



BAUER

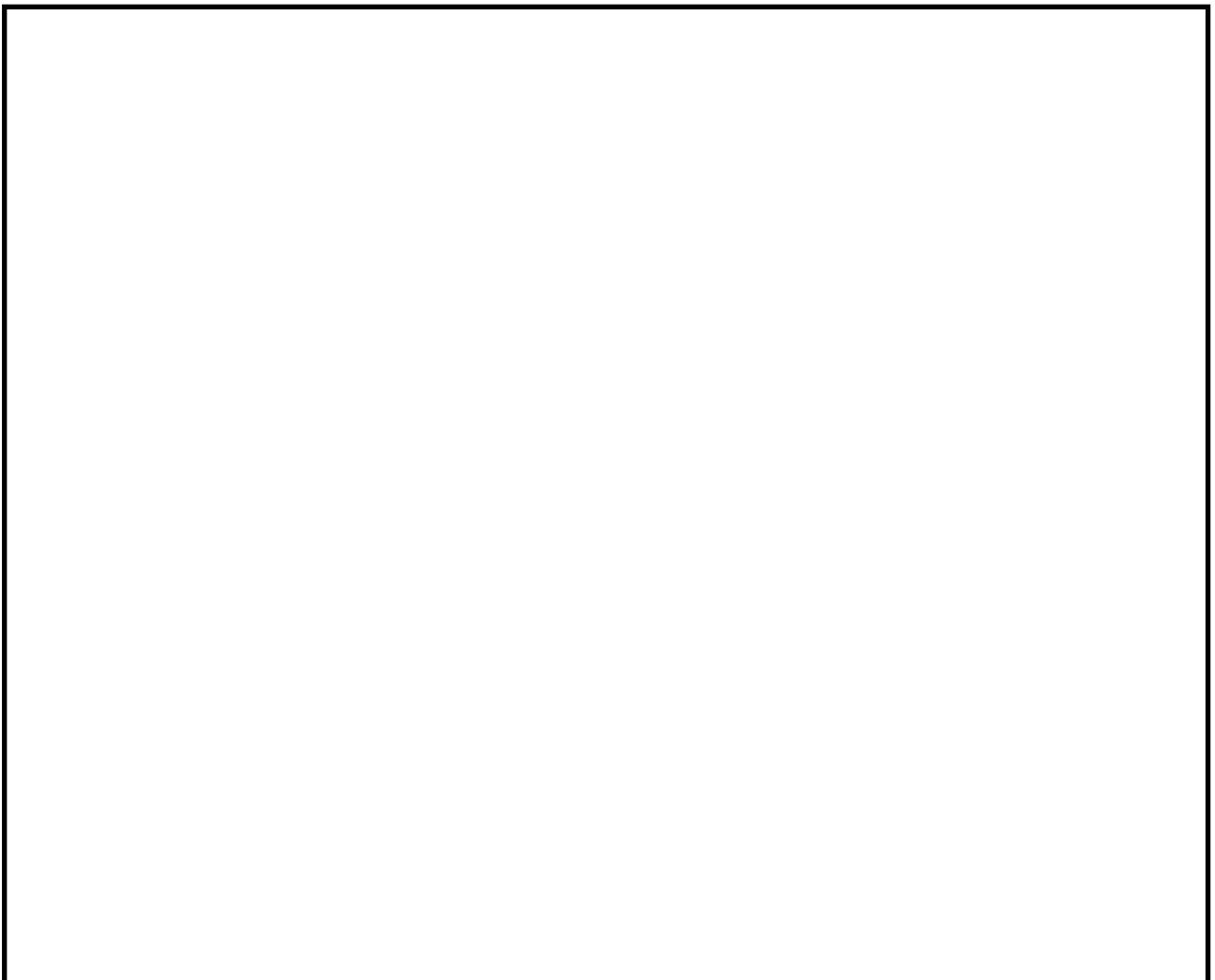
FOR A GREEN WORLD

OPERATING MANUAL

for

Rainstar

Series E





Manufacture date

Type description:: Rainstar

Type number: Series E

Serial number:¹

Dealer::

Name:

Address:

Tel./Fax:

Date of delivery:

Producer of the device:

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

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A - 8570 Voitsberg

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Ogner operating authority resp.: Name:

Address:

Tel. / Fax:

Instruction: Please note the Type- and the serial number of your Separator and of the accessories! Give this number your dealer when you contact him.

Printing date / Version: July 1998 / 00

¹ It is really necessary to note the whole serial number, included all letters, of the machine and of the needed BAUTEILEN bei allen Garantieansprüchen und den mit dieser Maschine zusammenhängenden Schriftwechsel anzugeben. Auf diesen Punkt kann nicht genug hingewiesen werden.



Introduction

The staff of BAUER has used its best efforts to offer you an **BAUER Separator** with up-to-date technology and top level quality. Ob Groß- oder Kleinbetrieb, Güllegemeinschaften oder Lohnunternehmen - wir bieten für jeden Bedarf den richtigen Separator. This manual covers the operation and maintenance of the **Separator**. Die Betriebsanleitung erhält aus Gründen der Übersichtlichkeit und wegen der möglichen Vielzahl nicht sämtliche Detailinformationen und kann insbesondere nicht jeden denkbaren Fall des Betriebes und Instandhaltung berücksichtigen. Sollten Sie weitere Informationen wünschen, oder sollten besondere Probleme auftreten, die in den mitgelieferten Betriebsanleitungen nicht ausführlich genug behandelt werden, können Sie die erforderliche Auskunft über die **Firma BAUER**, anfordern. Wir weisen darauf hin, daß der Inhalt dieser Betriebsanleitung nicht Teil einer früheren oder bestehender Vereinbarung, Zusage oder eines Rechtsverhältnisses ist, oder dieses abändern soll. Sämtliche Verpflichtungen der **Firma BAUER** ergeben sich aus dem jeweiligen Verkaufsvertrag, der auch die vollständige und allein gültige Gewährleistungsregelung enthält. Diese vertragliche Gewährleistungsbestimmungen werden durch die Ausführungen dieser Betriebsanleitung weder erweitert noch beschränkt. All information contained in this operating manual is based on the latest product information available at the time of printing. **BAUER** reserves the right to make changes without notice any time, without assuming any kind of liability! **BAUER Separator** is designed for safe and reliable performance provided you handle and operate it in accordance with the operating manual. Please read the complete owner's manual, although the handling with our Separator is simple, before you put the **Separator** into operation! Die darin angeführten Hinweise für die Bedienung, den Betrieb und die Wartung müssen genau beachtet werden. Unter diesen Voraussetzungen wird das Faß jahrelang zu Ihrer vollsten Zufriedenheit funktionieren. Non-observance of these instructions may cause personal injury or damage the equipment.

Diese Betriebsanleitung sollte als Teil des Separators angesehen werden. Lieferanten von Separatoren sind gehalten, schriftlich zu dokumentieren, daß diese Betriebsanleitung mit der Maschine ausgeliefert wurde.



Geben Sie diese Betriebsanleitung dem Bedienungspersonal. Always refer to the serial number of the device in all correspondence with the dealer or the manufacturer. You will find this serial number on the Fahrgestellrahmen.

We wish you a lot of success with your **BAUER RAINSTAR – series E!**

Allgemeine Sicherheitshinweise

Symbole und Begriffe



Das vom Hersteller anzubringende CE-Zeichen dokumentiert nach außen hin die Konformität der Maschine mit den Bestimmungen der Maschinenrichtlinien und mit anderen einschlägigen EG-Richtlinien.



ATTENTION!

This "Warning" symbol indicates important safety instructions contained hereinafter. Whenever you see this symbol you should be aware of the possible risk of injury or severe damage of the equipment. Read the instruction following this warning symbol very carefully and inform the other operators too.

IMPORTANT!

Eine Nichtbeachtung dieses Hinweises kann zur Beschädigung bzw. zur Zerstörung des Gerätes oder einzelner Bestandteile führen.

NOTE!

This symbol refers to measures suited for keeping up the good working conditions and performance reliability of the device.

Qualifiziertes Personal sind Personen, die aufgrund ihrer Ausbildung, Erfahrung und Unterweisung sowie ihrer Kenntnis über einschlägige Normen, Bestimmungen, Unfallverhütungsvorschriften und Betriebsverhältnisse, von dem für die Sicherheit der Anlage Verantwortlichen berechtigt worden sind, die jeweils erforderliche Tätigkeit ausüben und dabei mögliche Gefahren erkennen und vermeiden können. Unter anderem sind auch Kenntnisse in Erste-Hilfe-Maßnahmen erforderlich.

Produkthaftung

Im Sinne des Produkthaftungsgesetzes ist jeder Landwirt Unternehmer!

Gemäß §9 PHG wird die Haftung für Schäden, die durch Produktfehler an Sachen verursacht werden, ausdrücklich ausgeschlossen. Dieser Haftungsausschluß gilt auch für Teile, die die **Firma BAUER** nicht selbst erzeugt, sondern zukauf.

Informationspflicht

Auch bei späterer Weitergabe der Maschine durch den Kunden muß die Betriebsanleitung mitgegeben werden und der Übernehmer der Maschine muß unter Hinweis auf die genannten Vorschriften eingeschult werden.

Bestimmungsgemäße Verwendung

- Das **BAUER Kompressortankwagen** ist ausschließlich für den üblichen Einsatz bei landwirtschaftlichen Arbeiten gebaut (bestimmungsgemäßer Gebrauch).
- Jeder darüber hinaus gehende Gebrauch gilt als nicht bestimmungsgemäß. Für hieraus resultierende Schäden haftet der Hersteller nicht; das Risiko hierfür trägt allein der Benutzer.
- Zur bestimmungsgemäßen Verwendung gehört auch die Einhaltung, der vom Hersteller vorgeschriebenen Betriebs-, Wartungs- und Instandhaltungsbedingungen.
- Das **BAUER Kompressortankwagen** darf nur von Personen benutzt werden, die hiermit vertraut und über die Gefahren unterrichtet sind.
- Die einschlägigen Unfallverhütungsvorschriften sowie die sonstigen allgemein anerkannten sicherheitstechnischen, arbeitsmedizinischen und straßenverkehrsrechtlichen Regeln sind einzuhalten.
- Eigenmächtige Veränderungen an der Maschine schließen eine Haftung des Herstellers für daraus resultierende Schäden aus

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1 General Specifications for Safety and Accident Prevention

Check the working and traffic safety of the machine before every use!

1. All specifications generally valid for safety and accident prevention must be observed in addition to the instructions contained in this manual.
2. The warning and instruction signs affixed to the machine contain very important information for safe operation: please observe them for your safety!
3. Do not use a machine unless all guards and safety devices are mounted in their proper working position!
4. Acquaint yourself with all parts and controls, and their respective principle of operation before starting to work with the machine. Do not wait until you've started operating !
5. The operator's clothing should fit tightly!
6. Avoid wearing loose clothes.
7. Before starting to drive and operate check the area around the machine! (Children !) Make sure to have a good view!
8. Riding on the machine during operation and transport is prohibited!
9. Couple and secure the machine in accordance with regulations and only with the specified equipment!
10. All supports must be positioned properly when the machine is put up or dismantled. (Stability!)
11. Special care is required when the machine is coupled to or uncoupled from the tractor!
12. Observe the permissible axle load and overall weight!
13. Observe the permissible transport dimensions!
14. Observe the max. permissible carrying capacity of the trailer coupling, pendulum drawbar, or automatic pick-up hitch!
15. Ensure sufficient flexibility of joint when a drawbar is used!
16. Inspect and mount all equipment required for transport such as lighting, warning signals, and safety devices.
17. All control and operating devices (cables, chains, rods, etc.) of remote-controlled equipment must be fitted in a manner that prevents unintentional actuation in all transport and working positions!
18. For driving or transporting on public roads the machine must be adjusted according to the appropriate regulations and secured according to the Manufacturer's instructions!
19. Never leave the driver's cab during a ride!
20. Always adjust the driving speed to the actual site conditions: avoid sudden turns when driving uphill or downhill or transversing a slope!
21. Trailed machines and residual water in the machine influence the road behaviour and the steering and braking capacity. Make sure that proper steering and braking are possible!
22. When driving in curves always keep in mind the specific behaviour of this type of machine with regard to overturning!
23. Never start up the machine unless all safety devices are mounted and in their proper position!
24. Staying in the working range of the machine during operation is dangerous and prohibited!
25. Never stay in the turning range of the machine!
26. All externally powered devices (e.g. hydraulics) bear a crushing and shearing hazard!
27. Never fail to secure the machine before you leave the tractor! Turn off the engine and pull out the ignition key!
28. Nobody is allowed between the tractor and the irrigation machine unless the tractor has been secured by means of the parking brake and/or wedges under the wheels!
29. Before driving on public roads drain all water from pipes and spraying devices and arrange them in the proper position in accordance with regulations!
30. Before starting to irrigate near overhead transmission lines you should consult your competent power supply company with regard to the safety distances that have to be allowed (VDE rule 0105 Section 15 Art. 6.3)!

