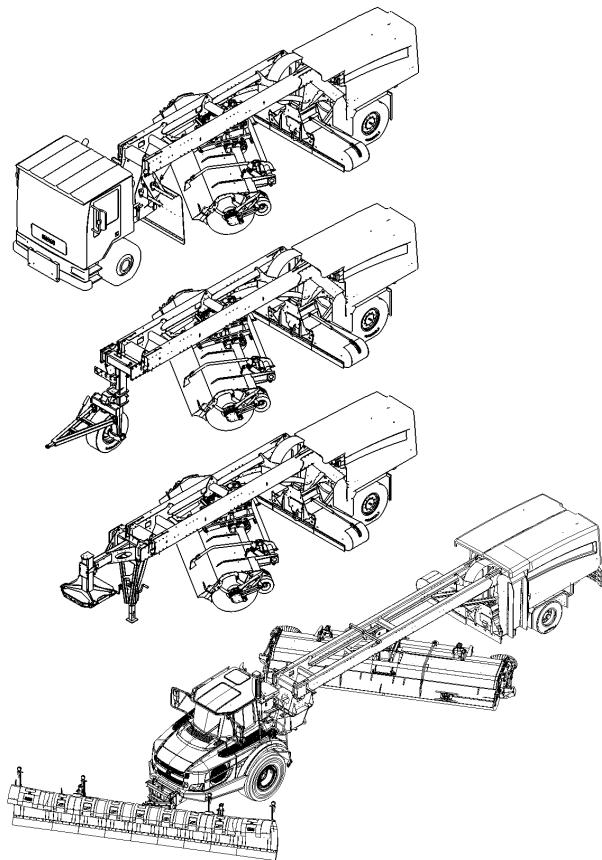




a brand of aebi schmidt

Snow Clearance

Towed Jet Sweeper
Model: TJS / TJS- C



Operating Instructions for Maintenance Personnel (Translation of Original Operating Instructions)

Valid from 12/ 2022

Valid till:

Revision: 1

Doc. no: 1367113-6 EN

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1 Foreword

Read this User Manual thoroughly before putting the machine into operation. Any references to other documents that are made in this User Manual automatically include those documents as part of the description/instructions. (e.g. for engines, vehicles etc.).

This User Manual contains all the important instructions for using and carrying out maintenance on your machine. If these instructions are adhered to, the machine will be able to complete its tasks satisfactorily and will achieve a long service life.

Anyone working with the machine must fully understand the machine functions and must be able to safely operate the machine. To ensure this is the case, the User Manual should always be available with the machine.

The User Manual belongs with the machine and should remain with it should it be transferred to a third party.

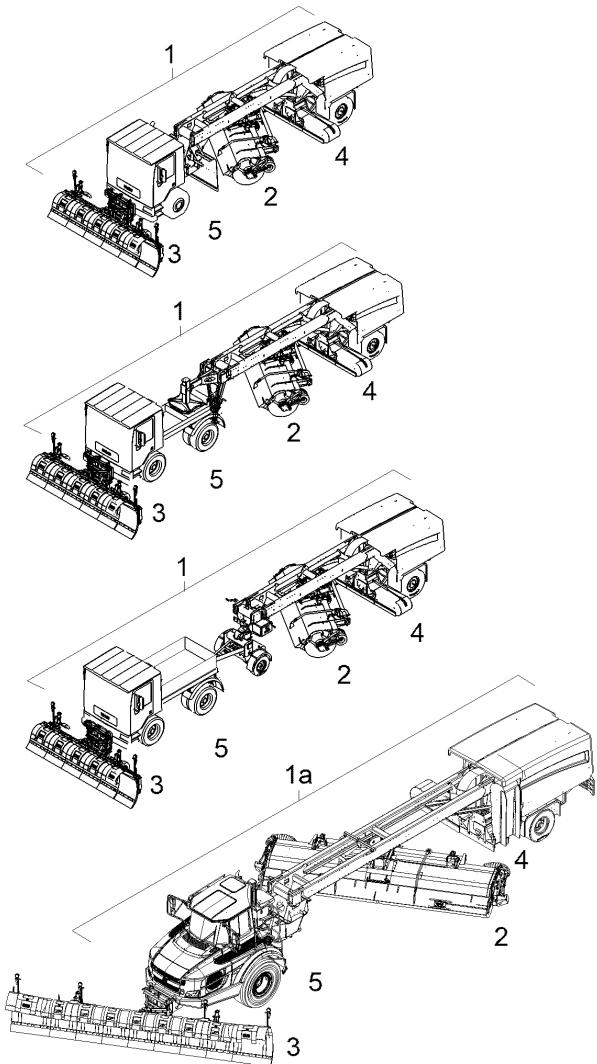
The User Manual must not be reprinted, translated or copied without written permission.

We reserve the right to make changes to the technical details included in the specifications and diagrams in this User Manual. No claims can be made as a result of these changes. Special equipment can be described as long as it requires an explanation.

Should you have any questions or problems with the machine, our service department will be pleased to assist you.

2 General information

2.1 Operating manual



In these operating instructions, the Towed Jet Sweeper Model TJS (1) or TJS-C (1a) will be referred to only as TJS and/or "machine".

The TJS or TJS-C is comprised of the following attachments, which are referred to by their names in the operating instructions:

- Snow plough (3)
- Sweeper unit (2) consisting of the sweeping brush and raising and lowering facility main components
- Blast nozzle (4) consisting of blower and blast shaft main components
- Vehicle (5)

Read these operating instructions carefully and make yourself familiar with the features of the TJS/TJS-C 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 TJS/TJS-C safely and economically.

Anyone working with the TJS/TJS-C must fully understand the TJS/TJS-C functions and must be able to safely operate the machine.

These operating instructions contain all the important indications for the use and maintenance of the TJS/TJS-C. As such, it is advisable to ensure that the operating manual is always within reach of the TJS/TJS-C.

To prolong superior performance, we recommend that you maintain the TJS/TJS-C in strict compliance with the instructions in this manual, and use only genuine Aebi Schmidt replacement parts. In this way, the TJS/TJS-C can complete its tasks to your satisfaction and offer a long service life.

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.

The operating instructions belong with the TJS/TJS-C and should remain with it should it be transferred to a third party.

2.2 Explanation of symbols

This operating manual contains information to help avoid accidents and personal injury. The relevant sections of text are marked with the following symbols:

**DANGER!**

Draws attention to a hazardous situation!

This situation will lead to death or serious injury if not avoided.

**WARNING!**

Draws attention to a hazardous situation!

This situation may lead to death or serious injury if not avoided.

**CAUTION!**

Hazardous situation!

This situation may lead to minor or moderate injury if not avoided.

This operating manual contains information to help avoid damage to property and the environment. The relevant sections of text are marked with the following symbols:

**IMPORTANT!**

This situation will lead to machine damage if not avoided.

**ENVIRONMENT!**

This situation will lead to environmental damage if not avoided.

**NOTE**

Additional information

Notice on understanding the machine and its functions, tips for simplifying work and optimising the use of machine performance.

2.3 Conversion table

Group	Unit	Meaning	Conversion
Time	s	Seconds	-
	min	Minutes	1 min = 60 s
	h	Hours	1 h = 60 min
Lengths	mm	Millimetres	1 mm = 0.001 m
	cm	Centimetres	1 cm = 0.01 m
	m	Metres	-
	km	Kilometres	1 km = 1000 m
	" (in)	Inches	1" = 2.54 cm
	ft	Feet	1 ft = 30.48 cm
	yd	Yards	1 yd = 3 ft = 0.9144 m
Electric	V	Volts	-
	A	Amperes	-
	Ah	Ampere hours	-
Force	Nm	Newton metres	-
Speed	m/s	Metres per second	1 m/s = 3.6 km/h
	km/h	Kilometres per hour	-
	mph	Miles per hour	1 mph = 1.61 km/h
	m/s^2	Metres per second ²	-
	rpm or U/min	Revolutions per minute	-
	Hz	Hertz (frequency)	1 Hz = 1 s^{-1}
Volume	ml	Millilitres	1 ml = 0.001 l
	l	Litres	-
	cm^3 or ccm	Cubic centimetres	1 cm^3 = 1 ml

Group	Unit	Meaning	Conversion
Weight	g	Grams	-
	kg	Kilograms	1 kg = 1000 g
	t	Tons	1 t = 1000 kg
	lb	Pounds	1 lb = 0.45 kg
Temperature	°C	Degrees Celsius	°C = (°F-32)*5/9
	°F	Degrees Fahrenheit	°F = °C*1.8+32
Pressure	mbar	Millibar	1 mbar = 0.001 bar
	bar	Bar	-
	psi	Pound per square inch	1 psi = 0.069 bar
Performance	W	Watts	-
	kW	Kilowatts	1 kW = 1000 W
	HP	Horse power	1 HP = 0.74 kW
Flow volume	l/min	Litres per minute	-
	l/h	Litres per hour	-
Other	db(A)	Decibels	-
	°	Angle	-

Group	Unit	Meaning	Conversion
Time	s	Second	-
	min	Minute	1 min = 60 s
	h	Hour	1h = 60 min

Group	Unit	Meaning	Conversion
Lengths	mm	Millimetre	1 mm = 0.001 m
	cm	Centimetre	1 cm = 0.01 m
	m	Metre	-
	km	Kilometre	1 km = 1000 m
	" (in)	Inch	1" = 2.54 cm
	ft	Foot	1 ft = 30.48 cm
	yd	Yard	1 yd = 3 ft = 0.9144 m
	Mile	1 mile (statute)	0.6214 mile = 1 km
	Mile	1 mile (nautical)	0.54 mile = 1 km
Electrical	V	Volt	-
	A	Ampere	-
	Ah	Ampere hour	-
Force	Nm	Newton metre	-
Speed	m/s	Metre per second	1 m/s = 3.6 km/h
	km/h	Kilometres per hour	-
	mph	Miles per hour	1 mph = 1.61 km/h
	m/s ²	Metre per second ²	-
	min ⁻¹ (rpm)	Per minute (revolutions per minute)	-
	Hz	Hertz (frequency)	1 Hz = 1 s ⁻¹
Volume	ml	Millilitre	1 ml = 0.001 l
	l	Litre	-
	cm ³ or ccm	Cubic centimetre	1 cm ³ = 1 ml
	cu.in.	Cubic inch	0.061023 cu.in. = 1 cm ³
	cu.ft.	Cubic foot	35.3156 cu.ft. = 1 m ³
	Pint		1 pint = 473.18 ml
	Gallon		1 gallon = 3.785 l

Group	Unit	Meaning	Conversion
Weight	g	Gram	-
	kg	Kilogram	1 kg = 1000 g
	t	Ton	1 t = 1000 kg
	lb.	Pound	1 lb. = 0.45 kg
	gr	Grain	15.432 gr = 1 g
	oz.	Ounce	0.0353 oz. = 1 g
Temperature	°C	Degrees Celsius	°C = (°F-32)*5/9
	°F	Degrees Fahrenheit	°F = °C*1.8+32
Pressure	mbar	Millibar	1 mbar = 0.001 bar
	bar	Bar	-
	psi	Pound per square inch	1 psi = 0.069 bar
	lbf./ft. ²		2048 lbf./ft. ² 1 kp/cm ²
Output	W	Watt	-
	kW	Kilowatt	1 kW = 1000 W
	HP	Horse power	1 HP = 0.74 kW
	HP	Horse power	0.9863 HP = 0.746 kW
Volumetric flow	l/min	Litres per minute	-
	l/h	Litres per hour	-
Miscellaneous	db(A)	Decibel	-
	°	Angular dimension	-

2.4 Abbreviations

Abbreviation	Meaning
AC	Alternating Current
ADC	Automatic Drive Control
Betr.SichV	Ordinance on Industrial Safety and Health
and/or	and/or, respectively

Abbreviation	Meaning
approx.	approximately
DC	Direct current
DIN	German Industry Standards
DOF	Diesel oxidation catalyst
DPF	Diesel particle filter
possible/any	possible/any
If required	If required
cpl.	Complete
LED	Light-emitting diode
le	Left
MA	Torque
max.	Maximum
MIL	Malfunction indicator light
min.	Minimum
No.	Number
OBD	On-board diagnosis
PA	Polyamide
ri	Right
SCR	Selective Catalytic Reduction
StVZO	German Road Traffic Licensing Act
AF	Software
etc.	And so on, etc.
UVV	Accident Prevention Regulations
e.g.	For example
Perm.	permissible
Ø	Diameter
%	Percent

3 Safety

3.1 Regulations

Additional airport regulations must be observed during use.

3.2 Modifications to the machine

Modifications to the machine

Aebi Schmidt must first approve any alterations, additions or modifications that may affect the safety of the machine. This also applies to settings for safety devices and welding of load-bearing parts or to modifications to the hydraulic or electronic systems.

3.3 General safety regulations

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



WARNING!

Supplementary to the operating instructions.

Non-observance can cause accidents that result in injuries.

- ▶ Generally applicable statutory and other regulations regarding accident prevention and environmental protection must be observed and followed.

**WARNING!**

Persons can be overlooked when working on exposed areas of the machine.

There is a risk of people becoming entangled or being run over when turning on the machine or driving it away.

- ▶ Work on the machine may only take place if it is safely parked.
-

**WARNING!**

Steps and treading surfaces may be slippery.

When used, people may fall.

- ▶ Keep dirt, grease, oil, snow, and ice away from steps and treading surfaces.
-

**WARNING!**

Excessive physical strain.

Spinal injuries are possible, for example.

- ▶ Assistance is to be sought or a suitable lifting device is to be used for work that requires excessive physical exertion.
-

**WARNING!**

Non-recognition of danger zones.

Danger zones are marked with safety and hazard instructions.

Non-observance can cause severe injuries.

- ▶ All safety and hazard instructions for the machine must be observed and retained in a complete and legible condition.
-

**WARNING!**

Control panel functions that require a password are usually dangerous.

People may be caught and injured by the suction effect.

Persons that use password-protected functions must:

- ▶ Have undergone training and instruction for these functions.
- ▶ These people must be informed of the dangers of the individual functions.
- ▶ The password is only to be passed on to trained and instructed personnel.
- ▶ After the work is complete, the password must be cleared by switching the ignition off.

**WARNING!**

Non-recognition or failure of legal warning equipment.

Machine dimensions, for example, may not be recognised. This can cause serious accidents with injuries.

- ▶ Check that any warning signs required (in Germany the StVZO [German Road Traffic Licensing Regulations] and approved instructions for winter service vehicles) are complete and functional and observe them.

**WARNING!**

Low-quality replacement parts.

Low-quality replacement parts may not fulfil their functions. This can cause serious accidents with injuries.

- ▶ Use only original parts or replacement parts of the same quality.

**WARNING!**

Sharp edges may arise due to the incorrect adjustment of machine parts, like the wiper, or due to wear of components.

Sharp edges can lead to cutting injuries.

- ▶ Corresponding personal protective equipment such as protective gloves and goggles must be worn during maintenance and repair work.
-

**WARNING!**

Working on the machine

The machine can start to move and cause injuries.

- ▶ Work may only be carried out on the machine if the vehicle is safely parked.
 - ▶ Protective and safety equipment may only be removed for maintenance and repair work.
 - ▶ The machine is only permitted to be put into operation with the protective and safety equipment fitted.
-

**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 changing the plastic cutting-edges etc.
-

**WARNING!**

The range of vision is limited by the machine.

People can be run over.

- ▶ When driving off with the machine, the driver must ensure that there are no persons located in the danger zones.
-

**WARNING!**

Machine movements when starting and using the machines.

People may be caught and injured.

- ▶ Absolutely ensure that no persons are located in the danger zone around the machine.
-

**CAUTION!**

Electronic devices (e.g. telephone and radio equipment) can cause interference and thus jeopardise the operating safety of the machine.

This circumstance can influence the operating safety of the machine and cause accidents with injuries.

- ▶ Use or install only equipment with an EMC test (E-certificate).
-

3.4 Intended use

The machine is intended for use on air traffic surfaces. The machine is only intended for removing snow, water and ice. Its use for any other or additional purpose, e.g. brushing grit, construction site dirt, etc., constitutes misuse. Do not operate the machine in the vicinity of substances that are hazardous to health, flammable or explosive.

3.5 Target groups

Vehicle owner

The vehicle owner is responsible for the machine. The owner must ensure that:

- The machine is in a safe condition compliant with regulations.

- The regular safety inspection (inspection according to accident prevention regulations in Germany) must be performed.
- Only qualified expert driving personnel must start up the machine.
- The driver has been instructed not to exceed the statutory working hours. Exceeding the working time can lead to overload of the driver and cause accidents.
- Only suitable workshop personnel must perform maintenance and repair work.
- Use only original parts or replacement parts of the same quality. Low-quality replacement parts may pose a safety risk.

Driving and operating personnel



WARNING!

Poorly trained or unqualified driving personnel.

This can cause serious accidents.

- ▶ Sufficiently and regularly train the driving personnel, e.g., after longer work breaks.
-

Requirements for the machine driver

- Valid driving licence to drive the machine.
- Training and instruction for the machine.
 - Vehicle
 - Auxiliary engine
 - Snow plough
 - Sweeping and suction unit
- Driver training with the machine.

Once training, instruction and driver training for the complete machine have been successfully completed, this should be confirmed in writing.

Important information is often forgotten.

After driving personnel have not used the vehicle for a long time:

- Before every winter season, refresher training must be carried out to maintain safety when using the machine.

Workshop personnel

Only expert workshop personnel authorised by Aebi Schmidt may maintain and service the machine to exclude any risks to people or the environment from the machine.

The authorised workshop personnel have the necessary specialised knowledge and tools for carrying out the required work on the machine properly.

The authorised personnel are herein-after referred to as the workshop personnel only.

3.6 Personal protection equipment

The personal protective equipment must guarantee safe use. Damaged protective equipment must not be used. It must be replaced immediately.

Hearing protection



- Reduced risk of hearing damage

Hearing protection must be worn from 85dB(A).

Safety shoes



- Reduce injuries to feet
- Improve grip

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 or pointed objects (such as cutting-edge change) can injure hands.
- Sharp edges may arise due to wear, damage to components, and so on. These sharp edges may cause hand injuries, e.g. when cleaning the machine.
- Fluids (such as oils, coolant, battery acid, etc.) can damage hands.
- For reasons of hygiene and safety, the wearing of gloves is recommended when cleaning the machine.

Reflective clothing, weather protection and protective clothing



- Reflective clothing improves visibility when outside the vehicle. 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



- The wearing of facial protection is recommended when working with high-pressure cleaners. Facial protection protects the eyes, in particular from splashed dirt particles, when cleaning the machine.

3.7 Danger zone of the machine

General notes on the danger zone



WARNING!

Non-observable machine movements.

Persons could get caught or be run over by the machine.

- If machine movements are performed or the machine is started up, no one may be in the danger zone. If necessary, a safety spotter who has a line of sight to the driver must be used.

Snow plough danger zone



WARNING!

The snow plough performs movements.

People may be caught and injured.

- The danger zone is described in the operating instructions of the snow plough. These operating instructions must be strictly observed to prevent accidents.

- The pivot area of the snow plough
 - People can be caught between the snow plough and the vehicle.

- Pivot range of the folding blades on the snow plough
 - People can be crushed between the folding blades and vehicle.
- Raising and lowering range of the snow plough
 - People can be caught between the snow plough and the ground below.
- Between the snow plough and the vehicle plate
 - People can be crushed when driving the vehicle up to the snow plough for attachment.

Wheels of the steerable rear axle turned

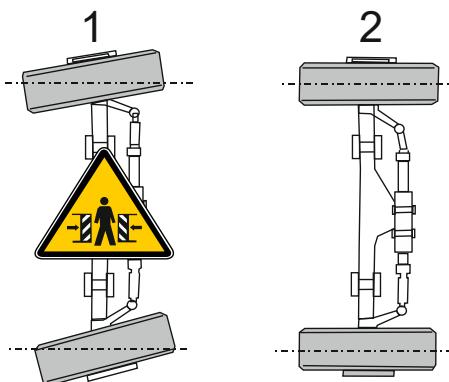


WARNING!

Wheels can unexpectedly move into straight-ahead driving due to the pressure reservoir.

People may be crushed.

- ▶ Do not stand or be otherwise located between the fenders and turned wheels.
When parking the machine, always set the rear axle steering wheels to straight ahead.
- ▶ Before maintenance and repair work on the steerable rear axle, always empty the pressure reservoir.



Shunting, reverse travel

Machine with turned wheels of the rear axle steering (1). During maintenance work, always set the rear axle steering in the straight-ahead position (2) and empty the pressure reservoir.

Shunting and reverse travel are dangerous. The responsibility for this driving manoeuvre always lies with the driver. Driving in reverse is only allowed if it is ensured that nobody is endangered. If necessary, a suitable person must be appointed as a spotter.



WARNING!

If the driver cannot see the area to the rear during reverse travel.
The rear-view camera does not replace the spotter.
People can be run over.

- ▶ If the area to the rear of the vehicle is not visible, a spotter must be used.

Driving into junctions



WARNING!

Due to the snow plough mounted on the front that protrudes, driving into crossings or side roads can constitute a dangerous situation.

This can lead to collisions with other vehicles.

- ▶ A safety spotter is always to be used in unclear intersections, junctions, etc.

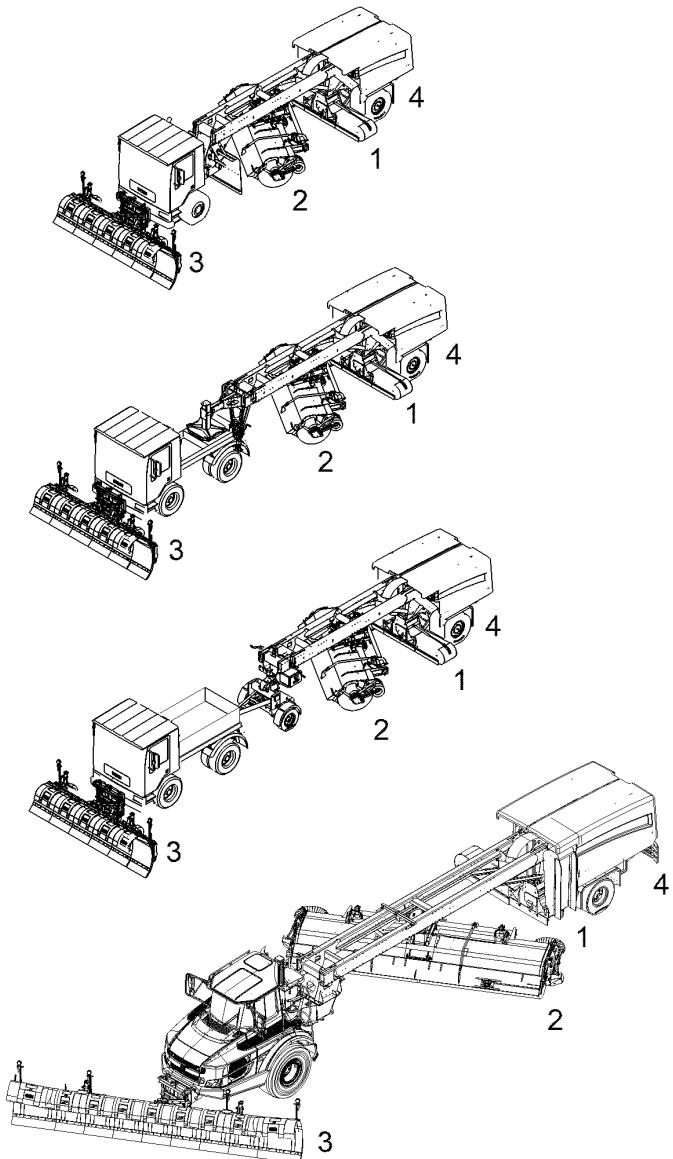
Danger zone when steering the TJS

**WARNING!**

Pivoting, lowering and lifting movements of the machines.

People may be caught and crushed.

- Keep a safe distance when the TJS is running.

**Snow plough (3)**

- See the snow plough's operating instructions.

Sweeper unit (2)

- The movement must be stopped immediately if somebody steps into the raising, lowering and pivoting area of the sweeper unit.
- Persons must keep a safe distance of at least 5 m.

Blast nozzle (1)

- Movement is to be stopped immediately if somebody steps into the raising and lowering area of the blast nozzle.
- Persons must keep a safe distance of at least 5 m.

Rear axle auxiliary steering (4)

- Turned wheels can unexpectedly switch to the straight-ahead position. Never enter the area between the turned wheels and the vehicle frame. When parking the TJS, always turn the steering into the straight-ahead position.

Danger zone during snow clearance with the TJS

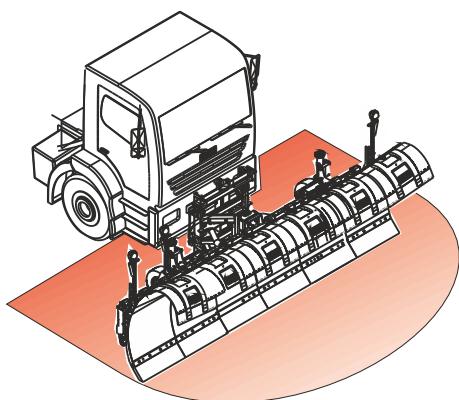


WARNING!

Throwing of objects hidden in the snow.

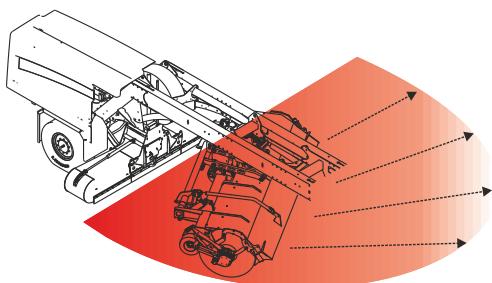
Persons could be hit by objects.

- ▶ Observe the required distance.
It should be noted that heavy objects hidden in the snow (such as stones, lumps of ice, etc.) may fly further than the snow itself. If persons are in or enter the danger zone, the TJS must be stopped and the drive of the blast nozzle and the sweeper unit must be switched off immediately.



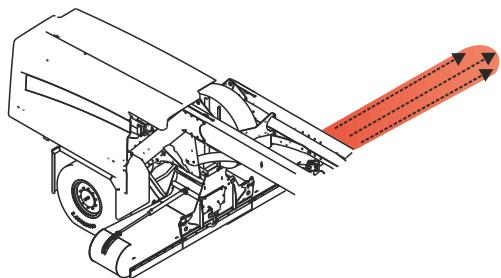
Snow plough

- See the snow plough operating instructions for the safety distance.



Sweeper unit

- Direction of snow discharge, sweeping direction
 - 15 m to the side
 - To the front 10 m



Blast nozzle

- Direction of snow discharge, blower direction
 - 30 m to the side.

Rear axle steering

- When the auxiliary steering is switched on, unusual driving behaviour may occur when negotiating curves. Inexperienced drivers drive slowly.

Open/close the engine cover danger zone

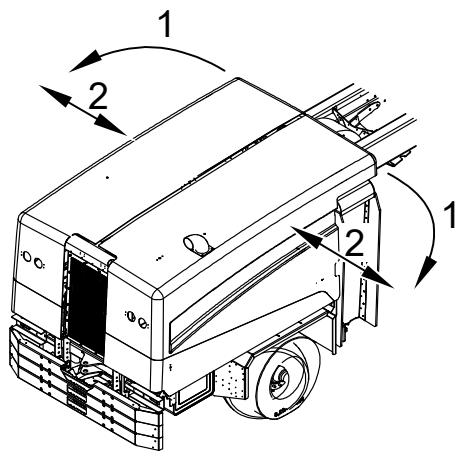
There are three ways to open the engine cover.

- Engine cover with swivel mechanism
- Engine cover with tilt mechanism
- Engine cover with swivel-tilt mechanism

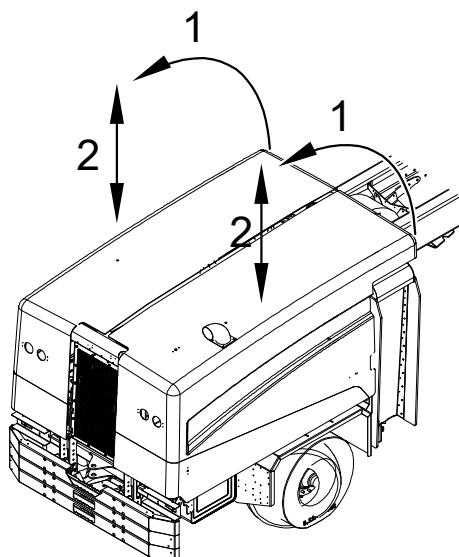
Depending on the design of your snow-clearing machine, the engine cover can be swivelled or tilted outwards when opened.

Motor cover with swivel mechanism

Motor cover is opened and closed manually. The engine cover swivels outwards (1) when opened.



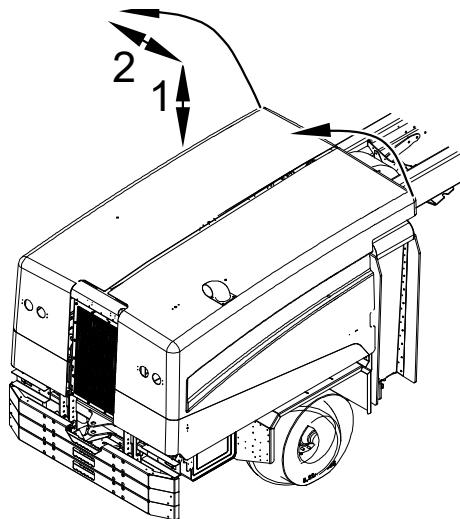
- People can be crushed between the engine cover and the outer wall.
- The engine cover can hit the outer wall and get damaged.
 - Before opening the engine cover, ensure sufficient clearance (2).



Engine cover with tilting mechanism

Engine cover is opened and closed hydraulically. The engine cover tilts upwards (1) when opened.

- The engine cover can collide with the ceiling. Objects on the ceiling can fall and injure people. The ceiling and engine cover can get damaged.
 - Before opening the engine cover, ensure sufficient clearing height (2).

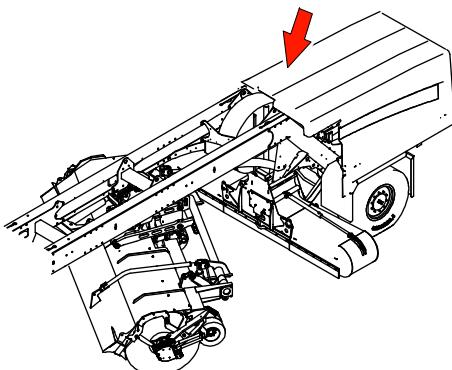


Engine cover with swivel-tilt mechanism

Engine cover is opened and closed hydraulically. The engine cover tilts upwards (1) and swivels outwards (2) when opened.

- The engine cover may collide with the outer wall and ceiling. Objects on the ceiling can fall and injure people.
 - Before opening the engine cover, ensure sufficient clearance.
- People can be crushed between the engine cover and the outer wall.

Engine cover



Never start driving the TJS with the engine cover open.

