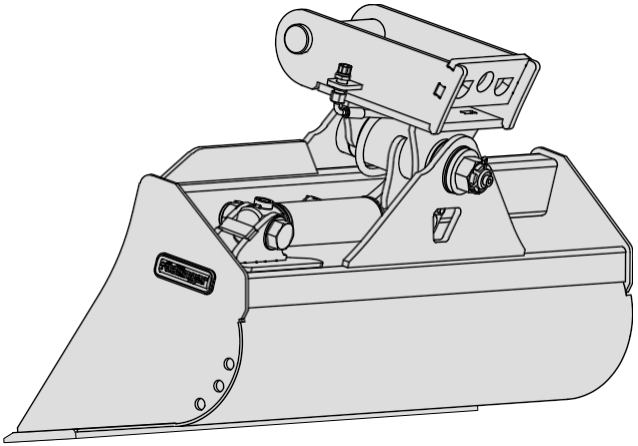
ORIGINAL OPERATING INSTRUCTIONS

Trench clearing bucket with cylinder



Read the document before initial commissioning! Keep for future use!

This documentation is not subject to change management.

IMPRINT

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1 INFORMATION ON THE DOCUMENT

This document is part of the technical documentation of the product.

It complies with "Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)" (Machinery Directive), Annex I, point 1.7.4."

This document is intended for the person in charge, who must hand it over to the personnel responsible for connecting, using and maintaining the product. They must ensure that they read and understood the information contained in this document and in the accompanying documents.

The document must be kept in a known and easily accessible place and must consulted even in case of slightest doubt.

The manufacturer accepts no liability for damage to persons, animals or property or to the product itself caused by improper use, non-compliance or insufficient compliance with the safety criteria contained in this document or by modification of the product or the use of unsuitable spare parts.

1.1 Structure of the safety-related information

Example structure

⚠SIGNAL WORD

Nature and source of the potential hazard

The consequences if no measures are taken to avert danger.

a) Measure for hazard avoidance.

b) Measure for hazard avoidance.

1.1.1 Signal words

For damage to persons

Signal word	For labelling...
 DANGER	... an imminently hazardous situation which, if not avoided, result in death or serious injury.
 WARNING	... a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	... a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

For damage to property/property

Signal word	For labelling...
ATTENTION	... a possible risk of damage to the product or other property that can be avoided by taking the recommended precautions.

For other information

Signal word	For labelling...
NOTE	... an operating simplification, a relevant instruction, a relevant procedure or a cross-reference.

1.1.2 Symbols

The following safety symbols in accordance with DIN EN ISO 7010 are used in this document and require special attention:

Warning signs

General warning sign

Warning of potentially explosive substances

Warning of danger of slipping

Warning of suspended load

Warning of hot surfaces

Warning of automatic start-up

Warning of crushing hazard

Warning of obstacles in the head area

Warning of hand injuries

Warning of falling objects

Prohibition sign

General prohibition sign

No smoking

Fire, naked flames and smoking are prohibited

Eating and drinking prohibited

Switching prohibited

No access for unauthorised persons

Command sign

General mandatory sign

Follow instructions

Wash your hands

Unlock before maintenance or repair

Keep locked

Use eye protection

Use foot protection

Use hand protection

Use protective clothing

Use head protection

1.2 Text formatting and presentation

Graphics

Illustrations may from your product variant.

Enumerations

Enumerations are used to summarise content briefly and concisely.

Instructions for action

The instructions guide step by step to concrete actions:

Theme and aim of the plot

1. Step-by-step calls to action
2. Step-by-step calls to action

➢ **Result**

2 IDENTIFICATION AND NOTES

Product designation	Trench clearing bucket with cylinder
Manufacturer	RÄDLINGER Rädlinger Maschinenbau GmbH Kammerdorfer Street 16 93413 Cham-Windischbergerdorf Germany Phone: +49 9971 8088-0 Fax: +49 9971 8088-9999 e-mail: info@raedlinger.de Web: www.raedlinger.de

2.1 General information

If you have any questions that go beyond the scope of this document, please do not hesitate to Raedlinger Maschinenbau GmbH.

The document is intended to familiarise the user with the handling of the product and to provide information on details regarding function and maintenance.

2.1.1 Warranty and liability

The "General Terms and Conditions of Sale and Delivery" of Raedlinger Maschinenbau GmbH shall apply. The "Terms and Conditions of Sale and Delivery" have been to the operator since the conclusion of the contract at the latest.

Warranty and liability claims for personal injury and damage to property are excluded if they attributable to one or more of the following causes:

" Improper use of the product

" Improper installation, , operation and maintenance of the product

" Disregarding the instructions and notes in this document and on the product

" Disregarding the limits of the product

" Unauthorised structural changes to the product

" Use of accessories or spare parts that are not original spare parts from the manufacturer or have been approved by the manufacturer

" Operating the product in the event of damage or malfunctions

" Inadequate implementation of the specified maintenance measures

" Disasters involving foreign bodies or force majeure.

2.1.2 Objectives of the document

This document serves as support and contains all the necessary instructions that must be observed for general safety, transport, installation, operation, maintenance, storage and disposal.

This document with all warning notices and all additional documents for assemblies from external suppliers must be provided:

" To be observed, read and understood by all persons working with the product

" Be freely accessible to every user

" Be consulted for all questions.

Goals:

" Prevent accidents

" Maximise the service life and reliability of the product

" Minimise production downtime costs

2.1.3 Target group of the document

Expertise	Transport	Installation	Commissioning	Operation	Fault diagnosis	Maintenance	Repair	Set up	Decommissioning	Waste disposal
Operating personnel			X	X		X			X	
Skilled labourer	X	X	X		X				X	X
Maintenance personnel					X	X	X	X		

Instructed personnel

A person who been instructed by qualified personnel about the tasks assigned to them and the possible dangers of improper behaviour and, if necessary, trained and instructed about the necessary protective equipment and protective measures.
These include:

" Operating personnel

" semi-skilled personnel.

Specialised personnel

A person who assess the work assigned to them and recognise potential hazards based on their professional training, knowledge and experience as well as knowledge of the relevant standards.
These include:

- Skilled worker
- Maintenance personnel.

Qualification of competences

Only persons who are authorised to work independently with the machine:

- Have reached the age of 18
- Are physically and mentally fit for the job.

Outside the Federal Republic of Germany, the relevant accident prevention regulations and safety regulations of the respective country apply.

2.2 Intended use

Depending on the type/version, the trench clearing bucket is used for:

- Picking up, transporting, lifting and dumping of medium-heavy soil types (light and medium use)
- Trench and trough construction
- Levelling and trench clearing/cleaning
- When using an embankment cutter: Creating embankments and verges. The following points

are necessary for the intended use:

- Match the product to the earth-moving machine
- Follow the instructions in the document

" Observe warning notices

" Observe the maintenance intervals.

Any other or extended use is considered improper and therefore inappropriate. In this case, safety and protective functions may be impaired.

Rädlinger Maschinenbau GmbH shall not be liable for any resulting damage.

2.2.1 Operating conditions

Ambient temperature	-20 °C to +40 °C; Storage at 10 °C to 25 °C
Altitude	Restrictions correspond to the earth-moving machine.
Pollution	Normal soiling from soil, clay and other bulk materials. Regular cleaning necessary. Avoid contact with acids or corrosive gases.
Special features	Only with sufficient lighting: at least 250 lx
Air humidity	For storage: up to 50%; otherwise no restriction
Soil class	Soil types with up to medium solubility

2.2.2 Service life

The service life depends on the factors:

" Operating environment

" Intensity of use

" Compliance with the maintenance intervals specified by the manufacturer.

2.3 Reasonably foreseeable misuse

Reasonably foreseeable misuse that could pose a risk to the user, third parties or the product is prohibited for all operating modes:

" Operating the product outside the physical limits of use

" Modifications to the product as well as additions and conversions without prior consultation with Rädlinger Maschinenbau GmbH

" Improper installation, , operation and maintenance of the product

" Operating the product if the requirements for the operator's field of vision are not met (ISO 5006)

" Use in hoist operation without authorised lifting gear

" Lifting of persons or means of passenger transport

" Pile driving, chiselling and impact work

" Handling of bulk goods above the authorised bulk weight

" Tearing or levering of concrete, use in rock (heavy-duty use)

" Feeding components and materials whose properties are not suitable for the product

" Use of unauthorised spare parts

" Operating the product with or with obvious faults or defective safety devices

" Repair, cleaning and maintenance work without complying with safety regulations

" Disregarding or not reading the instructions.

3 GENERAL SAFETY INFORMATION

The product is built according to the latest state of the art and recognised safety regulations. To prevent danger to the user, third parties and damage to the product, only use the product for its intended purpose and only use it when it is in an obviously safe condition.

The operator of the product or the persons authorised by him are responsible for damage to property and personal injury from failure follow the instructions given in the manual.

NOTE

Availability of the manual

The instructions are part of the product and are necessary for its safe use. If the instructions cannot be found or cannot be used:

a) order a replacement from Rädlinger Maschinenbau GmbH.

b) Keep the instructions within easy reach in the work area and make them accessible to staff at all times.

Eliminate faults, as these impair safety.

All safety and hazard information on the product must be kept in a legible condition.

3.1 Duties

Failure to do so will result in the loss of any warranty claims.

The following conditions increase the hazard potential of the product:

" Neglecting maintenance and servicing

" Malfunctions that may impair the safety of product operation.

Observe all warnings and safety instructions.

aware of the potential dangers.

3.1.1 Obligations of the operator

A safe condition and use of the product is a prerequisite for safe operation. The operator is therefore obliged to ensure that the following points are observed:

- **An operating instruction is required for occupational health and safety issues, which the operator must draw up.**
- Only qualified and authorised personnel should operate the product.
- Prohibit hazardous working methods. Check the actions of staff.
- Ask staff to confirm that they have read and understood the instructions.
- A copy of the complete instructions is available in the work area.
- Check the instructions regularly for completeness and legibility.
- The safety and danger notices attached to the product must kept in an appropriate condition or renewed.
- the wearing of protective equipment (PPE) for activities with a risk of injury.
- the responsibilities of the staff according to the areas of responsibility.
- Staff must report safety defects to a supervisor immediately.
- The product is only operated in one-man operation.
- The set pressures are documented using photos.
- The commissioning report is filled out and sent back to Rädlin- ger Maschinenbau GmbH together with the photos of the print settings.

Failure to do so will result in the loss of any warranty claims.

3.1.2 Duties of the staff

Persons working in the area of the product have a duty to co-operate to ensure safety and health protection in the workplace. They must be instructed in the use and operating conditions of the product. Everyone is obliged to contribute to the prevention of accidents at work and their consequences through their personal behaviour:

" Inform your supervisor if the product is not in proper condition

" Keep unauthorised personnel away from the danger zone

" Authorised personnel are only permitted to enter the danger zone while carrying out an instruction.

Tasks of the operating personnel

The operating personnel must carry out the following activities to ensure trouble-free operation:

" Identify faults and notify specialised personnel if necessary

" Commissioning of the product under the instruction of specialised personnel after a fault or after retrofitting

" Carrying out maintenance and servicing measures in accordance with the operator's specifications.

3.2 Danger zone

" The working, service and protection area of the product forms the danger zone.

" Hazardous areas on the product that require special attention are labelled with warning notices and safety symbols. They must clearly recognisable for persons working in this area.

" Working with the product while people are in the danger zone is not permitted.

" Hazardous areas may only be entered during the necessary steps.

3.3 Safety instructions

NOTE

Personal protective equipment (PPE)

Personal protective equipment must worn when working on the product.
The following components are at least part of suitable personal protective equipment:

a) Use eye protection.

b) Use foot protection.

c) Use hand protection.

d) Use protective clothing.

e) Use head protection.

f) Use respiratory protection.

NOTE

Risk of injury due to incorrect handling of equipment

Eating, drinking and smoking on the product and when handling equipment creates hazards.

a) Read the manufacturer's instructions and the safety data sheet of the product before use.

b) adequate ventilation around the product.

c) Do not inhale vapours.

d) Avoid skin and eye contact.

e) Wear PPE when handling equipment (gloves, safety goggles, respiratory protection).

f) Wash your hands after handling operating materials.

DANGER

Danger to life due to falling product

If the connecting bolts are not secured, there is a risk of the product falling down.

a) Check the fuses of the connecting bolts: After installation, before commissioning, before daily operation and before any maintenance.

⚠ DANGER

Danger to life due to hydraulic energy

If the pipes are defective, a jet of liquid can escape under high pressure.

a) Do not change print settings beyond the maximum values.

b) Follow all maintenance instructions.

c) **If hydraulic fluid escapes:** Do not touch the fluid jet.

d) **Stopping the liquid jet:** Switch off the earth-moving machine.

e) Depressurise hydraulic system.

f) Put on PPE.

g) Wait until the liquid jet stops.

h) Pick up spilled liquids and dispose of them properly.

i) Replace and repair defective parts.

⚠ WARNING

Risk of injury due to hydraulic energy

Hydraulically driven parts can move unexpectedly under high pressure and cause injuries.

a) Depressurise the hydraulic system before working on the product.

b) for freedom from pressure.



⚠ WARNING

Risk of crushing and amputation due to moving machines and components

The movements of the earth-moving machine and the product create hazards. Removing the protective devices creates hazards.

a) Do not touch the product during operation.

b) Do not open any protective devices.

c) Do not remove any connections or covers.


⚠ CAUTION

Risk of burns from hot hydraulic fluid and hot surfaces

Hot hydraulic fluid flows in the hydraulic lines. Contact with the lines or the fluid can cause burns.

a) Before working on the hydraulic system, depressurise it and allow oil-carrying components to cool down to ambient temperature.

b) Use hand protection.

c) Check all hydraulic lines regularly for damage.

