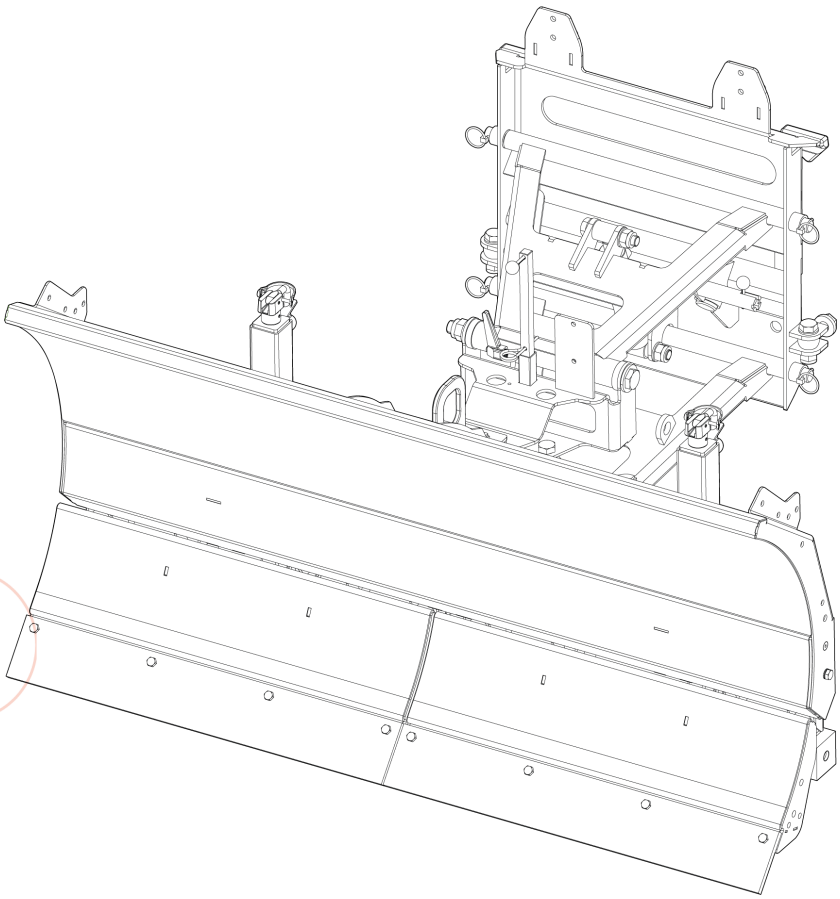
ZAUGG®
MASTERS OF SNOW

Operating instructions



Snow plow G9

No.: 2652-01.1en

G9-160/240-2-45

Every type of snow.
Every application.
ZAUGG impresses. Since 1893.

Identification

Operating instructions	
Object	**Snow plow** G9 **/** G9-160/240-2-45 **/ 00000**
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1.0	09/06/2023	M. Samuel	Initial production for the 0 series, snow plow G9-160 /180 /200 /220 /240.
1.1	July 15, 2025	M. Samuel	Spelling corrections and layout adjustments made.
1.2	August 18, 2025	M. Samuel	Adjustments made in chapter 3.6.3 Hydraulic system / Pressure relief valve block.

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Table of contents

1 For documentation

1.1 Introduction to the snow plow

The snow plow has the following special features:

- Lower fuel consumption thanks to smooth operation and good snow discharge.
- Good visibility at optimal plow height.
- Maintenance-free plastic lever bearing absorbs shocks.
- ZAUGG element suspension system offers a high level of comfort.
- Lifting device for snow plow.
- Plow blade divided in height and width, upper parts available in various designs.
- Lower segments preloaded by rubber hollow springs.
- Rubber hollow springs allow for long spring travel and damping.
- Shock absorbers and plow frame mounted in damping bushings.
- Height-adjustable wheels on the plow body.

1.2 Purpose

This operating manual provides instructions on the safe and proper use and maintenance of the snow plow.

The operating instructions must be read and understood by all persons working with the snow plow.

These operating instructions and all other relevant documents serve as a reference work after operator training on the machine and must be kept in the carrier vehicle.

1.3 Related documents

Tab. 1 Related documents

Index	Title	Contents
1	Spare parts	Technical drawings and spare parts lists for machine components

The complete documentation may comprise several documents.

1.4 Illustration

1.4.1 Markings

Control elements are enclosed in [square brackets].

- Example: Press the [Start] button.

References to other documents are *blue and italicized*.

- Example: See *Layout*.

References to internal content are orange and **bold**.

- Example: See **On-call and emergency service** .

1.4.2 Pictograms

Warning signs

Symbolism	Description
	General warning sign
	Warning of excessive pressure
	Warning of hand injuries

Symbolism	Description
	Warning of hot surface
	Warning of crushing hazard

Prohibition sign

Symbolism	Description
	General prohibition sign

Mandatory sign

Symbolism	Description
	General command sign
	Follow the instructions for use

Symbolism	Description
	Use eye protection
	Use foot protection

Symbolism	Description
	Use hearing protection
	Use protective clothing
	Wear a high-visibility vest
	Use attachment points

Symbolism	Description
	Wear protective gloves
	Use face protection
	Use restraint system

1.4.3 Warning notices

DANGER

Indicates an immediate danger. Failure to avoid this danger will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation. Failure to avoid it could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation. If not avoided, minor injury may result.

ATTENTION

Indicates a potentially hazardous situation. If not avoided, it could result in damage to equipment or machinery.

1.4.4 Note

Indicates useful information.

1.5 Representation of values

Values in illustrations may differ from the actual settings on the machine. **Only the information in the text** should be observed.

1.6 Training

Upon delivery of the machine, the manufacturer will conduct operator training with the operator's personnel.

ZAUGG AG EGGIWIL offers the following training courses on the machine:

- Operation
- Maintenance and servicing
- Cleaning

ZAUGG customer service provides information in accordance with **II Customer service and spare parts** .

1.7 Units

Tab. 2 Units

Unit	Designation	Description
″	inch	Length, 1″ = 25.4 mm
°	Degree	Angle
m	Meter	Length, 1 m = 1000 mm
m^2	Square meter	Area
mm	Millimeter	Length
l	Liter	Volume
l/min	Liters per minute	Volume flow
m^3	Cubic meters	Volume
kg	Kilogram	Mass (weight)
kg/m^2	Kilogram per square meter	Load capacity
mg/m^3	Milligrams per cubic meter	Emission, particle measurement
t	Ton	Mass (weight), 1 t = 1000 kg
°	Degree Celsius	Temperature
°F	Degrees Fahrenheit	Temperature, °F = °C × (9/5) + 32
K	Kelvin	Temperature, K = °C + 273.15
bar	Bar	Pressure, 1 bar = 10^5 Pa
Pa	Pascal	Pressure
dB_A	Decibel	Sound pressure level
Pcs	Piece	

2 Safety

2.1 Product safety

The snow plow is built according to the latest technology and recognized safety regulations. When used as intended, safe operation of the snow plow is guaranteed.

2.2 Safety concept

2.2.1 Principle

The snow plow is designed for attachment to a carrier vehicle with an overarching safety concept. The snow plow may only be put into operation if the connection between the carrier vehicle and the snow plow complies with the Machinery Directive.

2.2.2 Safety features

Mechanical locking

The mechanical lock on the carrier vehicle prevents the snow plow from lowering and detaching uncontrollably during transport.

Lighting and position markers

The lighting on the snow plow and the reflective elements ensure visibility even in poor lighting conditions.

2.3 Limitations

2.3.1 Intended use

The snow plow is intended exclusively for clearing snow in built-up areas (roads and sidewalks), outside built-up areas, and on mountain passes, in compliance with the performance data and operating conditions specified in the **Technical Data** section.

2.3.2 Misuse

WARNING

Misuse – risk of injury.

- Strictly observe the intended use.

Any use of the snow plow that deviates from its intended use is considered misuse.

The following, in particular, is considered misuse:

- Use of the snow plow on insufficient, standing ground (lack of stability).
- Failure to maintain a safe distance when maneuvering (moving) and when ejecting snow.
- Modifications made by the operator that have not been approved by the manufacturer.
- Transporting people, animals, or loads with the machine.

The manufacturer accepts no responsibility for accidents or damage caused by **misuse**.

2.3.3 Service life

The expected service life of the snow plow, provided that the prescribed maintenance intervals are observed, is 15 years or 4,500 operating hours.

2.4 Basic safety regulations

- The snow plow may only be operated when in perfect condition. Malfunctions and damage must be repaired immediately.
- The snow plow must be cleaned and maintained in accordance with the specified maintenance intervals.
- Technical modifications to the snow plow may only be carried out with the express consent of the manufacturer. This also applies to changes to the software.
- Only virus-free devices and data carriers may be used.
- Only original spare parts may be used.
- The availability of these operating instructions at the workplace must be ensured.
- All persons working with the snow plow must be instructed and must have read and understood the chapters of these operating instructions that are relevant to their work.
- Personnel in training may only work on the snow plow under the constant supervision of an experienced person.
- The operator must inform the manufacturer if any hazards or risks are identified that are not described in this operating manual.

2.5 Target group

2.5.1 Principle

The target group for this operating manual is qualified personnel in accordance with the national regulations and guidelines of the country in which the snow plow is operated.

The operator is responsible for training and instructing personnel.

ZAUGG customer service provides information in accordance with II Customer service and spare parts .

2.5.2 Staff qualifications

Depending on the activity involved in operating the snow plow, different personnel qualifications are expected and required.

The necessary personnel qualifications are specified at the beginning of each instruction.

2.5.3 Trained personnel

Trained personnel are instructed in the tasks to be performed and, if necessary, given training. They are aware of the potential dangers of improper behavior and the necessary protective measures.

2.5.4 Specialist personnel

Specialist personnel can assess the work to be carried out and identify potential hazards on the basis of their professional training and experience. They also have knowledge of the relevant regulations.

2.5.5 Personnel in training

Personnel in training are subordinate to specialized personnel and may only work on snow plows under the supervision of an experienced specialist.

2.5.6 Manufacturer

Personnel authorized by the manufacturer.

2.6 Safety signs

2.6.1 Principle

WARNING

Crush hazard – risk of injury in the swivel range of the snow plow.

- Avoid danger zones.
- No access for unauthorized persons.

WARNING

Misuse – Risk of injury due to incorrect fastenings.

- Check the tightening torques of the fastening screws before putting the snow plow into operation.
- Have maintenance work carried out by qualified personnel.

2.6.2 Safety signs on the machine

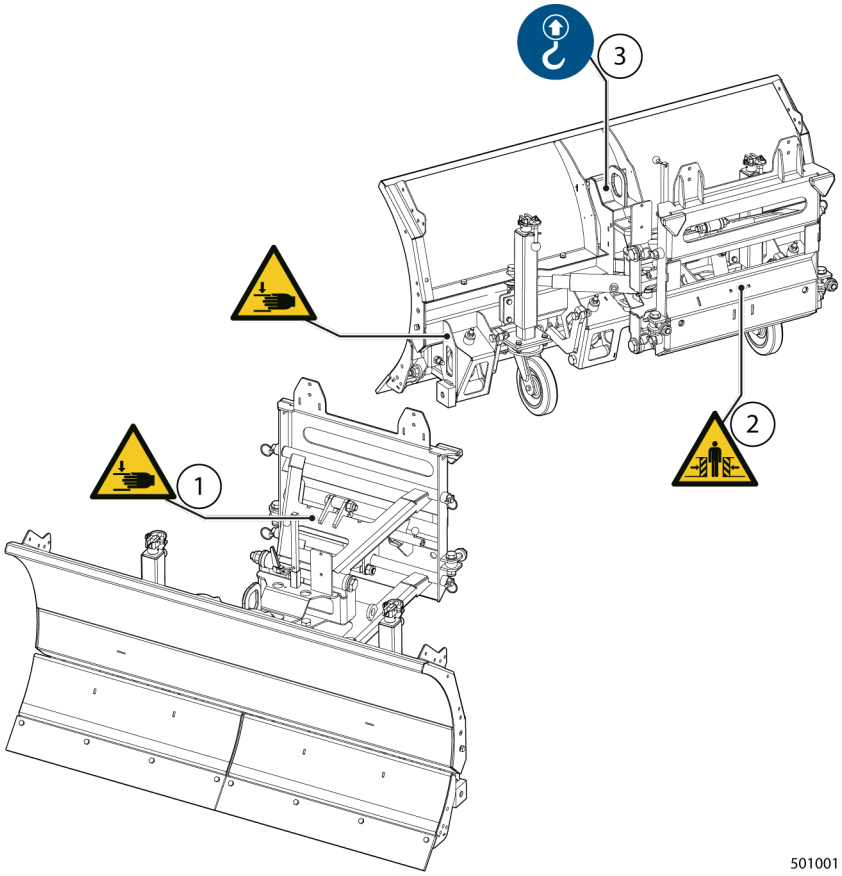


Fig. 1 safety signs on the machine

1 Risk of hand injuries when handling

2 Risk of crushing when handling

3 Snow plow attachment point

2.7 Residual risks

2.7.1 Operating fluids

Operating fluids (lubricants, cleaning agents) are harmful to health and the environment. Operating fluids can easily ignite, they can form harmful vapors, and they can cause skin irritation and allergies.

- Handle, store, and dispose of operating fluids properly.
- Wear protective gloves and safety goggles when handling operating fluids.
- Contain and bind spilled operating materials immediately.

2.7.2 Moving components

During maintenance work, there is a risk of injury from moving components.

- Before starting maintenance work, secure components against uncontrolled movement.

2.7.3 Lowering load

During maintenance work, there is a risk of injury from uncontrolled movement of components when connections are loosened or removed.

- Secure moving components against lowering before working on the hydraulic system.

2.7.4 Hydraulic system

When working on the hydraulic system, there is a risk of injury from spraying fluids and flying parts.

- Work on the hydraulic system may only be carried out by qualified personnel.
- Before working on the hydraulic system, depressurize the system.

2.7.5 Crush hazard

Risk of injury due to crushing when moving the snow plow.

- Before moving the snow plow, ensure that no persons are in the danger zone.

2.8 Danger zone

DANGER

Danger zone – risk of injury.

- Before starting up the snow plow, ensure that no persons are in the danger zones.

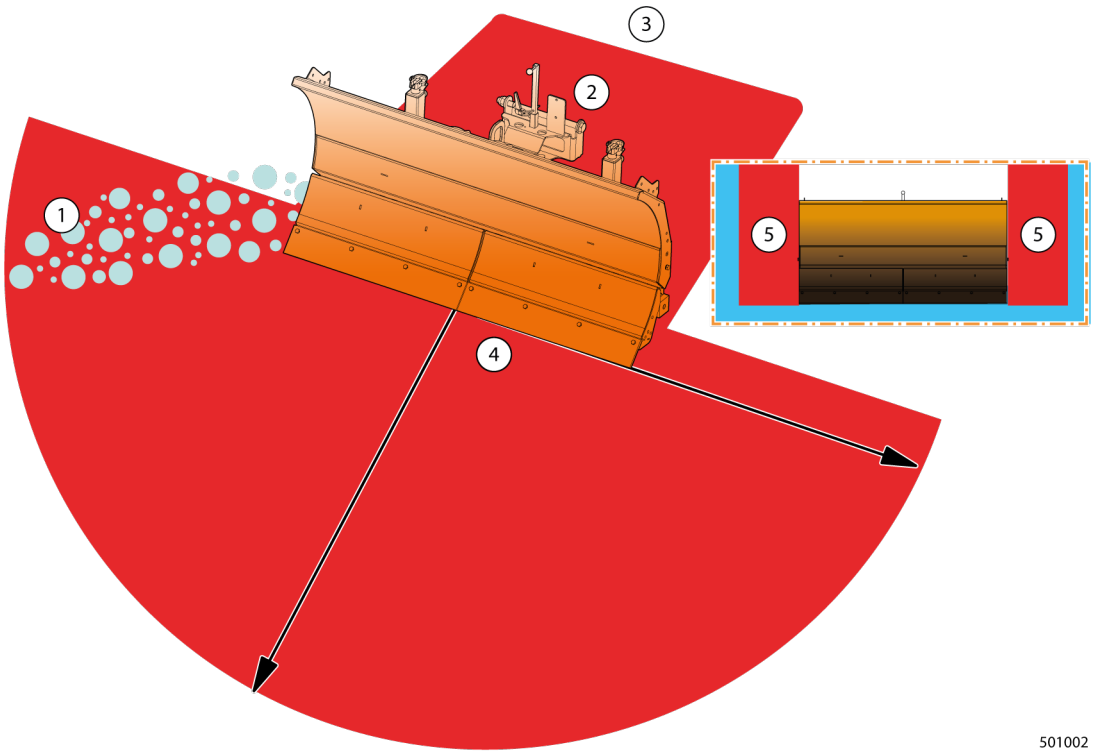


Fig. 2 Danger zones

1 Snow spray containing ice, sediment, and foreign matter

2 Hazards in the connection area between the carrier vehicle and snow plow

3 Poor or obstructed visibility of the rear section of the carrier vehicle

4 Dangers caused by forward movement

5 Danger zones between snow drift and snow wall

3 Structure and function

3.1 Overall view

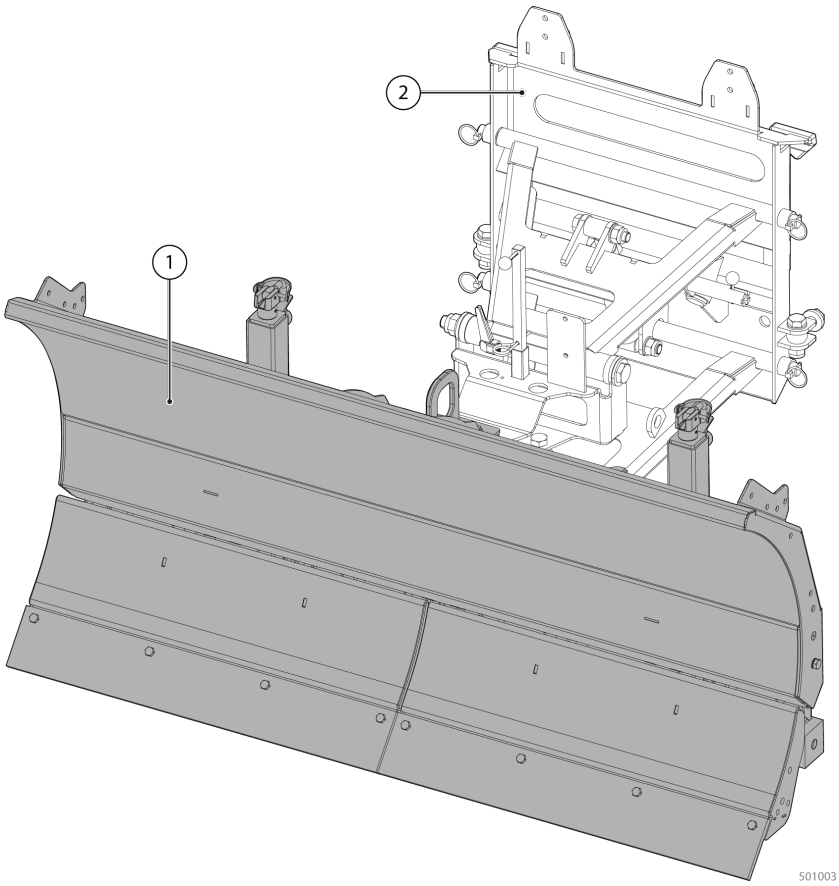


Fig. 3 Structure and function of snow plows

1 Snow plow
2 Parallelogram

3.2 Function description

CAUTION

Material wear – Increased wear due to misuse.

- Avoid pressing the wear rail onto the ground.
- The soil conditions must be known before starting work.

The plow body is divided in height and has lower segments that are preloaded by rubber hollow springs.

This keeps the suspension element on the ground and allows it to move up and back in a controlled manner when encountering obstacles.

The dynamic impact forces when encountering obstacles are dampened by damping bushings in the shock arms and in the plow frame.

Two wheels on the plow body can be adjusted in height as required.

3.3 Dislocation travel

Dislocation journeys are journeys with the snow plow to the place of use or to move the snow plow.

WARNING

Misuse - risk of injury.

- When driving with the snow plow attached, the applicable country-specific laws and regulations must be observed.
- During transport, the transport lock on the parallelogram must be engaged.
- Driving without a place of use and authorization is prohibited.

Further information can be found in the chapter **on using the transport lock**.

3.4 Snow plow

3.4.1 Principle

For reasons of clarity, the components described in this operating manual are shown with the "open plowshare" variant. Options that cannot be combined are marked accordingly.

