EN

Sieger Drain-Jet

www.sieger-machinery.com

USER MANUAL

Sieger Drain-Jet S
Sieger Drain-Jet HS
Sieger Drain-Jet WR

READ THIS MANUAL BEFORE USING THIS MACHINE

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Changes
This publication is based on the most recent information available at the time of publication. Because Sieger pursues a policy of continuous product improvement, this publication may be changed without prior notice.

Liability
This publication has been prepared with the greatest possible care. Nevertheless, it may not be entirely accurate. Sieger accepts no liability for any errors in this publication or the possible consequences thereof.

Language
☐ Original manual.
■ Translation of the original manual.

PREFACE

Dear customer, Congratulations on choosing a Sieger Drain-Jet drain cleaner.

Thanks to this quality machine from Sieger, you can look forward to years of low maintenance drain pipe cleaning. To ensure trouble-free operation the Drain-Jet is standard equipped with four driven rollers for driving the flushing hose. Moreover, the combination of a powerful high pressure pump and the standard 500 metre hose provide tremendous cleaning capacity. The hydraulic arm, which is a standard feature, makes the Drain-Jet drain cleaner ergonomic in use. The simple control enables you to work safely and efficiently.

For your safety it is important that the machine is operated maintained correctly. Read this manual before using the machine. Follow the instructions to avoid injury and property damage. Do not hesitate to contact Sieger if you have questions.

TABLE OF CONTENTS

1 INTRODUCTION

Intended use

The drain cleaner is intended for cleaning drain pipes. Do not use the drain cleaner for any other purpose.

Intended audience

Only adequately trained people who have read and understood this manual may use and maintain the drain cleaner.

About this manual

This manual pertains to the operation and maintenance of the Sieger Drain-Jet drain cleaner.

This document is applicable to the following models:

Sieger Drain-Jet S	(112202AS600)
Sieger Drain-Jet HS	(112202AS700)
Sieger Drain-Jet WR with ABS	(112202AS900)

Supplied documentation

The drain cleaner is accompanied by the following documentation:
- User manual
- Manual for the cardan shaft

Availability

The user manual must always be present in the cab. If the manual is lost, you can request a new copy from Sieger or download it from www.sieger-machinery.com.

Conventions used in this document
- This symbol indicates a summary of information.

1. Preceding numbers indicate the order in which steps must be performed.

[1] Numbers inside square brackets are references to parts in an illustration.

Left, right, front and rear

The designations 'left', 'right', 'front', and 'rear' are to be interpreted from the perspective of a person sitting in the driver's seat, facing the forward driving direction.

Customer service

If you have questions about the Sieger Drain-Jet that are not answered in this user manual, please do not hesitate to contact Sieger.

For other instructions you can naturally always consult our website www.sieger-machinery.com.

Warranty

You are, of course, entitled to warranty coverage if a defect develops despite correct operation and completion of the prescribed maintenance. The warranty does not cover the following:

- Normal wear
- Failure to heed instructions on the drain cleaner
- Ignoring the instructions in this manual
- Inadequate maintenance
- The use of non-OEM parts
- Abnormal external influences
- A modification not authorized by Sieger

Sieger honours the warranty conditions laid down in the METAALUNIE terms and conditions. A summary of the Sieger general terms and conditions is available online, on our website.

Machine identification

Fill in the identification data for the machine.
These data can be found on the type plate.
The type plate is located on the tube beside the attachment point of the upper link of the three-point linkage. Also fill in the delivery date.

Type	
Serial no.	
Year	
Weight kg	
Delivery date	

You can also register the machine online at www.sieger-machinery.com. By registering your product, you make it possible for us to optimize your experience. Registration is beneficial to you in a number of ways, one of which is that we will keep you up to date on the latest developments concerning technical improvements and use of the Drain-Jet drain cleaner. You will also receive news about the latest developments at Sieger.

EC declaration of conformity (only valid for Europe)

Manufacturer:	Modulen & Engineering Menzing B.V.
Address:	Handelsstraat 36b
Postal code:	7482 GW

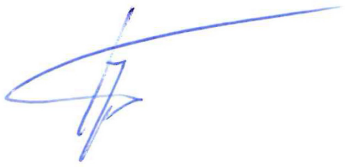
Product identification:

Description of the product:	Drain cleaner
Type or model:	Drain-Jet S
	Drain-Jet HS
	Drain-Jet WR
Serial number:	Pxxxxxx/xx

Meets the requirements:

EU Guideline:	2006/42/EC relating to machinery

Haaksbergen, April 2021



E. Jansen
Director
Modulen & Engineering Menzing B.V.

2 SAFETY

Introduction

Read this manual before using the machine. Follow the instructions to avoid injury and property damage. Do not hesitate to contact Sieger if you have questions.

REMAIN ALERT! YOUR SAFETY AND THE SAFETY OF OTHERS DEPENDS ON IT!

Symbols in this manual

The following symbols are used in this manual:

WARNING
Indicates a risky situation which, if not avoided, may result in severe bodily injury or death.

ATTENTION

Indicates a risky situation which, if not avoided, may result in property damage.

This symbol indicates additional information and tips. This symbol is not used to indicate a risky situation.

Safety warnings (stickers)

Various symbols can be found on the drain cleaner, the purpose of which is to alert you to a potentially hazardous situation, remind you to use personal protective equipment or refer you to a prescribed operation explained in this manual.

Safety glasses sticker
Sticker indicating that safety glasses must be worn.

User manual sticker
Refers to a prescribed operation.

Rotating parts sticker
Warning for mechanical danger/danger of being pulled in by moving parts.

Trapping sticker
Warning for mechanical danger/danger of crushing by moving parts.

3 GENERAL DESCRIPTION

Introduction

The drain cleaner consists of the following parts:
- Frame
- Cardan shaft
- Hydraulic system
- Reel
- Side arm with hose drive
- Distance indicator
- Guide arm
- Diaphragm pump
- Pressure regulator
- Filters
- Flexible hose section
- Cleaner nozzle

Frame
The frame has attachment points for transport with a forklift. The frame is designed for attachment to your tractor's three-point linkage.

Cardan shaft
The drain cleaner is delivered complete with a cardan shaft. This may need to be shortened. The cardan shaft is driven by the tractor PTO shaft.

Hydraulic system
The hydraulic system is connected to the tractor's double-acting valve or a single-acting valve with pressure-free return. The machine is operated through use of the 4-way valve block. The wind-out and wind-up speed is controlled by the speed control valve next to the valve block.

Reel
Due to its large diameter the reel can wind up a flushing hose with a maximum length of 500 metres. The drain cleaner is equipped standard with a flushing hose of this length.

Side arm with hose drive
The side arm is operated with hydraulic cylinders to position the guide arm in front of the drain pipe. The hose drive consists of four driven rubber rollers.

Distance indicator
The distance indicator is located behind the drive rollers. The indicator measures the rolled out hose length and can indicate the location of the blockage.

