct.

Summer use

- Picking up rubber residue, leaves and dirt with the sweeper unit
- Removing residual dirt with the blast nozzles
- Picking up cleaning agents with the suction duct.

Use on motorways and major roads

- Use on motorways and major roads

It is not permitted to pick up water, snow, slush or dirt with water being added at temperatures below 5°C. The machine must not be used to gather lightly flammable, explosive or hazardous materials. Its use for any other or additional purposes is considered improper. Aebi Schmidt does not accept any liability for resultant damage. The risk is borne solely by the operator.
If the machine is being used in ways that are not recommended or specified, ensure that there is no danger to persons and that the product safety remains guaranteed.

5.2 Noise emissions and vibration

5.2.1 Noise emissions

The sound level at the workplace (driver's cab) is less than 70 dB (A).

The user must generally wear hearing protection when using the hand suction unit

5.2.2 Vibration

5.2.2.1 Hand-arm vibration

The value is less than 2.5 m/s²

5.2.2.2 Whole body vibration

The value is less than 0.5 m/s²

5.3 Avoiding noise and vibration

5.3.1 Preventing noise

It is possible to avoid or lower noise by reducing the blower output. The leads to the sweeping and blowing power being reduced accordingly.

5.3.2 Preventing vibrations

It is possible to avoid or lower vibration by reducing the sweeping speed. The leads to the sweeping power being reduced accordingly.

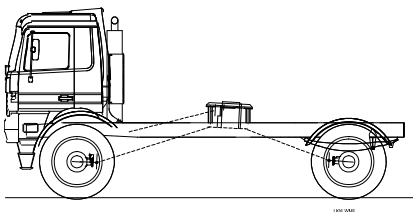
5.4 Machinery Directive

Conformance to the requirements of the directives 2006/42/EC, 2000/14/EC

The following standards were observed in its design and manufacture:

- DIN EN ISO 12 100:2011
- DIN EN ISO 13857:2008
- DIN EN ISO 13850:2016
- DIN EN ISO 13732-1:2008
- DIN EN 1679-1: 2011
- DIN EN ISO 4413: 2011
- DIN EN 13 019: 2009

6 Vehicle requirements for mounting the AS 990



Equipment according to specification

7 Parts description

7.1 Control panel

The control panel is integrated into the driver's cab of the machine.

The control panel should be adjusted using the adjustable control panel mounts so that the operator has a good view of the display and does not get tired when operating the switches and buttons.

Parameters can be defined on the control panel by our Aebi Schmidt customer service personnel so that the direction of the joystick corresponds with the movements of the machine. Various functions and values that can be adjusted or controlled via the control panel can be enabled or disabled by Aebi Schmidt customer service upon request.
It is normally a good idea to only enable the functions that are required for operation.
This greatly decreases the chances of operational mistakes being made by the operator.

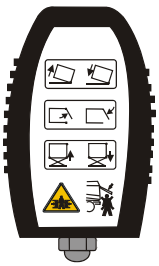
Functions that are only to be performed by the workshop personnel with the appropriate training and instruction are password protected.

Access to machine-specific parameters is also protected with a separate password. This area is only to be accessed, changed, evaluated or deleted by Aebi Schmidt customer service personnel.

7.2 Hand-held control panel

NOTE

Destruction of the suction hoses
► Lift the hopper only when the pick-up unit is lifted



Using the hand-held control panel, the hopper can be raised, lowered and the hopper door can be opened or closed, as well as the optional functionality of performing the quick-change for the suction assembly.

The vehicle engine and the auxiliary drive must be switched on

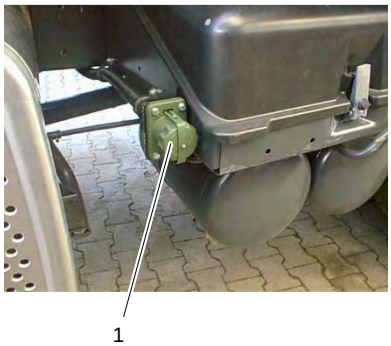
The electrical connection (1) and the storage compartment (2) for the hand-held control panel is in the container box on the right-hand side at the rear

7.3 Wanderhose

The hopper door can be fitted with a wanderhose. This can be used for manual cleaning jobs.

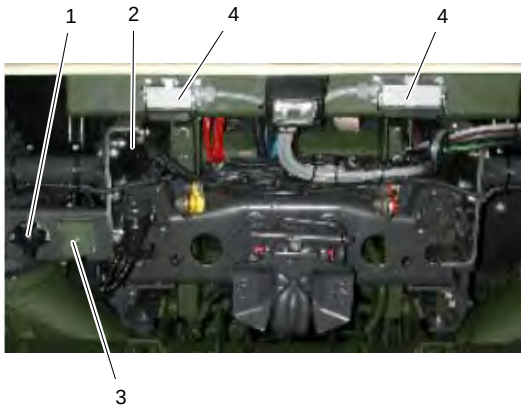
The wanderhose is equipped with a separate control panel (1). with the following functions:

- Set the diesel engine speed (maximum 1,400 rpm.)
- Turn on the working headlight
- Activating the signal for the driver
- Controlling the extension arm (depending on the model)



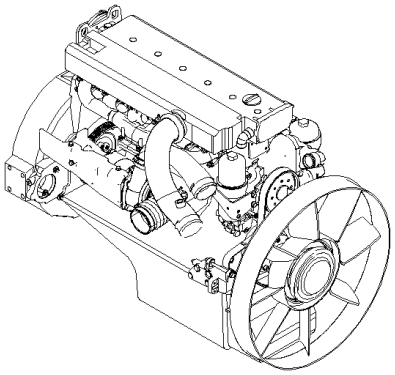
7.4 Remote start connector

The remote start connector (1) can be used to supply power to the vehicle via a special cable.



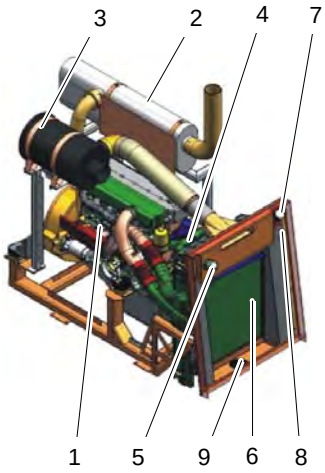
7.5 Plug-in connectors

- 7-pin socket (1)
- Cable (2) to supply current to the sockets (1 and 3)
- 12-pin socket (3)
- 25-pin socket (4)



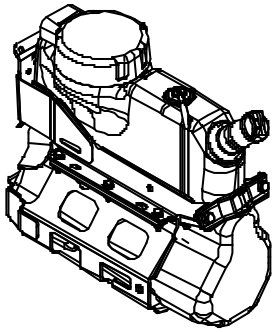
7.6 Drive engine

A diesel engine has been integrated for driving the hydraulic system (for blower, sweeper drive, water pump and oil cooler).
The silencer is located above the engine.
The engine is also equipped with a dry air filter with an electrical maintenance switch.
Fuel for this engine and the vehicle is supplied by a single tank.
All engine data that is necessary for operation is displayed on the control panel.



Overview

(1): Diesel engine
(2): Exhaust system / SCR catalytic converter
(3): Air suction system
(4): Coolant container
(5): Coolant filler opening
(6): Engine cooler
(7): Engine oil filler opening
(8): Engine oil dip-stick
(9): Cleaning aperture



7.7 AS 990 carbamide tank

In order to comply with legal exhaust regulations, the machine can be equipped with a carbamide tank.
It is active only when the engine speed is increased, not during idling speed.

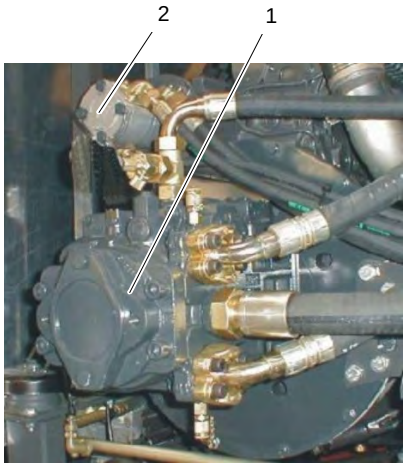
7.8 Hydraulic system

The hydraulic pumps are mounted directly on the diesel engine. They drive the blower, the cross brush, the disc brushes, the oil cooler blower and supply the hydraulic control elements of the machine. The hydraulic oil tank with filter and all the control elements are integrated in the hydraulic unit.

7.8.1 Hydraulic tank

The hydraulic tank supplies oil to all consuming equipment.

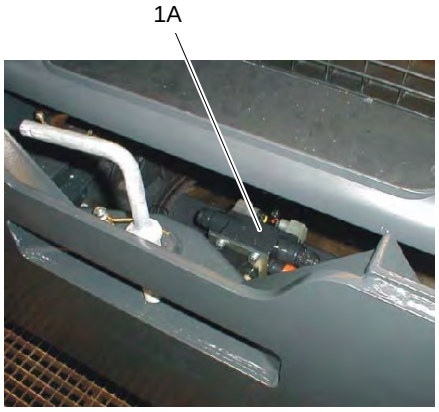
(1): Return filter
(2): Filler opening
(3): Sight glass for oil level. The oil level can also be read with the hopper closed. Only read the oil level if the hydraulic cylinder for hopper tipping has been retracted (hopper is lowered).
(4): When the hopper is closed, this opening can be used to refill the hydraulic oil.



7.8.2 Hydraulic pumps driven by the auxiliary engine

The hydraulic pumps are driven directly by the engine

(1): Hydraulic pump. Fan drive.
(2): Tandem hydraulic pump. Fan drive on hydraulic cooler.

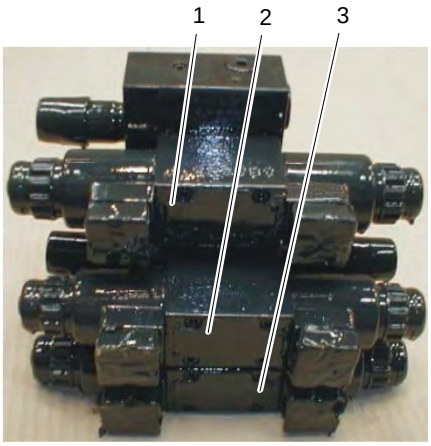


7.8.3 Hydraulic pump driven by the vehicle engine

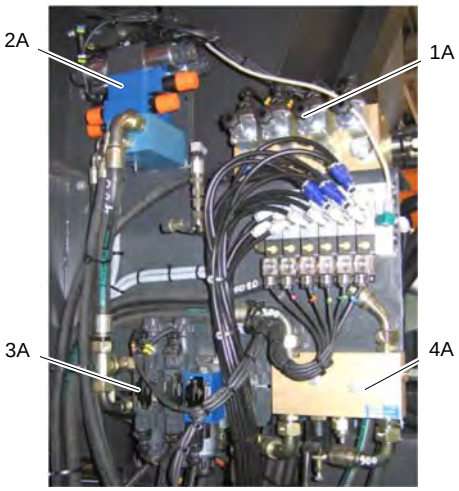
The hydraulic pump is driven by a V-belt.

Hydraulic valves—Vehicle front
The hydraulic valve block (1A) is located directly behind the vehicle plate. The following are controlled via the hydraulic valve block

- Front-mounted machine
- Raising/lowering the hopper
- Opening/closing the hopper doors

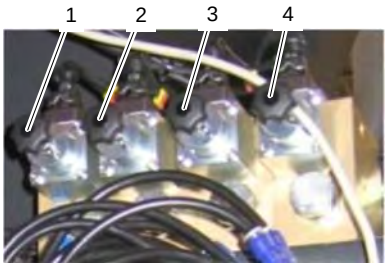


(1): Auxiliary valve
(2): Pivot front-mounted machine
(3): Raise / lower front-mounted machine



7.8.4 Hydraulic valves of the sweeper attachments

The following is a description of the hydraulic valves.



Valve block 1A

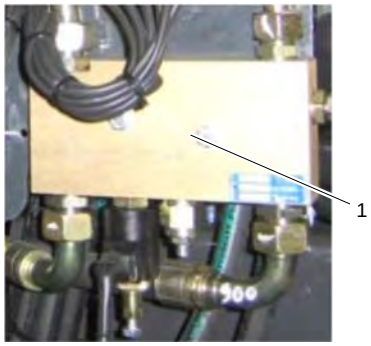
(1): Water pump drive
(2): Left disc brush drive
(3): Right disc brush drive
(4): High-pressure water pump drive

Valve block 2A

(1): Pilot control block

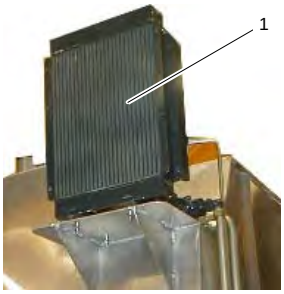
Valve block 3A

(1): Raising/lowering the hopper
(2): Opening/closing the hopper doors
(3): Pilot valve with pressure limitation



Valve block 4A

(1): Cylinder brush



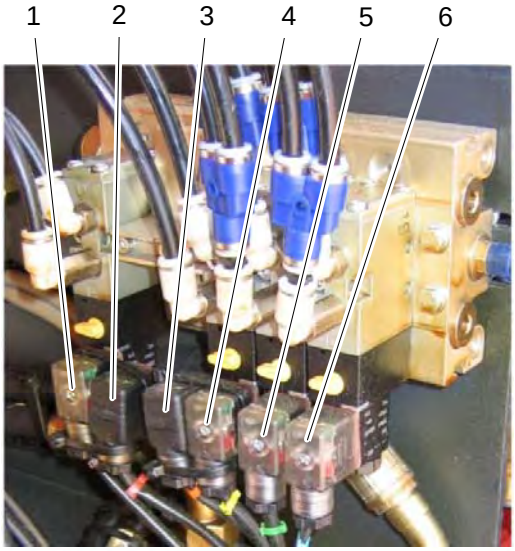
7.8.5 Oil cooler

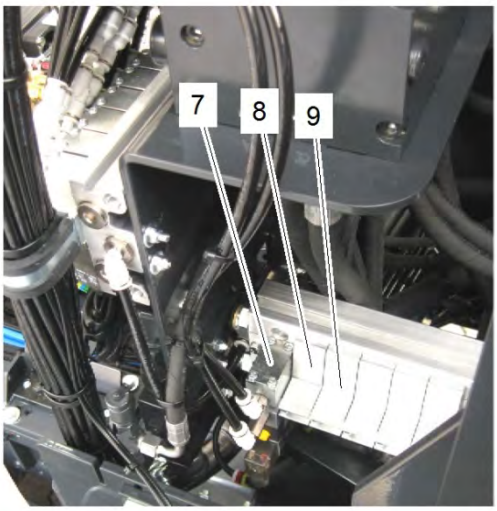
The oil cooler is installed on the water tank. It cools the hydraulic oil for the hydraulic system.

If a front-mounted machine (such as a front-mount sweeper) is operated as well, an additional oil cooler is required. This is also located in the same location on the water tank.

7.9 Pneumatic system

The movements of the cross brush, the disc brush and the switching of the air flow to blow operation are all controlled pneumatically. Compressed air is supplied by the vehicle via a separate compressed air tank.

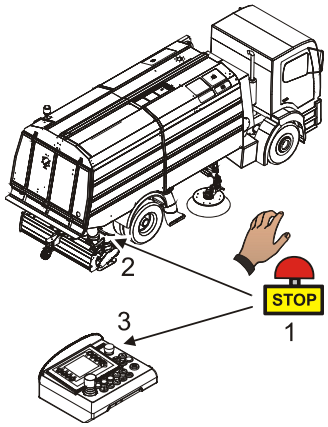




7.9.1 Pneumatic valves

(1): "Raise/lower" cylindrical brush (initial setting is raised)
(2): "Pivot in/out" right disc brush (initial setting is in).
(3): "Pivot in/out" left disc brush (initial setting is in).
(4): "Open/close" coarse debris flap (initial setting is closed).
(5): "Fan/suction operation" on blower flap (initial setting is blower operation).
(6): "Blast nozzles right/left" switchover (initial setting to the right).

Additional functions can be found on the second bar:
(7): "Open/close" liquid flap (initial setting is closed)
(8): "Raise/lower" front pick-up (initial setting is raised)
(9): Reserve

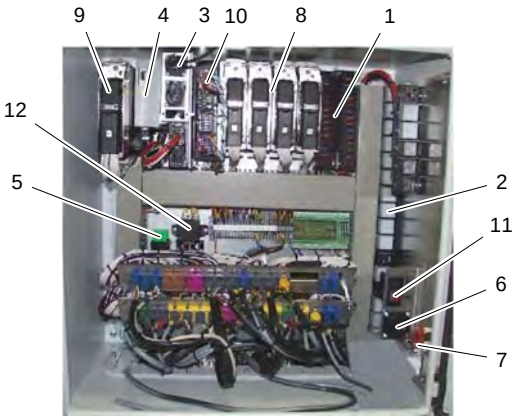


7.10 Electrical system

Movement control functions are carried out via a PLC controller.
The lighting system is state of the art.
The machine is fitted with two EMERGENCY STOP switches (1):

- Hopper rear right (2).
- Control panel (3)

7.10.1 Control cabinet



(1): Fuses (see table below for description)
(2): Relay bar
(3): Diagnostics connector (for customer service only)
(4): PLC interface
(5): Pre-fusing for 2X 30A assembly
(6): Plug-in connector for plugging the control panel in (customer service only)
(7): Limit switch: The hopper can only be lowered when the control cabinet is closed.
(8): IO Modules
(9): Computer
(10): Engine controller ADM 2
(11): PLC programming switch
(12): Main relay

7.10.2 Fuses

F1.1 / 30A	Maxi pre-fuse	**F31 / 10A**	PLC interface
F1.2 / 30A	Maxi pre-fuse	**F31.1 / 5A**	Hopper warning light
F2 / 3A	CR0020	**F32 / 30A**	Term. 30 engine control + flame start
F10 / 10A	Term. 15 SCR module	**F33 / 10A**	Term. 30 ADM
F11 / 10A	Term. 15 engine control + flame start	**F34 / 10A**	Term. 30 DC - diagnostic connector
F12 / 15A	CR0020 outputs	**F35 / 15A**	Term. 15 engine
F13 / 3A	EMERGENCY STOP	**F36 / 15A**	Fuel preheating
F14 / 10A	Module 2 outputs	**F37 / 5A**	Electro-hydraulics
F15 / 10A	Module 3 outputs	**F38 / 15A**	Water tank heating
F16 / 10A	Module 4 outputs	**F39 / 10A**	Reversing light
F17 / 10A	Module 5 outputs	**F40 / 15A**	Term. 15 IVECO engine
F18 / 10A	Control panel	**F41 / 15A**	IVECO engine starter
F19 / 3A	Modules and sensors	**F42 / 10A**	Term. 15
F20 / 3A	Suction hose flap	**F43 / 3A**	Water tank heating
F21 / 3A	Hydraulic sprayer	**F44 / 15A**	Term. 30 SCR module
F22 / 15A	Rotary beacon	**F45 / 20A**	SSR 0105
F23 / 10A	Central lubrication	**F46 / 10A**	Additional I/0 module
F24 / 5A	2nd working light, rear	**F47 / 10A**	Additional I/0 module
F25 / 25A	VKS oil cooler	**FNK1 / 5A**	Emergency function of hopper
F30 / 3A	EMERGENCY STOP		

7.10.3 Battery isolator switch

NOTE

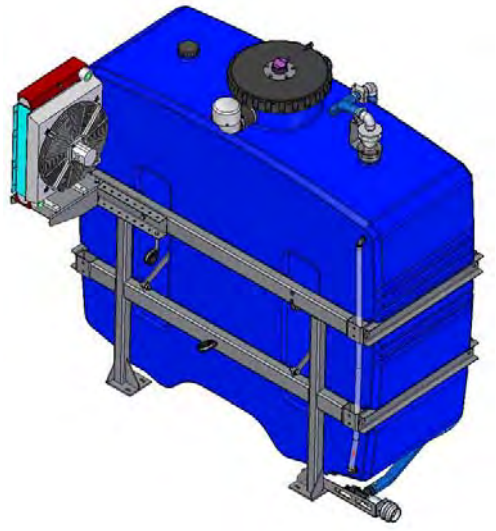
Electrics and electronics can be destroyed if the battery cut-off is pressed when the engines are running (vehicle and/or auxiliary engine).

The battery cut-off cuts the connection between the battery and vehicle electrics. The may be pressed only if the vehicle and auxiliary engines are shut down.
The machine is not de-energised until an approximate coastdown time of 3 minutes has passed.

7.10.4 Remote start connector

The starting aid for the auxiliary engine can be connected to the remote start connector.

7.11 Water system



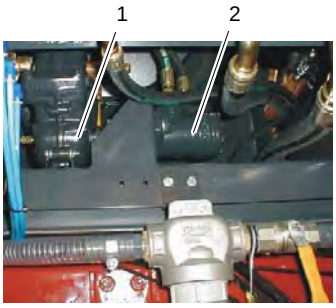
7.11.1 Water tank

The water tank is installed on the base frame in front of the drive unit and supplies the following equipment:

- Disc brush spray facility
- Spray unit of debris pick-up unit
- Spray beam above leaf filter
- Cleaning systems

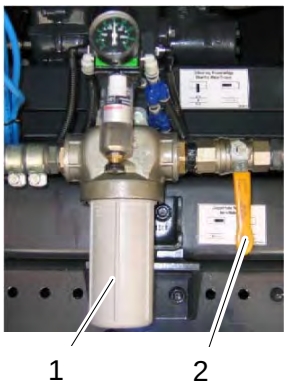
Filling and emptying:

The water tank is filled via the C connection
The water tank is emptied via the water filter.



7.11.2 Water pump

The water pump (1) is driven by a hydraulic motor (2). The pump supplies water to the devices that use it.



7.11.3 Water filter

The water filter (1) filters the water that is pumped to the equipment that uses it. To prevent the water tank from going empty when cleaning the filter, turn the ball valve (2) downward. After completing cleaning work, turn the ball valve back into the original position.

7.11.4 Water valves

Valves are closed in the original position.

The water supply to the consuming equipment can be switched on and off using the water valves.

7.12 Cleaning systems

NOTE

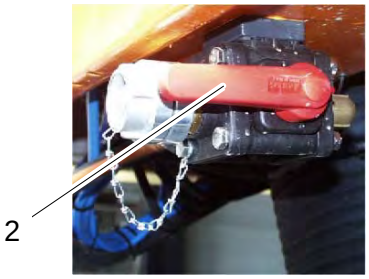
Damage to the cleaning system
► Use only drinking quality water, not dirty water or salty water

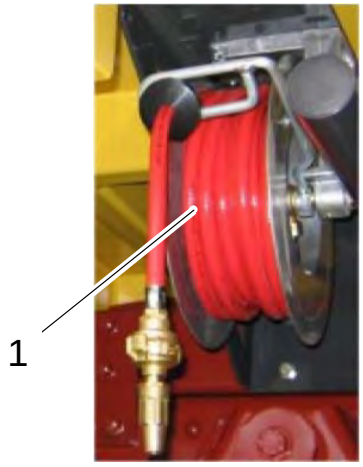
NOTE

Damage to the cleaning system
► If there is a risk of freezing, drain the complete water system.

7.12.1 Cleaning equipment with spray hose

The spray hose (size D) for cleaning work (1) is stored in the container box for the hand-held control panel.
The water connection (size D) for the spray hose can be found on the right-hand side at the rear.
The valve (2) is to be set so that the water is routed to the (size D) water connection.



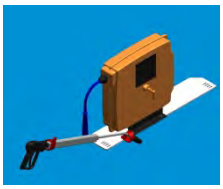


7.12.2 Spray hose with automatic roller

The spray hose with automatic roller (1) is at the rear of the right-hand side under the container box for the hand-held control panel. The valve is to be set so that the water is routed to the spray hose.

7.12.3 High-pressure cleaning system

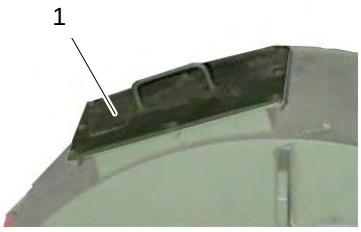
	**NOTE**	**Damage to the high-pressure water pump** **► Do not operate the water pump without water**



The water hose with automatic roller and wand is at the rear on the right-hand side.
The high-pressure cleaning system is intended for use against stubborn dirt.
The water is also supplied via the water tank.
The water level is displayed on the control panel.
The high-pressure water pump is switched on with the button (1).

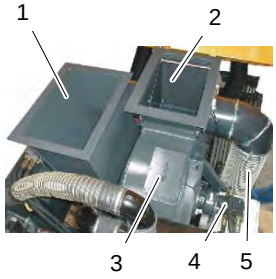
7.13 Fan

During sweeping, the blower generates the vacuum in the hopper and the air pressure for cleaning and drying the road surface.



The high-power blower is fastened to the base frame with rubber mounts. It is hydraulically driven. The power of the blower is set with the rpm of the diesel engine. On the outlet side, the discharged air can be routed upwards or sent to the blast nozzles. Interchangeable rubber strips are used as gaskets around the vacuum and the suction air outlet frames.

There is a cleaning aperture on the top of the housing (1).



Overview

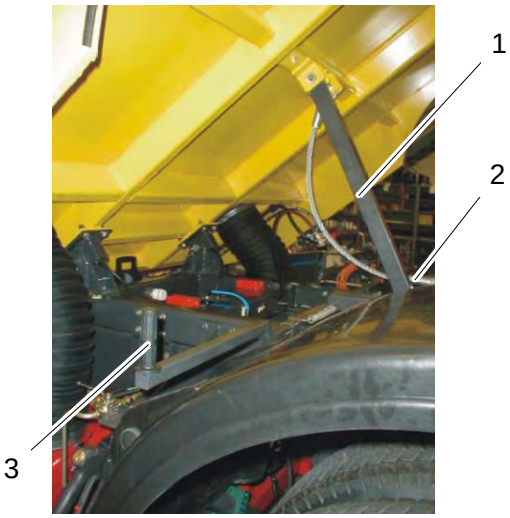
(1): Suction funnel on the blower
(2): Blowing connection duct on the blower
(3): Cleaning flap
(4): Fan drive with hydraulic motor
(5): Blowing air hose
(6): Blast nozzles
(7): Adjusting cylinder

7.14 Debris hopper

The hopper consists of a self-supporting steel construction. There is a filter insert on the debris hopper cover.
The hopper is closed by means of the hinged hopper door. It is emptied via a hydraulic rear tipping action.
A mechanical hopper support can be inserted to avoid unintended lowering of the hopper.

7.14.1 Tipping the hopper

DANGER	**Crushing** **► Ensure that no persons are in the lowering or raising area**
DANGER	**Crushing hazard when the debris hopper is raised** **► Prior to working, fit the support under the hopper**



Raise the hopper to the end stop. The hopper support (1) swings up over the support console.
Lower the hopper until the hopper support rests automatically in the support console (2).
Check to see that the hopper support (1) is securely in place.

Swinging out the mechanical hopper support:

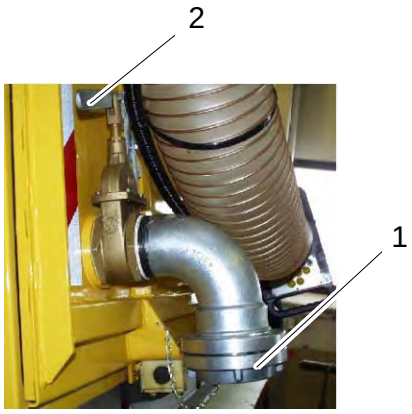
Raise the hopper to the end stop. Using the lever (3), push the mechanical support guide inwards and hold it there.

Lower hopper, the support bar (1) slides down the support guide over the support console (2).
The hopper can be lowered and the mechanical support guide (3) can be released.

7.14.2 Drainage connections

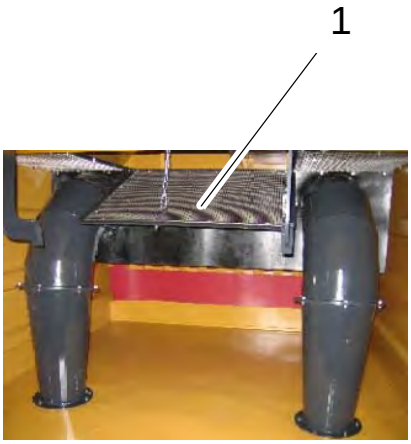
To protect yourself from flying debris, remain a safe distance from the vehicle and use suitable protective equipment.
Observe environmental protection regulations!

Draining dirty water via the C connection:
Open the C connection (1) carefully.



Draining dirty water via the C connection with the cut-off gate (2):

- Connect hose to coupling (1)
- Position hose in the direction of flow
- Open the gate (2) slowly



7.14.3 Leaf filter

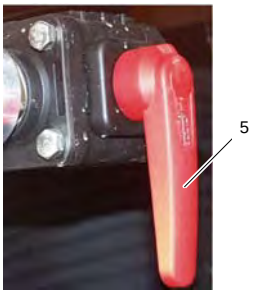
The filter (1) is automatically opened when the hopper door is opened.