⚠ CAUTION

Risk of slipping due to oil and lubricants

Oil or lubricant contamination can get onto the floor as a result of work on or faults with the product.
This creates a risk of slipping.

a) Watch out for soiling in the danger zone.

b) In the event of a fault: Eliminate the cause or inform the responsible specialist personnel.

c) Remove dirt, if present.

3.3.1 Residual risks

Despite all the precautions taken, there are residual risks that are not obvious.

You reduce the existing residual risks by observing and complying with the warnings and the intended use of the product.

⚠ DANGER

Danger to life due to impaired perception

Limited perception during contact with the product or when using it can result in hazards.

a) Only work with the product when it is fully operational.

b) Illumination of the working environment: at least 250 lx.

c) In the event of headaches, impaired vision, problems with acoustic perception, impaired responsiveness or similar restrictions: **Stop work**.

⚠DANGER

Danger to life due to malfunctions

Malfunctions of the product can cause hazards.

a) At the start of the shift: Check that the safety devices, supply lines and the overall condition of the product are in good working order.

b) In the event of a fault: Interrupt operation. **Eliminate the fault.**

c) Operation of the product is authorised again when all faults been rectified, safe operation is possible and the product's protective and safety devices are in place and intact.

⚠DANGER

Danger to life due to electric shock

Outside buildings, there is an increased risk of lightning strikes in the area of the product during thunderstorms.

a) Do not work on or with the product outdoors during a thunderstorm.

3.4 Additional information

The instruction of employees with regard to hazards and necessary protective measures must be repeated at regular intervals, but at least once a year. **An operating instruction is required for occupational health and safety matters, which the operator must draw up.** In addition to this documentation, operating instructions must be followed in full. The provisions of the accident prevention regulations of the employers' liability insurance association also apply to all work on the product.

NOTE

Danger due to missing instructions and labelling

Removing the instructions and labelling may result in hazards.

a) Keep the instructions and labelling belonging to the product in a legible condition and do not remove them.

b) After replacing parts and equipment: Reattach all labelling plates that have been removed for this purpose.

c) Stickers and signs that are no longer legible: Reorder from Rädlinger Maschinenbau GmbH.

Please also note:

" Applicable binding regulations on accident prevention

" Applicable binding regulations at the place of use

" Technical rules for safe and professional work

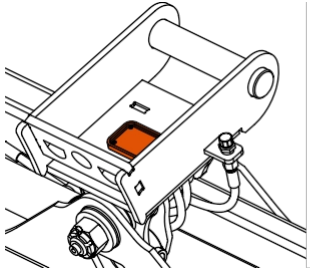
" Regulations on environmental protection

" Other applicable regulations

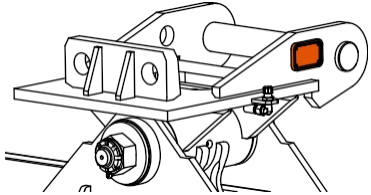
4.1 Labelling

Type plate

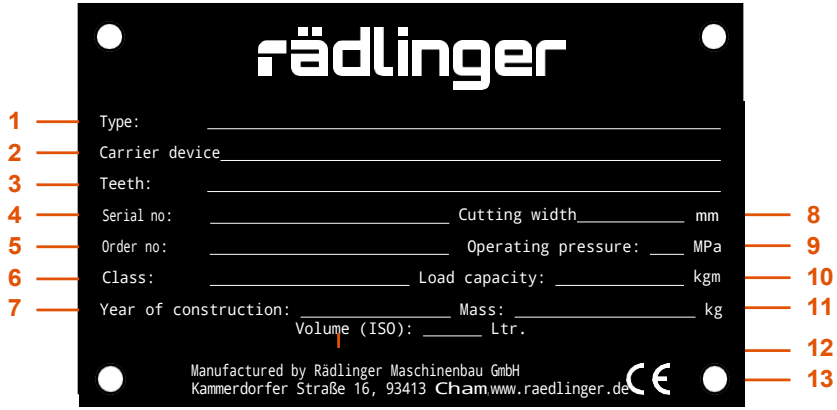
For bucket classes 01 - 09, the type plate is located on the cover plate of the swivel head:



For bucket classes 11 - 29, the type plate is located on the side of the suspension plate or the adapter frame:



The CE marking of the product is located on the rating plate.



1	Type	2	Carrier device
3	Teeth	4	Serial number
5	Order number	6	Class
7	Year of construction	8	Cutting width
9	Operating pressure	10	Load capacity
11	Volume (ISO)	12	Mass
13	CE labelling		

Warning signs

The warning sign for "**Warning of hand injuries**" is attached to the left and right suspension plate of the product.

4.2 Technical data

4.2.1 Features and equipment

Spoon class	01 - 06	07 - 09	11 - 29
Type of construction	20° tub		15° trough
	No centre crescent	No centre sickle, except cutting width 1800 mm	Centre crescent
	2° taper per side	2.5° taper per side	No rejuvenation
	No piston rod protection		Piston rod protection
	1 hydraulic cylinder		2 hydraulic cylinders
Swivelling angle	2× 45°		
Special equipment	Bucket body in HB 400		
	Slope cutting edge		
	Drainage holes		
	Load hook		
	Load holding valve		
	Profile knife		
	Underbolt turning knife		

4.2.2 Weight classes

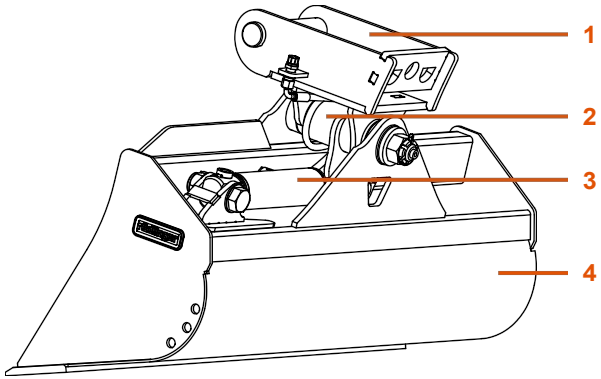
The technical data of the trench clearing bucket with cylinder depends on the respective configuration. Information can be found on the type plate.

You can enter the technical data for your product(s) in the following table:

Shovel type				
Carrier device				
Serial number				
Equipment class				
Cutting width (mm)				
Contents (SAE/L)				
Tooth data				
Weight (kg)				
Load hook (t)				

4.3 Structure

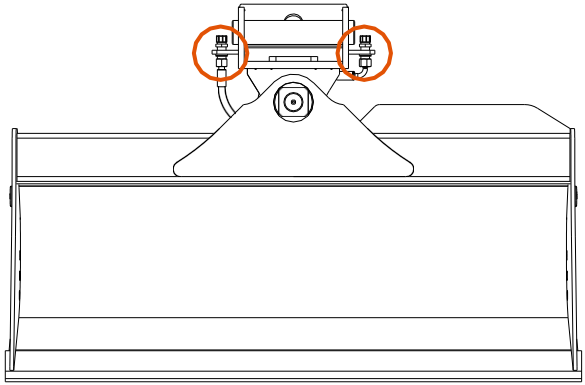
Depending on the version, the ditch cleaning bucket consists of a bucket trough, two suspension plates or an adapter frame, a swivel head and the hydraulic system. The suspension plates or the adapter frame are permanently to the swivel head.



1	Quick-release mount (or mount for fixed attachment)	2	Swivelling head
3	Hydraulic cylinder	4	Bucket pan

4.3.1 Hydraulic system

Depending on the bucket type, the hydraulic system consists of one or two hydraulic cylinders and the corresponding hoses. The hydraulic hoses for the swivelling mechanism lead upwards near the swivel head to the bucket mount on the bulkhead fittings (marked in the picture).

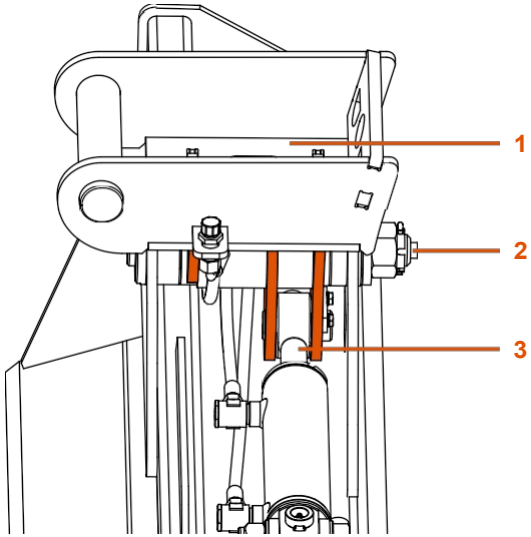


Damage to or tearing off of the hoses (e.g. by shrubbery, stones) is thus virtually ruled out.

Additional hydraulic hose lines are used to establish a connection to the additional control circuit of the earth-moving machine. These go from the bulkhead fittings on the bucket mount to the existing hydraulic connections on the earth-moving machine.

4.4 Function

The swivelling head is pivoted by means of the main pivot pin. The hydraulic cylinder is connected to the swivel head plates (coloured in the picture) on the piston rod side.



1 Cover plate swivelling head
2 Main pivot bolt
3 Piston rod Hydraulic cylinder

When the hydraulic cylinder is pressurised, it extends or retracts depending on the side on which it is pressurised. This swivels the bucket pan to the left or right.

The ditch cleaning bucket can be swivelled 45° to the left and right. The angle is determined by a mechanical limit. The cover plate of the swivelling head strikes the stop surfaces of the bucket trough suspension plate at the 45° end position.

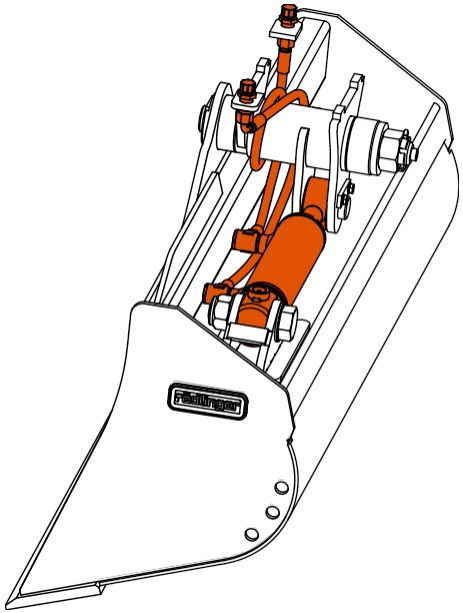


Fig. 1: Trench clearing bucket with hydraulic cylinder without bucket holder and rear suspension plate

5 TRANSPORT

Responsible personnel

Specialised personnel

⚠ DANGER

Danger to life due to falling loads

Inadequately or incorrectly secured transported goods can cause hazards.

a) Wear PPE.

b) Specialised personnel carry out the transport.

c) For internal transport, use a suitable lifting device, e.g. a crane with a lifting capacity corresponding to the weight of the product.

d) When transporting with a forklift truck, place a non-slip rubber mat on the forks so that the product cannot slip.

e) Note the position of the centre of gravity.

f) Secure the product for lorry transport on the loading area using suitable means.

g) Do not step under raised loads.

⚠ CAUTION

Risk of injury due to tripping or slipping

When transporting the product, there is a risk of tripping and slipping due to unsecured transport routes.

a) Paths, ramps and steps over which loads are moved must sure-footed, without obstacles and well lit.

The following points must observed when transporting and unloading the product:

" Wear safety shoes and gloves.

" Secure the product against falling off the pallet using metal straps or belts.

" Use rubber mats to prevent the product or transport pallet from slipping.

" Note the centre of gravity of the product.

" Only transport the product using suitable lifting gear with sufficient load-bearing capacity.

" The product must be moved with a suitable unloading aid.

" Check the lifting gear for damage.

" Use suitable ropes, chains or belts for unloading or loading in accordance with the load of the product.

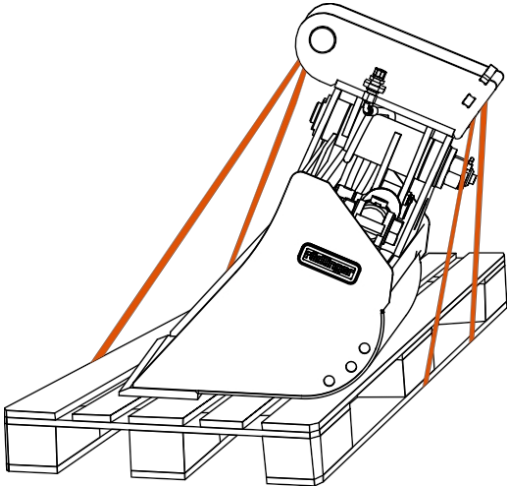
" Prevent chafing of ropes and lifting straps on sharp edges and corners.

" Check the product for damage or other abnormalities.

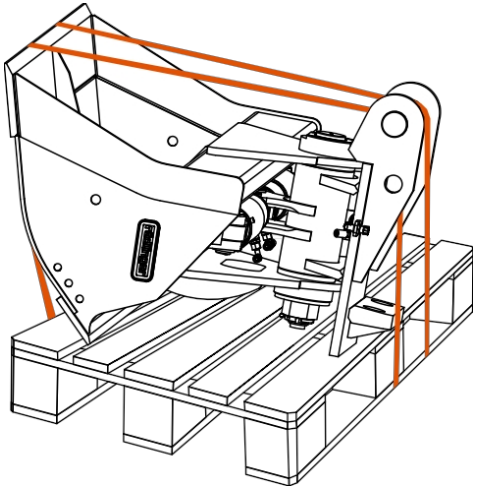
" Observe the applicable safety and accident prevention regulations (BGV D6, D8) during transport.

" Ensure that the installation site is adequately ventilated.