Guide arm
For road transport the guide arm must be folded in and secured, in accordance with the instructions in this manual.

ATTENTION

- Before the arm can be retracted, it is necessary to ensure that the flushing hose is not located in the folding part of the arm.
- Position the drain-shaft arch before the machine is folded in (otherwise the drain-shaft arch will contact the reel).

Diaphragm pump
The water pump is a suction diaphragm pump, driven by the tractor PTO. The recommended pump speed is 350 to 370 rpm. The maximum allowable speed of the pump is 540 rpm.

Pressure regulator
You can adjust the water pressure with the pressure regulator. A handle on the pressure regulator enables you to depressurize the pump, which may be desirable, for example, when positioning the guide arm in line with the drain pipe. The optimum operating pressure is 30 - 35 bar.

Pump pressure (bar)	Cleaner nozzle pressure (bar)	L/min at 500 metres
20	3.8	45
25	6.1	50
30	6.7	55.5
35	9.9	58.3
40	11	65
50	12.8	68.7

The return hose for the pressure regulator is connected to the top of the guide arm. The water 'lubricates' and cleans the flushing hose.

Filters
The suction hose is fitted with a suction strainer. The suction strainer is located upstream of the diaphragm pump.

Flexible hose section
The flexible hose section between the flushing hose and cleaner nozzle ensures that the cleaner nozzle remains in the middle of the drain pipe.

Cleaner nozzle
The standard cleaner nozzle has 13 holes: 1 forward-pointing hose and 12 backward-pointing holes at a 15° angle.

4 COMMISSIONING

Introduction

- Check the drain cleaner for possible transport damage at the time of delivery. Report transport damage to the carrier or Sieger immediately.

Cardan shaft

It may be necessary to shorten the cardan shaft (the inner and outer telescoping shaft sections and both protective sleeves). See the instructions in the manual supplied with the cardan shaft.

ATTENTION Do not allow the pump to run longer than two minutes without a supply of water.

Commissioning after winter storage

- Diaphragm pump: drain the antifreeze (if applicable). Dispose of the antifreeze in accordance with national regulations.

5 OPERATION

Introduction

The chapter provides information about operating the drain cleaner.

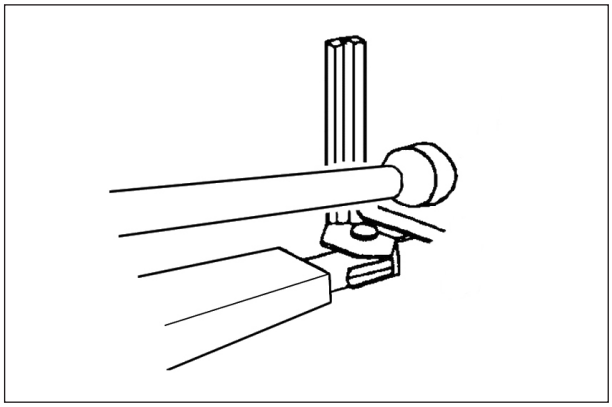
Safety

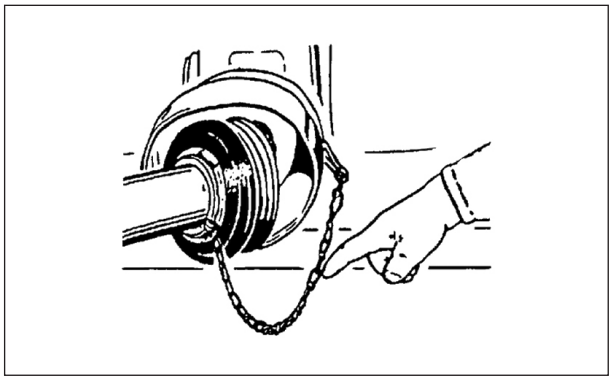
- Never leave the tractor engine running in an enclosed area (not even if the doors and windows are open) due to the risk of carbon monoxide poisoning!
- The guide arm must never be used as a hoist.
- Always wear eye protection (safety glasses). Due to the high pressure, small, hard objects can be ejected at high speed.
- Make the machine roadworthy prior to transport on public roads.
- Check the lighting. Have an assistant help you check the brake lights.
- Adjust the tractor mirrors if necessary.

There is a danger of crushing and bodily injury in the machine's guide arm zone. Never stand under the guide arm when it is raised.

Connecting to the tractor

1. Ensure that the work area is adequately lighted.
2. Hitch the drain cleaner to the tractor.
3. Disengage the PTO shaft and shut down the engine on the tractor, and take the ignition key with you.
4. Fit the cardan shaft (adapted to length if necessary) to the tractor PTO shaft.
5. Secure the tractor end of the protective sleeve to the tractor with the attachment chain to prevent it from rotating with the shaft.
6. Ensure that the protective sleeve on the drain cleaner side is secured against rotation with the other attachment chain.
7. Attach the hydraulic hoses; the connection for the pump side is marked in red.
8. Connect the 7-pole connector for the brake lights and direction indicators to the tractor socket.
9. WR model: connect the plug for the electrical circuit (black - / white +).





ATTENTION The maximum permissible speed of the tractor PTO shaft is 540 rpm. Do not exceed this speed.

ATTENTION Do not use the chains to hang up the cardan shaft.

Do not stand on the cardan shaft.
The cardan shaft can become very hot during use. Do not touch the cardan shaft during or soon after use.