Power take-off

(applies only to PTO driven implements)

1. Use only the types of PTO drive shafts recommended by the implement Manufacturer!
2. The drive shaft protection tube and guard as well as the P.T.O. guard on the machine must be mounted and in proper working order!
3. When using a telescopic PTO shaft observe the specified overlap in the 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. When using a drive shaft with an overload or overrunning clutch, which is not protected by the guard on the tractor, always mount the shaft with the overload or overrunning clutch on the machine side!
6. Make sure the telescopic drive shaft is always connected and secured properly!
7. Attach the safety chain to keep the drive shaft guard from rotating with the shaft!
8. Before you turn on the PTO make sure that the selected tractor PTO speed and direction of rotation corresponds with the permissible direction of rotation and speed of the machine.
9. Before starting the PTO make sure that nobody is standing in the danger zone of the machine!
10. Never turn on the PTO when the engine is turned off!
11. When working with the power take-off nobody is allowed near the turning PTO or drive shaft!
12. Always turn off the PTO immediately when the articulation angle gets too big, or if the PTO is not needed!
13. For cleaning, greasing or adjusting the PTO driven machine or the drive shaft, the PTO and the engine must be turned off and the ignition key pulled out!
14. When the drive shaft is removed put the safety shield on the PTO shaft!
15. If a defect is detected repair it immediately before starting to work with the machine!

Hydraulic system

1. The hydraulic system is under high pressure!
2. When hydraulic cylinders or motors are connected, make sure that the hydraulic hoses are connected as specified!
3. Before coupling the hydraulic hoses with the tractor's hydraulic equipment make sure that the entire hydraulic system is pressure-less on the tractor and on the machine as well!
4. The coupling sleeves and plugs of the hydraulic connection lines between tractor and machine, which control functions of the machine, should be marked to avoid malfunctions! Erroneously exchanged connections will cause reversed functions - e.g. lifting instead of lowering --> Accident hazard!
5. The hydraulic hoses must be inspected at regular intervals and replaced immediately in case of damage or ageing! The replaced hoses must comply with the technical specifications of the machine supplier!
6. When looking for leaks use the proper facilities because of the injury hazard.
7. Liquids emerging under high pressure (hydraulic oil) can penetrate the skin and cause serious injuries! Injured persons must see a doctor immediately! Danger of infection!
8. Before working on the hydraulic system it must be depressurised and the engine turned off!

Tires

1. When handling the tires make sure that the machine is firmly parked and secured against rolling (wedges)!
2. Mounting tires and wheels requires sufficient knowledge and proper tools!
3. Tires and wheels must be repaired only by specialists with the appropriate tools!
4. Check the tire pressure regularly! Observe the specified tire pressure!



Maintenance

1. For repairs, maintenance and cleaning work, and for the elimination of defects the drive must always be stopped and the engine turned off - pull out the ignition key
2. Check proper fit of all nuts and bolts regularly and tighten them, if necessary!
3. Always use suitable tools and gloves to exchange cutting tools!
4. Dispose used oil and grease in accordance with the appropriate regulations!
5. Always turn off power before working on the electric system!
6. Protective devices that are subject to wear must be inspected at regular intervals and replaced in time!
7. All spare parts must meet the Manufacturer's minimum technical specifications! This is the case with original spare parts!
8. Before electric welding on RAINSTARS that are equipped with the ECOSTAR system, disconnect the battery cables !



2 GENERAL

BAUER products are designed and constructed carefully and subject to a system of continuous quality control. BAUER Rainstar type E1 / E2 / E3 / E4 is a turbine-driven machine that makes irrigation a fully mechanised and time-saving job. The RAINSTAR is manoeuvred, set up and operated only with the tractor and it is no longer necessary to lay down and reposition individual pipes by hand for irrigating a field.

BAUER Rainstar is a universal machine for varying lengths and widths of fields and it works unattended from the beginning to the end of the run.

Strict observance of the handling, operating and maintenance instructions contained in this manual is a prerequisite for long years of satisfactory and trouble-free operation. Be sure to make this manual available to all machine operators before they start working with the Rainstar.

The nameplate indicates the model name and the serial number (Fz.-Ident-Nr.). The serial number is also marked on the underframe. Please refer to these identifications in all your inquiries and correspondence, warranty matters and parts orders.

We warrant for this machine according to our General Terms and Conditions of Sale.

3 Safety Precautions for the Rainstar series E

1. Study this manual thoroughly before working with the machine for the first time.
2. Never handle the PE-pipe near the machine or the machine during the unreeling or winding up of the pipe.
3. When you pull off the PE-pipe, or pull it in with the tractor's PTO, make sure that the gear shift lever is in the proper position. Never exceed the maximum permissible speed limit!

**CAUTION!**

Improper handling can be dangerous!

4. Never adjust or service the machine (except for speed adjustment) while the machine is running.
5. Keep clear off all moving parts.
6. Never disclose moving parts by removing the protective devices.
7. Keep a safe distance from the operating sprinkler.
8. Beware of high connecting pressures!
9. Make sure that the sprinkler's water jet does not hit public roads.
10. The Rainstar is approved only for transportation in agricultural operation. For transportation on public roads you must strictly adhere to the appropriate traffic regulations.
- 11.

**CAUTION!**

For safety reasons it is not permitted to transport the machine with a fork-type drawbar coupling (OPTIONAL) and the toolbar.

12. When you load the machine on a truck always keep in mind that the water remaining in the pipe shifts the machine's center of gravity upward.
13. Depending on the position of the machine's center of gravity, the permissible driving speed in curves is considerably lower.
14. Strictly observe all arresting instruction given in the general specifications for the transport of the machine.
15. Before starting to irrigate fields near overhead transmission lines consult your local power supply company regarding safety distance requirements.
16. Maximum permissible speed: 10 km/h.

4 Description

The Rainstar is a universal irrigation machine for varying lengths and widths of fields and best suited for sprinkling cereal crops, field crops, root crops, and horticultures as well as any kind of grassland.

The main components of the Rainstar are a two-wheel undercarriage on which is mounted the turntable swivelling through 270° and the reel with the special PE-pipe, the multifunctional compact gearbox and the TX20 or TX60 turbine, and the high-rise cart suited particularly for high crops with the BAUER wide-range gun.

The material of the PE-pipe corresponds to the latest findings. 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 is the TX 20 or TX 60 turbine. Both models are full-flow turbines mounted in a flow-promoting position directly on the reel. They are nearly insensitive to soiled water and offer 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 mechanical seal.

The TX 20 turbine is designed for water flow rates from 13 to over 60 m³/h and features a wide control range. Impeller speeds range from 200 to 800 rpm.

The TX 60 turbine is designed for water flow rates from 25 to over 100 m³/h and has also a wide control range. Impeller speeds range from 100 to 500 rpm.

The cart retraction speed is infinitely variable. It is adjusted by means of the regulating lever and can be read from the tachometer (Option on E1 and E2). Depending on the available water flow and the connecting pressure it may vary between 8 and 150 m/h. The connecting pressure at the machine should not exceed 11 bar.

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

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

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



CAUTION!

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

To slacken the stretched PE-pipe move the gear shift lever downward carefully (see proper procedure on page 15).

A winding carriage moved by a helically grooved spindle ensures that the PE-pipe is wound up properly on all layers. To keep the retraction speed constant on all layers independent of the pipe length still lying on the field, the Rainstar is equipped with a special layering mechanism. This compensating mechanism is actuated by the speed compensator bar of the shut-off frame that fits closely to the pipe on all layers and actuates the regulating flap of the turbine through the regulating rods.

At the end of the irrigation strip the automatic drive shut-off is actuated by rods.

If the machine is equipped with a shut-off valve the water supply to the machine is turned off simultaneously.

After the shut-off the rear hydraulic machine supports can be withdrawn and the sled is raised automatically into the transport position. Without any further preparations the Rainstar can be transported to its next setting-up position immediately. Pull off or lay down the PE-pipe again, connect the water supply, and the machine is ready for the next run.

When driving on public roads the reel must be turned into the driving direction and secured with the lock bolt. The full length of the PE-pipe must be wound up on the reel and the cart lifted. The jack and both rear machine supports must be withdrawn to their uppermost position.

On public roads the drawbar must be hitched to the tractor's coupling jaw. Unless you have an official permit the maximum permissible driving speed is 10 km/h. For increased safety against overturning in curves we recommend to set the maximum possible track width.

On principle, 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 must always be adapted to the existing conditions and should never exceed 5 km/h. You must also take into consideration that this type of transport requires a wider driving lane.

5 Start-up

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 operation and check the tires for the specified pressure (see Technical Data).

Tighten also the connecting bolts, the connection of the turntable side part on undercarriage, of the ball race on the undercarriage, and the fastening of the hitch eye according to the "Service and Maintenance" table.

5.1 Steps to be performed once or from time to time:



Set the required track width on the high-rise cart and on the Rainstar undercarriage according to the respective crop.



Place the appropriate number of balancing weights on the balancing pendulum of the cart

The number of weights depends on the adjusted cart track width, nozzle diameter, and nozzle pressure.

5.2 Table showing the concrete weights required for symmetric carts



Set the part circle on the wide-range gun (approx. 220 ° for full strip width).

For detailed instructions refer to the separate sprinkler manual. The WINDGUN can be adjusted to the prevailing wind conditions by changing the trajectory angle.

	Cart track width mm																			
	1500				1800				2000				2400				2800			
Nozzle dia. mm	Nozzle pressure bar																			
	3,0	4,0	5,0	6,0	3,0	4,0	5,0	6,0	3,0	4,0	5,0	6,0	3,0	4,0	5,0	6,0	3,0	4,0	5,0	6,0
26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
30	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
32	2	2	4	6	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2
34	2	2	4	6	2	2	4	4	2	2	2	4	2	2	2	2	2	2	2	2
36	2	2	6	6	2	2	4	6	2	2	2	4	2	2	2	2	2	2	2	2



5.3 OPERATING MODE I: PULLING OFF THE PE-PIPE

5.3.1 Transport of the machine to the setting-up position:

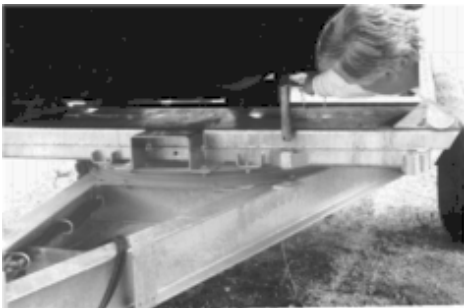


During transportation the reel should be turned into the driving direction and secured with the lock bolt. The cart, the jack and both rear support legs must be lifted or retracted. For pulling off the PE-pipe laterally, set up the Rainstar on the headland at right angles to the selected irrigation strip and detach it from the tractor.

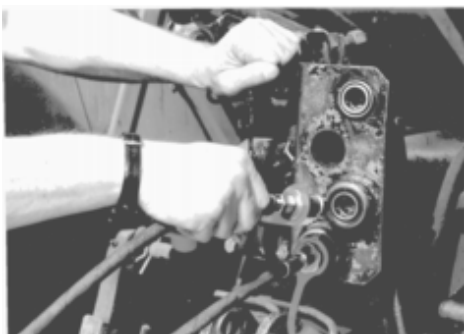


Adjust the undercarriage in a level position by means of the jack.

When positioning the Rainstar make sure that the machine's vertical axis of rotation is in the middle of the irrigation strip or two crop rows.



For pulling off the PE-pipe laterally, withdraw the lock bolt, turn the reel into the direction of the irrigation strip and secure it again with the lock bolt.



Couple both hydraulic hoses with the hydraulic system on the tractor and extend the supports



CAUTION!

The standard Rainstar equipment does not include a control unit (Optional). After coupling the hoses the tractor's hydraulic system for extending or retracting the supports must therefore be changed over accordingly. If this is not possible, you have to exchange the hoses.



For optimum stability the machine supports should be fully extended to their end position.



CAUTION!

During this procedure the operator's position must be outside the machine supports.

If the soil is very hard you should dig holes into which the supports are lowered.

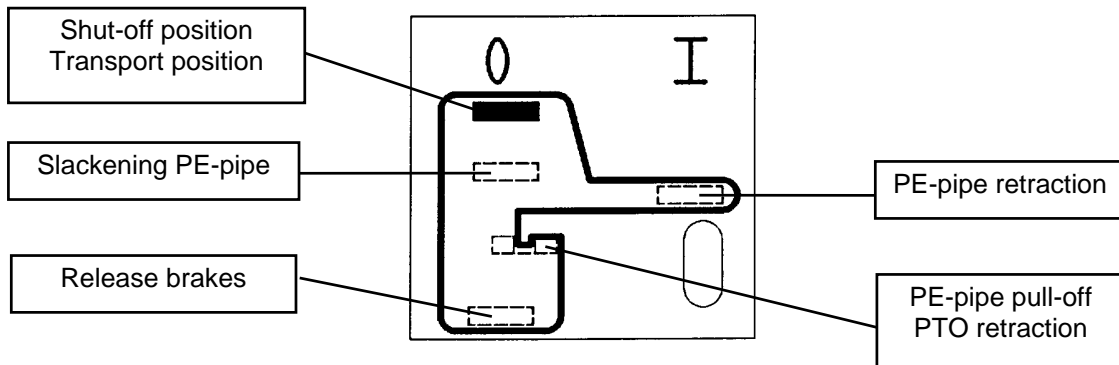
5.3.2 Lowering the cart



When the supports extend the cart is automatically lowered into the "PE-pipe pull-off" position.

Then depressurise the tractor's hydraulic system and uncouple the hydraulic hoses.