- Close engine cover

3.8 Protective and safety equipment

Mirrors

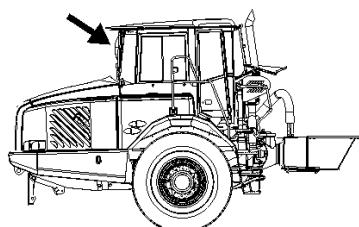
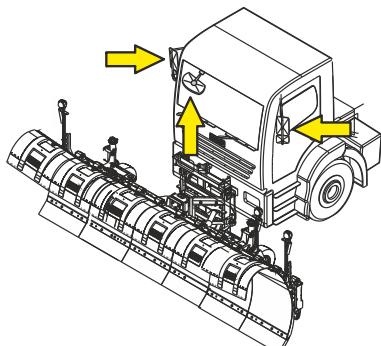


WARNING!

Non-observance of danger zones through mirrors

People may be caught and injured by the TJS.

- ▶ The danger zones are visible through mirrors. Before use, adjust the mirrors in such a way that the danger zones can be seen. Always keep mirrors clean. Destroyed mirrors must be replaced as quickly as possible.



Danger zones that can be viewed through mirrors

- The pivot area of the snow plough
 - People can be caught between the snow plough and the vehicle.
- Raising and lowering range of the snow plough
 - People can be caught between the snow plough and the ground below.

- Between the snow plough and the vehicle plate
 - People can be crushed when driving the vehicle up to the snow plough for attachment.
- The pivot area of the cross brush
 - People can be crushed between the cross brush and frame parts.
- Raising and lowering range of the cross brush
 - People can be crushed between the cross brush and frame parts.
- Raising and lowering movement of the blast nozzle
 - People can be caught between the blast nozzle and frame parts.

Emergency stop button

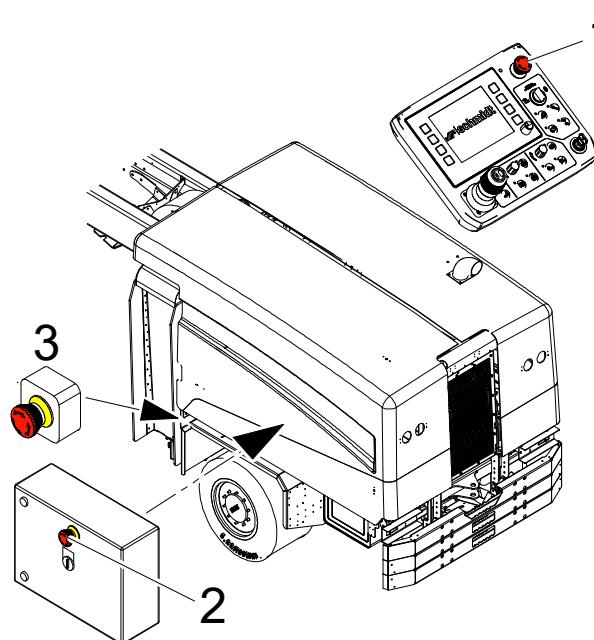


WARNING!

People enter the danger zone of the TJS.

Persons could be caught by the machines of the TJS.

► EMERGENCY STOP buttons serve to quickly shut down the TJS in the event of an emergency or to avoid a hazard.



1 The emergency stop button can be found on the following:

- Control panel (1).
- Electrical cabinet (2).
- At the rear left and right (3).

Fire extinguisher



The fire extinguisher is located behind the driver's cab.

The operational readiness of the fire extinguisher must be checked according to the manufacturer's information. The manufacturing date or final inspection date on the fire extinguisher applies.

Park the TJS safely



WARNING!

If the TJS is not parked properly, the TJS or parts of it can move and cause accidents.

- In case of any work performed on the TJS, you must park it safely.

Park TJS safely.

- Park the TJS on level ground that is able to support its weight

- Using auxiliary steering, set the wheels of the front and rear axles in the straight-ahead position.
- Lift or lower the cross brush onto the castor wheels and swivel it into the transit lock.
- Raise the blower unit.
- Park the snow plough safely (see separate operating instructions from the snow plough manufacturer).
- Turn off the control panel to steer the TJS.
- Apply handbrake. Turn the vehicle and auxiliary engines off and remove the ignition key.
- Lock the driver's cab doors.
- If necessary, place chocks under both wheels so that the TJS cannot roll away.

3.9 Lashing and mounting points

The TJS is not approved for driving on public roads. The TJS must be loaded onto another vehicle for transport on public roads.



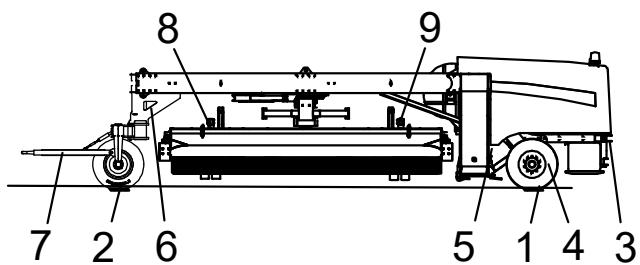
Lashing points

For road transport, the pertinent regulations for fastening and lashing must be observed.

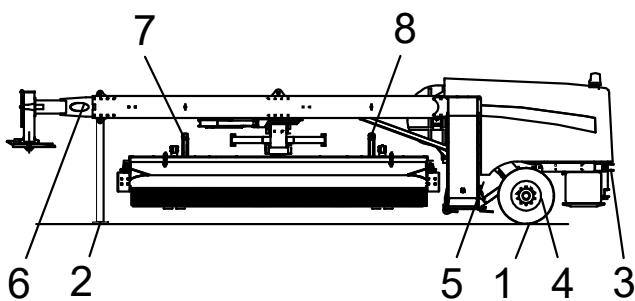
Lashing points are marked with this symbol.

Lashing and fastening points, model TJS-4-Rad

- Push TJS into the loading area with the appropriate vehicle.
- Secure the rear wheels (1) and castor wheel (2) with chocks against rolling and sideways movement.
- Lash TJS down and against deceleration and acceleration forces. Hang the lashing straps in the following eyelets or frame parts and tighten.
 - Tow hooks (tighten to the rear 3)
 - Axle on the left and right (4)
 - Eyelets on the left and right of the frame (5)
 - Breach on the frame part on the left and right (6)
 - Drawbar (7)
- Secure brush against swinging. Hang the lashing strap on support tube at the level of the castor wheels (8/9) and lash down.



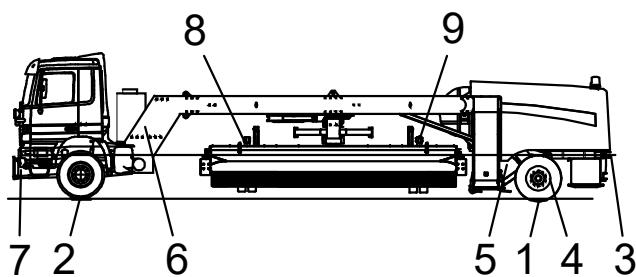
Lashing and fastening points, model TJS



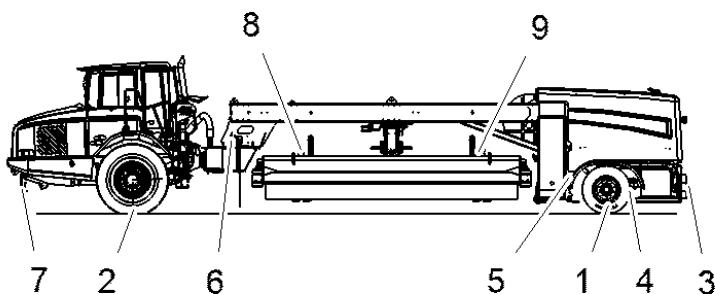
- Push TJS into the loading area with the appropriate vehicle and park on support leg.
- Secure the rear wheels (1) and castor wheel (2) with chocks against rolling or slipping and sideways movement.
- Lash TJS down and against deceleration and acceleration forces. Hang the lashing straps in the following eyelets or frame parts and tighten.
 - Tow hooks (tighten to the rear 3)
 - Axle on the left and right (4)
 - Eyelets on the left and right of the frame (5)
 - Breach on the frame part on the left and right (6)
- Secure brush against swinging. Hang the lashing straps on support tube at the level of the castor wheels (7/8) and lash down.

Lashing and fastening points, model TJS with power head

- Drive TJS into the loading area. Tighten the handbrake and close vehicle.
- Secure the rear wheels (1) and wheels of the power head (2) with chocks against rolling and sideways movement.
- Lash TJS down and against deceleration and acceleration forces. Hang the lashing straps in the following eyelets or frame parts and tighten.
 - Tow hooks (tighten to the rear 3)
 - Axle on the left and right (4)
 - Eyelets on the left and right of the frame (5)
 - Eyelets on the frame part on the left and right (6)
 - Frame part on the vehicle plate on the left and right (7).
- Secure brush against swinging. Hang the lashing strap on support tube at the level of the castor wheels (8/9) and lash down.



Lashing and fastening points TJS-C



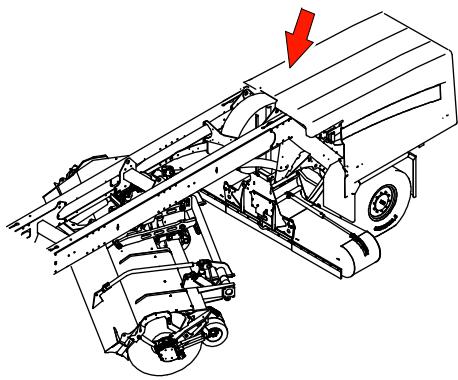
- Drive TJS into the loading area. Tighten the handbrake and close vehicle.
- Secure the rear wheels (1) and wheels of the tractor unit (2) with chocks against rolling and sideways movement.
- Lash TJS down to resist deceleration and acceleration forces. Hang the lashing straps in the following eyelets or frame parts and tighten.
 - Tow hooks (tighten to the rear 3).
 - Axle on the left and right (4).
 - Eyelets on the left and right of the frame (5).
 - Eyelets on the frame part on the left and right (6).
 - Frame part on the left and right side of the vehicle plate (7).
- Secure brush against swinging. Hang the lashing strap on support tube at the level of the castor wheels (8/9) and lash down.

Suspension points

The TJS does not have any eyelets to raise the TJS.

3.10 Covers

Engine cover

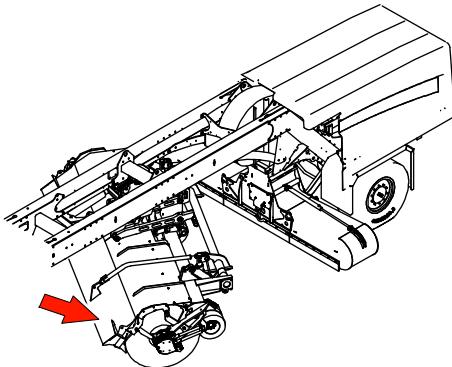


The engine cover covers the danger zones of the complete drive unit. Only the maintenance personnel may open the engine cover for the work on the drive unit.

Danger zones:

- Engine and engine mountings
 - People can seriously burn themselves on the engine and engine mountings.
- Blower
 - People may be caught by the rotating fan impeller and seriously injured.
 - Dirt particles can be ejected.
- Rotating ventilation wheel on the cooler
 - People may be caught and seriously injured.
- Water and oil cooler
 - People could be seriously burnt or scalded on the water and oil cooler.

Cylinder brush

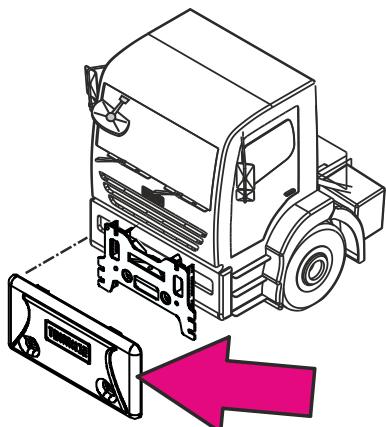


The cover goes over the cylinder brush.

The danger zones are:

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

Front-mounting plate



The cover is mounted to the front-mounting plate on the front side.

Function of the protective covering

- Covers corners and edges
- Protects against injuries
- Prevents soiling of the front-mounting plate

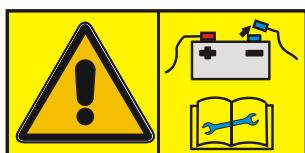
3.11 Labelling

Danger signs



The sign is located in the cab

- Read and follow the operating instructions before putting the machine into operation.



The sign is located in the battery box

- Remove the negative terminal on the battery before undertaking any repairs.

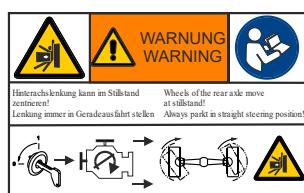


The sign is located on the rear side of the machine and on the cross brush.

- STOP Do not enter machine danger zones



The machine may be lashed down at these points.



The sign is located in the cab.
Rear axle steering can be centred at a standstill.

- Always park the machine safely.
The steerable rear axle must always be in the straight-ahead position.



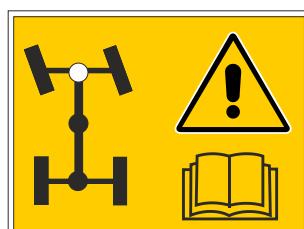
The sign is located above the steerable rear axle.

- Rear axle steering can be centred at a standstill.
- Do not stand or be otherwise located between the fenders and turned wheels.



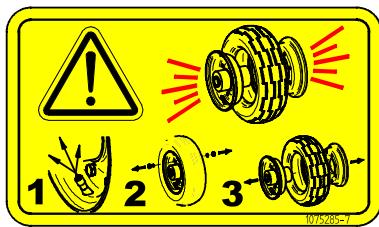
Attention: Hot drive parts, risk of burns

- Do not perform maintenance work until the drive parts have cooled down.



Differential lock; the sign is located in the cab.

- Read the operating instructions before putting the differential lock into place.

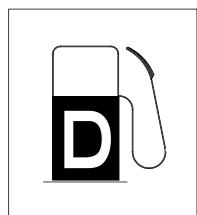


Remove the tyres; the plate is located on the trailing wheel on the sweeper unit.

There is a risk of injury if parts the wheel or tyres slip. When removing a tire or a rim half, make sure that they are not under pressure.

1. Let the air out
2. Take off the fastening bolts on the wheel halves.
3. Remove the wheel halves from the tyre.

Information signs



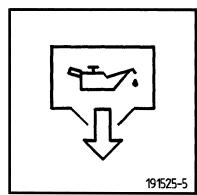
The sign is located on the diesel tank on the rear side.

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



Tyre pressure; the sign is located on the trailing wheel of the sweeper unit.

- Information sign. Recommended tyre pressure: 10 bar.



The sign is located in the middle on the frame.

- Oil drain plug for the diesel engine



Sign is located on the hydraulic tank.

- Hydraulic oil topped up at the factory

3.12 Noise emission and vibration

Noise emission

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

Vibration

Hand-arm vibration

The value is less than 2.5 m/s²

Whole-body vibration

The value is less than 0.5 m/s²

Noise prevention

It is possible to prevent or reduce noise by lower the speed of the blower and sweeper units. This will reduce the clearing performance accordingly.

Vibration prevention

It is possible to avoid or lower vibrations by reducing the clearing speed. This will reduce the clearing performance accordingly.

3.13 Lifting loads

If, for example, lifting equipment and load lifting devices are used for the assembly and disassembly of the machines (snow plough, sweeper, blower, etc.), it is essential to observe this:

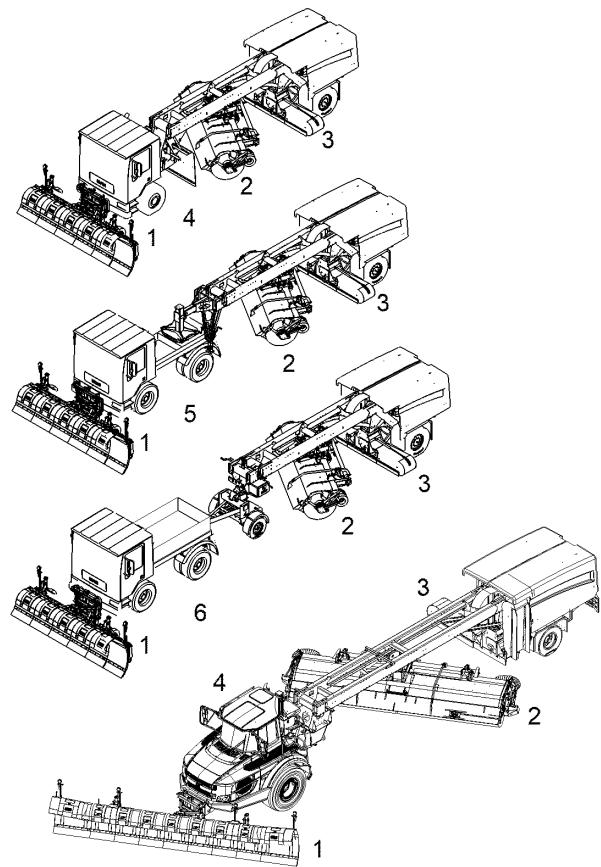
- Only use hoists and load handling devices that have been regularly inspected by a competent person.
- Before lifting, note the weight and the position of the centre of gravity.
- Lifting equipment and load handling devices must be suitable for the load.
- Hoists and load handling devices must be visually inspected before use.
- Professional lifting and setting down of the load.
- Ensure that no-one is in the danger zone during the performance test.

3.14 Installation and operation of additional devices

The installation guidelines of the base vehicle manufacturer must be observed for the installation, connection and operation of attachments to the vehicle.

4 Description of the machine

General information



The TJS is intended for use in winter on air traffic surfaces. It is a combination of snow plough (1), sweeper (2) and blast nozzle (3). A modified HGV is used as the towing vehicle.

Towing vehicles

- HGV power head (4)
- HGV with step deck trailer (5)
- HGV for trailer operation (6)
- Tractor unit (4)

Snow plough

The snow plough serves for initial clearing of the air traffic surfaces.

Sweeper

The sweeper sweeps the remaining snow to the side.

Blast nozzle

The blast nozzle clears the traffic surface of drifting snow with a simultaneous drying effect.

Vehicle with saddle plate

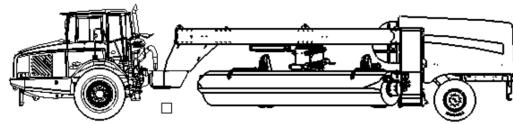
TJS jet sweeper with step deck trailer.

The jet sweeper in the step deck trailer version is hooked onto the truck with the fifth wheel.

Minimum equipment

- Actual vehicle weight min. 8 t.
- All-wheel drive and on-board power 24 V.
- Distance centre of connecting components and middle of rear axle (Dimension A) min. 0 mm / max. 300 mm.
- Distance top edge of connecting components and the ground (Dimension B) min. 1450 mm / max. 1750 mm.
- 2-circuit air-pressure brake system.
- Brake line couplings (red/yellow in accordance with DIN/ISO 1728)
- ABS socket (in accordance with ISO 7638-1) optional.
- 15- pin socket for lighting (in accordance with DIN ISO 12098 GGVS/ADR).
- Prerequisite for mounting an hydraulic pump (14 litre/min. 240 bar at nominal speed) and hydraulic tank.
- Mounting capability for vehicle plate (Size 5 DIN 76060). Required front axle load min 10,000 kg.
- Cabling for control panel

Power head (tractor unit)



TJS jet sweeper with power head (tractor unit).

The jet sweeper is permanently connected to a power head.



Minimum equipment

Equipment according to specification

Vehicle with suspension device

TJS jet sweeper with front axle and drawbar

The jet sweeper in the trailer version is connected to the trailer hitch of the tow-vehicle with the drawbar. The maximum turning radius of the front axle is 70° to the left and the right. Turning any further is not permitted.

Minimum equipment

- Actual vehicle weight min. 8 t, recommended 10 t to 12 t.
- All-wheel drive and on-board power 24 V.
- Trailer hitch with 38 mm coupling pin
- Distance coupling pin and vehicle rear (Dimension A) max. 420 mm.
- 2-circuit air-pressure brake system.
- Brake line couplings (red/yellow in accordance with DIN/ISO 1728)
- ABS socket (in accordance with ISO 7638-1) optional.
- 15-pin socket for lighting (in accordance with DIN ISO 12098 GGVS/ADR).
- Prerequisite for mounting an hydraulic pump (14 litre/min. 240 bar at nominal speed) and hydraulic tank.
- Mounting capability for vehicle plate (Size 5 DIN 76060). Required front axle load min 10,000 kg.
- Cabling for control panel

Optional equipment of the TJS

The TJS can be fitted with the following optional equipment.

Options	Function
Auxiliary steering	Steerable rear axle. Increases the manoeuvrability of the TJS.

Options	Function
Wear-dependent speed control	The speed is adapted to the cross brush diameter.
Coolant water preheating for driving engine/auxiliary engine	A preheated engine reduces the fuel consumption and wear. Activation takes place automatically under 10°C through a thermostat.
Hydraulic tank heating	Preheated hydraulics reduce the fuel consumption and wear. Activation takes place automatically under 10°C through a thermostat.
Rear view monitoring camera	Using the camera, the driver can view the area behind the machine that is not visible. The screen is shown on the display of the control panel.
Electrohydraulic system for raising and lowering the engine cover	Enables the opening and closing of the engine cover without having to start the auxiliary engine. Control takes place using the buttons on the control panel (see the "Opening and Closing the Engine Cover" chapter in the operating instructions for the driver).
Engine cover support rod	Additional securing of the lifted engine cover.
Central lubrication unit	Lubrication points connected to the central lubrication unit are automatically lubricated.
Filling check of the central lubrication unit	The warning indicator lights up when the grease container is empty. Fill the grease container.
Working lights, right or left	The lights are located on the roof of the driver's cab. Better lighting of the working range of the cross brush. Activation takes place using a switch in the control panel.

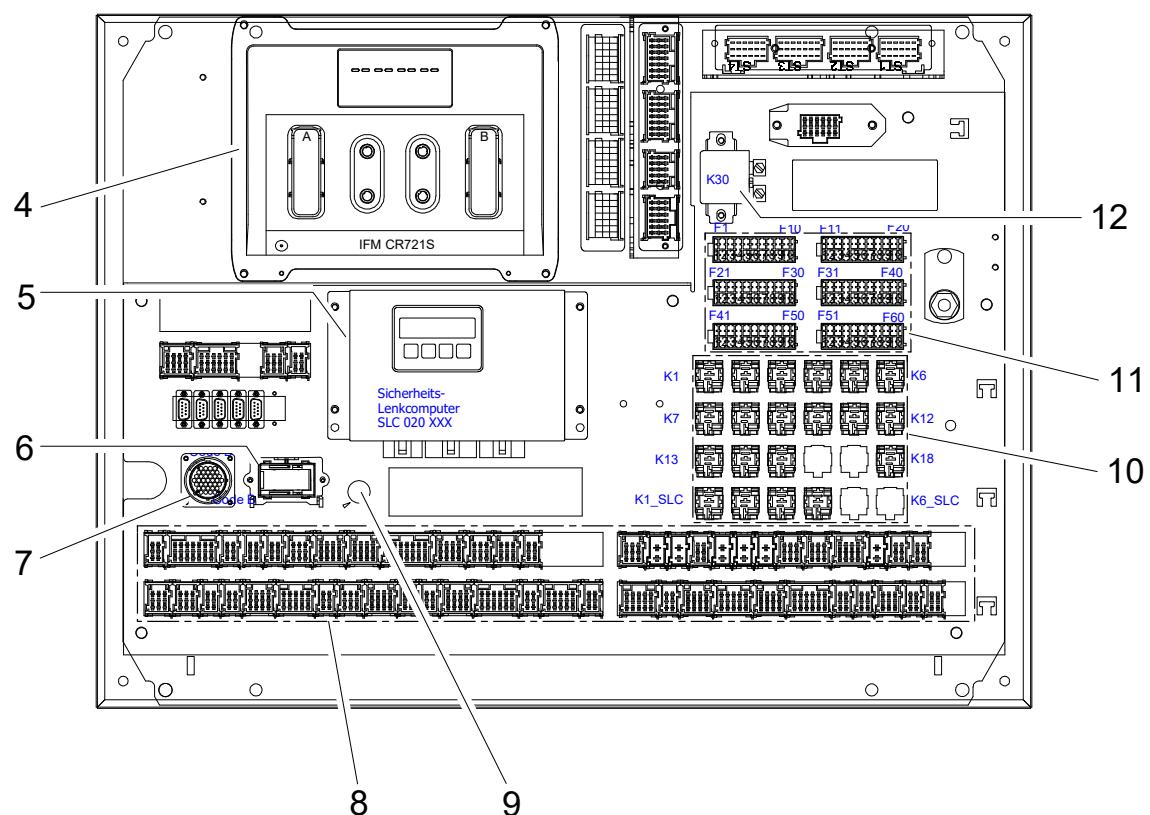
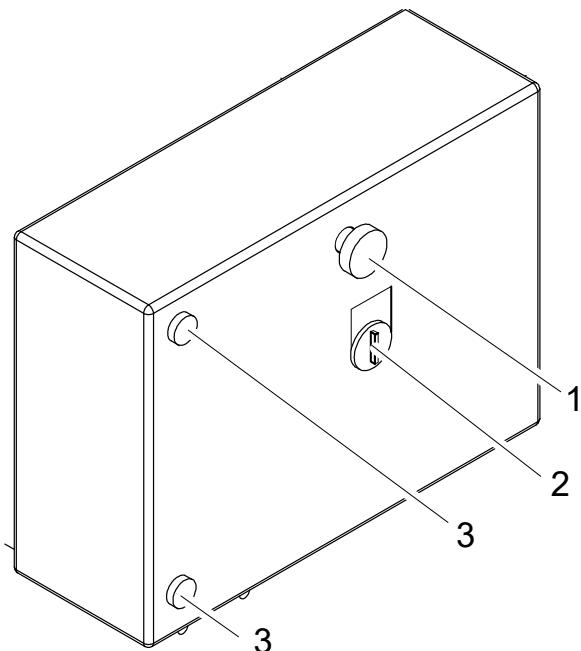
Options	Function
Additional reversing light	Better lighting of the rear area during while reversing.
EMERGENCY STOP button at the front of the vehicle	Additional safety equipment. If people are located between the vehicle and the snow plough, for example, while swivelling, they can stop the function by pressing the EMERGENCY STOP.
Fire extinguisher	The fire extinguisher is located behind the driver's cab. The operational readiness of the fire extinguisher must be checked according to the manufacturer's information. The manufacturing date or final inspection date on the fire extinguisher applies.
Extension cable for the control panel	<p>May only be used by workshop personnel and only for adjustment and maintenance work. Machine can be controlled with visual contact outside of the driver's cab. Never allow persons to be in danger zones.</p> <p>The extension cable should be laid in such a way that no danger arises.</p> <ul style="list-style-type: none"> • Extension cables are not caught by rotating components (e.g., by the cross brush). • People do not trip over the extension cable • The extension cable is not crushed by objects.
Spray guard between the rear axle and the fuel tank	Protects the fuel tank from dirt particles that are thrown up by the rear wheels.

Options	Function
Heatable side windows on the passenger door.	Keeps the windows free of ice and snow and prevents condensation. Better view of the snow plough. Activation takes place using a switch in the dashboard of the vehicle.
Fuel preheating	Preheated fuel reduces the fuel consumption. Activation takes place automatically through a thermostat when 10°C is undershot.
Additional reversing light	Better lighting of the rear area during while reversing.
Switching the fan on/off	The fan can be switched off without the blast nozzles lifting. This is necessary when passing people or loose objects. Control is handled via the control panel.
Snow deflector between the cross brush and front axle.	Protects the vehicle from dirt particles that are thrown up by the rotating cross brush.
Replacement wheel	It is used to exchange defective wheels.
LED clearance lamps	The machine is better visible at night.
Working velocity limited to 40 km/h.	Limits brush wear
Do not lift blast nozzles when setting reverse gear.	Useful for frequent turning manoeuvres on barrier-free areas.

4.1 Electrical system

Electrical switch cabinet

All components for controlling the TJS are located in the electrical switch cabinet.



Position	Parts in the electrical cabinet
1	Emergency stop
2	Cab lighting
3	Locking the electrical cabinet (the lock key is on the HGV key ring)
4	IFM control
5	Safety steering computer
6	On-board diagnosis connector
7	Control panel connection
8	Plug-in connector
9	24 volt socket
10	Main relay (see relay assignments)
11	Fuse strip (see fuse assignments)
12	Emergency stop relay

Fuses

Designation	Ampere	Consumer
F1	15A	KL 30 SLC
F2	10A	KL 15 SBC
F3	5A	IBNS KL 30
F4	20A	ABS
F5	10A	KL 30 OBD
F6	10A	KL 30 OPC
F7	15A	Thermoline I (fuel preheating)
F8	2A	Main controller KL 30
F9	10A	24V socket in the electrical cabinet
F10	7.5A	Rotary beacon engine cover
F11	15A	Working lights, cross brush
F12	10A	Additional reversing light
F13	15A	Thermoline II (fuel preheating)
F14	7.5A	Working lights of blast nozzle

Designation	Ampere	Consumer
F15	7.5A	Not used
F16	7.5A	Heater of heated side window
F17	15A	A1 controller outputs
F18	5A	KL 15, generator
F19	10A	KL 15, MCM, ACM
F20	5A	KL15, CPC, OBD
F21	15A	A1 Controller outputs
F22	10A	KL15 socket for control panel
F23	10A	KL15 engine compartment lighting 1
F24	2A	Main controller KL15
F25	15A	Diesel filter heating
F26	10A	Central lubrication
F27	10A	Auxiliary heating
F28	5A	IBNS KL15
F29	5A	KL15 sensors A
F30	10A	KL15 sensors B
31	15A	A1 controller outputs
32	15A	A1 controller outputs
33	15A	A1 controller outputs
34	15A	A1 controller outputs
35	10A	KL15NA relay, reserve
36	20A	Engine controller pre-fuse
37	5A	KL15 manual override
38	15A	Cross brush shaker
39	15A	Outputs for expansion module A2
40	15A	Outputs for expansion module A2
41	10A	KL15 relay, reserve
42	5A	KL15 telemetry interface
43	10A	ABS KL15
44	3A	KL15 SLC/sensors/messages

Designation	Ampere	Consumer
45	10A	KL30 relay, reserve
46	5A	KL30 telemetry interface
47	3A	KL30 SUB-D sockets
48	3A	Electrohydraulic system relay
49 to 57	--	Not used
58	20A	Battery charger
59	--	Not used
60	--	Not used

Relay

Designation	Technical data	Function
K1	24V/40A with diode	KL15 relays
K2	24V/40A with diode	KL15 supply to engine modules
K3	24V/20A with diode	ASW cross brush
K4	24V/20A with diode	TJS rotary beacon
K5	24V/20A with diode	Additional reversing light
K6	24V/20A with diode	Central lubrication unit
K7	24V/20A with diode	Reserve
K8	24V/20A with diode	Reserve
K9	24V/40A	Diesel hose for attachment heating
K10	24V/40A	Diesel hose for vehicle heating

Designation	Technical data	Function
K11	24V/20A with diode	ASW TJS blast nozzle
K12	24V/20A with diode	Reserve
K13	24V/20A with diode	Heated side window
K14	24V/40A	Cross brush shaker
K15	24V/20A	Electrohydraulic system relay
K16	--	--
K17	--	--
K18	24V/30A with diode	Reversing signal, four-wheel
K1_SLC	24V/20A	KL15 SBC
K2_SLC	--	--
K3_SLC	24V/20A with diode	RD SLC error message
K4_SLC	24V/20A with diode	YE SLC error message
K5_SLC	--	--
K6_SLC	--	--
K30	24V/50A with diode	KL15 emergency stop

4.2 Cold weather package



WARNING!