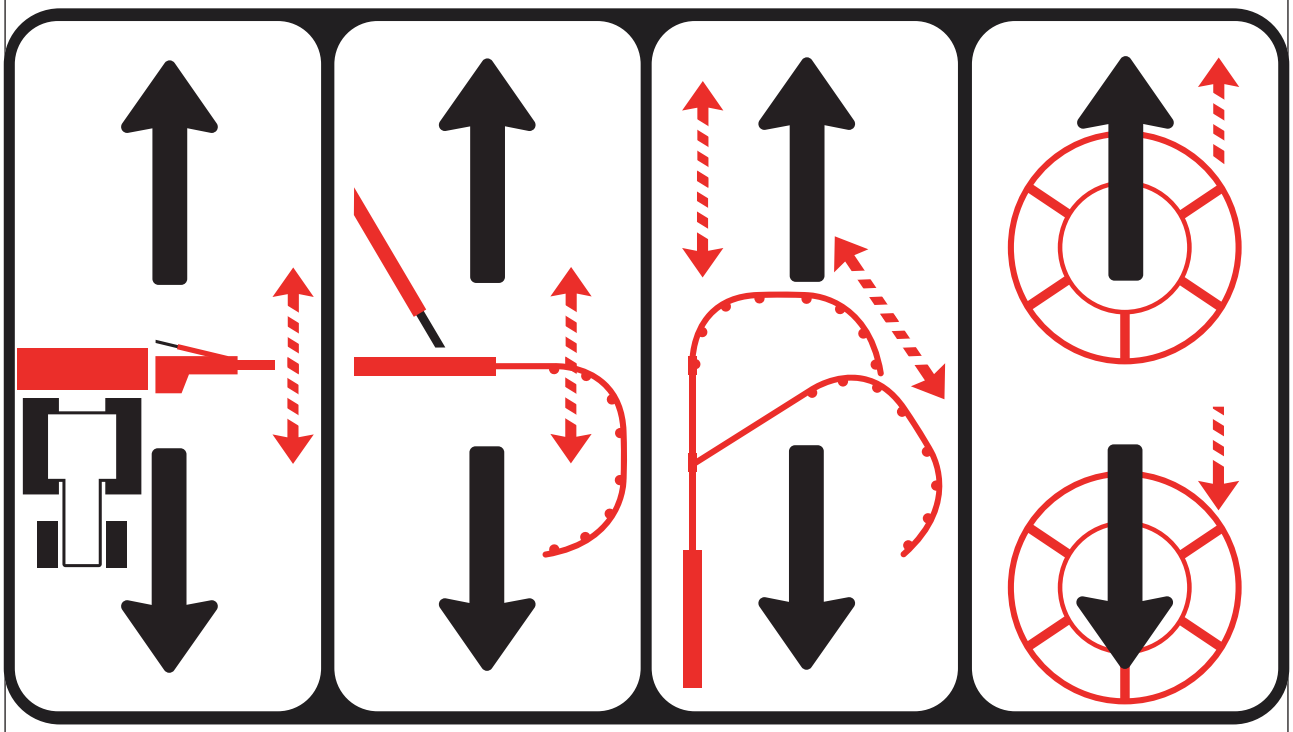
- Rotating parts (cardan shaft).
- Only use the cardan shaft with the protective sleeve and protective guards in place and in good condition.
- Maintain a safe distance from the rotating cardan shaft.
- Prior to maintenance on the cardan shaft:
- Disengage the PTO shaft and shut down the engine on the tractor.
- Remove the ignition key from the ignition lock cylinder.

Hydraulic system operation

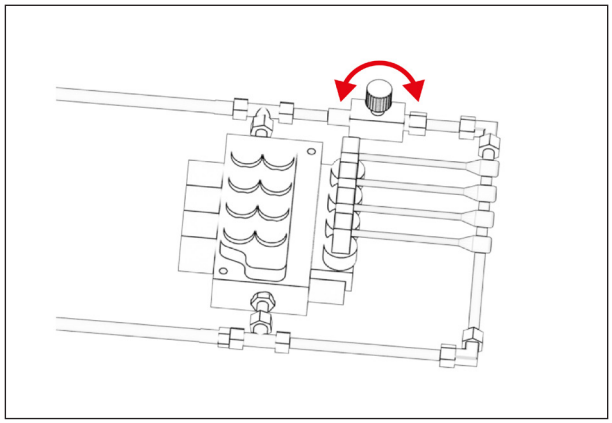
The machine is operated through use of the 4-way valve block. The wind-out and wind-up speed is controlled with the speed control valve next to the valve block.

The sticker on the control panel graphically indicates the various functions of the levers.

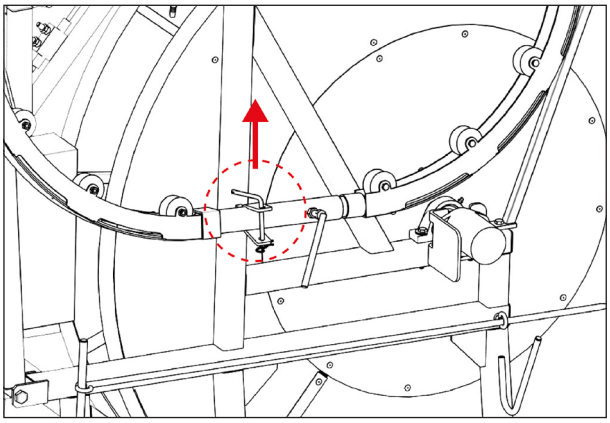
Note: Lever 4 is only present on the HS and WR model.

Lever 4 (HS/WR model)	Lever 3	Lever 2	Lever 1
Swing backwards	Raise arm	Extend arm Fold arm out	Reel out
			
Swing forwards	Lower arm	Retract arm Fold arm in	Reel in

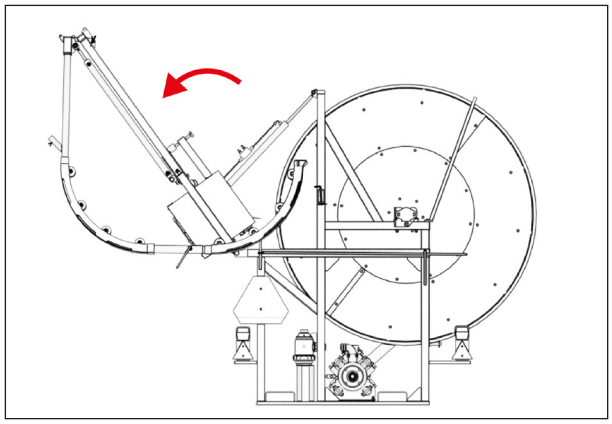
Machine operation: winding out (feeding in)



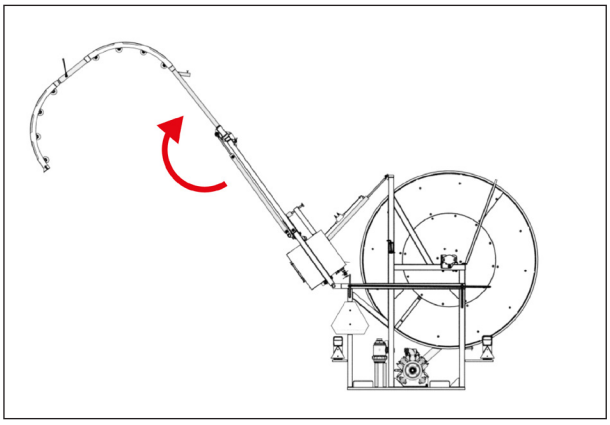
1 Pressurize the hydraulic system.
The speed can be adjusted with the speed control valve.



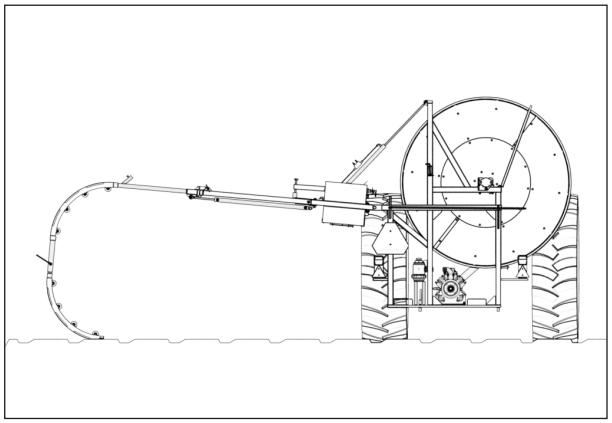
2 Release the arm from the road transport retainer.