3.4.2 Overview

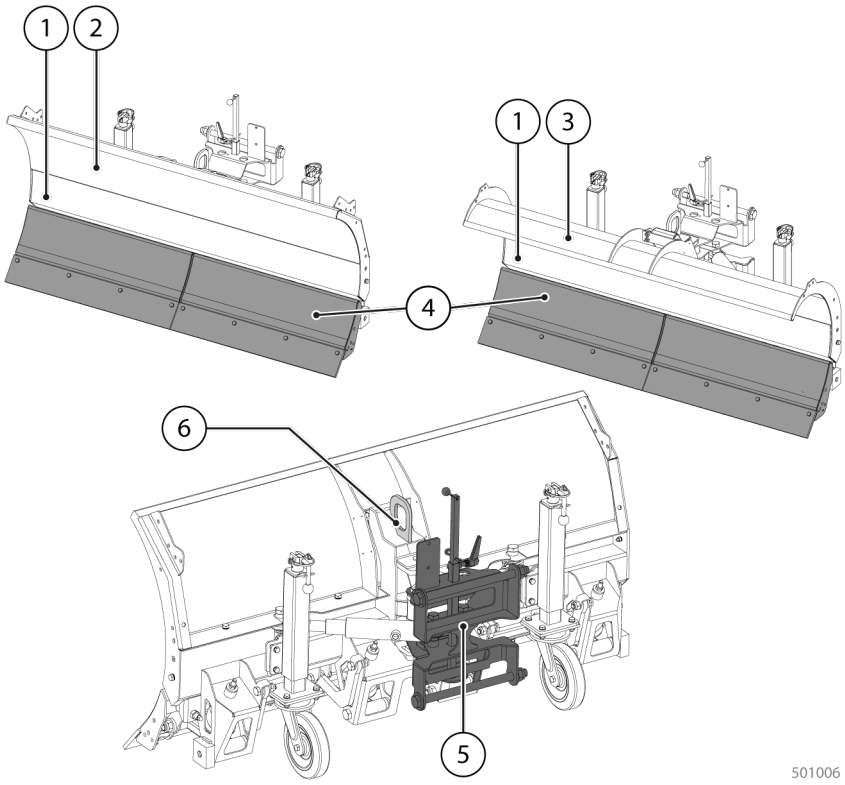


Fig. 4 Snow plow components

1	Plow body	2	Upper segment, open
3	Upper segment, closed	4	Suspension system
5	Swivel piece	6	Lifting device attachment point

3.4.3 Plow body

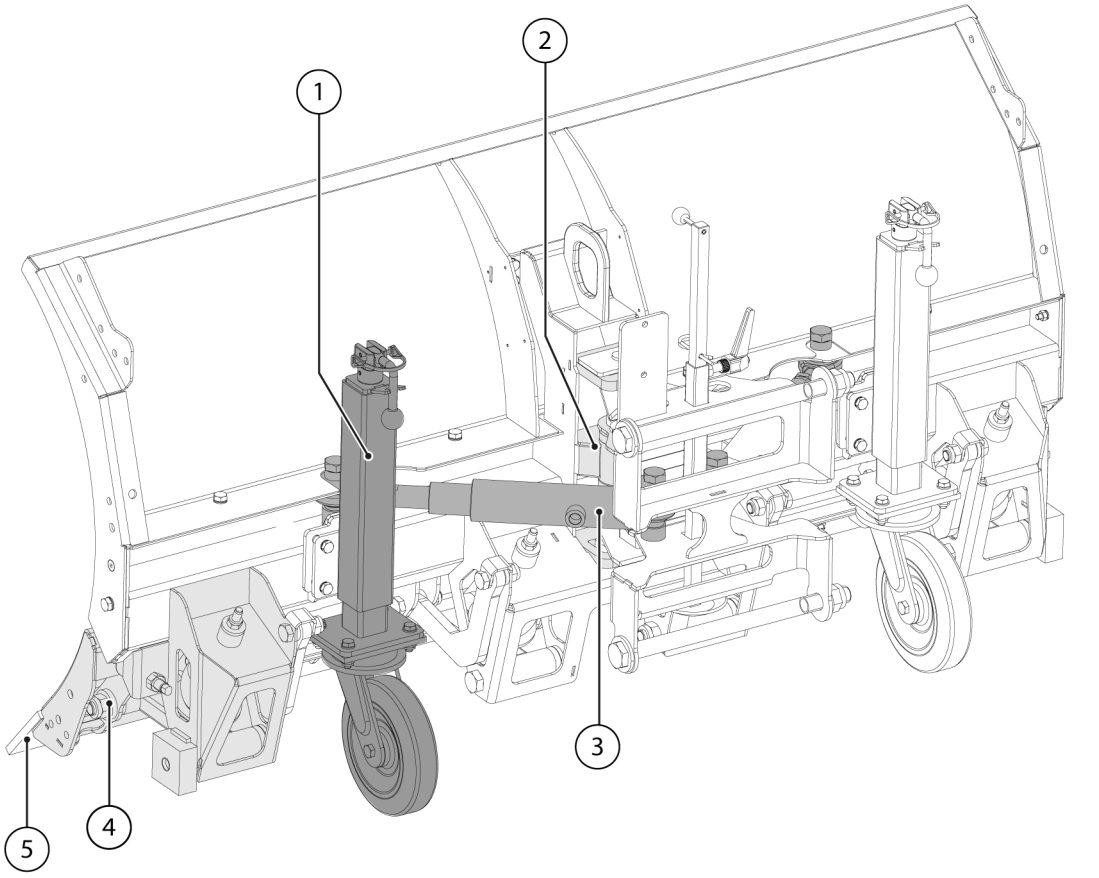


Fig. 5 Plow body

1 Impeller

2 Swivel bearing with integrated transverse oscillation

3 Telescopic cylinder, on both sides

4 Element cushioning system

5 Wear rail

3.4.4 Running wheel

The running wheels serve to support the plow body during operation.

CAUTION

Risk of material damage or injury.

- Do not use the wheels to support the snow plow during storage.

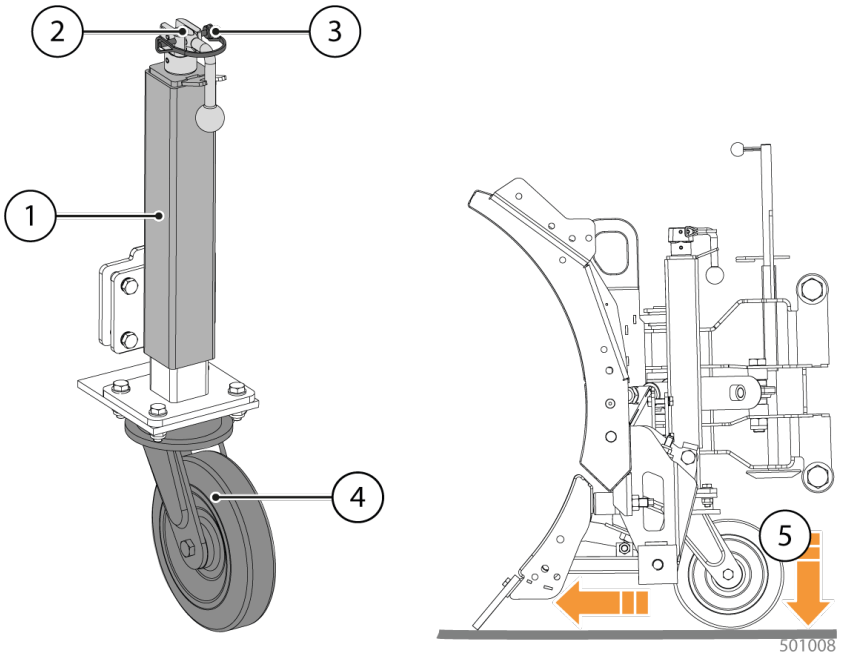


Fig. 6 Overview of the running wheel

1 Support tube
2 Hand crank
3 Folding pin with snap lock
4 Wheel
5 Working position of impeller, Black clearance

3.4.5 Element cushioning system

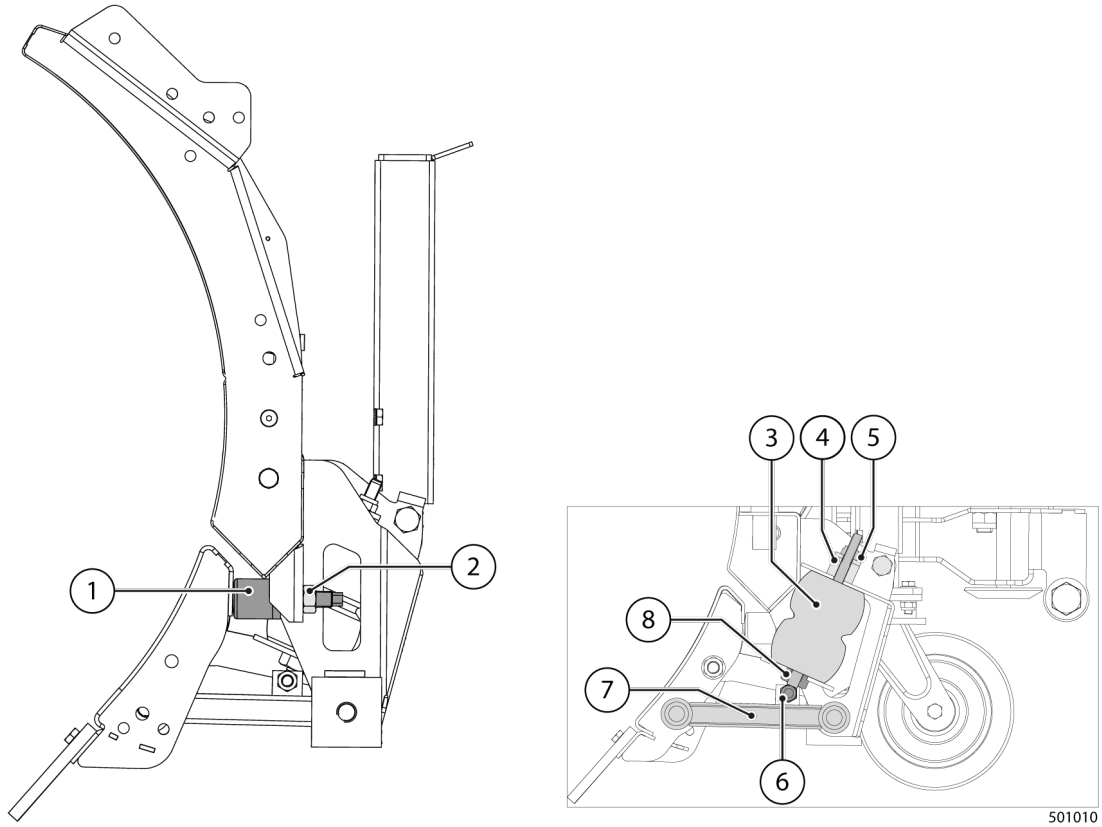


Fig. 7 Overview Element cushioning system

1	Stop buffer	2	Lock nut for stop buffer
3	Rubber hollow spring	4	Vulkollan bushing
5	Lock nut	6	Guide rod with eye bolt
7	Lever, element arm suspension	8	Adjusting nut Rubber hollow spring

Function description

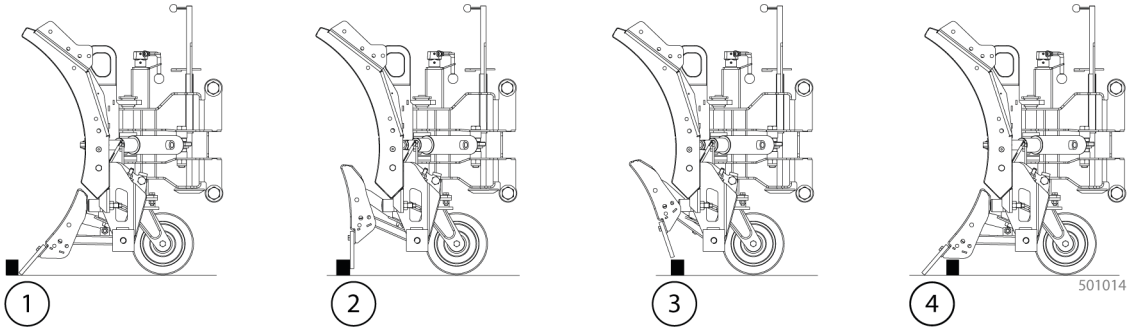


Fig. 8 Function description of suspension element

Process

When encountering obstacles (1), the suspension element deflects backward at a negative angle (2). After avoiding obstacles (3), the suspension element slides back to its original position (4).

The element arm suspension and the parallelogram are equipped with PUR damping bushings, which dampen dynamic impact forces when approaching obstacles. The mounting in the PUR bushings allows the element to adapt optimally to the ground.

3.4.6 Wear rail

The wear rail is used to remove snow masses during snow clearance.

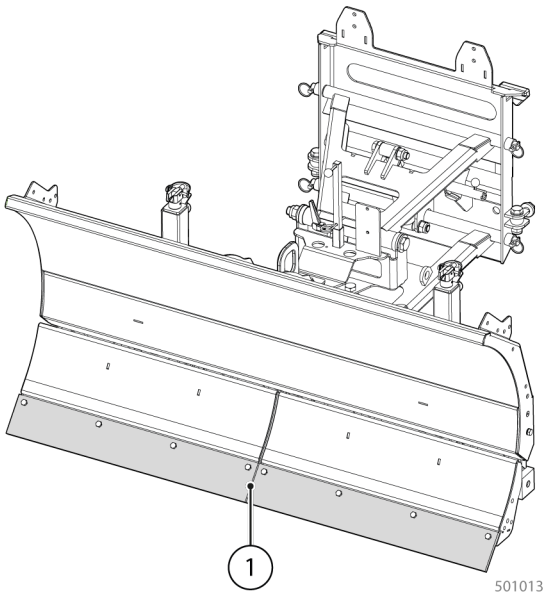


Fig. 9 Wear bar, example

1 Wear bar, steel

3.4.7 Parallelogram

The parallelogram is used to compensate for uneven ground during snow removal, to reduce wear and tear, and to lift the snow plow for dislocation travel.

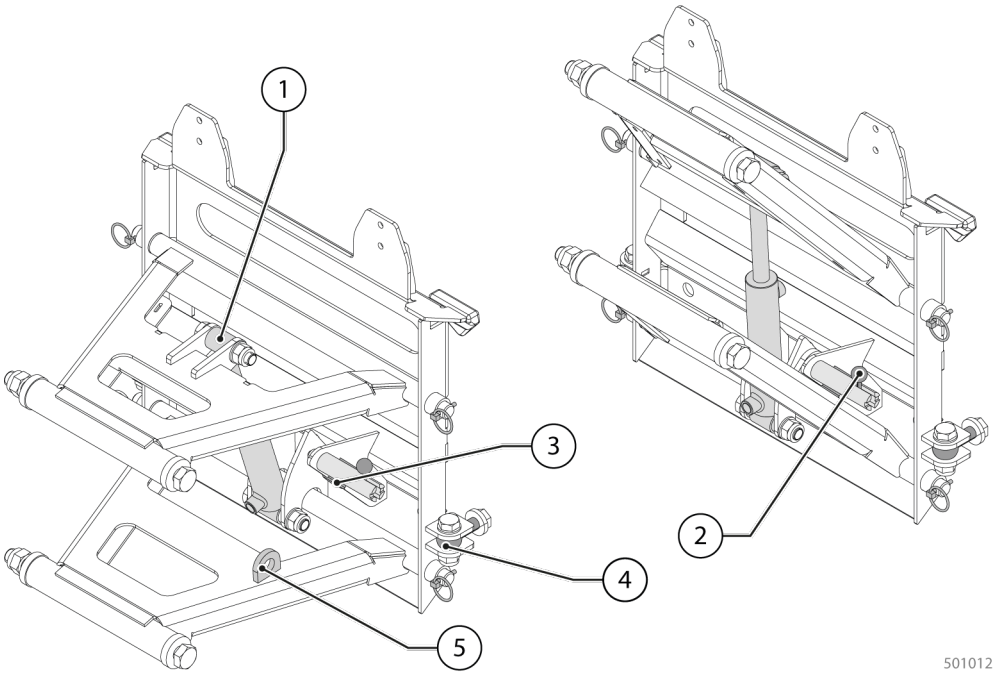


Fig. 10 Parallelogram

1 Cylinder for lifting the snow plow
2 Transport lock
3 Stop buffer, transport lock
4 Eye bolt, locking device Carrier vehicle
5 Locking tab, transport lock

3.4.8 Marking

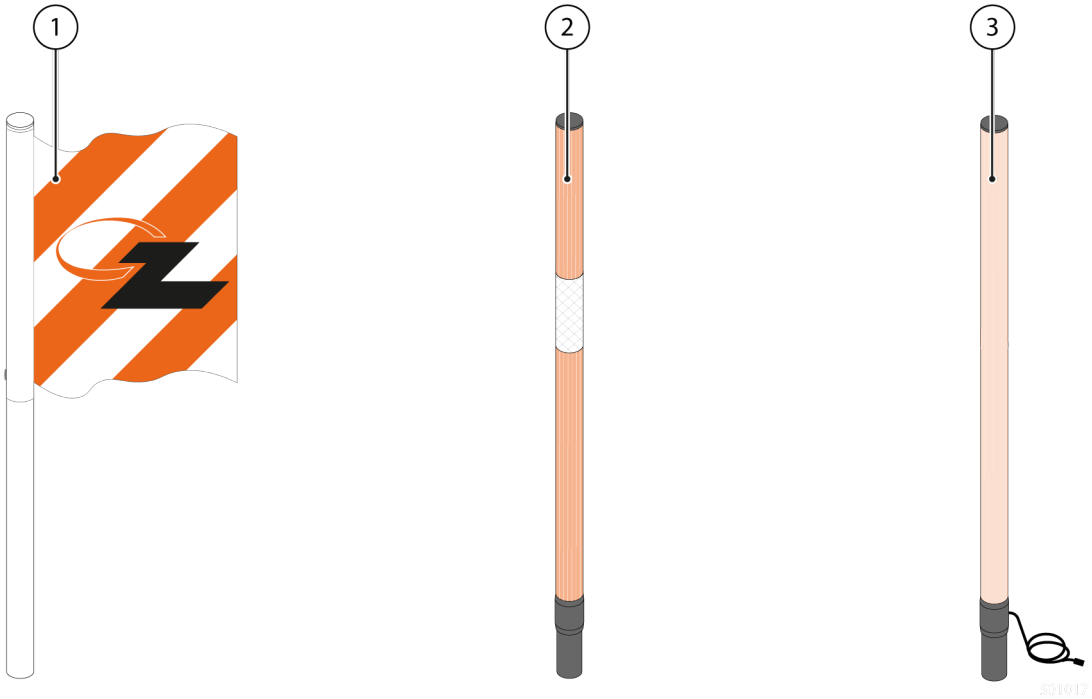


Fig. 11 Marking

1 Flag

2 Lumifog

3 Lumifog LED

3.5 Rotary piece

3.5.1 Overview

The swivel joint serves as a connecting element between the plow body and the attachment.

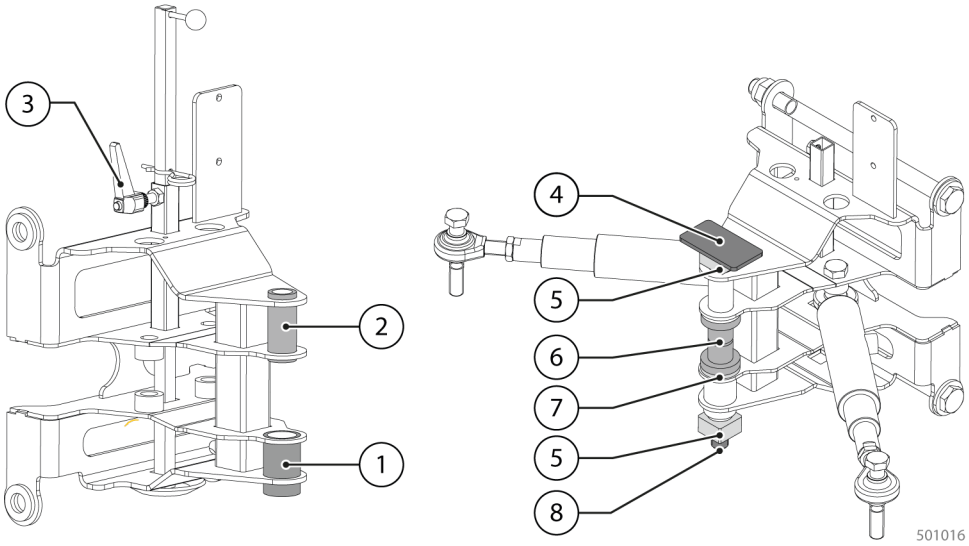


Fig. 12 Swivel

1	Bearing at bottom	2	Upper bearing
3	Clamping lever support	4	Rotary bolt
5	Sliding piece, installed twice	6	Vulkollan bushing, installed twice
7	Adjustment bushing	8	Lock nut

The transverse oscillation is achieved via the pivot pin and the PUR Vulkollan bushings.

3.5.2 Support

WARNING

Risk of crushing – risk of injury due to uncontrolled rolling away of the snow plow.

- Do not use the wheel to park the snow plow.
- Avoid the danger zone.

The support is used to park the snow plow and thus prevents it from tipping over or rolling away uncontrollably when attaching it to or removing it from the carrier vehicle.

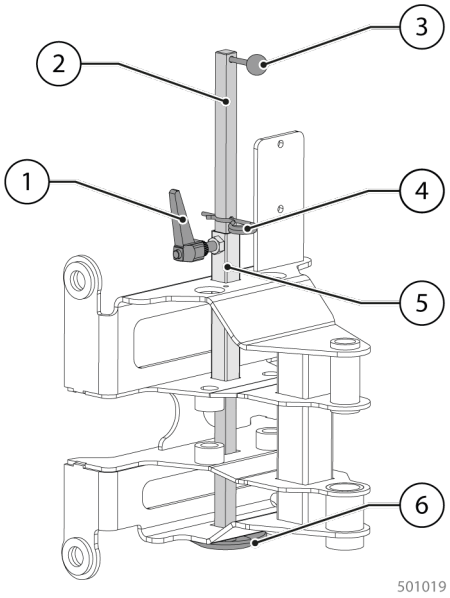


Fig. 13 Support.

1	Clamping screw	2	Tube
3	Ball handle	4	Double spring cotter pin
5	Support tube	6	Plate, support

Double spring pin

The double spring pin serves as a safety device for the support tube when the clamping screw is released.

When parking the snow plow, the double spring pin is inserted below the support tube to prevent the snow plow from lowering uncontrollably.

3.5.3 Transverse oscillation

The transverse oscillation compensates for uneven ground in the longitudinal direction.