The transport method for bucket classes 01 - 09 is upright:



The transport method for bucket classes 11 - 29 is horizontal:



6 INSTALLATION

Responsible personnel

Specialised personnel

NOTE! Observe the operating conditions.

See operating conditions [▶ 17].

6.1 Work, service and protection area

1. Implement the set-up of the future work, service and protection areas, which form the danger zone.
2. Cordon off the installation area extensively.
3. Use warning notices and safety symbols to mark the danger areas at the installation site that require special attention.
   NOTE! The warning notices and safety symbols must be clearly recognisable for persons working in this area.

6.2 Unpacking

⚠ CAUTION

Risk of injury due to fastening straps under tension

If the fastening straps are cut, they can strike out with great force when the tension is released and cause injuries.

a) Unpack the product with care and caution.

b) Stand to the side of the metal straps to avoid injury.

c) When cutting the cable, make sure that there are no other persons in the immediate vicinity.

✓ Gloves are put on.

1. Check that the delivery is complete. Use the delivery notes and the manufacturer's spare parts list.
2. Cut the fastening straps with metal scissors.

Disposal of transport and storage packaging

Disposal of the transport and storage packaging is governed by the local disposal regulations and the environmental protection laws applicable in the country of operation.

6.3 Assembly

⚠ WARNING

Risk of injury due to hydraulic energy

Hydraulically driven parts can move unexpectedly under high pressure and cause injuries.

a) Depressurise the hydraulic system before working on the product.

b) for freedom from pressure.

⚠ WARNING

Risk of injury due to uncontrolled start-up of the earth-moving machine

Automatic start-up of the earth-moving machine creates hazards.

a) Switch off the earth-moving machine and it against being switched on again.

b) No unauthorised person may have access to the earth-moving machine.

c) Third parties are prohibited from entering the danger zone.

⚠ WARNING

Risk of crushing and amputation due to moving machines and components

The movements of the earth-moving machine and the product create hazards.

a) Only work on the product when the earth-moving machine is switched off and secured against unintentional switching on.

b) Wear PPE.

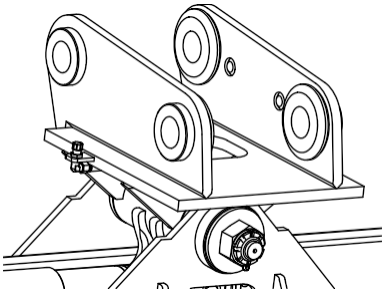
NOTE

Further information

Refer to the operating instructions for the earth-moving machine for further information.

6.3.1 Cultivation

Fixed attachment



The dipper arm and the pressure support of the earth-moving machine are connected to the corresponding mountings of the bucket suspension. The original connecting bolts are used for this and secured to the attachment's suspension with the respective bolt lock.

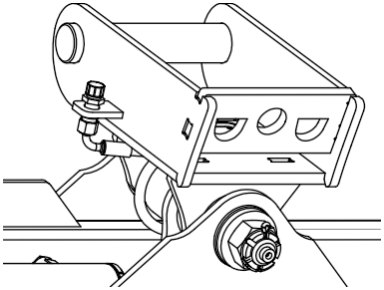
NOTE! If necessary, secure the swivelling head before mounting.

NOTE

Further information

Refer to the operating instructions for the earth-moving machine for further information.

About quick-change system



The quick coupler is attached via the adapter frame.

NOTE

Further information

Refer to the operating instructions for the quick coupler for further information.

6.3.2 Information on hydraulics

If no hydraulic package has been purchased, hydraulic lines and suitable press nipples are required for installation.

NOTE

Connection attachments

Suitable connection attachments are required to connect the hydraulic lines to the earth-moving machine.

a) Refer to the operating instructions for the earth-moving machine further information.

Connection sizes:

The screw connections have an **M18×1.5** connection thread for a **12 litre connection.**

The following must be observed for the hydraulic lines:

" Sufficient length and thickness

" Abrasion-resistant or additional protective coil

" Sufficient bending radii

" No crushing, buckling or pulling in the entire swivelling range

" Burst pressure of at least a factor of "**four**" above the maximum operating pressure

" Correct print settings [▸ 47].

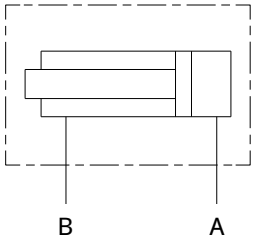
6.3.2.1 Print settings

Spoon class	01	02 - 06	07 - 09	11 - 23	23 - 29
Operating pressure (recommended)	210 bar				
Operating pressure (max.)	210 bar				
Presetting load-holding valve	180 bar				
Volume flow (swivelling time≙ 6 s)	1.2 l/min	4.8 l/min	11.2 l/min	22 l/min	40 l/min

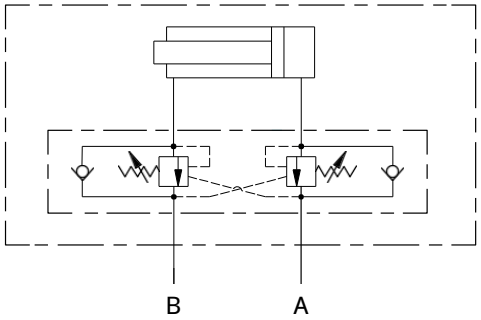
6.3.2.2 Hydraulic circuit diagram

Ditch cleaning bucket - Class 01 - 09

without load-holding valve

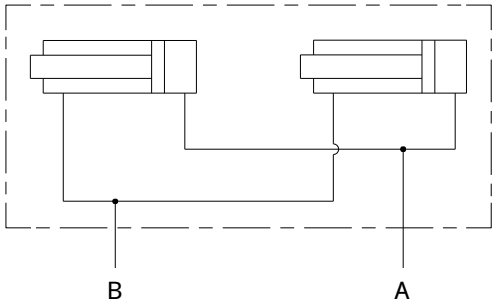


with load-holding valve

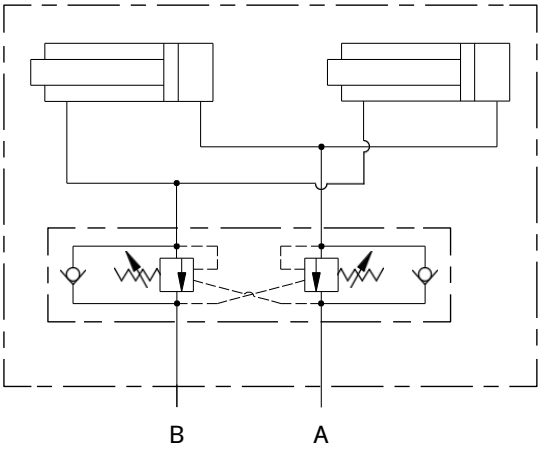


Ditch clearing bucket - Class 11 - 15

without load-holding valve



with load-holding valve



6.3.3 Connect hydraulics

Skip this sub-chapter if you are using a quick-change system with integrated hose quick-coupling function.

DANGER

Danger to life due to hydraulic energy

If the pipes are defective, a jet of liquid can escape under high pressure.

a) Do not change print settings beyond the maximum values.

b) Follow all maintenance instructions.

c) **If hydraulic fluid escapes:** Do not touch the fluid jet.

d) **Stopping the liquid jet:** Switch off the earth-moving machine.

e) Depressurise hydraulic system.

f) Put on PPE.

g) Wait until the liquid jet stops.

h) Pick up spilled liquids and dispose of them properly.

i) Replace and repair defective parts.

⚠ WARNING

Risk of injury due to bursting hydraulic lines

The use of inadequate hydraulic lines creates the risk of the lines bursting. During subsequent operation, injuries can occur due to high pressure and heated hydraulic fluid.

a) Design hydraulic lines with a burst pressure of at least a factor of four above the maximum operating pressure.

b) Ensure that the hoses have sufficient bending radii.

c) Take care not to kink or pull the hoses.

d) Ensure that the hydraulic hoses are adequately secured.

e) Ensure that the hose connections are sufficiently fixed.

⚠ WARNING

Risk of injury due to consumables

Hazards arise when handling harmful, irritating consumables.

a) Observe the specific operating and work instructions or safety data sheets when working with consumables such as oils, cleaning agents, etc.

⚠ WARNING

Risk of injury due to residual energy

When bleeding the hydraulic system, unforeseen movement actuators can cause hazards.

a) Further information can be found in the operating instructions for the earth-moving machine.

⚠ CAUTION

Risk of burns from hot hydraulic fluid and hot surfaces

Hot hydraulic fluid flows in the hydraulic lines. Contact with the lines or the fluid can cause burns.

a) Before working on the hydraulic system, depressurise it and allow oil-carrying components to cool down to ambient temperature.

b) Use hand protection.

c) Check all hydraulic lines regularly for damage.

⚠ CAUTION

Risk of slipping due to oil and lubricants

Oil or lubricant contamination can get onto the floor as a result of work on or faults with the product.
This creates a risk of slipping.

a) Watch out for soiling in the danger zone.

b) In the event of a fault: Eliminate the cause or inform the responsible specialist personnel.

c) Remove dirt, if present.

The hydraulic lines must lead from the pipe fittings of the attachment to the hydraulic connections for the auxiliary control circuit of the earth-moving machine.

Material required
Hydraulic lines with suitable compression nipples (see information on hydraulics [▶ 45])
Connection attachments for earth-moving machine
Hose line guides

✓ PPE is created.

✓ The attachment is attached to the dipper arm kinematics.

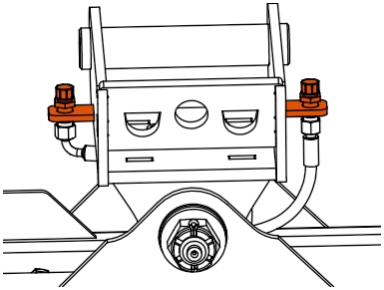
✓ The attachment is lowered onto level, firm ground.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

1. Check which connections need to be connected to each other.

   See information on hydraulics [▶ 45] and the operating instructions for the earth-moving machine.
2. Cut hydraulic lines to size.
3. Press the press nipple with the appropriate screw connection or hydraulic coupling at one end of the hydraulic lines.
4. Attach the appropriate connection attachment for the earth-moving machine to the other end.
5. Connect the hydraulic lines to the pipe fittings on the implement.
   Observe the screw tightening torques [▶ 124].



6. Route the hydraulic lines to the connections of the earth-moving machine using appropriate hose line guides.
7. Connect the hydraulic lines to the corresponding connections or hydraulic couplings of the earth-moving machine.

   Observe the screw tightening torques [▶ 124].

   ⇨ The hydraulic lines are securely connected.
8. Bleed the hydraulic system.

6.3.4 Control

A check is then carried out to ensure that the installation has been carried out correctly and the product is released for commissioning.

Control outside the earth-moving machine

⚠DANGER

Danger to life due to falling product

If the connecting bolts are not secured, there is a risk of the product falling down.

a) Check the fuses of the connecting bolts: After installation, before commissioning, before daily operation and before any maintenance.

✓ PPE is created.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

✓ Hydraulic components have cooled down to ambient temperature.

1. Check that the product is securely attached.
2. Check hydraulic lines for damage.
3. Check hydraulic screw connections for tightness.
4. Exclude leaks.

7 COMMISSIONING

Responsible personnel

Operating personnel, specialised personnel

The product is then checked to ensure that it functions normally and is authorised for operation.

Control outside the earth-moving machine

⚠DANGER

Danger to life due to falling product

If the connecting bolts are not secured, there is a risk of the product falling down.

a) Check the fuses of the connecting bolts: After installation, before commissioning, before daily operation and before every maintenance.

✓ PPE is created.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

✓ Hydraulic components have cooled down to ambient temperature.

1. Check that the product is securely attached.
2. Check hydraulic lines for damage.
3. Check hydraulic screw connections for tightness.

4. Exclude leaks.

Function check

⚠ WARNING

Risk of injury due to disregard of one-man operation

If are several people in the danger zone of the product, hazards arise.

a) The product may only operated by one person.

✓ The danger zone is secured and there are no people in it.

✓ Field of vision is not restricted according to ISO 5006.

---

1. Putting the earth-moving machine into operation.
2. Check that the pressure control devices are set to the nominal pressure. See information on hydraulics [▸ 45].
   NOTE! The set pressures are documented using photos. The commissioning log is issued and sent back to Raedlinger GmbH together with the photos of the print settings.
3. Perform a complete movement game.
   CAUTION! The hydraulic lines must not be damaged, pulled tight or subjected to tension or kinking. The attachment must not be loose and must not fall down.

➢ **If the inspection process is completed without any faults, the product is authorised for operation.**

If a fault [occurs, ▸ 61].

8 OPERATION

Responsible personnel

Operating personnel

DANGER

Danger to life due to entering the danger zone

Entering the danger zone creates hazards.

a) Do not enter the danger zone unless an action step requires it.

DANGER

Danger to life due to malfunctions

Malfunctions of the product can cause hazards.

a) At the beginning of the shift: Check the proper condition of the safety equipment, the supply lines and the overall condition of the product.

b) In the event of a fault: Interrupt operation. **Eliminate the fault.**

c) Operation of the product is authorised again when all faults been rectified, safe operation is possible and the product's protective and safety devices are in place and intact.

⚠ WARNING

Risk of injury due to disregard of one-man operation

If are several people in the danger zone of the product, hazards arise.

a) The product may only operated by one person.

ATTENTION

Material damage due to neglected maintenance

If maintenance is neglected, there is a risk that the product will no longer function properly.

a) Check the maintenance schedule daily.

b) Carry out all maintenance with care.

8.1 Check before operation

Carry out the check daily before the first operation.

✓ PPE is created.

✓ The attachment is lowered onto level, firm ground.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

✓ Hydraulic components have cooled down to ambient temperature.