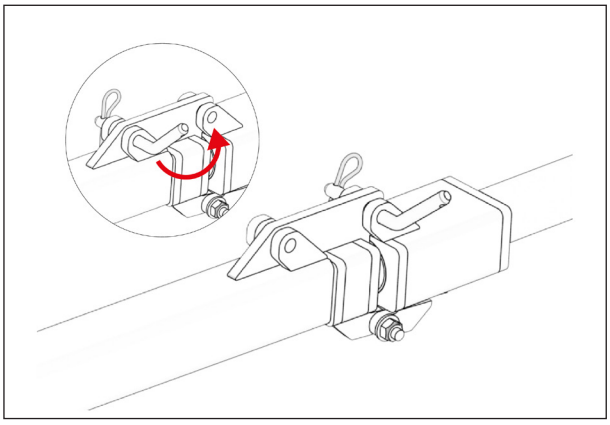
3 Lower the arm ±45 degrees (lever 3).



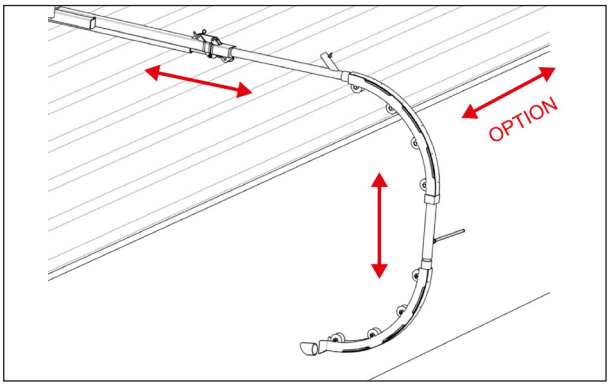
4 Fold out the arm as far as possible (lever 2).



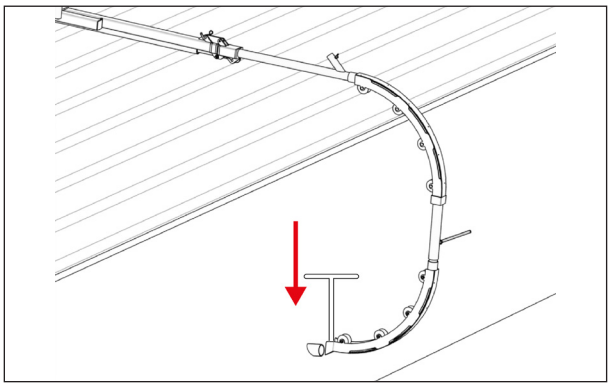
5 Lower the arm to the ground (lever 3).



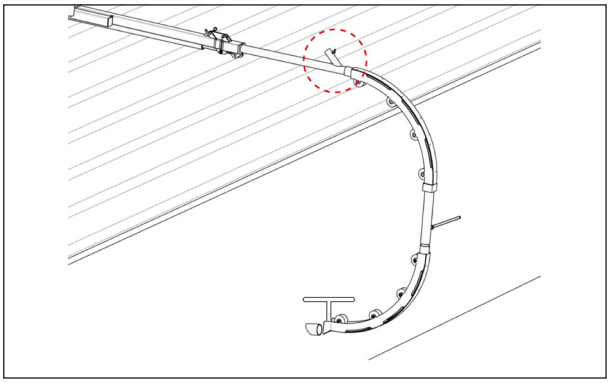
6 From transport position to operating position
If necessary, retract cylinder ±1 cm with lever 2.



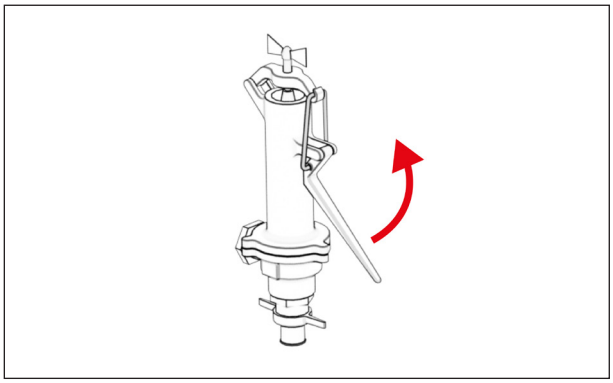
7 Drive the tractor to the ditch or pit. Position the drain-shaft arch in front of the drain.



8 Secure the drain-shaft arch with the ground anchor.

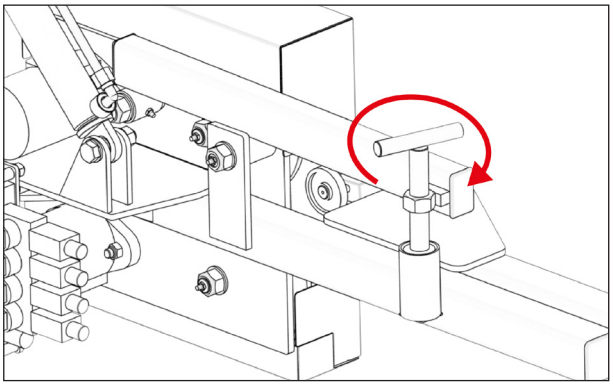


9 Lay/place the suction hose in the pit or water tank. Connect the return hose for the pressure regulator to the top of the guide arm. The water 'lubricates' and cleans the flushing hose.

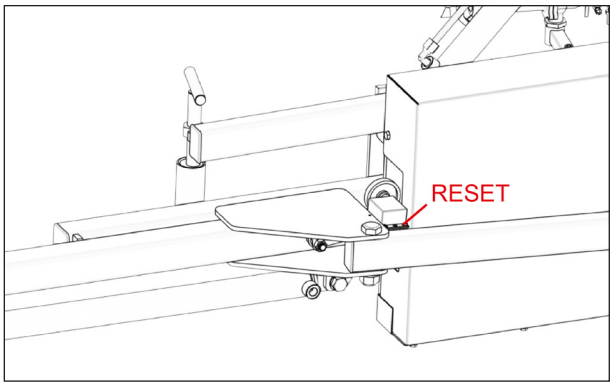


10 Disengage the pressure regulator. Engage the PTO.

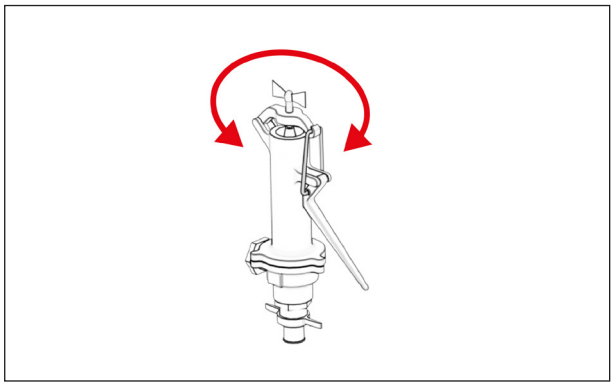
Recommended speed for the pump is 350 – 370 rpm. Use the lowest possible speed necessary to achieve the operating pressure of 30-35 bar.