The machine may be energised.



There is a risk of severe injury to personnel

- The external power supply must be secured with a residual current operated circuit breaker.

The external electrical installation for the external power supply of the cold weather package of the machine must be installed by expert personnel only.

If the cold weather package for the rear mount or vehicle is provided with maximum equipment, the external power supply for the rear mount must be designed for a power consumption of 3,100 W and 2,600 W for the vehicle.

Cold weather package for the rear mount

The plug-in connector for the power supply of the cold weather package of the rear mount is located at rear left.

The cold weather package installed on the machine consists of the following, depending on customer requirements:

- 230 V or 120 V plug connector
- Coolant heater for rear mount (2,000 W)
 - Heats the coolant for the diesel engine.
- Hydraulic oil heating rear mount (260 W).
 - Heats the hydraulic oil for the hydraulic drive of the machine.

- Battery charger for rear mount (800 W)
 - The batteries are being charged
 - The charging voltage of the batteries is maintained
 - The service life increases.

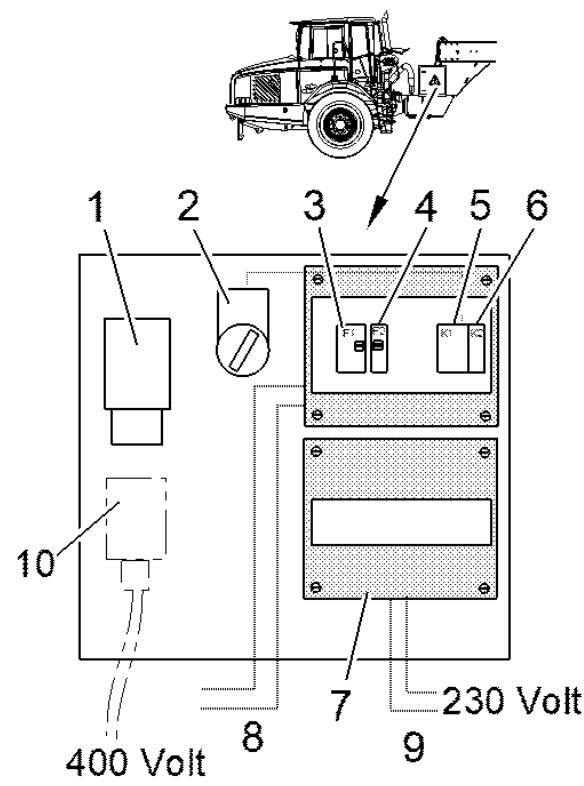
Cold weather package for the vehicle

The plug-in connector for the power supply of the cold weather package of the vehicle is located at the rear left behind the ladder.

The cold weather package installed on the vehicle consists of the following, depending on customer requirements:

- 230 V or 120 V plug connector
- 400 Volt/16A
- Vehicle coolant heating (approx. 2,000 W depending on design)
 - Heats the coolant for the diesel engine.
- Battery charger for vehicle (800 W)
 - The batteries are being charged
 - The charging voltage of the batteries is maintained
 - The service life increases.

Electrical switch cabinet for the cold package 400V



1. Electrical connection 400 Volt/16A
2. On/off switch
3. Residual current operated circuit breaker
4. Fuse 6 A
5. Electrical switch (contactor)
6. Electrical switch (contactor)
7. Terminal strip
8. Supply lead for vehicle heaters
 - Hydraulic tank heating
 - Coolant heating
9. Supply lead to TJS distribution box for:
 - Hydraulic tank heating
 - Coolant heating
 - Battery charger
10. Electrical power supply 400 Volt/16A

4.3 Rear ladder

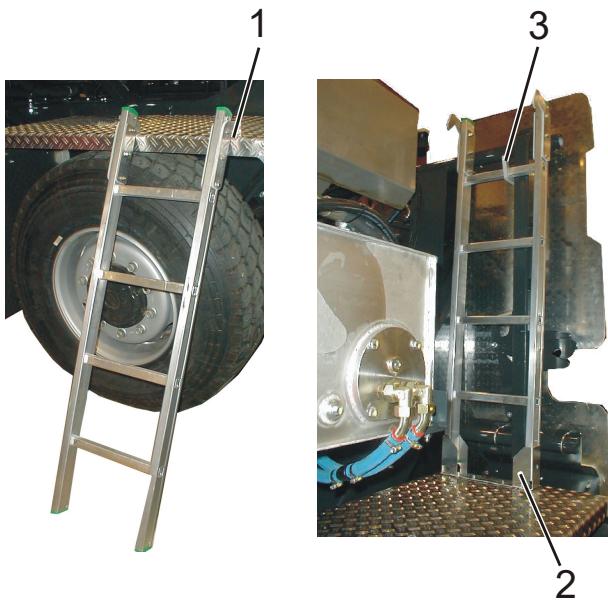


CAUTION!

Engine and hydraulic parts can be hot.

People can get burned

- ▶ Do not touch hot engine and hydraulic parts.
- ▶ If necessary, let hot engine parts cool down.

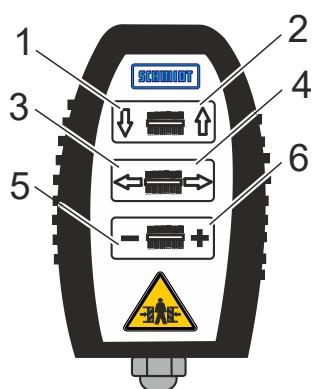
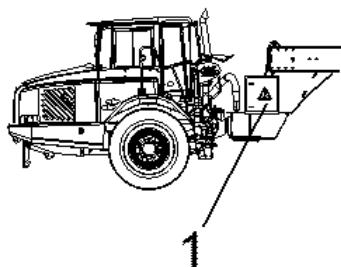


The engine compartment can be accessed for maintenance work using the rear ladder.

Ladder to the engine compartment

- Open the engine cabin completely
- For climbing up on the rear mount on the right and left of the TJS, the ladder provided must be used. In order to prevent slipping, the ladder is to be hung properly in the slots of the fender (1).
- The ladder is to be stored, hung in the holder (2) and the hooks (3) on the right on the fender.

Hand-held control



The hand-held control is used by the workshop personnel to control the cross brush when the brush is being changed and to pivot the cross brush into the transport position if the control panel fails. It is located in the electrical switch cabinet (1) behind the driver's cab.

It should be safely stored to prevent unauthorised usage.

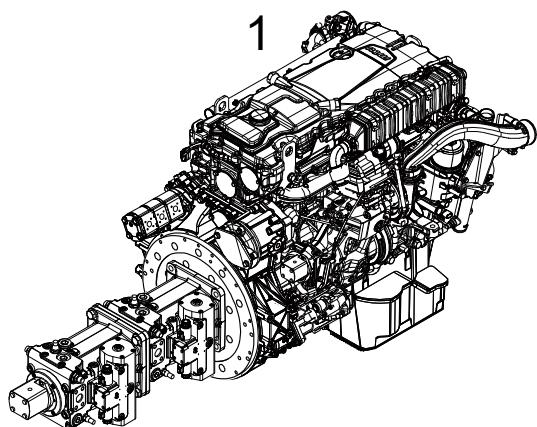
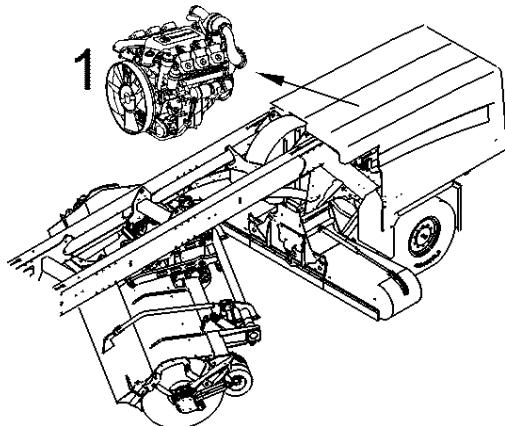
Controlling the cross brush with the hand-held control

- Switch on the ignition of the auxiliary engine
- Lower the cross brush (1)
- Raise the cross brush (2)
- Pivot the cross brush to the left (3)
- Pivot the cross brush to the right (4)
- Retract castor wheels (5)
- Extend castor wheels (6)

4.4 Drive

Diesel engine

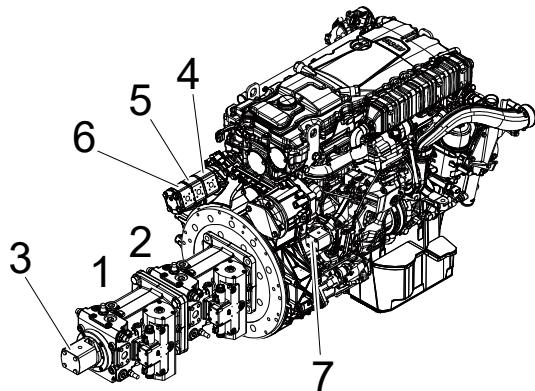
The diesel engine (1) drives the following units:



- Axial piston hydraulic pump for fan drive
- Axial piston hydraulic pump for cross brush drive
- Dual action pump
 - Fan drive for oil cooler
 - Control of the cross brush and blast nozzle flaps

- Triple pump
 - Control of the cross brush
 - Drive of impeller for cooling the coolant and hydraulic oil
 - Controller of rear axle steering
- Steering pump
- Electrical generator for the power supply of the machine.

Hydraulic pumps



Axial piston – hydraulic pump (1)

- Hydromatik A4VG 180 fan drive

Axial piston – hydraulic pump (2)

- Hydromatik A4VG 125 cross brush drive

Geared pump (3)

-

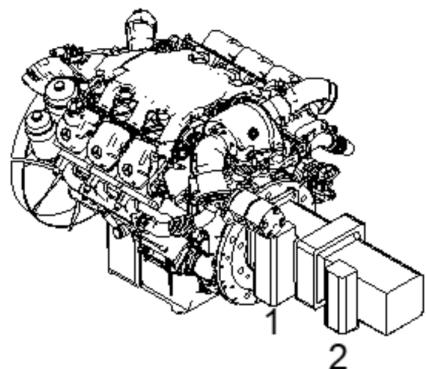
Triple geared pump (4, 5, 6)

- Hydraulic pump for the rear axle steering (4).
- Controller and cylindrical brush (5)
- Drive of impeller for oil and water cooler (6)

Steering pump with diesel priming pump (7)

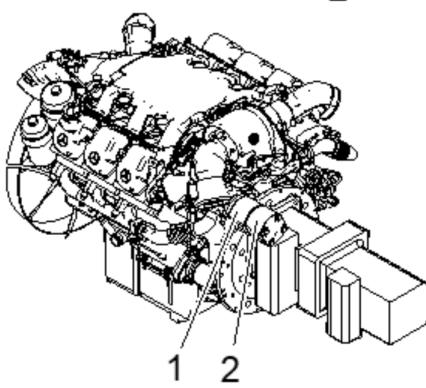
- Controller of blast nozzle flaps

Hydraulic pumps TJS-C



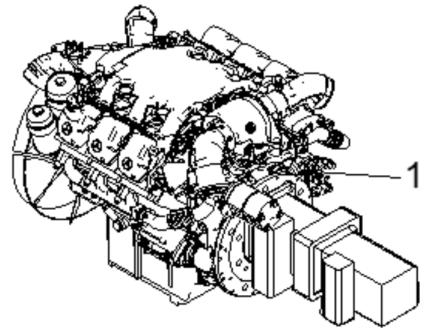
Axial piston – hydraulic pump

1. Blower drive
2. Cross brush drive



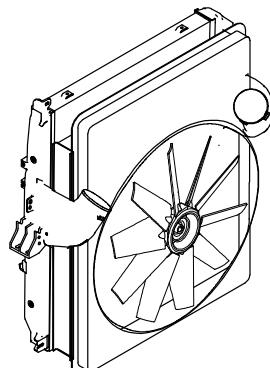
Dual gear pump

1. Control of blast nozzle flaps and cylindrical brush
2. Drive for the fan on the oil cooler



1. Hydraulic pump (steering pump with diesel priming pump) for raising/lowering the blast nozzle

Oil cooler



The oil cooler cools the hydraulic oil throughout the control and drive hydraulic systems. The oil cooler switches on automatically when the auxiliary engine is started up.

Hydraulic console

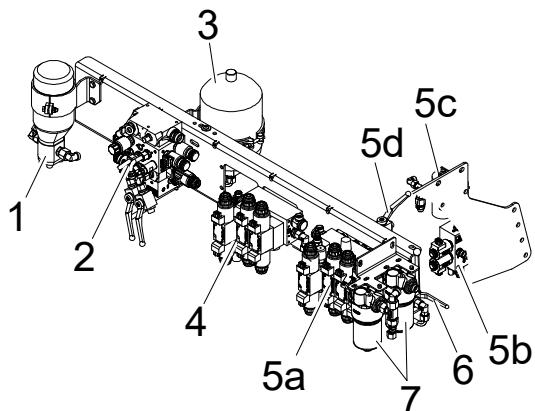


WARNING!

Unexpected machine movements

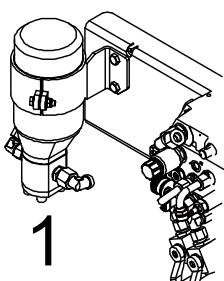
People may be caught and injured.

- ▶ Only specialist personnel with expert knowledge must work on the hydraulic system.
- ▶ We recommend using Aebi Schmidt Service.



The hydraulic console contains the most important hydraulic controls for the sweeper.

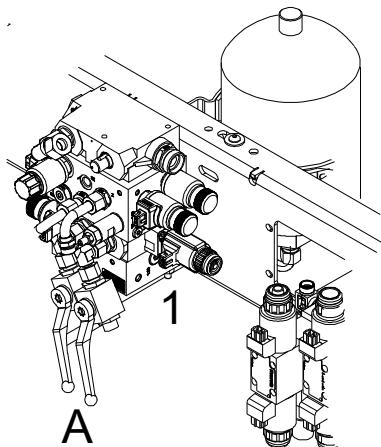
- Electrohydraulic pump (1)
- Hydraulic valve block (2) of steering
- Pressure reservoir (3)
- Controller of blast nozzles and hydraulic valve block (4)
- Controller of cross brush (5)
 - Raising, lowering and pivoting the hydraulic valve block (5a)
 - Hydraulic valve block sweeping range setting (5b)
 - Hydraulic cylinder (5c)
 - Ball valve float setting on/off (5d)
 - Ball valve float setting on/off (5e)
- Ball valve pressure monitoring (6)
- Pressure filter (7)



Electrohydraulic pump

The following functions can be performed using the electrohydraulic pump (1).

- Raise, lower and pivot the cross brush.
- Raise/lower the blast nozzles.
- Raise and lower the engine cover.



Hydraulic valve block of steering

The rear-axle auxiliary steering is controlled via the hydraulic valve block (1). The ball valves control the oil supply of the auxiliary steering.

Ball valves (A) open

- The oil supply to the rear-axle auxiliary steering is established.

Ball valves (A) closed

- The oil supply to the rear-axle auxiliary steering is closed. The rear-axle auxiliary steering is not functioning (blocked).



IMPORTANT!

Failure of rear axle steering

The rear axle performs undefinable steering movements

- ▶ Set the rear axle in the straight-ahead position
- ▶ Close the ball valves; the rear axle steering is blocked
- ▶ Larger curve radius required when turning.

Pressure reservoir

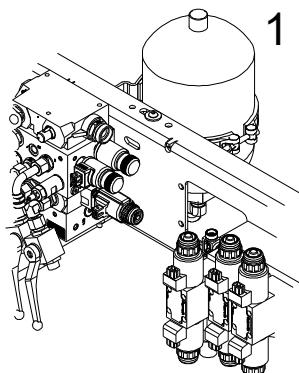


WARNING!

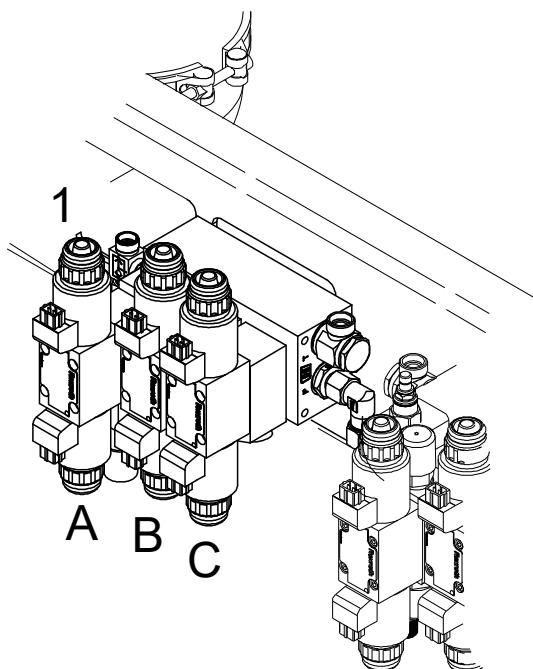
Working on the rear axle steering The rear axle steering may start moving unexpectedly.

People may be caught and seriously injured.

- ▶ Relieve the pressure reservoir; drain oil from the pressure reservoir.



In the event of a failure of the hydraulic system of the rear axle steering system, the steering is placed in the straight-ahead position using the pressure reservoir.



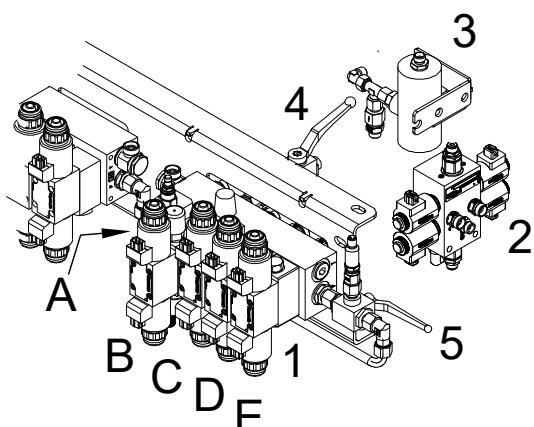
Hydraulic valve block of blast nozzles

The blast nozzle is controlled via the hydraulic valve block (1).

- Hydraulic valve (A)
 - Blast shaft middle section, open/close flap
- Hydraulic valve (B)
 - Raise/lower left blast channel
- Hydraulic valve (C)
 - Raise/lower right blast channel

Cross brush, hydraulic valve block

Base block (1)



The basic functions of the cross brush are controlled via the hydraulic valve block.

- Auxiliary valve (A)
 - Releases the oil for the corresponding function. The auxiliary valve is switched at every function.
- Hydraulic valve (B)
 - Raise/lower the cross brush.
- Hydraulic valve (C)
 - Retract/extend castor wheels
- Hydraulic valve (D)
 - Pivot the cross brush into work position.
- Hydraulic valve (E)
 - Pivot the cross brush into transport position

Hydraulic valve block (2) of sweeping range setting

- The oil coming from the cycle cylinder is evenly diverted to the castor wheels via the hydraulic valve block.

Cycle cylinder (3)

- A defined amount of oil is pumped to the castor wheels via the cycle cylinder and the sweeping range is adjusted. The number of cycles in a given time is controlled by software.

Ball valve (4)

In use, the raising-lowering cylinder of the cross brush is operated in the float setting.

If the cross brush is dismantled, the float setting can be switched off by the ball valve. This allows a sensitive raising/lowering of the cross brush in order to loosen the bolts.

Ball valve position

- Ball valve open
 - Sweeping mode
- Ball valve closed
 - Mounting and removal of the cross brush

Ball valve (5)

During the commissioning of and after repair work on the hydraulic system of the cross brush and blast nozzle, the pressures on the hydraulic valve blocks must be adjusted. The pressure sensors and measuring connections on the hydraulic valve blocks must be used to measure the pressures.

Ball valve position

- Horizontal ball valve position In this position, the ball valve must also be in use.
 - Pressure setting of the hydraulic valve block for the cross brush

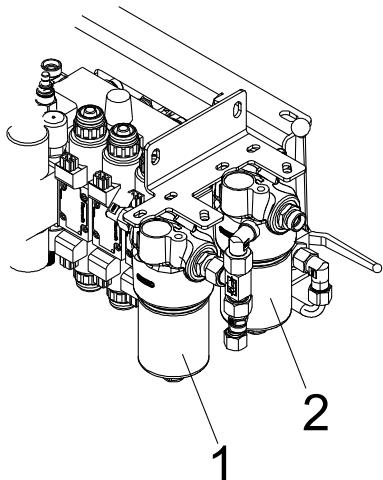
- Ball valve position downwards
 - Pressure setting of the hydraulic valve block for the blast nozzle controller

**NOTE**

The ball valve can become misadjusted in use.

Malfunction of the hydraulic system

- After the adjustment work, the ball valve must be fixed in the horizontal position.



Pressure filter

Pressure filter (1)

- Additionally filters the oil for the hydraulic valve block of the cross brush

Pressure filter (2)

- Additionally filters the oil for the hydraulic valve block of the auxiliary steering

Battery**WARNING!**

The triggering of a short circuit, light arc or similar can cause burns or machine damage.

- Before starting work on the electrical system, always disconnect the negative pole from the battery.

**WARNING!**

Special safety instructions:

The battery contains sulphuric acid! The sulphuric acid is caustic. Acid is not to come into contact with:
the skin, the eyes, the clothing or the vehicle.

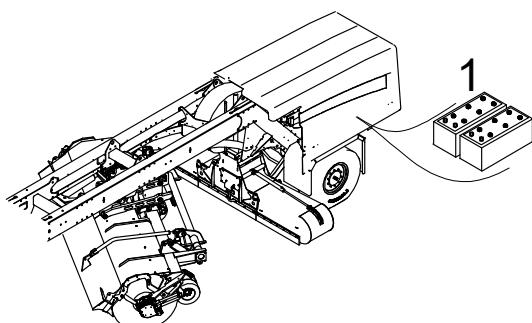
- ▶ Therefore, always wear protective eyewear and long-armed protective clothing when handling or working around the battery.

**IMPORTANT!**

If not observed, damage to the machinery results.

Before carrying out electrical welding tasks, protect the electronics by disconnecting:

- ▶ The positive and negative leads on the battery
- ▶ The plug for the control panel
- ▶ HGV electronics plug connector
- ▶ Auxiliary engine electronics plug connector

**Battery 2x 12V/ 220 Ah**

The batteries (1) supply the vehicle and the rear mount with electrical current. The main and auxiliary engines are each equipped with an alternator. This ensures that the batteries will continue to be charged even when only one engine is running.

**NOTE**

For longer downtimes

Starter battery kept charged by trickle charging

- ▶ The batteries are being charged
- ▶ The charging voltage is maintained
- ▶ The service life of the batteries is extended

5 Installing and removing machinery

5.1 Snow plough



The TJS is equipped with a Schmidt hydraulic system and Schmidt front-mounting plate.

Hydraulic connections for controlling the snow plough

Hydraulic couplings	Connec-tion	Function
	1	Raise
	2	Lower
	3	Pivot left
	4	Pivot right
	5	Extension blade Extend snow plough
	6	Extension blade Retract snow plough
		Separate return
		Pressure connection

Mounting and removing

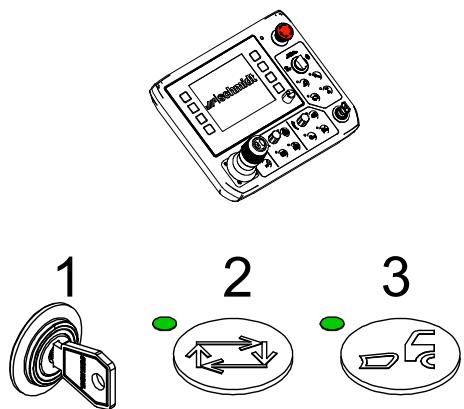
The mounting and removing should always occur with help from additional personnel who can monitor the danger area and provide hand signals to facilitate the mounting and removal. Mounting and removing the snow plough is described in the operating instructions of the snow plough.

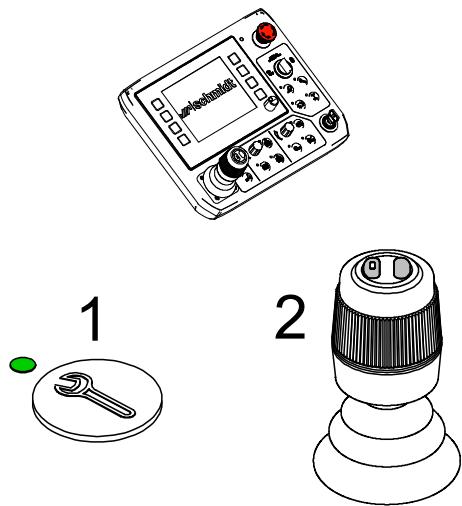
Removal

- Observe the snow plough's operating instructions.
- Undo the bolted joints between the implement plate of the snow plough and the front-mounting plate of the vehicle.

Lift the implement plate of the snow plough out of the front-mounting plate of the vehicle.

- Switch on the ignition of the auxiliary engine (1)
- Deactivate automatic mode (2)
- Preselect the snow plough controller (3)
- Start the vehicle engine





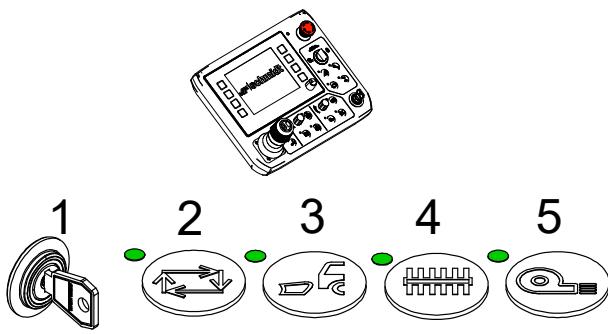
- Press and hold the safety button (1). Operate the lowering function with the joystick (2).
 - The implement plate from the snow plough is raised out of the implement plate. Carefully raise the implement plate until the claws of the implement plate are located over the front-mounting plate of the vehicle.
- Move the machine back approx. 10 cm until the implement plate from the snow plough can be lowered to the ground.
- Operate the lift function with the joystick (2). Lower the implement plate to the ground.
- Disconnect all hydraulic and electrical lines from the vehicle and protect with protection caps.

Mounting

To mount, follow the instructions above in the reverse order.

Controlling the hydraulic locking of the ploughs

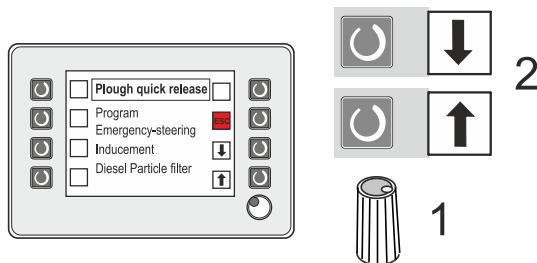
Any notes in the plough manufacturer's operating instructions must be observed.



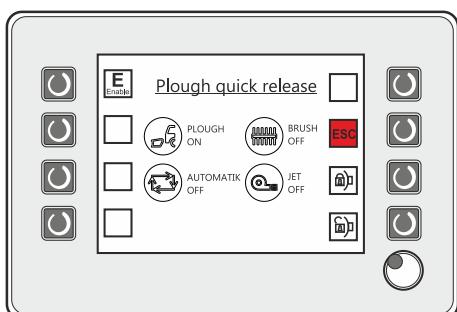
- Switch on the ignition of the auxiliary engine (1)
- Deactivate automatic mode (2)
- Switch off the program for the control of the snow plough (3), cross brush (4) and blower unit (5).
- Start the vehicle engine (4)



Switch to the following display with the "MENU" button.

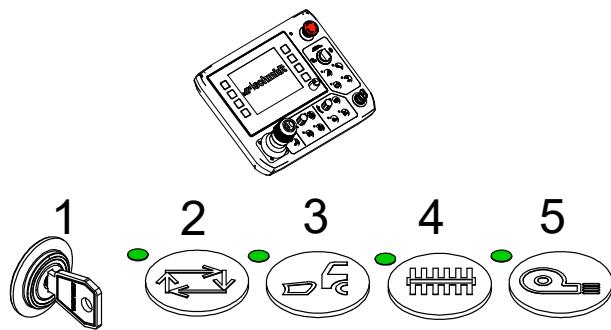


- By turning the rotary/push button (1) or using the arrow keys (2), select "Plough quick release" and confirm the selection by pressing the rotary/push button (1).
- The following menu screen appears.

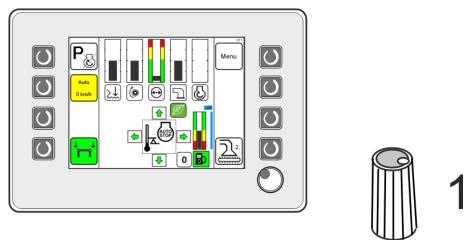


Menu screen

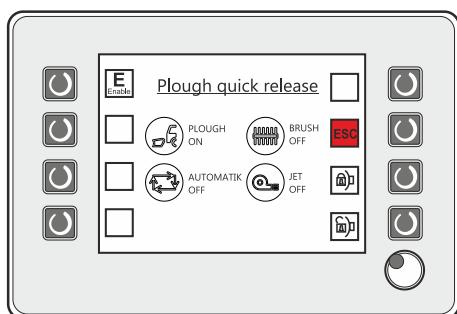
Optional quick start menu for the hydraulic locking of the ploughs



- Switch on the ignition of the auxiliary engine (1)
- Deactivate automatic mode (2)
- Switch off the program for the control of the snow plough (3), cross brush (4) and blower unit (5).
- Start the vehicle engine (4)



After the operating menu appears on the display, press and hold the rotary/push button (1). The following menu screen appears. The "Plough quick release" option must already have been activated during commissioning or by the service personnel.



Menu screen

Locking

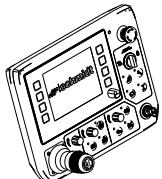


WARNING!

Risk of accident

An incorrectly mounted snow plough on the vehicle can become detached and cause an accident. When mounting on the vehicle, the following must be observed:

- ▶ Refer to the notes in the snow plough operating instructions.
- ▶ If the hydraulic locking has been safeguarded (e.g. by a ball valve) against unintended loosening, this must be closed after mounting.



- Press the buttons simultaneously. The lock between the snow plough and the vehicle will be activated.



Unlocking

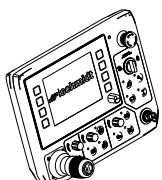


NOTE

Release the lock.

Additional information

- ▶ If the hydraulic lock on the snow plough has been safeguarded (e.g. by a ball valve) against accidental release, the lock must be opened before removal.



- Press the buttons simultaneously. The lock between the snow plough and the vehicle is released.



6 Commissioning

The commissioning is described in the operating instructions for the driving personnel.

7 Use

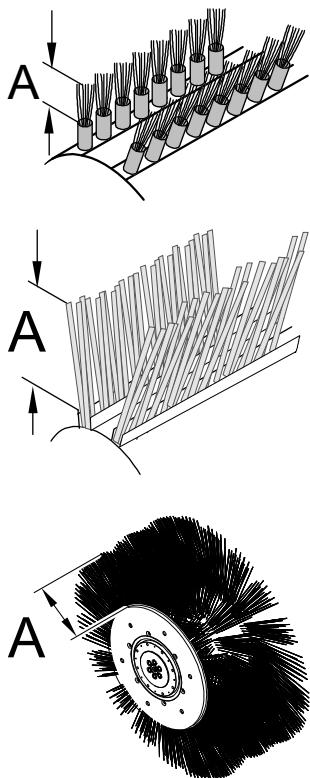
The deployment is described in the operating instructions for the driving personnel.

