



BAUER

FOR A GREEN WORLD

OPERATING MANUAL

for

RAINSTAR A3



Version VII-2012
Art. No. 827 9978

RAINSTAR A3
E

Introduction

Thank you for buying **BAUER RAINSTAR A3** !

The present **manual** is a very important document that describes how to operate and **BAUER RAINSTAR A3**.

This manual describes the system as detailed as possible. If you need still more information, please contact your dealer or turn directly to **BAUER** in Voitsberg/Austria.

Please note that the content of this manual neither constitutes part of nor alters in any way any previous or existing agreement, promise or legal relationship. **BAUER's** commitment is based solely on the respective purchase contract which also contains the complete and only valid warranty agreement. Said contractual warranty is neither extended nor limited by the content of this manual.

All information contained in the present manual is based on the latest product details available at the time of printing.

BAUER reserves the right to change without notice without assuming any liability!

BAUER RAINSTAR A3 is designed for highest performance safety and reliability provided it is operated in accordance with the present operating instructions.

Therefore you should study this manual thoroughly before starting your **BAUER RAINSTAR A3** !

Strictly observe all instructions pertaining to system handling, operation and service!

On this condition, **BAUER RAINSTAR A3** will operate to your satisfaction for many years!



Non-observance of this manual may cause personal injury or damage the equipment!

This manual is to be considered an integral part of **BAUER RAINSTAR A3**. Suppliers of both new and used systems are advised to put down in writing that they delivered the manual together with the system.

Please make this manual available to your staff. State the pump type and serial number of your **BAUER RAINSTAR A3** in all inquiries, correspondence, warranty problems, or parts orders.

We wish you a lot of success with BAUER RAINSTAR A3 !



Product details

Type designation: RAINSTAR A3

Type number:

Serial number¹:

Dealer:

Name:

Adresse:

ph./fax:

Date of shipment:

Manufacturer:

Kowalds

Röhren- und Pumpenwerk **BAUER** Ges.m.b.H.

tr. 2

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www.bauer-at.com

e-mail: sales@bauer-at.com

Owner or operator:

Name:

Address:

ph. / fax:

Note: Please make a note of the type and serial number of your RAINSTAR A3 and accessories. Be sure to specify these details every time you contact your dealer.

¹In all warranty claims and correspondence relating to this machine it is essential to specify the full serial number group including all letters. This applies to both the machine and the components concerned. We cannot emphasise this point often enough.

General Safety Instructions

Symbols and terms



The CE symbol that has to be affixed on the machine by the manufacturer outwardly demonstrates compliance of the machine with the directives for machines and other relevant EU directives.



WARNING!

This “Warning” symbol refers to important safety instructions in this manual. Whenever you see this symbol be aware of possible injury hazards. Read the note following the symbol very carefully and inform the other operators accordingly.

CAUTION

Non-observance of this instruction may cause damage to or destroy the machine or individual components.

NOTE

It is very important to observe this note or condition!

Qualified operators are persons who on account of their training, experience and instruction as well as their knowledge of relevant standards, rules, precautions to be taken for accident prevention, and prevailing operating conditions, have been authorised by the person in charge of plant safety to perform the respective tasks required, and in doing so are able to recognise and avoid potential hazards. Among other things, knowledge of first-aid procedures is also required.

Product liability

As defined by the product liability law every farmer is also an entrepreneur! According to §9 PHG (Product Liability Law), liability for damage to corporeal things caused by defective products is expressly excluded. This exclusion of liability also applies to parts not manufactured by BAUER itself but purchased from external suppliers.

Duty to furnish information

Even if the customer passes on the machine later-on he is obliged to hand the operating manual on to the new receiver, too. The receiver of the machine must be instructed with reference to the mentioned regulations.

Intended use

- BAUER RAINSTAR A3 is built exclusively for normal agricultural applications (intended use).
- Any use beyond this normal use is considered non-conforming. Manufacturer is not liable for damage resulting from such non-conforming use, the sole liability for damage from non-conforming use is with the user.
- Intended use also includes compliance with the manufacturer’s operating, maintenance and service instructions.
- The BAUER RAINSTAR A3 may be used and operated only by persons who are familiar with the device and aware of the hazards involved.
- All rules for accident prevention as well as any other generally valid specifications and regulations relating to safety, work medicine and traffic law must be strictly observed.
- Unauthorised modifications on the machine release the manufacturer from liability for damage resulting therefrom.



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General instructions for safety and accident prevention

Check the operational safety of the machine before every start-up.

1. In addition to the instructions contained in this manual, all specifications generally valid for safety and accident prevention must be observed!
2. The warning and instruction signs affixed to the machine give very important instructions for safe operation. Observing them serves your own personal safety!
3. Never put the machine into operation unless all guards and safety devices are completely mounted and in their proper working position!
4. Acquaint yourself with all equipment components and controls as well as their respective functions before starting to work. It is too late when the device is already running!
5. The operator's clothes should fit tightly. Avoid wearing loose clothes!
6. When handling slurry always keep in mind that the gasses produced are highly toxic and extremely explosive in combination with oxygen. Therefore, open fires, light tests, sparking and smoking are strictly forbidden!
7. Utmost care is required with regard to gasses in slurry and dung channels at open valves to the preliminary pit, before the main pit, or at cross channels. The same applies to mixing and withdrawal points when mixers or pumps are running!
8. When handling slurry always ensure sufficient ventilation!
9. Keep the machine clean to avoid fire hazards!

Power take-off (applies only to PTO driven machines)

1. It is not allowed to use any other types of PTO drive shafts except the ones prescribed by the manufacturer!
2. Drive-shaft guard tube and guard cone as well as the PTO guard – also on the machine side - must be mounted and in good working order!
3. When using a PTO drive shaft always observe the specified overlap in transport and working position!
4. Never connect or disconnect the PTO drive shaft unless the PTO is stopped, the engine turned off, and the ignition key pulled out!
5. Make sure the drive shaft is always connected and secured properly!
6. Attach the safety chain to keep the drive shaft guard from rotating with the shaft!
7. Before you turn on the PTO make sure that the selected tractor PTO speed corresponds with the permissible implement speed!
8. Before starting the PTO make sure that nobody is standing in the danger zone of the machine!
9. Never turn on the PTO when the engine is turned off or during a transport drive!
10. When working with the PTO nobody is allowed near the turning PTO or drive shaft!
11. Warning! The PTO shaft may continue turning due to its centrifugal mass after the PTO has been turned off! Keep clear of the machine during this time and do not touch until the PTO shaft stands absolutely still!
12. For cleaning, greasing, or adjusting the PTO driven implement or drive shaft, PTO and engine must be switched off and the ignition key pulled out!
13. Place the disconnected drive shaft on the provided support!
14. When drive shaft has been removed put the guard on the PTO shaft!
15. If a defect occurs repair it immediately before starting to work with the machine!

Hydraulic system

1. Hydraulic system is under high pressure!
2. When connecting hydraulic cylinders and motors, make sure the hydraulic hoses are connected as specified!
3. Before coupling the hydraulic hoses with the tractor's hydraulic system make sure that the entire hydraulic system is pressureless both on the tractor and implement side!
4. Inspect the hydraulic lines at regular intervals and replace them immediately in case of defects or ageing. Replaced hoses must comply with the technical specifications of the implement manufacturer!
5. When looking for leaks use only suitable equipment because of the injury hazard involved!



6. Liquids emerging under high pressure (hydraulic oil) may penetrate the skin and cause serious injuries! An injured person must see a doctor immediately! Danger of infection!
7. Before working on the hydraulic system the machine must be lowered, the system depressurised and the engine turned off!

Electric-driven implements

1. All work beyond normal maintenance of the implement should be performed only by a professional electrician!
2. Defective or broken plugs and sockets must be replaced by a professional electrician!
3. Never pull a plug out of the socket at the flexible electric cord!
4. Extension cables for power supply should be used only temporarily! Never use such lines permanently as a substitute for the required fixed installations!
5. Flexible lines laid across traffic areas on the farm must have at least 5 m ground clearance!
6. Always turn off the power supply before you do any work on the machine!
7. Check all electric lines for visible defects before you put the machine into operation! Replace defective cables and do not start the machine before that!
8. Never use electric-driven implements in damp situations or locations exposed to fire hazard unless they are adequately protected against moisture and dust!
9. Covering electric motors may cause heat concentration with high temperatures which could destroy the operating equipment and cause fires!