11 Run the reel slowly to roll out the hose; tighten the tension roller until the drive no longer slips.



12 Reel out the hose carefully until the nozzle is ±3 centimetres from the drain (lever 1). Set the distance indicator to 0.



13 Engage the pressure regulator and adjust it to 35 bar.

14 Reel out the hose at ±30 metres per minute. Retract the hose ±15 metres if the hose gets stuck or the drive wheels slip. Then continue reeling out, assuming that the end has not yet been reached.

15 If the cleaner nozzle gets stuck approximately 50 metres into the drain pipe due to heavy deposits: retract the hose completely to flush the contamination out of the drain pipe. Repeat to clean the next section of drain pipe.

Ensure that no one is within the working zone around the machine when the machine is in operation.

- Only remove the locking pin from the pivot point if the arm is resting on the ground.
- Do not place your hands between the drive wheels.

ATTENTION

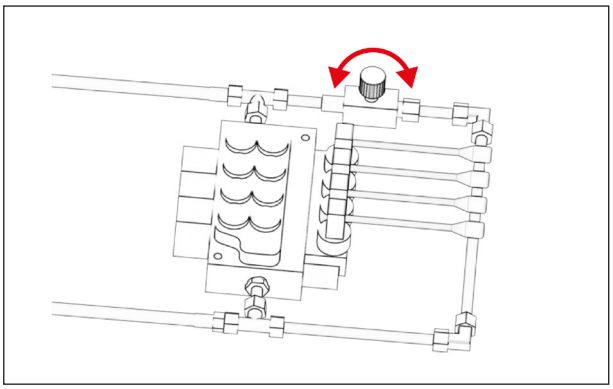
- Prevent the polyethylene hose from kinking by positioning the drain-shaft arch no more than 5 to 10 centimetres from the drain.
- Raise the drain cleaner until the angle of the PTO shaft is approximately 10 degrees (maximum 12 degrees).
- Stop immediately when a blockage is reached.
- Stop immediately at the end of the drain pipe.
- Never allow the flushing hose to stand still in the drain pipe for more than ten minutes.
- Retract the hose at a lower speed.

ATTENTION

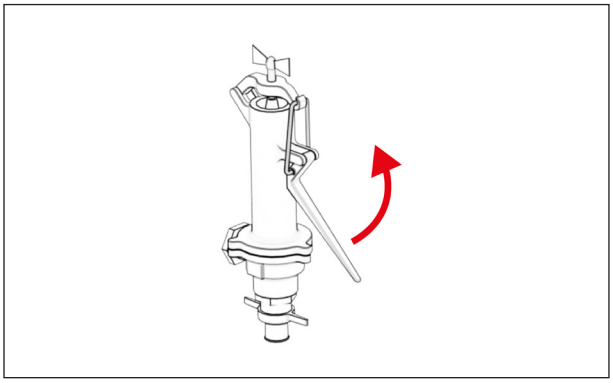
When the cleaner nozzle is in the drain:

- Do not switch off the pump!
- Keep the hose under pressure!
- Never leave the machine unattended!

Machine operation: winding up



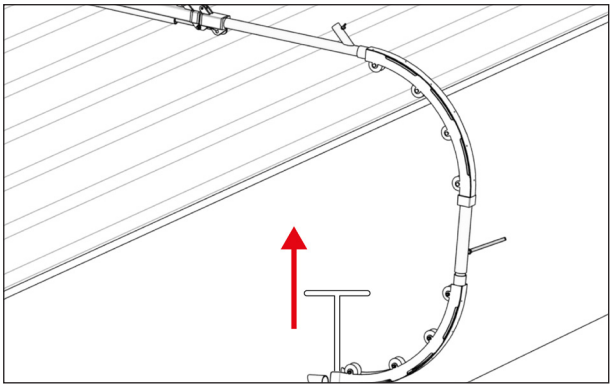
1 Roll up the hose once the end of the drain is reached. Reduce the speed from 20 to 25 metres per minute by adjusting the throttling valve. Watch the distance indicator carefully. Stop the reel once the hose is out of the drain.



2 Disengage the pressure regulator.

3 Disengage the PTO shaft.

4 Remove suction hose from the water.

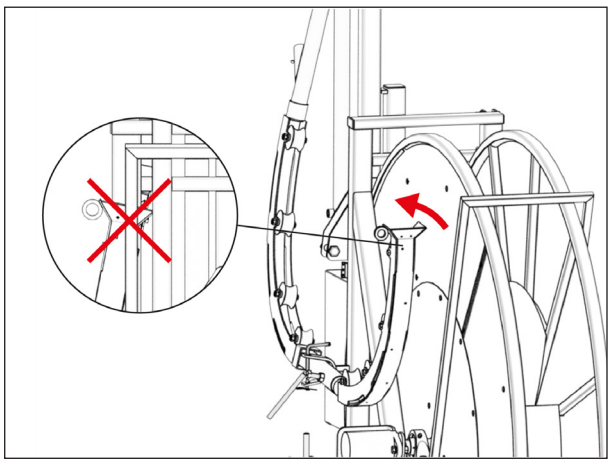


5 Remove ground anchor.

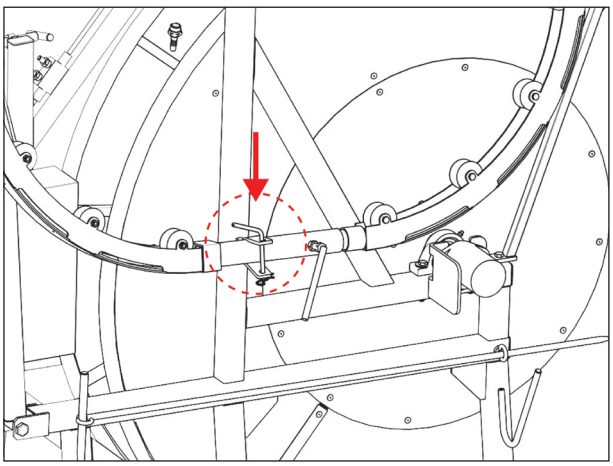
6 Raise arm slightly and drive to the next drain.

7 Remove suction hose from the water.

Folding in and transport



1 Turn the drain-shaft arch slightly before folding it in so it will not contact the reel.



2 During road transport the arm must be folded in and the oil pressure must be released from the machine. Do not forget to secure the arm in the transport position.