The open filter (1) can be cleaned with a spray hose.

When the hopper door is closed, the filter moves back into working position.

TIP

After cleaning, always set the ball valve to "off"; otherwise debris hopper cleaning is active.

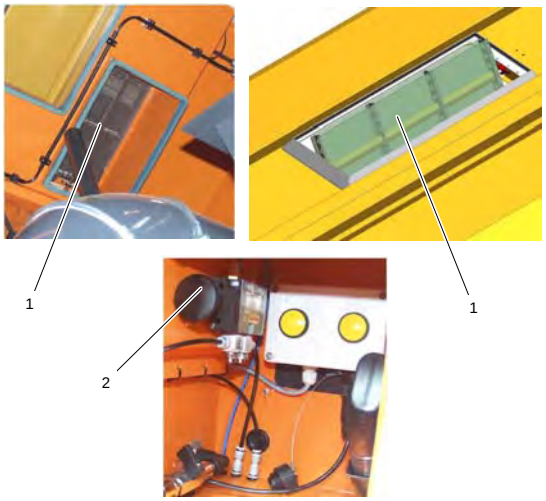


7.14.3.1 Spray beam above leaf filter

The spray beam (2) can be used to clean the hopper interior and the leaf filter when the blower is switched off.

- Start the auxiliary engine.
- Open container doors.
- Turn the ball valve towards the rear (3)
- Press button (4). The pump speed is increased to max. 800 rpm.
- The spray unit is switched on and the hopper is rinsed out.
- After cleaning is complete, press the button (4) again.
- After cleaning, always set the ball valve (3) to "Off" (5); otherwise debris hopper cleaning is active.

7.14.4 Exhaust diffuser



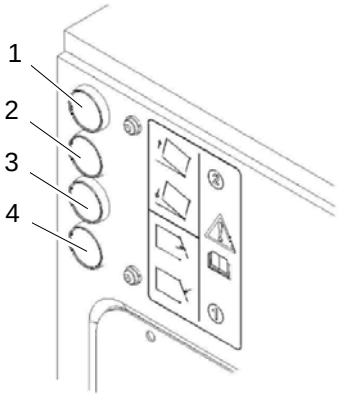
The exhaust diffuser (1) serves to calm the upward exhaust flow.

If contaminated (leaves, dirt particles, etc.), the exhaust diffuser must be cleaned:

Close the debris hopper.
Set the blower to the lowest setting.
Switch the blast nozzles off if they are in operation.
Press the pneumatic valve (2) several times for 4 - 5 seconds to pivot the exhaust diffuser.
The pneumatic valve is located in the container box.
Depending on the degree of contamination, the blower speed can be increased slightly and the hopper cleaning can also be switched on.

7.14.5 Emergency tipping for the debris hopper

	**DANGER**	**Falling over and crushing** **► Ensure that the ground is level and can support the weight** **► Never raise a filled hopper with the hopper door closed.** **► Do not drive with the hopper raised**
	**DANGER**	**Crushing** **► Ensure that no persons are in the lowering or raising area**
	**DANGER**	**Unpredictable movements due to activated safety devices (EMERGENCY STOP, hopper support proximity switch, control cabinet door switch)** **► Operate the emergency tipping device carefully**



The emergency tipping device is exclusively for emergency situations in which the electrical system is defective, which prevents the debris hopper being raised and the hopper doors can no longer be opened or closed.

The buttons for the emergency tipping device are located on the bottom of the electrical switch cabinet.

Button allocation:

- Raise debris hopper (1)
- Lower debris hopper (2)
- Open hopper door (3)
- Close hopper door (4)

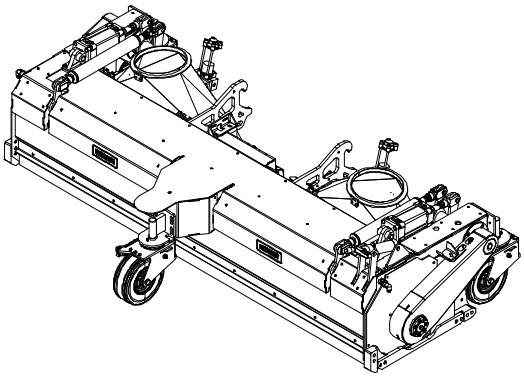
7.15 Pick-up Systems

The machine can be fitted with a debris or liquid pick-up system.
Both systems can be mounted between the axles and / or at the rear of the vehicle and have two suction units. They are steered by three guide rollers, the height of which can be adjusted, and they are raised or lowered hydraulically or pneumatically.
In sweeping mode, the pick-up systems are automatically raised when reverse gear is engaged.

7.15.1 Debris pick-up unit

DANGER	**Danger due to impermissible use** **► The machine must not be used to gather lightly flammable, explosive, or hazardous materials.**

NOTE	**Damage to the pick-up unit** **► Do not travel or roll in reverse with the pick-up unit lowered**



The debris pick-up unit is fitted with a hydraulically-driven cross brush for removing dirt.

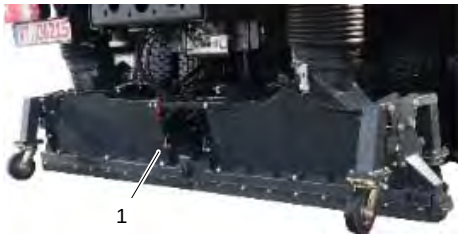
The system can also work without the cylindrical brush for liquid pick-up.

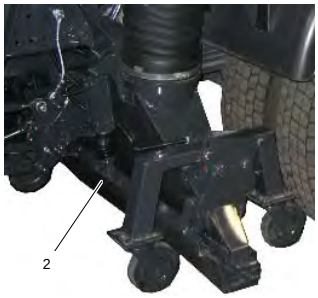
The cross brush is raised and lowered pneumatically. The speed of the cylindrical brush can be set via the control panel. Water is sprayed from nozzles into the suction flow to bind the dust.

7.15.2 Liquid pick-up unit

DANGER	**Danger due to impermissible use** **► The machine must not be used to gather lightly flammable, explosive, or hazardous materials.**

NOTE	**Damage to the pick-up unit** **► Do not travel or roll in reverse with the pick-up unit lowered**





The fluid pick up unit can be installed at the rear (1) or between the axles (2) of the vehicle.
The liquid pick-up unit is only suitable for picking up water or similar liquids (e.g. de-icing agents).

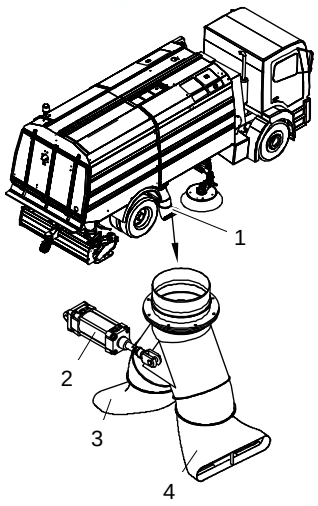
7.15.3 Side suction unit

DANGER	**Danger due to impermissible use** **► The machine must not be used to gather lightly flammable, explosive, or hazardous materials.**

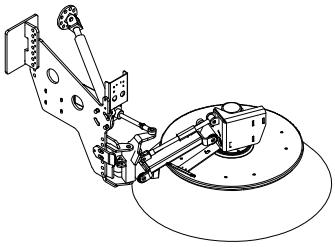
NOTE	**Damage to the side suction unit** **► Do not travel or roll in reverse with the side suction unit lowered**

The liquid pick up system consists of, on each side, a suction assembly, which can be pneumatically raised and moved sideways. Dirt outside the vehicle's footprint area can be dislodged with the gutter brush and picked up with the extended side suction equipment.
The suction nozzle has a pneumatically-operated coarse debris flap.
Water is sprayed from nozzles into the suction flow to bind the dust.

7.16 Blast nozzles



There are left and right hand side double blast nozzles (1) installed on the vehicle frame between the front and rear axles. The blast nozzles direct a powerful air current onto the road surface for cleaning or drying. Using the pneumatically adjustable deflection flap (2), the airflow can be directed to the right (4) or the left (3). This re-routing occurs synchronously with the left and right double blast nozzles.
The blast nozzles can be equipped with a raise/ lower function.

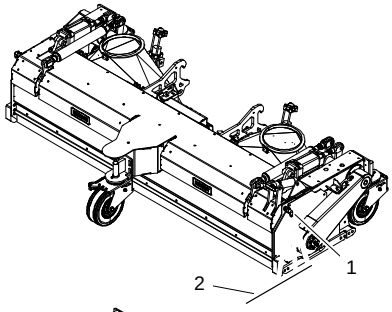


7.17 Disc brushes

The sweeping width is increased by disc brushes attached to the sides. They channel dirt towards the middle of the vehicle, where it is sucked up by the pick-up unit. Water is sprayed from nozzles into the suction flow to bind the dust.

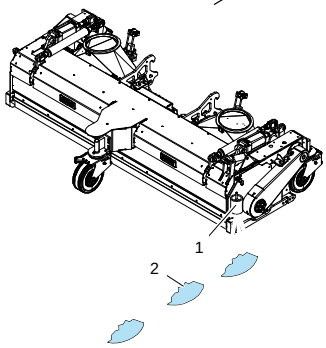
7.18 Path marking

There are path markers at the rear (1), on the left and right of the pick-up system. These mark out the area of the road surface that has already been cleaned.



7.18.1 Water marking

The surface that has been driven over (2) is marked on the left and right with a water jet (1).



7.18.2 Foam marking

The surface that has been driven over is marked on the left and right with a foam peak (2) using a foam nozzle (1).

7.19 Wanderhose

 **DANGER**	**Danger of hitting or running over people** **► Ensure that nobody is behind the machine or that there is contact (eye contact, spoken contact) between the driver and person.**

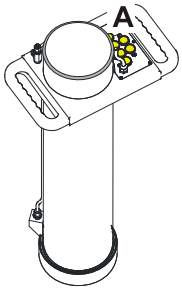
 **WARNING** 	**Risk of damage to hearing when working with wander hose** **► Wear ear protection.**

WARNING

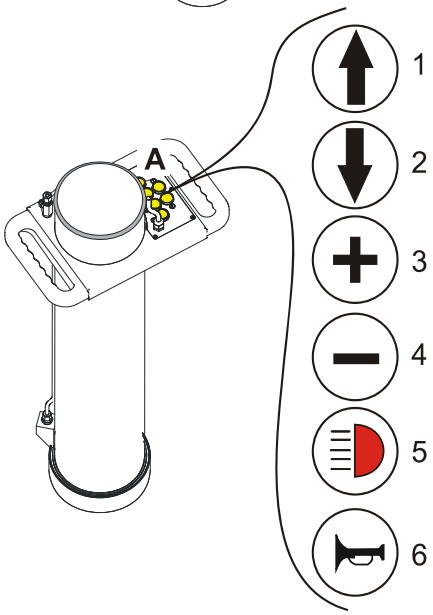
Gripping due to suction effect
► Direct suction opening only downwards
► Insert the suction tube into the transport bracket only when the wanderhose is switched off

Description of the wanderhose

The wanderhose is mounted on a boom that can be pivoted 180°. To increase the output of the wanderhose, the suction unit is to be lowered or the suction nozzle channels are to be closed.
The boom is controlled using the control panel on the suction tube (A).



- Start auxiliary engine
- Activate the wanderhose
- Taking the wanderhose out of the transport bracket.
- Start the wanderhose using the control panel (A).



Control panel on the wanderhose

- Raise debris hopper (1)
- Lower debris hopper (2)
- Increase suction power.
  Increase speed of attachment motor to a maximum of 1400 rpm (3). When the operation is complete, the engine must be returned to idle speed.
- Decrease suction power (4). Reduce the attachment motor speed.
- Switch working lights on and off (5).
- Activate warning signal in the cab (6).

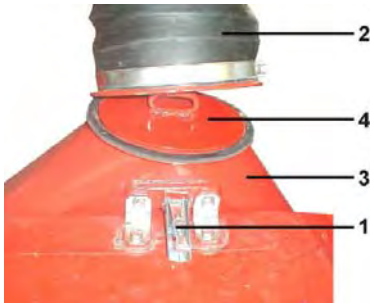
TIP

Suction power can be increased by:
- **Lowering the suction unit**

or
- **Closing the suction nozzle channels**

7.19.1 Closing and opening suction nozzle channel

7.19.1.1 Closing the suction nozzle channel with plug



- Switch off blower
- Parking the machine safely
- Open clamping locks (1)
- Remove suction hose (2) from suction nozzle channel (3).
- Place plug (4) in the suction nozzle channel (3).
- Put the suction hose (2) back on the closed suction nozzle channel (3) and secure the suction hose (2) with the clamping locks (1).

Opening the suction nozzle channel:

Opening the suction nozzle channel is the reverse procedure to that of closing it.

7.19.1.2 Closing the suction nozzle on the rear suction unit

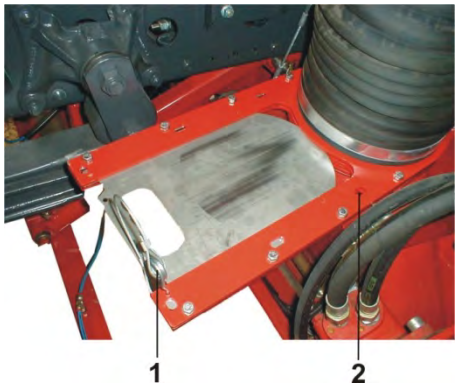
The suction unit is closed by means of a shutter gate.

NOTE

Damage to the shutter gate
► Do not use the gate unit as a ladder (e.g., during maintenance work)

TIP

The shutter gate is sluggish when the blower is switched on
► Only activate the gate unit if the blower is switched off.



- Switch off blower
- Parking the machine safely
- Unlock the shutter gate (pull out cotter pin 1).
- Push the shutter gate inwards and secure it with a spring clip. Insert the spring clip into the securing hole (2).

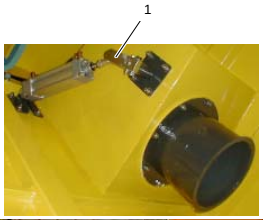
Opening the suction nozzle channel:
Opening the suction nozzle channel is the reverse procedure to that of closing it.

7.19.1.3 Closing the suction nozzle channel on the liquid pick-up unit between the axles

The suction nozzle unit of the liquid pick-up unit between the axles is closed using a pneumatically activated shutter gate (1). It is controlled automatically.

TIP

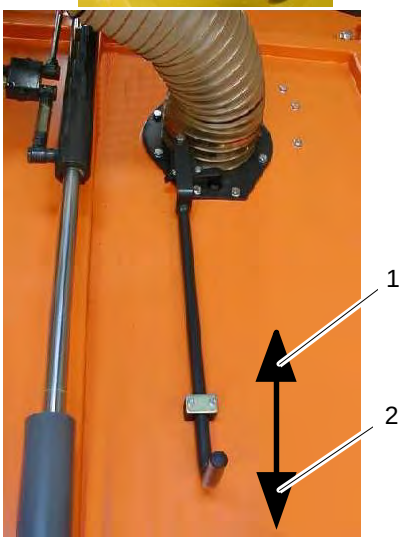
The gate for the suction between the axles is closed automatically when the wanderhose is started.



Gate positions:

Liquid pick-up unit raised
- Suction channel closed

Liquid pick-up unit lowered
- Suction channel open



7.19.1.4 Opening and closing the locking plate on the suction hose

In order for the vacuum created by the blower in the debris hopper to work within the suction hose, it must be connected to the debris hopper. The locking plate can be opened with the blower shut off to do this.

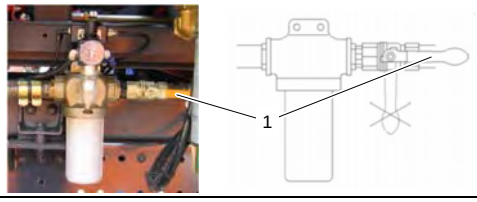
Flap closed (1)
- Wanderhose not in use

Flap open (2)
- Wanderhose can be put into operation.

After using the wanderhose, the suction nozzle channels must be opened again and the locking plate on the suction hose must be closed. Deactivate the "Wanderhose" menu.

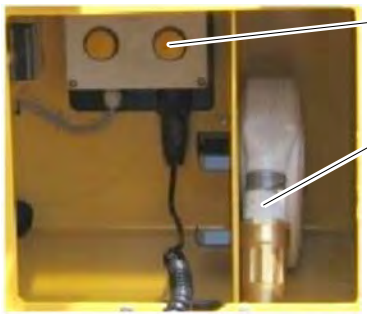
NOTE

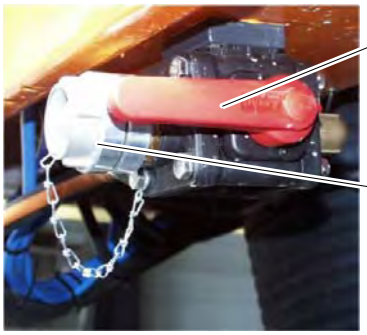
Before switching on, open the water pump ball valve (1) on the water filter



NOTE

Damage to cleaning and water system
► Completely empty both systems in case of a danger of frost





Commissioning:

- Start the auxiliary engine.
- Roll out and connect (2) the spray hose (1).
- Set ball valve (3) to "spraying hose" function.
- Press button (4). (The engine speed increases to approximately 1100 rpm.)
- Turn spray tube to the left: open

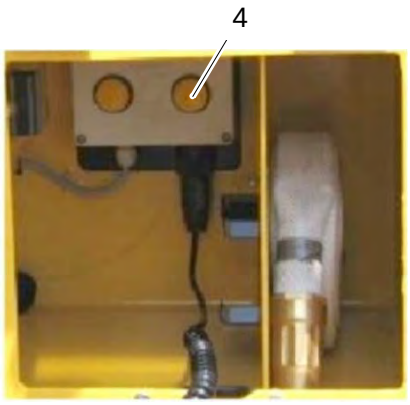
Shutting down:

- Turn spray tube to the right: close
- Press button (4).
- Set ball valve (5) to "Off".
- Open the spray tube briefly to reduce the water pressure in the spray hose.
- Disconnect the hose and roll it up.
- Cut off the water connection with the cover (6).

TIP

After cleaning, always set the ball valve to "off"; otherwise debris hopper cleaning is active.

7.19.2 Cleaning system with spray hose roller



Commissioning:

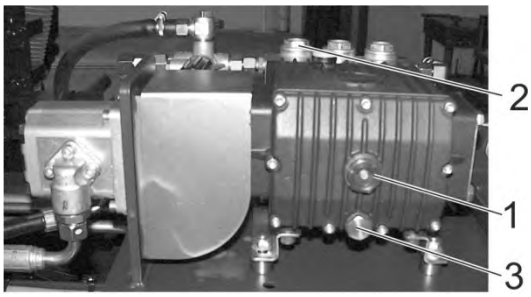
- Start the auxiliary engine.
- Press button (4) (engine speed increases to approximately 1100 rpm).
- Pull the spraying hose out of the roller.
- Turn spray tube to the left to open.

Shutting down:

- Press button (4).
- Turn spray pipe to the right to close.
- Roll up the spray hose.

7.19.3 High-pressure cleaning system (100 bar)

	**WARNING**	**Injury due to high pressure water** **► Only aim water spray at the working area, never at people or animals.** **► When turning on the lance, hold tight and resist pressure jolts.** **► Stop working immediately if people enter the danger area, and stop the machine** **► Beware of debris and pieces of material that can be pushed away by the high pressure hose.** **► Wear face protection**
	**NOTE**	**• Ambient temperature of high-pressure water pump: max. 60° to 70°C** **• Do not spray the hot pump with a cold high-pressure water jet because stress cracks may occur.** **• In the event of a danger of frost, blow out the pumps and hoses with air or with anti-frost agents.**
	**NOTE**	**Damage to the high-pressure water pump** **► Do not operate the water pump without water**



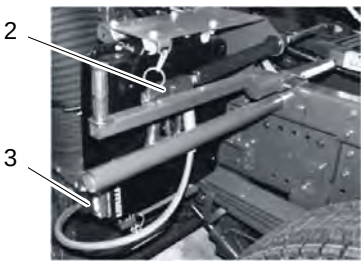
The high-pressure cleaning system is intended for use on stubborn dirt.

Observe the pump manufacturer's operating instructions!

Viewing glass (1)
Filling port (2)
Drainage screw (3)

- Fill the water system with water
- Clean filter
- Open water valve.

Without water, the high-pressure water pump switches off after 10 s.
► Rectify any faults.



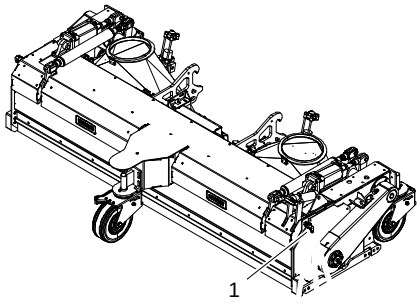
If the high-pressure water pump has been operating for more than 5 minutes, it switches off automatically for safety reasons. If cleaning takes longer, the high-pressure water pump can be re-started as often as necessary.

Commissioning:

- Start auxiliary engine
- Press the button (1) (engine speed increases to approximately 1100 rpm); the high-pressure water pump switches on.
- Remove the spray wand (2) from the transport bracket and pull the hose out of the hose roller (3).

Shutting down:

- Switch off the high-pressure water pump.
- Roll up hose.

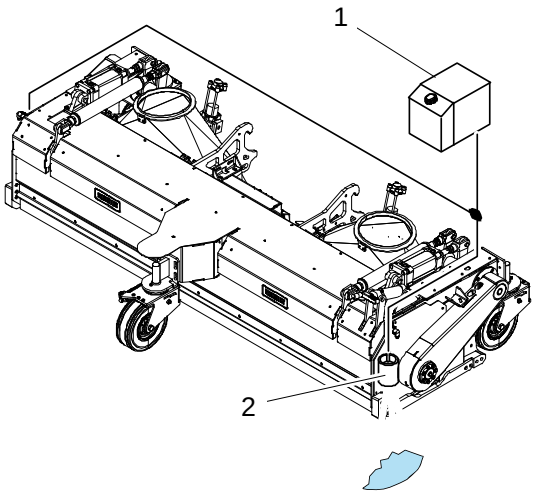


7.19.4 Path marking

7.19.5 Path marking with water jet

When the water system is switched on, the water nozzle (1) switches on automatically. The water supply can be interrupted with the water valve (2) in the container box (here, water flow switched on).

7.19.6 Path marking with foam peaks



The path-marking peaks are made from a mixture of foaming agent, water and air. The markers are forced out through the foam nozzle (2).

Fill the foaming agent container (1).

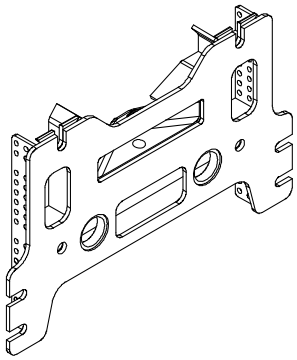
- Tip the debris hopper.
- Open the canister cover and fill it with the foaming agent.

Commissioning:

- Switch on the track marking with the control panel.

7.20 Front-mounted machines

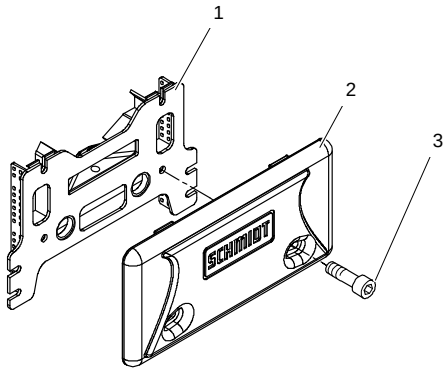
7.20.1 Aebi Schmidt vehicle plate



According to DIN EN 15432, front-mounted machines can be attached to the front vehicle plate. The height adjustment is designed in the construction so that it complies with DIN EN 15432 and is suitable for snow plough applications. A correction to these settings may be required, for example on the vehicle if changes to the tyres, suspension, attachments, etc. are subsequently made. In this case, any bolts taken out can be replaced by new bolts of the same specifications. The bolts are to be tightened to the specified torque.

 **DANGER**	**The fastening screws on the vehicle plate may become loose as a result of work being carried out.** **The vehicle plate could fall onto the road surface with the front-mounted machine and cause an accident. After the first 20 hours of use with an attachment (such as a snow plough), all screws are to be tightened with the correct torque. Subsequently tighten again at each annual check.**
 **NOTE**	**Screws that have become loose may be retightened with a maximum of 3 times of the correct torque setting or rotation angle. After this, the screws are to be replaced with new ones with the same strength.**
 **TIP**	**If the vehicle plate remains on the vehicle, the vehicle plate must be entered on the vehicle's documentation.** **We also recommend placing a protective covering on the vehicle.**

A towing ring is provided in the vehicle plate for recovery assistance. The towing ring should not be used for parking.



7.20.2 Protective covering

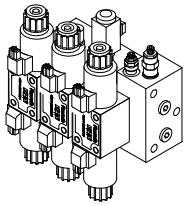
The protective covering (2) is attached at the front in the vehicle plate (1) and fastened with two cylinder screws (3).
The protective covering consists of a water and dirt-resistant plastic and covers the existing outer edges. The consequences of a frontal impact accident can therefore be minimized. Furthermore, the protective covering stops the vehicle plate getting dirty.

TIP

If the vehicle plate is on the HGV, in the case of a disassembled attachment, we recommend installing the protective covering on the vehicle plate with the machine off in order to minimise the consequences of a frontal impact accident.

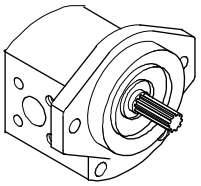
7.21 Hydraulic systems for front-mounted machinery

Aebi Schmidt hydraulic systems are built using the latest technology and conform with the applicable European safety regulations. The type plate is located near the vehicle type plate in the driver's cab. Control is handled via the control panel.



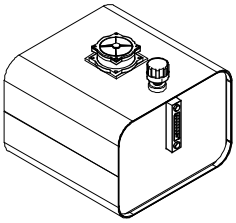
7.21.1 Hydraulic valve block

The valve block for controlling the attachment is located in a protected position behind the vehicle plate or behind the driver's cab.



7.21.2 Single hydraulic pump

The pump is flanged on the auxiliary drive of the vehicle engine. The pump (11 cm³/rev) supplies the front hydraulic valve block for controlling the attachment (snow plough).



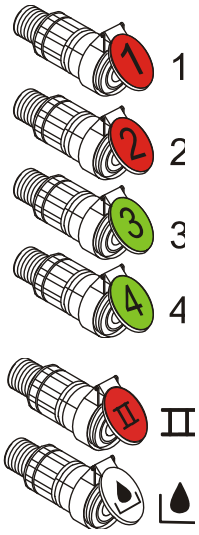
7.21.3 Hydraulic tank

The hydraulic tank is located behind the driver's cab. The contents of the tank amount to 40 l.
The hydraulic tank supplies the hydraulic pump to control the front hydraulic blocks using oil.

7.21.4 Hydraulic connections for controlling the snow plough

DANGER	**When the hydraulic couplings are connected, pressurised hydraulic oil, which may also be hot, can squirt out and could cause serious injury. Depressurise the hydraulic couplings completely before connecting the hydraulic system and wear gloves when connecting the hydraulic couplings.**
DANGER	**Actuator components for the hydraulic valves in the driver's cab must match the functions of the snow plough with regard to the individual functions and switching directions. Accordingly, the hydraulic hoses and their connection labelling must match the hydraulic couplings on the vehicle. Incorrect assignment of the hydraulic connections to the control unit will result in incorrect operation of the snow plough, which in turn can cause serious accidents and injuries.**

7.21.5 Front hydraulic connections



For example, connecting a snow plough or front-mounted sweeper

Connection (1): Raising
Connection (2): Lowering
Connection (3): Pivot to the left
Connection (4): Pivot to the right

e.g. connecting a front-mounted sweeper

Connection (II): Pressure hose
Connection ( ): Separate return

7.22 Electrical connection for front-mounted machines

There is a 7-pin connection (1) on the left of the vehicle plate for the power supply, for items such as side lamps.

7.23 Airport stand cleaning system

The airport stand cleaning system is intended for cleaning aircraft aprons. The cleaning system sprays cleaning agent and water onto the surface to be cleaned in an adjustable ratio. The container for the cleaning agent is located behind the driver's cab. Cleaning agent and water is pumped to the spray bars behind the front axle and sprayed at the stand.

Design of spray bars

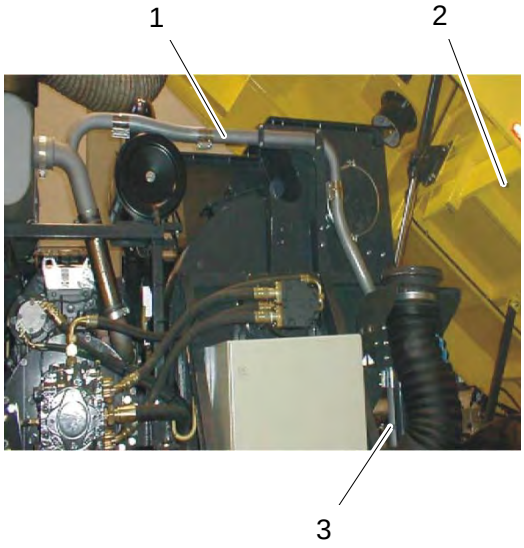
- Spray bars for water (1)
- Spray bars for cleaning agent (2)

The disc brushes mounted between the axles dislodge the dirt.