Hand-operated devices (valves)

1. Because of the slurry gasses produced in the lines, no slurry is allowed to remain in closed pipelines – bursting hazard!
2. Lay the pipelines with sufficient inclination and make sure that the selected closing order of valves allows all lines to be drained completely!
3. Protect the valves against unauthorised handling!
4. If a valve gets jammed do not apply force! Use only the operating levers supplied with the implement!
5. Observe the permissible maximum operating pressure of valves and pipelines when pumps are operated!
6. Service only when the tanks are empty!

Maintenance

1. Never perform any maintenance, service or cleaning work or fault elimination steps unless the drive is turned off and the engine is standing still!
2. Check proper fit of all nuts and bolts regularly and tighten them, if necessary.
3. If maintenance work is required on the lifted machine always secure it by means of appropriate supports!
4. When exchanging tools with cutting edges always use proper tools and wear safe protective gloves.
5. Dispose of oil, grease and filters according to local laws and regulations!
6. Always turn off power before working on the electric system!
7. Before electric welding on the tractor and mounted machines the generator and battery cables must be disconnected!
8. Spare parts must meet manufacturer's minimum technical specifications! This is the case for instance with original spare parts for instance!

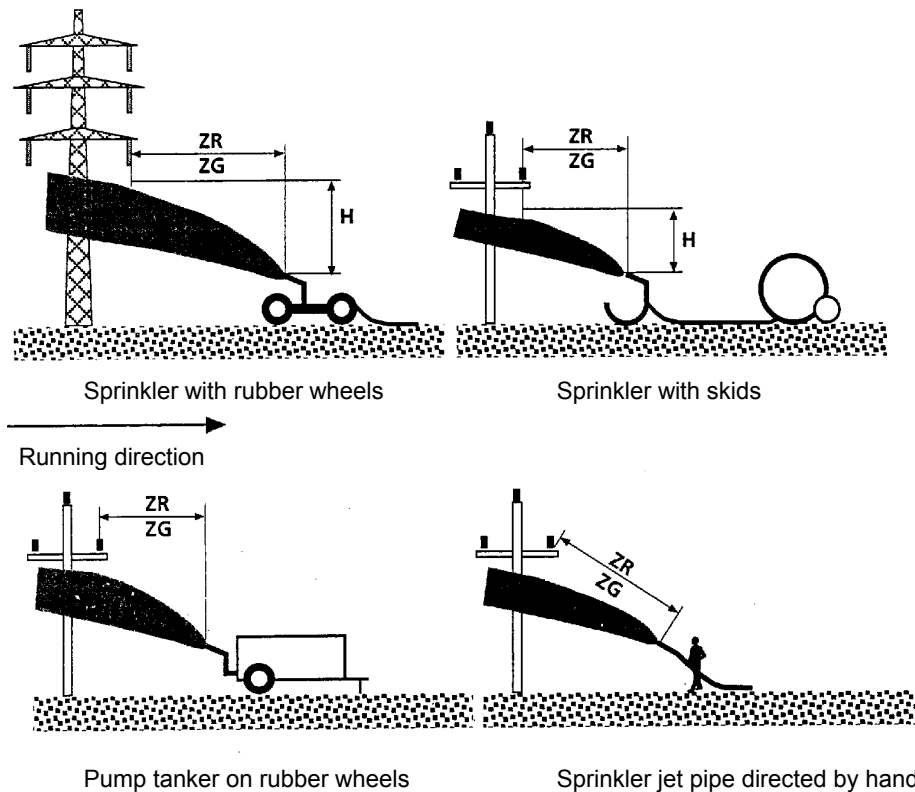
Safety distances Z from electric lines at:

IRrigation = ZR e. g.: with drinking water, ground water (e. g. well) or running water (e. g. river)

SlurryG = ZG e.g.: with liquid manure or slurry

H = minimum distance between sprinkler upper edge and conductor cable when crossing beneath an electric line

The safety distance when crossing beneath an electric line, is reached when the distances as per the below chart are kept. The water beam may touch the conductor cable but it may not be higher than the conductor cable.



ATTENTION: DO NOT SPRAY SLURRY ON INSULATORS AND MASTS!

Type and operation mode of the sprinkler		Safety distance Z in m, measured on the ground							
		With rubber wheels or directed by hand With metal or synthetic pipes				With skids or stationary/fixd With metal cart and metal pipes			
		Nozzle diameter in mm or flow in m ³ /h							
		26 mm \triangle 50 m ³ /h 36		mm \triangle 100 m ³ /h 26		mm \triangle 50 m ³ /h 36		mm \triangle 100 m ³ /h	
Jet type		Spray F	ull	Spray F	ull	Spray F	ull	Spray	Full
Up to 1.000 V H = 1 m	ZR	1 5 1 5				1 5 1			5
	ZG	1 8 1 8				1 8 1			8
Up to 30.000 V H = 2,5 m	ZR	3 9 5			21	3 7 4			9
	ZG	5 11		7 23 5			9	6	11
Up to 110.000 V H = 3 m	ZR	3 12		5 24 3			9	4	15
	ZG	5 14		7 26 5 11				6	17
Up to 220.000 V H = 4 m	ZR	4 14		6 26 4 12				6	22
	ZG	6 16		8 28 6 14				8	24
Up to 380.000 V H = 5 m	ZR	5 16		7 26 5 14				6	22
	ZG	7 18		9 28 7 16				8	24

The safety distances indicated in the above chart are valid for a nozzle diameter of 26 mm and/or 36 mm at an operating pressure of 5 bar. **For higher operating pressures the safety distances have to be increased by 2 m.** The safety distances are not valid when standardized jet pipes like those of fire brigades are being used.


When applying polluted water or slurry, note that a conductive layer can build up on the insulators. **Therefore do not spray on the insulators!** Flashovers and insulator damage can otherwise cause power failure.

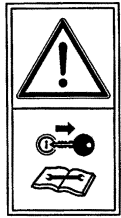
If metal sprinkler pipes are laid in parallel to a high voltage power line, this can lead even without irrigation to a perceptible contact voltage because of the electric influence. Touching the pipes is not dangerous but can be unpleasant and painful. This is why it should be avoided to lay metal pipes in parallel to high voltage lines or only over the shortest distances possible. When using synthetic pipes, you will not encounter any of these problems.

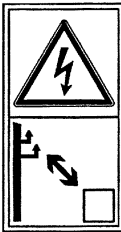
Note! Do not put pipeline pieces into a vertical position in the range of high voltage lines! Only transport them horizontally!

WARNING SIGNS

The hazard points of the **RAINSTAR A3** are marked by special safety labels on the machine. These labels must be affixed well visibly to the points indicated and they serve to protect persons staying around the machine.

1.		<p style="text-align: center;">WARNING !</p> <p>Study and observe carefully the operating manual and the safety hints before starting the machine.</p>
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2.		<p style="text-align: center;">WARNING!</p> <p>Stop the machine and read the operating manual before carrying out maintenance jobs and repairs.</p>
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3.		<p style="text-align: center;">WARNING!</p> <ol style="list-style-type: none"> 1. The working range of the RAINSTAR A3 always must be at a safe distance from electric high-voltage lines. 2. This applies to both the use of wide-range sprinklers and boom carts AS 26 / 32. The water jet of the nozzles and the sprinkler must not reach any electric lines.
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4.



WARNING!

Safety covers must not be removed during operation.
For repairs, make sure that the reel of the RAINSTAR A3 cannot move.
Slacken the PE pipe.

5.



WARNING!

1 Do not stay at rear of the **RAINSTAR A3** !
Operator is in danger of being crushed by the retracted sprinkler cart. Keep the distance !

GENERAL

BAUER products are designed and manufactured carefully, subject to a system of continuous quality control. The BAUER RAINSTAR A3 is a turbine-driven machine designed for fully mechanised and labour-saving irrigation. Individual pipe sets are no longer laid down by hand; system set-up, repositioning, and operation are all done with the tractor only.