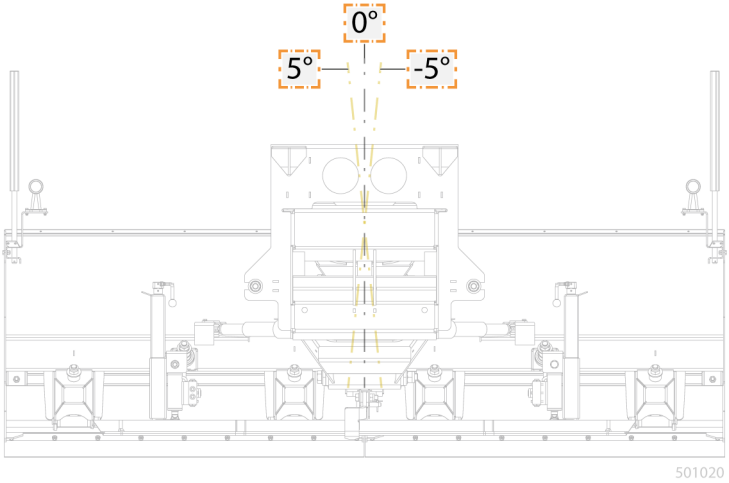


Fig. 14 Transverse oscillation, example

1	Rotation pin	2	Sliding piece
3	Vulkollan bushing	4	Washer
5	Adjustment bushing	6	Adjusting tube
7	Fastening screw	8	Lock nut

Function

The transverse oscillation is stabilized by two Vulkollan bushings on the pivot pin. Tightening the lock nut (8) from the chapter "*Rotary joint/Figure 12*" increases stability.

3.6 Hydraulic system

3.6.1 Overview

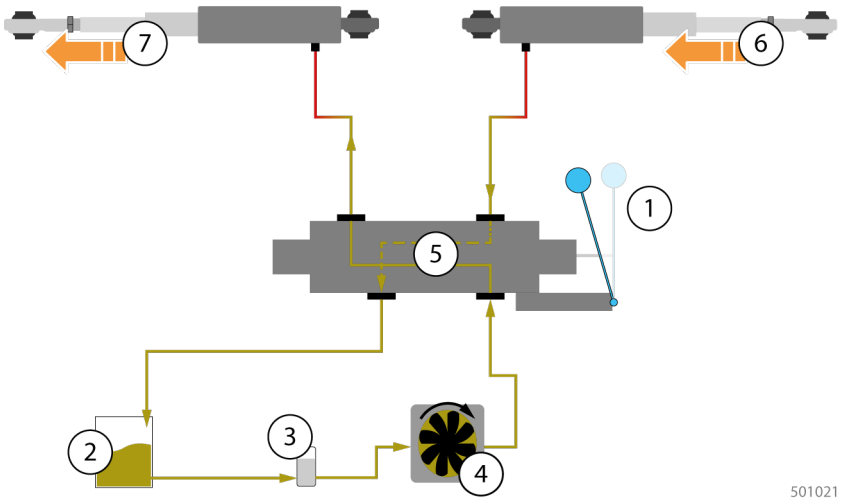


Fig. 15 Hydraulic system Snow plow

1 Actuating control lever, swivel left
2 Hydraulic oil tank
3 Hydraulic oil filter
4 Hydraulic pump
5 Control valve
6 Telescopic cylinder on the right retracts, empties
7 Left telescopic cylinder extends, fills

3.6.2 Function

When the control lever in the carrier vehicle is activated, oil flows into the telescopic cylinder with the aid of the hydraulic pump and the snow plow swivels to the left.

The displaced oil in the right cylinder can flow into the left cylinder via the pressure relief valve. This process takes place on both sides.

3.6.3 Pressure relief valve block

WARNING

When working on the pressure relief valve block, there is a risk of injury due to excess pressure.

- Depressurize all components before starting work on the hydraulic system.
- Have all adjustment work on the pressure relief valve block carried out by the manufacturer.

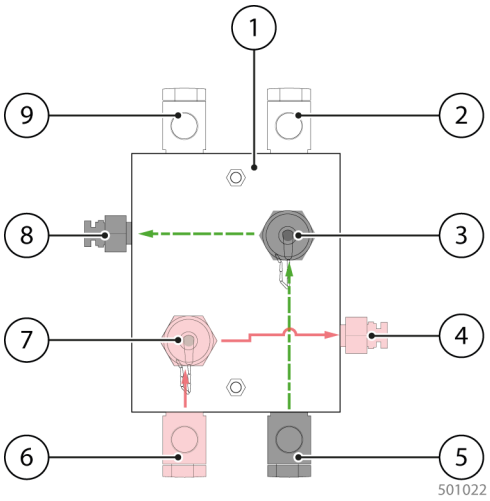


Fig. 16 Overpressure valve block

1	Overpressure valve block	2	Swivel screw connection
3	Pressure measurement, left side	4	Pressure relief valve
5	Swivel screw connection	6	Swivel fitting
7	Pressure measurement, right side	8	Pressure relief valve
9	Swivel screw connection		

The pressure in the pressure relief valve block is preset by the manufacturer to **100 bar**.

If the snow plow is swiveled to the right and an obstacle is encountered on the left side of the plow, the snow plow swivels to the left to avoid the obstacle. The displaced oil in the left cylinder can flow into the right cylinder via the pressure relief valve. This process takes place on both sides.

Settings	Direction of rotation	Pressure relief valve (Pos. 4/8)
Increase pressure	CW: "Clockwise" **Clockwise**	Turn in
Decrease pressure	CCW: "Counterclockwise" **Counterclockwise**	Turn out

3.6.4 Swivel device

The swivel device is used to adjust the snow plow during snow removal.

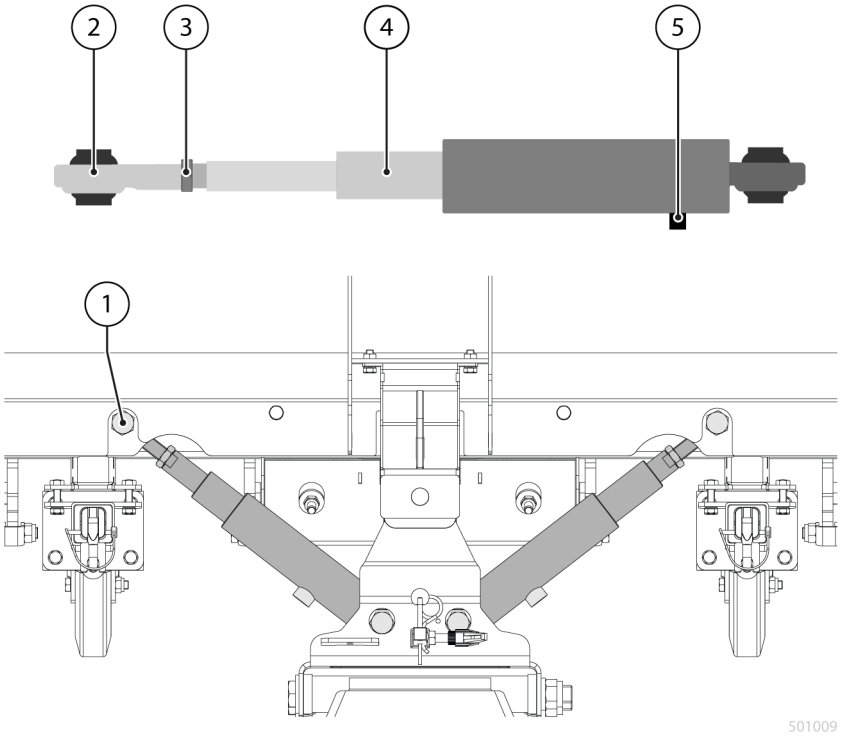


Fig. 17 Swivel device

1 Fastening screws
2 Ball bearings
3 Nut for locking
4 Telescopic cylinder
5 Hydraulic connection

3.6.5 Swivel angle reduction Optional

To prevent collisions between the plow body and the carrier vehicle, the swivel angle can be reduced by unscrewing the ball bearing on the hydraulic cylinder.

3.6.6 Swivel lock

The swivel lock is controlled by the pressure relief valve.

A fully extended left telescopic cylinder results in a fully retracted right telescopic cylinder.

3.6.7 Lifting device

The lifting device is used to lift the snow plow.

The individual functions are performed by operating the control valve on the carrier vehicle.

3.7 Axles

The various axles are used to move the snow plow in the desired direction.

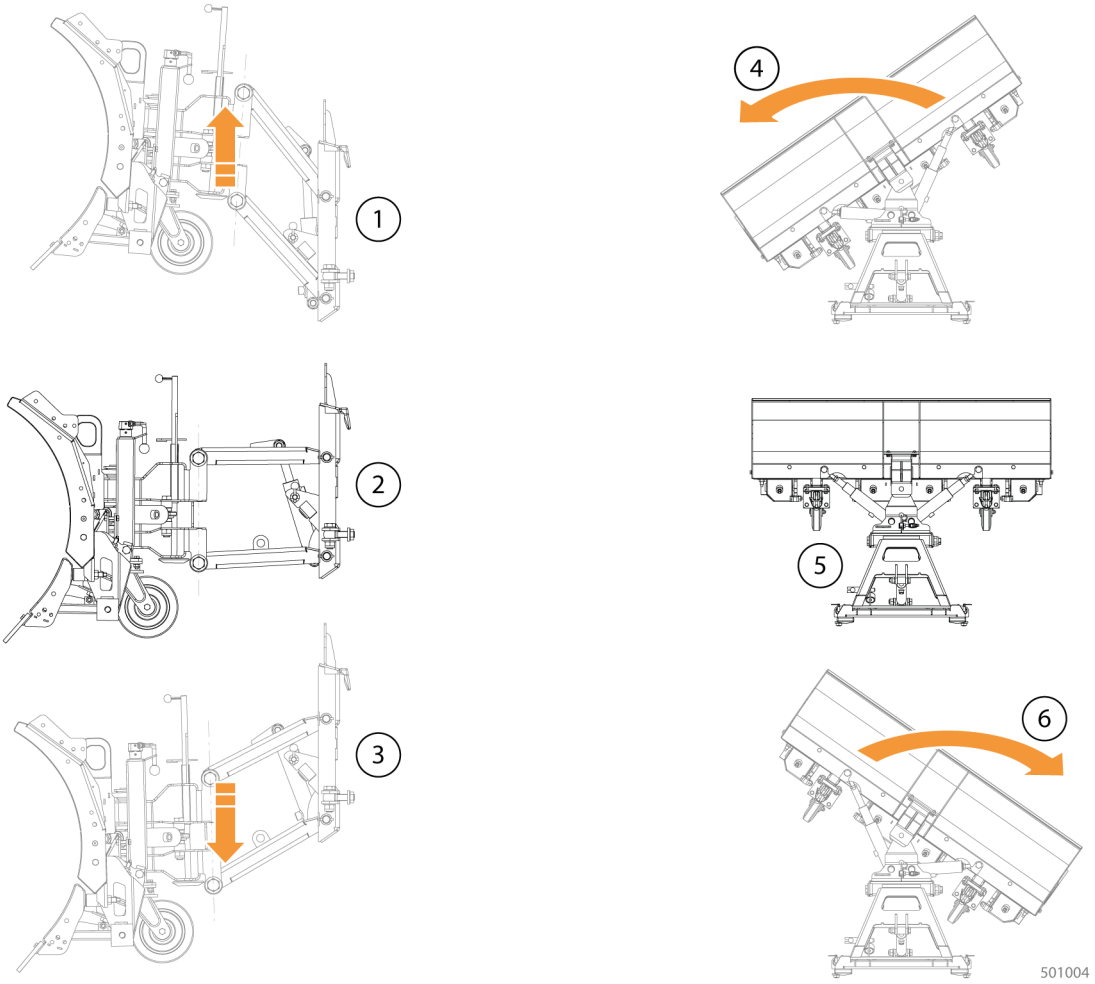


Fig. 18 Axles Snow plow

1) Z-axis: Lifting
2) Z-axis: Working position
3) Z-axis: Lower position, attachment
4) X-axis: Swiveling left
5) X-axis: Neutral position
6) X-axis: Swivel right

3.8 Interfaces

3.8.1 Safety

WARNING

Misuse.

- Do not use the snow plow as a shovel.
- Avoid hazardous areas.

CAUTION

The ZAUGG snow plow is intended exclusively for snow removal. All warranty claims will be rejected for damage to the snow plow equipment caused by use for other purposes.

- Observe the intended use.

3.8.2 How wheel loaders, farm loaders, and telescopic loaders work

The G9 with wheel loader attachment has a parallelogram that ensures optimum ground adaptation.

The parallelogram is available in two versions:

- mechanical end stops, or
- spring-damped.

The snow plow is lifted and lowered using the wheel loader, farm loader, or telescopic loader.

During use, care must be taken to ensure that the mounting plate of the snow plow is at a 90° angle to the ground or tilted slightly forward (max. 5°).

The arms of the parallelogram should run parallel to the ground to allow adjustment to the ground surface.

The swivel safety device is provided by the standard swivel safety device of the G9.

No special version is required, as the swivel cylinders are mounted at the front of the swivel piece.

3.8.3 3-point attachment

The 3-point mounting is adjustable and available for sizes Cat. 1 + 2.

3.8.4 Municipal cultivation plate

The municipal mounting plates are height-adjustable and available in different designs for the mounting plates.

4 Technical data

4.1 Dimensions and weights

4.1.1 Dimensions

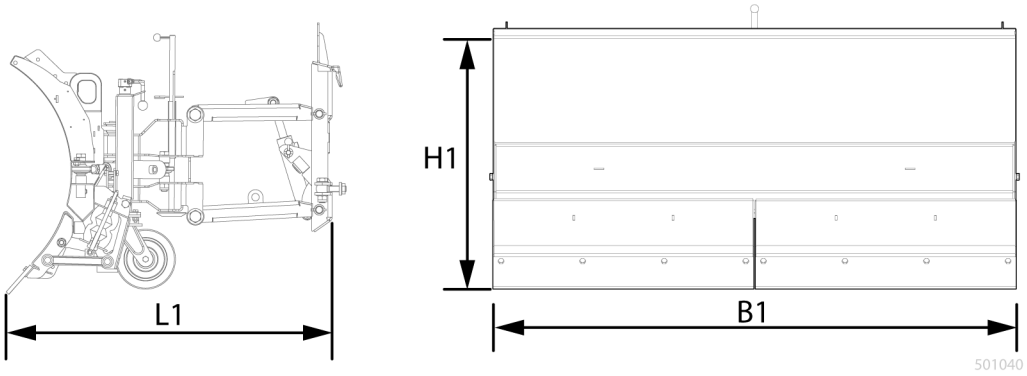


Fig. 19 Dimensions of snow plow

Tab. 3 Dimensions of snow plow

Dimensions	160	180	200	220	240	Unit
B1	1604	1804	2004	2204	2404	mm
H1 and **H2**, open closed	690 … 760					mm
L1, parallelogram VSS-B	1090					mm
L1, 3-point attachment cat.	940					mm
L1, municipal mounting plate	870					mm
L1, wheel loader	1140					mm
Total weight from:	280	290	300	310	320	kg

The widths specified do not include the dimensions of optional accessories.

4.1.2 During operation

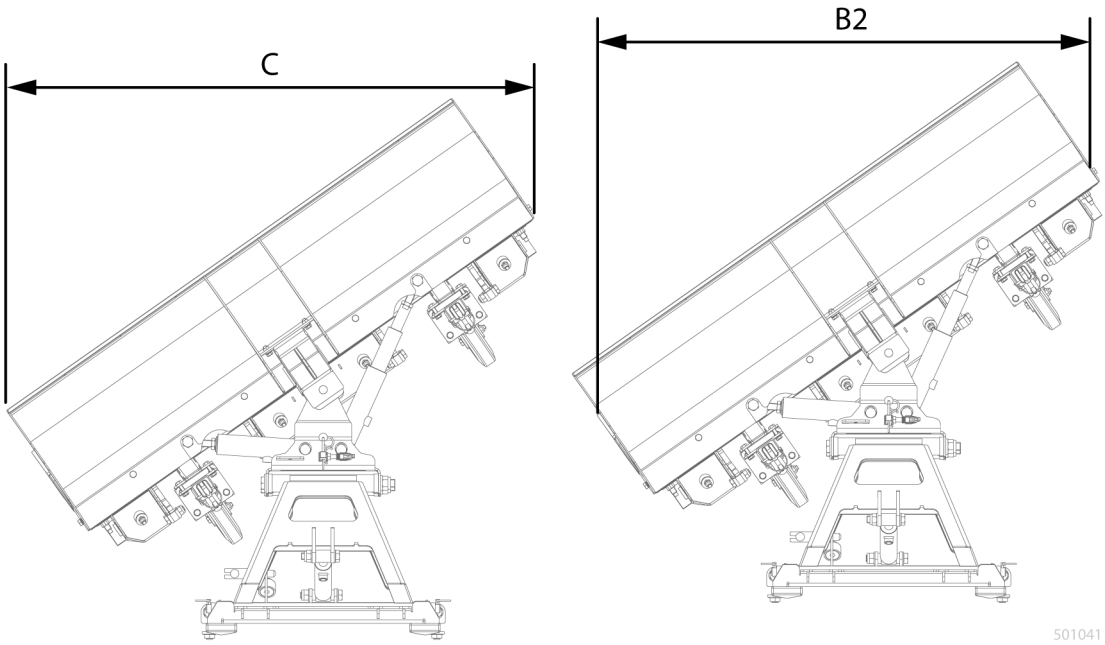


Fig. 20 Dimensions during operation

Tab. 4 Dimensions during operation

Designation	160	180	200	220	240	Unit
C, passage width "C" at 35° swivel angle	157	173	190	206	223	cm
C, passage width "C" at 45° swivel angle	145	159	173	188	202	cm
B2, clearing width at 35° swivel angle	131	147	164	180	197	cm
B2, clearing width at 45° swivel angle	113	127	141	156	170	cm
Transverse inclination Snow plow		+/- 5				° degrees

4.2 Configuration

Tab. 5 Snow plow configuration

Component	Type	Serial
Snow plow	G9-160-2-45°-C	39000

Designation	Description
G9	Snow plow type
16	Width
2	Number of elements Suspension system
45	Maximum swivel angle for snow removal
C	Open blade shape
0	Closed blade shape

4.3 Marking

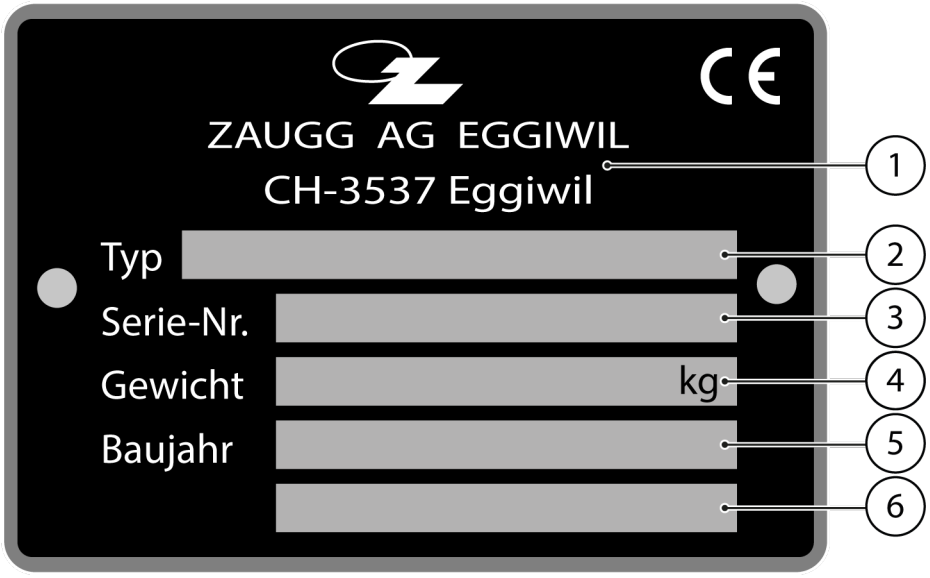


Fig. 21 Placement of type plate Snow plow

1) Manufacturer
2) Machine type
3) Serial number
4) Weight
5) Year of manufacture
6) Additional line Year of manufacture

4.4 Operating conditions

4.4.1 Soil conditions

Tab. 6 Soil conditions

Designation	Value
Maximum unevenness, clearance height	50 mm

4.4.2 Environmental conditions

Tab. 7 Ambient conditions

Designation	Value
Ambient temperature	+10° to -30° degrees
Distance to obstacles	>100 mm

4.4.3 Maximum speeds

Tab. 8 Maximum speeds

Designation	Value
Transport speed	V_{max} = 80 km/h
Snow clearance	V_{max} = 50 km/h

4.5 Hydraulic system

Designation	Value
Minimum tank capacity, on carrier vehicle	2
Volume flow	12 l/min
Swivel time	8 s
System pressure	180 bar

5 Options

5.1 Upper segment

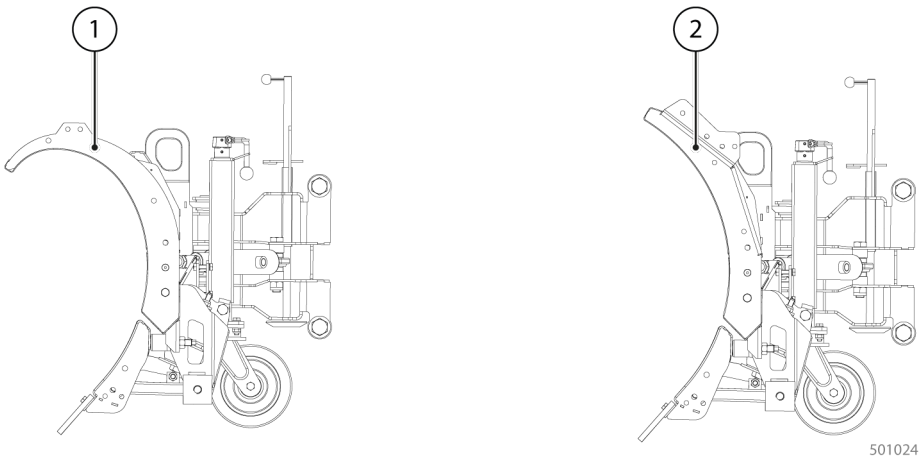


Fig. 22 Upper segment, overview

Shape	Description
Closed, Marking "C"	Protection against snow dust and turbulence during snow removal. **Options** • Side plate • Snow guide rubber
Open, Marking "**O**"	No protection against snow dust and turbulence during snow removal. **Options** • Snow dust protection • Side flap • Side plate

5.2 Wear bar

The wear rail is used to remove snow masses during snow clearance.