8 Wear dimensions

Cutting edge – Snow plough

See snow plough operating instructions.

Bristle length – cross brush



Strip brushes

Steel bristles

Strip brushes must be replaced when a bristle length of (A) approx. 30 mm is reached.

Plastic bristles

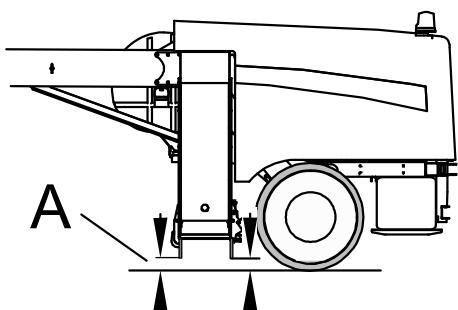
Strip brushes must be replaced when a bristle length of (A) approx. 80 mm is reached.

Ring brushes

Steel bristles

Ring brushes must be replaced when a bristle length of (A) approx. 50 mm is reached.

Rubber bars – blast nozzle

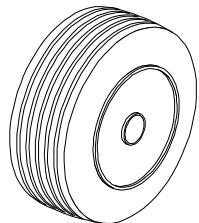


The distance of the rubber bar when used on level ground should be approximately 100 mm on both sides (A).

With uneven ground below, the distance of the rubber bars to the ground is to be increased.

If the setting of the rubber bars is exceeded, it must be reset via the slots. If this is no longer possible, the rubber bars must be replaced.

Castor wheel



Profile depth

The profile depth is crucial for the adhesion of tyres. If the profile depth of the tyre is less than 4 mm, the tyre must be changed.

Ageing

If the tyre shows signs of brittleness (cracks), it must be changed. With the tyres taken off, the inner tube should also be checked for cracks and also replaced if necessary.

Vehicle

See separate manufacturer's operating instructions.

Auxiliary engine

See separate manufacturer's operating instructions.

9 Maintenance

Only trained qualified personnel working in equipped workshops may perform maintenance work.

The maintenance work is described in a separate document.

Pre-operational checks



WARNING!

The machine may start moving unexpectedly

People could be run over

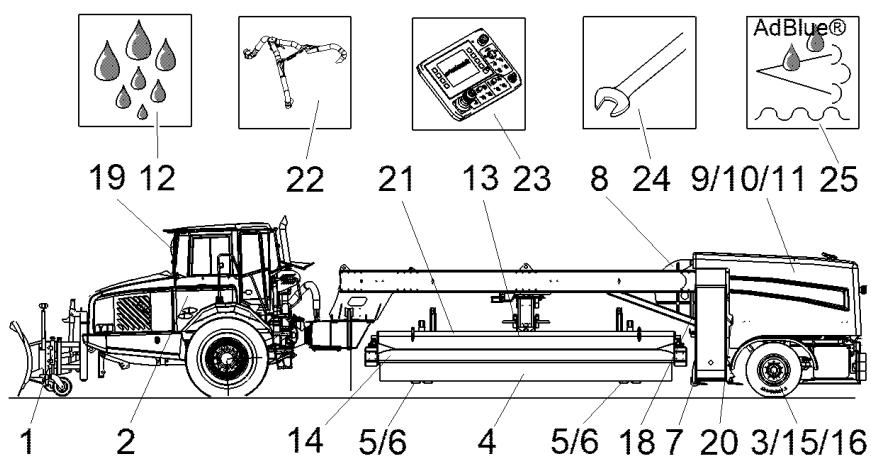
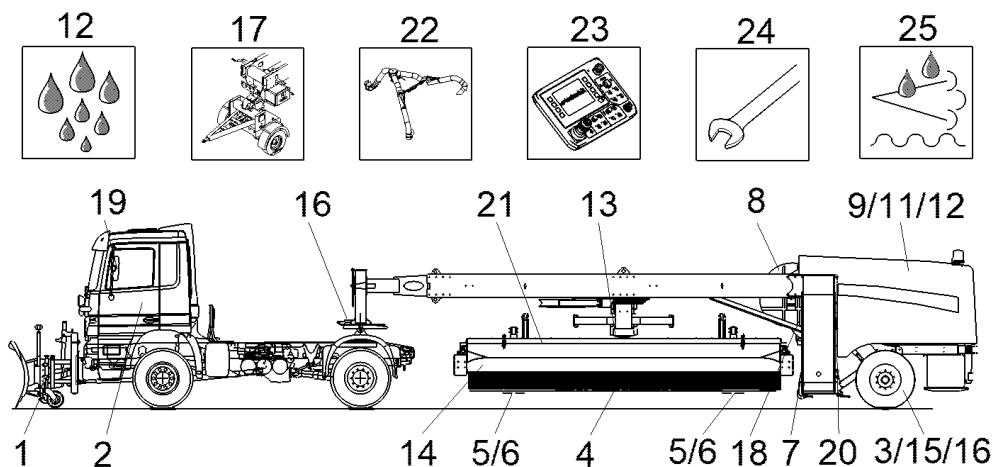
- ▶ The machine must be parked safely before inspection work is carried out.


CAUTION!

To protect against damaging influence whilst inspection work is being performed.

Illness due to external influences

- Wear warning, weatherproof, and protective clothing.



Item	Designation	Inspection work
1	Snow plough	See snow plough manufacturer's operating instructions
2	Vehicle	See the vehicle manufacturer's operating instructions

Item	Designation	Inspection work
3	Wheels	<p>Check wheel condition (see chapter on Wear dimensions) and tyre pressure (9 bar).</p> <p>Check that wheel nuts are tightly fastened.</p> <p>Make sure to torque the wheel nuts after the first 50 km after changing tyres or wheels (tightening torque 630 Nm see chapter Changing Wheels and Tyres)</p>
4	Cylindrical brush	Wear (see chapter on Wear dimensions)
5	Twin wheel	<p>Check wheel condition (see chapter on Wear dimensions) and tyre pressure (10 bar).</p> <p>Check that wheel nuts are tightly fastened.</p> <p>Make sure to torque the wheel nuts after the first 50 km after changing tyres or wheels (tightening torque 140 Nm see chapter "Changing wheels and tyres")</p>
6	Castor wheel lifting device	Ice-free
7	Rubber bars	Ground clearance, wear (see chapter Wear dimensions).
8	Fan	<p>Check intake grille for damage</p> <p>Check the fan housing for foreign objects</p>
9	Diesel engine	<p>See engine manufacturer's operating instructions.</p> <p>The maintenance personnel must check the engine oil level using the dipstick</p>

Item	Designation	Inspection work
10	Hydraulic tank and hoses	Hydraulic tank oil level. Check through the sight-glass on the tank. Oil deficiencies are indicated on the display in the control panel. Hydraulic hoses (see chapter "Wear dimensions")
11	Cooler unit	Check intake grille for damage Check fan housing for foreign objects.
12	Leaks	Hydraulic, fuel, cooling system. Leaks may cause fires.
13	Cross brush	Tighten screws and bolts when required
14	Wiper	Distance to cross brush 20 mm
15	Axle	See manufacturer's operating and maintenance instructions.
16	Axle, steering	See also manufacturer's operating and maintenance instructions.
17	Front wheel axle	Check wheel condition (see chapter on Wear dimensions) and tyre pressure (8 bar) Check that wheel nuts are tightly fastened. After changing tyres, tighten the wheel nuts again after 50 km (Torque 600 Nm)
18	Central lubrication unit	Check the fill level of the grease reservoir
19	Mirrors	Check that the mirrors are clean and properly adjusted
20	Engine cover	Check engine cover is correctly sealed and locked on the left and right.
21	Cover of the cross brush	Check the cover for damage
22	Blowing ahead of the brush	Check fastening of the pipe system

Item	Designation	Inspection work
23	Display	Observe error messages
24	Maintenance work	Check to see that maintenance work that workshop personnel were to carry out has been completed.
25	Carbamide (AdBlue®) tank	Check fill level. The fill level is shown on the display in the control panel.

9.1 General safety instructions for maintenance work



WARNING!

Carrying out maintenance work

People can be injured.

- ▶ Maintenance work is to be carried out in suitable workshops.
- ▶ The workshop personnel must wear the relevant protective clothing.
- ▶ The necessary tools and equipment (such as vehicle lifts, service platforms, etc.) must be present.
- ▶ The workshop personnel must have the required qualifications and the necessary specialist knowledge for the work to be carried out on the machine.



WARNING!

Maintenance work (visual inspection) on the running machine

People can get caught.

- ▶ Maintenance personnel must wear hearing protection and closely fitting clothes.
- ▶ The access points to danger zones are to be blocked off with suitable blocking measures (such as a protective grate).

**WARNING!**

Protective equipment that has not been fitted makes it possible to access danger zones.

People can get caught.

- ▶ When the work is finished, the protective equipment must be refitted, and a check made to ensure that all parts are present.
 - ▶ A function check must be performed
-

**WARNING!**

Work on moving components can injure persons due to uncontrolled movements.

Body parts can be crushed.

- ▶ Secure moving parts against unintentional movements by lashing.
-

**WARNING!**

It is possible that the working space cannot be seen.

There is a risk of people becoming entangled or being run over when turning on the machine or driving it away.

- ▶ Work on the machine may only take place if it is safely parked.
-

**WARNING!**

Control panel functions that require a password are usually dangerous.

People may be injured in case of carelessness.

- ▶ People that use password-protected functions must have undergone training and instruction on these functions.
- ▶ These people must be informed of the dangers of the individual functions.
- ▶ The password is only to be passed on to trained and instructed personnel.
- ▶ After the work is complete, the password must be cleared by switching off the control panel.

**CAUTION!**

Risk of injury due to excessive physical exertion.

Injury of the musculoskeletal system

- ▶ Assistance is to be sought or a suitable lifting device is to be used for work that requires excessive physical exertion.

**IMPORTANT!**

Required maintenance intervals

If not observed, damage to the machinery results.

- ▶ If the maintenance intervals are not adhered to, a full service is to be carried out after each clearing season.

**NOTE**

Functional safety of the machine

Reduced machine output or machine failure.

- ▶ A functional test must always be carried out after maintenance and repair work.

9.2 Hydraulic system maintenance notes

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



ENVIRONMENT!

Never allow oils to get into the soil on the ground.

If not observed, environmental damage results.

- ▶ Note environmental regulations concerning oils.
- ▶ Dispose of drained oil in accordance with regulations.



IMPORTANT!

Dirt in the hydraulic system can irreparably damage hydraulic components.

If not observed, damage to the machinery results.

- ▶ Always change the hydraulic filter in good time.
- ▶ The highest levels of cleanliness should be ensured when changing the filter or changing the oil.

Refill oil, change oil and filter



IMPORTANT!

Mixing oils and greases of the same specification is permitted.

- ▶ For your own safety, we recommend obtaining approval from the supplier before mixing oils and greases.

Only add hydraulic fluid via the filling filter.

**CAUTION!**

Always note the oil temperature when changing oil.

Direct contact with hot fluids with temperatures of 50°C and higher can cause skin damage.

- ▶ Allow the oil to cool down before draining.
- ▶ Always wear protective clothing when changing the oil.

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.

The oil should only be drained when warm to avoid a build-up of deposits. Always change the oil and filter at the same time.

9.3 Hydraulic system maintenance notes

Lubrication via grease nipples

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

Lubrication via central lubrication unit

**IMPORTANT!**

Failure of the central lubrication unit due to improper operation.

If not observed, damage to the machinery results.

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

The central lubrication unit supplies the lubrication points, which are normally supplied via grease nipples. Lubrication points that are located on

rotating machine parts must usually be greased manually with the grease gun using the lubricating nipples.

**IMPORTANT!**

The central lubrication unit is functional:

- ▶ When the auxiliary engine is running, automatic lubrication is in use.
 - ▶ When the ignition is switched on, use manual lubrication to test the central lubrication unit. Control is handled manually via the control panel.
-

**IMPORTANT!**

Lack of lubrication of components after repair work.

If not observed, damage to the machinery results.

- ▶ To perform manual lubrication through a central lubrication unit, the button in the password-protected area of the control panel must be pressed (see the "Performing Manual Lubrication").
Manual lubrication, for example, should be performed if lubrication is required after repairs.
-

Central lubrication unit maintenance

- Check the lubricant level in the grease reservoir daily. If required, top up the hopper.
- Manual lubrication (functional test) must be carried out every 50 operating hours. The emergence of the lubricant at the bearing points should be checked.

9.4 Lubricants

**Maximum start-up temperature up to
max. -25° C**

Designation in the main- tenance schedule	First filling Manufacturer's designa- tion	Standard designation
Hydraulic oil	Up to serial number 73-1-014 Agip ROTRA-ATF (colourless)	ATF-A Suffix A GM ATF Type A Suffix A
	From serial number 73-1-015 Autol Multigrade Hydraulic Oil HVI	ISO VG 46 DIN 51 524 T.3 - HVLP
Assembly grease	Open lubrication CASTROL, OPTIMOL PASTE WHITE T 400 Order number 0212888-2	
	Lubricant via lubricating nipples KP 2 P -20 Autol Top 2000 HIGH TEMP Order number 1134244-2	
Universal grease (lubri- cation via lubricating nip- ple)	AUTOL TOP 2000 HIGH TEMP	K2 K20 DIN 51825 T. 1
Multipurpose grease (Lubrication via central lubrication unit)		NiGl 00 fluid grease Alternative Fluid grease NiGl 0
Corrosion protection and lubricant paste	MAKRA company Product: MAKRA KERABRAKE	
Lubricating oil	e.g. WD-40	
Engine oil	Pay attention to the information provided by the engine manufacturer	
Coolant	Pay attention to the information provided by the engine manufacturer	

Designation in the maintenance schedule	First filling Manufacturer's designation	Standard designation
Diesel fuel	Winter diesel Pay attention to the information provided by the engine manufacturer	

Start temperature down to maximum

-40 °C

Designation in the maintenance schedule	First filling Manufacturer's designation	Manufacturer designation
Hydraulic oil	HVLP HC Avia Syntofluid PE-B 30	PAO HVLP HC DIN 51524 T3 HEPR ISO 6743 T4
Assembly grease	Open lubrication CASTROL, OPTIMOL PASTE WHITE T 400 Order number 0212888-2	Lubricant via lubricating nipples KP 2 P -20 Autol Top 2000 HIGH TEMP Order number 1134244-2
Multi-purpose grease (Lubrication via lubricating nipple)	AUTOL TOP 2000 HIGH TEMP	K2 K20 DIN 51825 T. 1
Multipurpose grease (Lubrication via central lubrication unit)		NiGI 00 fluid grease Alternative Fluid grease NiGI 0
Lubricating oil		e.g. WD-40
Engine oil		Pay attention to the information provided by the engine manufacturer
Coolant		Pay attention to the information provided by the engine manufacturer
Diesel fuel	Winter diesel Pay attention to the information provided by the engine manufacturer	

9.5 Lubrication and maintenance schedule

The lubrication points (position numbers marked by an asterisk (*) in the lubrication schedule) are supplied via the central lubrication unit.



IMPORTANT!

Bearing points without lubricating nipples

If not observed, damage to the machinery results.

- ▶ Slightly oil the bearing points.

Snow plough

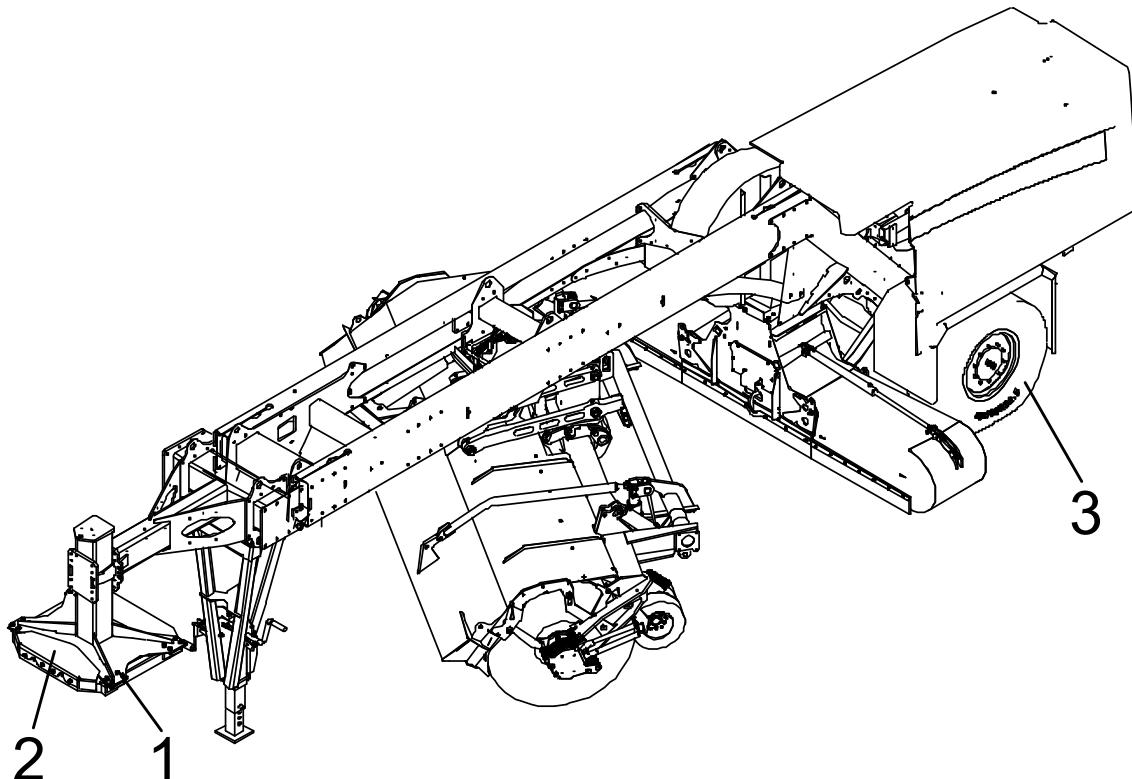
Refer to the separate operating instructions of the snow plough manufacturer.

Schmidt vehicle hydraulics

See separate operating instructions for Schmidt vehicle hydraulics.

Vehicle

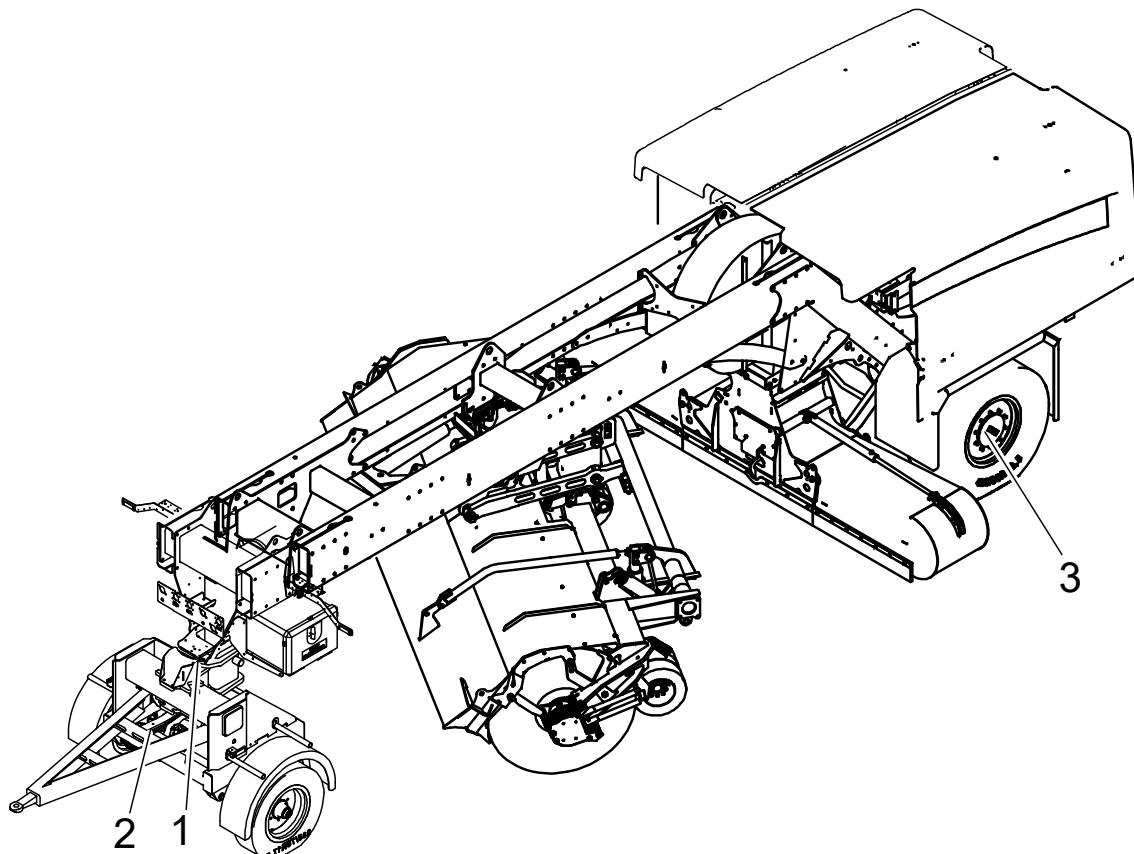
Refer to vehicle manufacturer's operating instructions

TJS attachment variants
TJS with trailer


Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Connecting compo-nents	Multi-pur- pose grease	Lubricate 4 grease nipples		X	
2	Rotation angle sen-sor for rear axle steer-ing		Check fastening and damage Observe the maintenance information of the manufac-turing companies and the chapter "Steering axle".			
3			Observe the maintenance information of the manufac-turing companies and the chapter "Steering axle".			

* Lubricated using the central lubrication unit (optional)

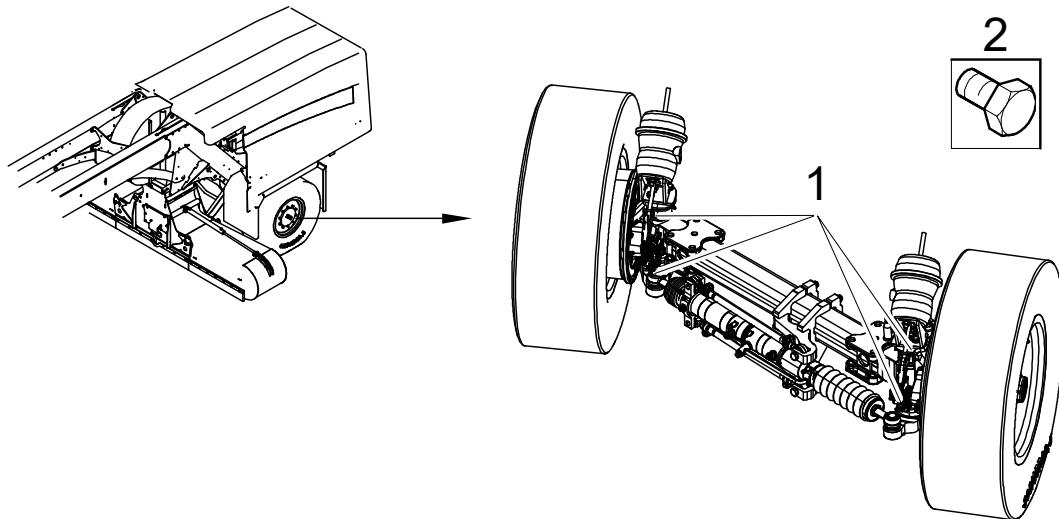
TJS with drawbar



Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Front axle bearing	Multi-pur- pose grease	Lubricate 1 lubricating nipple		X	
2	Steering compo- nents		Check for play, damage and wear	X		
3	Rear axle steering	Observe the maintenance information of the manufac- turing companies and the chapter "Steering axle".				

* Lubricated using the central lubrication unit (optional)

Steering axle



IMPORTANT!

Insufficient maintenance of the axle

If not observed, damage to the machinery results.

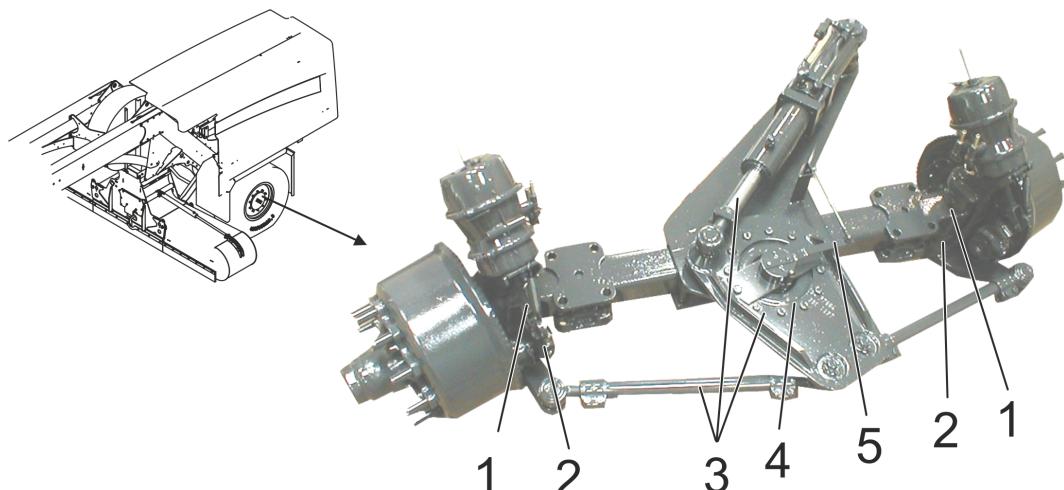
- ▶ Observe the maintenance instructions from the manufacturer.

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Axle spindle left and right	Multi-pur- pose grease	Lubricate 2 lubricating nipples each		X	

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
2	Screws on the steering system		Check the fastening			X

* Lubricated using the central lubrication unit (optional)

Maintenance, TJS- C steering axle



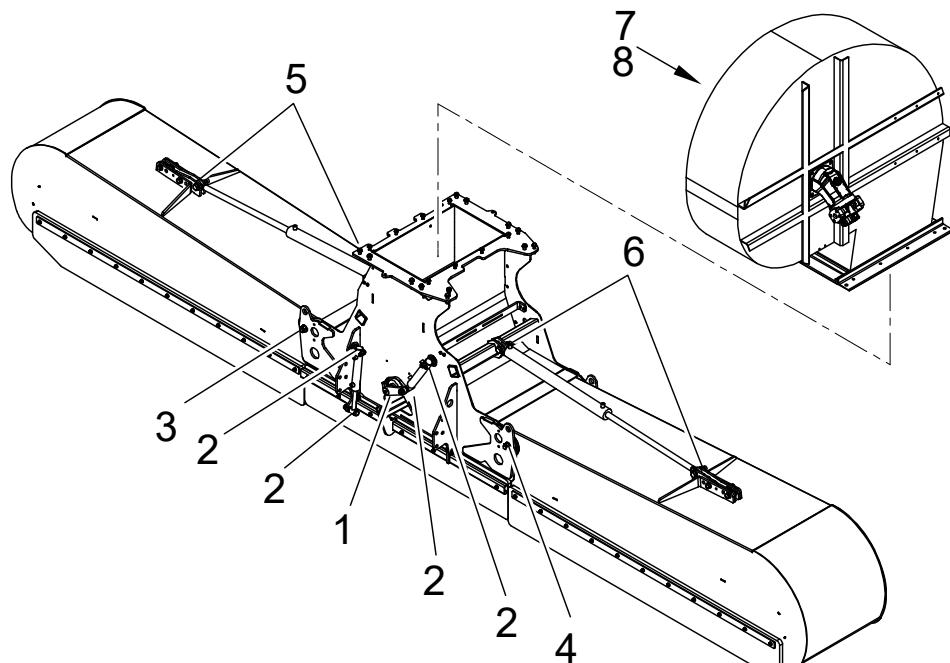
Maintenance instructions from the manufacturers must be observed!