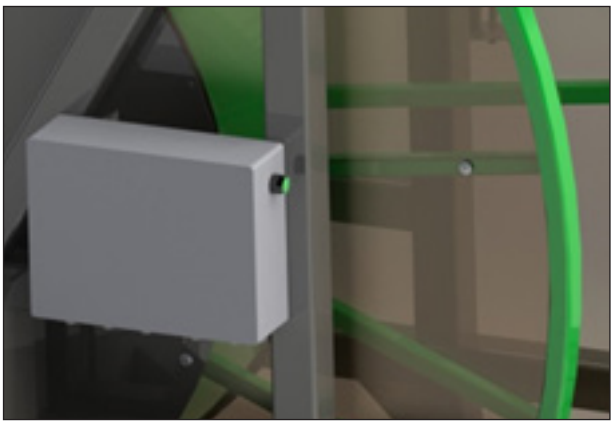
ATTENTION

- Turn the drain-shaft arch slightly before folding in.
- Always secure the arm in the transport position prior to road transport.

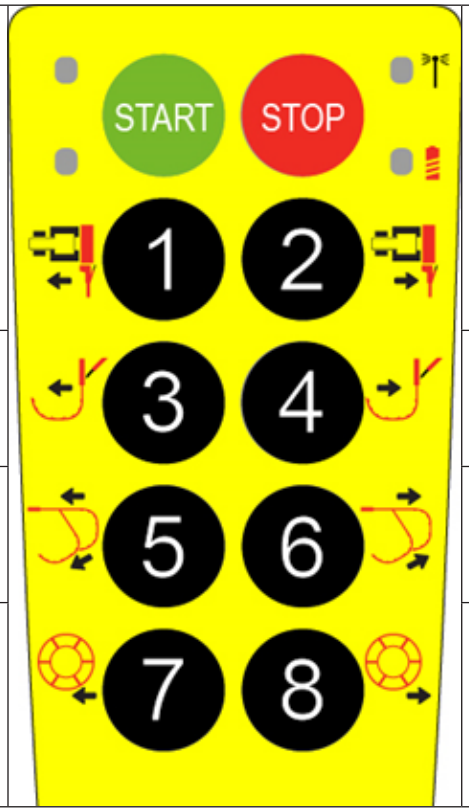
Remote control
(Option WR)

Plug the power cable for the receiver into the tractor. Then press the 'green' start button on the remote control. A green indicator now lights up in the ABS housing.

Once the green indicator in the ABS housing is lit, the machine can be operated.



OPERATION
(Option WR)

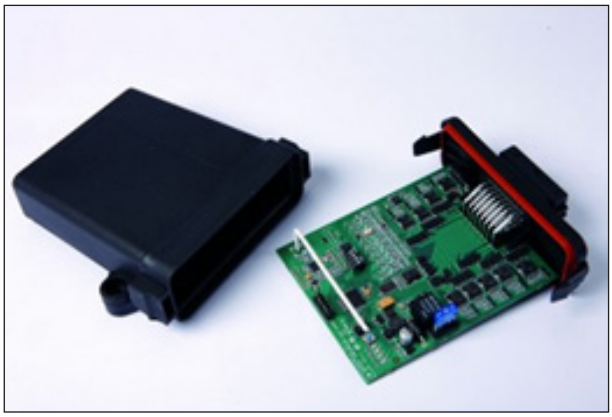
1. Swing forwards		2. Swing backwards
3. Lower arm		4. Raise arm
5. Retract		6. Extend
7. Wind up Start: press button Detent: double click button Stop: press button		8. Wind out Start: press button Detent: double click button Stop: press button

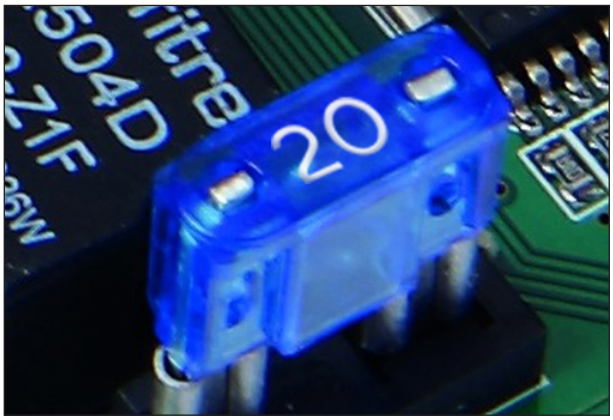
Do not leave the machine unattended while it is running. In an emergency situation press the red emergency stop button on the top of the remote control!

Replacing the fuse for Remote control
(Option WR)

The fuse is located in the receiver. The receiver for the remote control is mounted in the ABS housing.

1. Disconnect the power cable from the tractor.
2. Remove the cover of the ABS housing (six screws).
3. Disconnect the plug on the front side of the receiver. Note: you must pull/slide the purple tab outward. Now the plug is released and can be disconnected from the receiver.
4. Unscrew the receiver from the ABS housing.
5. Detach the front side of the receiver by removing the two screws. Carefully slide the inside out of the housing.
6. Replace the 20 A fuse.
7. Fit the inside in the housing and place the receiver back in the ABS housing. Fit the cover with the six matching screws.





5A Sieger ABS

Sieger Automatic Blockage Solver

Introduction

The Sieger Drain-Jet WR is equipped as standard with the Sieger ABS, the “Sieger Automatic Blockage Solver”. If this function is activated by the user, the drain cleaner reacts automatically to blockages or to the end of the drainage pipe by immediately stopping the supply of the spray hose to stop. A removal routine is then automatically routine is started automatically. This involves retracting the spray hose a little bit a number of times in order to then
try to get through the blockage. Once the obstruction has been removed, the spray hose If the blockage is removed, the spray hose continues on its way to the next blockage or end of pipe. If it does not succeed in removing the obstruction or at the end of the pipe, the system will end the cycle and automatically roll up the spray hose.

Operation

The Sieger ABS is an extension of the double-click functions on keys seven and eight on the remote control.

Rewinding:
The ABS function can be started by pressing key 8 on the remote control twice in quick succession. The machine immediately starts uncoiling until it detects a blockage or an end of pipe. If the obstruction cannot be removed, the hose is hose is automatically coiled to prevent damage to the drainage pipe and the machine.

Rewinding:
Pressing key 7 twice in succession starts automatic rewinding of the flushing hose. The machine stops rewinding automatically as soon as the flushing hose has passed the meter counter.

Operation

Place the machine in front of a drainage pipe to be cleaned. Insert the flushing hose into the pipe for a few metres. Set the desired reel speed with the blue rotary knob. For optimum operation of the ABS, it is recommended to stay slightly below the maximum speed of the
machine.

6 MAINTENANCE

Introduction

The chapter provides information about maintaining the machine. Contact Sieger for maintenance that it not covered in this manual.

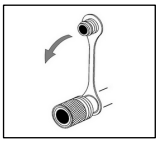
Avoid spilling oil and grease on the flushing hose. This can cause slipping when winding the hose in and out.