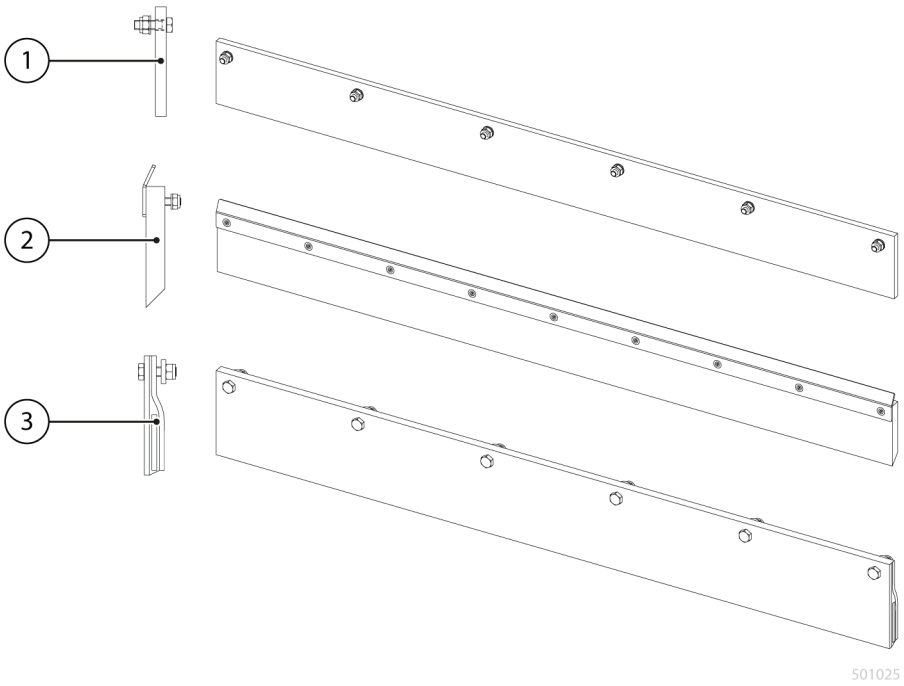


Fig. 23 Wear bar, overview

Pos	Equipment	Description
1	Steel	The steel wear rail is an effective tool with aggressive peeling action, robustness, and cost-effective reliability. Its main area of application is clearing black snow in high mountains.
2	PUR	The PUR wear rail is characterized by surface protection, optimal ground adaptation, elasticity, and shock absorption. Its main area of application is in municipalities and cities for gentle snow clearance.
3	Combi	The combi wear rails impress with their long service life, smooth running, and efficient gliding properties. Their limited aggressiveness allows snow removal on municipal roads, country and cantonal roads, and highways.

5.3 Curbstone deflectors

The curb deflectors serve to protect the plow body during snow removal.

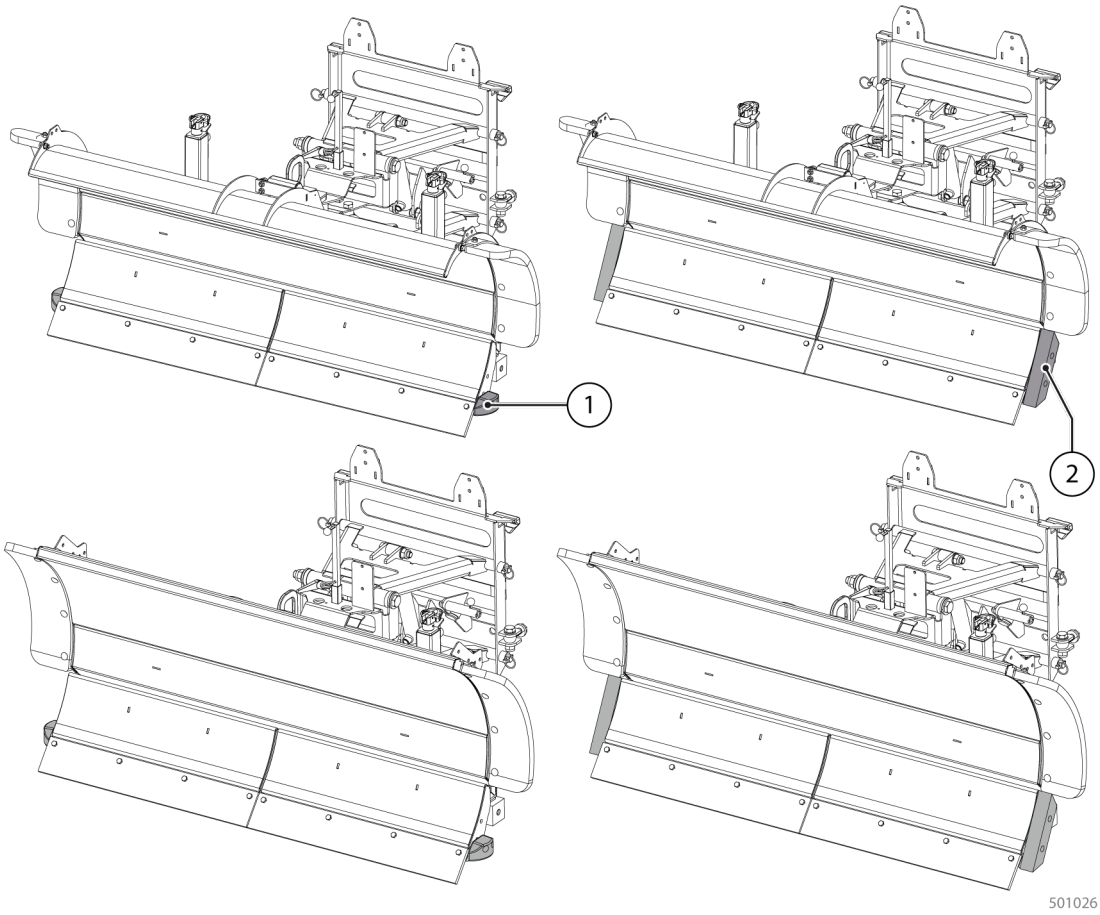


Fig. 24 Curbstone deflectors, overview

The choice of curb deflectors depends on specific snow removal requirements. The curb deflector option is available for both blade shapes.

Pos	Equipment	Description
1	Steel	Steel curb protectors are ideal for demanding applications thanks to their robustness. Their durability makes steel curb protectors less susceptible to wear and damage.
2	Rubber	Rubber curb protectors protect surfaces, minimize the risk of damage, and enable precise, gentle snow removal. The noise reduction achieved by absorbing vibrations is particularly advantageous in urban areas, and the flexibility of the rubber adapts to different surfaces and curb shapes.

5.4 Collision protection

The collision protection serves to minimize collisions with obstacles in the area of the snow plow.

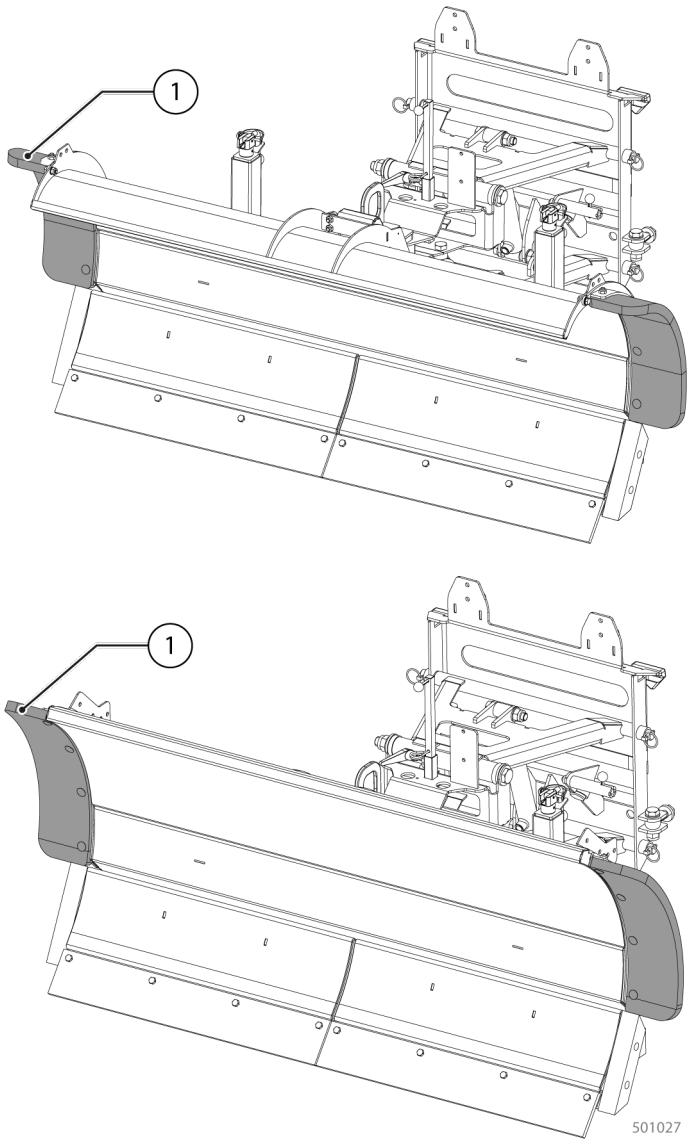


Fig. 25 Collision protection, illustration with curb deflector

The rubber collision protection option is available for both blade shapes.

Pos	Equipment	Description
1	PUR	The PUR collision protection minimizes collision damage and ensures gentle contact with surfaces in urban areas or guard rails on highways.

5.5 Running wheel and sliding shoe

The support wheel and sliding shoe are designed to clear snow masses evenly and gently, protecting the road surface.

WARNING

Misuse - risk of injury.

When storing the snow plow, there is a risk of injury due to misuse.

- Supporting the snow plow with the wheel or the skid plate is prohibited.

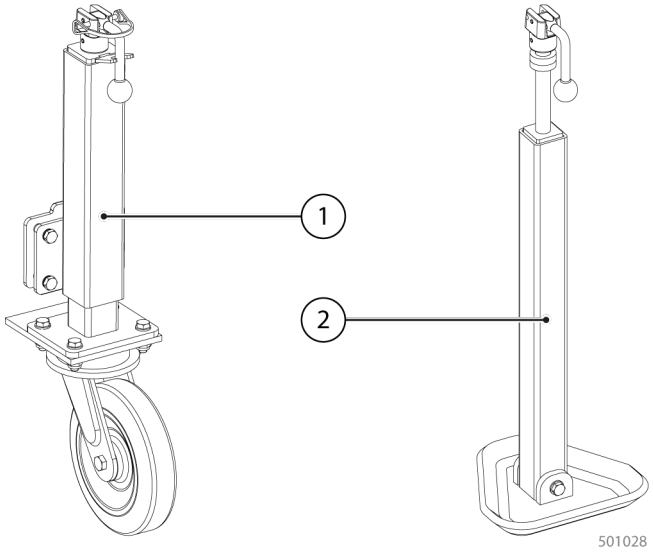


Fig. 26 Running wheel and skid

1 Running wheel 2 Skid

The snow plow is available with either a support wheel or a skid.

Pos	Equipment	Description
1	Support wheel	The support wheel on the snow plow enables low-friction movement on various road surfaces and contributes to stability during snow removal. It also serves as protection to prevent the snow plow from coming into direct contact with the ground.
2	Skid	The skid plate serves as a sliding surface that allows gentle contact with different surfaces. During snow removal, they minimize wear and tear and prevent damage to road surfaces. In storage, they provide stability and protect the snow plow from damage.

5.6 Swivel angle reduction

The swivel angle reduction limits the swivel angle of the snow plow during snow removal. To limit the swivel angle, an additional nut is installed on the telescopic cylinder for countering.

5.7 Connecting pieces

5.7.1 Overview

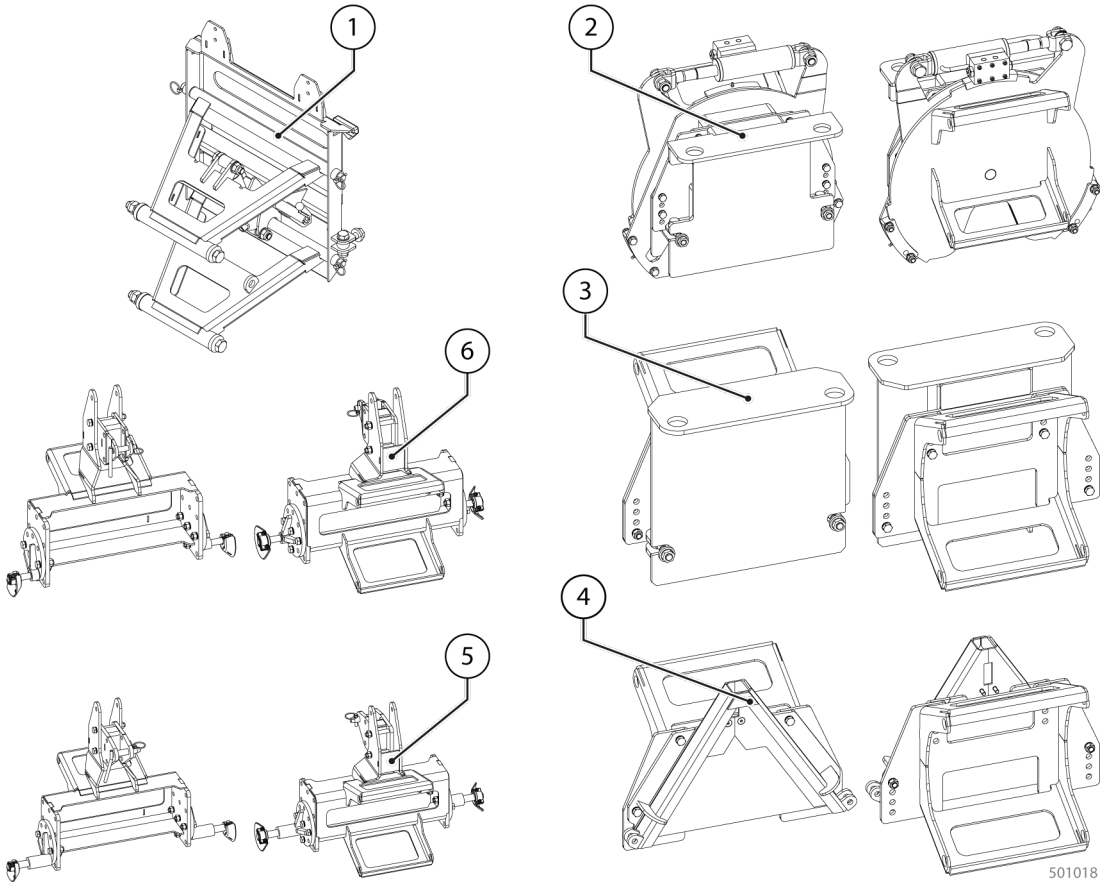


Fig. 27 Connecting pieces

Tab. 9 Connecting pieces

Pos	Mounting device	Description
1	Wheel loader with parallelogram and mounting plate VSS-B	The parallelogram is installed between the snow plow and the mounting plate with quick-change attachment. It is available in two versions: mechanical stop or spring-loaded.
2	Municipal attachment G9 with hydraulic cross tilt	The municipal adapter allows the G9 snow plow to be attached to many municipal vehicles with the help of the appropriate mounting device.
3	Municipal attachment G9	
4	Coupling triangle Cat. 0	The coupling triangle Cat. 0 enables quick coupling and uncoupling of the snow plow.
5	3-point hitch G9	The 3-point hitch is available in various designs for categories 1 and 2. The bolted design allows the snow plow to be optimally adapted to the carrier vehicle.
6		

5.7.2 Wheel loader attachment

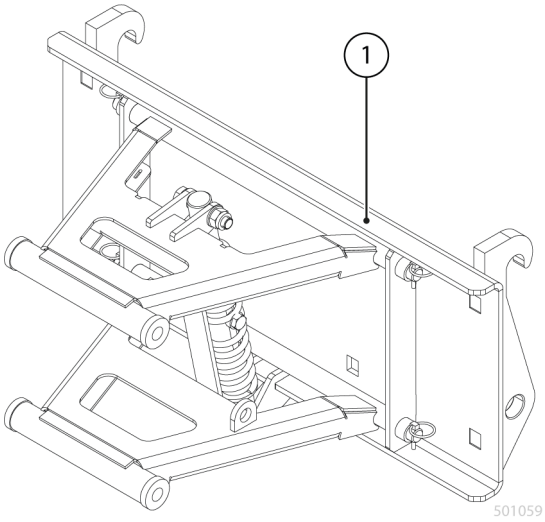


Fig. 28 Wheel loader attachment

Pos	Attachment	Description
1	Wheel loader attachment	The wheel loader attachment plate forms the link between the parallelogram and the quick-change device on wheel loaders, farm loaders, or telescopic loaders. The mounting varies depending on the quick-change device.

5.8 Marking

WARNING

Faulty equipment – risk of injury due to breakage or wear of the marking.

- Replace markings on the snow plow immediately if necessary, due to wear or material damage.
- Check the equipment after each use to ensure it is functioning properly and is securely fastened.

5.8.1 Overview

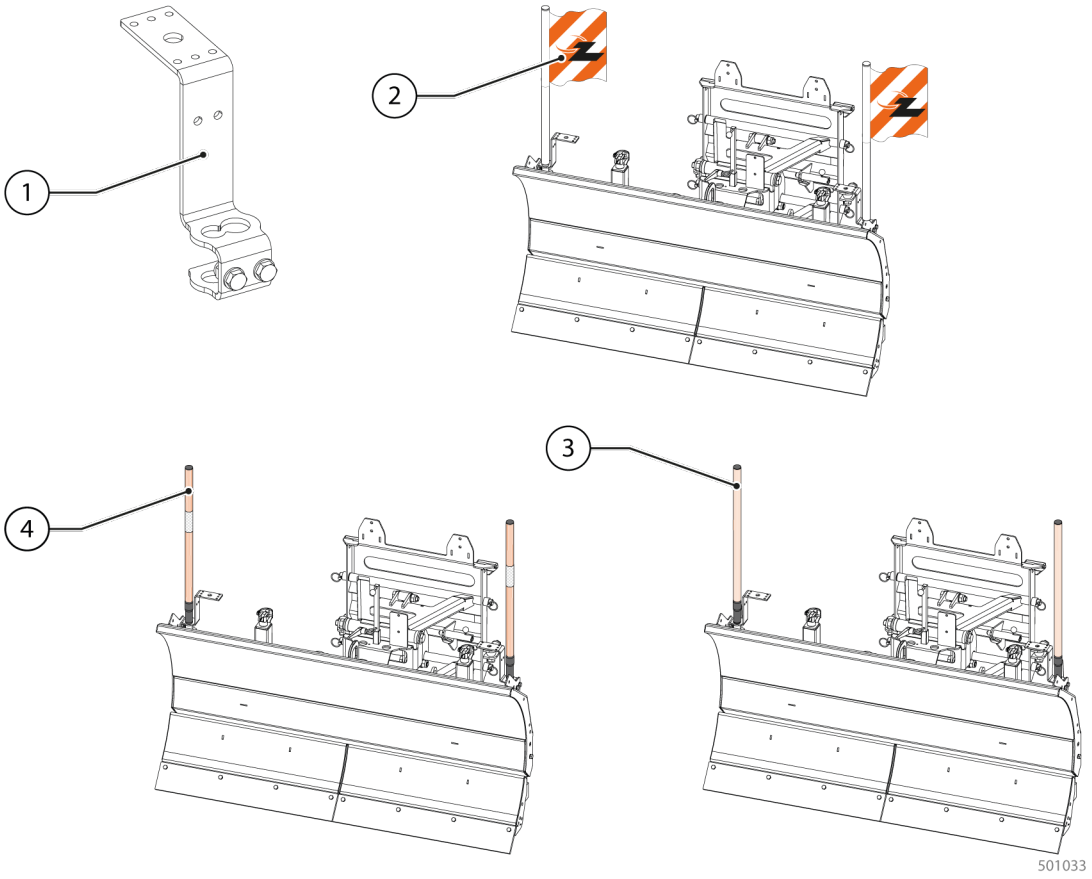


Fig. 29 Markings installed on the snow plow, overview

1	Marker holder	2	Fanion
3	Lumifog	4	Lumifog LED

The snow plow is equipped with a fanion and bracket as standard. Lumifog or Lumifog LED can be retrofitted.

ATTENTION

The marker does not replace the lighting required by law.

- Observe the applicable legal provisions.