1. Check the maintenance schedule.

2. Carry out due maintenance procedures or arrange for them to be carried out by notifying specialised personnel.
3. Check the product for damage or defects.

➢ **If damage or defects found: repair them or have them repaired.**

8.2 Operating the attachment

NOTE

Further information

Refer to the operating instructions for the earth-moving machine for further information.

8.2.1 Setting the swivelling speed

Responsible personnel

Specialised personnel

The maximum volume flow depends on the earth-moving machine.
The speed of the swivelling process is reduced by throttling the volume flow.

A change in the volume flow can affect the locking speed of any quick coupler that is fitted.

Options:

" Set the volume flow via the earth-moving machine.

" It may only be necessary to set the additional control circuit.

" Install or, if available, remove the throttle.

" Activate the attachment programme.

8.2.2 Swivelling

The attachment can be swivelled up to 45° to the right and left and is mechanically limited.

✓ The danger zone is secured and there are no people in it.
✓ Field of vision is not restricted according to ISO 5006.
✓ The product was connected to the auxiliary control circuit connection of the earth-moving machine.

1. actuate the toggle switch of the additional control circuit control.

8.2.3 Loaded

NOTE

Wear of the bucket trough

The bucket pan is exposed to high wear during loading when it touches the floor.

a) Position the blade of the attachment so that the bucket pan does not touch the ground.

8.3 Malfunctions

Responsible personnel

Specialised personnel, maintenance personnel

If a fault occurs, operation must be stopped and the fault rectified. Contact the manufacturer's customer service for faults that cannot be rectified:

" through a maintenance operation

" a replacement of a component with a spare part or

" can rectified with a new installation.

8.3.1 Information on troubleshooting

The following points must observed before searching for and rectifying the causes of faults:

" PSA is created.

" Earth-moving machine is depressurised and tested for freedom from pressure.

" Earth-moving machine is switched off and secured against being switched on again.

" Hydraulic components have cooled down to ambient temperature.

8.3.2 Causes of malfunction

Malfunction	Cause	Hint	Remedy
Pivots in the wrong direction.	The hydraulic connections have been swapped.	Fault that only occurs directly after installation.	Disconnect/ reconnect the hydraulic connections.
Does not swing far enough.	Pressure too low.	Check the pressure setting.	Adjust the pressure setting.
Does not swing far enough.	Attachment is too heavily loaded.		Reduce charge.

Malfunction	Cause	Hint	Remedy
Gives way/does not hold position.	Load holding valve defective.	If the attachment gives way directly.	Have it repaired or replaced.
Gives way/does not hold position.	Leak in the hydraulic system.	Check the reason for the pressure loss.	Repair the leak and contact the manufacturer if necessary.
Pans too quickly or too slowly.	The volume flow is set too high or too low.		Volume flow according to swivelling speed 60][▸.
Pans too quickly or too slowly.	A pressure reduction has been installed or is required.		Have the pressure reduction installed or removed.
Does not swivel.	A hydraulic line for the swivelling mechanism is leaking or defective.	Leakage.	Replace or repair hydraulic lines.
Does not swivel.	Hydraulic screw connections are loose or leaking.	Leakage.	Replace the screw connection or seal if tightening is not sufficient.
Does not swivel.	There is air in the hydraulic lines.		Bleed the hydraulic lines.
Does not swivel.	The hydraulic lines are shut off.		Disconnect the hydraulic lines: Openstopcock.

Malfunction	Cause	Hint	Remedy
Does not swivel.	Hydraulic cylinder defective.		Contact the manufacturer and have the hydraulic cylinder replaced.
Does not swivel.	Control circuit of the earth-moving machine is deactivated.		Activate control circuit.
Does not swivel.	Defect in the earth-moving machine.	Other (add-on) devices do not work either.	Consult the operating instructions for the earth-moving machine. Contact the earthmoving machine manufacturer.
Excessive play in the bearings of the swivelling mechanism.	Bolts or bushes worn out.		Contact the manufacturer to have bolts or sockets replaced.

9 SPECIAL EQUIPMENT

9.1 Load hook

Upgrade

⚠ CAUTION

Material damage due to unauthorised conversions

Unauthorised conversions and modifications to the product may result in damage to the product.

a) Only use parts that are authorised by the manufacturer.

b) Only certified specialised welding companies are permitted to carry out set-up and conversion work on the product.

General information

NOTE

Load safety devices for earth-moving machinery with a maximum permissible lifting capacity of ≥ 1000 kg or an overturning moment of≥ 40000 Nm in accordance with DIN EN 474-5

A load hook may only be used if a lifting load table is installed at the driver's position, an overload warning device and a pipe rupture safety device on the bucket and boom cylinders.
Please note:

a) ...the maximum load capacity of the load hook.

b) ...the maximum lifting capacity of the earth-moving machine.

c) ...the weight of the attachment must be deducted from the lifting capacity of the earth-moving machine.

d) ...the operating instructions for the earth-moving machine.

e) ...to lift the load slowly.

~~f) ...to attach the load parallel to the weld seam of the load hook.~~

" Observe the general accident prevention regulations.
In Germany, the applicable DGUV [1] regulations must also be observed. In other countries, please refer to the relevant regulations.

" The load capacity of the load hook is indicated on the load hook.

" Use suitable lifting equipment and aids.

Operating the load hook

" Lifting and transporting loads is only permitted using suitable chains, ropes and straps for lifting purposes.

1 German Social Accident Insurance

" Lift the load slowly.

" Attach the load parallel to the weld seam of the load hook.

" Do not strike the load on the safety catch of the load hook.

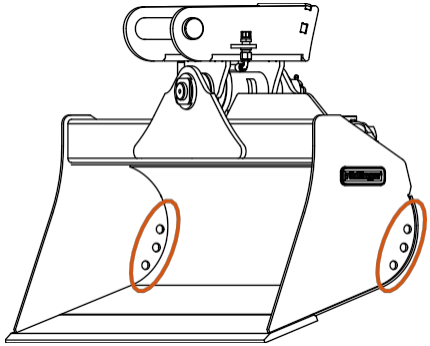
9.2 Load holding valve

The load holding valve the attachment in any tilted position. If the external pressure on the attachment becomes too strong, the valve opens and releases the locked position of the swivel head to prevent damage to the component.

9.3 Drainage holes

" There are holes in the side walls of the attachment to allow liquids to drain off.

" Keep the drill holes clean and clear.

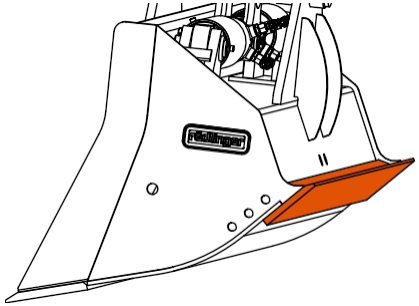


9.4 Slope cutting edge

" When using the slope cutter, position it at an angle so that the bucket pan does not touch the ground.

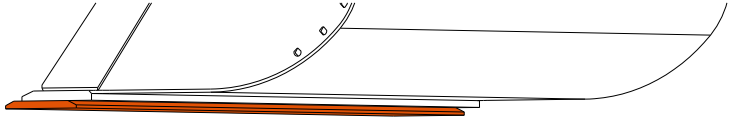
" Ensure that no components of the earth-moving machine or the quick coupler (if fitted) touch the ground.

" Empty and clean the slope cutter after use.



9.5 Underbolt turning knife

The under-screw spiral Checking the under-screw spiral blade [blade must turned or replaced in good time if it is worn (see ▸ 76]).



10 MAINTENANCE TABLE

Personnel	Interval	Further information	
Operating personnel	Daily	11.2	Check screws and bolts
		11.3	Check hydraulic lines and hydraulic cylinders
		11.4	Check all components
		11.5	Check the position of the hydraulic lines
		11.6	Check surface and mounting surfaces
		11.7	Checking the under-screw spiral blade
		11.8	Cleaning
		11.9	Lubrication
		11.10	Check labelling
	Weekly	11.11	Check coilerthe screw heads of the under-screw
		11.12	Check screws and bolts

Personnel	Interval	Further information	
Maintenance personnel	Daily	11.13	Check weld seams
		11.14	Check hydraulic system
	Every six years	11.15	Replace hydraulic lines
	If required	11.16	Turning the under-screw spiral blade
		11.17	Replacing the under-screw spiral blade

11 MAINTENANCE AND SERVICING

The maintenance table shows which personnel qualifications are required for certain maintenance and servicing work.

Only carry out maintenance work that is not listed and described in the maintenance documents after consulting the manufacturer (this includes disassembly and assembly of drive and safety components).

NOTE

Customisation of maintenance work

The operator of the product is required to document maintenance-relevant observations and to independently expand and specify the maintenance plans in these instructions accordingly.

a) This applies in particular to maintenance instructions that have to be carried out more frequently than recommended due to individual circumstances.

b) In addition, the maintenance instructions of the manufacturers of purchased parts must be observed.

11.1 General information

" Observe the general accident prevention regulations.
In Germany, the applicable DGUV [2] regulations must also be observed. In other countries, observe the relevant regulations.

" Carry the prescribed adjustment, maintenance and servicing work on time.

" Replace defective parts immediately.

" Inform the operating and supervisory personnel before starting maintenance and servicing work.

[2] German Social Accident Insurance

" Observe the instructions attached to the product, such as type plates.

" Only use tools that are in perfect condition.

" Always tighten loosened screw connections during maintenance and servicing work.

" Carry out a functional check after maintenance and repair work has been completed.

" Only use original spare parts authorised by the manufacturer.

During maintenance

⚠ DANGER

Danger to life due to falling product

If the connecting bolts are not secured, there is a risk of the product falling down.

a) Check the fuses of the connecting bolts: After installation, before commissioning, before daily operation and before every maintenance.

⚠ WARNING

Risk of injury due to hydraulic energy

Hydraulically driven parts can move unexpectedly under high pressure and cause injuries.

a) Depressurise the hydraulic system before working on the product.

b) for freedom from pressure.

⚠ WARNING

Risk of injury due to uncontrolled start-up of the earth-moving machine

Automatic start-up of the earth-moving machine creates hazards.

a) Switch off the earth-moving machine and it against being switched on again.

b) No unauthorised person may have access to the earth-moving machine.

c) Third parties are prohibited from entering the danger zone.

⚠ WARNING

Risk of crushing and amputation due to moving machines and components

The movements of the earth-moving machine and the product create hazards.

a) Only work on the product when the earth-moving machine is switched off and secured against unintentional switching on.

b) Wear PPE.

⚠ WARNING

Risk of injury due to disregard of one-man operation

If are several people in the danger zone of the product, hazards arise.

a) The product may only operated by one person.

⚠ CAUTION

Risk of burns from hot hydraulic fluid and hot surfaces

Hot hydraulic fluid flows in the hydraulic lines. Contact with the lines or the fluid can cause burns.

a) Before working on the hydraulic system, depressurise it and allow oil-carrying components to cool down to ambient temperature.

b) Use hand protection.

c) Check all hydraulic lines regularly for damage.

✓ PPE is created.

✓ The attachment is lowered onto level, firm ground.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

✓ Hydraulic components have cooled down to ambient temperature.

---

1. Carry out maintenance work.
   WARNING! Close all openings if work on the open hydraulic system is interrupted.

After maintenance

1. Check work.
2. Record all maintenance work carried out.
3. Make the earth-moving machine ready for use again.
4. Carry out a function check in accordance with commissioning [▸ 56].

11.1.1 Maintenance by operating personnel

Certain maintenance tasks can be carried out by operating personnel if they have been instructed to do so. It must be recorded in writing which interventions the operating personnel are authorised to carry out and when the responsible specialist must be informed or requested.

11.1.2 Maintenance by maintenance personnel

Have maintenance work carried out by maintenance personnel.

When repairing or replacing parts, ensure that the installation and operating instructions of the manufacturer of the relevant component or spare part are followed.

11.2 Check screws and bolts

✓ The chapter General information [▶ 71] has been followed.

1. Visually check all screws and bolts for tightness and completeness.

➢ **Tighten with a suitable tool if necessary.**
Observe the screw tightening torques [▶ 124].

11.3 Check hydraulic lines and hydraulic cylinders

✓ The chapter General information [▶ 71] has been followed.

1. Visually check all hydraulic lines and hydraulic cylinders for leaks.

➢ **Replace the hydraulic lines if necessary.**
See Replacing the hydraulic lines [▶ 85].

11.4 Check all components

✓ The chapter General information [▶ 71] has been followed.

1. check all components of the attachment for damage and completeness.

11.5 Check the position of the hydraulic lines

✓ The chapter General information [▶ 71] has been followed.

1. check the position of the hydraulic lines.
   CAUTION! Hydraulic lines must not be crushed or kinked and must not be under tension.

11.6 Check surface and mounting surfaces

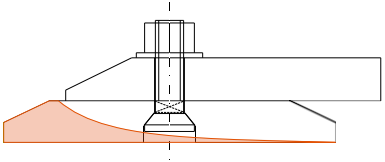
✓ The chapter General information [▶ 71] has been followed.

1. check the surface and mounting surfaces for deformation, cracking and wear.

11.7 Checking the under-screw spiral blade

✓ The chapter General information [▶ 71] has been followed.

1. check the wear of the under-screw spiral cutter.
   CAUTION! The under-screw spiral blade must protrude at least 10 mm from the main blade.



➢ **Turn the bottom spiral blade as soon as the cutting edge is worn. See Turning the bottom spiral blade [▶ 85].**

11.8 Cleaning

NOTE

Functional restriction due to disregarding the cleaning instructions

Failure to follow the manufacturer's cleaning instructions may impair the function of the product.

a) Clean the product in accordance with the maintenance schedule.