The BAUER RAINSTAR A3 is a universal machine suitable of covering fields of varying lengths and widths. There is no need for supervision while the system is operating.

Strict observance of all operating and service instructions in this manual is the basic prerequisite for many years of trouble-free operation. Therefore please make sure that all operators on your staff are familiar with the instructions given in this manual.

The model number as well as the serial number (Vehicle identification number) are stamped into the nameplate. In addition, the serial number is stamped into the frame of the undercarriage. Please state these data in all your inquiries, correspondence, warranty matters and parts orders.

We warrant according to our General Terms of Sale.



1 SAFETY PRECAUTIONS FOR THE RAINSTAR A3

1. Read this manual before putting the system into operation for the first time.
2. Never handle the PE-pipe near the machine or the machine itself during pull-off or pull-in.
3. During PE-pipe rewind with the tractor's PTO or during pipe pull-off, always make sure that the shifting lever is in the proper position. Moreover, the maximum permissible speed must not be exceeded. **Max. speed: 200 rpm**



WARNING!

Danger by improper handling!

4. Never carry out service- or setting jobs (except speed settings) while the machine is operating.
5. Keep clear of all moving parts.
6. Never expose any moving parts by removing protective elements.
7. Keep a safe distance from the sprinkler during operation.
8. Be careful in case of high connecting pressure!
9. Make sure that the water jet from spray nozzles does not hit public roads.
10. The RAINSTAR A3 is licensed for transport in agricultural operation only. For transportation on public roads, all applicable traffic requirements must be strictly observed.



WARNING!

For safety reasons, it is not allowed to transport the RAINSTAR A3 by pulling it with a fork-type drawbar (OPTIONAL) nor with the toolbar!

11. When loading the machine on a trailer, note that the water remaining in the pipe shifts the system's centre of gravity upward.
12. When driving in curves with the RAINSTAR A3 loaded on a trailer, the permissible maximum driving speed is reduced considerably in dependence on the position of the RAINSTAR A3's centre of gravity!
13. Always make sure that the locks and stops are secured according to the machine's general conditions for transport.
14. Before starting irrigation near electric power lines, you should contact your local power supply company regarding the safety distances to be observed.
15. Maximum permissible speed: 10 km/h.

2 DESCRIPTION

The RAINSTAR A3 is a universal irrigation machine for varying lengths and widths of fields and it is best suited for sprinkling seed crops and horticultures, parks, vegetable plantations as well as any kind of grassland.

The main components are a two-wheel undercarriage, the swiveling turntable and the reel with the special PE-pipe, the compact gearbox and the Ti 7-A turbine as well as the high-rise cart that is ideal particularly for high crops with the BAUER wide-range gun.

The material of the PE-pipe corresponds to the latest state-of-the-art. One end of the pipe connects to the reel drum and to the water supply through its axle. The other end of the pipe is coupled with the high-rise cart. The cart's track width is infinitely adjustable (see technical data).

The heart of the RAINSTAR A3 is the Ti 7-A turbine. This is a full-flow turbine, nearly insensitive to soiled water and offers maximum efficiency. The drive shaft is made of stainless steel. The regulating flap inside the turbine is coated with a wear-proof rubber lining.

The lifetime lubricated drive shaft bearing is sealed by a maintenance-free rotating mechanical seal.

The Ti 7-A turbine is designed for water flow rates from 4,8 to over 20 m³/h and features a wide control range. Impeller speeds range from 200 to 1000 rpm.

The system's connecting pressure should not exceed 8 bar.

Power is directly transmitted from the turbine to the change-speed gearbox as well as from the chain drive onto the reel. A reel brake prevents fast reverse rotation of the reel in the final shut-off position when the PE-pipe is stretched.

The reel brake and the gearwheels in the change-speed gearbox filled with oil, act as brake and prevent the PE-pipe windings on the reel from loosening during pipe pull-out.

For safety reasons, the drive is fitted with an emergency stop and a reversing stop. With this emergency stop device, the drive can be stopped immediately by hand.



WARNING!

Never remove the drive cover before you have turned off the water supply to the machine and slackened the stretched PE-pipe.

A winding carriage moved by a helically grooved spindle ensures that the PE-pipe is wound up properly on all layers.

Mechanical regulation: To keep the retraction speed constant on all layers independent of the pipe length still lying on the field, the RAINSTAR A3 is equipped with a layer compensating device. It is actuated by the shut-off frame that is always resting against the PE-pipe and acts on the regulating flap of the turbine via control rods.

At the end of the irrigation strip, the cart is lifted automatically to transport position. Thereby the drive is shut-off automatically by rods.

After shut-off, the cart lifted automatically, is locked through the transport lock. If the machine is equipped with a shut-off valve (mechanical regulation), the water supply will be shut off simultaneously. After shut-off, apply the reel brake (see item 5 "Quick Stop"). Now the RAINSTAR A3 can be transported to its next setting-up position immediately. Pull-off or lay down the PE-pipe, connect the water supply and the machine is ready for the next run.

When driving on public roads, the reel must be turned into driving direction and secured with the lock bolt. The PE-pipe must be fully wound up on the reel, the cart must be lifted and the reel brake must be applied. The jack and both rear machine supports must be withdrawn to their top position.

On public roads, the drawbar must be hitched to the tractor's yoke. Without administrative authorization, the driving speed must not exceed 10 km/h.

Basically it is possible to transport the machine between hydrants in the field with the cart lifted on the side. In this configuration, the driving speed always must be adapted to the existing conditions and it should never exceed 5 km/h.

3 PUTTING INTO OPERATION

Before and during the first start-up, grease all bearings, chains and guide parts of the winding mechanism. Use normal ball bearing grease for all bearing assemblies with grease nipples and a viscous and durable type of grease for chains, guide rods and joints.

Tighten the wheel nuts before the first starting and check the tires on the specified pressure (see technical data).

Tighten also the connecting bolts, the ball race on the undercarriage and turntable according to the "Service and Maintenance" table.

3.1 STEPS TO BE CARRIED OUT ONCE OR FROM TIME TO TIME



Set the required track width on the cart depending on the existing type of crop.



OPERATING MODE I: PE-PIPE PULL-OFF

3.1.1 Transport of Machine to Set-up Position



During transport, the reel should be turned into the driving direction and secured with the lock bolt. The reel brake must be applied. Cart, jack and both rear support legs must be lifted or retracted. For lateral PE-pipe pull-off, set up the RAINSTAR A3 on the headland at right angles to the selected irrigation strip and detach it from the tractor.



Adjust the undercarriage in a level position with the jack.

When positioning the RAINSTAR A3, make sure that the machine's vertical axis of rotation is in the middle of the driving lane or centered between two crop rows.



For lateral pull-off of the PE-pipe, remove the lock bolt, turn the reel into the direction of the driving lane and secure it again with the lock bolt.



Extend the supports into the ground by means of a winch.

On very hard soil, the supports must be extended into holes dug into the ground for this purpose.



3.1.2 LOWERING THE CART

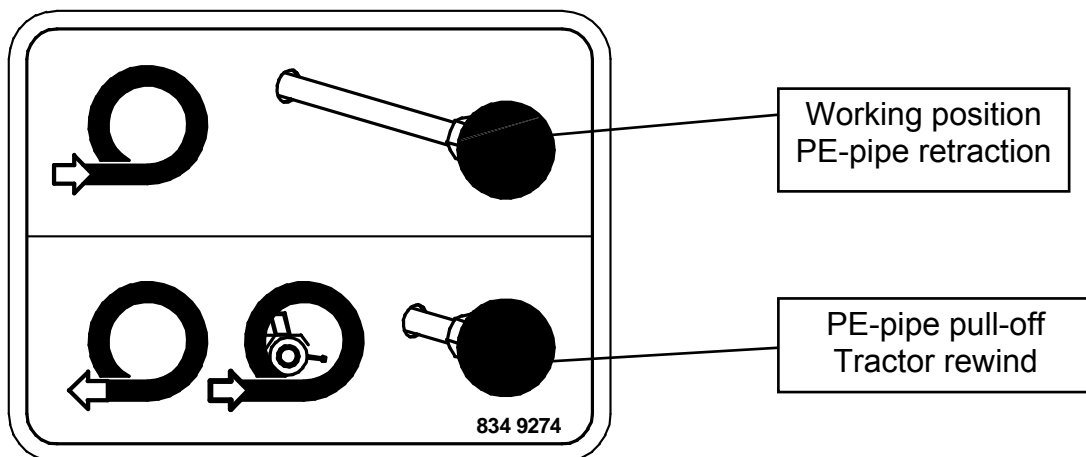


Unlock the cart mechanically in working position. Pull up the locking lever.