Switching positions of the shut off lever

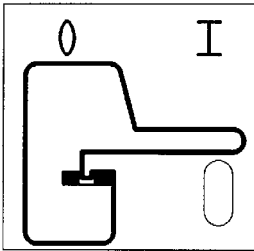




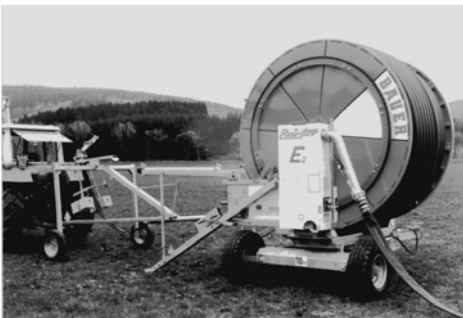
5.3.3 PE-pipe pull off



Move the gear shift lever into the “PE-pipe pull-off” position. A spring presses the lever up and locks it.



Pick up the double drawing-out hook with the toolbar and pull out the cart into the field.



If you are using a sled, it is lifted.

The standard wheel cart or asymmetric wheel cart need not be lifted.

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

Do not stop abruptly. Always slow down gradually in the field or at the end of the pull-off. Stop pulling off the pipe when the white marking line becomes visible on the reel.



CAUTION!

If the PE-pipe has been exposed to the sun for a longer period or if its surface temperature rises above 35 °C you must let water run through the pipe to cool it off before the unwinding or retraction procedure.

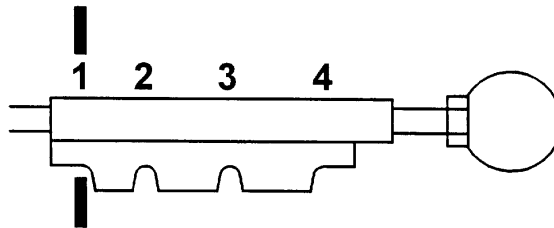


Couple the pressure hose. Open water supply.

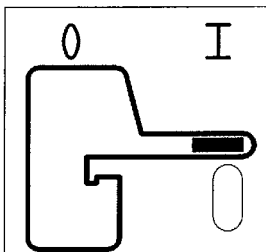
Move the gear shift lever into the appropriate position.

TX 20 - T 60

1	8	--	20	m / h
2	16	--	32	m / h
3	28	--	50	m / h
4			> 45	m / h



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.



If you selected a wrong gear speed:



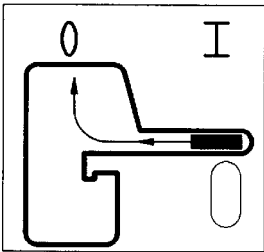
CAUTION!

CAUTION WHEN CHANGING THE SETTING:
If the PE-pipe is stretched, SLACKEN IT !

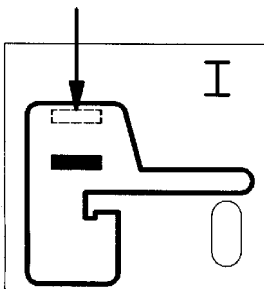


Proper procedure:

Pull the shut-off lever into the shut-off position



... and slacken the PE-pipe by carefully pressing the shut-off lever downward.



NOTE!

Switching into the gear speeds 1 to 4 is possible only when the turbine is rotating !

Move the gear shift lever into the desired position and set back the shut-off lever to the "PE-pipe retraction" position.

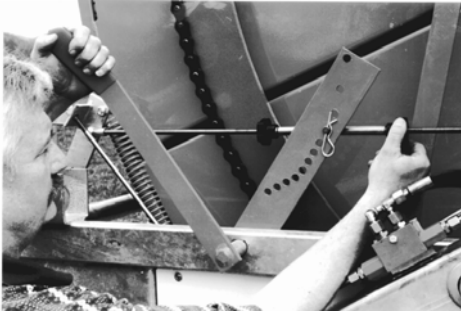
The reel starts pulling in the PE-pipe.

5.3.4 Speed adjustment



CAUTION!

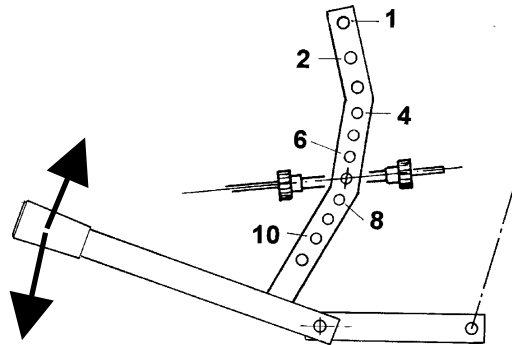
Do not start setting the speed until one half winding of the PE-pipe has been wound up on the reel and the pipe is already stretched.



Loosen the knurled nuts that secure the regulating lever.

Set the desired retraction speed with the regulating lever. The speed can be read from the tachometer (option on E1 and E2). Then secure the regulating lever again with the knurled nuts.

Lever upward = faster
Lever downward = slower



At the end of the irrigation run the drive is shut off by means of rods.

The water supply is stopped by the "overpressure shut-off valve" option, or the pump unit is shut down by the "low-pressure shut-off valve" option in combination with a pressure switch.



After retraction of the PE-pipe the supports can be carefully withdrawn with the tractor's hydraulic system. Thereby the cart is lifted into its transport position automatically.

In case of misalignment during the PE-pipe retraction, the machine must be realigned. For this purpose the PE-pipe must be slackened first.

Proper procedure:

1. Close the water supply to the Rainstar. The PE-pipe slackens only partially by the turbine that acts like a hydraulic brake.



2. Pull the shut-off lever to the shut-off position and **slacken the PE-pipe** by slowly and carefully ...

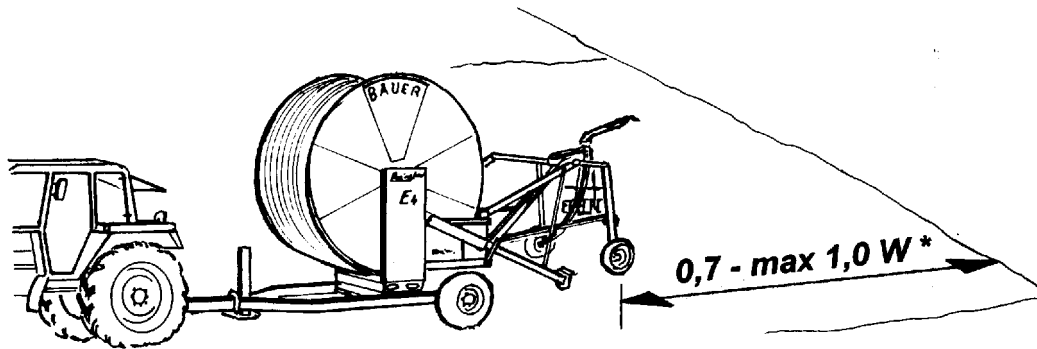


... pressing the lever downward (see also page 15 "Proper procedure").

3. Realign the machine and support it properly.
4. Open the water supply again.
5. Move the gear shift lever to the desired position.
6. PE-pipe retraction continues.

5.4 Operating mode II: laying down the pipe

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



Drive into the field with the Rainstar, allowing for the sprinkler's distance of throw.

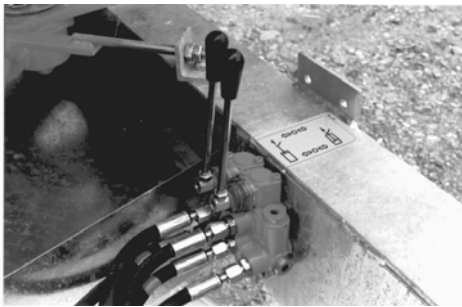
*) W = distance of throw of the sprinkler



Lower the cart as described under Operating mode I, chapter "Lowering the cart" and anchor it slightly



Then move forward with the machine for another two or three metres, withdraw the machine supports and continue across the field.

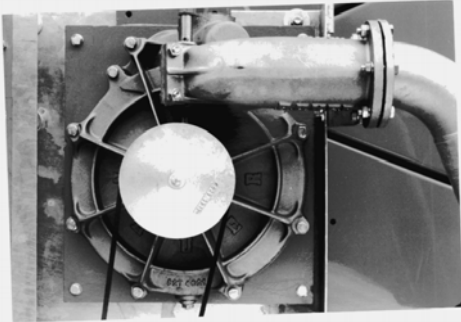


Extending and retracting the machine supports is much easier with the "Control valve block" OPTION for machine supports.

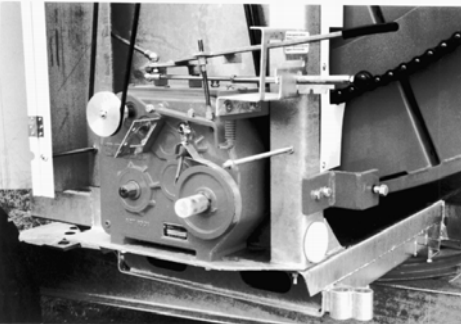
- If you are using a pipe guiding device , drive on about 10 to 20 metres after lowering the cart. Take the guide arms from the transport position and telescope the guide arm with the roller.
- Place the PE-pipe in the roller guide and close the side part of the pipe guide box.
- Take the supporting guide arm from the mounting and hook it up to the guide arm with the roller.
- Place the PE-pipe in the machine's wheel track or in the desired position between plant rows and secure the supporting guidearm in the appropriate hole with the lock pin.
- Hook up the chain to the "keyhole bracket".
- Withdraw the hydraulic support legs. The cart lift slightly hoists the pipe guiding device with the PE-pipe through the hooked up chain.
- Now the PE-pipe can be laid in a perfectly straight line between plant rows, for instance in the machine's wheel track.
- Carry out all other steps according to the procedure described above.

5.5 Functional description of the main components

5.5.1 Machine drive – full-flow turbine



The TX20 and TX 60 full-flow turbines are a special turbine design with large cross sections and minimum pressure loss. Therefore it is possible to reach high retraction speeds even with only very little flow rates. These turbines feature a very flow-promoting design and they are mounting directly on the reel shaft. They produce the energy needed for the PE-pipe retraction. The turbine speed is taken directly off the impeller shaft and transmitted over a V-belt drive to the BAUER change-speed gearbox.



The BAUER change-speed gearbox reduces the turbine speed according to the retraction speed setting. The gearbox incorporates four speed gears. The reel drive stop at the end of the irrigation strip is ensured by disengagement of the tooth clutch.

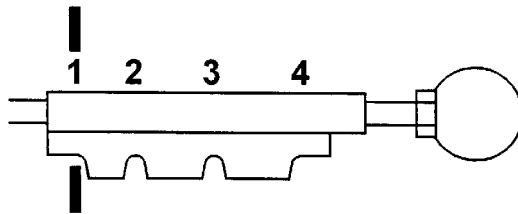
The four-speed gearbox adapts perfectly to the existing operating conditions. Therefore the following retraction speeds [m/h] can be reached:



Gear speed selection

TX 20 - TX 60

1	8	--	20	m / h
2	16	--	32	m / h
3	28	--	50	m / h
4	> 45			m / h

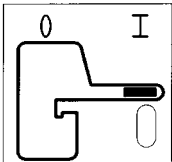
**CAUTION!**

Removal of the drive cover for service is only permitted when the PE-pipe is completely slack and the water supply turned off !
The gear shift lever must be moved to the shut-off position !
This lever position must also be used for transporting the machine on the road !

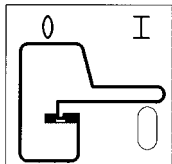
Changing between gears 1 to 4 is very easy with the gear shift lever when the turbine is rotating.

Note also the following:

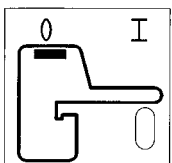
If the shut-off lever is in the "PE-pipe retraction" position, the gear shift lever is locked and cannot be shifted.



If the shut-off lever is in the position "PE - pull-off"



or in the shut-off position

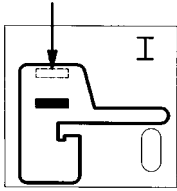


it is possible to shift to the desired gears 1 to 4.

**CAUTION!**

Slacken the PE-pipe before shifting gears !

If the shut-off lever is in the shut-off position, carefully pushing it downward will release the band brake and slacken the PE-pipe (see also page 15).



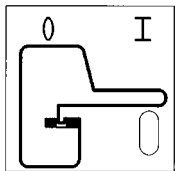
5.5.2 Driving with PTO:



If required, the PE-pipe can be wound up on the reel by means of the tractor's PTO.



For this purpose the shut-off lever must be shifted to "PE-pipe pull-off".



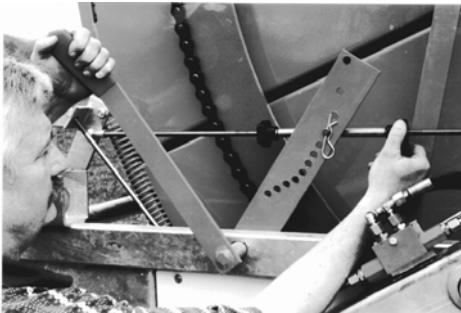
A spring presses the gear shift lever into a locking recess. In this position the band brake is slightly released and does not produce any brake action during the wind-up.

Winding up the PE-pipe with the PTO will become necessary if there is no need to continue irrigation due to natural rainfall, or if the PE-pipe was pulled off the reel for winterization.