5.9 Lighting

5.9.1 Marker lights Plow body

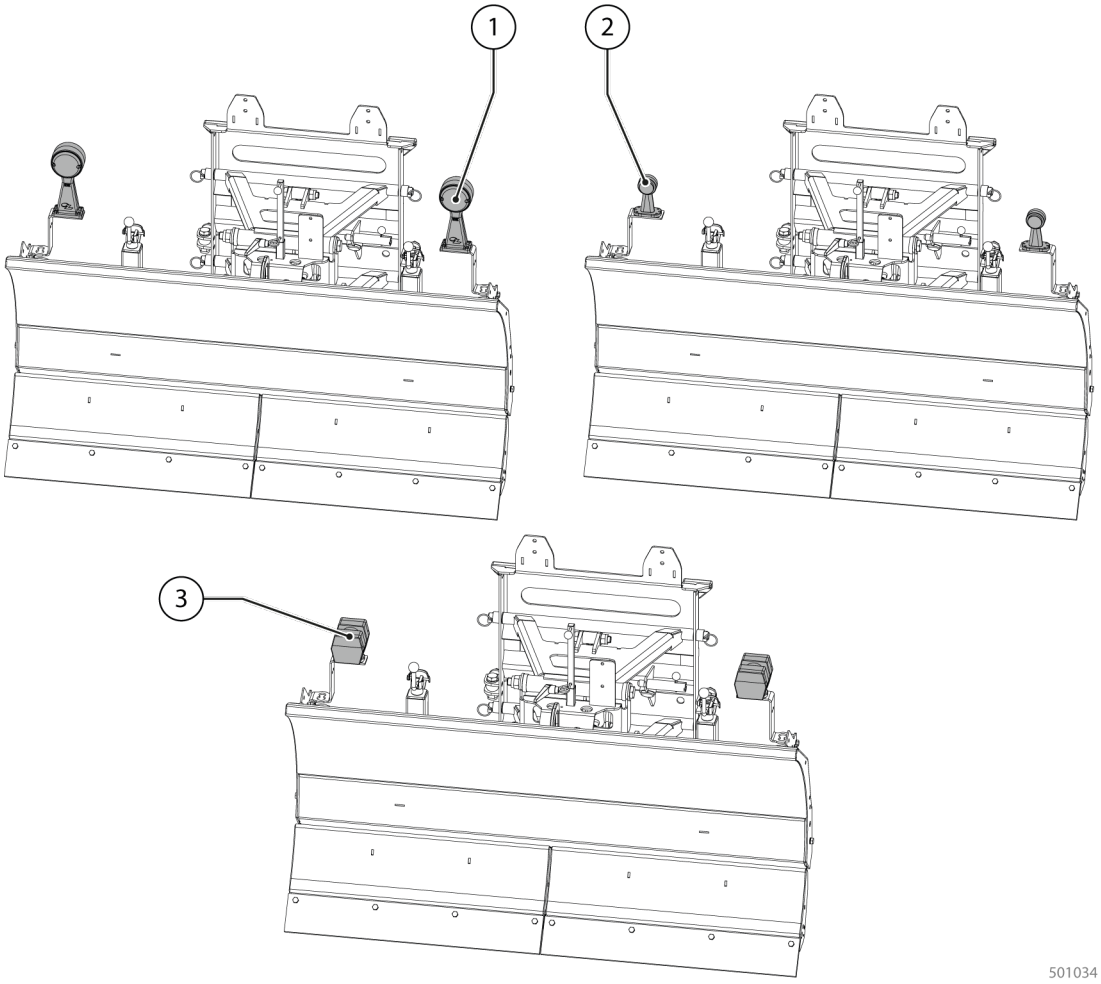


Fig. 30 Lighting, plow body

1 Double light LED 10-30V Kundert
2 LED outline light 12-24V red/white
3 Double LED light

5.9.2 Lighting system

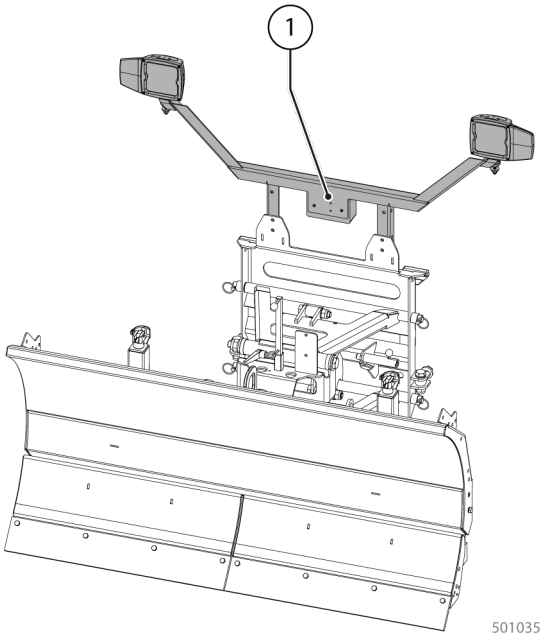


Fig. 31 Lighting system

Position	Equipment	Description
1	LED for 4×4 passenger cars	If the headlight system is covered by the snow plow, a raised headlight system must be installed. The headlight system on the snow plow has the great advantage that it is optimally matched to the snow plow and is only attached when it is actually needed.

5.10 Snow dust protection

The snow dust guard acts as a wind deflector and directs the snow dust downwards in the direction of ejection.

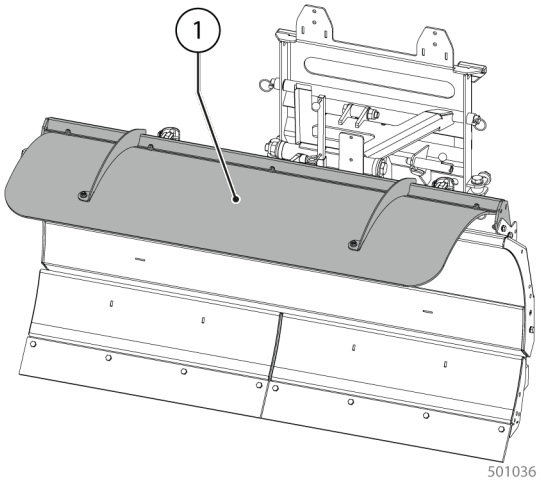


Fig. 32 Snow dust guard, example

1 Snow dust protection G9, width-dependent

The snow dust guard improves the driver's visibility and does not impair the cooling of the engine on the carrier vehicle.

The G9 snow dust guard is only available with an open blade shape for the respective snow plow width.

5.11 Snow guide rubber

The snow guide rubber serves as an extension of the closed blade shape and suppresses the formation of snow dust.

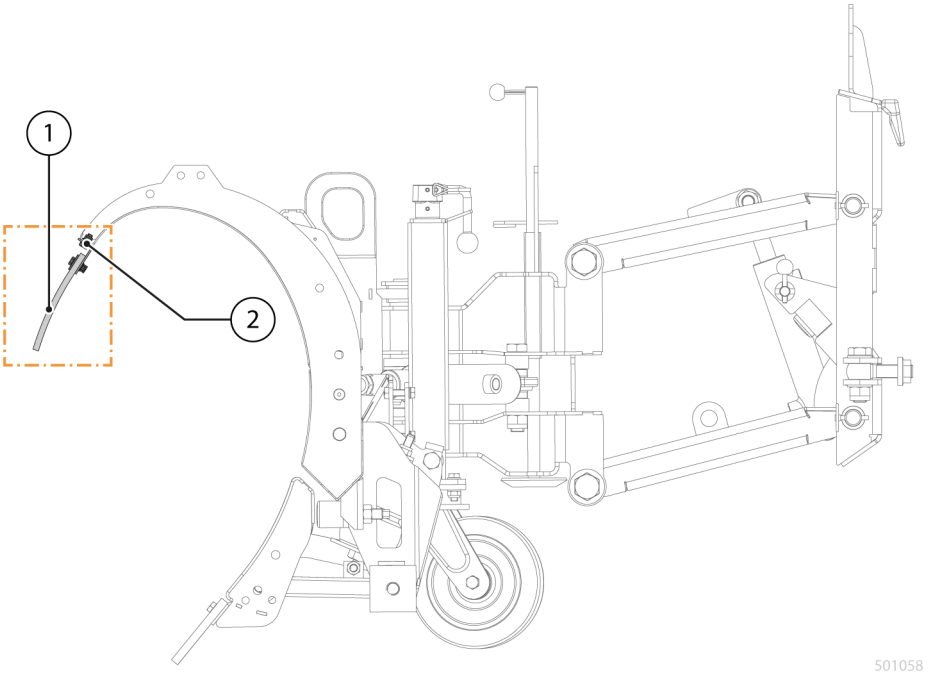


Fig. 33 Snow guide rubber, with closed blade shape

1 Snow guide rubber

2 Mounting bracket with screws

The snow guide rubber improves the driver's visibility and does not impair the cooling of the engine on the carrier vehicle.

The snow guide rubber is available for every snow plow width of the closed blade type.

5.12 Ejection lock

CAUTION

Damage to material or machine due to misuse.

- Avoid impact and overload on side plates.
- Do not use the snow plow as a shovel.
- Lift the snow plow off the ground before adjusting the hydraulic side plates.
- Do not use the side plates as snow plow extensions.

5.12.1 Side plate version 1

WARNING

Misuse – risk of injury

- Do not use the side plate to extend the clearing width.

The side plate serves as an ejection barrier and can be swiveled to the rear and locked into place when not in use.

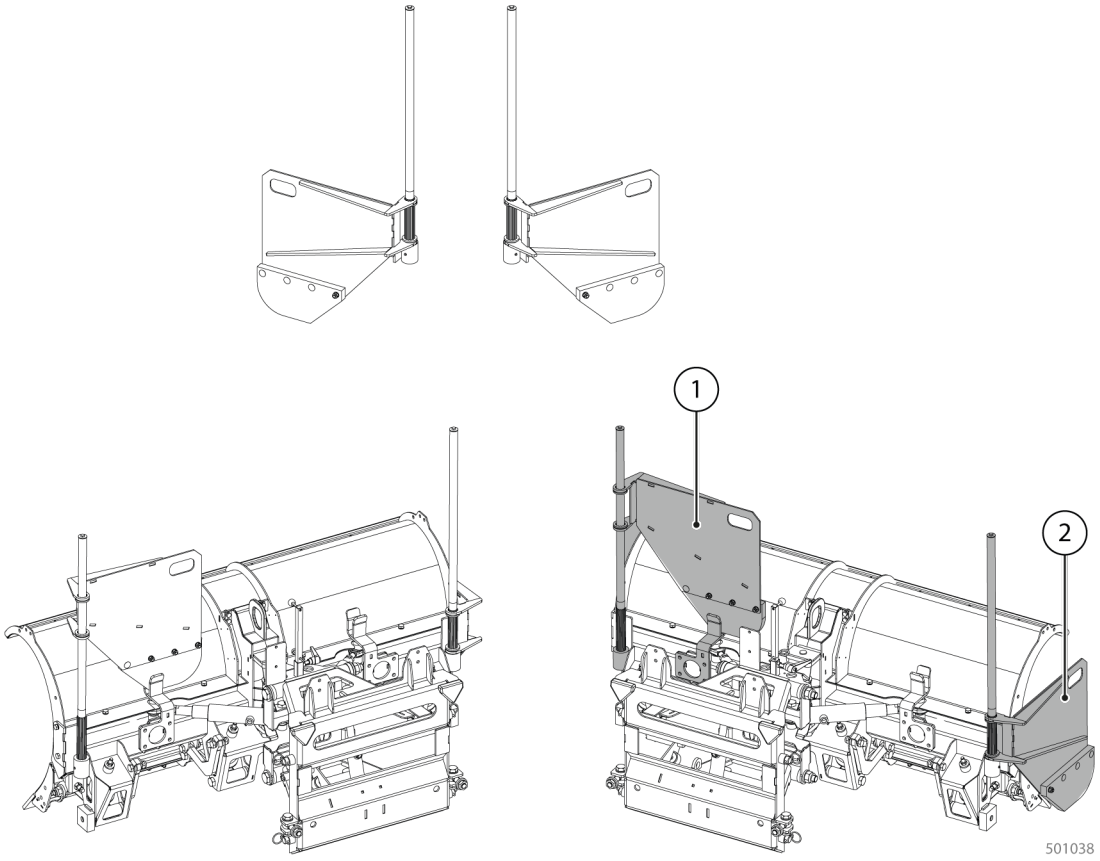


Fig. 34 Ejection barrier

1 Side plate on the left, in parking position 2 Right side plate, ready for use

5.12.2 Side plate version 2

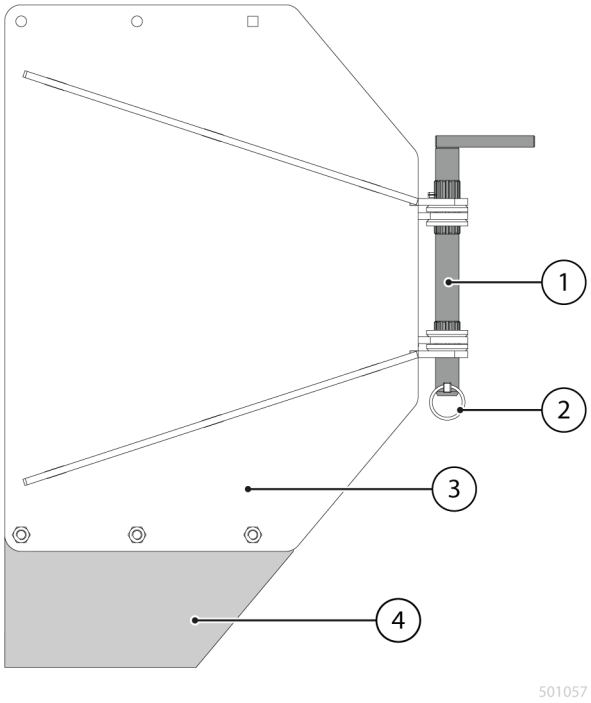


Fig. 35 Side plate version 2

1	Plug-in pin	2	Safety pin
3	Side plate version 2	4	Side plate extension

The side plate version 2 is available for snow plows with a width of 200 cm or more.

5.12.3 hydraulic side flaps

When raised, the hydraulic side flaps serve as snow dust protection, and when lowered, they serve as an ejection barrier during snow removal.

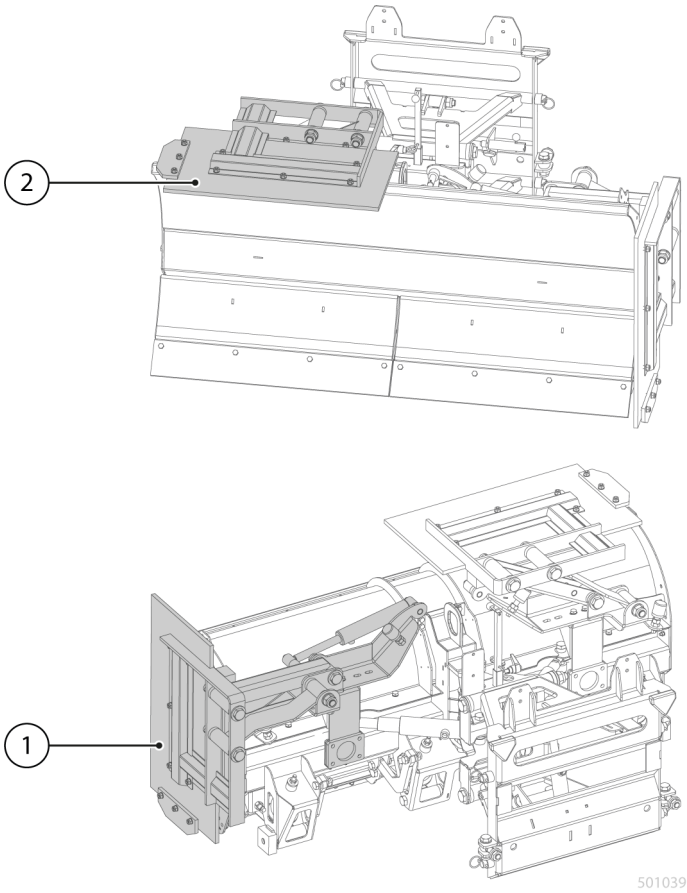


Fig. 36 Hydraulic side flaps

1 Side flap on the left side, lowered

2 Right side flap, raised

The hydraulic side flaps are available for all widths of the open coulter shape and can be controlled individually or in parallel.

5.13 Hydraulic cross tilt

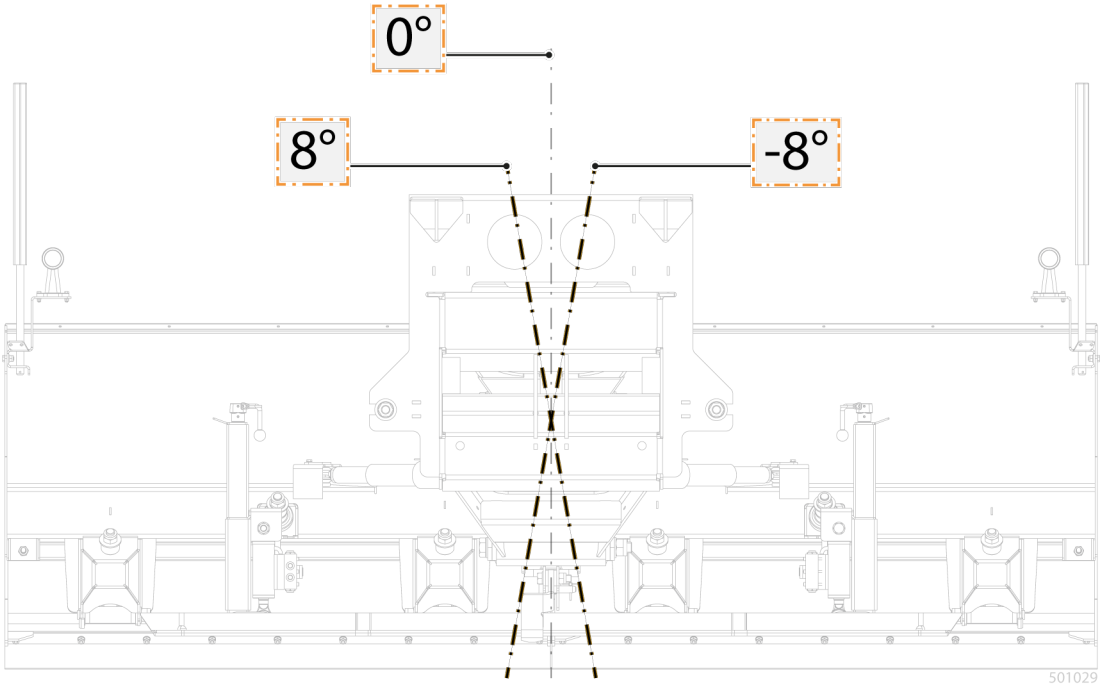


Fig. 37 Hydraulic cross tilt, example

The hydraulic cross tilt is used to additionally compensate for the snow plow in the longitudinal direction by tilting it by +/- 8°.

A wide variety of attachments can be installed on the transverse tilt, for example for snow removal on sidewalks.

5.14 Parallelogram for wheel loader attachment

The parallelogram for wheel loader attachments is installed between the snow plow and the mounting plate with quick-change attachment. It is available in two versions: mechanical stop or spring-loaded.

6 Transport

6.1 Safety

DANGER

Suspended load – risk of injury due to material breakage, tipping, slipping, or falling loads.

- Observe the transport instructions on the machine.
- Observe the transport weight and transport dimensions specified in the Technical Data/Dimensions and Weights section.
- Observe the orientation of the loads and attachment points.
- Only use suitable, undamaged, and fully functional lifting equipment with sufficient load capacity.
- Clear transport routes before transport and keep escape routes clear.
- Lift loads slowly and avoid jerky movements.
- Never stand under a raised load.

6.2 Check the scope of delivery

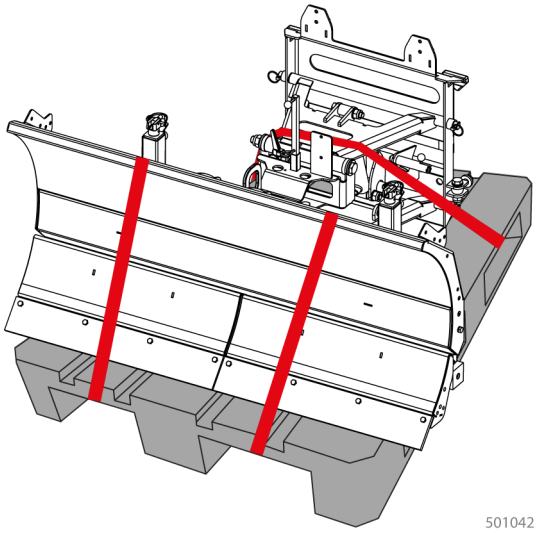


Fig. 38 Original packaging

Check the scope of delivery

Procedure

– Personnel qualification: Qualified personnel

1. ATTENTION: Check the delivery immediately for transport damage.
2. Document any visible or suspected transport damage with photos.
3. Report any transport damage to the manufacturer.
4. Check delivery for completeness according to the delivery note.

6.3 Transport in original packaging

The snow plow can be transported in its original packaging in the following ways:

- Crane
- Forklift

6.3.1 Transport by crane

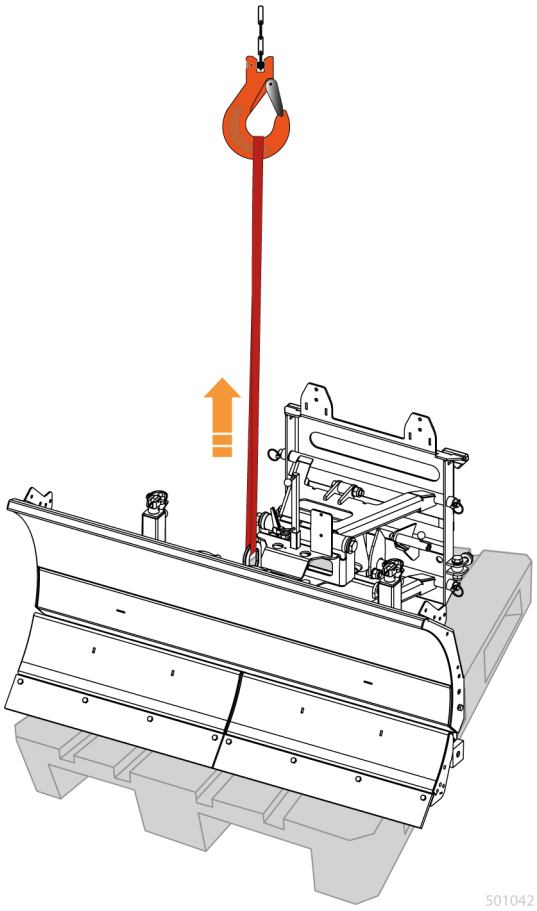


Fig. 39 Lifting points for crane

Procedure

– Personnel qualification: Specialized personnel

1. DANGER of slipping or tipping over: When transporting the snow plow, use the attachment point on the snow plow.
2. Attach lifting equipment to the attachment point.
3. Lift the snow plow slowly and horizontally.
4. DANGER from suspended load: Keep transport routes clear during the entire transport process.