Now loosen the reel brake.

SWITCHING POSITIONS OF THE SHUT-OFF LEVER





3.1.3 PULLING OFF THE PE-PIPE



Hitch the toolbar on the pulling hook and pull the cart into the field.



The standard wheel cart need not be lifted (therefore 1 pulling hook is sufficient).

Pull-off speed: Do not exceed 5 km/h!

Do not stop abruptly but slow down gradually at an intermediate stop or at the end of the pull-off.



WARNING!

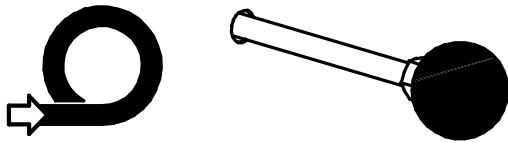
If the PE-pipe was exposed to the sun for a longer period or if its surface temperature rose above 35°C, you will have to cool the pipe by water flow before rewinding it.



Couple the pressure hose. Open the water supply.



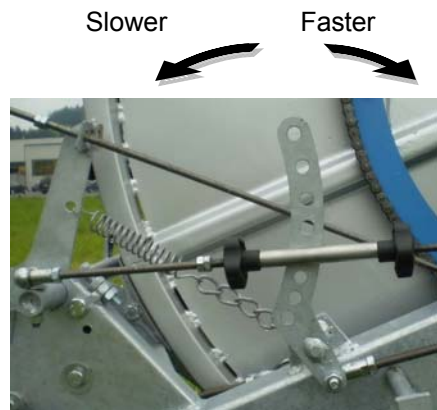
When the full operating pressure has been reached and clear water is discharged at the sprinkler's nozzle in a full jet without air bubbles, push the gear shift lever to the "PE-pipe retraction" position.



The reel starts to rewind the PE-pipe.

3.1.4 SPEED ADJUSTMENT with mechanical regulation

IMPORTANT! Adjust the speed only when the PE-pipe already has been rewound by half a winding and/or when it is stretched.



Loosen the knurled nuts (for fixation of the adjusting lever). Set the retraction speed which can be read on the speedometer (optional) by means of the adjusting lever. Then lock the adjusting lever again with the knurled nuts.

Retraction speed	m/h	10	20	30
Waterflow	10 m ³ /h	2	1	-
	14 m ³ /h	2	1	1
	18 m ³ /h	2	2	1

In the table you find the hole position.
Hole 1 is the bottom hole.

Note:

Small corrections deviating from the chart could be necessary, because the friction resistance of the Pipe on the ground is equal.



At the end of irrigation, the cart is lifted automatically and the drive is shut off by means of rods.



The water supply is stopped by the optional "overpressure shut-off valve".



Once the PE-pipe retraction has been finished, withdraw the supports by means of the winch.

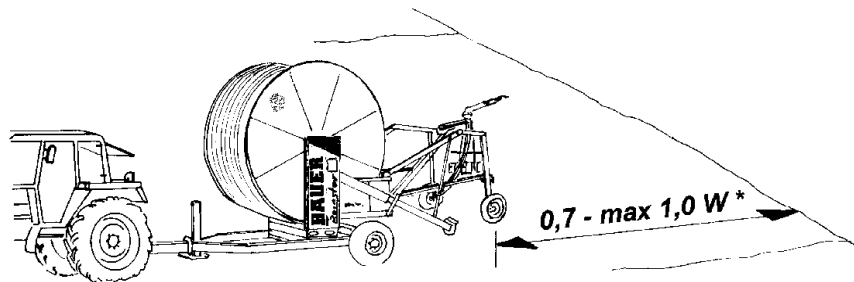


Move in the reel brake before the transport.



3.2 OPERATING MODE II: Laying down the PE-pipe

In addition to the pull-off method, the PE-pipe also can be laid down on the ground. This method is mostly used in situations where heavy soil makes it impossible to pull the cart across the field or where the field is longer than once the PE-pipe length. Moreover, the laying down method allows to use smaller tractors because no pulling forces are applied on the pipe.



Drive into the field with the RAINSTAR A3 taking into consideration the sprinkler's distance of throw.

*) W = distance of throw of the sprinkler



Lower the cart as described under Operating Mode I, item "Lowering the Cart" and anchor it slightly. Now move the machine across the field.

Carry out the next steps as already described.

3.2.1 FUNCTIONAL DESCRIPTION OF THE MAIN COMPONENTS

3.2.1.1 MACHINE DRIVE – FULL-FLOW TURBINE

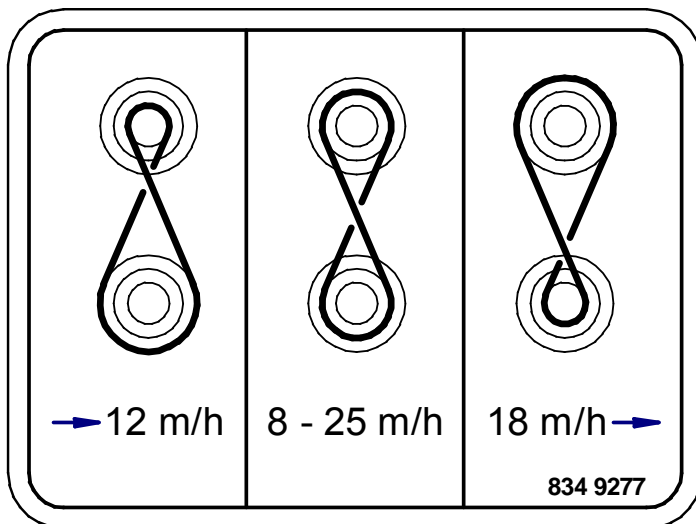


The full-flow turbine Ti 7-A is a drive turbine of specific design with large cross sections and minimum pressure loss. Therefore they are also suited for high retraction speeds at very low flow rates. They provide the energy needed for the PE-pipe retraction. The turbine speed is directly taken off the impeller shaft and transmitted via a three-step V-belt drive to the BAUER change-speed gearbox.



The change-speed gearbox consists of toothed wheels that reduce the turbine speed. Reel drive stop at the end of the irrigation strip is ensured by disengagement of the toothed clutch.

The gearbox in connection with the belt steps adapt perfectly to existing operating conditions. As a result the following retraction speeds (m/h) can be reached:



WARNING!

Removal of the drive cover for service jobs or change of transmission only is permitted when the PE-pipe has been slackened completely! Move the gear shift lever to shut-off position! This shut-off position also must be used for the transport of the machine on the roads!

**PTO REWIND:**

If required, you can rewind the PE-pipe also with the tractor's PTO system. Push the shifting lever to "Tractor retraction" position.

Winding up the PE-pipe with the PTO will become necessary when there is no need to continue irrigation due to natural rainfall.

**WARNING!**

- Retract the PE-pipe at lowest possible PTO speed – start slowly and smoothly and avoid jerks.
- **Highest PTO speed = 200 rpm**
- Avoid strain by excessive articulation of the PTO shaft.
- If the PE-pipe is covered with mud, it should be loosened and lifted off the ground to reduce the retraction forces before rewinding it.
- If the soil is deep and heavy, the PE-pipe must be wound up more slowly to make sure that the permissible loads on PE-pipe and machine are not exceeded.
- If you disengage the PTO shaft during PE-pipe retraction, make sure that the pipe reel stands still when you re-engage the PTO shaft. Double motion may cause severe damage!
- When driving the reel with the PTO, the automatic shut-off system is inactive. Therefore you must stop the PTO shaft in time.



When driving the reel with the PTO, the automatic shut-off system is inactive. Therefore you must stop the PTO in time and wind up the end of the PE-pipe with the hand wheel. This will prevent damage to cart, shut-off system, gearbox etc.