**CAUTION!**

- Retract the pipe at the lowest possible PTO speed - start slowly and smoothly and avoid jerks.
- Avoid strain by excessive articulation of the PTO shaft.
- If the PE-pipe is covered with mud it should be loosened and set free to reduce the tension load before it is wound up.
- The PE-pipe can be released and lifted off the ground by tying around a hemp rope or a fabric belt and pulling it along the pipe.
- If the soil is deep and heavy the PE-pipe must be wound up more slowly to make sure that the permissible loads on the PE-pipe and on the RAINSTAR are not exceeded.
- If you disengage the PTO shaft during the PE-pipe retraction, make sure that the pipe reel stands still before you re-engage the PTO shaft. (Slacken the PE-pipe). Double motion may cause severe damage!
- When you drive the reel with the PTO shaft the automatic shut-off system is inactive. Therefore you must stop the PTO shaft in time and wind up the end of the PE-pipe with the hand wheel. This will prevent damage to sled, shut-off system, gearbox, etc.

6 Speed control



The retraction speed is infinitely variable with the speed regulating lever that is secured with the knurled nuts after the desired setting has been made.

The speed remains nearly constant from the first layer to the last, and on the individual windings of each layer as well.

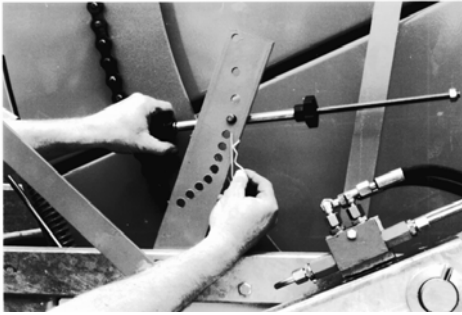
This is achieved by readjustment of the turbine speed through the speed compensating bar of the shut-off frame fitting closely to every layer of the PE-pipe during the run ...



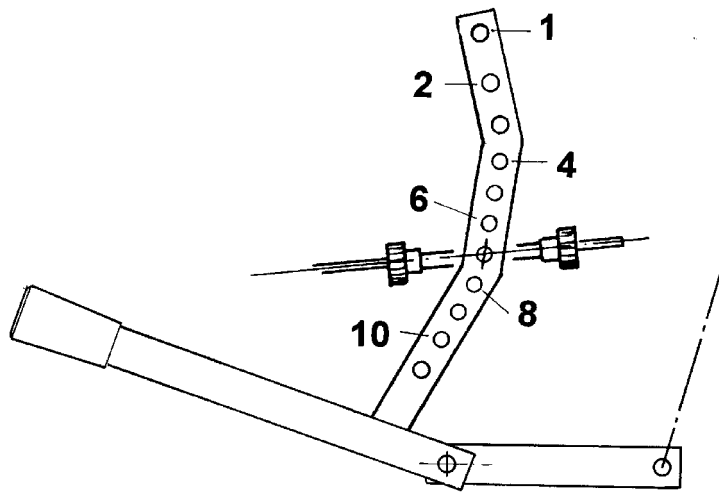
...and the regulating rod that actuates the regulating flap located directly on the turbine.

Varying soil conditions as well as low flow rates may cause uneven retraction speeds in spite of the layering mechanism.

If the retraction gets faster or slows down the regulating rod must therefore be hooked up to the next suitable hole.



Precise setting of the speed control depends also on the PE-pipe diameter and therefore differs for the PE-pipe dimensions 90 to 125 mm.

PROPOSED SPEED CONTROL SETTING**TX 20**

Wassermenge Water flow Debit m ³ / h	Einzugsgeschwindigkeit Retraction speed Vitesse d' enroulement m / h	E 1	E 2	E 3	E 4	E 5
		Loch / Hole / Trou				
15	10	4	3	3	3	3
	25	3	3	3	3	3
20	10	3	3	4	4	4
	20	4	3	4	4	4
30	35	4	3	3	3	3
	12	4	4	4	4	4
50	25	5	5	5	5	5
	55	6	5	5	5	5
50	15	5	4	4	4	4
	25	6	5	5	5	5
	60	7	6	6	6	6

**TX 60**

Wassermenge Water flow Debit m ³ / h	Einzugsgeschwindigkeit Retraction speed Vitesse d' enroulement m / h	<i>E 1</i>	<i>E 2</i>	<i>E 3</i>	<i>E 4</i>	<i>E 5</i>
		Loch / Hole / Trou				
40	10	5	4	4	4	4
	15	6	5	5	4	4
	25	7	6	5	4	4
50	12	4	4	4	4	4
	20	4	4	5	5	5
	30	5	5	5	5	5
60	15	6	4	5	3	3
	25	6	5	5	4	4
	35	7	6	6	5	5
	70	9	8	7	6	6
70	15	5	5	5	4	4
	25	6	6	6	5	5
	40	6	6	6	5	5
	75	8	8	7	6	6
90	20	6	6	6	5	5
	30	6	8	6	5	5
	45	7	7	7	6	6
	90	8	9	8	7	7
100	20	7	6	6	5	5
	35	8	7	7	6	6
	50	9	8	7	6	6
	100	10	9	8	8	8




The retraction speed of the sprinkler cart is displayed on the tachometer.



PE-pipe		Separator		max. allowed area		2 x 35.0 = 70.0 m ²		max. strip length		2 x 1500 feet	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
0.9	36	100	4	100	4	100	4	100	4	100	4
1.0	39	100	4	100	4	100	4	100	4	100	4
1.1	43	100	4	100	4	100	4	100	4	100	4
1.2	47	100	4	100	4	100	4	100	4	100	4
1.3	51	100	4	100	4	100	4	100	4	100	4

You take the appropriate speed value relating to machine connecting pressure, nozzle size, and precipitation rate, from the performance chart sticker.

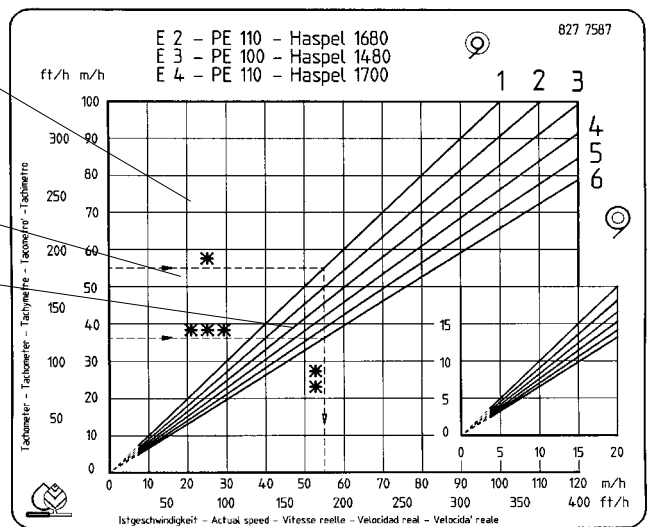


ATTENTION! The speed reading on the tachometer applies only to the innermost PE-pipe layer. The retraction speed for the second to the last layer must be taken from the diagram. The radial lines on the diagram sticker symbolise the individual layers of the PE-pipe.

Example:

Tacho reading: 1st PE-pipe layer
 Actual retraction speed: 55 m/h *

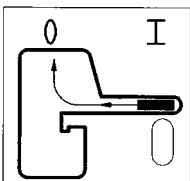
Tacho reading: 6th PE-pipe layer
 Actual retraction speed: 36 m/h ***
 Actual retraction speed: 55 m/h **



7 Emergency shut-off

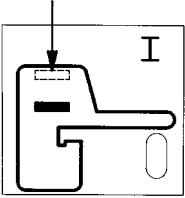


If something unforeseen happens, the pipe retraction can be interrupted by means of the emergency stop device. Pull the gear shift lever with the open hand from the "PE-pipe retraction" position to the shut-off position (Do not operate the lever with the closed hand or release it immediately !). The gearbox is disengaged. A spring snubs the lever up (shut-off position) and the band brake prevents fast reversing of the PE-pipe and the reel.

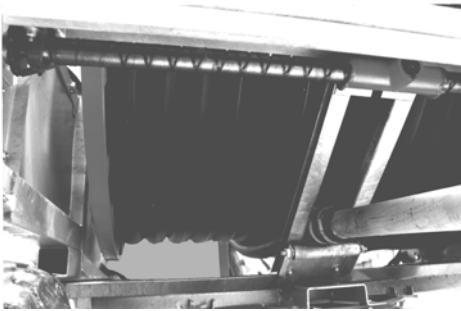




The PE-pipe is slackened by pushing down the gear shift lever carefully

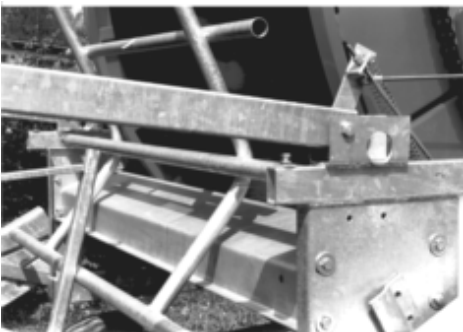


8 Winding mechanism



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 transporting the winding carriage of the PE-pipe. The winding mechanism ensures that the PE-pipe is properly guided 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.

9 Shut-off and safety equipment



Unattended performance of the Rainstar is made possible by a final and safety shut-off. The final shut-off is actuated when the sprinkler cart presses against the shut-off frame, which in turn operates the shut-off lever through a system of rods. This way the drive is stopped.

To avoid troubles caused by faulty windings of the PE-pipe on the reel, the shut-off is also activated by the shut-off frame when faulty pipe windings build up on the reel.



10 Sled/Cart



The high construction of both the symmetric and asymmetric wheel carts and the sleds provides maximum crop protection (Asymmetric wheel cart and sled are OPTIONAL). With infinitely variable track width the carts adapt to any crop row spacing. The width is symmetrically adjusted by means of the central shifting part.



For easier PE-pipe pull-off the carts are equipped with a double draw-out hook.

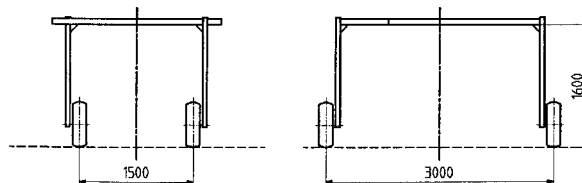
You pick up this hook with the tractor's toolbar and pull the cart across the field. If you are using a sled, it is lifted and the pipe pulled off the reel.

For turning the pipe reel and placing the Rainstar in a new setting-up position, the cart must be withdrawn to its end position on the Rainstar.

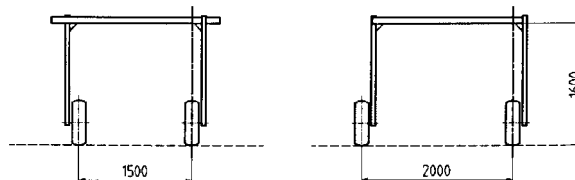
Depending on the type of sprinkler used, the nozzle height of the mounted sprinkler ranges between 1960 and 2120 mm.

At the end of the retraction, when it moves up to the machine the cart is slightly hoisted on the PE-pipe side. Owing to its pendulous mounting (self-balancing assembly) the sprinkler is not tilted and always remains in the optimum position in view of distance of throw and distribution uniformity. This pendulous mounting assembly compensates also slopes in longitudinal direction.

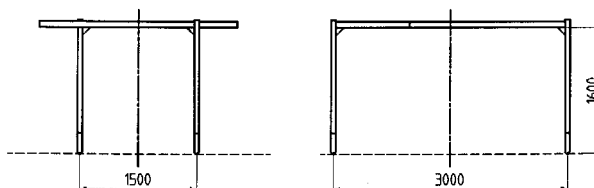
Symmetric wheel cart



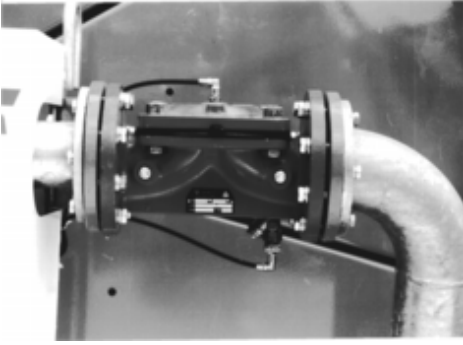
Asymmetric wheel cart



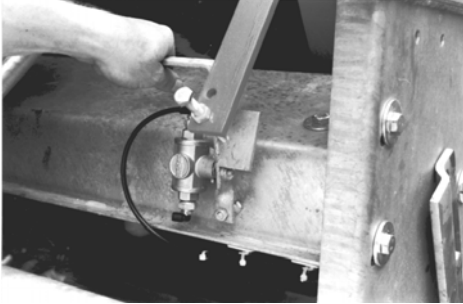
Sled



11 Overpressure shut-off valve (option)

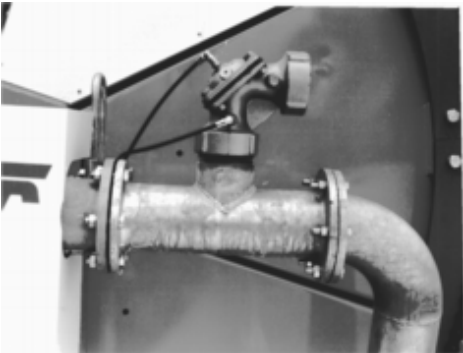


With an overpressure shut-off valve, the water supply to the machine is turned off completely at the end of the irrigation run. When the valve closes, the pressure in the supply line rises.



Therefore this valve can only be used in combination with an automatic pump shut-off device or in a line network supplying several machines. Before starting up again with water the hand lever must be shifted to the START position (to the rear, towards the cart). This way the shut-off valve is relieved and opens.