The sweeper unit mounted at the rear also dislodges dirt and debris. The suction unit picks up the dirt, debris, cleaning agent and water and stores it in the debris hopper.

7.24 Front spray beam

The sweeping surface can be sprayed with the front spray beams and the build up of dust when sweeping can be reduced.

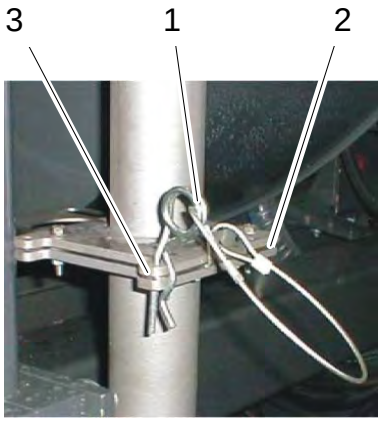


7.25 Hopper floor heating

Some of the hot exhaust emissions can be routed through the pipe system (1) via the aperture (2) (with the hopper lowered) into the floor of the hopper in order to heat it up.
This feature prevents damp refuse from freezing to the hopper floor in temperatures below 0°C.
The exhaust supply can be opened and shut using a gate (3).

WARNING

Burns
► Let hot vehicle parts, such as the gate, cool or move the gate using gloves



The exhaust supply to the hopper floor can be opened and closed using the shutter gate (2).
The gate must only be operated when cold.

Opening the gate (when there is a risk of frost):

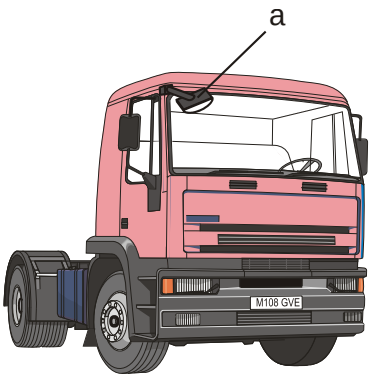
- Unlocking the gate: Pull out the cotter pin (1).
- Pull the gate (2) outwards. The channel is open.
- Close the gate: Put the cotter pin into the hole (3).

Closing the gate:
The process to close the gate is the reverse of the opening process.

7.26 Ladder

DANGER	**The ladder should be checked regularly and before each use to see that it is in good condition (visual inspection). Remove damaged ladders so they cannot be used. The ladder can slip and tip over. The ladder should be secured by a second person. People can be seriously injured if a ladder falls. The ladder may only be used in workshops with firm flooring. Accidents can be avoided if rules set out by the Employer's Liability Insurance Association and the operating instructions are adhered to. If the ladder can be substituted for other lifting devices, such as a lifting platform, then these are to be used.**

The telescopic ladder is located under the hopper floor on the right of the vehicle, in the direction of travel.
The ladder makes access to the coolant, water tank and blower cleaning flap possible.
The ladder is only to be put in its intended location.
The ladder is to be placed at an angle of between 65° and 75° and to be secured by a second person.



7.27 Mirror above the front window

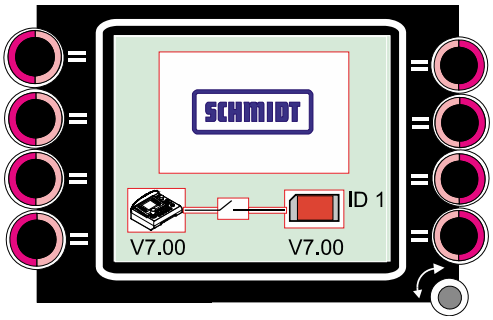
The mirror (a) is to be set so that when attaching, detaching and pivoting the plough, the hazard areas between the vehicle and the plough can be viewed.

8 Controlling the machine via the control panel

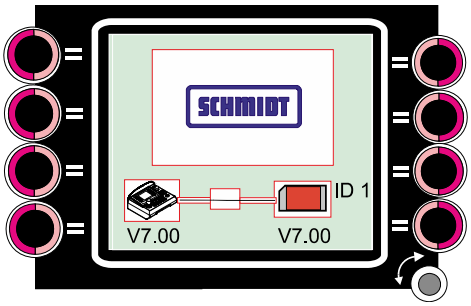
DANGER	***Observe the notes in the* Safety Information**
DANGER	**Rolling over and crushing** **► Ensure that no one is standing in the danger area.**
DANGER	**Incorrect operation of the machine or vehicle can cause dangerous situations that may lead to death or serious injuries. These operating instructions and those of the vehicle must be read and understood by the people that operate the machine. These instructions must be followed.**
DANGER	**The machine is envisaged for use at airports and for special use on motorways and major roads. The machine is not to be used for purposes other than those intended. The machine can cause serious injuries if used improperly.**
DANGER	**Danger due to impermissible use** **► The machine must not be used to gather lightly flammable, explosive, or hazardous materials.**

8.1 Start auxiliary engine

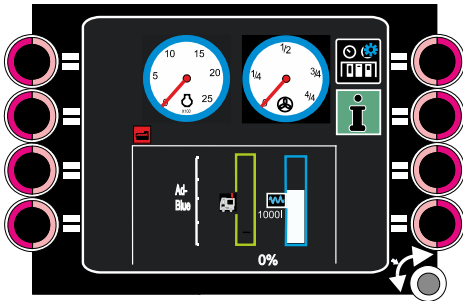
Switch on the ignition
Only start the auxiliary engine if the connection has been made to the PLC controller and the menu screen is shown.



Connection to the PLC controller has not been established.

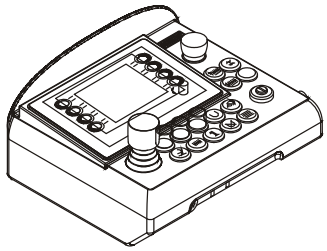


Connection has been established with the PLC controller

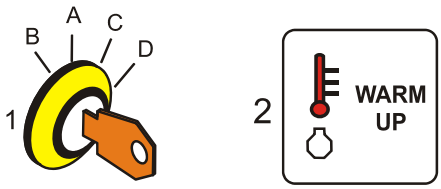


Start engine only after the menu screen appears.

DANGER	**Poisoning** **► Do not let the engine run in enclosed spaces or conduct away exhaust gases; provide proper ventilation**



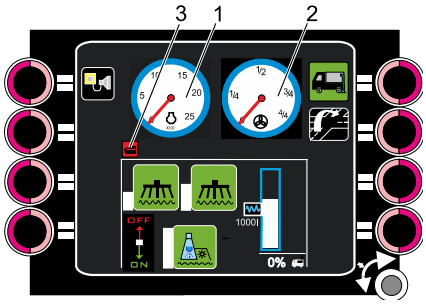
Start engine
Turn the ignition key as far as it can be turned (1).
In the case of a cold start, the motor switches to a warm-up phase. The symbol (2) on the display shows the difference between the actual and target temperature of the auxiliary engine. Sweep mode can be started and full load can be used once this light goes out.



Ignition key (1) start switch settings:

A	Ignition off, ignition key can be removed.
B	Ignition off, ignition key cannot be removed.
C	Ignition on.
D	Start the auxiliary engine (hold for at least 3 s).

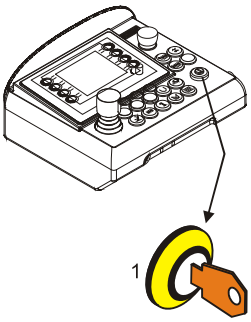
DANGER	**Flying foreign bodies when the blower is started (strange noise)** **► Safely shut down the vehicle and remove the foreign bodies** **► Check the blower for damage.**



The following values and warning and notice symbols are generally displayed when the auxiliary engine is running and in use:

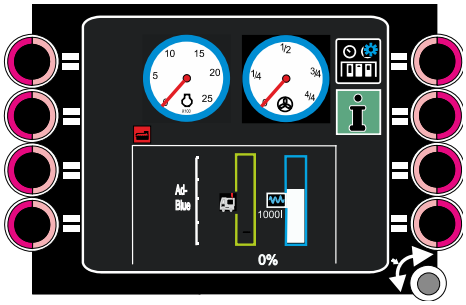
(1): Engine speed of the auxiliary engine
(2): Fan output (speed
(3): In case of a fault or warning, the corresponding warning or notice symbols light up.

The last application appears to be active and the corresponding buttons like "Brush" and "Suction unit" are preselect so that you can switch it off or start it directly (simultaneously) with the joystick.



8.2 Switching off the auxiliary engine

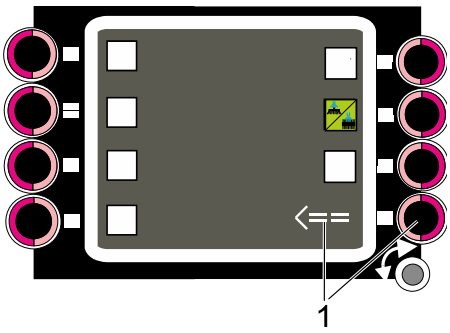
- Switch off all sweeping, suction and blowing functions.
- Use the ignition key (1) to switch off the engine and ignition.
- Parking the machine safely



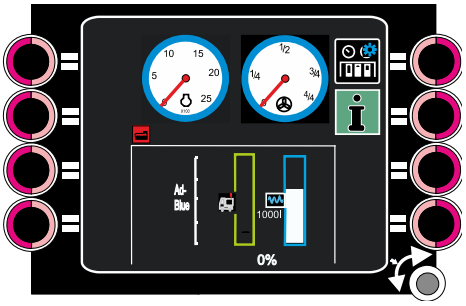
Ignition ON

The operating mode is provided without the engine:

- Drain water system

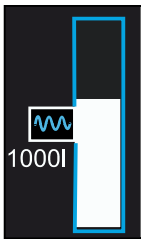


8.3 Information display

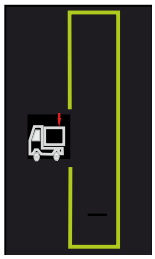


Motor off
Ignition on

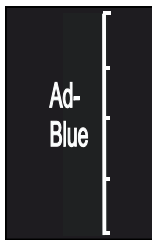
At the bottom of the display, information regarding fill levels is shown.



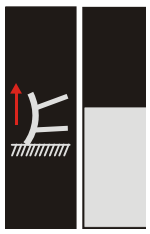
Water tank fill level



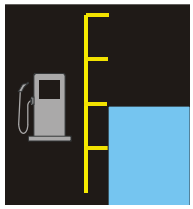
Debris hopper fill level (overload display)



Carbamide fill level



Plough-relief display

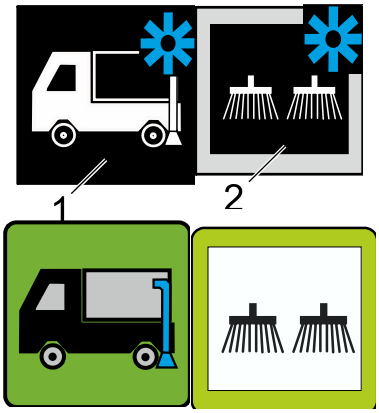


Auxiliary tank display

8.4 Menu

Ignition ON
Engine ON

1. Blue adjustment wheel:
   This operating mode can be preselected by pressing the button.
   The program then switches simultaneously to level 1.



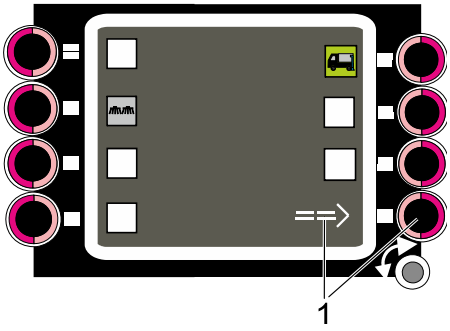
The following operating modes are provided depending on the equipment used:

- Sweeping (1)
- Airport stand cleaner (2)

2. The operating modes are divided over two levels.
   - Level 1: Frequently used functions
   - Level 2: Seldomly used functions

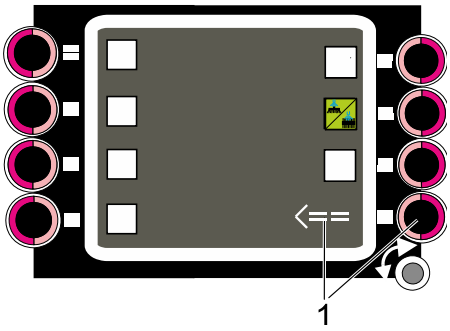
   Press button (1) or (2); you will switch to level 1 and the display will change.

8.4.1 Level 1



Only the functions that can be selected according to the machine equipment are displayed.
Switch to level 2 using button (1).

8.4.2 Level 2



Switch back to level 1 using button (1).

8.5 Sweep

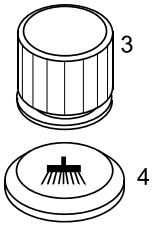
Switch to this position with button sequence described previously; see *Menu*.
The possible functions are subsequently described.

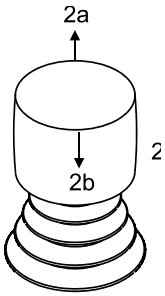
8.5.1 Putting the disc brush into operation

TIP

If other equipment, e.g., the suction unit or cylindrical brushes, is already in use:

- **Press the button (1); the disc brush lowers into the working position and switches on**
- **Press the button (1) again; the disc brush rises into the working position and switches off**





- Press button (4).
- Move the joystick (2) to the direction of (2b).
  Disc brush is lowered and switched on.
- Set the speed of the disc brush with rotary knob (3).
- A symbol (4) in the display indicates the use of the disc brush

Switch off disc brush

- Move the joystick (2) to the direction of (2a).
  The disc brush is raised, moved to transport position and switched off.

Or

Turn off the disc brush with the button (4). Only the disc brush is raised, moved to transport position and switched off.

8.5.2 Putting the sweeper unit into operation

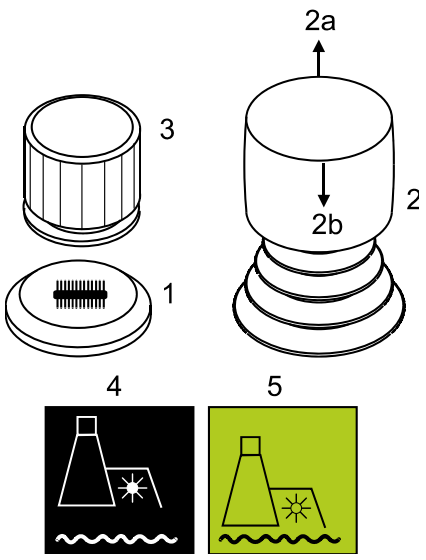
TIP

If other equipment, e.g., the suction unit or cylindrical brushes, is already in use:

- **Press the button (1); the disc brush lowers into the working position and switches on**
- **Press the button (1) again; the disc brush rises into the working position and switches off**

TIP

Changing and deactivating the sweeper menu is only possible if the blower output has dropped to less than ¼ power and no menu function has been activated with the joystick.



- Button (1) is preselected or press.
  Sweeper is preselected
- Move the joystick (2) to the direction of (2b).
  Sweeping unit is lowered and switched on.
- Set the speed of the cylindrical brush with rotary knob (3).

The rear sweeper functions are displayed with symbols in the display

- Sweeper unit off (4)
- Sweeper unit on (5)

Turning off the sweeper

- Move the joystick (2) to the direction of (2a).
  The sweeper is raised, moved to transport position and switched off.

Or

- Turn off the sweeper with button (1).

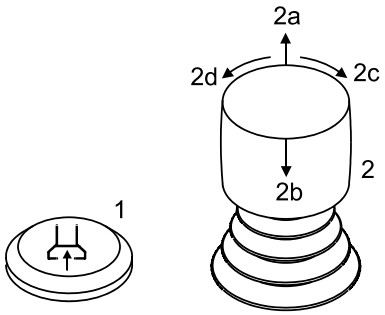
Only the sweeper is raised, moved to transport position and switched off.

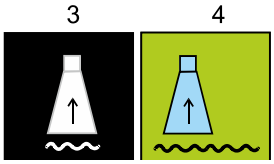
8.5.3 Putting the suction unit into operation

TIP

If other equipment, e.g., the suction unit or cylindrical brushes, is already in use:

- **Press the button (1); the disc brush lowers into the working position and switches on**
- **Press the button (1) again; the disc brush rises into the working position and switches off**





- Button (1) is preselected or press.
  Suction unit is preselected
- Set the motor speed by turning the joystick in the direction of (2c/2d). The blower is activated from a speed of 1,300 rpm and above.
- Move the joystick (2) to the direction of (2b).
  The sweeper is lowered and switched on.
  Water is supplied to the water spray unit in the suction nozzle and to the path marker. If the water supply for the path marker is interrupted, the stopcock (5) in the hopper box is to be closed.

The rear suction unit functions are displayed with symbols on the display

- Suction unit off (3)
- Suction unit on (4)

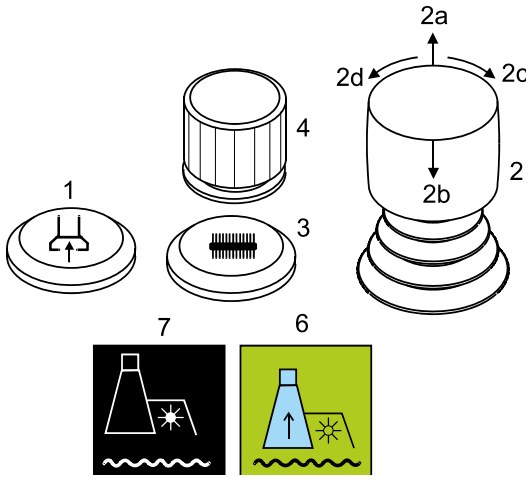
Switching off the suction unit

- Move the joystick (2) to the direction of (2a).
  All working devices are moved to the transport position and switched off.

Or

- Turn off suction unit with button (1).

Only the suction unit is raised in transport position and switched off.



8.5.4 Suction and sweeping with the sweeper

- Button (1) is preselected or press.
  Suction unit is preselected
- Press sweeper button (3).
  Sweeper is preselected
- Set the motor speed by turning the joystick in the direction of (2c/2d). The blower is activated from a speed of 1,300 rpm and above.
- Move the joystick (2) to the direction of (2b).
  Suction and sweeper is lowered and switched on.
  Water is supplied to the water spray unit in the suction nozzle and to the path marker. If the water supply for the path marker is interrupted, the stopcock (5) in the hopper box is to be closed.

The rear suction unit functions are displayed with symbols on the display

- Suction and sweeper unit off (7)
- Suction and sweeper unit on (6)

Switching off the suction unit

- Move the joystick (2) to the direction of (2a).
  All working devices are moved to the transport position and switched off.

Or

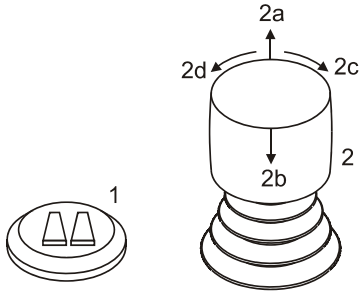
Turn off the suction unit and sweeper unit with button (1 / 3). The suction unit and sweeper are raised, moved to transport position and switched off.

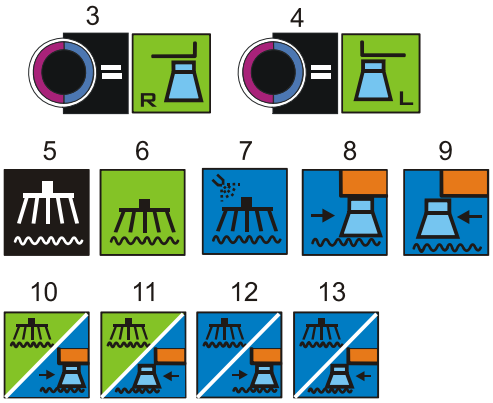
8.5.5 Putting the side suction into operation

TIP

If other equipment, e.g., the suction unit or cylindrical brushes, is already in use:

- **Press the button (1); the disc brush lowers into the working position and switches on**
- **Press the button (1) again; the disc brush rises into the working position and switches off**





- Button (1) is preselected or press.
  The side suction unit is preselected
- Select the left or right suction duct with button (3/4)
- Set the motor speed by turning the joystick in the direction of (2c/2d). The blower is activated from a speed of 1,300 rpm and above.
- Move the joystick (2) to the direction of (2b).
  The selected suction duct is extended, lowered and turned on.

The symbols shown in the display show the following operating states.

- Disc brush raised (5).
- Disc brush in working position (6).
- Disc brush in working position, water spray unit turned on (7).
- Suction duct retracted and lowered (8).
- Suction duct extended and lowered (9).
- Disc brush in working position, suction duct retracted and lowered (10).
- Disc brush in working position, suction duct extended and lowered (11).
- Disc brush in working position, water spray unit turned on, suction duct retracted and lowered (12).
- Disc brush in working position, water spray unit turned on, suction duct extended and lowered (13).

Switching off the suction unit

- Move the joystick (2) to the direction of (2a).
  All working devices are moved to the transport position and switched off.

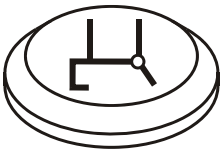
Or

- Turn off the side suction unit with button (1).
  Only the suction unit is raised to the transport position.

8.5.6 Putting the coarse protection flap on the suction duct into operation

TIP

If coarse debris is picked up with the coarse debris flap; the suction output reduces.



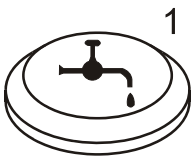
Open/close coarse debris flap

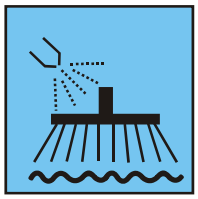
- Press and hold the button for approx. 1 s.
  The coarse debris flap is opened and the button is illuminated.
  To close, press the button.

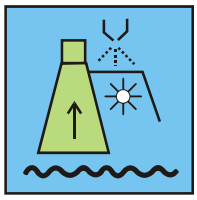
Or

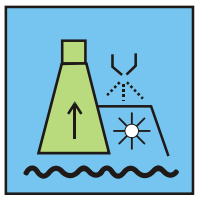
- Press the button briefly.
  Coarse debris flap opens and closes in delay-interval mode (3x).

8.5.7 Putting the sprayer/front spray bar into operation









- Press the button (1).
  The sprayer is turned on for all working devices that are currently in use.

The sprayers that are supplied with water are displayed via symbols in the display

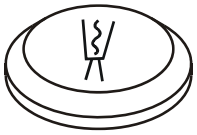
- Disc brush left or right (2)
- Rear suction unit (3)
- Rear sweeper unit (4)

8.5.8 Putting the foam path marking into operation

TIP

The path marker is only engaged if at least one of the following functions is switched on.

- **Sweeping with disc brushes**
- **Sweeping with the rear sweeper unit**
- **Cleaning with the blowing equipment**



- The path marker is preselected or press.
  The path marker is pre selected.
- Path marking is switched on by
  putting the suction, sweeper or blower unit into operation.

Turning off the path marking

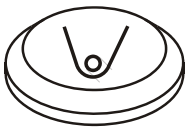
- Press the button

8.5.9 Putting the front pick-up into operation

NOTE

Used only on
take-off and landing strips
on even terrain
in the case of large pieces of waste, e.g., stones, screws

Use the front pick-up briefly only and then switch off again.

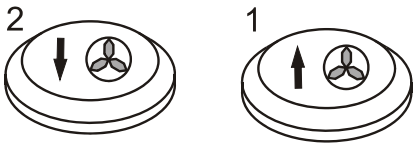


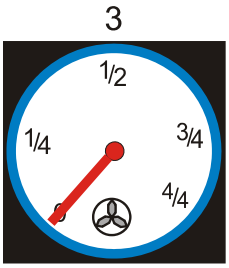
The suction function of the rear sweeper must be switched on.

- The front pick-up is preselected or press.
  The front pick-up is preselected.
- The front pick-up lifts or lowers.

8.5.10 Adjusting the blower output

DANGER	**Being knocked over or injured due to thrown objects as a result of high air speeds of the blowing equipment** **► Stop working immediately if people enter the danger areas of the blast nozzle** **► Reduce the blower output or switch it off when passing past persons, vehicles or other loose objects.**





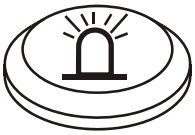
When the blower is activated in sweeping, blowing, wanderhose, stationary cleaning and dual suction mode, repeatedly pressing these two buttons can be used to increase or decrease the blower output. The blower output is displayed with the display instrument (3)

The button (1) for maximum blower power is illuminated when the control panel is switched on.

Adjusting the blower output

- Increase blower output with button (1). If the highest power has been achieved, the function lighting of the button is illuminated.
- Decrease blower output with (2) button. If the lowest power has been achieved, the function lighting of the button is illuminated.

8.5.11 Rotary beacon

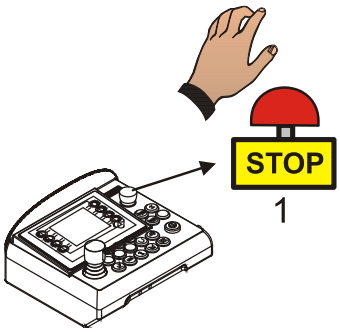


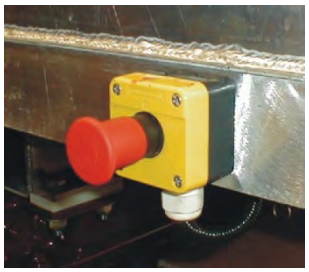
The rotary beacon is switched on or off with this button.

8.5.12 Working lights, environmental lighting

- Press the button: Working lights ON
- Press the button again: Working lights and environmental lighting ON
- Press the button again: Working lights and environmental lighting OFF

8.5.13 EMERGENCY STOP





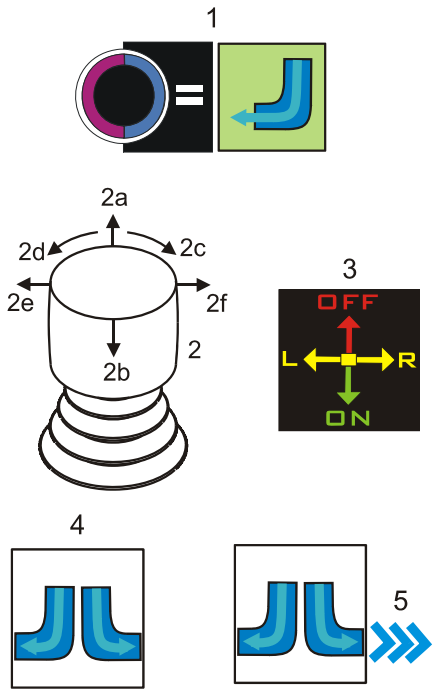
The auxiliary engine is immediately switched off immediately with the EMERGENCY STOP switch.

- Press the button, the auxiliary engine is turned off
- To unlock the button, turn it to the right.

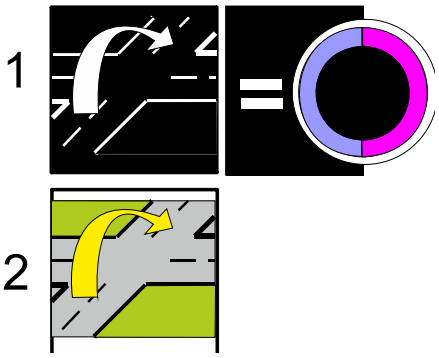
The auxiliary engine is to be restarted after the dangerous situation has been rectified. Settings that have been made before must be set again.

8.5.14 Putting the blower unit into operation

DANGER	**Being knocked over or injured due to thrown objects as a result of high air speeds of the blowing equipment** **► Stop working immediately if people enter the danger areas of the blast nozzle** **► Reduce the blower output or switch it off when passing past persons, vehicles or other loose objects.**
TIP	**Changing the blowing direction is only possible if the blower is turned off and the blower output has dropped to below the ¼ mark.**



- Button (1) is preselected or press.
  The blower unit is preselected.
- Symbol (4) appears on the display
- Symbol (3) appears on the display.
  The functions of the joystick (2) are displayed.
  OFF Switch off blower unit
  ON Switch off blower unit
  L Left blowing direction
  R Right blowing direction
- Move joystick (2).
  Direction (2b) Blowing equipment is lowered and switched on
- Set the blowing direction with the joystick (2).
  Direction (2e) Left blowing direction
  Direction (2f) Right blowing direction
- Blowing direction is displayed with symbol (5).
- The blower output (blower speed) can be increased or reduced by turning the joystick (2) in the direction (2c/2d).
- Move joystick (2).
  Direction (2a) Blowing equipment is switched off and raised.



8.5.15 Junction skip

The junction skip is only possible in sweep mode.

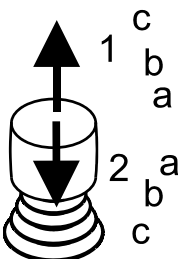
- Press the junction skip button, the display changes from (1) to (2).
  Sweeper unit raises, fan continues to run at set speed.