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1	Axle spindle left and right	Multi-pur- pose grease	Lubricate 4 lubricating nipples each side		X	
2	Brake trans- mission left and right	Multi-pur- pose grease	Lubricate 1 lubricating nipple each		X	

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
3	Connecting bolts on the steering system		Check the fastening			X
4	Rotating assembly	Multi-pur- pose grease	Lubricate 4 grease nipples		X	
5	Steering Position sensor		Clean and check for damage.			X

Blast nozzle variants

Blast nozzle unit, standard

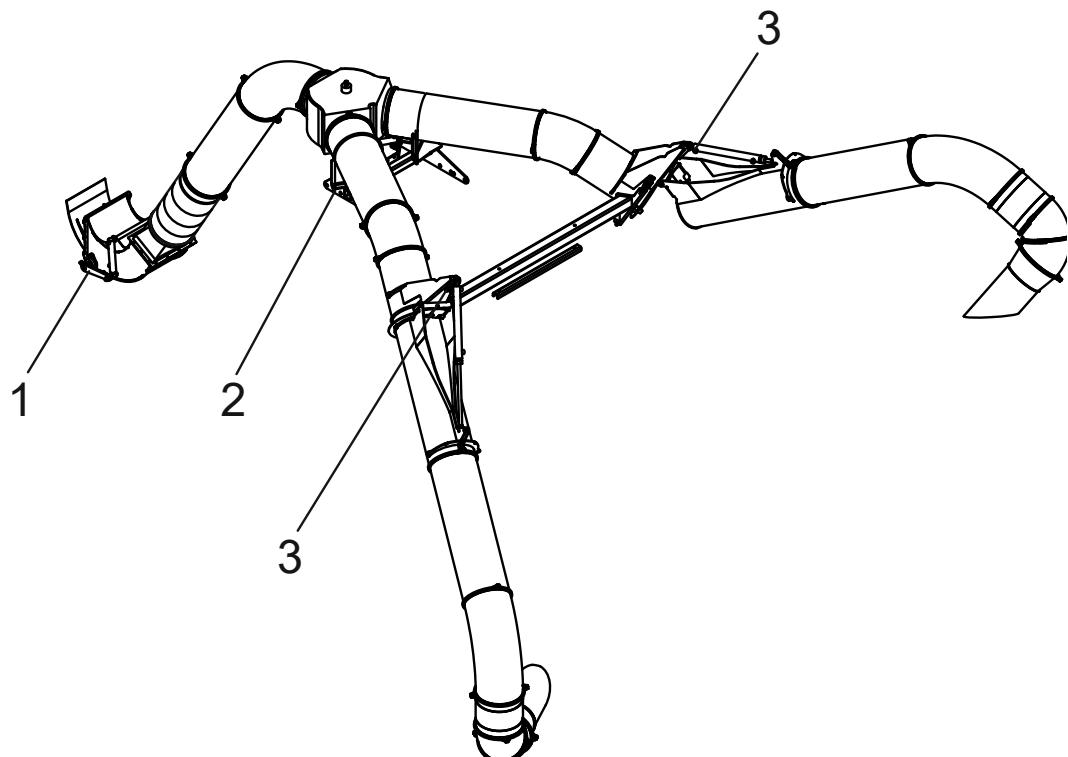


Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Front and rear bearings	Multi-purpose grease	Lubricate 2 lubricating nipples		X	
2	All bearing points	Machine oil	Oil		X	
3*	Blast shaft bearing, left	Multi-purpose grease	Lubricate 2 lubricating nipples		X	
4*	Blast shaft bearing, right	Multi-purpose grease	Lubricate 2 lubricating nipples		X	
5*	Cylinder pivot points left and right	Multi-purpose grease	Lubricate 2 lubricating nipples		X	

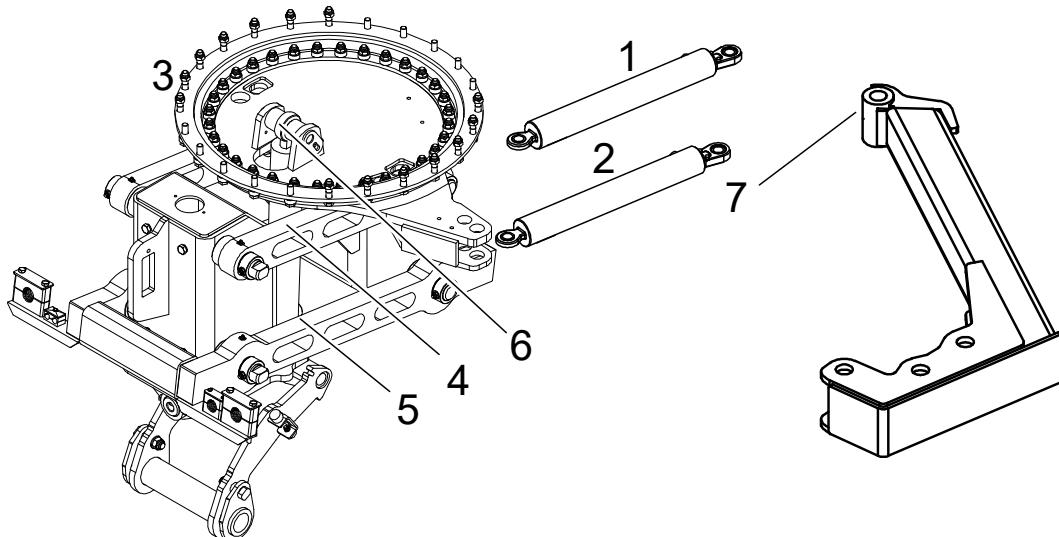
Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
6*	Cylinder pivot points left and right	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
7	Fan intake grille		Check for damage	X		
8	Fan impeller housing		Check for foreign objects	X		

* Lubricated using the central lubrication unit (optional)

Blast nozzle unit, blowing ahead of the brush



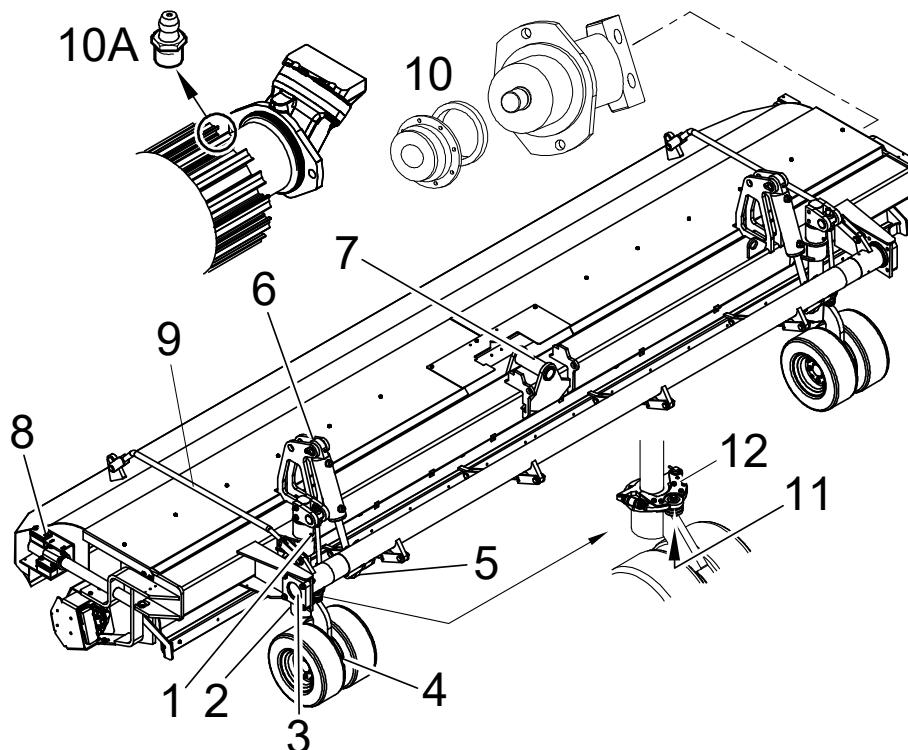
Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1	Blast air flap mount	Multi-purpose grease	Lubricate 2 lubricating nipples		X	
2	Flap adjustment cylinder pivot point left and right	Multi-purpose grease	Lubricate 2 lubricating nipples		X	
3	Raising and lowering facility cylinder pivot points left and right	Multi-purpose grease	Lubricate 2 lubricating nipples		X	

Cross brush
Raise, lower and pivot apparatus


Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Cylinder 1 pivot points	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
2*	Cylinder 2 pivot points	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
3*	Rotating assembly	Multi-pur- pose grease	Lubricate 4 grease nipples		X	
4*	Top guide bearing	Multi-pur- pose grease	Lubricate 4 grease nipples		X	
5*	Bottom guide bear- ing	Multi-pur- pose grease	Lubricate 4 grease nipples		X	
6*	Raise / lower cylin- der pivot points	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
7*	Control arm	Multi-pur- pose grease	Lubricate 1 lubricating nipple		X	

* Lubricated using the central lubrication unit (optional)

Cross brush with strip brushes

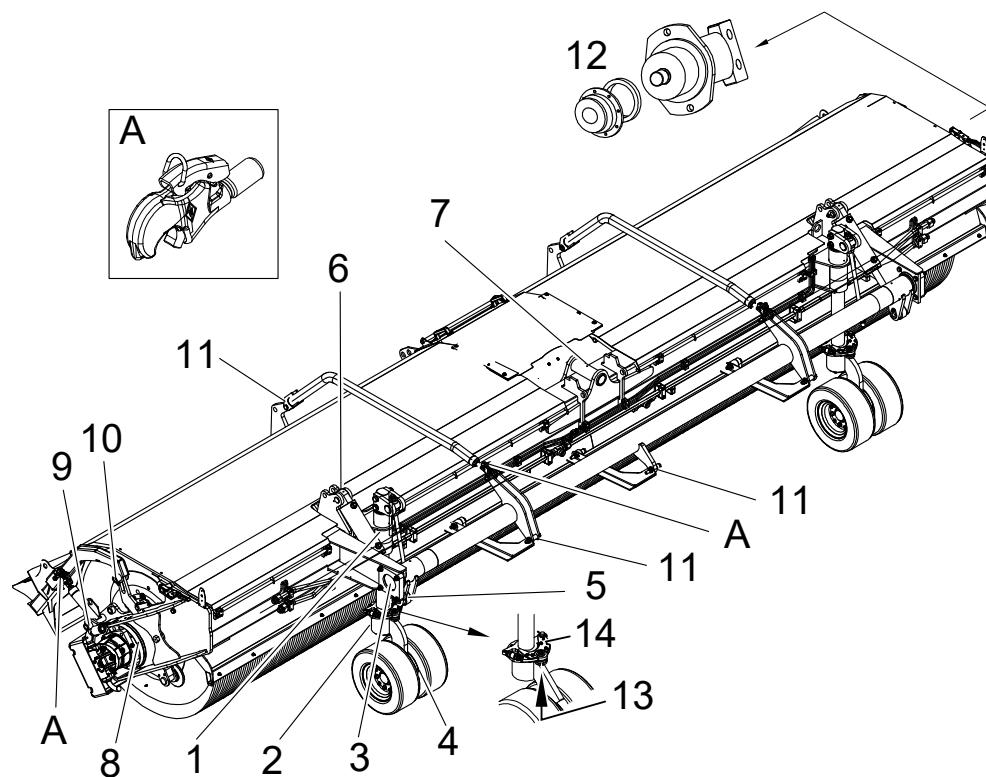


Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Castor wheel bear- ing top (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
2	Castor wheel bear- ing bottom (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
3*	Adjustment shaft bear- ing (right/ left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
4	Castor wheel hub (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
5*	Cylinder pivot point bottom (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
6*	Cylinder pivot point top (right/ left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
7*	Guide (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
8*	Bearing shaft (right and left)	Multi-pur- pose grease	Lubricate 1 lubricating nipple	X		
9	General moving con- necting parts	Multi-pur- pose grease	Lubricate	X		
10	Brush drive coupling Right/left	Assembly grease	Fill the coupling housing with grease			X
10A	Brush drive coupling Right/left (Design with lubri- cating nip- ples)	Assembly grease	Lubricate 2 lubricating nipples With grease gun Fill the coupling housing with grease	Or at every brush change		
				With every brush replacement		

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
11	Reset of trailing wheel, bearing bolts	Multi-purpose grease	Lubricate 2 lubricating nipples	X		
12	Reset of training wheel	Machine oil	Clean Oil lightly Check functionality	X		

* Lubricated using the central lubrication unit (optional)

Cross brush with ring brushes


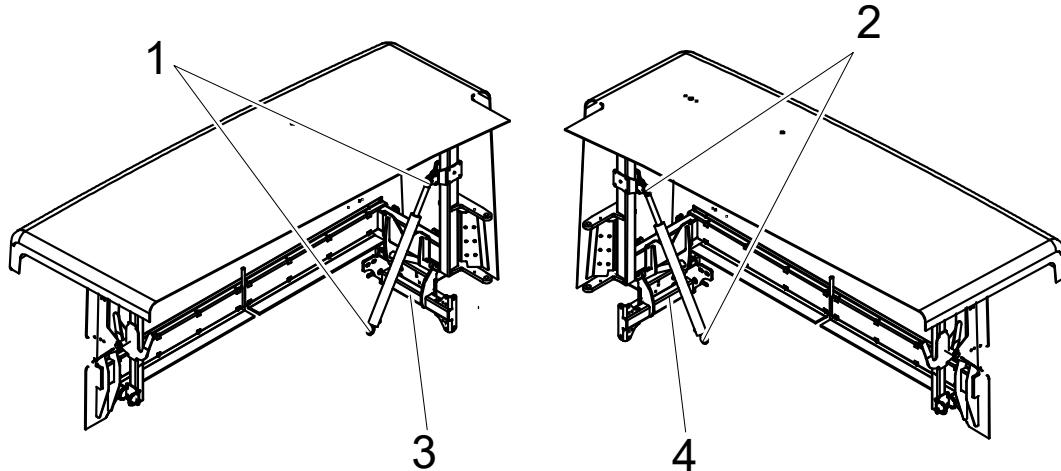
Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
A	Quick fas- teners (right/left)	Corrosion protection/ lubricant paste	Dab onto quick fastener 4	Regularly	Weekly	
1*	Castor wheel bear- ing top (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
2	Castor wheel bear- ing bottom (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
3*	Adjustment shaft bearing (right/ left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
4	Castor wheel hub (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
5*	Cylinder pivot point bottom (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
6*	Cylinder pivot point top (right/ left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
7*	Guide (right/left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
8*	Adjustment arm (right and left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
9*	Control arm (right and left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
10*	Flange (right and left)	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
11	General moving con- necting parts	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
12	Brush drive coupling	Assembly grease	Fill the coupling housing with grease (see chap- ter "Brush replace- ment")			X
				Or at every brush change		
13	Reset of trailing wheel, bear- ing bolts	Multi-pur- pose grease	Lubricate 2 lubricating nipples	X		
14	Reset of training wheel	Machine oil	Clean Oil lightly Check functionality	X		

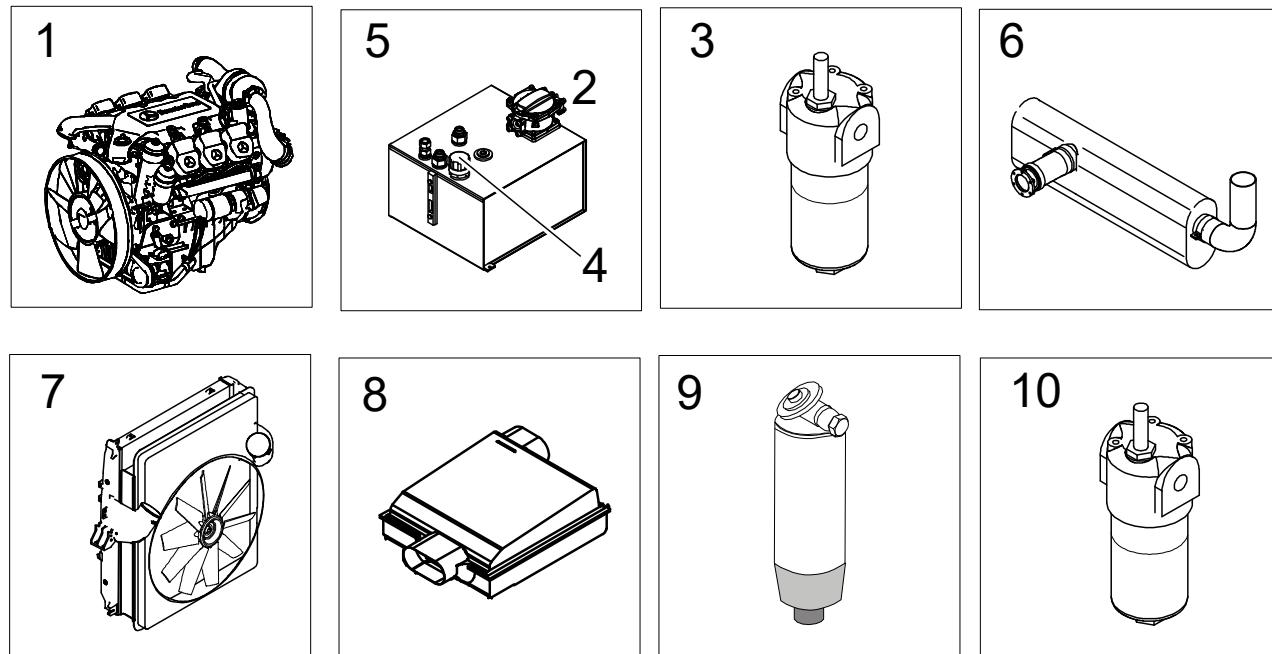
* Lubricated using the central lubrication unit (optional)

Engine cover hydraulically tippable



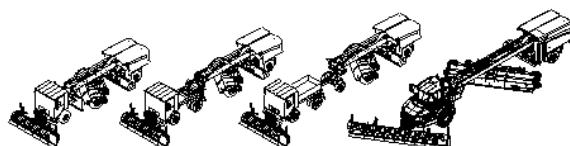
Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1*	Cylinder right, pivot points	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
2*	Cylinder left, pivot points	Multi-pur- pose grease	Lubricate 2 lubricating nipples		X	
3*	Engine cover bear- ing, right		Lubricate 1 lubricating nipple		X	
4*	Engine cover bear- ing, left	Multi-pur- pose grease	Lubricate 1 lubricating nipple		X	

* Lubricated using the central lubrication unit (optional)

Auxiliary engine


Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
1	Diesel engine		Observe the maintenance instruc- tions from the manufacturer.			
			Check the motor oil level using the dipstick only when the diesel engine is cold. Note: If an above-average oil loss is deter- mined, the maintenance interval must be reduced accordingly.		X	
2	Return filter		Change filter insert			X
3	Pressure fil- ter		Change filter insert			X
4	Top-up filter		Wash out			X
5	Hydraulic tank		Check oil level	X		
			Oil change 110 litres			X

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
6	Exhaust system		Check the status, rout- ing, support and check for leaks.	X		
7	Cooling sys- tem		Check fill level and for leaks	X		
8	Air filter		Change filter insert			X
9	Fuel water separator/ pre-filter		Check the water level in the collecting tray; drain water via the drain valve, if necessary	X		
			Change filter insert			X
10	Pressure fil- ter (for aux- iliary steer- ing)		Change filter insert			X



General information

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
	Lighting and signal sys- tem		Check	X		
	Emergency stop button		Check			X

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
	Electrical plug-in con- nections		Check for and protect against corrosion			X
	Complete machine		Check for status and corrosion		X	
	Wheels / tyres		Check the status, rout- ing, support and check for leaks.	X		
	Battery		Check the battery con- nections and acid level		X	
	Drive com- ponents, hydraulic pumps and hydraulic motors		Check seal tightness	X		
	Axle com- ponents		Check for play, leakage, damage and wear. Observe the mainte- nance instructions from the manufacturer.	X		
	Steering compo- nents		Check for play, leakage, damage and wear. Observe the mainte- nance instructions from the manufacturer.	X		
	Brake/ hydraulic hoses and lines		Check status, routing and support, and check for leaks		X	

Item	Designation Lubrication point	Lubricant	Maintenance work Number of lubrication points	Maintenance inter- val Operating hours		
				50	100	500
	Lines of the central lubrication unit		Check status and routing, and check for leaks			
	Drive belt (for pump drive, cooling fan, etc.)		Check condition and tension. Observe the maintenance instructions from the manufacturer		X	
	Warning signs		Check condition	X		
	Bolted joints Hydraulic bolted joints		Check for damage and stability			X
	Check for safe operating condition		You can commission Aebi Schmidt works customer service to carry out an industrial safety check based on current accident prevention guidelines, if required	Annually		
	Engine cover, lock		Check oils and functionality		X	
	Brake pads (auxiliary steering)		Check brake pad thickness		X	

9.6 Maintenance work

9.6.1 Changing the brush bars



WARNING!

Unexpected starting of the machine.

Persons can be caught by the cross brush.

- ▶ Always park the TJS safely during the brush change.



CAUTION!

Brush set has pointed wires and is sharp-edged.

This can cause injuries to eyes, hands and unprotected body parts

- ▶ Always wear personal protective equipment when changing brooms.



CAUTION!

When changing the brush, you can bump your head on the machine, e.g., on the frame.

This can cause head injuries.

- ▶ When changing brooms, a helmet must always be worn in addition to the personal protective equipment.



CAUTION!

Soiling and bad accessibility to the brush bars makes the brush change more difficult.

Injuries of the musculoskeletal system

- ▶ Ensure that there is sufficient working space.
- ▶ Additional personnel must be called to help when changing the brush.

**IMPORTANT!**

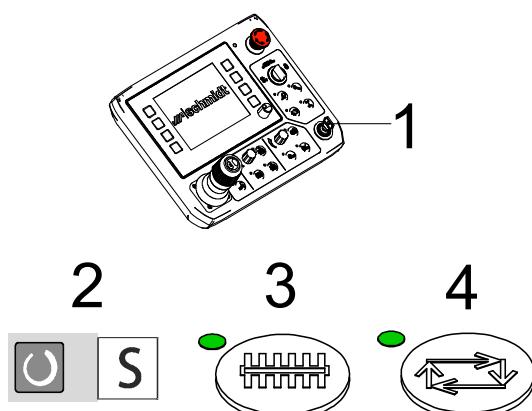
Assembly of dirty components.

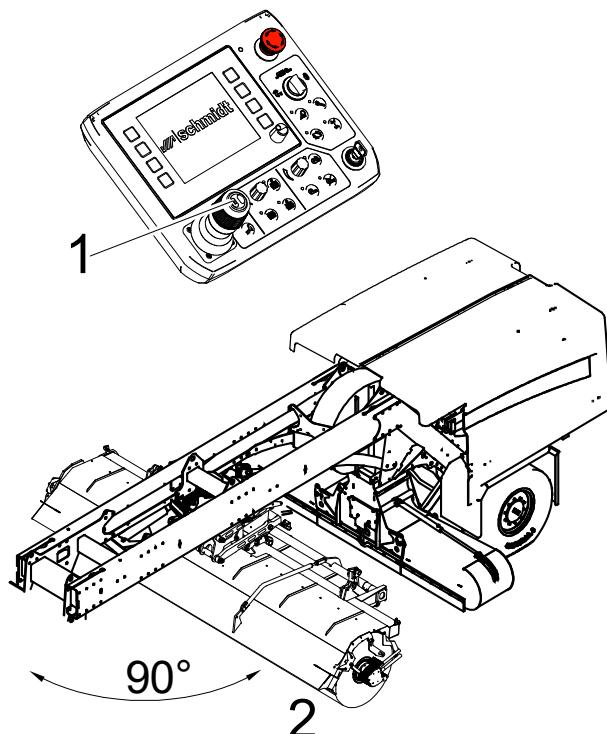
If not observed, damage to the machinery results.

- ▶ Clean the cross brush before mounting.
- ▶ During the mounting process, ensure that only cleaned components are assembled.
- ▶ Do not direct the high-pressure water spray at sealing and bearing points.

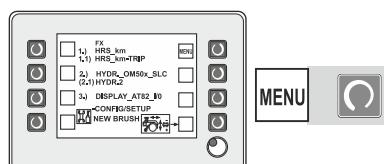
Preparation for changing the brush bars with the main control panel

- Park the machine on stable, level ground.
- Start the auxiliary engine (1).
- Preselect sweeper (2).
- Switch off automatic operation (3).

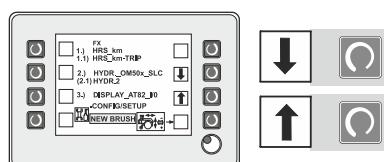




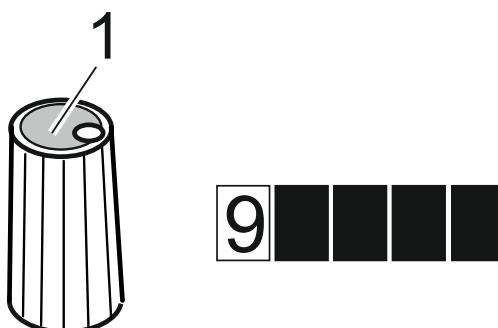
- Lift sweeper with joystick (depending on configuration 1 or 2)
- Swivel the cross brush 90° to the direction of travel (5) with the joystick (3 or 4).
- Lower the sweeper with the joystick (depending on configuration 1 or 2) and place it on the castor wheels.



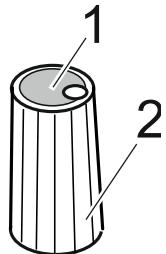
- Switch to the display with the "Menu" button.



- Use the arrow buttons to select the "NEW BRUSH" function.



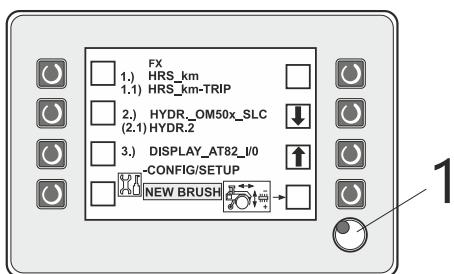
- Confirm the selection by pressing the rotary switch (1). Password fields appear and prompt for password entry.



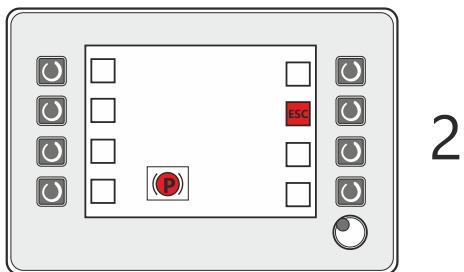
Enter the password

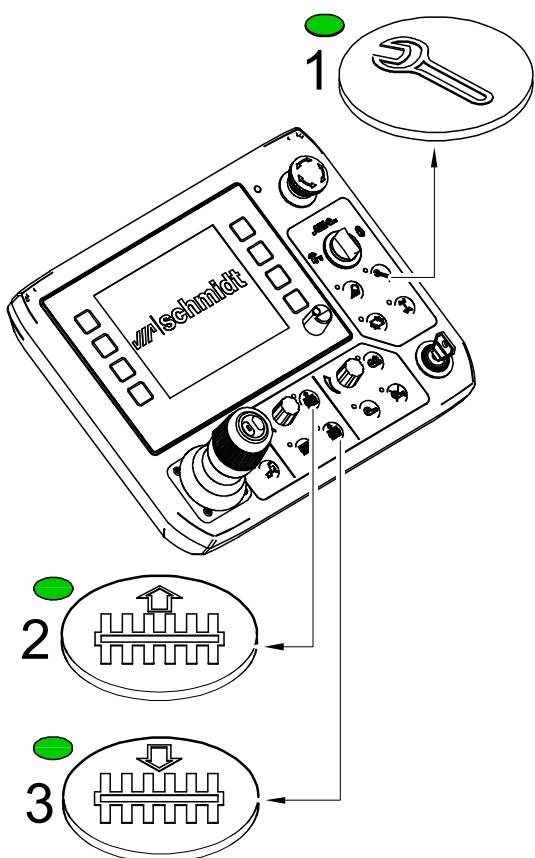
- Press the rotary switch (1) to enable the number pad. The number pad flashes.
- Set the number using the rotary switch (2).
- Confirm the number that you have set by pressing the rotary switch (1).

The following menu screen appears when the password has been completely entered and confirmed.



Confirm the menu "NEW BRUSH" by pressing the push-turn control (1). The menu screen (2) appears.





Extend castor wheels

When changing the brush, the castor wheels must always be fully extended.

- Extend castor wheels quickly
 - Press the buttons (1+2) simultaneously.
- Slowly extend the castor wheels
 - Press the button (2). The castor wheels extend slowly for 20 steps, and then the function switches to quick extension.

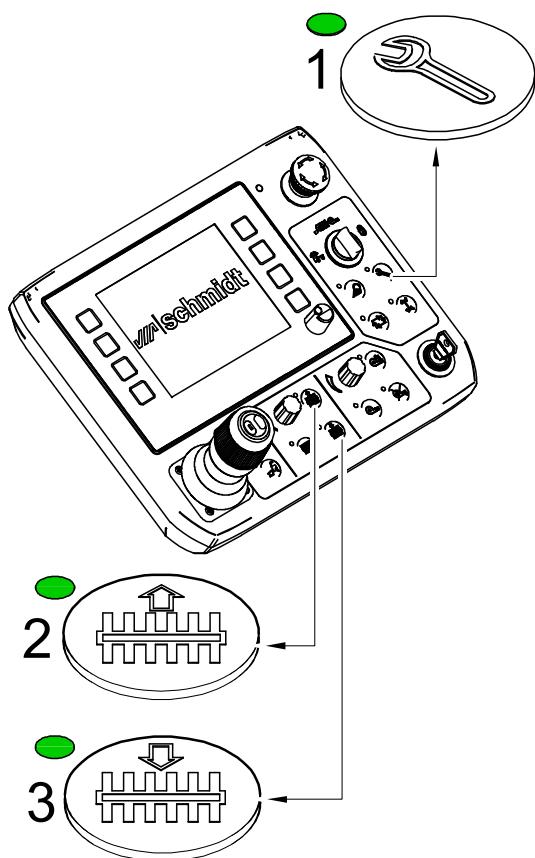


IMPORTANT!

Spoilers can collide with the cylinder brush

If not observed, damage to the machinery results.

- ▶ Retract the castor wheels with utmost care.

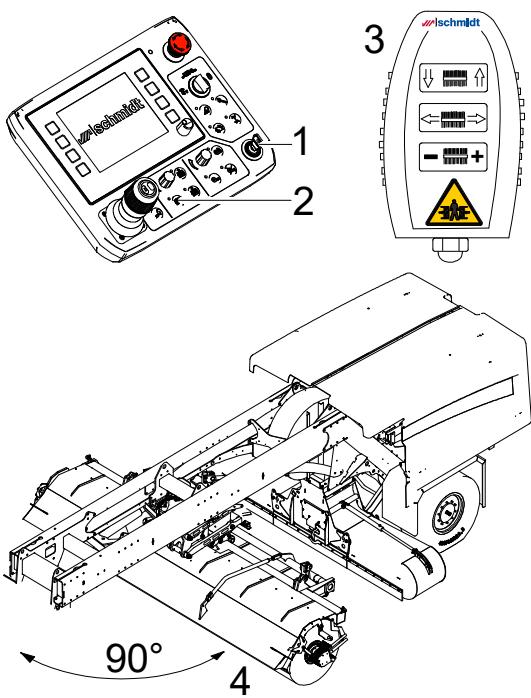


Retract castor wheels

- Retract castor wheels quickly
 - Press buttons (1+3) simultaneously.
- Break in the castor wheels slowly
 - Press button (3). The castor wheels retract slowly for 20 steps, and then the function switches to fast retraction.

Lower the cross brush onto the extended castor wheels.

Preparation for changing the brush bars with the hand-held control



Machine must be equipped with an electrohydraulic system.

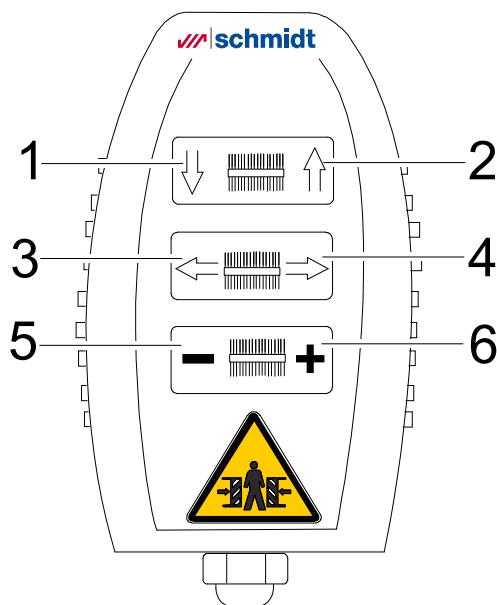
- Switch on the ignition of the auxiliary engine (1). The auxiliary engine does not need to be started.
- Preselect the cross brush (2).
- Plug the hand-held control (3) into the connector at the front left of the machine.
- Move the cross brush with hand-held control panel into the desired position.
 - Extend the castor wheels completely
 - Pivot the cross brush diagonally to the direction of travel (D).
- Switch the ignition for the auxiliary engine off again.
- Park the TJS safely.

**CAUTION!**

Danger of crushing

The cross brush can be moved using the hand-held control panel.

- The auxiliary engine ignition should be switched off before all work on the cross brush. The hand-held control panel will not function.

**Functions of the hand-held control**

- Lower (1)/lift (2) the cross brush
- Swivel the cross brush only when it is raised.
 - Pivot to the left (3)
 - Pivot to the right (4)
- Retracting (5) / extending (6) the castor wheels
 - Brief button press = retract in steps
 - Long button press = extend continuously
- Switch the ignition for the auxiliary engine off again.
- Park the TJS safely

**CAUTION!**

Danger of crushing

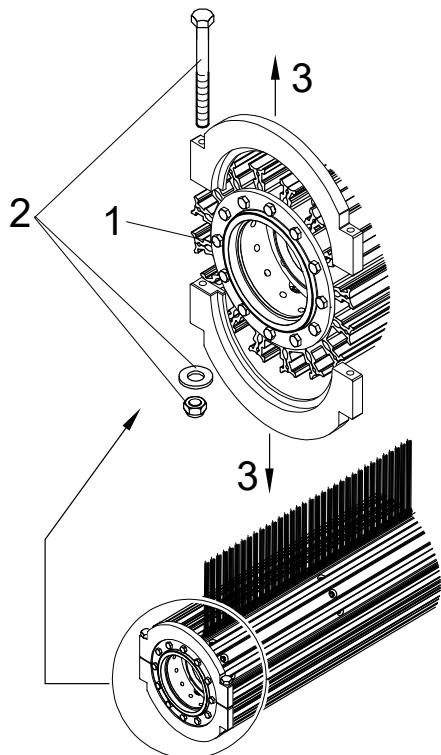
The cross brush can be moved using the hand-held control panel.

- The auxiliary engine ignition should be switched off before all work on the cross brush. The hand-held control panel will not function.