⚠ WARNING

Risk of injury due to consumables

Hazards arise when handling harmful, irritating consumables.

a) Observe the specific operating and work instructions or safety data sheets when working with consumables such as oils, cleaning agents, etc.

⚠DANGER

Explosion hazard due to flammable cleaning agents

There is a risk of explosion if petroleum ether is used for cleaning. It is highly flammable, electrostatically chargeable and can produce an explosive gas-air mixture.

a) halogen-free cold cleaners with a high flash point for cleaning.

✓ The chapter General information [▶ 71] has been followed.

1. remove coarse dirt from the marked areas with a steel brush.
   CAUTION! Do not damage any hoses, cables or lines. Always keep contact surfaces and openings clean. Do not remove dirt with your bare hands.

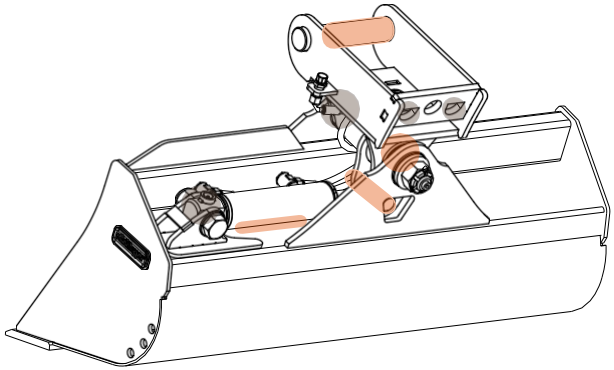


Fig. 2: Bucket class 01 to 09

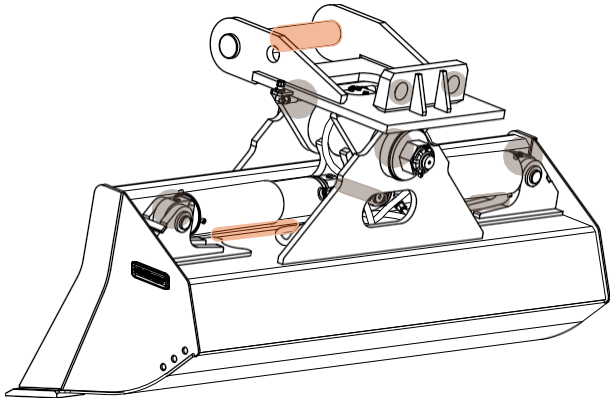


Fig. 3: Spoon class 11 to 29

11.9 Lubrication

NOTE

Functional impairment due to failure to follow the lubrication instructions

Disregarding the manufacturer's lubrication instructions impair the function of the product.

a) Lubricate the product in accordance with the maintenance schedule.

⚠ WARNING

Risk of injury due to consumables

Hazards arise when handling harmful, irritating consumables.

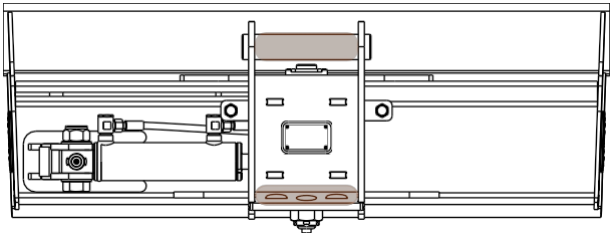
a) Observe the specific operating and work instructions or safety data sheets when working with consumables such as oils, cleaning agents, etc.

Chem. and phys. Characteristics	K2K-30 according to DIN 51502	Unit	Test procedure
NLGI class	2		DIN 51818
Fulling penetration	280	1/10 mm	DIN ISO 2137
Soap base	Lithium 12 hydroxystearate		
Dropping point	180	°C	DIN ISO 2176
Colour	yellow		
Temperature application range	-30 to +130	°C	
Base oil viscosity at 40 °C	130	mm^2/s	
VKA welding force	1800	N	DIN 51802
Corrosion protection	0	Corr. degree	DIN 51350

Table 1: Technical data for multi-purpose grease K2K-30

✓ The chapter General information [▶ 71] has been followed.

1. Grease the contact surfaces with multi-purpose grease.
NOTE! Only use greases and oils that have been approved for use on the product.



2. Grease the grease nipples at the marked points with multi-purpose grease.
NOTE! Only use greases and oils that have been approved for use on the product.

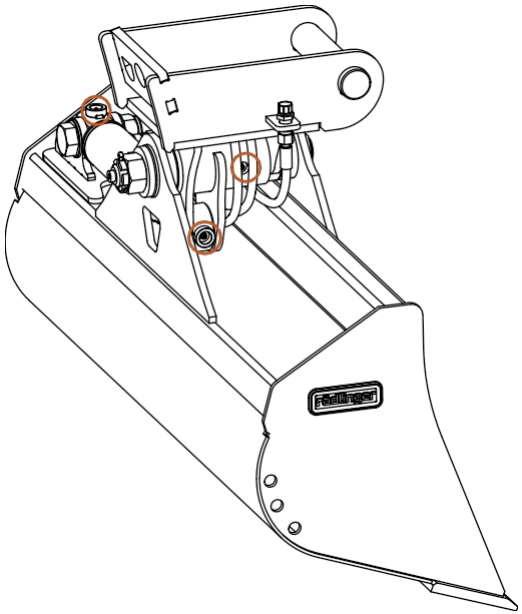


Fig. 4: Bucket class 01 to 09

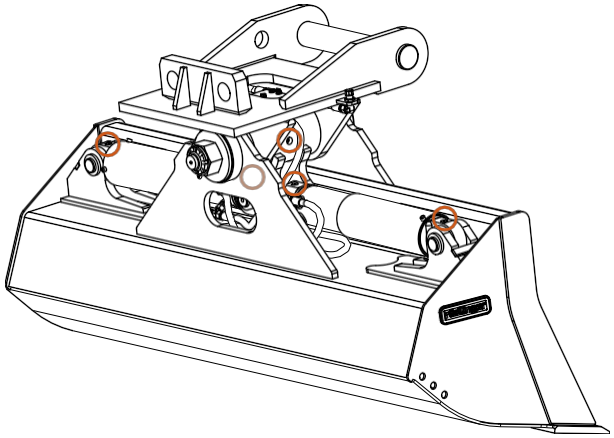


Fig. 5: Spoon class 11 to 29

11.10 Check labelling

✓ The chapter General information [▶ 71] has been followed.

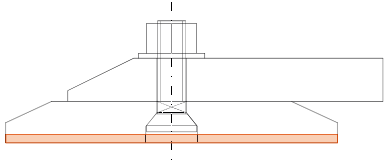
1. Check that notices and labelling attached to the product are recognisable and legible.

➢ **Replace if necessary and affix clearly visible to all.**

11.11 Check the screw heads of the under-screw spiral cutter

✓ The chapter General information [▶ 71] has been followed.

1. Check the depth of the screw head position on the underside of the under-screw spiral cutter.
   CAUTION! The screw heads must not removed.



➢ **Replace the bottom spiral blade before removing the screw heads [3]. See Replacing the bottom spiral blade [▶ 86].**

11.12 Check screws and bolts

✓ The chapter General information [▶ 71] has been followed.

1. check all screws and bolts for tightness using a suitable tool.
   Observe the screw tightening torques [▶ 124].

11.13 Check weld seams

✓ The chapter General information [▶ 71] has been followed.

1. check the condition of the weld seams.

[3] Order the appropriate spare parts in good time.

11.14 Check hydraulic system

✓ The chapter General information [▶ 71] has been followed.

1. check hydraulic lines and hydraulic cylinders for leaks, tightness and damage.

11.15 Replace hydraulic lines

✓ The chapter General information [▶ 71] has been followed.

1. replace all hydraulic lines and fabric protection hoses [4].

11.16 Turning the under-screw spiral blade

✓ The attachment is close to the ground (20-50 cm).

✓ The attachment is secured against falling under both side walls.

✓ The chapter General information [▶ 71] has been followed.

1. With the exception of the two outer nuts, loosen all hexagon nuts and remove them with the washers.
2. Remove the Plow Bolt screws.
3. Place a square timber under the right-hand side of the under-screw spiral cutter.
4. Loosen the outer hexagon nut on the right-hand side and remove with the washer.
5. Remove the plow bolt.
   CAUTION! Risk of crushing due to loosened bottom spiral blade.

[4] The recommended replacement interval for increased requirements is two years in accordance with DGUV Rule 113-020.

6. Place a square timber under the left-hand side of the under-screw spiral cutter.
7. Loosen the outer hexagon nut on the left-hand side and remove with the washer.
8. Remove the plow bolt.
   CAUTION! Risk of crushing due to loosened bottom spiral blade.
9. Turn the under-screw spiral blade.

NOTE! Note the following steps: First fasten the under-screw spiral blade on the outside and on the inside.

1. Insert the Plow Bolt screws through the holes from below.
2. Secure the plow bolt screws from above with washers and hexagon nuts.
   Observe the screw tightening torques [▶ 124].

11.17 Replacing the under-screw spiral blade

✓ The attachment is close to the ground (20-50 cm).
✓ The attachment is secured against falling under both side walls.
✓ The chapter General information [▶ 71] has been followed.

1. With the exception of the two outer nuts, loosen all hexagon nuts and remove them with the washers.
2. Remove the Plow Bolt screws.
3. Place a square timber under the right-hand side of the under-screw spiral cutter.
4. Loosen the outer hexagon nut on the right-hand side and remove with the washer.
5. Remove the plow bolt.
   CAUTION! Risk of crushing due to loosened bottom spiral blade.
6. Place a square timber under the left-hand side of the under-screw spiral cutter.
7. Loosen the outer hexagon nut on the left-hand side and remove with the washer.

8. Remove the plow bolt.
   CAUTION! Risk of crushing due to loosened bottom spiral blade.
9. Create a new under-screw spiral blade.

NOTE! Note the following steps: First fasten the under-screw spiral blade on the outside and on the inside.

1. Insert the Plow Bolt screws through the holes from below.
2. Secure the plow bolt screws from above with washers and hexagon nuts.
   Observe the screw tightening torques [▸ 124].

11.18 Components no longer required

11.18.1 Dismantling

When dismantling components to be replaced, note whether they can be returned to the manufacturer for reconditioning.

11.18.2 Recycling

Recyclable components must be fed into the national recycling system to protect the environment. In the case of contaminated recyclable materials, it must be checked whether recycling is possible or permissible.

11.18.3 Waste disposal

Substances and materials must be used properly and disposed of in accordance with local environmental protection regulations.

NOTE

Disposal of pollutants

Ensure that oils, greases and other pollutants do not enter the sewage system.

a) Collect and properly dispose of used oil and other environmentally harmful substances.

12 DECOMMISSIONING

Responsible personnel

Operating personnel, specialised personnel

12.1 Dismantling

⚠ WARNING

Risk of injury due to hydraulic energy

Hydraulically driven parts can move unexpectedly under high pressure and cause injuries.

a) Depressurise the hydraulic system before working on the product.

b) for freedom from pressure.

⚠ WARNING

Risk of injury due to uncontrolled start-up of the earth-moving machine

Automatic start-up of the earth-moving machine creates hazards.

a) Switch off the earth-moving machine and it against being switched on again.

b) No unauthorised person may have access to the earth-moving machine.

c) Third parties are prohibited from entering the danger zone.

⚠ CAUTION

Risk of burns from hot hydraulic fluid and hot surfaces

Hot hydraulic fluid flows in the hydraulic lines. Contact with the lines or the fluid can cause burns.

a) Before working on the hydraulic system, depressurise it and allow oil-carrying components to cool down to ambient temperature.

b) Use hand protection.

c) Check all hydraulic lines regularly for damage.

12.1.1 Preparation for disassembly

Material required	
Tarpaulin or drip tray for pressurised liquid	
Optional: Transport pallet	See transport [▶ 37]

1. Secure the floor to prevent hydraulic oil from seeping in, e.g. using a tarpaulin or drip tray.
2. Optional: Place transport pallet or other aid.

12.1.2 Removing the hydraulic connections

⚠ WARNING

Risk of injury due to consumables

Hazards arise when handling harmful, irritating consumables.

a) Observe the specific operating and work instructions or safety data sheets when working with consumables such as oils, cleaning agents, etc.

⚠ CAUTION

Risk of burns from hot hydraulic fluid and hot surfaces

Hot hydraulic fluid flows in the hydraulic lines. Contact with the lines or the fluid can cause burns.

a) Before working on the hydraulic system, depressurise it and allow oil-carrying components to cool down to ambient temperature.

b) Use hand protection.

c) Check all hydraulic lines regularly for damage.

⚠ CAUTION

Risk of slipping due to oil and lubricants

Oil or lubricant contamination can get onto the floor as a result of work on or faults with the product.
This creates a risk of slipping.

a) Watch out for soiling in the danger zone.

b) In the event of a fault: Eliminate the cause or inform the responsible specialist personnel.

c) Remove dirt, if present.

Material required
Covers for hydraulic couplings and for the ends of the hydraulic lines
Screw plugs
Locking cone and union nuts
Reservoir for hydraulic lines

✓ PPE is created.

✓ The attachment is lowered onto level, firm ground.

✓ Earth-moving machine is depressurised and tested for freedom from pressure.

✓ Earth-moving machine is switched off and secured against being switched on again.

✓ Hydraulic components have cooled down to ambient temperature.

1. Disconnect the hydraulic line from the auxiliary control circuit connection of the earth-moving machine.

2. Collect escaping oil with suitable means.
3. Close the open connection with an appropriate dust cover or a screw plug.
4. Close the loosened end of the hydraulic line.
5. Place the loosened end of the hydraulic line in the container.
6. Detach the other end of the hydraulic line from the pipe fitting.
7. Collect escaping oil with suitable means.
8. Fit the screw plug of the hydraulic connection points.
9. Close the hydraulic connection point with the sealing cone and union nut.
10. Close the second end of the hydraulic line.
11. Place the hydraulic line completely into the tank.
12. Repeat the procedure for the second connection line between the earth-moving machine and the attachment holder.
13. Clean the product from hydraulic oil contamination.