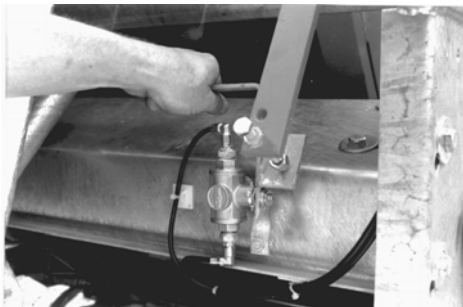
12 Low or underpressure shut-off valve (option)



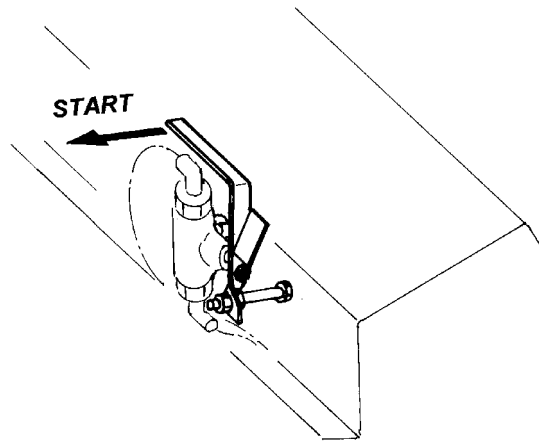
With the low pressure shut-off valve option, a diaphragm valve is opened at the end of the run through which a considerable part of the water is discharged into the open. This causes a sudden pressure decrease in the supply line (to about half the original pressure). Through this drop in pressure a pressure switch shuts off the pumping unit and thus also the water supply. Therefore this valve can only be used in combination with an automatic pump shut-off device.

Note!

The low pressure shut-off valve option can only be used if only one irrigation machine is fed by the pumping unit. If several machines are fed simultaneously by one pumping unit this low or underpressure shut-off valve cannot be used !



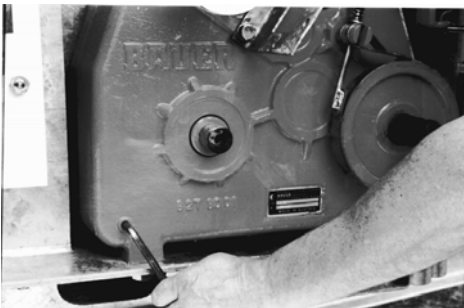
Before starting again with water the hand lever of the three-way cock must be shifted to the START position (to the rear, towards the cart). This way the water pressure will close the valve.



13 Winterization – Draining

In areas where frost is likely to occur after the irrigation season, the machine must be drained in time. A compressor with a minimum air capacity of 800 l/min at 2.5 bar overpressure is best suited for this purpose. Connect the compressor to the inlet of the machine. For blowing out the water the PE-pipe should not be pulled off. It can stay on the reel. In most cases, winding up the empty PE-pipe after the draining will cause extreme ovality and faulty winding. Before the blow-out procedure, uncouple the connecting hose at the sprinkler balancing assembly. The small amount of water remaining in the PE-pipe after the draining (approx. 30 to 50 % of the volume) will not do any harm.

Turn out the drain plug on the bottom of the TX 20 or TX 60 turbine. We recommend to turn it in again only when you start up the machine again at the beginning of the next season. If a shut-off valve is mounted the connecting hoses also have to be drained by opening the screwed joints. Clean the Rainstar 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.



Drain screw for gear oil.



Oil or grease the jack.

13.1 Draining the PE-pipe

With the blow-out and compressor unit
(Option on E3 and E4)

Note the following instructions to ensure proper function of the blow-out unit:

1. The blow-out must be performed immediately after the shut-down of the machine to ensure that the PE-pipe is not drained. After a longer stand-still (from 5 to 10 minutes) you must pressurise the RAINSTAR again before the blow-out procedure.



CAUTION!

If parts of the PE-pipe have been drained and air bubbles are enclosed in the pipe the blow-out will not work !

2. If a shut-off valve is mounted, open it:
If you have an overpressure or low pressure shut-off valve, shift the three-way ball cock to the start position.
If an electric shut-off valve is mounted, press the START key to open the valve.
3. Connect a drain pipe at the inlet of the machine to avoid soaking the machine's standing position.



CAUTION!

If you use the supply hose (8) for draining, make sure that the hose is not buckled and the water is allowed to run off freely.

PROCEDURE:

The PE-pipe is wound up on the reel, the cart stands just before the shut-off position. (Note when a shut-off valve is mounted: it must be possible to shift the three-way ball cock to the start position.)

Take off the end cap (with bore and baffle plate) from the "Garage" (1).
Press the plastic ball in the "garage" down by hand or with a piece of wood until the ball gets to lie in the straight horizontal pipe (2).

Disconnect the sprinkler connection hose (3) and connect the end ball with the valve (4) at this coupling.

Connect the 90° bend (5) to the "Garage"coupling - and the compressor hose (6) to the bend and to the compressor (7).

Now the PE-pipe can be drained with the compressor.
Technical requirements of compressor:
Operating pressure: 1.5 bar sufficient
Air capacity: minimum 5000 litres at 1.5 bar

It does not take more than 5 to 8 minutes to drain the PE-pipe. If the blow-out is continued for a longer time there will be air bubbles in the pipe that prevent further draining.



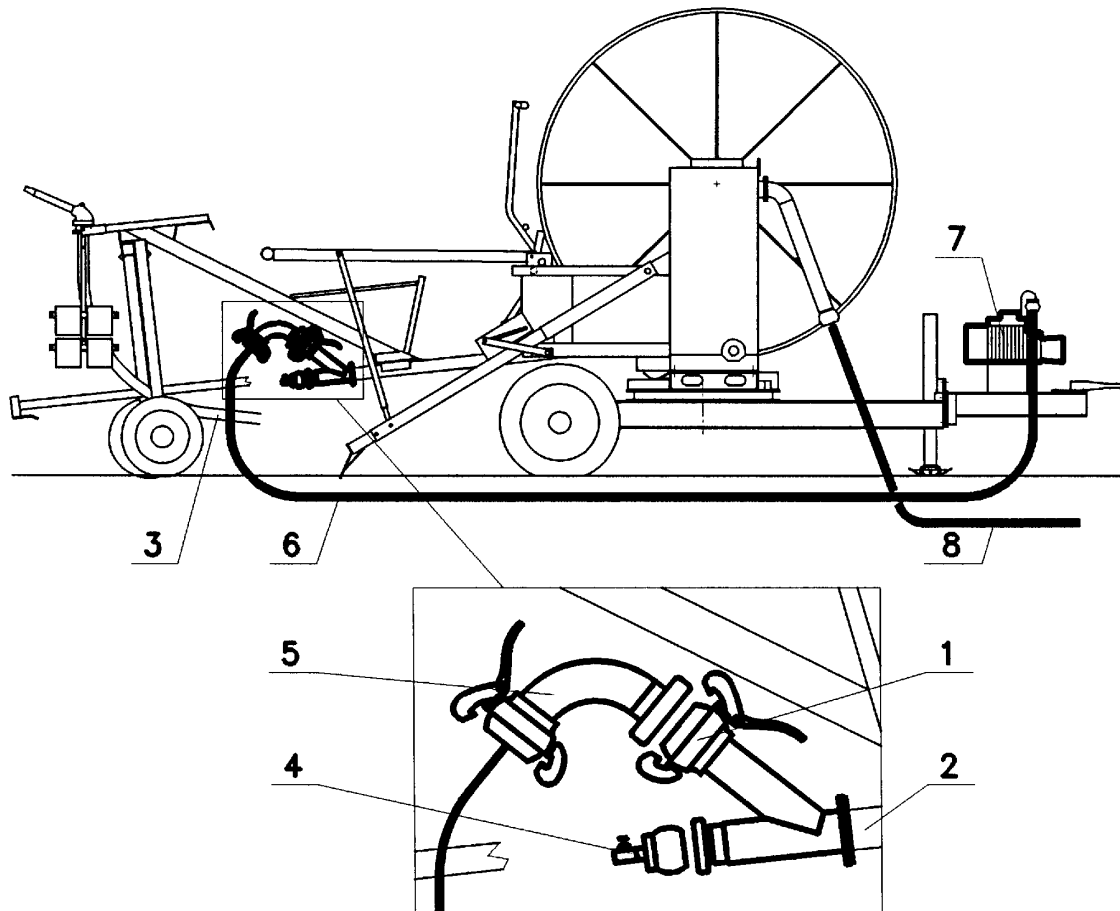
ATTENTION!

Before you open the couplings after the blow-out you must open the valve (4) to release the pressure in the PE-pipe !



Remove the fittings with the hose and couple the end cap with the baffle plate as well as the sprinkler connection hose.

The blow-out ball is located in the reel inlet bend. When you start irrigating the irrigation water carries the ball back into the „Garage“ (at the end of the horizontal pipe).



13.1.1 Possible faults during the PE-pipe blow-out with the

FAULT	REMEDY
PE-pipe has run empty.	Put the irrigation machine under pressure again until a full jet without air bubbles is discharged at the sprinkler.
Buckled drain hose from the turbine.	Lay the hose straight without buckles or connect a rigid pipe.
Shut-off valve not opened.	Open shut-off valve.
Plastic ball not in the proper position.	Push down the plastic ball far enough to place it in the straight horizontal pipe.
Incorrect plastic ball diameter.	Required ball diameter: PE-pipe dia. 100 mm : Ball dia. : 100 mm 110 mm : : 100 mm 120 mm : : 110 mm 125 mm : : 125 mm
Plastic ball damaged.	The ball must be round and faultless.
Insufficient compressor output.	Check compressor performance data and safety valve.

IMPORTANT!

The end cap on the branch pipe of the horizontal pipe („Garage“ of the plastic ball) must have a drain and vent hole through which the branch pipe is ventilated and drained when the ball is pressed to the cart by the water pressure from the turbine side. Then the plastic ball will park properly in the „garage“ during irrigation. If this drain hole is missing, the plastic ball remains in the area of the horizontal pipe during irrigation and may cause considerable pressure loss by diminished cross sections.

13.1.2 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 should be thoroughly checked and cleaned, and all parts regreased carefully.



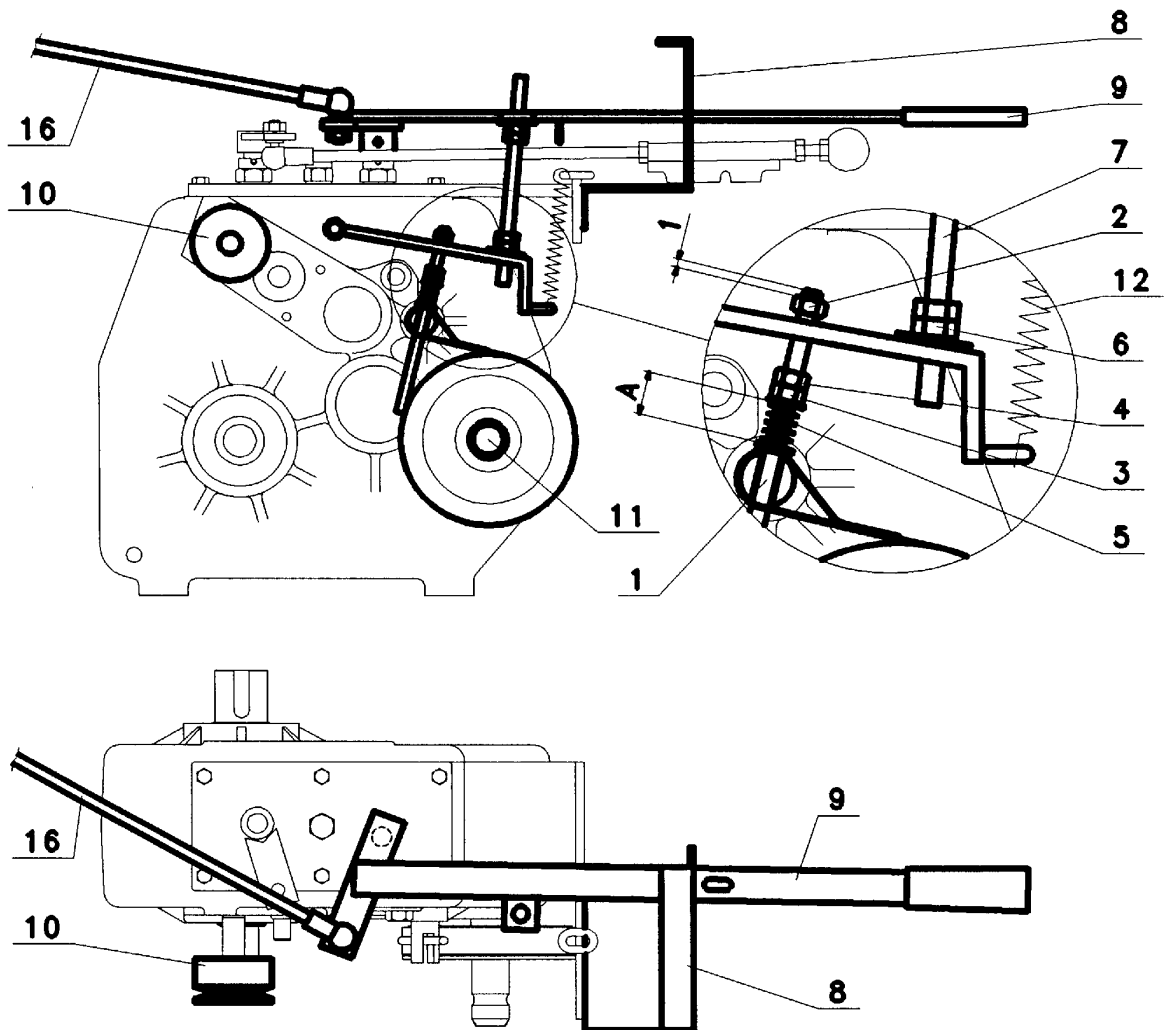
Machine part	Service interval	Lubricant, grease, oil
1. Helically grooved spindle of the winding mechanism	every 250 hours	Alvania Grease 3
2. Drive chain of winding mechanism	every 250 hours or as required	Alvania Grease 3
3. Driver (spindle nut) of winding mechanism	every 250 hours, change recommended after 2500 service hours	Alvania Grease 3
4. Driving chain	every 250 hours or as required	Alvania Grease 3
5. Change-speed gear	Change oil for first time after 500 service hours and then every 500 to 800 hours or at least once a year	6,0 l oil SAE 90 EP
6. Ball race	every 500 hours	through grease nipple Alvania Grease 3
7. Jack	as required	Oil SAE 20, Alvania Grease3 through grease nipple
8. Machine supports (sliding parts)	as required	Alvania Grease
9. Screwed joints	before putting into operation after 50 hours of operation	Tightening torques
Wheel nuts		300 Nm
Turntable side frame		210 Nm
Ball race on turntable and undercarriage		E1 - E4 = 85 Nm
Drawbar on frame		400 Nm
Hitch eye		210 Nm