4 Mechanical Regulation



The retraction speed is steplessly adjustable and it is set by means of the adjusting lever which is fixed with the knurled nuts after adjustment. The speed is nearly constant from the first to the last layer as well as within one layer. This is achieved by means of the layer compensating lever resting against the PE-pipe in any position



... It actuates via control rods the regulating flap mounted on the turbine and it regulates hence the turbine speed.



Varying conditions of ground as well as low water flow may lead to inconstant retraction speeds despite of the layer compensating device. This can be remedied by fixing the control rod one hole up or down when PE-pipe retraction becomes faster or slower.

The exact setting of the regulation also depends on the PE-pipe diameter and it is different for PE-pipes of 55 – 63 mm.

By fixing the bolt of the control rod one hole up, regulation will be reduced so that the retraction speed increases up to the last layer.

By fixing the bolt of the control rod one hole down, regulation will be increased so that the retraction speed is reduced up to the last layer.

5 QUICK STOP



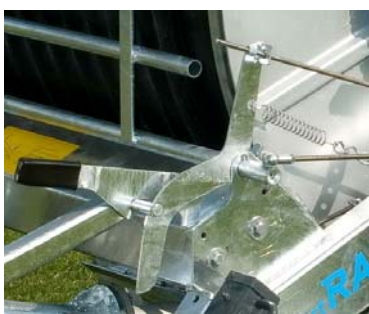
Apply the reel brake. Now the PE-pipe retraction can be stopped immediately by actuating the shut-off frame or the gear shifting lever. Thereby the gearbox is disengaged. Slacken the PE-pipe slowly by opening slightly the reel brake.

6 WINDING MECHANISM



The winding mechanism operates synchronously with the winding or unwinding of the PE-pipe. Starting from the reel, it is operated through a chain and the helically grooved spindle that transports the winding carriage of the PE-pipe. The winding mechanism ensures that the PE-pipe is guided properly winding for winding. When you put the machine into operation for the first time, pull off the full length of the PE-pipe to let it take a circular shape under pressure and eliminate ovality. This step is essential for trouble-free operation of the winding mechanism.

7 SHUT-OFF AND SAFETY EQUIPMENT



Unattended operation of the RAINSTAR A3 is ensured by a final- and safety shut-off device. The final shut-off device is actuated when the sprinkler cart pushes against the shut-off frame which in turn operates the gearbox shut-off lever through a system of rods stopping thus the drive. To avoid troubles caused by faulty windings of the PE-pipe on the reel, the shut-off device also is activated by the shut-off frame when faulty pipe windings build up on the reel.

8 CART



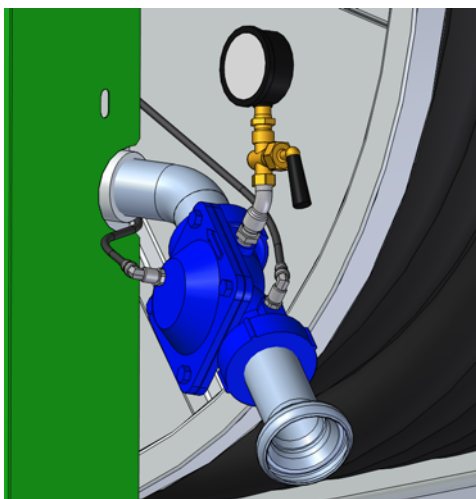
The high construction of the cart provides maximum crop protection. With infinitely variable track width, the cart adapts to any crop row spacing. For easier PE-pipe pull-off, the cart is equipped with a draw-out hook.



You pick up this hook with the tractor's toolbar and pull-off the PE-pipe. To turn the pipe reel and to reposition the [RAINSTAR A3](#) to a new set-up position, the cart must be pulled back to its end position.

For retraction, the cart is lifted automatically.

9 OVERPRESSURE SHUT-OFF VALVE



With an overpressure shut-off valve, the water supply to the machine is interrupted completely at the end of the irrigation run. When the valve closes, pressure rises in the supply line.



10 WINTERIZATION – DRAINING

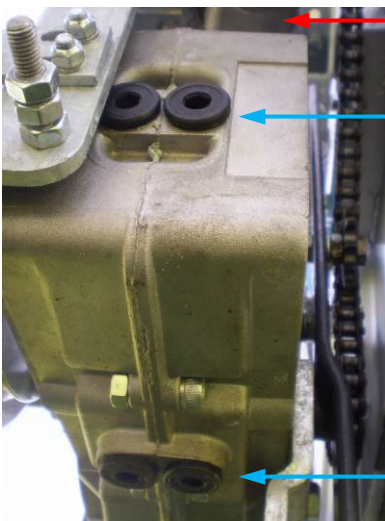
In areas where frost is likely in winter after the irrigation season, the machine must be drained in time. A compressor with a minimum air capacity of 500 l/min. at 1 bar overpressure is best suited for this purpose. The small amount of water remaining in the PE-pipe after the draining will not do any harm.

Turn out the drain plug on the bottom of the Ti 7 turbine. We recommend to turn it in again only when you start up the machine again at the beginning of the next season.

From 2012:

Open the ball cock at the bottom of the Ti 7 turbine. We recommend closing the ball cock only when you start up the machine at the beginning of the next season.

Clean the RAINSTAR A3 and regrease all appropriate points. The machine should preferably be stored in a roofed shelter where it is protected from direct exposure to the weather.



Red plug with ventilation mounted on top

Filling screw for gear oil (0,9 liters)

Drain screw for gear oil

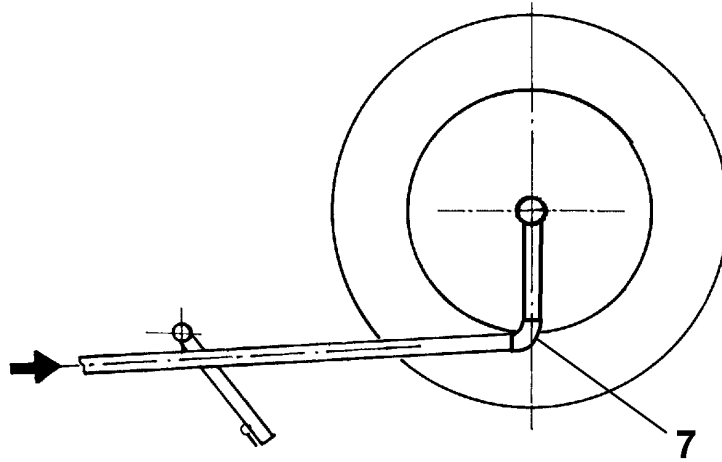


Grease the jack.



Grease the support.

11 WINDING MECHANISM – STARTING POSITION



Step 1:

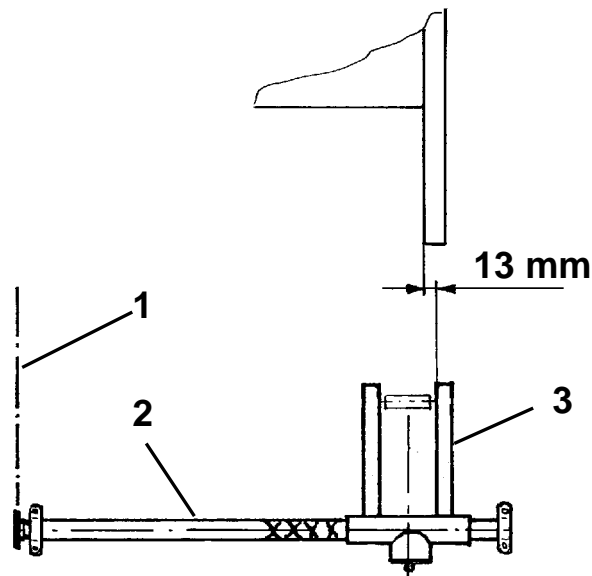
Pull off the PE-pipe and adjust the connecting bend (7) in a vertical position pointing down.

Step 2:

Loosen the winding chain (1) between the reel and the helically grooved spindle (2).