Exit junction skip:

- Press the junction skip button; the display changes from (1) to (2).
  The sweeper unit lowers.

Additional option.

- Move the joystick in direction (1a) and the junction skip display changes.



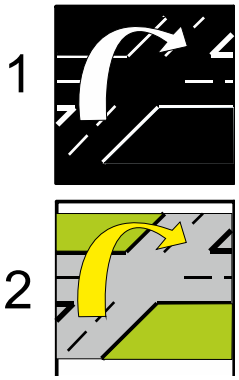
Exit junction skip:

- Move the joystick in direction (2c) and the junction skip display changes.

Additional option.

- Combination of button and joystick and vice versa.

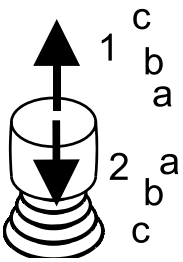
8.5.16 Reversing



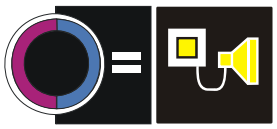
When engaging the reverse gear, the sweeper unit raises, the fan continues to run at the set speed.

- The display switches to the depiction of the junction skip (2).

When driving forward, move the joystick in direction (2c); the sweeper unit lowers, and the fan continues to run at the set speed.
The display switches from (2) to (1).



8.5.17 Reversing camera



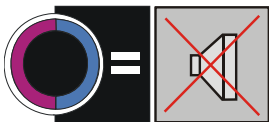
The reversing camera screen is shown on the display of the control panel. The camera is turned on when:

- Reverse gear is engaged.
- Switched on using the switch.

8.5.18 Acoustic warning signal

NOTE

Acoustic warning signal: Reaching of limit values
► The cause must be rectified immediately
Do not switch off the acoustic warning signal until the cause is rectified



When the button is pressed, the acoustic signal for the following warnings fades out.

- Water tank fill level
- Overload display
- Engine oil level
- Coolant temperature
- Dirt in the air filter
- Coolant level
- Fuel level

The acoustic warning signal is switched off.

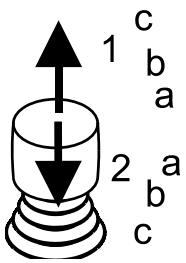
8.5.19 Switching on the high-pressure spray bar in front of the sweeper unit

	**DANGER**	**Ingress of fluid with high pressure** **► Stop working immediately if people enter the danger area** **► Do not place hands or feet in the spray jet**

	**WARNING**	**Thrown parts** **► Stop working immediately if people enter the danger area, and stop the machine** **► Look out for parts that may be ejected while work is in progress**

1

2



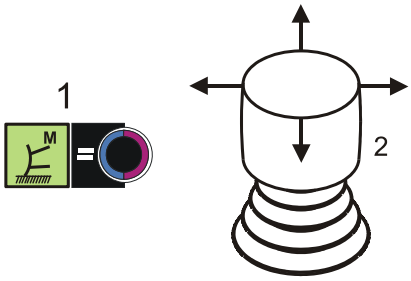
Press the sprayer button, the display changes from (1) to (2).

- Move joystick in direction (2c) and the high-pressure spray bar at the front switches on.
- The high-pressure system is switched off if the fill level in the water tank is too low.

8.5.20 Controlling front-mounted machine e.g. snowplough, magnetic beam

	**DANGER**	**People can be caught between the attachment and the vehicle. The attachment can only be moved if the danger zone can be seen. The attachment may not be moved if there are people in the danger zone.**
	**NOTE**	**Damage to castor wheels ► Lift the snow plough before swivelling**
	**TIP**	**The auxiliary engine does not need to be started to control the attachment. The ignition to start the attachment motor must be switched on.**

8.5.20.1 Manual operation

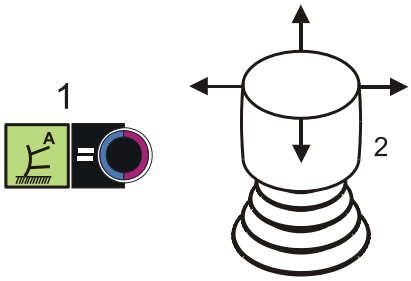


During manual operation, the joystick is to be held in the functional direction of the attachment until the end position has been reached.

- Start the vehicle engine and switch on the ignition of the attachment motor.
- Press the button (1). The "Manual control" symbol is illuminated in green.
- The attachment can be controlled (raised/lowered and pivoted) with the joystick (2).

8.5.20.2 Automatic mode

DANGER	**People can be caught between the front-mounted machine and the vehicle. In automatic mode, the function of the attachment can only be stopped by switching off the ignition of the auxiliary engine or via the EMERGENCY STOP.**
TIP	**The "Automatic" function is only activated when driving. If the vehicle is at a standstill, the control program switches to manual operation.**

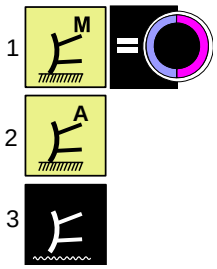


During automatic operation, the joystick only needs to be moved briefly in the functional direction of the attachment. The attachment moves automatically to its end position.

- Start the vehicle engine and switch on the ignition of the attachment motor.
- Press button (1); the "Automatic control" symbol is illuminated in green.

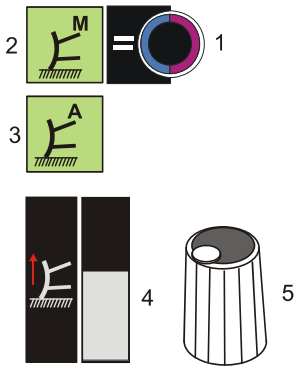
The function is executed to the end position by briefly tipping the joystick (2).

8.5.20.3 Turning off the control



To turn it off, press the 'Automatic' (1) or 'Manual operation' (2) button again until symbol (3) appears. Attachment is switched off.

8.5.21 Set plough relief

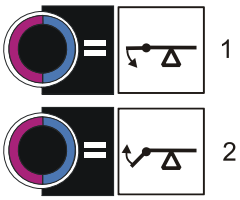


Switch on the ignition of the auxiliary engine.

- Continue to press the (1) button until the green symbol (2) "Manual" or (3) "Automatic" appears.
- Relief of the front-mounted machine is activated. It is shown in the display (4).
- Plough relief can be set by rotating the (5) knob. The relief is shown with the display (4).

8.5.22 Control snowplough with foldable side blade

DANGER	**People can be caught between the plough blade and the vehicle. The front mounted device can only be moved if the danger zone can be seen. The snow plough may not be moved if there are people in the danger zone.**



Front mounted snowplough with foldable side blade.

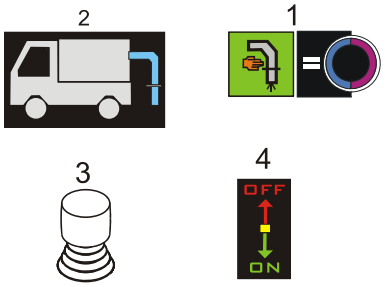
- Pivot side blade in (1)
- Pivot side blade out (2)

8.5.23 Activate the wanderhose

Switch to level 1 as described under *Menu*.

NOTE

If the wanderhose is switched on, all other attachments are switched off.

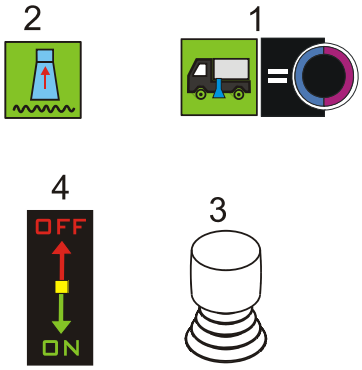


- Start auxiliary engine
- Button (1) is preselected or press.
  The wanderhose is preselected.
- By turning the joystick (3), the suction power (blower speed) can be increased or decreased.
- With the joystick (3) in the ON direction, see display (4). The joystick is to be moved to the OFF direction to turn it off.

8.5.24 Turning on dual suction

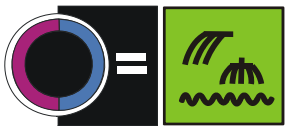
With dual suction, the fluid is suctioned up between the axles.
Switch to level 1 as described under *Menu*.

For optimum suction power you must close the suction channel in the rear suction equipment.



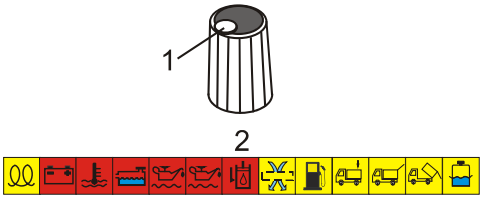
Activate dual suction

- Start auxiliary engine
- Button (1) is preselected or press.
  Dual suction is preselected.
- The display symbol appears (2).
- Start dual suction with the joystick (3). Fluid suction duct lowers and the blower switches on. Observe the symbol (4) indicating the joystick direction.
- By turning the joystick (3), the suction power (blower speed) can be increased or decreased.



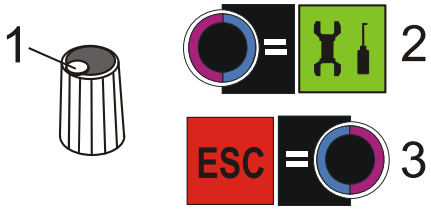
8.5.25 Debris rake

The button can be used to raise or lower the debris rake. The symbol is illuminated in green.



8.5.26 Display warning symbols

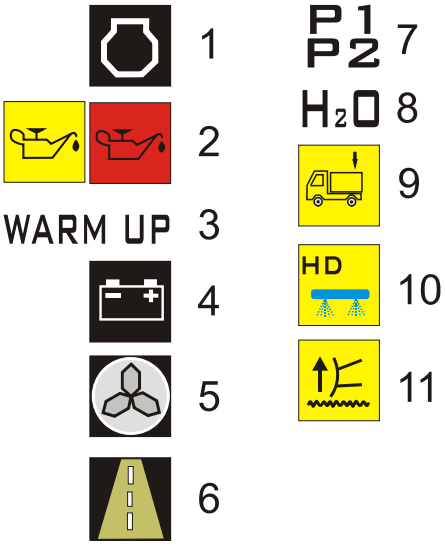
- Switch on the ignition of the auxiliary engine. Do not start the engine
- Press button (1) on the rotary knob for 6 seconds.
- Warning symbol bar is displayed. Lights are to be replaced if they fail.



8.5.27 Service menu for the driver

The driver can call up operating data using the service menu. It is not possible to change parameters.

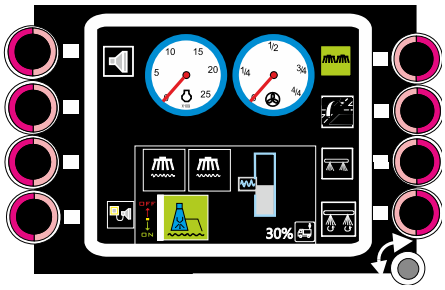
- Press button (1) on the rotary knob for 6 seconds.
- Switch to the service menu with the (2) button
- Leave the service menu with the (3) button.



The following data can be read off via the service menu.

- Auxiliary engine speed (1)
- Engine oil pressure (2)
- Warm running temperature (3)
- Electrical system voltage (4)
- Blower speed (5)
- Transit speed (6)
- Control pressure (7)
- Fill level in percent (8)
- Load display (9)
- Water tank fill level (10).
  If the value falls below 30%, a signal sounds.
  The high-pressure water pump turns off.
- Relief display of the front-mounted device in % and mA (11)

8.6 Activating the airport stand cleaner



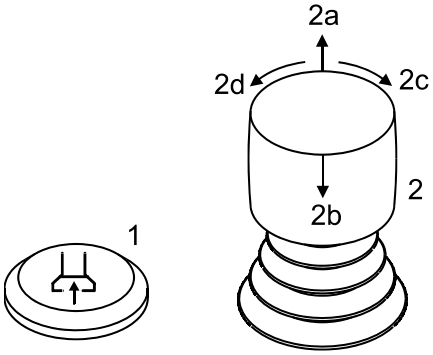
Switch to this position with button sequence described previously, see *menu*.
The possible functions are subsequently described.

8.6.1 Putting the suction unit into operation

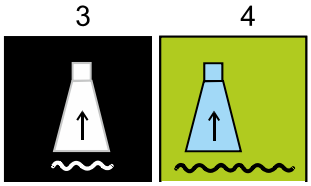
TIP

If other equipment, e.g., the suction unit or cylindrical brushes, is already in use:

- **Press the button (1); the disc brush lowers into the working position and switches on**
- **Press the button (1) again; the disc brush rises into the working position and switches off**



- Button (1) is preselected or press.
  Suction unit is preselected
- Set the motor speed by turning the joystick in the direction of (2c/2d). The blower is activated from a speed of 1,300 rpm and above.
- Move the joystick (2) to the direction of (2b).
  The sweeper is lowered and switched on.
  Water is supplied to the water spray unit in the suction nozzle and to the path marker. If the water supply for the path marker is interrupted, the stopcock (3) in the hopper box is to be closed.



The rear suction unit functions are displayed with symbols on the display

- Suction unit off (3)
- Suction unit on (4)

Switching off the suction unit

- Move the joystick (2) to the direction of (2a).
  All working devices are moved to the transport position and switched off.

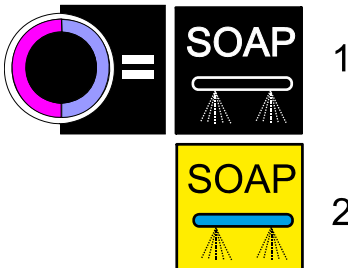
Or

- Turn off suction unit with button (1).
  Only the suction unit is raised in transport position and switched off.

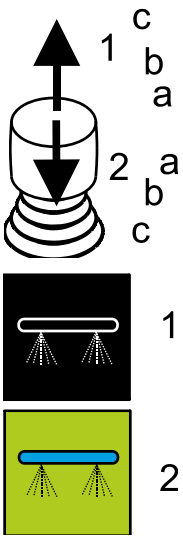
8.6.2 Switching on the detergent on the front sprayer bar

DANGER	**Ingress of fluid with high pressure** **► Stop working immediately if people enter the danger area** **► Do not place hands or feet in the spray jet**

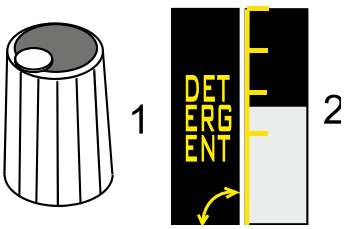
WARNING	**Thrown parts** **► Stop working immediately if people enter the danger area, and stop the machine** **► Look out for parts that may be ejected while work is in progress**



- Press the detergent button, the display changes from (1) to (2).



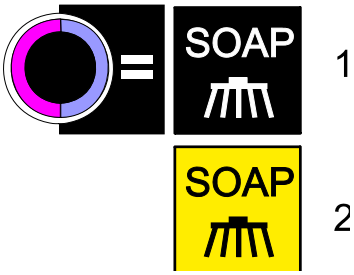
Move joystick in direction (2c) and the high-pressure spray bar at the front switches on with detergent and spray water.
The display switches from (1) to (2).



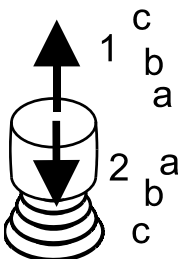
- Use the rotary knob (3) to set the quantity of cleaning agent to be fed to the spray bar.
  The amount is shown on the bar chart (4).

8.6.3 Switching on the detergent on the spray bar in front of the sweeper unit

DANGER	**Ingress of fluid with high pressure** **► Stop working immediately if people enter the danger area** **► Do not place hands or feet in the spray jet**



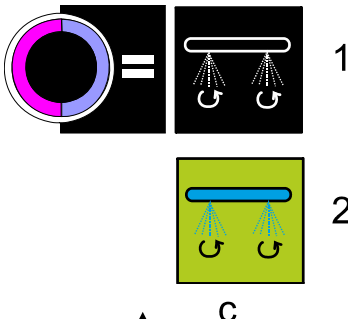
- Press the detergent spray bar button, the display changes from (1) to (2).



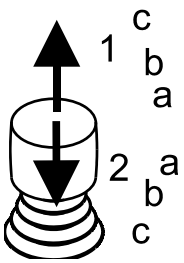
Preselect disc brush and suction unit.
Move joystick in direction (2b) and spray water bar switches on with detergent and spray water.

8.6.4 Switching on the high-pressure spray bar in front of the sweeper unit

	**DANGER**	**Ingress of fluid with high pressure** **► Stop working immediately if people enter the danger area** **► Do not place hands or feet in the spray jet**
	**WARNING**	**Thrown parts** **► Stop working immediately if people enter the danger area, and stop the machine** **► Look out for parts that may be ejected while work is in progress**



- Spray bar off (1)
- Spray bar ON (2)

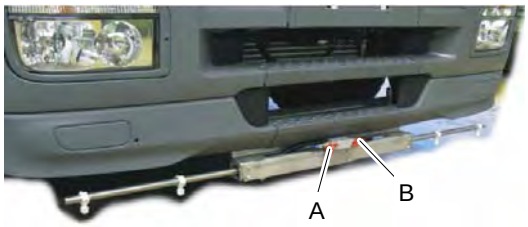


Move joystick in direction (2c) and the suction unit with rotation bar lowers and switches on.

8.6.4.1 Activate front spray bar

NOTE

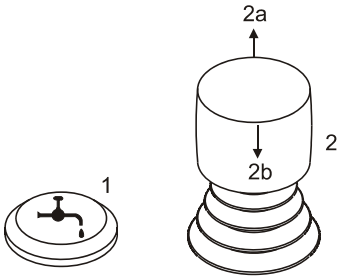
Damage to cleaning and water system
► Completely empty both systems in case of a danger of frost



The sweeping surface can be sprayed with the front spray beams and the build up of dust when sweeping can be reduced.

The water circulation leads from the water tank to the nozzles via a pump.
The way the water exits can be set at the valve on each side of the vehicle (1/2):

- Lever horizontal, valve open:
  - o Water exit right (A)
  - o Water exit left (B)
- Lever vertical, valve closed
  - o No exit of water

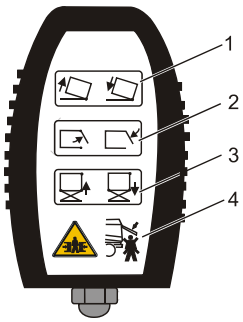


Switch on front spray beam:

- Open valve at the front spray bar (A/B)
- Select sweep function
- Select the front spray bar with the (1) button
- Move the joystick (2) to setting (2b), sweeping and spray function
- Joystick in position (2a) Functions are switched off.

8.7 Hopper control

DANGER	**Crushing** **► Ensure that no persons are in the lowering or raising area**
DANGER	**Crushing** **► Ensure that no persons are in the swivelling area of the hopper doors**
DANGER	**Falling over and crushing** **► Ensure that the ground is level and can support the weight** **► Never raise a filled hopper with the hopper door closed.** **► Do not drive with the hopper raised**
WARNING	**Injuries due to falling cover parts** **► Observe the upper clearance before lifting the hopper**

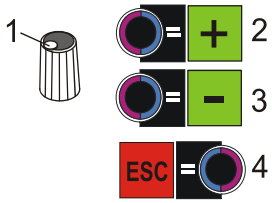


An acoustic warning signal sounds when being activated with the manual control panel.

Hopper control panel functions

- Raise/lower hopper (1)
- Open/close the hopper door (2)
- No function (3)
- Hazard instruction (4).

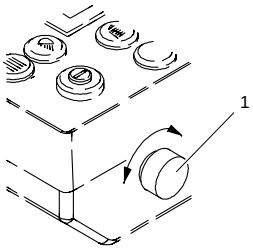
9 Adjustment work



9.1 Set the display brightness

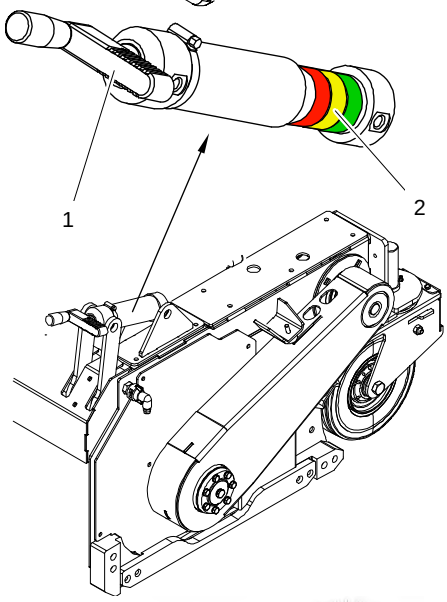
- Switch on the ignition for the auxiliary engine. Do not start the engine
- Press button (1) on the rotary knob for 6 seconds.
- Set brightness from 1 to 7 with button (2/3).
- Leave the setup menu with the (4) button.

9.2 Set search lighting



The brightness of the search lighting can be set using the rotary knob (1).

9.3 Setting up and measuring the sweep range of the cylindrical brush

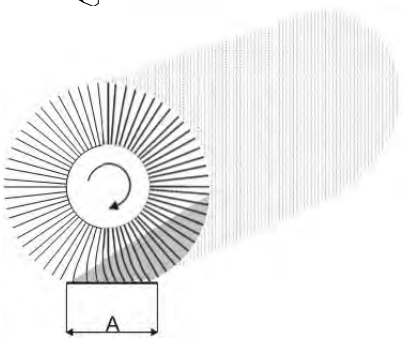


The optimum sweep range (distance A) is between 10 -30 mm (factory default setting). If the sweep range is increased, the wear on the bristles also increases.

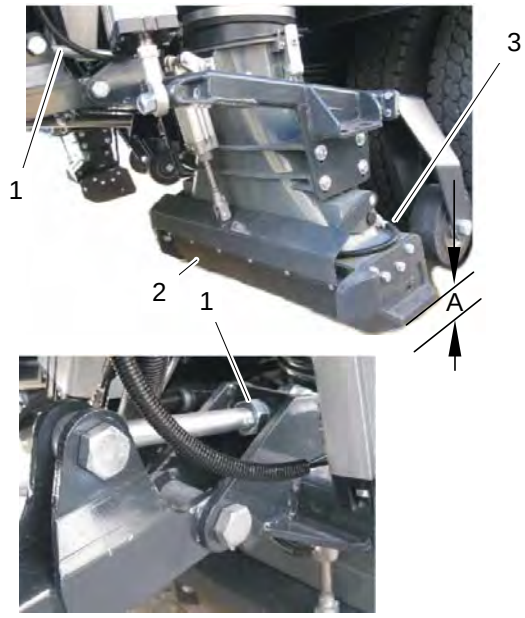
9.3.1 Setting the sweeping range

- Raise the cross brush.
- Set the sweep range with the crank (1). A colour scale (2) shows the degree of usage of the cylindrical brush.

9.3.2 Measuring the sweep range



- Lower the pick-up unit and cross brush.
- Leave the cross brush running with the vehicle at a stand-still.
- Lift sweeper unit and drive vehicle ahead.
- The sweep range, distance A (approx. 10 – 30 mm) can be identified on the visible sweeping surface. It must be of equal width on the left and right (parallel).



9.3.3 Adjusting the side suction unit

The distance (A) from the ground clearance of the pick-up unit to the sweeping surface should be approx.15-20 mm.

Adjust the eye screw nut (1) at the pulling arm of the suction assembly.

Set the distance of the rubber bars (2, 3) to approximately 15 mm, parallel to the sweeping surface.

Adjust the coarse debris flap to approximately 15 mm, as with the rubber bars.

9.4 Adjusting the liquid pick-up system

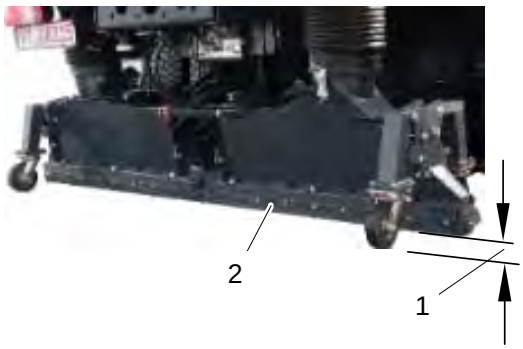
Optimum pick-up performance depends on having the correct setting. Therefore, the setting should be checked and re-adjusted regularly. To adjust the liquid pick-up system, it must be lowered completely.

9.4.1 Setting the coarse debris flap

Distance between the coarse debris flap and the sweeping surface (5):

- Closed coarse dirt flap
  Approx. 5 mm
- Open coarse dirt flap
  Approx. 15 mm

It is set using the caster wheel mounting slots (1) on the left and right.

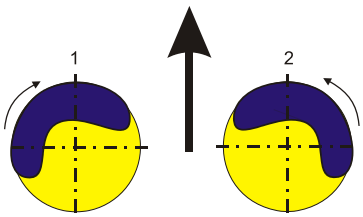


9.4.2 Setting the rubber bar

Setting distance (1)
Distance between the rubber bar and the sweeping surface approx. 5-6 mm

- Loosen all clamping bolts (2).
- Push the rubber bar downwards over the slots, parallel to the sweeping surface, until the ground clearance is approx. 5-6 mm.
- Tighten all clamping bolts again (torque 10 Nm).
- Distance (1) is to be checked again.

9.4.3 Disc brush, setting the sweeping pattern



To ensure an efficient sweeping pattern, it is necessary to set the disc brushes so they are at a certain angle to the sweeping surface. This ensures that the bristles only come into contact with the sweeping surface for a fraction of the sweeping circle. The brush should be calibrated in accordance with the diagram shown.

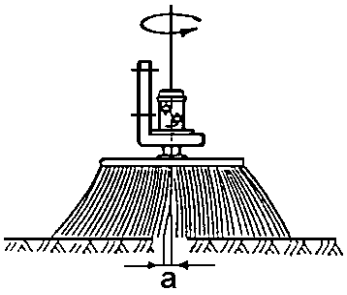
- Left brush (1)
- Right brush (2)

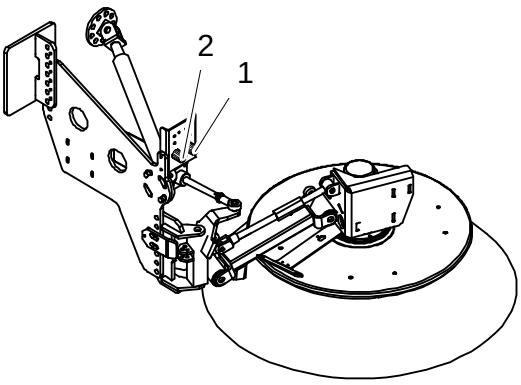
The following settings can be made:

- Engine mount angle
- Length setting for the upper brush steering arm
- Adjustment of the stop setting

9.4.4 Disc brush, setting the contact pressure

	WARNING	**Injury due to malfunctioning brush system** **► Do not stand on the disc brushes or transport people on them**
	WARNING	**Snagging, winding up or puncturing caused by moving brushes** **► Stop working immediately if people enter the danger area, and stop the machine**
	WARNING	**Impacts due to raising, lowering and pivoting the brush** **► Stop working immediately if people enter the danger area, and stop the machine**





To check the adjustment optically, switch on the disc brushes on the control panel and lower them. As a reference guide, the following setting is required for normal debris levels: As the brush turns, the bristle ends, distance (a), should be bent or trailing at a length of approx. 10 – 15 mm.

Adapting the setting

- Switch off the brushes
- Readjust the contact pressure using the pressure control valve (1)
- Switch on the brushes and optically check the setting

Repeat the procedure until the setting is correct.

The control valve (2) located next to it sets the swivel pressure. When correctly set, the disc brush should swivel inwards when it comes into contact with the kerb.
Pull and turn the knob to set.

The contact pressure of the brushes can be increased for dirt that is more difficult to remove. However, this increases the wear on the bristles.

9.5 Axle load setting

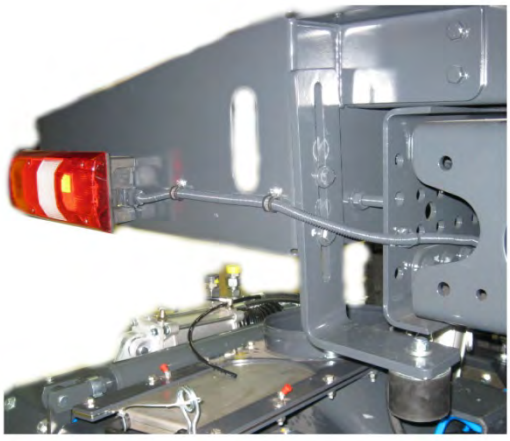
The factory-set axle load can be adjusted through the HGV suspension and should be checked regularly.

Therefore have the axle load checked and set by Aebi Schmidt Works Customer Service; see *Maintenance Schedule*.

9.6 Suction assembly limit stop

NOTE

Damage to the suction unit
► Do not move the height limit stop into another position.