Changing strip brushes

Prerequisite for changing the brushes safely:

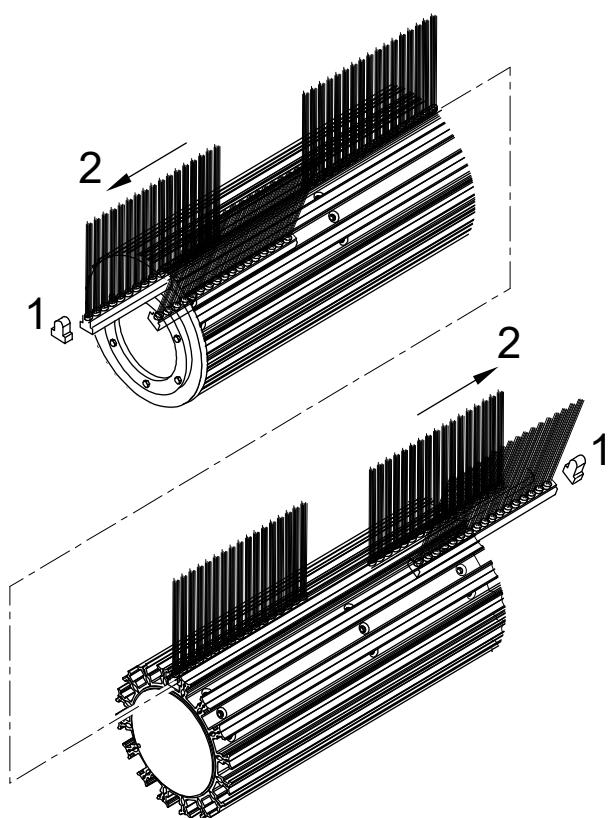
- Pivot the cross brush diagonally to the direction of travel.
- Extend the castor wheels completely and place them on the wheels.
- Park the sweeper safely.



Dismantling strip brushes

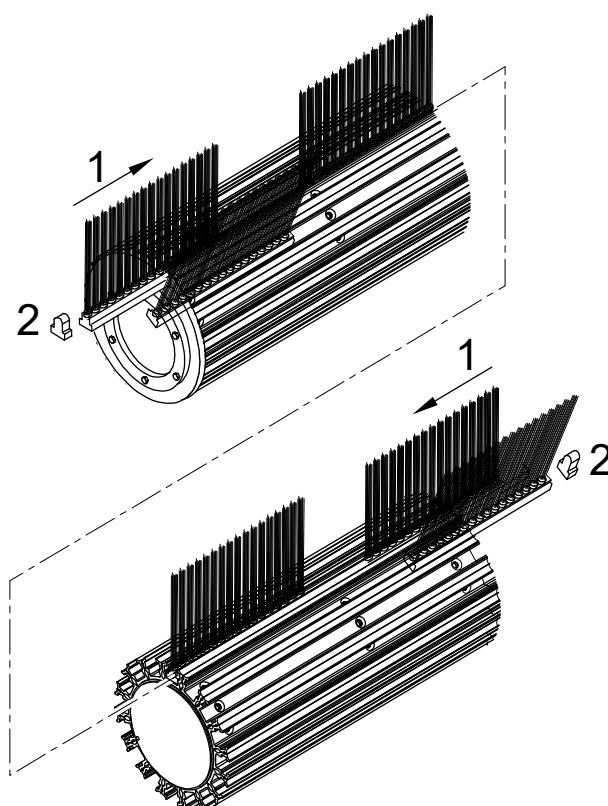
The work is to be carried out on the right and left of the cross brush.

- Loosen all screws (1)
- Remove the clamping ring
 - Remove the bolted joints (2) on both sides
 - Remove the clamping ring halves (3)



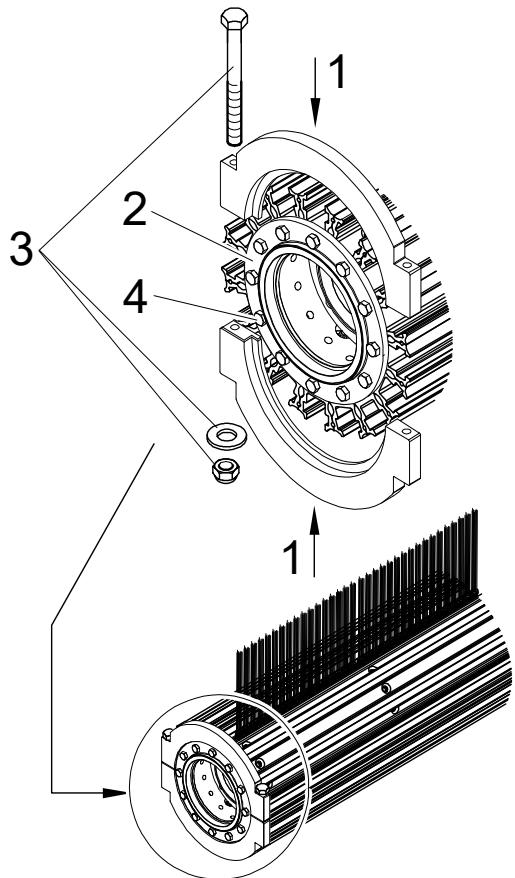
- Pull out the end piece (1) and brush segments (2) to the right and to the left respectively from the cross brush.
 - Properly dispose of worn brush segments and end pieces.
- Clean the cross brush.
 - Profile of the cross brush.
 - Clamping ring halves
 - Clamping surface on the cross brush

Mounting strip brushes



- Push new brush segments (1) and end pieces (2) from the right or from the left onto the cross brush. The end pieces must always be mounted offset to the left and right on the cylinder brush.

With the staggered mounting of the end pieces, a balanced sweeping pattern is achieved.



- Mount the clamping collar
 - Push the clamping ring halves (1) behind the loosened flange (2).
 - Connect the clamping ring halves (1) with the bolted joint (3). Tighten the bolted joint evenly (20 Nm)
- Tighten all screws (4).

Perform a test run

- Raise the cross brush and swivel it into the working position
- Switch on the cross brush and check the concentricity. The cross brush must rotate without vibration.
- Set the sweeping range.

9.6.2 Replacing the disk brushes



WARNING!

Unexpected setting into motion of the machine.

People can be run over.

- ▶ The TJS must always be parked safely before the disk brushes are replaced.
- ▶ If necessary, secure the machine against rolling away with chocks.



WARNING!

When starting the auxiliary engine, there is a risk that the cross brush will start rotating.

People may be caught and injured.

- ▶ The auxiliary engine must not be started while the disk brushes are being replaced.

Parking the sweeper correctly to replace the disk brushes.

- Park the sweeper on level and solid ground that is able to support its weight. The ground must allow the cylinder brush that has been removed to be rolled away on the parking trolley.
- A free space of 3 metres is required to the right and left of the machine for the brush change.

Preparations for the removal of the cross brush

**WARNING!**

When starting the auxiliary engine, there is a risk that the cross brush will start rotating.

People may be caught and injured.

- ▶ The auxiliary engine must not be started during brush change.
-

**CAUTION!**

Brush set has pointed wires and is sharp-edged.

This can cause injuries to eyes, hands and unprotected body parts.

- ▶ Always wear a helmet, safety goggles, gloves and protective clothing when changing the brush.
-

**IMPORTANT!**

Assembly of dirty components.

If not observed, damage to the machinery results.

- ▶ Clean the cross brush before mounting.
 - ▶ During the mounting process, ensure that only cleaned components are assembled.
 - ▶ Do not direct the high-pressure water spray at sealing and bearing points.
-

**IMPORTANT!****Assembly information**

If not observed, can lead to damage to the cylinder brush.

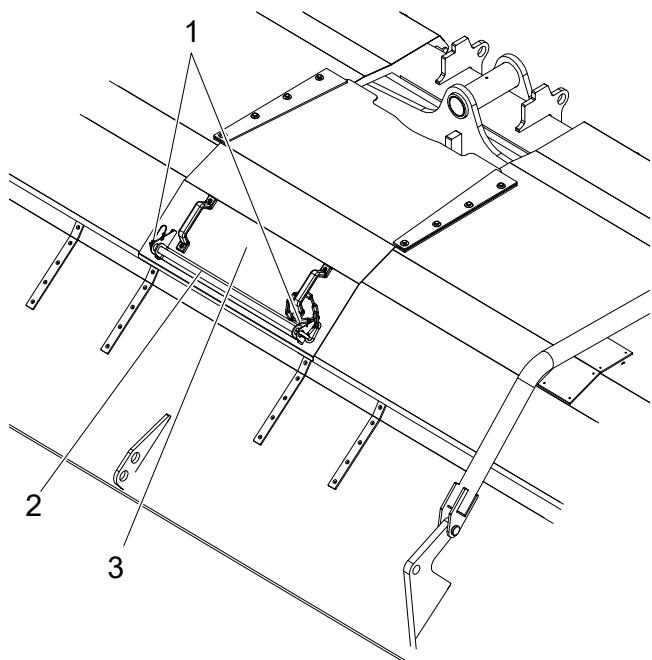
- ▶ The parts removed on the left, for example, must be fitted back onto the left-hand side during assembly. It is not permitted to swap around parts from left to right and vice versa.
- ▶ Incorrect rotational direction of the cylinder brush results in functional faults and damage to the cylinder brush.

Observe the rotational direction arrows!

The preparation for changing the cylinder brush with the main control panel and for changing the cylinder brush with the cylinder brush removal tool

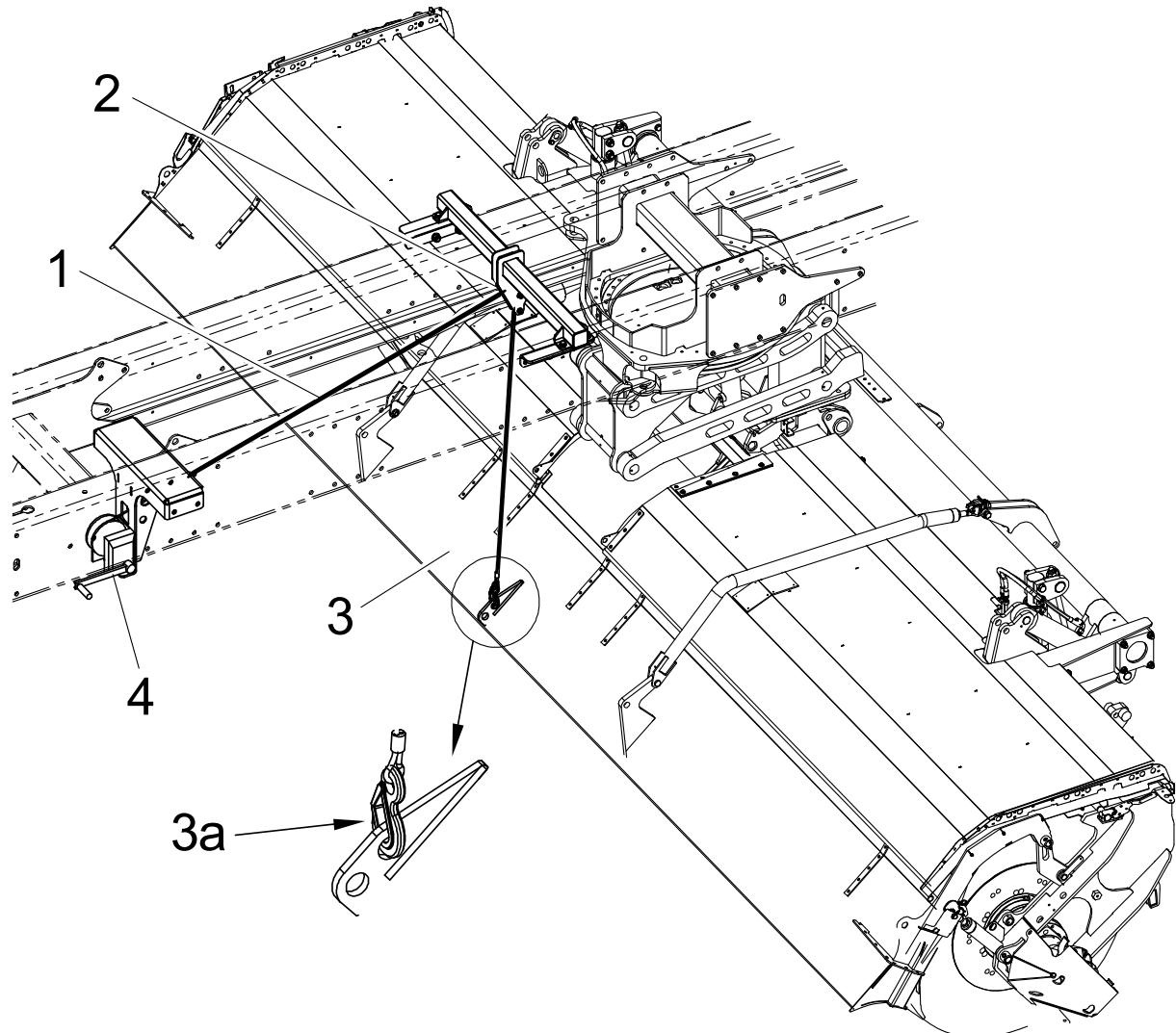
The following work must be carried out only by workshop personnel who have been given training and instruction (recommended minimum of 2 people).

The workshop must be equipped with safe lifting equipment, e.g. a crane (3000kg payload capacity).

Provide access to the cylinder brush

Remove the cover.

- Release the bolt (1).
- Remove the bolt (2).
- Take off the cover (3)

Attaching the wire cable from the winch to the spoiler

- Pull the wire cable (1) over the roller guide (2) and suspend from the rear borehole (3a) of the cover (3).
- Tension the wire cable slightly using the winch (4).

Releasing the spoiler

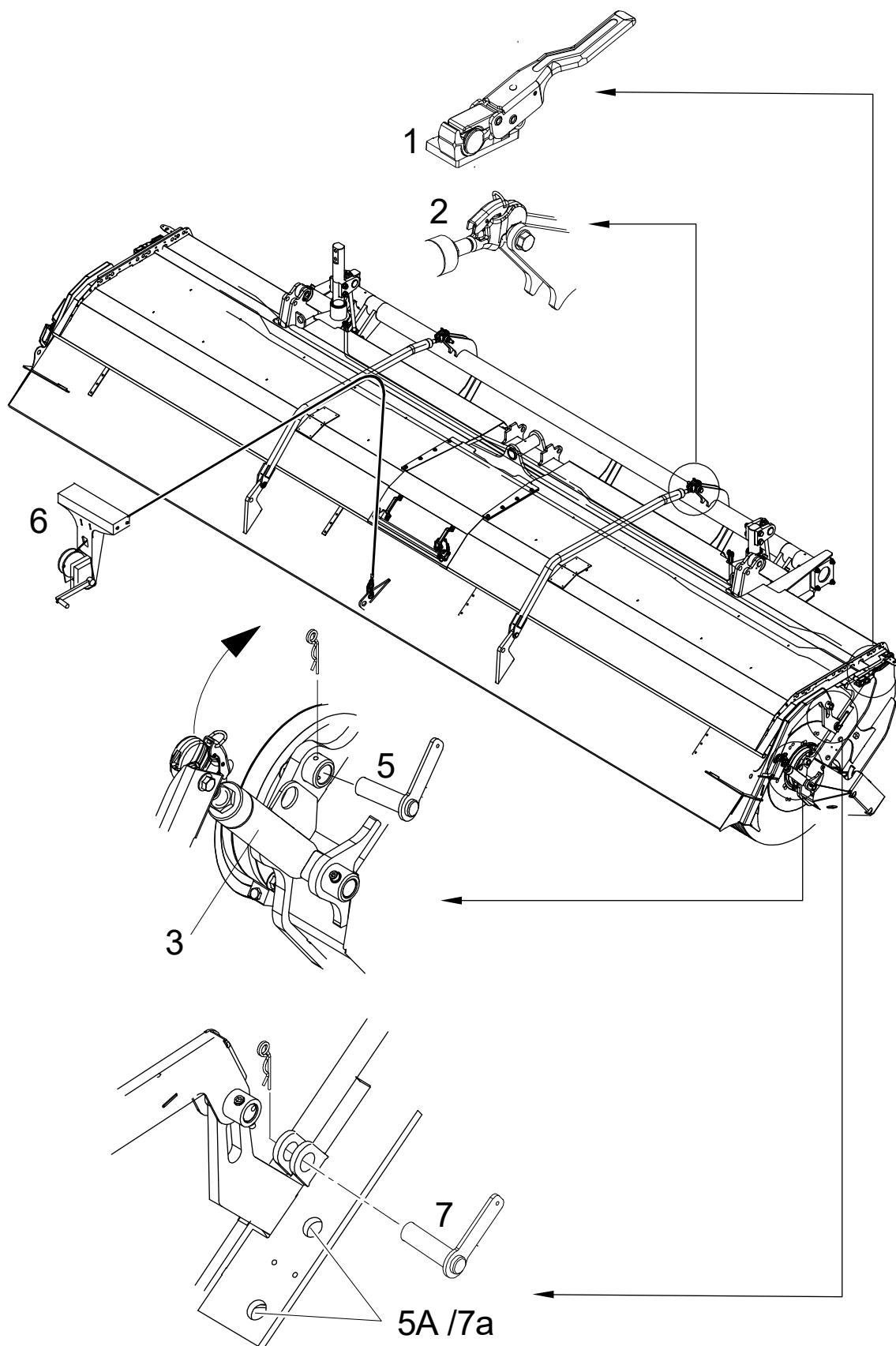


IMPORTANT!

The catch (1) on the right and left is closed and spoiler is lifted by the winch.

The spoiler will be damaged.

- ▶ The spoiler may only be pulled up when the catch (1) has been safely opened.

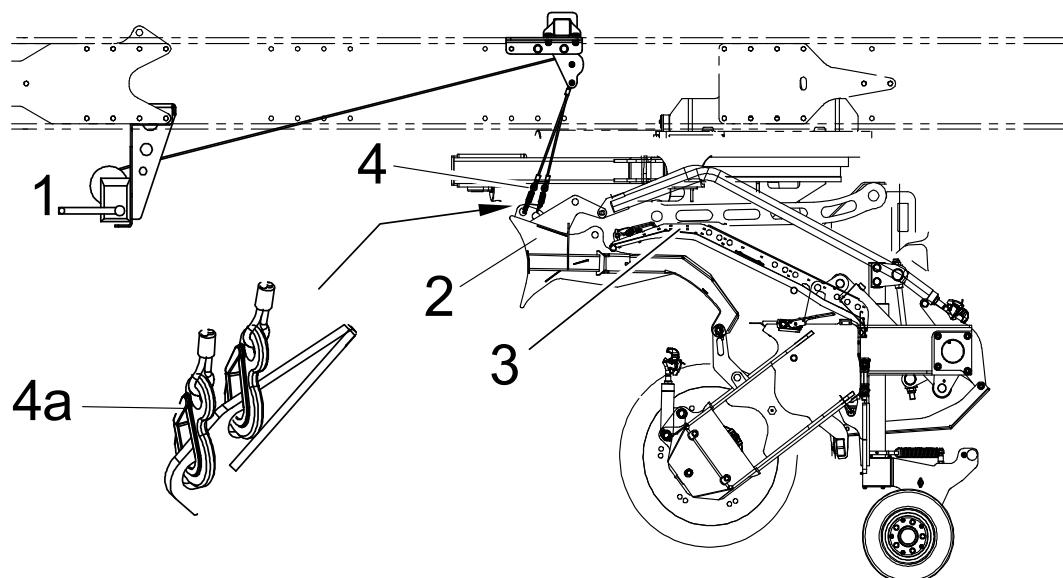


- Open the catch on the right and left (1).
- Lift the cover using the winch until the load is taken off the spoiler rods (2) and the control arms (3) on the left and right.
- Release and unhook the spoiler rods (2) on the left and right.
- Release and unhook the control arms (3) on the left and right. Pivot the control arms backwards and secure them with bolts and cotter pins (5).
- Lower the spoiler with the winch (6) until the bolts (7) on the left and right can be put in place and tightened.

**NOTE**

Store the bolts after changing the brushes.

► The bolts (5) and (7) must be stored in the holder (5a and 7a).

Raising the spoiler

- Pull the spoiler (2) and cover (3) upwards using the winch (1).
- Hook the safety rope (4) into the front hole (4a). The spoiler is secured with the safety rope against unintentional lowering, e.g. when operating the winch.

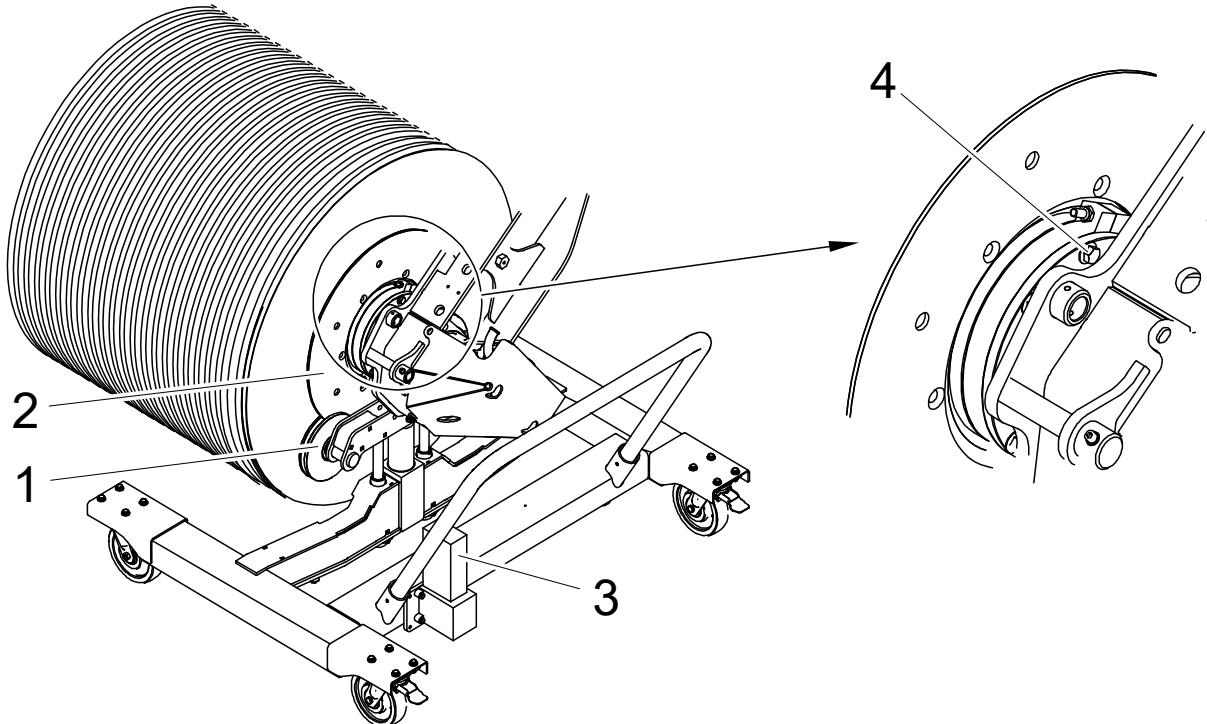
**CAUTION!**

The cover might be lowered unintentionally.

People can knock and injure themselves on the cover.

- ▶ Securing the cover against lowering with a safety rope.

Disassembling the cylinder brush



- Place the brush seat on the parking trolley (1) exactly under the terminal disk (2) of the cross brush on the left and right of the cylinder brush.
- Raise the lifting device of the mounting trolley using the hydraulic hand pump (3) until the brush end disk is securely centred in the roller guide of the brush seat.
- Continue to raise the cylinder brush until the load is taken off the connecting bolts (4) on the drive unit.

**CAUTION!**

Danger of crushing

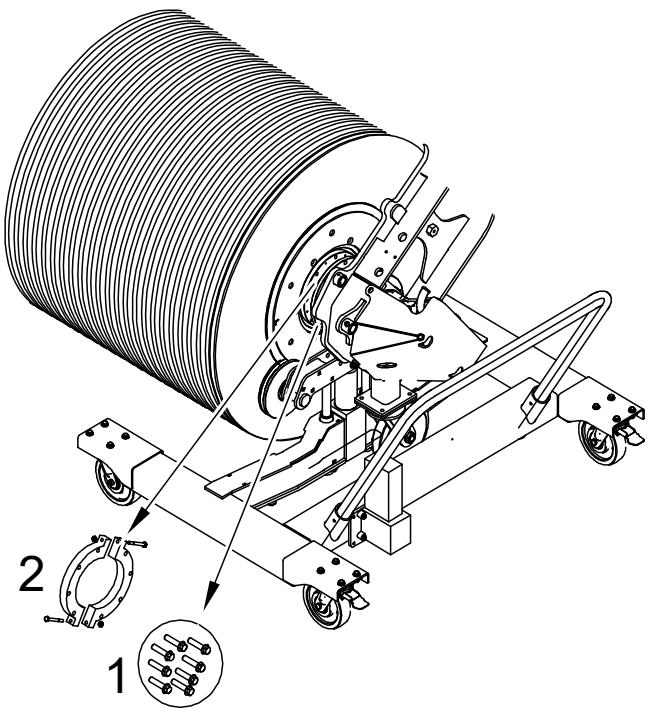
If the cylinder brush is rotated with the twist tool, for example, it is not permitted to work on the opposite side or on the cylinder brush.

- People must keep a safe distance.

**NOTE**

Simplify access to the connecting bolts.

- Rotate the cylinder brush into the required position using the twist tool.



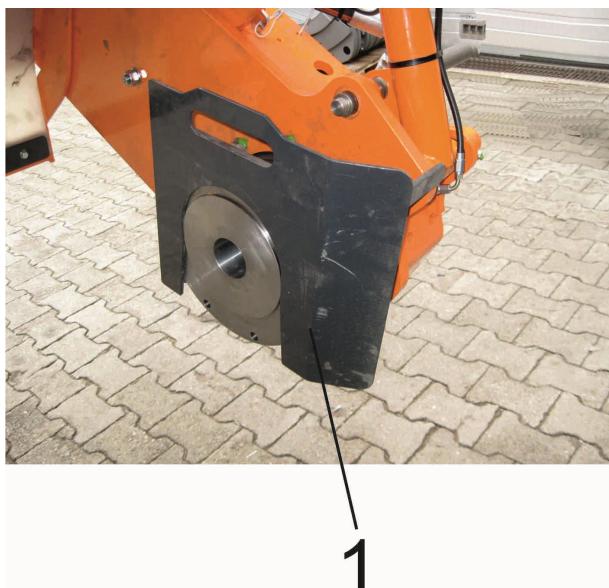
- Remove the connecting bolts (1). To remove the bolts, turn the cross brush with the twist tool. During the assembly process, the bolts must be tightened in opposite pairs (tightening torque 210 Nm -10 Nm).
- Remove the split spacer disk (2) by releasing the connecting parts (bolt, self-locking nut, washer).
- The cylinder brush has now been removed from the sweeper. The cylinder brush can be moved away on the mounting trolley.

Assembly notes

- During the assembly of the split spacer disks (2), ensure that the markings (number/colour identification) are lined up.
- The connecting bolts on the split spacer disks (tightening torque 45 Nm) must only be tightened when the connecting bolts (1) are fitted.

Installing the cylinder brush

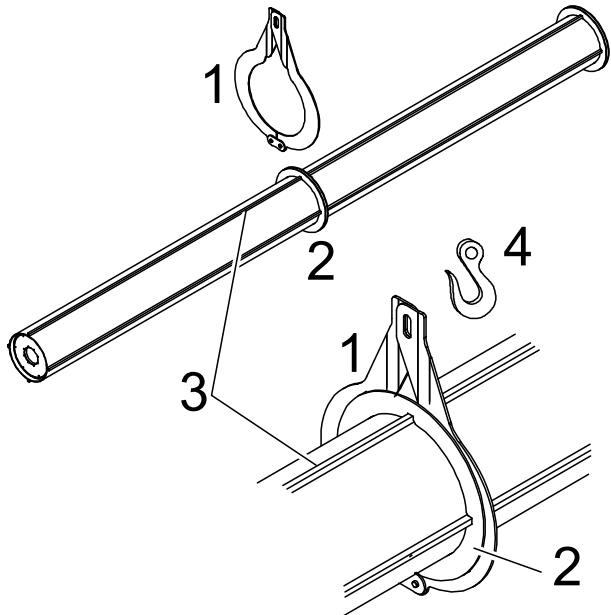
The installation of the cylinder brush is carried out in the reverse order from the removal process. The parts should be cleaned before assembly.



The cylinder brush may be damaged when inserting it between the drive units. To avoid damage to the drive unit, it should be protected on the left and right using the centring device (1). The arrows that indicate the direction of rotation of the cylinder brush must be observed.

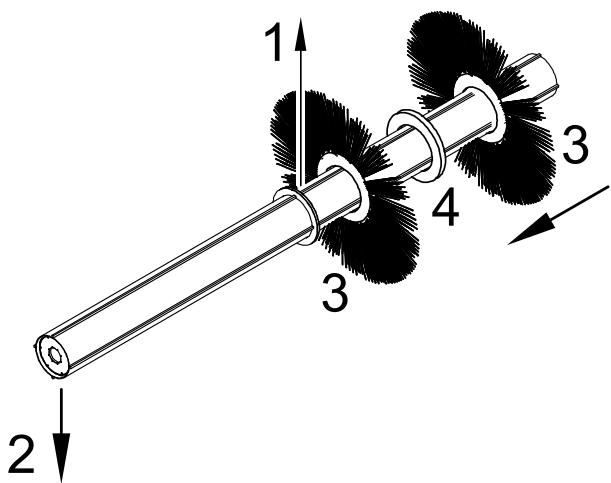
Fit the disk brushes and distance rings onto the ring brush roller pipe.

Approx. 75 disk brushes and approx. 74 distance rings should be fitted onto each side of the cylinder brush.



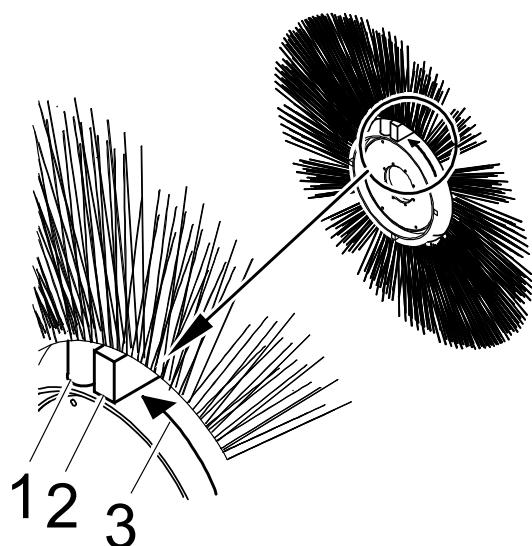
Raising the cylinder brush

- Place the suspension device (1) around the retainer (2) centrally from the cylinder brush.
- Align the cylinder brush in the suspension device in such a way that one of the carrier bars (3) is precisely at the top.
- Suspend the halves of the suspension device with the shackle, e.g., on the crane (4).
- Raise the cylinder brush approx. 1000 mm.