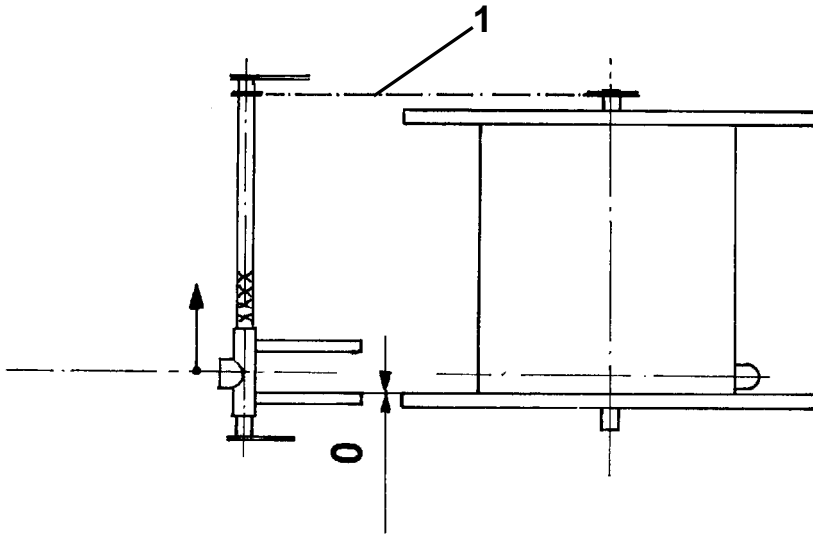
Step 3:

By turning the helically grooved spindle (2), the winding carriage (3) is moved to the right outer reversing point of the groove → value: **13 mm**.



Step 4:

By turning the helically grooved spindle, move the right guide bar to the value of "0" towards the inner reel side wall.

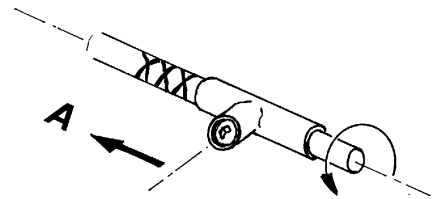


WARNING!

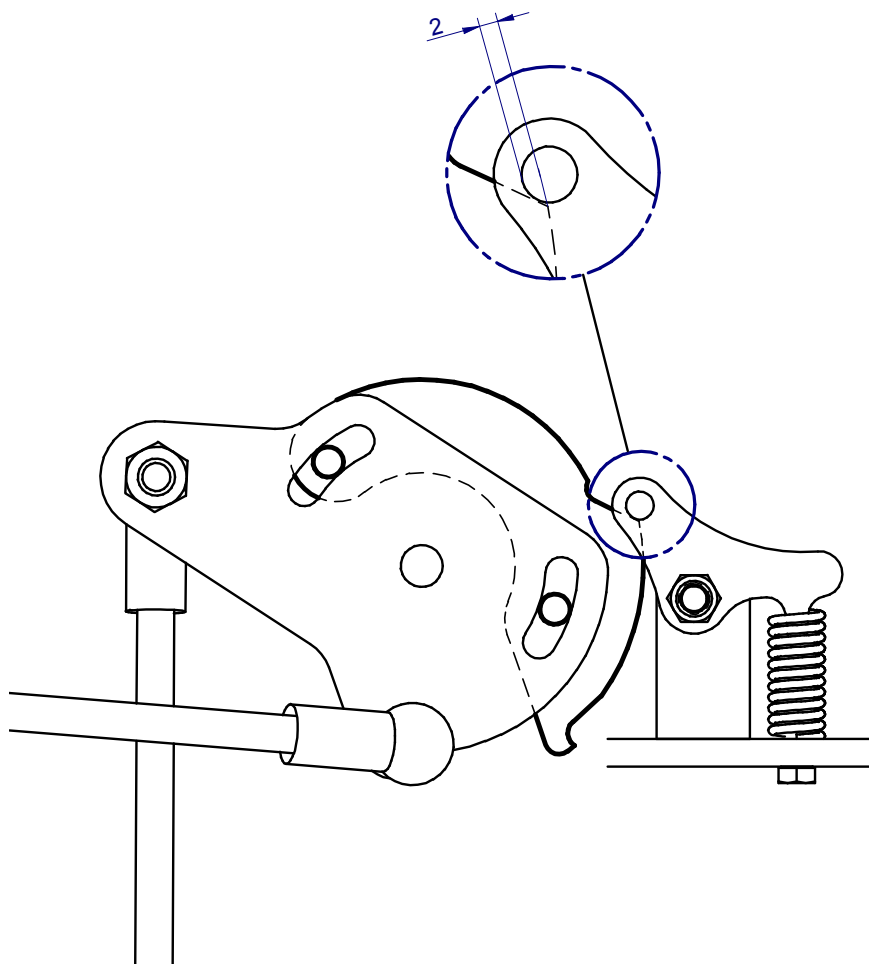
Thereby the spindle must be turned in the direction of winding (counter-clockwise, see sketch).
At this point, the winding carriage moves from the reversing point to the left (direction A).

Step 5:

Mount the winding chain (1), the reel remains unchanged with the inlet bend pointing down. Tighten the winding chain (1).



12 SETTING THE GEARBOX SHUT-OFF DEVICE

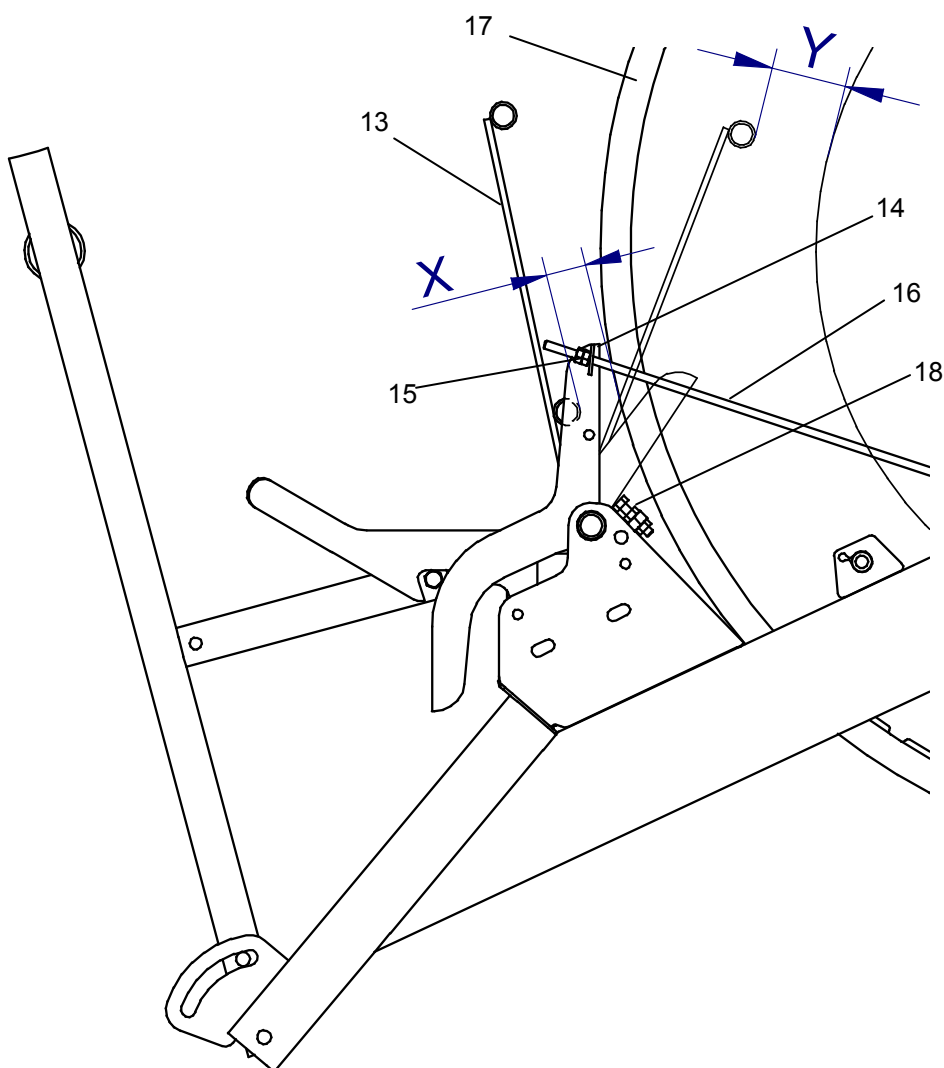


Turn the drive shaft at the gearbox (pulley). With the value of 2 mm at the gearbox and the value of "X" at the shut-off frame, the PTO must not turn anymore. (Put a hand wheel on the PTO for easier checking of the turning movement.)