➢ **The hydraulic connections were removed.**

12.1.3 Removing the attachment

Fixed attachment

The dipper arm and the pressure support of the earth-moving machine must be removed from the corresponding mountings of the bucket suspension.

NOTE

Further information

Refer to the operating instructions for the earth-moving machine for further information.

About quick-change system

The quick coupler must be unlocked and swivelled out of the adapter frame.

NOTE

Further information

For further information, refer to the operating instructions for the quick coupler.

Material required

Optional: Fastening material for transport

1. Remove the attachment in accordance with the further information.
2. Optional: Prepare the implement for transport. See Transport [▶ 37].

12.2 Store

The storage location must be cool and dry so as not to favour corrosion on individual parts of the product.

- The room temperature of the storage facility must be constantly between 10 °C and 25 °C.
- The humidity the storage room must not exceed 50 %.

1. Grease to prevent corrosion.
2. Pack and store the product in such a way that it not damaged by external influences during storage.
3. Secure the product against unintentional tipping and instability.

Shutdown for more than 4 weeks

Carry out the following additional storage measures if intend to the product out of operation for longer than 4 weeks:

1. Cover the product to prevent soiling.
2. Store product on transport pallet.

12.3 Waste disposal

Disposal of the product (including parts or operating materials) is governed by the local disposal regulations and the environmental protection laws applicable in the country of use.

Once the product has reached the end of its life cycle, safe and proper disposal must be when it is dismantled, especially of parts or substances that are harmful to the environment. This includes lubricants.

" Due to the risk of possible environmental pollution, have the product disposed of by an authorised specialist company.

13.1 Declaration of Conformity

Konformitätserklärung gemäß EG-Maschinenrichtlinie (2006/42/EG)

rädlinger

Original EG-Konformitätserklärung

Hersteller:	Rädlinger Maschinenbau GmbH Kammerdorfer Straße 16 93413 Cham-Windischbergerdorf Deutschland	Telefon: +49 9971 8088-0 Fax: +49 9971 8088-9999 E-Mail: info@raedlinger.de Web: www.raedlinger.de
Maschinenbezeichnung:	Grabenräumlöffel mit Zylinder	
Maschinentyp:	Klasse 01 - 29	
Optionale Ausstattung:	Lasthaken, Unterschraubwendemesser, Profilmesser, Böschungsschneide, Lasthalteventil, GPS-Halterung	
Verwendungszweck:	Der Grabenräumlöffel mit Hydraulikzylinder dient zum Aufnehmen, Transportieren, Heben und Ausschütten von bis zu mittelschwer lösbaren Bodenarten sowie zum Planieren und Graben räumen bzw. putzen. Bei einer Ausführung mit Böschungsschneide ist das Herstellen von Banketten möglich.	

Hiermit erklärt der Hersteller, dass die Maschine in der gelieferten Ausführung konform ist mit der Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung) sowie mit den nachfolgend aufgeführten harmonisierten Normen und normativen Dokumenten übereinstimmt, auf die sich diese Erklärung bezieht:

1. EN ISO 12100: 2010
   Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung
2. EN 474-1: 2006+A6: 2019
   Erdbaumaschinen - Sicherheit - Teil 1: Allgemeine Anforderungen
3. EN ISO 4413: 2010
   Fluidtechnik – Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile
4. EN ISO 13854:2019
   Sicherheit von Maschinen - Mindestabstände zur Vermeidung des Quetschens von Körperteilen

Dokumentationsbevollmächtigter der Rädlinger Maschinenbau GmbH:	Thomas Bogner Kammerdorfer Straße 16 93413 Cham-Windischbergerdorf
Die Genehmigung des QS-Systems erfolgte durch:	DEKRA-Certification GmbH Handwerkstraße 15 70565 Stuttgart Kennnummer: 2140

Wir versichern hiermit, dass das Bescheinigungsverfahren gemäß der Richtlinie für Maschinen (2006/42/EG) durchgeführt, und dass die Vorschriften der Norm DIN EN ISO/IEC 17050-1: 2010 „Konformitätsbewertung – Konformitätserklärung von Anbietern - Teil 1: Allgemeine Anforderungen" bei der Ausstellung dieser Konformitätserklärung beachtet wurden.

Bei einer mit uns nicht abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Jede eigenmächtige Veränderung in diesem Sinne schließt eine Haftung unsererseits aus.

Cham-Windischbergerdorf, den 13.01.2025

Datum

Thomas Wittmann
Geschäftsbereichsleitung

13.2 Hydraulic oil

The following hydraulic oil is in the hydraulic system of the attachment ex works.

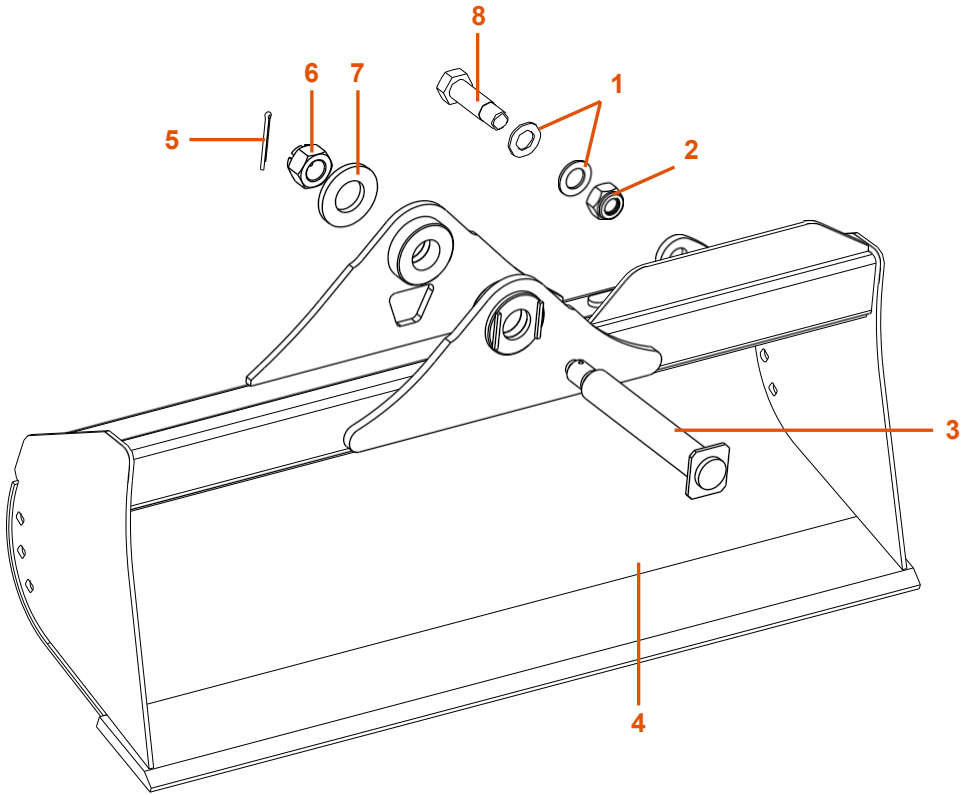
AVILUB FLUID HLP 46		
Viscosity class ISO VG	DIN ISO 3448	46
Density at 15°C	DIN 51757	876 kg/m³
Kinematic viscosity at 40 °C	DIN 51562	44.2 mm²/s
Viscosity index (VI)	DIN ISO 2909	103
Flash point COC	DIN EN ISO 2592	227 °C
Pourpoint	DIN EN ISO 3016	-30 °C

13.3 Spare parts list

13.3.1 Class 01

The article numbers for class 01 trench clearing buckets are order-specific.
Please state the serial number when ordering spare parts.

13.3.2 Spoon tray - Class 02 to 09

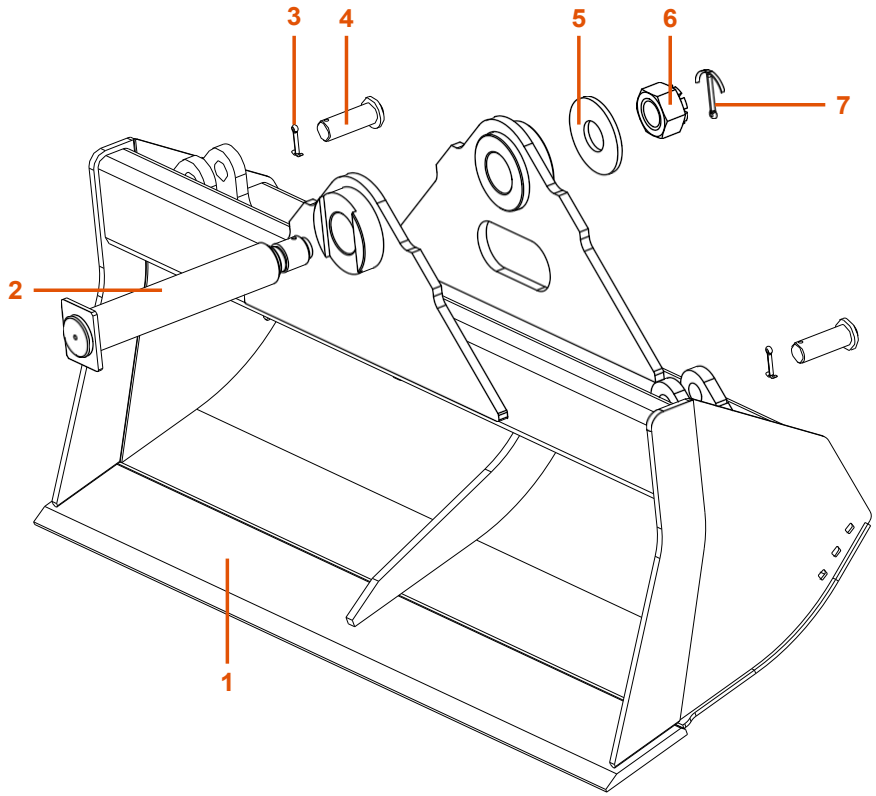


Pos.	Piece	Item no.	Spoon class	Designation
1	2	0006186	02, 03, 04, 05, 06	Washer DIN EN ISO 7090 - M33 galvanised.
		0003260	07, 08, 09	Disc 70 / 40×8
2	1	0000949	02, 03, 04, 05, 06	Hexagon nut DIN 985 - M30 - 8 galv. galvanised.
		0004040	07, 08, 09	Hexagon nut DIN 985 - M36 - 8 galv. galvanised.
3	1	0000917	02, 03, 04	Main pivot bolt
		0000918	05, 06	
		0004159	07, 08, 09	
4	1	[5]	02, 03, 04, 05, 06, 07, 08, 09	Spoon tray
5	1	0006515	02, 03, 04, 05, 06	Split pin DIN EN ISO 1234 - 6.3×71 - galvanised
		0010024	07, 08, 09	Split pin DIN EN ISO 1234 - 8×90 - galvanised.
6	1	0006516	02, 03, 04, 05, 06	Castle nut DIN 935 M36 - 8 - black
		0006517	07, 08, 09	Castle nut DIN 935 M 42 - 8 - black
7	1	0000923	02, 03, 04	Disc 80 / 41×10
		0000924	05, 06	Disc 100 / 52×10
		0004035	07, 08, 09	Disc 110 / 61×10

[5] Order-specific (specify serial number when ordering).

Pos.	Piece	Item no.	Spoon class	Cutting width in mm	Designation
8	1		02	850	
			02, 03, 04, 05, 06		
		0006501	07, 08, 09		Hexagon fitting screw DIN 610 - M30×110 - 8.8 - black

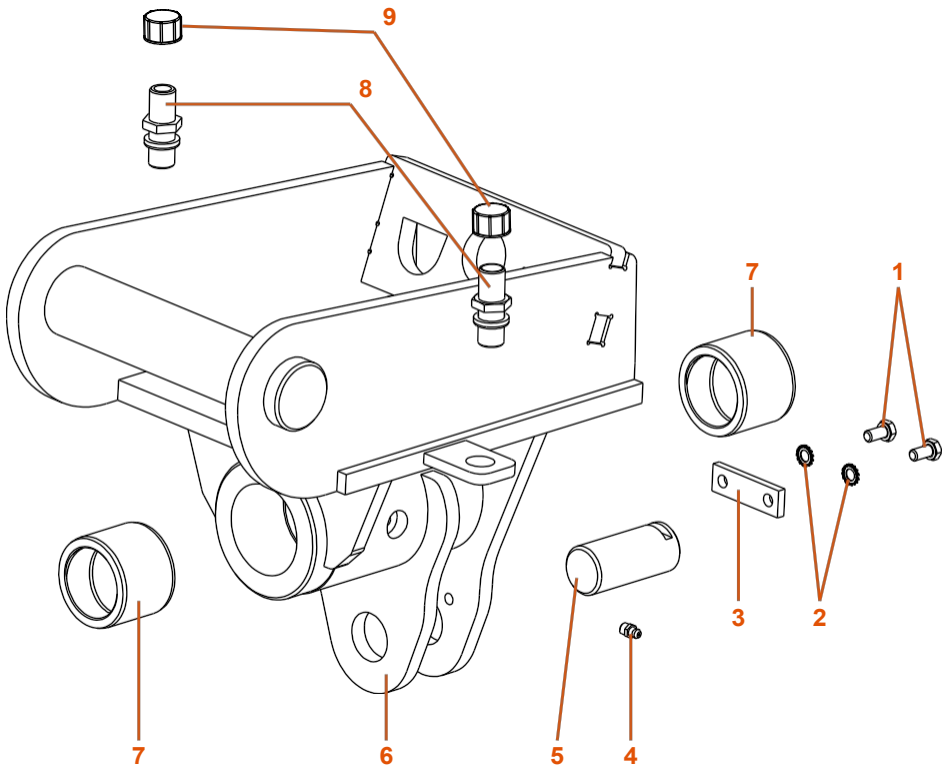
13.3.3 Spoon tray - Class 11 to 29



Pos.	Piece	Item no.	Spoon class	Cutting width in mm	Designation
1	1	0034308	11	1800	Spoon tray
		0034309		2000	
		0034367	15	1800	
		0034368		2000	
		0034369		2200	
		0034437	19	2000	
		0034436		2200	
		0035416	23	2200	
		0034456	29	2400	