14 Fault finding

FAULT	CAUSE	REMEDY
The PE-pipe cannot be pulled off.	Incorrect gear shift lever position.	Put it into the pull-off position.
	Brake band sticks to the brake drum.	Loosen the brake band.
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 PE-pipe actuates the safety shut-off.	Adjust the winding mechanism.
Repair broken winding chain.		
The final shut-off is actuated but the shut-off valve does not close.	Values for shut-off valve actuation are not set correctly.	Adjust the settings according to the manual.
	Thin plastic hose of shut-off valve blocked or broken.	Replace plastic hose.
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 varies from one PE-pipe layer to the next.	Varying ground conditions.	Adjust speed control to the existing ground conditions (change rod position on the lever of the layering mechanism).
The selected retraction speed is not reached.	Incorrect drive transmission.	Select proper V-belt and gear transmission.
	Blocked sprinkler nozzle.	Remove blockage.
	General: Compare connecting pressure and water flow with performance chart values.	



15 Setting instructions for Rainstar E



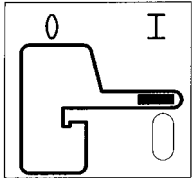


15.1 Setting the shifting gate

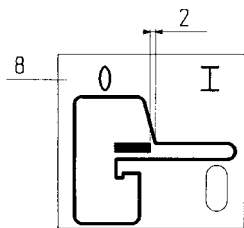
The shifting gate (8) must be adjusted to the shut-off point of the gearbox.

Procedure:

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



Turn the V-belt pulley (10) - the PTO shaft (11) rotates too!
Shift the shut-off lever (9) slowly to the "0" position.

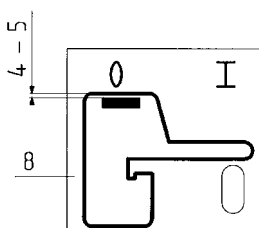


The shut-off point is reached when the PTO shaft no longer rotates.
Adjust the shifting gate (8) in this position according to the drawing (2 mm)!

The spring (12) presses the shut-off lever (9) upward along the incline of the shifting gate and thus into the recess in the gearbox.

15.2 Setting the threaded rod

Shift the shut-off lever to the shut-off position.



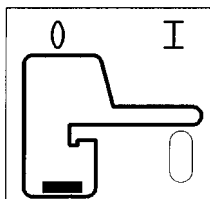
Turn the hex. nuts (6) on the threaded rod (7) apart until the spacing between the shifting gate (8) and the shut-off lever (9) is about 4 to 5 mm.
Secure the hex. nuts (6).

15.3 Setting the band brake

Tighten the hex. nut (2) of the band brake until the bolt thread of the brake band (1) projects 1 mm.
Tighten the hex. nut (3) until the spring (5) is biased with **A = 22 mm**.
Lock with nut (4).

15.4 Inspecting the band brake for release of the brake band

Move shut-off lever (9) to the "Release" position.



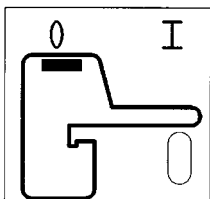
In this position the brake band must be slightly lifted off the brake disk. This prevents the brake band from sticking to the brake disk.

The brake band may stick after a longer standstill or after the winter period. It must be loosened before putting the machine into operation again !!! Do this by shortly turning the PTO shaft right and left with the hand wheel. If you do not observe this the gearbox may break !!!

15.5 Setting of the gearbox shut-off

The shut-off frame (13) is adjusted at **X** mm from the reel (17) (see chart).

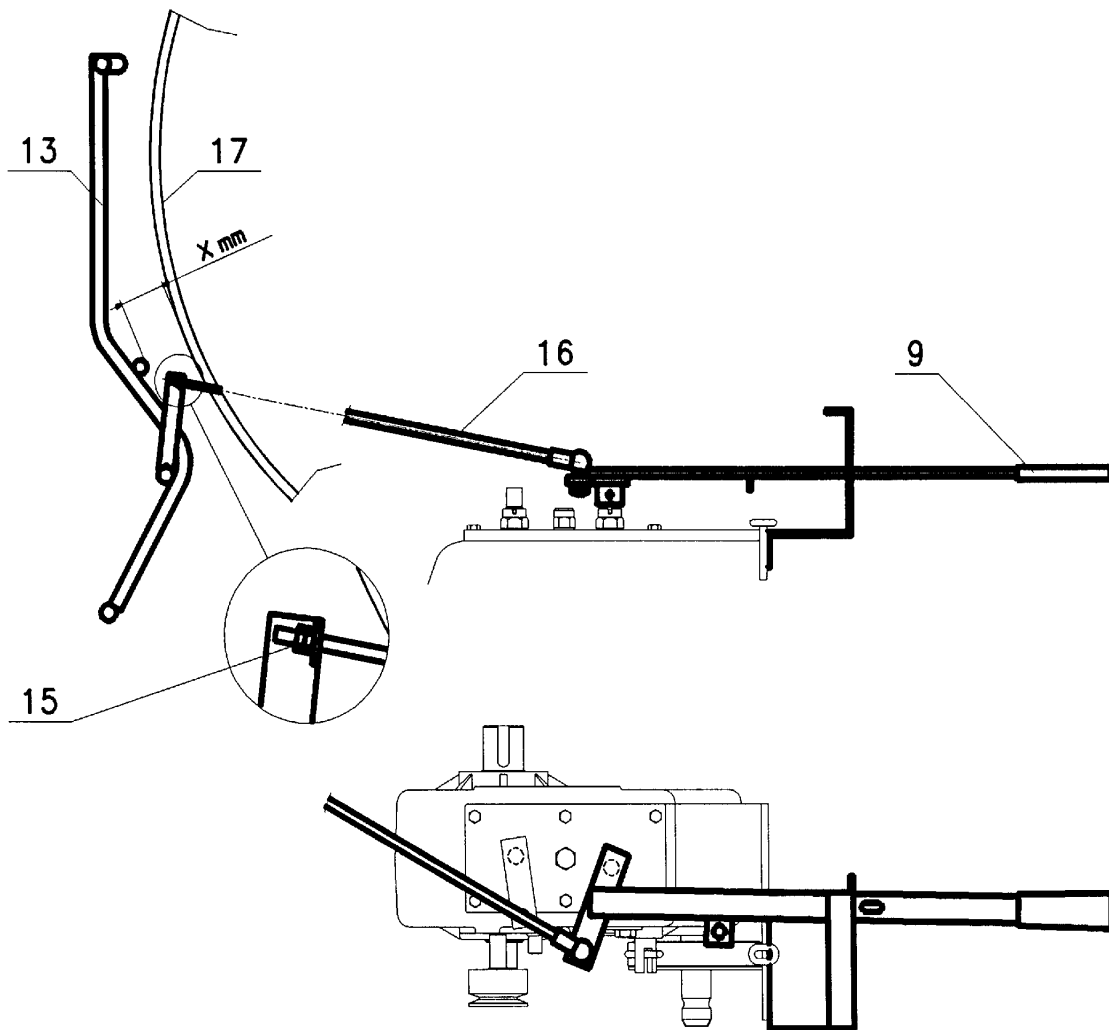
Move the shut-off lever (9) to the shut-off position.



The hex. nut (15) on the control lever (16) is adjusted to the bracket (14) of the shut-off frame. Secure the nut.

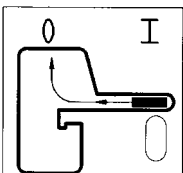
Pipe dia.	X mm
90	
100	
110	
120	
125	

„**X**“ see page 42



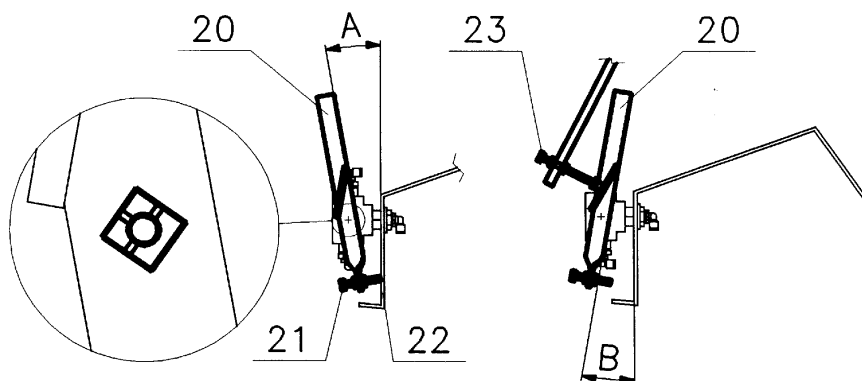
15.6 Testing the shut-off:

Put the shut-off frame (13) to the PE-pipe (last pipe layer).
Move the shut-off lever (9) to the "PE-pipe retraction" position.
Pull the shut-off frame (13) to the shut-off position (= **X** mm from the reel).
The shut-off lever must jump into the shut-off position!



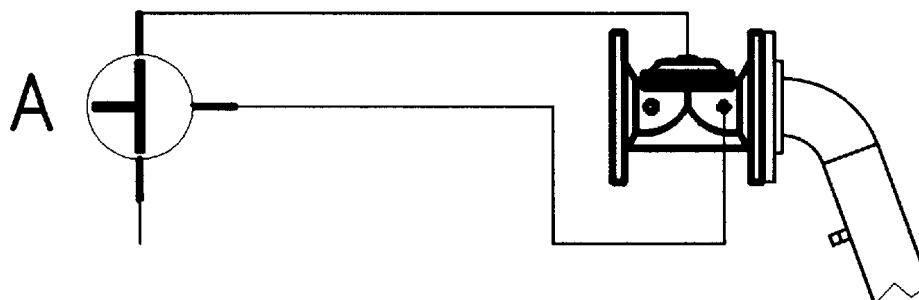
15.7 Setting the three way ball clock FOR LOW AND OVERPRESSURE SHUT-OFF VALVE OPTIONS

Shift the control lever (20) of the three-way ball cock to the position $A = 15^\circ$ and turn the adjusting screw (21) to the connecting bracket.

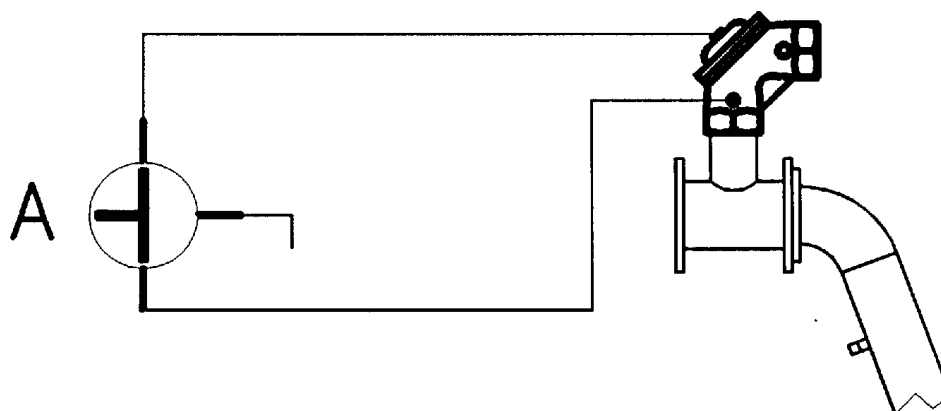


With the shut-off frame in position X mm (see pages 36 and 37), turn the adjusting screw (23) to the control lever (20) in position $B = 15^\circ$ and secure with the nut.

Switching diagram of OVERPRESSURE shut-off valve



Switching diagram of LOW PRESSURE shut-off valve





15.8 Adjusting the winding mechanism THE WINDING MECHANISM

Take off the drive chain of the winding mechanism (1) between the reel and the helically grooved spindle.

Shift the helically grooved spindle (2) with the pillow blocks completely to the left in the mounting holes of the connecting bracket (7) (looking into the driving direction from the rear) and fasten it again.

PE - pipe dia. 110 / E 4 : Shift the helically grooved spindle (2) with the pillow blocks completely to the **right** in the mounting holes of the connecting bracket (7) (looking into the driving direction from the rear) and fasten it again.