The shut-off frame (13) is set at **X** mm off the reel (17) (see below table).

The hex nut (15) on the shifting rod (16) is approached to the lever (14) of the shut-off frame. Secure the nut.

Machine	X mm	Y mm
RAINSTAR A3	45	75



Set the adjusting screw (18) to the shut-off frame (13) at the value of "Y" and secure it.

12.1 TESTING THE SHUT-OFF DEVICE

Put the shut-off frame (13) against the PE-pipe (last layer).

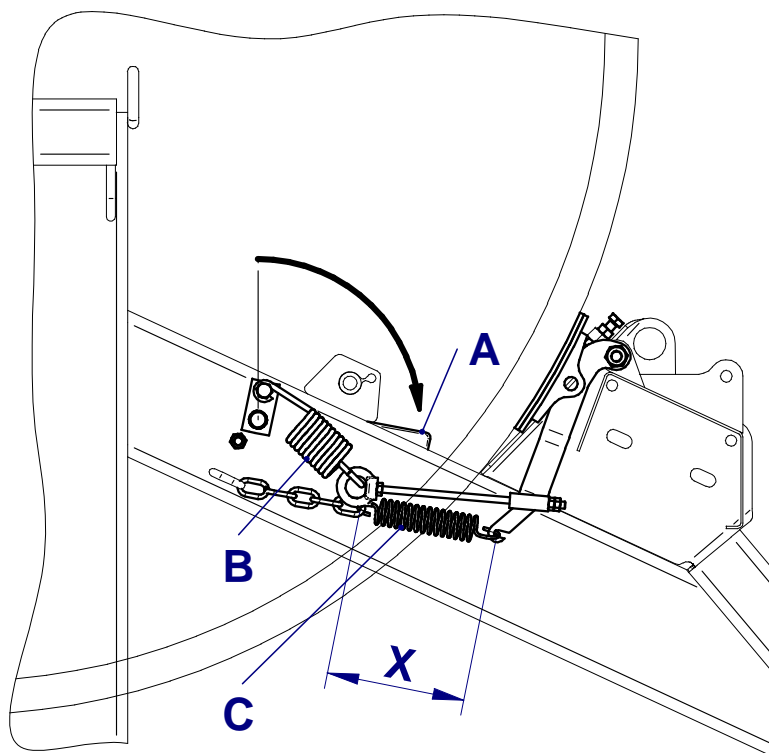
Move the shut-off lever (9) to position "PE-pipe retraction".

Pull the shut-off frame (13) to shut-off position (= **X** mm off the reel).

The shut-off lever must jump to shut-off position!

12.2 ADJUSTUNG REEL BRAKE

1. Open brake shoe (A) --> no tension on spring (B)
2. Adjust brake shoe so that is touching the reel at the biggest (outher) diameter --> no tension on spring (B)
3. Put tension on to spring (B) by turning one rotation on the nut --> fix with second nut.
4. Adjust spring (C) to a distance (X) between 115 and 130mm by using different chain links.



13 SPEEDOMETER

Programming the Computer

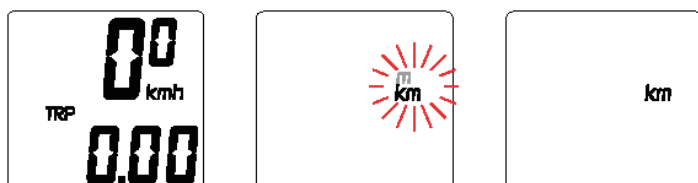
CHOOSE MILES OR KILOMETERS

The A4 allows to display the speed and the distance in kilometers or miles. You may always change between these units whereby all values will be converted automatically.

STEP 1 Open „TRP“ on the display. Keep the SET key pressed for approximately 3 seconds.

STEP 2 km or m is blinking on the right top of the display. Change to "km" by means of the MODE key.

STEP 3 Press the SET key to confirm your selection. Now A4 changes automatically to the setting mode for the radius factor.



PROGRAMMING THE RADIUS FACTOR

After selecting the unit – m or km – and pressing the SET key for confirmation, the computer changes automatically to the setting mode for the radius factor. Factory setting is 2155 mm and/or 84.8 inches.

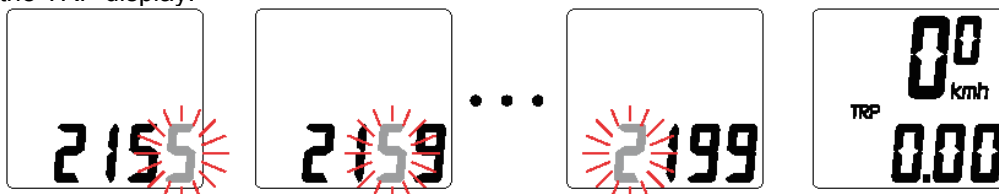
STEP 1 Set the blinking figure by means of the MODE key.

Radius factor with kilometers „ 728 „

STEP 2 Confirm the setting by means of the SET key. ==> The next figure is blinking.

STEP 3 Repeat the setting until all figures are set correctly.

STEP 4 Press the SET key for approximately 3 seconds in order to finish the setting procedure and to return to the TRP display.



SETTING THE TIME

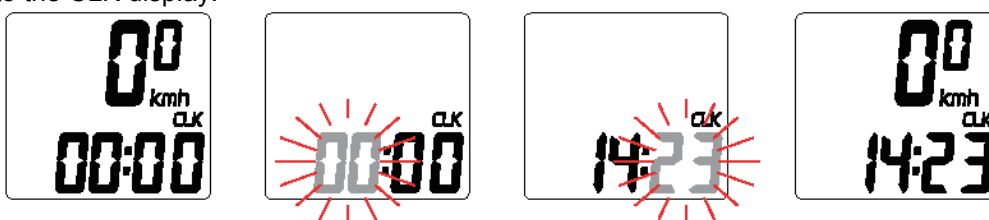
The VDO A4 has got a 24 hours time display.

STEP 1 Press the SET key in CLK mode for 3 seconds. Now your computer changes automatically to the time setting mode.

STEP 2 Set the blinking hours by means of the MODE key. Confirm your setting by means of the SET key. ==> The minute figures are blinking.

STEP 3 Set the blinking minutes by means of the MODE key. (Keep the key pressed for fast run).

STEP 4 Keep the SET key pressed for approx. 3 seconds in order to finish the setting procedure and to return to the CLK display.



CONVERSION TABLE FOR DISPLAYED SPEED

834 9278		Lage/Layer 1	Lage/Layer 2	Lage/Layer 3	Lage/Layer 4
Einzugs- geschwindigkeit m/h	Retraction Speed ft/h	Tachoanzeige / Displayed Speed			
5	15	5	4,4	4,0	3,6
10	30	10	8,9	8,0	7,3
15	45	15	13,3	12,0	10,9
20	60	20	17,8	16,0	14,5
25	75	25	22,2	20,0	18,1
30	90	30	26,7	24,0	21,8
35	105	35	31,1	28,0	25,4
40	120	40	35,5	32,0	29,0