Pos.	Piece	Item no.	Spoon class	Designation
2	1	0011387	11, 15	Main pivot bolt
		0011388	19	
		0011389	23, 29	
3	2	0003248	11, 15, 19	Split pin DIN EN ISO 1234 - 8× 56 - galvanised
		0003247	23, 29	Split pin DIN EN ISO 1234 - 8× 125 - galvanised
4	2	0011513	11, 15, 19	Cylinder stud 40× 127
		0011514	23, 29	Cylinder stud 50× 137
5	1	0006972	11, 15	Disc 150 / 60.7× 10
		0004295	19	Washer DIN EN ISO 7089 - M8 - galvanised.
		0006733	23, 29	Disc 193.7 / 60.5× 20
6	1	0010025	11, 15, 19, 23, 29	Castle nut DIN 935 - M56 - 8 black
7	1	0003247		Split pin DIN EN ISO 1234 - 8× 125 - galvanised

13.3.4 Swivelling head - Class 02 to 09



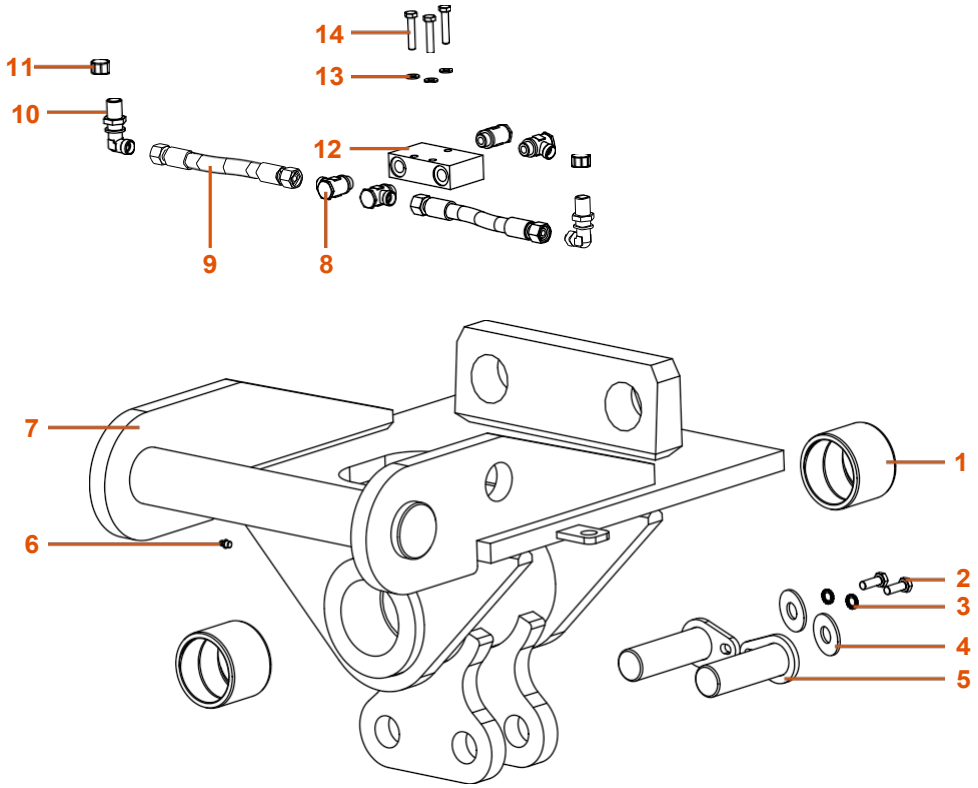
Pos.	Piece	Item no.	Spoon class	Designation
1	2	0006187	02, 03, 04, 05, 06	Hexagon head screw DIN EN ISO 4017 - M8× 16 - 8.8 galvanised
		0006513	07, 08, 09	Hexagon head screw DIN EN ISO 4017 - M8× 20 - 8.8 galvanised
2	2	0001044	02, 03, 04, 05, 06, 07, 08, 09	Serrated lock washer DIN 6798 - A - 8.4 - galvanised.
3	1	0001000	02, 03, 04, 05, 06	Bolt lock
		0004042	07, 08, 09	
4	1	0000909	02, 03, 04, 05, 06, 07, 08, 09	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
5	1	0000932	02, 03, 04, 05, 06	Swivel head bolt
		0004039	07, 08, 09	
6	1	0001011	02, 03, 04	Swivelling head, MS 01
		0001844		Swivelling head, MS 01 Radlog
		0003457		Swivelling head, MS 03
		0004122		Swivelling head, MS 03 Radlog
		0001012	05, 06	Swivelling head, MS 03
		0004123		Swivelling head, MS 03 Radlog

Pos.	Piece	Item no.	Spoon class	Designation
		0001857	07, 08, 09	Swivelling head, MS 08
		0006884		Swivelling head, MS 08 Radlog
		[6]	02, 03, 04, 05, 06, 07, 08, 09	Swivelling head
7	2	0001007	02, 03, 04	Bushing with lubrication groove 55 / 40× 40
		0001006	05, 06	Bushing with lubrication groove 65 / 50× 52
		0001698	07, 08, 09	Bushing with lubrication groove 75 / 60× 60
8	2	0000659	02, 03, 04, 05, 06, 07, 08, 09	Bulkhead connector CEL12

Pos.	Piece	Item no.	Spoon class	Cutting width in mm	Designation
9	2	0005641	02	850	Sealing cap
		0006504	02, 03, 04, 05, 06, 07, 08, 09		

[6] Swivel heads with other quick-change systems are order-specific (specify serial number when ordering).

13.3.5 Swivelling head - Class 11 to 29

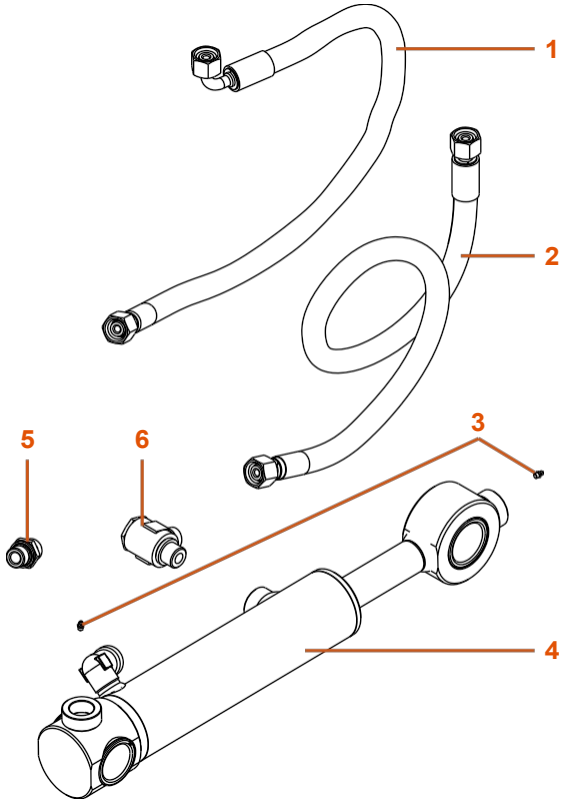


Pos.	Piece	Item no.	Spoon class	Designation
1	2	0001449	11, 15	Bushing with lubrication groove 95 / 80× 70
		0015644	19	Bushing with lubrication groove 105 / 90× 80
		0015643	23, 29	Bushing with lubrication groove 115 / 100× 95
2	2	0003053	11, 15, 19	Hexagon head screw DIN EN ISO 4017 - M10× 30 - 8.8 galvanised
		0003346	23, 29	Hexagon head screw DIN EN ISO 4017 - M12× 30 - 8.8 galvanised
3	2	0010052	11, 15, 19	Serrated lock washer DIN 6798 - A - 10.5 - galvanised.
		0010050	23, 29	Serrated lock washer DIN 6798 - A - 13 - galvanised.
4	2	0003055	23, 29	Disc DIN EN ISO 7094 R - 12 - 100 HV - bright
5	2	0011399	11, 15	Swivel head bolt
		0023572	19	
		0011400	23, 29	
6	1	0000909	11, 15, 19, 23, 29	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
7	1	0034294	11, 15	Swivelling head

	0034418	19	

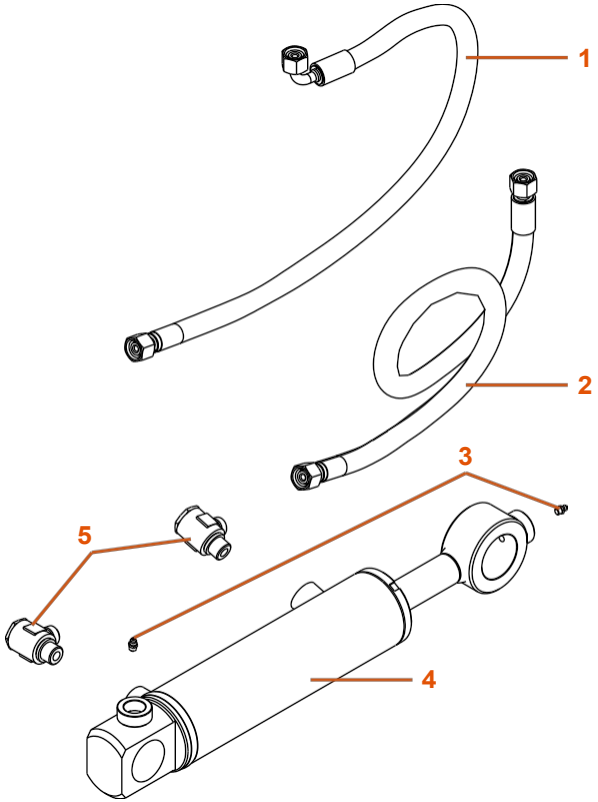
Pos.	Piece	Item no.	Spoon class	Designation
		0034461	23, 29	
8	4	0009475	11, 15, 19, 23, 29	Pipe fitting ISO 8434-1 - SDE - L12×G 3/8" A - Sealing edge ring
9	2	0020701	11, 15	Hose line DIN20066 - 2SC 10 NN - 230 KP210PRO
		0020318	19, 23, 29	Hose line DIN20066 - 2SC 10 NN - 270
10	2	0004137	11, 15, 19, 23, 29	Bulkhead connector 90° CEL12
11	2	0005641		Sealing cap
12	1	0018192		Hydraulic block
13	3	0004295		Washer DIN EN ISO 7089 - M8 - galvanised.
14	3	0009211		Hexagon head screw DIN EN ISO 4017 - M8× 40 - 8.8 galvanised

13.3.6 Hydraulics without load holding valve - class 02 (cutting width 850 mm)



Pos.	Piece	Item no.	Designation
1	1	0000855	Hydraulic line DIN 20066 - 2SC 8 NN90 - 780 KP208PRO
2	1	0000856	Hydraulic line DIN 20066 - 2SC 8 NN - 860 KP208PRO
3	2	0000909	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
4	1	0002603	Hydraulic cylinder
5	1	0001667	Screw-in connector DIN 2353 - EGR3/8"-WD CEL 12
6	1	0000890	Swivel fitting DF 90° M18×1.5 CEL12

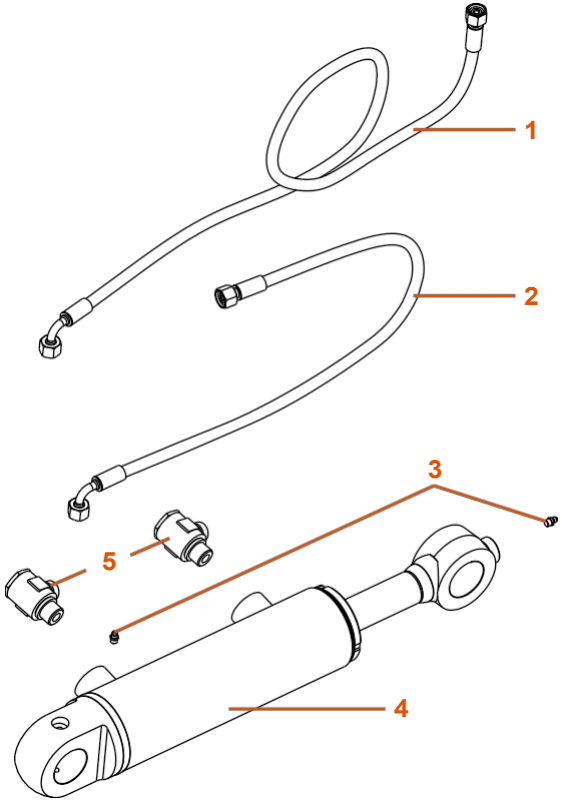
13.3.7 Hydraulics without load-holding valve - Class 02 to 06



Pos.	Piece	Item no.	Designation
1	1	0000855	Hydraulic line DIN 20066 - 2SC 8 NN90 - 780 KP208PRO for swivel head (MS 01, MS 01 Radlog, MS 03, MS 03 Radlog)
		[7]	Hydraulic line
2	1	0000856	Hydraulic line DIN 20066 - 2SC 8 NN - 860 KP208PRO for swivel head (MS 01, MS 01 Radlog, MS 03, MS 03 Radlog)
		[7]	Hydraulic line
3	2	0000909	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
4	1	0000876	Hydraulic cylinder
5	2	0000890	Swivel fitting DF 90° M18×1.5 CEL12

[7] Hydraulic lines for other quick-change systems are order-specific (specify serial number when ordering).