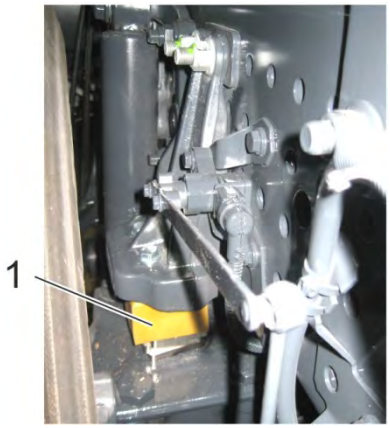


The suction assembly limit stop has been mounted to the correct height at the factory.
If the limit stop has to be removed or replaced, contact Aebi Schmidt customer service.

9.7 Air suspension limit stop

NOTE

Vehicle with air suspension
Damage to the pick-up unit
► Do not remove the height limit stop (1)



The limit stop limits the lowering of the air suspension so that the pick-up unit is not damaged.

10 Transit travel

	**DANGER**	**Accident due to changed driving behaviour** **► Observe axle loads** **► Adjust the driving speed to the respective road, traffic, terrain, and weather conditions** **► Observe decreased ground clearance and reduced slope gradients**

Proceed as follows for transit travel

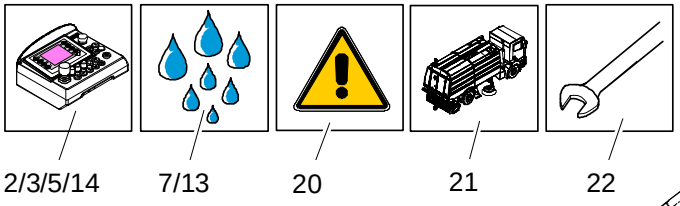
- Raise and secure pick-up unit.
- Raise and secure disc brushes.
- The hopper door must be closed completely.
- The wanderhose must be secured so that it cannot be lost.
- The debris hopper must be completely lowered.
- Loose residual dirt that could come off and soil the driving surface is to be removed.
- Ensure the auxiliary engine is switched off and cannot be started accidentally (remove ignition key).
- Switch on vehicle lighting in accordance with corresponding traffic regulations.

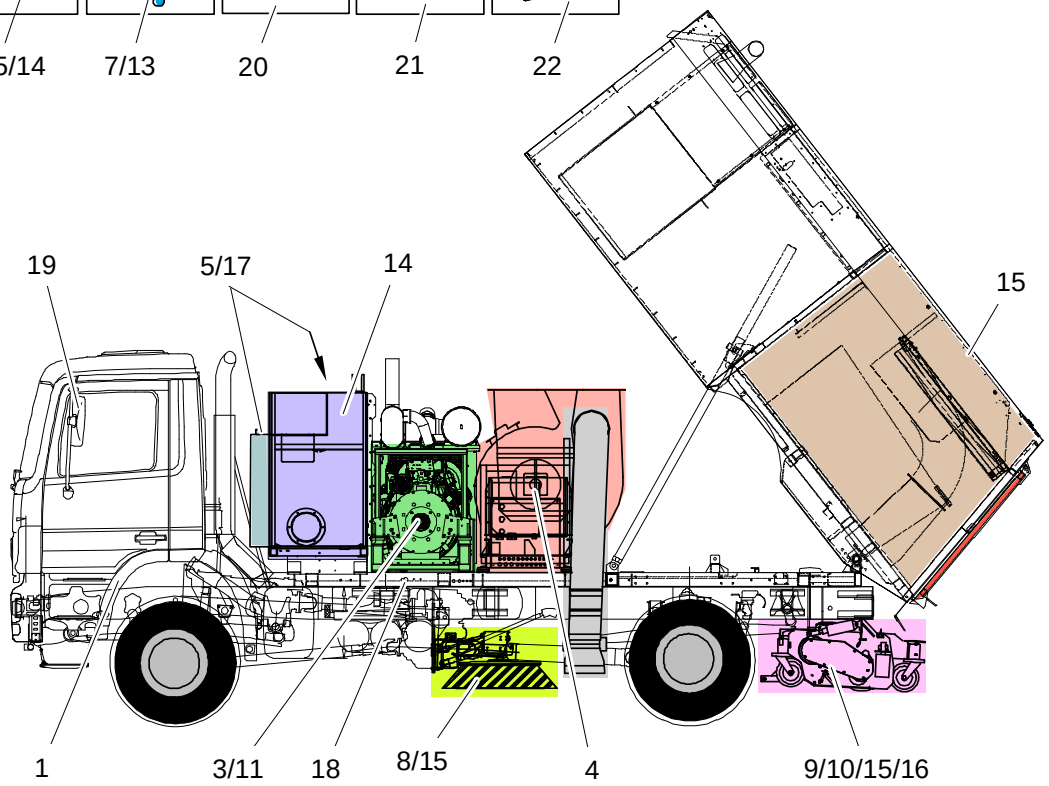
	**DANGER**	**Preventing accidents** **► Eliminate any discovered defects immediately**

11 Operation

11.1 Daily pre-operational checks

DANGER	**Rolling over and crushing** **► Safety shut down the machine before inspections**





Item	Designation	Checks
1	Vehicle	• See vehicle operating instructions.
2	Display	• Error messages note display.
3	Auxiliary engine	• See manufacturer's operating instructions. • Check oil level. • Note the low oil indicator on the display.

Item	Designation	Checks
4	Fan	• Check impeller wheel and housing for damage caused by foreign objects.
5	Hydraulic tank	• Oil level: Display on the tank • Low oil indicator: Note display on screen.
7	Leaks	• Hydraulic system
8	Disc brushes	• Check bristle wear (min. 60 mm). • Check contact pressure.
9	Pick-up unit	• Check diverse settings • Check screw and bolt fittings, tighten and fasten if necessary.
10	Cylindrical brush	• Check sweep range and bristle wear
11	Air filter (D3)	• Note soiling display on screen.
13	Pneumatic system	• Check system for leaks. • Drain the compressed air tank in winter operation.
14	Water tank	• Check water level using the indicator on the display.
15	Water nozzles	• Check functionality
16	Path marking with foam	• Check the hopper fill level and the foam nozzle to see that they work.
17	Hydraulic system for front-mounted machine	Single-circuit hydraulic system: • Oil level (dip stick) Dual-circuit hydraulic system: • Oil level (indicator on tank) • Oil filter contamination (contamination indicator) • Running noise when pump is being driven (drive shaft)
18	Central lubrication unit	• Check the grease level in the lubricant reservoir
19	Mirrors	• Check that the mirrors are properly adjusted. Danger areas must be able to be viewed.
20	Safety equipment	• Check of the safety equipment
21	Carry out functionality test.	• Fan, pick-up unit, cylindrical brushes etc.
22	Maintenance work	• Check to see that maintenance work that workshop staff were to carry out has been completed.
23	Water pump, high-pressure water pump	• Check fill level

11.2 Before using the machine

	**DANGER**	**Observe *Safety regulations* during commissioning. Check that all screw and bolt connections are tight and attached to the machine in a manner so they will not get lost.**

	**WARNING**	**Accident** **► Stop working immediately if people enter the danger area, and stop the machine**

- Perform pre-operational checks
- Detach transport safety devices.
- Put on the seat belt if available
- Ensure that no persons are in the danger zone
- Controlling the machine via the control panel

	**NOTE**	**Speed limit when switching on work equipment (disc brushes, suction unit)** **► Reduce the sweeping speed under 25 km/h**

11.3 Use

	**DANGER**	**Danger due to impermissible use** **► The machine must not be used to gather lightly flammable, explosive, or hazardous materials.**

- The driver must have read and understood the operating instructions.
- The driver must fulfilled the required prerequisites.
- The driver must always ensure that nobody is in the danger zone.
- For the control and monitoring of the machine, see *Controlling the machine via the control panel*.
- If a warning or notice symbol light up, the cause is to be rectified immediately.

11.3.1 Cold weather operation

- Observe the motor manufacturer's operating instructions for winter operation of the auxiliary engine.
- Drain the compressed air tank for controlling the machine (located under the water tank) daily.
- Check fluid level and anti-freeze in radiator.
- Carry out the following frost prevention measures on the water system after use:
  - Drain water tank.
  - Drain water filter.
  - Blow out water lines with compressed air.

11.3.2 Reversing

When the vehicle is put into reverse, you will hear a warning signal. The sweeper and pick-up unit are automatically raised when the auxiliary engine is switched on.

	**NOTE**	**Damage to the pick-up unit** **► Do not travel or roll in reverse with the pick-up unit lowered**

	**NOTE**	**Damage to the blowing unit due to higher objects** **► When the blowing unit is lowered, carefully drive around higher objects, such as kerb stones, street boundaries, etc. or lift the blowing unit**

11.3.3 Debris suction operation with disc brush

	**WARNING**	**Injury due to malfunctioning brush system** **► Do not stand on the disc brushes or transport people on them**

	**WARNING**	**Snagging, winding up or puncturing caused by moving brushes** **► Stop working immediately if people enter the danger area, and stop the machine**

	**WARNING**	**Impacts due to raising, lowering and pivoting the brush** **► Stop working immediately if people enter the danger area, and stop the machine**

	**NOTE**	**Speed limit when switching on work equipment (disc brushes, suction unit)** **► Reduce the sweeping speed under 25 km/h**

11.3.4 Sweeper suction operation with cylindrical brush

	**NOTE**	**Speed limit when switching on work equipment (disc brushes, suction unit)** **► Reduce the sweeping speed under 25 km/h**

- Start the vehicle engine
- Start auxiliary engine

	**NOTE**	**The cold diesel engine warms up automatically before it can be switched to full load capacity. The engine controller automatically ensures that this is the case.**

Sweeping in daily operation:

Sweeping without water in the suction hose is not permitted (except if in wet weather or rain). The water provides optimum dust separation when picking up debris.

Sweeping in icy conditions:

When sweeping with the machine in icy conditions - usually without water - the machine may be subject to greater wear. The lack of water intake in the debris pick-up area can lead to increased dust emissions. You should therefore sweep at a reduced speed.

- Use option switches to select the functions of your choice (disc brushes, cylindrical brushes, spraying unit, suction unit and path marker).
- Setting the brush speed (optional)
- Setting the diesel engine speed.
- Use the joystick **on the control panel** to raise and lower the selected units or switch them on or off
- Set vehicle in motion. Driving speed must be adapted to the respective debris levels on the road surface.
- Debris exceeding a certain size (suction nozzle width 70 mm with open coarse dirt flap) cannot be picked up by the machine. It could damage the pick-up unit.
- Empty and clean the hopper after use.

11.3.5 Suction operation - liquid pick-up (without cylindrical brush)

TIP

For optimum liquid pick-up, the recommended sweeping speed is 10-15 km/h.

- Start the vehicle engine
- Start auxiliary engine

NOTE

The cold diesel engine warms up automatically before it can be switched to full load capacity. The engine controller automatically ensures that this is the case.

- Ensure that debris hopper has been emptied.
- The steering bar in the debris pick-up unit must point upwards.
- Use the switches to select the functions (suction unit, spraying unit and path marker).
- Setting the diesel engine speed.
- Use the joystick on the control panel to raise and lower the selected units or switch them on or off
- Set vehicle in motion. Driving speed must be adapted to the respective debris levels on the road surface.
- Objects exceeding a certain size (5–10 mm) cannot be picked up by the machine It could damage the pick-up unit.
- Empty hopper after use.

11.3.6 Wanderhose

	**WARNING**	**Drawing in or trapping caused by vacuum** **► Stop working immediately if people enter the danger area, and stop the machine**
	**WARNING** 	**Risk of damage to hearing when working with wander hose** **► Wear ear protection.**

11.3.7 Liquid pick-up unit

	**TIP**	**For optimum liquid pick-up, the recommended sweeping speed is 10-15 km/h.**

- Start the vehicle engine
- Start auxiliary engine

	**NOTE**	**The cold diesel engine warms up automatically before it can be switched to full load capacity. The engine controller automatically ensures that this is the case.**

- Use the option switches to select the functions of your choice (suction unit and spray unit).
- Setting the diesel engine speed.
- Use the joystick on the control panel to raise and lower the selected units or switch them on or off
- Set vehicle in motion. Driving speed must be adapted to the respective debris levels on the road surface.

11.3.8 Empty hopper

 **DANGER**	**Crushing** **► Ensure that no persons are in the lowering or raising area**
 **DANGER**	**Crushing** **► Ensure that no persons are in the swivelling area of the hopper doors**
 **DANGER**	**Falling over and crushing** **► Ensure that the ground is level and can support the weight** **► Never raise a filled hopper with the hopper door closed.** **► Do not drive with the hopper raised**
 **DANGER**	**Falling over** **The debris does not slide when the hopper is lifted (e.g., the debris in the hopper is frozen solid)** **► Interrupt the emptying process** **► Rectify the cause (perform the emptying process manually, if necessary)**
 **WARNING**	**Injuries due to falling cover parts** **► Observe the upper clearance before lifting the hopper**
 **WARNING**	**Injury from sharp-edged objects, hazardous substances or bacterially contaminated road surface or organisms** **► Wear safety gloves and spray protection for face and body**
 **NOTE**	**Destruction of the suction hoses** **► Lift the hopper only when the pick-up unit is lifted**
 **TIP**	**To lift the hopper, start the vehicle engine and switch on the control panel to control the machine. The device motor does not need to be started.**
 **TIP**	**If the control panel to control the hopper is not working, the hopper can be controlled using the emergency tipping device**

Preparations to empty the hopper

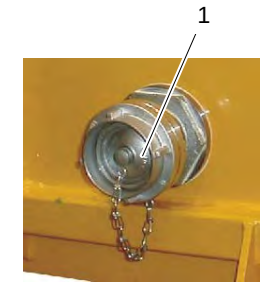
- Park the vehicle safely.
- People must leave the danger zone.
- To raise the hopper, the vehicle engine must be started and the control panel must be switched on.

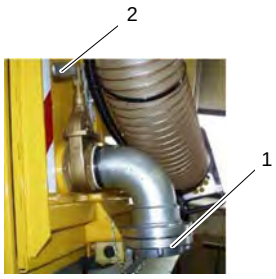
11.3.8.1 Letting out dirty water / de-icing agents

If you have only fluids in the container, they can be collected with the cover closed using a connection. Without the hopper being lifted, the water is drained down to the bottom edge of the connection.

Keep a distance to avoid impurities that may spray out and wear suitable protection equipment.

Observe environmental protection regulations!

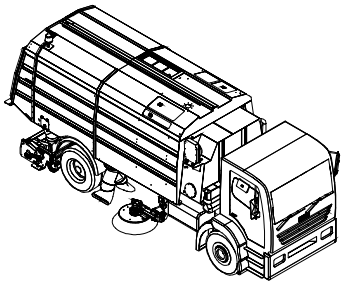




- Park the vehicle on a level, firm surface. Apply the parking brake.
- Draining fluid from the B connection (1)
- Draining fluid from the A connection (1) and with the cut-off gate (2)

11.3.8.2 Emptying remaining dirty water / de-icing agents

	**DANGER**	**Crushing hazard when the debris hopper is raised** **► Prior to working, fit the support under the hopper**
	**DANGER**	**Cutting and amputation injuries between the open hopper door and the hopper** **► Switch off control panel and remove the ignition key**
	**TIP**	**The hopper cannot be raised with the cover closed if the overload display is showing a load of greater than 50%.**



When raising the hopper by approximately 5°, the remaining fluid in the container can also be drained.

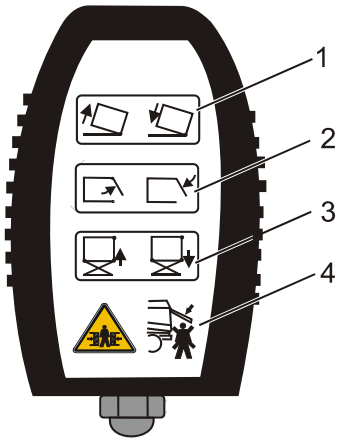
- Park the vehicle on a level, firm surface. Apply the parking brake.
- Ensure that there is sufficient space above and behind the vehicle and that no one is standing in the area behind the vehicle.
- Leave vehicle engine running (idle speed) and switch on auxiliary drive (tipper hydraulic pump).
- Switch on ignition using the AS 990 control panel.
- Connect the hand-held control panel to the connector in the container box.
- Raise the hopper.

11.3.8.3 Unloading debris from the hopper

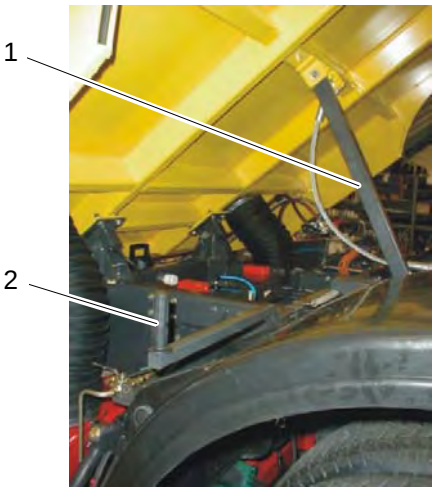
If you have fluids and debris in the hopper, you must raise and empty the hopper with the cover open.

DANGER	**Cutting and amputation injuries between the open hopper door and the hopper** **► Switch off control panel and remove the ignition key**

TIP	**The hopper can only be raised if the hopper door is completely open!**



- Park the vehicle on a level, firm surface. Apply the parking brake.
- Ensure that there is sufficient space above and behind the vehicle and that no one is standing in the area behind the vehicle.
- Leave vehicle engine running (idle speed) and switch on auxiliary drive (tipper hydraulic pump).
- Switch on ignition using the AS 990 control panel.
- Connect the hand-held control panel to the connector in the container box.
- Press button (2) until the hopper door is completely open.
- Raise the hopper, button (1).
- After emptying the debris hopper, remove any refuse still stuck to the hopper using a scraper and spraying hose. Clean the filter and the dirt screen.
- Clean the hopper area above the sieve with the built-in spray bar (on the hopper door). To do this, turn the valve and engage the water pump with the engine running by means of the button.
- Clean the closing edges of the hopper door and the hopper.
- The mechanical hopper support must always be inserted beforehand in case people place themselves between the raised hopper and the attachment/vehicle.

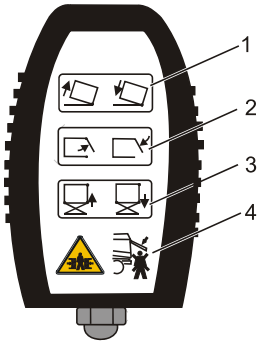


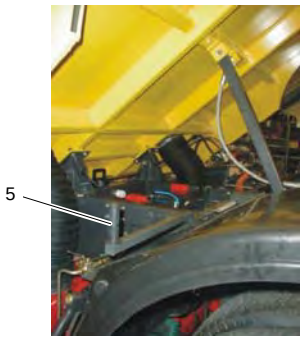
The space under the raised hopper is a hazardous area. Before anyone enters this area, the mechanical hopper support (1) must be securely clicked in under the hopper.

The bar automatically holds the debris hopper in place when it is fully raised. To release the hopper support, fully raise the hopper and press on the side gate (2) under the support.

11.3.8.4 Lower debris hopper

DANGER	**Crushing** **► Ensure that no persons are in the swivelling area of the hopper doors**





- Leave vehicle engine running (idle speed) and switch on auxiliary drive (tipper hydraulic pump).
- Switch on ignition using the AS 990 control panel.
- Connect the hand-held control panel at the rear right in the container box to the distributor housing.
- Raise the hopper to the end stop using the button (1).
- Push the support mechanism lever (5) inwards and hold to operate the mechanical hopper support.
- Lower hopper completely (1). The hopper support slides along the support mechanism over the support console. The lever (5) can be released.
- Close the hopper door (2).

11.3.9 Blowing operation

DANGER	**Being knocked over or injured due to thrown objects as a result of high air speeds of the blowing equipment** **► Stop working immediately if people enter the danger areas of the blast nozzle** **► Reduce the blower output or switch it off when passing past persons, vehicles or other loose objects.**

	**NOTE**	**Damage to the blowing unit due to higher objects** **► When the blowing unit is lowered, carefully drive around higher objects, such as kerb stones, street boundaries, etc. or lift the blowing unit**

	**TIP**	**The cold diesel engine warms up automatically before it can be switched to full load capacity. The engine controller automatically ensures that this is the case.**

The air from the blower is fed to the blast nozzles for blowing operation. The nozzles direct the air flow to the left or to the right.

- Start the vehicle engine.
- Start auxiliary engine
- Ensure that no people or objects are in the danger zone.
- Activate blowing operation
- Select blowing direction with the joystick on the control panel.
- Use the joystick on the control panel to switch the blower on; blast nozzles are activated.

11.3.10 Winter operation

- Observe the following for the winter operation of the auxiliary engine:
  Observe the engine manufacturer's operating instructions!
- Drain the compressed air tank daily.
- Check fluid level and anti-freeze in radiator.
- Carry out the following frost prevention measures on the water system after use:
  - o Drain water tank.
  - o Drain water filter.
  - o Blow out water lines with compressed air.

11.3.11 Front-mounted machines

	**DANGER**	**Danger of exceeding the maximum front axle load limit.** **Attachments (snow plough, front-mounted cross brush etc.) may only be used when the debris hopper and water tank on the machine are empty.**

11.3.11.1 Snow plough

	**DANGER**	**You must observe the separate operating instructions for the snow plough. You should particularly observe the safety regulations within them.**

Start the vehicle engine

	**TIP**	**The cold diesel engine warms up automatically before it can be switched to full load capacity. The engine controller automatically ensures that this is the case.**

- Select snow plough menu function.
- Use joystick **on the control panel** to control snow plough movements.
- Set vehicle in motion. Driving speed must be adapted to the amount of snow on the road surface.
- During reversing the attachment rises automatically.

Switching on ground pressure

	**NOTE**	**Ground pressure should only be used when:** • **Raising the implement plate during quick change** • **If pressing the snow plough onto the ground is required.**

Activate quick change.
Use joystick on the control panel

- Downwards: snow plough lowers with pressure
- Upwards: snow plough rises

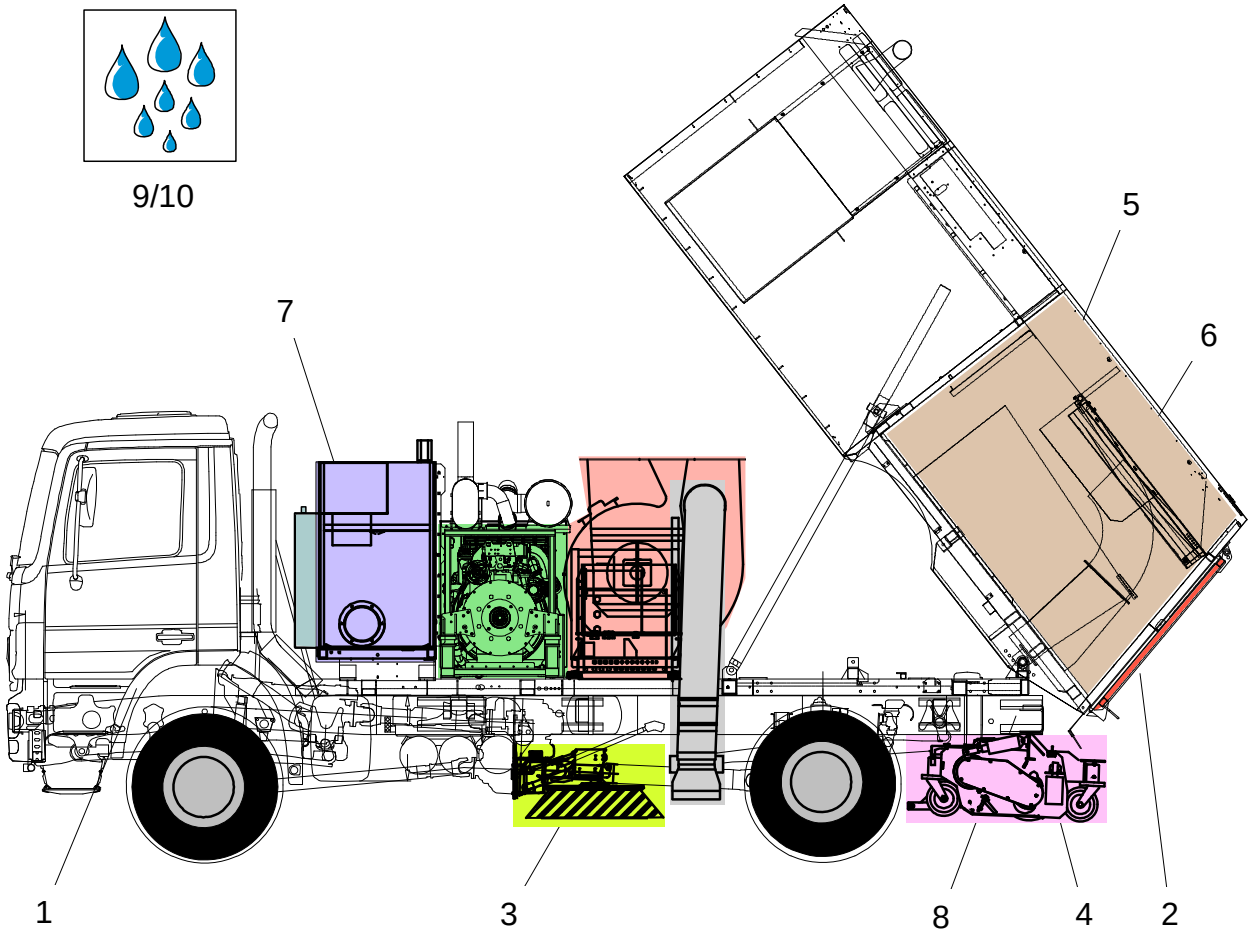
After use

- Hook in transport safety devices.
- Carry out post-operational checks daily.

	**NOTE**		**After cleaning, always set the ball valve to the "off" position, otherwise debris hopper cleaning is active.**

12 Checking and care of the vehicle after use

9/10



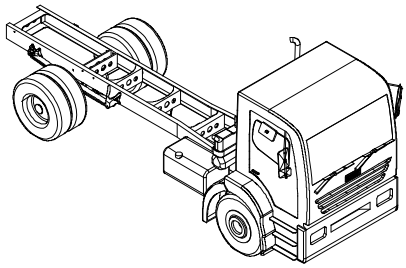
NOTE **If there is a risk of freezing, drain the complete water system.**

Item	Designation	Checks/cleaning
1	Vehicle/sweeper	• See vehicle operating instructions • Clean the entire machine after every use
2	Dirty water	• Drain properly after every sweeping operation. Observe environmental protection regulations
3	Disc brush left and right	• To be thoroughly cleaned • Check the disc brush wear
4	Debris pick-up unit	• To be thoroughly cleaned • Check the wear to the disc brush and rubber bars. • Check the bellows sleeve at the guides and cylinders for damage.

5	Debris hopper	• The interior is to be cleaned thoroughly • Check seals
6	Filter	• Dirt deposits above the filter are to be cleaned thoroughly
7	Water tank / water filter	• Check water level using the indicator on the display. • Clean the water filter each time before filling.
8	Suction tube/suction hose	• Clean • Check for damage and leakage
9	Leaks	• Hydraulic system
10	Pneumatic system	• Check system for leaks. • Drain the compressed air tank in winter operation.

13 Extent of wear

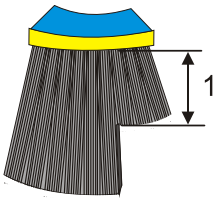
13.1 Vehicle



Refer to vehicle manufacturer

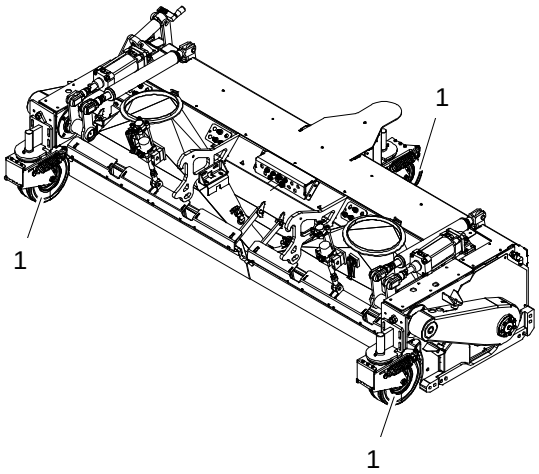
13.2 Disc brushes

	WARNING	**Cutting and/or shearing due to sharp brush parts** **► Wear protective gloves**



The brush must be replaced if the bristles (1) are less than 50-60 mm in length.

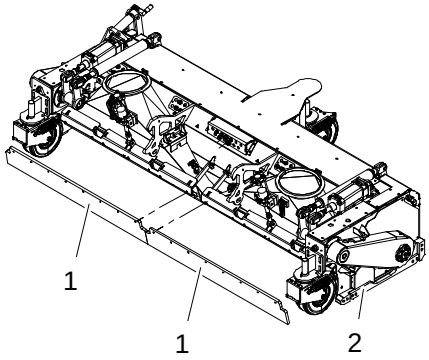
13.3 Debris pick-up unit



Castor wheel (1)

Replace tyre if

- It is damaged.
- Wheel diameter is less than 235 mm.