Safe maintenance

- Do not use the drain cleaner if any part is worn or damaged. Only replace parts with genuine Sieger Drain-Jet parts.
- Never leave the tractor engine running in an enclosed area (not even if the doors and windows are open) due to the risk of carbon monoxide poisoning!
- Wear close-fitting overalls, safety glasses (hydraulic oil!) and safety shoes.
- Use appropriate tools of the correct size.
- Ensure that no one can activate the machine during maintenance. Completely disconnect the machine from the tractor.
- Tighten bolts and nuts with the correct torque (see section ‘Tightening torques’).

Hydraulic system

Contamination is the number one enemy of hydraulic systems:
- Work with clean hands and clean tools.
- Clean the area around a part before removing it.
- Cover the area where a part has been removed.
- Cover the end of a disconnected hose with the provided cap.



Replace damaged or leaking hydraulic hoses immediately.

NEVER use your fingers to try to locate a leak. Use a piece of cardboard. Hydraulic oil under high pressure can penetrate your skin. The penetration of hydraulic oil is an emergency situation. Danger of infection! Seek the help of a doctor immediately!

Cardan shaft

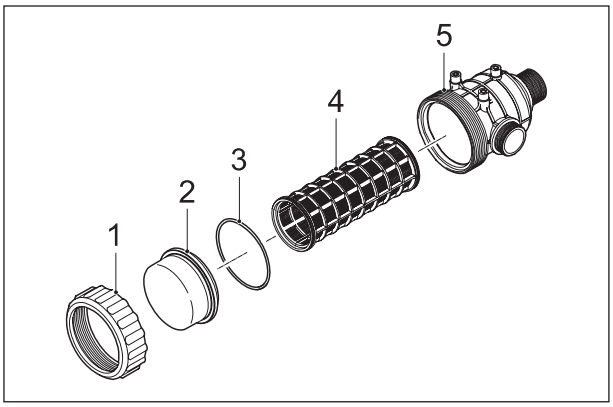
Check the cardan shaft daily.
Replace damaged protective sleeves and protective guards around the cardan shaft immediately.
Only use genuine parts.

- Rotating parts (cardan shaft).
- Only use the cardan shaft with the protective sleeve and protective guards in place and in good condition.
- Maintain a safe distance from the rotating cardan shaft.
- Prior to maintenance of the cardan shaft:
- Disengage the PTO shaft and shut down the engine on the tractor.
- Remove the ignition key from the ignition lock cylinder.

Repairing the flushing hose

If the hose is damaged, the damaged section must be removed. The remaining hose sections can be attached together using one hose connector (106901PA252) and two clamping sleeves (106901PA253).

Suction filter



Clean the filter element daily:

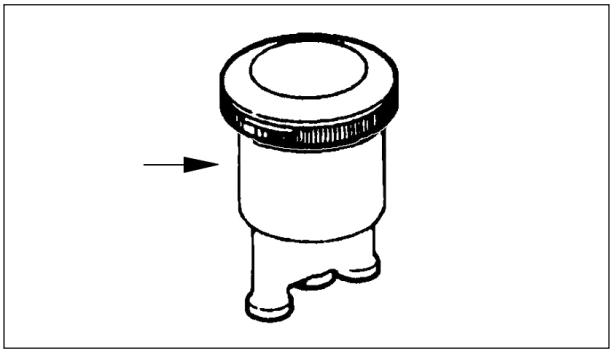
1. Remove the gland nut [1].
2. Remove the cap [2].
3. Remove the O-ring [3].
4. Remove and clean the filter element [4].
5. Place the parts back in the filter housing.

Diaphragm pump

Pressure accumulator
Check the air pressure in the pressure accumulator using a compressed air tyre filler with manometer. The desired air pressure depends on the pressure range within which the pump will be operated, in accordance with the table below:

PUMP OPERATING PRESSURE		ACCUMULATOR AIR PRESSURE	
bar	psi	bar	psi
10-20	145-290	5-7	73-102
20-50	290-725	7	102

Oil level
Check the oil level daily (after the pump has run for at least ten minutes):
1. Check the oil level.
2. Top up the oil if necessary.



Replacing the diaphragms/oil
The diaphragms must be replaced once a year (preferably at the end of the season). This requires disassembly of the pump.

Excessive oil consumption or a sudden drop in oil level indicates a ruptured membrane. Stop the pump immediately.
Milky white discolouration of the oil indicates a ruptured membrane (water in the oil). Stop the pump immediately and contact Sieger.

The service life of the diaphragms is determined by the condition of the suction filter and the speed of the pump (mechanical wear).

ATTENTION

Do not allow the pump to run longer than two minutes without a supply of water.

Tightening torques

Incorrectly tightened bolts and nuts can cause accidents. Tighten bolts and nuts in accordance with the table below (unless otherwise indicated in this manual).

Original bolts may only be replaced with bolts having the same dimensions and bolt class. Bolts that do not match the original ones can cause accidents.

Dimension	Tightening torques		
	Class 8.8	Class 10.9	Class 12.9
	Nm	Nm	Nm
M6	10	15	18
M8	25	37	43
M10	51	75	87
M12	87	130	150
M12 x 1.5	92	135	155
M14	140	205	240
M14 x 1.5	150	220	260
M16	215	310	370
M16 x 1.5	230	340	390
M18	300	430	510
M18 x 1.5	350	490	580
M20	430	620	720
M20 x 1.5	480	690	800
M22	580	830	970
M22 x 1.5	640	920	1070
M24	740	1060	1240
M24 x 2	810	1160	1350
M24 x 1.5	830	1180	1380
M27	1100	1550	1850
M27 x 2	1190	1700	2000
M30	1500	2100	2500
M 30 x 2	1610	2300	2690
M33	2000	2800	3400
M36	2600	3700	4300

The bolt class is indicated on the bolt head. The tightening torques apply for dry bolts.

Maintenance schedule

Lubrication points

Part	Action/material	Daily	Weekly	Annually
Water coupling	Lubrication grease		✓	
Reel bearings	Lubrication grease		✓	
Chain hose lead-through	Lubrication grease			✓
Pivot points guide arm	Lubrication grease			✓
Wheels hose lead-through	Lubrication grease			✓
PTO shaft	Lubrication grease		✓	
Pinch roller	Lubrication grease			✓
Extendible section of the arm	Lubrication grease		✓	
Distance indicator	Engine oil 5W29		✓	
Pressure regulator	Engine oil 5W30			✓
Nylon rollers hose lead-through	Engine oil 5W30		✓	✓
Nylon rollers drain-shaft arch	Engine oil 5W30		✓	
Locking pins	Engine oil 5W30		✓	
Diaphragm pump	Top up oil	First time after 300 hrs, then after 1000 hrs and/or after replacement of the diaphragms.		