6.3.2 Transport with forklift

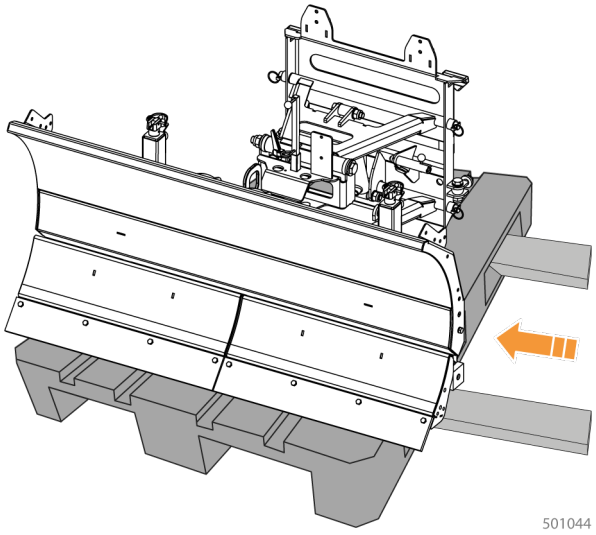


Fig. 40 Transport with forklift

Procedure

– Personnel qualification: Qualified personnel

1. DANGER of slipping or tipping over: Use the entire forklift fork.
2. Transport the snow plow slowly and horizontally.
4. DANGER of slipping or tipping over: Keep transport routes clear during the entire transport.

6.4 Unpack

Keep the packaging material for later use or dispose of it in accordance with local regulations.

Tab. 10 Recycling

Material	Type of recycling
Wood	Recycling
PE film	Recycling
Cardboard/paper	Recycling
Desiccants	Household waste

6.5 Transport after unpacking

6.5.1 Transportation by crane

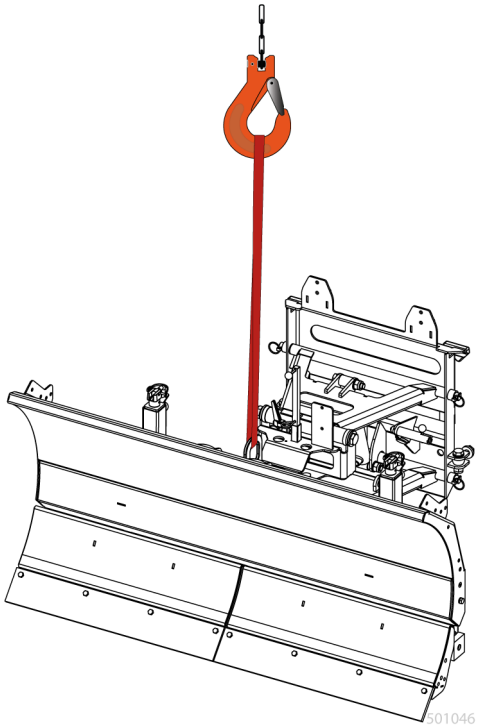


Fig. 41 Transport by crane

6.6 Transport after commissioning

WARNING

Misuse – risk of injury.

- Observe the applicable regulations when transporting after commissioning.
- Only carry out transport with a valid order.
- Avoid hazardous areas.

6.7 Relocation trip

Displacement journeys are journeys with a work order to the place of use or to move the snow plow.

WARNING

Misuse - risk of injury.

- When driving with the snow plow attached, the applicable country-specific laws and regulations must be observed.
- Relocation trips without authorization are prohibited.
- Before each transport, the snow plow must be raised and the transport lock engaged.

6.7.1 Use transport locks

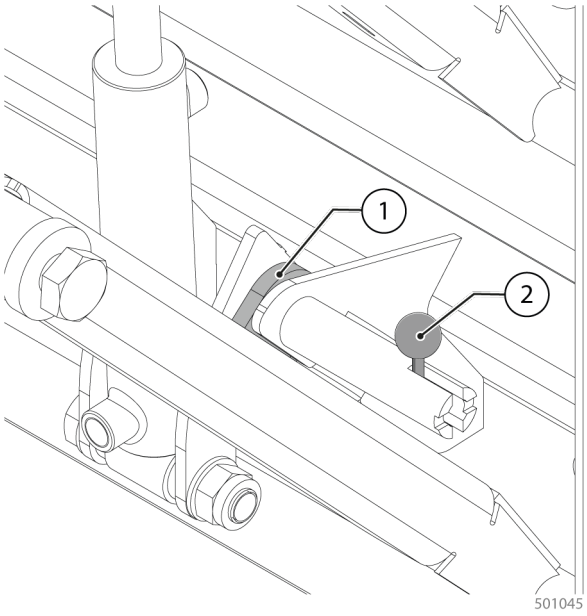


Fig. 42 Use transport safety device

1 Transport lock tab

2 Transport lock

This transport lock is only included in the parallelogram version. For other attachments, this must be ensured by the carrier vehicle.

7 Operation

WARN

There is a risk of injury from moving components when performing setup work.

- Before starting work, secure the snow plow against uncontrolled movement.

7.1 Attachment and removal Carrier vehicle

7.1.1 Principle

Attachment and removal on carrier vehicles with fixed equipment mounting plate

7.1.2 Safety

DANGER

When attaching and removing the snow plow, there is a risk of injury in the swivel range of the snow plow.

- Avoid danger zones.

CAUTION

For municipal and 3-point mounting devices, observe the manufacturer's instructions.

7.2 Attachment to carrier vehicle

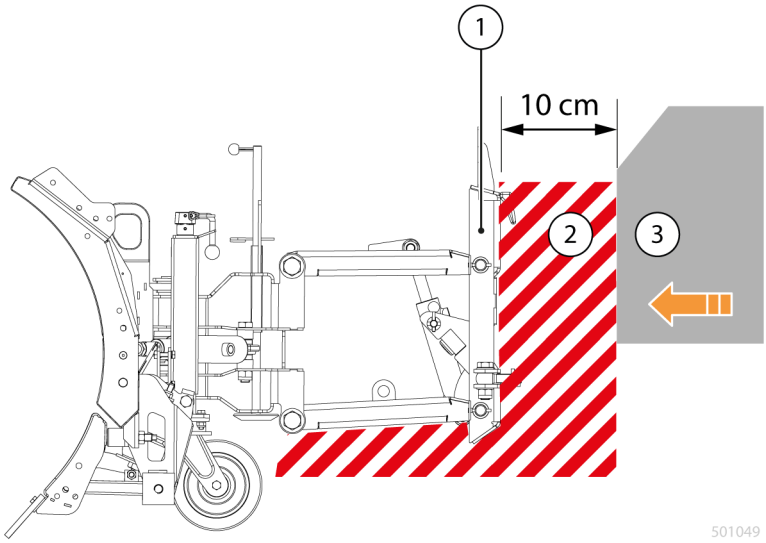


Fig. 43 Attachment to carrier vehicle

Procedure

– Personnel qualification: Qualified personnel.

1. Drive the carrier vehicle (3) to the connection plate.
   – (2) Maintain a distance of 10 cm from the carrier vehicle.
2. Connect the hose line with the coupling plug to the vehicle hydraulics.
   – The "Lift" and "Swivel" functions are available.
3. On the control hydraulics: Actuate the "Lift" lever.
   – The mounting plate lifts to the desired height.
4. Drive the carrier vehicle (3) to the mounting plate.
   – (1) The mounting plate can be lowered and locked into place.
5. On the control hydraulics: Actuate the "lower" lever.
   – The mounting plate lowers and the mounting plate can be locked.
   – Influence the engagement of the mounting wedges by raising and lowering.
6. Swivel the eye bolt with flange nut SW 30 inwards and tighten.
   – The mounting plate is pressed onto the equipment plate of the carrier vehicle.
7. On the support: Loosen the clamping screw, pull the support upwards and secure it with a spring pin to prevent it from lowering uncontrollably.
8. Tighten the clamping screw.
   – The snow plow is ready for snow removal.

7.3 Removal from the carrier vehicle

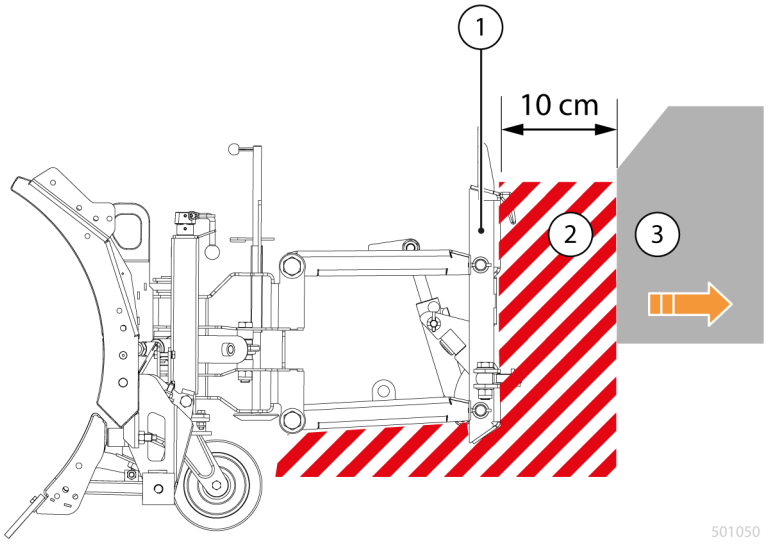


Fig. 44 Removal from the carrier vehicle

Procedure

– Personnel qualification: Qualified personnel.
– Snow plow is cleaned.

1. Park the snow plow at the storage location.
2. On support: Loosen clamping screw, slide support downwards and secure with spring pin to prevent uncontrolled lifting.
   – Tighten the clamping screw.
3. On the control hydraulics: Move the "Lower" lever to the "Float" position.
4. Loosen the eye bolt with flange nut SW 30 and swivel it outwards.
   – The mounting plate (1) is detached from the equipment plate of the carrier vehicle.
5. On the control hydraulics: Actuate the "Lift" lever.
   – The mounting plate lifts and the mounting plate lock is open.
   – Loosen the mounting wedges by raising and lowering them.
6. Move the carrier vehicle (3) away from the connection plate.
   – (2) Maintain a distance of 10 cm from the mounting plate.
7. On the control hydraulics: Actuate the "Lift" lever.
   – The snow plow lowers to the wear rail.
8. Disconnect the hose lines from the vehicle.
9. Remove the carrier vehicle ((3)) from the snow plow.

7.4 Set up

7.4.1 Element suspension system

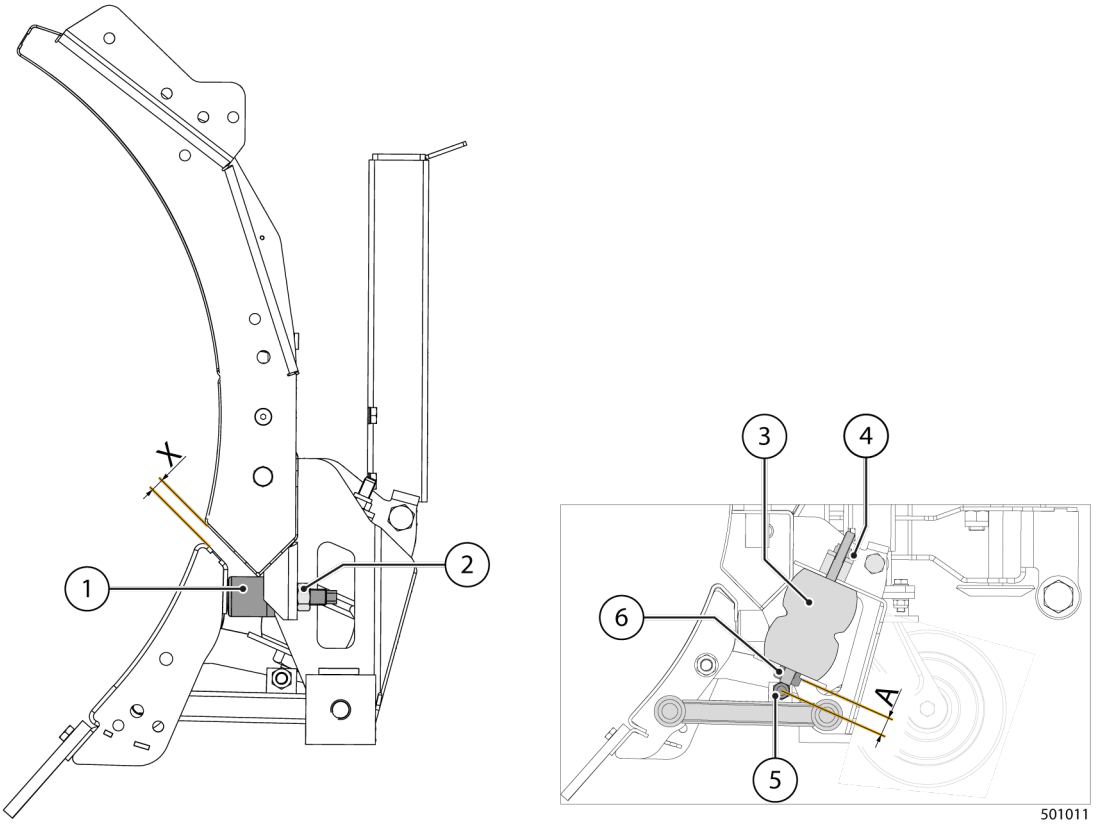


Fig. 45 Adjust element suspension system

1) Stop buffer
2) Locking nut for countering, Stop buffer
3) Rubber hollow spring
4) Lock nut for hollow rubber spring
5) Fastening screw for hollow rubber spring
6) Adjusting nut for hollow rubber spring
X) Clearance between plow body and Cushioning element
A) Distance between mounting screw and adjusting nut Rubber hollow spring

7.4.2 Principle

Before using the snow plow for the first time, the suspension elements must be checked and adjusted to prevent hand injuries.

The gap dimension "X" is adjusted using the lock nut, which should be applied without preload.

The preload of the rubber leaf spring is adjusted using the adjusting nut (6).

7.4.3 Adjusting the tipping resistance

Procedure

– Personnel qualification: Qualified personnel.
–

1. DANGER: Risk of hand injuries from moving components. Before using the machine for the first time, check the basic settings of the suspension elements on the snow plow.
2. Use the lock nut to set the gap dimension X according to Table 11 "Adjusting the tipping resistance."
   > The lock nut is not preloaded, gap dimension X is set.

Tab. 11 Adjusting the tipping resistance

Position	Designation	Value
X	Clearance between plow body and spring element.	10 to 15 mm
A	Minimum distance between mounting screw and rubber leaf spring.	35
A	Maximum distance between mounting screw and adjusting nut of rubber hollow spring.	50 mm

3 Use the adjusting nut to set the preload of the rubber hollow spring according to the "Tilt resistance" table.
   > Spring deflection height is set.

7.4.4 Adjusting the transition suspension element

Procedure

– Personnel qualification: Qualified personnel.

1. WARNING: Risk of hand injuries from moving components. Adjust the transition from the suspension element to the plow body.
2. Loosen nut (2) and adjust transition from spring element to plow body according to Table 12 "Transition spring element".

Tab. 12 Adjusting the transition between the spring element and the plow body

Designation	Value
Minimum transition from spring element to plow body	2
Maximum transition from spring element	5

3. Tighten nut (2).

7.4.5 Headlight system

The headlight system must be adjusted to working height before use.

When the snow plow is raised, the headlights must be visible through the snow plow and its attachments.

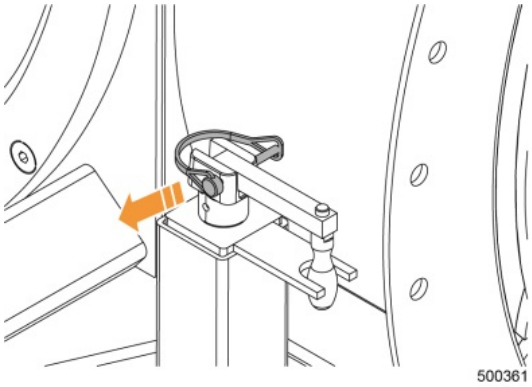
7.4.6 Lowering safety device Transport safety device

To prevent uncontrolled lowering while driving, the snow plow must be raised and secured with the transport lock.

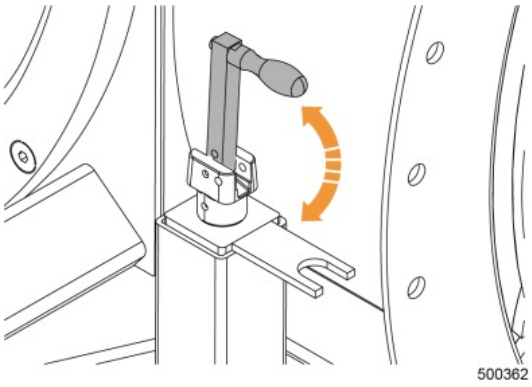
7.4.7 Adjusting the wheel

Height for snow removal

1. Loosen and remove the folding pin.



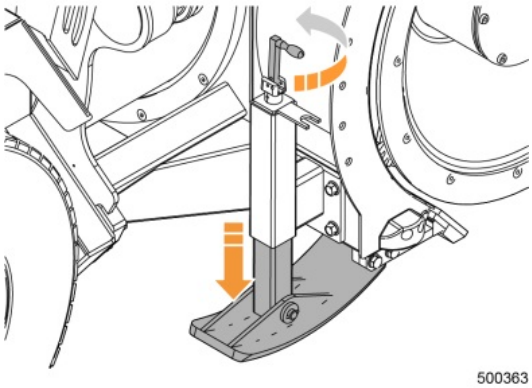
2. Fold out the hand crank.



3. Adjust the height for snow removal:

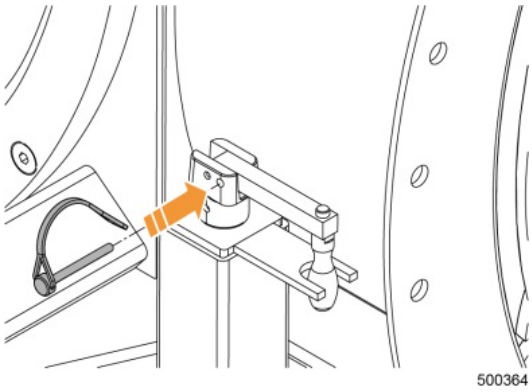
On sensitive surfaces, adjust the impeller so that the wear rail does not touch the ground.

For black ice removal, adjust the wheel so that the wear bar rests on the ground.



For clearing black ice, set the wheels approx. 2 cm from the ground.

4. Fold down the hand crank into the holder.
5. Secure the hand crank with the folding pin.



6. Perform a check.
   - The hand crank is correctly engaged and secured with the folding pin.
   - The spindle cannot move during snow removal.

7.4.8 Fit hoses

The hydraulic system of the snow plow is supplied with hydraulic oil by the hydraulic components of the carrier vehicle.

Procedure

- Personnel qualification: Trained personnel.

1. **Warning of crushing hazard**: There is a risk of injury when performing commissioning work.
2. Connect the snow plow hoses to the hydraulic interface of the carrier vehicle.

Further information can be found in the chapters **on attachment to** and **removal from the carrier vehicle**, as well as in the *original operating instructions for the carrier vehicle*.

7.4.9 Switch on lighting

Procedure

- Personnel qualification: Qualified personnel.
- The chapter **on attachment to the carrier vehicle** is now complete.
- Observe *the original operating instructions for the carrier vehicle*.

1. On the steering column: Activate the function lever.
   - Low beam is active.
2. On the steering column: Activate the function lever.
   - Headlight system is active.

8 Commissioning

8.1 Preparations

8.1.1 Principle

General information on the hydraulic components and controls of the carrier vehicle can be found in the *original operating manual for the carrier vehicle*.

8.1.2 Hydraulic system

The snow plow's hydraulics are supplied by the carrier vehicle's hydraulic system. No further work is required.

8.1.3 Initial filling

The initial filling of the hydraulic components of the snow plow is carried out by the manufacturer.

8.2 Checking functions

8.2.1 Raise/lower snow plow

Procedure

- Personnel qualification: Specialized personnel.
- The chapter **on attachment to the carrier vehicle** is now complete.

In the carrier vehicle

1. Move the function lever to the "Lower" position and check the movement of the snow plow.
2. Move the function lever to the "Raise" position and check the movement of the snow plow.
   > If the snow plow lowers evenly and in the correct direction, end the test.
   > If the snow plow does not lower or lowers jerkily, continue with step 3.
3. Perform check:
   - Connection of the lines between the snow plow and the carrier vehicle,
   - Check the oil level in the hydraulic tank of the carrier vehicle.

8.2.2 Swivel the snow plow

Procedure

– Personnel qualification: Qualified personnel.
– The chapter **on attachment to the carrier vehicle** is now complete.

In the carrier vehicle

1. Move the function lever to the "left" position and check the movement of the snow plow.
2. Move the function lever to the "right" position and check the movement of the snow plow.
   > If the snow plow swivels evenly and in the correct direction, end the test.
   > If the snow plow does not pivot or pivots jerkily, continue with step 3.
3. Perform check:
   – Connection of the lines between the snow plow and the carrier vehicle.

8.2.3 Folding hydraulic side flaps in/out

The hydraulic side flaps are controlled by the carrier vehicle's functional hydraulics. Further information can be found in the *original operating instructions* for the carrier vehicle.

8.2.4 Mounting the side panels

Procedure

– Personnel qualification: Qualified personnel.
–

1. Move the snow plow to its starting position.
2. Remove the required side plate from the holder and rotate it 270°.
3. Lower the side plate and snap it into the guide.
   – The side plate is now mounted for snow removal.

8.2.5 Removing the side plates

Procedure

– Personnel qualification: Qualified personnel.
–

1. Lift the side plate and rotate it 270°.
2. Lower the side plate into the holder.
   – The side plate is secured against uncontrolled movement.

9 Operation

9.1 Prepare for snow removal

9.1.1 Inspection

Before each snow removal operation, walk around the snow plow.