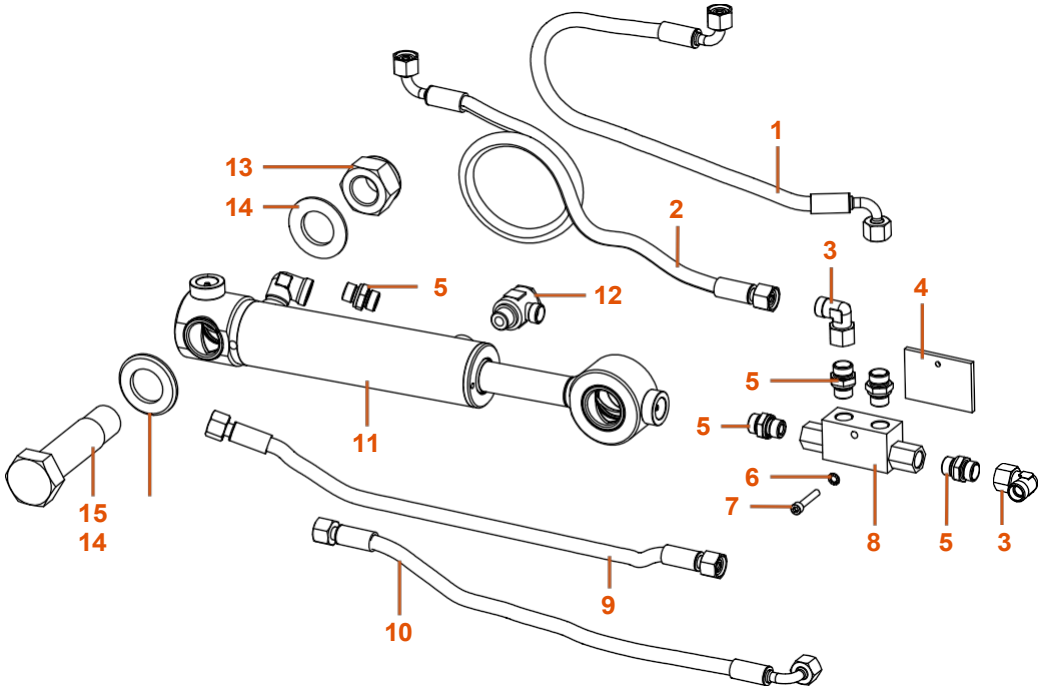
13.3.8 Hydraulics without load-holding valve - Class 07 to 09



Pos.	Piece	Item no.	Designation
1	1	0009076	Hydraulic line DIN 20066 - 2SC 8 NN - 1100 KP208PRO for swivel head (MS 08, MS 08 Radlog)
		[8]	Hydraulic line
2	1	0001297	Hydraulic line DIN 20066 - 2SC 8 NN90 - 980 KP208PRO for swivel head (MS 08, MS 08 Radlog)
		[8]	Hydraulic line
3	2	0000909	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
4	1	0002604	Hydraulic cylinder
5	2	0000890	Swivel fitting DF 90° M18× 1.5 CEL12

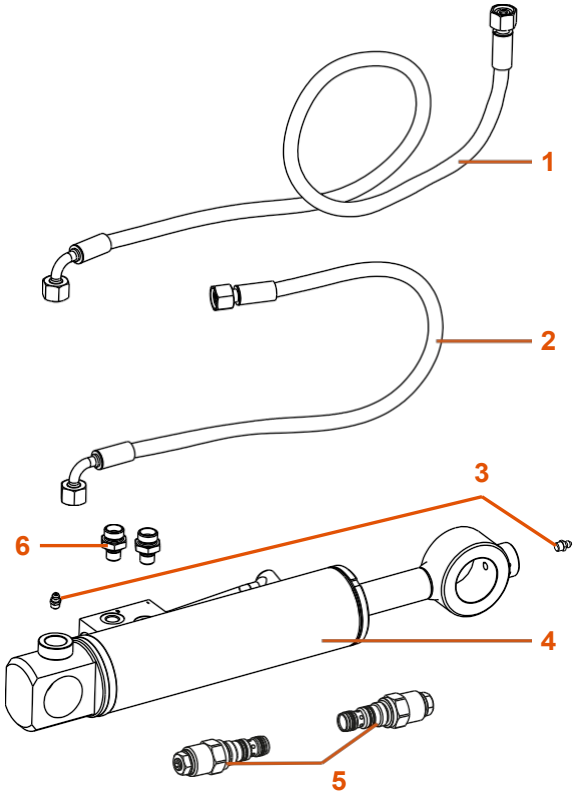
[8] Hydraulic lines for other quick-change systems are order-specific (specify serial number when ordering).

13.3.9 Hydraulics with load holding valve - class 02 (cutting width 850 mm)



Pos.	Piece	Item no.	Designation
1	1	0008522	Hydraulic line DIN 20066 - 2SC 8 N90N90 - 610 - V180 KP208PRO
2	1	0000855	Hydraulic line DIN 20066 - 2SC 8 NN90 - 780 KP208PRO
3	2	0004490	Pipe fitting ISO 8434-1 - SWOE - L12
4	1	0002984	Holder for load-holding valve
5	5	0001667	Screw-in connector DIN 2353 - EGR3/8"-WD CEL 12
6	1	0003026	Serrated lock washer DIN 6798 - A - 6.4 - galvanised.
7	1	0008513	Cheese head screw DIN EN ISO 4762 - M6 x 35 - 8.8 galv. galvanised.
8	1	0003051	Load-holding valve VRDE-F015FF or VBPDL/VP38
9	1	0008520	Hydraulic line DIN 20066 - 2SC 8 NN - 550 KP208PRO
10	1	0045641	Hydraulic line DIN 20066 - 2SC 8 NN90 - 580 KP208PRO
11	1	0002603	Hydraulic cylinder
12	1	0000890	Swivel fitting DF 90° M18× 1.5 CEL12
13	1	0000949	Hexagon nut DIN 985 - M30 - 8 galv. galvanised.
14	2	0006186	Washer DIN EN ISO 7090 - M33 galvanised.
15	1	0001661	Hexagon fitting screw DIN 610 - M30× 130 - 8.8 - black

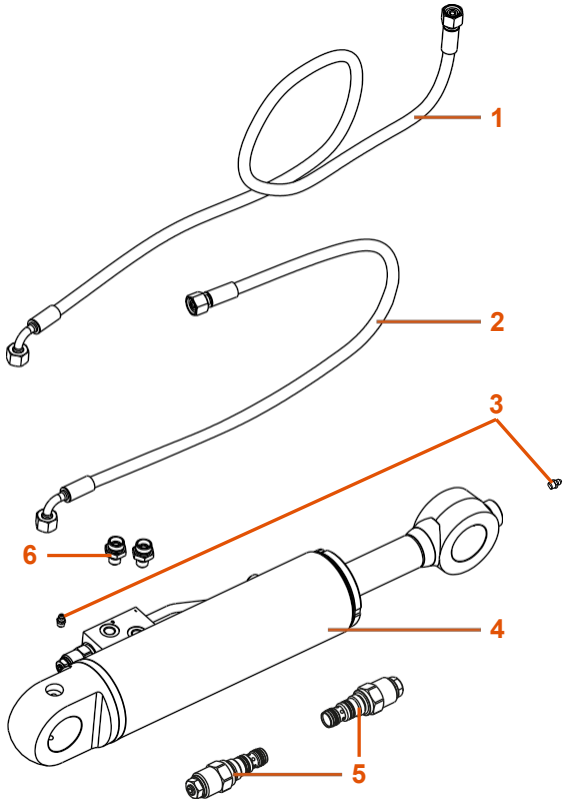
13.3.10 Hydraulics with load-holding valve - Class 02 to 06



Pos.	Piece	Item no.	Designation
1	1	0001296	Hydraulic line DIN 20066 - 2SC 8 N90N90 - 730 KP208PRO for swivel head (MS 01, MS 01 Radlog, MS 03, MS 03 Radlog)
		[9]	Hydraulic line
2	1	0001297	Hydraulic line DIN 20066 - 2SC 8 NN90 - 980 KP208PRO for swivel head (MS 01, MS 01 Radlog, MS 03, MS 03 Radlog)
		[9]	Hydraulic line
3	2	0000909	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
4	1	0001331	Hydraulic cylinder
5	2	0037388	Load-holding valve cartridge
6	2	0001667	Screw-in connector DIN 2353 - EGR3/8"-WD CEL 12

[9] Hydraulic lines for other quick-change systems are order-specific (specify serial number when ordering).

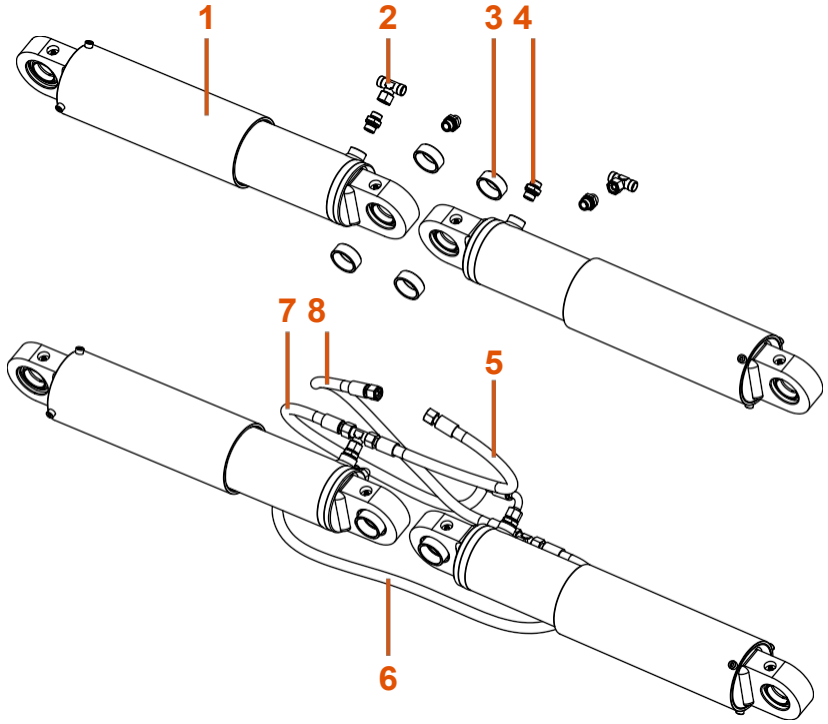
13.3.11 Hydraulics with load-holding valve - Class 07 to 09



Pos.	Piece	Item no.	Designation
1	1	0004057	Hydraulic line DIN 20066 - 2SC8 NN90 - 1310 KP208PRO for swivel head (MS 08, MS 08 Radlog)
		[10]	Hydraulic line
2	1	0037393	Hydraulic line for swivelling head (MS 08, MS 08 Radlog)
		[10]	Hydraulic line
3	2	0000909	Tapered grease nipple DIN 71412 - A - H1 - M8× 1.0 - 5.8
4	1	0002605	Hydraulic cylinder
5	2	0037389	Load-holding valve cartridge
6	2	0001667	Screw-in connector DIN 2353 - EGR3/8"-WD CEL 12

[10] Hydraulic lines for other quick-change systems are order-specific (specify serial number when ordering).

13.3.12 Hydraulics - Class 11 to 29



Pos.	Piece	Item no.	Spoon class	Designation
1	2	0009410	11, 15, 19	Hydraulic cylinder
		0010985	23, 29	
2	2	0010116	11, 15, 19, 23, 29	Pipe fitting ISO 8434-1 - SWOBT - L12 - L12 - L12
3	4	0020078	11, 15, 19	Spacer sleeve 48.3 / 40.5× 18.5
		0020293	23, 29	Spacer sleeve 60.3 / 50.5× 15
4	4	0004915	11, 15, 19, 23, 29	Screw-in connector AGM18× 1.5-WD CEL12
5	1	0020070	11, 15	Hydraulic line
		0021193	19	
		0020235	23, 29	
6	1	0020069	11, 15	Hydraulic line
		0021192	19	
		0020234	23, 29	
7	1	0020068	11, 15	Hydraulic line
		0020069	19	
		0020233	23, 29	
8	1	0020071	11, 15	Hydraulic line

Pos.	Piece	Item no.	Spoon class	Designation
		0021194	19	
		0020236	23, 29	

13.4 Screw tightening torques

The table shows the screw tightening torques for achieving the maximum permissible preload for control threads in Nm.

Metric standard thread

The tightening torques are based on VDI 2230 for.12.

Thread size	Hexagon [mm]	Hexagon socket [mm]	Torque [Nm]		
			Strength class 8.8	Strength class 10.9	Strength class 12.9
M5	8	4	6	9	11
M6	10	5	10,1	14,9	17,4
M8	13	6	24,6	36,1	42,2
M10	17	8	48	71	83
M12	19	10	84	123	144
M14	22	12	133	195	229
M16	24	14	206	302	354
M18	27	14	295	421	492
M20	30	17	415	592	692
M22	32	17	567	807	945
M24	36	19	714	1017	1190

Inch thread

Thread size	Torque [Nm]
5/8" (ø16 mm)	270± 40
3/4" (ø19 mm)	475± 60
7/8" (ø22 mm)	750± 90
1" (ø25 mm)	1150± 150
1 1/4" (ø32 mm)	2300± 300

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