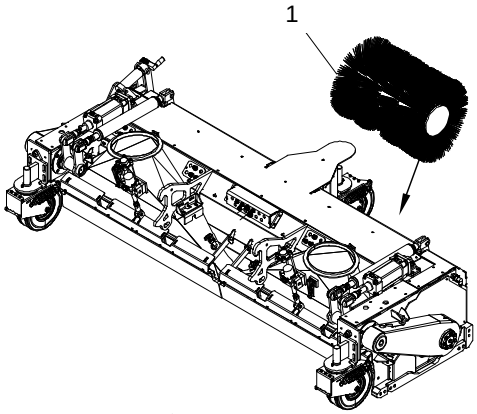


Front rubber bar (1)

Two-part rubber bar (1) is to be replaced if

- The rubber bar (1) is damaged
- The rubber bar (1) can no longer be set to the height of the wear plates (2).

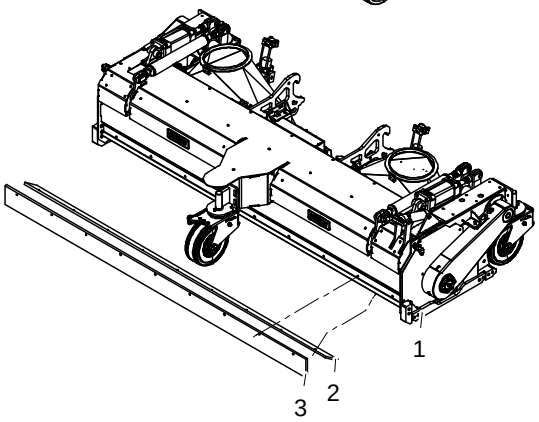
	WARNING	**Cutting and/or shearing due to sharp brush parts** **► Wear protective gloves**



Cylindrical brushes (1)

Replace cylindrical brushes if

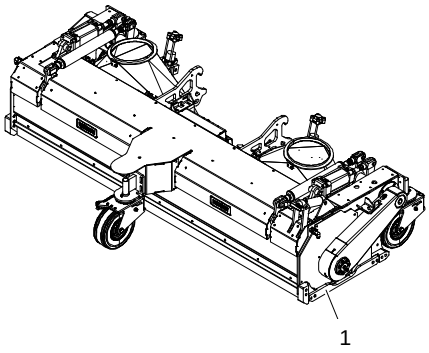
- a correct sweep range can no longer be set
- The cylindrical brush is damaged



Rear rubber bar

Replace rubber bars (2/3) if

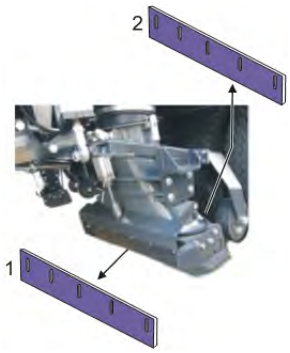
- The rubber bars (2/3) are damaged
- The rubber bars (2/3) can no longer be set to the height of the wear plates (1).



13.4 Wear plates

The wear plates (1) are to be changed if they are worn or irreparably damaged.

13.5 Side suction unit



Replace rubber bars if

- The rubber bar (1/2) is damaged
- The rubber bars (2/3) can no longer be set to the required distance.

13.6 Liquid pick-up unit

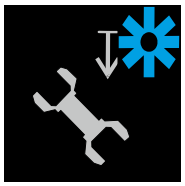
Replace rubber bars (1) if

- The rubber bar is damaged.
- The rubber bar can no longer be set to the required distance.

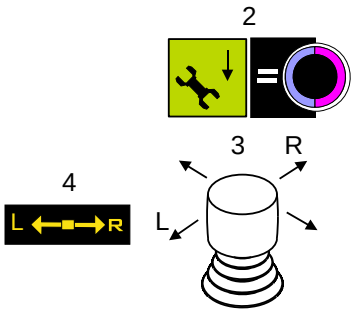
14 Attaching and detaching machine parts

14.1 Attaching and detaching the suction vehicle using the quick change system

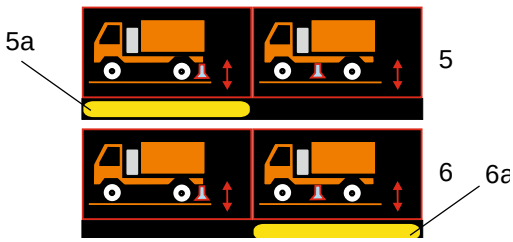
 **DANGER**	**Danger of crushing through improper performance of the quick-change process.** • **Wear safety footwear!** • **Observe safety regulations.** • **The hydraulics is not to be under pressure, since coupling could cause dangerous movements otherwise.** • **Only change components on a level and firm surface.**
 **NOTE**	**Ensure that everything is clean when inserting the hydraulic, pneumatic and water supply couplings.**

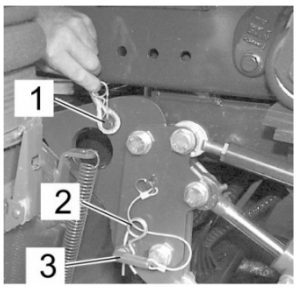


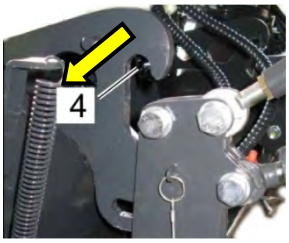
Switch to level 1 as described under *Menu*.

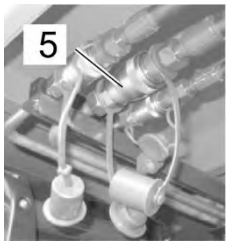


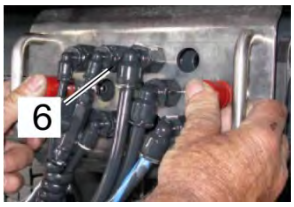
- Start auxiliary engine
- Button 2 is preselected or press.
  Quick release mode is preselected.
- The display also shows the symbol (5/6).
- By moving the joystick (3) in the direction L or R (4), the change procedure for the "rear suction assembly" (5a) or for the "intermediate suction assembly" (6a) can be selected.

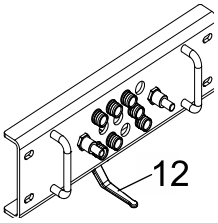


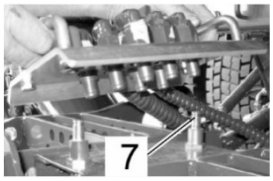


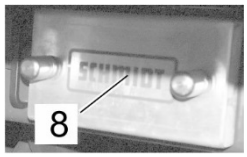


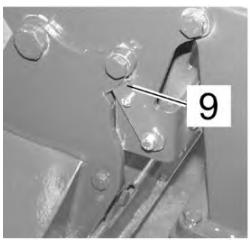


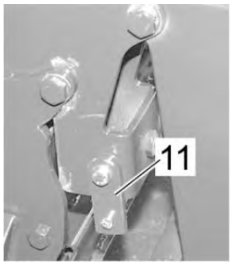


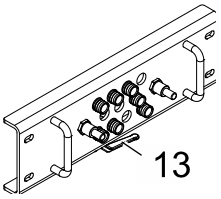












The quick-change process is explained using the rear suction assembly as an example:

- Park the vehicle safely
- Unhook the support cable (1) of the suction assembly.
- Remove the cotter pins (2) on the left and right of the suction assembly suspension gear and pull the safety bolts (3) out.
- Lower the suction assembly with the hand-held control panel until the claws (4) are free.
- The three hydraulic couplings (5), located on the left in the direction of travel, are to be disconnected.
- Change over the valve (12) to depressurise hydraulic lines.
- Remove the adapter plate (6) and clamp onto the intended position (7) on the suction assembly.
- Attach the protective guard (8).
- Turn the two levers (9) on the side of the suction assembly to the "Remove" position to prevent the removed suction assembly from tipping.
- Loosen the hose clamps (10) on the suction hoses, remove the hoses and push them to the rear.
- Pull the suction assembly away.

Attachment is carried out in the reverse order.

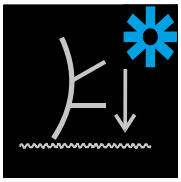
- In doing so, note the following: Both levers (9) on the side of the suction assembly are to be turned back into working position (11) when the unit is attached properly.
- Change over the valve (13).

14.2 Quick-change procedure of front-mounted machines

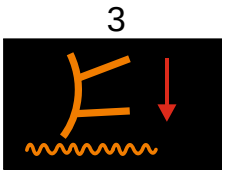
Observe the operating instructions for the attachment. The quick change process is described in these operating instructions. The "Lower with pressure" function must be performed for the changing procedure.

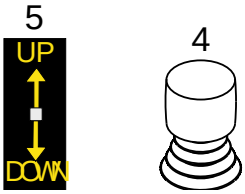
14.2.1 Lower front-mounted machine with pressure

	**NOTE**	**The device is lowered with pressure for a quick change.** **This function may not be used during clearing operations. The machine will be damaged.**
	**TIP**	**The auxiliary engine does not need to be started to control the attachment. The ignition to start the attachment motor must be switched on.**



Switch to level 1 as described under *Menu*.





- Switch on the ignition of the auxiliary engine.
- Button (2) is preselected or press.
  The quick release procedure is preselected.
- The symbol (3) appears on the display.
- Carry out the quick change with the joystick (4).
  Observe the symbol (5) indicating the joystick direction.

15 Faults

Faults	Causes/remedy
Cylindrical brush wearing quickly	• Sweep range too large
Cylindrical brush not picking up ground-in or coarse dirt	• Increase sweep range • The sweep range is incorrectly set
Disc brush not running smoothly	• Change brush speed • Change contact pressure Pivot pressure
The disc brush is not picking up trodden-in or coarse dirt.	Set the sweeping range correctly • Increase brush speed • Increase contact pressure Increase pivot pressure • Reduce sweeping speed
Dirt pick-up insufficient	• Engine speed too low • Debris hopper not completely lowered, hopper door not closed or other leaks in hopper. • Hopper filter blocked • Suction hose blocked • The sweep pick-up unit is incorrectly adjusted • Sweeping speed too high • Wanderhose flap not closed
Raising/lowering of disc brushes not working	• Safety cable attached • No compressed air supply in tank • Solenoid valves do not make contact • Defective electrical controller • Defective pneumatic cylinder • Damaged compressed air line
Raising/lowering of cylindrical brush not functioning.	• Safety cable attached • No compressed air supply in tank • Solenoid valves do not make contact • Defective electrical controller • Defective pneumatic cylinder • Damaged compressed air line
Fan unit vibrating	• Dirt deposits on the fan impeller: Open the cleaning flap and spray clean with a high-pressure jet of water. • Excessive wear or damage to the fan impeller: replace the impeller.

Blowing equipment has moved	• Hinges sticking: Clean and oil • Pneumatic cylinder defective. • Valves do not switch.
Malfunctions on the auxiliary engine	• See engine manufacturer's operating instructions
Engine not starting	• EMERGENCY STOP button activated and locked Unlock switch. • Fuel line damaged • Defective battery • Defective starter motor • Defective controls Coolant temperature too high Engine oil pressure too low • Compressed air supply less than 5.5 bar, carbamide system

15.1 Pneumatic system

Faults	Causes/remedy
Air pressure in HGV braking system too low	• Defective HGV pneumatic system. • Pneumatic valve for draining the water system open • Defective electrical controller - check valves by operating manually. • Loss of compressed air in the system (loose connections, hoses damaged).
Operating cylinder insufficient or not functioning.	• Pneumatic valve for draining the water system open • Defective electrical controller - check valves by operating manually. • Loss of compressed air in the system (loose connections, hoses damaged).
Engine can be started however than switches off again	• Compressed air supply too low for carbamide system

15.2 Hydraulic system

Faults	Causes/remedy
Operating cylinder not working	• Defective electric controller—check valves through manual operation. • **Note**: This check can only be carried out if the auxiliary valve is also activated at the same time through manual operation. • Check valve block operating pressure **(Rated = 150 bar)**.

Hopper not lowering	• Electrical control cabinet not closed
Hopper door not opening or closing	• Check one-way restrictor valve on valve block
Pick-up unit does not rise	• Check electric pilot check valve • Check hydraulic pressure
Cross brush/disc brush not turning	• Check current regulator valve • Defective electrical controller in current regulator valve

15.3 Water system

Faults	Causes/remedy
Water not supplied by water system	• Water tank empty Display • Water filter dirty • Solenoid valves do not make contact • Water pump not operating • Spray nozzles blocked • Stopcock on water filter closed • Solenoid valve for water pump drive is not switching.
High-pressure water pump: Bad spraying performance, pressure fluctuations, vibrations, pressure loss, increased noise, water in oil or gearbox, oil leakage, etc.	See the manufacturer's operating instructions.

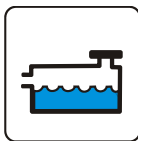
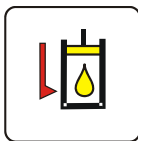
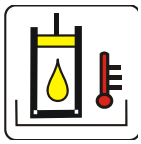
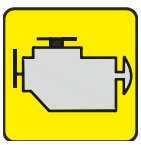
15.4 Electrical system

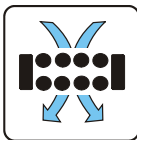
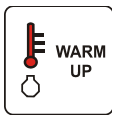
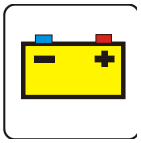
Faults	Causes/remedy
Defective control functions	• Check fuses. • Check control panel.
Diesel engine speed adjustment not functioning.	• Check fuses. • Defective electrical controller
Engine shuts down	• Coolant too low. Display • Oil pressure too low Display • Hydraulic oil too low.
Control panel	• Check fuse on control panel. • Check fuses.

15.5 Warning and notice symbols

NOTE

Warnings are displayed optically and acoustically. Depending on the warnings, suitable measures must be taken.

Symbol	Cause/solution
	Engine malfunction, switch Engine off immediately • Low engine oil pressure • Low coolant level • Motor problems (auxiliary engine)
	Engine malfunction, visit the work-shop
	Coolant temperature too high. Correct fault, add coolant water.
	Coolant level too low. Auxiliary engine shuts down. Correct fault, add coolant water.
	Engine oil pressure too low. Auxiliary engine shuts down. Correct fault, add oil, if necessary have vehicle towed away.
	Low oil level in the auxiliary engine. Add engine oil. Remedy any leakage.
	Hydraulic oil level in tank too low. Auxiliary motor shuts down. Remedy any leakage. Refill hydraulic oil.
	Hydraulic oil temperature in tank too high. Auxiliary engine is set to idle speed. Move the machine parts into the raised working position. Let the device motor run for a short period of time. Correct fault.
	Malfunction exhaust system on the auxiliary engine Rectify the fault; see the manufacturer's operating instructions.

Symbol	Cause/solution
	Compressed air supply too low. The function of the carbamide system can no longer be guaranteed. The following protective measures are adopted: • After 30 seconds, the blower, brushes, and water pump switch off and the speed of the auxiliary engine switches to idling speed. • After another 30 seconds, the auxiliary engine switches off. The auxiliary engine can still be started without the carbamide function and continue to operated at idling speed. Ensure there is a compressed air supply.
	Flame start system is switched on for the auxiliary engine
	Dirty air filter. Filter needs to be serviced.
	AS 990 is in the warm-up phase • Remaining warm up time is shown • Temperature difference (hydraulic oil, engine oil, coolant) to the set start temperature is shown.
	EMERGENCY STOP button is actuated. Rectify hazardous situation and twist the button to unlock the EMERGENCY STOP switch.
	No charge current.
	The symbol lights up every 2 minutes. Release switch for programming tasks is switched on in the cabinet.
	Indicator flashing: Carbamide tank contents too low Fill up with carbamide. The display lights up: Carbamide tank empty
	Fill the tank
	Water tank level lower than approximately 30%. The symbol flashes and a warning tone sounds. Refill with water.

Symbol	Cause/solution
 Open hopper door	
 Container tipped	
 Axle load exceeded	

16 Reversing

	**DANGER**	**Danger of hitting or running over people** **► Ensure that nobody is behind the machine or that there is contact (eye contact, spoken contact) between the driver and person.**
	**NOTE**	**Damage to the pick-up unit** **► Do not travel or roll in reverse with the pick-up unit lowered**
	**NOTE**	**Damage to the blowing unit due to higher objects** **► When the blowing unit is lowered, carefully drive around higher objects, such as kerb stones, street boundaries, etc. or lift the blowing unit**

If the machine is not equipped with an automatic lift control, the snow plough, sweeper, and blowing unit automatically raise themselves after reverse gear is engaged.

After disengaging the reverse gear, the attachments and machine parts can be lowered into working position again by actuating the joystick.

17 Transit travel

 **DANGER**	**Incorrect operation of the machines or the vehicle can cause dangerous situations that may lead to death or serious injuries. The operating instructions must have been read and understood by the person that is responsible for transport. The driver must have a driver's permit for the vehicle. The attachments and machine parts must be secured with the transit locks.**
 **DANGER**	**The auxiliary steering only works with the auxiliary engine running. It is not permitted to drive with the device motor running.**

17.1 Transport speed

 **DANGER**	**Due to its large size, you must ensure that the machine is permitted to drive on the intended roadways and that no other drivers will be endangered. If necessary, the attachments must be dismounted.**

Max. permitted speed must not be exceeded (install signs stating the maximum speed if necessary). Snow chains must be fitted for slippery roads. The travel speed must be adapted to the relevant road and traffic conditions, and the effect of the attachments must be taken into account when turning and braking. Special care and attention is required when turning into roads due to the attachment protruding at the front.

18 After sweeping

	**DANGER**	**Preventing accidents** **► Eliminate any discovered defects immediately**

- Parking the machine safely
  - Park the machine on level ground that is able to support its weight
  - Activate the handbrake
  - Raise sweeper unit, disc brush and blowing unit and stop them being lowered by using transit locks.
  - For the snowplough, see separate operating instructions
  - Switching off the auxiliary engine
  - Switch off the control panel
  - Switch off the vehicle
  - Take out the ignition key to start the vehicle engine and auxiliary engine
  - Lock the cab
  - Place wheel chocks under both wheels so that the machine cannot roll away.
- Clean the machine.
- Check the brushes for foreign bodies; remove foreign bodies if necessary.
- Carry out a visual inspection for leakages
- Carry out a visual inspection for damaged parts
- Check wear-and-tear parts
- Check for loose parts
- Check the warning signs
- Check the lights
- Check the warning lights

19 Towing

The permitted total weight of the AS 990 to be towed is that to be used with regards to the forces that occur during towing. The tow rope or tow bar must be designed for the respective forces and must be fastened to a suitable location on the vehicle. Towing with a tow rope, without a tow bar is only permitted if the brakes of the vehicle being towed are functioning properly. While towing with the vehicle engine switched off, the steering and brakes will be very sluggish. Turning the steering wheel and braking require greater force. Tow very carefully and drive slowly (max. 5 km/h). Take off and tow smoothly (no jerky movements). Only tow the machine in a straight line.

20 Maintenance work that the driver may carry out

All work that the driver carries out is to be carried out from firm ground.

 **DANGER**	**It is possible that the working space cannot be seen. When turning on the machine or driving it away, it is possible that people may be caught or run over and seriously injured or killed. Work may only be carried out on the machine if:** • **The vehicle engine and auxiliary engine are turned off.** • **The sweeper unit is lowered to the ground or raised and put in the transit lock.** • **The disc brushes are raised. Disc brushes with a diameter of 1200mm are to be secured against unintended lowering using transit locks.** • **For the snowplough, see separate operating instructions.** • **The hopper is lowered and hopper door and rear flap are closed.** • **The handbrake is applied.** • **The control panel to control the attached machine (snow plough, sweeper, disc brush, blowing unit) is switched off.** • **The ignition keys for the vehicle and device motor have been removed.** • **Wheel chocks have been placed under both wheels of one axle, so that the machine cannot roll away.**

20.1 Vehicle

See vehicle manufacturer's operating instructions

20.2 Auxiliary engine

See manufacturer's operating instructions.

20.3 General maintenance

20.3.1 Refuelling

20.3.1.1 Vehicle

See manufacturer's operating instructions.

20.3.1.2 Auxiliary engine

The auxiliary engine is supplied with fuel from the fuel tank of the vehicle. Note the instructions from the manufacturer when refuelling.

20.4 Refilling the carbamide tank

	**WARNING**	**Inflammation, chemical burns and poisoning from ammonia. Above 80°C, ammonia forms from decomposing carbamide** **► Do not inhale ammonia fumes** **► Maintain a sufficient distance** **► Keep away from ignition sources** **► Do not allow carbamide to come into contact with hot surfaces** **► Do not allow the tank to remain open**
	**WARNING**	**Injury** **Do not allow carbamide to come into contact with the skin, eyes or clothes.** **► Wear protective gloves** **► Rinse the affected area by carbamide immediately with copious amounts of water.** **► If carbamide comes into contact with the mouth, rinse immediately with copious amounts of water and drink copious amounts of water.** **► Immediately change any clothes that come into contact with carbamide.** **► Should any allergic reactions arise, seek medical attention immediately.** **► Keep carbamide away from children**
	**NOTE**	**Damage to the carbamide system or engine** **Do not dilute or mix carbamide fluid with other fluids.**
	**TIP**	**To prevent incorrect tank filling, filler nozzles for fuels cannot be inserted into the tank filler pipes.**
	**ENVIRONMENT**	**Dispose of carbamide in accordance with local regulations.**

Carbamide decomposes above 40°C and above 80°C forms pungent smelling, toxic, flammable ammonia, which is caustic to the skin and damages the eyes.

Park the machine on a horizontal surface:

- Switching off the auxiliary engine
- Switch off the carbamide preheating function.
- Turn lid and remove.
- Fill up with Diaxol carbamide.
- Close lid.

Rinse off any leaked carbamide from painted and aluminium surfaces with copious amounts of water.
Dilute any carbamide that has leaked on to the ground with copious amounts of water.
Do not reuse carbamide that has leaked or been transferred, e.g., during repairs.

ENVIRONMENT

Dispose of carbamide in accordance with local regulations.

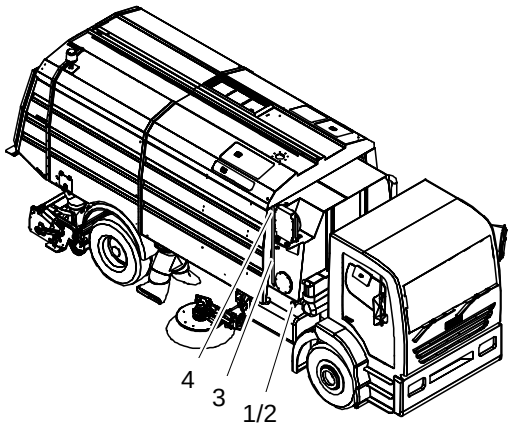
20.5 Filling the water tank

NOTE

Damage to the vehicle due to penetrating water
► Do not fill the water tank to the brim to ensure that it does not overflow.
► During filling, do not leave the tank unsupervised (observe the tank display)

NOTE

Dirty water, salt water and the like will cause damage.
► Only use clean water to fill (e.g., drinking water quality)



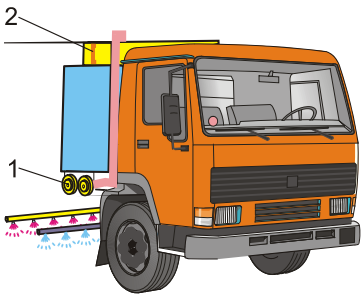
The water tank is filled via the C connection (1) at the front right.

Filling the water tank:

- Parking the machine safely
- Cleaning the water filter
- Remove the cover (2)
- Connect the filling hose.
- Open the water valve at the water source. Observe maximum fill pressure of 4 bar.
- Note the water level in the sight glass when filling the water tank (3). Stop filling shortly before the blue mark (4) is reached to ensure that the water does not escape through the ventilation on the upper side of the tank.

20.5.1 Filling the cleaning agent tank

	**DANGER**	**Injuries due to cleaning agent** **► Avoid breathing in and swallowing the cleaning agent, as well as contact with the skin, eyes, etc.** **See the manufacturer's specifications**
	**NOTE**	**Damage to cleaning and water system** **► Completely empty both systems in case of a danger of frost**
	**NOTE**	**Expiration of the warranty** **► Cleaning agent (detergent) "BioVersal FW" from BioVersal is approved by Aebi Schmidt to prevent corrosion of the hopper and fixtures.**



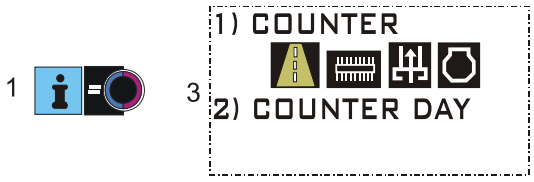
Filling the cleaning agent tank (version 1)

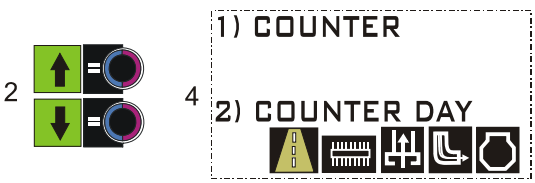
- Unscrew the cap (1) on the C connection.
- Connect the filling hose.
- Fill the cleaning agent tank slowly.
- Visually monitor the filling process continually at the fill level indicator (2) on the tank.
- Stop the filling process before reaching the maximum fill level.
- Screw the cap (1) back onto the C connection.

Filling the cleaning agent tank (Version 2)

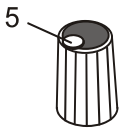
- Open the tank cap (3)
- Fill approximately 130 litres of cleaning agent via the filling port (4). Monitor the fill level indicator (5) during the process.
- Screw the tank cap (3) back on.

20.5.2 Calling up kilometres and hours

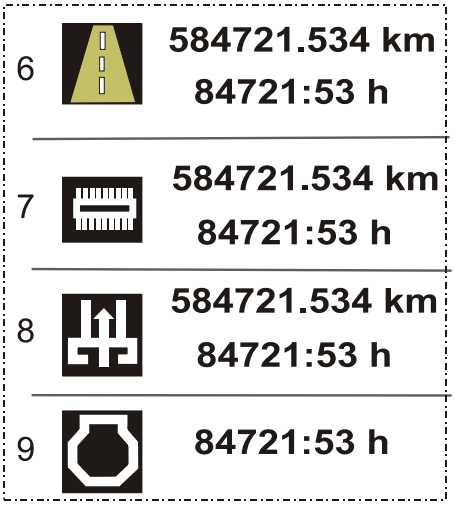




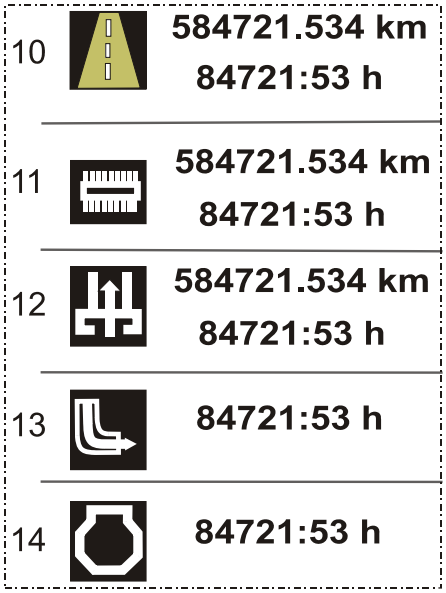
- Turn off auxiliary engine and start the ignition.
- Press the INFO button (1).
- Select total or daily data with the buttons (2). The corresponding symbol bar (3/4) illuminates.



- Select total display or daily display with button (5) on the rotary knob.
- Calling up kilometres and hours



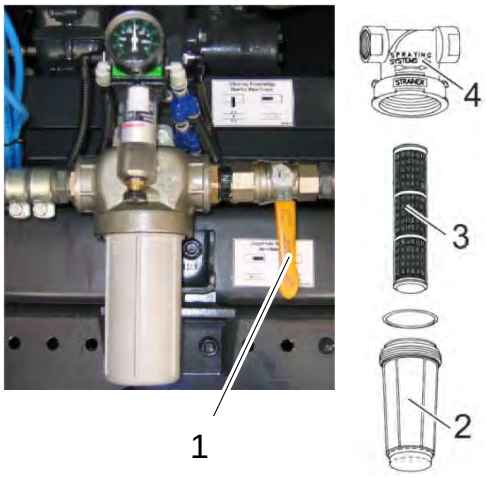
o Total display
- Distance travelled (6)
- Sweeper unit (7)
- Suction unit (8)
- Auxiliary engine (9)



o Day display
- Travel distance (10)
- Sweeper unit (11)
- Suction unit (12)
- Blower equipment (13)
- Auxiliary engine (14)

- The respective day display can be set to "0" by activating the (15) button.

- A switch to the main menu can be made by pressing the "ESC" key (16).



20.6 Cleaning the water filter

- Parking the machine safely
- Close the ball valve (1).
- Unscrew the filter holder (2).
- Remove the filter (3), wash it out filter with clean water and blow it out with compressed air.
- Insert the filter into the housing (4).
- Tighten the filter holder by hand.