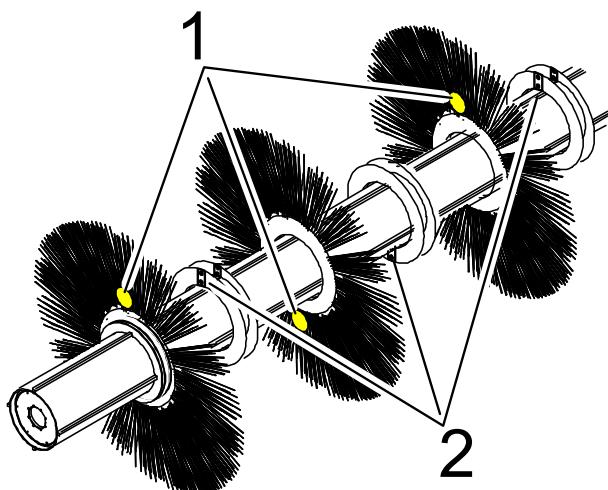


Fit the disk brushes onto the first half of the ring brush roller pipe.

- Lock the raised ring brush roller pipe (1) in the lower position (2).
 - This prevents the ring brush roller pipe from tipping when the brush disks are pushed on.
- Slide the disk brushes (3) alternating with the distance rings (4) onto the ring brush roller pipe on one side.



- The carrier pin (1) on the brush ring must always be positioned on the opposite side of the carrier bar (2), starting from the arrow tip of the direction of rotation indicator (3).
 - This prevents an initial twisting of the brush rings in use.
 - Keep the imbalance to a minimum.



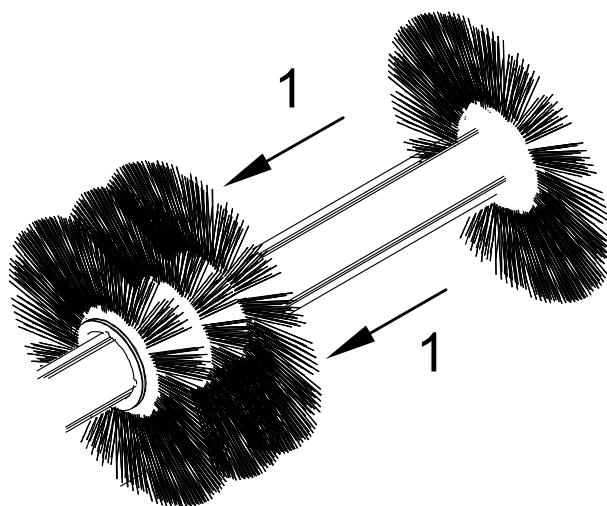
Brush and distance rings

Brush rings

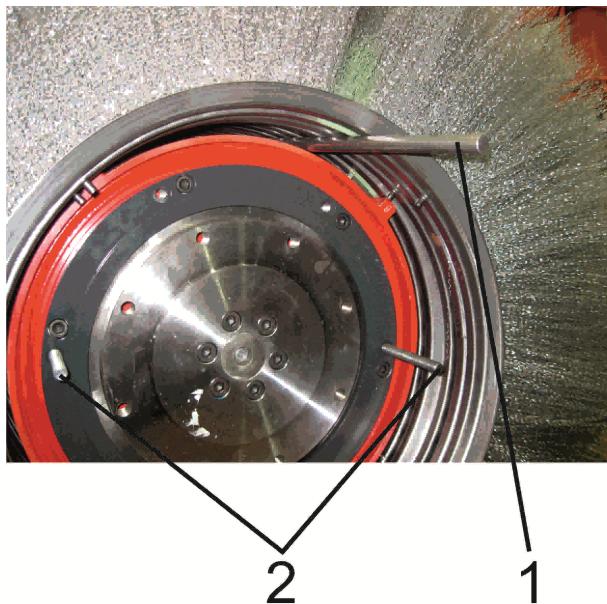
- Note the colour marking (1) on the brush rings.
 - When sliding on the brush rings, the colour marking (1) should always be on the opposite side of the brush ring previously fitted.

Distance rings

- Pay attention to the weld connection (2).
 - When sliding on the distance rings, the weld connection (2) should always be on the opposite side of the distance ring previously fitted.

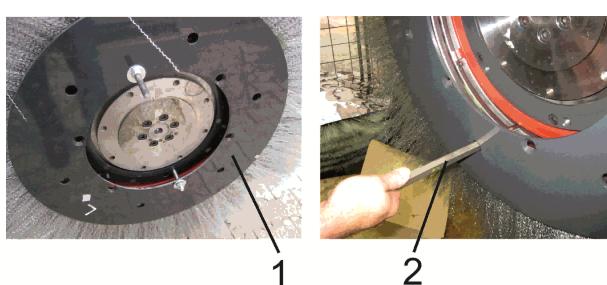


- When sliding on the brush rings, the brushes already fitted should be pressed firmly together (1) by hand.
 - This ensures that the brush disks are positioned closely together.

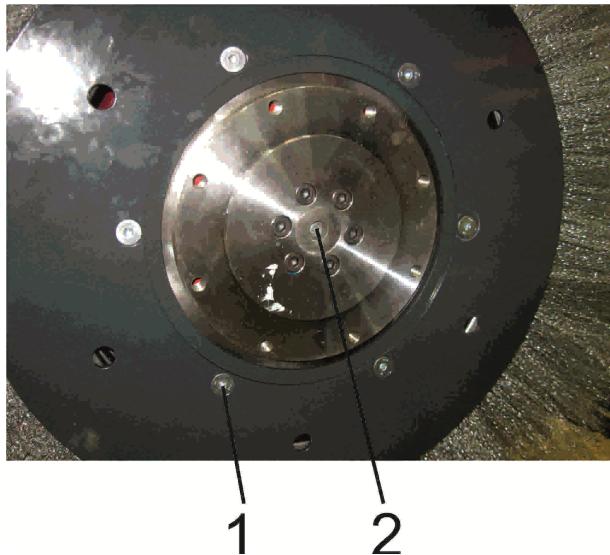


Experience shows that the last approx. 2 brush and distance rings have to be pressed onto the cylinder brush with the brush end disk.

- Insert the mounting rods Ø approx. 18 mm (1) between the cylinder brush and disk brushes. Place the remaining disk brushes onto the mounting rods.
- Screw the clamping bolts (2) into the holes on the cylinder brush.

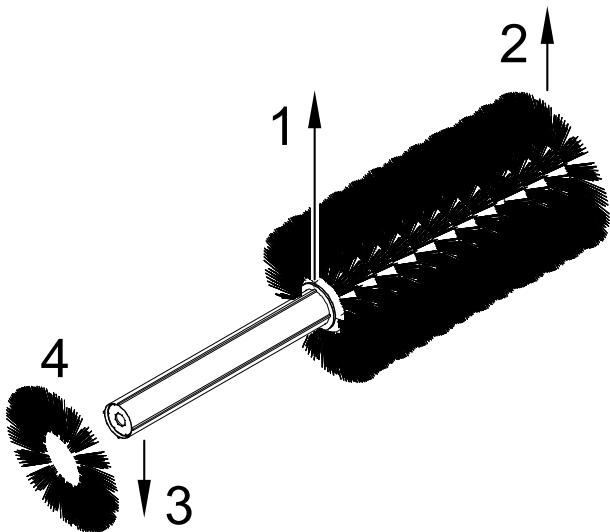


- Place the brush end disk (1) onto the clamping bolts and move towards the cylinder brush with the washer and nut.
- Use a mandrel to centre the disk brushes and intermediate rings so that they can be pressed onto the cylinder brush.

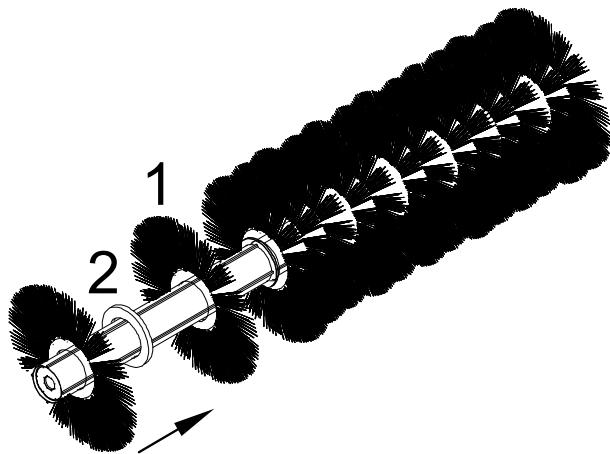


- When assembling the brush end disks, new countersunk screws (1) should be used and tightened crosswise in opposite pairs (M12x30-10.9, MA 115 Nm).
- Remove the clamping bolts.
- Grease the coupling via lubricating nipples (2). The coupling must not be permitted to push out of the bearing.

Fit the disk brushes onto the second half of the ring brush roller pipe.



- Lock the raised ring brush roller pipe (1) in the upper position (2).
 - This prevents the ring brush roller pipe from tipping when the lock is released downwards(3).
- Remove the lock downwards (3).
 - Access for pushing on the disk brushes (4) is enabled.



- Slide the disk brushes (1) alternating with the distance rings (2) onto the ring brush roller pipe.
- The remaining procedure must be performed in the same way as the assembly of the first half.
- Place the ring brush roller pipe fitted with brushes in the mounting trolley and fit it onto the cross brush.



ENVIRONMENT!

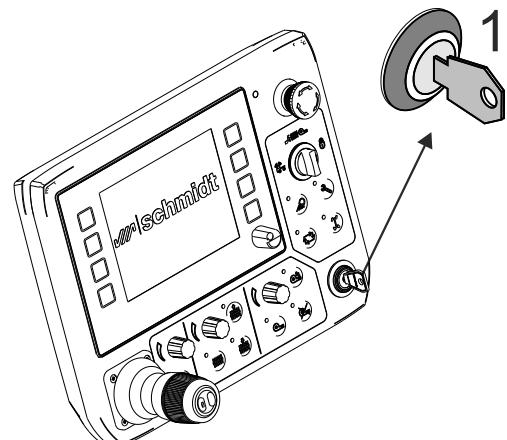
Brush disks and intermediate rings can enter the environment.

Environmental pollution

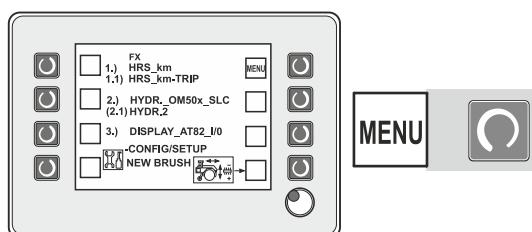
► Properly dispose of brush disks and intermediate rings.

9.6.3 Performing manual lubrication

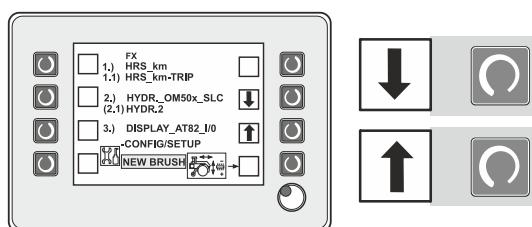
Manual lubrication is performed to check the function of the central lubrication unit or to perform additional lubrication.



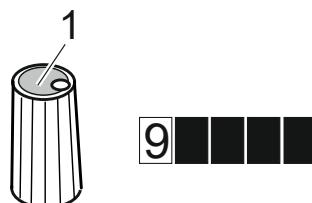
- Switch on the ignition (1). The auxiliary engine does not need to be started.



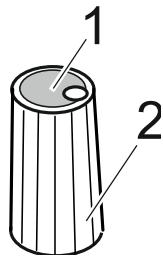
- Switch to the display   by pressing the button.



- Use the arrow button to select the "NEW BRUSH" function.



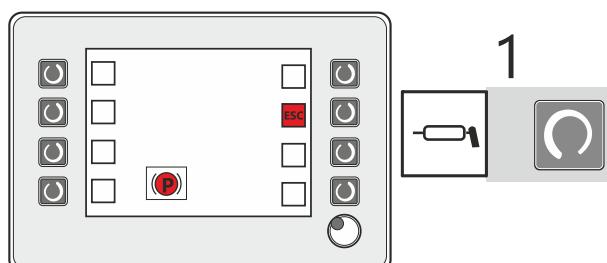
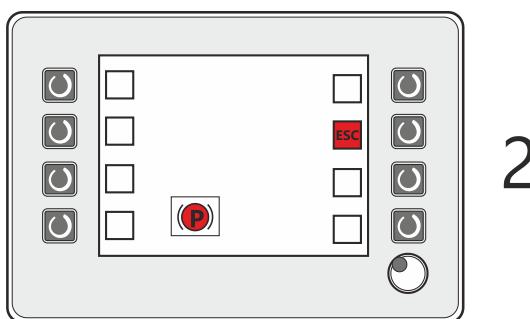
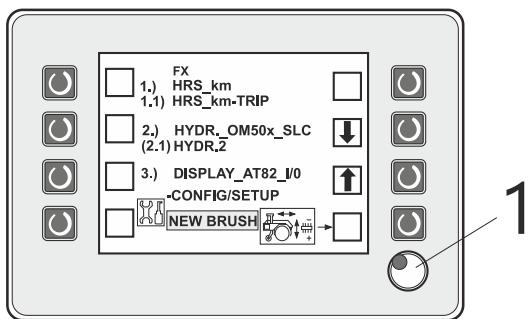
- Confirm the selection by pressing the rotary switch (1). Password fields appear.



Enter the password

- Press the rotary switch (1) to enable the number pad. The number pad flashes.
- Set the number using the rotary switch (2).
- Confirm the number that you have set by pressing the rotary switch (1).

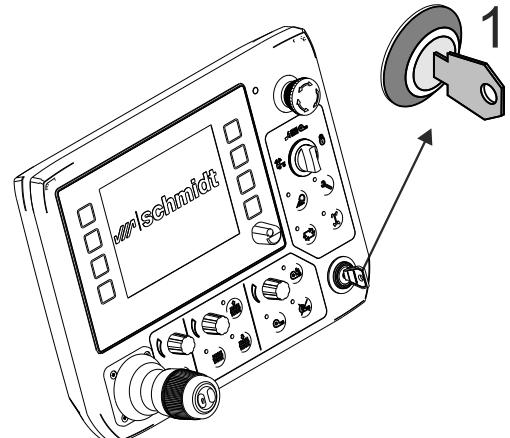
The following menu screen appears when the password has been completely entered and confirmed.



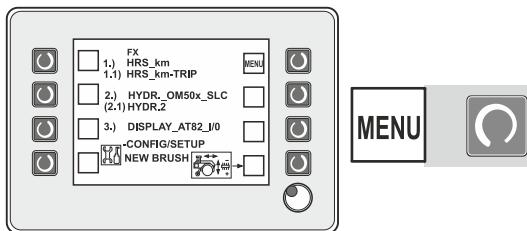
- Confirm the "NEW BRUSH" menu by pressing the rotary switch (1). Menu screen appears

- Start the central lubrication unit by pressing and holding down the button (1).

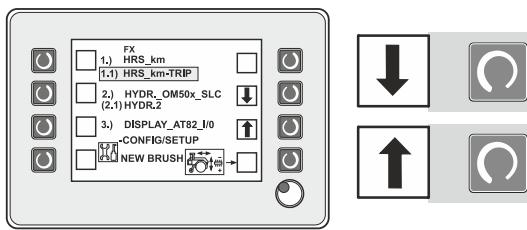
9.6.4 Resetting the trip counter



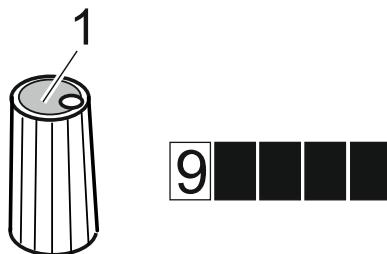
- Switch on the ignition (1). The auxiliary engine does not need to be started.



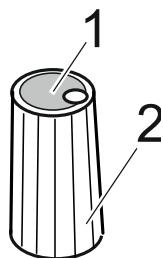
- Switch to the display  by pressing the button.



- Use the arrow button to select the "HRS_km-Trip" function.



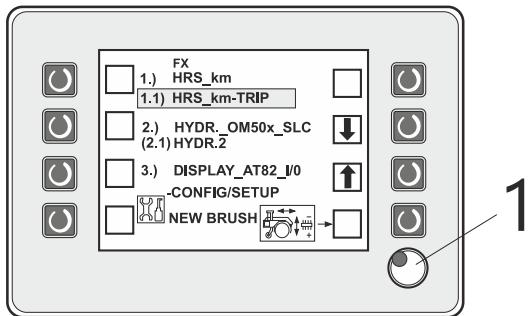
- Confirm the selection by pressing the rotary switch (1). Password fields appear and prompt for password entry.



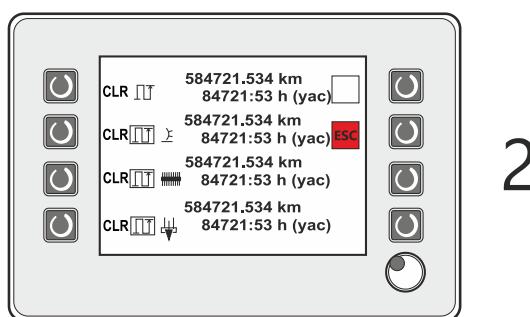
Enter the password

- Press the rotary switch (1) to enable the number pad. The number pad flashes.
- Set the number using the rotary switch (2).
- Confirm the number that you have set by pressing the rotary switch (1).

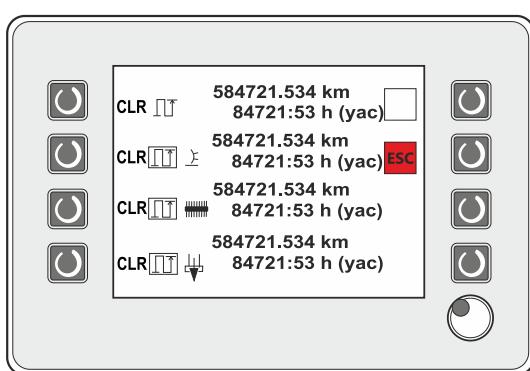
The following menu screen appears when the password has been completely entered and confirmed.



- Confirm the "HRS_km-Trip" menu with the rotary switch (1).



The menu screen (2) appears



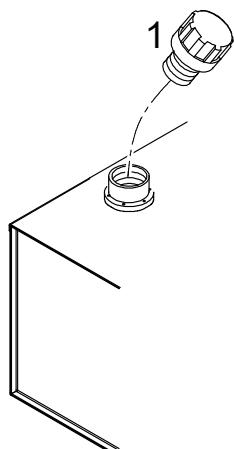
- Reset the counter with the respective button.



- Exit the screen with the button.

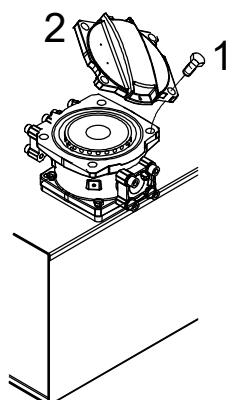
9.6.5 Suction and return filter

Change filter insert

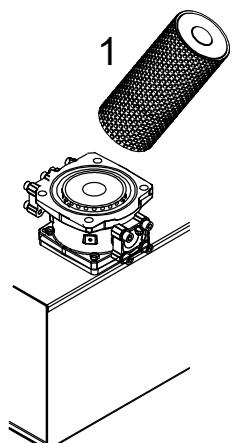


Take out the filter

- Switch off the auxiliary engine.
- Have the oil collection pan and cleaning cloths ready in order to catch and remove any oil that may run out.
- Open the ventilated filler cap (1) in order to allow any pressure in the tank to escape.



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



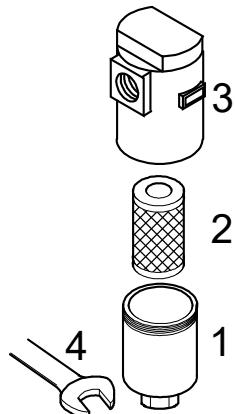
- Pull the filter element (1) from the filter housing.
- Clean the housing and cap.
- Check the O rings on the cap for damage and change these if necessary.

Install the filter

- The identification markings on the new filter element must correspond to those on the old filter element.
- Installing the filter is carried out by reversing the disassembly sequence.
- Arrows on the filter cover must be heeded.
- Switch on hydraulic system and check filter for leakage.
- Check oil level and top up with oil, if necessary.

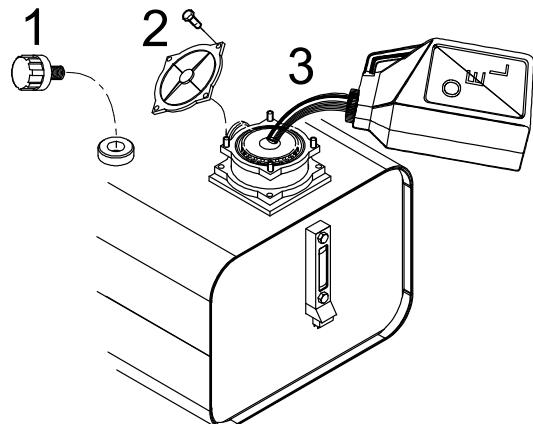
9.6.6 Pressure filter

Changing the filter insert



- Unscrew the filter holder (1) with an open-ended spanner (4). Catch any oil that runs out.
- Remove filter (2) from filter head (3).
- Press new filter into the filter head (3).
- Tighten the filter holder (1) by hand.

9.6.7 Changing hydraulic fluid



- Open the ventilated filler cap (1)
- Place catch pan under draining point. Open the oil drain screw and empty the tank.
- 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 (2). After filling, the filter cover (2) and the ventilated filler cap (1) are to be closed. Check oil level through sight glass.
- 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.

9.6.8 Adjusting the wiper apparatus



WARNING!

Adjustment and measurement work on the cross brush.

Persons can be caught by the cross brush.

- ▶ Only perform adjustment and measurement tasks when the diesel engine is switched off.

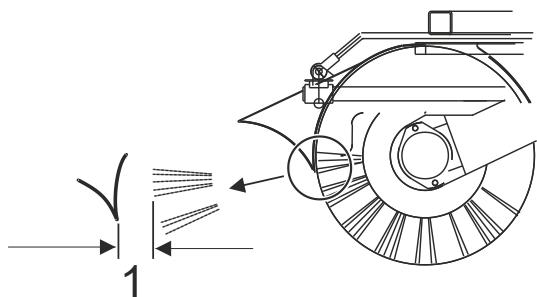
**IMPORTANT!**

If not observed, damage to the machinery results.

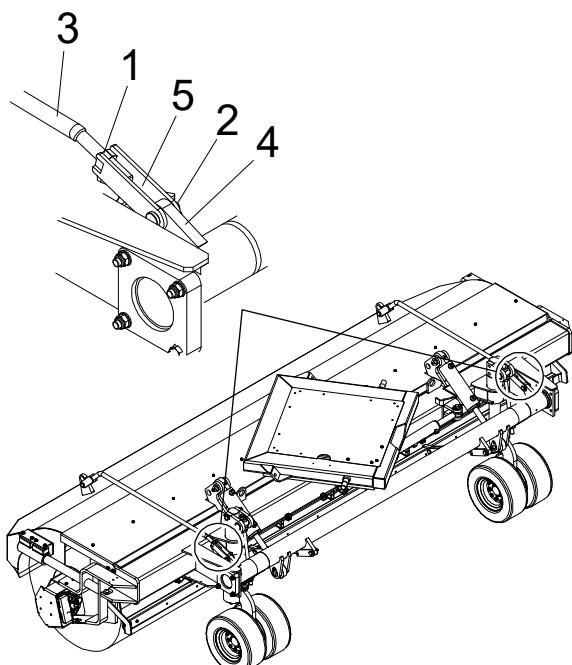
- The brush is never to come into contact with the wiper equipment during operation.

**NOTE**

The following adjustment tasks must be carried out on both sides.



The cross brush is equipped with a wiper plate. The clearance between the cross brush and the wiper plate (1) should be approx. 20 mm during operation.



- Lower the cross brush into working position
- Loosen locknut (1) (M24)
- Loosen and remove the bolts (2)
- Remove adjusting rod (3) from the support bracket (4) on the wiper plate.
- Adjust the fork head (5) so that the distance between the cross brush and the wiper plate is 20 mm.
- Pivot the adjusting rod (3) into the holder (4), fasten and lock with bolts (2). Tighten locknut (1).
- Move the cross brush into the working position and check the clearance.

9.6.9 Rear wiper apparatus

Adjusting the wiper apparatus

**WARNING!**

Adjustment and measurement work on the cross brush.

Persons can be caught by the cross brush.

- ▶ Only perform adjustment and measurement tasks when the diesel engine is switched off.
-

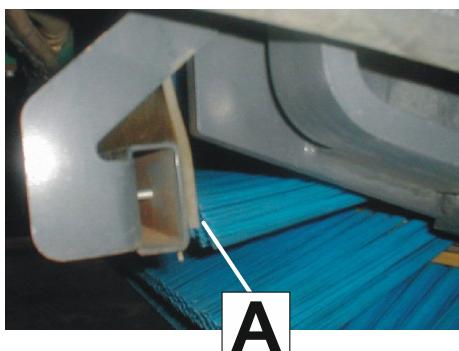
**IMPORTANT!**

If not observed, damage to the machinery results.

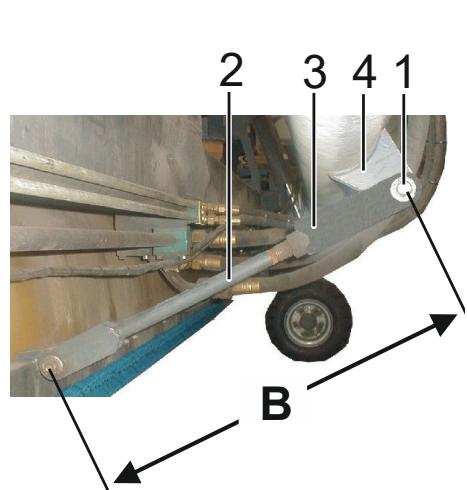
- ▶ The brush is never to come into contact with the wiper equipment during operation.
-

**NOTE**

The following adjustment tasks must be carried out on both sides.



The cross brush is equipped with a rear wiper apparatus. The clearance between the cross brush and the wiper plate "Dimension A" should be 20 mm during operation.



Adjust clearance

- Slacken and remove bolts (1)
- Remove the adjusting rod (2) from the support bracket of the adjustment tube (4).
- Set the fork head (3) until dimension "A" is 20 mm.
- Pivot the adjusting rod (2) into the holder (4), fasten and lock with bolts (1).
- Determine dimension "B" and apply this to the remaining adjustment rods.

9.6.10 Changing wheels and tyres



CAUTION!

There is a danger of injury if parts of the tyre or tube are ejected or slung away.

When removing a tire or a rim half, make sure that they are not under pressure. Let the air out of the tyre completely before loosening any bolts.

- The repairs are only to be done by capable personnel with the respective tools.

**WARNING!**

No proper maintenance work

There is a risk of injury to hands.

- ▶ Park the vehicle safely. In addition, fit a brake chock in front of and behind the wheels.
- ▶ Use the prescribed wheel and tyre size, tyre load rating and speed rating.
- ▶ Check the tyre air pressure.
- ▶ Tighten wheel nuts in alternating sequence
- ▶ Observe the tightening torques.

Changing a wheel or tyre may only be done at an authorised workshop.

Changing wheels and tyres on the sweeper

**IMPORTANT!**

Different tyre diameters can cause:

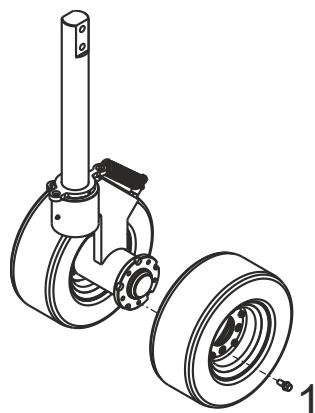
One-sided sweeping range setting.

Poor sweeping performance.

One-sided brush wear.

Damage to the sweeper because of tension on material.

- ▶ Always make sure that the tyre diameter is the same on the left and the right. Always change tires on the right and left at the same time.



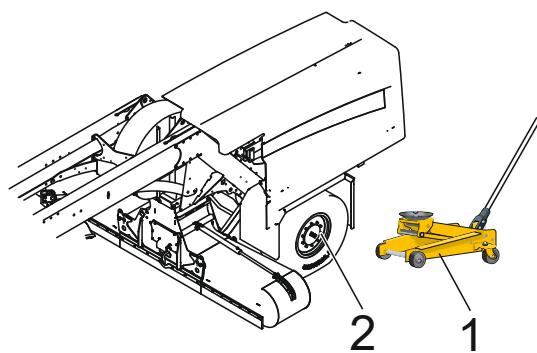
Disassembly

- Pivot the sweeper into transport position.
- Park the machine safely
- Fully deflate the tyre pressure
- Unfasten the wheel bolts (1)
- Remove the wheel from the hub

Assembly

- Tighten the collar wheel bolts (1) with a tightening torque of 140 Nm.
- Fill the tyre with an air pressure of 10 bar.
- After changing a tyre, retighten the wheel bolts (1) after 50 km.

Wheel change on the rear platform



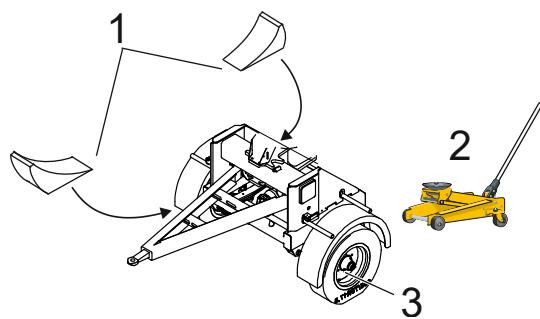
Disassembly

- Pivot the sweeper into transport position.
- Park the TJS safely
- Place brake chocks underneath the wheels
- Fit the trolley jack (1) with plate at a suitable position underneath the axle. It is not permitted for lines and cables to be damaged.
- Carefully raise the TJS as high as possible.
- Fully deflate the tyre pressure
- Loosen the wheel bolts (2)
- Remove the wheel from the hub

Assembly

- Tighten wheel bolts (2) with a torque of 630 Nm.
- Fill the tyre with an air pressure of 9 bar.
- Tighten the wheel bolts after 50 km of operation.

Wheel change on the front axle with drawbar



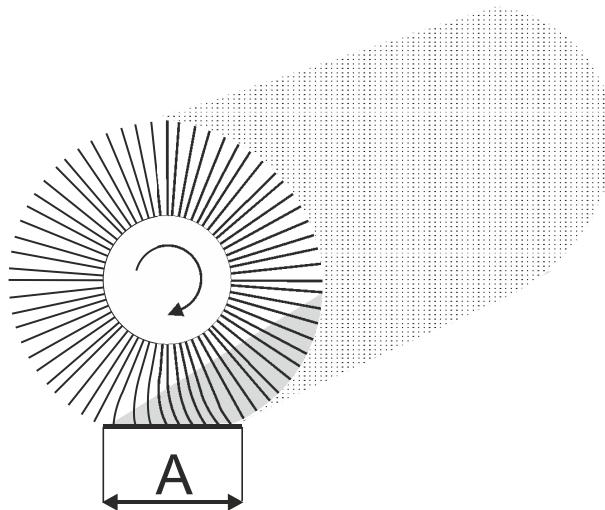
Disassembly

- Pivot the sweeper into transport position.
- Park the TJS safely
- Place a brake chock underneath the rear axle to prevent the machine rolling away.
- Block the turning radius of the front axle. To do this, place a brake chock (1) in front of and behind the wheel.
- Fit the trolley jack (2) with plate at a suitable position underneath the axle. It is not permitted for lines and cables to be damaged.
- Carefully raise the machine as high as possible.
- Fully deflate the tyre pressure
- Loosen the wheel bolts (3)
- Remove the wheel from the hub

Assembly

- Tighten the wheel bolts (1) with a tightening torque of 290 Nm.
- Fill the tyre with an air pressure of 8 bar.
- Tighten the wheel bolts after 50 km of operation.