Procedure

– Personnel qualification: Qualified personnel.
– The carrier vehicle is switched off and the ignition key is stored safely.

1. Record any material damage and faulty components on the snow plow.
2. Record loose parts and faulty fastenings.

9.1.2 Visual inspection

Procedure

– Personnel qualification: Specialized personnel.

1. **Warning of crushing hazard:** Check the snow plow for material damage and loose or defective parts.
   – If there are no loose or defective parts, start snow removal.
   – Replace loose and defective parts immediately.

9.2 Carry out snow clearance

9.2.1 Safety

DANGER

Noise – When clearing snow, there is a risk of fatigue and damage to health due to noise.

- Wear hearing protection.
- Take sufficient breaks.

DANGER

Poor visibility – When clearing snow, there is a risk of injury due to areas that are difficult or impossible to see.

- Hazardous areas and work areas must be visible to the vehicle operator at all times.
- Keep unauthorized persons away.
- Avoid danger zones.

9.2.2 Operation

The snow plow is operated using the controls of the carrier vehicle.

General information on the controls of the carrier vehicle can be found in the *original operating instructions for the carrier vehicle*.

Procedure

– Personnel qualification: Qualified personnel.

In the carrier vehicle

1. Perform the desired functions using the carrier vehicle controls.
2. Observe the control element displays and make adjustments if necessary.
3. Finish snow removal.

10 Malfunctions

10.1 Malfunction list

Malfunction	Cause	Remedy
No function after pressing the wind rose switch	1. Fuse defective 2. Control panel not connected 3. Engine speed too low, charging indicator light illuminates 4. Switching circuit board defective 5. Control relay defective 6. Battery empty	1. Check fuse 2. Check whether plug is connected correctly 3. Accelerate 4. Replace circuit board 5. Replace control relay 6. Charge the battery
No oil pressure	1. Insufficient voltage 2. Insufficient hydraulic oil 3. DC motor not running 4. Pressure relief valve does not close	1. Charge battery 2. Refill hydraulic oil 3. Check power supply 4. Clean pressure relief valve
Valves do not switch	1. Control cable or control panel defective 2. Magnet defective 3. Clogged dirt particles	1. Check diode plate and control cable 2. Replace magnet 3. Replace valve
Plow cannot be lowered.	1. In the current limiting valve at Lifting cylinder Contaminated parts	1. Loosen the angle screw fitting and hollow screw, unscrew the current limiting valve and clean it

Any malfunctions not described by the manufacturer must be reported to them.

11 Maintenance

11.1 Principle

Maintenance work contributes significantly to the operational safety and value retention of the snow plow. Therefore, in your own interest and for the safety of the operating personnel, carry out maintenance work in accordance with the specifications in this operating manual.

The manufacturer offers service contracts to effectively prevent unexpected production downtime.

11.2 Definitions

This operating manual uses the following terms:

- Maintenance: umbrella term for servicing and repair.
- Servicing: Preventive cleaning, inspections, lubrication, and refilling and replacement of operating fluids.
- Repair: Repair work and replacement of spare parts.

11.3 Safety

DANGER

Risk of injury – When performing maintenance work on the snow plow, there is a risk of injury from moving components.

- Secure the snow plow against lowering.
- Depressurize the hydraulic system.
- Have work on the snow plow carried out by qualified personnel.

WARNING

Operating fluids (fuels, coolants, lubricants, cleaning agents) – Risk of injury due to inhalation of vapors, skin irritation and allergies, fire hazard, risk of environmental damage.

- Handle, store, and dispose of operating fluids properly.
- No open flames. No smoking.
- Wear protective gloves and safety goggles when handling operating fluids.
- Contain and bind spilled operating materials immediately.

11.4 Operating fluids

Operating materials include fuels, coolants, lubricants, and cleaning agents.

Operating fluids must not be mixed. When refilling, use operating fluids from the same supplier and of the same type.

11.4.1 Hydraulic oil

Designation	Value
HVLP 46	20 l

11.4.2 Lubricating grease

Designation	Value
Lubricating spray	Spray 2000
Lubricating grease	Multi-purpose grease 2000

11.4.3 Cleaning agent

Designation	Value
Cleaning agent	Machine cleaner

11.4.4 Preservative

Designation	Value
Rust protection oil	Corrosion protection green 186

11.5 Tightening torques

11.5.1 Principle

Retighten all screws after the first use.

Repeat further checks of the screws periodically after prolonged use and before each winter.

11.5.2 Tightening torques

Tab. 13 Tightening torques, metric threads

Metric threads	Maximum tightening torques for the individual strength classes in [Nm]	
	8.8	**10.9**
M4	2.9	4.1
M5	6	8.5
M6	10	14
M8	25	35
M10	49	69
M12	86	120
M14	135	190
M16	210	295
M18	290	405
M20	410	580
M22	550	780
M24	710	1000
M27	1050	1500
M30	1450	2000

Tab. 14 Tightening torque for eye bolt

Metric threads	Maximum tightening torques for the individual strength classes in [Nm]
Eye bolt M24	**230**

11.6 Maintenance

11.6.1 Principle

Before starting maintenance work, the snow plow must be prepared and cleaned.

11.6.2 Preparing for maintenance

Procedure

– Personnel qualification: Qualified personnel.

1. **Warning of crushing hazard:** Secure the snow plow against unintentional movement.
   – Chapter Ending **the dislocation drive**.
2. Mark danger areas.
3. Prepare personal protective equipment.
4. Provide tools and cleaning agents.
5. Continue with the chapter on **cleaning the snow plow**.

11.6.3 Cleaning the snow plow

Procedure

– Personnel qualification: Qualified personnel.
– The chapter **Attaching to the carrier vehicle** is now complete.
– The chapter **on using the transport safety device** is now complete.

1. At the washing area: When cleaning the snow plow with high pressure, there is a risk of injury from flying parts or foreign objects.
   – Wear safety goggles or a face shield with side protection.
2. Clean the snow plow and remove salt residues.

11.7 Maintenance schedule

11.7.1 Maintenance during commissioning

No maintenance is necessary during commissioning with the manufacturer.

11.7.2 Daily maintenance

Tab. 15 Daily maintenance

Maintenance work	Chapter
Preparing for maintenance	11.6.2
Cleaning the snow plow	11.6.3
Ensuring operational readiness	11.8.1
Check the overall condition of the snow plow	11.8.2
Check overall condition of swivel	11.8.3
Check overall condition of element suspension system	11.8.4

11.7.3 Annual maintenance

Tab. 16 Annual maintenance

Maintenance work	Chapter
Preparing for maintenance	11.6.2
Cleaning the snow plow	11.6.3
Check overall condition of snow plow	11.8.2
Check the overall condition of the swivel	11.8.3
Check overall condition of element suspension system	11.8.4
Check fastenings	11.8.5
Check the sliding piece	11.8.6
Check pivot pin	11.8.7
Check the lever	11.8.9
Check rubber hollow spring	11.8.10
Check the stop buffer	11.8.11
Check the telescopic cylinder	11.8.12
Check the impeller	11.8.8
Check hoses	11.8.13

11.7.4 After use

Tab. 17 After use

Maintenance work	Chapter
Clean snow plow	11.6.3
Check overall condition of snow plow	11.8.2
Check overall condition of swivel	11.8.3
Check overall condition of element suspension system	11.8.4

11.7.5 Before the summer break

Tab. 18 After the summer break

Maintenance work	Chapter
Preparing for maintenance	11.6.2
Cleaning the snow plow	11.6.3
Ensure operational readiness	11.8.1
Check the overall condition of the snow plow	11.8.2
Check the overall condition of the swivel	11.8.3
Check the overall condition of the element suspension system	11.8.4
Check fastenings	11.8.5

11.7.6 After the summer break

Tab. 19 After summer break

Maintenance work	Chapter
Prepare for maintenance	11.6.2
Cleaning the snow plow	11.6.3
Ensure operational readiness	11.8.1
Check the overall condition of the snow plow	11.8.2
Check overall condition of swivel	11.8.3
Check overall condition of element suspension system	11.8.4
Check fastenings	11.8.5

11.8 Maintenance work

11.8.1 Ensure operational readiness

Procedure

– Personnel qualification: Trained personnel.

1. Order: Remove objects and tools that are not used to operate the machine.
2. Cleanliness: Remove obvious dirt from the machine or its surroundings.
3. Function: Check the snow plow for damage or unusual wear.
   > Have any defects repaired.
4. Safety: Ensure that all controls are freely accessible.

11.8.2 Check the overall condition of the snow plow

Procedure

– Personnel qualification: Qualified personnel.

1. Check the snow plow for leaks.
   – If there are no leaks, finish the check.
   > Repair leaks and defects immediately.
2. Check snow plow for cracks or damage.
   – No cracks or damage present, end inspection.
   > Replace defective parts and repair defects immediately.
3. Check the snow plow for dirt or blockages.
   – If there is no dirt or blockages, end the inspection.
   > Remove dirt and clean component.
   > Remove blockages.
4. Check snow plow for wear.
   – No wear present, end inspection.
   > Replace defective parts and rectify defects immediately.
5. Continue according to **the maintenance schedule** chapter.

11.8.3 Check the overall condition of the swivel joint

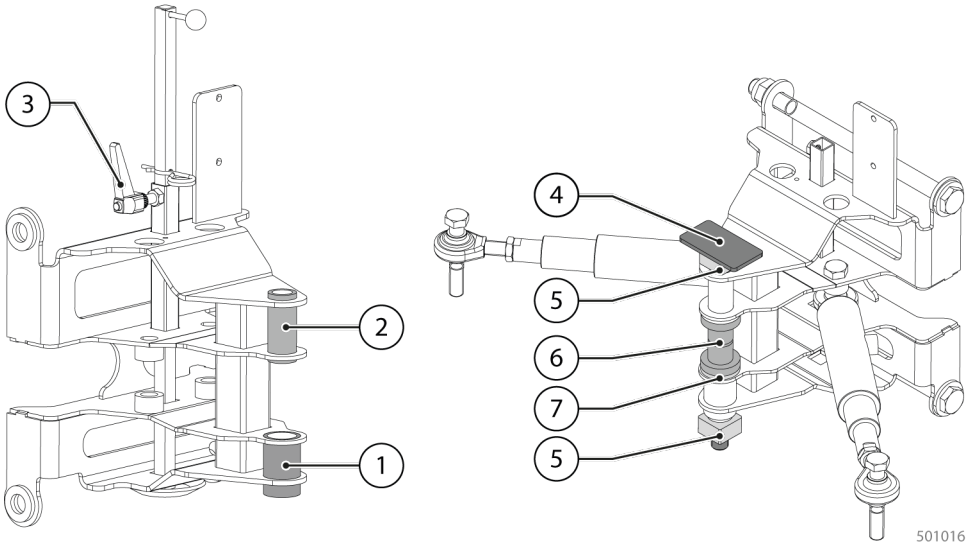


Fig. 46 Rotating part

1	Bearing at bottom	2	Upper bearing
3	Clamping lever support	4	Rotary bolt
5	Sliding piece, installed twice	6	Vulkollan bushing, installed twice
7	Adjustment bushing	8	Lock nut

Procedure

– Personnel qualification: Qualified personnel.

1. Check the rotary joint for leaks.
   – If there are no leaks, end the check.
   > Repair leaks and defects immediately.
2. Check the rotating part for cracks or damage.
   – No cracks or damage present, end inspection.
   > Replace defective parts and repair defects immediately.
3. Check the swivel for wear.
   – If there is no wear, end the inspection.
   > Replace defective parts and rectify defects immediately.
4. Check sliding parts for damage.
   – No wear present, end inspection.
   > Replace damaged sliding pieces immediately.

11.8.4 Check the overall condition of the element suspension system.

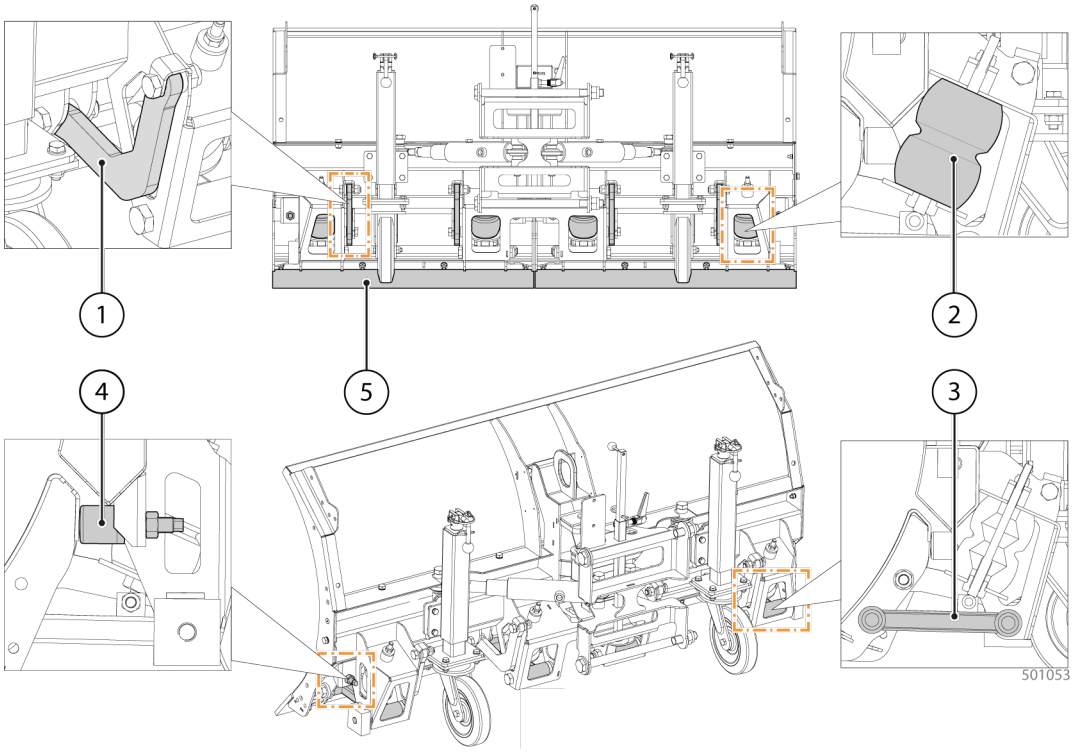


Fig. 47 Element suspension system

1	Lever	2	Rubber hollow spring
3	Control lever	4	Stop buffer
5	Wear rail		

Procedure

– Personnel qualification: Qualified personnel.

1. Check the element suspension system for leaks.
   – If there are no leaks, end the check.
   > Repair leaks and defects immediately.
2. Check the element suspension system for cracks or damage.
   – No cracks or damage present, end inspection.
   > Replace defective parts and repair defects immediately.
3. Check the element suspension system for wear.
   – No wear present, end inspection.
   > Replace defective parts and rectify defects immediately.

11.8.5 Check fastenings.

Procedure

- Personnel qualification: Qualified personnel.
- Set the torque wrench according to the chapter **on tightening torques**.

1. Check each fastener individually to ensure it is tight.
   - If the fastener is tight, continue with step 2.
   - If the fastener turns or is loose, continue with step 3.
2. Mark the fastener and record the result.
3. Place the torque wrench on the fastener.
4. Tighten the fastener evenly until you hear a click.
   > The fastener is now tightened.
5. Mark the fastener and record the result.

11.8.6 Check the sliding piece

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is mounted on the carrier vehicle.

1. **Clean** the snow plow without high-pressure wet cleaning in accordance with the section **on cleaning the snow plow**.
2. Check the sliding piece for material damage:
   - Deformation greater than **1 mm** or **2 mm**
   - Break
   - Play greater than **1 mm**
3. Replace compressed sliding pieces over **1 mm** or **2 mm** immediately.
4. Replace broken sliding pieces immediately.
5. Replace sliding pieces with play greater than **1 mm** immediately.

11.8.7 Check pivot pins

Procedure

- Personnel qualification: Qualified personnel

1. Check pivot pins for movement and secure fit.

11.8.8 Check the impeller

Procedure

– Personnel qualification: Qualified personnel.

1. Perform visual inspection:
   – If there is no damage or deformation, end the check.
   – Damage or deformation present, replace impeller as described in the chapter **on replacing impellers**.

11.8.9 Check lever

Procedure

– Personnel qualification: Qualified personnel
– Chapter **Dislocation travel** is complete.
– Element cushioning system is not loaded.

1. Move the suspension elements individually and check the function of the lever.
   – If the function complies with the specifications, finish the check and lubricate the lever.
   – If function is impaired or not present, replace lever immediately.

11.8.10 Check rubber hollow spring

Procedure

– Personnel qualification: Qualified personnel
– Snow plow is raised and secured, element suspension system is not loaded.

1. Check the rubber leaf spring for breaks and defective parts.
   – Replace defective rubber bellows immediately in accordance with the section on replacing rubber bellows.
   – All rubber springs are intact, end inspection.

11.8.11 Check the stop buffer

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is raised, element suspension system is not loaded.

1. Clean the contact surface of the stop buffer.
2. Check the stop buffer mounting.
3. Check the stop buffer for breakage and wear.
   - If the length of the stop buffer is less than 25 mm, the stop buffer is worn; continue with step 4.
   - If the length of the stop buffer is over 30 mm, the stop buffer may be used.
4. Replace the stop buffer.

11.8.12 Check the telescopic cylinder

Procedure

- Personnel qualification: Qualified personnel

1. Check the telescopic cylinder for leaks and defective components.
   - If the telescopic cylinder is leaking or defective, continue with the section **on replacing telescopic cylinders**.
   > The telescopic cylinder is tight, end the check.

11.8.13 Check hoses

After each use, check the hoses for damage or leaks.

Procedure

- Personnel qualification: Qualified personnel
- Snow clearing operation is complete.
- The chapter **on cleaning the snow plow** is complete.

1. Check the hoses on the snow plow for breaks, leaks, and other damage.
   - Replace defective hoses immediately.

11.9 Lubrication work

11.9.1 Lubrication schedule

Tab. 20 lubrication schedule

Lubrication point	Quantity	Every 25 hours	Every 50 hours	Annually
Guide tube support	15g		×	×
Rotary bolt	10g			×
Telescopic cylinder	**Telescopic cylinders are self-lubricating**			
Telescopic cylinder Ball joint	Spray	×		×
Ball bearing Impeller	Spray			×
hand crank	2g	×		×
Running wheel	10g	×		×
Fastening Rubber hollow spring	Spray			×
Swivel piece, lower bearing	Spray		×	×
Swivel piece, top bearing	Spray		×	×
Control lever	Spray	×		×
Sliding piece	5g			×

11.9.2 Lubrication points

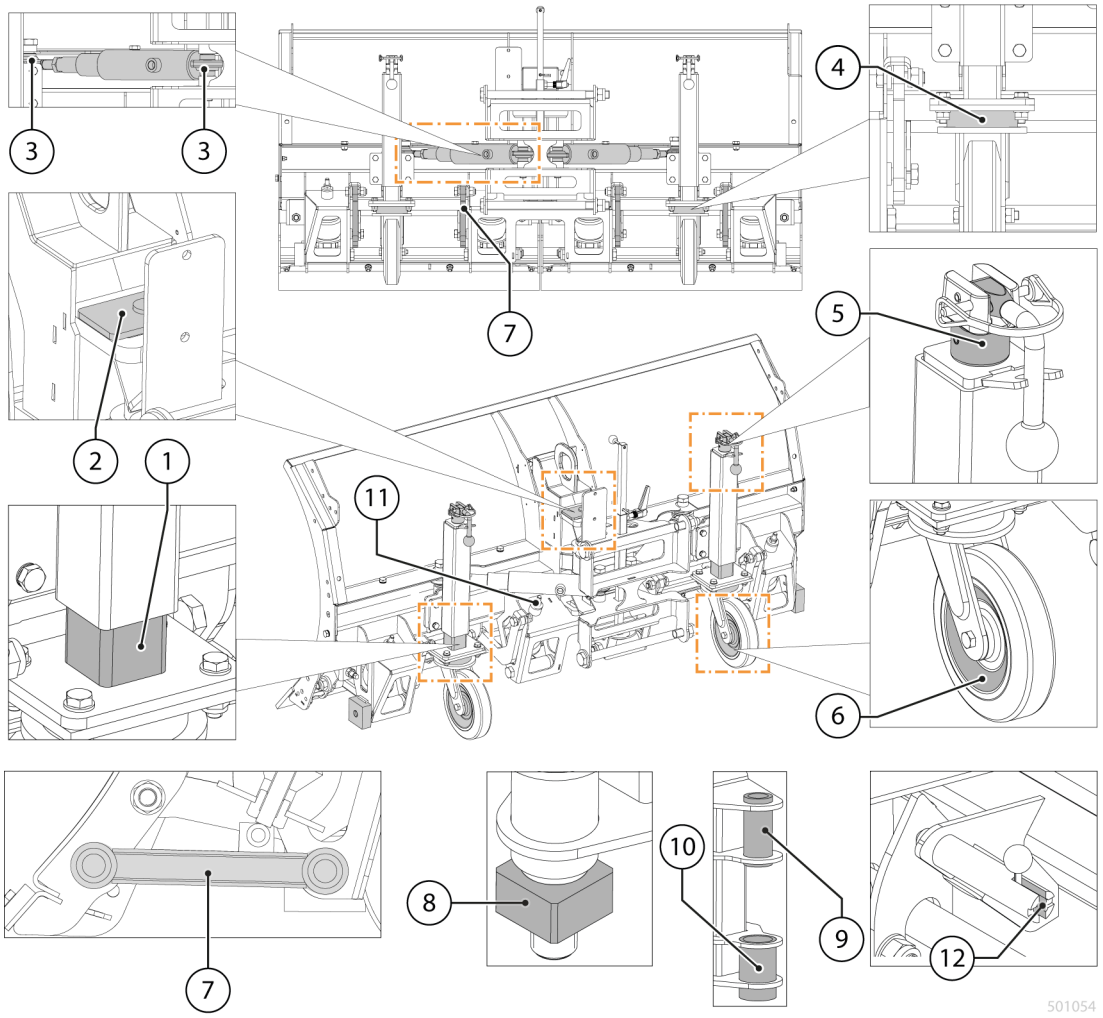


Fig. 48 Lubrication points

1	Guide tube support	2	Rotary pin
3	Telescopic cylinder Ball joint	4	Ball bearing Runner wheel
5	Hand crank	6	Wheel
7	Control lever	8	Sliding piece, installed twice
9	Rotating piece, upper bearing	10	Rotating piece, lower bearing
11	Rubber hollow spring mounting	12	Transport lock Parallelogram

11.9.3 Lubrication points Lubricate snow plow

Procedure

- Personnel qualification: Trained personnel.
- Snow plow is mounted on the carrier vehicle,
- Engine of carrier vehicle is switched off,
- Cloth.