20.7 Cleaning the machine

	**WARNING**	**Injury from sharp-edged objects, hazardous substances or bacterially contaminated road surface or organisms** **► Wear safety gloves and spray protection for face and body**

	**NOTE**	**Machine parts can get damaged. Do not direct the water stream towards electrical, hydraulic, bearing and joint components.**

The spraying hose can be used to clean parts of the machine, e.g. (when the hopper is open) the filter, the dirt screen, the hopper door closing edges etc.

20.7.1 Cleaning the machine with high-pressure cleaner

	**WARNING**	**Injury due to high pressure water** **► Only aim water spray at the working area, never at people or animals.** **► When turning on the lance, hold tight and resist pressure jolts.** **► Stop working immediately if people enter the danger area, and stop the machine** **► Beware of debris and pieces of material that can be pushed away by the high pressure hose.** **► Wear face protection**

NOTE

Water ingress and damage

► Keep a sufficient distance when spraying and do not spray water directly on to:

- **engine parts: starter motor, injection pump, alternator (see engine manufacturer's operating instructions)**
- **Electrical components, plug connections, fuse boxes**
- **Air filter**
- **Axial piston pump**
- **Seals**
- **Hoses**

► Leave the engine running for several minutes to dry

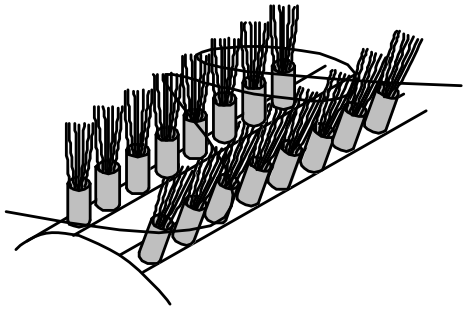
► Blow out the electrical connections with compressed air to prevent corrosion

If the machine is cleaned with a high pressure cleaner, the following is to be noted

- Refer to the notes in the high-pressure cleaner's operating instructions.
- Wear protective equipment
- Do not direct the water spray at bearings. Water can get into the bearings and irreparably damage them.
- Do not direct the water spray at warning and notice signs. Signs can come off or be damaged. Damaged signs or signs that have come off must be replaced immediately.
- After the machine has been cleaned, check all hydraulic fluid lines for loose connections, abrasion marks and damage.

20.7.2 Cleaning with the spraying hose

Activate the water pump with the button in the container box when the engine is running and set the water valve to spraying hose.

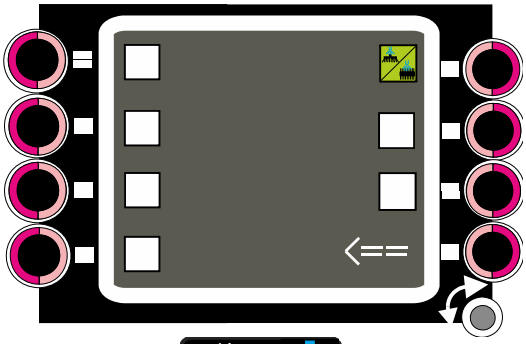


20.8 Cleaning brushes of foreign bodies

Park the vehicle safely.
Foreign bodies that have been caught in the cylindrical brushes or disc brushes may only be removed with gloves and protected arms. Wire that has become entangled in it, for instance, is to be made smaller with side cutters and pulled out with pliers.

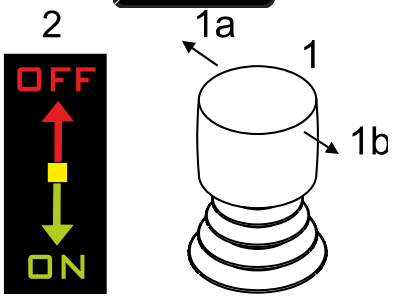
20.9 Drain water system

20.9.1 Activate drain mode

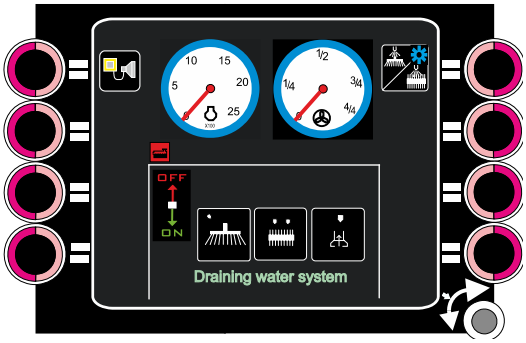


Switch off the engine.
Ignition ON
Select the "Draining mode" menu

- Press the button and the symbol changes. The function is activated.



- Move the joystick (1) in the direction of (1b) to ON (2). Drain mode starts. All water consumers are purged of water using air.
- The draining mode is to be ended once all items that use water have been drained. Move the joystick (1) in the direction of (1a) to OFF (2).

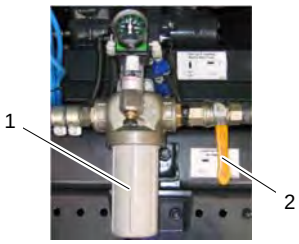


20.9.2 Drain water system

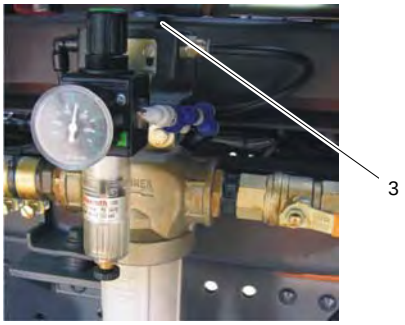
- Loosen the hose clamp (1)
- Remove hose
- After draining properly, attach the hose again.

Or:

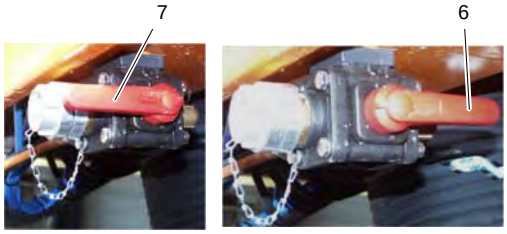
- Remove the cover (2).
- Release the check valve, e.g. with a screwdriver.



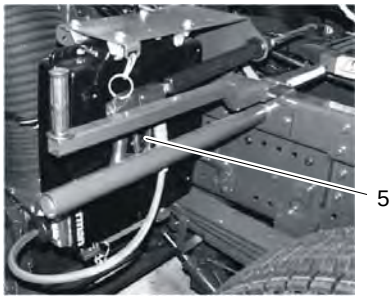
- Unscrew and drain water filter (1).
- Open ball valve (2) and drain tank.
- The ball valve (2a) must be closed. The tank can be irreparably damaged if air is blown into it.
- Switch on the ignition for the auxiliary engine and the control panel.
- Open pneumatic valve (3). Air is blown through the water system.
- Activate drain mode



- Water valves are automatically connected one after the other.
  This drains the following:
  - Spray bar
  - Disc brush spray facility
  - Suction assembly spray facility
- Set ball valve (6) to hopper spray bar.
  This drains the following:
  - Hopper spray bar



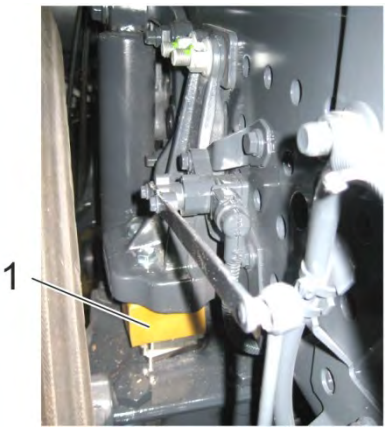
- Close D coupling with cover. Set ball valve to spraying hose (7) and open the spray hose nozzle.
  This drains the following:
  - Spraying hose
- High-pressure cleaning system by actuating the spray wand valve (5).
  This drains the following:
  - High-pressure cleaning system
- Close pneumatic valve (3).
- Open the ball valve (2) and install the water filter again.
- Set ball valve (7) to the spray hose position.



21 Maintenance and repair work that may only be carried out by workshop personnel

	**DANGER**	**Damage when the machine is running** **► Wear hearing protection and tight fitting clothes** **► Block access to danger zones using suitable measures**
	**DANGER**	**Injury** **► Maintenance work is only to be performed in suitable workshops** **► The necessary tools and equipment (e.g. lifting platforms, service platforms, etc.) must be present** **► Workshop personnel must be suitably trained and skilled for working on the machine**
	**DANGER**	**Rolling over and crushing** **► Ensure that no one is standing in the danger area.**
	**DANGER**	**Risk prevention before working on the machine** **► Turn off the vehicle engine and auxiliary engine** **► Remove the ignition key for the vehicle and auxiliary engine.** **► Bring the pick-up unit and disc brushes into the transport position and secure them** **► For the snow plough, see separate operating instructions** **► Engage the handbrake** **► Turn off the control panel to control the machine.** **► Place wheel chocks under both wheels of one axle so that the machine cannot roll away**
	**DANGER**	**Accident** **► Any alterations, additions or modifications that may compromise the vehicle's safety must first be approved by Aebi Schmidt. This is also applicable to programmable control systems, settings in safety equipment and welding on load-bearing carrying parts.**

	**DANGER**	**Accident** **► Inspection, maintenance, and repair work is only to be performed by suitably trained personnel** **► Reattach safety devices after maintenance and repair work** **► Perform work only when the machine is safely shut down**
	**DANGER**	**Injury due to unintentional movements; password-protected control panel functions** **► Access only by trained and instructed personnel** **► Pass on the password only to trained and instructed personnel** **► At the end of work, delete the password by switching off the ignition**
	**WARNING**	**Injury due to excessive physical strain** **Corresponding maintenance and repair work, etc. must always be carried out with suitable lifting equipment or personal support.**
	**WARNING**	**Slipping and falling** **► Remove dirt, grease, oil, snow, and ice from steps and walking areas**
	**WARNING**	**Vehicle with air suspension** **Damage to the pick-up unit** **► Do not remove the height limit stop (1)**



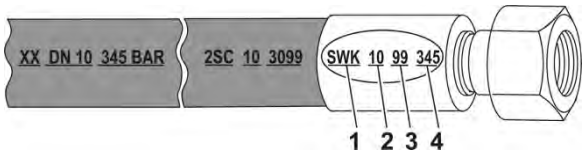
The limit stop limits the lowering of the air suspension so that the pick-up unit is not damaged.

	**NOTE**	**Loosening or bursting of lubrication lines** **► Lubrication pressure: maximum of 150 bar** **Grease gun can generate a pressure of 420 bar** **► Use grease gun with pressure display**
	**NOTE**	**If the maintenance intervals are not adhered to, a full service is to be carried out after each sweeping season.**
	**TIP**	**A functional test must always be carried out after maintenance and repair work**

21.1 Maintenance notes:

Work must be carried out at the specified intervals in order to maintain functionality and operating safety. Routine and thorough cleaning contribute to a long life of the machine.

- All safety and hazard instructions must be observed and retained in full and in a legible condition. The prescribed maintenance intervals must be observed. Any alterations, additions or modifications that may affect the vehicle's safety must first be approved by Aebi Schmidt. This also applies to settings for safety devices and welding of load-bearing parts or to modifications to the hydraulic or electronic systems. Replacement parts must comply with the technical specifications prescribed by the manufacturer. Only genuine spare parts are guaranteed to meet these specifications.
  All hydraulic lines that are to be opened must be depressurised before repair work is started.
  Check the condition of the hydraulic hoses regularly and replace hoses if necessary.
  Renew hydraulic hoses every 6 years. The date of manufacture is marked on the hydraulic hoses.



1 Manufacturer's code
2 Month of manufacture (e.g., October)
3 Year of manufacture (e.g., 1999)
4 Maximum permitted operating pressure (e.g., 345 bar)

- Any special equipment required for particular tasks must be used. Objects lodged in the brushes must only be removed with a tool (e.g. chip-removal tool) or protective gloves.
- Manually operating the hydraulic solenoids in the case of an emergency can result in dangerous movements. Appropriate safety measures must be made before any such work is undertaken.
- Dispose of all oil, fuel and filters appropriately after doing any maintenance work. Larger plastic parts are recyclable and are marked accordingly.

NOTE

Exposed bearings are to be oiled or greased carefully when required. Dirt sticks to exposed oil and grease and can irreparably damage bearings. Remove all exposed oil or grease

21.2 Lubricants

		Recommended lubricants	
	Lubricants named in maintenance schedule	Start temperature of max. **-25°C**	
		SCHMIDT Ein Unternehmen der Aebi Schmidt Gruppe	***NATO code***
	Hydraulic oil	*ATF SUFFIX A*	*O-1178*
	Universal oil	*15W 40*	*O-236*
Lubricant for grease nipples	***Multi-purpose grease***	*K2 K20 DIN 51825 T.1*	*G-421*
Lubrication via central lubrication unit	***Multi-purpose grease***	NiGL 00 fluid grease or Fluid grease NiGL 0	

21.3 Maintenance service

21.3.1 Hydraulic filter

The first filter change (pressure and return filter) is to be carried out after 50 hours of operation.

21.3.2 Hydraulic oil

The oil change and all other measures are to be performed and documented according to the following lubrication schedule. If the stated number of operating hours is not achieved within one season, an appropriate lubrication and maintenance service must be carried out at the end of each season.

NOTE

As an alternative, the oil quality can be checked by a qualified workshop. These specialist companies provide information about whether oil can still be cleaned or whether it needs changing.

21.3.3 Lubrication

Before lubricating, clean the grease nipples and remove the old grease.

21.3.4 Oil refill

Only add hydraulic fluid via the filling filter.

21.3.5 Oil change

The oil should only be drained when warm to avoid a build-up of deposits.

21.3.6 At the end of the season

Before extended downtimes, machines must be cleaned thoroughly, all greasing points and exposed parts must be greased, damage to paintwork must be touched up, and the fuel tank must be drained completely and filled with fresh fuel.

21.4 Lubrication and maintenance schedule

21.4.1 Notes on lubrication via a central lubrication unit

NOTE

Follow the instructions in the manufacturer's operating instructions for the central lubrication unit.

The central lubrication unit supplies the lubrication points that are normally supplied through a grease nipple.
Lubrication points that are located on rotating machine parts must usually be greased manually via the grease nipples.

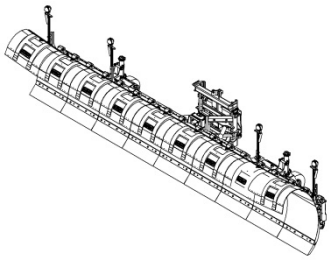
TIP

The central lubrication unit will only function when the machine ignition is switched on.

Central lubrication unit maintenance.
Check the lubricant level in the grease reservoir daily. Refill the reservoir if necessary. A functional test must be carried out after 25 operating hours. The button on the pump housing can be actuated at any time to activate intermediate greasing to check the lubrication supply to the respective bearing-points.

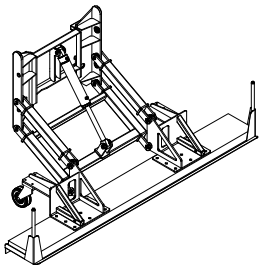
NOTE

The lubrication points marked in grey in the lubrication schedule are supplied via the central lubrication unit.



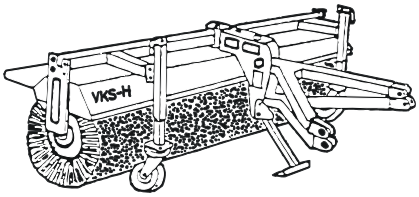
21.4.2 Snowplough

See separate operating instructions



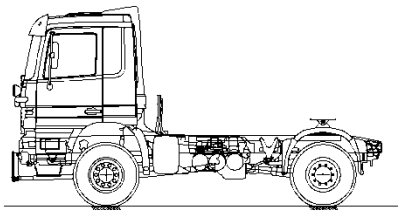
21.4.3 Magnetic beam

See separate operating instructions



21.4.4 Front mounted sweeper machine

See separate operating instructions



21.4.5 Vehicle

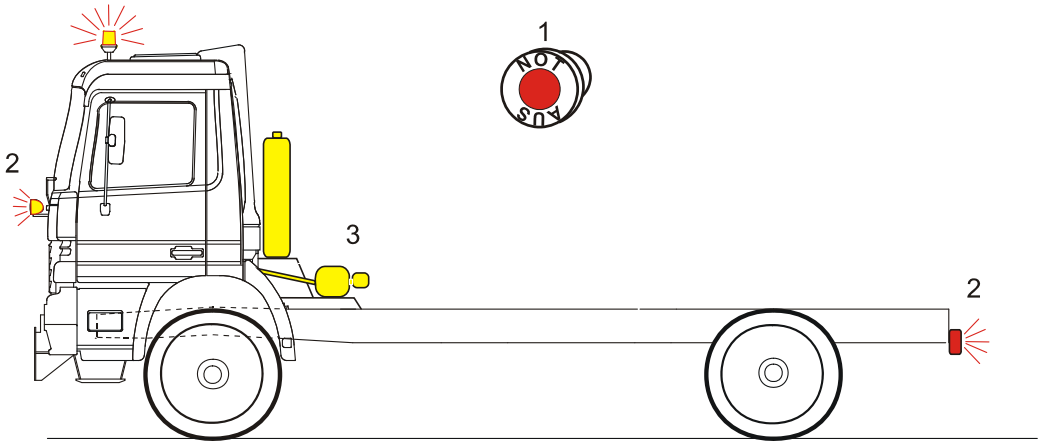
See vehicle manufacturer's operating instructions.

21.4.6 Aebi Schmidt vehicle hydraulic system

See separate operating instructions for the Aebi Schmidt vehicle hydraulics.

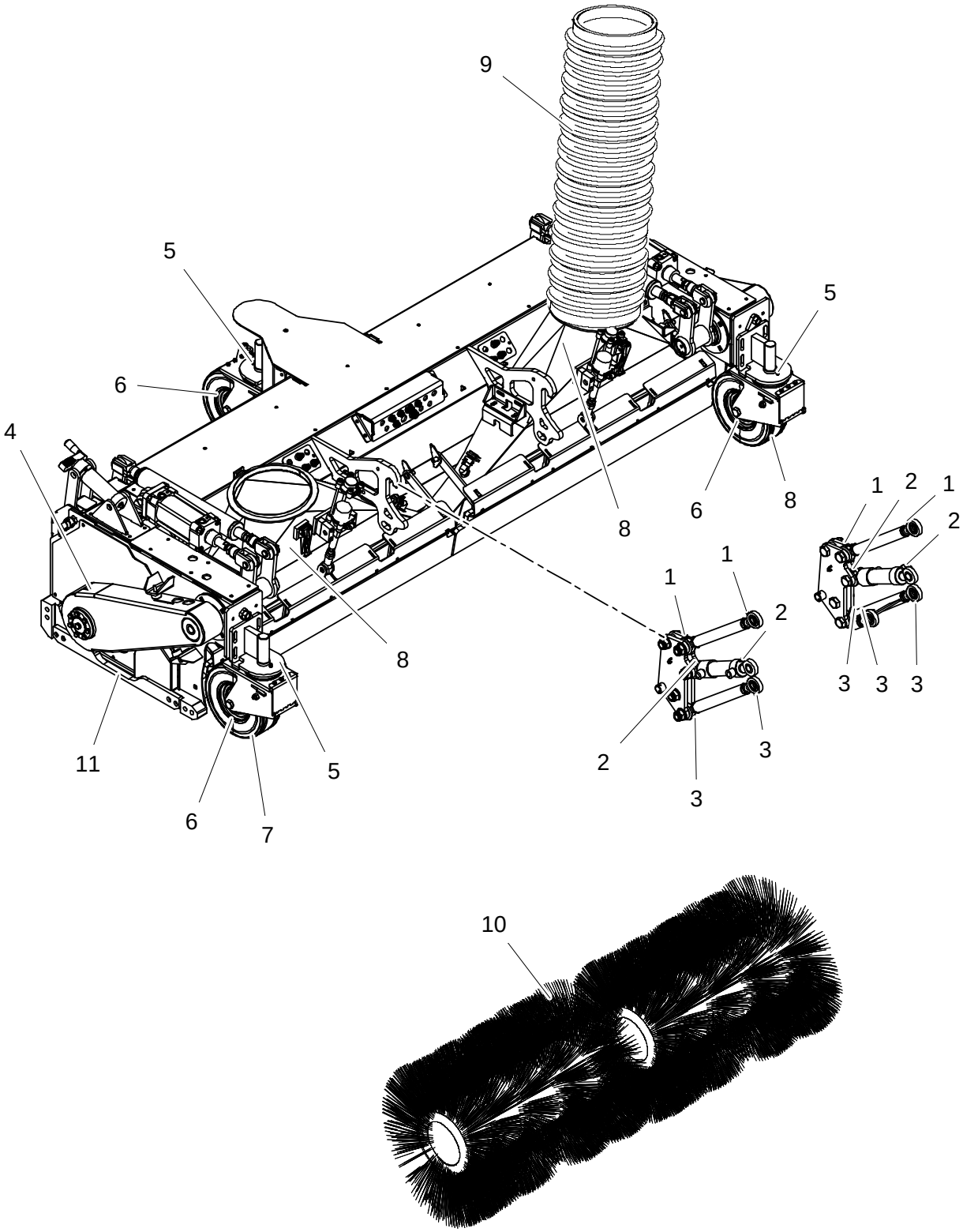
21.5 Maintenance schedule

21.5.1 Vehicle



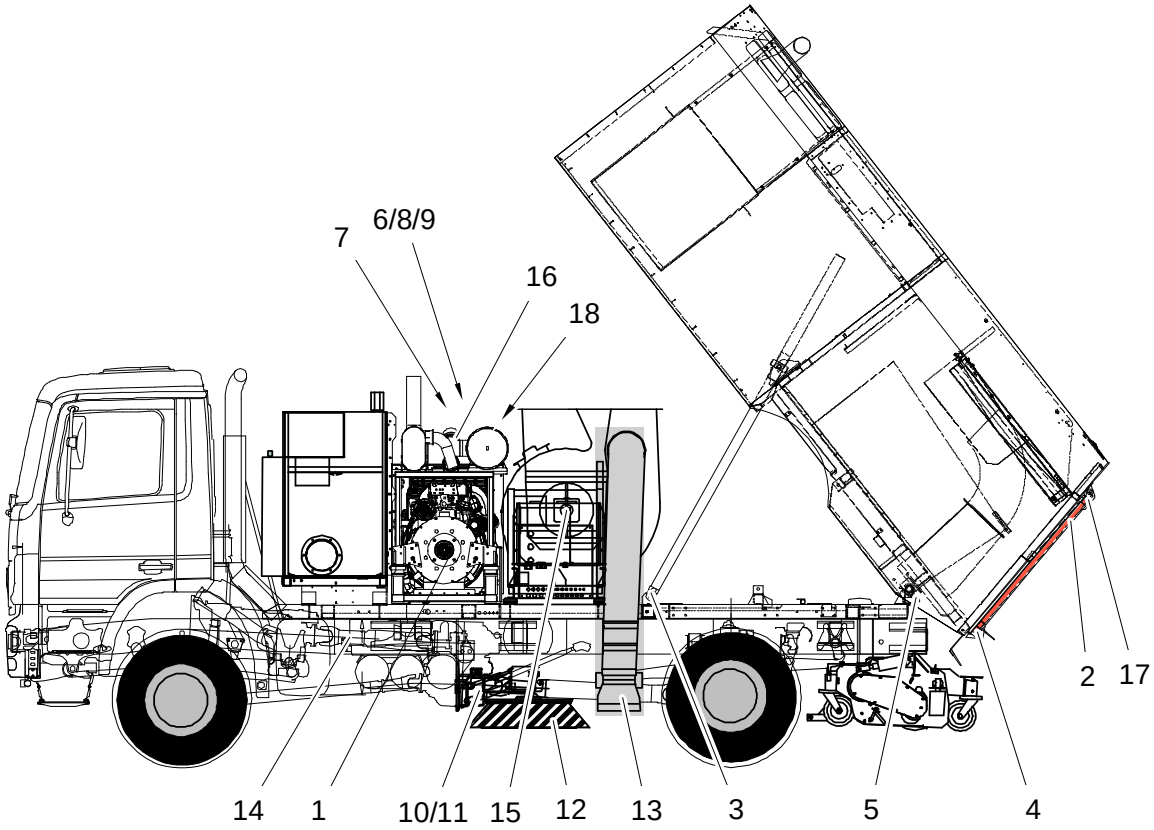
Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
1	EMERGENCY STOP button x2: right rear and on the control panel		Check functionality		X	
2	Lighting		Check functionality		X	
3	Single/dual circuit hydraulic system	Hydraulic oil (10 / 140 l)	Oil change Filter change			X
	Drive (cardan) shaft	Multi-purpose grease	2 grease nipples Drive (cardan) shaft (rocker bearing)			X
		Multi-purpose grease	Open lubrication point Longitudinal shift (profiled part)			X
			Check screw connection (M8 10.9 tightening torque 35 Nm)			X
4	High-pressure water pump: 100bar	Interpump oil X-9.9 SAE 15W40 MINERAL	Oil change	first time		X

21.5.2 Debris pick-up unit



Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
1	Left and right top links	Multi-purpose grease	4 grease nipples Lubricate	X		
2	Left and right cylinder links	Multi-purpose grease	4 grease nipples Lubricate	X		
3	Left and right lower link	Multi-purpose grease	5 lubricating nipples Lubricate	X		
4	Brush drive universal joint	Multi-purpose grease	1 lubricating nipple Lubricate			X
5	Castor wheel turning gear	Multi-purpose grease	3 lubricating nipples Lubricate	X		
6	Castor wheel	Multi-purpose grease	3 grease nipples (if present) Lubricate	X		
7	Castor wheel		Check diameter	X		
8	Suction nozzle left and right		Check for wear		X	
9	Suction hose left and right		Check for wear	X		
10	Cross brush		Check for damage and wear	X		
11	Wear plates left + right		Check for wear		X	

21.5.3 Layout



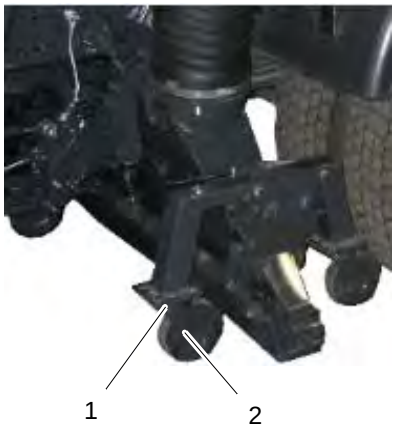
Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
1	Auxiliary engine	see manufacturer's operating instructions.		X		
2	Cylinder supports	Universal oil	Top and bottom Oil	X		
3	Pivot: debris hopper lifting cylinder	Multi-purpose grease	1 lubricating nipple Lubricate	X		
4	Pivots: door locks left and right	Universal oil	1 x each Oil	X		
5	Pivot bearing: hopper left and right	Multi-purpose grease	1 grease nipple each Lubricate	X		
6	Hydraulic tank return filter		Filter change			X
7	Water filter		Clean filter	X		

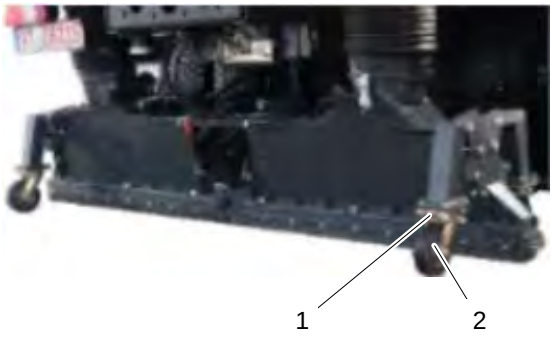
Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
8	Top-up filter for hydraulic tank		Clean top-up filter (if available)			X
9	Hydraulic oil tank	Hydraulic oil 130 l	Oil change			X
10	Disc brushes Lower link	Multi-purpose grease	1 grease nipple each Lubricate	X		
11	Disc brushes Top guide	Multi-purpose grease	1 grease nipple each Lubricate	X		
12	Disc brushes		Brush change	Depending on wear		
13	Blower equipment	Universal oil	1 x each Oil	X		
14	Water pump	Multi-purpose grease	1 lubricating nipple Lubricate	X		
15	Fan impeller bearing	Multi-purpose grease	1 lubricating nipple Lubricate			X
16	Suction line between air filter and engine		Check for damages and leaks		X	
17	Hopper door: pivot left and right	Universal oil	1 x each Oil	X		
18	Variable displacement pump Filter		Filter change			X

Further maintenance work

	Designation	• Maintenance work	Maintenance interval Operating hours	
			100	2 years
	Axle load setting: Leaf spring suspension	Check or adjust	First time	X
	Axle load setting: Leaf spring and air suspension	Check or adjust		X

21.5.4 Liquid pick-up unit





Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
1	Rotary disc (3 or 4 wheels)	Multi-purpose grease	1 lubricating nipple Lubricate	X		
2	Axle (3 or 4 wheels)	Multi-purpose grease	1 lubricating nipple Lubricate	X		

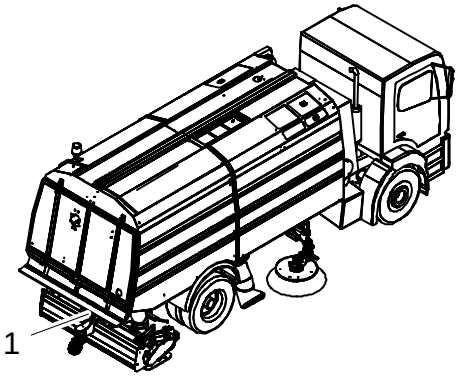
21.5.5 General maintenance

Item	Designation / Lubrication points	Lubricant	• Maintenance work • Number of lubrication points	Maintenance interval Operating hours		
				50	100	500
	Lighting and signal system		Check	X		
	Electrical plug-in connections	Contact grease	Check for and protect against corrosion			X
	Bodywork/equipment carrier		Check for status and corrosion		X	
	Wheels / tyres		Check status, wear and fastening	X		
	Battery connections and acid level		Check		X	
	Drive components, hydraulic pumps and motors		Check for proper seal	X		
	Drive belt (for pump drive, cooling fan, etc.)		Check condition and tension		X	
	Warning plates		Check condition	X		

22 Maintenance and repair work

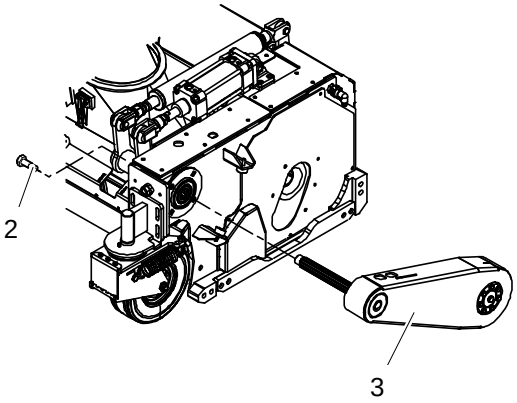
22.1 Changing the cylindrical brush

	**DANGER**	**Crushing** **► Maintain a sufficient distance** **The pneumatic cylinder extends when the ball valve (1) on the coupling plate is closed.**
	**WARNING**	**Hand injuries** **► Wear protective gloves**
	**NOTE**	**As a result of the conical brush shaft, the brush can only be changed via the left side of the sweeping unit.**

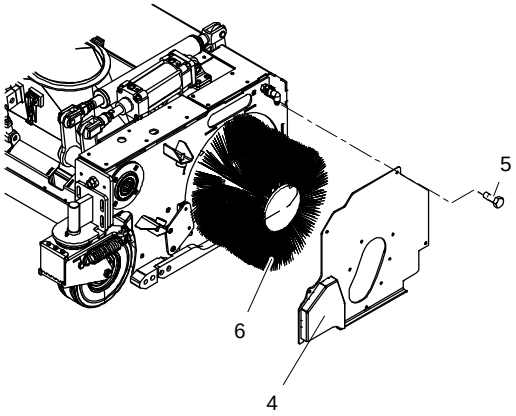


Disassembly

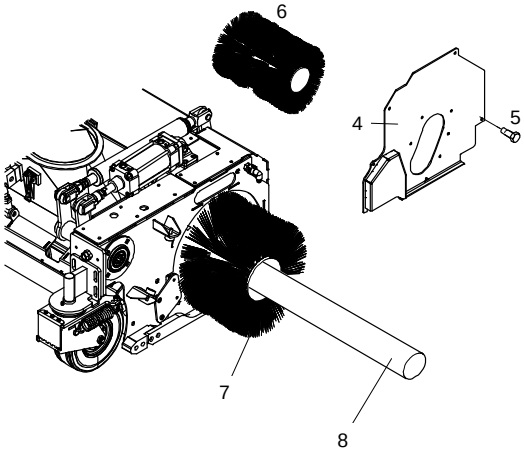
- Lower or raise the pick-up unit and secure it with transit locks.
- Park the vehicle safely.
- At the coupling plate (1), close the air supply from the HGV for the cylindrical brush function with the ball valve. Air in the pneumatic cylinder escapes through the ball valve. The cylindrical brush lowers in the pick-up unit down to the stopper.