9.6.11 Setting the sweeping range



Dimension "A" is used as the measurement.

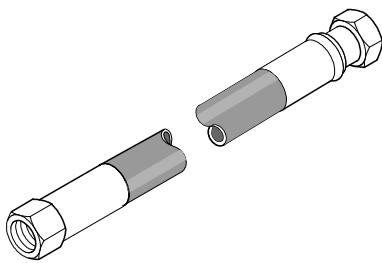
The controller is programmed to set a default sweeping range with new brushes to approximately 60 mm (Dim. "A").

The programming is carried out in a password-protected area. Programming another value is only to be carried out by Aebi Schmidt customer service.

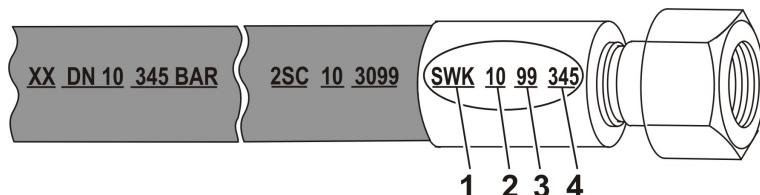
9.6.12 Hydraulic hose

Visual inspection points

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:



- Every 6 years in general.
- 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 tightness.



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)

9.6.13 Bolted joints

Visual inspection points

A visual inspection of the bolted joints by a qualified person should be arranged at least once a year.

The following features indicate a loose or damaged bolted joint.

- Distance between the components
- Cracked paint coating
- Broken spring ring / washer
- Bent bolt

**IMPORTANT!**

Tighten bolts

If not observed, damage to the machinery results.

- ▶ Determine the strength class of the bolted joint.
 - ▶ Retighten the bolt at the prescribed torque or rotation angle.
 - ▶ Repair damaged paint coating.
-

9.6.14 Corrosion protection



IMPORTANT!

Corrosion

If not observed, damage to the machinery results.

- ▶ Salt solutions, de-icing fluids etc. can destroy the materials. It must always be ensured that the machine is protected from external negative influences using preserving agents.

The machine must be protected from corrosion to ensure that it has a long life.

Machines that are exposed to salt solutions or de-icing fluids, for example at airports etc., are subject to very heavy corrosion.

The corrosion protection must be checked after each thorough clean and reapplied if required.

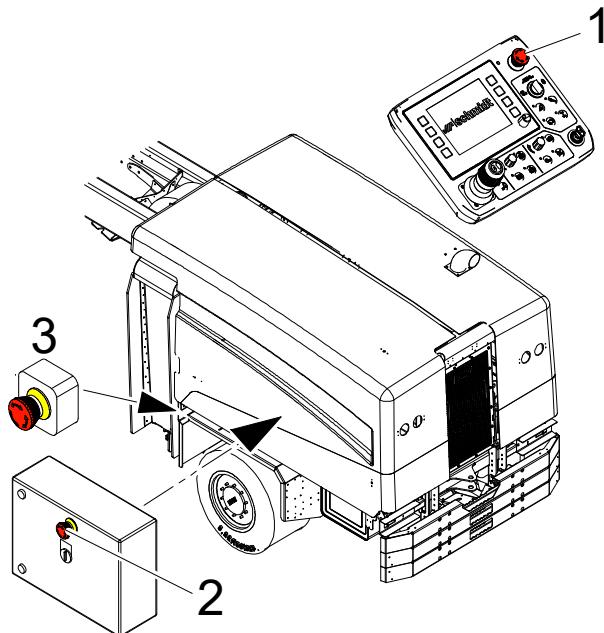
Corrosion protection measures must be carried out on the entire machine after each clearing season. If parts that are subject to corrosion are covered, these coverings must be removed in order to apply the protection from corrosion.

We recommend having the corrosion protection applied to the machine by a specialist company with the necessary knowledge or by Aebi Schmidt customer service.

Warranty claims resulting from inadequate or incorrect corrosion protection measures are excluded.

9.6.15 Emergency stop buttons

Checking the emergency stop button



There are emergency stop buttons (1) located on the:

- at the control panel (1)
- Electrical cabinet (2)
- at the rear left and right (3).



IMPORTANT!

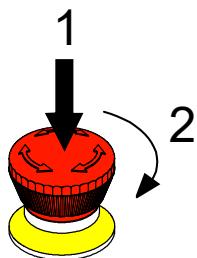
Test the emergency stop button at full load. The overrun of the blower and cross brush creates a very high pressure in the hydraulic system.

Hydraulic system may be damaged.

- ▶ Test the emergency stop buttons only at idling speed of the combustion engine.

Checking the functionality of the emergency stop button

- Run the combustion engine at idling speed.
- Press the emergency stop button (1). Combustion engine from the TJS is switched off.
 - Control panel remains on. Warning message "Emergency stop actuated" is displayed in the control panel.
 - Hydraulic drive for cross brush and blower are switched off.
 - The hydraulic controller is switched off.
 - Working light remains on.



Make the machine ready for use again.

- Disengaging the emergency stop button
 - Turn the emergency stop button (2) and pull it outwards.
- Switch off the ignition (turn ignition key to position "0").
- Start the machine.

10 Malfunctions and repairs

10.1 Changing wheels and tyres on the sweeper



CAUTION!

There is a risk of injury if parts of the tyre or tube slip.

Persons could be hit by wheel or hose parts

- ▶ When removing a tire or a rim half, make sure that they are not under pressure.
- ▶ The repairs are only to be done by capable personnel with the respective tools.
- ▶ Let the air out of the tyre completely before loosening any bolts.



WARNING!

Wheels can detach, and/or the vehicle can roll away.

Persons could be injured during the wheel change or when the vehicle is in use.

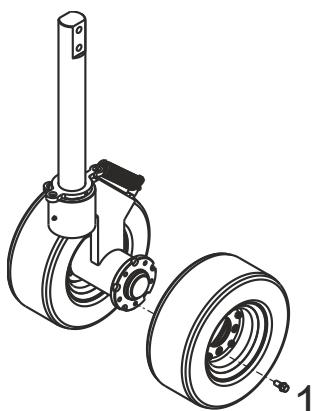
- ▶ Park the vehicle safely.
- ▶ Prescribed wheel and tyre size, tyre load rating and speed rating.
- ▶ Tyre air pressure 10 bar
- ▶ Tighten wheel nuts in alternating sequence
- ▶ Tightening torque 140 Nm

**IMPORTANT!**

Different tyre diameters can cause:

If not observed, damage to the machinery results.

- ▶ One-sided sweep range setting
- ▶ One-sided brush wear
- ▶ Poor sweeping performance
- ▶ Damage to the sweeper because of tension on material.
Always make sure that the tyre diameter is the same on the left and the right. Always change tires on the right and left at the same time.



Before loosening the collar wheel bolts (1), let all of the air out of the tyre.

Tighten the collar wheel bolts (1) using a tightening torque of 140 Nm during installation.

After changing a tyre, retighten the collar wheel bolts (1) after 50 km.

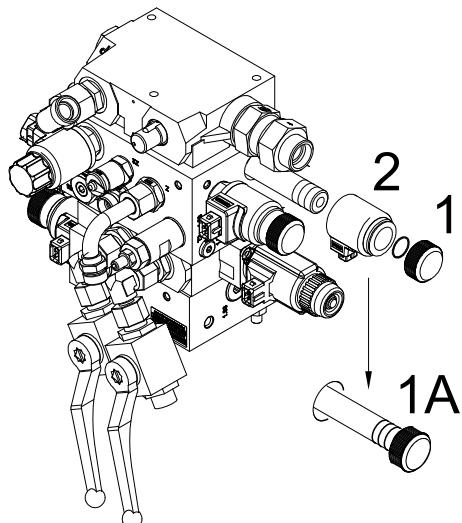
10.2 Auxiliary steering

Mechanical and software errors

The following should always be carried out during maintenance and repair work on the auxiliary steering:

- Switch off all engines
- Drain oil from the pressure reservoir. Filled pressure reservoirs could cause unexpected steering movements.
- Lower the machines to the ground or raise it and insert the transit locks.

10.3 Draining oil from the pressure reservoir



- Parking the machine safely
- Unscrew the cap (1) from the valve.
- Remove the magnet (2). Pay attention to the O-rings.
- Screw the cap onto the axle (1A). The pin in the cap opens the valve. Oil escapes from the pressure reservoir. The pressure reservoir is depressurised.

Installation is performed in reverse order.

When starting the auxiliary engine, the pressure reservoir is automatically filled with oil again.

10.4 Changing hydraulic hoses

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



ENVIRONMENT!

Leaking oil

If not observed, environmental damage results.

- ▶ 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.

10.5 Changing the battery



WARNING!

Battery gases are highly explosive.

A person could be severely injured or killed.

- ▶ Avoid sparking and naked flames near the battery.
- ▶ Electrical welding work may only be carried out properly by a qualified person.



IMPORTANT!

Short circuit danger

If not observed, damage to the machinery results.

- ▶ Ensure the correct polarity when attaching terminals and taking terminals off the battery.



NOTE

Electrical system

- ▶ The electrical system of the auxiliary engine is designed for 24 volts. The batteries are set up in parallel and in a series.



ENVIRONMENT!

The battery contains hazardous substances.

If not observed, environmental damage results.

- ▶ Dispose of batteries in accordance with regulations. Use any return option available.

Taking out the battery:

- Park the vehicle safely.
- Switch off all consumer devices.
- Turn off the battery isolating switch.
- Remove the battery cover.
- Separate the battery earth cable from the battery. This ensures that a short circuit does not occur.
- Disconnect the positive cable (red) from the battery.
- Release the battery fastening and take out the battery upwards.

Installing the battery**WARNING!**

The is a danger of a short circuit, sparking, etc.

A person could be severely injured or killed

- ▶ Ensure the correct polarity when attaching the terminals to the battery.

-
- Park the vehicle safely.
 - Switch off all consumer devices.
 - Turn off the battery isolating switch. Sparking can occur if this is not adhered to.
 - Remove the battery cover.
 - If necessary, insert and secure the battery with the help of personnel and using lifting equipment.
 - Connect the positive cable (red) to the battery.
 - Connect the earth cable to the earth terminal and lubricate.
 - Install the battery cover.

10.6 Welding work on the machine



IMPORTANT!

Welding work on the machine

If not observed, damage to the machinery results.

- ▶ Disconnect the battery
- ▶ Disconnect electrical and electronic components.

- Before welding work:
 - Disconnect the battery (first the (-) terminal, then the (+) terminal).
 - Unplug the electrical and electronic plug connectors.
- 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.

10.7 Special tools

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.

10.8 Emergency manual override

Emergency manual override of the solenoid valves can result in dangerous movements. Appropriate safety measures must be made before any such work is undertaken.

10.9 Towing/recovering

Definition of towing/recovery

Towing

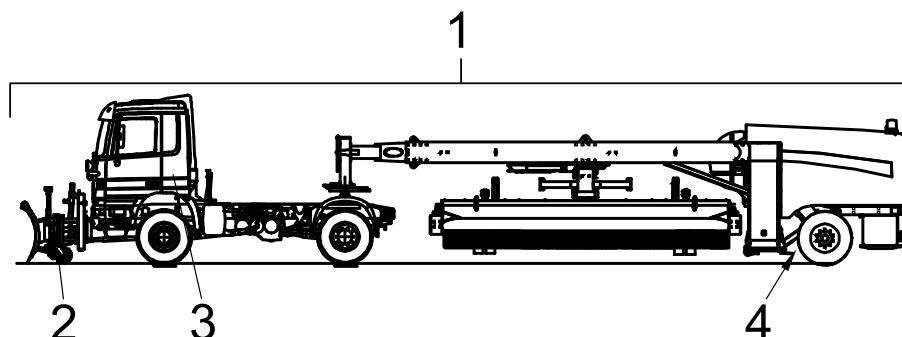
Towing is the pulling of a broken-down vehicle using another vehicle as short-term emergency assistance. Only trained personnel with practical experience may be assigned with towing tasks.

Recovery

Recovery is the pulling or pushing of a vehicle that has had an accident from an emergency situation. This task must also be performed by trained personnel with the pertinent practical experience using a special vehicle.

Towing the TJS

Preparation for towing



TJS (1)	Secure the TJS against rolling away. <ul style="list-style-type: none">Place brake chocks underneath the wheels.
Vehicle (3)	See the vehicle manufacturer's operating instructions
Snow plough (2)	<ul style="list-style-type: none">Raise the snow plough. In case of a failure of the hydraulic system snow plough lift as far as possible through the castor wheels (1).

Rear axle TJS (4)

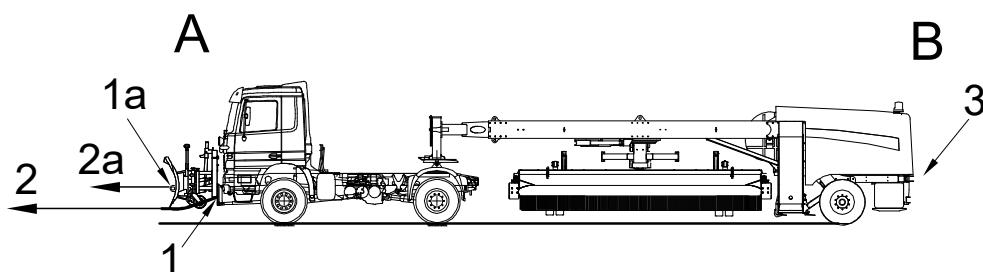
- Have the pneumatic brake (2) on the rear axle released by a specialist.

**IMPORTANT!**

Possible damage due to strong tensile forces on the snow plough connector.

If not observed, damage to the machinery results.

- If possible, always use the rear-side towing eye.

Attachment possibilities

Front side (A)

With functional brakes

- Attach the towing strap to the vehicle plate (1) and/or towing eye on the snow plough (Option 1a).
- Guide the towing strap under the snow plough (2) and/or directly (2a) to the towing vehicle and attach it. Protect the towing strap against the damage on sharp edges (e.g., cutting edge) with protectors.

Rear side (B)

When the brake system has failed

- Attach the tow bar to the towing eye (3).
- Attach the tow bar to the towing vehicle.

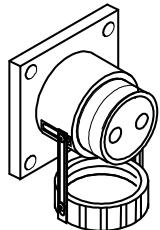
It is essential to note the following when towing:

- The personnel assigned with towing must always be in contact with the drivers of the towing and towed vehicles.
- If possible, always use the rear-side towing eye (3).
- In regard to the forces that occur during towing, assume the permitted total weight of the machine to be towed.
- The towing strap or tow bar must be designed for the respective forces and must be fastened to a suitable location on the vehicle.
- Always tow vehicles in a straight line.
- The towing speed of 5 km/h must not be exceeded.
- Only tow over short distances.
- Take off and tow smoothly (no jerky movements).
- When the brakes are defective, only the tow bar may be used to tow the vehicle.

Recovery of the TJS

To recover the TJS, a special vehicle with trained personnel who have the pertinent practical experience must be used.

Remote start connector 24V



The remote start connector is located in the battery area.

A helping vehicle can jump-start the TJS through the remote start connector.

Jump starting

- Turn off the ignition and all electrical consumers of the TJS.
- Connect the jumper cables on the TJS and the helping vehicle.
- Start the engine of the helping vehicle and let it run at high speed.
- Start the engine of the TJS.
- After a successful start of the engine, remove the jumper cables.

11 Taking the snowplough out of service

Only trained personnel working in suitably equipped workshops may perform decommissioning. The maintenance work is described in a separate document.

- Clean thoroughly.
- Carry out a full lubrication (in accordance with the lubrication schedule). An oil and filter change must be performed before the clearing season.
- Protect exposed piston rods of the hydraulic cylinders from corrosion with spray oil.
- Correct paint damage.
- 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 in a cool (room temperature) 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.
- Empty the fuel tank completely and fill it with fresh fuel. Measure reduces rust formation.
- Remove the battery, check acid levels and charge every 3 months.
- Perform all preservation tasks for the TJS.

12 Disposal

Consumables must be disposed of properly.

Oils and lubricants

Do not allow oils and lubricants to be released into the environment.

- Collect oils and lubricants in suitable, secure storage containers and dispose of properly.

Plastics

Plastics can cause considerable damage to the environment.

- Plastics must be disposed of appropriately.
- Indicated plastic parts can be recycled.

Snow plough

- Worn-out machines should be disposed of correctly by a qualified / certified company.

13 Accessories, special tools

Vehicle/auxiliary engine

See separate manufacturer's operating instructions.

TJS

No special tools are required to maintain or repair the TJS.

Electrical and hydraulic measuring tools are required for troubleshooting.

Changing and storing the cylindrical brush



Trolley

The trolley is required for the disassembly of the cylindrical brush.



Pillow block

The pillow block is used to store removed cylinder brushes.



Centring device

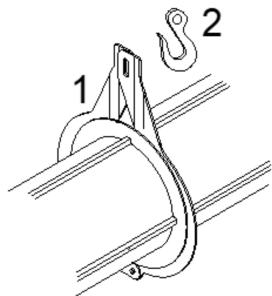
The centring device is available in left-hand and right-hand versions. The centring device is required to position the cylindrical brush between the drive motors.

**Anti-twist device**

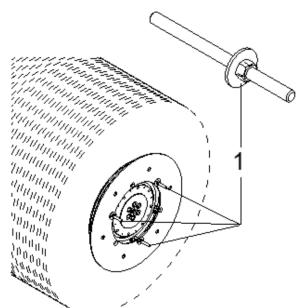
The anti-twist device is used to secure the steering wheel and secure the cylinder brush against twisting.

**Twist tool**

The twist tool can be used to turn the cylindrical brush.

**Suspension device**

The suspension device (1) can be used to raise the cylinder brush, e.g. for changing the brush with a lifting device (2) such as a crane.

**Clamping bolts**

The clamping bolts (1) can be used to pull up the brush end disk on the brush winch.

14 Declaration of Conformity

The CE declaration has been enclosed with the document folder as an original with reference to the respective vehicle identification number.

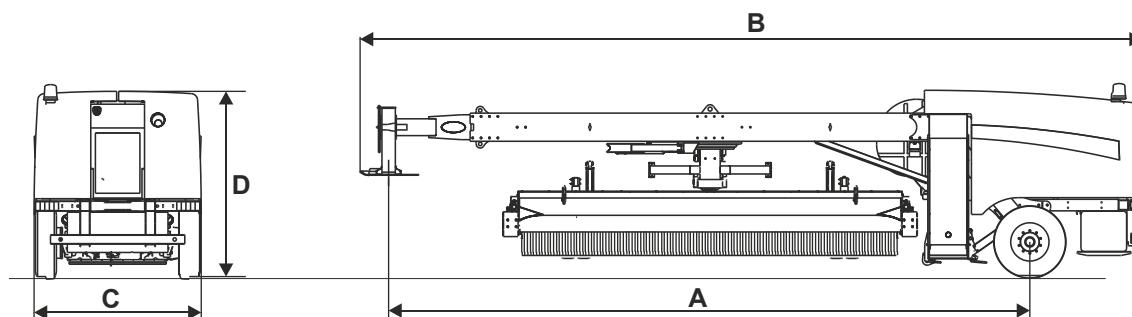
15 Technical specifications

TJS type plate

The type plate is on the rear right of the engine frame.

Dimensions

TJS



Dimensions (mm)	TJS 420	TJS 560	TJS 630
Length (Dimension B)	Approx. 10,330	Approx. 11,730	Approx. 12,430
Length of king-pin to the centre axle (dimension A)	Approx. 8,160	Approx. 9,560	Approx. 10,260
Transport width (Dimension C)	Approx. 2,550	Approx. 2,550	Approx. 2,550
Height (without rotary beacons) (Dimension D)	Approx. 2,780	Approx. 2,780	Approx. 2,780
Sweeping width at 32°			
	Approx. 3,560	Approx. 4,750	Approx. 5,340
Sweeping width at 36°	Approx. 3,400	Approx. 4,530	Approx. 5,100

Combustion engine

The exact description can be found in the corresponding operating instructions of the engine manufacturer.

Combustion engine Mercedes Benz OM 936 LA

Used with the TJS 420, TJS 560, TJS 630

Manufacturer	Mercedes Benz
Model	OM 936 LA
Design	6-cylinder, inline engine
Engine capacity	7,700 cm ³
Output	260 kW (354 HP) at 1,800 rpm
Emission level	3a

Combustion engine Mercedes Benz OM 936 LA

Used with the TJS 420

Manufacturer	Mercedes Benz
Model	Mercedes Benz OM 936 LA
Design	6-cylinder, inline engine
Engine capacity	7,700 cm ³
Output	260 kW (354 HP) at 1,800 rpm
Emission level	V

Combustion engine Mercedes Benz OM 936 LA

Used with the TJS 560, TJS 630

Manufacturer	Mercedes Benz
Model	OM 936 LA
Design	6-cylinder, inline engine
Engine capacity	7,700 cm ³
Output	280 kW (381 HP) at 1,800 rpm
Emission level	V

Internal combustion engine VOLVO D13

Used with the TJS 560, TJS 630

Manufacturer	VOLVO
Model	TAD1372VE
Design	6-cylinder, inline engine
Engine capacity	12,780 cm ³
Output	315 kW (428 HP) at 1,700 rpm
Emission level	Tier 4f (EU IV)

Internal combustion engine VOLVO D11

Used with the TJS 560, TJS 630

Manufacturer	VOLVO
Model	TAD1183VE
Design	6-cylinder, inline engine
Engine capacity	10,840 cm ³
Output	315 kW (428 HP) at 1,700 rpm
Emission level	V

Electrical system

Components	TJS 420	TJS 560	TJS 630
Generator	28 V, 100 A	28 V, 100 A	28 V, 100 A
Batteries	2 x 12 V / 220 Ah	2 x 12 V / 220 Ah	2 x 12 V / 220 Ah

Brush drive

	TJS 420	TJS 560	TJS 630
Type of drive	Hydrostatic	Hydrostatic	Hydrostatic
Variable displacement pump	Delivery volumes 180 cm ³ /rev.	Delivery volumes 180 cm ³ /rev.	Delivery volumes 180 cm ³ /rev.
Constant motor	Displacement volume 2x160 cm ³ /rev.	Displacement volume 2x160 cm ³ /rev.	Displacement volume 2x160 cm ³ /rev.

	TJS 420	TJS 560	TJS 630
Max. operating pressure	420 bar	420 bar	420 bar

Fan drive

	TJS 420	TJS 560	TJS 630
Type of drive	Hydrostatic	Hydrostatic	Hydrostatic
Variable displacement pump	Delivery volumes 180 cm ³ /rev.	Delivery volumes 180 cm ³ /rev.	Delivery volumes 180 cm ³ /rev.
Constant motor	Displacement volume 90 cm ³ /rev.	Displacement volume 90 cm ³ /rev.	Displacement volume 90 cm ³ /rev.
Max. operating pressure	420 bar	420 bar	420 bar

Sweeper apparatus

	TJS 420	TJS 560	TJS 630
Brush length	4,200 mm	5,600 mm	6,300 mm
Brush diameter	914 mm	914 mm	914 mm
Brush speed max.	Approx. 750 rpm	Approx. 750 rpm	Approx. 750 rpm
Working range (Brush diameter 914 mm)	300 to 750 rpm	300 to 750 rpm	300 to 750 rpm

Brush service life

In automatic mode, it is possible to ensure an optimal combination of good cleaning results and long service life. This mode increases the brush speed at increasing vehicle speed (to ensure constant cleaning performance per surface area). Basically, the service life of a brush is defined in cleaning a certain area before the wear limit of the brush is reached. If a sweeping task is completed at lower speed, a corresponding area

can be cleaned. If the speed is doubled, the wear limit is reached twice as quickly, but the swept area remains approximately the same. The achievable area performance depends decisively on the influencing factors of the surface to be swept (e.g. rough/smooth, dry/damp, etc.), brush speed and sweeping level (contact pressure of the brush on the sweeping surface).

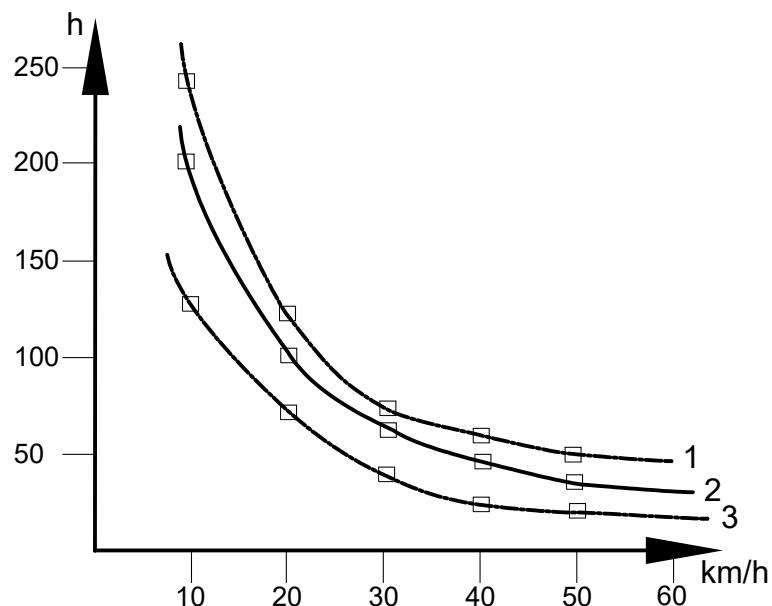
To be able to compare the "Brush service life" in operating hours, Aebi Schmidt always relates it to the operation based on a speed of 10 km/h. This means that at a brush service life of 50-60 operating hours at a speed of approx. 30-40 km/h, an equivalent brush service life will be 150 hours of operation or more at 10 km/h.



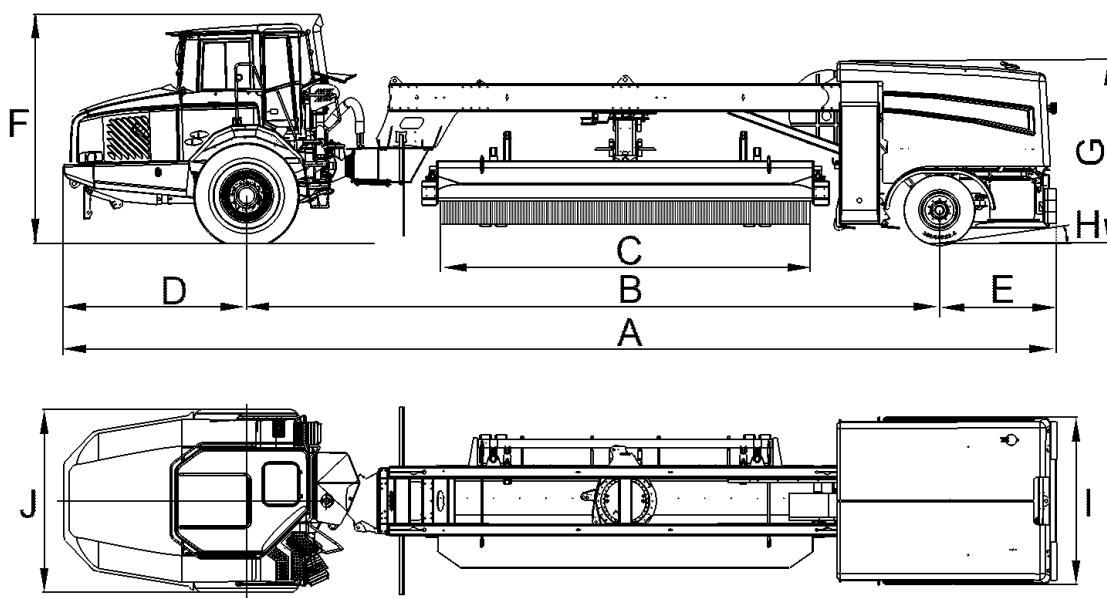
NOTE

Surface calculation

- ▶ The area calculations are applicable for TJS-C 630 type jet sweepers.



1. Light conditions (low relative abrasion, little snow and/or wet surface). A brush set had an "expected service life" of approx. 13.0 km².
2. Average conditions (average relative abrasion, snow under dry/cold conditions). A brush set has an "expected service life" of approx. 11.0 km².
3. Abrasive conditions (very abrasive surface, much snow under cold/dry conditions). A brush set has an "expected service life" of approx. 7.5 km².



Dimensions: (mm)	TJS-C 560	TJS-C 630
Length (dimension A)	Approx. 15,700	Approx. 16,400
Length (dimension B)	Approx. 10,500	Approx. 11,250
Length of cylinder brush (dimension C)	Approx. 5,600	Approx. 6,300
Sweeping width at 32°	Approx. 4,750	Approx. 5,350
Sweeping width at 36°	Approx. 4,530	Approx. 5,100
Length (dimension D)	Approx. 2,850	Approx. 2,850
Length (dimension E)	Approx. 2,300	Approx. 2,300
Height (dimension F)	Approx. 3,475	Approx. 3,475
Height (dimension G)	Approx. 2,760	Approx. 2,760
Slope gradient (dimension H)	Approx. 8°	Approx. 8°
Width (dimension I)	Approx. 2,540	Approx. 2,540
Width (dimension J)	Approx. 2,775	Approx. 2,775

Weight without plough: (kg) depending on equipment	
Total weight with diesel	Approx. 21,300
Axle load rear	Approx. 9,300

Weight without plough: (kg) depending on equipment			
Axle load front	Approx. 12,000		

Engine:	Mercedes Benz	VOLVO	VOLVO
Design	6 cylinder, V engine	6 cylinder, inline engine	6 cylinder, inline engine
Type	OM 501 LA	TAD1372VE	TAD1172VE
Output	315 kW (428 HP)	315 kW (428 HP)	285 kW (387 HP)
Max. torque	2,000 Nm at 1,080 rpm	2,175 Nm at 1,200 rpm.	1,938 Nm
Nominal speed	2,000 rpm	1,800 rpm.	1,700 rpm.
Exhaust level	EUROMOT 3a	EUROMOT 4	EU IV / US T4f
Engine capacity	11,950 cm ³	12,780 cm ³	10,800 cm ³
Generator	28 V, 100 A	28 V, 110 A	

Fuel system:	
Fuel tank	600 Litre

Electrical system:	
Starter	24 V
Batteries	2 x 12 V/225 Ah
Lighting	Rear lighting set

Brush drive:	
Type of drive	Hydrostatic
Variable displacement pump	
Mercedes Benz OM 501 LA VOLVO TAD1362VE	Delivery volume, 125 cm ³ /rev Delivery volume, 180 cm ³ /rev

Brush drive:	
Constant-speed motor	Max. pressure 420 bar Displacement volume 2x160 cm ³ /rev. Max. pressure 420 bar

Blower drive:	
Variable displacement pump	Delivery volume 180 cm ³ /rev.
Constant-speed motor	Displacement volume 90 cm ³ /rev.
Max. pressure	420 bar

Sweeper unit:	
Brush diameter	914 mm
Brush speed max.	approx. 750 rpm
Working range (brush diameter 914 mm)	300 to 500 rpm
Brush speed	Variable adjustment

16 Circuit diagrams

Circuit diagrams

The circuit diagrams are located on the accompanying CD.

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