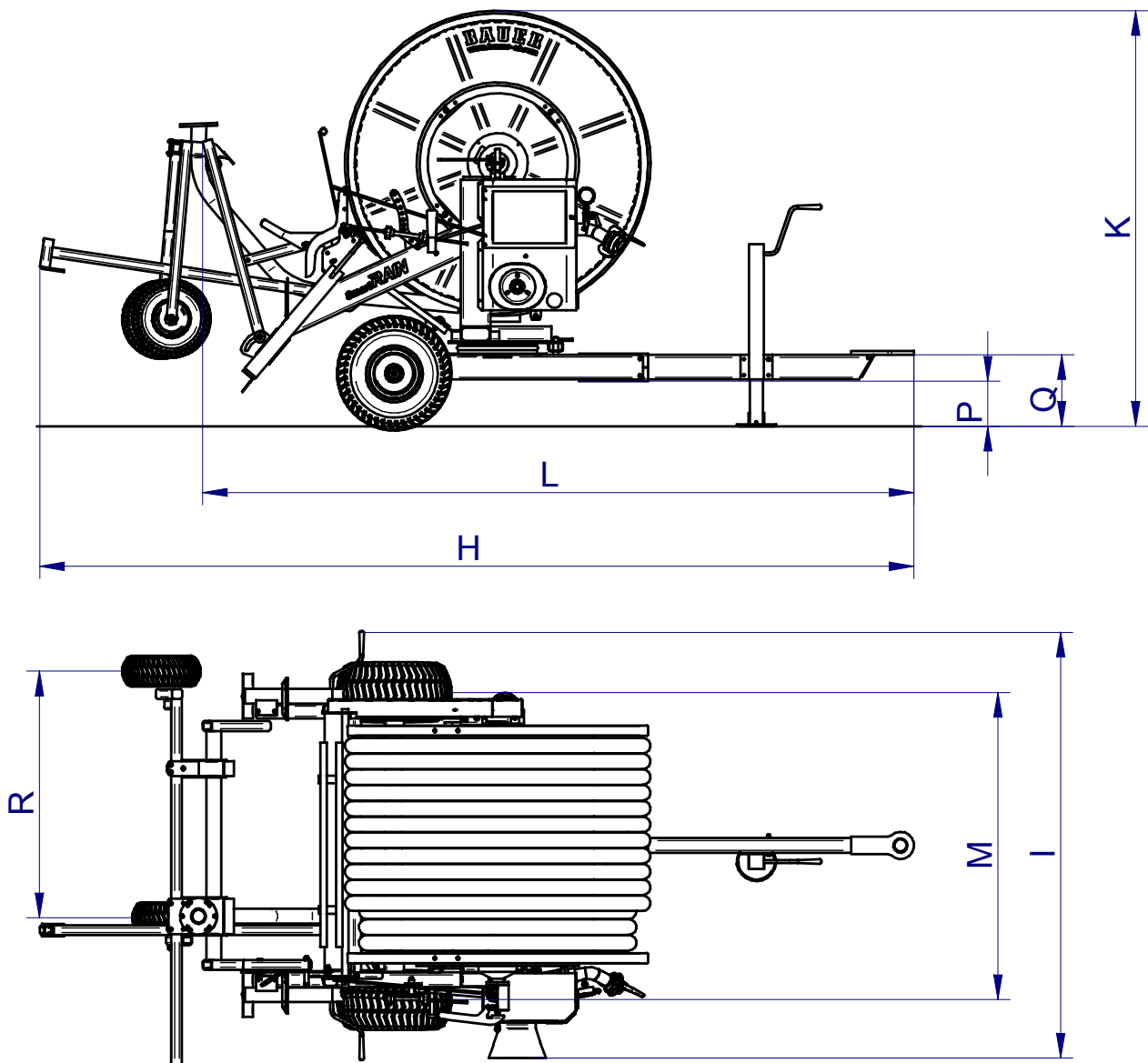
14 SERVICE AND MAINTENANCE

We cannot emphasise often enough that proper service at the right time is essential for the operating reliability and service life of a machine. At the end of every irrigation season, the RAINSTAR A3 should be checked and cleaned thoroughly and all parts should be greased carefully.

Machine part	Service interval	Lubricant, grease, oil
1. Helically grooved spindle of the winding mechanism	every 250 service hours	Alvania Grease 3
2. Drive chain of winding mechanism	every 250 service hours	Alvania Grease 3
3. Driver (spindle nut) of winding mechanism	every 250 service hours, replacement recommended after 2500 service hours	Alvania Grease 3
4. Driving chain	as required	Alvania Grease 3
5. Change-speed gear	First oil change after 500 service hours and then after 500 – 800 service hours or once a year	0,9 l of oil SAE 90 EP
6. Ball race	every 500 service hours	through greasing nipple Alvania Grease 3
7. Jack	as required	through greasing nipple Alvania Grease 3
8. Screwed joints		Tightening torques
Ball race on turntable and undercarriage	48	Nm

15 TROUBLE-SHOOTING

FAULT	CAUSE	REMEDY
The PE-pipe cannot be pulled off.	Incorrect gear shift lever position.	Put it into the pull-off position.
	Brake shoe sticks to the reel.	Loosen the brake shoe.
	Brake shoe has been applied	Loosen the brake shoe.
PE-pipe retraction stops before the final shut-off is actuated	Turbine blocked by a foreign body.	Remove the foreign body.
	Pressure drop in supply line.	Check pumping station and hydrant connections.
	Overwinding of PE-pipe activates the safety shut-off.	Adjust the winding mechanism.
Repair broken winding chain.		
The final shut-off is activated but the shut-off valve does not close.	Values for the shut-off valve activation are not set correctly.	Adjust the settings according to the manual.
The reel overwinds or the windings become loose when the PE-pipe is pulled off.	Tractor stopped abruptly.	Slow down gradually.
	No oil in the change-speed gear.	Refill oil.
The retraction speed is not constant from PE-pipe layer to PE-pipe layer.	Varying conditions of the ground	Adjust the regulation to the conditions of the ground (adjust the rods at the layer compensating lever).
The selected retraction speed is not reached.	Incorrect drive transmission.	Select proper gear transmission.
	Blocked sprinkler nozzle.	Remove blockage.
	General: Compare connecting pressure and water flow with performance chart values.	
Cart is not lifted.	Incorrect belt transmission.	Select proper belt transmission



- | | | | |
|----------|---------------------------------|----------|--------------------------------|
| A | PE-pipe diameter x length | M | Track width of undercarriage |
| B | Max. strip length | N | Tires of undercarriage |
| C | Flow | O | Tire pressure of undercarriage |
| D | Connecting pressure | P | Ground clearance |
| E | Nozzle range | Q | Hitch height - standard |
| F | Weight incl. PE-pipe with water | R | Cart track width |
| G | Weight incl. empty PE-pipe | S | Cart tires |
| H | Overall length incl. cart | T | Cart tire pressure |
| I | Max. width of largest track | | |
| K | Overall height | | |
| L | Length of machine without cart | | |



Type		RAINSTAR A3		
		55 - 170	63 - 125	63 - 150
A	mm x m	55 x 170	63 x 125	63 x 150
B	m	195	150	175
C	m ³	4,8 - 20		
D	bar	3,2 - 8		
E	mm	8 - 16		
F	kg	792	778	855
G	kg	515	512	537
H	mm	3550		
I	mm	1730		
K	mm	1690		
L	mm	2890		
M	mm	1250		
N		18x9.50-8 4PR		
O	bar	1,6		
P	mm	180		
Q	mm	290		
R	mm	1000 - 1500		
S		13x5.00/6		
T	bar	1,3		

14. CONFORMITY CERTIFICATE

EC Declaration of Conformity according to EC Directive 2006/42/EC

The manufacturer

Röhren- und Pumpenwerk BAUER Gesellschaft m.b.H.
Kowaldstraße 2, 8570 Voitsberg, Austria
phone +43 3142 200-0; fax: +43 3142 200-320/-340

herewith confirms that the machine mentioned below

Designation of machine	RAINSTAR
Machine type / basic units	A3
Consists of	Irrigation machine with cart

corresponds analogously to the requirements of the Machinery Directive 2006/42/EC.
In case of a modification of the machine not accorded with FAN GmbH, this declaration will cease to be valid.

The following standards as amended have been applied analogously:

DIN EN ISO 12100-1	Safety of machines – Basic concepts, general principles for design, Part 1: Basic terminology, methodology
DIN EN ISO 12100-2	Safety of machines – Basic concepts, general principles for design, Part 2: Technical principles and specifications
DIN EN 60204-1 Part	Safety of machines - Electrical equipment of machines, 1: General requirements
EN ISO 14121-1	Safety of machines – Risk assessment

Norms related to products

DIN EN 908 Irrigation machine with hard hose reel

Person in charge of documentation: Thomas Theissl, Kowaldstraße 2, 8570 Voitsberg, Austria,



Technical Designer in Charge




Commercial Manager

Voitsberg, 26.7.2010