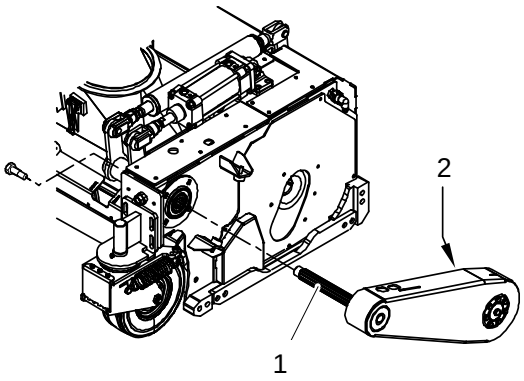
- Take out (2) the fastening screw (SW 13).
- Pull the brush extension with the hydraulic motor (3) out of the spline shaft bearing and carefully put it to one side.



- Remove the side plate (4) by taking out the screws (5).
- Pull the outer brush (6) out of the brush shaft.



- Pull the inner brush (7) out by pulling out the telescopic brush shaft (8).
- Pull the brush shaft out of the cylindrical brush.
- Clean the brush housing thoroughly with water.



Installation

- Assembly is carried out by reversing the disassembly sequence.
- The spline shaft (1), tappet (2) is to be cleaned and lightly greased.
- After installing, the vehicle engine is to be started so that the air supply is re-established for the pneumatic system.
- Set the sweep range.

TIP

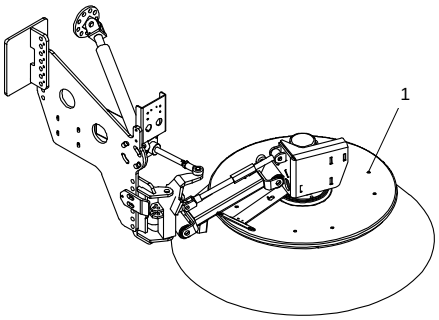
Do not forget. After the brushes have been changed, reconnect the air supply from the HGV with the ball valve for the "Raise/lower cylindrical brush" function.

22.2 Changing disc brushes

NOTE

Loosen the screw connection of the brush fastening

► At every brush change, use new self-locking nuts



Disassembly

- Lower disc brush.
- Depressurise the pneumatic system.
  - o Switch off the vehicle engine to shut down the air feed to the pneumatic tank.
  - o Actuate the drain valve on the pneumatic tank until the tank is empty.
- Loosen the eight screws and self-locking nuts (1).
- Raise disc brush.
- Dispose of disc brush correctly.

Installation

- Assembly is carried out by reversing the process.
- Only new self locking nuts are to be used to fasten the disc brushes
- After installing, the vehicle engine is to be started so that the air supply is re-established for the pneumatic system. The sweep range must be set again.

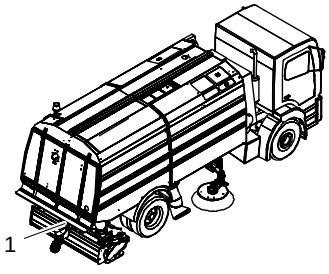
22.3 Grease the brush drive universal joint

DANGER

Crushing

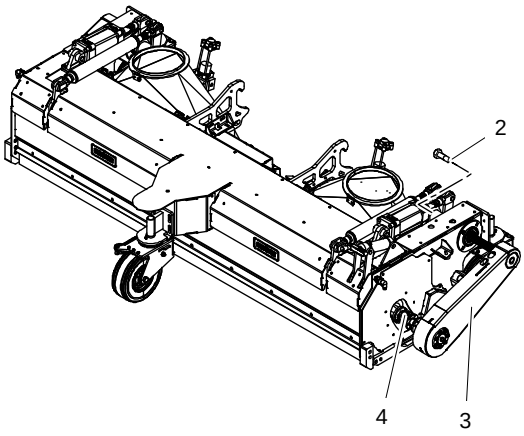
► Maintain a sufficient distance
The pneumatic cylinder extends when the ball valve (1) on the coupling plate is closed.

There is a universal joint on the right hand side of the brush drive.



Lubricate universal joint

- Lower or raise the pick-up unit and secure it with transit locks.
- Parking the machine safely
- At the coupling plate (1), close the air supply from the HGV for the cylindrical brush function with the ball valve. Air in the pneumatic cylinder escapes through the ball valve. The cylindrical brush lowers in the pick-up unit down to the stopper.
- Take out (2) the fastening screw (SW 13)
- Pull the brush extension with the hydraulic motor (3) out of the spline shaft until access to the grease nipple (3) can be obtained.



- Lightly grease the universal joint.
- Push the brush extension (2) back inside and secure it with a screw (2).

TIP

Do not forget. After the brushes have been changed, reconnect the air supply from the HGV with the ball valuve for the "Raise/lower cylindrical brush" function.

22.4 Changing the hydraulic oil and filter

WARNING

Slipping and falling
► Remove dirt, grease, oil, snow, and ice from steps and walking areas

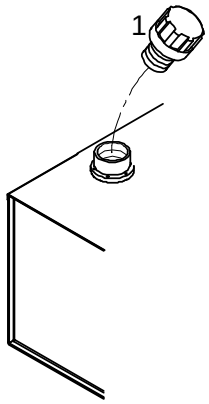
NOTE

Dirt in the hydraulic equipment can irreparably damage hydraulic components. Always change the hydraulic filter in good time. The highest levels of cleanliness should be ensured when changing the filter or changing the oil.

ENVIRONMENT

Never allow oils to get into the soil on the ground. Note environmental regulations concerning oils. Dispose of drained oil in accordance with regulations.

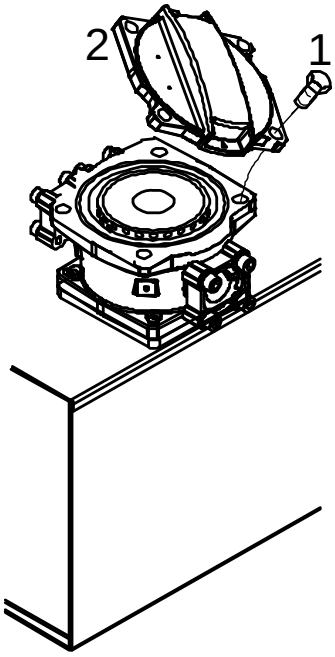
22.4.1 Filter change



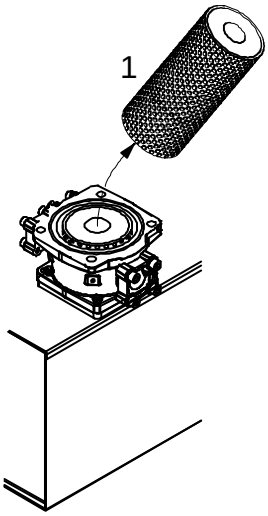
22.4.1.1 Return filter

Take out the filter

- Shut off the hydraulic system.
- Have the oil collection pan and cleaning cloths ready in order to catch and remove any oil that may run out.
- Open the filler cap (1) in order to get rid of any pressure in the tank.



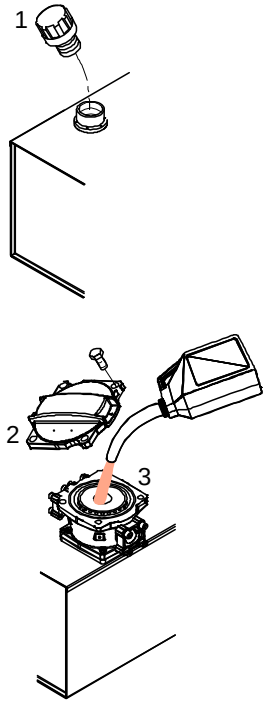
- Take of the screws (1) on the cover fastening (4 screws, SW 15) and remove cover (2).
- Check the surface of the filter for residual dirt and larger particles. These impurities can lead to damage to hydraulic components.



- Pull the filter element (1) from the filter housing.
- Clean the housing and cover.
- Check the O rings on the cover for damage and change these if necessary.

Install the filter

Installing the filter is carried out by reversing the disassembly sequence.
Wet the sealing surfaces with clean oil.
The identification markings on the new filter element must correspond to those on the old filter element.
Turn on hydraulic equipment, check the filter for leakages; check the oil level and fill if necessary.



22.4.2 Changing the hydraulic oil

- Open the ventilated filler cap (1)
- Place catch pan under draining point. Open the oil drain screw and empty the tank completely.
- Block the oil drainage point again with the drain plug and a new seal.
- Fill with new hydraulic fluid.
  To get any possible dirt particles out of the new oil, the oil should be filled using a filter unit or through the filter (3). After filling, the filter cover (2) and the ventilated filler cap (1) are to be closed. Check oil level through inspection window.
- Leave engine running for approximately one minute and then switch it off. Check the oil and add more oil if necessary.
  Repeat the procedure until the oil level no longer changes.

22.5 Replace castor wheel

DANGER	**Crushing hazard when the debris hopper is raised** **► Prior to working, fit the support under the hopper**

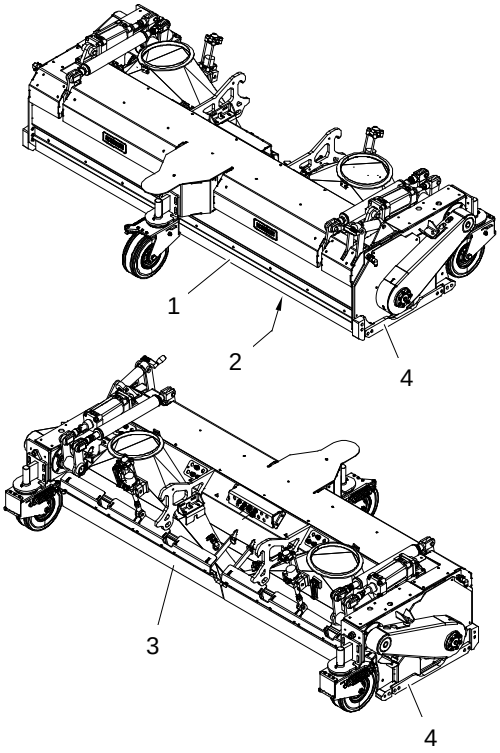
Disassembly:

- Parking the machine safely
- Open blower housing by dismantling suction disc and supports.
- Remove castor wheel lock.
- Attach a suitable extractor. Pull castor wheel from axle and lift from housing. When pulling it out, ensure that the castor wheel cannot slip down.

NOTE	**If the hydraulic motor is mounted to the flange bearing, the gears must be cleaned inside and out. Residues of solvent are to be cleaned with dry lint-free cloth and a thin covering layer of Klüber paste 46MR 401 is to be applied. Observe the manufacturers instructions!**

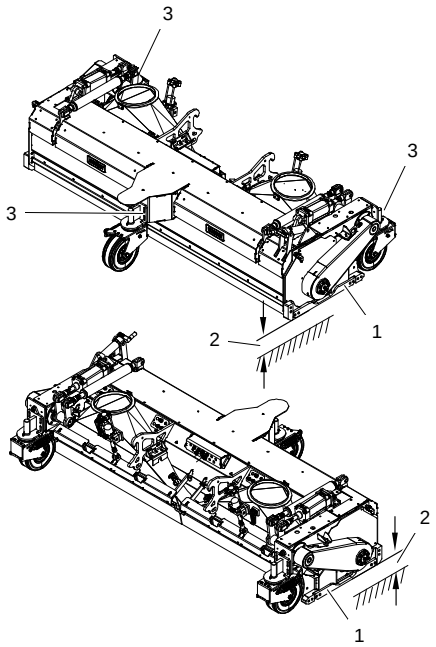
Castor wheel assembly is the reverse of the disassembly process.

22.6 Changing the rubber bars



If the rubber bars (1/2/3) are worn, they must be replaced. The new rubber bars are to be set to the height of the wear plates (4). The distance of the wear plate to the sweeping surface is 15 mm – 20 mm.

22.7 Setting the wear plates



The wear plates (1) must have a distance (2) of 15 mm – 20 mm to the sweeping surface. The distance is set using the slots (3) of the castor wheel fastening.

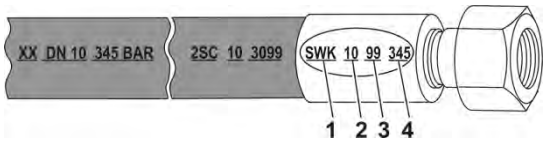
22.8 Changing hydraulic hoses

All hydraulic lines that are to be opened must be depressurised before repair work is started.

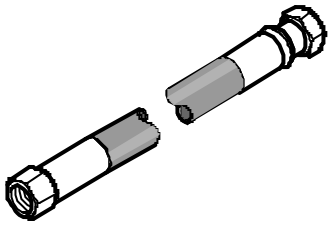
ENVIRONMENT	**Never allow oil to get onto the ground. Properly catch any oil that runs out and dispose of it properly. Note environmental regulations concerning oils.**

TIP

The date of manufacture is marked on the hydraulic hoses.



1 Manufacturer's code
2 Month of manufacture (e.g., October)
3 Year of manufacture (e.g., 1999)
4 Maximum permitted operating pressure (e.g., 345 bar)



The hose lines are to be checked at least once a year by an expert. The hoses are to be replaced immediately if the following criteria have been established:

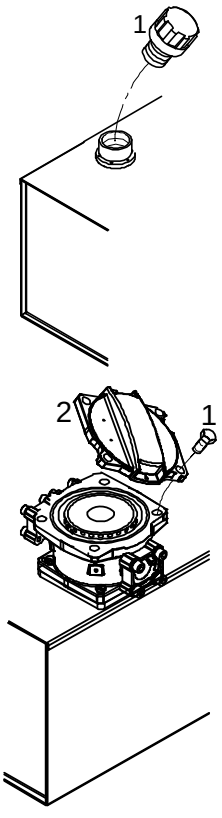
- In general, hydraulic hoses should be replaced every 6 years.
- Damage to the outer layer through to the insert (such as chafing points, cuts, cracks etc.).
- Brittleness (formation of cracks) on the outer layer.
- Deformations when not under pressure or when under pressure or when bent that do not correspond to the natural form of the hose line (such as separation of layers, formation of bubbles, areas that have been squashed, kinks, etc.)
- Damage, deformation, corrosion of the hose fittings that impair the seal

22.9 Vehicle hydraulics Changing the hydraulic oil and filter

WARNING	**Burns due to hot oil over 50°C** **► Wear protective clothing and gloves** **► Let the oil cool if necessary**

	**NOTE**	**Use only oils that have been approved by Aebi Schmidt.**
	**NOTE**	**Dirt in the hydraulic equipment can irreparably damage hydraulic components. Always change the hydraulic filter in good time. The highest levels of cleanliness should be ensured when changing the filter or changing the oil.**
	**TIP**	**It is possible to have oil quality checked by a specialist company. These specialist companies provide information about whether oil can still be cleaned or whether it needs changing.**
	**TIP**	**If oil is sucked out of the hydraulic tank, the oil should be at a temperature of approximately 50°C.**
	**ENVIRONMENT**	**Dispose of waste oil in accordance with local regulations.**

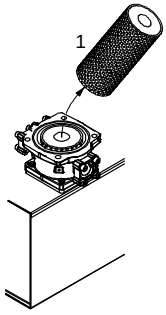
22.9.1 Filter change



Take out the filter

- Shut off the hydraulic system.
- Have the oil collection pan and cleaning cloths ready in order to catch and remove any oil that may run out.
- Open the filler cap (1) in order to get rid of pressure in the tank.

- Take of the screws (1) on the cover fastening (4 screws, SW 15) and remove cover (2).
- Check the surface of the filter for residual dirt and larger particles. These impurities can lead to damage to hydraulic components.



- Pull the filter element (1) from the filter housing.
  - Clean the housing and cover.
- Check the O rings on the cover for damage and change these if necessary.

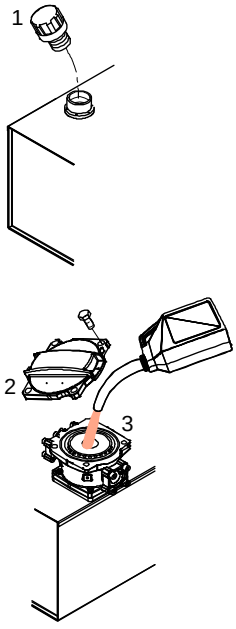
Install the filter

Installing the filter is carried out by reversing the disassembly sequence.
Wet the sealing surfaces with clean oil.
The identification markings on the new filter element must correspond to those on the old filter element.
Turn on hydraulic equipment, check the filter for leakages; check the oil level and fill if necessary.

22.9.2 Changing hydraulic fluid

TIP

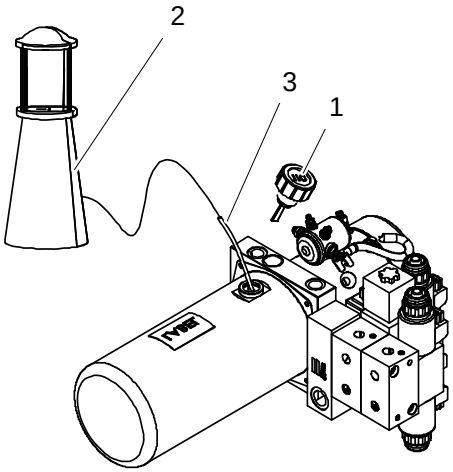
It is possible to have oil quality checked by an oil analysis carried out by a specialist company. These specialist companies provide information about whether oil can still be cleaned or whether it needs changing.



- Open the ventilated filler cap (1)
- Place catch pan under draining point. Open the oil drain screw and empty the tank completely.
- Block the oil drainage point again with the drain plug and a new seal.
- Fill with new hydraulic fluid.
  To get any possible dirt particles out of the new oil, the oil should be filled using a filter unit or through the filter (3). After filling, the filter cover (2) and the ventilated filler cap (1) are to be closed. Check oil level using the control panel.
- Leave engine running for approximately one minute and then switch it off. Check the oil and add more oil if necessary.

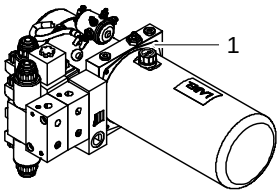
  <u>Repeat procedure until the oil level no longer changes.</u>

22.10 Electrohydraulics Changing the oil and cleaning the oil strainer



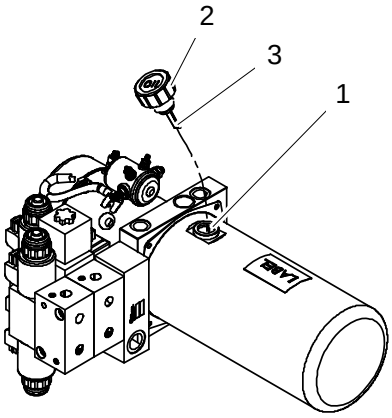
22.10.1 Removing the oil

- Warm the hydraulic fluid to approximately 50°C by moving the snow plough (raising, lowering, pivoting).
- Park the vehicle safely.
- Unscrew the filler cap with oil dipstick (1).
- Suck out the oil with suction equipment (2). Put the suction nozzle (3) into the filler opening and suck out the oil.



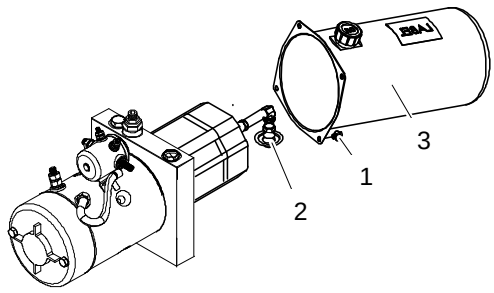
22.10.2 Draining oil

- Place the oil capture container under the electro-hydraulic pump.
- Carefully loosen the tank by loosening the 4 screws (1) until oil flows out between the pump flange and the oil container.
- Remove the tank
- Clean the tank, especially the magnets that are in the tank.
- Reinstall the tank. Ensure that the sealing surface is clean and that the sealing ring has been lightly oiled.



22.10.3 Fill the hydraulic equipment with oil

- Fill with oil (approximately 5 litres) using the filler opening (1).
- Check oil level using the dipstick (2). The oil must be between the markings (3) when the hydraulic cylinders are retracted.
- Turn on the hydraulic equipment and carry out all hydraulic functions. Check oil level again. Repeat the procedure until the oil level no longer changes.



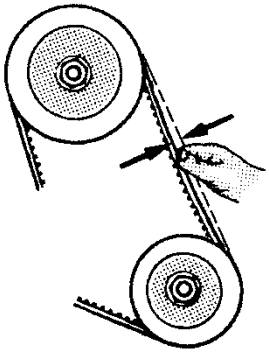
22.10.4 Clean the oil strainer

The oil strainer (2) does not need to be changed, only cleaned.

- Remove oil from the hopper (3).
- Remove the container by loosening the four screws (1).
- Clean the oil strainer that is released (2) with compressed air and cleaning agent (petroleum ether). Note the safety and hazard warnings before using the cleaning agent.
- Reinstall the tank (3). In doing so, ensure that:
  - The magnets in the tank that hold the iron swarf have been cleaned.
  - The sealing surface between the hydraulic tank and the hydraulic pump is clean and the sealing ring is lightly oiled.
- Fill the oil tank with oil.

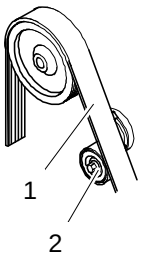
22.11 Pump drive

22.11.1 Pump drive via belts



Tensioning the belts

Tighten the V-belt so that you can press it in approx. 10 mm with your thumb, e.g. with an axle distance of 590 mm and a force of 41 N. If the V-belt is too tight or too loose, it will wear too quickly and damage the belt pulley bearing.
Check that new V-belts are at the correct tension after the first few operating hours and retighten if necessary.



Tensioning the flat drive belt

The flat drive belt (1) is tensioned using a tensioning roller (2).
If the flat drive belt is worn, we recommend that the flat drive belt and tensioning roller are always changed together.

22.12 Welding work

	**NOTE**	**Welding work carried out on the machine can irreparably damage the electrical system and electronics.**

	**NOTE** **24 Volts**	**Damage to the electronics** **► Never remove the connecting cables while the vehicle/auxiliary engine is running** **► Do not conduct voltage peaks to the vehicle electronics through quick chargers** **Non-deletable error in the memory of the engine control device.** **► After turning off the vehicle/auxiliary engine and ignition, wait a minimum of 3 minutes before disconnecting the connecting cable.**

- Before welding work:
  - o Disconnect the battery (first the (–) terminal, then the (+) terminal).
  - o Disconnect all electronic plug connections from the control units.
- Clamp the welder's earthing clamp as close to the welding area as possible.

After the welding work is complete, reconnect all plug-in connectors (pay attention to markings). Close up the housing and attach the battery: first (+) pole, then the (–) pole.

23 Circuit diagrams

There are wiring diagrams for the machine.
The wiring diagrams are attached in a separate document. There are the following wiring diagrams for the machine:

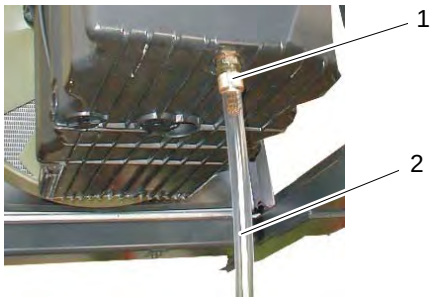
- Electrical system
- Hydraulics
- Pneumatics
- Water

24 Special tools and their use

24.1 Vehicle

See vehicle manufacturer's operating instructions.

24.2 Auxiliary engine



Oil drain device
As a result of the construction design of the machine, access to the standard engine oil drain screw is made difficult. The work is made considerably easier using a drain valve and drain hose.
The engine manufacturer's instructions for carrying out an oil change are to be noted.

Installing the drain hose

- Unscrew safety nut from oil drain valve (1).
- Screw hose (2) to the oil drain valve and the valve opens. Position the hose into the catch pan.
- Unscrew hose.
- Screw safety nut onto oil drain valve.

see manufacturer's operating instructions.

24.3 AS 990

No special tools are required to maintain or repair the machine. Electrical and hydraulic measuring tools are required for troubleshooting.

25 Shutdown

The following preparations must be made prior to extended downtimes:

25.1 Vehicle

See vehicle manufacturer's operating instructions.

25.2 Auxiliary engine

See manufacturer's operating instructions.

25.3 Snow plough

See snow plough operating instructions.

25.4 Sweep and pick-up unit

- Park the vehicle safely
- Carry out a thorough cleaning.
- Carry out a full lubrication (in accordance with the lubrication schedule).
- Protect exposed piston rods of the hydraulic cylinders from corrosion with spray oil.
- Put the cross brush into transport position.
- De-rust exposed parts and coat with an anti-corrosive substance (paint, spray oil, etc.).
- Store the control panel at room temperature in a dry, cool and dust-protected environment.
- Protect electrical and hydraulic connections from soiling. Electrical contacts are to be lubricated with contact grease.
- Treat rubber components with talcum powder or glycerine.
- Completely fill fuel tank with fuel.
- Completely drain water tank, water pump and filter system. Blow out water lines with compressed air. Lower the brush in this case, shut off the water and remove the water filter, switch on the spray nozzles, open the shut-off valve and close again after emptying. Fill water pump with a bio-degradable oil emulsion and turn pump a few times. Drain the compressed air tank using the drain valve.
- Remove the battery, check acid levels and charge every 3 months.

26 Index

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