Inspect and clean

Part	inspect/clean	Daily	Weekly	Annually
PTO shaft	Check guards	✓		
Suction filter	Clean		✓	
Suction strainer	Clean	✓		
Guards	Inspect	✓		
Lighting	Inspect	✓		
Safety stickers	Inspect	✓		
Accumulator (diaphragm pump)	Check pressure 7 bar		✓	
Diaphragm pump	Check oil level	✓		
Bolts and nuts	Inspect and re-torque	After initial 5 hours of operation		

Winter storage

1. Clean the machine. Dirt retains moisture, which causes rust. If you use a pressure washer, do not point it directly at bearings.
2. Place the machine in a dry, frost-free area. Never in the vicinity of fertilizer.
3. Repair paint damage (green = RAL 6018, grey = RAL 7021).
4. Apply an anti-corrosion product to bare metal parts.
5. Drain the suction filter.
6. Wind the hose onto the reel.
7. Run the pump until it draws air.
8. Engage the pressure regulator and turn the knob completely in.
9. Wind up the hose slowly. Water now sprays out of the nozzle. Stop when only air comes out of the nozzle.
10. Disengage the pressure regulator.
11. Order all parts that need to be replaced. Fit the parts when they arrive.

If the machine will not be stored in a dry, frost-free area and the diaphragms of the pump will not be replaced:

1. Disconnect the suction hose and fill the pump with antifreeze.
2. Let the pump shaft turn several revolutions.

Commissioning after winter storage

Diaphragm pump: drain the antifreeze (if applicable). Dispose of the antifreeze in accordance with national regulations.

7 TROUBLESHOOTING

Introduction

Consult the table to resolve problems. Contact Sieger if you cannot resolve the problem.

Problem	Possible cause	Solution
Diaphragm pump does not generate suction	• Pump is not getting enough water	• Completely submerge the suction strainer
	• Blocked suction filter	• Clean the filter element
	• Filter cap not tightly sealed	• Tighten the cap
	• Loose lines	• Tighten the fittings
	• Leaking hoses/lines	• Replace the hoses/lines
	• Leaking diaphragms	• Replace diaphragms
	• Damaged or worn suction/discharge valve or valve seats	• Replace the cylinder head • Replace the pump
Diaphragm pump: pressure too low or fluctuating	• Pump is not getting enough water	• Completely submerge the suction strainer
	• Blocked suction filter	• Clean the filter element
	• Loose lines	• Tighten the fittings
	• Pressure in the accumulator too low	• Pump up the accumulator (7 bar)
	• Leaking diaphragms	• Replace the diaphragms
	• Damaged or worn suction/discharge valve or valve seats	• Replace the cylinder head • Replace the pump
Not possible to regulate pressure	• Valve and seat in the pressure regulator are worn	• Replace
Water pressure drops off	• Oil level too low	• Top up
	• Valve spring broken	• Replace
Pump knocks (ticking sound)	• Blocked suction filter	• Clean the filter element
Hydraulics not working	• Flow control valve stuck fully open	• Tighten several turns
Reel does not roll out	• Contamination in flow restrictor: reel hydraulic motor	• Clean
Reel does not roll in	• Contamination in flow restrictor: on hydraulic motor drive rollers	• Clean
Hydraulic oil getting too hot	• Hole in flow restrictor on hydraulic motor drive rollers too small or plugged	• Clean • Drill the hole (Ø1.4) to an oversize several tenths of a millimetre larger (not too much!)
Remote control	• Remote control does not work	• Battery is flat • Emergency stop button (on the remote control) is pressed in • Green indicator lamp on the ABS housing in not lit • Fuse is blown; see section 'replacing the fuse'

8 ENVIRONMENT

Introduction

Environmental impact must be prevented as much as possible during use and maintenance of the drain cleaner.

Measures to protect the environment:
- Operate and maintain your drain cleaner in accordance with the instructions in this manual.
- Dispose of oil filters and used oil in accordance with national regulations.
- Dispose of the defective parts in accordance with national regulations.

9 DISPOSAL

Introduction

With normal use and proper maintenance the drain cleaner will have a very long service life. When the drain cleaner is disposed of after many years, this must be done in a safe and environmentally responsible manner. Many of the materials used are recyclable.

Disposal procedure

Follow this procedure:
1. Wear close-fitting overalls, safety shoes and safety glasses.
2. Use appropriate tools of the correct size.
3. Use suitable, safety-tested lifting equipment.
4. Relieve the pressure in the hydraulic system and drain all the oil.
5. Dispose of all oil in accordance with national regulations.
6. Remove all rubber and plastic parts.
7. Remove all electronic parts.
8. Dispose of all parts in accordance with national regulations.

10 TECHNICAL SPECIFICATIONS

Dimensions and weights

Length	m	1.0
Width		
Arm retracted	m	2.4
Extended and fully retracted	m	6.5
Extended	m	0.8
Height		
Top of arm (in transport position)	m	3.1
Top of reel	m	2.3
Weight		
Mass empty	kg	400
Mass with water	kg	565

Diaphragm pump

Brand and type	-	Comet™ APS 145 piston diaphragm pump
Drive	-	By tractor PTO shaft and supplied cardan shaft: WalterscheidTM W100E1010
Minimum speed	rpm	300
Recommended speed	rpm	350-370
Maximum speed	rpm	540
Optimum operating pressure	bar	30-35
Maximum operating pressure	bar	50
Maximum flow rate	l/min	142
Correct air precharge (at an operating pressure of 30-35 bar)	bar	7

Flushing hose & flushing speed

Material, flushing hose	-	HPE (Hard PolyEthylene)
Length, flushing hose	m	500
Diameter, flushing hose	mm	27
Wall thickness, flushing hose	mm	3.3
Drive, flushing hose	-	Hydraulic
Recommended wind-out speed[1]	m/min	30 m/min
Recommended wind-up speed[1]	m/min	20-25 m/min

[1]Depending on the circumstances and drainage tube diameter

Hoses and cleaning hoses

Length suction hose	m	10
Length, overflow hose	m	6
Cleaner nozzle (standard)	-	1x Ø2 mm forward-pointing. 12x Ø2 mm backward-pointing at 15° angle
Cleaner nozzles (options)	-	For stubborn contamination: 1x Ø2 mm forward-pointing. 12x Ø2 mm backward-pointing at 30° angle
	-	For sticky clay: 1 forward-pointing hole. 3 backward-pointing holes at 30° angle
	-	For large pipe diameters (Ø60, Ø75, Ø100 and Ø125 mm): Cleaning nozzles with guide

Remote control (type WR)

Frequency	MHz	868
Battery type	-	'AAA' 1.5 V
Service life of battery in standby	h	2500
Service life of battery in use	h	100
Range	m	100
Temperature	°C	-20 to +70

The maximum noise level is produced by the tractor. Consult the tractor documentation to determine whether hearing protection is required.

11 OPTIONS

Drain-shaft arches

For drain cleaning via drain collection points (drain-shafts): for 30 cm and for 40 to 60 cm.
See section 'Spare parts'.

Nozzles (or cleaning nozzles)

Various optional cleaning nozzles are available to match the type of soil, degree of contamination and diameter of the drain pipe.
See section 'Spare parts'.

Swing-arm function (for upgrade from type S to HS)

112202SP002
This conversion kit includes everything need to add the swing-arm function to the standard machine.