Move the guide block (3) of the winding carriage to the outermost reversing point on the right by turning the helically grooved spindle.

Align the right guide bar (4) of the winding carriage with the inner reel side wall at the measure **X 1** according to the drawing and fasten it on the guide part (3).

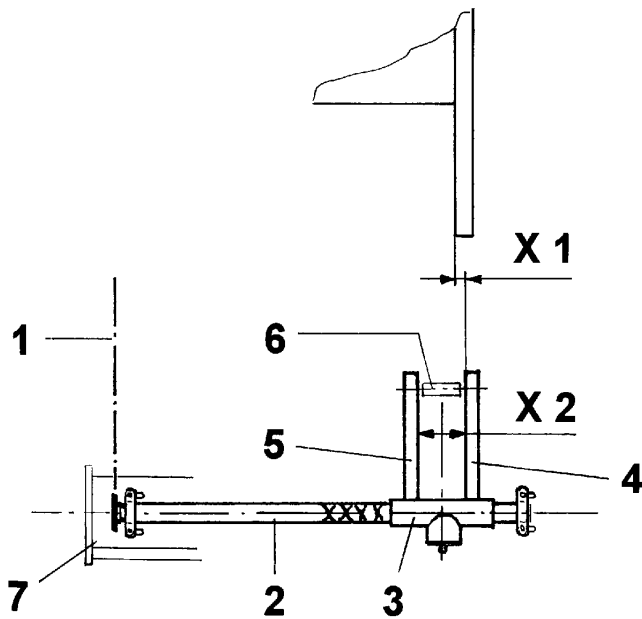
PE - pipe dia.		X 1	X 2
90	E1	0	110
100	E1 - E4	17	126
110	E1	14	140
110	E2 , E3	20	140
110	E4 , E5	18	146
120	E2 , E3	28	156
120	E4 , E5	18	150
125	E3 , E4 , E5	24	160
140	E4 , E5	20	170

Align the left guide bar (5) at the spacing **X 2** and fasten it.

Note!

When using a PE-pipe repair coupling you must increase the spacing **X 2** symmetrically by 15 to 20 mm !

Mount the roller bracket (6) with the roller



15.9 Setting the starting position

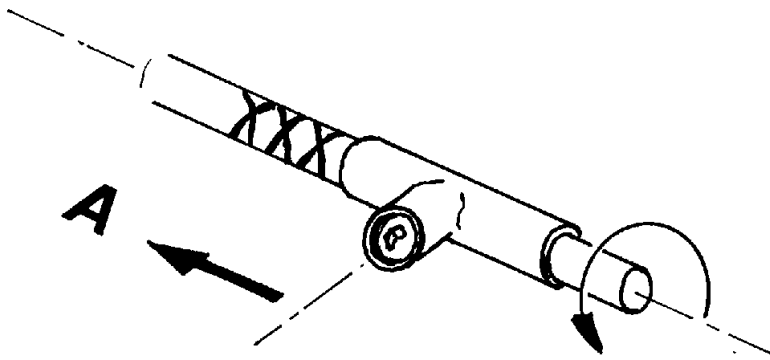
Adjust the reel with the connecting bend (7) according to the angle α .

PE - pipe dia.		X3	α
90	E1 - E4	0	0
100	E1 - E4	0	0
110	E1	35	0
110	E2 , E3	0	0
110	E4 , E5	0	0
120	E2 , E3	0	0
120	E4 , E5	0	0
125	E3 , E4 , E5	0	0
140	E4 , E5	0	0

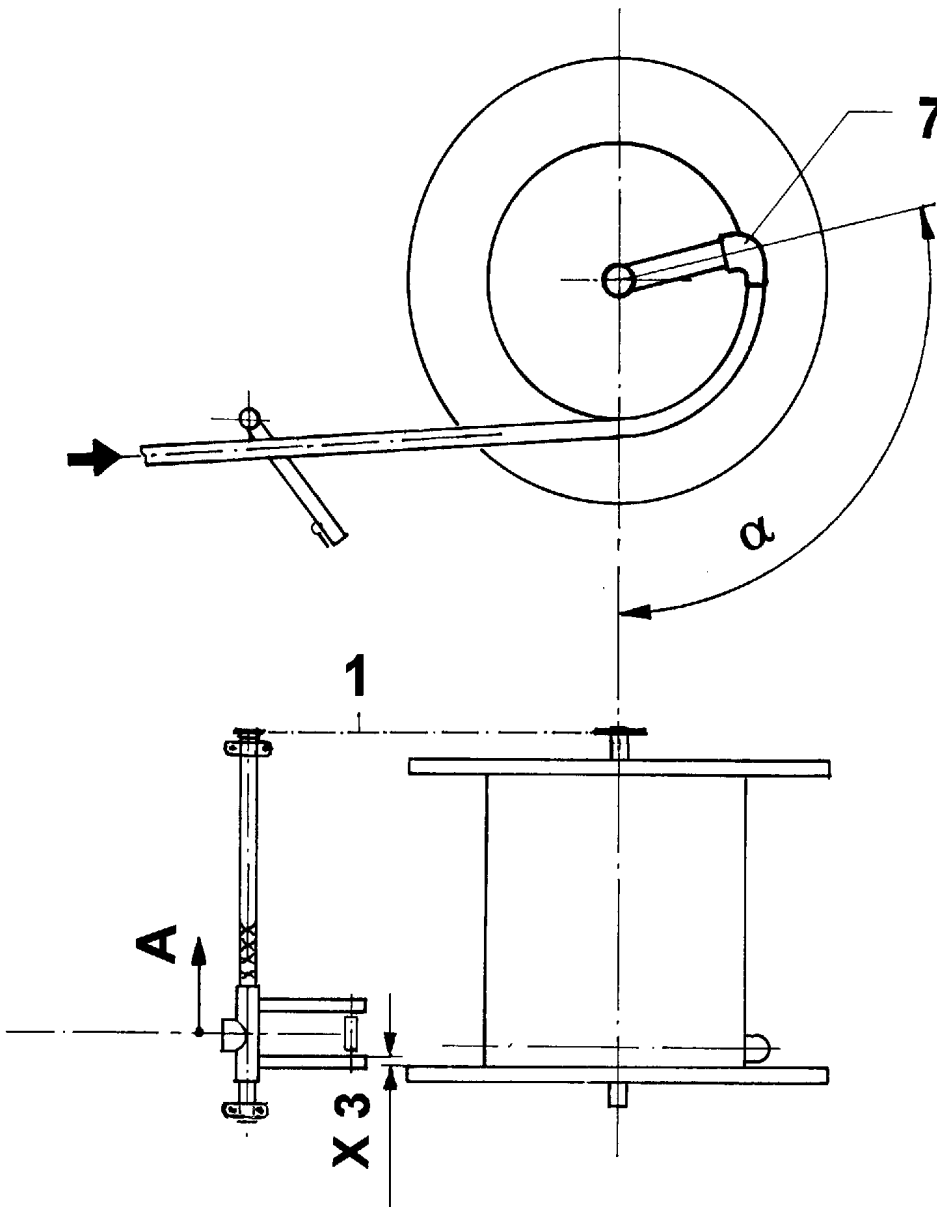
Align the right guide bar at the spacing **X 3** to the inner reel side wall by turning the helically grooved spindle.

Note!

Thereby the spindle must be turned corresponding to the wind-up (counter-clockwise, see drawing). The winding carriage moves left from the reversing point (direction A).



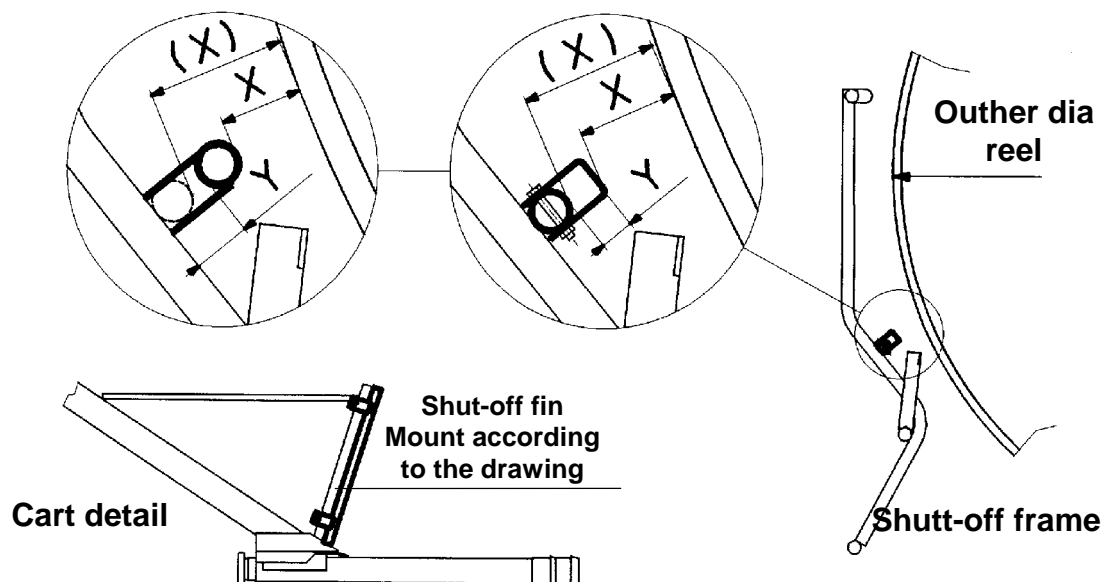
Put on the driving chain (1) of the winding mechanism again.



15.9.1 Setting values for shut-off frame and cart

Shut-off frame adjustable

Shut-off frame with a. without U-profil



Basic unit	Machine model	Shut-off frame		Cart shut-off fin adapter [mm]
		Spacing X (X) [mm]	Switch tube adapter Y [mm]	

E 1	E 90 - 370	50	35	30
	E 90 - 400	50	35	30
	E 90 - 420	50	35	30
	E 90 - 450	50	35	30
	E 90 - 480	(80)	--	--
	E 90 - 510	(80)	--	--
	E 100 - 300	50	35	--
	E 100 - 330	50	35	--
	E 100 - 350	60	35	30
	E 100 - 380	60	35	30
E 110 - 300	(80)	--	--	

Basic unit	Machine model	Shut-off frame		Cart shut-off fin adapter [mm]
		Spacing X (X) [mm]	Switch tube adapter Y [mm]	

E 3	E 100 - 480	60	20	--
	E 100 - 500	60	20	--
	E 110 - 450	(85)	--	--
	E 110 - 470	(85)	--	--
	E 125 - 310	(75)	--	--
	E 125 - 350	(75)	--	--

E 2	E 100 - 400	60	35	30
	E 100 - 430	60	35	30
	E 100 - 450	60	35	30
	E 110 - 350	(85)	--	--
	E 110 - 380	(85)	--	--
	E 110 - 400	(85)	--	--
	E 110 - 420	(85)	--	--
	E 120 - 300	(80)	--	--

E 4	E 100	(60)	--	--
E4/E5	E 110	(70)	--	--
E4/E5	E 120	(75)	--	--
	E 125	(75)	--	--
	E 140	(75)	--	--



15.10 Mounting the machine supports

Set up the Rainstar on level ground in an all-round horizontal position.

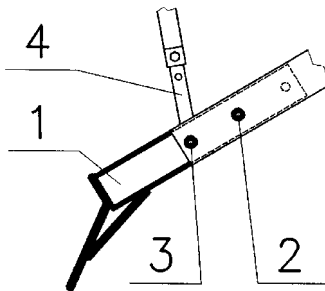
The right and left machine supports are shipped in a wooden crate.

Mount the supports on the machine as described below:

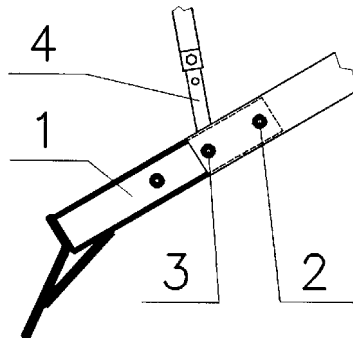
Mount the anchoring shields (1) (shipped loose) on both support legs according to the drawing.

Tighten bolt (2) firmly.

Tighten the bolt (3) with the lower support brace (4) only slightly to allow the support brace to swivel.



In special situations, if the path on which the Rainstar is standing is slightly inclined, the anchoring shield can be mounted in a 120 mm extended position.



Put the right support leg into engagement with the guide (5) (according to the drawing) and bolt it to the turntable side frame (7) with bolt (6).

Mount the support lift (8) in the turntable side frame with the bolt, turn up the fork and screw it with bolt (9).

Repeat this procedure for the left machine support.