1. Move movable components.
   - Telescopic cylinder
   - Sliding skid
   - Hand crank
   - Element cushioning system
2. Apply grease individually to each contact point.
   - Refer to **the lubrication schedule** section.
3. Remove any residue with a cloth.
4. Move components individually in each direction.
5. Swivel the snow plow 3 times in each direction.
   > The snow plow is lubricated.
   > Record the result.

11.10 Maintenance work

11.10.1 Overview

Tab. 21 Maintenance work

Maintenance work	Chapter
Replacing the pivot pin	
Replacing the lever	
Replacing the rubber hollow spring	
Replacing the control lever	
Replacing the wear rail	
Replace telescopic cylinder	
Replace impeller	
Replace hoses	
Renew paint	
Apply rust protection	
Apply preservative	
Replace hydraulic oil	

11.10.2 Replace pivot pins

Procedure

- Personnel qualification: Qualified personnel.
- Snow plow is secured against accidental tipping.
- Swivel piece is secured against accidental movement.

1. Slowly and evenly pull the pivot pin upwards out of the swivel piece.
   - Remove the Vulkollan bushings.
   - Remove the sliding pieces.
2. Install new pivot pin.
   - If the Vulkollan bushings are intact, continue to use them.
   - Vulkollan bushings defective or damaged, replace.
   - Sliding pieces intact, continue to use.
   - Sliding pieces damaged, replace immediately.

11.10.3 Replace lever

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is raised and secured, element suspension system is not loaded.

1. Loosen and remove the fastening screws on the lever.
2. Replace the lever and tighten the fastening screws.
   - Observe the tightening torque of the lock nut.
   - Dispose of defective levers properly.

11.10.4 Replace the rubber hollow spring

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is raised and secured, element suspension system is not loaded.

1. Loosen the lock nut.
   - Rubber hollow spring is depressurized and freely movable, remove lock nut.
2. Loosen the control lever fastening and remove the control lever.
3. Remove the defective rubber hollow spring.
   - Visually check the rubber hollow spring mounting screw for breakage or deformation.
   - If the rubber hollow spring mounting screw is not deformed or broken, continue with step 4.
4. Insert new rubber hollow spring.
5. Control lever and fastening Insert the control lever and tighten.
   - Tighten to the torque specified in the chapter *on tightening torques*.
6. Attach and tighten the lock nut.
   - Tighten to the torque specified in the chapter *on tightening torques*.
7. Readjust the element suspension system as described in the chapter **on setup**.

11.10.5 Replace control lever

Procedure

- Personnel qualification: Specialized personnel
- Snow plow is raised and secured, element suspension system is not loaded.

1. Secure the element suspension system against uncontrolled movement.
2. Loosen and remove the control lever mounting screws.
3. Replace the control lever and tighten the fastening screws securely.
   - Observe the tightening torque of the lock nut.
   - Dispose of defective control levers properly.

11.10.6 Replace wear rail

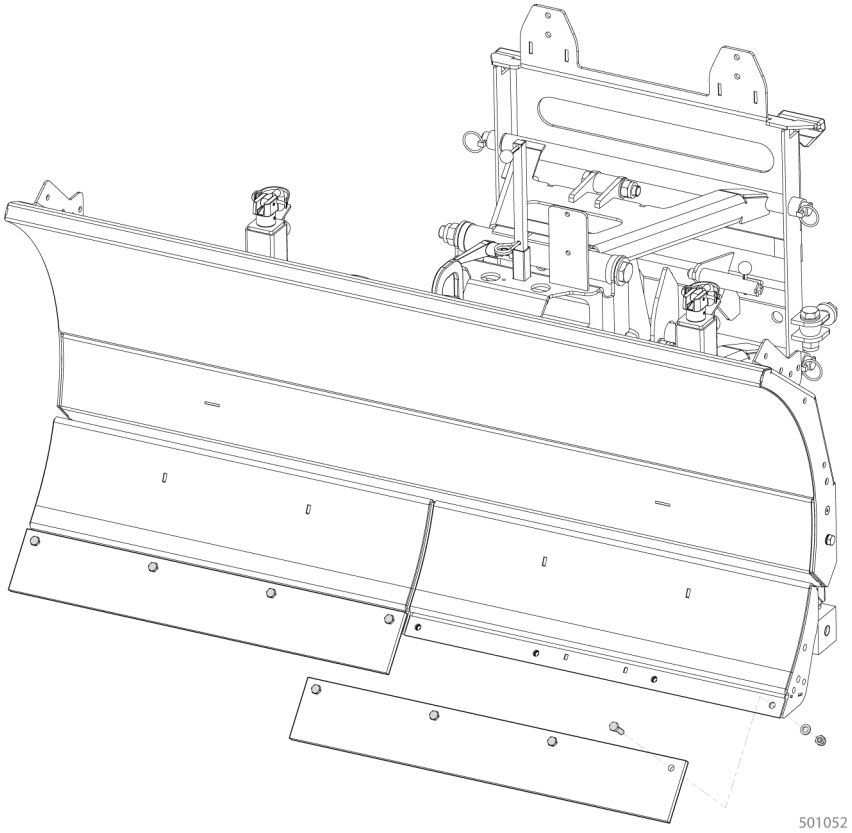


Fig. 49 Replace wear rail

Procedure

– Personnel qualification: Qualified personnel
– Snow plow is mounted on the carrier vehicle.
– Snow plow is secured against uncontrolled movement.

1. Loosen the lock nut and remove it with shims.
2. Remove the fastening screw and replace the wear rail.
3. Insert the wear rail into the plow body with the fastening screw.
4. Attach the washer with the lock nut and tighten the lock nut.
5. Attach the lock nut and tighten it.
   – Tighten to the torque specified in the chapter **on tightening torques.**
   > Dispose of defective wear rails properly.

11.10.7 Replace the telescopic cylinder

If the telescopic cylinder is leaking or has defective components, have it replaced by an authorized workshop or **II Customer service and spare parts** .

11.10.8 Replace rubber hollow spring

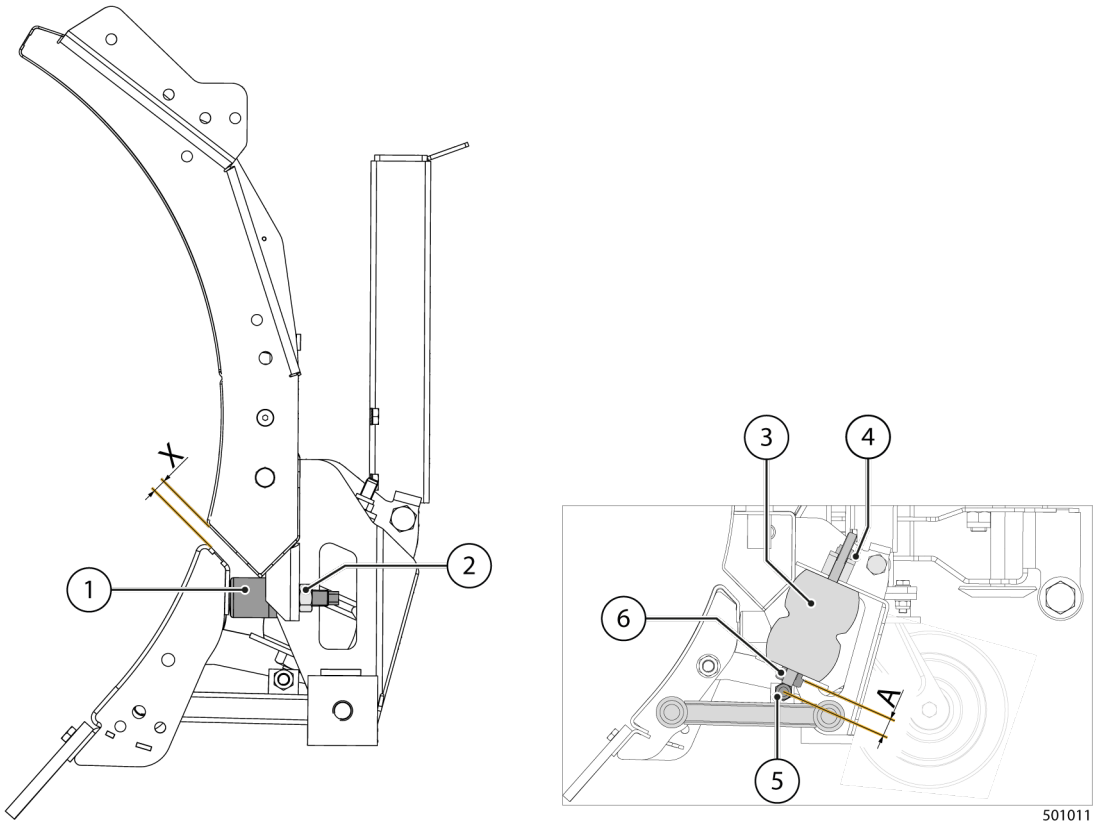


Fig. 50 Adjust element suspension system

1) Stop buffer
2) Fastening nut for locking, Stop buffer
3) Rubber hollow spring
4) Lock nut for hollow rubber spring
5) Fastening screw for hollow rubber spring
6) Adjusting nut for hollow rubber spring
X) Clearance between plow body and suspension element
A) Distance between mounting screw and rubber spring adjustment nut

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is raised and secured, element suspension system is not loaded.

1. Loosen the lock nut.
   - The rubber hollow spring is pressureless and freely movable; remove the lock nut.
2. Loosen the control lever fastening and remove the control lever.
3. Remove the defective rubber hollow spring.
   - Visually check the rubber hollow spring mounting screw for breakage or deformation.
   - If the rubber hollow spring mounting screw is not deformed or broken, continue with step 4.
4. Insert new rubber hollow spring.
5. Control lever and fastening Insert the control lever and tighten.
   - Tighten to the torque specified in the chapter *on tightening torques*.
6. Fasten and tighten the lock nut.
   - Tighten to the torque specified in the chapter *on tightening torques*.
7. Readjust the element suspension system as described in the section *on the element suspension system*.

11.10.9 Replacing the impeller

Procedure

- Personnel qualification: Qualified personnel
- Snow plow is mounted on the carrier vehicle.

1. Remove the wheel mounting bolt.
2. Remove the wheel and insert the new wheel.
3. Insert the impeller mounting screw and tighten it securely.
   - Tighten to the torque specified in the chapter *on tightening torques*.

11.10.10 Replace hoses

Have the hoses replaced by an authorized workshop.

11.10.11 Renew paint

Have paintwork carried out by an authorized workshop.

11.10.12 Apply rust protection

Have rust protection work carried out by an authorized workshop.

11.10.13 Apply preservative

Have preservation work carried out by an authorized workshop.

11.10.14 Replace hydraulic oil

Procedure

– Personnel qualification: Qualified personnel

1. Remove the oil tank cap.
   – Place the oil collection container under the drain plug.
2. Remove the oil drain plug and drain the oil into the collection container.
3. Tighten the oil drain plug.
   – Remove oil residue with a cloth.
4. Fill with oil according to the manufacturer's specifications.

12 Decommissioning

12.1 General

The following work must be carried out to take the snow plow out of service.

12.2 Summer break

To store the snow plow during the summer months, the following chapters must be observed and carried out.

12.2.1 Cleaning

Clean the snow plow as described in the chapter *on cleaning the snow plow*.

12.2.2 Function check

The functional check of all available functions and the overall condition of the snow plow must be carried out in accordance with the chapter *on maintenance* .

12.2.3 Fastenings

All fastenings on the snow plow must be checked in accordance with the chapter *on maintenance/fastenings*.

12.3 Preparing for transport

Further information on transporting the snow plow can be found in the *Transport* chapter.

12.4 Storage conditions

After use, do not store the snow plow in heated rooms to avoid damage from salt residues.

For storage during the summer break, the snow plow must be cleaned and the procedures described in the *Maintenance* chapter must be carried out.

Treat the snow plow as *described* in the chapter *on preservation*.

Only store the preserved snow plow at temperatures of +10°C.

After the summer break, maintenance must be carried out on the entire snow plow in accordance with the *Maintenance* chapter.

12.5 Maintenance during storage

No special maintenance is required during storage during the summer break.

A monthly visual inspection of the overall condition of the individual components in accordance with the chapter *on checking the overall condition of the snow plow* is recommended.

12.6 Disposal

Procedure

– The snow plow is dismantled and the components are sorted.

1. Remove operating fluids from the machine and dispose of them properly.
   – Ferrous metals
   – Non-ferrous metals
   – Plastics
   – Electronic components

13 Spare parts

13.1 Principle

Only original spare parts guarantee the proper functioning of the machine.

13.2 Order

To ensure a smooth ordering process, we require the following information:

- Type and number of the snow plow,
- Item number of the desired part,
- Description of the part,
- Number of parts required.

13.3 Order address

ZAUGG AG EGGIWIL	Phone	+41 (0) 34 491 81 81
Holzmatt 651 b	Email	aftersales@zaugg.swiss
	Web	www.zaugg.swiss

14 Directories

14.1 Table of contents

14.2 List of illustrations

15 Declaration of conformity

Konformitätserklärung

For the

ZAUGG snow plow type G9-160-2
ZAUGG snow plow type G9-180-2
ZAUGG snow plow type G9-200-2
ZAUGG snow plow type G9-220-2
ZAUGG snow plow type G9-240-2

We hereby confirm compliance with the requirements of Directive 2006/42/EC including the amendments and supplements published to date.

National and international standards and directives have been observed during design and manufacture.

This declaration loses its validity if the machine is modified without our consent.

Product manager: Sebastian Frautschi

Serial number: _____

Eggiwil, September 26, 2024 **ZAUGG AG EGGIWIL**

Peter Rüegsegger
Head of Technology

Wilhelm Rieder
Managing Director

ZAUGG®

MASTERS OF SNOW

Scan Me!

Индикативно предложение по проведени пазарна консултация №57252
с предмет "Доставка и монтаж на 2 /два/ броя гребла за почистване на сняг"

от

ЕМКО ВЕРДЕ ЕООД, ЕИК 205985080, адрес гр. Благоевград, ул. Зора 14, телефон 0887569977 ел. поща:em

№ по ред	ID на Възложителя	Описание и технически характеристики на предлаганото изделие	М.е.	К-во	Ед. цена без ДДС
		Доставка и монтаж на гребло за почистване на сняг ZAUGG L3 - 320 с електрохидравличен агрегат (EPA) и регулируем ъгъл на почистване, включително всички необходими части за монтиране към к амионите(Din плочи и др.), на товарни автомо били Mercedes-Benz Arocs 1835 с VIN номера: W1T96420210770035 и W1T96420X10769750.	бр.	2	88 444.00 лв.
					Обща стойност без ДДС

Срок на доставка: 90 дни след сключване на договор
Условие на доставка: До адрес на Възложителя
Гаранционен срок: 24 месеца
Производител/ ZAUGG AD Швейцария
Съпроводителна документация при доставка
*Декларация за съответствие, Ръководство за експлоатация, Приемно - предавателен протокол, Фактура.
Приложен е документ за представителство

Приложение №2

ıkoverde@abv.bg

Стойност без ДДС
176 888.00 лв.
176 888.00 лв.

ОПИСАНИЕ НА ОКОМПЛЕКТОВКА

Гребло за почистване на сняг ZAUGG L3 – 320 за монтаж към товарни автомобили Mercedes-Benz Arocs 1835:

- **VIN: W1T96420210770035**
- **VIN: W1T96420X10769750**

1. ZAUGG L3 – ширина 3200 мм

- Корпус: RAL 2011 оранжев

- Прикачни компоненти: RAL 9007 сиво алуминий

- Пластмасова плоча за защита на греблото: черна

- Сериен номер: SN 640764b, размер A

- Регулируем ъгъл на почистване до: 45°

- Електрохидравлично задвижване с EPA – електрохидравличен агрегат

- Съвместим с товарни автомобили Mercedes-Benz Arocs 1835:

- – VIN: W1T96420210770035

- – VIN: W1T96420X10769750

2. Монтажна плоча VSS размер A за Mercedes Arocs OffRoad (SN 640764b)

- Монтажна плоча VSS размер A с вграден теглич и щифт Ø32

- Опорно лагерно тяло и напречна греда с регулируеми долни рамена

- Комплект щифтове и монтажни болтове

- Пясъкоструйно обработена, заварена и боядисана

3. Капак за монтажна плоча VSS-A

4. Монтажни материали за свързване към акумулатора

- Електрически кабел 2×35 mm^2

- Защитна гофра

- Двуполюсен конектор Harrison

5. Контролна кутия ZAG107

6. Контролен кабел ZAG107 с 16-полюсен щепсел

7. Релеен интерфейс ZAG416

8. Кабелен комплект за ZAG416 Type Truck

- За допълнително осветление на снегорина

- Контролен кабел с щепселен конектор

9. Допълнителни компоненти, включени към основния модел

- Червено-бял сигнален флаг ZAUGG, монтиран върху корпуса

- Свързващ кабел за електрическата помпа (BH щепсел, SR 175)

- Монтажна плоча VSS размер A върху превозното средство

- Електрическа помпа/Електрохидравличен агрегат EPA

- Система за управление: ZAG Control

Снегорин ZAUGG L3
Мощен в действие.
Доказан и икономичен.

ZAUGG L3 остава уверен там, където други спират:
Добре обмислената конструкция позволява безопасно преодоляване на препятствия до 100 mm височина.
Ясната, функционална структура и електрохидравличен агрегат гарантират максимална надеждност и минимални изисквания за поддръжка.

Достига скорости на почистване до 60 [км/ч]

Благодарение на система, която предпазва гребло от повреди и позволява оптимално адаптиране към профила на пътя.

Така L3 е перфектно съобразен с изискванията на градските улици, междуселищните пътища и автомагистралите – навсякъде, където неравностите и препятствията са част от ежедневието.

ZAUGG L3

Снегорин ZAUGG L3	320	360	400
Брой елементи на окачването:	4	4	4
Ширина на снегорина (см):	320	360	400
Височина на работното гребло (см):	105, (с допълнително повдигнати крайни секции)		
Ъгъл на завъртане до:	45°, с механичен ограничител		
Ширина на почистване при 36° (см):	259	291	324
Ширина на преминаване при 36° (см):	296	328	361
Тегло (кг), от:	790	810	830
Типове машини-носители:	Комунални превозни средства, UNIMOG, трактори		

Област на приложение

● ГРАД ● ПЪТНА МРЕЖА

Перфектно за приложение в градски и местни улици, подходи към предприятия и заводи, кръгови движения, междуселищни пътища.

Работното гребло с кръгла, отворена форма е изработено от стомана.
Долната му част е разделена на четири елемента и е оборудвана със системата за елементно окачване на ZAUGG, което позволява преминаване през препятствия с височина до 100 mm.

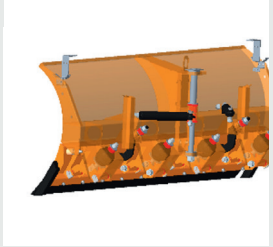
Опции (Допълнително оборудване)

- Адаптерни системи за монтаж:
  3-точково прикачване,
  Паралелограмна рама с монтажна плоча
- Защита от снежен прах
- ZAG-Control: Универсална система за управление за всички снегорини ZAUGG
- Гума за насочване на снега
- Опорна ролка/плъзгаща петя
- Фарове / осветителна система
- Допълнително осветление

ZAUGG — SINCE 18 93 — The Swiss Original

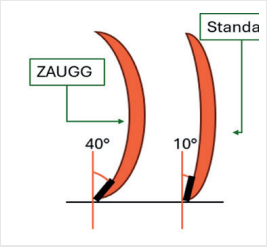
Топ 5 предимства на ZAUGG:

ZAUGG
Система за намаляване на вибрациите!



Специалното PUR-втулково демпфериране защитава носещото превозно средство и гребло от вибрации, като намалява необходимостта от поддръжка и цялостните сервизни разходи.

ZAUGG
Система за ефективно почистване на мокър сняг

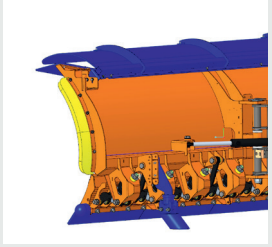


Плоският ъгъл на атака на гребло от 40° поема снега, без да го избутва. Допринася и намалява съпротивлението при придвижване.

ZAUGG
Система за преодоляване на препятствия

Премиум абсорбираща ударите система на окачване.
За безопасно преодоляване на препятствия с постоянна скорост.
Предпазва от удари и защитава превозното средство.

ZAUGG
Интелигентна система за настройка от оператора



Модулната конструкция на ZAUGG осигурява лесна употреба и спестява време при сервизни дейности.
Формите на гребло - отворени или затворени, са бързо и лесно сменяеми, за безпроблемно обслужване.

ZAUGG
Принцип на нискоемисионна работа

Спокоен ход, по - тиха работа, по - лека и стабилна конструкция, по-нисък разход на гориво и по-малко шум, по-добра защита на настилката и по-малко износващи се части.

Ще се радваме да Ви консултираме относно допълнителните предимства. Tel. +41 34 491 81 11 | sales@zaugg.swiss | www.zaugg.swiss | ZAUGG AG, CH-Eggiwil

Z-SP-B1-25-1