15.11 Mounting and adjusting the cart lift

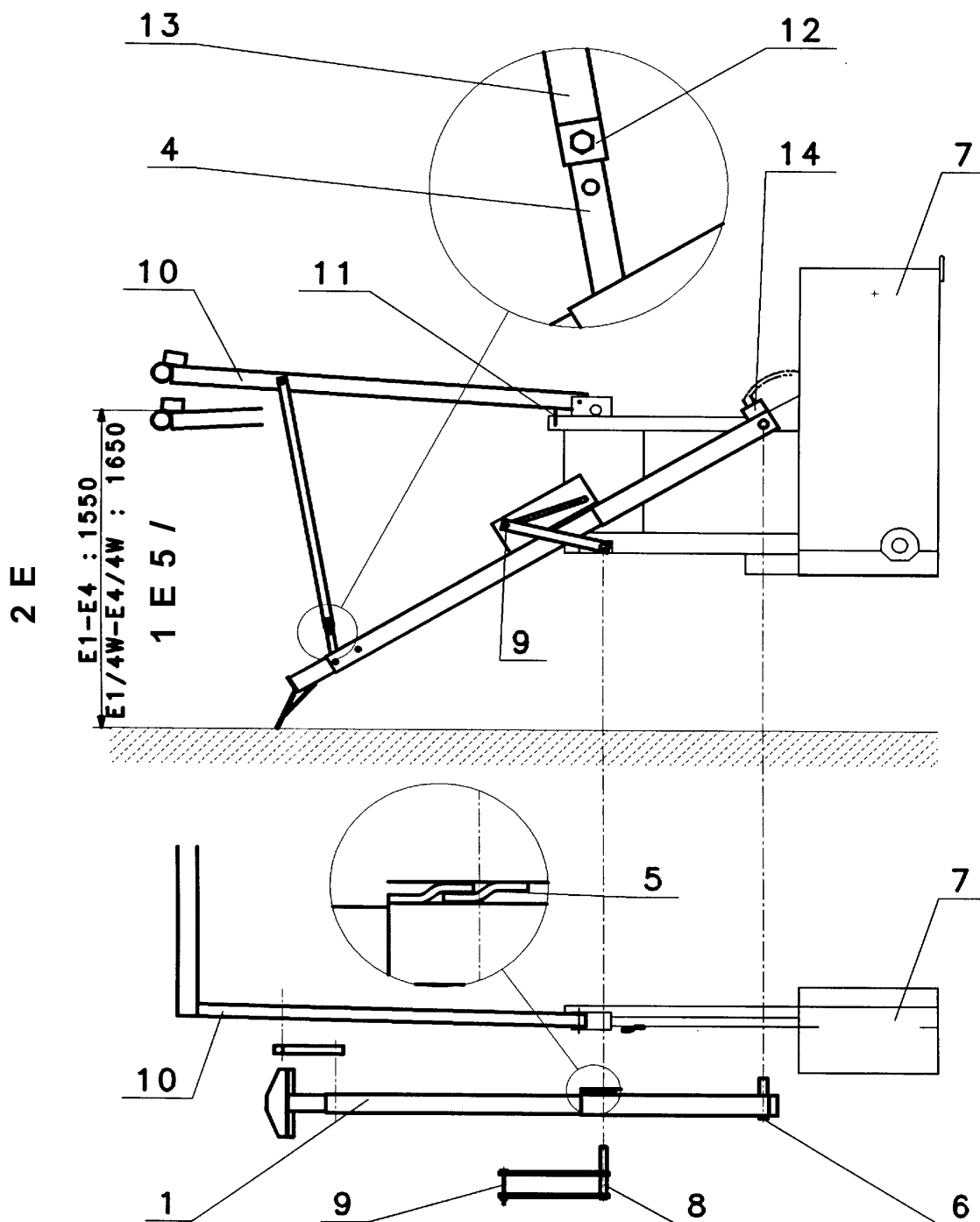
Mount the cart lift bracket (10) according to the drawing. (Stop brackets pointing upward).

Move the cross beam to 1550 mm height, adjust the setscrews (11) and secure them.

Mount both square washers (12) on the lower braces (4).

Note! The upper bore hole for E1 , E2 , E3 ; the lower bore hole for E4 , E5

Push the upper brace (13) over the lower brace (4).
 Lift up the cart lift bracket (10) and screw it with the braces in such a way that it can swivel.

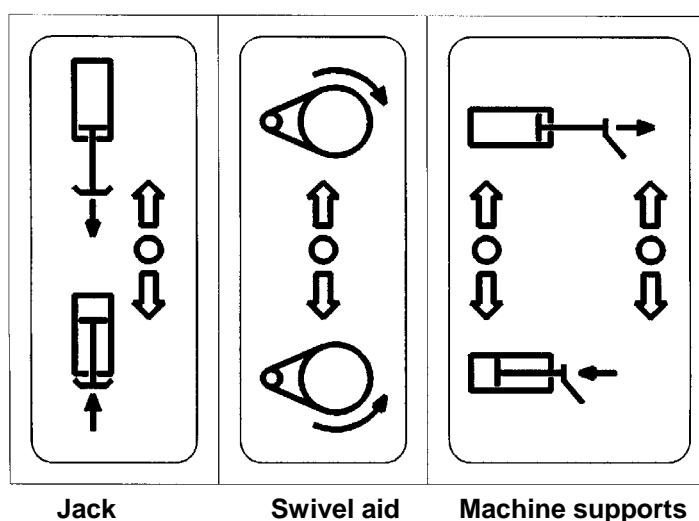


15.12 Description of the hydraulic system:

Now the hydraulic hoses are coupled with the non-return valve blocks (14).

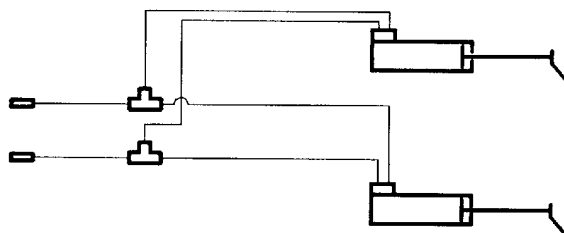
If the inspection of the hydraulic system shows that the cylinder movements are wrong you must exchange the hydraulic hoses !

This is also necessary when the moving directions with mounted control valve options do not correspond with the predefined switching diagrams.

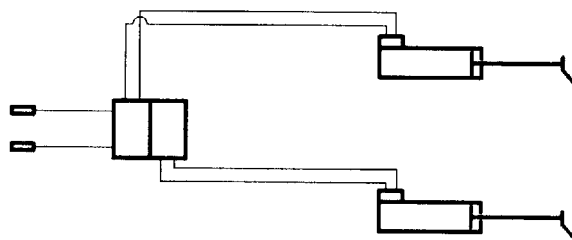


The standard Rainstar outfit includes hydraulic machine supports without a control valve block.

“Standard“ hydraulic diagram:

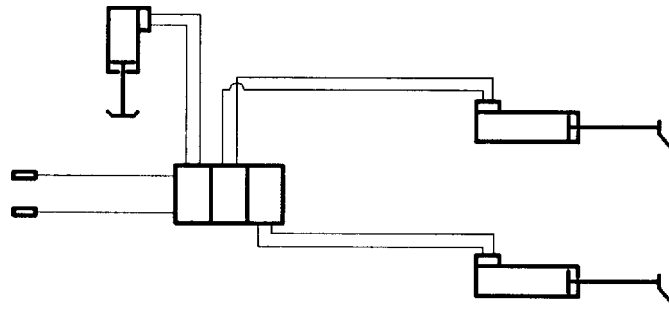


Hydraulic diagram “Control valve block - machine supports“ (OPTION)

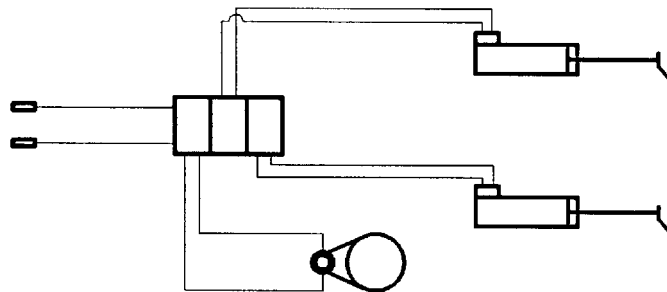




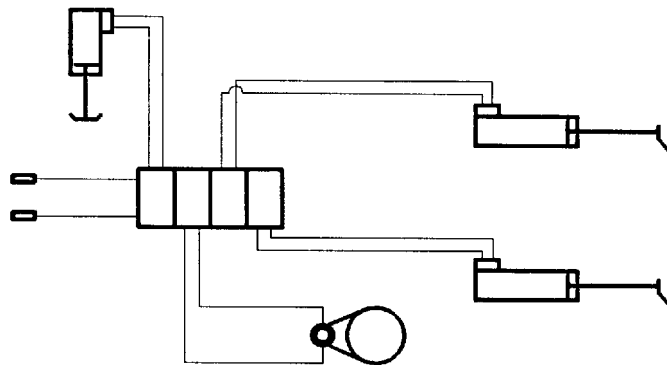
Hydraulic diagram "Control valve block - Machine supports + jack" (OPTION)



Hydraulic diagram "Control valve block - machine supports + swivel aid" (OPTION)

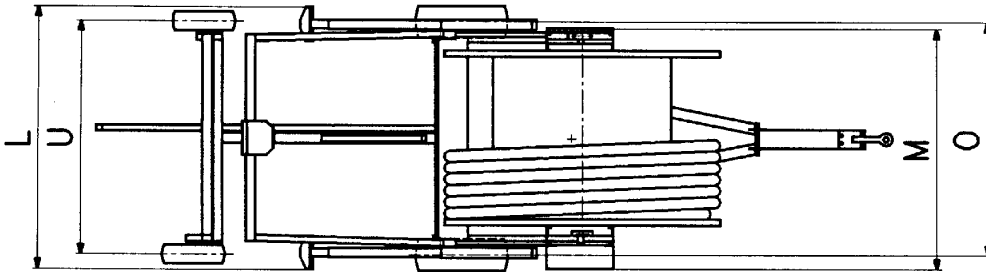
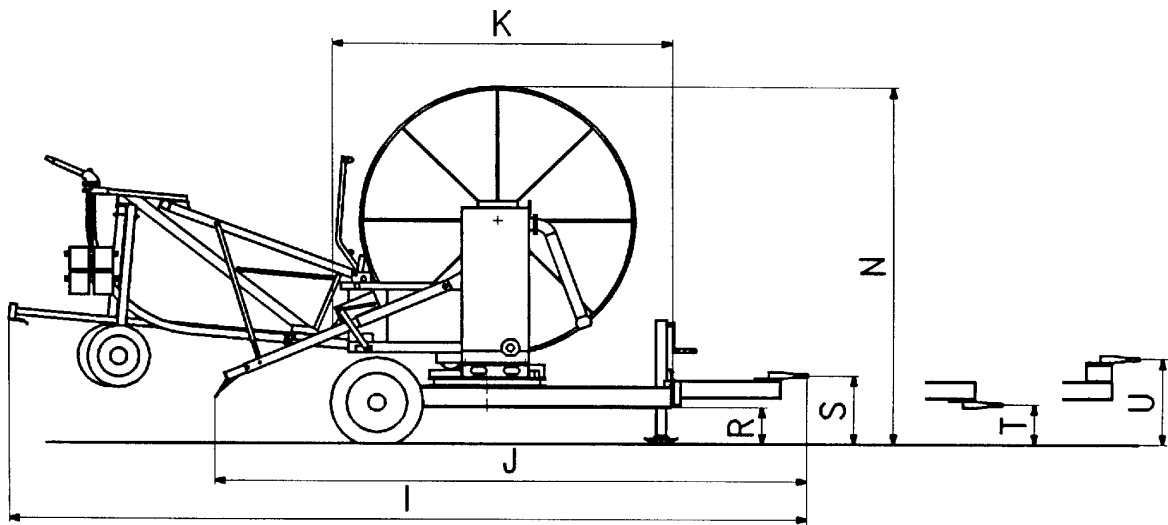


Hydraulic diagram "Control valve block - machine supports + jack +swivel aid" (OPTION)



CAUTION!

For safety reasons you must handle the hydraulic system with utmost care.
The rear right support and the cart area are not directly visible from the operator's position.
Therefore no other person is allowed in the immediate vicinity of the machine !



A	PE-pipe dia. x length	M	Shipping width
B	Max. strip length	N	Overall height
C	Turbine	O	Track width of undercarriage
D	Discharge capacity	P	Tires - undercarriage
E	Connecting pressure	Q	Tire pressure - undercarriage
F	Nozzle range	R	Ground clearance
G	Weight incl. PE-pipe with water *	S	Hitch height - standard
H	Weight incl. empty PE-pipe *	T	Hitch height - below PTO
I	Overall length incl. cart	U	Hitch height - w. height increase
J	Overall length without cart	V	Cart track width
K	Shipping length	W	Cart tires
L	Max. width	X	Cart tire pressure

* Overall weight including cart, sprinkler and two or 4 balancing weights.



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16 Declaration of Conformity

EU Declaration of Conformity

in accordance with the General EU Principles for Machinery
89/392/EEG/Annex IIA

We,

Röhren- und Pumpenwerk BAUER Gesellschaft m.b.H.
Kowaldstraße 2, A - 8570 Voitsberg - Austria
Tel. +43 / 3142 / 200 - 0, Telefax: +43 / 3142 / 23 0 95

Herewith declare that in respect of its conception and construction and in the types and styles marketed by us, the machine mentioned below fully corresponds with the relevant fundamental provisions for safety and health stipulated in the General EU Principles for Machinery.

Any modification to this machine without our express agreement will invalidate this attestation.

Designation: BAUER Rainstar

Basic model: E1, E2, E3, E4, E5

This range of machine is designed and manufactured in accordance with the standard:
EN 707

Which also includes the normative references to EN 292-1 – 1991, EN 292-2 – 1991 and EN 294 - 1992

Voitsberg, 25.07.1998

Dr. Ing. Erwin Reisinger
Director
Technical Design and Quality Control



17 Warranty

[Insert:: Garantiebedingungen, Registrierkarte, Garantiefall-Karte]